SECTION SC
STARTING & CHARGING SYSTEM

CONTENTS

SERVICE INFORMATION

PRECAUTIONS

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

INFOID:0000000004657873

The Supplemental Restraint System such as “AIR BAG” and “SEAT BELT PRE-TENSIONER”, used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. This system includes seat belt switch inputs and dual stage front air bag modules. The SRS system uses the seat belt switches to determine the front air bag deployment, and may only deploy one front air bag, depending on the severity of a collision and whether the front occupants are belted or unbelted. Information necessary to service the system safely is included in the “SUPPLEMENTAL RESTRAINT SYSTEM” and “SEAT BELTS” 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 NISSAN/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 “SUPPLEMENTAL RESTRAINT SYSTEM”.**
- **Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.**

PRECAUTIONS WHEN USING POWER TOOLS (AIR OR ELECTRIC) AND HAMMERS

WARNING:

- **When working near the Air Bag Diagnosis Sensor Unit or other Air Bag System sensors with the ignition ON or engine running, DO NOT use air or electric power tools or strike near the sensor(s) with a hammer. Heavy vibration could activate the sensor(s) and deploy the air bag(s), possibly causing serious injury.**
- **When using air or electric power tools or hammers, always switch the ignition OFF, disconnect the battery, and wait at least 3 minutes before performing any service.**

Precaution for Battery Service

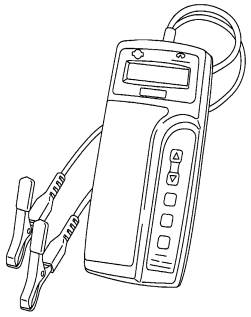
INFOID:0000000004657874

Before disconnecting the battery, lower both the driver and passenger windows. This will prevent any interference between the window edge and the vehicle when the door is opened/closed. During normal operation, the window slightly raises and lowers automatically to prevent any window to vehicle interference. The automatic window function will not work with the battery disconnected.

PREPARATION

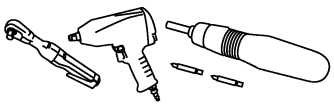
Special Service Tool

INFOID:0000000004657875

Tool number (Kent-Moore No.) Tool name	Description
— (J-48087) Battery Service Center  WKIA5280E	Tests battery. For operating instructions, refer to Technical Service Bulletin and Battery Service Center User Guide.
— (J-44373 Model MCR620) Starting/Charging System Tester  SEL403X	Tests starting and charging system. For operating instructions, refer to Technical Service Bulletin.

Commercial Service Tool

INFOID:0000000004657876

Tool name	Description
Power tool  PIIB1407E	Loosening bolts, nuts and screws

BATTERY

How to Handle Battery

INFOID:0000000004657877

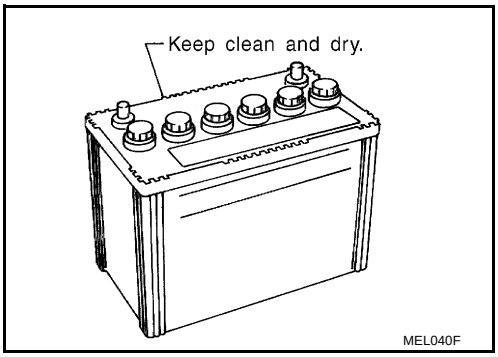
CAUTION:

- **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.**

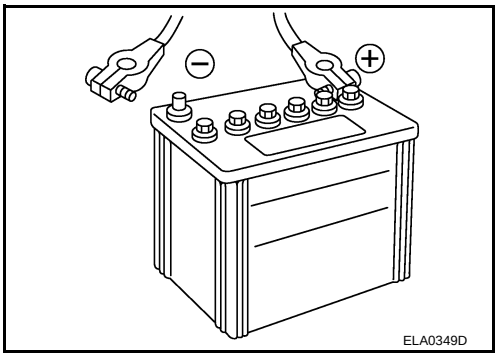
METHODS OF PREVENTING OVER-DISCHARGE

The following precautions must be taken to prevent over-discharging a battery.

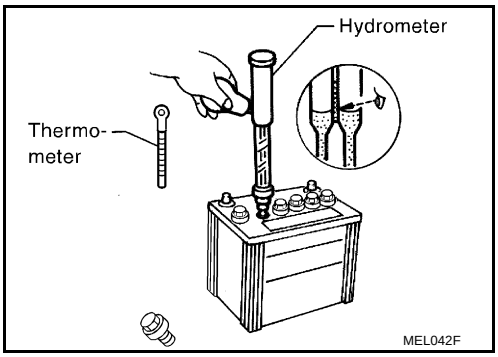
- The battery surface (particularly its top) should always be kept clean and dry.
- The terminal connections should be clean and tight.
- At every routine maintenance, check the electrolyte level.
  This also applies to batteries designated as “low maintenance” and “maintenance-free”.



- When the vehicle is not going to be used over a long period of time, disconnect the battery cable from the negative terminal.



- 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.

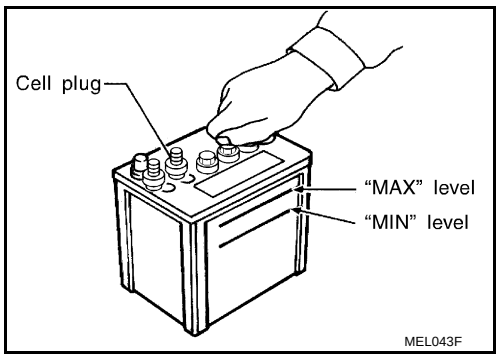


CHECKING ELECTROLYTE LEVEL

WARNING:

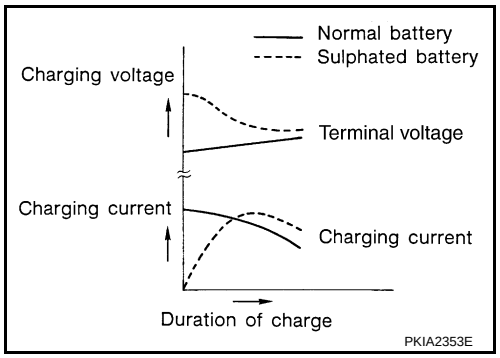
Never allow battery fluid to come in contact with skin, eyes, fabrics, or painted surfaces. After touching a battery, never touch or rub your eyes until you have thoroughly washed your hands. If acid contacts eyes, skin or clothing, immediately flush with water for 15 minutes and seek medical attention.

- Remove the cell plug using a suitable tool.
- Add distilled water up to the MAX level.



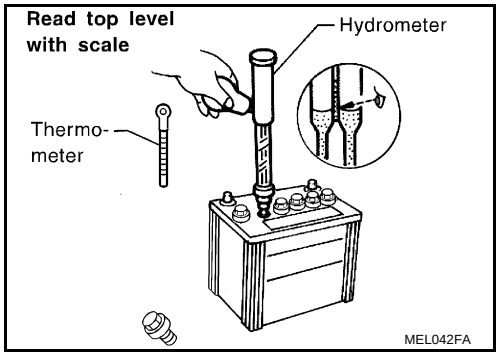
Sulphation

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

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

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
4 (40)	–0.016
–1 (30)	–0.020

Battery electrolyte temperature °C (°F)	Add to specific gravity reading
–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

CAUTION:

- **Never “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. Never turn on the charger first, as this may cause a spark.**
- **If battery electrolyte temperature rises above 55 °C (131 °F), stop charging. Always charge battery at a temperature below 55 °C (131 °F).**

Charging Rates

Amps	Time
50	1 hour
25	2 hours
10	5 hours
5	10 hours

Never 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 0.050, the battery should be replaced.

Trouble Diagnosis with Battery Service Center

INFOID:0000000004657878

For battery testing, use Battery Service Center (J-48087). For details and operating instructions, refer to Technical Service Bulletin and/or Battery Service Center User Guide.

Removal and Installation

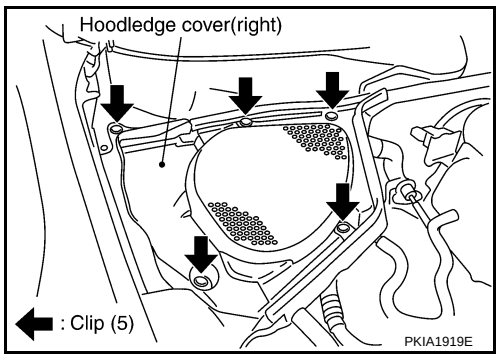
INFOID:0000000004657879

REMOVAL

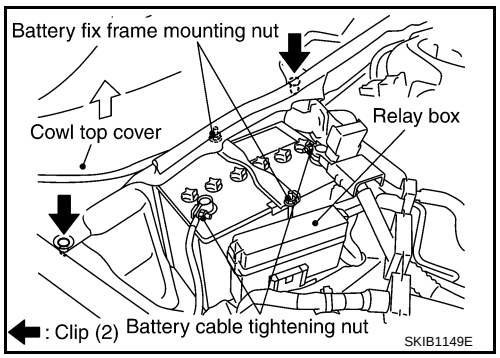
CAUTION:

Before disconnecting the battery, lower both the driver and passenger windows. This will prevent any interference between the window edge and the vehicle when the door is opened/closed. During normal operation, the window slightly raises and lowers automatically to prevent any window to vehicle interference. The automatic window function will not work with the battery disconnected.

1. Remove hoodledge cover (right).



2. Disconnect both battery cables from terminals.
   CAUTION:
   When disconnecting, disconnect the battery cable from the negative terminal first.
3. Remove clips of cowl top cover (right) and it raises to the up side.
4. Remove battery fix frame mounting nuts and battery fix frame.
5. Remove relay box from bracket.
6. Remove battery.



INSTALLATION

Installation is the reverse order of removal.

CAUTION:
When connecting, connect the battery cable to positive terminal first.

Battery fix frame mounting nut

: 3.9 N·m (0.40 kg-m, 35 in-lb)

Battery cable tightening nut

: 5.4 N·m (0.55 kg-m, 48 in-lb)

STARTING SYSTEM

System Description

INFOID:0000000004657880

M/T MODELS

Power is supplied at all times:
- through 40A fusible link (letter **M**, located in the fuse and fusible link block)
- to ignition switch terminal 1,
- through 10A fuse (No. 71, located in the IPDM E/R)
- to CPU of IPDM E/R,
- through 15A fuse (No. 78, located in the IPDM E/R)
- to CPU of IPDM E/R.

With the ignition switch in the ON or START position, power is supplied:
- to CPU of IPDM E/R, from battery direct
- through 10A fuse (No. 89, located in the IPDM E/R) and IPDM E/R terminal 25
- to clutch interlock switch terminal 1.

When the clutch pedal is depressed, power is supplied:
- through clutch interlock switch terminal 2
- to IPDM E/R terminal 53.

Ground is supplied:
- to IPDM E/R terminals 38, 50 and 60
- from grounds E17, E43 and B102 (with VDC, navigation system or telephone).
- from grounds E17, E43 and F152 (without VDC, navigation system and telephone).

Then starter relay is turn ON.
With the ignition switch in the START position, IPDM E/R is energized and power is supplied:
- from ignition switch terminal 5
- to IPDM E/R terminal 4 and
- through IPDM E/R terminal 3
- to starter motor terminal 1.

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.

A/T MODELS

Power is supplied at all times:
- through 40A fusible link (letter **M**, located in the fuse and fusible link block)
- to ignition switch terminal 1,
- through 10A fuse (No. 71, located in the IPDM E/R)
- to CPU of IPDM E/R,
- through 15A fuse (No. 78, located in the IPDM E/R)
- to CPU of IPDM E/R.

With the ignition switch in the ON or START position, power is supplied:
- to CPU of IPDM E/R, from battery direct.

When the selector lever in the “P” or “N” position, power is supplied:
- from A/T assembly (TCM) terminal 9
- to IPDM E/R terminal 53.

Ground is supplied:
- to IPDM E/R terminals 38, 50 and 60
- from grounds E17, E43 and B102 (with VDC, navigation system or telephone).
- from grounds E17, E43 and F152 (without VDC, navigation system and telephone).

Then starter relay is turn ON.
With the ignition switch in the START position, IPDM E/R is energized and power is supplied:
- from ignition switch terminal 5
- to IPDM E/R terminal 4 and
- through IPDM E/R terminal 3
- to starter motor terminal 1.

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 -

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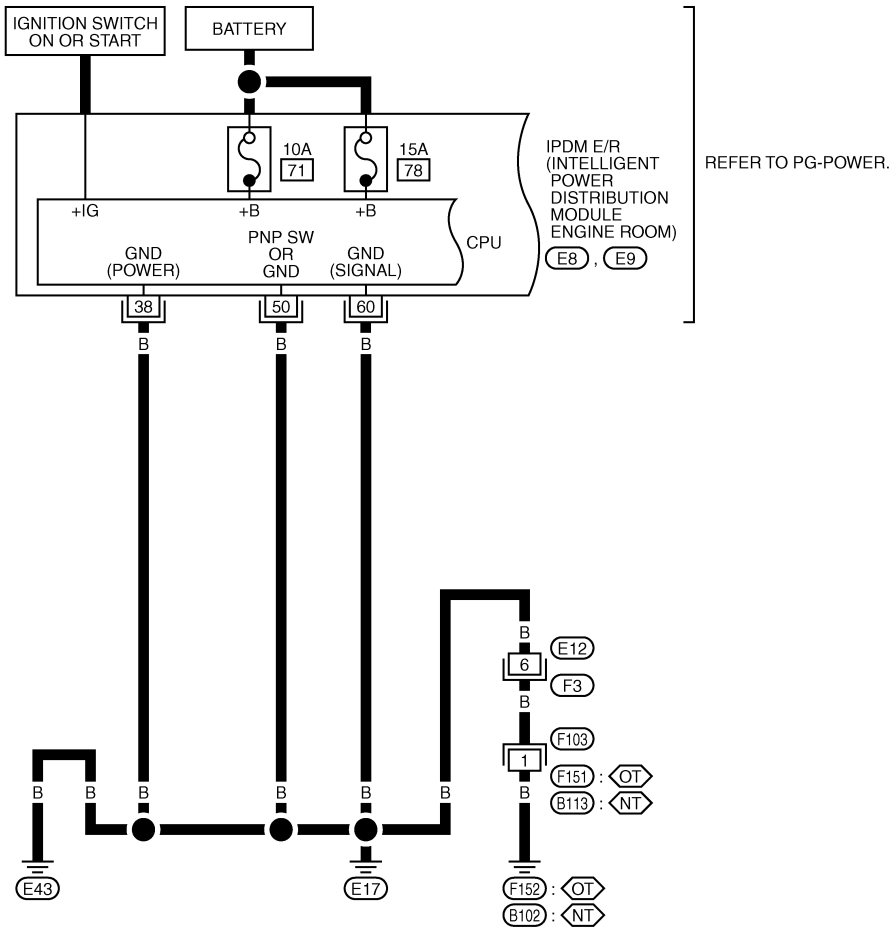
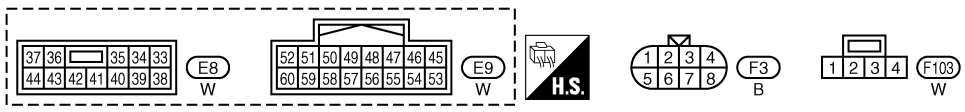
M/T MODELS

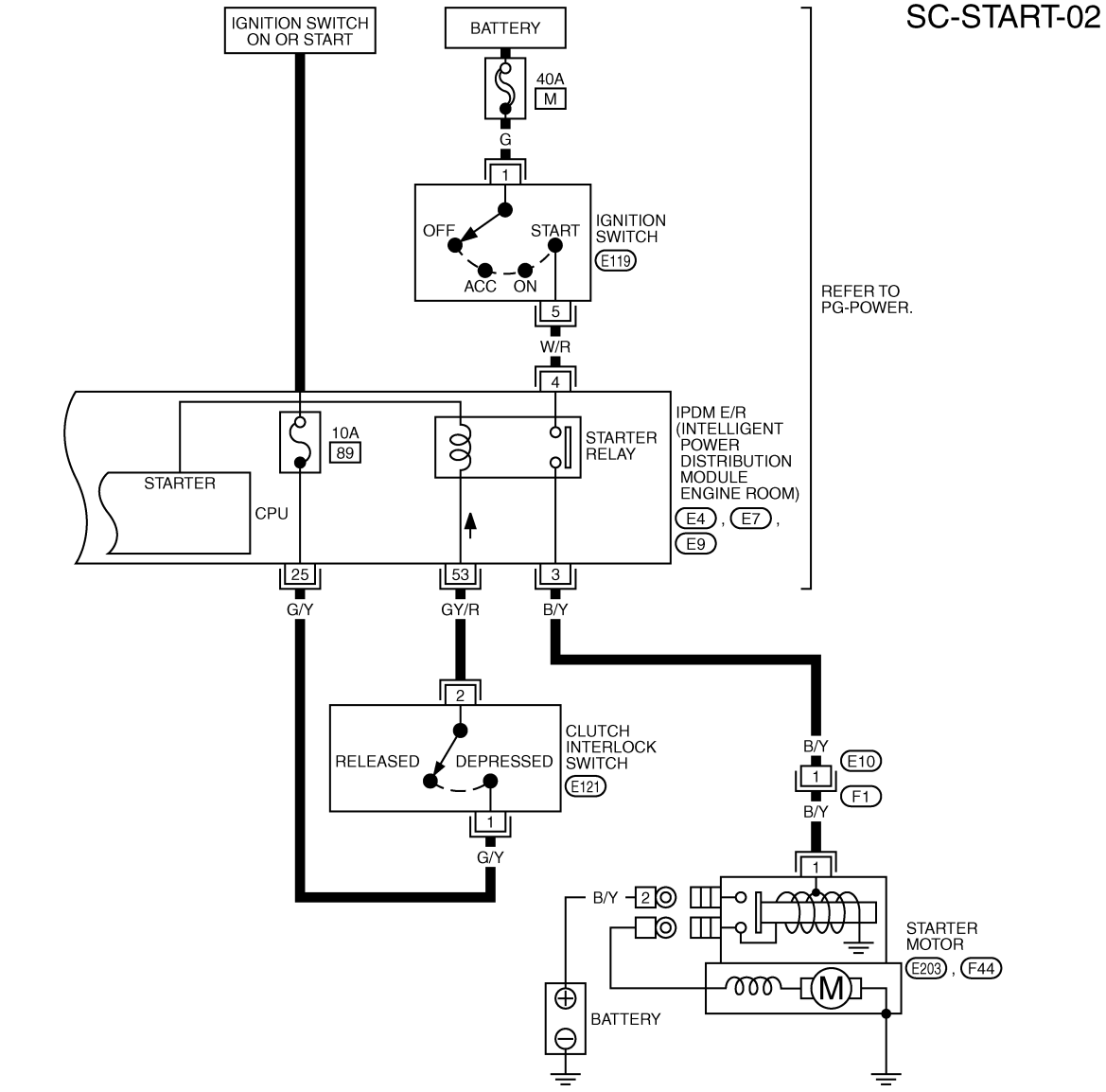
SC-START-01

NT : WITH VDC SYSTEM, NAVIGATION SYSTEM OR TELEPHONE
OT : WITHOUT VDC SYSTEM, NAVIGATION SYSTEM AND TELEPHONE

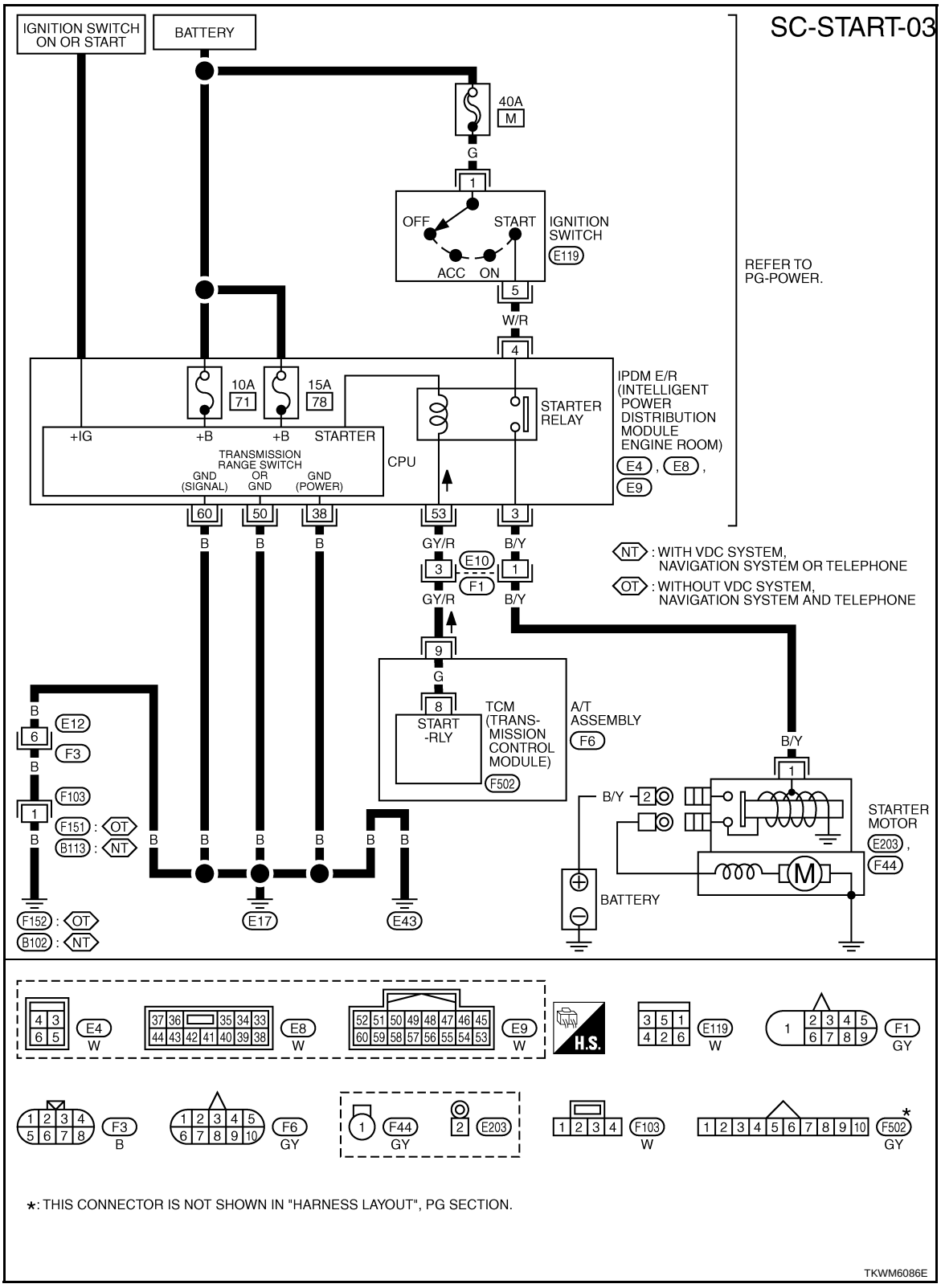




TKWT5715E


SC-START-02
IGNITION SWITCH ON OR START
BATTERY
40A
M
G
1
OFF
START
ACC
ON
IGNITION SWITCH
E119
5
W/R
4
REFER TO PG-POWER.
IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
E4 , E7 , E9
10A
89
STARTER RELAY
STARTER
CPU
25
53
3
G/Y
GY/R
B/Y
2
RELEASED
DEPRESSED
CLUTCH INTERLOCK SWITCH
E121
1
G/Y
B/Y
E10
1
F1
B/Y
1
B/Y
2
STARTER MOTOR
E203 , F44
M
BATTERY
E4
W
E7
GY
E9
W
H.S.
E119
W
E121
L
F1
GY
F44
GY
E203

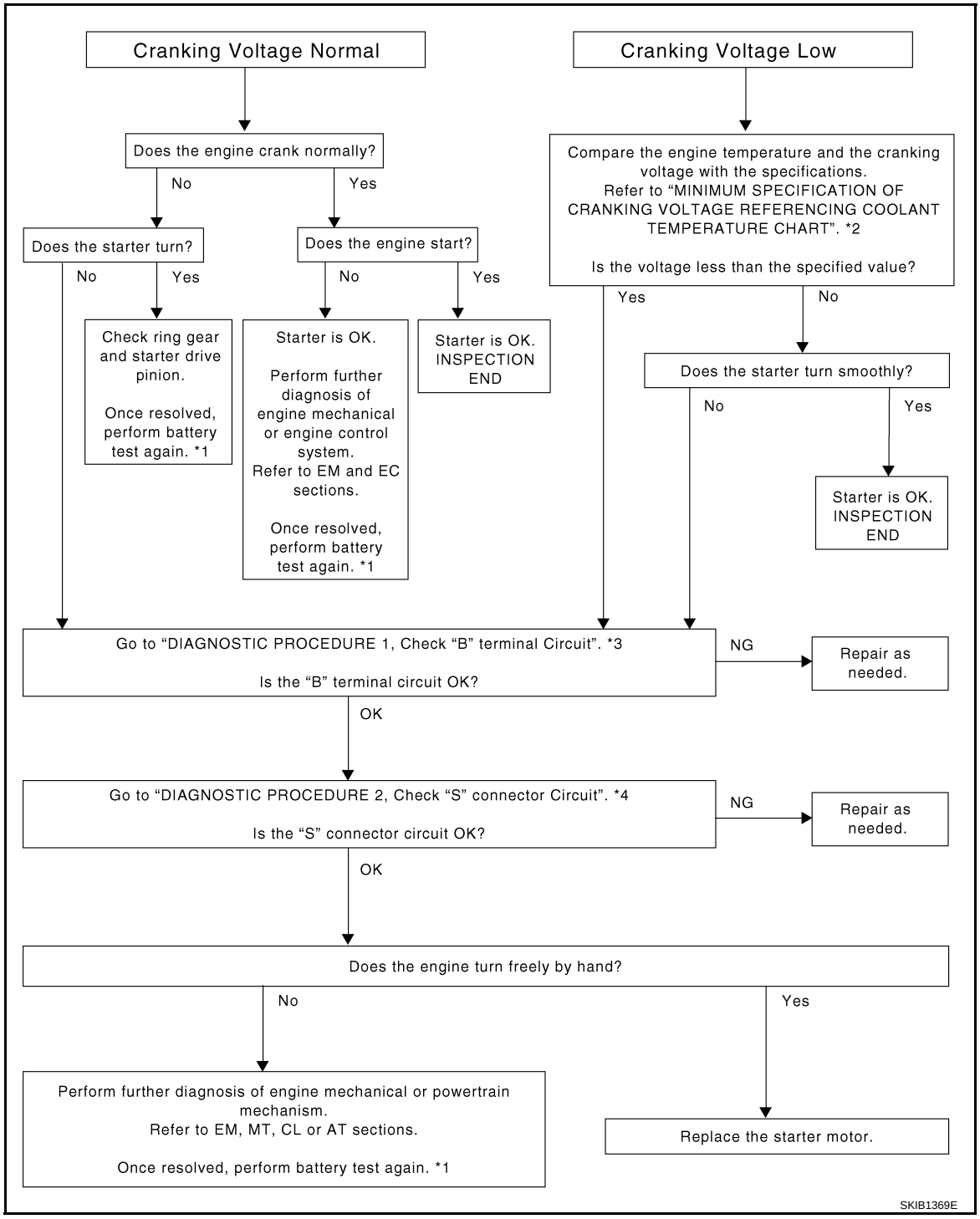
TKWT5716E



Trouble Diagnosis with Starting/Charging System Tester (Starting)

INFOID:0000000004657882

For starting system testing, use Starting/Charging System Tester (J-44373). For details and operating instructions, refer to Technical Service Bulletin.



*1 For battery testing, use Battery Service Center (J-48087). For details and operating instructions, refer to Technical Service Bulletin and/or Battery Service Center User Guide.

*2 "MINIMUM SPECIFICATION OF CRANKING VOLTAGE REFERENCING COOLANT TEMPERATURE"

*3 "Check "B" Terminal Circuit"

*4 "Check "S" Connector Circuit"

DIAGNOSTIC PROCEDURE 1

Check "B" Terminal Circuit

CAUTION:

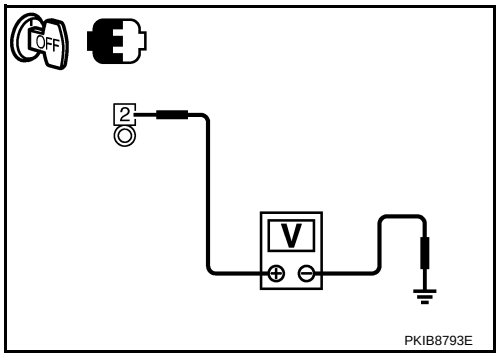
Perform diagnosis under the condition that engine cannot start by the following procedure.

1. Remove fuel pump fuse.

2. Crank or start the engine (where possible) until the fuel pressure is released.

1.CHECK “B” TERMINAL CIRCUIT

1. Turn ignition switch OFF.
2. Make sure that starter motor “B” terminal connection is clean and tight.
3. Check voltage between starter motor “B” terminal and ground.



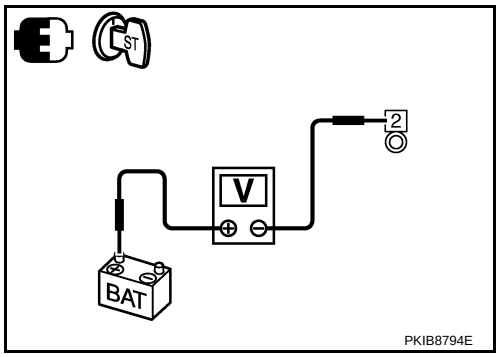
Terminals			Voltage (Approx.)
(+)		(–)	
Starter motor “B” terminal	Terminal		
E203	2	Ground	Battery voltage

OK or NG

OK >> GO TO 2.
NG >> Check harness between battery and starter motor for open circuit.

2.CHECK BATTERY CABLE CONNECTION STATUS (VOLTAGE DROP TEST)

1. Shift A/T selector lever to “P” or “N” position. (A/T models)
   Keep depressing clutch pedal fully. (M/T models)
2. Check voltage between starter motor “B” terminal and battery positive terminal.



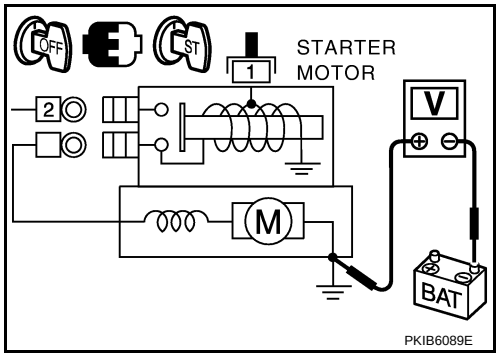
Terminals			Condition	Voltage (Approx.)
(+)	(–)			
	Starter motor “B” terminal	Terminal		
Battery positive terminal	E203	2	When the ignition switch is in START position	Less than 0.5 V

OK or NG

OK >> GO TO 3.
NG >> Check harness between the battery and the starter motor for poor continuity.

3.CHECK GROUND CIRCUIT STATUS (VOLTAGE DROP TEST)

1. Turn ignition switch OFF.
2. Shift A/T selector lever to “P” or “N” position. (A/T models)
   Keep depressing clutch pedal fully. (M/T models)
3. Check voltage between starter motor case and battery negative terminal.



Terminals		Condition	Voltage (Approx.)
(+)	(–)		
Starter motor case	Battery negative terminal	When the ignition switch is in START position	Less than 0.2 V

OK or NG

OK >> “B” terminal circuit is OK. Further inspection necessary. Refer to "Trouble Diagnoses with Starting/ Charging System Tester (Starting)".
NG >> Check the starter motor case and ground for poor continuity.

DIAGNOSTIC PROCEDURE 2

Check “S” Connector Circuit

CAUTION:

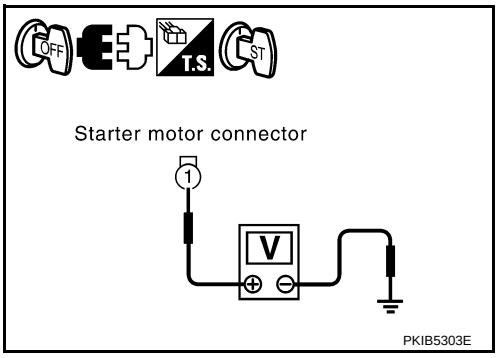
Perform diagnosis under the condition that engine cannot start by the following procedure.

1. Remove fuel pump fuse.

2. Crank or start the engine (where possible) until the fuel pressure is released.

1.CHECK “S” CONNECTOR CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect starter motor connector.
3. Shift A/T selector lever to “P” or “N” position. (A/T models)
   Keep depressing clutch pedal fully. (M/T models)
4. Check voltage between starter motor harness connector and ground.



Terminals			Condition	Voltage (Approx.)
(+)		(–)		
Starter motor connector	Terminal			
F44	1	Ground	When the ignition switch is in START position	Battery voltage

OK or NG

OK >> “S” connector circuit is OK. Further inspection necessary. Refer to "Trouble Diagnoses with Starting/Charging System Tester (Starting)".

NG >> Check the following.
- 40A fusible link (letter **M**, located in fuse and fusible link block)
- Ignition switch
- Starter relay (within the IPDM E/R)
- Harness for open or short

MINIMUM SPECIFICATION OF CRANKING VOLTAGE REFERENCING COOLANT TEMPERATURE

Engine coolant temperature	Voltage [V]
–30 °C to –20 °C (–22 °F to –4 °F)	8.6
–19 °C to –10 °C (–2 °F to 14°F)	9.1
–9 °C to 0 °C (16 °F to 32 °F)	9.5
More than 1 °C (More than 34 °F)	9.9

Removal and Installation

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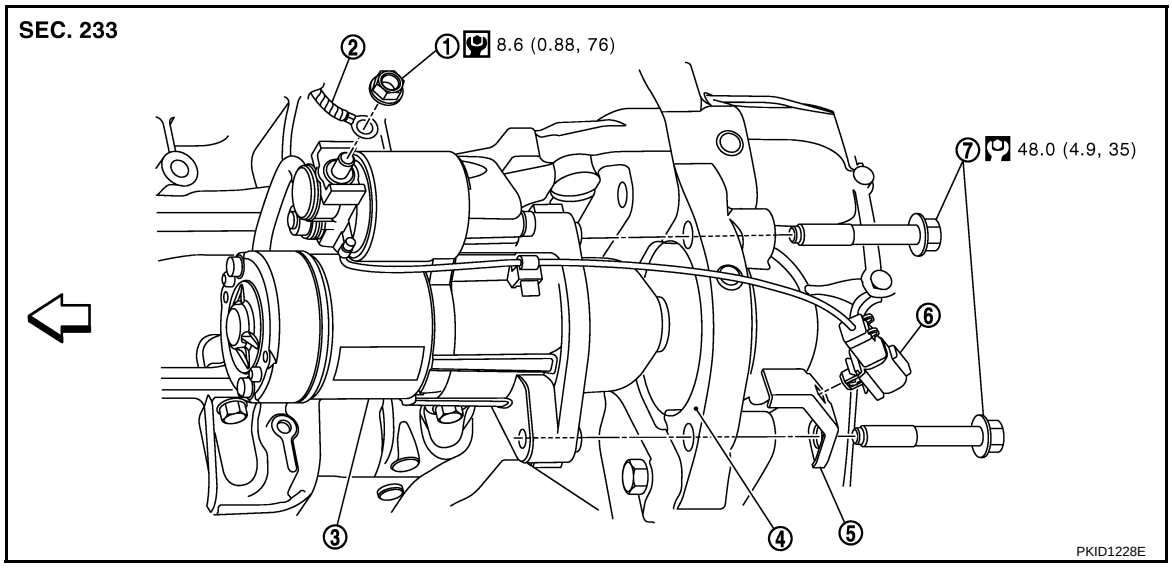


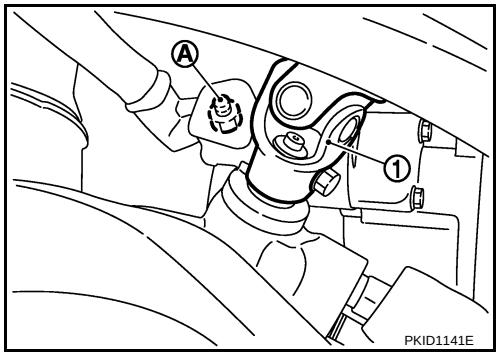
1. “B” terminal mounting nut
2. “B” terminal harness
3. Starter motor
4. Transmission case (M/T models) Converter housing (A/T models)
5. Harness clip bracket
6. “S” terminal connector
7. Starter motor mounting bolt

⇦: Vehicle front

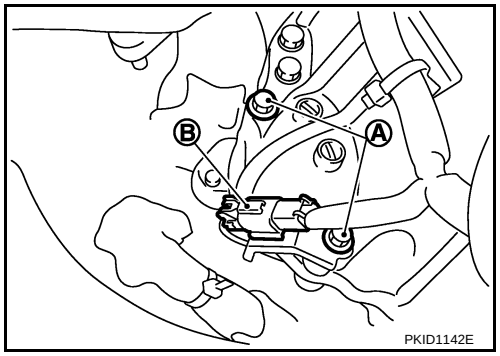
Refer to GI-8, "Component" for symbols not described on the above.

REMOVAL

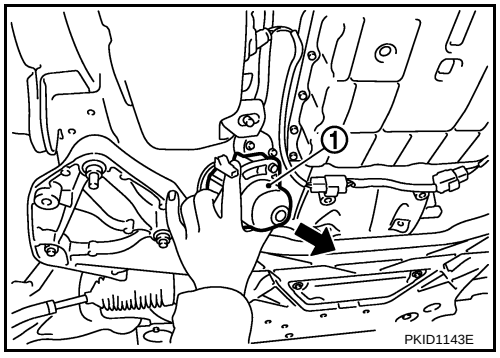
1. Open the driver and front passenger window, and then disconnect the battery cable from the negative terminal.
   CAUTION:
   Before disconnecting the battery, lower both the driver and passenger windows. This will prevent any interference between the window edge and the vehicle when the door is opened/closed. During normal operation, the window slightly raises and lowers automatically to prevent any window to vehicle interference. The automatic window function will not work with the battery disconnected.
2. Remove engine undercover, using power tools.
3. Disconnect steering lower joint (1), then remove it. Refer to PS-17, "Removal and Installation".
4. Remove “B” terminal mounting nut (A).



5. Disconnect “S” connector (B).
6. Remove starter motor mounting bolts (A) and harness connector clip bracket, using power tools.



7. Remove starter motor (1) downward from the vehicle.



INSTALLATION

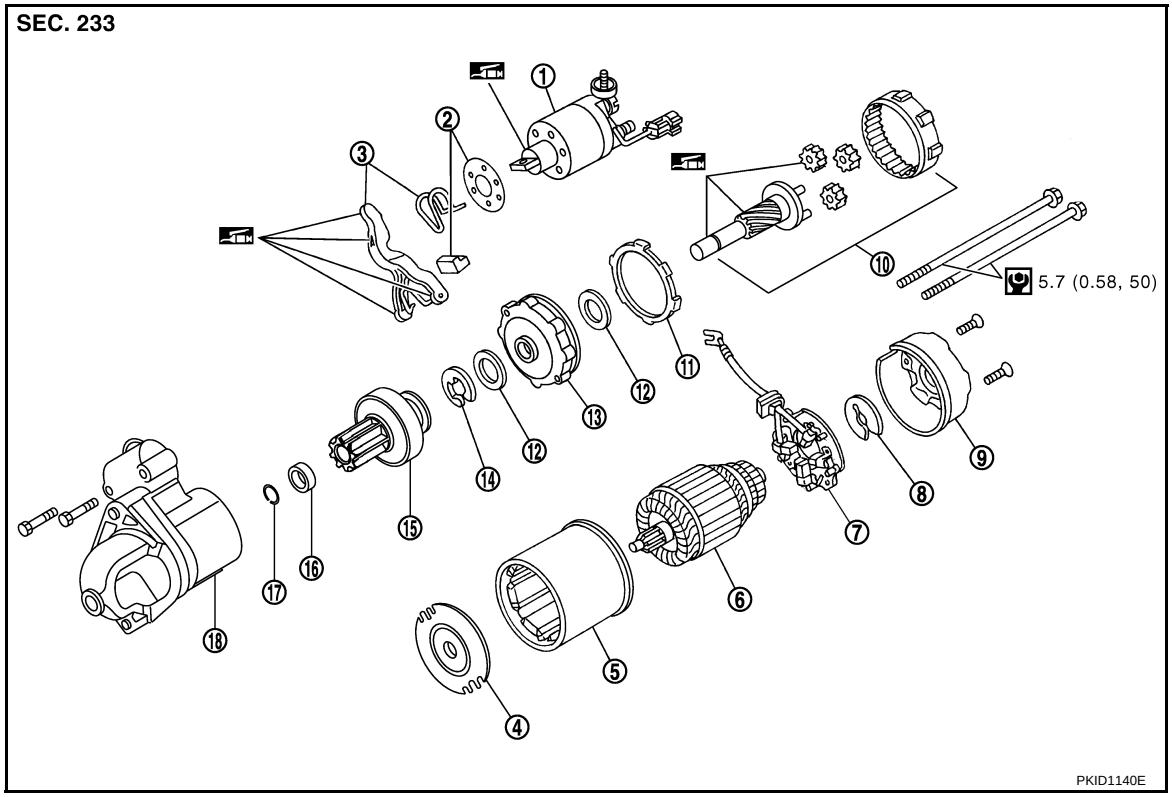
Installation is the reverse order of removal.

CAUTION:
Be sure to tighten “B” terminal nut carefully.

Disassembly and Assembly

INFOID:0000000004657884

TYPE: S114-928



1. Magnetic switch assembly	2. Dust cover kit	3. Shift lever set
4. Center bracket (A)	5. Yoke assembly	6. Armature assembly
7. Brush holder assembly	8. Thrust washer	9. Rear cover assembly
10. Shaft gear assembly	11. Packing	12. Thrust washer
13. Center bracket (P)	14. E-ring	15. Pinion assembly
16. Pinion stopper	17. Pinion stopper clip	18. Gear case assembly

: High-temperature grease point

Refer to GI-8, "Component" for symbols not described on the above.

INSPECTION AFTER DISASSEMBLY

Pinion/Clutch Check

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.

CHARGING SYSTEM

System Description

INFOID:0000000004657885

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
- through 10A fuse (No. 36, located in the fuse and fusible link block)
- to alternator terminal 4 (“S” terminal).

“B” terminal supplies power to charge the battery and operate the vehicle's electrical system. Output voltage is controlled by the IC regulator at terminal 4 (“S” terminal) detecting the input voltage.
The charging circuit is protected by the 140A fusible link (letter **A**, located in the fusible link holder).
The alternator is grounded to the engine block.
With the ignition switch in the ON or START position, power is supplied
- through 10A fuse [No. 14, located in the fuse block (J/B)]
- to combination meter terminal 23 for the charge warning lamp.

Ground is supplied with power and ground supplied
- to terminal 17 of combination meter
- through alternator terminal 3 (“L” terminal)
- through case ground.

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 malfunction is indicated.

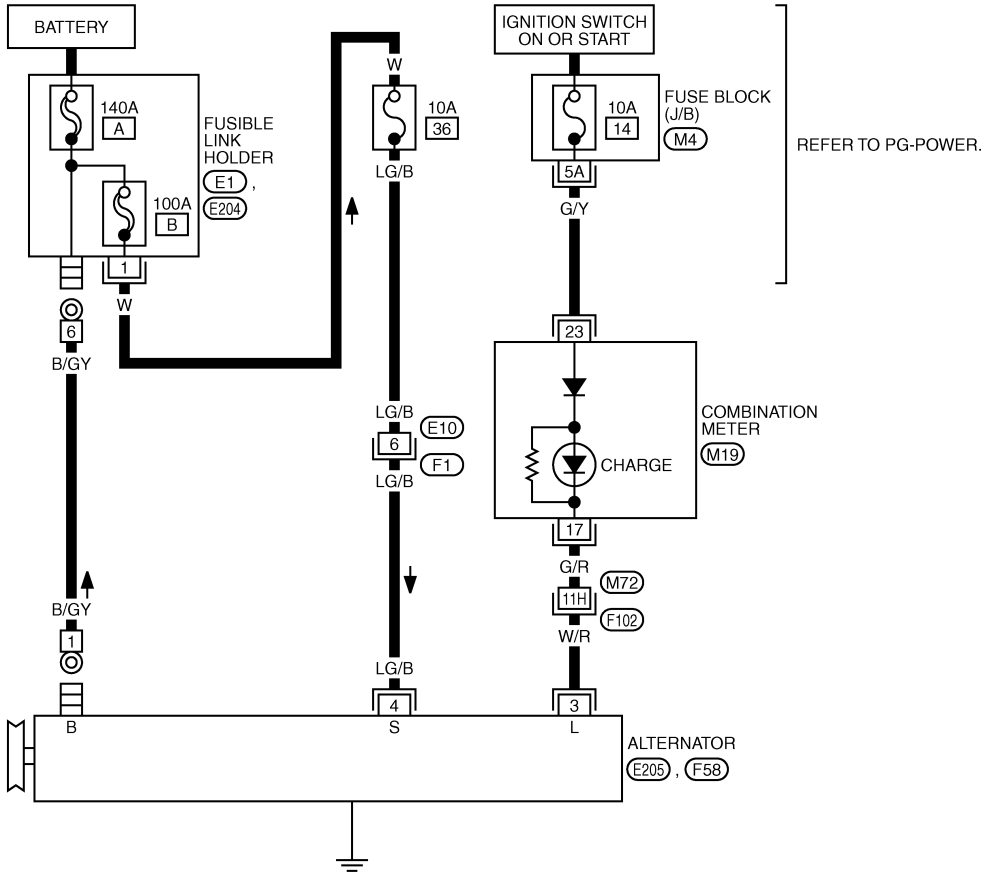
MALFUNCTION INDICATOR

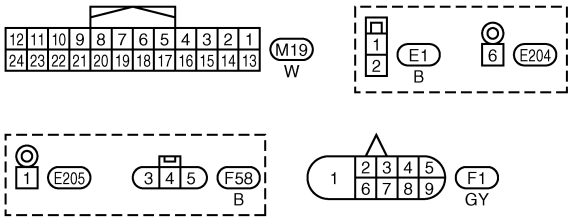
The IC regulator warning function activates to illuminate charge warning lamp, if any of the following symptoms occur while alternator is operating:
- Excessive voltage is produced.
- No voltage is produced.

Wiring Diagram - CHARGE -

INFOID:0000000004657886

SC-CHARGE-01





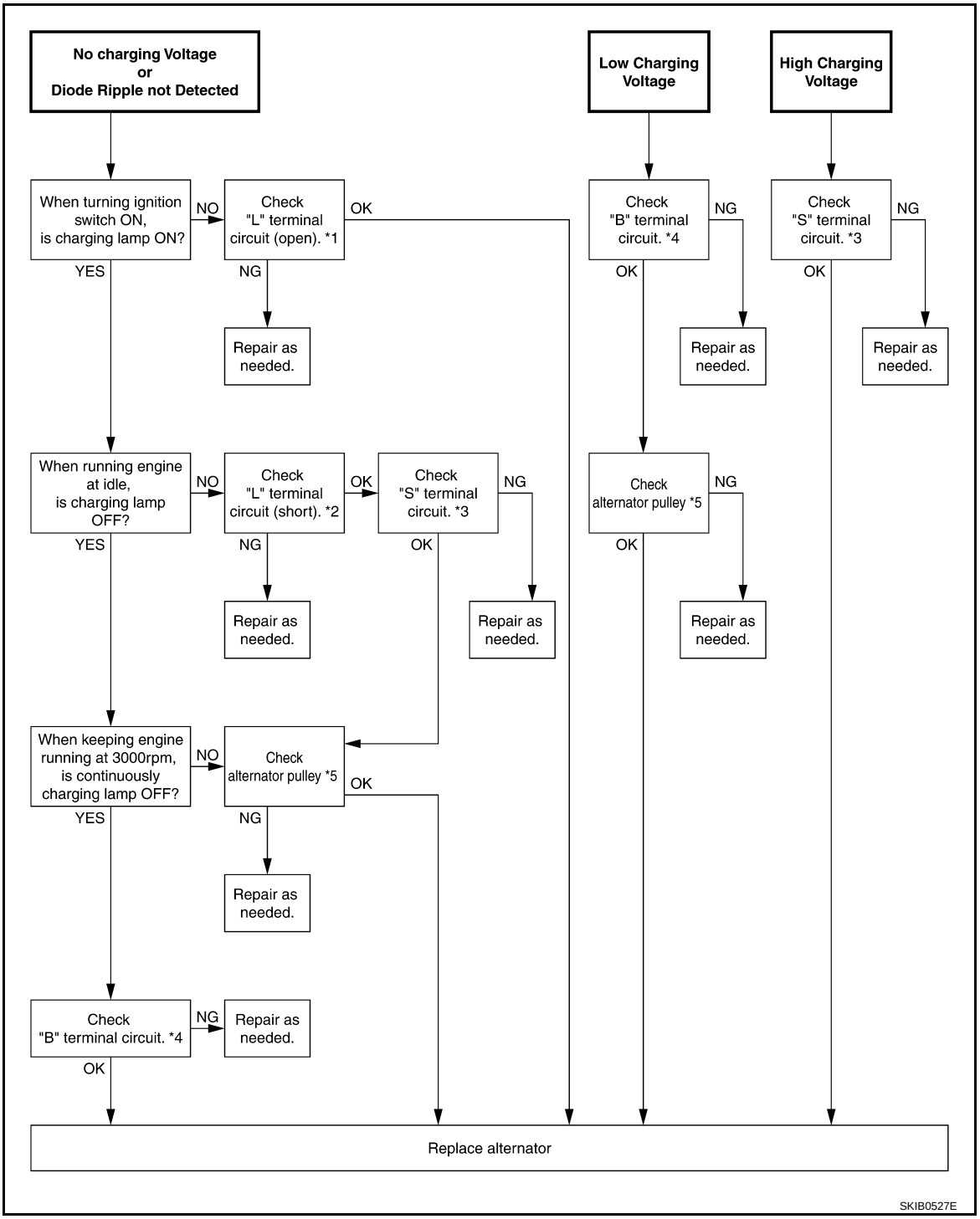
REFER TO THE FOLLOWING.
F102 -SUPER MULTIPLE JUNCTION (SMJ)
M4 -FUSE BLOCK-JUNCTION BOX (J/B)

TKWT5718E

Trouble Diagnosis with Starting/Charging System Tester (Charging)

INFOID:0000000004657887

For charging system testing, use Starting/Charging System Tester (J-44373). For details and operating instructions, refer to Technical Service Bulletin.



*1 "Check “L” Terminal Circuit (Open)" *2 "Check “L” Terminal Circuit (Short)" *3 "Check “S” Terminal Circuit"
*4 "Check “B” Terminal Circuit" *5 SC-22, "Removal and Installation"

PRELIMINARY INSPECTION

1. CHECK BATTERY TERMINALS CONNECTION

Check if battery terminals are clean and tight.

OK or NG

OK >> GO TO 2.
NG >> Repair battery terminals connection.

2.CHECK FUSE AND FUSIBLE LINK

Check for blown alternator and combination meter fuses and fusible links.

Unit	Power source (Power supply terminals)	Fuse and fusible link No.
Alternator	Battery (“S” terminal)	36, letter B, letter A
Combination meter	Ignition switch ON (“L” terminal)	14

OK or NG

OK >> GO TO 3.
NG >> Be sure eliminate cause of malfunction before installing new fuse and fusible link.

3.CHECK ALTERNATOR DRIVE BELT TENSION

Check alternator drive belt tension. Refer to EM-13, "Checking Drive Belts".

OK or NG

OK >> INSPECTION END
NG >> Repair as needed.

DIAGNOSTIC PROCEDURE 1

Check “L” Terminal Circuit (Open)

1.CHECK “L” TERMINAL CONNECTION

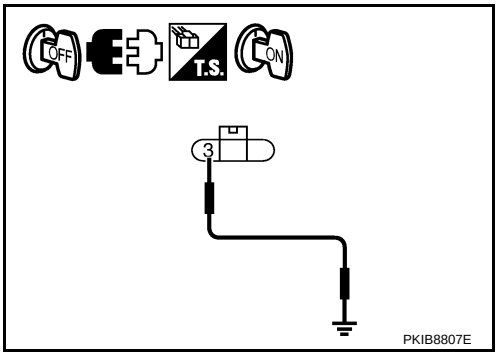
1. Turn ignition switch OFF.
2. Check if “L” terminal is clean and tight.

OK or NG

OK >> GO TO 2.
NG >> Repair “L” terminal connection. Confirm repair by performing complete Starting/Charging system test. Refer to Technical Service Bulletin.

2.CHECK “L” TERMINAL CIRCUIT (OPEN)

1. Disconnect alternator connector.
2. Apply ground to alternator harness connector terminal.
3. Check condition the charge warning lamp with the ignition switch in the ON position.



Alternator connector	Terminal	Ground	Condition	
			Ignition switch position	Charge warning lamp
F58	3		ON	illuminate

OK or NG

OK >> Go to "Trouble Diagnoses with Starting/Charging System Tester (Charging)".
NG >> Check the following.
- Harness for open between combination meter and alternator
- Harness for open between combination meter and fuse
- Charge warning lamp (Combination meter)

DIAGNOSTIC PROCEDURE 2

Check “L” Terminal Circuit (Short)

1.CHECK “L” TERMINAL CIRCUIT (SHORT)

1. Turn ignition switch OFF.
2. Disconnect alternator connector.
3. Turn ignition switch ON.

Charge warning lamp should light up?

YES >> Check the following.
- Harness for short between combination meter and alternator

• Charge warning lamp (Combination meter)

NO >> Go to "Trouble Diagnoses with Starting/Charging System Tester (Charging)".

DIAGNOSTIC PROCEDURE 3

Check “S” Terminal Circuit

1.CHECK “S” TERMINAL CONNECTION

1. Turn ignition switch OFF.
2. Check if “S” terminal is clean and tight.

OK or NG

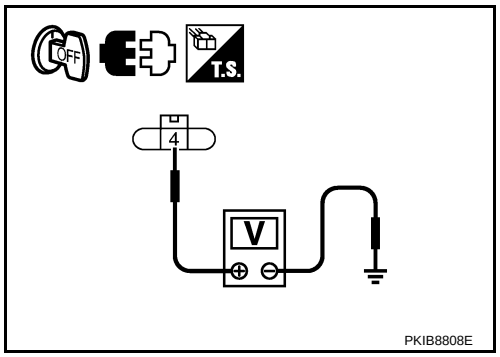
OK >> GO TO 2.

NG >> Repair “S” terminal connection. Confirm repair by performing complete Starting/Charging system test. Refer to Technical Service Bulletin.

2.CHECK “S” TERMINAL CIRCUIT

1. Disconnect alternator connector.
2. Check voltage between alternator harness connector and ground.

Terminals			Voltage (Approx.)
(+)		(–)	
Alternator connector	Terminal		
F58	4	Ground	Battery voltage



OK or NG

OK >> Go to "Trouble Diagnoses with Starting/Charging System Tester (Charging)".

NG >> Harness for open between alternator and fuse.

DIAGNOSTIC PROCEDURE 4

Check “B” Terminal Circuit

1.CHECK “B” TERMINAL CONNECTION

1. Turn ignition switch OFF.
2. Check if “B” terminal is clean and tight.

OK or NG

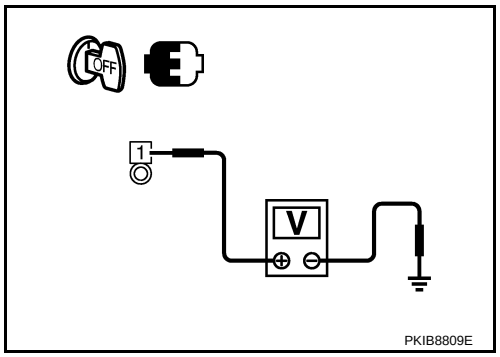
OK >> GO TO 2.

NG >> Repair “B” terminal connection. Confirm repair by performing complete Starting/Charging system test. Refer to Technical Service Bulletin.

2.CHECK “B” TERMINAL CIRCUIT

Check voltage between alternator “B” terminal and ground.

Terminals			Voltage (Approx.)
(+)		(–)	
Alternator “B” terminal	Terminal		
E205	1	Ground	Battery voltage



OK or NG

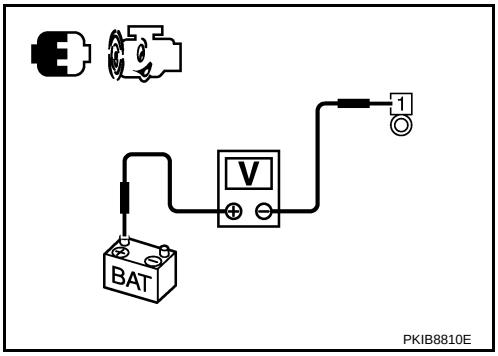
OK >> GO TO 3.

NG >> Check harness for open between alternator and fusible link.

3.CHECK “B” TERMINAL CONNECTION (VOLTAGE DROP TEST)

1. Start engine, then engine running at idle and warm.
2. Check voltage between battery positive terminal and alternator “B” terminal.

Terminals			Voltage (Approx.)
(+)	(–)		
	Alternator “B” terminal	Terminal	
Battery positive terminal	E205	1	Less than 0.2 V



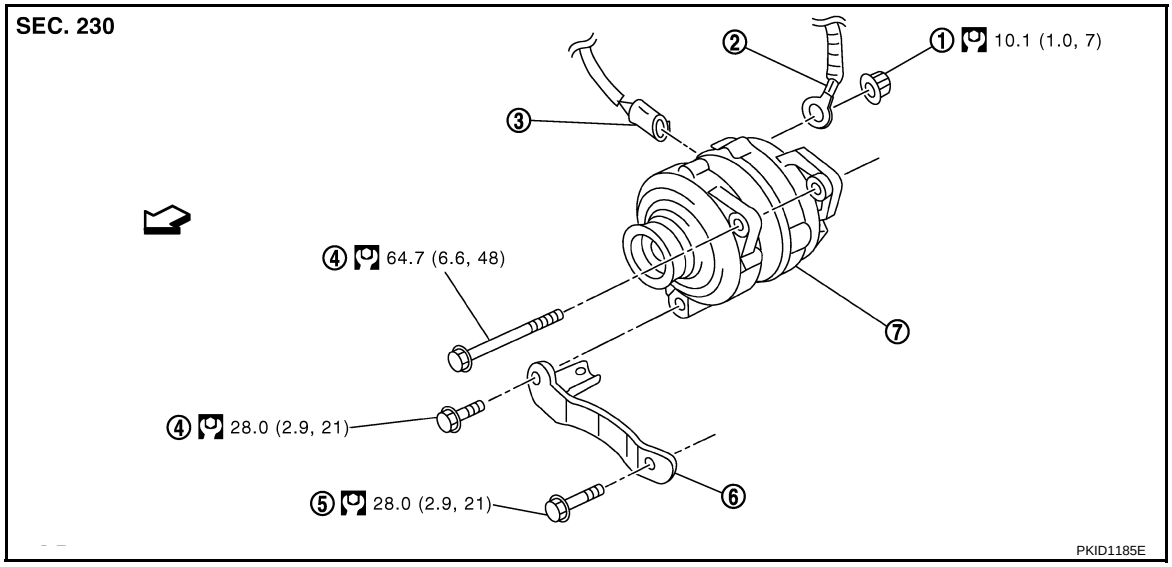
OK or NG

OK >> Go to "Trouble Diagnoses with Starting/Charging System Tester (Charging)".

NG >> Check harness between battery and alternator for poor continuity.

Removal and Installation

INFOID:0000000004657888



1. “B” terminal mounting nut
2. “B” terminal harness
3. Alternator connector
4. Alternator mounting bolt
5. Alternator stay mounting bolt
6. Alternator stay
7. Alternator

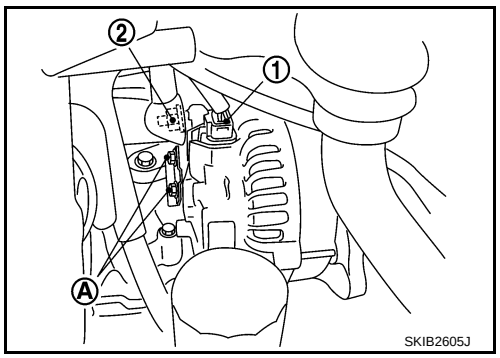
⇦:Vehicle front

Refer to GI-8, "Component" for symbols not described on the above.

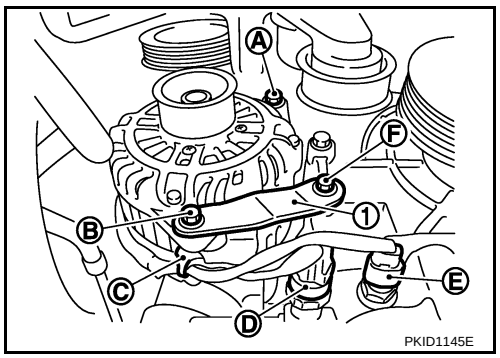
REMOVAL

1. Open the driver and front passenger window, and then disconnect the battery cable from the negative terminal.
   CAUTION:
   Before disconnecting the battery, lower both the driver and passenger windows. This will prevent any interference between the window edge and the vehicle when the door is opened/closed. During normal operation, the window slightly raises and lowers automatically to prevent any window to vehicle interference. The automatic window function will not work with the battery disconnected.
2. Remove engine undercover, using power tools.
3. Remove air cleaner assembly and harness clip. Refer to EM-16.
4. Remove radiator cooling fan assembly. Refer to CO-20.
5. Remove alternator and power steering oil pump belt. Refer to EM-13, "Removal and Installation".

6. Disconnect alternator connector (1).
7. Remove “B” terminal mounting nut (2).
8. Remove the harness bracket bolts (A).



9. Remove oil pressure switch harness clip (C) from alternator stay (1).
10. Disconnect oil pressure switch connector (D) and oil temperature sensor connector (E).
11. Remove alternator mounting bolt (B) and alternator stay mounting bolt (F) using power tools, then remove alternator stay.
12. Remove alternator mounting bolt (A), using power tools.



13. Remove alternator assembly downward from the vehicle.

ALTERNATOR PULLEY INSPECTION

Perform the following.
- Make sure that alternator pulley does not rattle.
- Make sure that alternator pulley nut is tight.

Alternator pulley nut:

: 118 N·m (12.0 kg-m, 87 ft-lb)

INSTALLATION

Installation is the reverse order of removal.
- Install alternator, and check tension of belt. Refer to EM-13, "Checking Drive Belts".

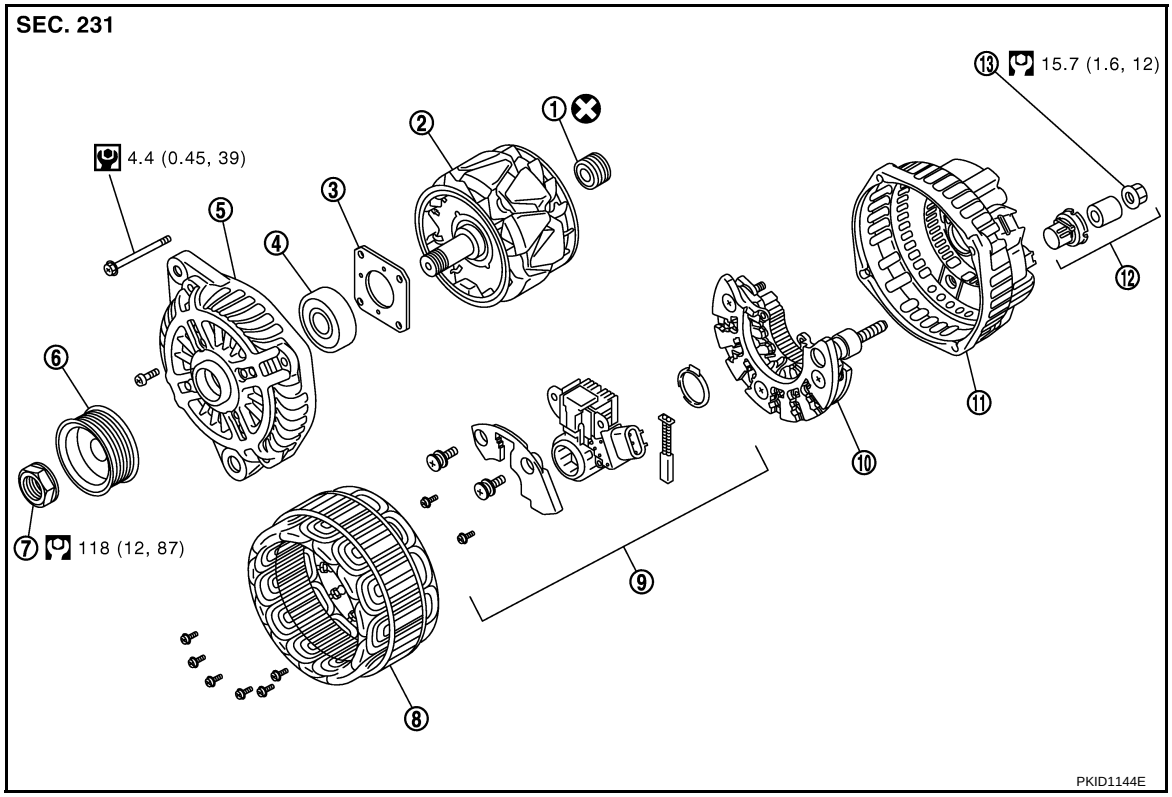
CAUTION:

Be sure to tighten “B” terminal nut carefully.

Disassembly and Assembly

INFOID:0000000004657889

TYPE: A3TJ1991



1. Rear bearing
2. Rotor assembly
3. Retainer
4. Front bearing
5. Front bracket assembly
6. Pulley
7. Pulley nut
8. Stator assembly
9. IC voltage regulator assembly
10. Diode assembly
11. Rear bracket assembly
12. Terminal set
13. “B” terminal nut

SERVICE DATA AND SPECIFICATIONS (SDS)

Battery

INFOID:0000000004657890

Type		80D23L
20 hour rate capacity	[V - Ah]	12 - 62
Cold cranking current (For reference value)	[A]	589

Starter

INFOID:0000000004657891

Type			S114-928
			HITACHI make
			Reduction gear type
System voltage		[V]	12
No-load	Terminal voltage	[V]	11
	Current	[A]	Less than 110
	Revolution	[rpm]	More than 2,700
Minimum diameter of commutator		[mm (in)]	28.0 (1.102)
Minimum length of brush		[mm (in)]	10.5 (0.413)
Brush spring tension		[N (kg, lb)]	16.2 (1.65, 3.6)
Clearance between bearing metal and armature shaft		[mm (in)]	Less than 0.2 (0.008)
Clearance between pinion front edge and pinion stopper		[mm (in)]	0.3 - 2.5 (0.012 - 0.098)

Alternator

INFOID:0000000004657892

Type		A3TJ1991
		MITSUBISHI make
Nominal rating	[V - A]	12 - 150
Ground polarity		Negative
Minimum revolution under no-load (When 13.5 V is applied)	[rpm]	Less than 1,300
Hot output current (When 13.5 V is applied)	[A/rpm]	More than 31/1,300 More than 122/2,500 More than 144/5,000
Regulated output voltage	[V]	14.1 - 14.7
Minimum length of brush	[mm (in)]	More than 5.00 (0.1969)
Brush spring pressure	[N (g, oz)]	4.1 - 5.3 (418 - 540, 14.8 - 19.1)
Slip ring minimum outer diameter	[mm (in)]	More than 22.1 (0.870)
Rotor (Field coil) resistance	[Ω]	1.7 - 2.0