QUICK REFERENCE CHART: QX4 [ ] 1999

ENGINE TUNE-UP DATA

Engine model		VG33E		
Firing order		1-2-3-4-5-6		
Idle speed rpm	A/T (in "N" position)	750±50		
Ignition timing (degree BTDC at idle speed)		15°±2°		
CO% at idle		Idle mixture screw is preset and sealed at factory.		
Drive belt deflection (Cold) mm (in)		Used belt		Deflection of new belt
		Limit	Deflection after adjustment	
Generator		10.5 (0.413)	6 - 7 (0.24 - 0.28)	5.5 - 6.5 (0.217 - 0.256)
Air conditioner compressor		16.5 (0.650)	10.5 - 11.5 (0.413 - 0.453)	9 - 10 (0.35 - 0.39)
Power steering oil pump		18 (0.71)	11 - 13 (0.43 - 0.51)	9 - 10 (0.35 - 0.39)
Applied pressed force N (kg, lb)		98 (10, 22)		
Drive belt tension adjustment (Cold) N (kg, lb)		Used belt		New belt
		Limit	After adjustment	
Generator		324 (33, 73)	731 - 818 (74.5 - 83.5, 165 - 184)	839 - 926 (85.5 - 94.5, 189 - 208)
Air conditioner compressor		196 (20, 44)	555 - 642 (56.5 - 65.5, 125 - 144)	672 - 760 (68.5 - 77.5, 151 - 170)
Power steering pump		147 (15, 33)	329 - 416 (33.5 - 42.5, 74 - 93)	466 - 554 (47.5 - 56.5, 105 - 124)
Radiator cap relief pressure kPa (kg/cm^2, psi)		78 - 98 (0.8 - 1.0, 11 - 14)		
Cooling system leakage testing pressure kPa (kg/cm^2, psi)		157 (1.6, 23)		
Compression pressure kPa (kg/cm^2, psi)/rpm	Standard	1,196 (12.20, 173.4)/300		
	Minimum	883 (9.01, 128.0)/300		
Spark plug	Standard	FR5AP-10		
	Cold	FR6AP-10		
	Hot	FR4AP-10		

WHEEL ALIGNMENT (Unladen*)

Applied model		245/70 R16 tire
Camber	Minimum	−0°35′ (−0.58°)
	Nominal	0°10′ (0.17°)
	Maximum	0°55′ (0.92°)
Degree minute (Decimal degree)	Left and right difference	45′ (0.75°) or less
Caster	Minimum	2°15′ (2.25°)
	Nominal	3°00′ (3.00°)
	Maximum	3°45′ (3.75°)
Degree minute (Decimal degree)	Left and right difference	45′ (0.75°) or less
Total toe-in	Minimum	1 (0.04)
Distance (A – B)	Nominal	2 (0.08)
mm (in)	Maximum	3 (0.12)
Angle (left plus right)	Minimum	5′ (0.08°)
	Nominal	10′ (0.17°)
Degree minute (Decimal degree)	Maximum	15′ (0.25°)
Wheel turning angle (Full turn)	Minimum	30°00′ (30.00°)
Inside	Nominal	33°00′ (33.00°)
Degree minute (Decimal degree)	Maximum	34°00′ (34.00°)
Outside	Minimum	28°00′ (28.00°)
Degree minute (Decimal degree)	Nominal	31°00′ (31.00°)
	Maximum	32°00′ (32.00°)

* Fuel, radiator coolant and engine oil full.
Spare tire, jack, hand tools and mats in designated positions.

BRAKE

Unit: mm (in)

Front brake	
Pad wear limit	2.0 (0.079)
Rotor repair limit	26.0 (1.024)
Rear brake	
Lining wear limit	1.5 (0.059)
Drum repair limit	296.5 (11.67)
Pedal free height	175 - 185 (6.89 - 7.28)
Pedal depressed height*1	70 (2.76)
Parking brake	
Number of notches*2	6 - 8

*1 Under force of 490 N (50 kg, 110 lb) with engine running
*2 At pulling force: 196 N (20 kg, 44 lb)

REFILL CAPACITIES

Unit			Liter	US measure
Coolant with reservoir			10.2	10-3/4 qt
Engine*	With oil filter		3.7	3-7/8 qt
	Without oil filter		3.4	3-5/8 qt
	Dry engine (engine overhaul)		4.2	4-1/2 qt
Transmission	A/T	4WD	8.5	9 qt
All-mode 4WD transfer			3.0	2-5/8 qt
Differential carrier		Front	1.85	3-7/8 pt
		Rear	2.8	5-7/8 pt
Power steering system			0.9	1 qt
Air conditioning system		Refrigerant	0.60 - 0.70 kg	1.32 - 1.54 lb
		Compressor oil	0.20	6.8 fl oz

* For further details, see "Changing Engine Oil" in MA section.

FRONT WHEEL BEARING

Preload (At hub bolt) N (kg, lb)	Wheel bearing lock nut Tightening torque N m (kg-m, ft-lb)	78 - 98 (8 - 10, 58 - 72)
	Retightening torque after loosening wheel bearing lock nut N m (kg-m, in-lb)	0.5 - 1.5 (0.05 - 0.15, 4.3 - 13.0)
	Axial end play mm (in)	0 (0)
	Starting force at wheel hub bolt N (kg, lb)	A
	Turning angle degree	15° - 30°
	Starting force at wheel hub bolt N (kg, lb)	B
	Wheel bearing preload at wheel hub bolt B – A N (kg, lb)	7.06 - 20.99 (0.72 - 2.14, 1.59 - 4.72)

INFINITI®

QX4

MODEL R50 SERIES

Volume 2

For the following sections, refer to Volume 1 (Pub. No. SM9E-1J50U0).

- MA, EM, LC, EC, FE, AT, TF and PD

QUICK REFERENCE INDEX

GENERAL INFORMATION	GI
MAINTENANCE	MA
ENGINE MECHANICAL	EM
ENGINE LUBRICATION & COOLING SYSTEMS	LC
ENGINE CONTROL SYSTEM	EC
ACCELERATOR CONTROL, FUEL & EXHAUST SYSTEMS	FE
AUTOMATIC TRANSMISSION	AT
TRANSFER	TF
PROPELLER SHAFT & DIFFERENTIAL CARRIER	PD
FRONT & REAR AXLE	AX
FRONT & REAR SUSPENSION	SU
BRAKE SYSTEM	BR
STEERING SYSTEM	ST
RESTRAINT SYSTEM	RS
BODY & TRIM	BT
HEATER & AIR CONDITIONER	HA
STARTING & CHARGING SYSTEM	SC
ELECTRICAL SYSTEM	EL
ALPHABETICAL INDEX	IDX

INFINITI®

© 1998 NISSAN MOTOR CO., LTD.

Printed in Japan

All rights reserved. No part of this Service Manual may be reproduced or stored in a retrieval system, or transmitted in any form, or by any means, electronic, mechanical, photocopying, recording or otherwise, without the prior written permission of Nissan Motor Company Ltd., Tokyo, Japan.

FOREWORD

This manual contains maintenance and repair procedures for the 1999 INFINITI QX4 models starting from SERIAL No. 060001.

For the following sections, refer to Volume 1 (Pub. No. SM9E-1J50U0).
- MA, EM, LC, EC, FE, AT, TF and PD

In order to assure your safety and the efficient functioning of the vehicle, this manual should be read thoroughly. It is especially important that the PRECAUTIONS in the GI section be completely understood before starting any repair task.

All information in this manual is based on the latest product information at the time of publication. The right is reserved to make changes in specifications and methods at any time without notice.

IMPORTANT SAFETY NOTICE

The proper performance of service is essential for both the safety of the technician and the efficient functioning of the vehicle.
The service methods in this Service Manual are described in such a manner that the service may be performed safely and accurately.
Service varies with the procedures used, the skills of the technician and the tools and parts available. Accordingly, anyone using service procedures, tools or parts which are not specifically recommended by INFINITI must first be completely satisfied that neither personal safety nor the vehicle's safety will be jeopardized by the service method selected.

INFINITI®

NISSAN MOTOR CO., LTD.
Overseas Service Department
Tokyo, Japan

GENERAL INFORMATION

SECTION GI

CONTENTS

PRECAUTIONS 2
Precautions 2
PRECAUTIONS FOR SUPPLEMENTAL RESTRAINT SYSTEM (SRS) "AIR BAG" AND "SEAT BELT PRE-TENSIONER" 2
PRECAUTIONS FOR IVIS (INFINITI VEHICLE IMMOBILISER SYSTEM — NATS) 2
PRECAUTIONS FOR INFINITI COMMUNICATOR (IVCS) 3
GENERAL PRECAUTIONS 3
PRECAUTIONS FOR MULTIPORT FUEL INJECTION SYSTEM OR ENGINE CONTROL SYSTEM 5
PRECAUTIONS FOR THREE WAY CATALYST 5
PRECAUTIONS FOR ENGINE OILS 5
PRECAUTIONS FOR FUEL 6
PRECAUTIONS FOR AIR CONDITIONING 6
HOW TO USE THIS MANUAL 7
HOW TO READ WIRING DIAGRAMS 9
Sample/Wiring Diagram — EXAMPL — 9
OPTIONAL SPLICE 10
Description 11
CONNECTOR SYMBOLS 13
HARNESS INDICATION 14
COMPONENT INDICATION 14
SWITCH POSITIONS 14
DETECTABLE LINES AND NON-DETECTABLE LINES 15
MULTIPLE SWITCH 16
FOLDOUT PAGE 17
HOW TO CHECK TERMINAL 18
Connector and Terminal Pin Kit 18
How to Probe Connectors 18
PROBING FROM HARNESS SIDE 18
PROBING FROM TERMINAL SIDE 18
How to Check Enlarged Contact Spring of Terminal 19
Waterproof Connector Inspection 20
RUBBER SEAL INSPECTION 20
WIRE SEAL INSPECTION 20
Terminal Lock Inspection 20
HOW TO PERFORM EFFICIENT DIAGNOSIS FOR AN ELECTRICAL INCIDENT 21
Work Flow 21
Incident Simulation Tests 22
INTRODUCTION 22
VEHICLE VIBRATION 22
HEAT SENSITIVE 23
FREEZING 23
WATER INTRUSION 24
ELECTRICAL LOAD 24
COLD OR HOT START UP 24
Circuit Inspection 24
INTRODUCTION 24
TESTING FOR "OPENS" IN THE CIRCUIT 25
TESTING FOR "SHORTS" IN THE CIRCUIT 26
GROUND INSPECTION 27
VOLTAGE DROP TESTS 27
CONTROL UNIT CIRCUIT TEST 29
HOW TO FOLLOW TROUBLE DIAGNOSES 31
How to Follow Test Groups in Trouble Diagnoses 32
Key to Symbols Signifying Measurements or Procedures 33
CONSULT CHECKING SYSTEM 35
Function and System Application 35
Lithium Battery Replacement 36
Checking Equipment 36
Loading Procedure 37
CONSULT Data Link Connector (DLC) Circuit 37
INSPECTION PROCEDURE 37
IDENTIFICATION INFORMATION 38
Model Variation 38
PREFIX AND SUFFIX DESIGNATIONS 38
Identification Number 38
VEHICLE IDENTIFICATION NUMBER ARRANGEMENT 39
IDENTIFICATION PLATE 39
ENGINE SERIAL NUMBER 40
AUTOMATIC TRANSMISSION NUMBER 40
TRANSFER SERIAL NUMBER 40
Dimensions 40

CONTENTS (Cont'd)

Wheels & Tires 41
LIFTING POINTS AND TOW TRUCK TOWING 42
Screw Jack 42
Garage Jack and Safety Stand 43
2-pole Lift 44
Tow Truck Towing 44
VEHICLE RECOVERY 45
TIGHTENING TORQUE OF STANDARD BOLTS 46
SAE J1930 TERMINOLOGY LIST 47
SAE J1930 Terminology List 47

Precautions

NBGI0001

Observe the following precautions to ensure safe and proper servicing. These precautions are not described in each individual section.

SGI646

PRECAUTIONS FOR SUPPLEMENTAL RESTRAINT SYSTEM (SRS) "AIR BAG" AND "SEAT BELT PRE-TENSIONER"

NBGI0001S01

The Supplemental Restraint System such as "AIR BAG" and "SEAT BELT PRE-TENSIONER" used along with a seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. The SRS system composition which is available to INFINITI QX4 is as follows:

- For a frontal collision
  The Supplemental Restraint System consists of driver air bag module (located in the center of the steering wheel), front passenger air bag module (located on the instrument panel on passenger side), seat belt pre-tensioners, a diagnosis sensor unit, warning lamp, wiring harness and spiral cable.
- For a side collision
  The Supplemental Restraint System consists of side air bag module (located in the outer side of front seat), satellite sensor, diagnosis sensor unit (one of components of air bags for a frontal collision), wiring harness, warning lamp (one of components of air bags for a frontal collision).

Information necessary to service the system safely is included in the **RS section** of this Service Manual.

WARNING:

- **To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance must be performed by an authorized INFINITI dealer.**
- **Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the RS section.**
- **Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. Spiral cable and wiring harnesses (except "SEAT BELT PRE-TENSIONER") covered with yellow insulation either just before the harness connectors or for the complete harness are related to the SRS.**

PRECAUTIONS FOR IVIS (INFINITI VEHICLE IMMOBILISER SYSTEM — NATS)

NBGI0001S08

NATS (Nissan Anti-Theft System)

NBGI0001S0801

NATS will immobilise the engine if someone tries to start it without the registered key of NATS.
Both of the originally supplied ignition key IDs have been NATS registered.

The security indicator is located on the instrument panel. The indicator blinks when the ignition switch is in OFF or ACC position. Therefore, NATS warns outsiders that the vehicle is equipped with the anti-theft system.

- When NATS detects trouble, the security indicator lamp lights up while ignition switch is in ON position.
  This lighting up indicates that the anti-theft is not functioning, so prompt service is required.
- When servicing NATS (trouble diagnoses, system initialization and additional registration of other NATS ignition key IDs), CONSULT hardware and CONSULT NATS software is necessary.
  Regarding the procedures of NATS initialization and NATS ignition key ID registration, refer to CONSULT operation manual, NATS.

Therefore, CONSULT NATS software (program card and operation manual) must be kept strictly confidential to maintain the integrity of the anti-theft function.

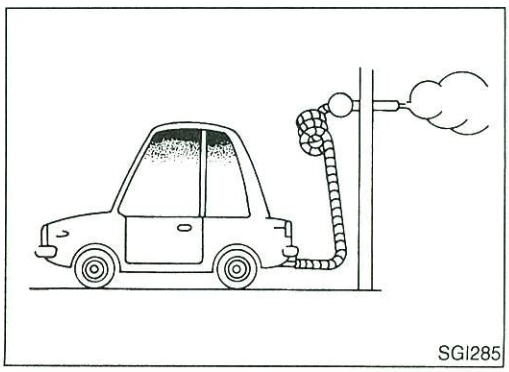
- When servicing NATS (trouble diagnoses, system initialization and additional registration of other NATS ignition key IDs), it may be necessary to re-register original key identification. Therefore, be sure to receive all keys from vehicle owner.
  A maximum of five key IDs can be registered into NATS.
- When failing to start the engine first time using the key of NATS (for example, when interference is caused by another NATS key, an automated full road device or automated payment device on the key ring), restart as follows.

a) Leave the ignition switch in ON position for approximately 5 seconds.
b) Turn ignition switch to OFF or LOCK position and wait approximately 5 seconds.
c) Repeat step 1 and 2.
d) Restart the engine while holding the device (which may have caused the interference) separate from the registered NATS key. If the no start condition re-occurs, NISSAN recommends placing the registered NATS key on a separate key ring to avoid interference from other devices.

PRECAUTIONS FOR INFINITI COMMUNICATOR (IVCS)

NBGI0001S09

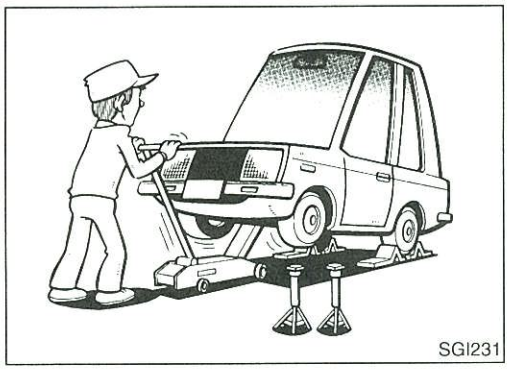
The purpose of INFINITI Communicator is to increase security for the vehicle owner by providing a convenient way to contact the most appropriate emergency assistance provider during an emergency.
Improper operation of the system may result in a police response. The theft warning system also activates INFINITI Communicator. For details, refer to INFINITI Communicator (IVCS) in the EL section


SGI285

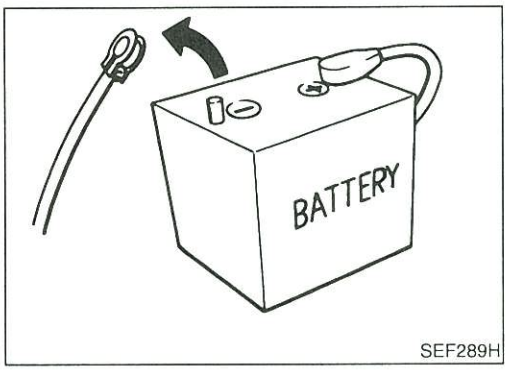
GENERAL PRECAUTIONS

NBGI0001S02

- Do not operate the engine for an extended period of time without proper exhaust ventilation.
  Keep the work area well ventilated and free of any inflammable materials. Special care should be taken when handling any inflammable or poisonous materials, such as gasoline, refrigerant gas, etc. When working in a pit or other enclosed area, be sure to properly ventilate the area before working with hazardous materials.
  Do not smoke while working on the vehicle.

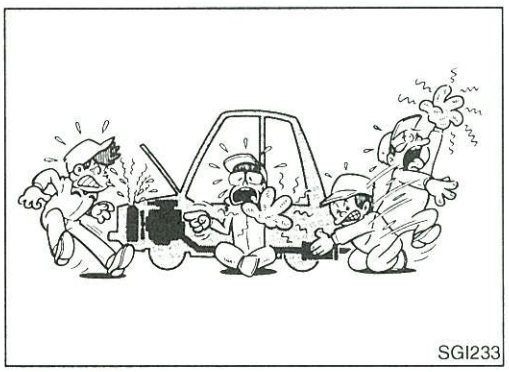

SGI231

- Before jacking up the vehicle, apply wheel chocks or other tire blocks to the wheels to prevent the vehicle from moving. After jacking up the vehicle, support the vehicle weight with safety stands at the points designated for proper lifting before working on the vehicle.
  These operations should be done on a level surface.
- When removing a heavy component such as the engine or transaxle/transmission, be careful not to lose your balance and drop it. Also, do not allow it to strike adjacent parts, especially the brake tubes and master cylinder.

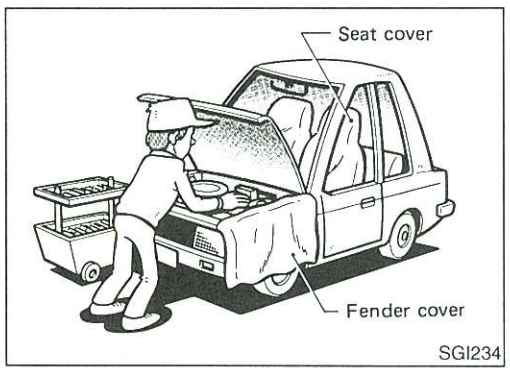


SEF289H

- Before starting repairs which do not require battery power:
  Turn off ignition switch.
  Disconnect the negative battery terminal.


SGI233

- To prevent serious burns:
  Avoid contact with hot metal parts.
  Do not remove the radiator cap when the engine is hot.



SGI234

- Before servicing the vehicle:
  Protect fenders, upholstery and carpeting with appropriate covers.
  Take caution that keys, buckles or buttons do not scratch paint.

- Clean all disassembled parts in the designated liquid or solvent prior to inspection or assembly.
- Replace oil seals, gaskets, packings, O-rings, locking washers, cotter pins, self-locking nuts, etc. with new ones.
- Replace inner and outer races of tapered roller bearings and needle bearings as a set.
- Arrange the disassembled parts in accordance with their assembled locations and sequence.
- Do not touch the terminals of electrical components which use microcomputers (such as ECMs).
  Static electricity may damage internal electronic components.

- After disconnecting vacuum or air hoses, attach a tag to indicate the proper connection.
- Use only the fluids and lubricants specified in this manual.
- Use approved bonding agent, sealants or their equivalents when required.
- Use tools and recommended special tools where specified for safe and efficient service repairs.
- When repairing the fuel, oil, water, vacuum or exhaust systems, check all affected lines for leaks.
- Dispose of drained oil or the solvent used for cleaning parts in an appropriate manner.

WARNING:
To prevent ECM from storing the diagnostic trouble codes, do not carelessly disconnect the harness connectors which are related to the engine control system and TCM (Transmission Control Module) system. The connectors should be disconnected only when working according to the WORK FLOW of TROUBLE DIAGNOSES in EC and AT sections.

SGI787

PRECAUTIONS FOR MULTIPORT FUEL INJECTION SYSTEM OR ENGINE CONTROL SYSTEM

NBGI0001S03

- Before connecting or disconnecting any harness connector for the multiport fuel injection system or ECM (Engine Control Module):
  Turn ignition switch to OFF position.
  Disconnect negative battery terminal.
  Otherwise, there may be damage to ECM.
- Before disconnecting pressurized fuel line from fuel pump to injectors, be sure to release fuel pressure.
- Be careful not to jar components such as ECM and mass air flow sensor.

PRECAUTIONS FOR THREE WAY CATALYST

NBGI0001S04

If a large amount of unburned fuel flows into the catalyst, the catalyst temperature will be excessively high. To prevent this, follow the instructions below:

- Use unleaded gasoline only. Leaded gasoline will seriously damage the three way catalyst.
- When checking for ignition spark or measuring engine compression, make tests quickly and only when necessary.
- Do not run engine when the fuel tank level is low, otherwise the engine may misfire causing damage to the catalyst.

Do not place the vehicle on flammable material. Keep flammable material off the exhaust pipe and the three way catalyst.

PRECAUTIONS FOR ENGINE OILS

NBGI0001S05

Prolonged and repeated contact with used engine oil may cause skin cancer. Try to avoid direct skin contact with used oil.
If skin contact is made, wash thoroughly with soap or hand cleaner as soon as possible.

Health Protection Precautions

NBGI0001S0501

- Avoid prolonged and repeated contact with oils, particularly used engine oils.

- Wear protective clothing, including impervious gloves where practicable.
- Do not put oily rags in pockets.
- Avoid contaminating clothes, particularly underpants, with oil.
- Heavily soiled clothing and oil-impregnated footwear should not be worn. Overalls must be cleaned regularly.
- First Aid treatment should be obtained immediately for open cuts and wounds.
- Use barrier creams, applying them before each work period, to help the removal of oil from the skin.
- Wash with soap and water to ensure all oil is removed (skin cleansers and nail brushes will help). Preparations containing lanolin replace the natural skin oils which have been removed.
- Do not use gasoline, kerosine, diesel fuel, gas oil, thinners or solvents for cleaning skin.
- If skin disorders develop, obtain medical advice without delay.
- Where practicable, degrease components prior to handling.
- Where there is a risk of eye contact, eye protection should be worn, for example, chemical goggles or face shields; in addition an eye wash facility should be provided.

Environmental Protection Precautions

NBGI0001S0502

Burning used engine oil in small space heaters or boilers can be recommended only for units of approved design. The heating system must meet the requirements of HM Inspectorate of Pollution for small burners of less than 0.4 MW. If in doubt check with the appropriate local authority and/or manufacturer of the approved appliance.

Dispose of used oil and used oil filters through authorized waste disposal contractors to licensed waste disposal sites, or to the waste oil reclamation trade. If in doubt, contact the local authority for advice on disposal facilities.

It is illegal to pour used oil on to the ground, down sewers or drains, or into water courses.

The regulations concerning pollution vary between regions.

PRECAUTIONS FOR FUEL

NBGI0001S06

Use unleaded gasoline with an octane rating of at least 87 AKI (Anti-Knock Index) number (research octane number 91).

CAUTION:

Do not use leaded gasoline. Using leaded gasoline will damage the three way catalyst.

Using a fuel other than that specified could adversely affect the emission control devices and systems, and could also affect the warranty coverage validity.

PRECAUTIONS FOR AIR CONDITIONING

NBGI0001S07

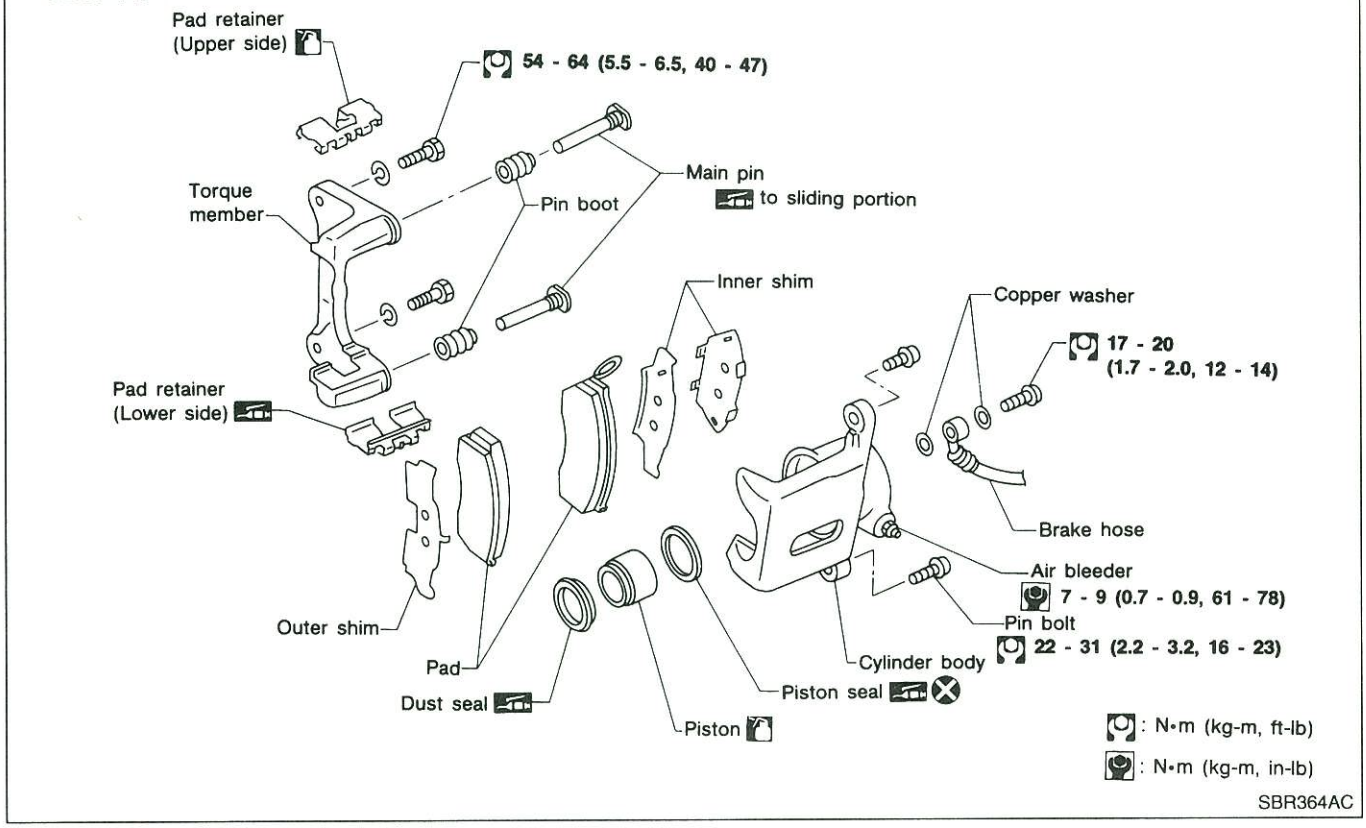
Use an approved refrigerant recovery unit any time the air conditioning system must be discharged. Refer to HA section ("HFC-134a (R-134a) Service Procedure", "SERVICE PROCEDURES") for specific instructions.

HOW TO USE THIS MANUAL

- The captions **WARNING** and **CAUTION** warn you of steps that must be followed to prevent personal injury and/or damage to some part of the vehicle.
  WARNING indicates the possibility of personal injury if instructions are not followed.
  CAUTION indicates the possibility of component damage if instructions are not followed.
  BOLD TYPED STATEMENTS except **WARNING** and **CAUTION** give you helpful information.
- **ALPHABETICAL INDEX** is provided at the end of this manual so that you can rapidly find the item and page you are searching for.
- **A QUICK REFERENCE INDEX**, a black tab (e.g. BR) is provided on the first page. You can quickly find the first page of each section by mating it to the section's black tab.
- **THE CONTENTS** are listed on the first page of each section.
- **THE TITLE** is indicated on the upper portion of each page and shows the part or system.
- **THE PAGE NUMBER** of each section consists of two letters which designate the particular section and a number (e.g. "BR-5").
- **THE LARGE ILLUSTRATIONS** are exploded views (See below.) and contain tightening torques, lubrication points, section number of the **PARTS CATALOG** (e.g. SEC. 440) and other information necessary to perform repairs.
  The illustrations should be used in reference to service matters only. When ordering parts, refer to the appropriate **PARTS CATALOG**.

"Example"

SEC. 440



- **THE SMALL ILLUSTRATIONS** show the important steps such as inspection, use of special tools, knacks of work and hidden or tricky steps which are not shown in the previous large illustrations.
  Assembly, inspection and adjustment procedures for the complicated units such as the automatic transaxle or transmission, etc. are presented in a step-by-step format where necessary.
- The **UNITS** given in this manual are primarily expressed as the SI UNIT (International System of Unit), and alternatively expressed in the metric system and in the yard/pound system.
  "Example"
  Tightening torque:
  59 - 78 N·m (6.0 - 8.0 kg-m, 43 - 58 ft-lb)
- **TROUBLE DIAGNOSES** are included in sections dealing with complicated components.

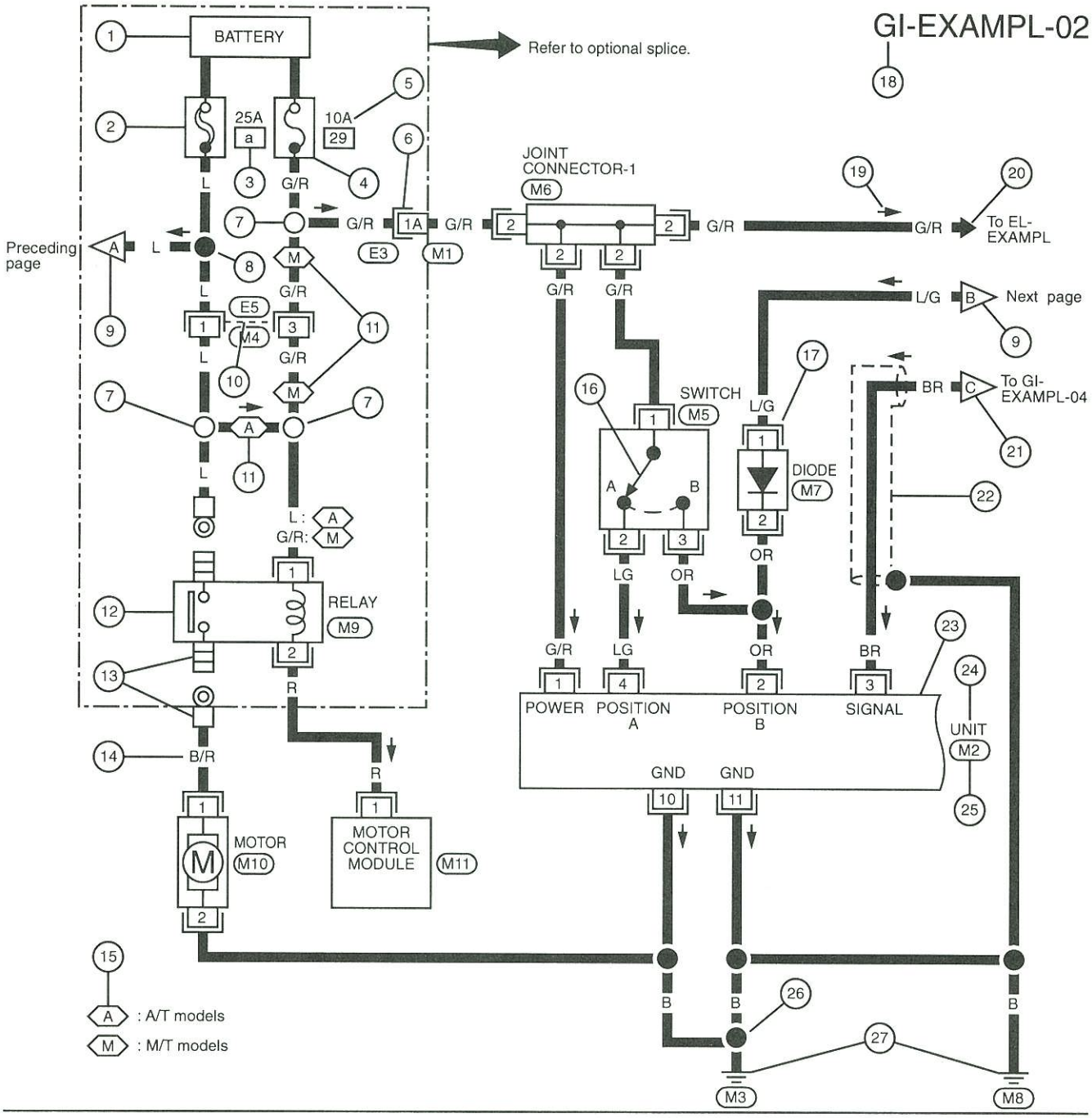
- **SERVICE DATA AND SPECIFICATIONS** are contained at the end of each section for quick reference of data.
- The following **SYMBOLS AND ABBREVIATIONS** are used:

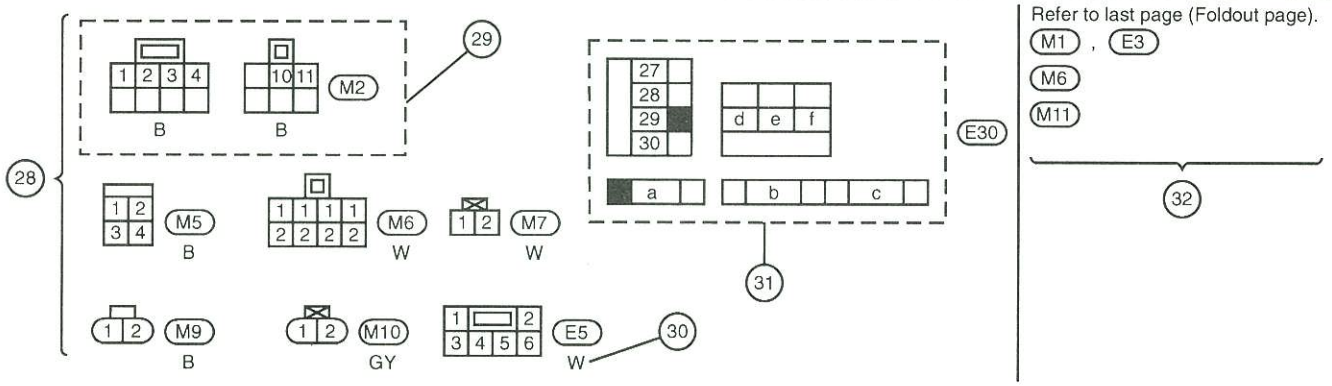
SYMBOL	ABBREVIATION	SYMBOL	ABBREVIATION
	Tightening torque	2WD	2-Wheel Drive
	Should be lubricated with grease. Unless otherwise indicated, use recommended multi-purpose grease.	A/C	Air Conditioner
	Should be lubricated with oil.	P/S	Power Steering
	Sealing point	SST	Special Service Tools
	Checking point	SAE	Society of Automotive Engineers, Inc.
	Always replace after every disassembly.	ATF	Automatic Transmission Fluid
Ⓟ	Apply petroleum jelly.	D_1	Drive range 1st gear
	Apply ATF.	D_2	Drive range 2nd gear
★	Select with proper thickness.	D_3	Drive range 3rd gear
☆	Adjustment is required.	D_4	Drive range 4th gear
SDS	Service Data and Specifications	OD	Overdrive
LH, RH	Left-Hand, Right-Hand	2_2	2nd range 2nd gear
FR, RR	Front, Rear	2_1	2nd range 1st gear
M/T	Manual Transaxle/Transmission	1_2	1st range 2nd gear
A/T	Automatic Transaxle/Transmission	1_1	1st range 1st gear
, 4WD	4-Wheel Drive		

Sample/Wiring Diagram — EXAMPL —

NBGI0003S01

- For Description, refer to GI-11.



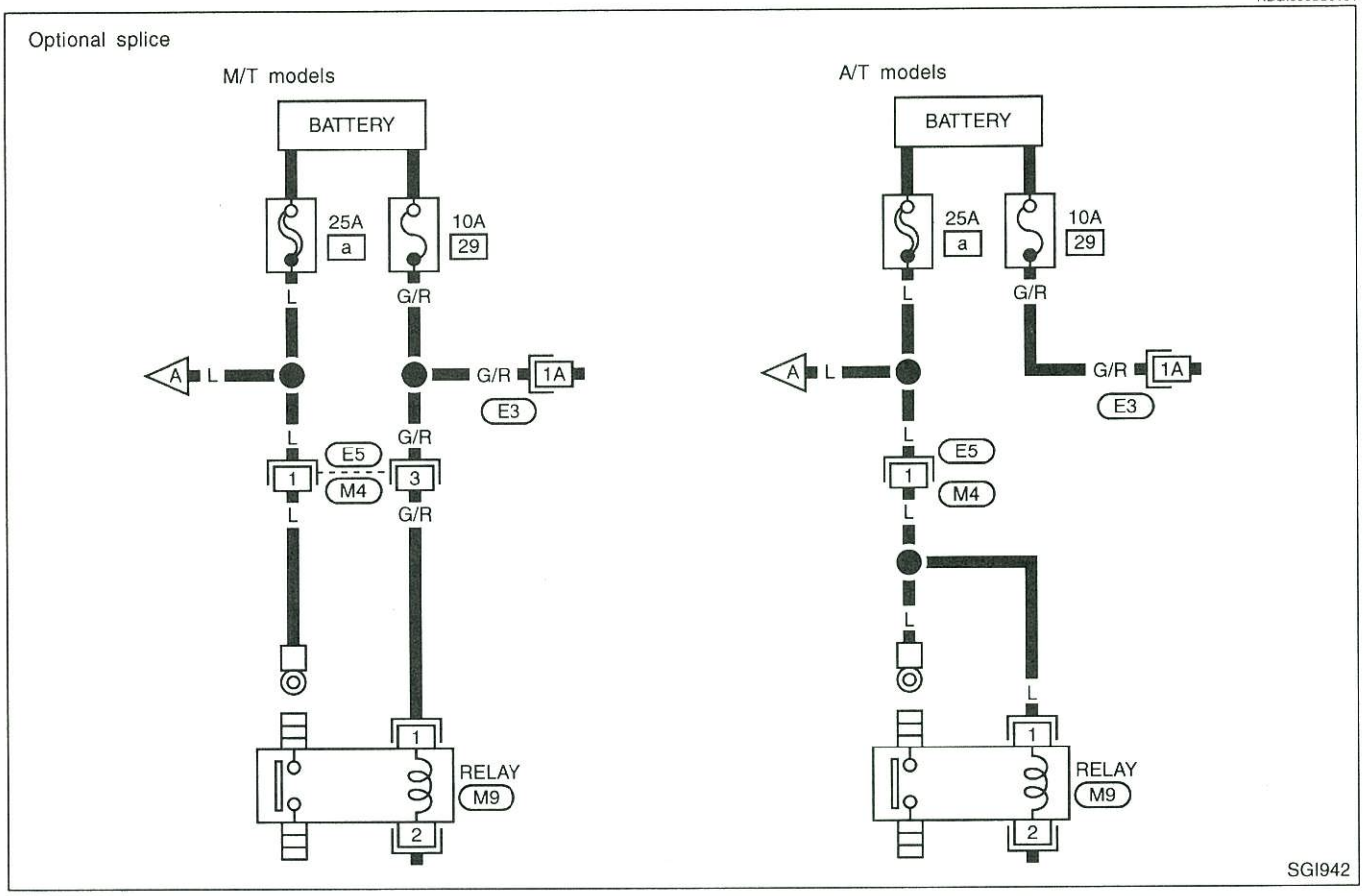


YGI001

OPTIONAL SPLICE

NBGI0003S0101

Optional splice



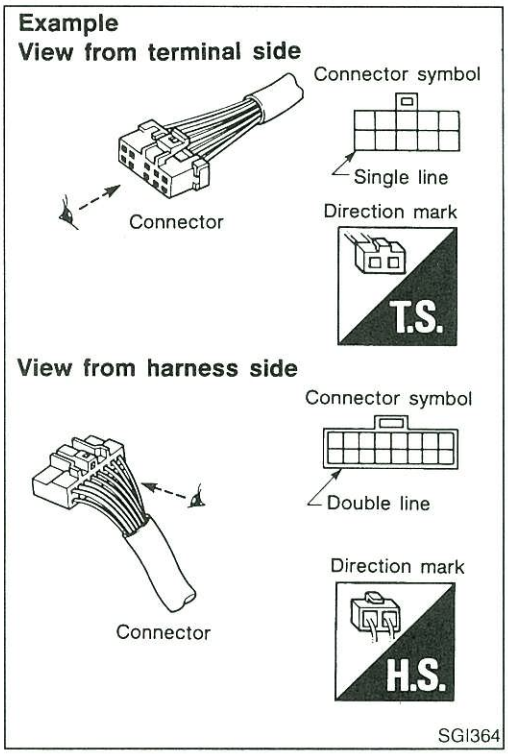
Description

=NBGI0003S02

Number	Item	Description
1	Power condition	• This shows the condition when the system receives battery positive voltage (can be operated).
2	Fusible link	• The double line shows that this is a fusible link. • The open circle shows current flow in, and the shaded circle shows current flow out.
3	Fusible link/fuse location	• This shows the location of the fusible link or fuse in the fusible link or fuse box. For arrangement, refer to EL section ("POWER SUPPLY ROUTING").
4	Fuse	• The single line shows that this is a fuse. • The open circle shows current flow in, and the shaded circle shows current flow out.
5	Current rating	• This shows the current rating of the fusible link or fuse.
6	Connectors	• This shows that connector E3 is female and connector M1 is male. • The G/R wire is located in the 1A terminal of both connectors. • Terminal number with an alphabet (1A, 5B, etc.) indicates that the connector is SMJ connector. Refer to GI-17.
7	Optional splice	• The open circle shows that the splice is optional depending on vehicle application.
8	Splice	• The shaded circle shows that the splice is always on the vehicle.
9	Page crossing	• This arrow shows that the circuit continues to an adjacent page. • The A will match with the A on the preceding or next page.
10	Common connector	• The dotted lines between terminals show that these terminals are part of the same connector.
11	Option abbreviation	• This shows that the circuit is optional depending on vehicle application.
12	Relay	• This shows an internal representation of the relay. For details, refer to EL section ("STANDARDIZED RELAY").
13	Connectors	• This shows that the connector is connected to the body or a terminal with bolt or nut.
14	Wire color	• This shows a code for the color of the wire. B = Black, W = White, R = Red, G = Green, L = Blue, Y = Yellow, LG = Light Green, BR = Brown, OR = Orange, P = Pink, PU = Purple, GY = Gray, SB = Sky Blue, CH = Dark Brown, DG = Dark Green When the wire color is striped, the base color is given first, followed by the stripe color as shown below: Example: L/W = Blue with White Stripe
15	Option description	• This shows a description of the option abbreviation used on the page.
16	Switch	• This shows that continuity exists between terminals 1 and 2 when the switch is in the A position. Continuity exists between terminals 1 and 3 when the switch is in the B position.
17	Assembly parts	• Connector terminal in component shows that it is a harness incorporated assembly.
18	Cell code	• This identifies each page of the wiring diagram by section, system and wiring diagram page number.
19	Current flow arrow	• Arrow indicates electric current flow, especially where the direction of standard flow (vertically downward or horizontally from left to right) is difficult to follow. • A double arrow " ↔ " shows that current can flow in either direction depending on circuit operation.

Description (Cont'd)

Number	Item	Description
20	System branch	• This shows that the system branches to another system identified by cell code (section and system).
21	Page crossing	• This arrow shows that the circuit continues to another page identified by cell code. • The C will match with the C on another page within the system other than the next or preceding pages.
22	Shielded line	• The line enclosed by broken line circle shows shield wire.
23	Component box in wave line	• This shows that another part of the component is also shown on another page (indicated by wave line) within the system.
24	Component name	• This shows the name of a component.
25	Connector number	• This shows the connector number. • The letter shows which harness the connector is located in. • Example: **M**: main harness. For detail and to locate the connector, refer to EL section ("Main Harness", "HARNESS LAYOUT"). A coordinate grid is included for complex harnesses to aid in locating connectors.
26	Ground (GND)	• The line spliced and grounded under wire color shows that ground line is spliced at the grounded connector.
27	Ground (GND)	• This shows the ground connection.
28	Connector views	• This area shows the connector faces of the components in the wiring diagram on the page.
29	Common component	• Connectors enclosed in broken line show that these connectors belong to the same component.
30	Connector color	• This shows a code for the color of the connector. For code meaning, refer to wire color codes, Number 14 of this chart.
31	Fusible link and fuse box	• This shows the arrangement of fusible link(s) and fuse(s), used for connector views of "POWER SUPPLY ROUTING" in EL section. The open square shows current flow in, and the shaded square shows current flow out.
32	Reference area	• This shows that more information on the Super Multiple Junction (SMJ) and Joint Connectors (J/C) exists on the foldout page. Refer to GI-17 for details.

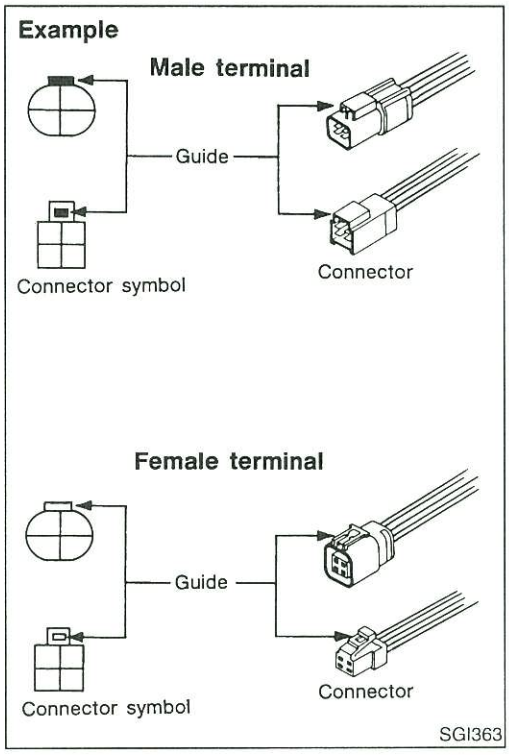


CONNECTOR SYMBOLS

=NBGI0003S0201

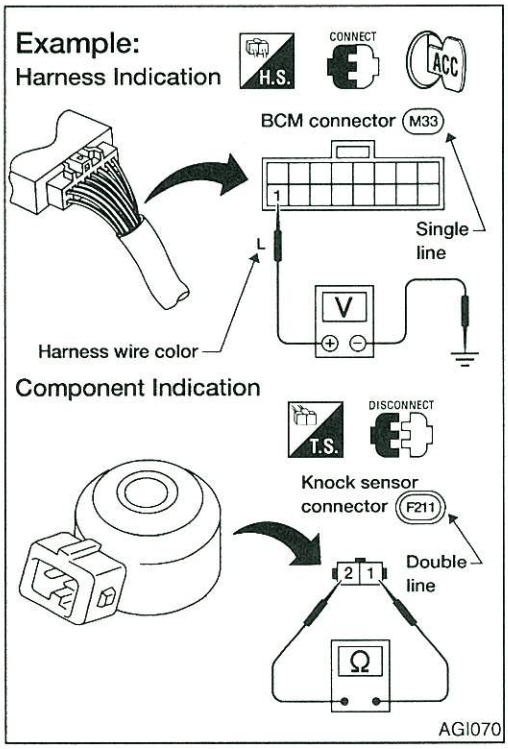
Most of connector symbols in wiring diagrams are shown from the terminal side.

- Connector symbols shown from the terminal side are enclosed by a single line and followed by the direction mark.
- Connector symbols shown from the harness side are enclosed by a double line and followed by the direction mark.



- Male and female terminals
  Connector guides for male terminals are shown in black and female terminals in white in wiring diagrams.

Description (Cont'd)



HARNESS INDICATION

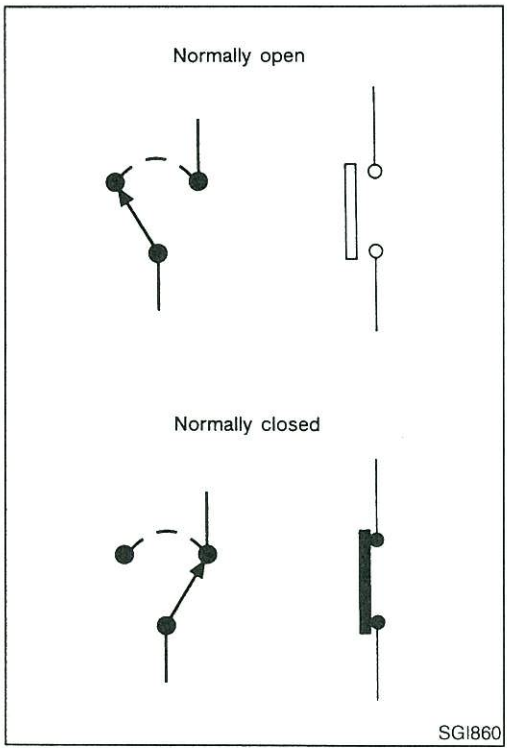
NBGI0003S0206

- Letter designations next to test meter probe indicate harness (connector) wire color.
- Connector numbers in a single circle M33 indicate harness connectors.

COMPONENT INDICATION

NBGI0003S0207

- Connector numbers in a double circle F211 indicate component connectors.



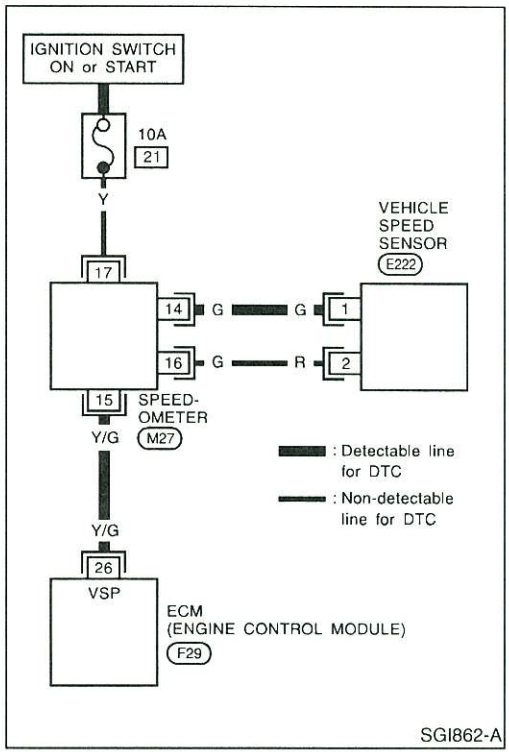
SWITCH POSITIONS

NBGI0003S0202

Switches are shown in wiring diagrams as if the vehicle is in the normal condition.

A vehicle is in the normal condition when:

- ignition switch is OFF,
- doors, hood and trunk lid/back door are closed,
- pedals are not depressed, and
- parking brake is released.



DETECTABLE LINES AND NON-DETECTABLE LINES

NBGI0003S0203

In some wiring diagrams, two kinds of lines, representing wires, with different weight are used.

- A line with regular weight (wider line) represents a "detectable line for DTC (Diagnostic Trouble Code)". A "detectable line for DTC" is a circuit in which ECM (Engine Control Module) can detect its malfunctions with the on board diagnostic system.
- A line with less weight (thinner line) represents a "non-detectable line for DTC". A "non-detectable line for DTC" is a circuit in which ECM cannot detect its malfunctions with the on board diagnostic system.

MULTIPLE SWITCH

=NBGI0003S0204

The continuity of multiple switch is described in two ways as shown below.

- The switch chart is used in schematic diagrams.
- The switch diagram is used in wiring diagrams.

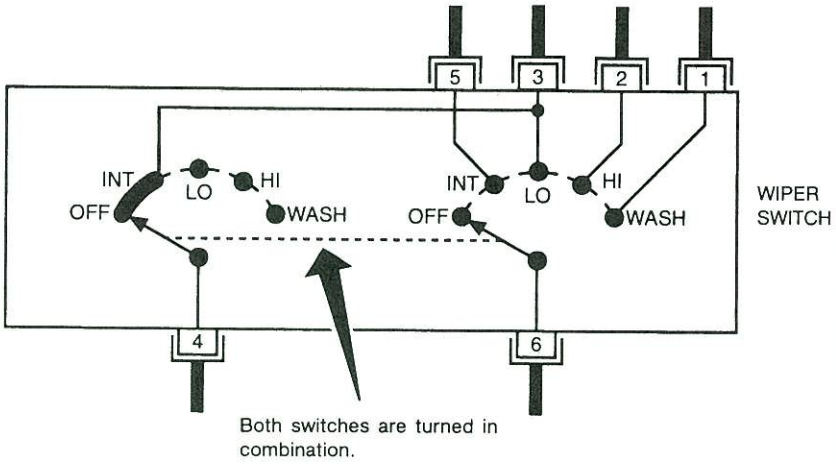
Example

(SWITCH CHART)

WIPER SWITCH

	OFF	INT	LO	HI	WASH
1					○
2				○	
3	○	○	○		
4	○	○			
5		○			
6		○	○	○	○

(SWITCH DIAGRAM)



Continuity circuit of wiper switch

SWITCH POSITION	CONTINUITY CIRCUIT
OFF	3 - 4
INT	3 - 4, 5 - 6
LO	3 - 6
HI	2 - 6
WASH	1 - 6

SGI875

FOLDOUT PAGE

=NBGI0003S0205

The foldout page should be opened when reading wiring diagram.

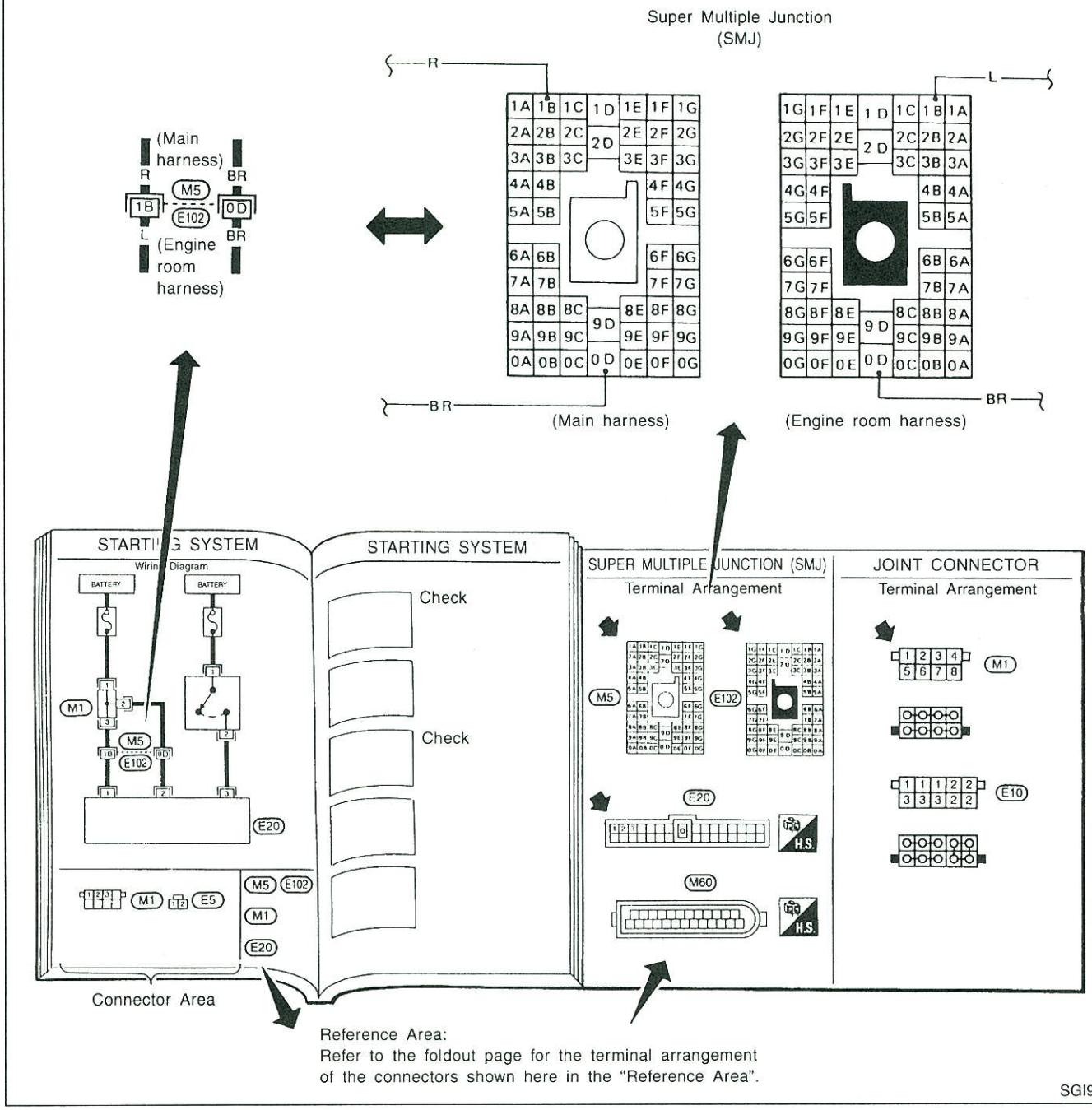
Super multiple junction (SMJ)

In wiring diagram, connectors consisting of terminals having terminal numbers with an alphabet (1B, 0D, etc.) are SMJ connectors. If connector numbers are shown in Reference Area, these connector symbols are not shown in Connector Area. For terminal arrangement of these connectors, refer to the foldout page at the end of this manual.

Joint connector

Joint connector symbols are shown in Connector Area in the wiring diagram concerned. Foldout page also carries inside wiring layout together with such joint connector symbols.

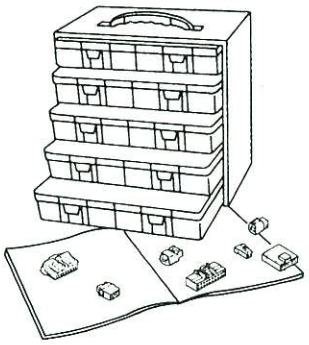
Example



Connector and Terminal Pin Kit

NBGI0011S01

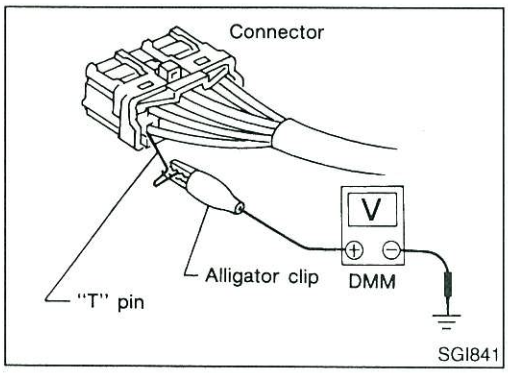
Use the connector and terminal pin kit listed below when replacing connectors or terminals.
The connector and terminal pin kit contains some of the most commonly used NISSAN connectors and terminals.

Tool number (Kent-Moore No.) Tool name	Description
— (J38751-95INF) Connector and terminal pin kit	 AGI063

How to Probe Connectors

NBGI0011S02

Connector damage and an intermittent connection can result from improperly probing of the connector during circuit checks.
The probe of a digital multimeter (DMM) may not correctly fit the connector cavity. To correctly probe the connector, follow the procedures below using a "T" pin. For the best contact grasp the "T" pin using an alligator clip.

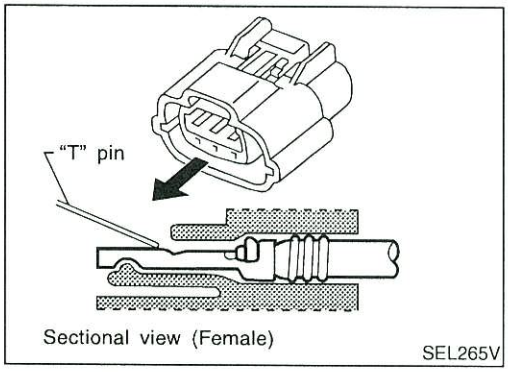


PROBING FROM HARNESS SIDE

NBGI0011S0201

Standard type (not waterproof type) connector should be probed from harness side with "T" pin.

- **If the connector has a rear cover such as a ECM connector, remove the rear cover before probing the terminal.**
- **Do not probe waterproof connector from harness side. Damage to the seal between wire and connector may result.**

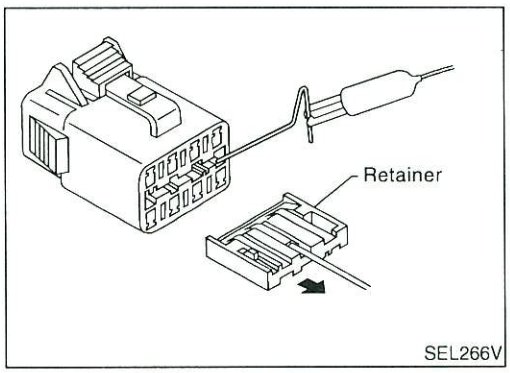


PROBING FROM TERMINAL SIDE

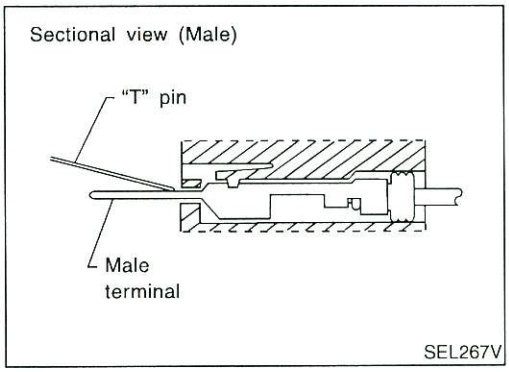
NBGI0011S0202

Female Terminal

- There is a small notch above each female terminal. Probe each terminal with the "T" pin through the notch.
  Do not insert any object other than the same type male terminal into female terminal.



- Some connectors do not have a notch above each terminal. To probe each terminal, remove the connector retainer to make contact space for probing.



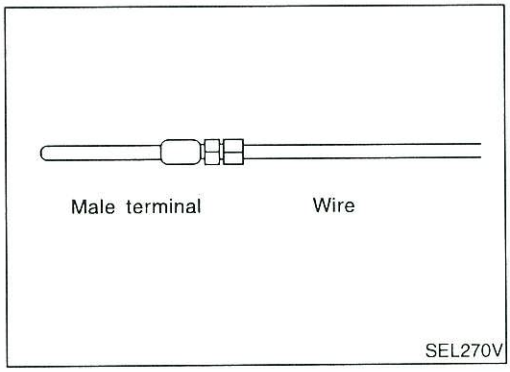
Male Terminal

Carefully probe the contact surface of each terminal using a "T" pin.
Do not bend terminal.

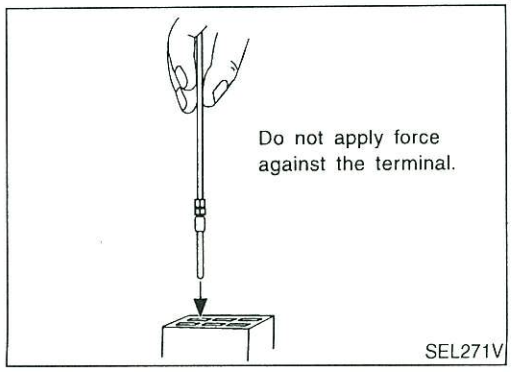
How to Check Enlarged Contact Spring of Terminal

NBGI0011S03

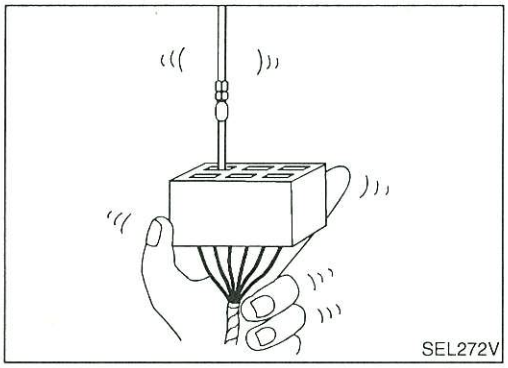
An enlarged contact spring of a terminal may create intermittent signals in the circuit.
If the intermittent open circuit occurs, follow the procedure below to inspect for open wires and enlarged contact spring of female terminal.



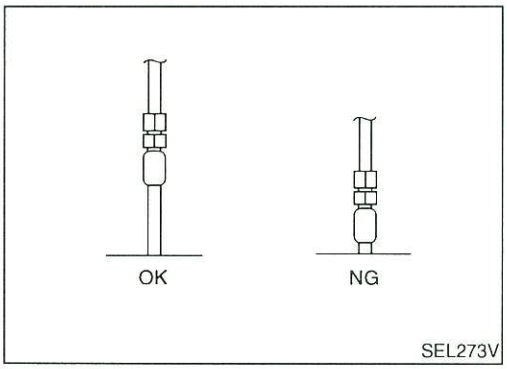
1. Assemble a male terminal and approx. 10 cm (3.9 in) of wire.
   Use a male terminal which matches the female terminal.
2. Disconnect the suspected faulty connector and hold it terminal side up.



3. While holding the wire of the male terminal, try to insert the male terminal into the female terminal.
   Do not force the male terminal into the female terminal with your hands.

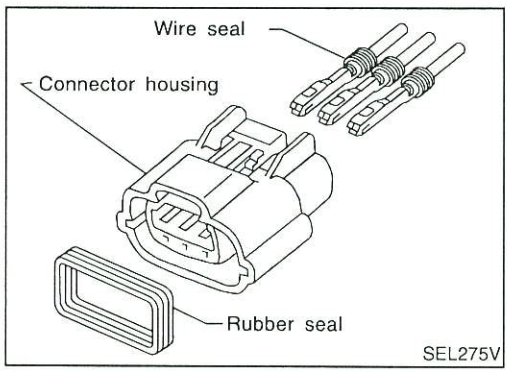

SEL272V

4. While moving the connector, check whether the male terminal can be easily inserted or not.



SEL273V

- If the male terminal can be easily inserted into the female terminal, replace the female terminal.



SEL275V

Waterproof Connector Inspection

NBGI0011S04

If water enters the connector, it can short interior circuits. This may lead to intermittent problems.
Check the following items to maintain the original waterproof characteristics.

RUBBER SEAL INSPECTION

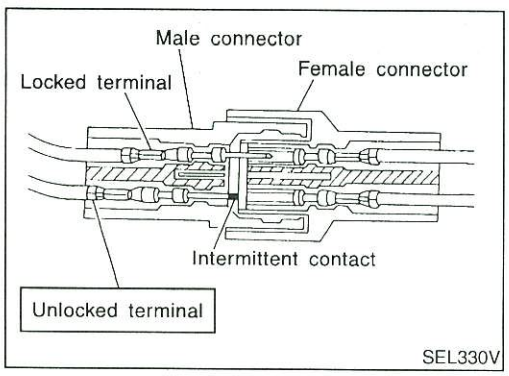
NBGI0011S0401

- Most waterproof connectors are provided with a rubber seal between the male and female connectors. If the seal is missing, the waterproof performance may not meet specifications.
- The rubber seal may come off when connectors are disconnected. Whenever connectors are reconnected, make sure the rubber seal is properly installed on either side of male or female connector.

WIRE SEAL INSPECTION

NBGI0011S0402

The wire seal must be installed on the wire insertion area of a waterproof connector. Be sure that the seal is installed properly.



SEL330V

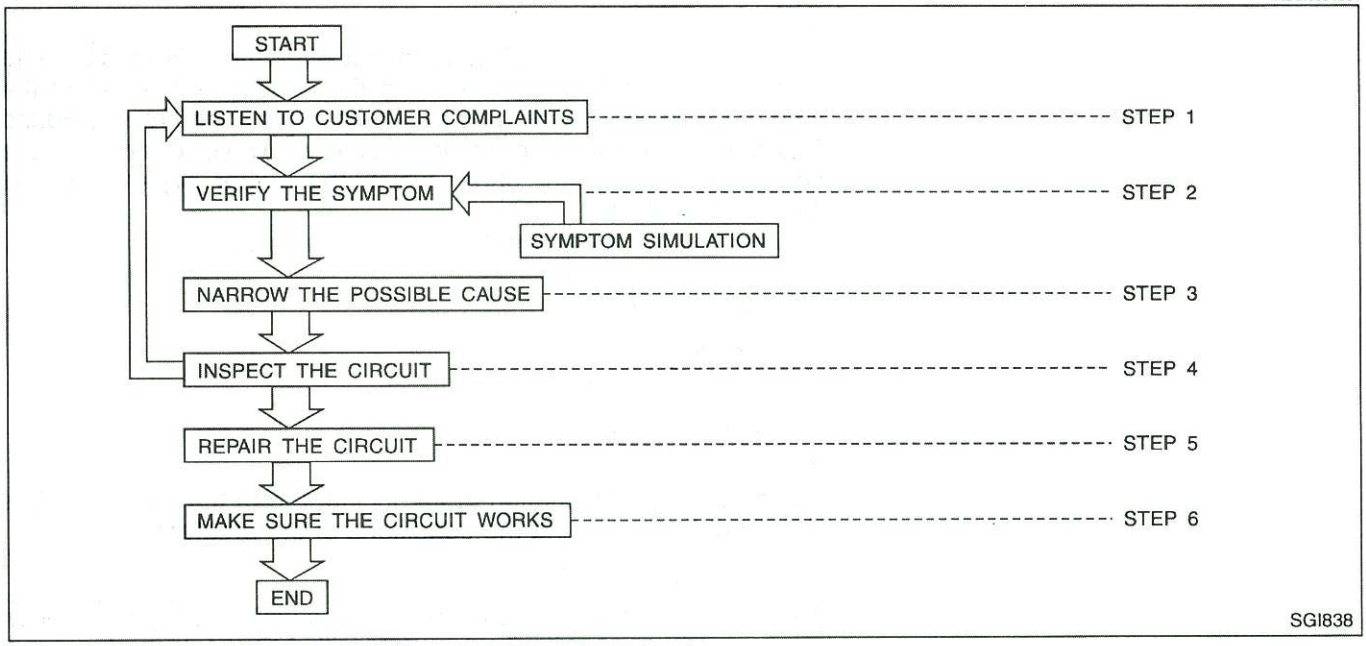
Terminal Lock Inspection

NBGI0011S05

Check for unlocked terminals by pulling wire at the end of connector. An unlocked terminal may create intermittent signals in the circuit.

Work Flow

NBGI0004S01



STEP	DESCRIPTION	
STEP 1	Get detailed information about the conditions and the environment when the incident occurred. The following are key pieces of information required to make a good analysis:	
	WHAT	Vehicle Model, Engine, Transmission and the System (i.e. Radio).
	WHEN	Date, Time of Day, Weather Conditions, Frequency.
	WHERE	Road Conditions, Altitude and Traffic Situation.
	HOW	System Symptoms, Operating Conditions (Other Components Interaction). Service History and if any After Market Accessories have been installed.
STEP 2	Operate the system, road test if necessary. Verify the parameter of the incident. If the problem can not be duplicated, refer to "Incident Simulation Tests" next page.	
STEP 3	Get the proper diagnosis materials together including: POWER SUPPLY ROUTING System Operation Descriptions Applicable Service Manual Sections Check for any Service Bulletin. Identify where to begin diagnosis based upon your knowledge of the system operation and the customer comments.	
STEP 4	Inspect the system for mechanical binding, loose connectors or wiring damage. Determine which circuits and components are involved and diagnose using the Power Supply Routing and Harness Layouts.	
STEP 5	Repair or replace the incident circuit or component.	
STEP 6	Operate the system in all modes. Verify the system works properly under all conditions. Make sure you have not inadvertently created a new incident during your diagnosis or repair steps.	

Incident Simulation Tests

NBGI0004S02

INTRODUCTION

NBGI0004S0201

Sometimes the symptom is not present when the vehicle is brought in for service. If possible, re-create the conditions present at the time of the incident. Doing so may help avoid a No Trouble Found Diagnosis. The following section illustrates ways to simulate the conditions/environment under which the owner experiences an electrical incident.

The section is broken into the six following topics:

- Vehicle vibration
- Heat sensitive
- Freezing
- Water intrusion
- Electrical load
- Cold or hot start up

Get a thorough description of the incident from the customer. It is important for simulating the conditions of the problem.

VEHICLE VIBRATION

NBGI0004S0202

The problem may occur or become worse while driving on a rough road or when engine is vibrating (idle with A/C on). In such a case, you will want to check for a vibration related condition. Refer to the illustration below.

Connectors & Harness

Determine which connectors and wiring harness would affect the electrical system you are inspecting. **Gently** shake each connector and harness while monitoring the system for the incident you are trying to duplicate. This test may indicate a loose or poor electrical connection.

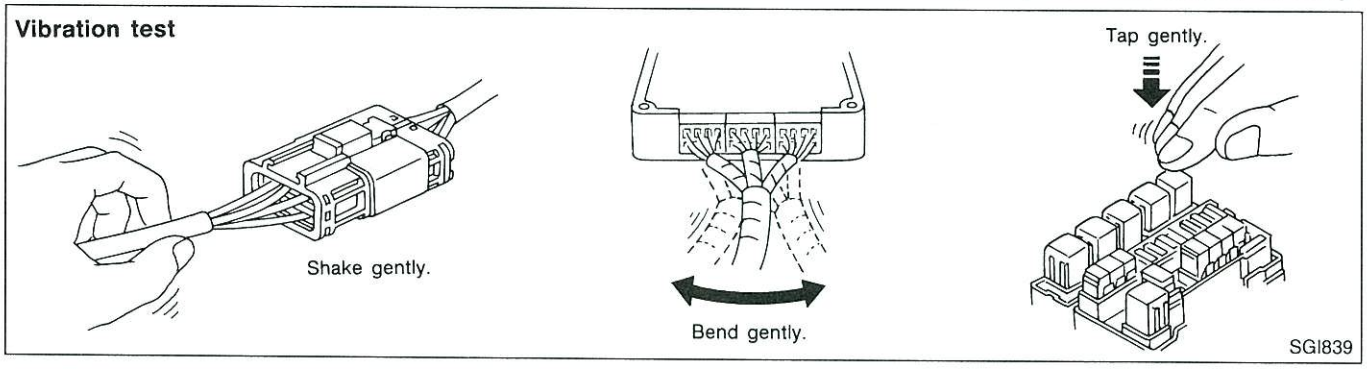
Hint

Connectors can be exposed to moisture. It is possible to get a thin film of corrosion on the connector terminals. A visual inspection may not reveal this without disconnecting the connector. If the problem occurs intermittently, perhaps the problem is caused by corrosion. It is a good idea to disconnect, inspect and clean the terminals on related connectors in the system.

Sensors & Relays

Gently apply a slight vibration to sensors and relays in the system you are inspecting.

This test may indicate a loose or poorly mounted sensor or relay.



Engine Compartment

There are several reasons a vehicle or engine vibration could cause an electrical complaint. Some of the things to check for are:

- Connectors not fully seated.
- Wiring harness not long enough and is being stressed due to engine vibrations or rocking.
- Wires laying across brackets or moving components.
- Loose, dirty or corroded ground wires.
- Wires routed too close to hot components.

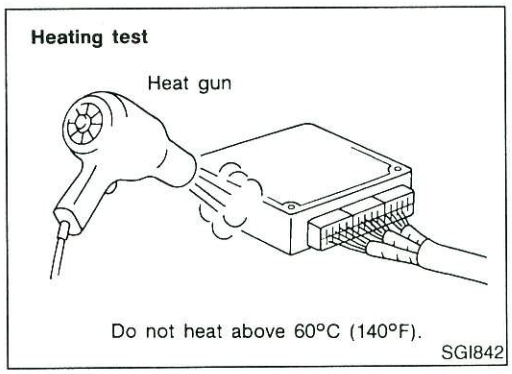
To inspect components under the hood, start by verifying the integrity of ground connections. (Refer to GROUND INSPECTION described later.) First check that the system is properly grounded. Then check for loose connection by **gently shaking** the wiring or components as previously explained. Using the wiring diagrams inspect the wiring for continuity.

Behind The Instrument Panel

An improperly routed or improperly clamped harness can become pinched during accessory installation. Vehicle vibration can aggravate a harness which is routed along a bracket or near a screw.

Under Seating Areas

An unclamped or loose harness can cause wiring to be pinched by seat components (such as slide guides) during vehicle vibration. If the wiring runs under seating areas, inspect wire routing for possible damage or pinching.



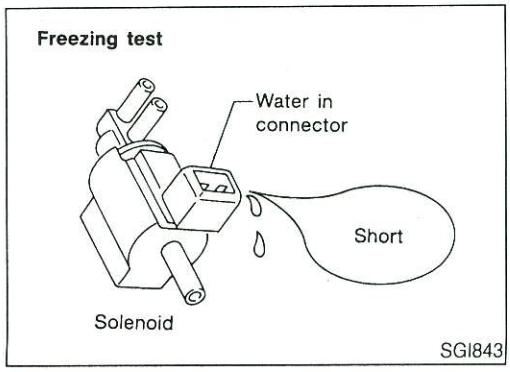
HEAT SENSITIVE

NBGI0004S0203

The owner's problem may occur during hot weather or after car has sat for a short time. In such cases you will want to check for a heat sensitive condition.

To determine if an electrical component is heat sensitive, heat the component with a heat gun or equivalent.

Do not heat components above 60°C (140°F). If incident occurs while heating the unit, either replace or properly insulate the component.



FREEZING

NBGI0004S0204

The customer may indicate the incident goes away after the car warms up (winter time). The cause could be related to water freezing somewhere in the wiring/electrical system.

There are two methods to check for this. The first is to arrange for the owner to leave his car overnight. Make sure it will get cold enough to demonstrate his complaint. Leave the car parked outside overnight. In the morning, do a quick and thorough diagnosis of those electrical components which could be affected.

The second method is to put the suspect component into a freezer long enough for any water to freeze. Reinstall the part into the car and check for the reoccurrence of the incident. If it occurs, repair or replace the component.

Water intrusion test

SGI844

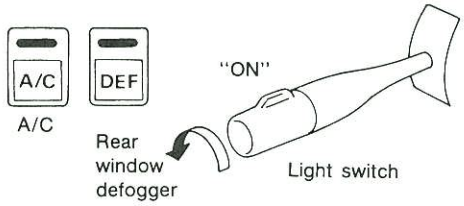
WATER INTRUSION

NBGI0004S0205

The incident may occur only during high humidity or in rainy/snowy weather. In such cases the incident could be caused by water intrusion on an electrical part. This can be simulated by soaking the car or running it through a car wash.

Do not spray water directly on any electrical components.

Electrical load test



SGI845

ELECTRICAL LOAD

NBGI0004S0206

The incident may be electrical load sensitive. Perform diagnosis with all accessories (including A/C, rear window defogger, radio, fog lamps) turned on.

COLD OR HOT START UP

NBGI0004S0207

On some occasions an electrical incident may occur only when the car is started cold. Or it may occur when the car is restarted hot shortly after being turned off. In these cases you may have to keep the car overnight to make a proper diagnosis.

Circuit Inspection

NBGI0004S03

INTRODUCTION

NBGI0004S0302

In general, testing electrical circuits is an easy task if it is approached in a logical and organized method. Before beginning it is important to have all available information on the system to be tested. Also, get a thorough understanding of system operation. Then you will be able to use the appropriate equipment and follow the correct test procedure.

You may have to simulate vehicle vibrations while testing electrical components. **Gently shake** the wiring harness or electrical component to do this.

OPEN	A circuit is open when there is no continuity through a section of the circuit.	
SHORT	There are two types of shorts.	
	• SHORT CIRCUIT	When a circuit contacts another circuit and causes the normal resistance to change.
	• SHORT TO GROUND	When a circuit contacts a ground source and grounds the circuit.

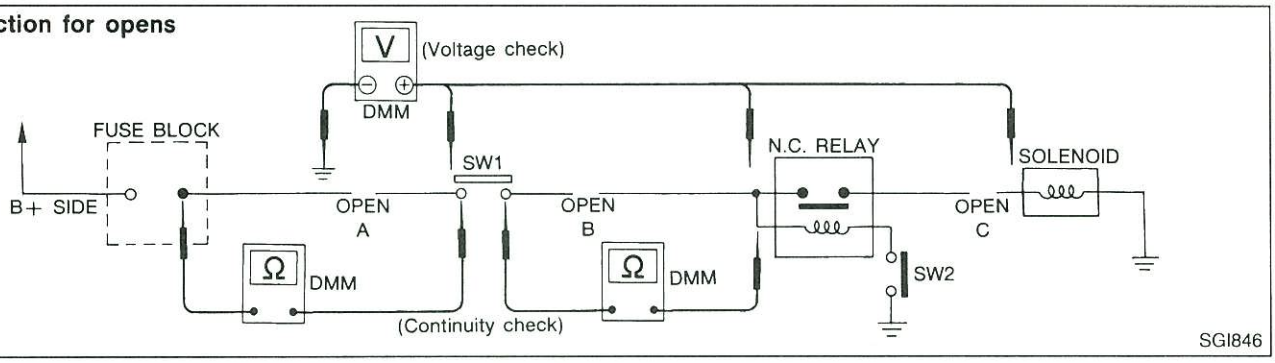
NOTE:
Refer to "HOW TO CHECK TERMINAL" in GI-18 to probe or check terminal.

TESTING FOR "OPENS" IN THE CIRCUIT

NBGI0004S0303

Before you begin to diagnose and test the system, you should rough sketch a schematic of the system. This will help you to logically walk through the diagnosis process. Drawing the sketch will also reinforce your working knowledge of the system.

Inspection for opens



Continuity Check Method

The continuity check is used to find an open in the circuit. The Digital Multimeter (DMM) set on the resistance function will indicate an open circuit as over limit (no beep tone or no ohms symbol). Make sure to always start with the DMM at the highest resistance level.

To help in understanding the diagnosis of open circuits please refer to the schematic above.

1) Disconnect the battery negative cable.
2) Start at one end of the circuit and work your way to the other end. (At the fuse block in this example)
3) Connect one probe of the DMM to the fuse block terminal on the load side.
4) Connect the other probe to the fuse block (power) side of SW1. Little or no resistance will indicate that portion of the circuit has good continuity. If there were an open in the circuit, the DMM would indicate an over limit or infinite resistance condition. (point A)
5) Connect the probes between SW1 and the relay. Little or no resistance will indicate that portion of the circuit has good continuity. If there were an open in the circuit, the DMM would indicate an over limit or infinite resistance condition. (point B)
6) Connect the probes between the relay and the solenoid. Little or no resistance will indicate that portion of the circuit has good continuity. If there were an open in the circuit, the DMM would indicate an over limit or infinite resistance condition. (point C)

Any circuit can be diagnosed using the approach in the above example.

Voltage Check Method

To help in understanding the diagnosis of open circuits please refer to the previous schematic.

In any powered circuit, an open can be found by methodically checking the system for the presence of voltage. This is done by switching the DMM to the voltage function.

1) Connect one probe of the DMM to a known good ground.
2) Begin probing at one end of the circuit and work your way to the other end.
3) With SW1 open, probe at SW1 to check for voltage.

voltage; open is further down the circuit than SW1.
no voltage; open is between fuse block and SW1 (point A).

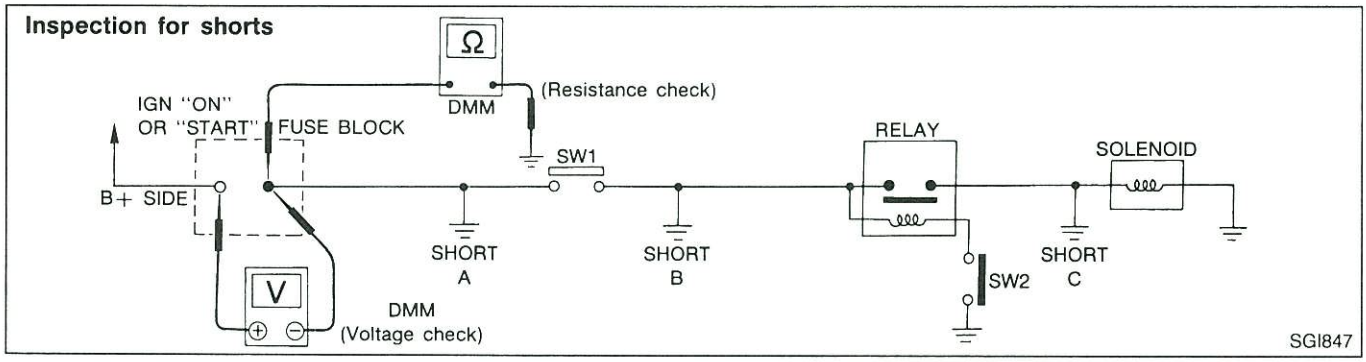
4) Close SW1 and probe at relay.
voltage; open is further down the circuit than the relay.
no voltage; open is between SW1 and relay (point B).
5) Close the relay and probe at the solenoid.
voltage; open is further down the circuit than the solenoid.
no voltage; open is between relay and solenoid (point C).

Any powered circuit can be diagnosed using the approach in the above example.

TESTING FOR "SHORTS" IN THE CIRCUIT

NBGI0004S0304

To simplify the discussion of shorts in the system please refer to the schematic below.



Resistance Check Method

1) Disconnect the battery negative cable and remove the blown fuse.
2) Disconnect all loads (SW1 open, relay disconnected and solenoid disconnected) powered through the fuse.
3) Connect one probe of the ohmmeter to the load side of the fuse terminal. Connect the other probe to a known good ground.
4) With SW1 open, check for continuity.
continuity; short is between fuse terminal and SW1 (point A).
no continuity; short is further down the circuit than SW1.
5) Close SW1 and disconnect the relay. Put probes at the load side of fuse terminal and a known good ground. Then, check for continuity.
continuity; short is between SW1 and the relay (point B).
no continuity; short is further down the circuit than the relay.
6) Close SW1 and jump the relay contacts with jumper wire. Put probes at the load side of fuse terminal and a known good ground. Then, check for continuity.
continuity; short is between relay and solenoid (point C).
no continuity; check solenoid, retrace steps.

Voltage Check Method

1) Remove the blown fuse and disconnect all loads (i.e. SW1 open, relay disconnected and solenoid disconnected) powered through the fuse.
2) Turn the ignition key to the ON or START position. Verify battery voltage at the B + side of the fuse terminal (one lead on the B + terminal side of the fuse block and one lead on a known good ground).
3) With SW1 open and the DMM leads across both fuse terminals, check for voltage.
voltage; short is between fuse block and SW1 (point A).
no voltage; short is further down the circuit than SW1.

4) With SW1 closed, relay and solenoid disconnected and the DMM leads across both fuse terminals, check for voltage.
voltage; short is between SW1 and the relay (point B).
no voltage; short is further down the circuit than the relay.
5) With SW1 closed, relay contacts jumped with fused jumper wire check for voltage.
voltage; short is down the circuit of the relay or between the relay and the disconnected solenoid (point C).
no voltage; retrace steps and check power to fuse block.

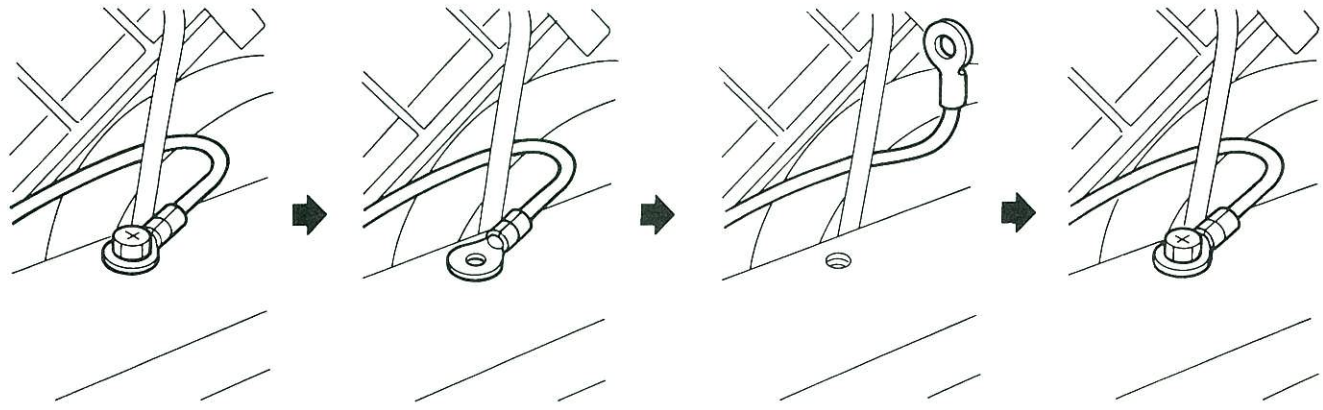
GROUND INSPECTION

NBGI0004S0305

Ground connections are very important to the proper operation of electrical and electronic circuits. Ground connections are often exposed to moisture, dirt and other corrosive elements. The corrosion (rust) can become an unwanted resistance. This unwanted resistance can change the way a circuit works.
Electronically controlled circuits are very sensitive to proper grounding. A loose or corroded ground can drastically affect an electronically controlled circuit. A poor or corroded ground can easily affect the circuit. Even when the ground connection looks clean, there can be a thin film of rust on the surface.
When inspecting a ground connection follow these rules:

1) Remove the ground bolt or screw.
2) Inspect all mating surfaces for tarnish, dirt, rust, etc.
3) Clean as required to assure good contact.
4) Reinstall bolt or screw securely.
5) Inspect for "add-on" accessories which may be interfering with the ground circuit.
6) If several wires are crimped into one ground eyelet terminal, check for proper crimps. Make sure all of the wires are clean, securely fastened and providing a good ground path. If multiple wires are cased in one eyelet make sure no ground wires have excess wire insulation.

Ground Inspection



VOLTAGE DROP TESTS

NBGI0004S0306

Voltage drop tests are often used to find components or circuits which have excessive resistance. A voltage drop in a circuit is caused by a resistance **when the circuit is in operation**.
Check the wire in the illustration. When measuring resistance with

ohmmeter, contact by a single strand of wire will give reading of 0 ohms. This would indicate a good circuit. When the circuit operates, this single strand of wire is not able to carry the current. The single strand will have a high resistance to the current. This will be picked up as a slight voltage drop.
Unwanted resistance can be caused by many situations as follows:

- Undersized wiring (single strand example)
- Corrosion on switch contacts
- Loose wire connections or splices.

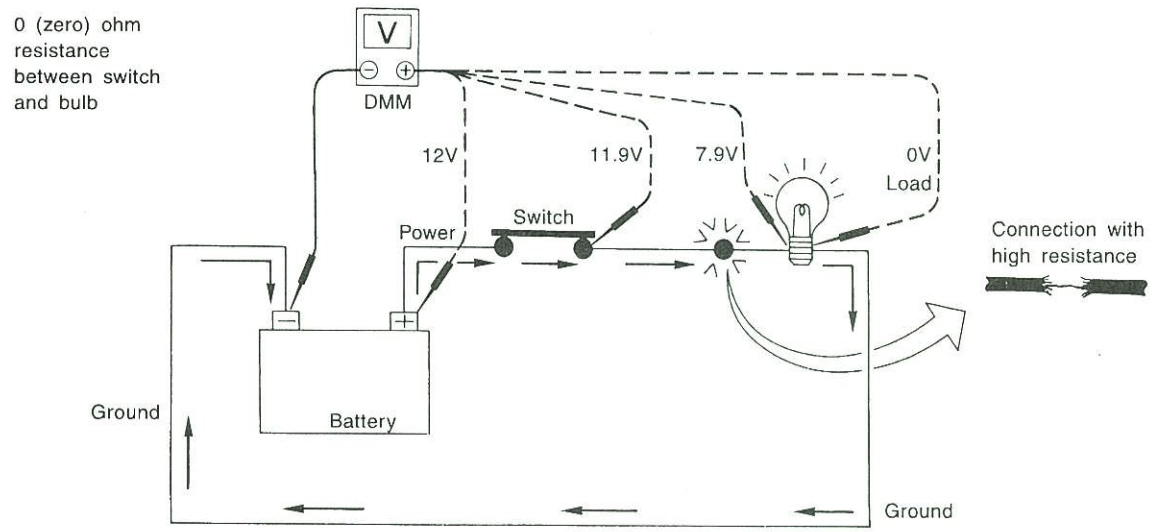
If repairs are needed always use wire that is of the same or larger gauge.

Measuring Voltage Drop — Accumulated Method

1) Connect the voltmeter across the connector or part of the circuit you want to check. The positive lead of the voltmeter should be closer to power and the negative lead closer to ground.
2) Operate the circuit.
3) The voltmeter will indicate how many volts are being used to "push" current through that part of the circuit.

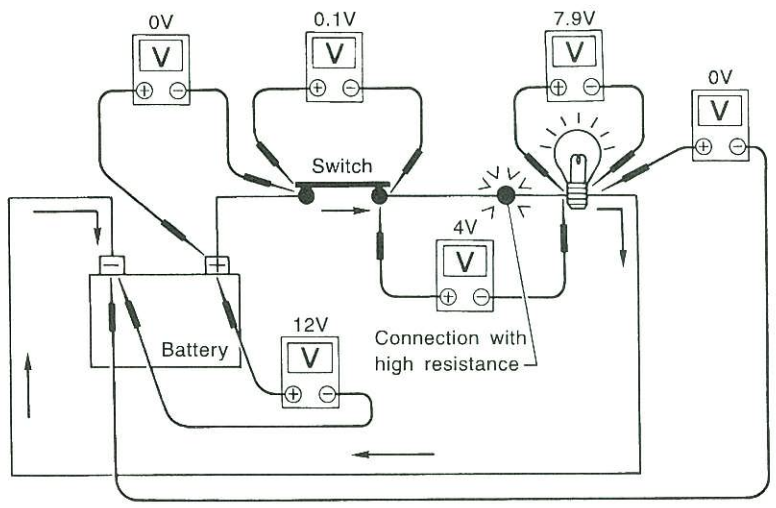
Note in the illustration that there is an excessive 4.1 volt drop between the battery and the bulb.

Symptom: Dim bulb or no operation



Measuring Voltage Drop — Step by Step

The step by step method is most useful for isolating excessive drops in low voltage systems (such as those in "Computer Controlled Systems").
Circuits in the "Computer Controlled System" operate on very low amperage.
The (Computer Controlled) system operations can be adversely affected by any variation in resistance in the system. Such resistance variation may be caused by poor connection, improper installation, improper wire gauge or corrosion.
The step by step voltage drop test can identify a component or wire with too much resistance.



1. Connect the voltmeter as shown, starting at the battery and working your way around the circuit.
2. An unusually large voltage drop will indicate a component or wire that needs to be repaired. As you can see the illustration above, the poor connection causes a 4 volt drop.

The chart that follows illustrates some maximum allowable voltage drops. These values are given as a guideline, the exact value for each component may vary.

COMPONENT	VOLTAGE DROP
Wire	negligible < .001 volts
Ground Connections	Approx. 0.1 volts
Switch Contacts	Approx. 0.3 volts

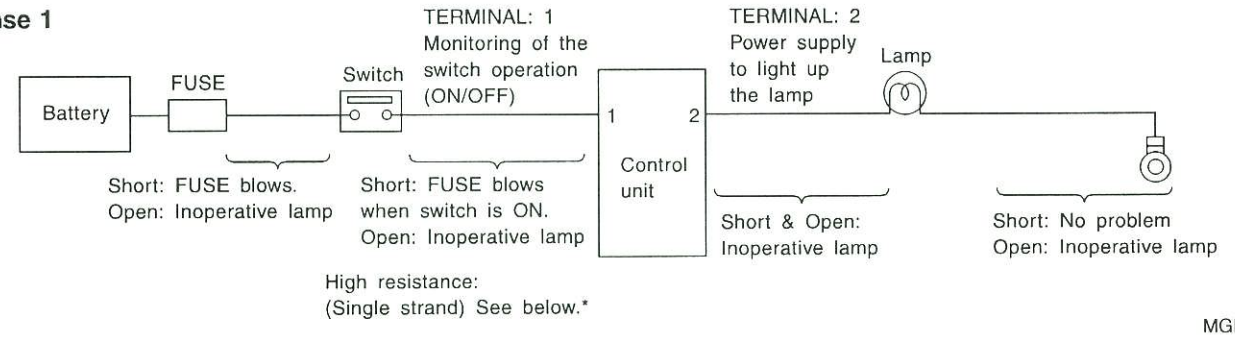
SGI854

CONTROL UNIT CIRCUIT TEST

NBGI0004S0307

System Description: When the switch is ON, the control unit lights up the lamp.

Case 1



MGI034A

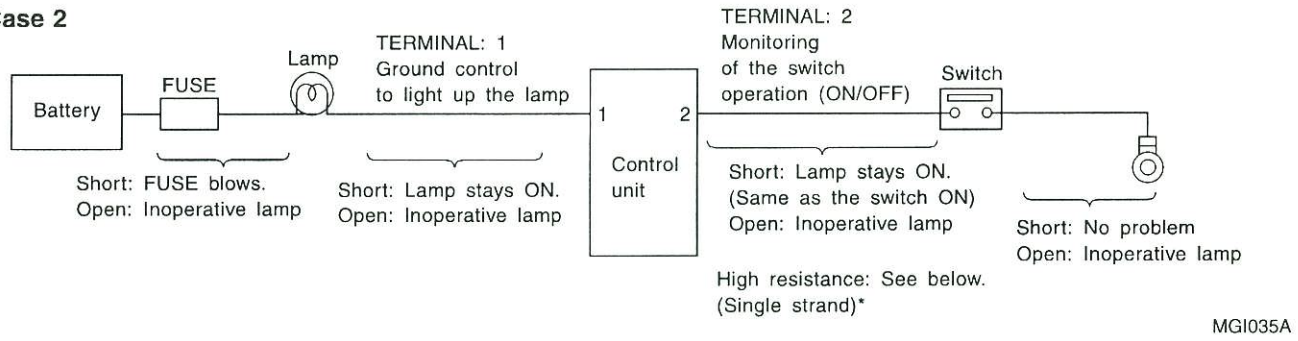
Input-output voltage chart

Pin No.	Item	Condition	Voltage value [V]	In case of high resistance such as single strand [V] *
1	Switch	Switch ON	Battery voltage	Lower than battery voltage Approx. 8 (Example)
		Switch OFF	Approx. 0	Approx. 0
2	Lamp	Switch ON	Battery voltage	Approx. 0 (Inoperative lamp)
		Switch OFF	Approx. 0	Approx. 0

The voltage value is based on the body ground.

* : If high resistance exists in the switch side circuit (caused by a single strand), terminal 1 does not detect battery voltage. Control unit does not detect the switch is ON even if the switch does not turn ON. Therefore, the control unit does not supply power to light up the lamp.

Case 2



MGI035A

Input-output voltage chart

Pin No.	Item	Condition	Voltage value [V]	In case of high resistance such as single strand [V] *
1	Lamp	Switch ON	Approx. 0	Battery voltage (Inoperative lamp)
		Switch OFF	Battery voltage	Battery voltage
2	Switch	Switch ON	Approx. 0	Higher than 0 Approx. 4 (Example)
		Switch OFF	Approx. 5	Approx. 5

The voltage value is based on the body ground.

* : If high resistance exists in the switch side circuit (caused by a single strand), terminal 2 does not detect approx. 0V. Control unit does not detect the switch is ON even if the switch does not turn ON. Therefore, the control unit does not control ground to light up the lamp.

HOW TO FOLLOW TROUBLE DIAGNOSES

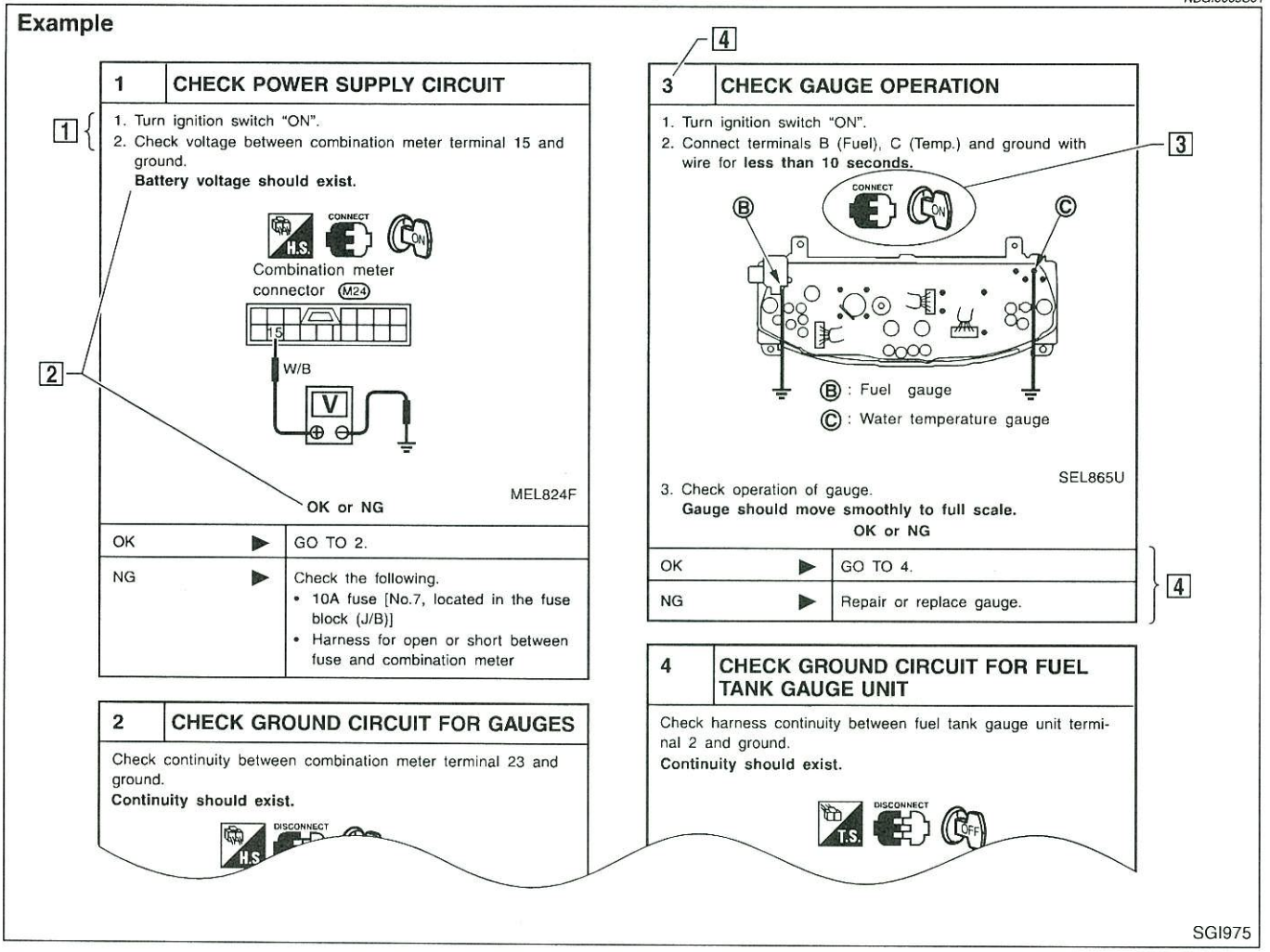
NOTICE:
Trouble diagnoses indicates work procedures required to diagnose problems effectively. Observe the following instructions before diagnosing.

1) **Before performing trouble diagnoses, read the "Preliminary Check", the "Symptom Chart" or the "Work Flow".**
2) **After repairs, re-check that the problem has been completely eliminated.**
3) **Refer to Component Parts and Harness Connector Location for the Systems described in each section for identification/location of components and harness connectors.**
4) **Refer to the Circuit Diagram for quick pinpoint check. If you need to check circuit continuity between harness connectors in more detail, such as when a sub-harness is used, refer to Wiring Diagram in each individual section and Harness Layout in EL section for identification of harness connectors.**
5) **When checking circuit continuity, ignition switch should be OFF.**
6) **Before checking voltage at connectors, check battery voltage.**
7) **After accomplishing the Diagnostic Procedures and Electrical Components Inspection, make sure that all harness connectors are reconnected as they were.**

How to Follow Test Groups in Trouble Diagnoses

NBGI0005S01

Example



1) **Work and diagnostic procedure**
Start to diagnose a problem using procedures indicated in enclosed test groups.

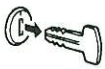
2) **Questions and required results.**
Questions and required results are indicated in bold type in test group.
The meaning of are as follows:
   a. Battery voltage → 11 - 14V or approximately 12V
   b. Voltage: Approximately 0V → Less than 1V

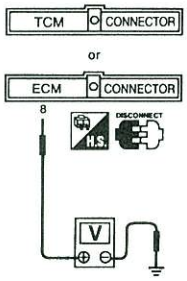
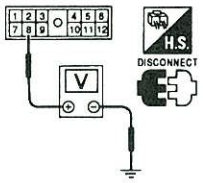
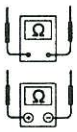
3) **Symbol used in illustration**
Symbols included in illustrations refer to measurements or procedures. Before diagnosing a problem, familiarize yourself with each symbol. Refer to "CONNECTOR SYMBOLS" (GI-13) and "Key to Symbols Signifying Measurements or Procedures" (GI-33).

4) **Action items**
Next action for each test group is indicated based on result of each question. Test group number is shown in the left upper portion of each test group.

Key to Symbols Signifying Measurements or Procedures

NBGI0005S02

Symbol	Symbol explanation	Symbol	Symbol explanation
	Check after disconnecting the connector to be measured.		Procedure with Generic Scan Tool (GST, OBD-II scan tool)
	Check after connecting the connector to be measured.		Procedure without CONSULT or GST
	Insert key into ignition switch.		A/C switch is "OFF".
	Remove key from ignition switch.		A/C switch is "ON".
	Turn ignition switch to "OFF" position.		REC switch is "ON".
	Turn ignition switch to "ON" position.		REC switch is "OFF".
	Turn ignition switch to "START" position.		Fan switch is "ON". (At any position except for "OFF" position)
	Turn ignition switch from "OFF" to "ACC" position.		Fan switch is "OFF".
	Turn ignition switch from "ACC" to "OFF" position.		Apply positive voltage from battery with fuse directly to components.
	Turn ignition switch from "OFF" to "ON" position.		Drive vehicle.
	Turn ignition switch from "ON" to "OFF" position.		Disconnect battery negative cable.
	Do not start engine, or check with engine stopped.		Depress brake pedal.
	Start engine, or check with engine running.		Release brake pedal.
	Apply parking brake.		Depress accelerator pedal.
	Release parking brake.		Release accelerator pedal.

Symbol	Symbol explanation	Symbol	Symbol explanation
	Check after engine is warmed up sufficiently.		Pin terminal check for SMJ type ECM and TCM connectors. **For details regarding the terminal arrangement, refer to the foldout page.** 
	Voltage should be measured with a voltmeter.		
	Circuit resistance should be measured with an ohmmeter.		
	Current should be measured with an ammeter.		
	Procedure with CONSULT		
	Procedure without CONSULT		

Function and System Application

NBGI0006S01

Diagnostic test mode	Function	ENGINE	ALL-MODE 4WD	A/T	ABS	AIR BAG	IVCS*1	IVIS (NATS)*2	SMART EN-TRANCE
Work support	This mode enables a technician to adjust some devices faster and more accurate by following the indications on CONSULT.	x	x	—	—	—	—	—	—
Self-diagnostic results	Self-diagnostic results can be read and erased quickly.	x	x	x	x	x	x	x	—
Trouble diagnostic record	Current self-diagnostic results and all trouble diagnostic records previously stored can be read.	—	—	—	—	x	—	—	—
ECU discriminated No.	Classification number of a replacement ECU can be read to prevent an incorrect ECU from being installed.	—	—	—	—	x	—	—	—
Data monitor	Input/Output data in the ECM can be read.	x	x	x	x	—	x	—	—
DTC work support	This mode enables a technician to set operating conditions to confirm self-diagnosis status/results.	—	—	x	—	—	—	—	—
Active test	Diagnostic Test Mode in which CONSULT drives some actuators apart from the ECMs and also shifts some parameters in a specified range.	x	—	—	x	—	—	—	—
ECM part number	ECM part number can be read.	x	x	x	x	—	x	—	—
Function test	Conducted by CONSULT instead of a technician to determine whether each system is “OK” or “NG”.	x	—	—	—	—	—	—	—
Control unit initialization	All registered ignition key IDs in NATS components can be initialized and new IDs can be registered.	—	—	—	—	—	—	x	—
Self-function check	ECM checks its own NATS communication interface.	—	—	—	—	—	—	x	—
DTC confirmation	The results of SRT (System Readiness Test) and the self-diagnosis status/results can be confirmed.	x	—	—	—	—	—	—	—
Function check	“Remote door unlock function” of IVCS system can be checked in this mode.	—	—	—	—	—	x	—	—

Function and System Application (Cont'd)

Diagnostic test mode	Function	ENGINE	ALL-MODE 4WD	A/T	ABS	AIR BAG	IVCS*1	IVIS (NATS)*2	SMART EN-TRANCE
Registered data	Display the VIN, etc. data registered in the IVCS unit.	—	—	—	—	—	x	—	—
Configuration	• The IVCS system can be set up in the demonstration mode to confirm system operation. • Various data related to both the Communicator Response Center contract and cellular provider can be written/rewritten in this mode.	—	—	—	—	—	x	—	—
REMO CONT ID SET UP	A maximum of four IDs (identifications) can be registered in the memory using the remote controller. These IDs can be also be confirmed and erased as required.	—	—	—	—	—	—	—	x

x: Applicable
*1: INFINITI Communicator (IVCS)
*2: IVIS (NATS) [INFINITI Vehicle Immobiliser System (Nissan Anti-Theft System)]

Lithium Battery Replacement

NBGI0006S02

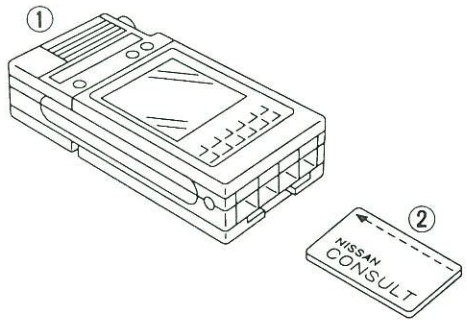
CONSULT contains a lithium battery. When replacing the battery obey the following:

WARNING:
Replace the lithium battery with SANYO Electric Co., Ltd., CR2032 only. Use of another battery may present a risk of fire or explosion. The battery may present a fire or chemical burn hazard if mistreated. Do not recharge, disassemble of dispose of in fire.
Keep the battery out of reach of children and discard used battery conforming to the local regulations.

Checking Equipment

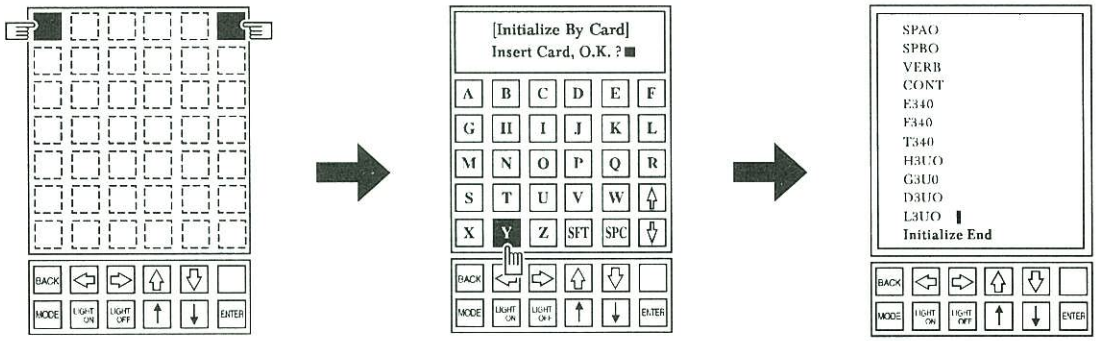
NBGI0006S03

When ordering the below equipment, contact your INFINITI distributor.

Tool name	Description
NISSAN CONSULT ① CONSULT unit and accessories ② Program card UE991, UE990, UE999 (For IVCS) and NATS-E980U (For IVIS)	 NT004

Loading Procedure

NBGI0006S04



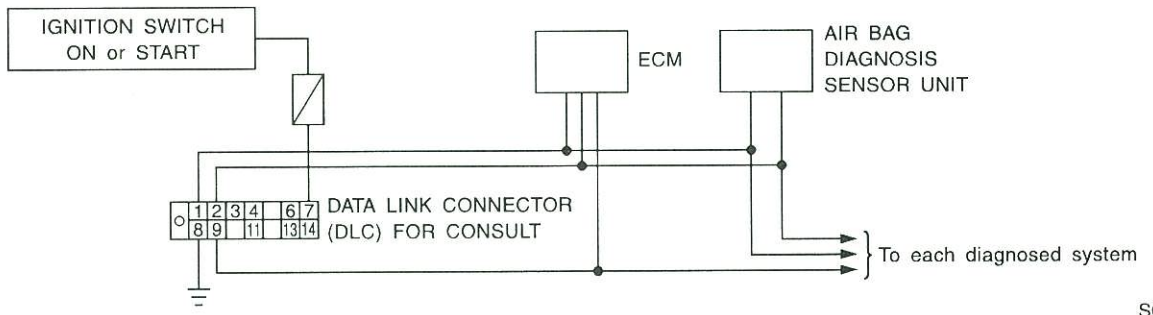
1. While holding down the upper left and right corner keys of the CONSULT touch panel, simultaneously press the power "ON" switch. While pushing the power "ON" switch, hold down both corner keys until the next screen appears.
2. If the initialization was done correctly, the following message will appear at the top of the display: "[Initialize By Card] Insert Card, O.K.?"
3. Insert the program card into the CONSULT program card reader.
4. Press "Y" on the touch panel.
5. Now the program will start to load.
6. After the "Initialize End" message appears, touch the "OFF" switch.

SGI983

CONSULT Data Link Connector (DLC) Circuit

NBGI0006S05

Example



SGI984

INSPECTION PROCEDURE

NAGI0006S0501

If the CONSULT cannot diagnose the system properly, check the following items.

Symptom	Check item
CONSULT cannot access any system.	• CONSULT DLC power supply circuit (Terminal 7) and ground circuit (Terminal 8) (For detailed circuit, refer to "MIL & Data Link Connectors Wiring Diagram" in EC section.) • CONSULT DDL cable
CONSULT cannot access individual system. (Other systems can be accessed.)	• CONSULT program card (Check the appropriate CONSULT program card for the system.) Refer to GI-35. • Power supply and ground circuit for the control unit of the system (For detailed circuit, refer to wiring diagram for each system.) • Open or short circuit between the system and CONSULT DLC (For detailed circuit, refer to wiring diagram for each system.)

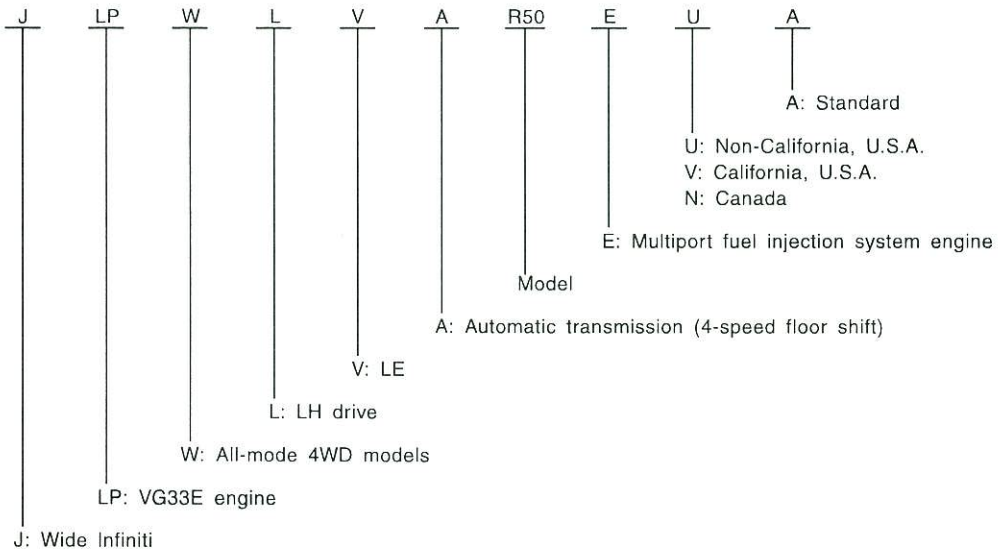
Model Variation

NBGI0007S01

Destination	Body	Grade	Engine	VG33E	
			Transmission	RE4R01A (Automatic)	
			Differential carrier	Front R200A	Rear H233B
			Transfer	ATX14A	
Non-California U.S.A.	Wide	LE	4-door	JLPWLVAR50EUA	
California U.S.A.				JLPWLVAR50EVA	
Canada				JLPWLVAR50ENA	

PREFIX AND SUFFIX DESIGNATIONS

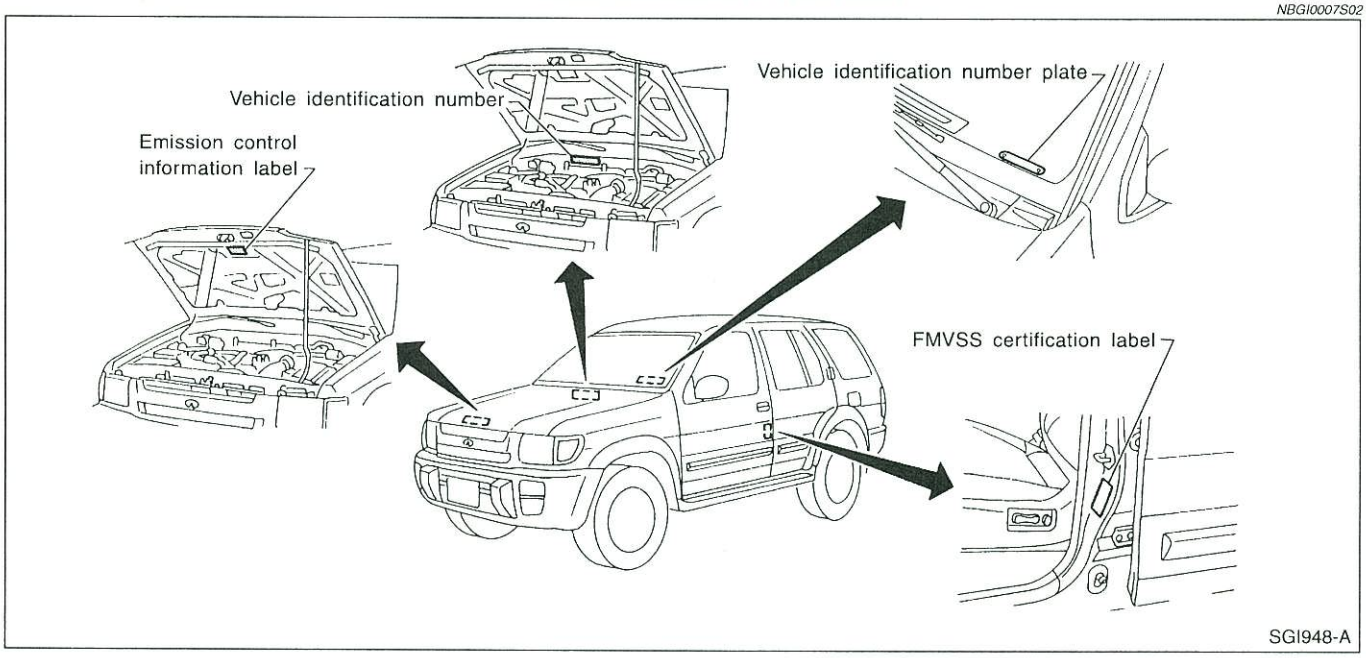
NBGI0007S0101



SGI995-A

Identification Number

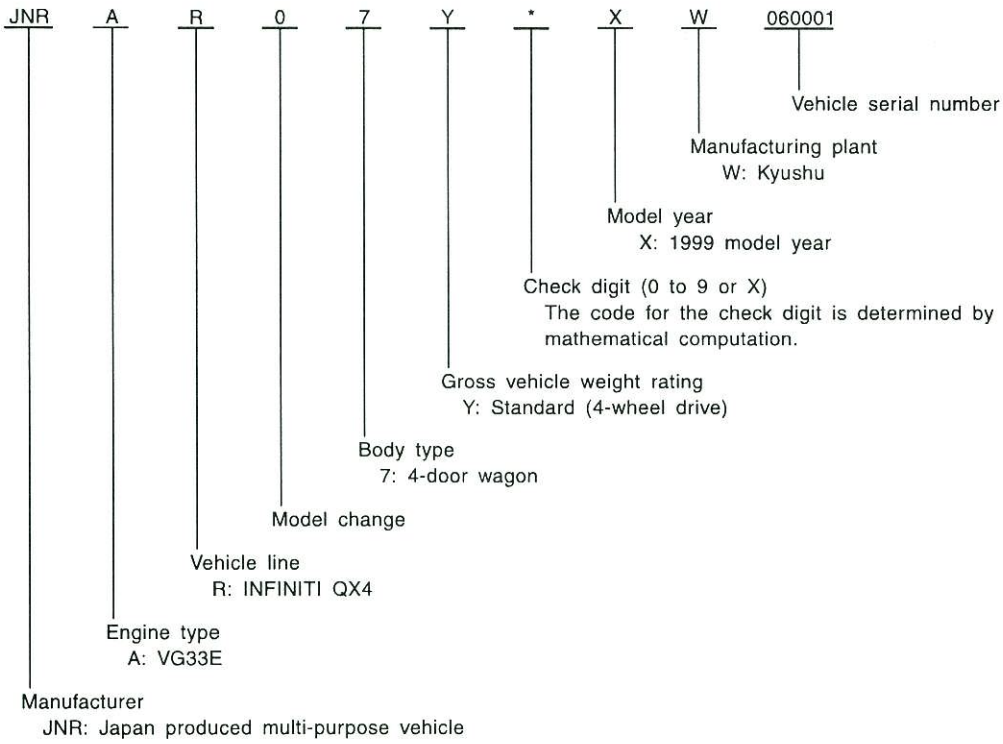
NBGI0007S02



SGI948-A

VEHICLE IDENTIFICATION NUMBER ARRANGEMENT

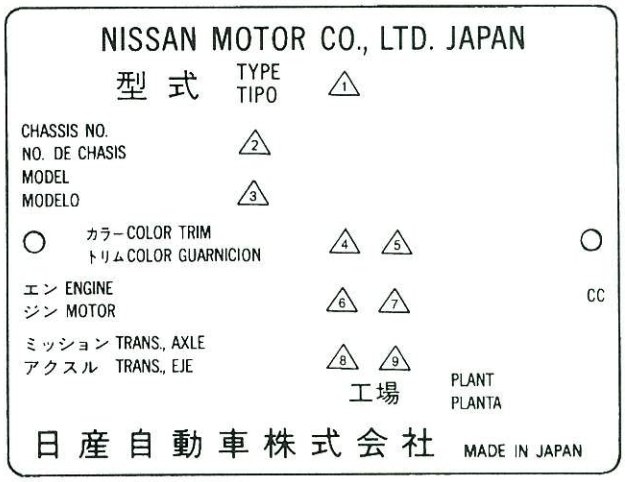
NBGI0007S0201



SGI068AA

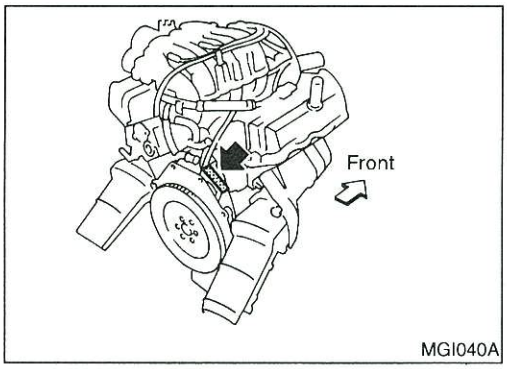
IDENTIFICATION PLATE

NBGI0007S0202



1 Type
2 Vehicle identification number (Chassis number)
3 Model
4 Body color code
5 Trim color code
6 Engine model
7 Engine displacement
8 Transmission model
9 Axle model

MGI039A

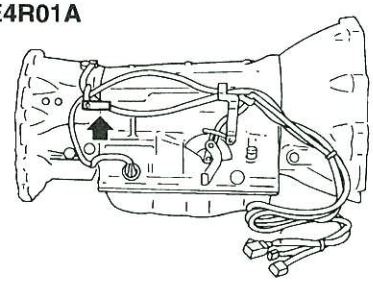


MGI040A

ENGINE SERIAL NUMBER

NBGI0007S0203

RE4R01A

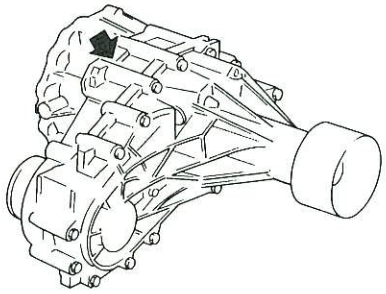


Automatic transmission number

MGI042A

AUTOMATIC TRANSMISSION NUMBER

NBGI0007S0204



MGI043A

TRANSFER SERIAL NUMBER

NBGI0007S0205

Dimensions

NBGI0007S03

Unit: mm (in)

	Wagon
	VG33E
Overall length	4,670 (183.9)
Overall width	1,840 (72.4)
Overall height	1,730 (68.1) 1,795 (70.7)*
Front tread	1,540 (60.6)
Rear tread	1,545 (60.8)
Wheelbase	2,700 (106.3)

*: With luggage rack

Wheels & Tires

NBGI0007S04

Grade	Road wheel/offset mm (in)	Tire	Spare tire size
LE	16 x 7JJ Aluminum/20 (0.79)	P255/65R16 106S	P255/65R16 106S

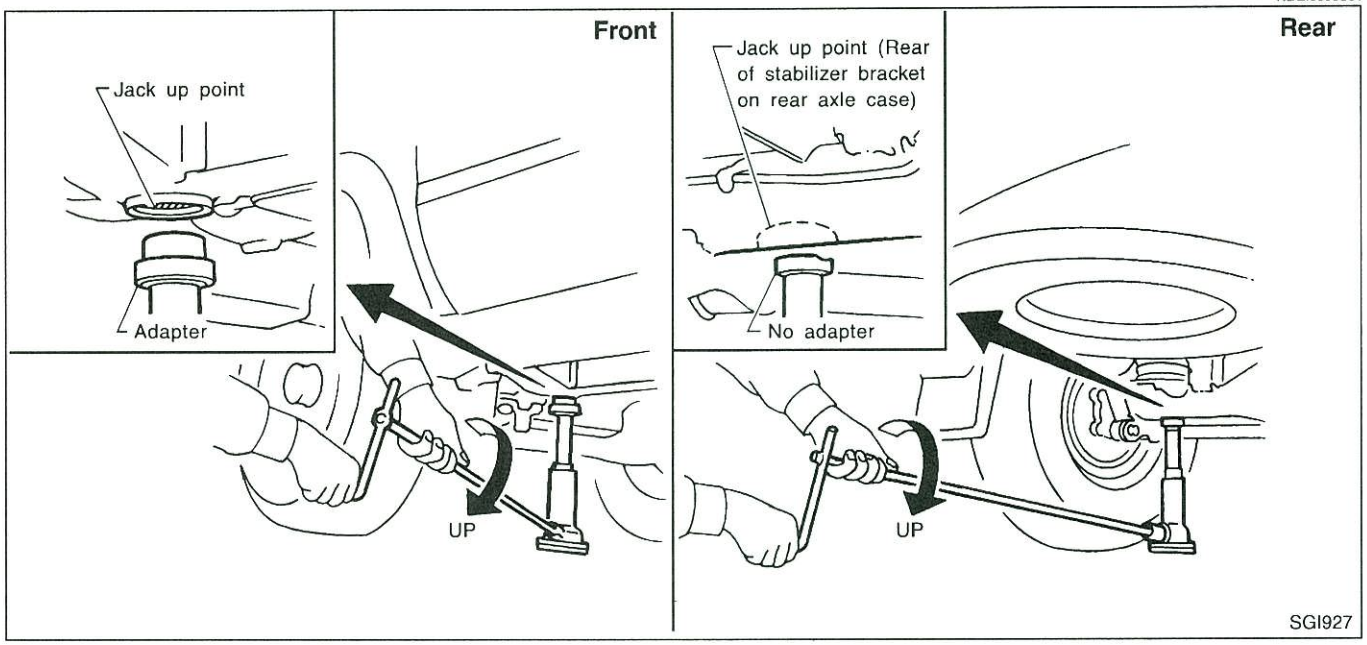
LIFTING POINTS AND TOW TRUCK TOWING

WARNING:

- **Never get under the vehicle while it is supported only by the jack. Always use safety stands to support the frame when you have to get under the vehicle.**
- **Place wheel chocks at both front and back of the wheels on the ground.**

Screw Jack

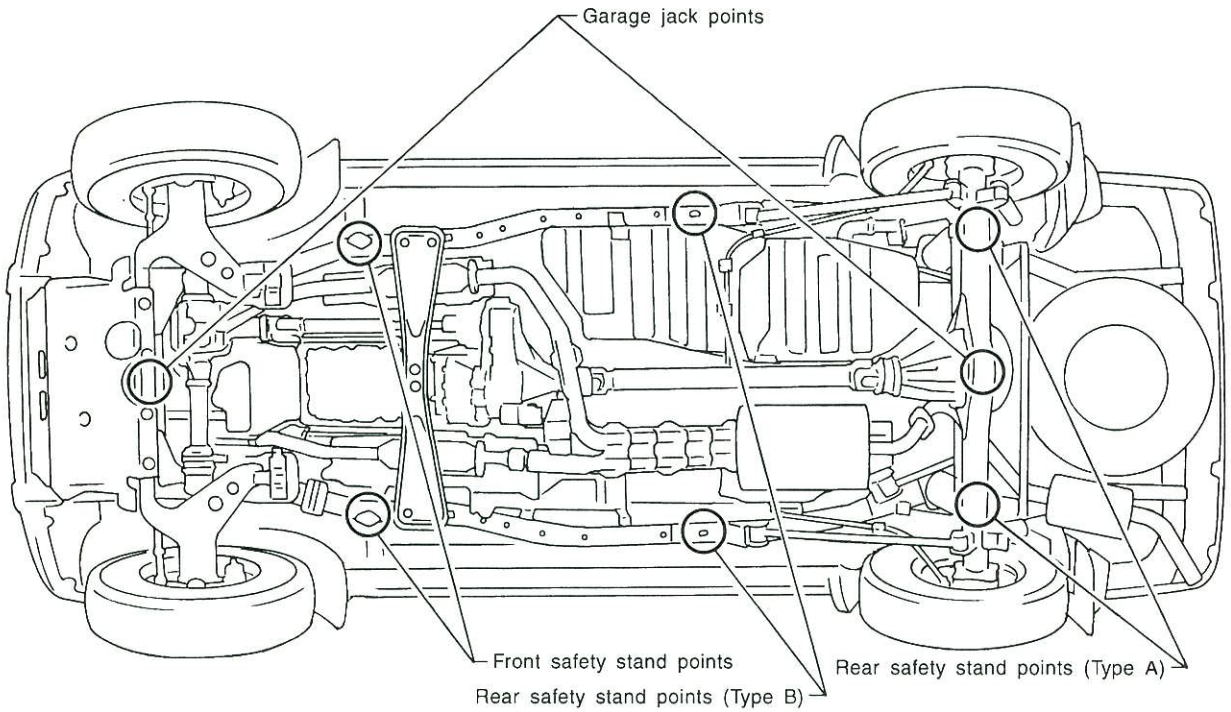
NBGI0008S01



Garage Jack and Safety Stand

=NBGI0008S02

CAUTION:
Place a wooden or rubber block between safety stand and vehicle body when the supporting body is flat.



Notes:
(1) Front and rear safety stand points (Type A) are the same as screw jack points.
(2) Rear safety stand points (Type B) are the same as rear 2-pole lift points.

SGI931

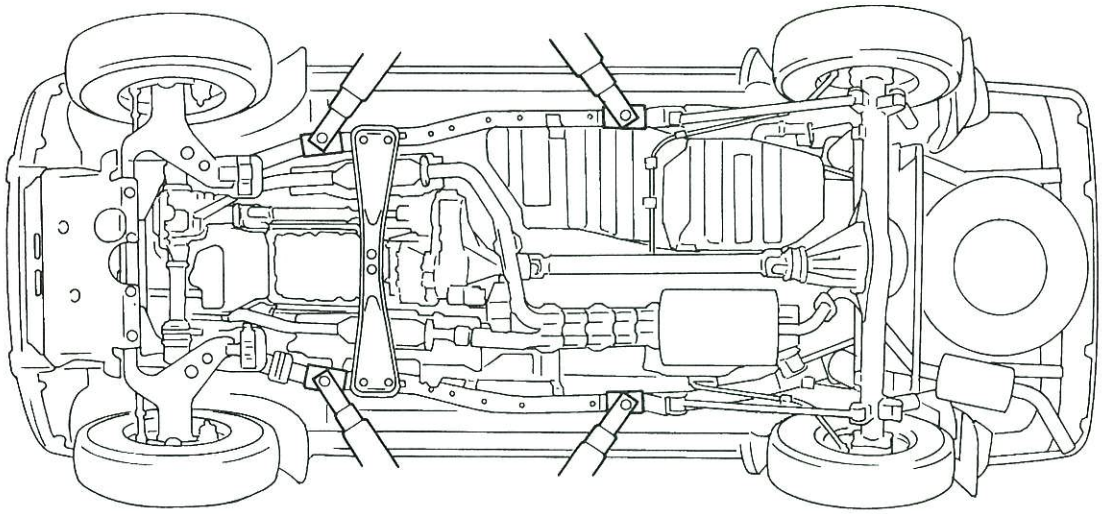
2-pole Lift

=NBGI0008S03

WARNING:

When lifting the vehicle, open the lift arms as wide as possible and ensure that the front and rear of the vehicle are well balanced.

When setting the lift arm, do not allow the arm to contact the brake tubes, brake cable and fuel lines.



Note: Lift-up points are the same as front safety stand points and rear safety stand points (Type B).

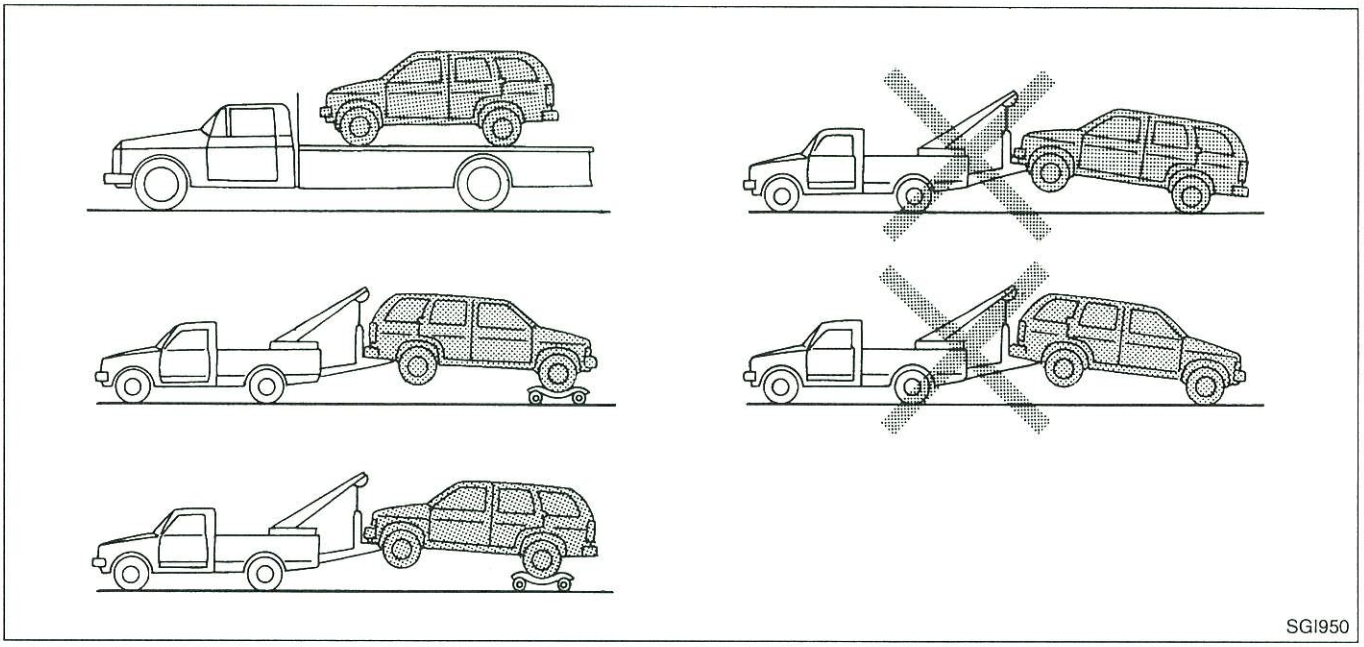
SGI932

Tow Truck Towing

NBGI0008S04

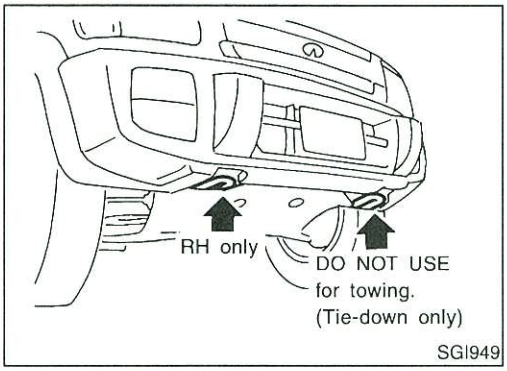
CAUTION:

- **All applicable state or Provincial (in Canada) laws and local laws regarding the towing operation must be obeyed.**
- **It is necessary to use proper towing equipment to avoid possible damage to the vehicle during towing operation. Towing is in accordance with Towing Procedure Manual at dealer.**
- **Always attach safety chains before towing.**
- **When towing, make sure that the transmission, steering system and power train are in good order. If any unit is damaged, dollies must be used.**



SGI950

INFINITI recommends that a dolly or a flat bed truck be used as illustrated when towing all-mode 4-wheel drive models.



SGI949

VEHICLE RECOVERY

NBGI0008S0401

- Use the towing **hook** only, not other parts of the vehicle. Otherwise, the vehicle body will be damaged.
- Use the towing hook **only** to free a vehicle stuck in sand, snow, mud, etc. **Never** tow the vehicle for a long distance using only the towing hook.
- The towing hook is under tremendous force when used to free a stuck vehicle. Always pull the cable straight out from the front or rear of the vehicle. **Never** pull on the hook at a sideways angle.
- Stand clear of a stuck vehicle.

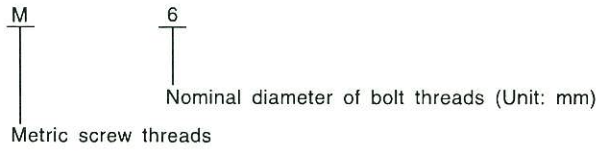
TIGHTENING TORQUE OF STANDARD BOLTS

Grade	Bolt size	Bolt diameter * mm	Pitch mm	Tightening torque (Without lubricant)							
				Hexagon head bolt				Hexagon flange bolt			
				N·m	kg-m	ft-lb	in-lb	N·m	kg-m	ft-lb	in-lb
4T	M6	6.0	1.0	5.1	0.52	3.8	45.1	6.1	0.62	4.5	53.8
	M8	8.0	1.25	13	1.3	9	—	15	1.5	11	—
			1.0	13	1.3	9	—	16	1.6	12	—
	M10	10.0	1.5	25	2.5	18	—	29	3.0	22	—
			1.25	25	2.6	19	—	30	3.1	22	—
	M12	12.0	1.75	42	4.3	31	—	51	5.2	38	—
			1.25	46	4.7	34	—	56	5.7	41	—
	M14	14.0	1.5	74	7.5	54	—	88	9.0	65	—
7T	M6	6.0	1.0	8.4	0.86	6.2	74.6	10	1.0	7	87
	M8	8.0	1.25	21	2.1	15	—	25	2.5	18	—
			1.0	22	2.2	16	—	26	2.7	20	—
	M10	10.0	1.5	41	4.2	30	—	48	4.9	35	—
			1.25	43	4.4	32	—	51	5.2	38	—
	M12	12.0	1.75	71	7.2	52	—	84	8.6	62	—
			1.25	77	7.9	57	—	92	9.4	68	—
	M14	14.0	1.5	127	13.0	94	—	147	15.0	108	—
9T	M6	6.0	1.0	12	1.2	9	—	15	1.5	11	—
	M8	8.0	1.25	29	3.0	22	—	35	3.6	26	—
			1.0	31	3.2	23	—	37	3.8	27	—
	M10	10.0	1.5	59	6.0	43	—	70	7.1	51	—
			1.25	62	6.3	46	—	74	7.5	54	—
	M12	12.0	1.75	98	10.0	72	—	118	12.0	87	—
			1.25	108	11.0	80	—	137	14.0	101	—
	M14	14.0	1.5	177	18.0	130	—	206	21.0	152	—

*: Nominal diameter

1) **Special parts are excluded.**
2) **This standard is applicable to bolts having the following marks embossed on the bolt head.**

Grade	Mark
4T	4
7T	7
9T	9



MGI044A

SAE J1930 Terminology List

NBGI0010S01

All emission related terms used in this publication in accordance with SAE J1930 are listed. Accordingly, new terms, new acronyms/abbreviations and old terms are listed in the following chart.

NEW TERM	NEW ACRONYM / ABBREVIATION	OLD TERM
Air cleaner	ACL	Air cleaner
Barometric pressure	BARO	***
Barometric pressure sensor-BCDD	BAROS-BCDD	BCDD
Camshaft position	CMP	***
Camshaft position sensor	CMPS	Crank angle sensor
Canister	***	Canister
Carburetor	CARB	Carburetor
Charge air cooler	CAC	Intercooler
Closed loop	CL	Closed loop
Closed throttle position switch	CTP switch	Idle switch
Clutch pedal position switch	CPP switch	Clutch switch
Continuous fuel injection system	CFI system	***
Continuous trap oxidizer system	CTOX system	***
Crankshaft position	CKP	***
Crankshaft position sensor	CKPS	***
Data link connector	DLC	***
Data link connector for CONSULT	DLC for CONSULT	Diagnostic connector for CONSULT
Diagnostic test mode	DTM	Diagnostic mode
Diagnostic test mode selector	DTM selector	Diagnostic mode selector
Diagnostic test mode I	DTM I	Mode I
Diagnostic test mode II	DTM II	Mode II
Diagnostic trouble code	DTC	Malfunction code
Direct fuel injection system	DFI system	***
Distributor ignition system	DI system	Ignition timing control
Early fuel evaporation-mixture heater	EFE-mixture heater	Mixture heater
Early fuel evaporation system	EFE system	Mixture heater control
Electrically erasable programmable read only memory	EEPROM	***
Electronic ignition system	EI system	Ignition timing control
Engine control	EC	***
Engine control module	ECM	ECCS control unit
Engine coolant temperature	ECT	Engine temperature
Engine coolant temperature sensor	ECTS	Engine temperature sensor
Engine modification	EM	***
Engine speed	RPM	Engine speed

SAE J1930 Terminology List (Cont'd)

NEW TERM	NEW ACRONYM / ABBREVIATION	OLD TERM
Erasable programmable read only memory	EPROM	***
Evaporative emission canister	EVAP canister	Canister
Evaporative emission system	EVAP system	Canister control solenoid valve
Exhaust gas recirculation valve	EGR valve	EGR valve
Exhaust gas recirculation control-BPT valve	EGRC-BPT valve	BPT valve
Exhaust gas recirculation control-solenoid valve	EGRC-solenoid valve	EGR control solenoid valve
Exhaust gas recirculation temperature sensor	EGRT sensor	Exhaust gas temperature sensor
EGR temperature sensor		
Flash electrically erasable programmable read only memory	FEEPROM	***
Flash erasable programmable read only memory	FEPROM	***
Flexible fuel sensor	FFS	***
Flexible fuel system	FF system	***
Fuel pressure regulator	***	Pressure regulator
Fuel pressure regulator control solenoid valve	***	PRVR control solenoid valve
Fuel trim	FT	***
Heated Oxygen sensor	HO2S	Exhaust gas sensor
Idle air control system	IAC system	Idle speed control
Idle air control valve-air regulator	IACV-air regulator	Air regulator
Idle air control valve-auxiliary air control valve	IACV-AAC valve	Auxiliary air control (AAC) valve
Idle air control valve-FICD solenoid valve	IACV-FICD solenoid valve	FICD solenoid valve
Idle air control valve-idle up control solenoid valve	IACV-idle up control solenoid valve	Idle up control solenoid valve
Idle speed control-FI pot	ISC-FI pot	FI pot
Idle speed control system	ISC system	***
Ignition control	IC	***
Ignition control module	ICM	***
Indirect fuel injection system	IFI system	***
Intake air	IA	Air
Intake air temperature sensor	IAT sensor	Air temperature sensor
Knock	***	Detonation
Knock sensor	KS	Detonation sensor
Malfunction indicator lamp	MIL	Check engine light
Manifold absolute pressure	MAP	***

NEW TERM	NEW ACRONYM / ABBREVIATION	OLD TERM
Manifold absolute pressure sensor	MAPS	***
Manifold differential pressure	MDP	***
Manifold differential pressure sensor	MDPS	***
Manifold surface temperature	MST	***
Manifold surface temperature sensor	MSTS	***
Manifold vacuum zone	MVZ	***
Manifold vacuum zone sensor	MVZS	***
Mass air flow sensor	MAFS	Air flow meter
Mixture control solenoid valve	MC solenoid valve	Air-fuel ratio control solenoid valve
Multiport fuel injection System	MFI system	Fuel injection control
Neutral position switch	***	Neutral switch
Nonvolatile random access memory	NVRAM	***
On board diagnostic system	OBD system	Self-diagnosis
Open loop	OL	Open loop
Oxidation catalyst	OC	Catalyst
Oxidation catalytic converter system	OC system	***
Oxygen sensor	O2S	Exhaust gas sensor
Park position switch	***	Park switch
Park/neutral position switch	PNP switch	Park/neutral switch
Periodic trap oxidizer system	PTOX system	***
Positive crankcase ventilation	PCV	Positive crankcase ventilation
Positive crankcase ventilation valve	PCV valve	PCV valve
Powertrain control module	PCM	***
Programmable read only memory	PROM	***
Pulsed secondary air injection control solenoid valve	PAIRC solenoid valve	AIV control solenoid valve
Pulsed secondary air injection system	PAIR system	Air induction valve (AIV) control
Pulsed secondary air injection valve	PAIR valve	Air induction valve
Random access memory	RAM	***
Read only memory	ROM	***
Scan tool	ST	***
Secondary air injection pump	AIR pump	***
Secondary air injection system	AIR system	***
Sequential multiport fuel injection system	SFI system	Sequential fuel injection
Service reminder indicator	SRI	***
Simultaneous multiport fuel injection system	***	Simultaneous fuel injection
Smoke puff limiter system	SPL system	***

SAE J1930 Terminology List (Cont'd)

NEW TERM	NEW ACRONYM / ABBREVIATION	OLD TERM
Supercharger	SC	***
Supercharger bypass	SCB	***
System readiness test	SRT	***
Thermal vacuum valve	TVV	Thermal vacuum valve
Three way catalyst	TWC	Catalyst
Three way catalytic converter system	TWC system	***
Three way + oxidation catalyst	TWC + OC	Catalyst
Three way + oxidation catalytic converter system	TWC + OC system	***
Throttle body	TB	Throttle chamber SPI body
Throttle body fuel injection system	TBI system	Fuel injection control
Throttle position	TP	Throttle position
Throttle position sensor	TPS	Throttle sensor
Throttle position switch	TP switch	Throttle switch
Torque converter clutch solenoid valve	TCC solenoid valve	Lock-up cancel solenoid Lock-up solenoid
Transmission control module	TCM	A/T control unit
Turbocharger	TC	Turbocharger
Vehicle speed sensor	VSS	Vehicle speed sensor
Volume air flow sensor	VAFS	Air flow meter
Warm up oxidation catalyst	WU-OC	Catalyst
Warm up oxidation catalytic converter system	WU-OC system	***
Warm up three way catalyst	WU-TWC	Catalyst
Warm up three way catalytic converter system	WU-TWC system	***
Wide open throttle position switch	WOTP switch	Full switch

FRONT & REAR AXLE

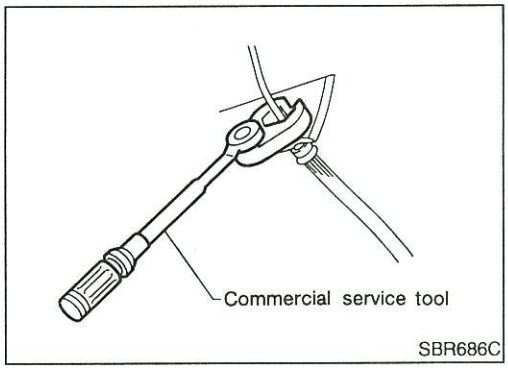
SECTION AX

CONTENTS

FRONT AXLE 2
- Precautions 2
  - PRECAUTIONS 2
- Preparation 2
  - SPECIAL SERVICE TOOLS 2
  - COMMERCIAL SERVICE TOOLS 2
- Noise, Vibration and Harshness (NVH) Troubleshooting 3
  - NVH TROUBLESHOOTING CHART 3
- On-vehicle Service 3
  - FRONT AXLE PARTS 3
  - FRONT WHEEL BEARING 4
  - DRIVE SHAFT 5
- Wheel Hub and Rotor Disc 6
  - COMPONENTS 6
  - REMOVAL 6
  - INSTALLATION 7
  - DISASSEMBLY 8
  - INSPECTION 8
  - ASSEMBLY 8
- Knuckle Spindle 9
  - REMOVAL 9
  - INSPECTION 10
  - INSTALLATION 10
- Drive Shaft 10
  - COMPONENTS 10
  - REMOVAL 11
  - DISASSEMBLY 11
  - INSPECTION 12
  - ASSEMBLY 13
  - INSTALLATION 14

REAR AXLE 16
- Precautions 16
  - PRECAUTIONS 16
- Preparation 16
  - SPECIAL SERVICE TOOLS 16
  - COMMERCIAL SERVICE TOOLS 17
- Noise, Vibration and Harshness (NVH) Troubleshooting 17
- On-vehicle Service 17
  - REAR AXLE PARTS 17
  - REAR WHEEL BEARING 17
- Components 18
- Removal 18
- Inspection 20
  - AXLE SHAFT 20
  - BEARING CAGE 20
  - REAR AXLE HOUSING 20
- Installation 20

SERVICE DATA AND SPECIFICATIONS (SDS) 22
- Wheel Bearing (Front) 22
- Drive Shaft 22
  - DRIVE SHAFT END SNAP RING 22
- Wheel Bearing (Rear) 22



Precautions

PRECAUTIONS

NBAX0001

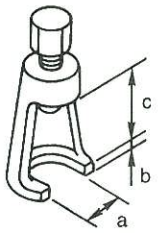
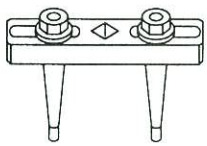
- **When installing rubber parts, final tightening must be carried out under unladen condition* with tires on ground. *Fuel, radiator coolant and engine oil full. Spare tire, jack, hand tools and mats in designated positions.**
- **Use flare nut wrench when removing and installing brake tubes.**
- **After installing removed suspension parts, check wheel alignment and adjust if necessary.**
- **Always torque brake lines when installing.**

Preparation

SPECIAL SERVICE TOOLS

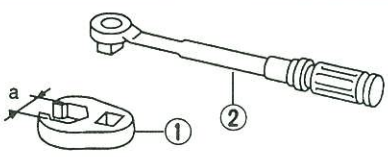
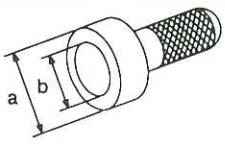
NBAX0002

The actual shapes of Kent-Moore tools may differ from those of special service tools illustrated here.

Tool number (Kent-Moore No.) Tool name	Description	
ST29020001 (J24319-01) Ball joint remover	 NT694	Removing tie-rod outer end and lower ball joint **a: 34 mm (1.34 in)** **b: 6.5 mm (0.256 in)** **c: 61.5 mm (2.421 in)**
KV401021S0 (—) Bearing race drift	NT153	Installing wheel bearing outer race
KV40105400 (J36001) Wheel bearing lock nut wrench	 NT154	Removing and installing wheel bearing lock nut

COMMERCIAL SERVICE TOOLS

NBAX0003

Tool name	Description	
1 Flare nut crowfoot 2 Torque wrench	 NT360	Removing and installing each brake piping **a: 10 mm (0.39 in)**
Hub cap drift	 NT115	Installing hub cap **a: 57 mm (2.24 in) dia.** **b: 46 mm (1.81 in) dia.**

Noise, Vibration and Harshness (NVH) Troubleshooting

NBAX0034

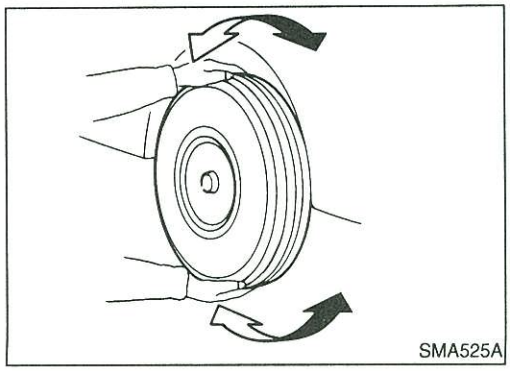
NVH TROUBLESHOOTING CHART

NBAX0034S01

Use the chart below to help you find the cause of the symptom. If necessary, repair or replace these parts.

Reference page			—	AX-12	—	AX-6, 18	—	AX-4, 17	NVH in PD section	NVH in PD section	Refer to DRIVE SHAFT in this chart.	Refer to AXLE in this chart.	NVH in SU section	NVH in SU section	NVH in SU section	NVH in BR section	NVH in ST section
Possible cause and SUSPECTED PARTS			Excessive joint angle	Joint sliding resistance	Imbalance	Improper installation, looseness	Parts interference	Wheel bearing damage	PROPELLER SHAFT	DIFFERENTIAL	DRIVE SHAFT	AXLE	SUSPENSION	TIRES	ROAD WHEEL	BRAKES	STEERING
Symptom	DRIVE SHAFT	Noise, Vibration	×	×					×	×		×	×	×	×	×	×
		Shake	×		×				×			×	×	×	×	×	×
	AXLE	Noise				×	×		×	×	×		×	×	×	×	×
		Shake				×	×		×		×		×	×	×	×	×
		Vibration				×	×		×		×		×	×			×
		Shimmy				×	×						×	×	×	×	×
		Judder				×							×	×	×	×	×
		Poor quality ride or handling				×	×	×					×	×	×		

×: Applicable


SMA525A

On-vehicle Service

FRONT AXLE PARTS

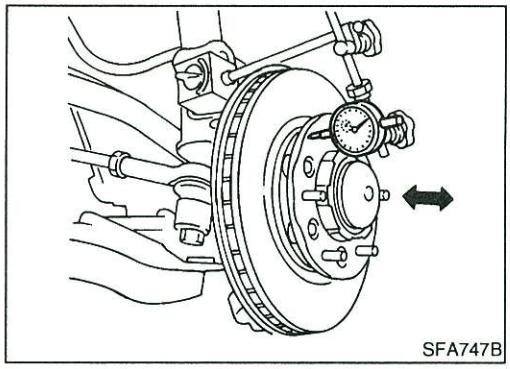
NBAX0004

Check front axle parts for excessive play, cracks, wear and other damage.

1. Shake each front wheel to check for excessive play.
2. Retighten all nuts and bolts to the specified torque.

Tightening torque:

Refer to "Wheel Hub and Rotor Disc", AX-6.


SFA747B

FRONT WHEEL BEARING

NBAX0005

1. Check that wheel bearings operate smoothly.
2. Check axial end play.
   Axial end play: 0 mm (0 in)
3. Adjust wheel bearing preload if there is any axial end play or wheel bearing does not turn smoothly.

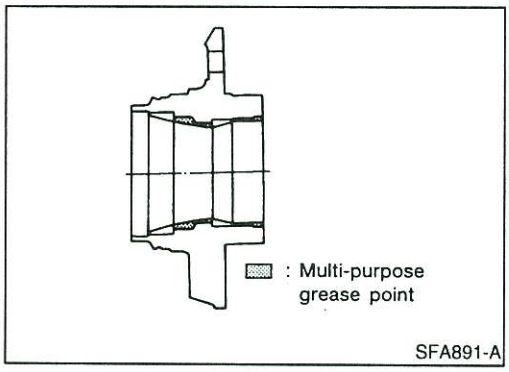
Preload Adjustment

NBAX0005S01

Adjust wheel bearing preload after wheel bearing has been replaced or front axle has been reassembled.

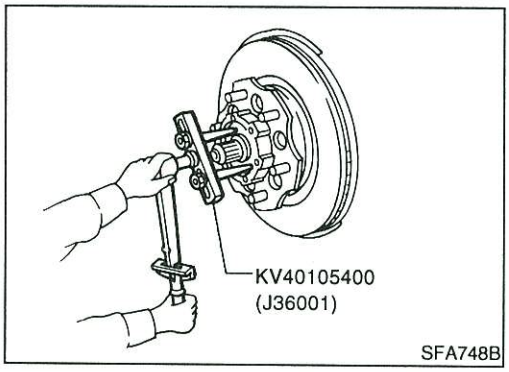
Adjust wheel bearing preload as follows:

1. Before adjustment, thoroughly clean all parts to prevent dirt entry.



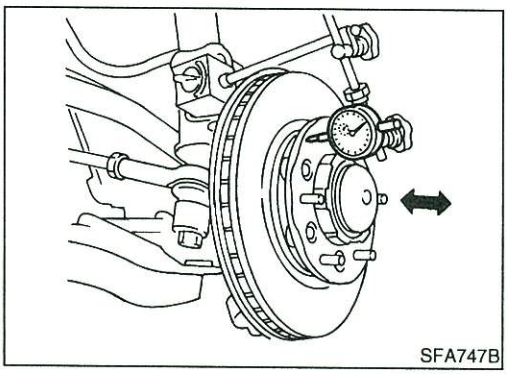
SFA891-A

2. Apply multi-purpose grease sparingly to the following parts:
   - Threaded portion of spindle
   - Contact surface between wheel bearing lock washer (chamfered side) and outer wheel bearing
   - Grease seal lip
   - Wheel hub (as shown at left)

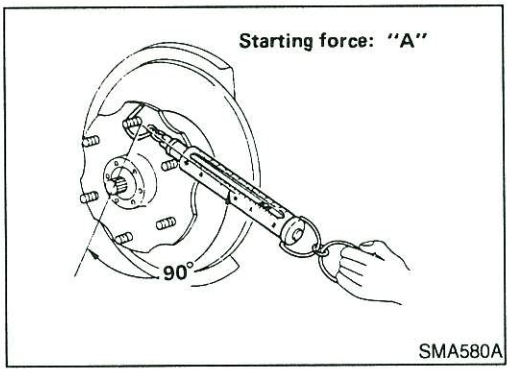


SFA748B

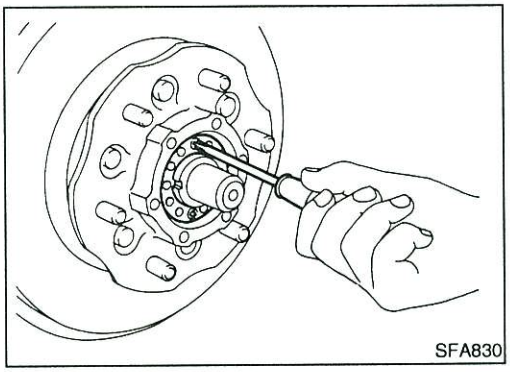
3. Tighten wheel bearing lock nut with Tool.
   : 78 - 98 N·m (8 - 10 kg-m, 58 - 72 ft-lb)
4. Turn wheel hub several times in both directions.
5. Loosen wheel bearing lock nut so that torque becomes 0 N·m (0 kg-m, 0 ft-lb).
6. Retighten wheel bearing lock nut with Tool.
   : 0.5 - 1.5 N·m (0.05 - 0.15 kg-m, 4.3 - 13.0 in-lb)


SFA747B

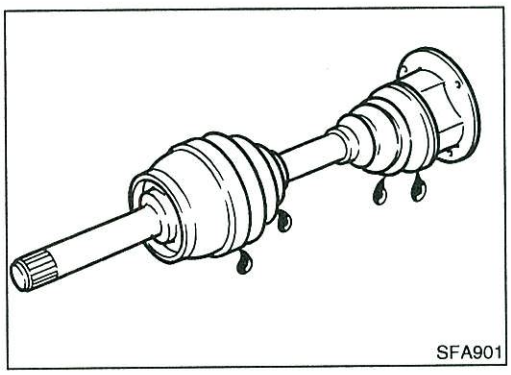
7. Turn wheel hub several times in both directions.
8. Retighten wheel bearing lock nut with Tool.
   : 0.5 - 1.5 N·m (0.05 - 0.15 kg-m, 4.3 - 13.0 in-lb)
9. Measure wheel bearing axial end play.
   Axial end play: 0 mm (0 in)



10. Measure starting force "A" at wheel hub bolt.



11. Install lock washer by tightening the lock nut within 15 to 30 degrees.
12. Turn wheel hub several times in both directions to seat wheel bearing correctly.
13. Measure starting force "B" at wheel hub bolt. Refer to procedure 10.
14. Wheel bearing preload "C" can be calculated as shown below.
    C = B – A
    Wheel bearing preload "C":
    7.06 - 20.99 N (0.72 - 2.14 kg, 1.59 - 4.72 lb)
15. If wheel bearing preload "C" is outside specifications, remove lock washer. Tighten or loosen lock nut within ±15 degrees (Refer to step 11 above). Install lock washer, then repeat steps 12, 13 and 14.
16. Repeat above procedures until correct axial end play and wheel bearing preload are obtained.
17. Install drive flange and wheel hub cap.



DRIVE SHAFT

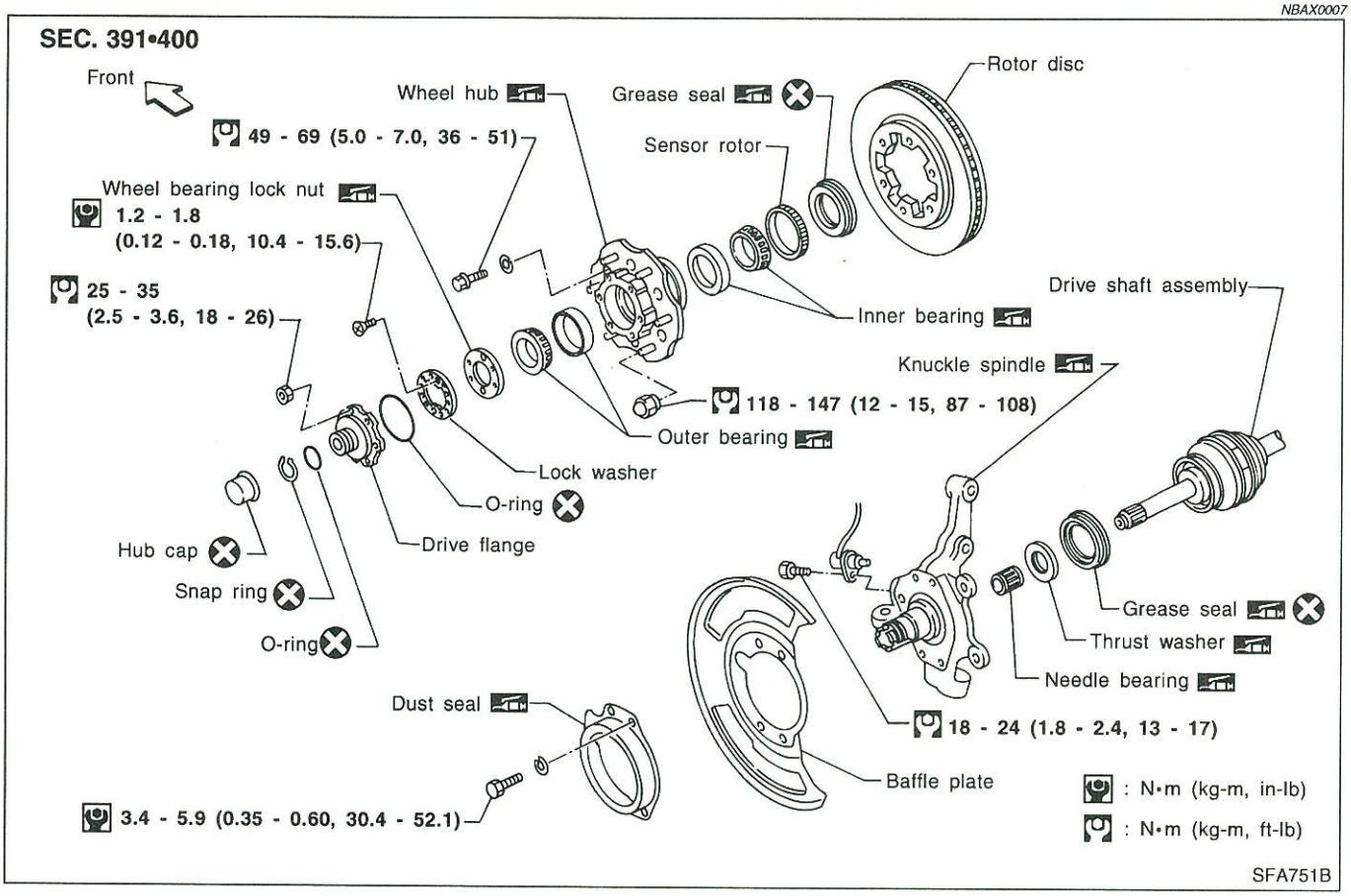
NBAX0006

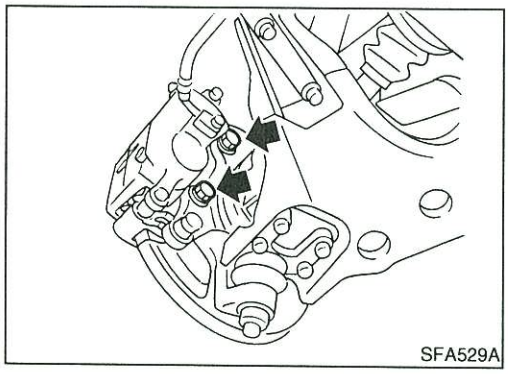
- Check boot and drive shaft for cracks, wear, damage and grease leakage.

Wheel Hub and Rotor Disc

COMPONENTS

NBAX0007





REMOVAL

NBAX0008

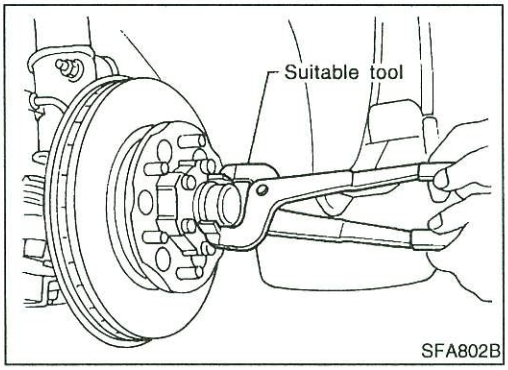
CAUTION:

Before removing the front axle assembly, disconnect the ABS wheel sensor from the assembly. Then move it away from the front axle assembly area. Failure to do so may result in damage to the sensor wires and the sensor becoming inoperative.

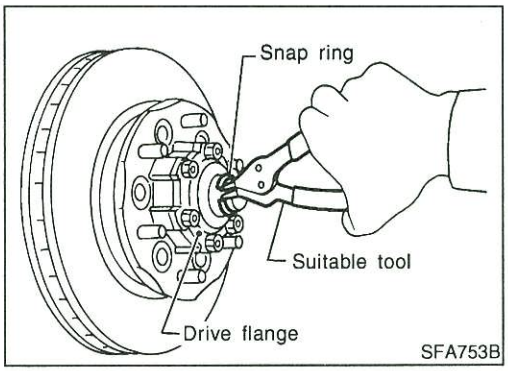
1. Remove brake caliper assembly.

Brake hose need not be disconnected from brake caliper. In this case, suspend caliper assembly with wire so as not to stretch brake hose.

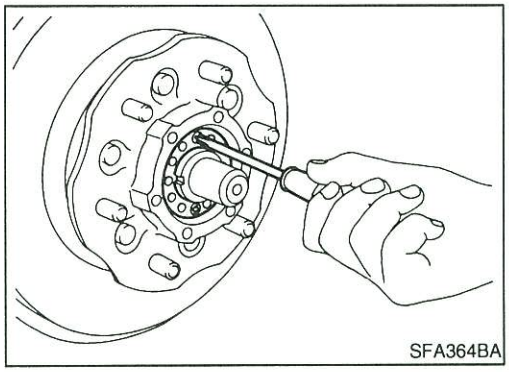
Be careful not to depress brake pedal, or piston will pop out. Make sure brake hose is not twisted.



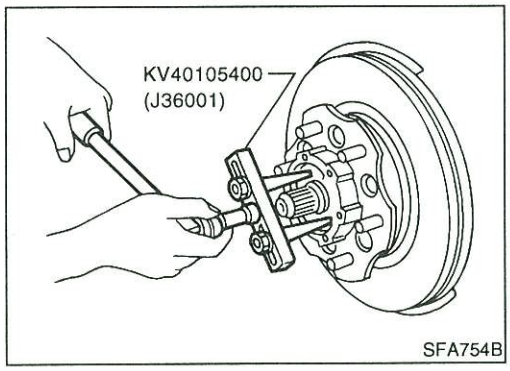
2. Remove hub cap with suitable tool.



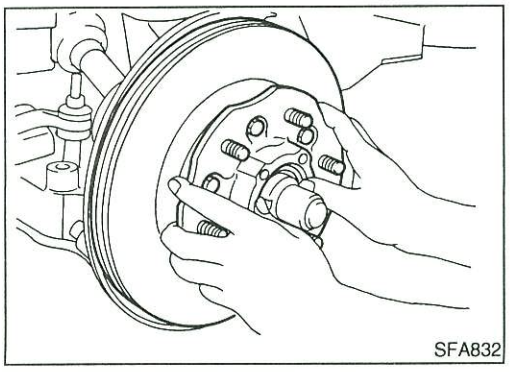
3. Remove snap ring with suitable tool.
4. Remove drive flange.



5. Remove lock washer.



6. Remove wheel bearing lock nut.

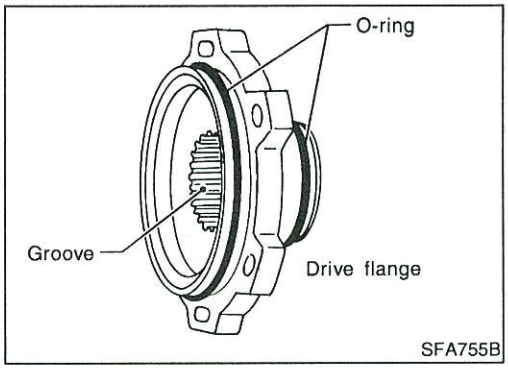


7. Remove wheel hub and wheel bearing.
   Be careful not to drop outer bearing.

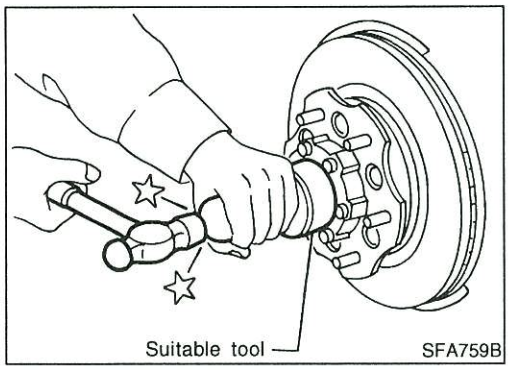
INSTALLATION

NBAX0009

1. After installing wheel hub and wheel bearing, adjust wheel bearing preload.
   Refer to "Preload Adjustment", "FRONT WHEEL BEARING", "On-vehicle Service", AX-4.

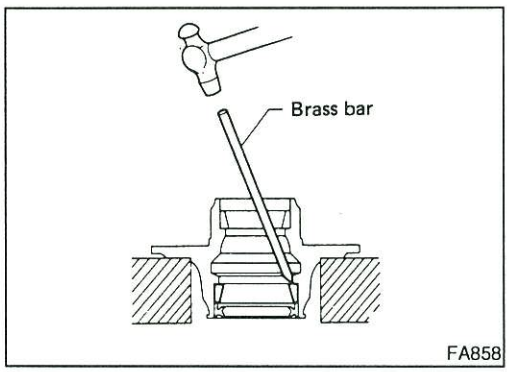


2. Pack drive flange groove with grease, apply grease to O-ring (two places) and mating surface of drive flange, and install flange.
3. Install snap ring.



4. Install hub cap using a suitable tool.

Do not reuse hub cap. When installing, replace it with a new one.



DISASSEMBLY

NBAX0010

- Remove grease seal and bearing outer races with suitable brass bar.

INSPECTION

NBAX0011

Thoroughly clean wheel bearings and wheel hub.

Wheel Bearing

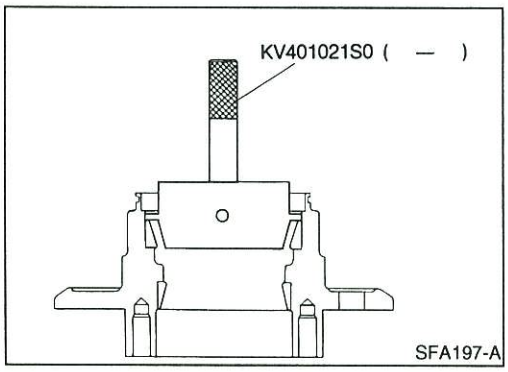
NBAX0011S01

- Make sure wheel bearing rolls freely and is free from noise, crack, pitting and wear.

Wheel Hub

NBAX0011S02

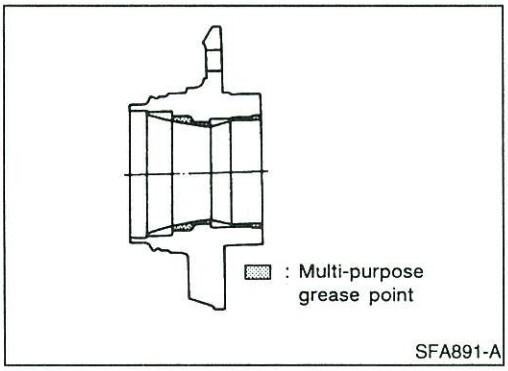
- Check wheel hub for crack by using a magnetic exploration or dyeing test.



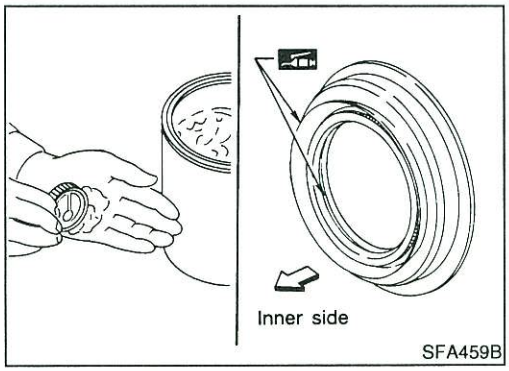
ASSEMBLY

NBAX0012

1. Install bearing outer race with Tool until it seats in hub.



2. Pack multi-purpose grease into wheel hub.



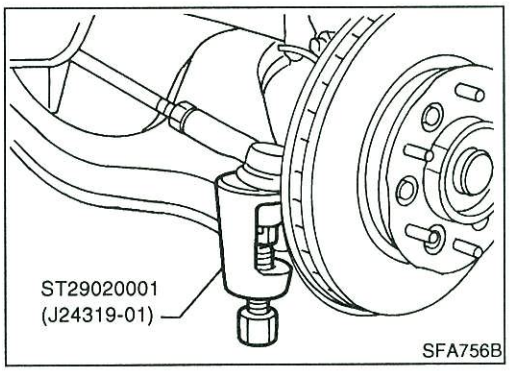
3. Apply multi-purpose grease to each bearing cone.
4. Pack grease seal lip with multi-purpose grease, then install it into wheel hub with suitable drift.

Knuckle Spindle

REMOVAL

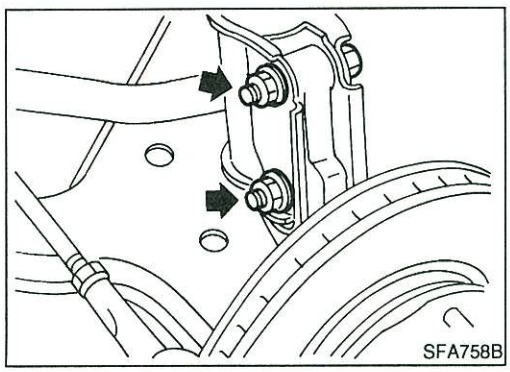
NBAX0013

1. Remove drive shaft.
   Refer to "Drive Shaft", AX-11.



2. Separate tie-rod end and lower ball joint from knuckle with Tool.

Install stud nut conversely on stud bolt so as not to damage stud bolt.



3. Separate knuckle from strut.

INSPECTION

NBAX0014

Knuckle Spindle

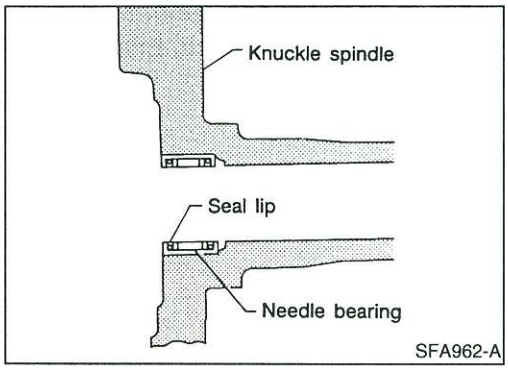
NBAX0014S01

- Check knuckle spindle for deformation, cracks and other damage by using a magnetic exploration or dyeing test.

Needle Bearing

NBAX0014S02

- Check needle bearing for wear, scratches, pitting, flaking and burn marks.



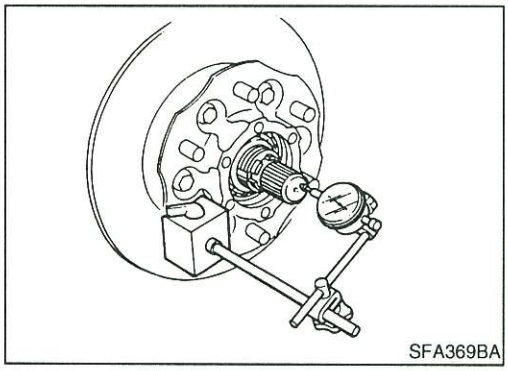
INSTALLATION

NBAX0015

1. Install needle bearing into knuckle spindle.

Make sure that needle bearing is facing in proper direction.
Apply multi-purpose grease.

2. Install knuckle with wheel hub.
3. Install tie-rod end and lower ball joint.

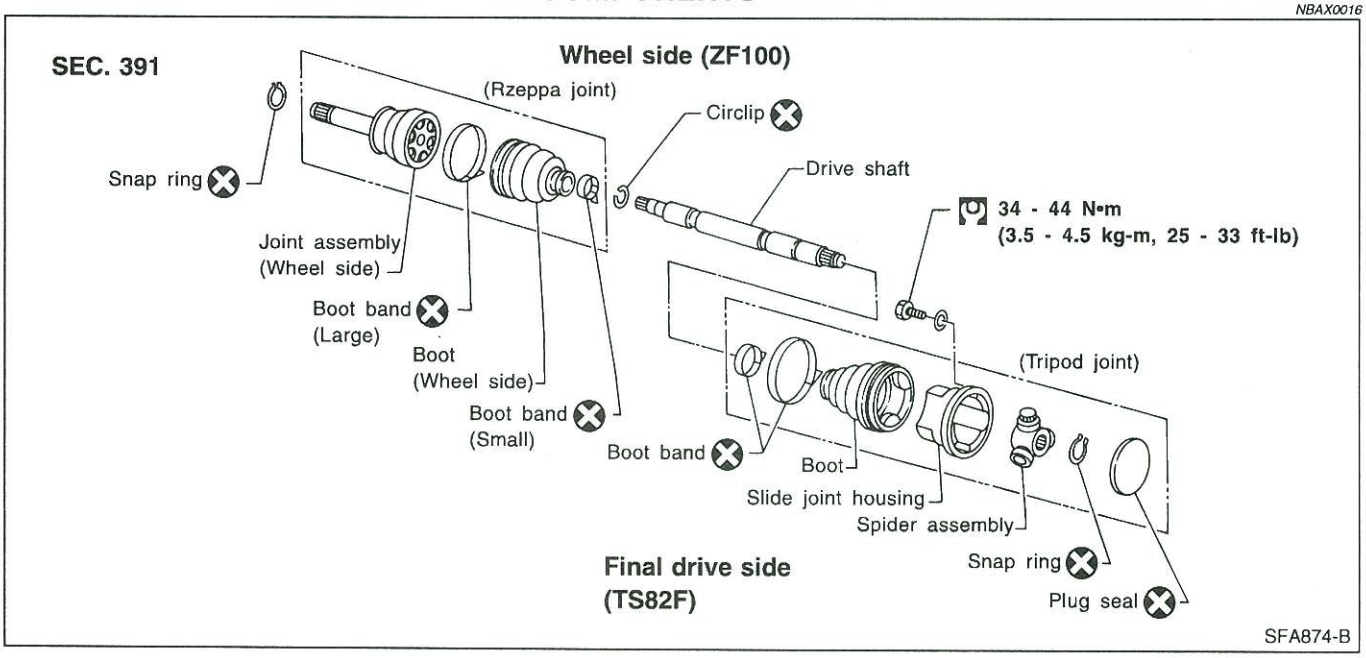


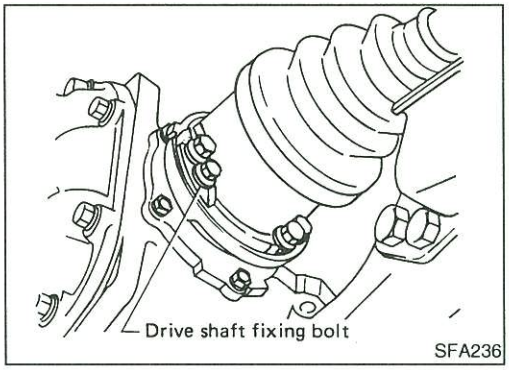
4. After installing knuckle spindle, adjust wheel bearing preload. Refer to "Preload Adjustment", "FRONT WHEEL BEARING", "On-vehicle Service", AX-4.
5. After installing drive shaft, check drive shaft axial end play. **Do not reuse snap ring once it has been removed.** Refer to "Drive Shaft", AX-10.

Drive Shaft

COMPONENTS

NBAX0016

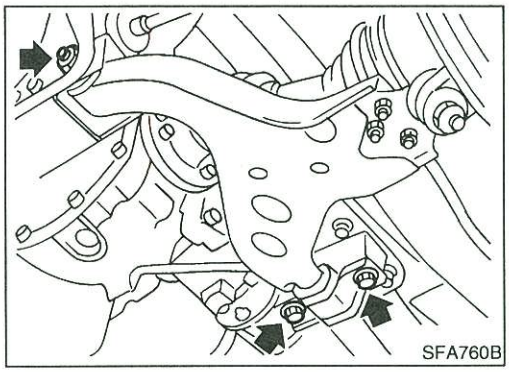




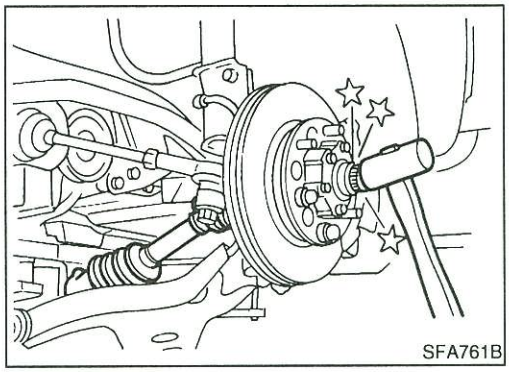
REMOVAL

NBAX0017

1. Remove hub cap and snap ring.
   Refer to "REMOVAL", "Wheel Hub and Rotor Disc", AX-6.
2. Remove bolts fixing drive shaft to final drive.

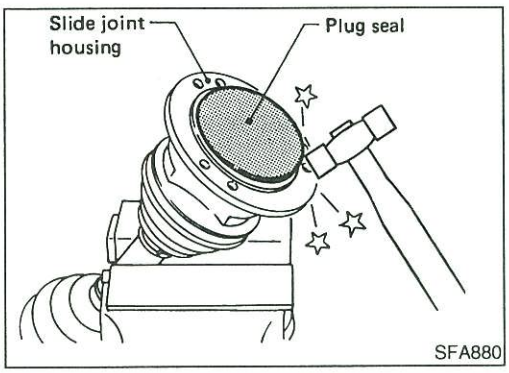


3. Remove transverse link fixing nut and bolts.



4. Separate drive shaft from knuckle by lightly tapping it with a copper hammer.

Cover boots with shop towel so as not to damage them when removing drive shaft.



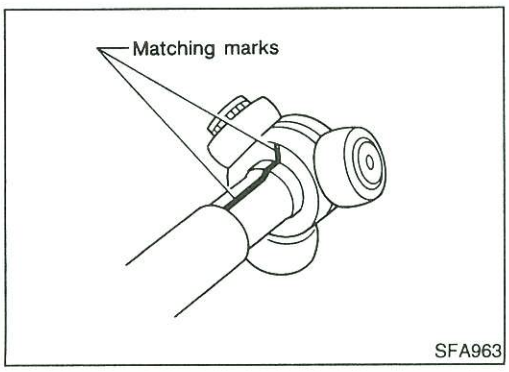
DISASSEMBLY

NBAX0018

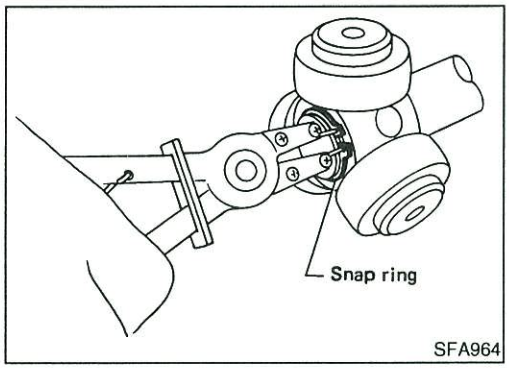
Final Drive Side (TS82F)

NBAX0018S01

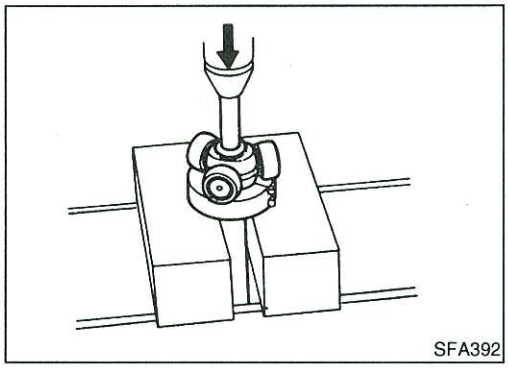
1. Remove plug seal from slide joint housing by lightly tapping around slide joint housing.
2. Remove boot bands.



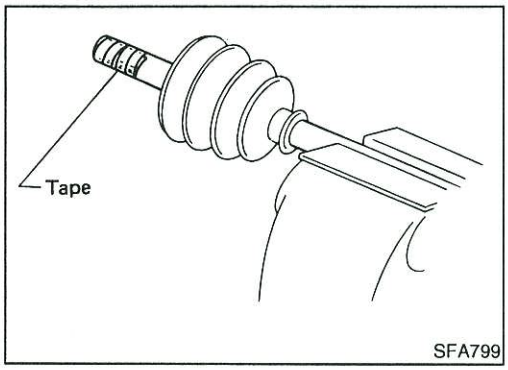
3. Move boot and slide joint housing toward wheel side, and put matching marks.



4. Remove snap ring.

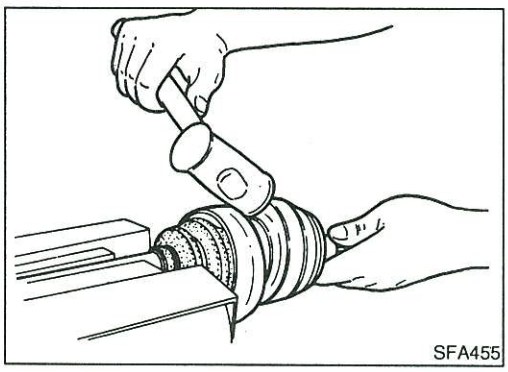


5. Detach spider assembly with press.



6. Draw out boot.

Cover drive shaft serration with tape so as not to damage the boot.



Wheel Side (ZF100)

NBAX0018S02

CAUTION:

The joint on the wheel side cannot be disassembled.

- Before separating joint assembly, put matching marks on drive shaft and joint assembly.
- Separate joint assembly with suitable tool.

Be careful not to damage threads on drive shaft.

- Remove boot bands.

INSPECTION

NBAX0019

Thoroughly clean all parts in cleaning solvent, and dry with compressed air. Check parts for evidence of deformation and other damage.

Drive Shaft

NBAX0019S01

Replace drive shaft if it is twisted or cracked.

Boot

NBAX0019S02

Check boot for fatigue, cracks, and wear. Replace boot with new boot bands.

Joint Assembly (Final drive side)

NBAX0019S03

- Replace any parts of double offset joint which show signs of scorching, rust, wear or excessive play.
- Check serration for deformation. Replace if necessary.
- Check slide joint housing for any damage. Replace if necessary.

Joint Assembly (Wheel side)

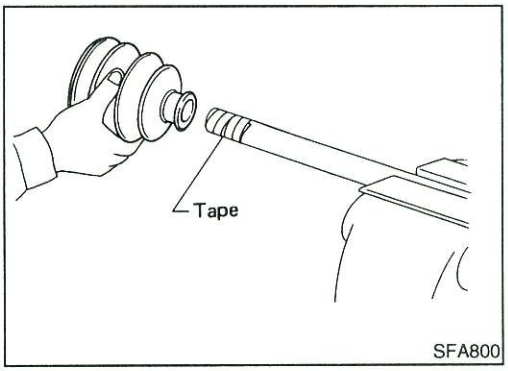
NBAX0019S04

Replace joint assembly if it is deformed or damaged.

ASSEMBLY

NBAX0020

- **After drive shaft has been assembled, ensure that it moves smoothly over its entire range without binding.**
- **Use NISSAN GENUINE GREASE or equivalent after every overhaul.**



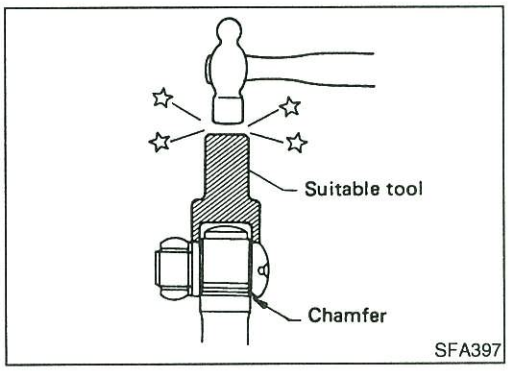
SFA800

Final Drive Side (TS82F)

NBAX0020S01

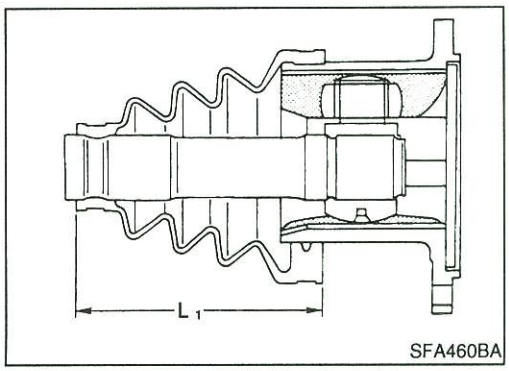
1. Install new small boot band, boot and side joint housing to drive shaft.

Cover drive shaft serration with tape so as not to damage boot during installation.



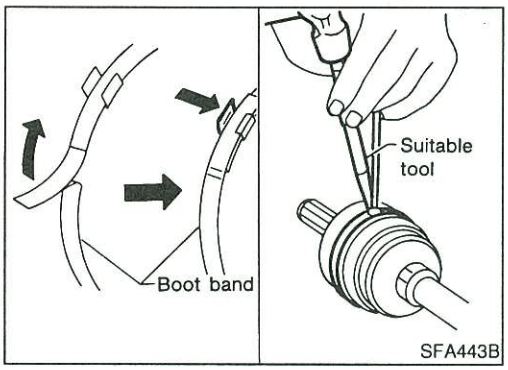
SFA397

2. Install spider assembly securely, ensuring marks are properly aligned.
   - **Press-fit with spider assembly serration chamfer facing shaft.**
3. Install new snap ring.



SFA460BA

4. Pack with grease.
   Specified amount of grease:
   95 - 105 g (3.35 - 3.70 oz)
5. Make sure that boot is properly installed on the drive shaft groove. Set boot so that it does not swell and deform when its length is "L_1".
   Length "L_1": 95 - 97 mm (3.74 - 3.82 in)



6. Lock new larger boot band securely with a suitable tool, then lock new smaller boot band.
7. Install new plug seal to slide joint housing by lightly tapping it.

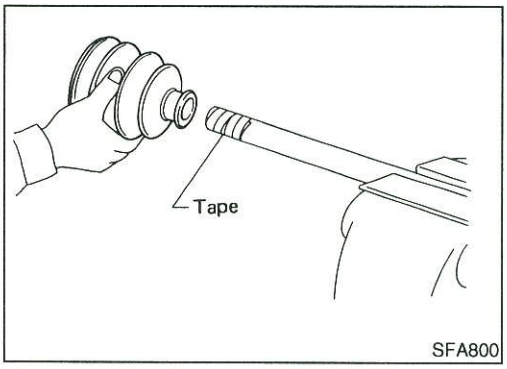
Apply sealant to mating surface of plug seal.

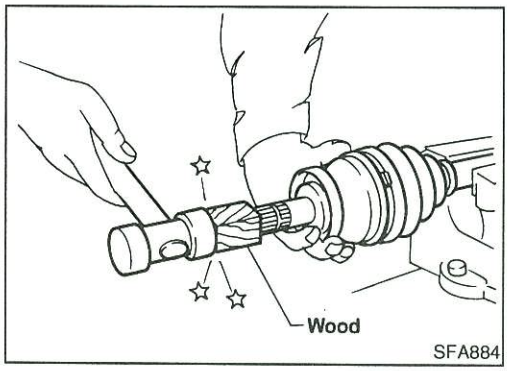
Wheel Side (ZF100)

NBAX0020S02

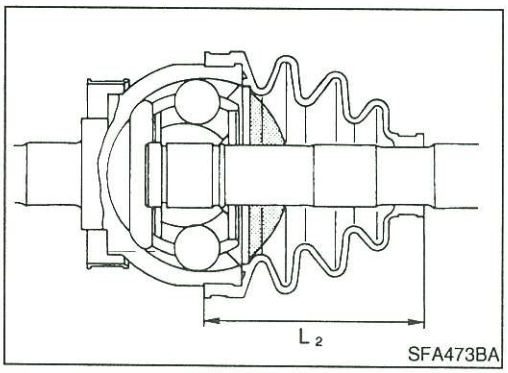
1. Install new small boot band and boot on drive shaft.

Cover drive shaft serration with tape so as not to damage boot during installation.





2. Set joint assembly onto drive shaft by lightly tapping it. Install joint assembly securely, ensuring marks which were made during disassembly are properly aligned.

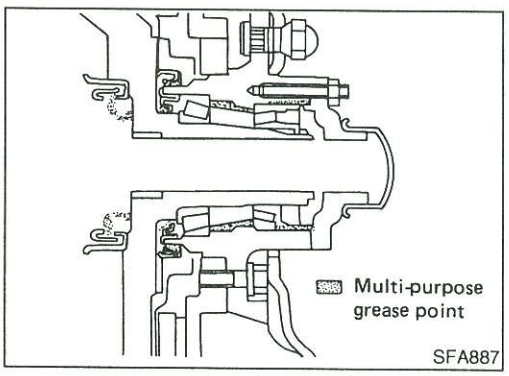


3. Pack drive shaft with specified amount of grease.

   Specified amount of grease:

   135 - 145 g (4.76 - 5.11 oz)
4. Make sure that boot is properly installed on the drive shaft groove. Set boot so that it does not swell and deform when its length is "L_2".

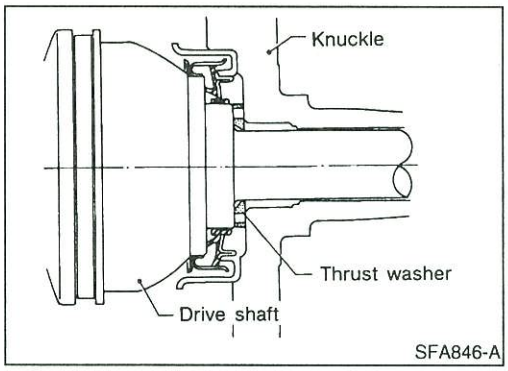
   Length "L_2": 96 - 98 mm (3.78 - 3.86 in)
5. Lock new larger boot band securely with a suitable tool.
6. Lock new smaller boot band.



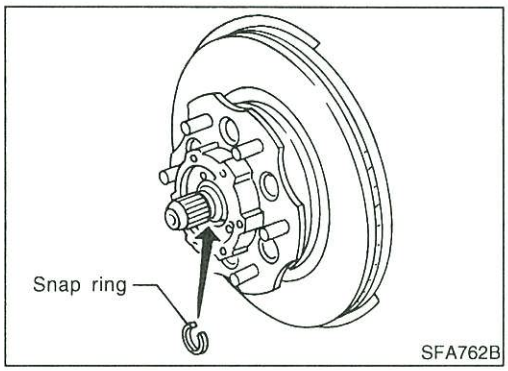
INSTALLATION

NBAX0021

1. Apply multi-purpose grease.

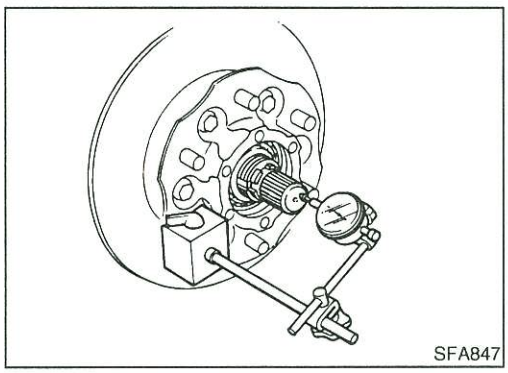


2. Install thrust washer onto drive shaft.
Make sure that thrust washer is facing in proper direction, apply multi-purpose grease.



3. When installing drive shaft, adjust drive shaft axial end play by selecting a suitable snap ring.

a. Temporarily install new snap ring on drive shaft in the same thickness as it was installed before removal.



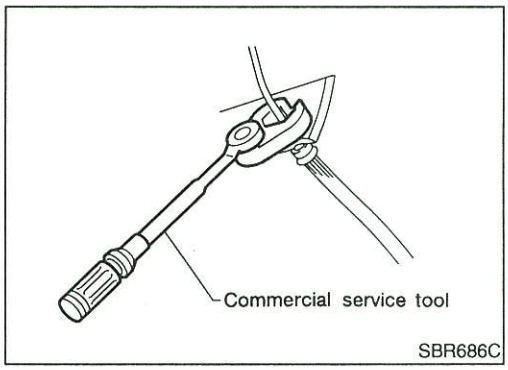
b. Set dial gauge on drive shaft end.

c. Measure axial end play of drive shaft.

Axial end play: 0.45 mm (0.0177 in) or less

d. If axial end play is not within the specified limit, select another snap ring.

1.1 mm (0.043 in) **1.3 mm (0.051 in)** **1.5 mm (0.059 in)** **1.7 mm (0.067 in)**	**1.9 mm (0.075 in)** **2.1 mm (0.083 in)** **2.3 mm (0.091 in)**



Precautions

PRECAUTIONS

NBAX0023

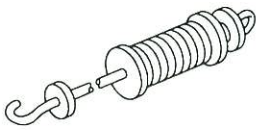
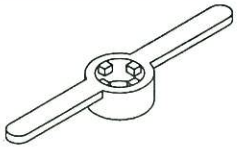
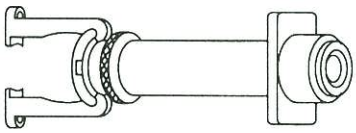
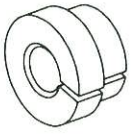
- **When installing rubber parts, final tightening must be carried out under unladen condition* with tires on ground. *Fuel, radiator coolant and engine oil full. Spare tire, jack, hand tools and mats in designated positions.**
- **Use flare nut wrench when removing and installing brake tubes.**
- **After installing removed suspension parts, check wheel alignment and adjust if necessary.**
- **Always torque brake lines when installing.**

Preparation

SPECIAL SERVICE TOOLS

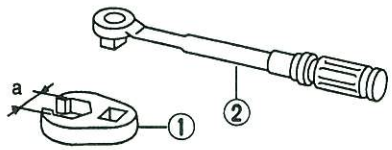
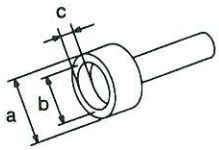
NBAX0024

The actual shapes of Kent-Moore tools may differ from those of special service tools illustrated here.

Tool number (Kent-Moore No.) Tool name	Description	
KV40101000 (J25604-01) Axle stand	NT159	Removing rear axle shaft
ST36230000 (J25840-A) Sliding hammer	 NT126	Removing rear axle shaft
ST38020000 (—) Bearing lock nut wrench	 NT160	Removing wheel bearing lock nut
HT72480000 or HT72210000 (J25852-B) Rear axle shaft bearing puller	 NT161	Removing wheel bearing
ST37840000 (—) Rear axle shaft guide	 NT162	Installing rear axle shaft

COMMERCIAL SERVICE TOOLS

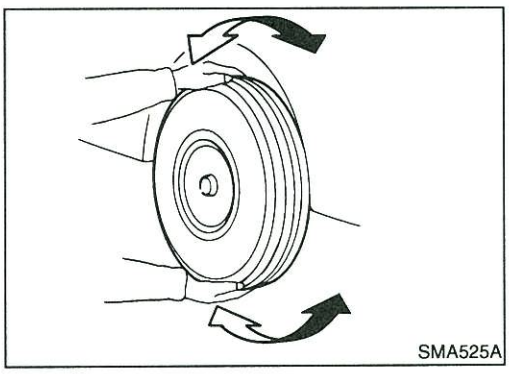
NBAX0025

Tool name	Description	
1 Flare nut crowfoot 2 Torque wrench	 NT360	Removing and installing each brake piping **a: 10 mm (0.39 in)**
Rear axle oil seal drift	 NT163	Installing oil seal **a: 74 mm (2.91 in) dia.** **b: 68 mm (2.68 in) dia.** **c: 10 mm (0.39 in)**

Noise, Vibration and Harshness (NVH) Troubleshooting

NBAX0035

Refer to "Noise, Vibration and Harshness (NVH) Troubleshooting", "FRONT AXLE", AX-3.


SMA525A

On-vehicle Service

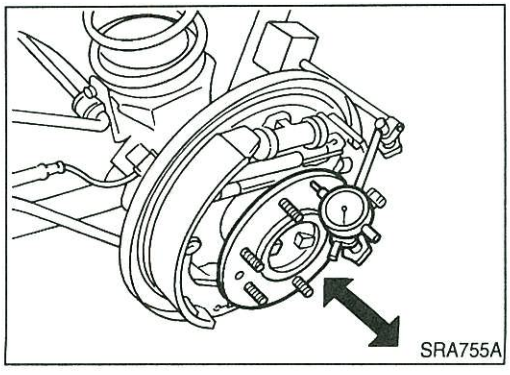
REAR AXLE PARTS

NBAX0026

Check rear axle parts for excessive play, wear and damage.

1. Shake each rear wheel to check for excessive play.
2. Retighten all nuts and bolts to the specified torque.

Tightening torque: Refer to "Components", AX-18.


SRA755A

REAR WHEEL BEARING

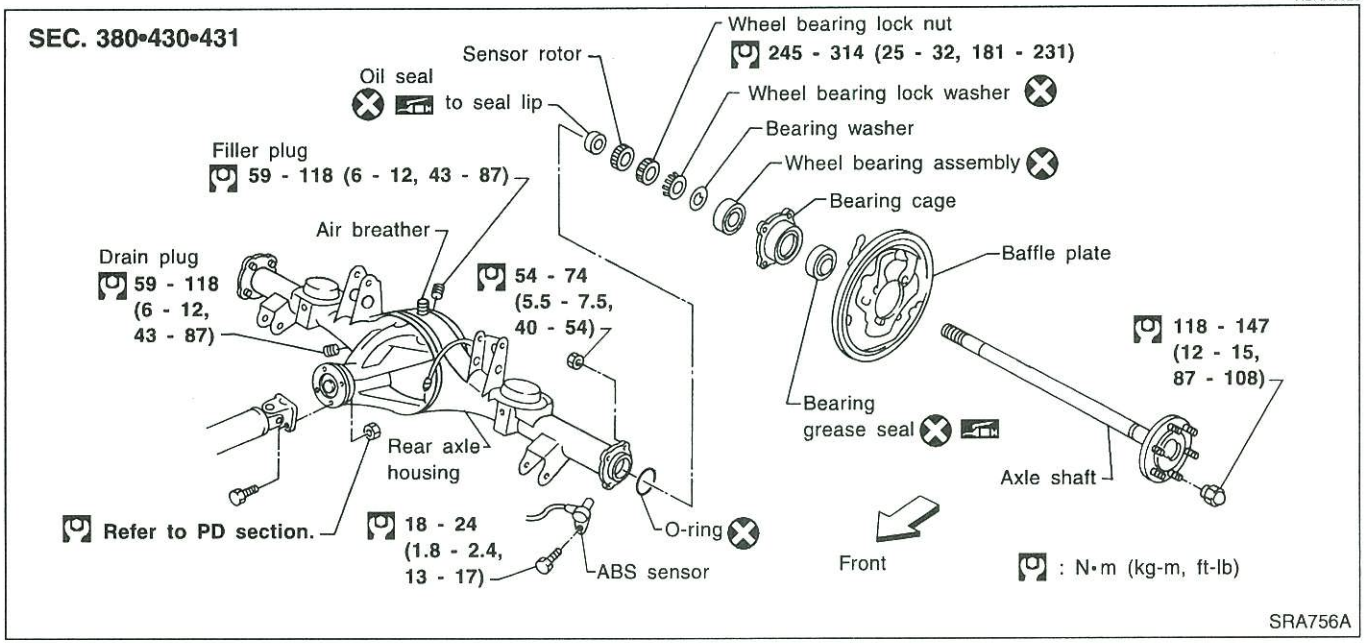
NBAX0027

1. Check that wheel bearings operate smoothly.
2. Check axial end play.

Axial end play:
0 mm (0 in)

Components

NBAX0028



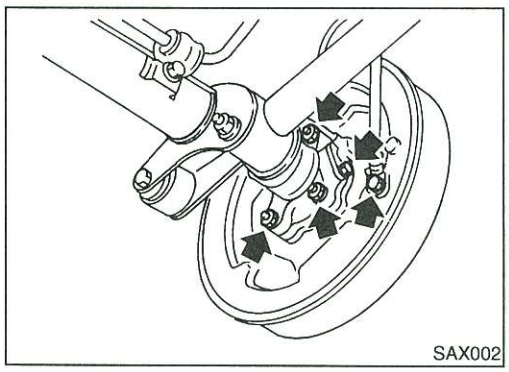
Removal

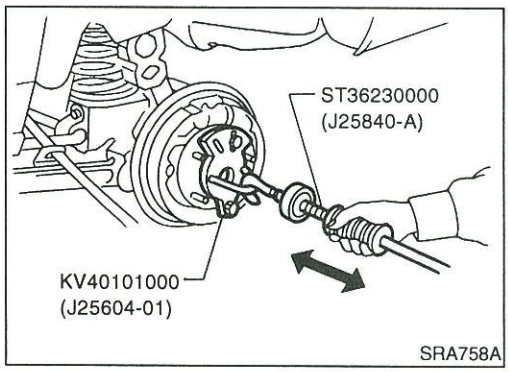
NBAX0029

CAUTION:

- **Before removing the rear axle, disconnect the ABS wheel sensor from the assembly. Then move it away from the axle. Failure to do so may result in damage to the sensor wires and the sensor becoming inoperative.**
- **Wheel bearing does not require maintenance.**
- If growling noise is emitted from wheel bearing during operation, replace wheel bearing assembly.
- If the wheel bearing assembly is removed, it must be renewed. The old assembly must not be re-used.

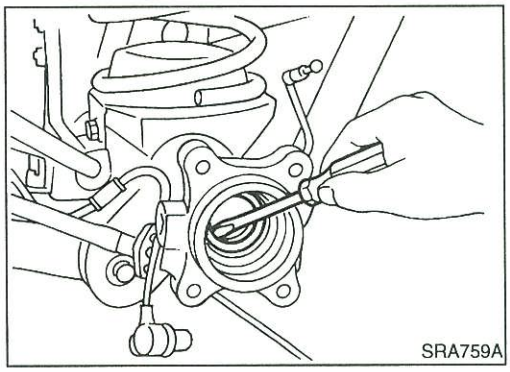
1. Disconnect parking brake cable and brake tube.
2. Remove nuts securing wheel bearing cage with baffle plate.





3. Draw out axle shaft with Tool.

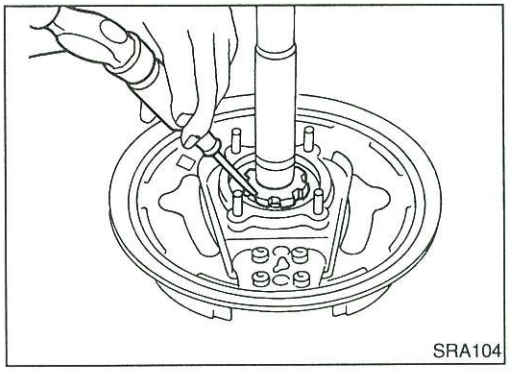
When drawing out axle shaft, be careful not to damage oil seal.



4. Remove oil seal with a screwdriver.

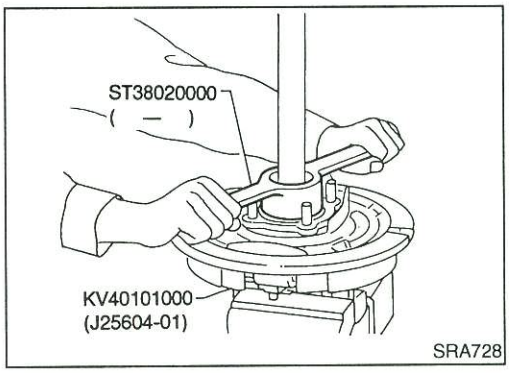
Do not reuse oil seal once it is removed. Always install new one.

5. Remove ABS sensor rotor.

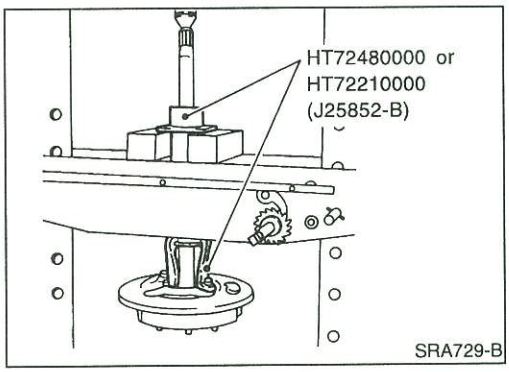


6. Unbend lock washer with a screwdriver.

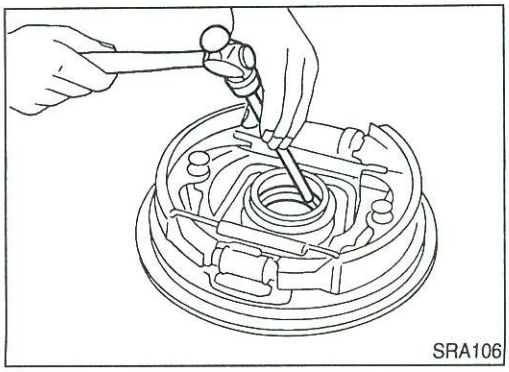
Do not reuse lock washer once removed. Always install new one.



7. Remove bearing lock nut with Tool.



8. Remove wheel bearing together with bearing cage and baffle plate from axle shaft.



9. Remove grease seal with a screwdriver.
10. Remove wheel bearing assembly with a brass drift.

Inspection

NBAX0030

AXLE SHAFT

NBAX0030S01

Check axle shaft for straightness, cracks, damage, wear and distortion. Replace if necessary.

BEARING CAGE

NBAX0030S02

Check bearing cage for deformation and cracks. Replace if necessary.

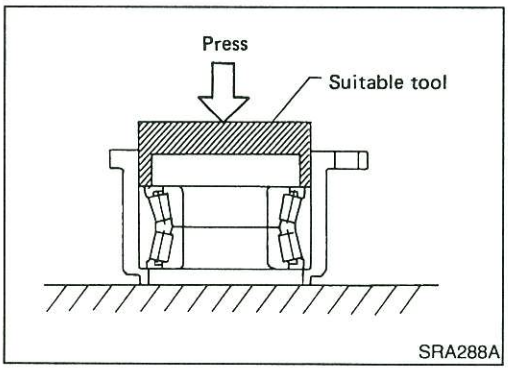
REAR AXLE HOUSING

NBAX0030S03

Check rear axle housing for yield, deformation and cracks. Replace if necessary.

Installation

NBAX0031

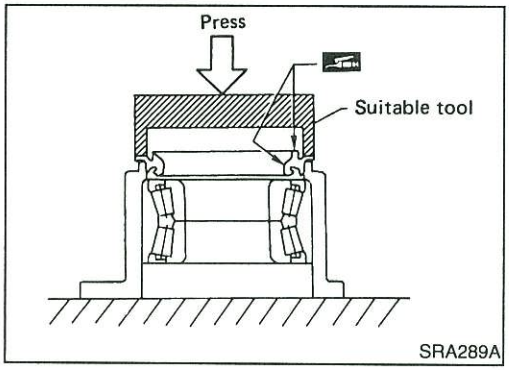


1. Press new wheel bearing until it bottoms end face of bearing cage.

   Maximum load P:

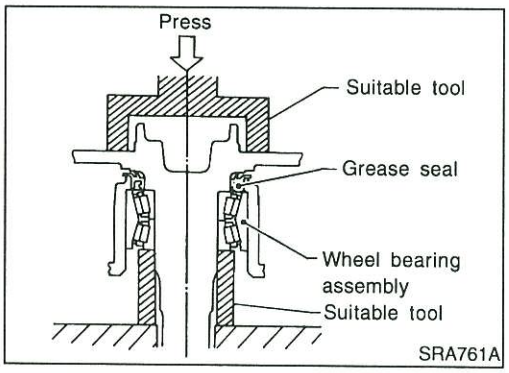
   39 kN (4 ton, 4.4 US ton, 3.9 Imp ton)

Always press outer race of wheel bearing during installation.



2. Press new grease seal until it bottoms end face of bearing cage.

After installing new grease seal, coat sealing lip with multi-purpose grease.

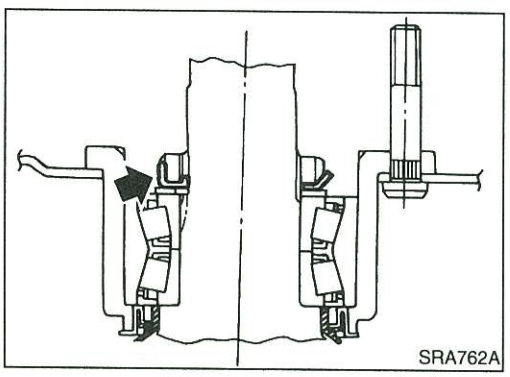


3. Press axle shaft into inner race of wheel bearing.

   Maximum load P:

   47.1 kN (4.8 ton, 5.3 US ton, 4.72 Imp ton)

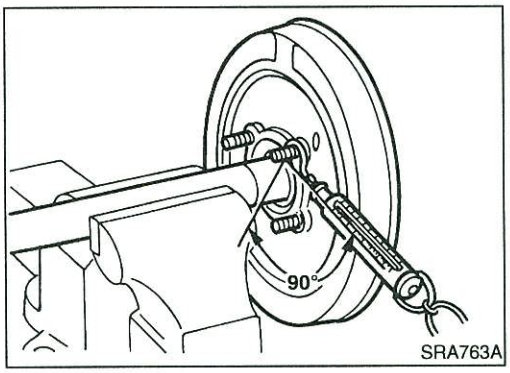
Be careful not to damage and deform grease seal.



4. Install plain washer and a new wheel bearing lock washer.
5. Tighten wheel bearing lock nut to specified torque.

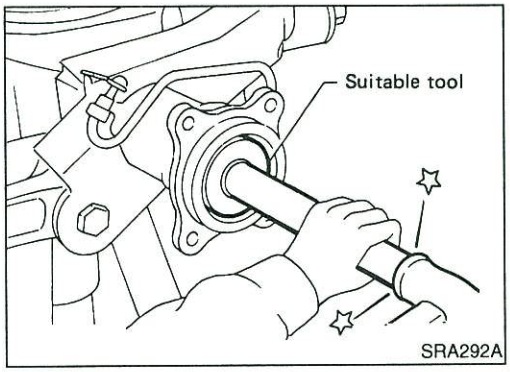
   : 245 - 314 N·m (25 - 32 kg-m, 181 - 231 ft-lb)

Fit wheel bearing lock washer lip in wheel bearing lock nut groove correctly by tightening lock nut. Be sure to bend it up.



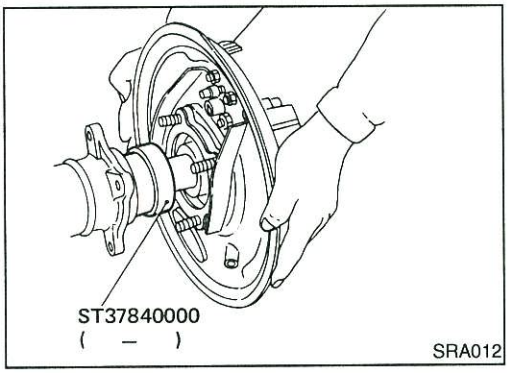
6. Check wheel bearing preload.
a. Turn bearing cage (with respect to axle shaft) two or three times. It must turn smoothly.
b. Attach spring gauge to bearing cage bolt (as shown at left) and pull it at a speed of 10 rpm to measure preload.

Spring gauge indication:
6.9 - 48.1 N (0.7 - 4.9 kg, 1.5 - 10.8 lb)



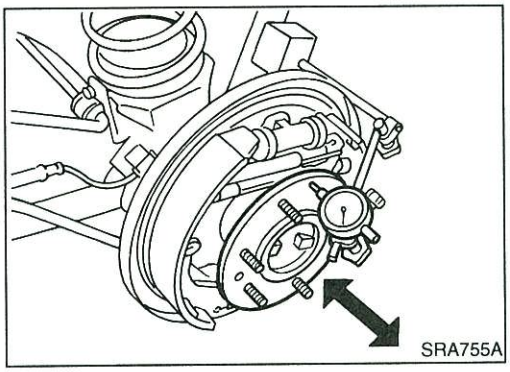
7. Install new oil seal to rear axle housing using a suitable tool.

After installing new oil seal, coat sealing lip with multi-purpose grease.



8. Press ABS sensor rotor onto axle shaft until it contacts wheel bearing lock nut.
9. Position axle shafts in rear axle housing with Tool as a guide.

Be careful not to damage oil seal.



10. Check axial end play.
a. Check that wheel bearings operate smoothly.
b. Check axial end play.

Axial end play:
0 mm (0 in)

Wheel Bearing (Front)

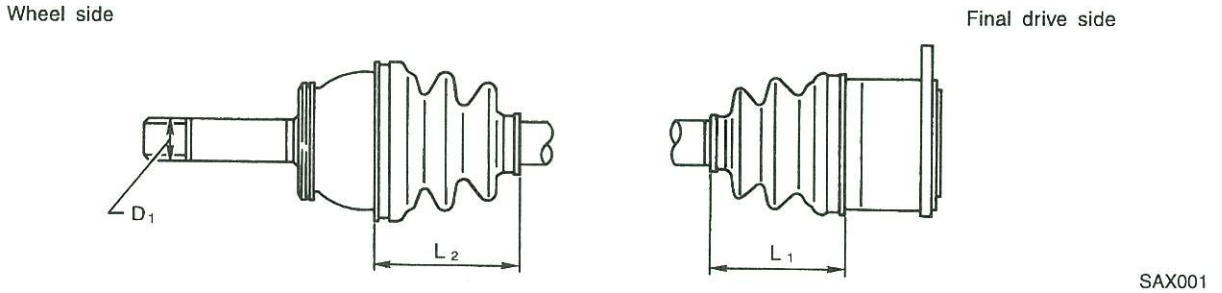
NBAX0022

Wheel bearing lock nut	Tightening torque	78 - 98 N·m (8 - 10 kg-m, 58 - 72 ft-lb)
	Retightening torque after loosening wheel bearing lock nut	0.5 - 1.5 N·m (0.05 - 0.15 kg-m, 4.3 - 13.0 in-lb)
	Axial end play	0 mm (0 in)
	Starting force at wheel hub bolt N (kg, lb)	A
	Turning angle	15° - 30°
	Starting force at wheel hub bolt N (kg, lb)	B
Wheel bearing preload at wheel hub bolt	B – A	7.06 - 20.99 N (0.72 - 2.14 kg, 1.59 - 4.72 lb)

Drive Shaft

NBAX0033

Drive shaft joint type	Final drive side		TS82F
	Wheel side		ZF100
	Fixed joint axial end play limit		1 mm (0.04 in)
Diameter	Wheel side (D_1)		29.0 mm (1.142 in)
Grease	Quality		Nissan genuine grease or equivalent
	Specified amount of grease	Final drive side	95 - 105 g (3.35 - 3.70 oz)
		Wheel side	135 - 145 g (4.76 - 5.11 oz)
Drive shaft axial end play			0.45 mm (0.0177 in) or less
Boot length	Final drive side (L_1)		95 - 97 mm (3.74 - 3.82 in)
	Wheel side (L_2)		96 - 98 mm (3.78 - 3.86 in)



SAX001

DRIVE SHAFT END SNAP RING

NBAX0033S01

Thickness mm (in)	Part No.	Thickness mm (in)	Part No.
1.1 (0.043)	39253-88G10	1.9 (0.075)	39253-88G14
1.3 (0.051)	39253-88G11	2.1 (0.083)	39253-88G15
1.5 (0.059)	39253-88G12	2.3 (0.091)	39253-88G16
1.7 (0.067)	39253-88G13		

Wheel Bearing (Rear)

NBAX0032

Wheel bearing axial end play	0 mm (0 in)
Wheel bearing lock nut tightening torque	245 - 314 N·m (25 - 32 kg-m, 181 - 231 ft-lb)
Wheel bearing preload measured at bearing cage bolt	6.9 - 48.1 N (0.7 - 4.9 kg, 1.5 - 10.8 lb)

FRONT & REAR SUSPENSION

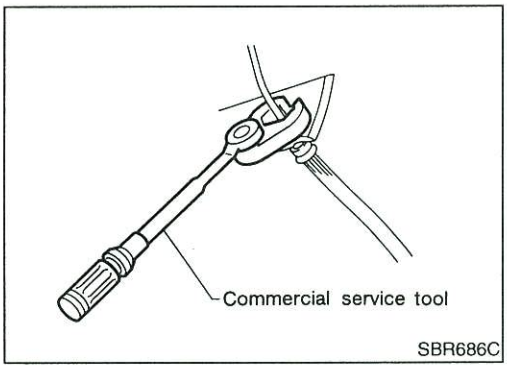
SECTION SU

CONTENTS

FRONT SUSPENSION 2
- Precautions 2
  - PRECAUTIONS 2
- Preparation 2
  - SPECIAL SERVICE TOOLS 2
  - COMMERCIAL SERVICE TOOLS 2
- Noise, Vibration and Harshness (NVH) Troubleshooting 3
  - NVH TROUBLESHOOTING CHART 3
- Components 4
- On-vehicle Service 5
  - FRONT SUSPENSION PARTS 5
  - FRONT WHEEL ALIGNMENT 6
- Coil Spring and Strut Assembly 8
  - COMPONENTS 8
  - REMOVAL 9
  - DISASSEMBLY 9
  - INSPECTION 9
  - ASSEMBLY 10
- Stabilizer Bar 10
  - REMOVAL AND INSTALLATION 10
  - INSPECTION 11
- Transverse Link and Lower Ball Joint 11
  - REMOVAL AND INSTALLATION 11
  - INSPECTION 12

REAR SUSPENSION 13
- Precautions 13
  - PRECAUTIONS 13
- Preparation 13
  - COMMERCIAL SERVICE TOOLS 13
- Noise, Vibration and Harshness (NVH) Troubleshooting 13
- Components 14
- On-vehicle Service 14
  - REAR SUSPENSION PARTS 14
- Removal and Installation 15
- Coil Spring and Shock Absorber 17
  - COMPONENTS 17
  - REMOVAL AND INSTALLATION 18
  - INSPECTION 18
- Upper Link, Lower Link and Panhard Rod 18
  - INSPECTION 18
  - BUSHING REPLACEMENT 18
  - INSTALLATION 19
- Stabilizer Bar 19
  - REMOVAL AND INSTALLATION 19

SERVICE DATA AND SPECIFICATIONS (SDS) 20
- General Specifications (Front) 20
- Wheel Alignment (Unladen*1) 20
- Lower Ball Joint 20
- Wheelarch Height (Unladen*) 21
- Wheel Runout Average* 21
- General Specifications (Rear) 21



Precautions

PRECAUTIONS

NBSU0001

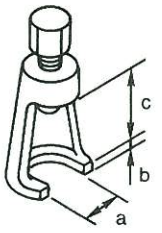
- **When installing rubber parts, final tightening must be carried out under unladen condition* with tires on ground. *Fuel, radiator coolant and engine oil full. Spare tire, jack, hand tools and mats in designated positions.**
- **Use flare nut wrench when removing and installing brake tubes.**
- **After installing removed suspension parts, check wheel alignment and adjust if necessary.**
- **Always torque brake lines when installing.**

Preparation

SPECIAL SERVICE TOOLS

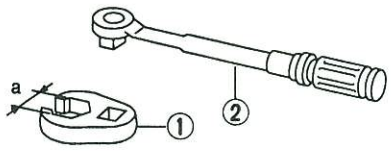
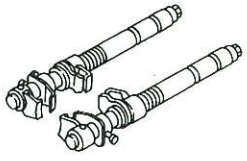
NBSU0002

The actual shapes of Kent-Moore tools may differ from those of special service tools illustrated here.

Tool number (Kent-Moore No.) Tool name	Description	
ST29020001 (J24319-01) Ball joint remover	 NT694	Removing tie-rod outer end and lower ball joint **a: 34 mm (1.34 in)** **b: 6.5 mm (0.256 in)** **c: 61.5 mm (2.421 in)**

COMMERCIAL SERVICE TOOLS

NBSU0003

Tool name	Description	
1 Flare nut crowfoot 2 Torque wrench	 NT360	Removing and installing each brake piping **a: 10 mm (0.39 in)**
Spring compressor	 NT717	Removing and installing coil spring

Noise, Vibration and Harshness (NVH) Troubleshooting

=NBSU0035

NVH TROUBLESHOOTING CHART

NBSU0035S01

Use the chart below to help you find the cause of the symptom. If necessary, repair or replace these parts.

Symptom			Reference page	SU-4, 14	SU-8, 17	—	—	—	SU-8, 17	SU-6	SU-10, 19	SU-6	—	—	—	—	—	—	NVH in PD section	NVH in PD section	NVH in AX section	NVH in AX section	Refer to SUSPENSION in this chart.	Refer to TIRES in this chart.	Refer to ROAD WHEEL in this chart.	NVH in BR section	NVH in ST section
			Possible cause and SUSPECTED PARTS	Improper installation, looseness	Shock absorber deformation, damage or deflection	Bushing or mounting deterioration	Parts interference	Spring fatigue	Suspension looseness	Incorrect wheel alignment	Stabilizer bar fatigue	Out-of-round	Imbalance	Incorrect air pressure	Uneven tire wear	Deformation or damage	Non-uniformity	Incorrect tire size	PROPELLER SHAFT	DIFFERENTIAL	DRIVE SHAFT	AXLE	SUSPENSION	TIRES	ROAD WHEEL	BRAKES	STEERING
Symptom	SUSPENSION	Noise		×	×	×	×	×	×										×	×	×	×		×	×	×	×
		Shake		×	×	×	×		×										×		×	×		×	×	×	×
		Vibration		×	×	×	×	×											×		×	×		×			×
		Shimmy		×	×	×	×			×												×		×	×	×	×
		Judder		×	×	×																×		×	×	×	×
		Poor quality ride or handling		×	×	×	×	×		×	×													×	×		
	TIRES	Noise		×								×	×	×	×	×	×		×	×	×	×	×		×	×	×
		Shake		×								×	×	×	×	×		×	×		×	×	×		×	×	×
		Vibration												×				×	×		×	×	×				×
		Shimmy		×								×	×	×	×	×	×	×				×	×		×	×	×
		Judder		×								×	×	×	×	×		×				×	×		×	×	×
		Poor quality ride or handling		×								×	×	×	×	×		×				×	×		×		
	ROAD WHEEL	Noise		×								×	×			×			×	×	×	×	×	×		×	×
		Shake		×								×	×			×			×		×	×	×	×		×	×
		Shimmy, Judder		×								×	×			×						×	×	×		×	×
		Poor quality ride or handling		×								×	×			×						×	×	×			

×: Applicable

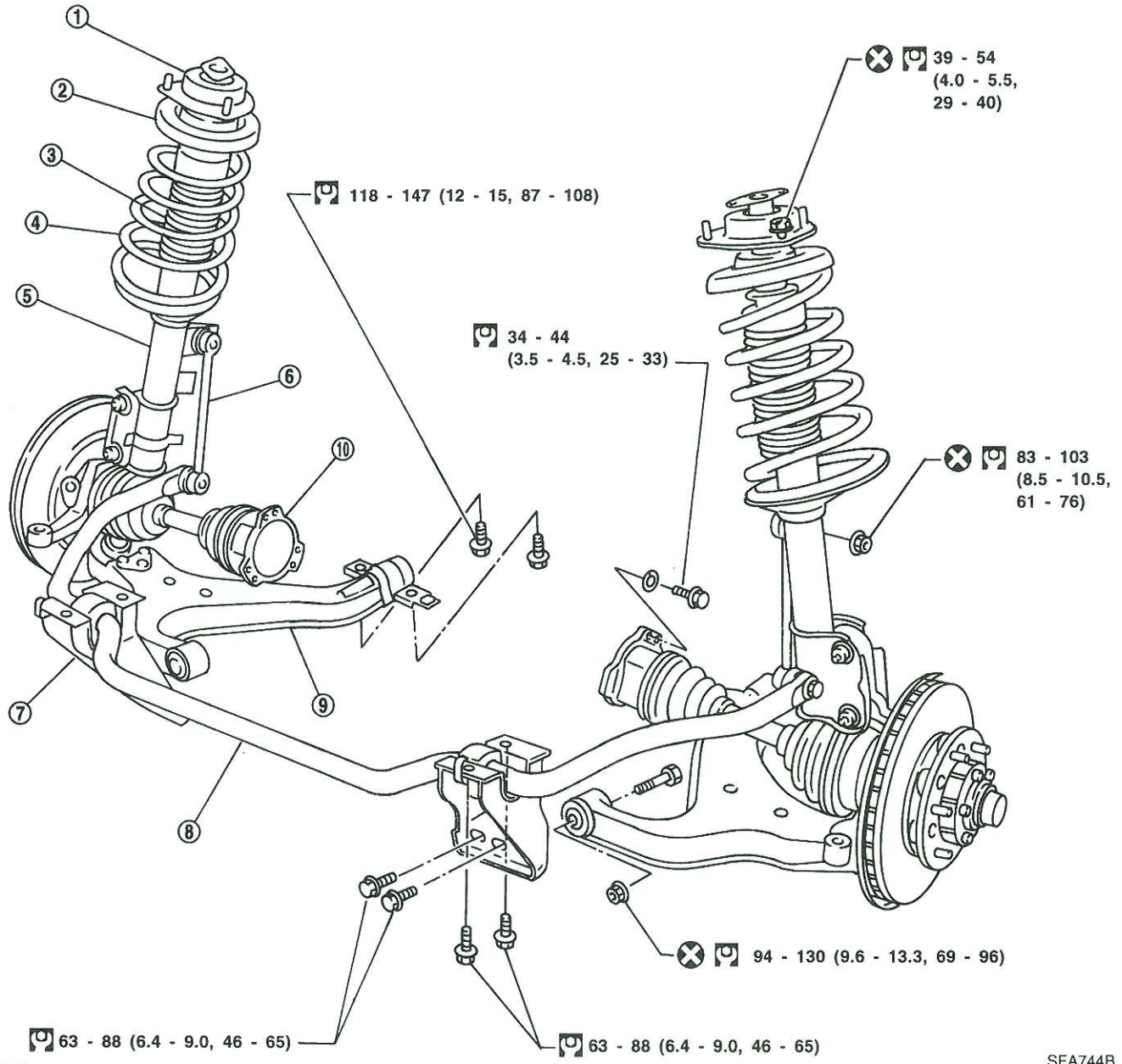
Components

NBSU0004

SEC. 391•400•401

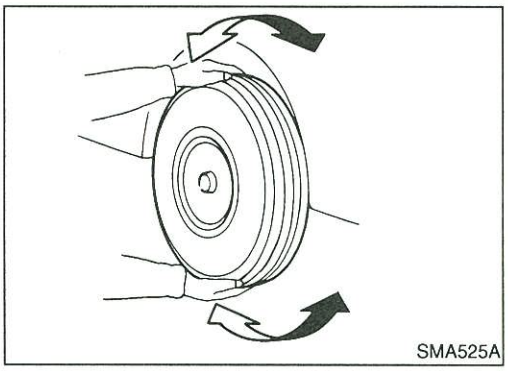
When installing rubber parts, final tightening must be carried out under unladen condition* with tires on ground.

*** Fuel, radiator coolant and engine oil full.**
Spare tire, jack, hand tools and mats in designated positions.



: N•m (kg-m, ft-lb)

1. Strut mounting insulator
2. Spring upper seat
3. Bound bumper
4. Coil spring
5. Strut assembly
6. Stabilizer connecting rod
7. Bracket
8. Stabilizer bar
9. Transverse link
10. Drive shaft


SMA525A

On-vehicle Service

FRONT SUSPENSION PARTS

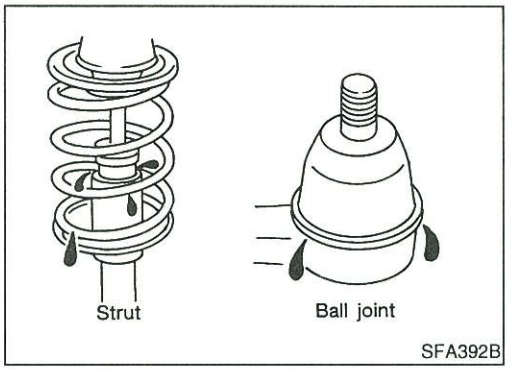
NBSU0005

Check front axle and front suspension parts for excessive play, cracks, wear and other damage.

1. Shake each front wheel to check for excessive play.
2. Retighten all axle and suspensions nuts and bolts to the specified torque.

   Tightening torque:

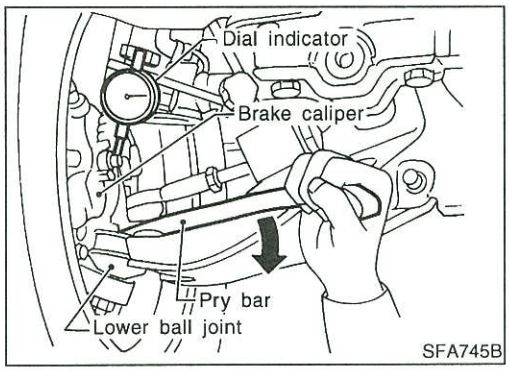
   Refer to "Components", SU-8.



SFA392B

3. Check strut (shock absorber) for oil leakage and other damage.
4. Check suspension ball joint for grease leakage and ball joint dust cover for cracks and other damage.
   If ball joint dust cover is cracked or damaged, replace ball joint assembly.
5. Check suspension ball joint end play.

a. Jack up front of vehicle and set the stands.
b. Clamp dial indicator onto transverse link and place indicator tip on lower edge of brake caliper.
c. Make sure front wheels are straight and brake pedal is depressed.



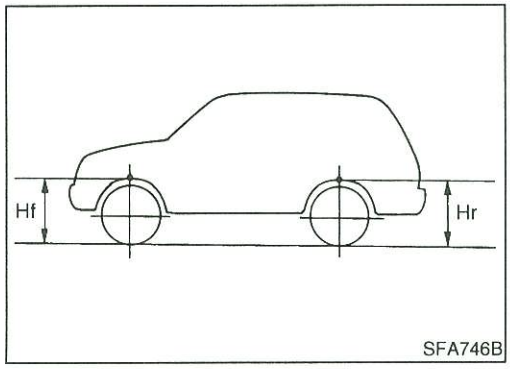
SFA745B

d. Place a pry bar between transverse link and knuckle.
e. While raising and releasing pry bar, observe maximum dial indicator value.

   Vertical end play:

   0 mm (0 in)

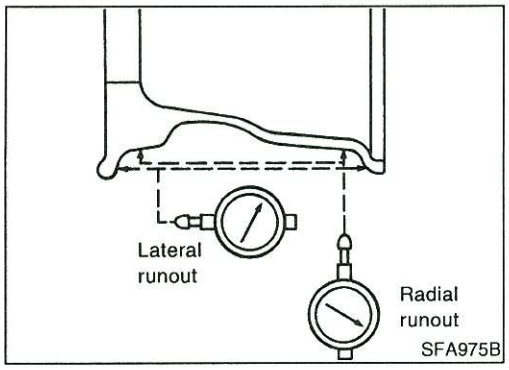
   If ball joint vertical end play exists, remove lower ball joint assembly and recheck the ball joint. Refer to "Tranverse Link and Lower Ball Joint", SU-11.



SFA746B

6. Check spring height from top of wheelarch to ground using the following procedure.

a. Park vehicle on a level surface with vehicle unladen*.
   *: Fuel, radiator coolant and engine oil full. Spare tire, jack, hand tools and mats in designated positions.
b. Check tires for proper inflation and wear (tread wear indicator must not be showing).
c. Bounce vehicle up and down several times and measure dimensions Hf and Hr. Refer to SDS, SU-21.
   Spring height is not adjustable. If out of specification, check for worn springs and suspension parts.



FRONT WHEEL ALIGNMENT

NBSU0006

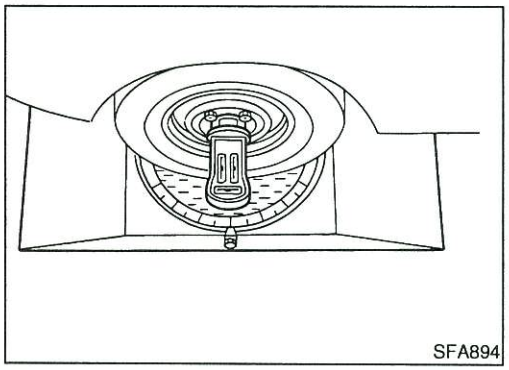
Before checking front wheel alignment, be sure to make a preliminary inspection (Unladen*).

*: Fuel, radiator coolant and engine oil full. Spare tire, jack, hand tools and mats in designated positions.

Preliminary Inspection

NBSU0006S01

1. Check tires for wear and improper inflation.
2. Check wheels for deformation, cracks and other damage. If deformed, remove wheel and check wheel runout.
   Wheel runout (Dial indicator value):
   Refer to SDS.
3. Check front wheel bearings for looseness.
4. Check front suspension for looseness.
5. Check steering linkage for looseness.
6. Check that front shock absorbers work properly.
7. Check vehicle posture (Unladen).

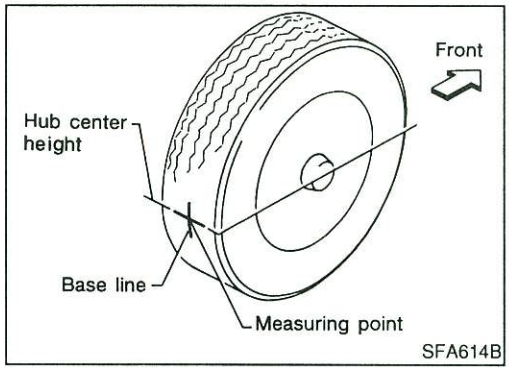


Camber, Caster and Kingpin Inclination

NBSU0006S02

Camber, caster and kingpin inclination are preset at factory and cannot be adjusted.

1. Measure camber, caster and kingpin inclination of both right and left wheels with a suitable alignment gauge.
   Camber, Caster and Kingpin inclination:
   Refer to SDS, SU-20.
2. If camber, caster or kingpin inclination is not within specification, inspect front suspension parts. Replace damaged or worn out parts.



Toe-in

NBSU0006S03

Measure toe-in using the following procedure.

WARNING:

- **Always perform the following procedure on a flat surface.**
- **Make sure that no person is in front of the vehicle before pushing it.**

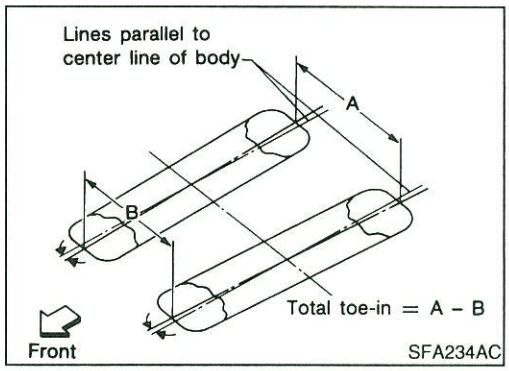
1. Bounce front of vehicle up and down to stabilize the posture.
2. Push the vehicle straight ahead about 5 m (16 ft).
3. Put a mark on base line of the tread (rear side) of both tires at the same height of hub center. This mark is a measuring point.
4. Measure distance "A" (rear side).
5. Push the vehicle slowly ahead to rotate the wheels 180 degrees (1/2 turn).

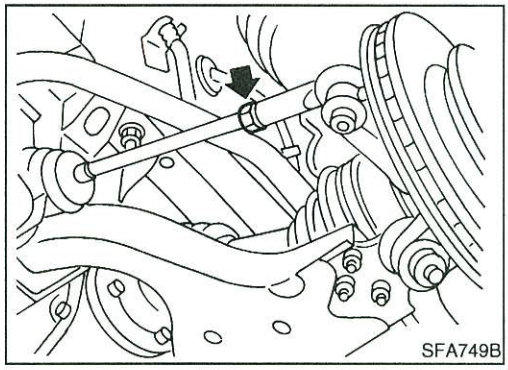
If the wheels have rotated more than 180 degrees (1/2 turn), try the above procedure again from the beginning. Never push vehicle backward.

6. Measure distance "B" (front side).

   Total toe-in:

   Refer to SDS, SU-20.





7. Adjust toe-in by varying the length of steering tie-rods.

a. Loosen lock nuts.

b. Adjust toe-in by screwing tie-rods in and out.

   Make sure both tie-rods are the same length.

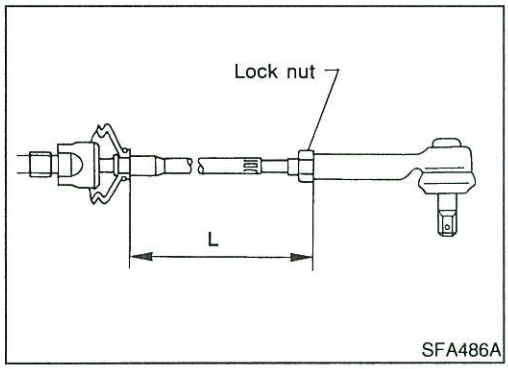
   Standard length "L":

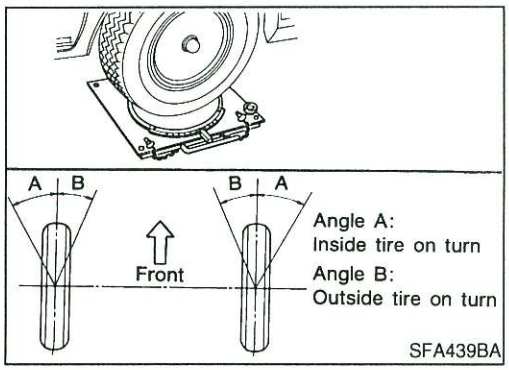
   Refer to ST section ("Steering Gear and Linkage", "SDS").

c. Tighten lock nuts to specified torque.

   Lock nut tightening torque:

   Refer to ST section ("POWER STEERING GEAR AND LINKAGE").





Front Wheel Turning Angle

NBSU0006S04

Turning angle is set by stroke length of steering gear rack and cannot be adjusted.

1. Set wheels in straight-ahead position. Then move vehicle forward until front wheels rest on turning radius gauge properly.
2. Rotate steering wheel all the way right and left; measure turning angle.

Do not hold the steering wheel on full lock for more than 15 seconds.

Wheel turning angle (Full turn):

Refer to SDS, SU-20.

Coil Spring and Strut Assembly

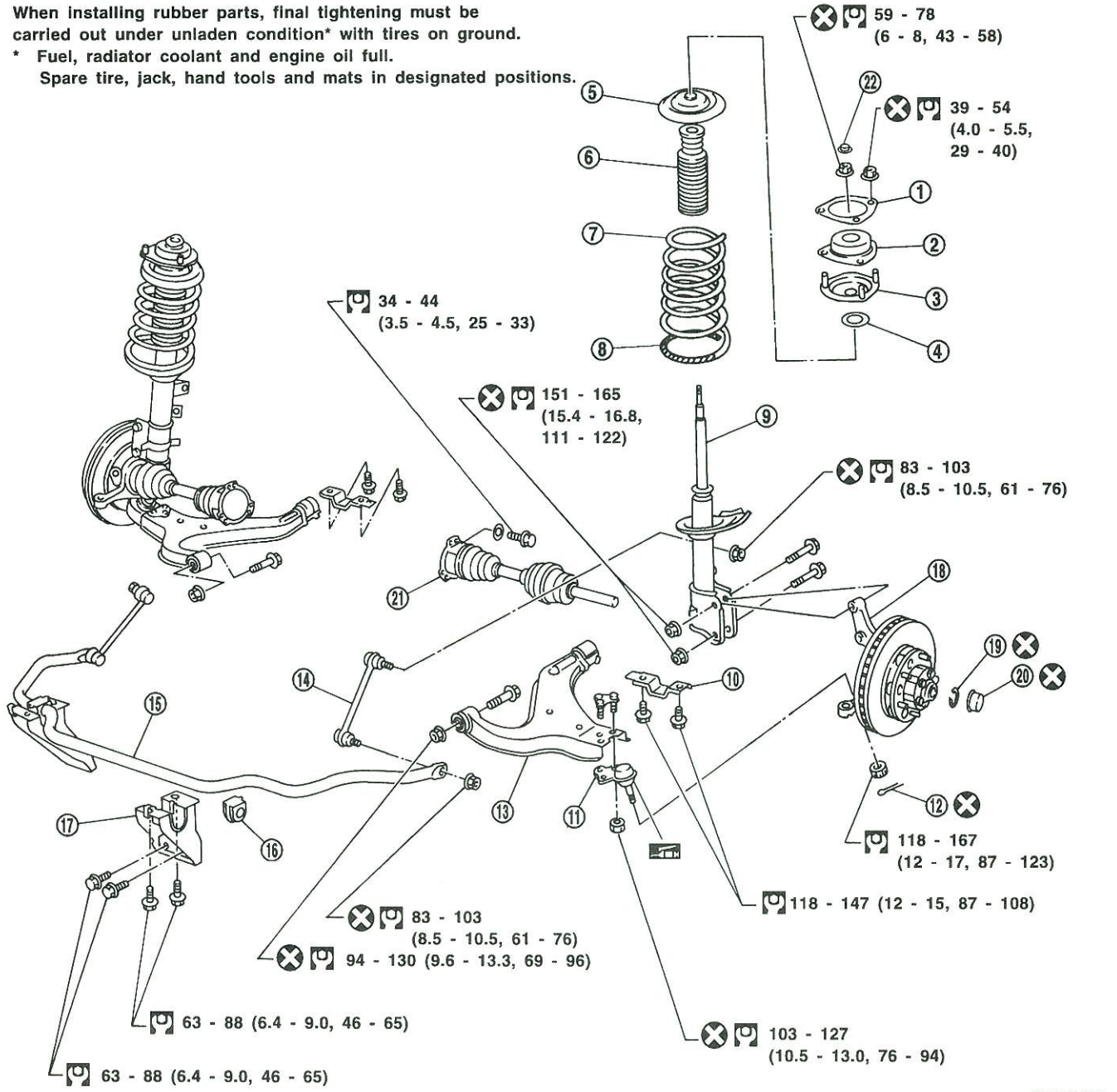
COMPONENTS

NBSU0007

SEC. 391•400•401

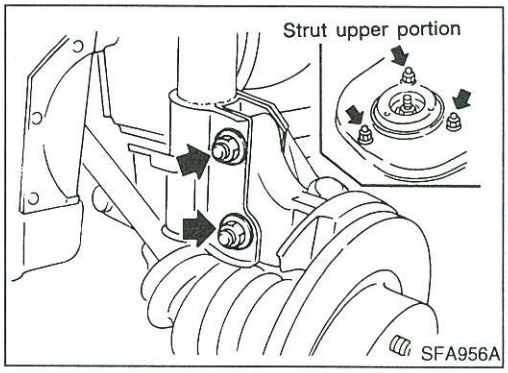
When installing rubber parts, final tightening must be carried out under unladen condition* with tires on ground.

*** Fuel, radiator coolant and engine oil full.**
Spare tire, jack, hand tools and mats in designated positions.



SFA764BA

1. Spacer
2. Strut mounting insulator
3. Bracket
4. Strut mounting bearing
5. Spring upper seat
6. Bound bumper
7. Coil spring
8. (Polyurethane tube)
9. Strut assembly
10. Bracket
11. Lower ball joint assembly
12. Cotter pin
13. Transverse link
14. Stabilizer connecting rod
15. Stabilizer bar
16. Bushing
17. Bracket
18. Knuckle spindle
19. Snap ring
20. Hub cap
21. Drive shaft
22. Cap

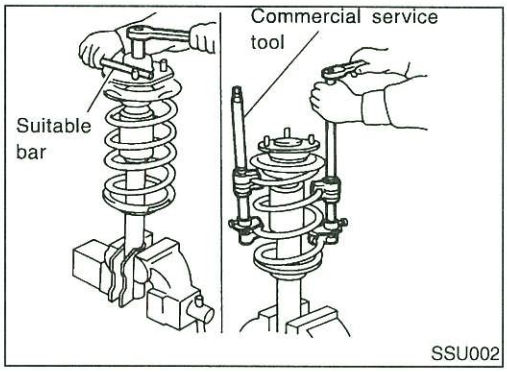


REMOVAL

NBSU0008

1. Remove stabilizer connecting rod.
2. Remove strut assembly fixing bolts and nuts (to hood-ledge).

Do not remove piston rod lock nut on vehicle.



DISASSEMBLY

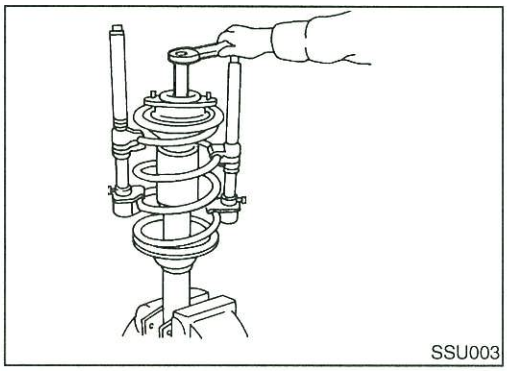
NBSU0009

1. Set strut assembly on vise, then **loosen** piston rod lock nut.

WARNING:
Do not remove piston rod lock nut at this time.

2. Compress spring with tool so that the strut mounting insulator can be turned by hand.

WARNING:
Make sure that the pawls of the two spring compressors are firmly hooked on the spring. The spring compressors must be tightened alternately so as not to tilt the spring.



3. Remove piston rod lock nut.

INSPECTION

NBSU0010

Strut Assembly

NBSU0010S01

- Check for smooth operation through a full stroke, both compression and extension.
- Check for oil leakage on welded and gland packing portion.
- Check piston rod for cracks, deformation and other damage.
- Replace if necessary.

Strut Mounting Insulator and Rubber Parts

NBSU0010S02

- Check cemented rubber-to-metal portion for separation and cracks. Check rubber parts for deterioration.
- Replace if necessary.

Strut Mounting Bearing

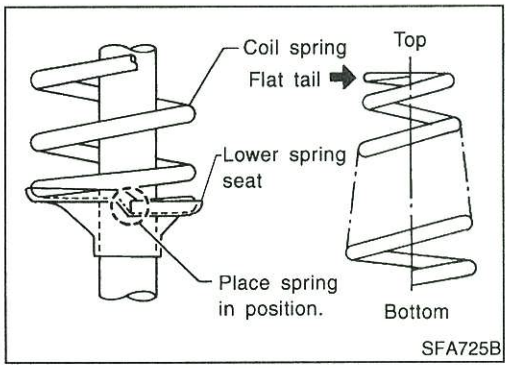
NBSU0010S03

- Check thrust bearing parts for abnormal noise and excessive rattle in axial direction.
- Replace if necessary.

Coil Spring

NBSU0010S04

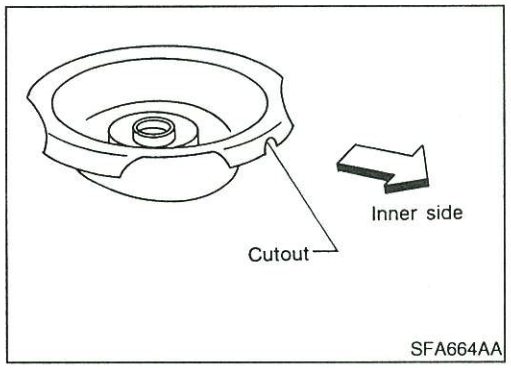
- Check for cracks, deformation and other damage. Replace if necessary.



ASSEMBLY

NBSU0011

- When installing coil spring on strut, it must be positioned as shown in the figure at left.

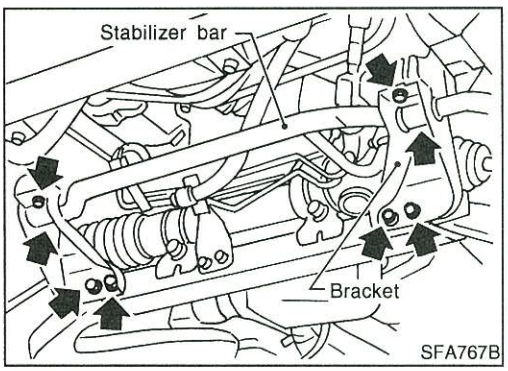


- Install upper spring seat with its cutout facing the inner side of vehicle.

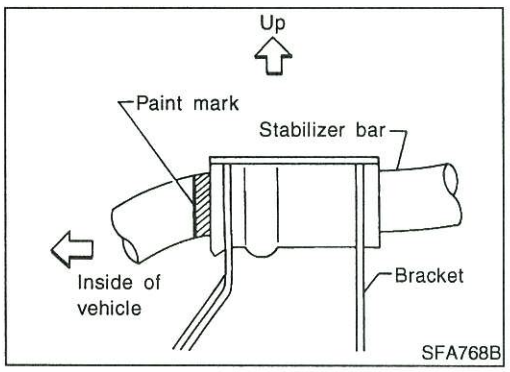
Stabilizer Bar

REMOVAL AND INSTALLATION

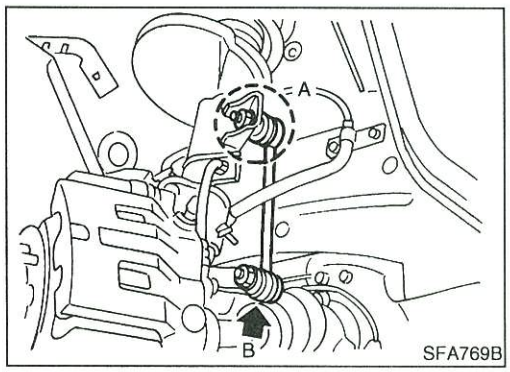
NBSU0012



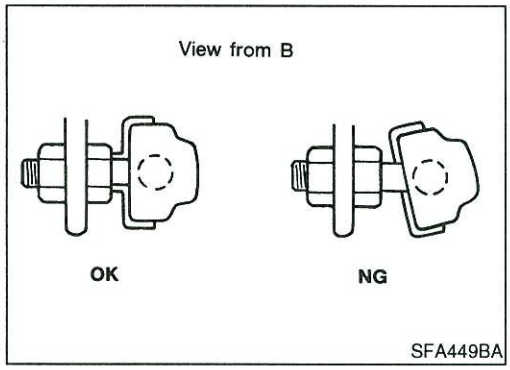
- Remove stabilizer bar and connecting rod.



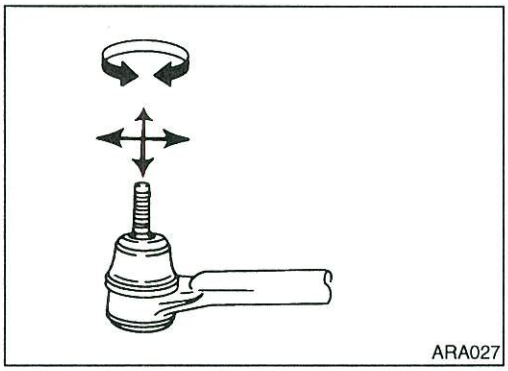
- When installing stabilizer, make sure that paint mark and bracket face in their correct directions.



- When removing and installing stabilizer bar fix portion A.



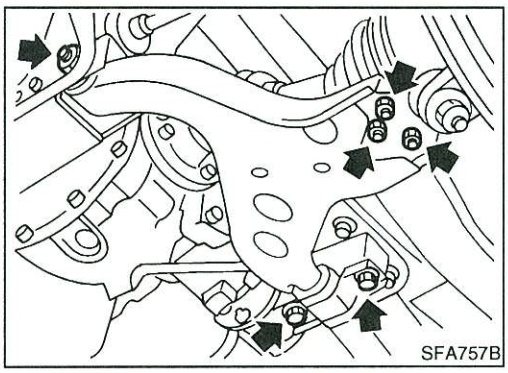
- Install stabilizer bar with ball joint socket properly placed.



INSPECTION

NBSU0013

- Check stabilizer for deformation and cracks. Replace if necessary.
- Check rubber bushings for deterioration and cracks. Replace if necessary.
- Check ball joint can rotate in all directions. If movement is not smooth and free, replace stabilizer bar connecting rod.



Transverse Link and Lower Ball Joint

REMOVAL AND INSTALLATION

NBSU0014

1. Separate drive shaft from knuckle.
   Refer to AX section ("Drive Shaft", "FRONT AXLE").
2. Separate lower ball joint stud from knuckle.
3. Remove lower ball joint assembly from transverse link.
4. Remove transverse link.
5. During installation, final tightening must be carried out at curb weight with tires on ground.
6. After installation, check wheel alignment.
   Refer to "FRONT WHEEL ALIGNMENT", "On-vehicle Service", SU-6.

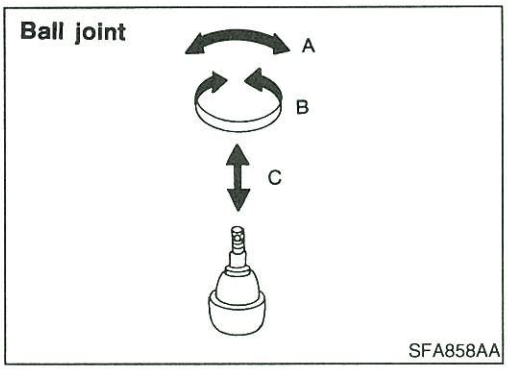
INSPECTION

NBSU0015

Transverse Link

NBSU0015S01

- Check transverse link for damage, cracks and deformation. Replace it if necessary.
- Check rubber bushing for damage, cracks and deformation. Replace transverse link if necessary.



Lower Ball Joint

NBSU0015S02

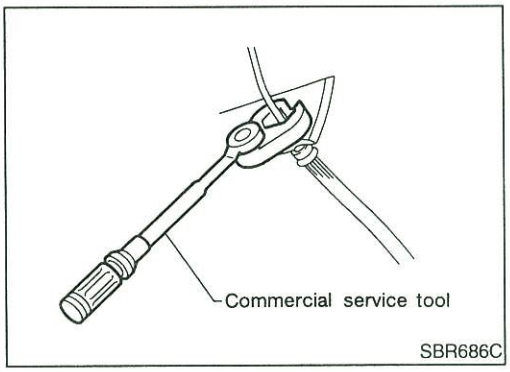
- Check ball joint for excessive play. Replace lower ball joint assembly if any of the following exists:

– Ball stud is worn.
– Joint is hard to swing.
– Play in axial direction is excessive.

Before checking, turn ball joint at least 10 revolutions so that ball joint is properly broken in.

Swinging force "A":
(measuring point: cotter pin hole of ball stud)
Refer to SDS, SU-20.
Turning torque "B":
Refer to SDS, SU-20.
Vertical end play "C":
Refer to SDS, SU-20.

Check dust cover for damage. Replace it and cover clamp if necessary.



Precautions

PRECAUTIONS

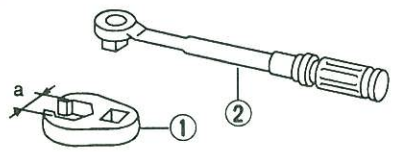
NBSU0021

- **When installing rubber parts, final tightening must be carried out under unladen condition* with tires on ground. *Fuel, radiator coolant and engine oil full. Spare tire, jack, hand tools and mats in designated positions.**
- **Use flare nut wrench when removing and installing brake tubes.**
- **After installing removed suspension parts, check wheel alignment and adjust if necessary.**
- **Always torque brake lines when installing.**

Preparation

COMMERCIAL SERVICE TOOLS

NBSU0023

Tool name	Description	
1 Flare nut crowfoot 2 Torque wrench	 NT360	Removing and installing each brake piping **a: 10 mm (0.39 in)**

Noise, Vibration and Harshness (NVH) Troubleshooting

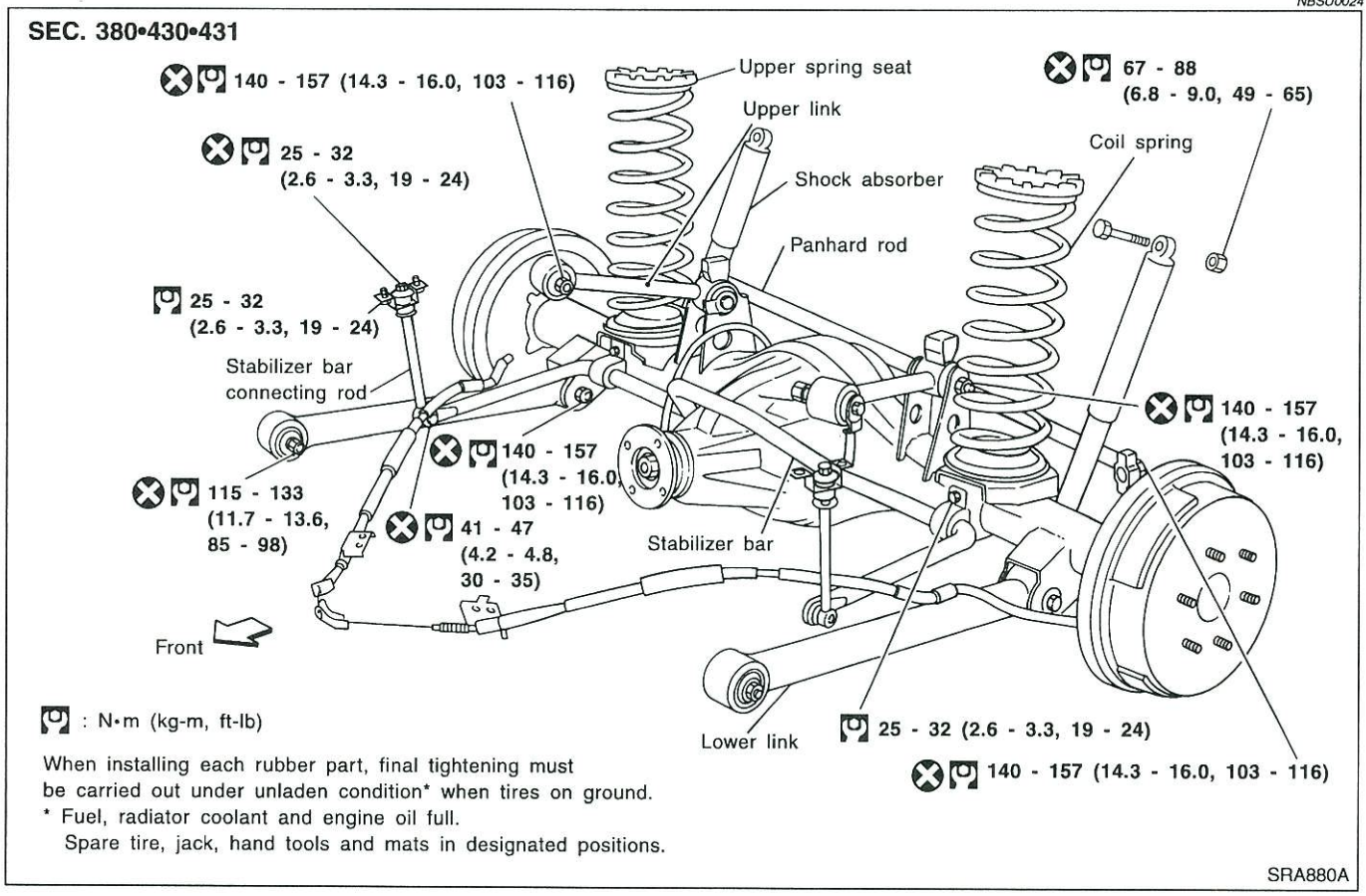
NBSU0036

Refer to "Noise, Vibration and Harshness (NVH) Troubleshooting", "FRONT SUSPENSION", SU-3.

Components

NBSU0024

SEC. 380•430•431

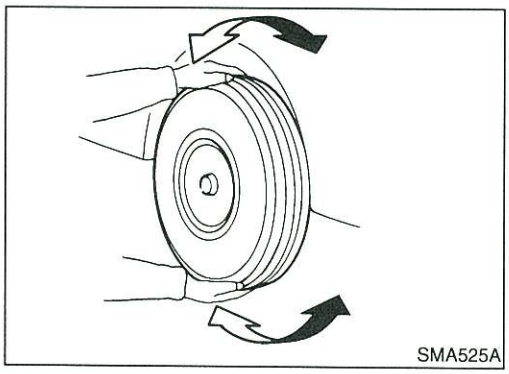


: N•m (kg-m, ft-lb)

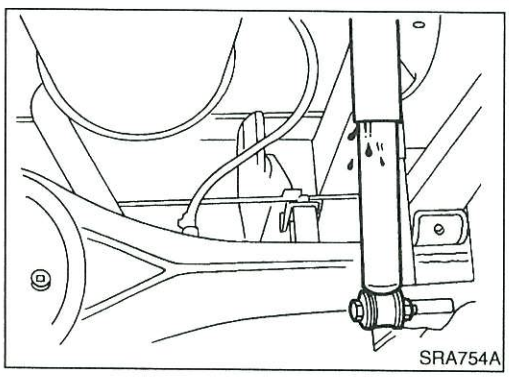
When installing each rubber part, final tightening must be carried out under unladen condition* when tires on ground.

* Fuel, radiator coolant and engine oil full.
Spare tire, jack, hand tools and mats in designated positions.

SRA880A



SMA525A



SRA754A

On-vehicle Service

REAR SUSPENSION PARTS

NBSU0025

Check rear axle and rear suspension parts for excessive play, wear and damage.

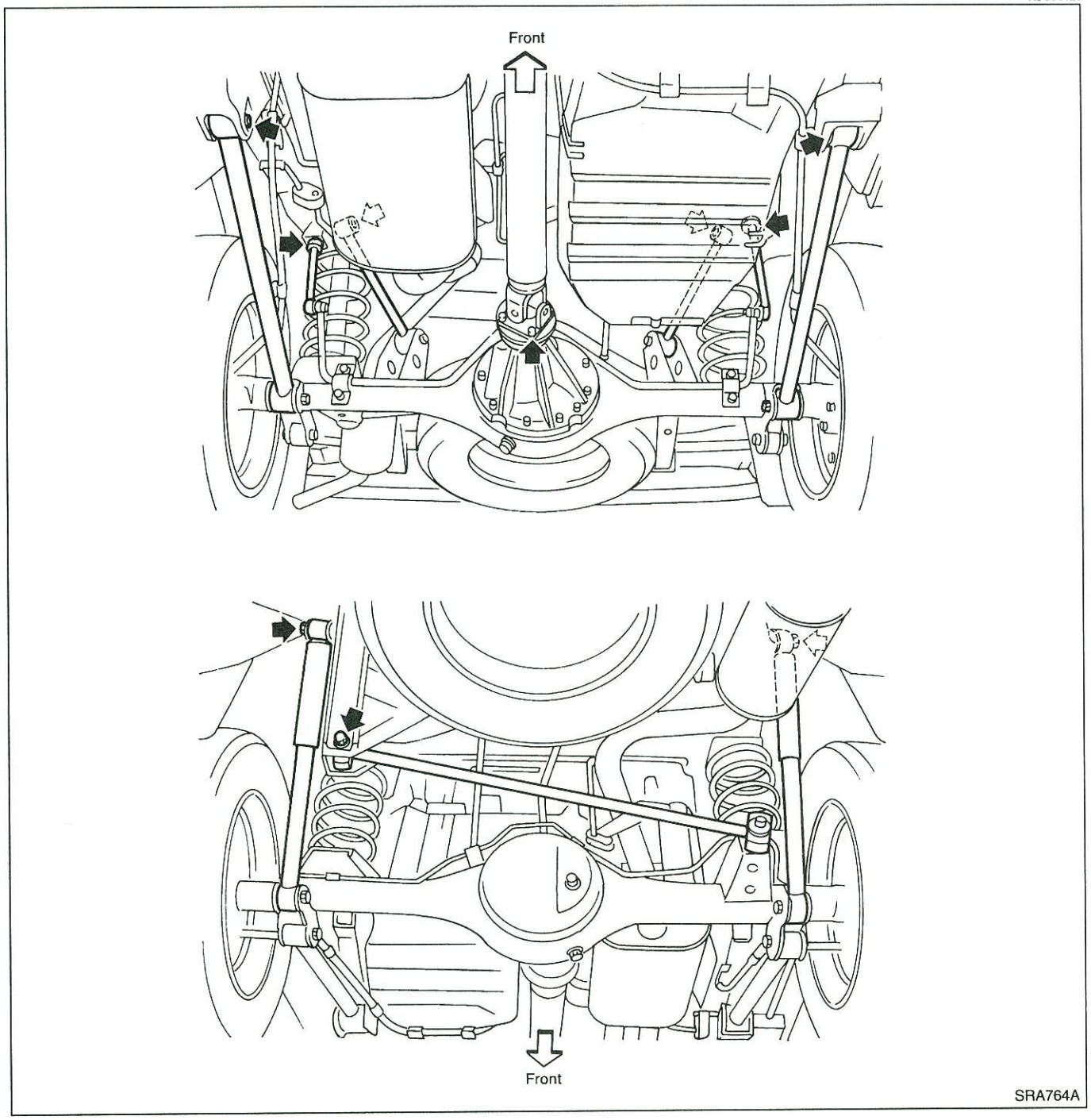
1. Shake each rear wheel to check for excessive play.
2. Retighten all nuts and bolts to the specified torque.

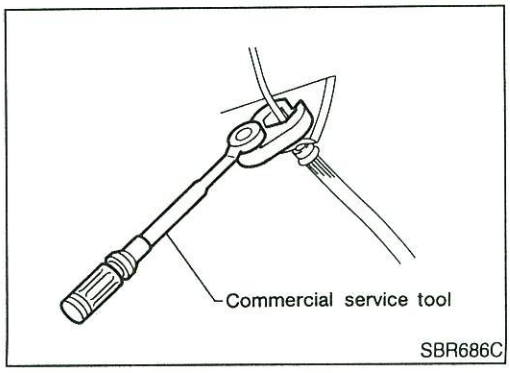
   Tightening torque: Refer to "Coil Spring and Shock Absorber", SU-17.

3. Check shock absorber for oil leakage and other damage.
4. Check shock absorber bushing for excessive wear and other damage.
5. Check wheelarch height. Refer to "On-vehicle Service", "FRONT SUSPENSION", SU-5.

Removal and Installation

NBSU0026





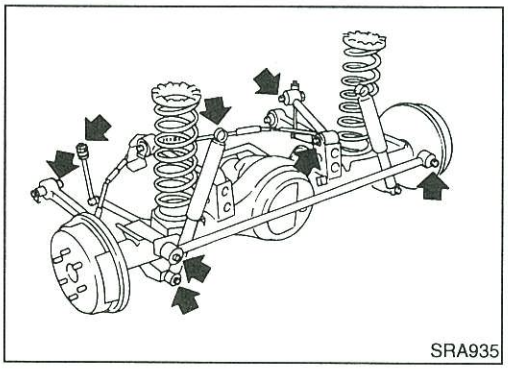
1. Support axle and suspension components with a suitable jack and block.
2. Disconnect brake hydraulic line and parking brake cables at back plates.

CAUTION:

- **Use flare nut wrench when removing and installing brake tubes.**
- **Before removing the rear suspension assembly, disconnect the ABS wheel sensor from the assembly. Then move it away from the rear suspension assembly. Failure to do**

so may result in damage to the sensor wires and the sensor becoming inoperative.

3. Remove stabilizer bar from body.
4. Remove upper links and lower links from body.
5. Remove panhard rod from body.
6. Disconnect rear end of propeller shaft. Refer to PD section ("Removal and Installation", "PROPELLER SHAFT").
7. Remove upper end nuts of shock absorber.



SRA935

Final tightening for rubber parts requires to be carried out under unladen condition with tires on ground.

Coil Spring and Shock Absorber

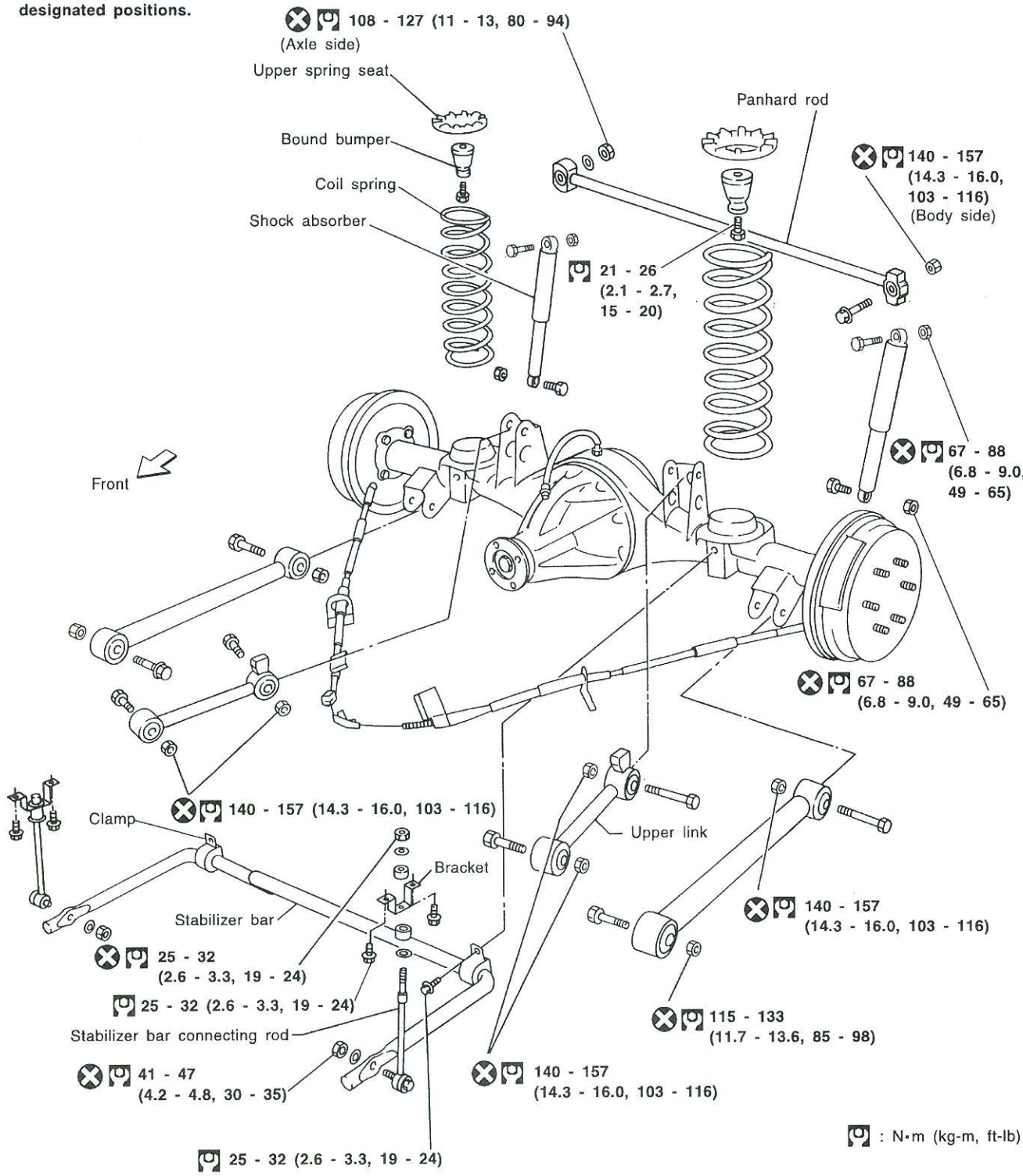
COMPONENTS

NBSU0027

SEC. 380•430•431

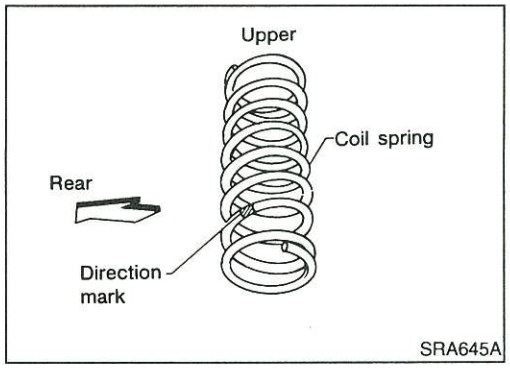
When installing rubber parts, final tightening must be carried out under unladen condition* with tires on ground.

*** Fuel, radiator coolant and engine oil full. Spare tire, jack, hand tools and mats in designated positions.**



SRA881A

Coil Spring and Shock Absorber (Cont'd)



REMOVAL AND INSTALLATION

NBSU0028

Refer to "Removal and Installation", "REAR SUSPENSION", SU-15.

When installing coil spring, pay attention to its direction.
Be sure spring rubber seat is not twisted and has not slipped off when installing coil spring.

INSPECTION

NBSU0029

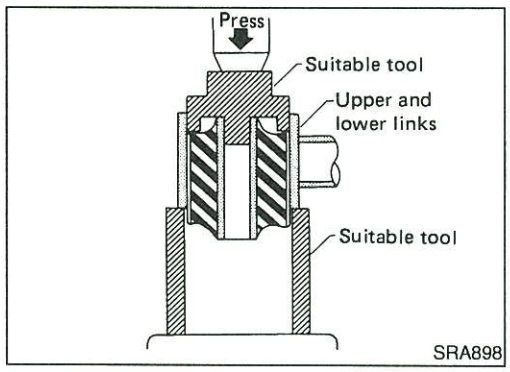
- Check coil spring for yield, deformation and cracks.
- Check shock absorber for oil leakage, cracks and deformation.
- Check all rubber parts for wear, cracks and deformation. Replace if necessary.

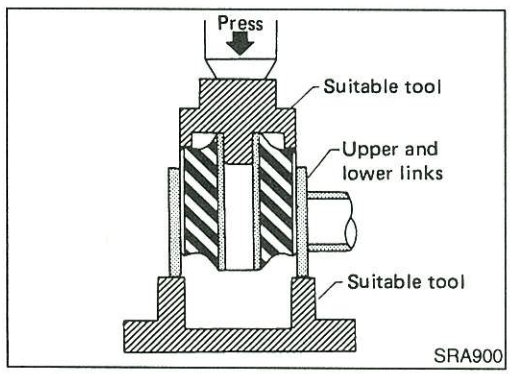
Upper Link, Lower Link and Panhard Rod

INSPECTION

NBSU0030

Check for cracks, distortion and other damage. Replace if necessary.





BUSHING REPLACEMENT

NBSU0031

Check for cracks and other damage. Replace with suitable tool if necessary.

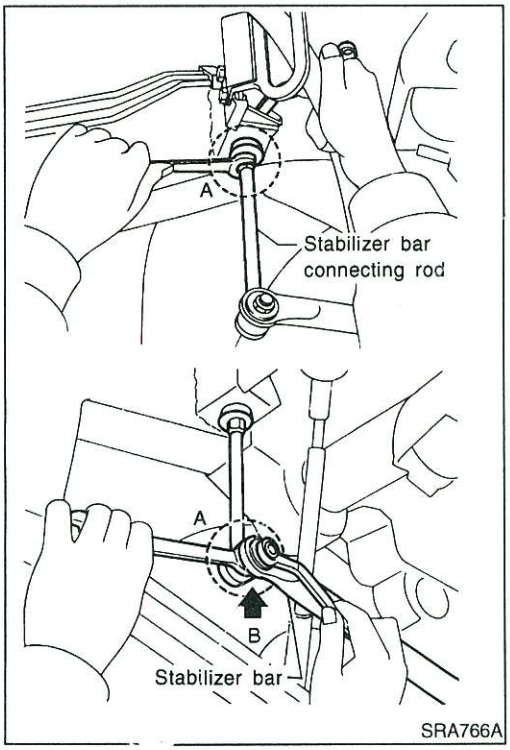
- Remove bushing with suitable tool.

When installing bushing, apply a coat of 1% soapy water to outer wall of bushing.
Always install new bushing.
Do not tap end face of bushing directly with a hammer.

INSTALLATION

NBSU0032

When installing each link, pay attention to direction of nuts and bolts.
When installing each rubber part, final tightening must be carried out under unladen condition with tires on ground.

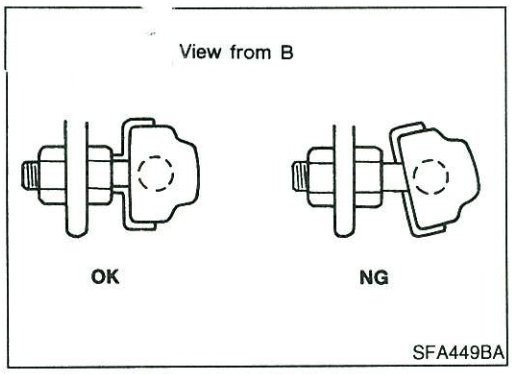


Stabilizer Bar

REMOVAL AND INSTALLATION

NBSU0033

- When removing and installing stabilizer bar, fix portion A.



- Install stabilizer bar with ball joint socket properly placed.

General Specifications (Front)

NBSU0016

Suspension type	Independent macpherson strut with coil spring
Strut type	Double-acting hydraulic
Stabilizer bar	Standard equipment

Wheel Alignment (Unladen*1)

NBSU0017

Unit: Degree minute (Decimal degree)

Applied model				All
Camber			Minimum	–0°35′ (–0.58°)
			Nominal	0°10′ (0.17°)
			Maximum	0°55′ (0.92°)
			Left and right difference	45′ (0.75°) or less
Caster			Minimum	2°15′ (2.25°)
			Nominal	3°00′ (3.00°)
			Maximum	3°45′ (3.75°)
			Left and right difference	45′ (0.75°) or less
Kingpin inclination			Minimum	13°35′ (13.58°)
			Nominal	14°20′ (14.33°)
			Maximum	15°05′ (15.08°)
Total toe-in	Distance (A - B)		Minimum	1 mm (0.04 in)
			Nominal	2 mm (0.08 in)
			Maximum	3 mm (0.12 in)
	Angle (left plus right)		Minimum	5′ (0.08°)
			Nominal	10′ (0.17°)
			Maximum	15′ (0.25°)
Wheel turning angle	Full turn*2	Inside	Minimum	30°00′ (30.00°)
			Nominal	33°00′ (33.00°)
			Maximum	34°00′ (34.00°)
		Outside	Minimum	28°00′ (28.00°)
			Nominal	31°00′ (31.00°)
			Maximum	32°00′ (32.00°)

*1: Fuel, radiator coolant and engine oil full. Spare tire, jack, hand tools and mats in designated positions.

*2: On power steering models, wheel turning force (at circumference of steering wheel) of 98 to 147 N (10 to 15 kg, 22 to 33 lb) with engine idle.

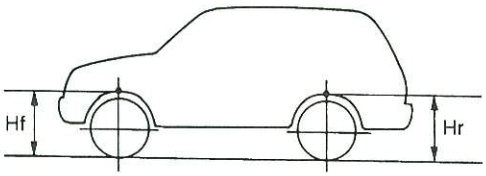
Lower Ball Joint

NBSU0018

Swinging force "A" (Measuring point: cotter pin hole of ball stud)	7.8 - 76.5 N (0.8 - 7.8 kg, 1.8 - 17.2 lb)
Turning torque "B"	0.5 - 4.9 N·m (5 - 50 kg-cm, 4.3 - 43.4 in-lb)
Vertical end play "C"	0 mm (0 in)

Wheelarch Height (Unladen*)

NBSU0019
Unit: mm (in)



SFA746B

Applied model	245/70 R16 tire (With over fender)
Front (Hf)	815 (32.09)
Rear (Hr)	846 (33.31)

*: Fuel, radiator coolant and engine oil full. Spare tire, jack, hand tools and mats in designated positions.

Wheel Runout Average*

NBSU0020
Unit: mm (in)

Radial runout limit	0.3 (0.012)
Lateral runout limit	0.3 (0.012)

*: Wheel runout average = (Outside runout value + Inside runout value) x 0.5

General Specifications (Rear)

NBSU0034

Suspension type	5-link type rigid with coil spring
Shock absorber type	Double-acting hydraulic
Stabilizer	Standard equipment

BRAKE SYSTEM

SECTION BR

CONTENTS

PRECAUTIONS 2
Supplemental Restraint System (SRS) "AIR BAG" and "SEAT BELET PRE-TENSIONER" 2
Precautions for Brake System 2
Wiring Diagrams and Trouble Diagnosis 3
PREPARATION 4
Special Service Tools 4
Commercial Service Tools 4
NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING 5
NVH Troubleshooting Chart 5
ON-VEHICLE SERVICE 6
Checking Brake Fluid Level 6
Checking Brake Line 6
Changing Brake Fluid 6
Bleeding Brake System 7
BRAKE HYDRAULIC LINE 8
Hydraulic Circuit 8
Removal 8
Inspection 9
Installation 9
LOAD SENSING VALVE 10
Inspection 10
Removal and Installation 10
BRAKE PEDAL AND BRACKET 12
Removal and Installation 12
Inspection 12
Adjustment 12
MASTER CYLINDER 14
Removal 14
Disassembly 14
Inspection 15
Assembly 15
Installation 16
BRAKE BOOSTER 17
On-vehicle Service 17
OPERATING CHECK 17
AIRTIGHT CHECK 17
Removal 17
Inspection 17
OUTPUT ROD LENGTH CHECK 17
Installation 18
VACUUM PIPING 19
Vacuum Hose 19
Removal and Installation 19
Inspection 19
HOSES AND CONNECTORS 19
CHECK VALVE 19
FRONT DISC BRAKE 20
Components 20
Pad Replacement 20
Removal 21
Disassembly 22
Inspection 22
CALIPER 22
ROTOR 22
Assembly 23
Installation 23
Brake Burnishing Procedure 23
REAR DRUM BRAKE 24
Components 24
Removal 24
Inspection 25
WHEEL CYLINDER 25
Wheel Cylinder Overhaul 26
Inspection 26
DRUM 26
LINING 26
Installation 26
PARKING BRAKE CONTROL 28
Components 28
Removal and Installation 28
Inspection 28
Adjustment 29

ABS

DESCRIPTION 30
Purpose 30

CONTENTS (Cont'd)

Operation 30
ABS Hydraulic Circuit 30
System Components 31
System Description 31
SENSOR 31
CONTROL UNIT (BUILT-IN ABS ACTUATOR AND ELECTRIC UNIT) 31
ABS ACTUATOR AND ELECTRIC UNIT 31
G SENSOR 32
Component Parts and Harness Connector Location 33
Schematic 34
Wiring Diagram — ABS — 35
ON BOARD DIAGNOSTIC SYSTEM DESCRIPTION 39
Self-diagnosis 39
FUNCTION 39
SELF-DIAGNOSIS PROCEDURE 39
HOW TO READ SELF-DIAGNOSTIC RESULTS (MALFUNCTION CODES) 40
HOW TO ERASE SELF-DIAGNOSTIC RESULTS (MALFUNCTION CODES) 40
CONSULT 41
CONSULT APPLICATION TO ABS 41
ECU (ABS CONTROL UNIT) PART NUMBER MODE 41
CONSULT Inspection Procedure 42
SELF-DIAGNOSIS PROCEDURE 42
SELF-DIAGNOSTIC RESULTS MODE 43
DATA MONITOR PROCEDURE 44
ACTIVE TEST PROCEDURE 45
DATA MONITOR MODE 46
ACTIVE TEST MODE 46
TROUBLE DIAGNOSIS — INTRODUCTION 47
How to Perform Trouble Diagnoses for Quick and Accurate Repair 47
INTRODUCTION 47
TROUBLE DIAGNOSIS — BASIC INSPECTION 48
Preliminary Check 48
Ground Circuit Check 50
ABS ACTUATOR AND ELECTRIC UNIT GROUND 50
TROUBLE DIAGNOSIS — GENERAL DESCRIPTION 51
Malfunction Code/Symptom Chart 51
TROUBLE DIAGNOSES FOR SELF-DIAGNOSTIC ITEMS 53
Wheel Sensor or Rotor 53
DIAGNOSTIC PROCEDURE 53
ABS Actuator Solenoid Valve or Solenoid Valve Relay 55
DIAGNOSTIC PROCEDURE 55
Motor Relay or Motor 57
DIAGNOSTIC PROCEDURE 57
Low Voltage 58
DIAGNOSTIC PROCEDURE 58
G Sensor and Circuit 59
DIAGNOSTIC PROCEDURE 59
ELECTRICAL COMPONENT INSPECTION 61
Control Unit 62
DIAGNOSTIC PROCEDURE 62
TROUBLE DIAGNOSES FOR SYMPTOMS 63
1. ABS Works Frequently 63
2. Unexpected Pedal Action 63
3. Long Stopping Distance 64
4. ABS Does Not Work 65
5. Pedal Vibration and Noise 65
6. Warning Lamp Does Not Come On When Ignition Switch Is Turned On 66
7. Warning Lamp Stays On When Ignition Switch Is Turned On 67
8. Vehicle Vibrates Excessively When ABS Is Operating 69
REMOVAL AND INSTALLATION 71
Front Wheel Sensor 71
Rear Wheel Sensor 71
Front Sensor Rotor 72
REMOVAL 72
INSTALLATION 72
Rear Sensor Rotor 72
REMOVAL 72
INSTALLATION 72
G Sensor 72
ABS Actuator and Electric Unit 73
REMOVAL 73
INSTALLATION 73

SERVICE DATA AND SPECIFICATIONS (SDS) 74
General Specifications 74
Disc Brake 74
Drum Brake 74
Brake Pedal 74
Parking Brake Control 75

Supplemental Restraint System (SRS) "AIR BAG" and "SEAT BELET PRE-TENSIONER"

NBBR0001

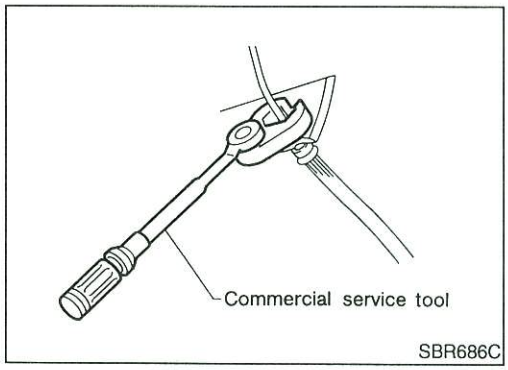
The supplemental Restraint System such as "AIR BAG" and "SEAT BELT PRE-TENSIONER" used along with a seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. The SRS system composition which is available to INFINITI QX4 is as follows:

- For a frontal collision
  The Supplemental Restraint System consists of driver air bag module (located in the center of the steering wheel), front passenger air bag module (located on the instrument panel on passenger side), seat belt pre-tensioners, a diagnosis sensor unit, warning lamp, wiring harness and spiral cable.
- For a side collision
  The Supplemental Restraint System consists of side air bag module (located in the outer side of front seat), satellite sensor, diagnosis sensor unit (one of components of air bags for a frontal collision), wiring harness, warning lamp (one of components of air bags for a frontal collision).

Information necessary to service the system safely is included in the **RS section** of this Service Manual.

WARNING:

- **To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance must be performed by an authorized INFINITI dealer.**
- **Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the RS section.**
- **Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. Spiral cable and wiring harnesses (except "SEAT BELT PRE-TENSIONER") covered with yellow insulation either just before the harness connectors or for the complete harness are related to the SRS.**



Precautions for Brake System

NBBR0002

- **Use brake fluid "DOT 3".**
- **Never reuse drained brake fluid.**
- **Be careful not to splash brake fluid on painted areas; it may cause paint damage. If brake fluid is splashed on painted areas, wash it away with water immediately.**
- **To clean master cylinder parts, disc brake caliper parts or wheel cylinder parts, use clean brake fluid.**
- **Never use mineral oils such as gasoline or kerosene. They will ruin rubber parts of hydraulic system.**
- **Use flare nut wrench when removing and installing brake tubes.**
- **Always torque brake lines when installing.**

WARNING:

- **Clean brakes with a vacuum dust collector to minimize risk of health hazard from powder caused by friction.**

Wiring Diagrams and Trouble Diagnosis

NBBR0003

When you read wiring diagrams, refer to the followings:

- "HOW TO READ WIRING DIAGRAMS" in GI section
- "POWER SUPPLY ROUTING" for power distribution circuit in EL section

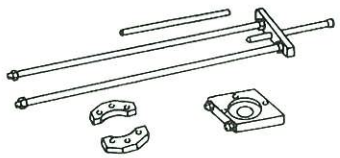
When you perform trouble diagnosis, refer to the followings:

- "HOW TO FOLLOW TEST GROUP IN TROUBLE DIAGNOSIS" in GI section
- "HOW TO PERFORM EFFICIENT DIAGNOSIS FOR AN ELECTRICAL INCIDENT" in GI section

Special Service Tools

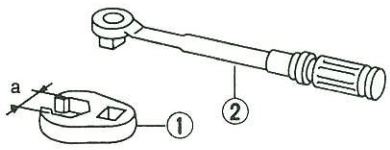
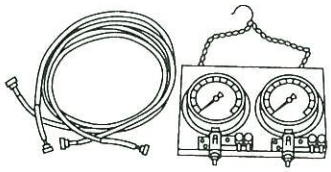
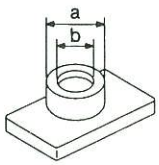
NBBR0004

The actual shapes of Kent-Moore tools may differ from those of special service tools illustrated here.

Tool number (Kent-Moore No.) Tool name	Description	
KV40106500 (J25852-B) Rear wheel bearing puller	 NT724	Removing rear wheel sensor rotor

Commercial Service Tools

NBBR0005

Tool name	Description	
1 Flare nut crowfoot 2 Torque wrench	 NT360	Removing and installing each brake piping **a: 10 mm (0.39 in)**
Brake fluid pressure gauge	 NT151	Measuring brake fluid pressure
Rear wheel sensor rotor drift	 NT509	Installing rear wheel sensor rotor **a: 75 mm (2.95 in) dia.** **b: 63 mm (2.48 in) dia.**

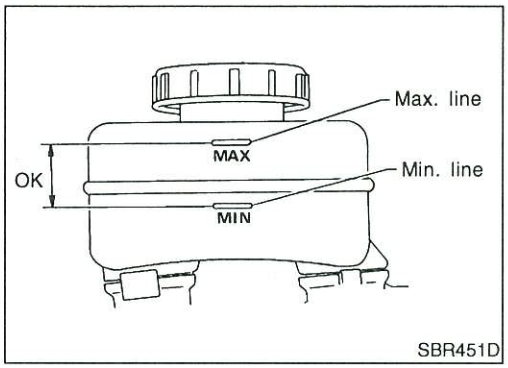
NVH Troubleshooting Chart

NBBR0085S01

Use the chart below to help you find the cause of the symptom. If necessary, repair or replace these parts.

Reference page			BR-20, 26	BR-20, 26	BR-24	BR-20	—	—	BR-22, 26	—	—	—	BR-23	BR-26	NVH in PD section	NVH in PD section	NVH in AX section	NVH in AX section	NVH in SU section	NVH in SU section	NVH in SU section	NVH in ST section
Possible cause and SUSPECTED PARTS			Linings or pads - damaged	Linings or pads - uneven wear	Return spring damaged	Shims damaged	Rotor or drum imbalance	Rotor or drum damage	Rotor or drum runout	Rotor or drum deformation	Rotor or drum deflection	Rotor or drum rust	Rotor thickness variation	Drum out of round	PROPELLER SHAFT	DIFFERENTIAL	DRIVE SHAFT	AXLE	SUSPENSION	TIRES	ROAD WHEEL	STEERING
Symptom	BRAKE	Noise	×	×	×	×									×	×	×	×	×	×	×	×
		Shake					×								×		×	×	×	×	×	×
		Shimmy, Judder					×	×	×	×	×	×	×	×				×	×	×	×	×

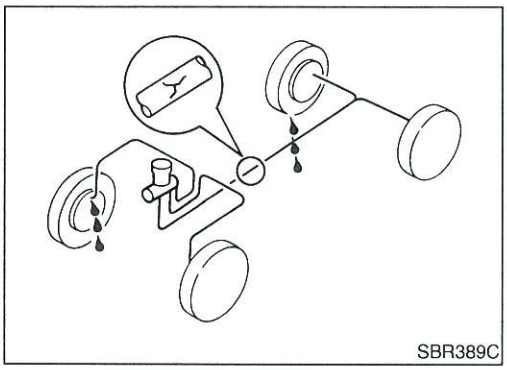
×: Applicable



Checking Brake Fluid Level

NBBR0006

- Check fluid level in reservoir tank. It should be between Max and Min lines on reservoir tank.
- If fluid level is extremely low, check brake system.
- If the brake warning lamp comes on, check brake fluid level switch and parking brake switch.



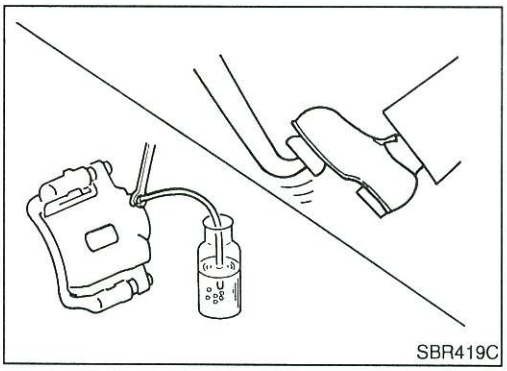
Checking Brake Line

NBBR0007

CAUTION:

If leakage occurs around joints, retighten or, if necessary, replace damaged parts.

1. Check brake lines (tubes and hoses) for cracks, deterioration or other damage. Replace any damaged parts.
2. Check for oil leakage by fully depressing brake pedal while engine is running.



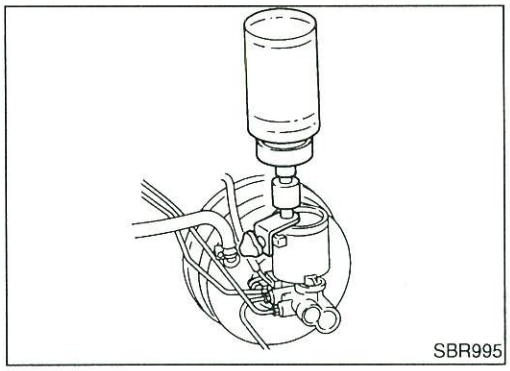
Changing Brake Fluid

NBBR0008

CAUTION:

- **Refill with new brake fluid "DOT 3".**
- **Always keep fluid level higher than minimum line on reservoir tank.**
- **Never reuse drained brake fluid.**
- **Be careful not to splash brake fluid on painted areas; it may cause paint damage. If brake fluid is splashed on painted areas, wash it away with water immediately.**

1. Clean inside of reservoir tank, and refill with new brake fluid.
2. Connect a vinyl tube to each air bleeder valve.
3. Drain brake fluid from each air bleeder valve by depressing brake pedal.
4. Refill until brake fluid comes out of each air bleeder valve.
   Use same procedure as in bleeding hydraulic system to refill brake fluid.
   Refer to "Bleeding Brake System", BR-7.


SBR995

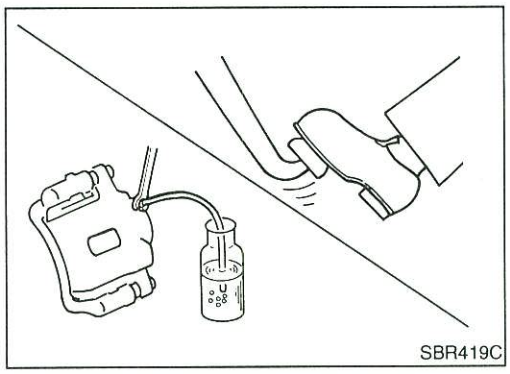
Bleeding Brake System

=NBBR0009

CAUTION:

- **Carefully monitor brake fluid level at master cylinder during bleeding operation.**
- **If master cylinder is suspected to have air inside, bleed air from master cylinder first. Refer to "Installation", "MASTER CYLINDER", BR-16.**
- **Fill reservoir with new brake fluid "DOT 3". Make sure it is full at all times while bleeding air out of system.**
- **Place a container under master cylinder to avoid spillage of brake fluid.**
- **Turn ignition switch OFF and disconnect ABS actuator and electric unit connectors or battery ground cable.**
- **Bleed air in the following order.**

1. LSV air bleeder
2. Left rear brake
3. Right rear brake
4. Left front brake
5. Right front brake

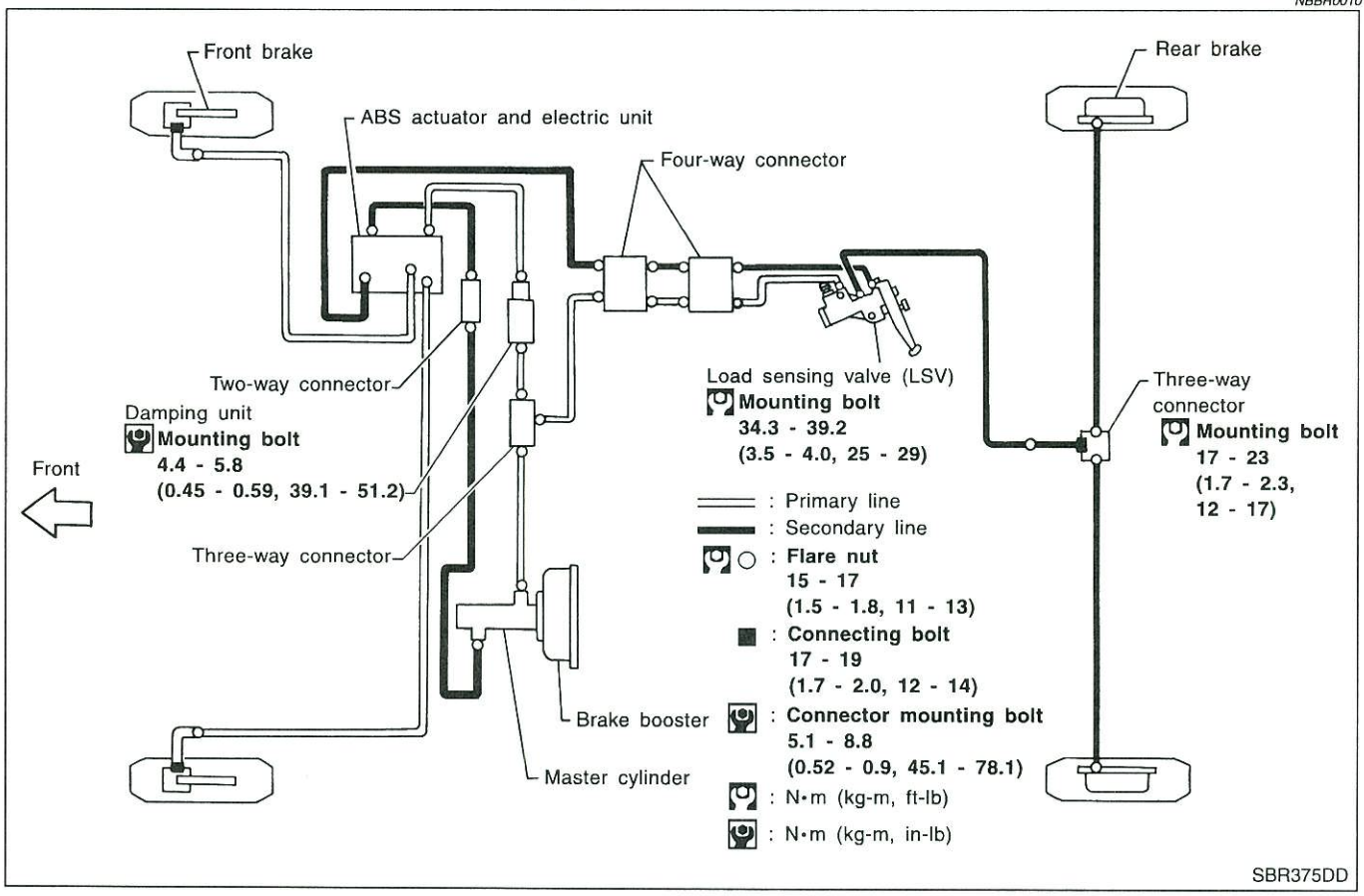

SBR419C

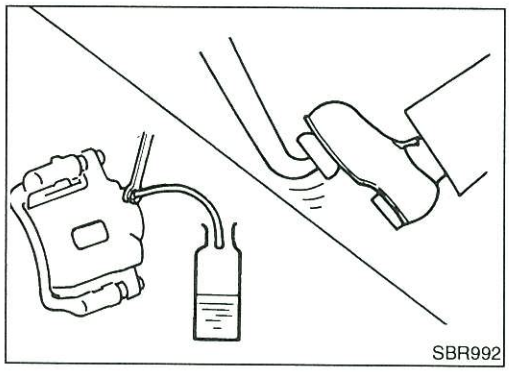
1. Connect a transparent vinyl tube to air bleeder valve.
2. Fully depress brake pedal several times.
3. With brake pedal depressed, open air bleeder valve to release air.
4. Close air bleeder valve.
5. Release brake pedal slowly.
6. Repeat steps 2. through 5. until clear brake fluid comes out of air bleeder valve.
7. Tighten air bleeder valve.

   : 7 - 9 N·m (0.7 - 0.9 kg-m, 61 - 78 in-lb)

Hydraulic Circuit

NBBR0010





Removal

NBBR0011

CAUTION:

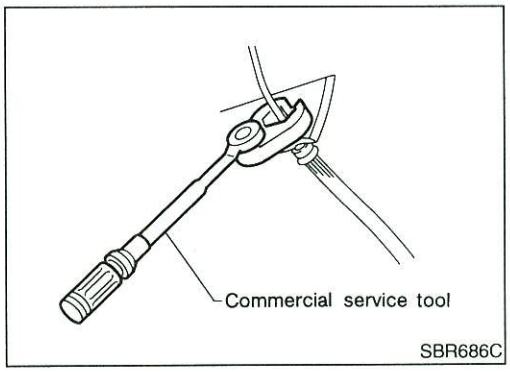
- **Be careful not to splash brake fluid on painted areas; it may cause paint damage. If brake fluid is splashed on painted areas, wash it away with water immediately.**
- **All hoses must be free from excessive bending, twisting and pulling.**

1. Connect vinyl tube to air bleeder valve.
2. Drain brake fluid from each air bleeder valve by depressing brake pedal.
3. Remove flare nut connecting brake tube and hose, then withdraw lock spring.
4. Cover openings to prevent entrance of dirt whenever disconnecting brake line.

Inspection

NBBR0012

Check brake lines (tubes and hoses) for cracks, deterioration or other damage. Replace any damaged parts.



Installation

NBBR0013

CAUTION:

- **Refill with new brake fluid "DOT 3".**
- **Never reuse drained brake fluid.**

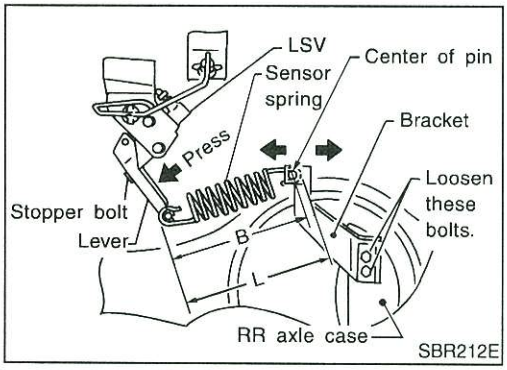
1. Tighten all flare nuts and connecting bolts.
   Flare nut:
   : 15 - 17 N·m (1.5 - 1.8 kg-m, 11 - 13 ft-lb)
   Connecting bolt:
   : 17 - 19 N·m (1.7 - 2.0 kg-m, 12 - 14 ft-lb)
2. Refill until new brake fluid comes out of each air bleeder valve.
3. Bleed air. Refer to "Bleeding Brake System", BR-7.

Inspection

NBBR0014

CAUTION:

- **Carefully monitor brake fluid level at master cylinder.**
- **Use new brake fluid "DOT 3".**
- **Be careful not to splash brake fluid on painted areas; it may cause paint damage. If brake fluid is splashed on paint areas, wash it away with water immediately.**
- **Depress pedal slowly when raising front brake pressure.**
- **Check rear brake pressure 2 seconds after front brake pressure reaches specified value.**
- **Disconnect harness connectors from ABS actuator and electric unit before checking.**



1. Park vehicle on a level surface with vehicle unloaded*.
   * Fuel, radiator coolant and engine oil full. Spare tire, jack, hand tools and mats in designated positions.
2. Press a lever to the stopper bolt, then check length "B" as follows:

Length "B"	Reference (Length "L")
207.7 mm (8.18 in)	217.3 mm (8.56 in)

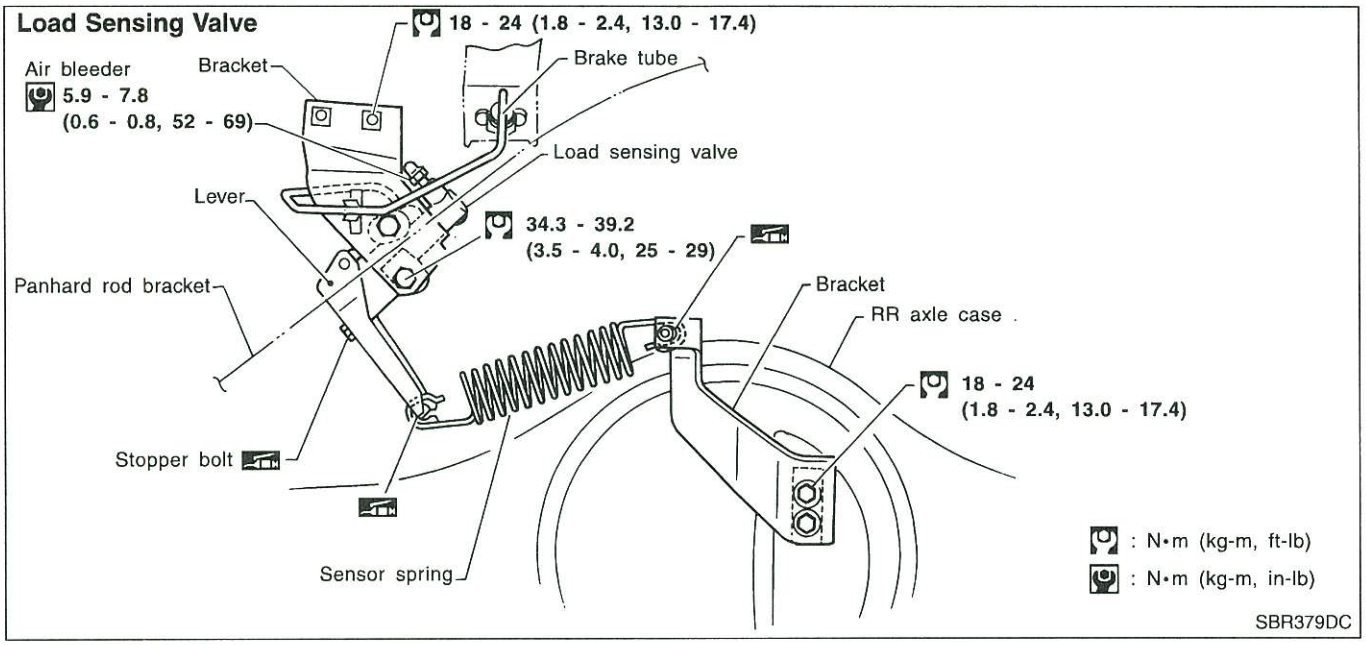
3. If length "B" is not within specification, adjust sensor spring length.

Removal and Installation

NBBR0015

CAUTION:

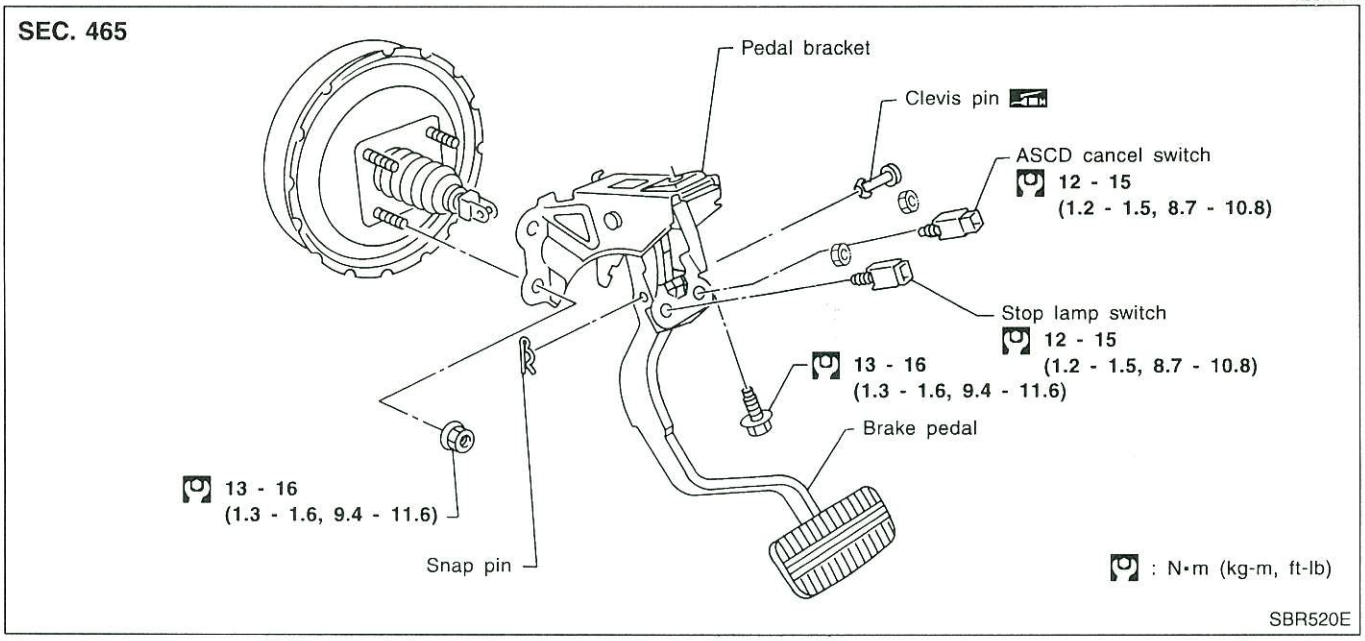
- **Refill with new brake fluid "DOT 3".**
- **Be careful not to splash brake fluid on painted areas; it may cause paint damage. If brake fluid is splashed on painted areas, wash it away with water immediately.**
- **Do not reuse Load Sensing Valve once it is disassembled.**
- **Replace damaged Load Sensing Valve as an assembly.**
- **When disassembling, apply multi-purpose grease to all rubbing areas.**



1. Tighten all flare nuts and mounting bolts.
   Flare nut:
   : 15 - 17 N·m (1.5 - 1.8 kg-m, 11 - 13 ft-lb)
2. Refill until new brake fluid comes out of each air bleeder valve.
3. Bleed air. Refer to "Bleeding Brake System", BR-7.

Removal and Installation

NBBR0016

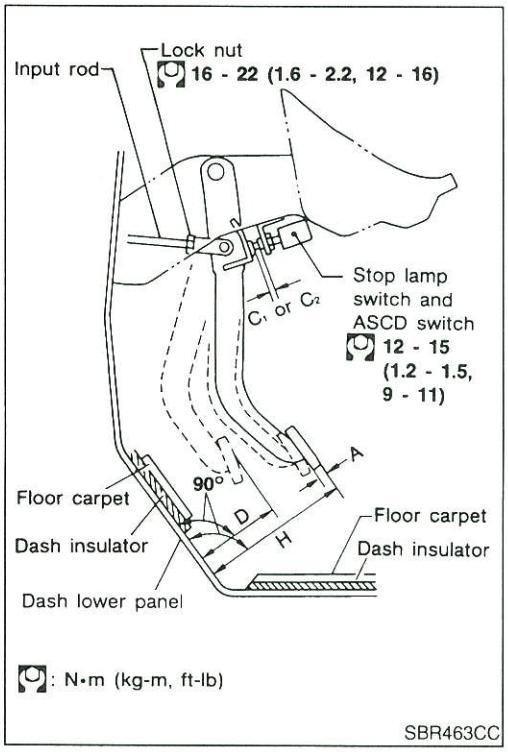


Inspection

NBBR0017

Check brake pedal for following items.

- Brake pedal bend
- Clevis pin deformation
- Crack of any welded portion
- Crack or deformation of clevis pin stopper



Adjustment

NBBR0018

Check brake pedal free height from dash lower panel.

H: Free height

Refer to SDS (BR-74).

D: Depressed height

Refer to SDS (BR-74).

Under force of 490 N (50 kg, 110 lb) with engine running

C_1, C_2: Clearance between pedal stopper and threaded end of stop lamp switch and ASCD switch

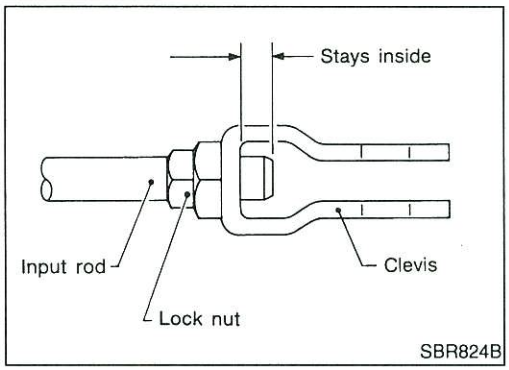
0.3 - 1.0 mm (0.012 - 0.039 in)

A: Pedal free play

1 - 3 mm (0.04 - 0.12 in)

If necessary, adjust brake pedal free height.

Adjustment (Cont'd)



1. Loosen lock nut and adjust pedal free height by turning brake booster input rod. Then tighten lock nut.

Make sure that tip of input rod stays inside.

2. Adjust clearance "C_1" and "C_2" with stop lamp switch and ASCD switch respectively. Then tighten lock nuts.
3. Check pedal free play.

Make sure that stop lamp is off when pedal is released.

4. Check brake pedal's depressed height while engine is running. If depressed height is below specified value, check brake system for leaks, accumulation of air or any damage to components (master cylinder, wheel cylinder, etc.). Then make necessary repairs.

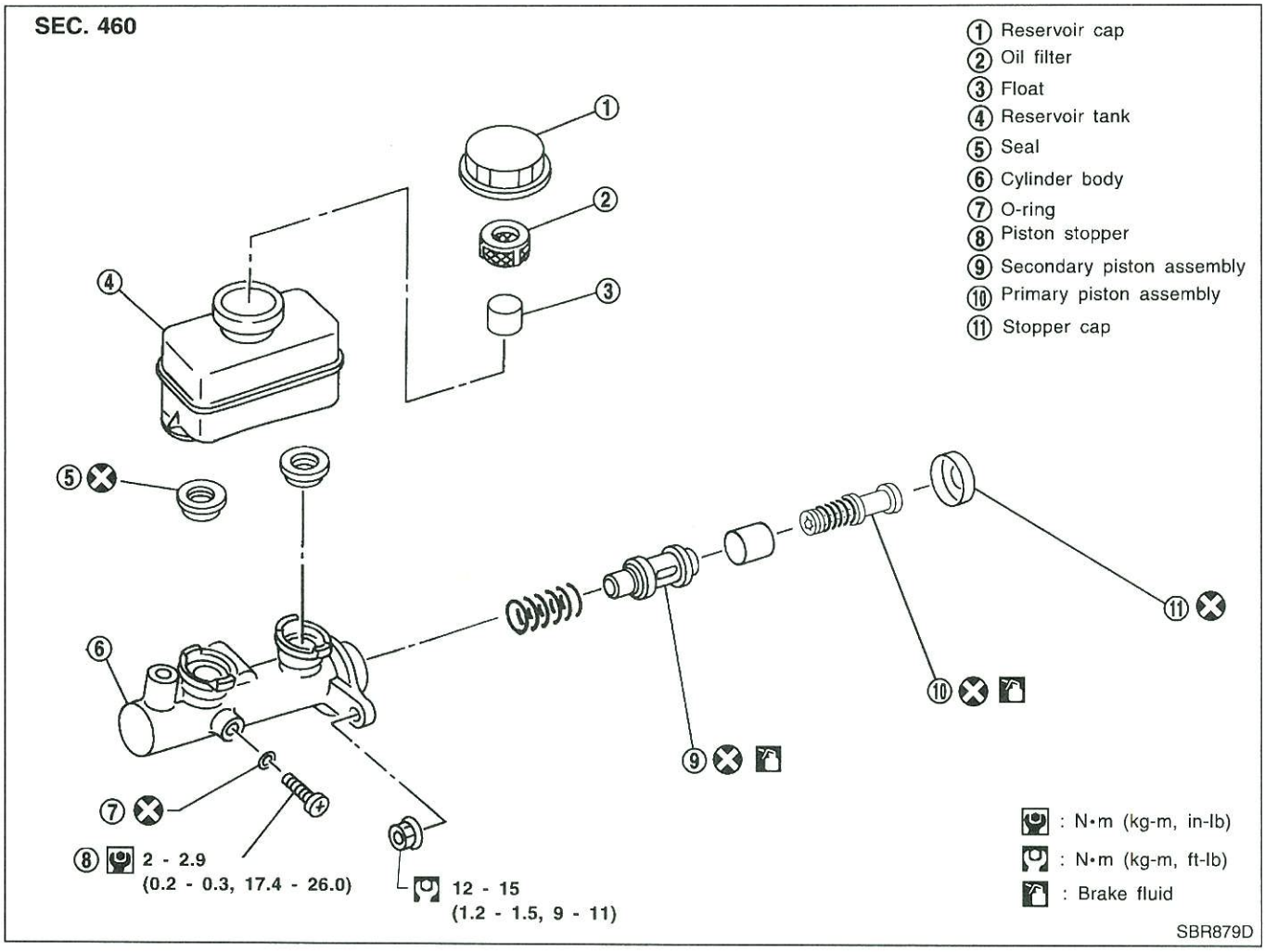
Removal

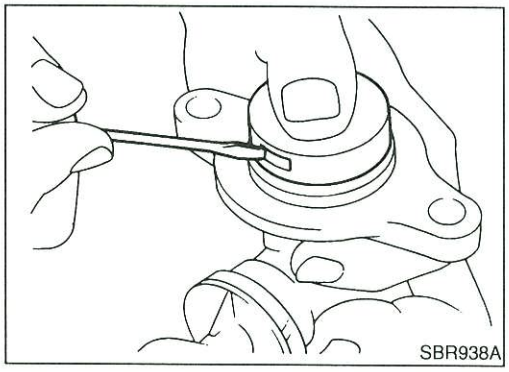
NBBR0019

CAUTION:

- **Be careful not to splash brake fluid on painted areas; it may cause paint damage. If brake fluid is splashed on painted areas, wash it away with water immediately.**
- **In the case of brake fluid leakage from the master cylinder, disassemble the cylinder. Then check piston cups for deformation or scratches and replace necessary parts.**

1. Connect a vinyl tube to air bleeder valve.
2. Drain brake fluid from each air bleeder valve, depressing brake pedal to empty fluid from master cylinder.
3. Remove brake pipe flare nuts.
4. Remove master cylinder mounting nuts.

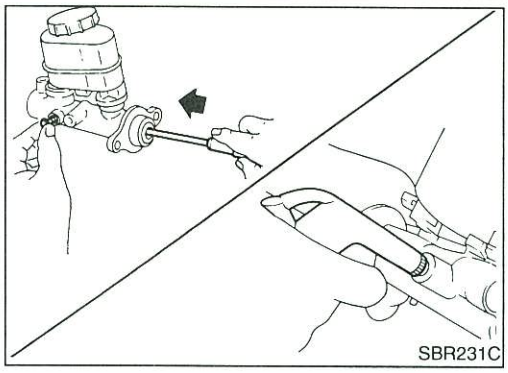




Disassembly

NBBR0020

1. Bend claws of stopper cap outward.



2. Remove piston stopper while piston is pushed into cylinder.
3. Remove piston assemblies.

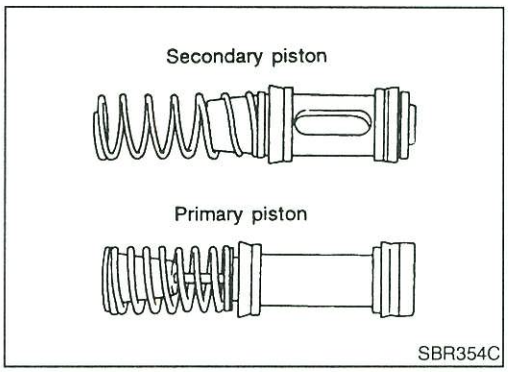
If it is difficult to remove secondary piston assembly, gradually apply compressed air through fluid outlet.

4. Draw out reservoir tank.

Inspection

NBBR0021

Check master cylinder inner wall for pin holes or scratches. Replace if damaged.

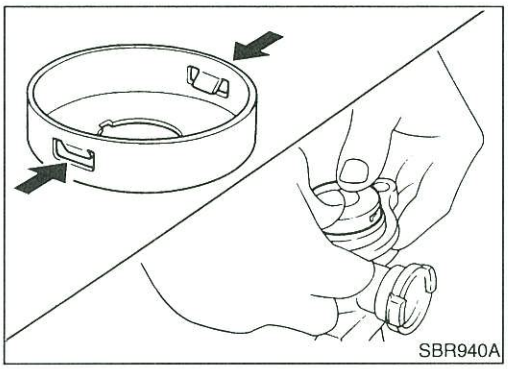


Assembly

NBBR0022

1. Insert secondary piston assembly. Then insert primary piston assembly.

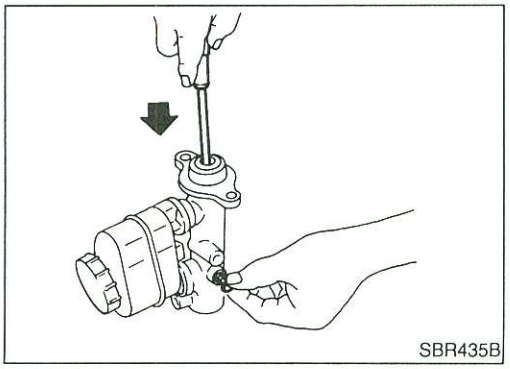
- **Pay attention to direction of piston cups in figure at left. Also, insert pistons squarely to avoid scratches on cylinder bore.**
- **Pay attention to alignment of secondary piston slit with valve stopper mounting hole of cylinder body.**



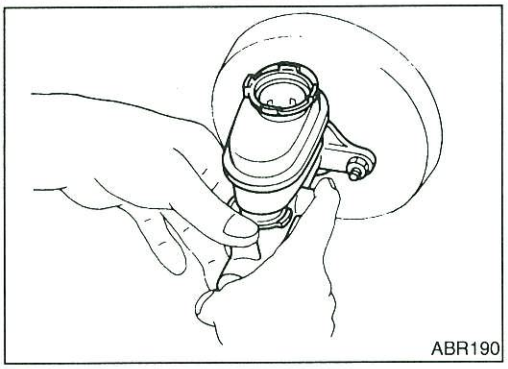
2. Install stopper cap.

Before installing stopper cap, ensure that claws are bent inward.

3. Push reservoir tank seals into cylinder body.
4. Push reservoir tank into cylinder body.



5. Install valve stopper while piston is pushed into cylinder.


ABR190

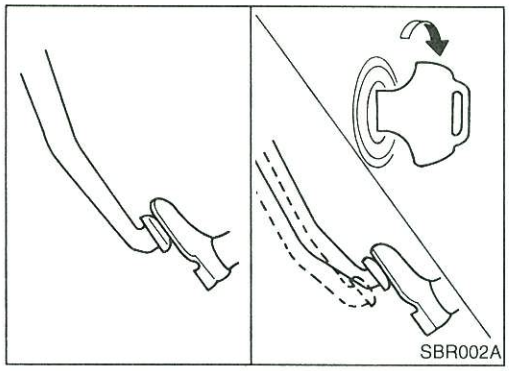
Installation

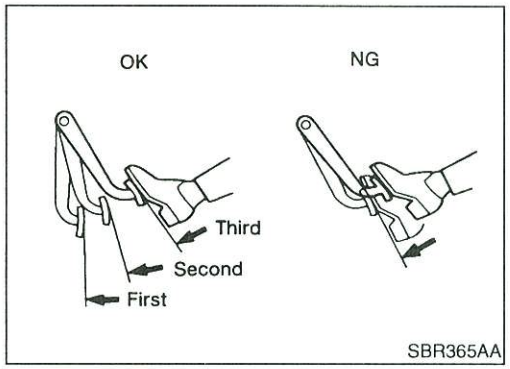
NBBR0023

CAUTION:

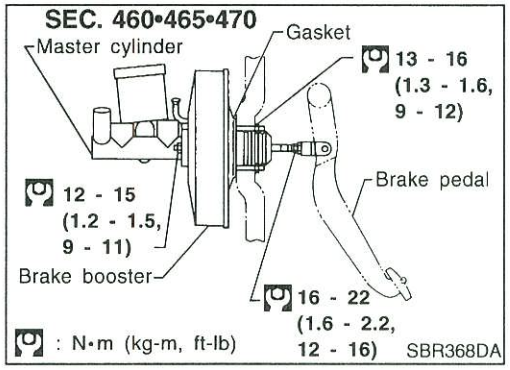
- **Refill with new brake fluid "DOT 3".**
- **Never reuse drained brake fluid.**

1. Place master cylinder onto brake booster and secure mounting nuts lightly.
2. Torque mounting nuts.
   : 12 - 15 N·m (1.2 - 1.5 kg-m, 9 - 11 ft-lb)
3. Fill up reservoir tank with new brake fluid.
4. Plug all ports on master cylinder with fingers to prevent air suction while releasing brake pedal.
5. Have driver depress brake pedal slowly several times until no air comes out of master cylinder.
6. Fit brake lines to master cylinder.
7. Tighten flare nuts.
   : 15 - 17 N·m (1.5 - 1.8 kg-m, 11 - 13 ft-lb)
8. Bleed air. Refer to "Bleeding Brake System", BR-7.

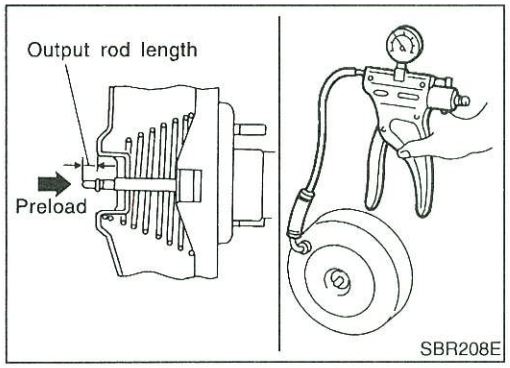

SBR002A



SBR365AA



SBR368DA



SBR208E

On-vehicle Service

NBBR0024

OPERATING CHECK

NBBR0024S01

1. Depress brake pedal several times with engine off. After exhausting vacuum, make sure there is no change in pedal stroke.
2. Depress brake pedal, then start engine. If pedal goes down slightly, operation is normal.

AIRTIGHT CHECK

NBBR0024S02

1. Start engine, and stop it after one or two minutes. Depress brake pedal several times slowly. Booster is airtight if pedal stroke is less each time.
2. Depress brake pedal while engine is running, and stop engine with pedal depressed. The pedal stroke should not change after holding pedal down for **30 seconds**.

Removal

NBBR0025

CAUTION:

- **Be careful not to splash brake fluid on painted areas; it may cause paint damage. If brake fluid is splashed on painted areas, wash it away with water immediately.**
- **Be careful not to deform or bend brake pipes, during removal of booster.**

Inspection

NBBR0026

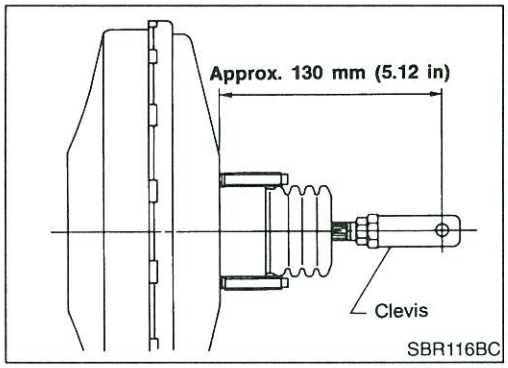
OUTPUT ROD LENGTH CHECK

NBBR0026S01

1. Apply vacuum of −66.7 kPa (−500 mmHg, −19.69 inHg) to brake booster with a hand vacuum pump.
2. Add preload of 19.6 N (2.0 kg, 4.4 lb) to output rod.
3. Check output rod length.

   Specified length:

   10.275 - 10.525 mm (0.4045 - 0.4144 in)



Installation

=NBBR0027

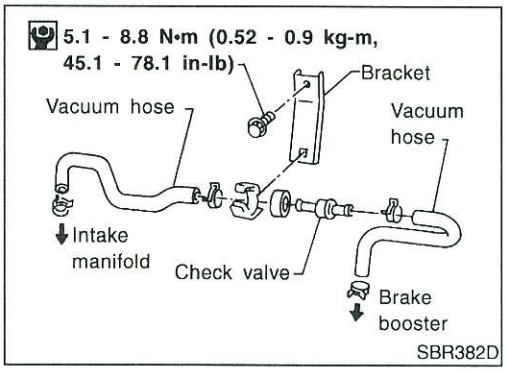
CAUTION:

- **Be careful not to deform or bend brake pipes during installation of booster.**
- **Replace clevis pin if damaged.**
- **Refill with new brake fluid "DOT 3".**
- **Never reuse drained brake fluid.**
- **Take care not to damage brake booster mounting bolt thread when installing. Due to the narrow angle of installation, the threads can be damaged by the dash panel.**

1. Before fitting booster, temporarily adjust clevis to dimension shown.
2. Fit booster, then secure mounting nuts (brake pedal bracket to brake booster) lightly.
3. Connect brake pedal and booster input rod with clevis pin.
4. Secure mounting nuts.

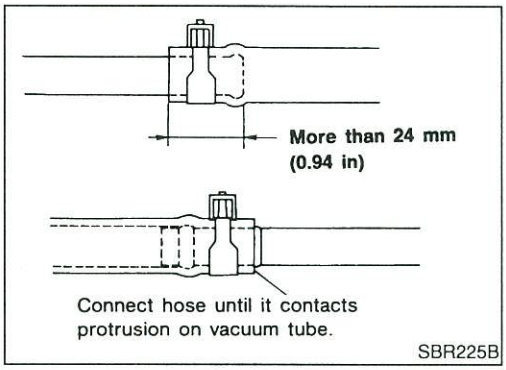
   Specification: 13 - 16 N·m (1.3 - 1.6 kg-m, 9 - 12 ft-lb)
5. Install master cylinder. Refer to "Installation" in "MASTER CYLINDER", BR-16.
6. Adjust brake pedal height and free play. Refer to "Adjustment" in "BRAKE PEDAL AND BRACKET", BR-12.
7. Secure lock nut for clevis.

   : 16 - 22 N·m (1.6 - 2.2 kg-m, 12 - 16 ft-lb)
8. Bleed air. Refer to "Bleeding Brake System", BR-7.



Vacuum Hose

NBBR0028



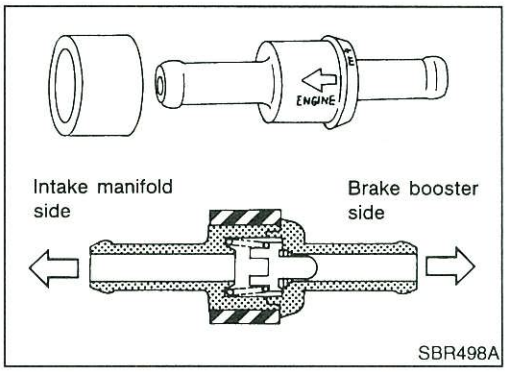
Removal and Installation

NBBR0029

CAUTION:

When installing vacuum hoses, pay attention to the following points.

- **Do not apply any oil or lubricants to vacuum hose and check valve.**
- **Insert vacuum tube into vacuum hose as shown.**



- **Install check valve, paying attention to its direction.**

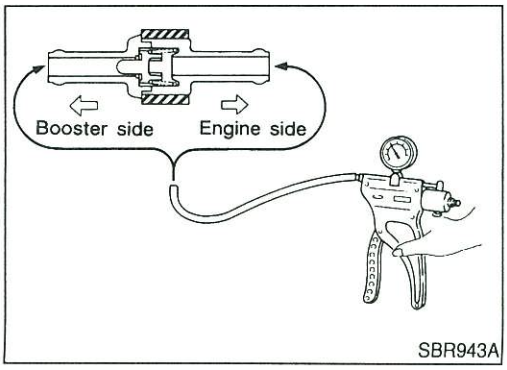
Inspection

NBBR0030

HOSES AND CONNECTORS

NBBR0030S01

Check vacuum lines, connections and check valve for airtightness, improper attachment chafing and deterioration.



CHECK VALVE

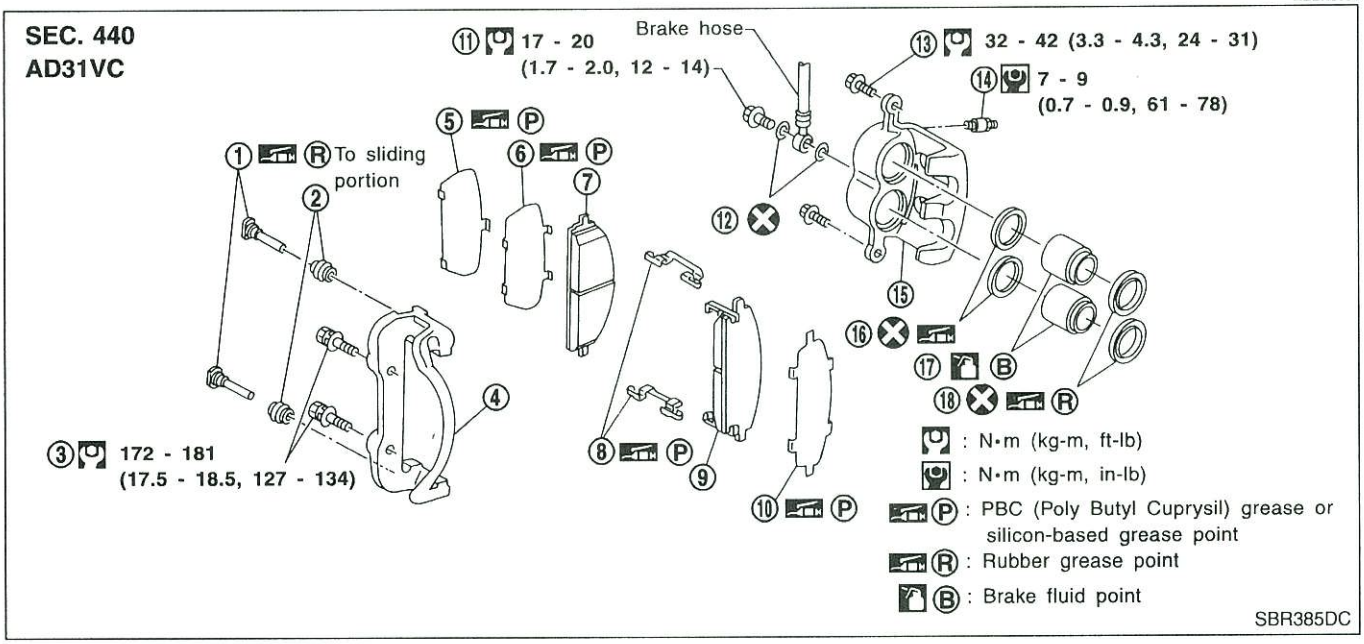
NBBR0030S02

Check vacuum with a vacuum pump.

Connect to booster side	Vacuum should exist.
Connect to engine side	Vacuum should not exist.

Components

NBBR0031



1. Main pin
2. Pin boot
3. Torque member fixing bolt
4. Torque member
5. Shim cover
6. Inner shim
7. Inner pad
8. Pad retainer
9. Outer pad
10. Outer shim
11. Connecting bolt
12. Copper washer
13. Main pin bolt
14. Bleed valve
15. Cylinder body
16. Piston seal
17. Piston
18. Piston boot

Pad Replacement

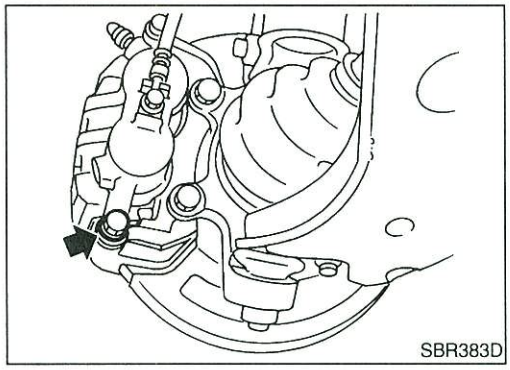
NBBR0032

WARNING:

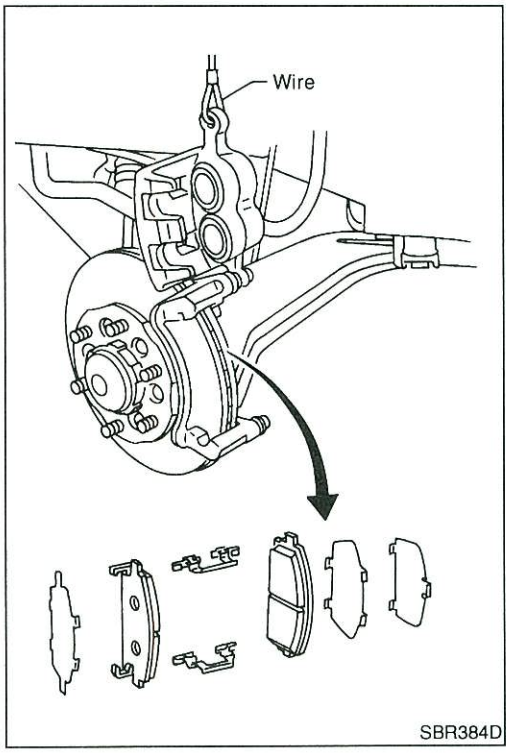
Clean brakes with a vacuum dust collector to minimize the hazard of airborne particles or other materials.

CAUTION:

- **When cylinder body is open, do not depress brake pedal, or piston will pop out.**
- **Be careful not to damage piston boot or get oil on rotor. Always replace shims when replacing pads.**
- **If shims are rusted or show peeling of the rubber coat, replace them with new shims.**
- **It is not necessary to remove connecting bolt except for disassembly or replacement of caliper assembly. In this case, suspend cylinder body with wire so as not to stretch brake hose.**
- **Carefully monitor brake fluid level because brake fluid will return to reservoir when pushing back piston.**


SBR383D

1. Remove master cylinder reservoir cap.
2. Remove lower pin bolt.



SBR384D

3. Open cylinder body upward. Then remove pad retainers, and inner and outer shims.

Standard pad thickness:
11.0 mm (0.433 in)
Pad wear limit:
2.0 mm (0.079 in)

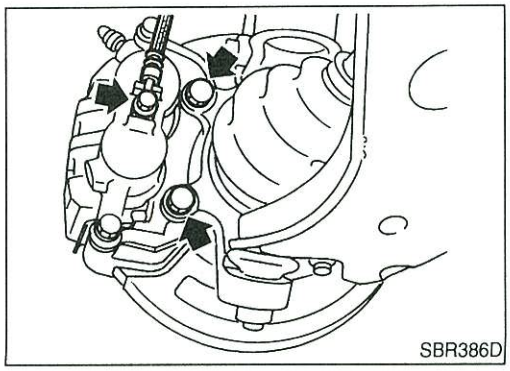
Carefully monitor brake fluid level because brake fluid will return to reservoir when pushing back piston.

Removal

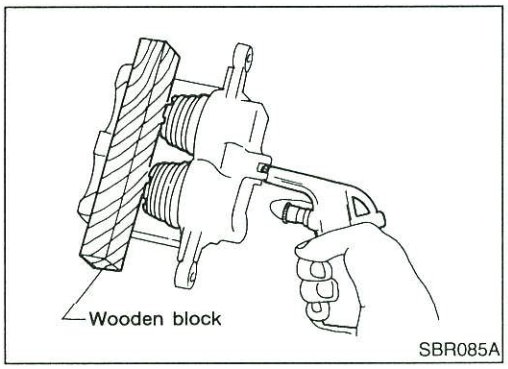
NBBR0033

WARNING:
Clean brake pads with a vacuum dust collector to minimize the hazard of airborne particles or other materials.

CAUTION:
Suspend caliper assembly with wire so as not to stretch brake hose.


SBR386D

Remove torque member fixing bolts and connecting bolt.
It is not necessary to remove connecting bolt except for disassembly or replacement of caliper assembly. In this case, suspend caliper assembly with wire so as not to stretch brake hose.



Disassembly

NBBR0034

WARNING:
Do not place your fingers in front of piston.

CAUTION:
Do not scratch or score cylinder wall.

1. Push out piston with dust seal with compressed air.
2. Remove piston seal with a suitable tool.

Inspection

NBBR0035

CALIPER

NBBR0035S01

Cylinder Body

NBBR0035S0101

- Check inside surface of cylinder for score, rust, wear, damage or presence of foreign objects. If any of the above conditions are observed, replace cylinder body.
- Minor damage from rust or foreign objects may be eliminated by polishing surface with a fine emery paper. Replace cylinder body if necessary.

CAUTION:
Use brake fluid to clean. Never use mineral oil.

Piston

NBBR0035S0102

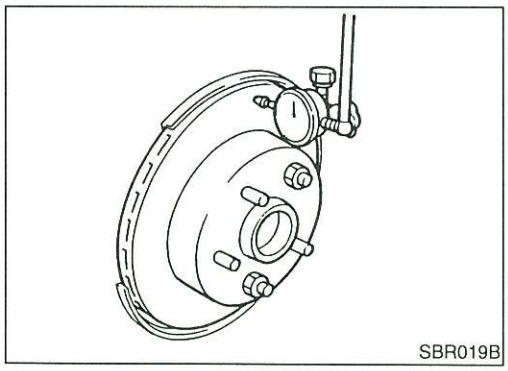
Check piston for score, rust, wear, damage or presence of foreign objects. Replace if any of the above conditions are observed.

CAUTION:
Piston sliding surface is plated. Do not polish with emery paper even if rust or foreign objects are stuck to sliding surface.

Slide Pin, Pin Bolt and Pin Boot

NBBR0035S0103

Check for wear, cracks, rust or other damage. Replace if any of the above conditions are observed.



ROTOR

NBBR0035S02

Runout

NBBR0035S0201

1. Secure rotor to wheel hub with at least two nuts (M12 × 1.25).
2. Check runout using a dial indicator.

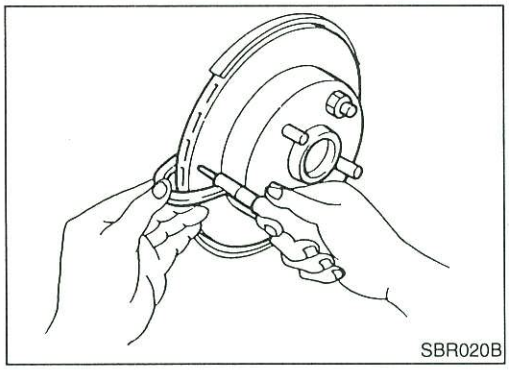
Make sure that wheel bearing axial end play is within the specifications before measuring. Refer to "Front Wheel Bearing" in AX section.

Maximum runout:
0.1 mm (0.004 in)

3. If the runout is out of specification, find minimum runout position as follows:

a. Remove nuts and rotor from wheel hub.
b. Shift the rotor one hole and secure rotor to wheel hub with nuts.
c. Measure runout.
d. Repeat steps a. to c. so that minimum runout position can be found.

4. If the runout is still out of specification, turn rotor with on-car brake lathe ("MAD, DL-8700", "AMMCO 700 and 705" or equivalent).


SBR020B

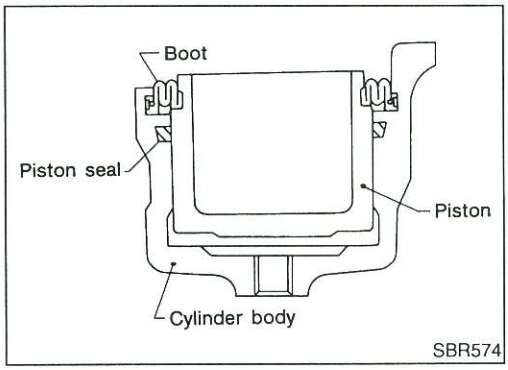
Thickness

NBBR0035S0202

Thickness variation (At least 8 positions):
Maximum 0.015 mm (0.0006 in)

If thickness variation exceeds the specification, turn rotor with on-car brake lathe.

Rotor repair limit:
26.0 mm (1.024 in)

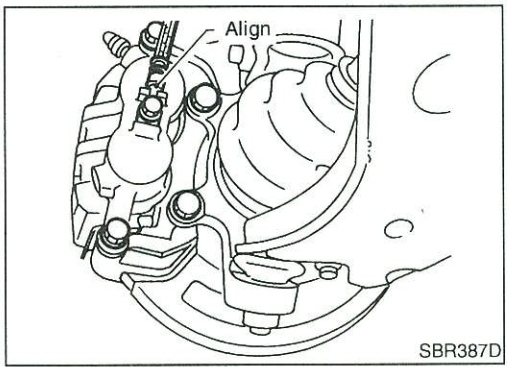


SBR574

Assembly

NBBR0036

1. Insert piston seal into groove on cylinder body.
2. With piston boot fitted to piston, insert piston boot into groove on cylinder body and install piston.
3. Properly secure piston boot



SBR387D

Installation

NBBR0037

CAUTION:

- **Refill with new brake fluid "DOT 3".**
- **Never reuse drained brake fluid.**

1. Install caliper assembly.
2. Install brake hose to caliper securely.
3. Install all parts and secure all bolts.
4. Bleed air. Refer to "Bleeding Brake System", BR-7.

Brake Burnishing Procedure

NBBR0086

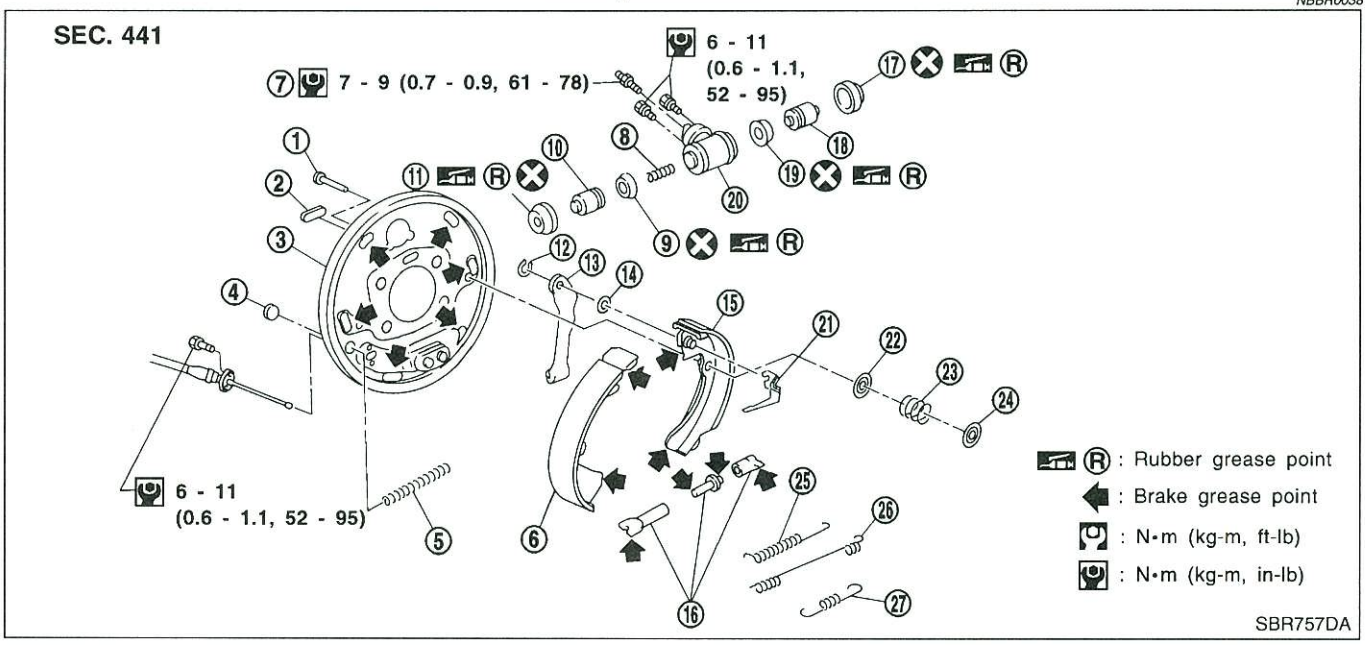
When experiencing soft brake pedal feel at very low mileage, or after replacing the rotor, burnish the brake pad contact surfaces according to the following procedures.

CAUTION:
Only perform this procedure under safe road and traffic conditions. Use extreme caution.

1. Drive the vehicle on a straight smooth road at 50 km/h (31 MPH).
2. Use medium brake pedal/foot effort to bring the vehicle to a complete stop from 50 km/h (31 MPH). Adjust brake pedal/foot pressure such that vehicle stopping time equals 3 to 5 seconds.
3. To cool the brake system, drive the vehicle at 50 km/h (31 MPH) for 1 minute without stopping.
4. Repeat steps 1 to 3 10 times or more to complete the burnishing procedure.

Components

NBBR0038



1. Shoe hold pin
2. Plug
3. Back plate
4. Check plug
5. Spring
6. Shoe (leading side)
7. Air bleeder
8. Spring
9. Piston cup
10. Piston
11. Boot
12. Retainer ring
13. Toggle lever
14. Wave washer
15. Shoe (trailing side)
16. Adjuster
17. Boot
18. Piston
19. Piston cup
20. Wheel cylinder
21. Adjuster lever
22. Spring seat
23. Shoe hold spring
24. Retainer
25. Adjuster spring
26. Return spring (upper)
27. Return spring (lower)

Removal

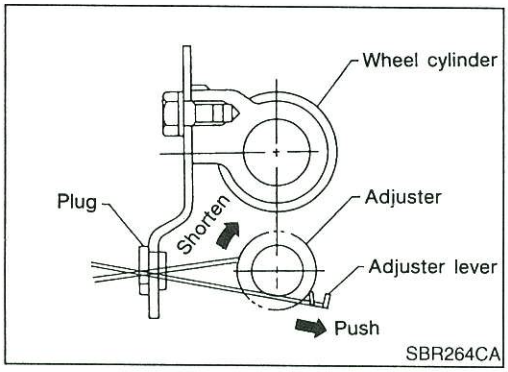
NBBR0039

WARNING:

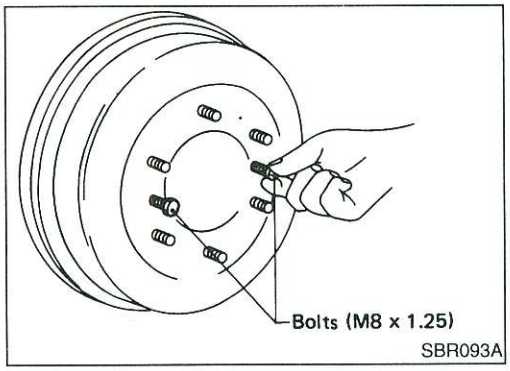
Clean brake lining with a vacuum dust collector to minimize the hazard of airborne asbestos or other materials.

CAUTION:

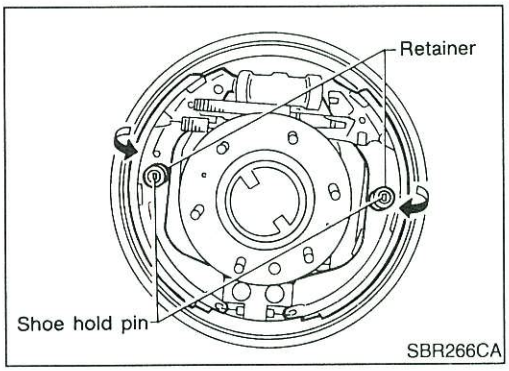
Make sure parking brake lever is released completely.



1. Release parking brake lever fully, then remove drum.
   If drum is hard to remove, the following procedures should be carried out.
   a. Remove plug. Then shorten adjuster to make clearance between brake shoe and drum as shown.



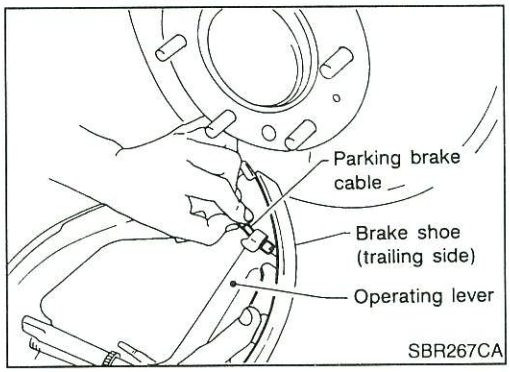
b. Tighten the two bolts gradually.



2. After removing shoe hold pin by rotating push retainer, remove leading shoe then remove trailing shoe. Remove spring by rotating shoes in direction arrow.

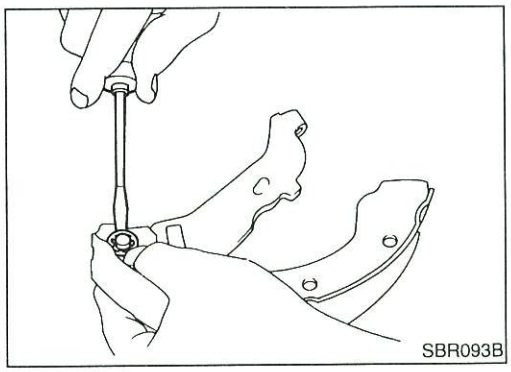
Be careful not to damage wheel cylinder piston boots.

3. Remove adjuster.

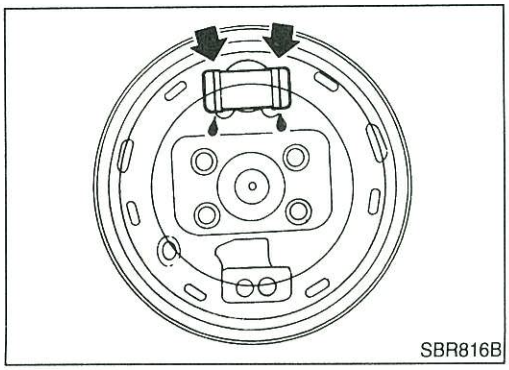


4. Disconnect parking brake cable from toggle lever.

Be careful not to damage parking brake cable when separating it.



5. Remove retainer ring with a suitable tool. Then separate toggle lever and brake shoe.



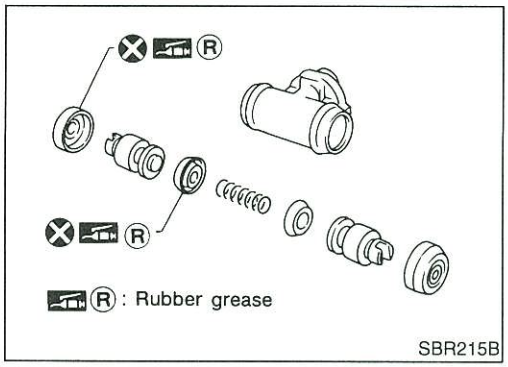
Inspection

NBBR0040

WHEEL CYLINDER

NBBR0040S01

- Check wheel cylinder for leakage.
- Check for wear, damage and loose conditions. Replace if any such condition exists.

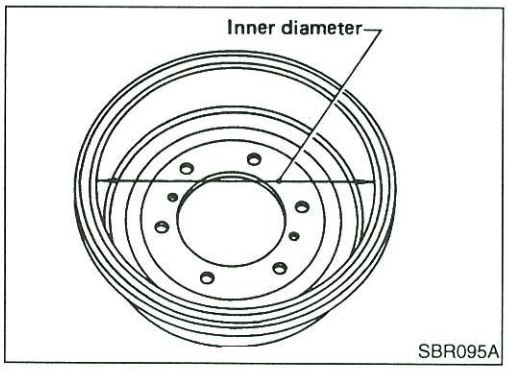


SBR215B

Wheel Cylinder Overhaul

NBBR0041

- Check all internal parts for wear, rust and damage. Replace if necessary.
- Pay attention so as not to scratch cylinder when installing pistons.



SBR095A

Inspection

NBBR0042

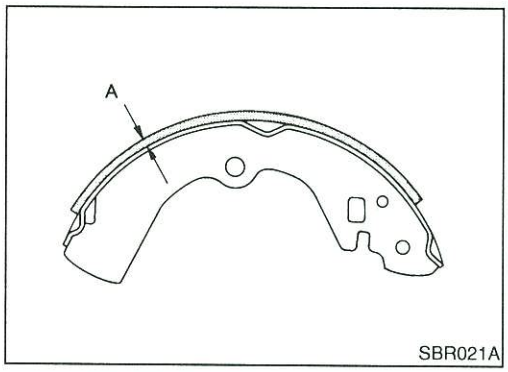
DRUM

NBBR0042S01

Maximum inner diameter: 296.5 mm (11.67 in)

Out-of-roundness: 0.03 mm (0.0012 in) or less

- Contact surface should be fine finished with No. 120 to 150 emery paper.
- Using a drum lathe, lathe brake drum if it shows scoring, partial wear or stepped wear.
- After brake drum has been completely reconditioned or replaced, check drum and shoes for proper contact pattern.



SBR021A

LINING

NBBR0042S02

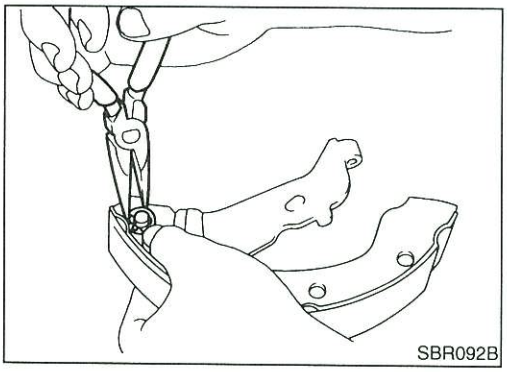
Check lining thickness.

Standard lining thickness:

6.1 mm (0.240 in)

Lining wear limit (A):

1.5 mm (0.059 in)

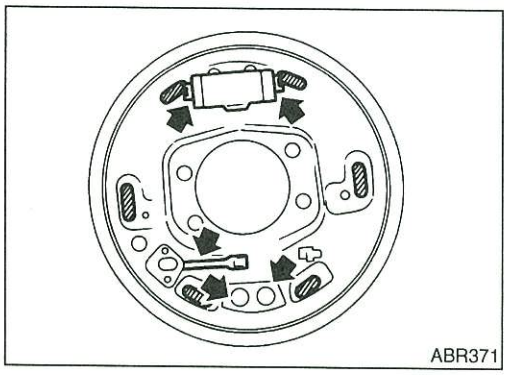

SBR092B

Installation

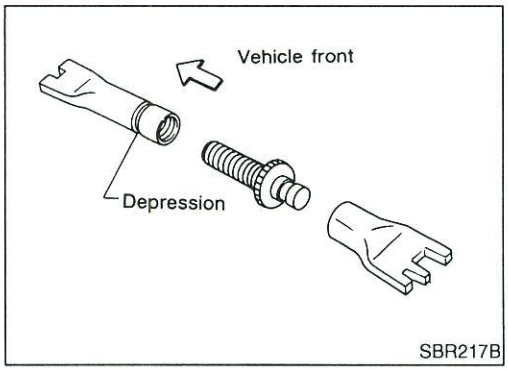
NBBR0043

Always perform shoe clearance adjustment. Refer to BR-29.

1. Fit toggle lever to brake shoe (trailing side) with retainer ring.


ABR371

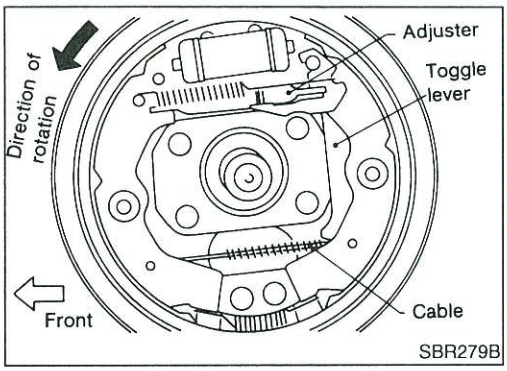
2. Apply brake grease to the contact areas (indicated by arrows and hatching) shown at left.



3. Shorten adjuster by rotating it.

- **Pay attention to direction of adjuster.**

Wheel	Screw	Depression
Left	Left-hand thread	Yes
Right	Right-hand thread	No



4. Connect parking brake cable to toggle lever.
5. Install all parts.

Be careful not to damage wheel cylinder piston boots.

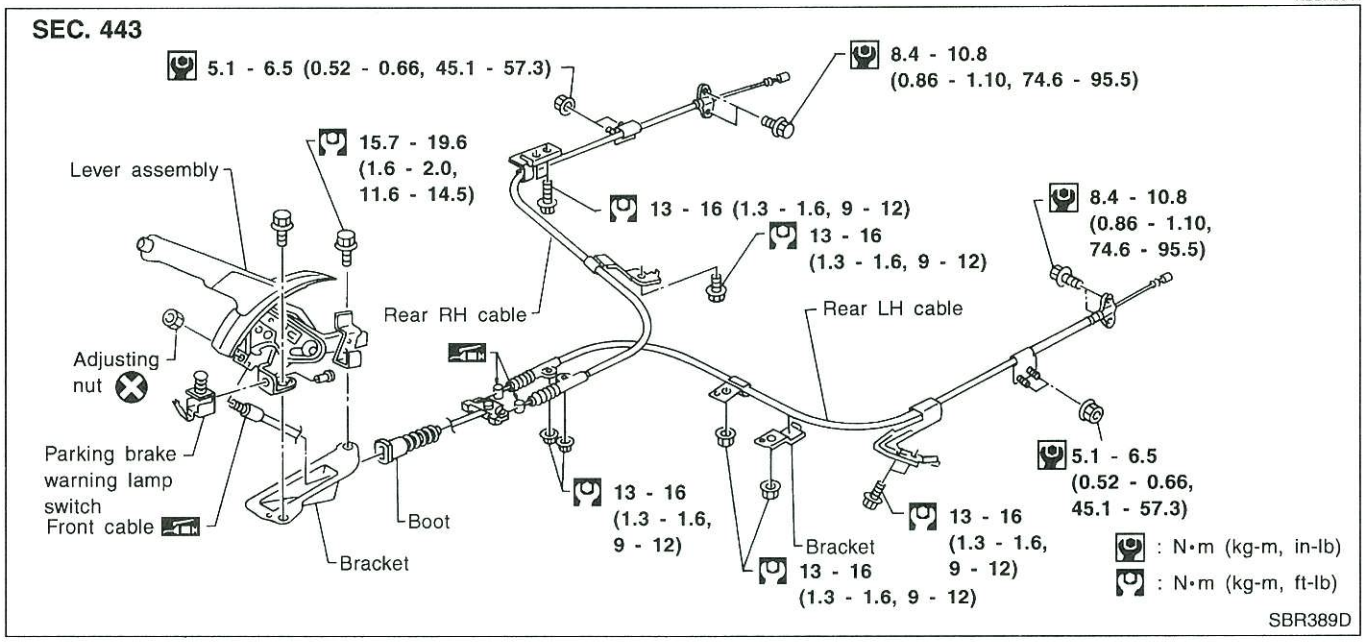
6. Check all parts are installed properly.

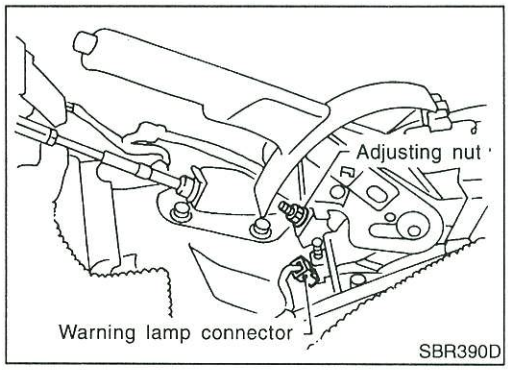
Pay attention to direction of adjuster assembly.

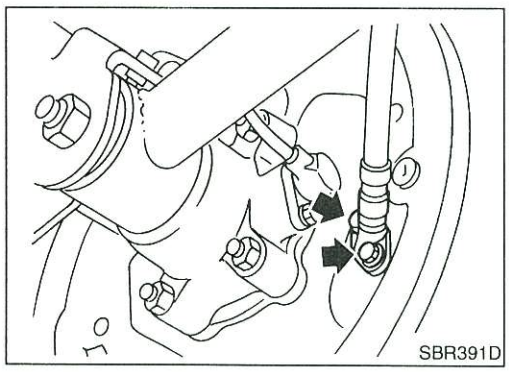
7. Install brake drum.
8. When installing new wheel cylinder or overhauling wheel cylinder, bleed air. Refer to "Bleeding Brake System", BR-7.
9. Adjust parking brake. Refer to "Adjustment", "PARKING BRAKE CONTROL", BR-29.

Components

NBBR0044







Removal and Installation

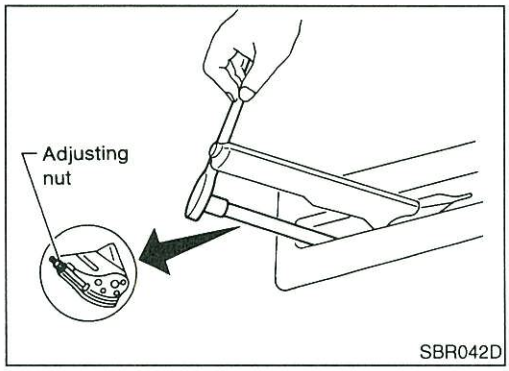
NBBR0045

1. To remove parking brake cable, first remove center console.
2. Disconnect warning lamp connector.
3. Remove bolts, slacken off and remove adjusting nut.
4. Disconnect cable. Refer to "Removal", "REAR DRUM BRAKE", BR-24.

Inspection

NBBR0046

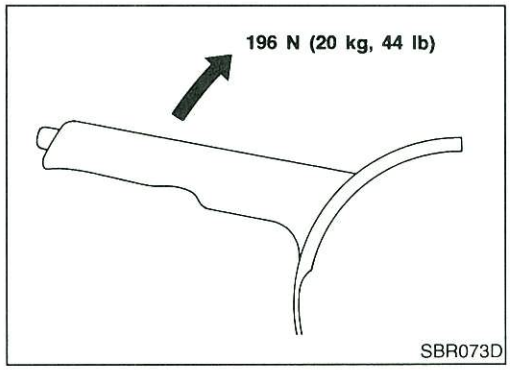
1. Check control lever for wear or other damage. Replace if necessary.
2. Check wires for discontinuity or deterioration. Replace if necessary.
3. Check warning lamp and switch. Replace if necessary.
4. Check parts at each connecting portion and, if deformed or damaged, replace.



Adjustment

NBBR0047

1. Adjust clearance between shoe and drum as follows:
a. Release parking brake lever and loosen adjusting nut.
b. Depress brake pedal fully at least 10 times with engine running.
2. Pull control lever 4 - 5 notches. Then adjust control lever by turning adjusting nut.



3. Pull control lever with specified amount of force. Check lever stroke and ensure smooth operation.
Number of notches: 6 - 8

4. Bend warning lamp switchplate to ensure:
- Warning lamp comes on when lever is lifted "A" notches.
- Warning lamp goes out when lever is fully released.
Number of "A" notches: 1 or less

Purpose

NBBR0087

The Anti-Lock Brake System (ABS) consists of electronic and hydraulic components. It allows for control of braking force so locking of the wheels can be avoided.

1) Improves proper tracking performance through steering wheel operation.
2) Eases obstacle avoidance through steering wheel operation.
3) Improves vehicle stability.

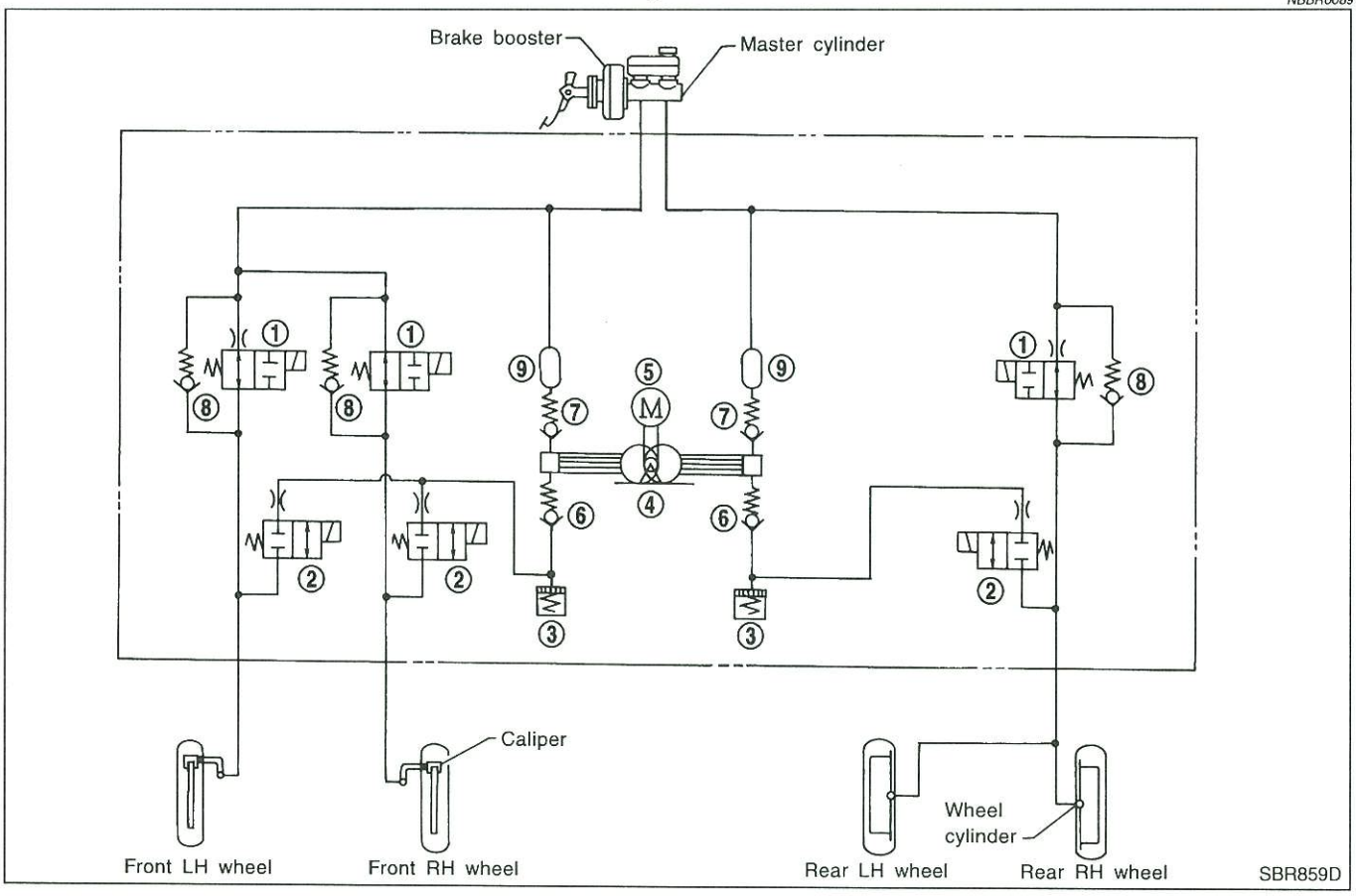
Operation

NBBR0088

- When the vehicle speed is less than 10 km/h (6 MPH) this system does not work.
- The Anti-Lock Brake System (ABS) has a self-test function. The system turns on the ABS warning lamp for 1 second each time the ignition switch is turned "ON". After the engine is started, the ABS warning lamp turns off. The system performs a test the first time the vehicle reaches 6 km/h (4 MPH). A mechanical noise may be heard as the ABS performs this self-test. This is a normal part of the self-test feature. If a malfunction is found during this check, the ABS warning lamp will stay on.
- While driving, a mechanical noise may be heard during ABS operation. This is a normal condition.

ABS Hydraulic Circuit

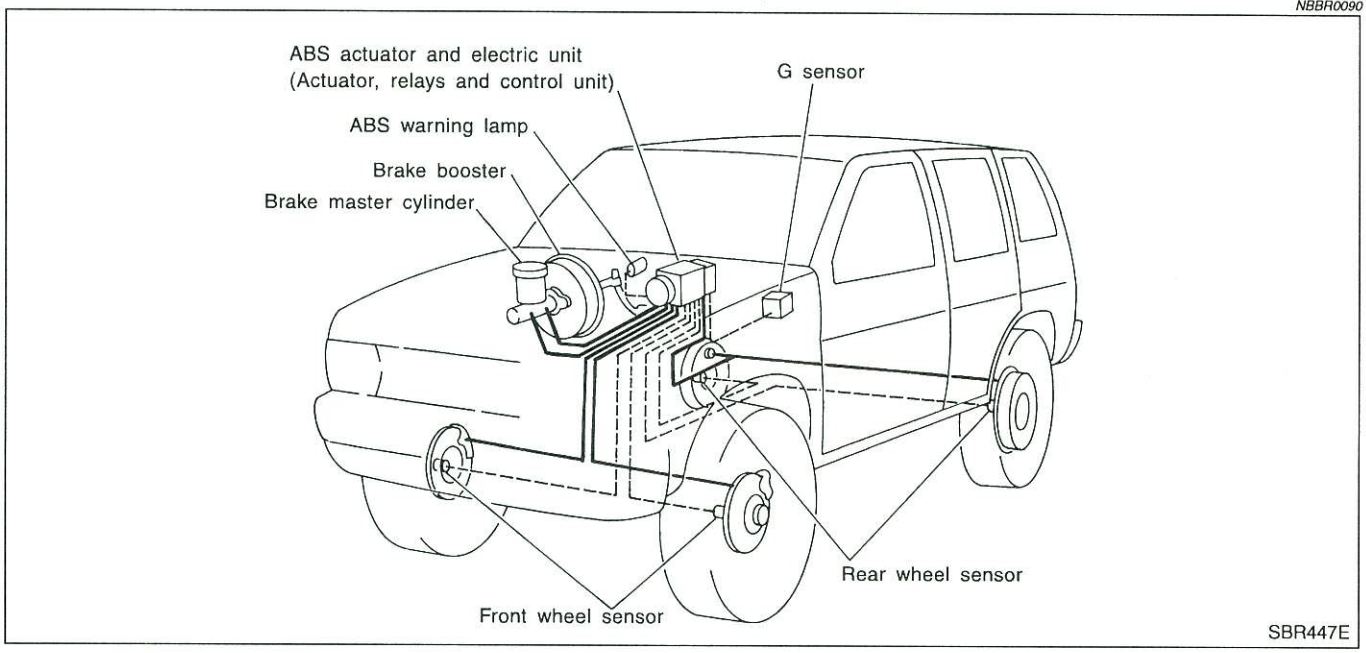
NBBR0089

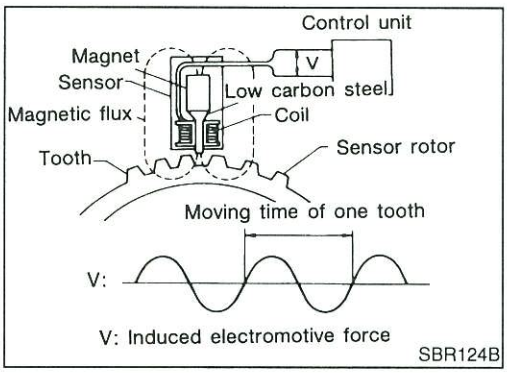


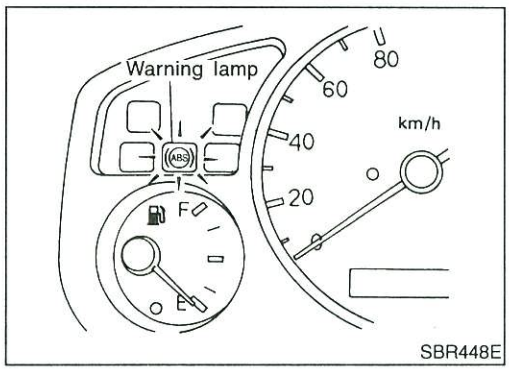
1. Inlet solenoid valve
2. Outlet solenoid valve
3. Reservoir
4. Pump
5. Motor
6. Inlet valve
7. Outlet valve
8. Bypass check valve
9. Damper

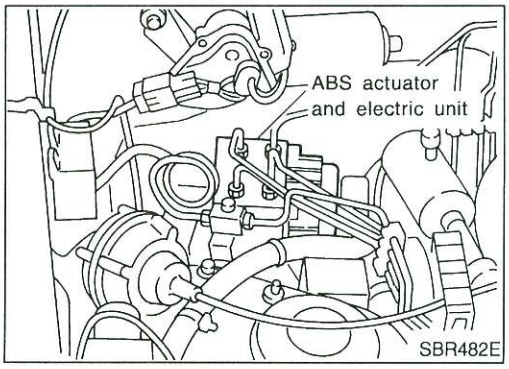
System Components

NBBR0090









System Description

SENSOR

NBBR0091

NBBR0091S01

The sensor unit consists of a gear-shaped sensor rotor and a sensor element. The element contains a bar magnet around which a coil is wound. The front sensors are installed on the front spindles and the rear sensors are installed on the rear spindles. As the wheel rotates, the sensor generates a sine-wave pattern. The frequency and voltage increase(s) as the rotating speed increases.

CONTROL UNIT (BUILT-IN ABS ACTUATOR AND ELECTRIC UNIT)

NBBR0091S02

The control unit computes the wheel rotating speed by the signal current sent from the sensor. Then it supplies a DC current to the actuator solenoid valve. It also controls ON-OFF operation of the valve relay and motor relay. If any electrical malfunction should be detected in the system, the control unit causes the warning lamp to light up. In this condition, the ABS will be deactivated by the control unit, and the vehicle's brake system reverts to normal operation. (For control unit layout, refer to ABS ACTUATOR AND ELECTRIC UNIT, BR-31.)

ABS ACTUATOR AND ELECTRIC UNIT

NBBR0091S03

The ABS actuator and electric unit contains:

- An electric motor and pump
- Two relays
- Six solenoid valves, each inlet and outlet for
  - — LH front
  - — RH front
  - — Rear
- ABS control unit

This component controls the hydraulic circuit and increases, holds or decreases hydraulic pressure to all or individual wheels. The ABS actuator and electric unit is serviced as an assembly.

ABS Actuator Operation

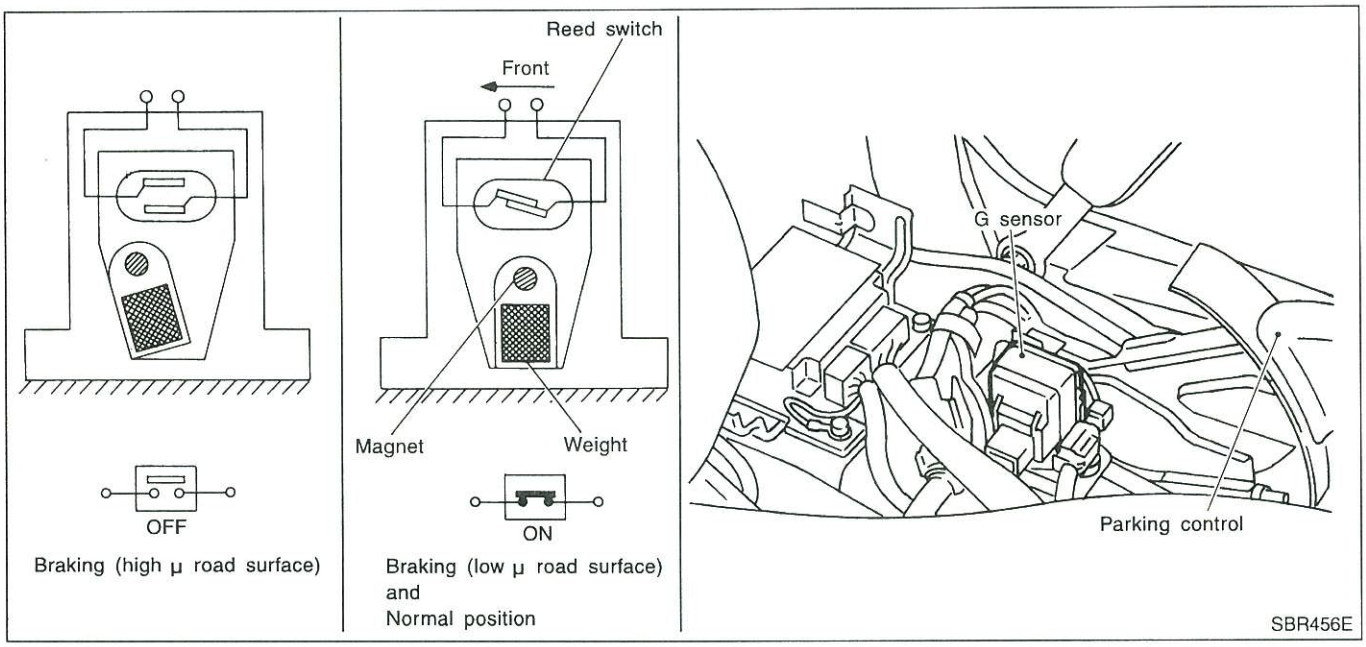
NBBR0091S0301

		Inlet solenoid valve	Outlet solenoid valve	
Normal brake operation		OFF (Open)	OFF (Closed)	Master cylinder brake fluid pressure is directly transmitted to caliper via the inlet solenoid valve.
ABS operation	Pressure hold	ON (Closed)	OFF (Closed)	Hydraulic circuit is shut off to hold the caliper brake fluid pressure.
	Pressure decrease	ON (Closed)	ON (Open)	Caliper brake fluid is sent to reservoir via the outlet solenoid valve. Then it is pushed up to the master cylinder by pump.
	Pressure increase	OFF (Open)	OFF (Closed)	Master cylinder brake fluid pressure is transmitted to caliper.

G SENSOR

NBBR0091S05

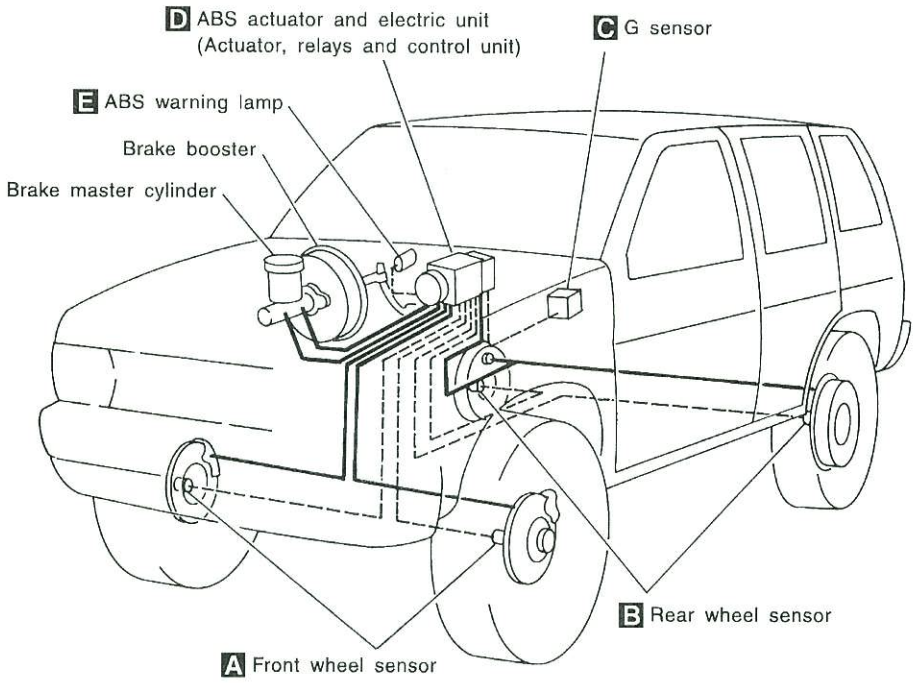
The G sensor senses deceleration during braking to determine whether the vehicle is being driven on a high μ road (asphalt road, etc.) or a low μ road (snow-covered road, etc.). It then sends a signal to the ABS control unit.

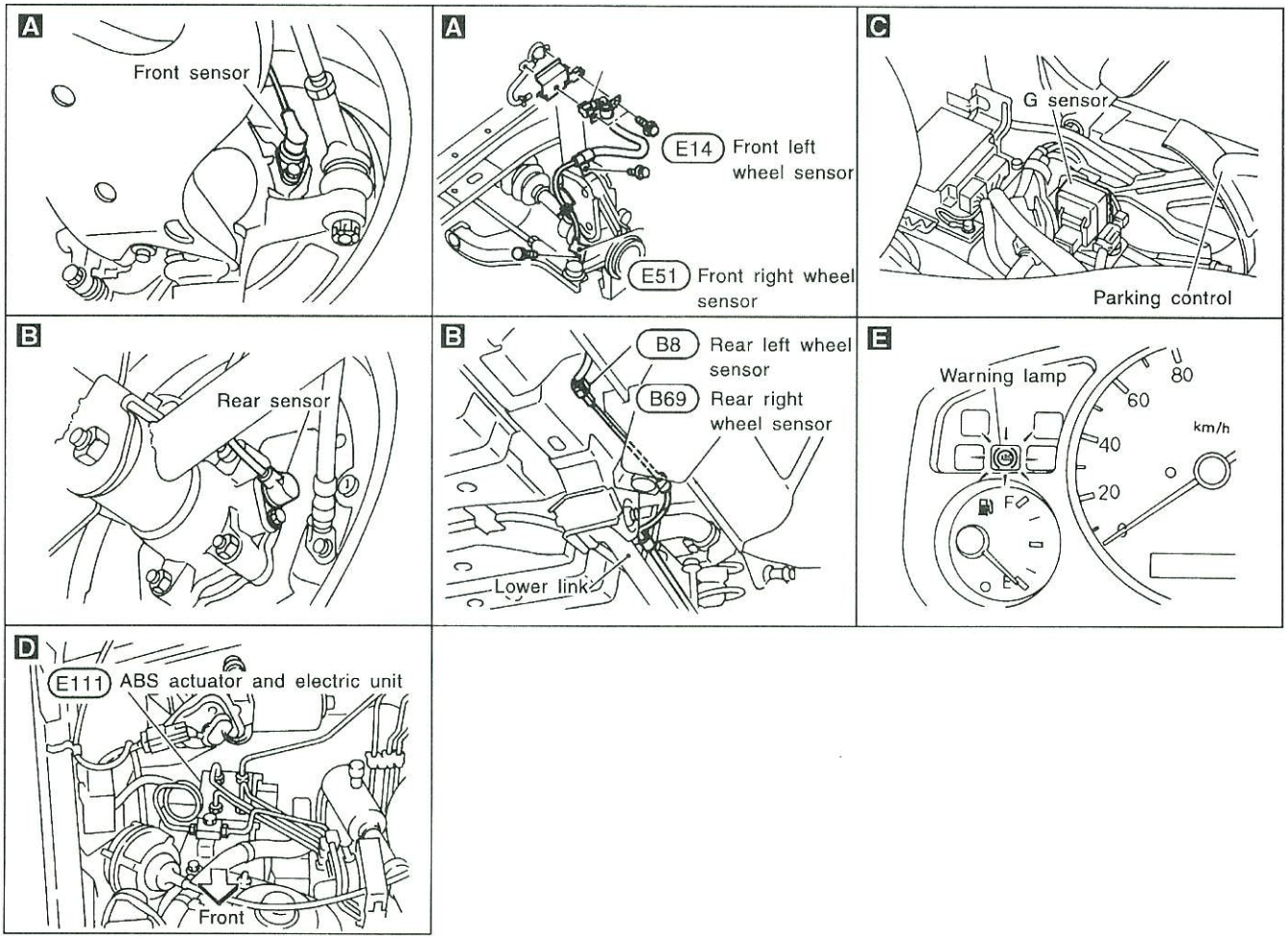


The reed switch turns on when it is affected by a magnetic field. During sudden deceleration (braking on a high μ road), the weight moves and the magnet in the weight moves away from the reed switch. The magnetic field then diminishes and the reed switch turns off.

Component Parts and Harness Connector Location

NBBR0092

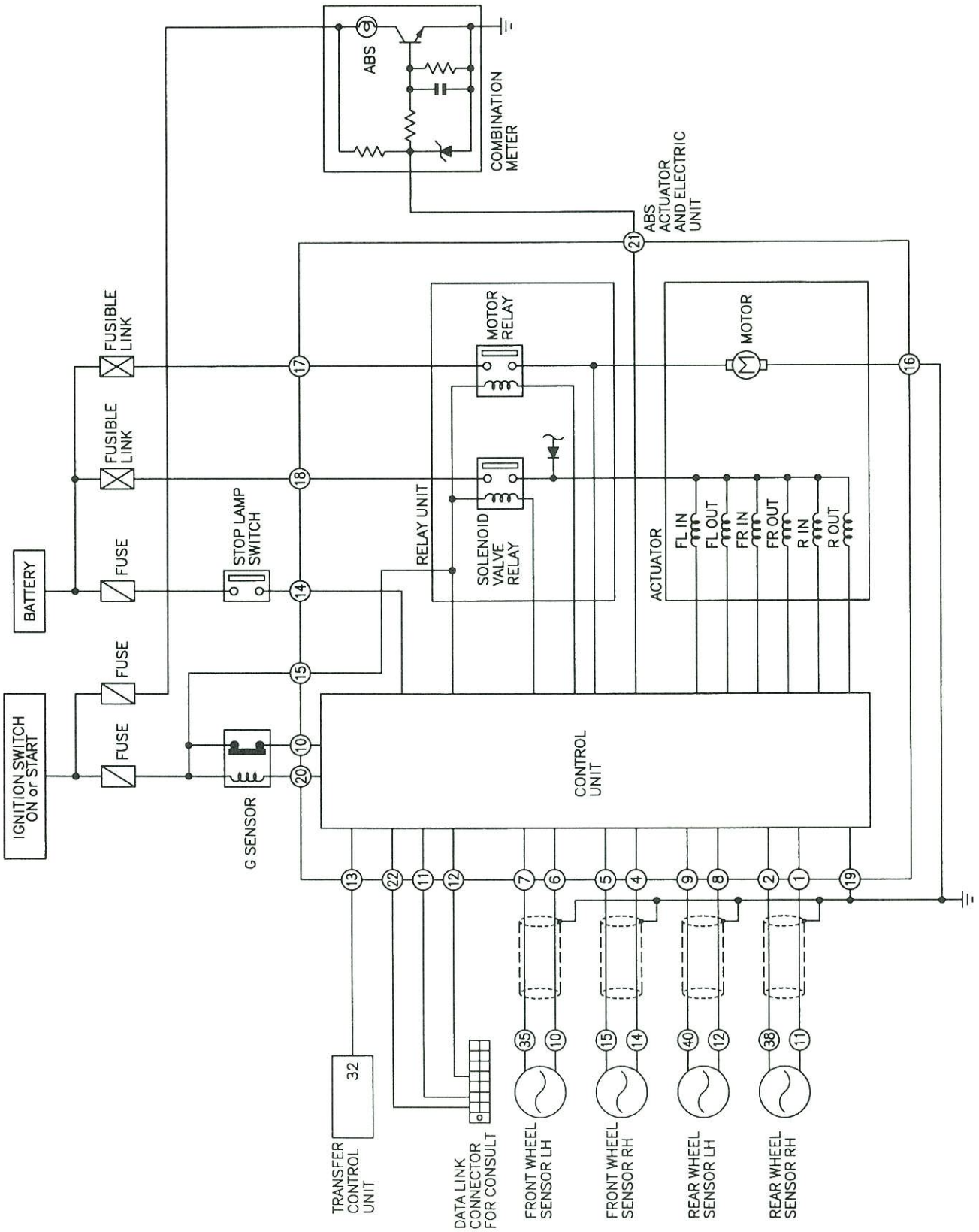




SBR483E

Schematic

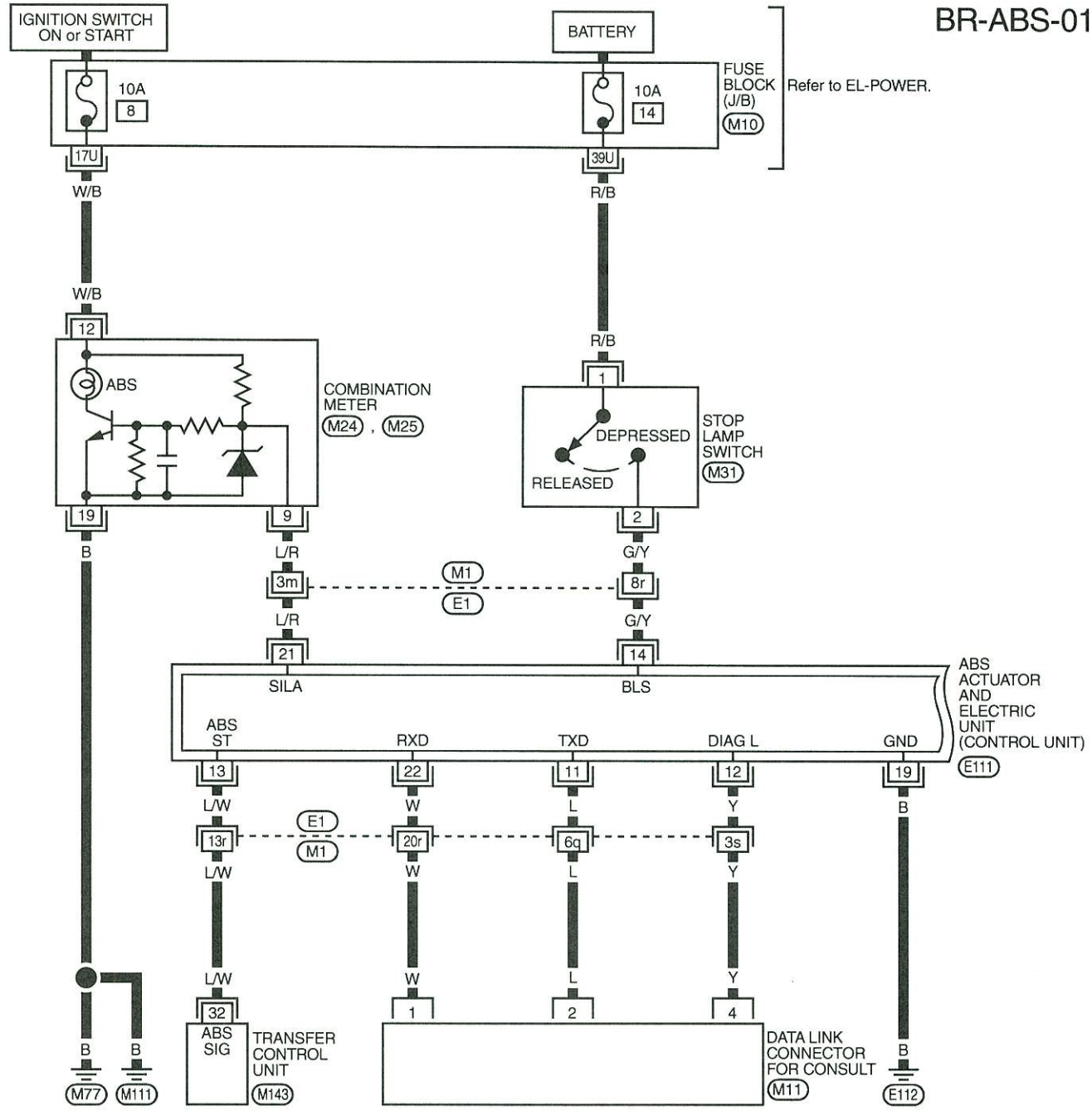
NBBR0093

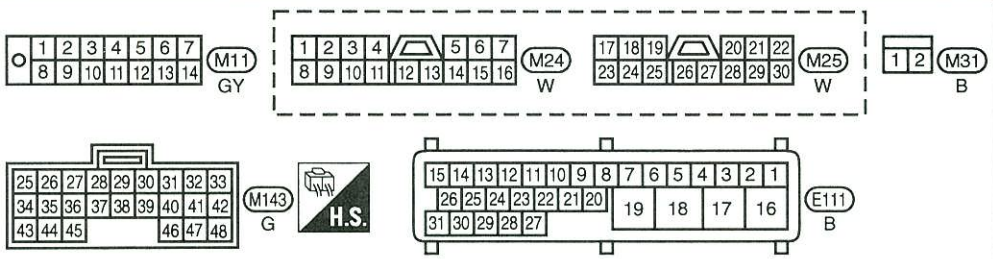


MBR350A

Wiring Diagram — ABS —

NBBR0094

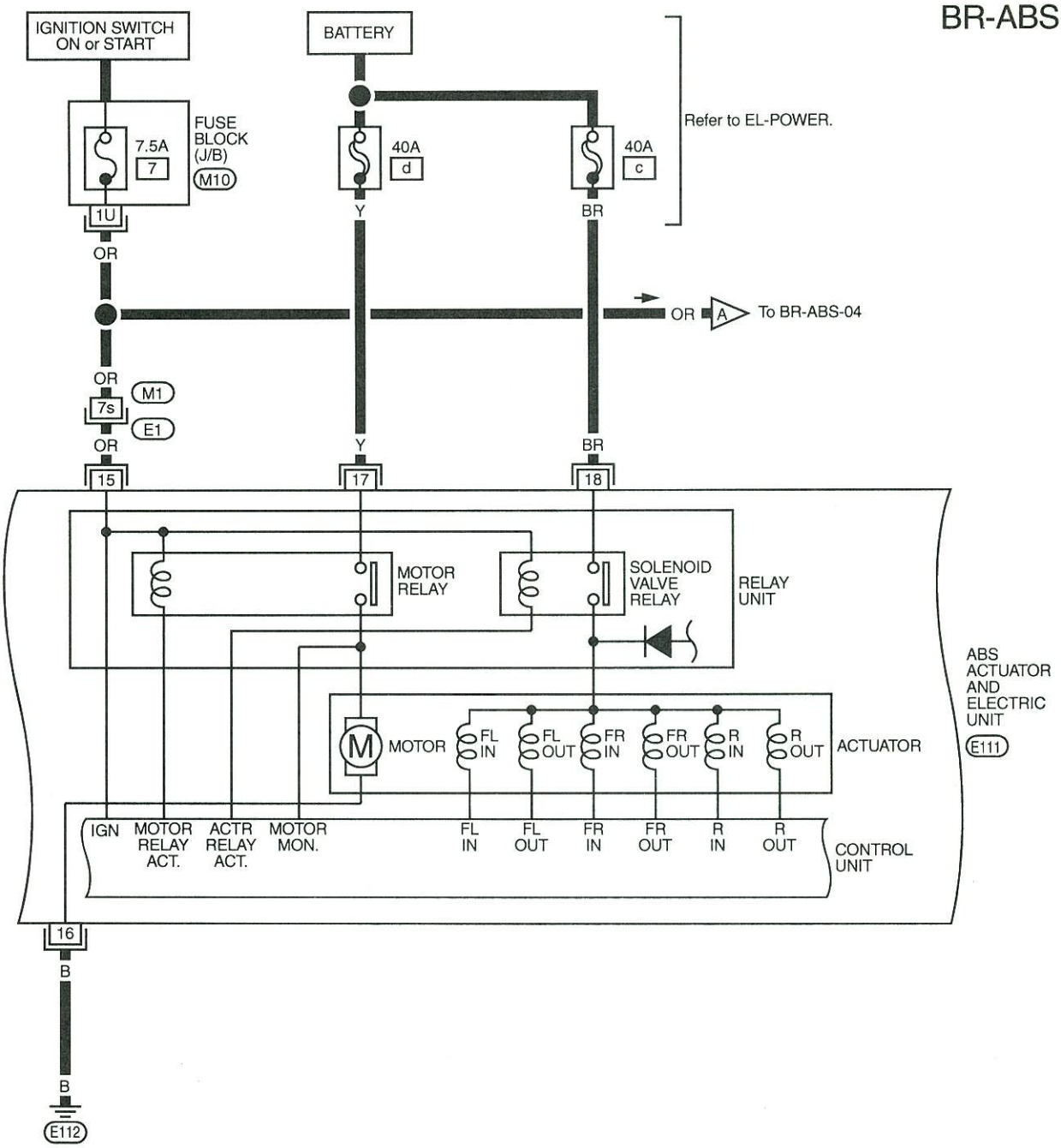


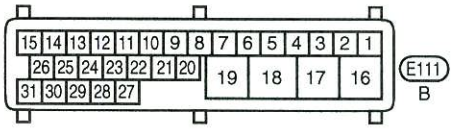


Refer to last page (Foldout page).
M1 , E1
M10

MBR351A

BR-ABS-02





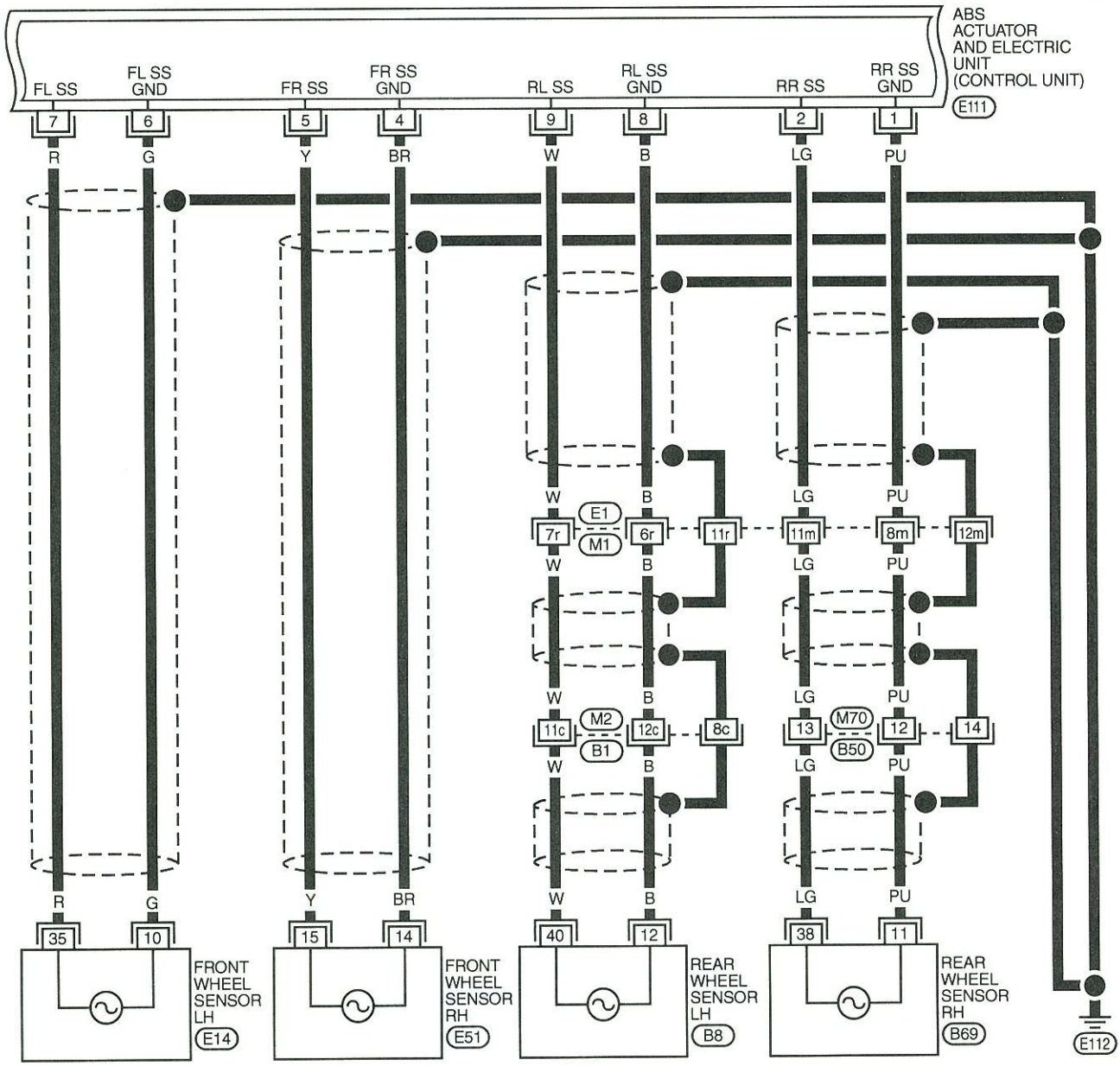
Refer to last page (Foldout page).

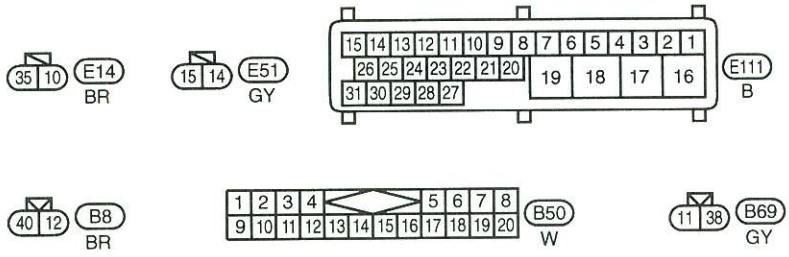
M1 , E1

M10

MBR352A

BR-ABS-03





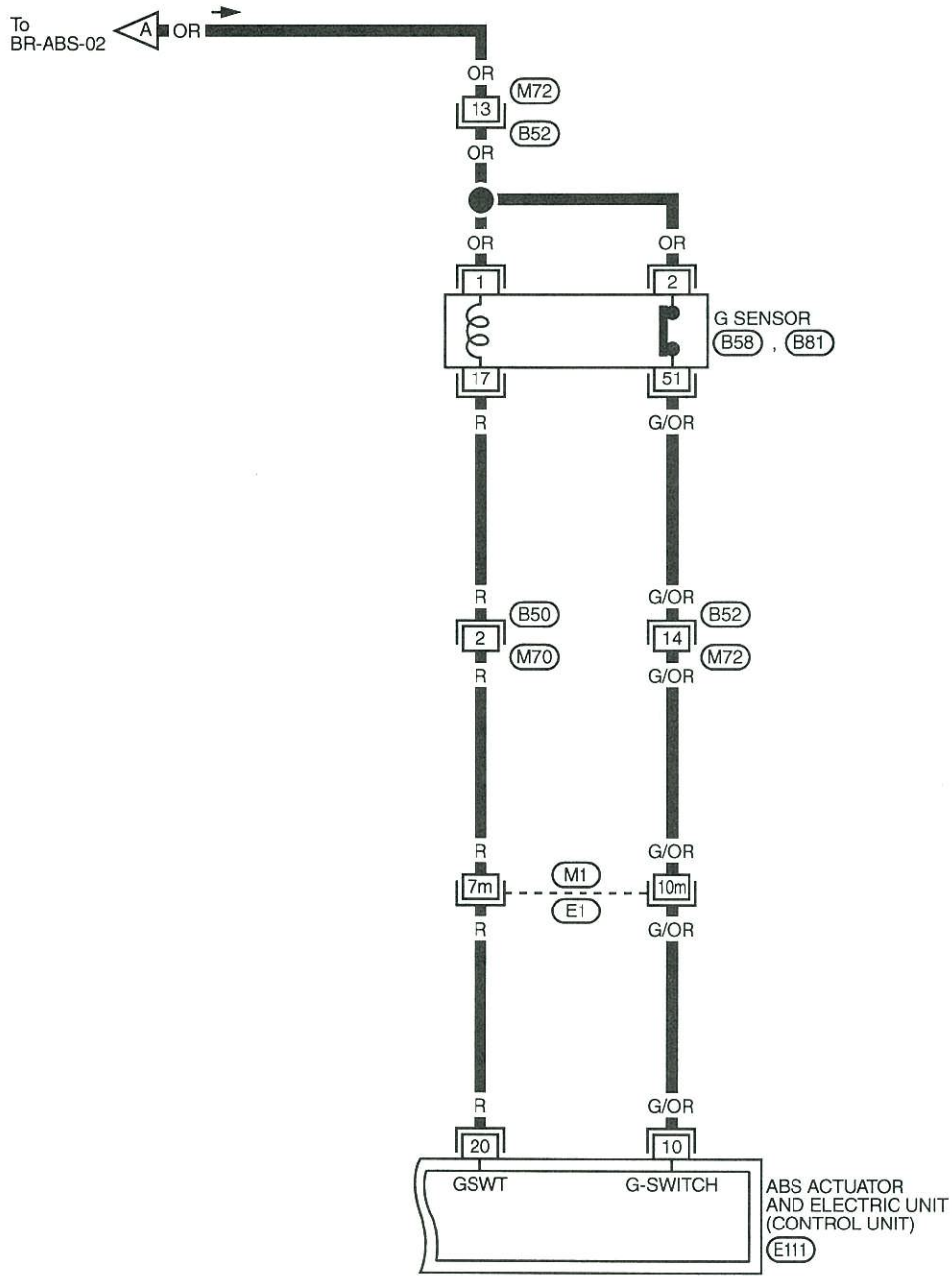
Refer to last page (Foldout page).

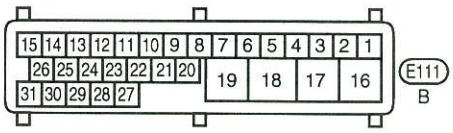
(M1), (E1)

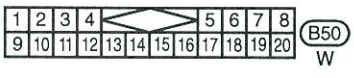
(M2), (B1)

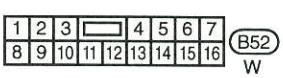
MBR353A

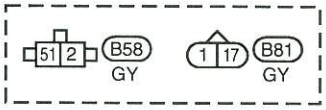
BR-ABS-04











Refer to last page (Foldout page).
M1 , E1

MBR354A

Self-diagnosis

NBBR0095

FUNCTION

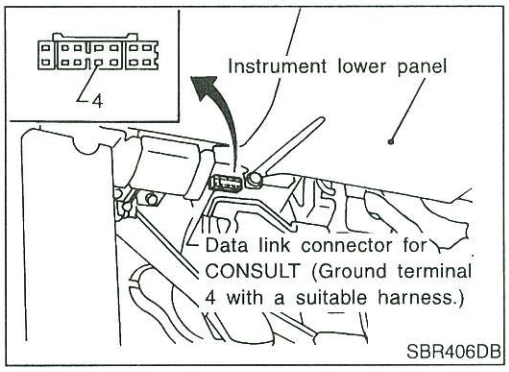
NBBR0095S01

- When a problem occurs in the ABS, the warning lamp on the instrument panel comes on. To start the self-diagnostic results mode, ground the self-diagnostic (check) terminal located on "Data Link Connector for CONSULT". The location of the malfunction is indicated by the warning lamp flashing.

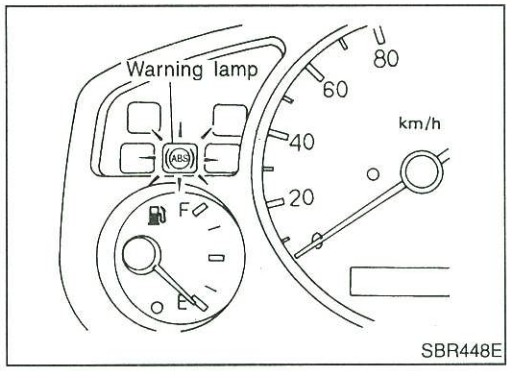
SELF-DIAGNOSIS PROCEDURE

NBBR0095S02

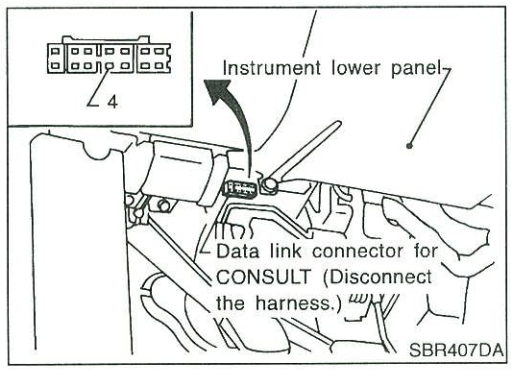
1. Drive vehicle over 30 km/h (19 MPH) for at least one minute.
2. Turn ignition switch OFF.



3. Ground terminal 4 of "Data link connector for CONSULT" with a suitable harness.
4. Turn ignition switch ON while grounding terminal 4.
   Do not depress brake pedal.



5. After 3.0 seconds, the warning lamp starts flashing to indicate the malfunction code No. (See NOTE.)
6. Verify the location of the malfunction with the malfunction code chart. Refer to BR-51. Then make the necessary repairs following the diagnostic procedures.
7. After the malfunctions are repaired, erase the malfunction codes stored in the control unit. Refer to BR-40.
8. Rerun the self-diagnostic results mode to verify that the malfunction codes have been erased.



9. Disconnect the check terminal from the ground. The self-diagnostic results mode is now complete.
10. Check warning lamp for deactivation after driving vehicle over 30 km/h (19 MPH) for at least one minute.
11. After making certain that warning lamp does not come on, test the ABS in a safe area to verify that it functions properly.

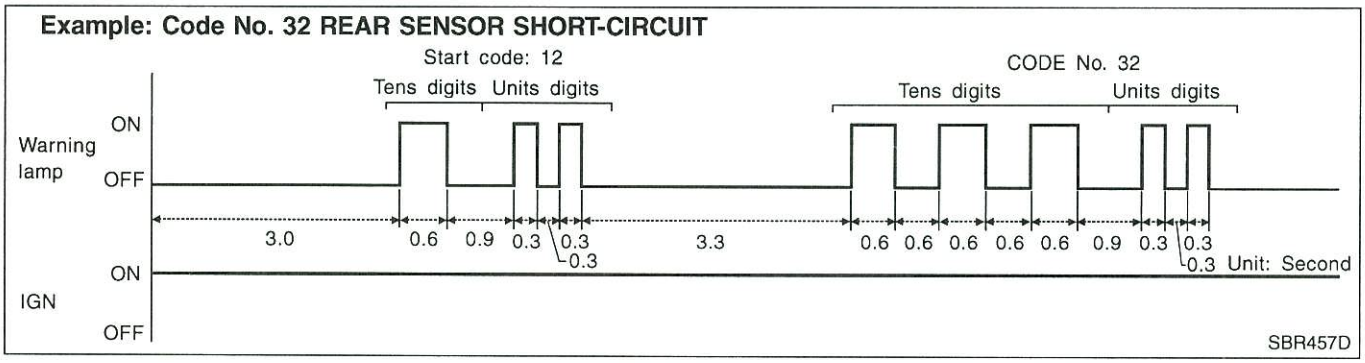
NOTE:
The indication terminates after 5 minutes.
However, when the ignition switch is turned from OFF to ON, the indication starts flashing again.

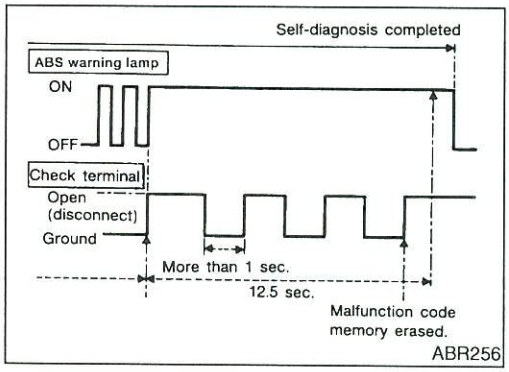
HOW TO READ SELF-DIAGNOSTIC RESULTS (MALFUNCTION CODES)

=NBBR0095S03

1. Determine the code No. by counting the number of times the warning lamp flashes on and off.
2. When several malfunctions occur at one time, up to three code numbers can be stored; the latest malfunction will be indicated first.
3. The indication begins with the start code 12. After that a maximum of three code numbers appear in the order of the latest one first. The indication then returns to the start code 12 to repeat (the indication will stay on for five minutes at the most).
4. The malfunction code chart is given on page BR-51.

Example: Code No. 32 REAR SENSOR SHORT-CIRCUIT





HOW TO ERASE SELF-DIAGNOSTIC RESULTS (MALFUNCTION CODES)

NBBR0095S04

1. Disconnect the check terminal from ground (ABS warning lamp will stay lit).
2. Within 12.5 seconds, ground the check terminal three times. Each terminal ground must last more than 1 second. The ABS warning lamp goes out after the erase operation has been completed.
3. Perform self-diagnosis again. Refer to BR-39. Only the start-code should appear, no malfunction codes.

CONSULT

CONSULT APPLICATION TO ABS

=NBBR0096

NBBR0096S01

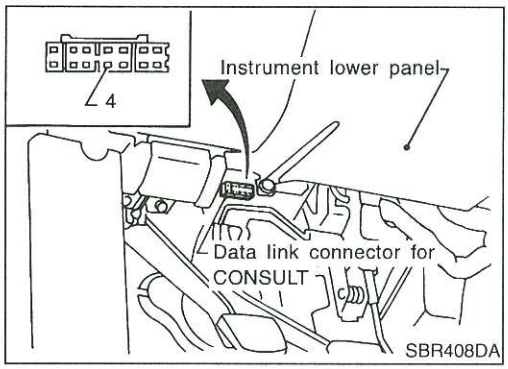
ITEM	SELF-DIAGNOSTIC RESULTS	DATA MONITOR	ACTIVE TEST
Front right wheel sensor	×	×	—
Front left wheel sensor	×	×	—
Rear right wheel sensor	×	×	—
Rear left wheel sensor	×	×	—
G switch (G sensor)	×	×	×
ABS sensor	×	—	—
Stop lamp switch	—	×	—
Front right inlet solenoid valve	×	×	×
Front right outlet solenoid valve	×	×	×
Front left inlet solenoid valve	×	×	×
Front left outlet solenoid valve	×	×	×
Rear inlet solenoid valve	×	×	×
Rear outlet solenoid valve	×	×	×
Actuator solenoid valve relay	×	×	—
Actuator motor relay (ABS MOTOR is shown on the Data Monitor screen.)	×	×	×
ABS warning lamp	—	×	—
Battery voltage	×	×	—
Control unit	×	—	—
ABS operating signal	—	×	×

×: Applicable
—: Not applicable

ECU (ABS CONTROL UNIT) PART NUMBER MODE

NBBR0096S02

Ignore the ECU part number displayed in the ECU PART NUMBER MODE. Refer to parts catalog to order the ECU.



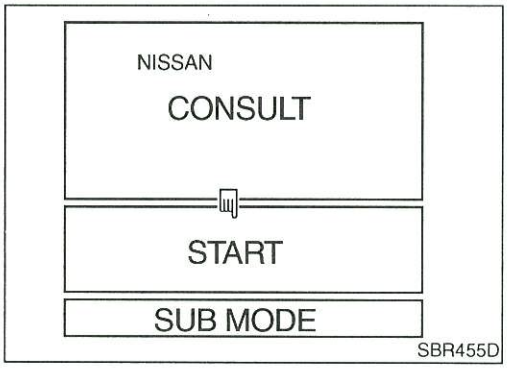
CONSULT Inspection Procedure

=NBBR0097

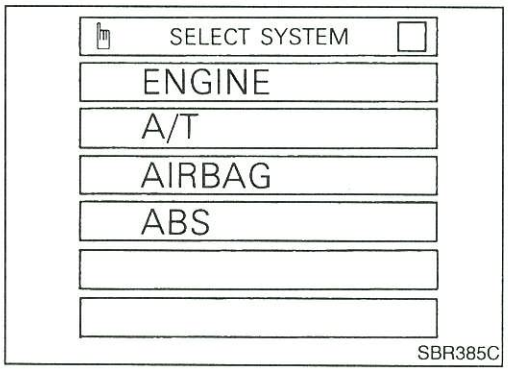
SELF-DIAGNOSIS PROCEDURE

NBBR0097S01

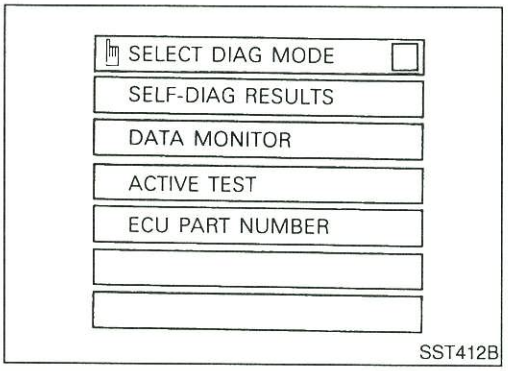
1. Turn ignition switch OFF.
2. Connect CONSULT to Data Link Connector for CONSULT.
3. Start engine.
4. Drive vehicle over 30 km/h (19 MPH) for at least one minute.



5. Stop vehicle with engine running and touch "START" on CONSULT screen.

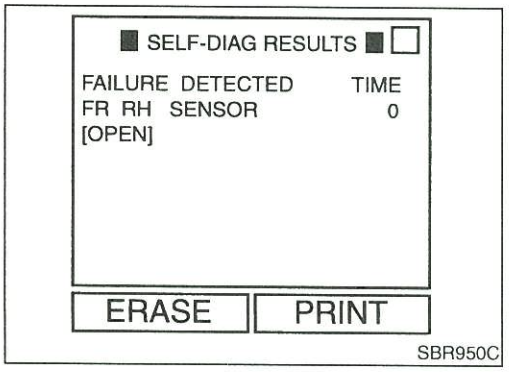


6. Touch "ABS".



7. Touch "SELF-DIAG RESULTS".
- The screen shows the detected malfunction and how many times the ignition switch has been turned ON since the malfunction.

8. Make the necessary repairs following the diagnostic procedures.



9. After the malfunctions are repaired, erase the self-diagnostic results stored in the control unit by touching "ERASE".
10. Check warning lamp for deactivation after driving vehicle over 30 km/h (19 MPH) for at least one minute.
11. Test the ABS in a safe area to verify that it functions properly.

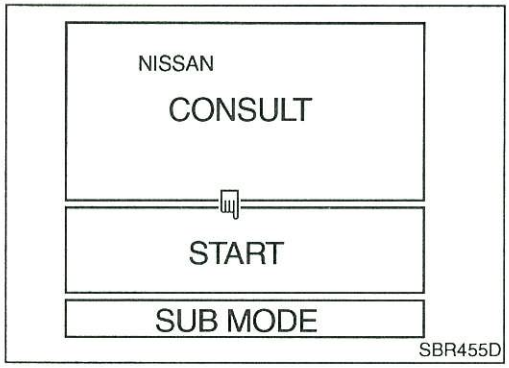
NOTE:
"SELF-DIAG RESULTS" screen shows the detected malfunction and how many times the ignition switch has been turned since the malfunction.

SELF-DIAGNOSTIC RESULTS MODE

NBBR0097S02

Diagnostic item	Diagnostic item is detected when ...	Reference Page
FR RH SENSOR★ [OPEN]	• Circuit for front right wheel sensor is open. (An abnormally high input voltage is entered.)	BR-53
FR LH SENSOR★ [OPEN]	• Circuit for front left wheel sensor is open. (An abnormally high input voltage is entered.)	BR-53
RR RH SENSOR★ [OPEN]	• Circuit for rear right sensor is open. (An abnormally high input voltage is entered.)	BR-53
RR LH SENSOR★ [OPEN]	• Circuit for rear left sensor is open. (An abnormally high input voltage is entered.)	BR-53
FR RH SENSOR★ [SHORT]	• Circuit for front right wheel sensor is shorted. (An abnormally low input voltage is entered.)	BR-53
FR LH SENSOR★ [SHORT]	• Circuit for front left wheel sensor is shorted. (An abnormally low input voltage is entered.)	BR-53
RR RH SENSOR★ [SHORT]	• Circuit for rear right sensor is shorted. (An abnormally low input voltage is entered.)	BR-53
RR LH SENSOR★ [SHORT]	• Circuit for rear left sensor is shorted. (An abnormally low input voltage is entered.)	BR-53
ABS SENSOR★ [ABNORMAL SIGNAL]	• Teeth damage on sensor rotor or improper installation of wheel sensor. (Abnormal wheel sensor signal is entered.)	BR-53
FR RH IN ABS SOL [OPEN, SHORT]	• Circuit for front right inlet solenoid valve is open. (An abnormally low output voltage is entered.)	BR-55
FR LH IN ABS SOL [OPEN, SHORT]	• Circuit for front left inlet solenoid valve is open. (An abnormally low output voltage is entered.)	BR-55
FR RH OUT ABS SOL [OPEN, SHORT]	• Circuit for front right outlet solenoid valve is open. (An abnormally low output voltage is entered.)	BR-55
FR LH OUT ABS SOL [OPEN, SHORT]	• Circuit for front left outlet solenoid valve is open. (An abnormally low output voltage is entered.)	BR-55
RR IN ABS SOL [OPEN, SHORT]	• Circuit for rear inlet solenoid valve is shorted. (An abnormally high output voltage is entered.)	BR-55
RR OUT ABS SOL [OPEN, SHORT]	• Circuit for rear out solenoid valve is shorted. (An abnormally high output voltage is entered.)	BR-55
ABS ACTUATOR RELAY [ABNORMAL]	• Actuator solenoid valve relay is ON, even if control unit sends off signal. • Actuator solenoid valve relay is OFF, even if control unit sends on signal.	BR-55
ABS MOTOR RELAY [ABNORMAL]	• Circuit for ABS motor relay is open or shorted. • Circuit for actuator motor is open or shorted. • Actuator motor relay is stuck.	BR-57
BATTERY VOLT [VB-LOW]	• Power source voltage supplied to ABS control unit is abnormally low.	BR-58
CONTROL UNIT	• Function of calculation in ABS control unit has failed.	BR-62
G SENSOR [ABNORMAL]	• G sensor circuit is open or shorted.	BR-59

★: If one or more wheels spin on a rough or slippery road for 40 seconds or more, the ABS warning lamp will illuminate. This does not indicate a malfunction. Only in the case of the short-circuit (Code Nos. 26, 22, 32 and 36), after repair the ABS warning lamp also illuminates when the ignition switch is turned ON. In this case, drive the vehicle at speeds greater than 30 km/h (19 MPH) for approximately 1 minute as specified in "SELF-DIAGNOSIS PROCEDURE", BR-39. Check to ensure that the ABS warning lamp goes out while the vehicle is being driven.

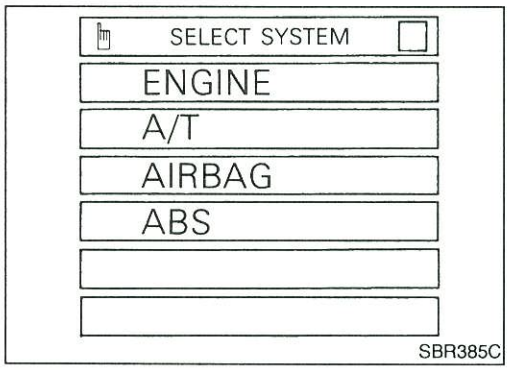


SBR455D

DATA MONITOR PROCEDURE

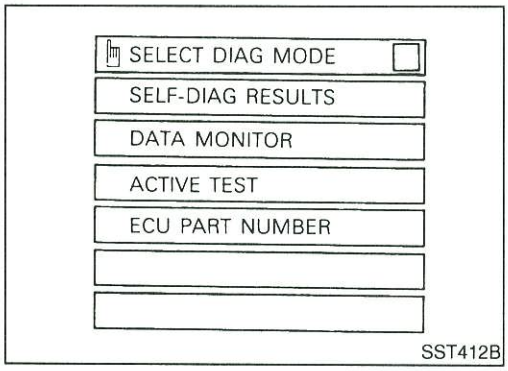
NBBR0097S03

1. Turn ignition switch OFF.
2. Connect CONSULT to Data Link Connector for CONSULT.
3. Turn ignition switch ON.
4. Touch "START" on CONSULT screen.



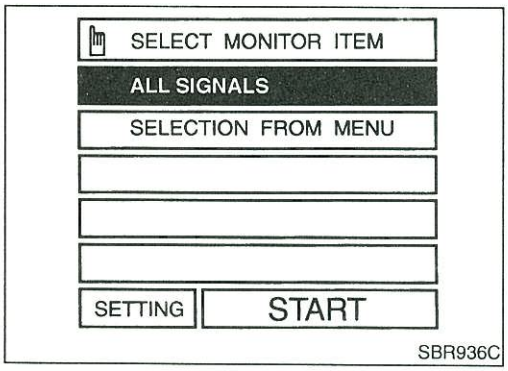
SBR385C

5. Touch "ABS".



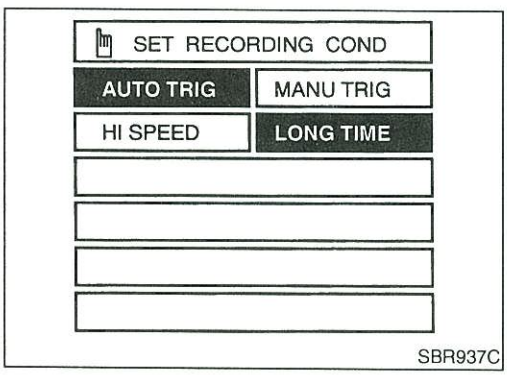
SST412B

6. Touch "DATA MONITOR".



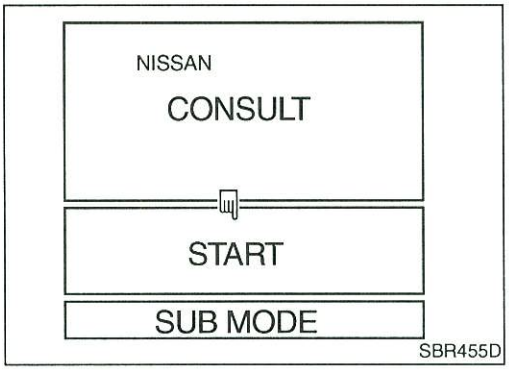
SBR936C

7. Touch "SETTING" on "SELECT MONITOR ITEM" screen.



SBR937C

8. Touch "LONG TIME" on "SET RECORDING COND" screen.
9. Touch "START" on "SELECT MONITOR ITEM".



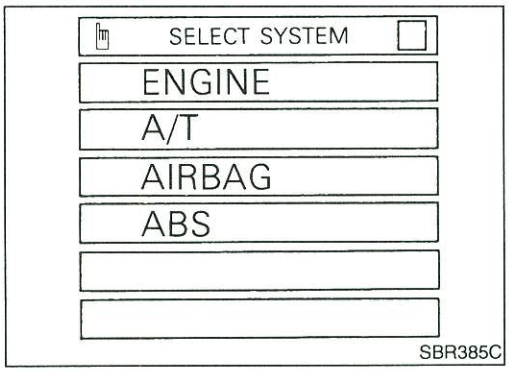
SBR455D

ACTIVE TEST PROCEDURE

NBBR0097S04

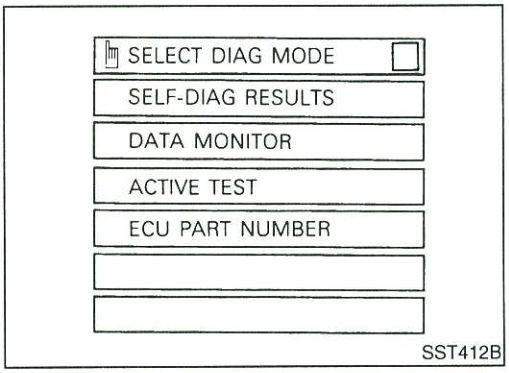
- When conducting Active test, vehicle must be stationary.
- When ABS warning lamp stays on, never conduct Active test.

1. Turn ignition switch OFF.
2. Connect CONSULT to Data Link Connector for CONSULT.
3. Start engine.
4. Touch "START" on CONSULT screen.



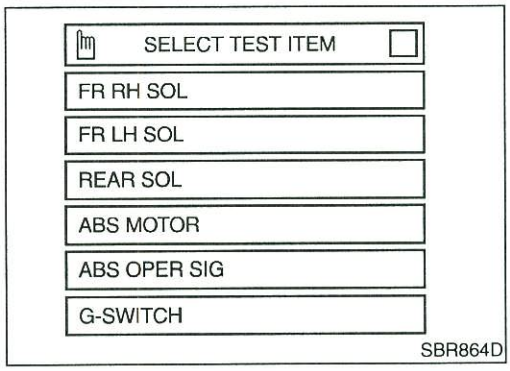
SBR385C

5. Touch "ABS".



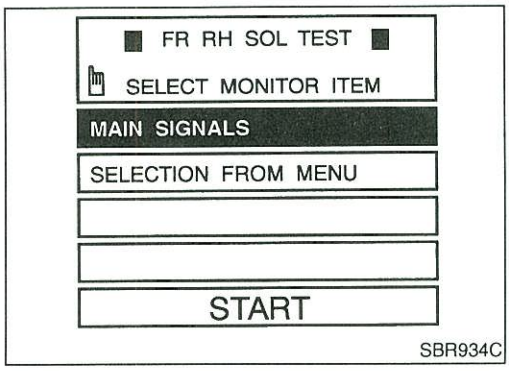
SST412B

6. Touch "ACTIVE TEST".



SBR864D

7. Select active test item by touching screen.



SBR934C

8. Touch "START".
9. Carry out the active test by touching screen key.

DATA MONITOR MODE

NBBR0097S05

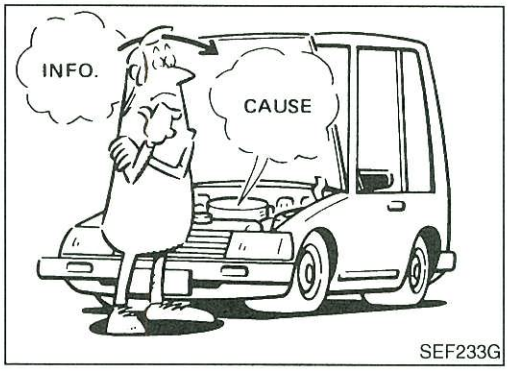
MONITOR ITEM	CONDITION	SPECIFICATION
FR RH SENSOR FR LH SENSOR RR RH SENSOR RR LH SENSOR	Drive vehicle. (Each wheel is rotating.)	Wheel speed signal (Almost the same speed as speedometer.)
STOP LAMP SW	Brake is depressed.	Depress the pedal: ON Release the pedal: OFF
G-SWITCH	Vehicle is driven. Vehicle is stopped. Brake is applied.	During sudden braking while driving on high μ roads (asphalt roads, etc.): OFF While vehicle is stopped or during constant-speed driving: ON
FR RH IN SOL FR RH OUT SOL FR LH IN SOL FR LH OUT SOL RR IN SOL RR OUT SOL	1. Drive vehicle at speeds over 30 km/h (19 MPH) for at least 1 minute. 2. Engine is running.	Operating conditions for each solenoid valve are indicated. ABS is not operating: OFF
MOTOR RELAY		ABS is not operating: OFF ABS is operating: ON
ACTUATOR RELAY	Ignition switch is ON or engine is running.	Ignition switch ON (Engine stops): OFF Engine running: ON
WARNING LAMP		ABS warning lamp is turned on: ON ABS warning lamp is turned off: OFF
BATTERY VOLT		Power supply voltage for control unit
ABS OPER SIG		ABS is not operating: OFF ABS is operating: ON

ACTIVE TEST MODE

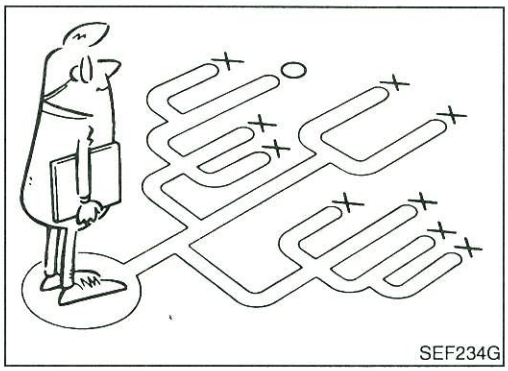
NBBR0097S06

TEST ITEM	CONDITION	JUDGEMENT		
FR RH SOLENOID FR LH SOLENOID RR SOLENOID	Engine is running.	Brake fluid pressure control operation		
			IN SOL	OUT SOL
		UP (Increase):	OFF	OFF
		KEEP (Hold):	ON	OFF
		DOWN (Decrease):	ON	ON
ABS MOTOR		ABS actuator motor ON: Motor runs (ABS motor relay ON) OFF: Motor stops (ABS motor relay OFF)		
ABS OPER SIG	Ignition switch is ON or engine is running.	ON: Set ABS OPER SIG "ON" (ABS is operating.) OFF: Set ABS OPER SIG "OFF" (ABS is not operating.)		
G SWITCH	Ignition switch is ON.	G SWITCH (G SENSOR) ON: Set G SWITCH MONITOR "ON" (G switch circuit is closed.) OFF: Set G SWITCH MONITOR "OFF" (G switch circuit is open.)		

NOTE:
Active test will automatically stop ten seconds after the test starts. (TEST IS STOPPED monitor shows ON.)



SEF233G


SEF234G

How to Perform Trouble Diagnoses for Quick and Accurate Repair

NBBR0098

INTRODUCTION

NBBR0098S01

The ABS system has an electronic control unit to control major functions. The control unit accepts input signals from sensors and instantly drives the actuators. It is essential that both kinds of signals are proper and stable. It is also important to check for conventional problems: such as air leaks in booster lines, lack of brake fluid, or other problems with the brake system.

It is much more difficult to diagnose a problem that occurs intermittently rather than continuously. Most intermittent problems are caused by poor electric connections or faulty wiring. In this case, careful checking of suspicious circuits may help prevent the replacement of good parts.

A visual check only may not find the cause of the problems, so a road test should be performed.

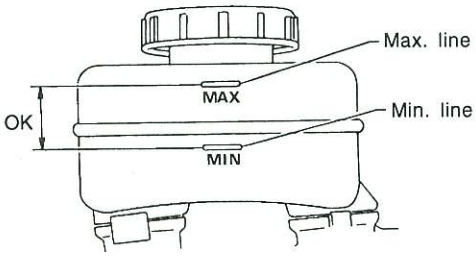
Before undertaking actual checks, take a few minutes to talk with a customer who approaches with an ABS complaint. The customer is a very good source of information on such problems; especially intermittent ones. By talking to the customer, find out what symptoms are present and under what conditions they occur. Start your diagnosis by looking for "conventional" problems first. This is one of the best ways to troubleshoot brake problems on an ABS controlled vehicle.

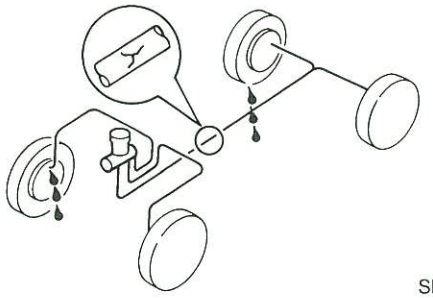
Also check related Service bulletins for information.

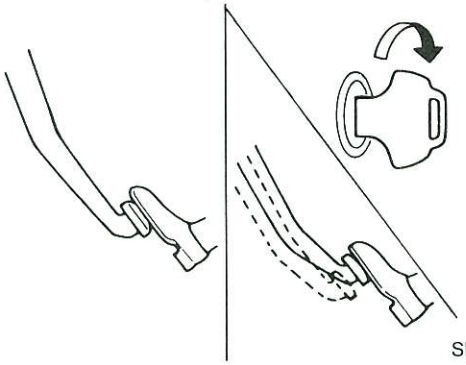
Preliminary Check

NBBR0099

1	CHECK BRAKE FLUID
Check brake fluid for contamination. **Has brake fluid been contaminated?**	
Yes ▶	Replace. GO TO 2.
No ▶	GO TO 2.

2	CHECK BRAKE FLUID LEVEL
Check brake fluid level in reservoir tank. Low fluid level may indicate brake pad wear or leakage from brake line.	
 SBR451D	
Is brake fluid filled between MAX and MIN lines on reservoir tank ?	
Yes ▶	GO TO 3.
No ▶	Fill up brake fluid. GO TO 3.

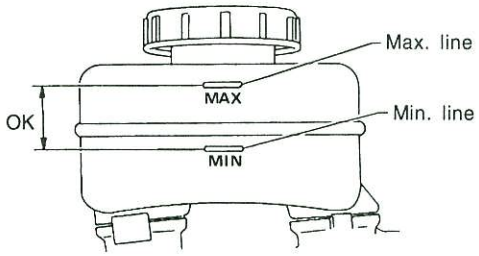
3	CHECK BRAKE LINE
Check brake line for leakage.	
 SBR389C	
Is leakage present at or around brake lines, tubes or hoses or are any of these parts cracked or damaged?	
Yes ▶	Repair. GO TO 4.
No ▶	GO TO 4.

4	CHECK BRAKE BOOSTER OPERATION
Check brake booster for operation and air tightness. Refer to "On-vehicle Service", "BRAKE BOOSTER", BR-17.	
 SBR058C	
Is brake booster airtight and functioning properly?	
Yes ▶	GO TO 5.
No ▶	Replace. GO TO 5.

5	CHECK BRAKE PAD AND ROTOR
Check brake pad and rotor. Refer to (BR-20, BR-22).	
 SBR059C	
Are brake pads and rotors functioning properly?	
Yes ▶	GO TO 6.
No ▶	Replace.

6	RECHECK BRAKE FLUID LEVEL

Check brake fluid level in reservoir tank again.



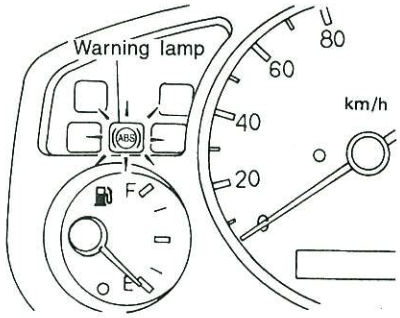
SBR451D

Is brake fluid filled between MAX and MIN lines on reservoir tank ?

Yes	▶	GO TO 7.
No	▶	Fill up brake fluid.

7	CHECK WARNING LAMP ACTIVATION

Check warning lamp activation.



SBR448E

Does warning lamp turn on when ignition switch is turned ON?

Yes	▶	GO TO 8.
No	▶	Check fuse, warning lamp bulb and warning lamp circuit.

8	CHECK WARNING LAMP DEACTIVATION

Check warning lamp for deactivation after engine is started.

Does warning lamp turn off when engine is started?

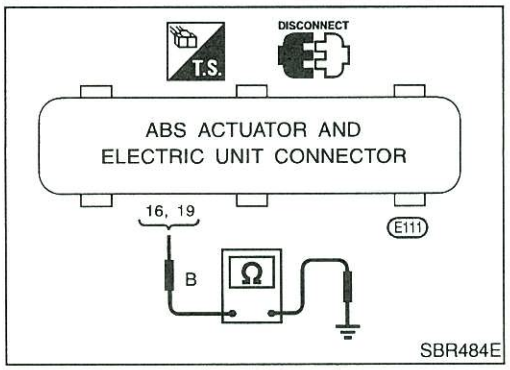
Yes	▶	GO TO 9.
No	▶	Go to Self-diagnosis (BR-39, 42).

9	DRIVE VEHICLE

Drive vehicle at speeds over 30 km/h (19 MPH) for at least one minute.

Does warning lamp remain off after vehicle has been driven at 30 km/h (19 MPH) for at least one minute?

Yes	▶	**INSPECTION END**
No	▶	Go to Self-diagnosis (BR-39, 42).



Ground Circuit Check

=NBBR0100

ABS ACTUATOR AND ELECTRIC UNIT GROUND

NBBR0100S01

- Check continuity between ABS actuator and electric unit connector terminals and ground.

  Continuity should exist.

Malfunction Code/Symptom Chart

NBBR0101

Code No. (No. of warning lamp flashes)	Malfunctioning part	Reference Page
12	Self-diagnosis could not detect any malfunctions.	—
17	G sensor and circuit	BR-59
18 ★1	Sensor rotor	BR-53
21 ★1	Front right sensor (open-circuit)	BR-53
22 ★1	Front right sensor (short-circuit)	BR-53
25 ★1	Front left sensor (open-circuit)	BR-53
26 ★1	Front left sensor (short-circuit)	BR-53
31 ★1	Rear right sensor (open-circuit)	BR-53
32 ★1	Rear right sensor (short-circuit)	BR-53
35 ★1	Rear left sensor (open-circuit)	BR-53
36 ★1	Rear left sensor (short-circuit)	BR-53
41	Actuator front right outlet solenoid valve	BR-55
42	Actuator front right inlet solenoid valve	BR-55
45	Actuator front left outlet solenoid valve	BR-55
46	Actuator front left inlet solenoid valve	BR-55
55	Actuator rear outlet solenoid valve	BR-55
56	Actuator rear inlet solenoid valve	BR-55
57 ★2	Power supply (Low voltage)	BR-58
61 ★3	Actuator motor or motor relay	BR-57
63	Solenoid valve relay	BR-55
71	Control unit	BR-62
Warning lamp stays on when ignition switch is turned ON.	Control unit power supply circuit Warning lamp bulb circuit Control unit or control unit connector Solenoid valve relay stuck Power supply for solenoid valve relay coil	BR-67
ABS works frequently	—	BR-63
Unexpected pedal action	—	BR-63
Long stopping distance	—	BR-64
ABS does not work	—	BR-65
Pedal vibration and noise	—	BR-65
Warning lamp does not come on when ignition switch is turned ON.	Fuse, warning lamp bulb or warning lamp circuit Control unit	BR-66
Vehicle vibrates excessively when ABS is operating.	ABS control unit to TCM circuit	BR-69

★1: If one or more wheels spin on a rough or slippery road for 40 seconds or more, the ABS warning lamp will illuminate. This does not indicate a malfunction. Only in the case of the short-circuit (Code Nos. 26, 22, 32 and 36), after repair the ABS warning lamp also illuminates when the ignition switch is turned ON. In this case, drive the vehicle at speeds greater than 30 km/h (19 MPH) for approximately 1 minute as specified in "SELF-DIAGNOSIS PROCEDURE", BR-39. Check to ensure that the ABS warning lamp goes out while the vehicle is being driven.

★2: The trouble code "57", which refers to a low power supply voltage, does not indicate that the ABS control unit is malfunctioning. Do not replace the ABS control unit with a new one.

Malfunction Code/Symptom Chart (Cont'd)

★3: The trouble code "61" can sometimes appear when the ABS motor is not properly grounded. If it appears, be sure to check the condition of the ABS motor ground circuit connection.

Wheel Sensor or Rotor

DIAGNOSTIC PROCEDURE

NBBR0102

Malfunction code No. 21, 22, 25, 26, 31, 32, 35, 36 or 18

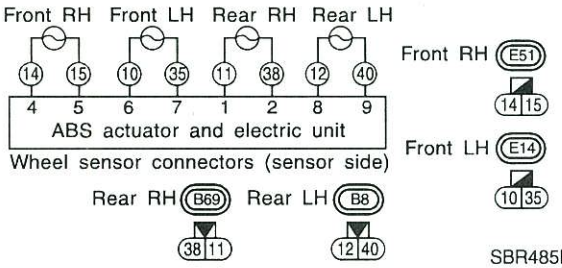
NOTE:

Wheel position should be distinguished by code No. except code No. 18 (sensor rotor).

1	INSPECTION START

Wheel sensor inspection

Wheel sensor inspection



SBR485E

▶ GO TO 2.

2	CHECK CONNECTOR

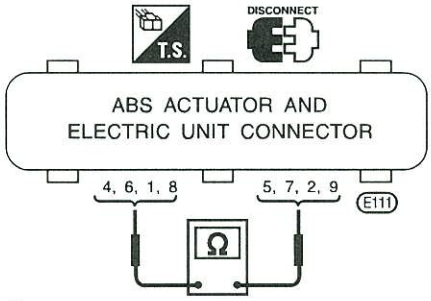
1. Disconnect connectors from ABS actuator and electric unit and wheel sensor of malfunction code No. Check terminals for damage or loose connection. Then reconnect connectors.
2. Carry out self-diagnosis again.

Does warning lamp activate again?

Yes	▶	GO TO 3.
No	▶	**INSPECTION END**

3	CHECK WHEEL SENSOR ELECTRICAL

1. Disconnect ABS actuator and electric unit connector.
2. Check resistance between ABS actuator and electric unit connector E111 (body side) terminals.
   Code No. 21 or 22 (Front RH wheel)
   Terminals 4 and 5
   Code No. 25 or 26 (Front LH wheel)
   Terminals 6 and 7
   Code No. 31 or 32 (Rear RH wheel)
   Terminals 1 and 2
   Code No. 35 or 36 (Rear LH wheel)
   Terminals 8 and 9



SBR486E

Resistance:
Front 0.9 - 1.1 kΩ
Rear 1.44 - 1.76 kΩ

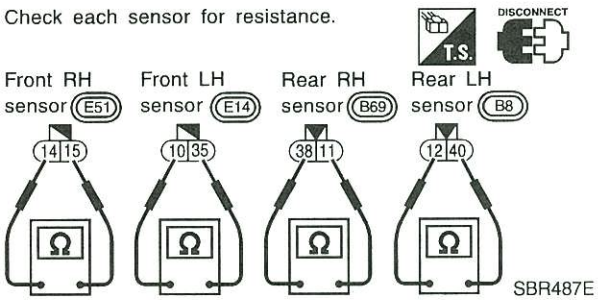
Is front resistance 0.9 - 1.1 kΩ and rear resistance 1.44 - 1.76 kΩ?

Yes	▶	GO TO 5.
No	▶	GO TO 4.

4	CHECK WHEEL SENSOR

Check each sensor for resistance.

Check each sensor for resistance.



Resistance:
Front 0.9 - 1.1 kΩ
Rear 1.44 - 1.76 kΩ

Is front resistance 0.9 - 1.1 kΩ and rear resistance 1.44 - 1.76 kΩ?

Yes	▶	**Check the following.** If NG, repair harness or connectors. • Harness connectors E111, E14, E51, B8, B69 • Harness for open or short between wheel sensor connectors and ABS actuator and electric unit
No	▶	Replace wheel sensor.

5	CHECK TIRE

Check for inflation pressure, wear and size of each tire. (See NOTE)

Are tire pressure and size correct and is tire wear within specifications?

Yes	▶	GO TO 6.
No	▶	Adjust tire pressure or replace tire(s). (See NOTE)

6	CHECK WHEEL BEARING

Check wheel bearing axial end play. (See NOTE)

Is wheel bearing axial end play within specifications? Refer to AX section ("On-vehicle Service", "FRONT AXLE" and "REAR AXLE").

Yes	▶	GO TO 7.
No	▶	Check wheel bearing. Refer to AX section ("On-vehicle Service", "FRONT AXLE" and "REAR AXLE").

7	CHECK SENSOR ROTOR

Check sensor rotor for teeth damage. (See NOTE)

Is sensor rotor free from damage?

Yes	▶	Check ABS actuator and electric unit pin terminals for damage or the connection of ABS actuator and electric unit harness connector. Reconnect ABS actuator and electric unit harness connector. Then retest.
No	▶	Replace sensor rotor. (See NOTE)

ABS Actuator Solenoid Valve or Solenoid Valve Relay

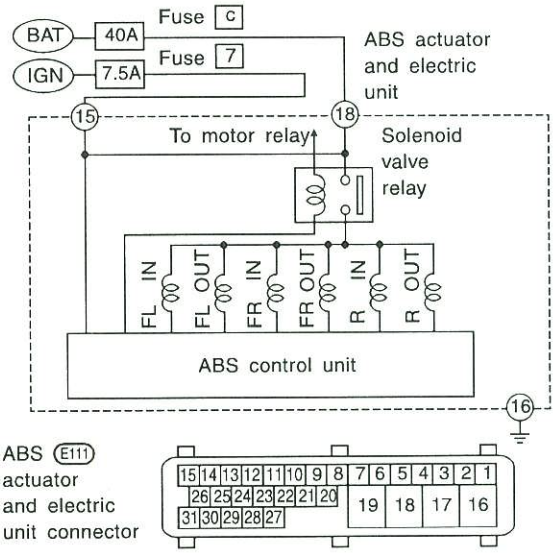
DIAGNOSTIC PROCEDURE

=NBBR0103

Malfunction code No. 41, 45, 55, 42, 46, 56, 63

1 INSPECTION START

Solenoid valve relay inspection



SBR488E

▶ GO TO 2.

2 CHECK FUSIBLE LINK

Check 40A fusible link **c**. For fusible link layout, refer to "POWER SUPPLY ROUTING" in EL section.

Is fusible link OK?

Yes	▶	GO TO 3.
No	▶	GO TO 6.

3 CHECK CONNECTOR

1. Disconnect connector from ABS actuator and electric unit. Check terminals for damage or loose connection. Then reconnect connector.
2. Carry out self-diagnosis again.

Does warning lamp activate again?

Yes	▶	GO TO 4.
No	▶	**INSPECTION END**

4 CHECK ABS ACTUATOR AND ELECTRIC UNIT GROUND CIRCUIT

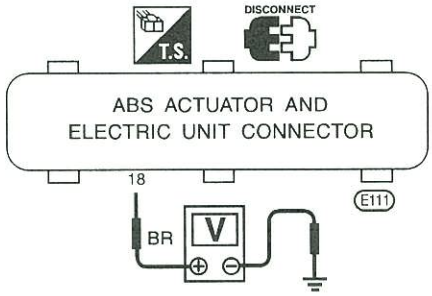
Refer to "ABS ACTUATOR AND ELECTRIC UNIT GROUND" in "Ground Circuit Check", BR-50.

Is ground circuit OK?

Yes	▶	GO TO 5.
No	▶	Repair harness or connector.

5 CHECK SOLENOID VALVE POWER SUPPLY CIRCUIT

1. Disconnect ABS actuator and electric unit connector.
2. Check voltage between ABS actuator and electric unit connector E111 (body side) terminal 18 and ground.



SBR489E

Does battery voltage exist?

Yes	▶	Replace ABS actuator and electric unit.
No	▶	**Check the following.** If NG, repair harness or connectors. • Harness connector E111 • Harness for open or short between ABS actuator and electric unit and fusible link

6 REPLACE FUSIBLE LINK

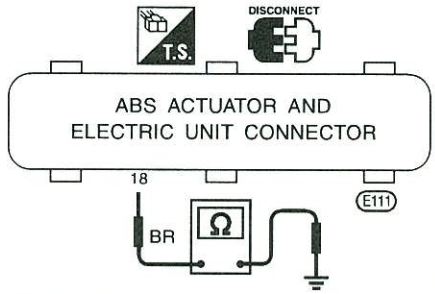
Replace fusible link.

Does the fusible link blow out when ignition switch is turned ON?

Yes	▶	GO TO 7.
No	▶	**INSPECTION END**

7	CHECK SOLENOID VALVE RELAY POWER SUPPLY CIRCUIT FOR SHORT

1. Disconnect battery cable and ABS actuator and electric unit connector.
2. Check continuity between ABS actuator and electric unit connector E111 (body side) terminal 18 and ground.



SBR490E

Continuity should not exist.

Does continuity exist?

Yes ▶	**Check the following.** If NG, repair harness or connector. • Harness connector E111 • Harness for open or short between ABS actuator and electric unit and fusible link
No ▶	Replace ABS actuator and electric unit.

Motor Relay or Motor

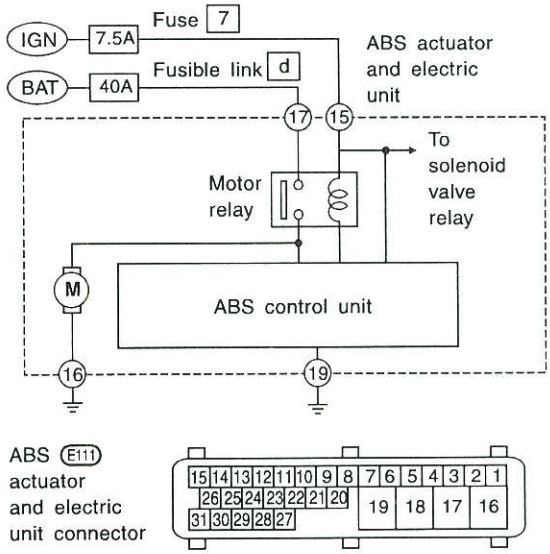
DIAGNOSTIC PROCEDURE

=NBBR0104

Malfunction code No. 61

1 INSPECTION START

ABS motor relay inspection



SBR491E

▶ GO TO 2.

2 CHECK FUSIBLE LINK

Check 40A fusible link **d**. For fusible link layout, refer to "POWER SUPPLY ROUTING" in EL section.

Is fusible link OK?

Yes ▶	GO TO 3.
No ▶	GO TO 6.

3 CHECK CONNECTOR

1. Disconnect ABS actuator and electric unit connector. Check terminals for damage or loose connection. Then reconnect connector.
2. Carry out self-diagnosis again.

Does warning lamp activate again?

Yes ▶	GO TO 4.
No ▶	**INSPECTION END**

4 CHECK ABS ACTUATOR AND ELECTRIC UNIT GROUND CIRCUIT

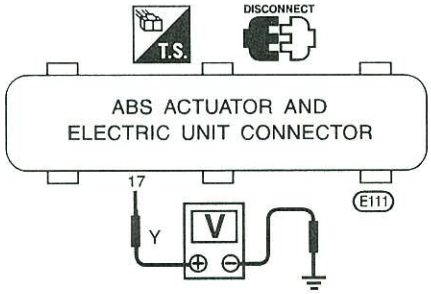
Refer to "ABS ACTUATOR AND ELECTRIC UNIT GROUND" in "Ground Circuit Check", BR-50.

Is ground circuit OK?

Yes ▶	GO TO 5.
No ▶	Repair harness or connector.

5 CHECK MOTOR RELAY POWER SUPPLY CIRCUIT

1. Disconnect ABS actuator and electric unit connector.
2. Check voltage between ABS actuator and electric unit connector E111 (body side) terminal 17 and ground.



SBR492E

Does battery voltage exist?

Yes ▶	Replace ABS actuator and electric unit.
No ▶	**Check the following.** If NG, repair harness or connector. • Harness connector E111 • Harness for open or short between ABS actuator and electric unit and fusible link

6 REPLACE FUSIBLE LINK

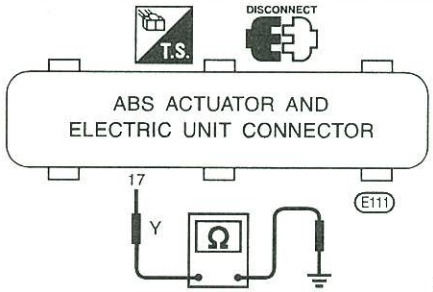
Replace fusible link.

Does the fusible link blow out when ignition switch is turned ON?

Yes ▶	GO TO 7.
No ▶	**INSPECTION END**

7	CHECK ABS ACTUATOR MOTOR POWER SUPPLY CIRCUIT FOR SHORT

1. Disconnect battery cable and ABS actuator and electric unit connector.
2. Check continuity between ABS actuator and electric unit connector E111 (body side) terminal 17 and ground.



SBR493E

Continuity should not exist.

Does continuity exist?

Yes	▶	**Check the following.** If NG, repair harness or connector. • Harness connector E111 • Harness for open or short between ABS actuator and electric unit and fusible link
No	▶	Replace ABS actuator and electric unit.

Low Voltage

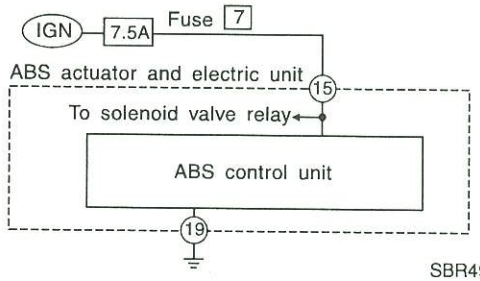
DIAGNOSTIC PROCEDURE

NBBR0105

Malfunction code No. 57

1	INSPECTION START

ABS actuator and electric unit power supply and ground circuit inspection



SBR494E

	▶	GO TO 2.

2	CHECK FUSE

Check 7.5A fuse No. 7. For fuse layout, refer to "POWER SUPPLY ROUTING" in EL section.

Is fuse OK?

Yes	▶	GO TO 3.
No	▶	GO TO 6.

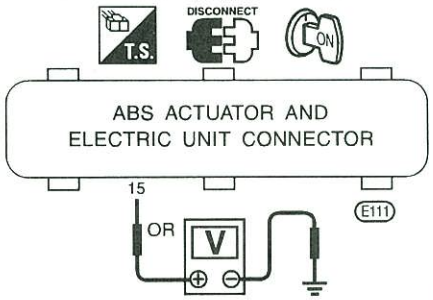
3	CHECK CONNECTOR

1. Disconnect ABS actuator and electric unit connector. Check terminals for damage or loose connections. Then reconnect connector.
2. Carry out self-diagnosis again.

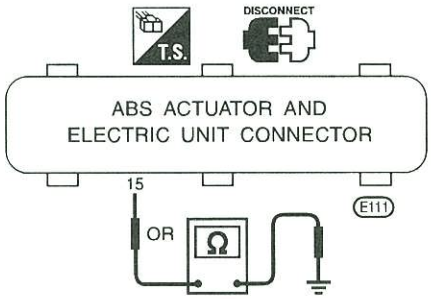
Does warning lamp activate again?

Yes	▶	GO TO 4.
No	▶	**INSPECTION END**

4	CHECK ABS ACTUATOR AND ELECTRIC UNIT GROUND CIRCUIT
Refer to "ABS ACTUATOR AND ELECTRIC UNIT GROUND" in "Ground Circuit Check", BR-50. **Is ground circuit OK?**	
Yes ▶	GO TO 5.
No ▶	Repair harness or connector.

5	CHECK ABS ACTUATOR AND ELECTRIC UNIT POWER SUPPLY CIRCUIT
1. Disconnect ABS actuator and electric unit connector. 2. Check voltage between ABS actuator and electric unit connector E111 (body side) terminal 15 and ground.  SBR495E **Does battery voltage exist when ignition switch is turned ON?**	
Yes ▶	Replace ABS actuator and electric unit.
No ▶	**Check the following.** If NG, repair harness or connector. • Harness connector E111 • Harness for open or short between ABS actuator and electric unit and fuse

6	REPLACE FUSE
Replace fuse. **Does the fuse blow out when ignition switch is turned ON?**	
Yes ▶	GO TO 7.
No ▶	**INSPECTION END**

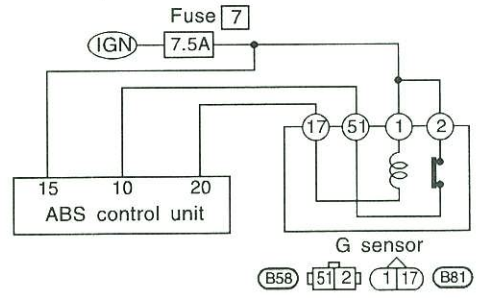
7	CHECK ABS ACTUATOR AND ELECTRIC UNIT POWER SUPPLY CIRCUIT FOR SHORT
1. Disconnect battery cable and ABS actuator and electric unit connector. 2. Check continuity between ABS actuator and electric unit connector E111 (body side) terminal 15 and ground.  SBR496E **Continuity should not exist.** **Does continuity exist?**	
Yes ▶	**Check the following.** If NG, repair harness or connector. • Harness connector E111 • Harness for open or short between ABS actuator and electric unit and fuse
No ▶	Replace ABS actuator and electric unit.

G Sensor and Circuit

DIAGNOSTIC PROCEDURE

NBBR0114

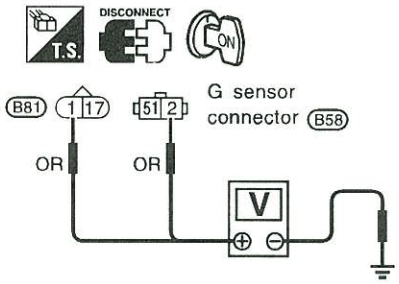
Malfunction code No. 17

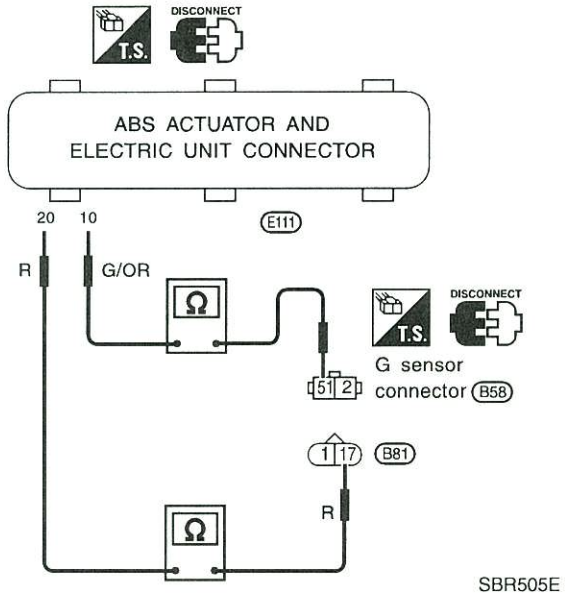
1	INSPECTION START
G sensor inspection  SBR504E	
▶	GO TO 2.

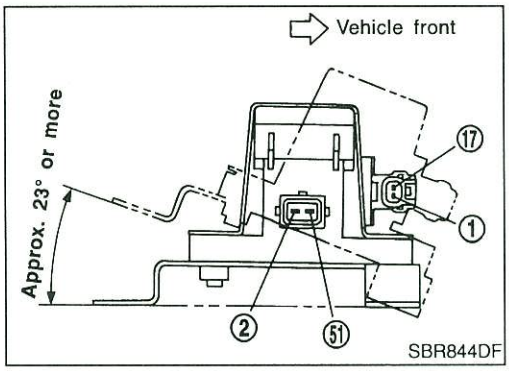
2	CHECK FUSE
Check 7.5A fuse No. 7 for ABS actuator and electric unit. For fuse layout, refer to "POWER SUPPLY ROUTING" in EL section. **Is fuse OK?**	
Yes ▶	GO TO 3.
No ▶	Replace fuse.

3	CHECK CONNECTOR
1. Disconnect connectors from ABS actuator and electric unit and G sensor. Check terminals for damage or loose connection. Then reconnect connectors. 2. Carry out self-diagnosis again. **Does warning lamp activate again?**	
Yes ▶	GO TO 4.
No ▶	INSPECTION END

4	CHECK G SENSOR	
Refer to "G SENSOR" in "Electrical Components Inspection", BR-61. **Is resistance within specifications?**		
Yes	▶	GO TO 5.
No	▶	Replace G sensor.

5	CHECK G SENSOR POWER SUPPLY CIRCUIT	
Check voltage between G sensor connector terminals 1, 2 and ground.  SBR861D **Does battery voltage exist?**		
Yes	▶	GO TO 6.
No	▶	**Check the following. If NG, repair harness or connectors.** • Harness connectors B58, B81 • Harness for open or short between G sensor and fuse

6	CHECK CIRCUIT	
1. Disconnect harness connector from ABS actuator and electric unit. 2. Check continuity between ABS actuator and electric unit connector terminals 20, 10 and G sensor connector terminals 17, 51.  SBR505E **Does continuity exist?**		
Yes	▶	Check actuator and electric unit pin terminals for damage or the connection of actuator and electric unit harness connector. Reconnect actuator and electric unit harness connector. Then retest.
No	▶	**Check the following. If NG, repair harness or connectors.** • Harness connectors E111, B58, B81 • Harness for open or short between G sensor connector and actuator and electric unit



ELECTRICAL COMPONENT INSPECTION

=NBBR0115

G Sensor

NBBR0115S01

CAUTION:

The G sensor is easily damaged if it sustains an impact. Be careful not to drop or bump it.

1. Measure resistance between terminals 2 and 51 of G sensor unit connector.

G sensor condition	Resistance between terminals 2 and 51	G sensor switch condition
Installed in vehicle	1.4 - 1.6 kΩ	"ON"
Tilted as shown in figure	4.7 - 5.5 kΩ	"OFF"

2. Measure resistance between terminals 1 and 17 of the G sensor unit connector.

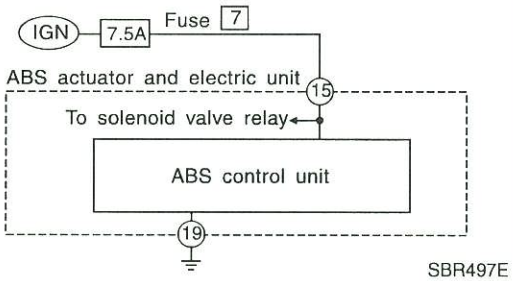
   Resistance: 70 - 124 Ω

Control Unit

DIAGNOSTIC PROCEDURE

=NBBR0106

Malfunction code No. 71

1	INSPECTION START
ABS actuator and electric unit power supply and ground circuit inspection  SBR497E	
▶	GO TO 2.

2	CHECK CONNECTOR
1. Disconnect ABS actuator and electric unit connector. Check terminals for damage or loose connection. Then reconnect connector. 2. Carry out self-diagnosis again. **Does warning lamp activate again?**	
Yes ▶	GO TO 3.
No ▶	**INSPECTION END**

3	CHECK ABS ACTUATOR AND ELECTRIC UNIT POWER SUPPLY CIRCUIT
Check voltage. Refer to "5. CHECK ABS ACTUATOR AND ELECTRIC UNIT POWER SUPPLY CIRCUIT" in "DIAGNOSTIC PROCEDURE", "Low Voltage", BR-58. **Does battery voltage exist when ignition switch is turned ON?**	
Yes ▶	GO TO 4.
No ▶	Repair.

4	CHECK WARNING LAMP INDICATION
Does warning lamp indicate code No. 71 again? **Yes or No**	
Yes ▶	Replace ABS actuator and electric unit.
No ▶	Inspect the system according to the code No.

1. ABS Works Frequently

NBBR0107

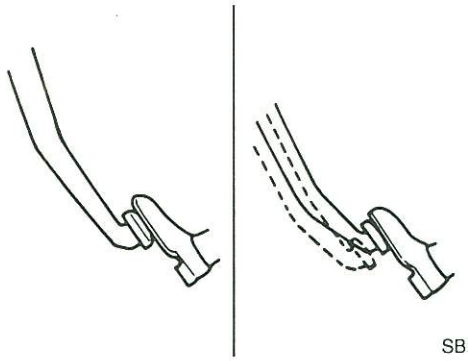
1	CHECK BRAKE FLUID PRESSURE
Check brake fluid pressure distribution. Refer to "Inspection", "LOAD SENSING VALVE", BR-10. **Is brake fluid pressure distribution normal?**	
Yes ▶	GO TO 2.
No ▶	Repair. Then perform Preliminary Check. Refer to BR-48.

2	CHECK WHEEL SENSOR
1. Check wheel sensor connector for terminal damage or loose connections. 2. Perform wheel sensor mechanical check. Refer to "7. CHECK SENSOR ROTOR" in "DIAGNOSTIC PROCEDURE", "Wheel Sensor or Rotor", BR-53. **Is wheel sensor mechanism OK?**	
Yes ▶	GO TO 3.
No ▶	Repair.

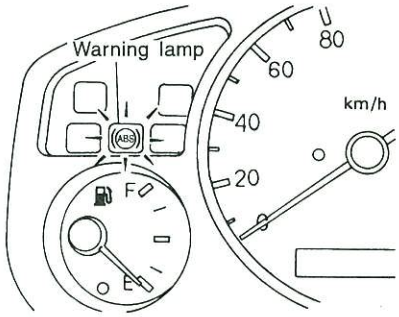
3	CHECK FRONT AXLE
Check front axles for excessive looseness. Refer to AX section ("Front Wheel Bearing", "ON-VEHICLE SERVICE"). **Is front axle installed properly?**	
Yes ▶	Go to "3. CHECK WARNING LAMP INDICATION" in "2. Unexpected Pedal Action", BR-63.
No ▶	Repair.

2. Unexpected Pedal Action

NBBR0108

1	CHECK BRAKE PEDAL STROKE
Check brake pedal stroke.  SBR540A **Is brake pedal stroke excessively large?**	
Yes ▶	Perform Preliminary Check. Refer to BR-48.
No ▶	GO TO 2.

2	CHECK MECHANICAL BRAKE SYSTEM PERFORMANCE
Disconnect ABS actuator and electric unit connector and check whether brake is effective. **Does brake system function properly when brake pedal is depressed?**	
Yes ▶	GO TO 3.
No ▶	Perform Preliminary Check. Refer to BR-48.

3	CHECK WARNING LAMP INDICATION
Ensure warning lamp remains off while driving.  SBR448E **Is warning lamp turned off?**	
Yes ▶	GO TO 4.
No ▶	Carry out self-diagnosis. Refer to BR-39, BR-42.

2. Unexpected Pedal Action (Cont'd)

4	CHECK WHEEL SENSOR	
1. Check wheel sensor connector for terminal damage or loose connection. 2. Perform wheel sensor mechanical check. Refer to "7. CHECK SENSOR ROTOR" in "DIAGNOSTIC PROCEDURE", "Wheel Sensor or Rotor", BR-53. **Is wheel sensor mechanism OK?**		
Yes	▶	Check ABS actuator and electric unit pin terminals for damage or the connection of ABS actuator and electric unit harness connector. Reconnect ABS actuator and electric unit harness connector. Then retest.
No	▶	Repair.

3. Long Stopping Distance

NBBR0109

1	CHECK MECHANICAL BRAKE SYSTEM PERFORMANCE	
Disconnect ABS actuator and electric unit connector and check whether stopping distance is still long. **Does brake system function properly when brake pedal is depressed?**		
Yes	▶	Perform Preliminary Check and air bleeding (if necessary).
No	▶	Go to "3. CHECK WARNING LAMP INDICATION" in "2. Unexpected Pedal Action", BR-63.

NOTE:
Stopping distance may be longer for vehicles without ABS when road condition is slippery.

4. ABS Does Not Work

=NBBR0110

1	CHECK WARNING LAMP INDICATION
Does the ABS warning lamp activate? **Yes or No**	
Yes ▶	Carry out self-diagnosis. Refer to BR-39, 42.
No ▶	Go to "3. CHECK WARNING LAMP INDICATION" in "2. Unexpected Pedal Action", BR-63.

NOTE:
ABS does not work when vehicle speed is under 10 km/h (6 MPH).

5. Pedal Vibration and Noise

NBBR0111

1	INSPECTION START
Pedal vibration and noise inspection Brake pedal SAT797A	
▶	GO TO 2.

2	CHECK SYMPTOM
1. Apply brake. 2. Start engine. **Does the symptom appear only when engine is started?**	
Yes ▶	Carry out self-diagnosis. Refer to BR-39, 42.
No ▶	Go to "3. CHECK WARNING LAMP INDICATION" in "2. Unexpected Pedal Action", BR-63.

NOTE:
ABS may operate and cause vibration under any of the following conditions.

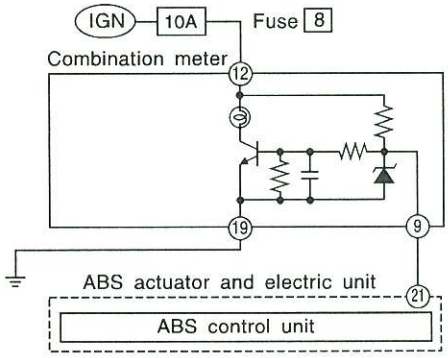
- Applying brake gradually when shifting or operating clutch.
- Low friction (slippery) road.
- High speed cornering.
- Driving over bumps and pot holes.
- Engine speed is over 5,000 rpm with vehicle stopped.

6. Warning Lamp Does Not Come On When Ignition Switch Is Turned On

NBBR0112

1	INSPECTION START

Warning lamp circuit inspection



SBR506E

▶ GO TO 2.

2	CHECK FUSE

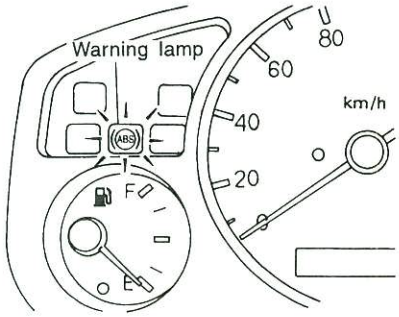
Check 10A fuse No. 8. For fuse layout, refer to "POWER SUPPLY ROUTING" in EL section.

Is fuse OK?

Yes	▶	GO TO 3.
No	▶	Replace fuse.

3	CHECK WARNING LAMP ACTIVATE

Disconnect ABS actuator and electric unit connector.



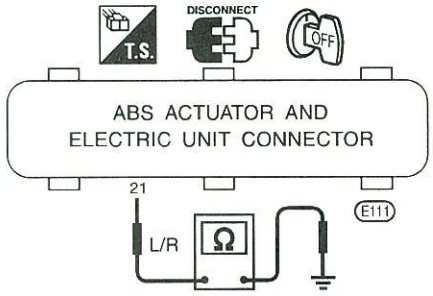
SBR448E

Does the warning lamp activate?

Yes	▶	Replace ABS actuator and electric unit.
No	▶	GO TO 4.

4	CHECK HARNESS FOR SHORT

1. Disconnect ABS actuator and electric unit connector and combination meter connector M24.
2. Check continuity between ABS actuator and electric unit connector E111 (body side) terminal 21 and ground.



SBR521E

Continuity should not exist.

Does continuity exist?

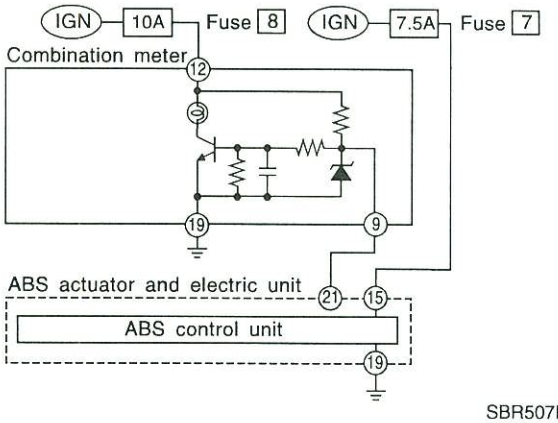
Yes	▶	Repair harness or connectors.
No	▶	**Check combination meter.** Refer to "WARNING LAMPS" in EL section.

7. Warning Lamp Stays On When Ignition Switch Is Turned On

=NBBR0113

1	INSPECTION START

ABS control unit inspection



SBR507E

▶ GO TO 2.

2	CHECK FUSE

Check 7.5A fuse No. 7. For fuse layout, refer to "POWER SUPPLY ROUTING" in EL section.

Is fuse OK?

Yes	▶	GO TO 3.
No	▶	GO TO 8.

3	CHECK HARNESS CONNECTOR

Check ABS actuator and electric unit pin terminals for damage or bad connection of ABS actuator and electric unit harness connector. Reconnect ABS actuator and electric unit harness connector. Then retest.

Does warning lamp stay on when ignition switch is turned ON?

Yes	▶	GO TO 4.
No	▶	**INSPECTION END**

4	CHECK ABS ACTUATOR AND ELECTRIC UNIT GROUND CIRCUIT

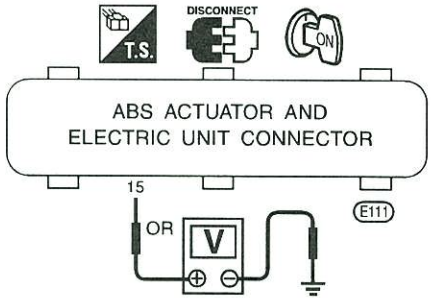
Refer to "ABS ACTUATOR AND ELECTRIC UNIT GROUND" in "Ground Circuit Check", BR-50.

Is ground circuit OK?

Yes	▶	GO TO 5.
No	▶	Repair harness or connector.

5	CHECK ABS ACTUATOR AND ELECTRIC UNIT POWER SUPPLY CIRCUIT

1. Disconnect ABS actuator and electric unit connector.
2. Check voltage between ABS actuator and electric unit connector E111 (body side) terminal 15 and ground.



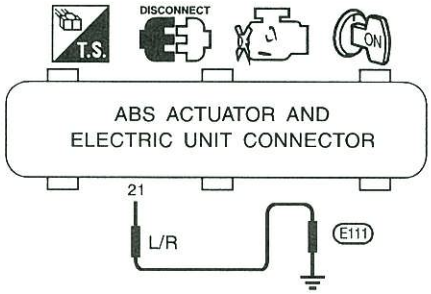
SBR495E

Does battery voltage exist when ignition switch is turned ON?

Yes	▶	GO TO 6.
No	▶	**Check the following.** If NG, repair harness or connector. • Harness connector E111 • Harness for open or short between ABS actuator and electric unit and fuse

6	CHECK WARNING LAMP

1. Disconnect ABS actuator and electric unit connector.
2. Connect suitable wire between ABS actuator and electric unit connector E111 (body side) terminal 21 and ground.



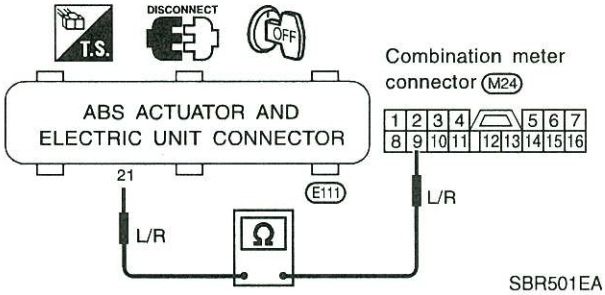
SBR502EA

Does the warning lamp deactivate?

Yes	▶	Replace ABS actuator and electric unit.
No	▶	GO TO 7.

7	CHECK ABS WARNING LAMP CONTROL CIRCUIT FOR OPEN

1. Disconnect combination meter connector M24.
2. Check continuity between combination meter connector M24 (body side) terminal 9 and ABS actuator and electric unit connector E111 (body side) terminal 21.
   NOTE:
   Connect positive lead of multimeter to combination meter connector M24 (body side) terminal 9 and negative lead to ABS actuator and electric unit connector E111 (body side) terminal 21.



SBR501EA

Continuity should exist.

Does continuity exist?

Yes	▶	**Check combination meter.** Refer to "WARNING LAMPS" in EL section.
No	▶	Repair harness or connectors.

8	REPLACE FUSE

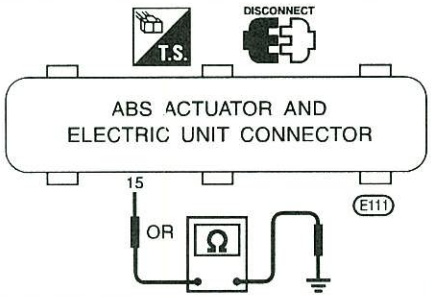
Replace fuse.

Does the fuse blow out when ignition switch is turned ON?

Yes	▶	GO TO 9.
No	▶	**INSPECTION END**

9	CHECK ABS ACTUATOR AND ELECTRIC UNIT POWER SUPPLY CIRCUIT FOR SHORT

1. Disconnect battery cable and ABS actuator and electric unit connector.
2. Check continuity between ABS actuator and electric unit connector E111 (body side) terminal 15 and ground.



SBR496E

Continuity should not exist.

Does continuity exist?

Yes	▶	**Check the following.** If NG, repair harness or connector. • Harness connector E111 • Harness for open or short between ABS actuator and electric unit and fuse
No	▶	Replace ABS actuator and electric unit.

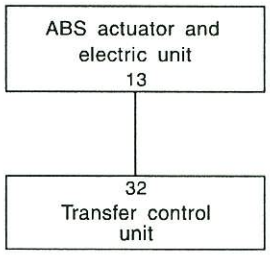
8. Vehicle Vibrates Excessively When ABS Is Operating

=NBBR0078

- While ABS is operating, brake pedal vibrates slightly. This is not a problem.
- If vehicle vibration is greater in the AUTO mode than in the 2WD mode, there is the possibility of failure in the communication line between the ABS control unit and transfer control unit. Check and locate the cause of the problem.

1	INSPECTION START

Inspection for excessive vibration of vehicle



SBR508E

▶	GO TO 2.

2	CARRY OUT SELF-DIAGNOSIS

Perform self-diagnosis for the ABS actuator and electric unit and transfer control unit.

Are there any malfunctions?

Yes	▶	GO TO 3.
No	▶	GO TO 4.

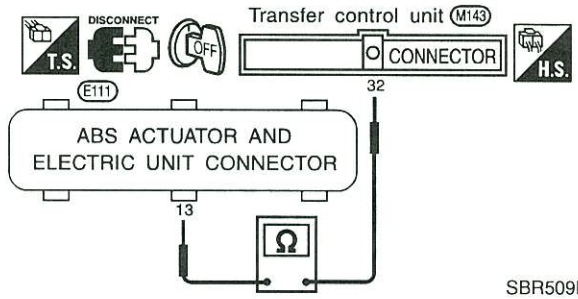
3	INSPECTION OR REPAIR

Inspect or repair the system according to the self-diagnostic item.

OK	▶	GO TO 4.

4	CHECK CIRCUIT

1. Disconnect connectors from ABS actuator and electric unit and transfer control unit. Check terminals for damage or loose connection.
2. Check continuity between ABS actuator and electric unit connector terminal 13 and transfer control unit connector terminal 32.



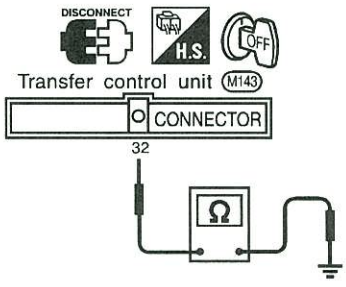
SBR509E

Does continuity exist?

Yes	▶	GO TO 5.
No	▶	**Check the following.** • Harness connectors E111, M143 • Harness for open or short between ABS actuator and electric unit and transfer control unit If NG, repair harness or connectors.

5	CHECK ABS OPERATING SIGNAL CIRCUIT

1. Reconnect only ABS actuator and electric unit connector.
2. Check continuity between transfer control unit connector terminal 32 and ground.
   Continuity should not exist.



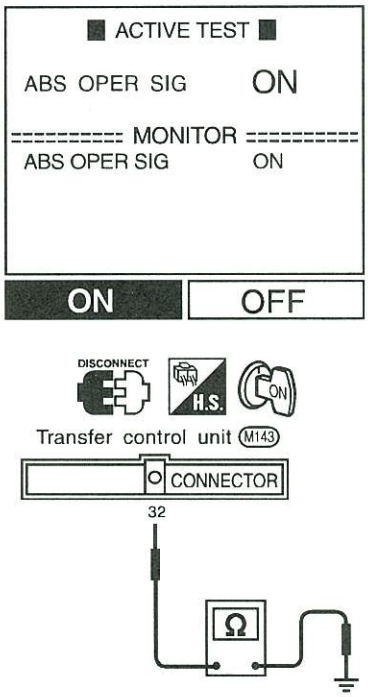
SBR510E

Does continuity exist?

Yes	▶	Replace ABS actuator and electric unit.
No	▶	GO TO 6.

6	CHECK ABS OPERATING SIGNAL

1. Connect CONSULT to Data Link Connector for CONSULT.
2. Turn ignition switch "ON". Set CONSULT in the active test mode to output an ABS operating signal.
   (Refer to "ACTIVE TEST PROCEDURE", "CONSULT Inspection Procedure", BR-45.)
3. An ABS operating signal lasts for 10 seconds. During the time the signal is being output, check resistance between transfer control unit connector terminal 32 and ground.
   Resistance: 0.5Ω, max.



SBR511E

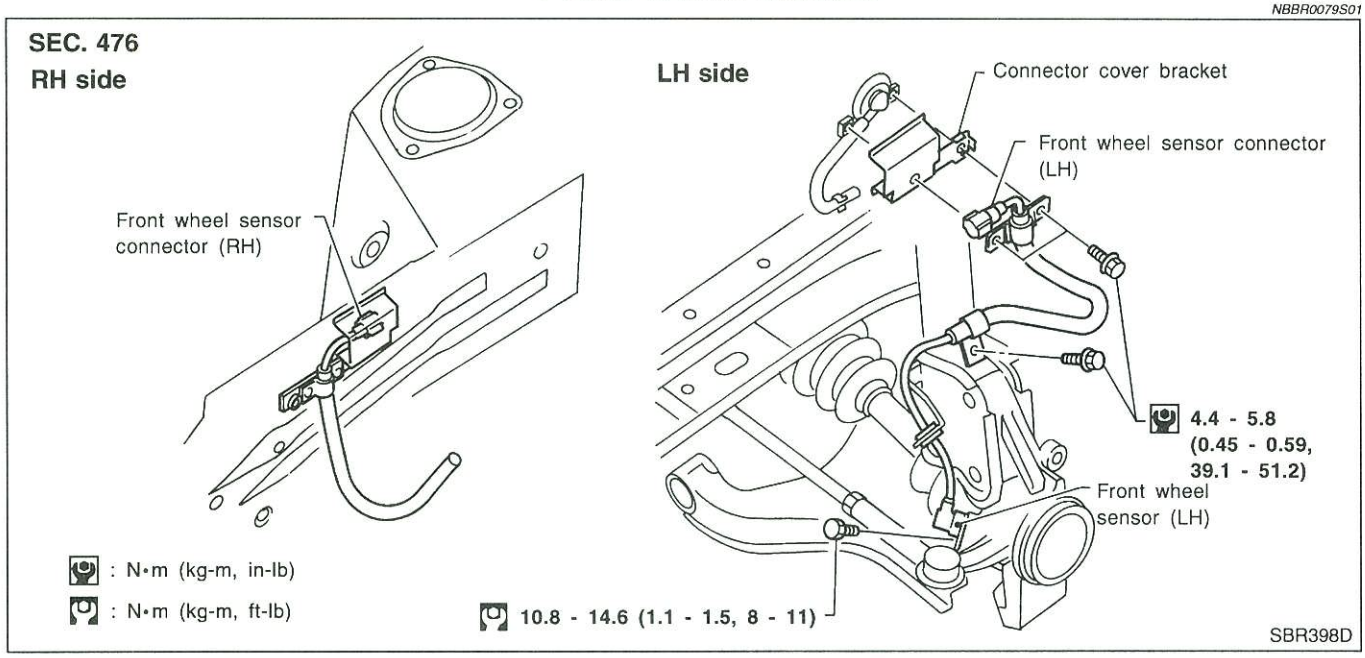
Is resistance within specifications?

Yes	▶	CHECK transfer control unit. Refer to TF section ("TROUBLE DIAGNOSIS FOR ABS OPERATION SIGNAL").
No	▶	Replace ABS actuator and electric unit.

CAUTION:
Be careful not to damage sensor edge and sensor rotor teeth. When removing the front or rear wheel hub assembly, disconnect the ABS wheel sensor from the assembly and move it away.

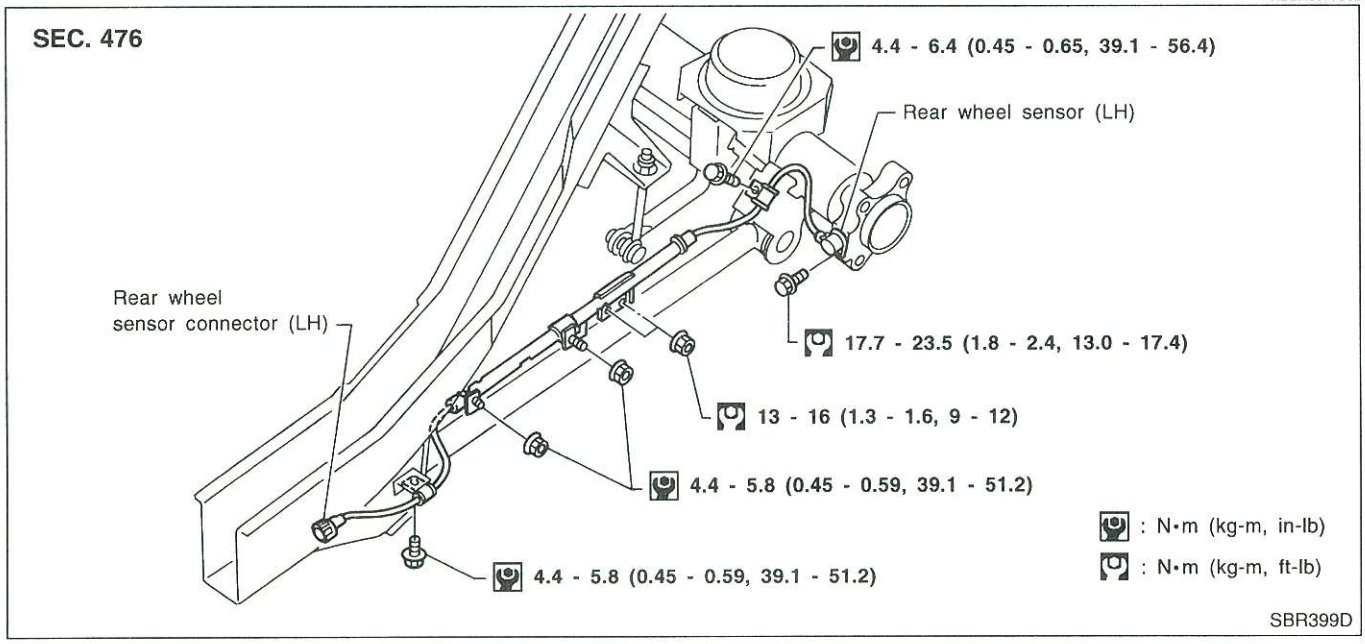
Front Wheel Sensor

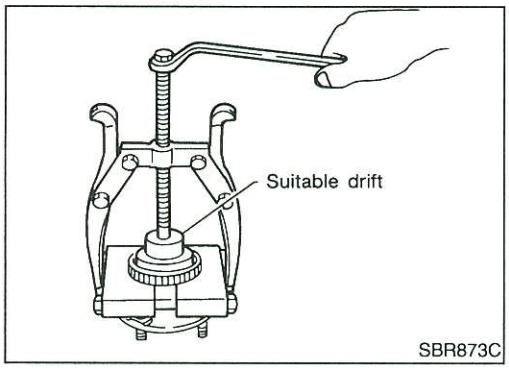
NBBR0079S01



Rear Wheel Sensor

NBBR0079S02





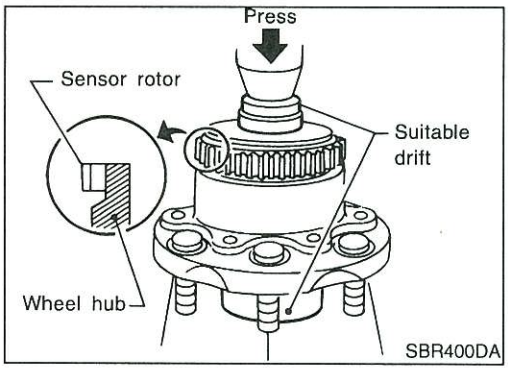
Front Sensor Rotor

NBBR0079S03

REMOVAL

NBBR0079S0301

1. Remove the front wheel hub. Refer to AX section ("FRONT AXLE").
2. Remove the sensor rotor using suitable puller, drift and bearing replacer.

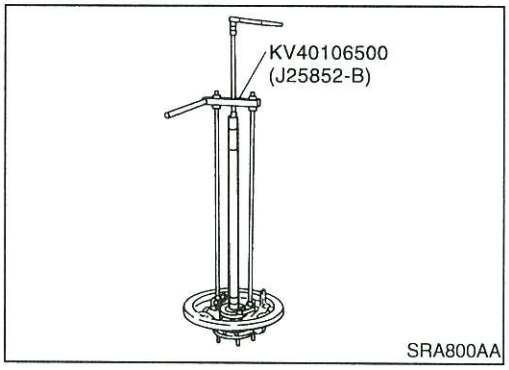


INSTALLATION

NBBR0079S0302

Install the sensor rotor using suitable drift and press.

- Always replace sensor rotor with new one.
- Pay attention to the direction of front sensor rotor as shown in figure.



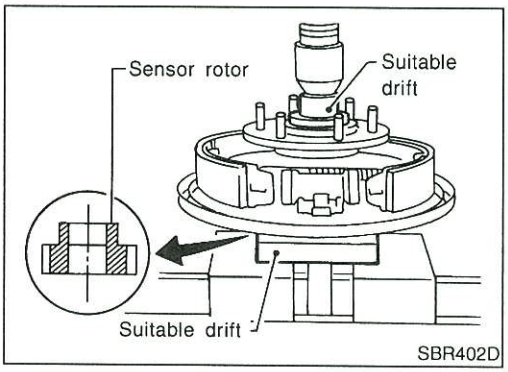
Rear Sensor Rotor

NBBR0079S04

REMOVAL

NBBR0079S0401

- Remove the sensor rotor using Tool.

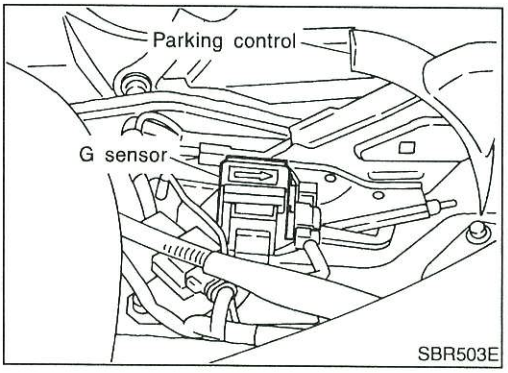


INSTALLATION

NBBR0079S0402

Install the sensor rotor using suitable drift and press.

- Always replace sensor rotor with new one.
- Pay attention to the direction of front sensor rotor as shown in figure.



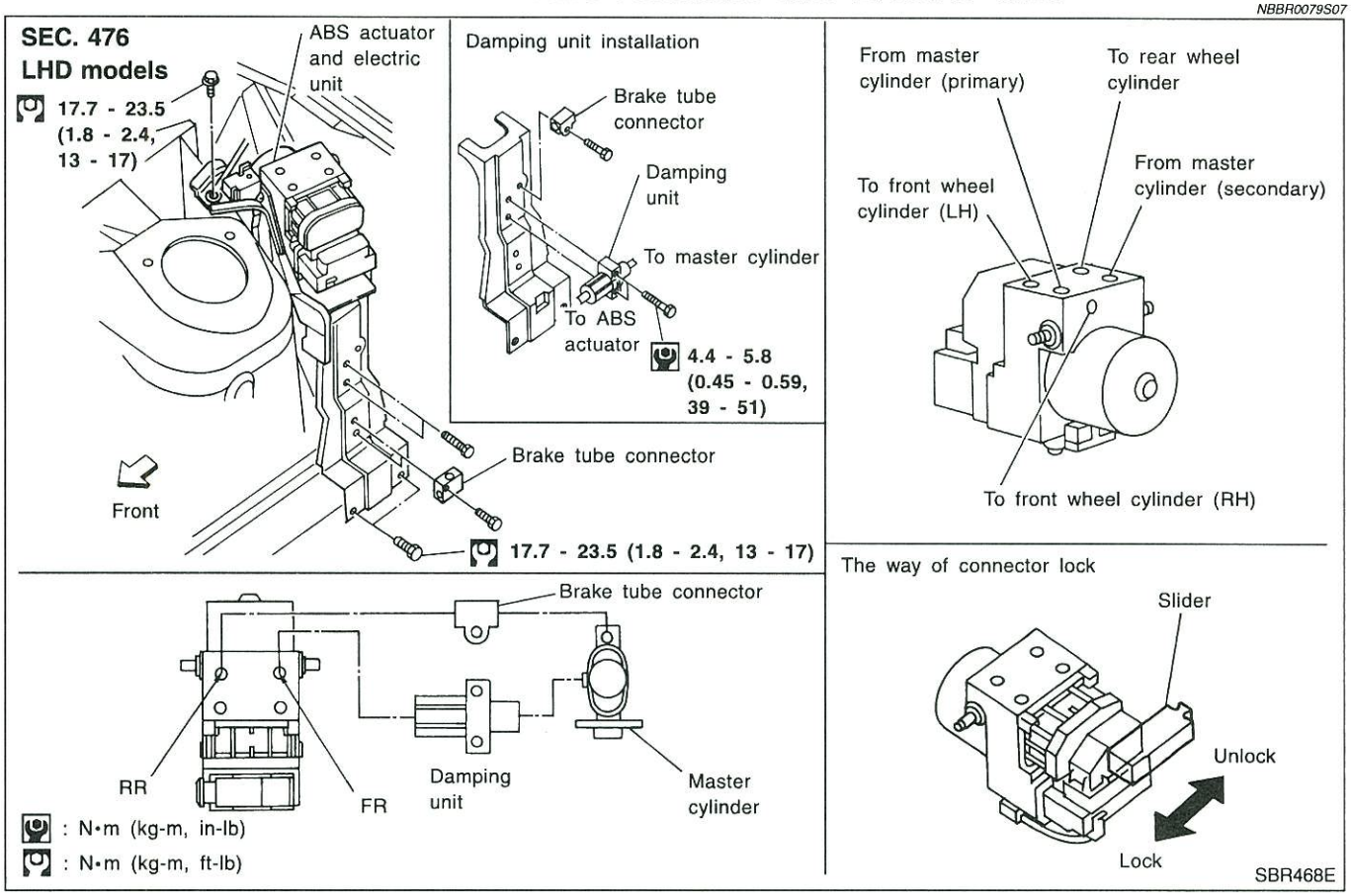
G Sensor

NBBR0079S06

Always replace G sensor if bumped or dropped. Otherwise, performance characteristics of G sensor will be changed, which in turn changes ABS control performance characteristics.

ABS Actuator and Electric Unit

NBBR0079S07



REMOVAL

NBBR0079S0701

1. Disconnect battery cable.
2. Drain brake fluid. Refer to "Changing Brake Fluid", BR-6.
3. Remove mounting bracket fixing bolts and nuts.
4. Disconnect connector, brake pipes and remove fixing nuts and actuator ground cable.

INSTALLATION

NBBR0079S0702

CAUTION:

After installation, refill brake fluid. Then bleed air. Refer to "Bleeding Brake System", BR-7.

1. Tighten actuator ground cable.

Place ground cable at a notch of mounting bracket.

2. Connect brake pipes temporarily.
3. Tighten fixing bolts and nuts.
4. Tighten brake pipes.
5. Connect connector and battery cable.

General Specifications

NBBR0080

Unit: mm (in)

Front brake	Brake model	AD31VC
	Cylinder bore diameter × number of pistons	44.45 (1.7500) × 2
	Pad Length × width × thickness	132.0 × 52.5 × 11 (5.20 × 2.067 × 0.43)
	Rotor outer diameter × thickness	300 × 28 (11.81 × 1.10)
Rear brake	Brake model	LT30C
	Cylinder bore diameter	22.23 (7/8)
	Lining length × width × thickness	296 × 50 × 6.1 (11.65 × 1.97 × 0.240)
	Drum inner diameter	295.0 (11.61)
Master cylinder	Bore diameter	25.40 (1)
Control valve	Valve model	Linkage type load sensing valve
	Split point kPa (kg/cm^2, psi) × reducing ratio	(Variable) × 0.18
Brake booster	Booster model	M215T
	Diaphragm diameter	Pri: 230 (9.06) Sec: 205 (8.07)
Recommended brake fluid		DOT 3

Disc Brake

NBBR0081

Unit: mm (in)

Brake model		AD31VC
Pad wear limit	Minimum thickness	2.0 (0.079)
Rotor repair limit	Minimum thickness	26.0 (1.024)

Drum Brake

NBBR0082

Unit: mm (in)

Brake model		LT30C
Lining wear limit	Minimum thickness	1.5 (0.059)
Drum repair limit	Maximum inner diameter	296.5 (11.67)
	Out-of-round limit	0.03 (0.0012)

Brake Pedal

NBBR0083

Unit: mm (in)

Free height "H"*		175 - 185 (6.89 - 7.28)
Depressed height "D" [under force of 490 N (50 kg, 110 lb) with engine running]		70 (2.76)
Clearance "C" between pedal stopper and threaded end of stop lamp switch or ASCD switch		0.3 - 1.0 (0.012 - 0.039)
Pedal free play	At clevis	1.0 - 3.0 (0.039 - 0.118)
	At pedal pad	4 - 12 (0.16 - 0.47)

*: Measured from surface of dash lower panel to pedal pad

Parking Brake Control

NBBR0084

Control Type	Center lever
Lever stroke [under force of 196 N (20 kg, 44 lb)]	6 - 8
Lever stroke when warning switch comes on	1

STEERING SYSTEM

SECTION ST

CONTENTS

PRECAUTIONS 2
Supplemental Restraint System (SRS) "AIR BAG" and "SEAT BELT PRE-TENSIONER" 2
Precautions for Steering System 2
PREPARATION 3
Special Service Tools 3
Commercial Service Tools 4
NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING 5
NVH Troubleshooting Chart 5
ON-VEHICLE SERVICE 6
Checking Steering Wheel Play 6
Checking Neutral Position on Steering Wheel 6
PRE-CHECKING 6
CHECKING 6
Front Wheel Turning Angle 6
Checking Gear Housing Movement 7
Adjusting Rack Retainer 7
Checking and Adjusting Drive Belts 7
Checking Fluid Level 7
Checking Fluid Leakage 7
Bleeding Hydraulic System 8
Checking Steering Wheel Turning Force 8
Checking Hydraulic System 9
STEERING WHEEL AND STEERING COLUMN 10
Components 10
Removal and Installation 10
STEERING WHEEL 10
STEERING COLUMN 11
Disassembly and Assembly 12
Inspection 13
TILT MECHANISM 13
STEERING TRANSFER GEAR 14
Removal 14
Installation 15
Inspection 15
POWER STEERING GEAR AND LINKAGE 16
Components 16
Removal and Installation 17
Disassembly 18
Inspection 19
BOOT 19
RACK 19
PINION ASSEMBLY 19
GEAR HOUSING CYLINDER 19
TIE-ROD OUTER AND INNER SOCKETS 20
Assembly 20
Adjustment 23
POWER STEERING OIL PUMP 26
Components 26
Pre-disassembly Inspection 26
Disassembly 27
Inspection 28
Assembly 28
SERVICE DATA AND SPECIFICATIONS (SDS) 30
General Specifications 30
Steering Wheel 30
Steering Column 30
Steering Transfer Gear 30
Steering Gear and Linkage 31
Power Steering 31

Supplemental Restraint System (SRS) "AIR BAG" and "SEAT BELT PRE-TENSIONER"

NBST0001

The supplemental Restraint System such as "AIR BAG" and "SEAT BELT PRE-TENSIONER" used along with a seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. The SRS system composition which is available to INFINITI QX4 is as follows:

- For a frontal collision
  The Supplemental Restraint System consists of driver air bag module (located in the center of the steering wheel), front passenger air bag module (located on the instrument panel on passenger side), seat belt pre-tensioners, a diagnosis sensor unit, warning lamp, wiring harness and spiral cable.
- For a side collision
  The Supplemental Restraint System consists of side air bag module (located in the outer side of front seat), satellite sensor, diagnosis sensor unit (one of components of air bags for a frontal collision), wiring harness, warning lamp (one of components of air bags for a frontal collision).

Information necessary to service the system safely is included in the **RS section** of this Service Manual.

WARNING:

- **To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance must be performed by an authorized INFINITI dealer.**
- **Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the RS section.**
- **Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. Spiral cable and wiring harnesses (except "SEAT BELT PRE-TENSIONER") covered with yellow insulation either just before the harness connectors or for the complete harness are related to the SRS.**

Precautions for Steering System

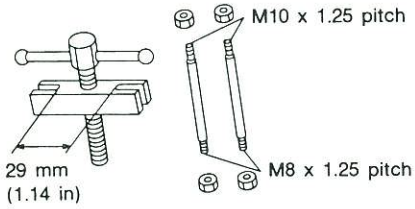
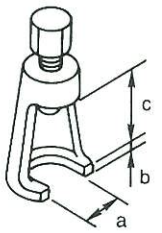
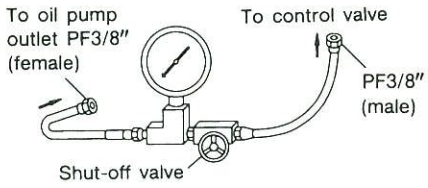
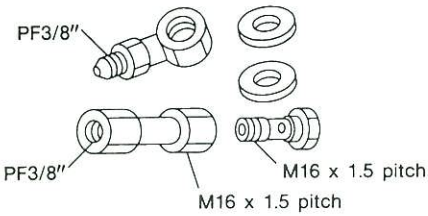
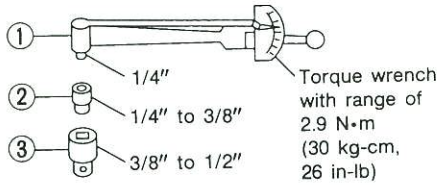
NBST0002

- **Before disassembly, thoroughly clean the outside of the unit.**
- **Disassembly should be done in a clean work area. It is important to prevent the internal parts from becoming contaminated by dirt or other foreign matter.**
- **Place disassembled parts in order, on a parts rack, for easier and proper assembly.**
- **Use nylon cloths or paper towels to clean the parts; common shop rags can leave lint that might interfere with their operation.**
- **Before inspection or reassembly, carefully clean all parts with a general purpose, non-flammable solvent.**
- **Before assembly, apply a coat of recommended power steering fluid* to hydraulic parts. Vaseline may be applied to O-rings and seals. Do not use any grease.**
- **Replace all gaskets, seals and O-rings. Avoid damaging O-rings, seals and gaskets during installation. Perform functional tests whenever designated.**
  ***: Genuine Nissan PSF II or equivalent. Refer to MA section ("Fluids and Lubricants", "RECOMMENDED FLUIDS AND LUBRICANTS").**

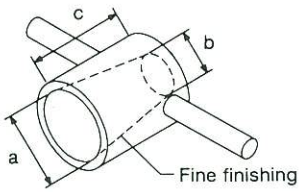
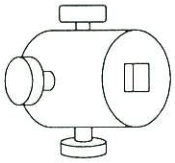
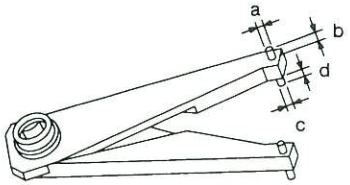
Special Service Tools

NBST0003

The actual shapes of Kent-Moore tools may differ from those of special service tools illustrated here.

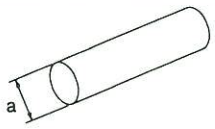
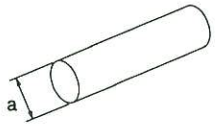
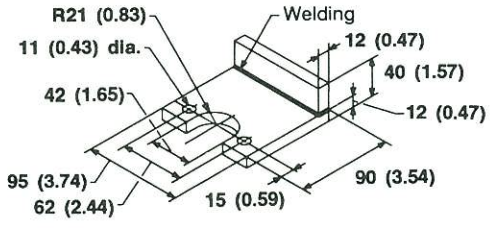
Tool number (Kent-Moore No.) Tool name	Description	
KV48100700 (J26364) Torque adapter	NT169	Measuring pinion rotating torque
ST27180001 (J25726-A) Steering wheel puller	 NT544	Removing steering wheel
ST29020001 (J24319-01) Ball joint remover	 NT694	Removing ball joint **a: 34 mm (1.34 in)** **b: 6.5 mm (0.256 in)** **c: 61.5 mm (2.421 in)**
KV48103500 (J26357 and J26357-10) Pressure gauge	 NT547	Measuring oil pressure
KV48102500 (—) Pressure gauge adapter	 NT542	Measuring oil pressure
ST3127S000 (See J25765-A) 1 GG91030000 (J25765-A) Torque wrench 2 HT62940000 (—) Socket adapter 3 HT62900000 (—) Socket adapter	 NT541	Measuring turning torque

Special Service Tools (Cont'd)

Tool number (Kent-Moore No.) Tool name	Description	
KV48104400 (—) Rack seal ring reformer	 NT550	Reforming teflon ring **a: 50 mm (1.97 in) dia.** **b: 36 mm (1.42 in) dia.** **c: 100 mm (3.94 in)**
KV48103400 (—) Torque adapter	 NT236	Measuring steering transfer gear rotating torque
KV48104200 (—) Rear cover wrench	 NT540	Removing and installing gear housing end cover **a: 4 mm (0.16 in) dia.** **b: 5 mm (0.20 in)** **c: 3 mm (0.12 in) dia.** **d: 5 mm (0.20 in)**

Commercial Service Tools

NBST0004

Tool name	Description	
Rear oil seal drift	 NT063	Installing rear oil seal **a: 28 mm (1.10 in) dia.**
Pinion oil seal drift	 NT063	Installing pinion oil seal **a: 40 mm (1.57 in) dia.**
Oil pump attachment	 NT179	Disassembling and assembling oil pump Unit: mm (in)

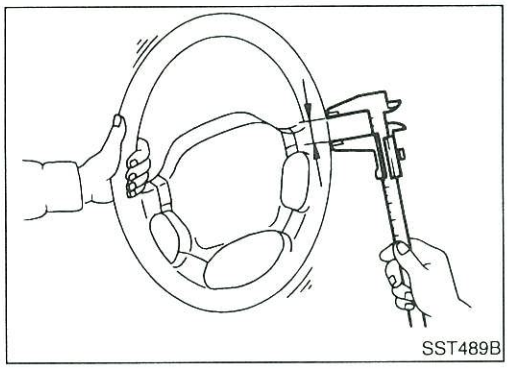
NVH Troubleshooting Chart

NBST0043S01

Use the chart below to help you find the cause of the symptom. If necessary, repair or replace these parts.

Reference page			ST-7	ST-8	ST-20	ST-20	ST-20	ST-7	ST-6	ST-8	Refer to MA section.	—	ST-12	ST-7	ST-12	ST-12	ST-16	NVH in PD section	NVH in PD section	NVH in AX section	NVH in AX section	NVH in SU section	NVH in SU section	NVH in SU section	NVH in BR section
Possible cause and SUSPECTED PARTS			Fluid level	Air in hydraulic system	Tie-rod ball joint swinging force	Tie-rod ball joint rotating torque	Tie-rod ball joint end play	Steering gear fluid leakage	Steering wheel play	Steering gear rack sliding force	Drive belt looseness	Improper steering wheel	Improper installation or looseness or tilt lock lever	Mounting rubber deterioration	Steering column deformation or damage	Improper installation or looseness of steering column	Steering linkage looseness	PROPELLER SHAFT	DIFFERENTIAL	DRIVE SHAFT	AXLE	SUSPENSION	TIRES	ROAD WHEEL	BRAKES
Symptom	STEERING	Noise	×	×	×	×	×	×	×	×	×							×	×	×	×	×	×	×	×
		Shake										×	×	×				×		×	×	×	×	×	×
		Vibration										×	×	×	×	×		×		×	×	×	×		
		Shimmy										×	×	×			×				×	×	×	×	×
		Judder												×			×				×	×	×	×	×

×: Applicable


SST489B

Checking Steering Wheel Play

NBST0005

1. With wheels in a straight-ahead position, check steering wheel play.

   Steering wheel play:

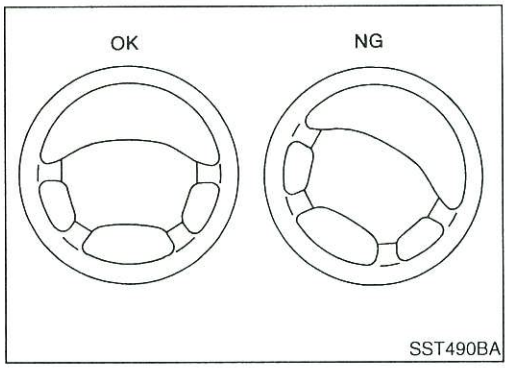
   35 mm (1.38 in) or less

2. If it is not within specification, check the following for loose or worn components.

   Steering gear assembly

   Steering column

   Front suspension and axle



SST490BA

Checking Neutral Position on Steering Wheel

NBST0006

PRE-CHECKING

NBST0006S01

- Make sure that wheel alignment is correct.

  Wheel alignment:

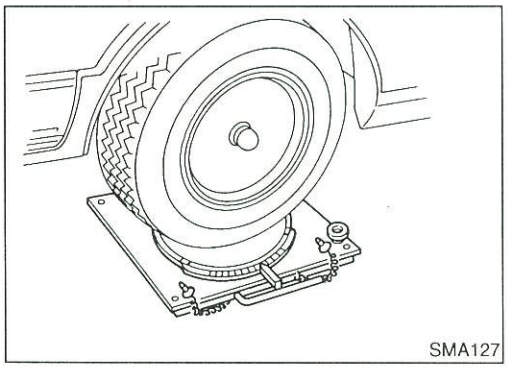
  Refer to SU section ("Wheel Alignment", "SDS").

- Verify that the steering gear is centered before removing the steering wheel.

CHECKING

NBST0006S2

1. Check that the steering wheel is in the neutral position when driving straight ahead.
2. If it is not in the neutral position, remove the steering wheel and reinstall it correctly.
3. If the neutral position is between two teeth, loosen tie-rod lock nuts. Turn the tie-rods by the same amount in opposite directions on both left and right sides.


SMA127

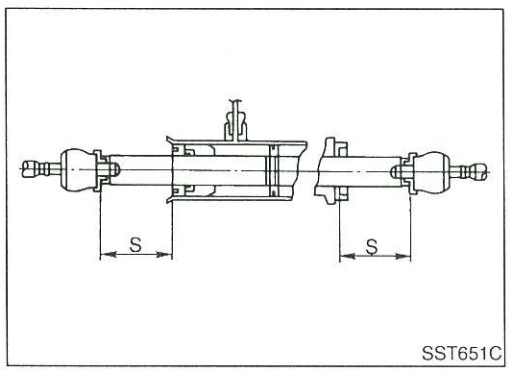
Front Wheel Turning Angle

NBST0007

1. Rotate steering wheel all the way right and left; measure turning angle.

   Turning angle of full turns:

   Refer to SU section ("Wheel Alignment", "SDS").

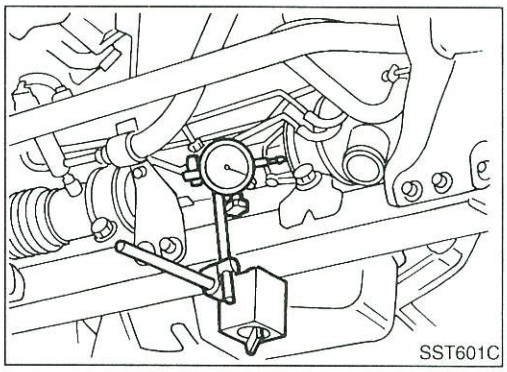


SST651C

2. If it is not within specification, check rack stroke.

   Rack stroke "S":

   Refer to SDS (ST-31).


SST601C

Checking Gear Housing Movement

NBST0008

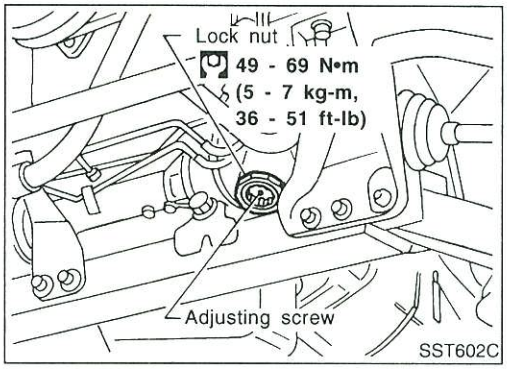
1. Check the movement of steering gear housing during stationary steering on a dry paved surface.

- Apply a force of 49 N (5 kg, 11 lb) to steering wheel to check the gear housing movement.
  Turn off ignition key while checking.

  Movement of gear housing:

  ±2 mm (±0.08 in) or less

2. If movement exceeds the limit, replace mount insulator after confirming proper installation of gear housing clamps.



SST602C

Adjusting Rack Retainer

NBST0009

- Perform this driving test on a flat road.

a) Check whether vehicle moves in a straight line when steering wheel is released.

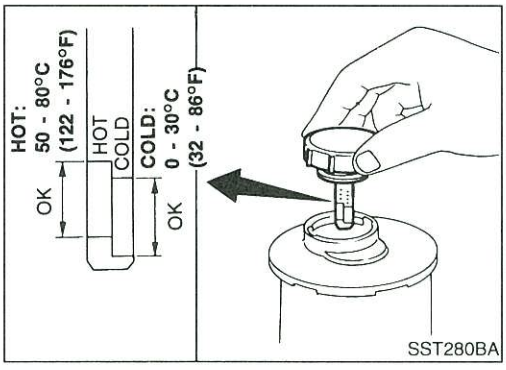
b) Check whether steering wheel returns to neutral position when steering wheel is released from a slightly turned (approx. 20°) position.

- If any abnormality is found, correct it by resetting adjusting screw.

Checking and Adjusting Drive Belts

NBST0010

Refer to MA section ("Checking Drive Belts", "ENGINE MAINTENANCE").



SST280BA

Checking Fluid Level

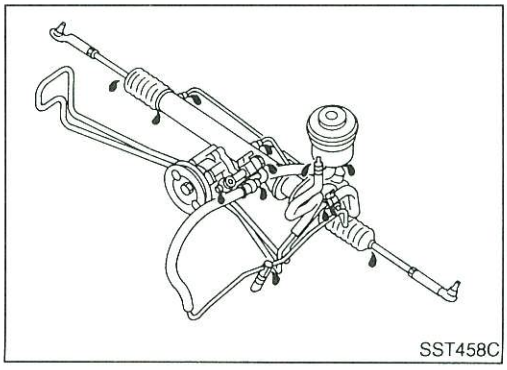
NBST0011

Check fluid level.

Use the correct range of the dipstick depending on the fluid temperature. Use the "HOT" range at 50 to 80°C (122 to 176°F), or the "COLD" range at 0 to 30°C (32 to 86°F).

CAUTION:

- **Do not overfill.**
- **Recommended fluid is Genuine Nissan PSF II or equivalent. Refer to MA section ("Fluids and Lubricants", "RECOMMENDED FLUIDS AND LUBRICANTS").**


SST458C

Checking Fluid Leakage

NBST0012

Check the lines for improper attachment and for leaks, cracks, damage, loose connections, chafing and deterioration.

1. Run engine between idle speed and 1,000 rpm.

Make sure temperature of fluid in oil tank rises to 60 to 80°C (140 to 176°F).

2. Turn steering wheel right-to-left several times.
3. Hold steering wheel at each "lock" position for five seconds and carefully check for fluid leakage.

CAUTION:
Do not hold the steering wheel in a locked position for more than 15 seconds.

4. If fluid leakage at connectors is noticed, loosen flare nut and then retighten.

Do not overtighten connector as this can damage O-ring, washer and connector.

5. Check rack boots for accumulation of power steering fluid.

Bleeding Hydraulic System

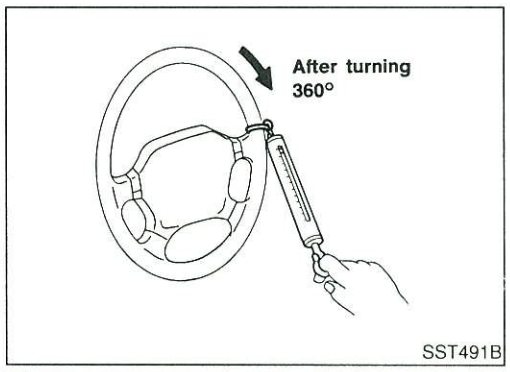
NBST0013

1. Raise front end of vehicle until wheels are clear of the ground.
2. Add fluid into oil tank to specified level. Then, quickly turn steering wheel fully to right and left and lightly touch steering stoppers.
   Repeat steering wheel operation until fluid level no longer decreases.
3. Start engine.
   Repeat step 2 above.

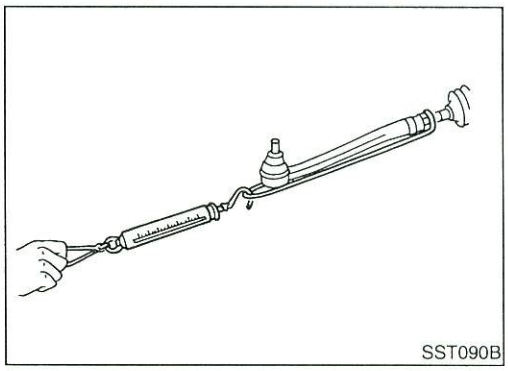
- Incomplete air bleeding will cause the following to occur. When this happens, bleed air again.

a) Air bubbles in reservoir tank
b) Clicking noise in oil pump
c) Excessive buzzing in oil pump

Fluid noise may occur in the valve or oil pump. This is common when the vehicle is stationary or while turning steering wheel slowly. This does not affect performance or durability of the system.



SST491B


SST090B

Checking Steering Wheel Turning Force

NBST0014

1. Park vehicle on a level, dry surface and set parking brake.
2. Start engine.
3. Bring power steering fluid up to adequate operating temperature. [Make sure temperature of fluid is approximately 60 to 80°C (140 to 176°F).]

Tires need to be inflated to normal pressure.

4. Check steering wheel turning force when steering wheel has been turned 360° from the neutral position.

   Steering wheel turning force:

   39 N (4 kg, 9 lb) or less

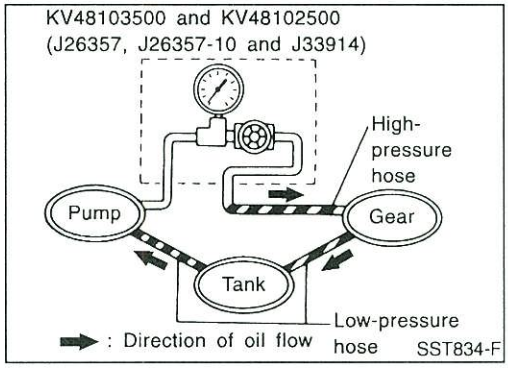
5. If steering wheel turning force is out of specification, check rack sliding force.

a. Disconnect steering column lower joint and knuckle arms from the gear.
b. Start and run engine at idle to make sure steering fluid has reached normal operating temperature.
c. Pull tie-rod slowly to move it from neutral position to ±11.5 mm (±0.453 in) at speed of 3.5 mm (0.138 in)/s. Check that rack sliding force is within specification.

   Rack sliding force:

   137 - 255 N (14 - 26 kg, 31 - 57 lb)

6. If rack sliding force is not within specification, overhaul steering gear assembly.
7. If rack sliding force is OK, inspect steering column. Refer to "Inspection", "STEERING WHEEL AND STEERING COLUMN", ST-13.



Checking Hydraulic System

NBST0015

Before starting, check belt tension, driving pulley and tire pressure.

1. Set Tool. Open shut-off valve. Then bleed air.
   Refer to "Bleeding Hydraulic System", ST-8.
2. Run engine, at idle speed or 1,000 rpm.

Make sure fluid temperature in reservoir tank rises to 60 to 80°C (140 to 176°F).

WARNING:
Warm up engine with shut-off valve fully opened. If engine is started with shut-off valve closed, fluid pressure in the power steering pump increase to maximum. This will raise fluid temperature abnormally.

3. Check pressure with steering wheel fully turned to left and right positions with engine idling at 1,000 rpm.

CAUTION:
Do not hold the steering wheel in a locked position for more than 15 seconds.

Power steering pump maximum operating pressure:
8,630 - 9,219 kPa
(88 - 94 kg/cm^2, 1,251 - 1,337 psi)

- If pressure reaches maximum operating pressure, system is OK.
- If pressure increases above maximum operating pressure, check power steering pump flow control valve. Refer to ST-27.

4. If power steering pressure is below the maximum operating pressure, slowly close shut-off valve and check pressure again.

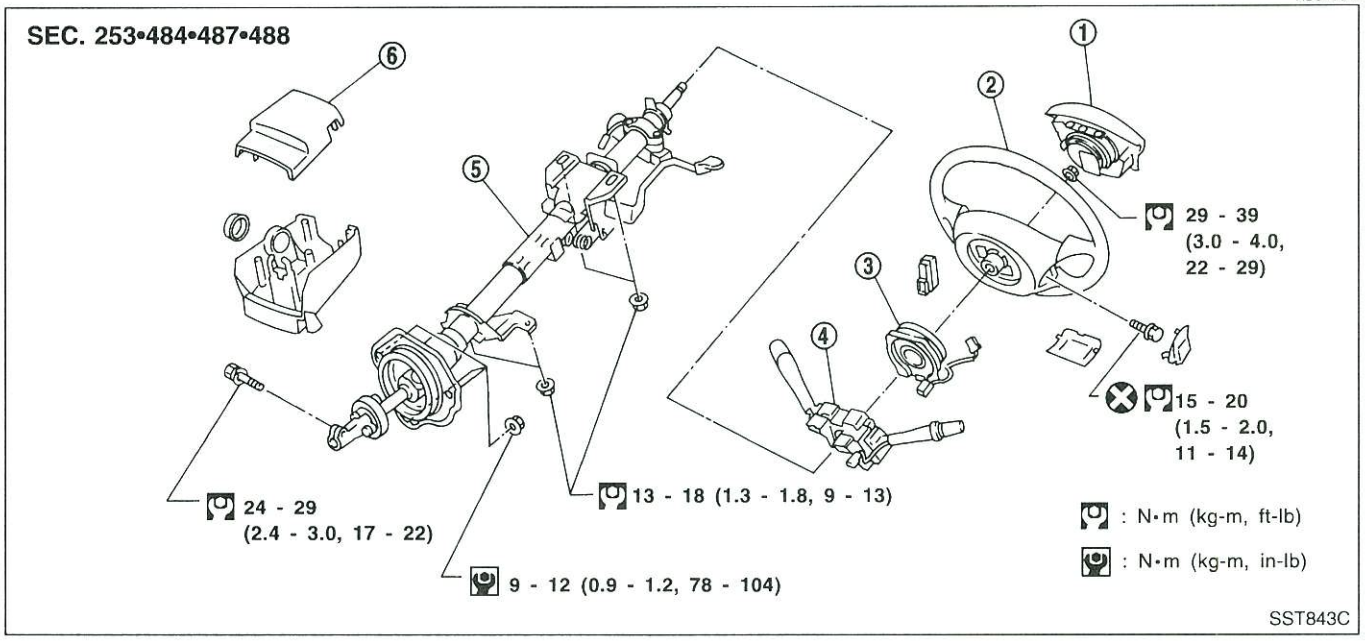
CAUTION:
Do not close shut-off valve for more than 15 seconds.

- If pressure increases to maximum operating pressure, gear should be damaged. Refer to "Removal and Installation", ST-17.
- If pressure remains below maximum operating pressure, pump should be damaged. Refer to "Disassembly", ST-27.

5. After checking hydraulic system, remove Tool and add fluid as necessary. Then completely bleed air out of system. Refer to ST-8.

Components

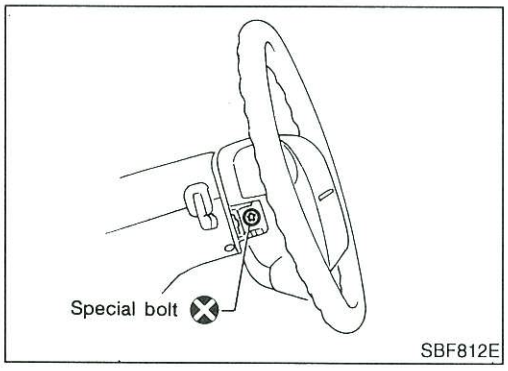
NBST0016



1. Air bag module
2. Steering wheel
3. Spiral cable
4. Combination switch
5. Steering column assembly
6. Column cover

CAUTION:

- **The rotation of the spiral cable (SRS "AIR BAG" component part) is limited. If the steering gear must be removed, set the front wheels in the straight-ahead direction. Do not rotate the steering column while the steering gear is removed.**
- **Remove the steering wheel before removing the steering lower joint to avoid damaging the SRS spiral cable.**



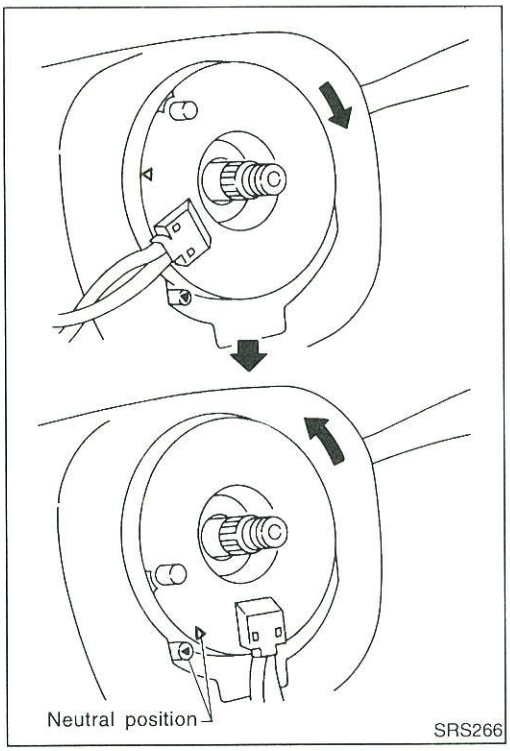
Removal and Installation

NBST0017

STEERING WHEEL

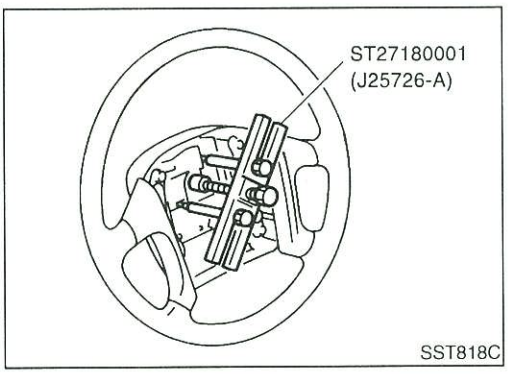
NBST0017S01

1. Remove air bag module and spiral cable. Refer to RS section ("Removal — Air Bag Module and Spiral Cable", "SUPPLEMENTAL RESTRAINT SYSTEM").

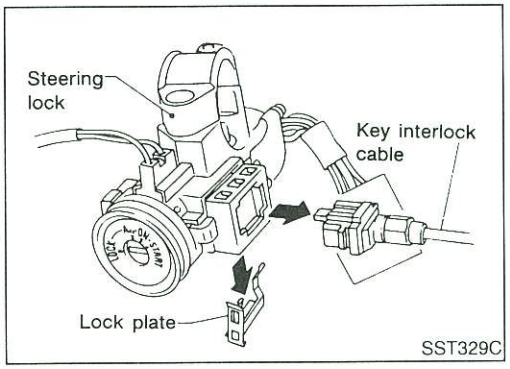


2. Align spiral cable correctly when installing steering wheel.
a. Set the front wheels in the straight-ahead position.
b. Make sure that the spiral cable is in the neutral position. The neutral position is detected by turning left about 2.5 revolutions from the right end position. Align the two marks (⧗).

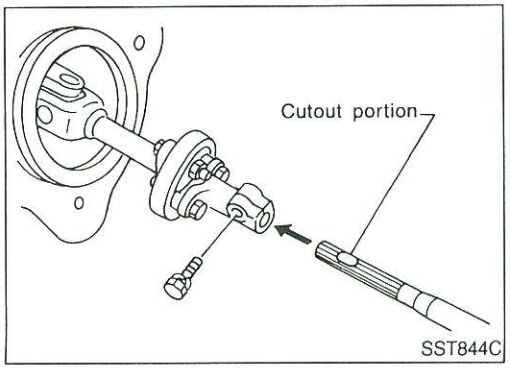
CAUTION:
- **The spiral cable may snap due to steering operation if the cable is installed in an improper position.**
- **Also, with the steering linkage disconnected, the cable may snap by turning the steering wheel beyond the limited number of turns. The spiral cable can be turned to the left about 2.5 turns from the right end position.**



3. Remove steering wheel with Tool.



4. Remove key interlock cable (A/T models).



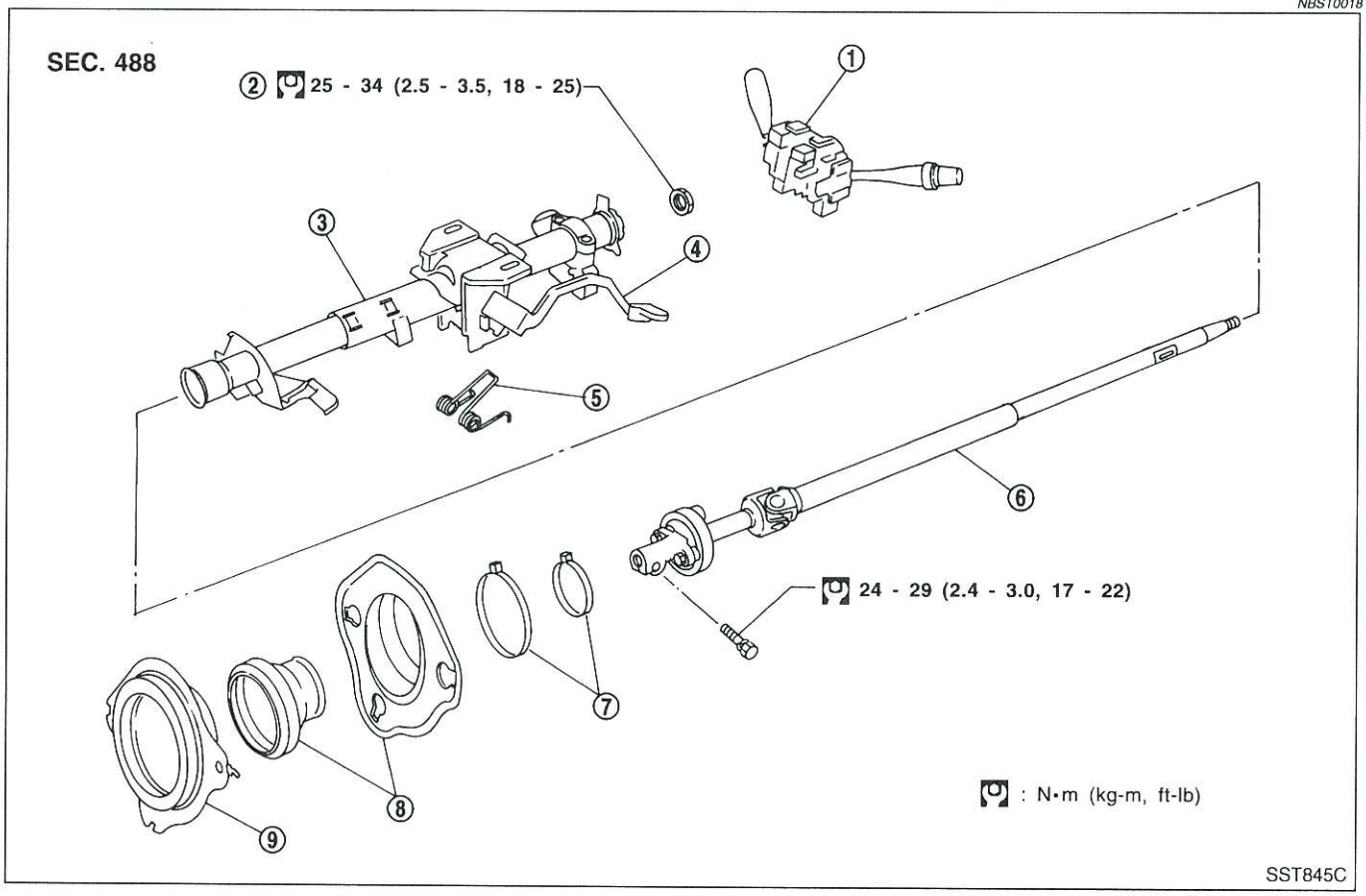
STEERING COLUMN

NBST0017S02

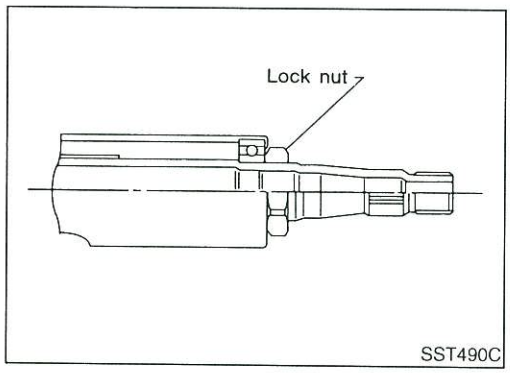
- When installing steering column, fingertighten all lower bracket and clamp retaining bolts; then tighten them securely. Do not apply undue stress to steering column.
- When attaching coupling joint, be sure tightening bolt faces cutout portion.

Disassembly and Assembly

NBST0018

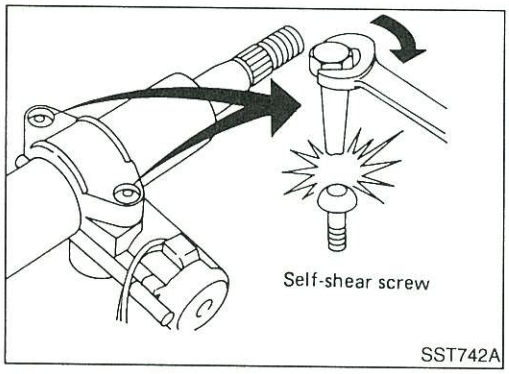


1. Combination switch
2. Lock nut
3. Jacket tube assembly
4. Tilt lever
5. Tilt spring
6. Steering column shaft assembly
7. Band
8. Jacket tube bracket insulator assembly
9. Hole cover



- When disassembling and assembling, unlock steering lock with key.
- Install lock nut on steering column shaft and tighten the nut to specification.

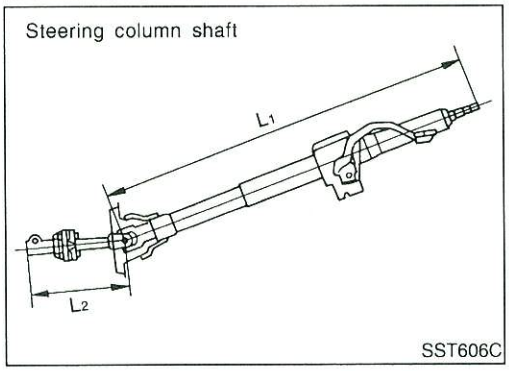
  : 25 - 34 N·m (2.5 - 3.5 kg-m, 18 - 25 ft-lb)

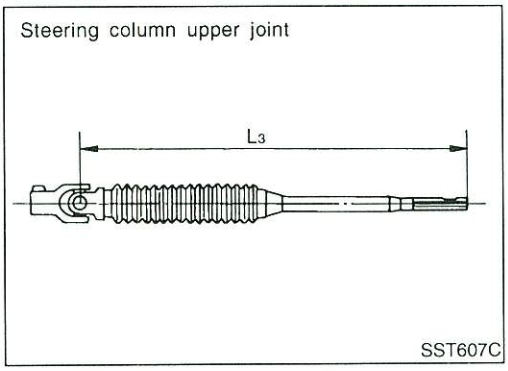


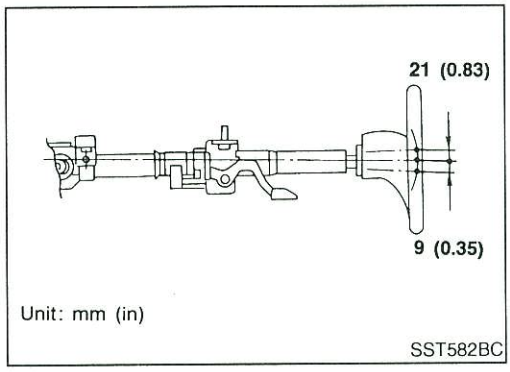
- Steering lock

a) Break self-shear type screws with a drill or other appropriate tool.

b) Install new self-shear type screws and then cut off self-shear type screw heads.







Inspection

NBST0019

- When steering wheel does not turn smoothly, check the steering column as follows and replace damaged parts.

a) Check column bearings for damage and unevenness. Lubricate with recommended multi-purpose grease or replace steering column as an assembly, if necessary.

b) Check steering column lower shaft for deformation and breakage. Replace if necessary.

- When the vehicle comes into a light collision, check length "L_1", "L_2" and "L_3".

Steering column length "L_1":
700.3 - 704.3 mm (27.57 - 27.73 in)
Steering column lower shaft length "L_2":
178 - 180 mm (7.01 - 7.09 in)
Steering column upper joint length "L_3":
430.7 - 432.7 mm (16.96 - 17.04 in)

If out of the specifications, replace steering column upper joint or steering column as an assembly.

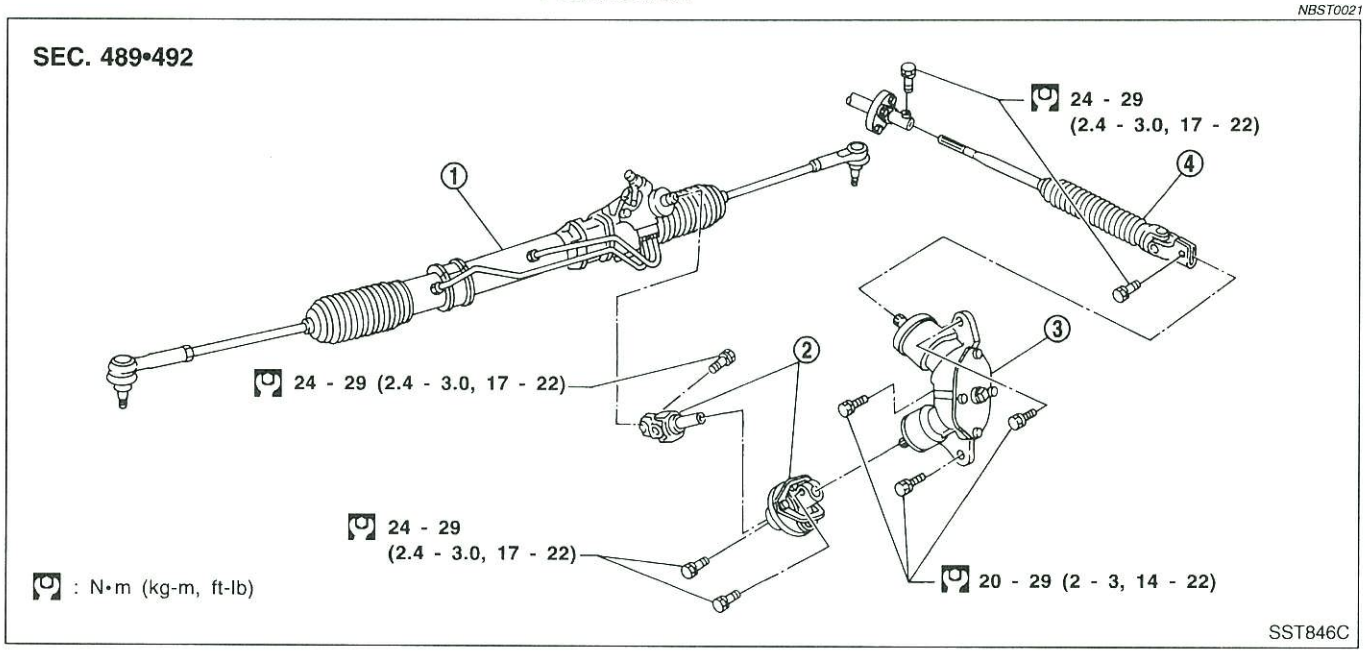
TILT MECHANISM

NBST0019S01

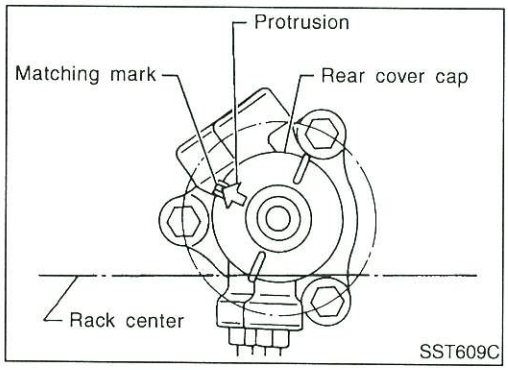
After installing steering column, check tilt mechanism operation.

Removal

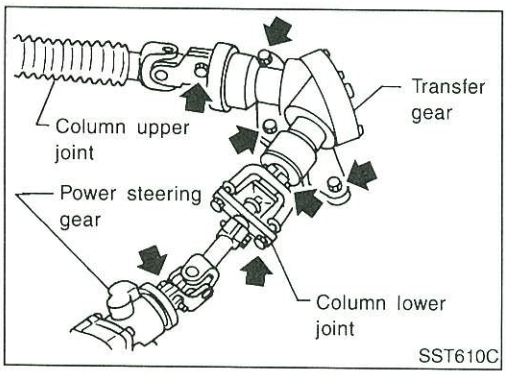
NBST0021



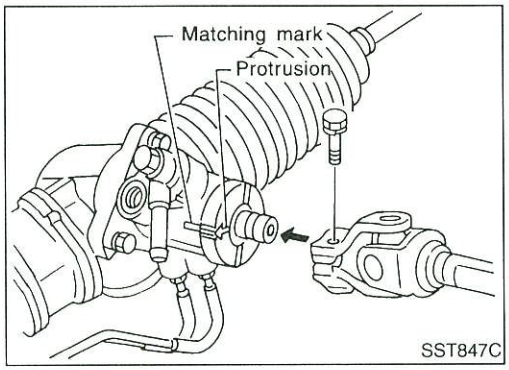
1. Power steering gear assembly
2. Steering column lower joint
3. Transfer gear assembly
4. Steering column upper joint



1. Set wheels in the straight-ahead position.
2. Straight-forward position is indicated by a protrusion on the power steering gear rear cover cap and matching mark on the rear housing.



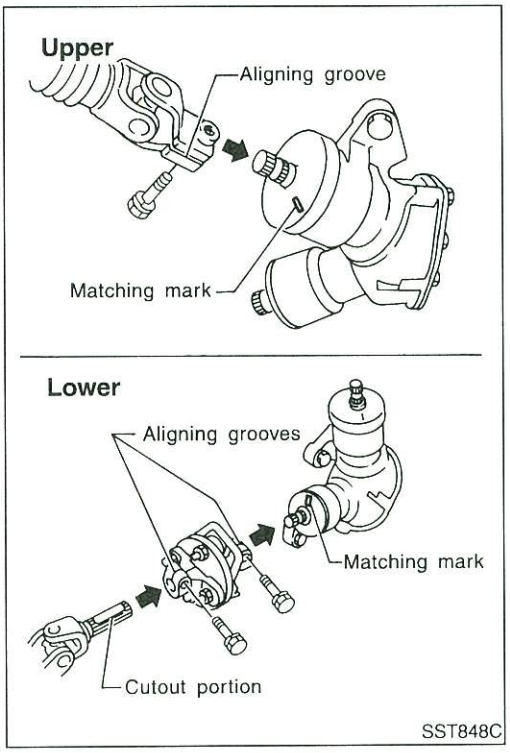
3. Remove steering column upper and lower joint from transfer gear.
4. Remove transfer gear assembly.



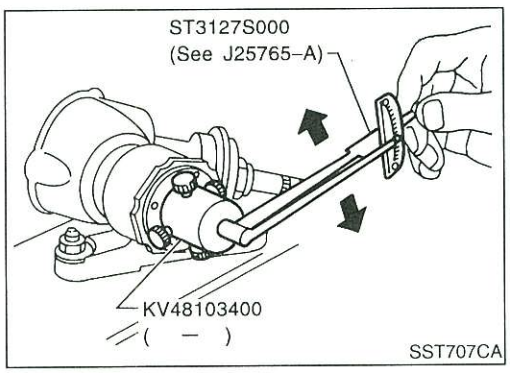
Installation

NBST0022

1. Set wheels in the straight-ahead position.
2. Install transfer gear assembly.
3. Install column lower joint while aligning groove with protrusions on the steering gear rear cover cap.
4. Tighten bolt while aligning groove on steering gear. Before tightening bolt, ensure it is inserted correctly.



5. When attaching steering column upper and lower joint to transfer gear, it must be positioned as shown in figure at left.



Inspection

NBST0024

Do not disassemble steering transfer gear assembly.

- Check that steering transfer gear assembly operates smoothly. Also check for grease leakage, deformation and damage. Replace steering transfer gear assembly if necessary.
- Check rotating torque at input shaft in 360° and in both directions.

  Rotating torque:

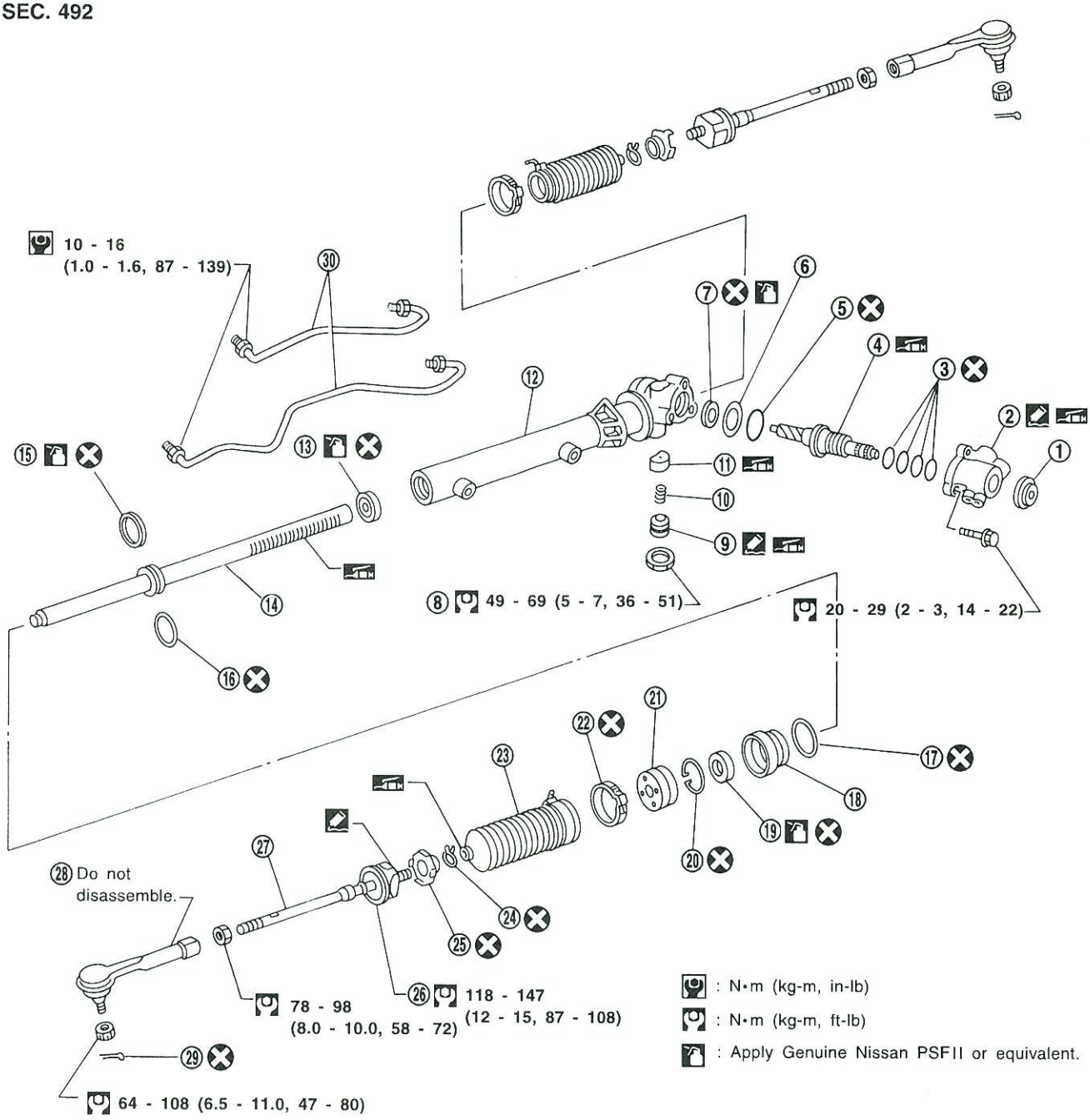
  0.25 - 0.69 N·m (2.5 - 7.0 kg-cm, 2.2 - 6.1 in-lb)

  If rotating torque is out of specification, replace steering transfer gear assembly.

Components

NBST0026

SEC. 492

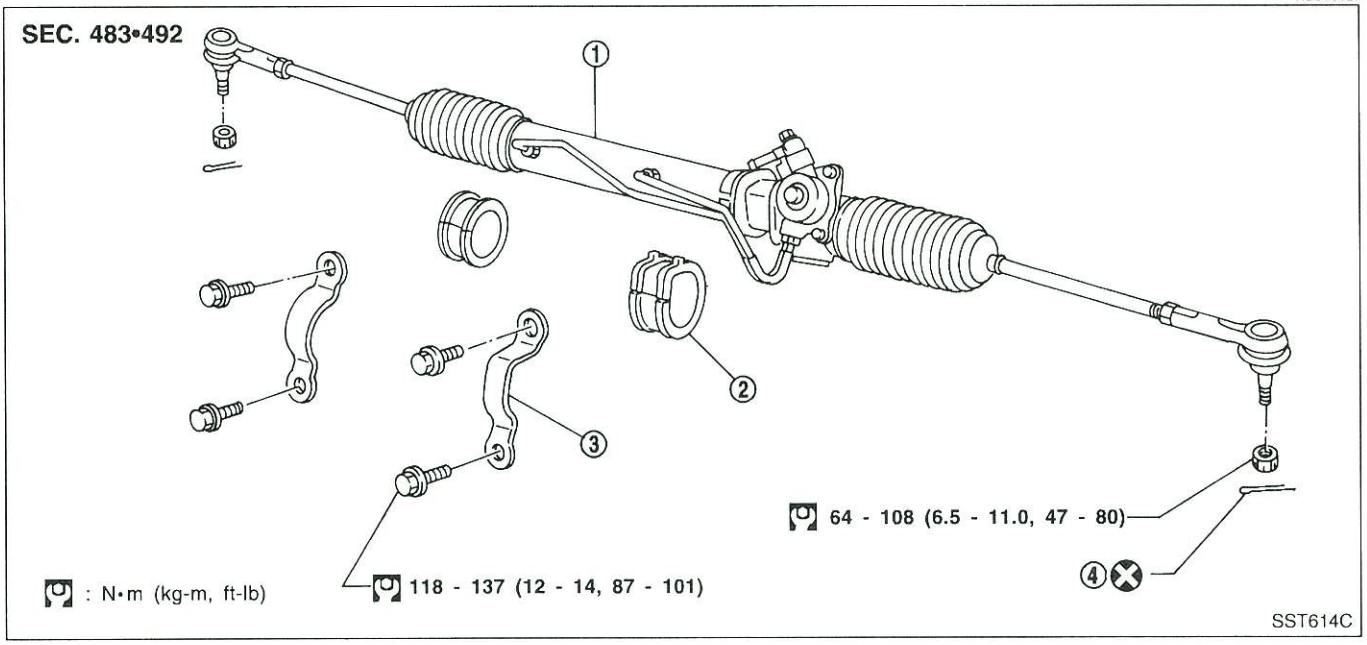


SST618CB

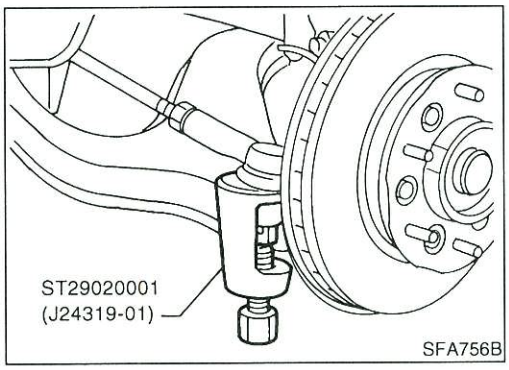
1. Rear cover cap
2. Rear housing assembly
3. Pinion seal ring
4. Pinion assembly
5. O-ring
6. Shim
7. Pinion oil seal
8. Lock nut
9. Adjusting screw
10. Spring
11. Retainer
12. Gear housing assembly
13. Rack oil seal
14. Rack assembly
15. Rack seal ring
16. O-ring
17. O-ring
18. Rack bushing
19. Rack oil seal
20. Snap ring
21. End cover assembly
22. Boot clamp
23. Dust boot
24. Boot clamp
25. Lock plate
26. Tie-rod inner socket
27. Tie-rod
28. Tie-rod outer socket
29. Cotter pin
30. Cylinder tube

Removal and Installation

NBST0027

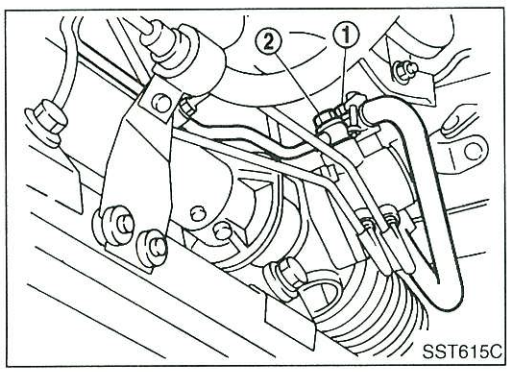


1. Gear and linkage assembly
2. Rack mounting insulator
3. Gear housing mounting bracket
4. Cotter pin



CAUTION:

- **The rotation of the spiral cable (SRS "AIR BAG" component part) is limited. If the steering gear must be removed, set the front wheels in the straight-ahead direction. Do not rotate the steering column while the steering gear is removed.**
- **Remove the steering wheel before removing the steering lower joint to avoid damaging the SRS spiral cable.**
- Detach tie-rod outer sockets from knuckle arms with Tool.



- Install pipe connector.
- Observe specified tightening torque when tightening high-pressure and low-pressure pipe connectors. Excessive tightening will damage threads of connector or O-ring.

  Connector tightening torque:

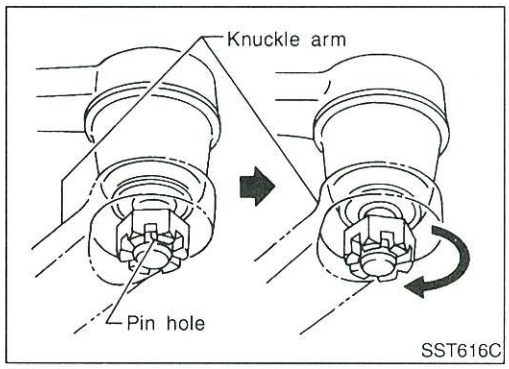
  Low-pressure side "1"

  30 - 35 N·m (3.1 - 3.6 kg-m, 22 - 26 ft-lb)

  High-pressure side "2"

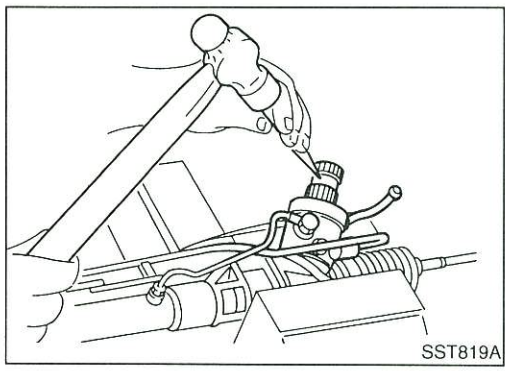
  30 - 35 N·m (3.1 - 3.6 kg-m, 22 - 26 ft-lb)
- The O-ring in low-pressure pipe connector is larger than that

in high-pressure connector. Take care to install the proper O-ring.

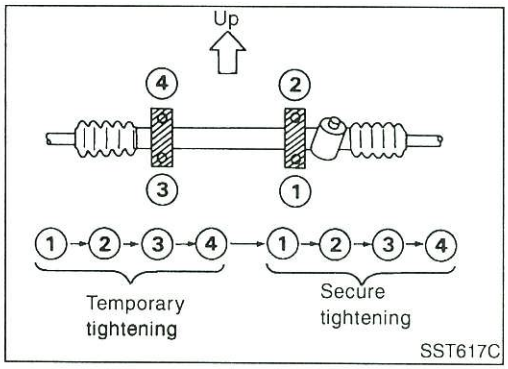


- Initially, tighten nut on tie-rod outer socket and knuckle arm to 64 to 69 N·m (6.5 to 7.0 kg-m, 47 to 51 ft-lb). Then tighten further to align nut groove with first pin hole so that cotter pin can be installed.

CAUTION:
Tightening torque must not exceed 108 N·m (11.0 kg-m, 80 ft-lb).

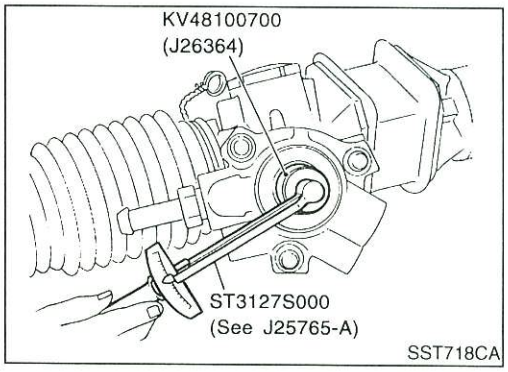


- Before removing steering column lower joint from gear, set gear in neutral (wheels in straight-ahead position). After removing steering column lower joint, put matching mark on pinion shaft and pinion housing to record neutral position.
- To install, set left and right dust boots to equal deflection. Attach steering column lower joint by aligning matching marks of pinion shaft and pinion housing.



- Tighten gear housing mounting bracket bolts in the order shown.

Secure tightening torque:
118 - 137 N·m (12 - 14 kg-m, 87 - 101 ft-lb)



Disassembly

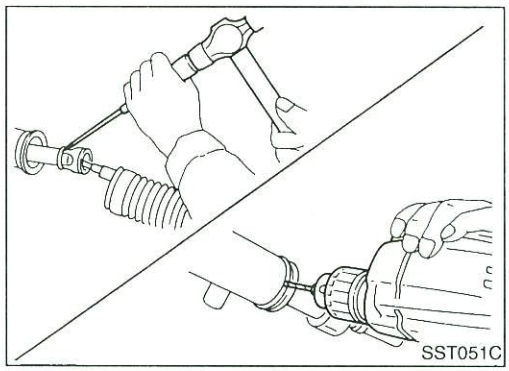
NBST0028

1. Prior to disassembling, measure pinion rotating torque. Record the pinion rotating torque as a reference.

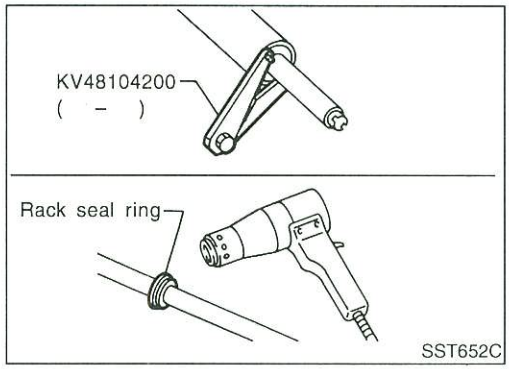
- **Before measuring, disconnect cylinder tube and drain fluid.**
- **Use soft jaws when holding steering gear housing. Handle gear housing carefully, as it is made of aluminum. Do not grip cylinder in a vise.**

2. Remove pinion gear.

Be careful not to damage pinion gear when removing pinion seal ring.



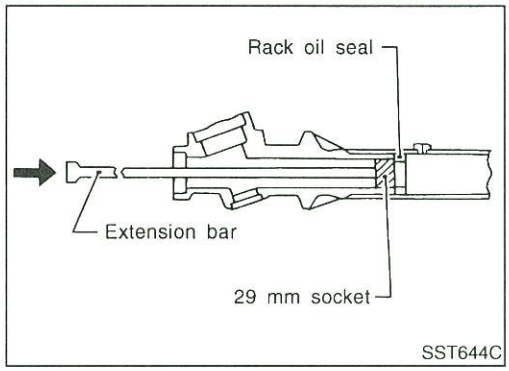
3. Remove tie-rod outer sockets and boots.
4. Loosen tie-rod inner socket by prying up staked portion, and remove socket.
5. Remove retainer.
6. Remove pinion assembly.
7. Use a 2 to 2.5 mm (0.079 to 0.098 in) diameter drill to completely remove staked portion of gear housing end.



8. Remove gear housing end cover assembly with a suitable tool.
9. Draw out rack assembly.
10. Remove rack seal ring.

- Using a heat gun, heat rack seal to approximately 40°C (104°F).
- Remove rack seal ring.

Be careful not to damage rack.



11. Remove rack bushing and rack oil seal using tape wrapped socket and extension bar.

Do not scratch inner surfaces of pinion housing.

Inspection

NBST0029

Thoroughly clean all parts in cleaning solvent or Genuine Nissan PSF II or equivalent. Blow dry with compressed air, if available.

BOOT

NBST0029S01

- Check condition of boot. If cracked excessively, replace it.
- Check boots for accumulation of power steering fluid.

RACK

NBST0029S02

Thoroughly examine rack gear. If damaged, cracked and worn, replace it.

PINION ASSEMBLY

NBST0029S03

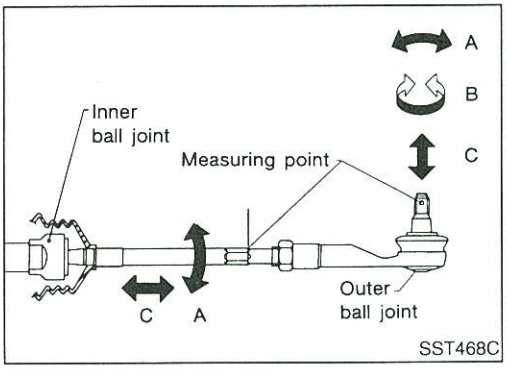
- Thoroughly examine pinion gear. If pinion gear is damaged, cracked and worn, replace it.
- Check that all bearings roll freely. Ensure that balls, rollers and races are not cracked, pitted and worn.

GEAR HOUSING CYLINDER

NBST0029S04

Check gear housing cylinder bore for scratches and other damage. Replace if necessary.

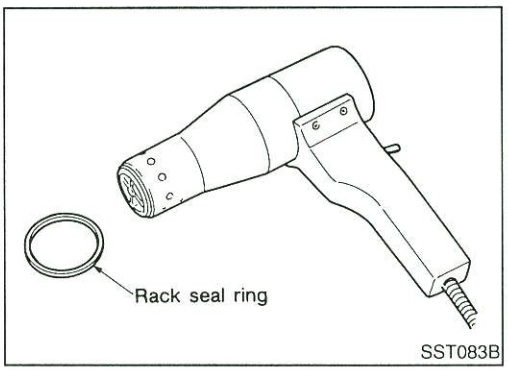
Inspection (Cont'd)



TIE-ROD OUTER AND INNER SOCKETS

NBST0029S05

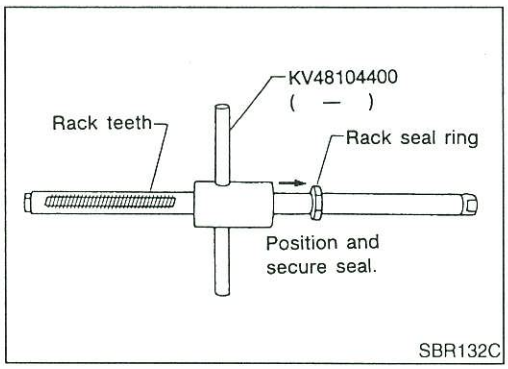
- Check ball joints for swinging force.
  Tie-rod outer and inner ball joints swinging force "A":
  Refer to SDS, ST-31.
- Check ball joint for rotating torque.
  Tie-rod outer ball joint rotating torque "B":
  Refer to SDS, ST-31.
- Check ball joints for axial end play.
  Tie-rod outer and inner ball joints axial end play "C":
  Refer to SDS, ST-31.
- Check condition of dust cover. If cracked excessively, replace outer tie-rod.



Assembly

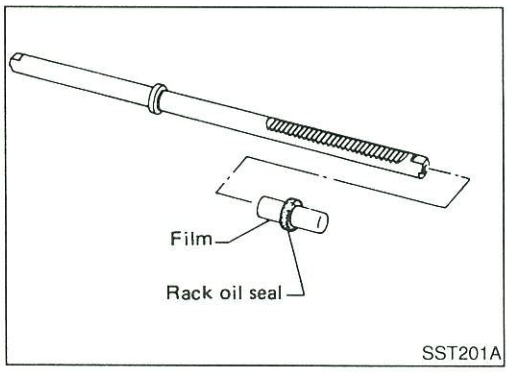
NBST0030

1. Using a heat gun, heat new teflon rack seal ring to approximately 40°C (104°F). Then place it onto rack.



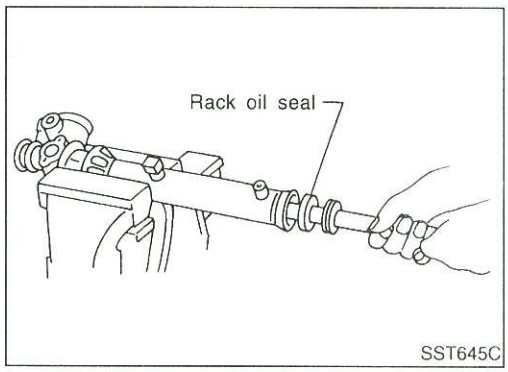
2. Using Tool, compress rack seal ring securely on rack.

Always insert Tool from the rack gear side.

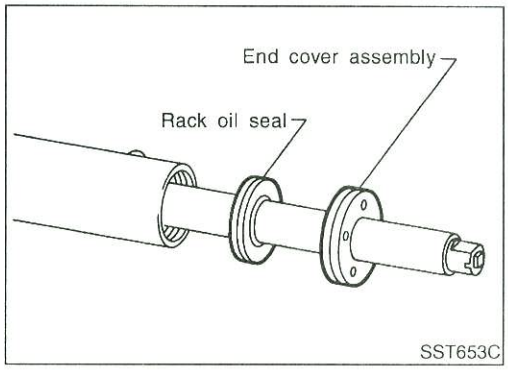


3. Insert new rack oil seal.

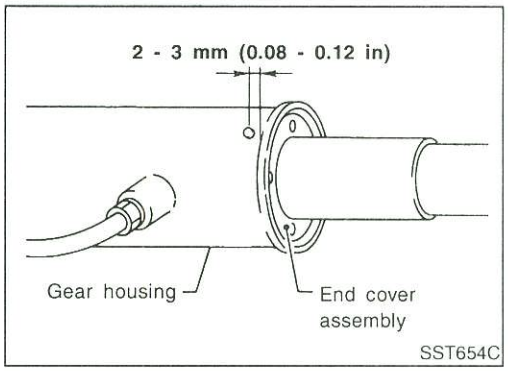
- **Place plastic film into rack oil seal to prevent damage by rack teeth.**
- **Do not forget to remove plastic film after rack oil seal is positioned properly.**
- **Make sure lips of rack oil seal face each other.**



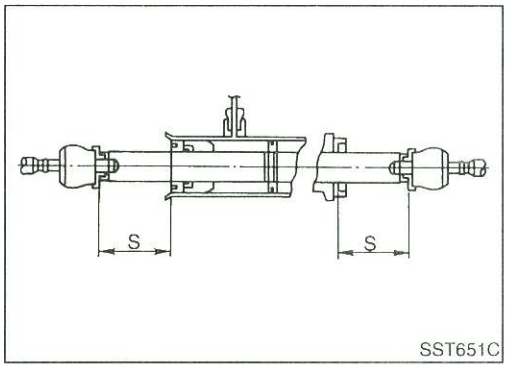
4. Install rack oil seal and rack bushing with rack assembly.



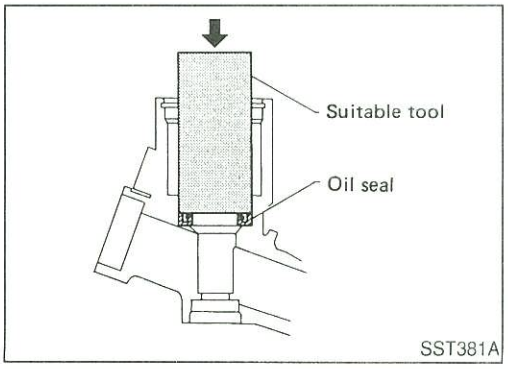
5. Insert rack oil seal and end cover assembly to rack. Then tighten end cover assembly.



6. Fasten cylinder end cover assembly to gear housing by staking.

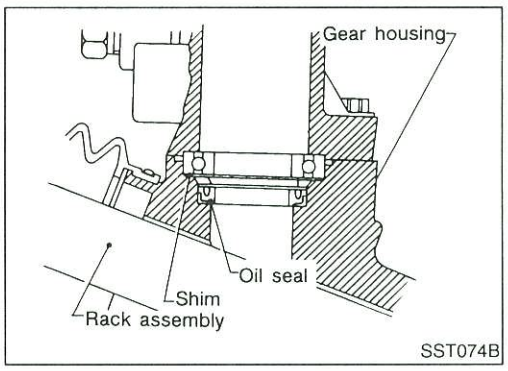


7. Set rack gear in the neutral position.
   Rack stroke "S":
   Refer to SDS, ST-31.

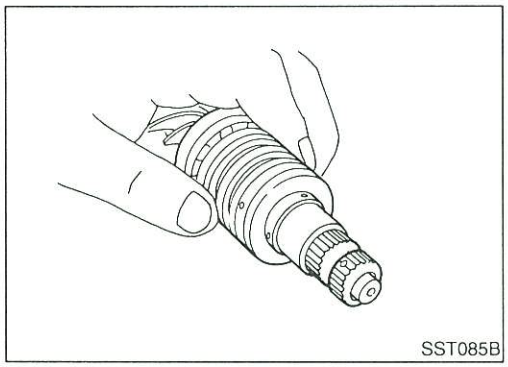


8. Coat seal lip of new pinion oil seal with multi-purpose grease. Install it into pinion housing of gear with a suitable tool.

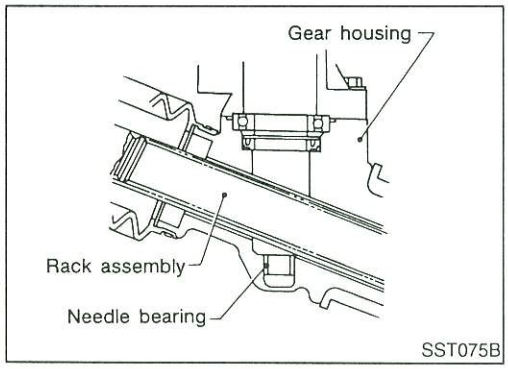
Make sure lip of oil seal faces up when installed.



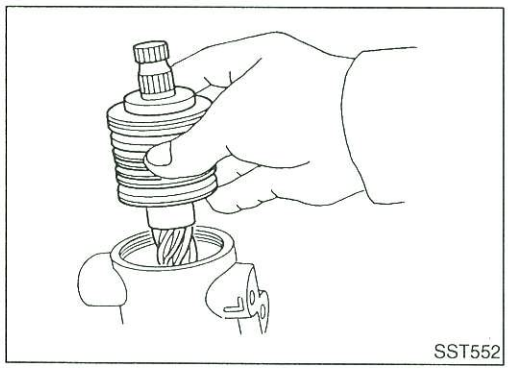
9. Install pinion bearing adjusting shim(s).
- Whenever pinion assembly, gear housing and rear housing are disassembled, replace shim(s) with new ones. Always use the same number of shim(s) when replacing.



10. Install new pinion seal ring (made of Teflon) on pinion gear assembly.
- Using a heat gun, heat pinion seal ring to approximately 40°C (104°F) before installing it onto pinion gear assembly.
- Make sure pinion seal ring is properly settled in valve groove.

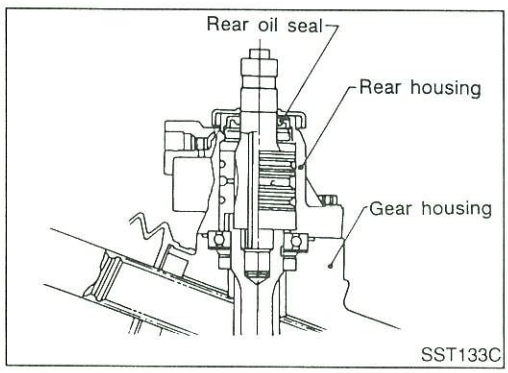


11. Apply a coat of multi-purpose grease to needle bearing roller and oil seal lip.

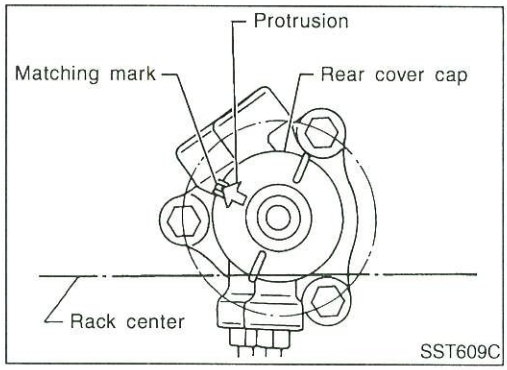


12. Install pinion assembly to rear housing.

Be careful not to damage pinion oil seal.



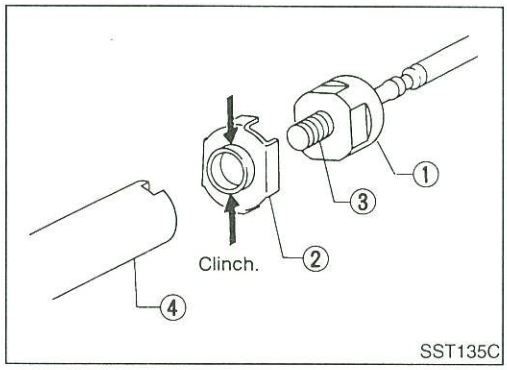
13. Apply a coat of multi-purpose grease to new rear oil seal lip before installing rear housing.



14. Ensure that the rack is centered. Install rear cover cap so that its protrusion is positioned as shown in figure.

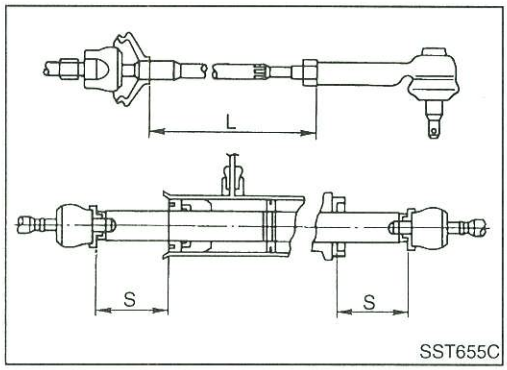
Be careful not to damage worm ring and oil seal.

15. Install retainer, spring and adjusting screw temporarily.

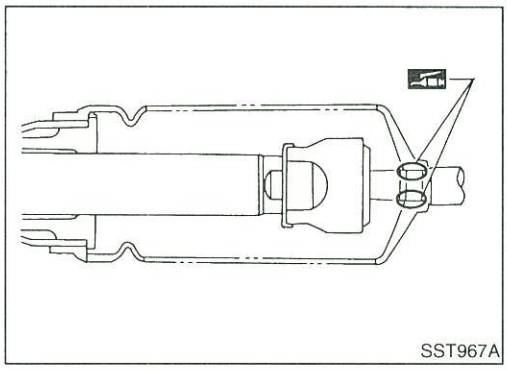


16. Install new lock plate.
- Attach lock plate 2 to side rod inner socket 1.
- Apply locking sealant to inner socket threads 3. Screw inner socket into rack 4 and tighten to specified torque.
- Clinch two places of lock plate at rack's groove.

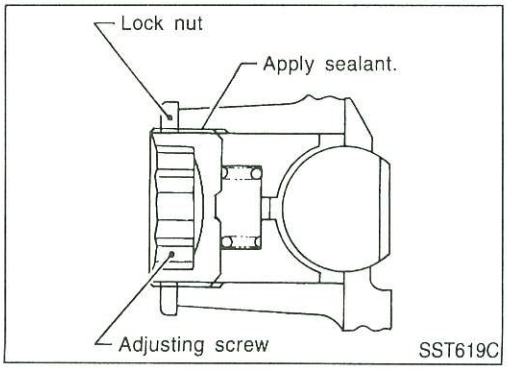
CAUTION:
To prevent scratching the boot, remove burrs from lock plate.



17. Tighten outer socket lock nut.
Tie-rod length "L":
Refer to SDS, ST-31.
18. Measure rack stroke.
Rack stroke "S":
Refer to SDS, ST-31.



19. Before installing boot, coat the contact surfaces between boot and tie-rod with grease.



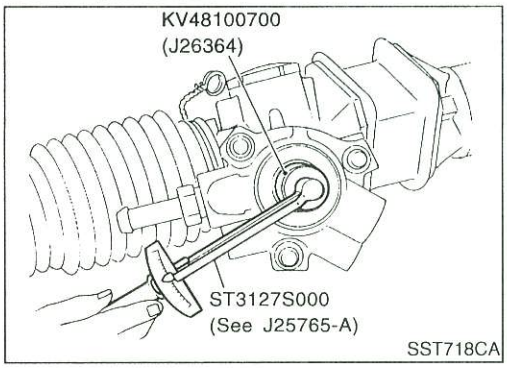
Adjustment

NBST0031

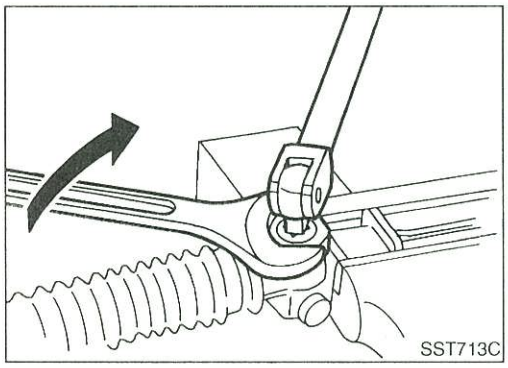
Adjust pinion rotating torque as follows:

1. Set rack to the neutral position without fluid in the gear.
2. Coat the adjusting screw with locking sealant and screw it in.
3. Lightly tighten lock nut.
4. Tighten adjusting screw to a torque of 4.9 to 5.9 N·m (50 to 60 kg-cm, 43 to 52 in-lb).
5. Loosen adjusting screw, then retighten it to 0.2 N·m (2 kg-cm, 1.7 in-lb).

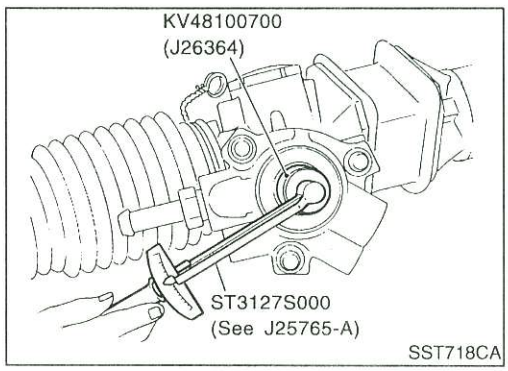
Adjustment (Cont'd)



6. Move rack over its entire stroke several times.
7. Measure pinion rotating torque within the range of 180° from neutral position.
   Stop the gear at the point of maximum torque.
8. Loosen adjusting screw, then retighten it to 4.9 to 5.9 N·m (50 to 60 kg-cm, 43 to 52 in-lb).
9. Loosen adjusting screw by 10° to 20°.

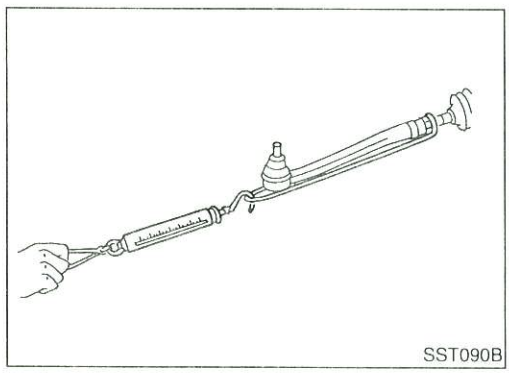


10. Prevent adjusting screw from turning, and tighten lock nut to specified torque.



11. Measure pinion rotating torque.
    Lock to lock:
    Average rotating torque
    0.78 - 1.47 N·m (8.0 - 15.0 kg-cm, 6.9 - 13.0 in-lb)
    Within ±100° from the neutral position:
    Maximum torque variation
    0.4 N·m (4 kg-cm, 3.5 in-lb)
    Outside the above range:
    Maximum force variation
    0.6 N·m (6 kg-cm, 5.2 in-lb)

- If pinion rotating torque is not within specifications, readjust it starting from step 4. If pinion rotating torque is still out of specifications after readjustment, replace steering gear assembly.



12. Check rack sliding force on vehicle as follows:
a. Install steering gear onto vehicle, but do not connect tie-rod to knuckle arm.
b. Connect all piping and fill with steering fluid.
c. Start engine and bleed air completely.
d. Disconnect steering column lower joint from the gear.
e. Keep engine at idle and make sure steering fluid has reached normal operating temperature.
f. Pull tie-rod slowly to move it from neutral position to ±11.5 mm (±0.453 in) at speed of 3.5 mm (0.138 in)/s. Check that rack sliding force is within specification.

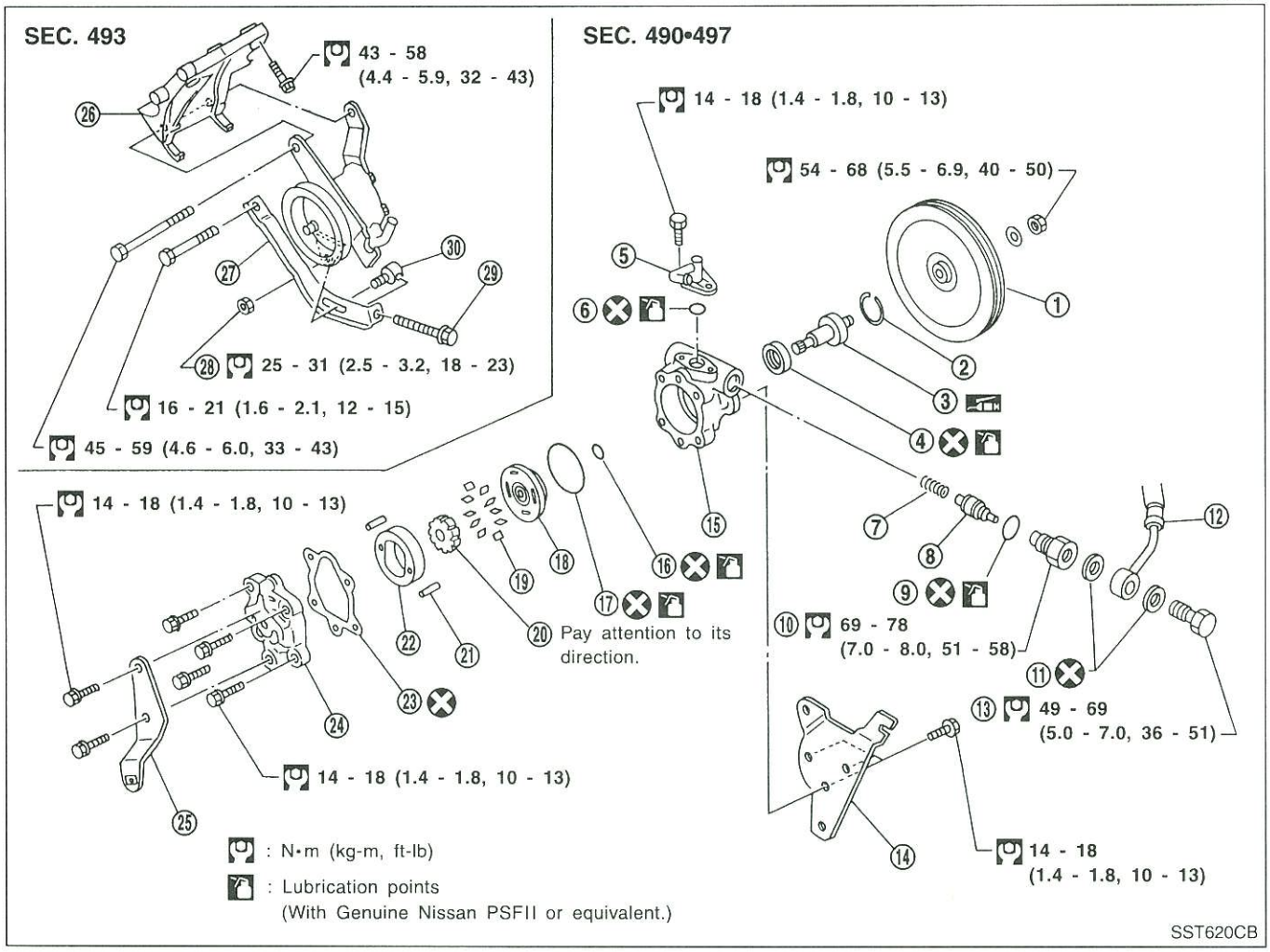
Rack sliding force:

137 - 255 N (14 - 26 kg, 31 - 57 lb)

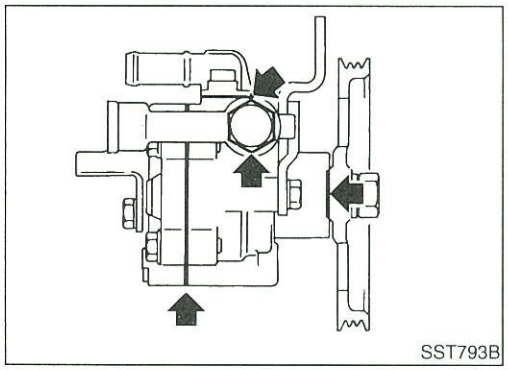
- If rack sliding force is not within specification, readjust by repeating adjustment procedure from the beginning.
- If rack sliding force is still out of specification after readjustment, gear assembly needs to be replaced.

Components

NBST0032



1. Pulley
2. Snap ring
3. Drive shaft assembly
4. Oil seal
5. Suction pipe
6. O-ring
7. Spring
8. Flow control valve
9. O-ring
10. Connector
11. Copper washer
12. Hose
13. Eye bolt
14. Front bracket
15. Front housing
16. O-ring
17. O-ring
18. Front side plate
19. Vane
20. Rotor
21. Pin
22. Cam ring
23. Gasket
24. Rear cover
25. Rear bracket
26. Power steering pump bracket
27. Adjusting bar
28. Adjusting bolt lock nut
29. Adjusting bolt
30. Adjusting bolt bracket



Pre-disassembly Inspection

NBST0033

Disassemble the power steering oil pump only if the following items are found.

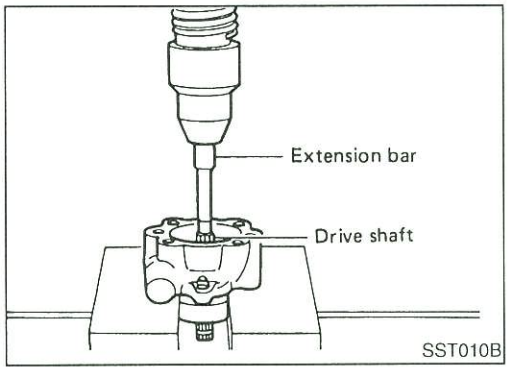
- Oil leak from any point shown in the figure.
- Deformed or damaged pulley.
- Poor performance.

Disassembly

NBST0034

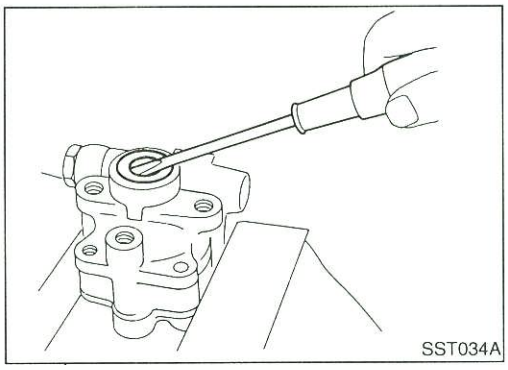
CAUTION:

- **Parts which can be disassembled are strictly limited. Never disassemble parts other than those specified.**
- **Disassemble in as clean a place as possible.**
- **Clean your hands before disassembly.**
- **Do not use rags; use nylon cloths or paper towels.**
- **Follow the procedures and cautions in the Service Manual.**
- **When disassembling and reassembling, do not let foreign matter enter or contact the parts.**



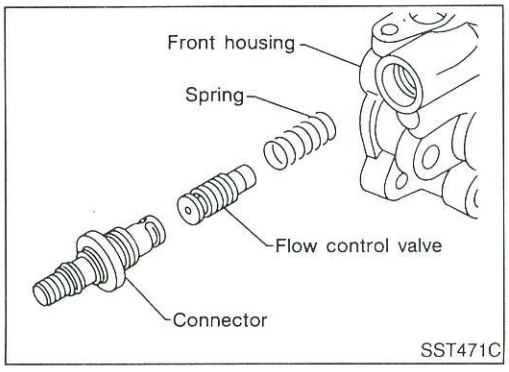
- Remove snap ring, then draw pulley shaft out.

Be careful not to drop drive shaft.



- Remove oil seal.

Be careful not to damage front housing.



- Remove connector and flow control valve with spring.

Be careful not to drop flow control valve.

Inspection

NBST0035

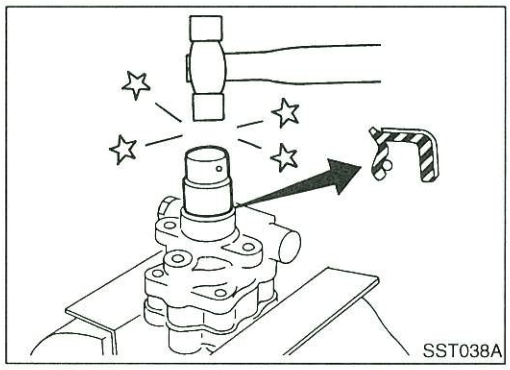
- If pulley is cracked or deformed, replace it.
- If an oil leak is found around pulley shaft oil seal, replace the seal.
- If serration on pulley or pulley shaft is deformed or worn, replace it.

Assembly

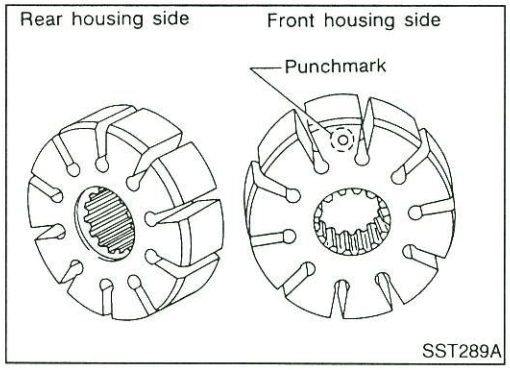
NBST0036

Assemble oil pump, noting the following instructions.

- Make sure O-rings and oil seal are properly installed.
- Always install new O-rings and oil seal.
- Be careful of oil seal direction.
- Cam ring, rotor and vanes must be replaced as a set if necessary.
- Coat each part with Genuine Nissan PSF II or equivalent when assembling.

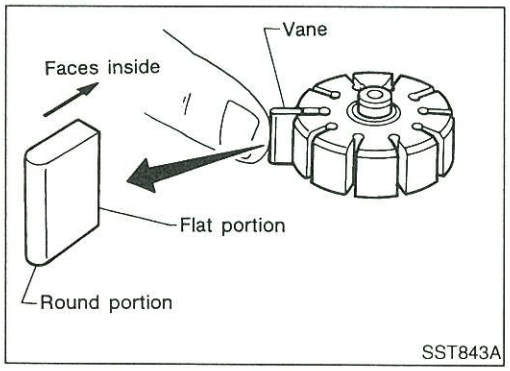

SST038A

- Pay attention to the direction of rotor.

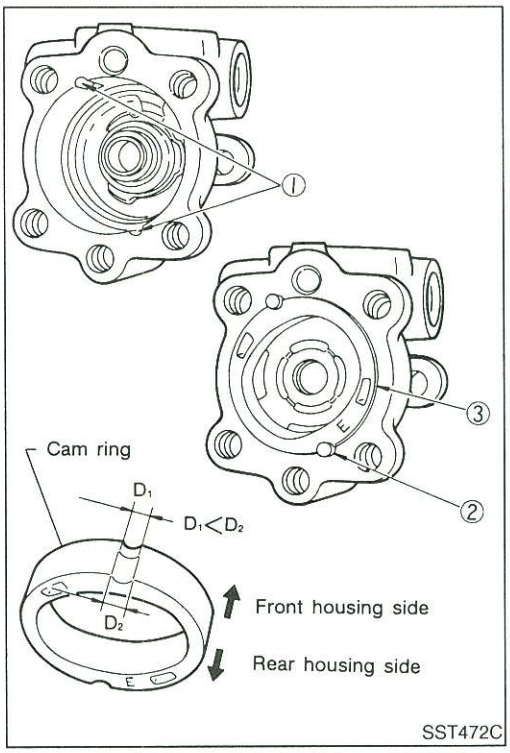


SST289A

- When assembling vanes to rotor, rounded surfaces of vanes must face cam ring side.



SST843A



- Insert pin 2 into pin groove 1 of front housing and front side plate. Then install cam ring 3 as shown at left.

  Cam ring:

  D_1 is less than D_2.

General Specifications

NBST0037

Applied model	All
Steering model	Power steering
Steering gear type	PR32K
Steering overall gear ratio	17.2
Turns of steering wheel (Lock to lock)	3.09
Steering column type	Collapsible, tilt

Steering Wheel

NBST0038

Unit: mm (in)

Steering wheel axial play	0 (0)
Steering wheel play	35 (1.38) or less
Movement of gear housing	±2 (±0.08) or less

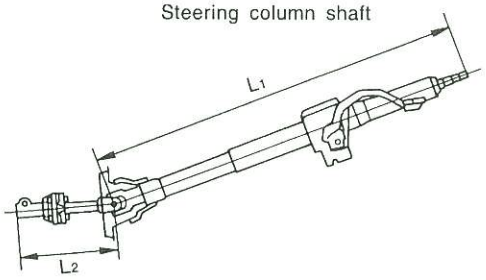
Steering Column

NBST0039

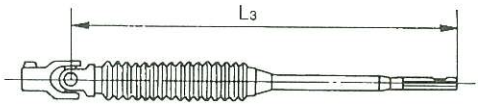
Unit: mm (in)

Steering column length "L_1"	700.3 - 704.3 (27.57 - 27.73)
Steering column lower shaft length "L_2"	178 - 180 (7.01 - 7.09)
Steering column upper joint length "L_3"	430.7 - 432.7 (16.96 - 17.04)

Steering column shaft



Steering column upper joint



SST739C

Steering Transfer Gear

NBST0041

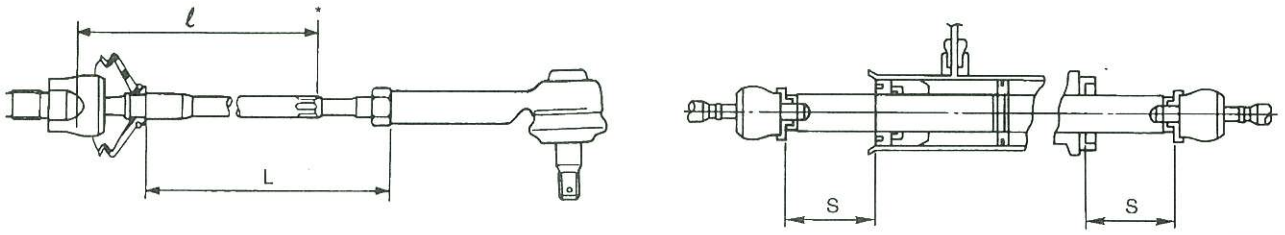
Rotating torque	0.25 - 0.69 N·m (2.5 - 7.0 kg-cm, 2.2 - 6.1 in-lb)

Steering Gear and Linkage

NBST0040

Applied model		All
Steering gear type		PR32K
Tie-rod outer ball joint	Swinging force at cotter pin hole: "A"	4.9 - 47.1 N (0.5 - 4.8 kg, 1.1 - 10.6 lb)
	Rotating torque: "B"	0.3 - 2.9 N·m (3 - 30 kg-cm, 2.6 - 26.0 in-lb)
	Axial end play: "C"	0.1 mm (0.004 in) or less
Tie-rod inner ball joint	Swinging force*: "A"	3.9 - 32.4 N (0.4 - 3.3 kg, 0.9 - 7.3 lb)
	Axial end play: "C"	0.3 mm (0.012 in) or less
Tie-rod standard length "L"		200 mm (7.87 in)
Rack stroke "S"		72.0 mm (2.835 in)
Pinion gear preload without gear fluid	Lock to lock Average rotating torque	0.78 - 1.47 N·m (8.0 - 15.0 kg-cm, 6.9 - 13.0 in-lb)
	Within ±100° from the neutral position Maximum torque variation	0.4 N·m (4 kg-cm, 3.5 in-lb)
	Outside the above range Maximum torque variation	0.6 N·m (6 kg-cm, 5.2 in-lb)

*: Measuring point [ℓ: 240 mm (9.45 in)]



SST740C

Power Steering

NBST0042

Steering gear type		PR32K
Rack sliding force Under normal operating oil pressure		137 - 255 N (14 - 26 kg, 31 - 57 lb)
Retainer adjustment (Adjustment screw)	Initial tightening torque	4.9 - 5.9 N·m (50 - 60 kg-cm, 43 - 52 in-lb)
	Retightening torque after loosening	0.2 N·m (2 kg-cm, 1.7 in-lb)
	Tightening torque after gear has settled	4.9 - 5.9 N·m (50 - 60 kg-cm, 43 - 52 in-lb)
	Returning angle	10° - 20°
Steering wheel turning force (Measured at one full turn from the neutral position)		39 N (4 kg, 9 lb) or less
Fluid capacity (Approximate)		0.9 ℓ (1 US qt, 3/4 Imp qt)
Oil pump maximum pressure		8,630 - 9,219 kPa (88 - 94 kg/cm^2, 1,251 - 1,337 psi)

RESTRAINT SYSTEM

SECTION RS

CONTENTS

SEAT BELTS 2
Precautions 2
SUPPLEMENTAL RESTRAINT SYSTEM (SRS) "AIR BAG" AND "SEAT BELT PRE-TENSIONER" 2
PRECAUTION FOR SEAT BELT SERVICE 2
Front Seat Belt 3
REMOVAL AND INSTALLATION 3
Rear Seat Belt 4
REMOVAL AND INSTALLATION 4
Seat Belt Inspection 6
AFTER A COLLISION 6
PRELIMINARY CHECKS 6
SEAT BELT RETRACTOR ON-VEHICLE CHECK 7
SEAT BELT RETRACTOR OFF-VEHICLE CHECK 7
SUPPLEMENTAL RESTRAINT SYSTEM (SRS) 9
Precautions 9
SUPPLEMENTAL RESTRAINT SYSTEM (SRS) "AIR BAG" AND "SEAT BELT PRE-TENSIONER" 9
PRECAUTIONS FOR SRS "AIR BAG" AND "SEAT BELT PRE-TENSIONER" SERVICE 9
WIRING DIAGRAMS AND TROUBLE DIAGNOSIS 9
Preparation 10
SPECIAL SERVICE TOOLS 10
Description 11
Seat Belt Pre-tensioner with Load Limiter 11
Built-in Type Side Air Bag 12
SRS Component Parts Location 12
Maintenance Items 13
Diagnosis Sensor Unit 14
REMOVAL AND INSTALLATION 14
Seat Belt Pre-tensioner 14
REMOVAL AND INSTALLATION 14
Satellite Sensor 15
REMOVAL AND INSTALLATION 15
Driver Air Bag Module and Spiral Cable 16
REMOVAL AND INSTALLATION 16
REMOVAL 16
INSTALLATION 18
Front Passenger Air Bag Module 18
REMOVAL 18
INSTALLATION 19
Side Air Bag Module 20
REMOVAL 20
INSTALLATION 21
Disposal of Air Bag Module and Seat Belt Pre-tensioner 22
CHECKING DEPLOYMENT TOOL 23
DEPLOYMENT PROCEDURES FOR AIR BAG MODULE (OUTSIDE OF VEHICLE) 24
DEPLOYMENT PROCEDURES FOR SEAT BELT PRE-TENSIONER (OUTSIDE OF VEHICLE) 26
DEPLOYMENT OF AIR BAG MODULE AND SEAT BELT PRE-TENSIONER WHILE MOUNTED IN VEHICLE 27
DISPOSING OF AIR BAG MODULE AND SEAT BELT PRE-TENSIONER 27
Trouble Diagnoses Introduction 29
DIAGNOSIS FUNCTION 29
DIAGNOSIS MODE FOR CONSULT 29
(B) HOW TO CHANGE SELF-DIAGNOSIS MODE WITH CONSULT 30
(X) HOW TO CHANGE SELF-DIAGNOSIS MODE WITHOUT CONSULT 31
HOW TO ERASE SELF-DIAGNOSIS RESULTS 31
How to Perform Trouble Diagnoses for Quick and Accurate Repair 32
INFORMATION FROM CUSTOMER 32
PRELIMINARY CHECK 32
WORK FLOW 32
Schematic 33
Wiring Diagram — SRS — 34
SRS Operation Check 37
DIAGNOSTIC PROCEDURE 1 37
(B) Trouble Diagnoses with CONSULT 39
DIAGNOSTIC PROCEDURE 2 39
DIAGNOSTIC PROCEDURE 3 42
DIAGNOSTIC PROCEDURE 4 (CONTINUED FROM DIAGNOSTIC PROCEDURE 2) 44
DIAGNOSTIC PROCEDURE 5 44
(X) Trouble Diagnoses without CONSULT 49
DIAGNOSTIC PROCEDURE 6 49

CONTENTS (Cont'd)

DIAGNOSTIC PROCEDURE 7 52
DIAGNOSTIC PROCEDURE 8 (CONTINUED FROM DIAGNOSTIC PROCEDURE 6) 54
Trouble Diagnoses: "AIR BAG" Warning Lamp Does Not Turn Off 55
DIAGNOSTIC PROCEDURE 9 55
Trouble Diagnoses: "AIR BAG" Warning Lamp Does Not Turn On 56
DIAGNOSTIC PROCEDURE 10 56
Trouble Diagnoses: SRS Does Not Enter Diagnosis Mode Using Door Switch 57
DIAGNOSTIC PROCEDURE 11 57
Trouble Diagnoses: "SEAT BELT" Warning Lamp Does Not Turn Off 58
DIAGNOSTIC PROCEDURE 12 58
Trouble Diagnoses: "SEAT BELT" Warning Lamp Does Not Turn On 59
DIAGNOSTIC PROCEDURE 13 59
Collision Diagnosis 59
FOR FRONTAL COLLISION 59
FOR SIDE COLLISION 61

Precautions

SUPPLEMENTAL RESTRAINT SYSTEM (SRS) "AIR BAG" AND "SEAT BELT PRE-TENSIONER"

NBRS0001

The Supplemental Restraint System such as "AIR BAG" and "SEAT BELT PRE-TENSIONER" used along with a seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. The SRS composition which is available to INFINITI QX4 is as follows:

- For a frontal collision
  The Supplemental Restraint System consists of driver air bag module (located in the center of the steering wheel), front passenger air bag module (located on the instrument panel on passenger side), seat belt pre-tensioners, a diagnosis sensor unit, warning lamp, wiring harness and spiral cable.
- For a side collision
  The Supplemental Restraint System consists of side air bag module (located in the outer side of front seat), satellite sensor, diagnosis sensor unit (one of components of air bags for a frontal collision), wiring harness, warning lamp (one of components of air bags for a frontal collision).

WARNING:

- **To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance must be performed by an authorized INFINITI dealer.**
- **Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system.**
- **Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. Spiral cable and wiring harnesses (except "SEAT BELT PRE-TENSIONER") covered with yellow insulation either just before the harness connectors or for the complete harness are related to the SRS.**

PRECAUTION FOR SEAT BELT SERVICE

NBRS0002

CAUTION:

- **Before removing the seat belt pre-tensioner assembly, turn the ignition switch off, disconnect both battery cables and wait at least 3 minutes.**
- **Do not use electrical test equipment for seat belt pre-tensioner connector.**
- **After replacing or reinstalling seat belt pre-tensioner assembly, or reconnecting seat belt pre-tensioner connector, check the system function. Refer to "Checking Seat Belt Pre-tensioner Operation by Using "SEAT BELT" Warning Lamp — User Mode", "SRS Operation Check" (RS-38) for details.**
- **Do not use disassemble buckle or seat belt assembly.**
- **Replace anchor bolts if they are deformed or worn out.**
- **Never oil tongue and buckle.**
- **If any component of seat belt assembly is questionable, do not repair. Replace the whole seat belt assembly.**
- **If webbing is cut, frayed, or damaged, replace seat belt assembly.**
- **When replacing seat belt assembly, use a genuine seat belt assembly.**
- **After any collision, inspect all seat belt assemblies, including retractors and other attached hardwares (i.e., guide rail set).**

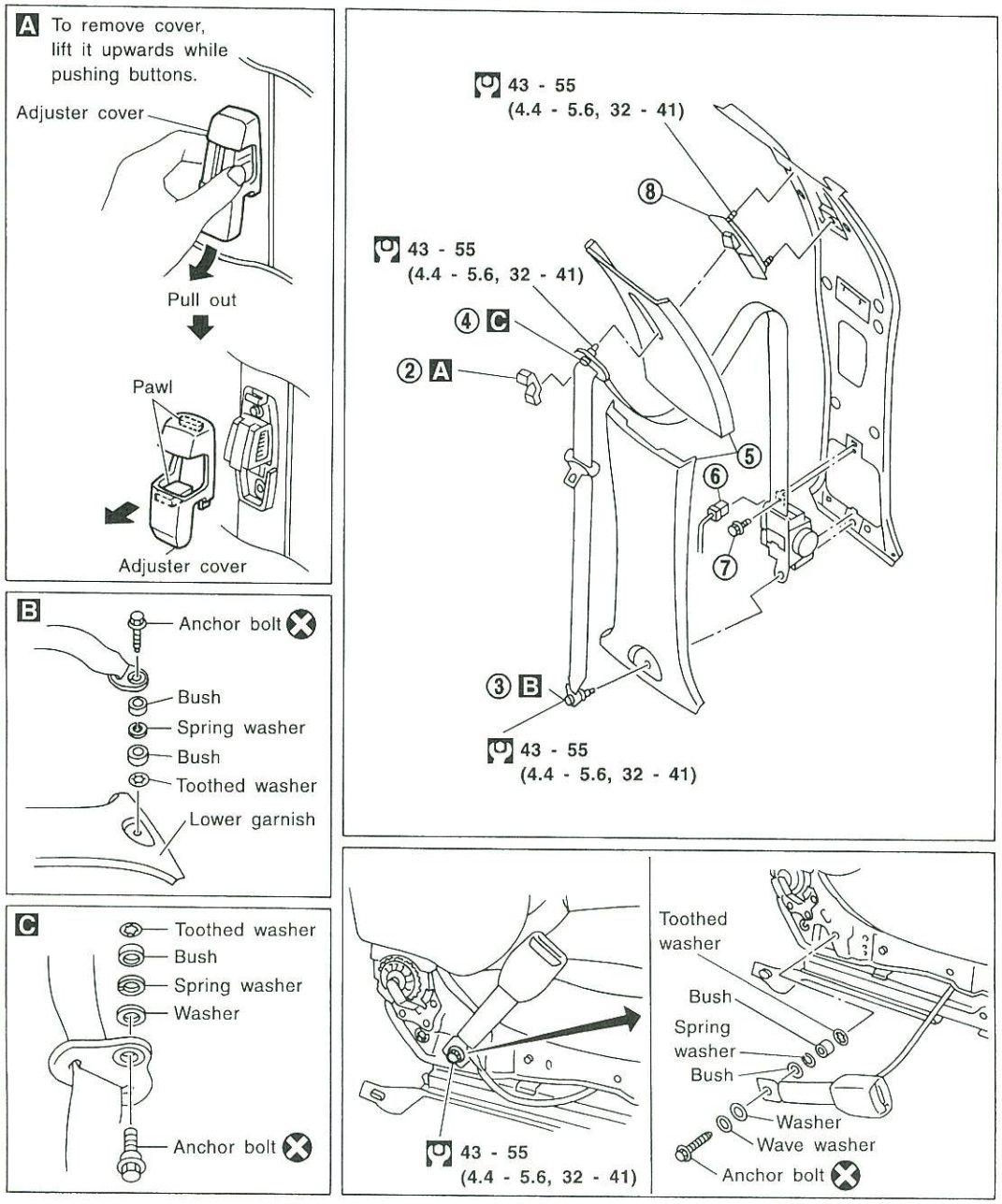
Front Seat Belt

REMOVAL AND INSTALLATION

=NBRS0003

1. Remove front seat. Refer to "FRONT SEAT" in BT section for details.
2. Remove adjuster cover. A
3. Remove floor anchor bolt. B
4. Remove shoulder anchor bolt. C
5. Remove center pillar upper and lower garnish. Refer to "SIDE AND FLOOR TRIM" in BT section for details.
6. Disconnect seat belt pre-tensioner connector.
7. Remove the bolt securing seat belt retractor, then remove seat belt and seat belt retractor.
8. Remove bolts securing seat belt adjuster, then remove seat belt adjuster.

SEC. 769•868•870



: N•m (kg-m, ft-lb)

SRS648

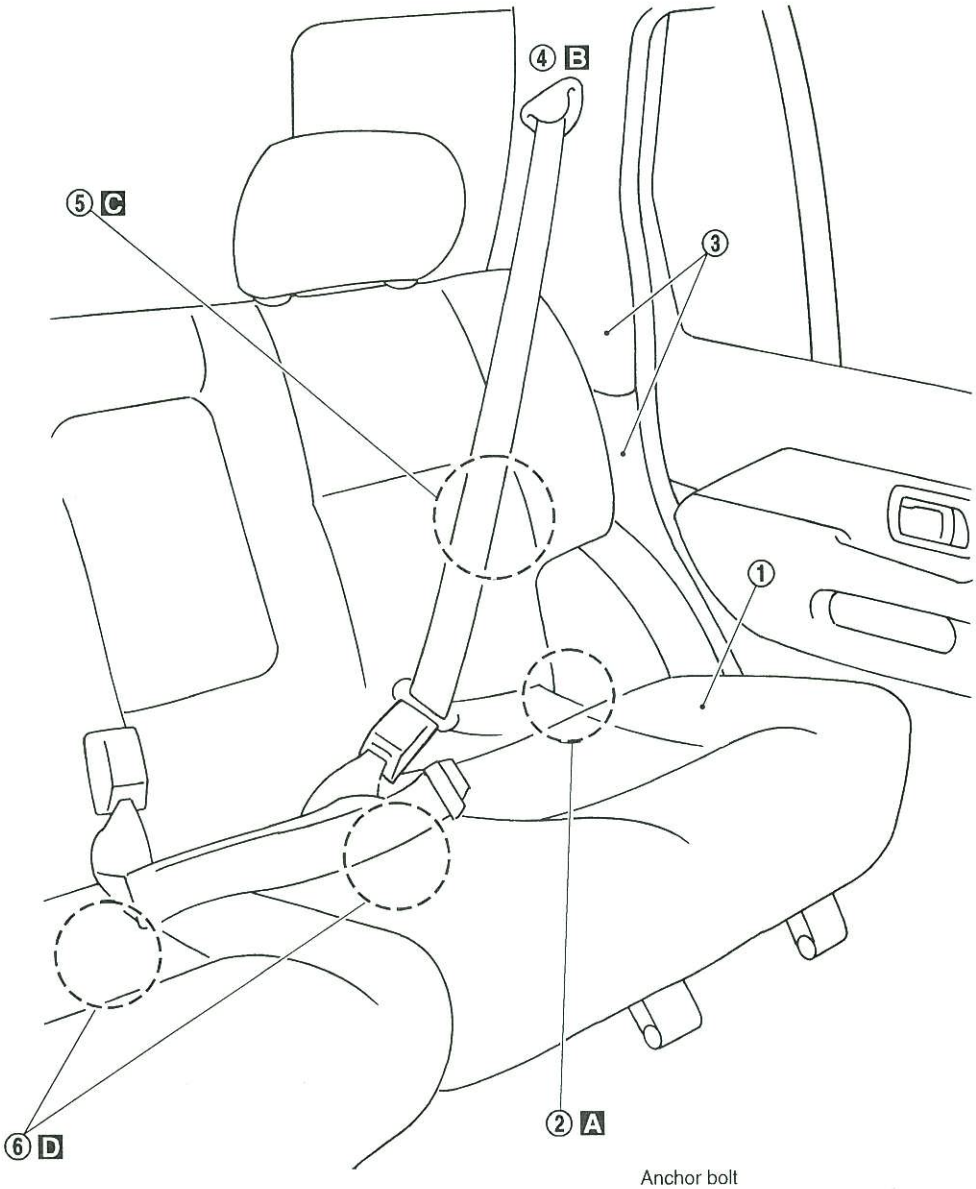
Rear Seat Belt

REMOVAL AND INSTALLATION

=NBRS0004

1. Raise up rear seat cushion.
2. Remove outer anchor bolt. A
3. Remove rear side upper and lower garnish. Refer to "SIDE AND FLOOR TRIM" in BT section for details.
4. Remove anchor through-bolt. B
5. Remove anchor bolt and bolt securing rear seat belt retractor, then remove seat belt and seat belt retractor. C
6. Remove each anchor bolt. D

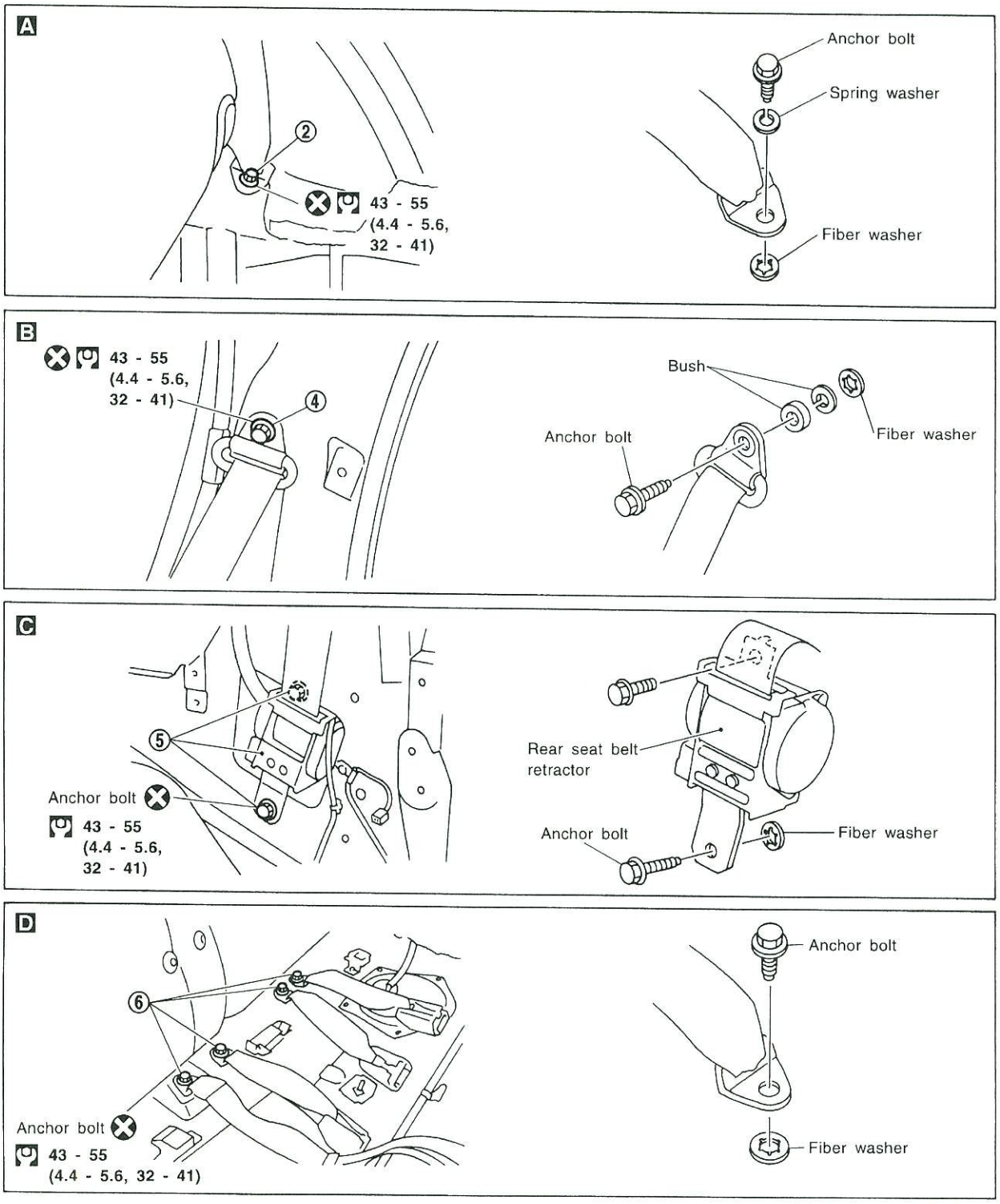
SEC. 869



Anchor bolt

43 - 55 N·m (4.4 - 5.6 kg-m, 32 - 41 ft-lb)

SRS654



: N•m (kg-m, ft-lb)

SRS649

Seat Belt Inspection

=NBRS0029

AFTER A COLLISION

NBRS0029S01

WARNING:

Inspect all seat belt assemblies including retractors and attaching hardware after any collision. NISSAN recommends that all seat belt assemblies in use during a collision be replaced unless the collision was minor and the belts show no damage and continue to operate properly. Failure to do so could result in serious personal injury in an accident. Seat belt assemblies not in use during a collision should also be replaced if either damage or improper operation is noted. Seat belt pre-tensioner should be replaced even if the seat belts are not in use during a frontal collision in which the air bags are deployed.

Replace any seat belt assembly if:

- The seat belt was in use at the time of a collision (except for minor collisions and the belts, retractors and buckles show no damage and continue to operate properly).
- The seat belt was damaged in an accident. (i.e. torn webbing, bent retractor or guide, etc.)
- The seat belt attaching point was damaged in an accident. Inspect the seat belt attaching area for damage or distortion and repair as necessary before installing a new seat belt assembly.
- The seat belt pre-tensioner should be replaced even if the seat belts are not in use during the collision in which the air bags are deployed.

PRELIMINARY CHECKS

NBRS0029S02

1. Check the seat belt warning lamp/chime for proper operation as follows:

a. Switch ignition ON. The seat belt warning lamp should illuminate. Also, the seat belt warning chime should sound for about seven seconds.

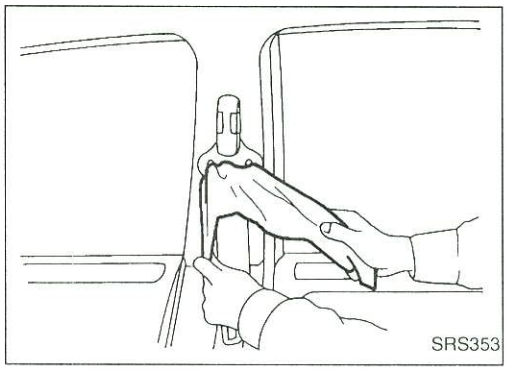
b. Fasten driver's seat belt. The seat belt warning lamp should go out and the chime (if sounding) should stop.

c. If the seat belt warning lamp is blinking, conduct self-diagnosis using CONSULT, and seat belt warning lamp. Refer to "Checking Seat Belt Pre-tensioner Operation by Using "SEAT BELT" Warning Lamp — User Mode", "SRS Operation Check", RS-38.

2. Check that the seat belt retractor, seat belt anchor and buckle bolts are securely attached.
3. Check the shoulder seat belt guide and shoulder belt height adjuster for front seats. Ensure guide swivels freely and that belt lays flat and does not bind in guide. Ensure height adjuster operates properly and holds securely.
4. Check retractor operation:

a. Fully extend the seat belt webbing and check for twists, tears or other damage.

b. Allow the seat belt to retract. Ensure that belt returns smoothly and completely into the retractor. If the seat belt does not returns smoothly, wipe the inside of the loops with a clean paper cloth etc. because dirt built up in the loops of the upper anchors can cause the seat belts to retractor slowly.



c. Fasten the seat belt. Pull firmly on belt and buckle to ensure belt remains latched. Unfasten seat belt. Ensure belt releases freely and buckle button returns to original position.

5. For center (non-retractable) seat belts, check that the seat belt are accessible. Check seat belt webbing for twists, tears or other damage. Fasten the seat belt. Pull firmly on belt and buckle to ensure belt remains latched. Unfasten seat belts. Ensure belt releases freely and buckle button returns to original position.
6. Repeat steps above as necessary to check the other seat belts.

SEAT BELT RETRACTOR ON-VEHICLE CHECK

NBRS0029S03

Emergency Locking Retractors (ELR) and Automatic Locking Retractors (ALR)

NBRS0029S0301

NOTE:

All seat belt retractors are of the Emergency Locking Retractors (ELR) type. In an emergency (sudden stop) the retractor will lock and prevent the belt from extending any further. All 3-point type seat belt retractors except the driver's seat belt also have an Automatic Locking Retractors (ALR) mode. The ALR mode (also called child restraint mode) is used when installing child seats. The ALR mode is activated when the seat belt is fully extended. When the belt is then retracted partially, the ALR mode automatically locks the seat belt in a specific position so the belt cannot be extended any further. To cancel the ALR mode, allow the seat belt to fully wind back into the retractor.

Check the seat belt retractors using the following test(s) to determine if a retractor assembly is operating properly.

ELR Function Stationary Check

NBRS0029S0302

Grasp the shoulder belt and pull forward quickly. The retractor should lock and prevent the belt from extending further.

ALR Function Stationary Check

NBRS0029S0304

1. Pull out entire length of seat belt from retractor until a click is heard.
2. Retract the belt partially. A clicking noise should be heard as the belt retracts indicating that the retractor is in the Automatic Locking Retractors (ALR) mode.
3. Grasp the seat belt and try to pull out the retractor. The belt must lock and not extend any further. If NG, replace the retractor assembly.
4. Allow the entire length of the belt to retract to cancel the automatic locking mode.

ELR Function Moving Check

NBRS0029S0303

WARNING:

Perform the following test in a safe, open area clear of other vehicles and obstructions (for example, a large, empty parking lot). Road surface must be paved and dry. DO NOT perform the following test on wet or gravel roads or on public streets and highways. This could result in an accident and serious personal injury. The driver and passenger must be prepared to brace themselves in the event the retractor does not lock.

1. Fasten driver's seat belt. Buckle a passenger into the seat for the belt that is to be tested.
2. Proceed to the designated safe area.
3. Drive the vehicle at approximately 16 km/h (10 MPH). Notify any passengers of a pending sudden stop and the driver and passenger must be prepared to brace themselves in the event the retractor does not lock, apply brakes firmly and make a very hard stop.

During stop, seat belts should lock and not be extended. If the seat belt retractor assembly does not lock, perform the retractor off-vehicle check.

SEAT BELT RETRACTOR OFF-VEHICLE CHECK

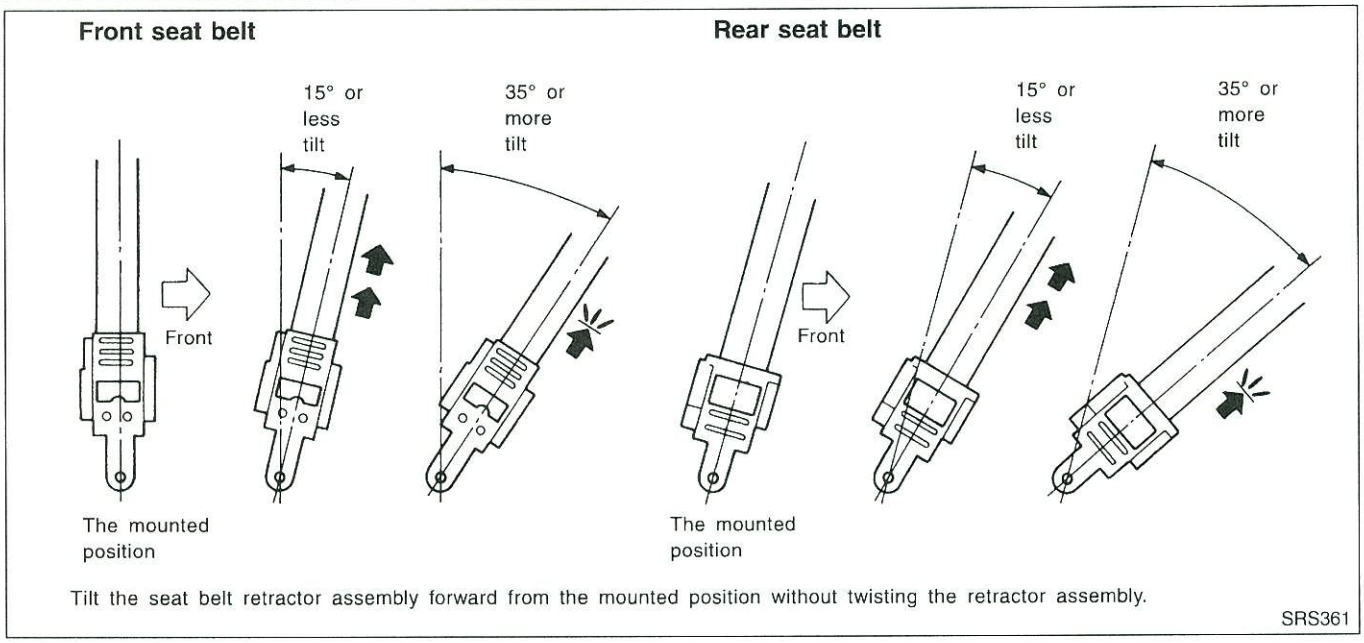
NBRS0029S04

1. Remove the seat belt retractor assembly.
2. Slowly pull out belt while tilting the retractor assembly forward from the mounted position without twisting the retractor assembly as shown in the illustration.

   15 degrees or less tilt: Belt can be pulled out.

   35 degrees or more tilt: Belt locks and cannot be pulled out.

Seat Belt Inspection (Cont'd)



Tilt the seat belt retractor assembly forward from the mounted position without twisting the retractor assembly.

SRS361

If NG, replace the retractor assembly.

Precautions

SUPPLEMENTAL RESTRAINT SYSTEM (SRS) "AIR BAG" AND "SEAT BELT PRE-TENSIONER"

NBRS0005

The Supplemental Restraint System such as "AIR BAG" and "SEAT BELT PRE-TENSIONER" used along with a seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. The SRS composition which is available to INFINITI QX4 is as follows:

- For a frontal collision
  The Supplemental Restraint System consists of driver air bag module (located in the center of the steering wheel), front passenger air bag module (located on the instrument panel on passenger side), seat belt pre-tensioners, a diagnosis sensor unit, warning lamp, wiring harness and spiral cable.
- For a side collision
  The Supplemental Restraint System consists of side air bag module (located in the outer side of front seat), satellite sensor, diagnosis sensor unit (one of components of air bags for a frontal collision), wiring harness, warning lamp (one of components of air bags for a frontal collision).

WARNING:

- **To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance must be performed by an authorized INFINITI dealer.**
- **Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system.**
- **Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. Spiral cable and wiring harnesses (except "SEAT BELT PRE-TENSIONER") covered with yellow insulation either just before the harness connectors or for the complete harness are related to the SRS.**

PRECAUTIONS FOR SRS "AIR BAG" AND "SEAT BELT PRE-TENSIONER" SERVICE

NBRS0006

- Do not use electrical test equipment to check SRS circuits unless instructed to in this Service Manual.
- Before servicing the SRS, turn ignition switch "OFF", disconnect both battery cables and wait at least 3 minutes.
  For approximately 3 minutes after the cables are removed, it is still possible for the air bag and seat belt pre-tensioner to deploy. Therefore, do not work on any SRS connectors or wires until at least 3 minutes have passed.
- Diagnosis sensor unit must always be installed with their arrow marks "⇐" pointing towards the front of the vehicle for proper operation. Also check diagnosis sensor unit for cracks, deformities or rust before installation and replace as required.
- The spiral cable must be aligned with the neutral position since its rotations are limited. Do not attempt to turn steering wheel or column after removal of steering gear.
- Handle air bag module carefully. Always place driver and passenger air bag modules with the pad side facing upward and side air bag module (built-in type) with the stud bolt side facing down.
- Conduct self-diagnosis to check entire SRS for proper function after replacing any components.
- After air bag inflates, the front instrument panel assembly should be replaced if damaged.

WIRING DIAGRAMS AND TROUBLE DIAGNOSIS

NBRS0007

When you read wiring diagrams, refer to the followings:

- "HOW TO READ WIRING DIAGRAMS" in GI section
- "POWER SUPPLY ROUTING" for power distribution circuit in EL section

When you perform trouble diagnosis, refer to the followings:

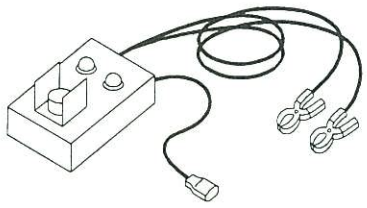
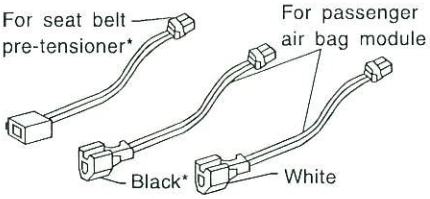
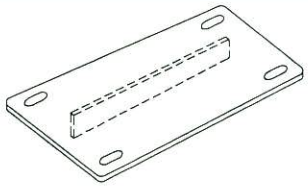
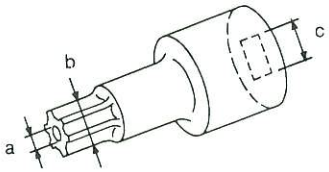
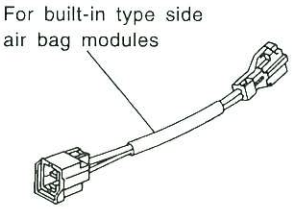
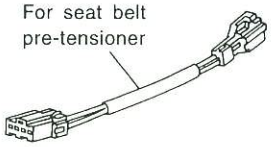
- "HOW TO FOLLOW TEST GROUP IN TROUBLE DIAGNOSIS" in GI section
- "HOW TO PERFORM EFFICIENT DIAGNOSIS FOR AN ELECTRICAL INCIDENT" in GI section

Preparation

SPECIAL SERVICE TOOLS

=NBRS0008

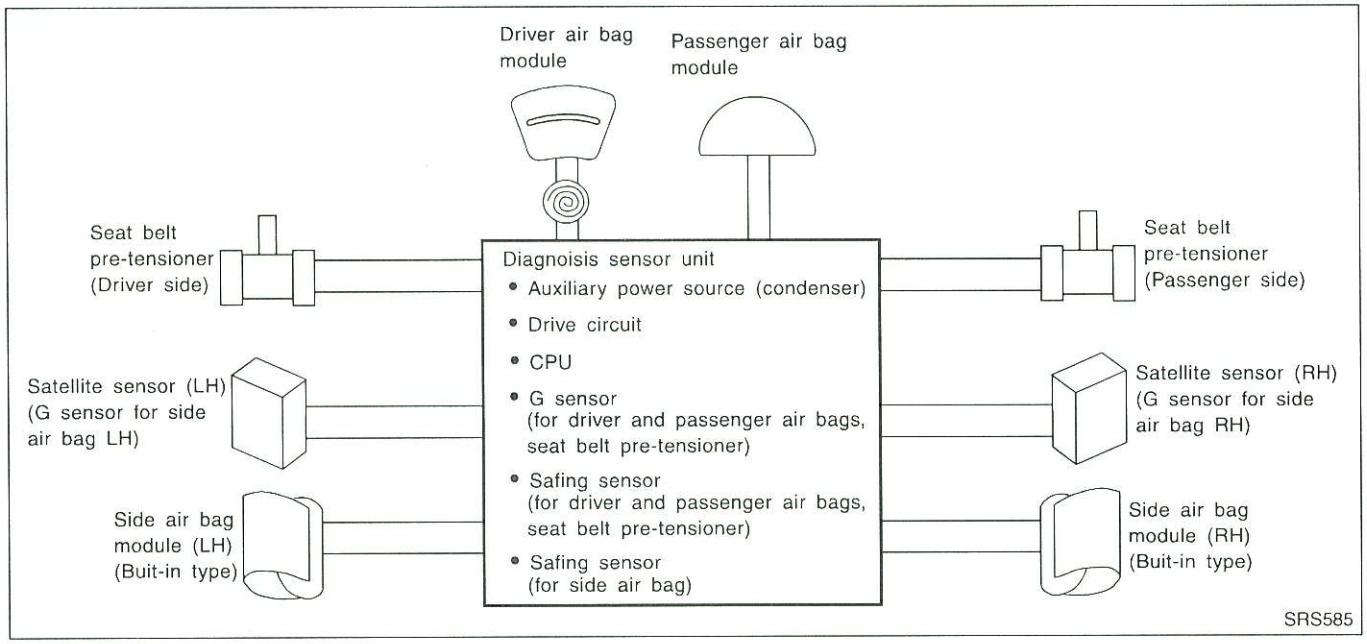
The actual shapes of Kent-Moore tools may differ from those of special service tools illustrated here.

Tool number (Kent-Moore No.) Tool name	Description	
KV991072S0 (J38381-KIT) Air bag deployment kit KV99106400 (J38381) Deployment tool	 NT357	Disposing of air bag module
KV991065S0 (J38381-30) Deployment tool adapters	 NT762	* Deployment tool adapters for seat belt pre-tesioner and for passenger air bag module with black connector are not necessary for servicing INFINITI QX4.
KV99105300 (J41246) Air bag module bracket	 NT354	Anchoring air bag module
HT61961000 and HT62152000 combined (J38219) *Special torx bit	 NT361	Use for special bolts [TAMPER RESISTANT TORX (Size T50)] **a: 3.5 (0.138) dia.** **b: 8.5 - 8.6 (0.335 - 0.339) dia.** **c: approx. 10 (0.39) sq.** Unit: mm (in)
KV99108300 (J38381-35) Deployment tool adapter for built-in type side air bags	 NT763	
KV99108200 (J38381-50) Deployment tool adapter for seat belt pre-tensioner	 NT721	

*: Special tool or commercial equivalent

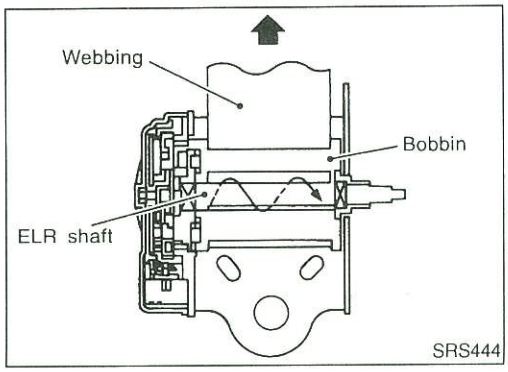
Description

NBRS0009



The air bag deploys if the diagnosis sensor unit activates while the ignition switch is in the "ON" or "START" position.
The collision modes for which supplemental restraint systems are activated are different among the SRS systems. For example, the driver air bag module and passenger air bag module are activated in a frontal collision but not in a side collision.
SRS configurations which are activated for some collision modes are as follows;

SRS configuration	Frontal collision	Left side collision	Right side collision
Driver air bag module	○	—	—
Passenger air bag module	○	—	—
Seat belt pre-tensioner (Driver side)	○	—	—
Seat belt pre-tensioner (Passenger side)	○	—	—
Side air bag module (LH)	—	○	—
Side air bag module (RH)	—	—	○



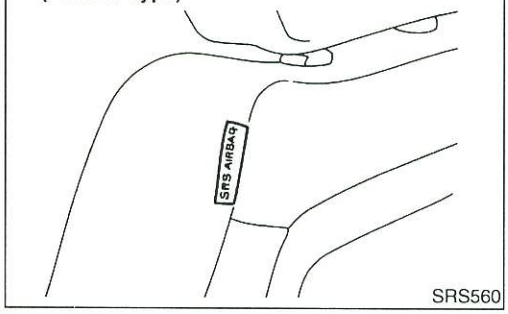
Seat Belt Pre-tensioner with Load Limiter

NBRS0032

The seat belt pre-tensioner system with load limiter is installed to both the driver's seat and the front passenger's seat. It operates simultaneously with the SRS air bag system in the event of a frontal collision with an impact exceeding a specified level.
When the frontal collision with an impact exceeding a specified level occurs, seat belt slack resulting from clothing or other factors is immediately taken up by the pre-tensioner. Vehicle passengers are securely restrained.
When passengers in a vehicle are thrown forward in a collision and the restraining force of the seat belt exceeds a specified level, the

load limiter permits the specified extension of the seat belt by the twisting of the ELR shaft, and a relaxation of the chest-area seat belt web tension while maintaining force.

Front seat back with front side air bag (Built-in type)



Built-in Type Side Air Bag

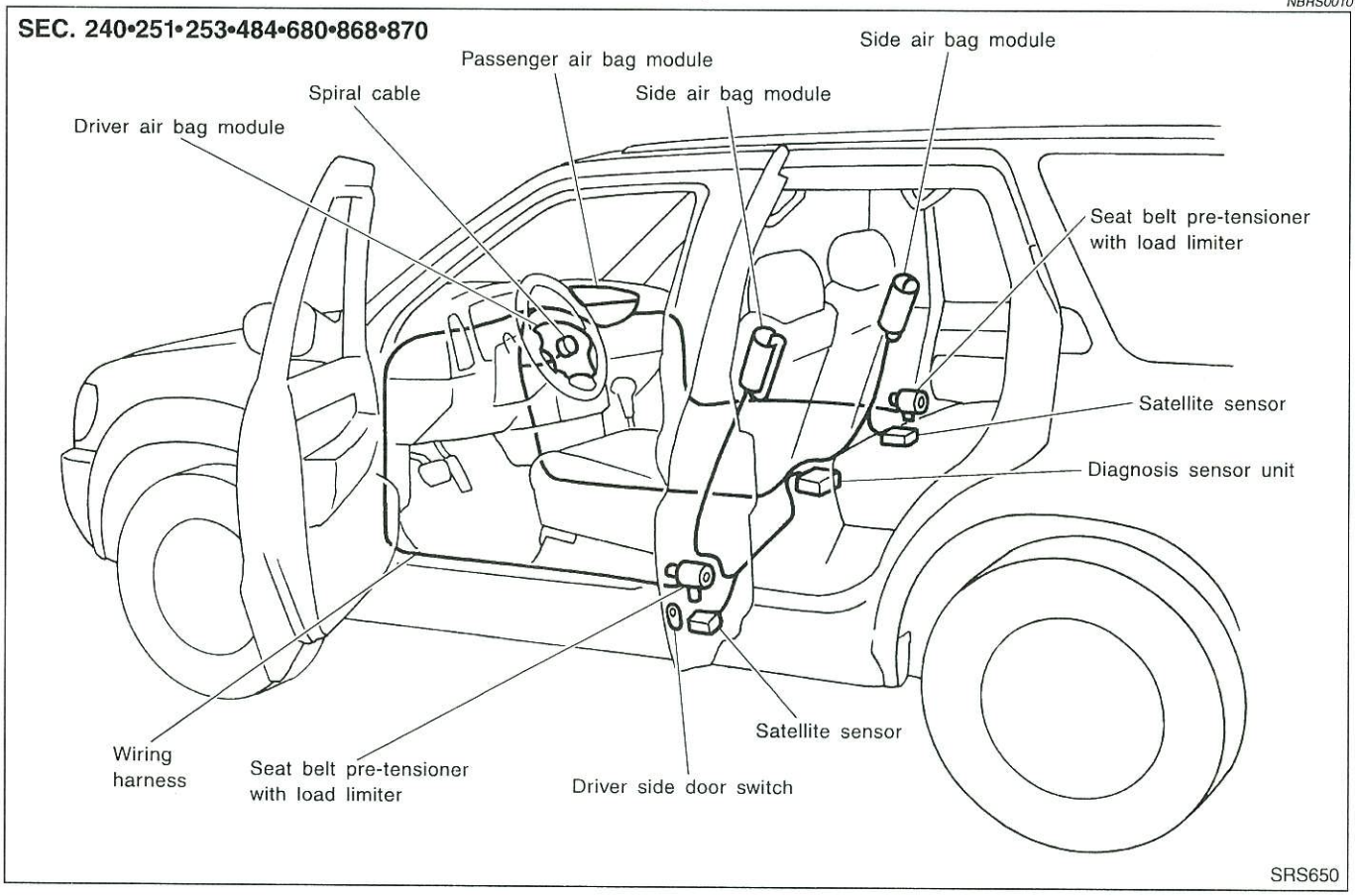
NBRS0033

Front side air bag is built-in type.
The front seat backs with built-in type side air bag have the labels shown in figures at left.

SRS Component Parts Location

NBRS0010

SEC. 240•251•253•484•680•868•870



Maintenance Items

NBRS0011

CAUTION:
Do not use electrical test equipment to check SRS circuit.

1. Check operation of "AIR BAG" and "SEAT BELT" warning lamps.
   After turning ignition key to "ON" position, both warning lamps illuminate. The "AIR BAG" warning lamp will go off after about 7 seconds if no malfunction is detected. The "SEAT BELT" warning lamp will also go off after about 7 seconds after seat belt has been fastened and no malfunction is detected. (When seat belt has not been fastened, the warning lamp continues to illuminate until seat belt is fastened.) If any of the following warning lamp conditions occur, immediately check the air bag or seat belt pre-tensioner system. Refer to RS-37 or RS-38 for details.

- The "AIR BAG" or "SEAT BELT" warning lamp does not illuminate when the ignition switch is turned "ON".
- The "AIR BAG" or "SEAT BELT" (with seat belt fastened) warning lamp does not go off about 7 seconds after the ignition switch is turned "ON".
- The "AIR BAG" or "SEAT BELT" (with seat belt fastened) warning lamp blinks after about 7 seconds after the ignition switch is turned "ON".

2. Visually check SRS components.

1) Diagnosis sensor unit
- Check diagnosis sensor unit and bracket for dents, cracks and deformities.
- Check connectors for damage, and terminals for deformities.

2) Air bag module and steering wheel
- Remove air bag module from steering wheel, instrument panel or seatback. Check harness cover and connectors for damage, terminals for deformities, and harness for binding.
- Install driver air bag module to steering wheel to check fit or alignment with the wheel.
- Check steering wheel for excessive free play.
- Install passenger air bag module to instrument panel to check fit or alignment with the instrument panel.
- Install side air bag module to seatback to check fit and alignment with the seat.

3) Spiral cable
- Check spiral cable for dents, cracks, or deformities.
- Check connectors and protective tape for damage.
- Check steering wheel for noise, binding or heavy operation.

4) Main harness, air bag harness, body harness, side air bag module sub-harness
- Check connectors for poor connections, damage, and terminals for deformities.
- Check harnesses for binding, chafing or cut.

5) Seat belt pre-tensioner
- Check harness cover and connectors for damage, terminals for deformities, and harness for binding.
- Check belts for damage and anchors for loose mounting.
- Check retractor for smooth operation.
- Perform self-diagnosis for seat belt pre-tensioner using seat belt warning lamp or CONSULT. Refer to "SRS Operation Check" for details. (RS-38)

6) Satellite sensor
- Check satellite sensor (including bracket portion) for dents, cracks or deformities.
- Check connectors for damage, and terminals for deformities.

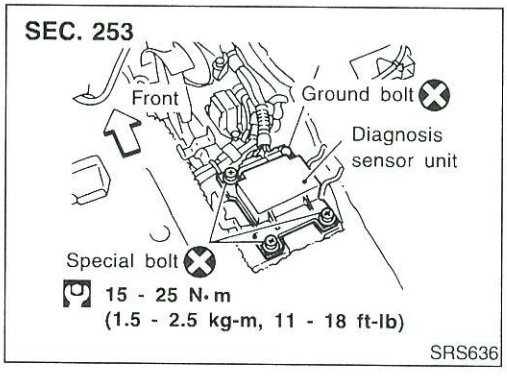
CAUTION:
Replace previously used special bolts, ground bolt and anchor bolt with new ones.

Diagnosis Sensor Unit

REMOVAL AND INSTALLATION

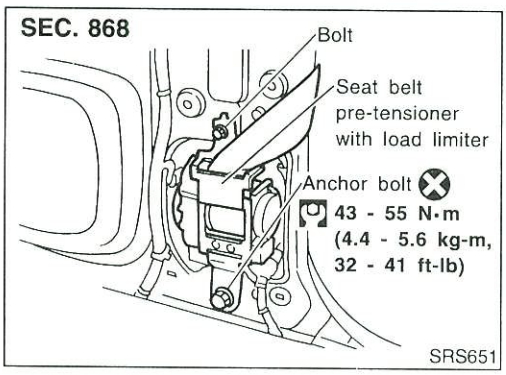
NBRS0012

CAUTION:
- **Before servicing SRS, turn the ignition switch off, disconnect both battery cables and wait for at least 3 minutes.**
- **The special bolts are coated with bonding agent while the other bolt is for ground. Do not use old bolts after removal; replace with new ones.**
- **Check diagnosis sensor unit for proper installation.**
- **Check diagnosis sensor unit to ensure it is free of deformities, dents, cracks or rust. If they show any visible signs of damage, replace them with new ones.**
- **Check diagnosis sensor unit brackets to ensure they are free of deformities or rust.**
- **Replace diagnosis sensor unit if it has been dropped or sustained an impact.**
- **After replacement of diagnosis sensor unit, perform self-diagnosis for SRS. Refer to "SRS Operation Check" for details (RS-37).**



1. Disconnect connectors for driver and passenger air bag modules and seat belt pre-tensioner.
2. Remove console box. Refer to "INSTRUMENT PANEL ASSEMBLY" in BT section.
3. Disconnect diagnosis sensor unit connector.
4. Remove ground bolt and also remove special bolts using the TAMPER RESISTANT TORX (Size T50), from diagnosis sensor unit.
   Then remove the diagnosis sensor unit.

NOTE:
- To install, reverse the removal procedure sequence.



Seat Belt Pre-tensioner

REMOVAL AND INSTALLATION

NBRS0034

CAUTION:
- **Before servicing SRS, turn the ignition switch off, disconnect both battery cables and wait for at least 3 minutes.**
- **Do not use old bolts and nuts coated with bonding agent after removal; replace with new ones.**
- **Check seat belt pre-tensioner with load limiter and satellite sensor for proper installation.**
- **After replacement of seat belt pre-tensioner, check SRS function and perform self-diagnosis for SRS. Refer to**

"Checking Seat Belt Pre-tensioner Operation by Using "Seat Belt" Waring Lamp — User Mode", "SRS Operation Check" for details. (RS-38)

- **Do not attempt to disassemble diagnosis sensor unit, seat belt pre-tensioner with load limiter and satellite sensor.**
- **Replace diagnosis sensor unit, seat belt pre-tensioner and satellite sensor if it has been dropped or sustained an impact.**
- **Do not expose seat belt pre-tensioner to temperatures exceeding 80°C (176°F).**

For removal of seat belt pre-tensioner, refer to "Front Seat Belt" for details. (RS-3)

NOTE:

- **To install, reverse the removal procedure sequence.**

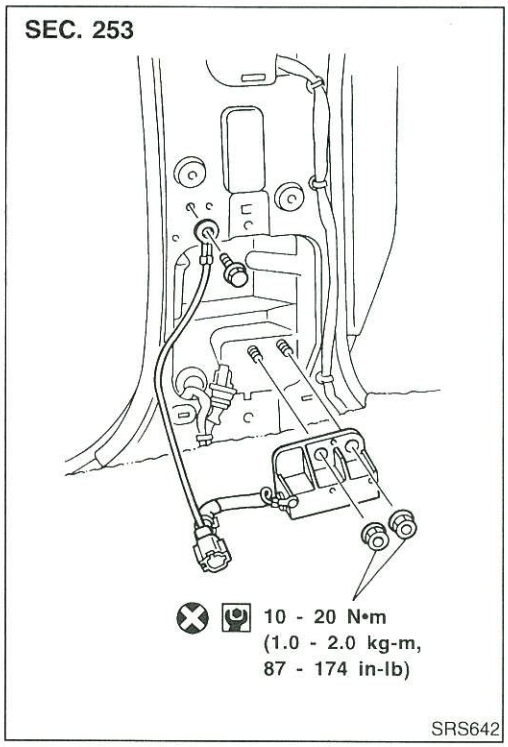
Satellite Sensor

REMOVAL AND INSTALLATION

NBRS0035

CAUTION:

- **Before servicing SRS, turn the ignition switch off, disconnect both battery cables and wait at least 3 minutes.**
- **Do not use old bolts coated with bonding agent after removal; replace with new ones.**
- **Check satellite sensor for proper installation.**
- **Check satellite sensor to ensure they are free of deformities, dents, cracks or rust. If it shows any visible signs of damage, replace it with new one.**
- **After replacement of satellite sensor, check SRS function and perform self-diagnosis for SRS. Refer to "SRS Operation Check" for details. (RS-37)**
- **Do not attempt to disassemble satellite sensor.**
- **Replace satellite sensor if it has been dropped or sustained an impact.**



1. Remove seat belt pre-tensioner with load limiter. Refer to "Front Seat Belt" for details. (RS-3)
2. Disconnect satellite sensor connector.
3. Remove bolt and nuts from satellite sensor unit. Then remove the satellite sensor.

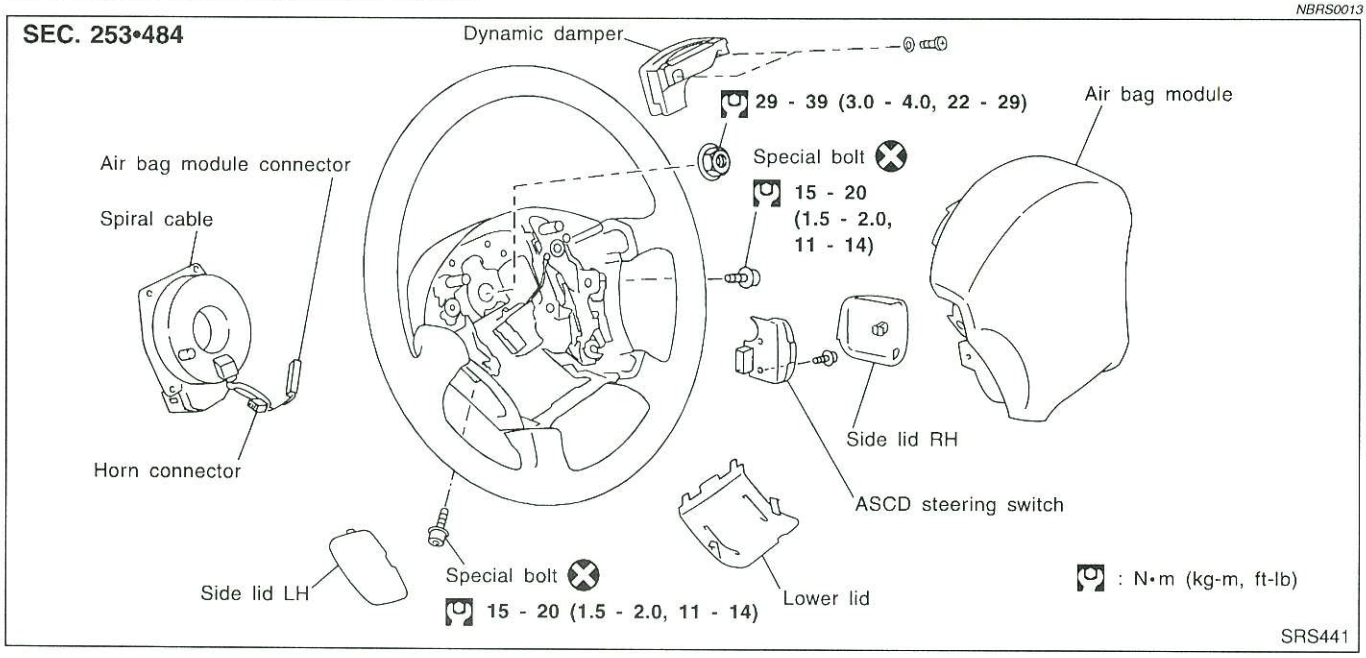
NOTE:

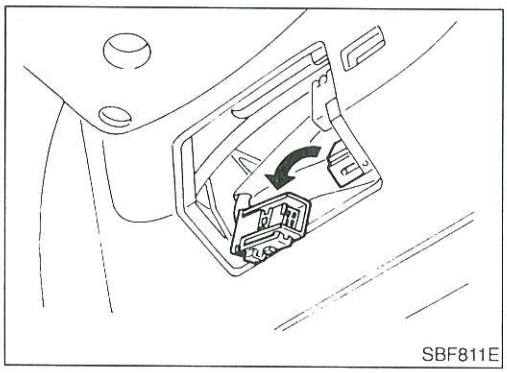
- To install, reverse the removal procedure sequence.

Driver Air Bag Module and Spiral Cable

REMOVAL AND INSTALLATION

NBRS0013





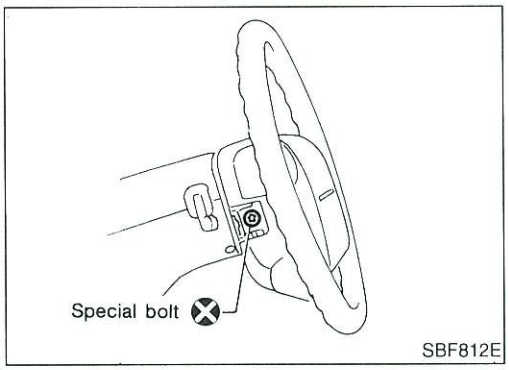
REMOVAL

NBRS0014

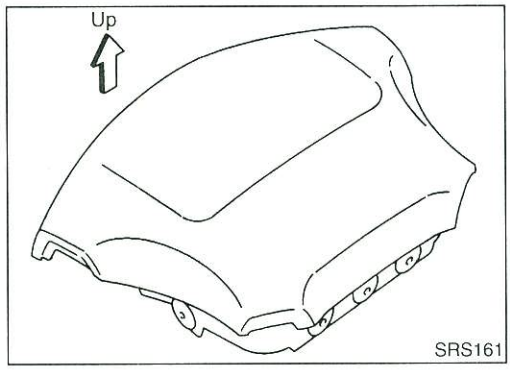
CAUTION:

- **Before servicing SRS, turn the ignition switch off, disconnect both battery cables and wait at least 3 minutes.**
- **Always work from the side of air bag module.**

1. Remove lower lid from steering wheel, and disconnect air bag module connector.

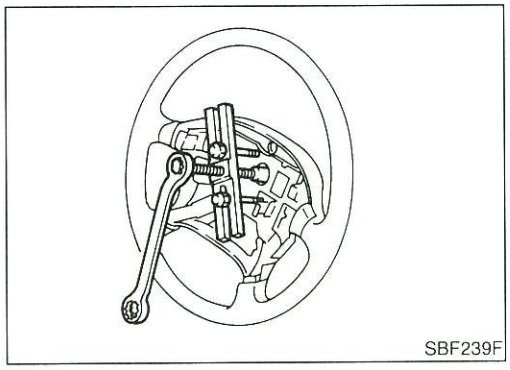


2. Remove side lids. Using the TAMPER RESISTANT TORX (Size T50), remove left and right special bolts. Air bag module can then be removed.



CAUTION:
- **Always place air bag module with pad side facing upward.**
- **Do not attempt to disassemble air bag module.**
- **The special bolts are coated with bonding agent. Do not use old bolts after removal; replace with new ones.**
- **Do not insert any foreign objects (screwdriver, etc.) into air bag module connector.**

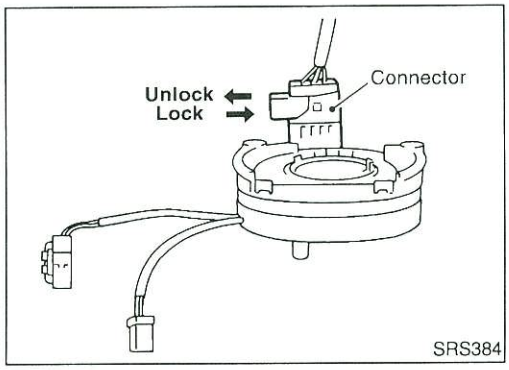
- **Replace air bag module if it has been dropped or sustained an impact.**
- **Do not expose the air bag module to temperatures exceeding 90°C (194°F).**
- **Do not allow oil, grease or water to come in contact with the air bag module.**



3. Set steering wheel in the neutral position.
4. Disconnect horn connector and remove nuts.
5. Remove dynamic damper. Then using steering wheel puller, remove steering wheel. Be careful not to over-tighten puller bolt on steering wheel.

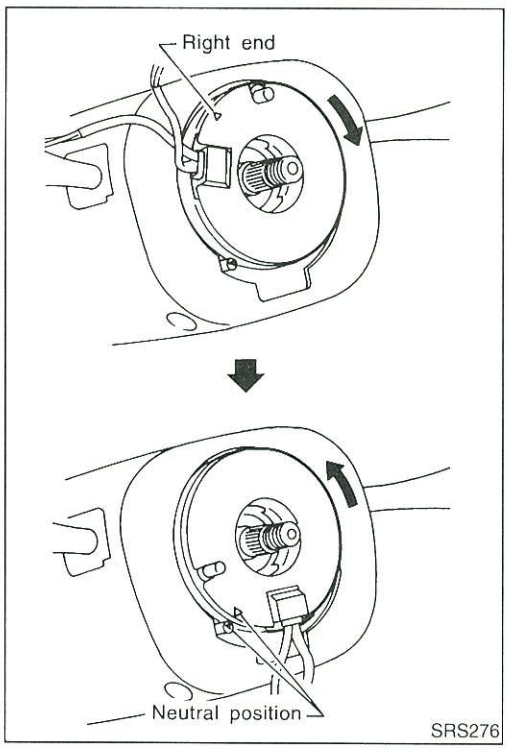
CAUTION:
- **Do not tap or bump the steering wheel.**

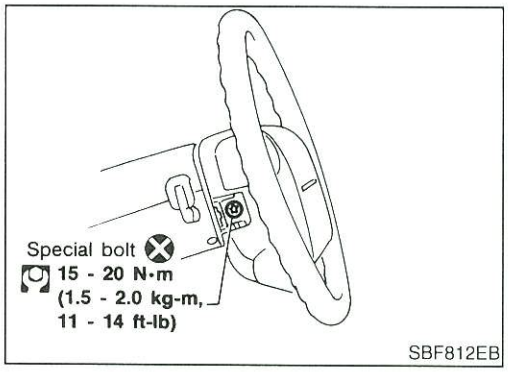
6. Remove steering column cover.



7. Unlock the spiral cable connector. Then disconnect connectors and remove the four screws. The spiral cable can then be removed.

CAUTION:
- **Do not attempt to disassemble spiral cable.**
- **Do not apply lubricant to the spiral cable.**





INSTALLATION

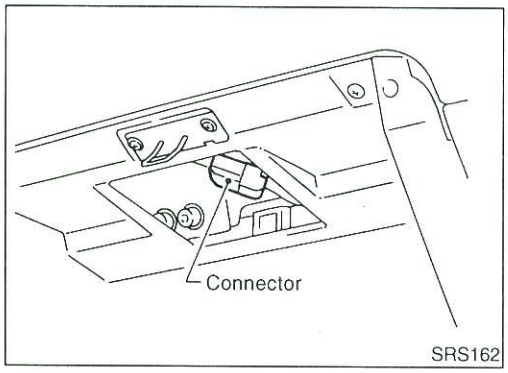
NBRS0015

1. Set the front wheels in the straight-ahead position.
2. Make sure that the spiral cable is in the neutral position.
   The neutral position is detected by turning left about 2.5 revolutions from the right end position. Align the two marks (⧗).

CAUTION:

- **The spiral cable may snap due to steering operation if the cable is installed in an improper position.**
- **Also, with the steering linkage disconnected, the cable may snap by turning the steering wheel beyond the limited number of turns. The spiral cable can be turned to the left about 2.5 turns from the right end position.**

3. Connect spiral cable connector and tighten with screws. Install steering column cover.
4. Install steering wheel, aligning with spiral cable pin guides, and pull spiral cable through.
5. Connect horn connector and engage spiral cable with pawls in steering wheel. Move air bag module connector away from steering wheel lower lid opening.
6. Tighten nut.
   : 29 - 39 N·m (3.0 - 4.0 kg-m, 22 - 29 ft-lb)
7. Install dynamic damper.
8. Position air bag module and tighten with new special bolts.
9. Connect air bag module connector.
10. Install all lids.
11. Conduct self-diagnosis to ensure entire SRS operates properly. (Use CONSULT or warning lamp check.)
    Before performing self-diagnosis, connect both battery cables.
12. Turn steering wheel to the left end and then to the right end fully to make sure that spiral cable is set in the neutral position.
    If air bag warning lamp blinks or stays ON (at the user mode), it shows the spiral cable may be snapped due to its improper position. Perform self-diagnosis again (use CONSULT or warning lamp). If a malfunction is detected, replace the spiral cable with a new one.
13. Perform self-diagnosis again to check that no malfunction is detected.



Front Passenger Air Bag Module

REMOVAL

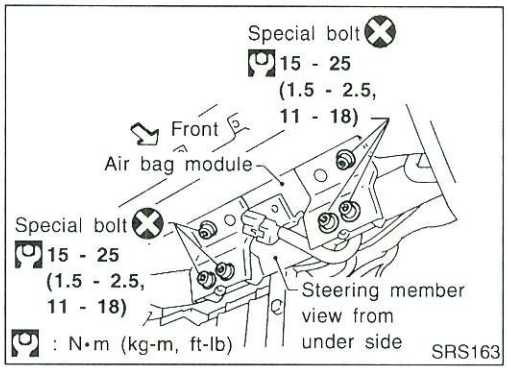
NBRS0016

CAUTION:

- **Before servicing SRS, turn the ignition switch off, disconnect both battery cables and wait for at least 3 minutes.**
- **Always work from the side of or under air bag module.**

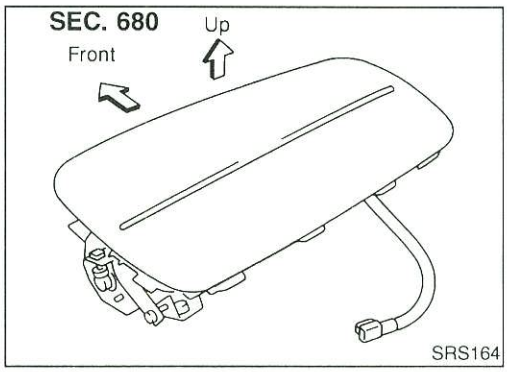
1. Remove glove box assembly. Refer to "INSTRUMENT PANEL ASSEMBLY" in BT section for details.
2. Disconnect front passenger air bag module connector from air bag harness connector.

3. Remove instrument lower panel on passenger side. Refer to "INSTRUMENT PANEL ASSEMBLY" in BT section for details.



4. Remove special bolts using the TAMPER RESISTANT TORX (Size T50) from front passenger air bag module.
5. Remove instrument panel assembly. Refer to "INSTRUMENT PANEL ASSEMBLY" in BT section for details.
6. Remove the bolts from left and right sides of front passenger air bag module. Then remove the air bag module from the instrument panel assembly.

- The air bag module is heavy and should be supported using both hands during removal.



CAUTION:

- **Always place air bag module with pad side facing upward.**
- **Do not attempt to disassemble air bag module.**
- **The special bolts are coated with bonding agent. Do not use old bolts after removal; replace with new coated bolts.**
- **Do not insert any foreign objects (screwdriver, etc.) into air bag module connector.**

- **Replace air bag module if it has been dropped or sustained an impact.**
- **Do not expose the air bag module to temperatures exceeding 90°C (194°F).**
- **Do not allow oil, grease or water to come in contact with the air bag module.**
- **After air bag inflates, the front instrument panel assembly should be replaced if damaged.**

INSTALLATION

NBRS0017

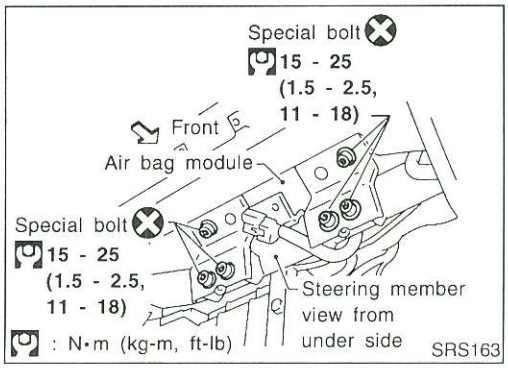
CAUTION:

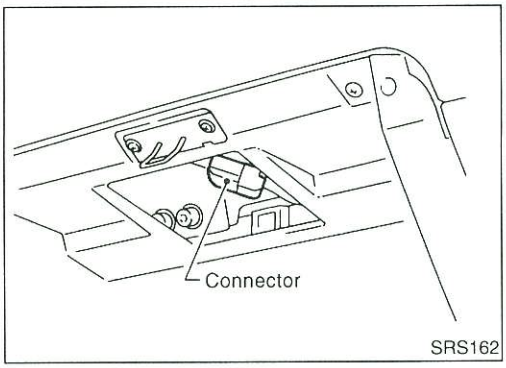
- **Always work from the side of or under air bag module.**

1. Install front passenger air bag module to instrument panel assembly.
2. Install instrument panel.

- Ensure harness is not caught between rear of air bag module and steering member.

3. Install front passenger air bag module to steering member.





4. Install instrument lower panel on passenger side.
5. Connect air bag module connector to air bag harness connector.
6. Install glove box assembly.
7. Connect both battery cables.
8. Conduct self-diagnosis to ensure entire SRS operates properly. (Use CONSULT or warning lamp check.)

Side Air Bag Module

REMOVAL

NBRS0036

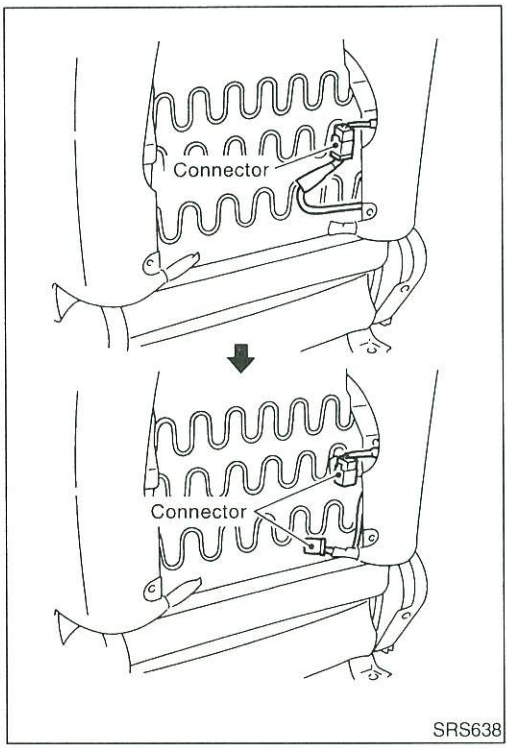
CAUTION:

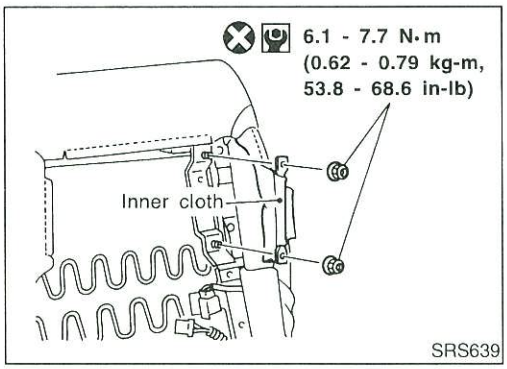
- **Before servicing SRS, turn the ignition switch OFF, disconnect both battery cables and wait at least 3 minutes.**
- **Always work from the rear of the air bag module.**

1. Remove seat back board.

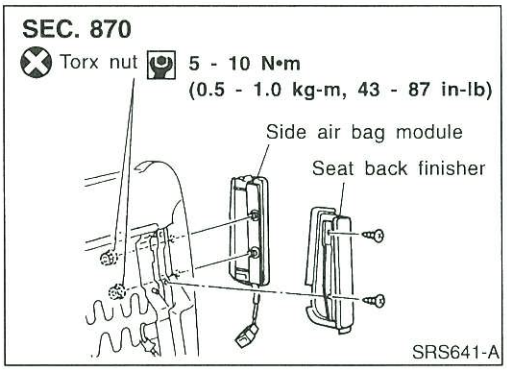
- **When using a clip removal tool to remove the seat back board, take care not to damage the air bag harness.**

2. Disconnect side air bag module connector.

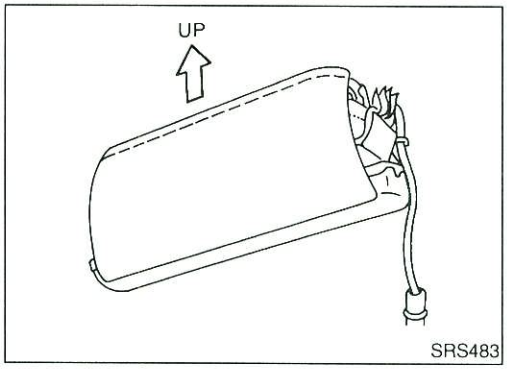




3. Pull up the seat back trim.
4. Remove the nuts securing the inner cloth with seat back frame. Then pull up the inner cloth.



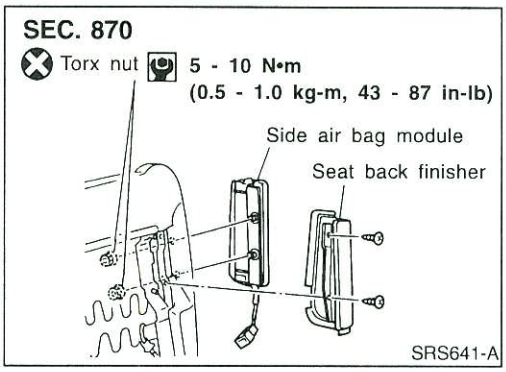
5. Remove seat back finisher.
6. Remove the torx nuts coated with bonding agent from the side air bag module.
7. Remove side air bag connector. Side air bag module can then be removed.



CAUTION:

- **Always place the air bag module with the stud bolt side facing down.**
- **Do not attempt to disassemble air bag module.**
- **The torx nuts are coated with bonding agent. Do not use old nuts after removal; replace with new coated nuts.**
- **Do not insert any foreign objects (screwdriver, etc.) into air bag module connector.**

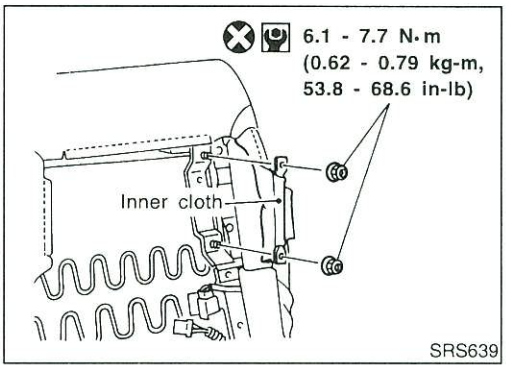
- **Replace air bag module if it has been dropped or sustained an impact.**
- **Do not expose the air bag module to temperatures exceeding 90°C (194°F).**
- **Do not allow oil, grease or water to come in contact with the air bag module.**
- **After air bag inflates, all parts of front seat back (including front seat back frame) should be replaced.**



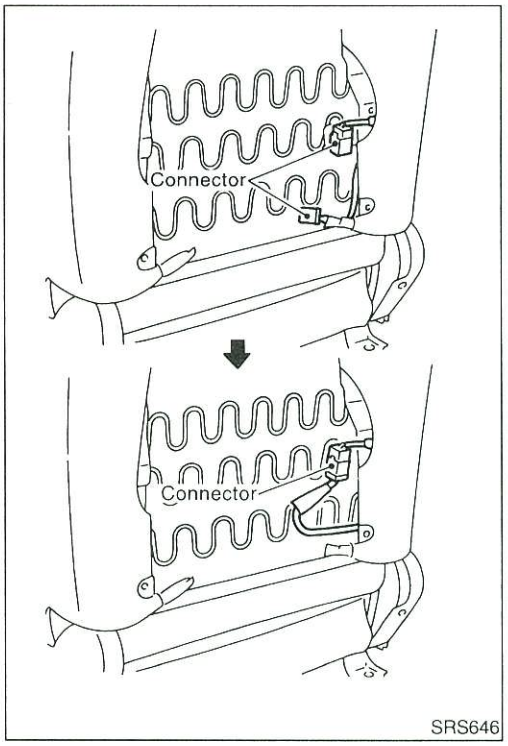
INSTALLATION

NBRS0037

1. Install side air bag module on seat back frame with new torx nuts coated with bonding agent.
2. Install side air bag connector.
3. Install seat back finisher with screw.



4. Secure the inner cloth which covers the side air bag module with nuts.

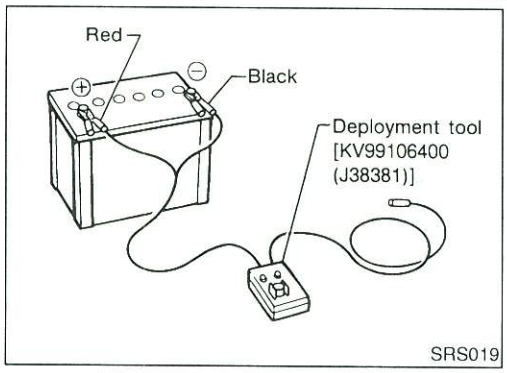


5. Connect side air bag module connector.
6. Install seat back board with new clips.
7. Connect both battery cables.
8. Go to "SRS Operation Check", RS-37 and perform self-diagnosis to ensure entire SRS operates properly. (Use CONSULT or air bag warning lamp.)

Disposal of Air Bag Module and Seat Belt Pre-tensioner

NBRS0018

- Before disposing of air bag module and seat belt pre-tensioner, or vehicles equipped with such systems, deploy the systems. If such systems have already been deployed due to an accident, dispose of them as indicated in "DISPOSING OF AIR BAG MODULE AND SEAT BELT PRE-TENSIONER" (RS-27).
- When deploying the air bag module and seat belt pre-tensioner, always use the Special Service Tool; Deployment tool KV99106400 (Kent-Moore No. J38381).
- When deploying the air bag module and seat belt pre-tensioner, stand at least 5 m (16 ft) away from the deployment component.
- When deploying air bag module and seat belt pre-tensioner, a fairly loud noise is made, followed by smoke being released. The smoke is not poisonous, however, be careful not to inhale smoke since it irritates the throat and can cause choking.
- Always activate one air bag module at a time.
- Due to heat, leave air bag module unattended for more than 30 minutes after deployment. Also leave seat belt pre-tensioner unattended for move than 10 minutes after deployment.
- Be sure to wear gloves when handling a deployed air bag module and seat belt pre-tensioner.
- Never apply water to the deployed air bag module and seat belt pre-tensioner.
- Wash your hands clean after finishing work.
- Place the vehicle outdoors with an open space of at least 6 m (20 ft) on all sides when deploying air bag module and seat belt pre-tensioner while mounted in vehicle.
- Use a voltmeter to make sure the vehicle battery is fully charged.
- Do not dispose of the air bag module and seat belt pre-tensioner un-deployed.



CHECKING DEPLOYMENT TOOL

NBRS0018S01

Connecting to Battery

NBRS0018S0101

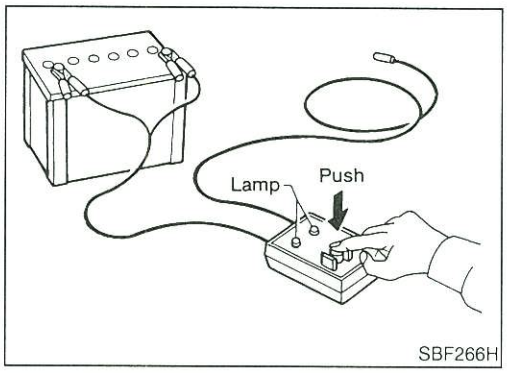
CAUTION:

The battery must show voltage of 9.6V or more.

Remove the battery from the vehicle and place it on dry wood blocks approximately 5 m (16 ft) away from the vehicle.

- Wait 3 minutes after the vehicle battery is disconnected before proceeding.
- Connect red clip of deployment tool to battery positive terminal and black clip to negative terminal.

Make sure the polarity is correct. The right side lamp in the tool, marked "deployment tool power", should glow with a green light. If the right side lamp glows red, reverse the connections to the battery.



Deployment Tool Check

NBRS0018S0102

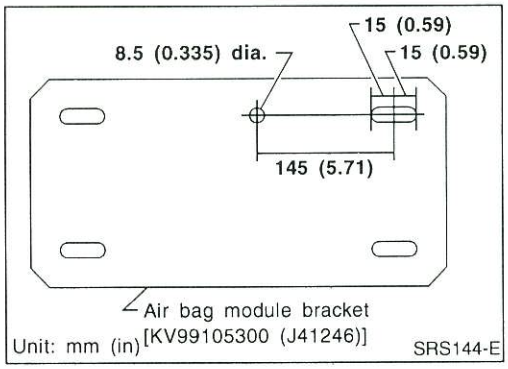
Press the deployment tool switch to the "ON" position. The left side lamp in the tool, marked "air bag connector voltage" should illuminate. If it does not illuminate, replace the tool.

Air Bag Deployment Tool Lamp Illumination Chart (Battery connected)

NBRS0018S0103

Switch operation	Left side lamp, green* "AIR BAG CONNECTOR VOLTAGE"	Right side lamp, green* "DEPLOYMENT TOOL POWER"
OFF	OFF	ON
ON	ON	ON

*: If this lamp glows red, the tool is connected to the battery incorrectly. Reverse the connections and make sure the lamp glows green.



DEPLOYMENT PROCEDURES FOR AIR BAG MODULE (OUTSIDE OF VEHICLE)

NBRS0018S02

Unless the vehicle is being scrapped, deploying the air bag in the vehicle is not recommended. This may cause damage to the vehicle interior.

Anchor air bag module bracket [KV99105300 (J41246)] in a vise secured to a firm foundation during deployment.

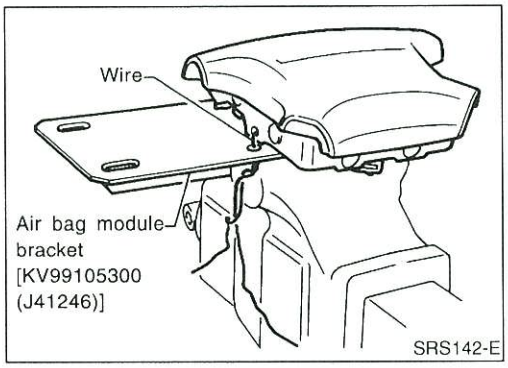
Deployment of Driver's Air Bag Module (Outside of vehicle)

NBRS0018S0201

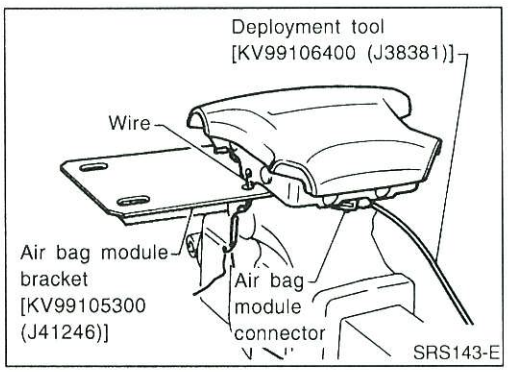
1. Make an 8.5 mm (0.335 in) diameter hole in air bag module bracket [SST: KV99105300 (J41246)] at the position shown in figure at left.
2. Using wire, secure air bag module to air bag module bracket [SST: KV99105300 (J41246)] at two places.

CAUTION:
Use wire of at least 1 mm (0.04 in) diameter.

3. Firmly secure air bag module bracket [SST: KV99105300 (J41246)] with air bag module attached, in a vise.

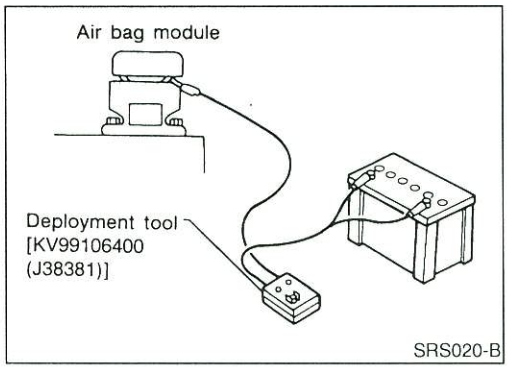


4. Connect deployment tool [SST: KV99106400 (J38381)] to air bag module connector.



5. Connect red clip of deployment tool to battery positive terminal and black clip to negative terminal.
6. The lamp on the right side of the tool, marked "deployment tool power", should glow green, not red.
7. Press the button on the deployment tool. The left side lamp on the tool, marked "air bag connector voltage", will illuminate and the air bag module will deploy.

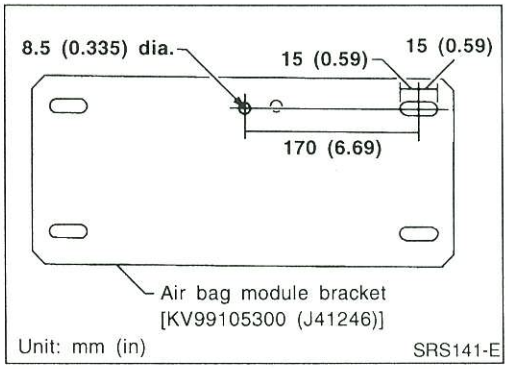
CAUTION:
When deploying the air bag module, stand at least 5 m (16 ft) away from the air bag module.

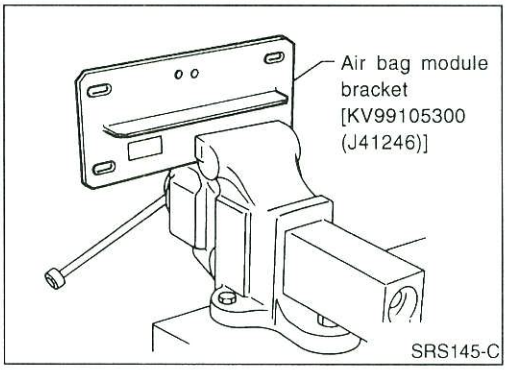


Deployment of Passenger Air Bag Module (Outside of vehicle)

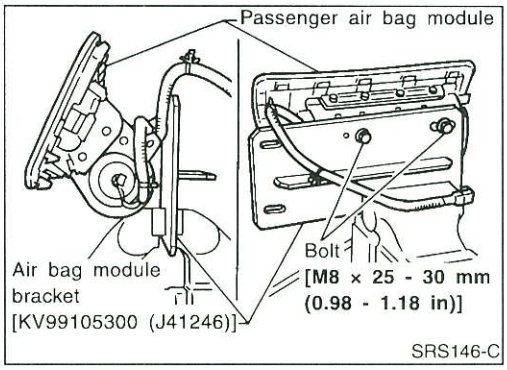
NBRS0018S0202

1. Make an 8.5 mm (0.335 in) diameter hole in air bag module bracket [SST: KV99105300 (J41246)] at the position shown in figure at left.



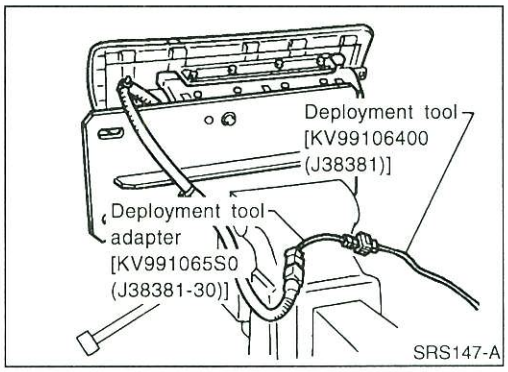


2. Firmly secure air bag module bracket [SST: KV99105300 (J41246)] in a vise.

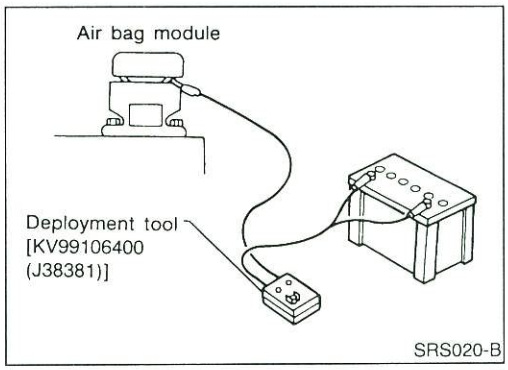


3. Match the two holes in air bag module bracket (held in vise) and passenger air bag module and fix them with two bolts [M8 × 25 - 30 mm (0.98 - 1.18 in)].

CAUTION:
If a gap exists between passenger air bag module and air bag module bracket, use a piece of wood inserted in the gap to stabilize the air bag module.



4. Connect deployment tool adapter [SST: KV991065S0 (J38381-30)] to deployment tool [SST: KV99106400 (J38381)] connector and air bag module connector.
5. Connect red clip of deployment tool to battery positive terminal and black clip to negative terminal.
6. The lamp on the right side of the tool, marked "deployment tool power", should glow green, not red.
7. Press the button on the deployment tool. The left side lamp on the tool, marked "air bag connector voltage", will illuminate and the air bag module will deploy.

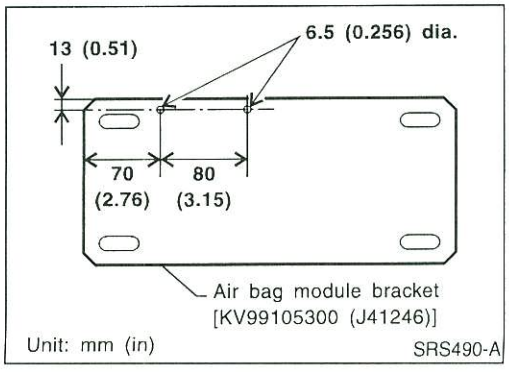


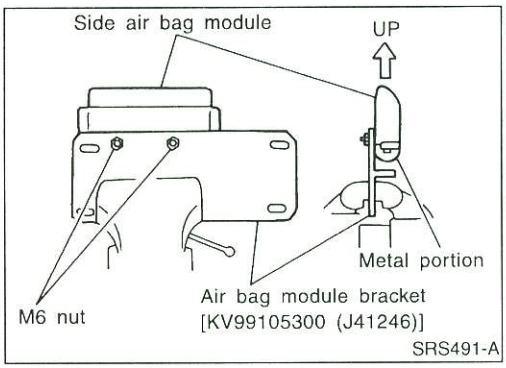
CAUTION:
- **When deploying the air bag module, do not stand on the deploying side.**
- **Stand at least 5 m (16 ft) away from the air bag module.**

Deployment of Side Air Bag Module (Built-in type) (Outside of vehicle)

NBRS0018S0203

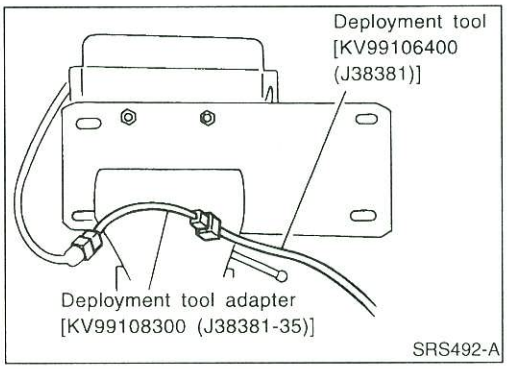
1. Make 6.5 mm (0.256 in) diameter holes in air bag module bracket [SST: KV99105300 (J41246)] at the position shown in figure at left.



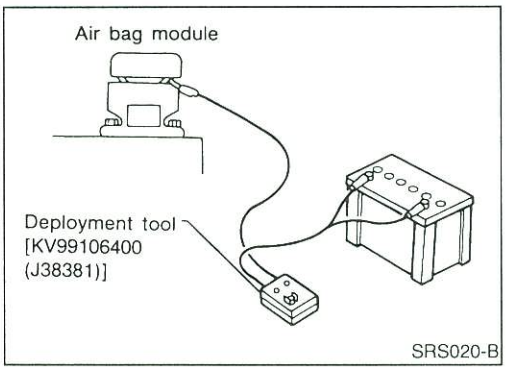


2. Firmly secure air bag module bracket [SST: KV99105300 (J41246)] in a vise.
3. Insert the stud bolts of side air bag module (built-in type) into the two holes in air bag module bracket (held in vise) and fix them with two M6 nuts.

CAUTION:
Side air bag module should be secured to air bag module bracket [SST: KV99105300 (J41246)] in a vise with metal portion facing down.



4. Connect deployment tool adapter [SST: KV99108300 (J38381-35)] to deployment tool [SST: KV99106400 (J38381)] connector and connector on air bag module.

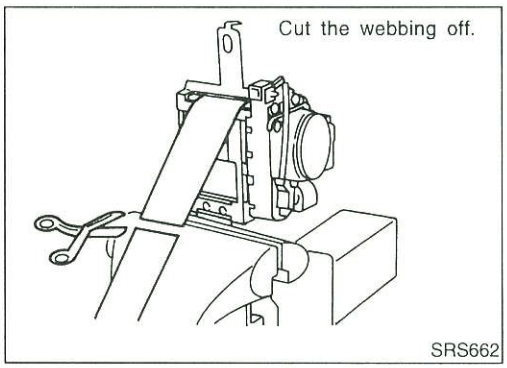


5. Connect red clip of deployment tool to battery positive terminal and black clip to negative terminal.
6. The lamp on the right side of the tool, marked "deployment tool power", should glow green, not red.
7. Press the button on the deployment tool. The left side lamp on the tool, marked "air bag connector voltage", will illuminate and the air bag module will deploy.

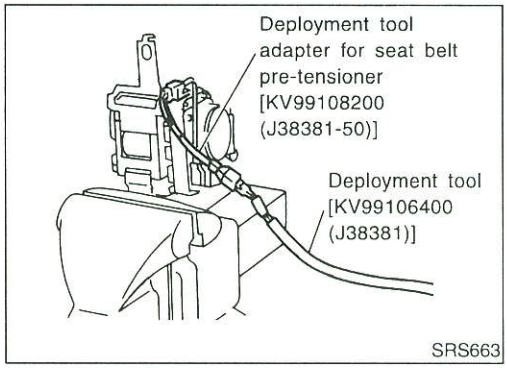
CAUTION:
When deploying the air bag module, stand at least 5 m (16 ft) away from the air bag module.

DEPLOYMENT PROCEDURES FOR SEAT BELT PRE-TENSIONER (OUTSIDE OF VEHICLE)

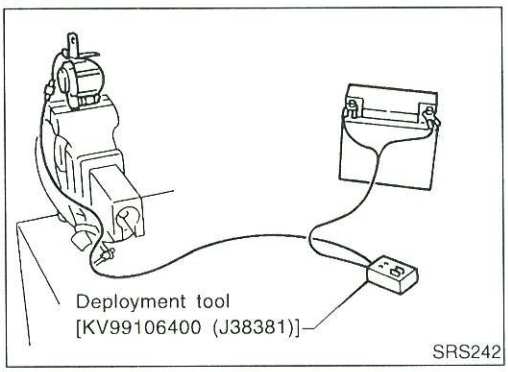
NBRS0018S05



1. Firmly grip pre-tensioner in a vise and cut the webbing off.



2. Connect deployment tool adapter [SST: KV99108200 (J38381-50)] to deployment tool [SST: KV99106400 (J38381)] connector and seat belt pre-tensioner connector.



3. Connect red clip of deployment tool to battery positive terminal and black clip to negative terminal.
4. The lamp on the right side of the tool, marked "deployment tool power", should glow green, not red.
5. Press the button on the deployment tool. The left side lamp on the tool, marked "seat belt pre-tensioner connector voltage", will illuminate and the seat belt pre-tensioner will deploy.

CAUTION:
When deploying the seat belt pre-tensioner, stand at least 5 m (16 ft) away from the seat belt pre-tensioner.

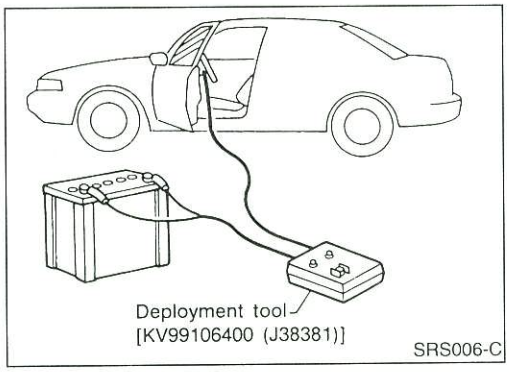
DEPLOYMENT OF AIR BAG MODULE AND SEAT BELT PRE-TENSIONER WHILE MOUNTED IN VEHICLE

NBRS0018S03

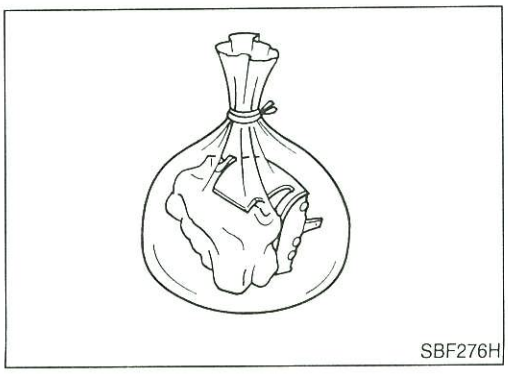
When disposing of a vehicle, deploy air bag module and seat belt pre-tensioners while they are mounted in vehicle.

CAUTION:
When deploying air bag module or seat belt pre-tensioner, ensure vehicle is empty.

1. Disconnect both the vehicle battery cables and wait 3 minutes.
2. Disconnect air bag module and seat belt pre-tensioner connector.
3. Connect deployment tool [SST: KV99106400 (J38381)] to air bag module or seat belt pre-tensioner.
   For front passenger air bag module, attach deployment tool adapter [SST: KV991065S0 (J38381-30)] to the tool connector. For side air bag module (built-in type), attach deployment tool adapter [SST: KV99108300 (J38381-35)]. For seat belt pre-tensioner, attach deployment tool adapter [SST: KV99108200 (J38381-50)] to the tool connector.



4. Connect red clip of deployment tool to battery positive terminal and black clip to negative terminal.
5. The lamp on the right side of the tool, marked "deployment tool power", should glow green, not red.
6. Press the button on the deployment tool. The left side lamp on the tool, marked "air bag connector voltage", will illuminate and the air bag module will deploy.



DISPOSING OF AIR BAG MODULE AND SEAT BELT PRE-TENSIONER

NBRS0018S04

Deployed air bag module and seat belt pre-tensioner are very hot. Before disposing of air bag module, and seat belt pre-tensioner wait at least 30 minutes, and 10 minutes, respectively. Seal them in a plastic bag before disposal.

CAUTION:
- **Never apply water to a deployed air bag module and seat belt pre-tensioner.**
- **Be sure to wear gloves when handling a deployed air bag module and seat belt pre-tensioner.**

- No poisonous gas is produced upon air bag module deployment. However, be careful not to inhale gas since it irritates throat and can cause choking.
- Do not attempt to disassemble air bag module and seat belt pre-tensioner.
- Air bag module and seat belt pre-tensioner cannot be reused.
- Wash your hands clean after finishing work.

Trouble Diagnoses Introduction

=NBRS0030

CAUTION:

- **Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses (except "SEAT BELT PRE-TENSIONER") are covered with yellow insulation either just before the harness connectors or for the complete harness, for easy identification.**
- **Do not attempt to repair, splice or modify the SRS wiring harness. If the harness is damaged, replace it with a new one.**
- **Keep ground portion clean.**

DIAGNOSIS FUNCTION

NBRS0030S01

The SRS self-diagnosis results can be read by using "AIR BAG" warning lamp, "SEAT BELT" warning lamp and/or CONSULT. The reading of these results is accomplished using one of two modes — "User mode" and "Diagnosis mode".

The User mode is exclusively prepared for the customer (driver). This mode warns the driver of a system malfunction through the operation of the "AIR BAG" warning lamp and/or "SEAT BELT" warning lamp.

The Diagnosis mode allows the technician to locate and inspect the malfunctioning part.

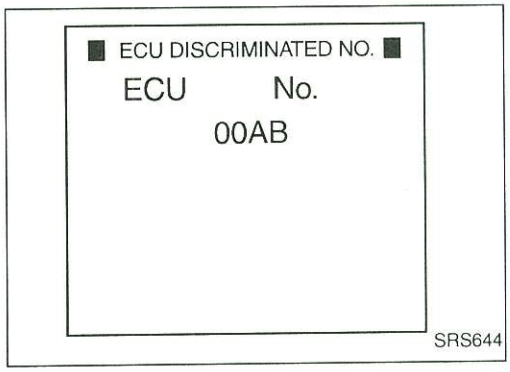
The mode applications for the "AIR BAG" warning lamp, "SEAT BELT" warning lamp and CONSULT are as follows:

	User mode	Diagnosis mode	Display type
"AIR BAG" warning lamp	X	X	ON-OFF operation
"SEAT BELT" warning lamp	X	—	ON-OFF operation
CONSULT	—	X	Monitoring

DIAGNOSIS MODE FOR CONSULT

NBRS0030S02

- "SELF-DIAG [CURRENT]"
  A current Self-diagnosis result (also indicated by the number of warning lamp flashes in the Diagnosis mode) is displayed on the CONSULT screen in real time. This refers to a malfunctioning part requiring repairs.
- "SELF-DIAG [PAST]"
  Diagnosis results previously stored in the memory are displayed on the CONSULT screen. The stored results are not erased until memory erasing is executed.
- "TROUBLE DIAG RECORD"
  With TROUBLE DIAG RECORD, diagnosis results previously erased by a reset operation can be displayed on the CONSULT screen.
- "ECU DISCRIMINATED NO."
  The diagnosis sensor unit for each vehicle model is assigned with its own, individual classification number. This number will be displayed on the CONSULT screen, as shown below. When replacing the diagnosis sensor unit, refer to the part number for the compatibility. After installation, replacement with a correct unit can be checked by confirming this classification number on the CONSULT screen.



For INFINITI QX4, the diagnosis sensor unit classification number assigned is 00AB.

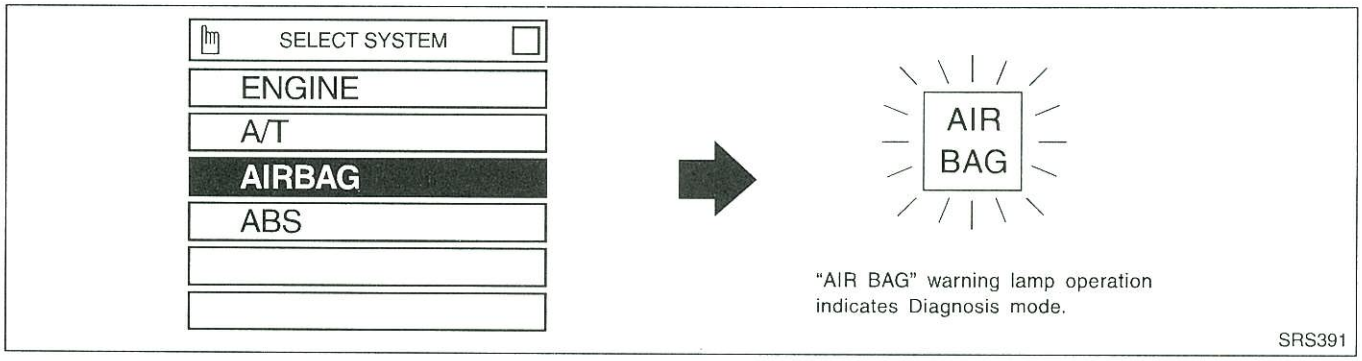
HOW TO CHANGE SELF-DIAGNOSIS MODE WITH CONSULT

NBRS0030S03

From User Mode to Diagnosis Mode

NBRS0030S0301

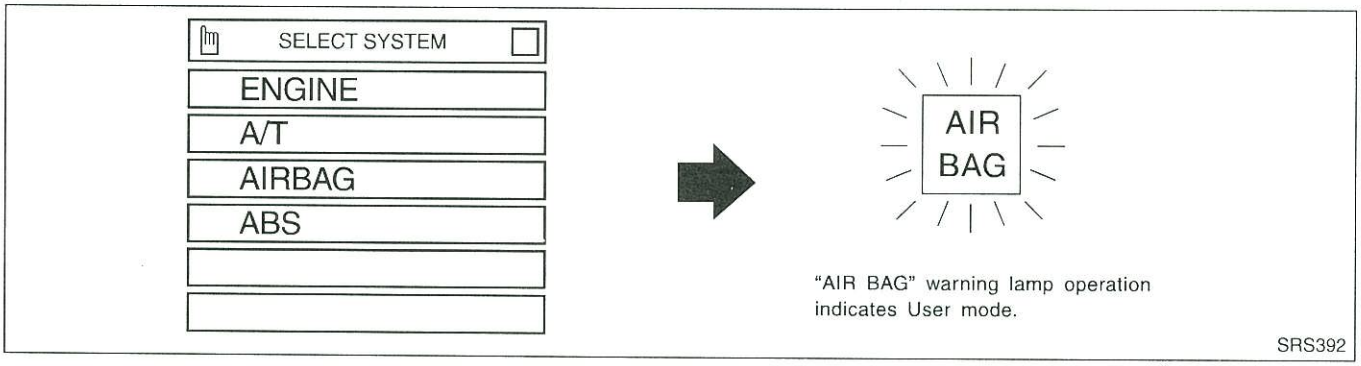
After selecting "AIR BAG" on the "SELECT SYSTEM" screen, User mode automatically changes to Diagnosis mode.



From Diagnosis Mode to User Mode

NBRS0030S0302

To return to User mode from Diagnosis mode, touch "BACK" key of CONSULT until "SELECT SYSTEM" appears, Diagnosis mode automatically changes to User mode.



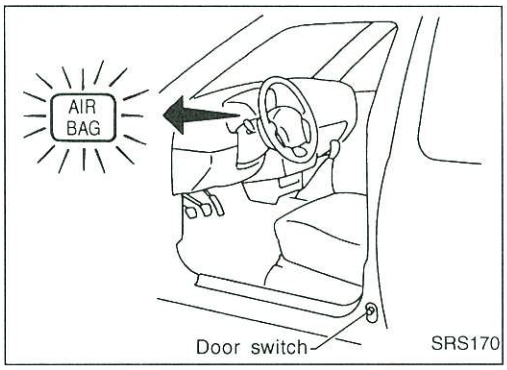
HOW TO CHANGE SELF-DIAGNOSIS MODE WITHOUT CONSULT

=NBRS0030S05

From User Mode to Diagnosis Mode

NBRS0030S0501

Diagnosis mode activates only when a malfunction is detected, by pressing the driver's door switch at least 5 times within 7 seconds after turning the ignition "ON". SRS will not enter Diagnosis mode, if no malfunction is detected.



From Diagnosis Mode to User Mode

NBRS0030S0502

After a malfunction is repaired, switch the ignition "OFF" for at least one second, then back "ON". Diagnosis mode is returned to User mode. If switching Diagnosis mode to User mode is required while malfunction is being detected, switch the ignition "OFF", then back "ON" and press the driver's door switch at least 5 times within 7 seconds.

HOW TO ERASE SELF-DIAGNOSIS RESULTS

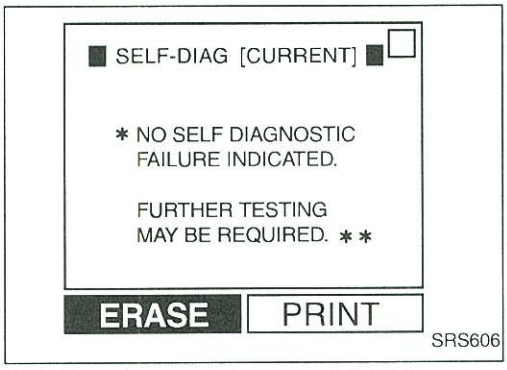
NBRS0030S04

With CONSULT

NBRS0030S0401

- "SELF-DIAG [CURRENT]"
  A current Self-diagnosis result is displayed on the CONSULT screen in real time.
  After the malfunction is repaired completely, no malfunction is detected on "SELF-DIAG [CURRENT]".
- "SELF-DIAG [PAST]"
  Return to the "SELF-DIAG [CURRENT]" CONSULT screen by pushing "BACK" key of CONSULT and select "SELF-DIAG [CURRENT]" in SELECT DIAG MODE. Touch "ERASE" in "SELF-DIAG [CURRENT]" mode.

NOTE:
If the memory of the malfunction in "SELF-DIAG [PAST]" is not erased, the User mode shows the system malfunction by the operation of the warning lamp even if the malfunction is repaired completely.



- "TROUBLE DIAG RECORD"
  The memory of "TROUBLE DIAG RECORD" cannot be erased.

Without CONSULT

NBRS0030S0402

After a malfunction is repaired, switch the ignition "OFF" for at least one second, then back "ON". Diagnosis mode returns to the User mode. At that time, the malfunction code is cleared.

How to Perform Trouble Diagnoses for Quick and Accurate Repair

NBRS0031

A good understanding of the malfunction conditions can make troubleshooting faster and more accurate. In general, each customer feels differently about a problem. It is important to fully understand the symptoms or conditions for a customer complaint.

INFORMATION FROM CUSTOMER

NBRS0031S01

WHAT ..... Vehicle model
WHEN ..... Date, Frequencies
WHERE ..... Road conditions
HOW ..... Operating conditions, Symptoms

PRELIMINARY CHECK

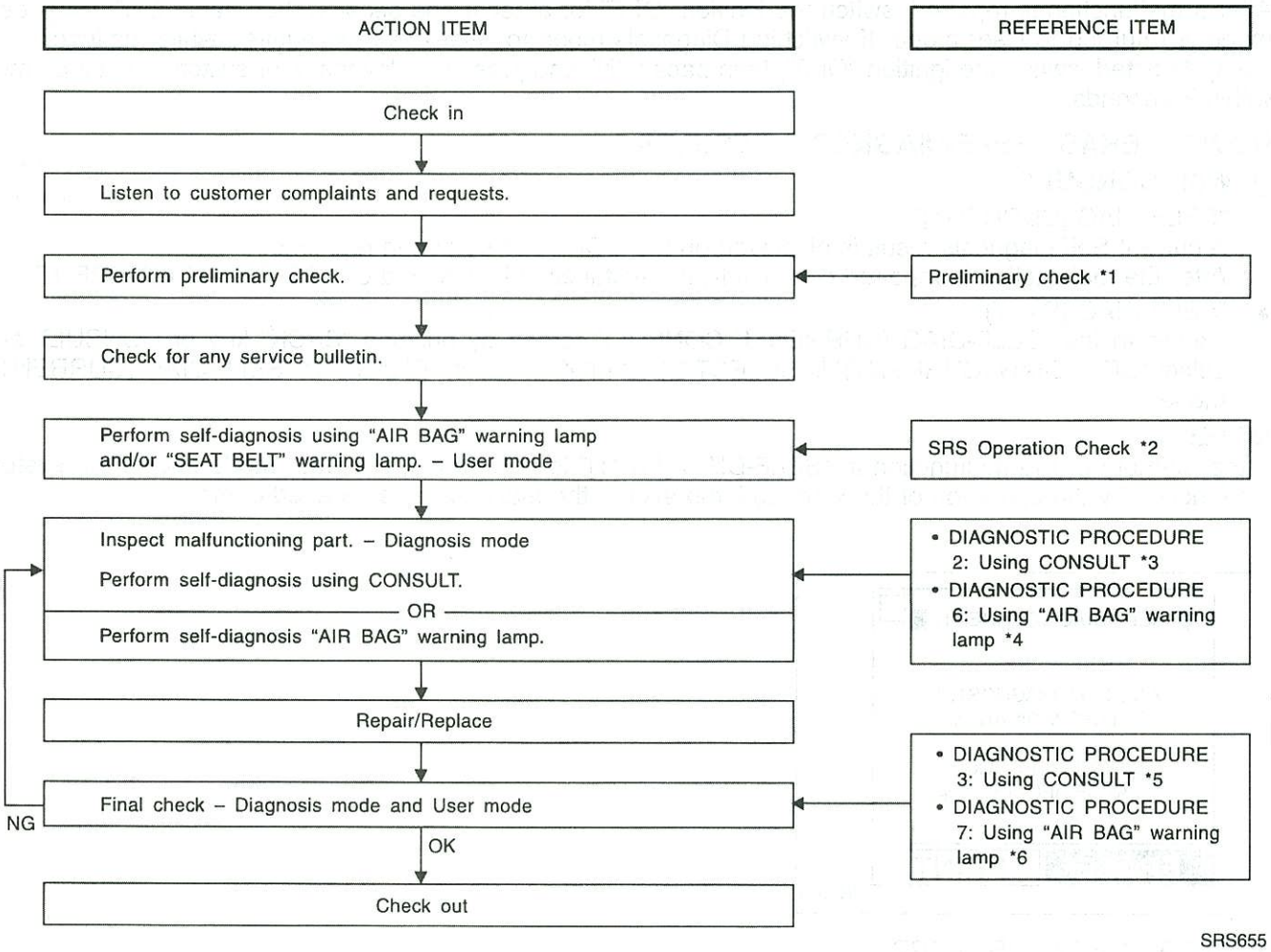
NBRS0031S02

Check that the following parts are in good order.

- Battery [Refer to SC section ("BATTERY").]
- Fuse [Refer to EL section ("Fuse", "POWER SUPPLY ROUTING").]
- System component-to-harness connections

WORK FLOW

NBRS0031S03

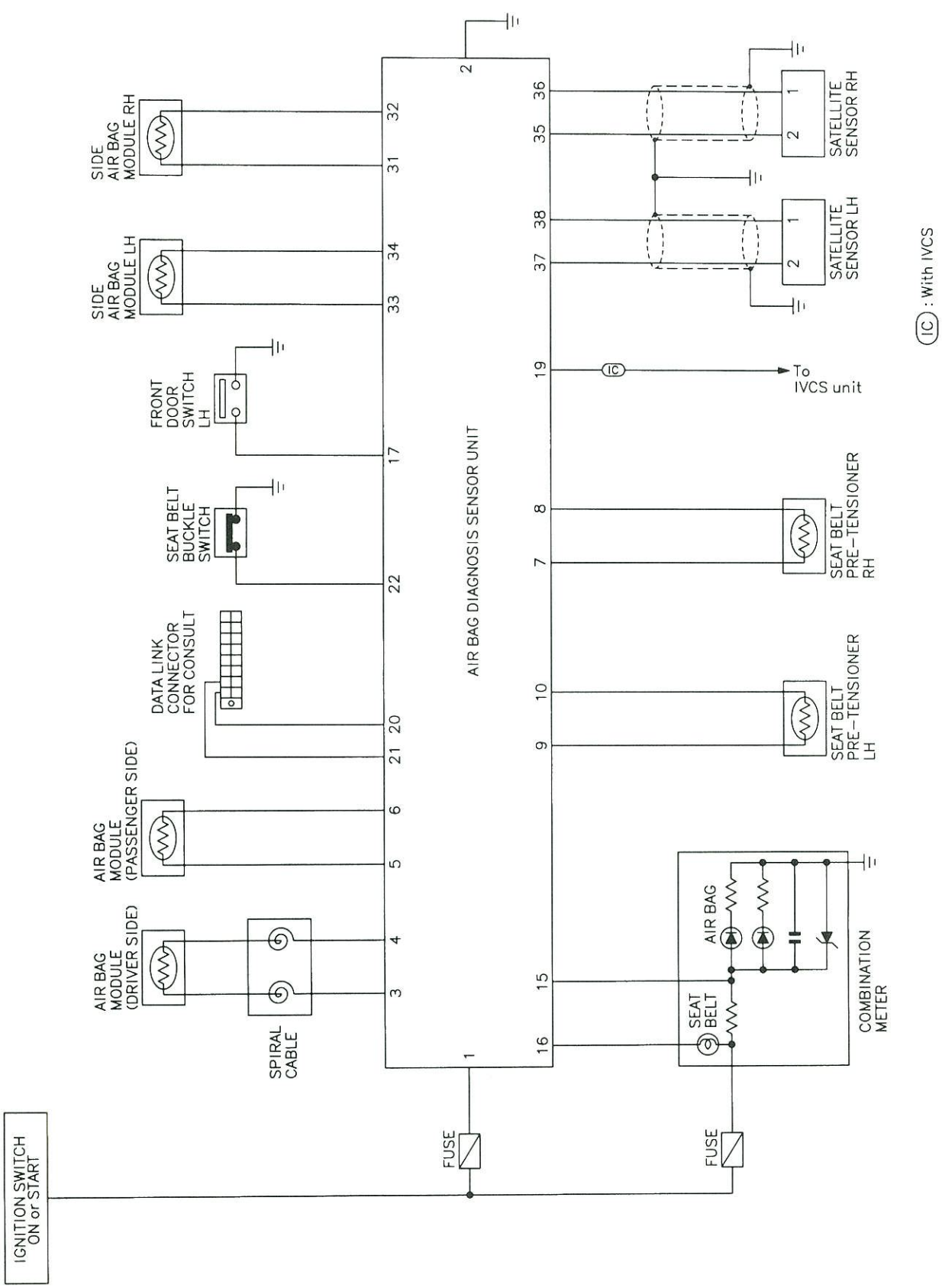


SRS655

*1: RS-32
*2: RS-37
*3: RS-39
*4: RS-49
*5: RS-42
*6: RS-52

Schematic

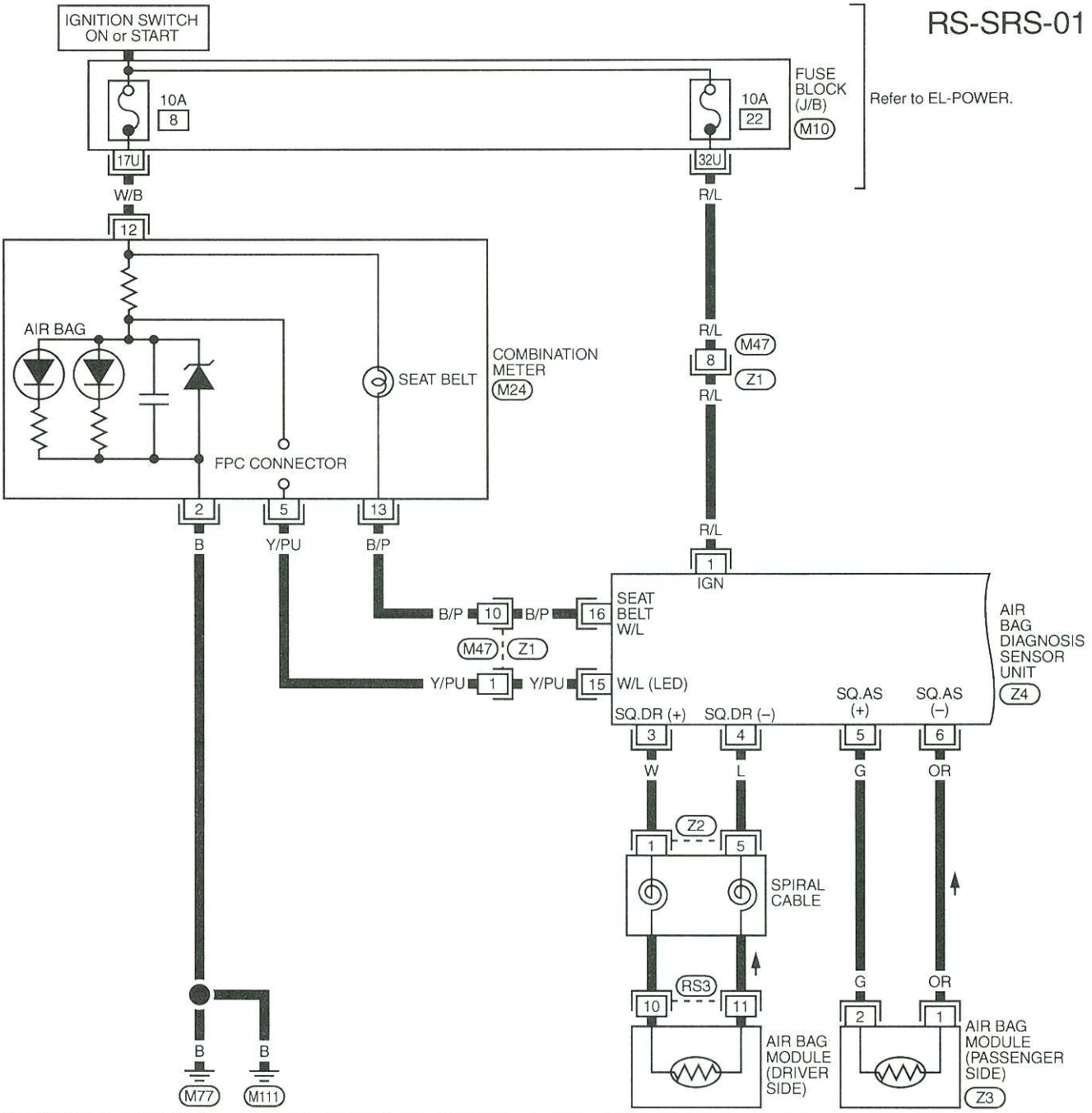
NBRS0020



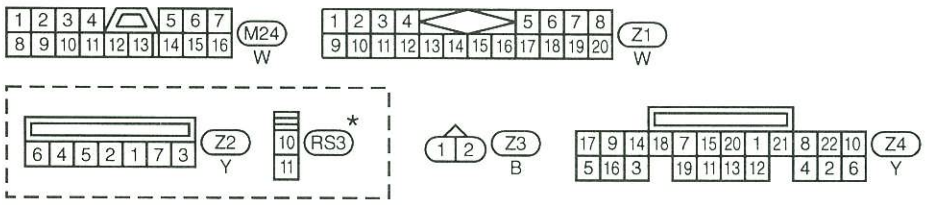
MRS248A

Wiring Diagram — SRS —

NBRS0021



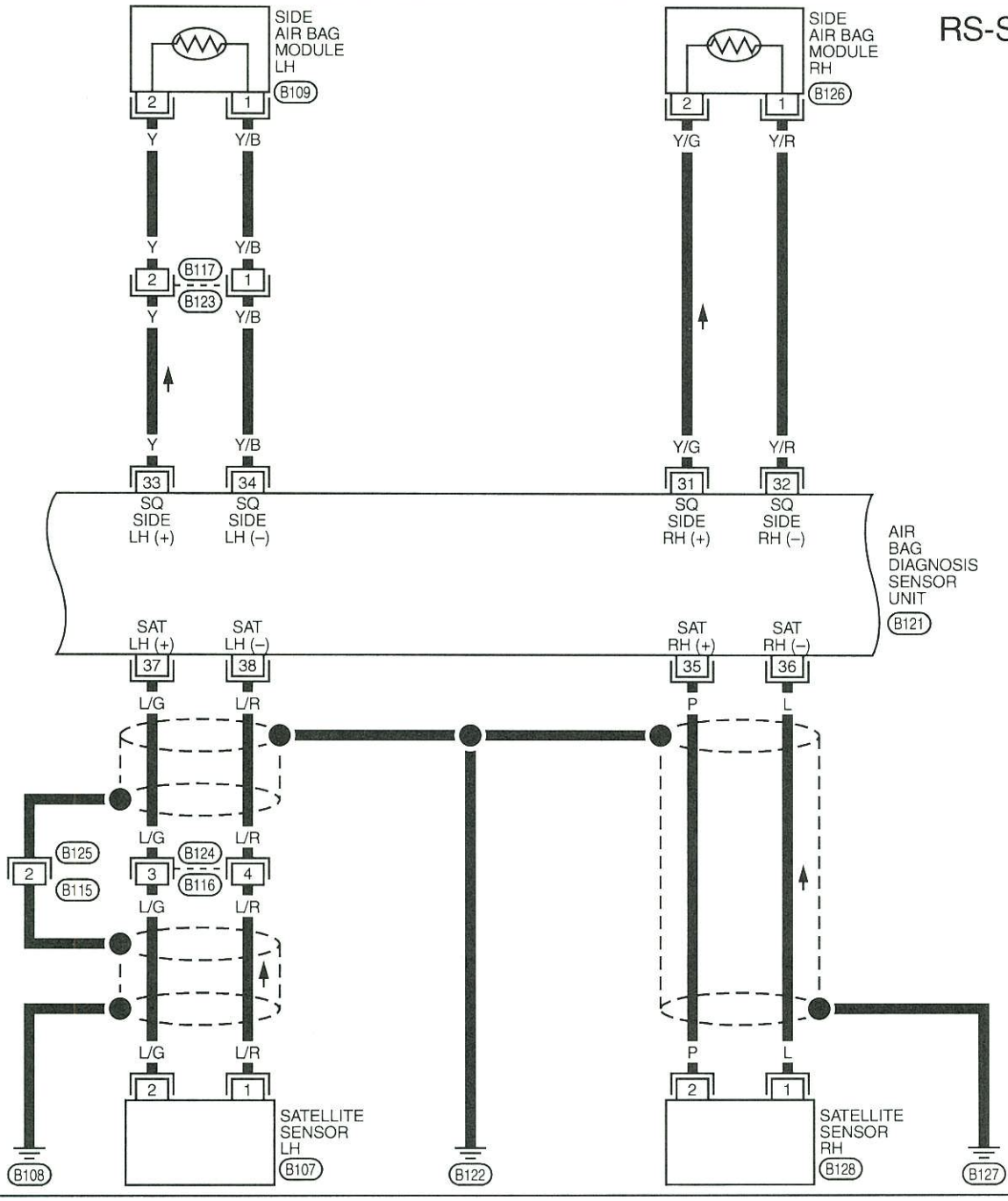
Refer to last page (Foldout page).
M10

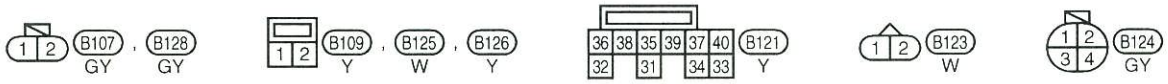


* This connector is not shown in "HARNESS LAYOUT" of EL section.

MRS249A

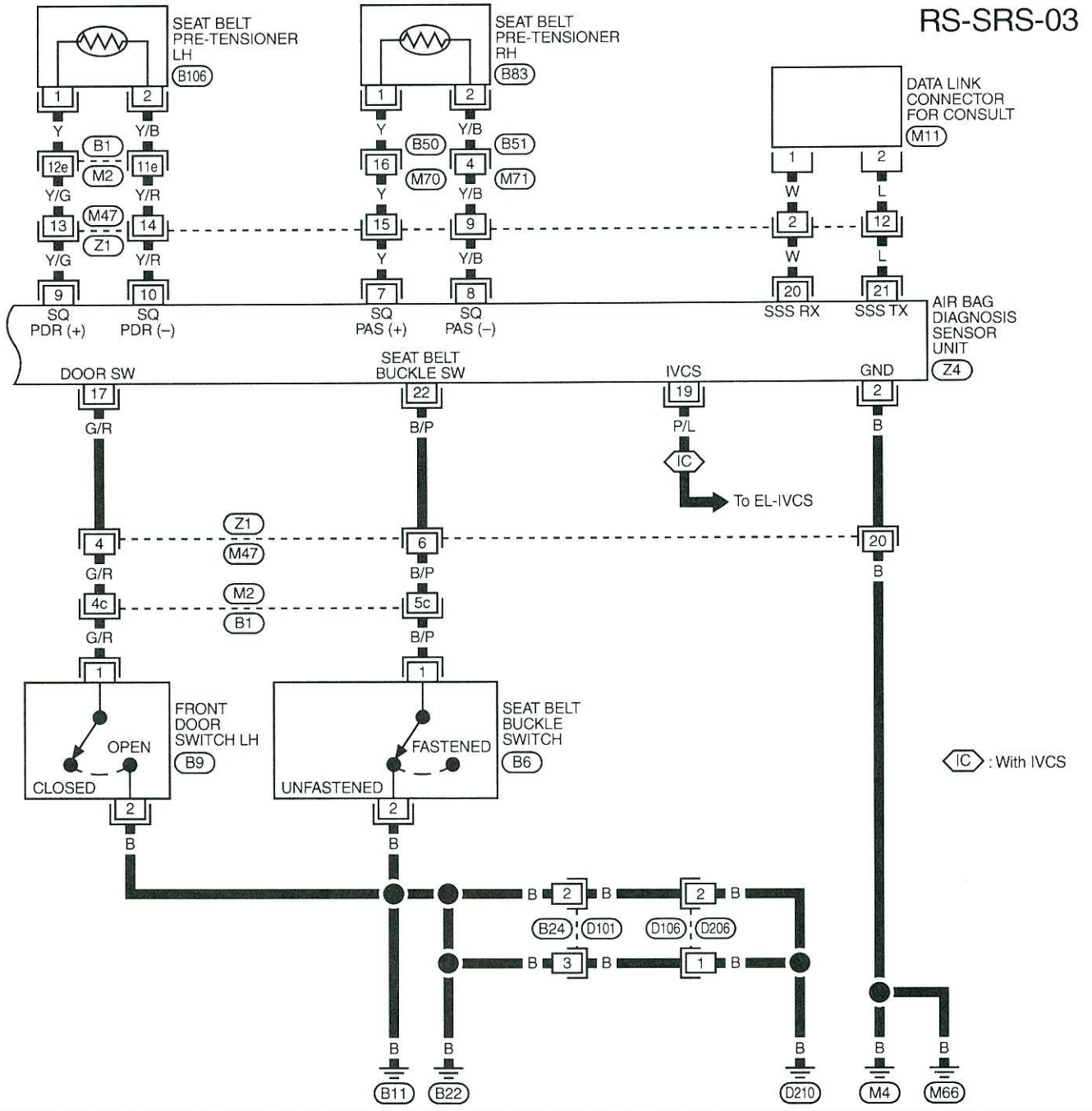
RS-SRS-02

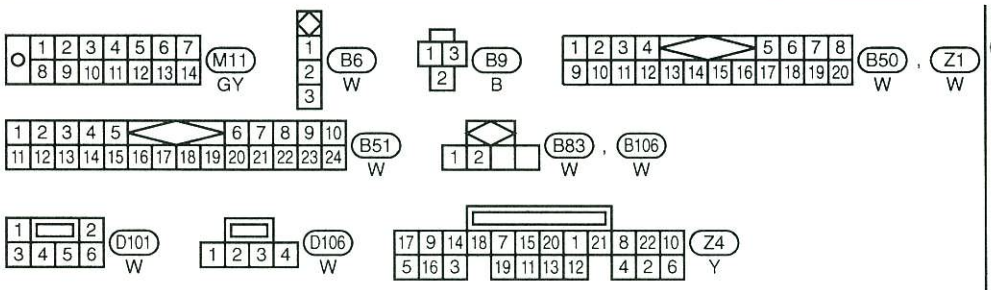




MRS250A

Wiring Diagram — SRS — (Cont'd)





Refer to last page (Foldout page).

M2 , B1

MRS251A

SRS Operation Check

NBRS0022

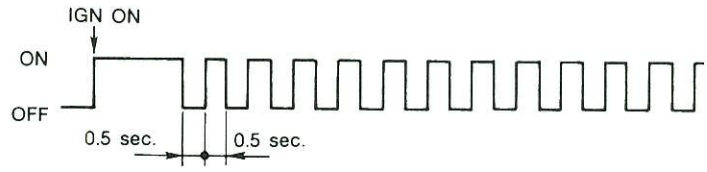
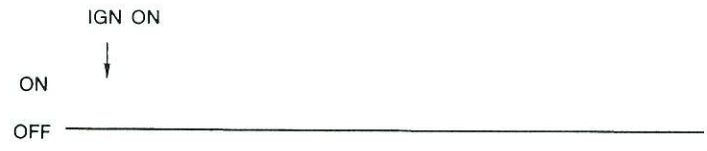
DIAGNOSTIC PROCEDURE 1

NBRS0022S01

Checking Air Bag Operation by using "AIR BAG" Warning Lamp — User Mode

NBRS0022S0101

1. After turning ignition switch from "OFF" to "ON", "AIR BAG" warning lamp operates.
2. Compare "AIR BAG" warning lamp operation to the chart below.

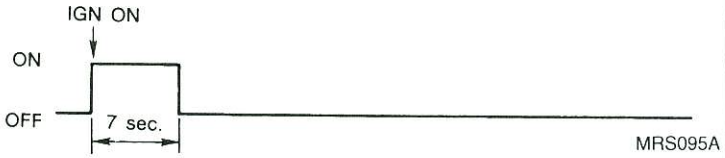
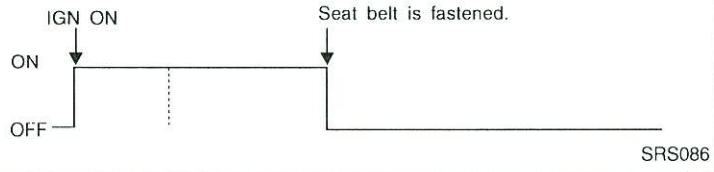
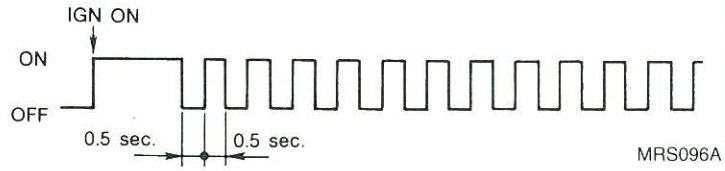
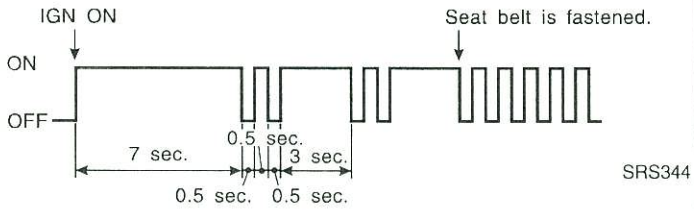
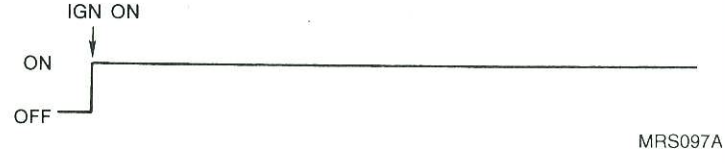
"AIR BAG" warning lamp operation — User mode —	SRS condition	Reference item
MRS095A	No malfunction is detected. No further action is necessary.	—
 MRS096A	The system is malfunctioning and needs to be repaired as indicated.	Go to DIAGNOSTIC PROCEDURE 2 or 6 (RS-39 or RS-49).
MRS097A	Air bag is deployed.	Go to COLLISION DIAGNOSIS (RS-59).
	Air bag fuse, diagnosis sensor unit or harness is malfunctioning and needs to be repaired.	Go to DIAGNOSTIC PROCEDURE 9 (RS-55).
 MRS098A	One of the following has occurred and needs to be repaired. • Meter fuse is blown. • "AIR BAG" warning lamp circuit has open or short. • Diagnosis sensor unit is malfunctioning.	Go to DIAGNOSTIC PROCEDURE 10 (RS-56).

NOTE:
If "AIR BAG" warning lamp operates differently from the operations shown above, refer to "AIR BAG" warning lamp operation — Diagnosis mode —, DIAGNOSTIC PROCEDURE 6 (step 4), RS-49.

Checking Seat Belt Pre-tensioner Operation by Using "SEAT BELT" Warning Lamp — User Mode

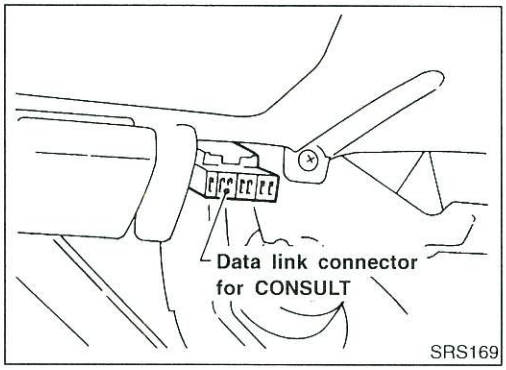
=NBRS0022S0102

1. After turning ignition switch from "OFF" to "ON", "SEAT BELT" warning lamp operates.
2. Compare "SEAT BELT" warning lamp operation to the chart below.

"SEAT BELT" warning lamp operation	SRS condition	Reference item
• After driver's seat belt has been fastened. 	No malfunction is detected. No further action is necessary.	—
• When driver's seat belt has not been fastened. 		
• After driver's seat belt has been fastened. 	• Seat belt pre-tensioner circuit is opened, or • Seat belt pre-tensioner power supply or ground circuit is shorted.	• If CONSULT is available, go to DIAGNOSTIC PROCEDURE 2 (RS-39). • If CONSULT is not available, repair the system as follows.* 1. Visually check the wiring harness connections. 2. Replace driver's and front passenger seat belt assemblies. (Before disposing, they must be deactivated.) 3. Replace diagnosis sensor unit. 4. Replace air bag harness.
• When driver's seat belt has not been fastened. 		
• When driver's seat belt is fastened. 	Seat belt pre-tensioner (and air bag) is deployed.	Go to COLLISION DIAGNOSIS (RS-59).
	Seat belt buckle switch, harness, combination meter assembly, diagnosis sensor unit are malfunctioning and need to be repaired.	Go to DIAGNOSTIC PROCEDURE 12 (RS-58).

"SEAT BELT" warning lamp operation	SRS condition	Reference item
IGN ON ↓ ON / OFF — MRS098A	Meter fuse, diagnosis sensor unit or "SEAT BELT" warning lamp circuit is shorted or open and needs to be repaired.	Go to DIAGNOSTIC PROCEDURE 13 (RS-59).

*** Follow the procedures in numerical order when repairing malfunctioning parts. Confirm whether malfunction is eliminated using the seat belt warning lamp each time repair is finished. If malfunction is still observed, proceed to the next step. When malfunction is eliminated, further repair work is not required.**



SRS169

Trouble Diagnoses with CONSULT

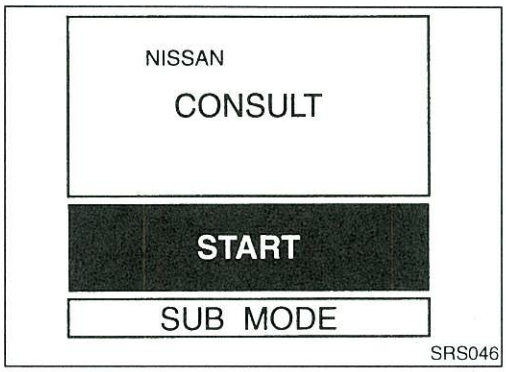
NBRS0023

DIAGNOSTIC PROCEDURE 2

NBRS0023S01

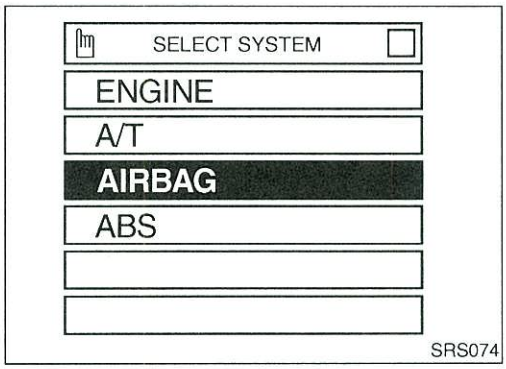
Inspecting SRS malfunctioning parts by using CONSULT — Diagnosis mode

1. Turn ignition switch "OFF".
2. Connect "CONSULT" to Data link connector.



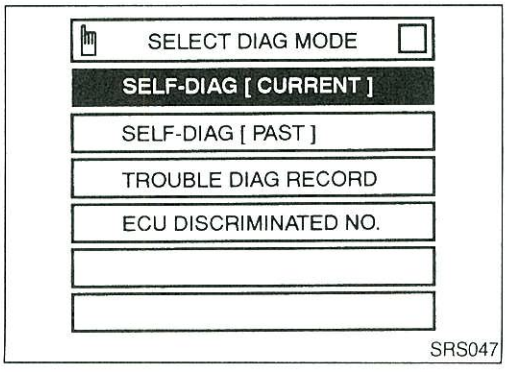
SRS046

3. Turn ignition switch "ON".
4. Touch "START".



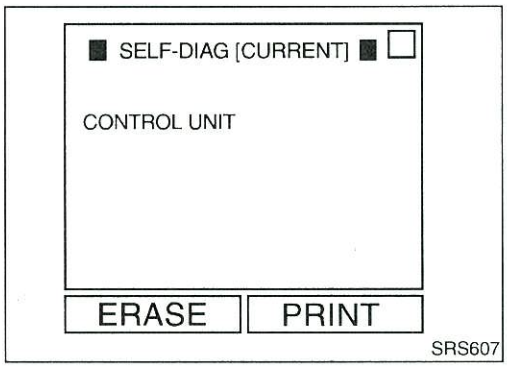
SRS074

5. Touch "AIRBAG".

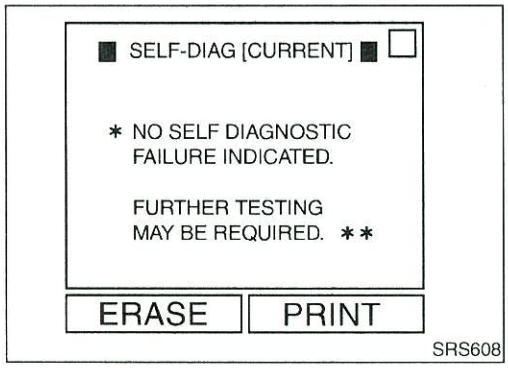


SRS047

6. Touch "SELF-DIAG [CURRENT]".



7. Diagnostic codes are displayed on "SELF-DIAG [CURRENT]".



If no malfunction is detected on "SELF-DIAG [CURRENT]" even though malfunction is detected in "SRS Operation Check", check the battery voltage.
If the battery voltage is less than 9V, charge the battery. Then go to DIAGNOSTIC PROCEDURE 3, page RS-42.
If the battery voltage is OK, go to DIAGNOSTIC PROCEDURE 4, page RS-44, to diagnose the following cases:

- Self-diagnostic result "SELF-DIAG [PAST]" (previously stored in the memory) might not be erased after repair.
- The SRS system malfunctions intermittently.

8. Touch "PRINT".
9. Compare diagnostic codes to "CONSULT Diagnostic Code Chart", page RS-40.
10. Touch "BACK" key of CONSULT until SELECT SYSTEM appears in order to return to User mode from Diagnosis mode, then turn off CONSULT.
11. Turn ignition switch "OFF", then disconnect CONSULT and both battery cables.
12. Repair the system as outlined by the "Repair order" in "CONSULT Diagnostic Code Chart", that corresponds to the self-diagnostic result. For replacement procedure of component parts, refer to RS-14.
13. After repairing the system, go to DIAGNOSTIC PROCEDURE 3, page RS-42 for final checking.

CONSULT Diagnostic Code Chart ("SELF-DIAG [CURRENT]")

NBRS0023S0101

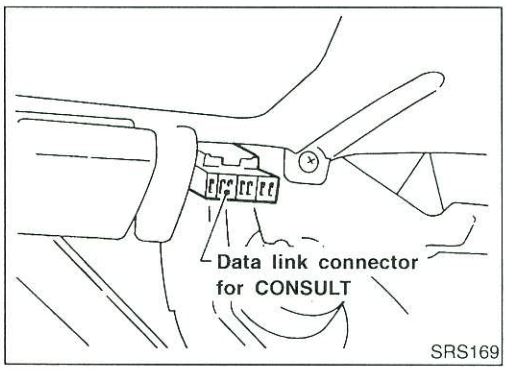
Diagnostic item	Explanation		Repair order **"Recheck SRS at each replacement."**
NO SELF DIAGNOSTIC FAILURE INDICATED.	When malfunction is indicated by the "AIR BAG" warning lamp in User mode	• Low battery voltage (Less than 9V)	• Go to DIAGNOSTIC PROCEDURE 3 (RS-42) after charging battery.
		• Self-diagnostic result "SELF-DIAG [PAST]" (previously stored in the memory) might not be erased after repair. • Intermittent malfunction has been detected in the past.	• Go to DIAGNOSTIC PROCEDURE 4 (RS-44).
	• No malfunction is detected.		• Go to DIAGNOSTIC PROCEDURE 3 (RS-42).

Diagnostic item	Explanation	Repair order "Recheck SRS at each replacement."
AIRBAG MODULE [OPEN]	• Driver's air bag module circuit is open. (including the spiral cable)	1. Visually check the wiring harness connection. 2. Replace the harness if it has visible damage. 3. Replace driver's air bag module. (Before disposal of it, it must be deployed.) 4. Replace the spiral cable. 5. Replace the diagnosis sensor unit. 6. Replace the related harness.
AIRBAG MODULE [VB-SHORT]	• Driver's air bag module circuit is shorted to some power supply circuit. (including the spiral cable)	1. Visually check the wiring harness connection. 2. Replace the harness if it has visible damage. 3. Replace the spiral cable. 4. Replace driver's air bag module. (Before disposal of it, it must be deployed.) 5. Replace the diagnosis sensor unit. 6. Replace the related harness.
AIRBAG MODULE [GND-SHORT]	• Driver's air bag module circuit is shorted to ground. (including the spiral cable)	
AIRBAG MODULE [SHORT]	• Driver's air bag module circuits are shorted to each other.	
ASSIST A/B MODULE [VB-SHORT]	• Front passenger air bag module circuit is shorted to some power supply circuit.	1. Visually check the wiring harness connection. 2. Replace the harness if it has visible damage. 3. Replace front passenger air bag module. (Before disposal of it, it must be deployed.) 4. Replace the diagnosis sensor unit. 5. Replace the related harness.
ASSIST A/B MODULE [OPEN]	• Front passenger air bag module circuit is open.	
ASSIST A/B MODULE [GND-SHORT]	• Front passenger air bag module circuit is shorted to ground.	
ASSIST A/B MODULE [SHORT]	• Front passenger air bag module circuits are shorted to each other.	
SIDE MODULE LH [OPEN]	• Side air bag module (LH) circuit is open.	1. Visually check the wiring harness connection. 2. Replace the harness if it has visible damage. 3. Replace side air bag module (LH). (Before disposal, it must be deployed.) 4. Replace the diagnosis sensor unit. 5. Replace the related harness.
SIDE MODULE LH [VB-SHORT]	• Side air bag module (LH) circuit is shorted to some power supply circuits.	
SIDE MODULE LH [GND-SHORT]	• Side air bag module (LH) circuit is shorted to ground.	
SIDE MODULE LH [SHORT]	• Side air bag module (LH) circuits are shorted to each other.	
SIDE MODULE RH [OPEN]	• Side air bag module (RH) circuit is open.	1. Visually check the wiring harness connection. 2. Replace the harness if it has visible damage. 3. Replace side air bag module (RH). (Before disposal, it must be deployed.) 4. Replace the diagnosis sensor unit. 5. Replace the related harness.
SIDE MODULE RH [VB-SHORT]	• Side air bag module (RH) circuit is shorted to some power supply circuits.	
SIDE MODULE RH [GND-SHORT]	• Side air bag module (RH) circuit is shorted to ground.	
SIDE MODULE RH [SHORT]	• Side air bag module (RH) circuits are shorted to each other.	
SATELLITE SENS LH [UNIT FAIL] SATELLITE SENS LH [COMM FAIL]	• Satellite sensor (LH)	1. Visually check the wiring harness connection. 2. Replace the harness if it has visible damage. 3. Replace the satellite sensor (LH). 4. Replace the diagnosis sensor unit. 5. Replace the related harness.

Trouble Diagnoses with CONSULT (Cont'd)

Diagnostic item	Explanation	Repair order "Recheck SRS at each replacement."
SATELLITE SENS RH [UNIT FAIL] SATELLITE SENS RH [COMM FAIL]	• Satellite sensor (RH)	1. Visually check the wiring harness connection. 2. Replace the harness if it has visible damage. 3. Replace the satellite sensor (RH). 4. Replace the diagnosis sensor unit. 5. Replace the related harness.
PRE-TEN FRONT LH [OPEN/VB-SHORT]	• The circuit for front LH pre-tensioner is open or shorted to some power supply circuit.	1. Visually check the wiring harness connections. 2. Replace the harness if it has visible damage. 3. Replace front LH seat belt. (Before disposing, it must be deactivated.) 4. Replace the diagnosis sensor unit. 5. Replace the related harness.
PRE-TEN FRONT LH [GND-SHORT]	• The circuit for front LH pre-tensioner is shorted to ground.	
PRE-TEN FRONT RH [OPEN/VB-SHORT]	• The circuit for front RH pre-tensioner is open or shorted to some power supply circuit.	1. Visually check the wiring harness connections. 2. Replace the harness if it has visible damage. 3. Replace front RH seat belt. (Before disposing, it must be deactivated.) 4. Replace the diagnosis sensor unit. 5. Replace the related harness.
PRE-TEN FRONT RH [GND-SHORT]	• The circuit for front RH pre-tensioner is shorted to ground.	
CONTROL UNIT	• Diagnosis sensor unit is malfunctioning.	1. Visually check the wiring harness connection. 2. Replace the diagnosis sensor unit.

*** Follow the procedures in numerical order when repairing malfunctioning parts. Confirm whether malfunction is eliminated using the air bag warning lamp or CONSULT each time repair is finished. If malfunction is still observed, proceed to the next step. When malfunction is eliminated, further repair work is not required.**



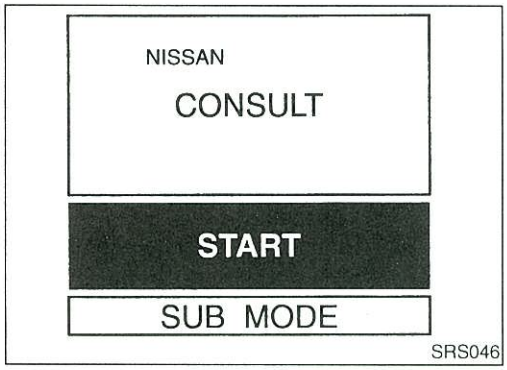
SRS169

DIAGNOSTIC PROCEDURE 3

NBRS0023S02

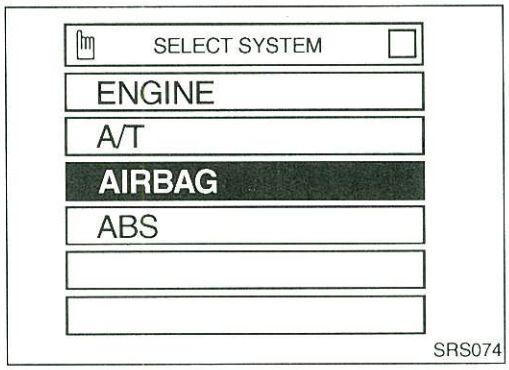
Final checking after repairing SRS by using CONSULT — Diagnosis mode

1. After repairing SRS, connect both battery cables.
2. Connect CONSULT to Data link connector.
3. Turn ignition switch from "OFF" to "ON".

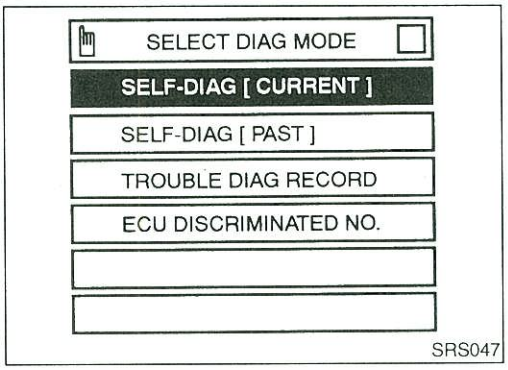


SRS046

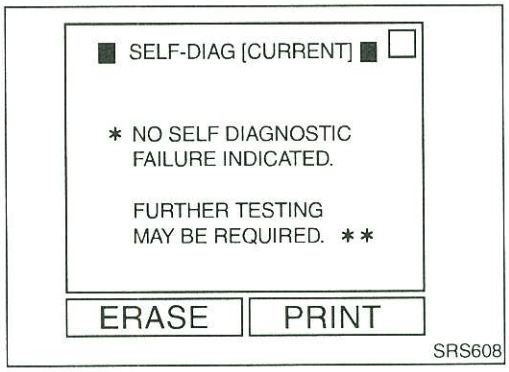
4. Touch "START".



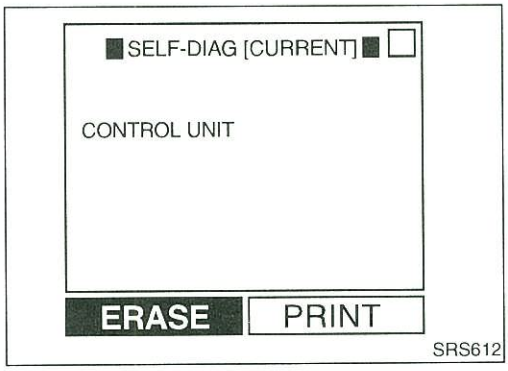
5. Touch "AIRBAG".



6. Touch "SELF-DIAG [CURRENT]".

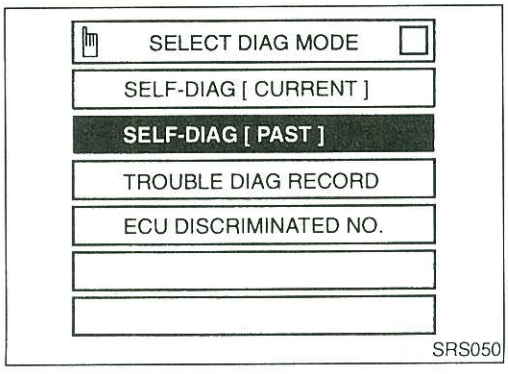


7. If no malfunction is detected on "SELF-DIAG [CURRENT]", repair of SRS is completed. Go to step 8.
(When the malfunction is only in the seat belt pre-tensioner system, go to step 11.)
If any malfunction is displayed on "SELF-DIAG [CURRENT]", the malfunctioning part is not repaired completely or another malfunctioning part is detected. Go to DIAGNOSTIC PROCEDURE 2, page RS-39, and repair malfunctioning part completely.

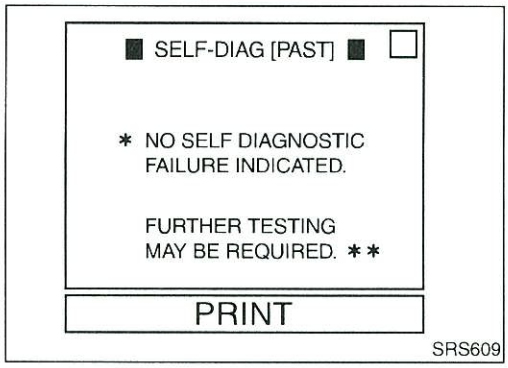


8. Touch "ERASE".

NOTE:
Touch "ERASE" to clear the memory of the malfunction ("SELF-DIAG [PAST]").
If the memory of the malfunction in "SELF-DIAG [PAST]" is not erased, the User mode shows the system malfunction by the operation of the warning lamp even if the malfunction is repaired completely.



9. Touch "BACK" key of CONSULT to "SELECT DIAG MODE" screen. Touch "SELF-DIAG [PAST]".



10. Check that no malfunction is detected on "SELF-DIAG [PAST]".

NOTE:
Past malfunctions of the seat belt pre-tensioner system will not be displayed on "SELF-DIAG [PAST]".

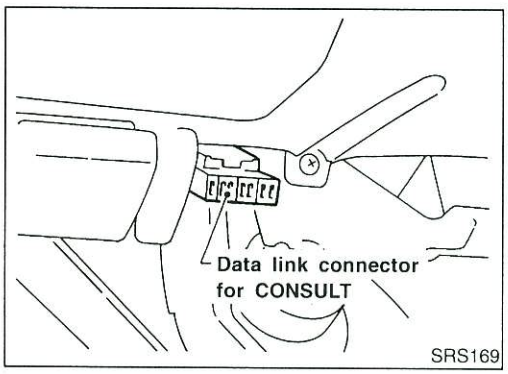
11. Touch "BACK" key of CONSULT until "SELECT SYSTEM" appears in order to return to User mode from Diagnosis mode, turn off CONSULT, then disconnect CONSULT.
12. Turn ignition switch "OFF".
13. Go to "SRS Operation Check", page RS-37 to check SRS operation by using "AIR BAG" warning lamp with User mode.

DIAGNOSTIC PROCEDURE 4 (CONTINUED FROM DIAGNOSTIC PROCEDURE 2)

NBRS0023S03

Inspecting SRS malfunctioning record

1	CONSIDER POSSIBILITY OF NOT ERASING SELF-DIAGNOSTIC RESULT AFTER REPAIRING	
Is it the first time for maintenance of SRS? Yes or No		
Yes	▶	Go to DIAGNOSTIC PROCEDURE 5 (RS-44).
No	▶	Self-diagnostic result "SELF-DIAG [PAST]" (previously stored in the memory) might not be erased after repair. Go to DIAGNOSTIC PROCEDURE 3, step 8 (RS-42).

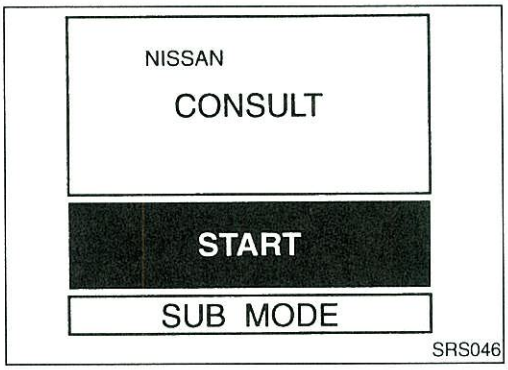


DIAGNOSTIC PROCEDURE 5

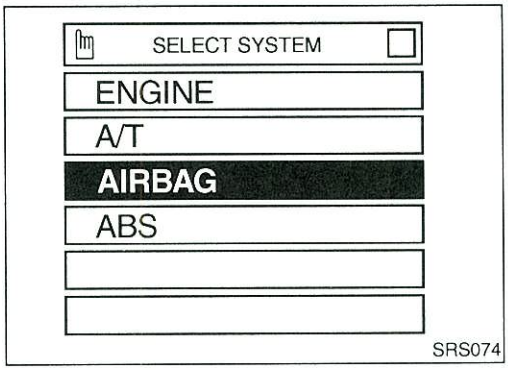
NBRS0023S04

Inspecting SRS intermittent malfunction by using CONSULT — Diagnosis mode

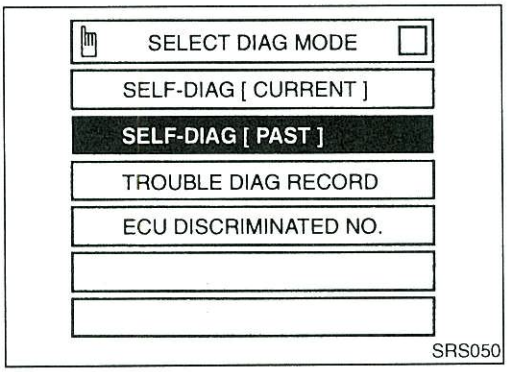
1. Turn ignition switch "OFF".
2. Connect "CONSULT" to Data link connector.



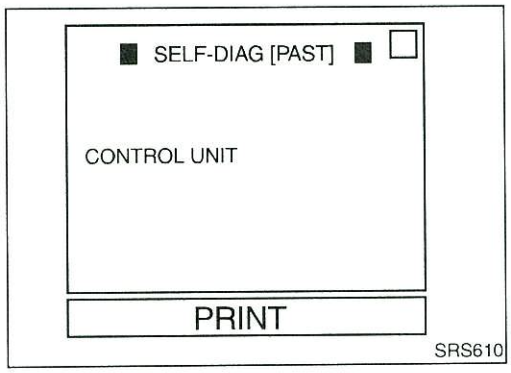
3. Turn ignition switch "ON".
4. Touch "START".



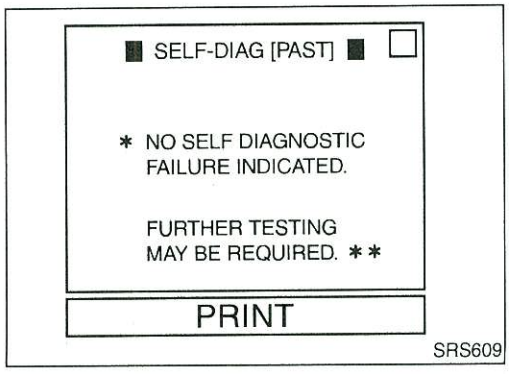
5. Touch "AIRBAG".



6. Touch "SELF-DIAG [PAST]".

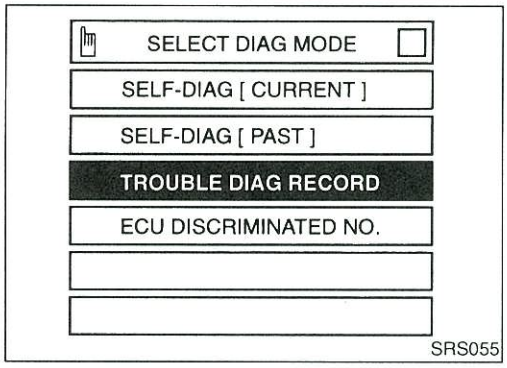


7. If diagnostic codes are displayed on "SELF-DIAG [PAST]", go to step 10.



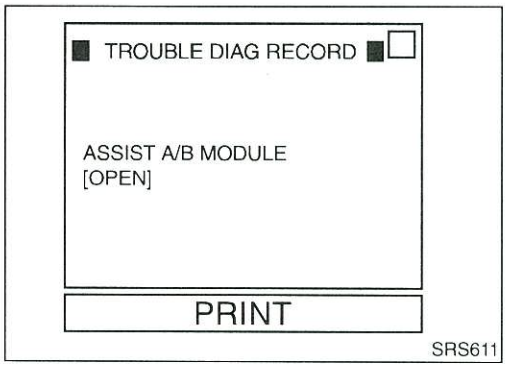
If no malfunction is detected on "SELF-DIAG [PAST]", touch "BACK" and go back to "SELECT DIAG MODE".

NOTE:
Past malfunctions of the seat belt pre-tensioner system will not be displayed on "SELF-DIAG [PAST]".



8. Touch "TROUBLE DIAG RECORD".

NOTE:
With "TROUBLE DIAG RECORD", diagnosis results previously erased by a reset operation can be displayed.



9. Diagnostic code is displayed on "TROUBLE DIAG RECORD".
10. Touch "PRINT".
11. Compare diagnostic codes to "Intermittent Malfunction Diagnostic Code Chart", page RS-47.
12. Touch "BACK" key of CONSULT until "SELECT SYSTEM" appears, then turn off CONSULT.
13. Turn ignition switch "OFF", then disconnect CONSULT and both battery cables.
14. Repair the system as outlined by the "Repair order" in "Intermittent Malfunction Diagnostic Code Chart", that corresponds to the self-diagnostic result. For replacement procedure of component parts, refer to RS-14.
15. Go to DIAGNOSTIC PROCEDURE 3, page RS-42, for final checking.

Intermittent Malfunction Diagnostic Code Chart ("SELF-DIAG [PAST]" or "TROUBLE DIAG RECORD")

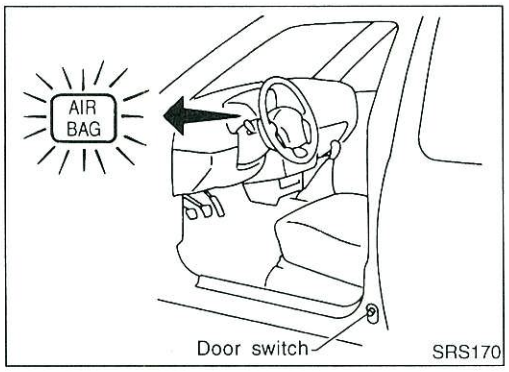
=NBRS0023S0401

Diagnostic item	Explanation		Repair order
NO SELF DIAGNOSTIC FAILURE INDICATED.	When malfunction is indicated by the "AIR BAG" warning lamp in User mode	• Low battery voltage (Less than 9V)	• Go to DIAGNOSTIC PROCEDURE 3 (RS-42) after charging battery.
	• No malfunction is detected.		• Go to DIAGNOSTIC PROCEDURE 3 (RS-42).
AIRBAG MODULE [OPEN]	• Driver's air bag module circuit is open. (including the spiral cable)		1. Visually check the wiring harness connection. 2. Replace air bag harness if it has visible damage. 3. If the harness check result is OK, replace driver's air bag module (Before disposal of it, it must be deployed.), diagnosis sensor unit and spiral cable.
AIRBAG MODULE [VB-SHORT]	• Driver's air bag module circuit is shorted to some power supply circuit. (including the spiral cable)		
AIRBAG MODULE [GND-SHORT]	• Driver's air bag module circuit is shorted to ground. (including the spiral cable)		
AIRBAG MODULE [SHORT]	• Driver's air bag module circuits are shorted to each other.		
ASSIST A/B MODULE [VB-SHORT]	• Front passenger air bag module circuit is shorted to some power supply circuit.		1. Visually check the wiring harness connection. 2. Replace air bag harness if it has visible damage. 3. If the harness check result is OK, replace front air bag module (Before disposal of it, it must be deployed.), and diagnosis sensor unit.
ASSIST A/B MODULE [OPEN]	• Front passenger air bag module circuit is open.		
ASSIST A/B MODULE [GND-SHORT]	• Front passenger air bag module circuit is shorted to ground.		
ASSIST A/B MODULE [SHORT]	• Front passenger air bag module circuits are shorted to each other.		
SIDE MODULE LH [OPEN]	• Side air bag module (LH) circuit is open.		1. Visually check the wiring harness connection. 2. Replace the harness if it has visible damage. 3. If the harness check is OK, replace the diagnosis sensor unit and side air bag module (LH). (Before disposing the side air bag module (LH), it must be deployed.)
SIDE MODULE LH [VB-SHORT]	• Side air bag module (LH) circuit is shorted to some power supply circuits.		
SIDE MODULE LH [GND-SHORT]	• Side air bag module (LH) circuit is shorted to ground.		
SIDE MODULE LH [SHORT]	• Side air bag module (LH) circuits are shorted to each other.		
SIDE MODULE RH [OPEN]	• Side air bag module (RH) circuit is open.		1. Visually check the wiring harness connection. 2. Replace the harness if it has visible damage. 3. If the harness check is OK, replace the diagnosis sensor unit and side air bag module (RH). (Before disposing the side air bag module (RH), it must be deployed.)
SIDE MODULE RH [VB-SHORT]	• Side air bag module (RH) circuit is shorted to some power supply circuits.		
SIDE MODULE RH [GND-SHORT]	• Side air bag module (RH) circuit is shorted to ground.		
SIDE MODULE RH [SHORT]	• Side air bag module (RH) circuits are shorted to each other.		
SATELLITE SENS LH [UNIT FAIL] SATELLITE SENS LH [COMM FAIL]	• Satellite sensor (LH)		1. Visually check the wiring harness connection. 2. Replace the harness if it has visible damage. 3. If the harness check is OK, replace the diagnosis sensor unit and satellite sensor (LH).

Trouble Diagnoses with CONSULT (Cont'd)

Diagnostic item	Explanation	Repair order
SATELLITE SENS RH [UNIT FAIL] SATELLITE SENS RH [COMM FAIL]	• Satellite sensor (RH)	1. Visually check the wiring harness connection. 2. Replace the harness if it has visible damage. 3. If the harness check is OK, replace the diagnosis sensor unit and satellite sensor (RH).
CONTROL UNIT	• Diagnosis sensor unit is malfunctioning.	1. Visually check the wiring harness connection. 2. Replace the harness if it has visible damage. 3. If the harness check is OK, replace the diagnosis sensor unit.

* Follow the procedures in numerical order when repairing malfunctioning parts, then make the final system check.



⊗ Trouble Diagnoses without CONSULT

=NBRS0024

DIAGNOSTIC PROCEDURE 6

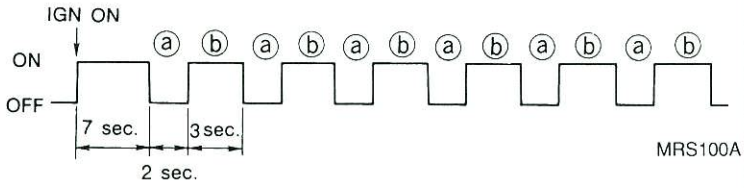
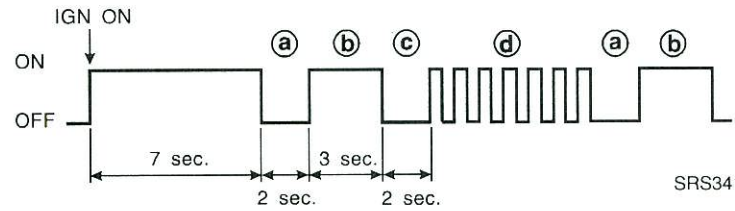
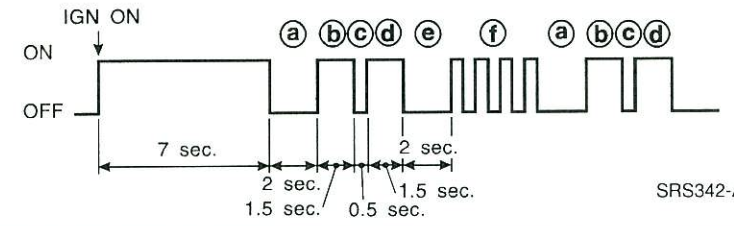
NBRS0024S01

Inspecting SRS malfunctioning parts by using "AIR BAG" warning lamp — Diagnosis mode

NOTE:
SRS will not enter Diagnosis mode if no malfunction is detected in User mode.

1. Open driver's door.
2. Turn ignition switch from "OFF" to "ON".
3. Press driver's door switch at least 5 times within 7 seconds after turning ignition switch "ON".
   SRS is now in Diagnosis mode.
4. "AIR BAG" warning lamp operates in Diagnosis mode as follows:

NOTE:
If SRS does not enter Diagnosis mode even though malfunction is detected in User mode, go to DIAGNOSTIC PROCEDURE 11, page RS-57.

No.	"AIR BAG" warning lamp operation — Diagnosis mode —		SRS condition
1		**a** through **b** are repeated.	• Diagnosis results (previously stored in the memory) might not be erased after repair. • Intermittent malfunction has been detected in the past. Go to DIAGNOSTIC PROCEDURE 8 (RS-54).
2		**a** through **d** are repeated. **b** — Driver and passenger air bag marker (For identifying driver and/or passenger air bag malfunctioning) **d** — Indicates malfunctioning part. The number of flash varies with malfunctioning part (0.5 sec. ON and 0.5 sec. OFF is counted as one flash.)	The system is malfunctioning and needs to be repaired.
3		**a** through **f** are repeated. **b, c, d** — Side air bag marker (For identifying side air bag malfunctioning) **f** — Indicates malfunctioning part. The number of flash varies with malfunctioning part (0.5 sec. ON and 0.5 sec. OFF is counted as one flash.)	

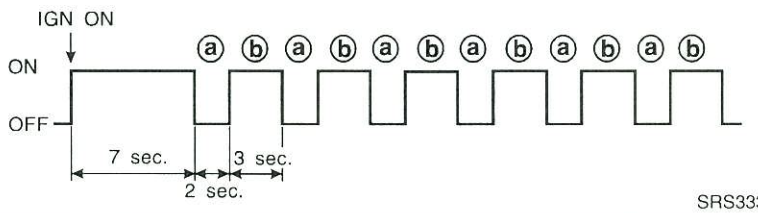
5. Malfunctioning part is indicated by the number of flashes (part **d** or **f**). Compare the number of flashes to "Air Bag Warning

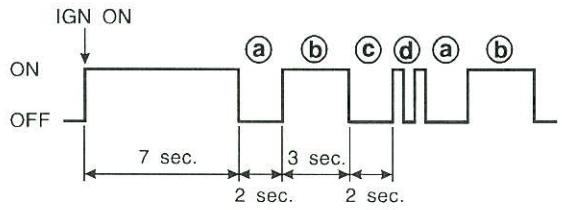
Lamp Flash Code Chart", page RS-50, and locate malfunctioning part.

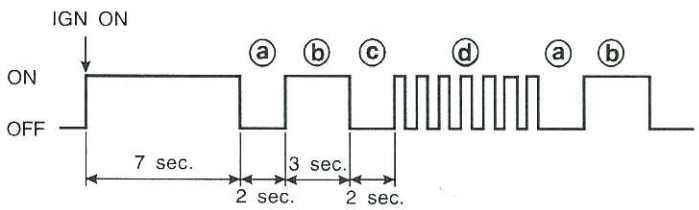
6. Turn ignition switch "OFF", and disconnect both battery cables.
7. Repair the system as outlined by the "Repair order" in "Air Bag Warning Lamp Flash Code Chart" that corresponds to the flash code. For replacement procedure of component parts, refer to RS-14.
8. After repairing the system, go to DIAGNOSTIC PROCEDURE 7, page RS-52.

Air Bag Warning Lamp Flash Code Chart (Diagnosis mode)

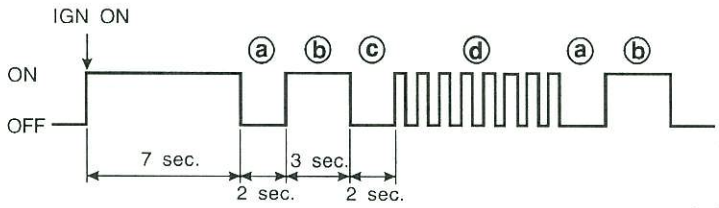
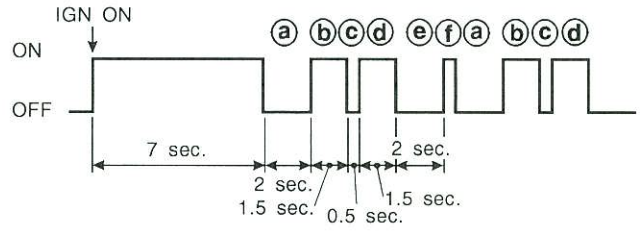
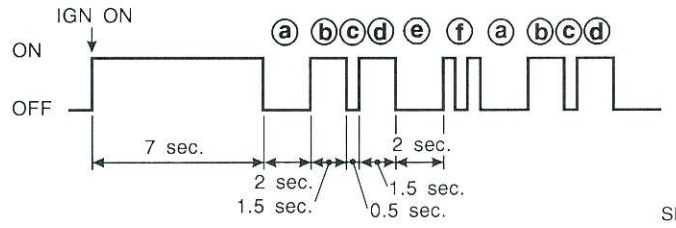
NBRS0024S0101

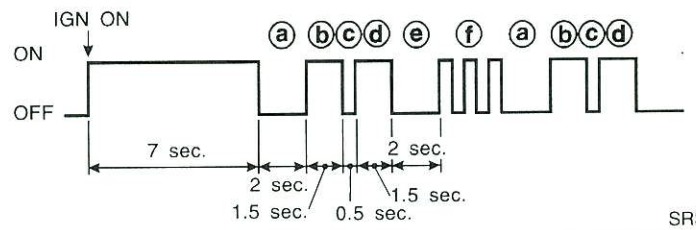
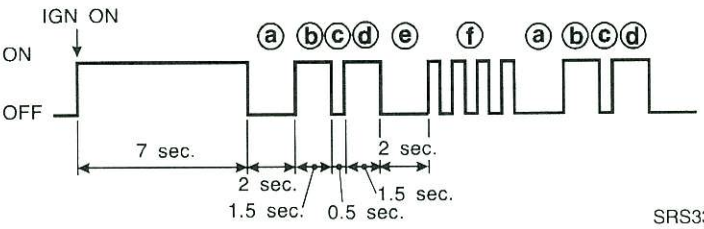
<table>
<tr><td rowspan="3">• Diagnosis results (previously stored in the memory) might not be erased after repair.
• Intermittent malfunction has been detected in the past.</td><td>Flash pattern</td></tr>
<tr><td> 

SRS333
a through **b** are repeated.</td></tr>
<tr><td>Repair order
• Go to DIAGNOSTIC PROCEDURE 8 (RS-54).</td></tr>
<tr><td rowspan="3">The driver's air bag module circuit is malfunctioning.
(**d**: 2 flashes)</td><td>Flash pattern</td></tr>
<tr><td> 

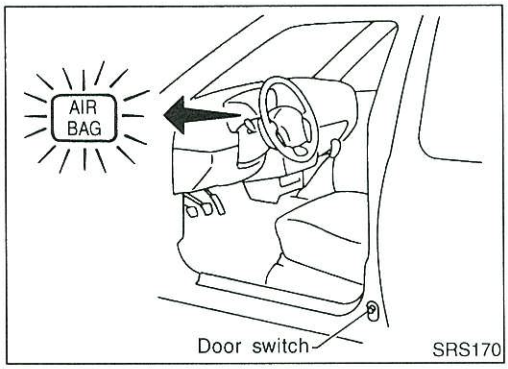
SRS334
a through **d** are repeated.
d — Two flashes indicate malfunctioning driver's air bag module circuit.</td></tr>
<tr><td>Repair order ("Recheck SRS at each replacement.")
1. Visually check the wiring harness connection.
2. Replace the harness if it has visible damage.
3. Replace the spiral cable.
4. Replace driver's air bag module.
(Before disposal, it must be deployed.)
5. Replace the diagnosis sensor unit.
6. Replace the related harness.</td></tr>
<tr><td rowspan="3">The diagnosis sensor unit is malfunctioning.
(**d**: 7 flashes)</td><td>Flash pattern</td></tr>
<tr><td> 

SRS335
a through d are repeated.
d — Seven flashes indicate malfunctioning diagnosis sensor unit.</td></tr>
<tr><td>Repair order ("Recheck SRS at each replacement.")
1. Visually check the wiring harness connections.
2. Replace the harness if it has visible damage.
3. Replace the diagnosis sensor unit.
4. Replace the related harness.</td></tr>
</table>

The front passenger air bag module circuit is malfunctioning. (**d**: 8 flashes)	Flash pattern  SRS336 **a** through **d** are repeated. **d** — Eight flashes indicate malfunctioning front passenger air bag module circuit. Repair order ("Recheck SRS at each replacement.") 1. Visually check the wiring harness connection. 2. Replace the harness if it has visible damage. 3. Replace front passenger air bag module. (Before disposal, it must be deployed.) 4. Replace the diagnosis sensor unit. 5. Replace the related harness.
The side air bag module (RH) circuit is malfunctioning. (**f**: 1 flash)	Flash pattern  SRS338 **a** through **f** are repeated. **f** — One flash indicates malfunctioning side air bag module (RH) circuit. Repair order ("Recheck SRS at each replacement.") 1. Visually check the wiring harness connection. 2. Replace the harness if it has visible damage. 3. Replace side air bag module (RH). (Before disposal, it must be deployed.) 4. Replace the diagnosis sensor unit. 5. Replace the related harness.
The side air bag module (LH) circuit is malfunctioning. (**f**: 2 flashes)	Flash pattern  SRS337 **a** through **f** are repeated. **f** — Two flashes indicate malfunctioning side air bag module (LH) circuit. Repair order ("Recheck SRS at each replacement.") 1. Visually check the wiring harness connection. 2. Replace the harness if it has visible damage. 3. Replace side air bag module (LH). (Before disposal, it must be deployed.) 4. Replace the diagnosis sensor unit. 5. Replace the related harness.

The satellite sensor (RH) is malfunctioning. (**f**: 3 flashes)	Flash pattern  **a** through **f** are repeated. **f** — Three flashes indicate malfunctioning satellite sensor (RH) circuit. Repair order ("Recheck SRS at each replacement.") 1. Visually check the wiring harness connection. 2. Replace the harness if it has visible damage. 3. Replace the satellite sensor (RH). 4. Replace the diagnosis sensor unit. 5. Replace the harness.
The satellite sensor (LH) is malfunctioning. (**f**: 4 flashes)	Flash pattern  **a** through **f** are repeated. **f** — Four flashes indicate malfunctioning satellite sensor (LH) circuit. Repair order ("Recheck SRS at each replacement.") 1. Visually check the wiring harness connection. 2. Replace the harness if it has visible damage. 3. Replace the satellite sensor (LH). 4. Replace the diagnosis sensor unit. 5. Replace the harness.

*** Follow the procedures in numerical order when repairing malfunctioning parts. Confirm whether malfunction is eliminated using the air bag warning lamp or CONSULT each time repair is finished. If malfunction is still observed, proceed to the next step. When malfunction is eliminated, further repair work is not required.**

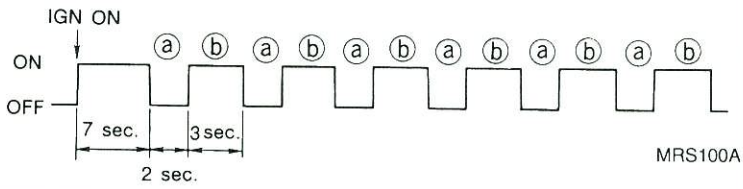
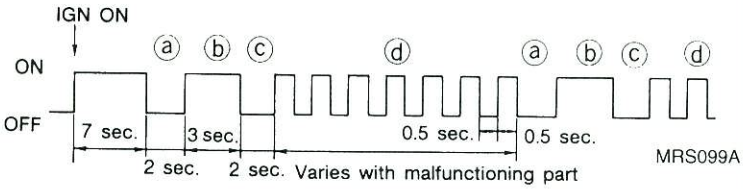
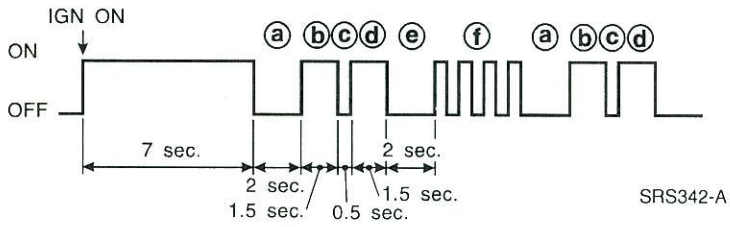


DIAGNOSTIC PROCEDURE 7

NBRS0024S02

Final checking after repairing SRS by using "AIR BAG" warning lamp — Diagnosis mode and User mode

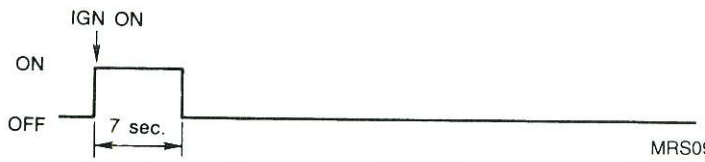
1. After repairing SRS connect both battery cables.
2. Open driver's door.
3. Turn ignition switch from "OFF" to "ON".
4. "AIR BAG" warning lamp operates in Diagnosis mode as follows:

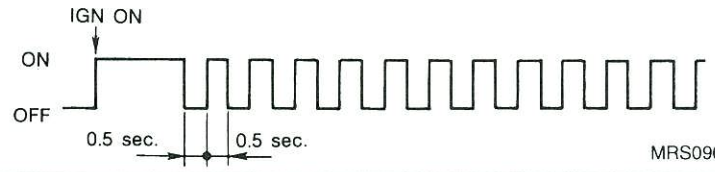
No.	"AIR BAG" warning lamp operation — Diagnosis mode —		SRS condition
1		**a** through **b** are repeated.	No malfunction is detected or repair is completed. No further action is necessary.
2		**a** through **d** are repeated. **NOTE:** **a** — Interval I **b** — Start signal (Start signal identifies display modes) **c** — Interval II **d** — Indicates malfunctioning part (0.5 sec. ON and 0.5 sec. OFF is counted as one flash.)	The system is malfunctioning and needs to be repaired.
3		**a** through **f** are repeated. **b**, **c**, **d** — Side air bag marker (For identifying side air bag malfunctioning) **f** — Indicates malfunctioning part. The number of flashes varies with malfunctioning part (0.5 sec. ON and 0.5 sec. OFF is counted as one flash.)	

NOTE:
When diagnosis sensor unit is replaced with new one, "AIR BAG" warning lamp will operate in User mode. Checking "AIR BAG" warning lamp operation in Diagnosis mode is not required. Go to step 6.

5. If "AIR BAG" warning lamp operates as shown in No. 1 in chart above, turn ignition switch "OFF" to reset from Diagnosis mode to User mode and to erase the memory of the malfunction. Then go to step 6.
   If "AIR BAG" warning lamp operates as shown in No. 2 or No. 3 in chart above, the malfunctioning part is not repaired completely, or another malfunctioning part is detected. Go to DIAGNOSTIC PROCEDURE 6, page RS-49, and repair malfunctioning part completely.
6. Turn ignition switch "ON". "AIR BAG" warning lamp operates in User mode. Compare "AIR BAG" warning lamp operation to the chart below.

NOTE:
If switching Diagnosis mode to User mode is required while malfunction is being detected, turn ignition switch from "OFF" to "ON". Then press driver's door switch at least 5 times within 7 seconds after turning ignition switch "ON". SRS is now in User mode.

"AIR BAG" warning lamp operation — User mode —	SRS condition	Reference item
	No malfunction is detected. No further action is necessary.	—

"AIR BAG" warning lamp operation — User mode —	SRS condition	Reference item
	The system is malfunctioning and needs to be repaired as indicated.	Go to DIAGNOSTIC PROCEDURE 2 or 6 (RS-39 or RS-49).
	Air bag is deployed.	Go to COLLISION DIAGNOSIS (RS-59).
	Air bag fuse, diagnosis sensor unit or harness is malfunctioning and needs to be repaired.	Go to DIAGNOSTIC PROCEDURE 9 (RS-55).
	One of the following has occurred and needs to be repaired. • Meter fuse is blown. • "AIR BAG" warning lamp circuit has open or short. • Diagnosis sensor unit is malfunctioning.	Go to DIAGNOSTIC PROCEDURE 10 (RS-56).

DIAGNOSTIC PROCEDURE 8 (CONTINUED FROM DIAGNOSTIC PROCEDURE 6)

NBRS0024S03

Inspecting SRS malfunctioning record

1	CONSIDER POSSIBILITY OF NOT ERASING SELF-DIAGNOSTIC RESULT AFTER REPAIRING	
Is it the first time for maintenance of SRS? **Yes or No**		
Yes	▶	Go to DIAGNOSTIC PROCEDURE 5 (RS-44).
No	▶	Diagnosis results (previously stored in the memory) might not be erased after repair. Go to DIAGNOSTIC PROCEDURE 7, step 5 (RS-52). (Further inspection cannot be performed without CONSULT.)

Trouble Diagnoses: "AIR BAG" Warning Lamp Does Not Turn Off

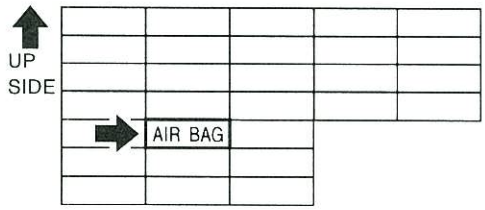
DIAGNOSTIC PROCEDURE 9

=NBRS0025

NBRS0025S01

1	SEE THE DEPLOYMENT OF AIR BAG MODULE
Is air bag module deployed?	
Yes or No	
Yes ▶	Refer to COLLISION DIAGNOSIS (RS-59).
No ▶	GO TO 2.

2	CHECK AIR BAG FUSE
Is SRS "Air Bag" fuse OK?	



SRS577

OK or NG	
OK ▶	GO TO 4.
NG ▶	GO TO 3.

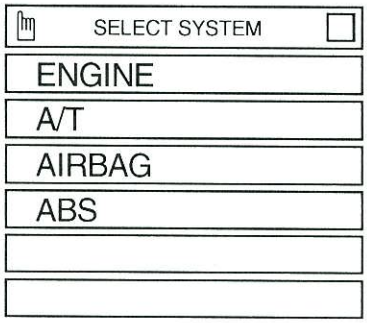
3	CHECK AIR BAG FUSE AGAIN
Replace air bag fuse and turn ignition switch ON.	
Is air bag fuse blown again?	
Yes ▶	Repair main harness and/or replace air bag harness.
No ▶	**INSPECTION END**

4	CHECK DIAGNOSIS SENSOR UNIT

With CONSULT

Connect CONSULT and touch "START".

- Is "AIRBAG" displayed on CONSULT?



SRS180

Yes or No	
Yes ▶	GO TO 5.
No ▶	Visually check the wiring harness connection of diagnosis sensor unit. If the harness connection check result is OK, replace diagnosis sensor unit.

5	CHECK HARNESS CONNECTION
Is harness connection between warning lamp and diagnosis sensor unit OK?	
OK or NG	
OK ▶	Replace diagnosis sensor unit.
NG ▶	Connect "AIR BAG" warning lamp and diagnosis sensor unit connector properly. If "AIR BAG" warning lamp still does not go off, replace harness.

Trouble Diagnoses: "AIR BAG" Warning Lamp Does Not Turn On

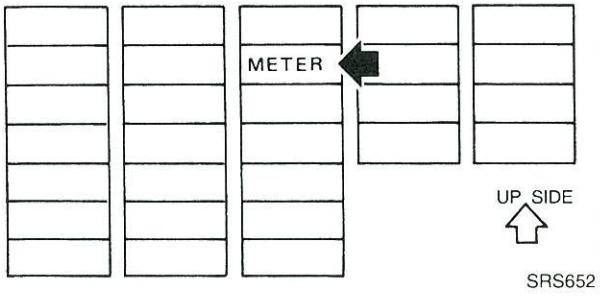
=NBRS0026

DIAGNOSTIC PROCEDURE 10

NBRS0026S01

1	CHECK "AIR BAG" WARNING LAMP FUSE

Is meter fuse OK?



OK or NG

OK	▶	GO TO 3.
NG	▶	GO TO 2.

2	CHECK "AIR BAG" WARNING LAMP FUSE AGAIN

Replace meter fuse and turn ignition switch ON.

Is meter fuse blown again?

Yes	▶	Repair main harness.
No	▶	**INSPECTION END**

3	CHECK "AIR BAG" WARNING LAMP LED

Is "AIR BAG" warning lamp LED OK?

OK or NG

OK	▶	GO TO 4.
NG	▶	Replace "AIR BAG" warning lamp LED.

4	CHECK HARNESS CONNECTION BETWEEN DIAGNOSIS SENSOR UNIT AND "AIR BAG" WARNING LAMP

Disconnect diagnosis sensor unit connector and turn ignition switch "ON".

- Does "AIR BAG" warning lamp turn on?

Yes or No

Yes	▶	Replace diagnosis sensor unit.
No	▶	Check the ground circuit of "AIR BAG" warning lamp.

Trouble Diagnoses: SRS Does Not Enter Diagnosis Mode Using Door Switch

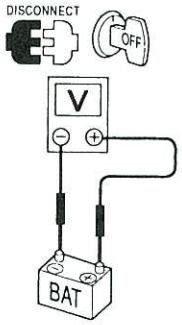
DIAGNOSTIC PROCEDURE 11

=NBRS0027

NBRS0027S01

1	CHECK BATTERY VOLTAGE

Disconnect both battery cables and check battery voltage using circuit tester.



SRS058

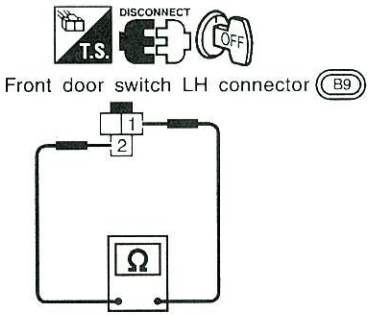
- **Is battery voltage more than 9V?**

Yes or No

Yes	▶	GO TO 2.
No	▶	Charge battery.

2	CHECK DRIVER'S DOOR SWITCH

Remove driver's door switch and check continuity between driver's door switch connector terminals 1 and 2 under the following conditions.



SRS370

Continuity:

Door switch is depressed (Door is closed).

NO

Door switch is released (Door is open).

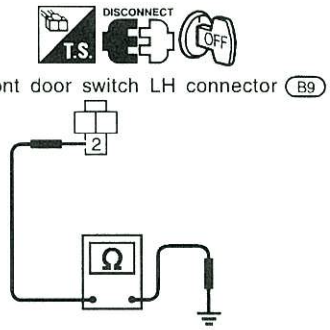
YES

OK or NG

OK	▶	GO TO 3.
NG	▶	Replace driver's door switch.

3	CHECK GROUND CIRCUIT FOR DRIVER'S DOOR SWITCH

Check harness continuity between driver's door switch connector terminal 2 and body ground.



SRS371

- **Does continuity exist?**

Yes or No

Yes	▶	Replace diagnosis sensor unit. Go to "SRS Operation Check" (RS-37).
No	▶	Replace or repair harness.

Trouble Diagnoses: "SEAT BELT" Warning Lamp Does Not Turn Off

NBRS0038

DIAGNOSTIC PROCEDURE 12

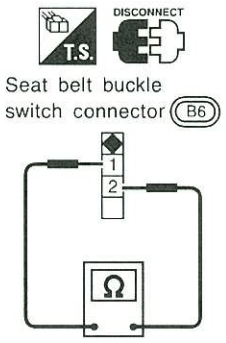
NBRS0038S01

1	SEE THE DEPLOYMENT OF SEAT BELT PRE-TENSIONER
Is seat belt pre-tensioner (and driver's and front passenger's air bags) deployed?	
Yes or No	
Yes ▶	Refer to COLLISION DIAGNOSIS (RS-59).
No ▶	GO TO 2.

2	CHECK THE STATUS OF SEAT BELT
Is driver's seat belt fastened?	
Yes or No	
Yes ▶	GO TO 3.
No ▶	Check "SEAT BELT" warning lamp operation after the seat belt is fastened.

3	CHECK DRIVER'S SEAT BELT BUCKLE SWITCH

1. Disconnect the seat belt buckle switch connector.
2. Check continuity between terminals 1 and 2.



SRS584-A

Continuity
Seat belt is unfastened.
YES
Seat belt is fastened.
NO
WARNING:
Do not measure resistance with harness side connector.

OK or NG	
OK ▶	GO TO 4.
NG ▶	Replace the seat belt buckle switch.

4	REPLACE DIAGNOSIS UNIT

1. Visually check the wiring harness connection.
2. Replace the diagnosis unit.
3. Fasten the seat belt.
4. Turn ignition switch to ON position.
   Does the "SEAT BELT" warning lamp illuminate for about 7 seconds and then turn off?

Yes or No	
Yes ▶	System is OK.
No ▶	GO TO 5.

5	REPLACE METER ASSEMBLY

1. Replace combination meter assembly.
2. Fasten the seat belt.
3. Turn ignition switch to ON position.
   Does the "SEAT BELT" warning lamp illuminate for about 7 seconds and then turn off?

Yes or No	
Yes ▶	System is OK.
No ▶	Replace the main harness and air bag harness.

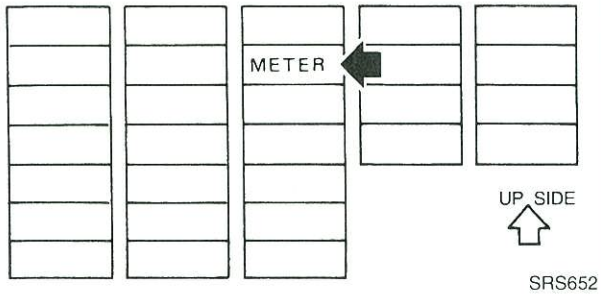
Trouble Diagnoses: "SEAT BELT" Warning Lamp Does Not Turn On

DIAGNOSTIC PROCEDURE 13

NBRS0039 NBRS0039S01

1	CHECK WARNING LAMP FUSE

Is meter fuse OK?



SRS652

OK or NG

OK	▶	GO TO 3.
NG	▶	GO TO 2.

2	CHECK WARNING LAMP FUSE AGAIN

Replace meter fuse and turn ignition switch ON.

Is meter fuse blown again?

Yes	▶	Repair main harness.
No	▶	**INSPECTION END**

3	CHECK WARNING LAMP BULB

Is warning lamp bulb OK?

OK or NG

OK	▶	GO TO 4.
NG	▶	Replace warning lamp bulb.

4	REPLACE DIAGNOSIS UNIT

1. Visually check the wiring harness connection.
2. Replace the diagnosis unit.
3. Fasten the seat belt.
4. Turn ignition switch to ON position.
   Does the "SEAT BELT" warning lamp illuminate for about 7 seconds and then turn off?

Yes or No

Yes	▶	System is OK.
No	▶	GO TO 5.

5	REPLACE METER ASSEMBLY

1. Replace combination meter assembly.
2. Fasten the seat belt.
3. Turn ignition switch to ON position.
   Does the "SEAT BELT" warning lamp illuminate for about 7 seconds and then turn off?

Yes or No

Yes	▶	System is OK.
No	▶	Replace the main harness and air bag harness.

Collision Diagnosis

NBRS0028 NBRS0028S01

FOR FRONTAL COLLISION

To repair the SRS, perform the following steps.

When SRS is activated in a collision:

1) Replace the diagnosis sensor unit.
2) Remove the air bag modules.
3) Check the SRS components using the table shown below:

- Replace any SRS components showing visible signs of damage (dents, cracks and deformation).

4) Install new air bag modules.
5) Conduct self-diagnosis using CONSULT or "AIR BAG" and "SEAT BELT" warning lamp. Refer to "SRS

Operation Check" for details (RS-37). Ensure entire SRS operates properly.

When SRS is not activated in a collision:

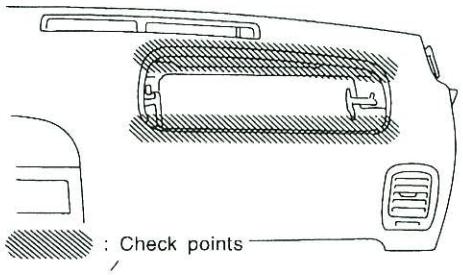
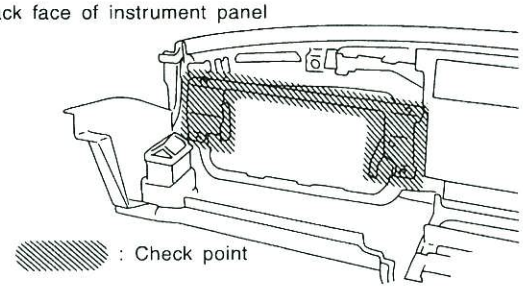
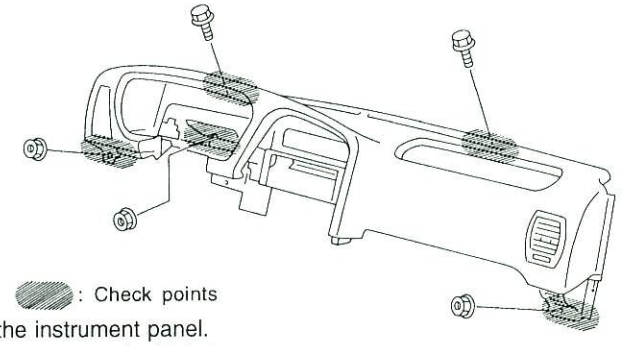
1) Check the SRS components using the table shown below:
- Replace any SRS components showing visible signs of damage (dents, cracks and deformation).

2) Conduct self-diagnosis using CONSULT or "AIR BAG" and "SEAT BELT" warning lamp. Refer to "SRS Operation Check" for details (RS-37). Ensure entire SRS operates properly.

SRS Inspection (For frontal collision)

NBRS0028S0101

Part	SRS is activated	SRS is NOT activated
Air bag module (driver and passenger side)	REPLACE Install with new bolts.	1. Remove air bag module. Check harness cover and connectors for damage, terminals for deformities, and harness for binding. 2. a. Install driver air bag module into the steering wheel to check fit and alignment with the wheel. b. Install passenger air bag module into the instrument panel to check fit with the instrument panel. 3. No damage found, reinstall with new bolts. 4. If damaged—REPLACE. Air bag must be deployed before discarding.
Seat belt pre-tensioner assembly	REPLACE Install seat belt pre-tensioner with new bolts.	1. Remove seat belt pre-tensioners. Check harness cover and connectors for damage, terminals for deformities, and harness for binding. 2. Check belts for damage and anchors for loose mounting. 3. Check retractor for smooth operation. 4. If no damage is found, reinstall with new bolts coated with bonding agent. 5. If damaged—REPLACE. Install the seat belt pre-tensioners with new bolts coated with bonding agent. Seat belt pre-tensioners must be deployed before discarding.
Diagnosis sensor unit	REPLACE Install with new bolts.	1. Check case for dents, cracks or deformities. 2. Check connectors for damage, and terminals for deformities. 3. If no damage is found, reinstall with new special bolts and ground bolt. 4. If damaged—REPLACE. Install diagnosis sensor unit with new special bolts and ground bolt.
Steering wheel	1. Visually check steering wheel for deformities. 2. Check harness (built into steering wheel) and connectors for damage, and terminals for deformities. 3. Install air bag module to check fit or alignment with steering wheel. 4. Check steering wheel for excessive free play. 5. If no damage is found, reinstall with bolts. 6. If damaged—REPLACE.	
Spiral cable	1. Visually check spiral cable and combination switch for damage. 2. Check connectors and protective tape for damage. 3. Check steering wheel for noise, binding or heavy operation. 4. If no damage is found, reinstall with bolts. 5. If damaged—REPLACE.	
Harness and Connectors	1. Check connectors for poor connection, damage, and terminals for deformities. 2. Check harness for binding, chafing, cuts, or deformities. 3. If no damage is found, reinstall the harness and connectors. 4. Damaged—REPLACE damaged section of harness. Do not attempt to repair, splice or modify any SRS harness.	
Instrument panel	Refer to the table on next page.	

Part	SRS is activated	SRS is NOT activated
Instrument panel	1. When passenger air bag inflates, check the following points for bending, deformities or cracks. • Opening portion for passenger air bag  SRS366 • Passenger air bag module brackets Back face of instrument panel  SRS367 • The portions securing the instrument panel  SRS653 2. If no damage is found, reinstall the instrument panel. 3. If damaged—REPLACE the instrument panel with bolts.	

FOR SIDE COLLISION

NBRS0028S02

To repair the SRS for a side collision, perform the following steps.

When the side air bag is activated in the side collision:

1) Replace the following component:
   - Diagnosis sensor unit
   - Satellite sensor (on the side on which side air bag is activated)
2) Remove the deployed side air bag module.
3) Check the SRS components and the related parts using the table shown below.

- Replace any SRS components and the related parts showing visible signs of damage (dents, cracks, deformation).

4) Install new side air bag module (on the side on which side air bag has been activated) with new nuts.
5) Conduct self-diagnosis using CONSULT, and "AIR BAG" and "SEAT BELT" warning lamp. Refer to "SRS Operation Check" for details (RS-37). Ensure entire SRS operates properly.

When SRS is not activated in the side collision:

1) Check the SRS components and the related parts using the table shown below.

- Replace any SRS components and the related parts showing visible signs of damage (dents, cracks, deformation).

2) Conduct self-diagnosis using CONSULT, and "AIR BAG" and "SEAT BELT" warning lamp. Refer to "SRS Operation Check" for details (RS-37). Ensure entire SRS operates properly.

SRS Inspection (For side collision)

NBRS0028S0201

Part	Side air bag is activated	SRS is NOT activated
Built-in type side air bags module (LH or RH)	REPLACE all parts of seat back with deployed side air bag module.	1. Check for visible signs of damage (dents, tears, deformation) of the seat back on the collision side. 2. If damaged—REPLACE the damaged seat parts with new bolts and remove the side air bag module. 3. Check for visible signs of damaged (tesrs etc.) of the side air bag module. 4. Check harness and connectors for damage, and terminals for deformities. 5. If no damaged is found, reinstall the side air bag module with new torx nuts coated with bonding agent. 6. If damaged—REPLACE the side air bag module with new torx nuts coated with bonding agent. Air bag must be deployed before disposing of it.
Satellite sensor (LH or RH)	REPLACE the satellite sensor on the collision side with new nuts coated with bonding agent. (Repair the center pillar inner, etc. before installing new one if damaged.)	1. Remove the satellite sensor on the collision side. Check harness connectors for damage, terminals for deformities, and harness for binding. 2. Check for visible signs of damage (dents, cracks, deformation) of the satellite sensor. 3. Install the satellite sensor to check fit. 4. If no damage is found, reinstall the satellite sensor with new nuts coated with bonding agent. 5. If damaged—REPLACE the satellite sensor with new nuts coated with bonding agent.
Diagnosis sensor unit	REPLACE the diagnosis sensor unit with the new bolts.	1. Check case and bracket for dents, cracks or deformities. 2. Check connectors for damage, and terminals for deformities. 3. If no damage is found, reinstall the diagnosis sensor unit with new special bolts and ground bolt. 4. If damaged—REPLACE. Install the diagnosis sensor unit with new special bolts and ground bolt.
Seat belt pre-tensioner assembly	1. Check if the seat belt can be extended smoothly. If the seat belt cannot be extended smoothly. – Check for deformities of the center pillar inner. – If the center pillar inner has no damage, REPLACE the seat belt pre-tensioner assembly. 2. Remove the seat belt pre-tensioner assembly on the collision side. Check harness cover and connectors for damage, terminals for deformities, and harness for binding. 3. Check for visible signs of damage (dents, cracks, deformation) of the seat belt pre-tensioner assembly. 4. If no damage is found, reinstall the seat belt pre-tensioner assembly with new bolts coated with bonding agent. 5. If damaged—REPLACE the seat belt pre-tensioner assembly with new bolts coated with bonding agent. The seat belt pre-tensioner assembly must be deployed before disposing of it.	
Seat	REPLACE all parts of seat back (including seat back frame)	1. Visually check the seat on the collision side. 2. Remove the seat on the collision side and check the following for damage and deformities. • Harness, connectors and terminals • Frame and recliner (for front and rear seat), and also adjuster and slides (for front seat) 3. If no damage is found, reinstall the seat. 4. If damaged—REPLACE the damaged seat parts with new bolts.
Center pillar inner	1. Check the center pillar inner on the collision side for damage (dents, cracks, deformation). 2. If damaged—REPAIR the center pillar inner.	
Trim	1. Check for visible signs of damage (dents, cracks, deformation) of the interior trim on the collision side. 2. If damaged—REPLACE the damaged trim parts.	

BODY & TRIM

SECTION BT

CONTENTS

PRECAUTIONS 2
Service Notice 2
Supplemental Restraint System (SRS) "AIR BAG" and "SEAT BELT PRE-TENSIONER" 2
CLIP AND FASTENER 3
Description 3
BODY FRONT END 5
Removal and Installation 5
FRONT BUMPER ASSEMBLY 5
BODY REAR END AND OPENER 8
Removal and Installation 8
REAR BUMPER ASSEMBLY 8
FRONT DOOR 11
Overhaul 11
REAR DOOR 12
Overhaul 12
INSTRUMENT PANEL ASSEMBLY 13
Removal and Installation 13
SIDE AND FLOOR TRIM 17
Removal and Installation 17
DOOR TRIM 19
Removal and Installation 19
ROOF TRIM 21
Removal and Installation 21
BACK DOOR TRIM 22
Removal and Installation 22
EXTERIOR 23
Removal and Installation 23
FRONT SEAT 30
Removal and Installation 30
HEATED SEAT 32
REAR SEAT 33
Removal and Installation 33
SUNROOF 34
Adjustment 34
Removal and Installation 35
Trouble Diagnoses 38
DIAGNOSTIC TABLE 38
WIND DEFLECTOR 38
ADJUSTMENT 39
DRAIN HOSES 40
WEATHERSTRIP 40
LINK AND WIRE ASSEMBLY 41
WINDSHIELD AND WINDOWS 42
Removal and Installation 42
REMOVAL 42
INSTALLATION 42
WINDSHIELD 43
REAR SIDE WINDOW 44
DOOR MIRROR 45
Removal and Installation 45
BODY (ALIGNMENT) 46
Alignment 46
ENGINE COMPARTMENT 47
UNDERBODY 49

Service Notice

NBBT0001

- When removing or installing various parts, place a cloth or padding onto the vehicle body to prevent scratches.
- Handle trim, molding, instruments, grille, etc. carefully during removing or installing. Be careful not to soil or damage them.
- Apply sealing compound where necessary when installing parts.
- When applying sealing compound, be careful that the sealing compound does not protrude from parts.
- When replacing any metal parts (for example body outer panel, members, etc.), be sure to take rust prevention measures.

Supplemental Restraint System (SRS) "AIR BAG" and "SEAT BELT PRE-TENSIONER"

NBBT0002

The supplemental Restraint System such as "AIR BAG" and "SEAT BELT PRE-TENSIONER" used along with a seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. The SRS system composition which is available to INFINITI QX4 is as follows:

- For a frontal collision
  The Supplemental Restraint System consists of driver air bag module (located in the center of the steering wheel), front passenger air bag module (located on the instrument panel on passenger side), seat belt pre-tensioners, a diagnosis sensor unit, warning lamp, wiring harness and spiral cable.
- For a side collision
  The Supplemental Restraint System consists of side air bag module (located in the outer side of front seat), satellite sensor, diagnosis sensor unit (one of components of air bags for a frontal collision), wiring harness, warning lamp (one of components of air bags for a frontal collision).

Information necessary to service the system safely is included in the **RS section** of this Service Manual.

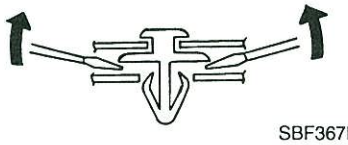
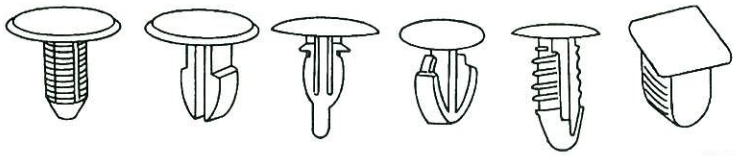
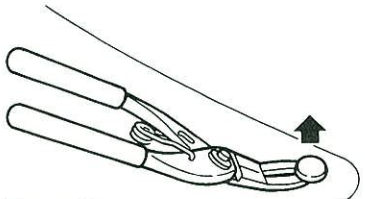
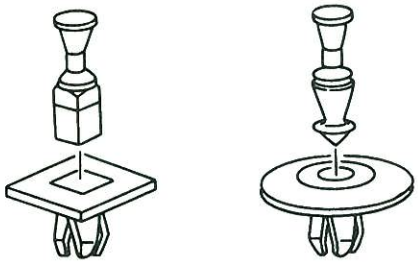
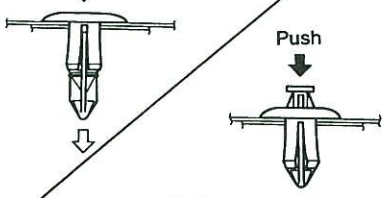
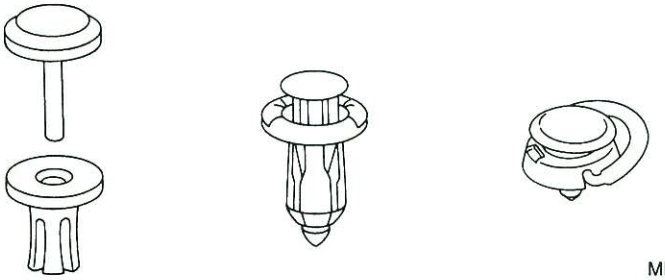
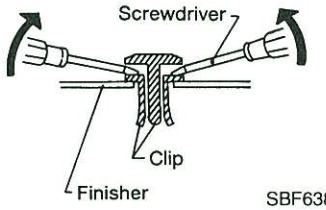
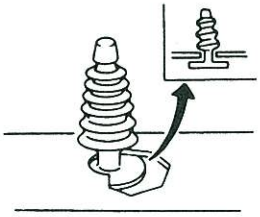
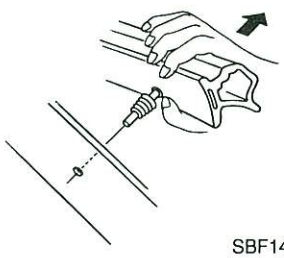
WARNING:

- **To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance must be performed by an authorized INFINITI dealer.**
- **Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the RS section.**
- **Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. Spiral cable and wiring harnesses (except "SEAT BELT PRE-TENSIONER") covered with yellow insulation either just before the harness connectors or for the complete harness are related to the SRS.**

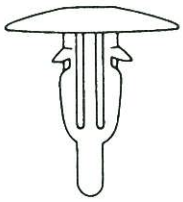
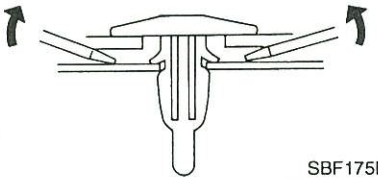
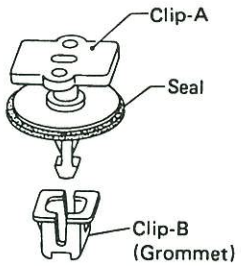
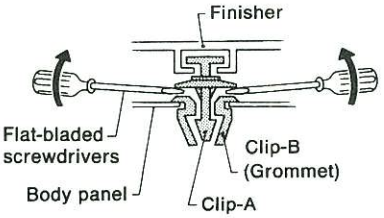
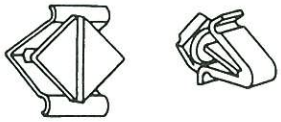
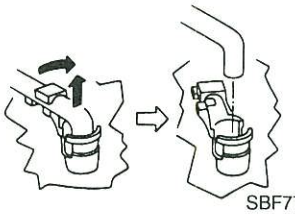
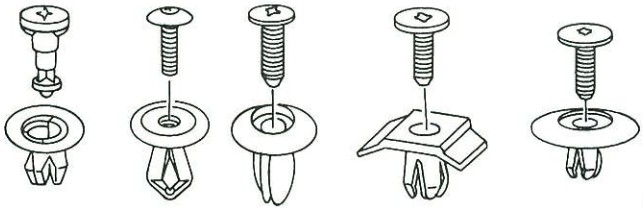
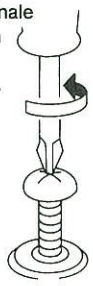
Description

NBBT0003

- Clips and fasteners in BT section correspond to the following numbers and symbols.
- Replace any clips and/or fasteners which are damaged during removal or installation.

Symbol No.	Shapes	Removal & Installation
C101	SBF302H	**Removal:** Remove by bending up with flat-bladed screwdrivers or clip remover.  SBF367BA
C103	 SBT095	 **Removal:** Remove with a clip remover. SBF423H
C203	 SBF258G	Push center pin to catching position. (Do not remove center pin by hitting it.) Push Push  **Installation:** SBF708E
C205	 MBT080A	**Removal:**  Screwdriver Clip Finisher SBF638C
CE103	 SBF104B	**Removal:**  SBF147B

Description (Cont'd)

Symbol No.	Shapes	Removal & Installation
CE117	 SBF174D	**Removal:** Remove with a flat-bladed screwdriver or pliers.  SBF175D
CF109	 SBF651B	**Removal:**  SBF652B
CG101	 SBF145B	**Removal:** Rotate 45° to remove. **Removal:** **Installation:** SBF085B
CR103	SBF768B	**Removal:** Holder portion of clip must be spread out to remove rod.  SBF770B
CS101	 SBF078B	**Removal:** 1. Screw out with a Phillips screwdriver. 2. Remove female portion with flat-bladed screwdriver.  SBF992G

Removal and Installation

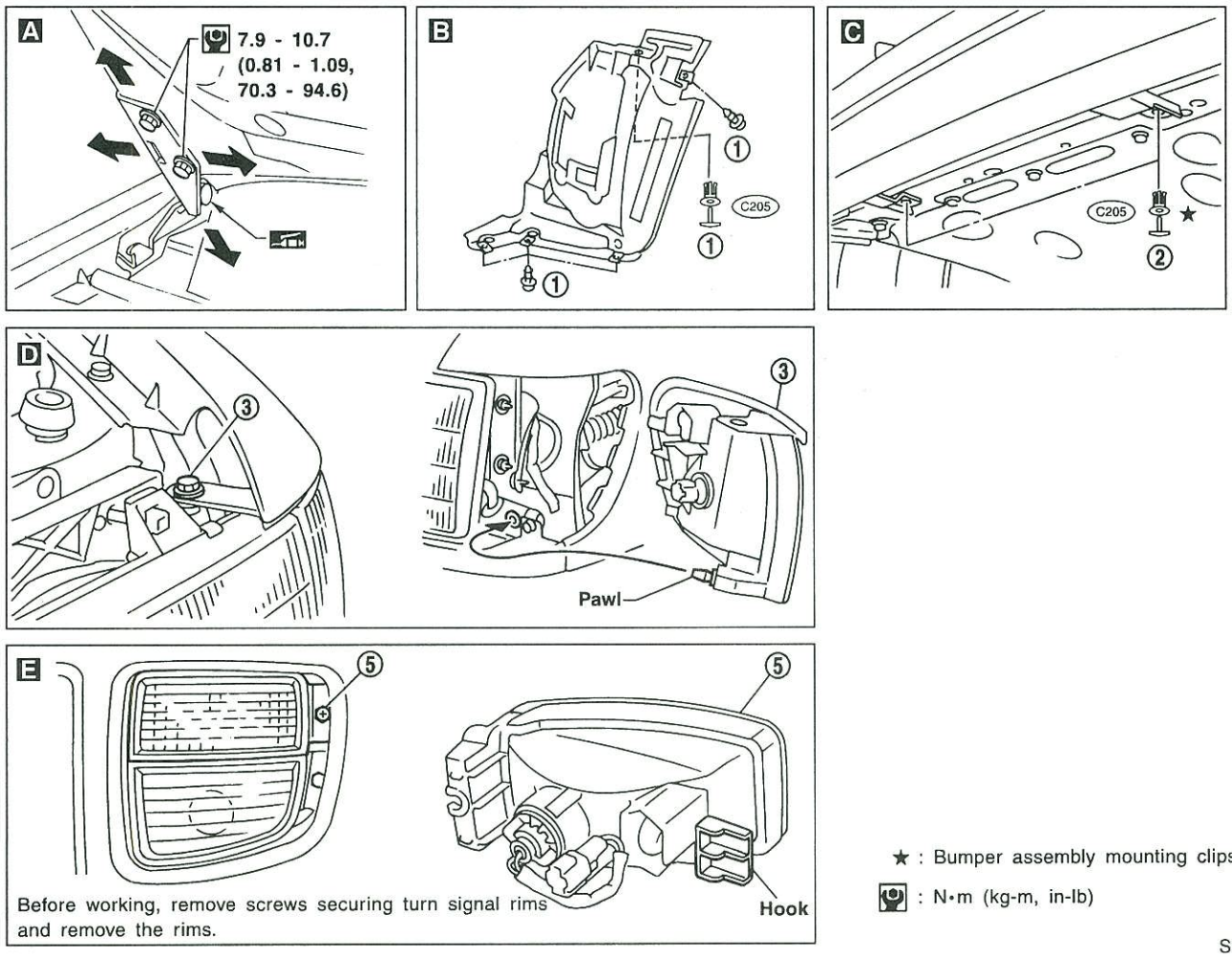
NBBT0004

- When removing or installing hood, place a cloth or other padding on front fender panel and cowl top. This prevents vehicle body from being scratched.
- Bumper fascia is made of plastic. Do not use excessive force and be sure to keep oil away from it.
- Hood adjustment: Adjust at hinge portion.
- Hood lock adjustment: After adjusting, check hood lock control operation. Apply a coat of grease to hood locks engaging mechanism.
- Hood opener: Do not attempt to bend cable forcibly. Doing so increases effort required to unlock hood.

FRONT BUMPER ASSEMBLY

NBBT0004S01

1. Remove screws and clips securing left and right sides of front fender protector. B
2. Remove clips securing bumper fascia to radiator core support lower. C
3. Remove bolts securing left and right clearance lamps and remove the lamps. D
4. Remove clips securing radiator grille and remove the radiator grille.
5. Remove bolts securing left and right turn signal lamps and remove the lamps. E
6. Remove bolts securing left and right fog lamps and remove the lamps. F
7. Remove bolts securing left and right radiator grille and remove the radiator grilles. G
8. Remove bolts securing license plate bracket and remove the license plate bracket. H
9. Remove clips securing bumper fascia to bumper reinforcement. I
10. Remove bolts securing front fender to bumper fascia. J
11. Extract bumper fascia assembly. K
12. Remove bolts and nuts securing bumper reinforcement. L
13. Extract bumper reinforcement.



★ : Bumper assembly mounting clips

: N•m (kg-m, in-lb)

SBT735

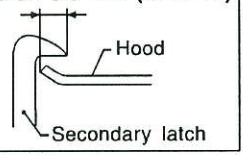
SEC. 260•261•262•263•620•623•630•650

Hood lock adjustment

- Adjust hood so that hood primary lock meshes at a position 1 to 1.5 mm (0.039 to 0.059 in) lower than fender.
- After hood lock adjustment, adjust bumper rubber.
- When securing hood lock, ensure it does not tilt. Striker must be positioned at the center of hood primary lock.
- After adjustment, ensure that hood primary and secondary lock operate properly.

Hood lock secondary latch hooking length

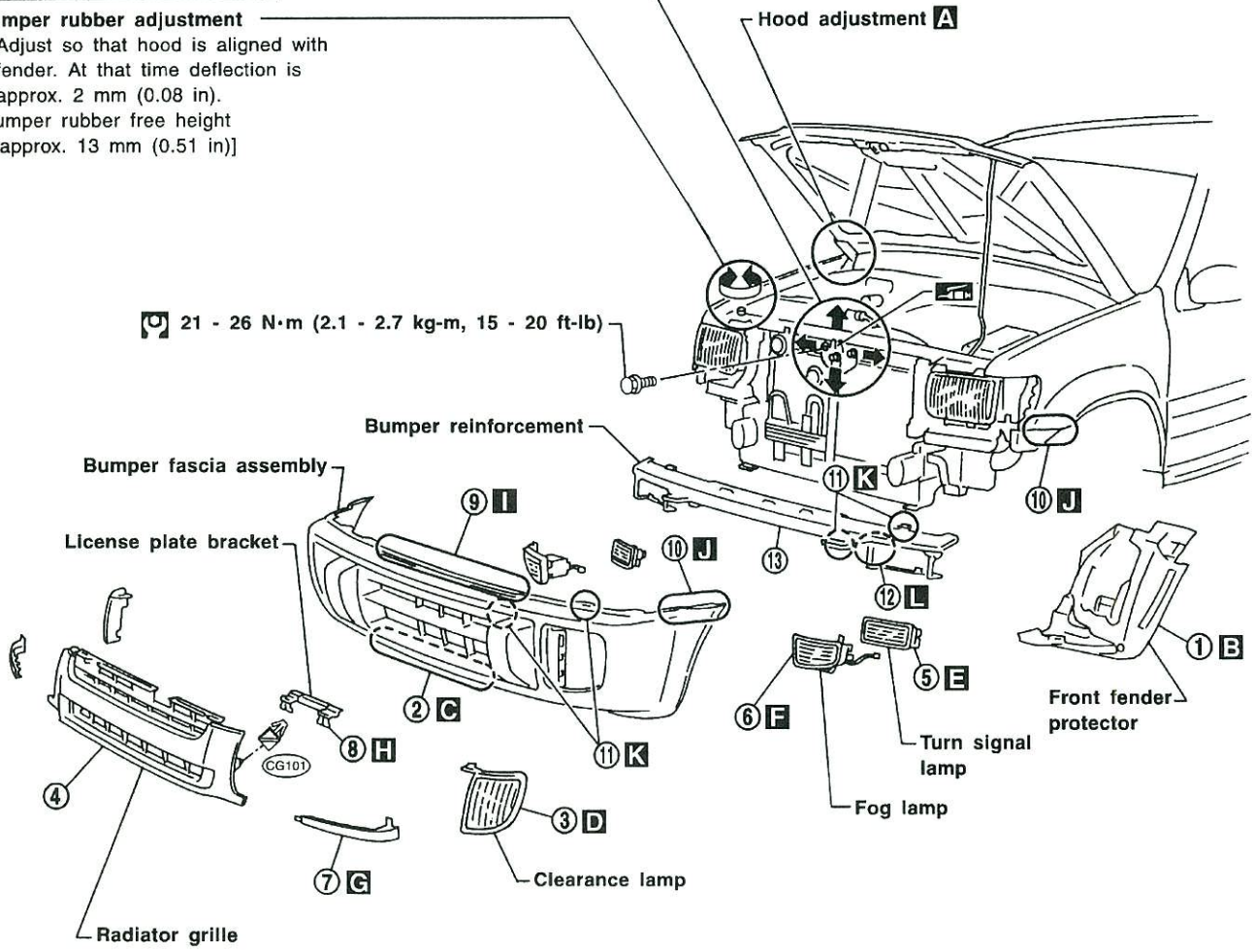
More than 5.0 mm (0.197 in)



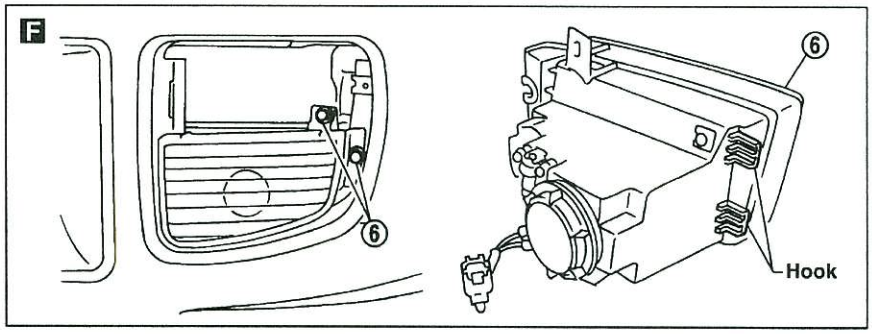
Bumper rubber adjustment

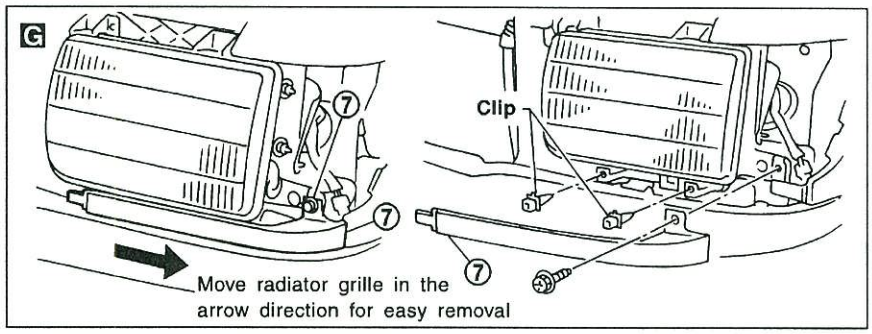
- Adjust so that hood is aligned with fender. At that time deflection is approx. 2 mm (0.08 in).

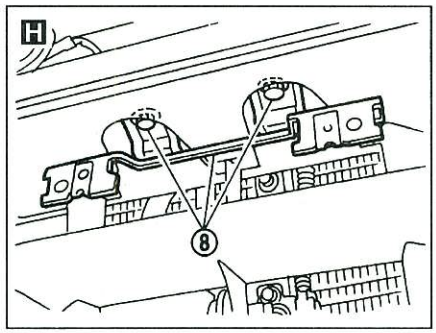
[Bumper rubber free height is approx. 13 mm (0.51 in)]

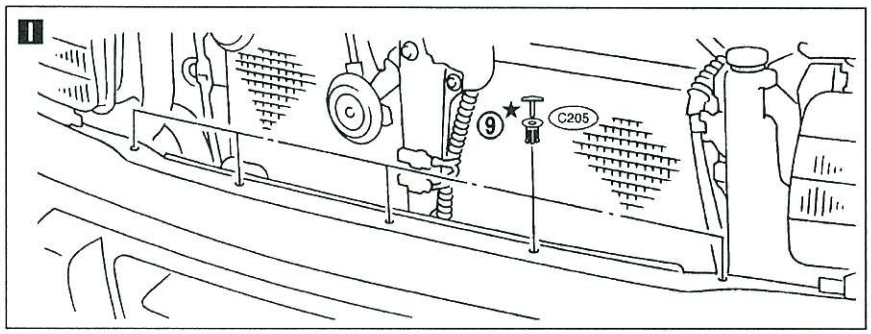


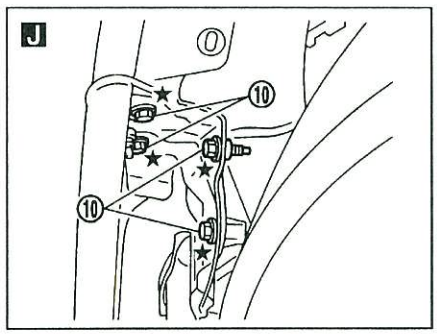
SBT347-A

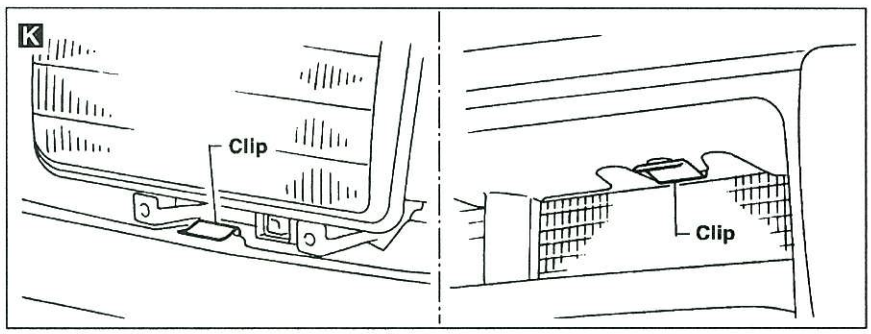


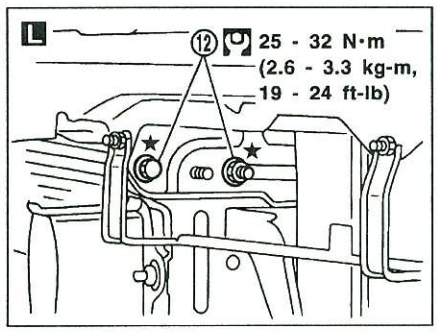












★ : Bumper assembly mounting clips, bolts and nuts.

SBT486

Removal and Installation

NBBT0005

- Bumper fascia is made of plastic. Do not use excessive force and be sure to keep oil away from it.
- Back door lock system adjustment: Adjust lock & striker so that they are in the center. After adjustment, check back door lock operation.
- Back door hatch lock system adjustment: Adjust lock & striker so that they are in the center. After adjustment, check back door hatch lock operation.

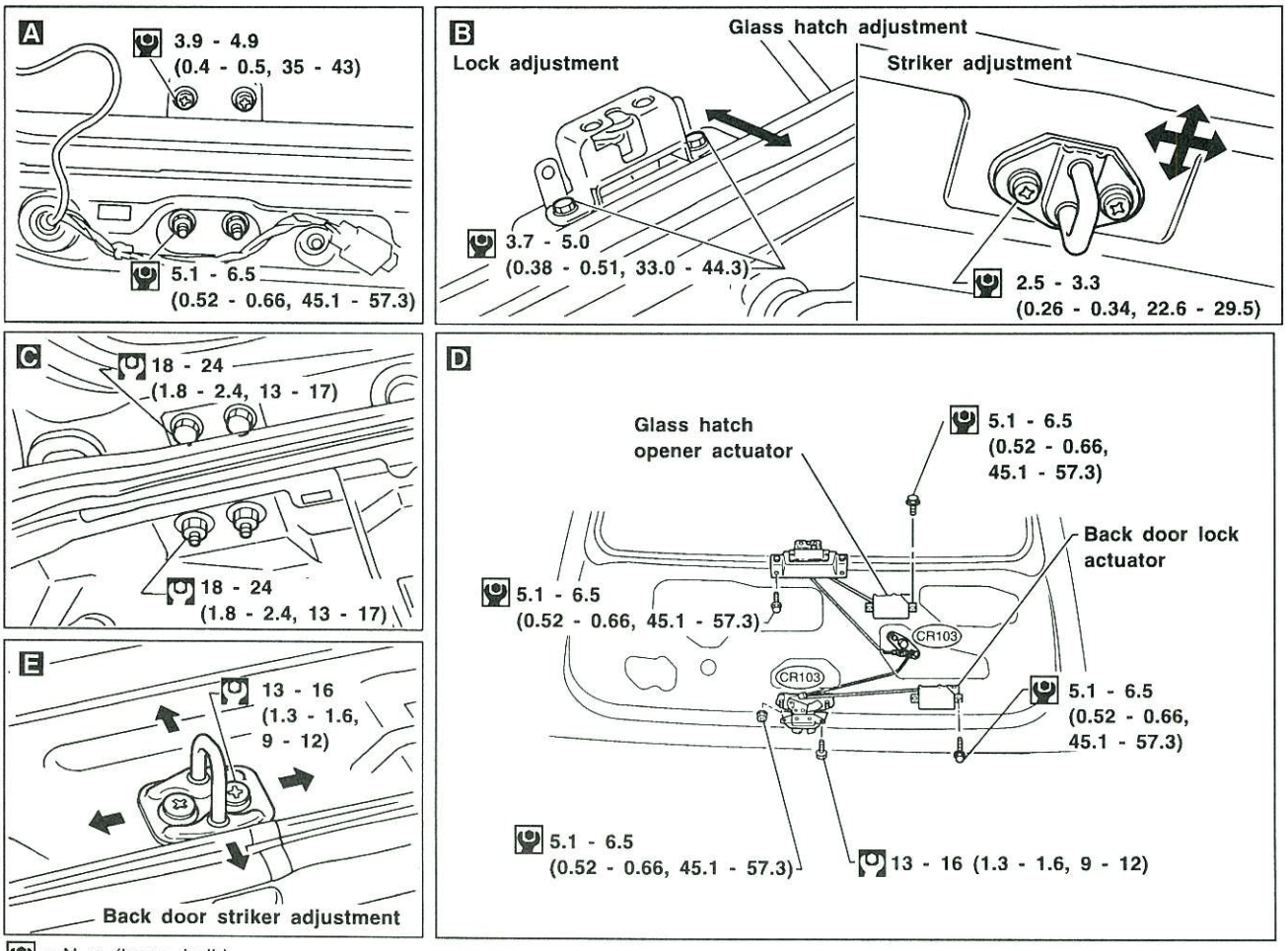
WARNING:

- **Be careful not to scratch back door stay and/or back door hatch stay when installing back door and/or back door hatch. A scratched stay may cause gas leakage.**
- **The contents of the back door stay and back door hatch stay are under pressure. Do not take apart, puncture, apply heat or allow fire near them.**

REAR BUMPER ASSEMBLY

NBBT0005S01

1. Remove bolts and screws securing left and right mudguards and remove the mudguards. J
2. Remove clips and screws securing left and right sides of wheel protector. K
3. Remove clips and bolts securing left and right rear fenders to bumper fascia. L
4. Remove bolts securing bumper reinforcement to bumper fascia. M
5. Remove clips securing bumper fascia. N
6. Extract bumper fascia assembly. O
7. Remove bolts and nuts securing bumper reinforcement. P
8. Extract bumper reinforcement.

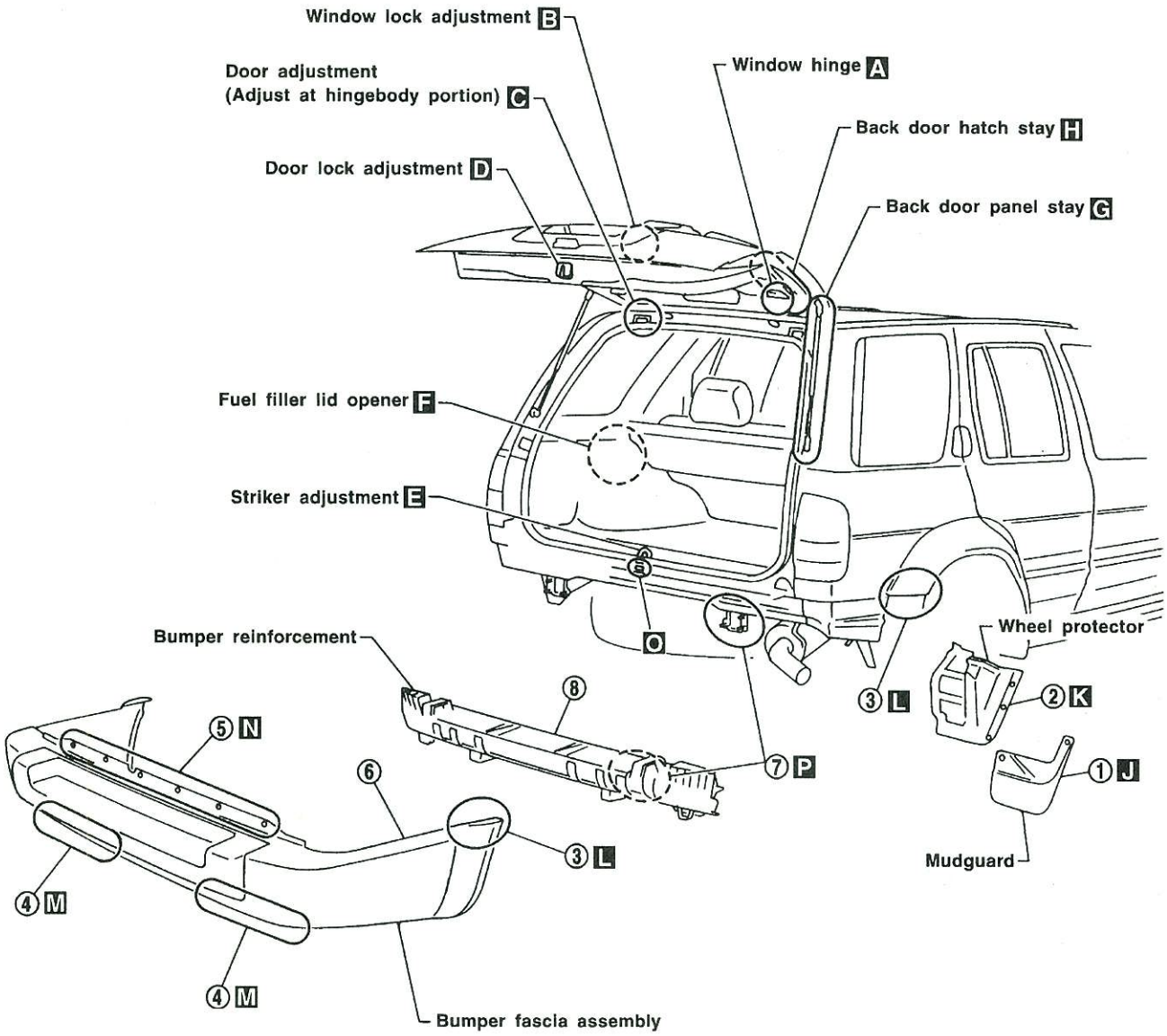


: N•m (kg-m, in-lb)

: N•m (kg-m, ft-lb)

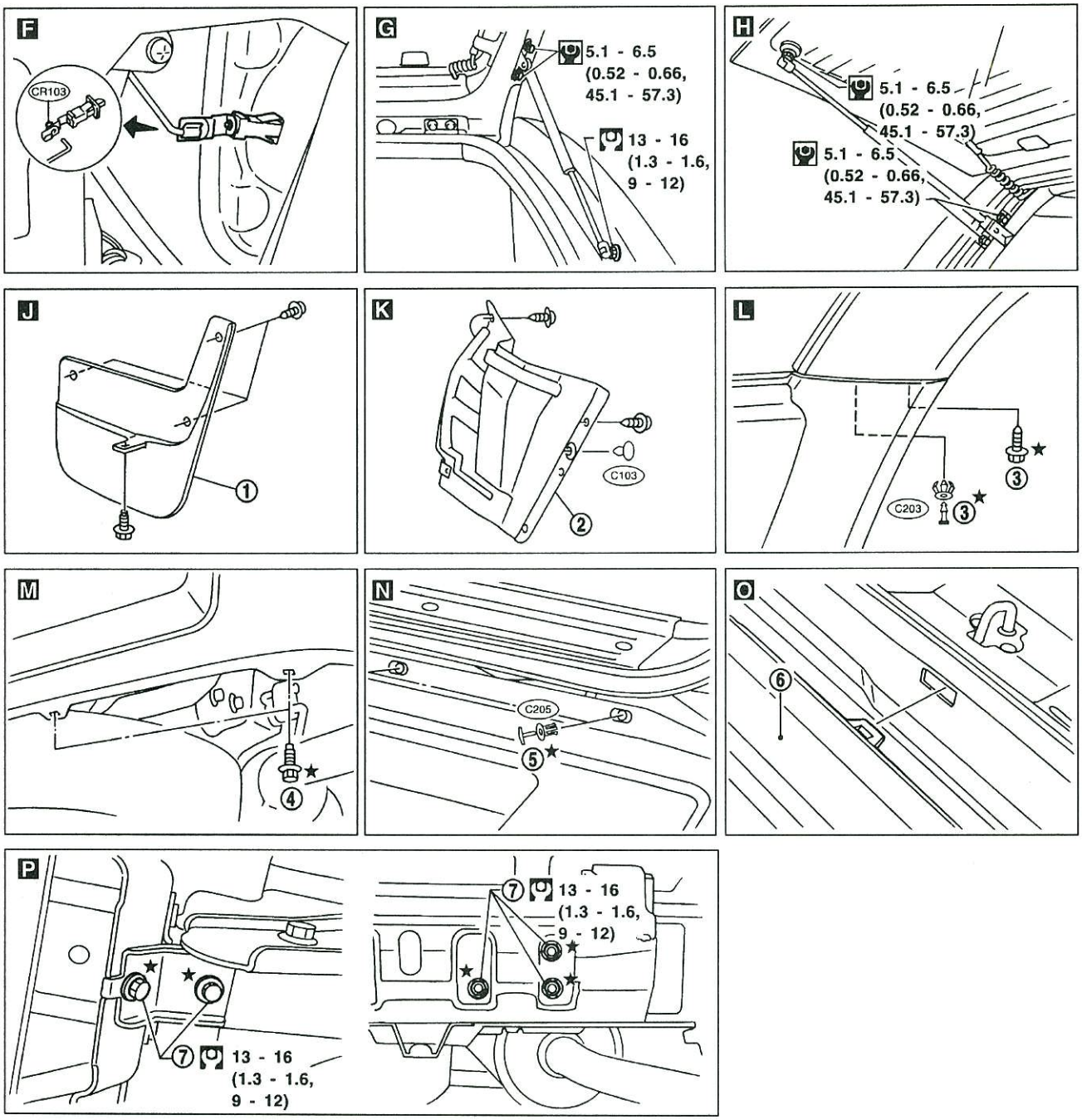
SBT715

SEC. 570•767•850•900•905



SBT716

Removal and Installation (Cont'd)



★ : Bumper assembly mounting bolts, nuts and clips

: N•m (kg-m, in-lb)

: N•m (kg-m, ft-lb)

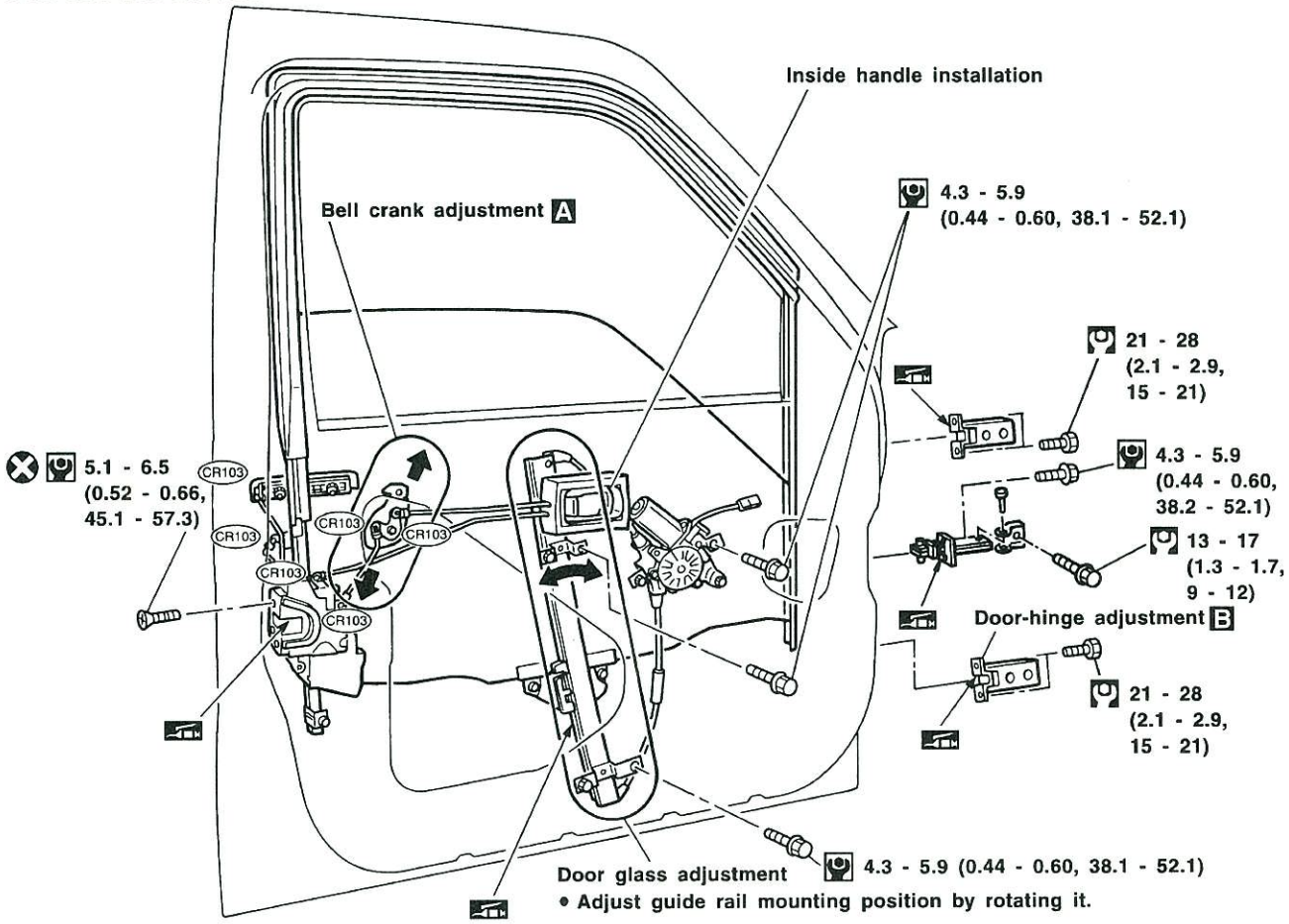
SBT717

Overhaul

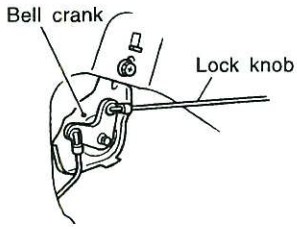
NBBT0006

- For removal of door trim, refer to "DOOR TRIM" (BT-19).
- After adjusting door or door lock, check door lock operation.

SEC. 800•803•805•998

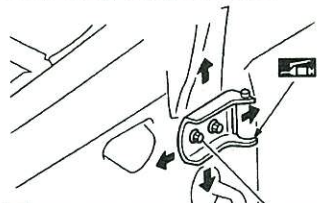


A Bell crank adjustment

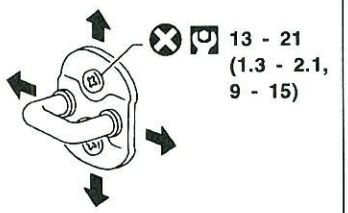


Lock door after setting door lock assembly and inside handle in position. Move bell crank in direction of arrow (shown in figure at left) to take up knob free play, and secure with bolts.

B Door-hinge adjustment



Striker adjustment



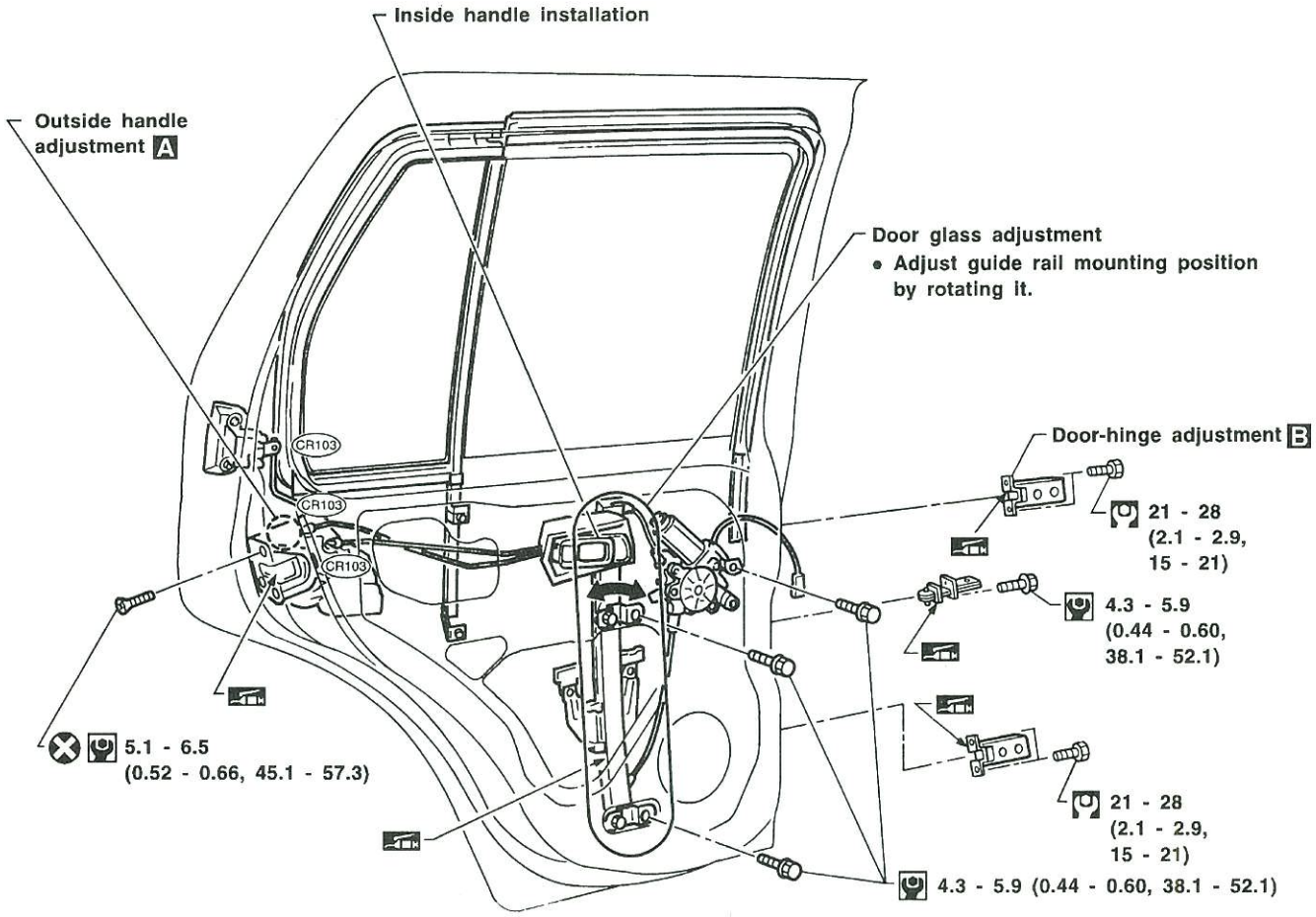
: N•m (kg-m, in-lb)
: N•m (kg-m, ft-lb)

SBT512-B

Overhaul

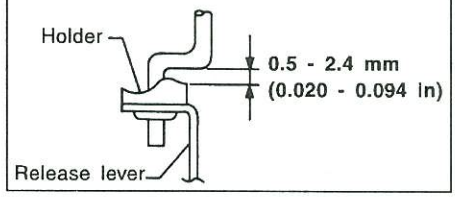
NBBT0007

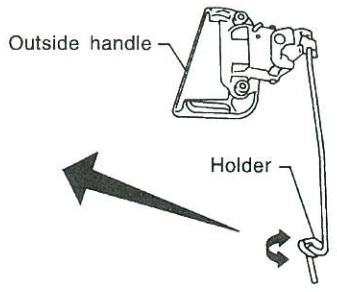
SEC. 820•823•825



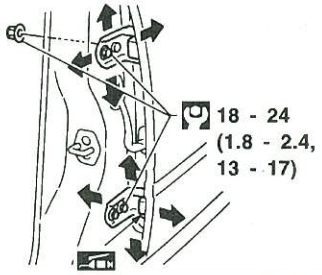
A Outside handle adjustment

Turn holder until the clearance between holder & rod is the specified value.

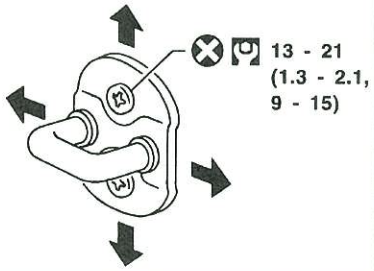




B Door-hinge adjustment



Striker adjustment



: N•m (kg-m, in-lb)

: N•m (kg-m, ft-lb)

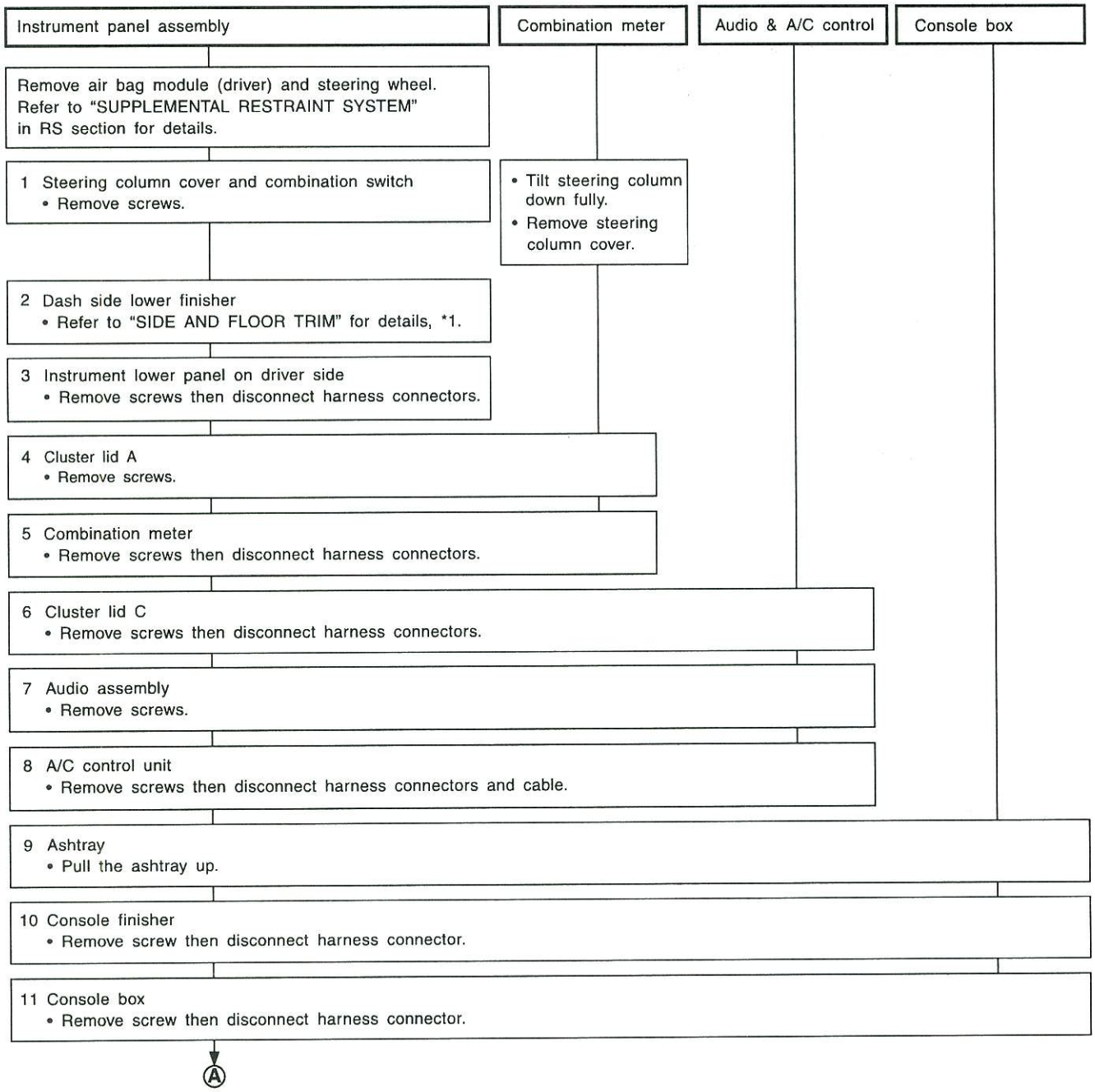
SBT736

Removal and Installation

NBBT0008

CAUTION:

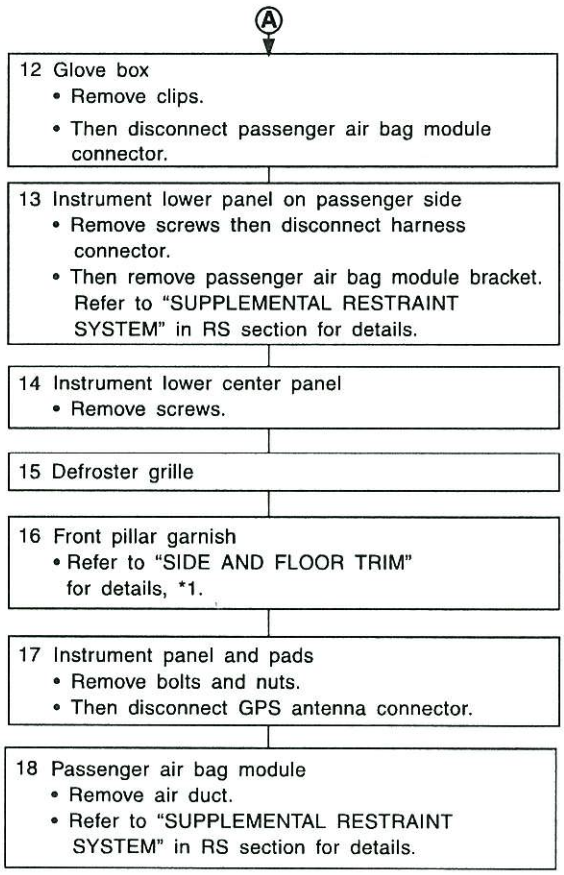
- **Disconnect both battery cables in advance.**
- **Disconnect air bag system line in advance.**
- **Never tamper with or force air bag lid open, as this may adversely affect air bag performance.**
- **Be careful not to scratch pad and other parts.**



SBT718

*1 BT-17

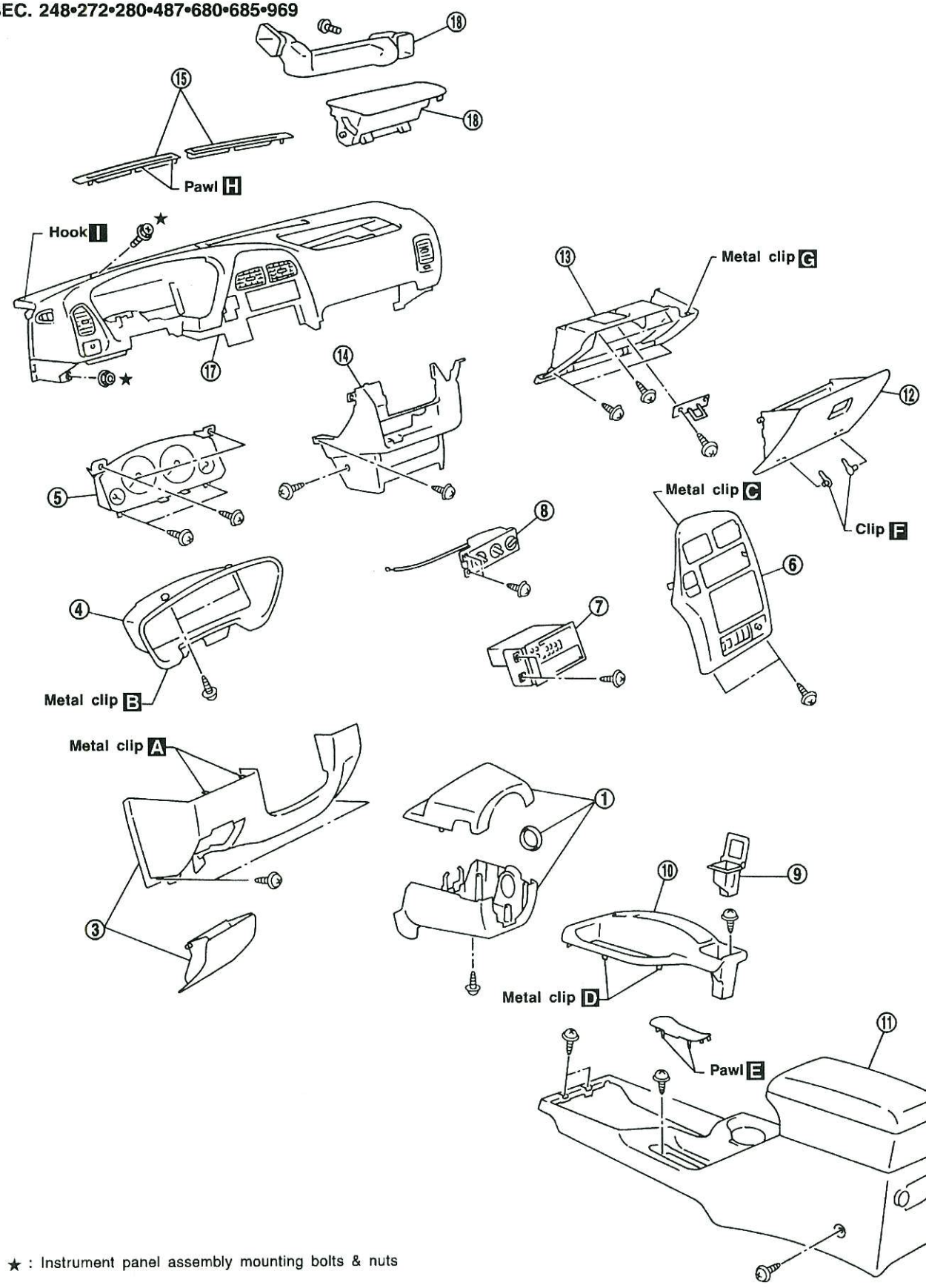
Removal and Installation (Cont'd)



SBT719

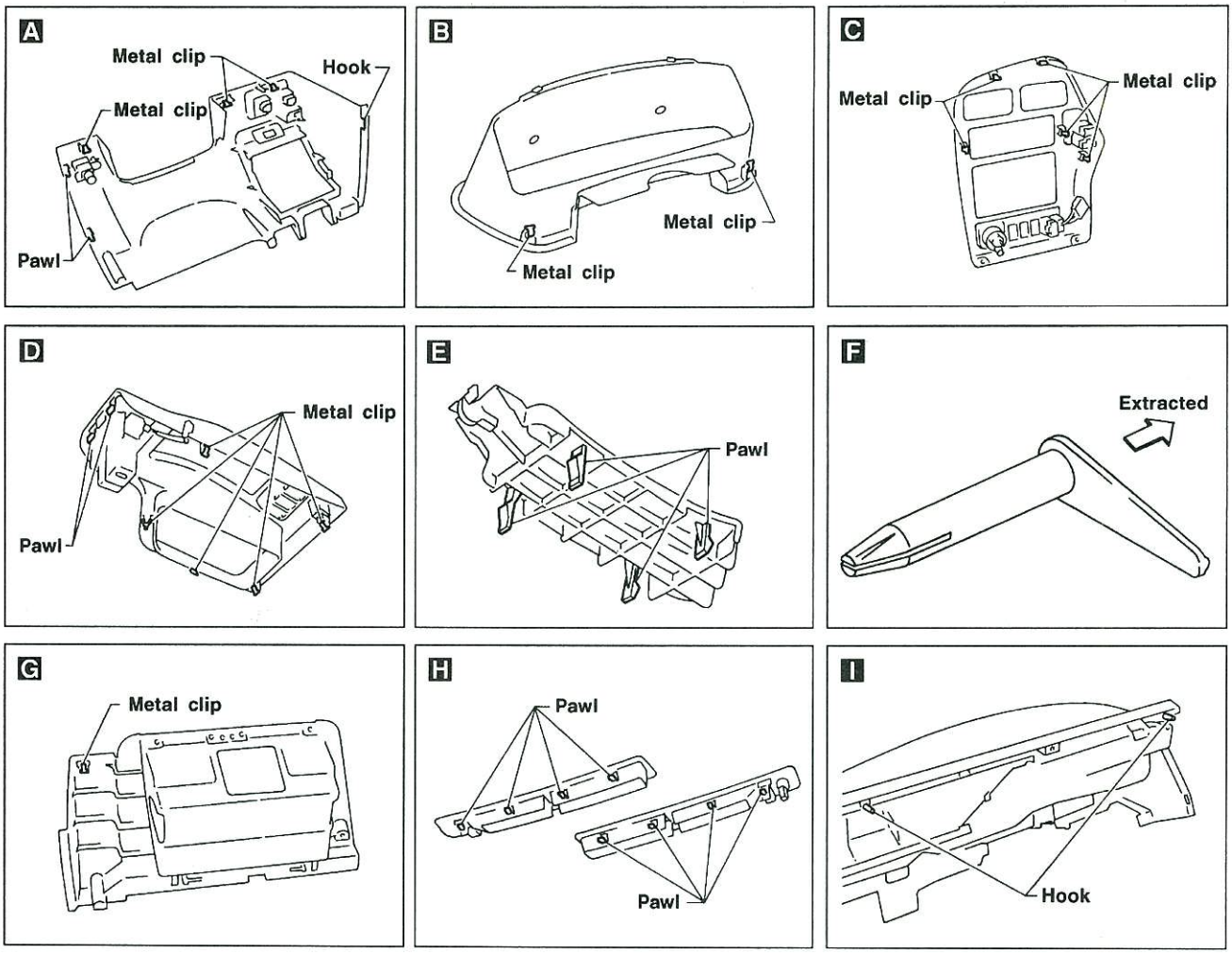
*1 BT-17

SEC. 248•272•280•487•680•685•969



★ : Instrument panel assembly mounting bolts & nuts

SBT720


A
Metal clip
Hook
Metal clip
Pawl
B
Metal clip
Metal clip
C
Metal clip
Metal clip
D
Metal clip
Pawl
E
Pawl
F
Extracted
G
Metal clip
H
Pawl
Pawl
I
Hook

SBT205

Removal and Installation

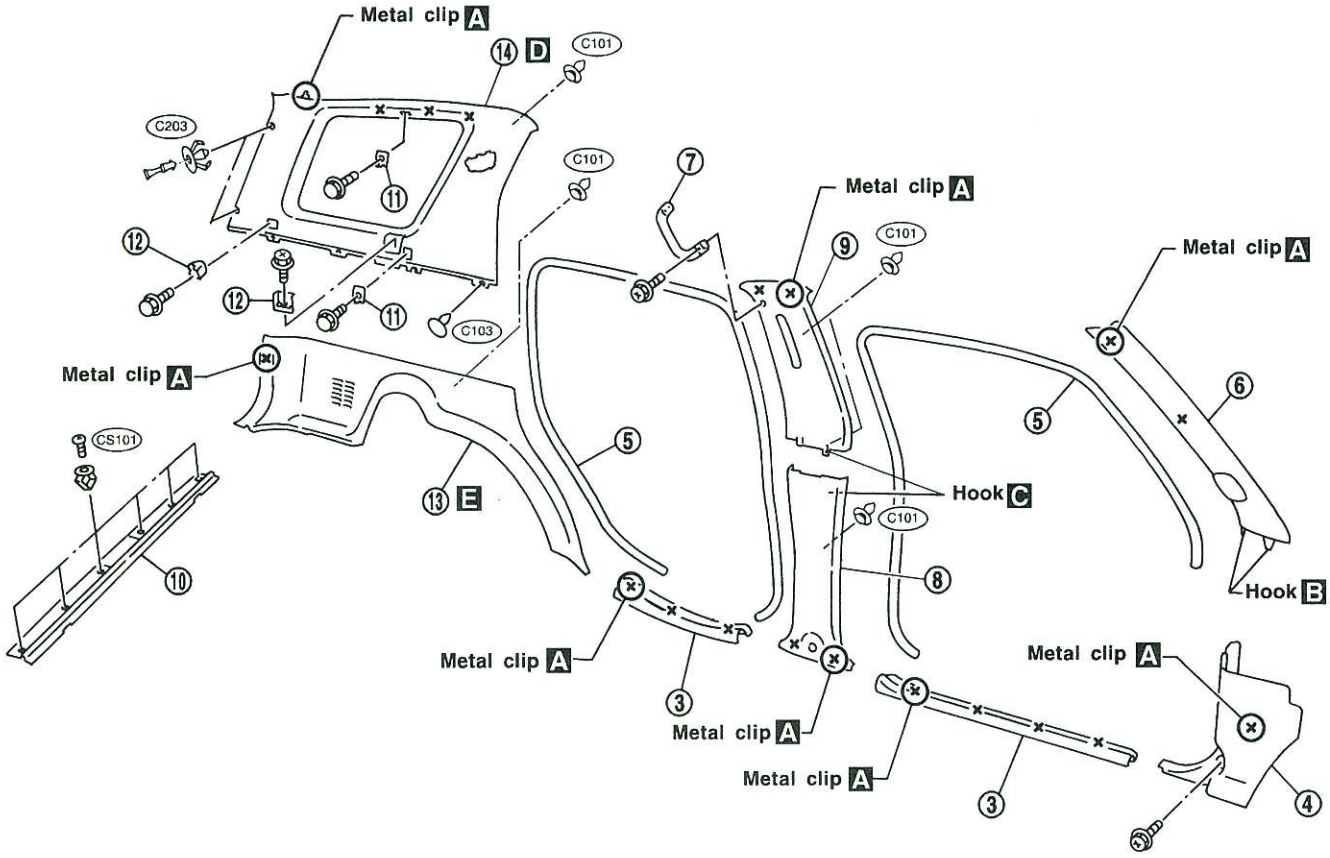
NBBT0009

CAUTION:

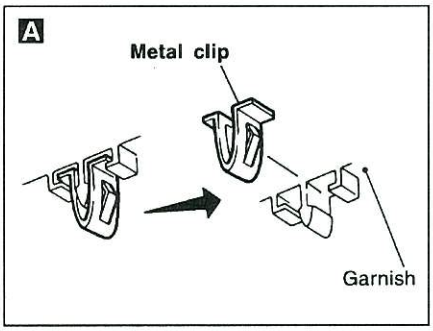
Wrap the tip of flat-bladed screwdriver with a cloth when removing metal clips from garnishes.

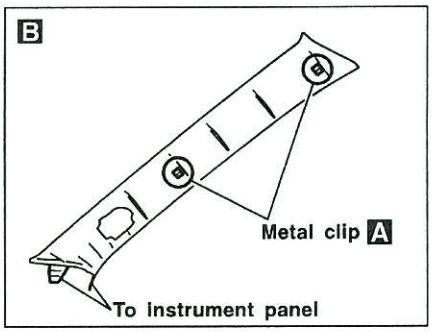
1. Remove front and rear seats. Refer to "FRONT SEAT" and "REAR SEAT" for details, BT-30, BT-33.
2. Romove front and rear seat belts. Refer to "SEAT BELTS" in RS section for details.
3. Remove front and rear kicking plates.
4. Remove dash side lower finishers.
5. Remove front and rear body side welts.
6. Remove front pillar garnishes. B
7. Remove center assist grips.
8. Remove center pillar lower garnishes. C
9. Remove center pillar upper garnishes. C
10. Remove rear gate kicking plate.
11. Remove rear net hooks.
12. Remove tonneau cover assembly and rear parcel holder.
13. Remove rear side lower garnishes. E
14. Remove rear side upper garnishes. D

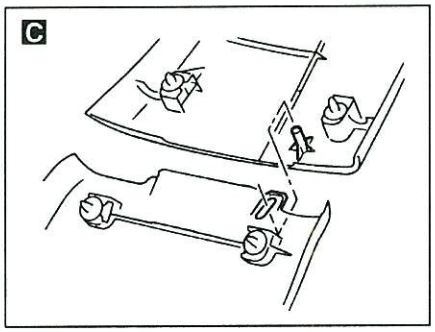
SEC. 678•738•769•799•849

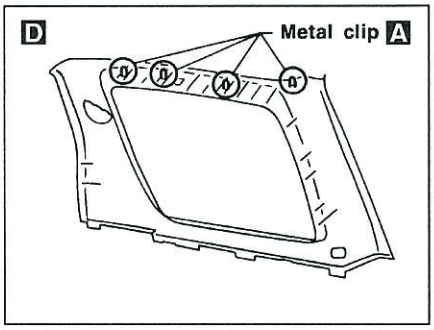


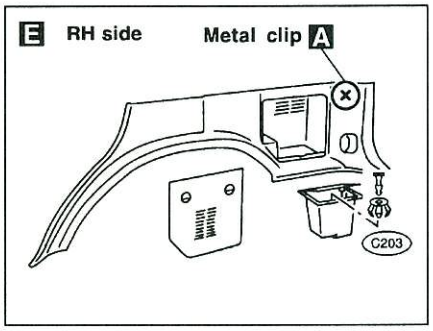
SBT694


A
Metal clip
Garnish


B
Metal clip A
To instrument panel


C


D
Metal clip A


E
RH side
Metal clip A
C203

SBT721

Removal and Installation

NBBT0010

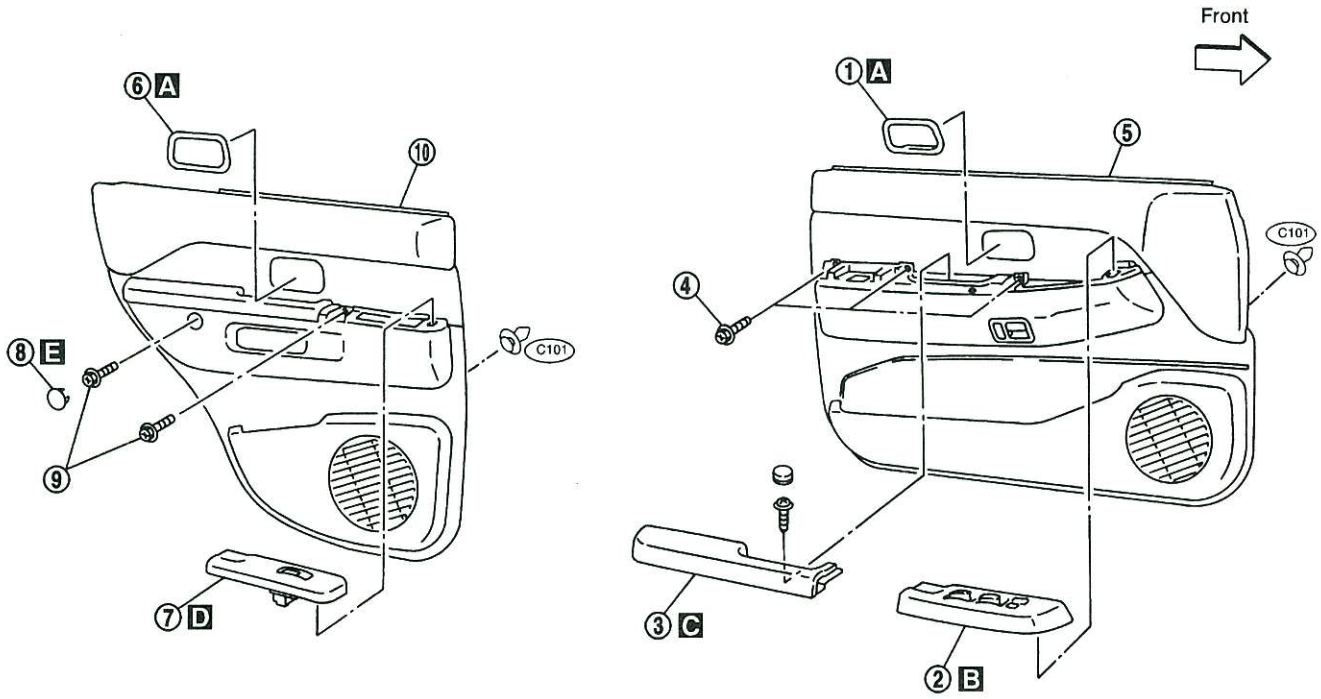
Front Door Trim

1. Remove inside handle escutcheon. A
2. Remove power window switch, then disconnect the connectors. B
3. Remove door armrest. C
4. Remove bolts securing door finisher.
5. Pull on door finisher to remove clips from door panel and remove door finisher, then disconnect glass hatch and fuel lid opener switch connector.

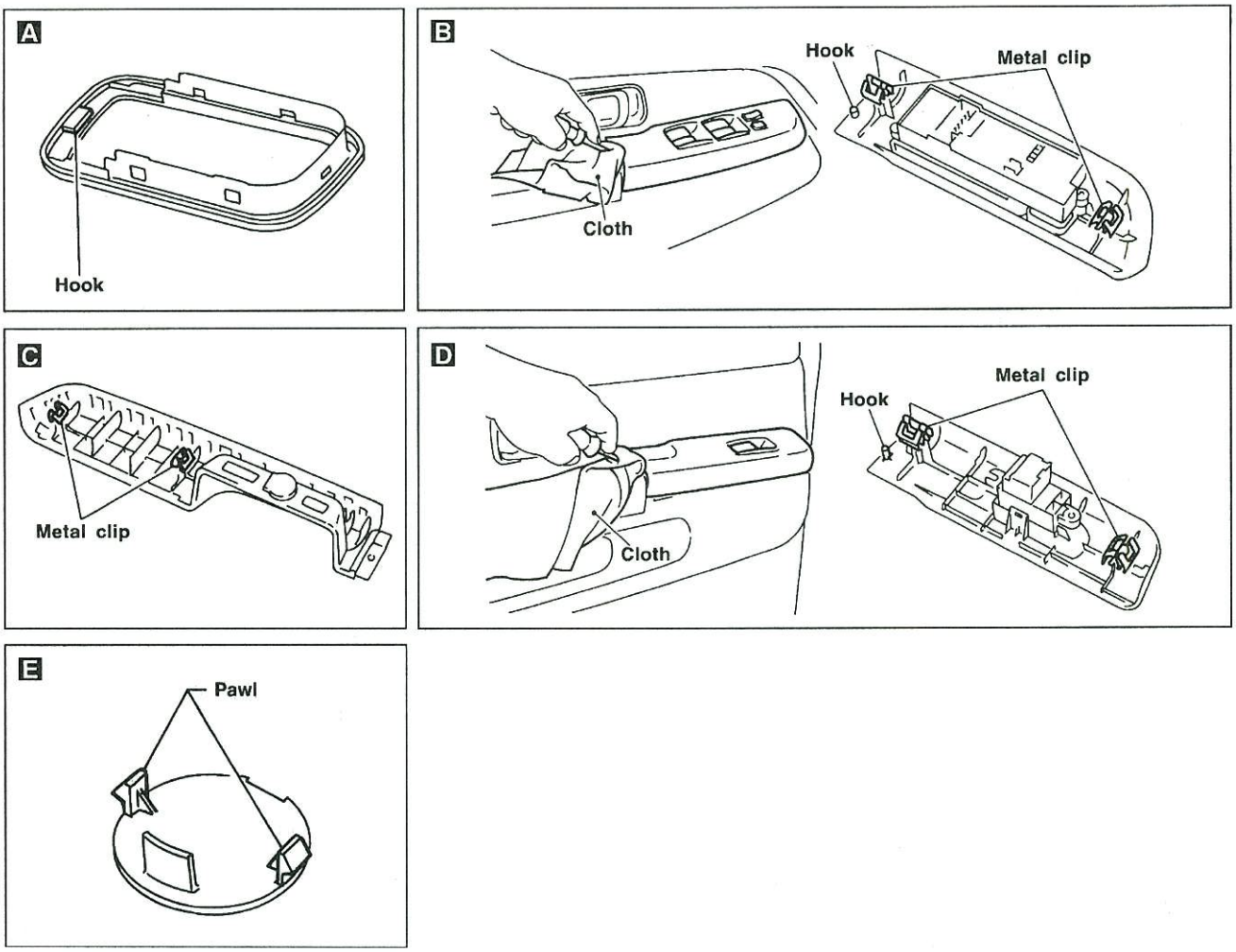
Rear Door Trim

6. Remove inside handle escutcheon. A
7. Remove power window switch, then disconnect the connector. D
8. Remove door armrest cap. E
9. Remove bolts securing door finisher.
10. Pull on door finisher to remove clips from door panel and remove door finisher.

SEC. 251•809•828



SBT696


A
Hook
B
Hook
Metal clip
Cloth
C
Metal clip
D
Metal clip
Hook
Cloth
E
Pawl

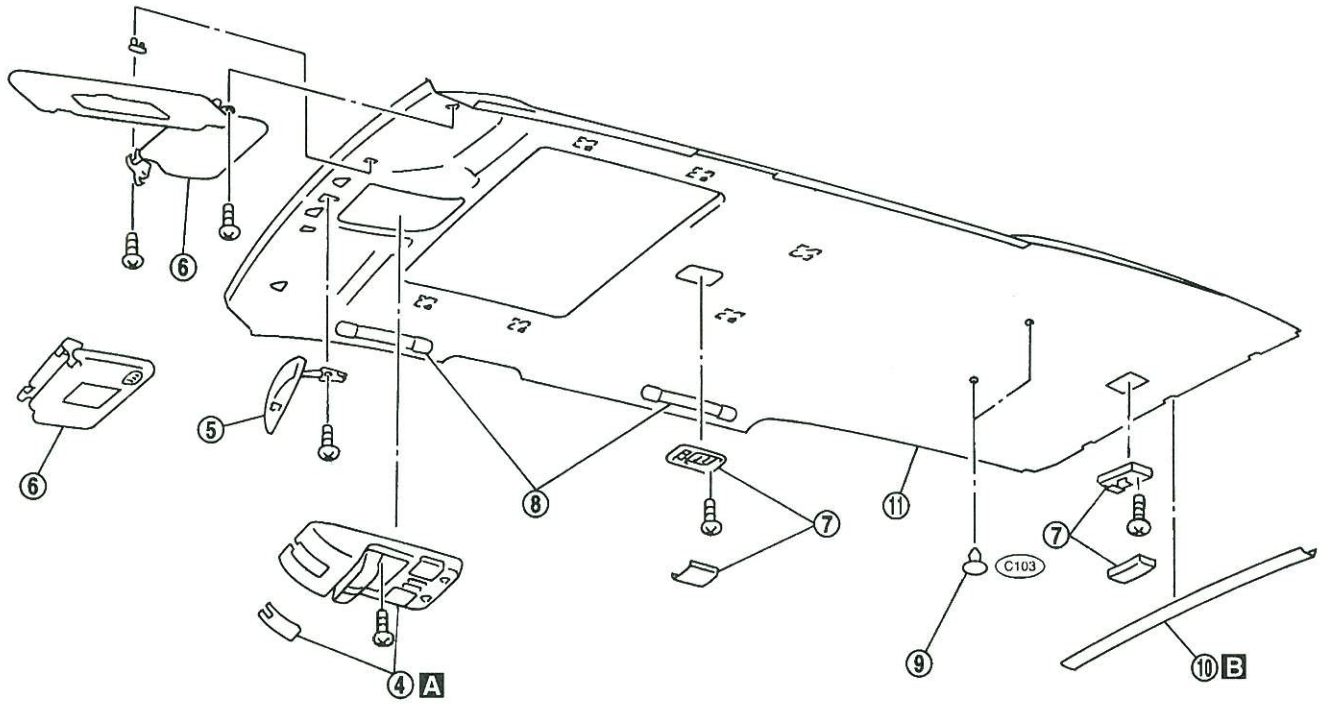
SBT697

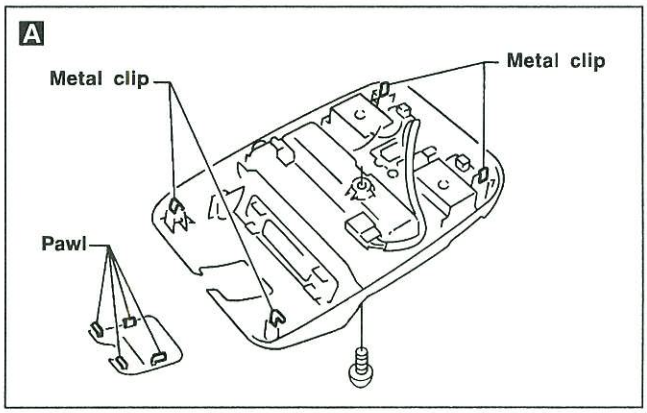
Removal and Installation

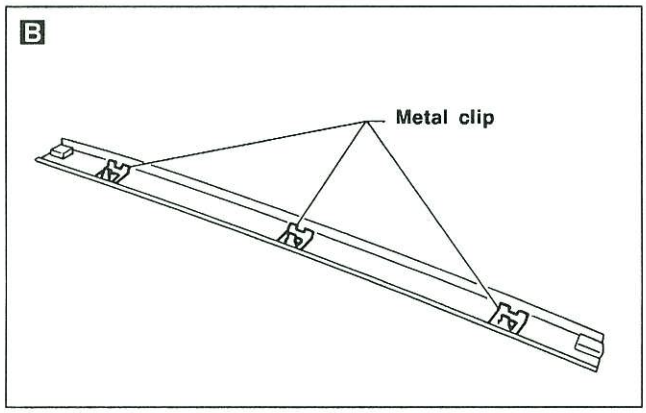
NBBT0011

1. Remove front and rear seats. Refer to "FRONT SEAT" and "REAR SEAT" for details, BT-30, BT-33.
2. Remove front and rear seat belts. Refer to "SEAT BELTS" in RS section for details.
3. Remove body side trim. Refer to "SIDE AND FLOOR TRIM" for details, BT-17.
4. Remove roof console assembly. A
5. Remove inside mirror assembly.
6. Remove sun visors.
7. Remove interior lamp assembly and luggage room lamp assembly.
8. Remove assist grips.
9. Remove clips securing headlining.
10. Remove rear roof garnish. B
11. Remove headlining from vehicle through either back door.

SEC. 264•738•963•964•970







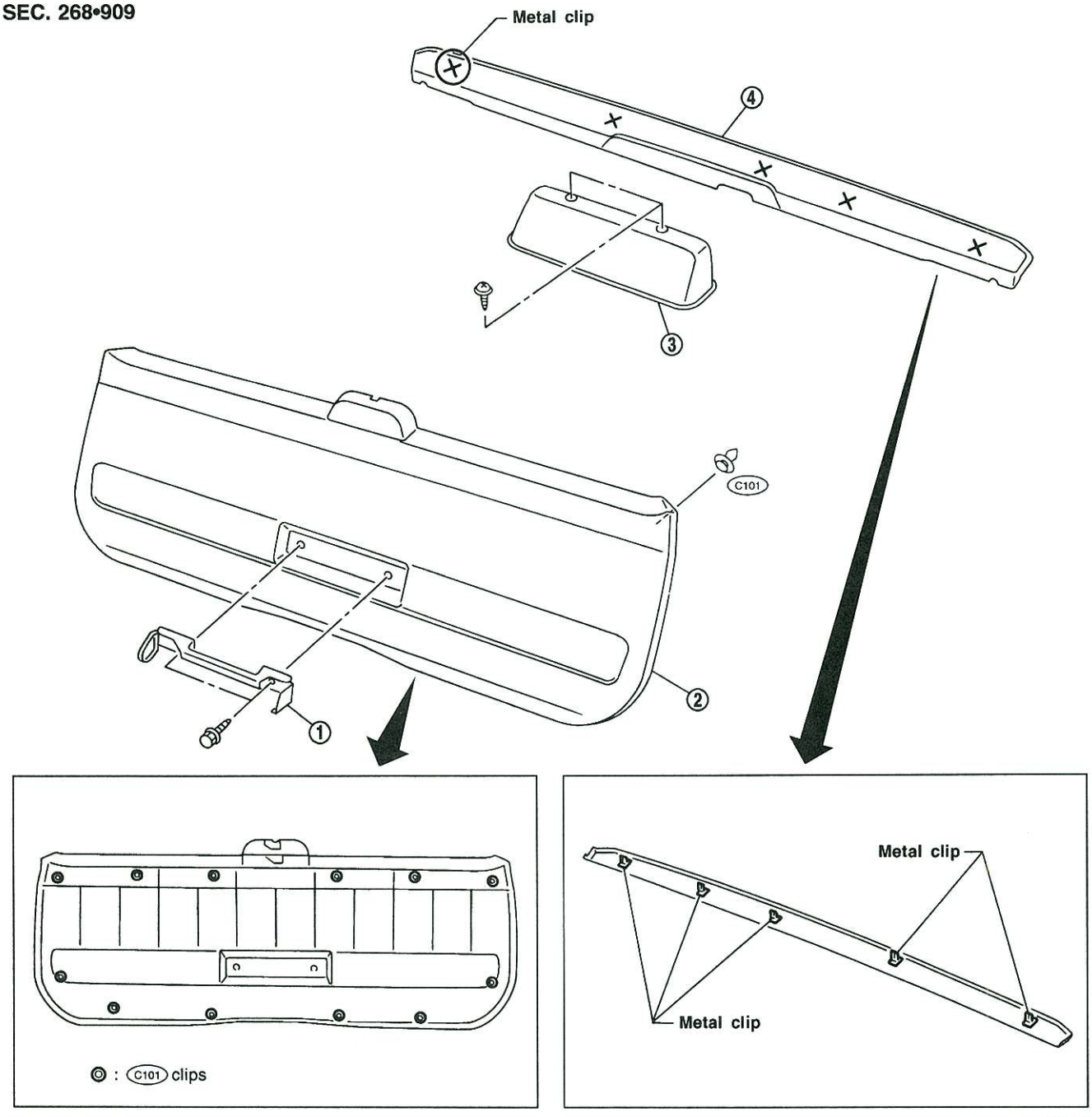
SBT487

Removal and Installation

NBBT0012

1. Remove back door grip.
2. Remove back door finisher assembly.
3. Remove high-mounted stop lamp.
4. Remove back door upper finisher assembly.

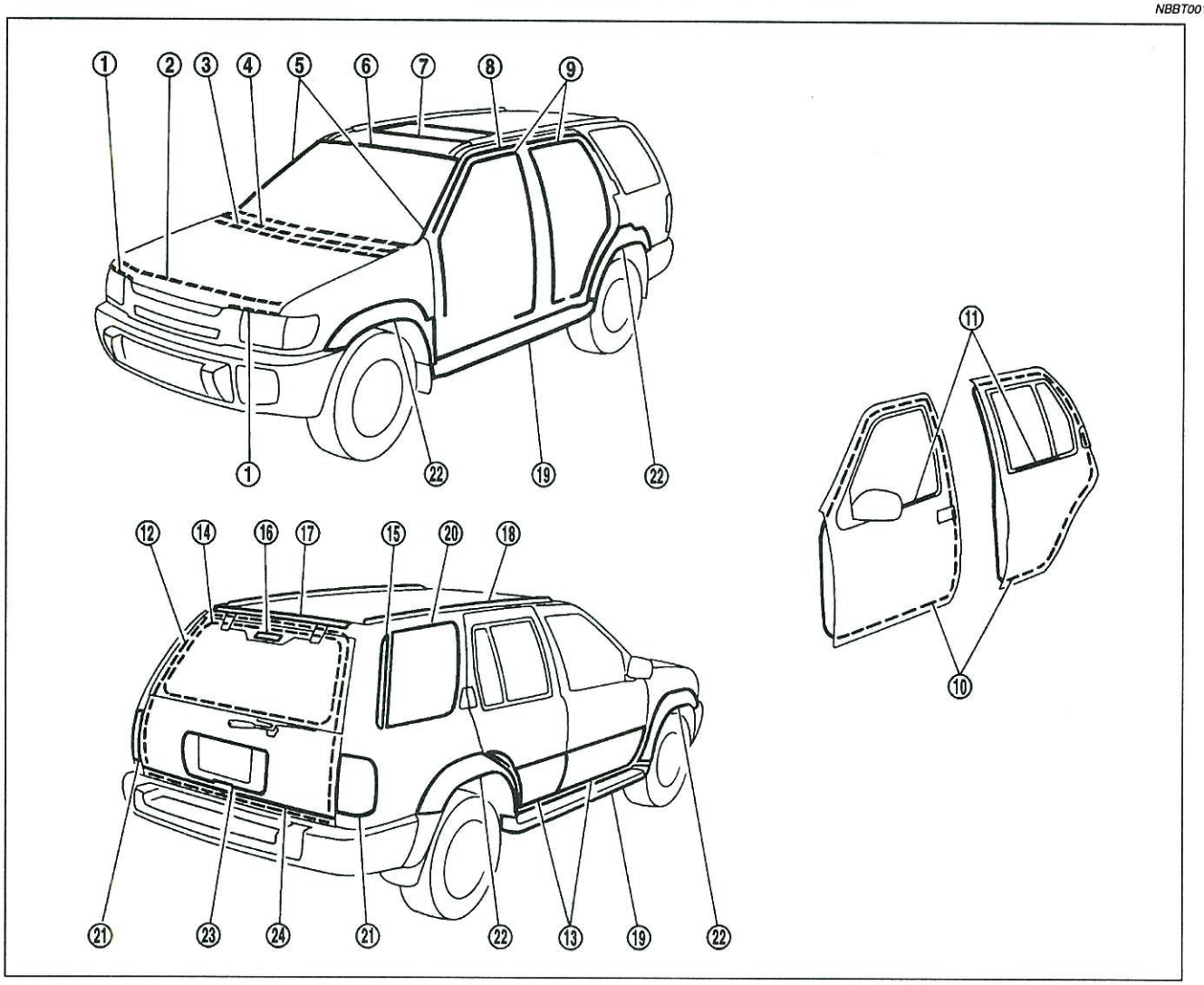
SEC. 268•909



SBT223

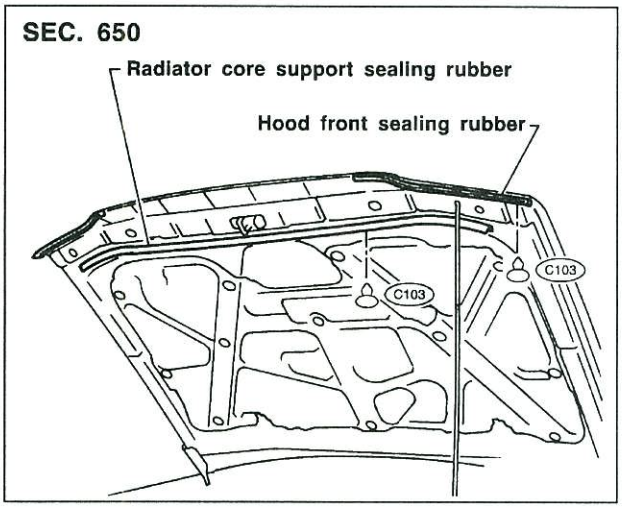
Removal and Installation

NBBT0013



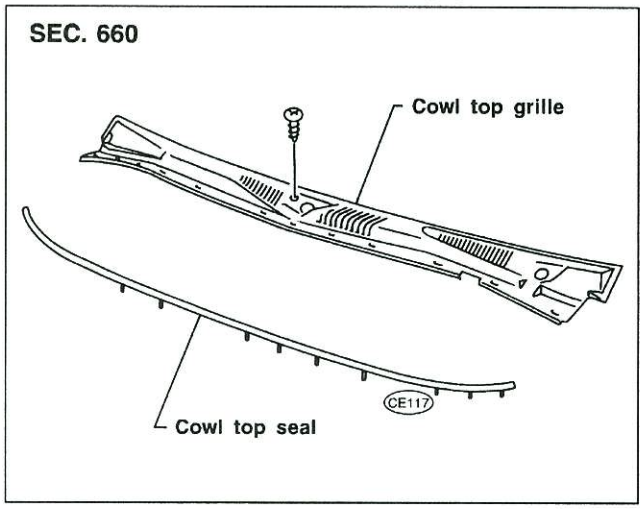
① ② Hood front seal

SEC. 650



③ ④ Cowl top seal and cowl top grille

SEC. 660



⑤ Windshield side molding

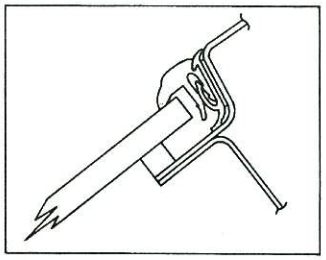
Mounted with screws.

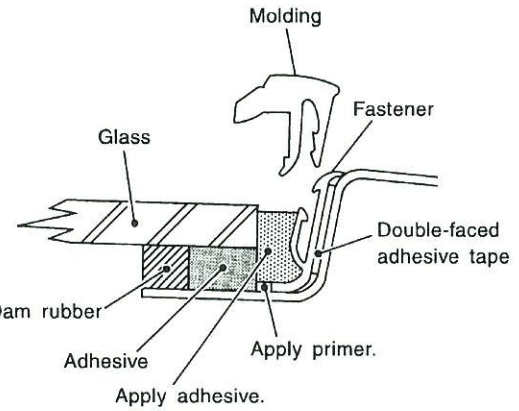
SBT494

⑥ Windshield upper molding

SEC. 720

1. Cut off adhesive at glass end.
2. Remove old adhesive from panel surface.
3. Set molding fastener and apply primer to body panel, and apply adhesive to body.

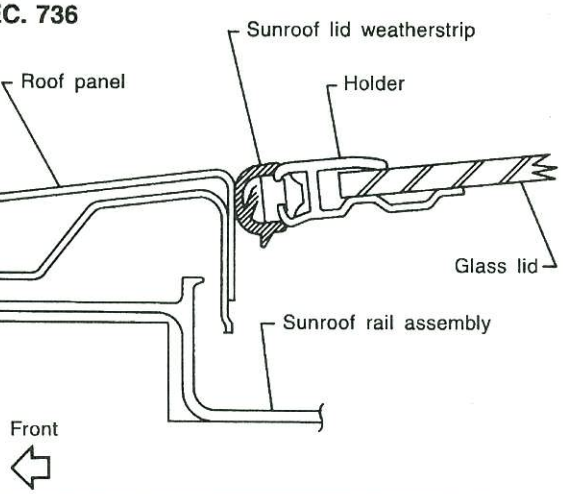




4. Install molding by aligning the molding mark located on center with vehicle center.
   Be sure to install tightly so that there is no gap around the corner.

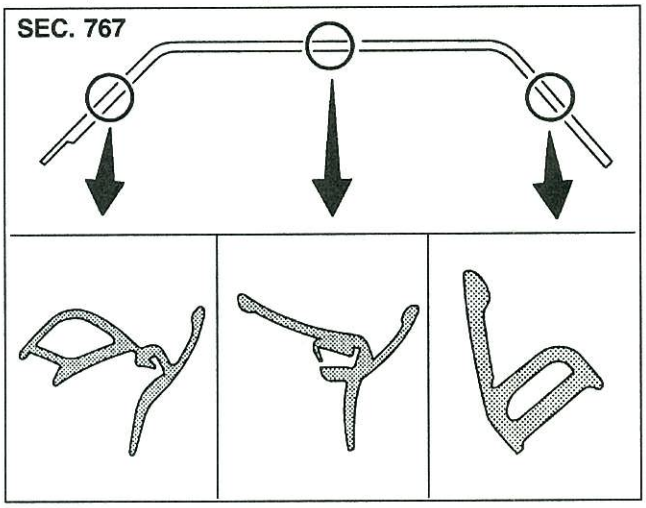
⑦ Sunroof lid weatherstrip

SEC. 736



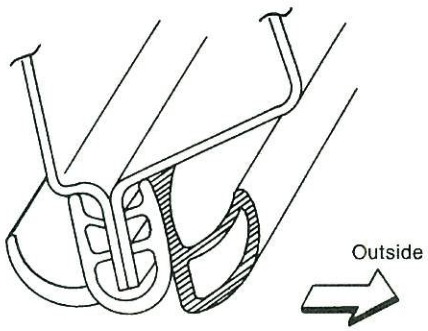
⑧ Drip weatherstrip

SEC. 767



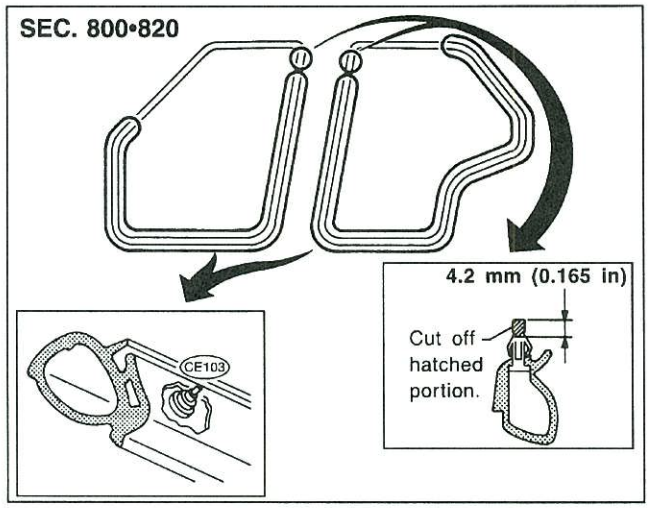
⑨ Body side welt

SEC. 769



⑩ Door weatherstrip

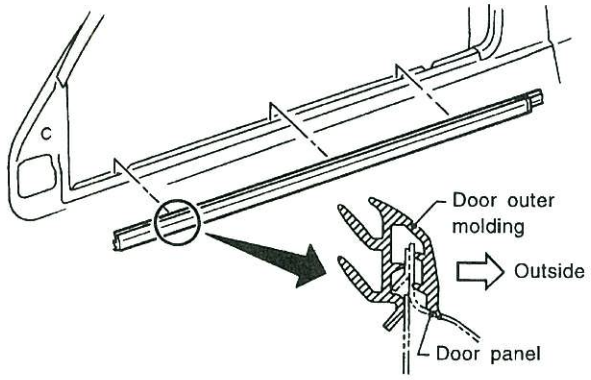
SEC. 800•820



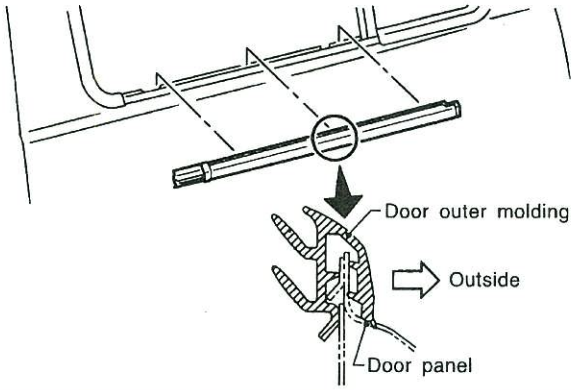
SBT722

⑪ Door outside molding

Front door
SEC. 800

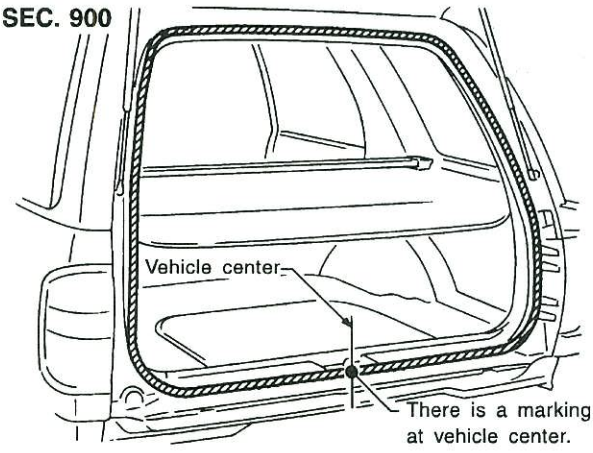


Rear door
SEC. 820



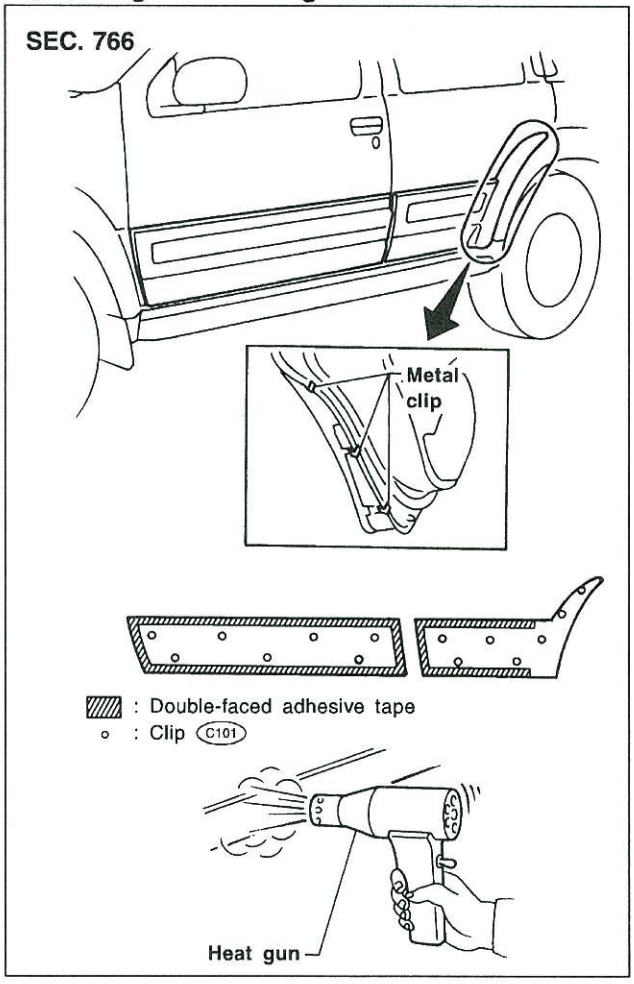
⑫ Back door weatherstrip

SEC. 900



⑬ Side guard molding

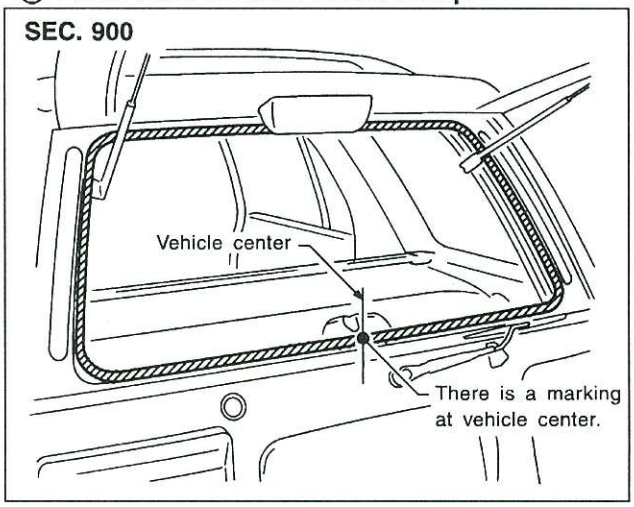
SEC. 766



- **With a vehicle coated with Hard Clear Coat, use double-faced 3M adhesive tape Product No. 4210 or equivalent, after priming with 3M primer Product No. N-200 or C-100 or equivalent.**

⑭ Back door window weatherstrip

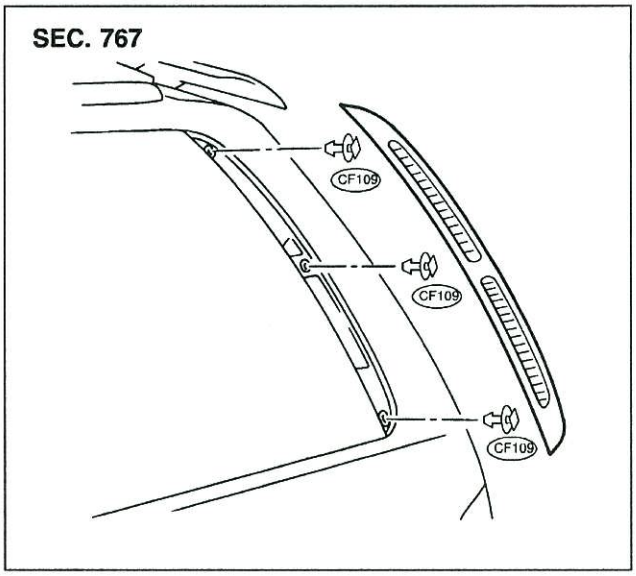
SEC. 900



SBT495

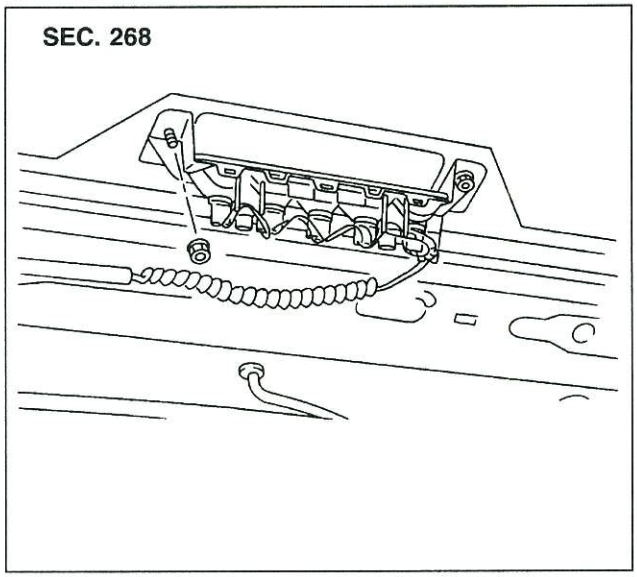
⑮ Air outlet grille

SEC. 767



⑯ High-mounted stop lamp

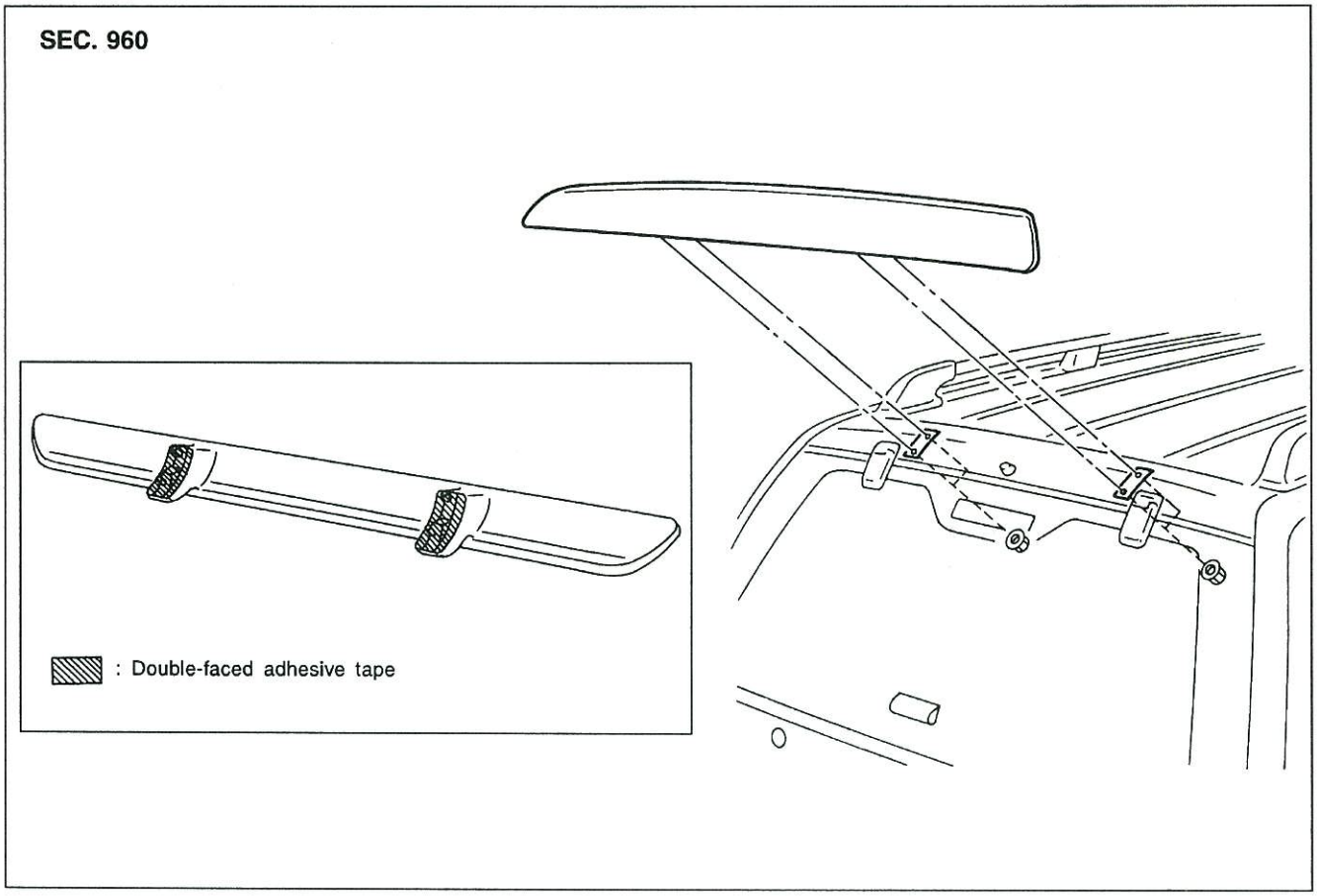
SEC. 268



⑰ Back door deflector

- When installing, make sure that there are not gaps or waves at ends of deflector.
- Before installing deflector, clean and remove oil from surface where deflector will be mounted.

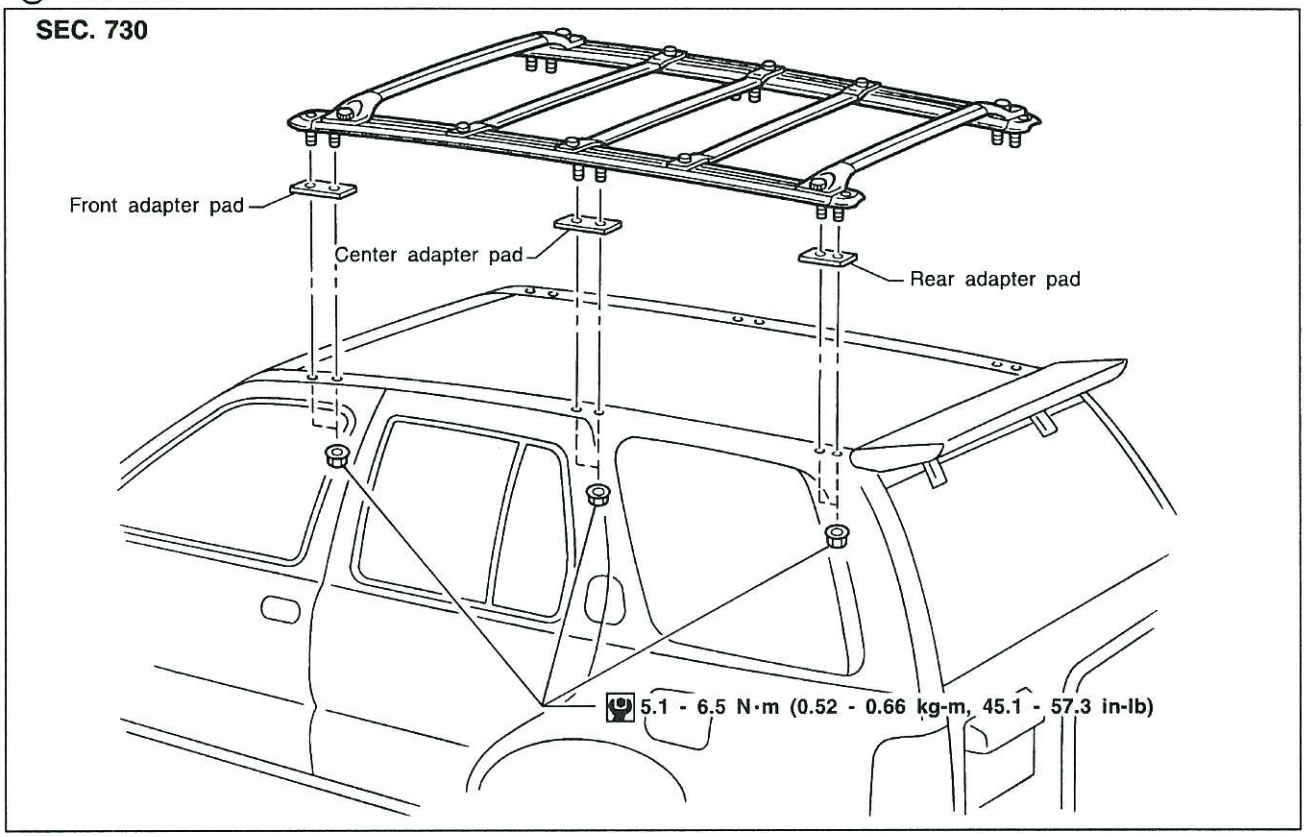
SEC. 960



SBT491

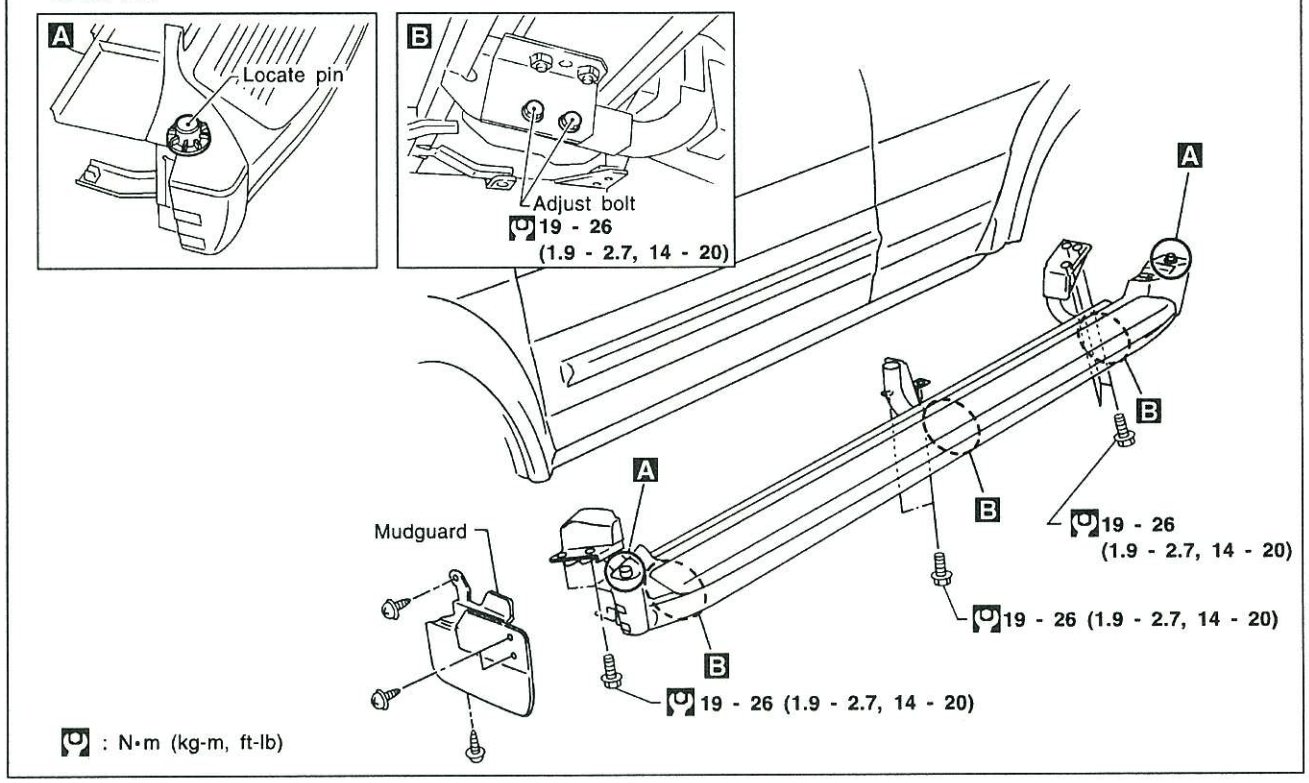
⑱ Roof rack

SEC. 730



⑲ Side step

SEC. 767



SBT496-A

⑳ Rear side window molding

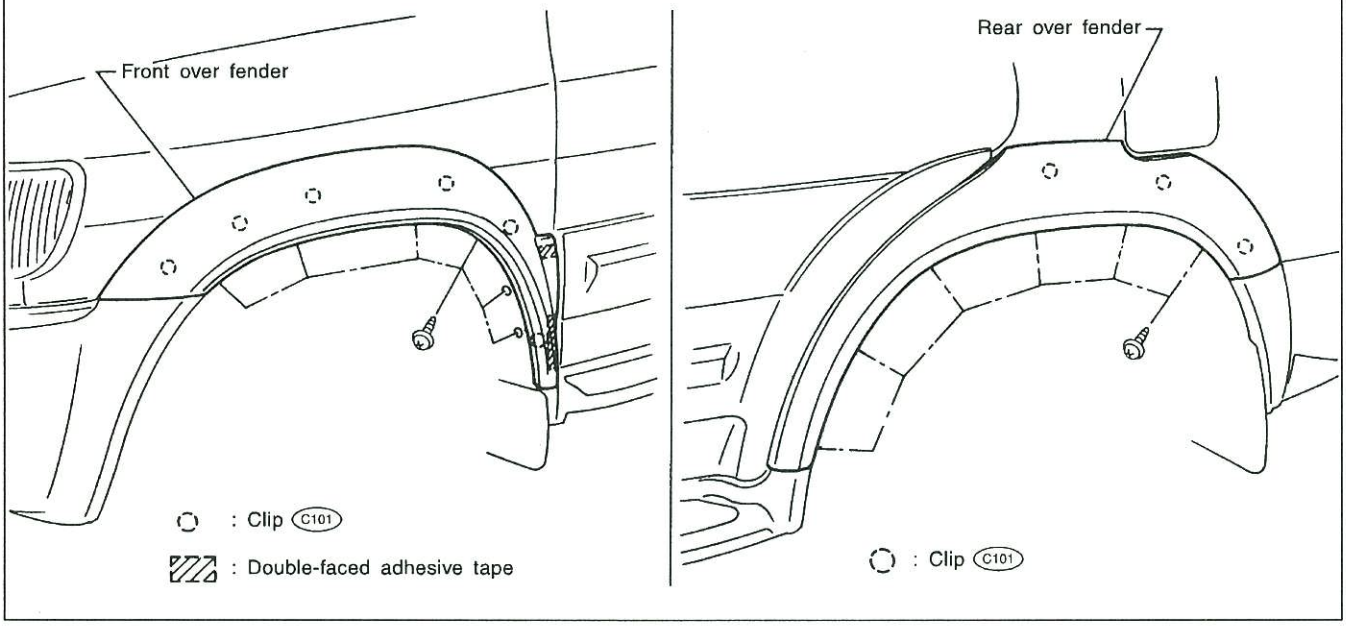
Refer to the applicable sections on the preceding pages.

㉑ Rear combination lamp

Rear combination lamps are installed with nuts.

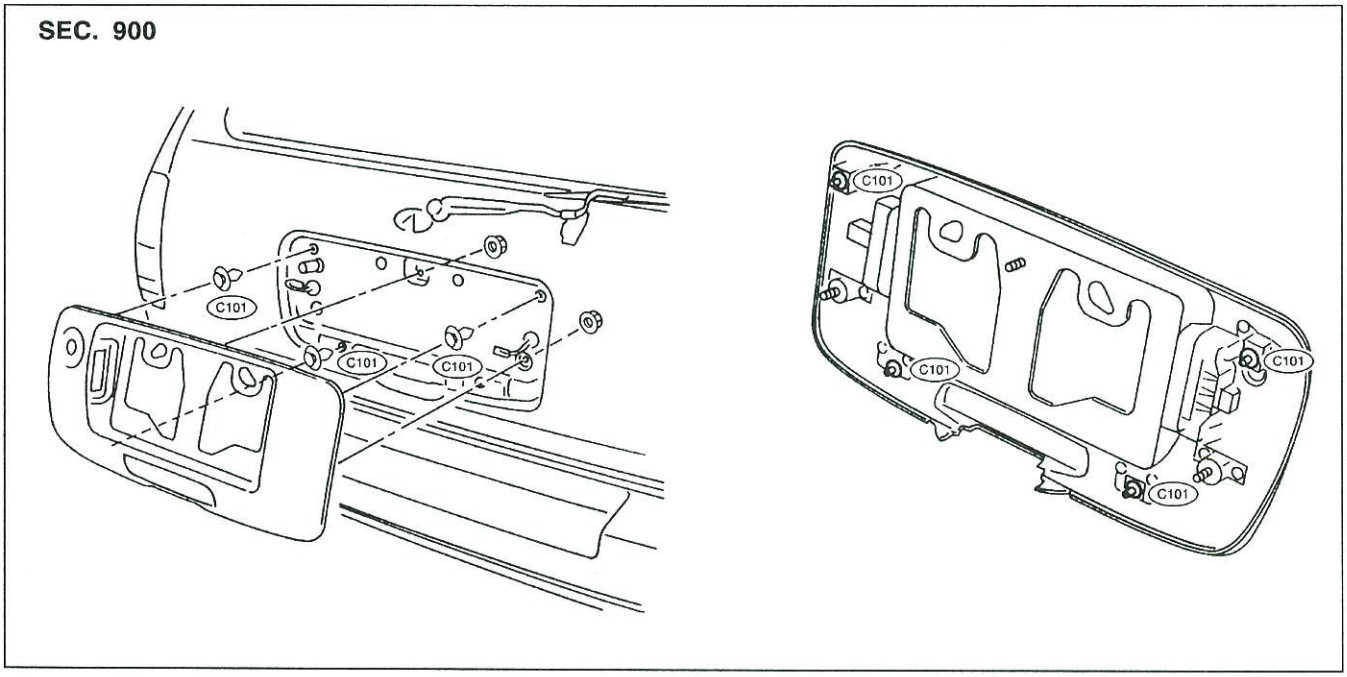
㉒ Over fender

SEC. 630•780



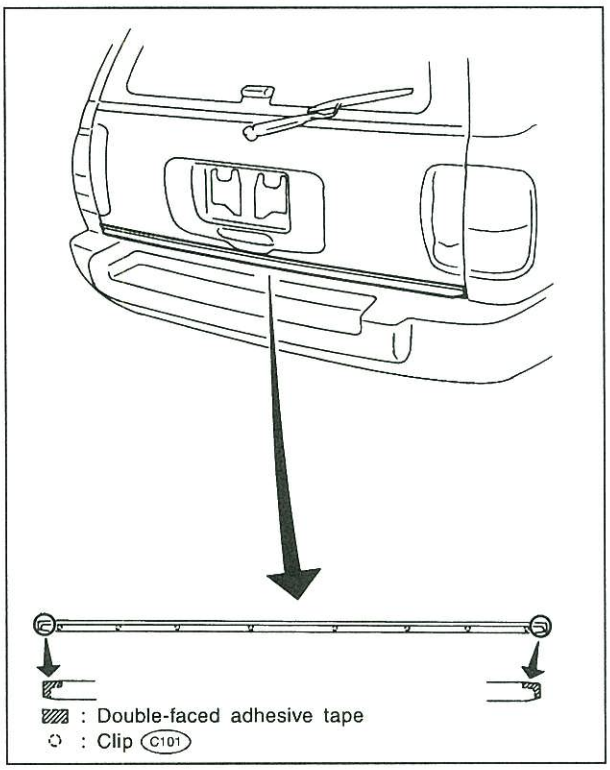
㉓ License plate finisher

SEC. 900



SBT497-A

㉔ Back door molding



- **With a vehicle coated with Hard Clear Coat, use double-faced 3M adhesive tape Product No. 4210 or equivalent, after priming with 3M primer Product No. N-200 or C-100 or equivalent.**

SBT498

Removal and Installation

NBBT0014

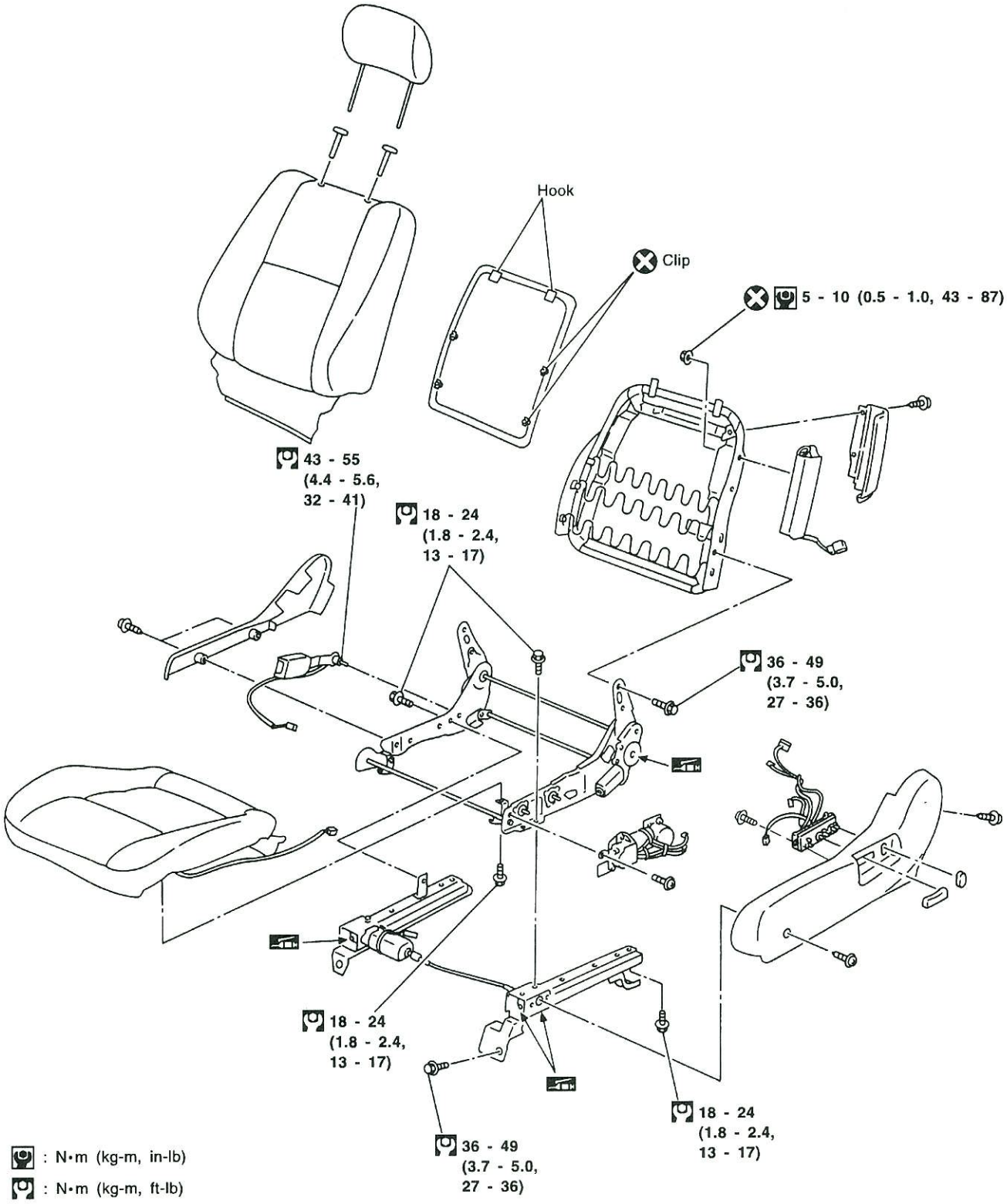
- When removing or installing the seat trim, carefully handle it to keep dirt out and avoid damage.

★ For Wiring Diagram, refer to "POWER SEAT" in EL section.

CAUTION:

- **Before removing the front seat, turn the ignition switch off, disconnect both battery cables and wait at least 3 minutes.**
- **When checking the power seat circuit for continuity using a circuit tester, do not confuse its connector with the side air bag module connector. Such an error may cause the air bag to deploy.**
- **Do not drop, tilt, or bump the side air bag module installed in the seat. Always handle it with care.**

SEC. 870



SBT711

Removal and Installation (Cont'd)

HEATED SEAT

=NBBT0014S03

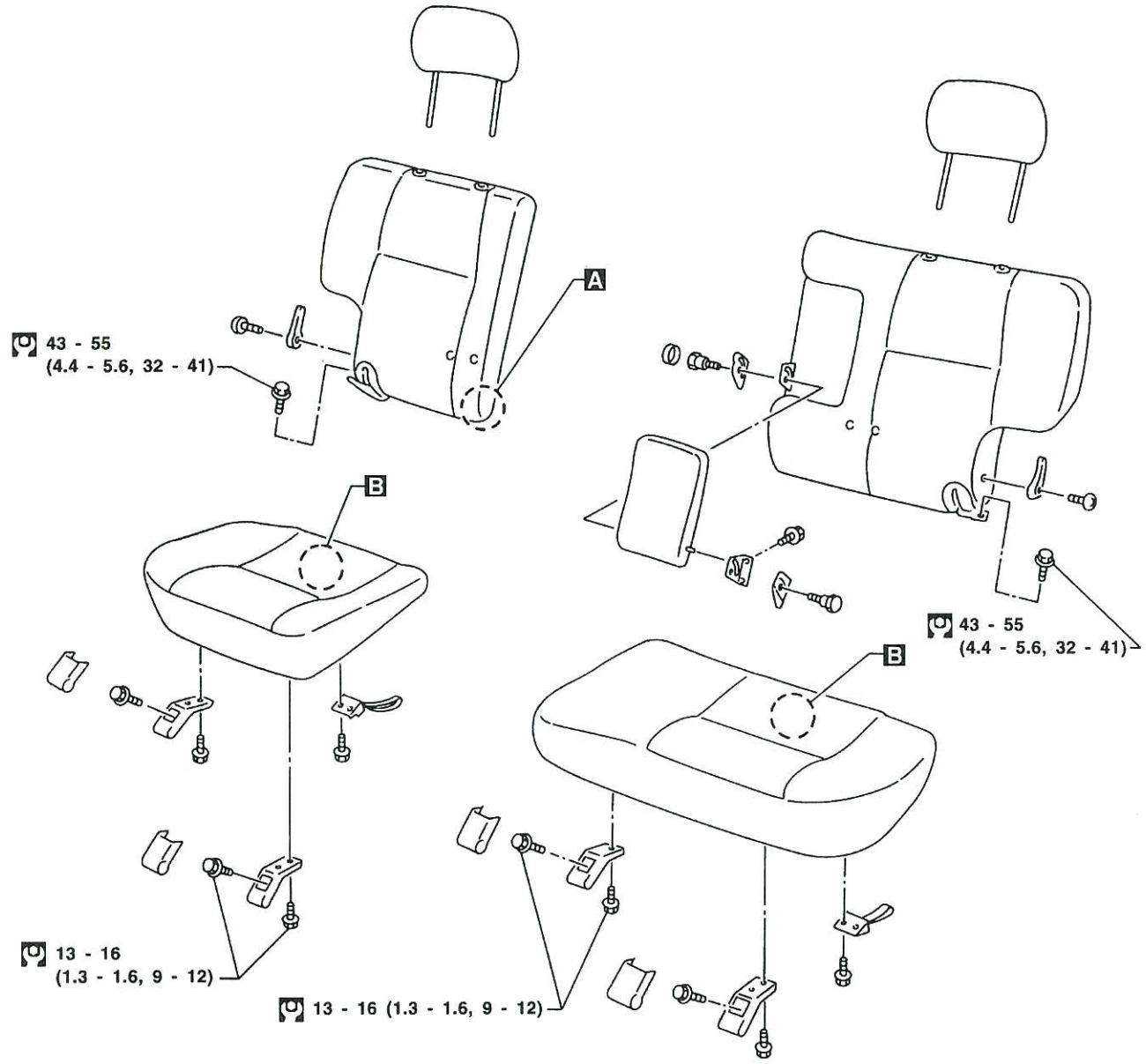
- When handling seat, be extremely careful not to scratch heating unit.
- To replace heating unit, seat trim and pad should be separated.
- Do not use any organic solvent, such as thinner, benzene, alcohol, gasoline, etc. to clean trims.

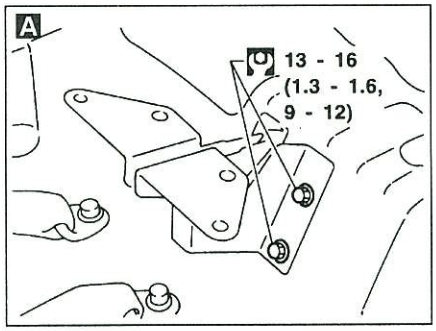
★ **For Wiring Diagram, refer to "HEATED SEAT" in EL section.**

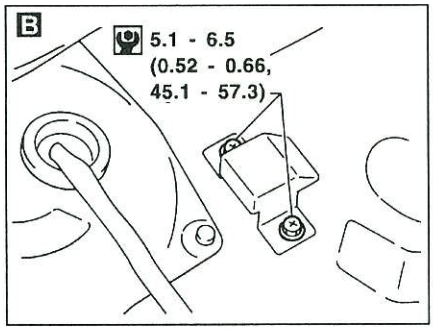
Removal and Installation

NBBT0015

SEC. 870







: N•m (kg-m, in-lb)
: N•m (kg-m, ft-lb)

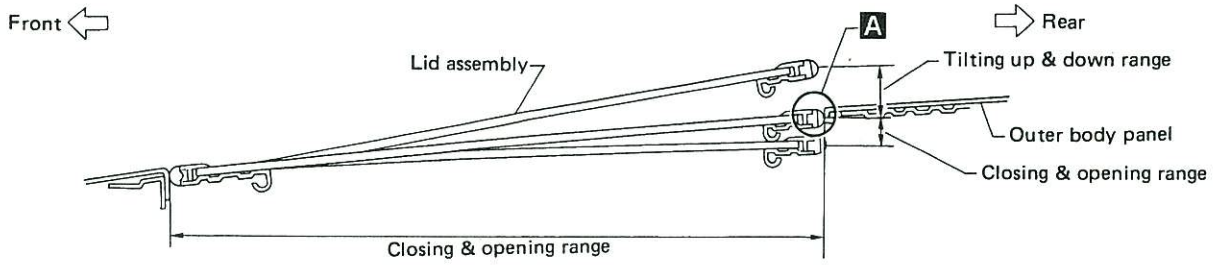
SBT190-A

Adjustment

NBBT0016

Install motor & limit SW assembly and sunroof rail assembly in the following sequence:

1. Arrange equal lengths of link and wire assemblies on both sides of sunroof opening.
2. Connect sunroof connector to sunroof switch and positive (+) power supply.
3. Set lid assembly to fully closed position A by operating OPEN switch and TILT switch.
4. Fit outer side of lid assembly to the surface of roof on body outer panel.
5. Remove motor, and keep OPEN switch pressed until motor pinion gear reaches the end of its rotating range.
6. Install motor.
7. Check that motor drive gear fits properly in wires.
8. Press TILT-UP switch to check lid assembly for normal tilting.
9. Check sunroof lid assembly for normal operations (tilt-up, tilt-down, open, and close).



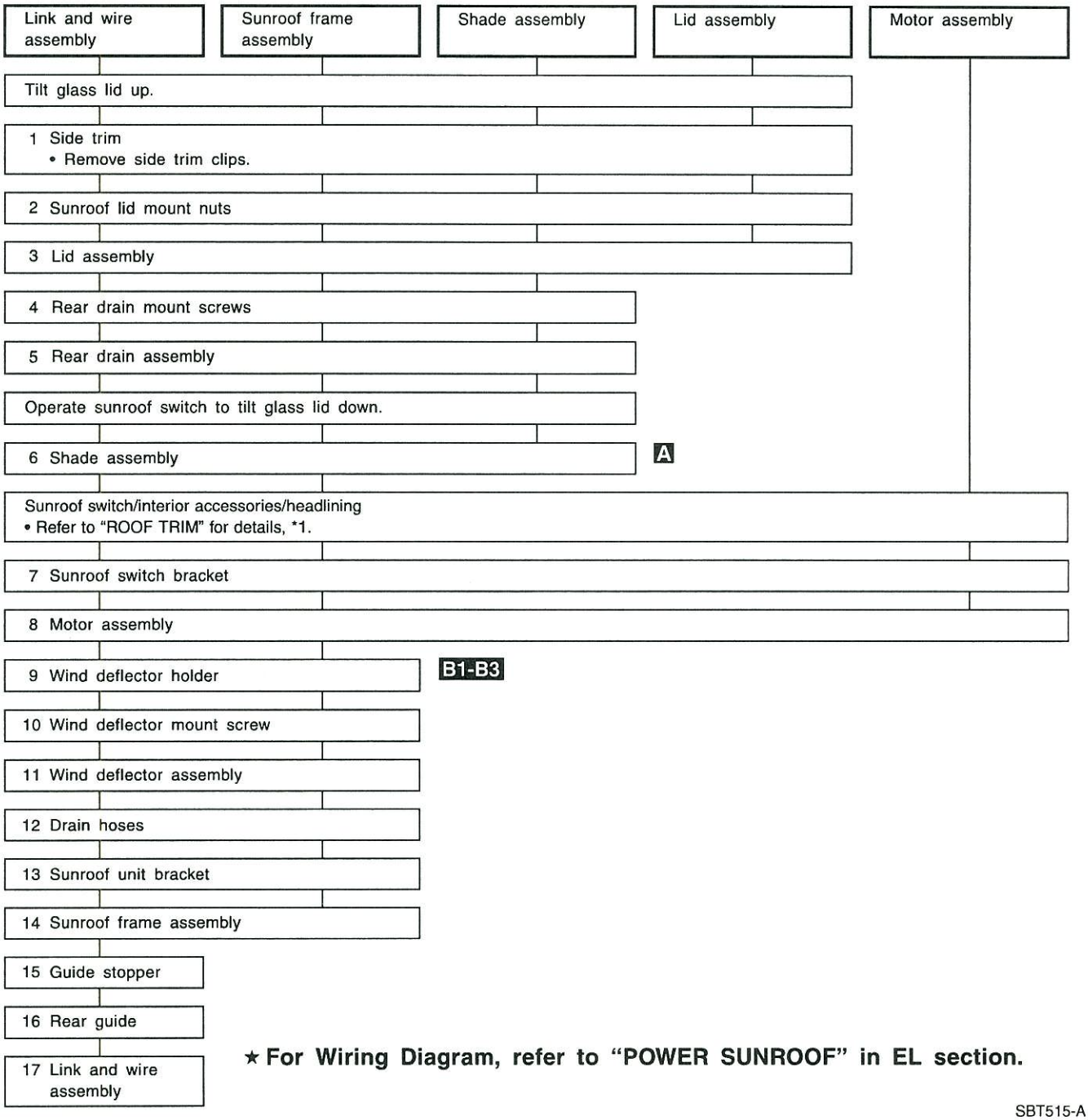
SBF920F

Removal and Installation

=NBBT0017

- After any adjustment, check sunroof operation and lid alignment.
- Handle finisher plate and glass lid with care so not to cause damage.
- It is desirable for easy installation to mark each point before removal.

CAUTION:
Always work with a helper.

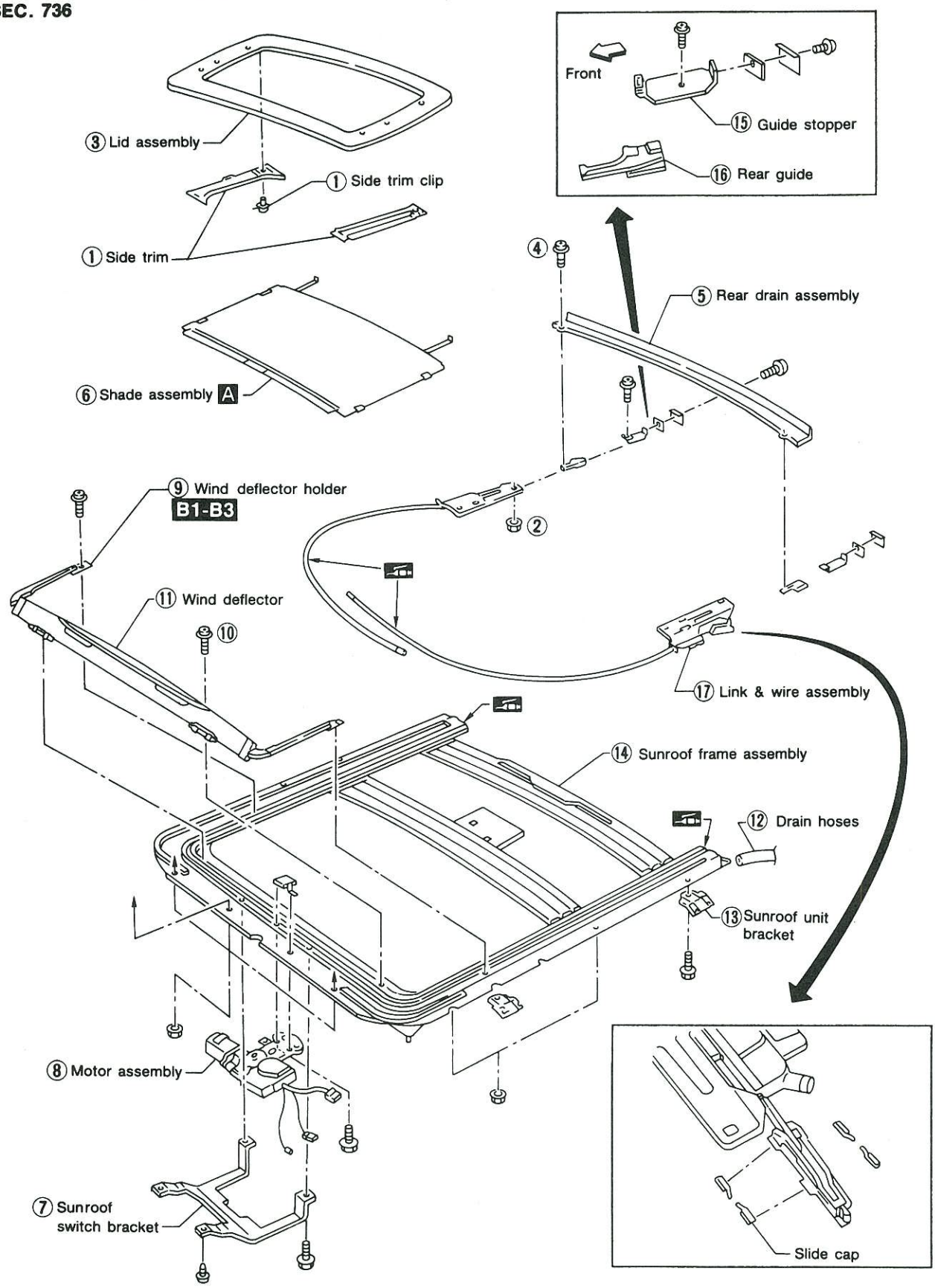


★ **For Wiring Diagram, refer to "POWER SUNROOF" in EL section.**

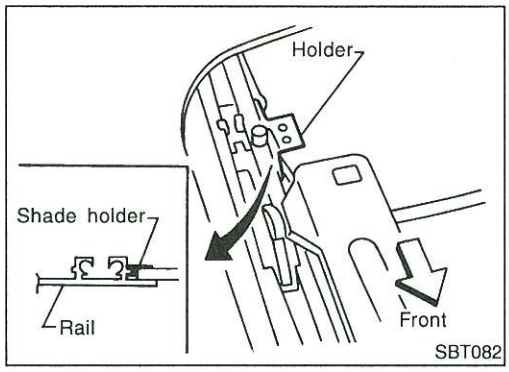
SBT515-A

*1 BT-21

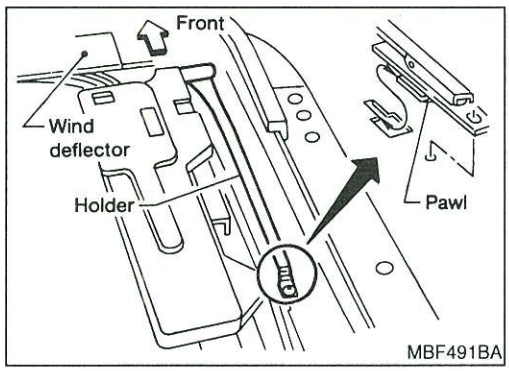
SEC. 736



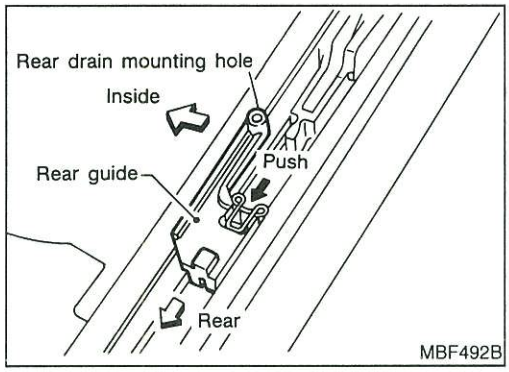
MBF462BG



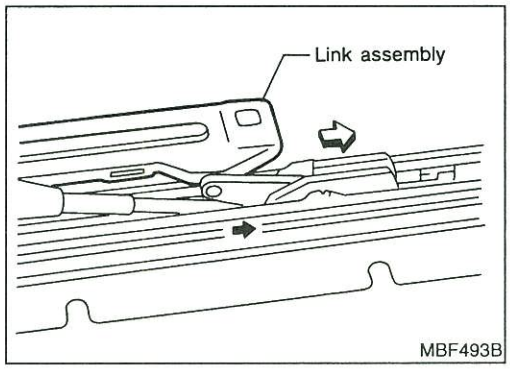
A Using flat-bladed screwdriver, pry shade assembly holder off rail. Then pull shade assembly forward to remove it from rail.



B1 Disengage pawls from rail, then remove wind deflector holder.



B2 Using flat-bladed screwdriver, pry stopper spring off rail groove. Then slide rear guide backward to remove it from rail.



B3 Remove wire and link assembly from rail while pushing link back with flat-bladed screwdriver.

Trouble Diagnoses

=NBBT0018

DIAGNOSTIC TABLE

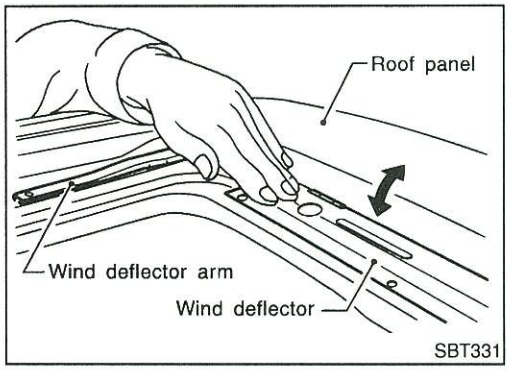
NBBT0018S01

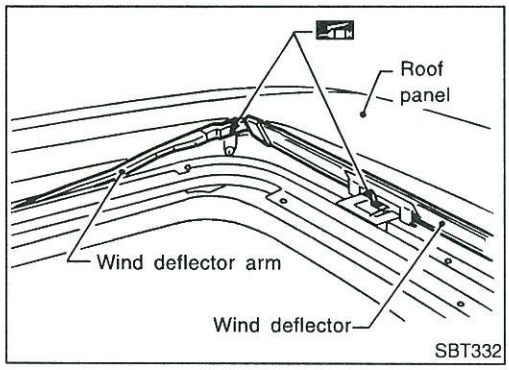
NOTE:

For diagnosing electric problem, refer to "POWER SUNROOF" in EL section.

		Check items (Components)				
		Wind deflector	Adjustment	Drain hoses	Weatherstrip	Link and wire assembly
	Reference page	BT-38	BT-39	BT-40	BT-40	BT-41
Symptom	Excessive wind noise	1	2		3	
	Water leaks		1	2	3	
	Sunroof rattles		1	4	2	3
	Excessive operation noise		1		2	3

The numbers in this table mean checking order.





WIND DEFLECTOR

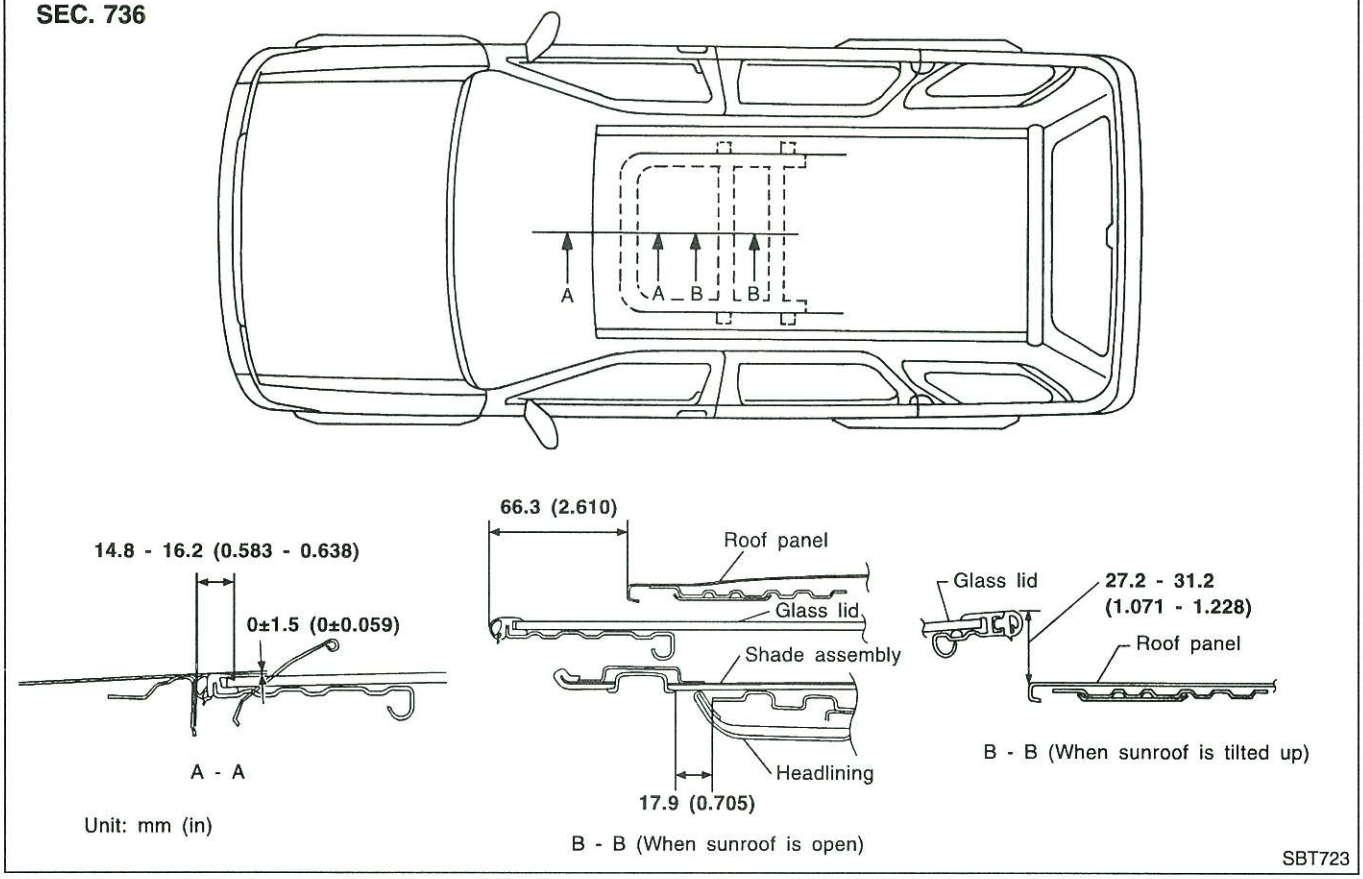
NBBT0018S02

1. Open lid.
2. Check visually for proper installation.
3. Check to ensure a proper amount of petroleum jelly has been applied to wind deflector connection points; apply if necessary.
4. Check that wind deflector is properly retracted by hand. If it is not, remove and visually check condition. (Refer to removal procedures, BT-35.) If wind deflector is damaged, replace with new one. If wind deflector is not damaged, re-install properly.

ADJUSTMENT

NBBT0018S03

SEC. 736



If any gap or height difference between glass lid and roof is found, check glass lid fit and adjust as follows:

Gap Adjustment

NBBT0018S0301

1. Open shade assembly.
2. Tilt glass lid up then remove side trim.
3. Loosen glass lid securing nuts (3 each on left and right sides), then tilt glass lid down.
4. Adjust glass lid from outside of vehicle so it resembles "A-A" as shown in the figure above.
5. Tilt glass lid up and down until it is adjusted to "B-B" as shown in the figure above.
6. After adjusting glass lid, tilt glass lid up and tighten nuts.
7. Tilt glass lid up and down several times to check that it moves smoothly.

Height Difference Adjustment

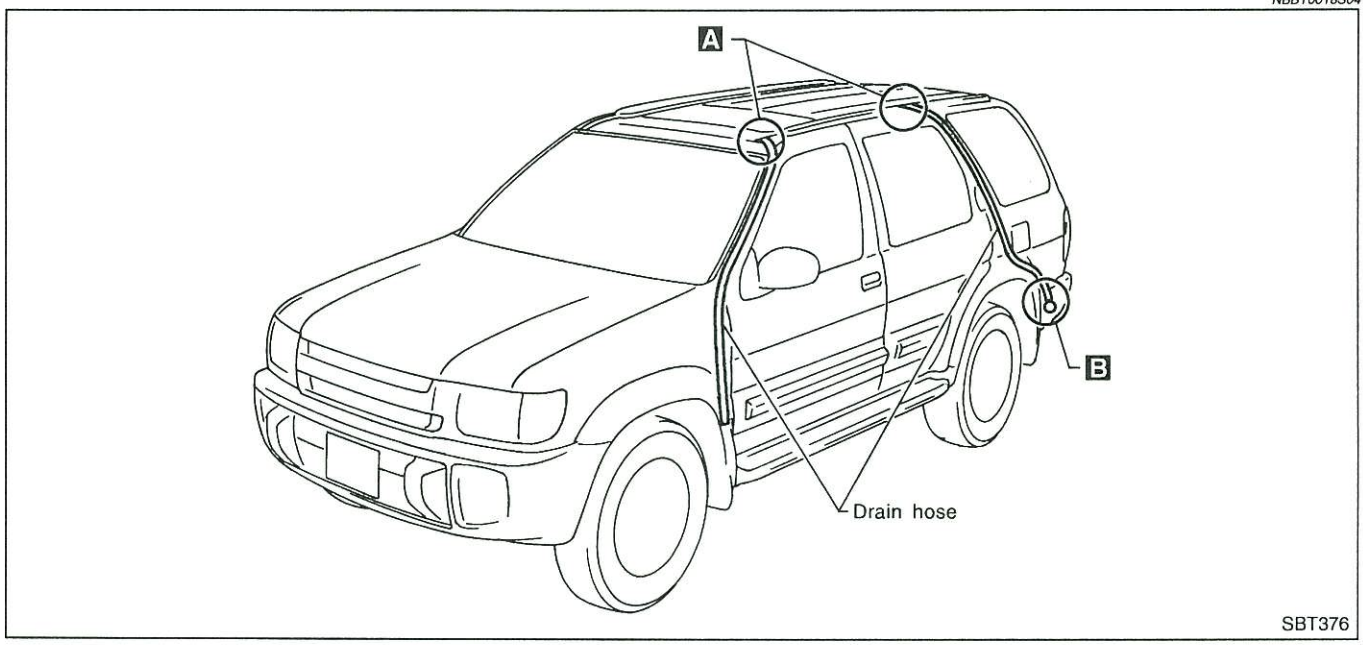
NBBT0018S0302

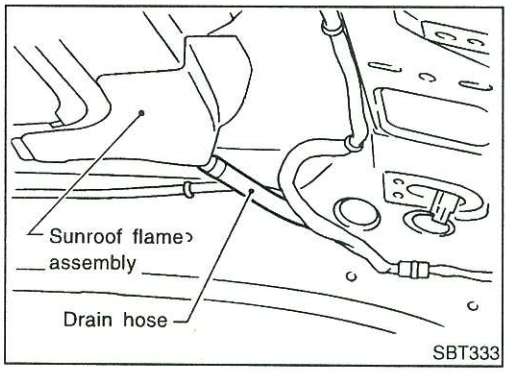
1. Tilt glass lid up and down.
2. Check height difference between roof panel and glass lid to see if it is as "A-A" as shown in the figure above.
3. If necessary, adjust it by using one of following procedures.

- Adjust by adding or removing adjustment shim(s) between glass lid and link assembly.
- If glass lid protrudes above roof panel, add shim(s) or plain washer(s) at sunroof mounting bracket or stud bolt locations to adjust sunroof installation as required.

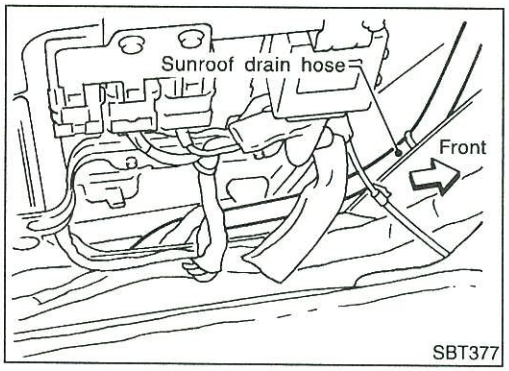
DRAIN HOSES

NBBT0018S04





1. Remove headlining to access drain hose connections. (Refer to "Removal and Installation" in "ROOF TRIM", BT-21, for detail.)
2. Check visually for proper connections, damage or deterioration. A (The figure shows only the front side.)



3. If leakage occurs around luggage room, remove luggage room side trim and check connecting area. Check for proper connection, damage or tear. B
4. Remove drain hoses and check visually for any damage, cracks, or deterioration.
5. Pour water into drain hoses and find damaged portion.

- If any damaged portion is found at each step, replace the damaged part.

WEATHERSTRIP

NBBT0018S05

- In the case of leakage around glass lid, close glass lid and pour water over glass lid to find damaged or gap portion.

1. Remove glass lid assembly. (Refer to removal procedures, BT-35, for details.)
2. Visually check weatherstrip for proper installation. If a gap exists between glass lid and weatherstrip, check for sufficient amount of butyl seal. If required, remove weatherstrip and apply butyl seal.
   Refer to "EXTERIOR" (BT-23), for details.

3. Check weatherstrip visually for any damage, deterioration, or flattening.

- If any damage is found, replace weatherstrip.

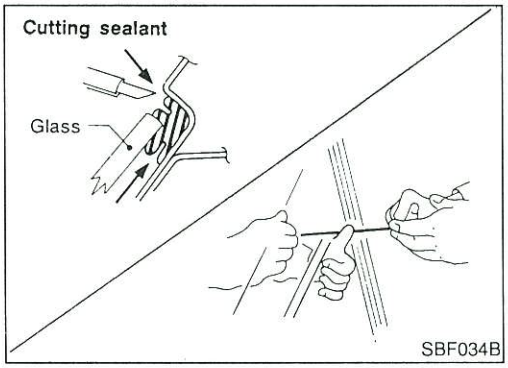
CAUTION:
Do not remove weatherstrip except when replacing, or filling up butyl seal.

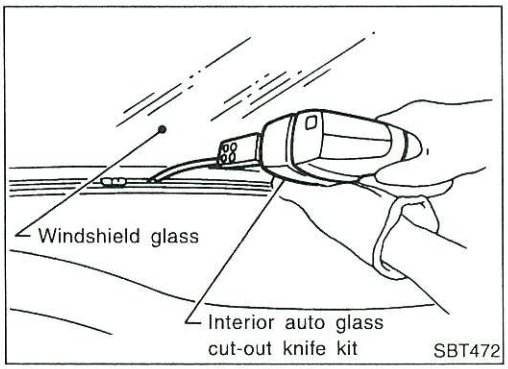
LINK AND WIRE ASSEMBLY

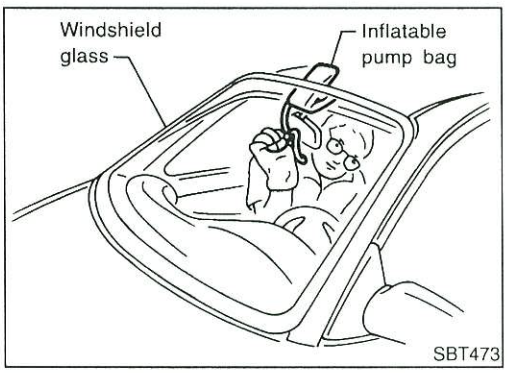
NBBT0018S06

NOTE:
Before replacing a suspect part, carefully ensure it is the source of noise being experienced.

1. Check link to determine if coating film has peeled off to such an extent that substrate is visible. Check also to determine if link is the source of noise. If it is, replace it.
2. Visually check to determine if a sufficient amount of petroleum jelly has been applied to wire or rail groove. If not, add petroleum jelly as required.
3. Check wire for any damage or deterioration. If any damage is found, remove rear guide (refer to removal procedures, BT-35 for details), then replace wire.







Removal and Installation

NBBT0019

REMOVAL

NBBT0019S01

After removing moldings, remove glass using piano wire or power cutting tool and an inflatable pump bag.

WARNING:

When cutting the glass from the vehicle, always wear safety glasses and heavy gloves to help prevent glass splinters from entering your eyes or cutting your hands.

CAUTION:

- **Be careful not to scratch the glass when removing.**
- **Do not set or stand the glass on its edge. Small chips may develop into cracks.**

INSTALLATION

NBBT0019S02

- **Use a genuine Nissan Urethane Adhesive Kit or equivalent and follow the instructions furnished with it.**
- **While the urethane adhesive is curing, open a door window. This will prevent the glass from being forced out by passenger compartment air pressure when a door is closed.**
- **The molding must be installed securely so that it is in position and leaves no gap.**
- **Inform the customer that the vehicle should remain stationary until the urethane adhesive has completely cured (preferably 24 hours). Curing time varies with temperature and humidity.**

WARNING:

- **Keep heat and open flames away as primers and adhesive are flammable.**
- **The materials contained in the kit are harmful if swallowed, and may irritate skin and eyes. Avoid contact with the skin and eyes.**
- **Use in an open, well ventilated location. Avoid breathing the vapors. They can be harmful if inhaled. If affected by vapor inhalation, immediately move to an area with fresh air.**
- **Driving the vehicle before the urethane adhesive has completely cured may affect the performance of the windshield in case of an accident.**

CAUTION:

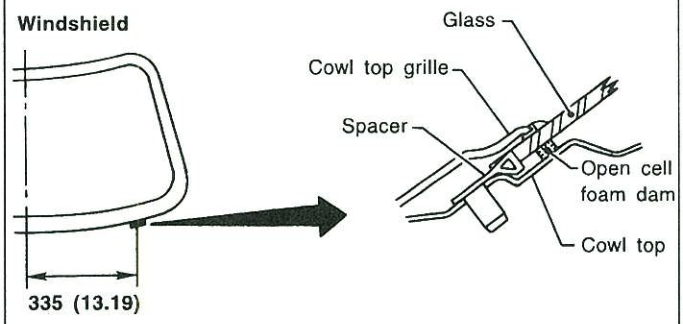
- **Do not use an adhesive which is past its usable term. Shelf life of this product is limited to six months after the date of manufacture. Carefully adhere to the expiration or manufacture date printed on the box.**
- **Keep primers and adhesive in a cool, dry place. Ideally, they should be stored in a refrigerator.**
- **Do not leave primers or adhesive cartridge unattended with their caps open or off.**
- **The vehicle should not be driven for at least 24 hours or until the urethane adhesive has completely cured. Curing time varies depending on temperature and humidities. The curing time will increase under higher temperatures and lower humidities.**

WINDSHIELD

NBBT0019S03

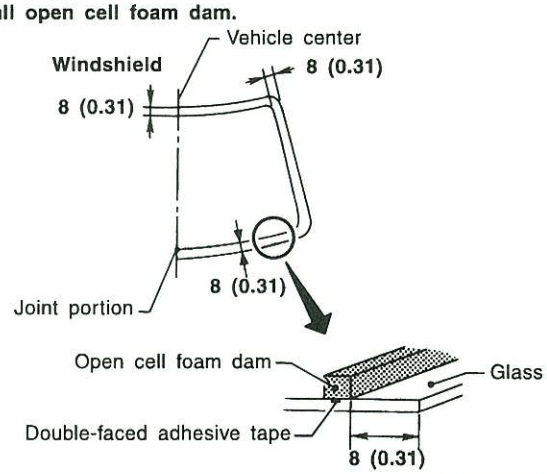
Body side

Install spacer to panel.



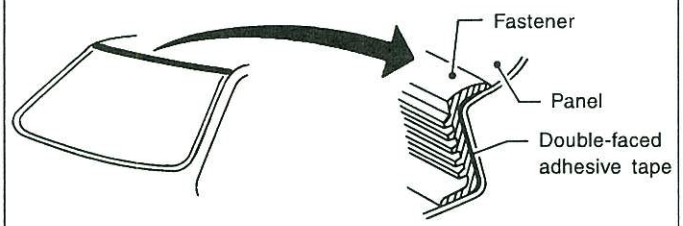
Glass side

Install open cell foam dam.



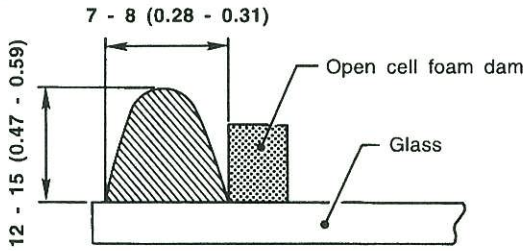
Install molding fastener.

When installing it, heat body panel and fastener to approx. 30 to 40°C (86 to 104°F).



Apply urethane adhesive evenly.

Windshield



Unit: mm (in)

SBT191-A

Repairing Water Leaks for Windshield

NBBT0019S0301

Leaks can be repaired without removing and reinstalling glass.

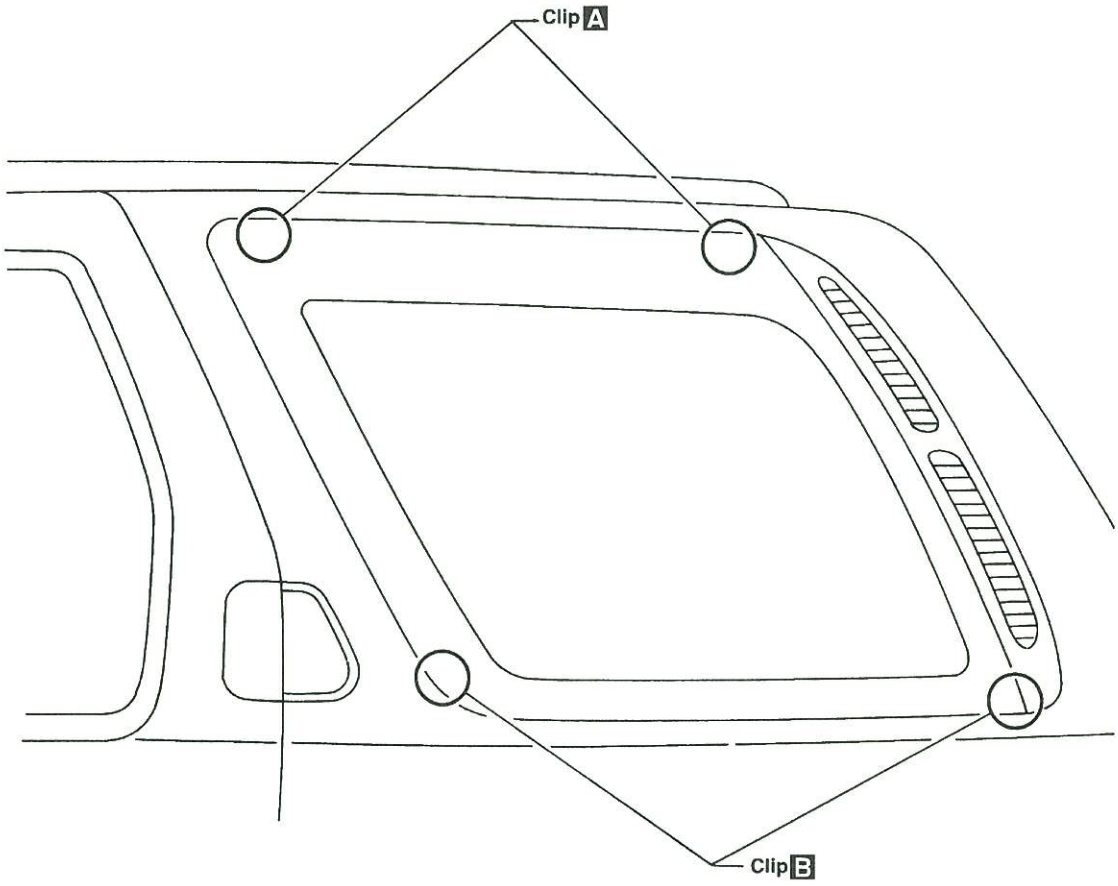
If water is leaking between the urethane adhesive material and body or glass, determine the extent of leakage. This can be done by applying water to the windshield area while pushing glass outward.

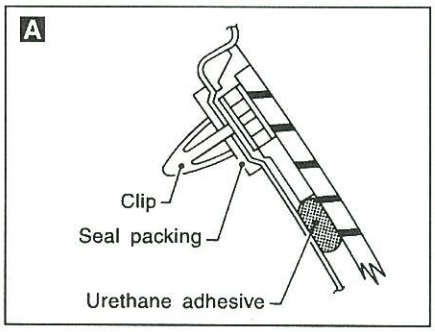
To stop the leak, apply primer (if necessary) and then urethane adhesive to the leak point.

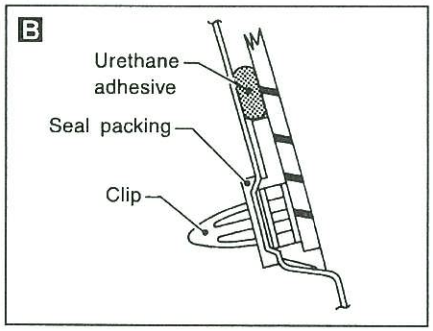
REAR SIDE WINDOW

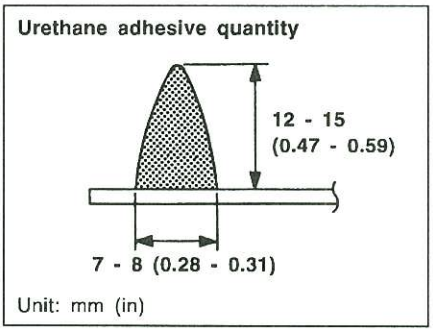
NBBT0019S04

SEC. 830









SBT359-A

Removal and Installation

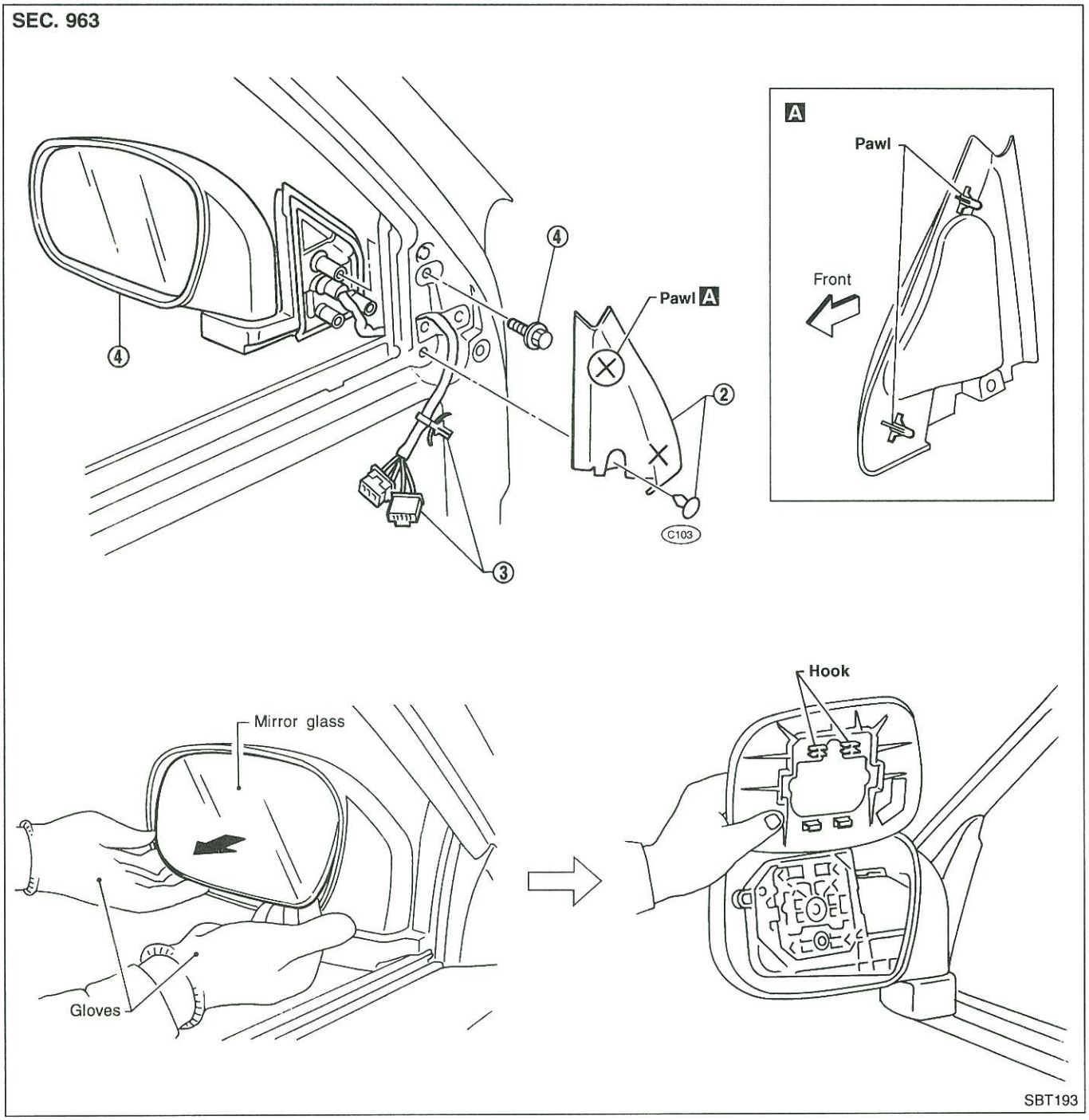
NBBT0020

CAUTION:
Be careful not to scratch door rearview mirror body.

★ For Wiring Diagram, refer to "POWER DOOR MIRROR" in EL section.

1. Remove door trim. Refer to "DOOR TRIM" for details, BT-19.
2. Remove clip securing inner cover from front corner of door.
3. Disconnect door mirror harness connector and clip.
4. Remove bolts securing door mirror, then remove door mirror assembly.

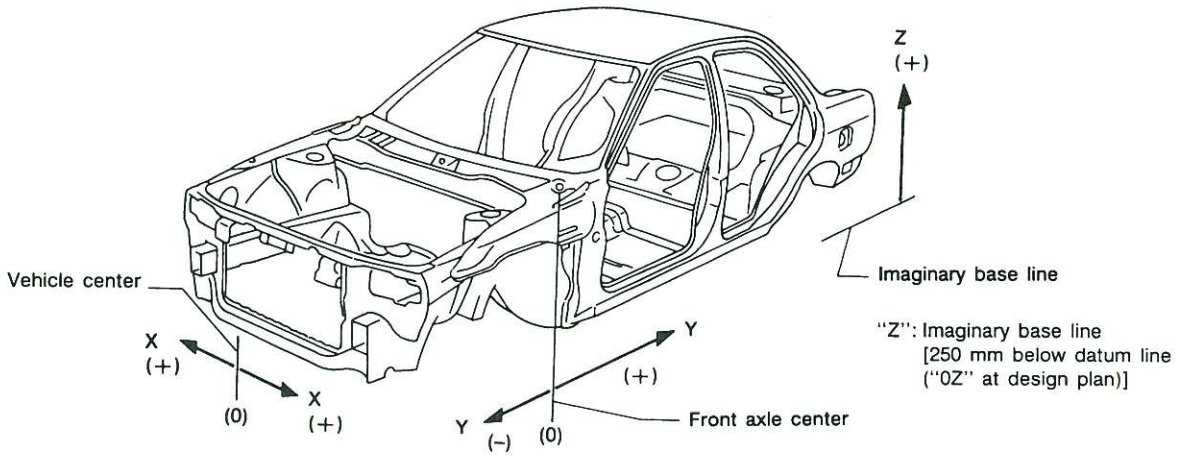
SEC. 963



Alignment

NBBT0021

- All dimensions indicated in figures are actual ones.
- When using a tracking gauge, adjust both pointers to equal length. Then check the pointers and gauge itself to make sure there is no free play.
- When a measuring tape is used, check to be sure there is no elongation, twisting or bending.
- Measurements should be taken at the center of the mounting holes.
- An asterisk (★) following the value at the measuring point indicates that the measuring point on the other side is symmetrically the same value.
- The coordinates of the measurement points are the distances measured from the standard line of "X", "Y" and "Z".



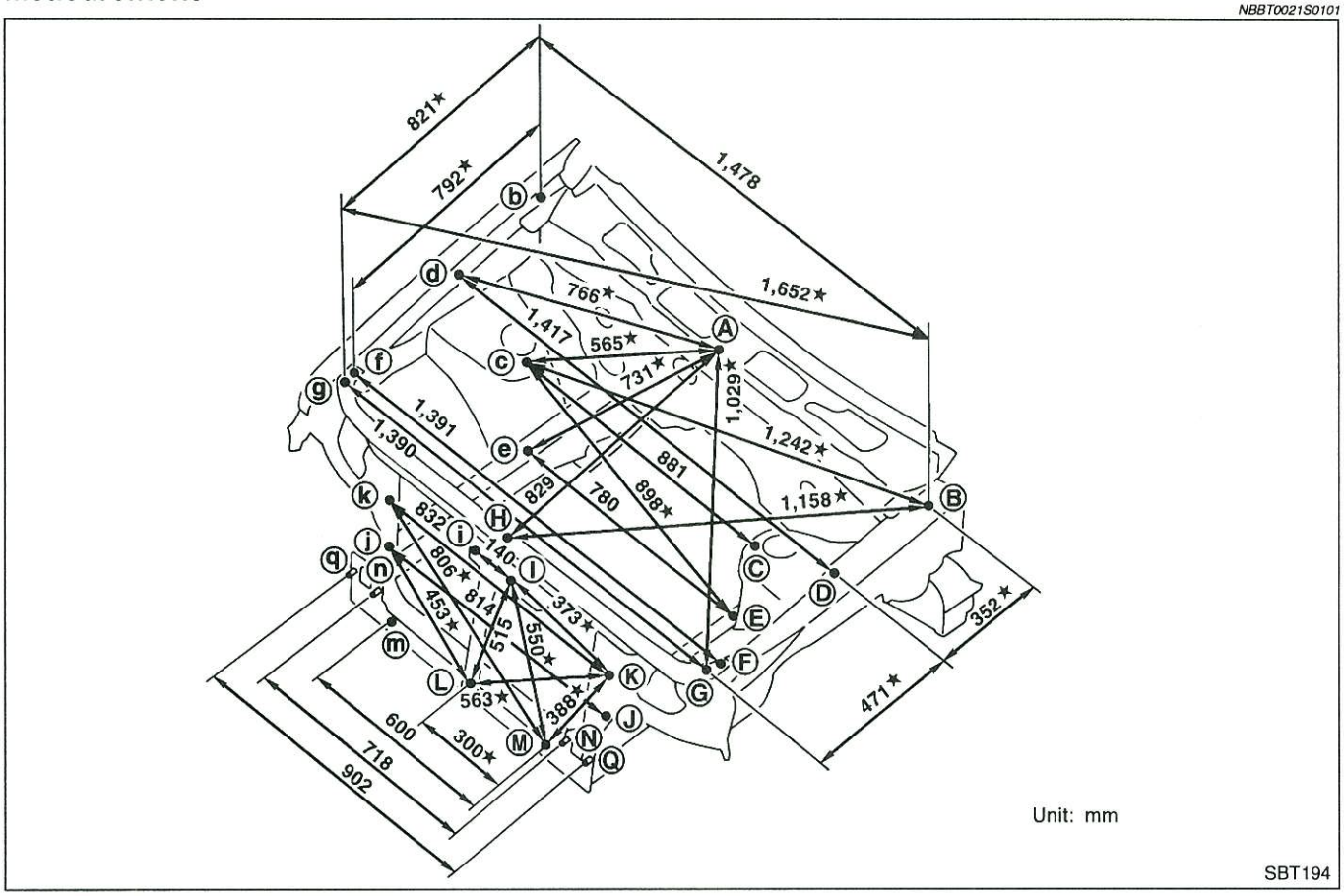
SBF874GD

ENGINE COMPARTMENT

Measurement

NBBT0021S01

NBBT0021S0101

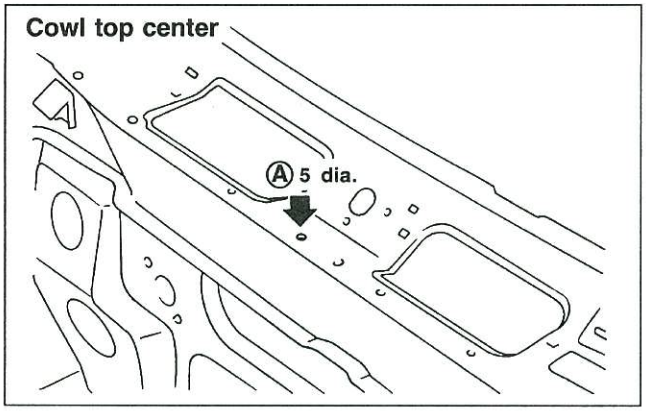


Measurement Points

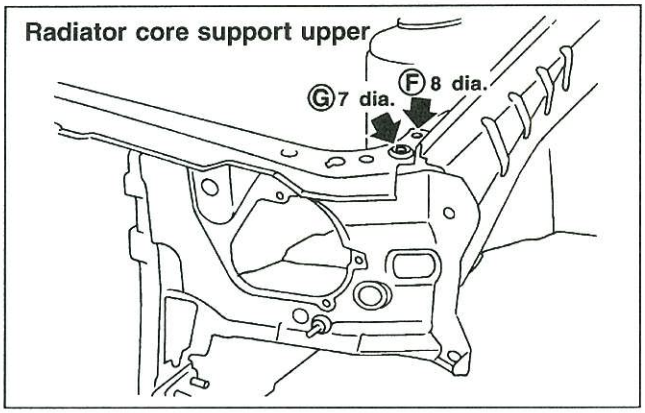
NBBT0021S0102

Unit: mm

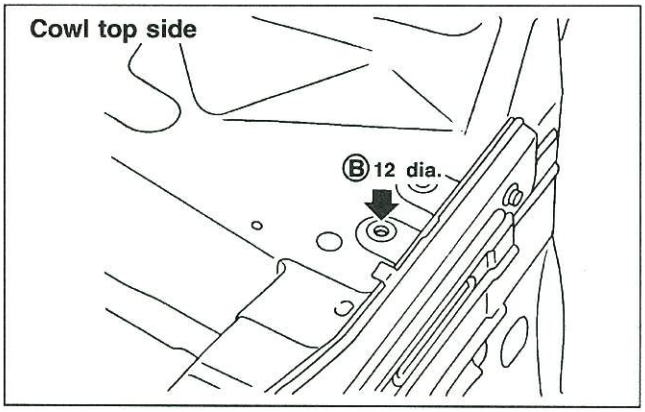
Cowl top center



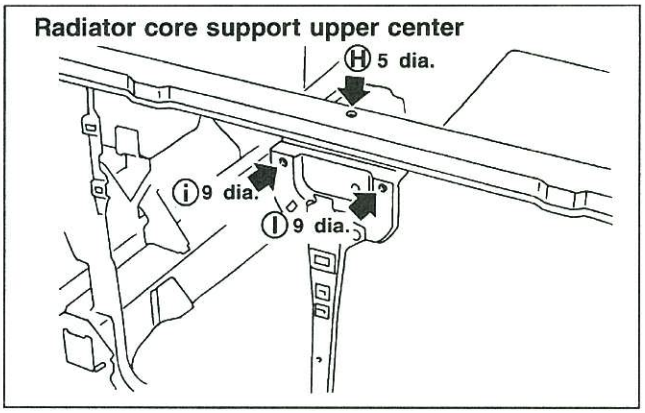
Radiator core support upper



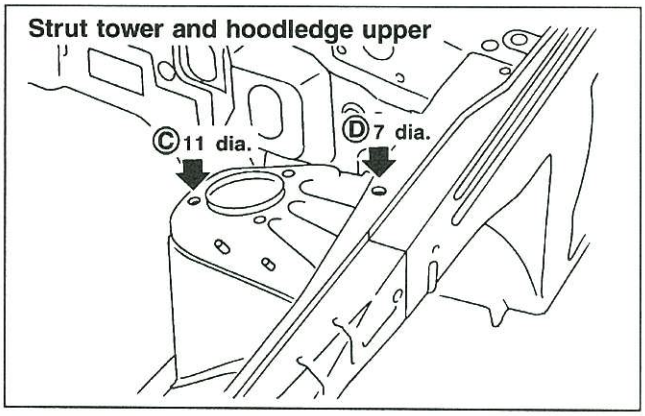
Cowl top side



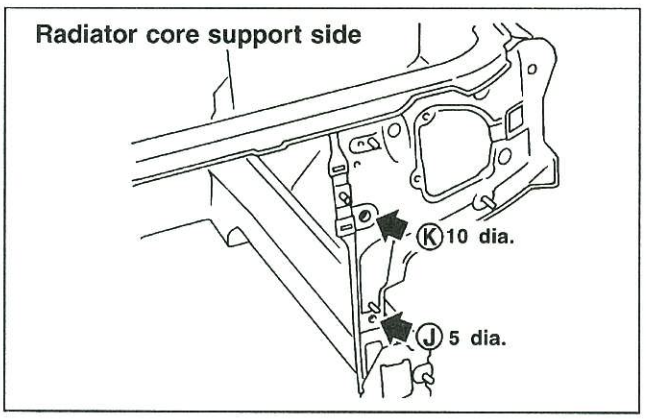
Radiator core support upper center



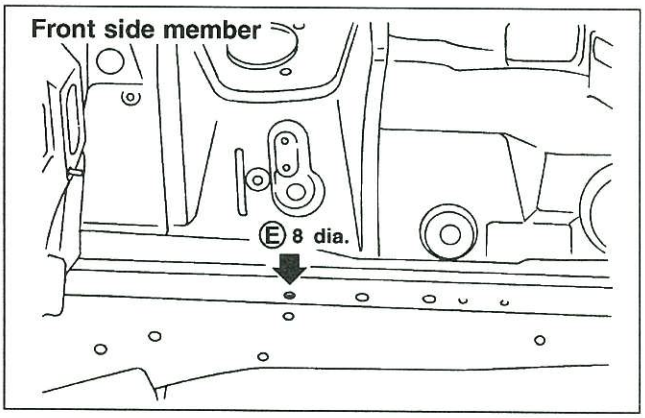
Strut tower and hoodledge upper



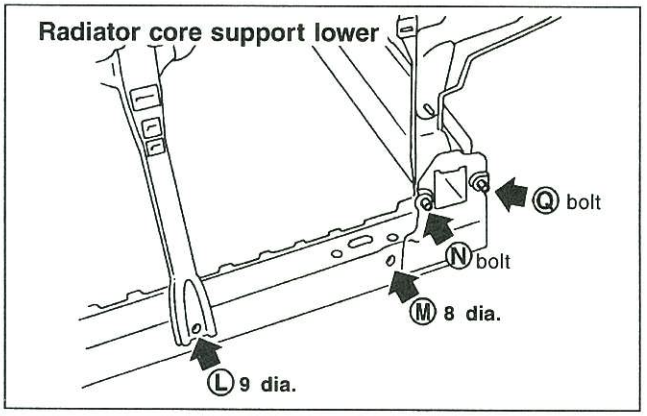
Radiator core support side



Front side member



Radiator core support lower

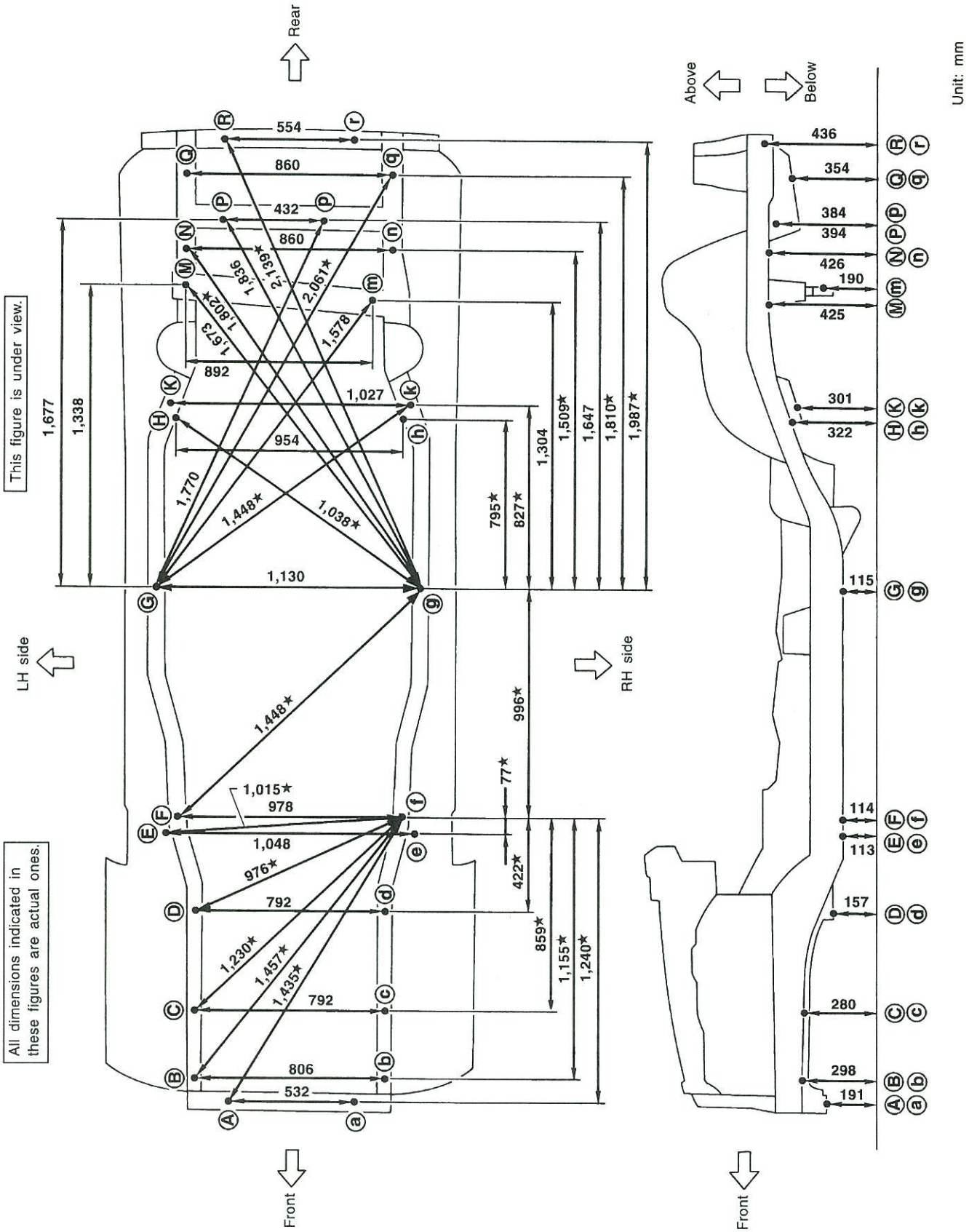


SBT195

UNDERBODY
Measurement

NBBT0021S02

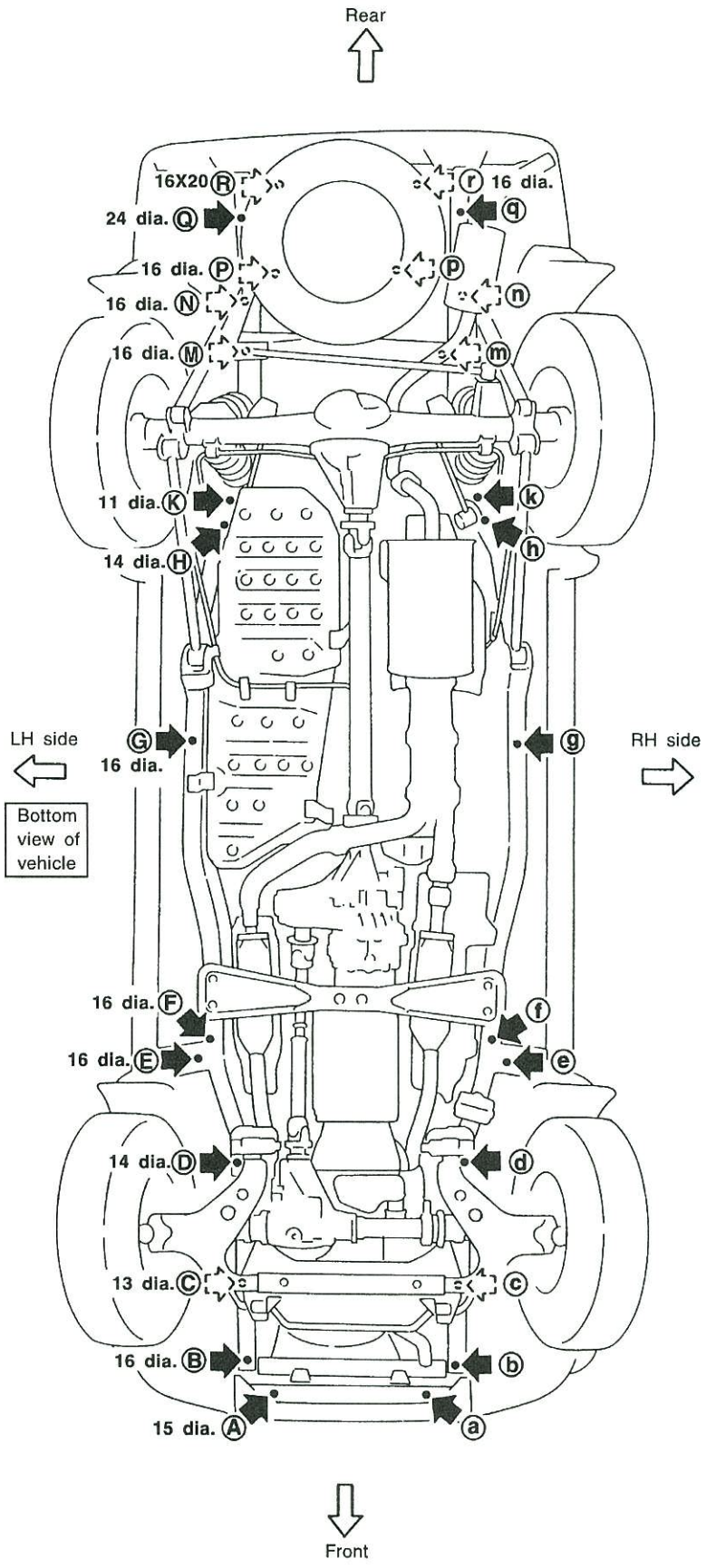
NBBT0021S0201



SBT360

Measurement Points

NBBT0021S0202

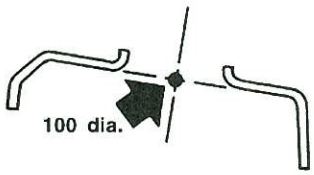


Front coordinates:	Rear coordinates:	
Ⓐ , ⓐ X: 266 Y: –580.4 Z: 191.4	Ⓖ , ⓖ X: 565 Y: 1,630 Z: 115	Ⓟ X: 142 Y: 3,230 Z: 383.6
Ⓑ , ⓑ X: 403 Y: –500 Z: 297.7	Ⓗ , ⓗ X: 476.9 Y: 2,392.6 Z: 321.9	Ⓠ , ⓠ X: 430 Y: 3,419.3 Z: 353.6
Ⓒ , ⓒ X: 396 Y: –201 Z: 279.7	Ⓚ , ⓚ X: 513.3 Y: 2,434.5 Z: 301.4	Ⓡ , ⓡ X: 277 Y: 3,570 Z: 435.6
Ⓓ , ⓓ X: 396 Y: 228 Z: 156.7	Ⓜ X: 446.1 Y: 2,960.2 Z: 190	
Ⓔ , ⓔ X: 524 Y: 568 Z: 112.7	ⓜ X: 350 Y: 2,878 Z: 424.8	
Ⓕ , ⓕ X: 489 Y: 637 Z: 114.1	Ⓝ , ⓝ X: 430 Y: 3,100 Z: 426.2	
	Ⓟ X: 290 Y: 3,230 Z: 394.1	

Unit: mm

Front strut tower center coordinates:

Ⓢ , ⓢ
X: 499.9
Y: 41.2
Z: 748.9



SBT361

HEATER & AIR CONDITIONER

SECTION HA

CONTENTS

PRECAUTIONS 2
- Supplemental Restraint System (SRS) "AIR BAG" and "SEAT BELT PRE-TENSIONER" 2
- Precautions for Working with HFC-134a (R-134a) 2
- General Refrigerant Precautions 3
- Precautions for Refrigerant Connection 3
- Precautions for Servicing Compressor 6
- Precautions for Service Equipment 6
- Wiring Diagrams and Trouble Diagnosis 8

PREPARATION 9
- Special Service Tools 9
- HFC-134a (R-134a) Service Tools and Equipment 10

DESCRIPTION 13
- Refrigeration System 13
- V-6 Variable Displacement Compressor 14
- Component Layout 20
- Introduction 21
- Features 21
- Overview of Control System 24
- Control Operation 24
- Discharge Air Flow 26
- System Description 27

TROUBLE DIAGNOSES 28
- Component Location 28
- Circuit Diagram 30
- Wiring Diagram — A/C, A — 31
- Auto Amp. Terminals and Reference Value 35
- Self-diagnosis 37
- How to Perform Trouble Diagnoses for Quick and Accurate Repair 43
- Operational Check 44
- A/C System 47
- Mode Door Motor 49
- Air Mix Door Motor 54
- Intake Door Motor 58
- Blower Motor 63
- Magnet Clutch 69
- Insufficient Cooling 74
- Insufficient Heating 82
- Noise 83
- Self-diagnosis 84
- Memory Function 85
- ECON (ECONOMY) Mode 86
- Ambient Sensor Circuit 86
- In-vehicle Sensor Circuit 89
- Sunload Sensor Circuit 91
- Intake Sensor Circuit 94
- Air Mix Door Motor PBR Circuit 96

SERVICE PROCEDURE 97
- HFC-134a (R-134a) Service Procedure 97
- Maintenance of Lubricant Quantity in Compressor 99
- Compressor 101
- Compressor Clutch 102
- Refrigerant Lines 106
- Belt 110
- Fast Idle Control Device (FICD) 110
- Ventilation Air Filter 110

SERVICE DATA AND SPECIFICATIONS (SDS) 111
- Compressor 111
- Lubricant 111
- Refrigerant 111
- Engine Idling Speed (When A/C is ON) 111
- Belt Tension 111

Supplemental Restraint System (SRS) "AIR BAG" and "SEAT BELT PRE-TENSIONER"

NBHA0001

The Supplemental Restraint System such as "AIR BAG" and "SEAT BELT PRE-TENSIONER" used along with a seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. The SRS system composition which is available to INFINITI QX4 is as follows:

- For a frontal collision
  The Supplemental Restraint System consists of driver air bag module (located in the center of the steering wheel), front passenger air bag module (located on the instrument panel on passenger side), seat belt pre-tensioners, a diagnosis sensor unit, warning lamp, wiring harness and spiral cable.
- For a side collision
  The Supplemental Restraint System consists of front side air bag module (located in the outer side of front seat), satellite sensor, diagnosis sensor unit (one of components of air bags for a frontal collision), wiring harness, warning lamp (one of components of air bags for a frontal collision).

Information necessary to service the system safely is included in the **RS section** of this Service Manual.

WARNING:

- **To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance must be performed by an authorized INFINITI dealer.**
- **Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the RS section.**
- **Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. Spiral cable and wiring harnesses (except "SEAT BELT PRE-TENSIONER") covered with yellow insulation either just before the harness connectors or for the complete harness are related to the SRS.**

Precautions for Working with HFC-134a (R-134a)

NBHA0002

WARNING:

- **CFC-12 (R-12) refrigerant and HFC-134a (R-134a) refrigerant are not compatible. If the refrigerants are mixed and compressor failure is likely to occur, refer to "CONTAMINATED REFRIGERANT" below. To determine the purity of HFC-134a (R-134a) in the vehicle and recovery tank, use Refrigerant Recovery/Recycling Recharging equipment (ACR4) (J-39500-INF) and Refrigerant Identifier.**
- **Use only specified lubricant for the HFC-134a (R-134a) A/C system and HFC-134a (R-134a) components. If lubricant other than that specified is used, compressor failure is likely to occur.**
- **The specified HFC-134a (R-134a) lubricant rapidly absorbs moisture from the atmosphere. The following handling precautions must be observed:**

a) **When removing refrigerant components from a vehicle, immediately cap (seal) the component to minimize the entry of moisture from the atmosphere.**

b) **When installing refrigerant components to a vehicle, do not remove the caps (unseal) until just before connecting the components. Connect all refrigerant loop components as quickly as possible to minimize the entry of moisture into system.**

c) **Only use the specified lubricant from a sealed container. Immediately reseal containers of lubricant. Without proper sealing, lubricant will become moisture saturated and should not be used.**

d) **Avoid breathing A/C refrigerant and lubricant vapor or mist. Exposure may irritate eyes, nose and throat. Remove R-134a from the A/C system, using certified service equipment meeting requirements of SAE J2210 (R-134a recycling equipment), or J2209 (R-134a recovery equipment). If accidental system discharge occurs, ventilate work area before resuming service. Additional health and safety information may be obtained from refrigerant and lubricant manufacturers.**

e) **Do not allow lubricant (Nissan A/C System Oil Type S) to come in contact with styrofoam parts. Damage may result.**

CONTAMINATED REFRIGERANT

NBHA0002S01

If a refrigerant other than pure R-134a is identified in a vehicle, your options are:

- Explain to the customer that environmental regulations prohibit the release of contaminated refrigerant into the atmosphere.

- Explain that recovery of the contaminated refrigerant could damage your service equipment and refrigerant supply.
- Suggest the customer return the vehicle to the location of previous service where the contamination may have occurred.
- If you choose to perform the repair, recover the refrigerant using only **dedicated equipment and containers. Do not recover contaminated refrigerant into your existing service equipment.** If your facility does not have dedicated recovery equipment, you may contact a local refrigerant product retailer for available service. This refrigerant must be disposed of in accordance with all federal and local regulations. In addition, replacement of all refrigerant system components on the vehicle is recommended.
- If the vehicle is within the warranty period, the air conditioner warranty is void. Please contact Nissan Customer Affairs for further assistance.

General Refrigerant Precautions

NBHA0003

WARNING:

- **Do not release refrigerant into the air. Use approved recovery/recycling equipment to capture the refrigerant every time an air conditioning system is discharged.**
- **Always wear eye and hand protection (goggles and gloves) when working with any refrigerant or air conditioning system.**
- **Do not store or heat refrigerant containers above 52°C (125°F).**
- **Do not heat a refrigerant container with an open flame; if container warming is required, place the bottom of the container in a warm pail of water.**
- **Do not intentionally drop, puncture, or incinerate refrigerant containers.**
- **Keep refrigerant away from open flames: poisonous gas will be produced if refrigerant burns.**
- **Refrigerant will displace oxygen, therefore be certain to work in well ventilated areas to prevent suffocation.**
- **Do not pressure test or leak test HFC-134a (R-134a) service equipment and/or vehicle air conditioning systems with compressed air during repair. Some mixtures of air and R-134a have been shown to be combustible at elevated pressures. These mixtures, if ignited, may cause injury or property damage. Additional health and safety information may be obtained from refrigerant manufacturers.**

Precautions for Refrigerant Connection

NBHA0004

A new type refrigerant connection has been introduced to all refrigerant lines except the following location.

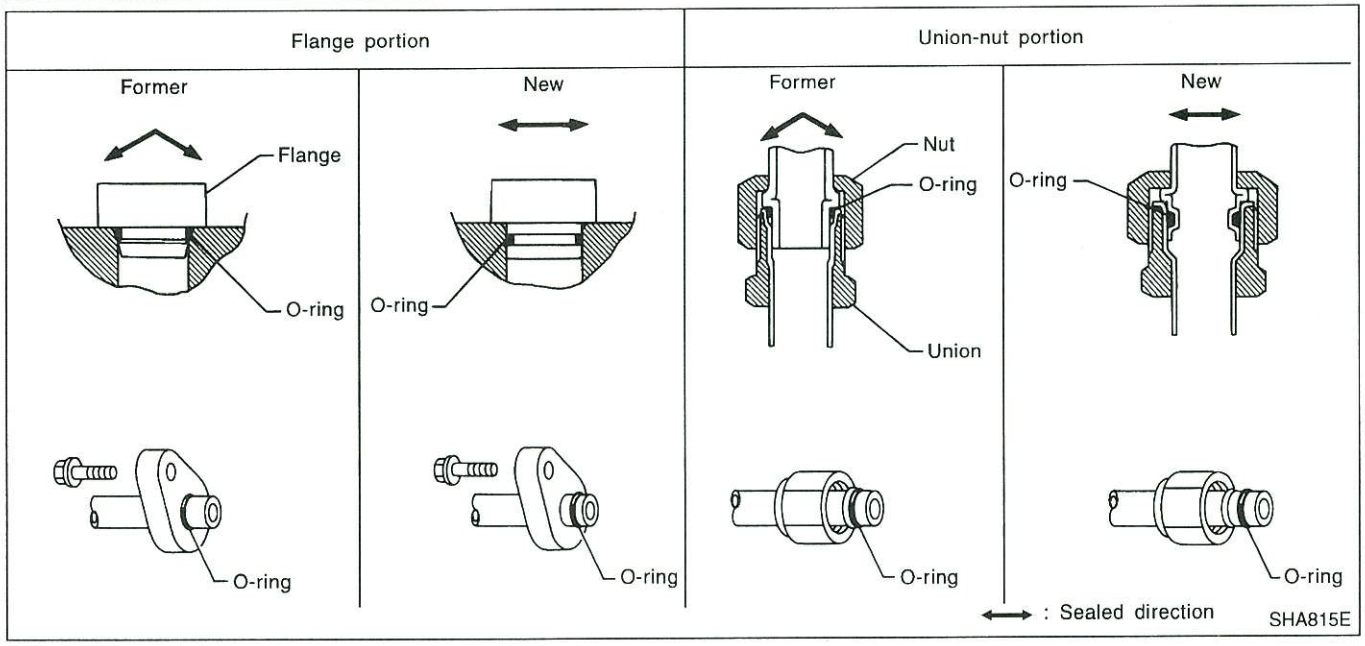
- Expansion valve to cooling unit

FEATURES OF NEW TYPE REFRIGERANT CONNECTION

NBHA0004S01

- The O-ring has been relocated. It has also been provided with a groove for proper installation. This eliminates the chance of the O-ring being caught in, or damaged by, the mating part. The sealing direction of the O-ring is now set vertically in relation to the contacting surface of the mating part to improve sealing characteristics.
- The reaction force of the O-ring will not occur in the direction that causes the joint to pull out, thereby facilitating piping connections.

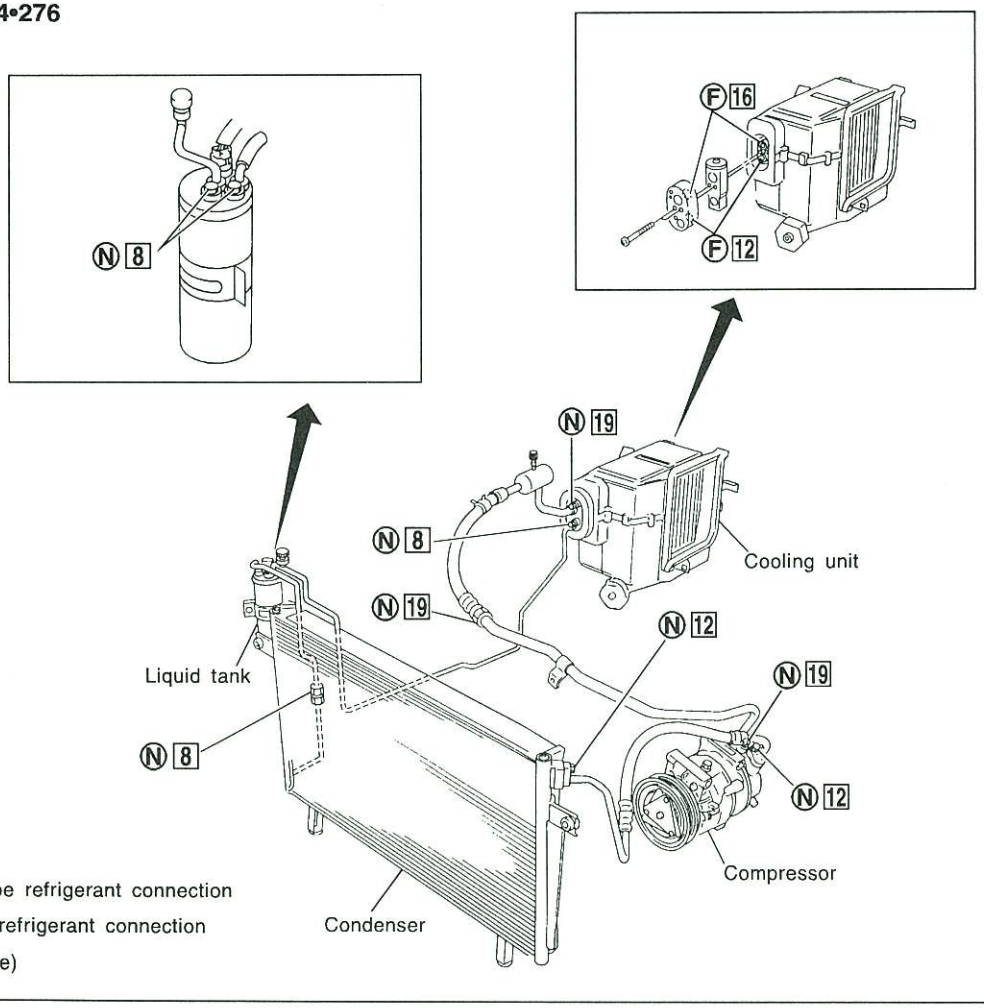
Precautions for Refrigerant Connection (Cont'd)



O-RING AND REFRIGERANT CONNECTION

NBHA0004S02

SEC. 271•274•276

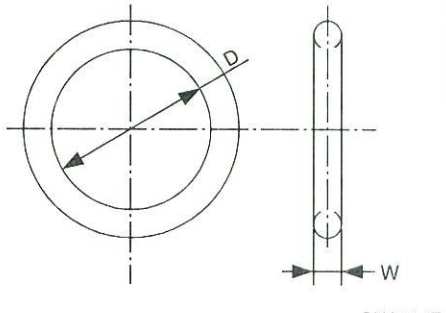


CAUTION:

The new and former refrigerant connections use different O-ring configurations. Do not confuse O-rings since they are not interchangeable. If a wrong O-ring is installed, refrigerant will leak at, or around, the connection.

O-Ring Part Numbers and Specifications

NBHA0004S0201



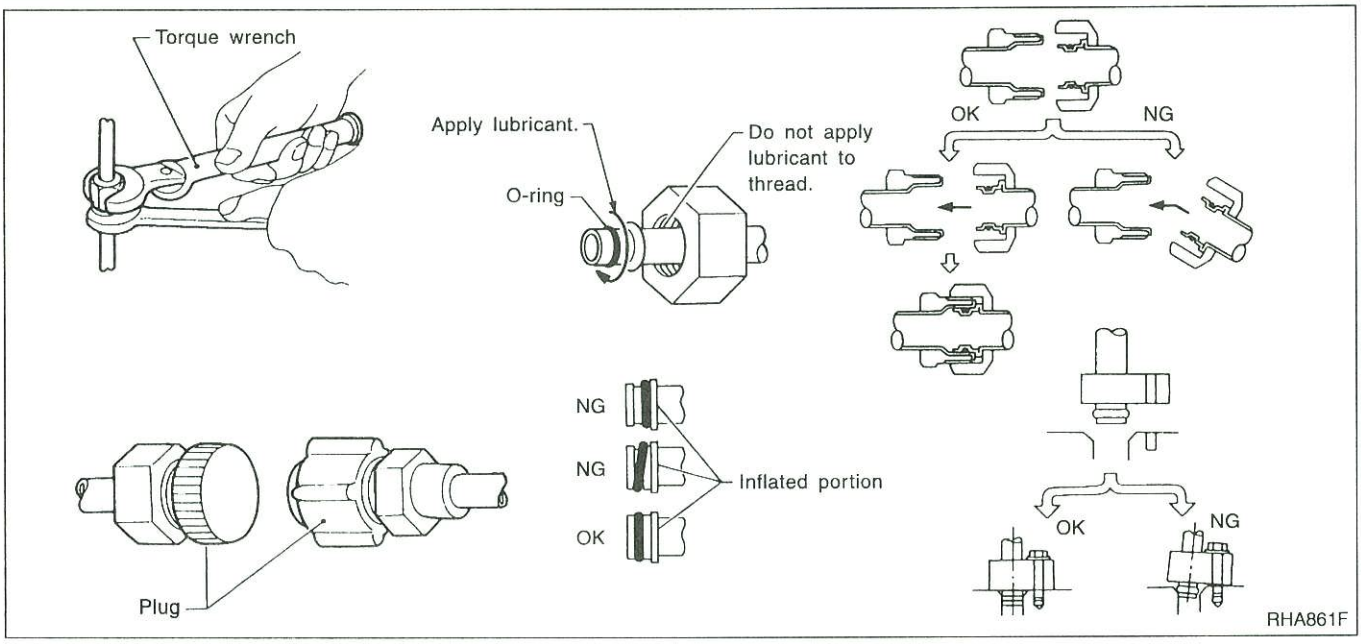
SHA814E

Connection type	O-ring size	Part number	D mm (in)	W mm (in)
New	8	92471 N8210	6.8 (0.268)	1.85 (0.0728)
Former		92470 N8200	6.07 (0.2390)	1.78 (0.0701)
New	12	92472 N8210	10.9 (0.429)	2.43 (0.0957)
Former		92475 71L00	11.0 (0.433)	2.4 (0.094)
New	16	92473 N8210	13.6 (0.535)	2.43 (0.0957)
Former		92475 72L00	14.3 (0.563)	2.3 (0.0906)
New	19	92474 N8210	16.5 (0.650)	2.43 (0.0957)
Former		92477 N8200	17.12 (0.6740)	1.78 (0.0701)

WARNING:
Make sure all refrigerant is discharged into the recycling equipment and the pressure in the system is less than atmospheric pressure. Then gradually loosen the discharge side hose fitting and remove it.

CAUTION:
When replacing or cleaning refrigerant cycle components, observe the following.

- **When the compressor is removed, store it in the same position as it is when mounted on the car. Failure to do so will cause lubricant to enter the low pressure chamber.**
- **When connecting tubes, always use a torque wrench and a back-up wrench.**
- **After disconnecting tubes, immediately plug all openings to prevent entry of dirt and moisture.**
- **When installing an air conditioner in the vehicle, connect the pipes as the final stage of the operation. Do not remove the seal caps of pipes and other components until just before required for connection.**
- **Allow components stored in cool areas to warm to working area temperature before removing seal caps. This prevents condensation from forming inside A/C components.**
- **Thoroughly remove moisture from the refrigeration system before charging the refrigerant.**
- **Always replace used O-rings.**
- **When connecting tube, apply lubricant to circle of the O-rings shown in illustration. Be careful not to apply lubricant to threaded portion.**
  Lubricant name: Nissan A/C System Oil Type S
  Part number: KLH00-PAGS0
- **O-ring must be closely attached to dented portion of tube.**
- **When replacing the O-ring, be careful not to damage O-ring and tube.**
- **Connect tube until you hear it click, then tighten the nut or bolt by hand until snug. Make sure that the O-ring is installed to tube correctly.**
- **After connecting line, conduct leak test and make sure that there is no leakage from connections. When the gas leaking point is found, disconnect that line and replace the O-ring. Then tighten connections of seal seat to the specified torque.**



Precautions for Servicing Compressor

NBHA0005

- **Plug all openings to prevent moisture and foreign matter from entering.**
- **When the compressor is removed, store it in the same position as it is when mounted on the car.**
- **When replacing or repairing compressor, follow "Maintenance of Lubricant Quantity in Compressor" exactly. Refer to HA-99.**
- **Keep friction surfaces between clutch and pulley clean. If the surface is contaminated, with lubricant, wipe it off by using a clean waste cloth moistened with thinner.**
- **After compressor service operation, turn the compressor shaft by hand more than five turns in both directions. This will equally distribute lubricant inside the compressor. After the compressor is installed, let the engine idle and operate the compressor for one hour.**
- **After replacing the compressor magnet clutch, apply voltage to the new one and check for normal operation.**

Precautions for Service Equipment

NBHA0006

RECOVERY/RECYCLING EQUIPMENT

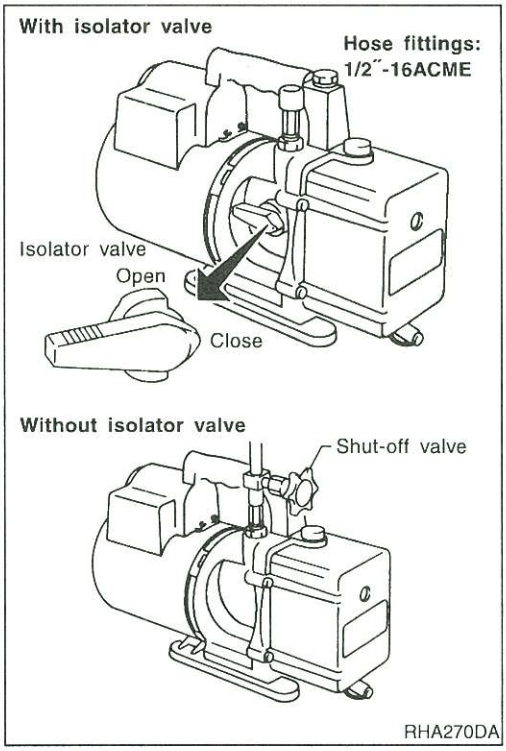
NBHA0006S01

Be certain to follow the manufacturers instructions for machine operation and machine maintenance. Never introduce any refrigerant other than that specified into the machine.

ELECTRONIC LEAK DETECTOR

NBHA0006S02

Be certain to follow the manufacturer's instructions for tester operation and tester maintenance.



VACUUM PUMP

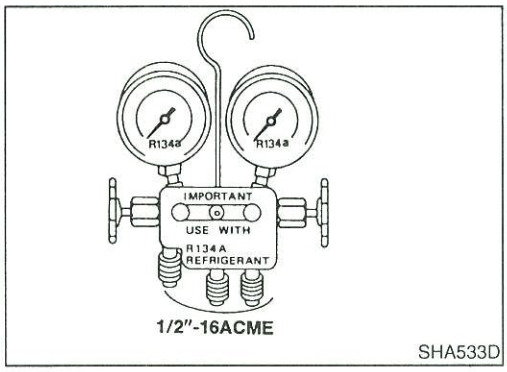
NBHA0006S03

The lubricant contained inside the vacuum pump is not compatible with the specified lubricant for HFC-134a (R-134a) A/C systems. The vent side of the vacuum pump is exposed to atmospheric pressure. So the vacuum pump lubricant may migrate out of the pump into the service hose. This is possible when the pump is switched off after evacuation (vacuuming) and hose is connected to it.

To prevent this migration, use a manual valve placed near the hose-to-pump connection, as follows.

- Usually vacuum pumps have a manual isolator valve as part of the pump. Close this valve to isolate the service hose from the pump.
- For pumps without an isolator, use a hose equipped with a manual shut-off valve near the pump end. Close the valve to isolate the hose from the pump.
- If the hose has an automatic shut off valve, disconnect the hose from the pump. As long as the hose is connected, the valve is open and lubricating oil may migrate.

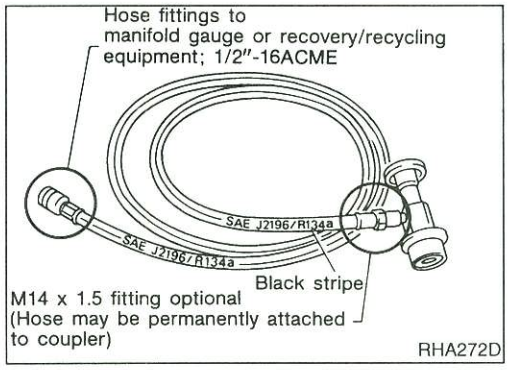
Some one-way valves open when vacuum is applied and close under a no vacuum condition. Such valves may restrict the pump's ability to pull a deep vacuum and are not recommended.



MANIFOLD GAUGE SET

NBHA0006S04

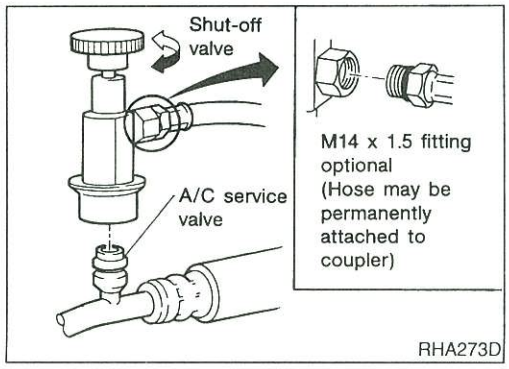
Be certain that the gauge face indicates R-134a or 134a. Be sure the gauge set has 1/2″-16 ACME threaded connections for service hoses. Confirm the set has been used only with refrigerant HFC-134a (R-134a) and specified lubricants.



SERVICE HOSES

NBHA0006S05

Be certain that the service hoses display the markings described (colored hose with black stripe). All hoses must include positive shut off devices (either manual or automatic) near the end of the hoses opposite the manifold gauge.

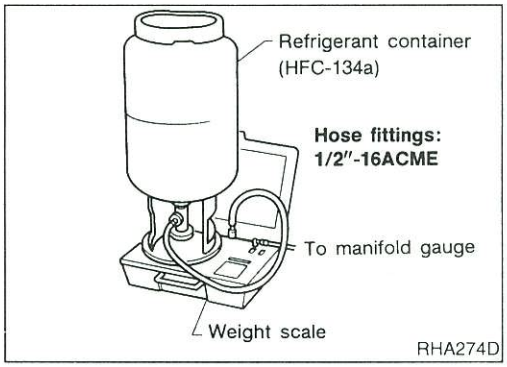


SERVICE COUPLERS

NBHA0006S06

Never attempt to connect HFC-134a (R-134a) service couplers to an CFC-12 (R-12) A/C system. The HFC-134a (R-134a) couplers will not properly connect to the CFC-12 (R-12) system. However, if an improper connection is attempted, discharging and contamination may occur.

Shut-off valve rotation	A/C service valve
Clockwise	Open
Counterclockwise	Close



REFRIGERANT WEIGHT SCALE

NBHA0006S07

Verify that no refrigerant other than HFC-134a (R-134a) and specified lubricants have been used with the scale. If the scale controls refrigerant flow electronically, the hose fitting must be 1/2″-16 ACME.

CALIBRATING ACR4 WEIGHT SCALE

NBHA0006S09

Calibrate the scale every three months.

To calibrate the weight scale on the ACR4 (J-39500-INF):

1. Press **Shift/Reset** and **Enter** at the same time.
2. Press **8787**. "**A1**" will be displayed.
3. Remove all weight from the scale.
4. Press **0**, then press **Enter**. "**0.00**" will be displayed and change to "**A2**".
5. Place a known weight (dumbbell or similar weight), between 4.5 and 8.6 kg (10 and 19 lb) on the center of the weight scale.
6. Enter the known weight using four digits. (Example 10 lbs = 10.00, 10.5 lbs = 10.50)
7. Press **Enter** — the display returns to the vacuum mode.
8. Press **Shift/Reset** and **Enter** at the same time.
9. Press **6** — the known weight on the scale is displayed.
10. Remove the known weight from the scale. "**0.00**" will be displayed.
11. Press **Shift/Reset** to return the ACR4 to the program mode.

CHARGING CYLINDER

NBHA0006S08

Using a charging cylinder is not recommended. Refrigerant may be vented into air from cylinder's top valve when filling the cylinder with refrigerant. Also, the accuracy of the cylinder is generally less than that of an electronic scale or of quality recycle/recharge equipment.

Wiring Diagrams and Trouble Diagnosis

NBHA0007

When you read wiring diagrams, refer to the followings:

- "HOW TO READ WIRING DIAGRAMS" in GI section
- "POWER SUPPLY ROUTING" for power distribution circuit in EL section

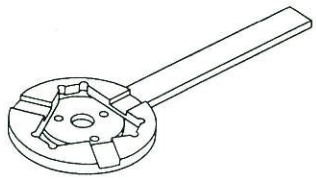
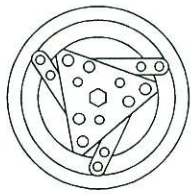
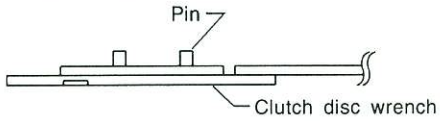
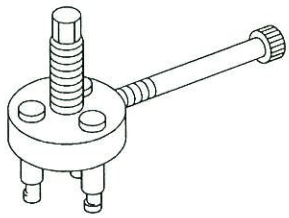
When you perform trouble diagnosis, refer to the followings:

- "HOW TO FOLLOW TEST GROUP IN TROUBLE DIAGNOSIS" in GI section
- "HOW TO PERFORM EFFICIENT DIAGNOSIS FOR AN ELECTRICAL INCIDENT" in GI section

Special Service Tools

NBHA0008

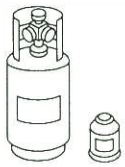
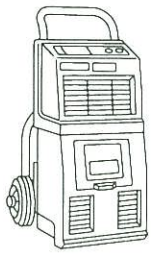
The actual shapes of Kent-Moore tools may differ from those of special service tools illustrated here.

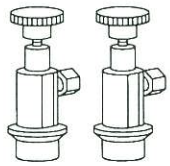
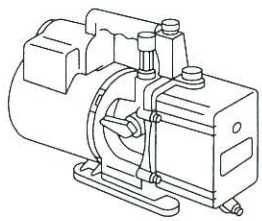
Tool number (Kent-Moore No.) Tool name	Description
KV99106100 (J-41260) Clutch disc wrench	Removing center bolt  NT232  When replacing the magnet clutch in the above compressor, use a clutch disc wrench with the pin side on the clutch disc to remove it.  NT378
KV99232340 (J-38874) or KV992T0001 (—) Clutch disc puller	Removing clutch disc  NT376
KV99106200 (J-41261) Pulley installer	Installing pulley NT235

HFC-134a (R-134a) Service Tools and Equipment

=NBHA0009

Never mix HFC-134a refrigerant and/or its specified lubricant with CFC-12 (R-12) refrigerant and/or its lubricant.
Separate and non-interchangeable service equipment must be used for handling each type of refrigerant/lubricant.
Refrigerant container fittings, service hose fittings and service equipment fittings (equipment which handles refrigerant and/or lubricant) are different between CFC-12 (R-12) and HFC-134a (R-134a). This is to avoid mixed use of the refrigerants/lubricant.
Adapters that convert one size fitting to another must never be used: refrigerant/lubricant contamination will occur and compressor failure will result.

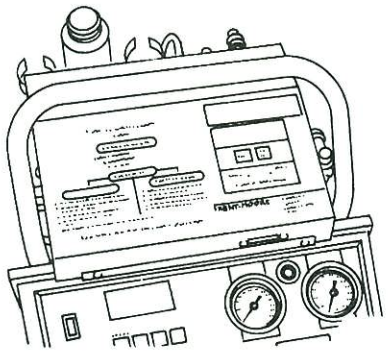
Tool number (Kent-Moore No.) Tool name	Description	
HFC-134a (R-134a) refrigerant	 NT196	Container color: Light blue Container marking: HFC-134a (R-134a) Fitting size: Thread size • large container 1/2″-16 ACME
KLH00-PAGS0 (—) Nissan A/C System Oil Type S	 NT197	Type: Poly alkylene glycol oil (PAG), type S Application: HFC-134a (R-134a) swash plate (piston) compressors (Nissan only) Lubricity: 40 mℓ (1.4 US fl oz, 1.4 Imp fl oz)
(J-39500-INF) Recovery/Recycling Recharging equipment (ACR4)	 NT195	Function: Refrigerant Recovery and Recycling and Recharging
(J-41995) Electrical leak detector	 AHA281A	Power supply: • DC 12V (Cigarette lighter)

Tool number (Kent-Moore No.) Tool name	Description	
(J-39183) Manifold gauge set (with hoses and couplers)	NT199	Identification: • The gauge face indicates R-134a. Fitting size: Thread size • 1/2″-16 ACME
Service hoses • High side hose (J-39501-72) • Low side hose (J-39502-72) • Utility hose (J-39476-72)	NT201	Hose color: • Low hose: Blue with black stripe • High hose: Red with black stripe • Utility hose: Yellow with black stripe or green with black stripe Hose fitting to gauge: • 1/2″-16 ACME
Service couplers • High side coupler (J-39500-20) • Low side coupler (J-39500-24)	 NT202	Hose fitting to service hose: • M14 x 1.5 fitting is optional or permanently attached.
(J-39650) Refrigerant weight scale	NT200	For measuring of refrigerant Fitting size: Thread size • 1/2″-16 ACME
(J-39649) Vacuum pump (Including the isolator valve)	 NT203	Capacity: • Air displacement: 4 CFM • Micron rating: 20 microns • Oil capacity: 482 g (17 oz) Fitting size: Thread size • 1/2″-16 ACME

HFC-134a (R-134a) Service Tools and Equipment (Cont'd)

COMMERCIAL SERVICE TOOL

NBHA0009S01

Tool name	Description	
Refrigerant identifier equipment	 NT765	For checking refrigerant purity and system contamination

Refrigeration System

REFRIGERATION CYCLE

Refrigerant Flow

NBHA0010

NBHA0010S01

The refrigerant flows in the standard pattern, that is, through the compressor, the condenser, the liquid tank, through the evaporator, and back to the compressor. The refrigerant evaporation through the evaporator coil is controlled by an externally equalized expansion valve, located inside the evaporator case.

Freeze Protection

NBHA0010S02

Under Normal Operating Conditions, When The A/C Is Switched On, The Compressor Runs Continuously, And The Evaporator Pressure, And Therefore Temperature, Is Controlled By The V-6 Variable Displacement Compressor To Prevent Freeze Up.

Refrigerant System Protection

NBHA0010S03

Dual-pressure Switch

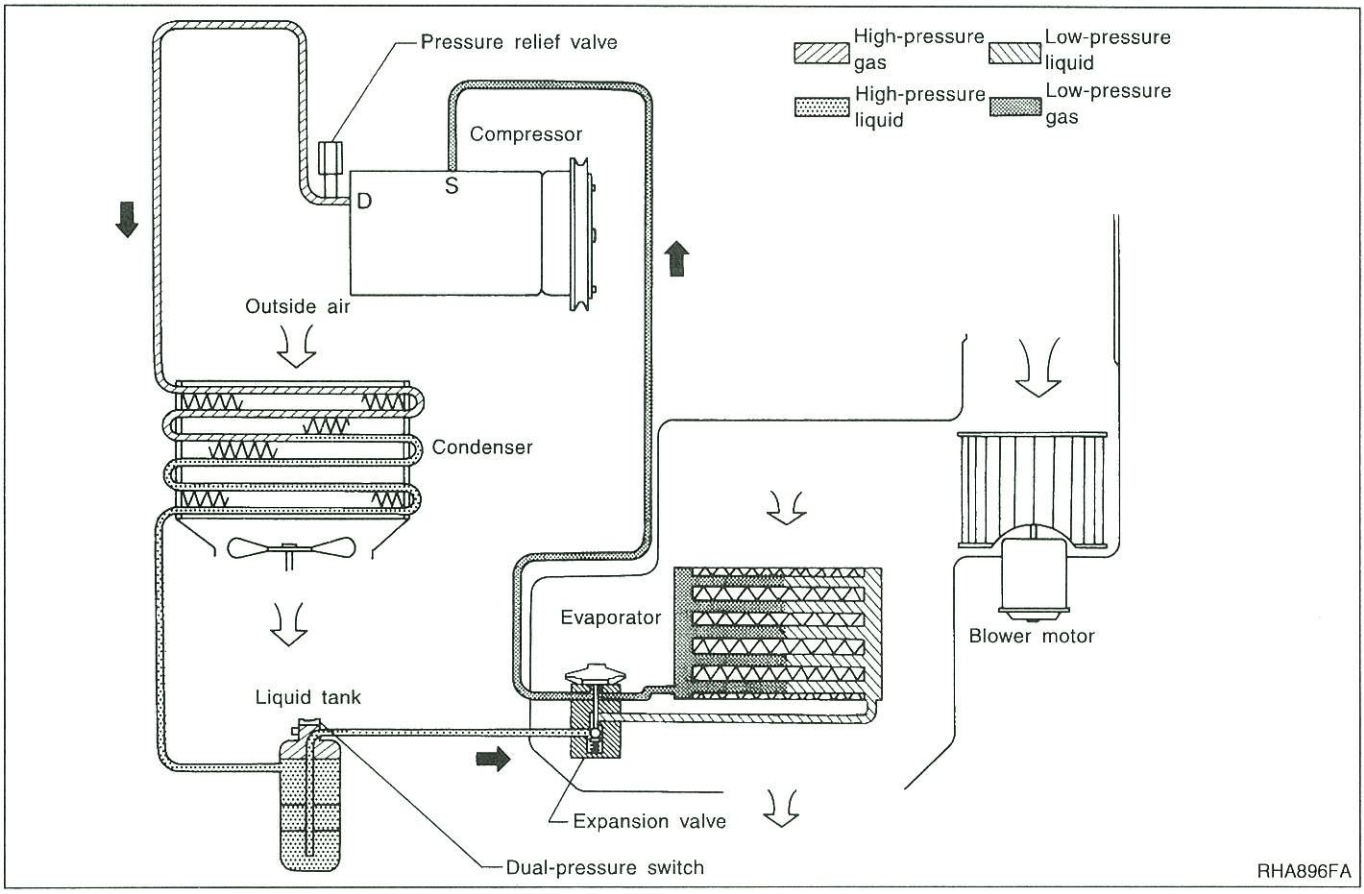
NBHA0010S0301

The refrigerant system is protected against excessively high or low pressures by the dual-pressure switch, located on the liquid tank. If the system pressure rises above, or falls below the specifications, the dual-pressure switch opens to interrupt the compressor operation.

Pressure Relief Valve

NBHA0010S0302

The refrigerant system is also protected by a pressure relief valve, located in the rear head of the compressor. When the pressure of refrigerant in the system increases to an abnormal level [more than 3,727 kPa (38 kg/cm^2, 540 psi)], the release port on the pressure relief valve automatically opens and releases refrigerant into the atmosphere.



V-6 Variable Displacement Compressor

GENERAL INFORMATION

=NBHA0086

1. The V-6 variable compressor differs from previous units. The vent temperatures of the V-6 variable compress do not drop too far below 5°C (41°F) when:
   - evaporator intake air temperature is less than 20°C (68°F)
   - engine is running at speeds less than 1,500 rpm.

   This is because the V-6 compressor provides a means of "capacity" control.
2. The V-6 variable compressor provides refrigerant control under varying conditions. During cold winters, it may not produce high refrigerant pressure discharge (compared to previous units) when used with air conditioning systems.
3. A "clanking" sound may occasionally be heard during refrigerant charge. The sound indicates that the tilt angle of the swash plate has changed and is not a problem.
4. For air conditioning systems with the V-6 compressor, the clutch remains engaged unless: the system main switch, fan switch or ignition switch is turned OFF. When ambient (outside) temperatures are low or when the amount of refrigerant is insufficient, the clutch is disengaged to protect the compressor.
5. A constant range of suction pressure is maintained when engine speed is greater than a certain value. It normally ranges from 147 to 177 kPa (1.5 to 1.8 kg/cm^2, 21 to 26 psi) under varying conditions.
   In previous compressors, however, suction pressure was reduced with increases in engine speed.

DESCRIPTION

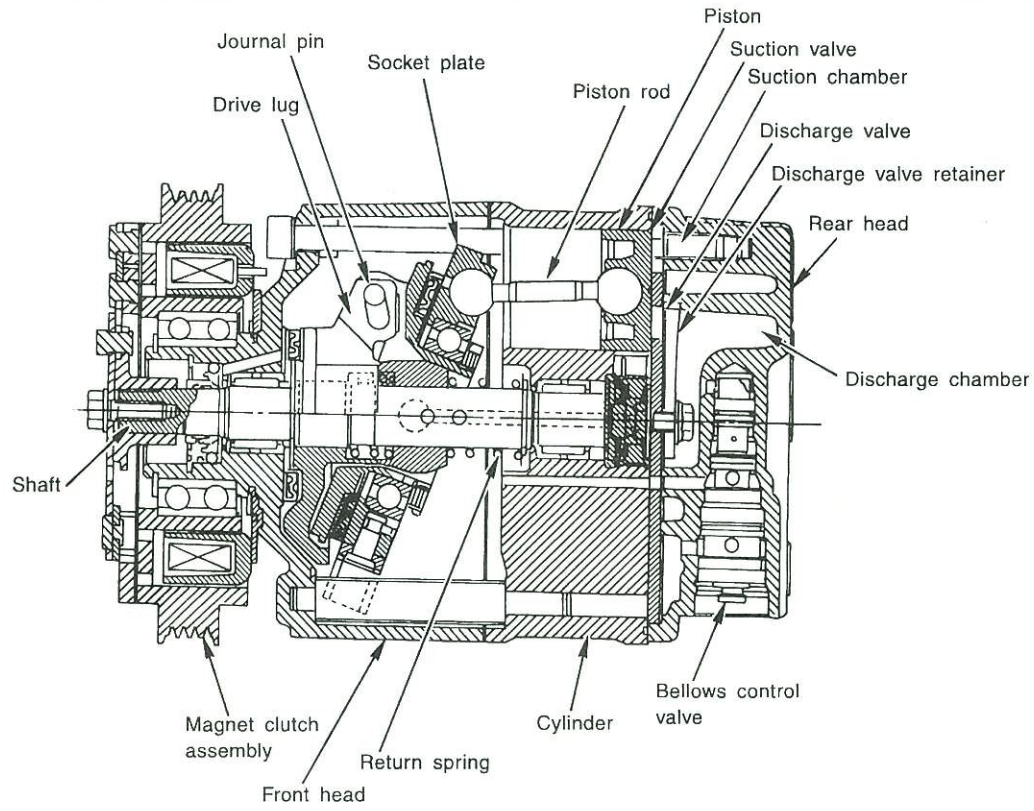
General

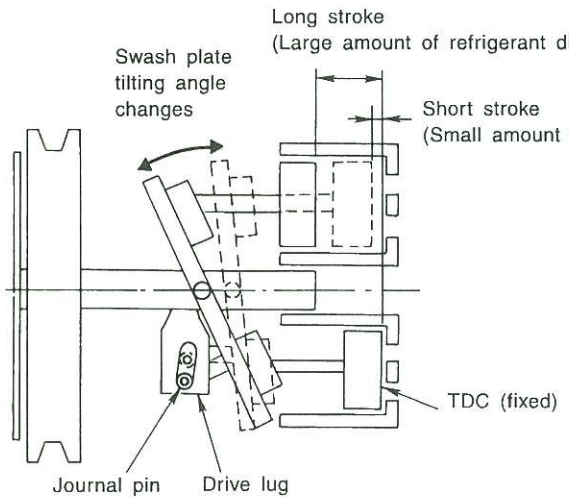
=NBHA0087

NBHA0087S01

The variable compressor is basically a swash plate type that changes piston stroke in response to the required cooling capacity.

The tilt of the swash plate allows the piston's stroke to change so that refrigerant discharge can be continuously changed from 14.5 to 184 cm^3 (0.885 to 11.228 cu in).





Discharge control	Discharge capacity cm^3 (cu in)/rev.	Piston stroke length mm (in)
Minimum	14.5 (0.885)	2.3 (0.091)
Maximum	184 (11.228)	28.6 (1.126)

RHA037DD

Operation

=NBHA0087S02

1. Operation Control Valve

NBHA0087S0201

Operation control valve is located in the suction port (low-pressure) side, and opens or closes in response to changes in refrigerant suction pressure.
Operation of the valve controls the internal pressure of the crankcase.
The angle of the swash plate is controlled between the crankcase's internal pressure and the piston cylinder pressure.

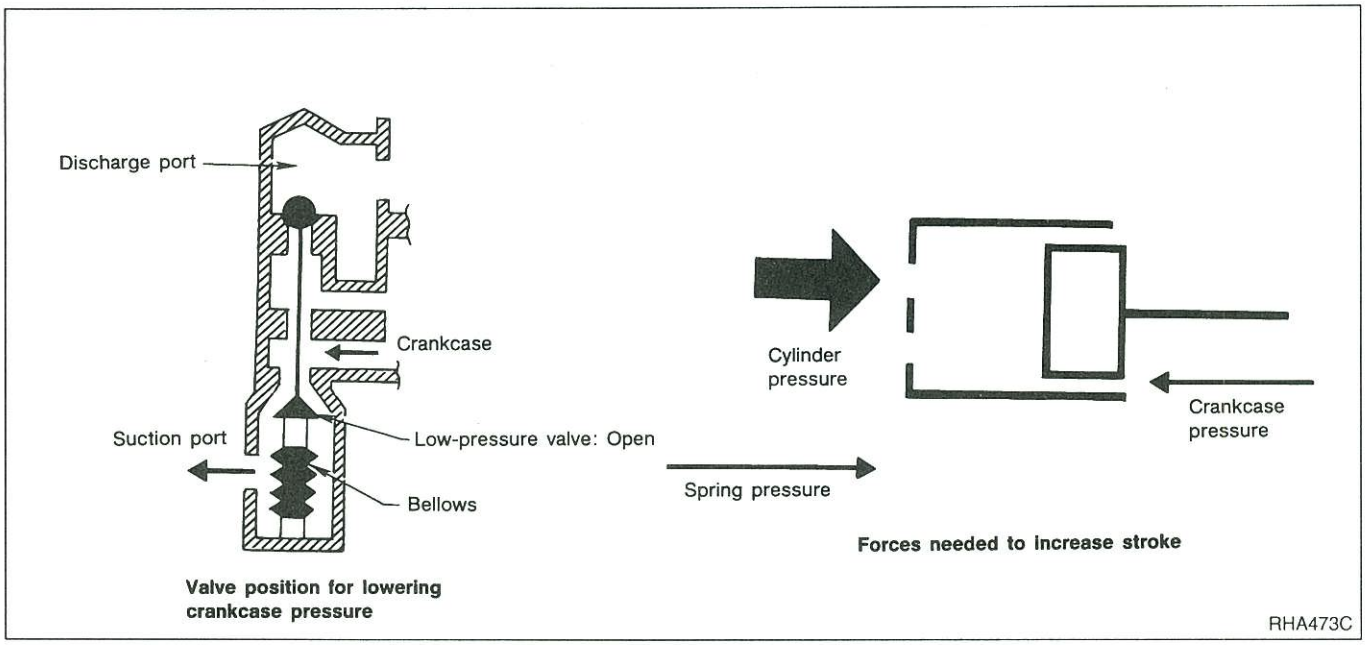
2. Maximum Cooling

NBHA0087S0202

Refrigerant pressure on the low-pressure side increases with an increase in heat loads.
When this occurs, the control valve's bellows compress to open the low-pressure side valve and close the high-pressure side valve.
This causes the following pressure changes:

- the crankcase's internal pressure to equal the pressure on the low-pressure side;
- the cylinder's internal pressure to be greater than the crankcase's internal pressure.

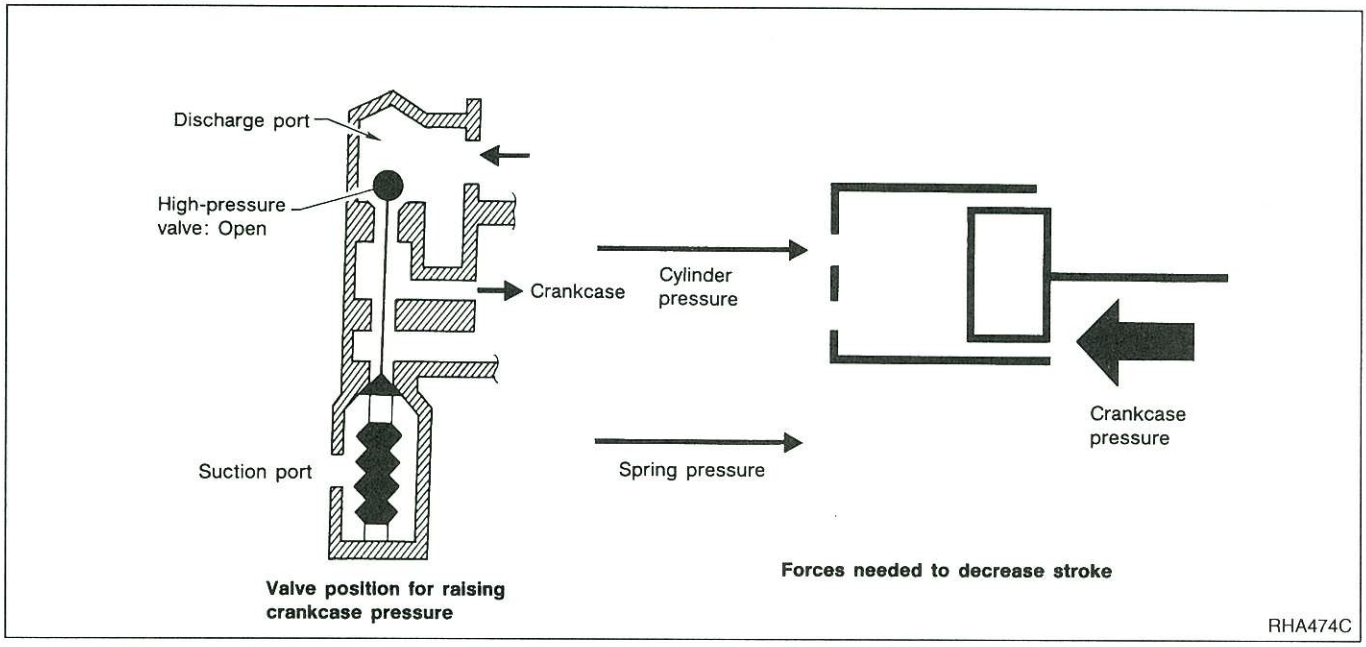
Under this condition, the swash plate is set to the maximum stroke position.



3. Capacity Control

NBHA0087S0203

- Refrigerant pressure on suction side is low during high speed driving or when ambient or interior temperature is low.
- The bellows expands when refrigerant pressure on the suction pressure side drops below approximately 177 kPa (1.8 kg/cm^2, 26 psi).
  Since suction pressure is low, it makes the suction port close and the discharge port open. Thus, crankcase pressure becomes high as high pressure enters the crankcase.
- The force acts around the journal pin near the swash plate, and is generated by the pressure difference before and behind the piston.
  The drive lug and journal pin are located where the piston generates the highest pressure. Piston pressure is between suction pressure Ps and discharge pressure Pd, which is near suction pressure Ps. If crankcase pressure Pc rises due to capacity control, the force around the journal pin makes the swash plate angle decrease and also the piston stroke decrease. In other words, crankcase pressure increase triggers pressure difference between the piston and the crankcase. The pressure difference changes the angle of the swash plate.



Valve position for raising crankcase pressure

Forces needed to decrease stroke

RHA474C

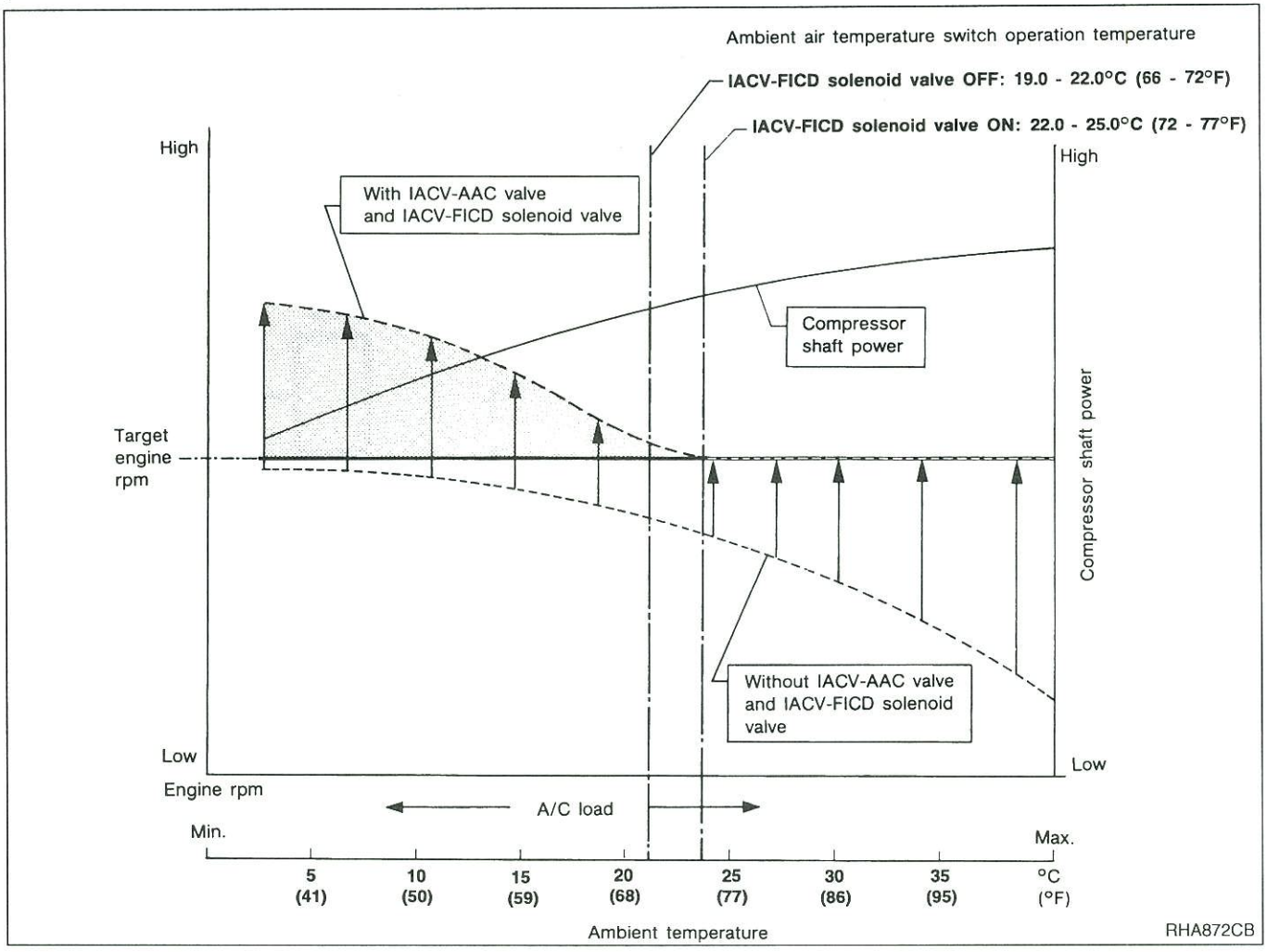
FICD CONTROL SYSTEM

=NBHA0088

General

NBHA0088S01

With the variable displacement compressor, the compressor power requirements differ from when the ambient temperature is high and maximum cooling effect is required (i.e., when refrigerating load is large and the tilt angle of the compressor swash plate is large) to when the ambient temperature is low and less cooling effect is required (i.e., when refrigerating load is small and the tilt angle of the swash plate is small). To correspond correctly to this change in compressor power requirements, it is also necessary to control the operation of the IACV-FICD according to the refrigerating load. Thus, an ambient air temperature switch is provided on the front face of the condenser so that the IACV-FICD can be controlled depending on the ambient temperature.



Operation

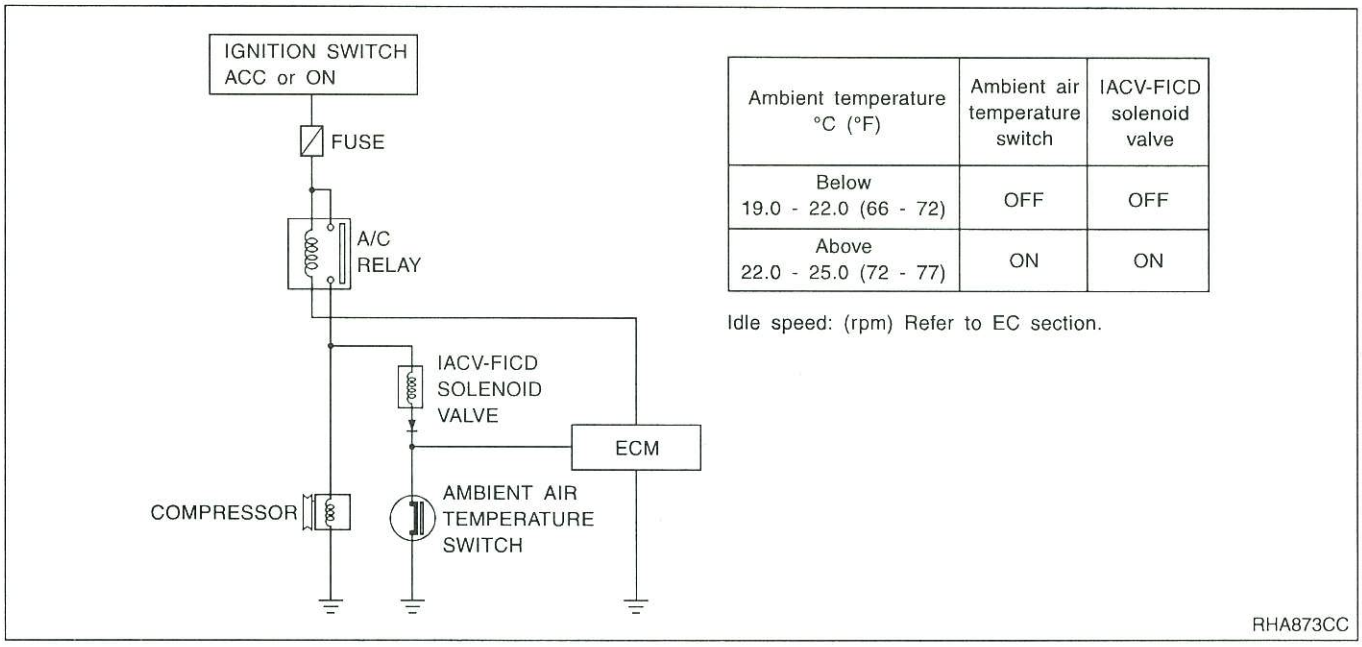
=NBHA0088S02

When the air conditioner is OFF, the ECM detects the load applied to the engine, and controls the IACV-AAC valve to adjust the engine idling speed to the appropriate rpm by supplying additional air from the IACV-AAC valve.

When the air conditioner is ON (A/C relay is ON), and when the ambient air temperature switch is ON [this switch turns ON automatically when the ambient temperature rises to approx. 25.0°C (77°F) or higher], the IACV-FICD solenoid valve is energized and additional air is supplied to the engine.

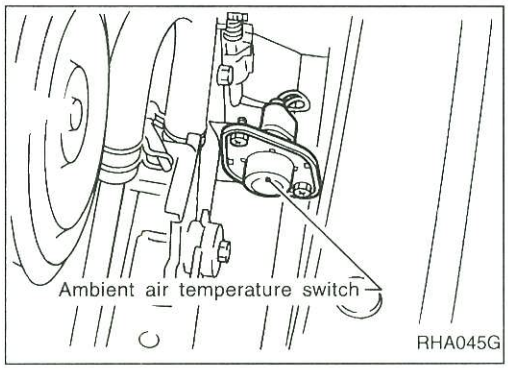
If the appropriate engine speed is not reached, the IACV-AAC valve supplies the additional air required to increase the engine rpm.

If the ambient air temperature switch is OFF [this switch turns OFF when the ambient temperature is below 19.0°C (66°F)] even when the air conditioner is ON (A/C relay is ON), the IACV-FICD solenoid valve is deenergized, and the idling speed is controlled so that the appropriate rpm can be achieved by operation of the IACV-AAC valve only.



Ambient temperature °C (°F)	Ambient air temperature switch	IACV-FICD solenoid valve
Below 19.0 - 22.0 (66 - 72)	OFF	OFF
Above 22.0 - 25.0 (72 - 77)	ON	ON

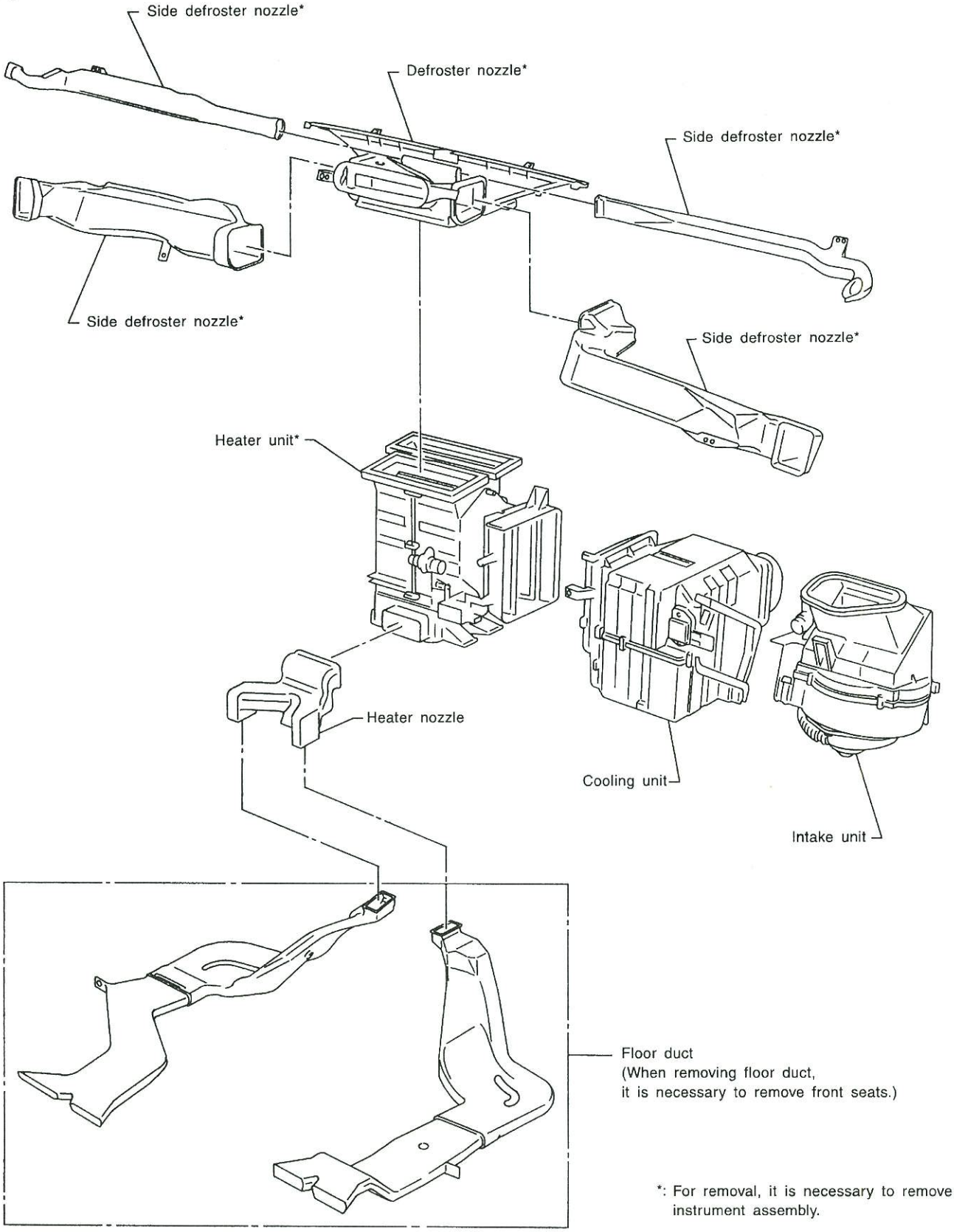
Idle speed: (rpm) Refer to EC section.



Component Layout

NBHA0012

SEC. 270•271•272•273



*: For removal, it is necessary to remove instrument assembly.

RHA451G

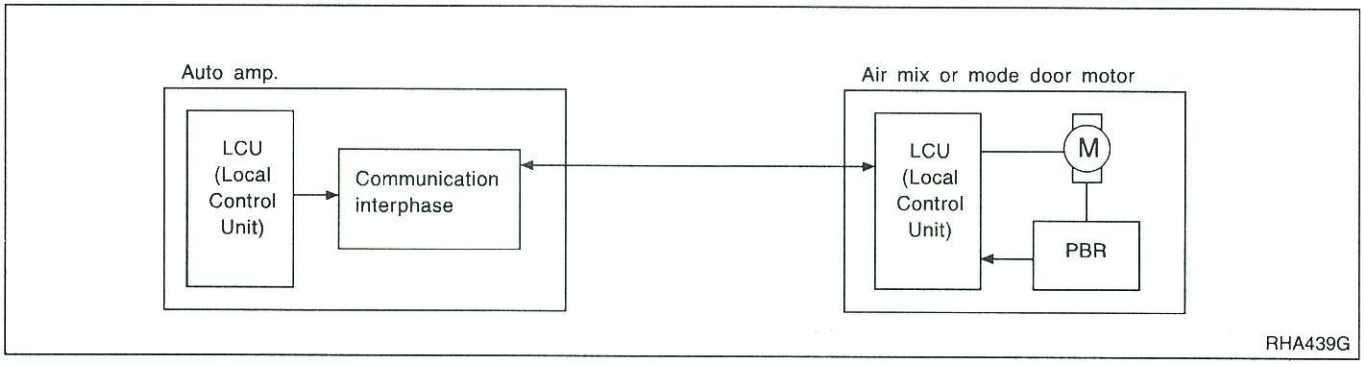
Introduction

NBHA0013

AIR CONDITIONER LAN SYSTEM OVERVIEW CONTROL SYSTEM

NBHA0013S01

The LAN system consists of auto amp., air mix door motor and mode door motor.
A configuration of these components is shown in the diagram below.



Features

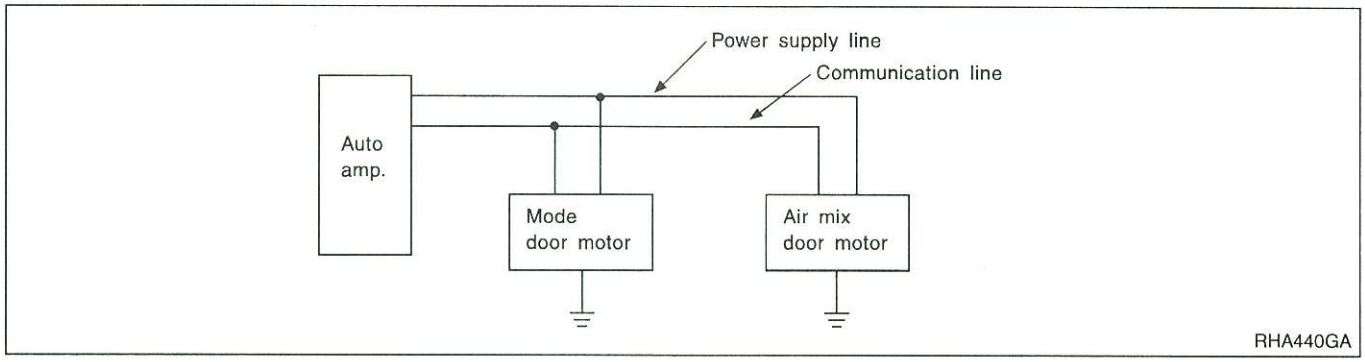
NBHA0014

SYSTEM CONSTRUCTION (LAN)

NBHA0014S08

A small network is constructed between the auto amplifier, air mix door motor and mode door motor. The auto amplifier and motors are connected by data transmission lines and motor power supply lines. The LAN network is built through the ground circuits of the two motors.
Addresses, motor opening angle signals, motor stop signals and error checking messages are all transmitted through the data transmission lines connecting the auto amplifier and two motors.
The following functions are contained in LCUs built into the air mix door motor and the mode door motor.

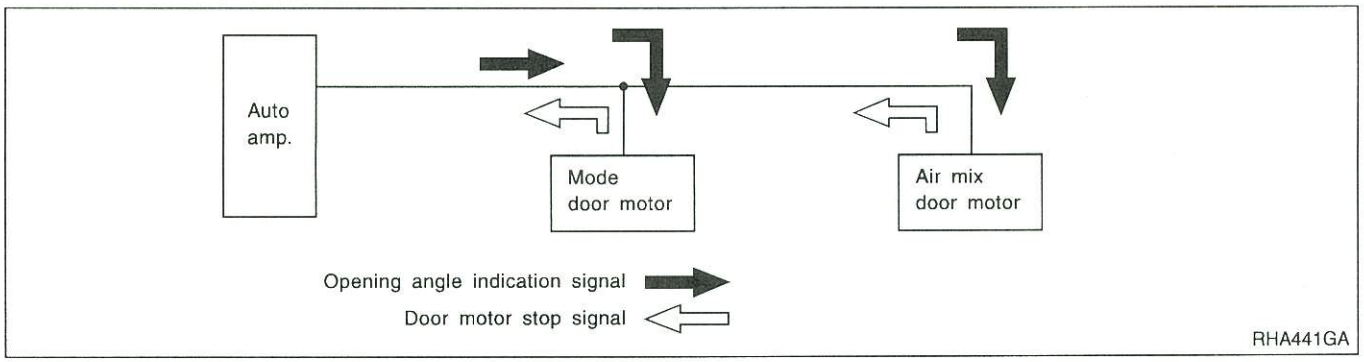
- Address
- Motor opening angle signals
- Data transmission
- Motor stop and drive decision
- Opening angle sensor (PBR function)
- Comparison
- Decision (Auto amplifier indicated value and motor opening angle comparison)



Operation

NBHA0014S0801

The auto amplifier receives data from each of the sensors. The amplifier sends air mix door and mode door opening angle data to the air mix door motor LCU and mode door motor LCU.
The air mix door motor and mode door motor read their respective signals according to the address signal. Opening angle indication signals received from the auto amplifier and each of the motor position sensors are compared by the LCUs in each motor with the existing decision and opening angles. Subsequently, HOT/COLD or DEFROST/VENT operation is selected. The new selection data is returned to the auto amplifier.



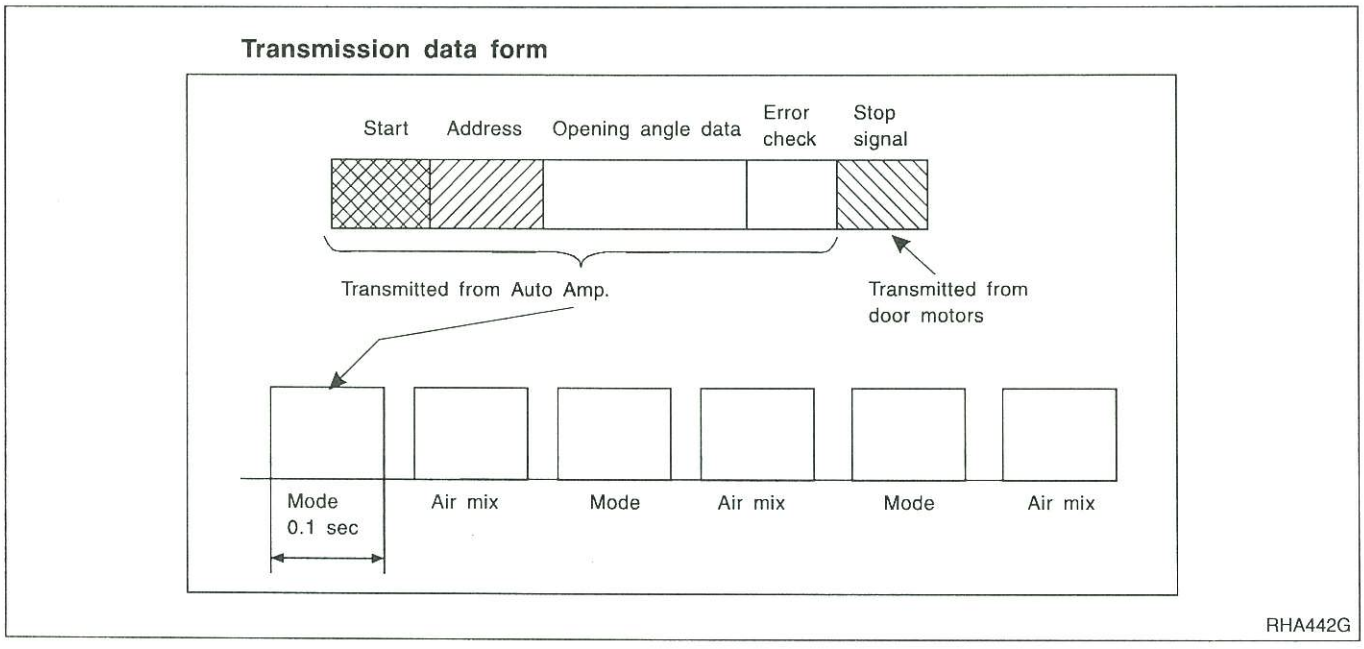
Transmission Data and Transmission Order

NBHA0014S0802

Amplifier data is transmitted consecutively to each of the door motors following the form shown in figure below.
Start: Initial compulsory signal sent to each of the door motors.
Address: Data sent from the auto amplifier is selected according to data-based decisions made by the air mix door motor and mode door motor.
If the addresses are identical, the opening angle data and error check signals are received by the door motor LCUs. The LCUs then make the appropriate error decision. If the opening angle data is normal, door control begins.
If an error exists, the received data is rejected and corrected data received. Finally, door control is based upon the corrected opening angle data.
Opening angle: Data that shows the indicated door opening angle of each door motor.
Error check: Procedure by which sent and received data is checked for errors. Error data is then compiled. The error check prevents corrupted data from being used by the air mix door motor and mode door motor. Error data can be related to the following problems.

- Abnormal electrical frequency
- Poor electrical connections
- Signal leakage from transmission lines
- Signal level fluctuation

Stop signal: At the end of each transmission, a stop operation, in-operation, or internal problem message is delivered to the auto amplifier. This completes one data transmission and control cycle.



Air Mix Door Control (Automatic Temperature Control)

NBHA0014S0803

The air mix door is automatically controlled so that in-vehicle temperature is maintained at a predetermined value by: The temperature setting, ambient temperature, in-vehicle temperature and amount of sunload.

Fan Speed Control

NBHA0014S0804

Blower speed is automatically controlled based on temperature setting, ambient temperature, in-vehicle temperature, intake temperature, amount of sunload and air mix door position.
With FAN switch set to "AUTO", the blower motor starts to gradually increase air flow volume.
When engine coolant temperature is low, the blower motor operation is delayed to prevent cool air from flowing.

Intake Door Control

NBHA0014S0805

The intake doors are automatically controlled by: The temperature setting, ambient temperature, in-vehicle temperature, intake temperature, amount of sunload and ON-OFF operation of the compressor.

Outlet Door Control

NBHA0014S0806

The outlet door is automatically controlled by: The temperature setting, ambient temperature, in-vehicle temperature, intake temperature and amount of sunload.

Magnet Clutch Control

NBHA0014S0807

The ECM controls compressor operation using input signals from the throttle position sensor and auto amplifier.

Self-diagnostic System

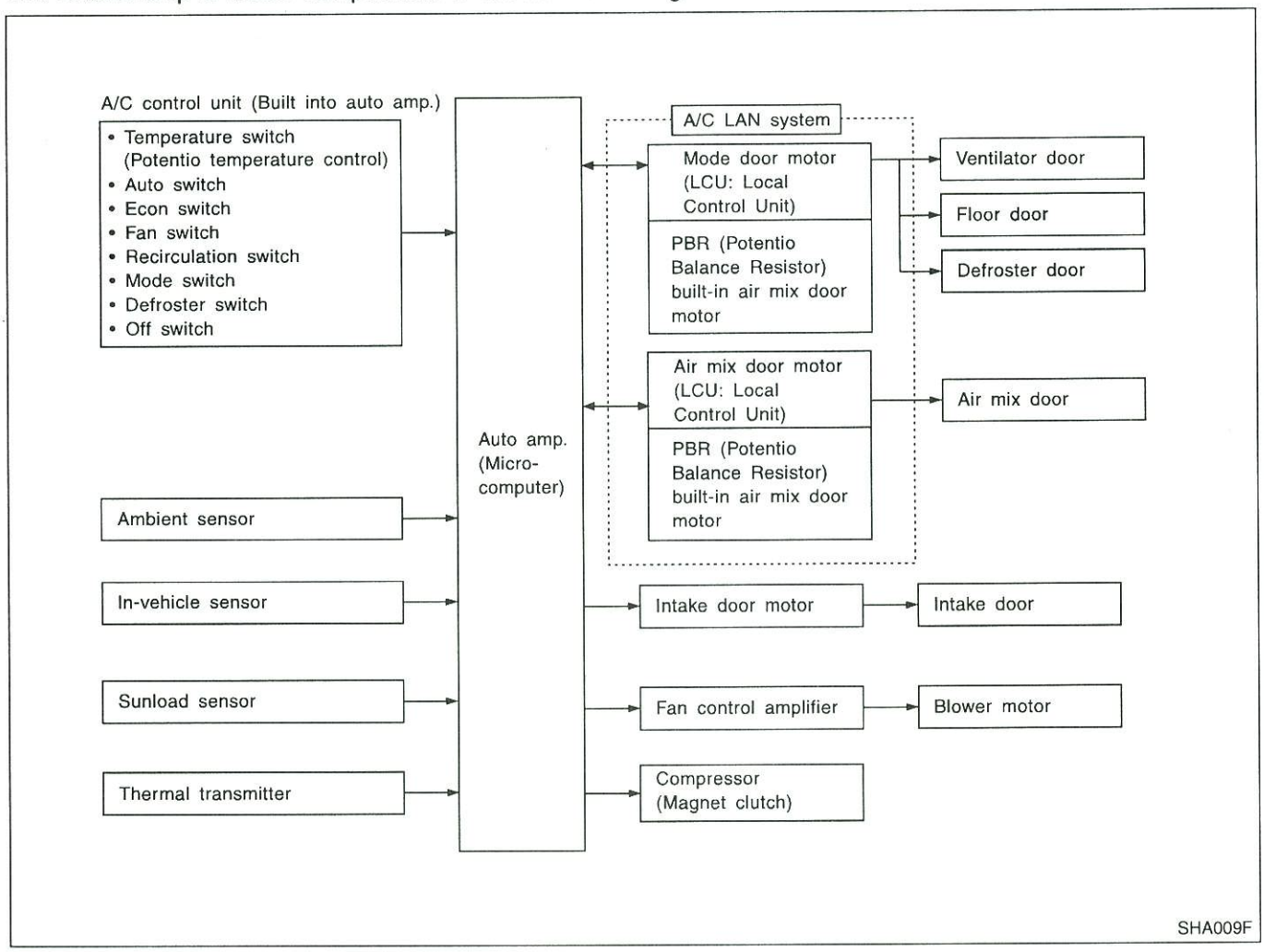
NBHA0014S0808

The self-diagnostic system is built into the auto amplifier (LCU) to quickly locate the cause of problems.

Overview of Control System

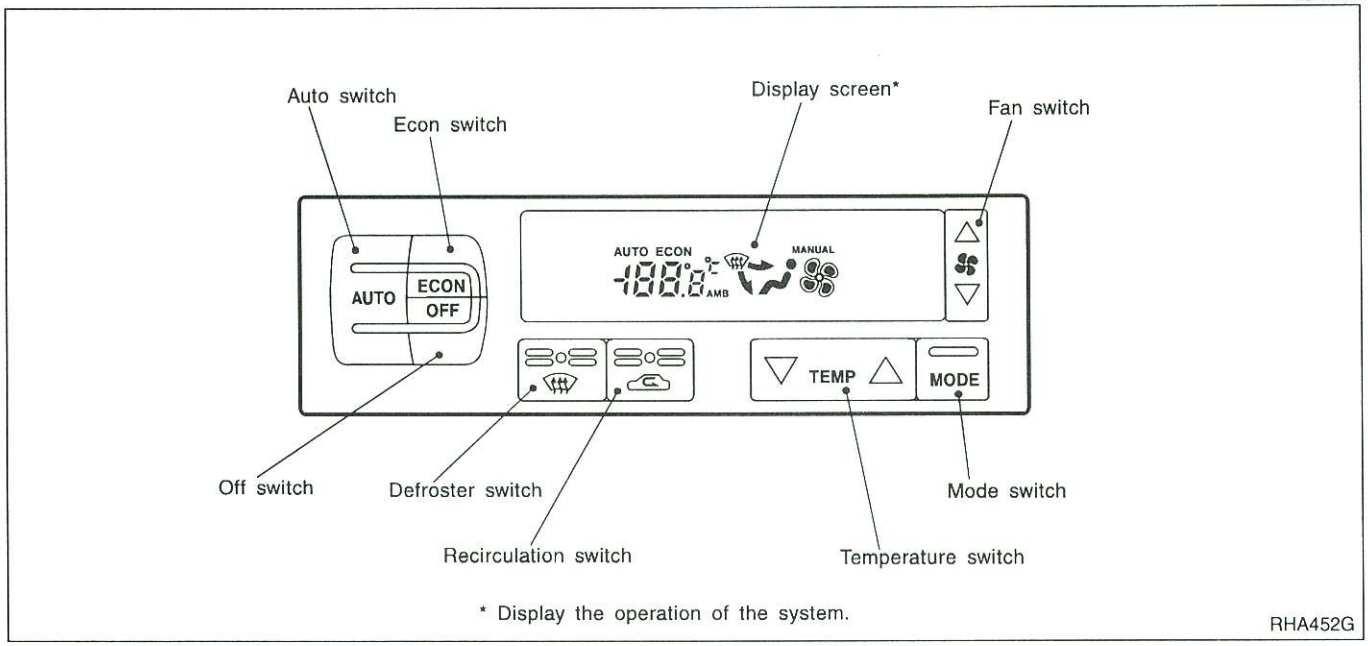
=NBHA0015

The control system consists of input sensors, switches, the automatic amplifier (microcomputer) and outputs. The relationship of these components is shown in the diagram below:



Control Operation

NBHA0016



DISPLAY SCREEN

NBHA0016S01

Displays the operational status of the system.

AUTO SWITCH

NBHA0016S02

The compressor, intake doors, air mix door, outlet doors, and blower speed are automatically controlled so that the in-vehicle temperature will reach, and be maintained at the set temperature selected by the operator.

ECON SWITCH

NBHA0016S03

By pressing the ECON switch, the display should indicate ECON and the compressor always turns OFF. With the compressor OFF, the system will not remove heat (cool) or de-humidify. The system will maintain the in-vehicle temperature at the set temperature when the set temperature is above the ambient (outside) temperature. The system will set the intake doors to the outside air position.

TEMPERATURE SWITCH (POTENTIO TEMPERATURE CONTROL)

NBHA0016S04

Increases or decreases the set temperature.

OFF SWITCH

NBHA0016S05

The compressor and blower are OFF, the intake doors are set to the outside air position, and the air outlet doors are set to the foot (80% foot and 20% defrost) position.

FAN SWITCH

NBHA0016S06

Manual control of the blower speed. Four speeds are available for manual control (as shown on the display screen):
low , medium low , medium high , high

RECIRCULATION (REC) SWITCH

NBHA0016S07

OFF position: Outside air is drawn into the passenger compartment.
ON position: Interior air is recirculated inside the vehicle.

DEFROSTER (DEF) SWITCH

NBHA0016S08

Positions the air outlet doors to the defrost position. Also positions the intake doors to the outside air position.

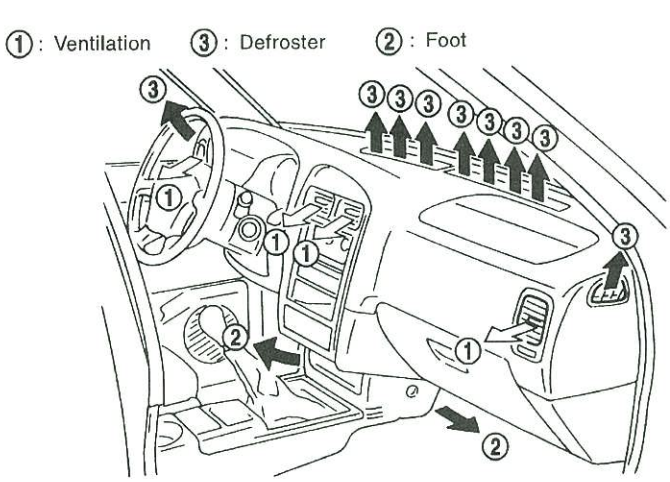
MODE SWITCHES

NBHA0016S09

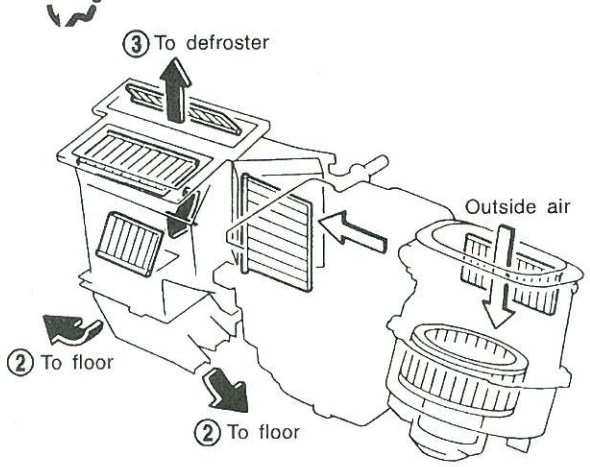
Control the air discharge outlets.

Discharge Air Flow

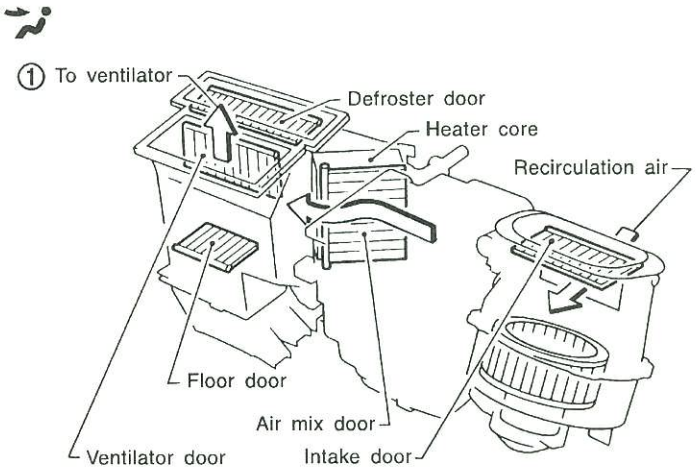
NBHA0017



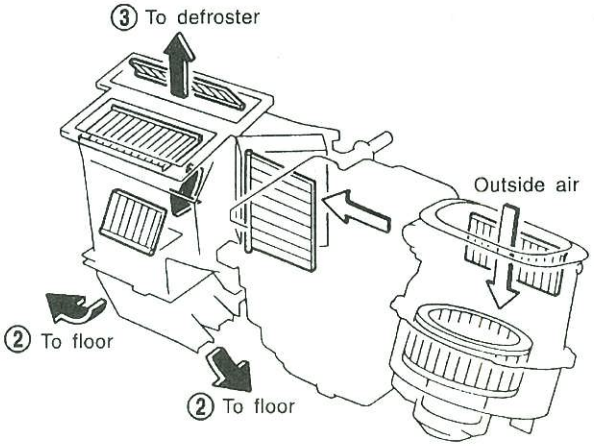
Floor



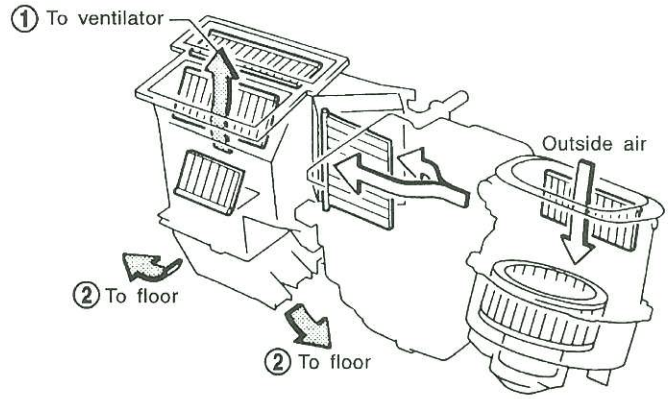
Ventilation
(A/C switch "ON")



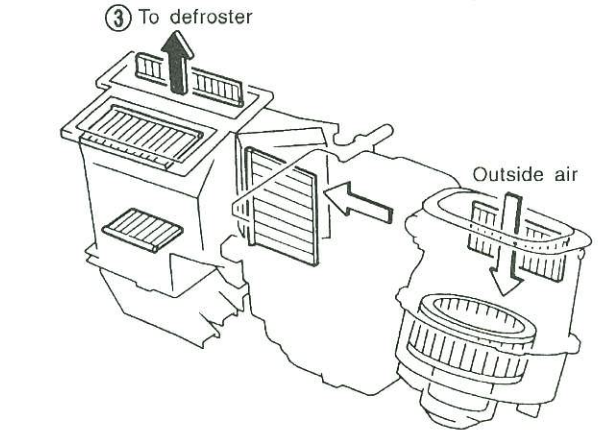
Floor and defroster



Bi-level
(A/C switch "OFF")



Defroster



: Air passed through heater core

: Mixed air (+)

: Air not passed through heater core

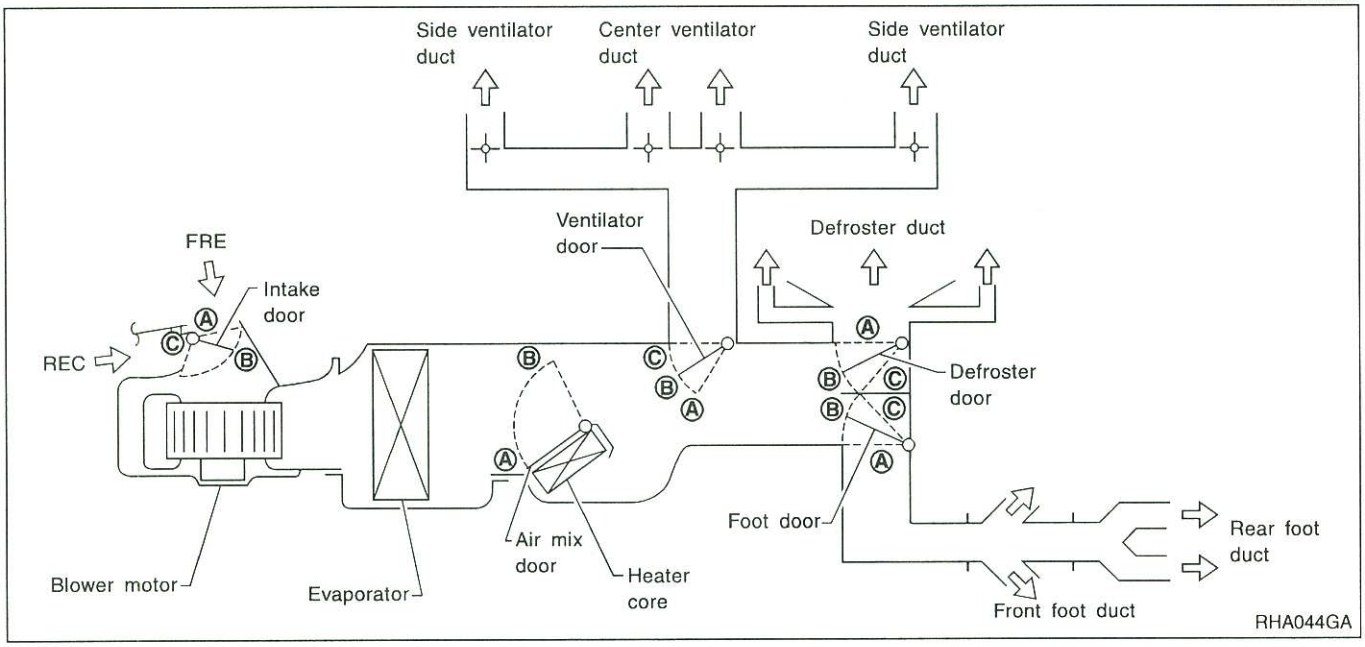
RHA043G

System Description

NBHA0110

SWITCHES AND THEIR CONTROL FUNCTIONS

NBHA0110S01



Position or switch	MODE SW				DEF SW		AUTO SW	ECON SW	REC SW		Temperature SW		
	VENT	B/L	FOOT	D/F	ON	OFF			ON	OFF	▼ TEMP ▲		
Door							AUTO	ECON			18.0°C (65°F)	—	32.0°C (85°F)
Ventilator door	A	B	C	C	C	—	AUTO	AUTO	—		—		
Foot door	A	B	C	C	A				—		—		
Defroster door	A	A	B	C	C				—		—		
Air mix door	—				—				—		A	AUTO	B
Intake door	—				C				A	AUTO*1	—		

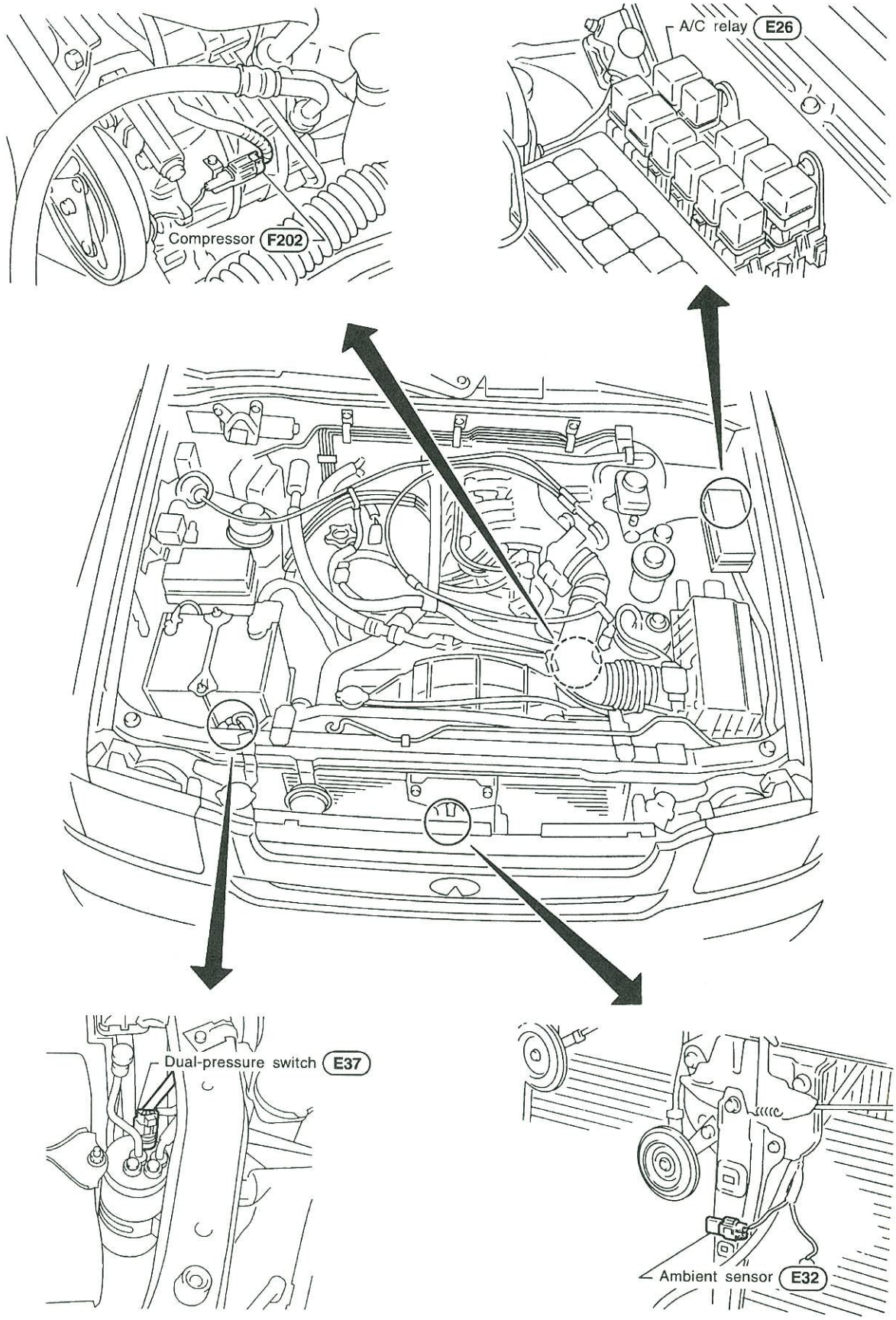
*1: Automatically controlled when REC switch is OFF.

Component Location

NBHA0033

ENGINE COMPARTMENT

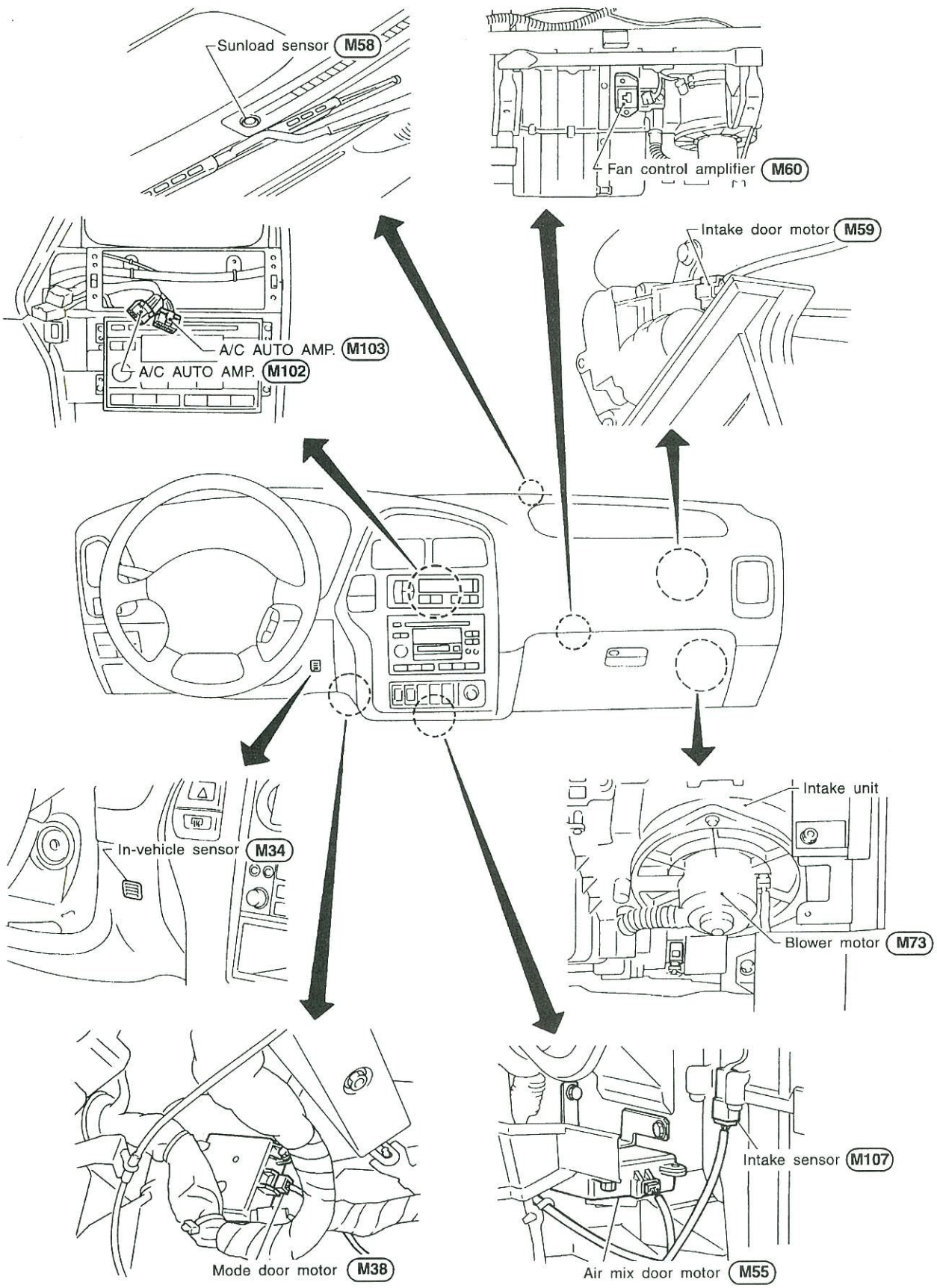
NBHA0033S01



SHA281F

PASSENGER COMPARTMENT

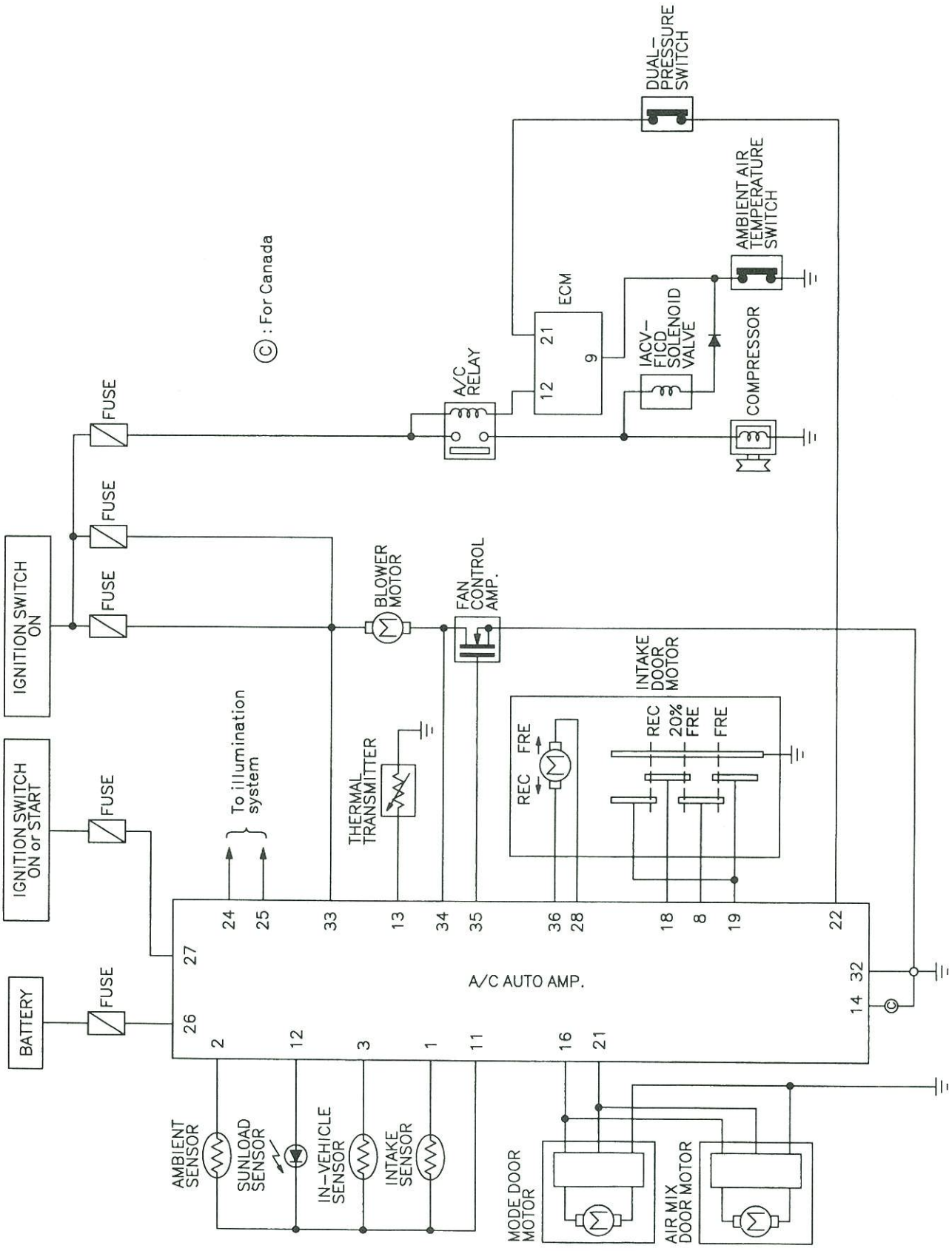
NBHA0033S02



RHA498G

Circuit Diagram

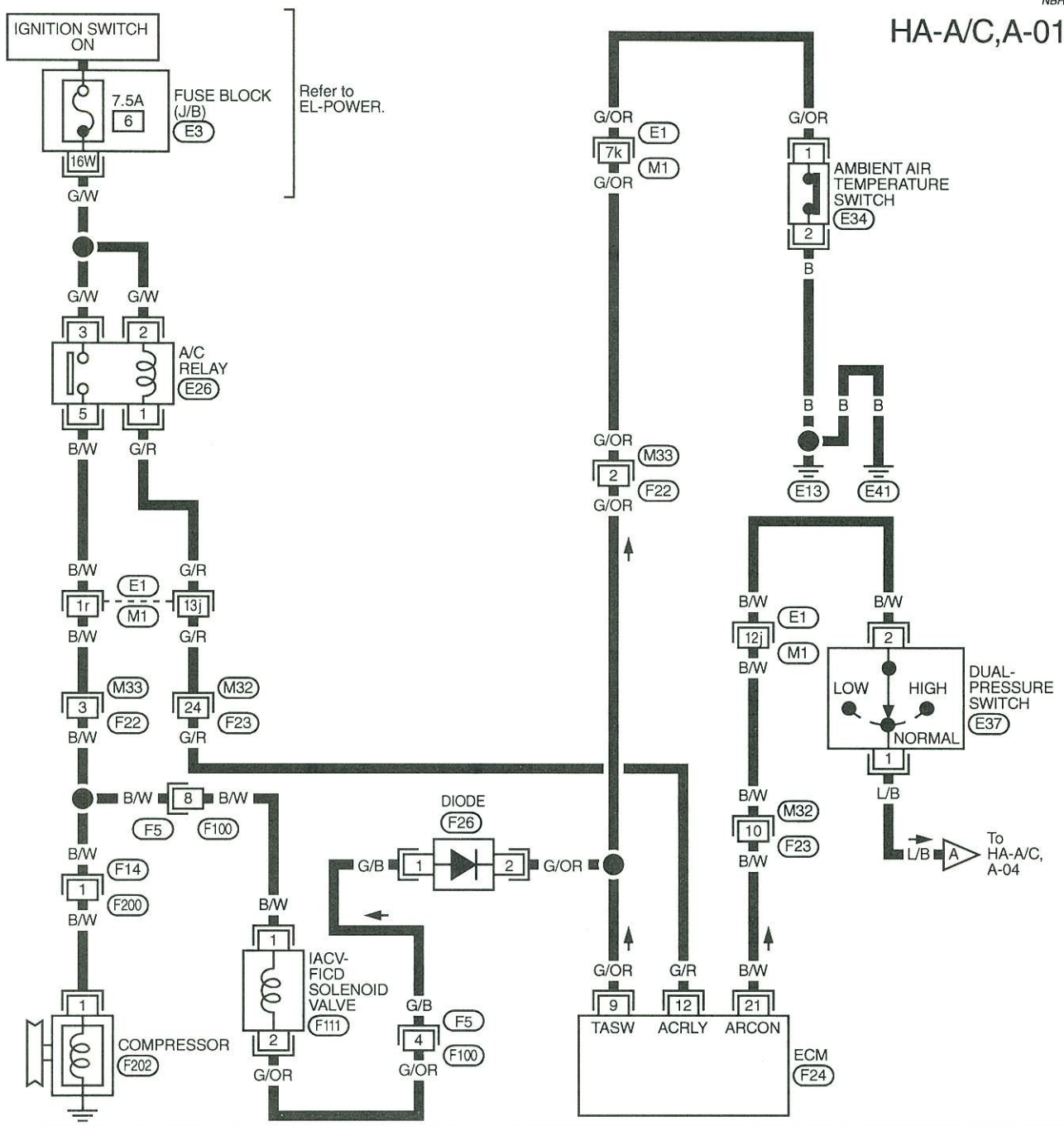
NBHA0034

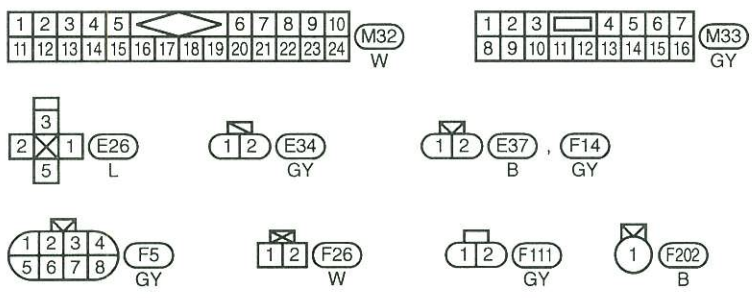


MHA874A

Wiring Diagram — A/C, A —

NBHA0035





Refer to last page (Foldout page).

M1 , E1

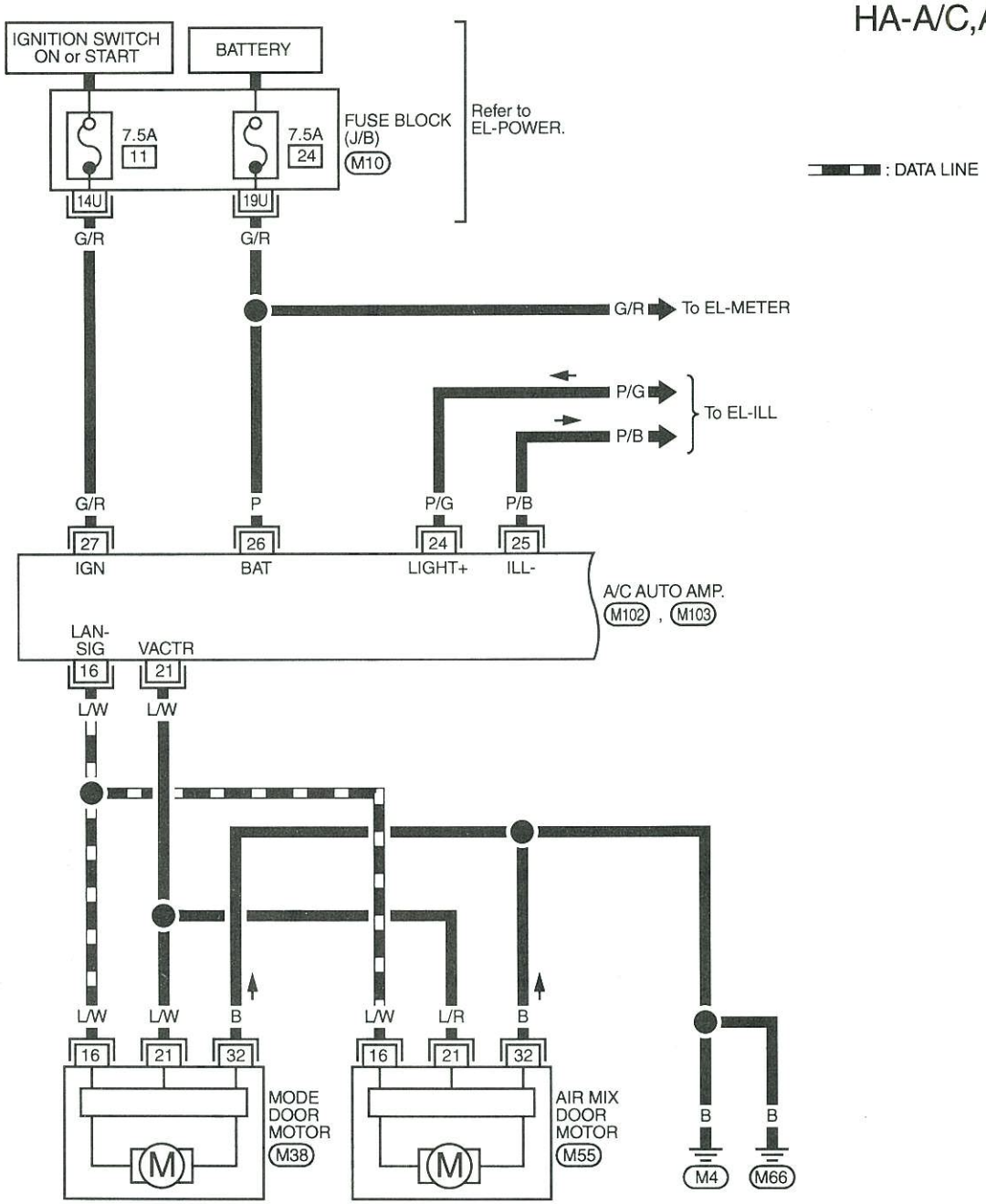
E3

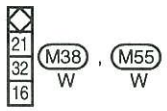
F24

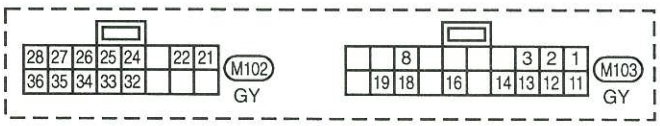
MHA875A

Wiring Diagram — A/C, A — (Cont'd)

HA-A/C,A-02



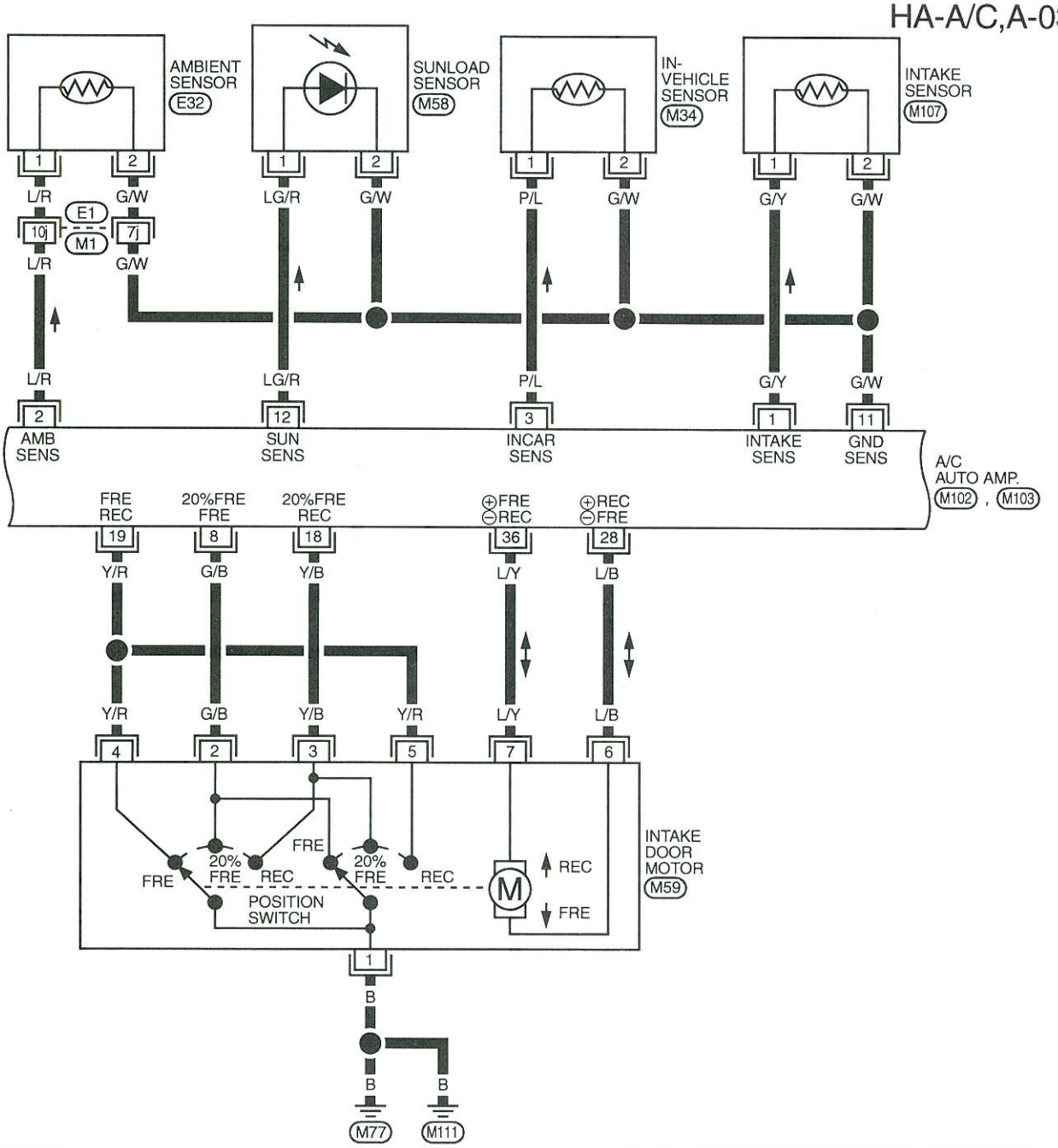


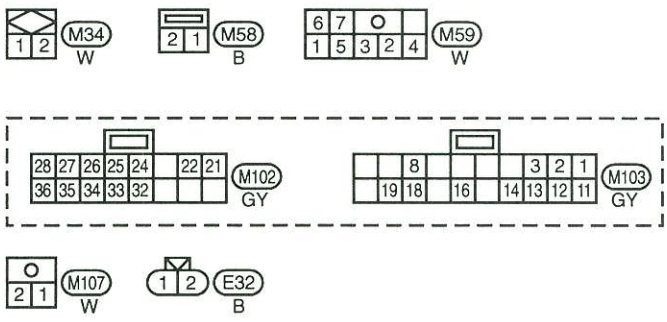


Refer to last page (Foldout page).
M10

MHA876A

HA-A/C,A-03

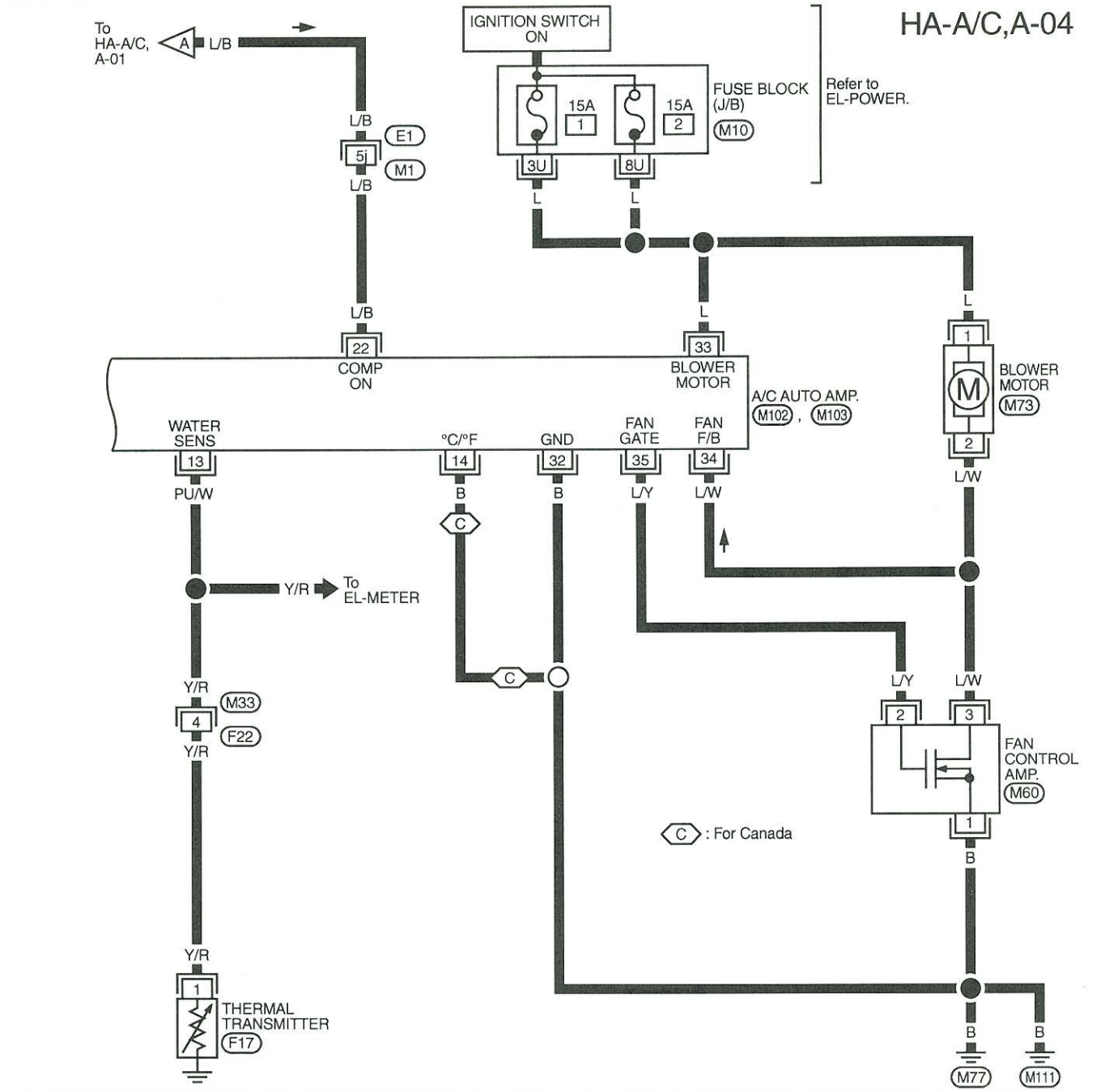


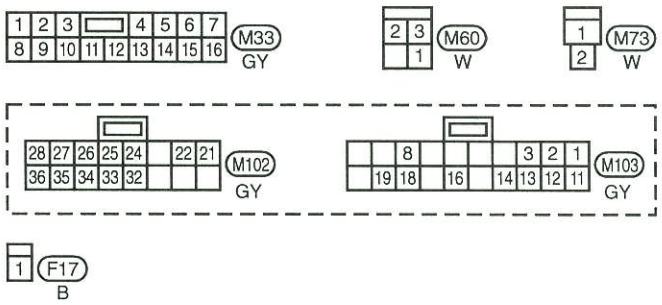


Refer to last page (Foldout page).
(M1) , (E1)

MHA877A

Wiring Diagram — A/C, A — (Cont'd)



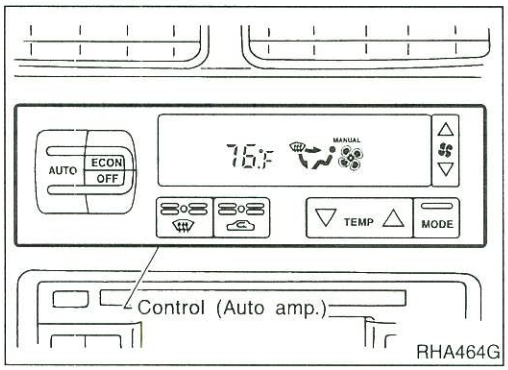


Refer to last page (Foldout page).

M1 , E1

M10

MHA878A



Auto Amp. Terminals and Reference Value

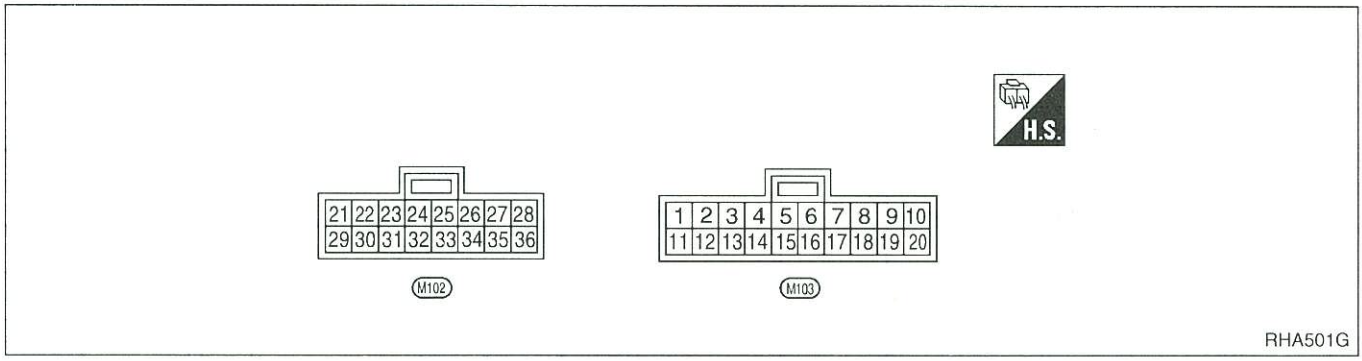
NBHA0036

INSPECTION OF AUTO AMP.

NBHA0036S01

- Measure voltage between each terminal and body ground by following "AUTO AMP. INSPECTION TABLE".

- Pin connector terminal layout



AUTO AMP. INSPECTION TABLE

NBHA0036S02

TERMINAL NO.	ITEM	CONDITION			Voltage V
1	Intake sensor	—			—
2	Ambient sensor	—			—
3	In-vehicle sensor	—			—
8	Intake door position switch	ON	Intake door position	FRESH	Approximately 0
				RECIRCULATION or 20% FRESH	Approximately 4.6
11	Sensor ground		—		Approximately 0
12	Sunload sensor	—			—
13	Thermal transmitter		Engine coolant temperature	Approximately 40°C (104°F)	Approximately 10.8
				Approximately 55°C (131°F)	Approximately 9.9
				Approximately 60°C (140°F)	Approximately 9.5
14	Ground (for Canada)		—		Approximately 0
16	A/C LAN signal		—		—
18	Intake door position switch	ON	Intake door position	20% FRE	Approximately 0
				FRESH or RECIRCULATION	Approximately 4.6
19	Intake door position switch		Intake door position	RECIRCULATION	Approximately 0
				20% FRE or FRESH	Approximately 4.7
21	Power supply for mode door motor and air mix door motor		—		*1

Auto Amp. Terminals and Reference Value (Cont'd)

TERMINAL NO.	ITEM	CONDITION			Voltage V
22	Compressor ON signal		Compressor	ON	Approximately 0
				OFF	Approximately 4.6
26	Power supply for BAT		—		BATTERY VOLTAGE
27	Power supply for IGN		—		Approximately 12
28	Power supply for intake door motor		Intake door position	FRESH	Approximately 12
				RECIRC	Approximately 0
32	Ground		—		Approximately 0
33	Power source for A/C		Ignition voltage feed back		Approximately 12
34	Blower motor feed back		Fan speed: Low		Approximately 7 - 10
35	Fan control AMP. control signal		Fan speed	Low, Middle low or Middle high	Approximately 2.5 - 3.0
				High	Approximately 9 - 10
36	Power supply for intake door motor		Intake door position	FRESH	Approximately 0
				RECIRC	Approximately 12

*1: When the motor is working, approx. 0V will be indicated. When the motor stops, approx. 12V will exist.

Self-diagnosis

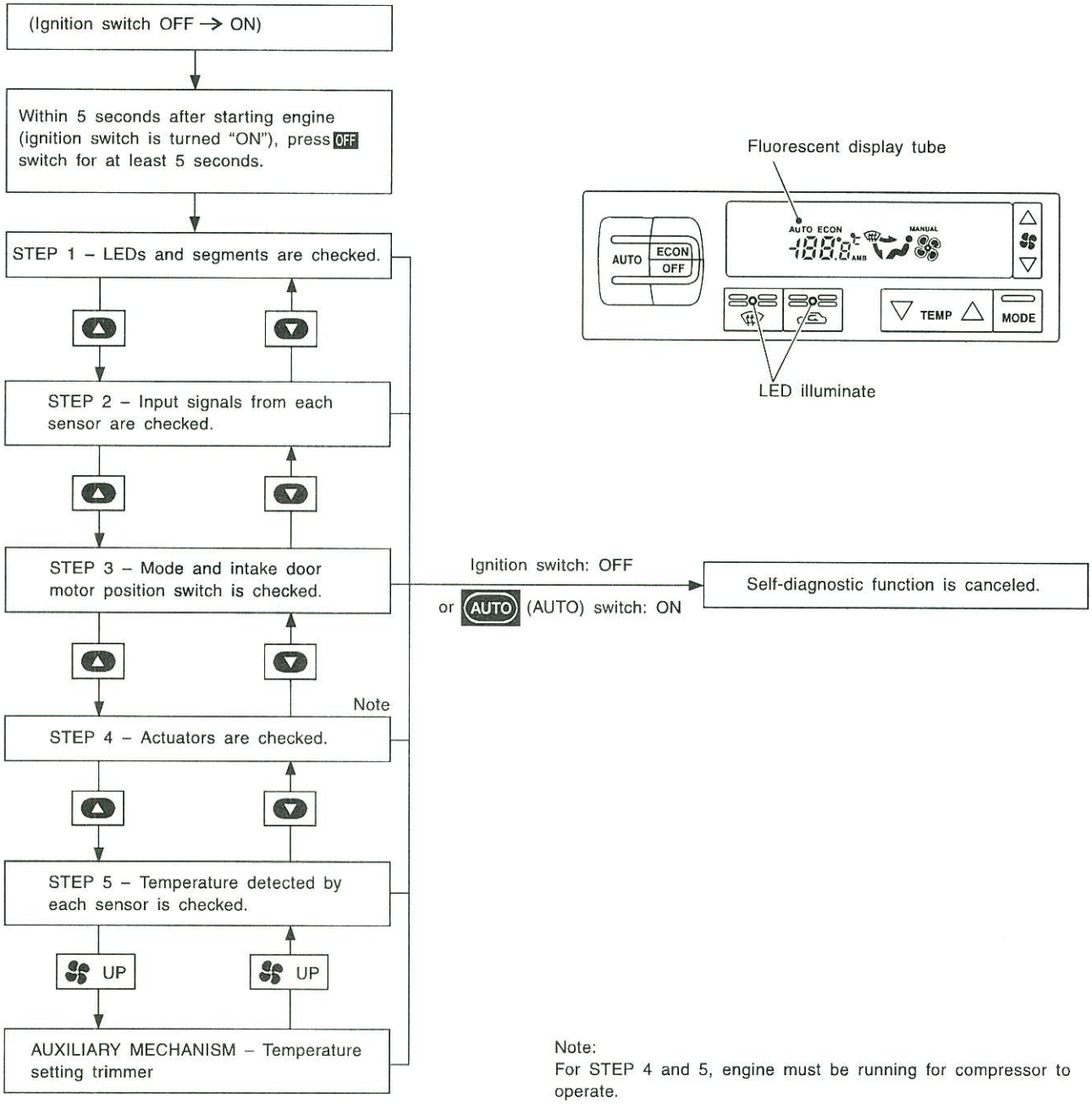
INTRODUCTION AND GENERAL DESCRIPTION

=NBHA0021

NBHA0021S01

The self-diagnostic system diagnoses sensors, door motors, blower motor, etc. by system line. Refer to applicable sections (items) for details. Shifting from normal control to the self-diagnostic system is accomplished by starting the engine (turning the ignition switch from "OFF" to "ON") and pressing " OFF " switch for at least 5 seconds. The " OFF " switch must be pressed within 5 seconds after starting the engine (ignition switch is turned "ON"). This system will be canceled by either pressing AUTO (AUTO) switch or turning the ignition switch "OFF". Shifting from one step to another is accomplished by means of pushing ▲ (HOT) or ▼ (COLD) switch, as required.

Additionally shifting from STEP 5 to AUXILIARY MECHANISM is accomplished by means of pushing ✻ (fan) UP switch.



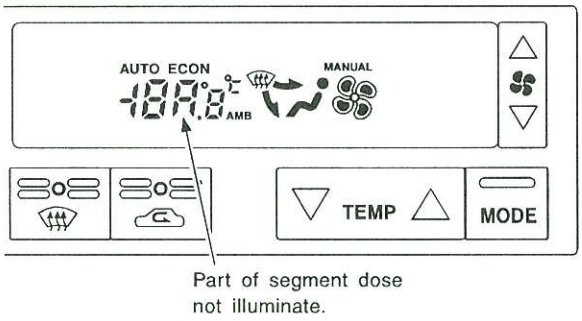
Note:
For STEP 4 and 5, engine must be running for compressor to operate.

RHA453G

STEP-BY-STEP PROCEDURE

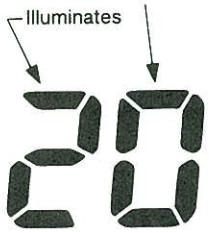
=NBHA0021S02

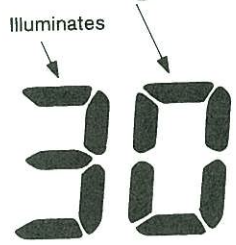
1	SET IN SELF-DIAGNOSTIC MODE
1. Turn ignition switch ON. 2. Set in self-diagnostic mode as follows. Within 5 seconds after starting engine (ignition switch is turned "ON".), press OFF switch for at least 5 seconds.	
▶	GO TO 2.

2	STEP 1 - LEDs AND SEGMENT ARE CHECKED
Do all LEDs and segments illuminate? **Display malfunction**  Part of segment dose not illuminate. RHA454G	
Yes or No	
Yes ▶	GO TO 3.
No ▶	Malfunctioning OFF switch, LED or fluorescent display tube. Replace A/C auto amp.

3	CHECK TO ADVANCE SELF-DIAGNOSIS STEP 2
1. Press ▲ (HOT) switch. 2. Advance to self-diagnosis STEP 2?	
Yes or No	
Yes ▶	GO TO 4.
No ▶	Malfunctioning ▲ (HOT) switch. Replace A/C auto amp.

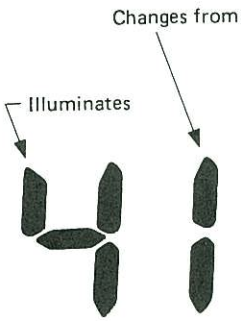
4	CHECK TO RETURN SELF-DIAGNOSIS STEP 1
1. Press ▼ (COLD) switch. 2. Return to self-diagnosis STEP 1?	
Yes or No	
Yes ▶	GO TO 5.
No ▶	Malfunctioning ▼ (COLD) switch. Replace A/C auto amp.

5	STEP 2 - SENSOR CIRCUITS ARE CHECKED FOR OPEN OR SHORT CIRCUIT
Press ▲ (HOT) switch. Does code No. 20 appear on the display? **Display (when all sensors are in good order)** Illuminates 4 seconds after " 2 " is illuminated.  RHA970DA	
Yes or No	
Yes ▶	GO TO 6.
No ▶	GO TO 13.

6	STEP 3 - MODE DOOR AND INTAKE DOOR POSITIONS ARE CHECKED
Press ▲ (HOT) switch. Does code No. 30 appear on the display? **Display (when all doors are in good order)** Illuminates 16 seconds after " 3 " is shown on display.  RHA869DA	
Yes or No	
Yes ▶	GO TO 7.
No ▶	GO TO 14.

7	STEP 4 - OPERATION OF EACH ACTUATOR IS CHECKED

Press ▲ (HOT) switch.
Engine running.
Press DEF switch, code No. of each actuator test is indicated on the display.



RHA495A

▶ GO TO 8.

8	CHECK ACTUATORS

Refer to the following chart and confirm discharge air flow, air temperature, blower motor voltage and compressor operation. **Checks must be made visually, by listening to any noise, or by touching air outlets with your hand, etc. for improper operation.**

Code No.	Actuator test pattern				
	Mode door	Intake door	Air mix door	Blower motor	Compressor
41	VENT	REC	Full Cold	4 - 5V	ON
42	B/L	REC	Full Cold	9 - 11V	ON
43	B/L	20% FRE	Full Hot	7 - 9V	OFF
44	FOOT	FRE	Full Hot	7 - 9V	OFF
45	D/F	FRE	Full Hot	7 - 9V	ON
46	DEF	FRE	Full Hot	10 - 12V	ON

MTBL0200

Discharge air flow

Mode control knob	Air outlet/distribution		
	Face	Foot	Defroster
	100%		
	60%	40%	
		80%	20%
		60%	40%
			100%

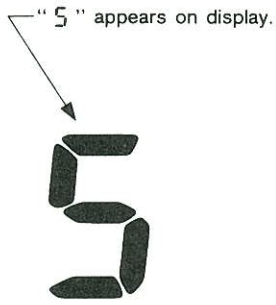
MTBL0044

OK or NG

OK	▶	GO TO 9.
NG	▶	• Air outlet does not change. Go to "Mode Door Motor" (HA-49). • Intake door does not change. Go to "Intake Door Motor" (HA-58). • Blower motor operation is malfunctioning. Go to "Blower Motor" (HA-63). • Magnet clutch does not engage. Go to "Magnet Clutch" (HA-69). • Discharge air temperature does not change. Go to "Air Mix Door Motor" (HA-54).

9	STEP 5 - TEMPERATURE OF EACH SENSOR IS CHECKED

Press ▲ (HOT) switch.
Code No. 5 appears on the display.

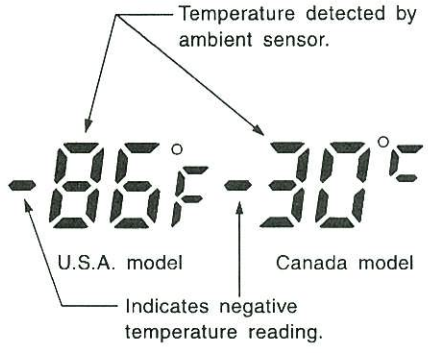


RHA492A

▶	GO TO 10.

10	CHECK AMBIENT SENSOR

Press (DEF) switch one time, temperature detected by ambient sensor is indicated on the display.
ECON shown in display indicates negative temperature reading.
NOTE:
If temperature shown on display greatly differs from actual temperature, check sensor circuit first, then inspect sensor.



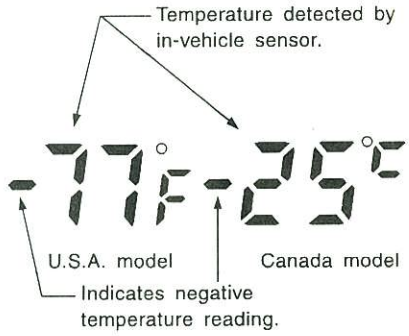
RHA499G

OK or NG

OK	▶	GO TO 11.
NG	▶	Go to Ambient Sensor Circuit (HA-86).

11	CHECK IN-VEHICLE SENSOR

Press (DEF) switch the second time, temperature detected by in-vehicle sensor is indicated on the display screen.
ECON shown in display indicates negative temperature reading.
NOTE:
If temperature shown on display greatly differs from actual temperature, check sensor circuit first, then inspect sensor.



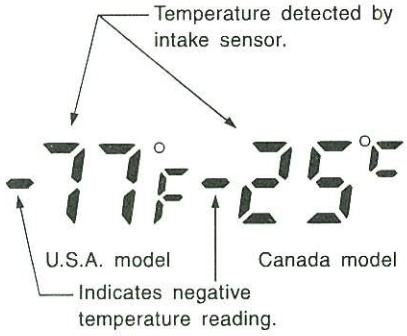
RHA500G

OK or NG

OK	▶	GO TO 12.
NG	▶	Go to In-vehicle Sensor Circuit (HA-89).

12	CHECK INTAKE SENSOR

Press (DEF) switch the third time, temperature detected by intake sensor is indicated on the display.
NOTE:
If temperature shown on display greatly differs from actual temperature, check sensor circuit first, then inspect sensor.



RHA500GB

OK or NG

OK	▶	1. Press (DEF) switch the fourth time. Display returns to original presentation 5. 2. Turn ignition switch OFF or (AUTO) switch ON. 3. END
NG	▶	Go to Intake Sensor Circuit (HA-94).

13 CHECK MALFUNCTIONING SENSOR

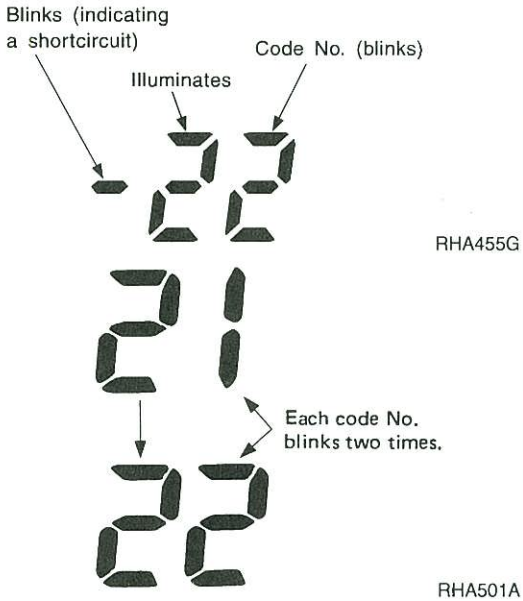
Refer to the following chart for malfunctioning code No.
(If two or more sensors malfunction, corresponding code Nos. blink respectively two times.)

Code No.	Malfunctioning sensor (including circuits)	Reference page
21 -21	Ambient sensor	*2
22 -22	In-vehicle sensor	*3
24 -24	Intake sensor	*4
25 -25	Sunload sensor*1	*5
26 -26	Air mix door motor (LCU) PBR	*6

MTBL0083

***1: Conduct self-diagnosis STEP 2 under sunshine.**
When conducting indoors, aim a light (more than 60W) at sunload sensor, otherwise Code No. 25 will indicate despite that sunload sensor is functioning properly.
*2: HA-86
*3: HA-89
*4: HA-94
*5: HA-91
*6: HA-96

Display (when sensor malfunctions)



RHA455G

RHA501A

▶ INSPECTION END

14 CHECK MALFUNCTIONING DOOR MOTOR POSITION SWITCH

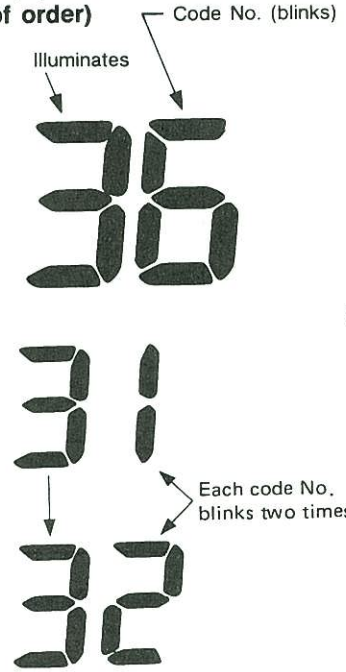
Mode or (and) intake door motor position switch(es) is (are) malfunctioning.
(If two or more mode or intake doors are out of order, corresponding code numbers blink respectively two times.)

Code No. *1 *2	Mode or intake door position		Reference page
31	VENT	Mode door motor	*3
32	B/L		
34	FOOT		
35	D/F		
36	DEF		
37	REC	Intake door motor	*4
38	20% FRE		
39	FRE		

MTBL0201

*1: If mode door motor harness connector is disconnected, the following display pattern will appear.
31 → 32 → 34 → 35 → 36 → Return to 31
*2: If intake door motor harness connector is disconnected, the following display pattern will appear.
37 → 38 → 39 → Return to 37
*3: HA-49
*4: HA-58

Display (when a door is out of order)



RHA168DA

RHA498A

▶ INSPECTION END

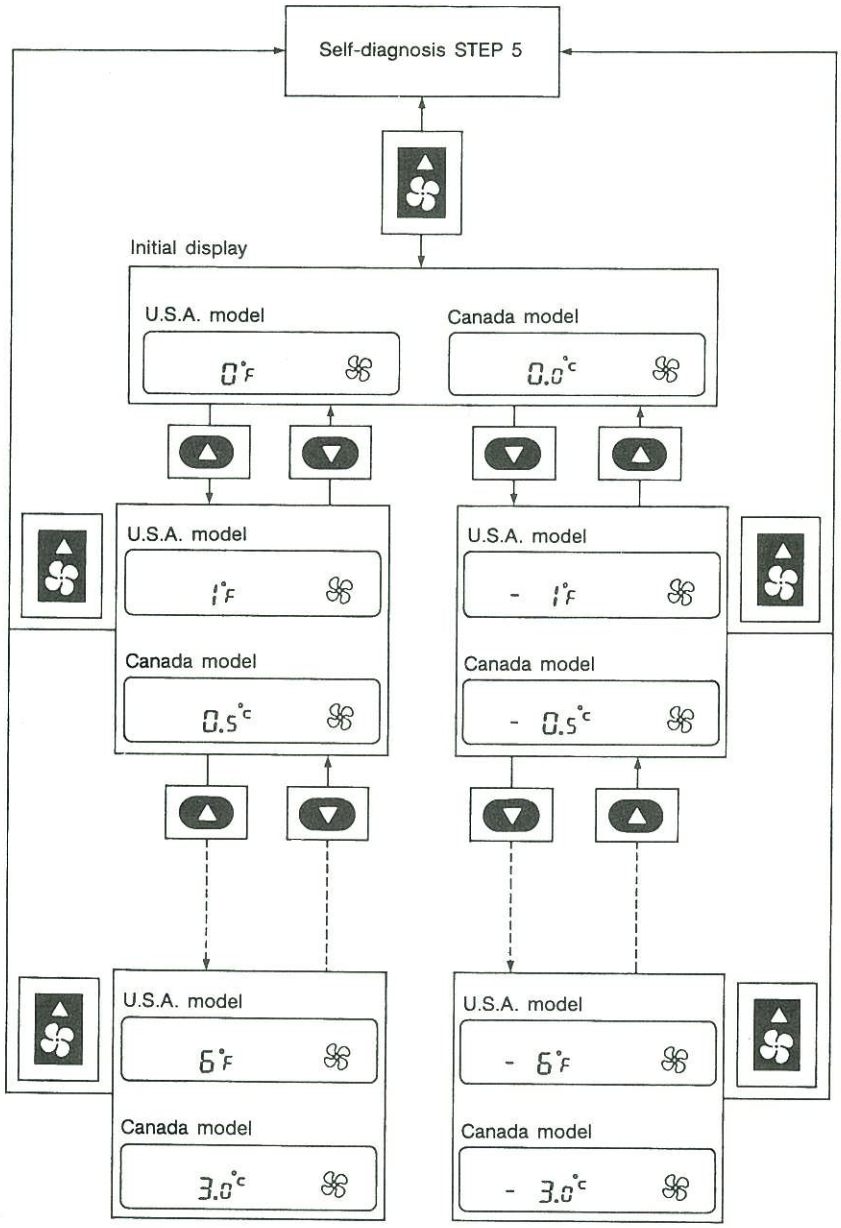
AUXILIARY MECHANISM: TEMPERATURE SETTING TRIMMER

=NBHA0021S03

The trimmer compensates for differences in range of ±3°C (±6°F) between temperature setting (displayed digitally) and temperature felt by driver.

Operating procedures for this trimmer are as follows:

- Begin Self-diagnosis STEP 5 mode.
- Press ❀ (fan) UP switch to set system in auxiliary mode.
- Display shows "61" in auxiliary mechanism.
  It takes approximately 3 seconds.
- Press either ▲ (HOT) or ▼ (COLD) switch as desired. Temperature will change at a rate of 0.5°C (1°F) each time a switch is pressed.



SHA197E

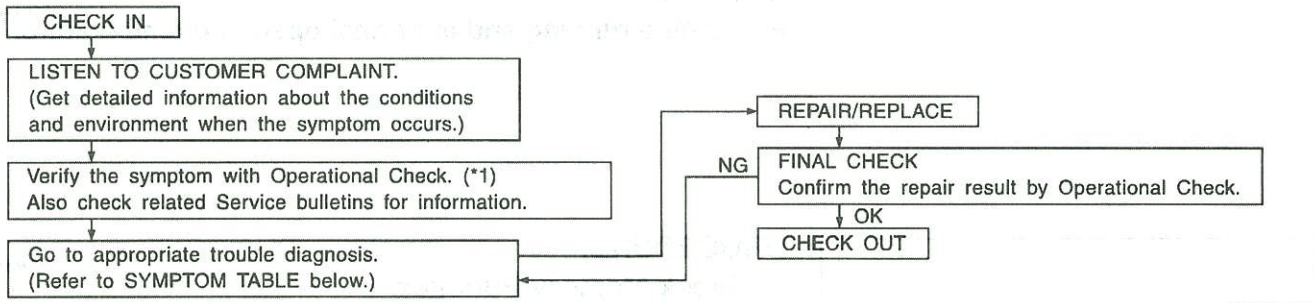
When battery cable is disconnected, trimmer operation is canceled. Temperature set becomes that of initial condition, i.e. 0°C (0°F).

How to Perform Trouble Diagnoses for Quick and Accurate Repair

=NBHA0018

WORK FLOW

NBHA0018S01



SHA900E

*1: Operational Check (HA-44)

SYMPTOM TABLE

NBHA0018S02

Symptom	Reference Page	
• A/C system does not come on.	• Go to Trouble Diagnosis Procedure for A/C system.	HA-47
• Air outlet does not change. • Mode door motor does not operate normally.	• Go to Trouble Diagnosis Procedure for Mode Door Motor. (LAN)	HA-49
• Discharge air temperature does not change. • Air mix door motor does not operate normally.	• Go to Trouble Diagnosis Procedure for Air Mix Door Motor. (LAN)	HA-54
• Intake door does not change. • Intake door motor does not operate normally.	• Go to Trouble Diagnosis Procedure for Intake Door Motor.	HA-58
• Blower motor operation is malfunctioning. • Blower motor operation is malfunctioning under out of starting fan speed control.	• Go to Trouble Diagnosis Procedure for Blower Motor.	HA-63
• Magnet clutch does not engage.	• Go to Trouble Diagnosis Procedure for Magnet Clutch.	HA-69
• Insufficient cooling.	• Go to Trouble Diagnosis Procedure for Insufficient Cooling.	HA-74
• Insufficient heating.	• Go to Trouble Diagnosis Procedure for Insufficient Heating.	HA-82
• Noise.	• Go to Trouble Diagnosis Procedure for Noise.	HA-83
• Self-diagnosis can not be performed.	• Go to Trouble Diagnosis Procedure for Self-diagnosis.	HA-84
• Memory function does not operate.	• Go to Trouble Diagnosis Procedure for Memory Function.	HA-85
• ECON mode does not operate.	• Go to Trouble Diagnosis Procedure for ECON (ECONOMY) — mode.	HA-86

Operational Check

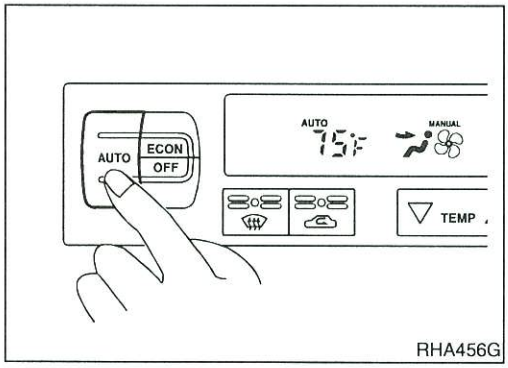
NBHA0019

The purpose of the operational check is to confirm that the system operates properly.

CONDITIONS:

NBHA0019S01

- **Engine running and at normal operating temperature.**



RHA456G

PROCEDURE:

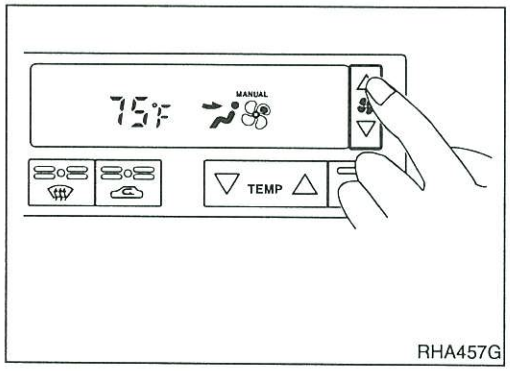
NBHA0019S02

1. Check Memory Function

NBHA0019S0201

1. Set the temperature 75°F or 25°C.
2. Press OFF switch.
3. Turn the ignition off.
4. Turn the ignition on.
5. Press the AUTO switch.
6. Confirm that the set temperature remains at previous temperature.
7. Press OFF switch.

If NG, go to trouble diagnosis procedure for memory function (HA-85).
If OK, continue with next check.



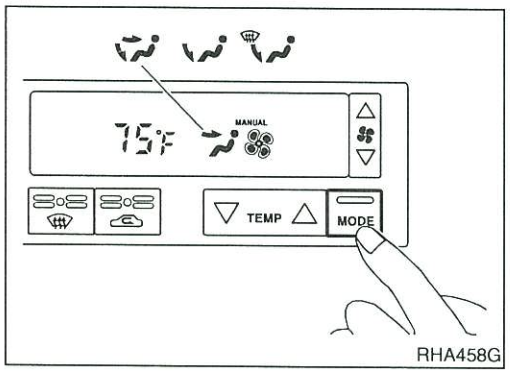
RHA457G

2. Check Blower

NBHA0019S0202

1. Press fan switch (up side) one time.
   Blower should operate on low speed.
   The fan symbol should have one blade lit .
2. Press fan switch (up side) one more time, and continue checking blower speed and fan symbol until all speeds are checked.
3. Leave blower on MAX speed .

If NG, go to trouble diagnosis procedure for blower motor (HA-63).
If OK, continue with next check.



RHA458G

3. Check Discharge Air

NBHA0019S0203

1. Press mode switch four times and DEF button.
2. Each position indicator should change shape.

Discharge air flow

Mode control knob	Air outlet/distribution		
	Face	Foot	Defroster
	100%	–	–
	60%	40%	–
	–	80%	20%
	–	60%	40%
	–	–	100%

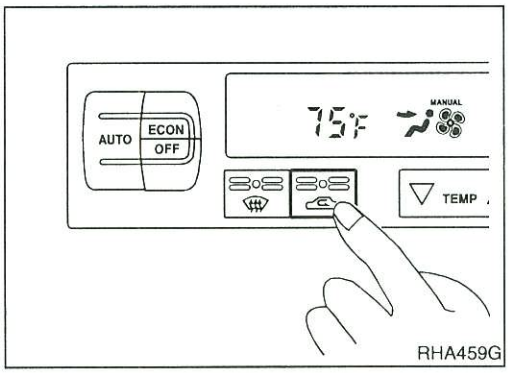
RHA654F

3. Confirm that discharge air comes out according to the air distribution table at left.
   Refer to "Discharge Air Flow" (HA-26).

NOTE:

Confirm that the compressor clutch is engaged (visual inspection) and intake door position is at FRESH when the DEF is selected.

Intake door position is checked in the next step.
If NG, go to trouble diagnosis procedure for mode door motor (HA-49).
If OK, continue with next check.



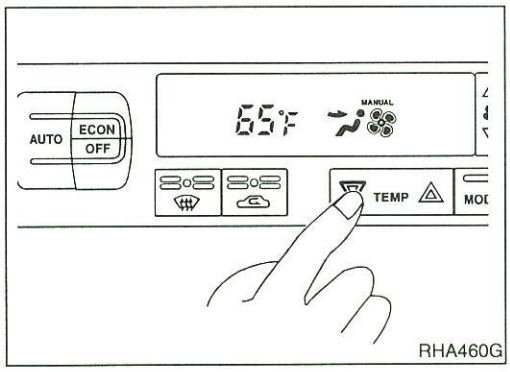
RHA459G

4. Check Recirculation

NBHA0019S0204

1. Press REC switch.
   Recirculation indicator should illuminate.
2. Listen for intake door position change (you should hear blower sound change slightly).

If NG, go to trouble diagnosis procedure for intake door (HA-58).
If OK, continue with next check.



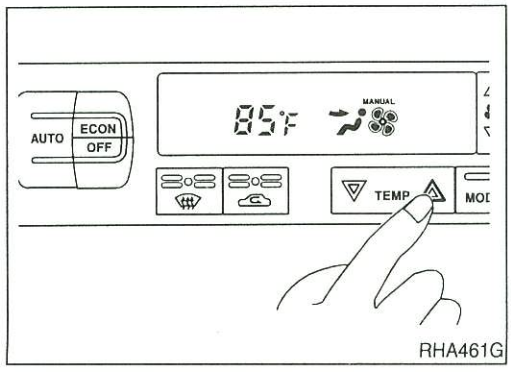
RHA460G

5. Check Temperature Decrease

NBHA0019S0205

1. Press the temperature decrease button until 18°C (65°F) is displayed.
2. Check for cold air at discharge air outlets.

If NG, go to trouble diagnosis procedure for insufficient cooling (HA-74).
If OK, continue with next check.



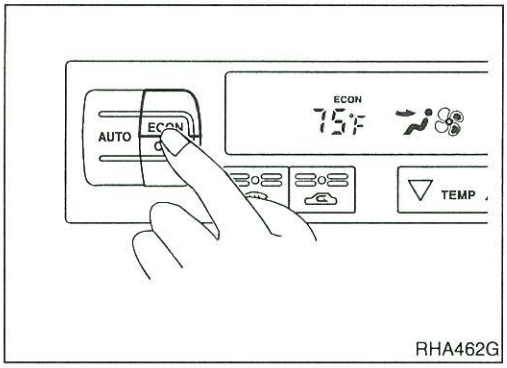
RHA461G

6. Check Temperature Increase

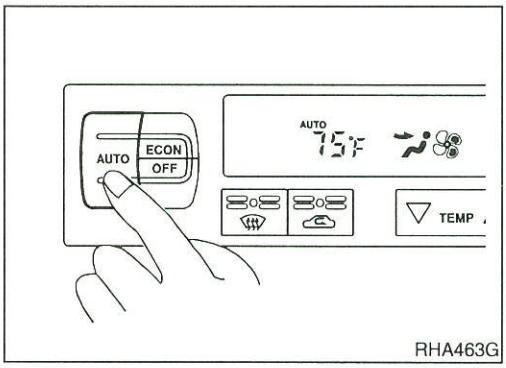
NBHA0019S0206

1. Press the temperature increase button until 32°C (85°F) is displayed.
2. Check for hot air at discharge air outlets.

If NG, go to trouble diagnosis procedure for insufficient heating (HA-82).
If OK, continue with next check.



RHA462G



RHA463G

7. Check ECON (Economy) Mode

NBHA0019S0207

1. Set the temperature 75°F or 25°C.
2. Press ECON switch.
3. Display should indicate ECON (no AUTO).
   Confirm that the compressor clutch is not engaged (visual inspection).
   (Discharge air and blower speed will depend on ambient, in-vehicle and set temperatures.)

If NG, go to trouble diagnosis procedure for ECON (Economy) mode (HA-86).
If OK, continue with next check.

8. Check AUTO Mode

NBHA0019S0208

1. Press AUTO switch.
2. Display should indicate AUTO (no ECON).
   Confirm that the compressor clutch engages (audio or visual inspection).
   (Discharge air and blower speed will depend on ambient, in-vehicle and set temperatures.)

If NG, go to trouble diagnosis procedure for A/C system (HA-47), then if necessary, trouble diagnosis procedure for magnet clutch (HA-69).

If all operational check are OK (symptom can not be duplicated), go to "Incident Simulation Tests" (GI section) and perform tests as outlined to simulate driving conditions environment. If symptom appears, refer to "Symptom Table" (HA-43) and perform applicable trouble diagnosis procedures.

A/C System

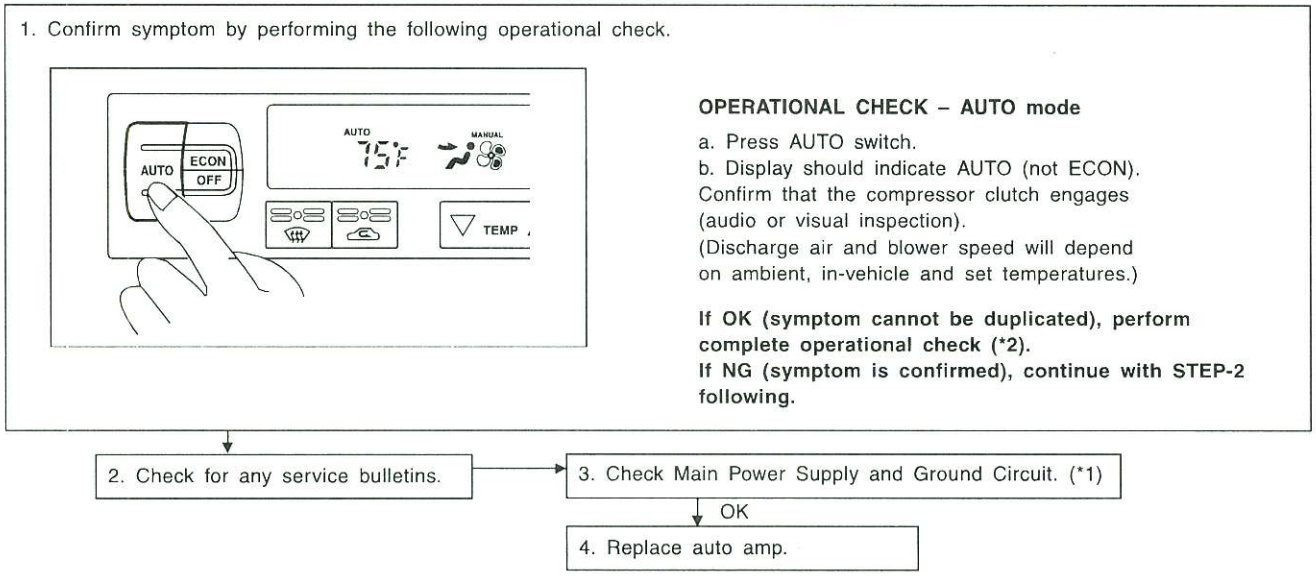
TROUBLE DIAGNOSIS PROCEDURE FOR A/C SYSTEM

=NBHA0089

SYMPTOM:

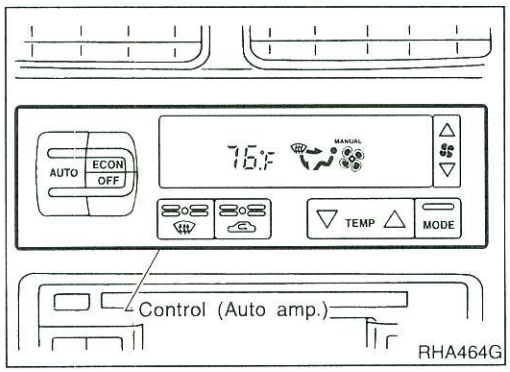
- **A/C system does not come on.**

INSPECTION FLOW



SHA888EB

*1: HA-47 *2: HA-44



MAIN POWER SUPPLY AND GROUND CIRCUIT CHECK

NBHA0037

Component Description

NBHA0037S01

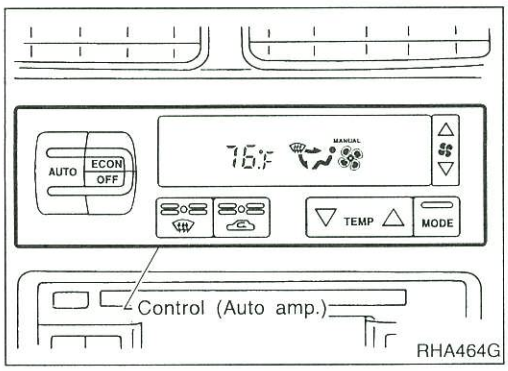
Automatic Amplifier (Auto Amp.)

NBHA0037S0101

The auto amplifier has a built-in microcomputer which processes information sent from various sensors needed for air conditioner operation. The air mix door motor, mode door motor, intake door motor, blower motor and compressor are then controlled.

The auto amplifier is unitized with control mechanisms. Signals from various switches and Potentio Temperature Control (PTC) are directly entered into auto amplifier.

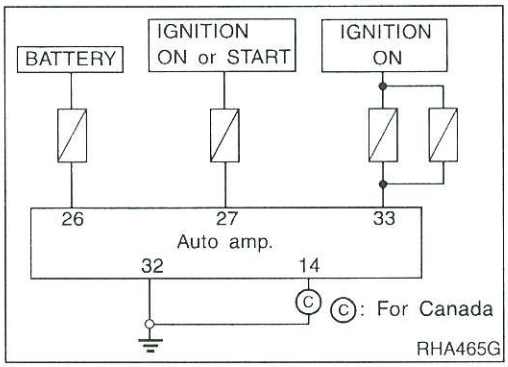
Self-diagnostic functions are also built into auto amplifier to provide quick check of malfunctions in the auto air conditioner system.



Potentio Temperature Control (PTC)

NBHA0037S0102

The PTC is built into the A/C auto amp. It can be set at an interval of 0.5°C (1.0°F) in the 18°C (65°F) to 32°C (85°F) temperature range by pushing the temperature button. The set temperature is digitally displayed.

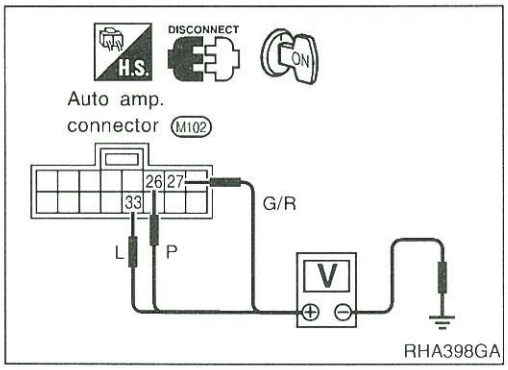


DIAGNOSTIC PROCEDURE

NBHA0107

SYMPTOM:

- **A/C system does not come on.**

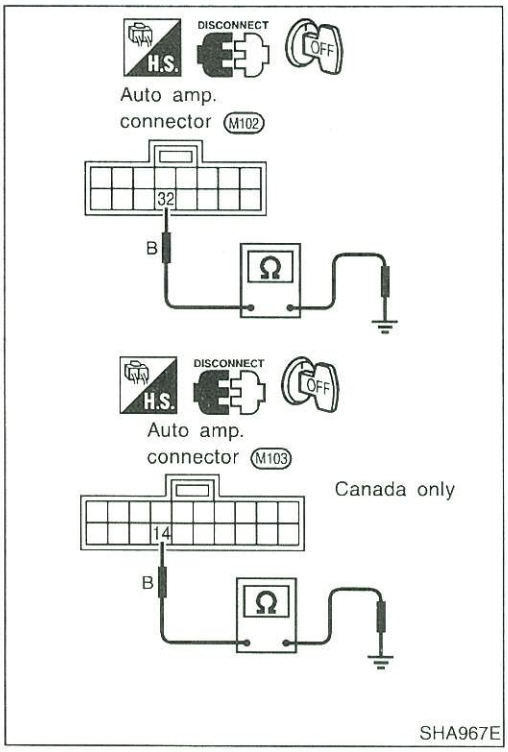


Auto Amp. Check

NBHA0107S02

Check power supply circuit for auto amp. with ignition switch ON. Measure voltage across terminal Nos. 26, 27, 33 and body ground.

Voltmeter terminal		Voltage
(+)	(−)	
26	Body ground	Approx. 12V
27		
33		



Check body ground circuit for auto amp. with ignition switch OFF. Check for continuity between terminal Nos. 32, 14 and body ground.

Ohmmeter terminal		Continuity
(+)	(−)	
32	Body ground	Yes
14 (Canada only)		

If OK, check auto amp. ground circuit, see below.

- If NG, check 7.5A fuses (No. 11 and 24, located in the fuse block) and 15A fuses (No. 1 and 2, located in the fuse block).
- If fuses are OK, check for open circuit in wiring harness. Repair or replace as necessary.
- If fuses are NG, replace fuse and check wiring harness for short circuit. Repair or replace as necessary.

NOTE:

If OK, replace auto amp.
If NG, repair or replace harness.

Mode Door Motor

TROUBLE DIAGNOSIS PROCEDURE FOR MODE DOOR MOTOR (LAN)

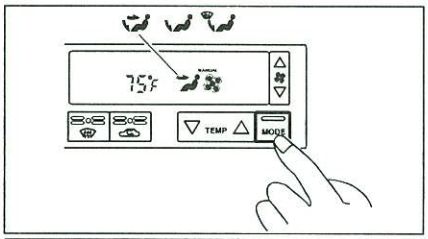
=NBHA0090

SYMPTOM:

- **Air outlet does not change.**
- **Mode door motor does not operate normally.**

INSPECTION FLOW

1. Confirm symptom by performing the following operational check.



OPERATIONAL CHECK – Discharge air

a. Press mode switch four times and DEF button.
b. Each position indicator should change shape.

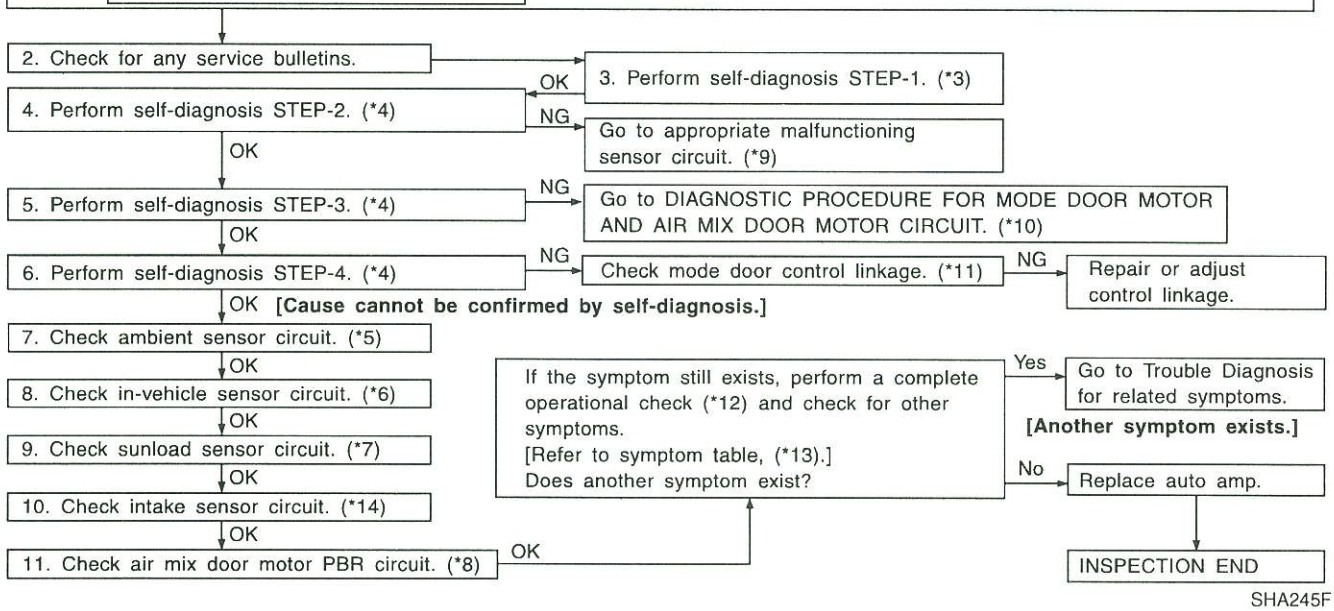
Discharge air flow

Mode control knob	Air outlet/distribution		
	Face	Foot	Defroster
	100%	–	–
	60%	40%	–
	–	80%	20%
	–	60%	40%
	–	–	100%

c. Confirm that discharge air comes out according to the air distribution table at left.
Refer to "Discharge Air Flow" (*1).

NOTE:

- **If OK (symptom cannot be duplicated), perform complete operational check (*2).**
  If NG (symptom is confirmed), continue with STEP-2 following.
- **Confirm that the compressor clutch is engaged (visual inspection) and intake door position is at FRESH when DEF is selected.**
  Intake door position is checked in the next step.



SHA245F

*1: HA-26
*2: HA-44
*3: HA-37
*4: HA-38
*5: HA-86
*6: HA-89
*7: HA-91
*8: HA-96
*9: STEP-BY-STEP PROCEDURE (HA-38), see No. 13.
*10: HA-51
*11: HA-53
*12: HA-44
*13: HA-43
*14: HA-94

SYSTEM DESCRIPTION

=NBHA0052

Component Parts

NBHA0052S01

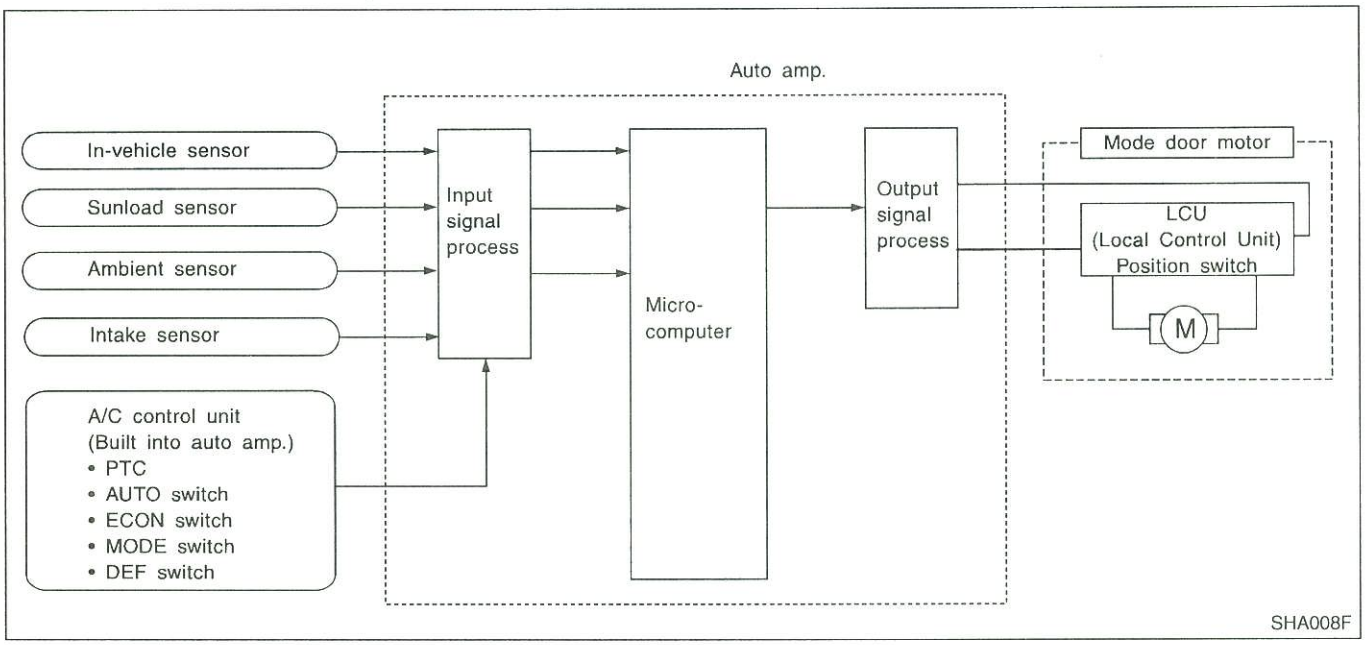
Mode door control system components are:

1) Auto amp.
2) Mode door motor (LCU)
3) In-vehicle sensor
4) Ambient sensor
5) Sunload sensor
6) Intake sensor

System Operation

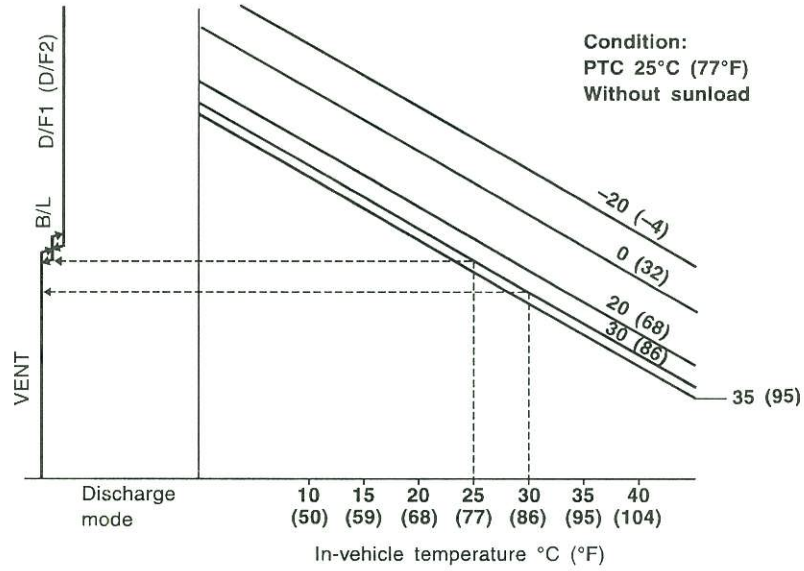
NBHA0052S02

The auto amplifier receives data from each of the sensors. The amplifier sends air mix door and mode door opening angle data to the air mix door motor LCU and mode door motor LCU.
The air mix door motor and mode door motor read their respective signals according to the address signal. Opening angle indication signals received from the auto amplifier and each of the motor position sensors are compared by the LCUs in each motor with the existing decision and opening angles. Subsequently, HOT/COLD or DEFROST/VENT operation is selected. The new selection data is returned to the auto amplifier.



Mode Door Control Specification

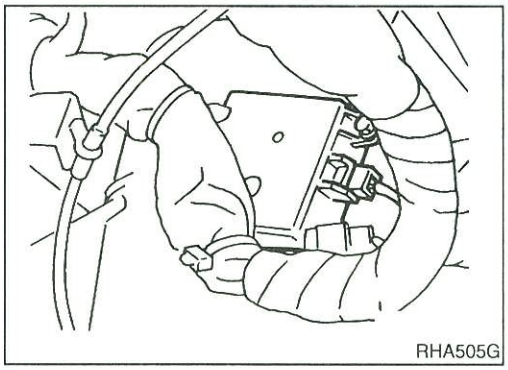
NBHA0052S03



Example:

- Mode door is automatically set in VENT position under the following no sunload conditions:
  1) Temperature set at 25°C (77°F)
  2) Ambient and in-vehicle temperatures are 30°C (86°F).
- Then in-vehicle temperature will lower. When target temperature of 25°C (77°F) is reached, mode door will shift from VENT to B/L position.

RHA135G

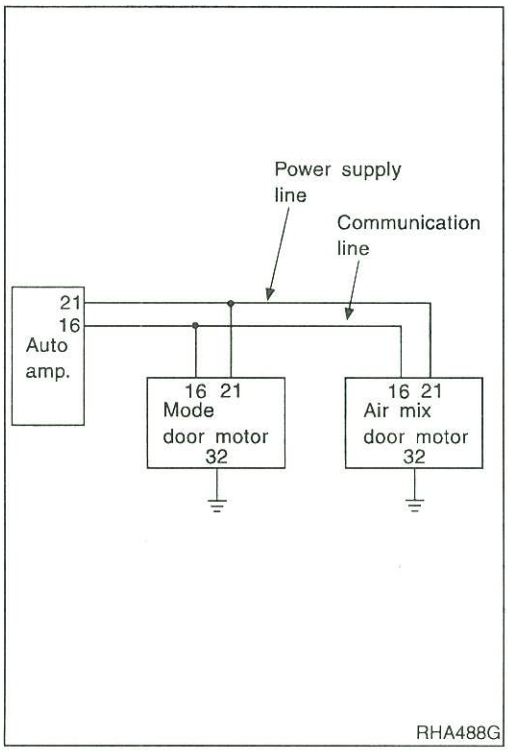


RHA505G

COMPONENT DESCRIPTION

NBHA0053

The mode door motor is attached to the heater unit. It rotates so that air is discharged from the outlet set by the auto amplifier. Motor rotation is conveyed to a link which activates the mode door.



RHA488G

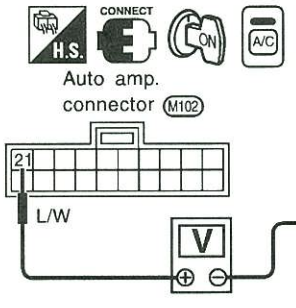
DIAGNOSTIC PROCEDURE FOR MODE DOOR MOTOR AND AIR MIX DOOR MOTOR CIRCUIT

NBHA0104

SYMPTOM: Mode door motor and/or air mix door motor does not operate normally.

1	CHECK POWER SUPPLY FOR AUTO AMP. (LCU) SIDE

Do approx. 12 volts exist between auto amp. (LCU) harness terminal No. 21 and body ground?



SHA966E

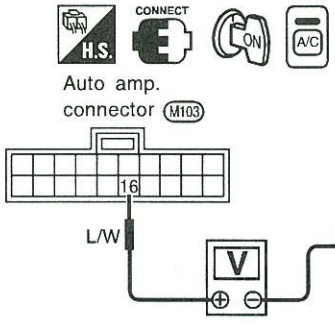
NOTE:
If the result is NG or No after checking circuit continuity, repair harness or connector.

Yes or No

Yes	▶	GO TO 2.
No	▶	Replace auto amp. (LCU).

2	CHECK SIGNAL FOR AUTO AMP. (LCU) SIDE

Do approx. 5.5 volts exist between auto amp. (LCU) terminal No. 16 and body ground?



SHA965E

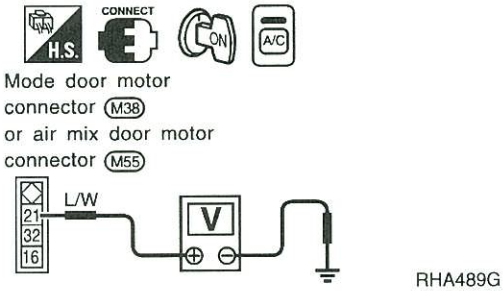
NOTE:
If the result is NG or No after checking circuit continuity, repair harness or connector.

Yes or No

Yes	▶	GO TO 3.
No	▶	Replace auto amp. (LCU).

3	CHECK POWER SUPPLY FOR MOTOR SIDE

Do approx. 12 volts exist between door motor (LCU) harness terminal No. 21 and body ground?



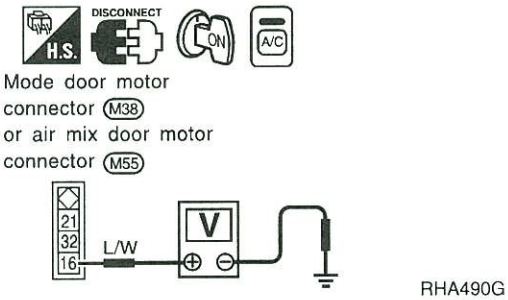
RHA489G

Yes or No

Yes	▶	GO TO 4.
No	▶	Repair harness or connector.

4	CHECK SIGNAL FOR MOTOR SIDE

Do approx. 5.5 volts exist between door motor (LCU) terminal No. 16 and body ground?



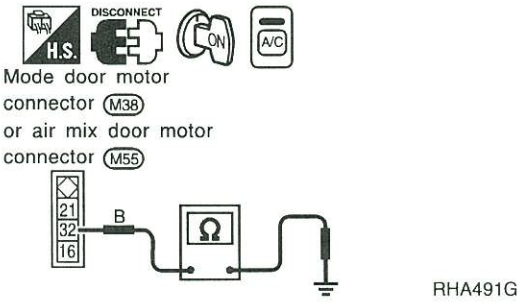
RHA490G

Yes or No

Yes	▶	GO TO 5.
No	▶	Repair harness or connector.

5	CHECK MOTOR GROUND CIRCUIT

Does continuity exist between door motor (LCU) harness terminal No. 32 and body ground?



RHA491G

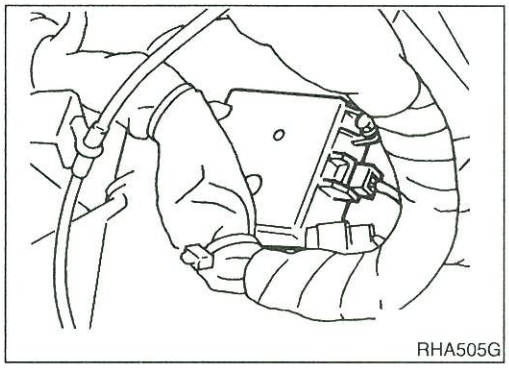
Yes or No

Yes	▶	GO TO 6.
No	▶	Repair harness or connector.

6	CHECK MOTOR OPERATION
Disconnect and reconnect the motor connector and confirm the motor operation.	
OK or NG	
OK (Return to operate normally) ▶	Poor contacting the motor connector
NG (Does not operate normally) ▶	GO TO 7.

7	CHECK MODE DOOR MOTOR OPERATION
1. Disconnect the mode door motor and air mix door motor connector. 2. Reconnect the mode door motor and confirm the motor operation.	
OK or NG	
OK (Mode door motor operates normally) ▶	Replace the air mix door motor.
NG (Mode door motor does not operate normally) ▶	GO TO 8.

8	CHECK AIR MIX DOOR MOTOR OPERATION
1. Disconnect the mode door motor connector. 2. Reconnect the air mix door motor and confirm the air mix door motor operation.	
OK or NG	
OK (Air mix door motor operates normally) ▶	Replace mode door motor.
NG (Air mix door motor does not operate normally) ▶	Replace auto amp.



RHA505G

CONTROL LINKAGE ADJUSTMENT

NBHA0091

Mode Door

NBHA0091S01

1. Install mode door motor on heater unit and connect it to main harness.
2. Set up code No. in Self-diagnosis STEP 4. Refer to HA-38.
3. Move side link by hand and hold mode door in DEF mode.
4. Attach mode door motor rod to side link rod holder.
5. Make sure mode door operates properly when changing from code No. 41 to 46 by pushing DEF switch.

41	42	43	44	45	46
VENT	B/L	B/L	FOOT	D/F	DEF

Air Mix Door Motor

TROUBLE DIAGNOSIS PROCEDURE FOR AIR MIX DOOR (LAN)

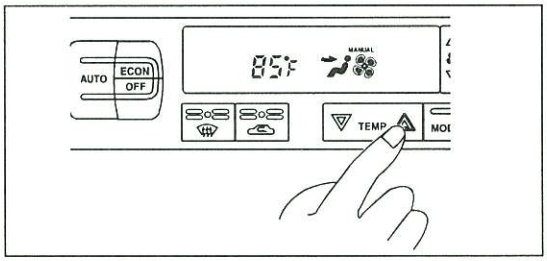
=NBHA0098

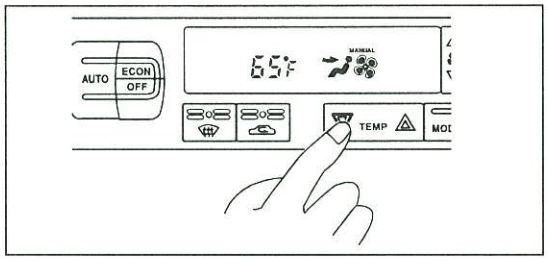
SYMPTOM:

- **Discharge air temperature does not change.**
- **Air mix door motor does not operate.**

INSPECTION FLOW

1. Confirm symptom by performing the following operational check.





OPERATIONAL CHECK

Temperature increase

a. Press the temperature increase button until 32°C (85°F) is displayed.
b. Check for hot air at discharge air outlets.

Temperature decrease

a. Press the temperature decrease button until 18°C (65°F) is displayed.
b. Check for cold air at discharge air outlets.

If OK (symptom cannot be duplicated), perform complete operational check (*10).
If NG (symptom is confirmed), continue with STEP-2 following.

2. Check for any service bulletins.

3. Perform self-diagnosis STEP-1. (*1)

OK

4. Perform self-diagnosis STEP-2. (*15)

NG → Go to appropriate malfunctioning sensor circuit. (*6)

OK

5. Perform self-diagnosis STEP-4. (*15)

NG → Go to DIAGNOSTIC PROCEDURE FOR MODE DOOR MOTOR AND AIR MIX DOOR MOTOR CIRCUIT. (*7)

OK

NG → Check air mix door control linkage. (*8)

NG → Repair or adjust control linkage. (*9)

OK **[Cause cannot be confirmed by self-diagnosis.]**

6. Check ambient sensor circuit. (*2)

OK

7. Check in-vehicle sensor circuit. (*3)

OK

8. Check sunload sensor circuit. (*4)

OK

9. Check intake sensor circuit. (*14)

OK

10. Check air mix door motor PBR circuit. (*5)

OK

If the symptom still exists, perform a complete operational check (*12) and check for other symptoms. [Refer to symptom table, (*13).] Does another symptom exist?

Yes → Go to Trouble Diagnosis for related symptom.

Another symptom exists.

No

Replace auto amp. → INSPECTION END

SHA246F

*1: HA-37
*2: HA-86
*3: HA-89
*4: HA-91
*5: HA-96
*6: STEP-BY-STEP PROCEDURE (HA-38), see No. 13.
*7: HA-51
*8: HA-56
*9: HA-56
*10: HA-44
*12: HA-44
*13: HA-43
*14: HA-94
*15: HA-38

SYSTEM DESCRIPTION

Component Parts

=NBHA0059

NBHA0059S01

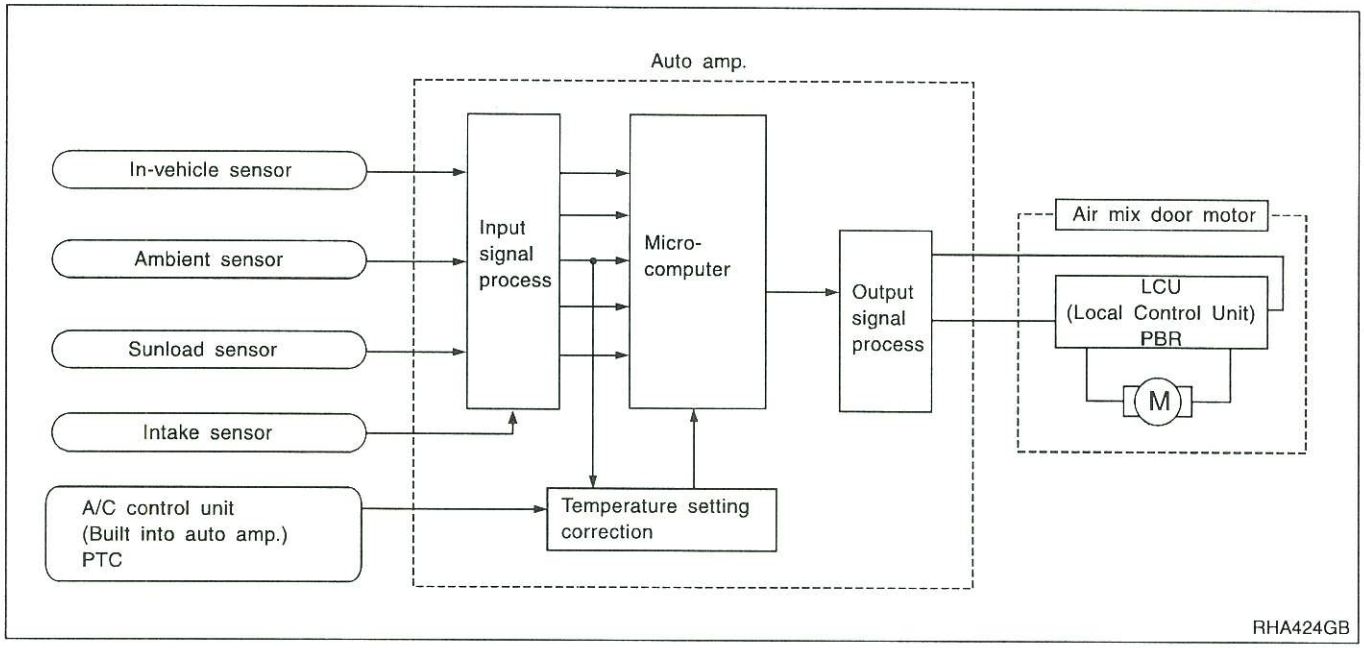
Air mix door control system components are:

1) Auto amp.
2) Air mix door motor (LCU)
3) In-vehicle sensor
4) Ambient sensor
5) Sunload sensor
6) Intake sensor

System Operation

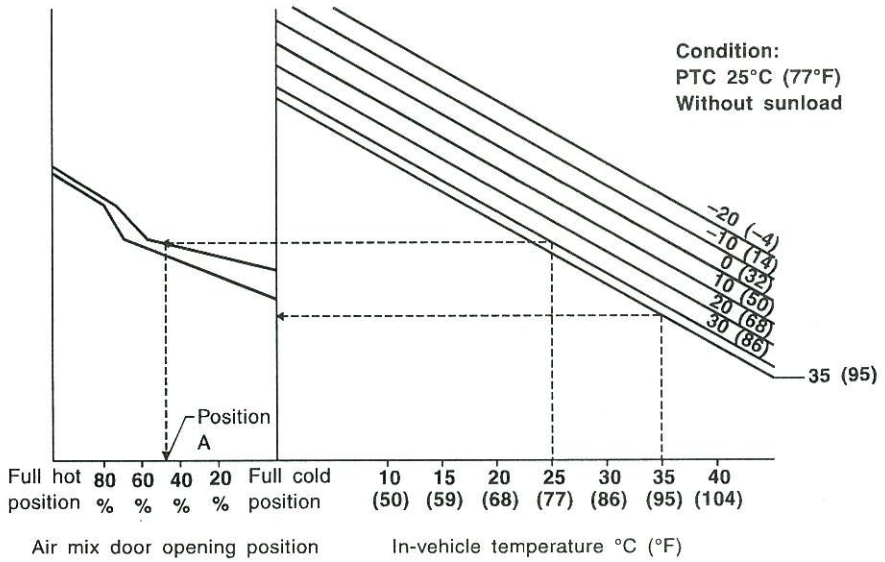
NBHA0059S02

The auto amplifier receives data from each of the sensors. The amplifier sends air mix door and mode door opening angle data to the air mix door motor LCU and mode door motor LCU.
The air mix door motor and mode door motor read their respective signals according to the address signal. Opening angle indication signals received from the auto amplifier and each of the motor position sensors are compared by the LCUs in each motor with the existing decision and opening angles. Subsequently, HOT/COLD or DEFROST/VENT operation is selected. The new selection data is returned to the auto amplifier.



Air Mix Door Control Specification

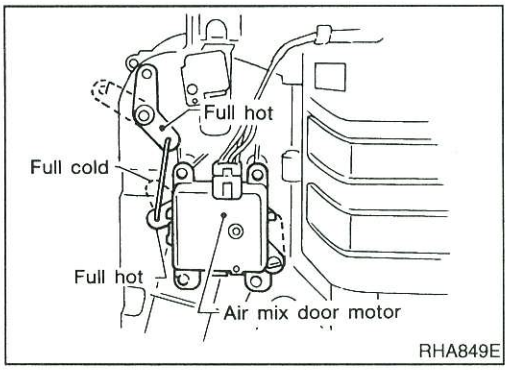
NBHA0059S03



Example:

- Air mix door is initially automatically set in full cold position under the following no sunload conditions:
  1) Temperature set at 25°C (77°F)
  2) Ambient and in-vehicle temperatures are 35°C (95°F).
- Within some period, in-vehicle temperature will lower towards the objective temperature, and the air mix door position will shift gradually towards the cold side and finally stay in this position (A).
  Air mix door opening position is always fed back to auto amp. by PBR built-in air mix door.

RHA137G

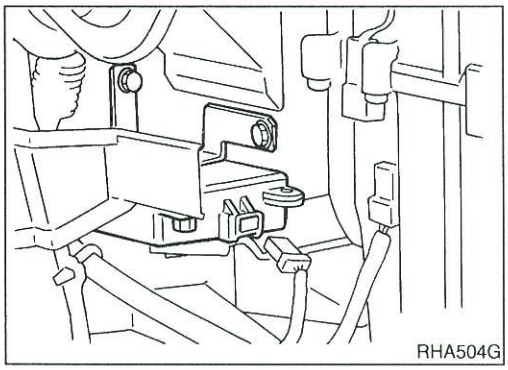


RHA849E

COMPONENT DESCRIPTION

NBHA0060

The air mix door motor is attached to the heater unit. It rotates so that the air mix door is opened or closed to a position set by the auto amplifier. Motor rotation is then conveyed through a shaft and the air mix door position is then fed back to the auto amplifier by PBR built-in air mix door motor.



RHA504G

CONTROL LINKAGE ADJUSTMENT

NBHA0099

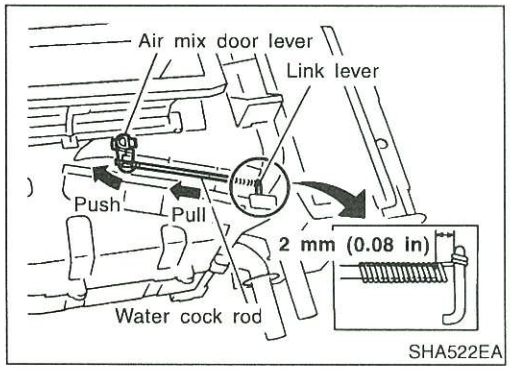
Air Mix Door (Water Cock)

NBHA0099S01

1. Install air mix door motor on heater unit and connect it to main harness.
2. Set up code No. 41 in Self-diagnosis STEP 4. Refer to HA-37.
3. Move air mix door lever by hand and hold it in full cold position.
4. Attach air mix door lever to rod holder.
5. Make sure air mix door operates properly when changing from code No. 41 to 46 by pushing DEF switch.

41	42	43	44	45	46
Full cold		Full hot			

6. Set up code No. 41 in Self-diagnosis STEP 4.
7. Attach water cock rod to air mix door lever and secure with clip.
8. Rotate air mix door lever (CLOCKWISE completely) and hold water cock rod and link lever in the full cold position.
9. Attach water cock rod to link lever and secure with clip (white mark on cable housing should be centered under the retaining clip).



SHA522EA

10. Check that water cock operates properly when changing from code No. 41 to 46 by pushing DEF switch. (After several cycles, water cock lever should be midpoint of plate opening when code No. 41 is set.)

Intake Door Motor

TROUBLE DIAGNOSIS PROCEDURE FOR INTAKE DOOR

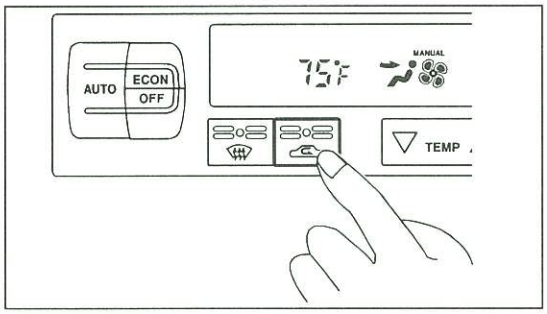
=NBHA0092

SYMPTOM:

- **Intake door does not change.**
- **Intake door motor does not operate normally.**

INSPECTION FLOW

1. Confirm symptom by performing the following operational check.



OPERATIONAL CHECK – Recirculation

a. Press REC switch.
Recirculation indicator should illuminate.
b. Listen for intake door position change (you should hear blower sound change slightly).

If OK (symptom cannot be duplicated), perform complete operational check (*9).
If NG (symptom is confirmed), continue with STEP-2 following.

2. Check for any service bulletins.

3. Perform self-diagnosis STEP-1. (*1)

OK

4. Perform self-diagnosis STEP-2. (*10)

NG → Go to appropriate malfunctioning sensor circuit. (*6)

OK

5. Perform self-diagnosis STEP-4. (*10)

NG → Check intake door control linkage. (*8)

NG → Repair or adjust control linkage.

OK → Go to Intake Door Motor Circuit. (*7)

OK

[Cause cannot be confirmed by self-diagnosis.]

6. Check ambient sensor circuit. (*2)

OK

7. Check in-vehicle sensor circuit. (*3)

OK

8. Check sunload sensor circuit. (*4)

OK

9. Check intake sensor circuit. (*13)

OK

10. Check air mix door motor PBR circuit. (*5)

OK

If the symptom still exists, perform a complete operational check (*11) and check for other symptoms. [Refer to symptom table, (*12).] Does another symptom exist?

No → Replace auto amp. → INSPECTION END

Yes → Follow the instruction in the "system table".

Another symptom exists.

SHA247F

*1: HA-37
*2: HA-86
*3: HA-89
*4: HA-91
*5: HA-96
*6: STEP-BY-STEP PROCEDURE (HA-38), see No. 13.
*7: HA-60
*8: HA-62
*9: HA-44
*10: HA-38
*11: HA-44
*12: HA-43
*13: HA-94

SYSTEM DESCRIPTION

=NBHA0056

Component Parts

NBHA0056S01

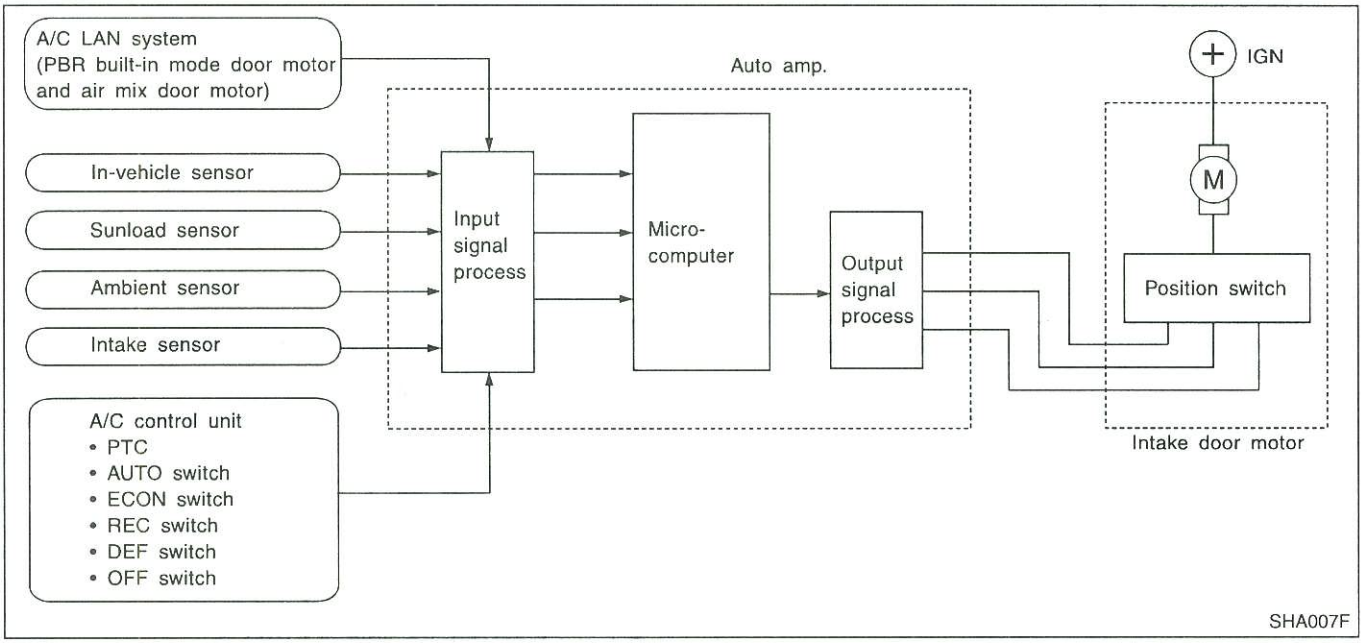
Intake door control system components are:

1) Auto amp.
2) Intake door motor
3) A/C LAN system (PBR built-in mode motor and air mix door motor)
4) In-vehicle sensor
5) Ambient sensor
6) Sunload sensor
7) Intake sensor

System Operation

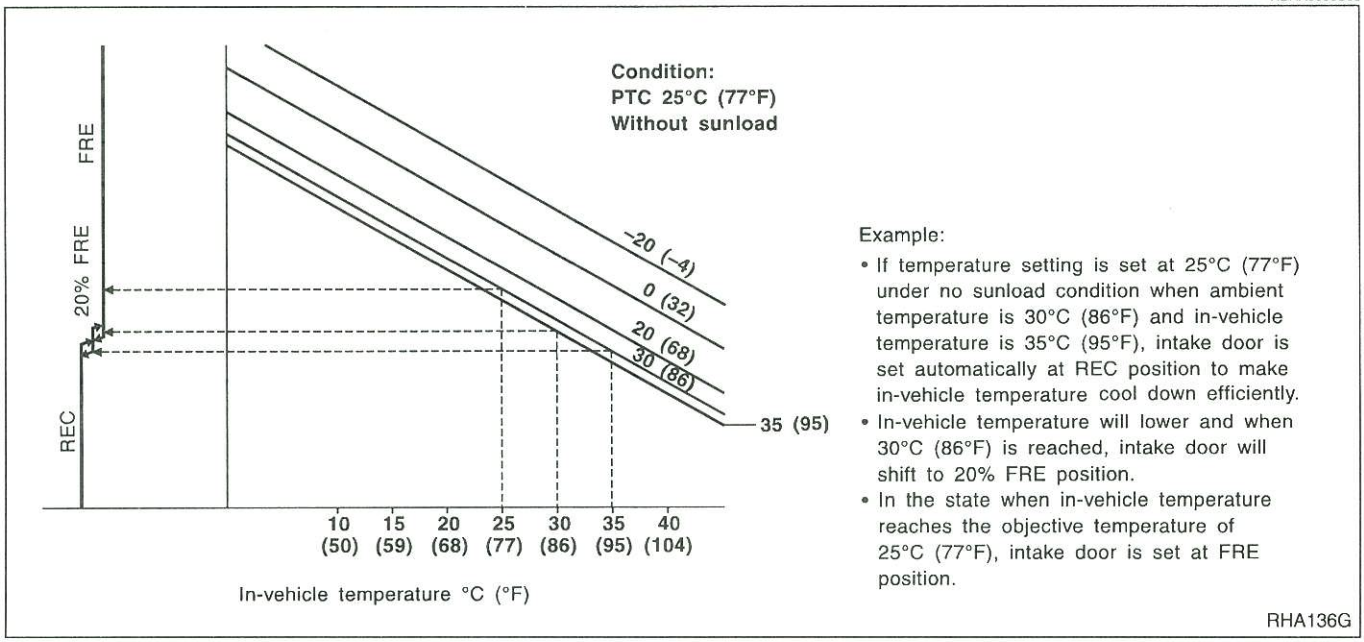
NBHA0056S02

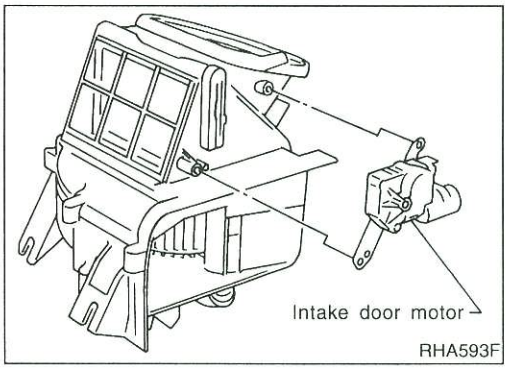
The intake door control determines intake door position based on the ambient temperature, the intake air temperature and the in-vehicle temperature. When the ECON, DEFROST, or OFF switches are pushed, the auto amplifier sets the intake door at the "Fresh" position.



Intake Door Control Specification

NBHA0056S03

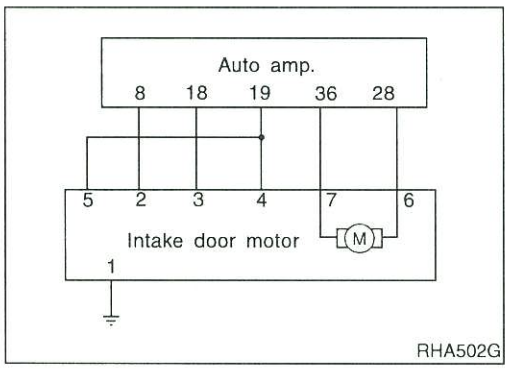




COMPONENT DESCRIPTION

NBHA0057

The intake door motor is attached to the intake unit. It rotates so that air is drawn from inlets set by the auto amplifier. Motor rotation is conveyed to a lever which activates the intake door.



DIAGNOSTIC PROCEDURE

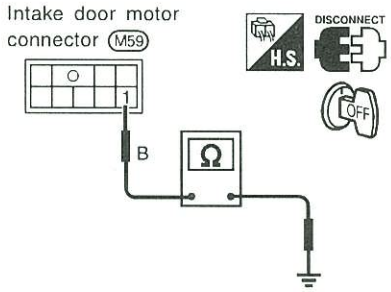
NBHA0058

SYMPTOM: Intake door motor does not operate normally.

- **Perform Self-diagnosis STEPS 1 before referring to the flow chart.**

1	CHECK BODY GROUND CIRCUIT FOR INTAKE DOOR MOTOR

Does continuity exist between intake door harness terminal No. 1 and body ground?

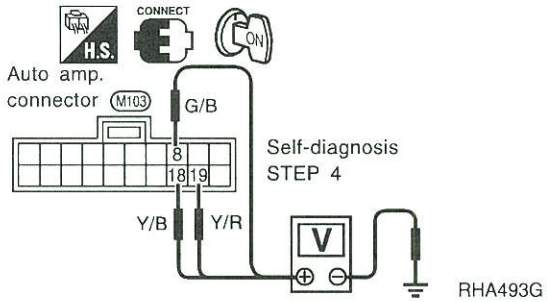


Yes or No

Yes	▶	GO TO 2.
No	▶	Repair harness or connector.

2	CHECK FOR AUTO AMP. OUTPUT

Set up Self-diagnosis STEP 4.
Measure voltage across auto amp. harness terminals and body ground.



Code No.	Terminals No. (+)	Terminals No. (−)	Condition	Voltage V
41	8	Body ground	REC	5
42	18 or 19			0
43	19		20% FRE	5
	8 or 18			0
44 45 46	18		FRE	5
	8 or 19			0

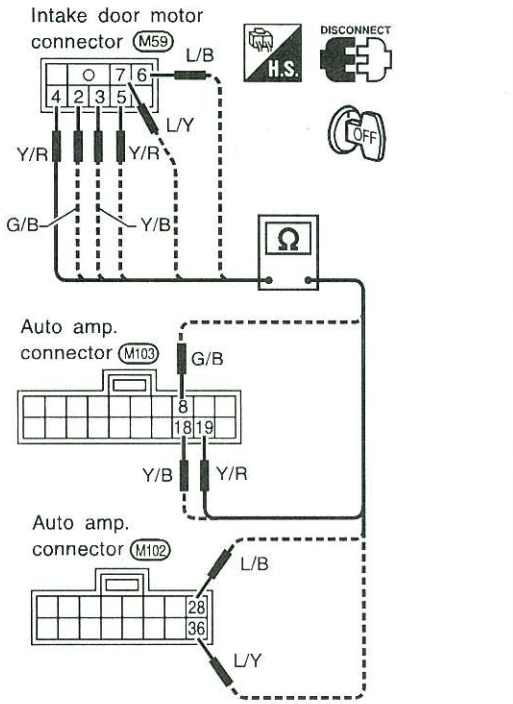
0V: Approx. 0V
5V: Approx. 5V

MTBL0076

OK or NG

OK	▶	INSPECTION END
NG	▶	GO TO 3.

3	CHECK CIRCUIT CONTINUITY BETWEEN EACH TERMINAL ON AUTO AMP. AND ON INTAKE DOOR MOTOR



RHA494G

Terminal No.		Continuity
Auto amp.	Intake door motor	
(19)	(4)	Yes
(8)	(2)	
(18)	(3)	
(19)	(5)	
(28)	(6)	
(36)	(7)	

MTBL0077

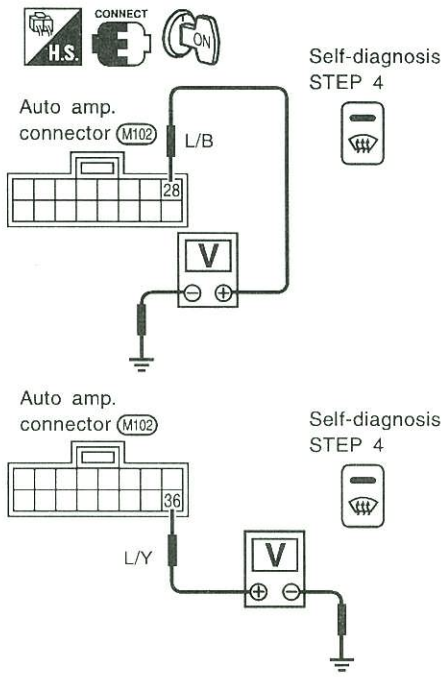
If OK, check harness for short.

OK or NG

OK	▶	GO TO 4.
NG	▶	Repair harness or connector.

4	CHECK FOR AUTO AMP. OUTPUT

Set up Self-diagnosis STEP 4.
Measure voltage across auto amp. harness terminals and body ground.



RHA506G

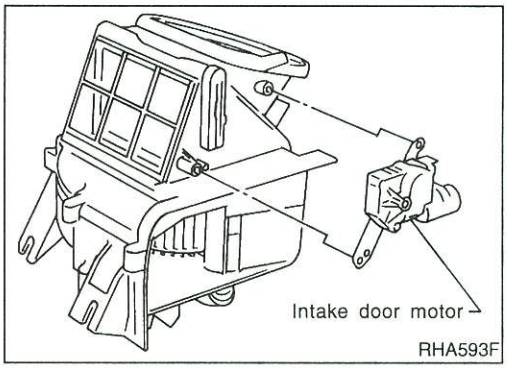
Code No.	Terminals No. (+)	Terminals No. (−)	Condition	Voltage V
41 42	28	Body ground	REC	12
	36			0
44 45 46	28		FRE	0
	36			12

0V: Approx. 0V
12V: Approx. 12V

MTBL0078

OK or NG

OK	▶	Replace intake door motor.
NG	▶	Replace auto amp.



CONTROL LINKAGE ADJUSTMENT

=NBHA0093

Intake Door

NBHA0093S01

1. Install intake door motor on intake unit and connect it to main harness.
2. Set up code No. 41 in Self-diagnosis STEP 4. Refer to HA-38.
3. Move intake door link by hand and hold it in REC position.
4. Attach intake door lever to rod holder.
5. Make sure intake door operates properly when changing from code No. 41 to 46 by pushing DEF switch.

41	42	43	44	45	46
REC		20% FRE	FRE		

Blower Motor

TROUBLE DIAGNOSIS PROCEDURE FOR BLOWER MOTOR

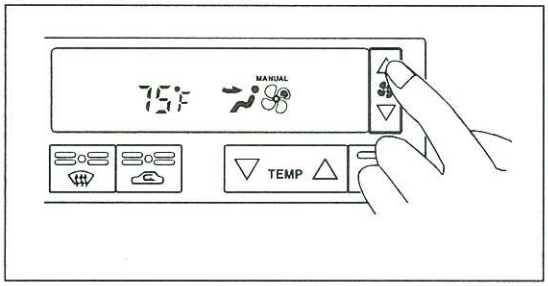
=NBHA0094

SYMPTOM:

- **Blower motor operation is malfunctioning.**
- **Blower motor operation is malfunctioning under out of starting fan speed control.**

INSPECTION FLOW

1. Confirm symptom by performing the following operational check.



OPERATIONAL CHECK – Blower

a. Press fan switch (up side) one time.
Blower should operate on low speed.
The fan symbol should have one blade lit.
b. Press fan switch (up side) one more time, and continue checking blower speed and fan symbol until all speeds are checked.
c. Leave blower on MAX speed.

If OK (symptom cannot be duplicated), perform complete operational check (*12).
If NG (symptom is confirmed), continue with STEP-2 following.

2. Check for any service bulletins.

3. Perform self-diagnosis STEP-1. (*1)

OK

4. Perform self-diagnosis STEP-2. (*9)
Code No. 20 should be displayed after approx. 4 second.

NG → Go to appropriate malfunctioning sensor circuit. (*6)

OK

5. Perform self-diagnosis STEP-4. (*9)
Does blower motor speed change according to each code No.?

No → Go to Blower Motor Circuit. (*7)

Code No.	41	42	43	44	45	46
Blower motor speed	Low	Middle high	Middle low			High

Yes

6. Is engine coolant temperature below 50°C (122°F) and ambient temperature below 15°C (59°F)?

No → Blower motor operation is normal.

Yes

7. Is blower motor operating under starting blower speed control?

No → Go to Blower Motor Circuit. (*8)

OK → Check thermal transmitter control circuit. Refer to EL section ("Thermal Transmitter Check", "METERS AND GAUGES").

Yes **[Cause cannot be confirmed by self-diagnosis.]**

8. Check ambient sensor circuit. (*2)

OK

9. Check in-vehicle sensor circuit. (*3)

OK

10. Check sunload sensor circuit. (*4)

OK

11. Check intake sensor circuit. (*13)

OK

12. Check air mix door motor PBR circuit. (*5)

OK

If the symptom still exists, perform a complete operational check (*10) and check for other symptoms. [Refer to symptom table, (*11).] Does another symptom exist?

Yes → Go to Trouble Diagnosis for related symptom.

Another symptom exists.

No

Replace auto amp. → INSPECTION END

SHA248F

*1: HA-37
*2: HA-86
*3: HA-89
*4: HA-91
*5: HA-96
*6: STEP-BY-STEP PROCEDURE (HA-38), see No. 13.
*7: HA-65
*8: HA-65
*9: HA-38
*10: HA-44
*11: HA-43
*12: HA-44
*13: HA-94

SYSTEM DESCRIPTION

=NBHA0062

Component parts

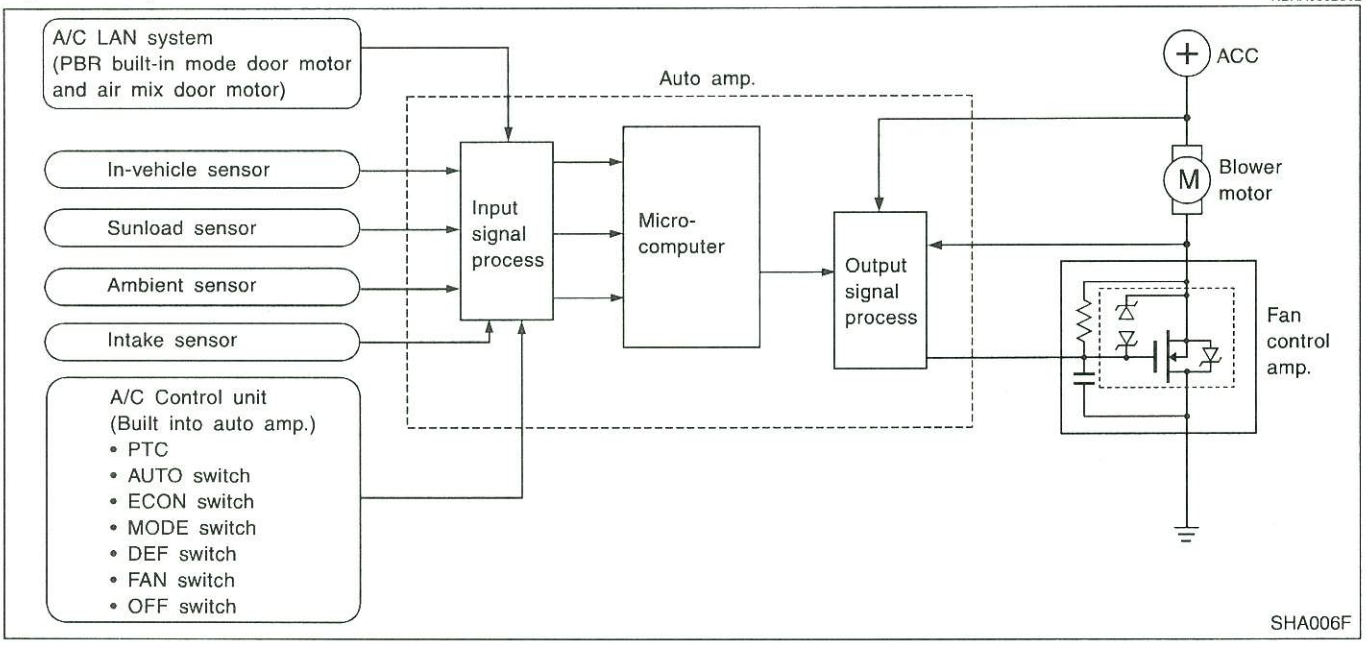
NBHA0062S01

Fan speed control system components are:

1) Auto amp.
2) Fan control amp.
3) A/C LAN system (PBR built-in mode door motor and air mix door motor)
4) In-vehicle sensor
5) Ambient sensor
6) Sunload sensor
7) Intake sensor

System Operation

NBHA0062S02



Automatic Mode

NBHA0062S03

In the automatic mode, the blower motor speed is calculated by the automatic amplifier based on inputs from the PBR, in-vehicle sensor, sunload sensor, intake sensor and ambient sensor. The blower motor applied voltage ranges from approximately 5 volts (lowest speed) to 12 volts (highest speed).

The control blower speed (in the range of 5 to 12V), the automatic amplifier supplies a gate voltage to the fan control amplifier. Based on this voltage, the fan control amplifier controls the voltage supplied to the blower motor.

Starting Fan Speed Control

NBHA0062S04

Start Up From "COLD SOAK" Condition (Automatic mode)

NBHA0062S0401

In a cold start up condition where the engine coolant temperature is below 50°C (122°F), the blower will not operate for a short period of time (up to 126 seconds). The exact start delay time varies depending on the ambient and engine coolant temperature.

In the most extreme case (very low ambient) the blower starting delay will be 126 seconds as described above. After this delay, the blower will operate at low speed until the engine coolant temperature rises above 55°C (131°F), at which time the blower speed will increase to the objective speed.

Start Up From Normal or "HOT SOAK" Condition (Automatic mode)

NBHA0062S0402

The blower will begin operation momentarily after the AUTO button is pushed. The blower speed will gradually rise to the objective speed over a time period of 3 seconds or less (actual time depends on the objective blower speed).

Blower Speed Compensation

NBHA0062S05

Sunload

NBHA0062S0501

When the in-vehicle temperature and the set temperature are very close, the blower will be operating at low speed. The low speed will vary depending on the sunload. During conditions of high sunload, the blower low speed is "normal" low speed (approx. 6V). During low or no sunload conditions, the low speed will drop to "low" low speed (approx. 5V).

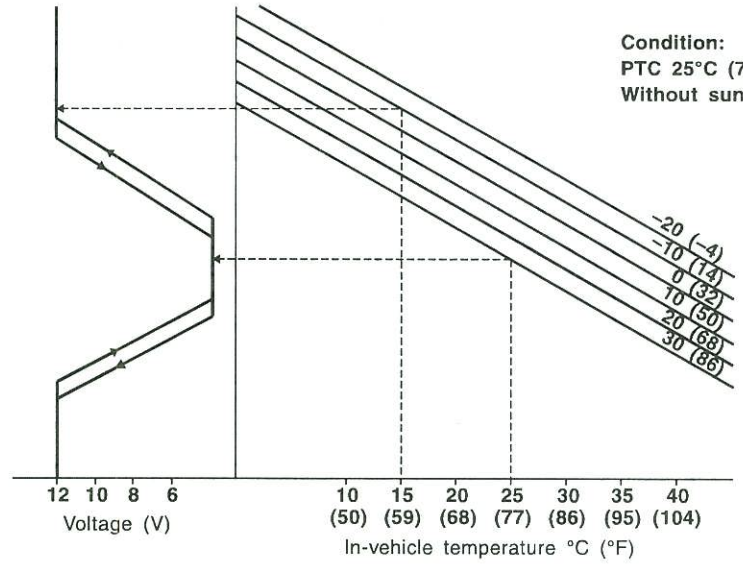
Ambient

NBHA0062S0502

When the ambient temperature is in the "moderate" range [10 - 15°C (50 - 59°F)], the computed blower voltage will be compensated (reduced) by up to 3.5V (depending on the blower speed). In the "extreme" ambient ranges [below 0°C (32°F) and above 20°C (68°F)] the computed objective blower voltage is not compensated at all. In the ambient temperature ranges between "moderate" and "extreme" [0 - 10°C (32 - 50°F) and 15 - 20°C (59 - 68°F)], the amount of compensation (for a given blower speed) varies depending on the ambient temperature.

Fan Speed Control Specification

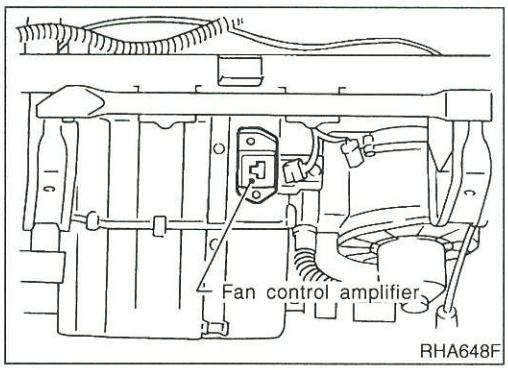
NBHA0062S06



Example:

- If temperature setting is set at 25°C (77°F) under no sunload condition when ambient temperature is −10°C (14°F) and in-vehicle temperature is 15°C (59°F), blower motor voltage is approx. 12 volts.
- When ambient temperature is 30°C (86°F) and in-vehicle temperature is reduced to 25°C (77°F) under the same condition above, blower motor voltage is approx. 5 volts.

RHA138G



RHA648F

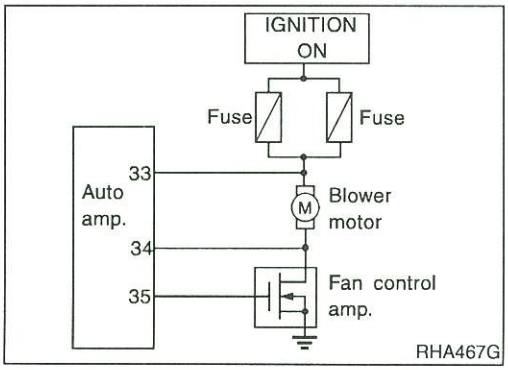
COMPONENT DESCRIPTION

NBHA0063

Fan Control Amplifier

NBHA0063S01

The fan control amplifier is located on the cooling unit. The fan control amp. receives a gate voltage from the auto amp. to steplessly maintain the blower fan motor voltage in the 5 to 12 volt range (approx.).



RHA467G

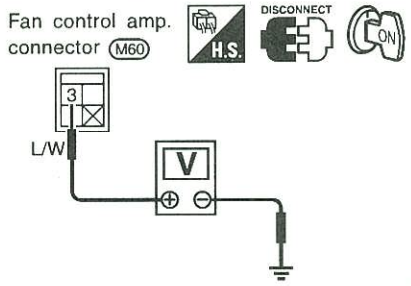
DIAGNOSTIC PROCEDURE

NBHA0064

SYMPTOM: Blower motor operation is malfunctioning under Starting Fan Speed Control.

1	CHECK POWER SUPPLY FOR FAN CONTROL AMP.

Disconnect fan control amp. harness connector.
Do approx. 12 volts exist between fan control amp. harness terminal No. 3 and body ground?



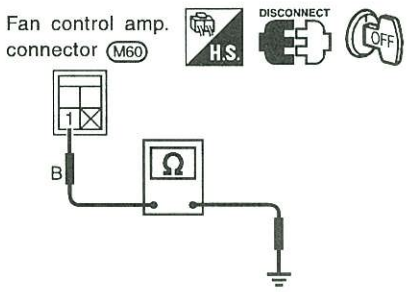
RHA480G

Yes or No

Yes	▶	GO TO 2.
No	▶	GO TO 7.

2	CHECK BODY GROUND CIRCUIT FOR FAN CONTROL AMP.

Does continuity exist between fan control amp. harness terminal No. 1 and body ground?



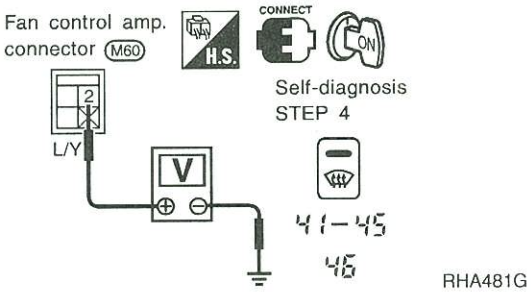
RHA089G

Yes or No

Yes	▶	Reconnect fan control amp. harness connector. And GO TO 3.
No	▶	Repair harness or connector.

3	CHECK FOR AUTO AMP. OUTPUT

Set up Self-diagnosis STEP 4.
Measure voltage across fan control amp. harness terminal No. 2 and body ground.



RHA481G

Code No.	Terminal No. (+)	Terminal No. (−)	Voltage
41 – 45	(2)	Body ground	Approx. 2.5 - 3V
46			Approx. 9 - 10V

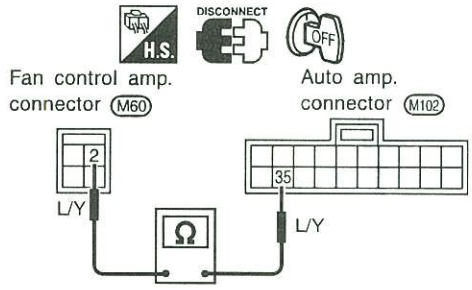
MTBL0061

OK or NG

OK	▶	1. Replace fan control amp. 2. Go to self-diagnosis step-by-step procedure (HA-38) and perform self-diagnosis STEP-4. Confirm that blower motor operation is normal.
NG	▶	GO TO 4.

4 CHECK FAN CONTROL AMP. CIRCUIT BETWEEN FAN CONTROL AMP. AND AUTO AMP. (LCU)

1. Disconnect auto amp. (LCU) and fan control amp. harness connector.
2. Check circuit continuity between auto amp. (LCU) harness terminal No. 35 and fan control amp. harness terminal No. 2.



RHA468G

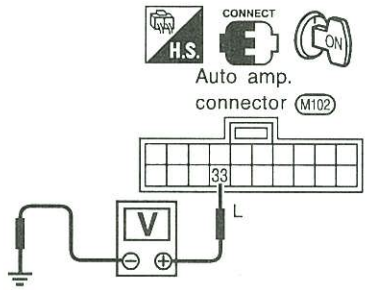
Continuity should exist.
If OK, check harness for short.

OK or NG

OK	▶	GO TO 5.
NG	▶	Repair harness or connector.

5 CHECK FAN FEED BACK CIRCUIT

Reconnect auto amp. (LCU) harness connector.
Do approx. 12 volts exist between auto amp. (LCU) harness terminal No. 33 and body ground?



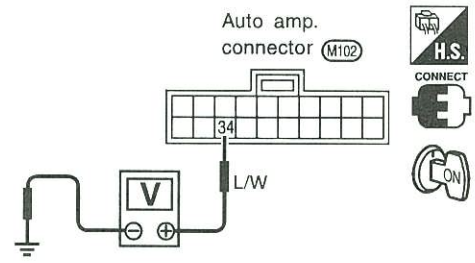
RHA470GC

Yes or No

Yes	▶	GO TO 6.
No	▶	Check power supply circuit and 15A fuses (No. 1 and 2, located in the fuse block). Refer to EL section ("Wiring Diagram", "POWER SUPPLY ROUTING"). • If OK, check for open circuit in wiring harness. Repair or replace as necessary. • If NG, replace fuse and check wiring harness for short circuit. Repair or replace as necessary.

6 CHECK POWER SUPPLY FOR AUTO AMP.

Do approx. 12 volts exist between auto amp. harness terminal No. 34 and body ground?



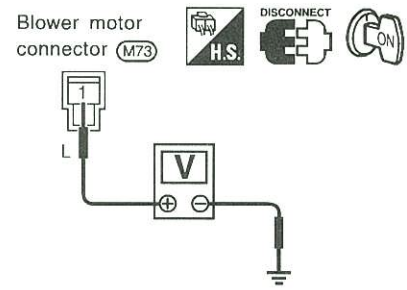
RHA469GB

Yes or No

Yes	▶	1. Replace auto amp. 2. Go to self-diagnosis step-by-step procedure (HA-38) and perform self-diagnosis STEP-4. Confirm that blower motor operation is normal.
No	▶	GO TO 9.

7 CHECK POWER SUPPLY FOR BLOWER MOTOR

Disconnect blower motor harness connector.
Do approx. 12 volts exist between blower motor harness terminal No. 1 and body ground?



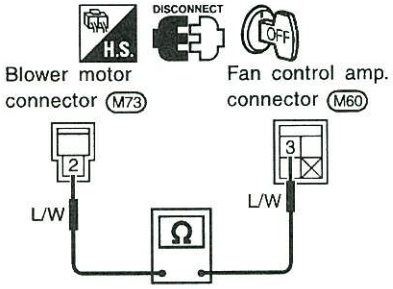
RHA091G

Yes or No

Yes	▶	GO TO 8.
No	▶	**Check power supply circuit and 15A fuses (No. 1 and 2, located in the fuse block).** • If OK, check for open circuit in wiring harness. Repair or replace as necessary. • If NG, replace fuse and check wiring harness for short circuit. Repair or replace as necessary.

8	CHECK CIRCUIT CONTINUITY BETWEEN BLOWER MOTOR AND FAN CONTROL AMP.

Disconnect blower motor connector and auto amp. (LCU) connector.
Check circuit continuity between blower motor harness terminal No. 2 and fan control amp. harness terminal No. 3.



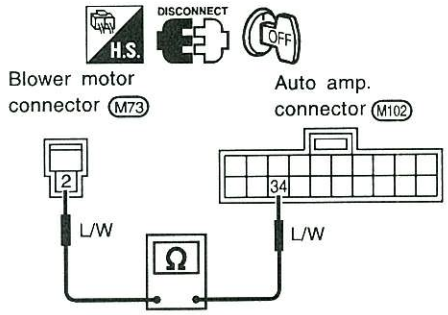
RHA472G

OK or NG

OK	▶	**Check blower motor. (Refer to HA-68.)** 1. If NG, replace blower motor. 2. Go to self-diagnosis step-by-step procedure (HA-38) and perform self-diagnosis STEP-4. Confirm that blower motor operation is normal.
NG	▶	Repair harness or connector.

9	CHECK BLOWER MOTOR CIRCUIT BETWEEN BLOWER MOTOR AND AUTO AMP. (LCU)

Check circuit continuity between blower motor harness terminal No. 2 and auto amp. (LCU) harness terminal No. 34.

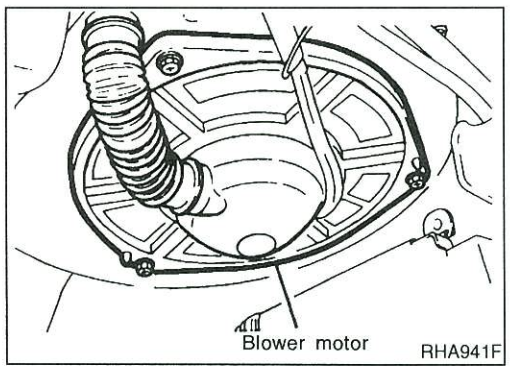


RHA471GB

Continuity should exist.

OK or NG

OK	▶	Check harness for short.
NG	▶	Repair harness or connector.



RHA941F

COMPONENT INSPECTION

NBHA0065

Blower Motor

NBHA0065S01

Confirm smooth rotation of the blower motor.

- Ensure that there are no foreign particles inside the intake unit.

Magnet Clutch

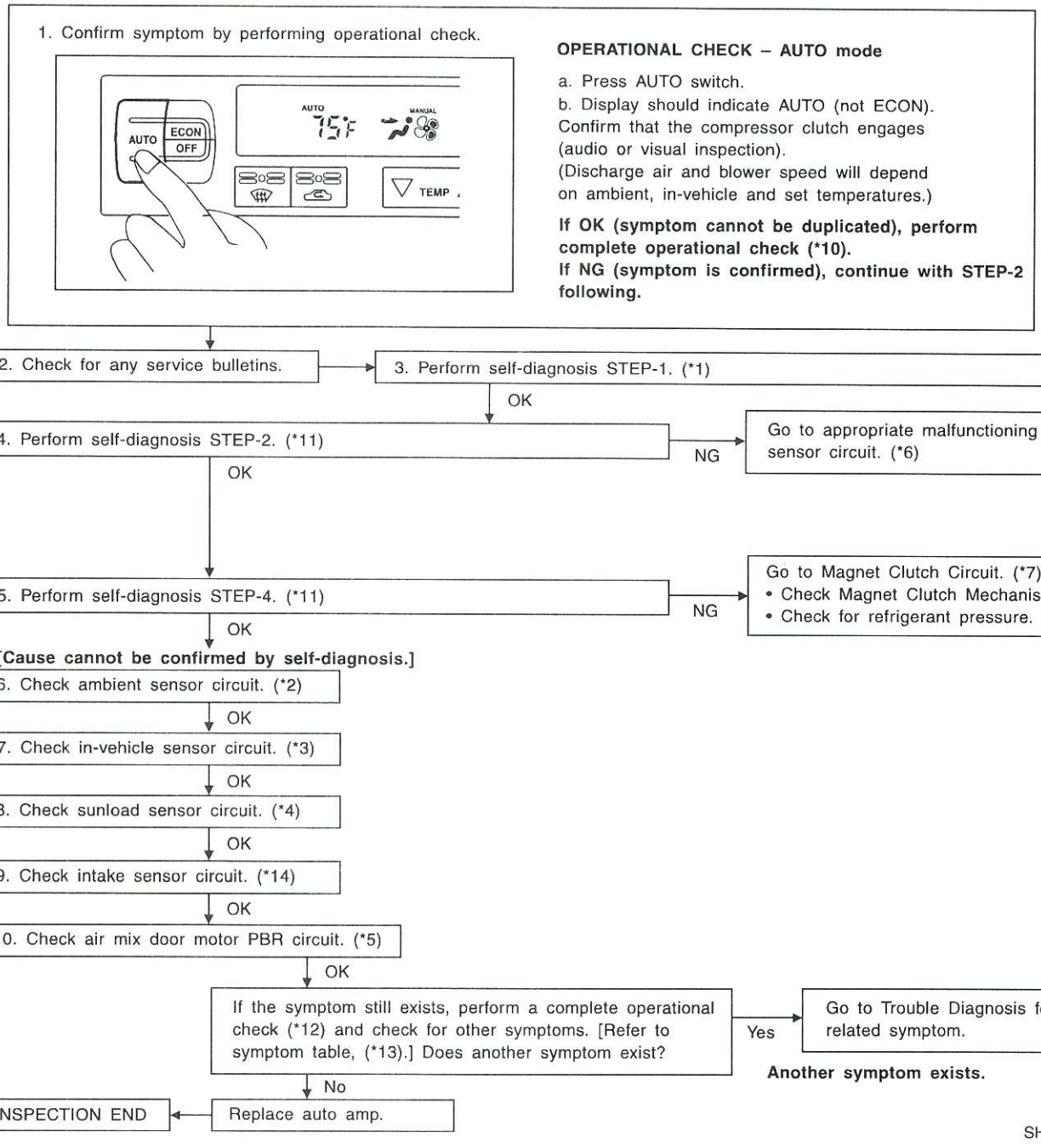
TROUBLE DIAGNOSIS PROCEDURE FOR MAGNET CLUTCH

=NBHA0095

SYMPTOM:

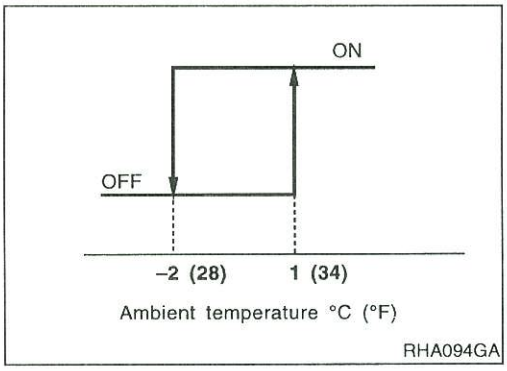
- **Magnet clutch does not engage.**

INSPECTION FLOW



SHA249F

*1: STEP-BY-STEP PROCEDURE (HA-37)
*2: HA-86
*3: HA-89
*4: HA-91
*5: HA-96
*6: STEP-BY-STEP PROCEDURE (HA-38), see No. 13.
*7: HA-70
*8: HA-102
*9: HA-107
*10: HA-44
*11: HA-38
*12: HA-44
*13: HA-43
*14: HA-94



SYSTEM DESCRIPTION

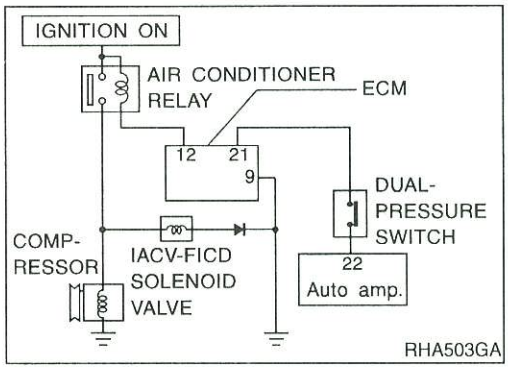
=NBHA0066

Auto amplifier controls compressor operation by ambient temperature and signal from ECM.

Low Temperature Protection Control

NBHA0066S01

Auto amplifier will turn the compressor "ON" or "OFF" as determined by a signal detected by ambient sensor.
When ambient temperatures are greater than 1°C (34°F), the compressor turns "ON". The compressor turns "OFF" when ambient temperatures are less than –2°C (28°F).



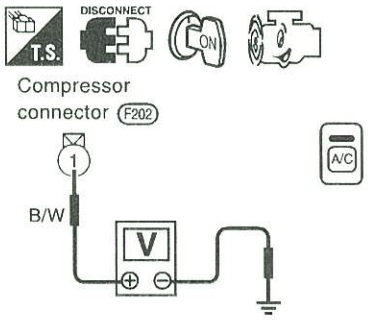
DIAGNOSTIC PROCEDURE

NBHA0067

SYMPTOM: Magnet clutch does not engage when AUTO switch is ON.

1	CHECK POWER SUPPLY FOR COMPRESSOR

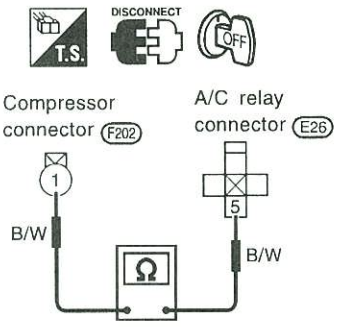
Disconnect compressor harness connector. Do approx. 12 volts exist between compressor harness terminal No. 1 and body ground?



Yes or No

Yes	▶	**Check magnet clutch coil.** 1. If NG, replace magnet clutch. Refer to HA-102. 2. Go to self-diagnosis step-by-step procedure (HA-38) and perform self-diagnosis STEP-4. Confirm that magnet clutch operation is normal.
No	▶	Disconnect A/C relay. And GO TO 2.

2	CHECK CIRCUIT CONTINUITY BETWEEN A/C RELAY HARNESS TERMINAL NO. 5 AND COMPRESSOR HARNESS TERMINAL NO. 1



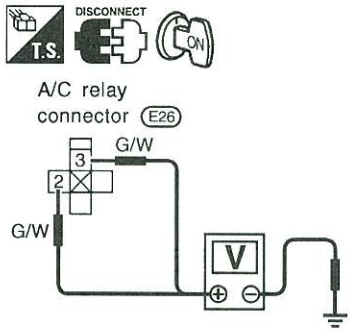
Continuity should exist.
If OK, check harness for short.

OK or NG

OK	▶	GO TO 3.
NG	▶	Repair harness or connector.

3	CHECK POWER SUPPLY FOR A/C RELAY

Disconnect A/C relay.
Do approx. 12 volts exist between A/C relay harness terminal Nos. 2, 3 and body ground?



RHA614F

Yes or No

Yes	▶	GO TO 4.
No	▶	Check power supply circuit and 7.5A (No. 6) fuse at fuse block. Refer to EL section ("Wiring Diagram", "POWER SUPPLY ROUTING"). • If OK, check for open circuit in wiring harness. Repair or replace as necessary. • If NG, replace fuse and check wiring harness for short circuit. Repair or replace as necessary.

4	CHECK A/C RELAY AFTER DISCONNECTING IT

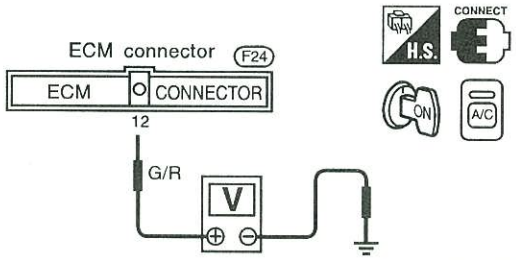
Refer to HA-72.

OK or NG

OK	▶	Reconnect A/C relay. And GO TO 5.
NG	▶	1. Replace A/C relay. 2. Go to self-diagnosis step-by-step procedure (HA-38) and perform self-diagnosis STEP-4. Confirm that magnet clutch operation is normal.

5	CHECK COIL SIDE CIRCUIT OF A/C RELAY

Do approx. 12 volts exist between ECM harness terminal No. 12 and body ground?



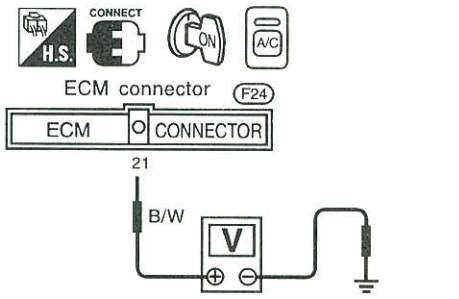
RHA482GB

Yes or No

Yes	▶	GO TO 6.
No	▶	Disconnect A/C relay. Disconnect ECM harness connector. GO TO 10.

6	CHECK VOLTAGE FOR ECM

Do approx. 12 volts exist between ECM harness terminal No. 21 and body ground?

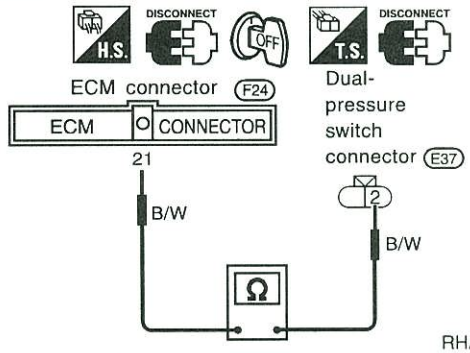


RHA701FC

Yes or No

Yes	▶	Disconnect ECM harness connector. Disconnect dual-pressure switch harness connector. GO TO 7.
No	▶	Check ECM. Refer to EC section.

7	CHECK CIRCUIT CONTINUITY BETWEEN ECM HARNESS TERMINAL NO. 21 AND DUAL-PRESSURE SWITCH HARNESS TERMINAL NO. 2



RHA585FB

Continuity should exist.
If OK, check harness for short.

OK or NG

OK	▶	GO TO 8.
NG	▶	1. Repair harness or connector. 2. Go to self-diagnosis step-by-step procedure (HA-38) and perform self-diagnosis STEP-4. Confirm that magnet clutch operation is normal.

8	CHECK DUAL-PRESSURE SWITCH.

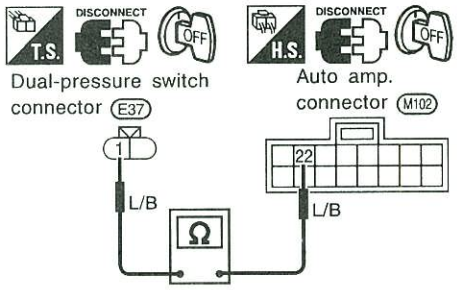
Refer to HA-73.

OK or NG

OK	▶	Disconnect A/C switch harness connector. And GO TO 9.
NG	▶	Replace dual-pressure switch.

9	CHECK DUAL-PRESSURE SWITCH CIRCUIT BETWEEN DUAL-PRESSURE AND AUTO AMP. (LCU)

Check circuit continuity between auto amp. harness terminal No. 22 and dual-pressure switch terminal No. 1.



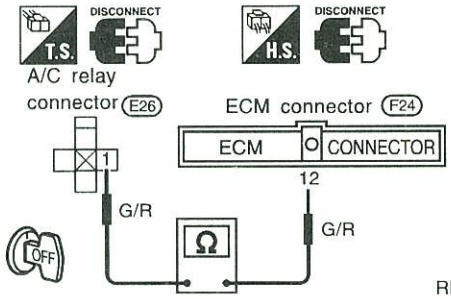
SHA303F

Continuity should exist.
If OK, check harness for short.

OK or NG

OK	▶	1. Replace auto amp. 2. Go to self-diagnosis step-by-step procedure (HA-38) and perform self-diagnosis STEP-4. Confirm that magnet clutch operation is normal.
NG	▶	Repair harness or connector.

10	CHECK CIRCUIT CONTINUITY BETWEEN A/C RELAY HARNESS TERMINAL NO. 1 AND ECM HARNESS TERMINAL NO. 12

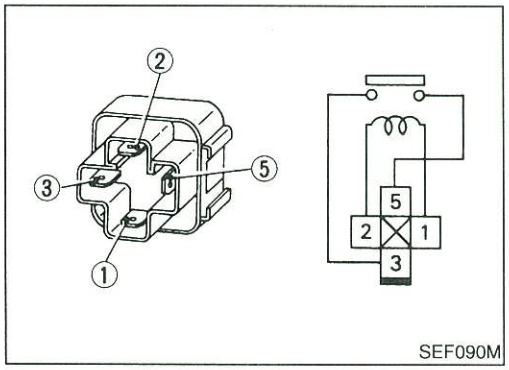


RHA474GA

Continuity should exist.

OK or NG

OK	▶	Check harness for short.
NG	▶	Repair harness or connector.



SEF090M

COMPONENT INSPECTION

NBHA0068

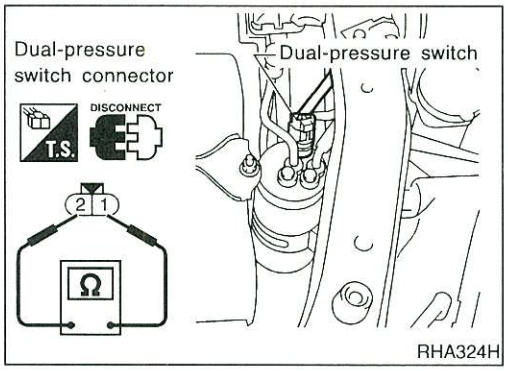
A/C Relay

NBHA0068S01

Check continuity between terminal Nos. 3 and 5.

Conditions	Continuity
12V direct current supply between terminal Nos. 1 and 2	Yes
No current supply	No

If NG, replace relay.



Dual-pressure Switch

NBHA0068S02

	ON kPa (kg/cm^2, psi)	OFF kPa (kg/cm^2, psi)
Low-pressure side	Increasing to 157 - 216 (1.6 - 2.2, 23 - 31)	Decreasing to 157 - 196 (1.6 - 2.0, 23 - 28)
High-pressure side	Decreasing to 1,863 - 2,256 (19 - 23, 270 - 327)	Increasing to 2,452 - 2,844 (25 - 29, 356 - 412)

Insufficient Cooling

TROUBLE DIAGNOSIS PROCEDURE FOR INSUFFICIENT COOLING

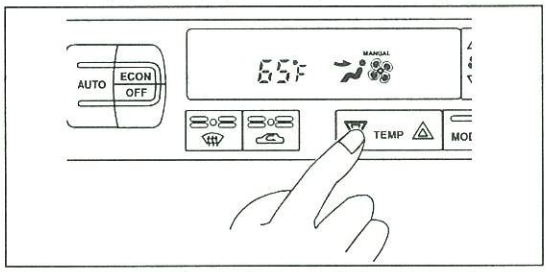
=NBHA0096

SYMPTOM:

- **Insufficient cooling**

INSPECTION FLOW

1. Confirm symptom by performing the following operational check.



OPERATIONAL CHECK – Temperature decrease

a. Press the temperature decrease button until 18°C (65°F) is displayed.
b. Check for cold air at discharge air outlets.

If OK (symptom cannot be duplicated), perform complete operational check (*11).
If NG (symptom is confirmed), continue with STEP-2 following.

2. Check for any service bulletins.

3. Perform self-diagnosis STEP-1. (*1)
   - OK
   - NG → Go to appropriate malfunctioning sensor circuit. (*5)

4. Perform self-diagnosis STEP-2. (*12)
   - OK
   - NG → **Go to appropriate malfunctioning items.**
     - Check mode door motor and air mix door motor circuit. (*6)
     - Check intake door circuit. (*7)
     - Check blower motor circuit. (*8)
     - Check magnet clutch circuit. (*9)

5. Perform self-diagnosis STEP-4. (*12)
   - OK
   - NG → **Go to appropriate malfunctioning items.** (same list as above)

6. Check compressor belt tension. Refer to MA section ("Checking Drive Belts", "ENGINE MAINTENANCE").
   - OK
   - NG → Adjust or replace compressor belt.

7. Check air mix door operation. (*2)
   - OK
   - NG → Adjust or replace air mix door control linkage.

8. Check cooling fan motor operation.
   - OK
   - NG → Refer to EC section.

9. Before connecting ACR4 to vehicle, check ACR4 gauges. No refrigerant pressure should be displayed. If NG, recover refrigerant from equipment lines.

10. Confirm refrigerant purity in supply tank using ACR4 and refrigerant identifier.
    - OK
    - NG → Refer to Contaminated refrigerant. (*13)

11. Connect ACR4 to vehicle.
    Confirm refrigerant purity in vehicle A/C system using ACR4 and refrigerant identifier.
    - OK
    - NG → Refer to Contaminated refrigerant. (*13)

12. Check refrigeration cycle pressure with manifold gauge connected. Refer to (*3).
    - OK
    - NG → Perform performance test diagnoses. Refer to (*10).

13. Check for evaporator coil freeze up.
    - (Does not freeze up.) OK
    - (Freeze up.) NG → Replace compressor.

14. Check ducts for air leaks.
    - OK
    - NG → Repair air leaks.

15. Perform temperature setting trimmer. (*4)
    (1) Set up AUXILIARY MECHANISM mode in self-diagnosis.
    (2) Press ▼ (COLD) switch as desired.
    - OK

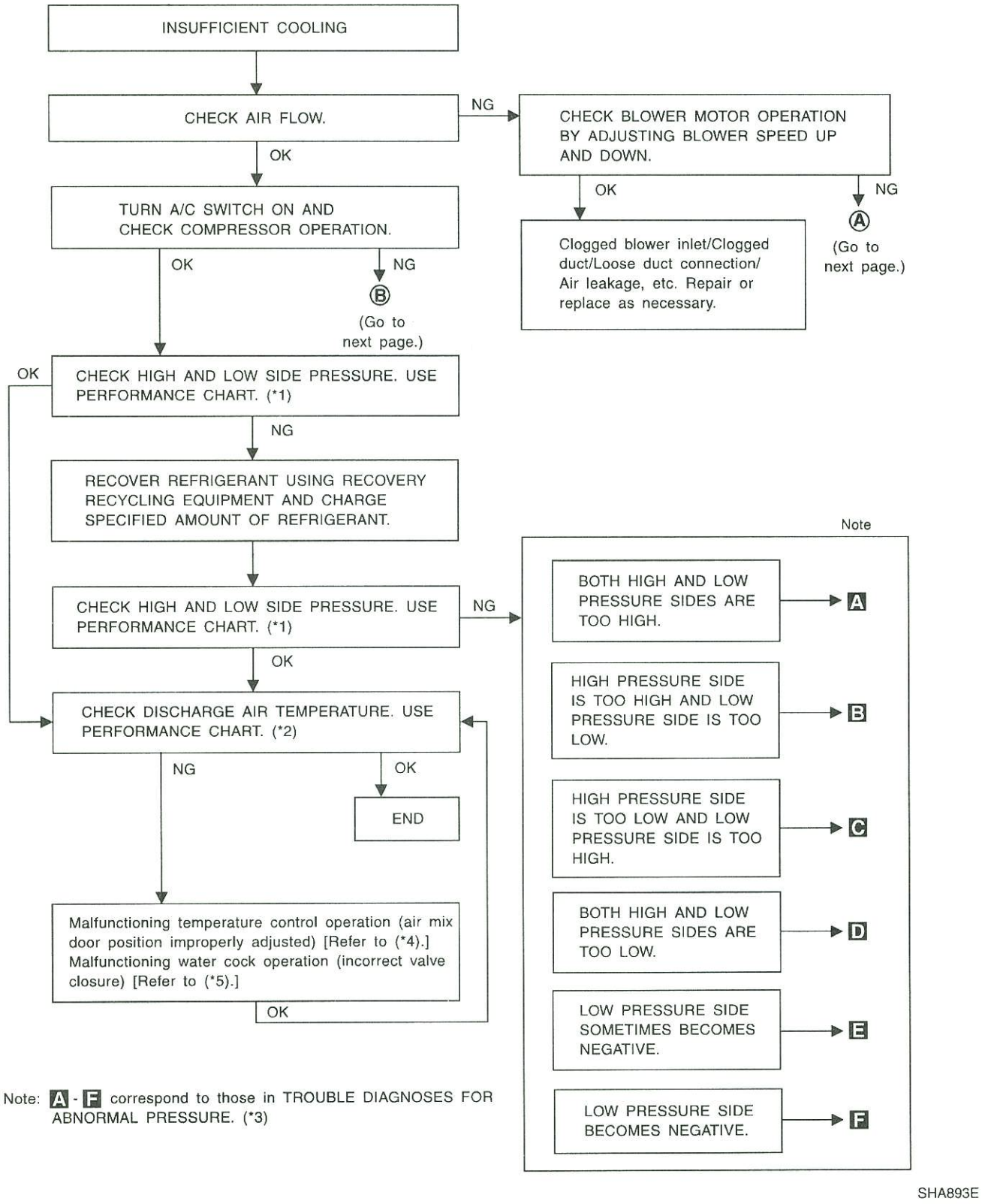
INSPECTION END

SHA190F

*1: HA-37
*2: HA-56
*3: HA-77
*4: HA-42
*5: STEP-BY-STEP PROCEDURE (HA-38), see No. 13.
*6: HA-50
*7: HA-59
*8: HA-64
*9: HA-70
*10: HA-75
*11: HA-44
*12: HA-38
*13: HA-2

PERFORMANCE TEST DIAGNOSES

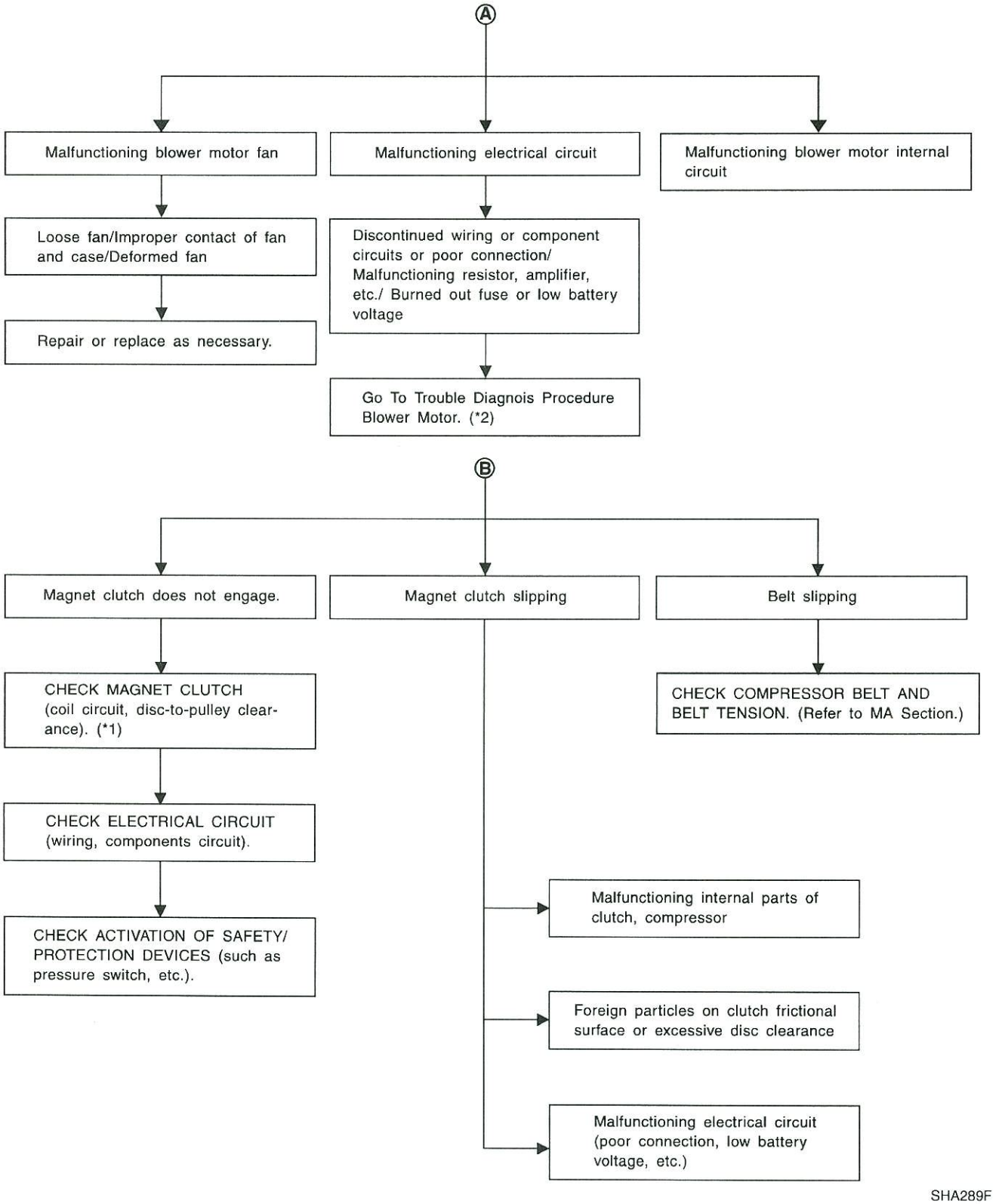
NBHA0030



Note: A - F correspond to those in TROUBLE DIAGNOSES FOR ABNORMAL PRESSURE. (*3)

SHA893E

*1: HA-77
*2: HA-77
*3: HA-77
*4: HA-56
*5: HA-56



*1: HA-101

*2: HA-63

PERFORMANCE CHART

NBHA0031

Test Condition

NBHA0031S01

Testing must be performed as follows:

Vehicle location	Indoors or in the shade (in a well-ventilated place)
Doors	Closed
Door window	Open
Hood	Open
TEMP.	Max. COLD
Mode switch	(Ventilation) set
REC switch	(Recirculation) set
(blower) speed	Max. speed set
Engine speed	Idle speed
Operate the air conditioning system for 10 minutes before taking measurements.	

Test Reading

NBHA0031S02

Recirculating-to-discharge Air Temperature Table

NBHA0031S0201

Inside air (Recirculating air) at blower assembly inlet		Discharge air temperature at center ventilator °C (°F)
Relative humidity %	Air temperature °C (°F)	
50 - 60	25 (77)	6.0 - 9.0 (43 - 48)
	30 (86)	10.0 - 13.6 (50 - 56)
	35 (95)	15.2 - 19.5 (59 - 67)
	40 (104)	22.5 - 27.1 (73 - 81)
60 - 70	25 (77)	9.0 - 12.2 (48 - 54)
	30 (86)	13.6 - 17.2 (56 - 63)
	35 (95)	19.5 - 23.7 (67 - 75)
	40 (104)	27.1 - 32.3 (81 - 90)

Ambient Air Temperature-to-operating Pressure Table

NBHA0031S0202

Ambient air		High-pressure (Discharge side) kPa (kg/cm^2, psi)	Low-pressure (Suction side) kPa (kg/cm^2, psi)
Relative humidity %	Air temperature °C (°F)		
50 - 70	25 (77)	1,226 - 1,638 (12.5 - 16.7, 178 - 237)	172 - 250 (1.75 - 2.55, 25 - 36)
	30 (86)	1,422 - 1,883 (14.5 - 19.2, 206 - 273)	196 - 275 (2.0 - 2.8, 28 - 40)
	35 (95)	1,657 - 2,187 (16.9 - 22.3, 240 - 317)	231 - 309 (2.35 - 3.15, 33 - 45)
	40 (104)	1,922 - 2,501 (19.6 - 25.5, 279 - 363)	280 - 373 (2.85 - 3.8, 41 - 54)

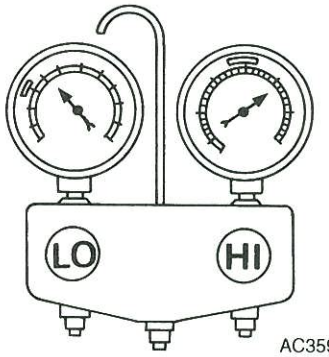
TROUBLE DIAGNOSES FOR ABNORMAL PRESSURE

NBHA0032

Whenever system's high and/or low side pressure is abnormal, diagnose using a manifold gauge. The marker above the gauge scale in the following tables indicates the standard (normal) pressure range. Since the standard (normal) pressure, however, differs from vehicle to vehicle, refer to HA-77 ("Ambient air temperature-to-operating pressure table").

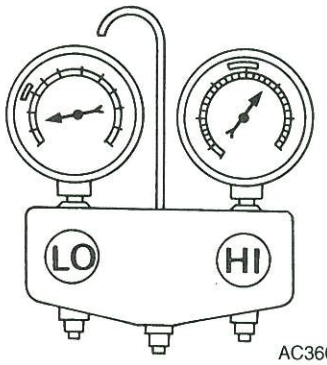
Both High and Low-pressure Sides are Too High.

NBHA0032S01

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
Both high and low-pressure sides are too high. A  AC359A	• Pressure is reduced soon after water is splashed on condenser.	Excessive refrigerant charge in refrigeration cycle	Reduce refrigerant until specified pressure is obtained.
	Air suction by cooling fan is insufficient.	Insufficient condenser cooling performance ↓ 1. Condenser fins are clogged. 2. Improper fan rotation of cooling fan	• Clean condenser. • Check and repair cooling fan as necessary.
	• Low-pressure pipe is not cold. • When compressor is stopped high-pressure value quickly drops by approximately 196 kPa (2 kg/cm^2, 28 psi). It then decreases gradually thereafter.	Poor heat exchange in condenser (After compressor operation stops, high pressure decreases too slowly.) ↓ Air in refrigeration cycle	Evacuate repeatedly and recharge system.
	Engine tends to overheat.	Engine cooling systems malfunction.	Check and repair each engine cooling system.
	• An area of the low-pressure pipe is colder than areas near the evaporator outlet. • Plates are sometimes covered with frost.	• Excessive liquid refrigerant on low-pressure side • Excessive refrigerant discharge flow • Expansion valve is open a little compared with the specification. ↓ 1. Improper thermal valve installation 2. Improper expansion valve adjustment	Replace expansion valve.

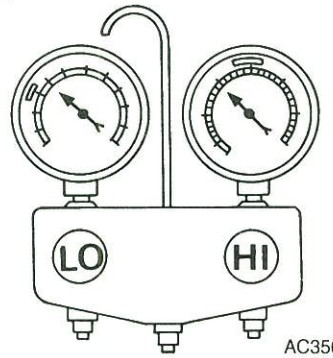
High-pressure Side is Too High and Low-pressure Side is Too Low.

NBHA0032S02

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
High-pressure side is too high and low-pressure side is too low. B  AC360A	Upper side of condenser and high-pressure side are hot, however, liquid tank is not so hot.	High-pressure tube or parts located between compressor and condenser are clogged or crushed.	• Check and repair or replace malfunctioning parts. • Check lubricant for contamination.

High-pressure Side is Too Low and Low-pressure Side is Too High.

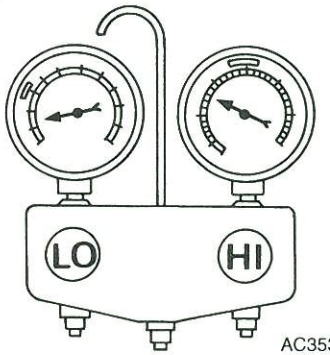
NBHA0032S03

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
High-pressure side is too low and low-pressure side is too high. C  AC356A	High and low-pressure sides become equal soon after compressor operation stops.	Compressor pressure operation is improper. ↓ Damaged inside compressor packings	Replace compressor.
	No temperature difference between high and low-pressure sides	Compressor pressure operation is improper. ↓ Damaged inside compressor packings.	Replace compressor.

Insufficient Cooling (Cont'd)

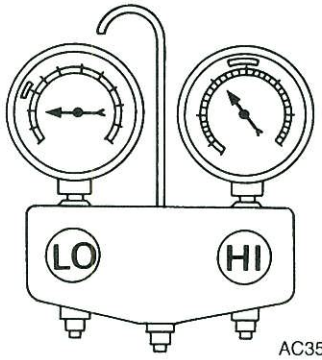
Both High- and Low-pressure Sides are Too Low.

NBHA0032S04

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
Both high- and low-pressure sides are too low. D  AC353A	• There is a big temperature difference between receiver drier outlet and inlet. Outlet temperature is extremely low. • Liquid tank inlet and expansion valve are frosted.	Compressor discharge capacity does not change. (Compressor stroke is set at maximum.)	• Replace liquid tank. • Check lubricant for contamination.
	• Temperature of expansion valve inlet is extremely low as compared with areas near liquid tank. • Expansion valve inlet may be frosted. • Temperature difference occurs somewhere in high-pressure side	High-pressure pipe located between receiver drier and expansion valve is clogged.	• Check and repair malfunctioning parts. • Check lubricant for contamination.
	• Expansion valve and liquid tank are warm or only cool when touched.	Low refrigerant charge ↓ Leaking fittings or components	Check refrigerant for leaks. Refer to "Checking Refrigerant Leaks", HA-107.
	There is a big temperature difference between expansion valve inlet and outlet while the valve itself is frosted.	Expansion valve closes a little compared with the specification. ↓ 1. Improper expansion valve adjustment 2. Malfunctioning thermal valve 3. Outlet and inlet may be clogged.	• Remove foreign particles by using compressed air. • Check lubricant for contamination.
	An area of the low-pressure pipe is colder than areas near the evaporator outlet.	Low-pressure pipe is clogged or crushed.	• Check and repair malfunctioning parts. • Check lubricant for contamination.
	Air flow volume is not enough or is too low.	Evaporator is frozen. ↓ Compressor discharge capacity does not change. (Compressor stroke is set at maximum length.)	Replace compressor.

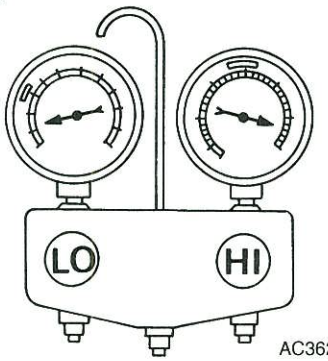
Low-pressure Side Sometimes Becomes Negative.

NBHA0032S05

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
Low-pressure side sometimes becomes negative. E  AC354A	• Air conditioning system does not function and does not cyclically cool the compartment air. • The system constantly functions for a certain period of time after compressor is stopped and restarted.	Refrigerant does not discharge cyclically. ↓ Moisture is frozen at expansion valve outlet and inlet. ↓ Water is mixed with refrigerant.	• Drain water from refrigerant or replace refrigerant. • Replace liquid tank.

Low-pressure Side Becomes Negative.

NBHA0032S06

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
Low-pressure side becomes negative. F  AC362A	Liquid tank or front/rear side of expansion valve's pipe is frosted or dewed.	High-pressure side is closed and refrigerant does not flow. ↓ Expansion valve or liquid tank is frosted.	Leave the system at rest until no frost is present. Start it again to check whether or not the problem is caused by water or foreign particles. • If water is the cause, initially cooling is okay. Then the water freezes causing a blockage. Drain water from refrigerant or replace refrigerant. • If due to foreign particles, remove expansion valve and remove the particles with dry and compressed air (not shop air). • If either of the above methods cannot correct the problem, replace expansion valve. • Replace liquid tank. • Check lubricant for contamination.

Insufficient Heating

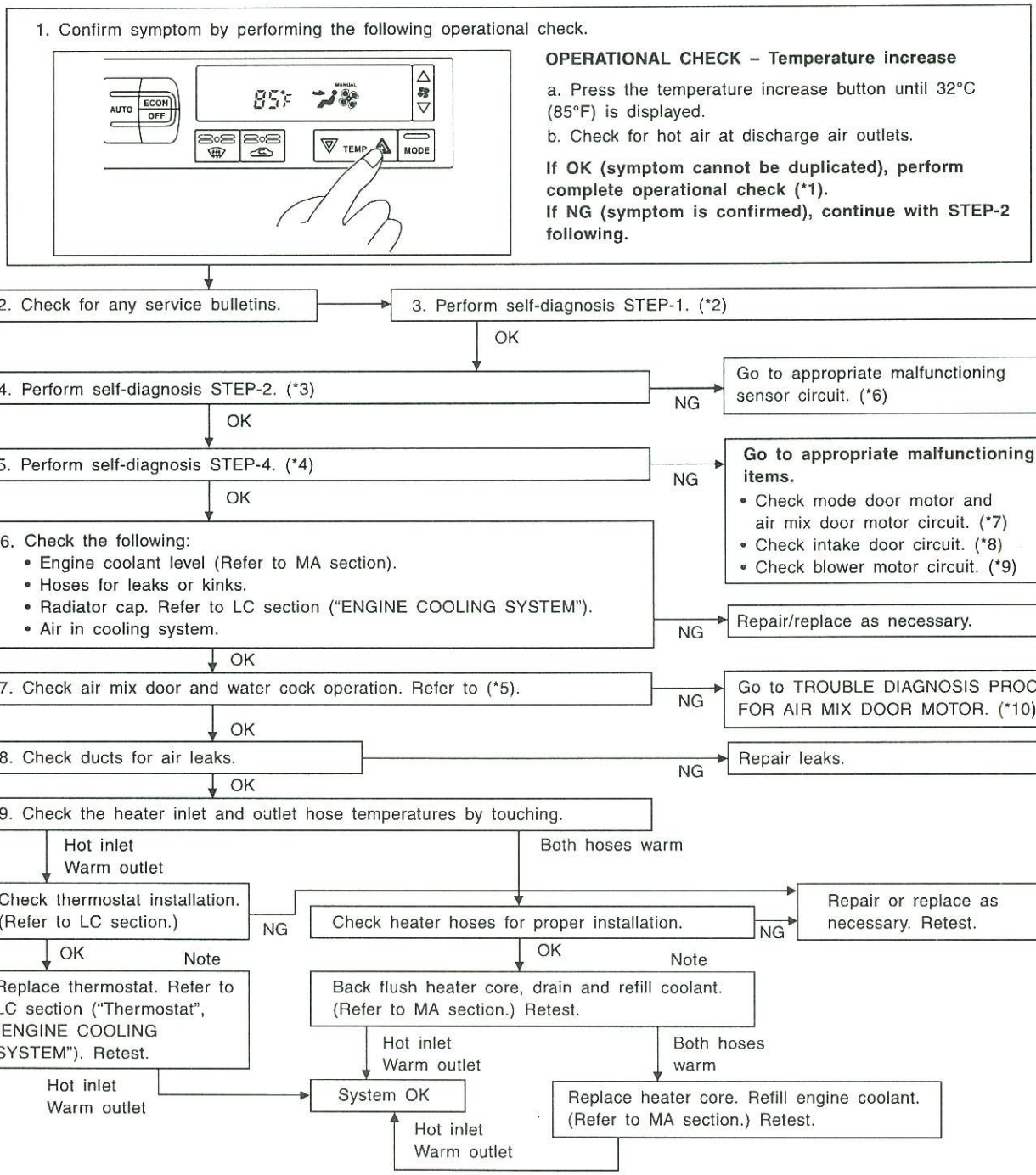
TROUBLE DIAGNOSIS PROCEDURE FOR INSUFFICIENT HEATING

NBHA0097

SYMPTOM:

- **Insufficient heating**

INSPECTION FLOW



SHA894E

*1: HA-44
*2: HA-37
*3: HA-38
*4: HA-38
*5: HA-56
*6: STEP-BY-STEP PROCEDURE (HA-38), see No. 13.
*7: HA-51
*8: HA-60
*9: HA-65
*10: HA-54

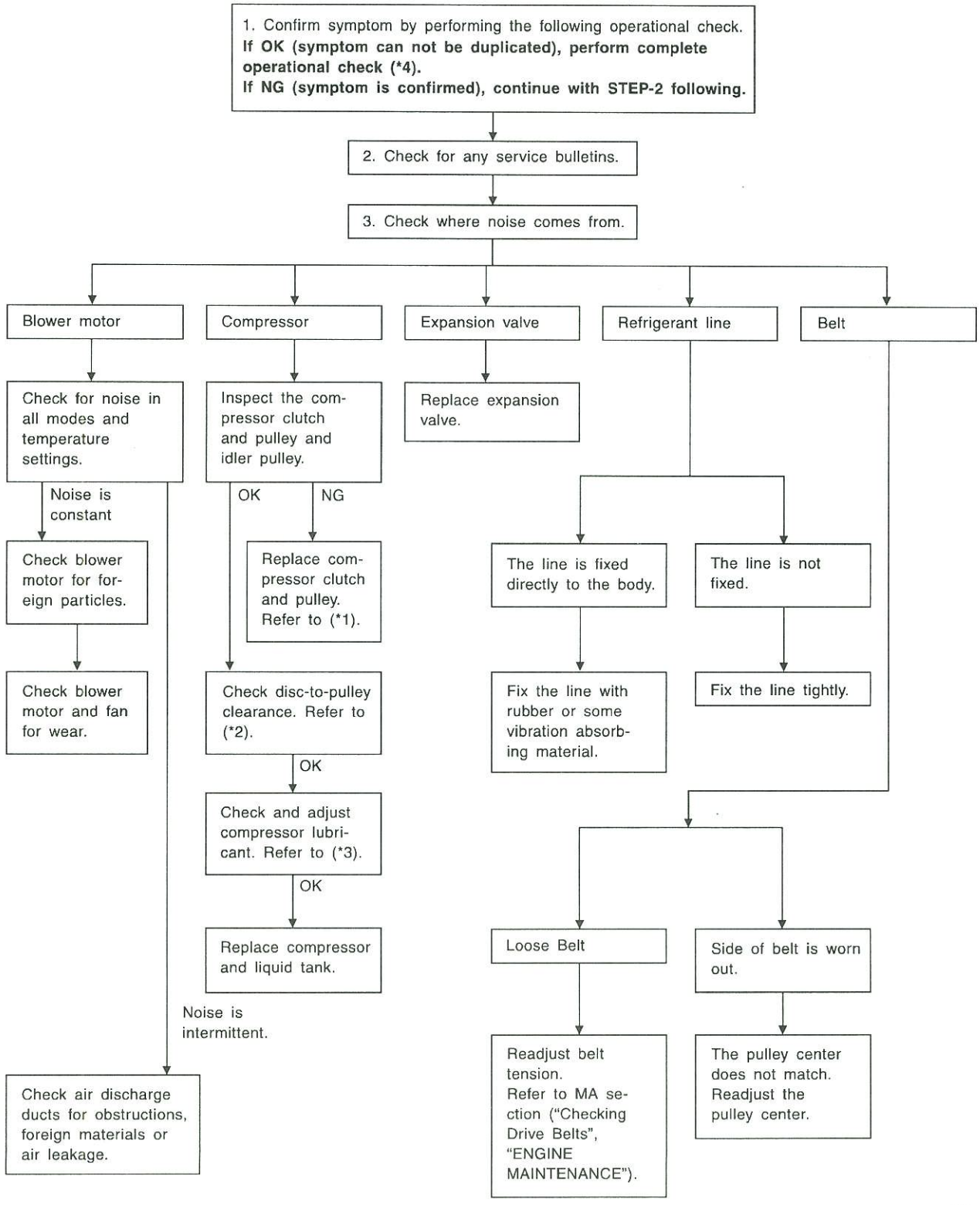
Noise

TROUBLE DIAGNOSIS PROCEDURE FOR NOISE

=NBHA0100

SYMPTOM:

- **Noise**



SHA896E

*1: HA-102 *3: HA-99 *4: HA-44

*2: HA-104

Self-diagnosis

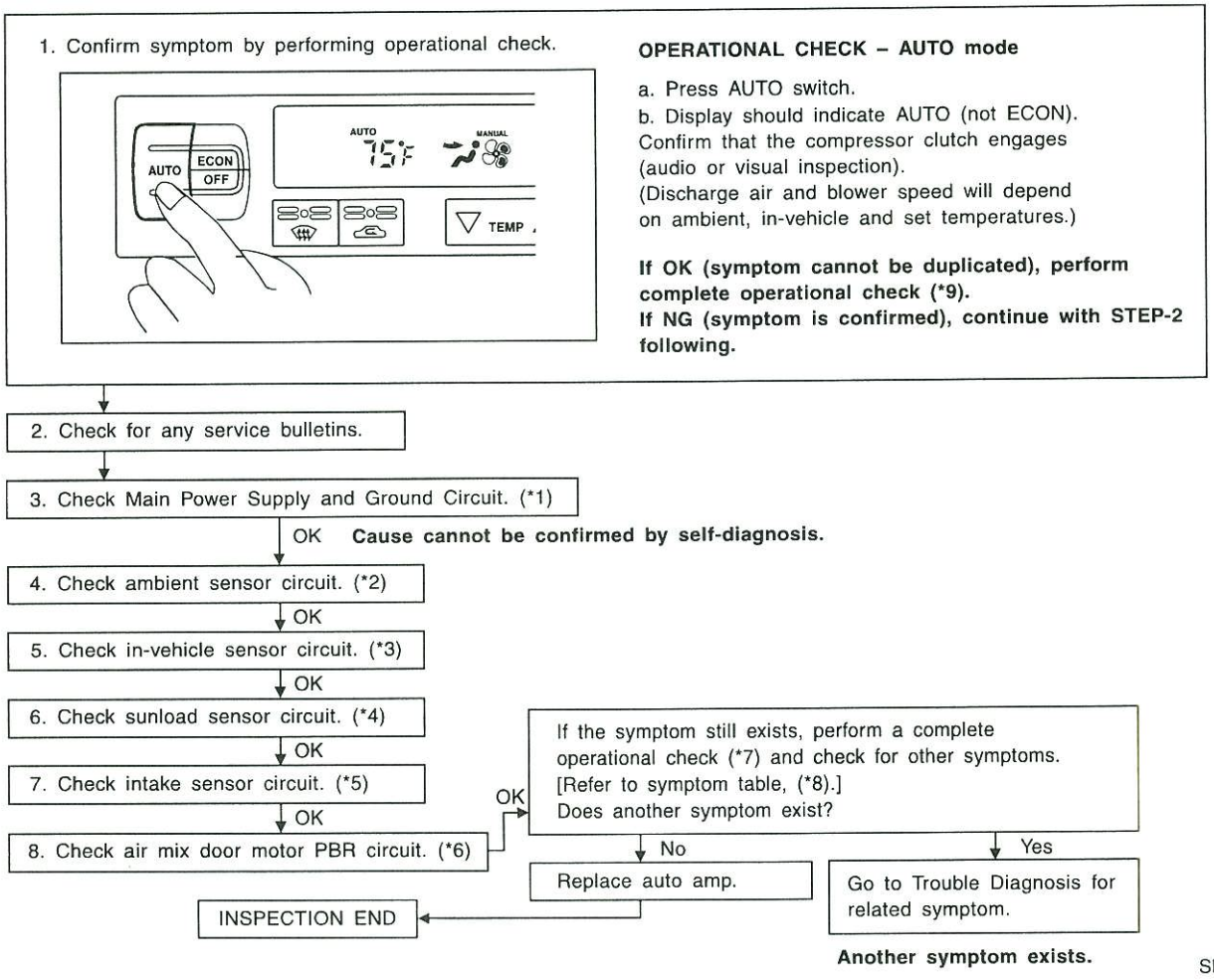
TROUBLE DIAGNOSIS PROCEDURE FOR SELF-DIAGNOSIS

=NBHA0101

SYMPTOM:

- **Self-diagnosis cannot be performed.**

INSPECTION FLOW



SHA250F

*1: HA-47
*2: HA-86
*3: HA-89
*4: HA-91
*5: HA-94
*6: HA-96
*7: HA-44
*8: HA-43
*9: HA-44

Memory Function

TROUBLE DIAGNOSIS PROCEDURE FOR MEMORY FUNCTION

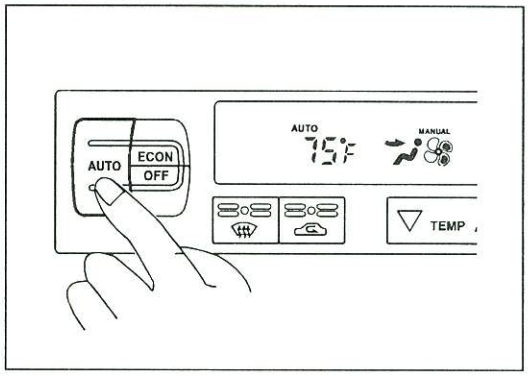
=NBHA0102

SYMPTOM:

- **Memory function does not operate.**

INSPECTION FLOW

1. Confirm symptom by performing the following operational check.



OPERATIONAL CHECK – Memory function

a. Set the temperature 75°F or 25°C.
b. Press OFF switch.
c. Turn the ignition off.
d. Turn the ignition on.
e. Press the AUTO switch.
f. Confirm that the set temperature remains at previous temperature.
g. Press OFF switch.

If OK (symptom cannot be duplicated), perform complete operational check (*2).
If NG (symptom is confirmed), continue with STEP-2 following.

2. Check for any service bulletins.

3. Check Main Power Supply and Ground Circuit. (*1)

OK

4. Replace auto amp.

5. FINAL CHECK
   Go to self-diagnosis step-by-step procedure (*3) and perform self-diagnosis STEP-2.
   Confirm that code No. 20 is displayed.

SHA898E

*1: HA-47 *2: HA-44 *3: HA-38

ECON (ECONOMY) Mode

TROUBLE DIAGNOSIS PROCEDURE FOR ECON (ECONOMY) MODE

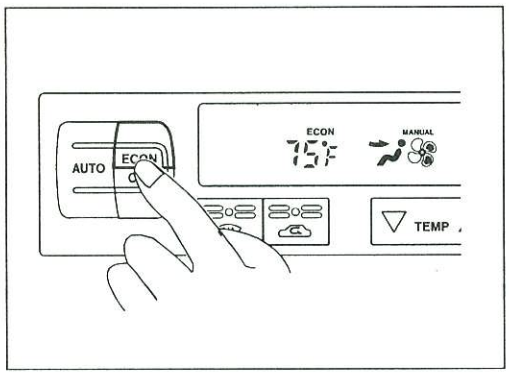
NBHA0103

SYMPTOM:

- **ECON mode does not operate.**

INSPECTION FLOW

1. Confirm symptom by performing the following operational check.



OPERATIONAL CHECK – ECON (ECONOMY) mode

a. Set the temperature 75°F or 25°C.
b. Press ECON switch.
c. Display should indicate ECON (not AUTO).
Confirm that the compressor clutch is not engaged (visual inspection).
(Discharge air and blower speed will depend on ambient, in-vehicle and set temperatures.)

If OK (symptom cannot be duplicated), perform complete operational check (*2).
If NG (symptom is confirmed), continue with STEP-2 following.

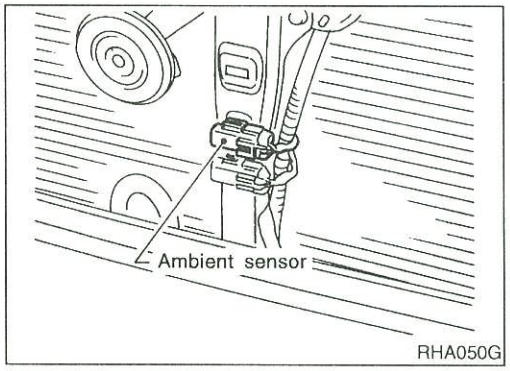
2. Check for any service bulletins.
3. Check Main Power Supply and Ground Circuit. (*1)

OK

4. Replace auto amp.
5. FINAL CHECK
   Go to self-diagnosis step-by-step procedure (*3) and perform self-diagnosis STEP-2.
   Confirm that code No. 20 is displayed.

SHA920EA

*1: HA-47 *2: HA-44 *3: HA-38



Ambient Sensor Circuit

COMPONENT DESCRIPTION

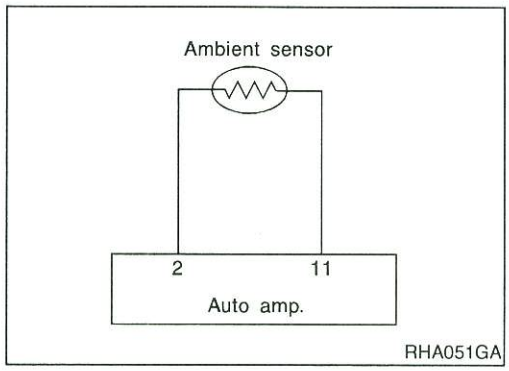
NBHA0039

The ambient sensor is attached in front of the driver's side condenser. It detects ambient temperature and converts it into a resistance value which is then input into the auto amplifier.

AMBIENT TEMPERATURE INPUT PROCESS

NBHA0040

The automatic amplifier includes a "processing circuit" for the ambient sensor input. However, when the temperature detected by the ambient sensor increases quickly, the processing circuit retards the auto amp. function. It only allows the auto amp. to recognize an ambient temperature increase of 0.33°C (0.6°F) per 100 seconds. As an example, consider stopping for a cup of coffee after high speed driving. Although the actual ambient temperature has not changed, the temperature detected by the ambient sensor will increase. This is because the heat from the engine compartment can radiate to the front grille area, location of the ambient sensor.



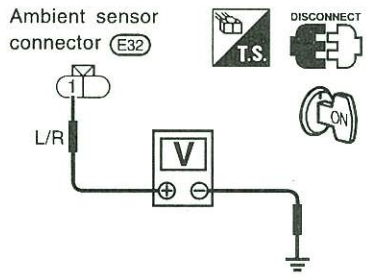
DIAGNOSTIC PROCEDURE

NBHA0041

SYMPTOM: Ambient sensor circuit is open or shorted. (21 or −21 is indicated on the display as a result of conducting Self-diagnosis STEP 2.)

1	CHECK VOLTAGE BETWEEN AMBIENT SENSOR HARNESS CONNECTOR AND BODY GROUND

Disconnect ambient sensor harness connector.
Do approx. 5 volts exist between ambient sensor harness terminal No. 1 and body ground?

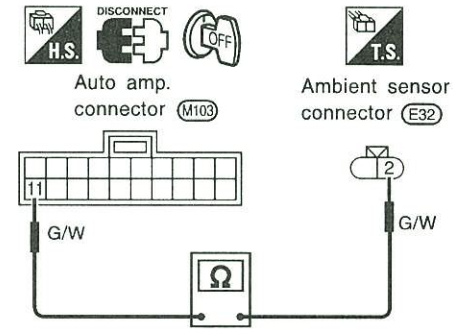


Yes or No

Yes	▶	GO TO 2.
No	▶	GO TO 4.

2	CHECK AMBIENT SENSOR CIRCUIT BETWEEN AMBIENT SENSOR AND AUTO AMP. (LCU)

1. Disconnect auto amp. (LCU) harness connector.
2. Check circuit continuity between ambient sensor harness terminal No. 2 and auto amp. (LCU) harness terminal No. 11.

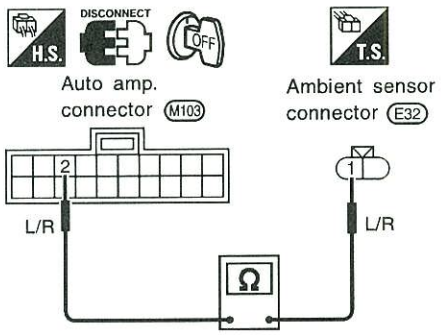


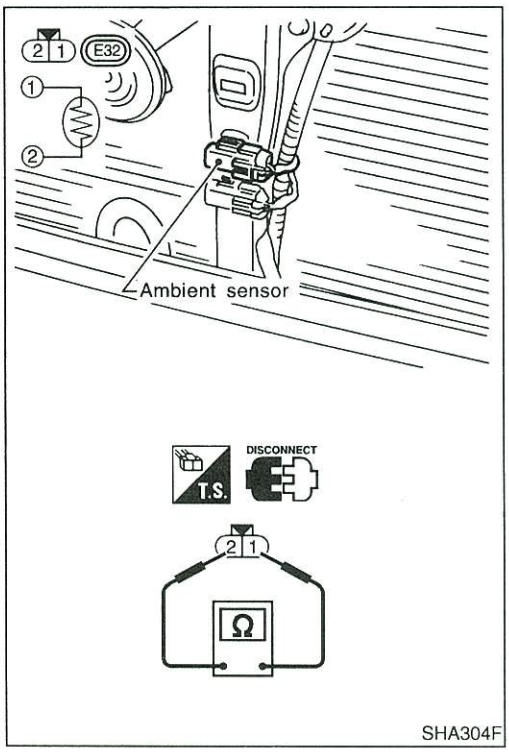
Continuity should exist.
If OK, check harness for short.

OK or NG

OK	▶	GO TO 3.
NG	▶	Repair harness or connector.

3	CHECK AMBIENT SENSOR
Refer to HA-88.	
OK or NG	
OK ▶	1. Replace auto amp. (LCU). 2. Go to self-diagnosis step-by-step procedure (HA-38) and perform self-diagnosis STEP-2. Confirm that code No. 20 is displayed.
NG ▶	Replace ambient sensor.

4	CHECK AMBIENT SENSOR CIRCUIT BETWEEN AMBIENT SENSOR AND AUTO AMP. (LCU)
1. Disconnect auto amp. (LCU) harness connector. 2. Check circuit continuity between ambient sensor harness terminal No. 1 and auto amp. (LCU) harness terminal No. 2.	
 RHA476G	
Continuity should exist. If OK, check harness for short.	
OK or NG	
OK ▶	1. Replace auto amp. (LCU). 2. Go to self-diagnosis step-by-step procedure (HA-38) and perform self-diagnosis STEP-2. Confirm that code No. 20 is displayed.
NG ▶	Repair harness or connector.



SHA304F

COMPONENT INSPECTION

NBHA0042

Ambient Sensor

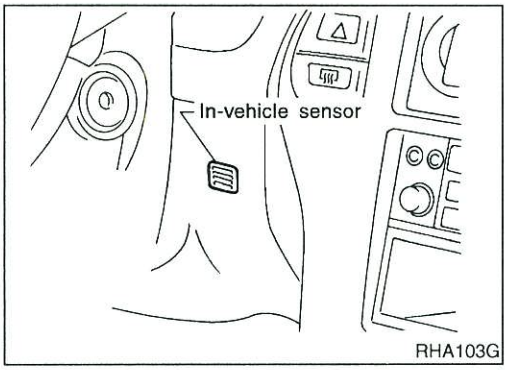
NBHA0042S01

After disconnecting ambient sensor harness connector, measure resistance between terminals 2 and 1 at sensor harness side, using the table below.

Temperature °C (°F)	Resistance kΩ
–15 (5)	12.73
–10 (14)	9.92
–5 (23)	7.80
0 (32)	6.19
5 (41)	4.95
10 (50)	3.99
15 (59)	3.24
20 (68)	2.65
25 (77)	2.19
30 (86)	1.81

Temperature °C (°F)	Resistance kΩ
35 (95)	1.51
40 (104)	1.27
45 (113)	1.07

If NG, replace ambient sensor.



In-vehicle Sensor Circuit

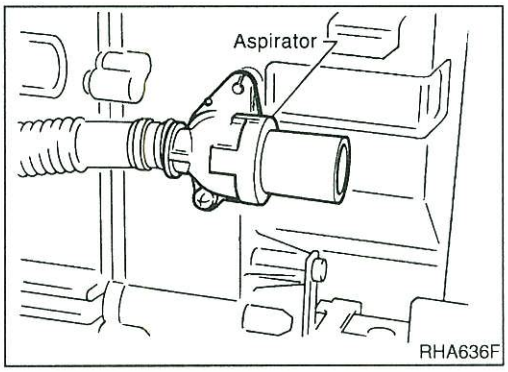
COMPONENT DESCRIPTION

NBHA0043

In-vehicle sensor

NBHA0043S01

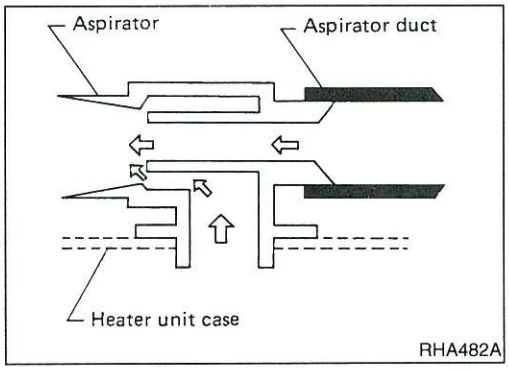
The in-vehicle sensor is located on instrument lower panel. It converts variations in temperature of compartment air drawn from the aspirator into a resistance value. It is then input into the auto amplifier.



Aspirator

NBHA0043S02

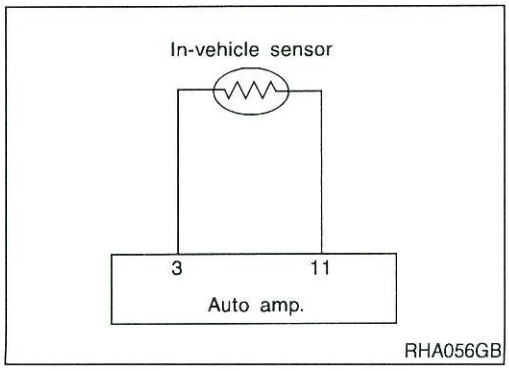
The aspirator is located in front of heater unit. It produces vacuum pressure due to air discharged from the heater unit, continuously taking compartment air in the aspirator.



DIAGNOSTIC PROCEDURE

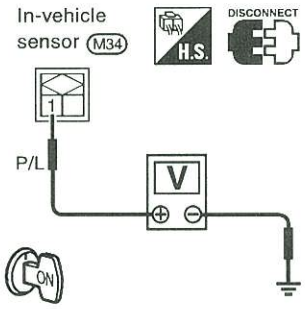
NBHA0044

SYMPTOM: In-vehicle sensor circuit is open or shorted. (22 or –22 is indicated on the display as a result of conducting Self-diagnosis STEP 2.)



1	CHECK IN-VEHICLE SENSOR CIRCUIT BETWEEN IN-VEHICLE SENSOR AND BODY GROUND

Disconnect in-vehicle sensor harness connector.
Do approx. 5 volts exist between in-vehicle sensor harness terminal No. 1 and body ground?



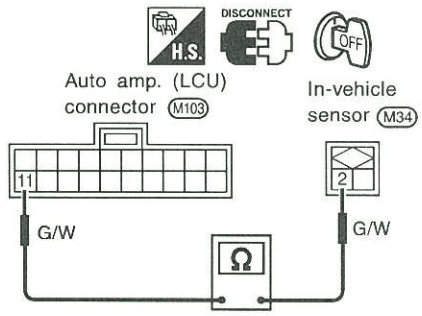
RHA477G

Yes or No

Yes	▶	GO TO 2.
No	▶	GO TO 4.

2	CHECK IN-VEHICLE SENSOR CIRCUIT BETWEEN IN-VEHICLE SENSOR AND AUTO AMP. (LCU)

1. Disconnect auto amp. (LCU) harness connector.
2. Check circuit continuity between in-vehicle sensor harness terminal No. 2 and auto amp. (LCU) harness terminal No. 11.



RHA478G

Continuity should exist.
If OK, check harness for short.

OK or NG

OK	▶	GO TO 3.
NG	▶	Repair harness or connector.

3	CHECK IN-VEHICLE SENSOR

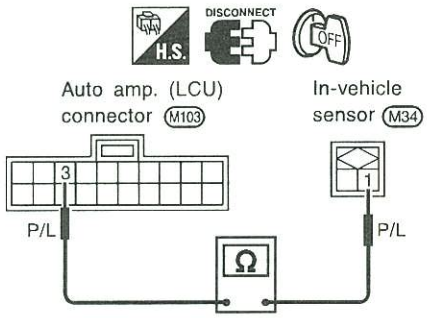
Refer to HA-91.

OK or NG

OK	▶	1. Replace auto amp. 2. Go to self-diagnosis step-by-step procedure (HA-38) and perform self-diagnosis STEP-2. Confirm that code No. 20 is displayed.
NG	▶	1. Replace in-vehicle sensor. 2. Go to self-diagnosis step-by-step procedure (HA-38) and perform self-diagnosis STEP-2. Confirm that code No. 20 is displayed.

4	CHECK IN-VEHICLE SENSOR CIRCUIT BETWEEN AMBIENT SENSOR AND AUTO AMP. (LCU)

1. Disconnect auto amp. (LCU) harness connector.
2. Check circuit continuity between in-vehicle sensor harness terminal No. 1 and auto amp. (LCU) harness terminal No. 3.

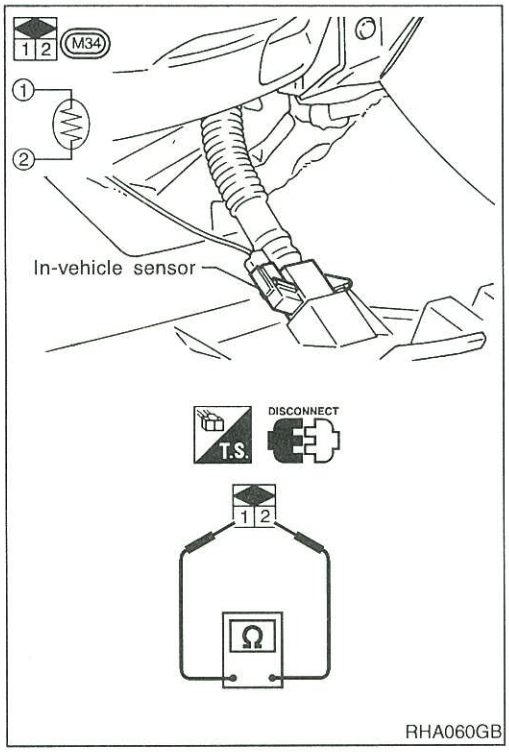


RHA479G

Continuity should exist.
If OK, check harness for short.

OK or NG

OK	▶	1. Replace auto amp. (LCU). 2. Go to self-diagnosis step-by-step procedure (HA-38) and perform self-diagnosis STEP-2. Confirm that code No. 20 is displayed.
NG	▶	Repair harness or connector.



COMPONENT INSPECTION

NBHA0045

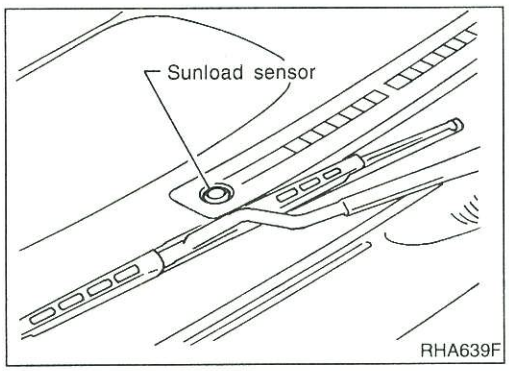
In-vehicle Sensor

NBHA0044S01

After disconnecting in-vehicle sensor harness connector, measure resistance between terminals 1 and 2 at sensor harness side, using the table below.

Temperature °C (°F)	Resistance kΩ
–15 (5)	12.73
–10 (14)	9.92
–5 (23)	7.80
0 (32)	6.19
5 (41)	4.95
10 (50)	3.99
15 (59)	3.24
20 (68)	2.65
25 (77)	2.19
30 (86)	1.81
35 (95)	1.51
40 (104)	1.27
45 (113)	1.07

If NG, replace in-vehicle sensor.



Sunload Sensor Circuit

COMPONENT DESCRIPTION

NBHA0046

The sunload sensor is located on the right defroster grille. It detects sunload entering through windshield by means of a photo diode. The sensor converts the sunload into a current value which is then input into the auto amplifier.

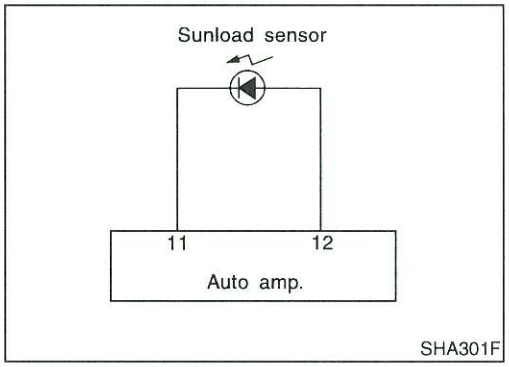
SUNLOAD INPUT PROCESS

NBHA0047

The auto amp. also includes a processing circuit which "average" the variations in detected sunload over a period of time. This prevents drastic swings in the ATC system operation due to small or quick variations in detected sunload.

For example, consider driving along a road bordered by an occasional group of large trees. The sunload detected by the sunload sensor will vary whenever the trees obstruct the sunlight. The processing circuit averages the detected sunload over a period of time, so that the (insignificant) effect of the trees momentarily

obstructing the sunlight does not cause any change in the ATC system operation. On the other hand, shortly after entering a long tunnel, the system will recognize the change in sunload, and the system will react accordingly.



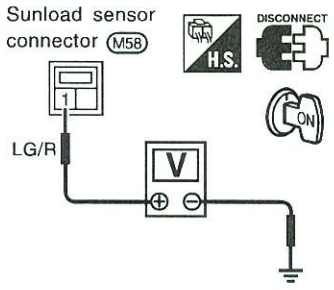
DIAGNOSTIC PROCEDURE

NBHA0048

SYMPTOM: Sunload sensor circuit is open or shorted. (25 or –25 is indicated on the display as a result of conducting Self-diagnosis STEP 2.)

1	CHECK SUNLOAD SENSOR CIRCUIT BETWEEN SUNLOAD SENSOR AND BODY GROUND

Disconnect sunload sensor harness connector.
Do approx. 5 volts exist between sunload sensor harness terminal No. 1 and body ground?



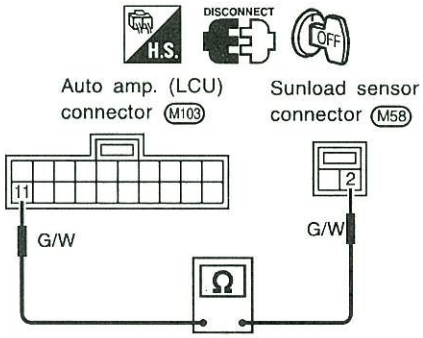
RHA062G

Yes or No

Yes	▶	GO TO 2.
No	▶	GO TO 4.

2	CHECK SUNLOAD SENSOR CIRCUIT BETWEEN SUNLOAD SENSOR AND AUTO AMP. (LCU)

1. Disconnect auto amp. (LCU) harness connector.
2. Check circuit continuity between sunload sensor harness terminal No. 2 and auto amp. (LCU) harness terminal No. 11.



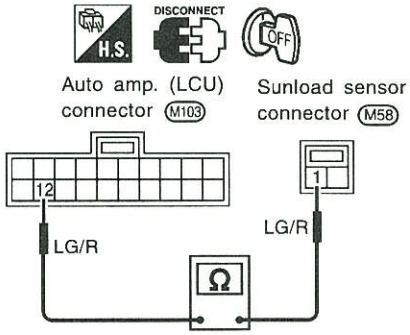
RHA483G

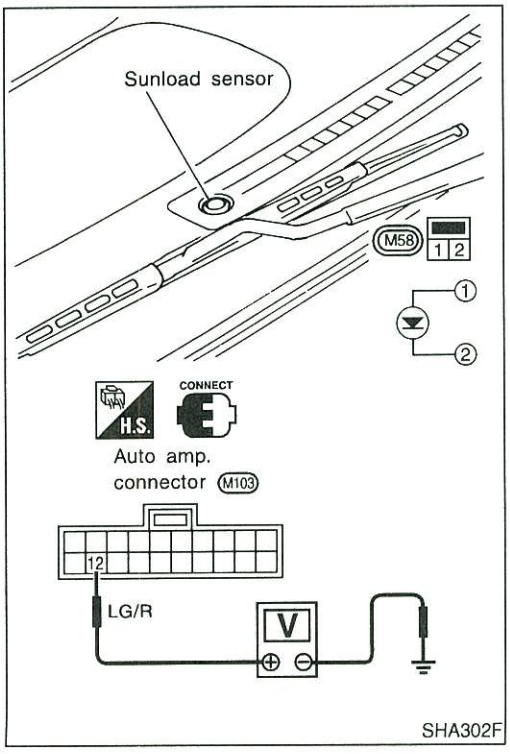
Continuity should exist.
If OK, check harness for short.

OK or NG

OK	▶	GO TO 3.
NG	▶	Repair harness or connector.

3	CHECK SUNLOAD SENSOR.
Refer to HA-93.	
OK or NG	
OK ▶	1. Replace auto amp. (LCU). 2. Go to self-diagnosis step-by-step procedure (HA-38) and perform self-diagnosis STEP-2. Confirm that code No. 20 is displayed.
NG ▶	1. Replace sunload sensor. 2. Go to self-diagnosis step-by-step procedure (HA-38) and perform self-diagnosis STEP-2. Confirm that code No. 20 is displayed.

4	CHECK SUNLOAD SENSOR CIRCUIT BETWEEN SUNLOAD SENSOR AND AUTO AMP. (LCU)
1. Disconnect auto amp. (LCU) harness connector. 2. Check circuit continuity between sunload sensor harness terminal No. 1 and auto amp. (LCU) harness terminal No. 12.	
 RHA484G	
Continuity should exist. If OK, check harness for short.	
OK or NG	
OK ▶	1. Replace auto amp. 2. Go to self-diagnosis step-by-step procedure (HA-38) and perform self-diagnosis STEP-2. Confirm that code No. 20 is displayed.
NG ▶	Repair harness or connector.



SHA302F

COMPONENT INSPECTION

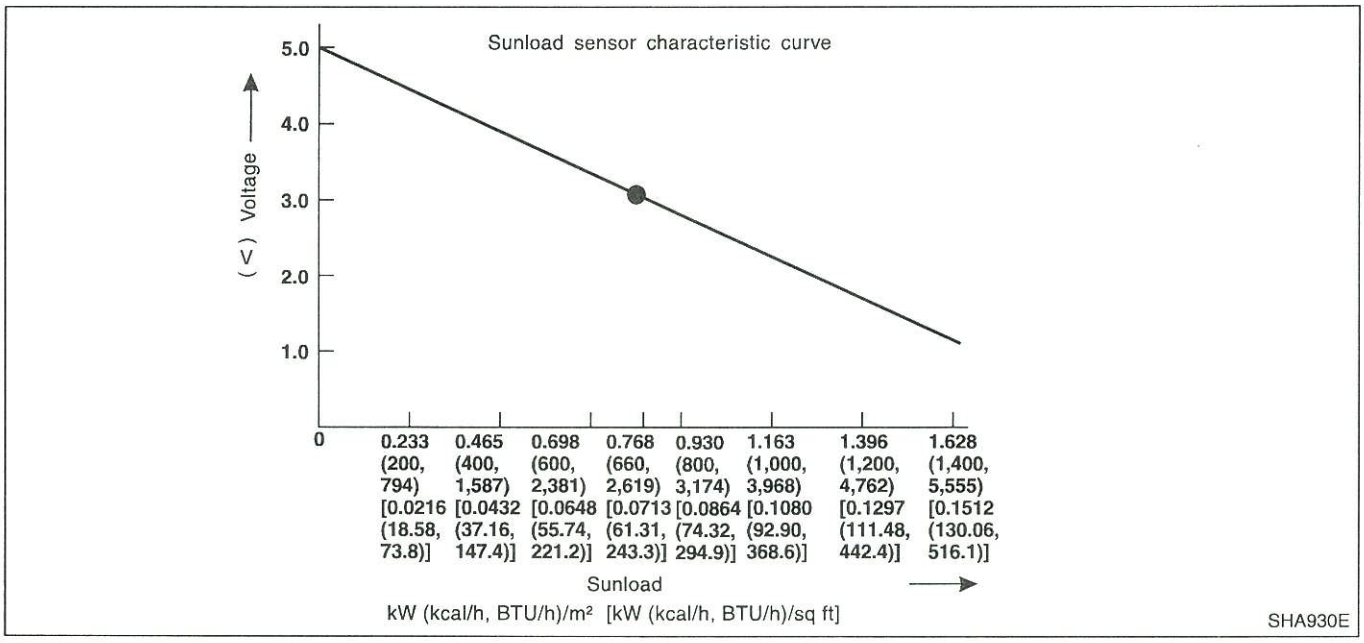
NBHA0049

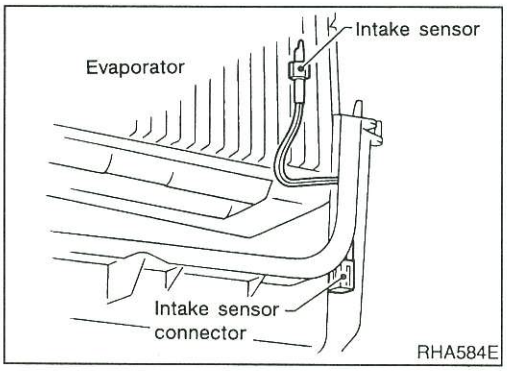
Sunload Sensor

NBHA0049S01

Measure voltage between auto amp. terminal 12 and body ground.
If NG, replace sunload sensor.

- **When checking sunload sensor, select a place where sun shines directly on it.**





Intake Sensor Circuit

COMPONENT DESCRIPTION

NBHA0105

Intake Sensor

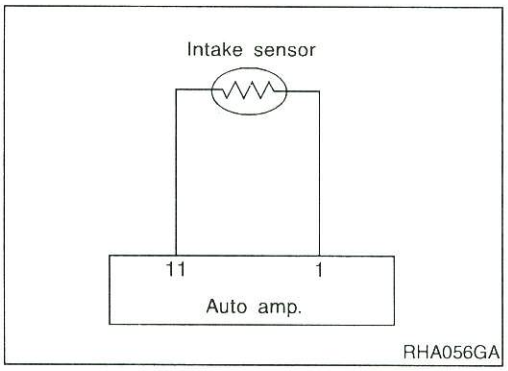
NBHA0105S01

The intake sensor is located on the cooling unit. It converts temperature of air after it passes through the evaporator into a resistance value which is then input to the auto amp.

After disconnecting intake sensor harness connector, measure resistance between terminals 1 and 2 at sensor harness side, using the table below.

Temperature °C (°F)	Resistance kΩ
–15 (5)	12.73
–10 (14)	9.92
–5 (23)	7.80
0 (32)	6.19
5 (41)	4.95
10 (50)	3.99
15 (59)	3.24
20 (68)	2.65
25 (77)	2.19
30 (86)	1.81
35 (95)	1.51
40 (104)	1.27
45 (113)	1.07

If NG, replace intake sensor.



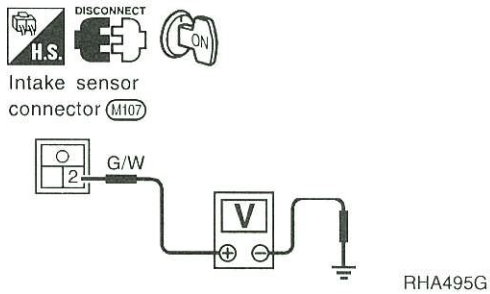
DIAGNOSTIC PROCEDURE

NBHA0106

SYMPTOM: Intake sensor circuit is open or shorted. (24 or –24 is indicated on the display as a result of conducting Self-diagnosis STEP 2.)

1	CHECK INTAKE SENSOR CIRCUIT BETWEEN INTAKE SENSOR AND BODY GROUND

Disconnect intake sensor harness connector.
Do approx. 5 volts exist between intake sensor harness terminal No. 2 and body ground?

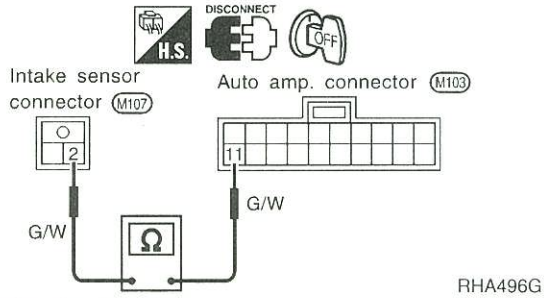


Yes or No

Yes	▶	GO TO 2.
No	▶	GO TO 4.

2	CHECK INTAKE SENSOR CIRCUIT BETWEEN INTAKE SENSOR AND AUTO AMP. (LCU)

1. Disconnect auto amp. (LCU) harness connector.
2. Check circuit continuity between intake sensor harness terminal No. 2 and auto amp. (LCU) harness terminal No. 11.



Continuity should exist.
If OK, check harness for short.

OK or NG

OK	▶	GO TO 3.
NG	▶	Repair harness or connector.

3	CHECK INTAKE SENSOR

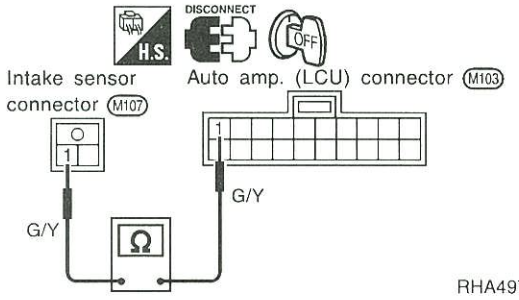
Refer to HA-94.

OK or NG

OK	▶	1. Replace auto amp. 2. Go to self-diagnosis step-by-step procedure (HA-38) and perform self-diagnosis STEP-2. Confirm that code No. 20 is displayed.
NG	▶	1. Replace intake sensor. 2. Go to self-diagnosis step-by-step procedure (HA-38) and perform self-diagnosis STEP-2. Confirm that code No. 20 is displayed.

4	CHECK INTAKE SENSOR CIRCUIT BETWEEN AMBIENT SENSOR AND AUTO AMP. (LCU)

1. Disconnect auto amp. (LCU) harness connector.
2. Check circuit continuity between intake sensor harness terminal No. 1 and auto amp. (LCU) harness terminal No. 1.



Continuity should exist.
If OK, check harness for short.

OK or NG

OK	▶	1. Replace auto amp. 2. Go to self-diagnosis step-by-step procedure (HA-38) and perform self-diagnosis STEP-2. Confirm that code No. 20 is displayed.
NG	▶	Repair harness or connector.

Air Mix Door Motor PBR Circuit

DIAGNOSTIC PROCEDURE

NBHA0050

For description of mode door motor and air mix door motor circuit, refer to HA-55.

SYMPTOM: If PBR circuit is open or shorted. (–26 or 26 is indicated on the display as a result of conducting Self-diagnosis STEP 2.)

Perform diagnostic procedure for mode door motor and air mix door motor. Refer to HA-51.

HFC-134a (R-134a) Service Procedure

NBHA0070

SETTING OF SERVICE TOOLS AND EQUIPMENT

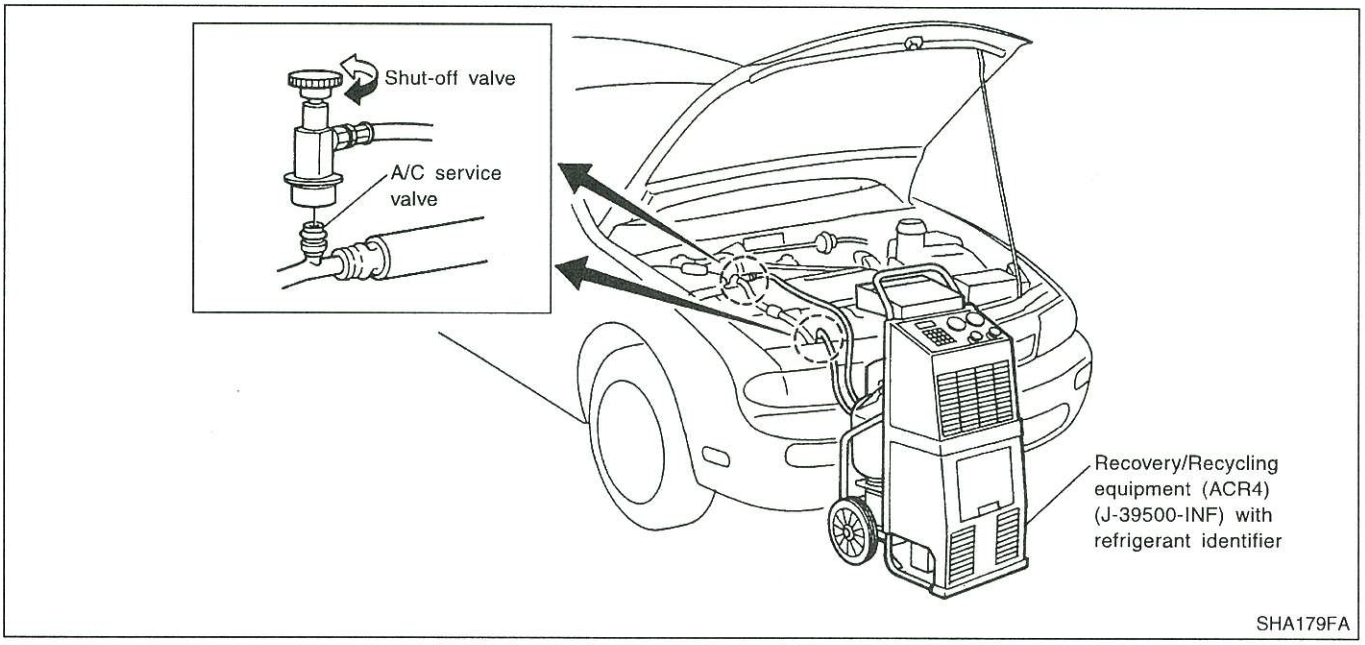
NBHA0070S01

DISCHARGING REFRIGERANT

NBHA0070S0101

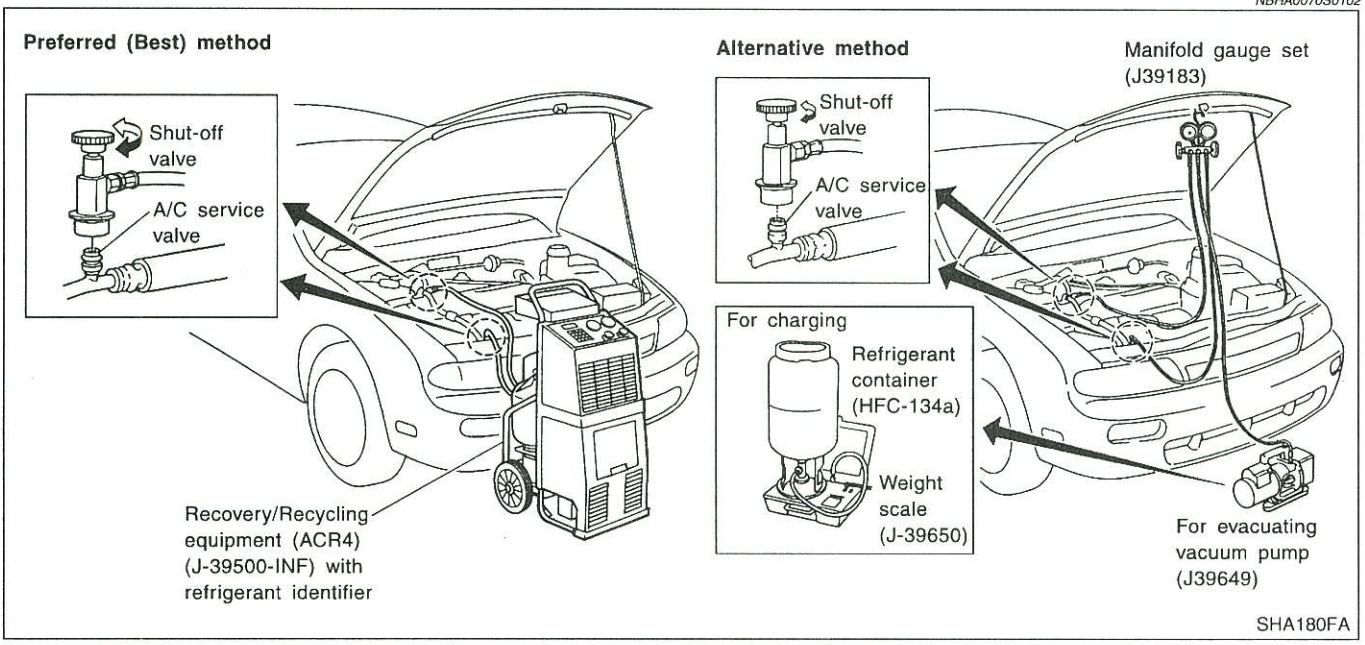
WARNING:

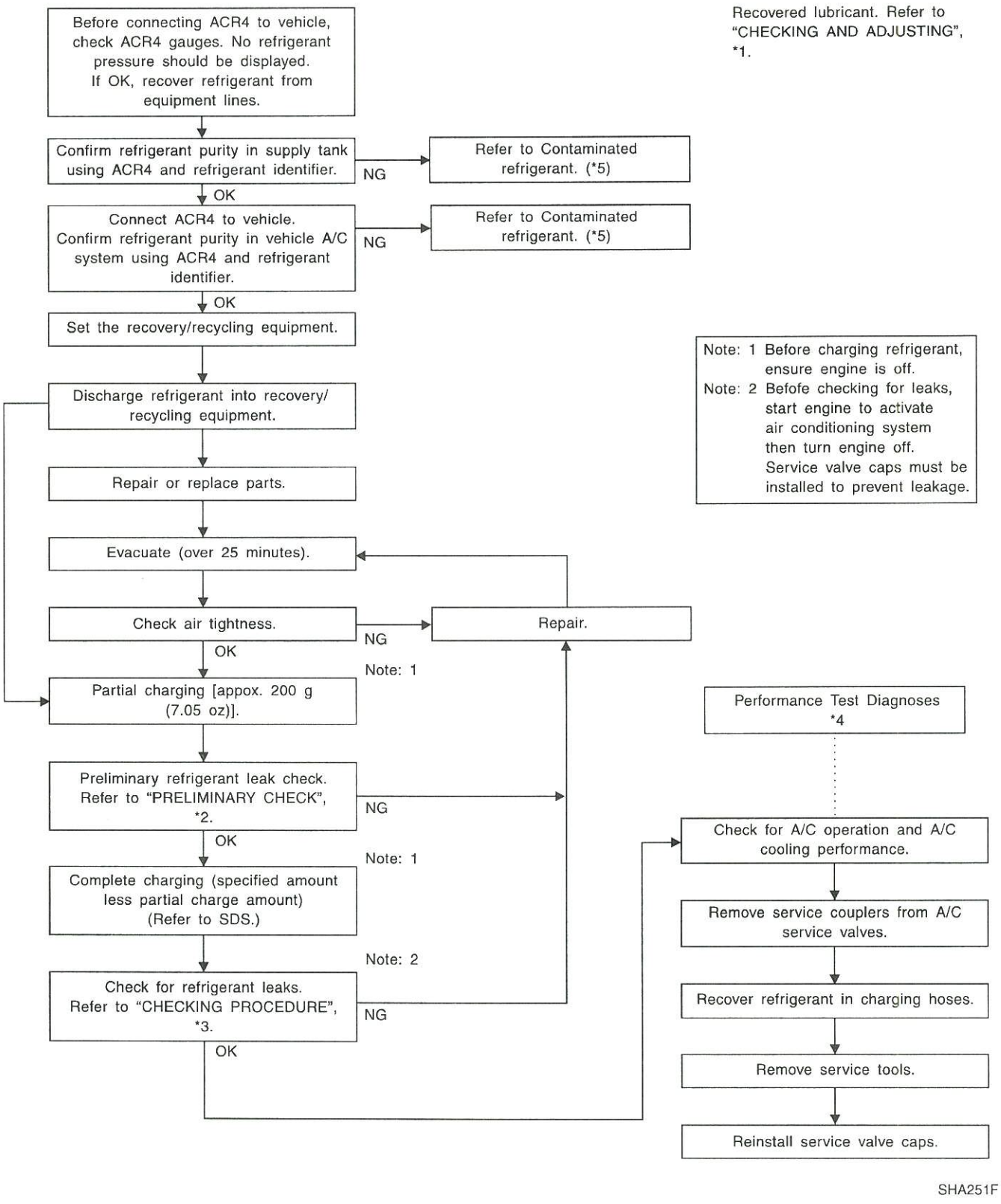
Avoid breathing A/C refrigerant and lubricant vapor or mist. Exposure may irritate eyes, nose and throat. Remove HFC-134a (R-134a) from A/C system using certified service equipment meeting requirements of SAE J2210 (R-134a recycling equipment) or J2209 (R-134a recovery equipment). If accidental system discharge occurs, ventilate work area before resuming service. Additional health and safety information may be obtained from refrigerant and lubricant manufacturers.



Evacuating System and Charging Refrigerant

NBHA0070S0102





SHA251F

*1: HA-99
*2: HA-107
*3: HA-108
*4: HA-75
*5: HA-2

Maintenance of Lubricant Quantity in Compressor

NBHA0071

The lubricant in the compressor circulates through the system with the refrigerant. Add lubricant to compressor when replacing any component or after a large gas leakage occurred. It is important to maintain the specified amount.
If lubricant quantity is not maintained properly, the following malfunctions may result:

- Lack of lubricant: May lead to a seized compressor
- Excessive lubricant: Inadequate cooling (thermal exchange interference)

LUBRICANT

NBHA0071S01

Name: Nissan A/C System Oil Type S
Part number: KLH00-PAGS0

CHECKING AND ADJUSTING

NBHA0071S02

Adjust the lubricant quantity according to the test group shown below.

1	CHECK LUBRICANT RETURN OPERATION	
Can lubricant return operation be performed? • A/C system works properly. • There is no evidence of a large amount of lubricant leakage. **Yes or No**		
Yes	▶	GO TO 2.
No	▶	GO TO 3.

2	PERFORM LUBRICANT RETURN OPERATION, PROCEEDING AS FOLLOWS:	
1. Start engine, and set the following conditions: • **Test condition** **Engine speed: Idling to 1,200 rpm** **A/C or AUTO switch: ON** **Blower speed: Max. position** **Temp. control: Optional [Set so that intake air temperature is 25 to 30°C (77 to 86°F).]** 2. **Next item is for V-5 or V-6 compressor. Connect the manifold gauge, and check that the high pressure side pressure is 588 kPa (6 kg/cm², 85 psi) or higher. If less than the reference level, attach a cover to the front face of the condenser to raise the pressure.** 3. Perform lubricant return operation for about 10 minutes. 4. Stop engine. **CAUTION:** **If excessive lubricant leakage is noted, do not perform the lubricant return operation.**		
OK	▶	GO TO 3.

3	CHECK COMPRESSOR	
Should the compressor be replaced? **Yes or No**		
Yes	▶	Go to "Lubricant Adjustment Procedure for Compressor Replacement", (HA-100).
No	▶	GO TO 4.

4	CHECK ANY PART	
Is there any part to be replaced? (Evaporator, condenser, liquid tank or in case there is evidence of a large amount of lubricant leakage.) **Yes or No**		
Yes	▶	Go to "Lubricant Adjusting Procedure for Components Replacement Except Compressor", (HA-100).
No	▶	Carry out the A/C performance test.

Lubricant Adjusting Procedure for Components Replacement Except Compressor

=NBHA0071S0201

After replacing any of the following major components, add the correct amount of lubricant to the system.

Amount of lubricant to be added

Part replaced	Lubricant to be added to system	Remarks
	Amount of lubricant mℓ (US fl oz, Imp fl oz)	
Evaporator	75 (2.5, 2.6)	—
Condenser	75 (2.5, 2.6)	—
Liquid tank	5 (0.2, 0.2)	Add if compressor is not replaced. *1
In case of refrigerant leak	30 (1.0, 1.1)	Large leak
	—	Small leak *2

*1: If compressor is replaced, addition of lubricant is included in the table.

*2: If refrigerant leak is small, no addition of lubricant is needed.

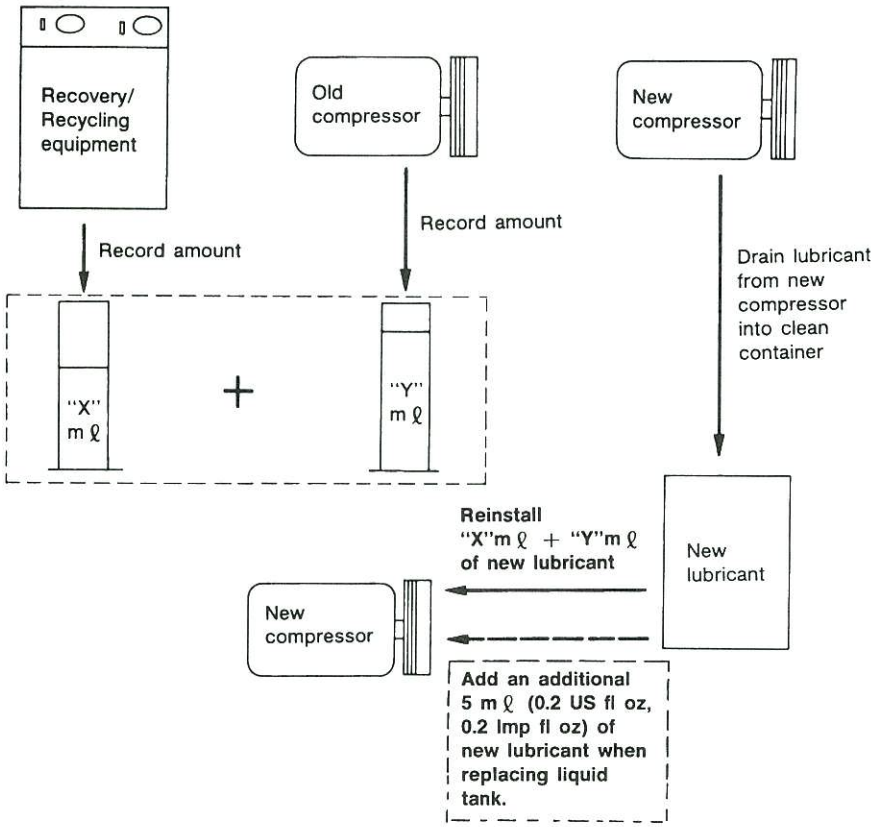
Lubricant Adjusting Procedure for Compressor Replacement

NBHA0071S0202

1. Before connecting ACR4 to vehicle, check ACR4 gauges. No refrigerant pressure should be displayed. If NG, recover refrigerant from equipment lines.
2. Connect ACR4 to vehicle. Confirm refrigerant purity in supply tank using ACR4 and refrigerant identifier. If NG, refer to "CONTAMINATED REFRIGERANT", HA-2.
3. Confirm refrigerant purity in vehicle A/C system using ACR4 and refrigerant identifier. If NG, refer to "CONTAMINATED REFRIGERANT", HA-2.
4. Discharge refrigerant into the refrigerant recovery/recycling equipment. Measure lubricant discharged into the recovery/recycling equipment.
5. Remove the drain plug of the "old" (removed) compressor. Drain the lubricant into a graduated container and record the amount of drained lubricant.
6. Remove the drain plug and drain the lubricant from the "new" compressor into a separate, clean container.
7. Measure an amount of new lubricant installed equal to amount drained from "old" compressor. Add this lubricant to "new" compressor through the suction port opening.
8. Measure an amount of new lubricant equal to the amount recovered during discharging. Add this lubricant to "new" compressor through the suction port opening.
9. Torque the drain plug.

   18 - 19 N·m (1.8 - 1.9 kg-m, 13 - 14 ft-lb)
10. If the liquid tank also needs to be replaced, add an additional 5 mℓ (0.2 US fl oz, 0.2 Imp fl oz) of lubricant at this time.
    Do not add this 5 mℓ (0.2 US fl oz, 0.2 Imp fl oz) of lubricant if only replacing the compressor.

Lubricant adjusting procedure for compressor replacement

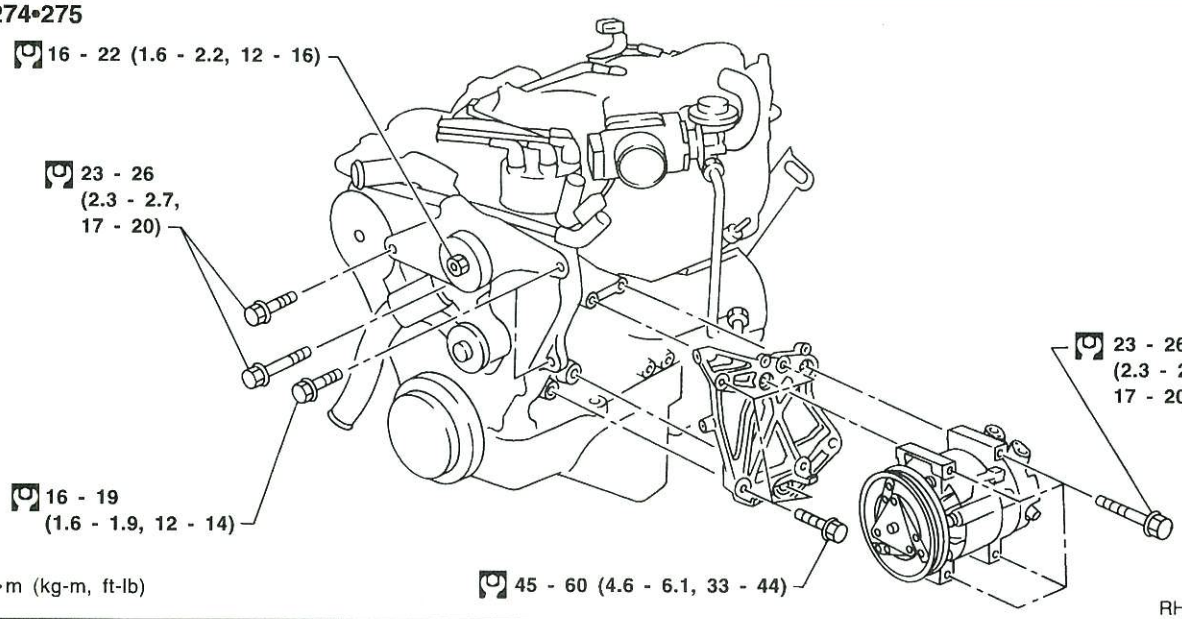


RHA065DD

Compressor
REMOVAL AND INSTALLATION

NBHA0072

SEC. 274•275

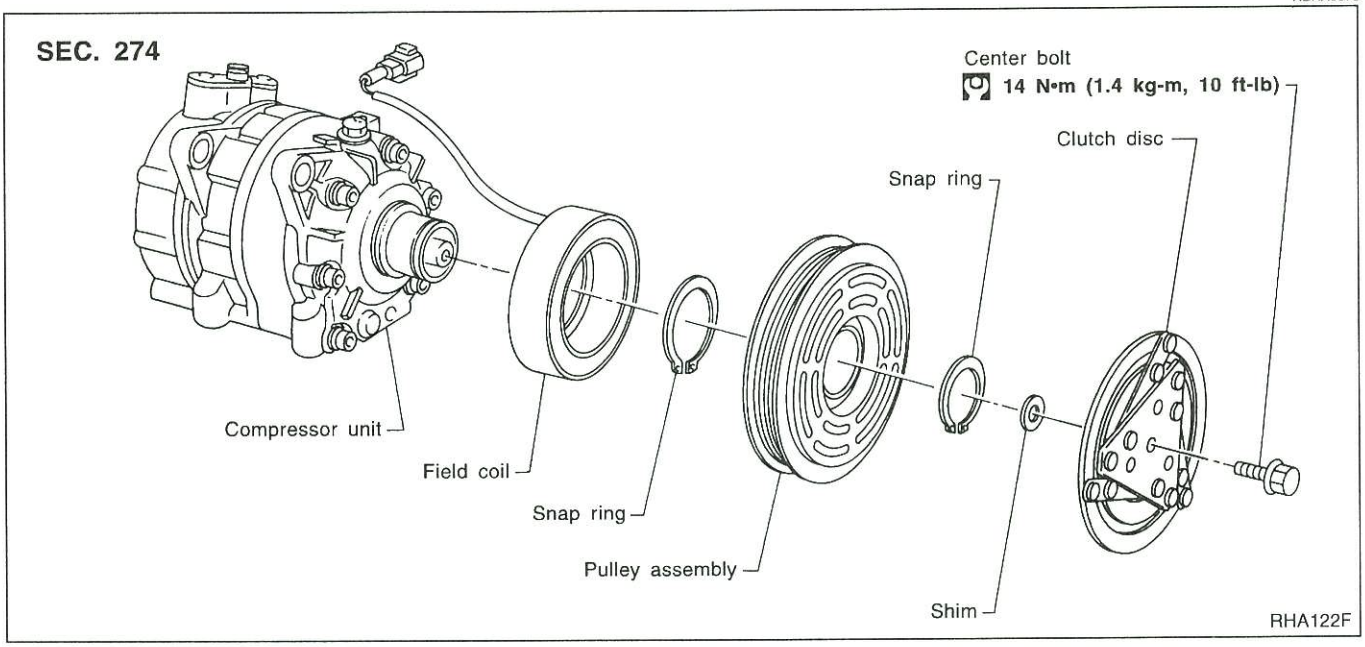


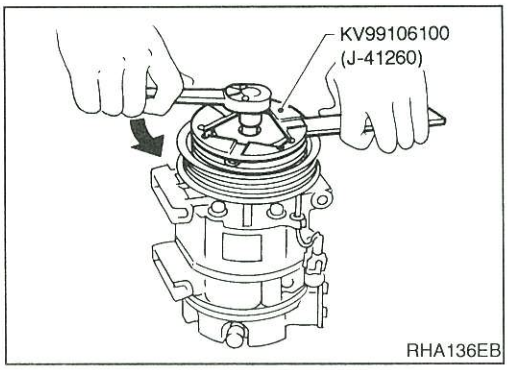
RHA650F

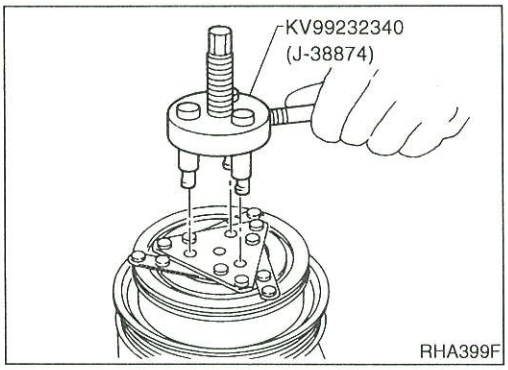
Compressor Clutch

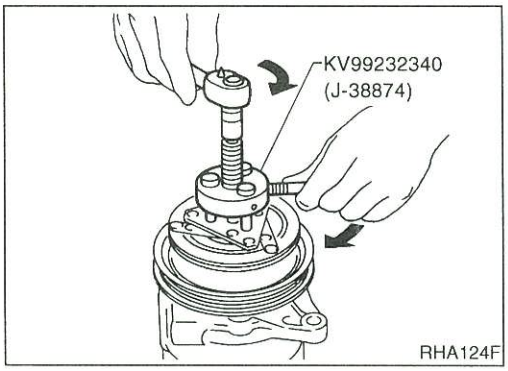
OVERHAUL

NBHA0073







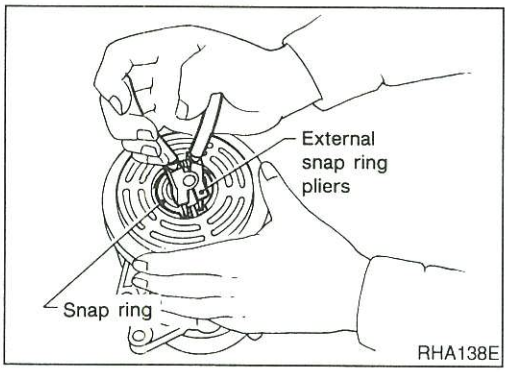


REMOVAL

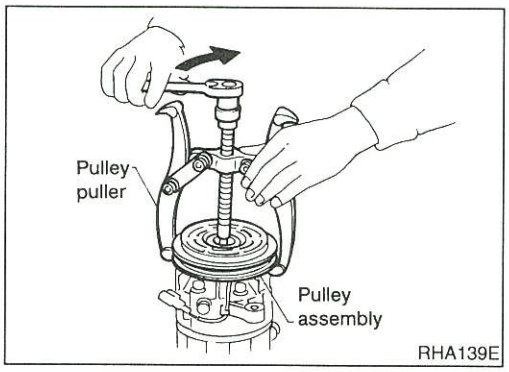
NBHA0074

- When removing center bolt, hold clutch disc with clutch disc wrench.

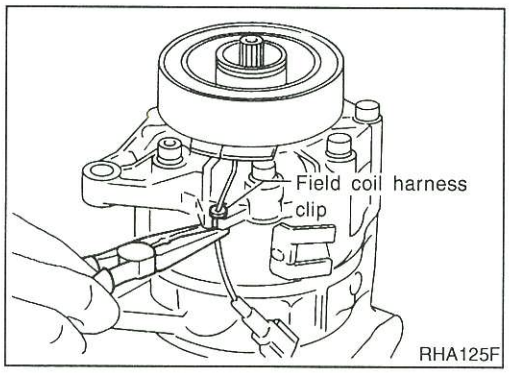
- Remove the clutch disc using the clutch disc puller.
  Insert the holder's three pins into the holes in the clutch disc. Rotate the holder clockwise to hook it onto the plate. Then, tighten the center bolt to remove the clutch disc.
  After removing the clutch disc, remove the shims from either the drive shaft or the clutch disc.



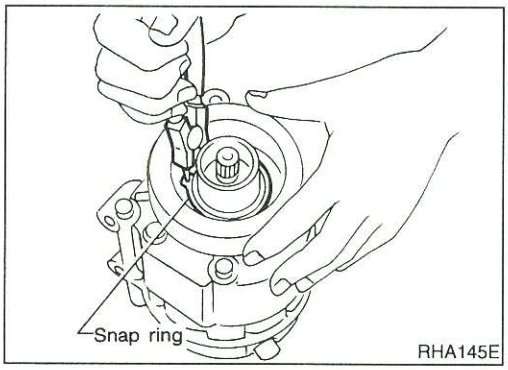
- Remove the snap ring using external snap ring pliers.



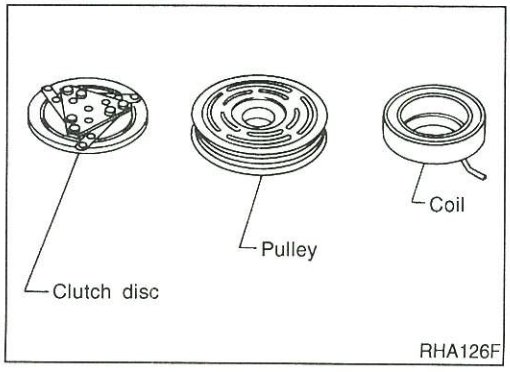
- Pulley removal
  Position the center pulley puller on the end of the drive shaft, and remove the pulley assembly using any commercially available pulley puller.
  To prevent the pulley groove from being deformed, the puller claws should be positioned onto the edge of the pulley assembly.



- Remove the field coil harness clip using a pair of pliers.



- Remove the snap ring using external snap ring pliers.



INSPECTION

NBHA0075

Clutch Disc

NBHA0075S01

If the contact surface shows signs of damage due to excessive heat, replace clutch disc and pulley.

Pulley

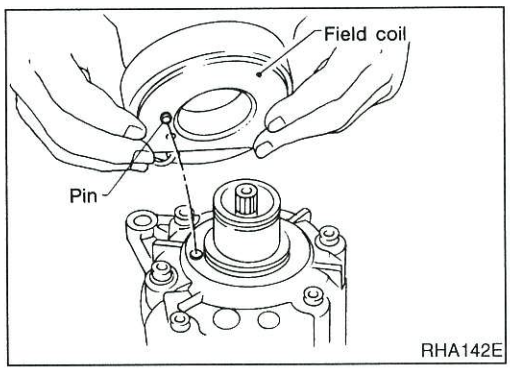
NBHA0075S02

Check the appearance of the pulley assembly. If the contact surface of pulley shows signs of excessive grooving, replace clutch disc and pulley. The contact surfaces of the pulley assembly should be cleaned with a suitable solvent before reinstallation.

Coil

NBHA0075S03

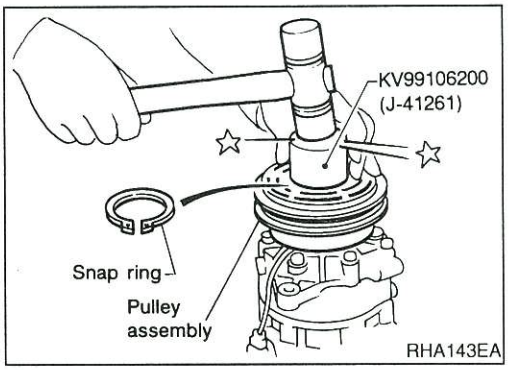
Check coil for loose connection or cracked insulation.



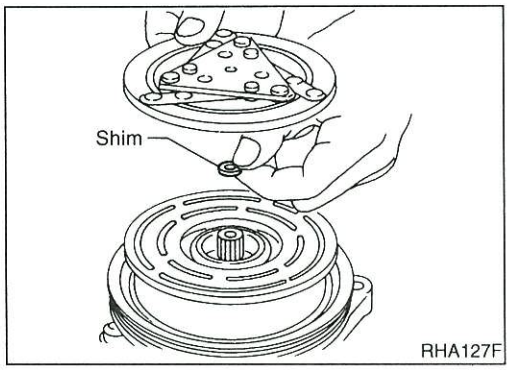
INSTALLATION

NBHA0076

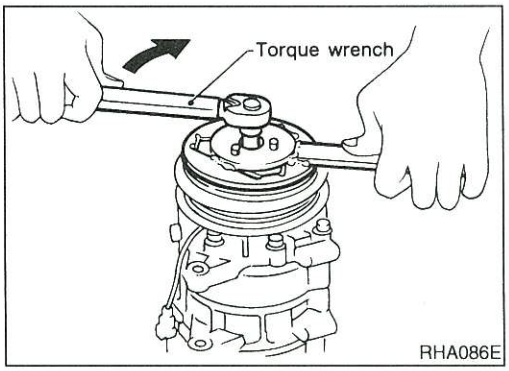
- Install the field coil.
  Be sure to align the coil's pin with the hole in the compressor's front head.
- Install the field coil harness clip using a screwdriver.



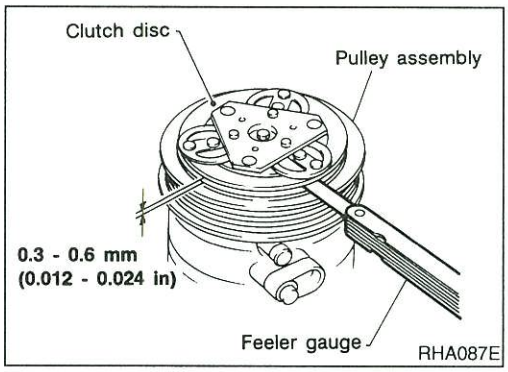
- Install the pulley assembly using the installer and a hand press, and then install the snap ring using snap ring pliers.



- Install the clutch disc on the drive shaft, together with the original shim(s). Press the clutch disc down by hand.



- Using the holder to prevent clutch disc rotation, tighten the bolt to 14 N·m (1.4 kg-m, 10 ft-lb) torque.
  After tightening the bolt, check that the pulley rotates smoothly.



- Check clearance around the entire periphery of clutch disc.

  Disc-to-pulley clearance:

  0.3 - 0.6 mm (0.012 - 0.024 in)

  If the specified clearance is not obtained, replace adjusting spacer and readjust.

Break-in Operation

NBHA0076S01

When replacing compressor clutch assembly, always carry out the break-in operation. This is done by engaging and disengaging the clutch about thirty times. Break-in operation raises the level of transmitted torque.

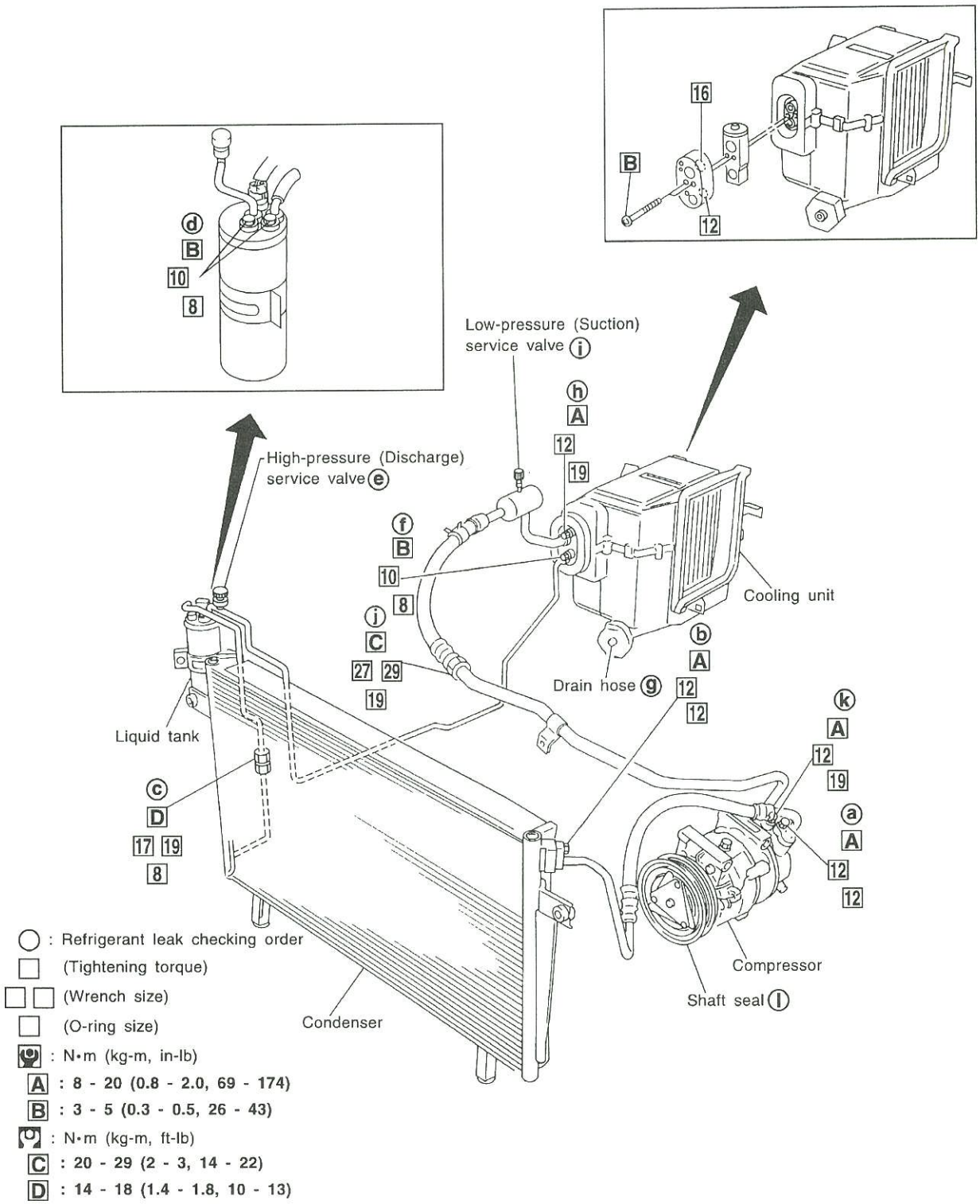
Refrigerant Lines

REMOVAL AND INSTALLATION

=NBHA0077

- Refer to page HA-3 regarding "Precautions for Refrigerant Connection".

SEC. 271•274•276



SHA305F

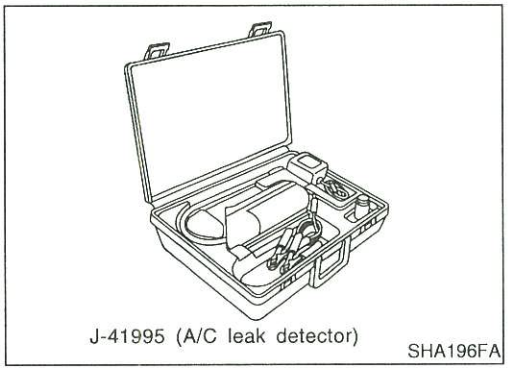
CHECKING REFRIGERANT LEAKS

NBHA0078

Preliminary Check

NBHA0078S01

Perform a visual inspection of all refrigeration parts, fittings, hoses, and components for signs of A/C lubricant leakage, damage and corrosion. Take note of the areas with A/C lubricant leakage to allow extra time in these areas with electronic leak detector.



J-41995 (A/C leak detector) SHA196FA

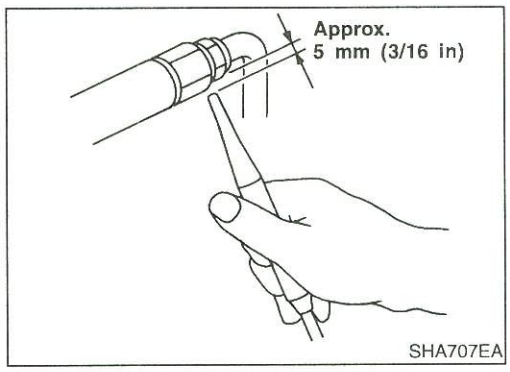
Precautions for Handling Leak Detector

NBHA0078S02

When performing a refrigerant leak check, use a J-41995 A/C leak detector or equivalent. Ensure that the instrument is calibrated and set properly per the operating instructions.

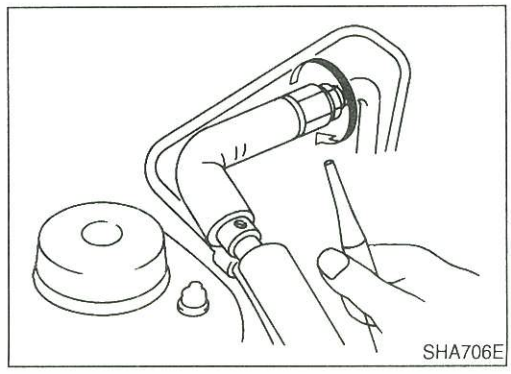
The leak detector is a delicate device. In order to use the leak detector properly, read the operating instructions and perform any specified maintenance.

Other gases in the work area or substances on the A/C components, for example, anti-freeze, windshield washer fluid, solvents and lubricants, may falsely trigger the leak detector. Make sure the surfaces to be checked are clean. Clean with a dry cloth or blow off with shop air. Do not allow the sensor tip of the detector to contact with any substance. This can also cause false readings and may damage the detector.



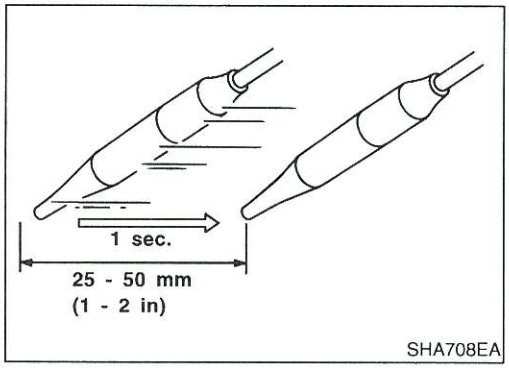
SHA707EA

1. Position probe approximately 5 mm (3/16 in) away from point to be checked.



SHA706E

2. When testing, circle each fitting completely with probe.



3. Move probe along component approximately 25 to 50 mm (1 to 2 in)/sec.

Checking Procedure

NBHA0078S03

To prevent inaccurate or false readings, make sure there is no refrigerant vapor, shop chemicals, or cigarette smoke in the vicinity of the vehicle. Perform the leak test in calm area (low air/wind movement) so that the leaking refrigerant is not dispersed.

1. Turn engine off.
2. Connect a suitable A/C manifold gauge set to the A/C service ports.
3. Check if the A/C refrigerant pressure is at least 345 kPa (3.52 kg/cm^2, 50 psi) above 16°C (61°F). If less than specification, recover/evacuate and recharge the system with the specified amount of refrigerant.

NOTE:
At temperatures below 16°C (61°F), leaks may not be detected since the system may not reach 345 kPa (3.52 kg/cm^2, 50 psi).

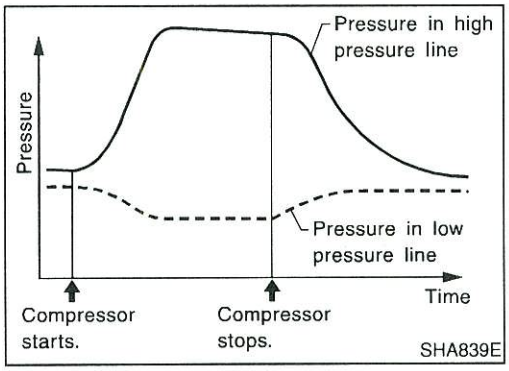
4. Conduct the leak test from the high side (compressor discharge **a** to evaporator inlet **f**) to the low side (evaporator drain hose **g** to shaft seal **l**). Refer to HA-106. Perform a leak check for the following areas carefully. Clean the component to be checked and move the leak detector probe completely around the connection/component.

- **Compressor**
  Check the fitting of high and low pressure hoses, relief valve and shaft seal.
- **Liquid tank**
  Check the pressure switch, tube fitting, weld seams and the fusible plug mount.
- **Service valves**
  Check all around the service valves. Ensure service valve caps are secured on the service valves (to prevent leaks).

NOTE:
After removing A/C manifold gauge set from service valves, wipe any residue from valves to prevent any false readings by leak detector.

- **Cooling unit (Evaporator)**
  With engine OFF, turn blower fan on "High" for at least 15 seconds to dissipate any refrigerant trace in the cooling unit. Wait a minimum of 10 minutes accumulation time (refer to the manufacturer's recommended procedure for actual wait time) before inserting the leak detector probe into the drain hose. Keep the probe inserted for at least ten seconds. Use caution not to contaminate the ptobe tip with water or dirt that may be in the drain hose.

5. If a leak detector detects a leak, verify at least once by blowing compressed air into area of suspected leak, then repeat check as outlined above.
6. Do not stop when one leak is found. Continue to check for additional leaks at all system components.
   If no leaks are found, perform steps 7 - 10.
7. Start engine.
8. Set the heater A/C control as follows:
   1) A/C switch ON.
   2) Face mode
   3) Recirculation switch ON
   4) Max cold temperature
   5) Fan speed high
9. Run engine at 1,500 rpm for at least 2 minutes.
10. Turn engine off and perform leak check again following steps 4 through 6 above.



Refrigerant leaks should be checked immediately after stopping the engine. Begin with the leak detector at the compressor. The pressure on the high pressure side will gradually drop after refrigerant circulation stops and pressure on the low pressure side will gradually rise, as shown in the graph. Some leaks are more easily detected when pressure is high.

11. Before connecting ACR4 to vehicle, check ACR4 gauges. No refrigerant pressure should be displayed. If pressure is displayed, recover refrigerant from equipment lines and then check refrigerant purity.
12. Confirm refrigerant purity in supply tank using ACR4 and refrigerant identifier.
13. Confirm refrigerant purity in vehicle A/C system using ACR4 and refrigerant identifier.
14. Discharge A/C system using approved refrigerant recovery equipment. Repair the leaking fitting or component as necessary.
15. Evacuate and recharge A/C system and perform the leak test to confirm no refrigerant leaks.
16. Conduct A/C performance test to ensure system works properly.

Belt

TENSION ADJUSTMENT

NBHA0079

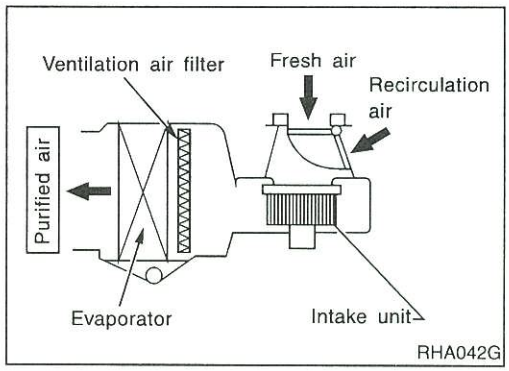
- **Refer to MA section.**

Fast Idle Control Device (FICD)

INSPECTION

NBHA0080

- **Refer to EC section and HA-18.**



Ventilation Air Filter

FUNCTION

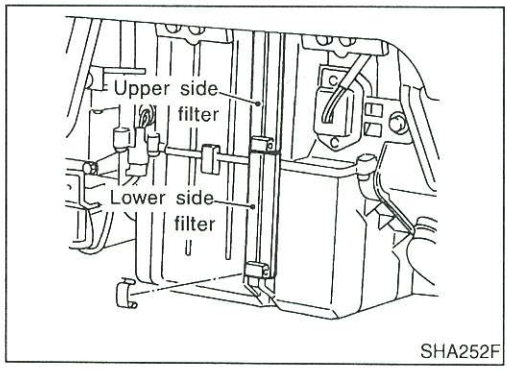
NBHA0108

Air inside passenger compartment is kept clean at either recirculation or fresh mode by installing ventilation air filter into cooling unit.

NOTE:

To replace ventilation air filter, refer to "PERIODIC MAINTENANCE" in MA section.

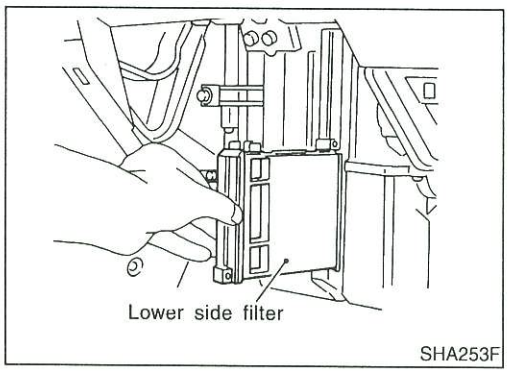
Caution label is fixed inside the glove box.



REPLACEMENT PROCEDURE

NBHA0109

1. Remove glove box.
2. Remove instrument lower panel from instrument panel.
3. Remove ventilation air filter fixed clip.



4. Take out the lower side ventilation air filter from cooling unit.
5. Then slide upper side filter to the bottom position and take off the ventilation air filter from the cooling unit.
6. Replace with new one and reinstall on cooling unit.
7. Reinstall clip, instrument lower panel and glove box.

Compressor

NBHA0081

Model		CALSONIC make V-6
Type		V-6 variable displacement
Displacement cm^3 (cu in)/rev.	Max.	184 (11.228)
	Min.	14.5 (0.885)
Cylinder bore x stroke mm (in)		37 (1.46) x [2.3 - 28.6 (0.091 - 1.126)]
Direction of rotation		Clockwise (viewed from drive end)
Drive belt		Poly V

Lubricant

NBHA0082

Model		CALSONIC make V-6
Name		Nissan A/C System Oil Type S
Part number		KLH00-PAGS0
Capacity mℓ (US fl oz, Imp fl oz)	Total in system	200 (6.8, 7.0)
	Compressor (Service part) charging amount	200 (6.8, 7.0)

Refrigerant

NBHA0083

Type	HFC-134a (R-134a)
Capacity kg (lb)	0.60 - 0.70 (1.32 - 1.54)

Engine Idling Speed (When A/C is ON)

NBHA0084

- **Refer to EC section.**

Belt Tension

NBHA0085

- **Refer to Checking Drive Belts (MA section).**

STARTING & CHARGING SYSTEM

SECTION SC

CONTENTS

PRECAUTIONS 2
- Supplemental Restraint System (SRS) "AIR BAG" and "SEAT BELT PRE-TENSIONER" 2
- Wiring Diagrams and Trouble Diagnosis 2

BATTERY 3
- How to Handle Battery 3
  - METHODS OF PREVENTING OVER-DISCHARGE 3
  - CHECKING ELECTROLYTE LEVEL 3
  - SPECIFIC GRAVITY CHECK 4
  - CHARGING THE BATTERY 5

STARTING SYSTEM 6
- System Description 6
- Wiring Diagram — START — 7
- Construction 8
- Removal and Installation 8
- Pinion/Clutch Check 8

CHARGING SYSTEM 9
- System Description 9
- Wiring Diagram — CHARGE — 10
- Trouble Diagnoses 11
  - WITH IC REGULATOR 11
  - MALFUNCTION INDICATOR 11
- Construction 12
- Removal and Installation 12

SERVICE DATA AND SPECIFICATIONS (SDS) 13
- Battery 13
- Starter 13
- Alternator 13

Supplemental Restraint System (SRS) "AIR BAG" and "SEAT BELT PRE-TENSIONER"

NBSC0001

The Supplemental Restraint System such as "AIR BAG" and "SEAT BELT PRE-TENSIONER" used along with a seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. The SRS system composition which is available to INFINITI QX4 is as follows:

- For a frontal collision
  The Supplemental Restraint System consists of driver air bag module (located in the center of the steering wheel), front passenger air bag module (located on the instrument panel on passenger side), seat belt pre-tensioners, a diagnosis sensor unit, warning lamp, wiring harness and spiral cable.
- For a side collision
  The Supplemental Restraint System consists of side air bag module (located in the outer side of front seat), satellite sensor, diagnosis sensor unit (one of components of air bags for a frontal collision), wiring harness, warning lamp (one of components of air bags for a frontal collision).

Information necessary to service the system safely is included in the **RS section** of this Service Manual.

WARNING:

- **To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance must be performed by an authorized INFINITI dealer.**
- **Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the RS section.**
- **Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. Spiral cable and wiring harnesses (except "SEAT BELT PRE-TENSIONER") covered with yellow insulation either just before the harness connectors or for the complete harness are related to the SRS.**

Wiring Diagrams and Trouble Diagnosis

NBSC0002

When you read wiring diagrams, refer to the followings:

- "HOW TO READ WIRING DIAGRAMS" in GI section
- "POWER SUPPLY ROUTING" for power distribution circuit in EL section

When you perform trouble diagnosis, refer to the followings:

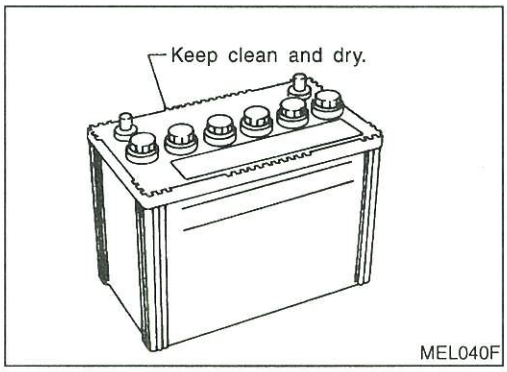
- "HOW TO FOLLOW TEST GROUP IN TROUBLE DIAGNOSIS" in GI section
- "HOW TO PERFORM EFFICIENT DIAGNOSIS FOR AN ELECTRICAL INCIDENT" in GI section

How to Handle Battery

NBSC0003

CAUTION:

- **If it becomes necessary to start the engine with a booster battery and jumper cables, use a 12-volt booster battery.**
- **After connecting battery cables, ensure that they are tightly clamped to battery terminals for good contact.**
- **Never add distilled water through the hole used to check specific gravity.**



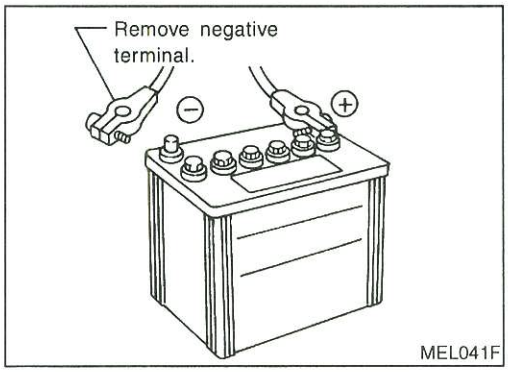
MEL040F

METHODS OF PREVENTING OVER-DISCHARGE

NBSC0003S01

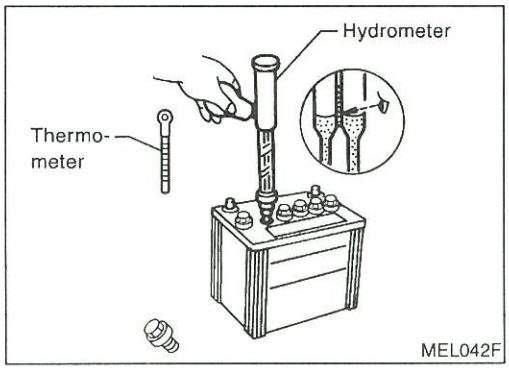
The following precautions must be taken to prevent over-discharging a battery.

- The battery surface (particularly its top) should always be kept clean and dry.
- The terminal connections should be clean and tight.
- At every routine maintenance, check the electrolyte level. This also applies to batteries designated as "low maintenance" and "maintenance-free".



MEL041F

- When the vehicle is not going to be used over a long period of time, disconnect the negative battery terminal. (If the vehicle has an extended storage switch, turn it off.)



MEL042F

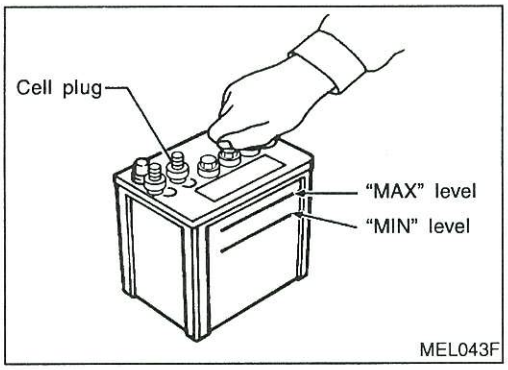
- Check the charge condition of the battery. Periodically check the specific gravity of the electrolyte. Keep a close check on charge condition to prevent over-discharge.

CHECKING ELECTROLYTE LEVEL

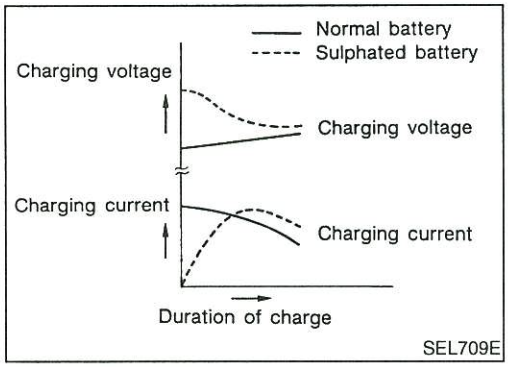
NBSC0003S02

WARNING:

Do not allow battery fluid to come in contact with skin, eyes, fabrics, or painted surfaces. After touching a battery, do not touch or rub your eyes until you have thoroughly washed your hands. If acid contacts eyes, skin or clothing, immediately flush with water for 15 minutes and seek medical attention.



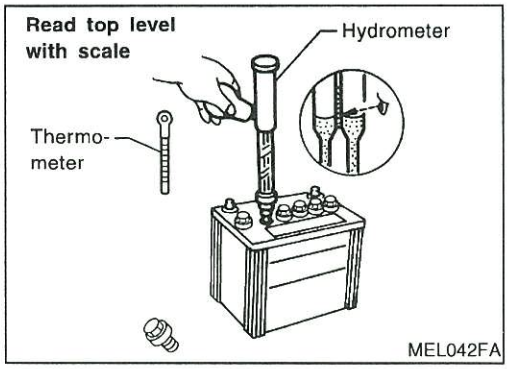
- Remove the cell plug using a suitable tool.
- Add distilled water up to the MAX level.



Sulphation

NBSC0003S0201

A battery will be completely discharged if it is left unattended for a long time and the specific gravity will become less than 1.100. This may result in sulphation on the cell plates.
To determine if a battery has been "sulphated", note its voltage and current when charging it. As shown in the figure, less current and higher voltage are observed in the initial stage of charging sulphated batteries.
A sulphated battery may sometimes be brought back into service by means of a long, slow charge, 12 hours or more, followed by a battery capacity test.



SPECIFIC GRAVITY CHECK

NBSC0003S03

1. Read hydrometer and thermometer indications at eye level.

2. Use the chart below to correct your hydrometer reading according to electrolyte temperature.

Hydrometer Temperature Correction

NBSC0003S0301

Battery electrolyte temperature °C (°F)	Add to specific gravity reading
71 (160)	0.032
66 (150)	0.028
60 (140)	0.024
54 (130)	0.020
49 (120)	0.016
43 (110)	0.012
38 (100)	0.008
32 (90)	0.004
27 (80)	0
21 (70)	–0.004
16 (60)	–0.008
10 (50)	–0.012

Battery electrolyte temperature °C (°F)	Add to specific gravity reading
4 (40)	−0.016
−1 (30)	−0.020
−7 (20)	−0.024
−12 (10)	−0.028
−18 (0)	−0.032

Corrected specific gravity	Approximate charge condition
1.260 - 1.280	Fully charged
1.230 - 1.250	3/4 charged
1.200 - 1.220	1/2 charged
1.170 - 1.190	1/4 charged
1.140 - 1.160	Almost discharged
1.110 - 1.130	Completely discharged

CHARGING THE BATTERY

NBSC0003S04

CAUTION:

- **Do not "quick charge" a fully discharged battery.**
- **Keep the battery away from open flame while it is being charged.**
- **When connecting the charger, connect the leads first, then turn on the charger. Do not turn on the charger first, as this may cause a spark.**
- **If battery electrolyte temperature rises above 60°C (140°F), stop charging. Always charge battery at a temperature below 60°C (140°F).**

Charging Rates

NBSC0003S0401

Amps	Time
50	1 hour
25	2 hours
10	5 hours
5	10 hours

Do not charge at more than 50 ampere rate.

NOTE:

The ammeter reading on your battery charger will automatically decrease as the battery charges. This indicates that the voltage of the battery is increasing normally as the state of charge improves. The charging amps indicated above refer to initial charge rate.

- If, after charging, the specific gravity of any two cells varies more than .050, the battery should be replaced.

System Description

NBSC0004

Power is supplied at all times

- to ignition switch terminal 1
- through 40A fusible link (letter **e**, located in the fuse and fusible link box).

With the ignition switch in the ON or START position, power is supplied through 10A fuse [No. 18, located in the fuse block (J/B)].

- to park/neutral position relay terminal 1.

Also, with the ignition switch in the START position, power is supplied

- from ignition switch terminal 5
- to park/neutral position relay terminal 6.

With the selector lever in the P or N position, ground is supplied

- to park/neutral position relay terminal 2 through the park/neutral position switch.

Then park/neutral position relay is energized and power is supplied

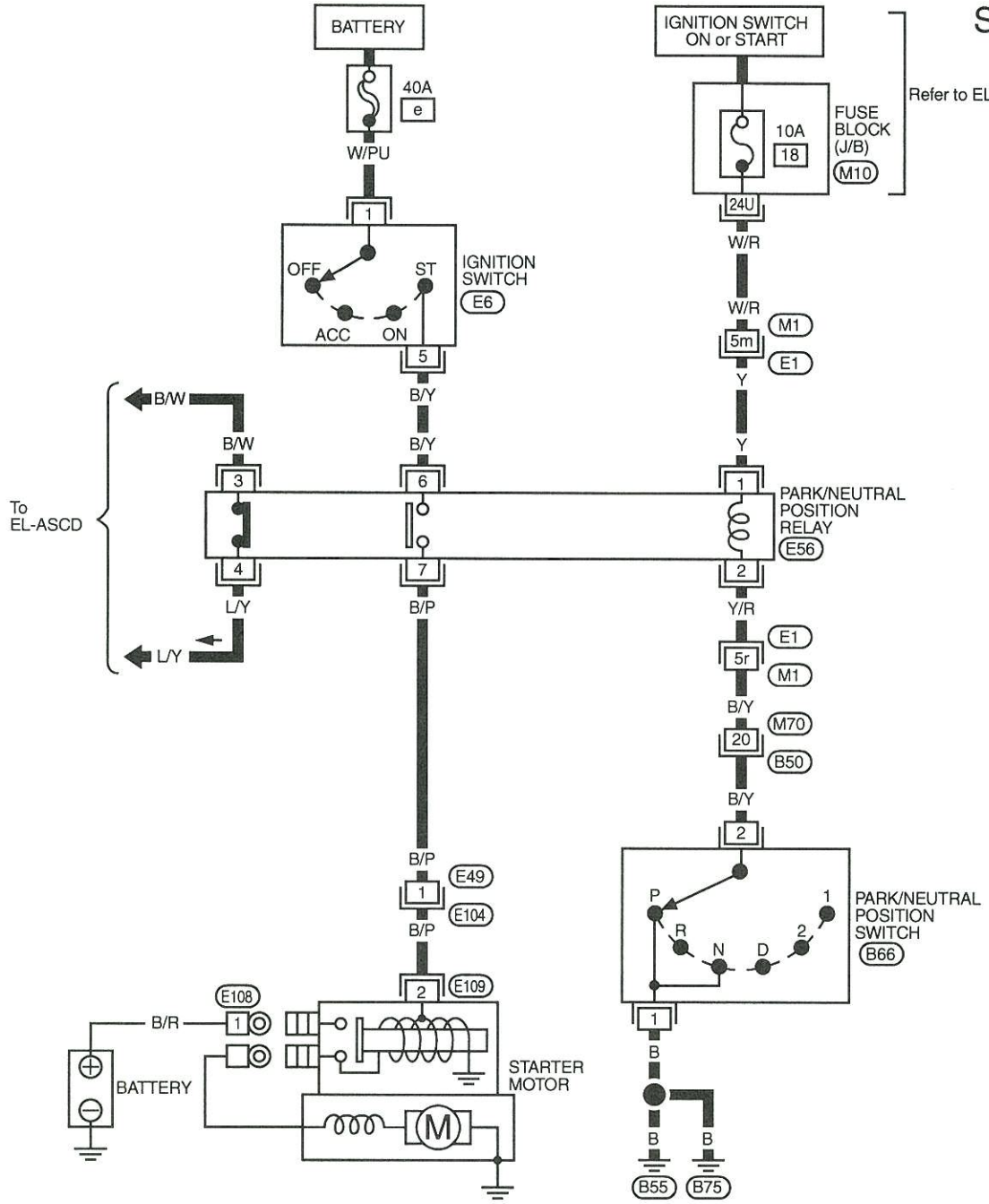
- from park/neutral position relay terminal 7
- to terminal 2 of the starter motor windings.

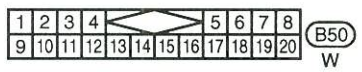
The starter motor plunger closes and provides a closed circuit between the battery and starter motor. The starter motor is grounded to the engine block. With power and ground supplied, cranking occurs and the engine starts.

Wiring Diagram — START —

NBSC0005

SC-START-01



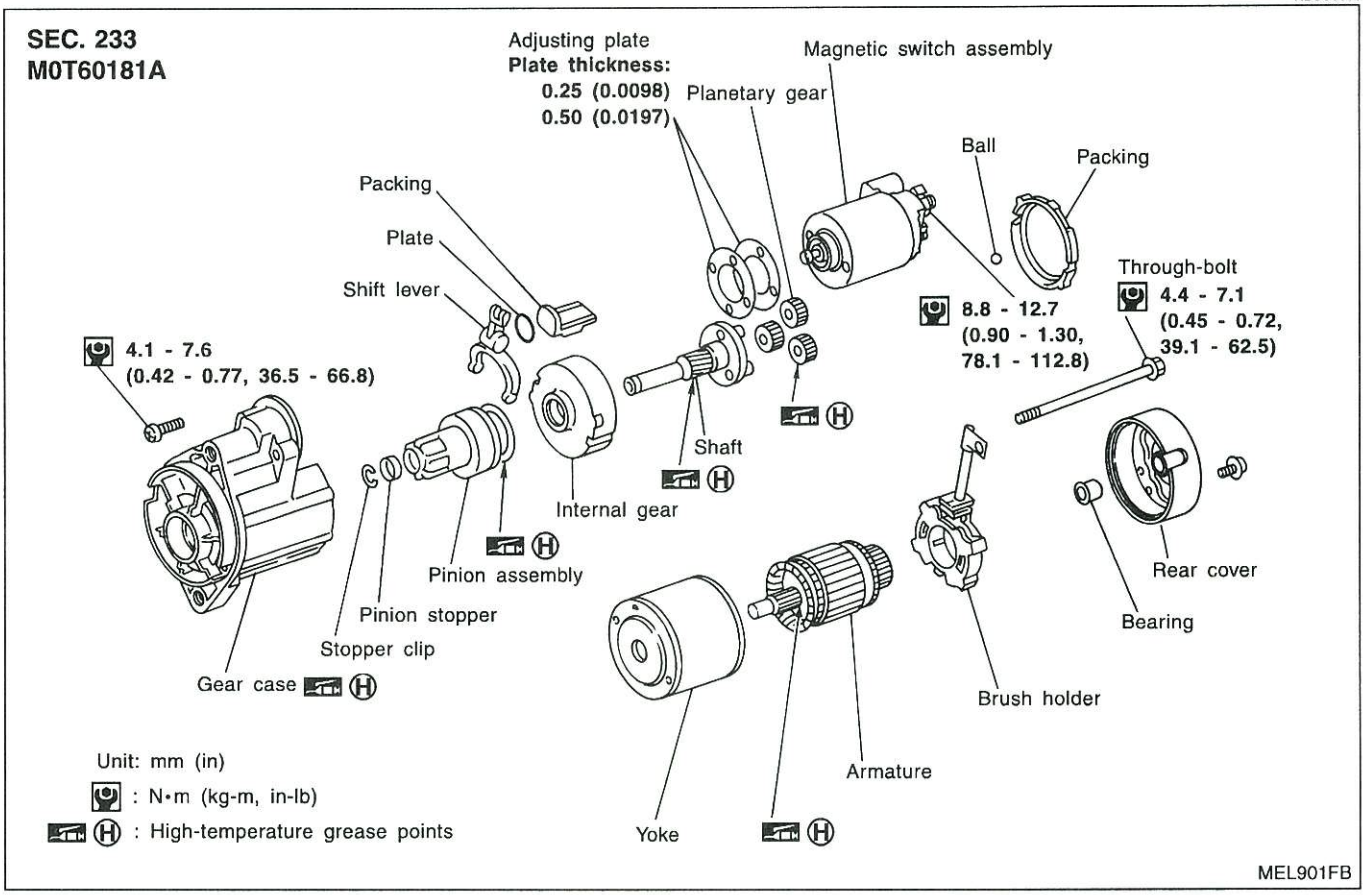


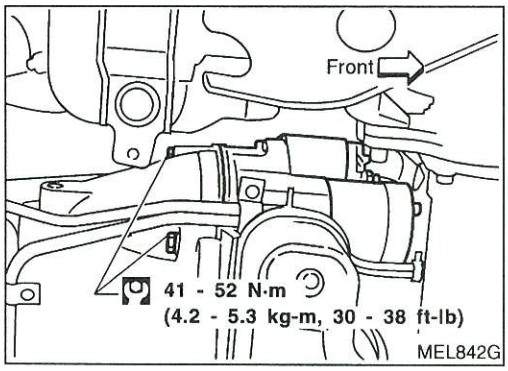
Refer to last page (Foldout page).
M1 , E1
M10

MEL736J

Construction

NBSC0006





Removal and Installation

NBSC0007

Pinion/Clutch Check

NBSC0008

1. Inspect pinion teeth.
- Replace pinion if teeth are worn or damaged. (Also check condition of ring gear teeth.)
2. Inspect reduction gear teeth.
- Replace reduction gear if teeth are worn or damaged. (Also check condition of armature shaft gear teeth.)
3. Check to see if pinion locks in one direction and rotates smoothly in the opposite direction.
- If it locks or rotates in both directions, or unusual resistance is evident, replace.

System Description

NBSC0009

The alternator provides DC voltage to operate the vehicle's electrical system and to keep the battery charged. The voltage output is controlled by the IC regulator.
Power is supplied at all times to alternator terminal S through:

- 100A fusible link (letter **a**, located in the fuse and fusible link box), and
- 7.5A fuse (No. 65, located in the fuse and fusible link box).

Terminal B supplies power to charge the battery and operate the vehicle's electrical system. Output voltage is controlled by the IC regulator at terminal S detecting the input voltage. The charging circuit is protected by the 100A fusible link.
Terminal E of the alternator supplies ground through body ground E101.
With the ignition switch in the ON or START position, power is supplied

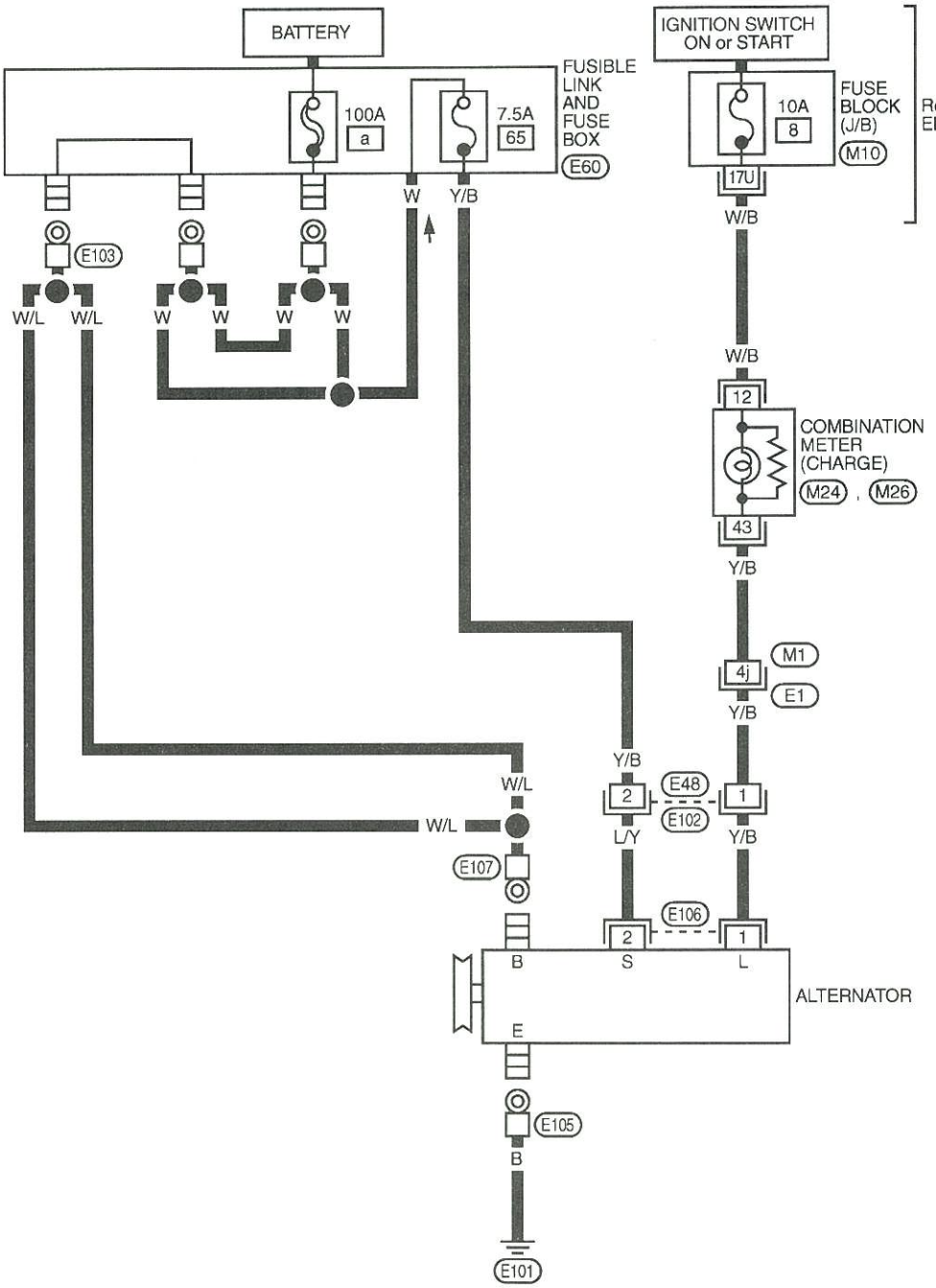
- through 10A fuse [No. 8, located in the fuse block (J/B)]
- to combination meter terminal 12 for the charge warning lamp.

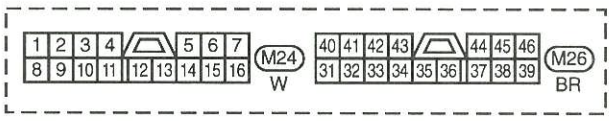
Ground is supplied to terminal 43 of the combination meter through terminal L of the alternator. With power and ground supplied, the charge warning lamp will illuminate. When the alternator is providing sufficient voltage with the engine running, the ground is opened and the charge warning lamp will go off.
If the charge warning lamp illuminates with the engine running, a fault is indicated.

Wiring Diagram — CHARGE —

NBSC0010

SC-CHARGE-01





Refer to last page (Foldout page).

M1 , E1

M10

E60

MEL784H

Trouble Diagnoses

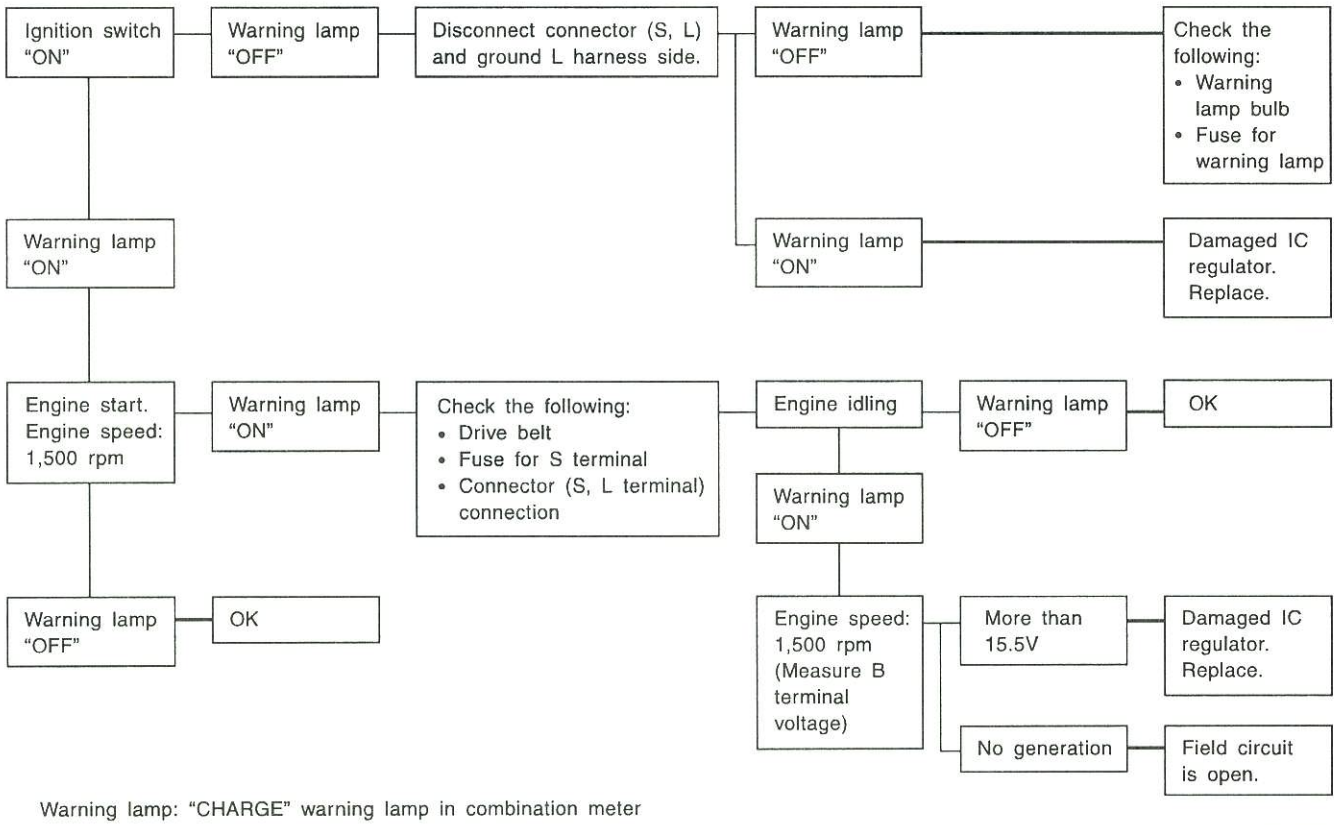
NBSC0011

Before conducting an alternator test, make sure that the battery is fully charged. A 30-volt voltmeter and suitable test probes are necessary for the test. The alternator can be checked easily by referring to the Inspection Table.

- **Before starting, inspect the fusible link.**
- **Use fully charged battery.**

WITH IC REGULATOR

NBSC0011S01



Warning lamp: "CHARGE" warning lamp in combination meter

SEL338V

NOTE:

- If the inspection result is OK even though the charging system is malfunctioning, check the B terminal connection. (Check the tightening torque.)
- When field circuit is open, check condition of rotor coil, rotor slip ring and brush. If necessary, replace faulty parts with new ones.

MALFUNCTION INDICATOR

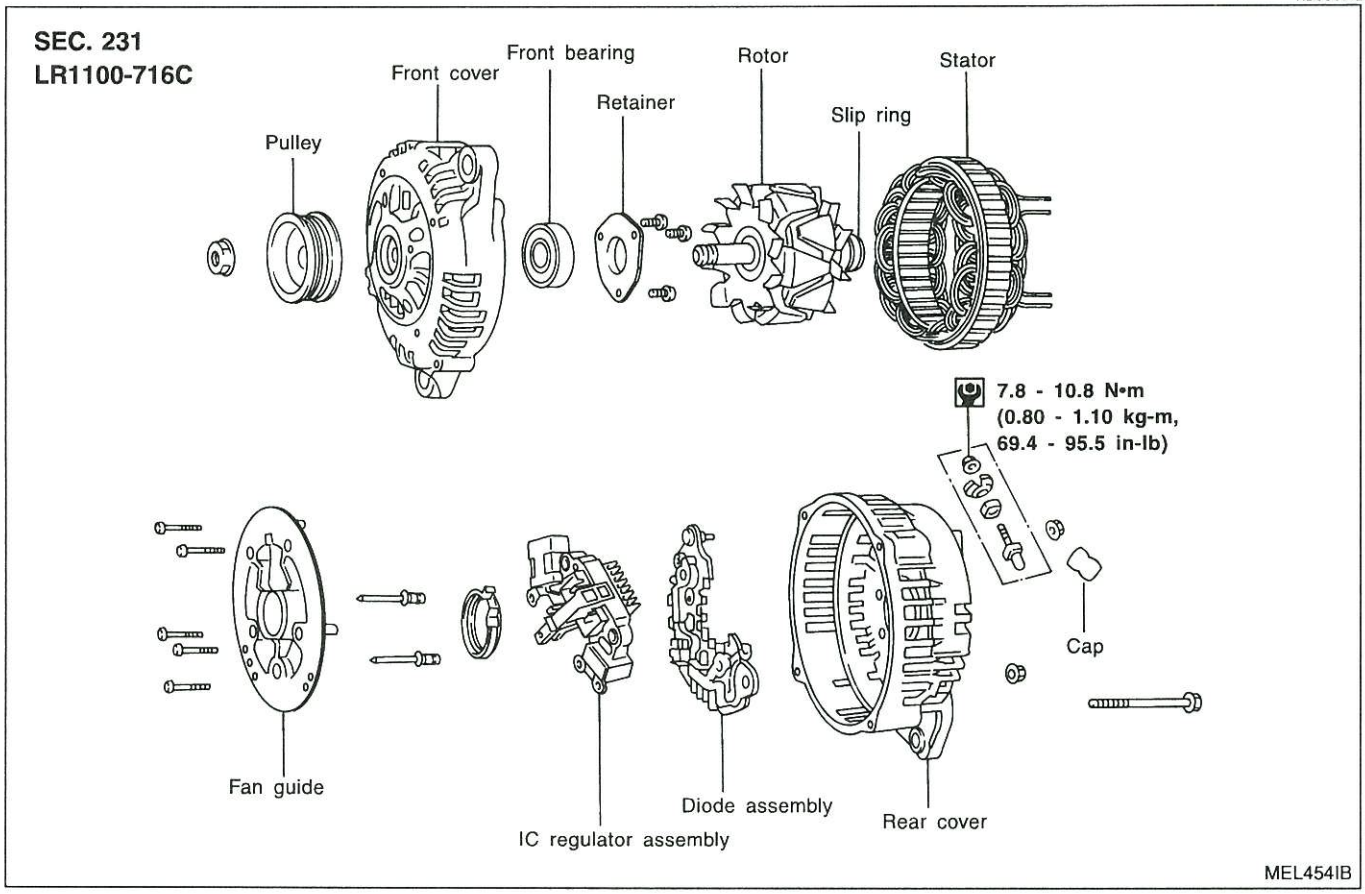
NBSC0011S02

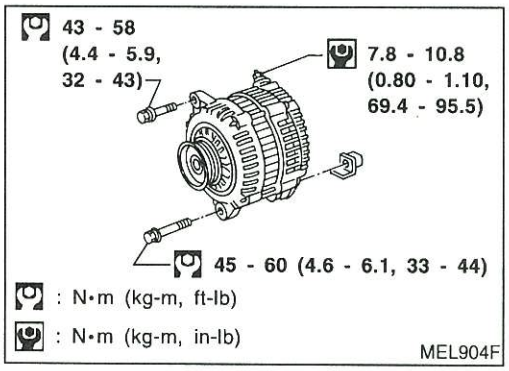
The IC regulator warning function activates to illuminate "CHARGE" warning lamp, if any of the following symptoms occur while alternator is operating:

- Excessive voltage is produced.
- No voltage is produced.

Construction

NBSC0012





Removal and Installation

NBSC0013

Battery

NBSC0014

Applied area	USA		Canada
	Standard	Option	Standard
Type	55D23R	80D26R	
Capacity V-AH	12-60	12-65	
Cold cranking current A (For reference value)	356	582	

Starter

NBSC0015

Type		M0T60181A
		MITSUBISHI make
		Reduction gear type
System voltage		12V
No-load	Terminal voltage	11.0V
	Current	Less than 90A
	Revolution	More than 2,500 rpm
Minimum diameter of commutator		28.8 mm (1.134 in)
Minimum length of brush		7.0 mm (0.276 in)
Brush spring tension		18.3 - 24.8 N (1.87 - 2.53 kg, 4.11 - 5.58 lb)
Clearance between pinion front edge and pinion stopper mm (in)		—

Alternator

NBSC0016

Type	LR1100-716C
	HITACHI make
Nominal rating	12V-100A
Ground polarity	Negative
Minimum revolution under no-load (When 13.5 volts is applied)	Less than 1,000 rpm
Hot output current (When 13.5 volts is applied)	More than 30A/1,300 rpm More than 78A/2,500 rpm More than 90A/5,000 rpm
Regulated output voltage	14.1 - 14.7V
Minimum length of brush	6.0 mm (0.236 in)
Brush spring pressure	1.0 - 3.43 N (102 - 350 g, 3.60 - 12.34 oz)
Slip ring minimum outer diameter	26.0 mm (1.024 in)

ELECTRICAL SYSTEM

SECTION EL

CONTENTS

PRECAUTIONS 2
- Supplemental Restraint System (SRS) "AIR BAG" and "SEAT BELT PRE-TENSIONER" 2
- Wiring Diagrams and Trouble Diagnosis 2

HARNESS CONNECTOR 3
- Description 3

STANDARDIZED RELAY 5
- Description 5

POWER SUPPLY ROUTING 7
- Schematic 7
- Wiring Diagram — POWER — 8
- Inspection 14

GROUND 15
- Ground Distribution 15

COMBINATION SWITCH 20
- Check 20
- Replacement 21

STEERING SWITCH 22
- Check 22

HEADLAMP (FOR USA) 23
- Component Parts and Harness Connector Location 23
- System Description 23
- Schematic 26
- Wiring Diagram — H/LAMP — 27
- Trouble Diagnoses 30
- Bulb Replacement 32
- Aiming Adjustment 32

HEADLAMP (FOR CANADA) — DAYTIME LIGHT SYSTEM — 34
- Component Parts and Harness Connector Location 34
- System Description 34
- Schematic 37
- Wiring Diagram — DTRL — 38
- Trouble Diagnoses 43
- Bulb Replacement 44
- Aiming Adjustment 44

PARKING, LICENSE AND TAIL LAMPS 45
- System Description 45
- Schematic 46
- Wiring Diagram — TAIL/L — 47
- Trouble Diagnoses 50

STOP LAMP 51
- Wiring Diagram — STOP/L — 51

BACK-UP LAMP 53
- Wiring Diagram — BACK/L — 53

FRONT FOG LAMP 54
- System Description 54
- Wiring Diagram — F/FOG — 56
- Aiming Adjustment 58

TURN SIGNAL AND HAZARD WARNING LAMPS 59
- System Description 59
- Wiring Diagram — TURN — 61
- Trouble Diagnoses 63
- Electrical Components Inspection 63

ILLUMINATION 64
- System Description 64
- Schematic 66
- Wiring Diagram — ILL — 67

INTERIOR, SPOT, VANITY MIRROR AND LUGGAGE ROOM LAMPS 71
- System Description 71
- Schematic 73
- Wiring Diagram — INT/L — 74

METERS AND GAUGES 78
- Component Parts and Harness Connector Location 78
- System Description 78
- Combination Meter/For USA 80
- Combination Meter/For Canada 81
- Wiring Diagram — METER — 82
- Meter/Gauge Operation and Odo/Trip Meter Segment Check in Diagnosis Mode 83
- Flexible Print Circuit (FPC) 84
- Trouble Diagnoses 85
- Electrical Components Inspection 90

COMPASS AND THERMOMETER 92

CONTENTS (Cont'd)

System Description....92
Wiring Diagram — COMPAS —....93
Trouble Diagnoses....94
Calibration Procedure for Compass....95
WARNING LAMPS....96
Schematic....96
Wiring Diagram — WARN —....97
Fuel Warning Lamp Sensor Check....103
Electrical Components Inspection....103
WARNING CHIME....104
Component Parts and Harness Connector Location....104
System Description....104
Wiring Diagram — CHIME —....106
Trouble Diagnoses....108
FRONT WIPER AND WASHER....113
System Description....113
Wiring Diagram — WIPER —....115
Trouble Diagnoses....117
Removal and Installation....119
Washer Nozzle Adjustment....120
Washer Tube Layout....121
REAR WIPER AND WASHER....122
System Description....122
Schematic....124
Wiring Diagram — WIP/R —....125
Trouble Diagnoses....128
Removal and Installation....128
Washer Nozzle Adjustment....129
Washer Tube Layout....129
Check Valve....129
HORN....130
Wiring Diagram — HORN —....130
CIGARETTE LIGHTER....131
Wiring Diagram — CIGAR —....131
REAR WINDOW DEFOGGER....133
Component Parts and Harness Connector Location....133
System Description....133
Wiring Diagram — DEF —....135
Trouble Diagnoses....137
Electrical Components Inspection....138
Filament Check....138
Filament Repair....139
AUDIO....141
System Description....141
Schematic....142
Wiring Diagram — AUDIO —....143
Trouble Diagnoses....147
Inspection....148
AUDIO ANTENNA....149
System Description....149
Wiring Diagram — P/ANT —....150
Trouble Diagnoses....151
Location of Antenna....151
Antenna Rod Replacement....151
POWER SUNROOF....153
System Description....153
Wiring Diagram — SROOF —....154
DOOR MIRROR....156
Wiring Diagram — MIRROR —....156
GLASS HATCH OPENER....157
Wiring Diagram — TLID —....157
FUEL FILLER LID OPENER....158
Wiring Diagram — F/LID —....158
POWER SEAT....159
Wiring Diagram — SEAT —....159
HEATED SEAT....161
Wiring Diagram — HSEAT —....161
AUTOMATIC SPEED CONTROL DEVICE (ASCD)....162
Component Parts and Harness Connector Location....162
System Description....163
Schematic....165
Wiring Diagram — ASCD —....166
Fail-safe System....171
Trouble Diagnoses....172
Electrical Component Inspection....181
ASCD Wire Adjustment....181
POWER WINDOW....183
System Description....183
Schematic....185
Wiring Diagram — WINDOW —....186
Trouble Diagnoses....190
POWER DOOR LOCK....191
Component Parts and Harness Connector Location....191
System Description....191
Schematic....192
Wiring Diagram — D/LOCK —....193
Trouble Diagnoses....198
MULTI-REMOTE CONTROL SYSTEM....206
Component Parts and Harness Connector Location....206
System Description....206
Schematic....209
Wiring Diagram — MULTI —....210
Trouble Diagnoses....213
CONSULT....222
ID Code Entry Procedure (Without CONSULT)....224
Remote Controller Battery Replacement....225
THEFT WARNING SYSTEM....226
Component Parts and Harness Connector Location....226

CONTENTS (Cont'd)

System Description 227
Schematic 230
Wiring Diagram — THEFT — 232
Trouble Diagnoses 238
SMART ENTRANCE CONTROL UNIT 250
Description 250
Schematic 252
Smart Entrance Control Unit Inspection Table 254
INTEGRATED HOMELINK TRANSMITTER 255
Wiring Diagram — TRNSMT — 255
Trouble Diagnoses 256
IVIS (INFINITI VEHICLE IMMOBILISER SYSTEM — NATS) 258
Component Parts and Harness Connetor Location 258
System Description 259
System Composition 259
Wiring Diagram — NATS — 260
CONSULT 261
Trouble Diagnoses 263
How to Replace NATS IMMU 272
INFINITI COMMUNICATOR (IVCS) 273
Precaution 273
Communicator Response Center Telephone Number for Technicians 273
Component Parts and Harness Connector Location 274
System Description 275
Schematic 283
Wiring Diagram — IVCS — 284
CONSULT 288
Trouble Diagnoses 293
Trouble Diagnoses for Intermittent Incident 302
Demonstration Mode 304
System Setting (When IVCS Unit is Replaced) 306
ELECTRICAL UNITS LOCATION 310
Engine Compartment 310
Passenger Compartment 311
HARNESS LAYOUT 313
How to Read Harness Layout 313
Outline 314
Main Harness 316
Engine Room Harness 318
Engine Control Harness 320
Body Harness LH 322
Body Harness RH 323
Back Door Harness 324
Engine and Transmission Harness 325
Room Lamp 326
Air Bag Harness 327
Front Door Harness 328
Rear Door Harness 329
BULB SPECIFICATIONS 330
Headlamp 330
Exterior Lamp 330
Interior Lamp 330
WIRING DIAGRAM CODES (CELL CODES) 331
SUPER MULTIPLE JUNCTION (SMJ) ..... Foldout
Installation ..... Foldout
Terminal Arrangement ..... Foldout
FUSE BLOCK — JUNCTION BOX (J/B) ..... Foldout
Terminal Arrangement ..... Foldout
FUSE AND FUSIBLE LINK BOX ..... Foldout
Terminal Arrangement ..... Foldout
ELECTRICAL UNITS ..... Foldout
Terminal Arrangement ..... Foldout

Supplemental Restraint System (SRS) "AIR BAG" and "SEAT BELT PRE-TENSIONER"

NBEL0001

The supplemental Restraint System such as "AIR BAG" and "SEAT BELT PRE-TENSIONER" used along with a seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. The SRS system composition which is available to INFINITI QX4 is as follows:

- For a frontal collision
  The Supplemental Restraint System consists of driver air bag module (located in the center of the steering wheel), front passenger air bag module (located on the instrument panel on passenger side), seat belt pre-tensioners, a diagnosis sensor unit, warning lamp, wiring harness and spiral cable.
- For a side collision
  The Supplemental Restraint System consists of side air bag module (located in the outer side of front seat), satellite sensor, diagnosis sensor unit (one of components of air bags for a frontal collision), wiring harness, warning lamp (one of components of air bags for a frontal collision).

Information necessary to service the system safely is included in the **RS section** of this Service Manual.

WARNING:

- **To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance must be performed by an authorized INFINITI dealer.**
- **Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the RS section.**
- **Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. Spiral cable and wiring harnesses (except "SEAT BELT PRE-TENSIONER") covered with yellow insulation either just before the harness connectors or for the complete harness are related to the SRS.**

Wiring Diagrams and Trouble Diagnosis

NBEL0002

When you read wiring diagrams, refer to the followings:

- "HOW TO READ WIRING DIAGRAMS" in GI section
- "POWER SUPPLY ROUTING" for power distribution circuit in EL section

When you perform trouble diagnosis, refer to the followings:

- "HOW TO FOLLOW TEST GROUP IN TROUBLE DIAGNOSIS" in GI section
- "HOW TO PERFORM EFFICIENT DIAGNOSIS FOR AN ELECTRICAL INCIDENT" in GI section

Check for any Service bulletins before servicing the vehicle.

Description

HARNESS CONNECTOR (TAB-LOCKING TYPE)

NBEL0003

NBEL0003S01

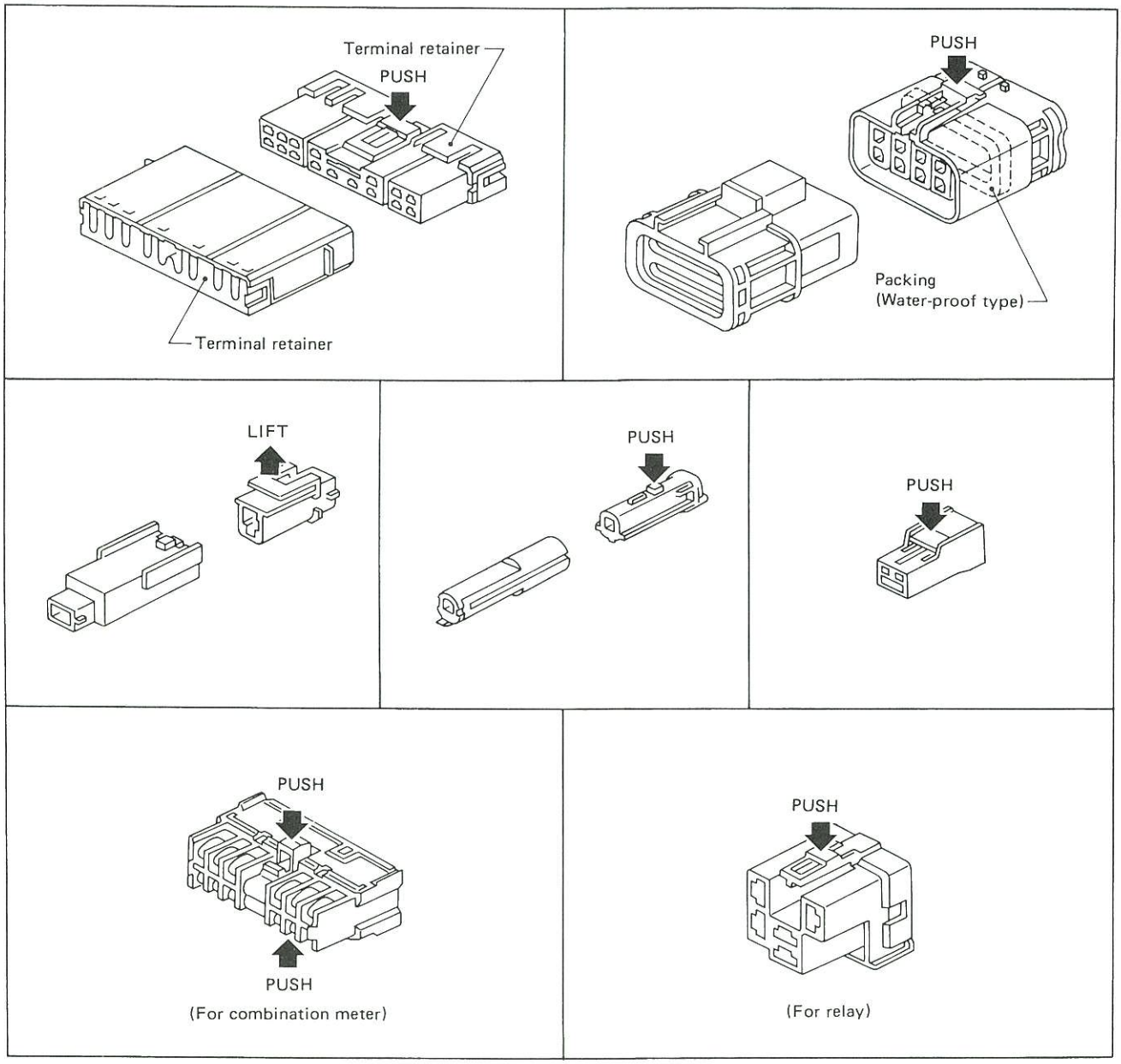
- The tab-locking type connectors help prevent accidental looseness or disconnection.
- The tab-locking type connectors are disconnected by pushing or lifting the locking tab(s). Refer to the illustration below.

Refer to the next page for description of the slide-locking type connector.

CAUTION:

Do not pull the harness when disconnecting the connector.

[Example]



SEL769D

Description (Cont'd)

HARNESS CONNECTOR (SLIDE-LOCKING TYPE)

=NBEL0003S02

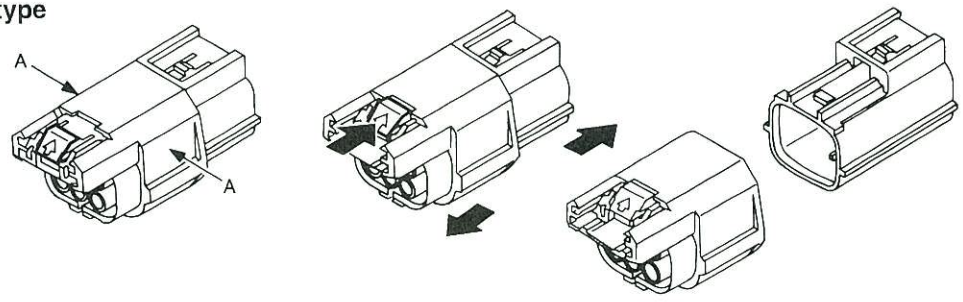
- A new style slide-locking type connector is used on certain systems and components, especially those related to OBD.
- The slide-locking type connectors help prevent incomplete locking and accidental looseness or disconnection.
- The slide-locking type connectors are disconnected by pushing or pulling the slider. Refer to the illustration below.

CAUTION:

- **Do not pull the harness or wires when disconnecting the connector.**
- **Be careful not to damage the connector support bracket when disconnecting the connector.**

[Example]

Waterproof type

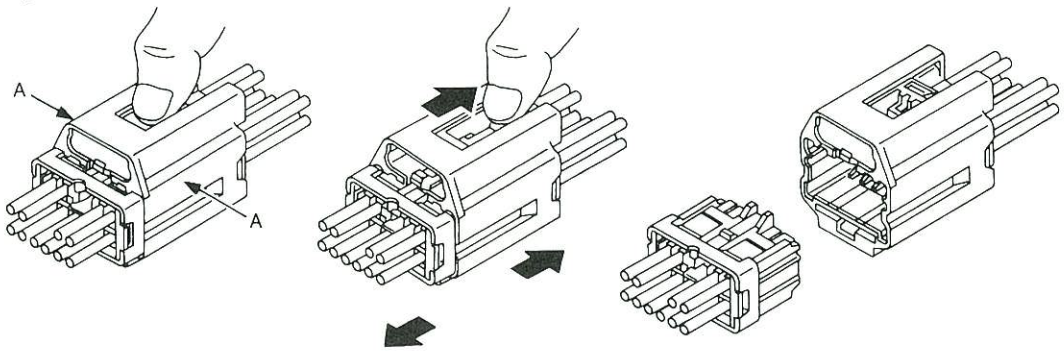


① Firmly grasp shell of connector housing at A.

② Push slider until connector pops or snaps apart.

③ Disconnect harness connector.

Non-waterproof type



① Firmly grasp shell of connector housing at A.

② Pull back on the slider while pulling apart male and famale halves of connector.

③ Disconnect harness connector.

SEL769V

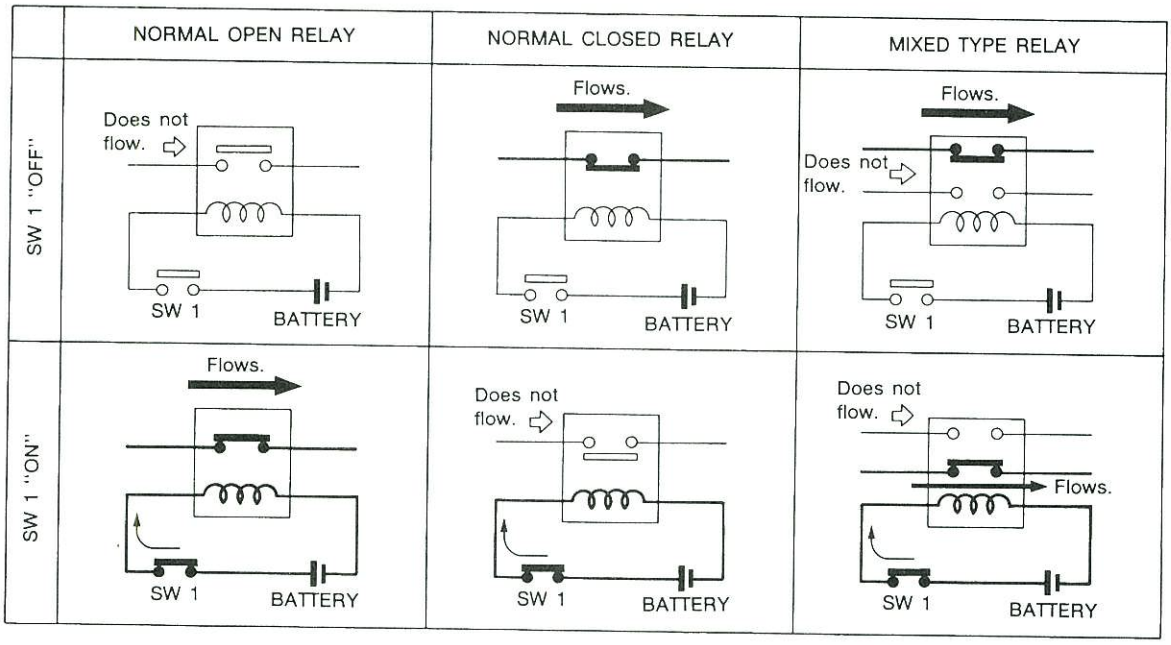
Description

NORMAL OPEN, NORMAL CLOSED AND MIXED TYPE RELAYS

NBEL0004

NBEL0004S01

Relays can mainly be divided into three types: normal open, normal closed and mixed type relays.

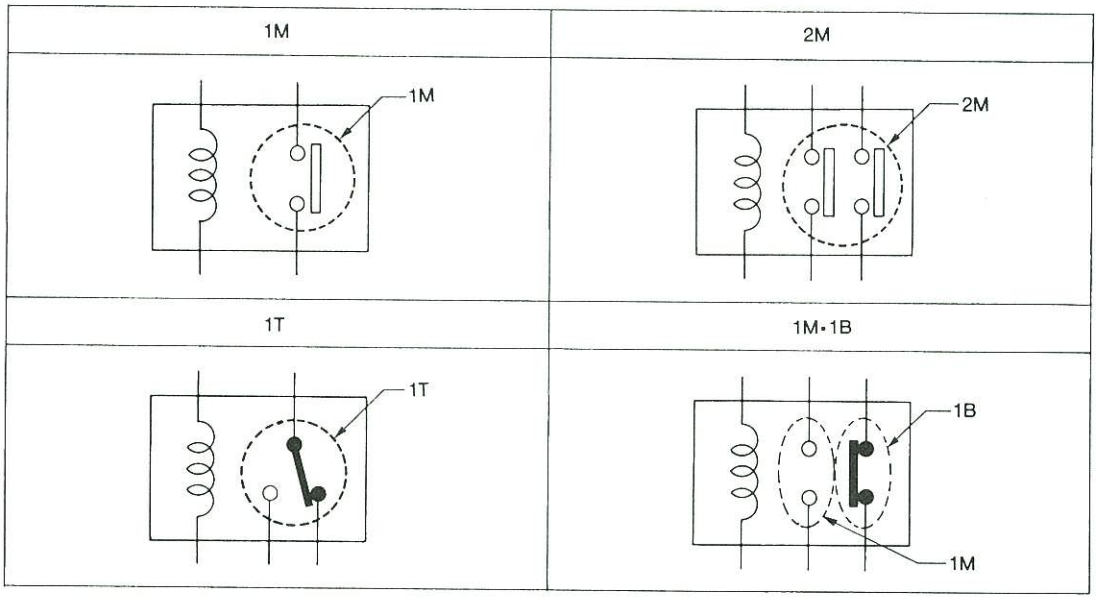


SEL881H

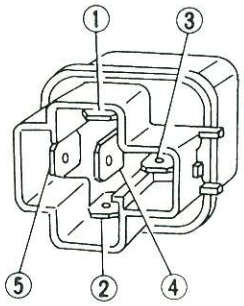
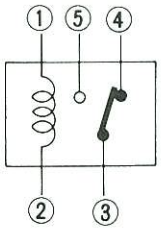
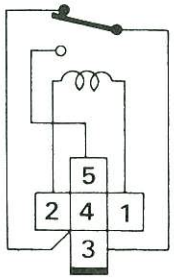
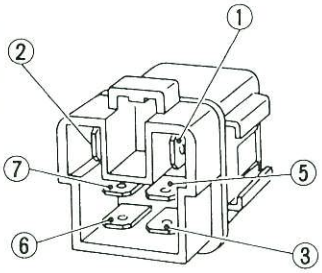
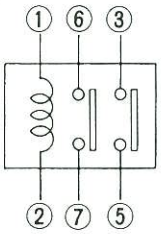
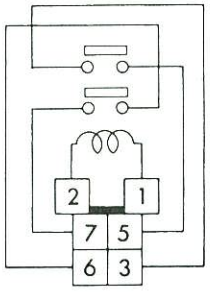
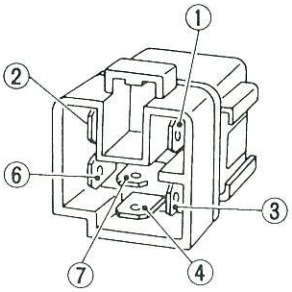
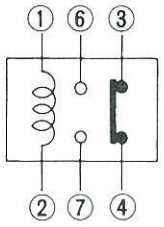
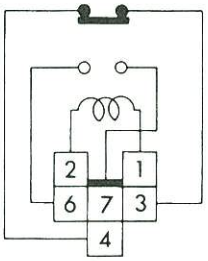
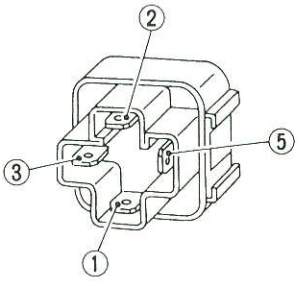
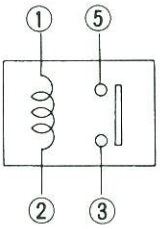
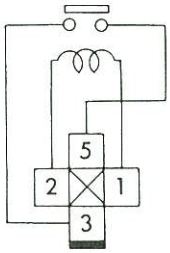
TYPE OF STANDARDIZED RELAYS

NBEL0004S02

1M	1 Make	2M	2 Make
1T	1 Transfer	1M·1B	1 Make 1 Break



SEL882H

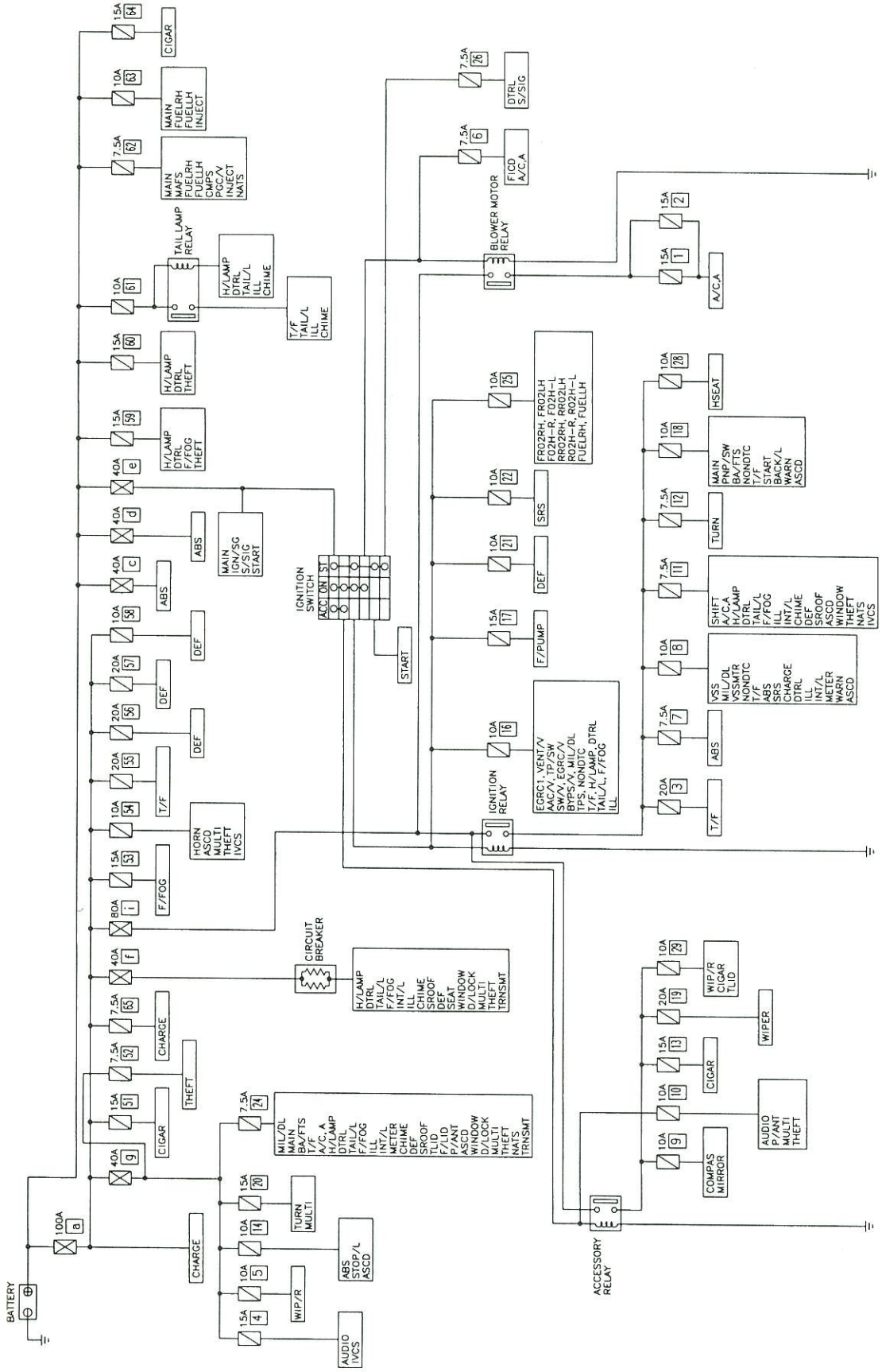
Type	Outer view	Circuit	Connector symbol and connection	Case color
1T				BLACK
2M				BROWN
1M•1B				GRAY
1M				BLUE

The arrangement of terminal numbers on the actual relays may differ from those shown above.

SEL661TA

Schematic

NBEL0005



MEL740J

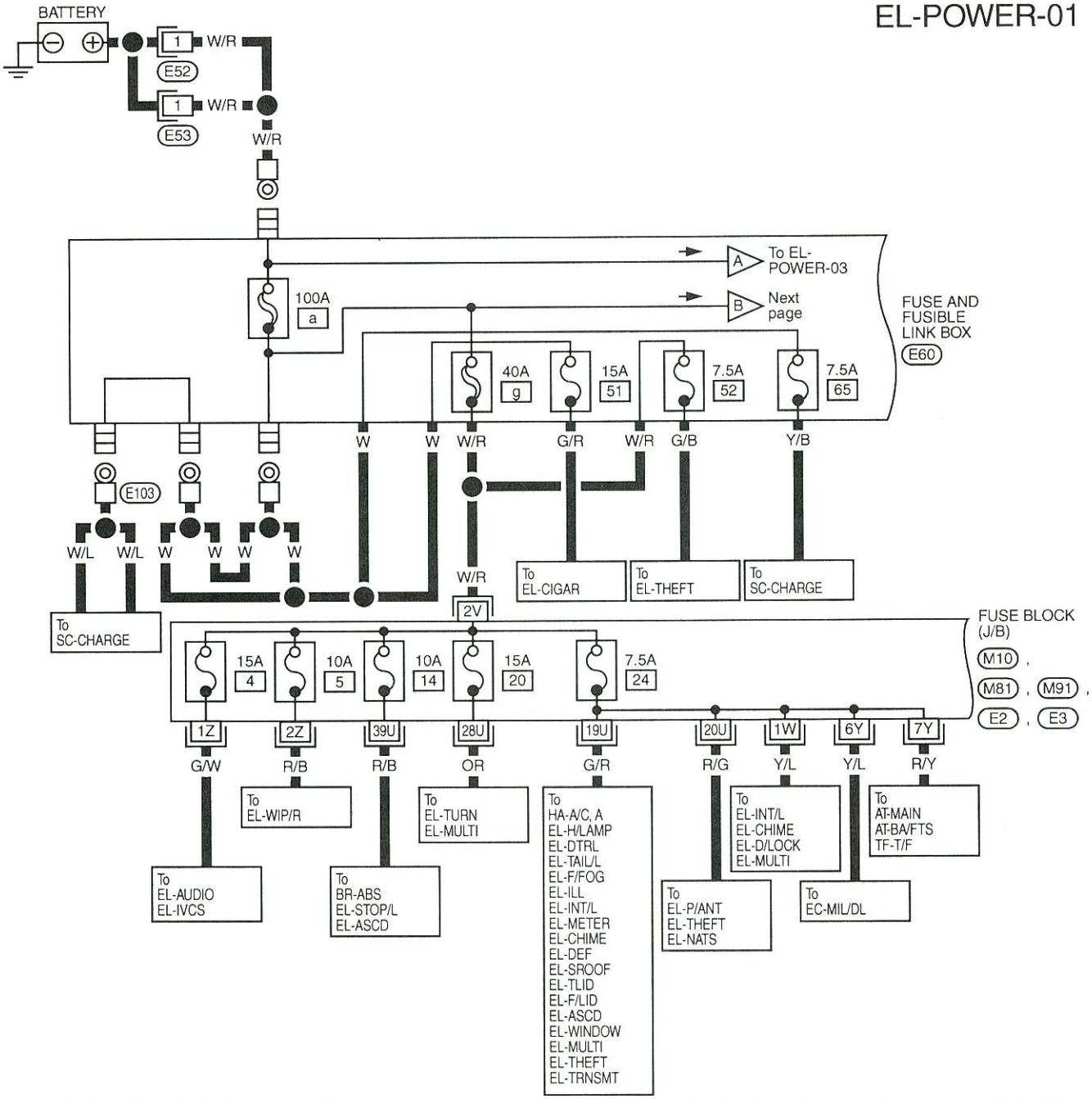
Wiring Diagram — POWER —

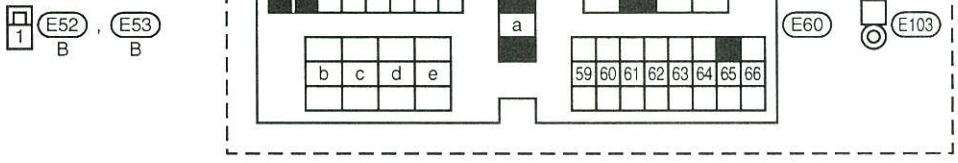
NBEL0006

BATTERY POWER SUPPLY — IGNITION SW. IN ANY POSITION

NBEL0006S01

EL-POWER-01





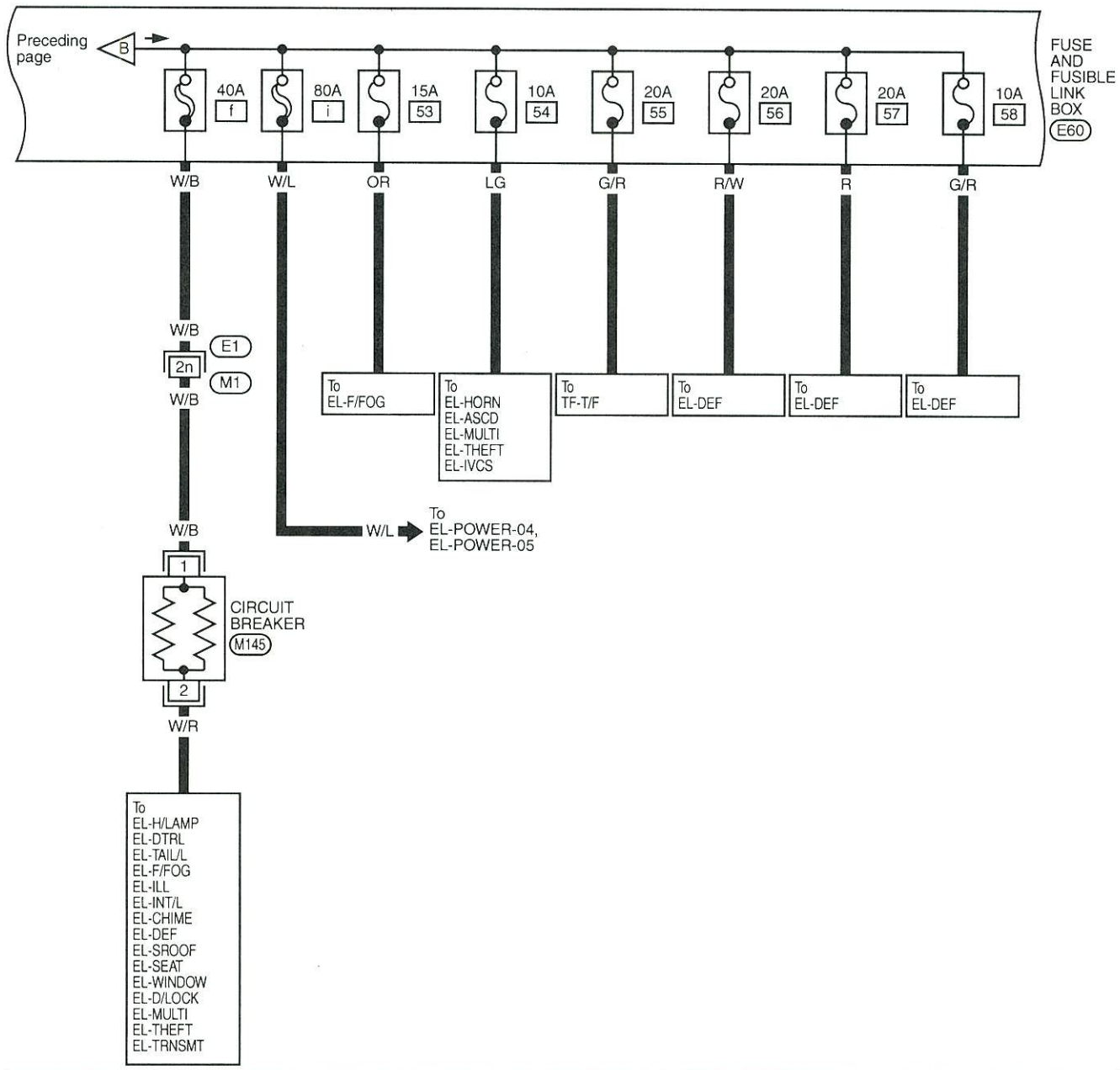
Refer to last page (Foldout page).

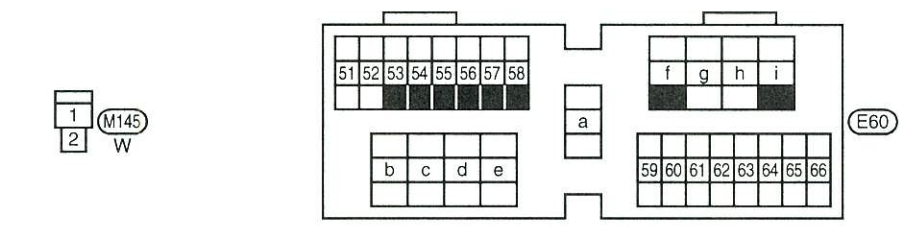
M10 , M81 , M91 , E2 , E3

1	2	3	4	5
6	7	8	9	10
11	12	13	14	15
16	17	18	19	20
21	22			
24	25	26		
	28	29		

MEL741J

EL-POWER-02

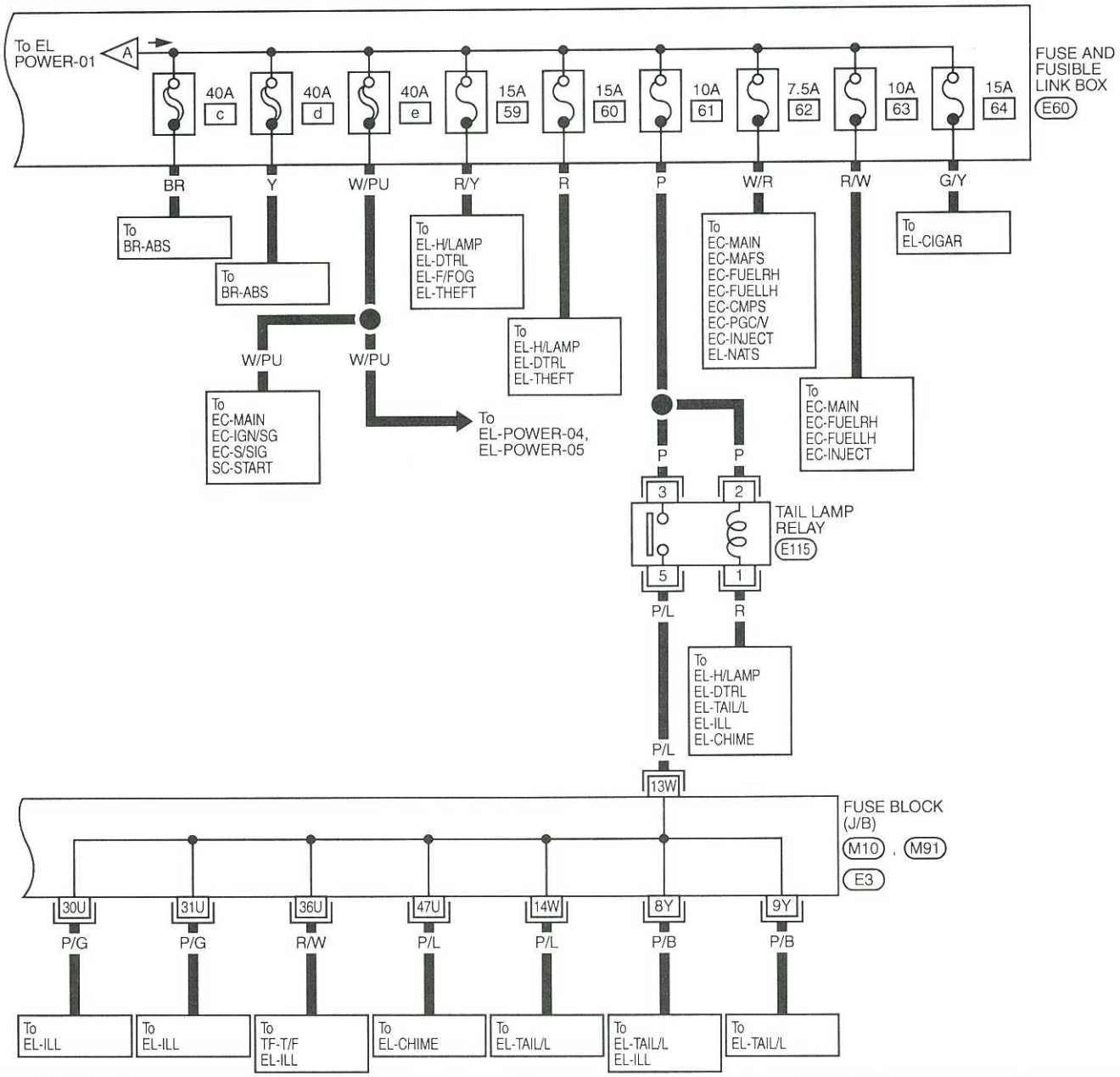


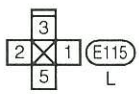


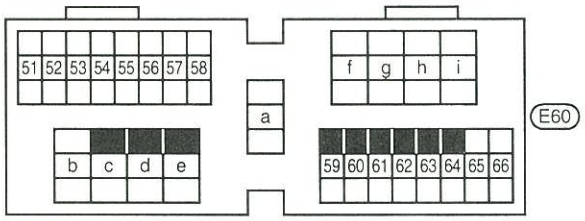
Refer to last page (Foldout page).
(M1) , (E1)

MEL742J

EL-POWER-03







Refer to last page (Foldout page).

M10, M91, E3

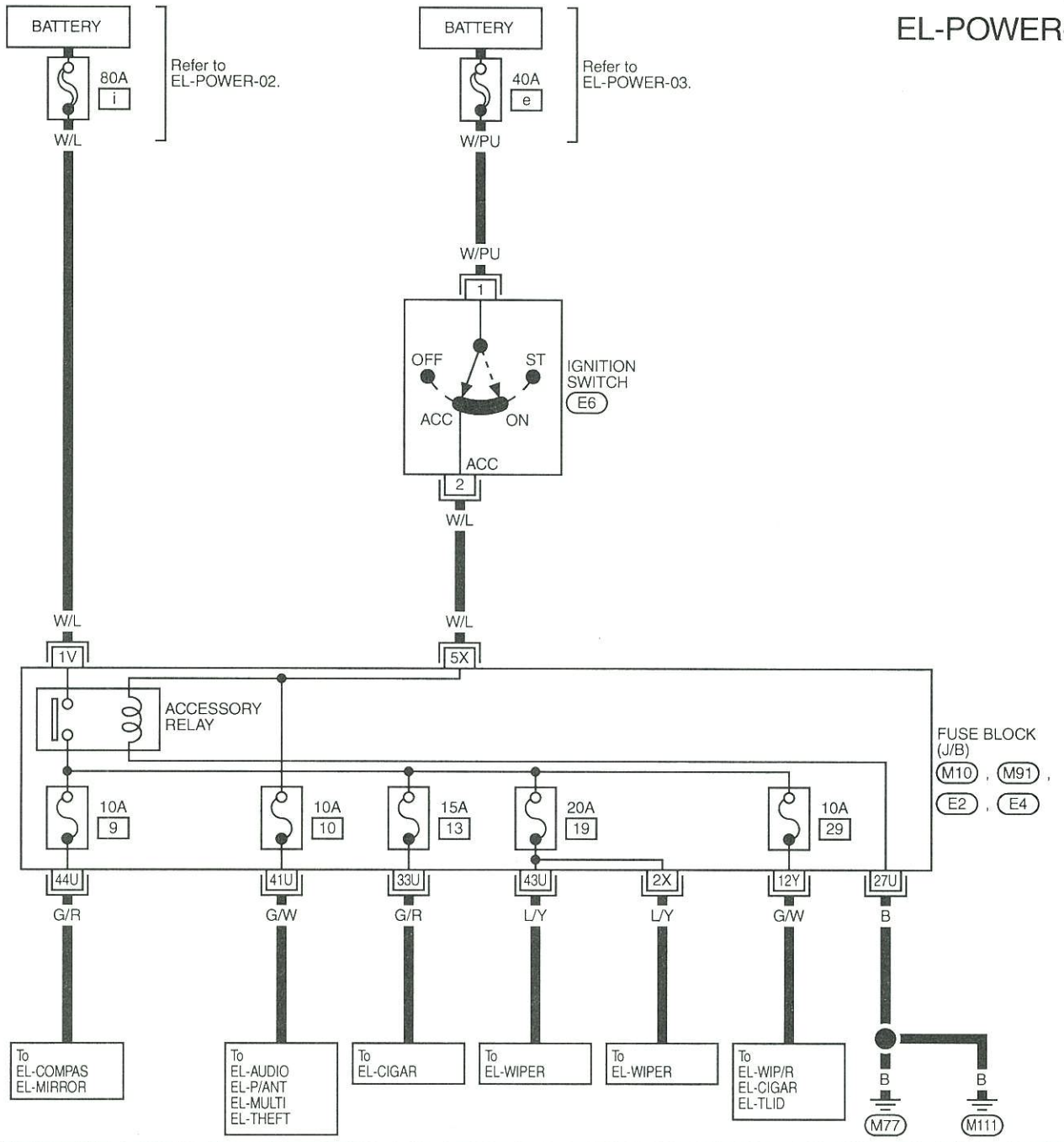
1	2	3	4	5
6	7	8	9	10
11	12	13	14	15
16	17	18	19	20
21	22			
24	25	26		
	28	29		

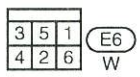
MEL743J

ACCESSORY POWER SUPPLY — IGNITION SW. IN "ACC" OR "ON"

NBEL0006S02

EL-POWER-04





Refer to last page (Foldout page).

M10 , M91 , E2 , E4

1	2	3	4	5
6	7	8	9	10
11	12	13	14	15
16	17	18	19	20
21	22			
24	25	26		
	28	29		

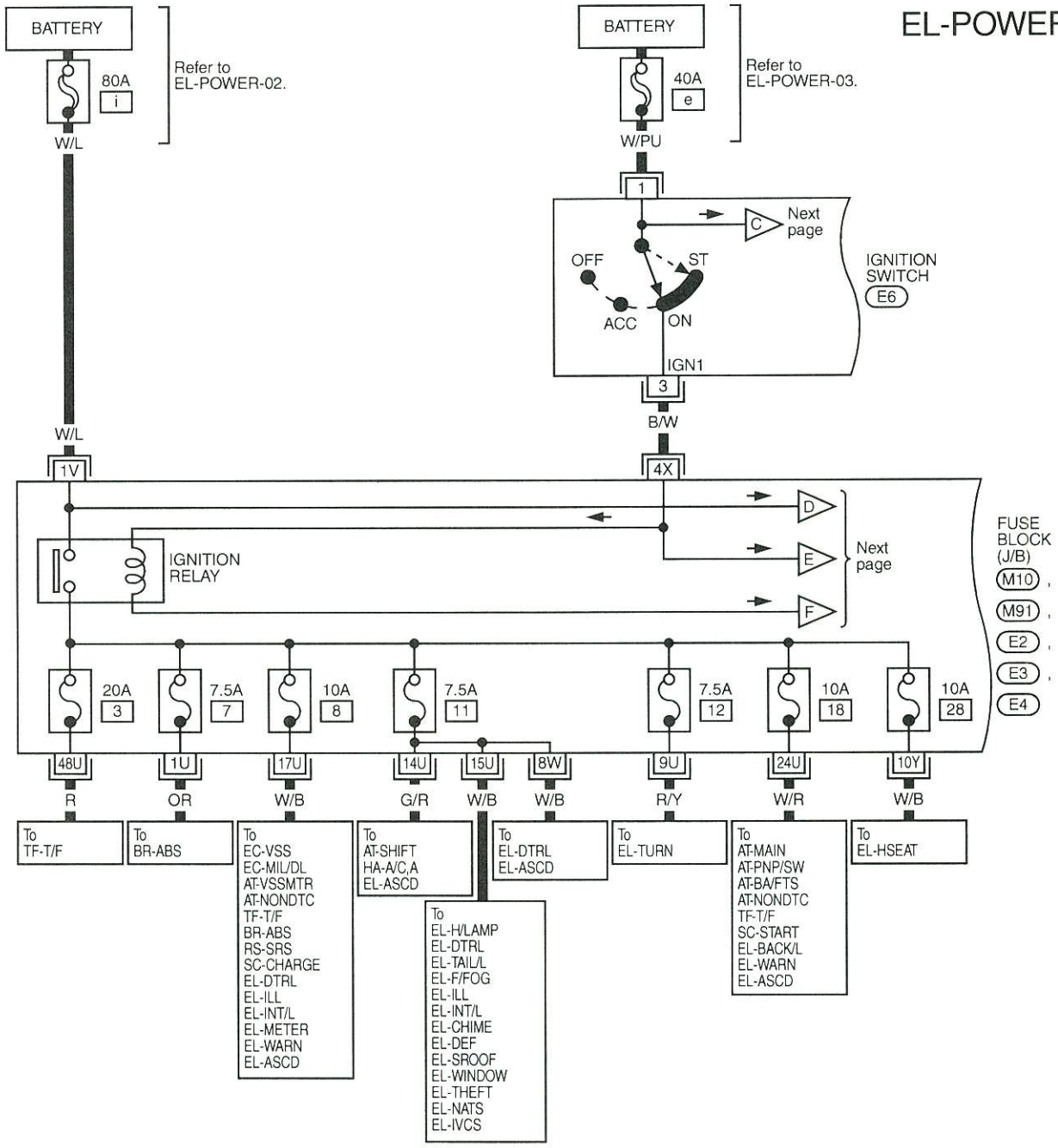
MEL744J

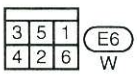
Wiring Diagram — POWER — (Cont'd)

IGNITION POWER SUPPLY — IGNITION SW. IN "ON" AND/OR "START"

NBEL0006S03

EL-POWER-05





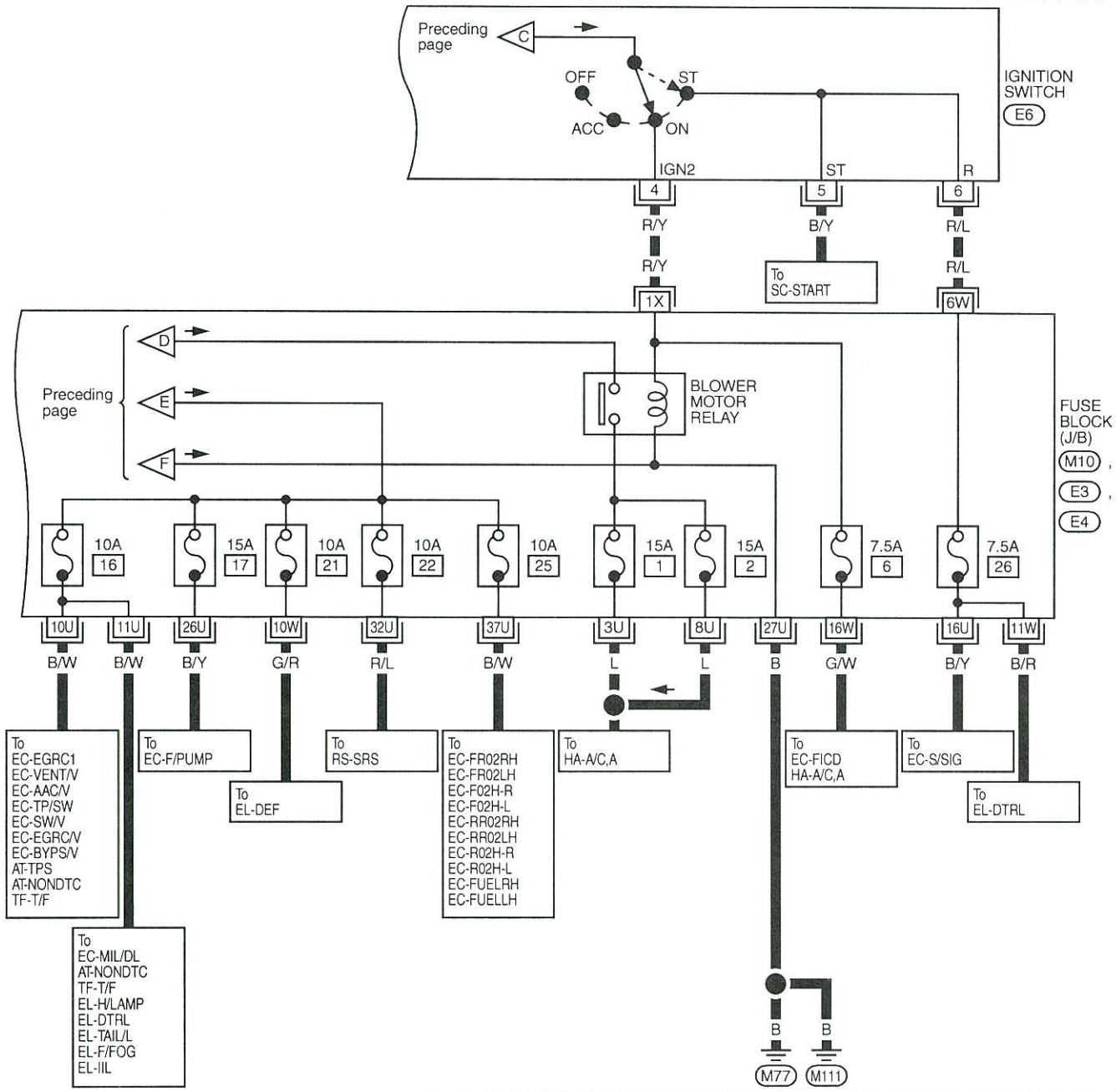
Refer to last page (Foldout page).

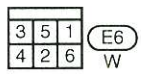
M10 , M91 , E2 , E3 , E4

1	2	3	4	5
6	7	8	9	10
11	12	13	14	15
16	17	18	19	20
21	22			
24	25	26		
	28	29		

MEL745J

EL-POWER-06



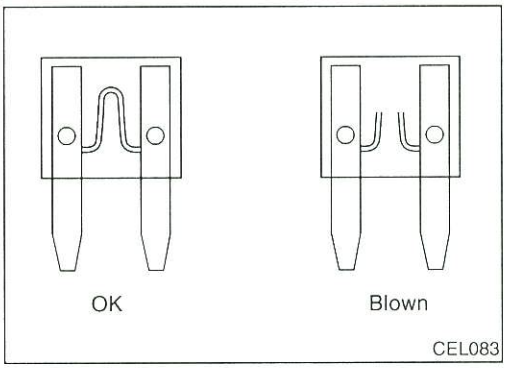


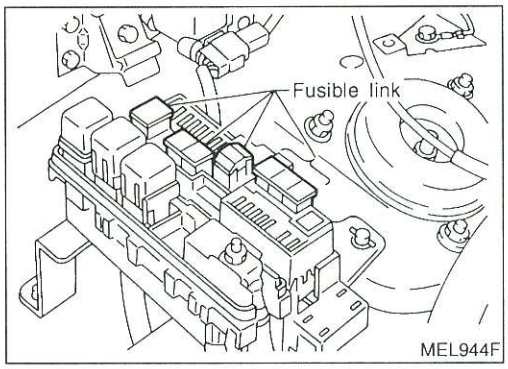
Refer to last page (Foldout page).

M10 , E3 , E4

1	2	3	4	5
6	7	8	9	10
11	12	13	14	15
16	17	18	19	20
21	22			
24	25	26		
	28	29		

MEL746J





Inspection

NBEL0007

FUSE

NBEL0007S01

- **If fuse is blown, be sure to eliminate cause of problem before installing new fuse.**
- **Use fuse of specified rating. Never use fuse of more than specified rating.**
- **Do not partially install fuse; always insert it into fuse holder properly.**
- **Remove fuse for "ELECTRICAL PARTS (BAT)" if vehicle is not used for a long period of time.**

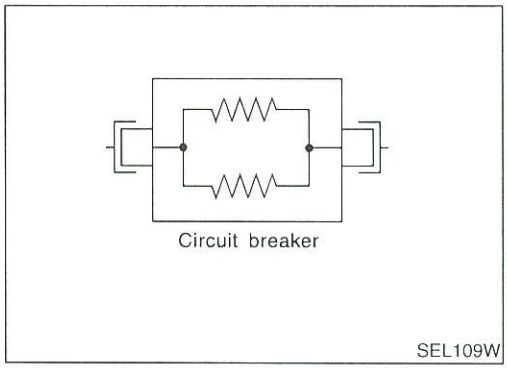
FUSIBLE LINK

NBEL0007S02

A melted fusible link can be detected either by visual inspection or by feeling with finger tip. If its condition is questionable, use circuit tester or test lamp.

CAUTION:

- **If fusible link should melt, it is possible that critical circuit (power supply or large current carrying circuit) is shorted. In such a case, carefully check and eliminate cause of problem.**
- **Never wrap outside of fusible link with vinyl tape. Important: Never let fusible link touch any other wiring harness, vinyl or rubber parts.**



CIRCUIT BREAKER (PTC THERMISTOR TYPE)

NBEL0007S03

The PTC thermister generates heat in response to current flow. The temperature (and resistance) of the thermister element varies with current flow. Excessive current flow will cause the element's temperature to rise. When the temperature reaches a specified level, the electrical resistance will rise sharply to control the circuit current.

Reduced current flow will cause the element to cool. Resistance falls accordingly and normal circuit current flow is allowed to resume.

Ground Distribution

NBEL0008

EARTH	CONNECT TO	CONN. NO.	CELL CODE
M4/M66	AIR BAG DIAGNOSIS SENSOR UNIT	Z4	RS-SRS
	AIR MIX DOOR MOTOR	M55	HA-A/C, A
	ASCD CONTROL UNIT	M3	EL-ASCD
	ASCD MAIN SWITCH	M18	EL-ASCD
	COMBINATION FLASHER UNIT	M15	EL-TURN
	DOOR LOCK AND UNLOCK SWITCH RH	D38	EL-D/LOCK
	DOOR MIRROR DEFOGGER RH	D31	EL-DEF
	DOOR MIRROR REMOTE CONTROL SWITCH	M17	EL-MIRROR
	FRONT DOOR KEY CYLINDER SWITCH RH	D39	EL-D/LOCK EL-THEFT
	HEADLAMP BATTERY SAVER CONTROL UNIT	M115	EL-H/LAMP EL-DTRL EL-TAIL/L EL-F/FOG EL-ILL
	HEADLAMP BATTERY SAVER CONTROL UNIT	M116	EL-H/LAMP EL-DTRL EL-TAIL/L EL-F/FOG EL-ILL
	MODE DOOR MOTOR	M38	HA-A/C, A
	POWER ANTENNA	M69	EL-P/ANT
	POWER WINDOW RELAY	M23	EL-SROOF EL-WINDOW
	REAR POWER SOCKET RELAY	M144	EL-CIGAR
	REAR WINDOW DEFOGGER SWITCH	M36	EL-DEF
	SHIELD WIRE (TWEETER LH)	M8	EL-AUDIO
M77/M111	A/C AUTO AMP.	M102	HA-A/C, A
	A/C AUTO AMP.	M103	HA-A/C, A
	AUDIO AMP. RELAY	B47	EL-AUDIO
	COMBINATION METER (4WD SHIFT INDICATOR LAMP)	M25	TF-T/F
	COMBINATION METER (ABS)	M25	BR-ABS EL-WARN
	COMBINATION METER (AIR BAG)	M24	RS-SRS EL-WARN
	COMBINATION METER (CRUISE INDICATOR LAMP)	M25	EL-WARN EL-ASCD
	COMBINATION METER (FUEL GAUGE)	M24	EL-METER
	COMBINATION METER (HIGH BEAM INDICATOR)	M25	EL-H/LAMP EL-DTRL
	COMBINATION METER (SPEEDOMETER)	M24	TF-T/F EC-VSS AT-VSSMTR EL-METER EL-ASCD
	COMBINATION METER (TURN SIGNAL)	M25	EL-TURN
	COMBINATION METER (WATER TEMPERATURE GAUGE)	M24	EL-METER
	COMPASS AND THERMOMETER	R4	EL-COMPAS
	COMPASS AND THERMOMETER (ILLUMINATION)	R4	EL-ILL
	CIGARETTE LIGHTER SOCKET	M56	EL-CIGAR
	DATA LINK CONNECTOR FOR CONSULT	M11	EC-MIL/DL AT-NONDTC TF-T/F
	DATA LINK CONNECTOR FOR GST	M9	EC-MIL/DL

Ground Distribution (Cont'd)

EARTH	CONNECT TO	CONN. NO.	CELL CODE
M77/M11	DOOR MIRROR DEFOGGER LH	D1	EL-DEF
	FAN CONTROL AMP.	M60	HA-A/C, A
	FRONT DOOR KEY CYLINDER SWITCH LH	D9	EL-D/LOCK EL-THEFT
	FRONT DOOR LOCK ACTUATOR LH	D7	EL-INT/L EL-MULTI EL-THEFT
	FRONT DOOR LOCK ACTUATOR RH	D37	EL-THEFT
	FRONT DOOR SPEAKER LH	D12	EL-AUDIO
	FRONT DOOR SPEAKER RH	D42	EL-AUDIO
	FRONT WIPER AMP.	M79	EL-WIPER
	FRONT WIPER MOTOR	M78	EL-WIPER
	FUEL FILLER LID AND GLASS HATCH OPENER SWITCH	D14	EL-TLID EL-F/LID
	FUSE BLOCK (ACCESSORY RELAY, IGNITION RELAY AND BLOWER MOTOR RELAY)	M10	EL-POWER
	HEADLAMP BATTERY SAVER CONTROL UNIT	M115	EL-H/LAMP EL-DTRL EL-TAIL/L EL-F/FOG EL-ILL
	HEADLAMP BATTERY SAVER CONTROL UNIT	M116	EL-H/LAMP EL-DTRL EL-TAIL/L EL-F/FOG EL-ILL
	HEATED SEAT SWITCH LH	M52	EL-HSEAT
	HEATED SEAT SWITCH RH	M53	EL-HSEAT
	ILLUMINATION CONTROL SWITCH	M19	EL-ILL
	INTEGRATED HOMELINK™ TRANSMITTER	R5	EL-TRNSMT
	INTAKE DOOR MOTOR	M59	HA-A/C, A
	IVCS SWITCH	R10	EL-IVCS
	POWER WINDOW MAIN SWITCH	D6	EL-WINDOW
	POWER WINDOW MAIN SWITCH (DOOR LOCK AND UNLOCK SWITCH LH)	D6	EL-D/LOCK EL-MULTI
	SHIELD WIRE (FRONT DOOR SPEAKER LH)	D12	EL-AUDIO
	SHIELD WIRE (FRONT DOOR SPEAKER RH)	D42	EL-AUDIO
	SHIELD WIRE (TWEETER RH)	M64	EL-AUDIO
	SMART ENTRANCE CONTROL UNIT	M121	EL-H/LAMP EL-DTRL EL-TAIL/L EL-F/FOG EL-ILL EL-INT/L EL-CHIME EL-DEF EL-SROOF EL-WINDOW EL-D/LOCK EL-MULTI EL-THEFT EL-TRNSMT
	SPOT LAMP	R6	EL-INT/L
	VANITY MIRROR LH (ILLUMINATION)	R5	EL-INT/L
	VANITY MIRROR RH (ILLUMINATION)	R3	EL-INT/L

EARTH	CONNECT TO	CONN. NO.	CELL CODE
E13/E41	AMBIENT AIR TEMPERATURE SWITCH	E34	EC-FICD HA-A/C, A
	ASCD HOLD RELAY	E22	EL-ASCD
	BRAKE FLUID LEVEL SWITCH	E28	EL-WARN
	COMBINATION SWITCH (FRONT FOG LAMP SWITCH)	E63	EL-F/FOG
	COMBINATION SWITCH (FRONT WIPER SWITCH)	E9	EL-WIPER
	COMBINATION SWITCH (LIGHTING SWITCH)	E7	EL-H/LAMP EL-F/FOG EL-TAIL/L EL-ILL EL-CHIME EL-DTRL
	COMBINATION SWITCH (REAR WIPER SWITCH)	E114	EL-WIP/R
	DAYTIME LIGHT CONTROL UNIT	E45	EL-DTRL EL-THEFT
	FRONT FOG LAMP LH	E61	EL-F/FOG
	FRONT FOG LAMP RH	E62	EL-F/FOG
	FRONT TURN SIGNAL LAMP LH	E30	EL-TURN
	FRONT TURN SIGNAL LAMP RH	E39	EL-TURN
	HEADLAMP LH	E29	EL-H/LAMP EL-THEFT
	HEADLAMP RH	E38	EL-H/LAMP EL-DTRL EL-THEFT
	HOOD SWITCH	E31	EL-THEFT
	PARKING LAMP LH	E12	EL-TAIL/L
	PARKING LAMP RH	E40	EL-TAIL/L
	REAR WASHER MOTOR	E43	EL-WIP/R
	THEFT WARNING HORN RELAY	E23	EL-THEFT
	TRANSFER SHIFT HI RELAY	E95	TF-T/F
	TRANSFER SHIFT LOW RELAY	E99	TF-T/F
	WASHER LEVEL SWITCH	E42	EL-WARN
E101	ALTERNATOR	E105	SC-CHARGE
	POWER STEERING OIL PRESSURE SWITCH	E110	EC-PST/SW
E112	ABS ACTUATOR AND ELECTRIC UNIT	E111	BR-ABS
	SHIELD WIRE (FRONT WHEEL SENSOR LH)	E14	BR-ABS
	SHIELD WIRE (FRONT WHEEL SENSOR RH)	E51	BR-ABS
	SHIELD WIRE (REAR WHEEL SENSOR LH)	B8	BR-ABS
	SHIELD WIRE (REAR WHEEL SENSOR RH)	B69	BR-ABS
F20/F25	DATA LINK CONNECTOR FOR GST	M9	EC-MIL/DL
	DISTRIBUTOR (CAMSHAFT POSITION SENSOR)	F7	EC-CMPS
	DISTRIBUTOR (IGNITION)	F7	EC-IGN/SG
	ECM	F24	EC-MAIN
	NATS IMMU	E113	EL-NATS
	REAR HEATED OXYGEN SENSOR LH	F3	EC-RRO2LH EC-RO2H-L
	REAR HEATED OXYGEN SENSOR RH	F1	EC-RRO2RH EC-RO2H-R
	SHIELD WIRE (ABSOLUTE PRESSURE SENSOR)	E88	EC-AP/SEN

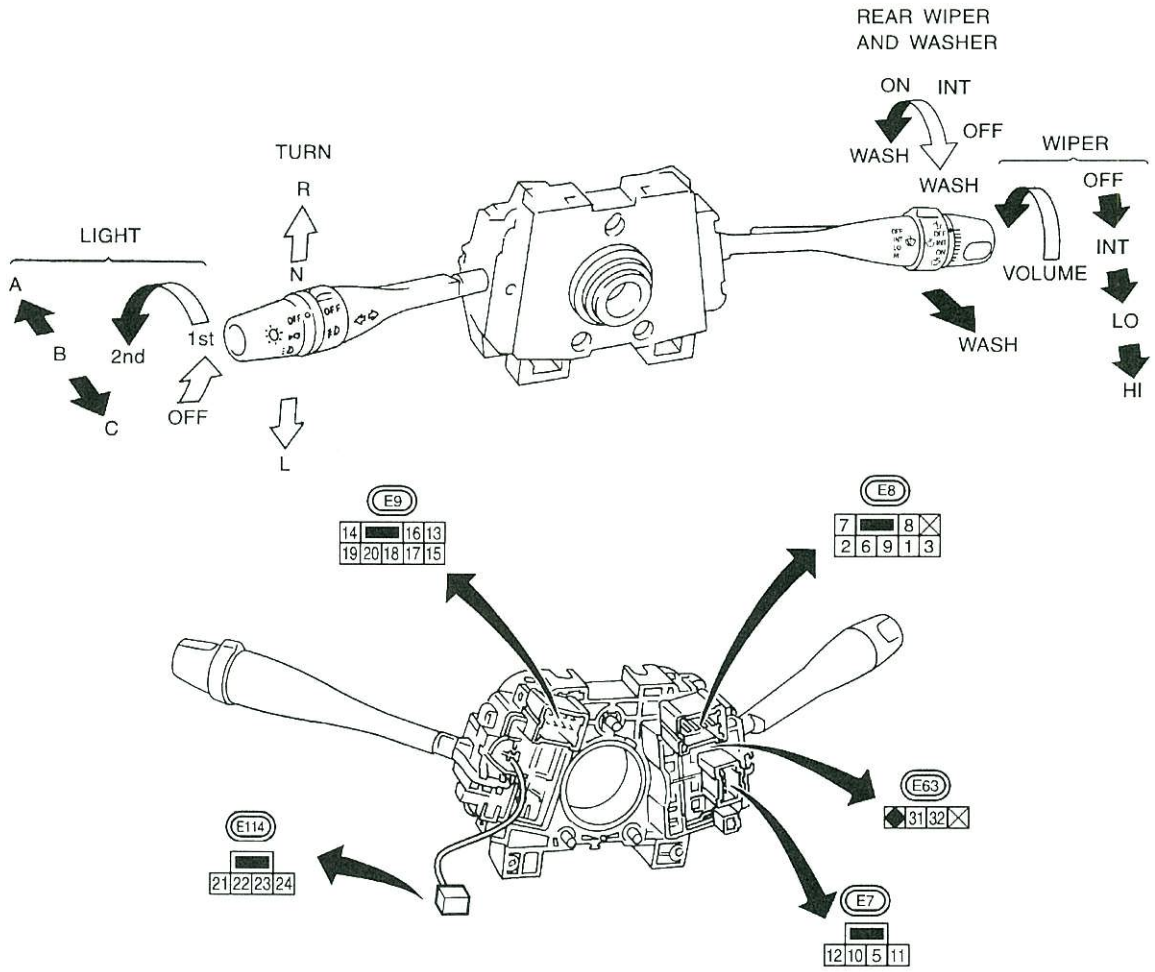
Ground Distribution (Cont'd)

EARTH	CONNECT TO	CONN. NO.	CELL CODE
F20/F25	SHIELD WIRE [CRANKSHAFT POSITION SENSOR (OBD)]	F110	EC-CKPS
	SHIELD WIRE [DISTRIBUTOR (CAMSHAFT POSITION SENSOR)]	F7	EC-CMPS
	SHIELD WIRE (EVAP CONTROL SYSTEM PRESSURE SENSOR)	B102	EC-PRE/SE
	SHIELD WIRE (FRONT HEATED OXYGEN SENSOR LH)	F4	EC-FRO2LH EC-FO2H-L EC-FUELLH
	SHIELD WIRE (FRONT HEATED OXYGEN SENSOR RH)	F2	EC-FRO2RH EC-FO2H-R EC-FUELRH
	SHIELD WIRE (KNOCK SENSOR)	F102	EC-KS
	SHIELD WIRE (MASS AIR FLOW SENSOR)	F10	EC-MAFS
	SHIELD WIRE (REAR HEATED OXYGEN SENSOR LH)	F3	EC-RRO2LH EC-RO2H-L
	SHIELD WIRE (REAR HEATED OXYGEN SENSOR RH)	F1	EC-RRO2RH EC-RO2H-R
	SHIELD WIRE (THROTTLE POSITION SENSOR)	F8	EC-TPS AT-TPS TF-T/F
	TCM (TRANSMISSION CONTROL MODULE)	M120	AT-MAIN
	TRANSFER CONTROL UNIT	M142	TF-T/F
	TRANSFER CONTROL UNIT	M143	TF-T/F
B11/B22/D210	BACK DOOR HANDLE SWITCH	D213	EL-IVCS
	BACK DOOR LOCK ACTUATOR	D207	EL-THEFT
	BACK DOOR KEY CYLINDER SWITCH	D201	EL-D/LOCK EL-THEFT
	BACK DOOR SWITCH	D208	EL-INT/L EL-D/LOCK EL-MULTI EL-THEFT
	DOOR MIRROR DEFOGGER RELAY	B112	EL-DEF
	FUEL PUMP	B13	EC-F/PUMP
	FUEL TANK GAUGE UNIT	B12	EC-TFTS EL-METER EL-WARN
	FRONT DOOR SWITCH LH	B9	RS-SRS EL-H/LAMP EL-DTRL EL-TAIL/L EL-F/FOG EL-ILL EL-INT/L EL-CHIME EL-SROOF EL-WINDOW EL-D/LOCK EL-MULTI EL-THEFT
	GLASS HATCH OPENER ACTUATOR	D200	EL-TLID
	GLASS HATCH SWITCH	D209	EL-INT/L EL-WIP/R EL-THEFT
	HEATED SEAT LH	B5	EL-HSEAT
	IVCS UNIT	B114	EL-IVCS
	HIGH-MOUNTED STOP LAMP	D302	EL-STOP/L
	LICENSE PLATE LAMP LH	D202	EL-TAIL/L
	LICENSE PLATE LAMP RH	D211	EL-TAIL/L
	LUGGAGE ROOM LAMP	D103	EL-INT/L

EARTH	CONNECT TO	CONN. NO.	CELL CODE
B11/B22/D210	POWER SEAT LH	B7	EL-SEAT
	POWER SOCKET	B4	EL-CIGAR
	POWER SOCKET RELAY	B111	EL-CIGAR
	REAR COMBINATION LAMP LH (BACK-UP LAMP LH)	B26	EL-BACK/L
	REAR COMBINATION LAMP LH (STOP LAMP LH)	B26	EL-TAIL/L EL-STOP/L
	REAR COMBINATION LAMP LH (TAIL LAMP LH)	B26	EL-TAIL/L EL-STOP/L
	REAR COMBINATION LAMP LH (TURN SIGNAL LAMP LH)	B26	EL-TURN
	REAR WIPER AMP.	B14	EL-WIP/R
	REAR DOOR LOCK ACTUATOR LH	D54	EL-THEFT
	REAR WIPER MOTOR	D212	EL-WIP/R EL-TLID
	REAR SPEAKER AMP.	B46	EL-AUDIO
	SEAT BELT BUCKLE SWITCH	B6	RS-SRS EL-WARN EL-CHIME
B55/B75	A/T DEVICE (PARK POSITION SWITCH and OVER-DRIVE CONTROL SWITCH)	B59	AT-NONDTC AT-SHIFT
	ASHTRAY ILLUMINATION	B76	EL-ILL
	ATP SWITCH	B210	TF-T/F EL-WARN
	HEATED SEAT RH	B56	EL-HSEAT
	PARK/NEUTRAL POSITION SWITCH	B66	EC-PNP/SW SC-START EL-ASCD
	POWER SEAT RH	B57	EL-SEAT
	REAR COMBINATION LAMP RH (BACK-UP LAMP RH)	B74	EL-BACK/L
	REAR COMBINATION LAMP RH (STOP LAMP RH)	B74	EL-TAIL/L EL-STOP/L
	REAR COMBINATION LAMP RH (TAIL LAMP RH)	B74	EL-TAIL/L EL-STOP/L
	REAR COMBINATION LAMP RH (TURN SIGNAL LAMP RH)	B74	EL-TURN
	REAR DOOR LOCK ACTUATOR RH	D74	EL-THEFT
	REAR POWER SOCKET	B129	EL-CIGAR
	TRANSFER CONTROL DEVICE	B252	TF-T/F
	TRANSFER MOTOR	B212	TF-T/F
	WAIT DETECTION SWITCH	B211	TF-T/F
	NEUTRAL-4LO SWITCH	B213	TF-T/F EL-WARN
B108	SHIELD WIRE (SATELLITE SENSOR LH)	B107	RS-SRS
B122	SHIELD WIRE (AIR BAG DIAGNOSIS SENSOR UNIT)	B121	RS-SRS
B127	SHIELD WIRE (SATELLITE SENSOR RH)	B128	RS-SRS
D305	REAR WINDOW DEFOGGER	D304	EL-DEF

Check

NBEL0009



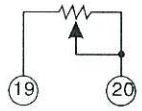
LIGHTING SWITCH

	OFF			1			2		
	A	B	C	A	B	C	A	B	C
5			○			○	○	○	○
6			○			○	○		○
7								○	
8			○			○	○	○	○
9			○			○	○		○
10								○	
11				○	○	○	○	○	○
12				○	○	○	○	○	○

FRONT WIPER SWITCH

	OFF	INT	LO	HI	WASH
13	○	○			
14	○	○	○		
15		○			
16				○	
17		○	○	○	○
18					○

VARIABLE
INTERMITTENT
WIPER VOLUME



FOG LAMP
SWITCH

	OFF	ON
31		○
32		○

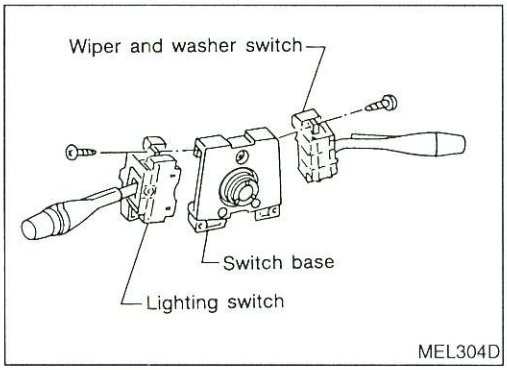
	L	N	R
1	○		○
2			○
3	○		

TURN
SIGNAL
SWITCH

REAR WIPER SWITCH

	WASH	OFF	INT	ON	WASH
21			○		
22				○	○
23	○				○
24	○		○	○	○

MEL860J

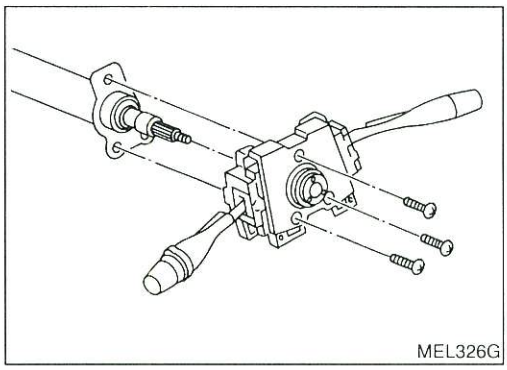


Replacement

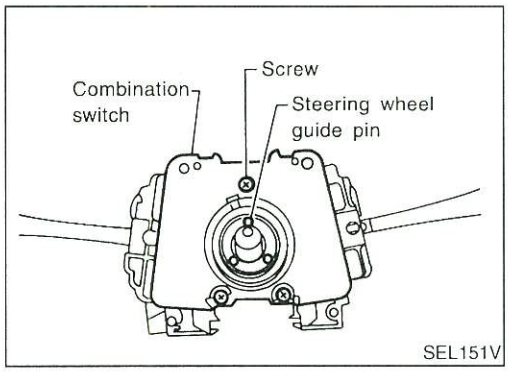
NBEL0010

For removal and installation of spiral cable, refer to RS section ["Installation — Air Bag Module and Spiral Cable", "SUPPLEMENTAL RESTRAINT SYSTEM (SRS)"].

- Each switch can be replaced without removing combination switch base.



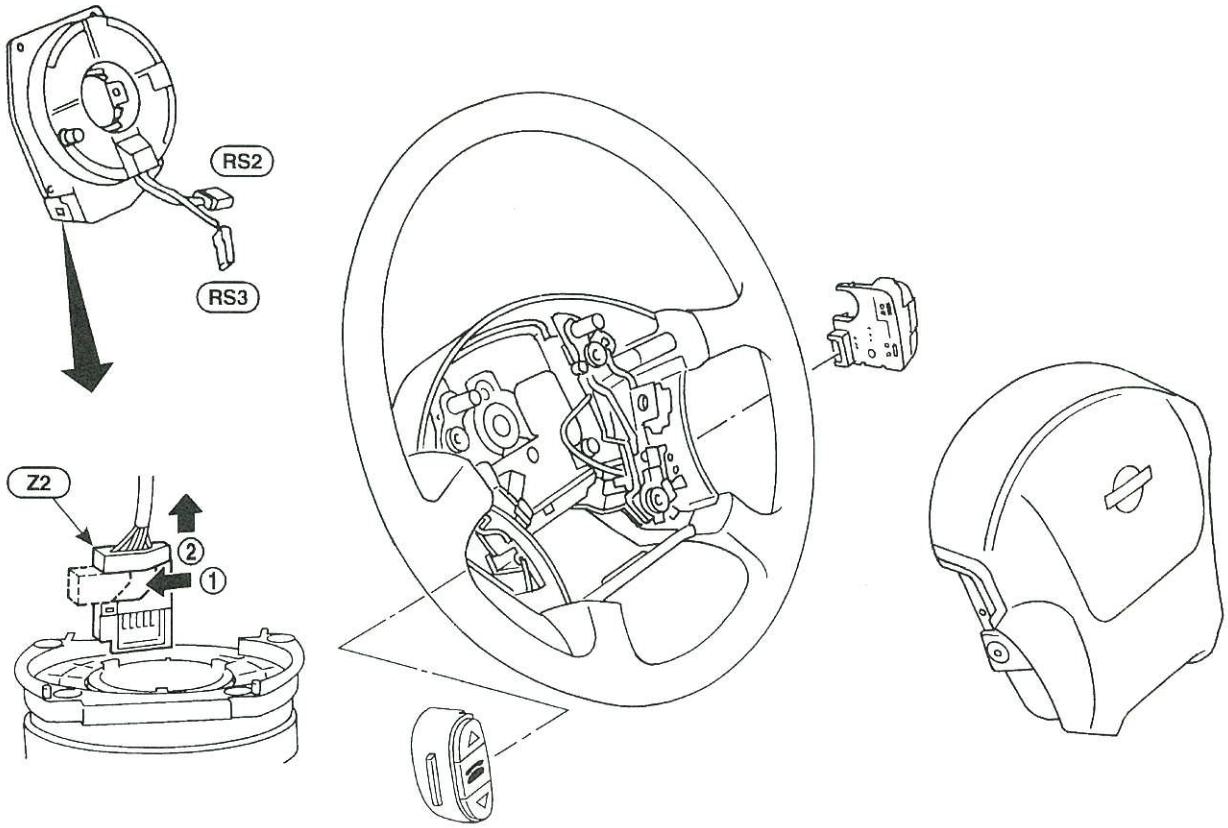
- To remove combination switch base, remove base attaching screw.

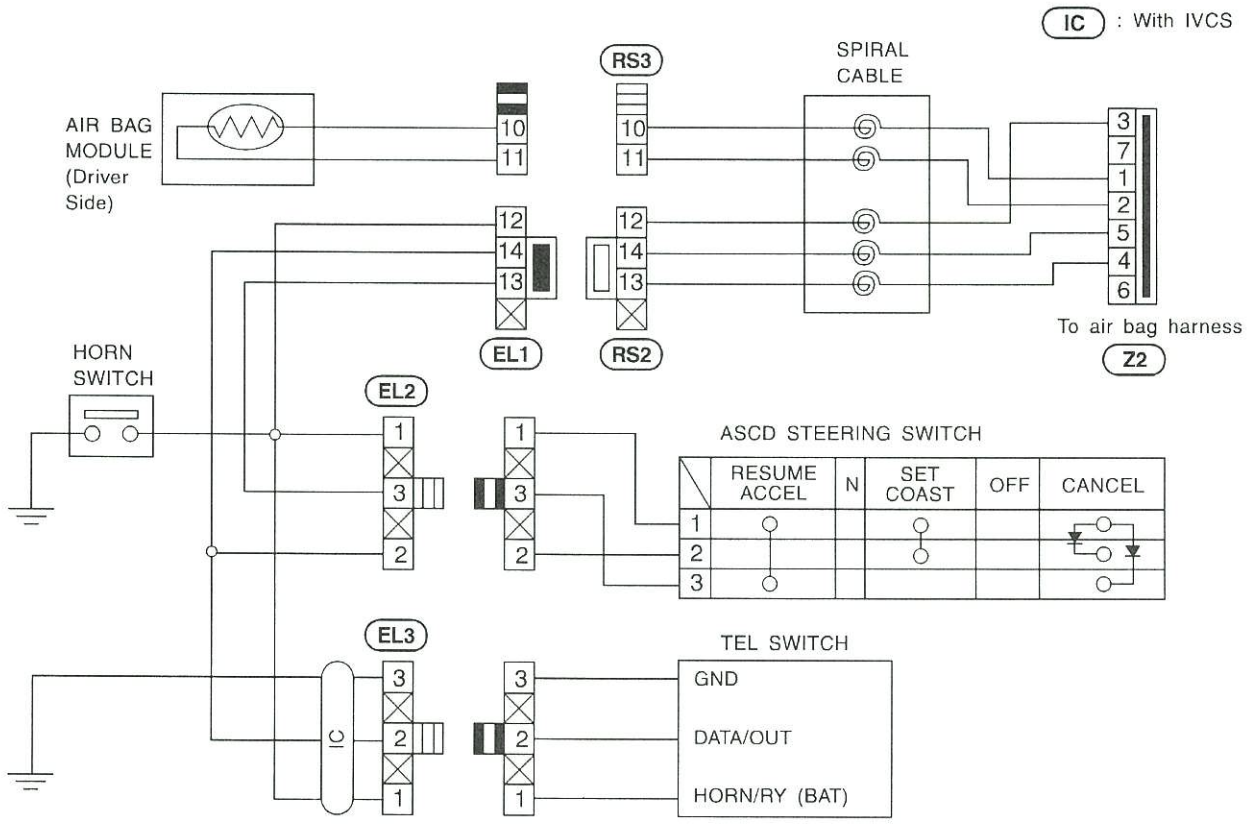


- Before installing the steering wheel, align the steering wheel guide pins with the screws which secure the combination switch as shown in the left figure.

Check

NBEL0011

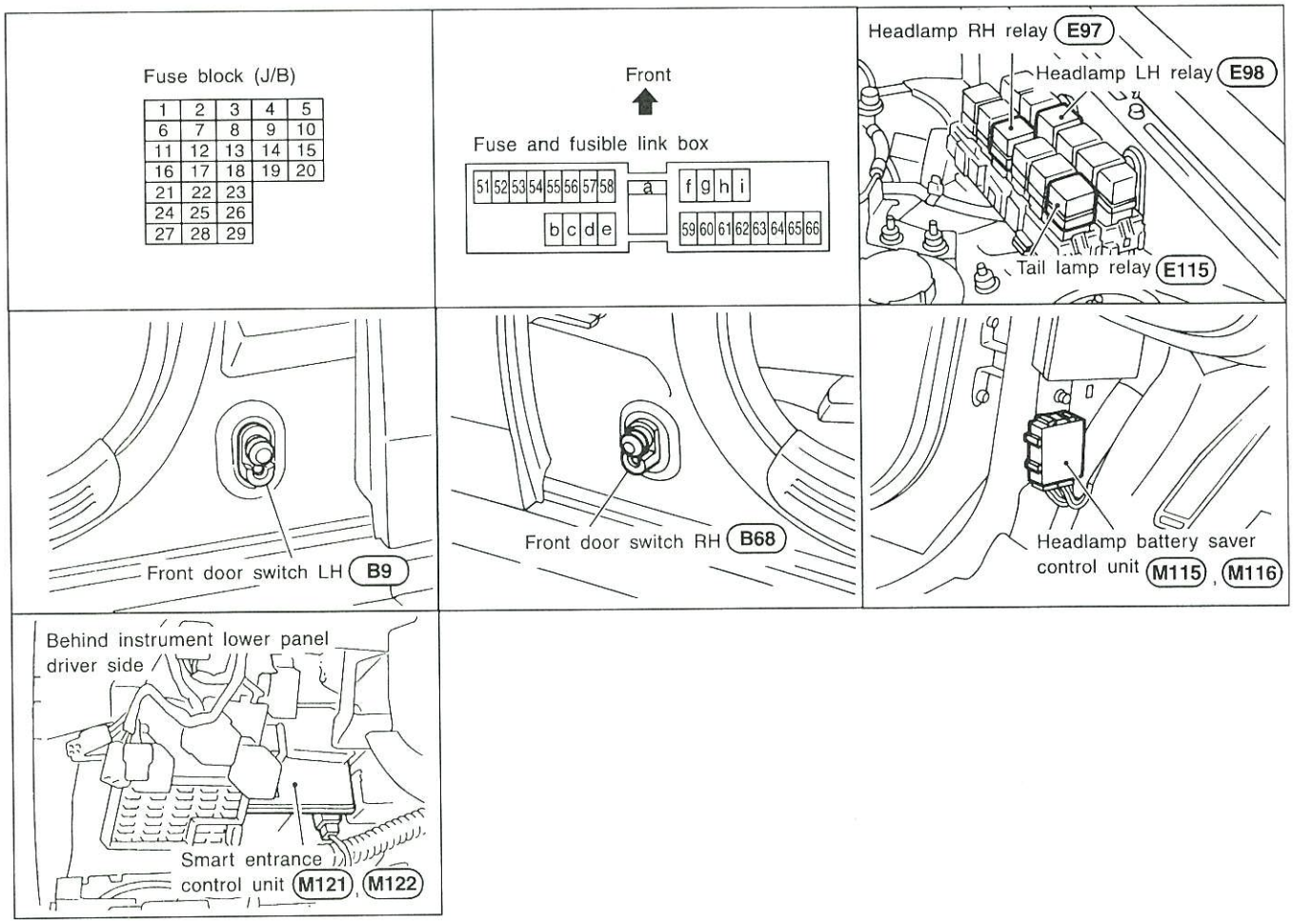




MEL861J

Component Parts and Harness Connector Location

NBEL0159



SEL044W

System Description

NBEL0012

The headlamp operation is controlled by the lighting switch which is built into the combination switch and headlamp battery saver control unit. And the headlamp battery saver system is controlled by the headlamp battery saver control unit and smart entrance control unit.

OUTLINE

NBEL0012S04

Power is supplied at all times

- to headlamp LH relay terminals 2 and 3
- through 15A fuse (No. 60, located in the fuse and fusible link box), and
- to headlamp RH relay terminals 2 and 3
- through 15A fuse (No. 59, located in the fuse and fusible link box), and
- to headlamp battery saver control unit terminal 7
- through 7.5A fuse [No. 24, located in the fuse block (J/B)].

When the ignition switch is in the ON or START position, power is supplied

- to headlamp battery saver control unit terminal 1
- through 10A fuse [No. 16, located in the fuse block (J/B)], and
- to headlamp battery saver control unit terminal 10, and
- to smart entrance control unit terminal 33
- through 7.5A fuse [No. 11, located in the fuse block (J/B)]

Ground is supplied to headlamp battery saver control unit terminals 4 and 11.

When Ignition Switch is in ON or START Position

NBEL0012S0401

Ground is supplied

- to headlamp LH relay terminal 1 from headlamp battery saver control unit terminal 2
- through headlamp battery saver control unit terminal 3, and
- through body grounds M4 and M66, and
- to headlamp RH relay terminal 1 from headlamp battery saver control unit terminal 8
- through headlamp battery saver control unit terminal 9, and
- through body grounds M77 and M111.

Headlamp relays (LH and RH) are then energized.

When Ignition Switch is in OFF or ACC Position

NBEL0012S0402

When lighting switch is in 2ND (or 1ST) position, ground is supplied

- to headlamp battery saver control unit terminals 5 and 13
- from lighting switch terminal 11.

And then, ground is also supplied to headlamp LH and RH relays terminal 1 from headlamp battery saver control unit. Headlamp relays (LH and RH) are then energized.

LOW BEAM OPERATION

NBEL0012S01

When the lighting switch is turned to the 2ND position and placed in LOW ("B") position, power is supplied

- from lighting switch terminal 10
- to terminal 2 of the LH headlamp, and
- from lighting switch terminal 7
- to terminal 2 of the RH headlamp.

Terminal 3 of each headlamp supplies ground through body grounds E13 and E41.
With power and ground supplied, the headlamp(s) will illuminate.

HIGH BEAM OPERATION/FLASH-TO-PASS OPERATION

NBEL0012S02

When the lighting switch is turned to the 2ND position and placed in HIGH ("A") position or PASS ("C") position, power is supplied

- from lighting switch terminal 6
- to terminal 1 of the RH headlamp, and
- from lighting switch terminal 9
- to terminal 1 of the LH headlamp, and
- to combination meter terminal 33 for the high beam indicator.

Ground is supplied to terminal 19 of the combination meter through body grounds M77 and M111.
Terminal 3 of each headlamp supplies ground through body grounds E13 and E41.
With power and ground supplied, the high beams and the high beam indicator illuminate.

BATTERY SAVER CONTROL

NBEL0012S05

When the ignition switch is turned from ON or START to OFF or ACC positions while headlamps illuminate, the RAP signal is supplied to terminal 10 of the headlamp battery saver control unit from smart entrance control unit terminal 5.
After counting 45 seconds by the RAP signal from the smart entrance control unit to headlamp battery saver control unit, the ground supply to terminal 1 of the headlamp LH and RH relay from headlamp battery saver control unit terminals 2 and 8 is terminated.
Then the headlamps are turned off.
The headlamps are turned off when driver or passenger side door is opened even if 45 seconds have not passed after ignition switch is turned from ON (or START) to OFF (or ACC) positions while headlamps are illuminated.
When the lighting switch is turned from OFF to 2ND after headlamps are turned to off by the battery saver control, ground is supplied

- to headlamp battery saver control unit terminals 5 and 13 from lighting switch terminal 11, and
- to headlamp LH and RH relays terminal 1 from headlamp battery saver control unit terminals 2 and 8.

Then headlamps illuminate again.

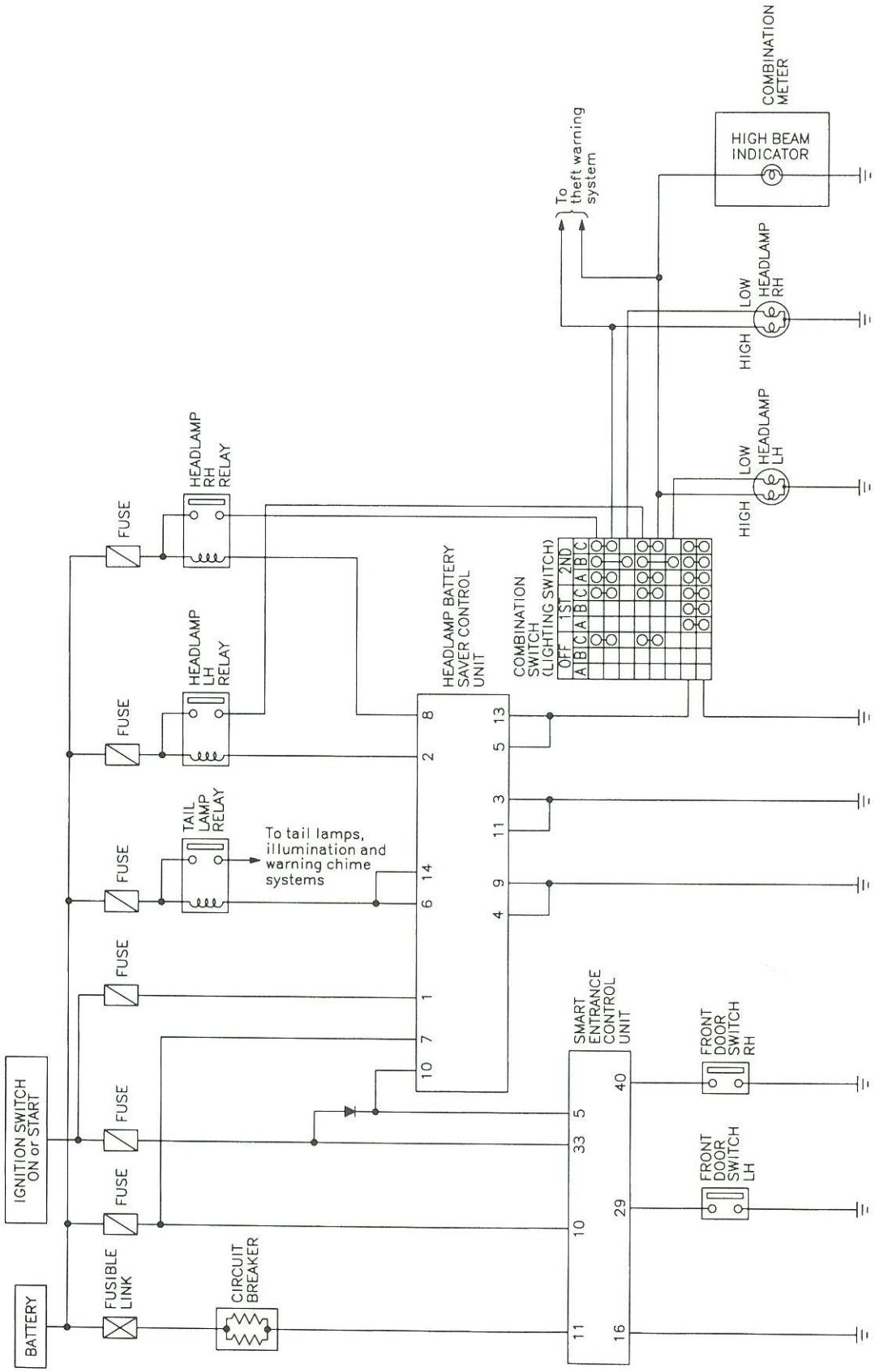
THEFT WARNING SYSTEM

NBEL0012S03

The theft warning system will flash the high beams if the system is triggered. Refer to "THEFT WARNING SYSTEM" (EL-227).

Schematic

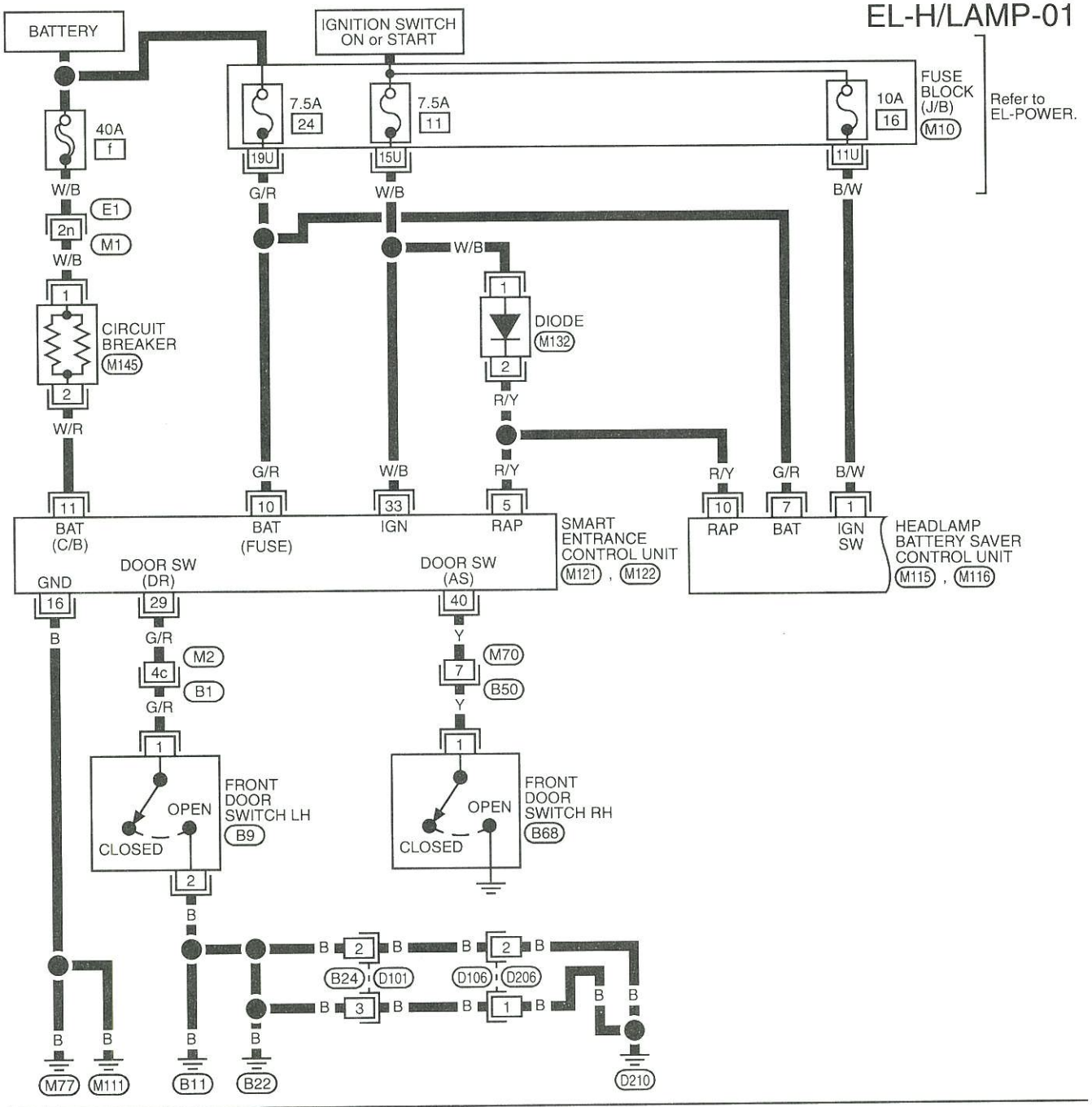
NBEL0160

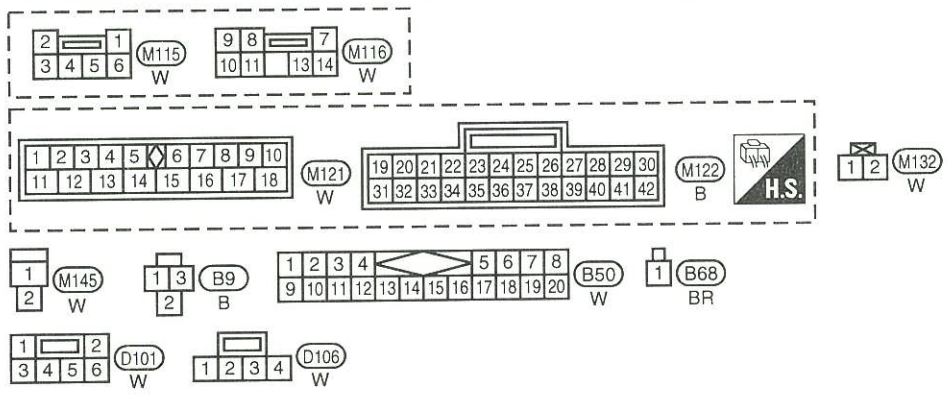


MEL837J

Wiring Diagram — H/LAMP —

NBEL0013





Refer to last page (Foldout page).

M1 , E1

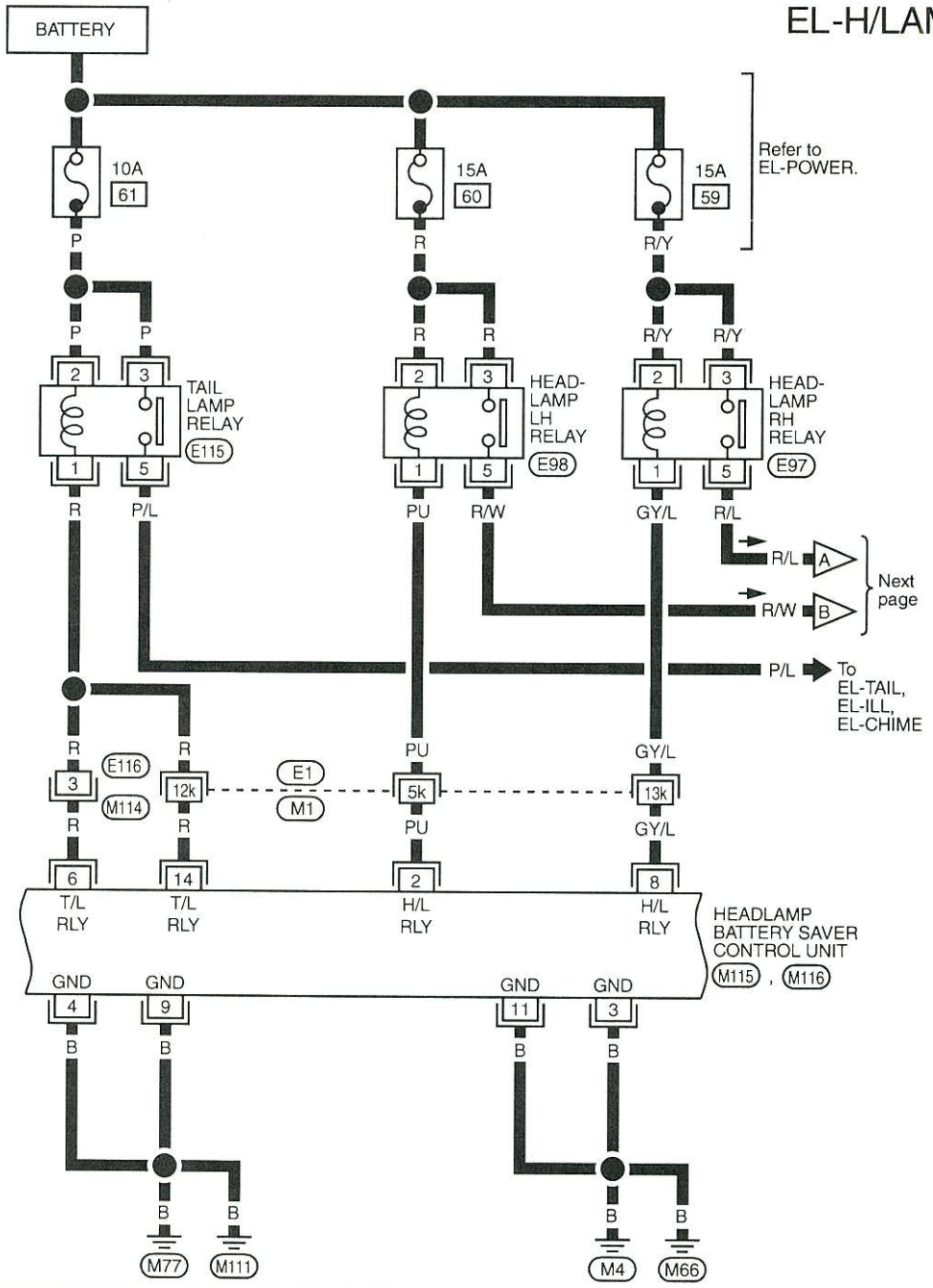
M2 , B1

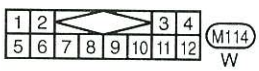
M10

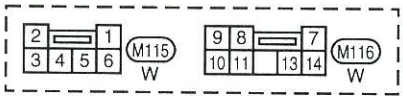
MEL838J

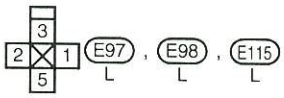
Wiring Diagram — H/LAMP — (Cont'd)

EL-H/LAMP-02







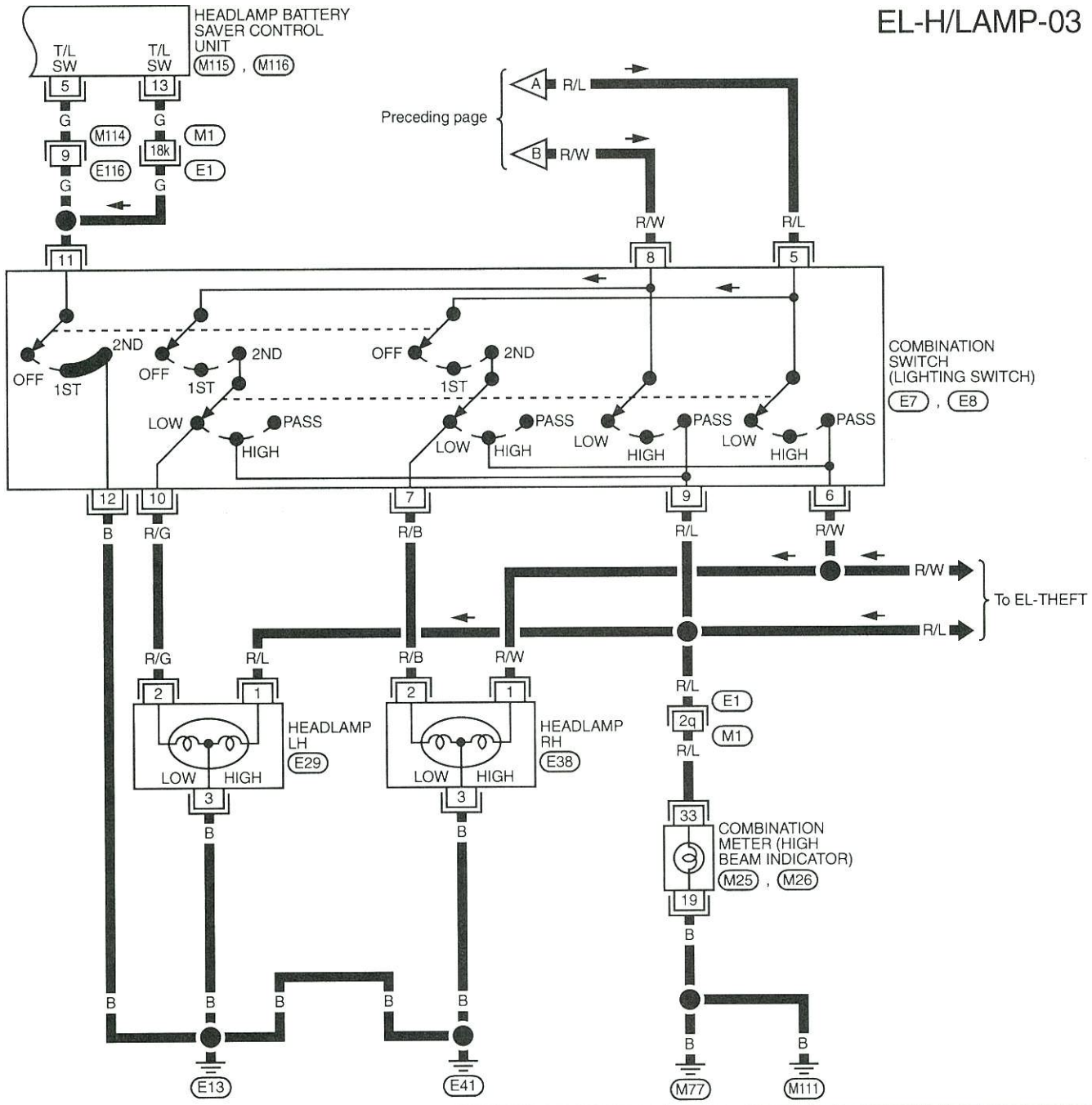


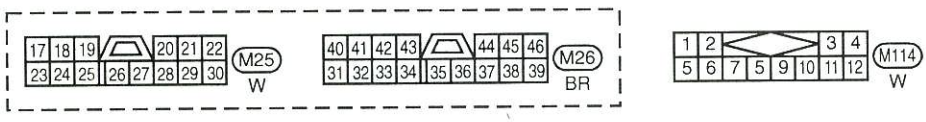
Refer to last page (Foldout page).

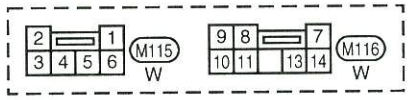
M1 , E1

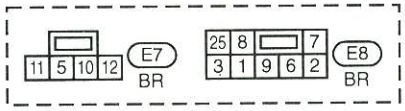
MEL747J

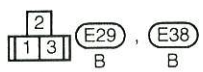
EL-H/LAMP-03











Refer to last page (Foldout page).
M1 , E1

MEL748J

Trouble Diagnoses

NBEL0014

Symptom	Possible cause	Repair order
Neither headlamp operates.	1. 7.5A fuse 2. Lighting switch 3. Headlamp battery saver control unit	1. Check 7.5A fuse [No. 24, located in fuse block (J/B)]. Verify battery positive voltage is present at terminal 7 of headlamp battery saver control unit. 2. Check Lighting switch. 3. Check headlamp battery saver control unit.
LH headlamp (low and high beam) does not operate, but RH headlamp (low and high beam) does operate.	1. Bulb 2. LH headlamp ground circuit 3. 15A fuse 4. Headlamp LH relay 5. Headlamp LH relay circuit 6. Lighting switch 7. Headlamp battery saver control unit	1. Check bulb. 2. Check harness between LH headlamp and ground. 3. Check 15A fuse (No. 60, located in fusible link and fuse box). Verify battery positive voltage is present at terminals 2 and 3 of headlamp LH relay. 4. Check headlamp LH relay. 5. Check harness between headlamp LH relay and lighting switch. Check harness between headlamp LH relay and headlamp battery saver control unit. 6. Check lighting switch. 7. Check headlamp battery saver control unit.
RH headlamp (low and high beam) does not operate, but LH headlamp (low and high beam) does operate.	1. Bulb 2. RH headlamp ground circuit 3. 15A fuse 4. Headlamp RH relay 5. Lighting switch circuit 6. Lighting switch 7. Headlamp battery saver control unit	1. Check bulb. 2. Check harness between RH headlamp and ground. 3. Check 15A fuse (No. 59, located in fusible link and fuse box). Verify battery positive voltage is present at terminals 2 and 3 of headlamp RH relay. 4. Check headlamp RH relay. 5. Check harness between headlamp RH relay and lighting switch. Check harness between headlamp RH relay and headlamp battery saver control unit. 6. Check lighting switch. 7. Check headlamp battery saver control unit.
LH high beam does not operate, but LH low beam does operate.	1. Bulb 2. Open in LH high beams circuit 3. Lighting switch	1. Check bulb. 2. Check R/L wire between lighting switch and LH headlamp for an open circuit. 3. Check lighting switch.
LH low beam does not operate, but LH high beam does operate.	1. Bulb 2. Open in LH low beams circuit 3. Lighting switch	1. Check bulb. 2. Check R/G wire between lighting switch and LH headlamp for an open circuit. 3. Check lighting switch.
RH high beam does not operate, but RH low beam does operate.	1. Bulb 2. Open in RH high beams circuit 3. Lighting switch	1. Check bulb. 2. Check R/W wire between lighting switch and RH headlamp for an open circuit. 3. Check lighting switch.
RH low beam does not operate, but RH high beam does operate.	1. Bulb 2. Open in RH low beams circuit 3. Lighting switch	1. Check bulb. 2. Check R/B wire between lighting switch and RH headlamp for an open circuit. 3. Check lighting switch.
High beam indicator does not work.	1. Bulb 2. Ground circuit 3. Open in high beam circuit	1. Check bulb in combination meter. 2. Check harness between high beam indicator and ground. 3. Check R/L wire between lighting switch and combination meter for an open circuit.

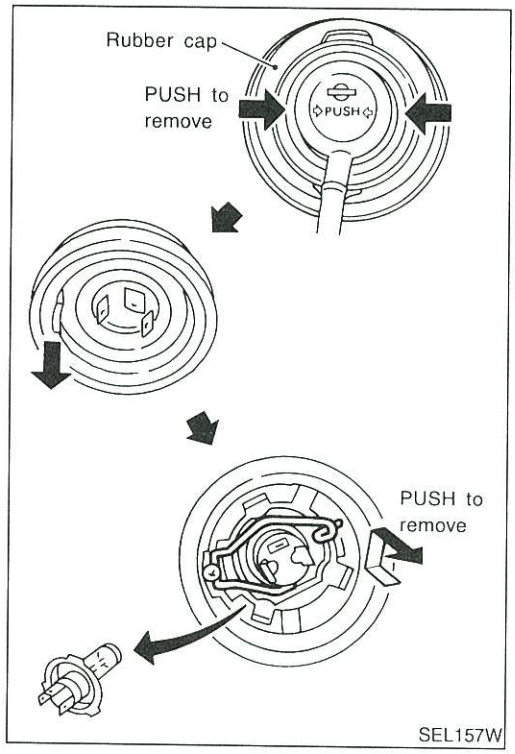
Symptom	Possible cause	Repair order
Battery saver control does not operate properly.	1. RAP signal circuit 2. Driver or passenger side door switch circuit 3. Lighting switch circuit 4. Headlamp battery saver control unit 5. Smart entrance control unit	1. Check harness between headlamp battery saver control unit terminal 10 and smart entrance control unit terminal 5 for open or short circuit. 2. Check harness between smart entrance control unit and driver or passenger side door switch for open or short circuit. Check driver or passenger side door switch ground circuit. Check driver or passenger side door switch. 3. Check harness between headlamp battery saver control unit terminals 5 or 13 and lighting switch terminal 11 for open or short circuit. Check harness between lighting switch terminal 12 and ground. Check lighting switch. 4. Check headlamp battery saver control unit. (EL-31) 5. Check smart entrance control unit. (EL-254)

BATTERY SAVER CONTROL UNIT INSPECTION TABLE

NBEL0014S01

Terminal No.	Item	Condition		Voltage (Approximate value)
1	Ignition ON power supply	Ignition switch	OFF or ACC	Less than 1V
			ON or START	Battery voltage
2	Headlamp LH relay	Ignition switch (with lighting switch OFF)	OFF or ACC	Battery voltage
			ON or START	Less than 1V
		Lighting switch (with ignition switch OFF)	OFF	Battery voltage
			1ST or 2ND	Less than 1V
3	Ground	—		—
4	Ground	—		—
5	Tail lamp switch	Lighting switch	OFF	Battery voltage
			1ST or 2ND	Less than 1V
6	Tail lamp relay	Ignition switch (with lighting switch OFF)	OFF or ACC	Battery voltage
			ON or START	Less than 1V
		Lighting switch (with ignition switch OFF)	OFF	Battery voltage
			1ST or 2ND	Less than 1V
7	Power supply	—		Battery voltage
8	Headlamp RH relay	Ignition switch (with lighting switch OFF)	OFF or ACC	Battery voltage
			ON or START	Less than 1V
		Lighting switch (with ignition switch OFF)	OFF	Battery voltage
			1ST or 2ND	Less than 1V
9	Ground	—		—

Terminal No.	Item	Condition		Voltage (Approximate value)
10	RAP signal	Ignition switch	OFF or ACC (After more than 45 seconds with ignition switch turned OFF or ACC)	Less than 1V
			ON or START	Battery voltage
11	Ground	—		—
13	Tail lamp switch	Lighting switch	OFF	Battery voltage
			1ST or 2ND	Less than 1V
14	Tail lamp relay	Ignition switch (with lighting switch OFF)	OFF or ACC	Battery voltage
			ON or START	Less than 1V
		Lighting switch (with ignition switch OFF)	OFF	Battery voltage
			1ST or 2ND	Less than 1V



Bulb Replacement

NBEL0015

The headlamp is a semi-sealed beam type which uses a replaceable halogen bulb. The bulb can be replaced from the engine compartment side without removing the headlamp body.

- **Grasp only the plastic base when handling the bulb. Never touch the glass envelope.**

1. Disconnect the battery cable.
2. Disconnect the harness connector from the back side of the bulb.
3. Pull off the rubber cap.
4. Remove the headlamp bulb carefully. Do not shake or rotate the bulb when removing it.
5. Install in the reverse order of removal.

CAUTION:

Do not leave headlamp reflector without bulb for a long period of time. Dust, moisture, smoke, etc. entering headlamp body may affect the performance of the headlamp. Remove headlamp bulb from the headlamp reflector just before a replacement bulb is installed.

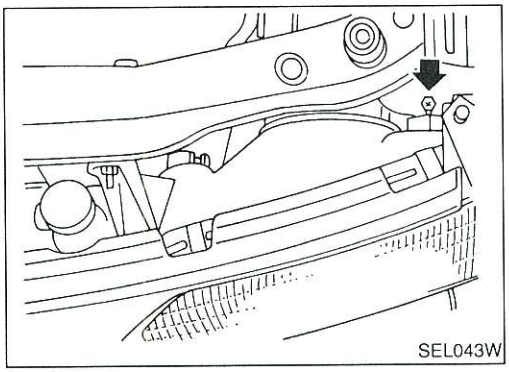
Aiming Adjustment

NBEL0016

Before performing aiming adjustment, check the following.

For details, refer to the regulations in your own country.

1) Keep all tires inflated to correct pressures.
2) Place vehicle flat surface.
3) See that there is no-load in vehicle (coolant, engine oil filled up to correct level and full fuel tank) other than the driver (or equivalent weight placed in driver's position).

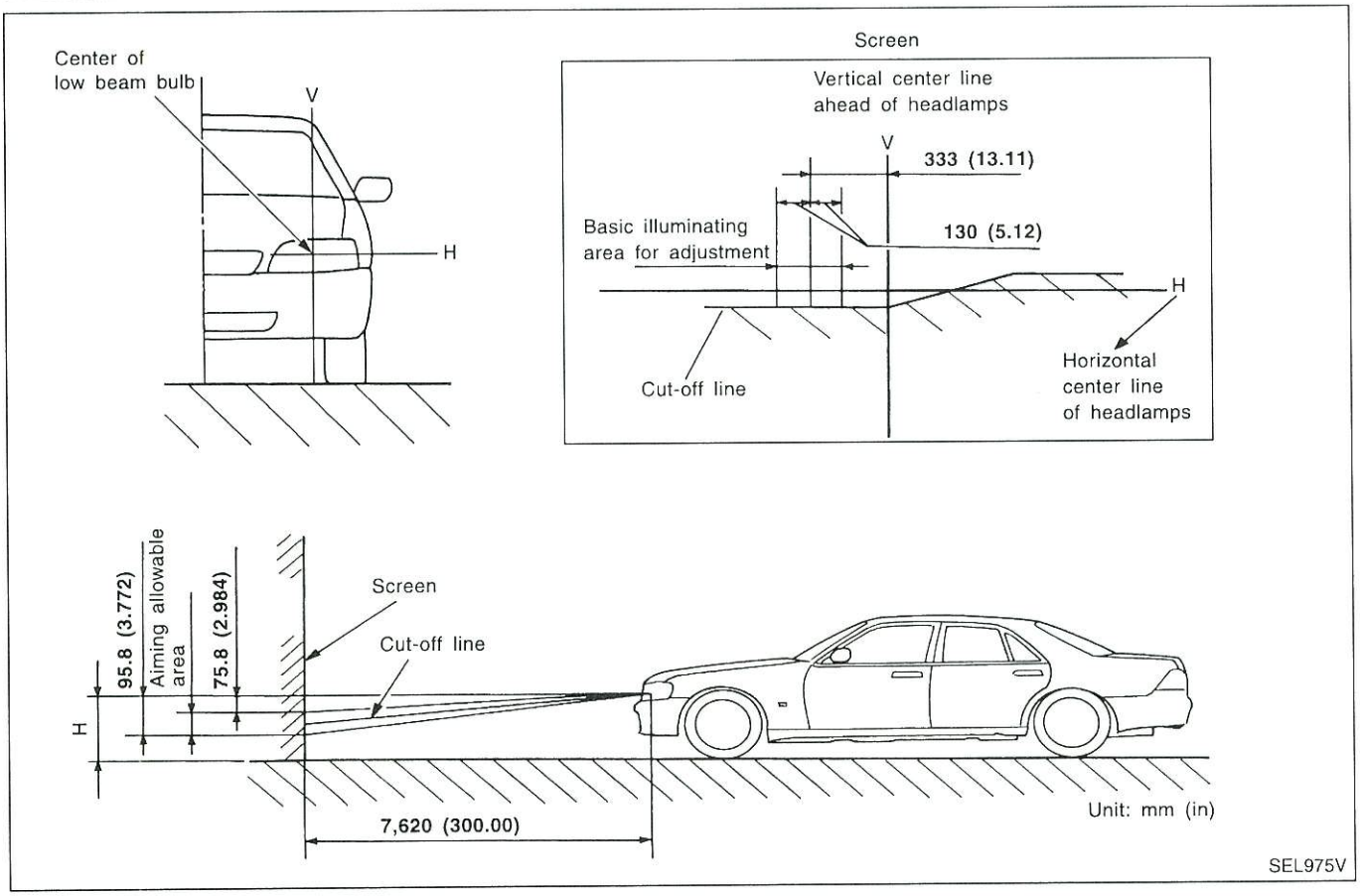

SEL043W

LOW BEAM

NBEL0016S02

1. Turn headlamp low beam on.
2. Use adjusting screws to perform aiming adjustment.

- **First tighten the adjusting screw all the way and then make adjustment by loosening the screw.**

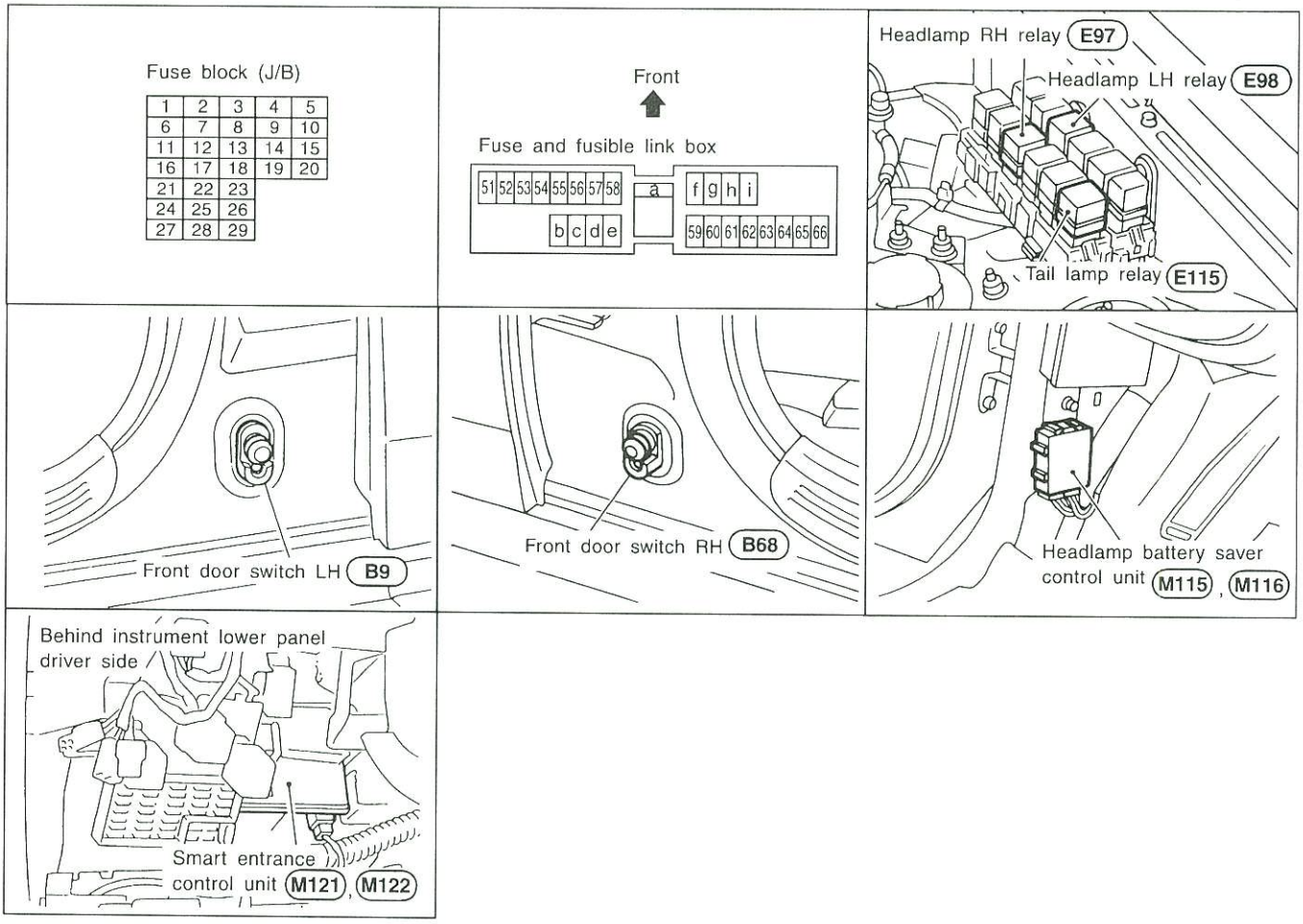


If the vehicle front body has been repaired and/or the headlamp assembly has been replaced, check aiming. Use the aiming chart shown in the figure.

- **Basic illuminating area for adjustment should be within the range shown on the aiming chart. Adjust headlamps accordingly.**

Component Parts and Harness Connector Location

NBEL0161



SEL044W

System Description

NBEL0017

The headlamp system for Canada vehicles contains a daytime light control unit that activates the high beam headlamps at approximately half illumination whenever the engine is running. If the parking brake is applied before the engine is started the daytime lights will not be illuminated. The daytime lights will illuminate once the parking brake is released. Thereafter, the daytime lights will continue to operate when the parking brake is applied.

And battery saver system is controlled by the headlamp battery saver control unit and smart entrance control unit.

Power is supplied at all times

- to daytime light control unit terminal 3, and
- to headlamp LH relay terminals 2 and 3
- through 15A fuse (No. 60, located in the fuse and fusible link box), and
- to daytime light control unit terminal 2 and
- to headlamp RH relay terminals 2 and 3
- through 15A fuse (No. 59, located in the fuse and fusible link box), and
- to headlamp battery saver control unit terminal 7
- through 7.5A fuse [No. 24, located in the fuse block (J/B)].

Ground is supplied

- to daytime light control unit terminal 9 and
- to headlamp battery saver control unit terminals 4 and 11

When the ignition switch is in the ON (or START) position, power is also supplied

- to daytime light control unit terminal 12,
- to headlamp battery saver control unit terminal 10, and
- to smart entrance control unit terminal 33
- through 7.5A fuse [No. 11, located in the fuse block (J/B)], and
- to headlamp battery saver control unit terminal 1
- through 10A fuse [No. 16, located in the fuse block (J/B)].

When the ignition switch is in the START position, power is supplied

- to daytime light control unit terminal 1
- through 7.5A fuse [No. 26, located in the fuse block (J/B)].

HEADLAMP OPERATION

NBEL0017S01

When Ignition Switch is in ON or START Position

NBEL0017S0103

Ground is supplied

- to headlamp LH relay terminal 1 from headlamp battery saver control unit terminal 2
- through headlamp battery saver control unit terminal 3, and
- through body grounds M4 and M66, and
- to headlamp RH relay terminal 1 from headlamp battery saver control unit terminal 8
- through headlamp battery saver control unit terminal 9, and
- through body grounds M77 and M111.

Headlamp relays (LH and RH) are then energized.

When Ignition Switch is in OFF or ACC Position

NBEL0017S0104

When lighting switch is in 1ST (or 2ND) position, ground is supplied

- to headlamp battery saver control unit terminals 5 and 13
- from lighting switch terminal 11.

And then, ground is also supplied to headlamp LH and RH relays terminal 1 from headlamp battery saver control unit. Headlamp relays (LH and RH) are then energized.

Low Beam Operation

NBEL0017S0101

When the lighting switch is turned to the 2ND position and placed in LOW ("B") position, power is supplied

- from lighting switch terminal 7
- to RH headlamp terminal 2
- to daytime light control unit terminal 4.

Ground is supplied to RH headlamp terminal 3 through body grounds E13 and E41.
Also, when the lighting switch is turned to the 2ND position and placed in LOW ("B") position, power is supplied

- from lighting switch terminal 10
- to LH headlamp terminal 2.

Ground is supplied

- to LH headlamp terminal 3
- from daytime light control unit terminal 7
- through daytime light control unit terminal 9
- through body grounds E13 and E41.

With power and ground supplied, the low beam headlamps illuminate.

High Beam Operation/Flash-to-pass Operation

NBEL0017S0102

When the lighting switch is turned to the 2ND position and placed in HIGH ("A") position, power is supplied

- from lighting switch terminal 6
- to terminal 1 of RH headlamp.

When the lighting switch is turned to the 2ND position and placed in HIGH ("A") position, power is supplied

- from lighting switch terminal 9
- to daytime light control terminal 5
- to combination meter terminal 33 for the high beam indicator, and
- through daytime light control terminal 6

- to terminal 1 of LH headlamp.

Ground is supplied in the same manner as low beam operation.
Ground is supplied to terminal 19 of the combination meter through body grounds M77 and M111.
With power and ground supplied, the high beam headlamps and HI BEAM indicator illuminate.

BATTERY SAVER CONTROL

NBEL0017S04

When the ignition switch is turned from ON (or START) to OFF (or ACC) positions while headlamps are illuminated, The RAP signal is supplied to terminal 10 of the headlamp battery saver control unit from smart entrance control unit terminal 5.
After counting 45 seconds by the RAP signal from the smart entrance control unit to headlamp battery saver control unit, the ground supply to terminal 1 of headlamp LH and RH relays from headlamp battery saver control unit terminals 2 and 8 is terminated.
Then headlamps are turned off.
The headlamps are turned off when driver or passenger side door is opened even if 45 seconds have not passed after the ignition switch is turned from ON (or START) to OFF (or ACC) positions while headlamps are illuminated.
When the lighting switch is turned from OFF to 2ND after headlamps are turned to off by the battery saver control, ground is supply

- to headlamp battery saver control unit terminals 5 and 13 from lighting switch terminal 11, and
- to headlamp LH and RH relays terminal 1 from headlamp battery saver control unit terminals 2 and 8.

Then headlamps illuminate again.

DAYTIME LIGHT OPERATION

NBEL0017S02

With the engine running, the lighting switch in the OFF or 1ST position and parking brake released, power is supplied

- through daytime light control unit terminal 6
- to terminal 1 of LH headlamp, and
- through terminal 3 of LH headlamp
- to daytime light control unit terminal 7, and
- through daytime light control unit terminal 8
- to terminal 1 of RH headlamp.

Ground is supplied to terminal 3 of RH headlamp through body grounds E13 and E41.
Because the high beam headlamps are now wired in series, they operate at half illumination.

OPERATION

NBEL0017S03

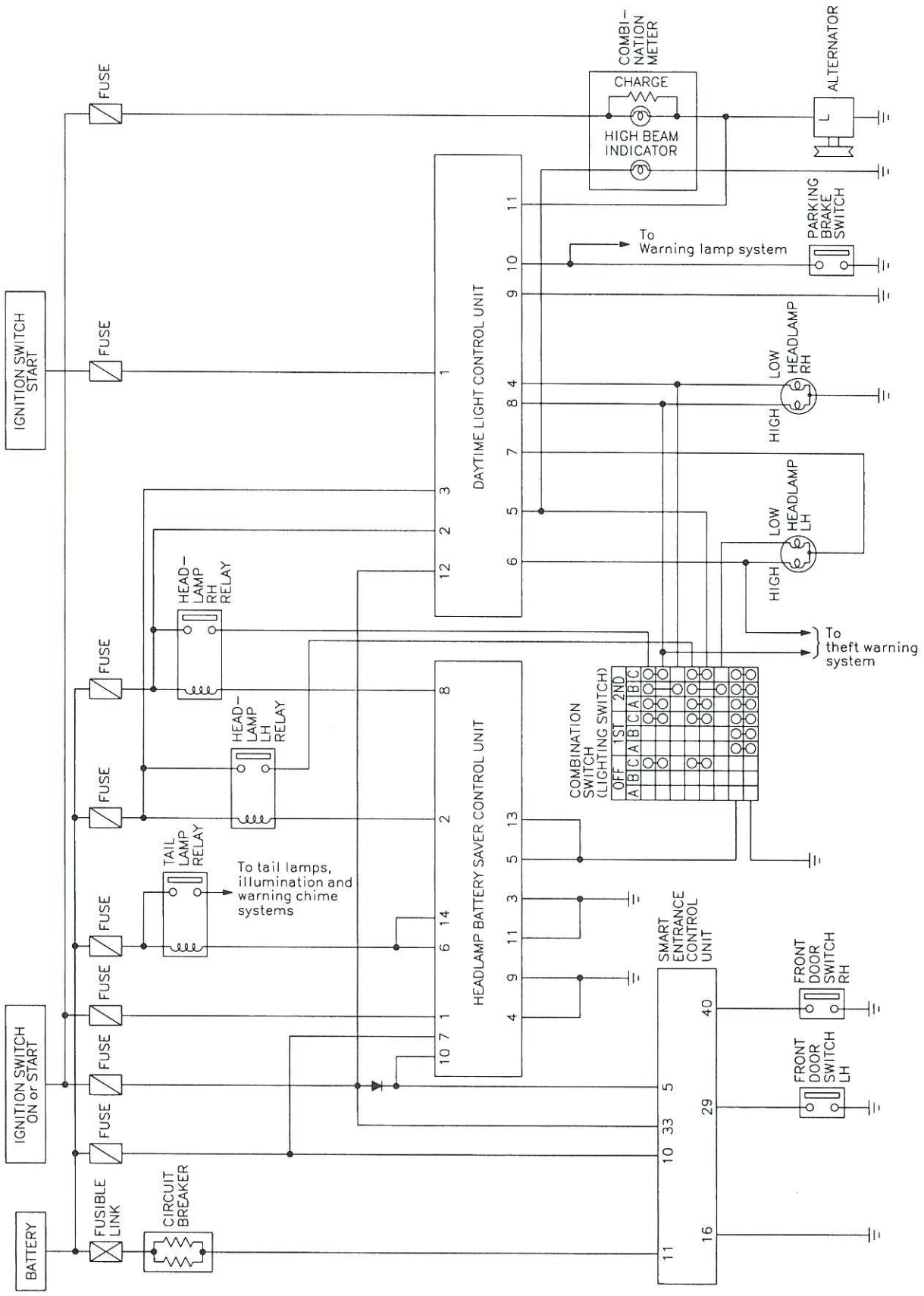
After starting the engine with the lighting switch in the "OFF" or "1ST" position, the headlamp high beam automatically turns on. Lighting switch operations other than the above are the same as conventional light systems.

Engine		With engine stopped									With engine running								
Lighting switch		OFF			1ST			2ND			OFF			1ST			2ND		
		A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C
Headlamp	High beam	X	X	O	X	X	O	O	X	O	△*	△*	O	△*	△*	O	O	X	O
	Low beam	X	X	X	X	X	X	X	O	X	X	X	X	X	X	X	X	O	X
Clearance and tail lamp		X	X	X	O	O	O	O	O	O	X	X	X	O	O	O	O	O	O
License and instrument illumination lamp		X	X	X	O	O	O	O	O	O	X	X	X	O	O	O	O	O	O

A: "HIGH BEAM" position
B: "LOW BEAM" position
C: "FLASH TO PASS" position
O : Lamp "ON"
X : Lamp "OFF"
△ : Lamp dims. (Added functions)
*: When starting the engine with the parking brake released, the daytime light will come ON.
When starting the engine with the parking brake pulled, the daytime light won't come ON.

Schematic

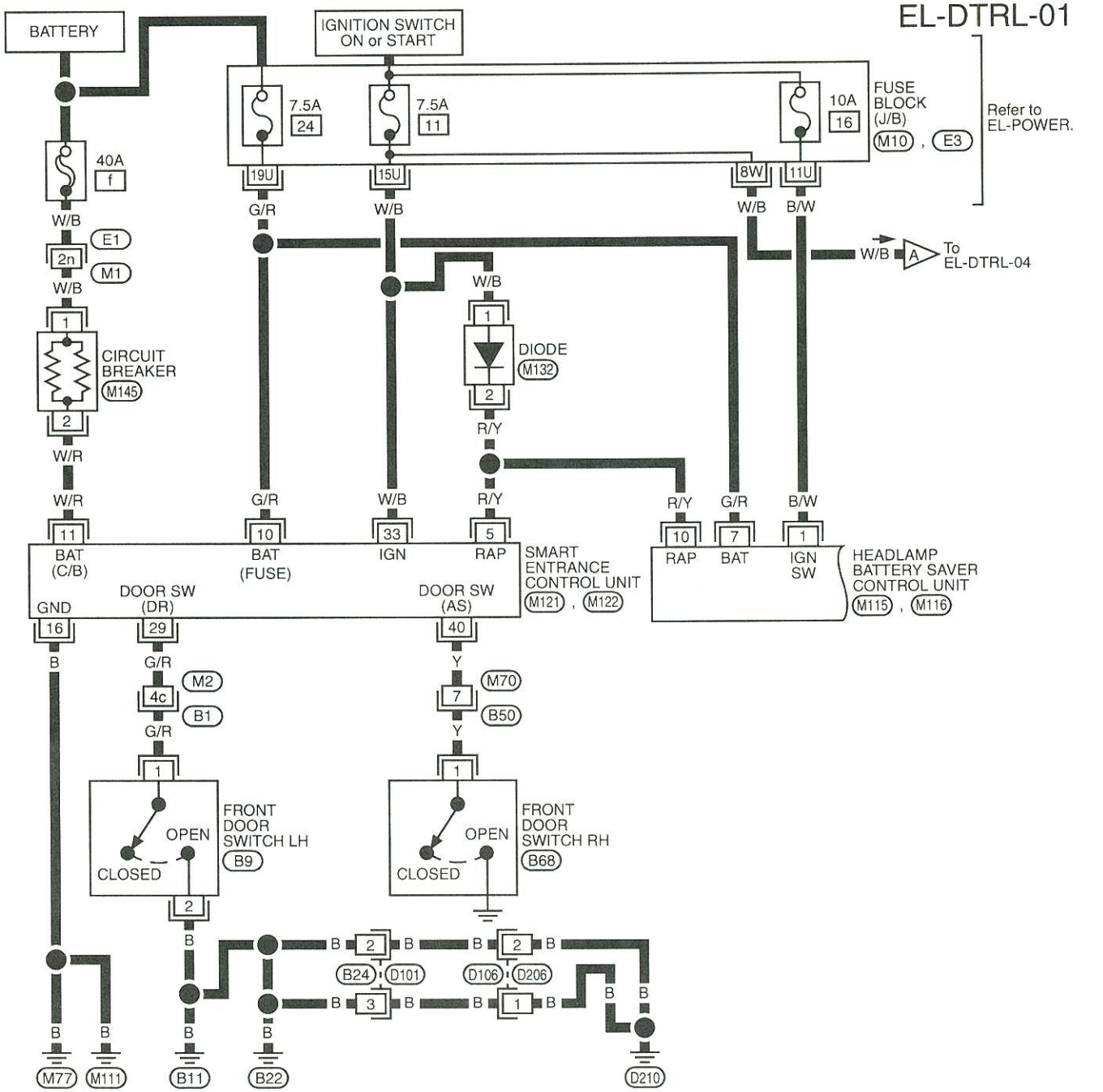
NBEL0019

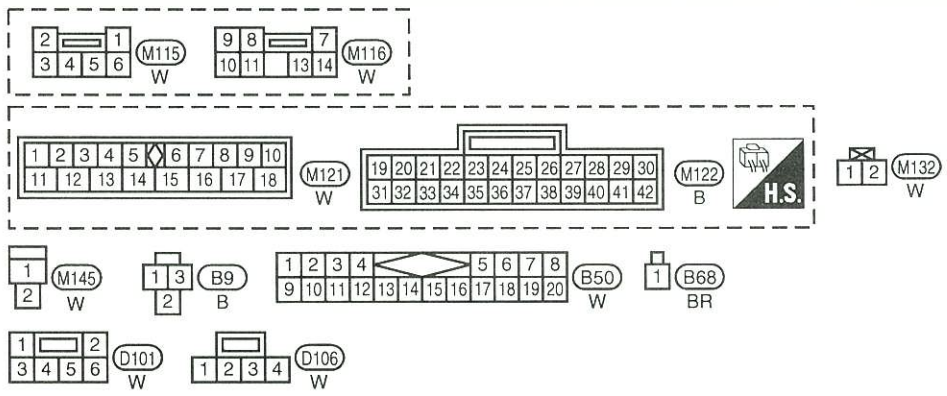


MEL749J

Wiring Diagram — DTRL —

NBEL0020

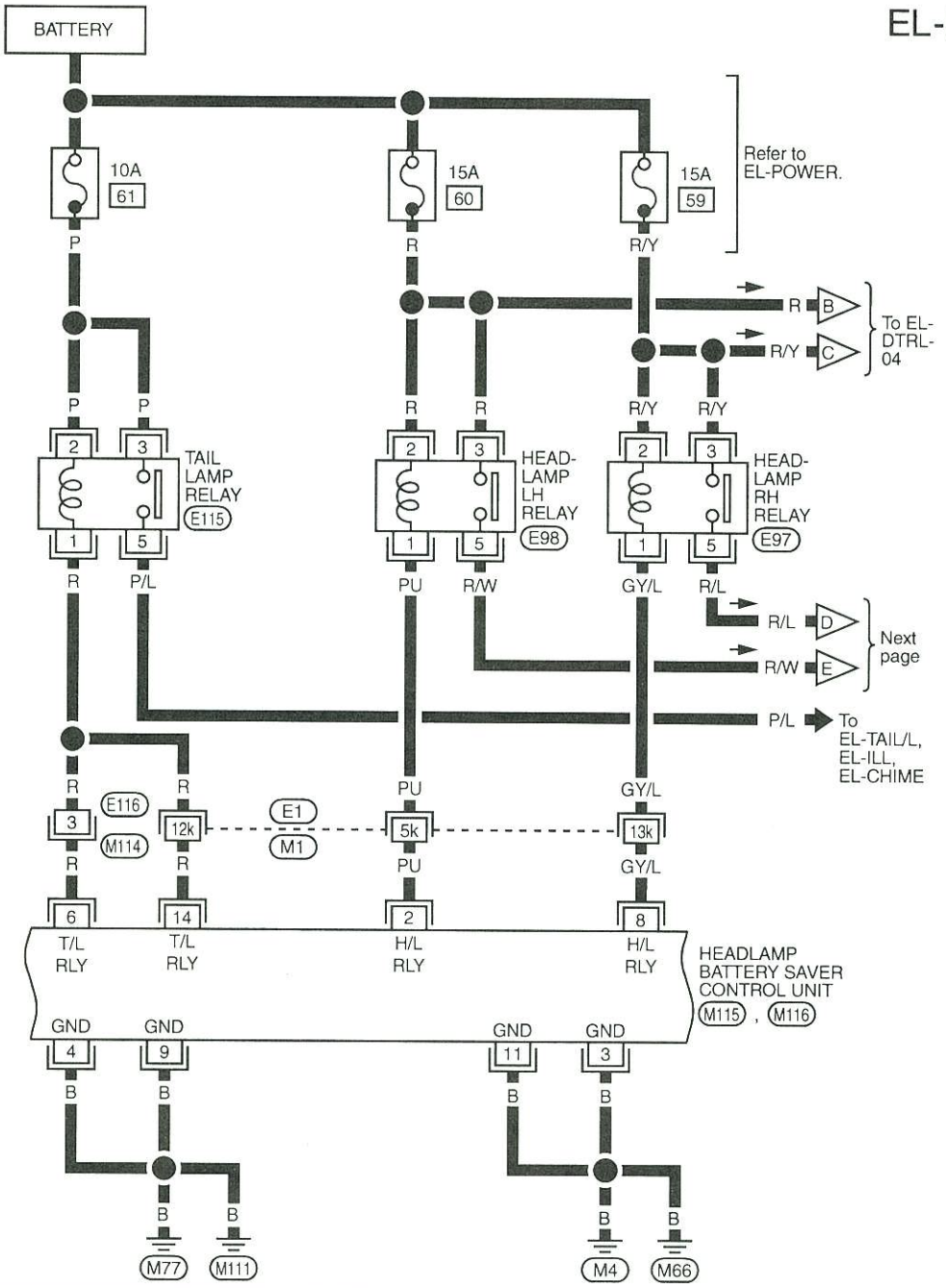


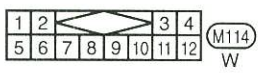


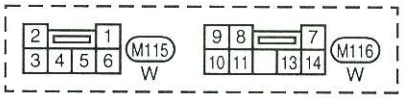
Refer to last page (Foldout page).
M1 , E1
M2 , B1
M10
E3

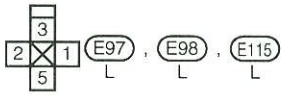
MEL839J

EL-DTRL-02





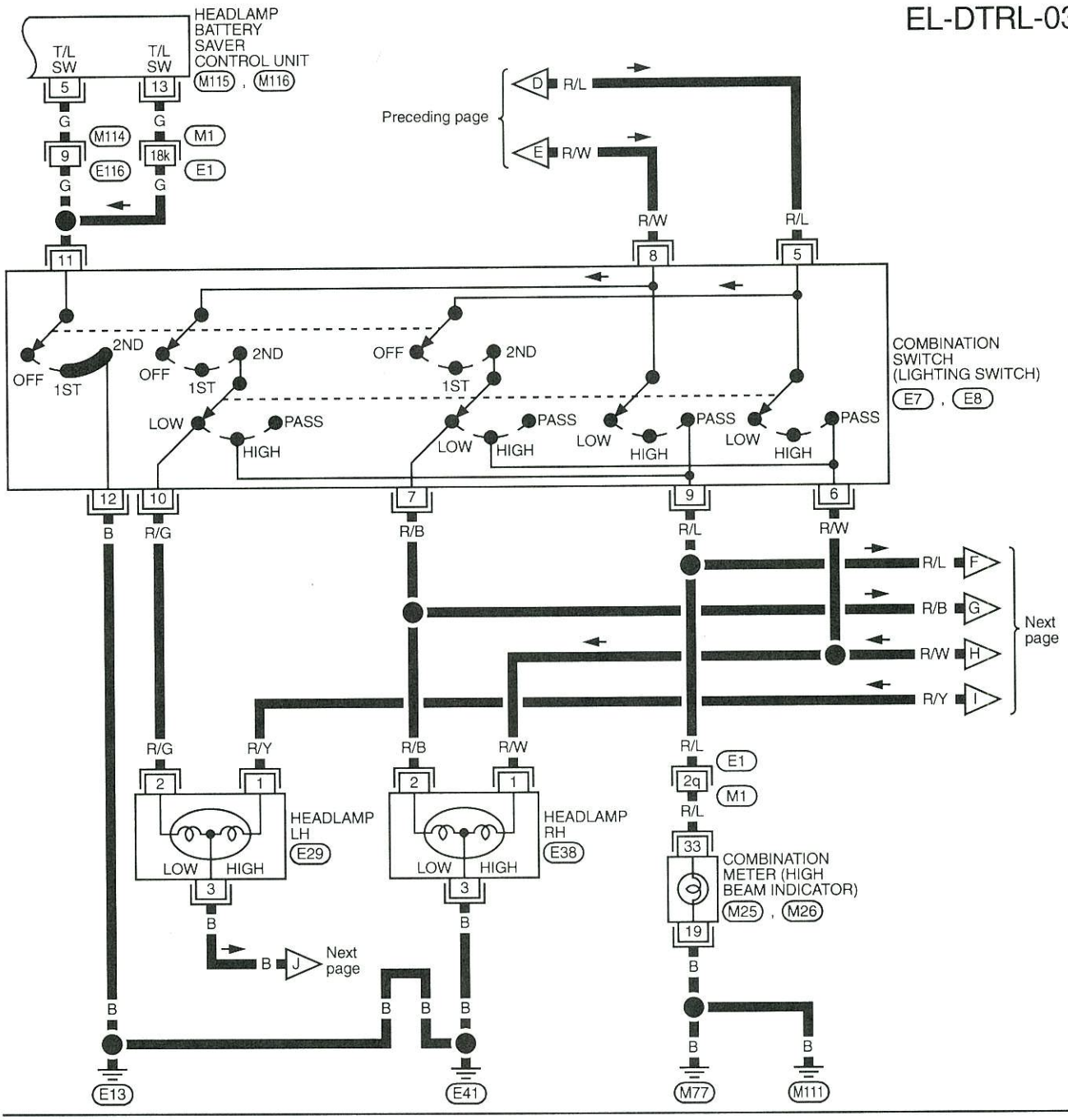


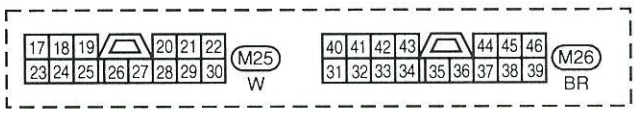


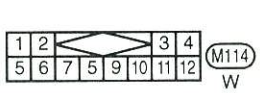
Refer to last page (Foldout page).
M1, E1

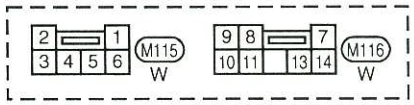
MEL750J

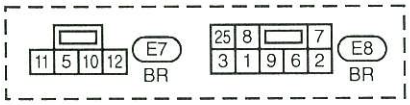
EL-DTRL-03

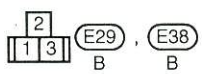








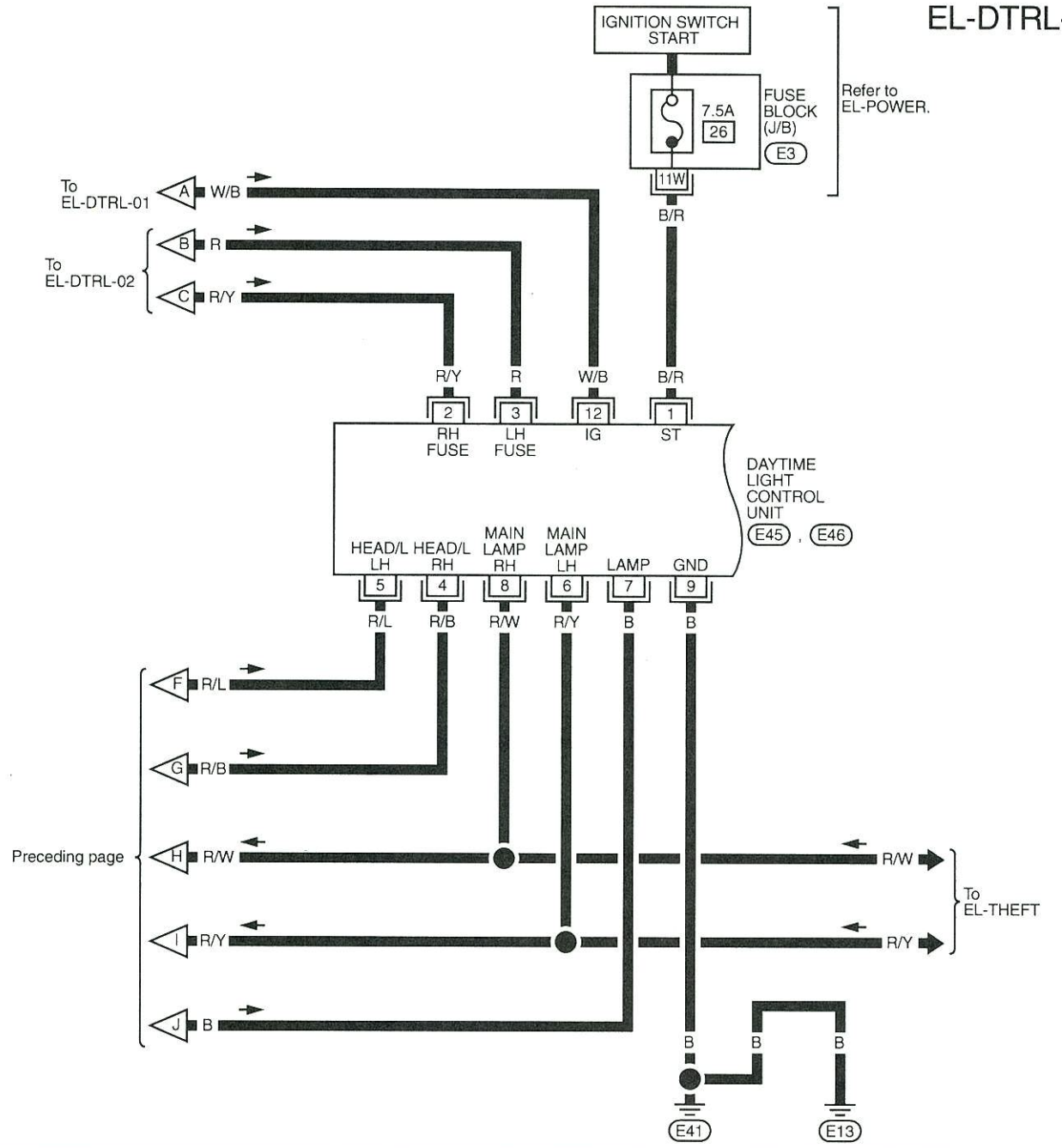


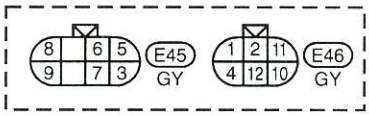


Refer to last page (Foldout page).
M1 , E1

MEL751J

EL-DTRL-04

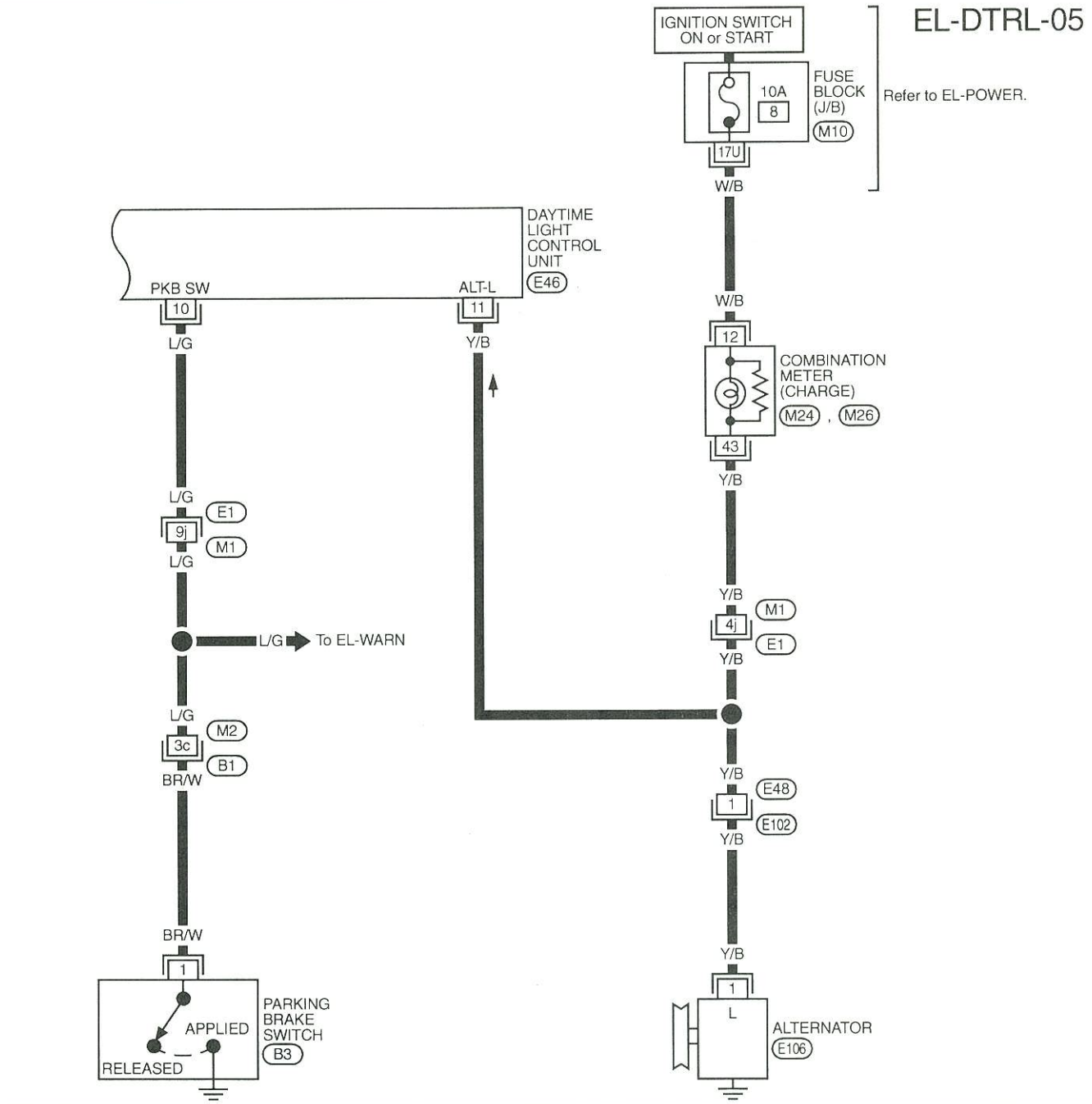


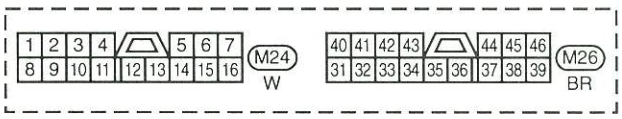


Refer to last page (Foldout page).
E3

MEL752J

Wiring Diagram — DTRL — (Cont'd)





Refer to last page (Foldout page).

M1 , E1

M2 , B1

M10

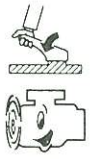
MEL753J

Trouble Diagnoses

DAYTIME LIGHT CONTROL UNIT INSPECTION TABLE

NBEL0021

NBEL0021S01

Terminal No.	Item	Condition		Voltage (Approximate values)
1	Start signal		When turning ignition switch to "ST"	Battery voltage
			When turning ignition switch to "ON" from "ST"	Less than 1V
			When turning ignition switch to "OFF"	Less than 1V
2	Power source		When turning ignition switch to "ON"	Battery voltage
			When turning ignition switch to "OFF"	Battery voltage
3	Power source		When turning ignition switch to "ON"	Battery voltage
			When turning ignition switch to "OFF"	Battery voltage
4	Lighting switch (Lo beam)		When lighting switch is turned to the 2ND position with "LOW BEAM" position	Battery voltage
5	Lighting switch (Hi beam)		When turning lighting switch to "HI BEAM"	Battery voltage
			When turning lighting switch to "FLASH TO PASS"	Battery voltage
6	LH hi beam		When turning lighting switch to "HI BEAM"	Battery voltage
			When releasing parking brake with engine running and turning lighting switch to "OFF" (daytime light operation) **CAUTION:** **Block wheels and ensure selector lever is in N or P position.**	Battery voltage
7	LH headlamp control (ground)		When lighting switch is turned to the 2ND position with "LOW BEAM" position	Less than 1V
			When releasing parking brake with engine running and turning lighting switch to "OFF" (daytime light operation) **CAUTION:** **Block wheels and ensure selector lever is in N or P position.**	Approx. half battery voltage
8	RH hi beam		When lighting switch is turned to the 2ND position with "HI BEAM" position	Battery voltage
			When releasing parking brake with engine running and turning lighting switch to "OFF" (daytime light operation) **CAUTION:** **Block wheels and ensure selector lever is in N or P position.**	Approx. half battery voltage
9	Ground		—	—

Trouble Diagnoses (Cont'd)

Terminal No.	Item	Condition		Voltage (Approximate values)
10	Parking brake switch		When parking brake is released	Battery voltage
			When parking brake is set	Less than 1.5V
11	Alternator		When turning ignition switch to "ON"	Less than 1V
			When engine is running	Battery voltage
			When turning ignition switch to "OFF"	Less than 1V
12	Power source		When turning ignition switch to "ON"	Battery voltage
			When turning ignition switch to "ST"	Battery voltage
			When turning ignition switch to "OFF"	Less than 1V

BATTERY SAVER CONTROL UNIT INSPECTION TABLE

NBEL0021S02

Refer to "HEADLAMP (FOR USA)" EL-31.

Bulb Replacement

NBEL0022

Refer to "HEADLAMP (FOR USA)" (EL-32).

Aiming Adjustment

NBEL0023

Refer to "HEADLAMP (FOR USA)" (EL-32).

System Description

NBEL0162

The parking, license and tail lamp operation is controlled by the lighting switch which is built into the combination switch and headlamp battery saver control unit. The battery saver system is controlled by the headlamp battery saver control unit and smart entrance control unit.

Power is supplied at all times

- to tail lamp relay terminals 2 and 3
- through 10A fuse (No. 61, located in the fuse and fusible link box), and
- to headlamp battery saver control unit terminal 7
- through 7.5A fuse [No. 24, located in the fuse block (J/B)].

When ignition switch is in ON or START position, power is supplied

- to headlamp battery saver control unit terminal 1
- through 10A fuse [No. 16, located in the fuse block (J/B)], and
- to headlamp battery saver control unit terminal 10, and
- to smart entrance control unit terminal 33
- through 7.5A fuse [No. 11, located in the fuse block (J/B)].

Ground is supplied to headlamp battery saver control unit terminals 4 and 11.

LIGHTING OPERATION BY LIGHTING SWITCH

NBEL0162S01

When lighting switch is in 1ST (or 2ND) position, ground is supplied

- to tail lamp relay terminal 1 from headlamp battery saver control unit terminals 6 and 14
- through headlamp battery saver control unit terminals 5 and 13, and
- through body grounds E13 and E41.

Tail lamp relay is then energized and the parking, license and tail lamps illuminate.

BATTERY SAVER CONTROL

NBEL0162S02

When the ignition switch is turned from ON (or START) to OFF (or ACC) positions while parking, license and tail lamps are illuminated, the RAP signal is supplied to terminal 10 of the headlamp battery saver control unit from smart entrance control unit terminal 5.

After counting 45 seconds by the RAP signal from the smart entrance control unit to headlamp battery saver control unit, the ground supply to terminal 1 of the tail lamp relay from headlamp battery saver control unit terminals 6 and 14 is terminated.

Then the parking, license and tail lamps are turned off.

The parking, license and tail lamps are turned off when driver or passenger side door is opened even if 45 seconds have not passed after the ignition switch is turned from ON (or START) to OFF (or ACC) positions while parking, license and tail lamps are illuminated.

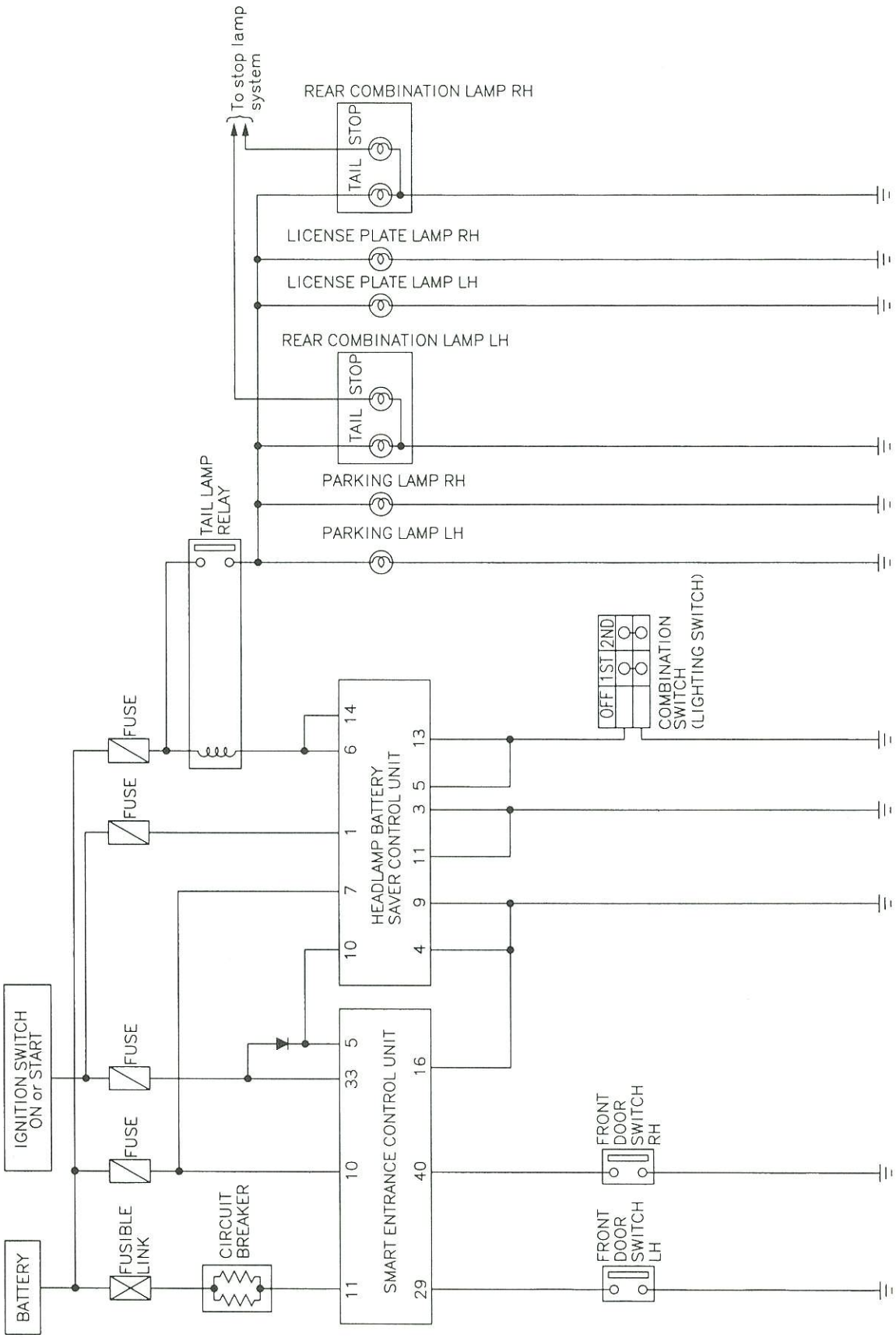
When the lighting switch is turned from OFF to 1ST (or 2ND) after the parking, license and tail lamps are turned off by the battery saver control, ground is supplied.

- to headlamp battery saver control unit terminals 5 and 13 from lighting switch terminal 11, and
- to tail lamp relay terminal 1 from headlamp battery saver control unit terminals 6 and 14.

Then the parking, license and tail lamps illuminate again.

Schematic

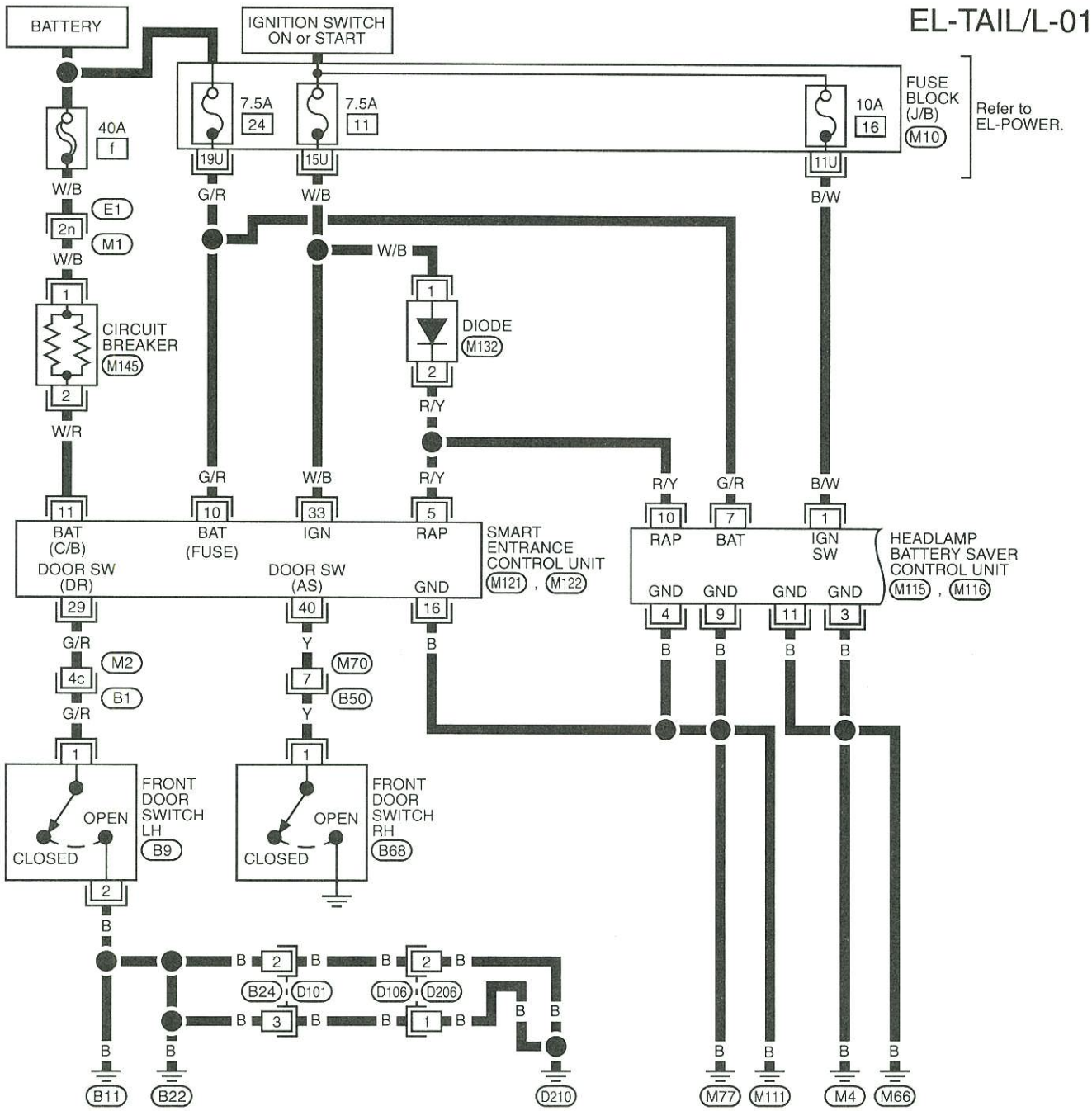
NBEL0163

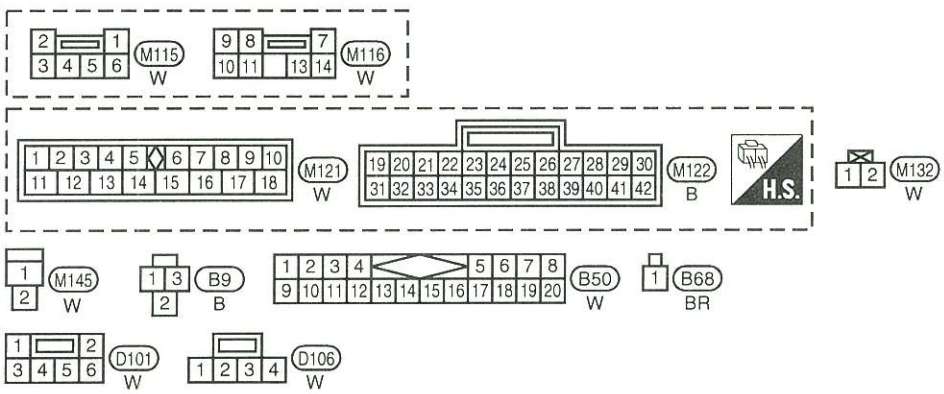


MEL840J

Wiring Diagram — TAIL/L —

NBEL0024





Refer to last page (Foldout page).

M1, E1

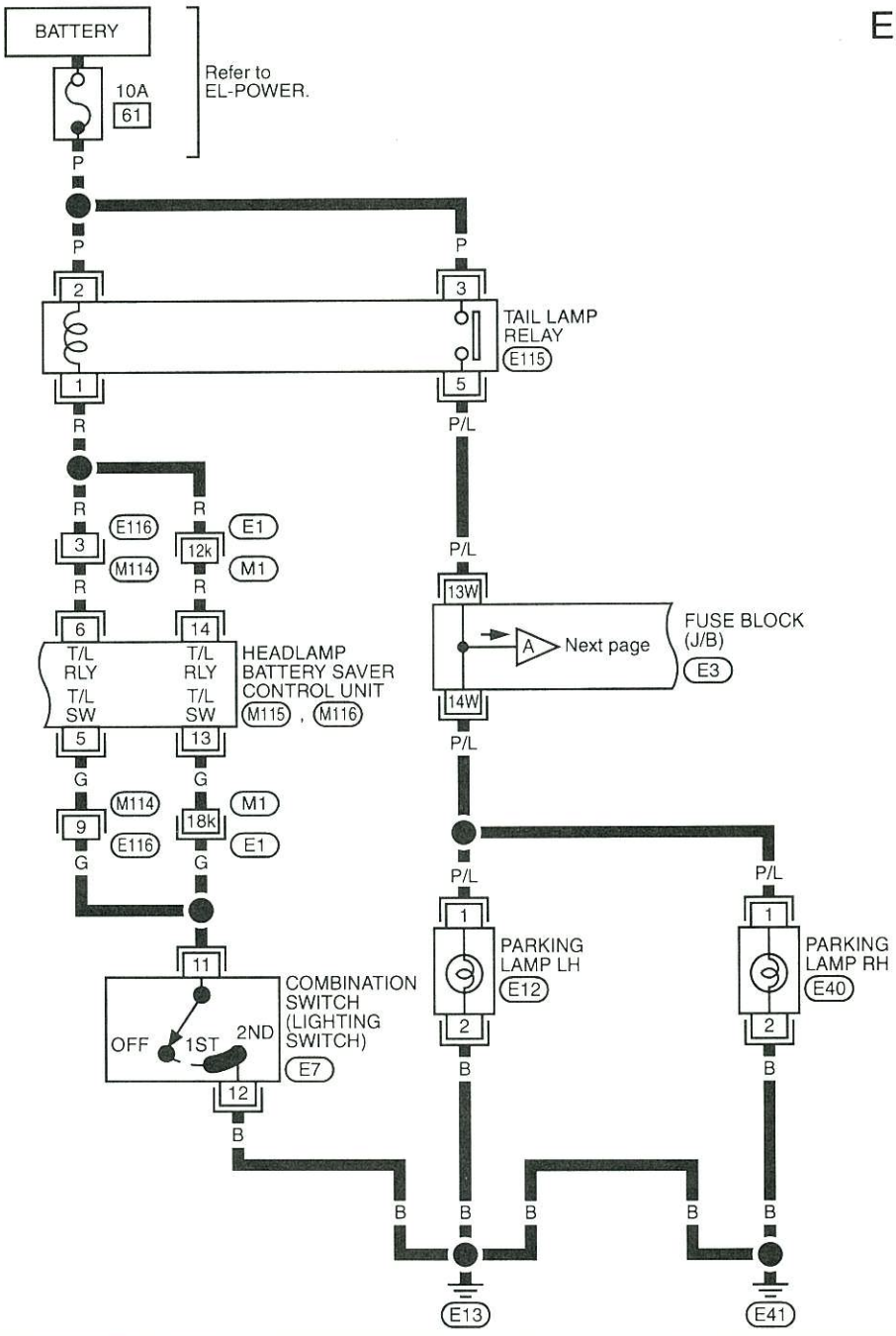
M2, B1

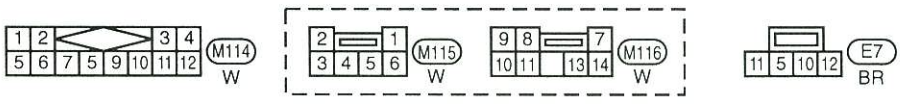
M10

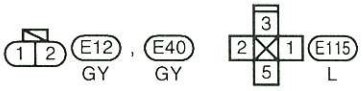
MEL841J

Wiring Diagram — TAIL/L — (Cont'd)

EL-TAIL/L-02



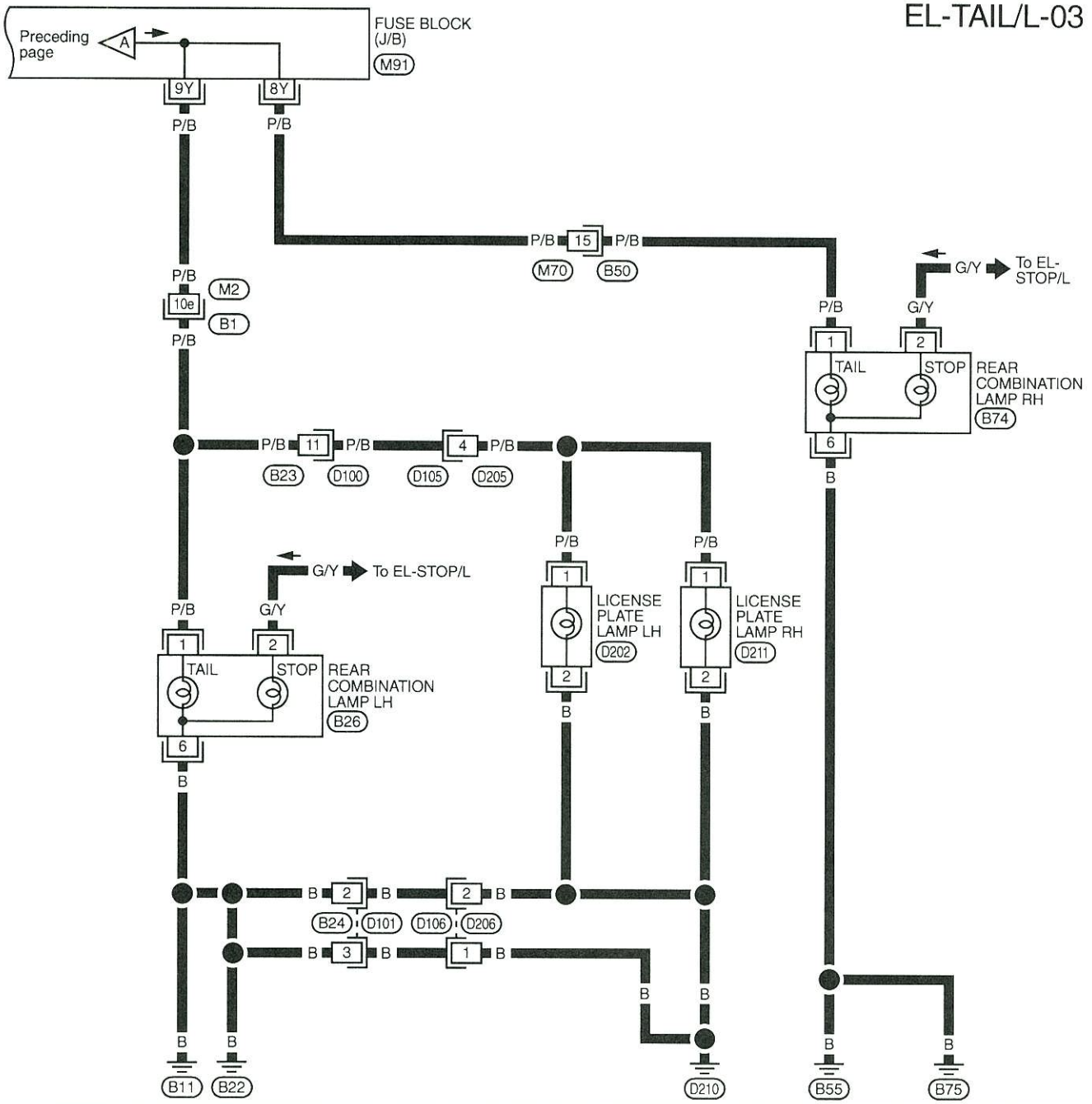


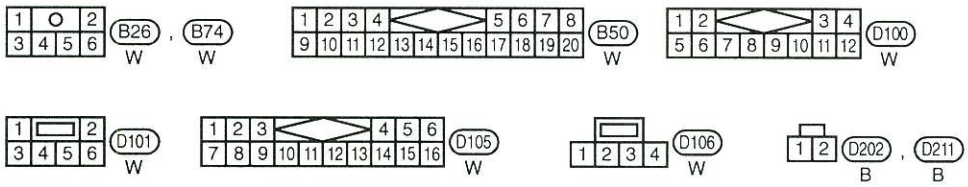


Refer to last page (Foldout page).
M1 , E1
E3

MEL754J

EL-TAIL/L-03





Refer to last page (Foldout page).

M2 , B1

M91

MEL755J

Trouble Diagnoses

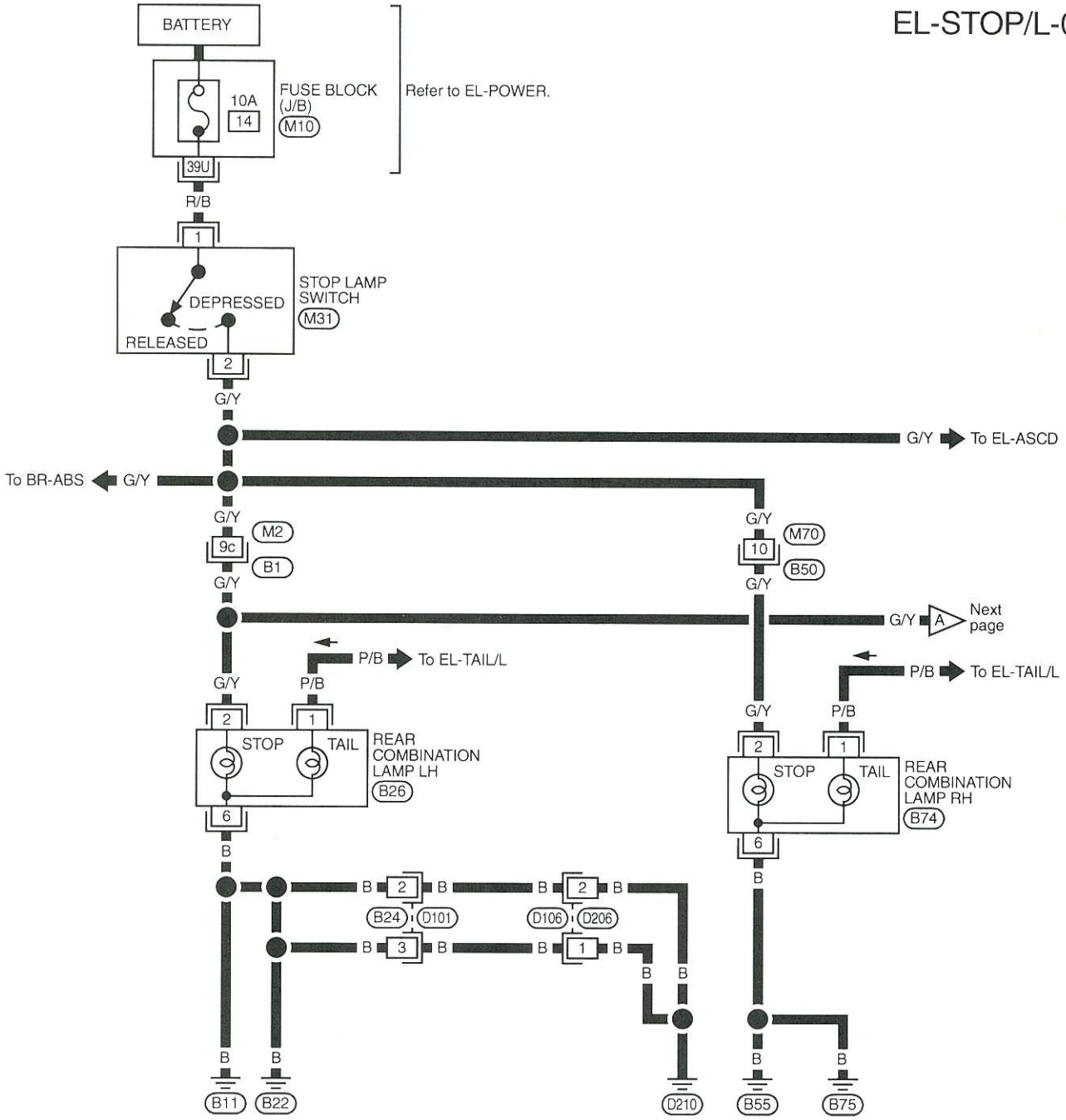
NBEL0164

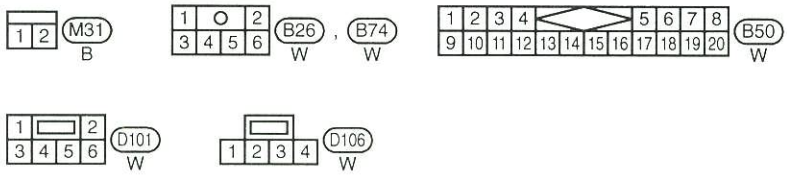
Symptom	Possible cause	Repair order
No lamps operate (including headlamps).	1. 7.5A fuse 2. Lighting switch 3. Headlamp battery saver control unit	1. Check 7.5A fuse [No. 24, lacated in fuse block (J/B)]. Verify battery positive voltage is present at terminal 7 of headlamp battery saver control unit. 2. Check lighting switch. 3. Check headlamp battery saver control unit. (EL-31)
No parking, license and tail lamps operate, but headlamps do operate.	1. 10A fuse 2. Tail lamp relay 3. Tail lamp relay circuit 4. Lighting switch 5. Lighting switch circuit 6. Headlamp battery saver control unit	1. Check 10A fuse (No. 61, located in fusible and fuse block). Verify battery positive voltage is present at terminals 2 and 3 of tail lamp relay. 2. Check tail lamp relay. 3. Check harness between headlamp battery saver control unit terminals 6 and 14 and tail lamp relay terminal 1. Check harness between tail lamp relay terminal 5 and fuse block. 4. Check lighting switch. 5. Check harness between lighting switch terminal 11 and headlamp battery saver control unit terminals 5 and 13. Check harness between lighting switch terminal 12 and ground. 6. Check headlamp battery saver control unit. (EL-31)
Battery saver control does not operate properly.	1. RAP signal circuit 2. Driver or passenger side door switch circuit 3. Lighting switch circuit 4. Headlamp battery saver control unit 5. Smart entrance control unit	1. Check harness between headlamp battery saver control unit terminal 10 and smart entrance control unit terminal 5 for open or short circuit. 2. Check harness between smart entrance control unit and driver or passenger side door switch for open or short circuit. Check driver or passenger side door switch ground circuit. Check driver or passenger side door switch. 3. Check harness between headlamp battery saver control unit terminals 5 or 13 and lighting switch terminal 11 for open or short circuit. Check harness between lighting switch terminal 12 and ground. Check lighting switch. 4. Check headlamp battery saver control unit. (EL-31) 5. Check smart entrance control unit. (EL-254)

Wiring Diagram — STOP/L —

NBEL0025

EL-STOP/L-01

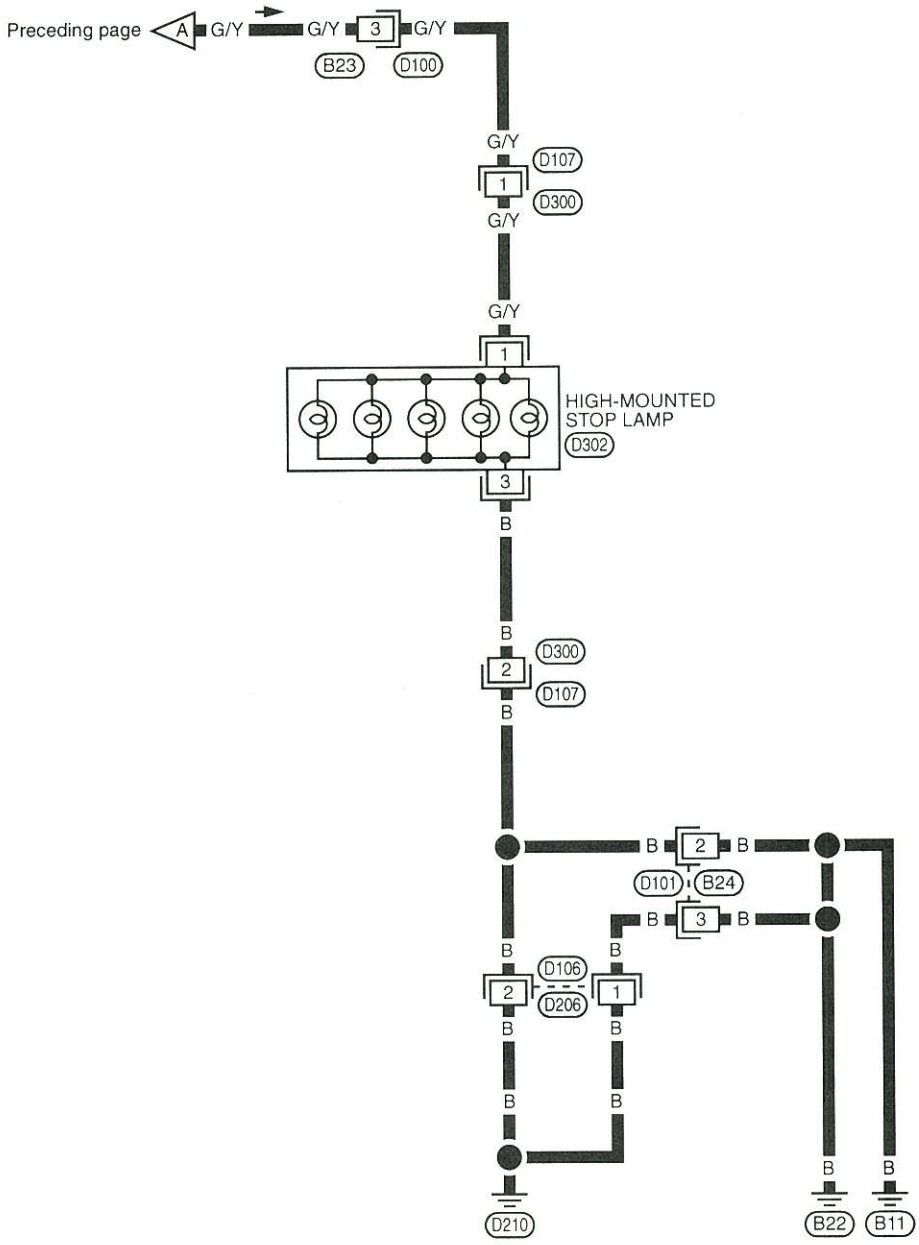


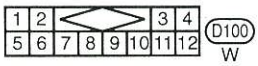


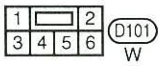
Refer to last page (Foldout page).
M2 , B1
M10

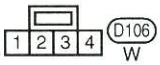
MEL756J

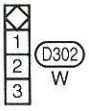
EL-STOP/L-02









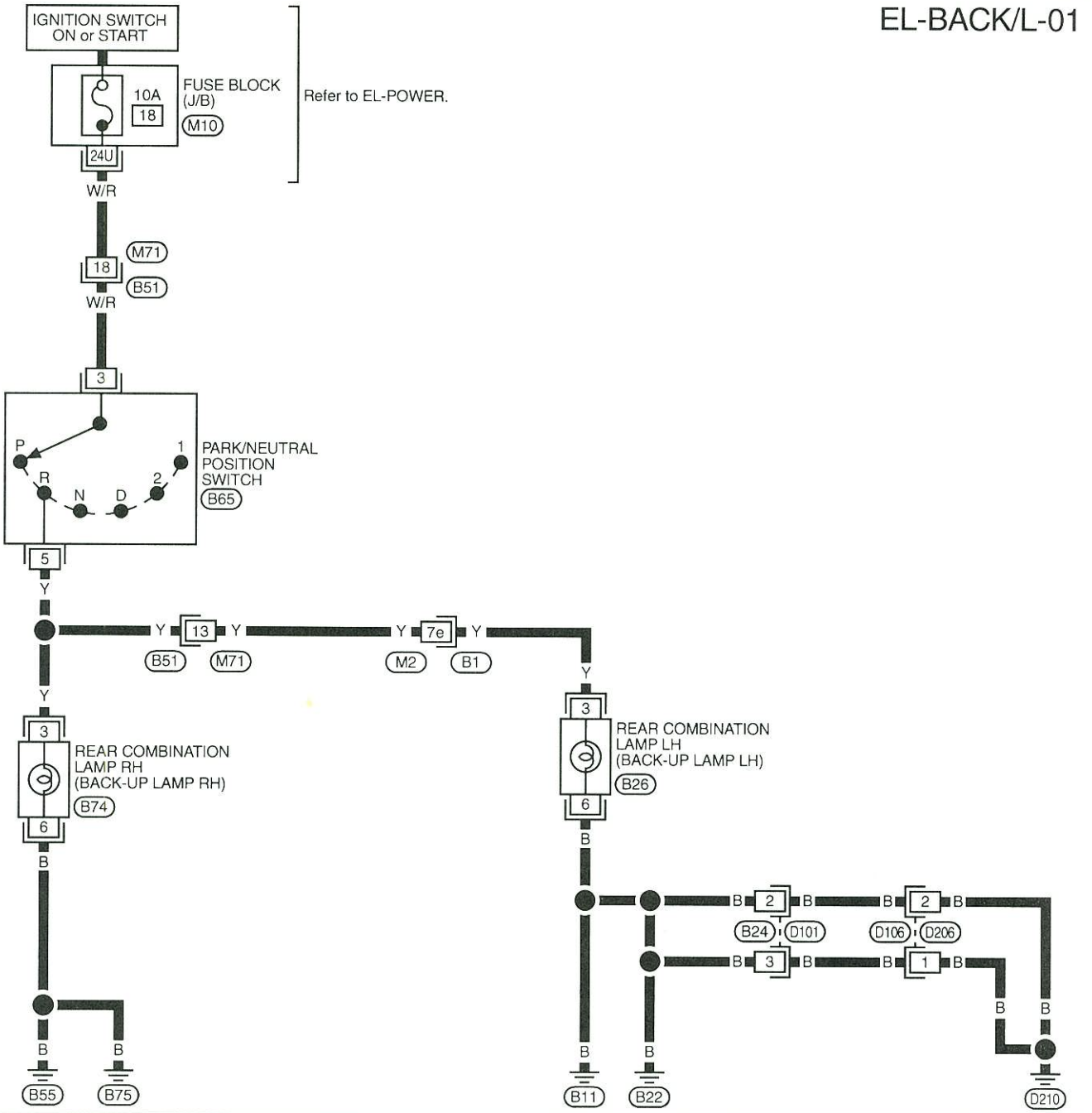


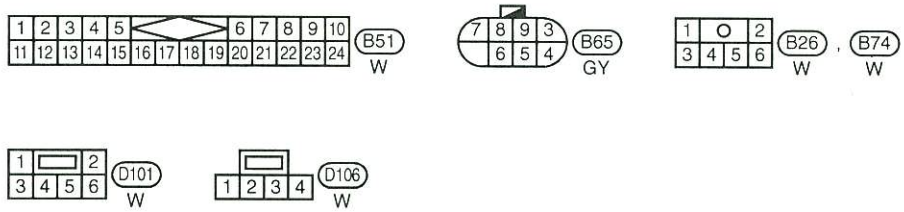
MEL550F

Wiring Diagram — BACK/L —

NBEL0026

EL-BACK/L-01





Refer to last page (Foldout page).

M2 , B1

M10

MEL757J

System Description

NBEL0027

OUTLINE

NBEL0027S02

Power is supplied at all times

- to headlamp RH relay terminals 2 and 3
- through 15A fuse (No. 59, located in the fuse and fusible link box), and
- to headlamp battery saver control unit terminal 7
- through 7.5A fuse [No. 24, located in the fuse block (J/B)], and
- to front fog lamp relay terminal 3
- through 15A fuse (No. 53, located in the fuse and fusible link box).

When ignition switch is in ON or START position, power is supplied

- to headlamp battery saver control unit terminal 1
- through 10A fuse [No. 16, located in the fuse block (J/B)], and
- to headlamp battery saver control unit terminal 10, and
- to smart entrance control unit terminal 33
- through 7.5A fuse [No. 11, located in the fuse block (J/B)].

Ground is supplied to headlamp battery saver control unit terminals 4 and 11.

When Ignition Switch is in ON or START Position

NBEL0027S0201

Ground is supplied

- to headlamp RH relay terminal 1 from headlamp battery saver control unit terminal 8.
- through headlamp battery saver control unit terminal 9, and
- through body grounds M77 and M111.

Headlamp RH relay is then energized.

When Ignition Switch is in OFF or ACC Position

NBEL0027S0202

When lighting switch is in 2ND (or 1ST) position, ground is supplied

- to headlamp battery saver control unit terminals 5 and 13
- from lighting switch terminal 11.

And then, ground is also supplied to headlamp RH relay terminal 1 from the headlamp battery saver control unit. The headlamp RH relay is then energized.

FOG LAMP OPERATION

NBEL0027S01

The fog lamp switch is built into the combination switch. The lighting switch must be in the 2ND position and LOW ("B") position for fog lamp operation.
With the fog lamp switch in the ON position, ground is supplied

- to fog lamp relay terminal 2
- through the fog lamp switch and body grounds E13 and E41.

The fog lamp relay is energized and power is supplied

- from fog lamp relay terminal 5
- to terminal 1 of each fog lamp.

Ground is supplied to terminal 2 of each fog lamp through body grounds E13 and E41.
With power and ground supplied, the fog lamps illuminate.

BATTERY SAVER CONTROL

NBEL0027S03

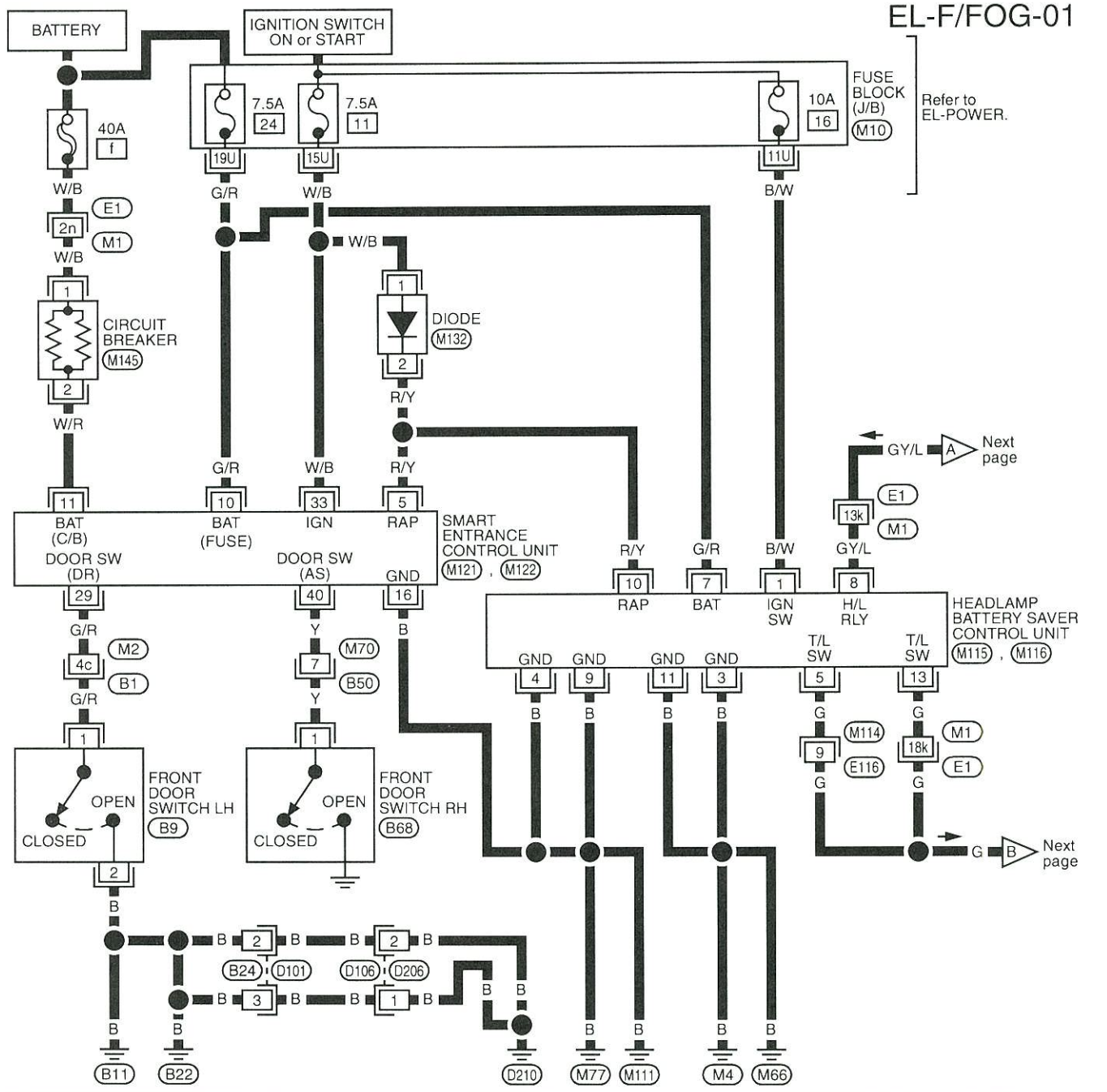
When the ignition switch is turned from ON (or START) to OFF (or ACC) positions while fog lamps are illuminated, the RAP signal is supplied to terminal 10 of the headlamp battery saver control unit from smart entrance control unit terminal 5.
After counting 45 seconds by the RAP signal from the smart entrance control unit to headlamp battery saver control unit, the ground supply to terminal 1 of headlamp RH relay from headlamp battery saver control unit teminal 8 is terminated.
Then fog lamps are turned to off.
Fog lamps are turned off when driver or passenger side door is opened even if 45 seconds have not passed after the ignition switch is turned from ON (or START) to OFF (or ACC) positions while fog lamps are illuminated.
When the lighting switch is turned from OFF to 2ND after fog lamps are turned off by the battery saver control, ground is supplied

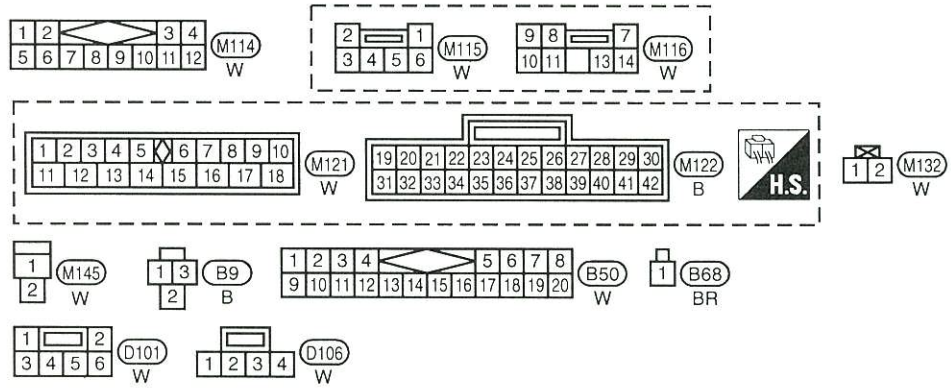
- to headlamp battery saver control unit terminals 5 and 13 from lighting switch terminal 11, and
- to headlamp RH relay terminal 1 from headlamp battery saver control unit terminal 8.

Then the fog lamps illuminate again.

Wiring Diagram — F/FOG —

NBEL0028





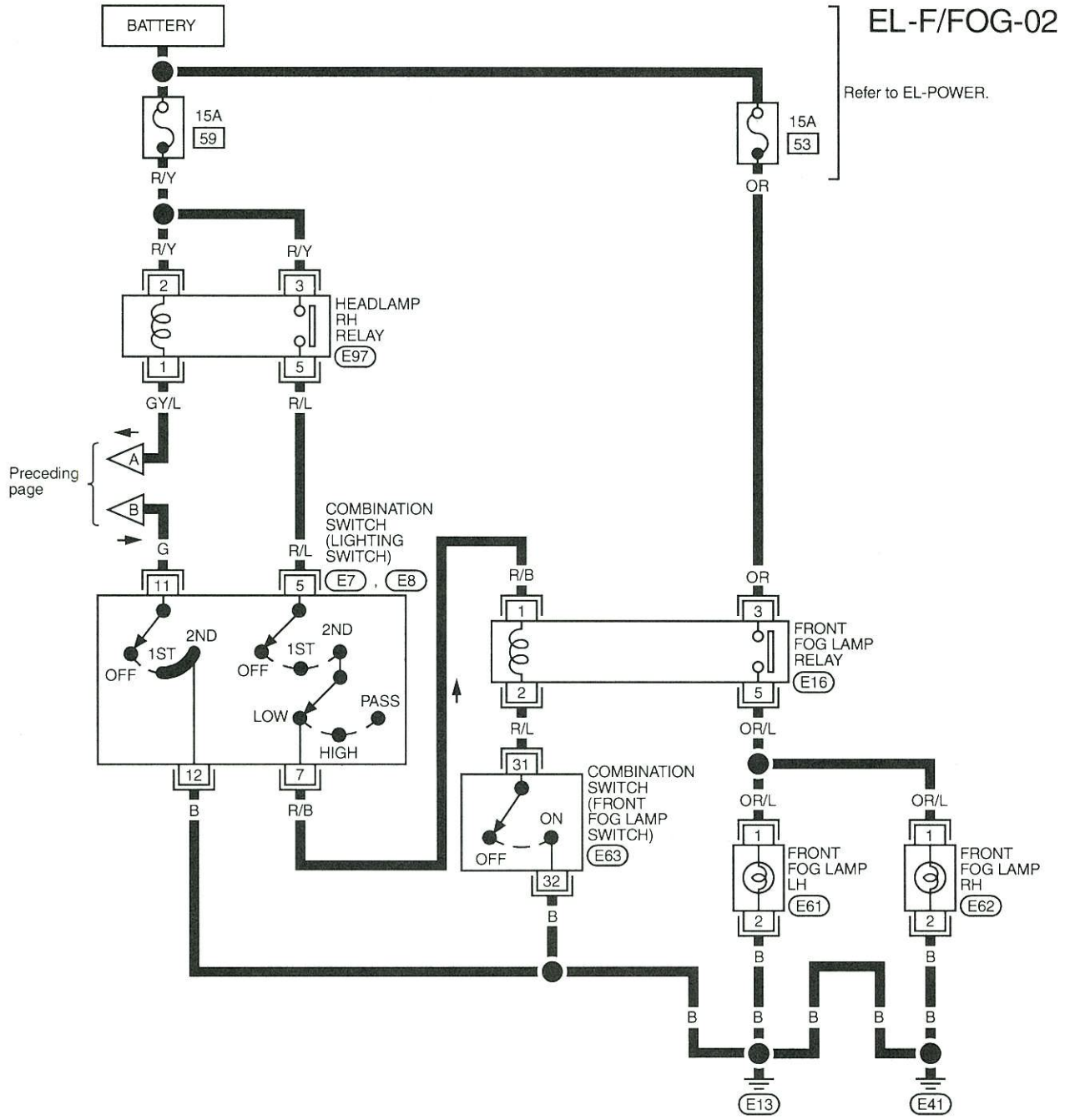
Refer to last page (Foldout page).

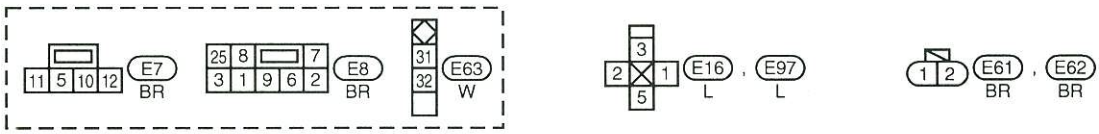
M1, E1

M2, B1

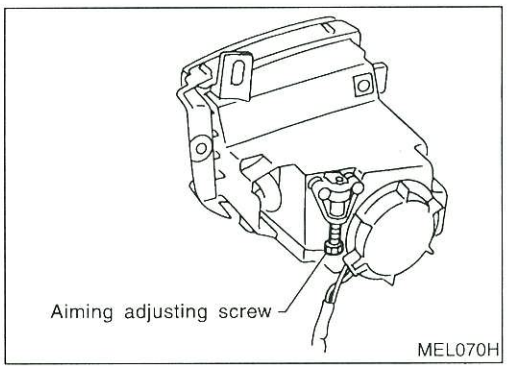
M10

MEL068K


EL-F/FOG-02
BATTERY
15A
59
R/Y
15A
53
OR
Refer to EL-POWER.
HEADLAMP RH RELAY
E97
GY/L
R/L
Preceding page
A
B
G
COMBINATION SWITCH (LIGHTING SWITCH)
E7
E8
OFF
1ST
2ND
LOW
HIGH
PASS
R/B
FRONT FOG LAMP RELAY
E16
OR/L
COMBINATION SWITCH (FRONT FOG LAMP SWITCH)
E63
ON
FRONT FOG LAMP LH
E61
FRONT FOG LAMP RH
E62
B
E13
E41


E7
BR
E8
BR
E63
W
E16
L
E97
L
E61
BR
E62
BR

MEL758J



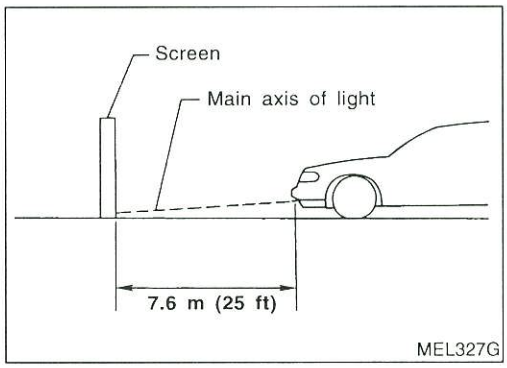
Aiming Adjustment

NBEL0029

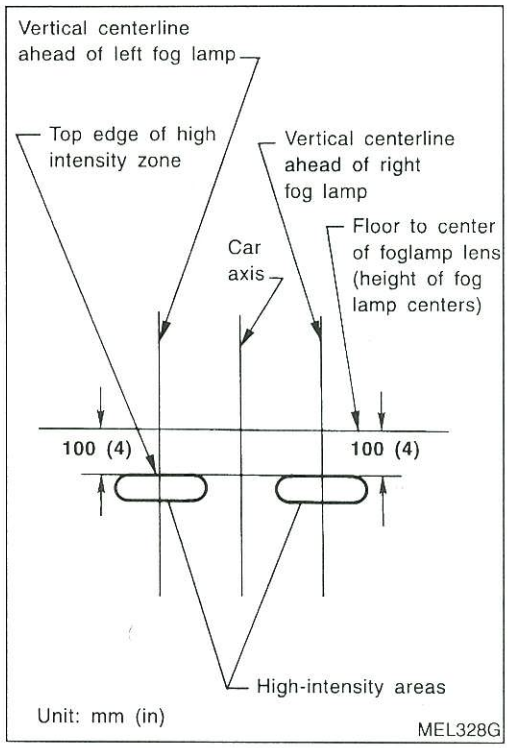
Before performing aiming adjustment, make sure of the following.

1) Keep all tires inflated to correct pressure.
2) Place vehicle on level ground.
3) See that vehicle is unloaded (except for full levels of coolant, engine oil and fuel, and spare tire, jack, and tools). Have the driver or equivalent weight placed in driver's seat.

Adjust aiming in the vertical direction by turning the adjusting screw.



1. Set the distance between the screen and the center of the fog lamp lens as shown at left.
2. Turn front fog lamps ON.



3. Adjust front fog lamps so that the top edge of the high intensity zone is 100 mm (4 in) below the height of the fog lamp centers as shown at left.

- When performing adjustment, if necessary, cover the headlamps and opposite fog lamp.

System Description

NBEL0030

TURN SIGNAL OPERATION

NBEL0030S01

With the hazard switch in the OFF position and the ignition switch in the ON or START position, power is supplied

- through 7.5A fuse [No. 12, located in the fuse block (J/B)]
- to hazard switch terminal 2
- through terminal 1 of the hazard switch
- to combination flasher unit terminal 1
- through terminal 3 of the combination flasher unit
- to turn signal switch terminal 1.

Ground is supplied to combination flasher unit terminal 2 through body grounds M4 and M66.

LH Turn

NBEL0030S0101

When the turn signal switch is moved to the LH position, power is supplied from turn signal switch terminal 3 to

- front turn signal lamp LH terminal 2
- combination meter terminal 34
- rear combination lamp LH terminal 5.

Ground is supplied to the front turn signal lamp LH terminal 1 through body grounds E13 and E41.
Ground is supplied to the rear combination lamp LH terminal 6 through body grounds B11, B22 and D210.
Ground is supplied to combination meter terminal 19 through body grounds M77 and M111.
With power and ground supplied, the combination flasher unit controls the flashing of the LH turn signal lamps.

RH Turn

NBEL0030S0102

When the turn signal switch is moved to the RH position, power is supplied from turn signal switch terminal 2 to

- front turn signal lamp RH terminal 2
- combination meter terminal 32
- rear combination lamp RH terminal 5.

Ground is supplied to the front turn signal lamp RH terminal 1 through body grounds E13 and E41.
Ground is supplied to the rear combination lamp RH terminal 6 through body grounds B55 and B75.
Ground is supplied to combination meter terminal 19 through body grounds M77 and M111.
With power and ground supplied, the combination flasher unit controls the flashing of the RH turn signal lamps.

HAZARD LAMP OPERATION

NBEL0030S02

Power is supplied at all times to hazard switch terminal 3 through:

- 15A fuse [No. 20, located in the fuse block (J/B)].

With the hazard switch in the ON position, power is supplied

- through terminal 1 of the hazard switch
- to combination flasher unit terminal 1
- through terminal 3 of the combination flasher unit
- to hazard switch terminal 4.

Ground is supplied to combination flasher unit terminal 2 through body grounds M4 and M66.
Power is supplied through terminal 5 of the hazard switch to

- front turn signal lamp LH terminal 2
- combination meter terminal 34
- rear combination lamp LH terminal 5.

Power is supplied through terminal 6 of the hazard switch to

- front turn signal lamp RH terminal 2
- combination meter terminal 32
- rear combination lamp RH terminal 5.

System Description (Cont'd)

Ground is supplied to terminal 1 of each front turn signal lamp through body grounds E13 and E41.
Ground is supplied to terminal 6 of the rear combination lamp LH through body grounds B11, B22 and D210.
Ground is supplied to terminal 6 of the rear combination lamp RH through body grounds B55 and B75.
Ground is supplied to combination meter terminal 19 through body grounds M77 and M111.
With power and ground supplied, the combination flasher unit controls the flashing of the hazard warning lamps.

MULTI-REMOTE CONTROL SYSTEM OPERATION

NBEL0030S03

Power is supplied at all times

- through 15A fuse [No. 20, located in the fuse block (J/B)]
- to multi-remote control relay terminals 1, 3 and 6.

Ground is supplied to multi-remote control relay terminal 2, when the multi-remote control system is triggered through the smart entrance control unit.
Refer to "MULTI-REMOTE CONTROL SYSTEM", EL-206.
The multi-remote control relay is energized.
Power is supplied through terminal 7 of the multi-remote control relay

- to front turn signal lamp LH terminal 2
- to combination meter terminal 34
- to rear combination lamp LH terminal 5.

Power is supplied through terminal 5 of the multi-remote control relay

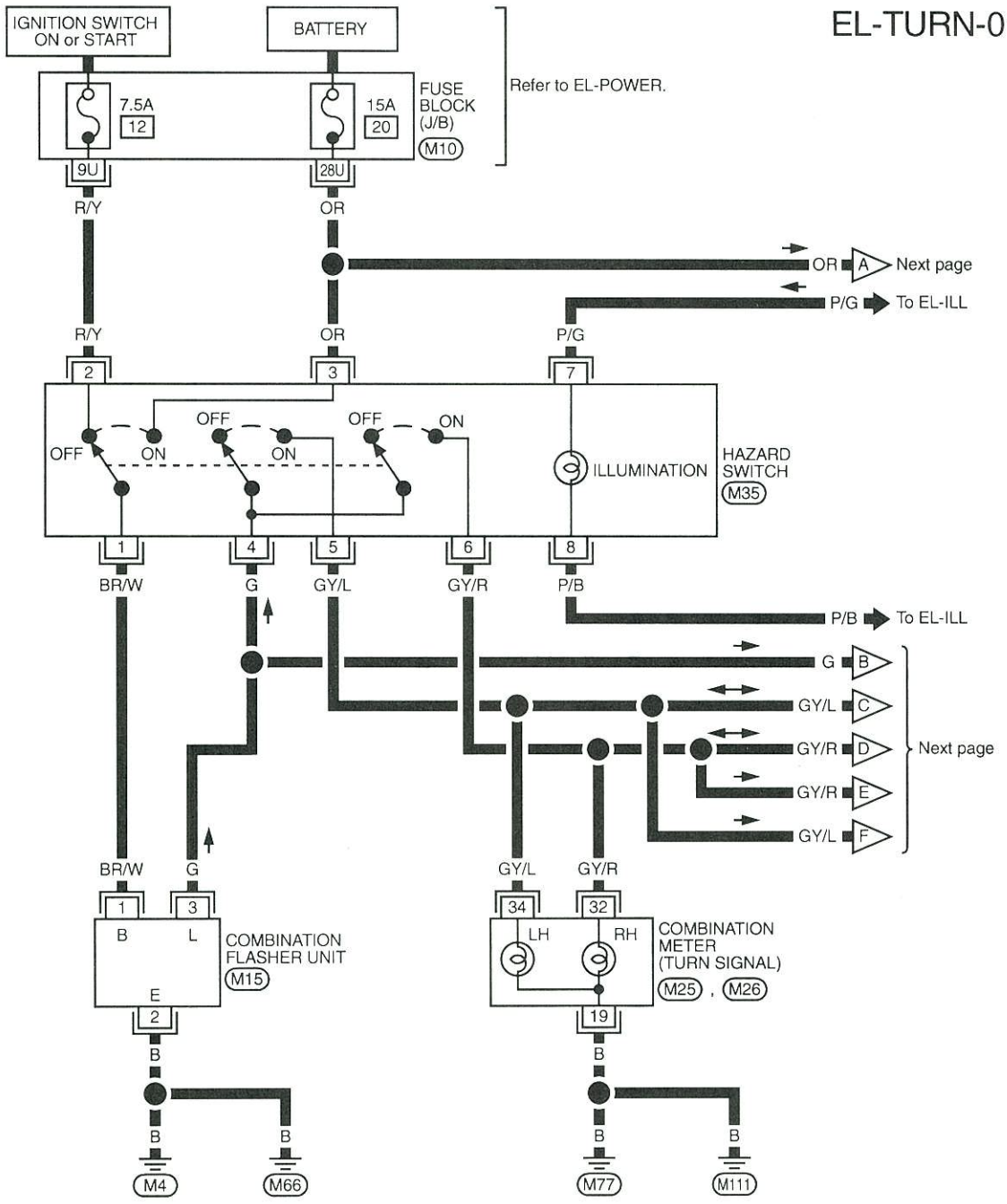
- to front turn signal lamp RH terminal 2
- to combination meter terminal 32
- to rear combination lamp RH terminal 5.

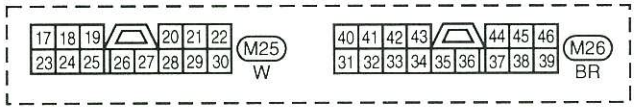
Ground is supplied to terminal 1 of each front turn signal lamp through body grounds E13 and E41.
Ground is supplied to terminal 6 of the rear combination lamp LH through body grounds B11, B22 and D210.
Ground is supplied to terminal 6 of the rear combination lamp RH through body grounds B55 and B75.
Ground is supplied to combination meter terminal 19 through body grounds M77 and M111.
With power and ground supplied, the smart entrance control unit controls the flashing of the hazard warning lamps.

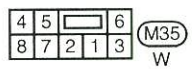
Wiring Diagram — TURN —

NBEL0032

EL-TURN-01





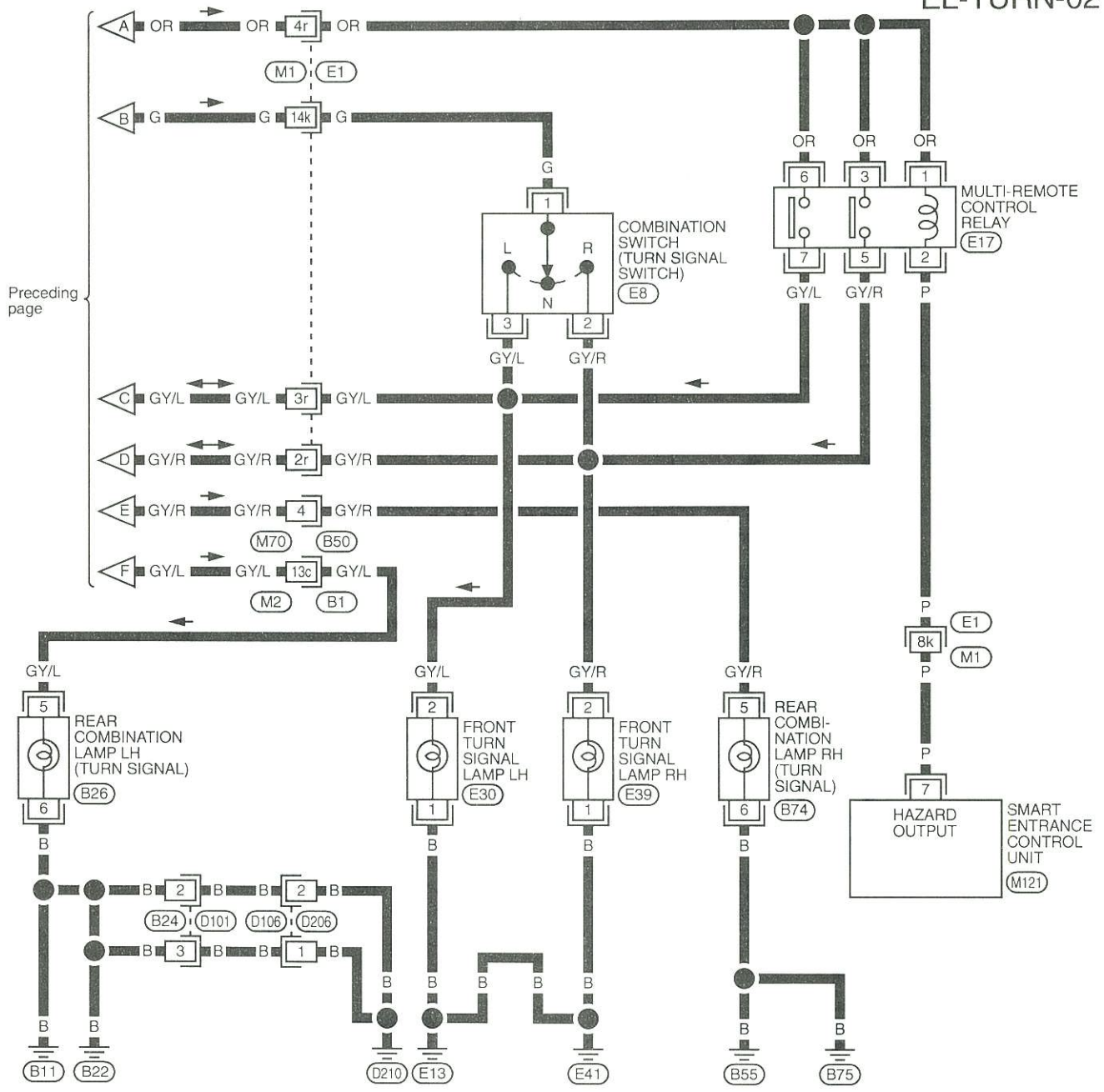


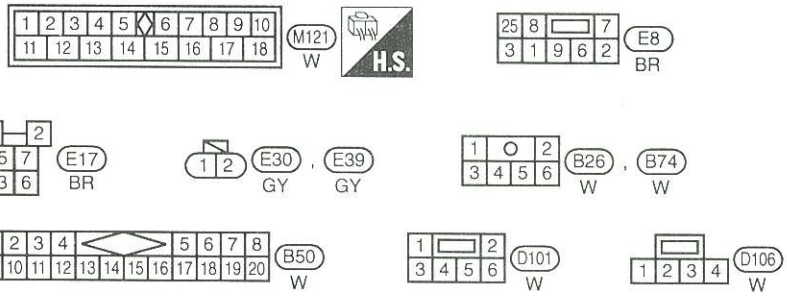
Refer to last page (Foldout page).
M10

MEL759J

Wiring Diagram — TURN — (Cont'd)

EL-TURN-02





Refer to last page (Foldout page).

M1 , E1

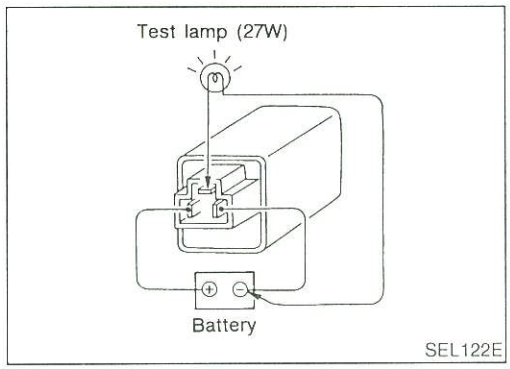
M2 , B1

MEL760J

Trouble Diagnoses

NBEL0033

Symptom	Possible cause	Repair order
Turn signal and hazard warning lamps do not operate.	1. Hazard switch 2. Combination flasher unit 3. Open in combination flasher unit circuit	1. Check hazard switch. 2. Refer to combination flasher unit check. 3. Check wiring to combination flasher unit for open circuit.
Turn signal lamps do not operate but hazard warning lamps operate.	1. 7.5A fuse 2. Hazard switch 3. Turn signal switch 4. Open in turn signal switch circuit	1. Check 7.5A fuse [No. 12, located in fuse block (J/B)]. Turn ignition switch ON and verify battery positive voltage is present at terminal 2 of hazard switch. 2. Check hazard switch. 3. Check turn signal switch. 4. Check G wire between combination flasher unit and turn signal switch for open circuit.
Hazard warning lamps do not operate but turn signal lamps operate.	1. 15A fuse 2. Hazard switch 3. Open in hazard switch circuit	1. Check 15A fuse [No. 20, located in fuse block (J/B)]. Verify battery positive voltage is present at terminal 3 of hazard switch. 2. Check hazard switch. 3. Check G wire between combination flasher unit and hazard switch for open circuit.
Front turn signal lamp LH or RH does not operate.	1. Bulb 2. Grounds E13 and E41	1. Check bulb. 2. Check grounds E13 and E41.
Rear turn signal lamp LH does not operate.	1. Bulb 2. Grounds B11, B22 and D210	1. Check bulb. 2. Check grounds B11, B22 and D210.
Rear turn signal lamp RH does not operate.	1. Bulb 2. Grounds B55 and B75	1. Check bulb. 2. Check grounds B55 and B75.
LH and RH turn indicators do not operate.	1. Ground	1. Check grounds M77 and M111.
LH or RH turn indicator does not operate.	1. Bulb	1. Check bulb in combination meter.



Electrical Components Inspection

NBEL0034

COMBINATION FLASHER UNIT CHECK

NBEL0034S01

- Before checking, ensure that bulbs meet specifications.
- Connect a battery and test lamp to the combination flasher unit, as shown. Combination flasher unit is properly functioning if it blinks when power is supplied to the circuit.

System Description

NBEL0035

The illumination lamp operation is controlled by the lighting switch which is built into the combination switch and headlamp battery saver control unit. The battery saver system is controlled by the headlamp battery saver control unit and smart entrance control unit.

Power is supplied at all times

- to tail lamp relay terminals 2 and 3
- through 10A fuse (No. 61, located in the fuse and fusible link box), and
- to headlamp battery saver control unit terminal 7
- through 7.5A fuse [No. 24, located in the fuse block (J/B)].

When ignition switch is in ON or START position, power is supplied

- to headlamp battery saver control unit terminal 1
- through 10A fuse [No. 16, located in the fuse block (J/B)], and
- to headlamp battery saver control unit terminal 10, and
- to smart entrance control unit terminal 33
- through 7.5A fuse [No. 11, located in the fuse block (J/B)].

Ground is supplied to headlamp battery saver control unit terminals 4 and 11.

LIGHTING OPERATION BY LIGHTING SWITCH

NBEL0035S01

When lighting switch is 1ST (or 2ND) position, ground is supplied

- to tail lamp relay terminal 1 from headlamp battery saver control unit terminals 6 and 14
- through headlamp battery saver control unit terminals 5 and 13, and
- through body grounds E13 and E41.

Tail lamp relay is then energized and illumination lamps illuminate.

The lighting switch must be in the 1ST or 2ND position for illumination.

The illumination control switch that controls the amount of current to the illumination system. As the amount of current increases, the illumination becomes brighter.

The following chart shows the power and ground connector terminals for the components included in the illumination system.

Component	Connector No.	Power terminal	Ground terminal
Illumination control switch	M19	1	3
4WD shift switch	M141	7	8
A/T indicator	B59	3	4
Ashtray	B76	1	2
Cigarette lighter	M57	3	4
Audio unit	M48	8	7
Compass and thermometer	R4	5	2
ASCD main switch	M18	5	6
Hazard switch	M35	7	8
Rear window defogger switch	M36	5	6
Power window main switch	D6	4	2
A/C auto amp.	M102	24	25
IVCS switch	R10	2	12
Combination meter	M25, M26	37	29
Odo trip (Combination meter)	M24, M25	12	29

The ground for all of the components except for compass, thermometer and ashtray are controlled through terminals 2 and 3 of the illumination control switch and body grounds M4 and M77.

BATTERY SAVER CONTROL

NBEL0035S02

When the ignition switch is turned from ON (or START) to OFF (or ACC) positions while illumination lamps are illuminated, the RAP signal is supplied to terminal 10 of the headlamp battery saver control unit from smart entrance control unit terminal 5.

After counting 45 seconds by the RAP signal from the smart entrance control unit to headlamp battery saver control unit, the ground supply to terminal 1 of the tail lamp relay from headlamp battery saver control unit teminals 6 and 14 is terminated.

Then illumination lamps are turned off.

Illumination lamps are turned off when driver or passenger side door is opened even if 45 seconds have not passed after the ignition switch is turned from ON (or START) to OFF (or ACC) positions while illumination lamps are illuminated.

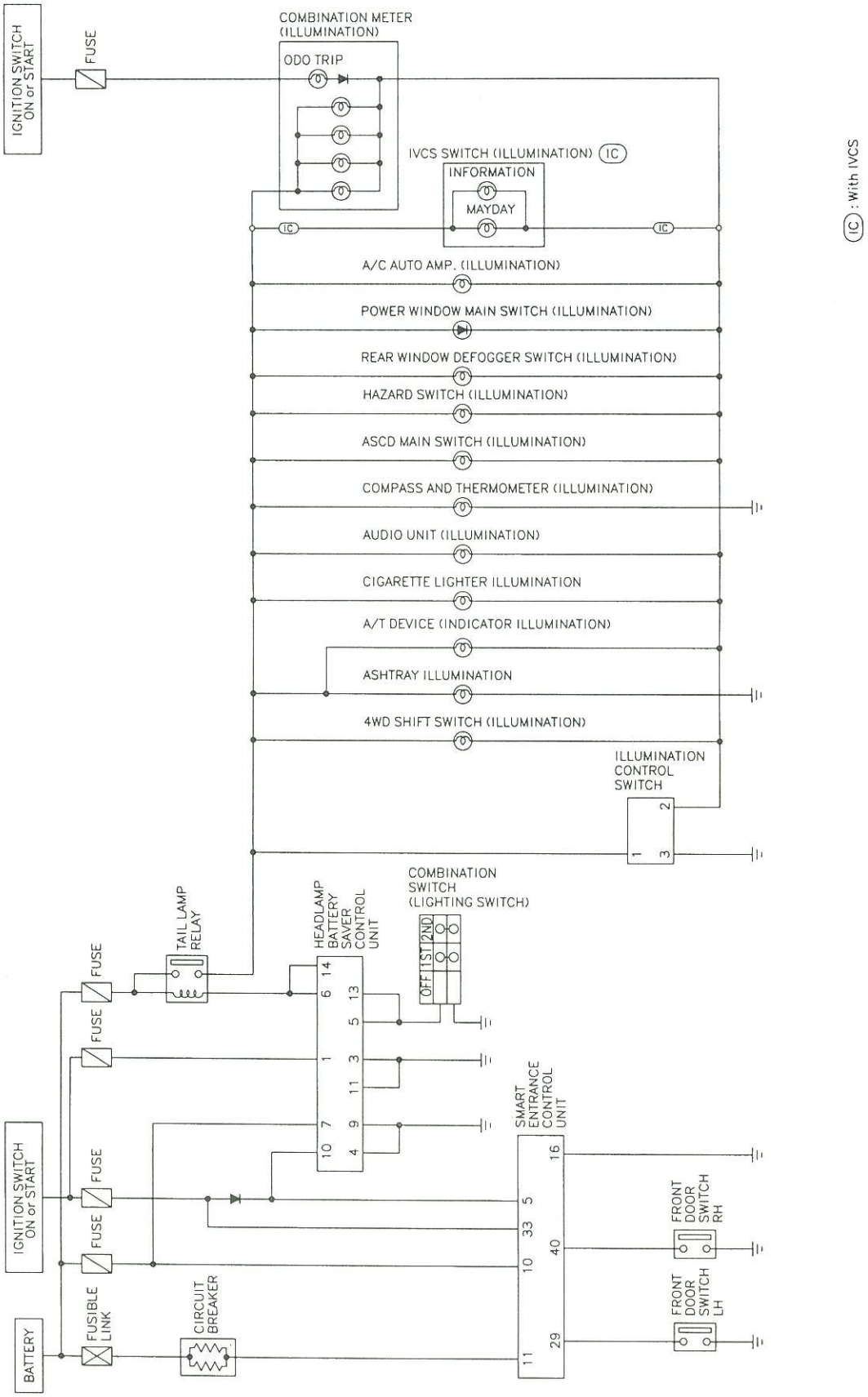
When the lighting switch is turned from OFF to 1ST (or 2ND) after illumination lamps are turned off by the battery saver control, ground is supplied

- to headlamp battery saver control unit terminals 5 and 13 from lighting switch terminal 11, and
- to tail lamp relay terminal 1 from headlamp battery saver control unit terminals 6 and 14.

Then illumination lamps illuminate again.

Schematic

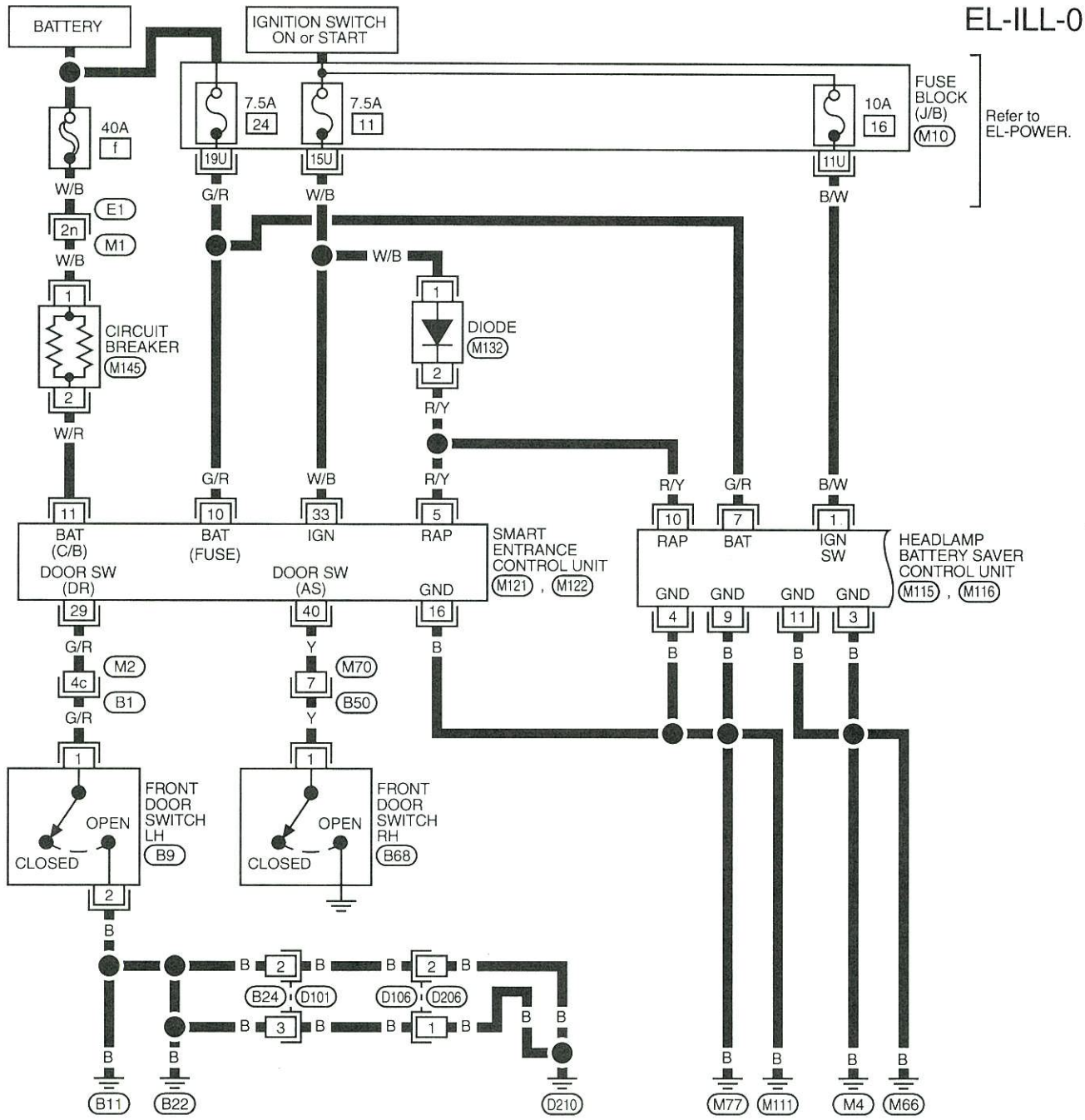
NBEL0036

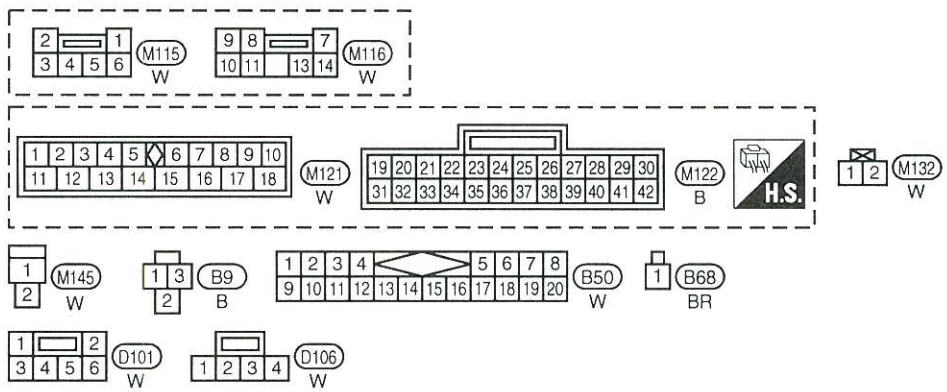


MEL761J

Wiring Diagram — ILL —

NBEL0037





Refer to last page (Foldout page).

M1, E1

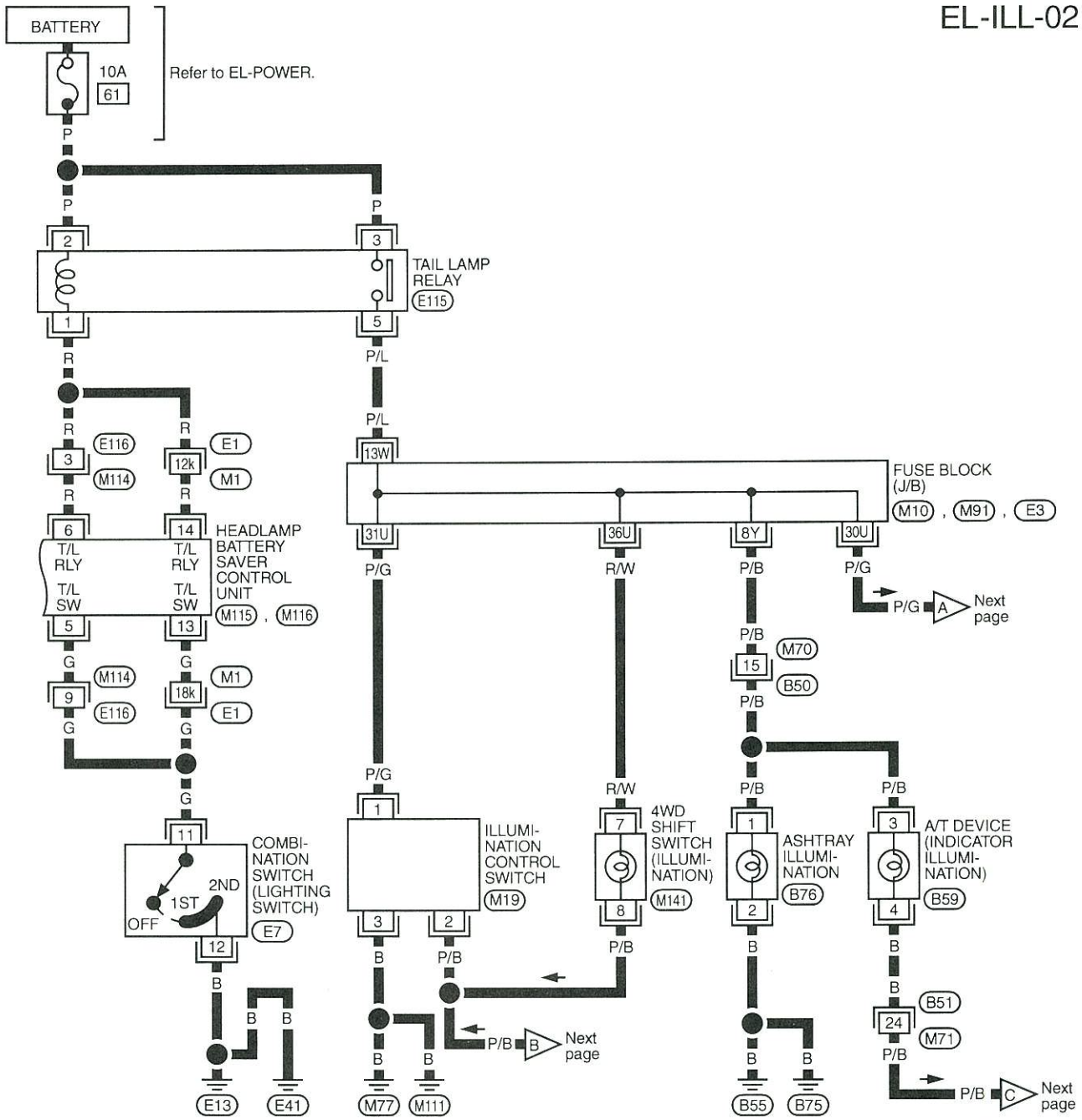
M2, B1

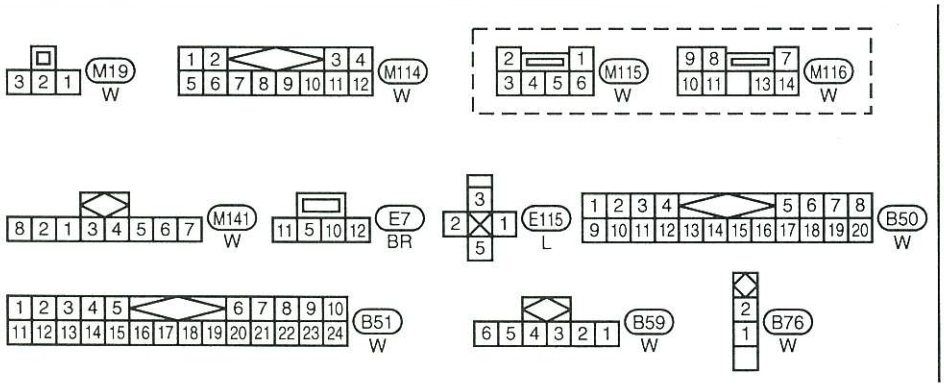
M10

MEL069K

Wiring Diagram — ILL — (Cont'd)

EL-ILL-02





Refer to last page (Foldout page).

M1 , E1

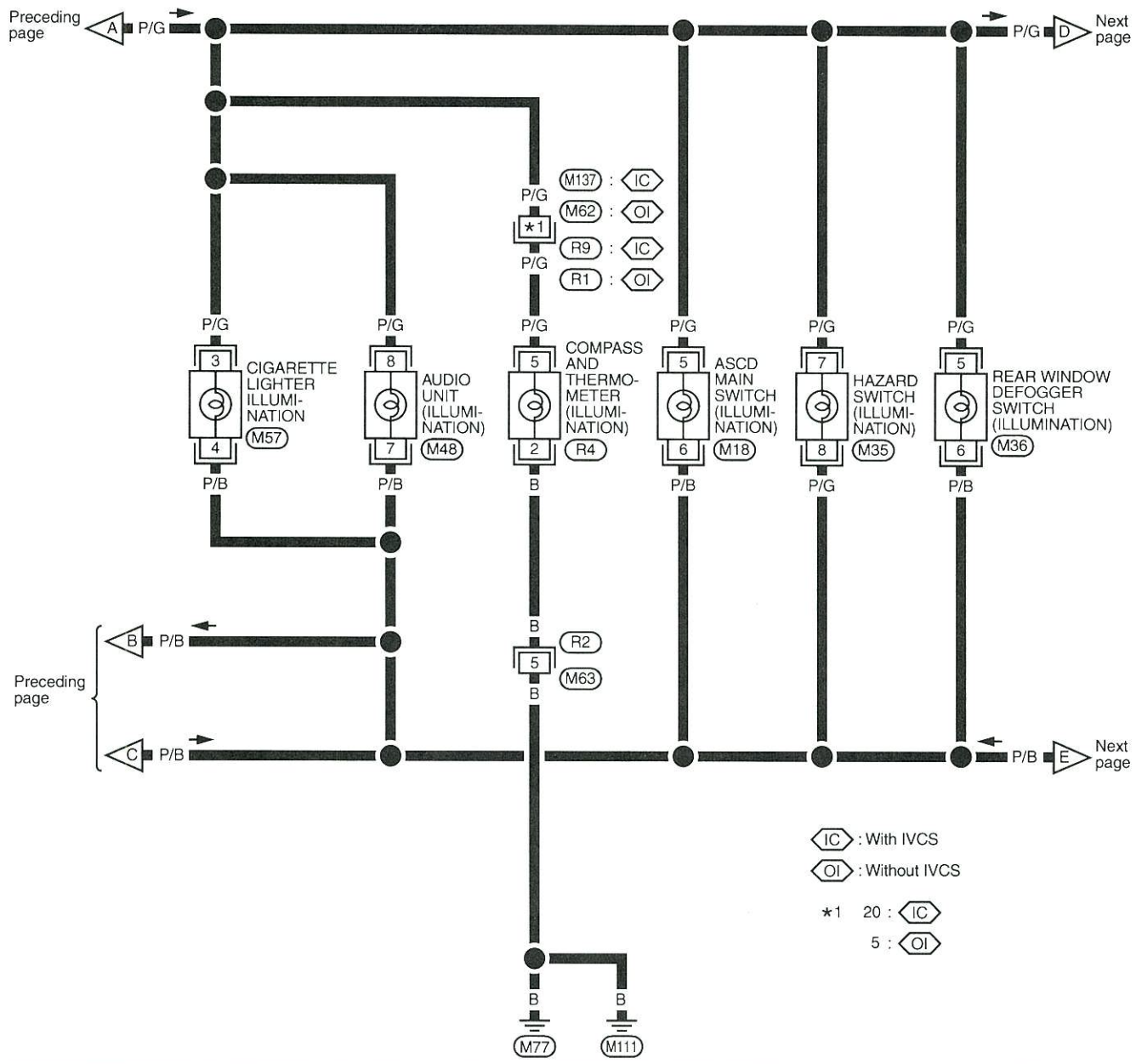
M10

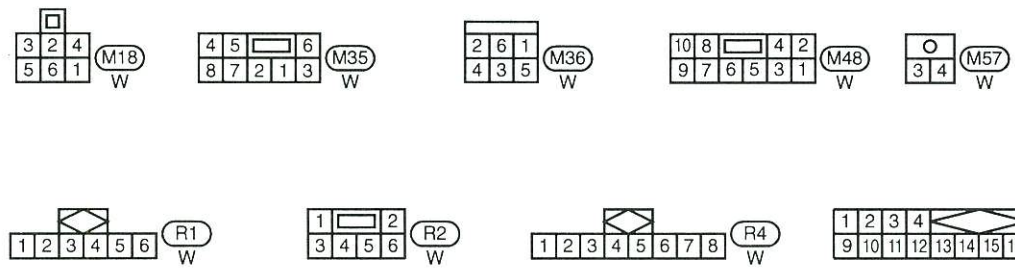
M91

E3

MEL762J

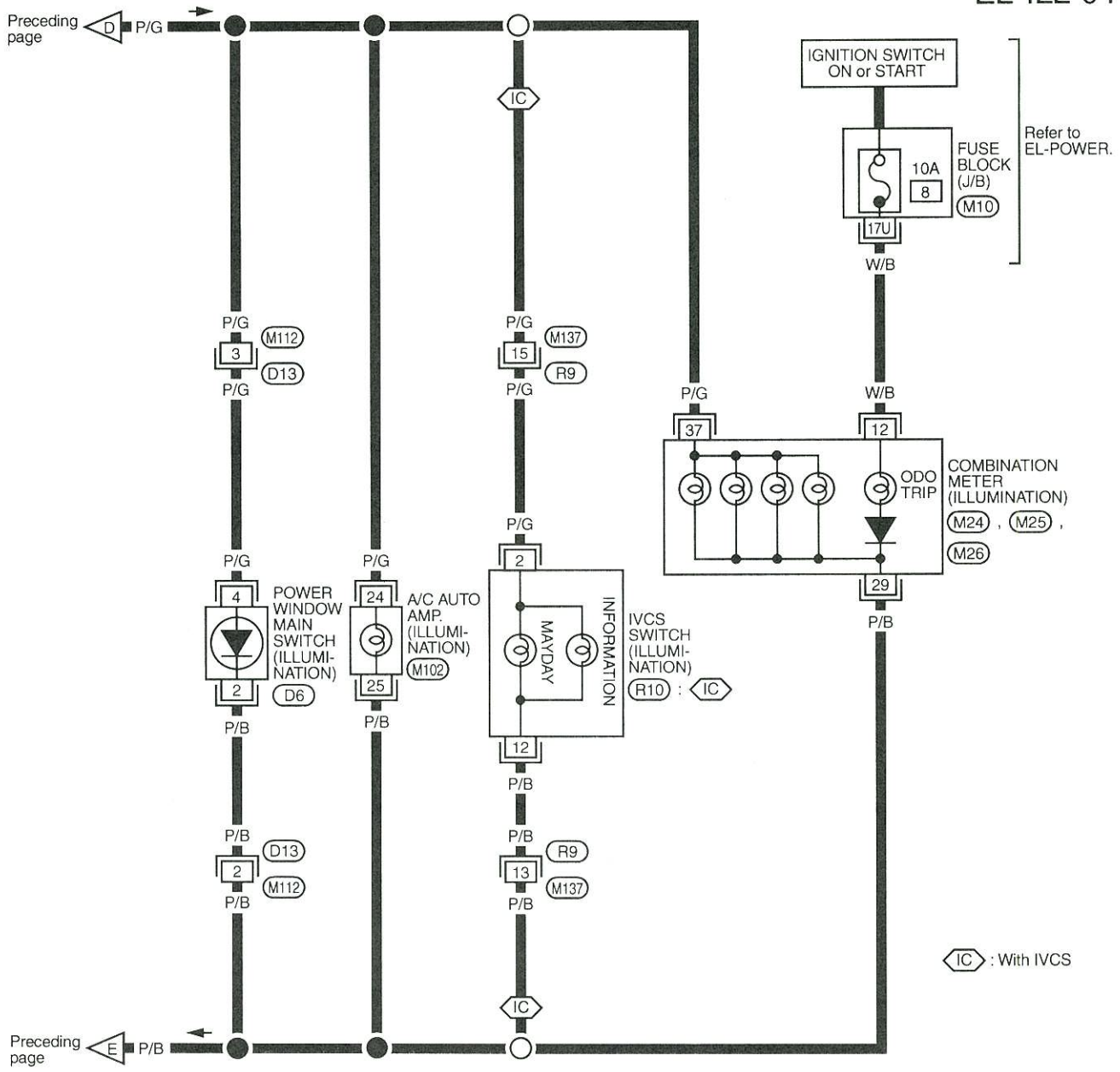
EL-ILL-03

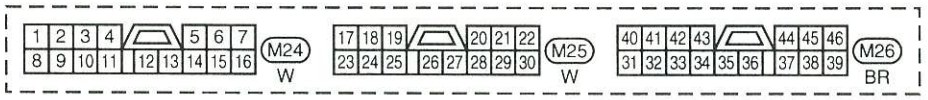


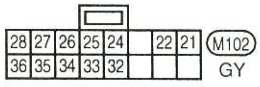


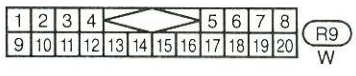
MEL763J

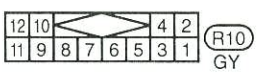
EL-ILL-04

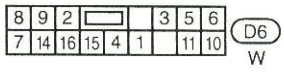


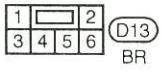












Refer to last page (Foldout page).

M10

MEL764J

System Description

NBEL0038

POWER SUPPLY AND GROUND

NBEL0038S06

Power is supplied at all times:

- through 40A fusible link (Letter **f**, located in the fuse and fusible link box)
- to circuit breaker terminal 1
- through circuit breaker terminal 2
- to smart entrance control unit terminal 11.

Power is supplied at all times:

- through 7.5A fuse [No. 24, located in the fuse block (J/B)]
- to key switch terminal 2 and
- to smart entrance control unit terminal 10.

When the key is removed from ignition key cylinder, power is interrupted:

- through key switch terminal 1
- to smart entrance control unit terminal 32.

With the ignition key switch in the ON or START position, power is supplied:

- through 7.5A fuse [No. 11, located in the fuse block (J/B)]
- to smart entrance control unit terminal 33.

Ground is supplied:

- to smart entrance control unit terminal 16
- through body grounds terminals M77 and M111.

When the front driver side door is opened, ground is supplied:

- through body grounds B11, B22 and B210
- to front door switch (driver side) terminal 2
- from front door switch (driver side) terminal 1
- to smart entrance control unit terminal 29.

When the front passenger side door is opened, ground is supplied:

- through case ground of front door switch (passenger side)
- from front door switch (passenger side) terminal 1
- to smart entrance control unit terminal 40.

When any other door (except front door) is opened, ground is supplied to smart entrance control unit terminal 28 in the same manner as the front door switch (front passenger side).

When the front driver side door is unlocked, the smart entrance control unit receives a ground signal:

- through body grounds terminals M77 and M111
- to front door lock actuator (driver side unlock sensor) terminal 2
- from front door lock actuator (driver side unlock sensor) terminal 4
- to smart entrance control unit terminal 36.

When a signal, or combination of signals is received by the smart entrance control unit, ground is supplied:

- through smart entrance control unit terminal 8
- to interior lamp terminal 2.

With power and ground supplied, the interior lamp illuminates.

SWITCH OPERATION

NBEL0038S07

When interior lamp switch is ON, ground is supplied:

- through case grounds of interior lamp
- to interior lamp.

And power is supplied:

- to interior lamp terminal 1
- from smart entrance control unit terminal 17.

When spot lamp (LH and/or RH) is ON, ground is supplied:

- through body grounds M77 and M111
- to spot lamp terminal 2.

And power is supplied:

- to spot lamp terminal 1
- from smart entrance control unit terminal 17.

When vanity mirror illumination (LH and/or RH) is ON, ground is supplied:

- through body grounds M77 and M111
- to vanity mirror illuminations (LH and RH) terminals 2.

And power is supplied:

- to vanity mirror illuminations (LH and RH) terminals 1
- from smart entrance control unit terminal 17.

With power and ground supplied, interior lamps turn ON.

INTERIOR LAMP TIMER OPERATION

NBEL0038S08

When interior lamp switch is in the "DOOR" position, the smart entrance control unit keeps the interior lamp illuminated for about 30 seconds when:

- unlock signal is supplied from driver's door unlock sensor while all doors are closed and key is removed from ignition key cylinder
- key is removed from ignition key cylinder while all doors are closed
- driver's door is opened and then closed while key is removed from the iginition key cylinder. (However, if the driver's door is closed with the key insered in the ignition key cylinder after the driver's door is opened with the key removed, the timer is operated.)

When the interior lamp switch is in the "DOOR" position and the unlock signal is supplied from the multi-remote controller while the driver's door is locked and all doors are closed (even if key is inserted), the smart entrance control unit keeps the interior lamp illuminated for about 30 senconds.
The timer is canceled when:

- driver's door is locked,
- driver's door is opened, or
- ignition switch is turned ON.

ON-OFF CONTROL

NBEL0038S09

When the driver side door, front passenger door, rear LH or RH door is opened, the interior room lamp turns on while the interior room lamp switch is in the "DOOR" position.

BATTERY SAVER

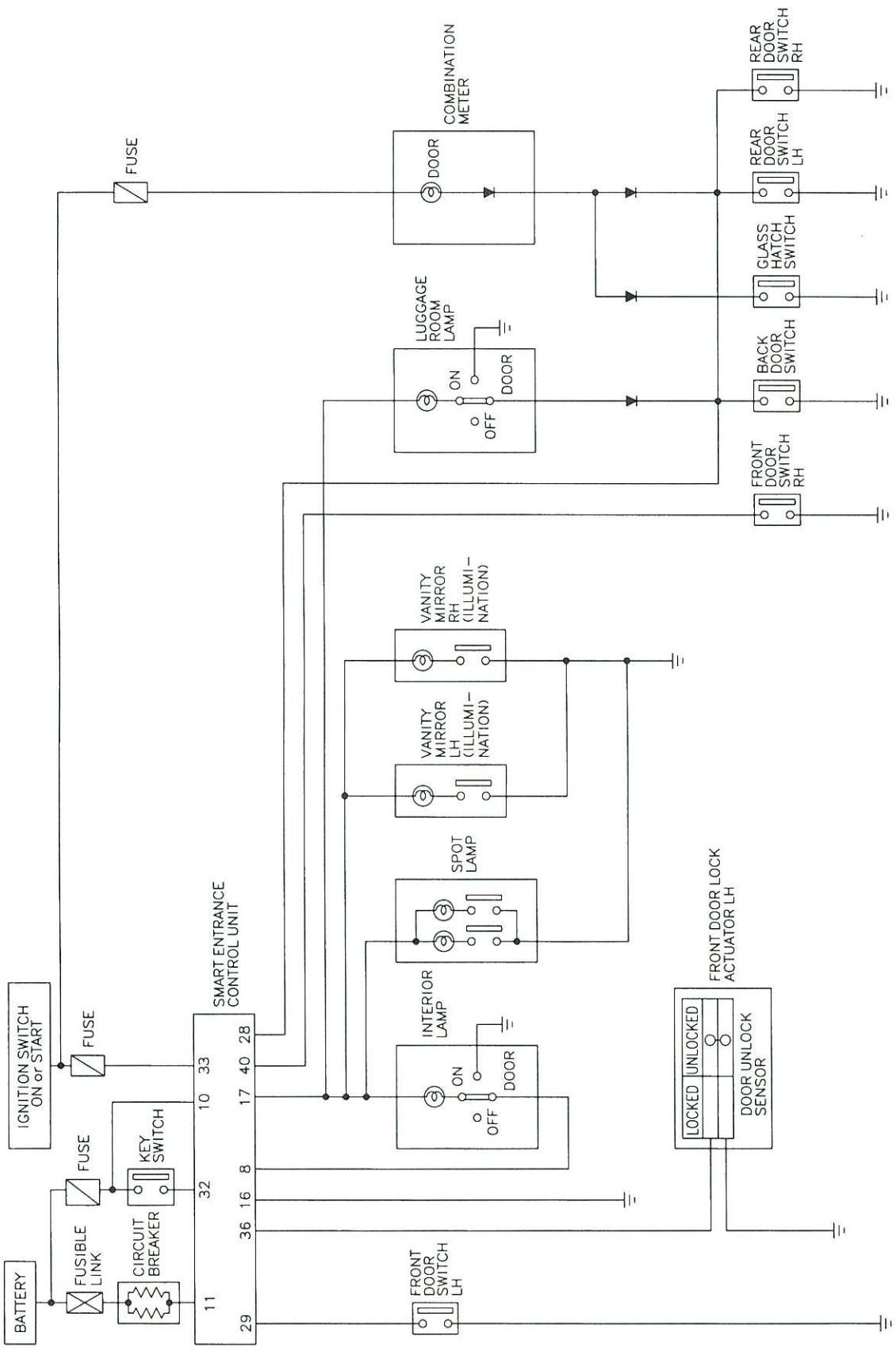
NBEL0038S10

The lamp turns off automatically when interior lamp, luggage room lamp, spot lamp and/or vanity mirror illumination is illuminated with the ignition key is in OFF position, if the lamp remains lit by the door switch open signal or if the lamp switch is in ON position for more than 10 minutes.
After lamps turn OFF by the battery saver system, the lamps illuminate again when:

- driver's door is locked or unlocked,
- door is opened or closed,
- key is inserted in ignition key cylinder.

Schematic

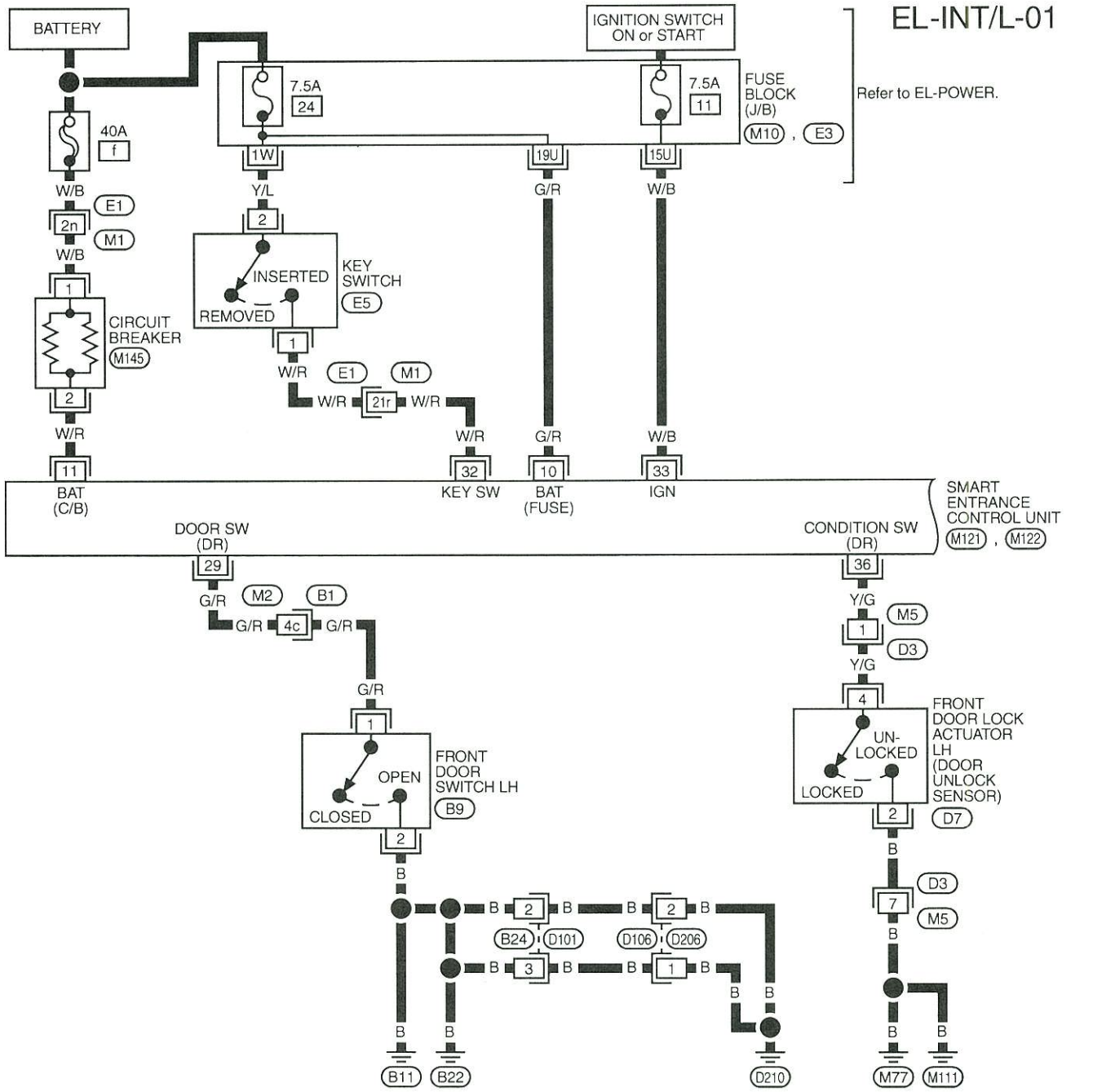
NBEL0158



MEL765J

Wiring Diagram — INT/L —

NBEL0040

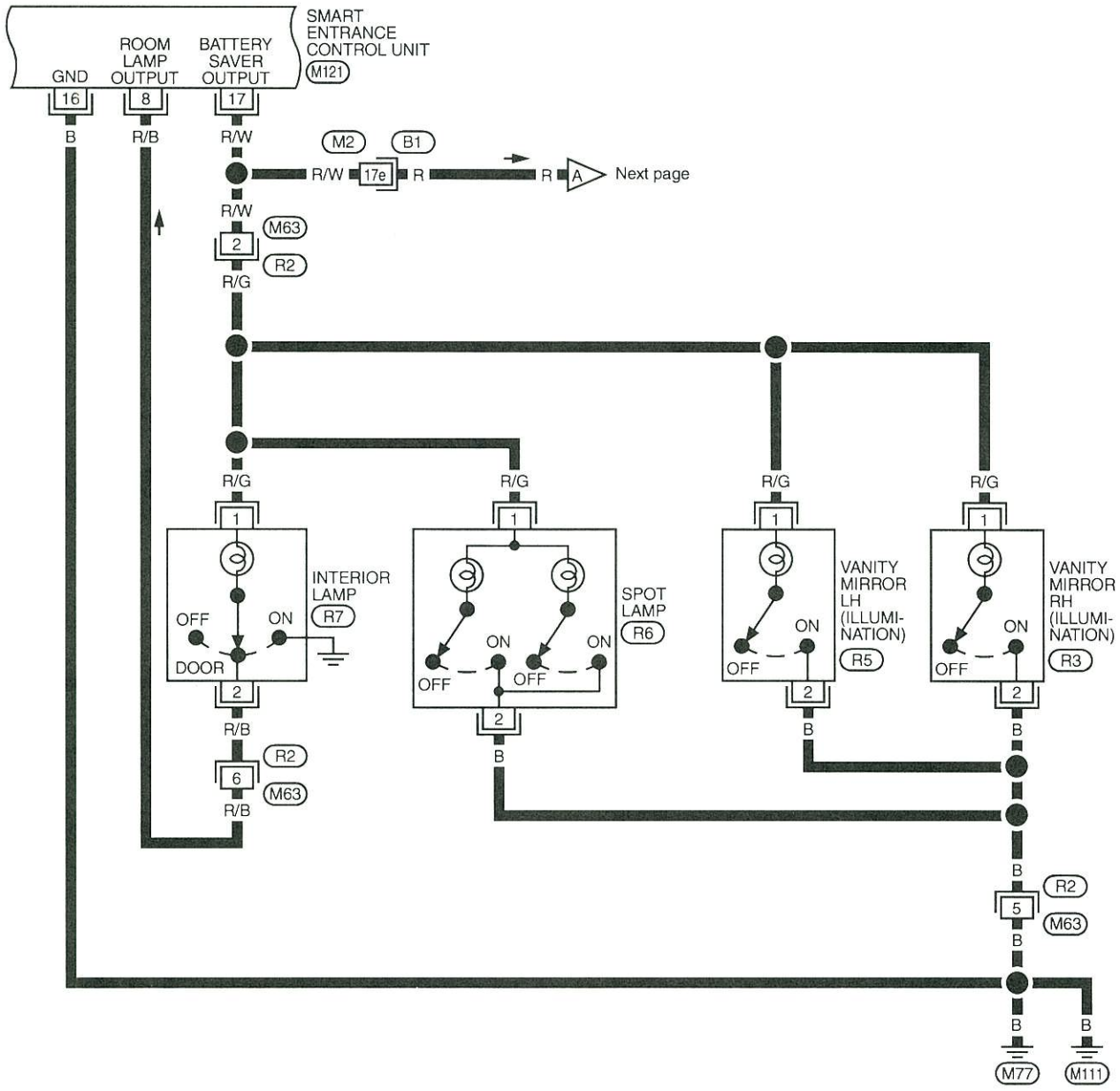


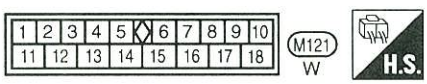
Refer to last page (Foldout page).

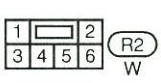
M1 , E1
M2 , B1
M10
E3

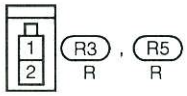
MEL766J

EL-INT/L-02







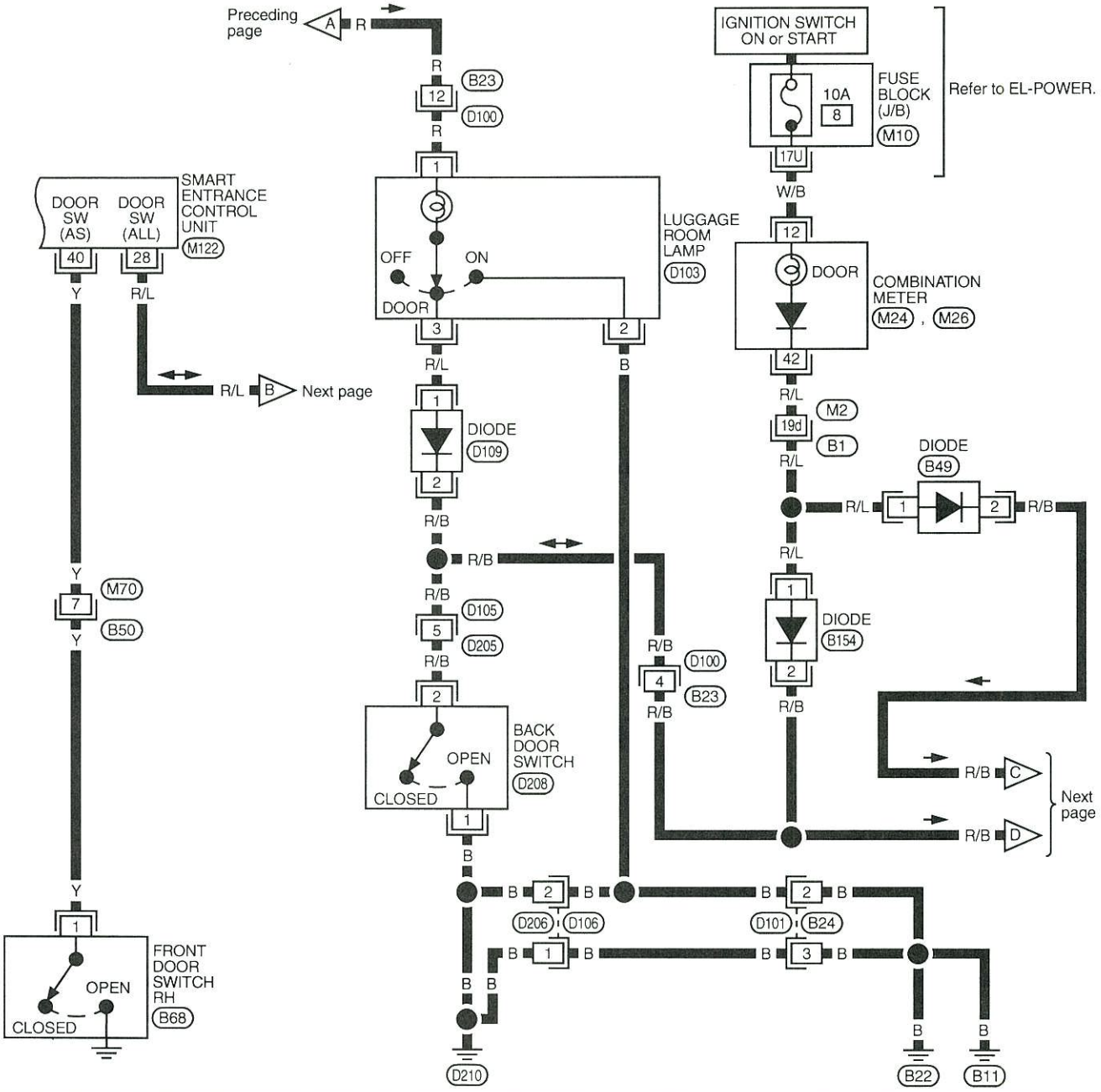


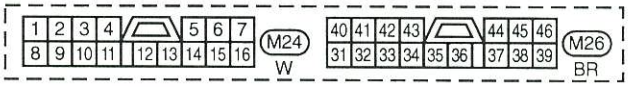
Refer to last page (Foldout page).

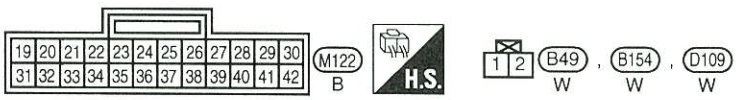
M2 , B1

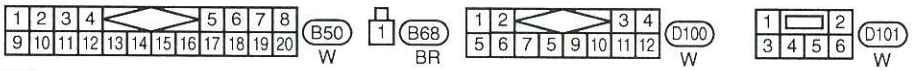
MEL767J

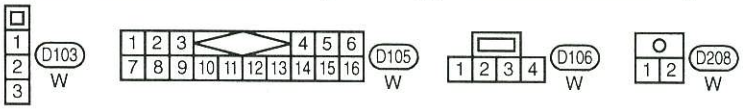
EL-INT/L-03







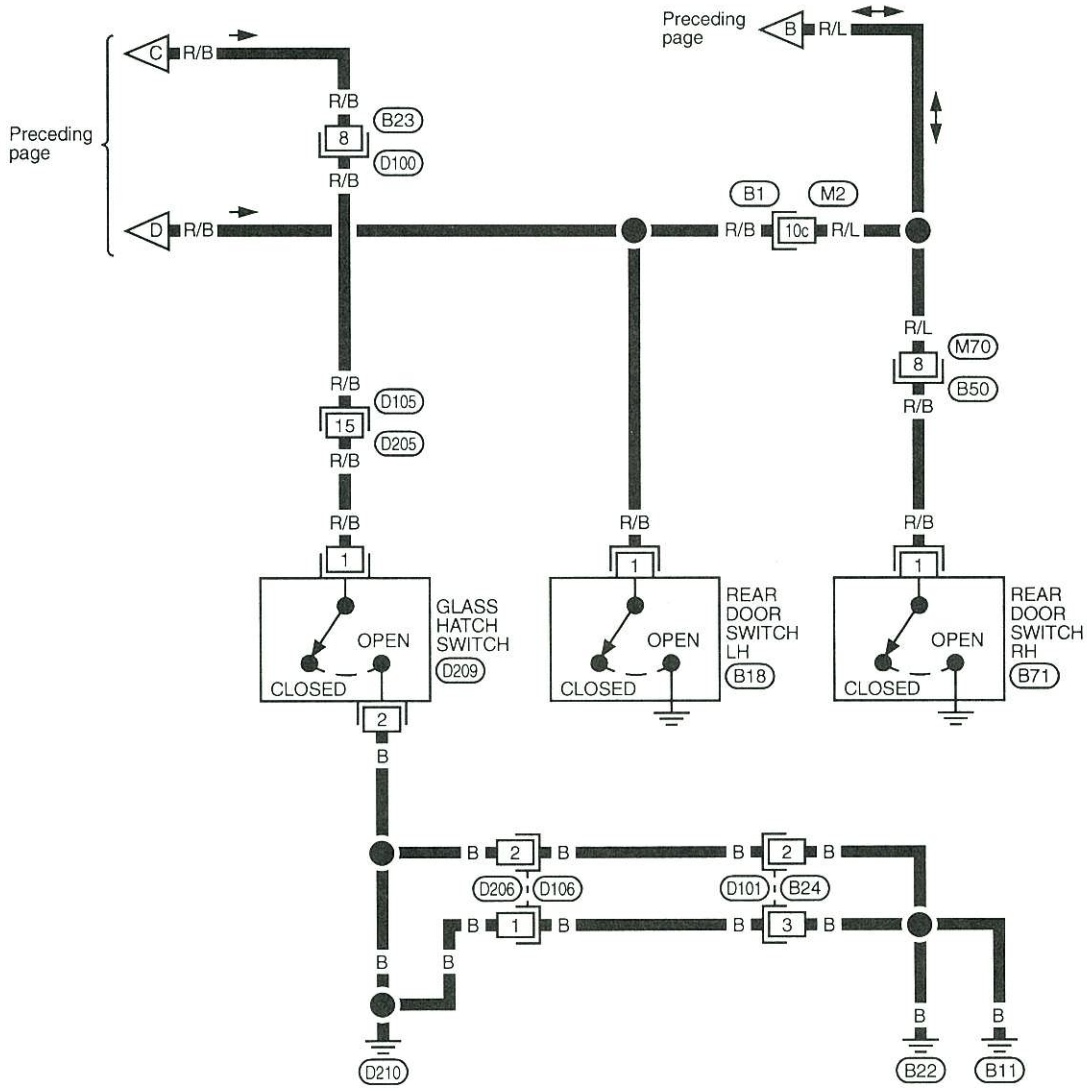


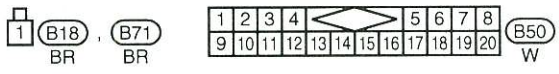


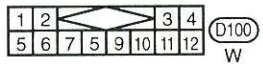
Refer to last page (Foldout page).
M2 , B1
M10

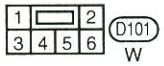
MEL768J

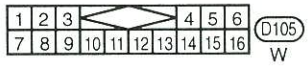
EL-INT/L-04

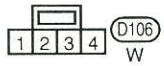










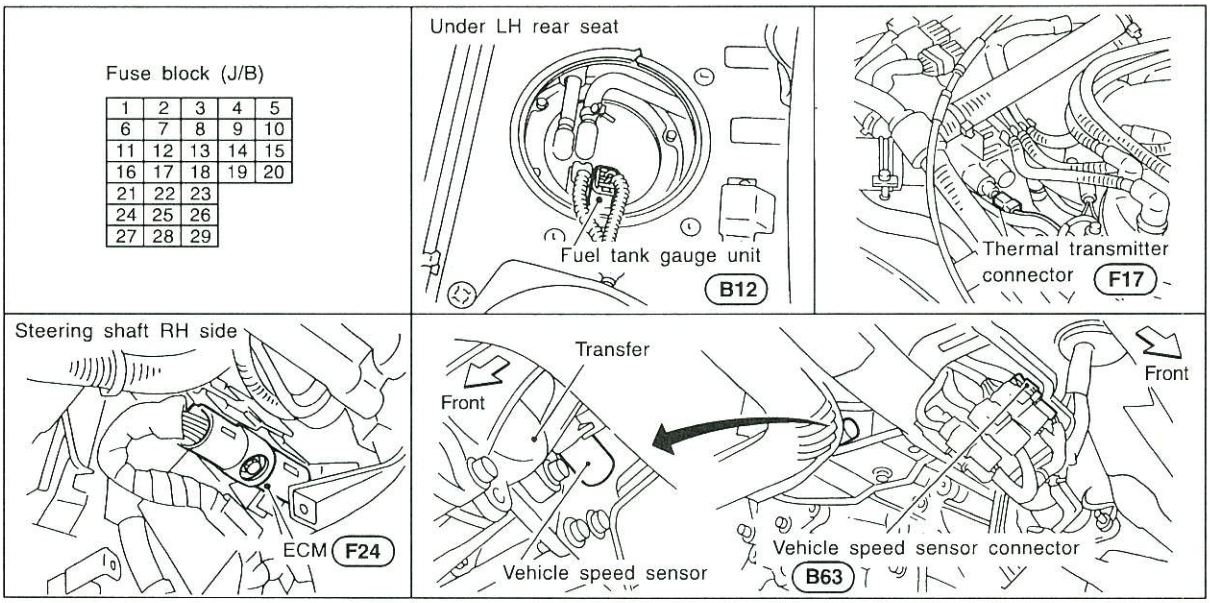


Refer to last page (Foldout page).
M2 , B1

MEL769J

Component Parts and Harness Connector Location

NBEL0041



SEL045W

System Description

NBEL0042

UNIFIED CONTROL METER

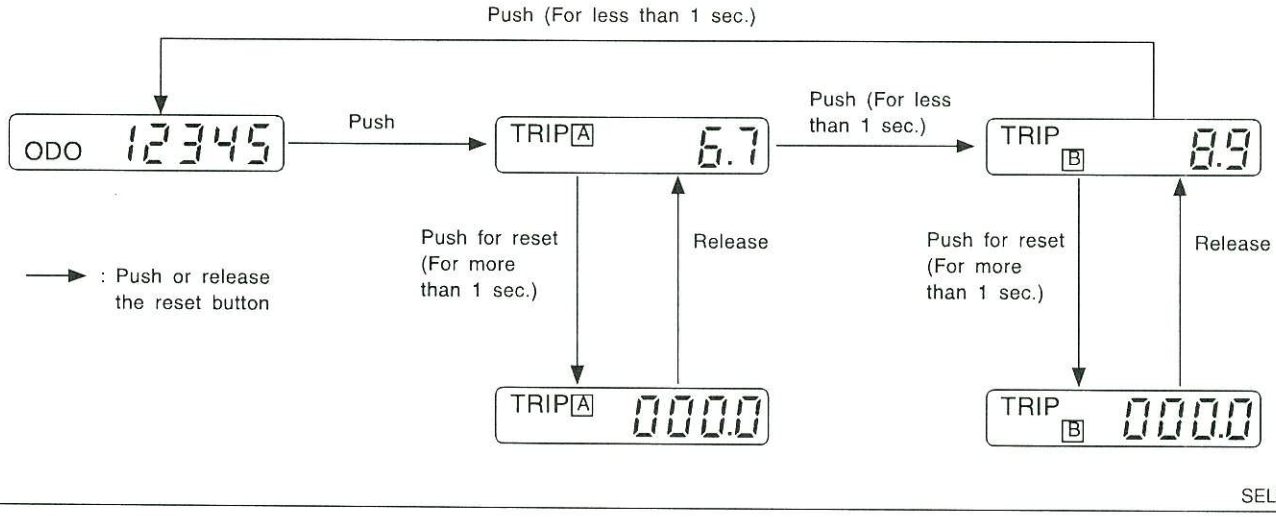
NBEL0042S06

- Speedometer, odo/trip meter, tachometer, fuel gauge and water temperature gauge are controlled totally by control unit combined with speedometer.
- Digital meter is adopted for odo/trip meter.*
  *The record of the odo meter is kept even if the battery cable is disconnected. The record of the trip meter is erased when the battery cable is disconnected.
- Odo/trip meter segment can be checked in diagnosis mode.
- Meter/gauge can be checked in diagnosis mode.

HOW TO CHANGE THE DISPLAY FOR ODO/TRIP METER

NBEL0042S07

The display is changed by pushing the reset button.



SEL253V

NOTE:
Turn ignition switch to the "ON" position to operate odo/trip meter.

POWER SUPPLY AND GROUND CIRCUIT

NBEL0042S08

Power is supplied at all times

- through 7.5A fuse [No. 24, located in the fuse block (J/B)]
- to combination meter terminal 3.

With the ignition switch in the ON or START position, power is supplied

- through 10A fuse [No. 8, located in the fuse block (J/B)]
- to combination meter terminal 12.

Ground is supplied

- to combination meter terminal 2
- through body grounds M77 and M111.

WATER TEMPERATURE GAUGE

NBEL0042S01

The water temperature gauge indicates the engine coolant temperature. The reading on the gauge is based on the resistance of the thermal transmitter.

As the temperature of the coolant increases, the resistance of the thermal transmitter decreases. A variable ground is supplied to terminal 6 of the combination meter for the water temperature gauge. The needle on the gauge moves from "C" to "H".

TACHOMETER

NBEL0042S02

The tachometer indicates engine speed in revolutions per minute (rpm).

The tachometer is regulated by a signal

- from terminal 3 of the ECM
- to combination meter terminal 15 for the tachometer.

FUEL GAUGE

NBEL0042S03

The fuel gauge indicates the approximate fuel level in the fuel tank.

The fuel gauge is regulated by a variable ground signal supplied

- to combination meter terminal 7 for the fuel gauge
- from terminal 3 of the fuel tank gauge unit
- through terminal 2 of the fuel tank gauge unit and
- through body grounds B11, B22 and D210.

SPEEDOMETER

NBEL0042S04

The vehicle speed sensor provides a voltage signal to the combination meter for the speedometer.

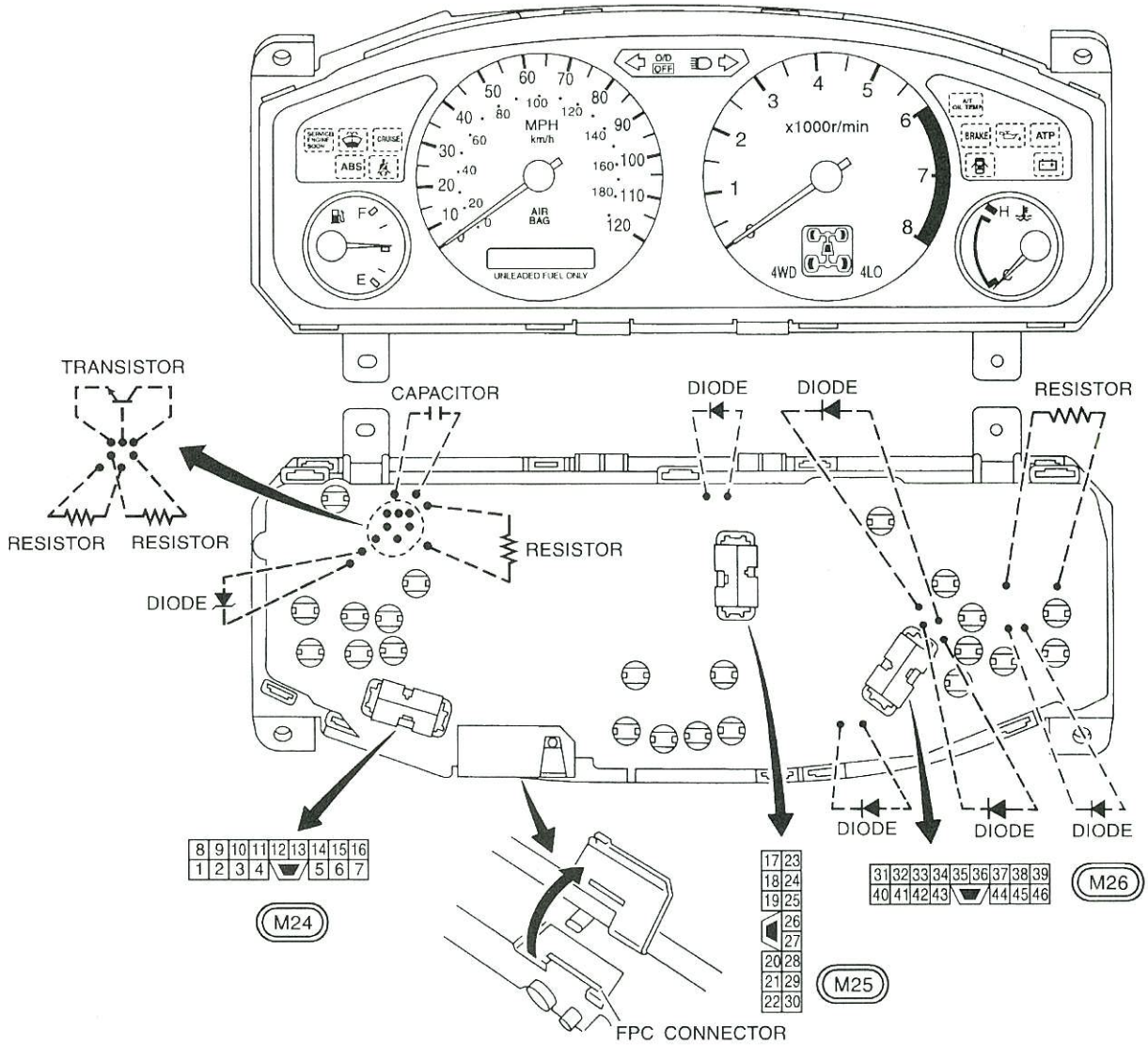
The voltage is supplied

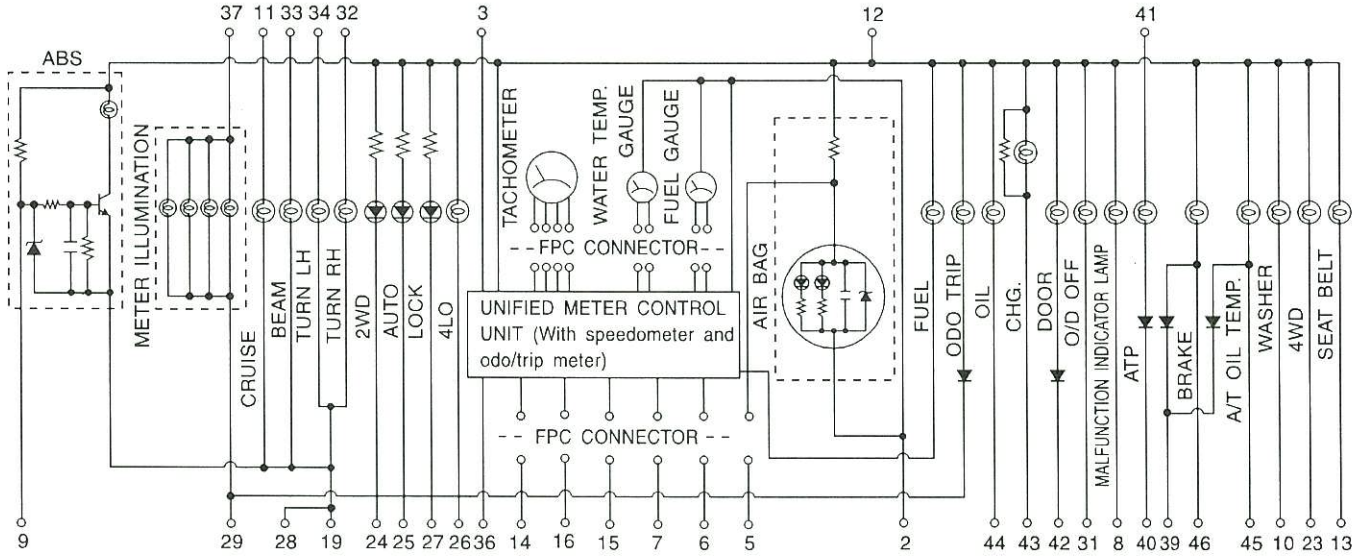
- to combination meter terminals 16 and 14 for the speedometer
- from terminals 2 and 1 of the vehicle speed sensor.

The speedometer converts the voltage into the vehicle speed displayed.

Combination Meter/For USA

NBEL0043

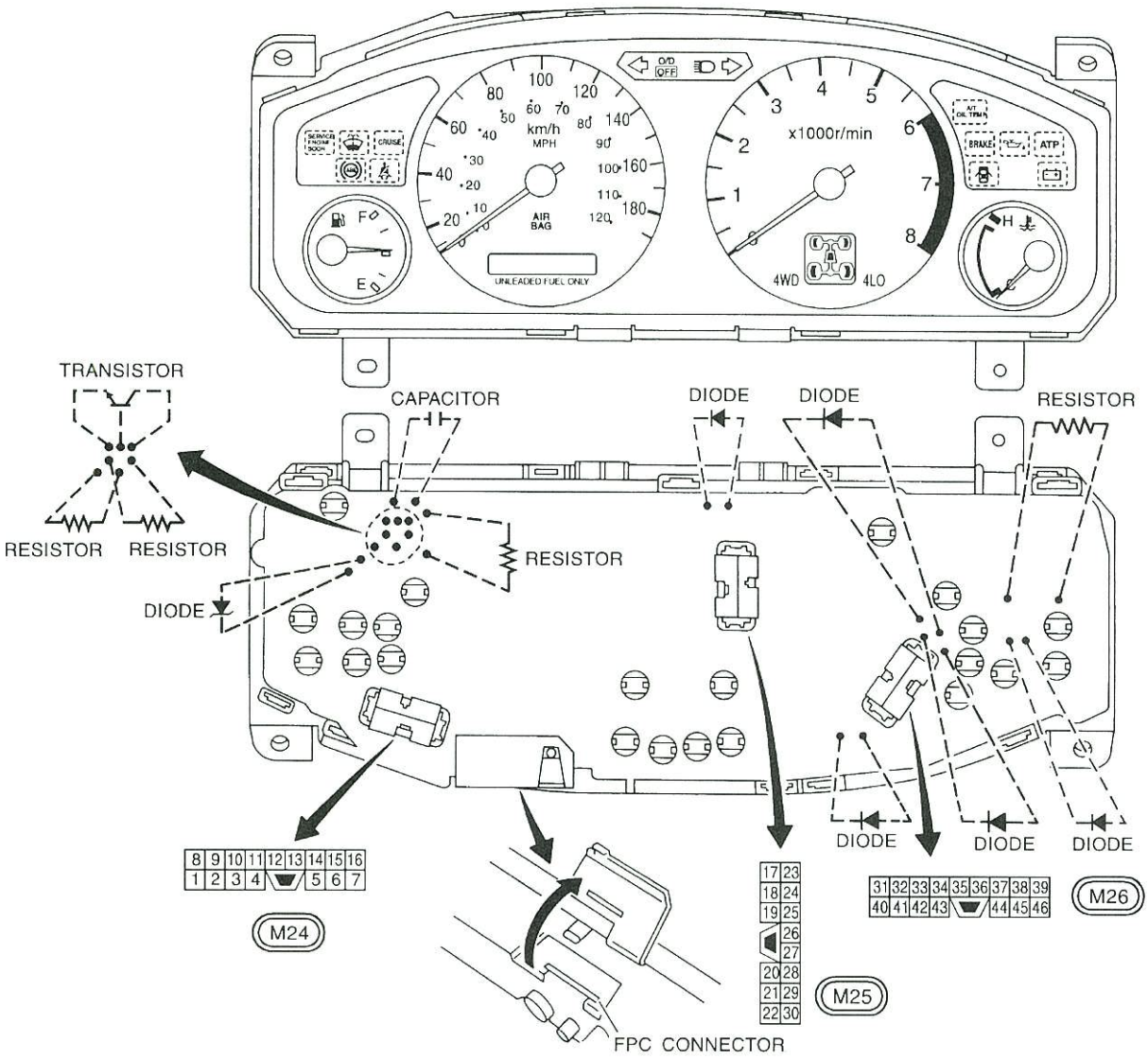


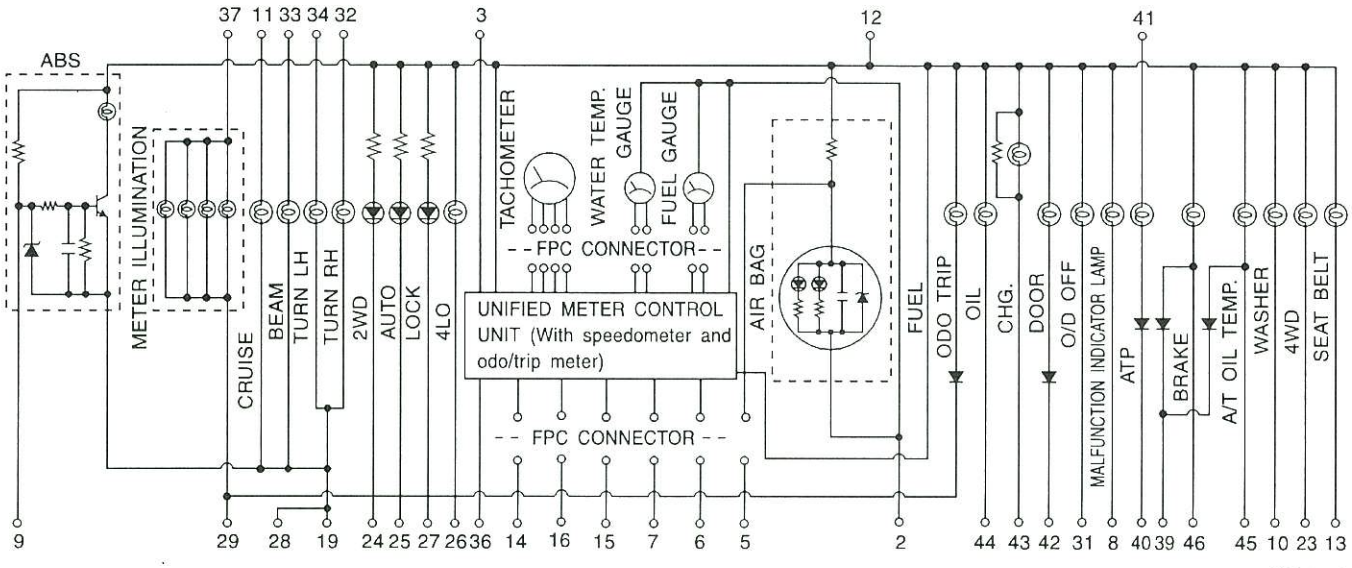


MEL858J

Combination Meter/For Canada

NBEL0165



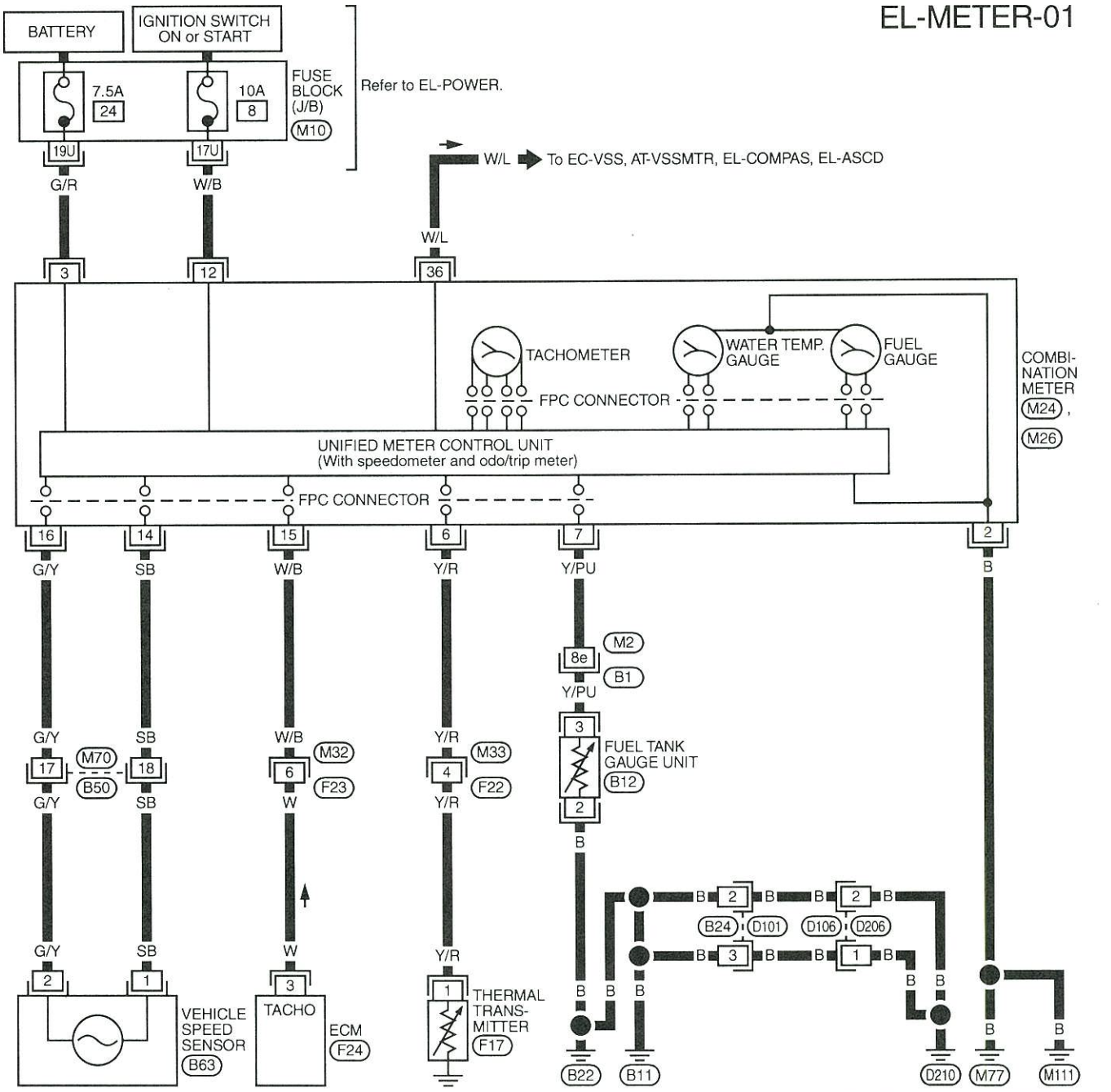


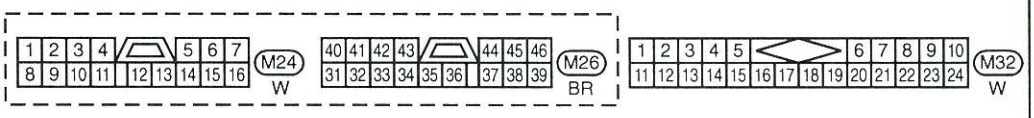
MEL859J

Wiring Diagram — METER —

NBEL0045

EL-METER-01





Refer to last page (Foldout page).
M2 , B1
M10
F24

MEL770J

Meter/Gauge Operation and Odo/Trip Meter Segment Check in Diagnosis Mode

NBEL0151

DIAGNOSIS FUNCTION

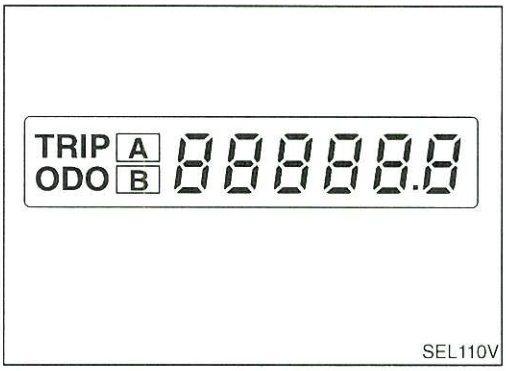
NBEL0151S01

- Odo/trip meter segment can be checked in diagnosis mode.
- Meters/gauges can be checked in diagnosis mode.

HOW TO ALTERNATE DIAGNOSIS MODE

NBEL0151S02

1. Turn ignition switch to ON and change odo/trip meter to "TRIP A" or "TRIP B".
2. Turn ignition switch to OFF.
3. Turn ignition switch to ON when pushing odo/trip meter switch.
4. Confirm that trip meter indicates "000.0".
5. Push odo/trip meter switch more than three times within 5 seconds.

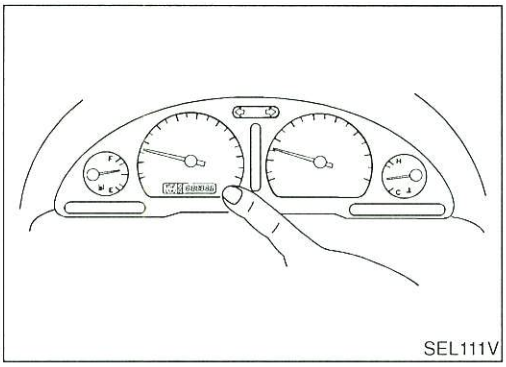


SEL110V

6. All odo/trip meter segments should be turned on.

NOTE:
If some segments are not turned on, speedometer (unified meter control unit) with odo/trip meter should be replaced.

At this point, the unified control meter is turned to diagnosis mode.


SEL111V

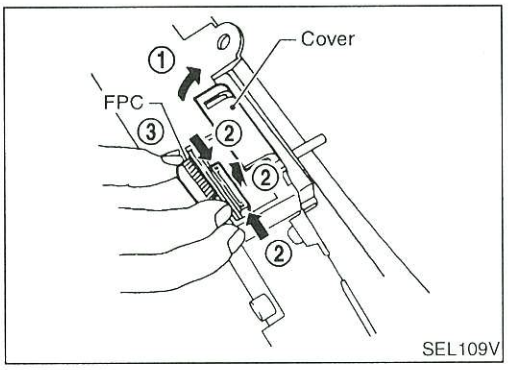
7. Push odo/trip meter switch. Indication of each meter/gauge should be as shown left during pushing odo/trip meter switch if it is no malfunctioning.

NOTE:
It takes about 1 minute for indication of fuel gauge to become stable.

Flexible Print Circuit (FPC)

=NBEL0152

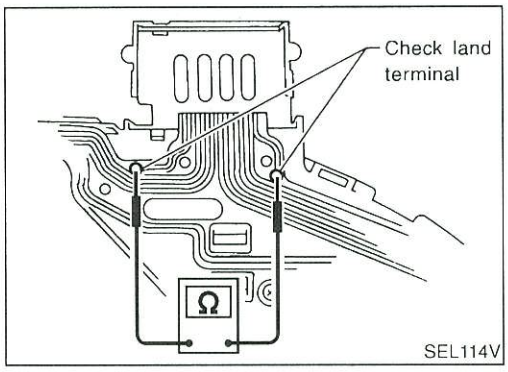
Tachometer, fuel gauge and water temperature gauge are connected with unified meter control unit (speedometer) by Flexible Print Circuit (FPC) connector. When replace or remove and install unified control unit (speedometer), disconnect and connect FPC connector according to the following steps.



DISCONNECT

NBEL0152S01

1. Open connector cover.
2. Release connector lock by holding both ends of it and pulling it up.
3. Disconnect FPC by pulling it up.



CONNECT

NBEL0152S02

1. Insert FPC into connector and lock connector pushing FPC downward.
2. Check secure connection of FPC.
3. Check continuity of check land terminal for secure connection of FPC.

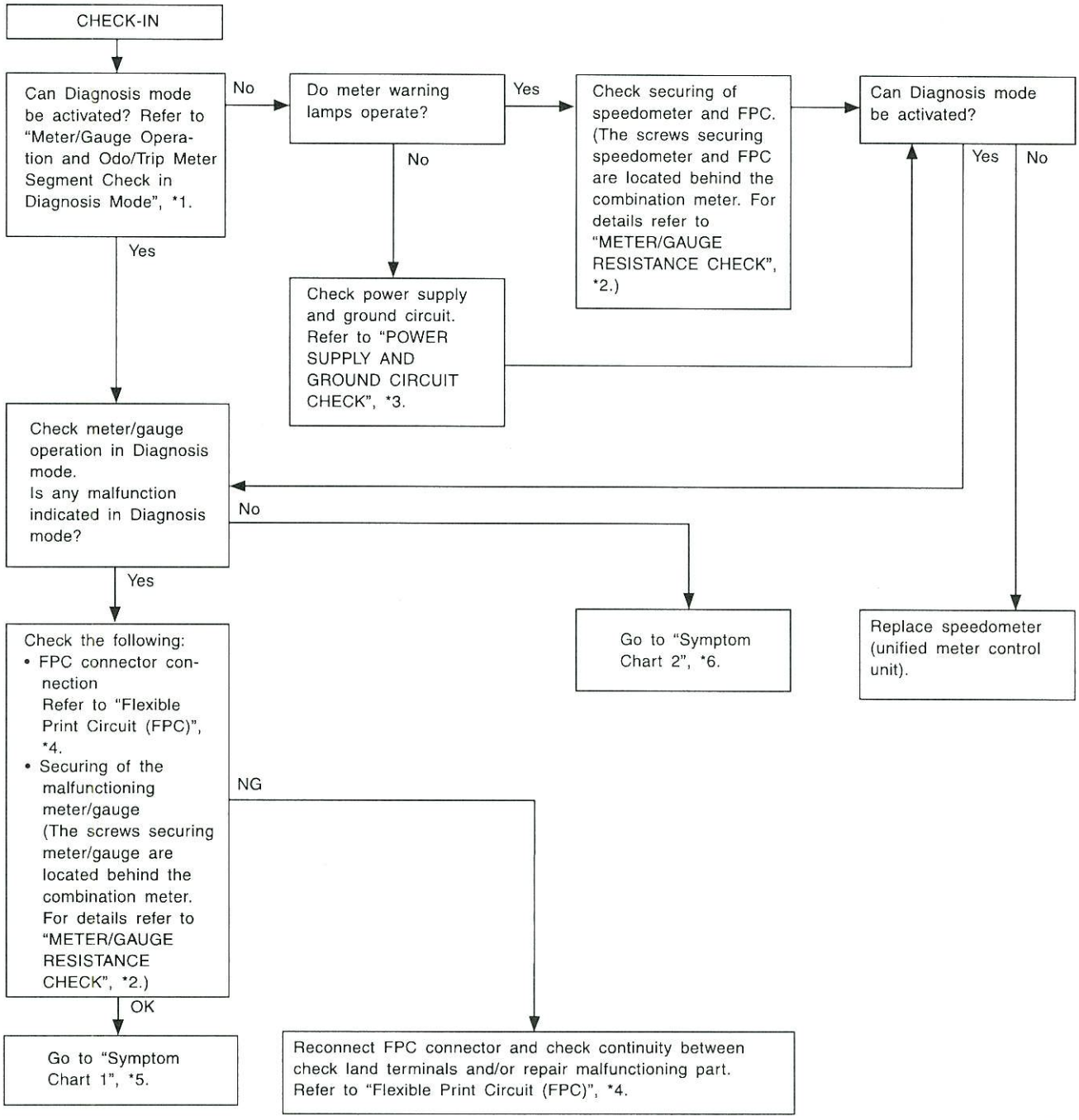
   Resistance: 0Ω
4. Close connector cover.

Trouble Diagnoses

PRELIMINARY CHECK

NBEL0046

NBEL0046S04



MEL474HA

*1: Meter/Gauge Operation and Odo/Trip Meter Segment Check in Diagnosis Mode (EL-83)

*2: METER/GAUGE RESISTANCE CHECK (EL-90)

*3: POWER SUPPLY AND GROUND CIRCUIT CHECK (EL-87)

*4: Flexible Print Circuit (FPC) (EL-84)

*5: Symptom Chart 1 (EL-86)

*6: Symptom Chart 2 (EL-86)

Trouble Diagnoses (Cont'd)

SYMPTOM CHART

NBEL0046S10

Symptom Chart 1 (Malfunction is Indicated in Diagnosis Mode)

NBEL0046S1001

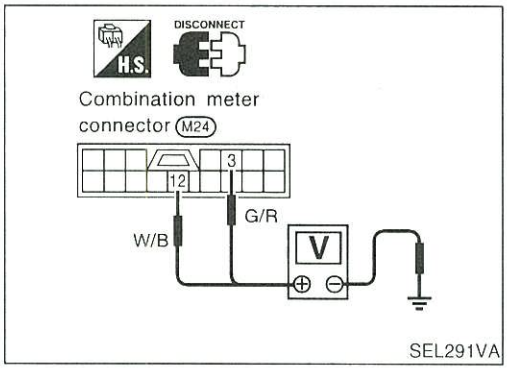
Symptom	Possible causes	Repair order
Speedometer and/or odo/trip meter indicate(s) malfunction in Diagnosis mode.	• Speedometer (Unified meter control unit)	• Replace speedometer (unified meter control unit).
Multiple meter/gauge indicate malfunction in Diagnosis mode.		
One of tachometer/fuel gauge/water temp. gauge indicates malfunction in Diagnosis mode.	• Meter/Gauge • Speedometer (Unified meter control unit)	1. Check resistance of meter/gauge indicating malfunction. If the resistance is NG, replace the meter/gauge. Refer to "METER/GAUGE RESISTANCE CHECK", EL-90. 2. If the resistance is OK, replace speedometer (unified meter control unit).

Symptom Chart 2 (No Malfunction is Indicated in Diagnosis Mode)

NBEL0046S1002

Symptom	Possible causes	Repair order
Speedometer and odo/trip meter are malfunctioning.	1. Sensor - Speedometer, Odo/Trip meter 2. FPC connector 3. Speedometer (Unified meter control unit)	1. Check vehicle speed sensor. INSPECTION/VEHICLE SPEED SENSOR (Refer to EL-88.) 2. Check FPC connector. Refer to "Flexible Print Circuit (FPC)", EL-84. 3. Replace speedometer (unified meter control unit).
Multiple meter/gauge are malfunctioning. (except speedometer, odo/trip meter)	1. FPC connector 2. Speedometer (Unified meter control unit)	1. Check FPC connector. Refer to "Flexible Print Circuit (FPC)", EL-84. 2. Replace speedometer (unified meter control unit).
One of tachometer/fuel gauge/water temp. gauge is malfunctioning.	1. Sensor/Engine revolution signal - Tachometer - Fuel gauge - Water temp. gauge 2. FPC connector 3. Speedometer (Unified meter control unit)	1. Check the sensor for malfunctioning meter/gauge. INSPECTION/ENGINE REVOLUTION SIGNAL (Refer to EL-88.) INSPECTION/FUEL TANK GAUGE UNIT (Refer to EL-89.) INSPECTION/THERMAL TRANSMITTER (Refer to EL-89.) 2. Check FPC connector. Refer to "Flexible Print Circuit (FPC)", EL-84. 3. Replace speedometer (unified meter control unit).

Before starting trouble diagnoses below, perform PRELIMINARY CHECK, EL-85.



POWER SUPPLY AND GROUND CIRCUIT CHECK

=NBEL0046S07

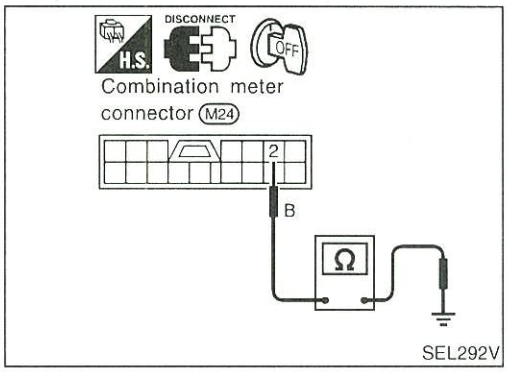
Power Supply Circuit Check

NBEL0046S0701

Terminals		Ignition switch position		
(+)	(–)	OFF	ACC	ON
3	Ground	Battery voltage	Battery voltage	Battery voltage
12	Ground	0V	0V	Battery voltage

If NG, check the following.

- 7.5A fuse [No. 24, located in fuse block (J/B)]
- 10A fuse [No. 8, located in fuse block (J/B)]
- Harness for open or short between fuse and combination meter



Ground Circuit Check

NBEL0046S0702

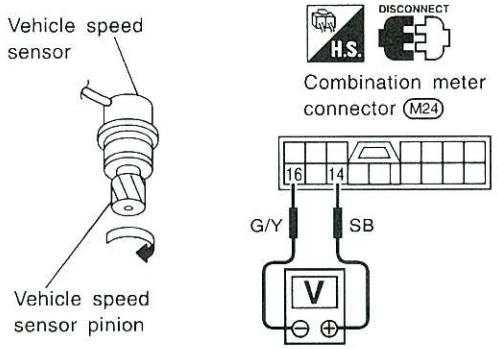
Terminals	Continuity
2 - Ground	Yes

INSPECTION/VEHICLE SPEED SENSOR

=NBEL0046S03

1	CHECK VEHICLE SPEED SENSOR OUTPUT

1. Remove vehicle speed sensor from transmission.
2. Check voltage between combination meter terminals 14 and 16 while quickly turning speed sensor pinion.



NOTE:
Vehicle speed sensor connector should remain connected.

SEL293V

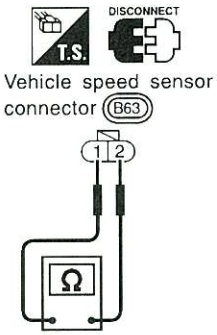
Voltage: Approx. 0.5V

OK or NG

OK	▶	Vehicle speed sensor is OK.
NG	▶	GO TO 2.

2	CHECK VEHICLE SPEED SENSOR

Check resistance between vehicle speed sensor terminals 1 and 2.



SEL344V

Resistance: Approx. 250Ω

OK or NG

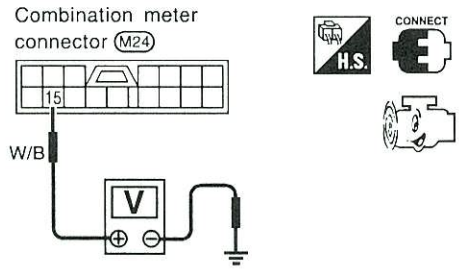
OK	▶	Check harness or connector between speedometer and vehicle speed sensor.
NG	▶	Replace vehicle speed sensor.

INSPECTION/ENGINE REVOLUTION SIGNAL

NBEL0046S02

1	CHECK ECM OUTPUT

1. Start engine.
2. Check voltage between combination meter terminals 15 and ground at idle and 2,000 rpm.



SEL294V

Higher rpm = Higher voltage
Lower rpm = Lower voltage
Voltage should change with rpm.

OK or NG

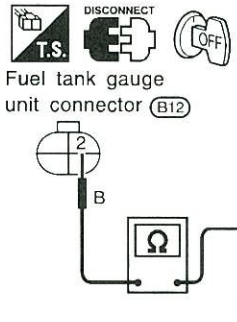
OK	▶	Engine revolution signal is OK.
NG	▶	Harness for open or short between ECM and combination meter

INSPECTION/FUEL TANK GAUGE UNIT

=NBEL0046S08

1	CHECK GROUND CIRCUIT FOR FUEL TANK GAUGE UNIT

Check harness continuity between fuel tank gauge unit terminal 2 and ground.



MEL839G

Does continuity exist?

Yes	▶	GO TO 2.
No	▶	Repair harness or connector.

2	CHECK GAUGE UNITS

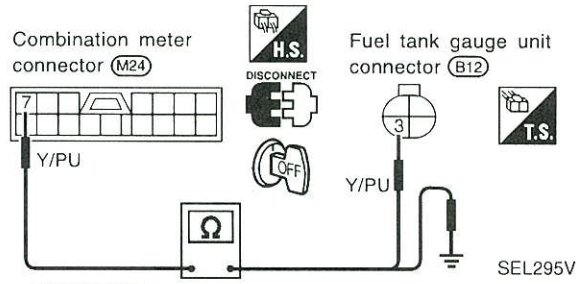
Refer to "FUEL TANK GAUGE UNIT CHECK" (EL-90).

OK or NG

OK	▶	GO TO 3.
NG	▶	Replace fuel tank gauge unit.

3	CHECK HARNESS FOR OPEN OR SHORT

1. Disconnect combination meter connector and fuel tank gauge unit connector.
2. Check continuity between combination meter terminal 7 and fuel tank gauge unit terminal 3.
3. Check continuity between combination meter terminal 7 and ground.



SEL295V

Continuity:

Combination meter terminal 7 and fuel tank gauge unit terminal 3

Yes

Combination meter terminal 7 and ground

No

OK or NG

OK	▶	Fuel tank gauge unit is OK.
NG	▶	Repair harness or connector.

INSPECTION/THERMAL TRANSMITTER

NBEL0046S09

1	CHECK THERMAL TRANSMITTER

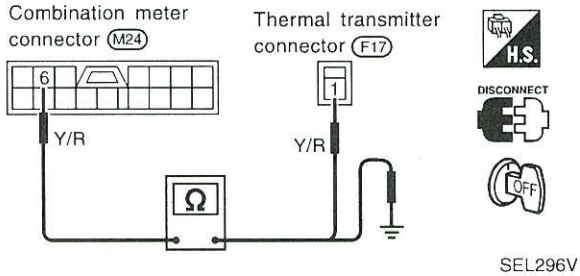
Refer to "THERMAL TRANSMITTER CHECK" (EL-91).

OK or NG

OK	▶	GO TO 2.
NG	▶	Replace.

2	CHECK HARNESS FOR OPEN OR SHORT

1. Disconnect combination meter connector and thermal transmitter connector.
2. Check continuity between combination meter terminal 6 and thermal transmitter terminal 1.
3. Check continuity between combination meter terminal 6 and ground.



SEL296V

Continuity:

Combination meter terminal 6 and thermal transmitter terminal 1

Yes

Combination meter terminal 6 and ground

No

OK or NG

OK	▶	Thermal transmitter is OK.
NG	▶	Repair harness or connector.

Electrical Components Inspection

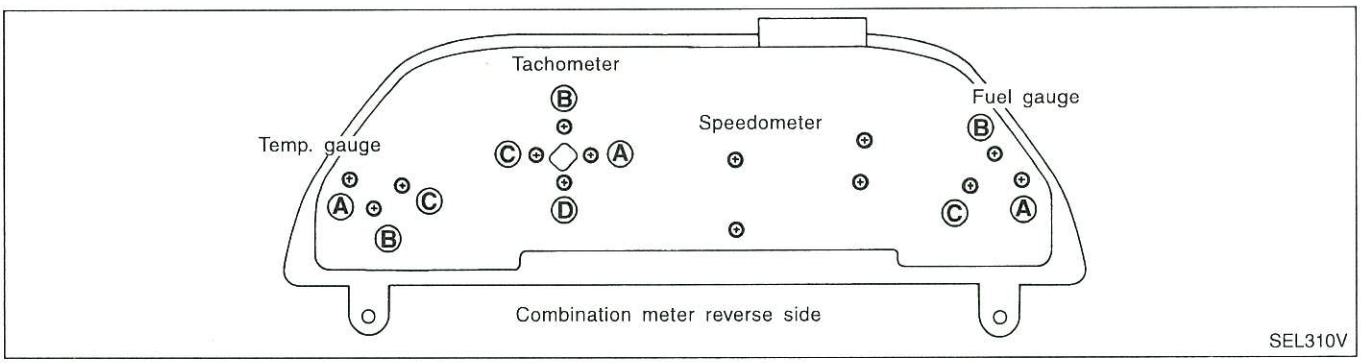
NBEL0047

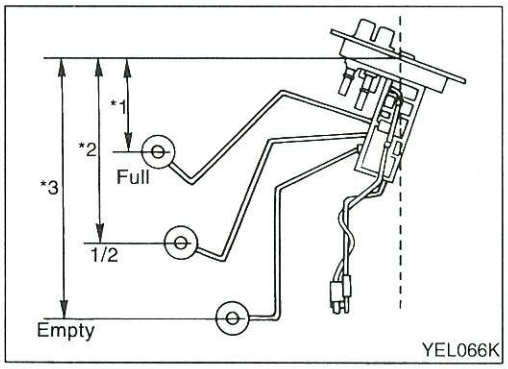
METER/GAUGE RESISTANCE CHECK

NBEL0047S04

1. Disconnect FPC connector. Refer to "Flexible Print Circuit (FPC)" (EL-84).
2. Check resistance between installation screws of meter/gauge.

Screws		Resistance Ω
Tachometer	Fuel/Temp. gauge	
A - C	A - C	Approx. 70 - Approx. 140
B - D	B - C	Approx. 90 - Approx. 170





FUEL TANK GAUGE UNIT CHECK

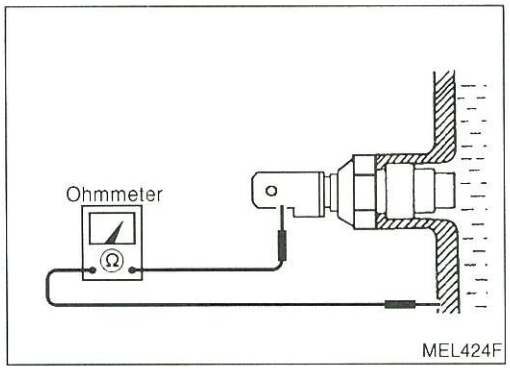
NBEL0047S01

- For removal, refer to FE section.

Check the resistance between terminals 3 and 2.

Ohmmeter		Float position mm (in)			Resistance value (Ω)
(+)	(−)				
3	2	*1	Full	95 (3.74)	Approx. 4 - 6
		*2	1/2	184 (7.24)	31 - 34
		*3	Empty	265 (10.43)	80 - 83

*1 and *3: When float rod is in contact with stopper.

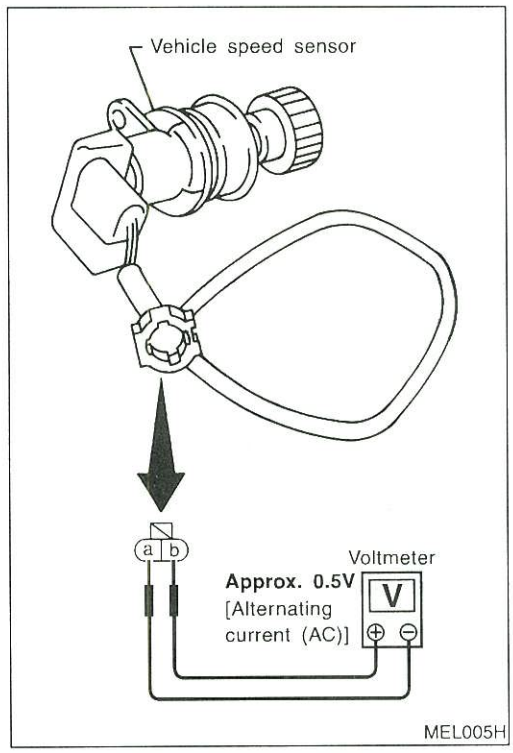


THERMAL TRANSMITTER CHECK

NBEL0047S02

Check the resistance between the terminals of thermal transmitter and body ground.

Water temperature	Resistance
60°C (140°F)	Approx. 170 - 210Ω
100°C (212°F)	Approx. 47 - 53Ω



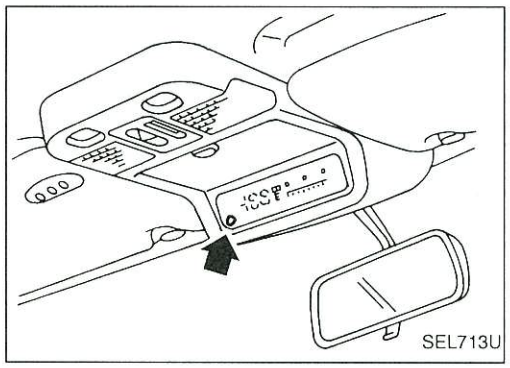
VEHICLE SPEED SENSOR SIGNAL CHECK

NBEL0047S03

1. Remove vehicle speed sensor from transmission.
2. Turn vehicle speed sensor pinion quickly and measure voltage across a and b.

System Description

NBEL0153



This unit displays following items:

- Earth magnetism and heading direction of vehicle.
- Outside air temperature.
- Caution for frozen road surfaces.

OUTSIDE TEMPERATURE DISPLAY

NBEL0153S01

Push the switch when the ignition key is in the "ACC" or "ON" position. The outside temperature will be displayed in "°F".

- Selecting the indication range
  Push the switch to change from "°F" to "°C".
- When the outside temperature drops below freezing point, ICE is displayed on the unit.
- When the outside temperature is between 55°C (130°F) and 70°C (158°F), the display shows 55°C (130°F).
- When the outside temperature is lower than −30°C (−20°F) or higher than 70°C (158°F), the display shows only "---" though it is operating. This is not a problem.
- The indicated temperature on the thermometer is not readily affected by engine heat. It changes only when one of the following conditions is present.

a) The temperature detected by the ambient air temperature sensor is lower than the indicated temperature on the thermometer.

b) The difference in temperature detected during a period of 40 seconds is less than 1°C (1.8°F) when vehicle speed has been greater than 24 km/h (15 MPH) for more than 100 seconds.
(This is to prevent the indicated temperature from being affected by engine heat or cooling fan operation during low-speed driving.)

c) The ignition key has been turned to the "OFF" position for more than 4 hours. (The engine is cold.)

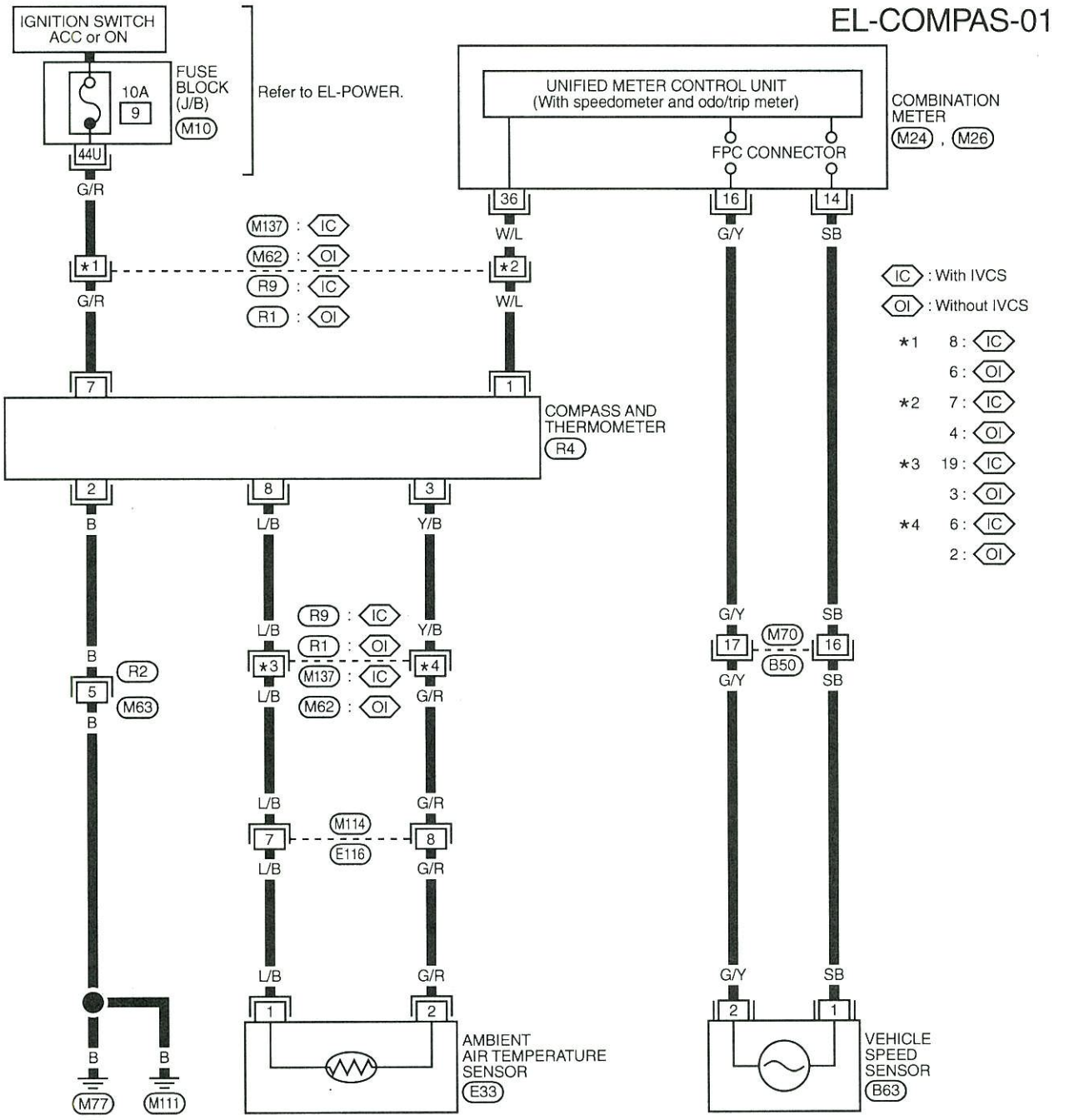
DIRECTION DISPLAY

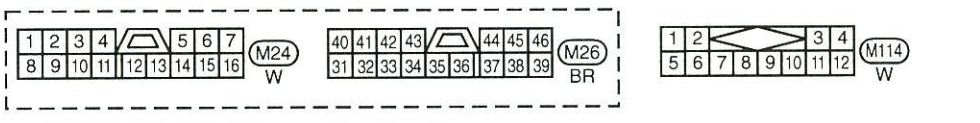
NBEL0153S02

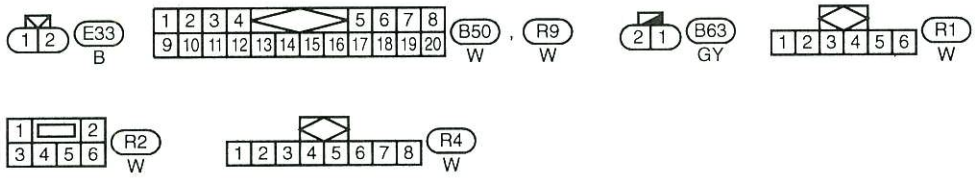
Push the switch when the ignition key is in the "ACC" or "ON" position. The direction will be displayed.

Wiring Diagram — COMPAS —

NBEL0154







Refer to last page (Foldout page).
M10

MEL771J

Trouble Diagnoses

NBEL0048

PRELIMINARY CHECK FOR THERMOMETER

NBEL0048S02

1	COOL DOWN CHECK
1. Turn the ignition key switch to the "ACC" position. 2. Cool down the ambient air temperature sensor with water or ice, so that the indicated temperature falls. **Does the indicated temperature fall?**	
Yes ▶	GO TO 2.
No ▶	The system is malfunctioning. Check the system following "INSPECTION/ COMPASS AND THERMOMETER".

2	WARM UP CHECK
1. Leave the vehicle for 10 minutes, so that the indicated temperature rises. 2. With the ignition key in the "ACC" position, disconnect and reconnect the ambient air temperature sensor connector. **Does the indicated temperature rise?**	
Yes ▶	The system is OK.
No ▶	The system is malfunctioning. Check the system following "INSPECTION/ COMPASS AND THERMOMETER".

NOTE:

- When the outside temperature is between 55°C (130°F) and 70°C (158°F), the display shows 55°C (130°F). When the outside temperature is lower than –30°C (–20°F) or higher than 70°C (158°F), the display shows only "---".
- The indicated temperature on the thermometer is not readily affected by engine heat. It changes only when one of the following conditions is present.

a) The temperature detected by the ambient air temperature sensor is lower than the indicated temperature on the thermometer.

b) The difference in temperature detected during a period of 40 seconds is less than 1°C (1.8°F) when vehicle speed has been greater than 24 km/h (15 MPH) for more than 100 seconds. (This is to prevent the indicated temperature from being affected by engine heat or cooling fan operation during low-speed driving.)

c) The ignition key has been turned to the "OFF" position for more than 4 hours. (The engine is cold.)

INSPECTION/COMPASS AND THERMOMETER

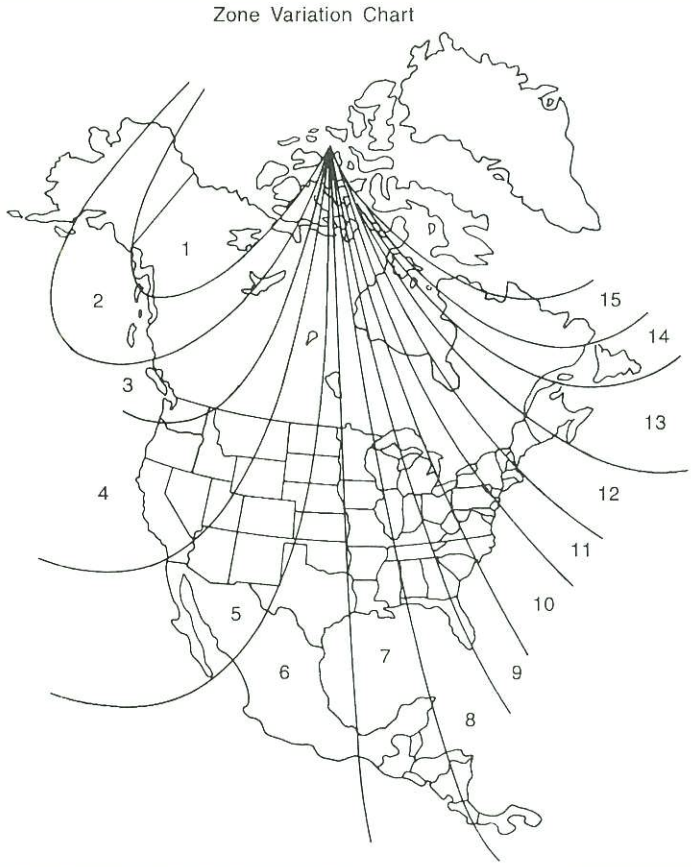
NBEL0048S01

Symptom	Possible causes	Repair order
No display at all	1. 10A fuse 2. Ground circuit 3. Compass and thermometer	1. Check 10A fuse [No. 9, located in fuse block (J/B)]. Turn the ignition switch ON and verify that battery positive voltage is at terminal 7 of compass and thermometer. 2. Check ground circuit for compass and thermometer. 3. Replace compass and thermometer.
Forward direction indication slips off the mark or incorrect.	1. In manual correction mode (Bar and display vanish.) 2. Zone variation change is not done.	1. Drive the vehicle and turn at an angle of 90°. 2. Perform the zone variation change.
Compass reading remains unchanged.	1. Vehicle speed sensor is not entered. 2. Compass and thermometer	1. Check harness for open or short between combination meter terminal 36 and compass and thermometer terminal 1. 2. Replace compass and thermometer.
Displays wrong temperature when ambient temperature is between –30°C (–20°F) and 55°C (130°F). (See NOTE above.)	1. Check operation 2. Ambient air temperature sensor circuit 3. Vehicle speed sensor is not entered. 4. Ambient air temperature sensor 5. Compass and thermometer	1. Perform preliminary check shown above. 2. Check harness for open or short between ambient air temperature sensor and compass and thermometer. 3. Check harness for open or short between combination meter terminal 36 and compass and thermometer terminal 1. 4. Replace ambient air temperature sensor. 5. Replace compass and thermometer.

Calibration Procedure for Compass

NBEL0155

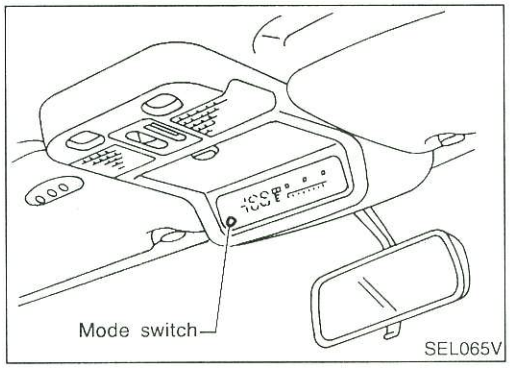
The difference between magnetic North and geographical North can sometimes be great enough to cause false compass readings. In order for the compass to operate accurately in a particular zone, it must be calibrated using the following procedure.



1. Determine your location on the zone map. Record your zone number.
2. Turn the ignition switch to ACC or ON position.
3. Push the "Mode" switch continuously for five seconds until the current zone entry number is displayed.
4. Press the "Mode" switch repeatedly until the desired zone number is displayed.

Once the desired zone number is displayed, stop pressing the "Mode" switch and the display will show compass direction after a few seconds.

SEL738UA



CORRECTION FUNCTIONS OF COMPASS

NBEL0155S01

The direction display is equipped with automatic correction function. If the direction is not shown correctly, carry out initial correction.

INITIAL CORRECTION PROCEDURE FOR COMPASS

NBEL0155S02

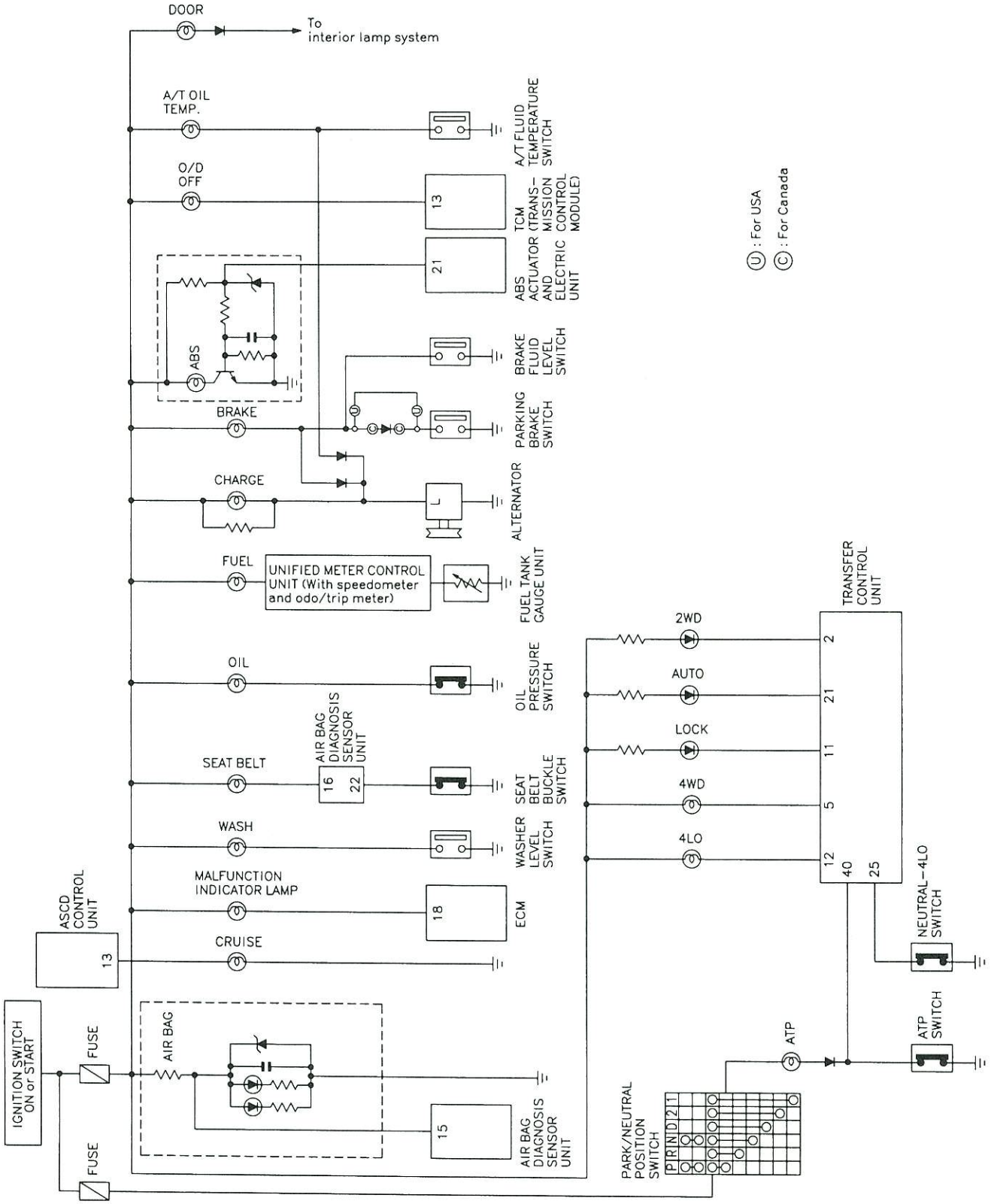
1. Pushing the "Mode" switch for about 10 seconds will enter the initial correction mode. The direction bar starts blinking.
2. Turn the vehicle slowly in an open, safe place. The initial correction is completed in one or two turns.

NOTE:

In places where the terrestrial magnetism is extremely disturbed, the initial correction may start automatically.

Schematic

NBEL0049

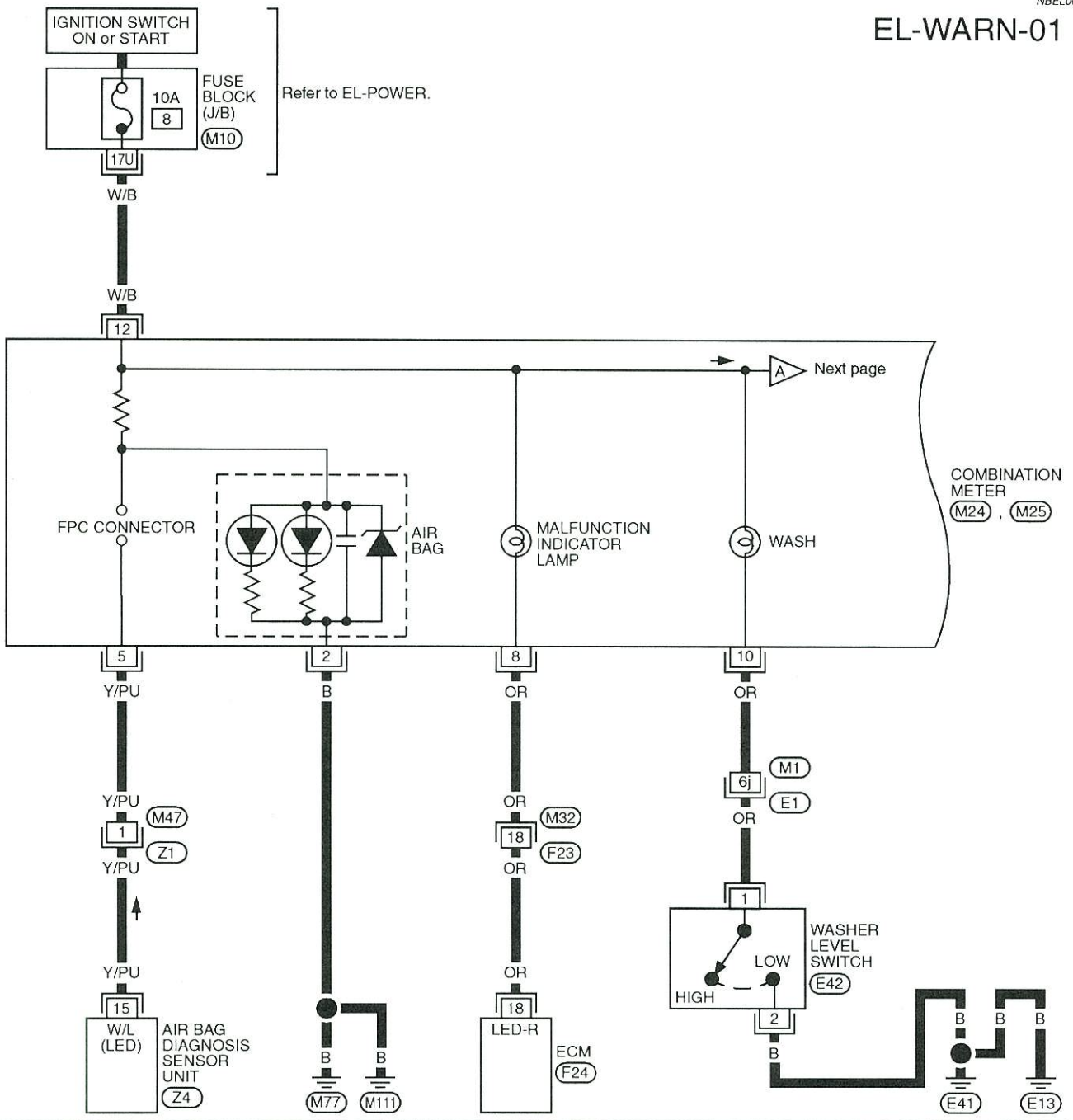


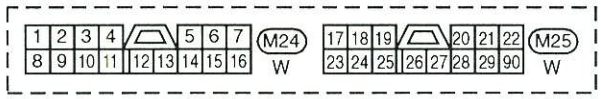
MEL772J

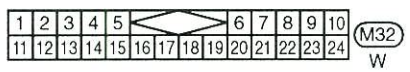
Wiring Diagram — WARN —

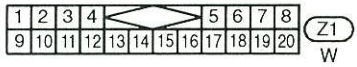
NBEL0050

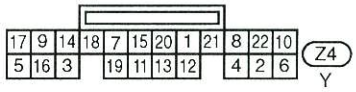
EL-WARN-01











Refer to last page (Foldout page).

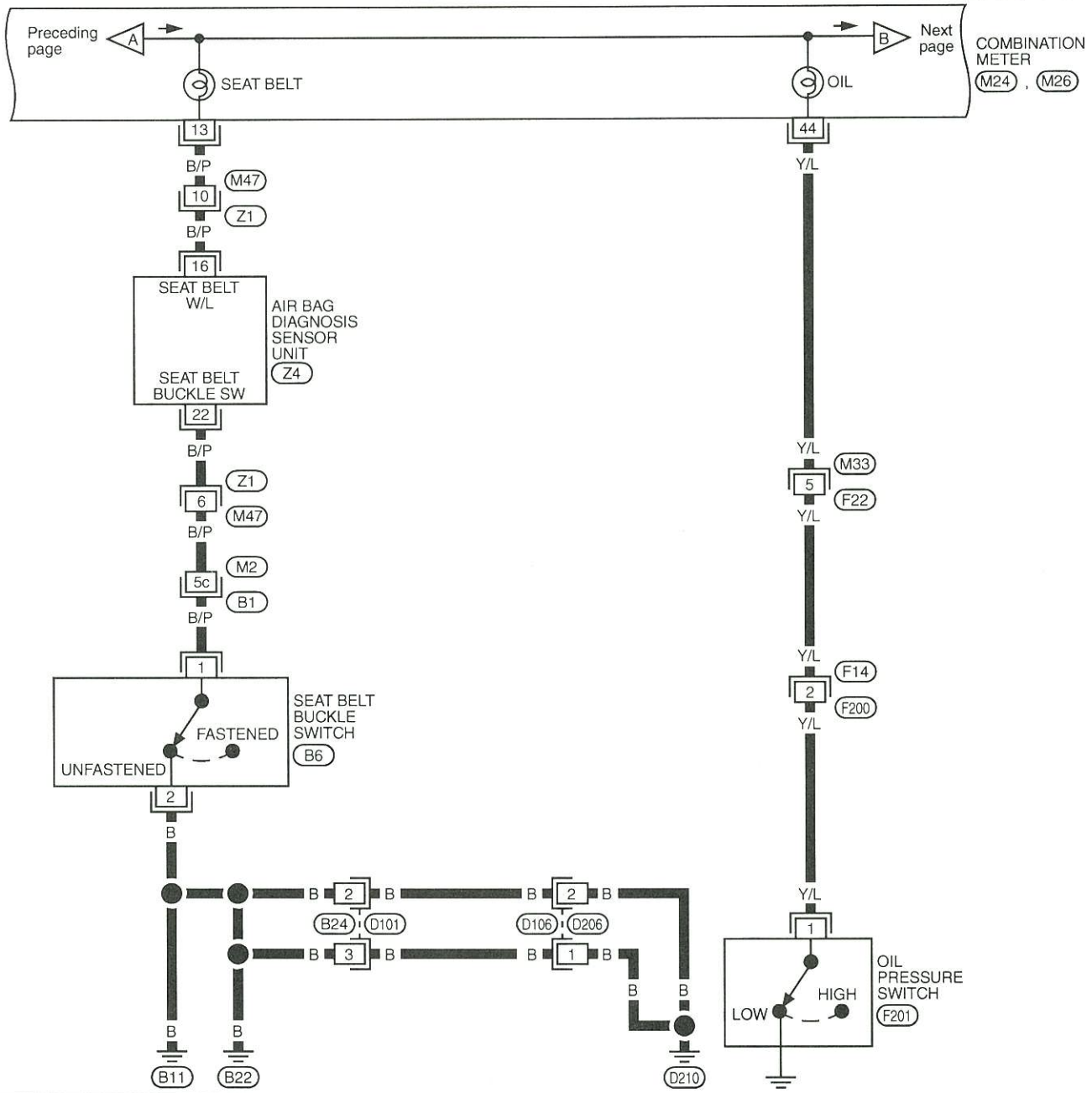
M1 , E1

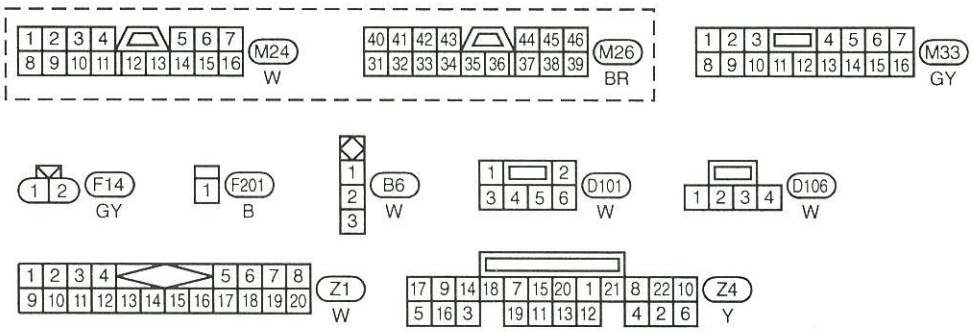
M10

F24

MEL773J

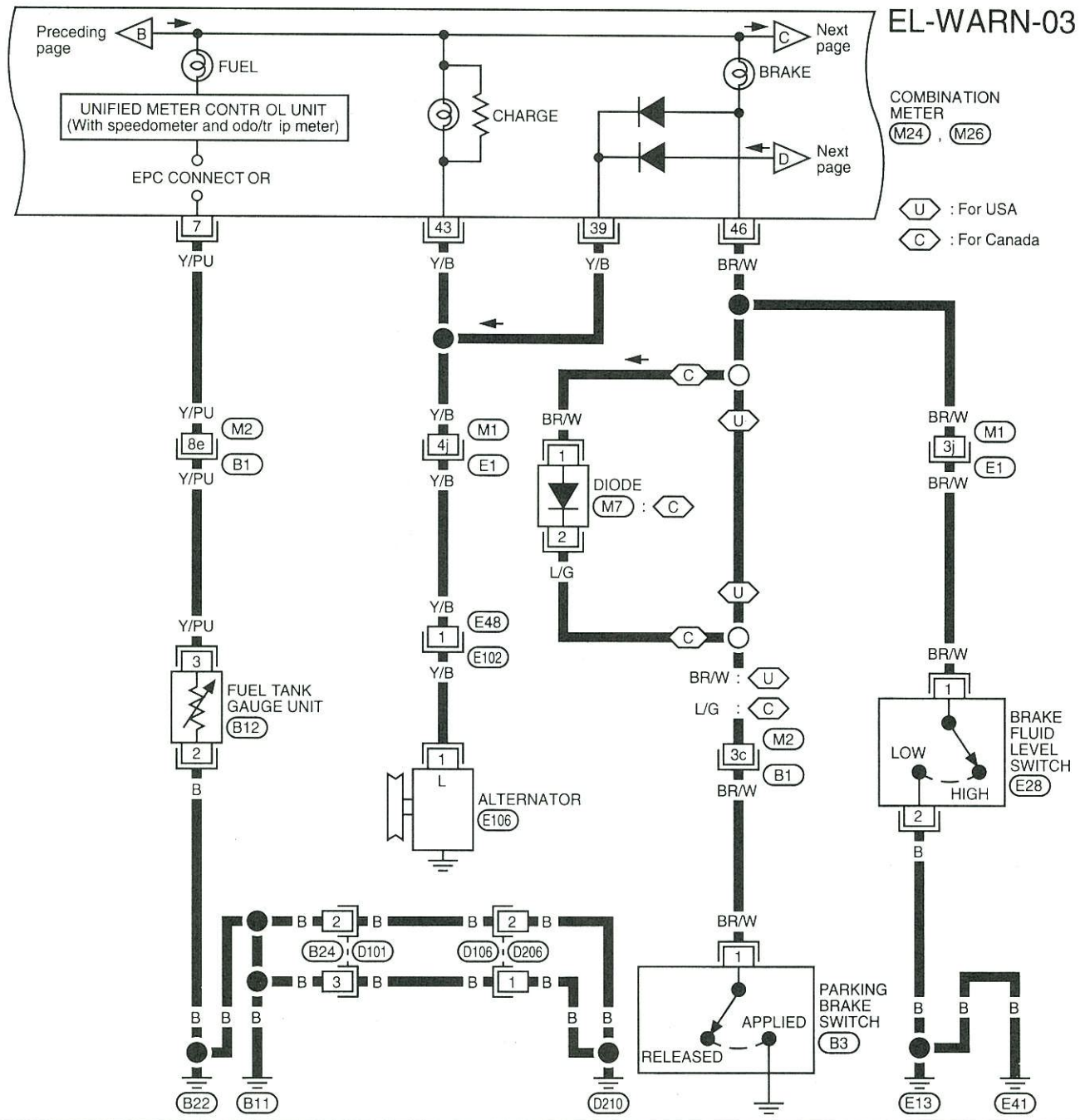
EL-WARN-02

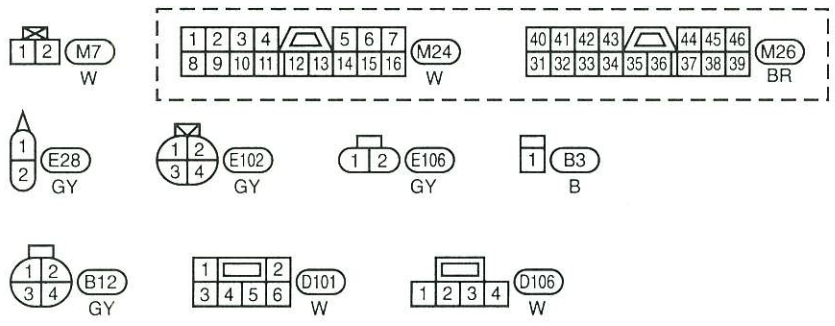




Refer to last page (Foldout page).
M2 , B1

MEL774J





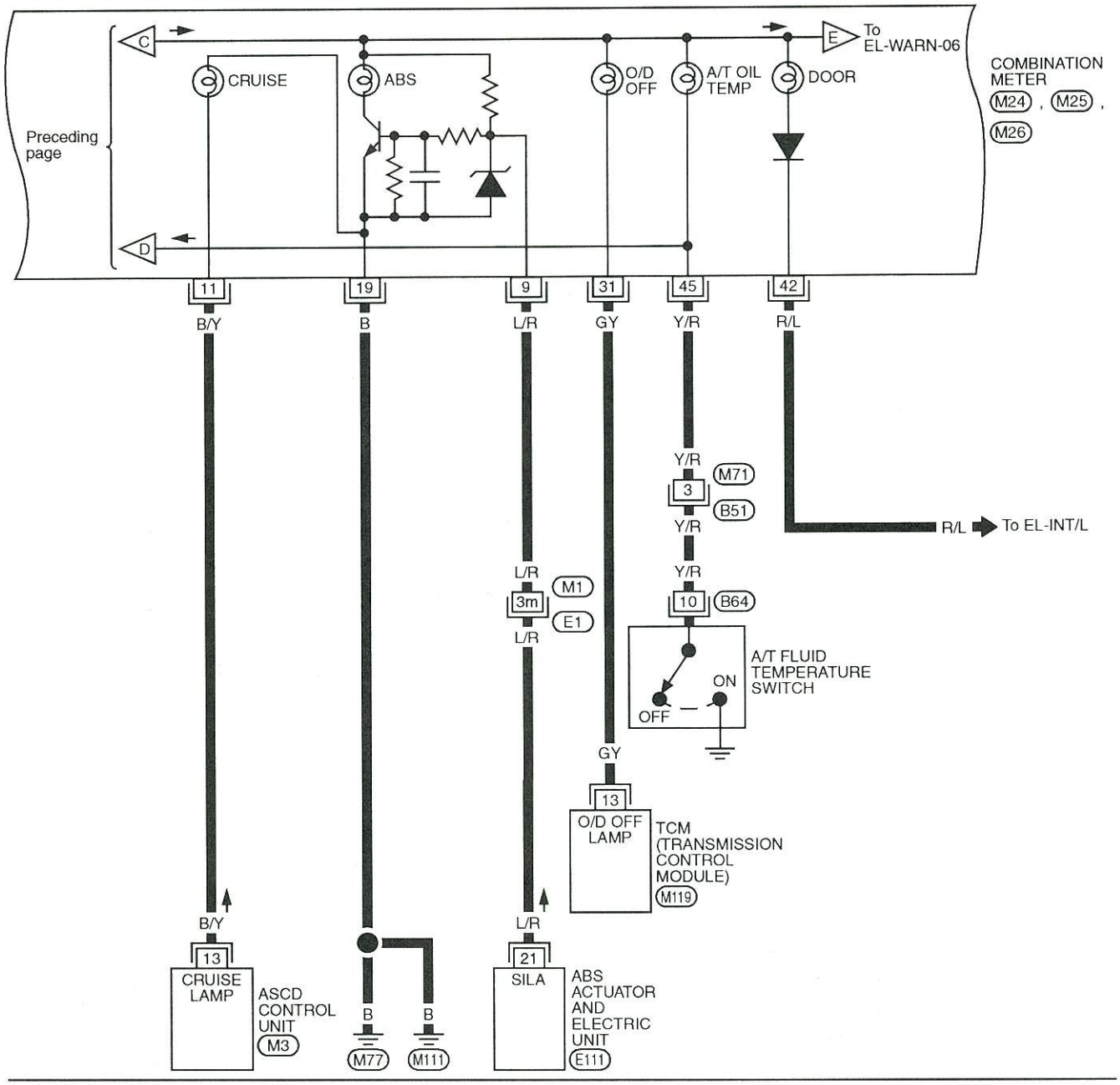
Refer to last page (Foldout page).

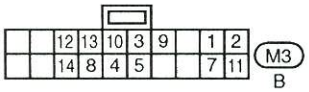
M1 , E1

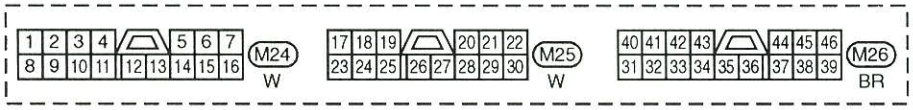
M2 , B1

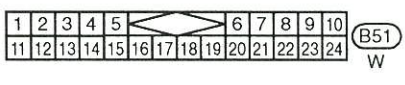
MEL775J

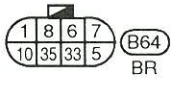
EL-WARN-04

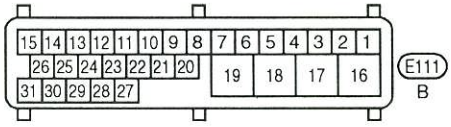












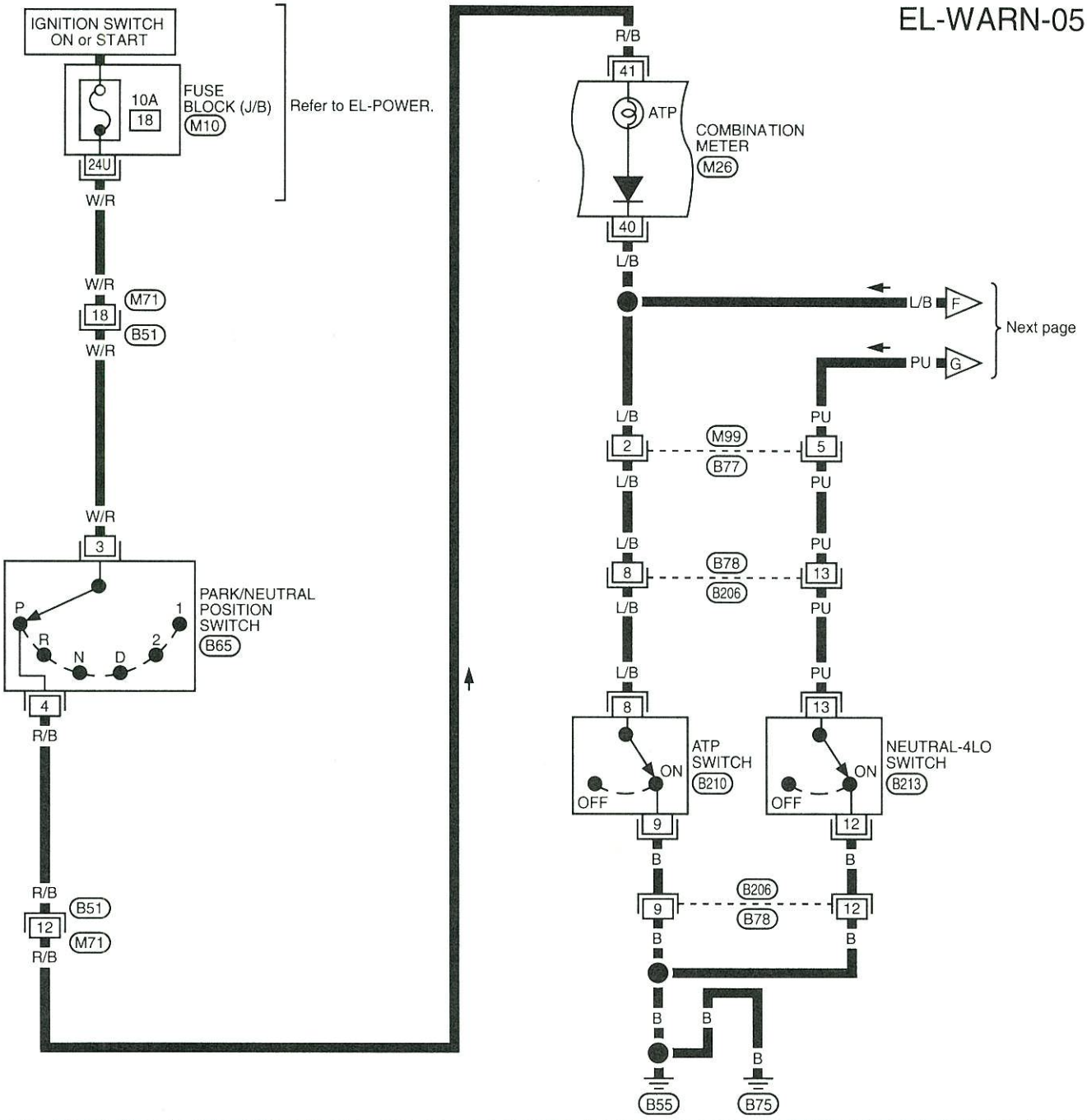
Refer to last page (Foldout page).

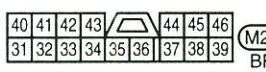
M1 , E1

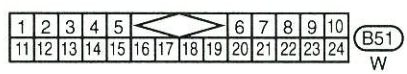
M119

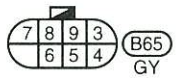
MEL776J

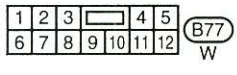
EL-WARN-05

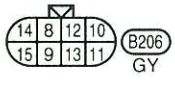


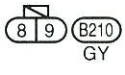


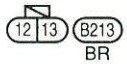








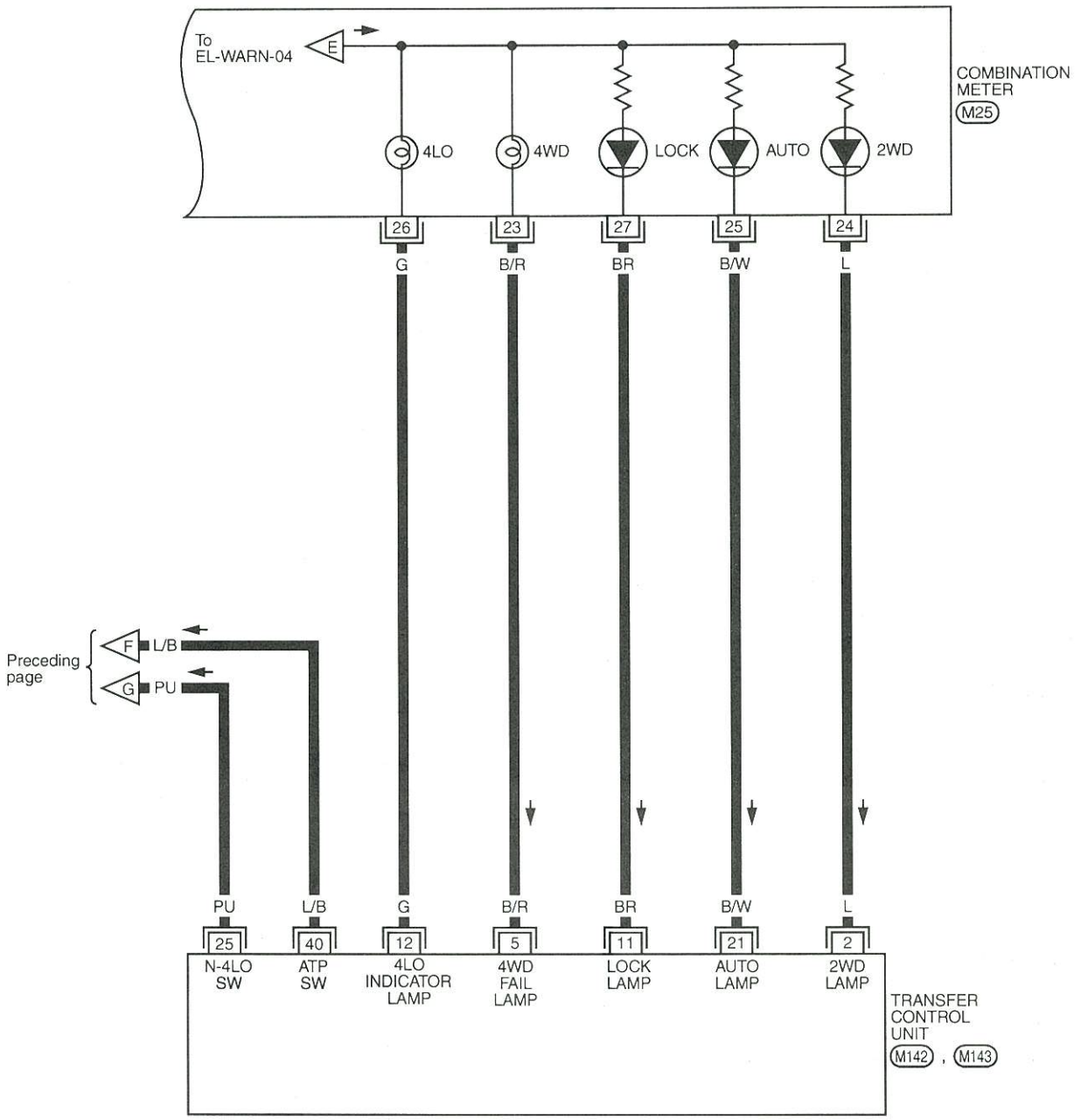


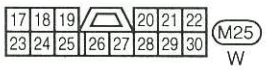


Refer to last page (Foldout page).
M10

MEL777J

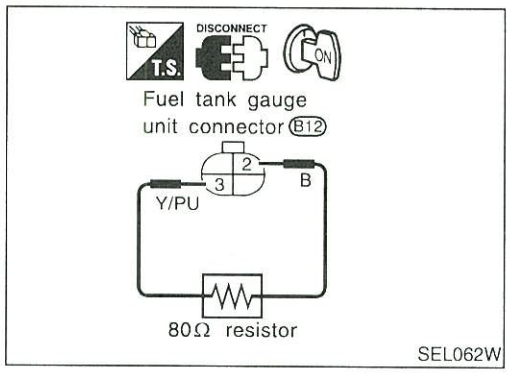
EL-WARN-06





Refer to last page (Foldout page).
M142 , M143

MEL778J



Fuel Warning Lamp Sensor Check

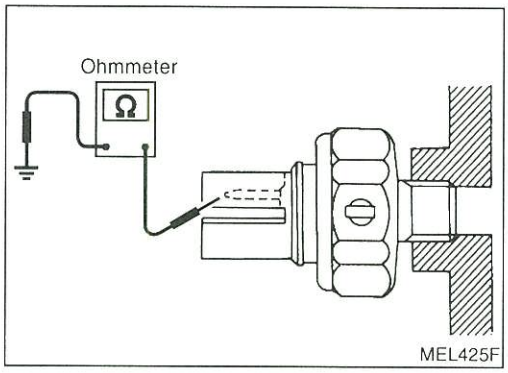
NBEL0166

1. Turn ignition switch "OFF".
2. Disconnect fuel tank gauge unit harness connector B12.
3. Connect a resistor (80Ω) between fuel tank gauge unit harness connector terminals 2 and 3.
4. Turn ignition switch "ON".

The fuel warning lamp should come on.

NOTE:

ECM might store the 1st trip DTC P0180 during this inspection.
If the DTC is stored in ECM memory, erase the DTC after reconnecting fuel tank gauge unit harness connector.
Refer to "HOW TO ERASE EMISSION-RELATED DIAGNOSTIC INFORMATION" "Emission-related Diagnostic Information" "ON BOARD DIAGNOSTIC SYSTEM DESCRIPTION" in EC section.



Electrical Components Inspection

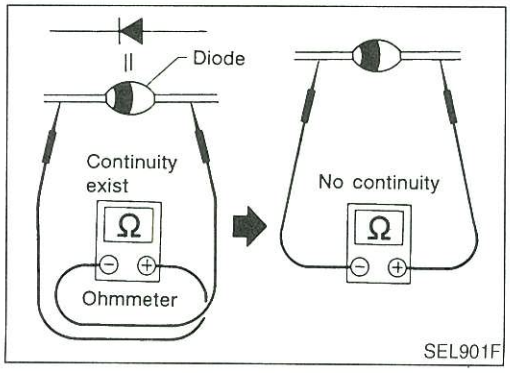
NBEL0051

OIL PRESSURE SWITCH CHECK

NBEL0051S02

	Oil pressure kPa (kg/cm^2, psi)	Continuity
Engine start	More than 10 - 20 (0.1 - 0.2, 1 - 3)	NO
Engine stop	Less than 10 - 20 (0.1 - 0.2, 1 - 3)	YES

Check the continuity between the terminals of oil pressure switch and body ground.



DIODE CHECK

NBEL0051S03

- Check continuity using an ohmmeter.
- Diode is functioning properly if test results are as shown in the figure at left.

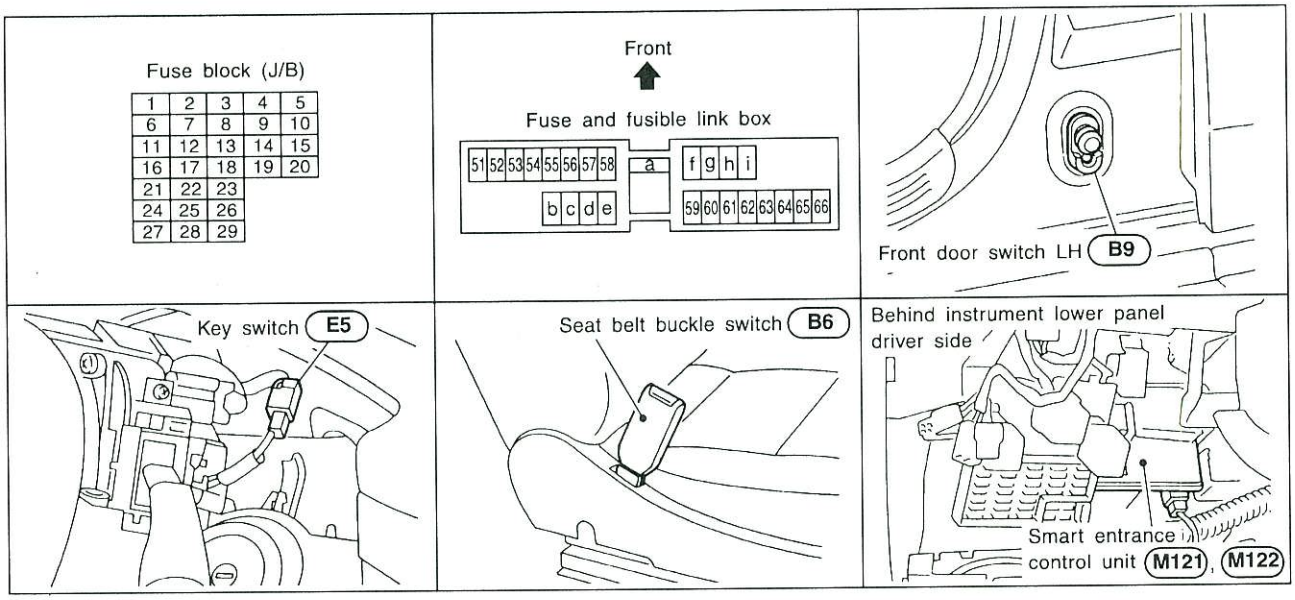
NOTE:

Specification may vary depending on the type of tester. Before performing this inspection, be sure to refer to the instruction manual for the tester to be used.

- Diodes for warning lamps are built into the combination meter printed circuit.
- For location of diodes, refer to Combination Meter, EL-80.

Component Parts and Harness Connector Location

NBEL0052



SEL046W

System Description

NBEL0053

The warning chime is controlled by the smart entrance control unit.
The warning chime is located in the smart entrance control unit.
Power is supplied at all times

- through 7.5A fuse [No. 24, located in the fuse block (J/B)]
- to key switch terminal 2.

Power is supplied at all times

- through 10A fuse [No. 61, located in the fuse block (J/B)]
- to tail lamp relay terminals 2 and 3.

Power is supplied at all times

- through 40A fusible link (letter **f**, located in the fuse and fusible link box).
- to smart entrance control unit terminal 11.

With the ignition switch in the ON or START position, power is supplied

- through 7.5A fuse [No. 11, located in the fuse block (J/B)]
- to smart entrance control unit terminal 33.

Ground is supplied to smart entrance control unit terminal 16 through body grounds M77 and M111.

IGNITION KEY WARNING CHIME

NBEL0053S01

With the key in the ignition switch in the OFF or ACC position, and the driver's door open, the warning chime will sound. A battery positive voltage is supplied

- from key switch terminal 1
- to smart entrance control unit terminal 32.

Ground is supplied

- from front door switch LH terminal 1
- to smart entrance control unit terminal 29.

Front door switch LH terminal 2 is grounded through body grounds B11, B22 and D210.

LIGHT WARNING CHIME

NBEL0053S02

With ignition switch OFF or ACC, driver's door open, warning chime will sound. [Except when headlamp battery saver control operates (for 45 seconds after ignition switch is turned to OFF or ACC position) and headlamps do not illuminate.] A battery positive voltage is supplied.

- from tail lamp relay terminal 5

- to smart entrance control unit terminal 34.

Ground is supplied

- from front door switch LH terminal 1
- to smart entrance control unit terminal 29.

Front door switch LH terminal 2 is grounded through body grounds B11, B22 and D210.

SEAT BELT WARNING CHIME

NBEL0053S03

With ignition switch turned ON and seat belt unfastened (seat belt switch ON), warning chime will sound for approximately 6 seconds.

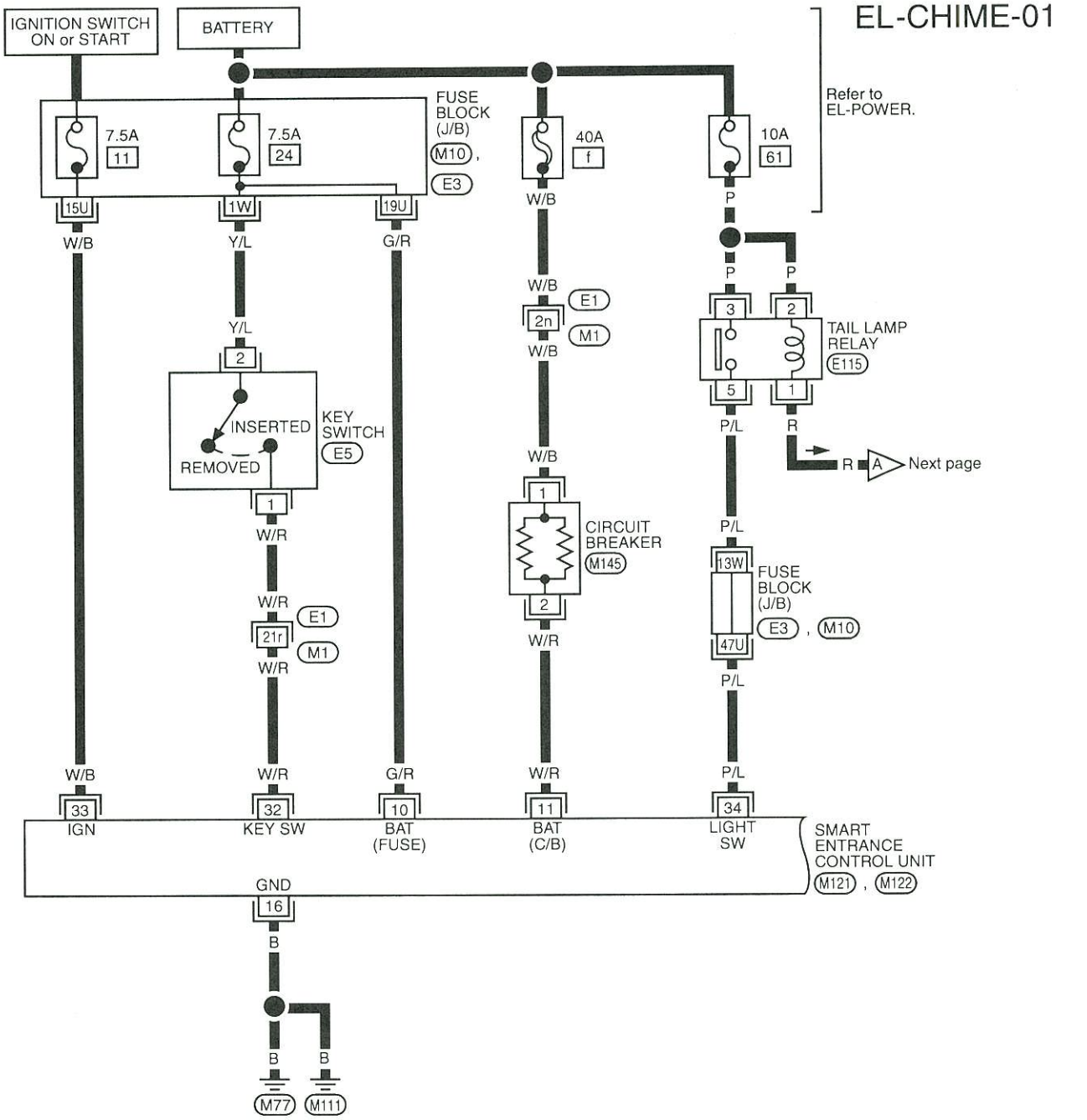
Ground is supplied

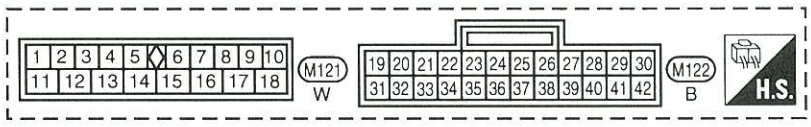
- from seat belt switch terminal 1
- to smart entrance control unit terminal 22.

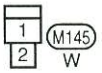
Seat belt switch terminal 2 is grounded through body grounds B11, B22 and D210.

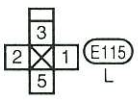
Wiring Diagram — CHIME —

NBEL0054









Refer to last page (Foldout page).

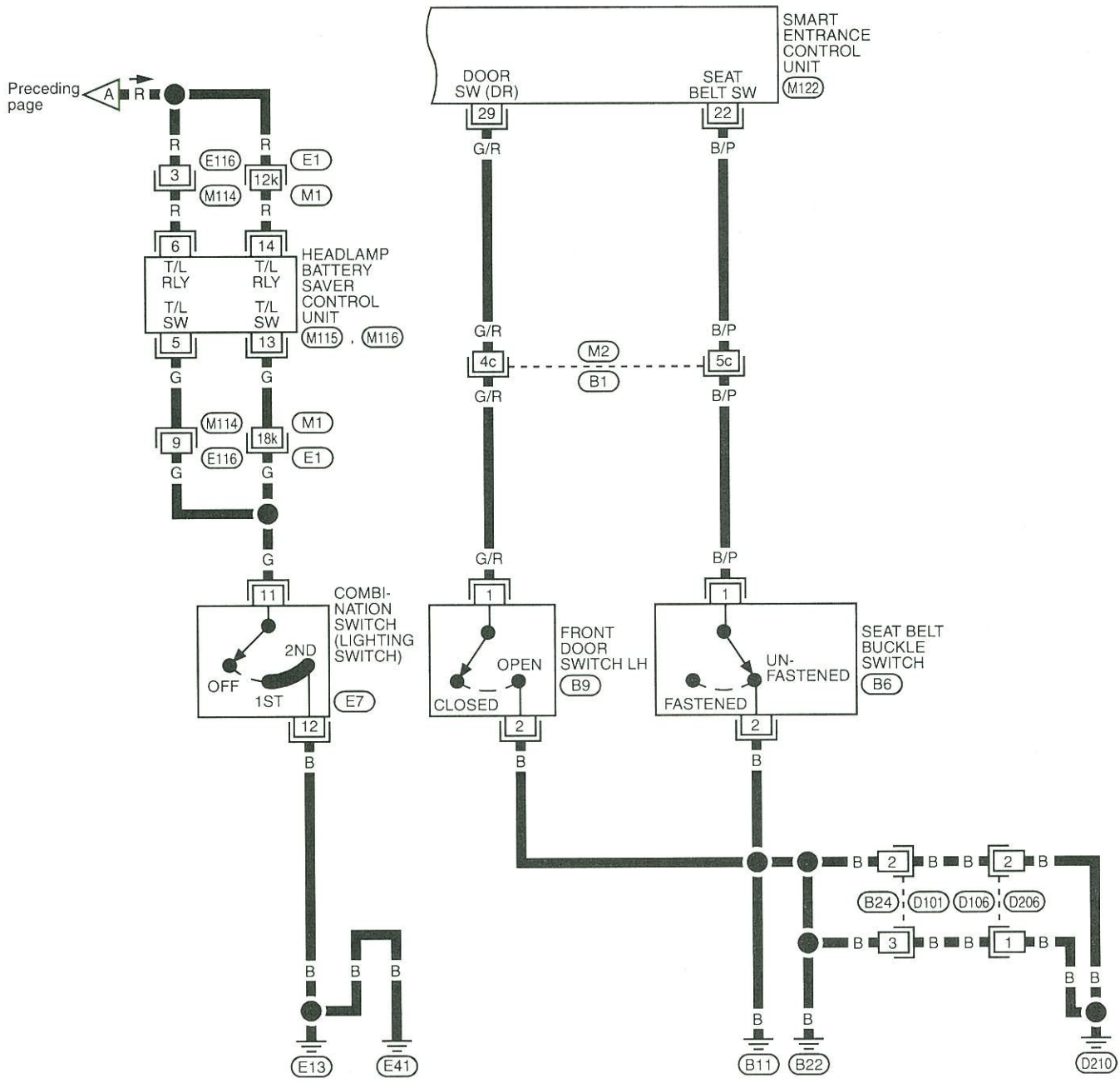
M1, E1

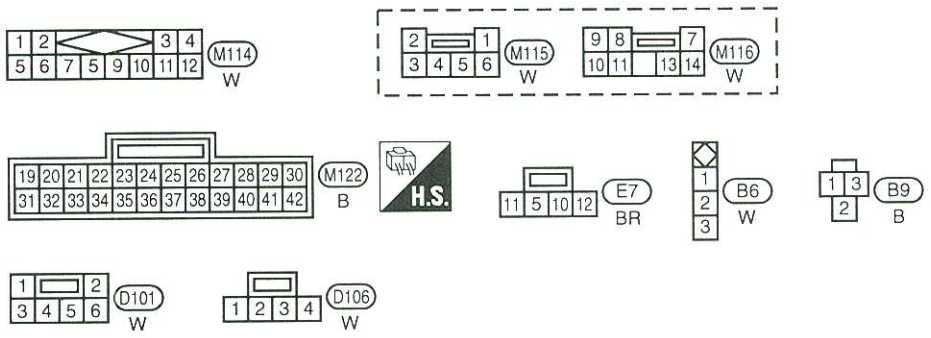
M10

E3

MEL779J

EL-CHIME-02





Refer to last page (Foldout page).

M1 , E1

M2 , B1

MEL780J

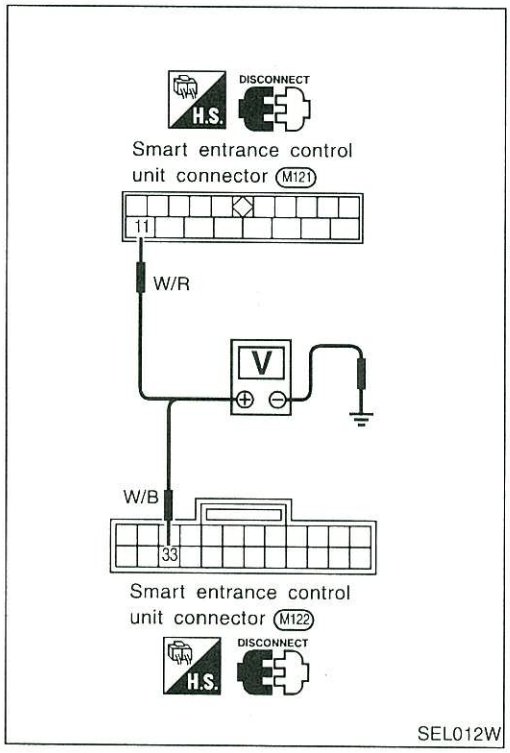
Trouble Diagnoses

SYMPTOM CHART

NBEL0055

NBEL0055S01

REFERENCE PAGE (EL-)	108	110	111	112	112
SYMPTOM	POWER SUPPLY AND GROUND CIRCUIT CHECK	LIGHTING SWITCH INPUT SIGNAL CHECK	KEY SWITCH (INSERT) CHECK	SEAT BELT BUCKLE SWITCH CHECK	DRIVER SIDE DOOR SWITCH CHECK
Light warning chime does not activate.	X	X			X
Ignition key warning chime does not activate.	X		X		X
Seat belt warning chime does not activate.	X			X	
All warning chimes do not activate.	X				X



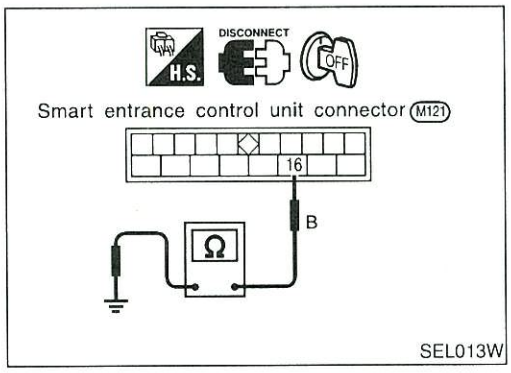
POWER SUPPLY AND GROUND CIRCUIT CHECK

NBEL0055S02

Power Supply Circuit Check

NBEL0055S0201

Terminals		Ignition switch position		
(+)	(−)	OFF	ACC	ON
11	Ground	Battery voltage	Battery voltage	Battery voltage
33	Ground	0V	0V	Battery voltage



Ground Circuit Check

NBEL0055S0202

Terminals	Continuity
16 - Ground	Yes

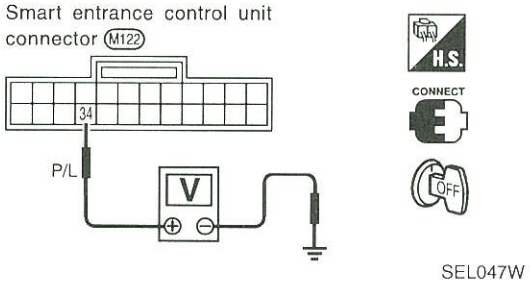
LIGHTING SWITCH INPUT SIGNAL CHECK

=NBEL0055S03

1 CHECK LIGHTING SWITCH INPUT SIGNAL

Check voltage between smart entrance control unit terminal 34 and ground.

Smart entrance control unit connector (M122)



SEL047W

Voltage [V]:

Condition of lighting switch: 1ST or 2ND

Approx. 12

Condition of lighting switch: OFF

0

OK or NG

OK	▶	Lighting switch is OK.
NG	▶	GO TO 2.

2 CHECK FUSE

Is 10A fuse (No. 61, located in the fuse and fusible link box) OK?

OK or NG

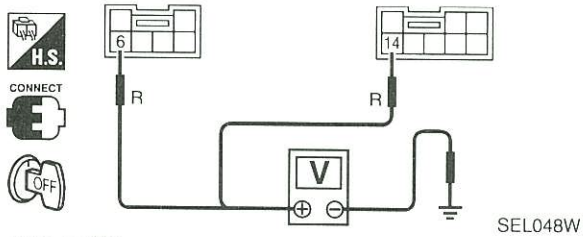
OK	▶	GO TO 3.
NG	▶	Replace fuse.

3 CHECK TAIL LAMP RELAY CIRCUIT

Check voltage between headlamp battery saver control unit terminal 6, 14 and ground.

Headlamp battery saver control unit connector (M115)

Headlamp battery saver control unit connector (M116)



SEL048W

Voltage [V]:

Condition of lighting switch: 1ST or 2ND

0

Condition of lighting switch: OFF

Approx. 12

OK or NG

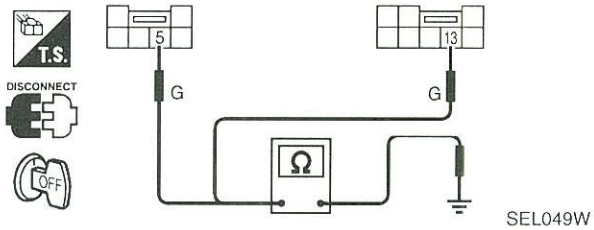
OK	▶	GO TO 4.
NG	▶	**Check the following.** • Tail lamp relay • Harness for open or short between headlamp battery saver control unit and tail lamp relay

4 CHECK TAIL LAMP SWITCH GROUND CIRCUIT

1. Disconnect headlamp battery saver control unit connector.
2. Check continuity between headlamp battery saver control unit terminal 5, 13 and ground.

Headlamp battery saver control unit connector (M115)

Headlamp battery saver control unit connector (M116)



SEL049W

Continuity:

Condition of lighting switch: 1ST or 2ND

Yes

Condition of lighting switch: OFF

No

OK or NG

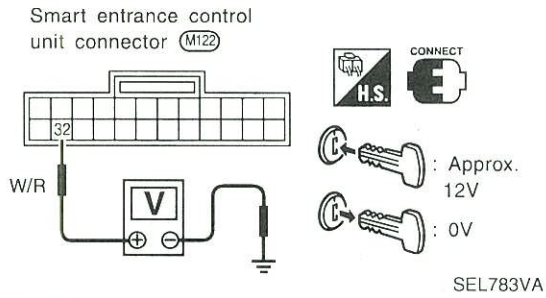
OK	▶	**Check the following.** • Harness for open or short between smart entrance control unit and tail lamp relay
NG	▶	**Check the following.** • Lighting switch • Harness for open or short between headlamp battery saver control unit terminal 5, 13 and lighting switch terminal 11 • Harness between lighting switch terminal 12 and ground

KEY SWITCH (INSERT) CHECK

NBEL0055S04

1	CHECK KEY SWITCH INPUT SIGNAL

Check voltage between control unit terminal 32 and ground.



SEL783VA

Voltage [V]:

Condition of key switch: Key is inserted.

Approx. 12

Condition of key switch: Key is removed.

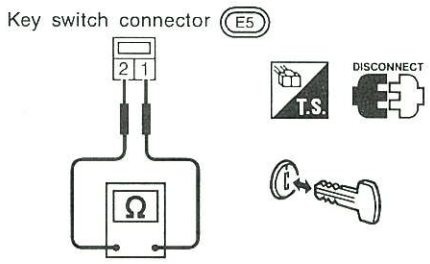
0

OK or NG

OK	▶	Key switch is OK.
NG	▶	GO TO 2.

2	CHECK KEY SWITCH (INSERT)

Check continuity between terminals 1 and 2.



SEL784VA

Continuity:

Condition of key switch: Key is inserted.

Yes

Condition of key switch: Key is removed.

No

OK or NG

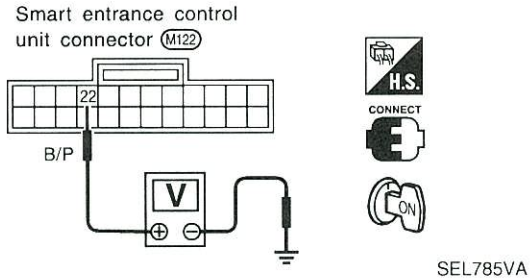
OK	▶	**Check the following.** • 7.5A fuse [No. 24, located in fuse block (J/B)] • Harness for open or short between key switch and fuse • Harness for open or short between control unit and key switch
NG	▶	Replace key switch.

SEAT BELT BUCKLE SWITCH CHECK

=NBEL0055S05

1 CHECK SEAT BELT BUCKLE SWITCH INPUT SIGNAL

1. Turn ignition switch "ON".
2. Check voltage between control unit terminal 22 and ground.



SEL785VA

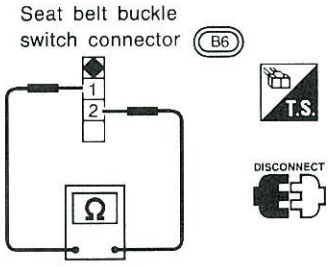
Voltage [V]:
Condition of seat belt buckle switch: Fastened
Approx. 12
Condition of seat belt buckle switch: Unfastened
0

OK or NG

OK	▶	Seat belt buckle switch is OK.
NG	▶	GO TO 2.

2 CHECK SEAT BELT BUCKLE SWITCH

Check continuity between terminals 1 and 2 when seat belt is fastened and unfastened.



SEL298V

Continuity:
Seat belt is fastened.
No
Seat belt is unfastened.
Yes

OK or NG

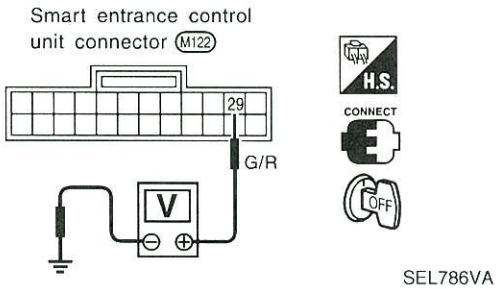
OK	▶	**Check the following.** • Seat belt buckle switch ground circuit • Harness for open or short between control unit and seat belt buckle switch
NG	▶	Replace seat belt buckle switch.

DRIVER SIDE DOOR SWITCH CHECK

NBEL0055S06

1 CHECK DOOR SWITCH INPUT SIGNAL

Check voltage between control unit terminal 29 and ground.



SEL786VA

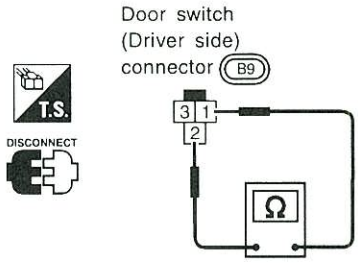
Voltage [V]:
Condition of driver's door: CLOSED
Approx. 5
Condition of driver's door: OPENED
0

OK or NG

OK	▶	Driver side door switch is OK.
NG	▶	GO TO 2.

2 CHECK DRIVER SIDE DOOR SWITCH

Check continuity between terminals 1 and 2.



SEL050W

Continuity:
Door switch is pushed.
No
Door switch is released.
Yes

OK or NG

OK	▶	**Check the following.** • Door switch ground circuit • Harness for open or short between control unit and door switch
NG	▶	Replace driver side door switch.

System Description

NBEL0057

WIPER OPERATION

NBEL0057S01

The wiper switch is controlled by a lever built into the combination switch.
There are three wiper switch positions:

- LO speed
- HI speed
- INT (Intermittent)

With the ignition switch in the ACC or ON position, power is supplied

- through 20A fuse [No. 19, located in the fuse block (J/B)]
- to wiper motor terminal 6.

Low and High Speed Wiper Operation

NBEL0057S0101

Ground is supplied to wiper switch terminal 17 through body grounds E13 and E41.
When the wiper switch is placed in the LO position, ground is supplied

- through terminal 14 of the wiper switch
- to wiper motor terminal 2.

With power and ground supplied, the wiper motor operates at low speed.
When the wiper switch is placed in the HI position, ground is supplied

- through terminal 16 of the wiper switch
- to wiper motor terminal 1.

With power and ground supplied, the wiper motor operates at high speed.

Auto Stop Operation

NBEL0057S0102

With wiper switch turned OFF, wiper motor will continue to operate until wiper arms reach windshield base.
When wiper arms are not located at base of windshield with wiper switch OFF, ground is provided

- from terminal 14 of the wiper switch
- to wiper motor terminal 2, in order to continue wiper motor operation at low speed.

Ground is also supplied

- through terminal 13 of the wiper switch
- to wiper amplifier terminal 2
- through terminal 7 of the wiper amplifier
- to wiper motor terminal 5
- through terminal 4 of the wiper motor, and
- through body grounds M77 and M111.

When wiper arms reach base of windshield, wiper motor terminals 5 and 6 are connected instead of terminals 4 and 5. Wiper motor will then stop wiper arms at the PARK position.

Intermittent Operation

NBEL0057S0103

The wiper motor operates the wiper arms one time at low speed at a set interval of approximately 3 to 13 seconds. This feature is controlled by the wiper amplifier.
When the wiper switch is placed in the INT position, ground is supplied

- to wiper amplifier terminal 1
- from wiper switch terminal 15
- through body grounds E13 and E41.
- to wiper motor terminal 2
- through the wiper switch terminal 14
- to wiper switch terminal 13
- through wiper amplifier terminal 2
- to wiper amplifier terminal 3
- through body grounds M77 and M111.

The desired interval time is input

- to wiper amplifier terminal 8
- from wiper switch terminal 19.

The wiper motor operates at low speed at the desired time interval.

System Description (Cont'd)

WASHER OPERATION

NBEL0057S02

With the ignition switch in the ACC or ON position, power is supplied

- through 20A fuse [No. 19, located in the fuse block (J/B)]
- to washer motor terminal 1.

When the lever is pulled to the WASH position, ground is supplied

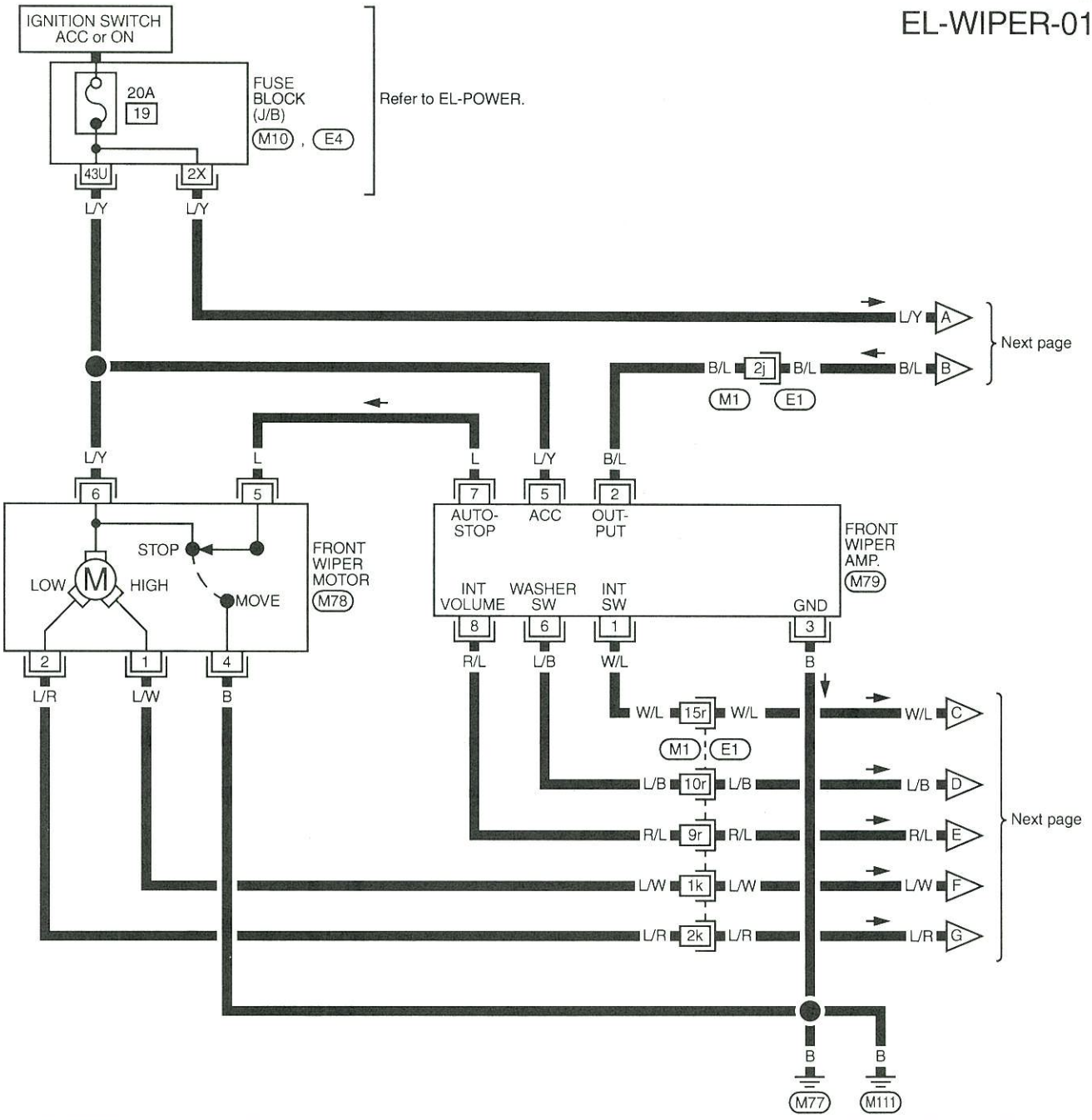
- to washer motor terminal 2, and
- to wiper amplifier terminal 6
- from terminal 18 of the wiper switch
- through terminal 17 of the wiper switch, and
- through body grounds E13 and E41.

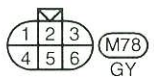
With power and ground supplied, the washer motor operates.
When the lever is pulled to the WASH position for one second or more, the wiper motor operates at low speed for approximately 3 seconds to clean windshield. This feature is controlled by the wiper amplifier in the same manner as the intermittent operation.

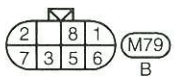
Wiring Diagram — WIPER —

NBEL0058

EL-WIPER-01



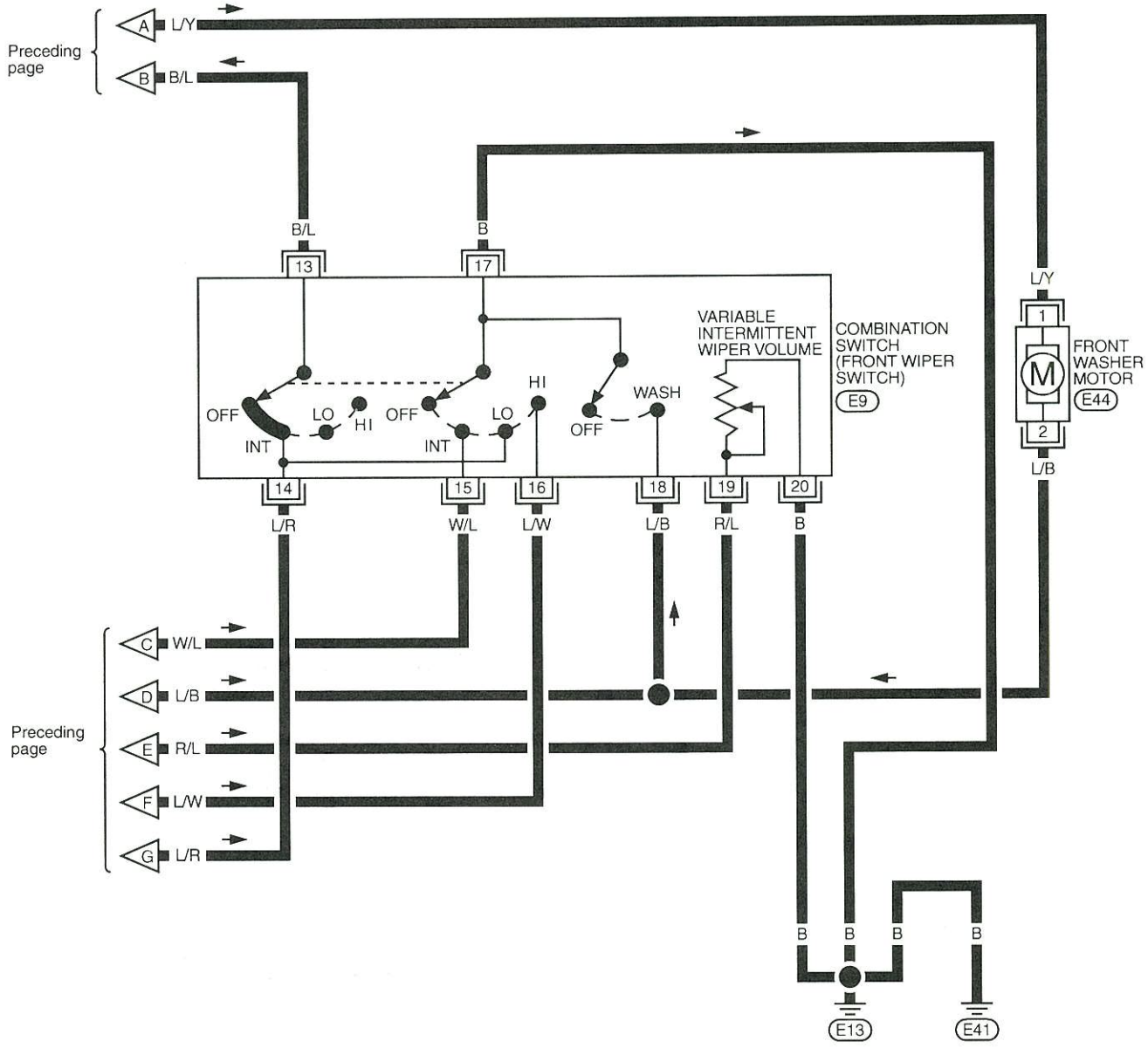


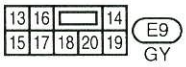


Refer to last page (Foldout page).
M1 , E1
M10
E4

MEL781J

EL-WIPER-02





MEL952J

Trouble Diagnoses

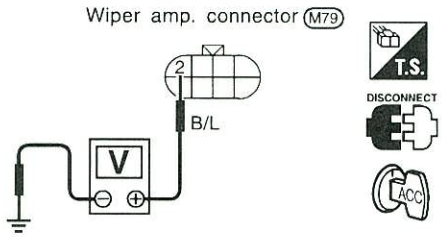
NBEL0059

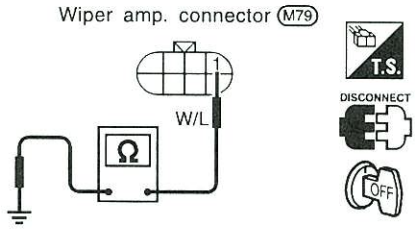
DIAGNOSTIC PROCEDURE 1

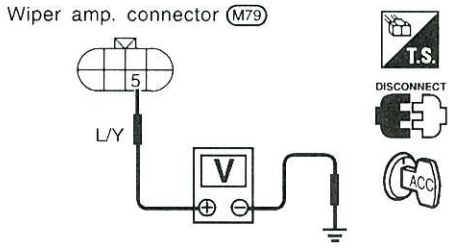
NBEL0059S01

SYMPTOM: Intermittent wiper does not operate.

1	CHECK WIPER OPERATION
Check whether wiper operates with the wiper switch at Lo position. **Does wiper operate at Lo speed?**	
Yes ▶	GO TO 2.
No ▶	**Check the following.** • 20A fuse [No. 19, located in fuse block (J/B)] • Wiper motor • Wiper switch • Harness for open or short

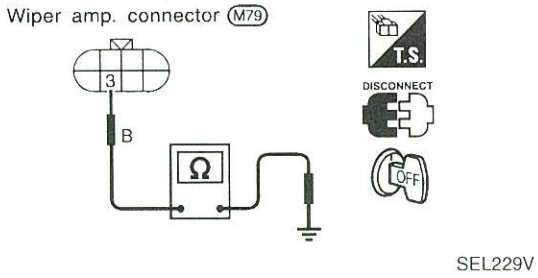
2	CHECK WIPER AMP. OUTPUT
1. Turn front wiper switch to OFF. 2. Disconnect wiper amp. connector. 3. Check voltage between wiper amp. terminal 2 and ground.  SEL226V **Does battery voltage exist?**	
Yes ▶	GO TO 3.
No ▶	**Check the following.** • Wiper switch • Harness for open or short between wiper amp. terminal 2 and wiper switch terminal 13

3	CHECK INTERMITTENT SWITCH INPUT SIGNAL
Check harness continuity between wiper amp. terminal 1 and ground.  SEL227V **Continuity:** **Condition of wiper switch: OFF** **No** **Condition of wiper switch: INT** **Yes** **OK or NG**	
OK ▶	GO TO 4.
NG ▶	**Check the following.** • Wiper switch • Harness for open or short between wiper amp. terminal 1 and wiper switch terminal 15 • Ground circuit for front wiper switch terminal 17

4	CHECK WIPER AMP. POWER SUPPLY CIRCUIT
Check voltage between wiper amp. terminal 5 and ground while ignition switch is "ACC".  SEL228V **Does battery voltage exist?**	
Yes ▶	GO TO 5.
No ▶	**Check the following.** • 20A fuse [No. 19, located in fuse block (J/B)] • Harness for open or short between wiper amp. and fuse

5	CHECK WIPER AMP. GROUND CIRCUIT

Check harness continuity between wiper amp. terminal 3 and body ground.



SEL229V

Does continuity exist?

Yes	▶	Replace wiper amp.
No	▶	Repair harness or connector.

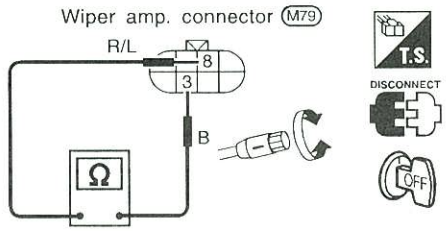
DIAGNOSTIC PROCEDURE 2

NBEL0059S02

SYMPTOM: Intermittent time of wiper cannot be adjusted.

1	CHECK INTERMITTENT WIPER VOLUME INPUT SIGNAL

1. Disconnect wiper amp. connector.
2. Measure resistance between wiper amp. terminals 8 and 3 while turning intermittent wiper volume.



SEL230V

Resistance [Ω]:
Position of wiper knob: S
0
Position of wiper knob: L
Approx. 1 k

OK or NG

OK	▶	Replace wiper amp.
NG	▶	**Check the following.** • Intermittent wiper volume • Harness for open or short between wiper amp. terminal 8 and wiper switch terminal 19 • Ground circuit for front wiper switch terminal 20

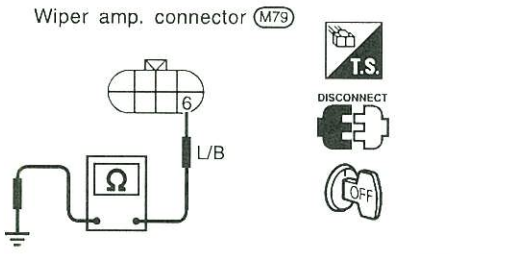
DIAGNOSTIC PROCEDURE 3

=NBEL0059S03

SYMPTOM: Wiper and washer activate individually but not in combination.

1	CHECK WASHER SWITCH INPUT SIGNAL

1. Turn ignition switch to "OFF".
2. Disconnect wiper amp. connector.
3. Check harness continuity between wiper amp. terminal 6 and ground.

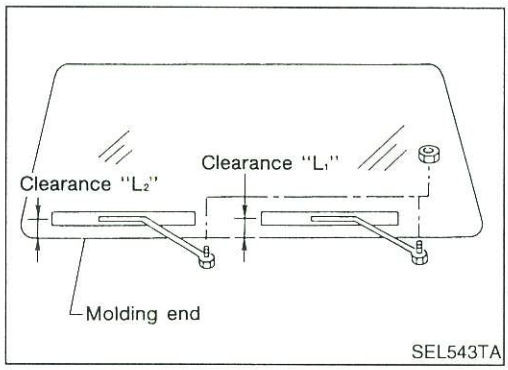


SEL231V

Continuity:
Condition of washer switch: OFF
No
Condition of washer switch: ON
Yes

OK or NG

OK	▶	Go to DIAGNOSTIC PROCEDURE 1.
NG	▶	Check harness for open or short between wiper amp. terminal 6 and wiper switch terminal 18.



SEL543TA

Removal and Installation

NBEL0060

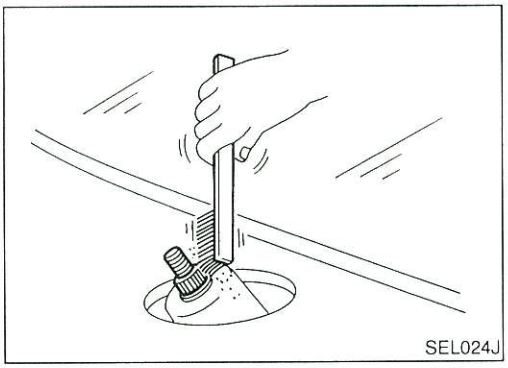
WIPER ARMS

NBEL0060S01

1. Prior to wiper arm installation, turn on wiper switch to operate wiper motor and then turn it "OFF" (Auto Stop).
2. Lift the blade up and then set it down onto glass surface to set the blade center to clearance "L_1" & "L_2" immediately before tightening nut.
3. Eject washer fluid. Turn on wiper switch to operate wiper motor and then turn it "OFF".
4. Ensure that wiper blades stop within clearance "L_1" & "L_2".
   Clearance "L_1": 34 mm (1.34 in)
   Clearance "L_2": 37 mm (1.46 in)

- Tighten wiper arm nuts to specified torque.
  Front wiper: 21 - 26 N·m (2.1 - 2.7 kg-m, 15 - 20 ft-lb)

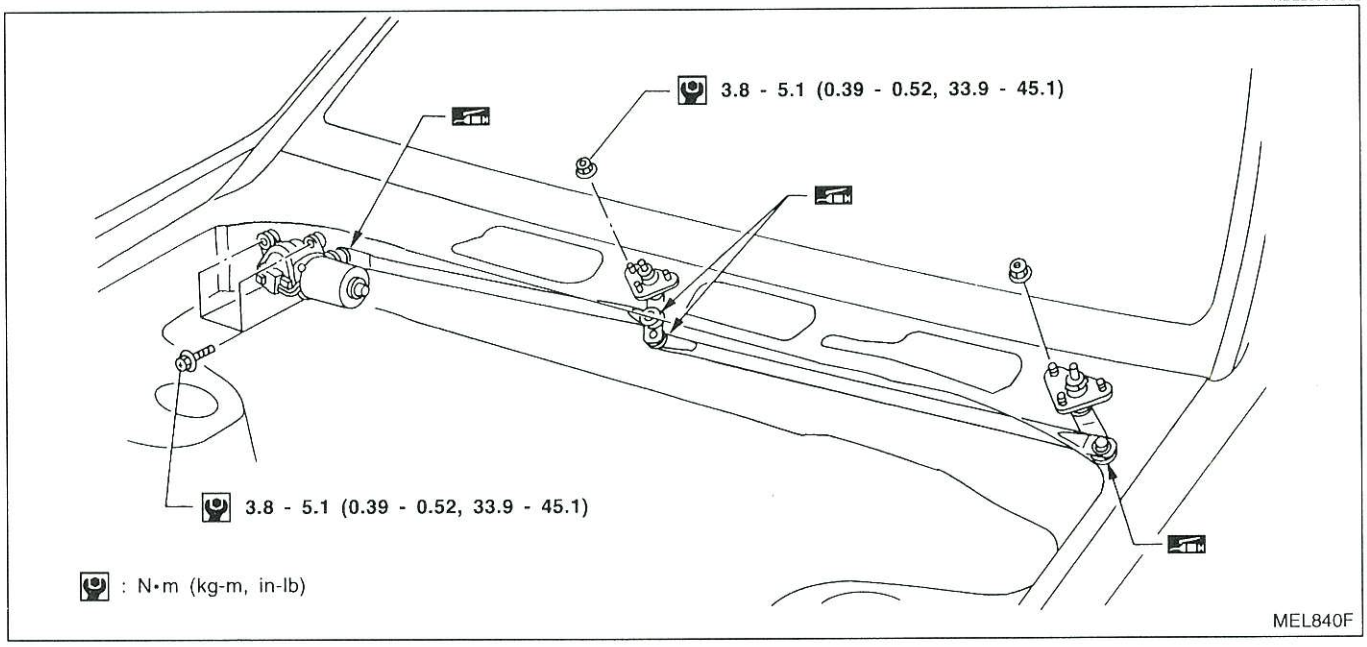
Removal and Installation (Cont'd)



- **Before reinstalling wiper arm, clean up the pivot area as illustrated. This will reduce possibility of wiper arm looseness.**

WIPER LINKAGE

NBEL0060S02



Removal

NBEL0060S0201

1. Remove 4 bolts that secure wiper motor.
2. Detach wiper motor from wiper linkage at ball joint.
3. Remove wiper linkage.

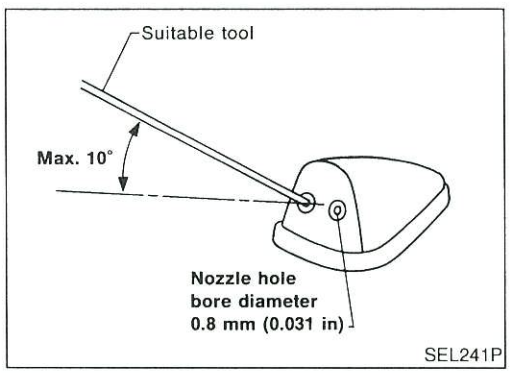
Be careful not to break ball joint rubber boot.

Installation

NBEL0060S0202

- Grease ball joint portion before installation.

1. Installation is the reverse order of removal.

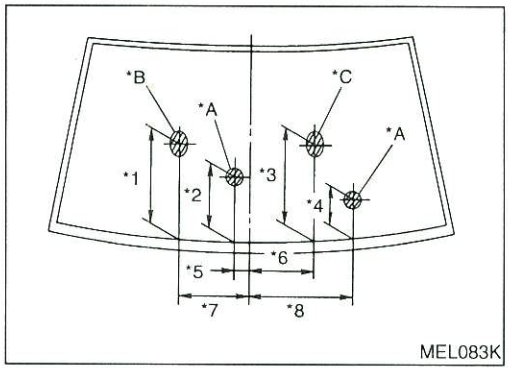


Washer Nozzle Adjustment

NBEL0061

- Adjust washer nozzle with suitable tool as shown in the figure at left.

  Adjustable range: ±10°



MEL083K

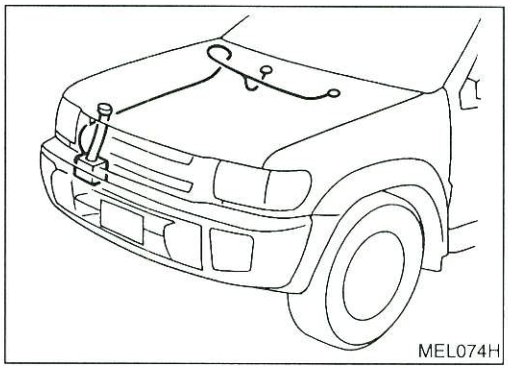
Unit: mm (in)

*1	395 (15.55)	*5	122 (4.80)
*2	157 (6.18)	*6	160 (6.30)
*3	410 (16.14)	*7	259 (10.20)
*4	169 (6.65)	*8	524 (20.63)

*A: The diameters of these circles are less than 80 mm (3.15 in).
*B: The diameter of this circle is less than 127 × 80 mm (5.00 × 3.15 in).
*C: The diameter of this circle is less than 142 × 80 mm (5.59 × 3.15 in).

Washer Tube Layout

NBEL0062


MEL074H

System Description

NBEL0063

WIPER OPERATION

NBEL0063S01

Power Supply and Ground

NBEL0063S0101

Power is supplied at all times

- through 10A fuse [No. 5, located in the fuse block (J/B)]
- to rear wiper amp. terminal 1.

With ignition switch in the ACC or ON position, power is supplied

- through 10A fuse [No. 29, located in the fuse block (J/B)]
- to rear wiper amp. terminal 2.

When the glass hatch switch is OPEN, ground is supplied

- to rear wiper amp. terminal 12
- from glass hatch switch terminal 1.

Then washer motor and wiper motor is interrupted.
(If the glass hatch is opened, no function of rear wiper motor will operate.)
Ground is supplied

- to rear wiper amplifier terminal 3
- through body grounds B11, B22 and D210.

Rising Up Operation

NBEL0063S0102

When the rear wiper switch is turned to the ON position, ground is supplied

- through terminal 22 of rear wiper switch
- to rear wiper amp. terminal 15.

When the rear wiper switch is turned to the INT position, ground is supplied

- through terminal 21 of rear wiper switch
- to rear wiper amp. terminal 14.

Then power is supplied

- through rear wiper amp. terminal 5
- to rear wiper motor terminal 4.

Ground is supplied

- through rear wiper motor terminal 3
- to rear wiper amp. terminal 8.

With power and ground supplied, rear wiper operates and rear wiper arm moves up.
Wiper does not return to resting position until wiper switch is turned to OFF position.

Low Speed Wiper Operation

NBEL0063S0103

When the rear wiper switch is placed in the ON position, ground is supplied

- to rear wiper amp. terminal 15
- from body grounds
- through rear wiper switch terminals 22 and 24.

With power and ground supplied, the wiper motor operates at low speed.

Auto Stop Operation

NBEL0063S0104

With rear wiper switch turned OFF, rear wiper motor will continue to operate until wiper arms reach rear wiper stopper.
When wiper arm is not located at rear wiper stopper with wiper switch OFF, ground is provided

- to rear wiper amp. terminal 7
- through wiper motor terminals 7 and 8
- from body grounds B11, B22 and D210.

Then, power continues to be supplied

- through rear wiper amp. terminal 5
- to rear wiper motor terminal 4.

Ground continues to be supplied

- through rear wiper motor terminal 3

- to rear wiper amp. terminal 8.

With power and ground supplied, rear wiper continues to operate.
When wiper arms reach rear wiper stopper, ground is interrupted

- to rear wiper amp. terminal 7
- from body grounds.

Rear wiper motor will then stop wiper arms at the PARK position.

Intermittent Operation

NBEL0063S0105

The rear wiper motor operates the wiper arms at low speed approximately every 7 seconds. This feature is controlled by the wiper amp.
When the wiper switch is placed in the INT position, ground is supplied

- to wiper amp. terminal 14
- from rear wiper switch terminal 21
- through body grounds E13 and E41.

Then, power is supplied

- through rear wiper amp. terminal 5
- to rear wiper motor terminal 4.

Ground is supplied

- through rear wiper motor terminal 3
- to rear wiper amp. terminal 8.

The rear wiper motor operates at low speed intermittent.

WASHER OPERATION

NBEL0063S02

When the rear wiper switch is turned to WASH position, ground is supplied

- to rear wiper amp. terminal 13
- through terminals 23 and 24 of rear wiper switch
- through body grounds E13 and E41.

Then, power is supplied

- through rear wiper amp. terminal 9
- to rear washer motor terminal 2.

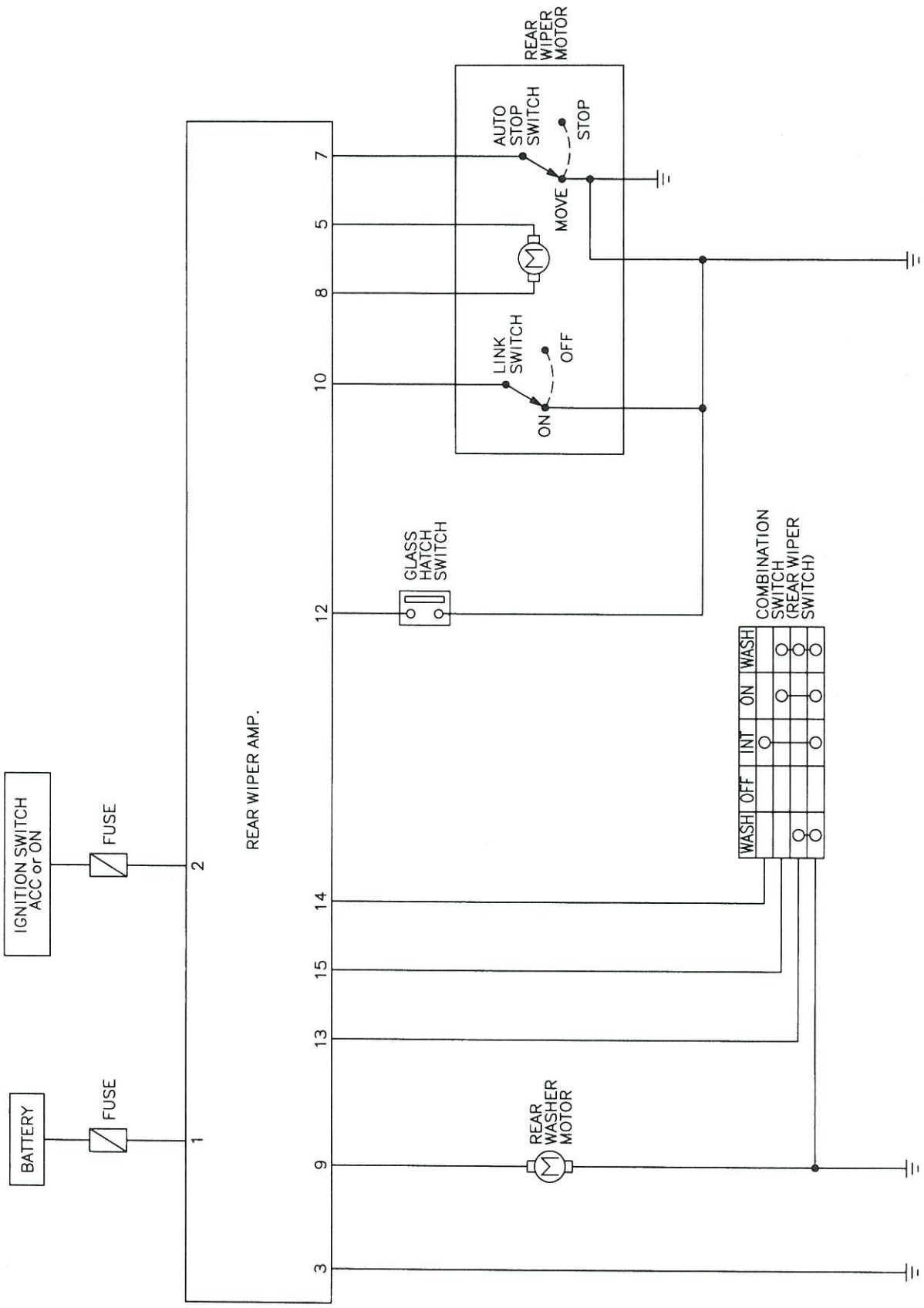
Ground is supplied

- through body grounds E13 and E41
- to rear washer motor terminal 1.

With power and ground supplied, the rear washer motor operates.
When the rear wiper switch is turned to WASH position for one second or more, the rear wiper motor operates at low speed for approximately 3 seconds after the rear wiper switch is released. This feature is controlled by the rear wiper amp. in the same manner as the intermittent operation.

Schematic

NBEL0064

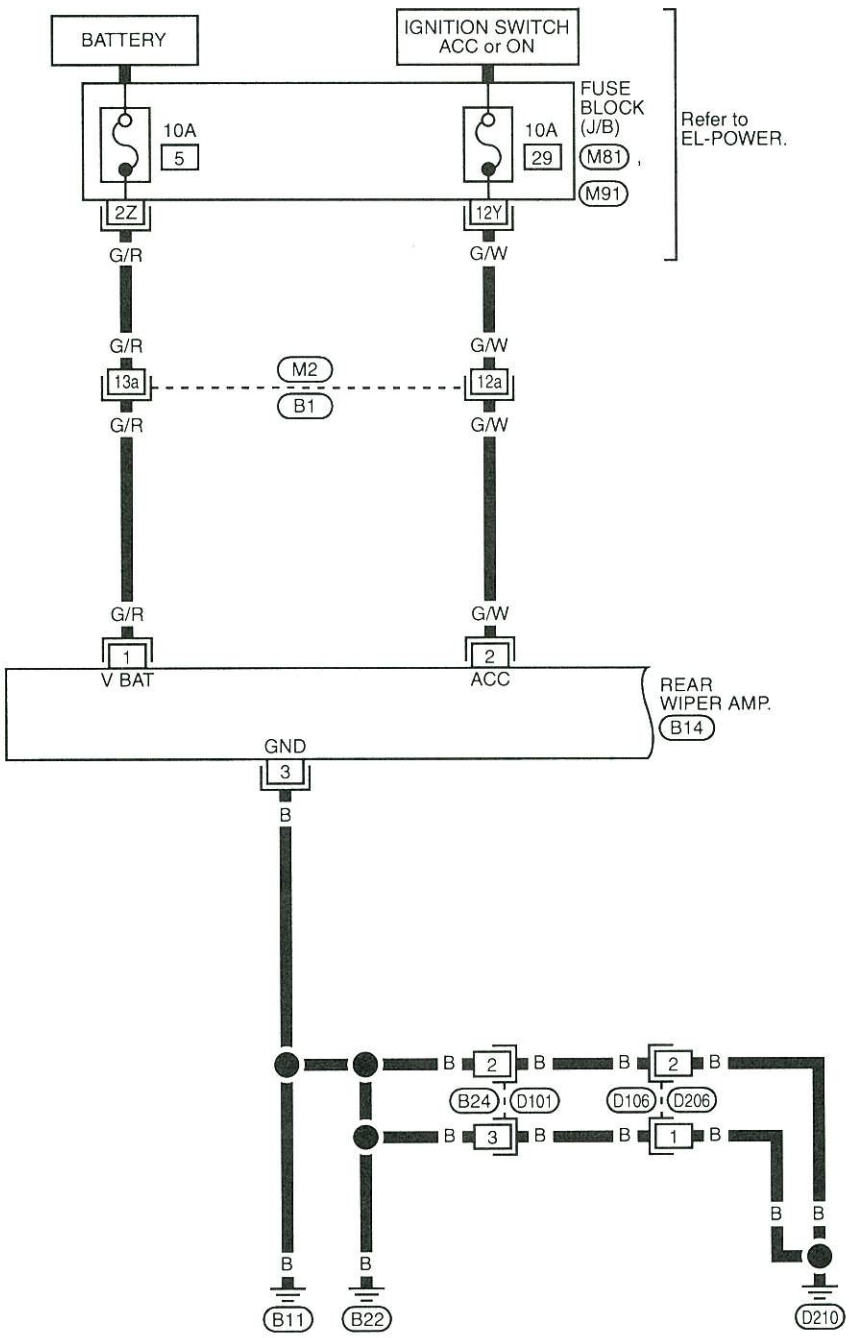


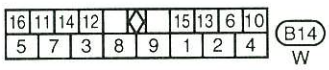
MEL782J

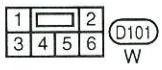
Wiring Diagram — WIP/R —

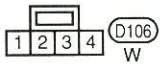
NBEL0065

EL-WIP/R-01









Refer to last page (Foldout page).

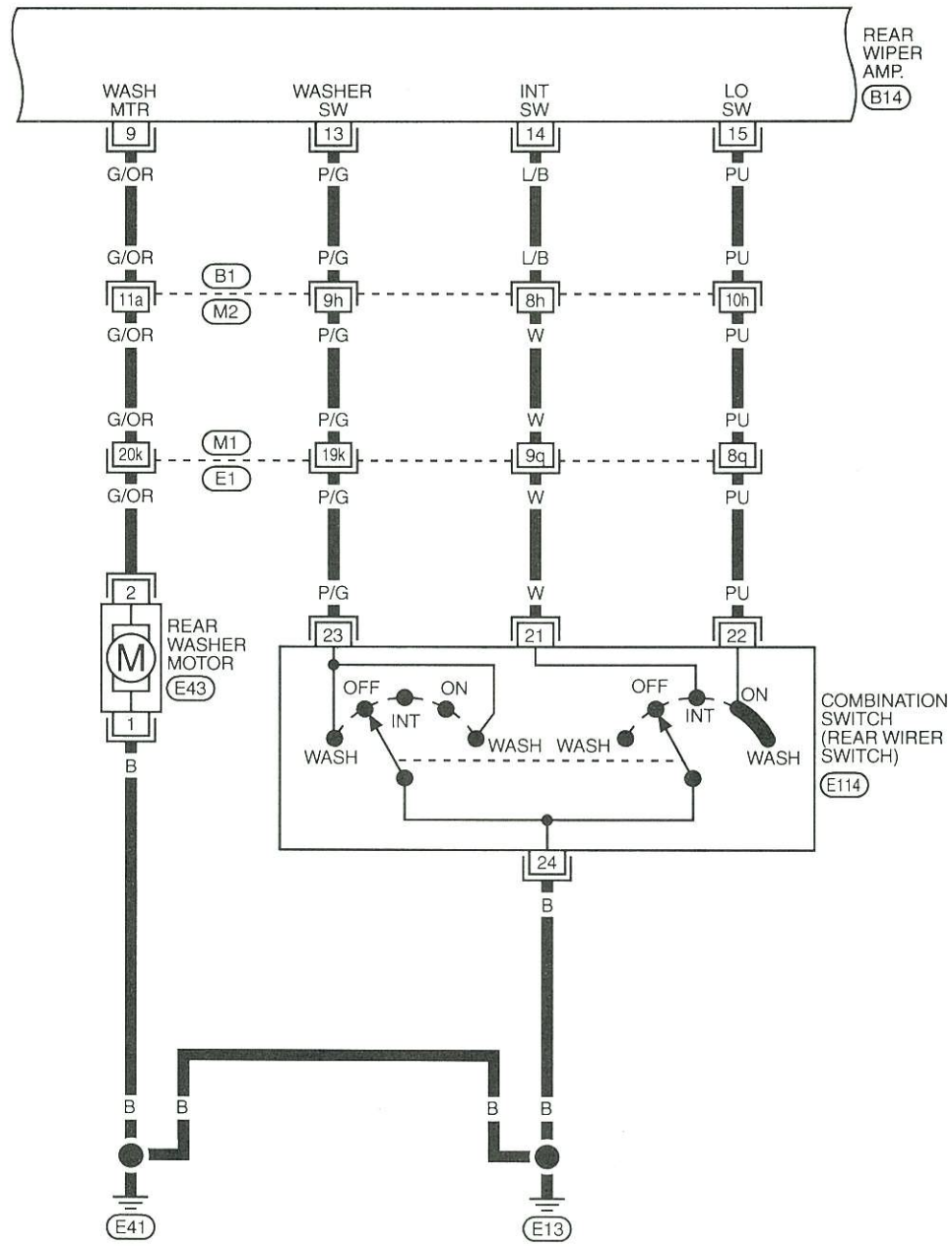
M2 , B1

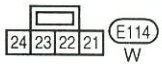
M81

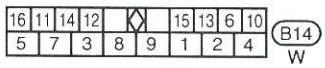
M91

MEL783J

EL-WIP/R-02







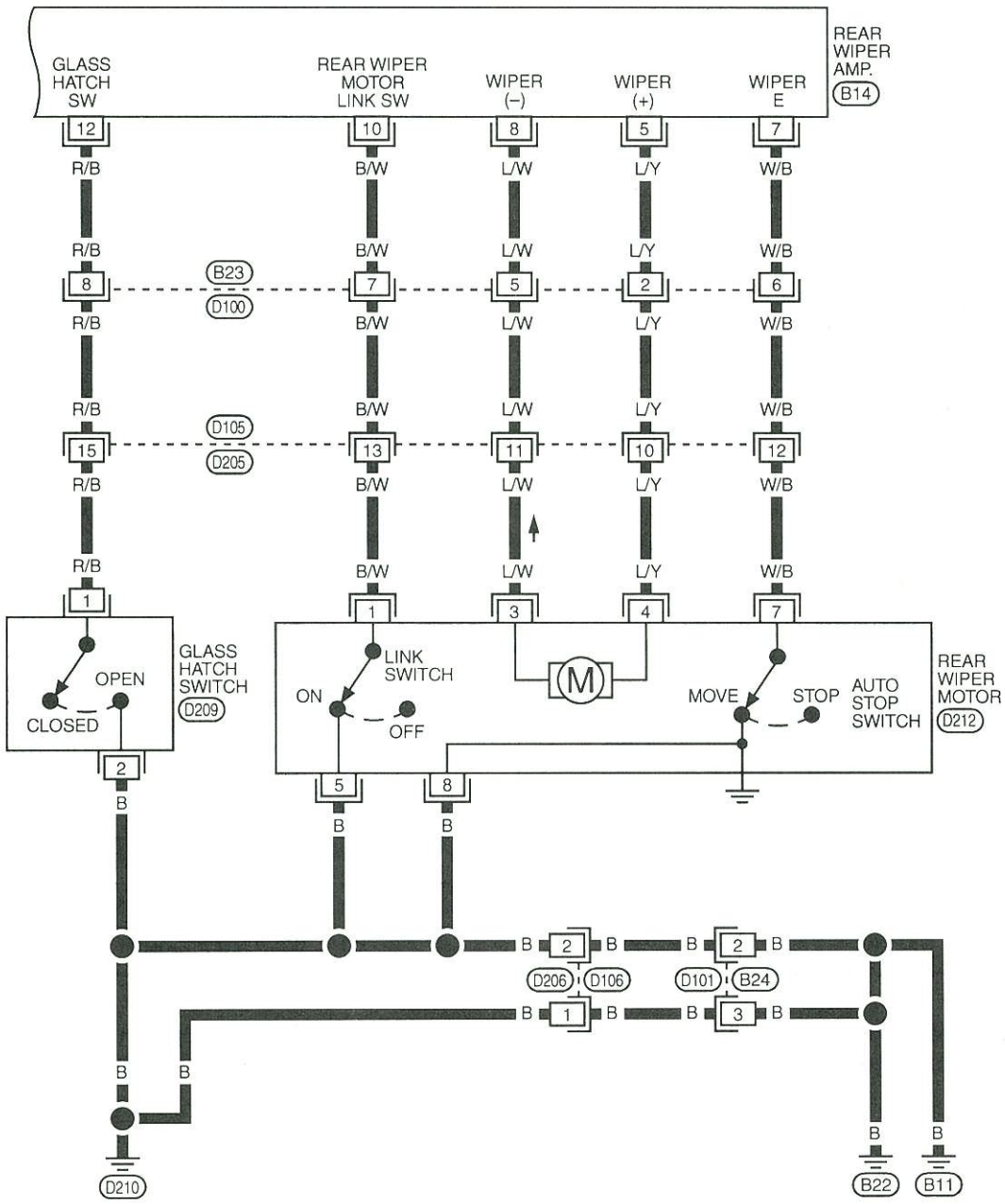
Refer to last page (Foldout page).

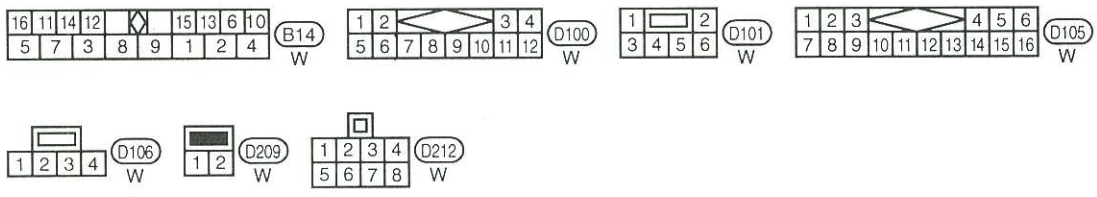
(M1), (E1)

(M2), (B1)

MEL784J

EL-WIP/R-03





MEL785J

Trouble Diagnoses

NBEL0066

REAR WIPER AMP. INSPECTION TABLE

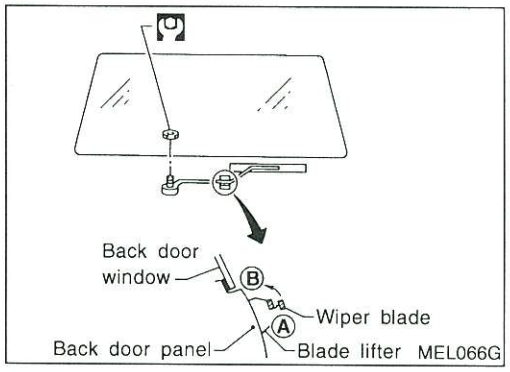
NBEL0066S01

(Data are reference values.)

Terminal No.	Item	Condition			Voltage (Approximate value)
1	Power supply (BAT)	—			Battery voltage
2	Power supply (ACC)		—		Battery voltage
3	Ground	—			—
5	Rear wiper motor		Rear wiper switch	ON	Battery voltage
				OFF	Less than 1V
7	Auto stop		Rear wiper switch should be at "INT" to inspect the value for wiper movement.	Wiper is moving	Less than 1V
				Wiper stop	Battery voltage
10	Link switch		Rear wiper switch should be at "ON" to inspect the value.	Wiper is moving	Less than 1V
				Wiper stop	Battery voltage
12	Glass hatch switch	Glass hatch		Open	Less than 1V
				Closed	Battery voltage
13	Washer switch		Rear wiper switch	WASH	Less than 1V
				OFF, ON or INT	Battery voltage
14	Intermittent switch		Rear wiper switch	INT	Less than 1V
				OFF, ON or WASH	Battery voltage
15	Wiper on switch		Rear wiper switch	ON or WASH	Less than 1V
				OFF or INT	Battery voltage

NOTE:

Power to the rear wiper amp. will be interrupted when the rear glass hatch is opened. In that case, conduct the inspection of the rear wiper amp. with the rear glass hatch closed, unless otherwise indicated.



Removal and Installation

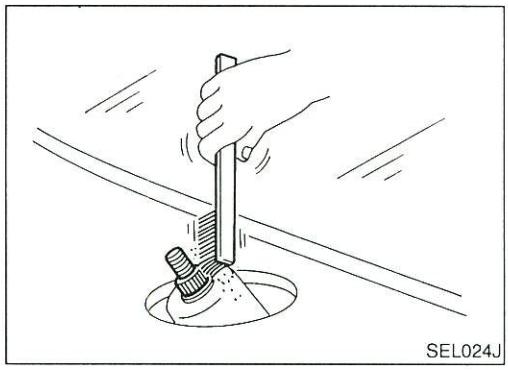
NBEL0067

WIPER ARMS

NBEL0067S01

1. Prior to wiper arm installation, turn on wiper switch to operate wiper motor and then turn it "OFF" (Auto Stop).
2. Install wiper arm to portion A as in figure below and tighten wiper arm nut to specification.
3. Then, set wiper arm to portion B.

: 13 - 18 N·m (1.3 - 1.8 kg-m, 9 - 13 ft-lb)

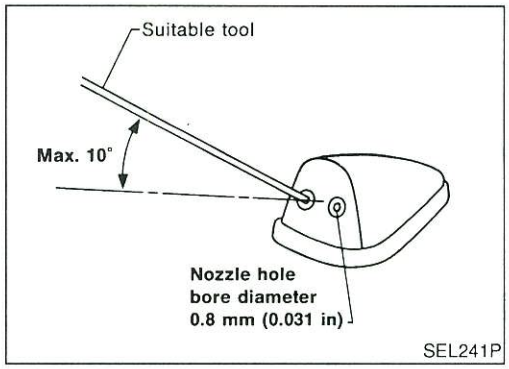


SEL024J

- **Before reinstalling wiper arm, clean up the pivot area as illustrated. This will reduce possibility of wiper arm looseness.**

Washer Nozzle Adjustment

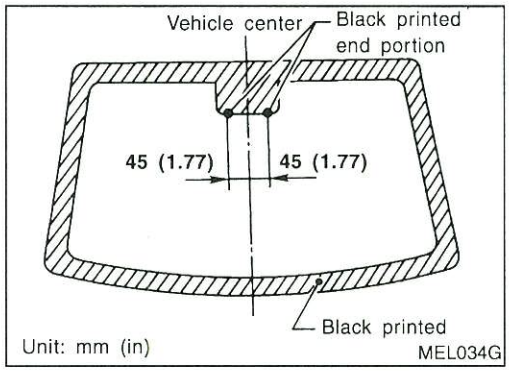
NBEL0068



SEL241P

- Adjust washer nozzle with suitable tool as shown in the figure at left.

  Adjustable range: ±10° (In any direction)

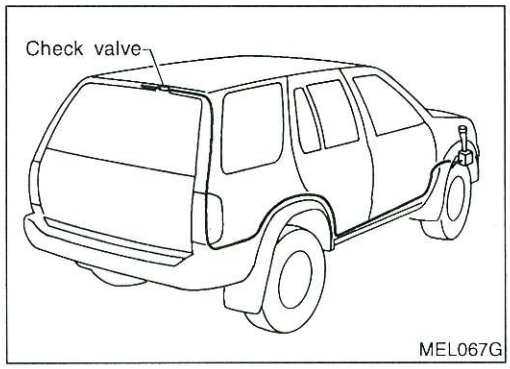


Unit: mm (in)

MEL034G

Washer Tube Layout

NBEL0069

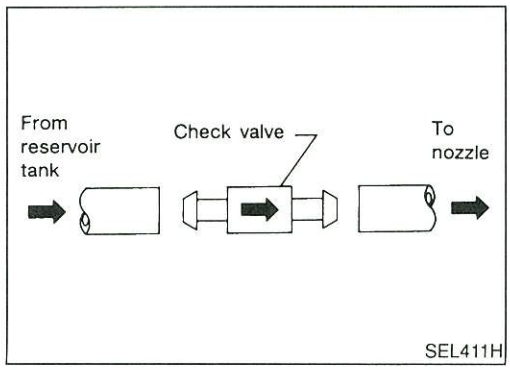


MEL067G

Check Valve

NBEL0070

- A check valve is provided in the washer fluid line. Be careful not to connect check valve to washer tube in the wrong direction.

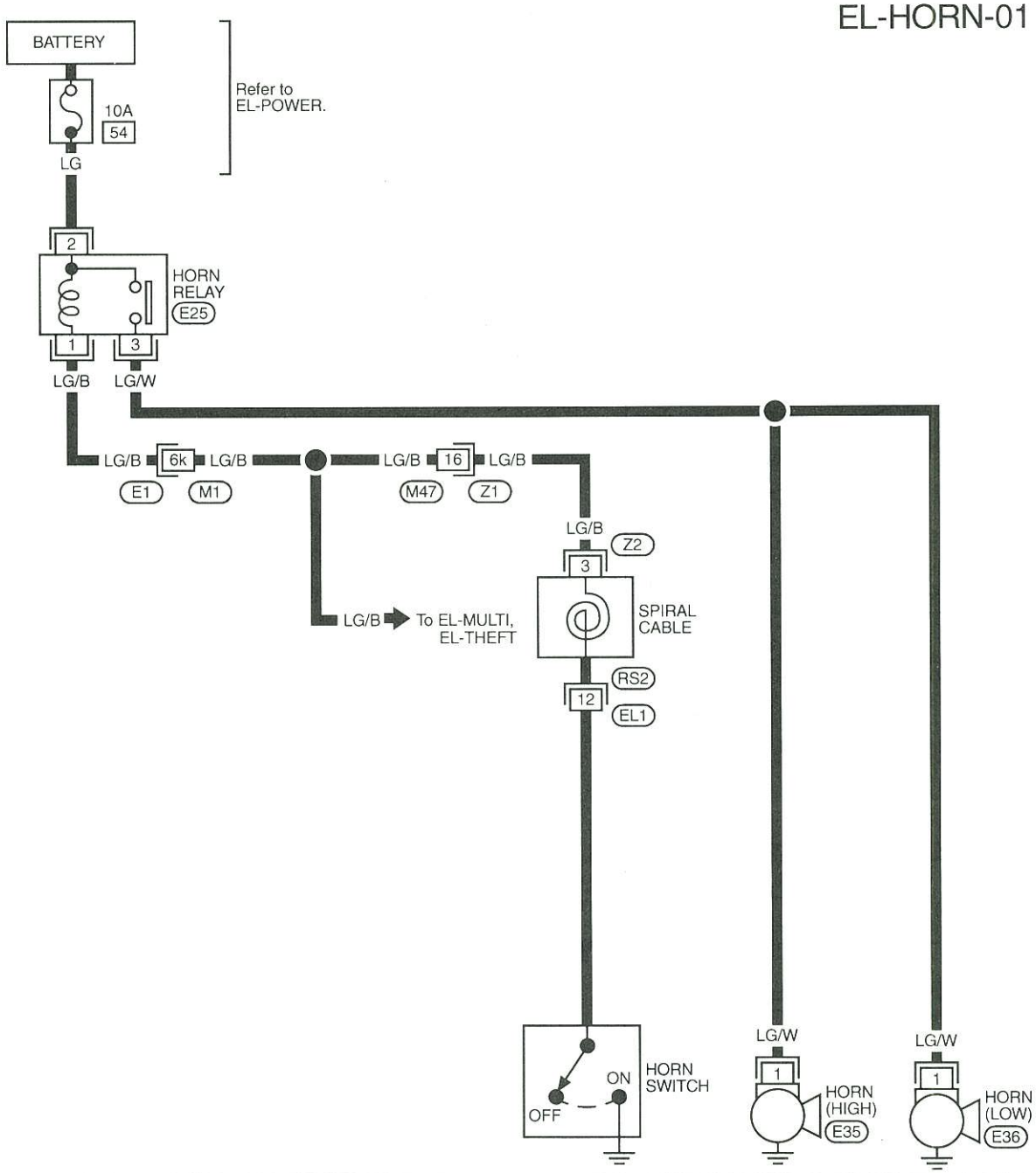


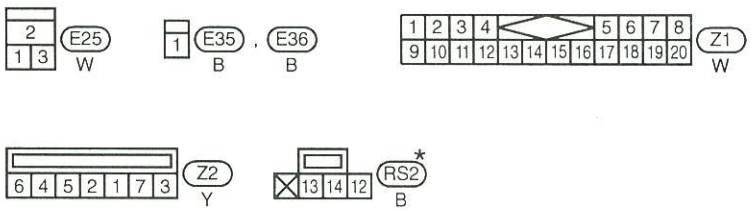
SEL411H

Wiring Diagram — HORN —

NBEL0071

EL-HORN-01





* : This connector is not shown in "HARNESS LAYOUT".

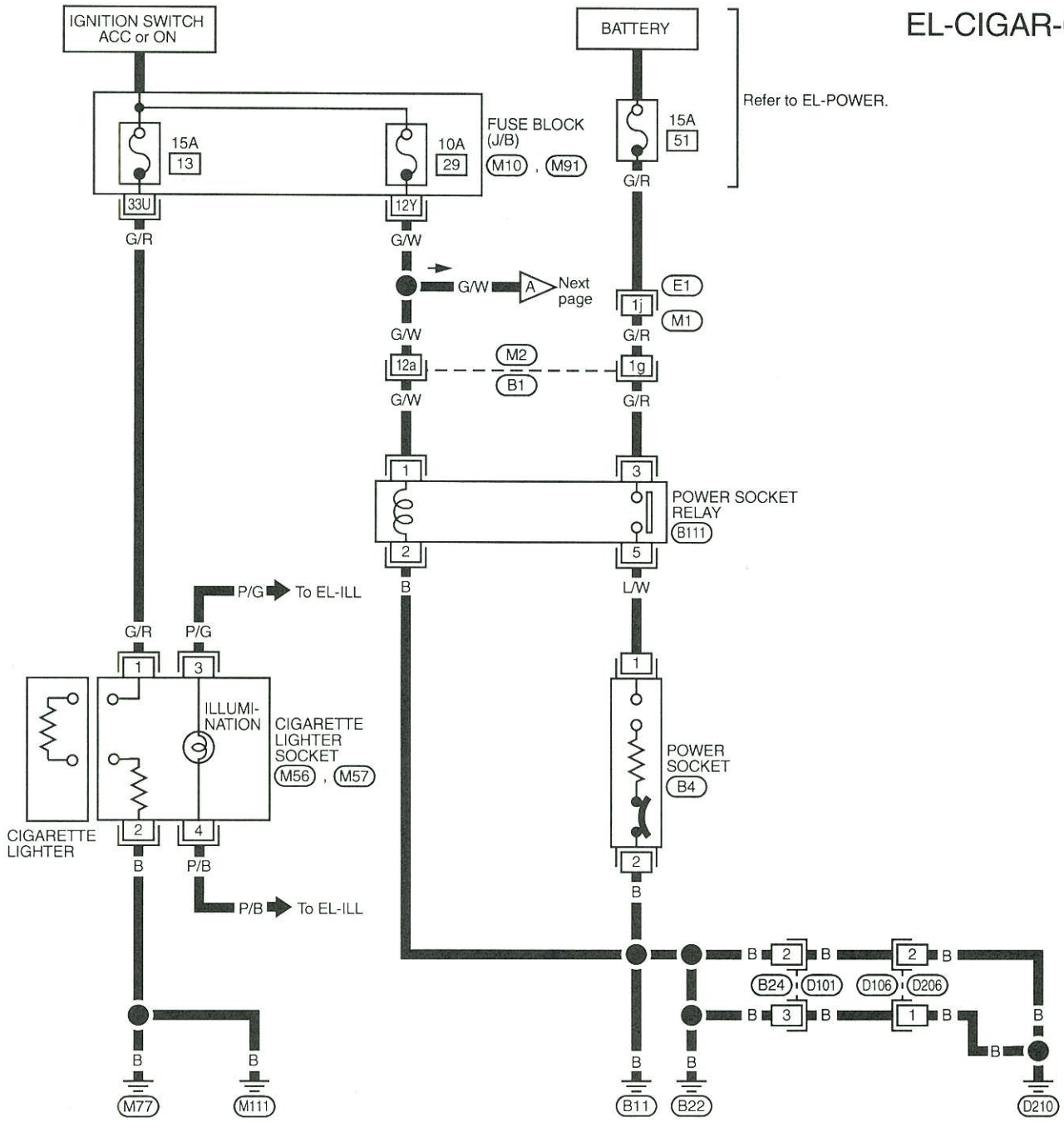
Refer to last page (Foldout page).
M1 , E1

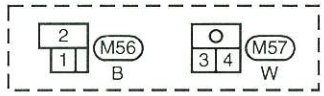
MEL786J

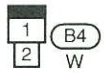
Wiring Diagram — CIGAR —

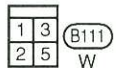
NBEL0156

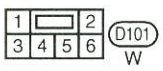
EL-CIGAR-01

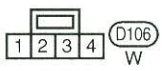












Refer to last page (Foldout page).

M1 , E1

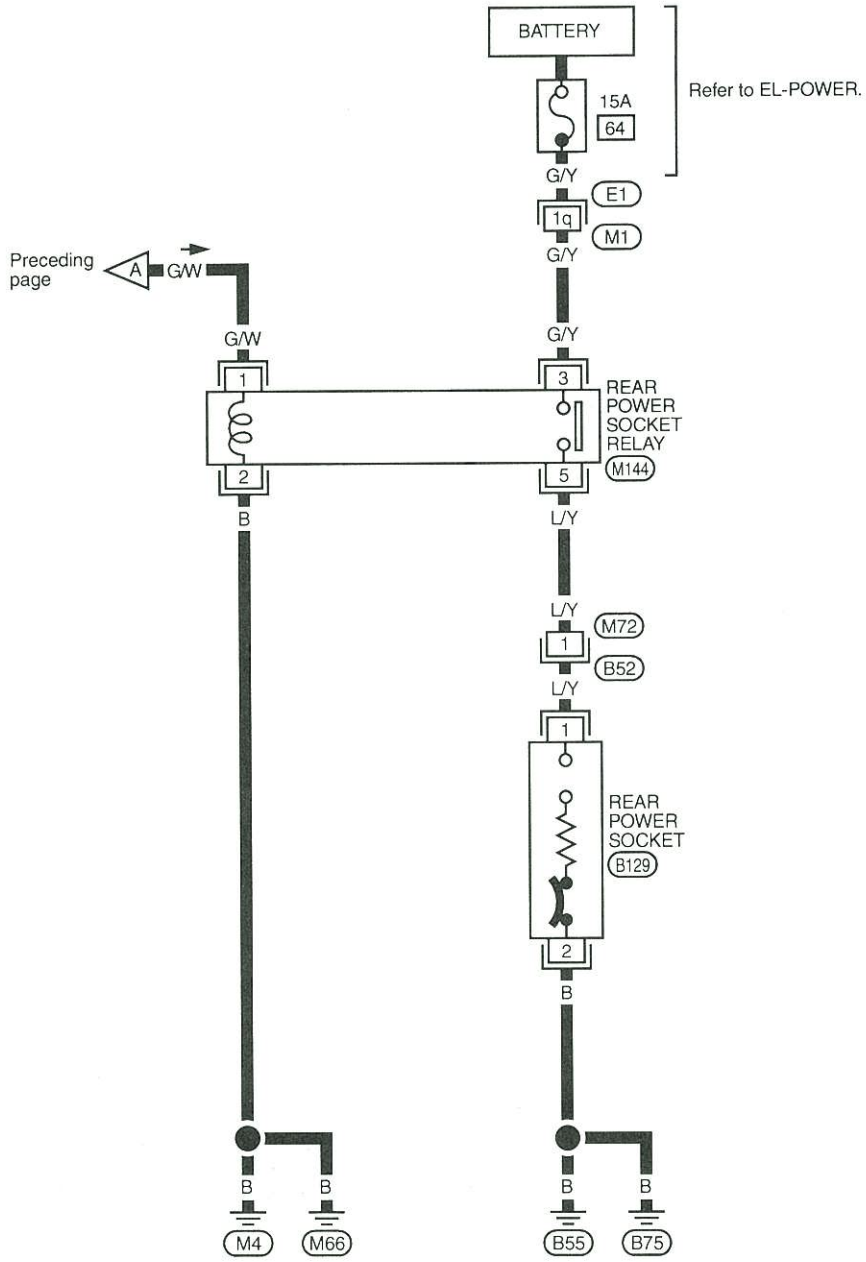
M2 , B1

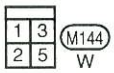
M10

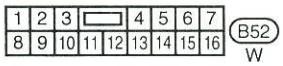
M91

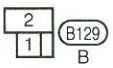
MEL787J

EL-CIGAR-02









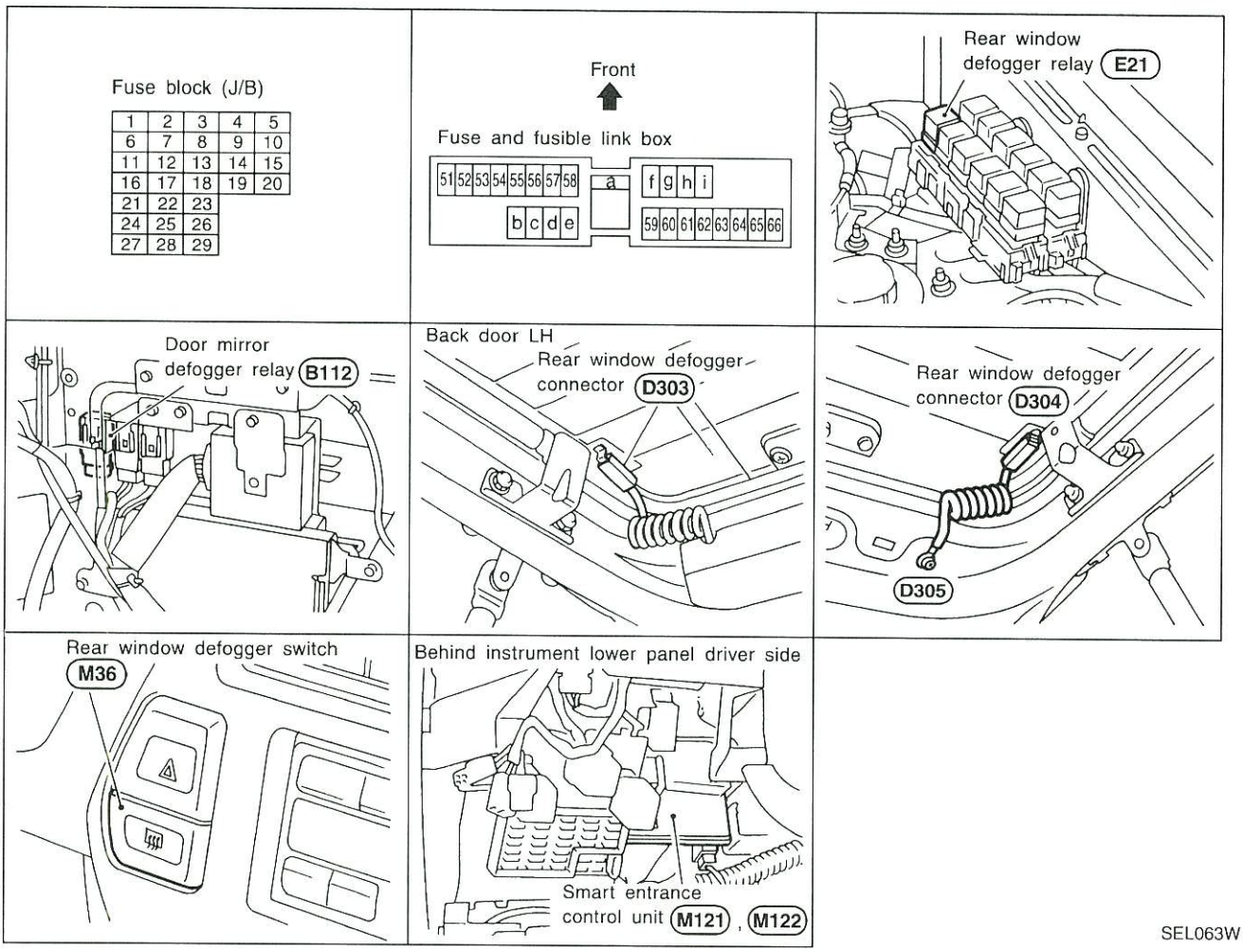
Refer to last page (Foldout page).

(M1) , (E1)

MEL070K

Component Parts and Harness Connector Location

NBEL0072



SEL063W

System Description

NBEL0073

The rear window defogger system is controlled by the smart entrance control unit. The rear window defogger operates only for approximately 15 minutes.

Power is supplied at all times

- to rear window defogger relay terminal 3
- through 20A fuse (No. 56, located in the fuse and fusible link box) and
- to rear window defogger relay terminal 6
- through 20A fuse (No. 57, located in the fuse and fusible link box).

With the ignition switch in the ON or START position, power is supplied

- through 10A fuse [No. 21, located in the fuse block (J/B)]
- to the rear window defogger relay terminal 1 and
- through 7.5A fuse [No. 11, located in the fuse block (J/B)]
- to smart entrance control unit terminal 33.

Ground is supplied to terminal 1 of the rear window defogger switch through body grounds M4 and M66.

When the rear window defogger switch is turned ON, ground is supplied

- through terminal 2 of the rear window defogger switch
- to smart entrance control unit terminal 39.

Terminal 2 of the smart entrance control unit then supplies ground to the rear window defogger relay terminal 2.

With power and ground supplied, the rear window defogger relay is energized.

Power is supplied

System Description (Cont'd)

- through terminals 5 and 7 of the rear window defogger relay
- to the rear window defogger.

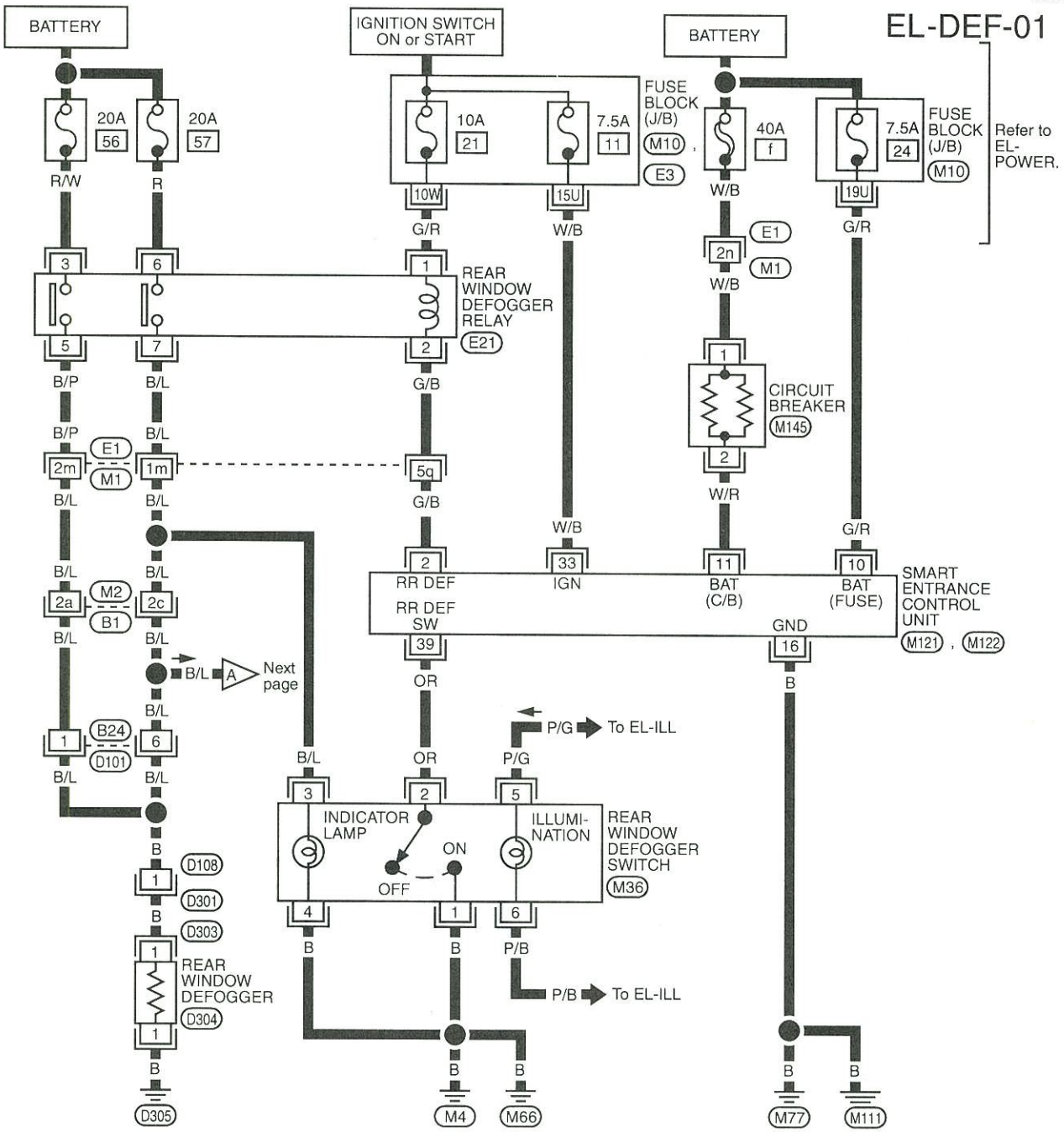
The rear window defogger has an independent ground.
With power and ground supplied, the rear window defogger filaments heat and defog the rear window.
When the system is activated, the rear window defogger indicator illuminates in the rear window defogger switch.
Power is supplied

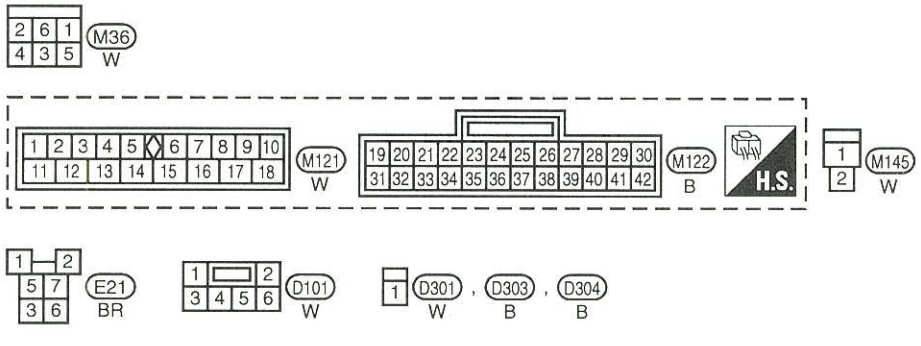
- to terminal 3 of the rear window defogger switch
- from terminal 7 of the rear window defogger relay.

Terminal 4 of the rear window defogger switch is grounded through body grounds M4 and M66.

Wiring Diagram — DEF —

NBEL0074





Refer to last page (Foldout page).

M1, E1

M2, B1

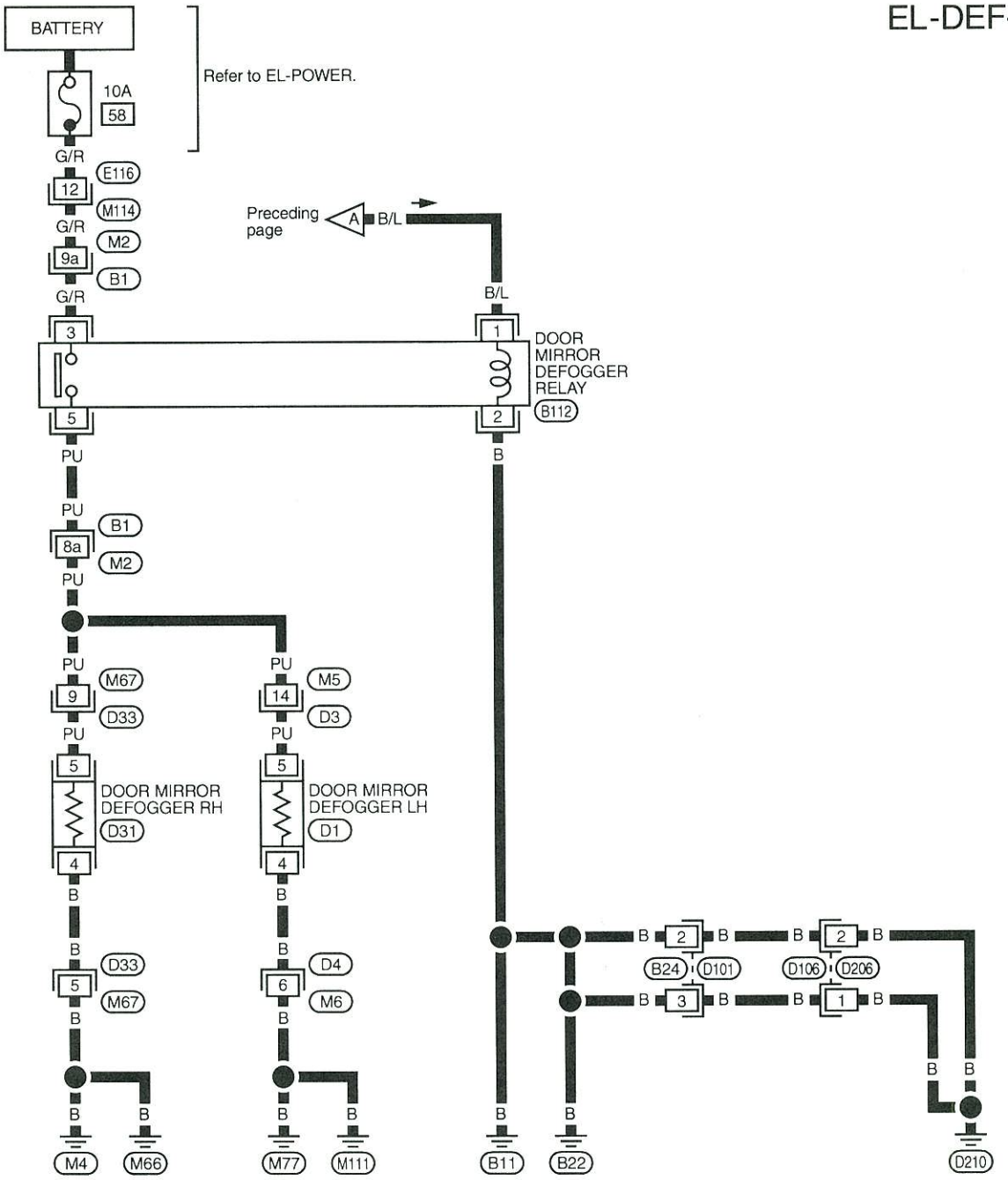
M10

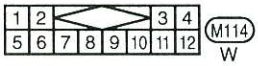
E3

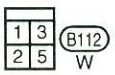
MEL788J

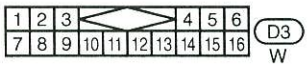
Wiring Diagram — DEF — (Cont'd)

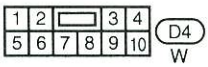
EL-DEF-02

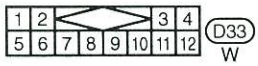


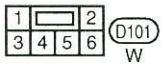


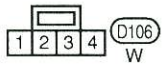












Refer to last page (Foldout page).

M2 , B1

MEL789J

Trouble Diagnoses

NBEL0075

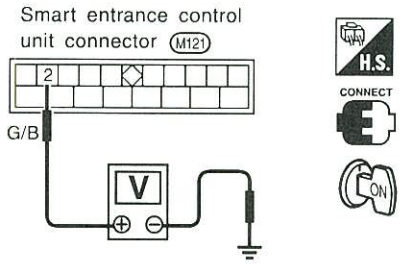
DIAGNOSTIC PROCEDURE

NBEL0075S01

SYMPTOM: Rear window defogger does not activate, or does not go off after activating.

1 CHECK REAR WINDOW DEFOGGER OUTPUT SIGNAL

1. Turn ignition switch to ON position.
2. Check voltage between control unit harness terminal 2 and ground.



SEL787VA

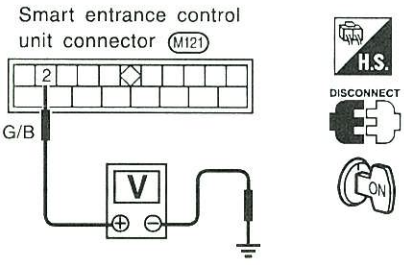
Voltage [V]:
Rear window defogger switch is "OFF".
Approx. 12
Rear window defogger switch is "ON".
0

OK or NG

OK	▶	**Check the following.** • Rear window defogger relay (Refer to EL-138.) • Rear window defogger circuit • Rear window defogger filament (Refer to EL-138.)
NG	▶	GO TO 2.

2 CHECK DEFOGGER RELAY COIL SIDE CIRCUIT

1. Disconnect control unit connector.
2. Turn ignition switch to ON position.
3. Check voltage between control unit terminal 2 and ground.



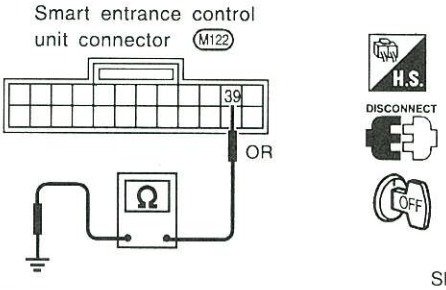
SEL788VA

Does battery voltage exist?

Yes	▶	GO TO 3.
No	▶	**Check the following.** • 10A fuse [No. 21, located in the fuse block (J/B)] • Rear window defogger relay • Harness for open or short between rear window defogger relay and control unit

3 CHECK REAR WINDOW DEFOGGER SWITCH INPUT SIGNAL

Check continuity between control unit terminal 39 and ground.



SEL789VA

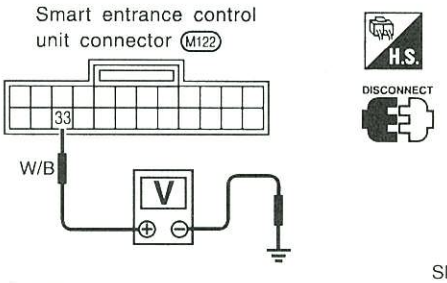
Continuity:
Rear window defogger switch is pushed.
Yes
Rear window defogger switch is released.
No

OK or NG

OK	▶	GO TO 4.
NG	▶	**Check the following.** • Rear window defogger switch (Refer to EL-138.) • Harness for open or short between control unit and rear window defogger switch • Rear window defogger switch ground circuit

4 CHECK IGNITION INPUT SIGNAL

Check voltage between control unit terminal 33 and ground.



SEL790VA

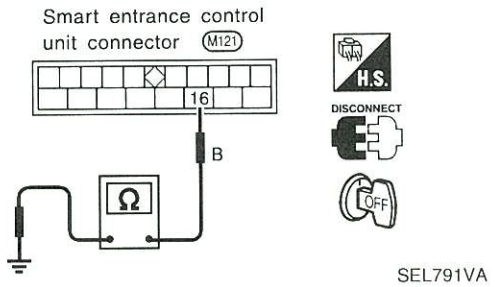
Voltage [V]:
Ignition switch is "ON".
Approx. 12
Ignition switch is "OFF".
0

OK or NG

OK	▶	GO TO 5.
NG	▶	**Check the following.** • 7.5A fuse [No. 11, located in the fuse block (J/B)] • Harness for open or short between control unit and fuse

5	CHECK CONTROL UNIT GROUND CIRCUIT

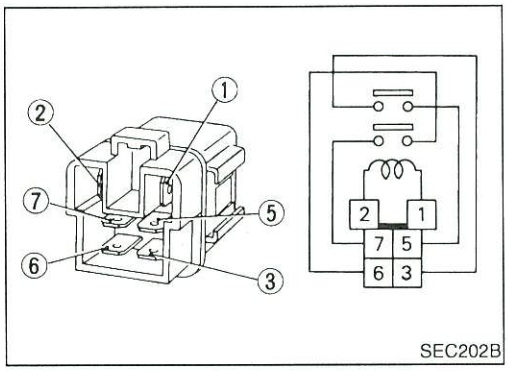
Check continuity between control unit terminal 16 and ground.



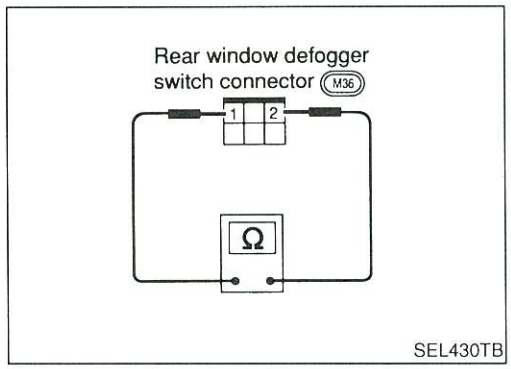
SEL791VA

Does continuity exist?

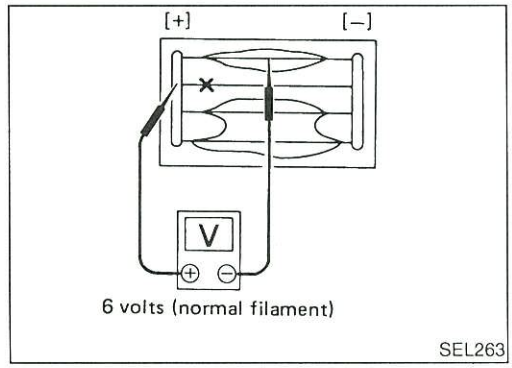
Yes	▶	Replace control unit.
No	▶	Repair harness or connectors.



SEC202B



SEL430TB



SEL263

Electrical Components Inspection

NBEL0076

REAR WINDOW DEFOGGER RELAY

NBEL0076S01

Check continuity between terminals 3 and 5, 6 and 7.

Condition	Continuity
12V direct current supply between terminals 1 and 2	Yes
No current supply	No

REAR WINDOW DEFOGGER SWITCH

NBEL0076S02

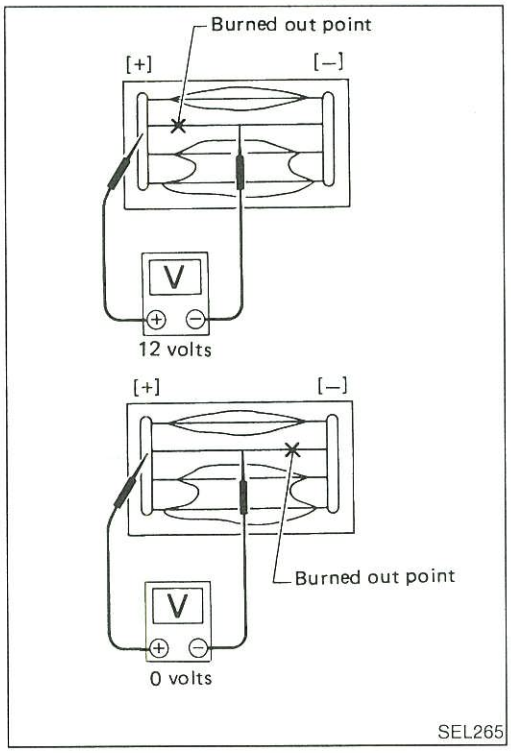
Check continuity between terminals when rear window defogger switch is pushed and released.

Terminals	Condition	Continuity
1 - 2	Rear window defogger switch is pushed	Yes
	Rear window defogger switch is released	No

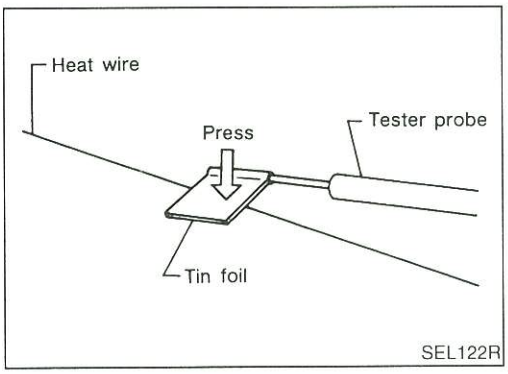
Filament Check

NBEL0077

1. Attach probe circuit tester (in volt range) to middle portion of each filament.



2. If a filament is burned out, circuit tester registers 0 or 12 volts.
3. To locate burned out point, move probe to left and right along filament. Test needle will swing abruptly when probe passes the point.



- **When measuring voltage, wrap tin foil around the top of the negative probe. Then press the foil against the wire with your finger.**

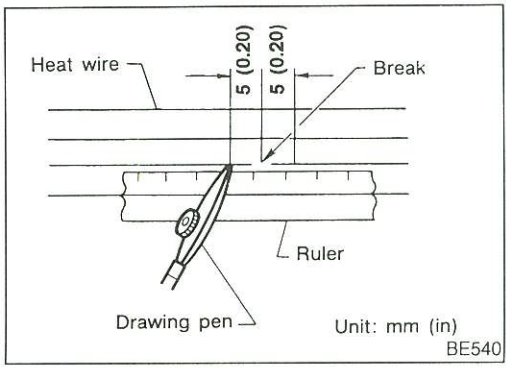
Filament Repair

NBEL0078

REPAIR EQUIPMENT

NBEL0078S01

1) Conductive silver composition (Dupont No. 4817 or equivalent)
2) Ruler 30 cm (11.8 in) long
3) Drawing pen
4) Heat gun
5) Alcohol
6) Cloth



REPAIRING PROCEDURE

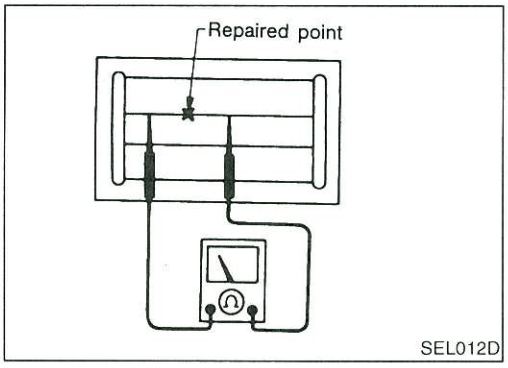
NBEL0078S02

1. Wipe broken heat wire and its surrounding area clean with a cloth dampened in alcohol.
2. Apply a small amount of conductive silver composition to tip of drawing pen.

Shake silver composition container before use.

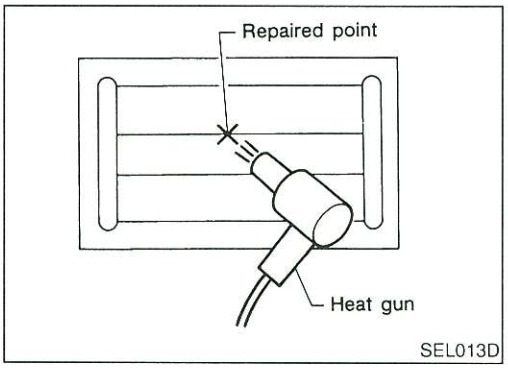
3. Place ruler on glass along broken line. Deposit conductive silver composition on break with drawing pen. Slightly overlap existing heat wire on both sides [preferably 5 mm (0.20 in)] of the break.

Filament Repair (Cont'd)



4. After repair has been completed, check repaired wire for continuity. This check should be conducted 10 minutes after silver composition is deposited.

Do not touch repaired area while test is being conducted.



5. Apply a constant stream of hot air directly to the repaired area for approximately 20 minutes with a heat gun. A minimum distance of 3 cm (1.2 in) should be kept between repaired area and hot air outlet. If a heat gun is not available, let the repaired area dry for 24 hours.

System Description

NBEL0079

Refer to Owner's Manual for audio system operating instructions.
Power is supplied at all times

- through 15A fuse [No. 4, located in the fuse block (J/B)]
- to audio unit terminal 6,
- to audio amp. relay terminal 3 and
- to rear speaker amp. terminal 11.

With the ignition switch in the ACC or ON position, power is supplied

- through 10A fuse [No. 10, located in the fuse block (J/B)]
- to audio unit terminal 10.

Ground is supplied through the case of the audio unit.
Ground is supplied

- to audio amp. relay terminal 2,
- to front door speaker LH terminal 5 and
- to front door speaker RH terminal 5
- through body grounds M77 and M111
- to rear speaker amp. terminal 24
- through body grounds B11, B22 and D210.

When the audio unit POWER button is pressed, power is supplied to rear speaker amp. terminal 9 and audio amp. relay terminal 1 from audio unit terminal 12. Then audio amp. relay is energized and power is supplied

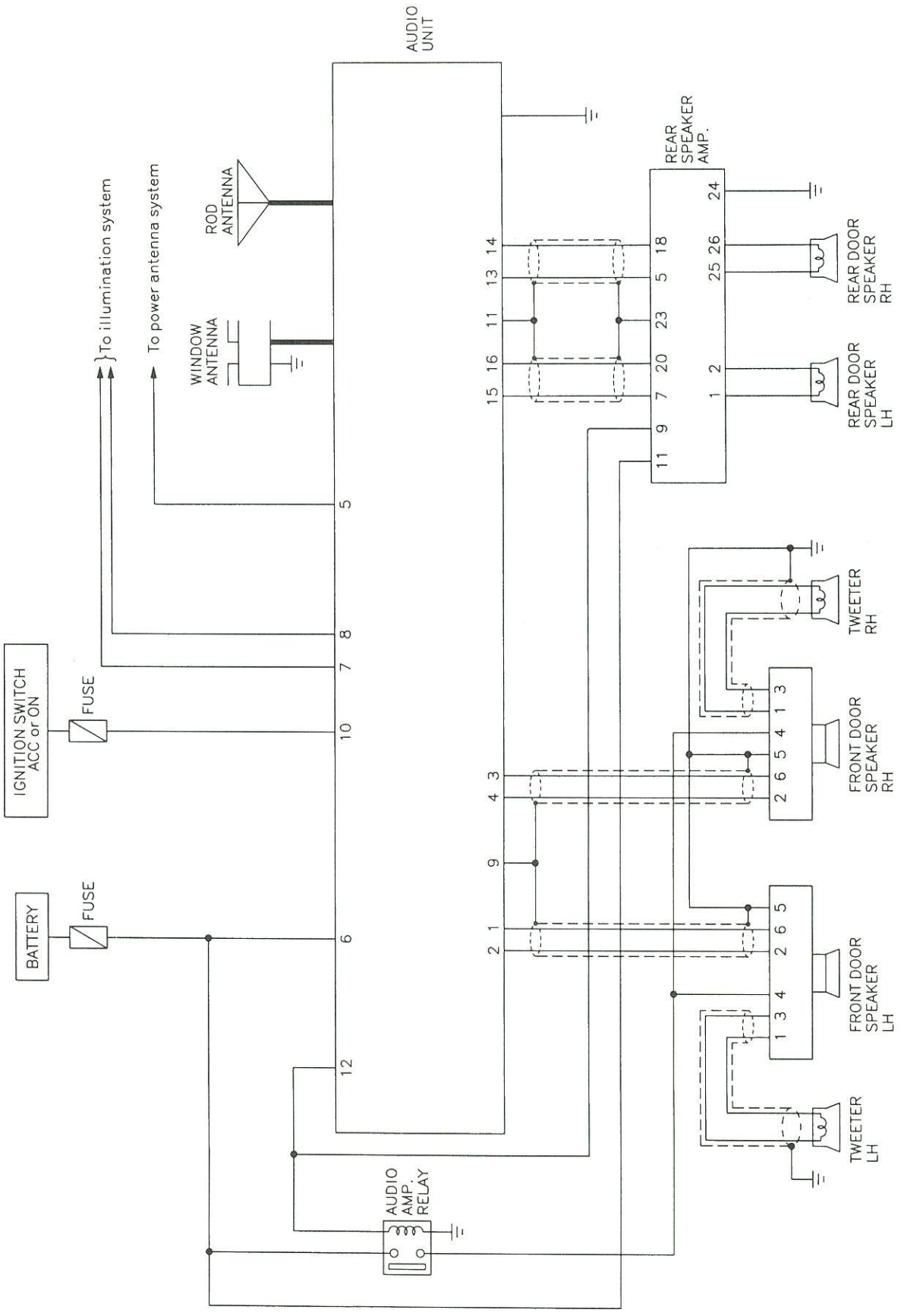
- to front door speaker LH terminal 4 and
- to front door speaker RH terminal 4.

Audio signals are supplied

- through audio unit terminals 1, 2, 3, 4, 13, 14, 15 and 16
- to terminals 2 and 6 of the LH and RH front speakers and terminals 5, 7, 18 and 20 of the rear speaker amp.
- to LH and RH tweeters through terminals 1 and 3 of the front speakers
- to rear LH and RH speakers through terminals 1, 2, 25 and 26 of the rear speaker amp.

Schematic

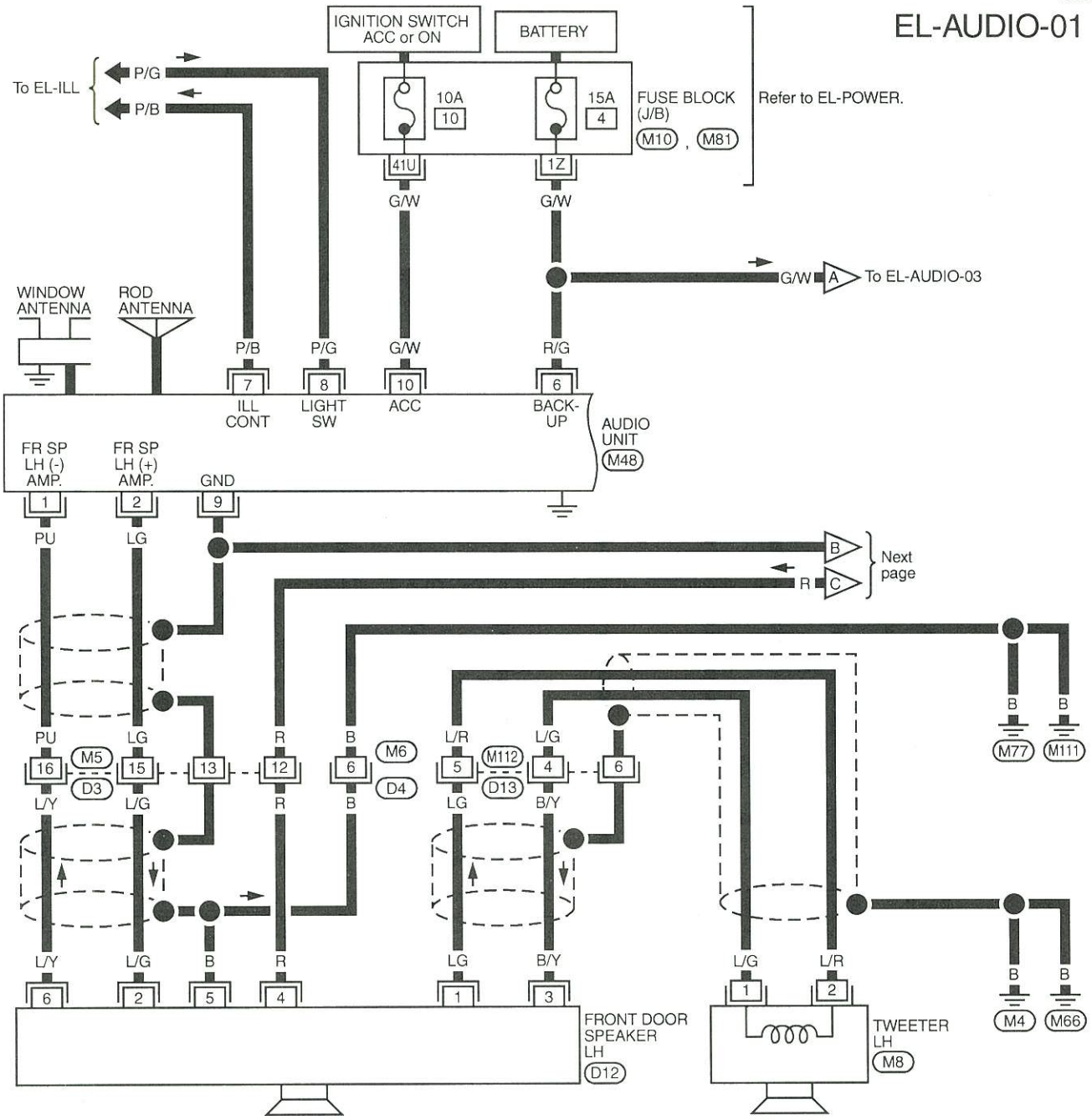
NBEL0080



MEL091K

Wiring Diagram — AUDIO —

NBEL0081



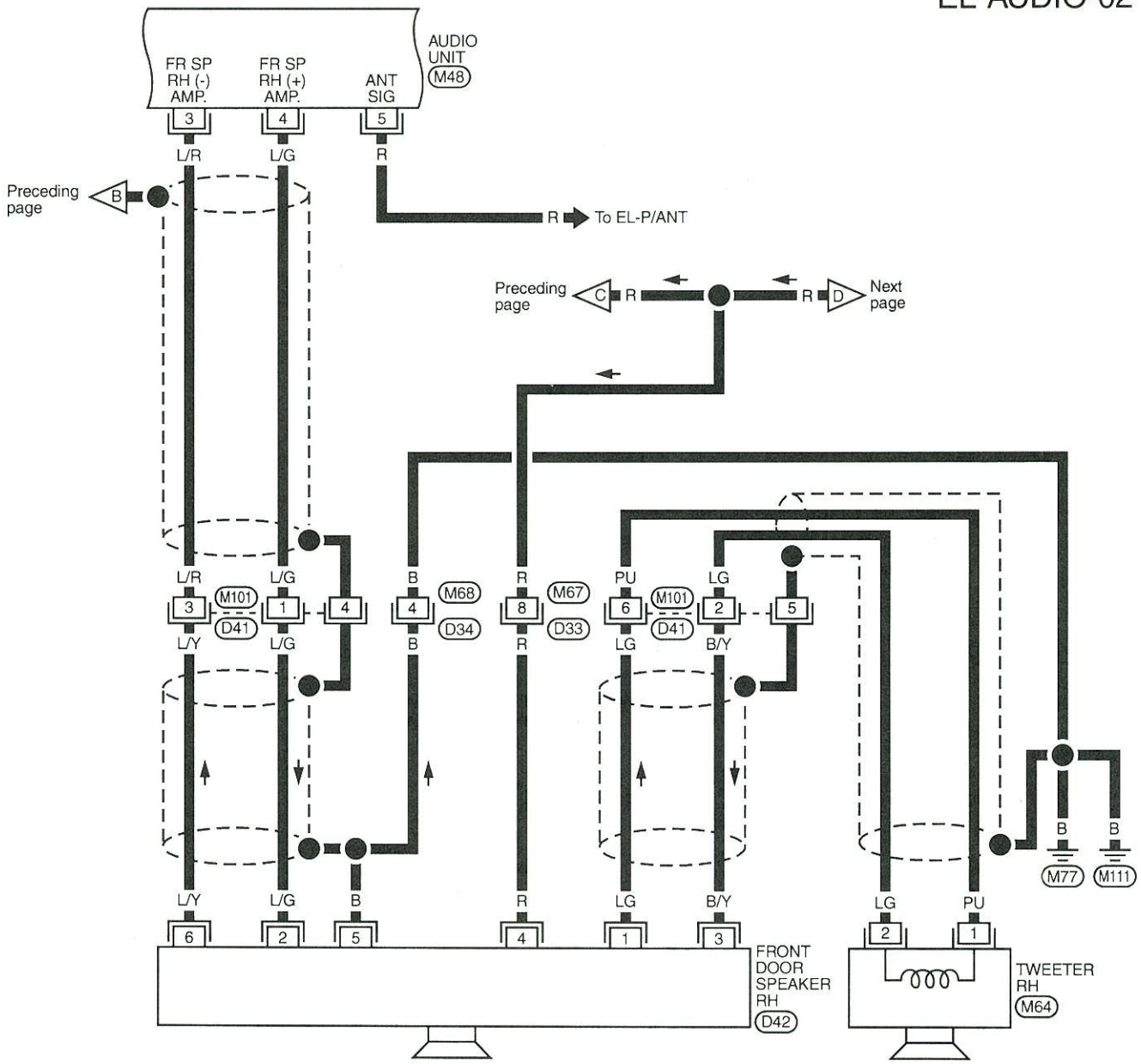
Refer to last page (Foldout page).

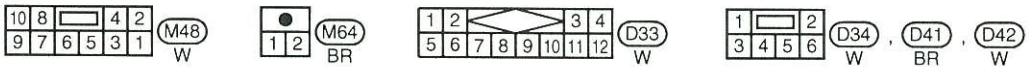
M10

M81

MEL790J

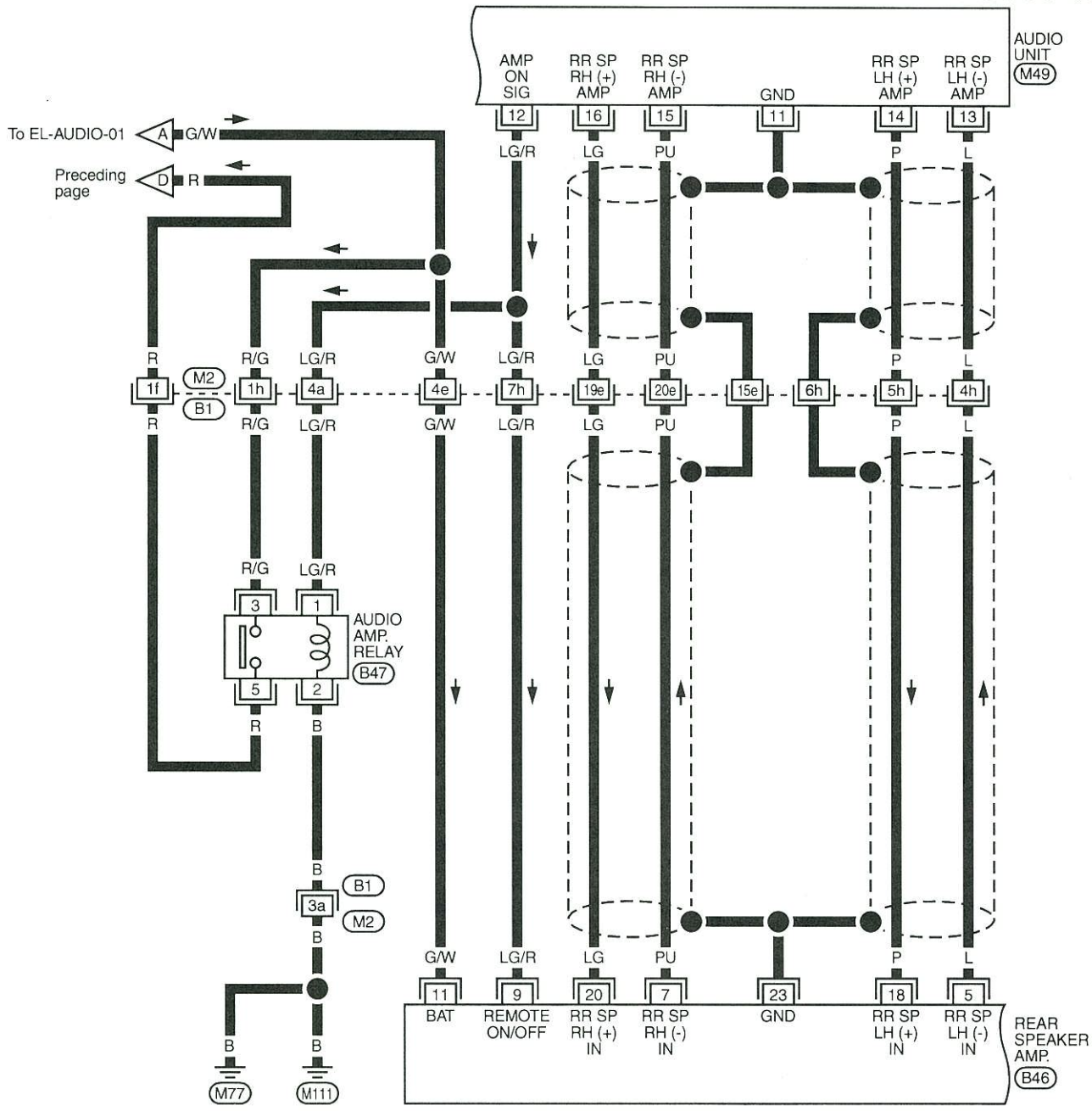
EL-AUDIO-02

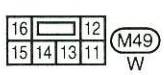


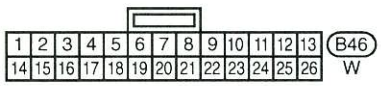


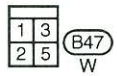
MEL791J

EL-AUDIO-03







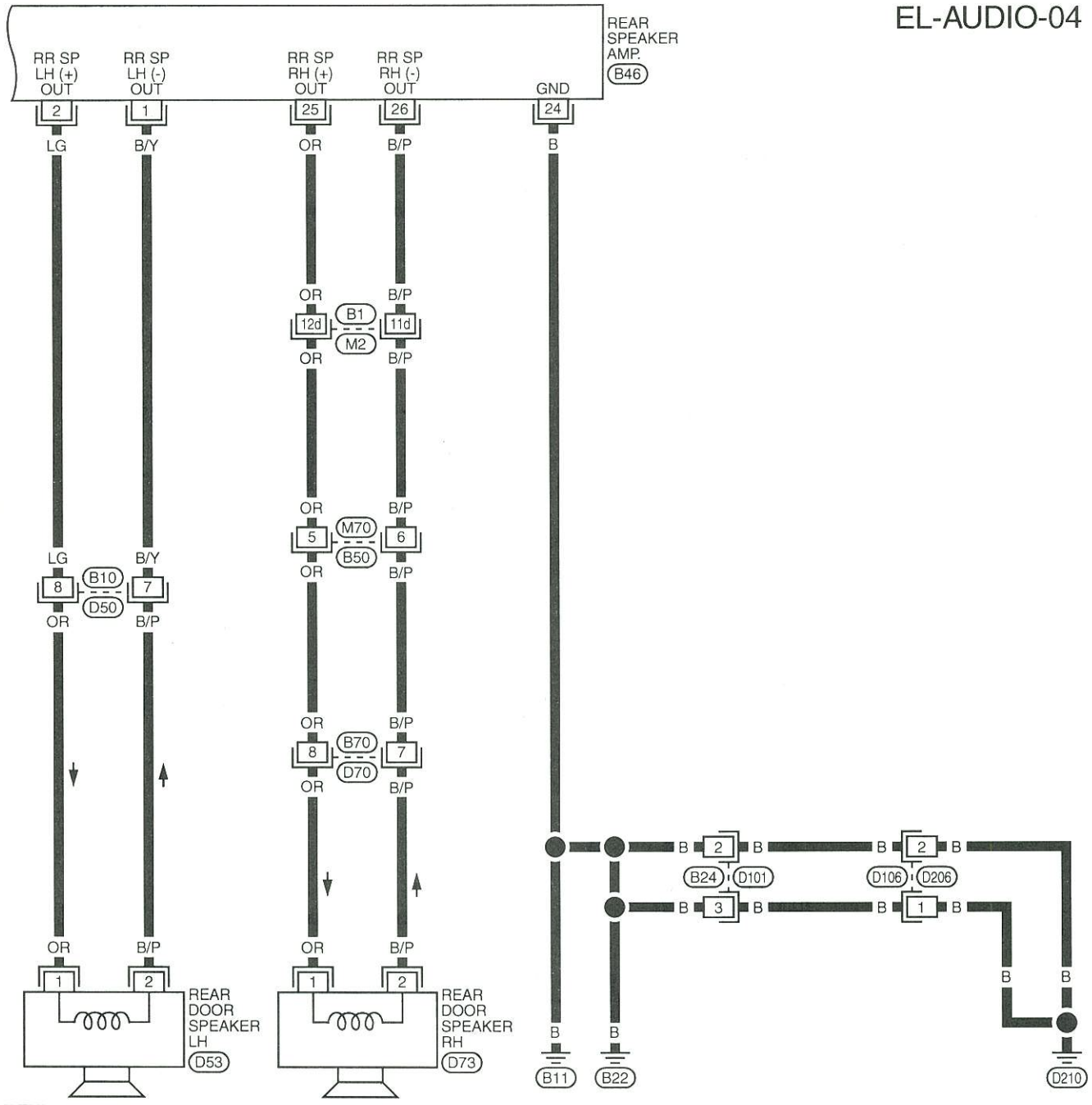


Refer to last page (Foldout page).
M2 , B1

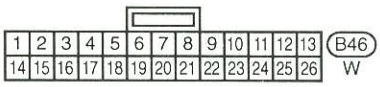
MEL792J

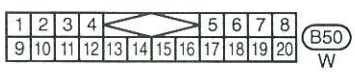
Wiring Diagram — AUDIO — (Cont'd)

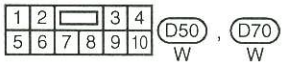
EL-AUDIO-04

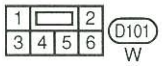


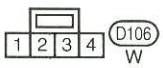
Refer to last page (Foldout page).
(M2), (B1)











MEL793J

Trouble Diagnoses

AUDIO UNIT

NBEL0082

NBEL0082S01

Symptom	Possible causes	Repair order
Audio unit inoperative (no digital display and no sound from speakers).	1. 10A fuse 2. Poor audio unit case ground 3. Audio unit	1. Check 10A fuse [No. 10, located in fuse block (J/B)]. Turn ignition switch ON and verify that battery positive voltage is present at terminal 10 of audio unit. 2. Check audio unit case ground. 3. Remove audio unit for repair.
Audio unit presets are lost when ignition switch is turned OFF.	1. 15A fuse 2. Audio unit	1. Check 15A fuse [No. 4, located in fuse block (J/B)] and verify that battery positive voltage is present at terminal 6 of audio unit. 2. Remove audio unit for repair.
AM stations are weak or noisy (FM stations OK).	1. Antenna 2. Poor audio unit ground 3. Audio unit	1. Check antenna. 2. Check audio unit ground. 3. Remove audio unit for repair.
FM stations are weak or noisy (AM stations OK).	1. Window antenna 2. Audio unit	1. Check window antenna. 2. Remove audio unit for repair.
Audio unit generates noise in AM and FM modes with engine running.	1. Poor audio unit ground 2. Loose or missing ground bonding straps 3. Ignition condenser or rear window defogger noise suppressor condenser 4. Alternator 5. Ignition coil or secondary wiring 6. Audio unit	1. Check audio unit ground. 2. Check ground bonding straps. 3. Replace ignition condenser or rear window defogger noise suppressor condenser. 4. Check alternator. 5. Check ignition coil and secondary wiring. 6. Remove audio unit for repair.
Audio unit generates noise in AM and FM modes with accessories on (switch pops and motor noise).	1. Poor audio unit ground 2. Antenna 3. Accessory ground 4. Faulty accessory	1. Check audio unit ground. 2. Check antenna. 3. Check accessory ground. 4. Replace accessory.
Audio unit controls are operational, but no sound is heard from any speaker.	1. 15A fuse 2. Audio unit output 3. Audio unit	1. Check 15A fuse [No. 4, located in fuse block (J/B)]. Verify battery positive voltage is present at terminal 3 of audio amp. relay. 2. Check audio unit output voltage (Terminal 12). 3. Remove audio unit for repair.
All front speakers are inoperative.	1. Audio amp. relay 2. Audio amp. relay ground 3. Amp. ON signal	1. Check audio amp. relay. 2. Check audio amp. relay ground (Terminal 2). 3. Turn ignition switch ACC and audio unit ON. Verify battery positive voltage is present at terminal 1 of audio amp. relay.
Individual front speaker is noisy or inoperative.	1. Speaker ground 2. Power supply 3. Audio unit output 4. Speaker	1. Check speaker ground (Terminal 5). 2. Check power supply for speaker (Terminal 4). 3. Check audio unit output voltage for speaker. 4. Replace speaker.
Both rear speakers are inoperative.	1. Poor rear speaker amp. ground 2. Power supply 3. Amp. ON signal 4. Rear speaker amp.	1. Check rear speaker amp. ground circuit. 2. Check power supply for rear speaker amp. (Terminal 11). 3. Turn ignition switch ACC and audio unit ON. Verify battery positive voltage is present at terminal 9 of rear speaker amp. 4. Remove rear speaker amp. for repair.
Individual rear speaker is noisy or inoperative.	1. Speaker 2. Audio unit/amp. output 3. Speaker circuit 4. Audio unit	1. Check speaker. 2. Check audio unit/amp. output. 3. Check wires for open or short between audio unit/amp. and speakers. 4. Remove audio unit for repair.

Inspection

NBEL0083

AUDIO UNIT AND AMP.

NBEL0083S01

All voltage inspections are made with:

- Ignition switch ON or ACC
- Audio unit ON
- Audio unit and amps. connected (If audio unit or amp. is removed for inspection, supply a ground to the case using a jumper wire.)

ANTENNA

NBEL0083S02

1. Using a jumper wire, clip an auxiliary ground between antenna and body.

- If reception improves, check antenna ground (at body surface).
- If reception does not improve, check main feeder cable for short circuit or open circuit.

System Description

NBEL0084

Power is supplied at all times

- through 7.5A fuse [No. 24, located in the fuse block (J/B)]
- to power antenna terminal 6.

Ground is supplied to the power antenna terminal 2 through body grounds M4 and M66.
When the audio unit is turned to the ON position, battery positive voltage is supplied

- through audio unit terminal 5
- to power antenna terminal 4.

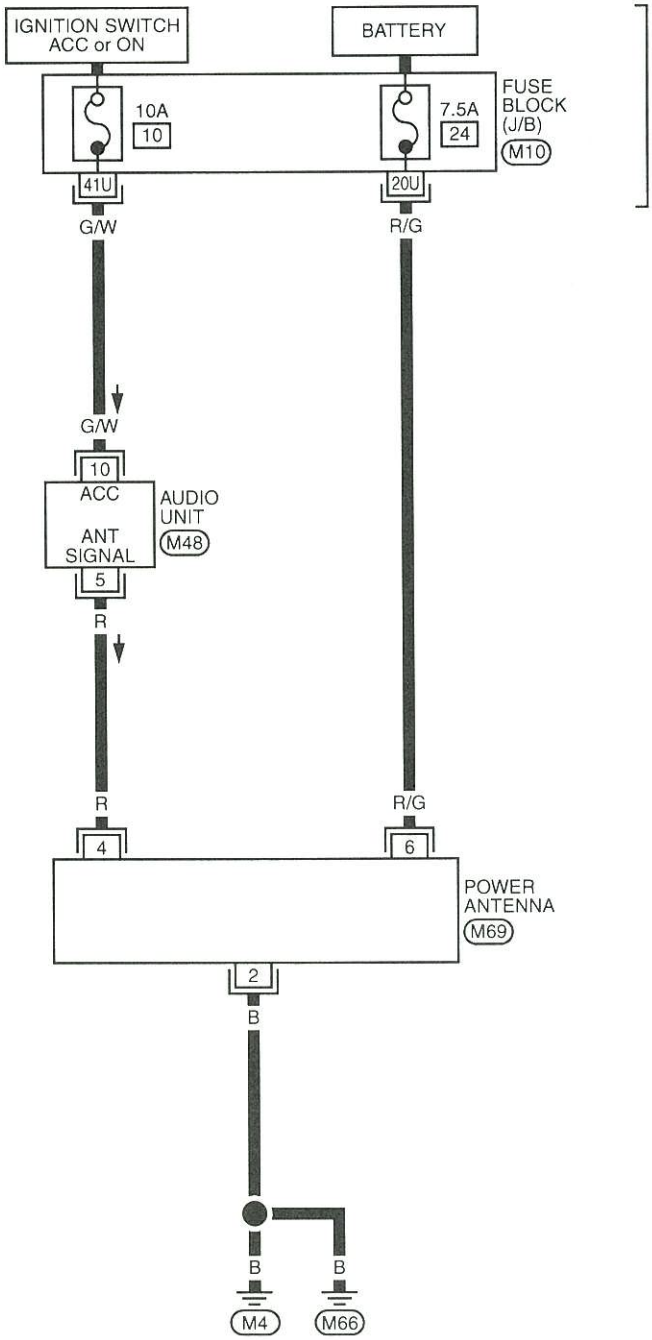
The antenna raises and is held in the extended position.
When the audio unit is turned to the OFF position, battery positive voltage is interrupted

- from audio unit terminal 5
- to power antenna terminal 4.

The antenna retracts.

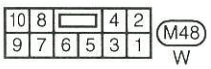
Wiring Diagram — P/ANT —

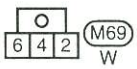
NBEL0085



EL-P/ANT-01

Refer to EL-POWER.





Refer to last page (Foldout page).
M10

MEL092K

Trouble Diagnoses

POWER ANTENNA

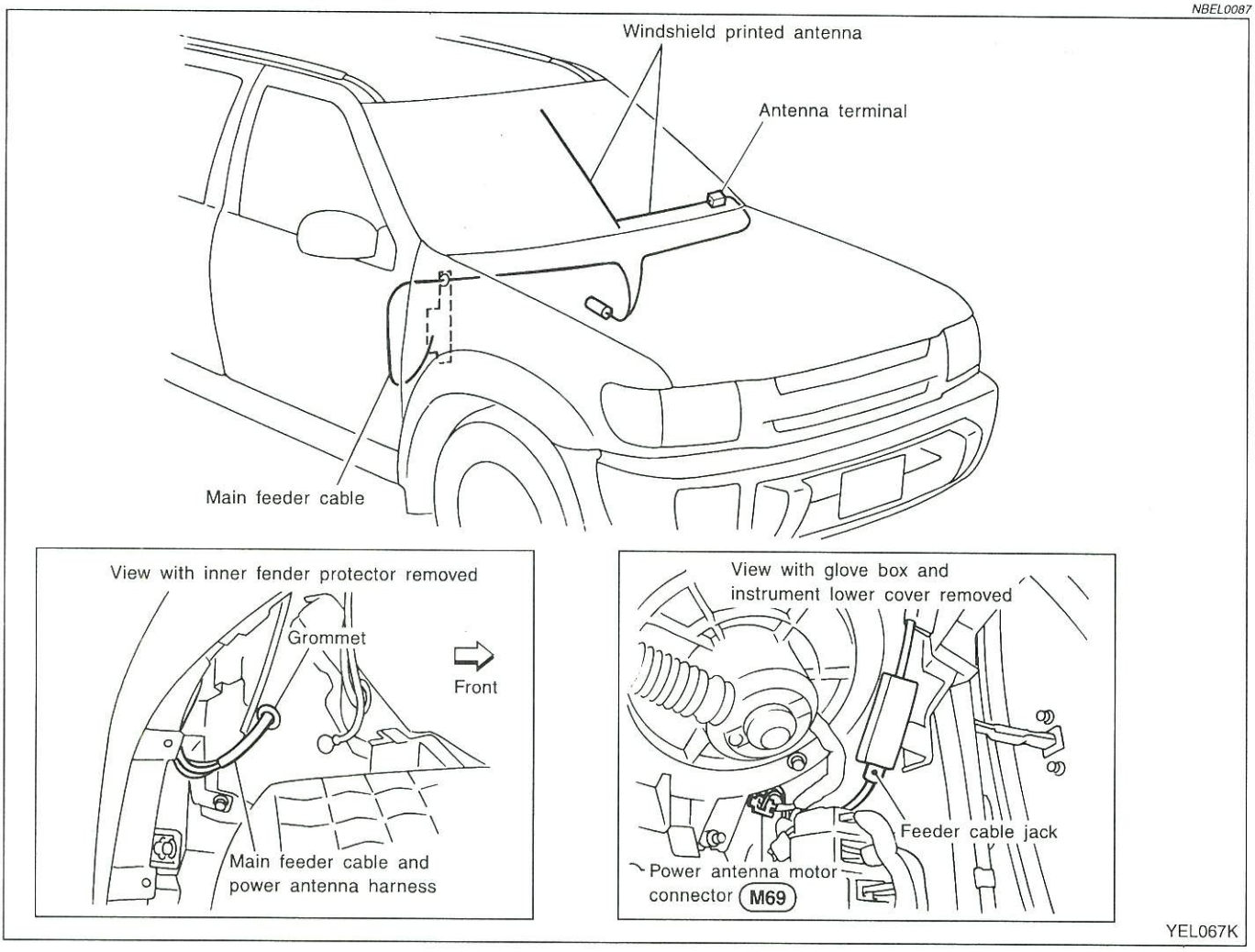
NBEL0086

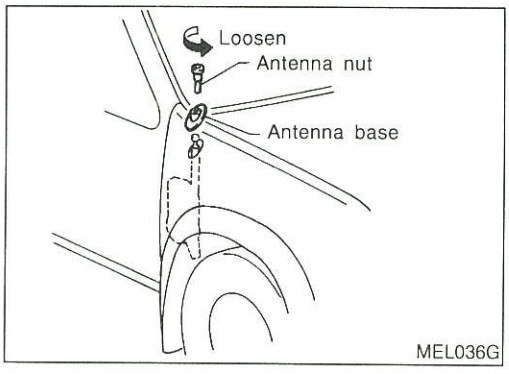
NBEL0086S01

Symptom	Possible causes	Repair order
Power antenna does not operate.	1. 7.5A fuse 2. Audio unit signal 3. Grounds M4 and M66	1. Check 7.5A fuse [No. 24, located in fuse block (J/B)]. Verify that battery positive voltage is present at terminal 6 of power antenna. 2. Turn ignition switch and audio unit ON. Verify that battery positive voltage is present at terminal 4 of power antenna. 3. Check grounds M4 and M66.

Location of Antenna

NBEL0087





Antenna Rod Replacement

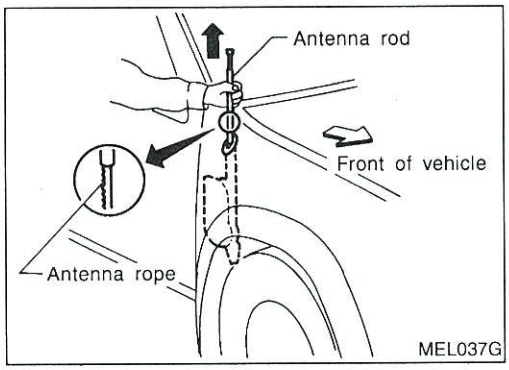
NBEL0088

NBEL0088S01

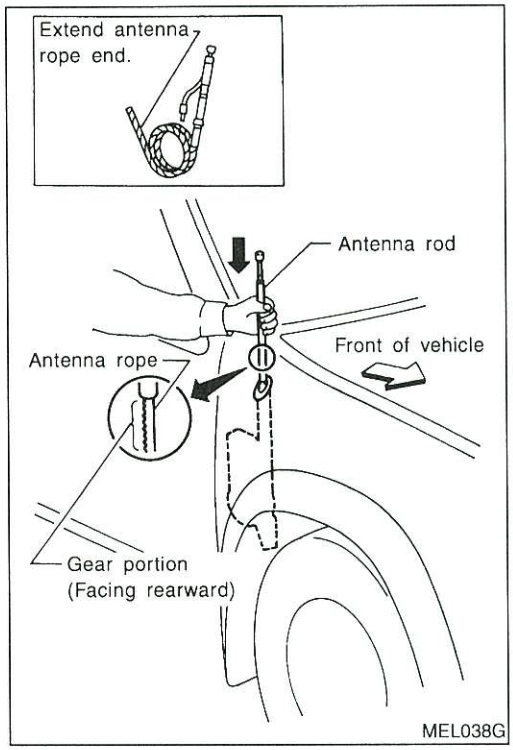
REMOVAL

1. Remove antenna nut and antenna base.

Antenna Rod Replacement (Cont'd)



2. Withdraw antenna rod while raising it by operating antenna motor.



INSTALLATION

NBEL0088S02

1. Lower antenna rod by operating antenna motor.
2. Insert gear section of antenna rope into place with it facing toward antenna motor.
3. As soon as antenna rope is wound on antenna motor, stop antenna motor. Insert antenna rod lower end into antenna motor pipe.
4. Retract antenna rod completely by operating antenna motor.
5. Install antenna nut and base.

System Description

OUTLINE

NBEL0167

NBEL0167S01

Electric sunroof system consists of

- Sunroof switch
- Sunroof motor
- Power window relay
- Smart entrance control unit

Smart entrance control unit controls retained power operation.

RETAINED POWER OPERATION

NBEL0167S02

When the ignition switch is turned to OFF position from ON or START position, power is supplied for 45 seconds

- to power window relay terminal 2
- from smart entrance control unit terminal 5.

Ground is always supplied

- to power window relay terminal 1
- through body grounds.

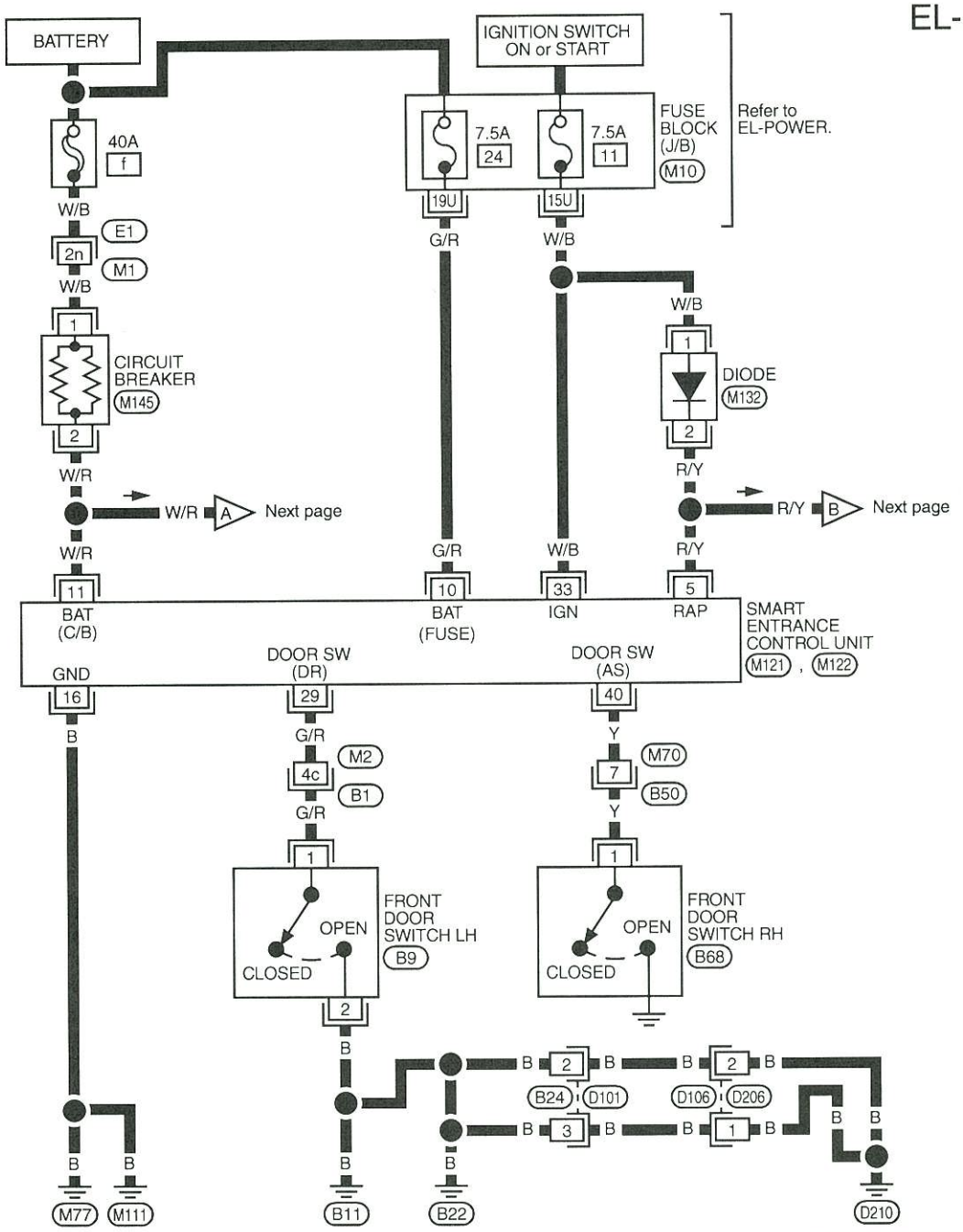
When power and ground is supplied, the power window relay continues to be energized, and the electrical sunroof can be operated.

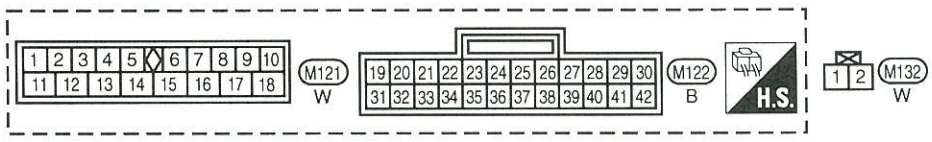
The retained power operation is canceled when the driver or passenger side door is opened.

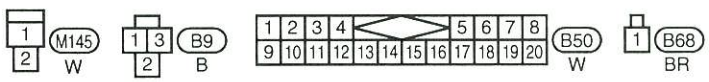
Wiring Diagram — SROOF —

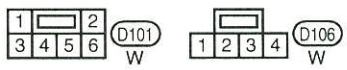
NBEL0089

EL-SROOF-01









Refer to last page (Foldout page).

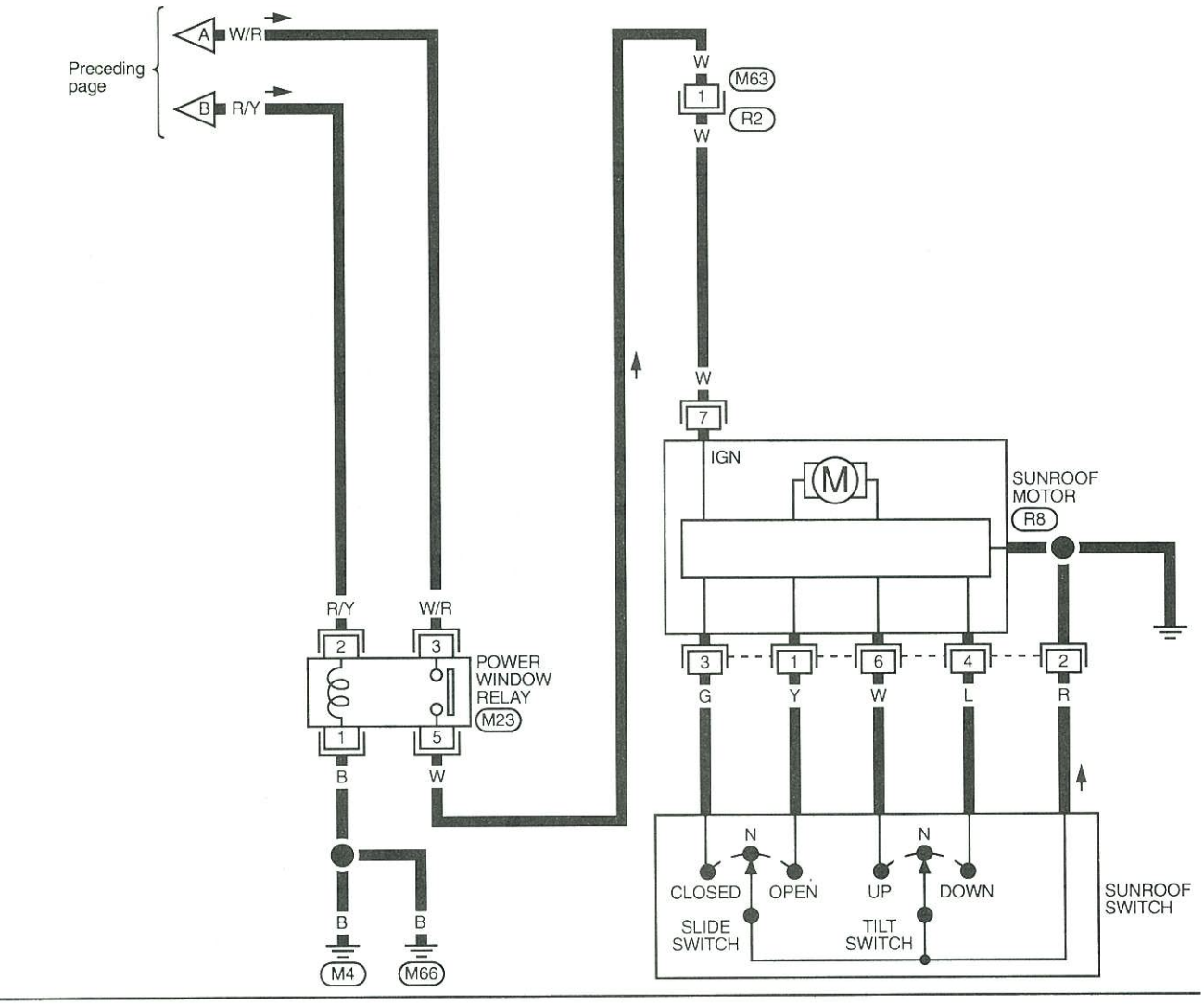
M1 , E1

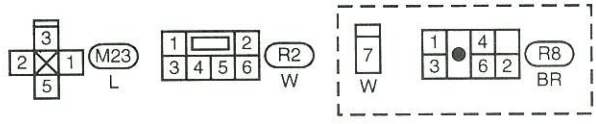
M2 , B1

M10

MEL071K

EL-SROOF-02



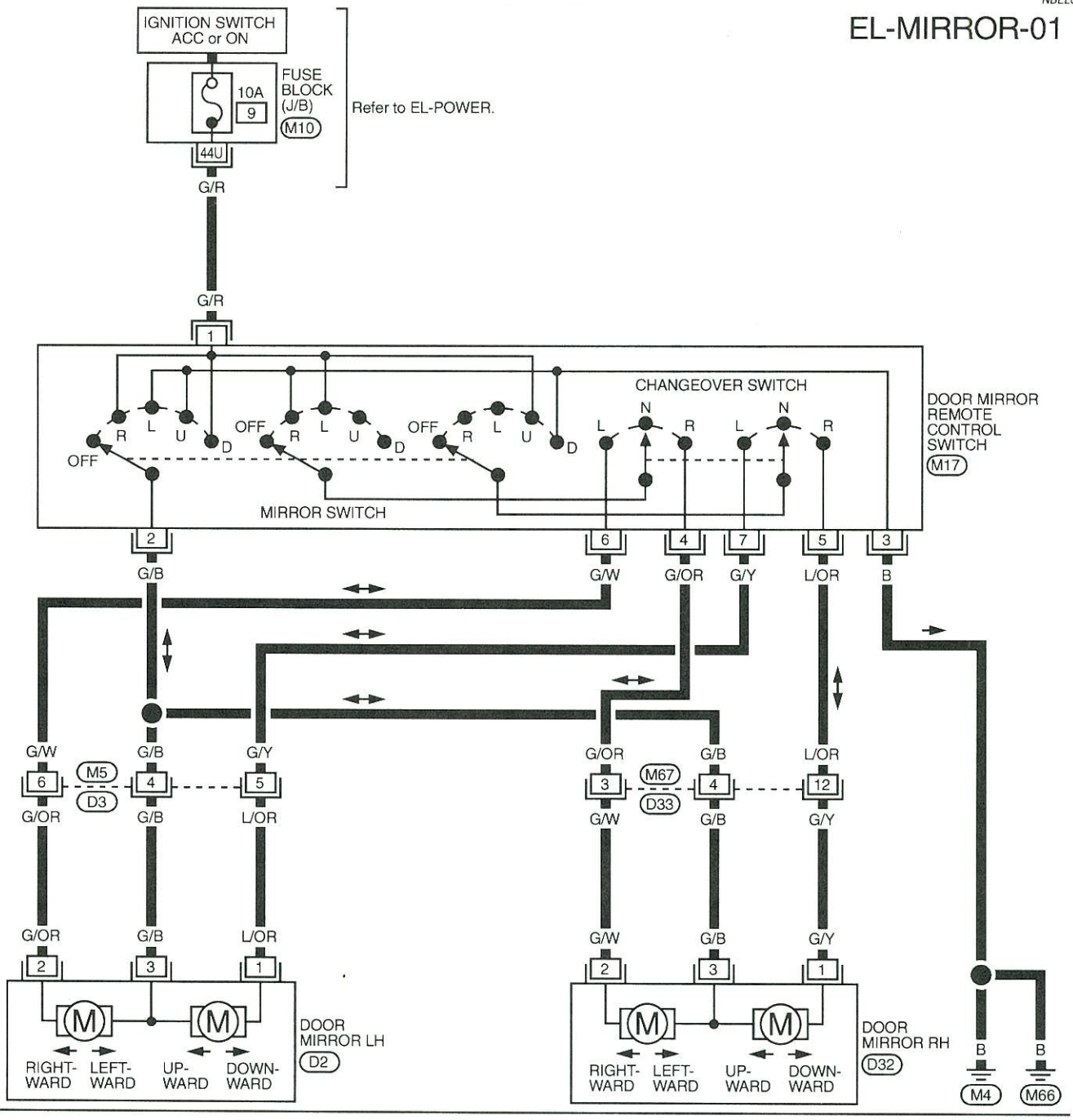


MEL794J

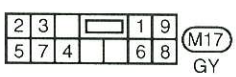
Wiring Diagram — MIRROR —

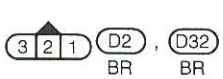
NBEL0090

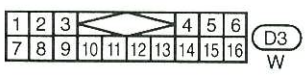
EL-MIRROR-01

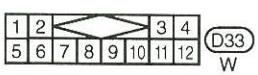


Refer to last page (Foldout page).
M10







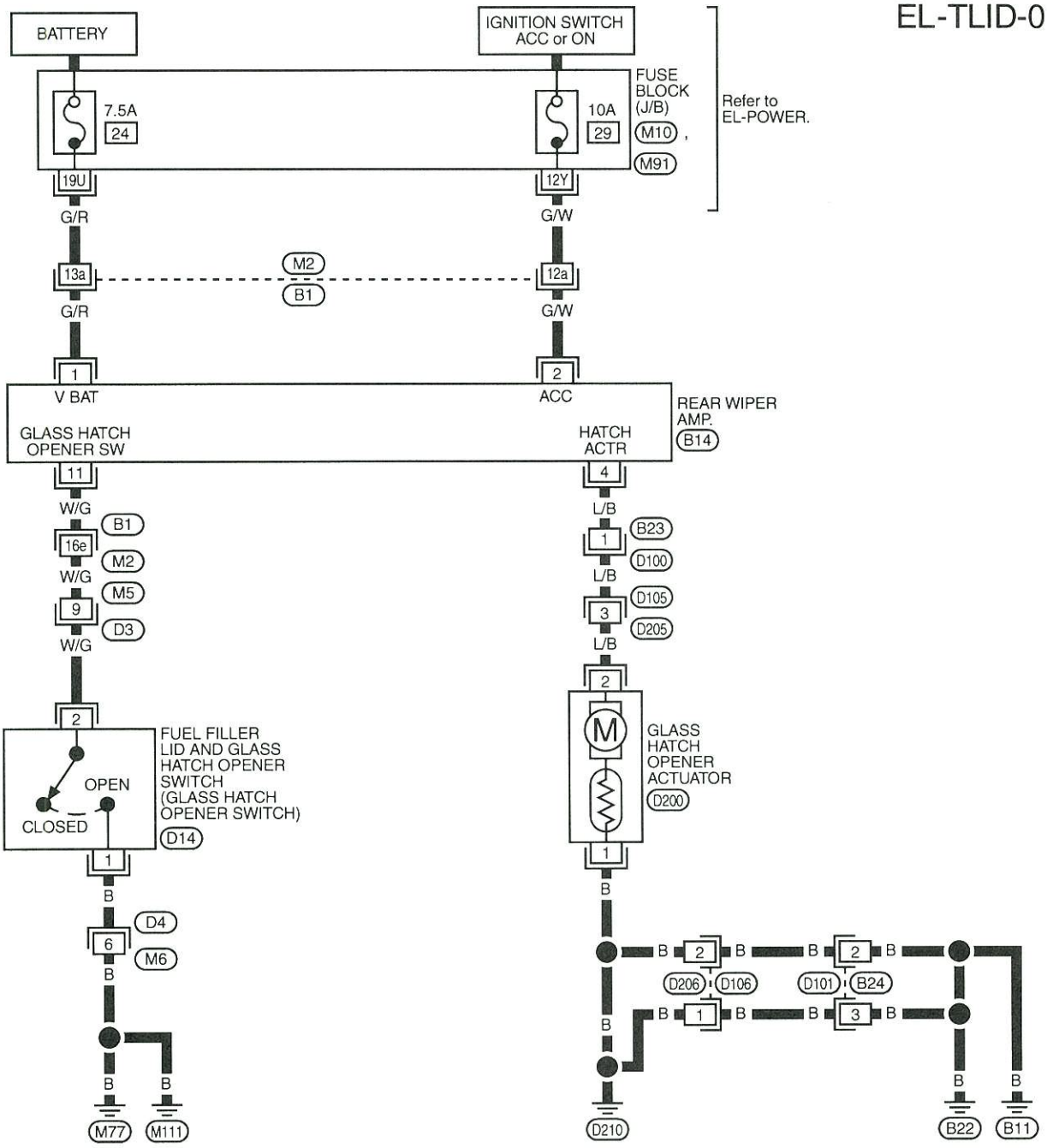


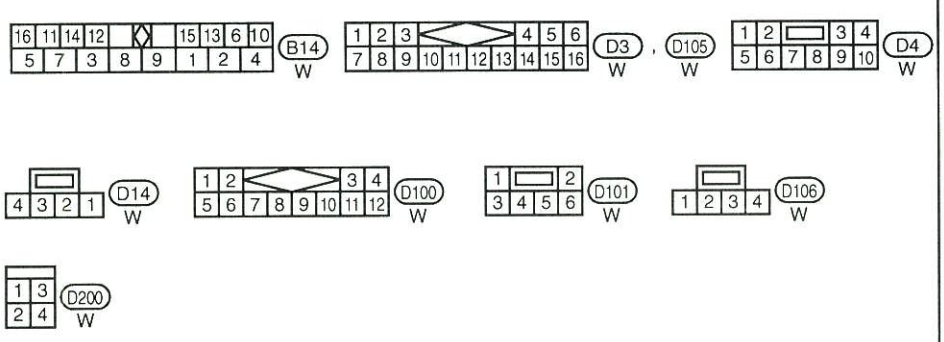
MEL052I

Wiring Diagram — TLID —

NBEL0091

EL-TLID-01





Refer to last page (Foldout page).

M2 , B1

M10

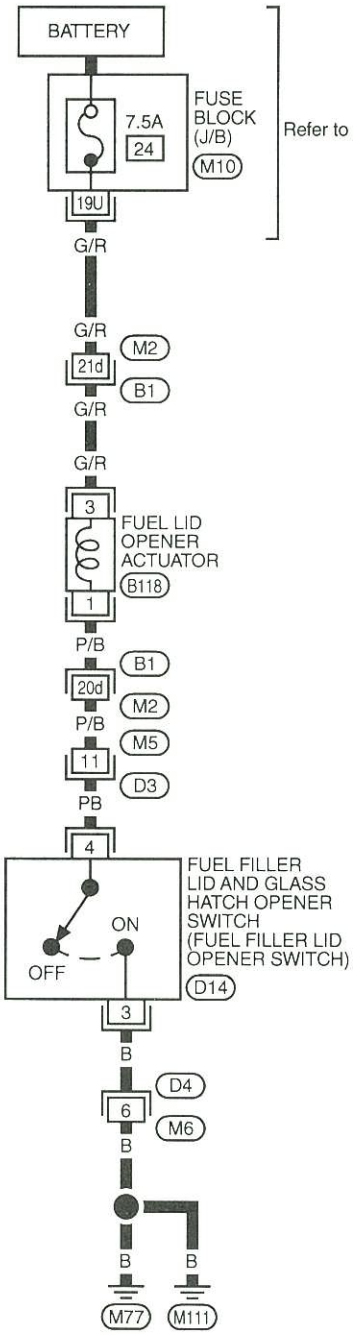
M91

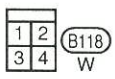
MEL795J

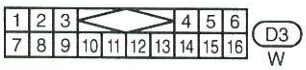
Wiring Diagram — F/LID —

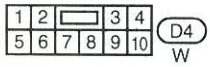
NBEL0168

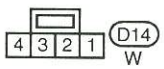
EL-F/LID-01











Refer to last page (Foldout page).

M2 , B1

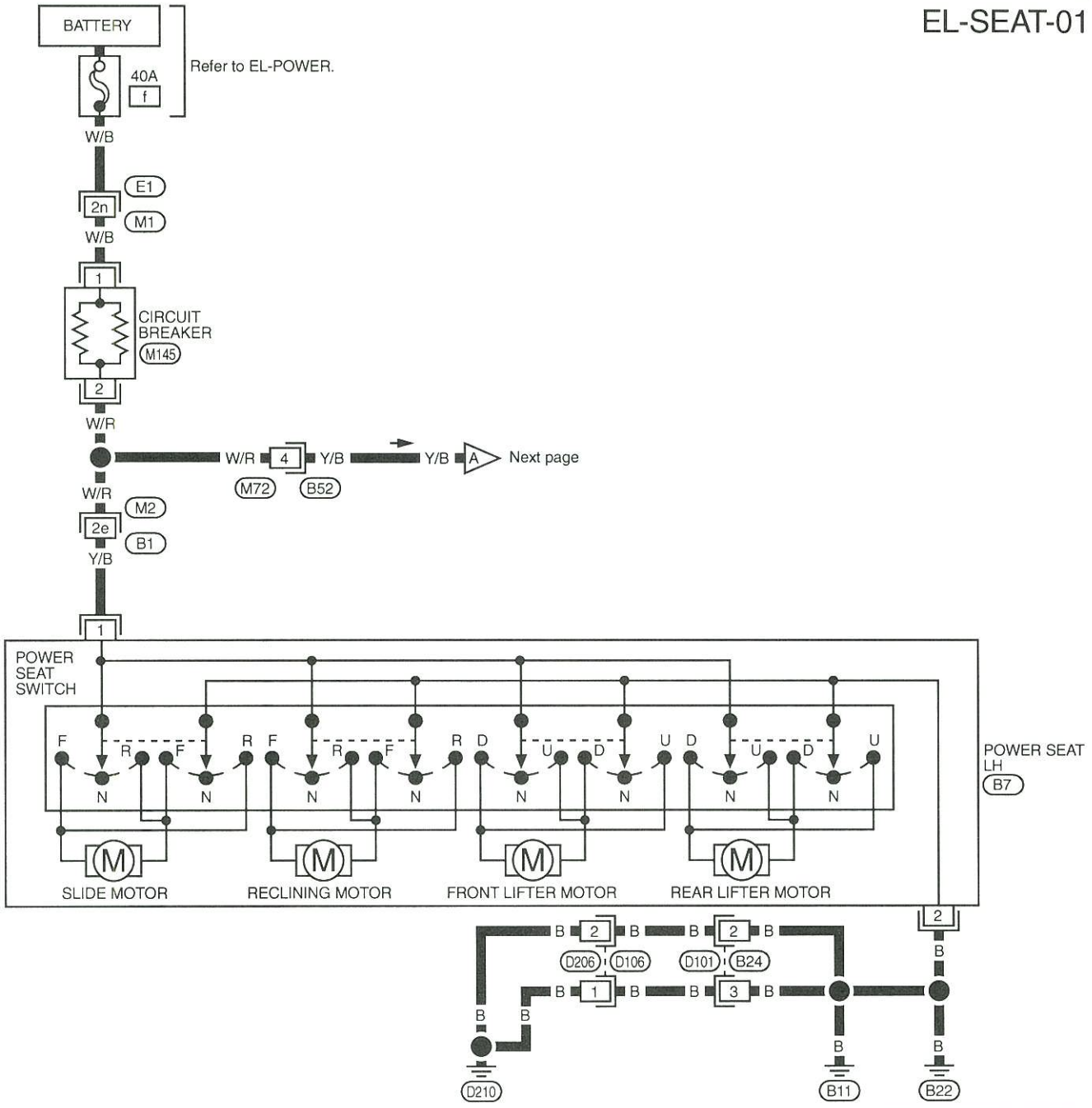
M10

MEL796J

Wiring Diagram — SEAT —

NBEL0092

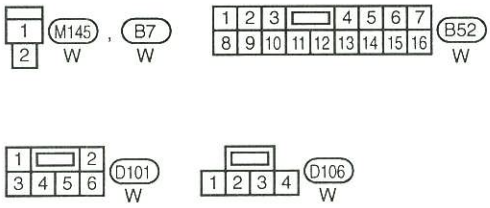
EL-SEAT-01



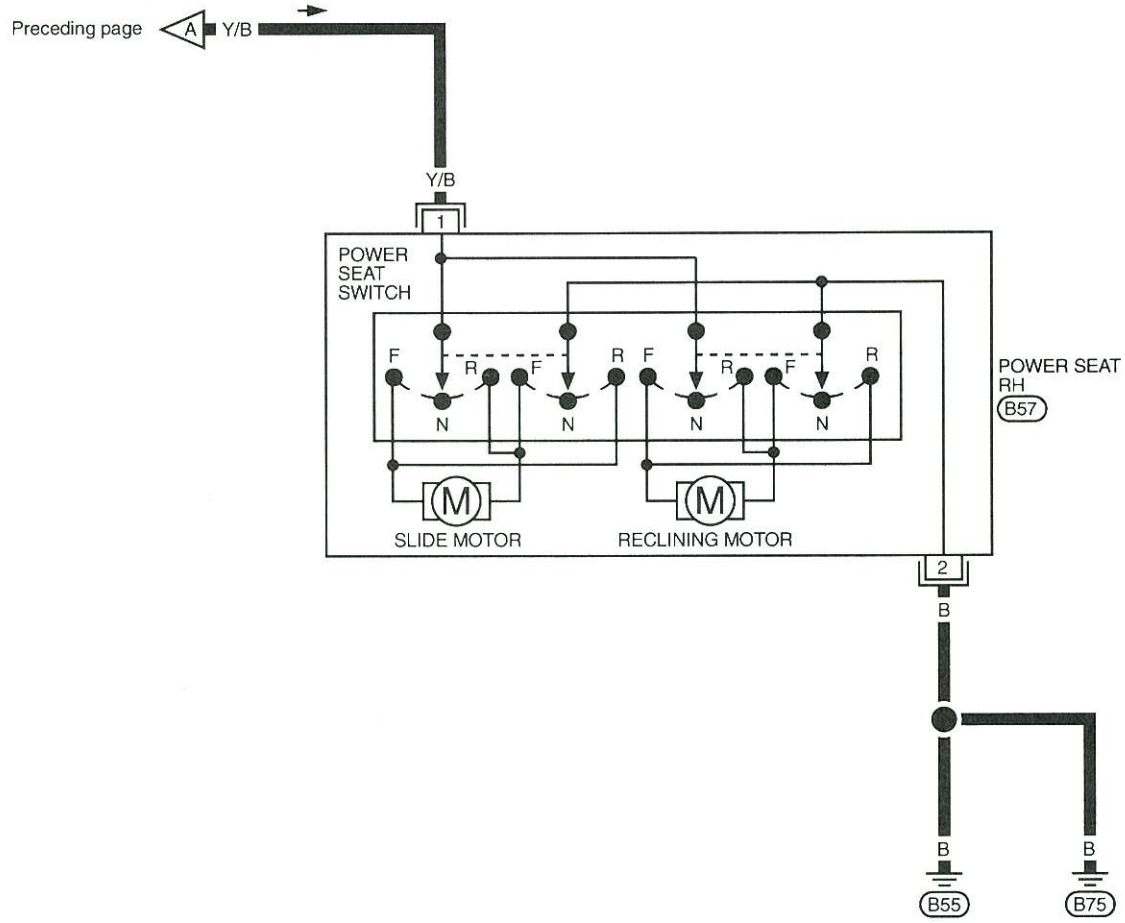
Refer to last page (Foldout page).

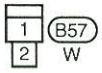
M1 , E1

M2 , B1



MEL797J


Preceding page
A
Y/B
Y/B
1
POWER SEAT SWITCH
F
R
F
R
F
R
F
R
N
N
N
N
M
M
SLIDE MOTOR
RECLINING MOTOR
POWER SEAT RH
B57
2
B
B
B
B55
B75

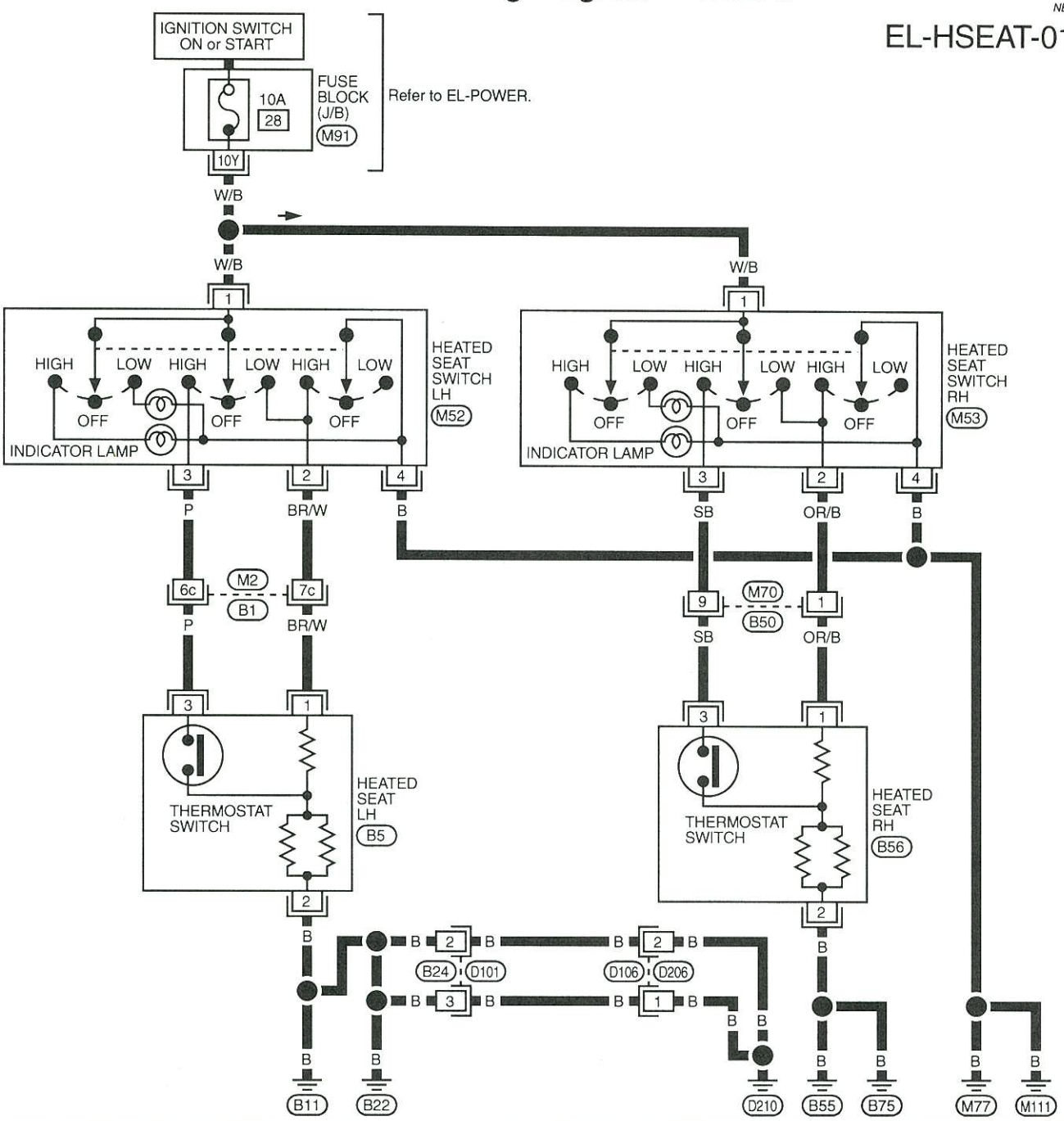

1
2
B57
W

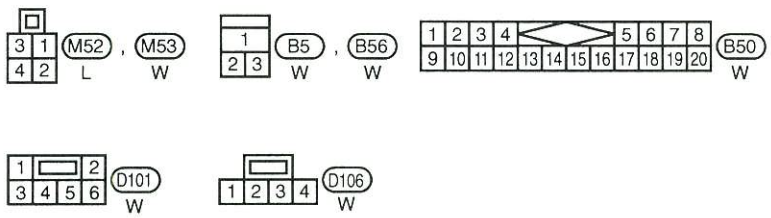
MEL601F

Wiring Diagram — HSEAT —

NBEL0093

EL-HSEAT-01



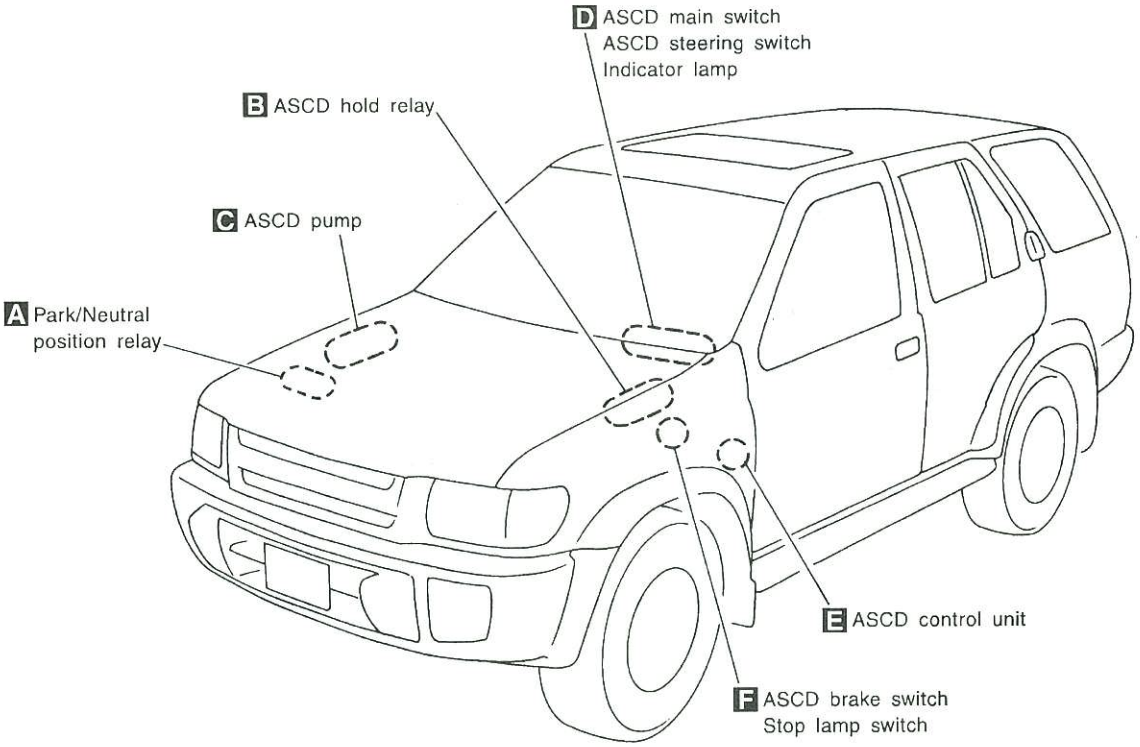


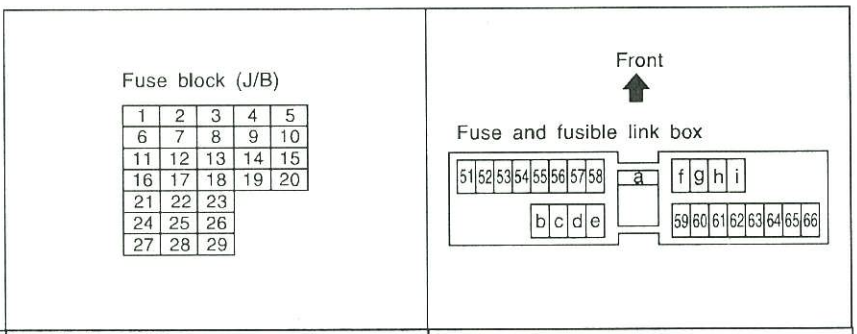
Refer to last page (Foldout page).
M2 , B1
M91

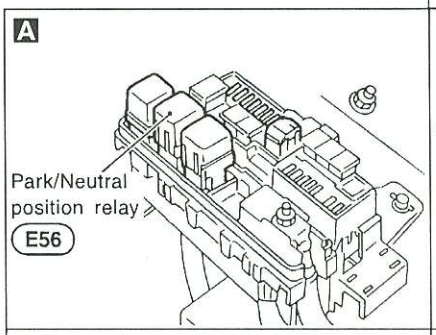
MEL798J

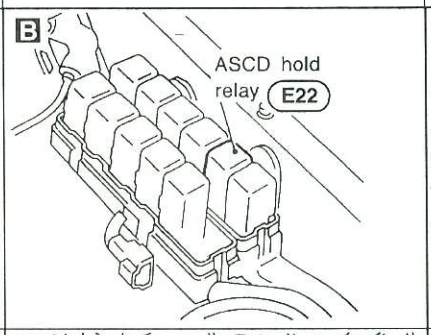
Component Parts and Harness Connector Location

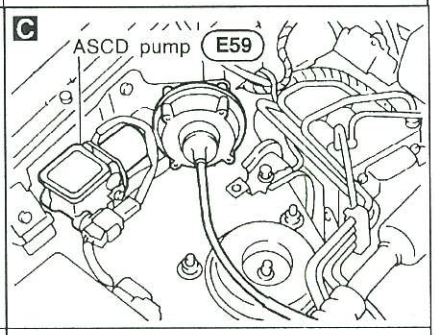
NBEL0094

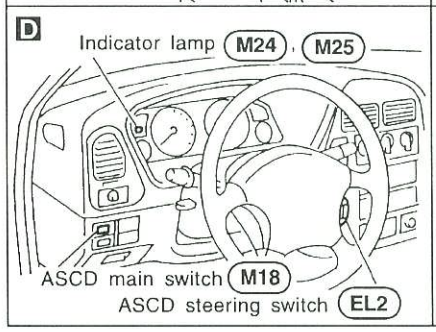


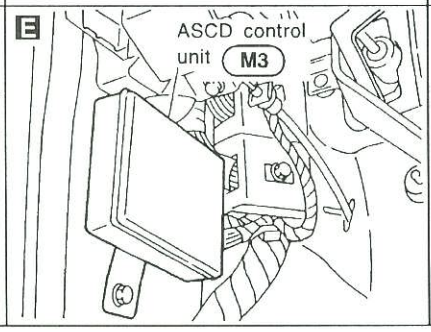


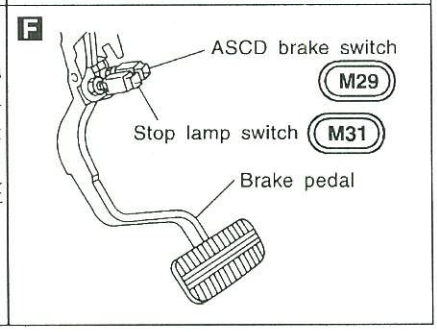












MEL458I

System Description

NBEL0095

Refer to Owner's Manual for ASCD operating instructions.

POWER SUPPLY AND GROUND

NBEL0095S03

When ignition switch is in the ON or START position, power is supplied
- through 7.5A fuse [No. 11, located in the fuse block (J/B)]
- to ASCD hold relay terminal 7 and
- to ASCD main switch terminal 1.

When ASCD main switch is in the ON position, power is supplied
- from ASCD main switch terminal 3
- to ASCD hold relay terminal 1.

Ground is supplied
- to ASCD hold relay terminal 2
- through body grounds E13 and E41.

With power and ground is supplied, ASCD hold relay is energized. And then power is supplied
- from ASCD hold relay terminal 6
- to ASCD control unit terminal 4 and
- to ASCD main switch terminal 2.

After the ASCD main switch is released, power remains supplied
- to the coil circuit of ASCD hold relay
- through ASCD main switch terminals 2 and 3.

This power supply is kept until one of following conditions exists.
- Ignition switch is returned to the ACC or OFF position.
- ASCD main switch is turned to OFF position.

During ASCD hold relay is energized power is also supplied to ASCD control unit terminal 5
- through ASCD brake switch, ASCD hold relay and park/neutral position relay.

Ground is supplied
- to ASCD control unit terminal 3
- through body grounds M4 and M66.

OPERATION

NBEL0095S04

Set Operation

NBEL0095S0401

To activate the ASCD, all of following conditions must exist.
- Power supply to ASCD control unit terminal 4
- Power supply to ASCD control unit terminal 5 (Brake pedal is released and A/T selector lever is in other than P and N position.)
- Vehicle speed is greater than 48 km/h (30 MPH). (Signal from combination meter)

When the SET/COAST switch is depressed, power is supplied
- from ASCD steering switch terminal 2
- to ASCD control unit terminal 2.

And then ASCD pump is activated to control throttle wire and ASCD control unit supply power
- to combination meter terminal 11 to illuminate CRUISE indicator.

A/T Overdrive Control during Cruise Control Driving

NBEL0095S0402

When the vehicle speed is approximately 8 km/h (5 MPH) below set speed, a signal is sent
- from ASCD control unit terminal 12
- to TCM (transmission control module) terminal 24.

When this occurs, the TCM (transmission control module) cancels overdrive.
After vehicle speed is approximately 3 km/h (2 MPH) above set speed, overdrive is reactivated.

Coast Operation

NBEL0095S0403

When the SET/COAST switch is depressed during cruise control driving, ASCD actuator returns the throttle cable to decrease vehicle set speed until the switch is released. And then ASCD will keep the new set speed.

Accel Operation

NBEL0095S0404

When the RESUME/ACCEL switch is depressed, power is supplied

- from ASCD steering switch terminal 3
- to ASCD control unit terminal 1.

If the RESUME/ACCEL switch is depressed during cruise control driving, ASCD actuator pulls the throttle cable to increase the vehicle speed until the switch is released or vehicle speed is reached to maximum controlled speed by the system. And then ASCD will keep the new set speed.

Cancel Operation

NBEL0095S0405

When any of following condition exists, cruise operation will be canceled.

- CANCEL switch is depressed. (Power supply to ASCD control unit terminals 1 and 2)
- Brake pedal is depressed. (Power supply to ASCD control unit terminal 11 from stop lamp switch)
- Brake pedal is depressed or A/T selector lever is shifted to P or N position. (Power supply to ASCD control unit terminal 5 is interrupted.)

If MAIN switch is turned to OFF during ASCD is activated, all of ASCD operation will be canceled and vehicle speed memory will be erased.

Resume Operation

NBEL0095S0406

When the RESUME/ACCEL switch is depressed after cancel operation other than depressing MAIN switch is performed, vehicle speed will return to last set speed. To resume vehicle set speed, vehicle condition must meet following conditions.

- Brake pedal is released.
- A/T selector lever is in other than P and N position.
- Vehicle speed is greater than 48 km/h (30 MPH).

ASCD PUMP OPERATION

NBEL0095S05

The ASCD pump consists of a vacuum motor, an air valve and a release valve. When the ASCD activates, power is supplied

- from terminal 8 of ASCD control unit
- to ASCD pump terminal 1.

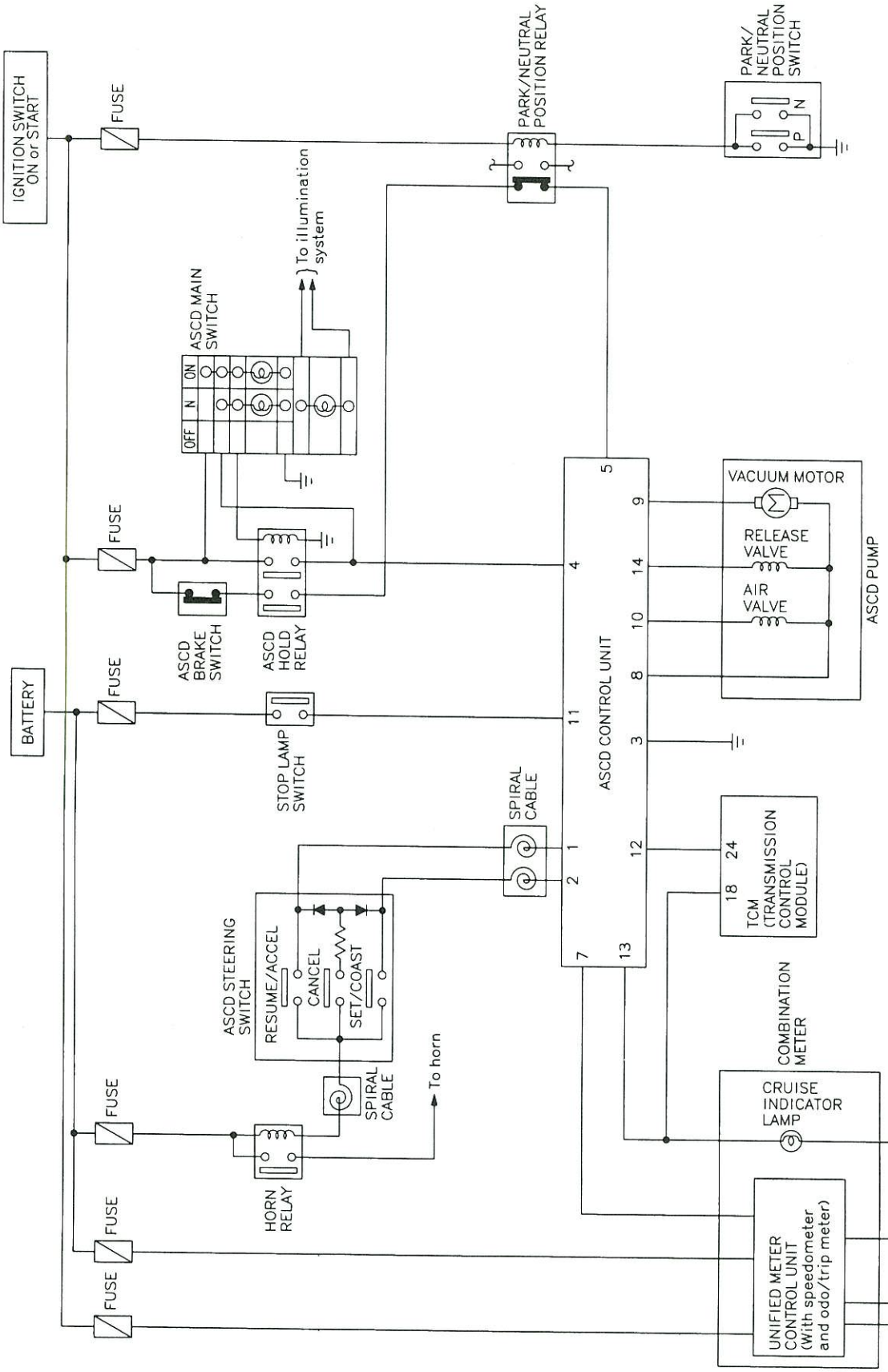
Ground is supplied to vacuum motor, air valve and release valve from ASCD control unit depending on the operated condition as shown in the below table.
The pump is connected to ASCD actuator by vacuum hose. When the ASCD pump is activated, the ASCD pump vacuum the diaphragm of ASCD actuator to control throttle cable.

		Air valve (*1)	Release valve (*1)	Vacuum motor	Actuator inner pressure
ASCD not operating		Open	Open	Stopped	Atmosphere
ASCD operating	Releasing throttle cable	Open	Closed	Stopped	Vacuum
	Holding throttle position	Closed	Closed	Stopped	Vacuum (*2)
	Pulling throttle cable	Closed	Closed	Operated	Vacuum

*1: When power and ground is supplied, valve is closed.
*2: Set position held.

Schematic

NBEL0096



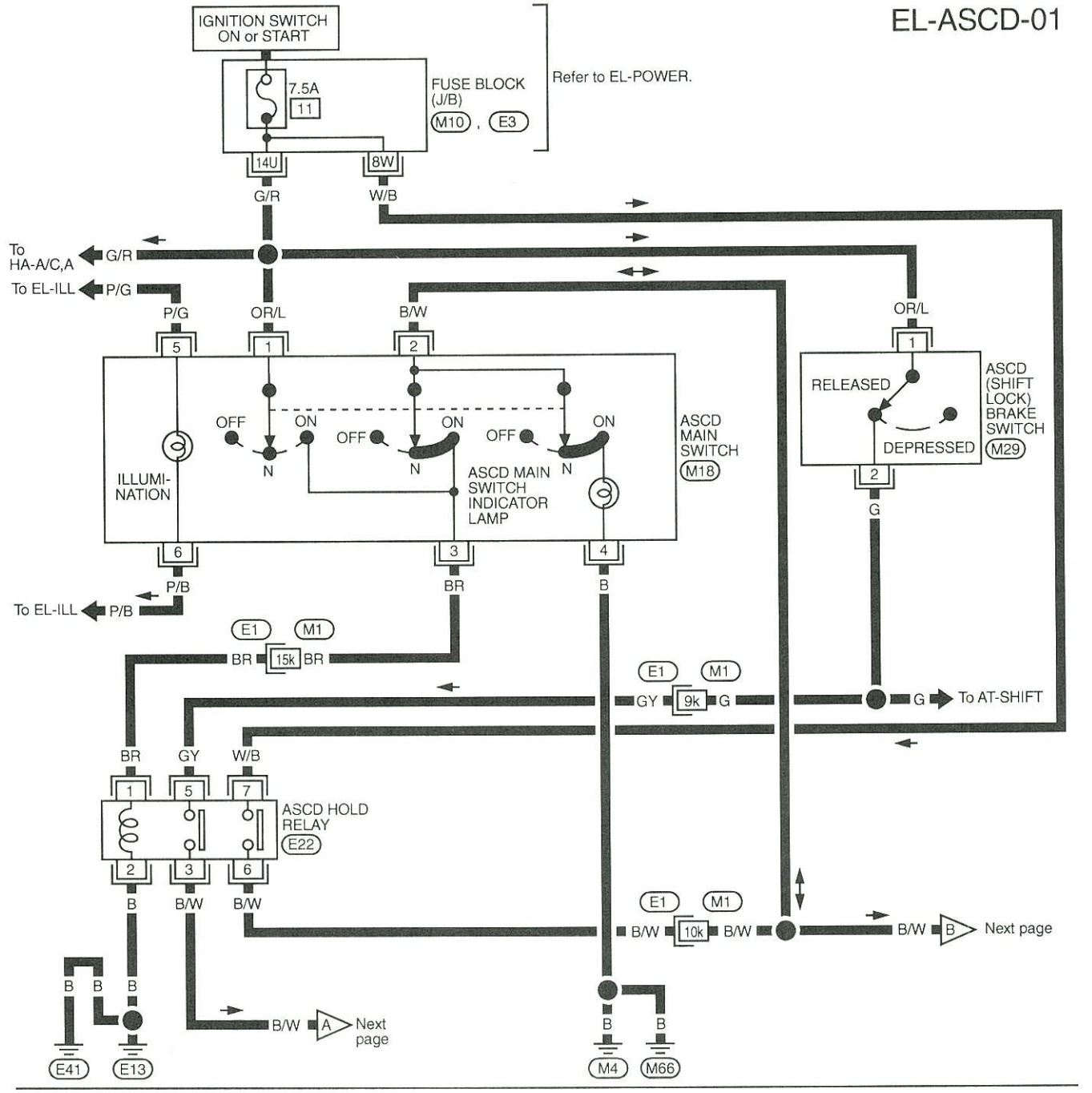
MEL799J

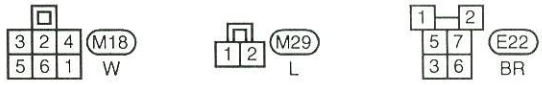
Wiring Diagram — ASCD —

NBEL0097

FIG. 1

NBEL0097S01





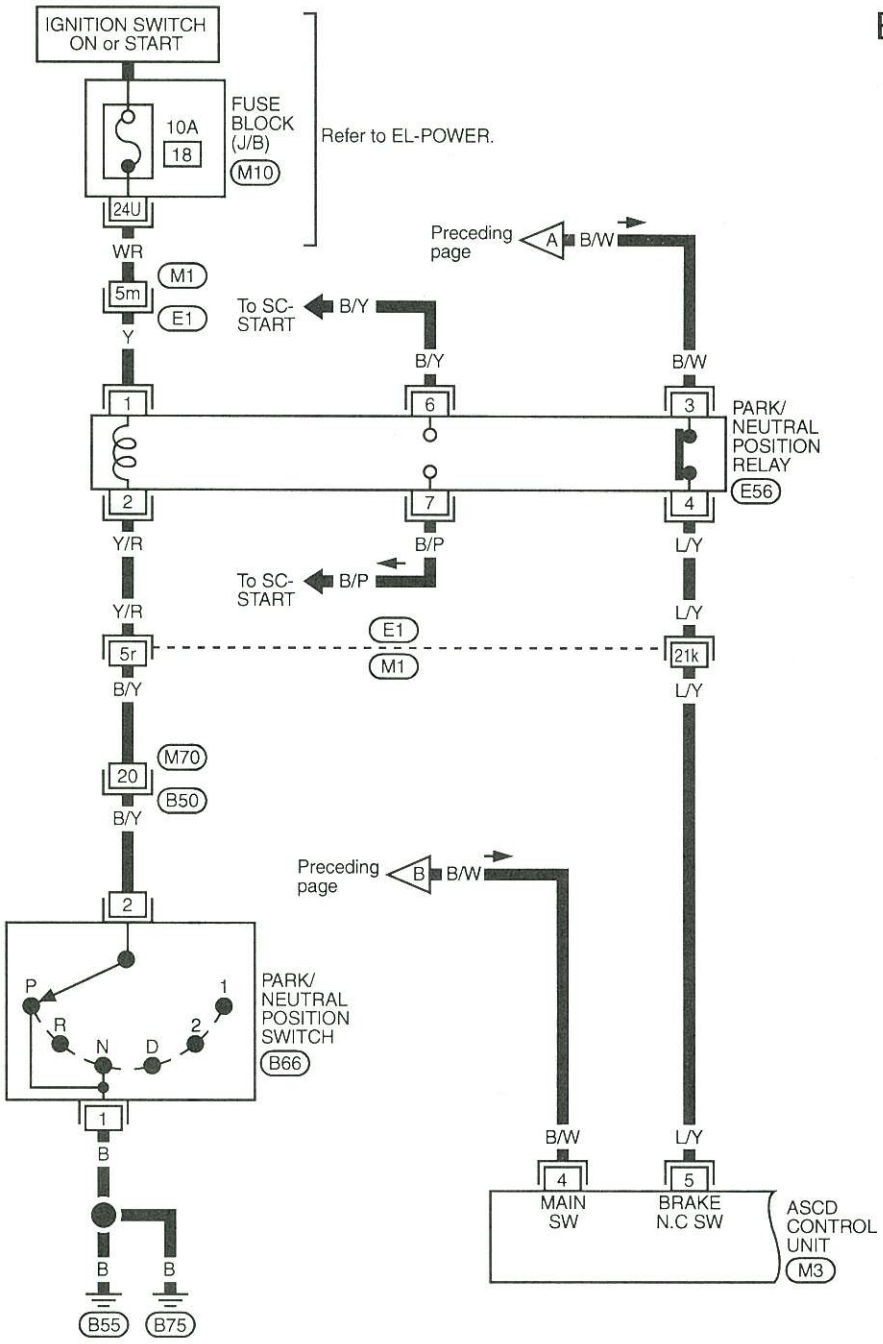
Refer to last page (Foldout page).
M1 , E1
M10
E3

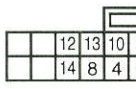
MEL800J

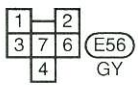
FIG. 2

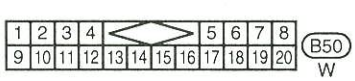
NBEL0097S02

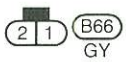
EL-ASCD-02











Refer to last page (Foldout page).

M1 , E1

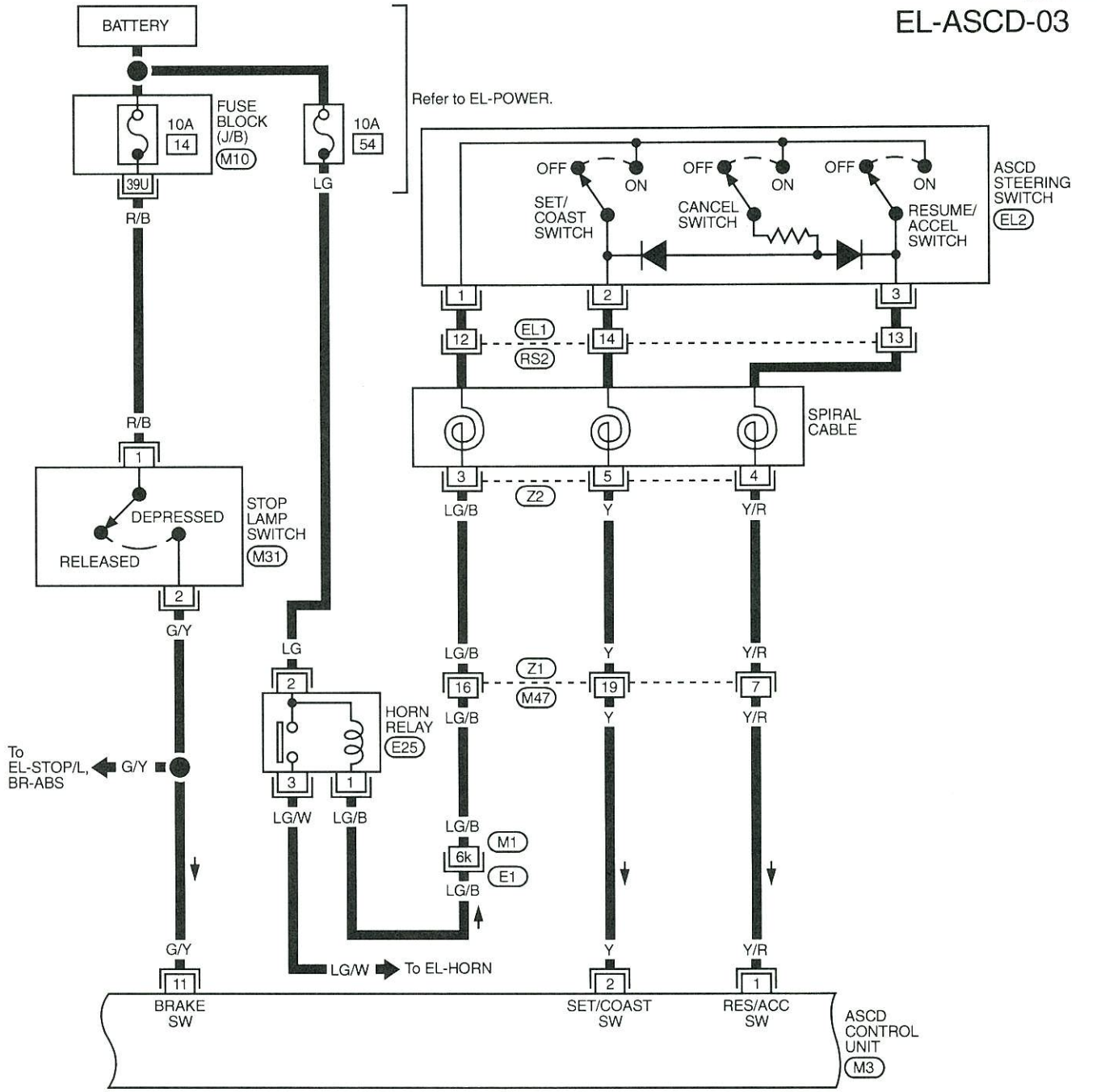
M10

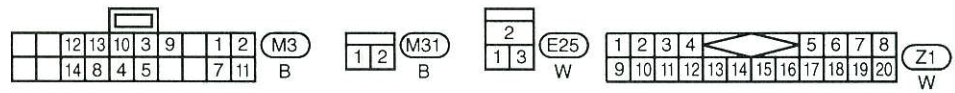
MEL801J

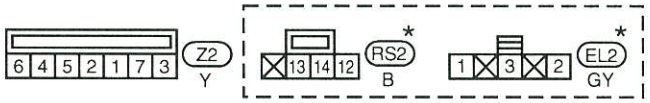
FIG. 3

NBEL0097S03

EL-ASCD-03







Refer to last page (Foldout page).
M1 , E1
M10

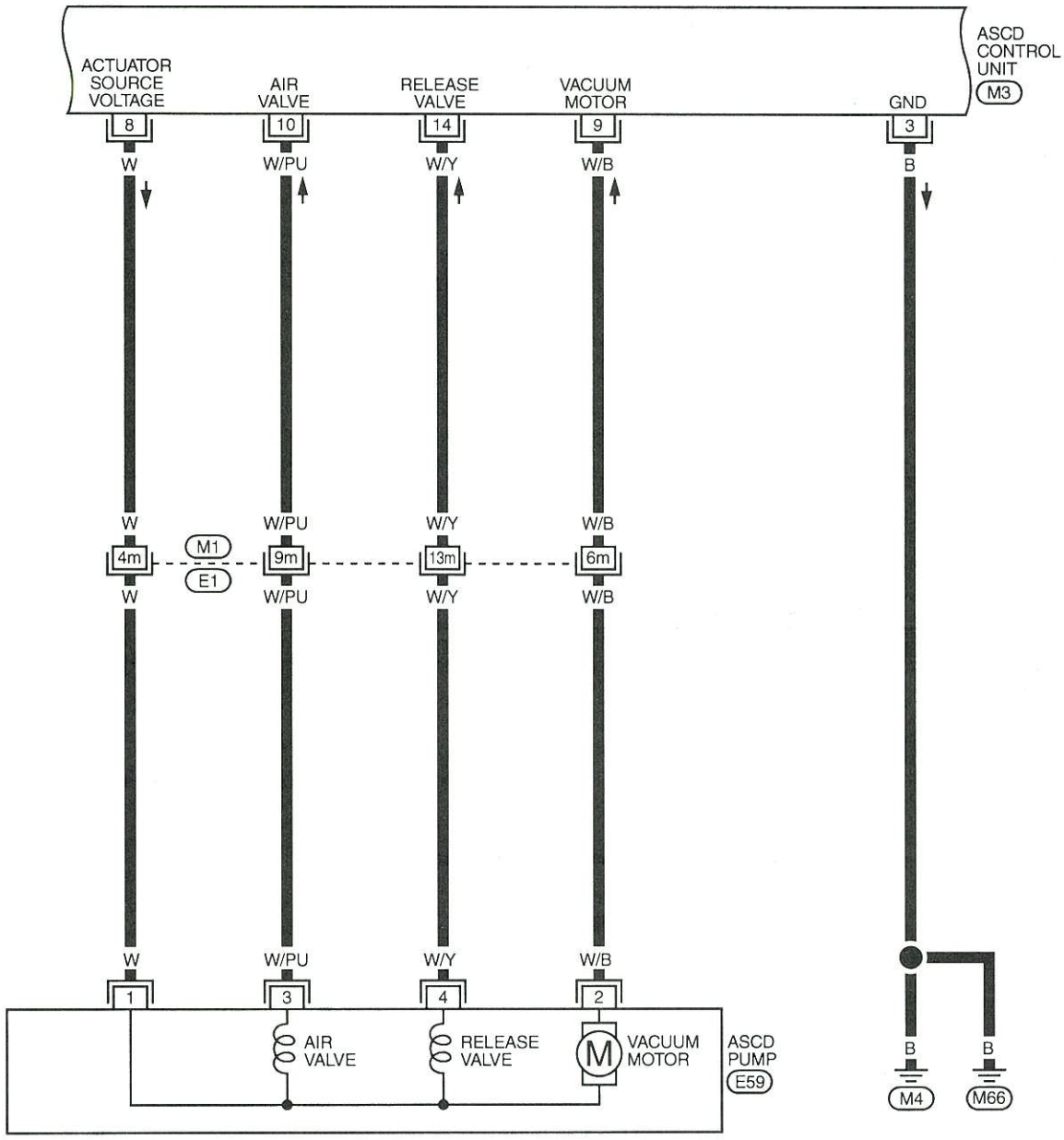
* : This connector is not shown in "HARNESS LAYOUT".

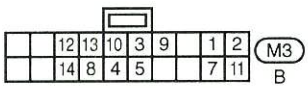
MEL802J

FIG. 4

NBEL0097S04

EL-ASCD-04



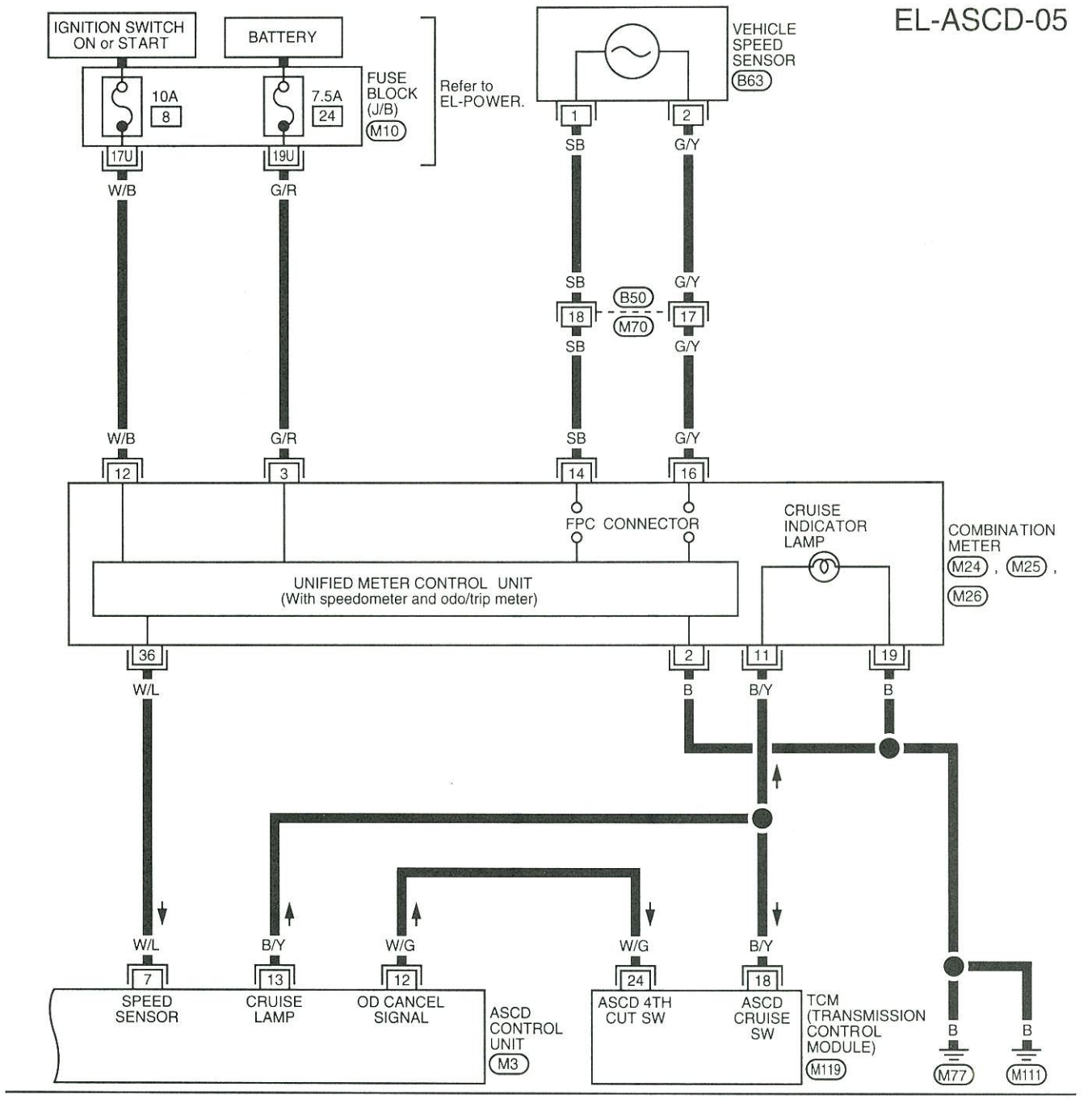


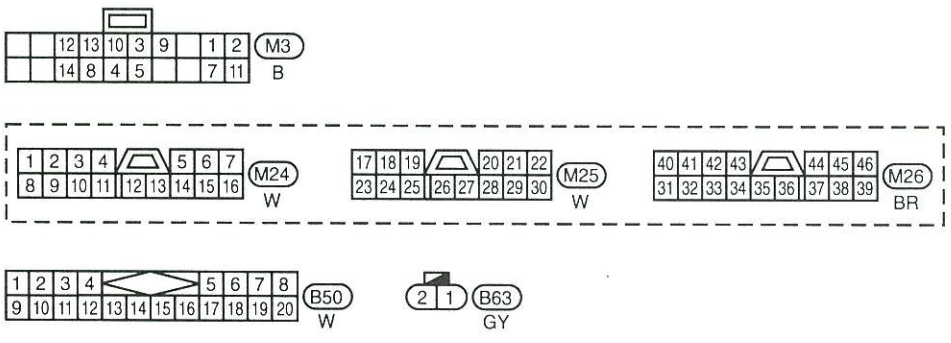
Refer to last page (Foldout page).
(M1), (E1)

MEL803J

FIG. 5

NBEL0097S05

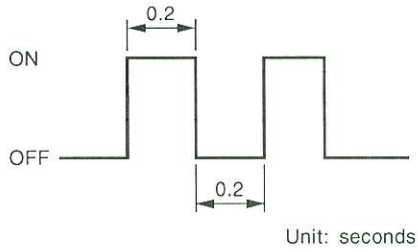




Refer to last page (Foldout page).
M10
M119

MEL804J

CRUISE indicator operation



Unit: seconds

CEL322

Fail-safe System

NBEL0098

DESCRIPTION

NBEL0098S01

When the fail-safe system senses a malfunction, it deactivates ASCD operation. The CRUISE indicator in the combination meter will then flash.

MALFUNCTION DETECTION CONDITIONS

NBEL0098S02

Detection conditions	ASCD operation during malfunction detection
• ASCD steering (RESUME/ACCEL, CANCEL, SET/COAST) switch is stuck. • Vacuum motor ground circuit or power circuit is open or shorted. • Air valve ground circuit or power circuit is open or shorted. • Release valve ground circuit or power circuit is open or shorted. • Vehicle speed sensor is faulty. • ASCD control unit internal circuit is malfunctioning.	• ASCD is deactivated. • Vehicle speed memory is canceled.
• ASCD brake switch or stop lamp switch is faulty.	• ASCD is deactivated. • Vehicle speed memory is not canceled.

Trouble Diagnoses

SYMPTOM CHART

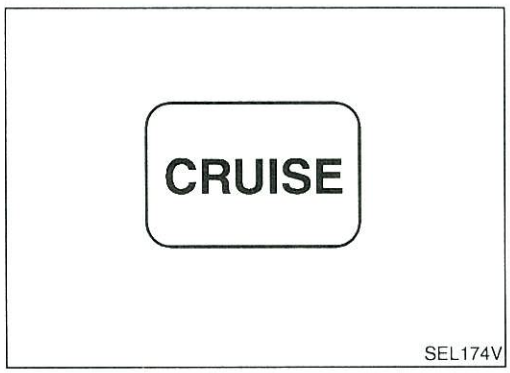
NBEL0099

NBEL0099S01

PROCEDURE	Diagnostic procedure								
REFERENCE PAGE (EL-)	173	174	175	176	177	178	179	179	180
SYMPTOM	FAIL-SAFE SYSTEM CHECK	POWER SUPPLY AND GROUND CIRCUIT CHECK	ASCD MAIN SWITCH CHECK	ASCD HOLD RELAY CHECK	ASCD BRAKE/STOP LAMP SWITCH CHECK	ASCD STEERING SWITCH CHECK	VEHICLE SPEED SENSOR CHECK	ASCD PUMP CIRCUIT CHECK	ASCD ACTUATOR/PUMP CHECK
ASCD cannot be set. ("CRUISE" indicator lamp does not blink.)		X	X	X		X	X		
ASCD cannot be set. ("CRUISE" indicator lamp blinks.★1)	X				X	X	X	X	
Vehicle speed does not decrease after SET/COAST switch has been pressed.						X			X
Vehicle speed does not return to the set speed after RESUME/ACCEL switch has been pressed.★2						X			X
Vehicle speed does not increase after RESUME/ACCEL switch has been pressed.						X			X
System is not released after CANCEL switch (steering) has been pressed.						X			X
Large difference between set speed and actual vehicle speed.									X
Deceleration is greatest immediately after ASCD has been set.									X

★1: It indicates that system is in fail-safe. After completing diagnostic procedures, perform "FAIL-SAFE SYSTEM CHECK" (EL-173) to verify repairs.

★2: If vehicle speed is greater than 48 km/h (30 MPH) after system has been released, pressing RESUME/ACCEL switch returns vehicle speed to the set speed previously achieved. However, doing so when the ASCD main switch is turned to "OFF", vehicle speed will not return to the set speed since the memory is canceled.



SEL174V

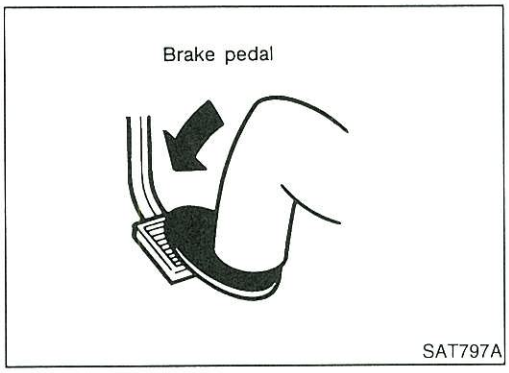
FAIL-SAFE SYSTEM CHECK

=NBEL0099S02

1. Turn ignition switch to ON position.
2. Turn ASCD main switch to ON and check if the "cruise indicator" blinks.
   If the indicator lamp blinks, check the following.
- ASCD steering switch. Refer to EL-178.

SEL767P

3. Drive the vehicle at more than 48 km/h (30 MPH) and push SET/COAST switch.
   If the indicator lamp blinks, check the following.
- Vehicle speed sensor. Refer to EL-179.
- ASCD pump circuit. Refer to EL-179.
- Replace control unit.



SAT797A

4. Depress brake pedal slowly (brake pedal should be depressed more than 5 seconds).
   If the indicator lamp blinks, check the following.
- ASCD brake/stop lamp switch. Refer to EL-177.

5. END. (System is OK.)

POWER SUPPLY AND GROUND CIRCUIT CHECK

=NBEL0099S03

1	OPERATION CHECK

1. Turn ignition switch ON.
2. Turn ASCD main switch "ON".

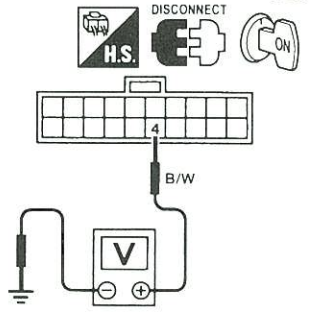
Does ASCD indicator illuminate?

Yes	▶	GO TO 2.
No	▶	Go to ASCD MAIN SWITCH CHECK. Refer to EL-175.

2	CHECK POWER SUPPLY CIRCUIT FOR ASCD CONTROL UNIT

1. Disconnect ASCD control unit connector.
2. Turn ignition switch ON.
3. Turn ASCD main switch "ON".
4. Check voltage between control unit connector terminal 4 and ground.

ASCD control unit connector (M3)



SEL289UD

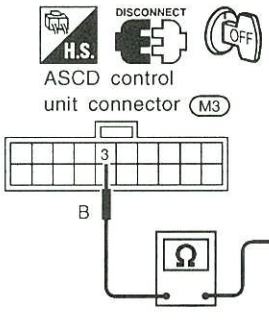
Refer to wiring diagram in EL-167.

Does battery voltage exist?

Yes	▶	GO TO 3.
No	▶	**Check the following.** • ASCD hold relay Refer to "ASCD HOLD RELAY CHECK", EL-176. • Harness for open or short

3	CHECK GROUND CIRCUIT FOR ASCD CONTROL UNIT

Check continuity between ASCD control unit harness terminal 3 and body ground.



SEL764U

Refer to wiring diagram in EL-169.

Does continuity exist?

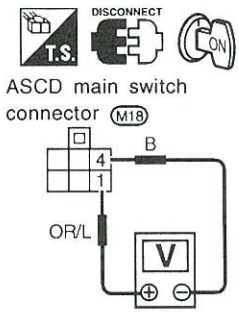
Yes	▶	Power supply and ground circuit is OK.
No	▶	Repair harness.

ASCD MAIN SWITCH CHECK

=NBEL0099S04

1	CHECK POWER SUPPLY FOR ASCD MAIN SWITCH

1. Disconnect main switch connector.
2. Check voltage between main switch terminals 1 and 4.



MEL842F

Refer to wiring diagram in EL-166.

Does battery voltage exist?

Yes	▶	GO TO 2.
No	▶	**Check the following.** • 7.5A fuse (No. 11, located in the fuse block) • Harness for open or short between fuse and ASCD main switch • Ground circuit for ASCD main switch

2	CHECK ASCD MAIN SWITCH

Refer to "Electrical Component Inspection" (EL-181).

OK or NG

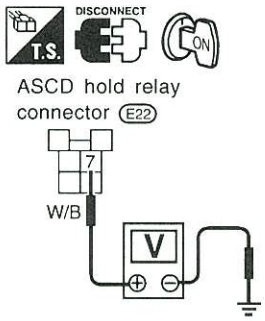
OK	▶	Go to ASCD HOLD RELAY CHECK. Refer to EL-176.
NG	▶	Replace ASCD main switch.

ASCD HOLD RELAY CHECK

=NBEL0099S05

1 CHECK POWER SUPPLY CIRCUIT FOR ASCD HOLD RELAY

1. Disconnect ASCD hold relay.
2. Check voltage between ASCD hold relay terminal 7 and body ground.



MEL843F

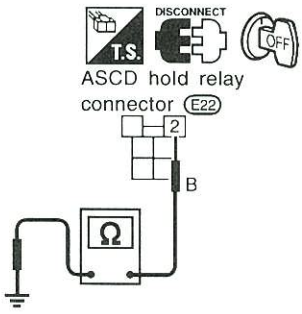
Refer to wiring diagram in EL-166.

Does battery voltage exist?

Yes	▶	GO TO 2.
No	▶	**Check the following.** • 7.5A fuse (No. 11, located in the fuse block) • Harness for open or short between fuse and ASCD hold relay

2 CHECK GROUND CIRCUIT FOR ASCD HOLD RELAY

Check continuity between ASCD hold relay terminal 2 and ground.



MEL844F

Does continuity exist?

Yes	▶	GO TO 3.
No	▶	Repair harness.

3 CHECK ASCD HOLD RELAY

Check ASCD hold relay.

OK or NG

OK	▶	GO TO 4.
NG	▶	Replace ASCD hold relay.

4 CHECK ASCD MAIN SWITCH

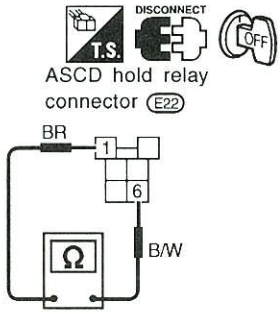
Refer to "Electrical Component Inspection" (EL-181).

OK or NG

OK	▶	GO TO 5.
NG	▶	Replace ASCD main switch.

5 CHECK ASCD HOLD RELAY OPEN OR SHORT CIRCUIT

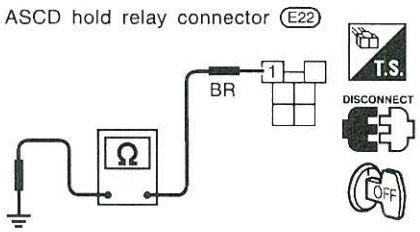
1. Connect ASCD main switch.
2. Check ASCD hold relay terminals 1 and 6.



MEL845F

Continuity should exist.

3. Check continuity between ASCD hold relay terminal 1 and ground.



SEL392V

Continuity should not exist.

OK or NG

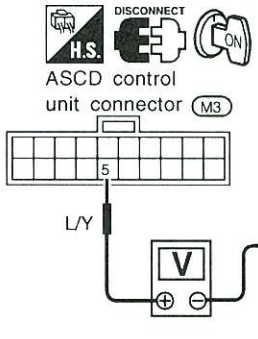
OK	▶	ASCD hold relay is OK.
NG	▶	Repair harness.

ASCD BRAKE/STOP LAMP SWITCH CHECK

=NBEL0099S06

1 CHECK ASCD BRAKE SWITCH CIRCUIT

1. Disconnect control unit connector.
2. Turn ignition switch ON.
3. Turn ASCD main switch "ON".
4. Check voltage between control unit connector terminal 5 and ground.



SEL765U

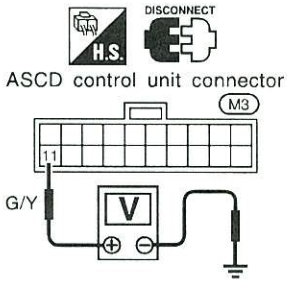
When brake pedal is depressed or A/T selector lever is in "N" or "P" range:
Approx. 0V
When both brake pedal is released and A/T selector lever is not in "N" or "P" range:
Battery voltage should exist.
Refer to wiring diagram in EL-167.

OK or NG

OK	▶	GO TO 2.
NG	▶	**Check the following.** • ASCD brake switch Refer to "Electrical Component Inspection" (EL-181). • Park/neutral position switch Refer to "Electrical Component Inspection" (EL-181). • ASCD hold relay • Park/neutral position relay • Harness for open or short

2 CHECK STOP LAMP SWITCH CIRCUIT

1. Disconnect control unit connector.
2. Check voltage between control unit terminal 11 and ground.



SEL154W

Voltage [V]:
Stop lamp switch: Depressed
Approx. 12
Stop lamp switch: Released
0
Refer to wiring diagram in EL-168.

OK or NG

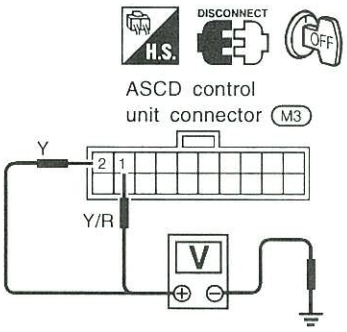
OK	▶	ASCD brake/stop lamp switch is OK.
NG	▶	**Check the following.** • 10A fuse [No. 14, located in the fuse block (J/B)] • Harness for open or short between ASCD control unit and stop lamp switch • Harness for open or short between fuse and stop lamp switch • Stop lamp switch Refer to "Electrical Component Inspection" (EL-181).

ASCD STEERING SWITCH CHECK

=NBEL0099S07

1 CHECK ASCD STEERING SWITCH CIRCUIT FOR ASCD CONTROL UNIT

1. Disconnect control unit connector.
2. Check voltage between control unit harness terminals and ground.



SEL760U

	Terminal No.		Switch condition	
	(+)	(−)	Pressed	Released
SET/COAST SW	2	ground	12V	0V
RESUME/ACC SW	1	ground	12V	0V
CANCEL SW	2	ground	12V	0V
	1	ground	12V	0V

MTBL0002

Refer to wiring diagram in EL-168.

OK or NG

OK	▶	ASCD steering switch is OK.
NG	▶	GO TO 2.

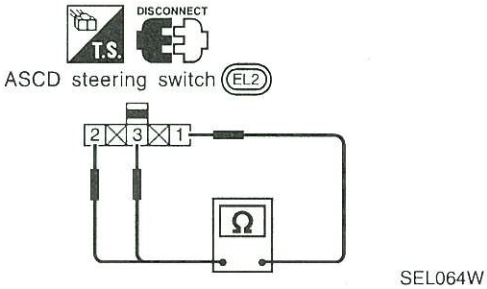
2 CHECK POWER SUPPLY FOR ASCD STEERING SWITCH

Does horn work?

Yes	▶	GO TO 3.
No	▶	**Check the following.** • 10A fuse (No. 54, located in the relay box) • Horn relay • Harness for open or short between horn and fuse

3 CHECK ASCD STEERING SWITCH

1. Disconnect ASCD steering switch.
2. Check continuity between terminals by pushing each switch.



SEL064W

Switch	Terminal		
	1	2	3
RESUME/ACCEL	○		○
SET/COAST	○	○	
CANCEL	○	▶○	
	○	▶	○

MTBL0267

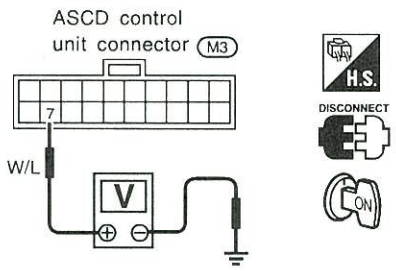
OK or NG

OK	▶	Check harness for open or short between ASCD steering switch and ASCD control unit.
NG	▶	Replace ASCD steering switch.

VEHICLE SPEED SENSOR CHECK

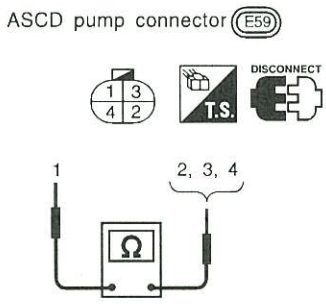
=NBEL0099S08

1	CHECK SPEEDOMETER OPERATION	
Refer to wiring diagram in EL-170. **Does speedometer operate normally?**		
Yes	▶	GO TO 2.
No	▶	Check speedometer and vehicle speed sensor circuit. Refer to EL-85.

2	CHECK VEHICLE SPEED INPUT	
1. Apply wheel chocks and jack up drive wheel. 2. Disconnect control unit connector. 3. Check voltage between control unit terminal 7 and ground with turning drive wheel slowly.  SEL347V **Does voltage pointer deflect?**		
Yes	▶	Vehicle speed sensor is OK.
No	▶	Check harness for open or short between ASCD control unit terminal 7 and combination meter terminal 36.

ASCD PUMP CIRCUIT CHECK

NBEL0099S09

1	CHECK ASCD PUMP	
1. Disconnect ASCD pump connector. 2. Measure resistance between ASCD pump terminals 1 and 2, 3, 4.  MEL243H		
Refer to wiring diagram in EL-169. **OK or NG**		
OK	▶	Check harness for open or short between ASCD pump and ASCD control unit.
NG	▶	Replace ASCD pump.

Terminals		Resistance [Ω]
1	2	Approx. 3
	3	Approx. 65
	4	Approx. 65

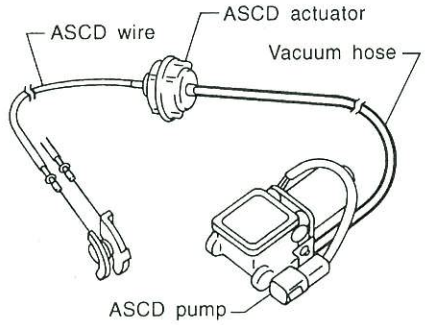
MTBL0048

ASCD ACTUATOR/PUMP CHECK

=NBEL0099S10

1 CHECK VACUUM HOSE

Check vacuum hose (between ASCD actuator and ASCD pump) for breakage, cracks or fracture.



MEL402G

OK or NG

OK	▶	GO TO 2.
NG	▶	Repair or replace hose.

2 CHECK ASCD WIRE

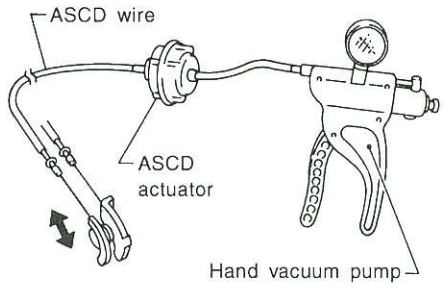
Check wire for improper installation, rust formation or breaks.

OK or NG

OK	▶	GO TO 3.
NG	▶	Repair or replace wire. Refer to "ASCD Wire Adjustment" (EL-181).

3 CHECK ASCD ACTUATOR

1. Disconnect vacuum hose from ASCD actuator.
2. Apply –40 kPa (–0.41 kg/cm^2, –5.8 psi) vacuum to ASCD actuator with hand vacuum pump.
   ASCD wire should move to pull throttle drum.
3. Wait 10 seconds and check for decrease in vacuum pressure.
   Vacuum pressure decrease:
   Less than 2.7 kPa (0.028 kg/cm^2, 0.39 psi)



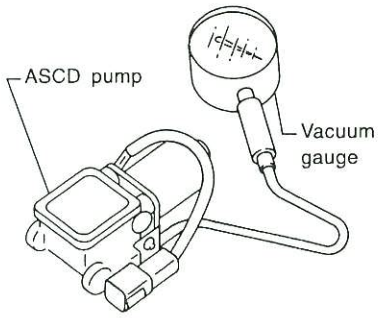
MEL403G

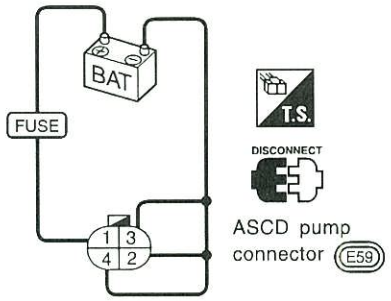
OK or NG

OK	▶	GO TO 4.
NG	▶	Replace ASCD actuator.

4 CHECK ASCD PUMP

1. Disconnect vacuum hose from ASCD pump and ASCD pump connector.
2. If necessary remove ASCD pump.
3. Connect vacuum gauge to ASCD pump.
4. Apply 12V direct current to ASCD pump and check operation.





MEL844G

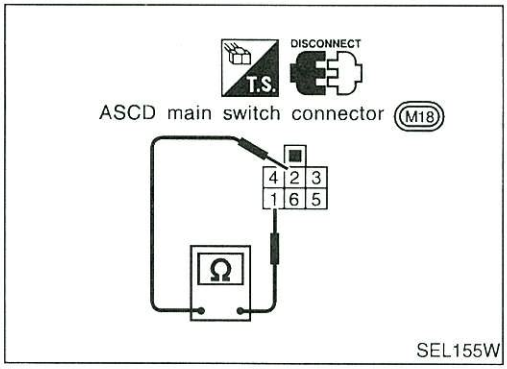
	12V direct current supply terminals		Operation
	(+)	(–)	
Air valve	1	3	Close
Release valve		4	Close
Vacuum motor		2	Operate

MTBL0004

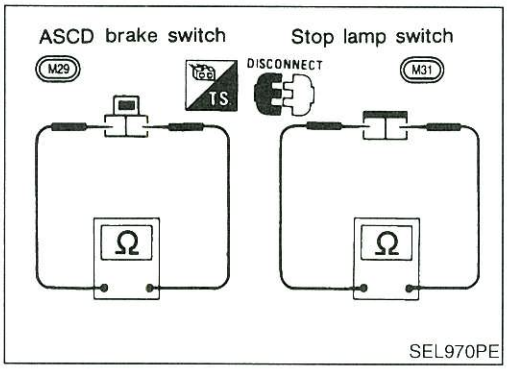
A vacuum pressure of at least –40 kPa (–0.41 kg/cm^2, –5.8 psi) should be generated.

OK or NG

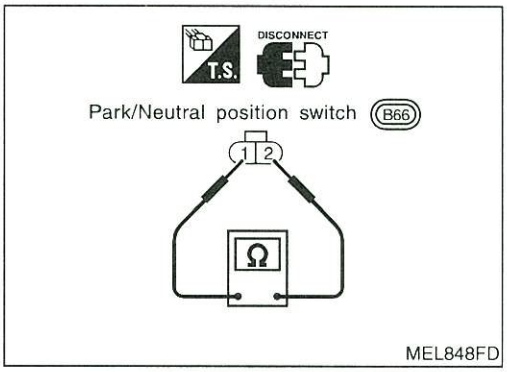
OK	▶	INSPECTION END
NG	▶	Replace ASCD pump.



SEL155W



SEL970PE



MEL848FD

Electrical Component Inspection

NBEL0100

ASCD MAIN SWITCH

NBEL0100S01

Check continuity between terminals by pushing switch to each position.

Switch position	Terminals	Illumination
ON	1 - 2 - 3 - 4	5 - 6
N	2 - 3 - 4	
OFF		

ASCD BRAKE SWITCH AND STOP LAMP SWITCH

NBEL0100S02

Condition	Continuity	
	ASCD brake switch	Stop lamp switch
When brake pedal is depressed	No	Yes
When brake pedal is released	Yes	No

Check each switch after adjusting brake pedal — refer to BR section.

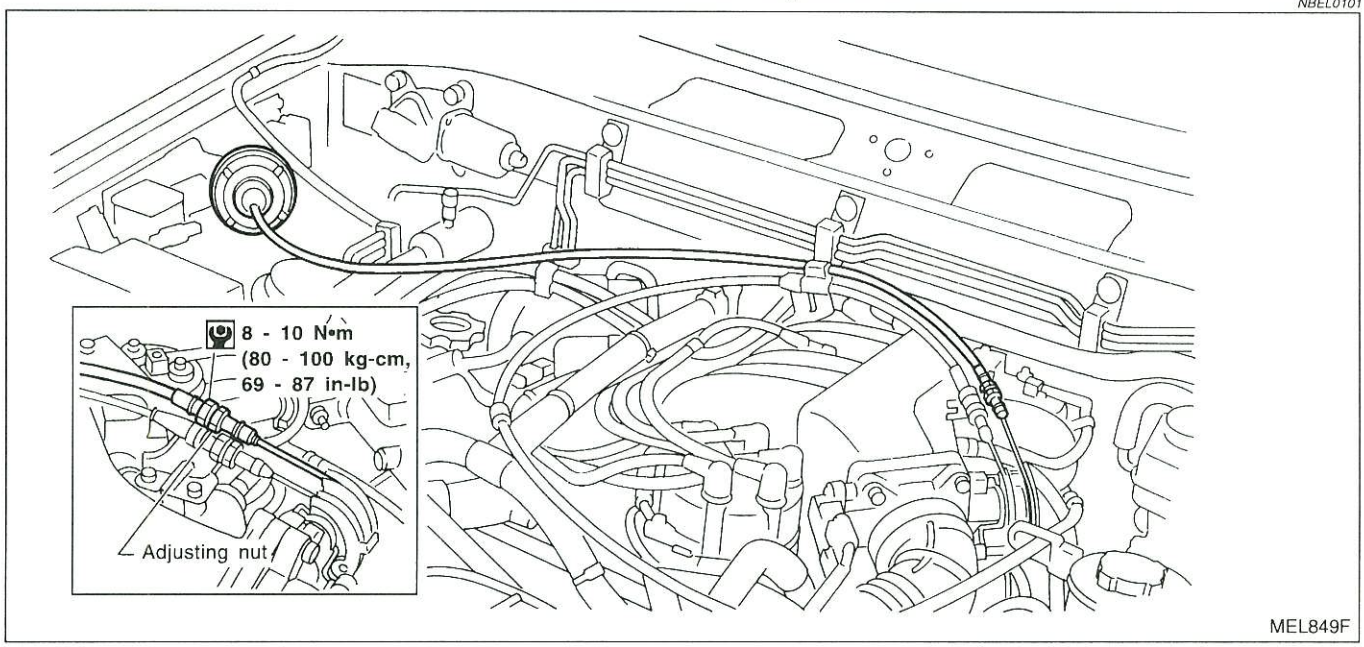
PARK/NEUTRAL POSITION SWITCH

NBEL0100S03

Selector lever position	Continuity
	Between terminals 1 and 2
"P"	Yes
"N"	Yes
Except "P" and "N"	No

ASCD Wire Adjustment

NBEL0101



MEL849F

CAUTION:

- **Be careful not to twist ASCD wire when removing it.**
- **Do not tense ASCD wire excessively during adjustment.**

Adjust the tension of ASCD wire in the following manner.

1. Loosen lock nut and adjusting nut.
2. Make sure that accelerator wire is properly adjusted. Refer to FE section ("ACCELERATOR CONTROL SYSTEM").
3. Tighten adjusting nut just until throttle drum starts to move.
4. Loosen adjusting nut again 1/2 to 1 turn.
5. Tighten lock nut.

System Description

NBEL0102

Power is supplied at all times
- from 40A fusible link (letter **f**, located in the fuse and fusible link box)
- to circuit breaker terminal 1
- through circuit breaker terminal 2
- to power window relay terminal 3.

With ignition switch in ON or START position, power is supplied
- through 7.5A fuse [No. 11, located in the fuse block (J/B)]
- to power window relay terminal 2, and
- to smart entrance control unit terminal 33.

Ground is supplied to power window relay terminal 1
- through body grounds M4 and M66.

The power window relay is energized and power is supplied
- through power window relay terminal 5
- to power window main switch terminal 1,
- to power window sub switch terminal 5.

MANUAL OPERATION

NBEL0102S01

Front Door LH

NBEL0102S0101

Ground is supplied
- to power window main switch terminal 3
- through body grounds M77 and M111.

WINDOW UP

When the front LH switch in the power window main switch is pressed in the up position, power is supplied
- to front power window regulator LH terminal 2
- through power window main switch terminal 9.

Ground is supplied
- to front power window regulator LH terminal 1
- through power window main switch terminal 8.

Then, the motor raises the window until the switch is released.

WINDOW DOWN

When the LH switch in the power window main switch is pressed in the down position, power is supplied
- to front power window regulator LH terminal 1
- through power window main switch terminal 8.

Ground is supplied
- to front power window regulator LH terminal 2
- through power window main switch terminal 9.

Then, the motor lowers the window until the switch is released.

Front Door RH

NBEL0102S0102

Ground is supplied
- to power window main switch terminal 3
- through body grounds M77 and M111.

NOTE:

Numbers in parentheses are terminal numbers, when power window switch is pressed in the UP and DOWN positions respectively.

MAIN SWITCH OPERATION

Power is supplied
- through power window main switch (5, 6)
- to front power window sub-switch (3, 4).

The subsequent operation is the same as the sub-switch operation.

SUB-SWITCH OPERATION

Power is supplied

- through front power window sub-switch (1, 2)
- to front power window regulator RH (2, 1).

Ground is supplied

- to front power window regulator RH (1, 2)
- through front power window sub-switch (2, 1)
- to front power window sub-switch (4, 3)
- through power window main switch (6, 5).

Then, the motor raises or lowers the window until the switch is released.

Rear Door

NBEL0102S0103

Rear door windows will raise and lower in the same manner as front door RH window.

AUTO OPERATION

NBEL0102S02

The power window AUTO feature enables the driver to lower the driver's window without holding the window switch in the down position.
The AUTO feature only operates on the driver's window downward movement.

POWER WINDOW LOCK

NBEL0102S03

The power window lock is designed to lock operation of all windows except for driver's door window.
When the lock switch is pressed to lock position, ground of the sub-switches in the power window main switch is disconnected. This prevents the power window motors from operating.

RETAINED POWER OPERATION

NBEL0102S04

When the ignition switch is turned to OFF position from ON or START position, power is supplied for 45 seconds

- to power window relay terminal 2
- from smart entrance control unit terminal 5.

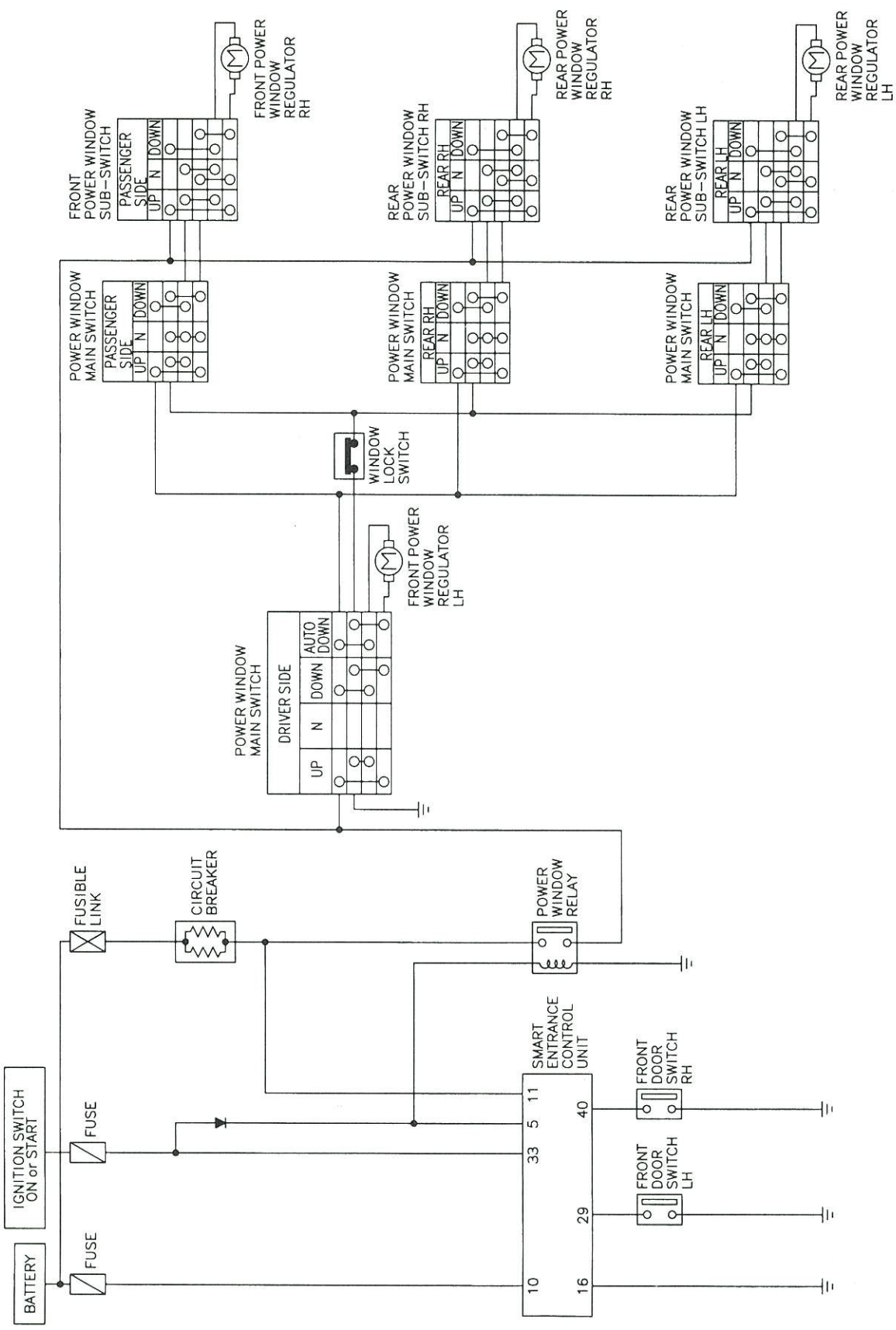
Ground is always supplied

- to power window relay terminal 1
- through body grounds.

When power and ground are supplied, the power window relay continues to be energized, and the power window can be operated.
The retained power operation is canceled when the driver or passenger side door is opened.

Schematic

NBEL0103

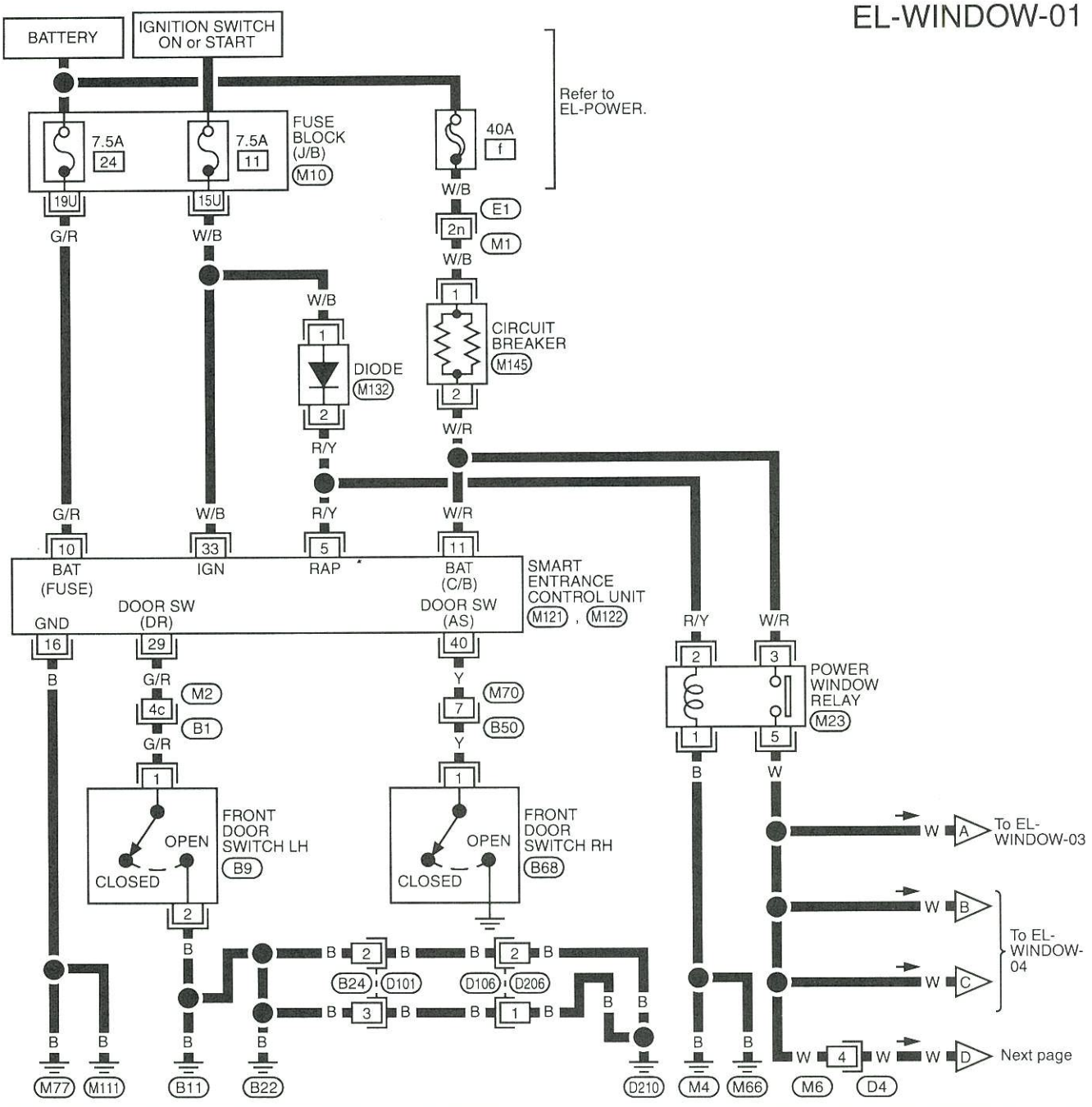


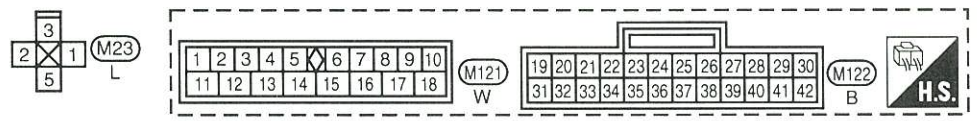
MEL805J

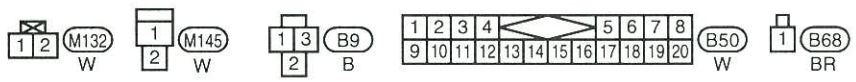
Wiring Diagram — WINDOW —

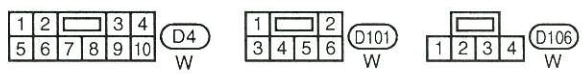
NBEL0104

EL-WINDOW-01









Refer to last page (Foldout page).

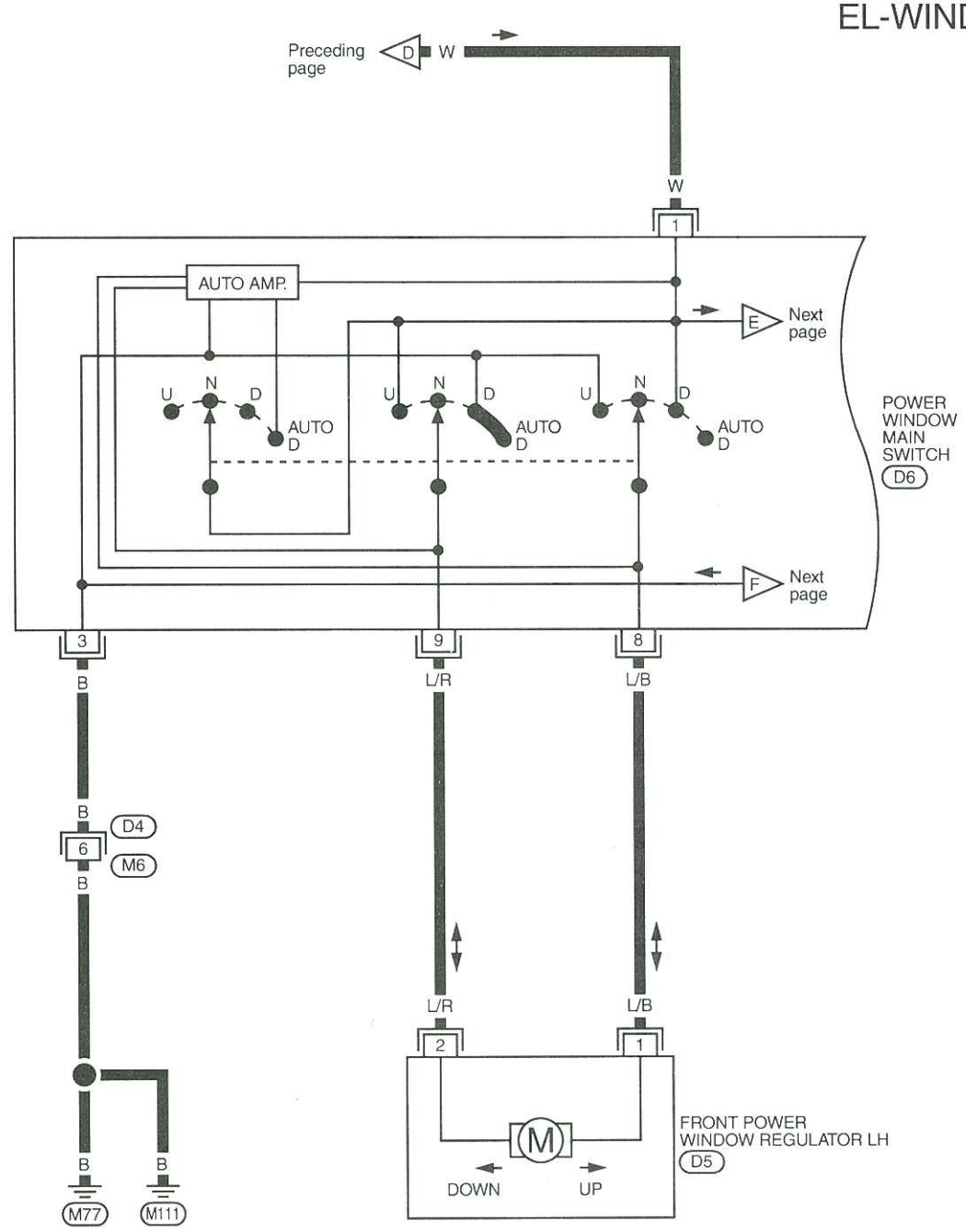
M1, E1

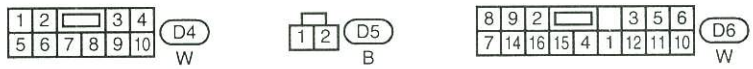
M2, B1

M10

MEL806J

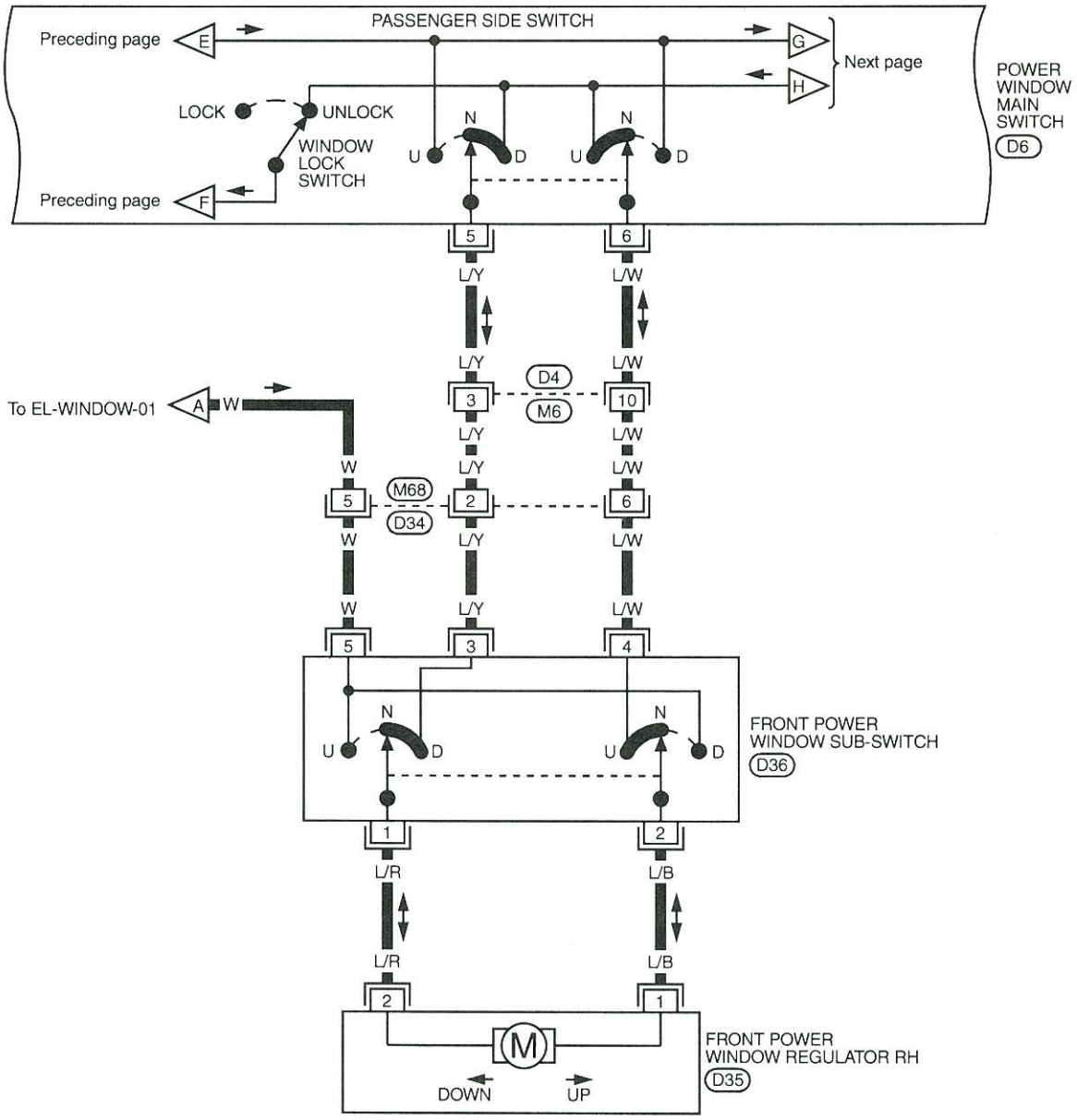
EL-WINDOW-02

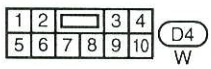


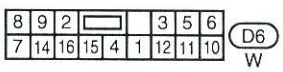


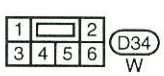
MEL807J

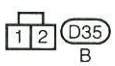
EL-WINDOW-03

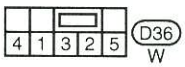






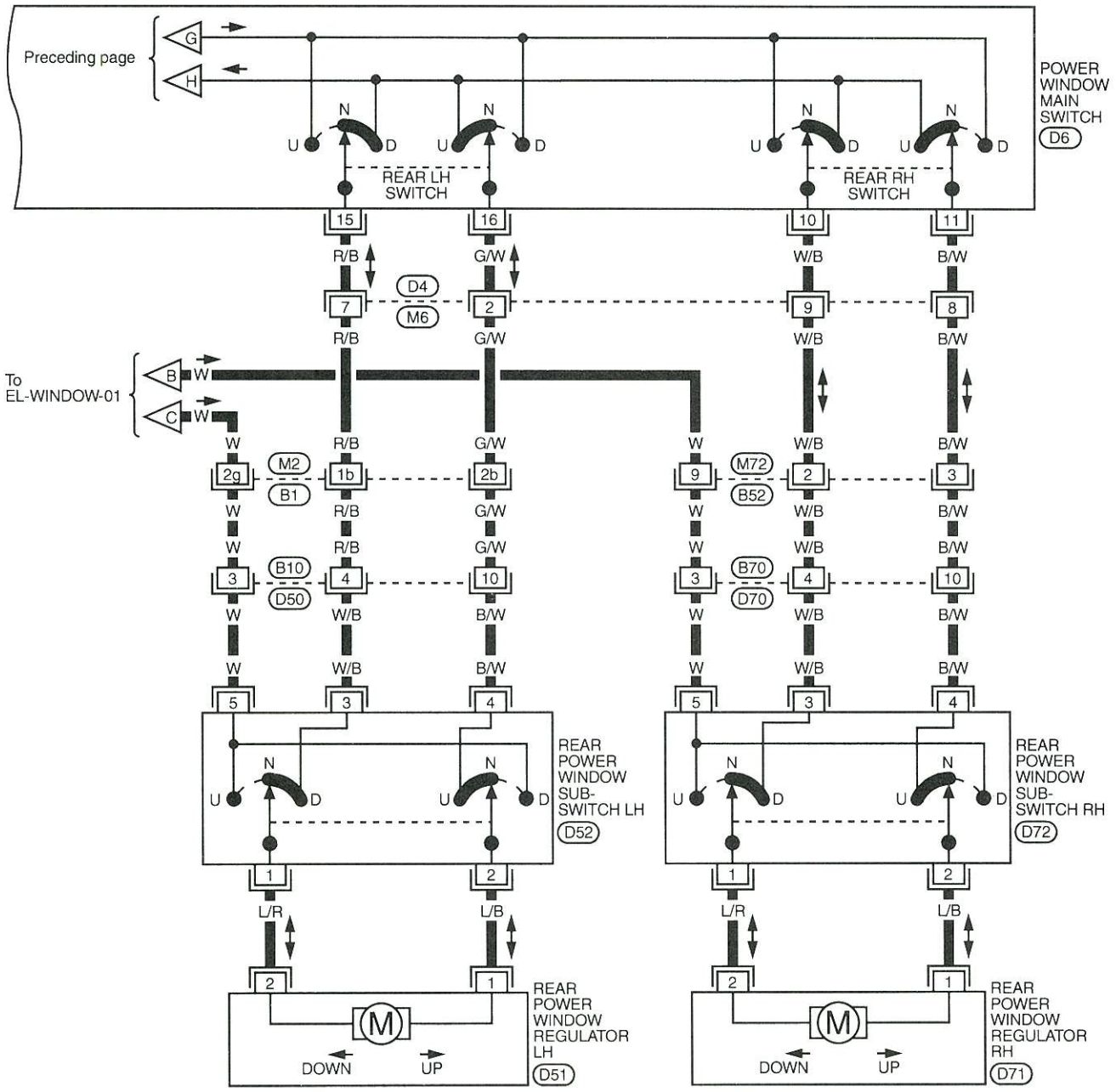


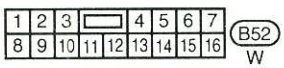


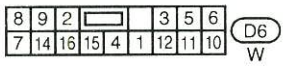


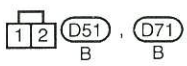
MEL808J

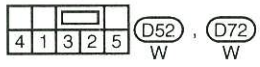
EL-WINDOW-04











Refer to last page (Foldout page).

M2 , B1

MEL809J

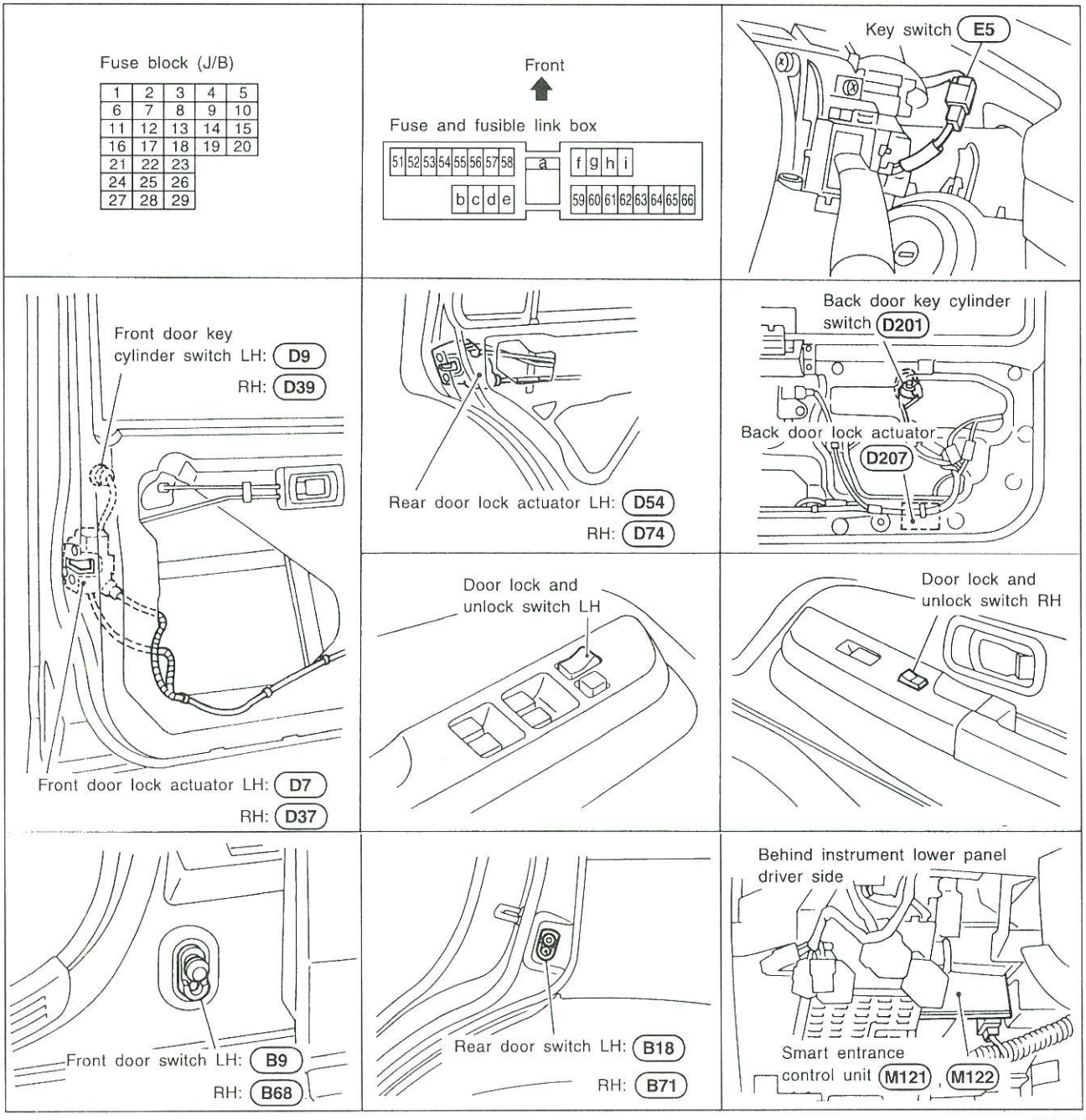
Trouble Diagnoses

NBEL0105

Symptom	Possible cause	Repair order
None of the power windows can be operated using any switch.	1. 7.5A fuse, 40A fusible link and M145 circuit breaker 2. Grounds M4 and M66 3. Power window relay 4. Open/short in power window main switch circuit	1. Check 7.5A fuse [No. 11, located in fuse block (J/B)], 40A fusible link (letter **f**, located in fuse and fusible link box) and M145 circuit breaker. Turn ignition switch "ON" and verify battery positive voltage is present at terminal 1 of power window main switch and terminal 5 of sub-switch. 2. Check grounds M4 and M66. 3. Check power window relay. 4. Check W wire between power window relay and power window main switch for open/short circuit.
Driver side power window cannot be operated but other windows can be operated.	1. Driver side power window regulator circuit 2. Driver side power window regulator 3. Power window main switch	1. Check harness between power window main switch and power window regulator for open or short circuit. 2. Check driver side power window regulator. 3. Check power window main switch.
Passenger power window cannot be operated.	1. Power window sub-switches 2. Passenger side power window regulators 3. Power window main switch 4. Power window circuit	1. Check power window sub-switch. 2. Check passenger side power window regulator. 3. Check power window main switch. 4. Check the following. a. Check harnesses between power window main switch and power window sub-switch for open/short circuit. b. Check harnesses between power window sub-switch and power window regulator for open/short circuit.
Passenger power window cannot be operated using power window main switch but can be operated by power window sub-switch.	1. Power window main switch	1. Check power window main switch.
Driver side power window auto function cannot be operated using power window main switch.	1. Power window main switch	1. Check power window main switch.
Retained power operation does not operate properly.	1. RAP signal circuit 2. Driver or passenger side door switch circuit 3. Smart entrance control unit	1. Check harness between power window relay terminal 2 and smart entrance control unit terminal 5 for open or short circuit. 2. Check harness between smart entrance control unit and driver or passenger side door switch for open or short circuit. Check driver or passenger side door switch ground circuit. Check driver or passenger side door switch. 3. Check smart entrance control unit. (EL-254)

Component Parts and Harness Connector Location

NBEL0106



SEL065W

System Description

NBEL0107

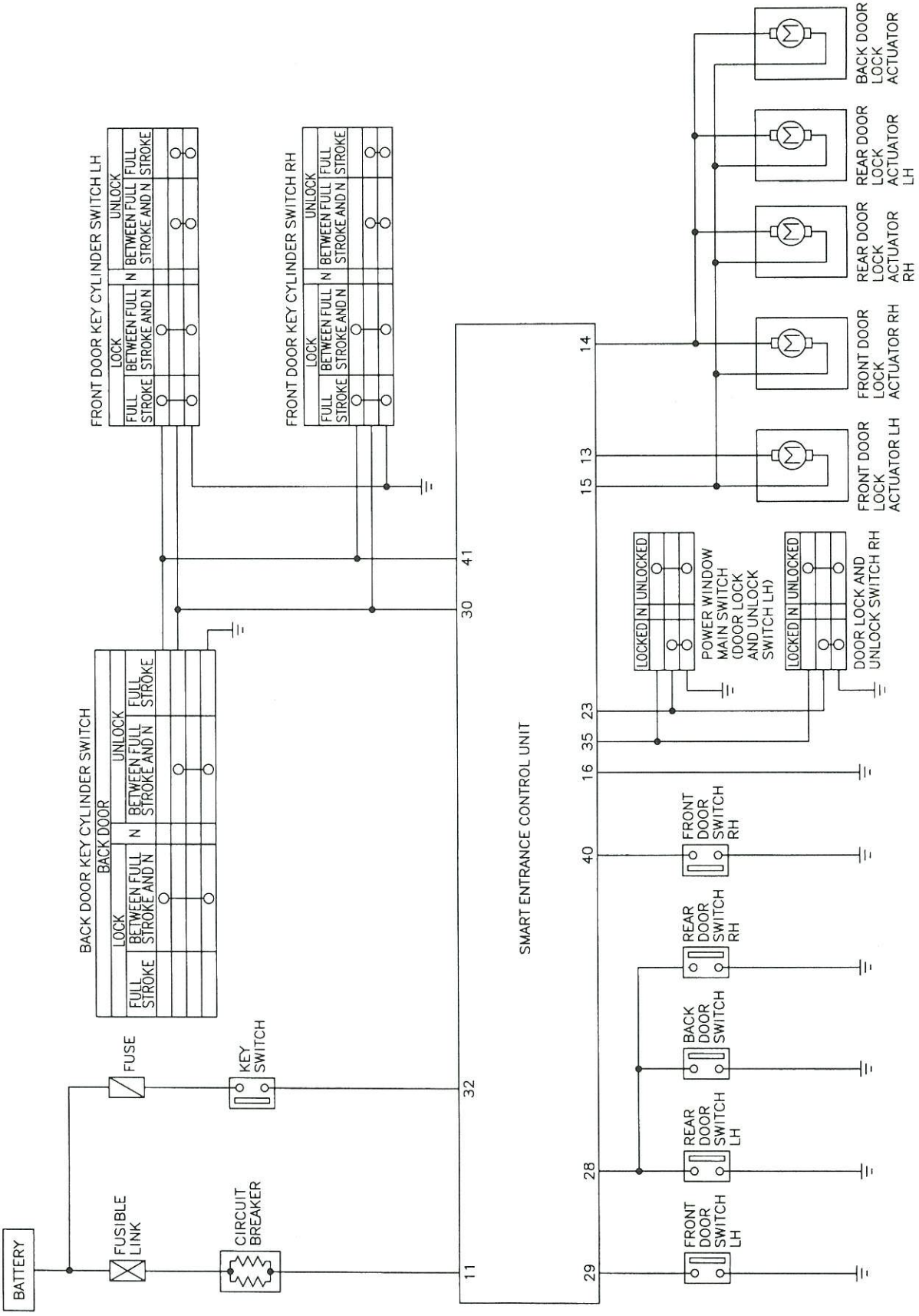
OPERATION

NBEL0107S04

- The lock/unlock switch (LH and RH) on door trim can lock and unlock all doors.
- With the door key inserted in the key cylinder on front LH, RH or back door, turning it to "LOCK", will lock all doors; turning it to "UNLOCK" once unlocks the corresponding door; turning it to "UNLOCK" again within 5 seconds after the first unlock operation unlocks all of the other doors. (Signals from door key cylinder switch)
- If the ignition key is in the ignition key cylinder and one or more of doors are open, setting the lock/unlock switch to "LOCK" locks the doors once but then immediately unlock them. (Combination signals from key switch and door switches) - (KEY REMINDER DOOR SYSTEM)

Schematic

NBEL0108



MEL810J

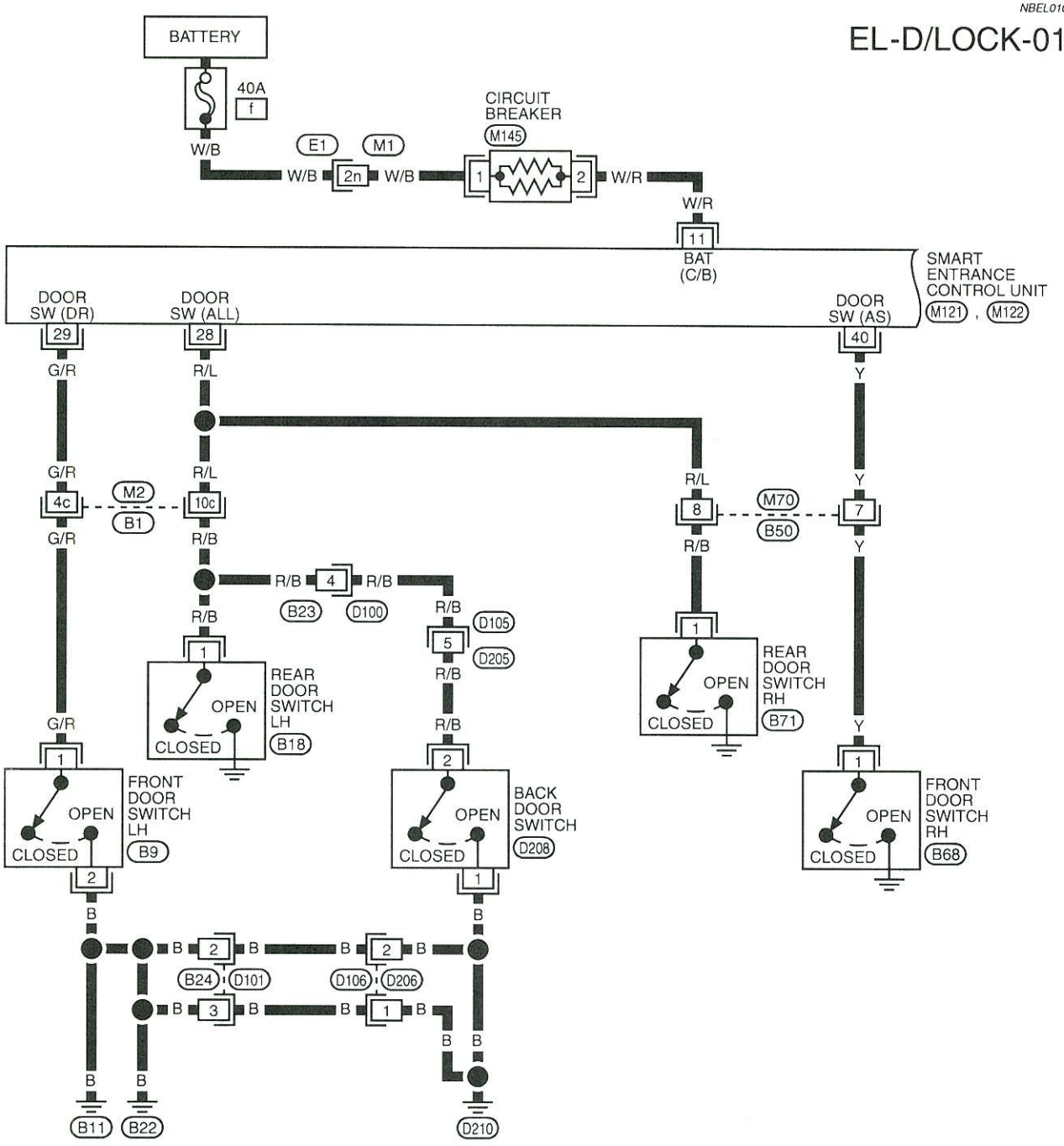
Wiring Diagram — D/LOCK —

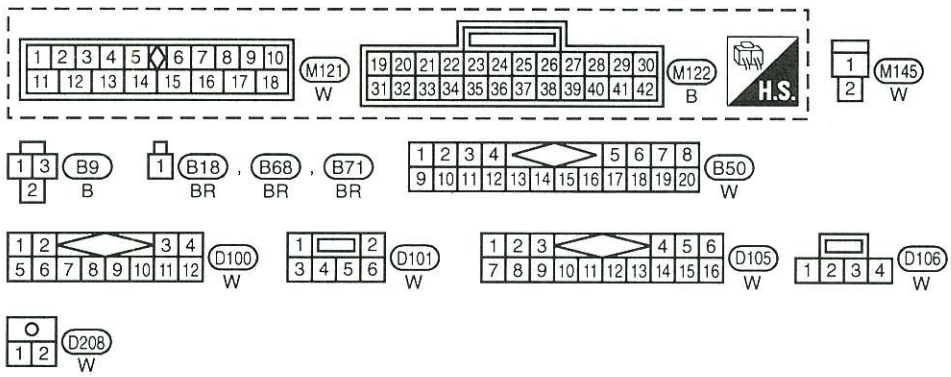
NBEL0109

FIG. 1

NBEL0109S01

EL-D/LOCK-01





Refer to last page (Foldout page).

M1 , E1

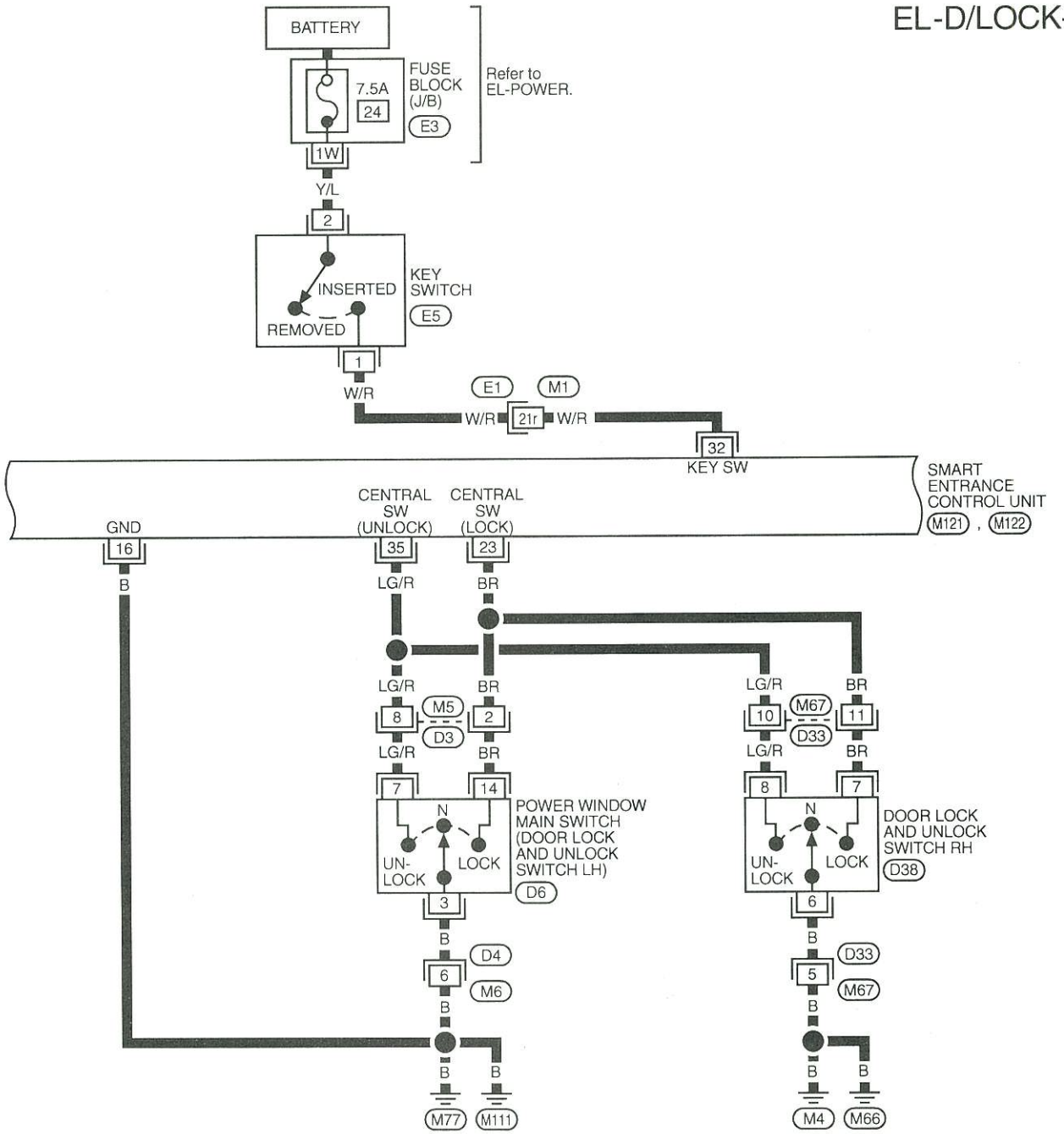
M2 , B1

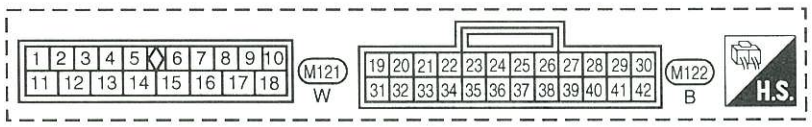
MEL072K

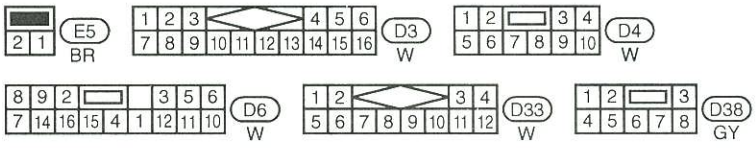
FIG. 2

NBEL0109S02

EL-D/LOCK-02







Refer to last page (Foldout page).

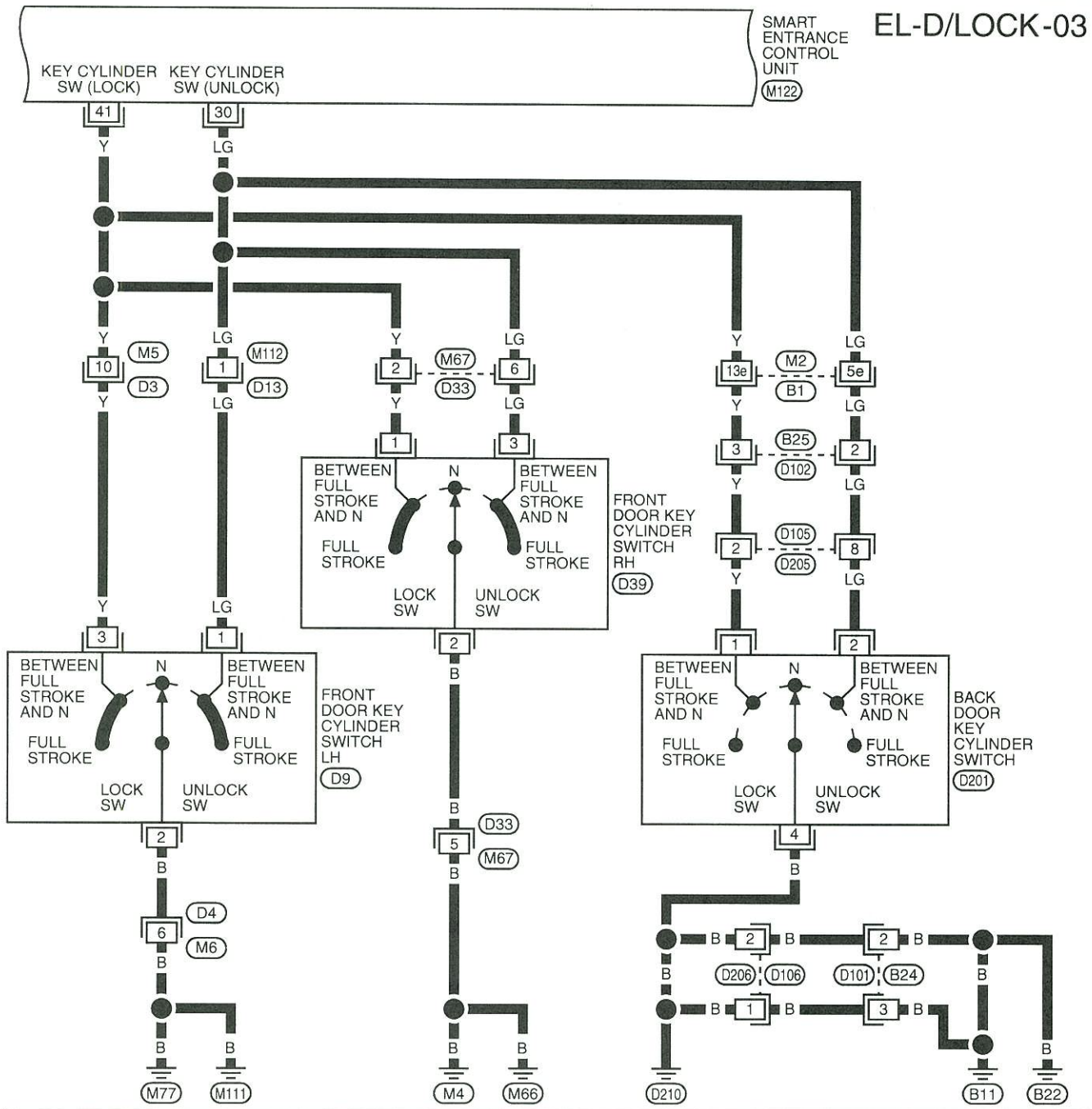
M1 , E1

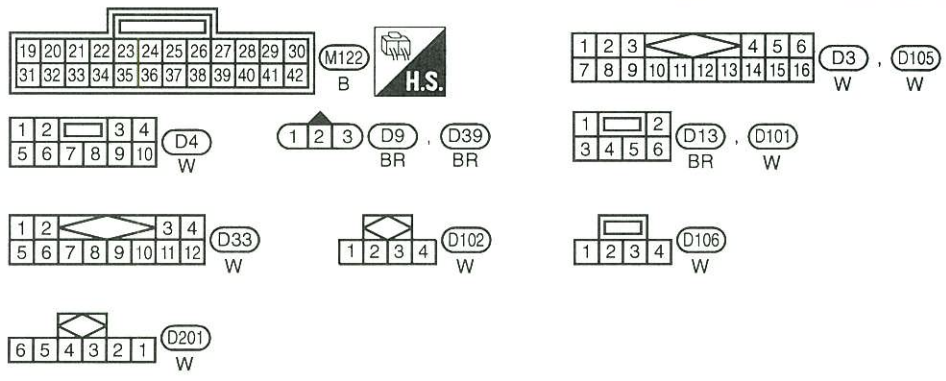
E3

MEL811J

FIG. 3

NBEL0109S03





Refer to last page (Foldout page).
M2 , B1

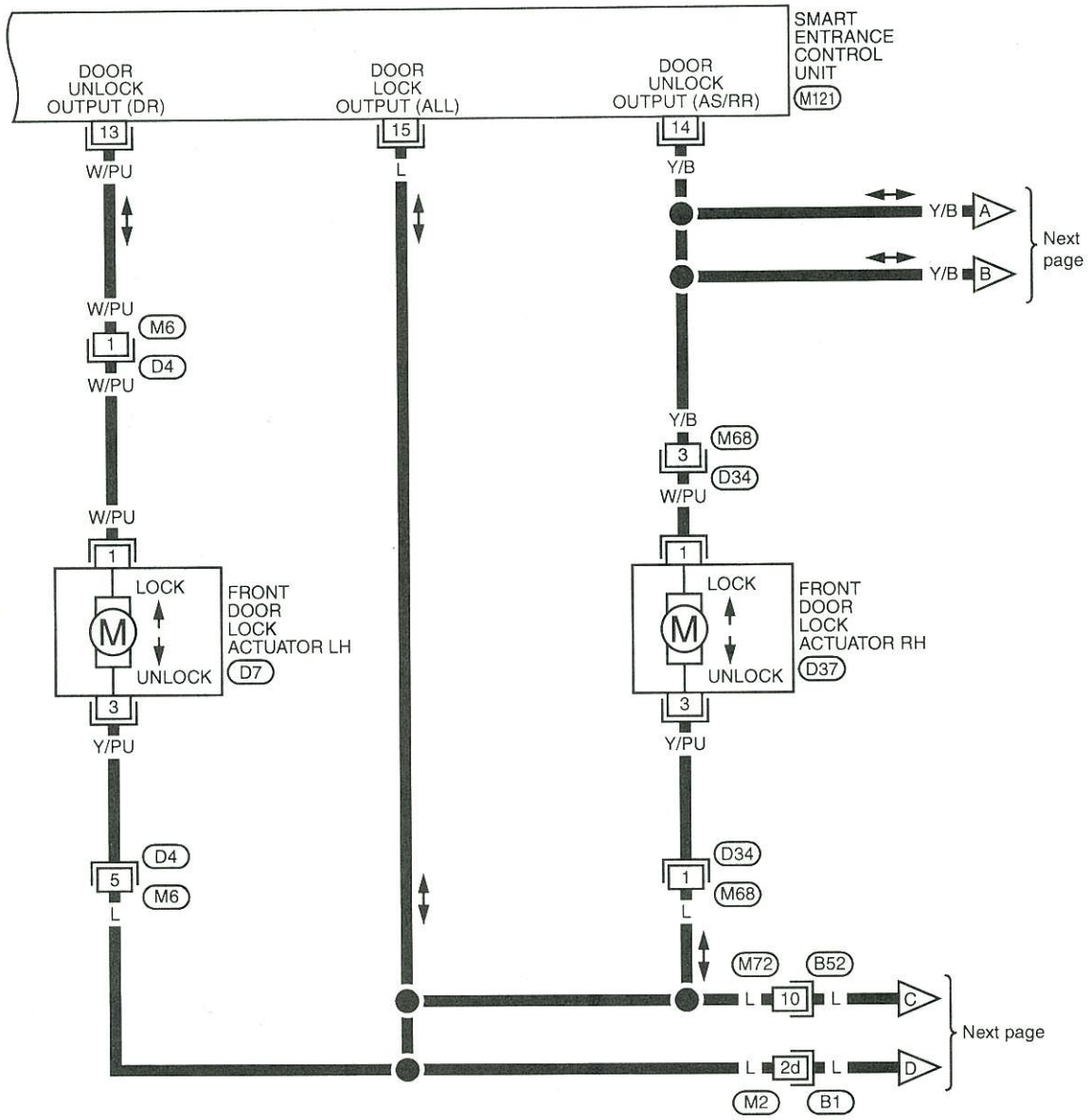
MEL812J

Wiring Diagram — D/LOCK — (Cont'd)

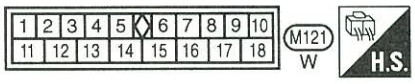
FIG. 4

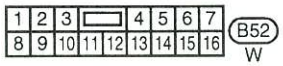
NBEL0109S04

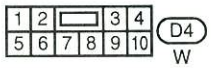
EL-D/LOCK-04

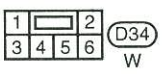


Refer to last page (Foldout page).
M2 , B1







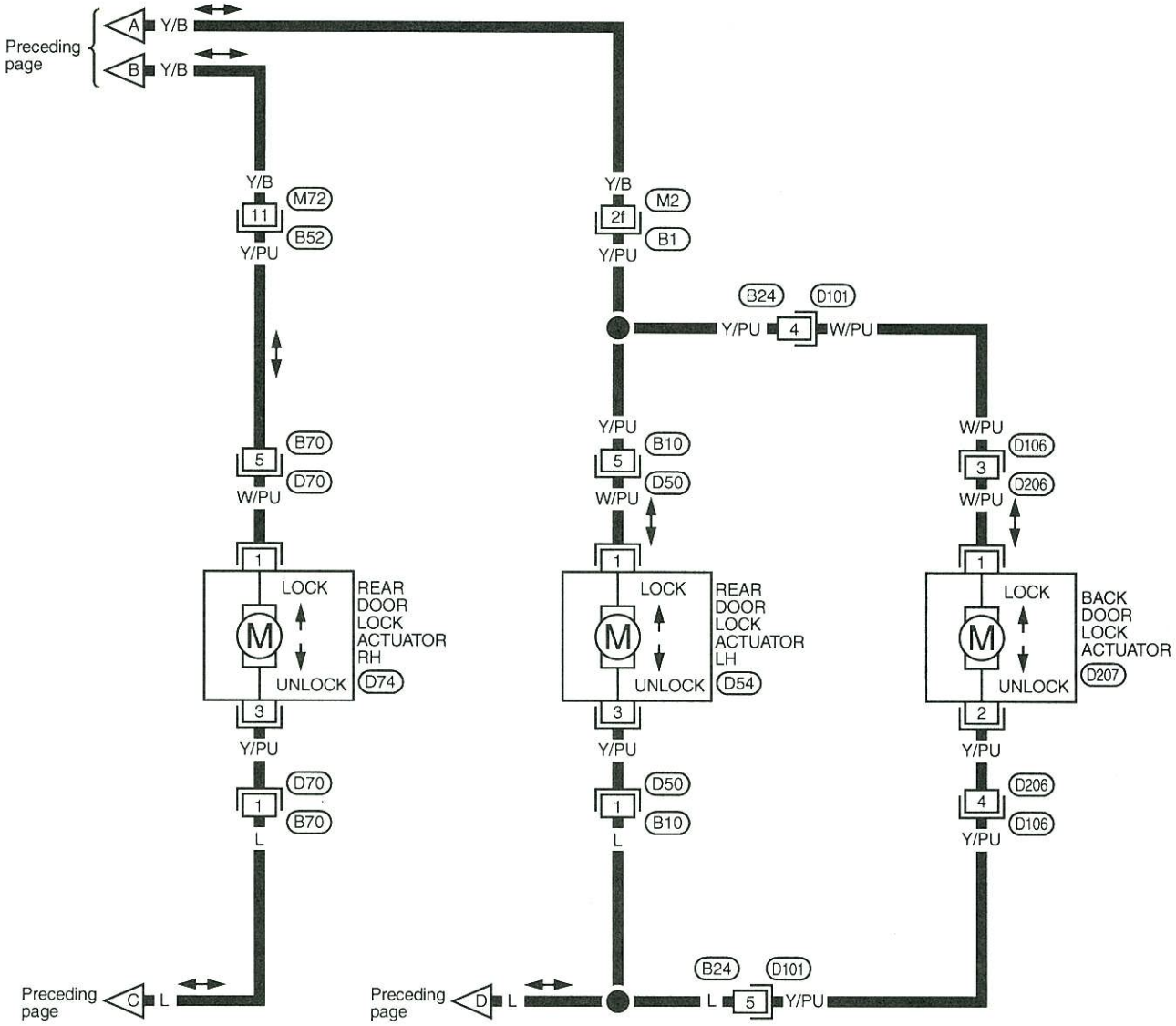


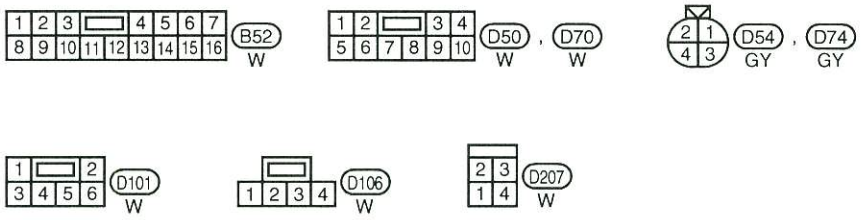
MEL813J

FIG. 5

NBEL0109S05

EL-D/LOCK-05





Refer to last page (Foldout page).

M2 , B1

MEL814J

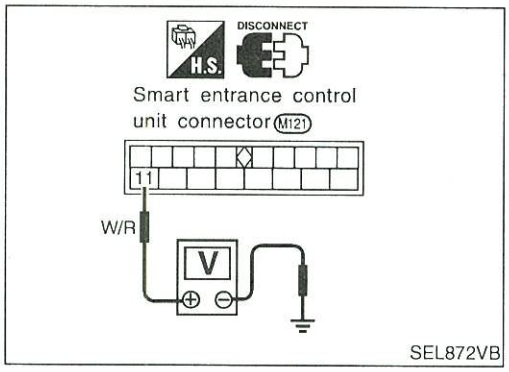
Trouble Diagnoses

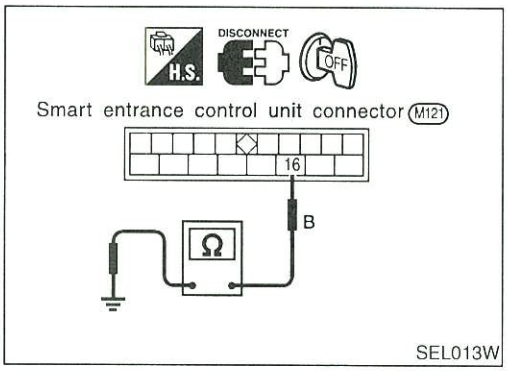
SYMPTOM CHART

NBEL0110

NBEL0110S01

REFERENCE PAGE (EL-)	199	200	201	202	203	204	205
SYMPTOM	MAIN POWER SUPPLY AND GROUND CIRCUIT CHECK	DOOR SWITCH CHECK	KEY SWITCH (INSERT) CHECK	DOOR LOCK/UNLOCK SWITCH CHECK	FRONT DOOR KEY CYLINDER SWITCH CHECK	BACK DOOR KEY CYLINDER SWITCH CHECK	DOOR LOCK ACTUATOR CHECK
Key reminder door system does not operate properly.	X	X	X				X
Specific door lock actuator does not operate.	X						X
Power door lock does not operate with door lock and unlock switch (LH and RH) on door trim.	X			X			
Power door lock does not operate with front door key cylinder operation.	X				X		
Power door lock does not operate with back door key cylinder operation.	X					X	





MAIN POWER SUPPLY AND GROUND CIRCUIT CHECK

=NBEL0110S02

Main Power Supply Circuit Check

NBEL0110S0201

Terminal		Ignition switch		
(+)	(–)	OFF	ACC	ON
11	Ground	Battery voltage	Battery voltage	Battery voltage

Ground Circuit Check

NBEL0110S0202

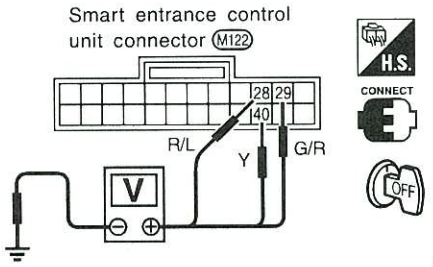
Terminals	Continuity
16 - Ground	Yes

DOOR SWITCH CHECK

=NBEL0110S05

1 CHECK DOOR SWITCH INPUT SIGNAL

Check voltage between control unit terminals 28, 29 or 40 and ground.



SEL886VA

	Terminals		Condition	Voltage [V]
	(+)	(−)		
Front LH door switch	29	ground	Open	0
			Closed	Approx. 5
Front RH door switch	40	ground	Open	0
			Closed	Approx. 5
Rear and back door switches	28	ground	Open	0
			Closed	Approx. 5

MTBL0262

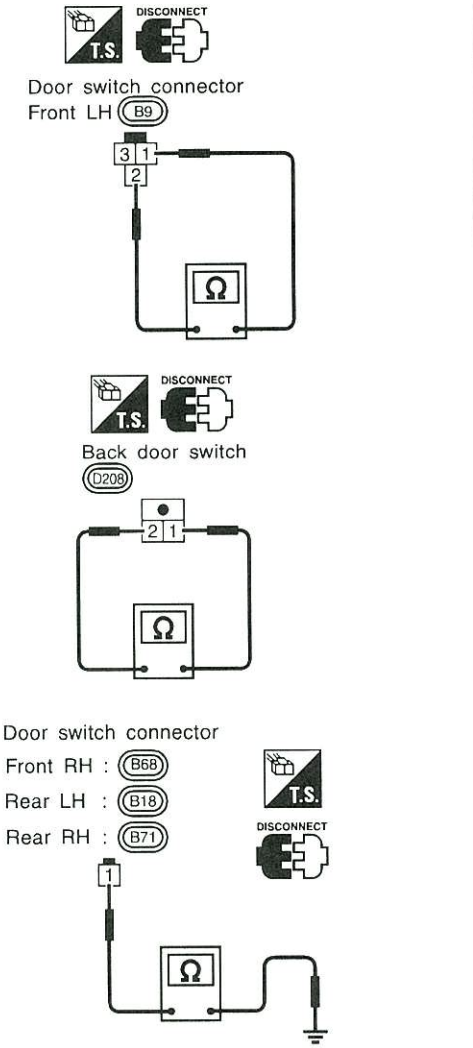
Refer to wiring diagram in EL-193.

OK or NG

OK ▶	Door switch is OK.
NG ▶	GO TO 2.

2 CHECK DOOR SWITCH

1. Disconnect door switch connector.
2. Check continuity between door switch terminals.



SEL066W

	Terminals	Condition	Continuity
Front LH door switch	1 - 2	Closed	No
		Open	Yes
Back door switch	1 - 2	Closed	No
		Open	Yes
Front RH and rear door switches	1 - ground	Closed	No
		Open	Yes

MTBL0263

OK or NG

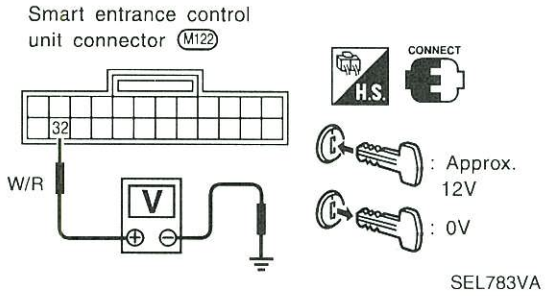
OK ▶	**Check the following.** • Door switch ground circuit (Front LH, back door) or door switch ground condition • Harness for open or short between control unit and door switch
NG ▶	Replace door switch.

KEY SWITCH (INSERT) CHECK

=NBEL0110S06

1	CHECK KEY SWITCH INPUT SIGNAL

Check voltage between control unit terminal 32 and ground.



SEL783VA

Voltage [V]:

Condition of key switch: Key is inserted.

Approx. 12

Condition of key switch: Key is removed.

0

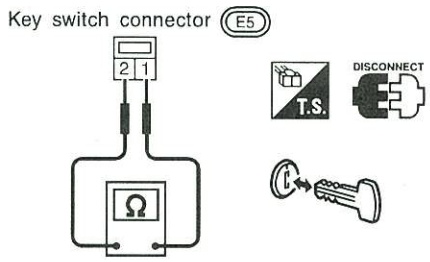
Refer to wiring diagram in EL-194.

OK or NG

OK	▶	Key switch is OK.
NG	▶	GO TO 2.

2	CHECK KEY SWITCH (INSERT)

Check continuity between terminals 1 and 2.



SEL784VA

Continuity:

Condition of key switch: Key is inserted.

Yes

Condition of key switch: Key is removed.

No

OK or NG

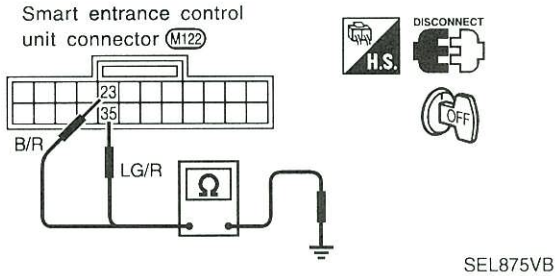
OK	▶	**Check the following.** • 7.5A fuse [No. 24, located in fuse block (J/B)] • Harness for open or short between key switch and fuse • Harness for open or short between control unit and key switch
NG	▶	Replace key switch.

DOOR LOCK/UNLOCK SWITCH CHECK

=NBEL0110S03

1 CHECK DOOR LOCK/UNLOCK SWITCH INPUT SIGNAL

1. Disconnect control unit connector.
2. Check continuity between control unit terminal 23 or 35 and ground.



SEL875VB

Terminals	Door lock/unlock switch (LH or RH) condition	Continuity
23 - ground	Lock	Yes
	N and Unlock	No
35 - ground	Unlock	Yes
	N and Lock	No

MTBL0264

Refer to wiring diagram in EL-194.

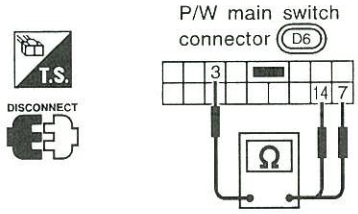
OK or NG

OK	▶	Door lock/unlock switch is OK.
NG	▶	GO TO 2.

2 CHECK DOOR LOCK/UNLOCK SWITCH

1. Disconnect door lock/unlock switch connector.
2. Check continuity between each door lock/unlock switch terminals.

- Power window main switch (Door lock/unlock switch LH)

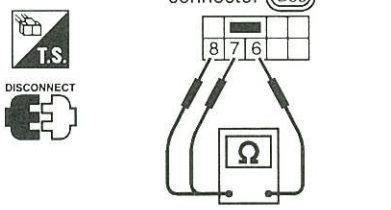


SEL067W

Condition	Terminals		
	3	7	14
Lock	○		○
N	No continuity		
Unlock	○	○	

MTBL0265

- Door lock/unlock switch RH



SEL068W

Condition	Terminals		
	6	7	8
Lock	○	○	
N	No continuity		
Unlock	○		○

MTBL0266

OK or NG

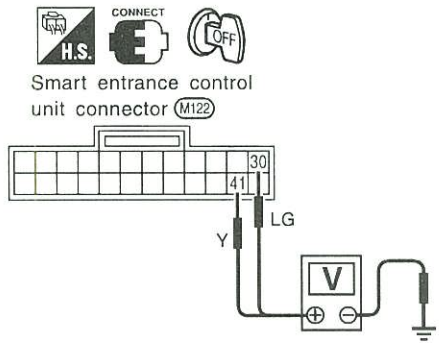
OK	▶	**Check the following.** • Ground circuit for door lock/unlock switch • Harness for open or short between door lock/unlock switch and control unit connector
NG	▶	Replace door lock/unlock switch.

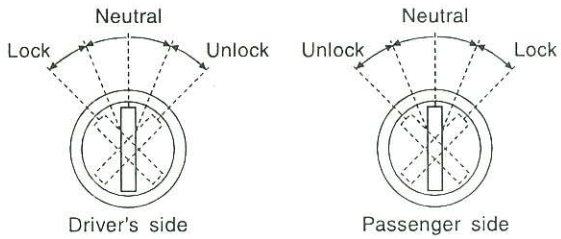
FRONT DOOR KEY CYLINDER SWITCH CHECK

=NBEL0110S07

1 CHECK DOOR KEY CYLINDER SWITCH INPUT SIGNAL (LOCK/UNLOCK SIGNAL)

Check voltage between control unit terminals 30 or 41 and ground.





SEL069W

Terminals		Key position	Voltage [V]
(+)	(−)		
41	Ground	Neutral/Unlock	Approx. 5
		Lock	0
30	Ground	Neutral/Lock	Approx. 5
		Unlock	0

MTBL0268

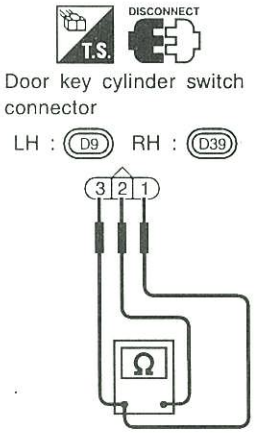
Refer to wiring diagram in EL-195.

OK or NG

OK	▶	Door key cylinder switch is OK.
NG	▶	GO TO 2.

2 CHECK DOOR KEY CYLINDER SWITCH

1. Disconnect door key cylinder switch connector.
2. Check continuity between door key cylinder switch terminals.



① : Door unlock switch terminal (LH)
Door lock switch terminal (RH)
② : Ground terminal
③ : Door lock switch terminal (LH)
Door unlock switch terminal (RH)

SEL070W

Terminals	Key position	Continuity
LH: 3 - 2	Neutral/Unlock	No
RH: 1 - 2	Lock	Yes
LH: 1 - 2	Neutral/Lock	No
RH: 3 - 2	Unlock	Yes

MTBL0269

OK or NG

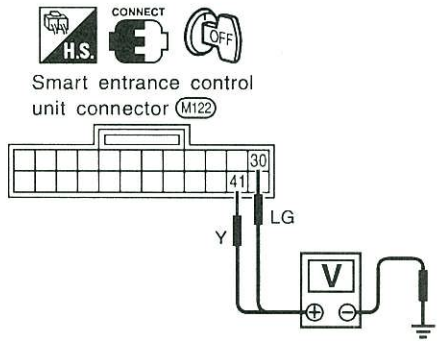
OK	▶	**Check the following.** • Door key cylinder switch ground circuit • Harness for open or short between control unit and door key cylinder switch
NG	▶	Replace door key cylinder switch.

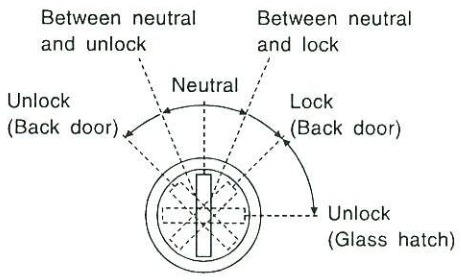
BACK DOOR KEY CYLINDER SWITCH CHECK

=NBEL0110S08

1 CHECK BACK DOOR KEY CYLINDER SWITCH INPUT SIGNAL (LOCK/UNLOCK SIGNAL)

Check voltage between control unit terminals 30 or 41 and ground.





SEL071W

	Terminals		Key position	Voltage [V]
	(+)	(−)		
Back door	41	Ground	Between neutral and lock	0
			Other positions	Approx. 5
	30	Ground	Between neutral and unlock	0
			Other positions	Approx. 5

MTBL0270

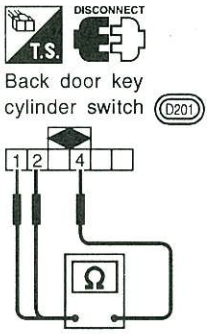
Refer to wiring diagram in EL-195.

OK or NG

OK	▶	Back door key cylinder switch is OK.
NG	▶	GO TO 2.

2 CHECK BACK DOOR KEY CYLINDER SWITCH

1. Disconnect back door key cylinder switch connector.
2. Check continuity between back door key cylinder switch terminals.



SEL616U

Key position	Terminals		
	1	2	4
Between neutral and lock (Back door)	○		○
Between neutral and unlock (Back door)		○	○

MTBL0052

OK or NG

OK	▶	**Check the following.** • Back door key cylinder switch ground circuit • Harness for open or short between control unit and back door key cylinder switch
NG	▶	Replace back door key cylinder switch.

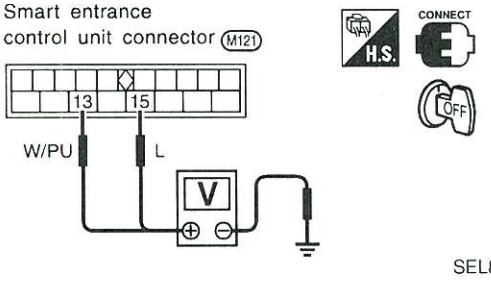
DOOR LOCK ACTUATOR CHECK

=NBEL0110S04

1 CHECK DOOR LOCK ACTUATOR CIRCUIT

Check voltage for door lock actuator.

- Door lock actuator front LH

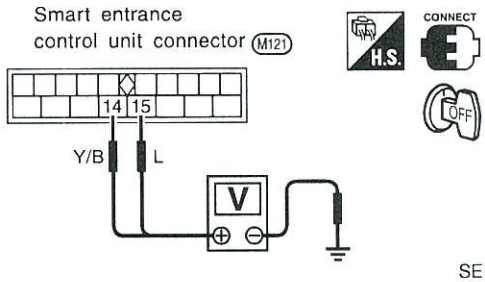


SEL879VA

Door lock/unlock switch condition	Terminal No. (+)	Terminal No. (−)	Voltage (V)
Lock	15	ground	Approx. 12
Unlock	13	ground	

MTBL0271

- Door lock actuator front RH, rear and back



SEL880VA

Door lock/unlock switch condition	Terminal No. (+)	Terminal No. (−)	Voltage (V)
Lock	15	ground	Approx. 12
Unlock	14	ground	

MTBL0272

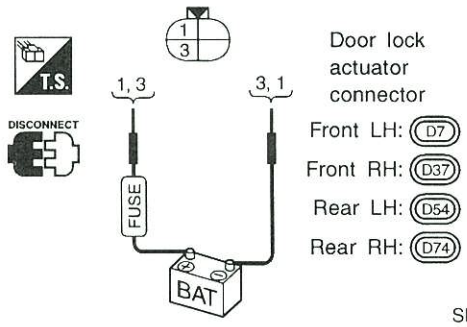
Refer to wiring diagram in EL-196.

OK or NG

OK	▶	GO TO 2.
NG	▶	Replace smart entrance control unit. (Before replacing control unit, perform "DOOR LOCK/UNLOCK SWITCH CHECK".)

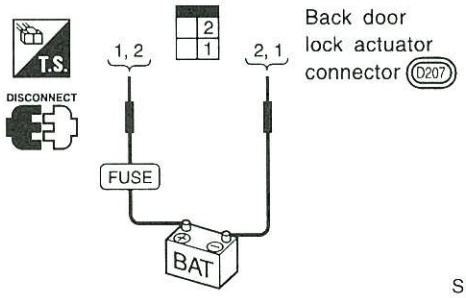
2 CHECK DOOR LOCK ACTUATOR

1. Disconnect door lock actuator connector.
2. Apply 12V direct current to door lock actuator and check operation.



SEL736U

- **Door lock actuator operation:**
  Terminals between (+): 3 and (−): 1
  Unlocked → Locked
  Terminals between (+): 1 and (−): 3
  Locked → Unlocked



SEL072W

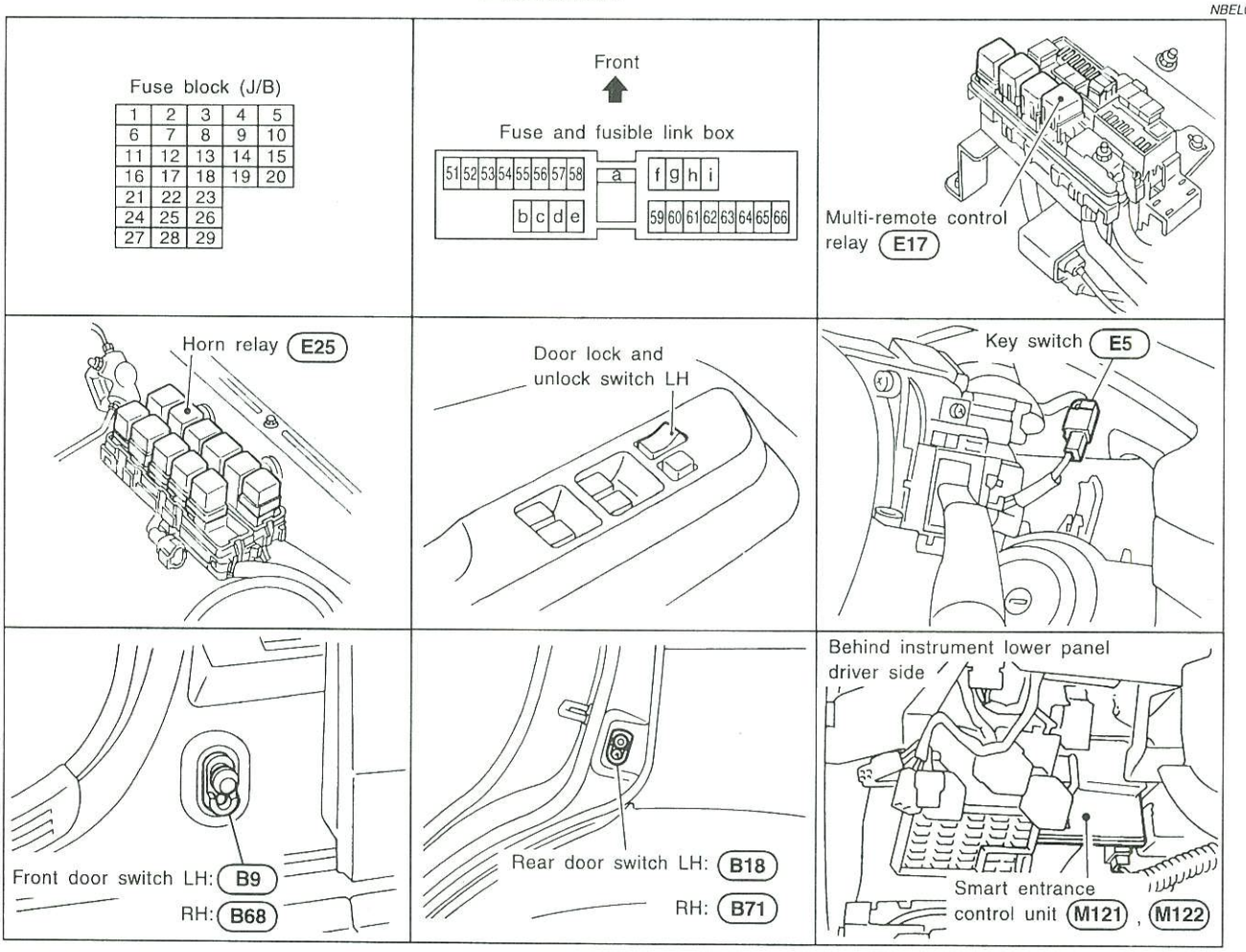
- **Back door lock actuator operation:**
  Terminals between (+): 2 and (−): 1
  Unlocked → Locked
  Terminals between (+): 1 and (−): 2
  Locked → Unlocked

OK or NG

OK	▶	Check harness for open or short between control unit connector and door lock actuator.
NG	▶	Replace door lock actuator.

Component Parts and Harness Connector Location

NBEL0111



SEL073W

System Description

NBEL0112

INPUTS

NBEL0112S01

Power is supplied at all times

- to key switch terminal 2
- through 7.5A fuse [No. 24, located in the fuse block (J/B)].

When the key switch is ON (ignition key is inserted in key cylinder), power is supplied

- through key switch terminal 1
- to smart entrance control unit terminal 32.

When the front door switch LH is OPEN, ground is supplied

- to smart entrance control unit terminal 29
- through front door switch LH terminal 1
- to front door switch LH terminal 2
- through body grounds B11, B22 and D210.

When the front door switch RH is OPEN, ground is supplied

- to smart entrance control unit terminal 40
- through front door switch RH body ground.

When the other door switches are OPEN, ground is supplied

- to smart entrance control unit terminal 28
- through other door switches body grounds.

Remote controller signal is inputted to smart entrance control unit (The antenna of the system is combined with smart entrance control unit).
The multi-remote control system controls operation of the

- power door lock
- interior lamp
- panic alarm
- hazard and horn reminder

OPERATED PROCEDURE

NBEL0112S02

Power Door Lock Operation

NBEL0112S0201

Smart entrance control unit receives a LOCK signal from remote controller. Smart entrance control unit locks all doors with input of LOCK signal from remote controller.
When an UNLOCK signal is sent from remote controller once, driver's door will be unlocked.
Then, if an UNLOCK signal is sent from remote controller again within 5 seconds, all other door will be unlocked.

Hazard and Horn Reminder

NBEL0112S0204

Power is supplied at all times

- to multi-remote control relay terminals 1, 3 and 6
- through 15A fuse [No. 20, located in the fuse block (J/B)], and
- to horn relay terminal 2
- through 10A fuse (No. 54, located in the fusible link and fuse box)

When smart entrance control unit receives LOCK or UNLOCK signal from remote controller with all doors closed, ground is supplied

- to multi-remote control relay terminal 2
- through smart entrance control unit terminal 7, and
- to horn relay terminal 1
- through smart entrance control unit terminal 19

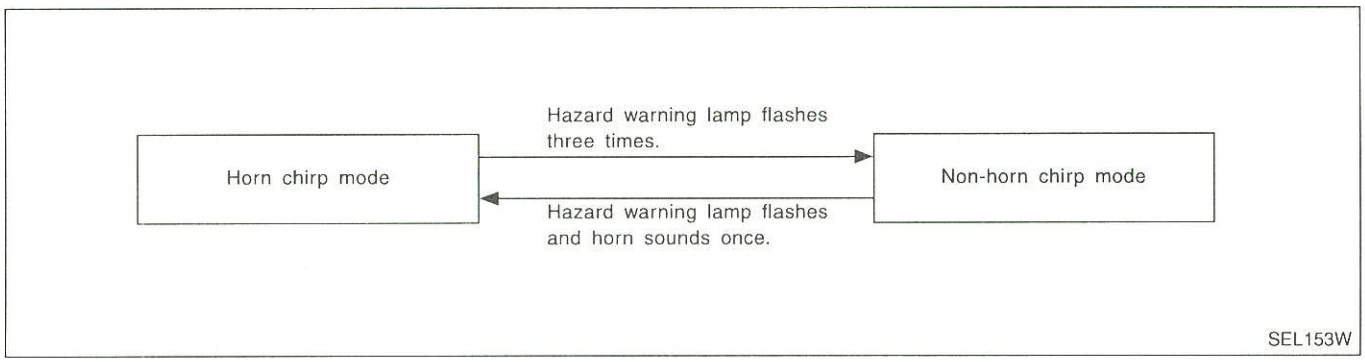
Multi-remote control relay and horn relay are now energized, and hazard warning lamp flashes and horn sounds as a reminder.
The hazard and horn reminder has a horn chirp mode and a non-horn chirp mode.

Operating function of hazard and horn reminder

	Horn chirp mode		Non-horn chirp mode	
	Hazard warning lamp flash	Horn sound	Hazard warning lamp flash	Horn sound
Lock	Twice	Once	Twice	—
Unlock	Once	—	—	—

How to change hazard and horn reminder mode

When LOCK and UNLOCK signals are sent from the remote controller for more than 2 seconds at the same time, the hazard and horn reminder mode is changed and hazard warning lamp flashes and horn sounds as follows:



Interior Lamp Operation

NBEL0112S0202

When the following input signals are both supplied:

- door switch CLOSED (when all the doors are closed);
- driver's door LOCKED;

multi-remote control system turns on interior lamp (for 30 seconds) with input of UNLOCK signal from remote controller.
For detailed description, refer to "INTERIOR, SPOT, VANITY MIRROR AND LUGGAGE ROOM LAMPS" (EL-71).

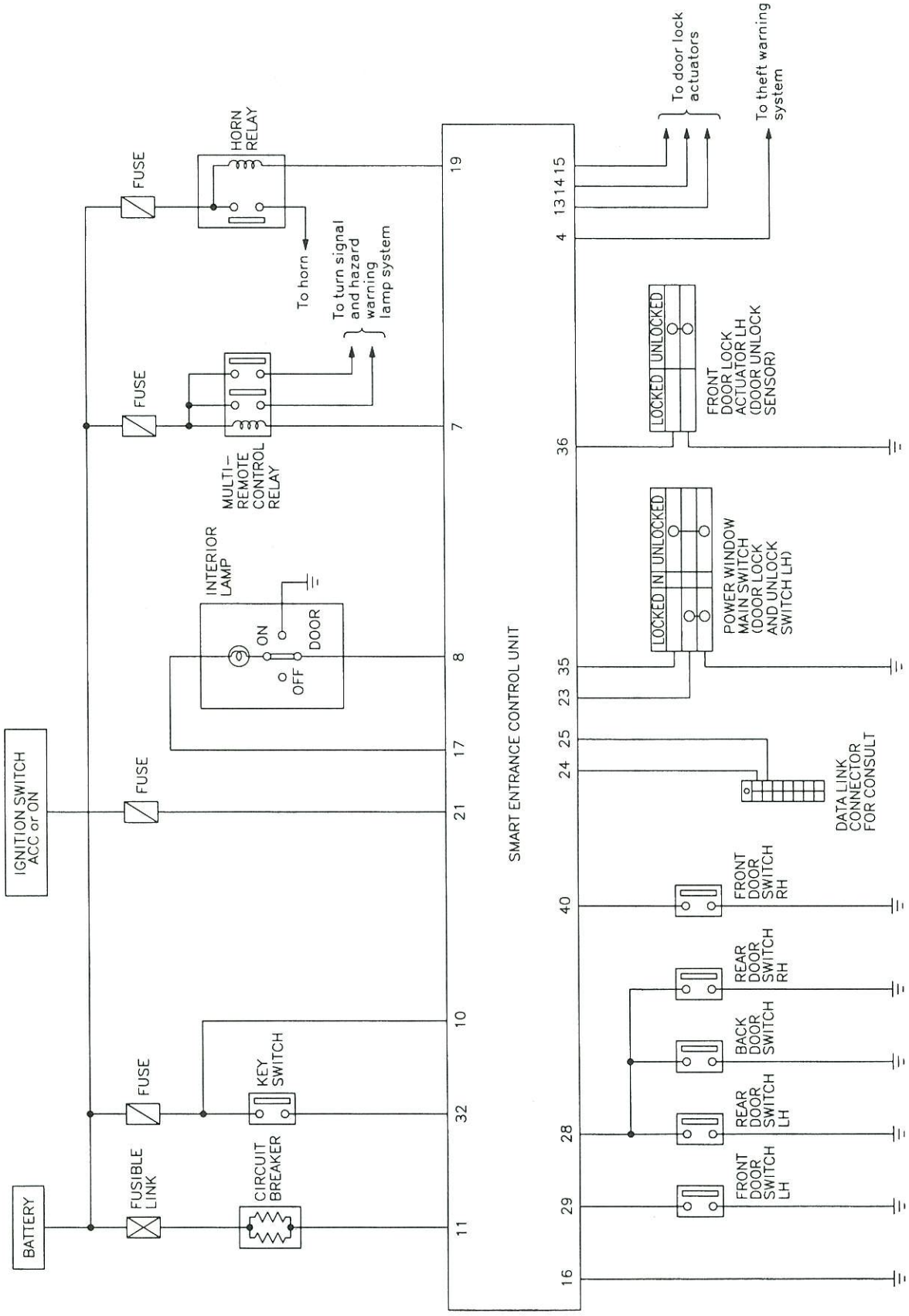
Panic Alarm Operation

NBEL0112S0203

When key switch is OFF (when ignition key is not inserted in key cylinder), multi-remote control system turns on and off horn and headlamp intermittently with input of PANIC ALARM signal from remote controller.
For detailed description, refer to "THEFT WARNING SYSTEM" (EL-227).

Schematic

NBEL0113



MEL815J

Wiring Diagram — MULTI —

NBEL0114

NBEL0114S01

FIG. 1

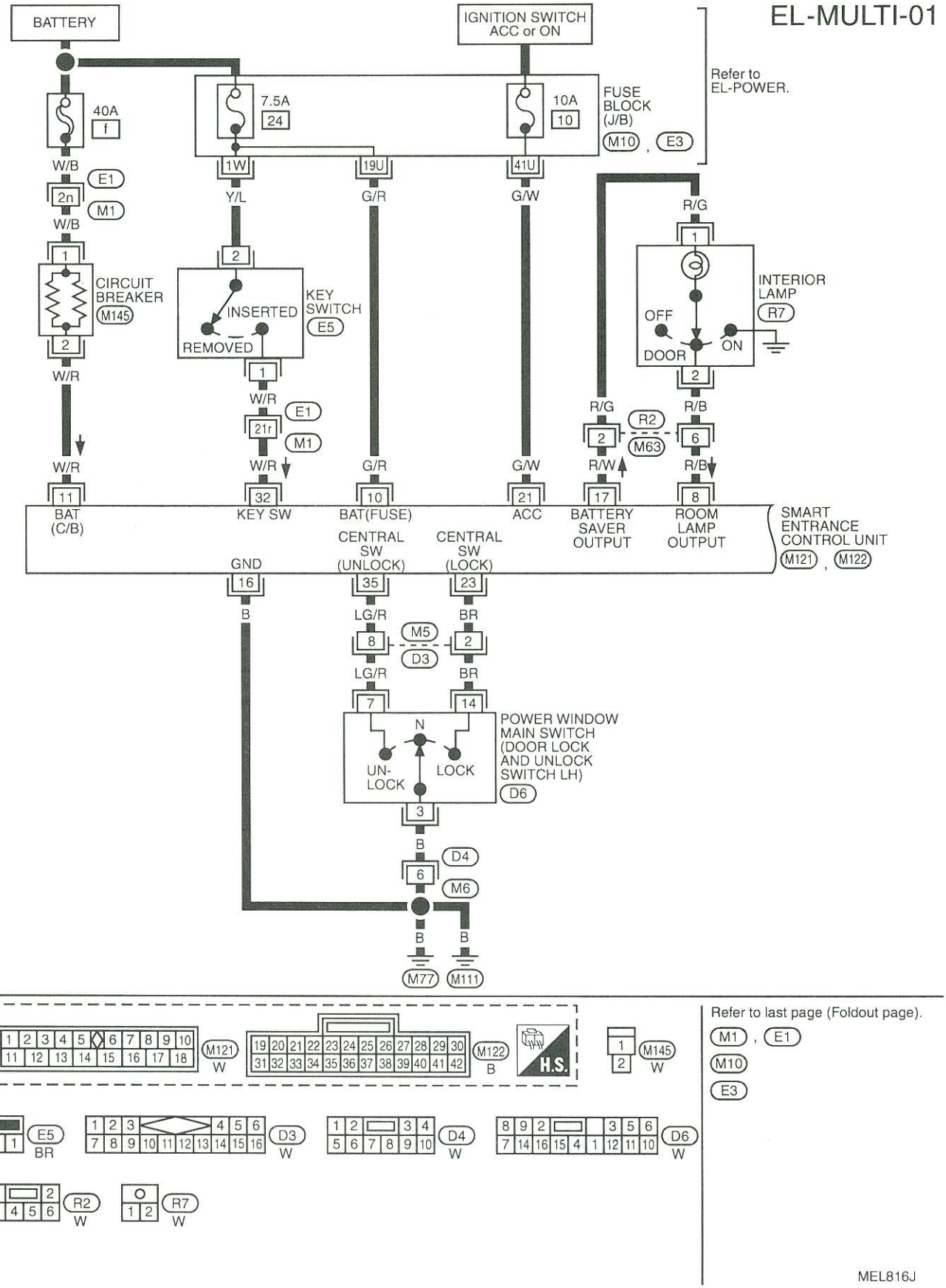
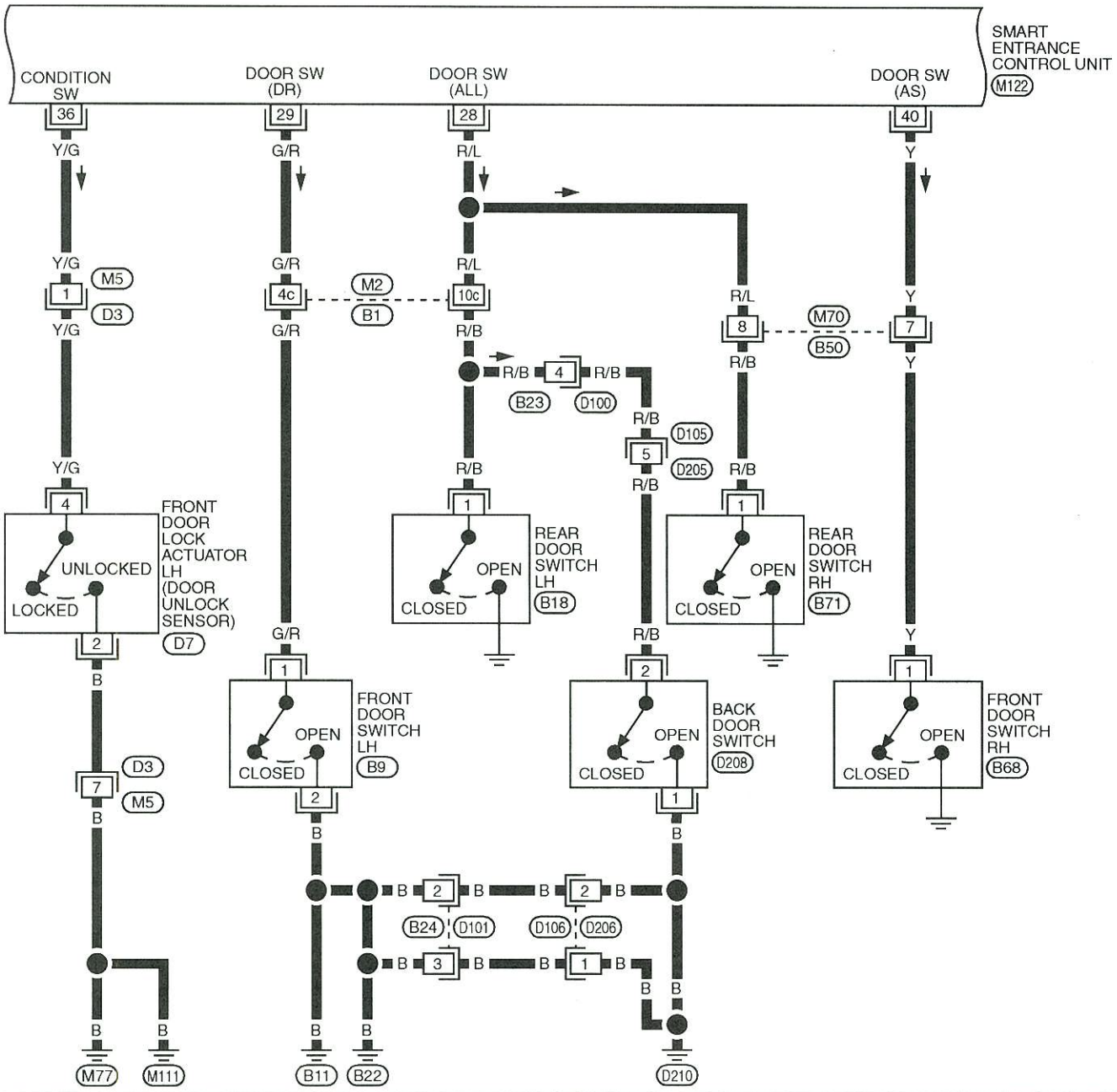
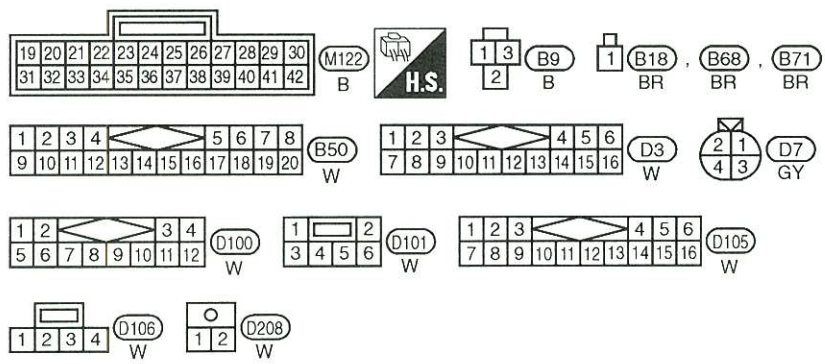


FIG. 2

NBEL0114S02

EL-MULTI-02





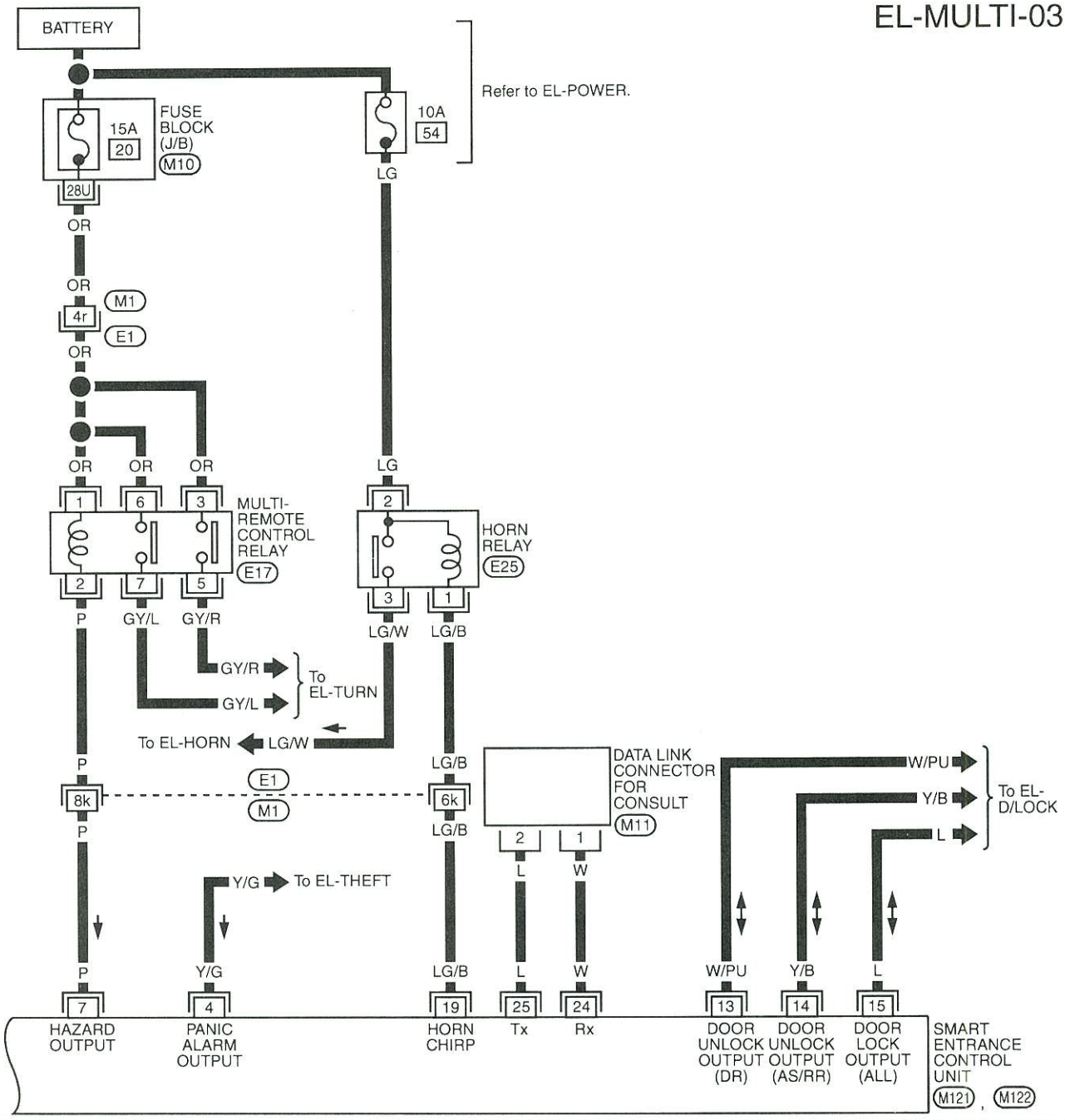
Refer to last page (Foldout page).
M2 , B1

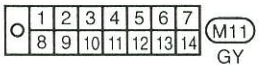
MEL817J

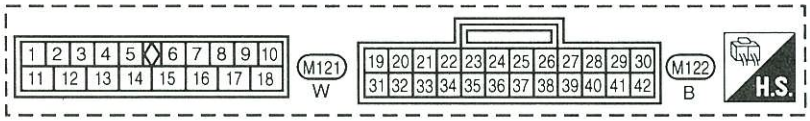
FIG. 3

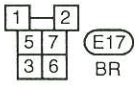
NBEL0114S03

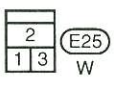
EL-MULTI-03











Refer to last page (Foldout page).
M1, E1
M10

MEL819J

Trouble Diagnoses

NBEL0115

SYMPTOM CHART

NBEL0115S01

NOTE:

- Always check remote controller battery before replacing remote controller.
- The panic alarm operation of multi-remote control system does not activate with the ignition key inserted in the ignition key cylinder.

Symptom	Diagnoses/service procedure	Reference page (EL-)
All function of multi-remote control system do not operate.	1. Remote controller battery check	214
	2. Power supply and ground circuit for control unit check	215
	3. Replace romote controller. Refer to ID Code Entry Procedure.	224
The new ID of remote controller cannot be entered.	1. Remote controller battery check	214
	2. Key switch (insert) check	217
	3. Door switch check	216
	4. Door lock/unlock switch LH check	218
	5. Power supply and ground circuit for control unit check	215
	6. Replace romote controller. Refer to ID Code Entry Procedure.	224
Door lock or unlock does not function. (If the power door lock system does not operate manually, check power door lock system. Refer to EL-198.)	1. Replace remote controller. Refer to ID Code Entry Procedure.	224
Hazard and horn reminder does not activate properly when pressing lock or unlock button of remote controller.	1. Harzard reminder check	220
	2. Horn reminder check* *: Horn chirp can be activated or deactivated. First check the horn chirp setting. Refer to "System Description", EL-206.	221
	3. Door switch check	216
	4. Replace remote controller. Refer to ID Code Entry Procedure.	224
Interior lamp operation does not activate properly.	1. Interior room lamp operation check	221
	2. Key switch (insert) check	217
	3. Door switch check	216
	4. Front LH door unlock sensor check	219
	5. Replace remote controller. Refer to ID Code Entry Procedure.	224
Panic alarm (horn and headlamp) does not activate when panic alarm button is continuously pressed.	1. Theft warning operation check. Refer to "PRELIMINALY CHECK" in "THEFT WARNING SYSTEM".	238
	2. Key switch (insert) check	217
	3. Replace remote controller. Refer to ID Code Entry Procedure.	224

REMOTE CONTROLLER BATTERY CHECK

=NBEL0115S02

1	CHECK REMOTE CONTROLLER BATTERY

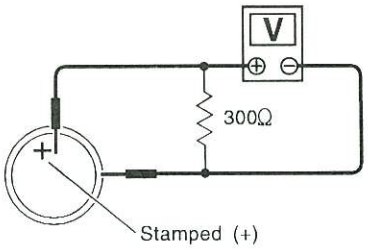
Remove battery (refer to EL-225) and measure voltage across battery positive and negative terminals, (+) and (–).

Voltage [V]:

2.5 - 3.0

NOTE:

Remote controller does not function if battery is not set correctly.



SEL277V

OK or NG

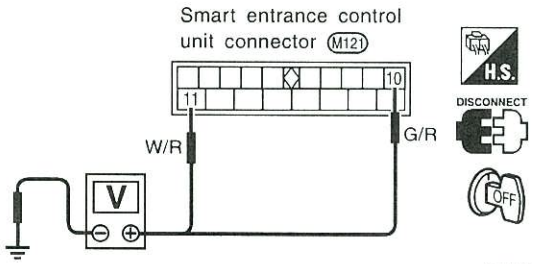
OK	▶	Check remote controller battery terminals for corrosion or damage.
NG	▶	Replace battery.

POWER SUPPLY AND GROUND CIRCUIT CHECK

=NBEL0115S04

1 CHECK MAIN POWER SUPPLY CIRCUIT FOR CONTROL UNIT

1. Disconnect connector from control unit.
2. Check voltage between control unit terminal 10 or 11 and ground.



SEL156W

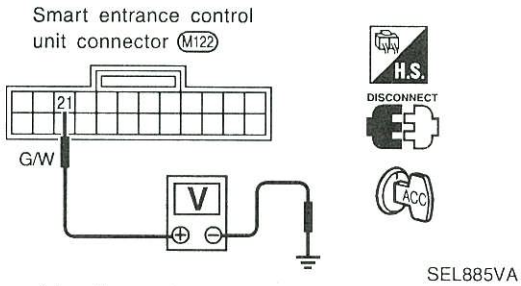
Refer to wiring diagram in EL-210.

Does battery voltage exist?

Yes	▶	GO TO 2.
No	▶	**Check the following.** • 40A fusible link (letter **f**, located in fuse and fusible link box) • 7.5A fuse [No. 24, located in fuse block (J/B)] • M21 circuit breaker • Harness for open or short between control unit and fuse

2 CHECK IGNITION SWITCH "ACC" CIRCUIT

1. Disconnect control unit connector.
2. Check voltage between control unit terminal 21 and ground while ignition switch is "ACC".



SEL885VA

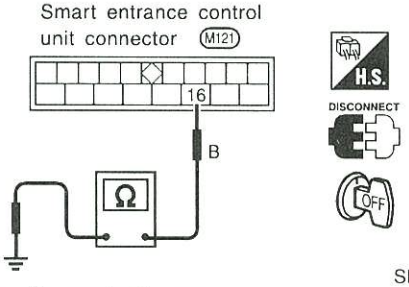
Refer to wiring diagram in EL-210.

Does battery voltage exist?

Yes	▶	GO TO 3.
No	▶	**Check the following.** • 10A fuse [No. 10, located in fuse block (J/B)] • Harness for open or short between control unit and fuse

3 CHECK GROUND CIRCUIT FOR CONTROL UNIT

Check continuity between terminal 16 and ground.



SEL791VA

Refer to wiring diagram in EL-210.

Does continuity exist?

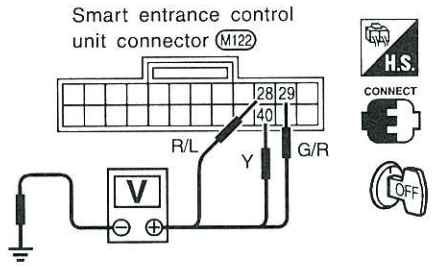
Yes	▶	Power supply and ground circuits are OK.
No	▶	Check ground harness.

DOOR SWITCH CHECK

=NBEL0115S05

1 CHECK DOOR SWITCH INPUT SIGNAL

Check voltage between control unit terminals 28, 29 or 40 and ground.



SEL886VA

	Terminals		Condition	Voltage [V]
	(+)	(−)		
Front LH door switch	29	ground	Open	0
			Closed	Approx. 5
Front RH door switch	40	ground	Open	0
			Closed	Approx. 5
Rear and back door switches	28	ground	Open	0
			Closed	Approx. 5

MTBL0273

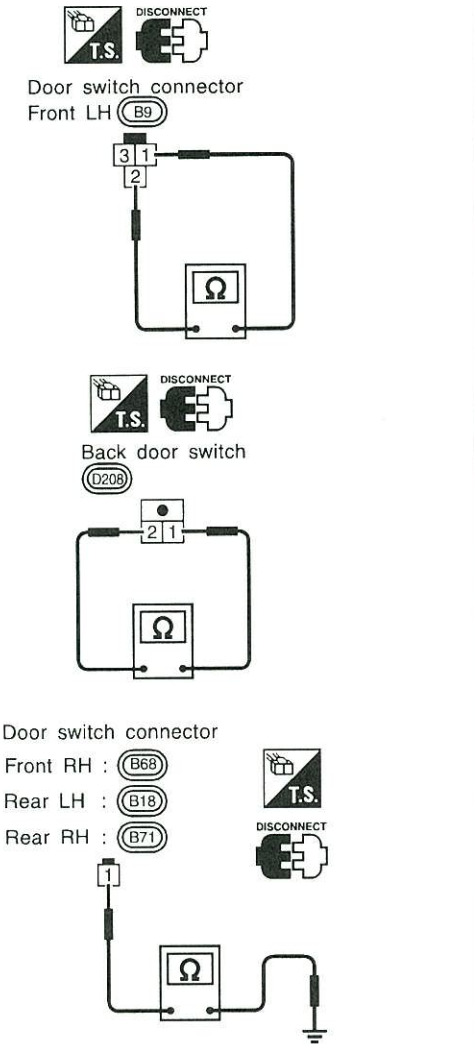
Refer to wiring diagram in EL-211.

OK or NG

OK ▶	Door switch is OK.
NG ▶	GO TO 2.

2 CHECK DOOR SWITCH

1. Disconnect door switch connector.
2. Check continuity between door switch terminals.



SEL066W

	Terminals	Condition	Continuity
Front LH door switch	1 - 2	Closed	No
		Open	Yes
Back door switch	2 - 1	Closed	No
		Open	Yes
Front RH and rear door switches	1 - ground	Closed	No
		Open	Yes

MTBL0274

OK or NG

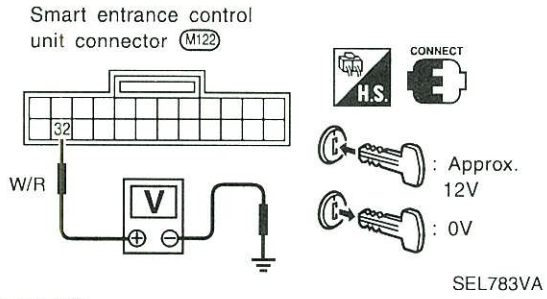
OK ▶	**Check the following.** • Door switch ground circuit (Front, back door) or door switch ground condition • Harness for open or short between control unit and door switch
NG ▶	Replace door switch.

KEY SWITCH (INSERT) CHECK

=NBEL0115S07

1	CHECK KEY SWITCH INPUT SIGNAL

Check voltage between control unit terminal 32 and ground.



SEL783VA

Voltage [V]:

Condition of key switch: Key is inserted.

Approx. 12

Condition of key switch: Key is removed.

0

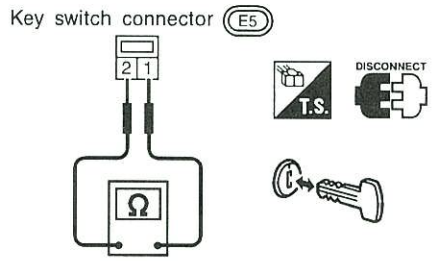
Refer to wiring diagram in EL-210.

OK or NG

OK	▶	Key switch is OK.
NG	▶	GO TO 2.

2	CHECK KEY SWITCH (INSERT)

Check continuity between terminals 1 and 2.



SEL784VA

Continuity:

Condition of key switch: Key is inserted.

Yes

Condition of key switch: Key is removed.

No

OK or NG

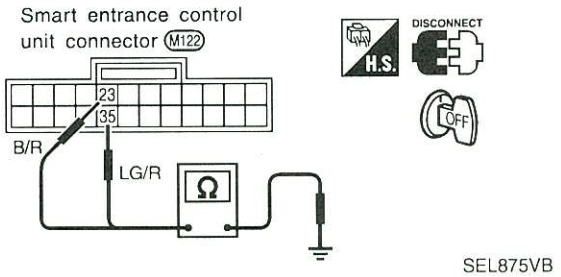
OK	▶	**Check the following.** • 7.5A fuse [No. 24, located in fuse block (J/B)] • Harness for open or short between key switch and fuse • Harness for open or short between control unit and key switch
NG	▶	Replace key switch.

DOOR LOCK/UNLOCK SWITCH LH CHECK

=NBEL0115S10

1 CHECK DOOR LOCK/UNLOCK SWITCH INPUT SIGNAL

1. Disconnect control unit connector.
2. Check continuity between control unit terminal 23 or 35 and ground.



SEL875VB

Terminals	Door lock/unlock switch LH condition	Continuity
23 - ground	Lock	Yes
	N and Unlock	No
35 - ground	Unlock	Yes
	N and Lock	No

MTBL0278

Refer to wiring diagram in EL-210.

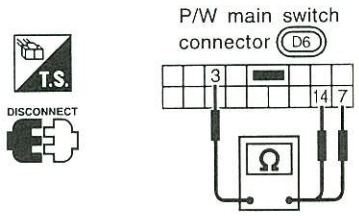
OK or NG

OK	▶	Door lock/unlock switch is OK.
NG	▶	GO TO 2.

2 CHECK DOOR LOCK/UNLOCK SWITCH

1. Disconnect door lock/unlock switch connector.
2. Check continuity between each door lock/unlock switch terminals.

- Power window main switch (Door lock/unlock switch LH)



SEL067W

Condition	Terminals		
	3	7	14
Lock	○		○
N	No continuity		
Unlock	○	○	

MTBL0265

OK or NG

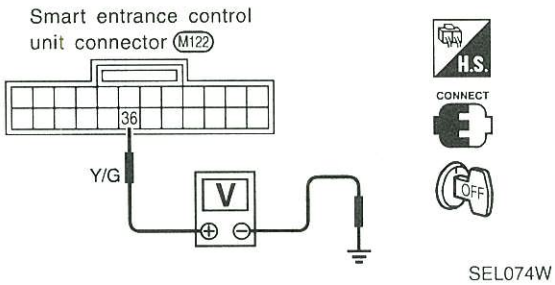
OK	▶	**Check the following.** • Ground circuit for door lock/unlock switch • Harness for open or short between door lock/unlock switch and control unit connector
NG	▶	Replace door lock/unlock switch.

FRONT LH DOOR UNLOCK SENSOR CHECK

=NBEL0115S06

1 CHECK FRONT LH DOOR UNLOCK SENSOR INPUT SIGNAL

Check voltage between control unit terminal 36 and ground.



SEL074W

	Terminals		Condition	Voltage [V]
	(+)	(–)		
Front LH door	36	Ground	Locked	Approx. 5
			Unlocked	0

MTBL0275

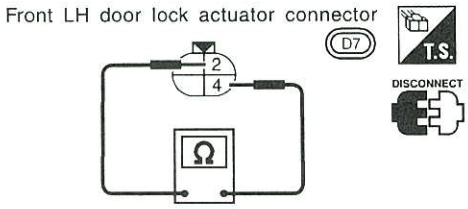
Refer to wiring diagram in EL-211.

OK or NG

OK	▶	Door unlock sensor is OK.
NG	▶	GO TO 2.

2 CHECK FRONT LH DOOR UNLOCK SENSOR

1. Disconnect front LH door unlock sensor connector.
2. Check continuity between door unlock sensor terminals.



SEL247VD

Continuity:
Condition: Locked
No
Condition: Unlocked
Yes

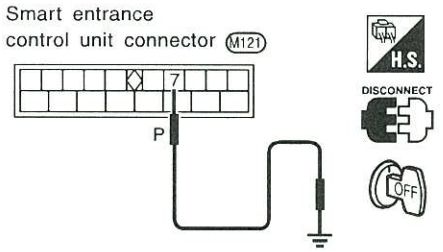
OK or NG

OK	▶	**Check the following.** • Door unlock sensor ground circuit • Harness for open or short between control unit and door unlock sensor
NG	▶	Replace door unlock sensor.

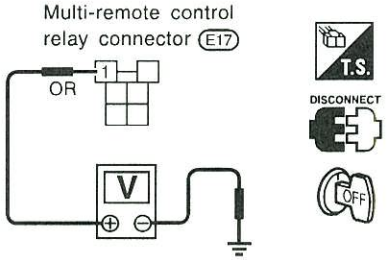
HAZARD REMINDER CHECK

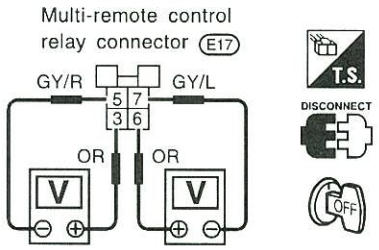
=NBEL0115S08

1	CHECK HAZARD INDICATOR	
Check if hazard indicator flashes with hazard switch. **Does hazard indicator operate?**		
Yes	▶	GO TO 2.
No	▶	Check "hazard indicator" circuit.

2	CHECK HAZARD REMINDER OPERATION	
1. Disconnect control unit connector. 2. Apply ground to control unit terminal 7.  SEL890VA Refer to wiring diagram in EL-212. **Does hazard indicator illuminate?**		
Yes	▶	Replace smart entrance control unit.
No	▶	GO TO 3.

3	CHECK MULTI-REMOTE CONTROL RELAY	
Check multi-remote control relay. **OK or NG**		
OK	▶	GO TO 4.
NG	▶	Replace.

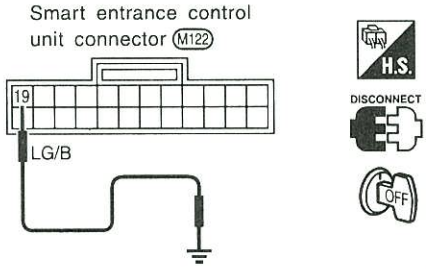
4	CHECK POWER SUPPLY FOR MULTI-REMOTE CONTROL RELAY	
1. Disconnect multi-remote control relay connector. 2. Check voltage between terminal 1 and ground.  SEL244V **Does battery voltage exist?**		
Yes	▶	GO TO 5.
No	▶	**Check the following.** • 15A fuse [No. 20, located in fuse block (J/B)] • Harness for open or short between multi-remote control relay and fuse

5	CHECK MULTI-REMOTE CONTROL RELAY CIRCUIT	
1. Disconnect multi-remote control relay connector. 2. Check voltage between terminals 3 and 5. 3. Check voltage between terminals 6 and 7.  SEL245V **Battery voltage should exist.** **OK or NG**		
OK	▶	Check harness for open or short between control unit and multi-remote control relay.
NG	▶	**Check the following.** • Harness for open or short between multi-remote control relay and fuse • Harness for open or short between multi-remote control relay and turn signal lamps

HORN REMINDER CHECK

=NBEL0115S11

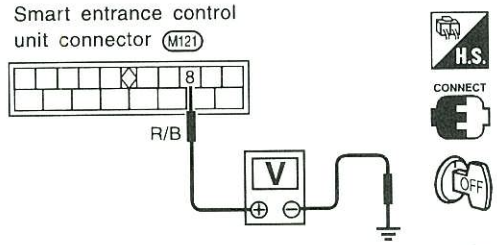
1	CHECK HORN	
Check if horn sounds with horn switch. **Does horn operate?**		
Yes	▶	GO TO 2.
No	▶	Check horn circuit.

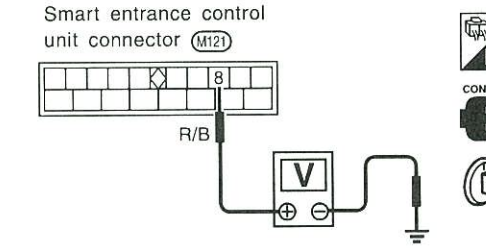
2	CHECK HORN REMINDER OPERATION	
1. Disconnect control unit connector. 2. Apply ground to control unit terminal 19.  SEL075W Refer to wiring diagram in EL-212. **Does horn sound?**		
Yes	▶	Replace smart entrance control unit.
No	▶	Check harness for open or short between control unit and horn relay.

INTERIOR ROOM LAMP OPERATION CHECK

NBEL0115S09

1	CHECK INTERIOR ROOM LAMP	
Check if the interior room lamp switch is in the "ON" position and the lamp illuminates. **Does interior room lamp illuminate?**		
Yes	▶	GO TO 2.
No	▶	**Check the following.** • Harness for open or short between control unit and interior room lamp • Interior room lamp

2	CHECK INTERIOR ROOM LAMP CIRCUIT	
When interior room lamp switch is "DOOR" position, check voltage across control unit terminal 8 and ground.  SEL891VA Refer to wiring diagram in EL-210. **Does battery voltage exist?**		
Yes	▶	GO TO 3.
No	▶	Repair harness between control unit and interior room lamp.

3	CHECK CONTROL UNIT OUTPUT	
Push unlock button of remote controller with key removed and all doors closed, and check voltage across control unit terminal 8 and ground.  SEL891VA **Voltage (V):** **Unlock button is pushed.** **0 (For approx. 30 seconds.)** **Unlock button is not pushed.** **Battery voltage** **OK or NG**		
OK	▶	Check system again.
NG	▶	Replace smart entrance control unit.

CONSULT

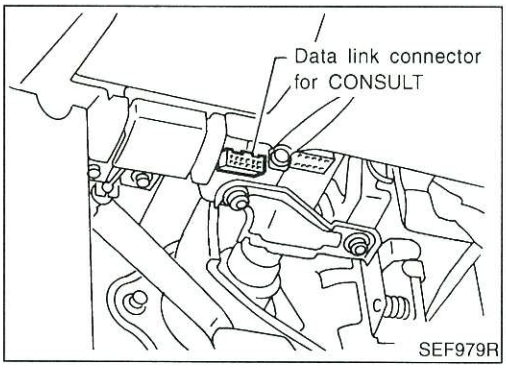
NBEL0169

CONSULT REMOTE CONTROLLER ID SET UP PROCEDURE

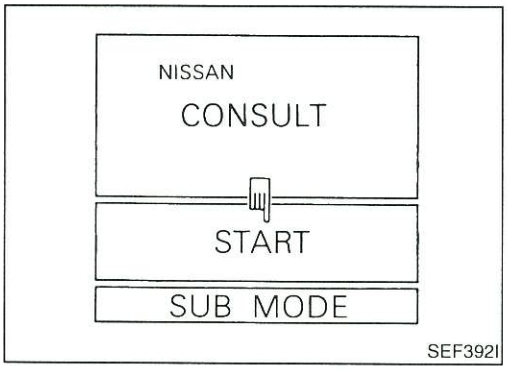
NBEL0169S01

NOTE:

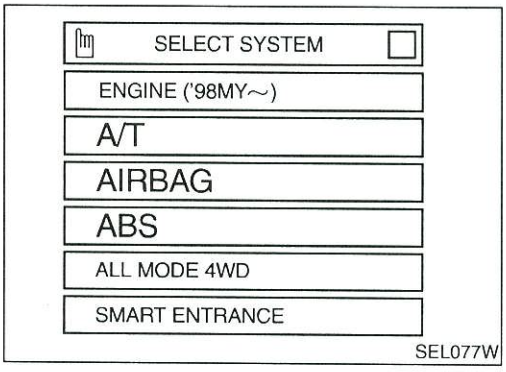
When a customer loses the remote controller, it is recommended to erase the ID code of the lost remote controller to prevent someone from using the lost remote controller. When the ID code of lost remote controller cannot be specified, all ID codes which have been registered should be erased. It will then be necessary to register the ID codes for the remaining remote controller.



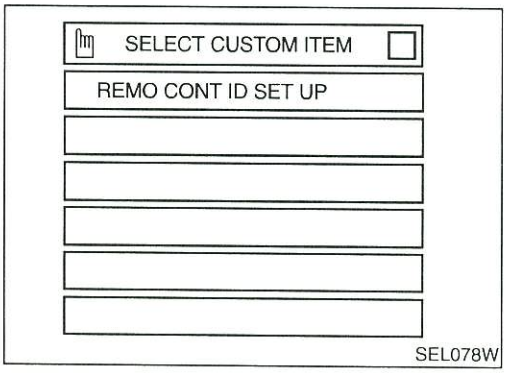
1. Turn ignition switch "OFF".
2. Connect "CONSULT" to the data link connector.



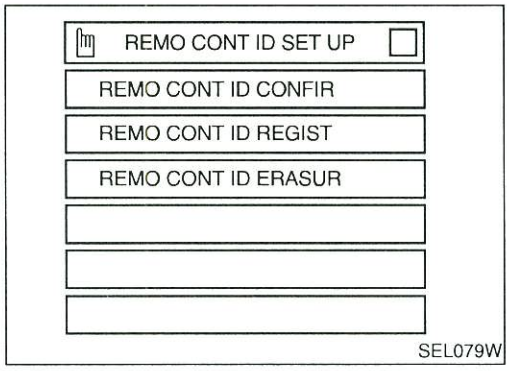
3. Turn ignition switch "ON".
4. Touch "START".



5. Touch "SMART ENTRANCE".



6. Touch "REMO CONT ID SET UP".



7. The items shown on the figure at left can be set up.

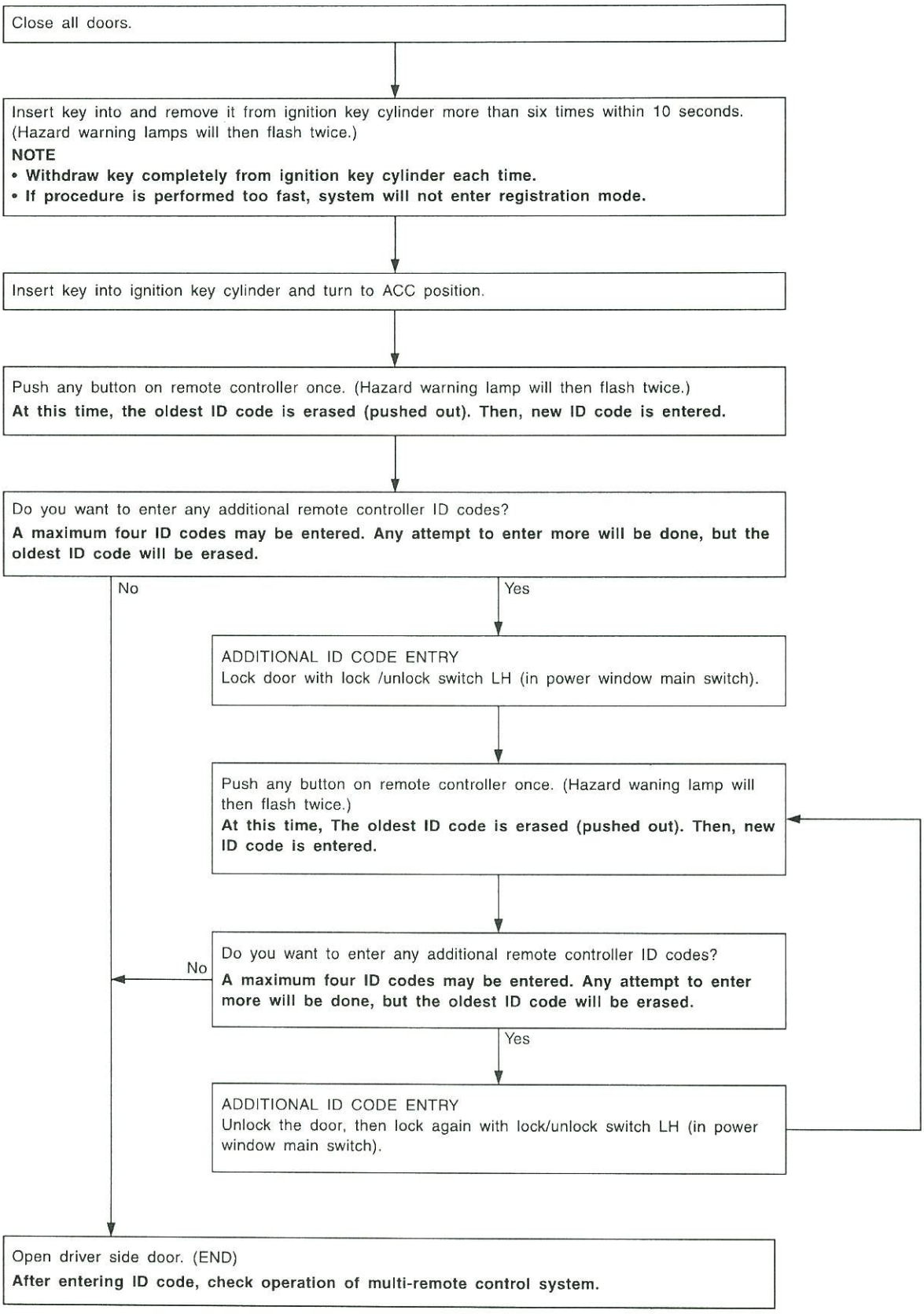
- "REMO CONT ID CONFIR"
  This mode can be confirmed whether remote controller ID code is registered or not.
- "REMO CONT ID REGIST"
  Remote controller ID code can be registered.

NOTE:
Enter the ID code when remote controller or smart entrance control unit is replaced and additional remote controller is activated.

- "REMO CONT ID ERASUR"
  Remote controller ID code can be erased.

ID Code Entry Procedure (Without CONSULT)

NBEL0117



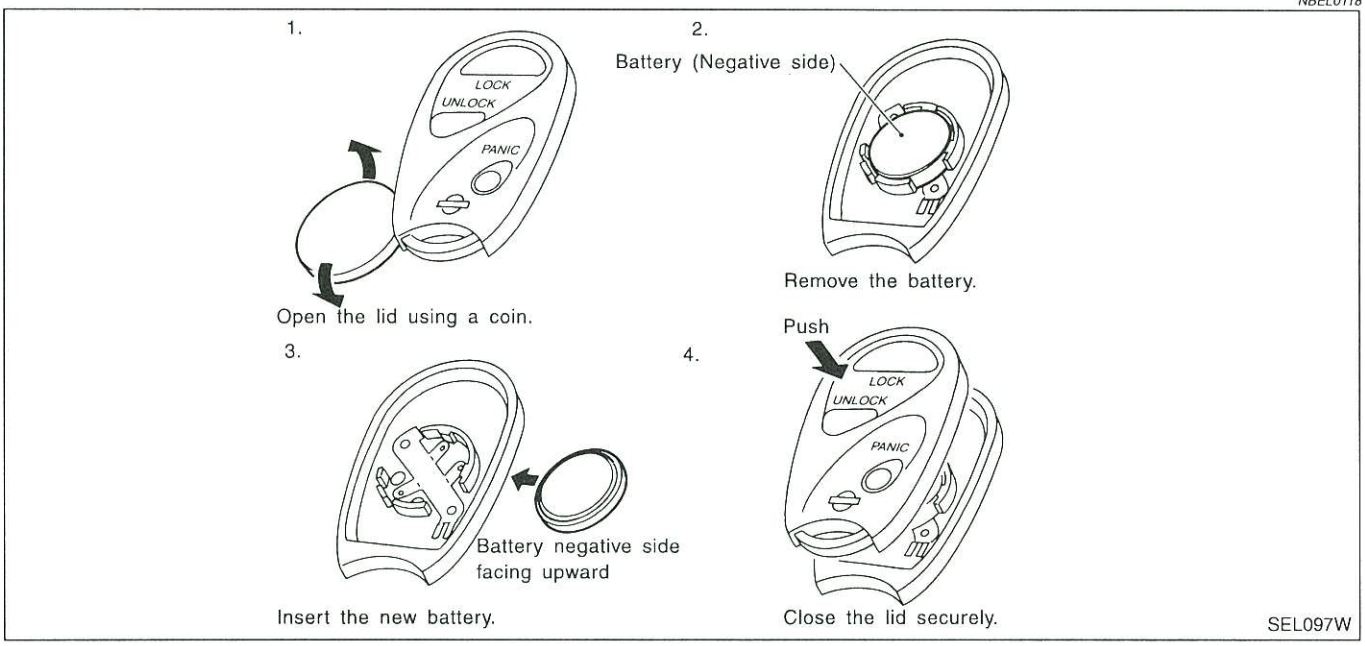
SEL076W

NOTE:

- When a customer loses the remote controller, it is recommended to erase the ID code of the lost remote controller to prevent someone from using the lost remote controller. When the ID code of lost remote controller cannot be specified, all ID codes which have been registered should be erased. It will then be necessary to register the ID codes for the remaining remote controller.
- If you need to activate more than two additional new remote controllers, repeat the procedure "Additional ID code entry" for each new remote controller.
- Entry of maximum four ID codes is allowed. When more than four ID codes are entered, the oldest ID code will be erased.
- Even if the same ID code that is already in the memory is input, the same ID code can be entered. The code is counted as an additional code.

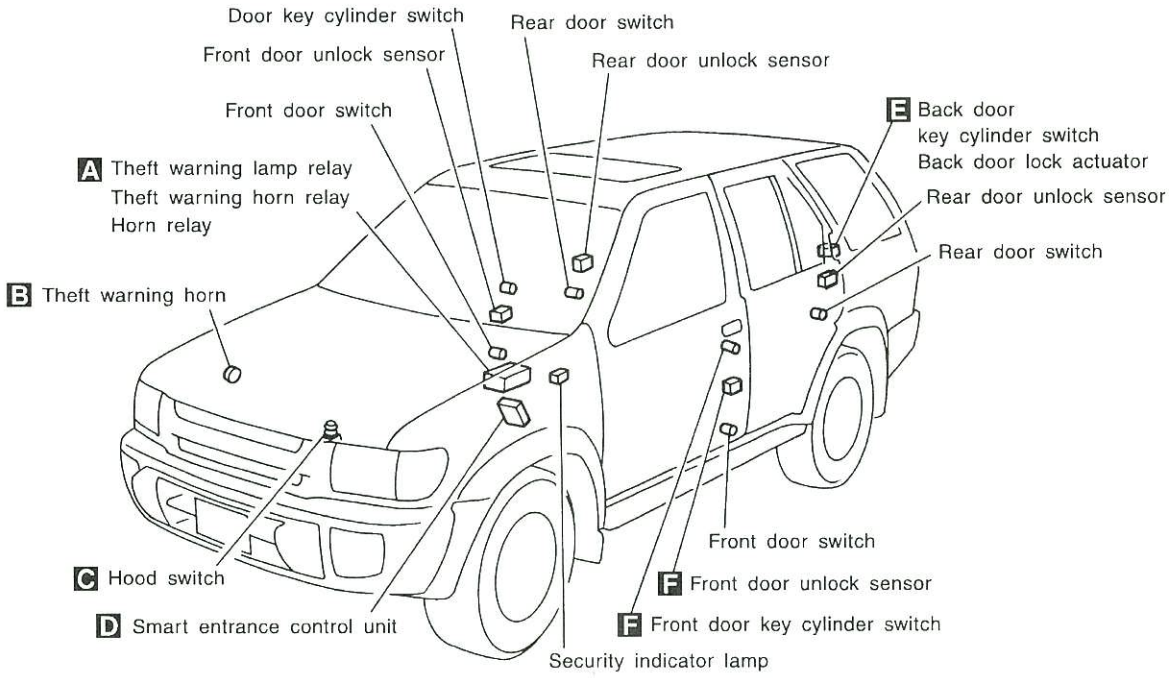
Remote Controller Battery Replacement

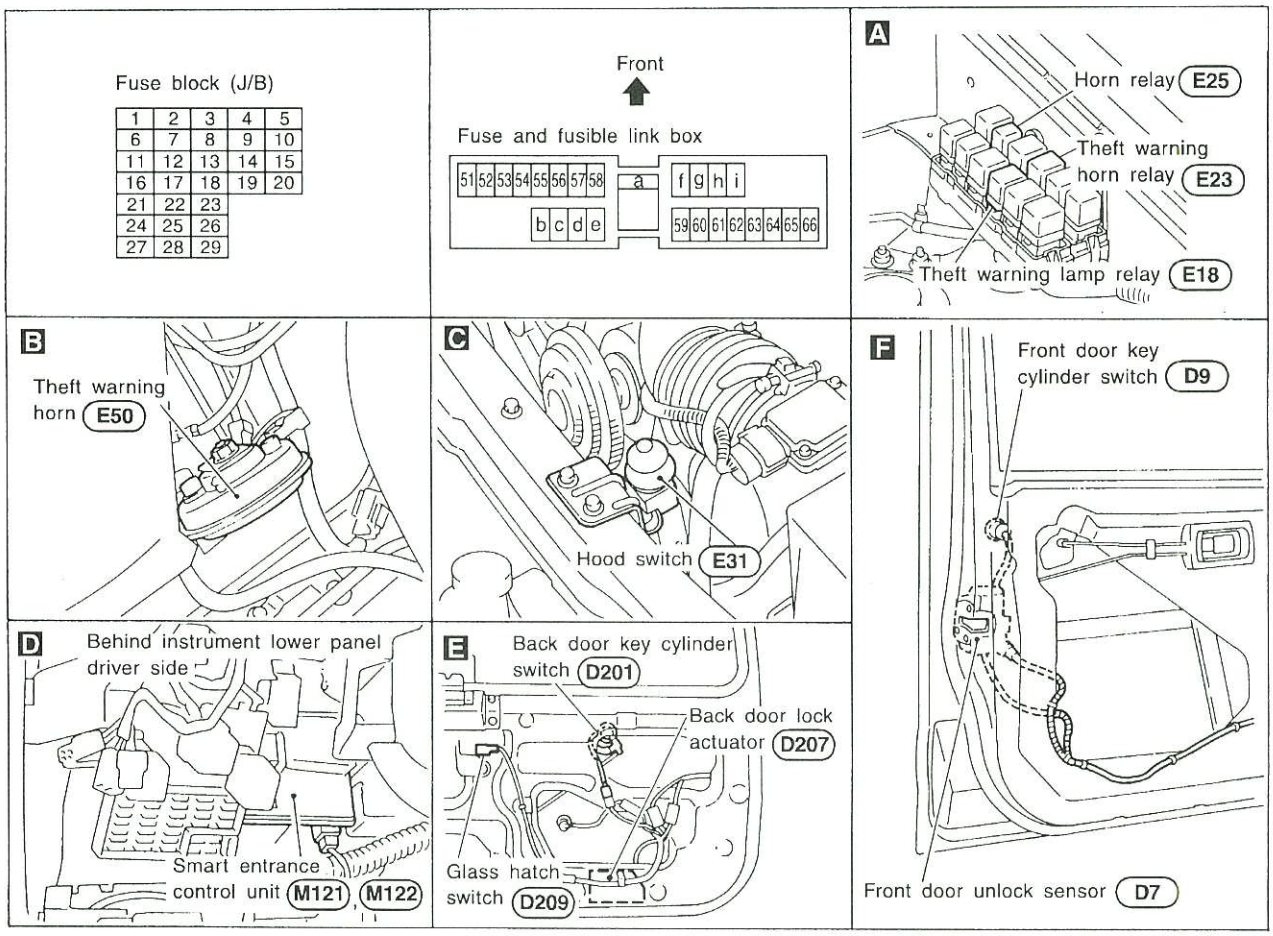
NBEL0118



Component Parts and Harness Connector Location

NBEL0119





SEL080W

System Description

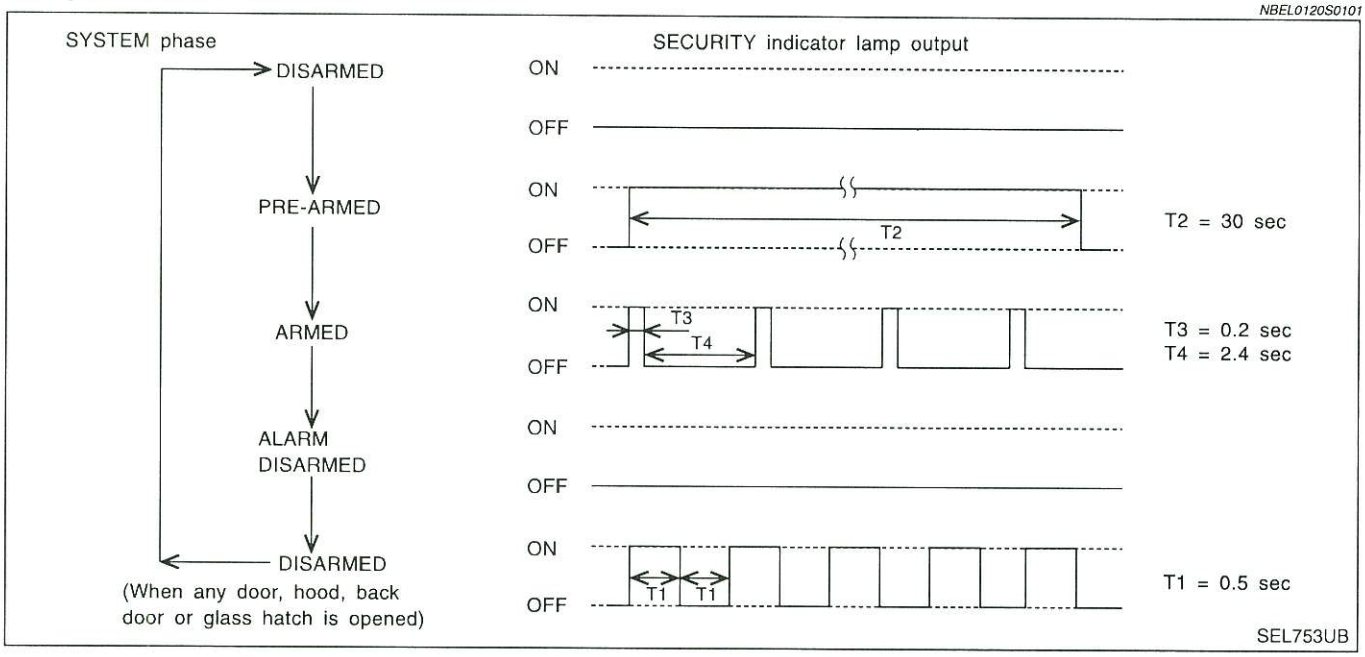
DESCRIPTION

NBEL0120

1. Operation Flow

NBEL0120S01

NBEL0120S0101



2. Setting The Theft Warning System

NBEL0120S0102

Initial condition

1) Close all doors.
2) Close hood and glass hatch.

Disarmed phase

The theft warning system is in the disarmed phase when any door(s), hood or glass hatch is opened. The security indicator lamp blinks every second.

Pre-armed phase and armed phase

The theft warning system turns into the "pre-armed" phase when hood, glass hatch and all doors are closed and the doors are locked by key or multi-remote controller. (The security indicator lamp illuminates.)
After about 30 seconds, the system automatically shifts into the "armed" phase (the system is set). (The security indicator lamp blinks every 2.6 seconds.)

3. Canceling The Set Theft Warning System

NBEL0120S0103

When the following 1) or 2) operation is performed, the armed phase is canceled.

1) Unlock the doors with the key or multi-remote controller.
2) Open the glass hatch with the key.

4. Activating The Alarm Operation of The Theft Warning System

NBEL0120S0104

Make sure the system is in the armed phase. (The security indicator lamp blinks every 2.6 seconds.)
When the following operation 1) or 2) is performed, the system sounds the horns and flashes the headlamps for about 2.5 minutes.

1) Engine hood, glass hatch or any door is opened before unlocking door with key or multi-remote controller.
2) Door is unlocked without using key or multi-remote controller.

POWER SUPPLY AND GROUND

NBEL0120S07

Power is supplied at all times

- through 7.5A fuse [No. 24, located in the fuse block (J/B)]
- to security indicator lamp terminal 1.

Power is supplied at all times

- through 40A fusible link (letter **f**, located in the fuse and fusible link box)
- to smart entrance control unit terminal 11.

With the ignition switch in the ON ro START position, power is supplied
- through 7.5A fuse [No. 11, located in the fuse block (J/B)]
- to smart entrance control unit terminal 33.

With the ignition switch in the ACC or ON position, power is supplied
- through 10A fuse [No. 10, located in the fuse block (J/B)]
- to smart entrance control unit terminal 21.

Ground is supplied
- to smart entrance control unit terminal 16
- through body grounds M77 and M111.

INITIAL CONDITION TO ACTIVATE THE SYSTEM

NBEL0120S02

The operation of the theft warning system is controlled by the doors, hood and glass hatch.
To activate the theft warning system, the smart entrance control unit must receive signals indicating the doors, hood and glass hatch are closed and the doors are locked.
When a door is open, smart entrance control unit terminal 28, 29 or 40 receives a ground signal from each door switch.
When a door is unlocked, smart entrance control unit terminal 26, 36 or 37 receives a ground signal from terminal 4 of each door unlock sensor or terminal 3 of back door unlock sensor.
When the hood is open, smart entrance control unit terminal 27 receives a ground signal
- from terminal 1 of the hood switch
- through body grounds E13 and E41.

When the glass hatch is open, smart entrance control unit terminal 38 receives a ground signal
- from terminal 1 of the glass hatch switch
- through body grounds D210, B11 and B22.

When the doors are locked with key or multi-remote controller and none of the described conditions exist, the theft warning system will automatically shift to armed mode.

THEFT WARNING SYSTEM ACTIVATION (WITH KEY OR REMOTE CONTROLLER USED TO LOCK DOORS)

NBEL0120S03

If the key is used to lock doors, terminal 41 receives a ground signal
- from terminal 3 of the key cylinder switch LH
- from terminal 1 of the door key cylinder switch RH
- through body grounds M77 and M111 or M4 and M66
- from terminal 1 of the back door key cylinder switch
- through body grounds B11, B22 and D210.

If this signal or lock signal from remote controller is received by the smart entrance control unit, the theft warning system will activate automatically.
Once the theft warning system has been activated, smart entrance control unit terminal 31 supplies ground to terminal 2 of the security indicator lamp.
The security lamp will illuminate for approximately 30 seconds and then blink.
Now the theft warning system is in armed phase.

THEFT WARNING SYSTEM ALARM OPERATION

NBEL0120S04

The theft warning system is triggered by
- opening a door
- opening the hood or the glass hatch
- unlocking door without using the key or multi-remote controller.

Once the theft warning system is in armed phase, if the smart entrance control unit receives a ground signal at terminal 26, 36, 37 (door unlock sensor), 28, 29, 40 (door switch), 38 (glass hatch switch) or 27 (hood switch), the theft warning system will be triggered. The headlamps flash and the horn sounds intermittently.
Power is supplied at all times
- through 7.5A fuse (No. 52, located in fuse and fusible link box)
- to theft warning lamp relay terminal 1 and
- to theft warning horn relay terminal 1.

When the theft warning system is triggered, ground is supplied intermittently
- from terminal 4 of the smart entrance control unit

- to theft warning lamp relay terminal 2 and
- to theft warning horn relay terminal 2.

The headlamps flash and the horn sounds intermittently.
The alarm automatically turns off after 2 or 3 minutes but will reactivate if the vehicle is tampered with again.

THEFT WARNING SYSTEM DEACTIVATION

NBEL0120S05

To deactivate the theft warning system, a door, the back door or the glass hatch must be unlocked with the key or remote controller.
When the key is used to unlock the door, smart entrance control unit terminal 30 receives a ground signal

- from terminal 1 of the LH key cylinder switch
- from terminal 3 of the RH key cylinder switch
- from terminal 2 of the back door key cylinder switch.

When the key is used to open the glass hatch, smart entrance control unit terminal 42 receives a ground signal from terminal 3 of the back door key cylinder switch.
When the smart entrance control unit receives either one of these signals or unlock signal from remote controller, the theft warning system is deactivated. (Disarmed phase)

PANIC ALARM OPERATION

NBEL0120S06

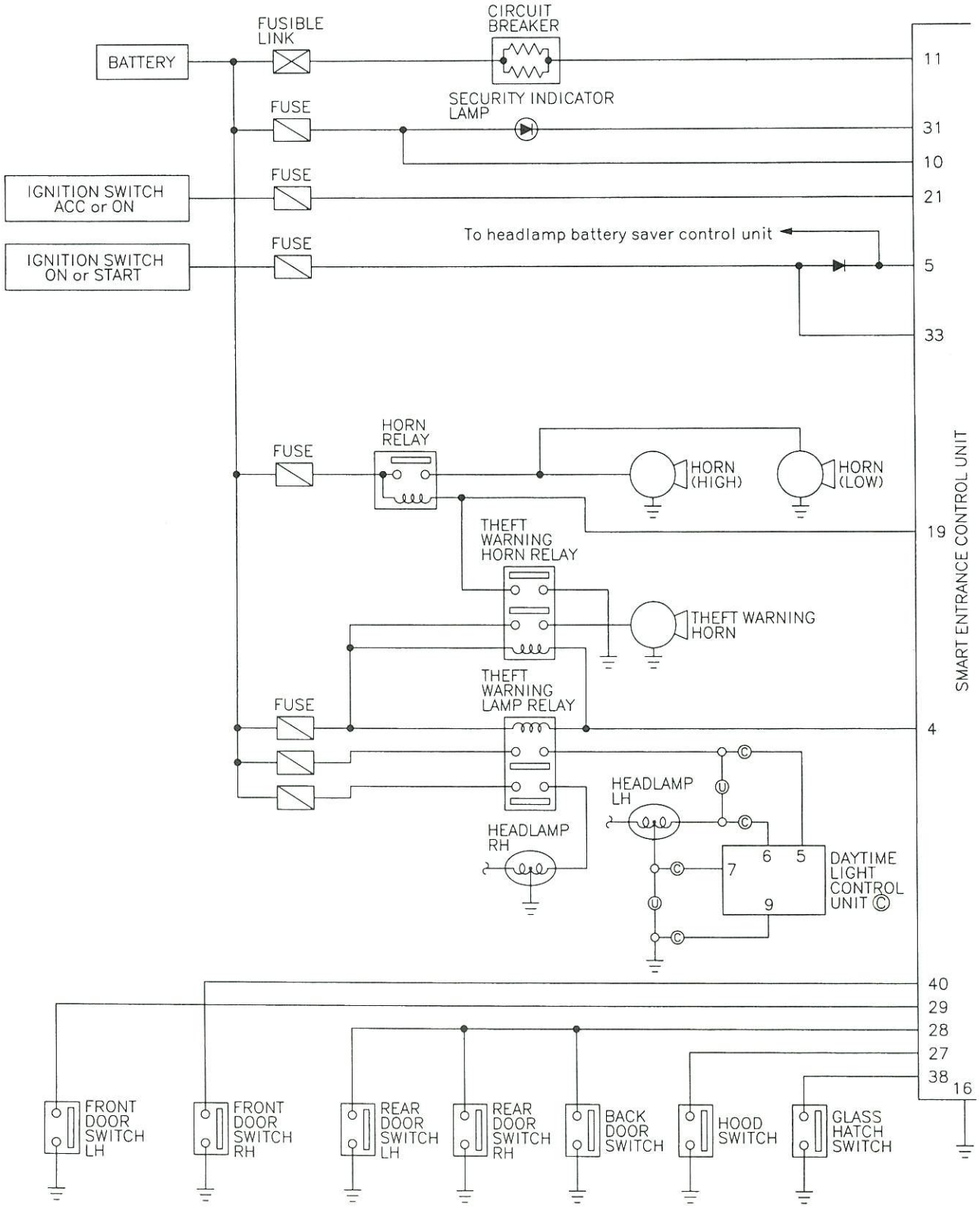
Multi-remote control system may or may not operate theft warning system (horn and headlamps) as required.
When the multi-remote control system is triggered, ground is supplied intermittently.

- from smart entrance control unit terminal 4
- to theft warning lamp relay terminal 2 and
- to theft warning horn relay terminal 2.

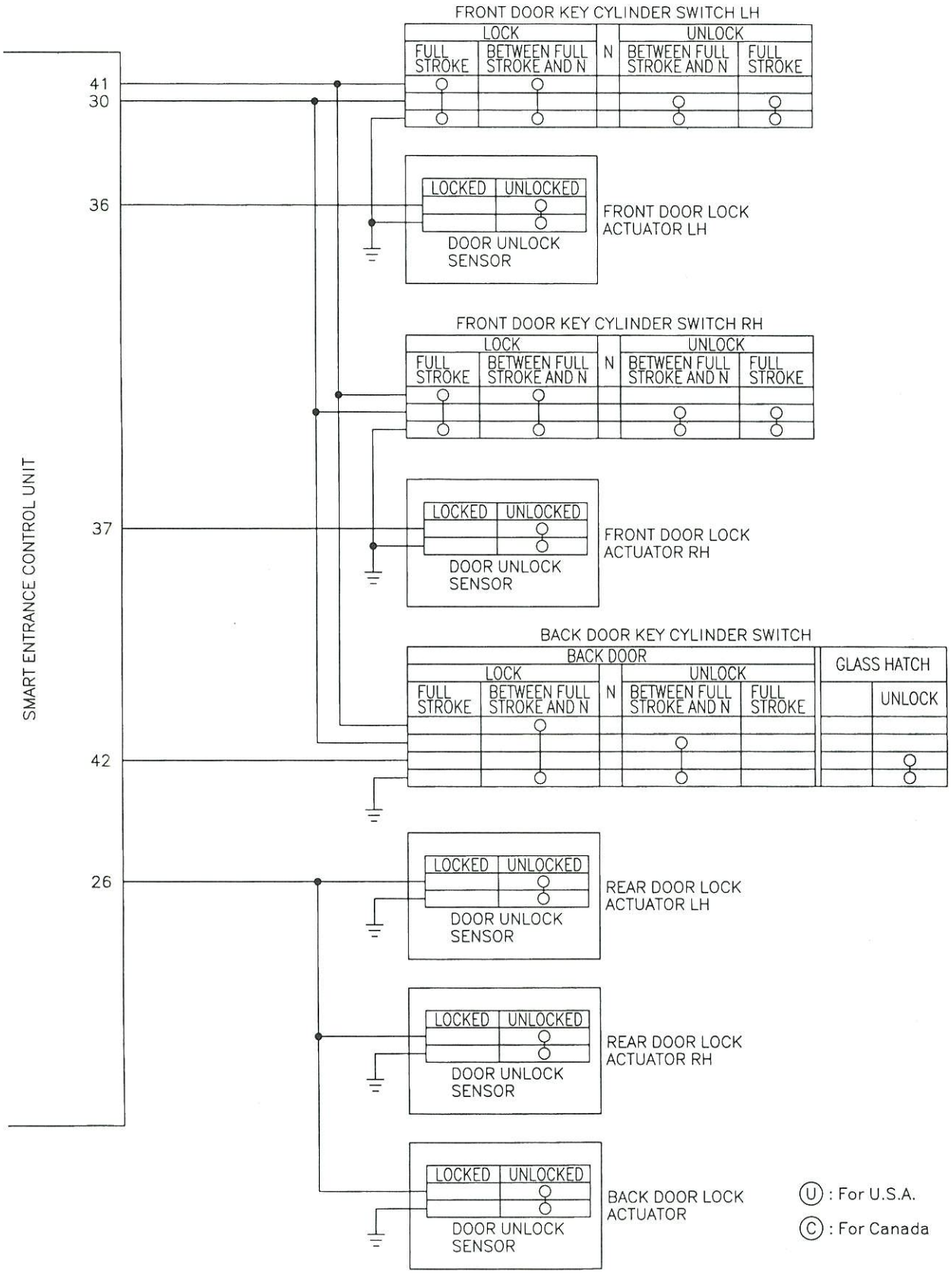
The headlamp flashes and the horn sounds intermittently.
The alarm automatically turns off after 30 seconds or when smart entrance control unit receives any signal from multi-remote controller.

Schematic

NBEL0121



MEL820J


FRONT DOOR KEY CYLINDER SWITCH LH
LOCK
FULL STROKE
BETWEEN FULL STROKE AND N
N
UNLOCK
BETWEEN FULL STROKE AND N
FULL STROKE
41
30
36
LOCKED
UNLOCKED
DOOR UNLOCK SENSOR
FRONT DOOR LOCK ACTUATOR LH
FRONT DOOR KEY CYLINDER SWITCH RH
37
FRONT DOOR LOCK ACTUATOR RH
BACK DOOR KEY CYLINDER SWITCH
BACK DOOR
GLASS HATCH
UNLOCK
42
26
REAR DOOR LOCK ACTUATOR LH
REAR DOOR LOCK ACTUATOR RH
BACK DOOR LOCK ACTUATOR
SMART ENTRANCE CONTROL UNIT
Ⓤ : For U.S.A.
Ⓒ : For Canada

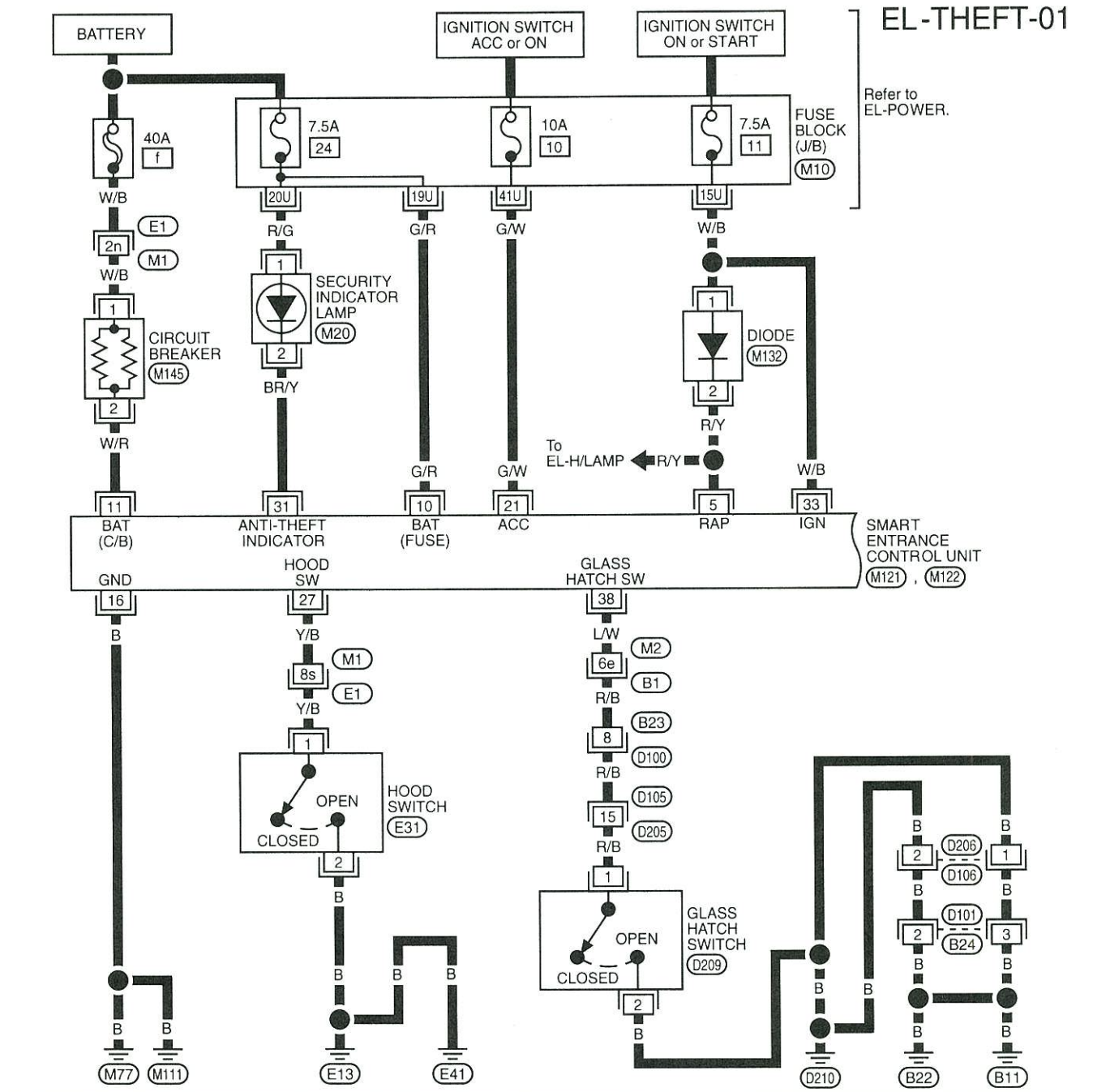
MEL821J

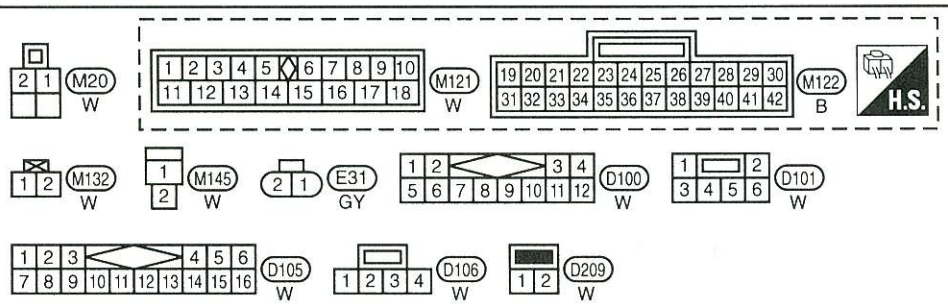
Wiring Diagram — THEFT —

NBEL0122

FIG. 1

NBEL0122S01





Refer to last page (Foldout page).

M1, E1

M2, B1

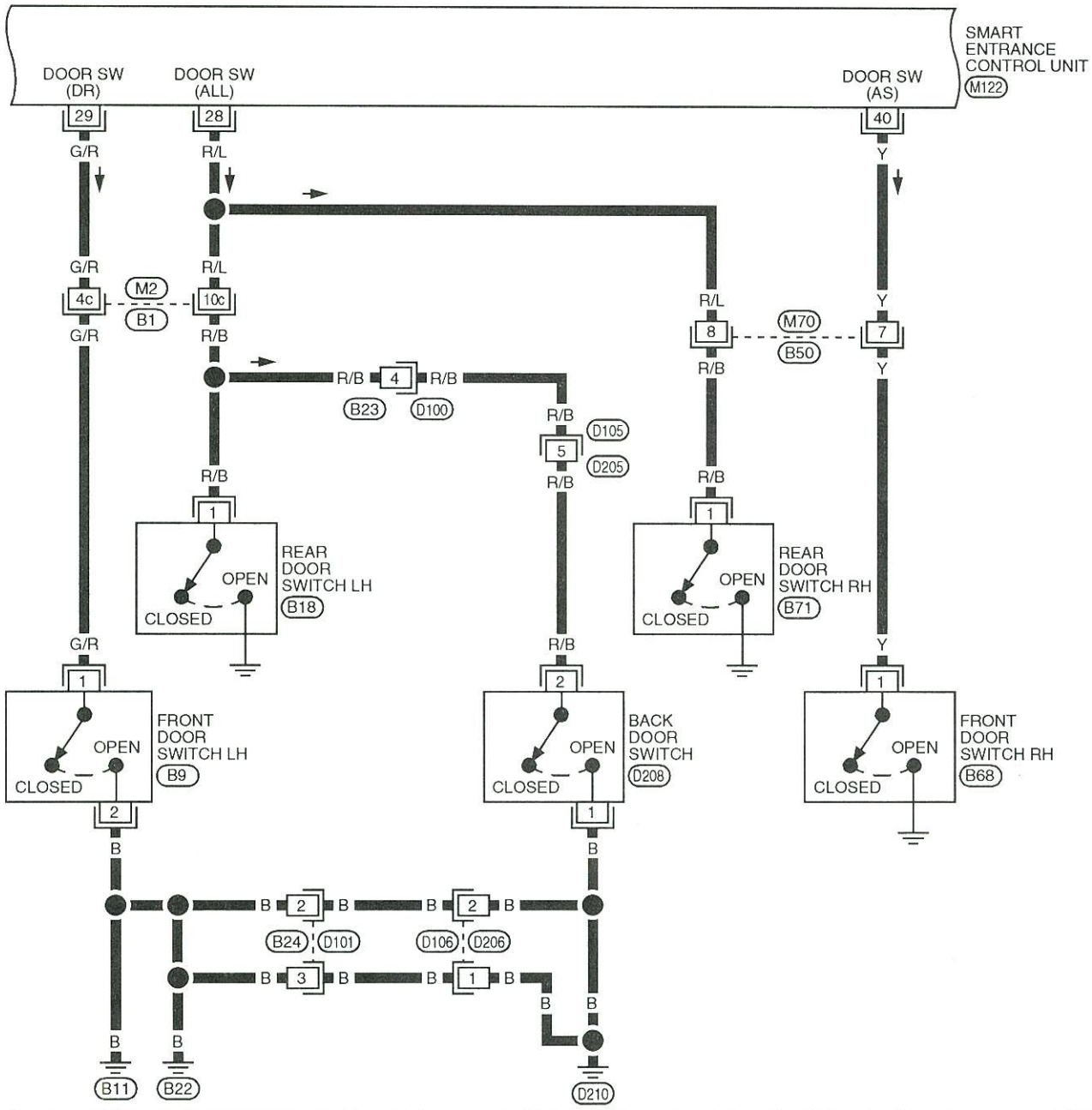
M10

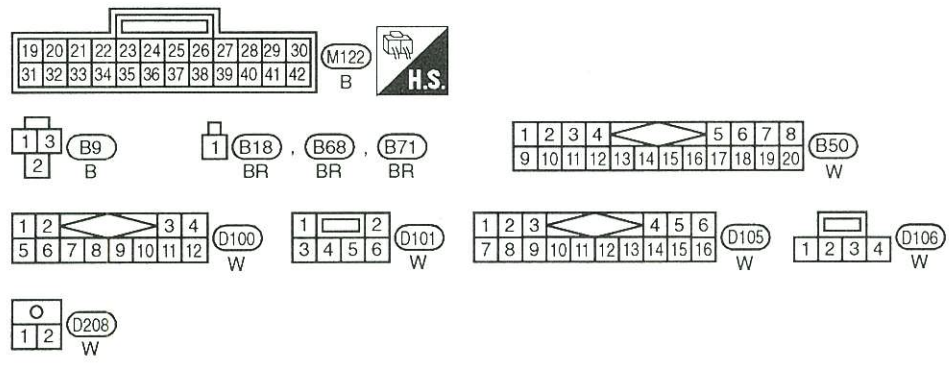
MEL822J

FIG. 2

NBEL0122S02

EL-THEFT-02





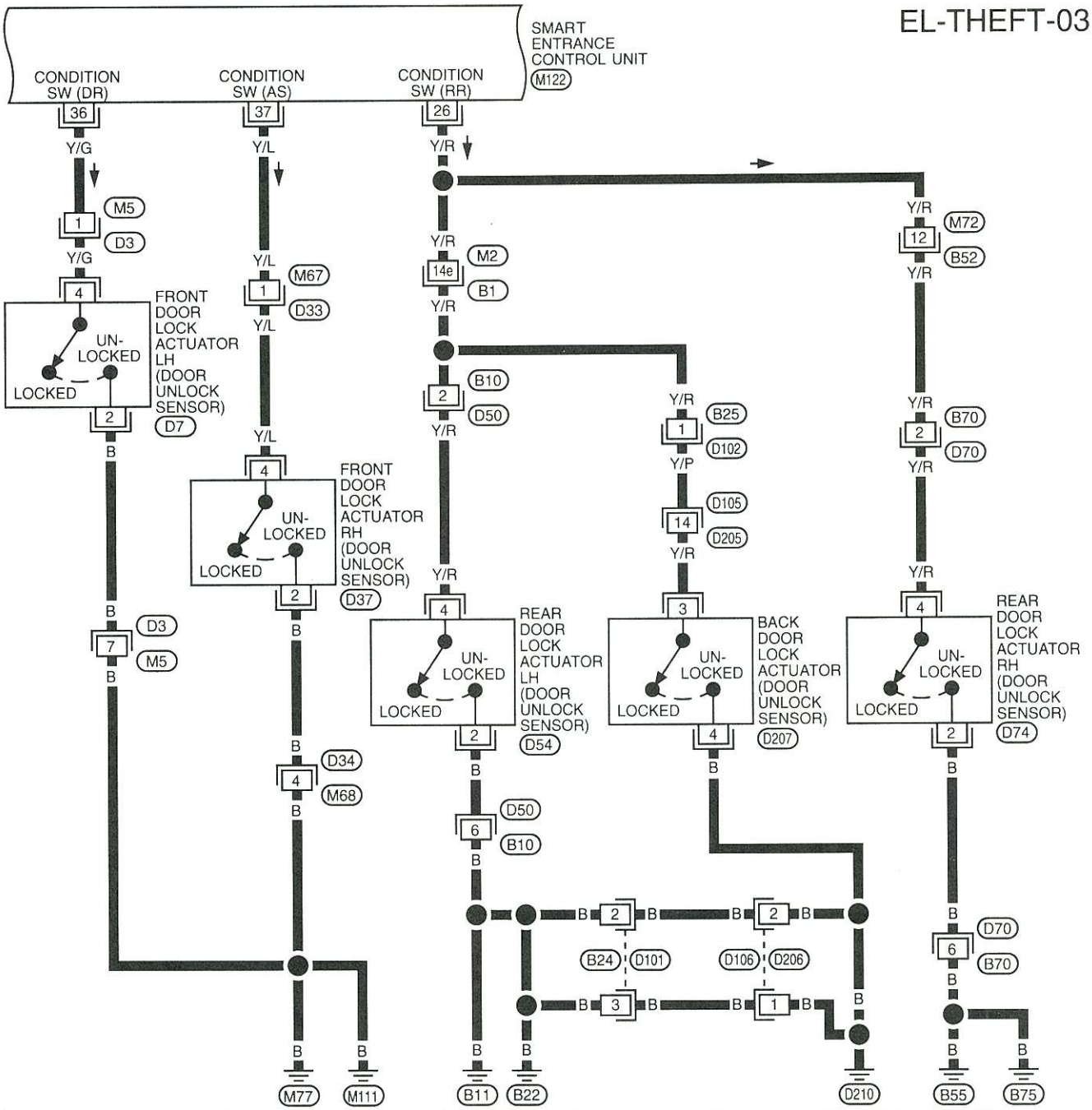
Refer to last page (Foldout page).
(M2), (B1)

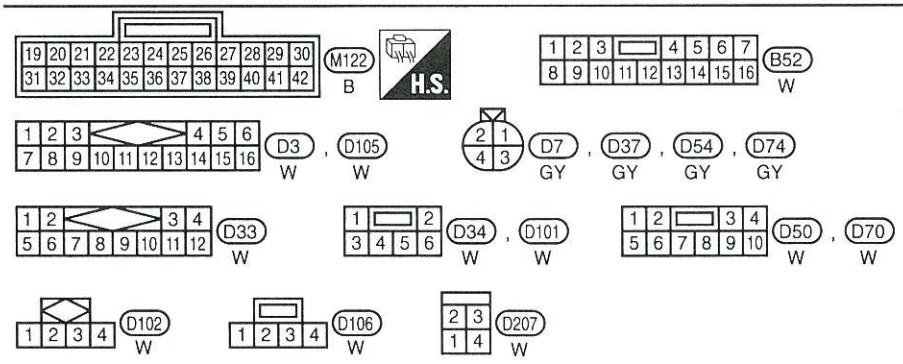
MEL823J

FIG. 3

NBEL0122S03

EL-THEFT-03





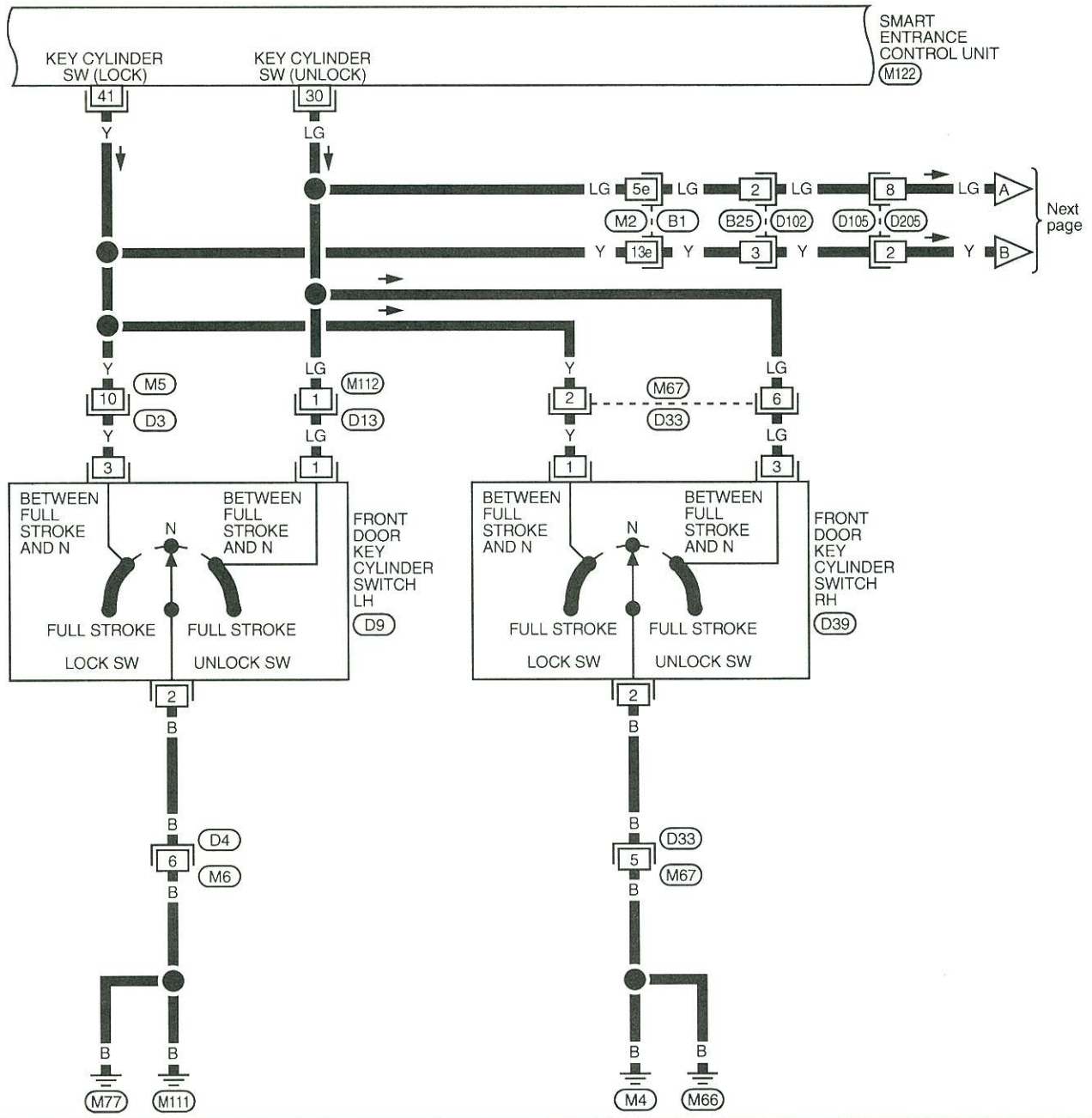
Refer to last page (Foldout page).
M2 , B1

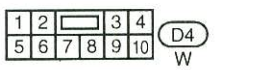
MEL824J

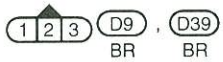
FIG. 4

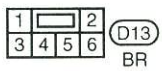
NBEL0122S04

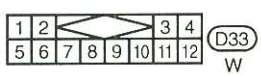
EL-THEFT-04









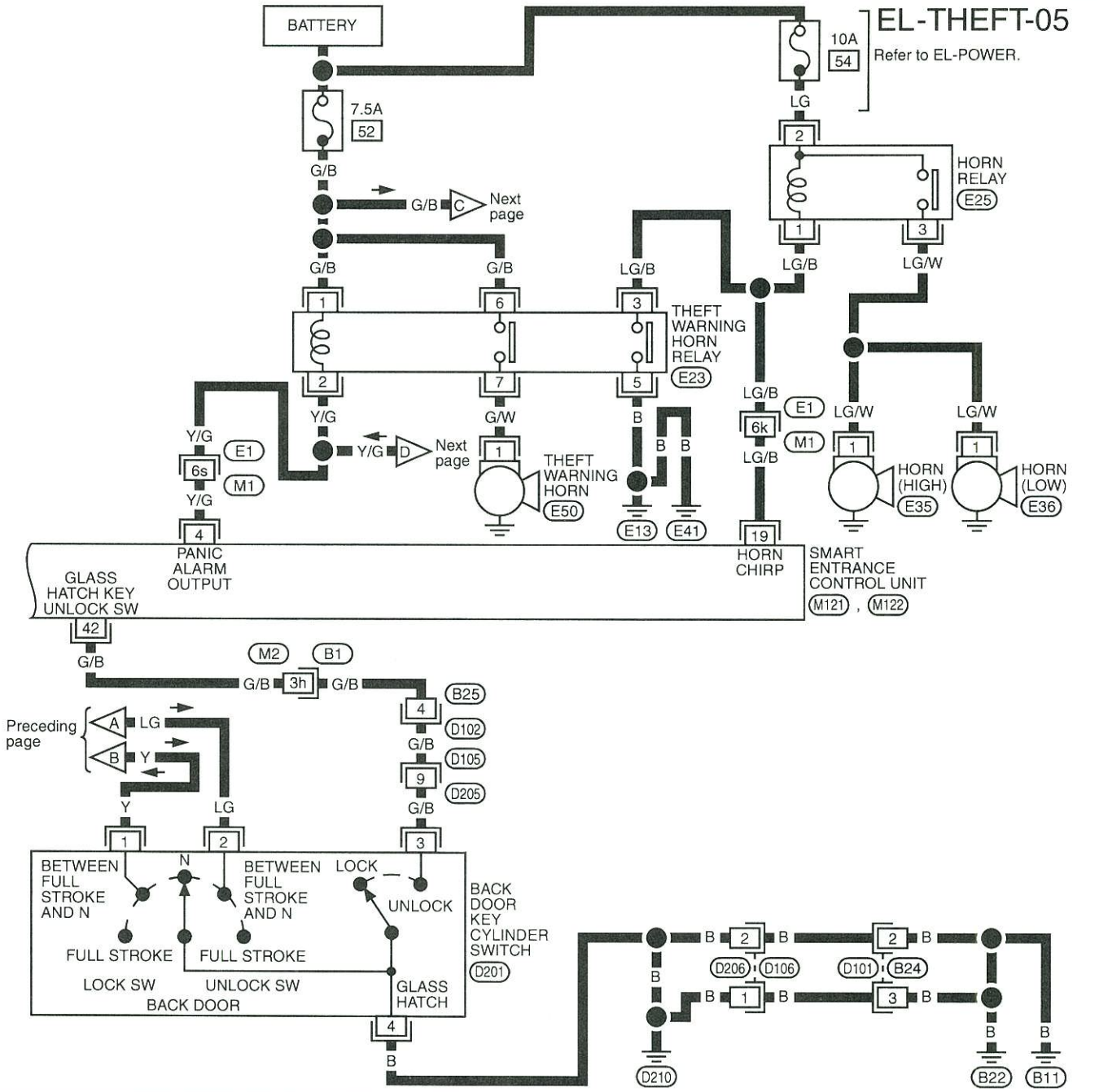


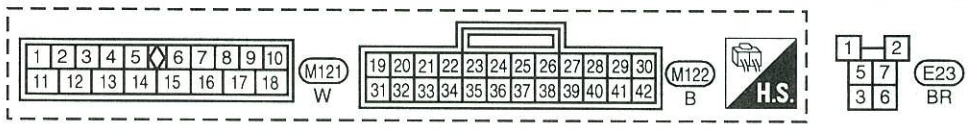
Refer to last page (Foldout page).
M2 , B1

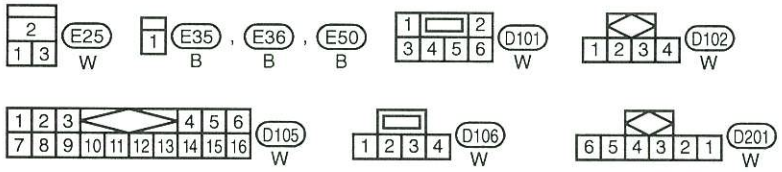
MEL825J

FIG. 5

NBEL0122S05







Refer to last page (Foldout page).

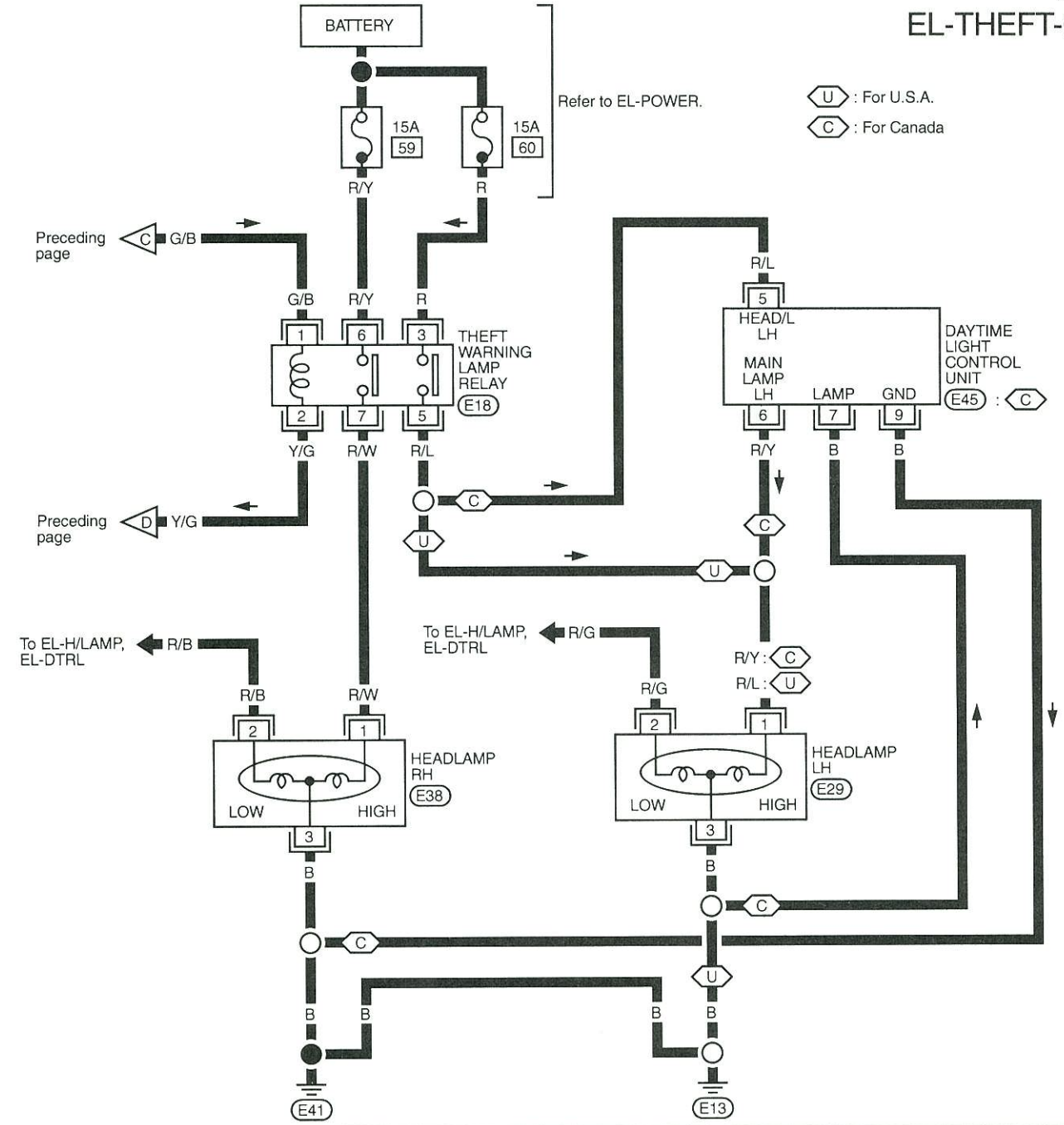
M1, E1

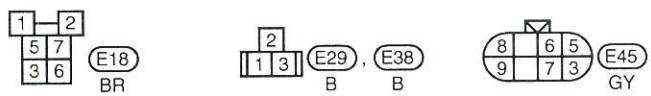
M2, B1

MEL826J

FIG. 6

NBEL0122S06





MEL827J

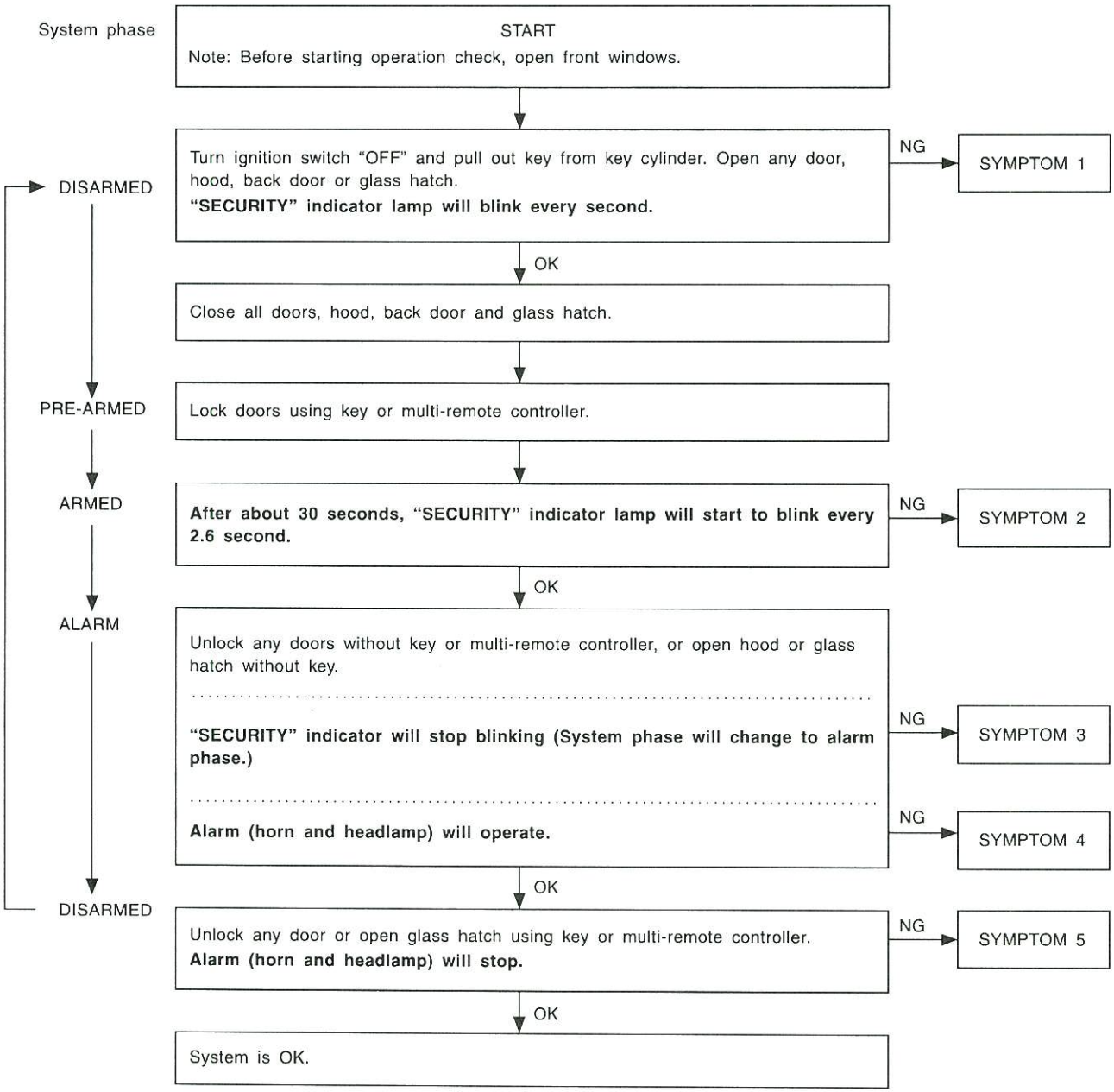
Trouble Diagnoses

NBEL0123

PRELIMINARY CHECK

NBEL0123S01

The system operation is canceled by turning ignition switch to "ACC" at any step between START and ARMED in the following flow chart.



MEL447HC

After performing preliminary check, go to symptom chart in next page.

SYMPTOM CHART

NBEL0123S02

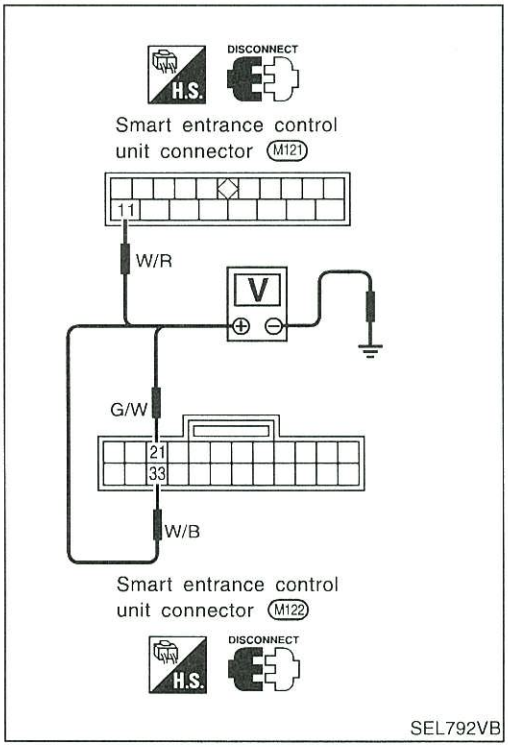
REFERENCE PAGE (EL-)			238	240	241	244	245	246	247	248	249	213
SYMPTOM			PRELIMINARY CHECK	POWER SUPPLY AND GROUND CIRCUIT CHECK	DOOR, HOOD AND GLASS HATCH SWITCH CHECK	SECURITY INDICATOR LAMP CHECK	DOOR UNLOCK SENSOR CHECK	DOOR KEY CYLINDER SWITCH CHECK	BACK DOOR KEY CYLINDER SWITCH CHECK	THEFT WARNING HORN ALARM CHECK	THEFT WARNING HEADLAMP ALARM CHECK	Check "MULTI-REMOTE CONTROL" system.
1	Theft warning indicator does not turn "ON" and is not blinking.		X	X	X	X						
2	Theft warning system cannot be set by	All items	X	X	X		X					
		Door outside key	X					X				
		Back door key	X						X			
		Multi-remote control	X									X
3	*1 Theft warning system does not alarm when ...	Any door is opened.	X		X							
		Any door is unlocked without using key or multi-remote controller	X				X					
4	Theft warning alarm does not activate.	All function	X		X		X					
		Horn alarm	X							X		
		Headlamp alarm	X								X	
5	Theft warning system cannot be canceled by	Door outside key	X					X				
		Back door key	X						X			
		Multi-remote control	X									X

X : Applicable

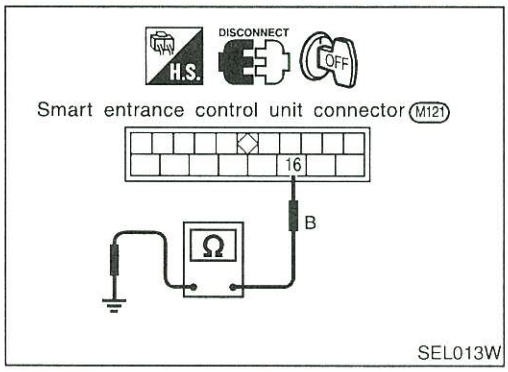
*1: Make sure the system is in the armed phase.

Before starting trouble diagnoses above, perform preliminary check, EL-238.

Symptom numbers in the symptom chart correspond with those of preliminary check.



SEL792VB



SEL013W

POWER SUPPLY AND GROUND CIRCUIT CHECK

NBEL0123S03

Power Supply Circuit Check

NBEL0123S0301

Terminals		Ignition switch position		
(+)	(−)	OFF	ACC	ON
11	Ground	Battery voltage	Battery voltage	Battery voltage
21	Ground	0V	Battery voltage	Battery voltage
33	Ground	0V	0V	Battery voltage

Ground Circuit Check

NBEL0123S0302

Terminals	Continuity
16 - Ground	Yes

DOOR, HOOD AND GLASS HATCH SWITCH CHECK

=NBEL0123S04

Door Switch Check

NBEL0123S0401

1	PRELIMINARY CHECK

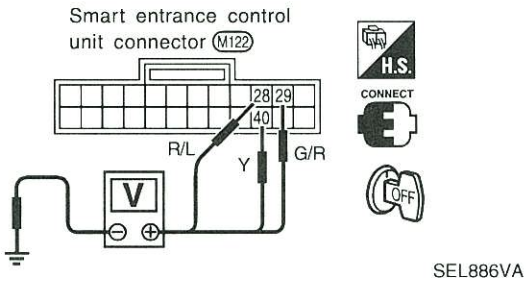
1. Turn ignition switch "OFF" and remove key from key cylinder.
2. Close all doors, hood and glass hatch.
   "SECURITY" indicator lamp should turn off.
3. Open any passenger door or back door.
   "SECURITY" indicator lamp should blink every second.

OK or NG

OK	▶	Door switch is OK.
NG	▶	GO TO 2.

2	CHECK DOOR SWITCH INPUT SIGNAL

Check voltage between control unit terminals 28, 29 or 40 and ground.



SEL886VA

	Terminals		Condition	Voltage [V]
	(+)	(−)		
Front LH door switch	29	ground	Open	0
			Closed	Approx. 5
Front RH door switch	40	ground	Open	0
			Closed	Approx. 5
Rear and back door switches	28	ground	Open	0
			Closed	Approx. 5

MTBL0273

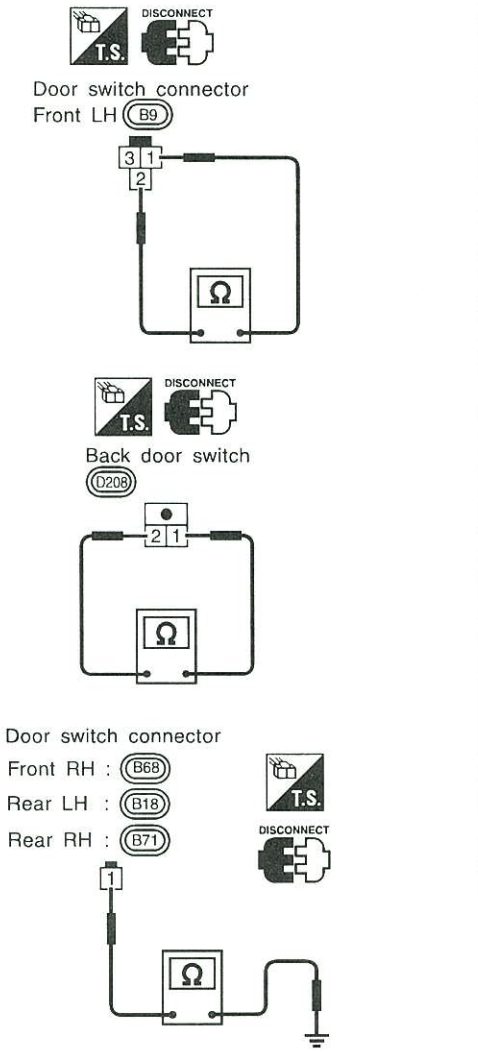
Refer to wiring diagram in EL-233.

OK or NG

OK	▶	Door switch is OK, and go to hood switch check.
NG	▶	GO TO 3.

3	CHECK DOOR SWITCH

1. Disconnect door switch connector.
2. Check continuity between door switch terminals.



SEL066W

	Terminals	Condition	Continuity
Front LH door switch	1 - 2	Closed	No
		Open	Yes
Back door switch	2 - 1	Closed	No
		Open	Yes
Front RH and rear door switches	1 - ground	Closed	No
		Open	Yes

MTBL0274

OK or NG

OK	▶	**Check the following.** • Door switch ground circuit (Front LH, back door) or door switch ground condition • Harness for open or short between control unit and door switch
NG	▶	Replace door switch.

Hood Switch Check

=NBEL0123S0402

1	PRELIMINARY CHECK

1. Turn ignition switch "OFF" and remove key from key cylinder.
2. Close all doors, hood and glass hatch.
   "SECURITY" indicator lamp should turn off.
3. Open hood.
   "SECURITY" indicator lamp should blink every second.

OK or NG

OK	▶	Hood switch is OK.
NG	▶	GO TO 2.

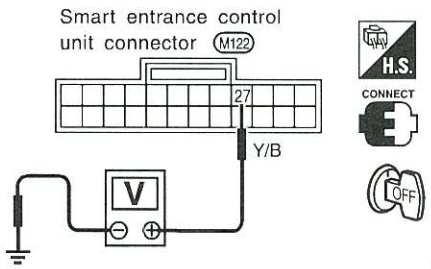
2	CHECK HOOD SWITCH FITTING CONDITION

OK or NG

OK	▶	GO TO 3.
NG	▶	Adjust installation of hood switch or hood.

3	CHECK HOOD SWITCH INPUT SIGNAL

Check voltage between control unit terminal 27 and ground.



SEL932VA

Voltage [V]:
Hood is open.
0
Hood is closed.
Approx. 5

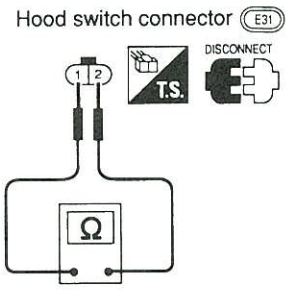
Refer to wiring diagram in EL-232.

OK or NG

OK	▶	Hood switch is OK, and go to glass hatch switch check.
NG	▶	GO TO 4.

4	CHECK HOOD SWITCH

1. Disconnect hood switch connector.
2. Check continuity between hood switch terminals 1 and 2.



SEL397TB

Continuity:
Condition: Pushed
No
Condition: Released
Yes

OK or NG

OK	▶	**Check the following.** • Hood switch ground circuit • Harness for open or short between control unit and hood switch
NG	▶	Replace hood switch.

Glass Hatch Switch Check

=NBEL0123S0403

1	PRELIMINARY CHECK

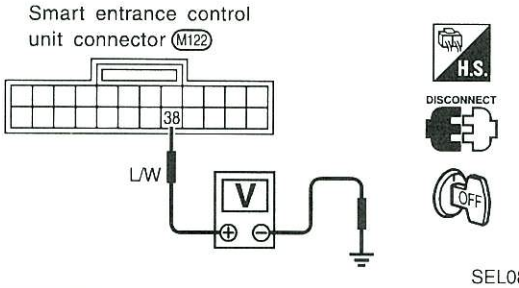
1. Turn ignition switch "OFF" and remove key from key cylinder.
2. Close all doors, hood and glass hatch.
   "SECURITY" indicator lamp should turn off.
3. Open glass hatch.
   "SECURITY" indicator lamp should blink every second.

OK or NG

OK	▶	Glass hatch switch is OK.
NG	▶	GO TO 2.

2	CHECK GLASS HATCH SWITCH INPUT SIGNAL

Check voltage between control unit terminal 38 and ground.



SEL081W

Voltage [V]:
Glass hatch is open.
Approx. 0
Glass hatch is closed.
Approx. 12

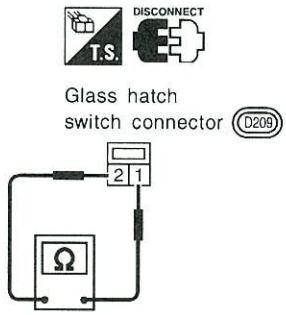
Refer to wiring diagram in EL-232.

OK or NG

OK	▶	Glass hatch switch is OK.
NG	▶	GO TO 3.

3	CHECK GLASS HATCH SWITCH

1. Disconnect glass hatch switch connector.
2. Check continuity between glass hatch switch terminals 1 and 2.



SEL609U

Continuity:
Condition: Closed
No
Condition: Open
Yes

OK or NG

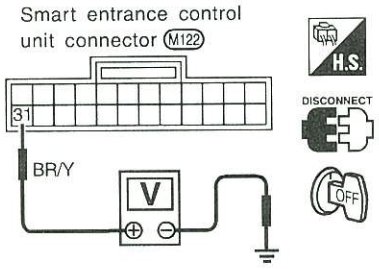
OK	▶	**Check the following.** • Glass hatch switch ground circuit • Harness for open or short between control unit and glass hatch switch
NG	▶	Replace glass hatch switch.

SECURITY INDICATOR LAMP CHECK

=NBEL0123S05

1	CHECK INDICATOR LAMP OUTPUT SIGNAL

1. Disconnect control unit connector.
2. Check voltage between control unit terminal 31 and ground.



SEL935VA

Refer to wiring diagram in EL-232.

Does battery voltage exist?

Yes	▶	Security indicator lamp is OK.
No	▶	GO TO 2.

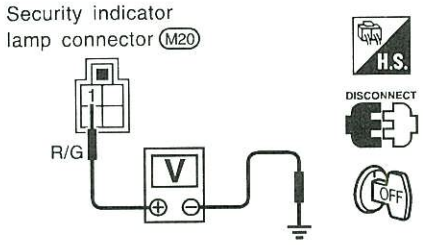
2	CHECK INDICATOR LAMP

OK or NG

OK	▶	GO TO 3.
NG	▶	Replace indicator lamp.

3	CHECK POWER SUPPLY CIRCUIT FOR INDICATOR LAMP

1. Disconnect security lamp connector.
2. Check voltage between indicator lamp terminal 1 and ground.



SEL082W

Does battery voltage exist?

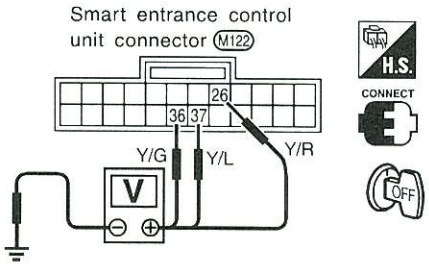
Yes	▶	Check harness for open or short between security indicator lamp and control unit.
No	▶	**Check the following.** • 7.5A fuse [No. 24, located in fuse block (J/B)] • Harness for open or short between security indicator lamp and fuse

DOOR UNLOCK SENSOR CHECK

=NBEL0123S06

1 CHECK DOOR UNLOCK SENSOR INPUT SIGNAL

Check voltage between control unit terminals 26, 36 or 37 and ground.



SEL937VA

	Terminals		Condition	Voltage [V]
	(+)	(−)		
Front LH door	36	Ground	Locked	Approx. 5
			Unlocked	0
Front RH door	37	Ground	Locked	Approx. 5
			Unlocked	0
Rear and back door	26	Ground	Locked	Approx. 5
			Unlocked	0

MTBL0276

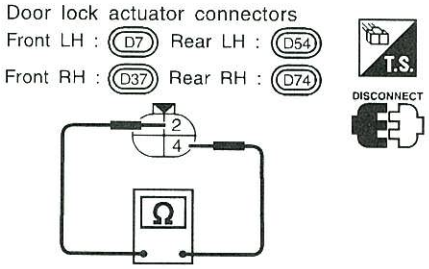
Refer to wiring diagram in EL-234.

OK or NG

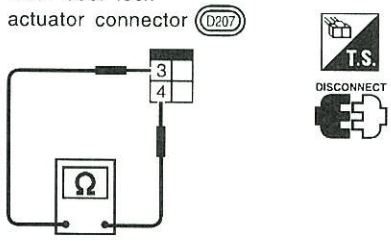
OK	▶	Door unlock sensor is OK.
NG	▶	GO TO 2.

2 CHECK DOOR UNLOCK SENSOR

1. Disconnect door unlock sensor connector.
2. Check continuity between door unlock sensor terminals.



SEL247V



SEL352V

Continuity:
Condition: Locked
No
Condition: Unlocked
Yes

OK or NG

OK	▶	**Check the following.** • Door unlock sensor ground circuit • Harness for open or short between control unit and door unlock sensor
NG	▶	Replace door unlock sensor.

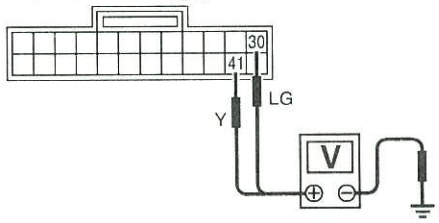
FRONT DOOR KEY CYLINDER SWITCH CHECK

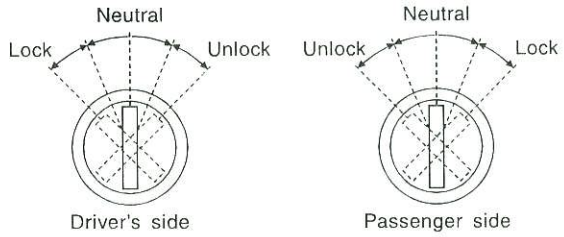
=NBEL0123S07

1 CHECK DOOR KEY CYLINDER SWITCH INPUT SIGNAL (LOCK/UNLOCK SIGNAL)

Check voltage between control unit terminals 30 or 41 and ground.

Smart entrance control unit connector (M122)





SEL069W

Terminals (+)	Terminals (−)	Key position	Voltage [V]
41	Ground	Neutral/Unlock	Approx. 5
		Lock	0
30	Ground	Neutral/Lock	Approx. 5
		Unlock	0

MTBL0268

Refer to wiring diagram in EL-235.

OK or NG

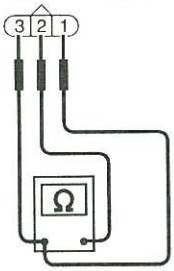
OK	▶	Door key cylinder switch is OK.
NG	▶	GO TO 2.

2 CHECK DOOR KEY CYLINDER SWITCH

1. Disconnect door key cylinder switch connector.
2. Check continuity between door key cylinder switch terminals.

Door key cylinder switch connector

LH : (D9) RH : (D39)



① : Door unlock switch terminal (LH)
Door lock switch terminal (RH)

② : Ground terminal

③ : Door lock switch terminal (LH)
Door unlock switch terminal (RH)

SEL070W

Terminals	Key position	Continuity
LH: 3 - 2	Neutral/Unlock	No
RH: 1 - 2	Lock	Yes
LH: 1 - 2	Neutral/Lock	No
RH: 3 - 2	Unlock	Yes

MTBL0269

OK or NG

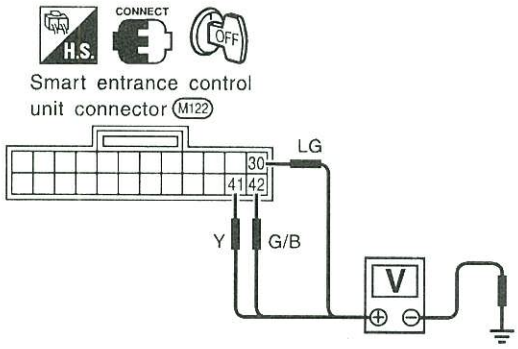
OK	▶	**Check the following.** • Door key cylinder switch ground circuit • Harness for open or short between control unit and door key cylinder switch
NG	▶	Replace door key cylinder switch.

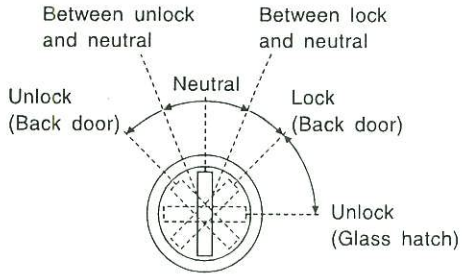
BACK DOOR KEY CYLINDER SWITCH CHECK

=NBEL0123S08

1 CHECK BACK DOOR KEY CYLINDER SWITCH INPUT SIGNAL (LOCK/UNLOCK SIGNAL)

Check voltage between control unit terminals 30, 41 or 42 and ground.





SEL083W

	Terminals (+)	Terminals (−)	Key position	Voltage [V]
Back door	41	Ground	Between neutral and lock	0
			Other positions	Approx. 5
	30	Ground	Between neutral and unlock	0
			Other positions	Approx. 5
Glass hatch	42	Ground	Unlock (Glass hatch)	0
			Other positions	Approx. 5

MTBL0277

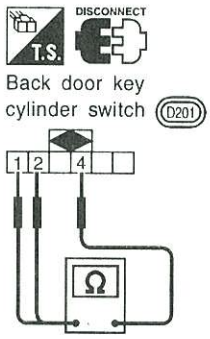
Refer to wiring diagram in EL-235.

OK or NG

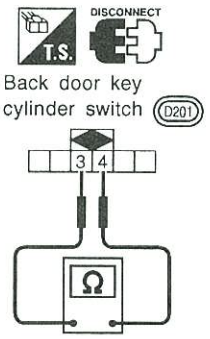
OK	▶	Back door key cylinder switch is OK.
NG	▶	GO TO 2.

2 CHECK BACK DOOR KEY CYLINDER SWITCH

1. Disconnect back door key cylinder switch connector.
2. Check continuity between back door key cylinder switch terminals.



SEL616U



SEL613U

Key position	Terminals 1	2	3	4
Between neutral and lock (Back door)	○			○
Between neutral and unlock (Back door)		○		○
Between lock (Back door) and unlock (glass hatch)			○	○

MTBL0043

OK or NG

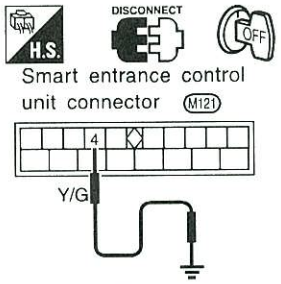
OK	▶	**Check the following.** • Back door key cylinder switch ground circuit • Harness for open or short between control unit and back door key cylinder switch
NG	▶	Replace back door key cylinder switch.

THEFT WARNING HORN ALARM CHECK

=NBEL0123S09

1 CHECK THEFT WARNING HORN ALARM OPERATION

1. Disconnect control unit connector.
2. Apply ground to control unit terminal 4.



SEL943VA

Refer to wiring diagram in EL-236.

Does horn alarm activate?

Yes	▶	Horn alarm is OK.
No	▶	GO TO 2.

2 CHECK THEFT WARNING HORN RELAY

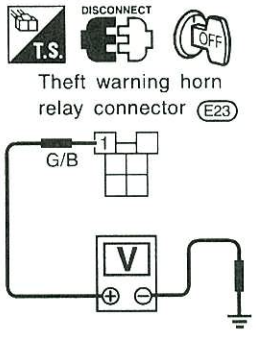
Check theft warning horn relay.

OK or NG

OK	▶	GO TO 3.
NG	▶	Replace theft warning horn relay.

3 CHECK POWER SUPPLY FOR THEFT WARNING HORN RELAY

1. Disconnect theft warning horn relay connector.
2. Check voltage between terminal 1 and ground.



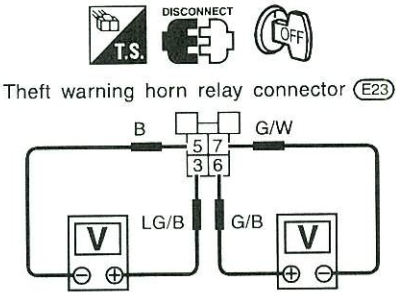
SEL755UB

Does battery voltage exist?

Yes	▶	GO TO 4.
No	▶	**Check the following.** • 7.5A fuse (No. 52, located in the fuse and fusible link box) • Harness for open or short between theft warning horn relay and fuse

4 CHECK THEFT WARNING HORN RELAY CIRCUIT

1. Disconnect theft warning horn relay connector.
2. Check voltage between terminals 3 and 5.
3. Check voltage between terminals 6 and 7.



SEL756UD

Battery voltage should exist.

OK or NG

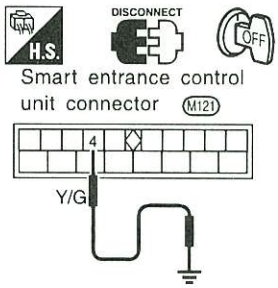
OK	▶	Check harness for open or short between theft warning horn relay and control unit.
NG	▶	Check harness for open or short.

THEFT WARNING HEADLAMP ALARM CHECK

=NBEL0123S10

1 CHECK THEFT WARNING HEADLAMP ALARM OPERATION

1. Disconnect control unit connector.
2. Apply ground to control unit terminal 4.



SEL943VA

Refer to wiring diagram in EL-236.

Does headlamp alarm activate?

Yes	▶	Headlamp alarm is OK.
No	▶	GO TO 2.

2 CHECK HEADLAMP OPERATION

Does headlamp come on when turning lighting switch "ON"?

Yes	▶	GO TO 3.
No	▶	Check headlamp system. Refer to "HEADLAMP".

3 CHECK THEFT WARNING LAMP RELAY

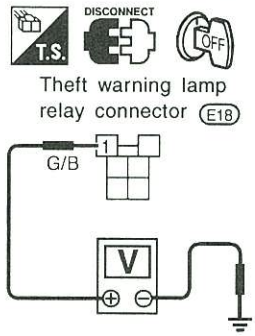
Check theft warning lamp relay.

OK or NG

OK	▶	GO TO 4.
NG	▶	Replace theft warning lamp relay.

4 CHECK POWER SUPPLY FOR THEFT WARNING LAMP RELAY

1. Disconnect theft warning lamp relay connector.
2. Check voltage between terminal 1 and ground.



SEL757U

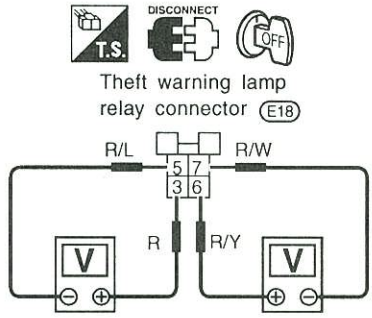
Refer to wiring diagram in EL-237.

Does battery voltage exist?

Yes	▶	GO TO 5.
No	▶	**Check the following.** • 7.5A fuse (No. 52, located in the fuse and fusible link box) • Harness for open or short between theft warning lamp relay and fuse

5 CHECK THEFT WARNING LAMP RELAY CIRCUIT

1. Disconnect theft warning lamp relay connector.
2. Check voltage between terminals 3 and 5.
3. Check voltage between terminals 6 and 7.



SEL758U

Battery voltage should exist.

OK or NG

OK	▶	Check harness for open or short between theft warning lamp relay and control unit.
NG	▶	**Check the following.** • Harness for open or short between fuse and theft warning lamp relay • Harness for open or short between theft warning lamp relay and headlamps

Description

NBEL0124

The following systems are controlled by the smart entrance control unit.

- Warning chime
- Rear window defogger and door mirror defogger timer
- Power door lock
- Multi-remote control system
- Theft warning system
- Interior lamp timer
- Electric sunroof and power window timer
- Headlamp battery saver
- Battery saver

For detailed description and wiring diagrams, refer to the relevant pages for the each system.
The control unit receives data from the switches and sensors to control their corresponding system relays and actuators.

INPUT/OUTPUT

NBEL0124S01

System	Input	Output
Power door lock	Door lock and unlock switch LH and RH Key switch (Insert) Door switches Door key cylinder switches	Door lock actuator
Multi-remote control	Key switch (Insert) Ignition switch (ACC) Door switches Front door unlock sensor LH Remote controller signal	Horn relays Theft warning lamp relay Theft warning lamp relay Interior lamp Multi-remote control relay Door lock actuator
Warning chime	Key switch (Insert) Ignition switch (ON) Lighting switch (1st) Seat belt switch Front door switch LH	Warning chime (located in smart entrance control unit)
Rear window defogger and door mirror defogger timer	Ignition switch (ON) Rear window defogger switch	Rear window defogger relay
Theft warning	Ignition switch (ACC, ON) Door switches Hood switch Door key cylinder switches (lock/unlock) Trunk lid key cylinder switch (unlock) Door unlock sensores	Horn relays Theft warning lamp relay Theft warning relay Security indicator
Interior lamp timer	Door switches Front door unlock sensor LH Ignition switch (ON) Key switch (Insert)	Interior lamp
Electric sunroof and power window timer	Front door switches ignition switch (ON)	Power window relay
Headlamp battery saver timer	Front door switches ignition switch (ON)	Headlamp battery saver control unit
Battery saver	Ignition switch (ON) Door switches	Interior lamp Luggage room lamp Spot lamp Vanity mirror illumination lamp

BATTERY SAVER

NBEL0124S02

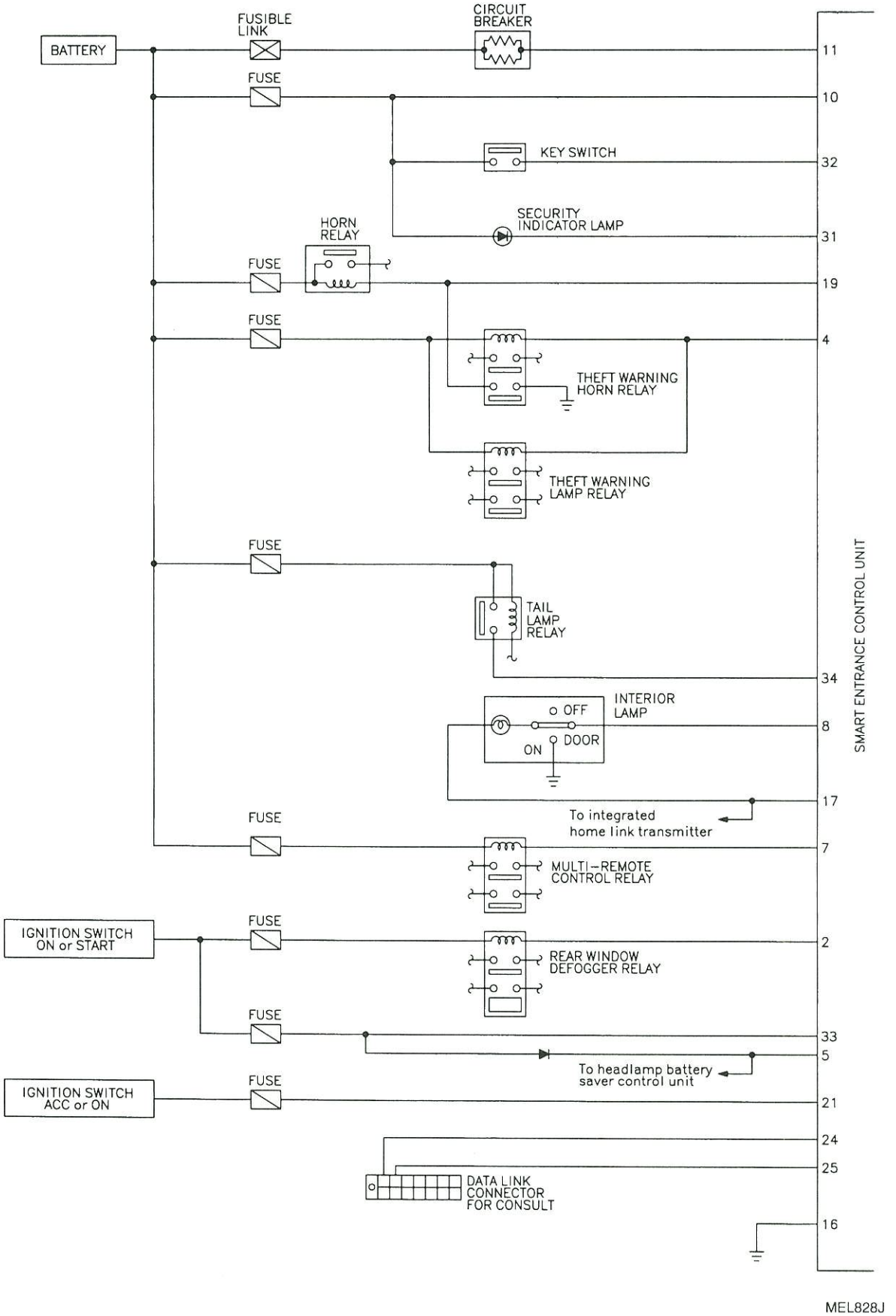
The lamp turns off automatically when the interior lamp, luggage room lamp, spot lamp or/and vanity mirror illumination is illuminated with the ignition key in the OFF position, if the lamp remains lit by the door switch open signal or if the lamp switch is in the ON position for more than 10 minutes.

After lamps turn off by the battery saver system, the lamps illuminate again when:

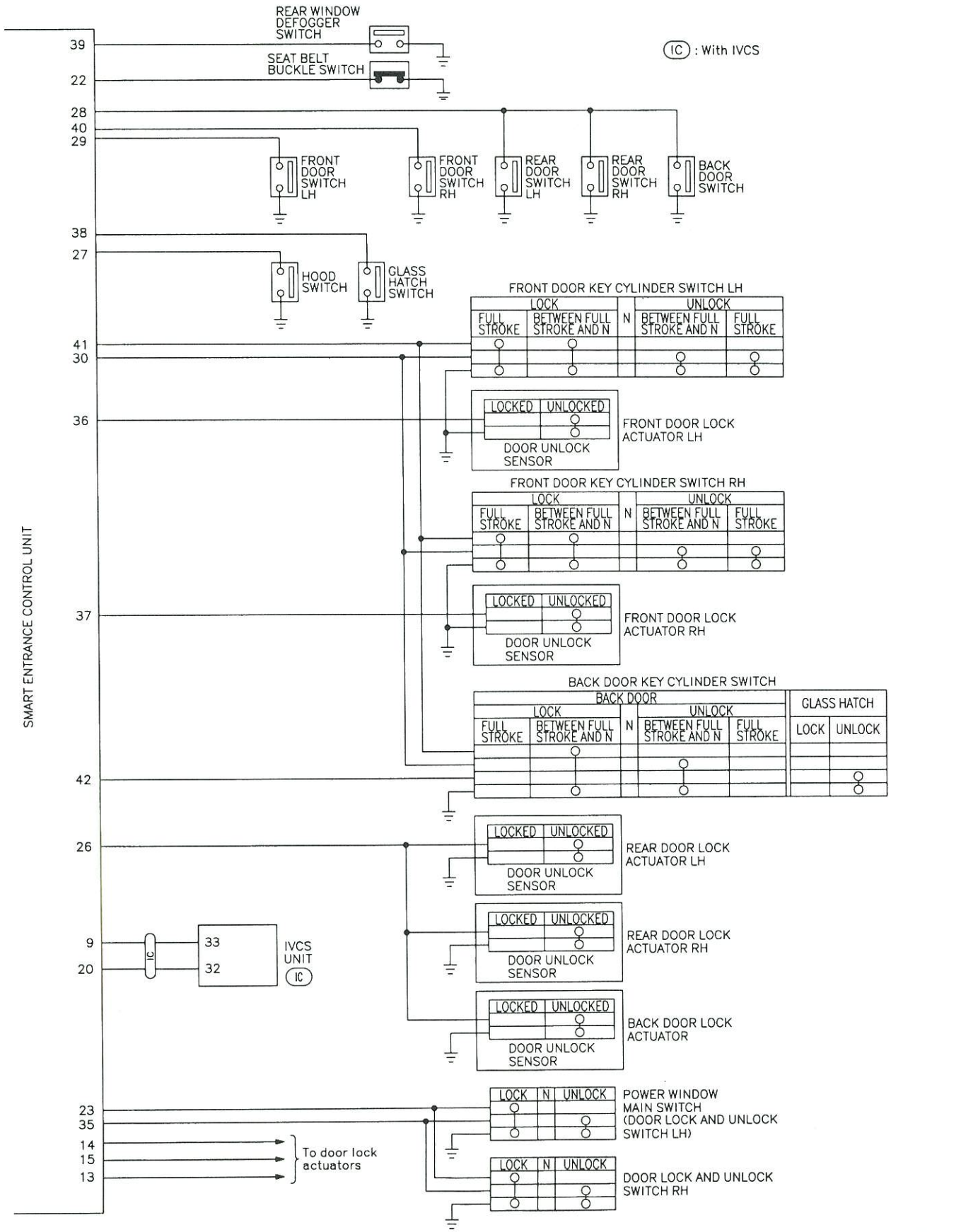
- driver's door is locked or unlocked,
- door is opened or closed,
- key is inserted in ignition key cylinder.

Schematic

NBEL0125



MEL828J


SMART ENTRANCE CONTROL UNIT
REAR WINDOW DEFOGGER SWITCH
SEAT BELT BUCKLE SWITCH
IC : With IVCS
FRONT DOOR SWITCH LH
FRONT DOOR SWITCH RH
REAR DOOR SWITCH LH
REAR DOOR SWITCH RH
BACK DOOR SWITCH
HOOD SWITCH
GLASS HATCH SWITCH
FRONT DOOR KEY CYLINDER SWITCH LH
FRONT DOOR KEY CYLINDER SWITCH RH
LOCK
UNLOCK
FULL STROKE
BETWEEN FULL STROKE AND N
N
LOCKED
UNLOCKED
DOOR UNLOCK SENSOR
FRONT DOOR LOCK ACTUATOR LH
FRONT DOOR LOCK ACTUATOR RH
BACK DOOR KEY CYLINDER SWITCH
BACK DOOR
GLASS HATCH
REAR DOOR LOCK ACTUATOR LH
REAR DOOR LOCK ACTUATOR RH
BACK DOOR LOCK ACTUATOR
IVCS UNIT
POWER WINDOW MAIN SWITCH (DOOR LOCK AND UNLOCK SWITCH LH)
DOOR LOCK AND UNLOCK SWITCH RH
To door lock actuators
39
22
28
40
29
38
27
41
30
36
37
42
26
9
20
33
32
23
35
14
15
13

MEL829J

Smart Entrance Control Unit Inspection Table

Smart Entrance Control Unit Inspection Table

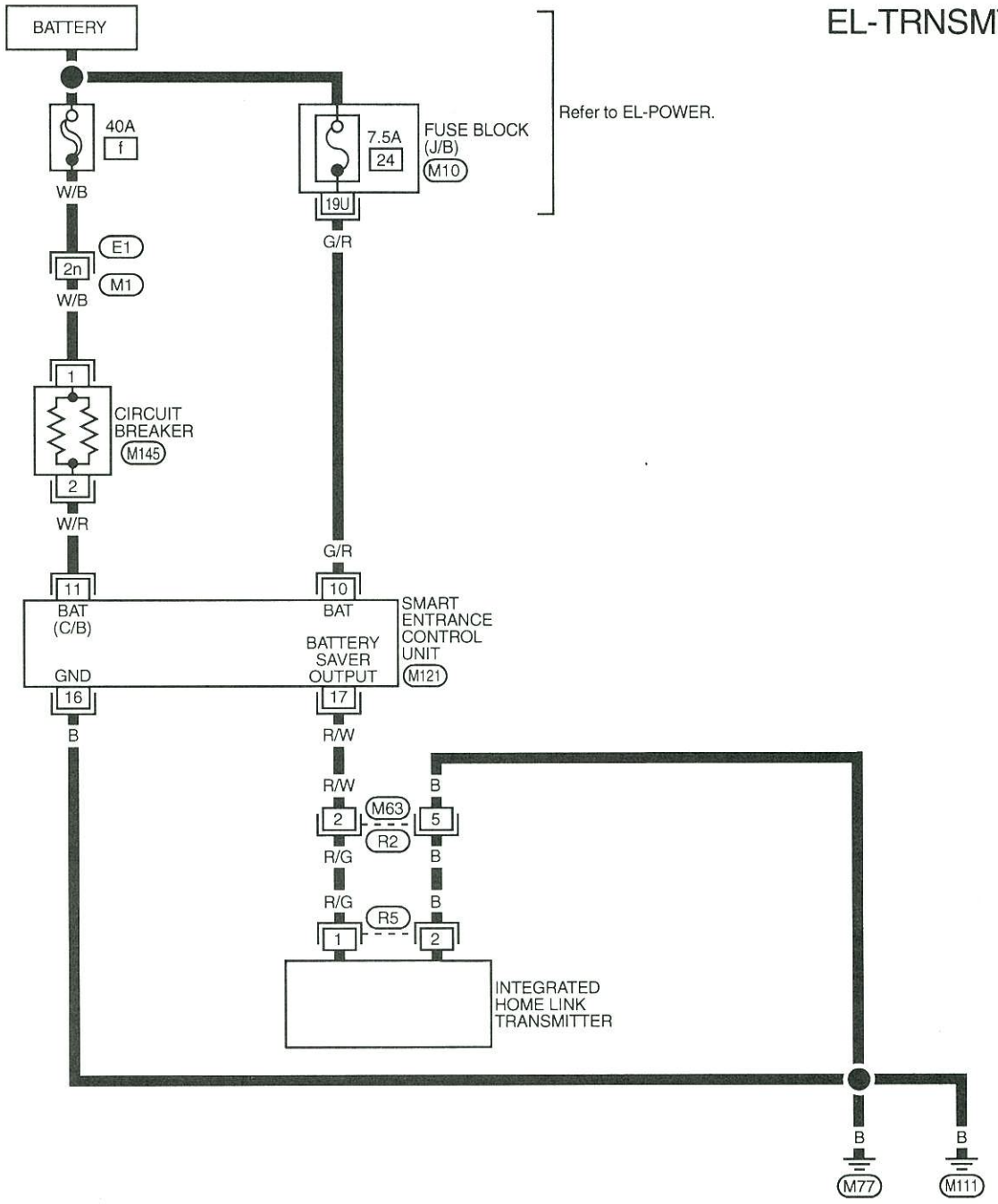
NBEL0126

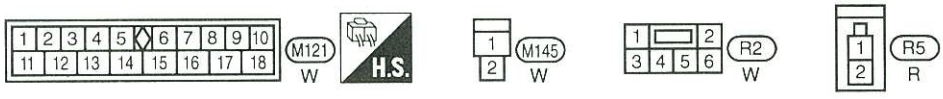
Terminal No.	Wire color	Connections	Operated condition		Voltage (Approximate values)
2	G/B	Rear window defogger relay	OFF → ON (Ignition key is in "ON" position)		0V → 12V
4	Y/G	Theft warning horn/lamp relay	When panic alarm is operated using remote controller		12V → 0V
5	R/Y	Headlamp battery saver control unit	When headlamp battery saver timer is operated		12V
7	P	Multi-remote control relay	When doors are locked using remote controller		12V → 0V
8	R/B	Interior lamp	When interior lamp is operated using remote controller. (Lamp switch in "DOOR" position)		0V → 12V
10	G/R	Power source (Fuse)	—		12V
11	W/R	Power source (C/B)	—		12V
13	W/PU	Driver door lock actuator	Door lock & unlock switch	Free	0V
14	Y/B	Passenger door lock actuator		Unlocked	12V
15	L	Door lock actuators	Door lock & unlock switch	Free	0V
				Locked	12V
16	B	Ground	—		—
17	R/W	Battery saver (Interior lamp)	Battery saver is not operate → Operate		12V → 0V
19	LG/B	Horn relay	When doors are locked using remote controller with horn chirp mode.		12V → 0V
21	G/W	Ignition switch (ACC)	"ACC" position		12V
22	B/P	Seat belt buckle switch	Unfasten → Fasten (Ignition key is in "ON" position)		0V → 12V
23	B/R	Door lock & unlock switches	Neutral → Locks		5V → 0V
26	Y/R	Rear door unlock sensors	All doors are locked → One or more doors are unlocked		5V → 0V
27	Y/B	Hood open signal	ON (Open) → OFF (Closed)		0V → 5V
28	R/L	Rear and back door switches	OFF (Closed) → ON (Open)		5V → 0V
29	G/R	Driver door switch	OFF (Closed) → ON (Open)		5V → 0V
30	LG	Door key cylinder unlock switch	OFF (Neutral) → ON (Unlocked)		12V → 0V
31	BR/Y	Theft warning indicator	Goes off → Illuminates		12V → 0V
32	W/R	Ignition key switch (Insert)	key inserted → key removed from IGN key cylinder		12V → 0V
33	W/B	Ignition switch (ON)	Ignition key is in "ON" position		12V
34	P/L	Tail lamp relay	1ST, 2ND positions: ON → OFF		12V → 0V
35	LG/R	Door lock & unlock switches	Neutral → Unlocks		5V → 0V
36	Y/G	Driver door unlock sensor	Driver door: Locked → Unlocked		5V → 0V
37	Y/L	Passenger door unlock sensor	Passenger door: Locked → Unlocked		5V → 0V
38	L/W	Glass hatch switch	ON (Open) → OFF (Closed)		0V → 12V
39	OR	Rear window defogger switch	OFF → ON		5V → 0V
40	Y	Passenger door switch	OFF (Closed) → ON (Open)		5V → 0V
41	Y	Door key cylinder lock switch	OFF (Neutral) → ON (Locked)		5V → 0V
42	G/B	Back door key unlock switch	OFF (Neutral) → ON (Unlock)		5V → 0V

Wiring Diagram — TRNSMT —

NBEL0127

EL-TRNSMT-01





Refer to last page (Foldout page).
M1 , E1
M10

MEL836J

Trouble Diagnoses

NBEL0128

DIAGNOSTIC PROCEDURE

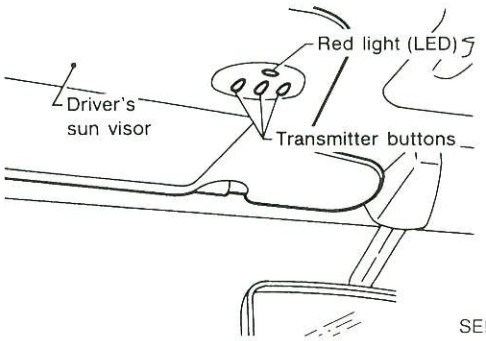
NBEL0128S01

SYMPTOM: Transmitter does not activate receiver.

Before conducting the procedure given below, make sure that system receiver (garage door opener, etc.) operates with original, hand-held transmitter. If NG, receiver or hand-held transmitter is at fault, not vehicle related.

1	PRELIMINARY CHECK

1. Turn ignition switch "OFF".
2. Does red light (LED) of transmitter illuminate when any button is pressed?



Yes or No

Yes	▶	GO TO 2.
No	▶	GO TO 3.

2	CHECK TRANSMITTER FUNCTION

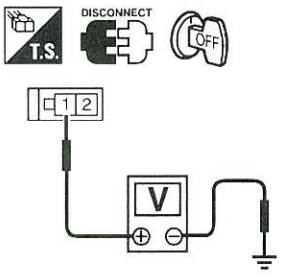
Check transmitter with Tool.
For details, refer to Technical Service Bulletin.

OK or NG

OK	▶	Receiver or handheld transmitter fault, not vehicle related.
NG	▶	Replace transmitter with sun visor assembly.

3	CHECK POWER SUPPLY

1. Disconnect transmitter connector.
2. Turn ignition switch "OFF".
3. Check voltage between terminal 1 and body ground.

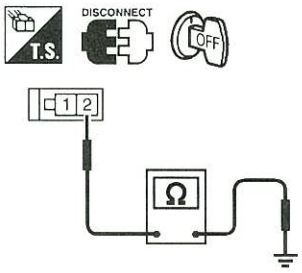


Does battery voltage exist?

Yes	▶	GO TO 4.
No	▶	GO TO 5.

4	CHECK GROUND CIRCUIT

Check continuity between terminal 2 and ground.

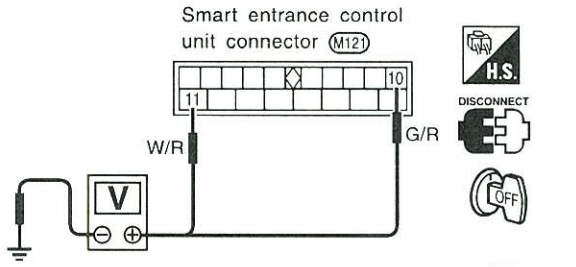


Does continuity exist?

Yes	▶	Replace transmitter with sun visor assembly.
No	▶	Repair harness.

5	CHECK MAIN POWER SUPPLY FOR SMART ENTRANCE CONTROL UNIT

1. Disconnect smart entrance control unit.
2. Check voltage between control unit terminals 10 or 11 and ground.



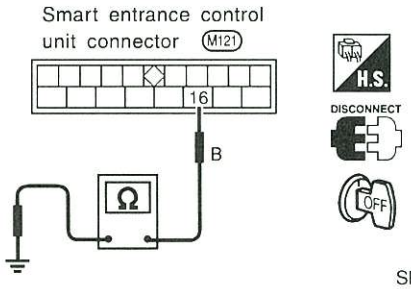
SEL156W

Does battery voltage exist?

Yes	▶	GO TO 6.
No	▶	**Check the following.** • 7.5A fuse No. 24, located in fuse block (J/B) • 40A fusible link (letter **f**, located in fuse and fusible link box)

6	CHECK GROUND CIRCUIT FOR SMART ENTRANCE CONTROL UNIT

Check continuity between terminal 16 and ground.



SEL791VA

Does continuity exist?

Yes	▶	Power supply and ground circuits are OK.
No	▶	Check ground harness.

Component Parts and Harness Connetor Location

NBEL0170

Fuse block (J/B)

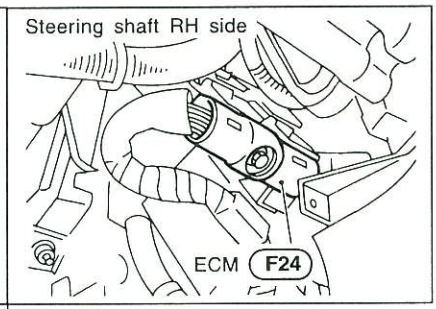
1	2	3	4	5
6	7	8	9	10
11	12	13	14	15
16	17	18	19	20
21	22	23		
24	25	26		
27	28	29		

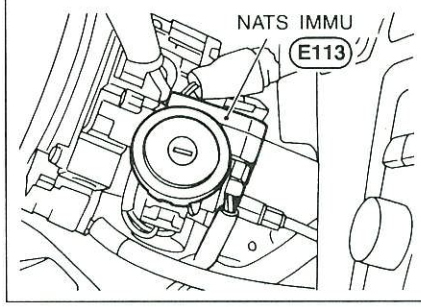
Front

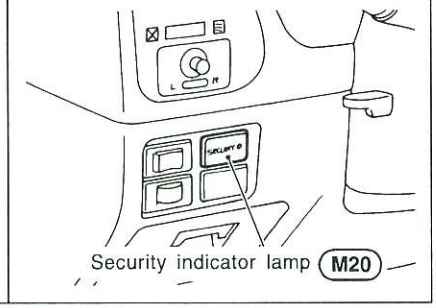
Fuse and fusible link box

51 52 53 54 55 56 57 58 a f g h i

b c d e 59 60 61 62 63 64 65 66







SEL084W

System Description

=NBEL0171

NATS (Nissan Anti-Theft System) has the following immobiliser functions:

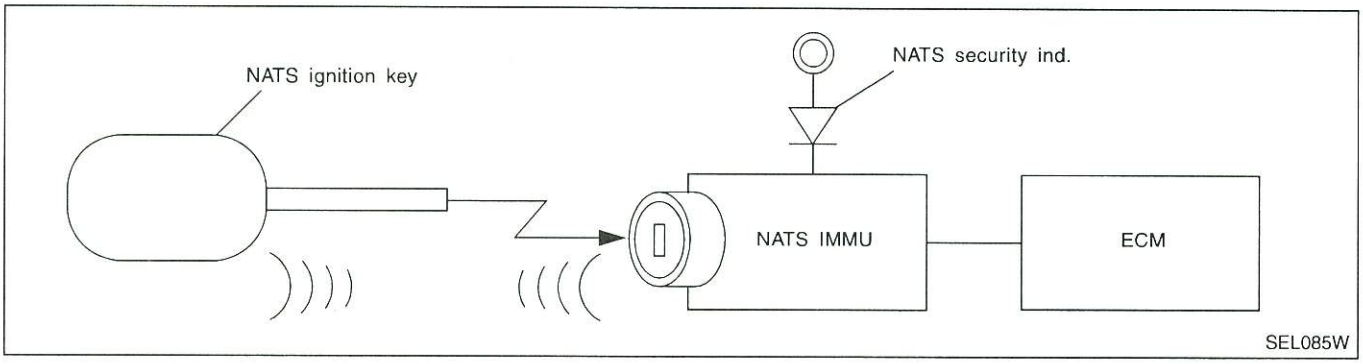
- Since only NATS ignition keys, whose ID nos. have been registered into the ECM and IMMU of NATS, allow the engine to run, operation of a stolen vehicle without a NATS registered key is prevented by NATS. That is to say, NATS will immobilise the engine if someone tries to start it without the registered key of NATS.
- All of the originally supplied ignition key IDs (except for card plate key) have been NATS registered. If requested by the vehicle owner, a maximum of five key IDs can be registered into the NATS components.
- The security indicator blinks when the ignition switch is in "OFF" or "ACC" position. Therefore, NATS warns outsiders that the vehicle is equipped with the anti-theft system.
- When NATS detects trouble, the security indicator lamp lights up while ignition key is in the "ON" position.
- NATS trouble diagnoses, system initialization and additional registration of other NATS ignition key IDs must be carried out using CONSULT hardware and CONSULT NATS software.
  When NATS initialization has been completed, the ID of the inserted ignition key is automatically NATS registered. Then, if necessary, additional registration of other NATS ignition key IDs can be carried out.
  Regarding the procedures of NATS initialization and NATS ignition key ID registration, refer to CONSULT operation manual, NATS.
- **When servicing a malfunction of the NATS (indicated by lighting up of Security Indicator Lamp) or registering another NATS ignition key ID no., it may be necessary to re-register original key identification. Therefore, be sure to receive all keys from vehicle owner.**

System Composition

NBEL0172

The immobiliser function of the NATS consists of the following:

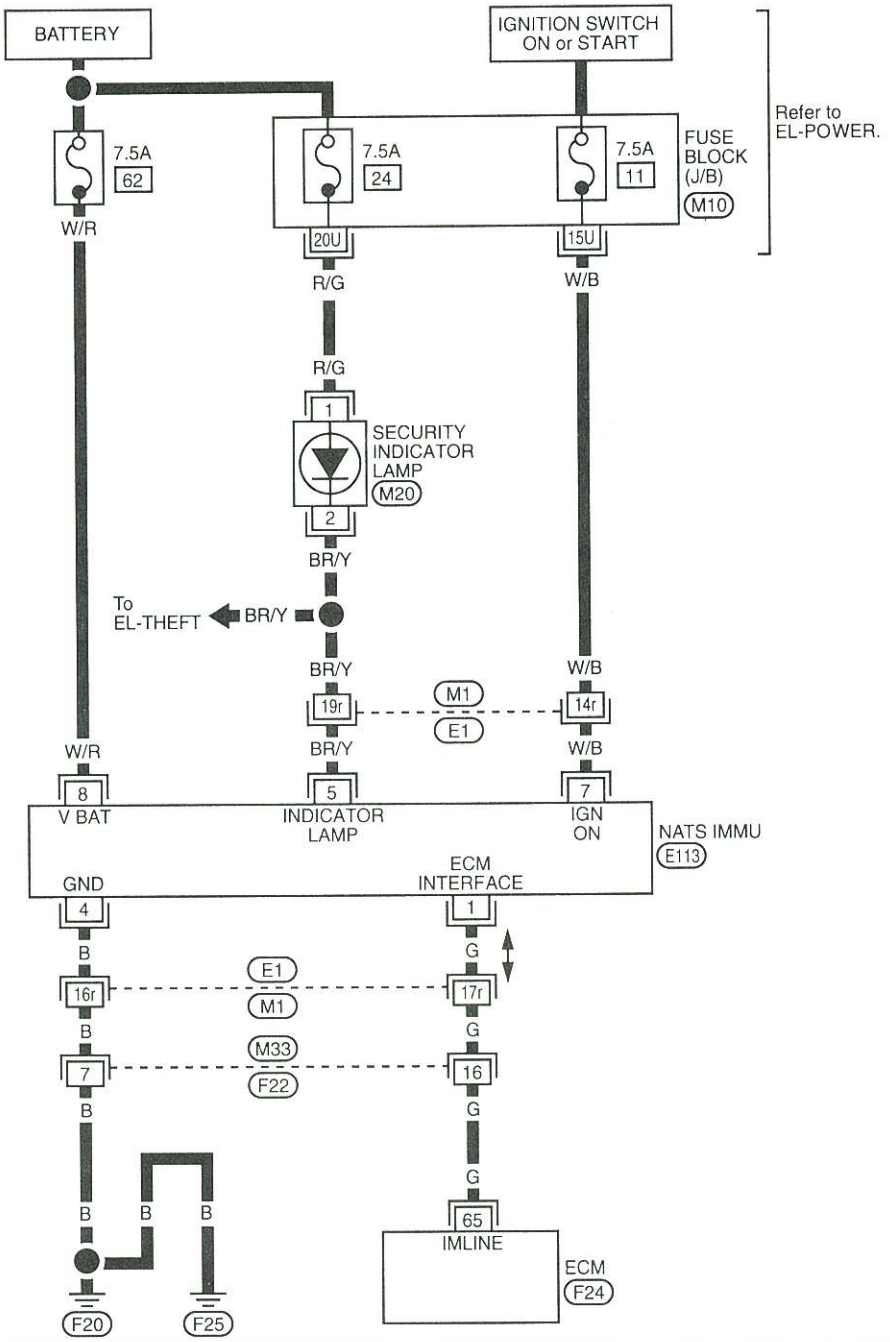
- NATS ignition key
- NATS immobiliser control unit (NATS IMMU) located in the ignition key cylinder
- Engine control module (ECM)
- Security indicator

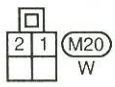


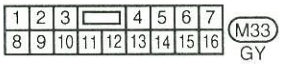
Wiring Diagram — NATS —

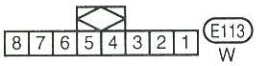
NBEL0173

EL-NATS-01





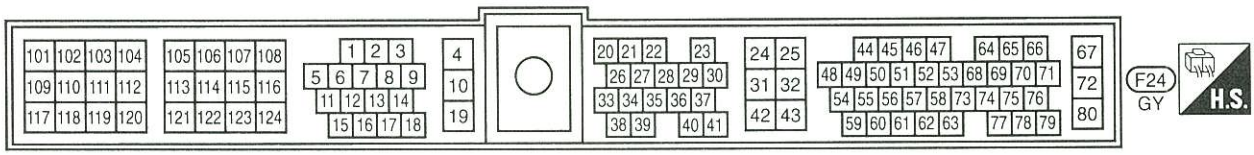




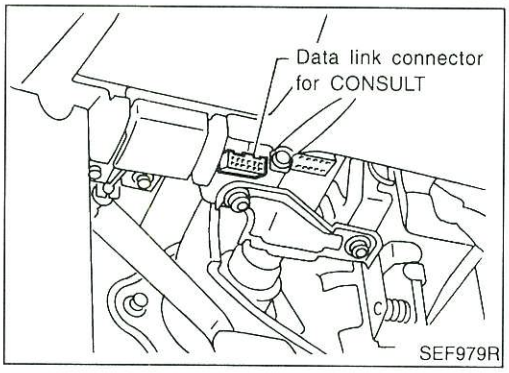
Refer to last page (Foldout page).

M1 , E1

M10



MEL830J



SEF979R

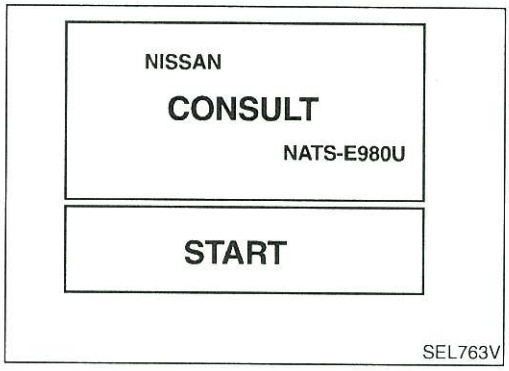
CONSULT

CONSULT INSPECTION PROCEDURE

NBEL0174

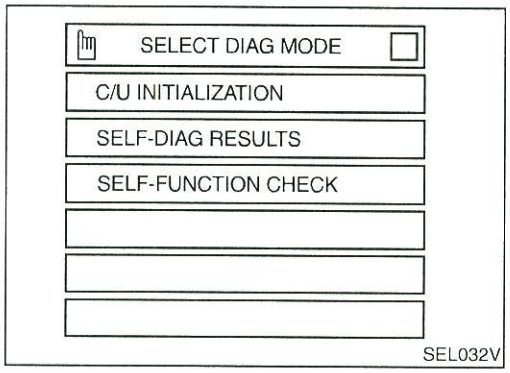
NBEL0174S01

1. Turn ignition switch OFF.
2. Connect "CONSULT" to Data link connector for CONSULT.



SEL763V

3. Insert NATS program card into CONSULT.
   ⇦: **Program card**
   NATS-E980U
4. Turn ignition switch ON.
5. Touch "START".



SEL032V

6. Perform each diagnostic test mode according to each service procedure.

For further information, see the CONSULT Operation Manual, NATS.

CONSULT DIAGNOSTIC TEST MODE FUNCTION

NBEL0174S02

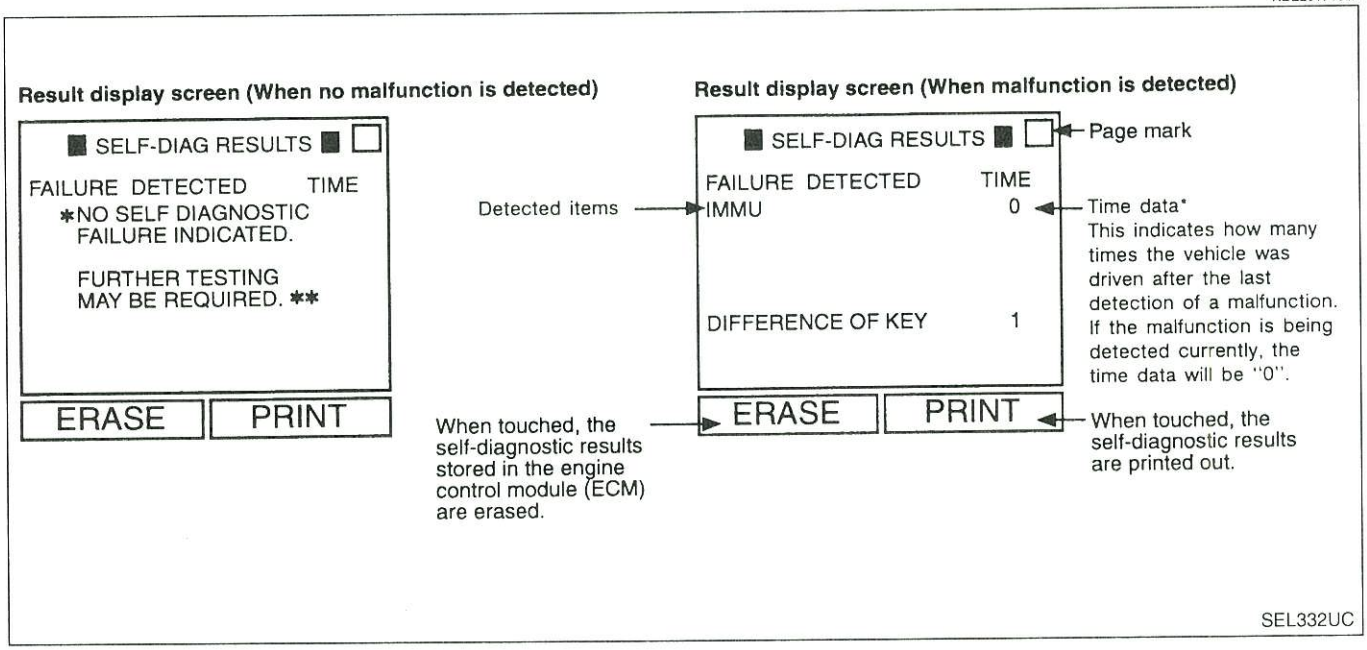
CONSULT DIAGNOSTIC TEST MODE	Description
C/U INITIALIZATION	When replacing any of the following three components, C/U initialization is necessary. [NATS ignition key/IMMU/ECM]
SELF-FUNCTION CHECK	ECM checks its own NATS communication interface by itself.
SELF-DIAGNOSTIC RESULTS	Detected items (screen terms) are as shown in the chart below.

NOTE:
When any initialization is performed, all ID previously registered will be erased and all NATS ignition keys must be registered again. The engine cannot be started with an unregistered key. In this case, the system may show "DIFFERENCE OF KEY" or "LOCK MODE" as a self-diagnostic result on the CONSULT screen.

CONSULT (Cont'd)

HOW TO READ SELF-DIAGNOSTIC RESULTS

NBEL0174S03



* If trip number is more than 1, MIL does not blink.

SELF-DIAGNOSTIC RESULTS ITEM CHART

NBEL0174S04

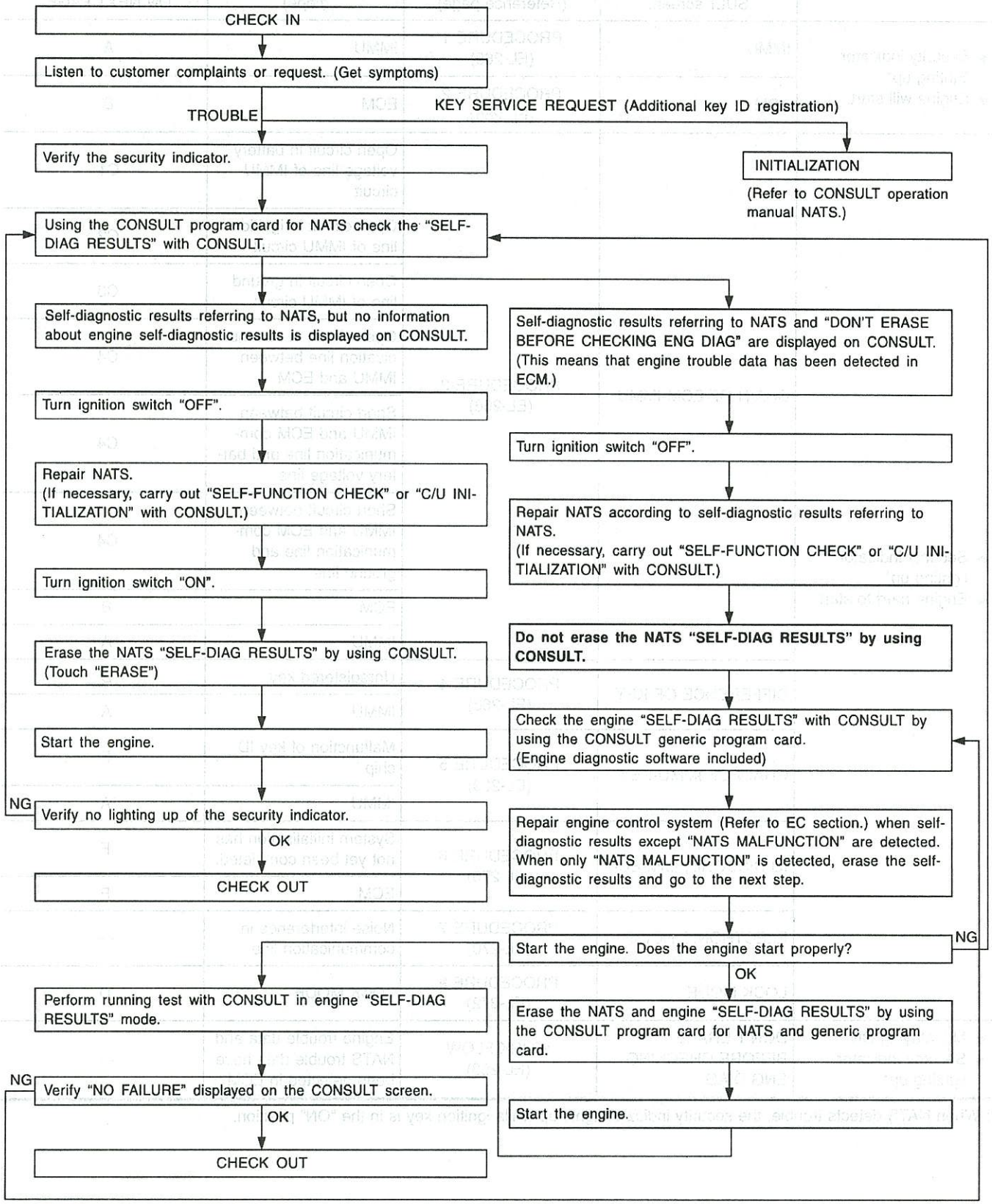
Detected items (Screen terms)	Description	Reference page
IMMU	ECM received the signal from IMMU that IMMU is malfunctioning.	EL-265
ECM	ECM is malfunctioning.	EL-265
CHAIN OF ECM-IMMU	Communication impossible between ECM and IMMU.	EL-266
DIFFERENCE OF KEY	IMMU can receive the key ID signal but the result of ID verification between key ID and IMMU is NG.	EL-268
CHAIN OF IMMU-KEY	IMMU cannot receive the key ID signal.	EL-269
ID DISCORD, IMM-ECM	The result of ID verification between IMMU and ECM is NG. System initialization is required.	EL-270
ELECTRONIC NOISE	Noise (interference) interfered into NATS communication lines during communicating.	EL-270
DON'T ERASE BEFORE CHECKING ENG DIAG	Engine trouble data and NATS trouble data have been detected in ECM.	EL-263
LOCK MODE	When the starting operation is carried out 5 or more times consecutively under the following conditions, NATS will shift the mode to one which prevents the engine from being started. • unregistered ignition key is used • IMMU or ECM malfunctioning	EL-272

Trouble Diagnoses

WORK FLOW

NBEL0175

NBEL0175S01



SEL086W

SYMPTOM MATRIX CHART 1
(Self-diagnosis related item)

NBEL0175S02

SYMPTOM	Displayed "SELF-DIAG RESULTS" on CONSULT screen.	DIAGNOSTIC PROCEDURE (Reference page)	SYSTEM (Malfunctioning part or mode)	REFERENCE PART NO. OF ILLUSTRATION ON NEXT PAGE
• Security indicator lighting up* • Engine will start.	IMMU	PROCEDURE 1 (EL-265)	IMMU	A
	ECM	PROCEDURE 2 (EL-265)	ECM	B
• Security indicator lighting up* • Engine hard to start	CHAIN OF ECM-IMMU	PROCEDURE 3 (EL-266)	Open circuit in battery voltage line of IMMU circuit	C1
			Open circuit in ignition line of IMMU circuit	C2
			Open circuit in ground line of IMMU circuit	C3
			Open circuit in communication line between IMMU and ECM	C4
			Short circuit between IMMU and ECM communication line and battery voltage line	C4
			Short circuit between IMMU and ECM communication line and ground line	C4
			ECM	B
			IMMU	A
	DIFFERENCE OF KEY	PROCEDURE 4 (EL-268)	Unregistered key	D
			IMMU	A
	CHAIN OF IMMU-KEY	PROCEDURE 5 (EL-269)	Malfunction of key ID chip	E
			IMMU	A
	ID DISCORD, IMM-ECM	PROCEDURE 6 (EL-270)	System initialisation has not yet been completed.	F
			ECM	F
	ELECTRONIC NOISE	PROCEDURE 7 (EL-270)	Noise interference in communication line	—
	LOCK MODE	PROCEDURE 9 (EL-272)	LOCK MODE	D
• MIL staying ON • Security indicator lighting up*	DON'T ERASE BEFORE CHECKING ENG DIAG	WORK FLOW (EL-263)	Engine trouble data and NATS trouble data have been detected in ECM	—

*: When NATS detects trouble, the security indicator lights up while ignition key is in the "ON" position.

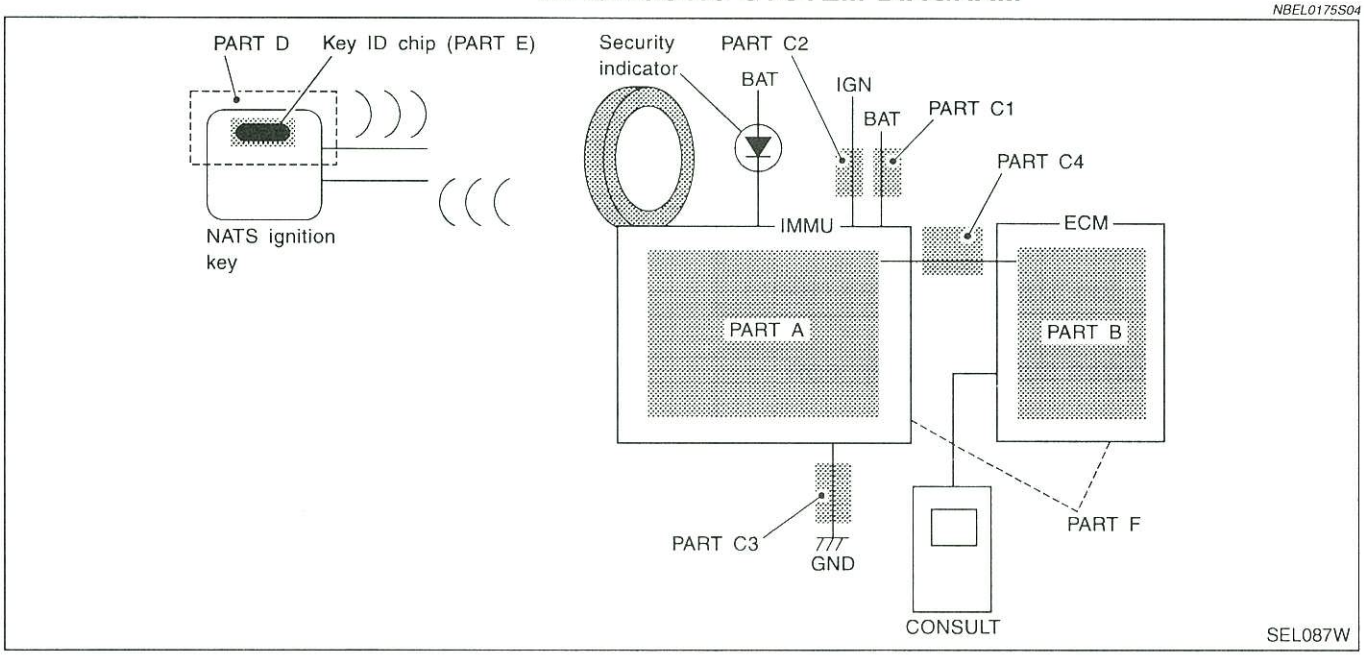
SYMPTOM MATRIX CHART 2
(Non self-diagnosis related item)

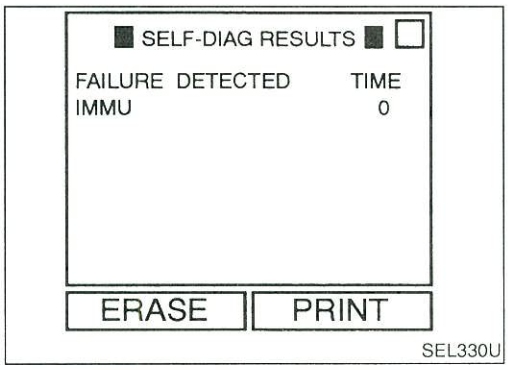
NBEL0175S03

SYMPTOM	DIAGNOSTIC PROCEDURE (Reference page)	SYSTEM (Malfunctioning part or mode)
Security ind. does not light up.	PROCEDURE 8 (EL-271)	Security ind.
		Open circuit between Fuse and NATS IMMU
		Continuation of initialization mode
		NATS IMMU

DIAGNOSTIC SYSTEM DIAGRAM

NBEL0175S04



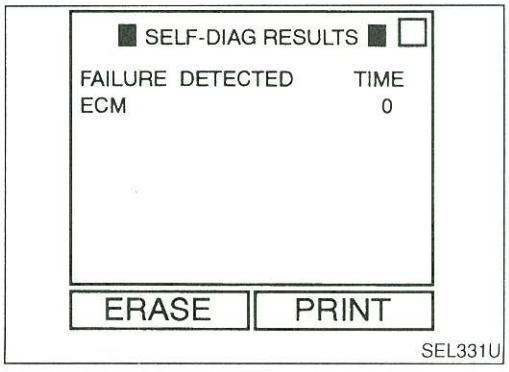


DIAGNOSTIC PROCEDURE 1

NBEL0175S05

Self-diagnostic results:
"IMMU" displayed on CONSULT screen

1. Confirm SELF-DIAGNOSTIC RESULTS "ECM" displayed on CONSULT screen. Ref. part No. B.
2. Replace IMMU.
3. Perform initialization with CONSULT.
   For initialization, refer to "CONSULT operation manual NATS".



DIAGNOSTIC PROCEDURE 2

NBEL0175S06

Self-diagnostic results:
"ECM" displayed on CONSULT screen

1. Confirm SELF-DIAGNOSTIC RESULTS "ECM" displayed on CONSULT screen. Ref. part No. B.
2. Replace ECM.
3. Perform initialization with CONSULT.
   For initialization, refer to "CONSULT operation manual NATS".

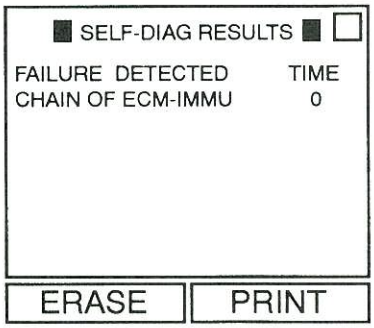
DIAGNOSTIC PROCEDURE 3

NBEL0175S07

Self-diagnostic results:
"CHAIN OF ECM-IMMU" displayed on CONSULT screen

1 CONFIRM SELF-DIAGNOSTIC RESULTS

Confirm SELF-DIAGNOSTIC RESULTS "CHAIN OF ECM-IMMU" displayed on CONSULT screen.



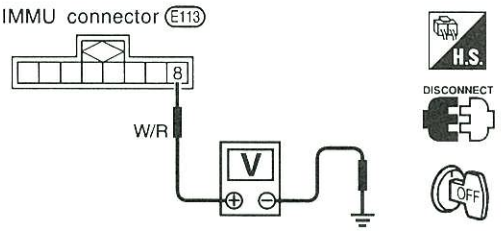
SEL333U

Is CONSULT screen displayed as above?

Yes	▶	GO TO 2.
No	▶	GO TO SYMPTOM MATRIX CHART 1.

2 CHECK POWER SUPPLY CIRCUIT FOR IMMU

1. Disconnect IMMU connector.
2. Check voltage between terminal 8 of IMMU and ground with CONSULT or tester.



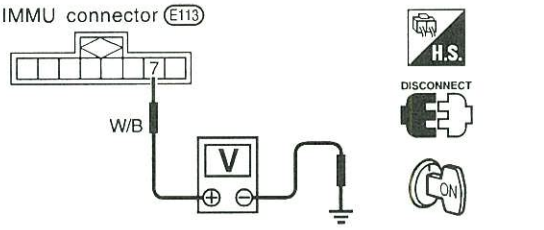
SEL088W

Does battery voltage exist?

Yes	▶	GO TO 3.
No	▶	**Check the following** • 7.5A fuse (No. 62, located in the fuse and fusible link box) • Harness for open or short between fuse and IMMU connector **Ref. Part No. C1**

3 CHECK IGN SW. ON SIGNAL

1. Turn ignition switch ON.
2. Check voltage between terminal 7 of IMMU and ground with CONSULT or tester.



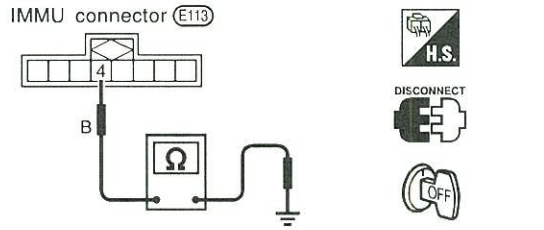
SEL089W

Does battery voltage exist?

Yes	▶	GO TO 4.
No	▶	**Check the following** • 7.5A fuse [No. 11, located in the fuse block (J/B)] • Harness for open or short between fuse and IMMU connector **Ref. part No. C2**

4 CHECK GROUND CIRCUIT FOR IMMU

1. Turn ignition OFF.
2. Check harness continuity between IMMU terminal 4 and ground.



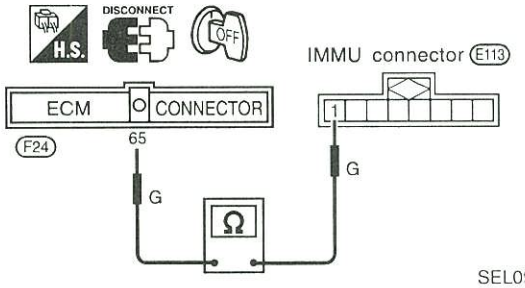
SEL090W

Does continuity exist?

Yes	▶	GO TO 5.
No	▶	Repair harness. **Ref. part No. C3**

5 CHECK COMMUNICATION LINE OPEN CIRCUIT

1. Disconnect ECM connector.
2. Check harness continuity between IMMU terminal 1 and ECM terminal 65.



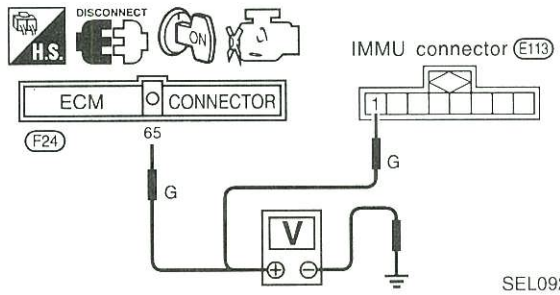
SEL091W

Does continuity exist?

Yes ▶	GO TO 6.
No ▶	Repair harness or connector. **Ref. part No. C4**

6 CHECK COMMUNICATION LINE BATTERY SHORT CIRCUIT

1. Turn ignition ON.
2. Check voltage between ECM terminal 65 or IMMU terminal 1 and ground.



SEL092W

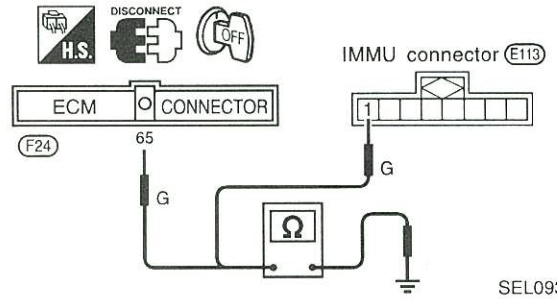
Voltage: 0V

OK or NG

OK ▶	GO TO 7.
NG ▶	Communication line is short-circuited with battery voltage line or ignition switch ON line. Repair harness or connectors. **Ref. part No. C4**

7 CHECK COMMUNICATION LINE GROUND SHORT CIRCUIT

1. Turn ignition switch OFF.
2. Check continuity between ECM terminal 65 or IMMU terminal 1 and ground.



SEL093W

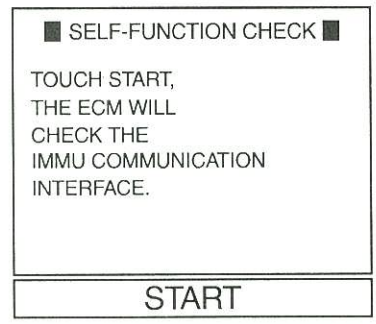
Continuity should not exist.

OK or NG

OK ▶	GO TO 8.
NG ▶	Communication line is short-circuited with ground line. Repair harness or connectors. **Ref. part No. C4**

8 SELF-FUNCTION CHECK

1. Connect ECM connector and disconnect IMMU connector.
2. Turn ignition switch ON.
3. Touch "SELF-FUNCTION CHECK" on CONSULT "SELECT DIAG MODE" screen.
4. Touch "START". ECM will then check its communication interface by itself.



SEL037V

SELF-FUNCTION CHECK result:

OK or NG

OK ▶	IMMU is malfunctioning. Replace IMMU. **Ref. part No. A** Perform initialization with CONSULT. For the operation of initialization, refer to "CONSULT operation manual NATS".
NG ▶	ECM is malfunctioning. Replace ECM. **Ref. part No. B** Perform initialization with CONSULT. For the operation of initialization, refer to "CONSULT operation manual NATS".

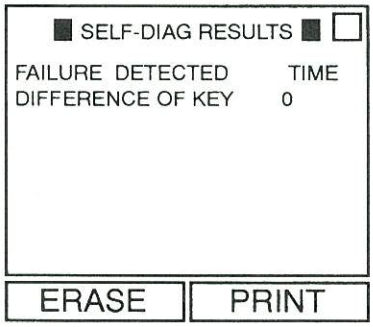
DIAGNOSTIC PROCEDURE 4

=NBEL0175S08

Self-diagnostic results:
"DIFFERENCE OF KEY" displayed on CONSULT screen

1	CONFIRM SELF-DIAGNOSTIC RESULTS

Confirm SELF-DIAGNOSTIC RESULTS "DIFFERENCE OF KEY" displayed on CONSULT screen.



SEL344U

Is CONSULT screen displayed as above?

Yes	▶	GO TO 2.
No	▶	GO TO SYMPTOM MATRIX CHART 1.

2	PERFORM INITIALIZATION WITH CONSULT

Perform initialization with CONSULT. Re-register all NATS ignition key IDs.
For initialization, refer to "CONSULT operation manual NATS".

SEL038V

NOTE:
If the initialization is not completed or fails, CONSULT shows above message on the screen.
Can the system be initialized?

Yes or No

Yes	▶	Start engine. (END) (Ignition key ID was unregistered. **Ref. part No. D**)
No	▶	IMMU is malfunctioning. Replace IMMU. **Ref. part No. A** Perform initialization with CONSULT. For initialization, refer to "CONSULT operation manual NATS".

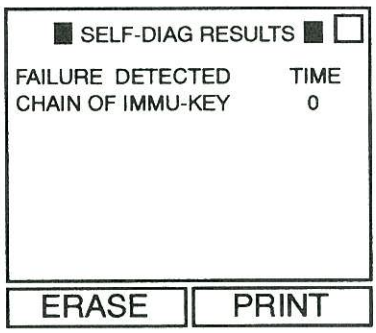
DIAGNOSTIC PROCEDURE 5

=NBEL0175S09

Self-diagnostic results:
"CHAIN OF IMMU-KEY" displayed on CONSULT screen

1	CONFIRM SELF-DIAGNOSTIC RESULTS

Confirm SELF-DIAGNOSTIC RESULTS "CHAIN OF IMMU-KEY" displayed on CONSULT screen.



SEL373U

Is CONSULT screen displayed as above?

Yes	▶	GO TO 2.
No	▶	GO TO SYMPTOM MATRIX CHART 1.

2	CHECK NATS IGNITION KEY ID CHIP

Start engine with another registered NATS ignition key.

Does the engine start?

Yes	▶	Ignition key ID chip is malfunctioning. Replace the ignition key. **Ref. part No. E** Perform initialization with CONSULT. For initialization, refer to "CONSULT operation manual NATS".
No	▶	GO TO 3.

3	CHECK NATS IMMU INSTALLATION

Check NATS IMMU installation.
Refer to "How to Replace NATS IMMU" in EL-272.

OK or NG

OK	▶	IMMU is malfunctioning. Replace IMMU. **Ref. part No. A** Perform initialization with CONSULT. For initialization, refer to "CONSULT operation manual NATS".
NG	▶	Reinstall NATS IMMU correctly.

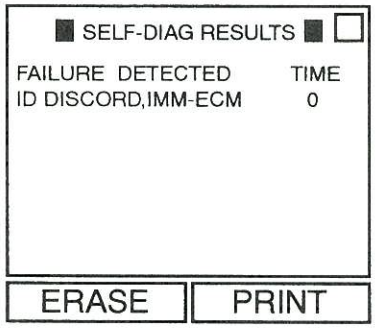
DIAGNOSTIC PROCEDURE 6

=NBEL0175S10

Self-diagnostic results:
"ID DISCORD, IMM-ECM" displayed on CONSULT screen

1	CONFIRM SELF-DIAGNOSTIC RESULTS

Confirm SELF-DIAGNOSTIC RESULTS "ID DISCORD, IMM-ECM" displayed on CONSULT screen.



SEL383U

NOTE:
"ID DISCORD IMMU-ECM":
Registered ID of IMMU is in discord with that of ECM.

Is CONSULT screen displayed as above?

Yes	▶	GO TO 2.
No	▶	GO TO SYMPTOM MATRIX CHART 1.

2	PERFORM INITIALIZATION WITH CONSULT

Perform initialization with CONSULT. Re-register all NATS ignition key IDs.
For initialization, refer to "CONSULT operation manual NATS".

SEL038V

NOTE:
If the initialization is not completed or fails, CONSULT shows above message on the screen.
Can the system be initialized?

Yes or No

Yes	▶	Start engine. (END) (System initialization had not been completed. **Ref. part No. F**)
No	▶	ECM is malfunctioning. Replace ECM. **Ref. part No. F** Perform initialization with CONSULT. For initialization, refer to "CONSULT operation manual NATS".

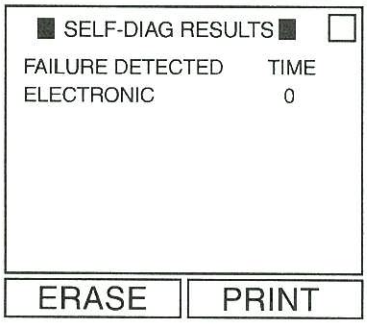
DIAGNOSTIC PROCEDURE 7

NBEL0175S11

Self-diagnostic results:
"ELECTRONIC NOISE" displayed on CONSULT screen

1	CONFIRM SELF-DIAGNOSTIC RESULTS

Confirm SELF-DIAGNOSTIC RESULTS "ELECTRONIC NOISE" displayed on CONSULT screen.



SEL039V

Is CONSULT screen displayed as above?

Yes	▶	GO TO 2.
No	▶	GO TO SYMPTOM MATRIX CHART 1.

2	TURN OFF AND REMOVE NOISE

1. Turn off or remove any possible noise sources.
2. Touch "ERASE" on CONSULT SELF-DIAGNOSTIC RESULTS screen.
3. Start engine.

Does engine start?

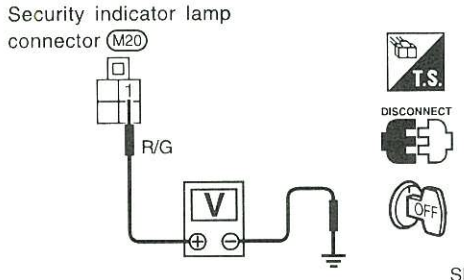
Yes	▶	INSPECTION END
No	▶	GO TO 1.

DIAGNOSTIC PROCEDURE 8
"SECURITY INDICATOR LAMP DOES NOT LIGHT UP"

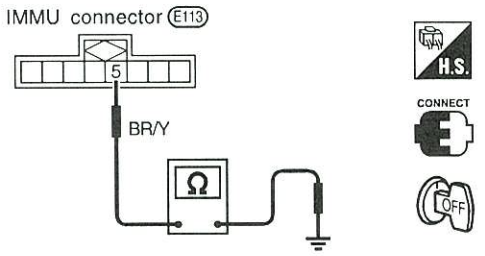
=NBEL0175S12

1	CHECK FUSE
Check 7.5A fuse [No. 24, located in the fuse block (J/B)].	
Is 7.5A fuse OK?	
Yes ▶	GO TO 2.
No ▶	Replace fuse.

2	CHECK SECURITY INDICATOR LAMP
1. Install 7.5A fuse. 2. Perform initialization with CONSULT. For initialization, refer to "CONSULT operation manual NATS". 3. Turn ignition switch OFF. 4. Start engine and turn ignition switch OFF. 5. Check the security indicator lamp lighting.	
Does security indicator lamp light up?	
Yes ▶	INSPECTION END
No ▶	GO TO 3.

3	CHECK SECURITY INDICATOR LAMP POWER SUPPLY CIRCUIT
1. Disconnect security indicator lamp connector. 2. Check voltage between security indicator lamp connector terminal 1 and ground.	
 SEL094W	
Does battery voltage exist?	
Yes ▶	GO TO 4.
No ▶	Check harness for open or short between fuse and security indicator lamp.

4	CHECK SECURITY INDICATOR LAMP
Check security Indicator Lamp.	
Is security indicator lamp OK?	
Yes ▶	GO TO 5.
No ▶	Replace security indicator lamp.

5	CHECK NATS IMMU FUNCTION
1. Connect NATS IMMU connector. 2. Disconnect security indicator lamp connector. 3. Check continuity between NATS IMMU terminal 5 and ground.	
 SEL095W	
Does continuity exist intermittently?	
Yes ▶	Check harness for open or short between security indicator lamp and NATS IMMU.
No ▶	NATS IMMU is malfunctioning. Replace IMMU. Perform initialization with CONSULT. For initialization, refer to "CONSULT operation manual NATS".

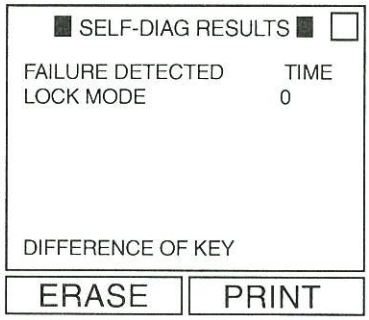
DIAGNOSTIC PROCEDURE 9

=NBEL0175S13

Self-diagnostic results:
"LOCK MODE" displayed on CONSULT screen

1	CONFIRM SELF-DIAGNOSTIC RESULTS

Confirm SELF-DIAGNOSTIC RESULTS "LOCK MODE" is displayed on CONSULT screen.



SEL790U

Is CONSULT screen displayed as above?

Yes	▶	GO TO 2.
No	▶	GO TO SYMPTOM MATRIX CHART 1.

2	ESCAPE FROM LOCK MODE

1. Turn ignition switch OFF.
2. Turn ignition switch ON with registered key. (Do not start engine.) Wait 5 seconds.
3. Return the key to OFF position.
4. Repeat steps 2 and 3 twice (total of three cycles).
5. Start the engine.

Does engine start?

Yes	▶	System is OK. (Now system is escaped from "LOCK MODE".)
No	▶	GO TO 3.

3	CHECK NATS IMMU ILLUSTRATION

Check NATS IMMU installation. Refer to "How to Replace NATS IMMU" in EL-272.

OK or NG

OK	▶	GO TO 4.
NG	▶	Reinstall NATS IMMU corectly.

4	PERFORM INITIALIZATION WITH CONSULT

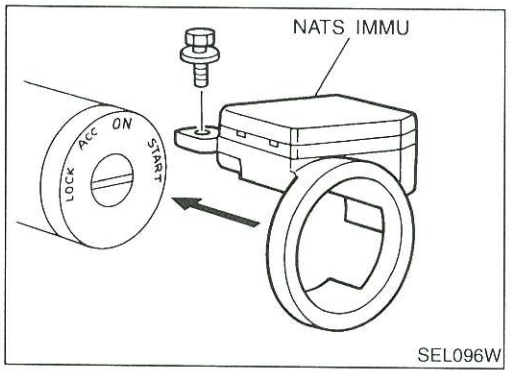
Perform initialization with CONSULT.
For initialization, refer to "CONSULT operation manual NATS".

SEL038V

NOTE:
If the initialization is not completed or fails, CONSULT shows the above message on the screen.
Can the system be initialized?

Yes or No

Yes	▶	System is OK.
No	▶	GO TO DIAGNOSTIC PROCEDURE 5 to check "CHAIN OF IMMU-KEY", refer to EL-269.



SEL096W

How to Replace NATS IMMU

NBEL0176

NOTE:

- **If NATS IMMU is not installed correctly, NATS system will not operate properly and SELF-DIAG RESULTS on CONSULT screen will show "LOCK MODE" or "CHAIN OF IMMU-KEY".**

Precaution

NBEL0177

CAUTION:

- **Use CONSULT to set the system "Demonstration mode" if INFINITI Communicator needs to be activated during service procedures. (For details of the demonstration mode, refer to EL-304.)**
- **Make sure to turn the demonstration mode OFF before returning the vehicle to the owner.**
- **In the demonstration mode, no service from the Communicator Response Center is available. Therefore, even if the customer encounters an emergency, no service will be dispatched.**
- **If the theft warning system is activated for more than 7 seconds, INFINITI Communicator will dial to the Communicator Response Center automatically. The operator will contact the customer to confirm whether the vehicle has been stolen or not.**
- **When "Mayday" emergency dialing is activated (if the system is not in the demonstration mode), the Communicator Response Center operator will come online. If there is no emergency, the operator will ask the occupant for the user password (option). Failure to provide the correct password results in a police response.**
- **IVCS unit memory includes VIN (Vehicle Identification Number) and other such vehicle specific data. Therefore, the IVCS unit cannot be transferred to another vehicle. When the IVCS unit is replaced, the new unit must be set up and programmed. The INFINITI Communicator system automatically contacts the Communicator Response Center the first time the vehicle is started after a phone number has been changed or a module (IVCS unit) is replaced. The VIN will be written in the memory of the new unit by transmitting data from the Communicator Response Center. For details, refer to "System Setting", EL-306.**
- **Before servicing the vehicle, confirm that the VIN memorized by the IVCS unit is the same as the VIN on the vehicle's identification plate.**

Communicator Response Center Telephone Number for Technicians

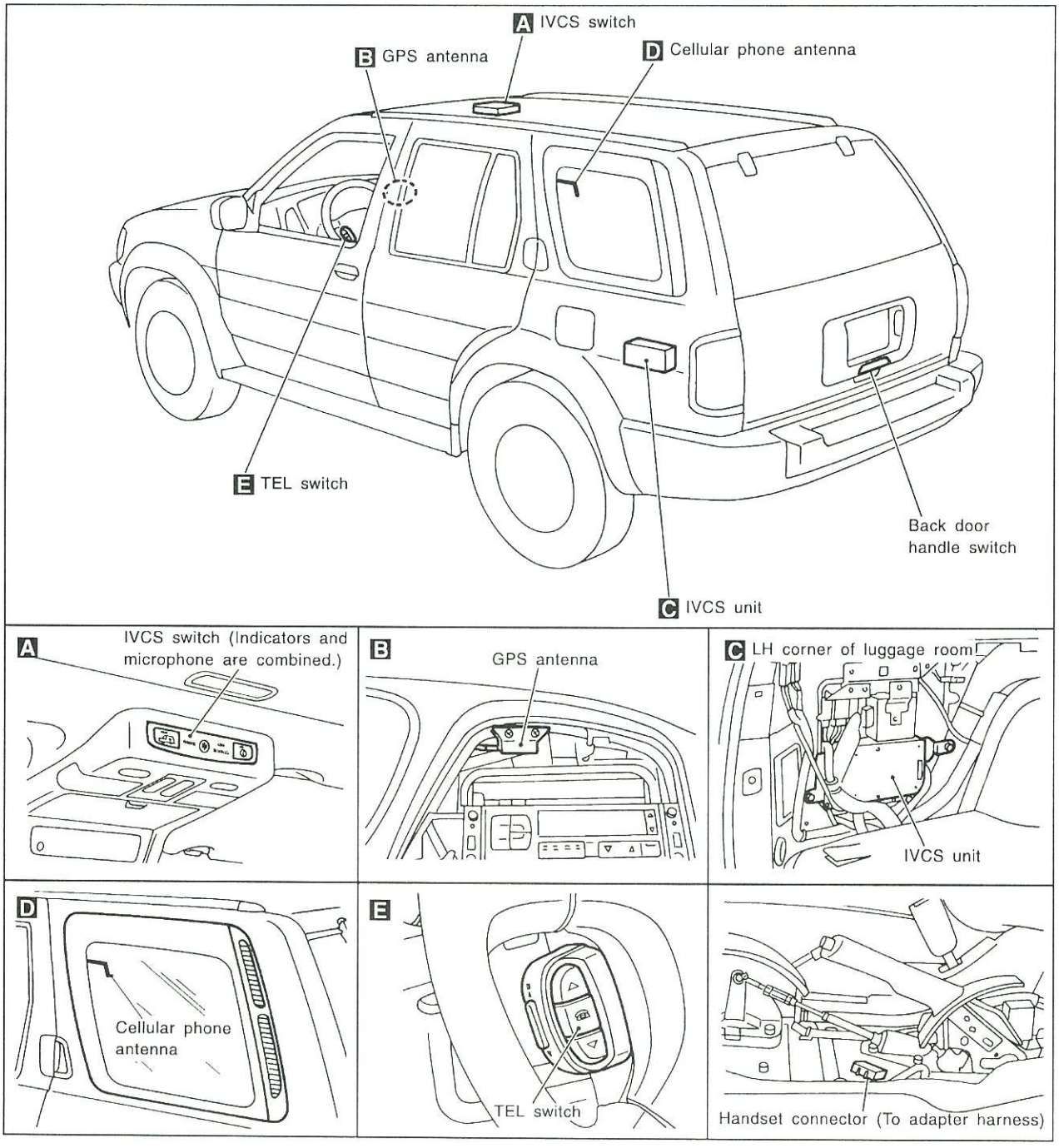
NBEL0178

The Communicator Response Center telephone number for technicians is **1-888-427-4812**.
Whenever an INFINITI dealer technician dials the above number, the following information will be required by the Communicator Response Center operator.

- Customer name
- Unit ID number of old IVCS unit (For details, refer to EL-292.)
- Unit ID number of new IVCS unit
- VIN
- Dealer name and code (For security purposes)
- Dealer contact person (technician)
- Dealer phone and fax numbers

Component Parts and Harness Connector Location

NBEL0179



SEL098W

System Description

NBEL0180

OUTLINE

NBEL0180S01

INFINITI Communicator system uses the Global Positioning System (GPS), cellular phone technology and the Communicator Response Center to provide the following functions.

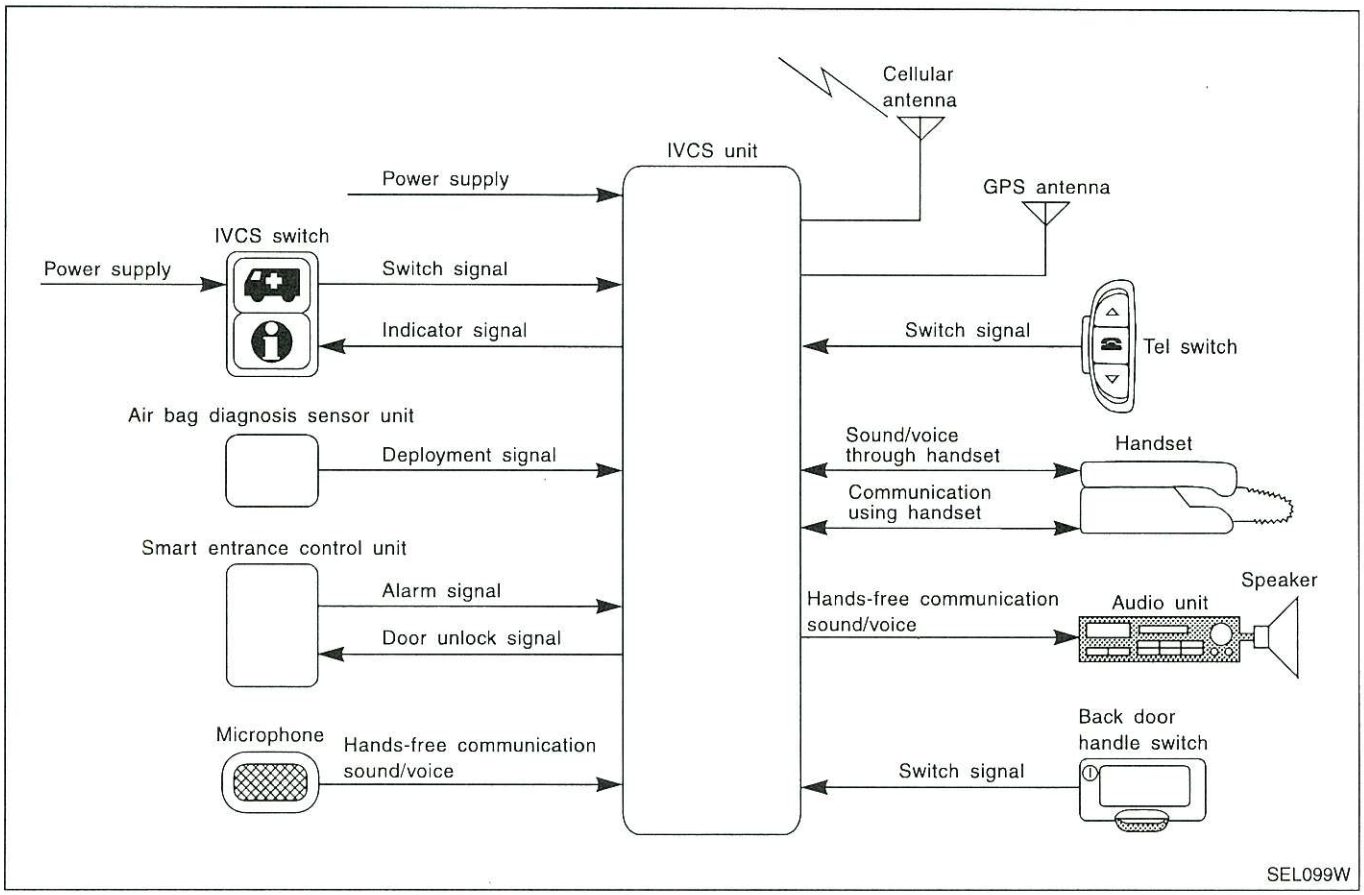
- One touch "Information" dialing
- One touch "Mayday" emergency dialing
- Automatic air bag inflation notification
- Stolen vehicle tracking
- Alarm notification
- Remote door unlock

There are limitations to the INFINITI Communicator system. To understand the system, read SYSTEM LIMITATIONS (EL-276) thoroughly.

SYSTEM COMPOSITION

NBEL0180S02

- The INFINITI Communicator system is controlled by the IVCS (In Vehicle Communication System) unit. System status ("Mayday"-emergency dialing, or re-dialing, etc.) is displayed by the indicators in the IVCS switch.
- The INFINITI Communicator system can only make calls to the Communicator Response Center and receive calls from the center, unless the customer chooses to have the optional handset install.



SYSTEM LIMITATIONS

NBEL0180S03

Service Area

NBEL0180S0301

Depending on the cellular provider chosen, service is provided in the 48 contiguous states. Service is not available in Alaska, Hawaii, Canada, or Mexico. The Communicator Response Center will not be able to locate the customer's vehicle outside of the continental United States.

Inoperative if Cellular Phone is Inactive or Inoperative

NBEL0180S0302

INFINITI Communicator will be inoperative if the customer does not have an active account with cellular provider, since INFINITI Communicator relies on the cellular network. When the INFINITI Communicator system is outside of cellular service, the "NO SERVICE" indicator will illuminate. If you try to activate INFINITI Communicator, the REQUEST will be cancelled. Cellular phone transmission may become temporarily disabled, or interrupted by environmental factors like tunnels, bridges, or tall buildings. In such cases, INFINITI Communicator will re-dial up to four times. After several failed attempts, the system will quit dialing and return to normal mode.

Inoperative if The System is in The Demonstraiton Mode

NBEL0180S0303

The INFINITI Communicator system remains in the demonstration mode until the setup procedures are completed. If the system is activated in this mode, the Communicator Response Center will recognize this operation as a demonstration and will not provide any service. The system can be changed to the demonstration mode by using CONSULT to check the system operation. Do not forget to turn off the demonstration mode after confirmation.

Battery

NBEL0180S0304

Since INFINITI Communicator is powered by the vehicle's battery, if the battery is removed, damaged or discharged, the system will not work.

Inopertive if Cellular System is Busy

NBEL0180S0305

When INFINITI Communicator tries to contact the Communicator Response Center, but the cellular network is busy, the system attempts to re-dial for up to two hours. This time varies greatly depending on the cellular network and cellular signal strength. The system resets to ready when the system completes the re-dialing attempts.

Roaming

NBEL0180S0306

If the customer's cellular provider does not have a roaming agreement with the provider where the vehicle locates, it may not be possible to use the lines of a different cellular provider. Therefore, it is impossible that INFINITI Communicator will contact the Communicator Response Center.

Special Cellular Features

NBEL0180S0307

Some cellular carriers offer custom phone numbers that are assigned a Personal Identification Number (PIN). The cellular phone user is required to enter the PIN anytime a phone call is made. The INFINITI Communicator system is not compatible with the PIN feature. A PIN requirement on the cellular phone will cause the INFINITI Communicator system to be inoperative.

Other special features such as call waiting, voice mail, call forwarding, etc. can interfere with INFINITI Communicator system operation.

Cellular Airwave Interference

NBEL0180S0308

At times someone other than the Communicator Response Center operator may be heard. This is caused by Cellular Airwave Interference and is not caused by an INFINITI Communicator system malfunction.

Possibility of Positioning Capability Degraded

NBEL0180S0309

Vehicle positioning is accomplished using the GPS (Global Positioning System). If the signal from the GPS satellite is obstructed by a tunnel or building, positioning capability may be degraded or lost. In this case, the last valid position obtained before the obstruction is transmitted to the Communicator Response Center. The precision is also influenced by the location of GPS satellites.
Once the battery cable is disconnected, it will take about 5 minutes to determine the vehicle location. This is because the memory related to GPS is lost when the battery cable is disconnected.

OPERATION

NBEL0180S04

One Touch "Information" Dialing

NBEL0180S0401

- If the vehicle becomes disabled due to problems such as engine trouble, press the "Information" switch to connect to the Communicator Response Center and receive the desired service.
- When the indicator lamp on the switch lights up, it means that the system has started to contact the Communicator Response Center. (Voice communication with Communicator Response Center operator is not available while DATA is being transmitted even if the indicator lamp is lit.)
- When the indicator lamp blinks, it means that the system is preparing for cellular connection or attempting to re-dial.

One Touch "Mayday" Emergency Dialing

NBEL0180S0402

- When an emergency occurs, press the "Mayday" emergency switch to connect to the Communicator Response Center. With this report, the Communicator Response Center recognizes that an emergency has occurred and provides necessary service.
- The operator will request a password (if the customer chooses to establish a password). If the wrong password or if no password is provided, the Communicator Response Center will assume the customer is in a duress situation and dispatch police.
- When no voice reply is heard from the vehicle or the sound heard indicates an emergency situation, the Communicator Response Center will have the police rush to the scene.
- Other operations are the same as service dialing.

Automatic Air Bag Inflation Notification

NBEL0180S0403

- When an air bag inflates, the air bag diagnosis sensor unit sends the air bag inflation signal to the IVCS unit, and the system automatically dials the Communicator Response Center to report the occurrence of an accident.

Stolen Vehicle Tracking

NBEL0180S0404

- When a vehicle is stolen, the owner can contact the Communicator Response Center to attempt to locate the stolen vehicle. The Communicator Response Center will activate the stolen vehicle tracking to locate the vehicle. If the Communicator Response Center successfully locates the vehicle, they will contact the police to provide the location.

- The vehicle location data is calculated using GPS.
- The vehicle ignition switch must be turned to the ON position to obtain the vehicle location. (This is because the system is in the sleep mode when the ignition switch is OFF.)
- Once this function starts up, regardless of the ignition switch position, the system keeps transmitting the vehicle location until the cancel signal is transmitted from the Communicator Response Center.
- While this function is operating, the operator can covertly monitor what is happening inside the vehicle through the hands-free microphone.

Alarm Notification

NBEL0180S0405

- When theft warning system sounds an alarm for more than 7 seconds because of improper access, the alarm signal is transmitted from the smart entrance control unit to the IVCS unit, and the system executes automatic dialing to the Communicator Response Center.
  If the alarm is reset before 7 seconds has elapsed, the INFINITI Communicator will not place a call to the Communicator Response Center.
- This function operates regardless of ignition switch position.
- While this function is operating, the operator can covertly monitor what is happening inside the vehicle through the hands-free microphone.

Remote Door Unlock

NBEL0180S0406

- When the door is locked with the key inside the vehicle, the door can be unlocked by contacting the Communicator Response Center (Proof that the person calling is the owner must be received by the Communicator Response Center.)
- When the ignition key is in the "OFF" position, the system is in the sleep mode. Therefore, back door outside handle must be pulled to wake up the system.
- To perform remote door unlock, call the Communicator Response Center and follow the operator's instructions.

NOTE:

- **When the system contacts the Communicator Response Center, data including the vehicle location is transmitted to the Communicator Response Center.**
- **Communication with the Communicator Response Center is not completed until the completion signal is transmitted from the Communicator Response Center. (Any calls to the Communicator Response Center can only be terminated by Communicator Response Center.)**
- **Functions other than alarm notification and remote door unlock operate while the ignition switch is ON and only for three minutes after the switch is turned OFF.**
- **Once a call to the Communicator Response Center is made, the communication continues regardless of the ignition key switch position.**
- **All the voice communication with the Communicator Response Center is made through the hands-free telephone.**
- **When the INFINITI Communicator system is activated, the handset does not function.**

DATA TRANSMITTING

NBEL0180S05

When contact to the Communicator Response Center is made, vehicle sends electrical data including type of activation (i.e., emergency call or alarm notification), vehicle location, time, etc.

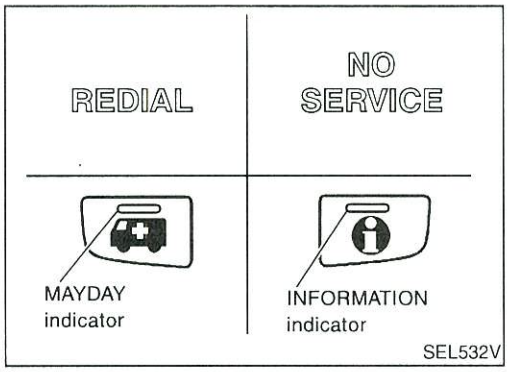
SLEEP/WAKE UP CONTROL

NBEL0180S06

3 minutes after the ignition switch is turned OFF, the system goes into the SLEEP MODE to save battery power supply. Communication with Communicator Response Center is not available in the SLEEP MODE.

To wake up the system, perform either of the following operations.

- Turn Ignition switch ON.
- Pull back door outside handle for more than 10 seconds. (Operation for door unlock function)



INDICATOR LAMPS OPERATION

NBEL0180S07

The system status is displayed as below by the indicator lamps.

Indicator	Condition	Description
MAYDAY	Blinks.	System is trying to acquire an available cellular channel by "Mayday" switch operation.
	Lights up. (See NOTE.)	System is connected to a cellular channel and is communicating information to the Communicator Response Center.
INFORMATION	Blinks.	System is trying to acquire an available cellular channel by "Information" switch operation.
	Lights up. (See NOTE.)	System is connected to a cellular channel and is communicating information to the Communicator Response Center.
REDIAL	Lights up.	Re-dialing
	Blinks.	Waiting for re-dial
NO SERVICE	Lights up.	Out of CELLULAR PHONE service area or signal is too weak.

NOTE:

- **When connection to Communicator Response Center by re-dial ends in failure, all the indicators are turned off.**
- **All indicators illuminate for up to 30 seconds or more when ignition switch is turned from OFF to ON and the system performs a self check.**
- **If both of MAYDAY and INFORMATION indicators do not turn off 30 seconds or more after the ignition switch is turned to ON, the system is malfunctioning.**

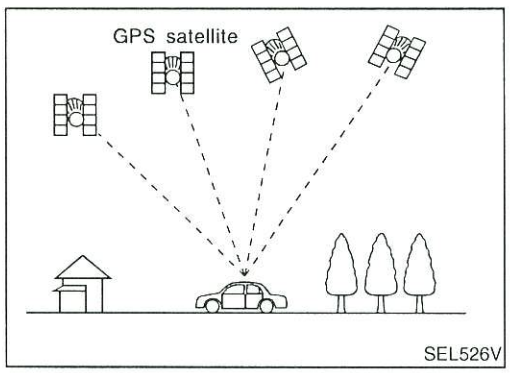
AUTOMATIC RE-DIAL/AUTO RESET TO READY

NBEL0180S08

- When INFINITI Communicator tries to contact the Communicator Response Center, but the cellular network is busy, the system attempts to dial for up to 2 hours. This time varies

greatly depending on the cellular network and cellular signal strength. The system resets to ready when the system completes the dialing attempts. The vehicle owner can press the button again if he or she still needs to contact the Communicator Response Center.

- INFINITI Communicator automatically redials if communication between the vehicle owner and Communicator Response Center is lost for some reason.
- The only way for a transmission to be officially terminated is for the Communicator Response Center to send an end transmission signal, which turns off the indicator in the switch. (Communication with Communicator Response Center can not be terminated by the occupant.)
- If the vehicle owner start the engine during a call, the conversation may be interrupted. When this happens the system may try to resume transmission once after the engine has been started.



GPS (GLOBAL POSITIONING SYSTEM)

NBEL0180S09

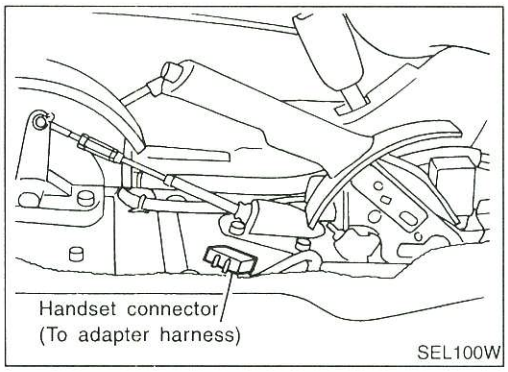
GPS is the global positioning system developed and operated by the US Department of Defense. GPS satellites (NAVSTAR) transmit radio waves and orbit around the earth at an altitude of approximately 21,000 km (13,000 miles).

GPS receiver calculates the three-dimensional position of the vehicle (latitude, longitude, and altitude from the sea level) by the time difference of the radio wave arriving from more than four GPS satellites (three-dimensional positioning).

When the radio wave is received from only three GPS satellites, the two-dimensional position (latitude and longitude) is calculated, using the altitude from the sea level data calculated by using four GPS satellites (two-dimensional positioning).

Positioning capability is degraded in the following cases.

- In two-dimensional positioning, when the vehicle's altitude from the sea level changes, the precision becomes lower.
- The location detection performance can have an error of about 100 m (300 ft) even in three-dimensional positioning with high precision. Because the precision is influenced by the location of GPS satellites used for positioning, the location detection performance may drop depending on the location of GPS satellites.
- When the radio wave from GPS satellites cannot be received, for example, when the vehicle is in a tunnel, in a parking lot inside building, under an elevated superhighway or near strong power lines, the location may not be detected. Turbulent/electric weather conditions may also affect positioning performance. If something is placed on the antenna, the radio wave from GPS satellites may not be received.

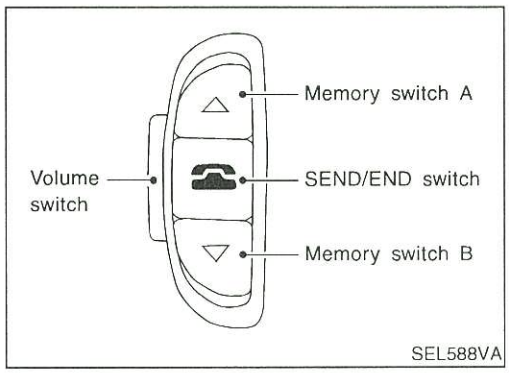


HANDSET

NBEL0180S10

NOTE:

- If an optional handset is installed, INFINITI Communicator can be used as a normal cellular phone.
- If INFINITI Communicator is activated when INFINITI Communicator system's cellular phone is in use, the current phone transmission will be cut and INFINITI Communicator will dial the Communicator Response Center. The cellular handset will be disabled, and communication with the Communicator Response Center operator will be carried out through the hands-free microphone.
- After communication with Communicator Response Center is finished, the handset last number memory will be erased.
- While INFINITI Communicator is activated, the handset becomes inoperative and all communication with the operator is accomplished via the hands-free phone. When an activation is terminated, the handset will be unlocked.



TEL SWITCH

NBEL0180S11

When any of the TEL switches is pressed, the TEL switch which is combined with the multiplex transmitting unit sends operational commands to the IVCS unit. TEL switch has following three functions.

- Volume adjust
- Placing re-dial call
- Placing memorized call (The telephone numbers are stored in the handset. A maximum of 6 memories are operative.)

VOLUME Switch

NBEL0180S1103

Voice volume from the front RH speaker can be adjusted by using the VOLUME switch.

SEND/END Switch Operation

NBEL0180S1101

- When a call is received, press SEND/END switch to permit conversation.
- At the completion of the conversation, press the SEND/END switch to terminate the call.
- To re-dial the last phone number, press SEND/END switch.

MEMORY Switch Operation

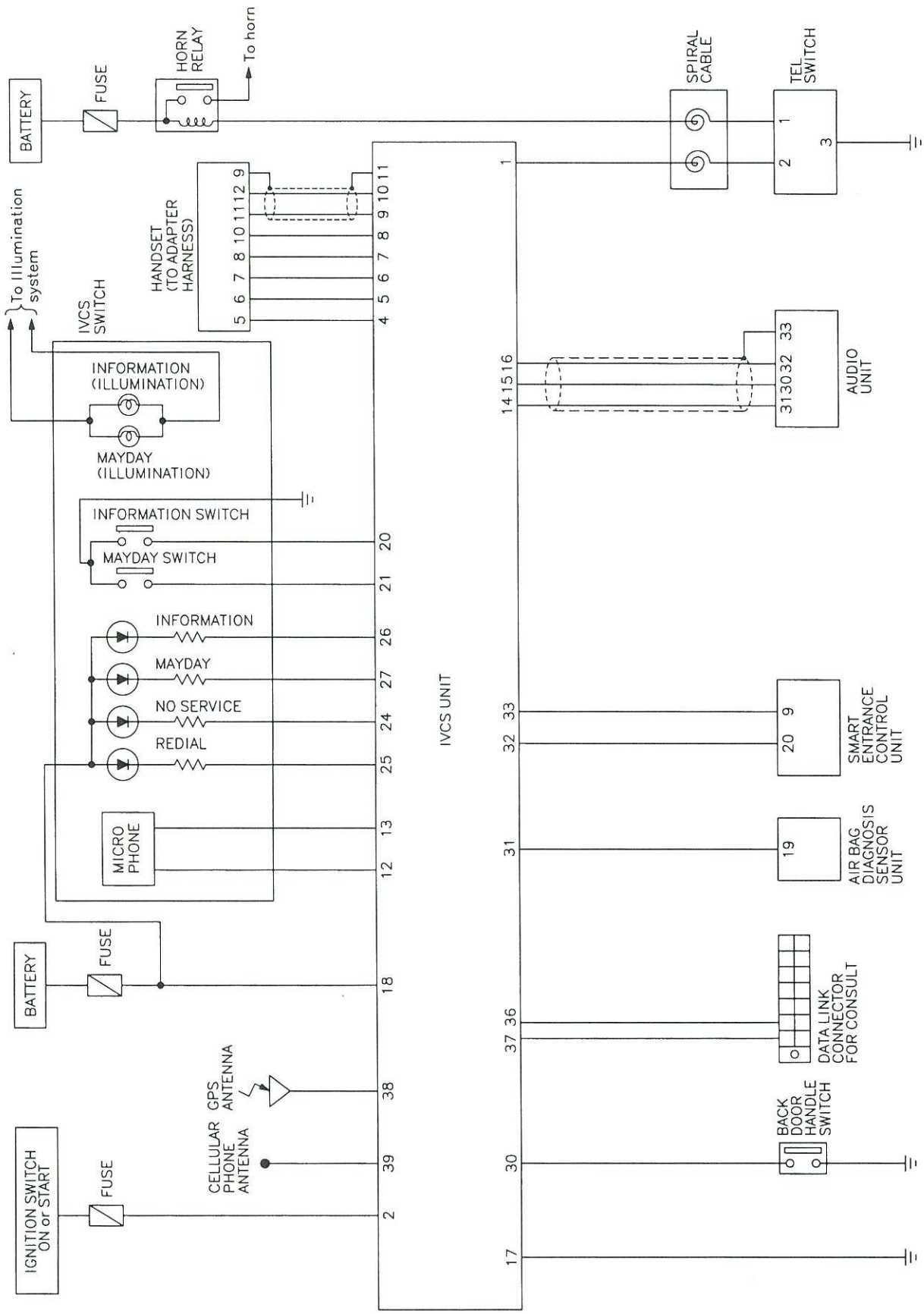
NBEL0180S1102

- A maximum of 6 telephone numbers which stored in the memory of the handset can be dialed by MEMORY switch operation.
- The last phone number is erased if the ignition switch is turned off or if the INFINITI Communicator system has been activated.
- For the procedure to input telephone numbers, refer to the handset operation manual.
- To select memory 1 to 6, push MEMORY switch A or B. Every push on the switch changes the memory as follows.
  SWITCH A: Memory 1 → 2 → 3 → OFF
  SWITCH B: Memory 4 → 5 → 6 → OFF
  After selecting memory, push SEND/END switch to make a call.

NOTE:
Memory switches are not functional unless handset is installed.

Schematic

NBEL0181

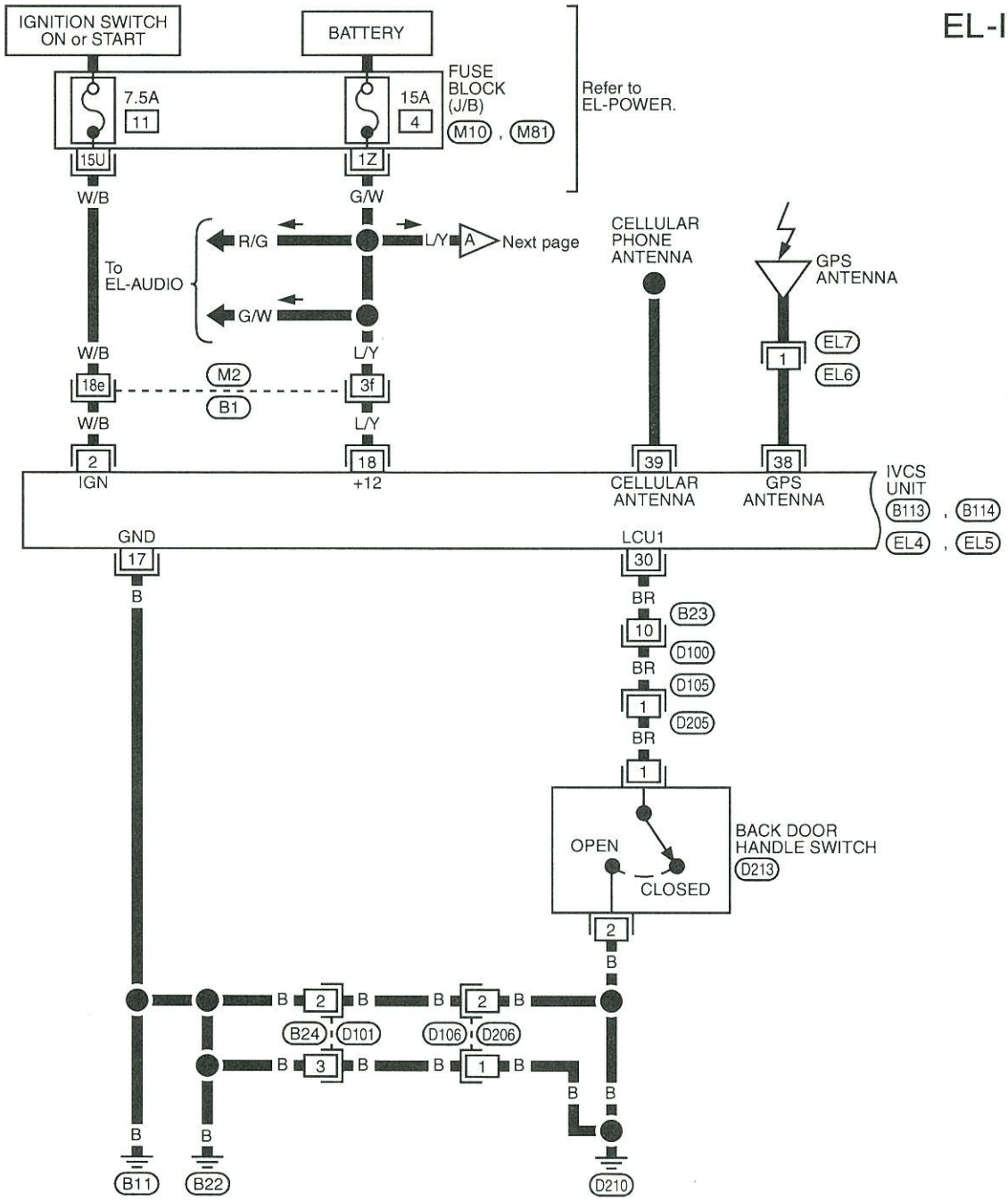


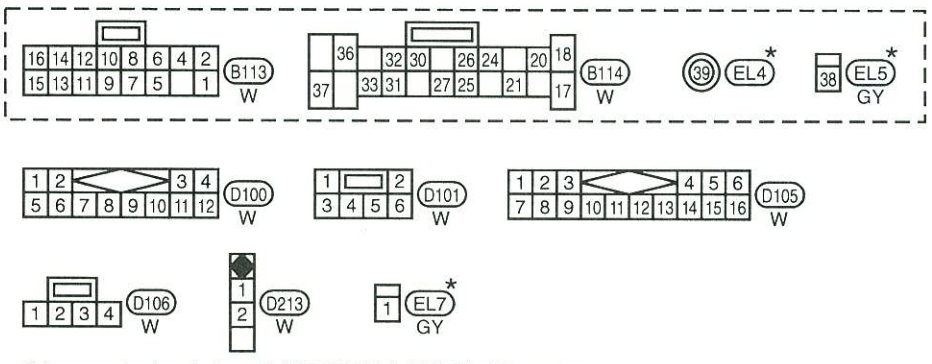
MEL831J

Wiring Diagram — IVCS —

NBEL0182

EL-IVCS-01





∗ : This connector is not shown in "HARNESS LAYOUT" of EL section.

Refer to last page (Foldout page).

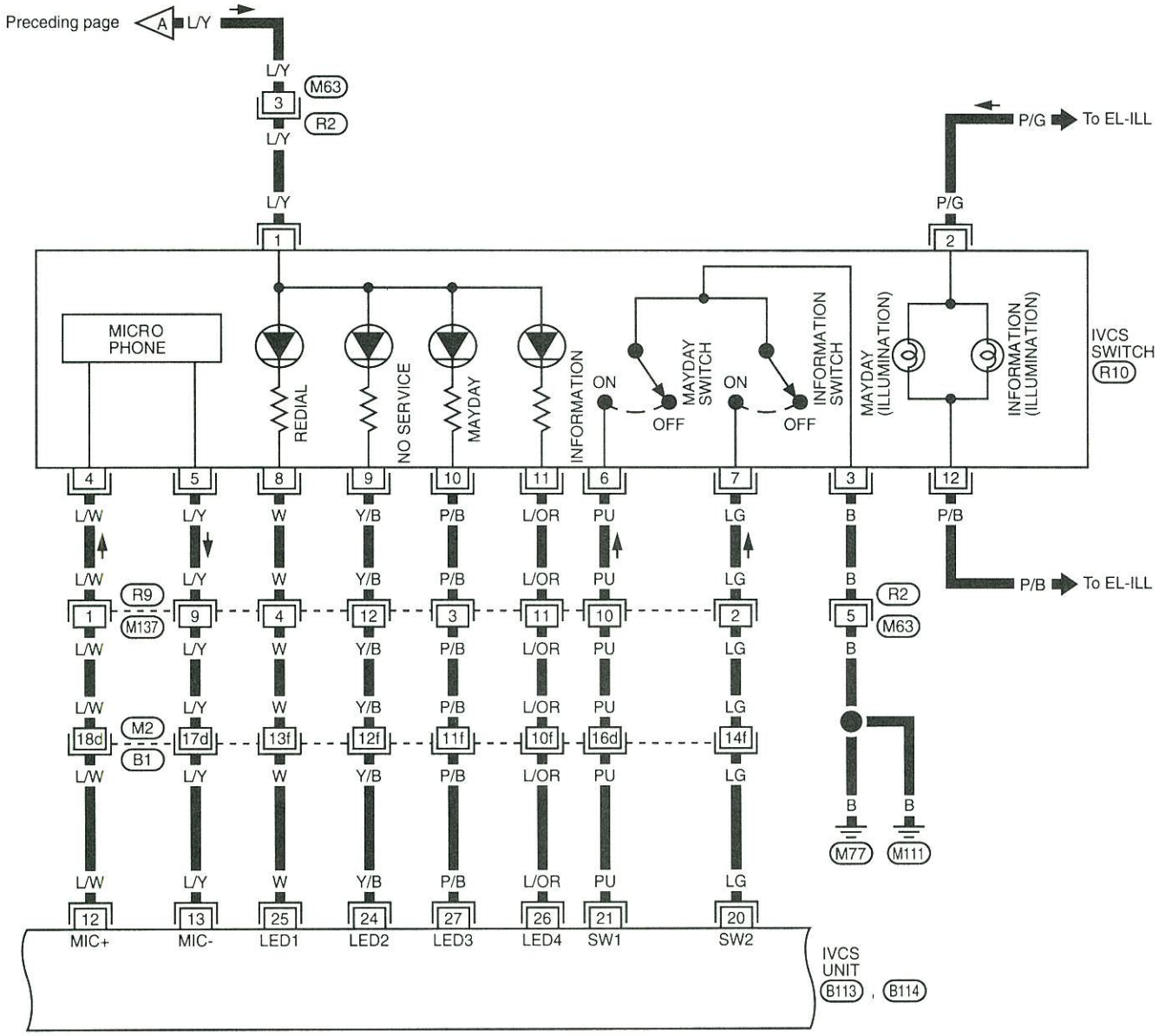
M2 , B1

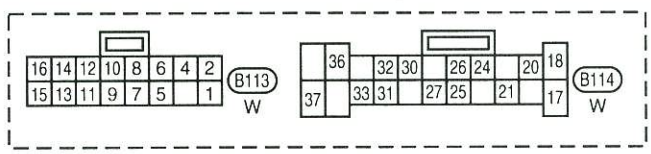
M10

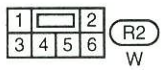
M81

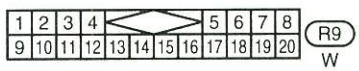
MEL832J

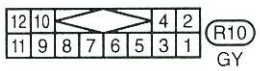
EL-IVCS-02







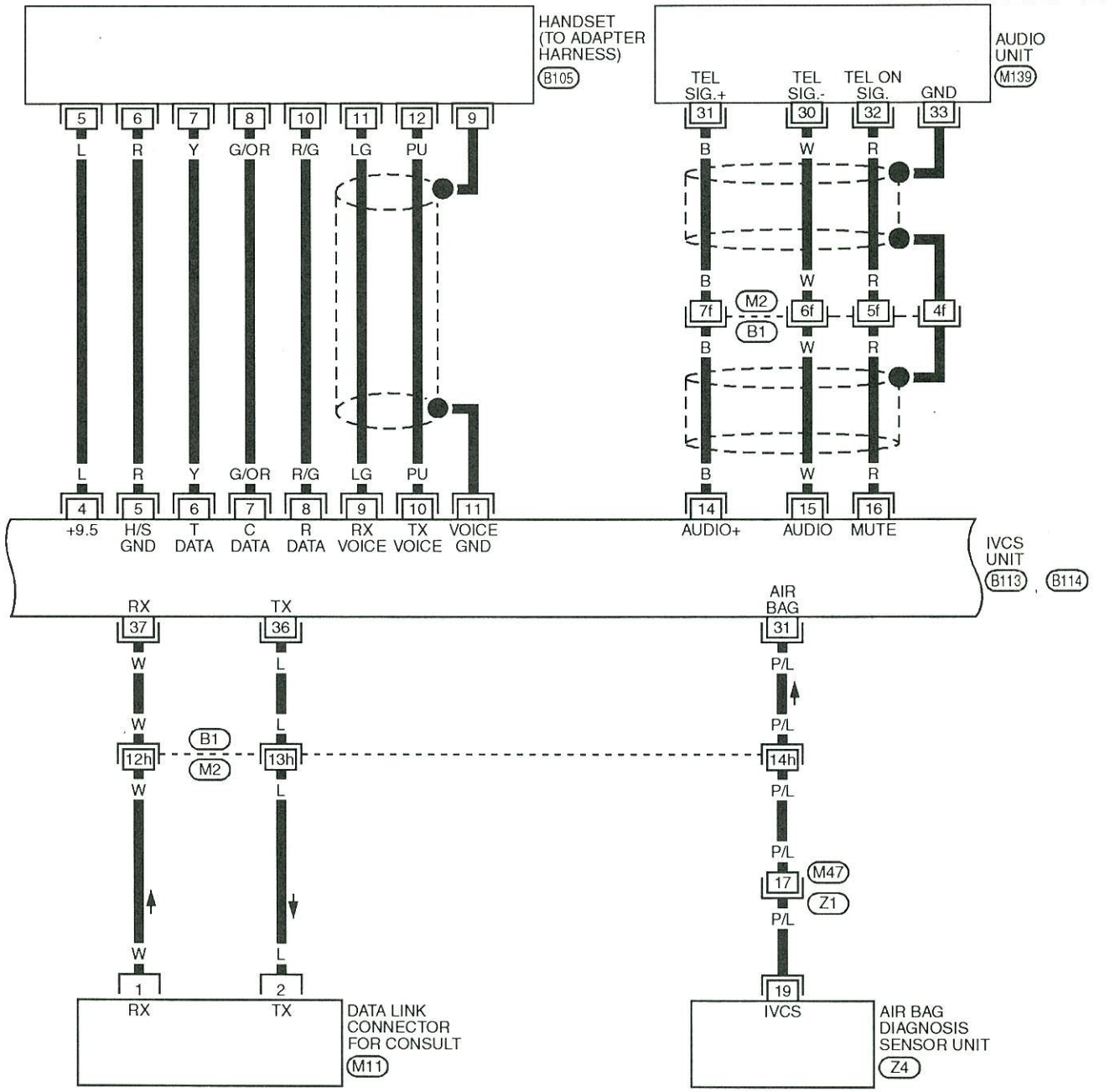


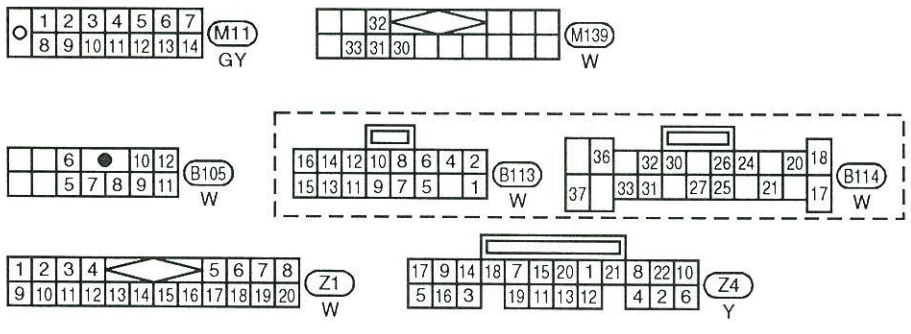


Refer to last page (Foldout page).
M2 , B1

MEL833J

EL-IVCS-03

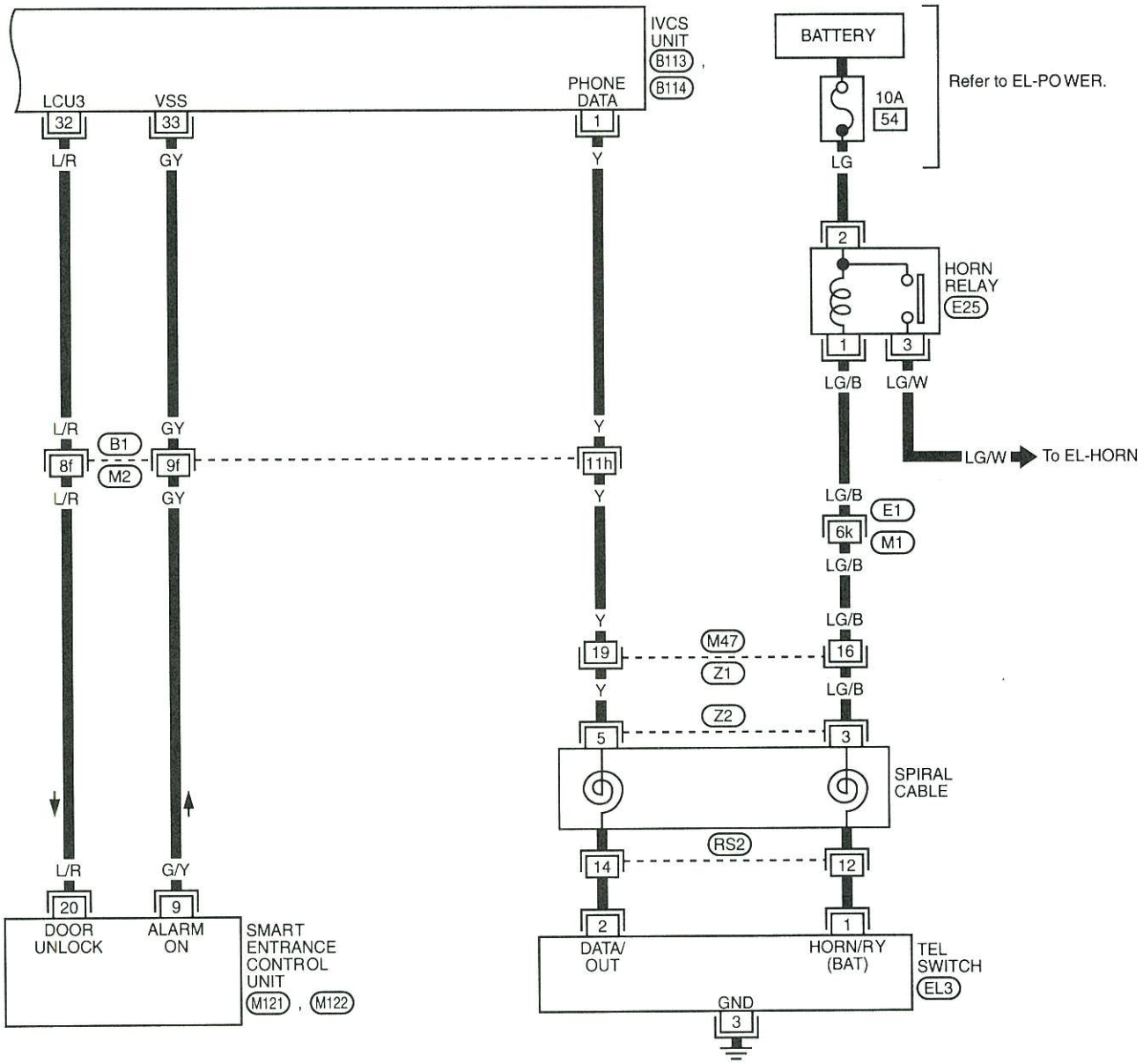


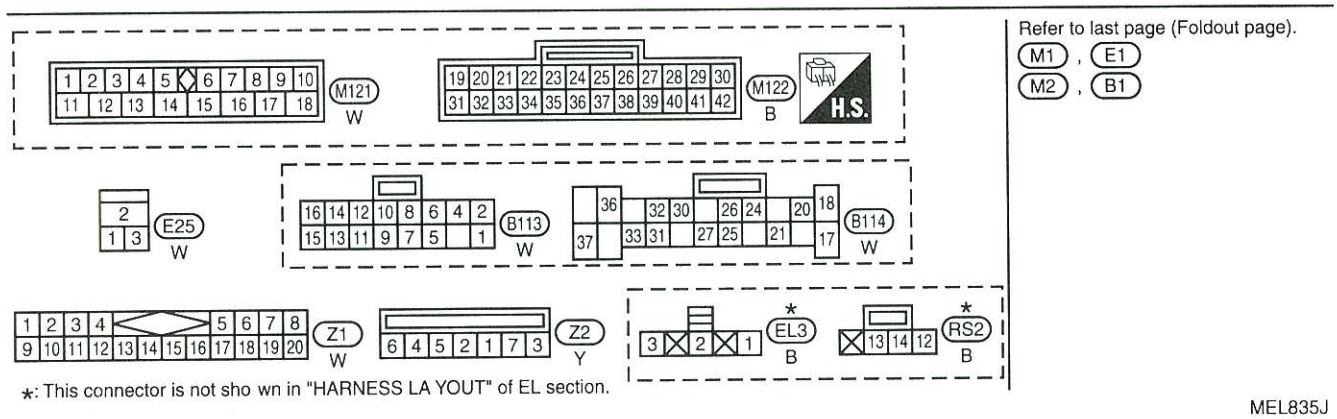


Refer to last page (Foldout page).
(M2) , (B1)

MEL834J

EL-IVCS-04

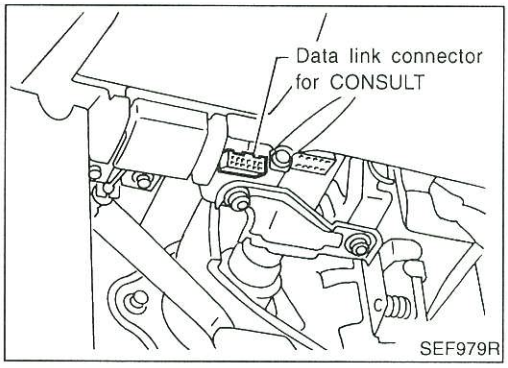




Refer to last page (Foldout page).
M1, E1
M2, B1

★: This connector is not sho wn in "HARNESS LA YOUT" of EL section.

MEL835J



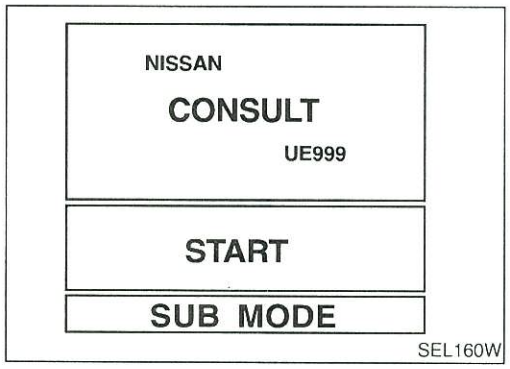
CONSULT

NBEL0183

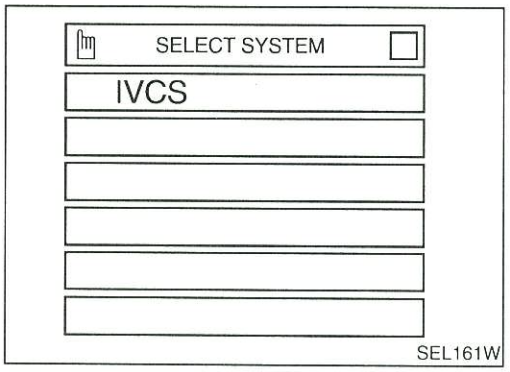
CONSULT INSPECTION PROCEDURE

NBEL0183S01

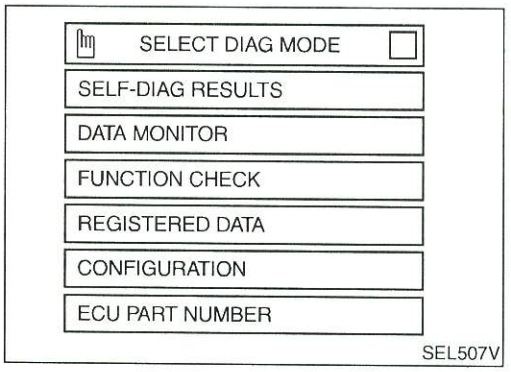
1. Turn ignition switch "OFF".
2. Connect "CONSULT" to the data link connector.



3. Insert UE999 program card in to CONSULT.
4. Turn ignition switch "ON".
5. Touch "START".



6. Touch "IVCS".



7. Perform each diagnostic item according to the item application chart as follows:

8. When CONSULT inspection is terminated, follow the procedure shown below.

a. Touch "BACK" key of CONSULT until "SELECT SYSTEM" appears, then turn off CONSULT.
b. Turn ignition switch to OFF position.
c. Disconnect CONSULT DDL connector.

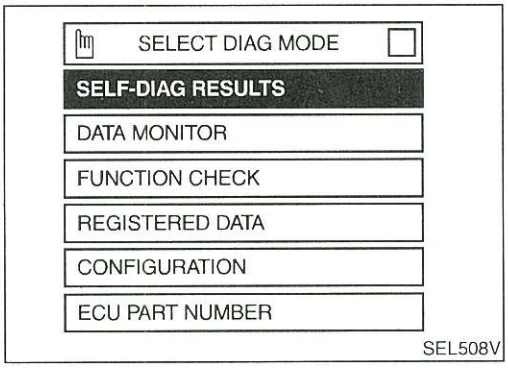
NOTE:
If the DDL connector is disconnected before turning ignition switch to "OFF" position, INFINITI communicator may not operate properly.

APPLICATION ITEMS

NBEL0183S02

Mode	Description	Reference page
SELF DIAG RESULTS	Displays the result of self-diagnosis.	EL-289
DATA MONITOR	Two modes, "GPS MONITOR" and "SWITCH MONITOR" can be selected in this mode. • Displays current data related to GPS in "GPS MONITOR" mode. • Displays IVCS switch and outside door handle switch condition in "SWITCH MONITOR" mode.	EL-291
FUNCTION CHECK	In this mode, "Remote door unlock function" can be checked using CONSULT. Door can be unlocked according to the commands to the smart entrance control unit by the IVCS unit. This check verifies communication circuit between smart entrance control unit and IVCS unit.	EL-299
REGISTERED DATA	Displays the following data registered in the IVCS unit. In this mode the data cannot be re-written. • Unit ID • Cellular phone number • VIN (Vehicle Identification Number)	EL-292
CONFIGURATION (See Note.)	In this mode, the system can be set up in the demonstration mode to confirm system operation.	EL-304
	Various data related to both the Communicator Response Center contract and cellular provider can be written/updated in this mode. • Phone number • NAM (Number Assignment Module) • Stolen vehicle tracking setting (Default should always be on.) • Alarm notification setting (Default should always be on.)	EL-306
ECU PART NUMBER	Displays the part number of the IVCS unit.	—

NOTE:
Data must not be rewritten without prior approval from the customer.



SEL508V

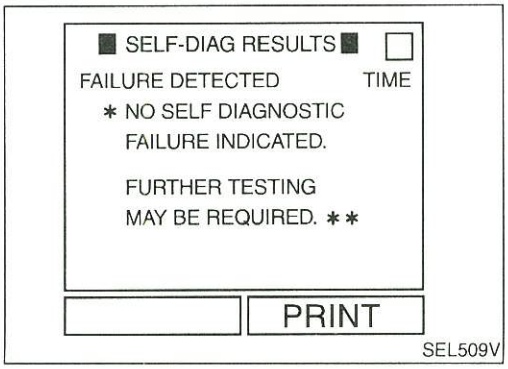
"SELF-DIAG RESULTS" MODE

NBEL0183S03

How to Perform Self-diagnosis

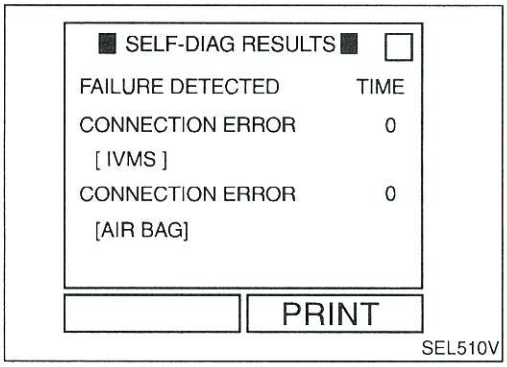
NBEL0183S0301

1. Touch "SELF-DIAG RESULTS".
2. Touch "START".



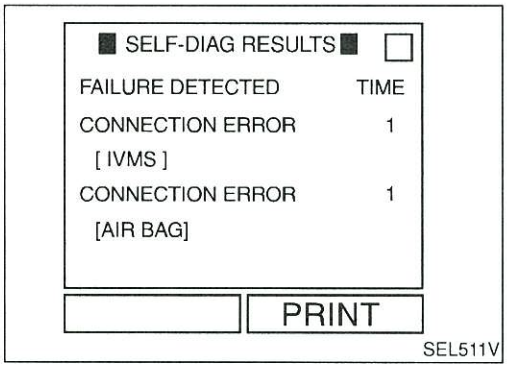
SEL509V

3. If no malfunction is detected, CONSULT will show "NO FAILURE".



- If trouble codes are displayed with "TIME = 0", repair/replace the system according to "SYMPTOM CHART 1 (SELF-DIAGNOSIS ITEM)", EL-294.
- In this case, both "MAYDAY" and "INFORMATION" indicator lamps illuminate for more than 30 seconds while the ignition switch is in the ON position.

NOTE:
The time data in CONSULT "SELF-DIAG RESULTS" mode displays the number of ignition switch cycles without the same malfunctioning occurring.



- If trouble codes are displayed with "TIME = 1 or greater", it means that the trouble code is historical data. So no further diagnosis is required.

NOTE:
If trouble codes are displayed with "TIME = 1 or greater" even though the INFINITI Communicator has never been serviced. Intermittent incidents may occur. Check the system, refer to "Trouble Diagnoses for Intermittent Incident", EL-302.

- If the system does not detect any trouble, the IVCS indicators will turn off after bulb check (self-diagnosis) is completed while the ignition switch is in the ON position.

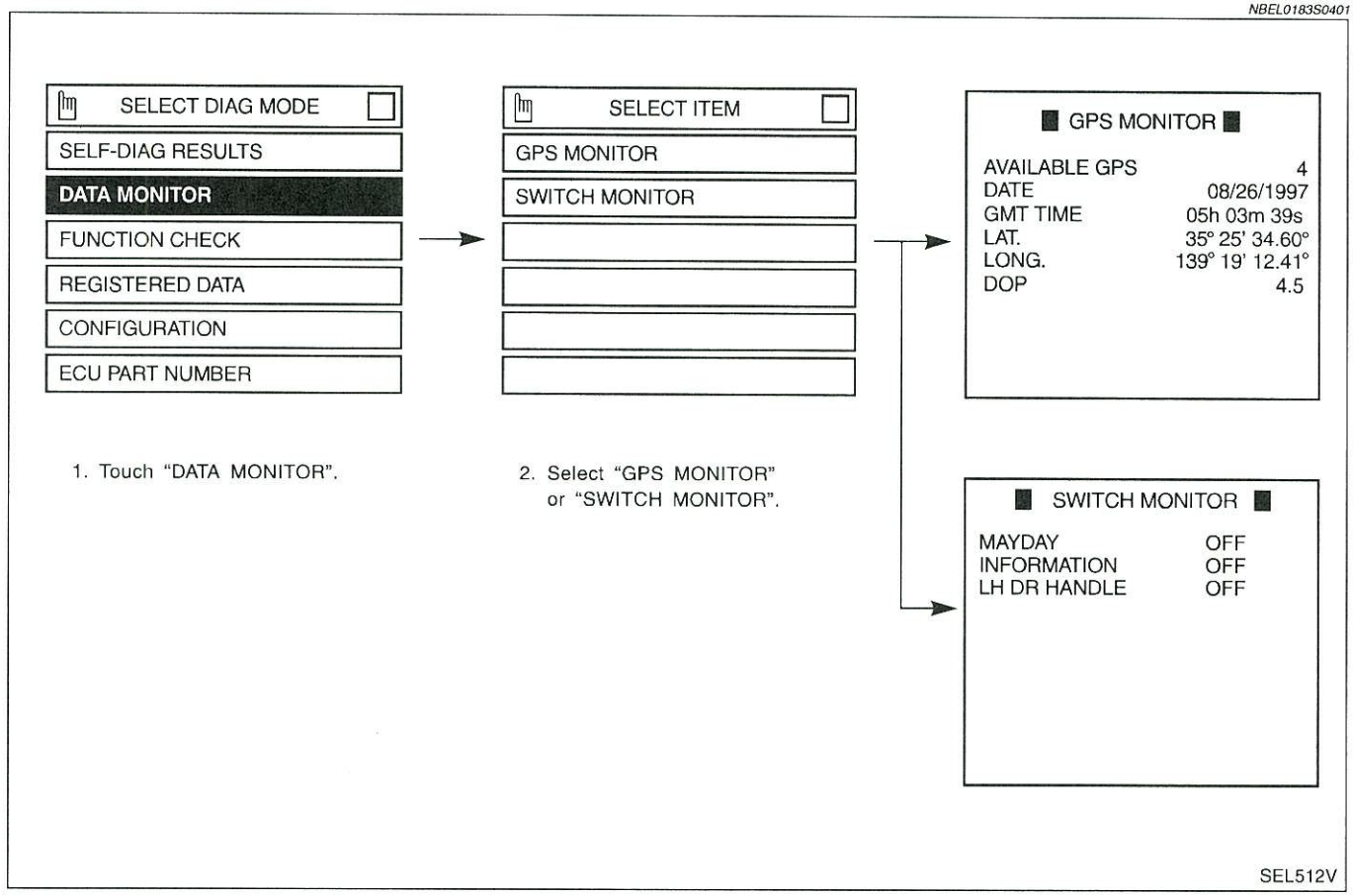
NOTE:
- **The trouble codes cannot be erased by CONSULT.**
- **After 50 ignition cycles, the trouble codes are no longer displayed in the CONSULT " SELF-DIAG RESULTS" mode.**
- **The IVCS unit does not count the ignition switch cycles unless the ignition switch is OFF for more than 3 minutes between each ignition switch cycle.**

"DATA MONITOR" MODE

How to Perform Data Monitor

NBEL0183S04

NBEL0183S0401

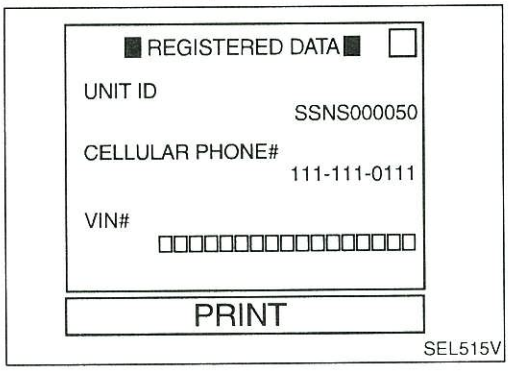


Data Monitor Item Chart

NBEL0183S0402

Mode	Monitor item	Description
GPS MONITOR	AVAILABLE GPS	The number of GPS satellites captured by GPS antenna
	DATE	Date of Greenwich mean time
	GMT TIME	Greenwich mean time (Different from local time)
	LAT.	Latitude
	LONG.	Longitude
	DOP	Index of precision (an index of location status of GPS satellites. The smaller the value is, the higher the positioning precision is.)
SWITCH MONITOR	MAYDAY	"MAYDAY" emergency switch condition
	INFORMATION	"INFORMATION" switch condition
	LH DR HANDLE	Back door handle switch condition

CONSULT (Cont'd)



"REGISTERED DATA" MODE

NBEL0183S05

Item	Description
UNIT ID	ID number of the IVCS unit. ID number is unique to each unit and differs for each unit.
CELLULAR PHONE #	—
VIN #	Vehicle Identification Number. When the IVCS unit is replaced, VIN # is written in the memory of the replaced unit by transmitting data from the Communicator Response Center.

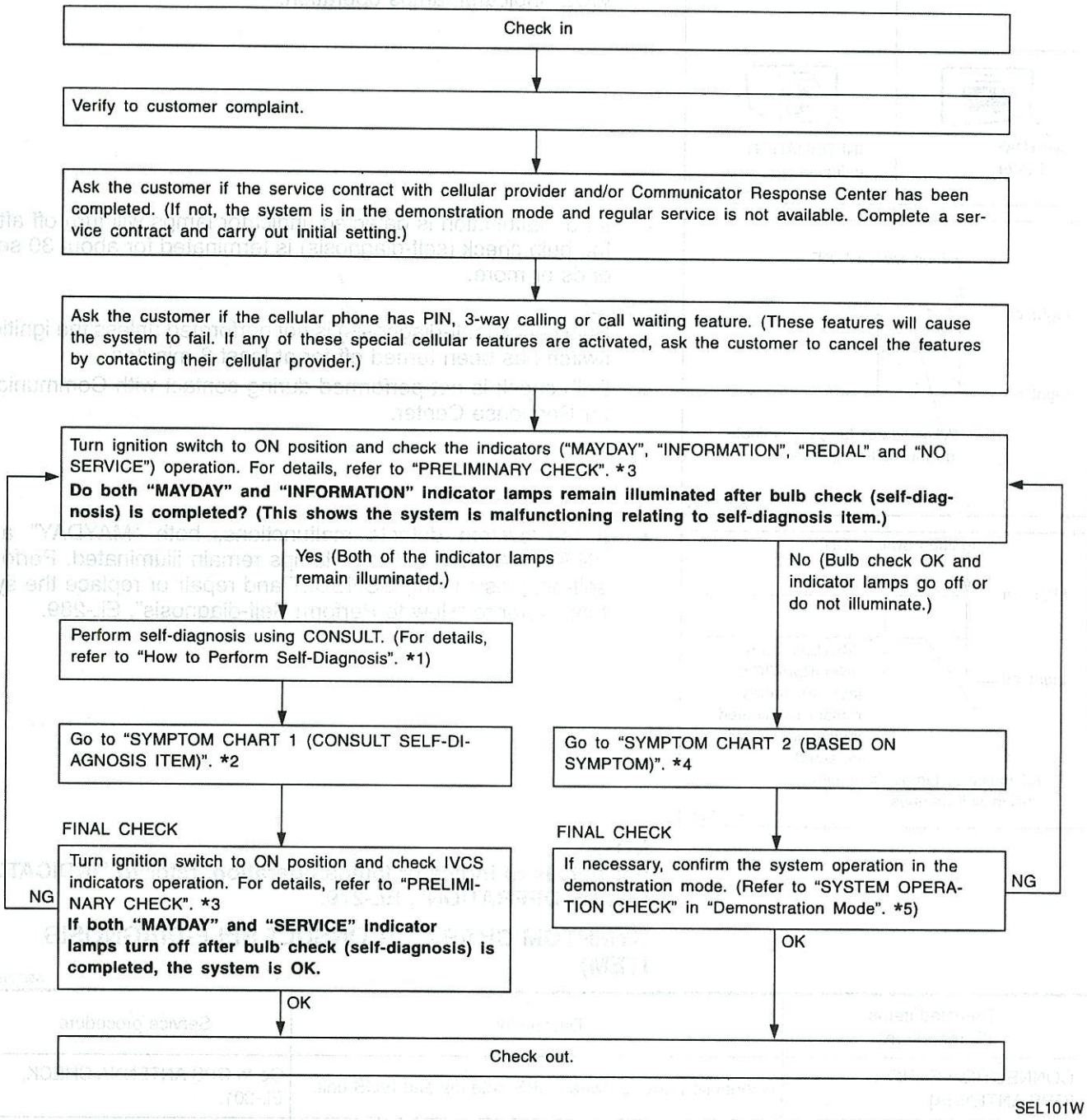
NOTE:
No data can be changed in this CONSULT mode.

Trouble Diagnoses

WORK FLOW

NBEL0184

NBEL0184S01

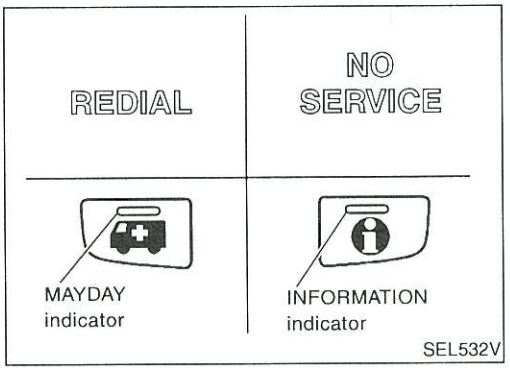


SEL101W

*1 EL-289
*2 EL-294
*3 EL-294
*4 EL-295
*5 EL-304

WARNING:

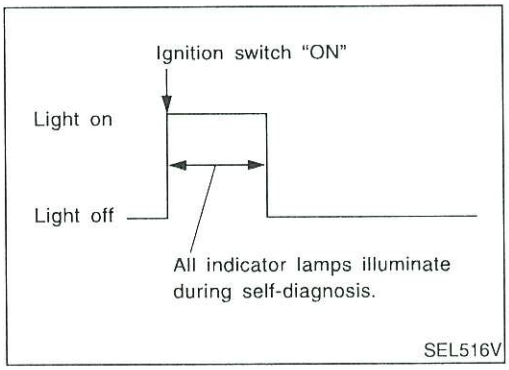
- **Whenever possible, set the system to "Demonstration mode" if INFINITI Communicator system needs to be activated during service procedures. (For details of the demonstration mode, refer to EL-304.)**
- **If you activate the INFINITI Communicator system (when the system is not in the demonstration mode), the Communicator Response Center operator may dispatch police.**



PRELIMINARY CHECK

NBEL0184S02

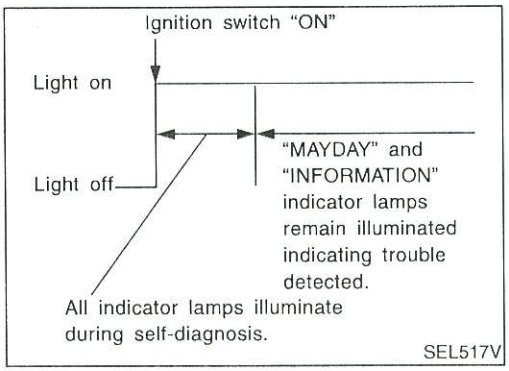
1. Turn ignition switch ON.
2. Check "MAYDAY", "INFORMATION", "REDIAL" and "NO SERVICE" indicator lamps operation.



- If no malfunction is detected, indicator lamps will turn off after the bulb check (self-diagnosis) is terminated for about 30 seconds or more.

NOTE:

- Bulb check (self-diagnosis) is not performed unless the ignition switch has been turned off for at least 3 minutes.
- Bulb check is not performed during contact with Communicator Response Center.



- If the system detects malfunctions, both "MAYDAY" and "INFORMATION" indicator lamps remain illuminated. Perform self-diagnosis using CONSULT and repair or replace the system. Refer to "How to Perform Self-diagnosis", EL-289.

NOTE:
For details of indicator lamps operation, refer to "INDICATOR LAMPS OPERATION", EL-279.

SYMPTOM CHART 1 (CONSULT SELF-DIAGNOSIS ITEM)

NBEL0184S03

Detected items (Screen items)	Description	Service procedure
CONNECTION ERROR [GPS ANTENNA]	Connection error between GPS antenna and IVCS unit.	Go to GPS ANTENNA CHECK, EL-301.
CELLULAR PHONE [TWB ERROR]	Communication error between CPU in the IVCS unit and transceiver	Replace IVCS unit.
MEMORY ERROR	Inner memory error of the IVCS unit	Replace IVCS unit.
CONNECTION ERROR [AIR BAG]	Connection error between air bag diagnosis sensor unit and IVCS unit.	Go to AIR BAG DIAGNOSIS SENSOR COMMUNICATION CHECK, EL-301.
CONNECTION ERROR [IVMS]	Connection error between smart entrance control unit and IVCS unit. If this error occurs, alarm notification and auto door unlock may not operate.	Go to SMART ENTRANCE CONTROL UNIT COMMUNICATION CHECK, EL-301.

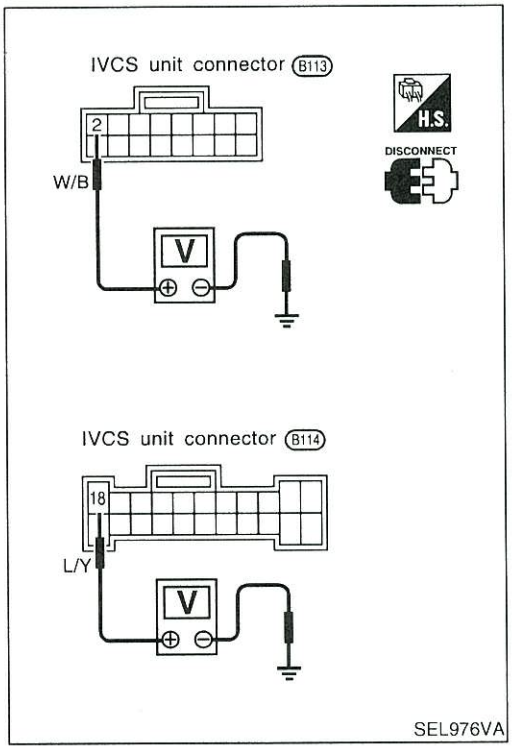
NOTE:
After replacing IVCS unit, set up the replaced IVCS unit. Refer to "System Setting (When IVCS Unit is Replaced.)" in EL-306.

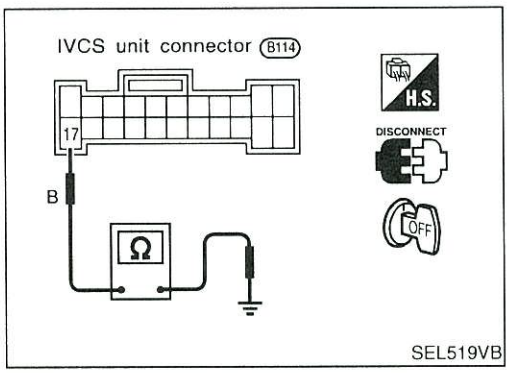
SYMPTOM CHART 2 (BASED ON SYMPTOM)

NBEL0184S04

Before referencing this chart, confirm the operation of the indicator lamps. Refer to "PRELIMINARY CHECK" in EL-294. If the indicators show the system is malfunctioning, perform the self-diagnosis using CONSULT.

Symptom	Diagnoses/service procedure	Reference page
"MAYDAY", "INFORMATION", "RE-DIAL", "NO SERVICE" indicator lamps do not illuminate when ignition switch is turned to ON position. (Bulb check is NG.)	1. Power supply and ground circuit for IVCS unit check	EL-296
	2. Indicator lamps check	EL-297
Mayday/Information call does not operate.	1. IVCS switch check	EL-298
	2. INFINITI Communicator operation check in demonstration mode	EL-304
Remote door unlocking function does not operate.	1. Back door handle switch check	EL-299
	2. Remote door unlock function check	EL-299
	3. INFINITI Communicator operation check in demonstration mode	EL-304
Stolen vehicle tracking function does not operate.	1. Stolen vehicle tracking setting check (Check whether the function is disabled or not.)	EL-300
	2. INFINITI Communicator operation check in demonstration mode	EL-304
Alarm notification function does not operate.	1. Alarm notification setting check (Check whether the function is disabled or not.)	EL-300
	2. INFINITI Communicator operation check in demonstration mode	EL-304
Hands free telephone cannot be operated by using steering switch. (Cellular phone operates properly by using handset.)	1. Telephone steering switch check	EL-302
No sounds related to the telephone are heard from Front RH speaker. (If the audio does not operate properly, check the audio system.)	1. Check harness for open or short between IVCS unit and audio unit.	—
The "NO SERVICE" indicator lamp is not turned off. (Even if a contract with telephone carrier has not been made, the indicator lamp remains illuminated.)	1. Make sure the vehicle is in an area with cellular service.	—
	2. Check cellular phone antenna feeder cable connection.	—
Cellular phone does not operate properly.	1. Check hand set connector connection.	—
	2. Check hand set.	—
No sound is transmitted to the other party by hands free telephone.	1. Check harness for open or short between IVCS unit and microphone.	—
	2. Replace microphone. (IVCS switch assembly)	—





POWER SUPPLY AND GROUND CIRCUIT FOR IVCS UNIT CHECK

NBEL0184S05

Main Power Supply Circuit Check

NBEL0184S0501

Terminal		Ignition switch		
(+)	(–)	OFF	ACC	ON
18	Ground	Battery voltage	Battery voltage	Battery voltage
2	Ground	0V	0V	Battery voltage

If NG, check the following:

- 15A fuse [No. 4, located in fuse and fusible link box]
- 7.5A fuse [No. 11, located in fuse block (J/B)]
- Harness for open or short between fuse and IVCS unit

Ground Circuit Check

NBEL0184S0502

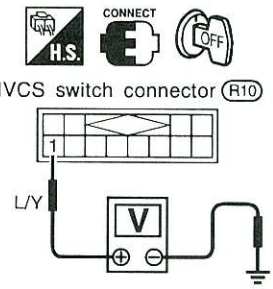
Terminals	Continuity
17 - Ground	Yes

INDICATOR LAMPS CHECK

=NBEL0184S06

1	CHECK POWER SUPPLY FOR INDICATOR LAMPS

Check voltage between IVCS switch terminal 1 and ground.



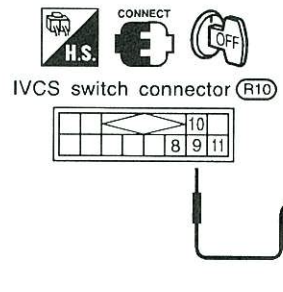
SEL102W

Does battery voltage exist?

Yes	▶	GO TO 2.
No	▶	**Check the following.** • 15A fuse [No. 4, located in fuse block (J/B)] • Harness for open or short between fuse and IVCS switch

2	CHECK INDICATOR LAMPS

1. Disconnect IVCS unit connector (Control unit connector).
2. Apply ground to IVCS switch each terminal and check illumination.



SEL103W

Indicator	Terminal
REDIAL	8
NO SERVICE	9
MAYDAY	10
INFORMATION	11

MTBL0259

OK or NG

OK	▶	Check harness for open or short between indicators and IVCS unit.
NG	▶	Replace IVCS switch assembly.

IVCS SWITCH CHECK

=NBEL0184S07

1	CHECK IVCS SWITCH INPUT SIGNAL

1. Turn ignition switch "ON".
2. Select "SWITCH MONITOR" in "DATA MONITOR" mode.
3. Check each switch signal.

Condition:

When MAYDAY/INFORMATION switch is pushed:
MAYDAY/INFORMATION ON

When MAYDAY/INFORMATION switch is released:
MAYDAY/INFORMATION OFF

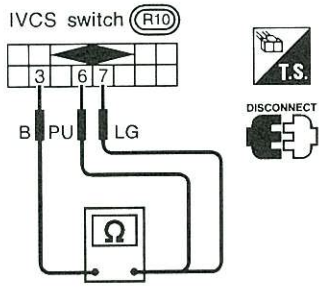
NOTE:
When CONSULT "DATA MONITOR" mode is operating, INFINITI Communicator does not dial to Communicator Response Center when the switches are operated.

OK or NG

OK	▶	IVCS switch is OK.
NG	▶	GO TO 2.

2	CHECK IVCS SWITCH.

1. Disconnect IVCS switch.
2. Check continuity between IVCS switch terminals.



SEL104W

Terminals	Condition	Continuity
6 - 3	Mayday switch is turned ON.	Yes
	Mayday switch is OFF.	No
7 - 3	Information switch is turned ON.	Yes
	Information switch is OFF.	No

MTBL0260

OK or NG

OK	▶	**Check the following.** • IVCS switch ground circuit • Harness for open or short between IVCS switch and IVCS unit
NG	▶	Replace IVCS switch assembly.

BACK DOOR HANDLE SWITCH CHECK

=NBEL0184S08

1	CHECK BACK DOOR HANDLE SWITCH INPUT SIGNAL

1. Turn ignition switch ON.
2. Select "SWITCH MONITOR" in "DATA MONITOR" mode.
3. Check the switch operation.

Condition:

When back door handle switch is pushed:
LH DR HANDLE ON

When back door handle switch is released:
LH DR HANDLE OFF

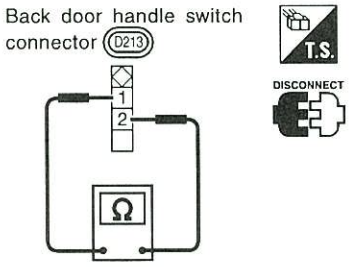
NOTE:
When CONSULT "DATA MONITOR" mode is operating, INFINITI Communicator does not dial to Communicator Response Center when the switches are operated.

OK or NG

OK ▶	Back door handle switch is OK.
NG ▶	GO TO 2.

2	CHECK BACK DOOR HANDLE SWITCH

1. Disconnect back door handle switch connector.
2. Check continuity between back door handle switch terminals 1 and 2.



SEL105W

Back door handle switch condition	Continuity
Pulled	Yes
Released	No

MTBL0261

OK or NG

OK ▶	**Check the following.** • Back door handle switch ground circuit • Harness for open or short between back door handle switch and IVCS unit
NG ▶	Replace back door handle switch.

REMOTE DOOR UNLOCK FUNCTION CHECK (CONSULT "FUNCTION CHECK" MODE)

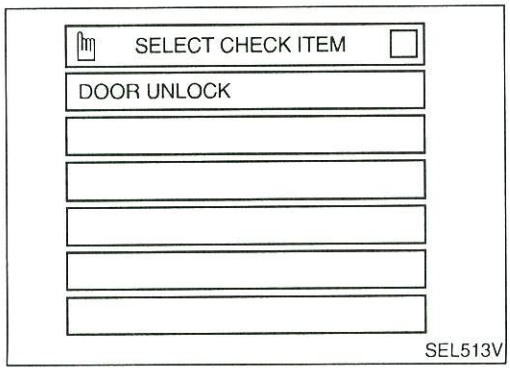
NBEL0184S09

Description

NBEL0184S0901

"Remote door unlock function" can be checked using CONSULT. Driver side door can be unlocked according to the commands to the smart entrance control unit by the IVCS unit.

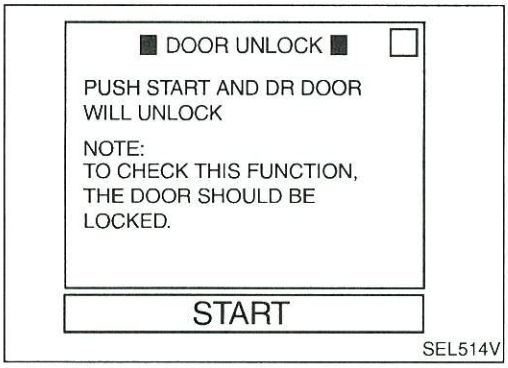
NOTE:
Before performing the function check, confirm that power door lock system operates properly.



SEL513V

How to perform function check.

1. Lock the doors with door lock/unlock switch on driver's door trim.
2. Touch "FUNCTION CHECK".
3. Touch "DOOR UNLOCK".



4. Touch "START". Then driver side door will be unlocked.

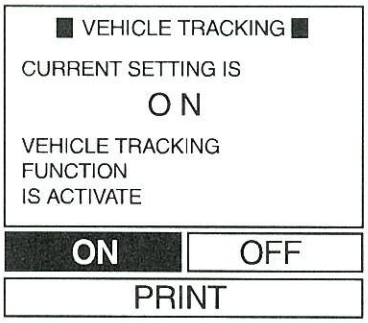
- If the door cannot be unlocked using CONSULT, check harness for open or short between smart entrance control unit terminal 20 and IVCS unit terminal 32.

STOLEN VEHICLE TRACKING/ALARM NOTIFICATION SETTING CHECK (CONSULT "CONFIGURATION" MODE)

NBEL0184S10

1	CHECK SYSTEM SETTING

1. Turn ignition switch ON.
2. Select "VHCL TRACKING" or "ALARM NOTIFICATION" in "CONFIGURATION" mode.
3. Check the function setting.



- ON shows the function is activated.
- OFF shows the function is deactivated.

Does the system setting comply with the customer's contract?
NOTE:
Setting of "VEHICLE TRACKING" must be ON at all times.

OK or NG

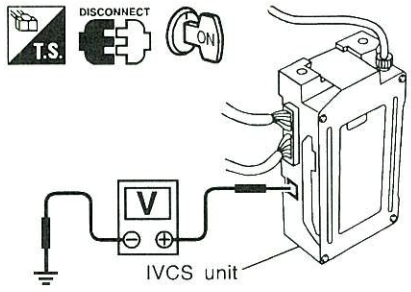
OK	▶	System setting is OK.
NG	▶	If either setting is OFF, contact the Communicator Response Center at 1-888-427-4812 to verify the system setting. **NOTE:** **Whenever dialing the above number, some information about the vehicle will be required by the operator. For details, refer to EL-273.**

GPS ANTENNA CHECK

=NBEL0184S11

1	CHECK VOLTAGE FOR GPS ANTENNA

1. Disconnect GPS feeder cable connector from IVCS unit.
2. Turn ignition switch ON.
3. Check voltage at IVCS unit GPS feeder cable terminal.



SEL106W

Does approx. 5V exist?

Yes	▶	Replace GPS antenna.
No	▶	Replace IVCS unit.

AIR BAG DIAGNOSES SENSOR UNIT COMMUNICATION CHECK

NBEL0184S12

1	AIR BAG OPERATION CHECK

Turn ignition switch ON and check air bag warning lamp operation. (For details, refer to RS section.)

Does air bag warning lamp operate properly?

Yes	▶	Check harness connector connection between air bag diagnosis sensor unit and IVCS unit.
No	▶	Check supplemental restraint system. Refer to RS section in the Service Manual.

SMART ENTRANCE CONTROL UNIT COMMUNICATION CHECK

NBEL0184S13

1	CHECK SMART ENTRANCE CONTROL UNIT OPERATION

Check the system related smart entrance control unit operation. (e.g.: power door lock, power window)

Does the system operate properly?

Yes	▶	Check harness for open or short between smart entrance control unit and IVCS unit.
No	▶	Check smart entrance control unit. Refer to "SMART ENTRANCE CONTROL UNIT" in the Service Manual.

TELEPHONE STEERING SWITCH CHECK

=NBEL0184S14

1	CHECK POWER SUPPLY FOR STEERING SWITCH
Check power supply for steering switch. **Does horn work?**	
Yes ▶	**Check the following.** • 10A fuse (No. 54, located in fuse and fusible link box) • Horn relay • Harness for open or short
No ▶	GO TO 2.

2	CHECK STEERING SWITCH SUB-HARNESS
1. Remove driver's air bag module. For removal procedure, refer to RS section. 2. Check steering switch sub-harness for open or short and ground screw. For details of the harness circuit, refer to "STEERING SWITCH", EL-22. **OK or NG**	
OK ▶	Check harness for open or short between telephone steering switch and IVCS unit. If the circuit is OK, replace telephone steering switch.
NG ▶	Replace or repair the harness.

Trouble Diagnoses for Intermittent Incident

NBEL0185

DESCRIPTION

NBEL0185S01

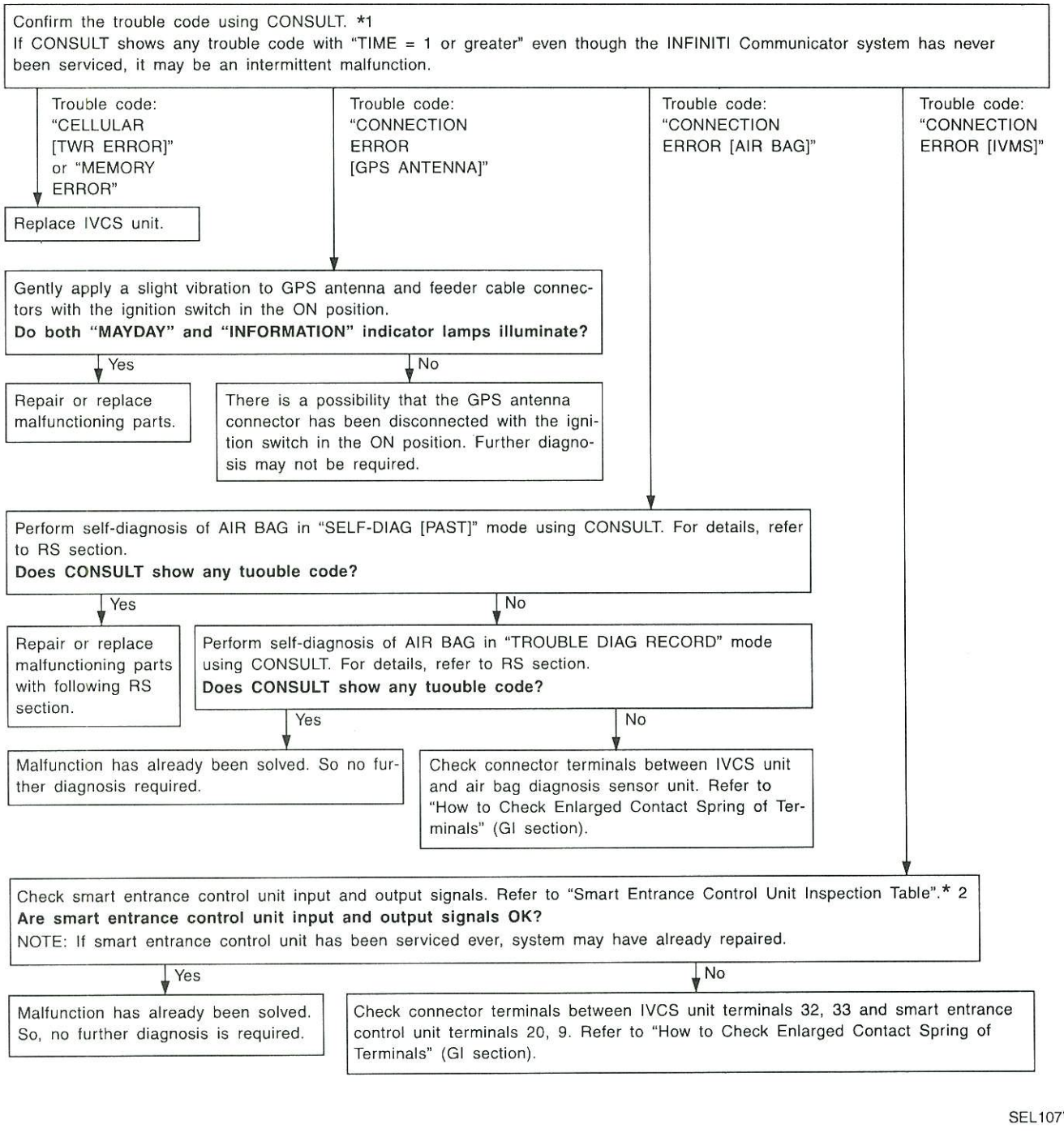
An intermittent incident may be occurring if all of the following conditions exist.

- Both "MAYDAY" emergency and "INFORMATION" indicators have shown that the system is malfunctioning.
- CONSULT self-diagnosis result screen indicates a trouble code with "TIME = 1 or greater".
- The INFINITI Communicator system has not been previously serviced.

To find out the cause of a malfunction, follow the procedures shown below.

DIAGNOSTIC PROCEDURE

NBEL0185S02



SEL107W

*1 EL-289 *2 EL-254

NOTE:
Enlarged spring contact of terminals may be cause of intermittent malfunction for "CONNECTION ERROR [AIR BAG]/[IVMS]". When you inspect terminals for enlarged contact, refer to "How to Check Enlarged Contact Spring of Terminals" in GI section.

Demonstration Mode

NBEL0186

DESCRIPTION

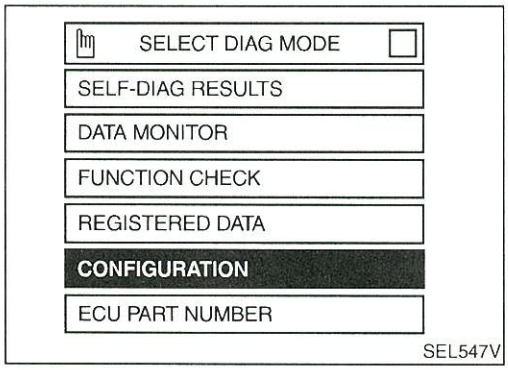
NBEL0186S01

By setting up the system in the demonstration mode, automatic dialing operation can be confirmed by "MAYDAY" emergency and "INFORMATION" switch operation.
Automatic dialing in this mode is connected to the demonstration center of Communicator Response Center, and is different from the normal service.
When the contract with Communicator Response Center is not concluded, all the INFINITI Communicator operations are connected to the demonstration center.
Connection to Communicator Response Center in this mode will not be charged by Communicator Response Center nor will the call be handled as an emergency.

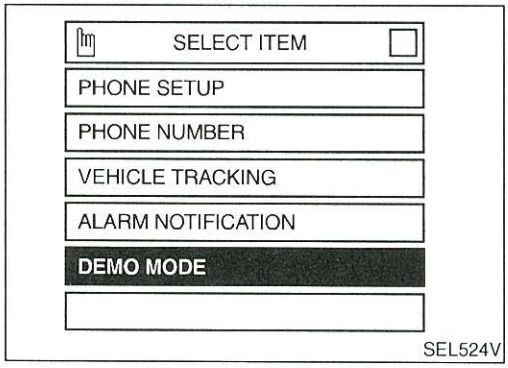
SYSTEM OPERATION CHECK

NBEL0186S02

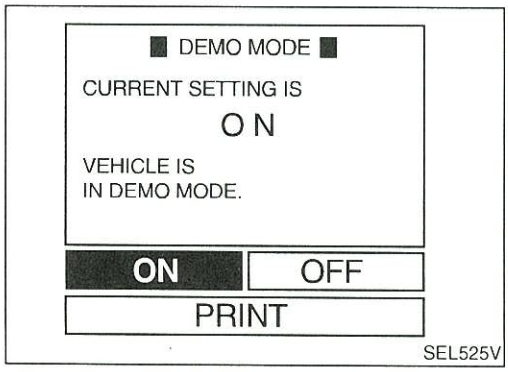
1. Touch "CONFIGURATION".

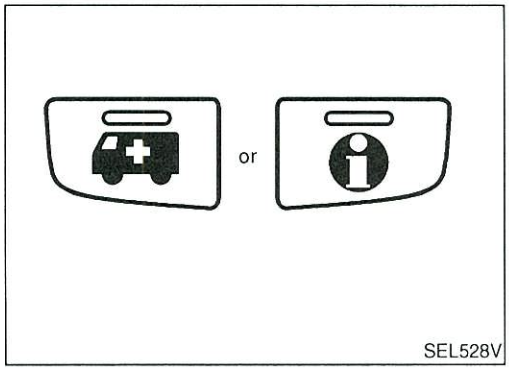


2. Touch "DEMO MODE".



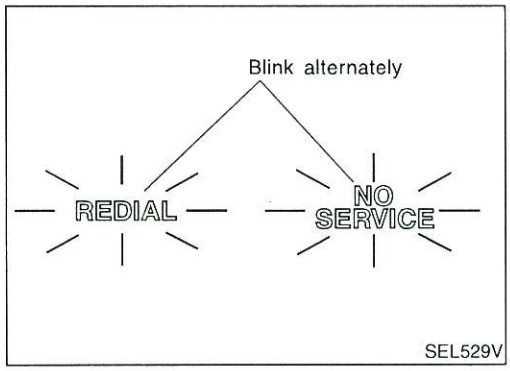
3. Touch "ON". Now, the system is in demonstration mode. (To return to normal mode, touch "OFF".)





SEL528V

4. Touch "BACK" key of CONSULT until "SELECT SYSTEM" appears, then turn off CONSULT.
5. Turn ignition switch to the OFF position.
6. Disconnect CONSULT DDL connector.
7. Start the engine.
8. Touch the "MAYDAY" or "INFORMATION" switches. Then the system will call the demonstration center.

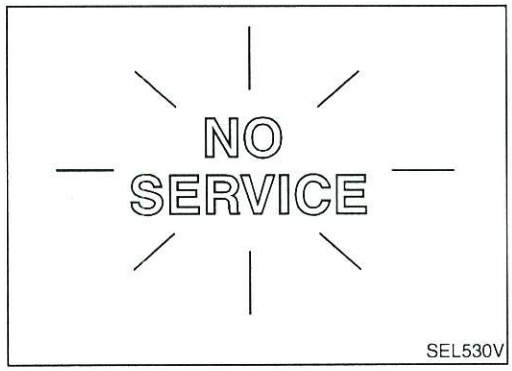


SEL529V

9. Check INFINITI Communicator operation.

- If contact with Communicator Response Center is successful, system is OK.

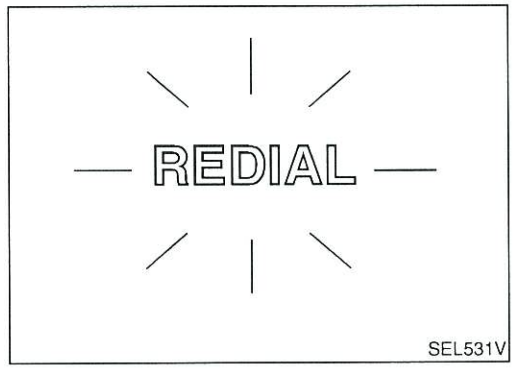
NOTE:
During the system contact to Communicator Response Center in demonstration mode, "REDIAL" and "NO SERVICE" indicators blink alternately.



SEL530V

- If "NO SERVICE" indicator illuminates and the contact to Communicator Response Center is unsuccessful, retry from other location where the cellular connection seems good. (e.g.; move the vehicle outside of the workshop and retry.)

NOTE:
If "NO SERVICE" indicator frequently illuminates from a location where the cellular connection seems good, check the connection of the feeder cable for the cellular phone antenna.



SEL531V

- If "REDIAL" indicator lamp illuminates and the contact to Communicator Response Center is unsuccessful, the cellular network is busy or there are no open cellular channels. The system will redial automatically.

NOTE:
If redial fails several times, confirm whether the roaming agreement of customer's cellular provider at the vehicle location is available or not.

WARNING:

- **Make sure to turn the demonstration mode OFF before returning the vehicle to the owner.**
- **In the demonstration mode, any service from Communicator Response Center is not available. Therefore, even if the customer encounters an emergency, no service will be dispatched.**

System Setting (When IVCS Unit is Replaced)

NBEL0187

DESCRIPTION

NBEL0187S01

When the IVCS unit is replaced, carry out the following data settings.

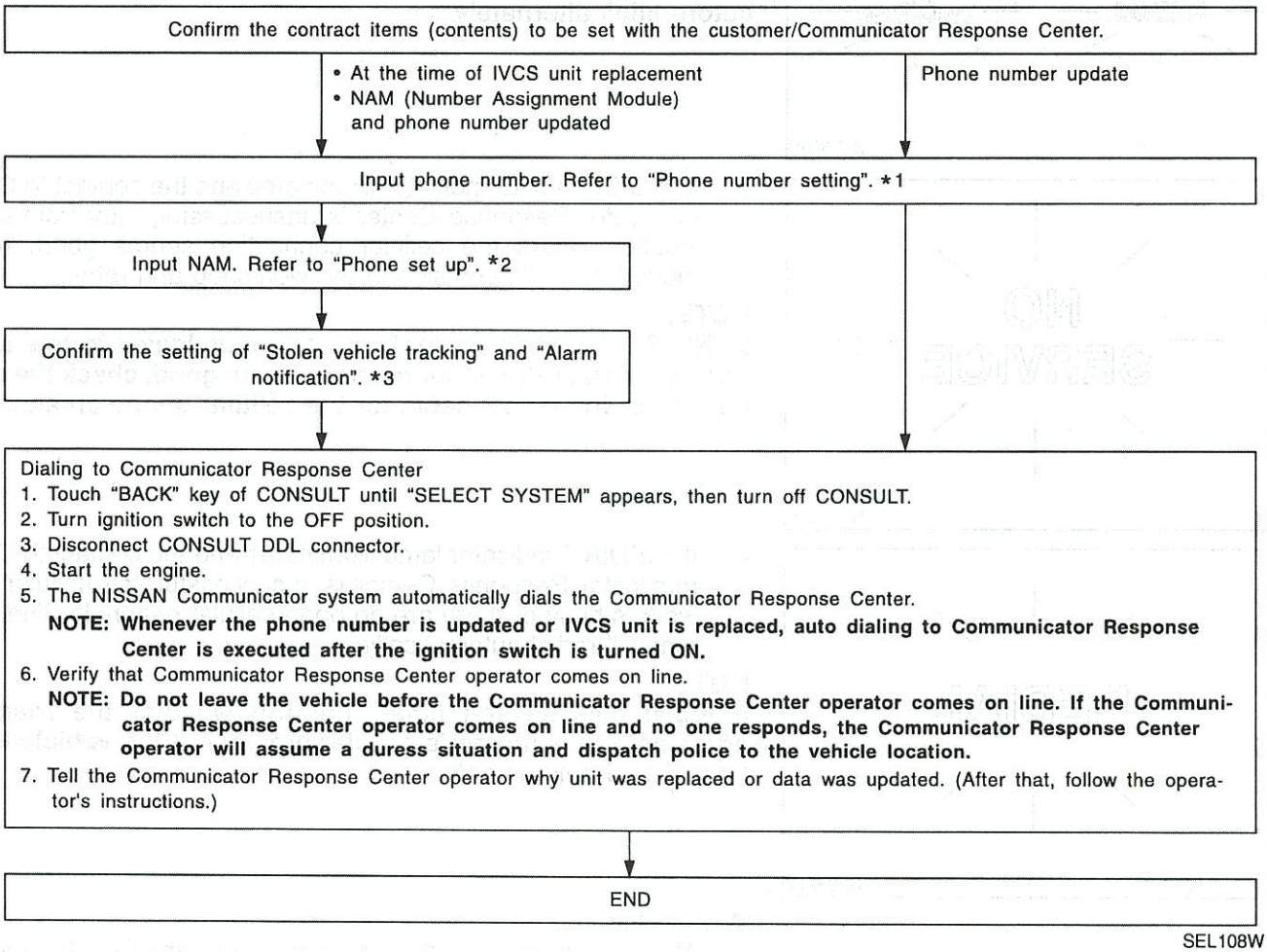
- Phone setup — Data setting regarding NAM (Number Assignment Module)
- Phone number — Phone number setting

NOTE:

- **Data must not be updated without prior approval from the customer.**
- **NAM and phone number can be programed by using handset. For details, refer to the handset operation manual.**
- **The IVCS unit does not permit updating of NAM more than 15 times.**

WORK FLOW

NBEL0187S02



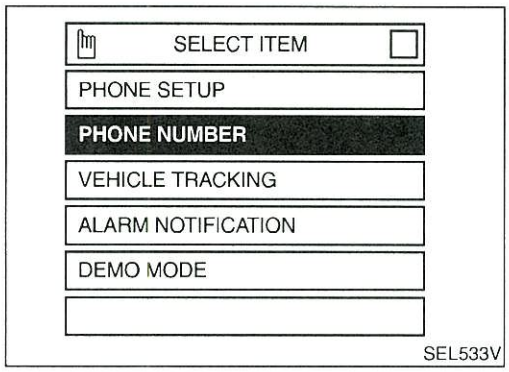
SEL108W

*1 EL-307 *2 EL-308 *3 EL-309

NOTE:

- **If a Communicator Response Center operator does not come on line even though the system activates, the system may not be properly configured. Call the Communicator Response Center at 1-888-427-4812 to verify the configuration information.**

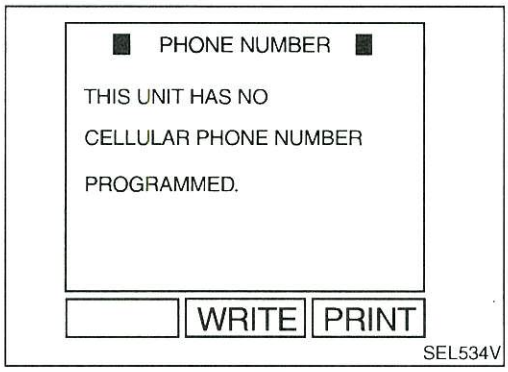
- **Whenever dialing the above number, information about the vehicle is required by the operator. For details, refer to EL-273.**
- **Never release the vehicle to the customer unless INFINITI Communicator system operation is verified by a Communicator Response Center operator coming on line.**



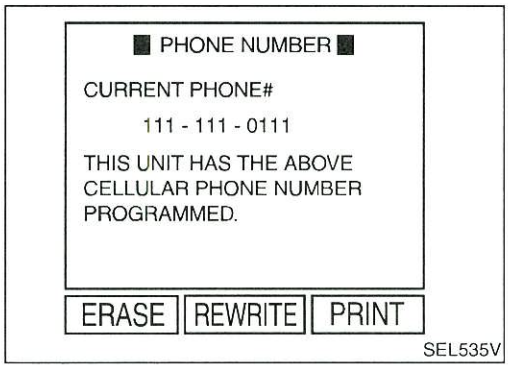
PHONE NUMBER SETTING

NBEL0187S03

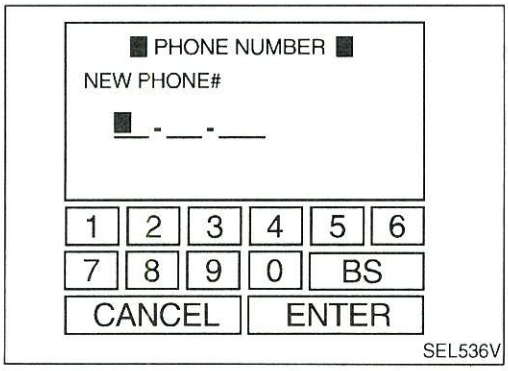
1. Touch "CONFIGURATION".
2. Touch "PHONE NUMBER".



3. Touch "WRITE" or "REWRITE".
   - If no phone number is previously memorized, the display shows "This unit has no cellular phone number programmed".



   - If the phone number is previously memorized, the display shows the current phone number.
   - To erase the phone number, touch "ERASE".



4. Input new phone number.
5. Touch "ENTER".

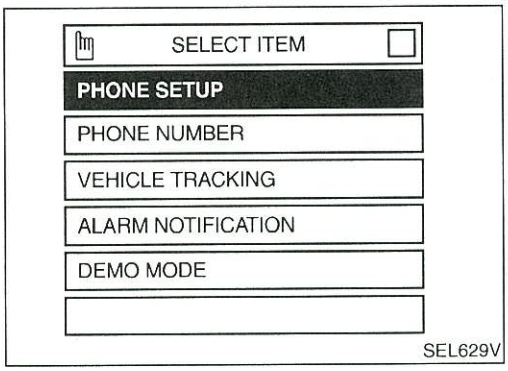
6. Touch "OK".
7. Carry out the next system setting or contact Communicator Response Center and information them that data has been updated or the IVCS unit has been replaced. For details, refer to EL-306.

NOTE:
Whenever the phone number is updated or the IVCS unit is replaced, the INFINITI Communicator system automatically contacts the Communicator Response Center the first time the vehicle is started.

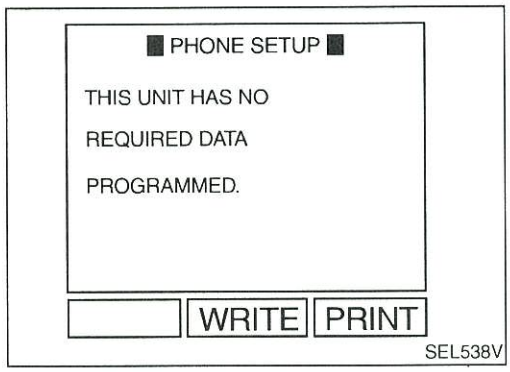
PHONE SET UP

NBEL0187S04

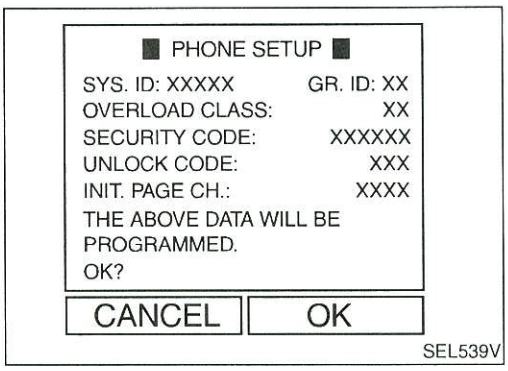
1. Touch "CONFIGURATION".
2. Touch "PHONE SET UP".



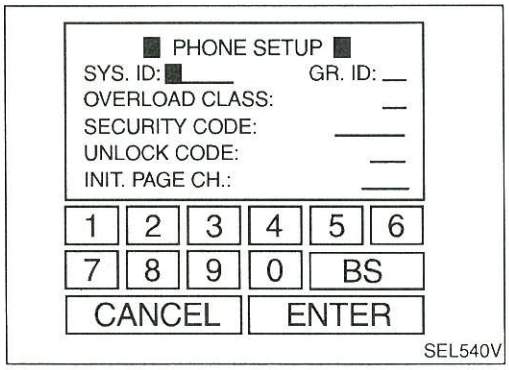
3. Touch "WRITE" or "REWRITE".



- If no data is previously memorized, the display shows "This unit has no required data programmed".



- If NAM (Number Assignment Module) data is previously memorized, the display shows the current NAM data.
- To erase the NAM, touch "ERASE".

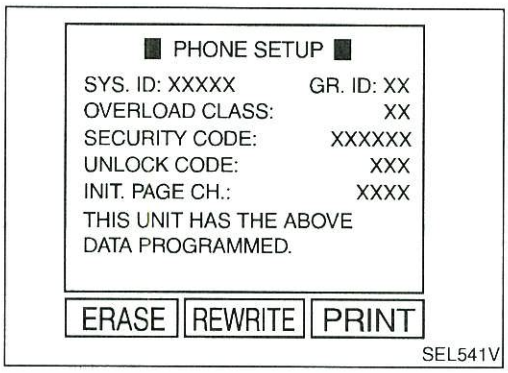


4. Input new NAM data.

- SYS ID (Carrier system ID number) — Available number: 0 to 32765
- GR ID (Group ID mark) — Available number: 0 to 15
- OVERLOAD CLASS (Access overload class) — Available number: 0 to 15
- SECURITY CODE (User security code)
- UNLOCK CODE
- INIT PAGE CH (Initial paging channel)

NOTE:
If an unavailable number is input as "SYS ID", "GR ID" or "OVERLOAD CLASS", CONSULT may be locked. In such cases, disconnect the vehicle battery cable once and then setup the system again.

5. Touch "ENTER".



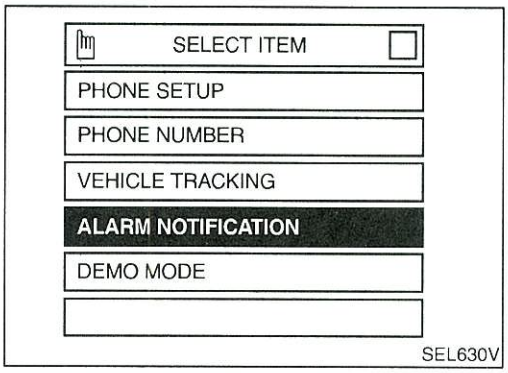
6. Touch "OK".
7. Carry out the next system setting or contact Communicator Response Center and inform them that data has been updated or IVCS unit has been replaced. For details, refer to EL-306.

NOTE:
Whenever the phone number is updated or the IVCS unit is replaced, the INFINITI Communicator system automatically contacts the Communicator Response Center the first time the vehicle is stared.

STOLEN VEHICLE TRACKING/ALARM NOTIFICATION SETTING CHECK

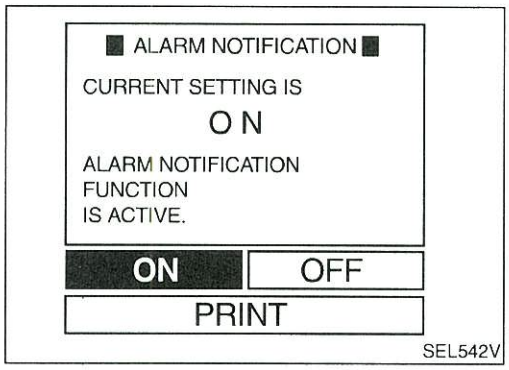
NBEL0187S05

1. Touch "CONFIGURATION".
2. Touch "VEHICLE TRACKING" or "ALARM NOTIFICATION".



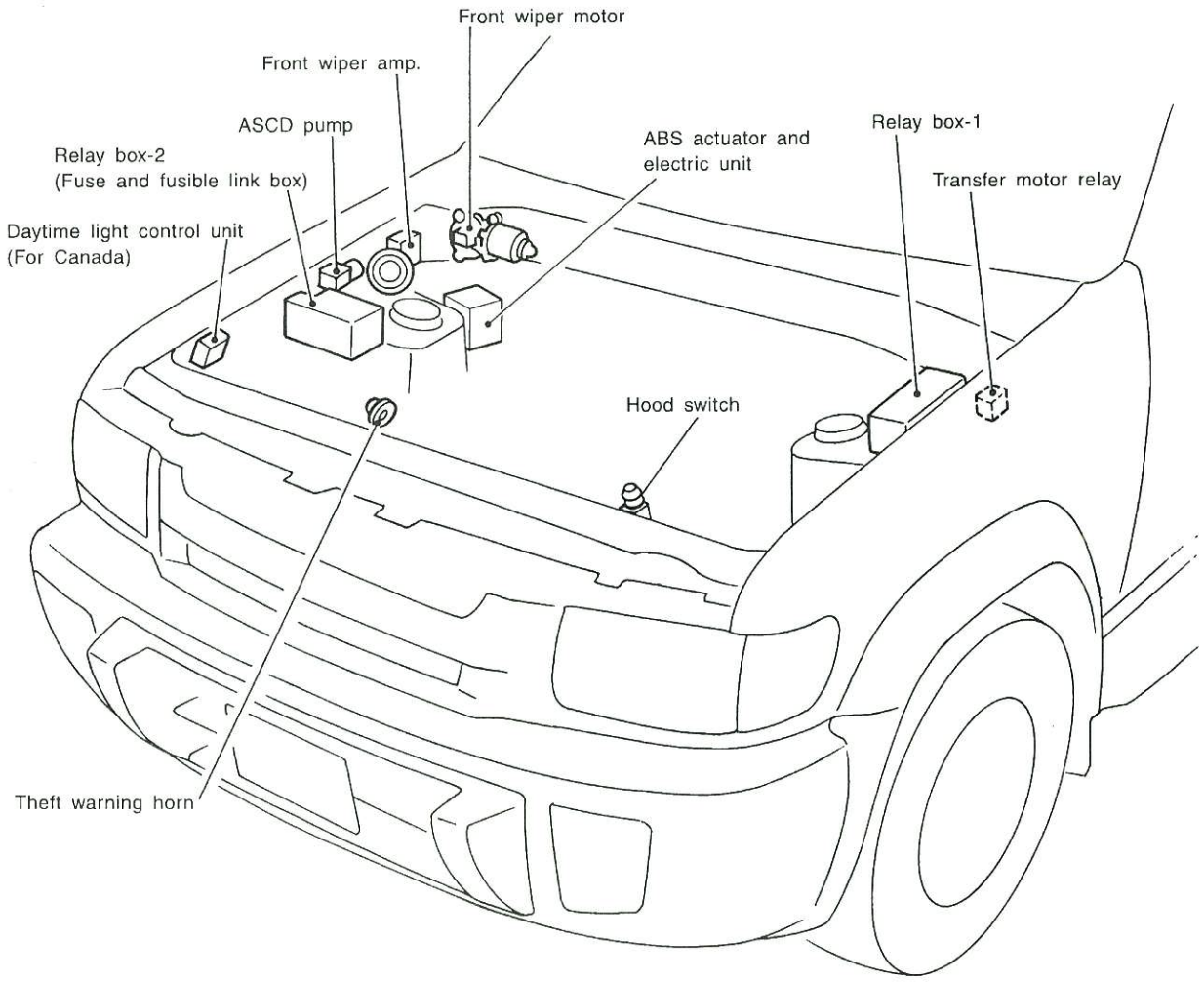
3. This function should always be "ON" (function activate.)

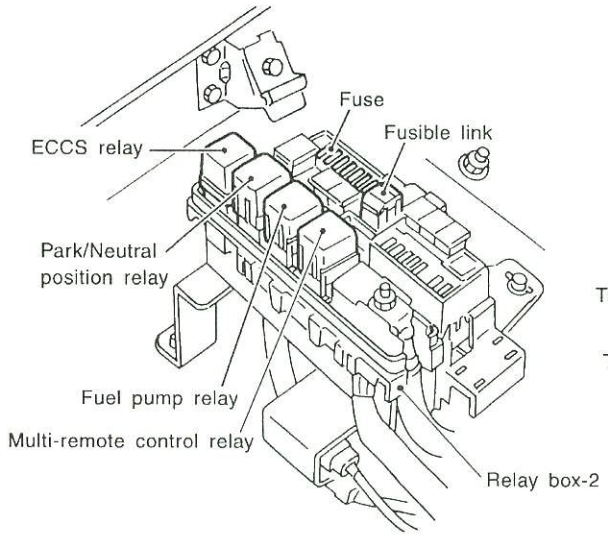
NOTE:
- **If either setting is "OFF", contact the Communicator Response Center at 1-888-427-4812 to verify the system setting.**
- **Whenever dialing the above number, information about the vehicle is required by the operator. For details, refer to EL-273.**

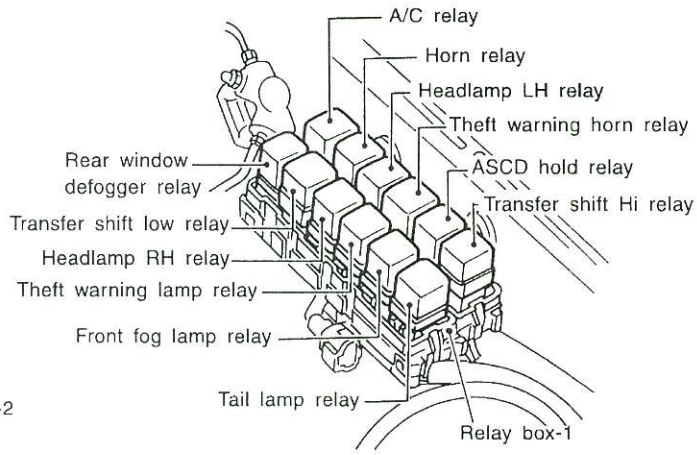


Engine Compartment

NBEL0129



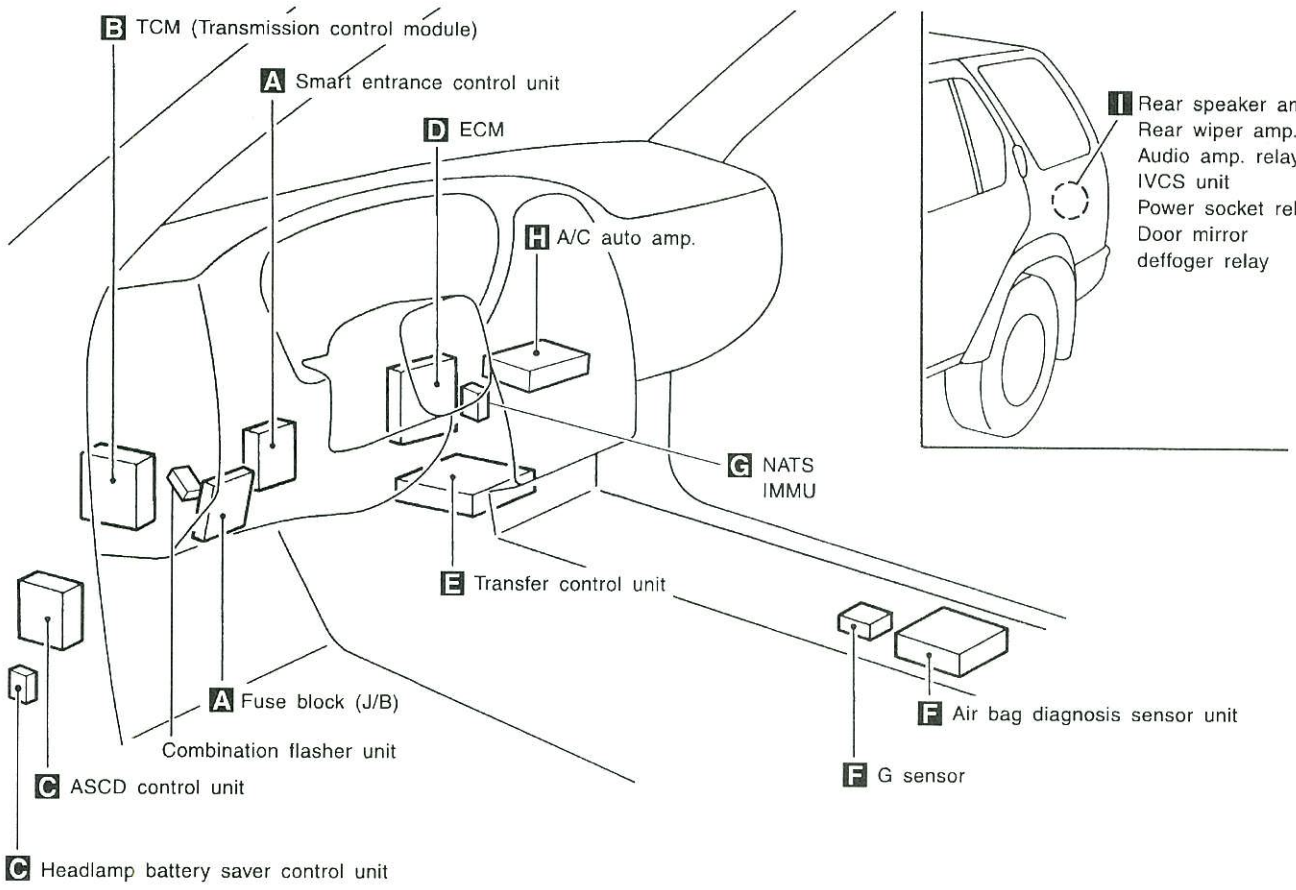


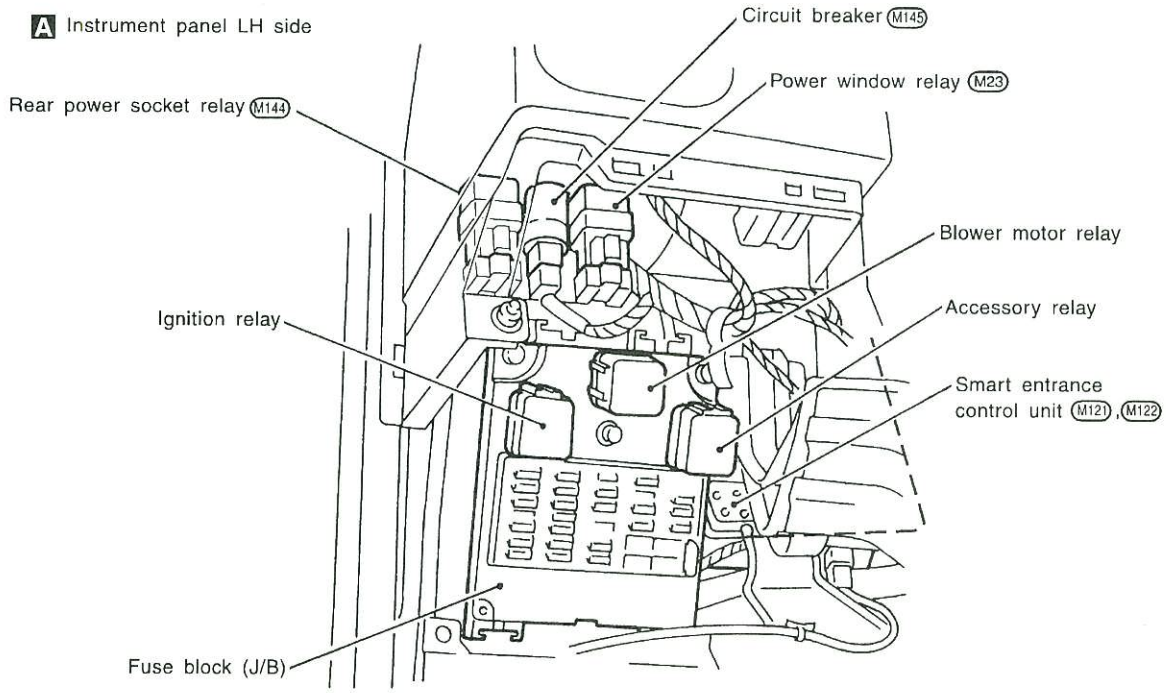


MEL864J

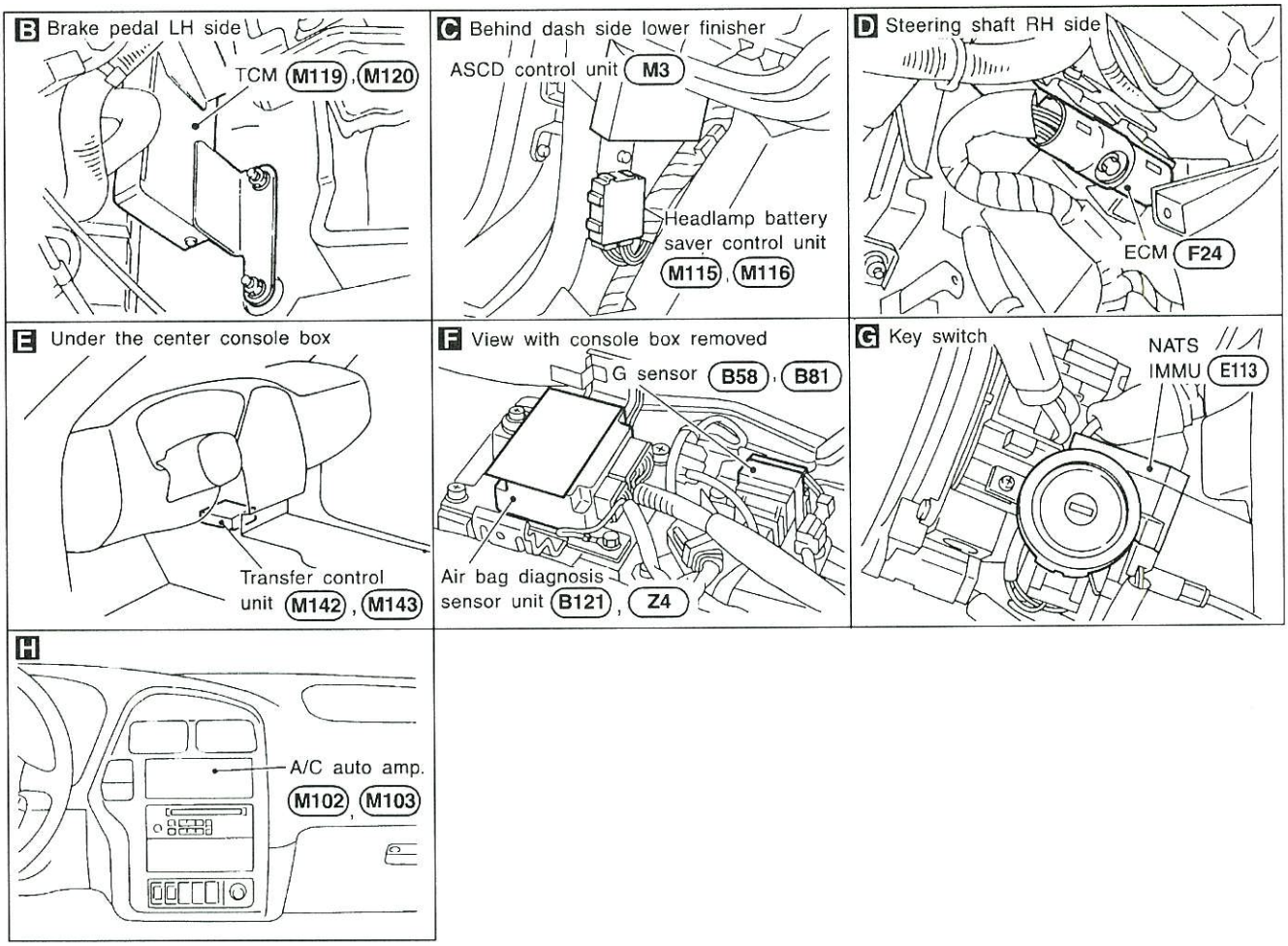
Passenger Compartment

NBEL0130

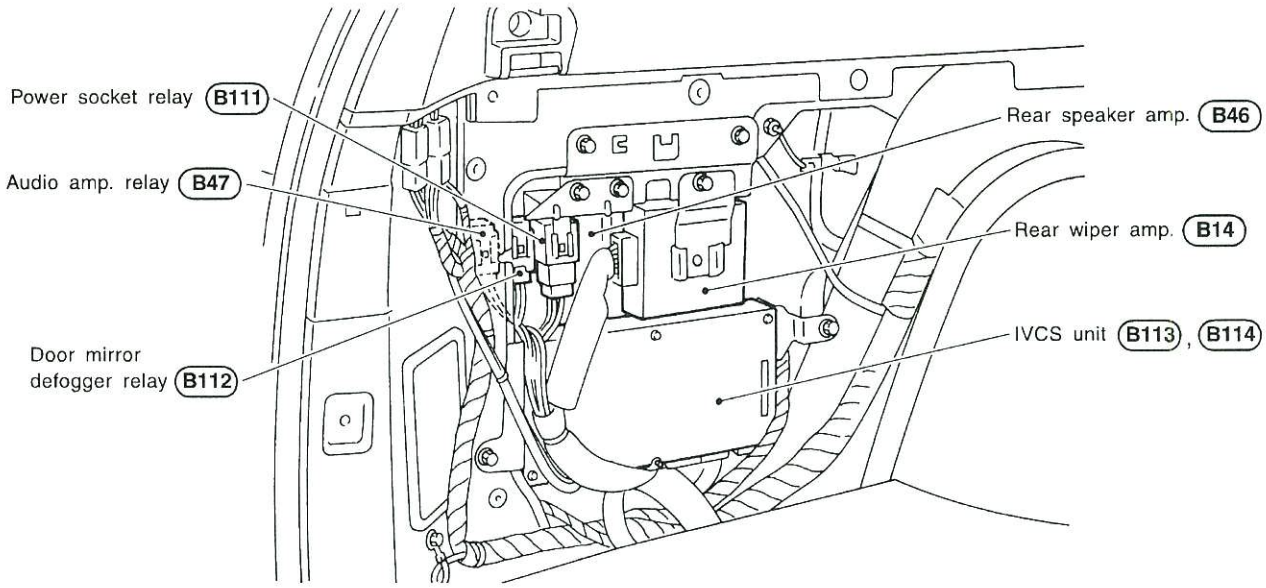




MEL865J



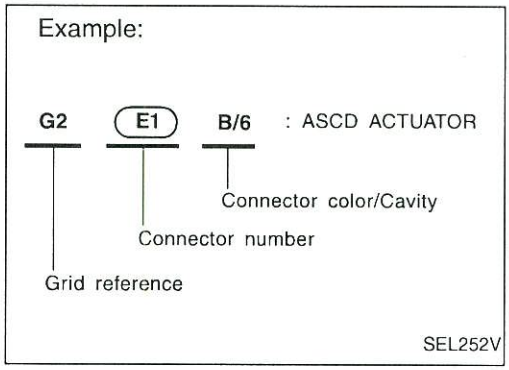
I Behind the luggage room trim LH side



MEL866J

How to Read Harness Layout

NBEL0131



The following Harness Layouts use a map style grid to help locate connectors on the drawings:

- Main Harness
- Engine Room Harness (Engine Compartment)
- Engine Control Harness

TO USE THE GRID REFERENCE

NBEL0131S01

1. Find the desired connector number on the connector list.
2. Find the grid reference.
3. On the drawing, find the crossing of the grid reference letter column and number row.
4. Find the connector number in the crossing zone.
5. Follow the line (if used) to the connector.

CONNECTOR SYMBOL

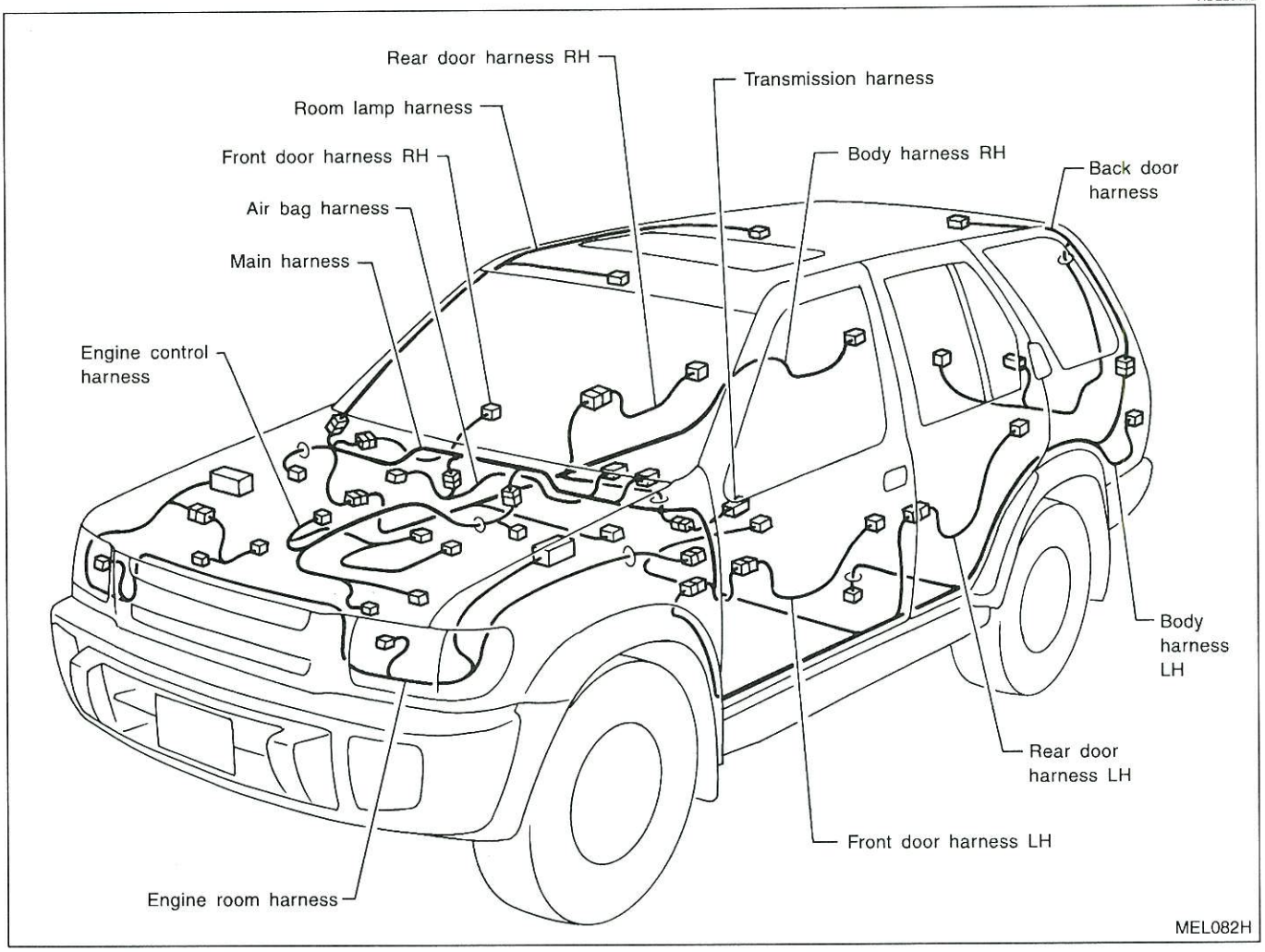
NBEL0131S02

Main symbols of connector (in Harness Layout) are indicated in the below.

Connector type	Water proof type		Standard type	
	Male	Female	Male	Female
• Cavity: Less than 4 • Relay connector				
• Cavity: From 5 to 8				
• Cavity: More than 9	—	—		
• Ground terminal etc.	—			

Outline

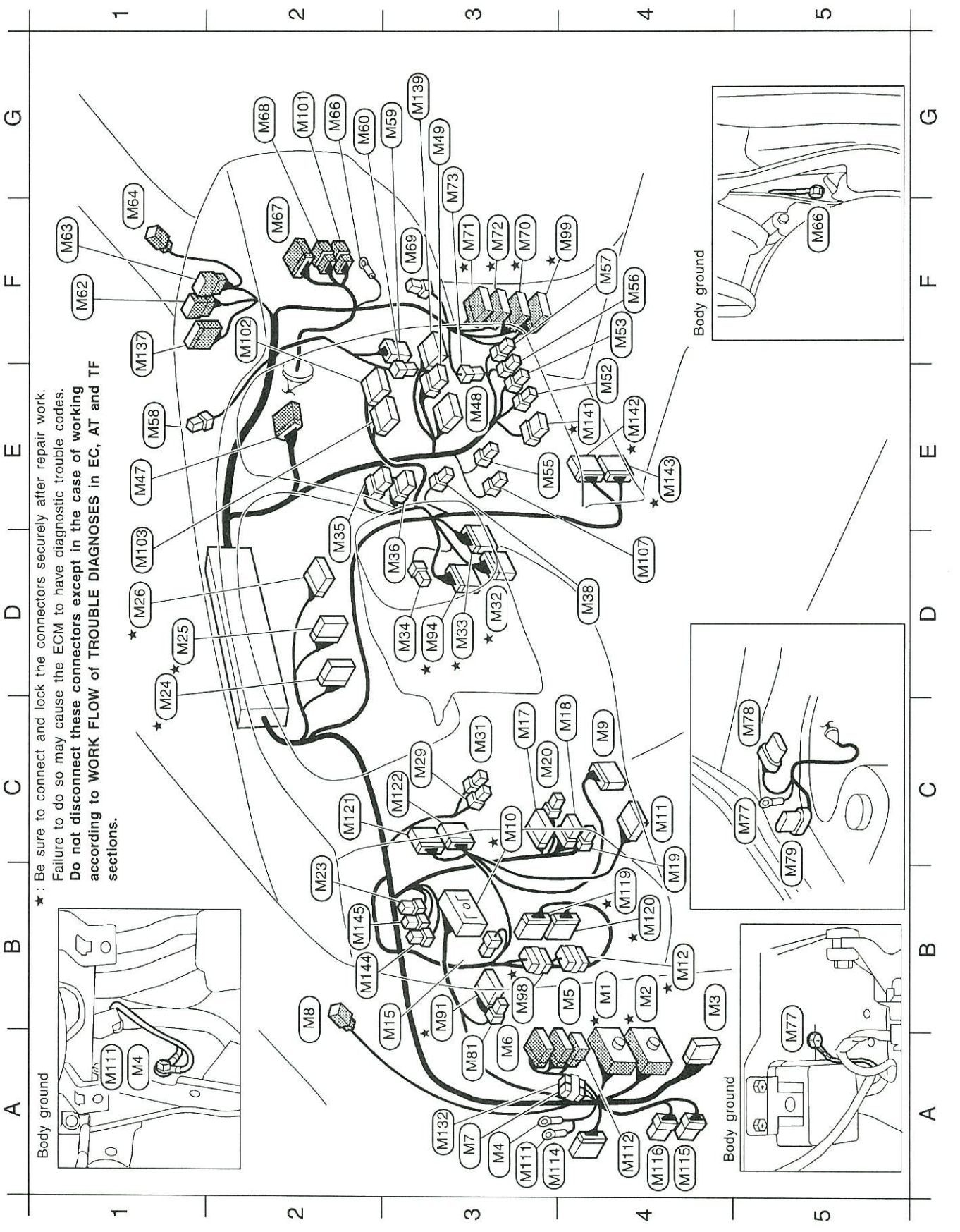
NBEL0132



NOTE:

Main Harness

NBEL0133

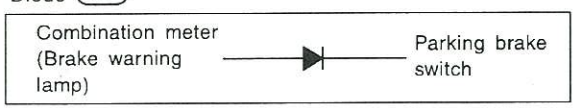


MEL842J

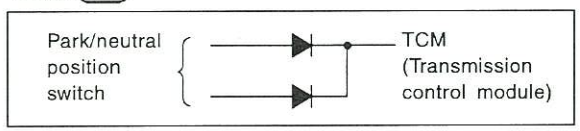
B4★	M1	SMJ	:	To E1
B4★	M2	SMJ	:	To B1
B4	M3	B/20	:	ASCD control unit
A3	M4	—	:	Body ground
B4	M5	W/16	:	To D3
A3	M6	W/10	:	To D4
A3	M7	W/2	:	Diode
B2	M8	BR/2	:	Tweeter LH
C4	M9	W/16	:	Data link connector for GST
C3★	M10	SMJ	:	Fuse block (J/B)
C4	M11	GY/14	:	Data link connector for CONSULT
B4★	M12	SB/6	:	Diode
B3	M15	B/3	:	Combination flasher unit
C3	M17	GY/12	:	Door mirror remote control switch
C4	M18	W/6	:	ASCD main switch
C4	M19	W/3	:	Illumination control switch
C3	M20	W/4	:	Security indicator lamp
B2	M23	L/4	:	Power window relay
D1★	M24	W/16	:	Combination meter
D1★	M25	W/14	:	Combination meter
D1★	M26	BR/16	:	Combination meter
C3	M29	L/2	:	ASCD brake switch
C3	M31	B/2	:	Stop lamp switch
D3★	M32	W/24	:	To F23
D3★	M33	GY/16	:	To F22
D3	M34	W/2	:	In-vehicle sensor
D2	M35	W/8	:	Hazard switch
D3	M36	W/6	:	Rear window defogger switch
D4	M38	W/3	:	Mode door motor
E1	M47	W/20	:	To Z1
E3	M48	W/10	:	Audio unit
G3	M49	W/6	:	Audio unit
E4	M52	L/4	:	Heated seat switch LH
F4	M53	W/4	:	Heated seat switch RH
E3	M55	W/3	:	Air mix door motor
F4	M56	B/2	:	Cigarette lighter socket
F4	M57	W/2	:	Cigarette lighter illumination
E1	M58	B/2	:	Sunload sensor
G3	M59	W/8	:	Intake door motor
G2	M60	W/4	:	Fan control amp.
F1	M62	W/6	:	To R1 (Without IVCS)
F1	M63	W/6	:	To R2
F1	M64	BR/2	:	Tweeter RH
G2	M66	—	:	Body ground
F2	M67	W/12	:	To D33
G2	M68	W/6	:	To D34
F3	M69	W/3	:	Power antenna
F3★	M70	W/20	:	To B50
F3★	M71	W/24	:	To B51
F3★	M72	W/16	:	To B52
G3	M73	W/2	:	Blower motor
C5	M77	—	:	Body ground
C5	M78	GY/6	:	Front wiper motor
C5	M79	B/8	:	Front wiper amp.
A3	M81	B/2	:	Fuse block (J/B)
B3★	M91	W/12	:	Fuse block (J/B)
D3★	M94	W/18	:	To F27
B3★	M98	GY/6	:	Joint connector
F4★	M99	W/12	:	To B77
G2	M101	BR/6	:	To D41
F2	M102	GY/16	:	A/C auto amp.
D1	M103	GY/20	:	A/C auto amp.
D4	M107	W/2	:	Intake sensor
A3	M111	–	:	Body ground
A4	M112	BR/6	:	To D13
A4	M114	W/12	:	To E116
A4	M115	W/6	:	Headlamp battery saver control unit
A4	M116	W/8	:	Headlamp battery saver control unit
B4★	M119	W/24	:	TCM (Transmission control module)
B4★	M120	GY/24	:	TCM (Transmission control module)
C2	M121	W/18	:	Smart entrance control unit
C3	M122	B/24	:	Smart entrance control unit
A3	M132	W/2	:	Diode
F1	M137	W/20	:	To R9 (With IVCS)
G3	M139	W/16	:	Audio unit (With IVCS)
E4★	M141	W/8	:	4WD shift switch
E4★	M142	L/24	:	Transfer control unit
E4★	M143	G/24	:	Transfer control unit
B2	M144	W/4	:	Rear power socket relay
B2	M145	W/2	:	Circuit breaker

★ : Be sure to connect and lock the connectors securely after repair work. Failure to do so may cause the ECM to have diagnostic trouble codes.
Do not disconnect these connectors except in the case of working according to WORK FLOW of TROUBLE DIAGNOSES in EC, AT and TF sections.

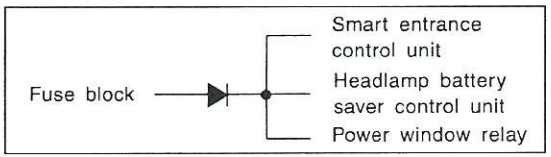
Diode M7



Diode M12



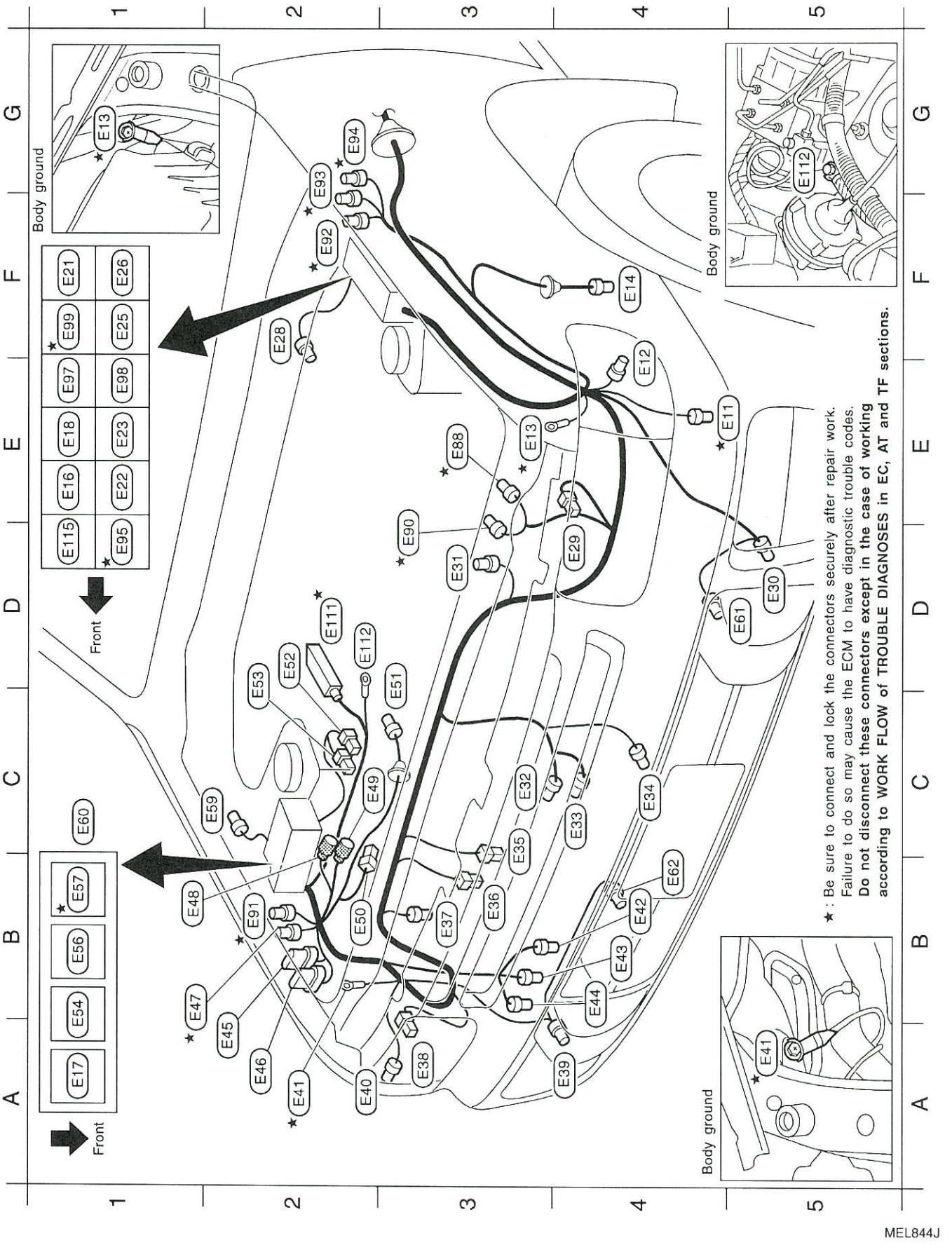
Diode M132



MEL843J

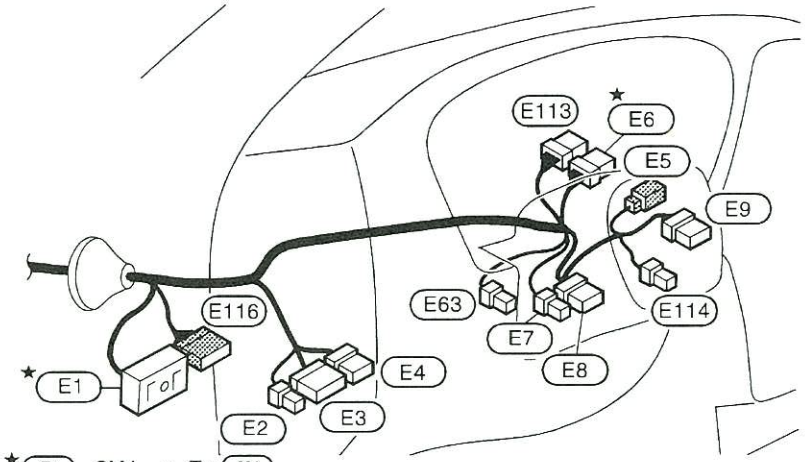
Engine Room Harness

NBEL0134



★: Be sure to connect and lock the connectors securely after repair work. Failure to do so may cause the ECM to have diagnostic trouble codes. **Do not disconnect these connectors except in the case of working according to WORK FLOW of TROUBLE DIAGNOSES in EC, AT and TF sections.**

MEL844J



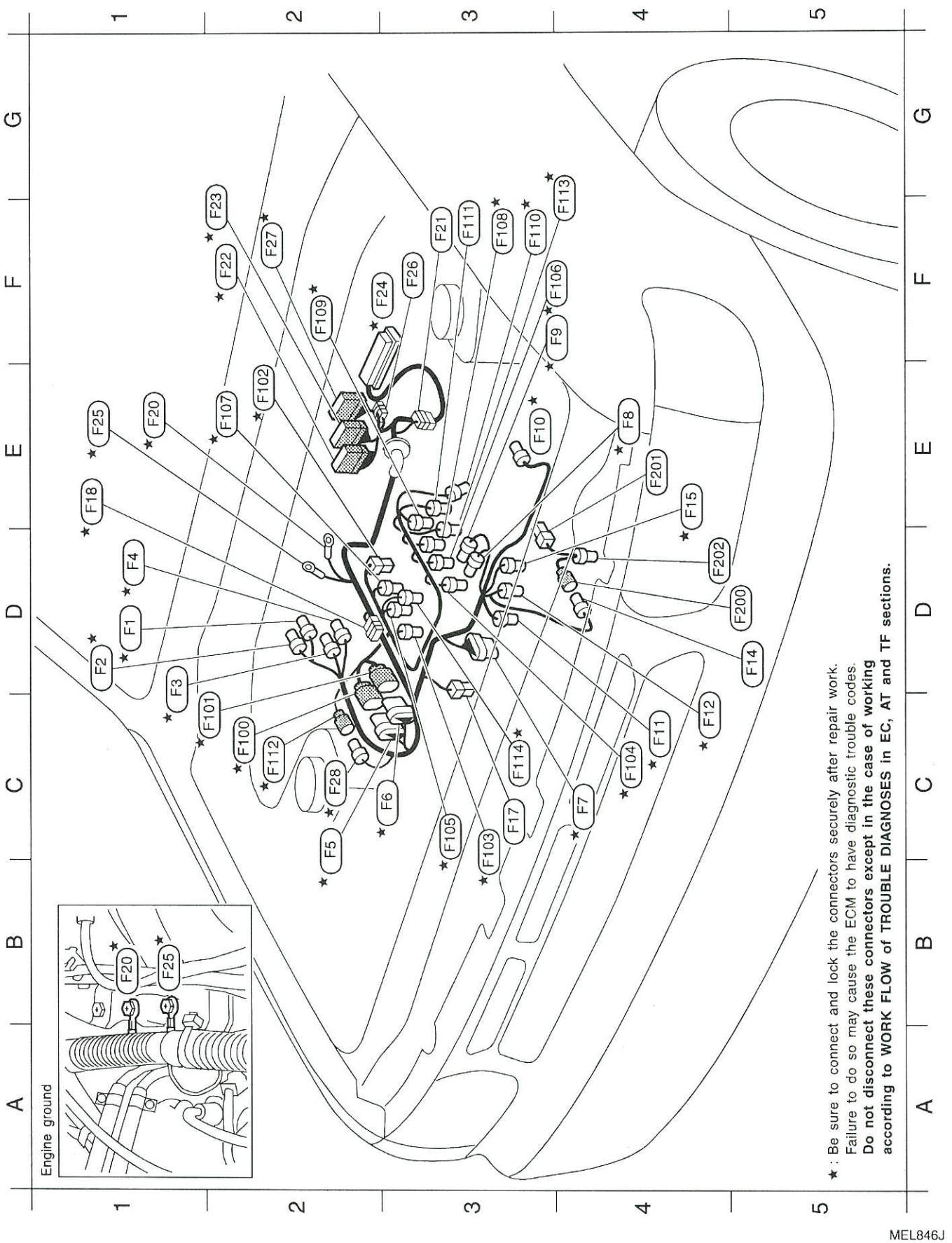
★ : Be sure to connect and lock the connectors securely after repair work. Failure to do so may cause the ECM to have diagnostic trouble codes. **Do not disconnect these connectors except in the case of working according to WORK FLOW of TROUBLE DIAGNOSES in EC, AT and TF sections.**

★	E1	SMJ	:	To M1
	E2	B/2	:	Fuse block (J/B)
	E3	W/16	:	Fuse block (J/B)
	E4	W/4	:	Fuse block (J/B)
	E5	BR/2	:	Key switch
★	E6	W/6	:	Ignition switch
	E7	BR/4	:	Combination switch (Lighting switch)
	E8	BR/8	:	Combination switch (Lighting & turn signal switch)
	E9	GY/8	:	Combination switch (Front wiper switch)
E4 ★	E11	GY/2	:	Intake air temperature sensor
E4	E12	GY/2	:	Parking lamp LH
E3 ★	E13	—	:	Body ground
F4	E14	BR/2	:	Front wheel sensor LH
E1	E16	L/4	:	Front fog lamp relay (Relay box-1)
A1	E17	BR/6	:	Multi-remote control relay (Relay box-2)
E1	E18	BR/6	:	Theft warning lamp relay
F1	E21	BR/6	:	Rear window defogger relay
E1	E22	BR/6	:	ASCD hold relay
E1	E23	BR/6	:	Theft warning horn relay
F1	E25	W/3	:	Horn relay
F1	E26	L/4	:	A/C relay
F2	E28	GY/2	:	Brake fluid level switch
D4	E29	B/3	:	Headlamp LH
				(Relay box-1)
D5	E30	GY/2	:	Front turn signal lamp LH
D3	E31	GY/2	:	Hood switch
C3	E32	B/2	:	Ambient sensor
C4	E33	B/2	:	Ambient air temperature sensor (For thermometer)
C4	E34	GY/2	:	Ambient air temperature switch
C3	E35	B/1	:	Horn (High)
B3	E36	B/1	:	Horn (Low)
B3	E37	B/2	:	Dual-pressure switch
A3	E38	B/3	:	Headlamp RH
A4	E39	GY/2	:	Front turn signal lamp RH
A2	E40	GY/2	:	Parking lamp RH
A2 ★	E41	—	:	Body ground
B4	E42	BR/2	:	Washer level switch
B4	E43	GY/2	:	Rear washer motor
B4	E44	GY/2	:	Front washer motor
A2	E45	GY/8	:	Daytime light control unit
A2	E46	GY/6	:	Daytime light control unit
B1 ★	E47	GY/2	:	A/T dropping resistor
B1	E48	GY/4	:	To E102
C2	E49	GY/1	:	To E104
B2	E50	B/1	:	Theft warning horn
C3	E51	GY/2	:	Front wheel sensor RH
D2	E52	B/1	:	Battery
D2	E53	B/1	:	Battery
B1	E54	L/4	:	Fuel pump relay
B1	E56	GY/6	:	Park/Neutral position relay
				(Relay box-2)
B1 ★	E57	BR/6	:	ECCS relay
C2	E59	GY/4	:	ASCD pump
C1	E60	—	:	Fuse and fusible link box
D5	E61	BR/2	:	Front fog lamp LH
B4	E62	BR/2	:	Front fog lamp RH
	E63	W/3	:	Combination switch (Front fog lamp switch)
E3 ★	E88	GY/3	:	Absolute pressure sensor
D3 ★	E90	B/2	:	MAP/BARO switch solenoid valve
B2 ★	E91	GY/2	:	Transfer dropping resistor
F2 ★	E92	W/1	:	Transfer motor relay
G2 ★	E93	W/1	:	Transfer motor relay
G2 ★	E94	G/2	:	Transfer motor relay
D1 ★	E95	B/5	:	Transfer shift Hi relay
E1	E97	L/4	:	Headlamp RH relay
E1	E98	L/4	:	Headlamp LH relay
F1 ★	E99	B/5	:	Transfer shift low relay
				(Relay box-1)
D2 ★	E111	SMJ	:	ABS actuator and electric unit
D2	E112	–	:	Body ground
	E113	W/8	:	NATS IMMU
	E114	W/4	:	Combination switch (Rear wiper switch)
D1	E115	L/4	:	Tail lamp relay (Relay box-1)
	E116	W/12	:	To M114

MEL845J

Engine Control Harness

NBEL0135



MEL846J

D1★	F1	GY/4	:	Rear heated oxygen sensor RH
D1★	F2	GY/3	:	Front heated oxygen sensor RH
D1★	F3	GY/4	:	Rear heated oxygen sensor LH
D1★	F4	GY/3	:	Front heated oxygen sensor LH
C2★	F5	GY/8	:	To F100
C3★	F6	B/8	:	To F101
C4★	F7	GY/6	:	Distributor
E4★	F8	BR/3	:	Throttle position sensor
F4★	F9	GY/3	:	Throttle position switch
E3★	F10	BR/4	:	Mass air flow sensor
C4★	F11	GY/2	:	Distributor
C4★	F12	GY/2	:	EGR temperature sensor
D5	F14	GY/2	:	To F200
E4★	F15	G/2	:	EGRC-solenoid valve
C3	F17	B/1	:	Thermal transmitter
E1★	F18	GY/2	:	Resistor
E1★	F20	—	:	Engine ground
F3	F21	L/12	:	Joint connector
F2★	F22	GY/16	:	To M33
F2★	F23	W/24	:	To M32
F2★	F24	SMJ	:	ECM
E1★	F25	—	:	Engine ground
F3	F26	W/2	:	Diode
F2★	F27	W/18	:	To M94
C2★	F28	B/4	:	To F112
C2★	F100	GY/8	:	To F5
C2★	F101	B/8	:	To F6
E2★	F102	B/2	:	Knock sensor
C3★	F103	B/2	:	Injector No. 1
C4★	F104	B/2	:	Injector No. 2
C3★	F105	B/2	:	Injector No. 3
F4★	F106	B/2	:	Injector No. 4
E2★	F107	B/2	:	Injector No. 5
F3★	F108	B/2	:	Injector No. 6
F2★	F109	BR/2	:	IACV-AAC valve
F3★	F110	GY/2	:	Crankshaft position sensor (OBD)
F3	F111	GY/2	:	IACV-FICD solenoid valve
C2★	F112	B/4	:	To F28
F4★	F113	L/2	:	EVAP canister purge volume control solenoid valve
C3★	F114	GY/2	:	Engine coolant temperature sensor
D5	F200	GY/2	:	To F14
E4	F201	B/1	:	Oil pressure switch
D4	F202	B/1	:	Compressor (Air conditioner)

Diode F26

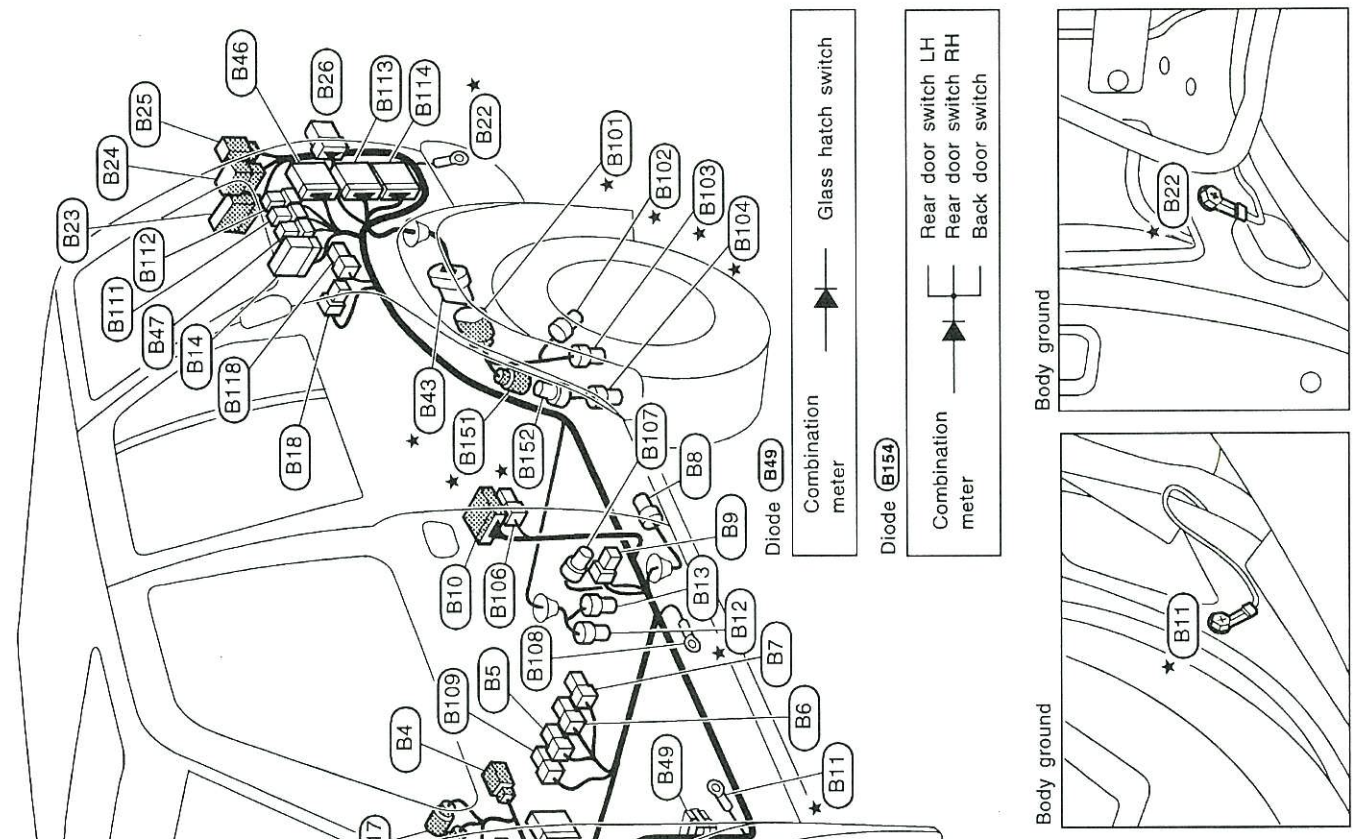
IACV-FICD solenoid valve → Ambient air temperature switch

★: Be sure to connect and lock the connectors securely after repair work. Failure to do so may cause the ECM to have diagnostic trouble codes. **Do not disconnect these connectors except in the case of working according to WORK FLOW of TROUBLE DIAGNOSES in EC, AT and TF sections.**

MEL847J

Body Harness LH

NBEL0136



★ B1	SMJ	: To M2	
B3	B/1	: Parking brake switch	
B4	W/2	: Power socket	
B5	W/3	: Heated seat LH	
B6	W/3	: Seat belt buckle switch	
B7	W/2	: Power seat LH	
B8	BR/2	: Rear wheel sensor LH	
B9	B/3	: Front door switch LH	
B10	W/10	: To D50	
★ B11	—	: Body ground	
★ B12	GY/4	: Fuel tank gauge unit	
B13	GY/2	: Fuel pump	
B14	W/18	: Rear wiper amp.	
B18	BR/1	: Rear door switch LH	
★ B22	—	: Body ground	
B23	W/12	: To D100	
B24	W/6	: To D101	
B25	W/4	: To D102	
B26	W/6	: Rear combination lamp LH	
★ B43	GY/8	: To B101	
B46	W/26	: Rear speaker amp.	
B47	W/4	: Audio amp. relay	
B49	W/2	: Diode	
★ B101	GY/8	: To B43	
★ B102	GY/3	: EVAP control system pressure sensor	
★ B103	B/2	: EVAP canister vent control valve	
★ B104	G/2	: Vacuum cut valve bypass valve	
B105	W/12	: Handset (With IVCS)	
B106	W/4	: Seat belt pre-tensioner LH	
B107	GY/2	: Satellite sensor LH	
B108	—	: Body ground	
B109	Y/2	: Side air bag module LH	
B111	W/4	: Power socket relay	
B112	W/4	: Door mirror defogger relay	
B113	W/16	: IVCS unit (With IVCS)	
B114	W/22	: IVCS unit (With IVCS)	
B115	W/2	: To B125	
B116	GY/4	: To B124	
B117	W/2	: To B123	
B118	W/4	: Fuel lid opener actuator	
★ B151	GY/2	: To B152	
★ B152	GY/2	: To B151	
B154	W/2	: Diode	

★: Be sure to connect and lock the connectors securely after repair work. Failure to do so may cause the ECM to have diagnostic trouble codes.
Do not disconnect these connectors except in the case of working according to WORK FLOW of TROUBLE DIAGNOSES in EC, AT and TF sections.

MEL848J

Body Harness RH

NBEL0137

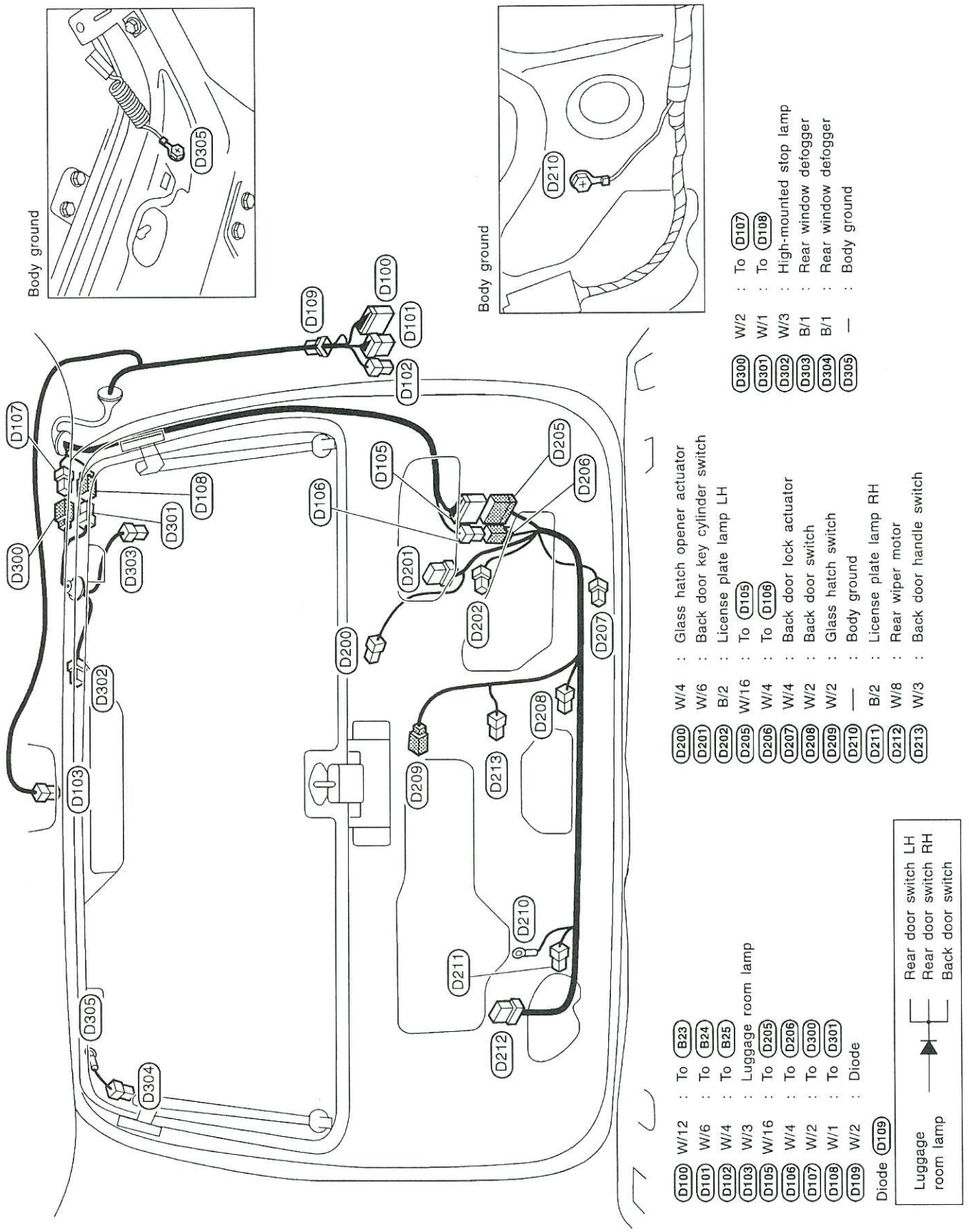
★	B50	W/20	: To M70
★	B51	W/24	: To M71
★	B52	W/16	: To M72
★	B55	—	: Body ground
	B56	W/3	: Heated seat RH
	B57	W/2	: Power seat RH
	B58	GY/2	: G sensor
	B59	W/6	: A/T device
★	B63	GY/2	: Vehicle speed sensor
★	B64	BR/8	: Terminal cord assembly
★	B65	GY/8	: Park/neutral position switch
★	B66	GY/2	: Park/neutral position switch
★	B67	GY/3	: Rear revolution sensor (A/T)
	B68	BR/1	: Front door switch RH
	B69	GY/2	: Rear wheel sensor RH
	B70	W/10	: To D70
	B71	BR/1	: Rear door switch RH
	B74	W/6	: Rear combination lamp RH
★	B75	—	: Body ground
	B76	W/3	: Ashtray illumination
★	B77	W/12	: To M99
★	B78	GY/8	: To B206
★	B79	B/4	: To B208
★	B80	B/8	: To B207
	B81	GY/2	: G sensor
★	B82	GY/6	: To B251
	B83	W/4	: Seat belt pre-tensioner RH
	B121	Y/10	: Air bag diagnosis sensor unit
	B122	—	: Body ground
	B123	W/2	: To B117
	B124	GY/4	: To B116
	B125	W/2	: To B115
	B126	Y/2	: Side air bag module RH
	B127	—	: Body ground
	B128	GY/2	: Satellite sensor RH
	B129	B/Z	: Rear power socket

★: Be sure to connect and lock the connectors securely after repair work.
Failure to do so may cause the ECM to have diagnostic trouble codes.
Do not disconnect these connectors except in the case of working according to WORK FLOW of TROUBLE DIAGNOSES in EC, AT and TF sections.

MEL849J

Back Door Harness

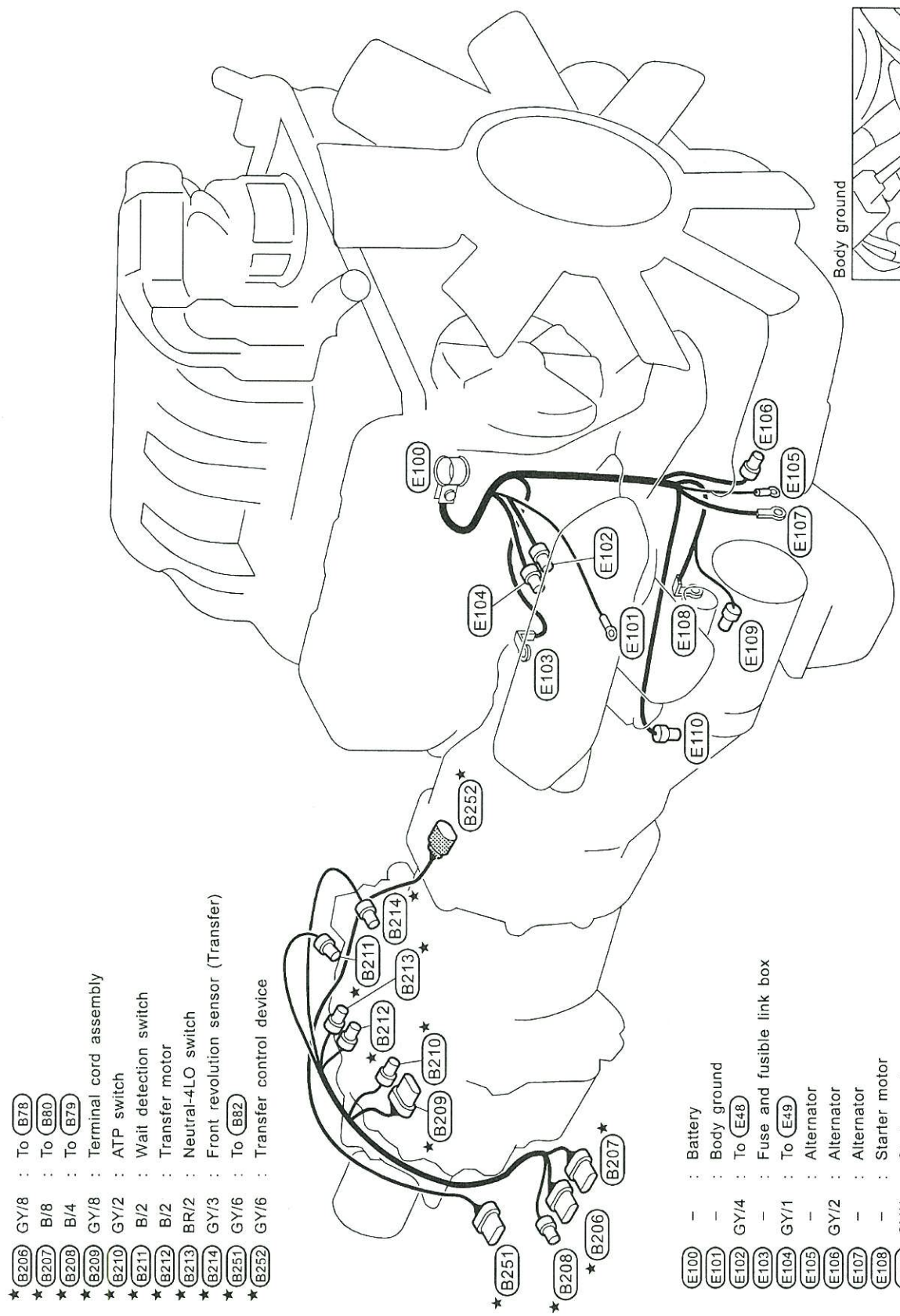
NBEL0138



MEL850J

Engine and Transmission Harness

NBEL0139



★ Be sure to connect and lock the connectors securely after repair work.
Failure to do so may cause the ECM to have diagnostic trouble codes.
Do not disconnect these connectors except in the case of working according to WORK FLOW of TROUBLE DIAGNOSES in EC, AT and TF sections.

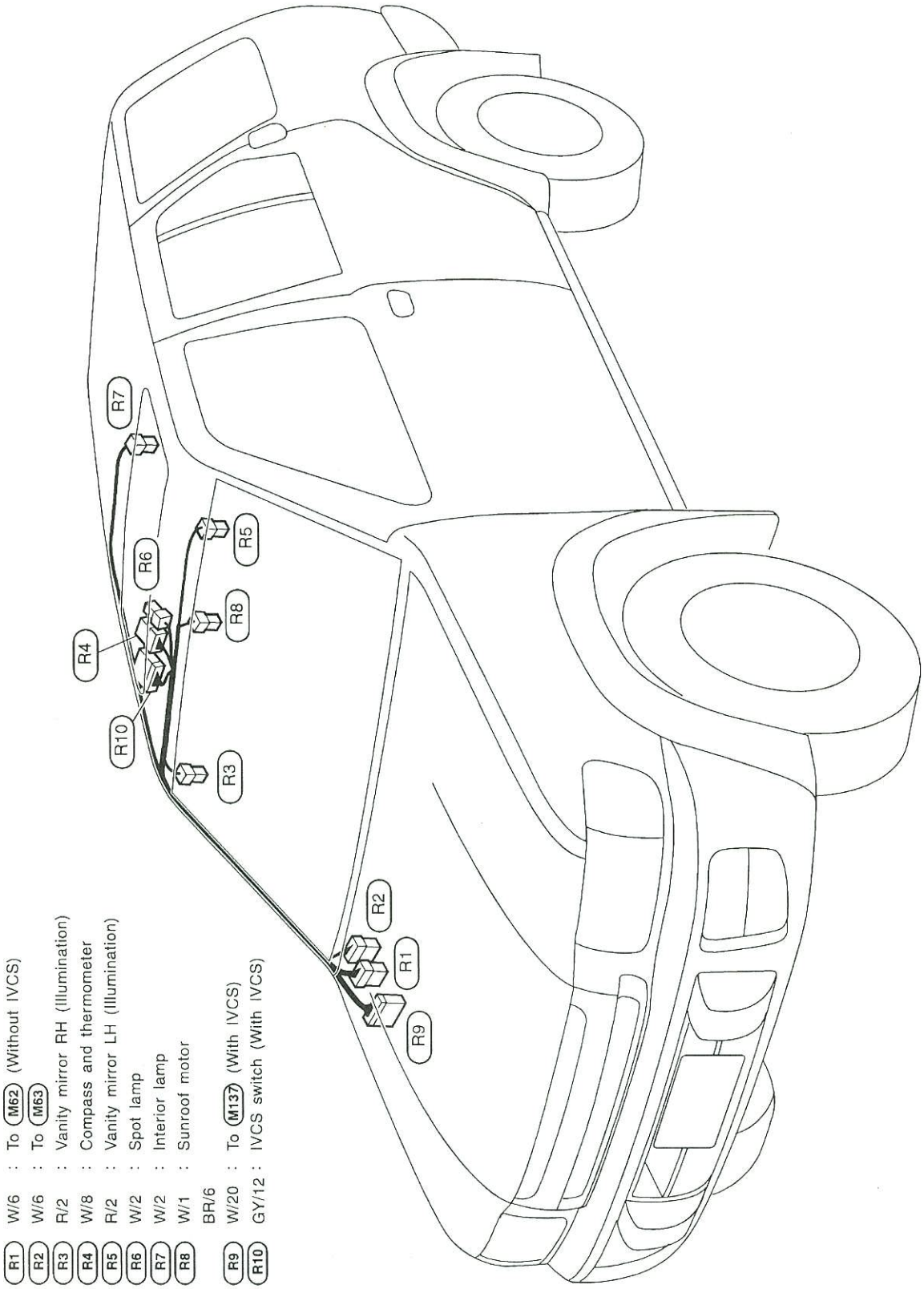
★ B206	GY/8	: To B78
★ B207	B/8	: To B80
★ B208	B/4	: To B79
★ B209	GY/8	: Terminal cord assembly
★ B210	GY/2	: ATP switch
★ B211	B/2	: Wait detection switch
★ B212	B/2	: Transfer motor
★ B213	BR/2	: Neutral-4LO switch
★ B214	GY/3	: Front revolution sensor (Transfer)
★ B251	GY/6	: To B82
★ B252	GY/6	: Transfer control device

E100	–	: Battery
E101	–	: Body ground
E102	GY/4	: To E48
E103	–	: Fuse and fusible link box
E104	GY/1	: To E49
E105	–	: Alternator
E106	GY/2	: Alternator
E107	–	: Alternator
E108	–	: Starter motor
E109	GY/1	: Starter motor
E110	GY/2	: Power steering oil pressure switch

MEL851J

Room Lamp

NBEL0140

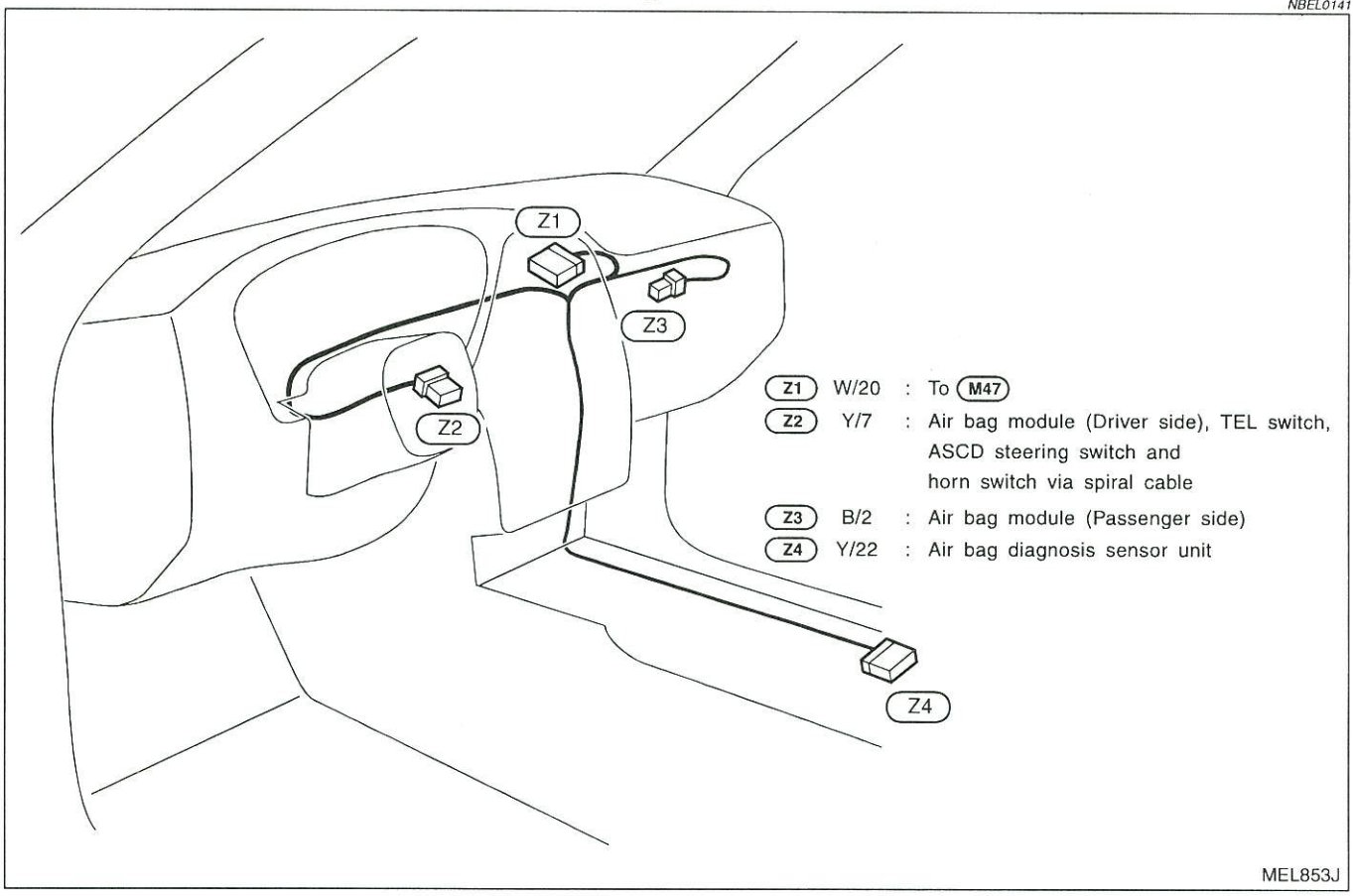


R1 W/6 : To M62 (Without IVCS)
R2 W/6 : To M63
R3 R/2 : Vanity mirror RH (Illumination)
R4 W/8 : Compass and thermometer
R5 R/2 : Vanity mirror LH (Illumination)
R6 W/2 : Spot lamp
R7 W/2 : Interior lamp
R8 W/1 : Sunroof motor
BR/6
R9 W/20 : To M137 (With IVCS)
R10 GY/12 : IVCS switch (With IVCS)

MEL852J

Air Bag Harness

NBEL0141

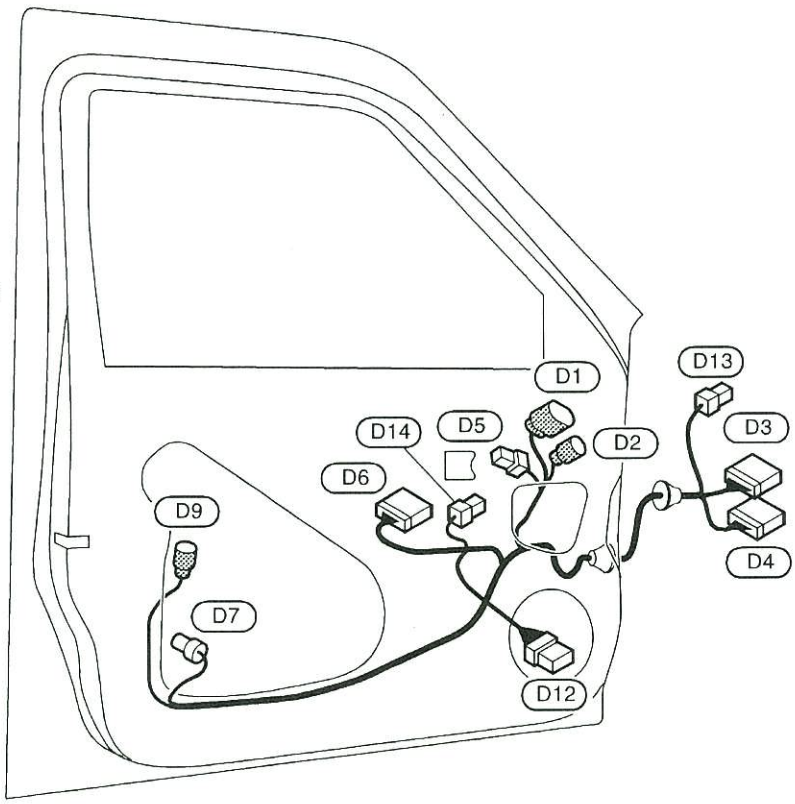


Front Door Harness

NBEL0142

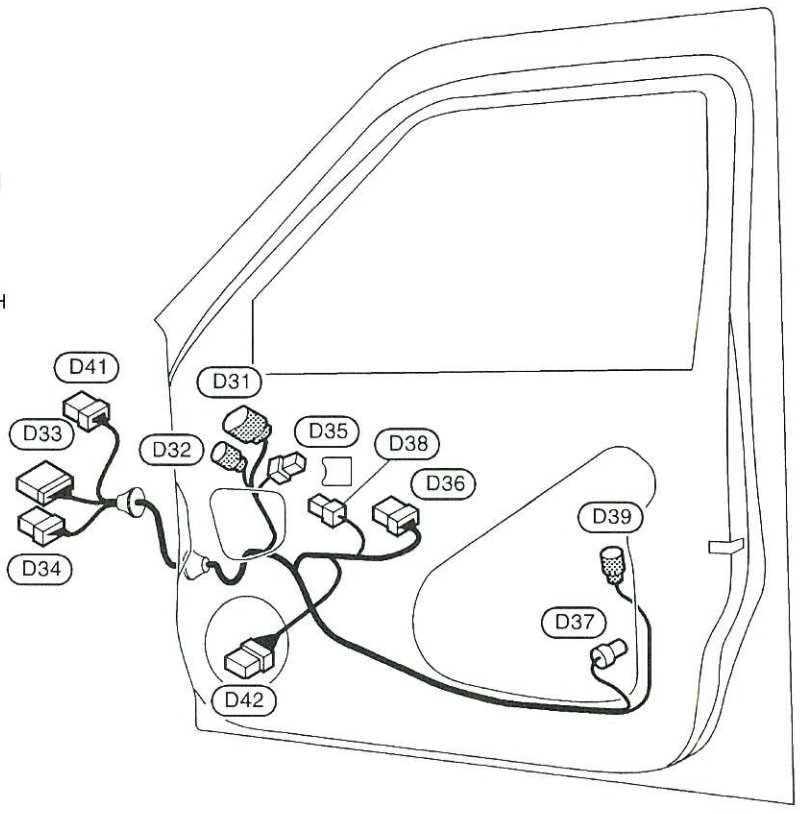
LH side

- (D1) GY/5 : Door mirror defogger LH
- (D2) BR/3 : Door mirror LH
- (D3) W/16 : To (M5)
- (D4) W/10 : To (M6)
- (D5) B/2 : Front power window regulator LH
- (D6) W/16 : Power window main switch
- (D7) GY/4 : Front door lock actuator LH
- (D9) BR/3 : Front door key cylinder switch LH
- (D12) W/6 : Front door speaker LH
- (D13) BR/6 : To (M112)
- (D14) W/4 : Fuel filler lid delete and glass hatch opener switch



RH side

- (D31) GY/5 : Door mirror defogger RH
- (D32) BR/3 : Door mirror RH
- (D33) W/12 : To (M67)
- (D34) W/6 : To (M68)
- (D35) B/2 : Front power window regulator RH
- (D36) W/8 : Front power window sub-switch
- (D37) GY/4 : Front door lock actuator RH
- (D38) GY/8 : Door lock and unlock switch RH
- (D39) BR/3 : Front door key cylinder switch RH
- (D41) BR/6 : To (M101)
- (D42) W/6 : Front door speaker RH

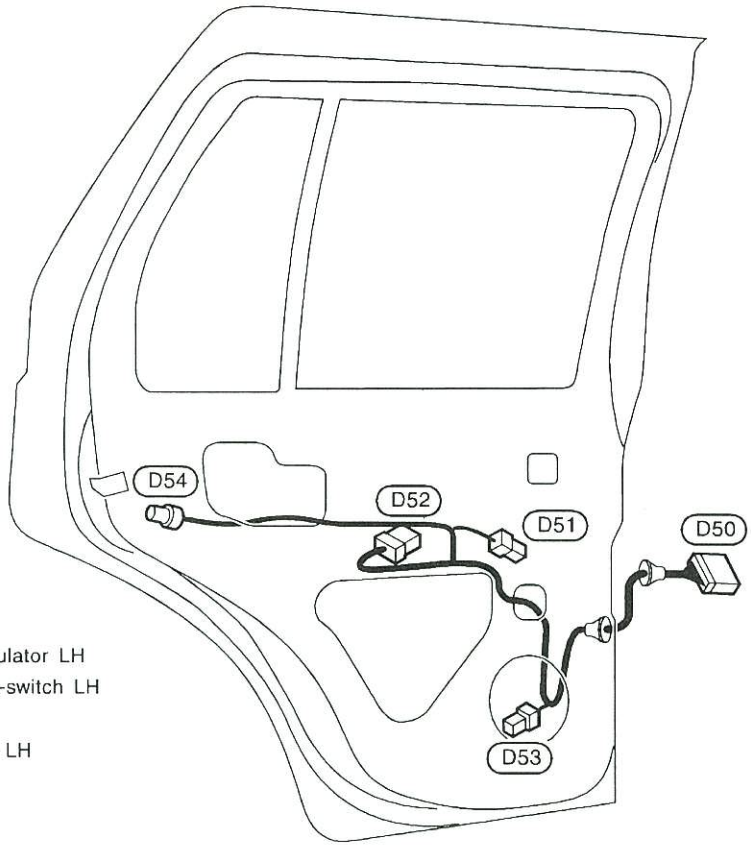


MEL854J

Rear Door Harness

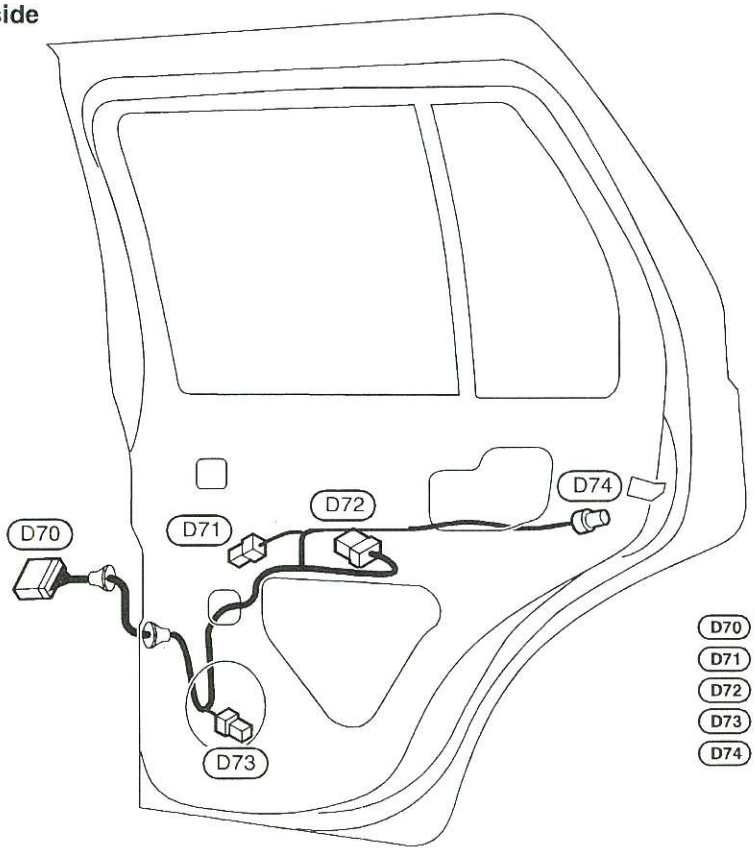
NBEL0143

LH side



D50	W/10	:	To B10
D51	B/2	:	Rear power window regulator LH
D52	W/8	:	Rear power window sub-switch LH
D53	BR/2	:	Rear door speaker LH
D54	GY/4	:	Rear door lock actuator LH

RH side



D70	W/10	:	To B70
D71	B/2	:	Rear power window regulator RH
D72	W/8	:	Rear power window sub-switch RH
D73	BR/2	:	Rear door speaker RH
D74	GY/4	:	Rear door lock actuator RH

MEL870H

BULB SPECIFICATIONS

Headlamp

Headlamp

NBEL0144S03

Item	Wattage (W)
High/Low (Semi-sealed beam)	65/55 (HB2)

Exterior Lamp

NBEL0144S01

Item		Wattage (W)
Front fog lamp		55
Front turn signal lamp		27
Parking lamp		5
Rear combination lamp	Turn signal lamp	27
	Stop/Tail lamp	27/8
Back-up lamp		27
License plate lamp		5
High-mounted stop lamp		5

Interior Lamp

NBEL0144S02

Item	Wattage (W)
Interior lamp	10
Spot lamp	8
Luggage room lamp	10

WIRING DIAGRAM CODES (CELL CODES)

Use the chart below to find out what each wiring diagram code stands for.
Refer to the wiring diagram code in the alphabetical index to find the location (page number) of each wiring diagram.

Code	Section	Wiring Diagram Name
1STSIG	AT	A/T 1ST Signal
2NDSIG	AT	A/T 2ND Signal
3RDSIG	AT	A/T 3RD Signal
4THSIG	AT	A/T 4TH Signal
A/C, A	HA	Auto Air Conditioner
AAC/V	EC	IACV-AAC Valve
ABS	BR	Anti-lock Brake System
AP/SEN	EC	Absolute Pressure Sensor
ASCD	EL	Automatic Speed Control Device
AT/C	EC	A/T Control
ATDIAG	EC	A/T Diagnosis Communication Line
AUDIO	EL	Audio
BA/FTS	AT	A/T Fluid Temperature Sensor and TCM Power Supply
BACK/L	EL	Back-up Lamp
BYPS/V	EC	Vacuum Cut Valve Bypass Valve
CHARGE	SC	Charging System
CHIME	EL	Warning Chime
CIGAR	EL	Cigarette Lighter
CKPS	EC	Crankshaft Position Sensor (OBD)
CMPS	EC	Camshaft Position Sensor
COMPAS	EL	Compass and Thermometer
D/LOCK	EL	Power Door Lock
DEF	EL	Rear Window Defogger
DTRL	EL	Headlamp — With Daytime Light System —
ECTS	EC	Engine Coolant Temperature Sensor
EGR/TS	EC	EGR Temperature Sensor
EGRC/V	EC	EGRC-solenoid Valve
EGRC1	EC	EGR Function
ENGSS	AT	Engine Speed Signal
F/FOG	EL	Front Fog Lamp
F/LID	EL	Glass Hatch Opener
F/PUMP	EC	Fuel Pump Control
FICD	EC	IACV-FICD Solenoid Valve
FO2H-L	EC	Front Heated Oxygen Sensor Heater (Left Bank)
FO2H-R	EC	Front Heated Oxygen Sensor Heater (Right Bank)
FRO2LH	EC	Front Heated Oxygen Sensor (Front HO2S) (Left Bank)
FRO2RH	EC	Front Heated Oxygen Sensor (Front HO2S) (Right Bank)
FTS	AT	A/T Fluid Temperature Sensor
FUELLH	EC	Fuel Injection System Function (Left Bank)
FUELRH	EC	Fuel Injection System Function (Right Bank)
H/LAMP	EL	Headlamp
HORN	EL	Horn
HSEAT	EL	Heated Seat
IATS	EC	Intake Air Temperature Sensor
IGN/SG	EC	Ignition Signal
ILL	EL	Illumination
INJECT	EC	Injector
INT/L	EL	Interior, Spot, Vanity Mirror, and Luggage Room Lamps
IVCS	EL	INFINITI Communicator
KS	EC	Knock Sensor
LPSV	AT	Line Pressure Solenoid Valve
MAFS	EC	Mass Air Flow Sensor
MAIN	AT	Main Power Supply and Ground Circuit
MAIN	EC	Main Power Supply and Ground Circuit
METER	EL	Speedometer, Tachometer, Temp., Oil, and Fuel Gauges
MIL/DL	EC	MIL and Data Link Connectors
MIRROR	EL	Door Mirror
MULTI	EL	Multi-remote Control System
NATS	EL	IVIS (Infiniti Vehicle Immobiliser System)
NONDTC	AT	Non-detectable Items
OVRCSV	AT	Overrun Clutch Solenoid Valve
P/ANT	EL	Power Antenna
PGC/V	EC	EVAP Canister Purge Volume Control Solenoid Valve

Code	Section	Wiring Diagram Name
PNP/SW	EC	Park/Neutral Position Switch
PNP/SW	AT	Park/Neutral Position Switch
POWER	EL	Power Supply Routing
PRE/SE	EC	EVAP Control System Pressure Sensor
PST/SW	EC	Power Steering Oil Pressure Switch
RO2H-L	EC	Rear Heated Oxygen Sensor Heater Left Bank
RO2H-R	EC	Rear Heated Oxygen Sensor Heate Right Bank
RRO2LH	EC	Rear Heated Oxygen Sensor Left Bank
RRO2RH	EC	Rear Heated Oxygen Sensor Right Bank
S/SIG	EC	Start Signal
SEAT	EL	Power Seat
SHIFT	AT	A/T Shift Lock System
SROOF	EL	Sunroof
SRS	RS	Supplemental Restraint System
SSV/A	AT	Shift Solenoid Valve A
SSV/B	AT	Shift Solenoid Valve B
START	SC	Starting System
STOP/L	EL	Stop lamp
SW/V	EC	MAP/BARO Switch Solenoid Valve
TAIL/L	EL	Parking, License and Tail Lamps
TCCSIG	AT	A/T TCC Signal (Lock up)
TCV	AT	Torque Converter Clutch Solenoid Valve
T/F	TF	Transfer
TFTS	EC	Tank Fuel Temperature Sensor
THEFT	EL	Theft Warning System
TLID	EL	Glass Hatch Opener
TP/SW	EC	Throttle Position Switch
TPS	AT	Throttle Position Sensor
TPS	EC	Throttle Position Sensor
TRNSMT	EL	Integrated HOMELINK™ Transmitter
TURN	EL	Turn Signal and Hazard Warning Lamps
VENT/V	EC	EVAP Canister Vent Control Valve
VSS	EC	Vehicle Speed Sensor
VSSA/T	AT	Vehicle Speed Sensor A/T (Revolution Sensor)
VSSMTR	AT	Vehicle Speed Sensor MTR
WARN	EL	Warning Lamps
WINDOW	EL	Power Window
WIP/R	EL	Rear Wiper and Washer
WIPER	EL	Front Wiper and Washer

ALPHABETICAL INDEX

SECTION IDX

A

AAC/V - Wiring diagram EC-340
ABS - Wiring diagram BR-35
ABS sensor rotor AX-6, 18
Absolute pressure sensor EC-131
A/C air flow HA-26
A/C component layout HA-20
A/C compressor clutch removal and installation HA-102
A/C compressor precaution HA-6
A/C compressor special service tool HA-9
A/C control operation HA-24
A/C diagnostic work flow HA-43
A/C HFC134a (R134a) system precaution HA-2
A/C HFC134a (R134a) system service procedure HA-97
A/C HFC134a (R134a) system service tools HA-10
A/C HFC134a system service equipment precaution HA-6
A/C lubricant (R134a) HA-99
A/C operational check HA-44
A/C performance chart HA-77
A/C performance test diagnoses HA-75
A/C relay HA-72
A/C self-diagnoses HA-37
A/C service data specification HA-111
A/C system description HA-24
A/C trouble diagnoses HA-28
A/C, A - Wiring diagram HA-31
Accelerator control system FE-3
Accelerator wire adjustment FE-3
Actuator lever (Transfer) TF-96
Air bag RS-9
Air bag disposal RS-22
Air bag precautions GI-2
Air bleeding for brake system BR-7
Air cleaner filter replacement MA-17
Air conditioner cut control EC-23
Air flow meter - See Mass air flow sensor EC-122
Air mix door control linkage adjustment HA-56
Air mix. door motor HA-54, 96
Air spoiler, rear BT-23
All - mode 4WD system TF-9
Alternator SC-12
Ambient sensor HA-86
Angular tightening application EM-2
Antenna - See Power antenna EL-149
Anti-lock brake system - Wiring diagram BR-35
AP/SEN - Wiring diagram EC-134
ASCD (automatic speed control device) EL-162
ASCD - Wiring diagram EL-166
A/T - Wiring diagram - AT - FTS AT-94
A/T - Wiring diagram - AT - MAIN AT-85
A/T - Wiring diagram - AT - PNP/SW AT-89
A/T - Wiring diagram - AT - VSS A/T AT-99
A/T control EC-349
A/T diagnosis communication line EC-440
A/T fluid temperature sensor AT-96
A/T self-diagnoses AT-44
A/T shift lock system AT-220
A/T shift lock system - Wiring diagram AT-221
A/T trouble diagnoses AT-49
A/T Wiring diagram - AT - ENG SS AT-104
A/T Wiring diagram AT - 1ST AT-109
A/T Wiring diagram AT - 2ND AT-115
A/T Wiring diagram AT - 3RD AT-121
A/T Wiring diagram AT - 4TH AT-128
A/T Wiring diagram AT - BA/FTS AT-174
A/T Wiring diagram AT - LPSV AT-146
A/T Wiring diagram AT - NONDTC AT-185
A/T Wiring diagram AT - OVRCSV AT-169
A/T Wiring diagram AT - SSV/A AT-152
A/T Wiring diagram AT - SSV/B AT-157
A/T Wiring diagram AT - TCCSIG AT-140
A/T Wiring diagram AT - TCV AT-134
A/T Wiring diagram AT - TPS AT-163
A/T Wiring diagram AT - VSSMTR AT-179
AT/C - Wiring diagram EC-351
ATDIAG - Wiring diagram EC-441
ATP switch TF-88
ATP warning lamp TF-80
Audio EL-141
AUDIO - Wiring diagram EL-143
Audio and A/C control removal and installation - See Instrument panel BT-13
Auto air conditioner - Wiring diagram HA-31
Automatic amplifier HA-35, 47
Automatic speed control system - See ASCD EL-162
Automatic transmission fluid replacement MA-21
Automatic transmission number GI-40
Auxiliary air control (AAC) valve EC-336
Axle housing (rear) AX-18

B

Back door BT-8
Back door opener - See Back door BT-8
Back door trim BT-22
Back-up lamp EL-53
BACK/L - Wiring diagram EL-53
Ball joint (front) SU-12
Basic inspection EC-86
Battery SC-3
Block heater EM-45
Blower motor HA-63
Body alignment BT-46
BPT valve EC-297, 300
Brake booster BR-17
Brake fluid change BR-6
Brake fluid level MA-25
Brake fluid level and line check BR-6
Brake hydraulic line BR-8

Brake inspection MA-25
Brake lines and cables inspection MA-25
Brake lining wear temporary checking MA-26
Brake master cylinder BR-14
Brake pedal BR-12
Bulb specifications EL-330
Bumper, front BT-5
Bumper, rear BT-8
BYPS/V - Wiring diagram EC-430, 436

C

Camshaft inspection EM-30
Camshaft position sensor (CMPS).....EC-282
Canister-See EVAP canister EC-24
Center case (Transfer).....TF-99
CHARGE - Wiring diagram SC-10
Charging system SC-9
Chassis and body maintenance MA-21
CHIME - Wiring diagram.....EL-106
CIGAR - Wiring diagram.....EL-131
Cigarette lighter.....EL-131
Circuit breaker.....EL-14
CKPS - Wiring diagram.....EC-279, 375
Closed loop control (Left bank).....EC-365
Closed loop control (Right bank) EC-365
Closed throttle position switch EC-343
Clutch drum (Transfer).....TF-101
Clutch force release limit adjustment TF-38
Clutch pressure switch (Transfer).....TF-87
CMPS - Wiring diagram EC-285
Coil spring (front).....SU-8
Coil spring (rear) SU-17
Collision diagnosis.....RS-59
Combination lamp, front, removal and installation BT-5
Combination lamp, rear, removal and installation BT-23
Combination meter.....EL-78
Combination meter removal and installation - See Instrument panel.....BT-13
Combination switch.....EL-20
COMPAS - Wiring diagram.....EL-93
Compass EL-92
Component Location HA-28
Compression pressure.....EM-12
Compressor clutch removal and installation.....HA-102
Compressor precaution HA-6
Compressor special service tool HA-9
Connecting rod.....EM-47
Connecting rod bearing clearance.....EM-52
Connecting rod bushing clearance EM-53
Connector inspection.....GI-18
Console box - See Instrument panel.....BT-13
CONSULT for ABS BR-41
CONSULT for all-mode 4WD.....TF-29
CONSULT for engine EC-67
CONSULT general information.....GI-35
Control valve (A/T) AT-252
Control valve (Transfer) TF-104
Converter housing installation.....AT-231
Coolant mixture ratio.....MA-12
Coolant replacement.....MA-14
Cooling circuit (engine).....LC-8
Crank angle sensor built into distributor - See Camshaft position sensor.....EC-282
"Crankcase emission control system - See positive crankcase ventilation".....EC-30
Crankshaft.....EM-50
Crankshaft position sensor (OBD) EC-277
Crankshaft position sensor (OBD) cog chipping EC-373
Cruise control - See ASCD.....EL-162
Cylinder block EM-44
Cylinder block boring EM-49
Cylinder head.....EM-26
Cylinder head bolt tightening EM-38

D

Data link connector for Consult.....EC-67
Daytime light system.....EL-34
Daytime running light - See Daytime light system EL-34
DEF - Wiring diagram EL-135
Detonation sensor - See Knock sensor.....EC-272
Diagnostic trouble code (DTC) for OBD system EC-2, 45
Diagnostic trouble code (DTC) inspection priority chart.....EC-95
Differential carrier assembly.....PD-25, 51
Differential carrier disassembly PD-38
Differential gear oil replacement.....MA-24
Dimensions GI-40
Distributor EC-22
Distributor ignition (DI) system.....EC-22
D/LOCK - Wiring diagram.....EL-193
Dome light - See Interior lamp EL-71
Door glass BT-11
Door lock.....BT-11
Door mirror.....BT-45
Door trim BT-19
Door, front.....BT-11
Door, rear BT-12
Drive belt inspection MA-13
Drive chain (Transfer) TF-101
Drive pinion diff. inspection.....PD-18, 41
Drive pinion height PD-20, 47
Drive plate runout EM-53
Drive shaft (front).....AX-10
Dropping resistor (A/T).....AT-149
DTC work support EC-76
DTRL - Wiring diagram EL-38
Dual pressure switch.....HA-73

E

ECM input/output signal EC-106
ECTS - Wiring diagram EC-148, 164
EGR control (EGRC) - BPT valve EC-297
EGR control (EGRC) - solenoid valve EC-378
EGR control valve EC-289, 296, 389, 394
EGR temperature sensor EC-383
EGR/TS - Wiring diagram EC-386
EGRC/V - Wiring diagram EC-380
EGRC1 - Wiring diagram EC-293, 392
Electric sun roof EL-153
Electrical diagnoses GI-21
Electrical ignition system EC-22
Electrical unit ..... Foldout
Electrical units location EL-310
Engine compartment BT-47
Engine control circuit diagram EC-16
Engine control component parts location EC-14
Engine control module (ECM) EC-353
Engine control system diagram and chart EC-17
Engine coolant temperature sensor (ECTS) EC-146, 162
Engine fail-safe system EC-96
Engine oil filter replacement MA-18
Engine oil precautions GI-5
Engine oil replacement MA-17
Engine outer component parts EM-9
Engine removal EM-41
Engine room - See Engine compartment BT-47
Engine serial number GI-40
EVAP canister EC-25
EVAP canister purge volume control solenoid valve EC-24, 311, 403
EVAP canister vent control valve EC-317, 410, 421
EVAP control system (small leak) diagnosis EC-304, 396
EVAP control system pressure sensor EC-323
EVAP control system purge flow monitoring diagnosis EC-415
EVAP vapor lines inspection MA-20
Evaporative emission (EVAP) system EC-24
Exhaust gas recirculation (EGR) valve EC-289, 389
Exhaust system FE-8
Exhaust system inspection MA-21
Exterior BT-23

F

4LO indicator lamp TF-82
4WD shift indicator lamp TF-78
4WD shift switch TF-87
4WD solenoid valve TF-87
4WD warning lamp TF-12
Fan control amp. HA-65
Fast idle cam (FIC) inspection and adjustment EC-33
F/FOG - Wiring diagram EL-56
FICD - Wiring diagram EC-468
Final drive disassembly PD-37
Final drive pre-inspection PD-37
Final drive removal and installation PD-37
Finisher, interior - See Trim BT-17
F/LID - Wiring diagram EL-158
Fluid temperature sensor (A/T) AT-96
Fluids MA-11
FO2H-L - Wiring diagram EC-207
FO2H-R - Wiring diagram EC-206
Fog lamp, front EL-54
Fog lamp, front, removal and installation BT-5
Forward clutch AT-271
F/PUMP - Wiring diagram EC-459
Freeze frame data EC-46
FRO2LH - Wiring diagram EC-171, 191, 200
FRO2RH - Wiring diagram EC-170, 190, 199
Front axle AX-2
Front bumper BT-5
Front case (Transfer) TF-109
Front combination lamp removal and installation BT-5
Front disc brake BR-20
Front door BT-11
Front drive shaft (Transfer) TF-101
Front final drive disassembly (4WD) PD-13
Front final drive pre-inspection (4WD) PD-13
Front final drive removal and installation (4WD) PD-13
Front fog lamp EL-54
Front fog lamp removal and installation BT-5
Front heated oxygen sensor (HO2S) (Left bank) EC-167, 175, 181, 187, 196
Front heated oxygen sensor (HO2S) (Right bank) EC-167, 175, 181, 187, 196
Front heated oxygen sensor heater (Left bank) EC-204
Front heated oxygen sensor heater (Right bank) EC-204
Front oxygen sensor (O2S) monitor EC-58
Front revolution sensor (Transfer) TF-88
Front seat BT-30
Front seat belt RS-3
Front suspension SU-2
Front washer EL-113
Front wiper EL-113
Fuel cut control (at no load & high engine speed) EC-24
Fuel filler lid BT-8
Fuel filter replacement MA-16
Fuel gauge EL-78
Fuel injection system (Left bank) EC-249, 256
Fuel injection system (Right bank) EC-249, 256
Fuel lid opener, electric EL-158
Fuel line inspection MA-16

Fuel precautions GI-6
Fuel pressure check EC-31
Fuel pressure regulator EC-32
Fuel pressure release EC-31
Fuel pump EC-458
Fuel system FE-4
Fuel tank vacuum relief valve EC-25
FUELLH - Wiring diagram EC-252, 259
FUELRH - Wiring diagram EC-251, 258
Fuse EL-14
Fuse block ..... Foldout
Fusible link EL-14

G

Garage jack and safety stand GI-43
Gauges EL-78
Generator - See Alternator SC-12
Generic scan tool (GST) EC-80
Glass BT-11
Glass hatch opener, electric EL-157
Grease MA-11
Ground distribution EL-15

H

Harness connector EL-3
Harness connector inspection GI-18
Harness layout EL-313
Hazard warning lamp EL-59
Headlamp EL-23
Headlining - See Roof trim BT-21
Heated seat BT-32, EL-161
Height (Dimensions) GI-40
HFC134a (R134a) system precaution HA-2
HFC134a (R134a) system service procedure HA-97
HFC134a (R134a) system service tools HA-10
HFC134a system service equipment precaution HA-6
High clutch AT-269
H/LAMP - Wiring diagram EL-27
Hood BT-5
Horn EL-130
HORN - Wiring diagram EL-130
How to erase DTC for OBD system EC-55
HSEAT - Wiring diagram EL-161
Hydraulic lash adjuster inspection EM-35

I

IACV-AAC valve EC-336
IACV-FICD solenoid valve EC-467
IATS - Wiring diagram EC-143
Identification plate GI-39
Idle air control valve (IACV) EC-336
Idle mixture ratio EC-35
Idle speed EC-35
IGN/SG - Wiring diagram EC-369
Ignition timing EC-35
Ignition wire inspection EC-271
ILL - Wiring diagram EL-67
Illumination EL-64
In vehicle sensor HA-89
INFINITI COMMUNICATOR EL-273
Infiniti communicator (IVCS) EL-273
INJECT - Wiring diagram EC-449
Injector EC-453
Injector removal and installation EC-32
Instrument panel BT-13
INT/L - Wiring diagram EL-74
Intake air temparature sensor EC-140
Intake door control linkage adjustment HA-62
Intake door motor HA-58
Intake sensor HA-94
Integrated homelink transmitter EL-255
Interior BT-17
Interior lamp EL-71
Interior lamp on-off control EL-72
Internal gear (Transfer) TF-110
IVCS - Wiring diagram EL-284
IVIS (Infiniti vehicle immobiliser system) EL-258
IVIS (Infiniti vehicle immobiliser system) precautions GI-2

J

Jacking points GI-42
Journal bearing assembly (propeller shaft) PD-6
Journal bearing disassembly (propeller shaft) PD-6
Junction box (J/B) ..... Foldout

K

Keyless entry system - See Multi-remote control system EL-206
Knock sensor (KS) EC-272
Knuckle spindle AX-9
KS - Wiring diagram EC-274

L

Length (Dimensions) GI-40
License lamp EL-45
Lifting points GI-44
Limited slip diff. adjustment PD-44
Limited slip diff. assembly PD-45
Limited slip diff. disassembly PD-42
Limited slip diff. inspection PD-43
Line pressure solenoid valve AT-131, 143, 148
Line pressure switch (Transfer) TF-87

Line pressure test (A/T) AT-58
Liquid gasket application EM-2
Location of electrical units EL-310
Lock, door.....BT-11
Low and reverse brake AT-275
LSV (Load sensing valve) BR-10
Lubricant (R134a) A/C.....HA-99
Lubricants.....MA-11
Lubrication circuit (engine) LC-3
Lubrication-locks, hinges and hood latches MA-27
Luggage room lamp.....EL-71

M

MAFS - Wiring diagram.....EC-127
Magnet clutch.....HA-69, 102
MAIN - Wiring diagram.....EC-116
Main oil pump (Transfer).....TF-107
Mainshaft (Transfer).....TF-101
Maintenance (engine) MA-13
MAJOR OVERHALL.....AT-233
Major overhaul (Transfer) TF-96
Malfunction indicator lamp (MIL).....EC-57
MAP/BARO switch solenoid valve EC-355
Mass air flow sensor (MAFS).....EC-122
Master cylinder (brake) BR-14
Meter EL-78
METER - Wiring diagram.....EL-82
MIL & Data link connectors circuit EC-472
MIL/DL - Wiring diagram EC-472
MIRROR - Wiring diagram.....EL-156
Mirror defogger EL-133
Mirror, door.....BT-45
Mirror, out side BT-45
Misfire EC-267
Mode door control linkage adjustment.....HA-53
Mode door motor.....HA-49
Model variation GI-38
Molding - See Exterior BT-23
MULTI - Wiring diagram.....EL-210
Multi-remote control system.....EL-206
Multiport fuel injection (MFI) system EC-20
Multiport fuel injection precautions.....GI-5

N

NATS (Nissan anti-theft system) precautions GI-2
NATS - Wiring diagram.....EL-260
Neutral-4LO switch TF-88
NVH troubleshooting (AX).....AX-3, 17
NVH troubleshooting (BR).....BR-5
NVH troubleshooting (PD).....PD-2
NVH troubleshooting (ST).....ST-5
NVH troubleshooting (SU) SU-3, 13

O

Oil change (capacity) MA-11
Oil filter (Transfer).....TF-94
Oil pan (engine) EM-14
Oil pressure (engine) LC-3
Oil pump (A/T).....AT-248
Oil pump (engine) LC-4
Oil pump regulator valve (engine) LC-5
Oil seal replacement (engine).....EM-24
Oil seal replacement (front final drive 4WD).....PD-10
Oil seal replacement (front of final drive) PD-34
On board diagnostic system EC-44
Out side mirror BT-45
Overdrive control switch.....AT-217
Overrun clutch AT-271
Overrun clutch solenoid valve.....AT-170
Oversize piston EM-49

P

P/ANT - Wiring diagram.....EL-150
Park/Neutral position switch.....EC-443
Park/neutral position switch (A/T).....AT-91, 218
Parking brake control BR-28
Parking lamp EL-45
PCV (positive crankcase ventilation) EC-30
PGC/V - Wiring diagram EC-314, 406
Pilot bushing replacement - See Pilot converter.....EM-55
Pinion bearing preload diff. PD-20
Pinion gear height diff. PD-20, 47
Piston assembly.....EM-53
Piston pin inspection.....EM-46
Piston ring inspection.....EM-47
Piston to bore clearance EM-48
Planetary carrier (Transfer) TF-110
PNP/SW - Wiring diagram EC-446
POWER - Wiring diagram.....EL-8
Power antenna.....EL-149
Power door lock EL-191
Power door mirror EL-156
Power seat EL-159
Power steering fluid level.....MA-27, ST-7
Power steering gear.....ST-16
Power steering hydraulic pressure ST-9
Power steering oil pressure switch EC-463
Power steering oil pump ST-26
Power steering system bleeding.....ST-8
Power supply routing EL-7
Power transistor & ignition coil.....EC-367
Power window.....EL-183
PRE/SE - Wiring diagram EC-326
Precautions (General) GI-3
Pressure test (A/T).....AT-58
Propeller shaft PD-2

Propeller shaft greasing MA-23
Propeller shaft inspection MA-23
Propeller shaft on vehicle service PD-4
Propeller shaft vibration PD-4
PST/SW - Wiring diagram EC-464

R

Rack retainer adjustment ST-7
Radiator LC-12
Radio - See Audio EL-141
Rear air spoiler BT-23
Rear axle AX-16
Rear bumper BT-8
Rear case (Transfer) TF-99
Rear combination lamp removal and installation BT-23
Rear cover packing replacement diff. PD-11
Rear door BT-12
Rear drum brake BR-24
Rear heated oxygen sensor (HO2S) EC-210, 218, 226, 235
Rear heated oxygen sensor (HO2S) heater EC-243
Rear seat BT-33
Rear seat belt RS-4
Rear side window BT-44
Rear suspension SU-13
Rear washer EL-122
Rear window defogger EL-133
Rear wiper EL-122
Refrigerant connection precaution HA-3
Refrigerant discharging evacuating charging HA-97
Refrigerant general precaution HA-3
Refrigerant lines HA-106
Refrigeration cycle HA-13
Removal and installation (A/T) AT-230
Removal and installation (Transfer) TF-95
Reverse clutch AT-265
Revolution sensor (A/T) AT-101
Ring gear diff. inspection PD-18, 41
RO2H-L - Wiring diagram EC-246
RO2H-R - Wiring diagram EC-245
Road wheel size GI-41
Roof trim BT-21
Room lamp - See Interior lamp EL-71
RRO2LH - Wiring diagram EC-214, 222, 230, 238
RRO2RH - Wiring diagram EC-213, 221, 229, 237

S

SAE J1930 terminology list GI-47
Screw jack GI-42
Seal - See Exterior BT-23
SEAT - Wiring diagram EL-159
Seat belt inspection MA-28, RS-6
Seat belt pre-tensioner RS-2
Seat belt pre-tensioner disposal RS-22
Seat belt, front RS-3
Seat belt, rear RS-4
Seat, front BT-30
Seat, rear BT-33
Self-diagnosis (Transfer) TF-26
Self-diagnostic results EC-58
SHIFT - Wiring diagram AT-221
Shift lock system AT-220
Shift schedule AT-307
Shift solenoid valve A (A/T) AT-111, 122, 131, 153
Shift solenoid valve B (A/T) AT-111, 116, 131, 158
Shock absorber (rear) SU-17
Side air bag RS-20
Side bearing preload (front final drive 4WD) PD-19
Side trim BT-17
Side window - See Rear side window BT-44
Smart entrance control unit EL-250
SMJ (super multiple junction) ..... Foldout
Spare tire size GI-41
Spark plug replacement MA-19
Speedometer EL-78
Spot lamp EL-71
Spring (Wheelarch) height SU-5
SROOF - Wiring diagram EL-154
SRS - See Supplemental Restraint System RS-9
SRS - Wiring diagram RS-34
S/SIG - Wiring diagram EC-455
Stabilizer bar (front) SU-10
Stabilizer bar (rear) SU-19
Stall test (A/T) AT-55
Standardized relay EL-5
START - Wiring diagram SC-7
Starter SC-8
Starting system SC-6
Starting torque offset adjustment TF-39
Steering gear, linkage and transfer gear inspection MA-26
Steering linkage ST-16
Steering switch EL-22
Steering transfer gear ST-14
Steering wheel and column ST-10
Steering wheel play ST-6
Steering wheel turning force ST-8
Stop lamp EL-51
STOP/L - Wiring diagram EL-51
Strut (front) SU-8
Sub-oil pump (Transfer) TF-107
Sun gear (Transfer) TF-110
Sun roof, electric EL-153
Sunload sensor HA-91
Sunroof BT-34
Supplemental Restraint System RS-9
Supplemental restraint system - Wiring diagram RS-34
SW/V - Wiring diagram EC-359
Symbols and abbreviations GI-8
Symptom matrix chart EC-97

System readiness test (SRT) code EC-46

T

2-4WD shift solenoid valve TF-87
Tachometer EL-78
Tail lamp EL-45
TAIL/L - Wiring diagram EL-47
Tank fuel temperature sensor EC-263
TCM circuit diagram AT-11
TCM inspection table AT-81
TFTS - Wiring diagram EC-265
THEFT - Wiring diagram EL-232
Theft warning system EL-226
Thermometer EL-92
Thermostat LC-10
Three way catalyst function (Left bank) EC-301
Three way catalyst function (Right bank) EC-301
Three way catalyst precautions GI-5
Throttle position sensor (TPS) EC-151
Throttle position sensor adjustment EC-86
Throttle position switch EC-343, AT-166, 218
Tie-rod ST-20
Tie-rod ball joints ST-20
Tightening torque of standard bolts GI-46
Timing belt EM-17
Tire rotation MA-24
Tire size GI-41
TLID - Wiring diagram EL-157
Tooth contact (front final drive 4WD) PD-24
Tooth contact diff. PD-50
Torque converter installation AT-231
Torque convertor clutch solenoid valve AT-135, 143
Tow truck towing GI-44
Towing point GI-45
TP/SW - Wiring diagram EC-345
TPS - Wiring diagram EC-157
Transfer control unit inspection table TF-50
Transfer dropping resistor TF-88
Transfer fluid replacement MA-22
Transfer fluid temperature sensor TF-87
Transfer motor TF-93
Transfer motor relay TF-89
Transfer serial number GI-40
TRANSMT - Wiring diagram EL-255
Tread-FR&RR (Dimensions) GI-40
Trim BT-17
Trouble diagnoses GI-31
Trunk lid opener, electric EL-157
TURN - Wiring diagram EL-61
Turn signal lamp EL-59
Two trip detection logic EC-44
Two-pole lift GI-44

U

Under body BT-49

V

Vacuum cut valve EC-24, 439
Vacuum cut valve bypass valve EC-24, 428, 433
Vacuum hose (brake system) BR-19
Vacuum hose drawing (Engine control) EC-18
Valve clearance EM-58
Valve guide EM-32
Valve seat EM-33
Valve spring EM-34
Vehicle identification number GI-39
Vehicle recovery (freeing a stuck vehicle) GI-45
Vehicle speed sensor (VSS) EC-331
VENT/V - Wiring diagram EC-319, 412, 424
Ventilation air filter HA-110
Viscosity number (SAE) MA-12
VSS - Wiring diagram EC-334

W

Wait detection switch TF-88
WARN - Wiring diagram EL-97
Warning chime EL-104
Warning lamps EL-96
Washer, front EL-113
Washer, rear EL-122
Water pump LC-9
Water temperature gauge EL-78
Weatherstrip - See Exterior BT-23
Wheel balance MA-24
Wheel bearing (front) AX-4
Wheel bearing (rear) AX-17
Wheel hub (front) AX-6
Wheel sensors (ABS) BR-53, 71
Wheel size GI-41
Wheelarch height SU-5
Wheelbase (Dimensions) GI-40
Wide open & closed throttle position switch EC-151
Width (Dimensions) GI-40
WINDOW - Wiring diagram EL-186
Window, door BT-11
Window, rear side BT-44
Window, side - See Rear side window BT-44
Windshield BT-42
WIP/R - Wiring diagram EL-125
WIPER - Wiring diagram EL-115
Wiper, front EL-113
Wiper, rear EL-122
Wiring Diagram (Cell code) list EL-331
Wiring diagram (Transfer) TF-17
Wiring diagrams GI-9

Wrist pin - See Piston pin inspection.....EM-46

INFINITI®

PLEASE HELP MAKE THIS SERVICE MANUAL BETTER!

Your comments are important to INFINITI and will help us to improve our Service Manuals.

Use this form to report any issues or comments you may have regarding our Service Manuals.

Please photocopy this form and type or print your comments below. Mail or fax to:

Nissan North America, Inc.
Technical Service Information
39001 Sunrise Drive, P.O. Box 9200
Farmington Hills, MI USA 48331
FAX: (248) 488-3910

SERVICE MANUAL: Model:_____ **Year:**_____

PUBLICATION NO. (Please photocopy back cover):_____

VEHICLE INFORMATION VIN:_____ **Production Date:**_____

Please describe any issues or problems in detail:

Page number(s)_____ *Note: Please include a copy of each page, marked with your comments.*

_____

_____

_____

_____

_____

Are the trouble diagnosis procedures logical and easy to use? (circle your answer) YES NO

If no, what page number(s)?_____*Note: Please include a copy of each page, marked with your comments.*

Please describe the issue or problem in detail:_____

_____

_____

_____

Is the organization of the manual clear and easy to follow? (circle your answer) YES NO

Please comment:_____

_____

_____

_____

_____

What information should be included in INFINITI Service Manuals to better support you in servicing or repairing customer vehicles?

_____

_____

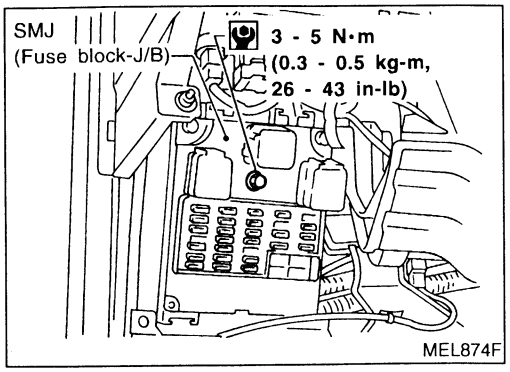
_____

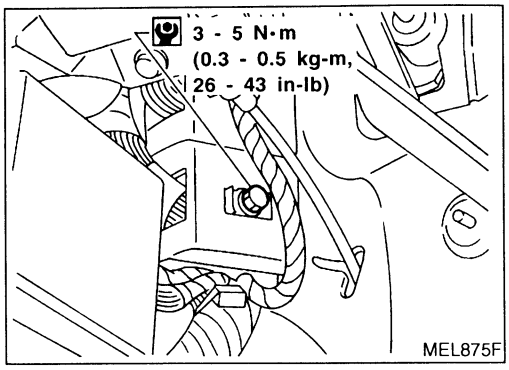
_____

DATE:_____ YOUR NAME:_____ POSITION:_____

DEALER:_____ DEALER NO.:_____ ADDRESS:_____

CITY:_____ STATE/PROV./COUNTRY:_____ ZIP/POSTAL CODE:_____





Installation

NBEL0146

To install SMJ, tighten bolts until orange "fulltight" mark appears and then retighten to specified torque as required.

: 3 - 5 N·m
(0.3 - 0.5 kg-m, 26 - 43 in-lb)

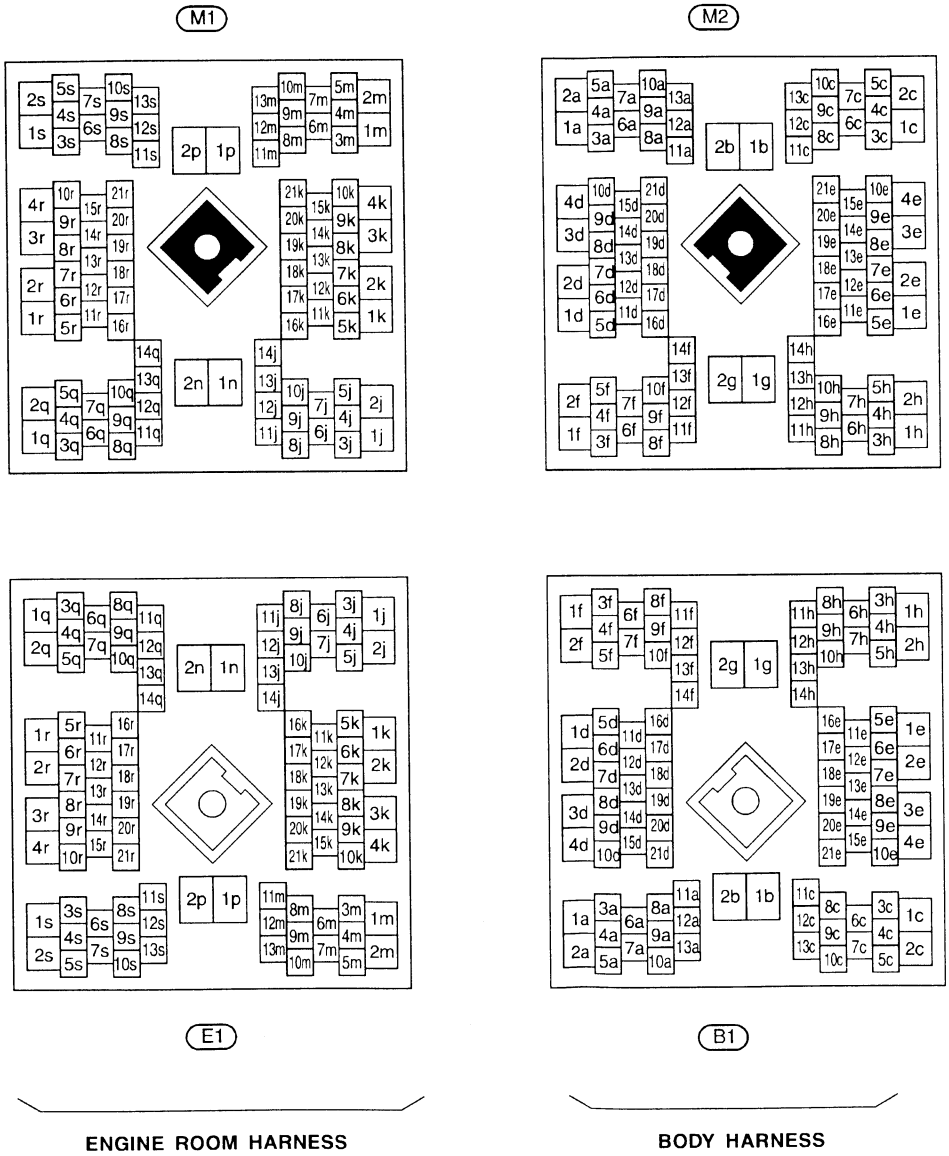
CAUTION:
Do not overtighten bolts, otherwise, they may be damaged.

Terminal Arrangement

NBEL0147

MAIN HARNESS

T.S.

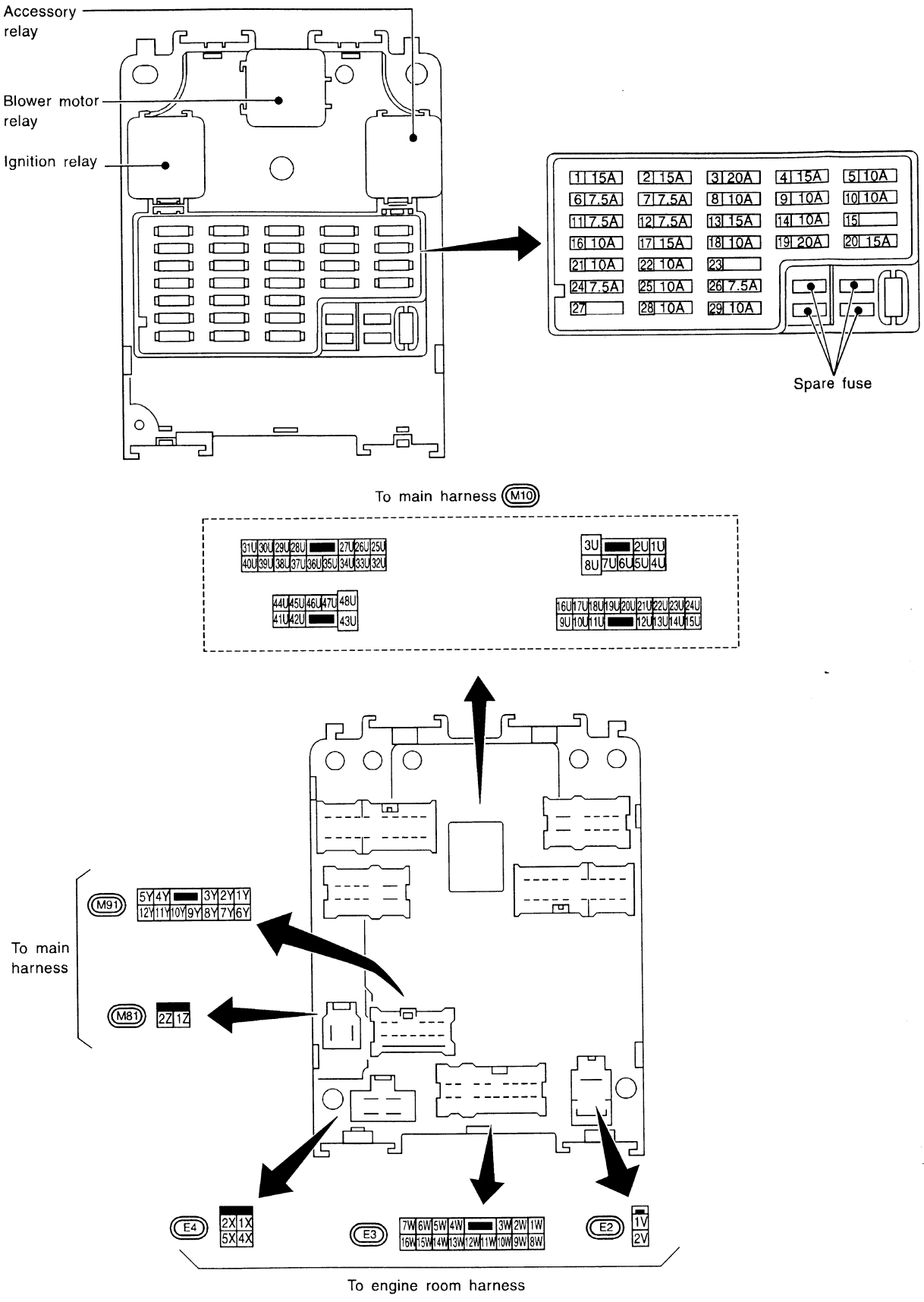


ENGINE ROOM HARNESS

BODY HARNESS

Terminal Arrangement

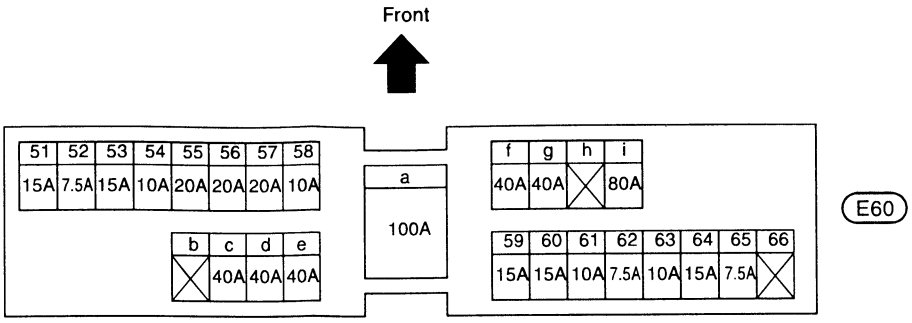
NBEL0148



MEL869J

Terminal Arrangement

NBEL0149



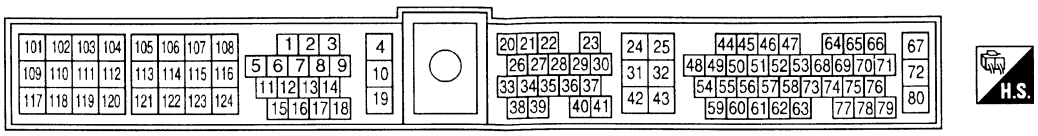
No. 51 - 66: FUSE a - i: FUSIBLE LINK

MEL872J

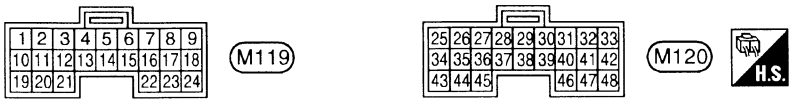
Terminal Arrangement

NBEL0150

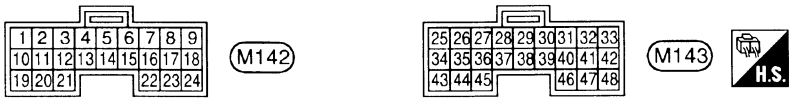
ECM (F24)



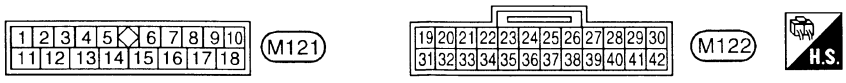
TCM (TRANSMISSION CONTROL MODULE)



TRANSFER CONTROL UNIT



SMART ENTRANCE CONTROL UNIT



INCH TO METRIC CONVERSION TABLE

(Rounded-off for automotive use)

inches	mm	inches	mm
.100	**2.54**	.610	**15.49**
.110	**2.79**	.620	**15.75**
.120	**3.05**	.630	**16.00**
.130	**3.30**	.640	**16.26**
.140	**3.56**	.650	**16.51**
.150	**3.81**	.660	**16.76**
.160	**4.06**	.670	**17.02**
.170	**4.32**	.680	**17.27**
.180	**4.57**	.690	**17.53**
.190	**4.83**	.700	**17.78**
.200	**5.08**	.710	**18.03**
.210	**5.33**	.720	**18.29**
.220	**5.59**	.730	**18.54**
.230	**5.84**	.740	**18.80**
.240	**6.10**	.750	**19.05**
.250	**6.35**	.760	**19.30**
.260	**6.60**	.770	**19.56**
.270	**6.86**	.780	**19.81**
.280	**7.11**	.790	**20.07**
.290	**7.37**	.800	**20.32**
.300	**7.62**	.810	**20.57**
.310	**7.87**	.820	**20.83**
.320	**8.13**	.830	**21.08**
.330	**8.38**	.840	**21.34**
.340	**8.64**	.850	**21.59**
.350	**8.89**	.860	**21.84**
.360	**9.14**	.870	**22.10**
.370	**9.40**	.880	**22.35**
.380	**9.65**	.890	**22.61**
.390	**9.91**	.900	**22.86**
.400	**10.16**	.910	**23.11**
.410	**10.41**	.920	**23.37**
.420	**10.67**	.930	**23.62**
.430	**10.92**	.940	**23.88**
.440	**11.18**	.950	**24.13**
.450	**11.43**	.960	**24.38**
.460	**11.68**	.970	**24.64**
.470	**11.94**	.980	**24.89**
.480	**12.19**	.990	**25.15**
.490	**12.45**	1.000	**25.40**
.500	**12.70**	2.000	**50.80**
.510	**12.95**	3.000	**76.20**
.520	**13.21**	4.000	**101.60**
.530	**13.46**	5.000	**127.00**
.540	**13.72**	6.000	**152.40**
.550	**13.97**	7.000	**177.80**
.560	**14.22**	8.000	**203.20**
.570	**14.48**	9.000	**228.60**
.580	**14.73**	10.000	**254.00**
.590	**14.99**	20.000	**508.00**
.600	**15.24**		

METRIC TO INCH CONVERSION TABLE

(Rounded-off for automotive use)

mm	inches	mm	inches
1	.0394	**51**	2.008
2	.079	**52**	2.047
3	.118	**53**	2.087
4	.157	**54**	2.126
5	.197	**55**	2.165
6	.236	**56**	2.205
7	.276	**57**	2.244
8	.315	**58**	2.283
9	.354	**59**	2.323
10	.394	**60**	2.362
11	.433	**61**	2.402
12	.472	**62**	2.441
13	.512	**63**	2.480
14	.551	**64**	2.520
15	.591	**65**	2.559
16	.630	**66**	2.598
17	.669	**67**	2.638
18	.709	**68**	2.677
19	.748	**69**	2.717
20	.787	**70**	2.756
21	.827	**71**	2.795
22	.866	**72**	2.835
23	.906	**73**	2.874
24	.945	**74**	2.913
25	.984	**75**	2.953
26	1.024	**76**	2.992
27	1.063	**77**	3.031
28	1.102	**78**	3.071
29	1.142	**79**	3.110
30	1.181	**80**	3.150
31	1.220	**81**	3.189
32	1.260	**82**	3.228
33	1.299	**83**	3.268
34	1.339	**84**	3.307
35	1.378	**85**	3.346
36	1.417	**86**	3.386
37	1.457	**87**	3.425
38	1.496	**88**	3.465
39	1.535	**89**	3.504
40	1.575	**90**	3.543
41	1.614	**91**	3.583
42	1.654	**92**	3.622
43	1.693	**93**	3.661
44	1.732	**94**	3.701
45	1.772	**95**	3.740
46	1.811	**96**	3.780
47	1.850	**97**	3.819
48	1.890	**98**	3.858
49	1.929	**99**	3.898
50	1.969	**100**	3.937