SECTION CHG
CHARGING SYSTEM

CONTENTS

PRECAUTION

PRECAUTIONS

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

INFOID:0000000012409983

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 “SRS AIR BAG” and “SEAT BELT” of this Service Manual.

WARNING:

Always observe the following items for preventing accidental activation.

- **To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision that 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 “SRS AIR BAG”.**
- **Never 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:

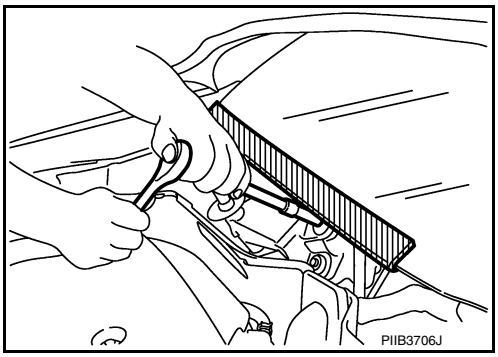
Always observe the following items for preventing accidental activation.

- **When working near the Air Bag Diagnosis Sensor Unit or other Air Bag System sensors with the ignition ON or engine running, never 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 Procedure without Cowl Top Cover

INFOID:0000000012409984

When performing the procedure after removing cowl top cover, cover the lower end of windshield with urethane, etc to prevent damage to windshield.



Precautions For Xenon Headlamp Service

INFOID:0000000012409985

WARNING:

Comply with the following warnings to prevent any serious accident.

- **Disconnect the battery cable (negative terminal) or the power supply fuse before installing, removing, or touching the xenon headlamp (bulb included). The xenon headlamp contains high-voltage generated parts.**
- **Never work with wet hands.**
- **Check the xenon headlamp ON-OFF status after assembling it to the vehicle. Never turn the xenon headlamp ON in other conditions. Connect the power supply to the vehicle-side connector.**

(Turning it ON outside the lamp case may cause fire or visual impairments.)
- **Never touch the bulb glass immediately after turning it OFF. It is extremely hot.**

CAUTION:

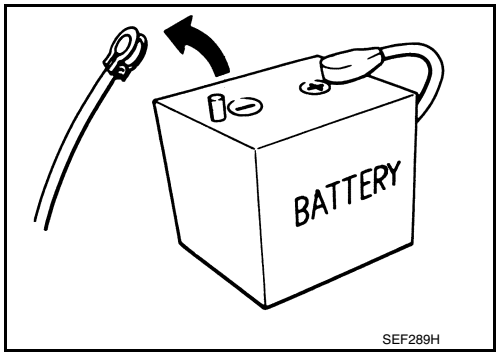
Comply with the following cautions to prevent any error and malfunction.
- **Install the xenon bulb securely. (Insufficient bulb socket installation may melt the bulb, the connector, the housing, etc. by high-voltage leakage or corona discharge.)**
- **Never perform HID circuit inspection with a tester.**
- **Never touch the xenon bulb glass with hands. Never put oil and grease on it.**
- **Dispose of the used xenon bulb after packing it in thick vinyl without breaking it.**
- **Never wipe out dirt and contamination with organic solvent (thinner, gasoline, etc.).**

Precautions for Removing Battery Terminal

INFOID:0000000013056640

When disconnecting the battery terminal, pay attention to the following.
- Always use a 12V battery as power source.
- Never disconnect battery terminal while engine is running.
- When removing the 12V battery terminal, turn OFF the ignition switch and wait at least 30 seconds.
- For vehicles with the engine listed below, remove the battery terminal after a lapse of the specified time:

D4D engine	: 20 minutes	YS23DDT	: 4 minutes
HRA2DDT	: 12 minutes	YS23DDTT	: 4 minutes
K9K engine	: 4 minutes	ZD30DDTi	: 60 seconds
M9R engine	: 4 minutes	ZD30DDTT	: 60 seconds
R9M engine	: 4 minutes		
V9X engine	: 4 minutes		
YD25DDTi	: 2 minutes		



NOTE:
ECU may be active for several tens of seconds after the ignition switch is turned OFF. If the battery terminal is removed before ECU stops, then a DTC detection error or ECU data corruption may occur.
- After high-load driving, if the vehicle is equipped with the V9X engine, turn the ignition switch OFF and wait for at least 15 minutes to remove the battery terminal.

NOTE:
- Turbocharger cooling pump may operate in a few minutes after the ignition switch is turned OFF.
- Example of high-load driving
  - Driving for 30 minutes or more at 140 km/h (86 MPH) or more.
  - Driving for 30 minutes or more on a steep slope.
- For vehicles with the 2-batteries, be sure to connect the main battery and the sub battery before turning ON the ignition switch.

NOTE:
If the ignition switch is turned ON with any one of the terminals of main battery and sub battery disconnected, then DTC may be detected.
- After installing the 12V battery, always check "Self Diagnosis Result" of all ECUs and erase DTC.

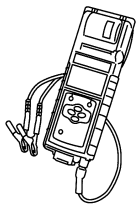
NOTE:
The removal of 12V battery may cause a DTC detection error.

PREPARATION

PREPARATION

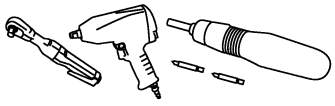
Special Service Tools

INFOID:0000000012409987

Tool number (TechMate No.) Tool name		Description
— (—) Model GR8-1200 NI Multitasking battery and electrical diagnostic station	 AWIIA1239ZZ	Tests batteries, starting and charging systems and charges batteries. For operating instructions, refer to diagnostic station instruction manual.
— (—) Model EXP-800 NI Battery and electrical diagnostic analyzer	 JSMIA0806ZZ	Tests batteries and charging systems. For operating instructions, refer to diagnostic analyzer instruction manual.

Commercial Service Tools

INFOID:0000000012409988

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

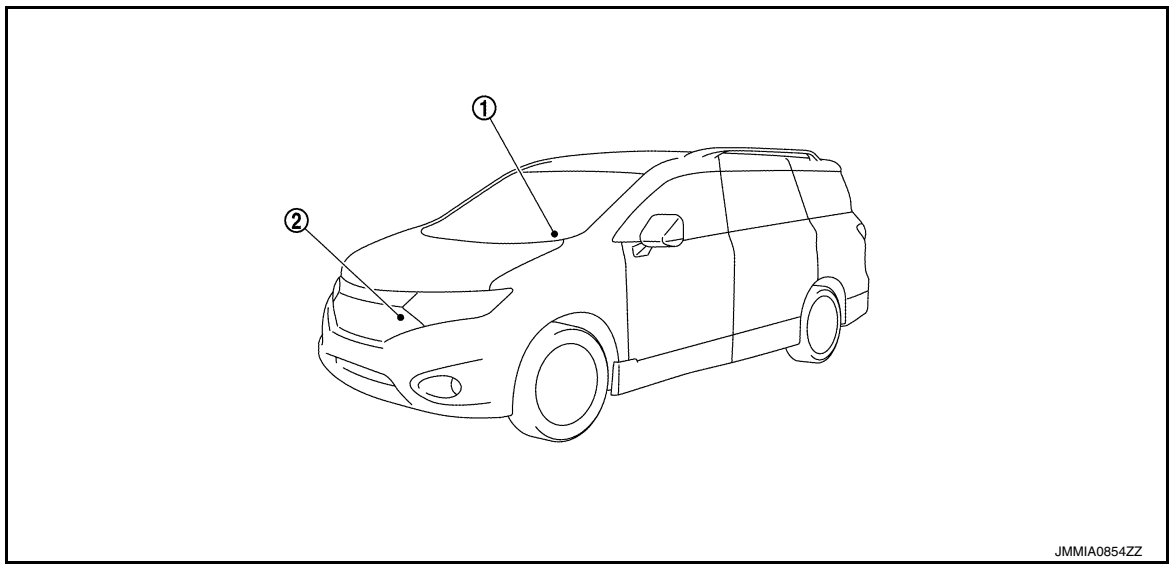
SYSTEM DESCRIPTION

COMPONENT PARTS

CHARGING SYSTEM

CHARGING SYSTEM : Component Parts Location

INFOID:0000000012409989

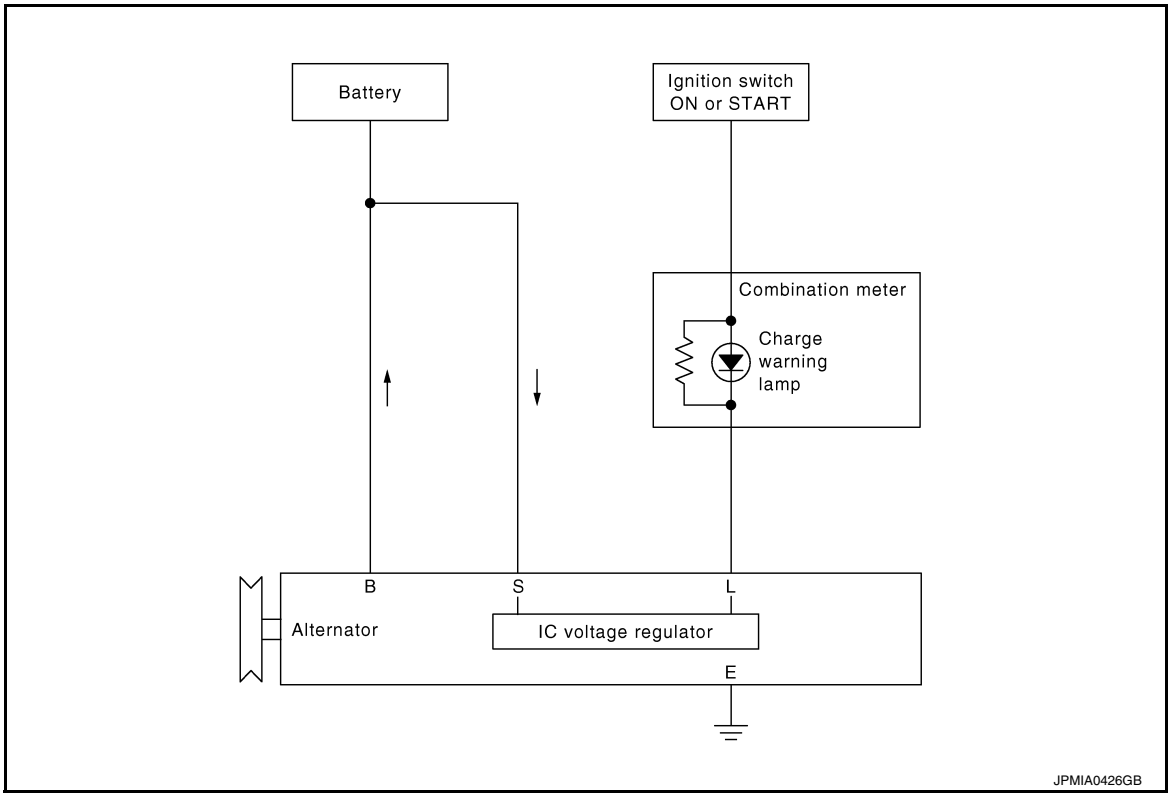


No.	Component part		Description
1.	Combination meter (Charge warning lamp)		The IC voltage regulator warning function activates to illuminate the charge warning lamp, if any of the following symptoms occur while alternator is operating: • Excessive voltage is produced. • No voltage is produced.
2.	Alternator	“B” terminal	Refer to CHG-19, "Description".
		“S” terminal	Refer to CHG-23, "Description".
		“L” terminal	Refer to CHG-20, "Description".

SYSTEM
CHARGING SYSTEM
CHARGING SYSTEM : System Description

INFOID:0000000012409990

SYSTEM DIAGRAM



OUTLINE

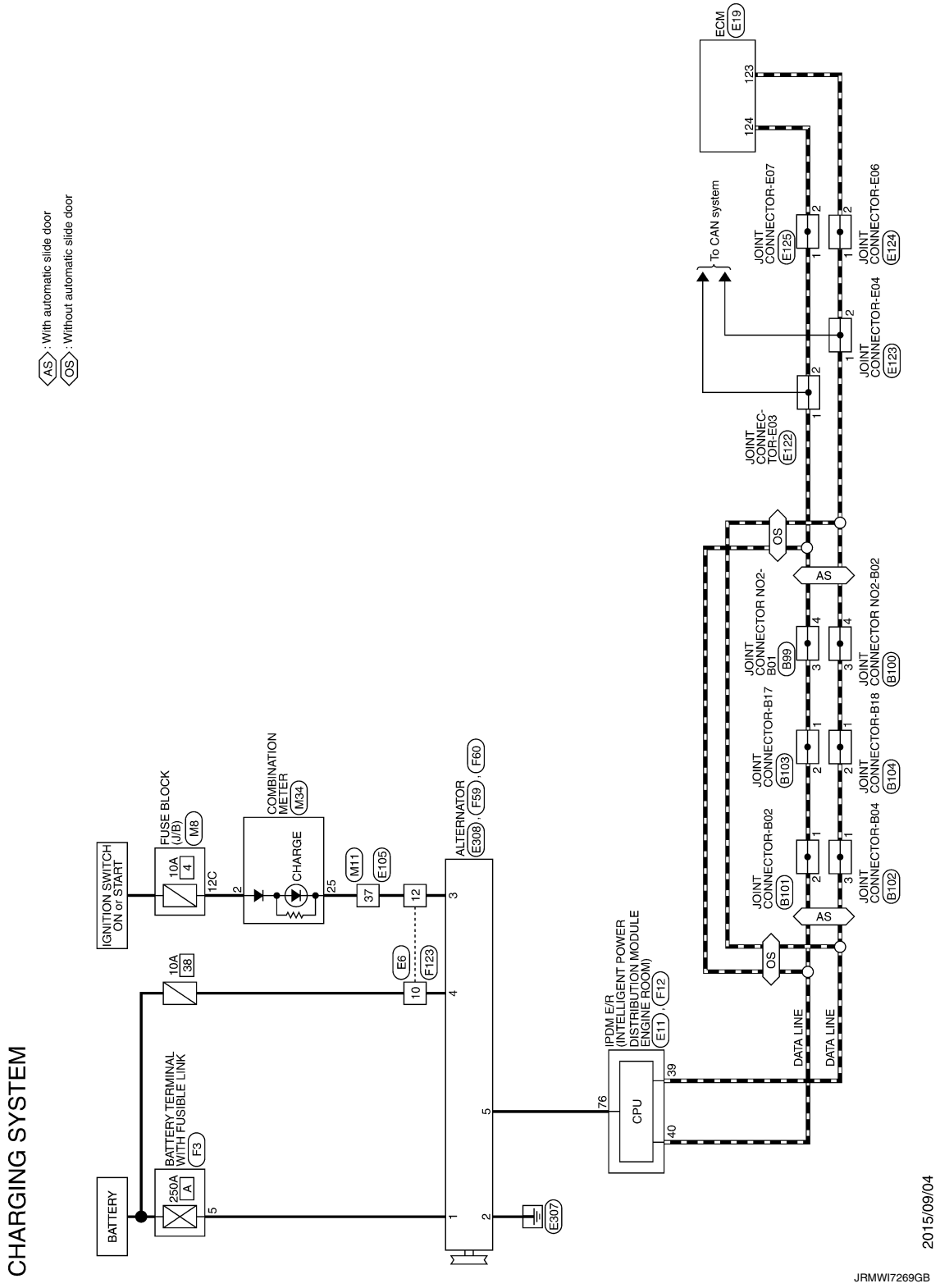
The alternator provides DC voltage to operate the vehicle's electrical system and to keep the battery charged. The voltage output is controlled by the IC voltage regulator.

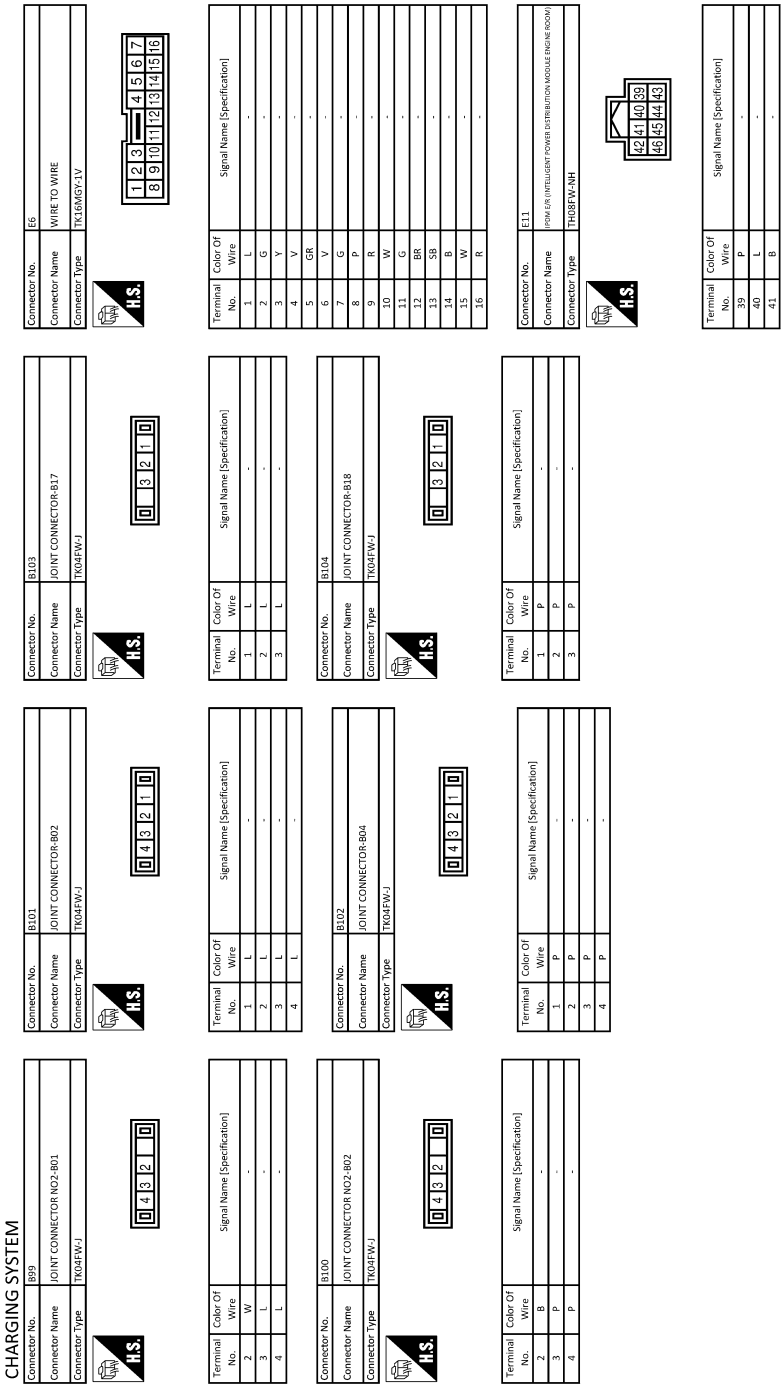
WIRING DIAGRAM

CHARGING SYSTEM

Wiring Diagram

INFOID:0000000012409991





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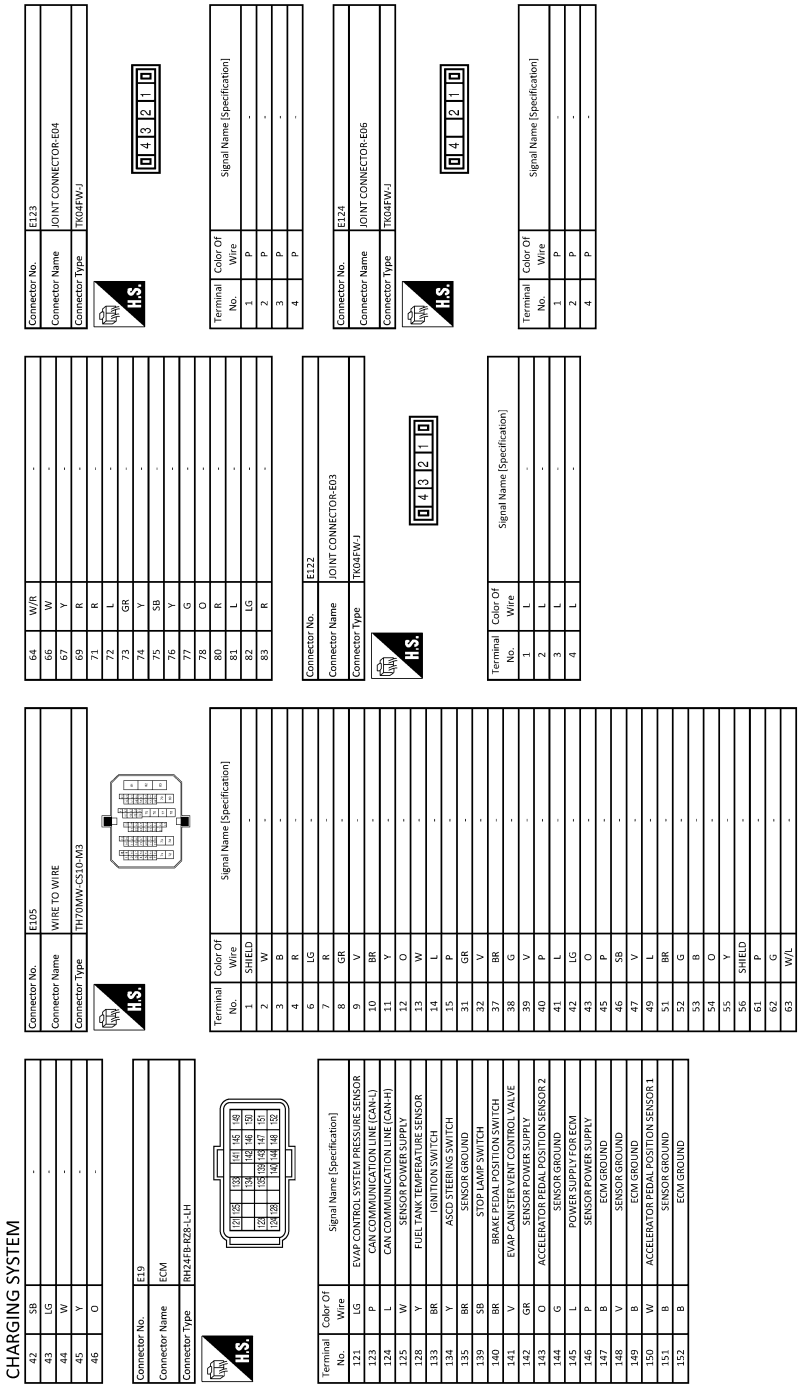

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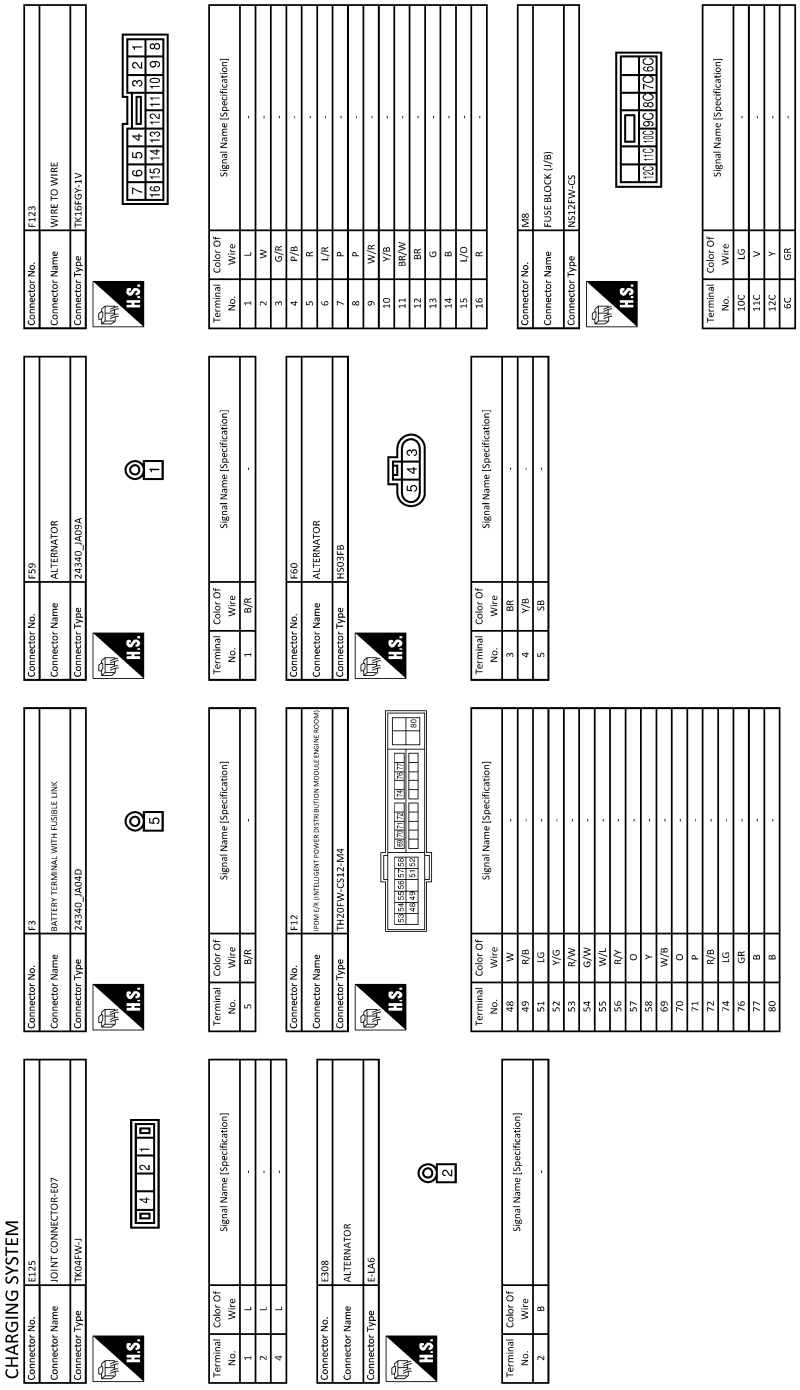

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CHARGING SYSTEM

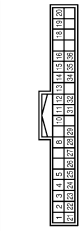
7C	GR	-
8C	G	-
9C	Y	-

Connector No.	M11
Connector Name	WIRE TO WIRE
Connector Type	TH70FW-CS10-M3

Terminal No.	Color Of Wire	Signal Name [Specification]
1	SHIELD	-
2	W	-
3	B	-
4	R	-
6	G	-
7	R	-
8	G	-
9	B	-
10	R	-
11	W	-
12	L	- [Without automatic drive positioner]
12	LG	- [With automatic drive positioner]
13	G	- [Without automatic drive positioner]
13	Y	- [With automatic drive positioner]
14	L	-
15	P	-
31	R	-
32	LG	-
37	BR	- [With automatic drive positioner]
37	W	- [Without automatic drive positioner]
38	R	-
39	BE	- [Without automatic drive positioner]
39	Y	- [With automatic drive positioner]
40	P	-
41	L	-
42	G	-
43	W	-
45	P	-
46	V	-
47	R	-
49	G	-

51	G	-
52	W	-
53	B	-
54	LG	-
55	L	-
56	SHIELD	-
61	R	-
62	W	-
63	B	-
64	W	-
66	W	-
67	BR	-
69	P	-
71	R	-
72	L	-
73	LG	-
74	Y	-
75	Y	-
76	V	-
77	P	-
78	BR	-
80	Y	-
81	W	-
82	L	-
83	R	-

Connector No.	M34
Connector Name	COMBINATION METER
Connector Type	TH40FW-NH



Terminal No.	Color Of Wire	Signal Name [Specification]
1	O	BATTERY POWER SUPPLY [With automatic drive positioner]
1	P	BATTERY POWER SUPPLY [Without automatic drive positioner]
2	G	IGNITION SIGNAL [Without automatic drive positioner]
2	Y	IGNITION SIGNAL [With automatic drive positioner]
3	B	GROUND
4	B	GROUND
5	B	ILLUMINATION CONTROL SIGNAL [Without automatic drive positioner]
5	B/P	ILLUMINATION CONTROL SIGNAL [With automatic drive positioner]
8	G	TRIP RESET SWITCH SIGNAL [Without automatic drive positioner]
8	SB	TRIP RESET SWITCH SIGNAL [With automatic drive positioner]
10	P	METER CONTROL SWITCH GROUND
11	G	ENTER SWITCH SIGNAL
12	BR	SELECT SWITCH SIGNAL [With automatic drive positioner]
12	R	SELECT SWITCH SIGNAL [Without automatic drive positioner]
13	W	ILLUMINATION CONTROL SWITCH SIGNAL (+) [Without automatic drive positioner]
13	Y	ILLUMINATION CONTROL SWITCH SIGNAL (+) [With automatic drive positioner]
14	G	ILLUMINATION CONTROL SWITCH SIGNAL [Without automatic drive positioner]
14	V	ILLUMINATION CONTROL SWITCH SIGNAL [With automatic drive positioner]
15	BR	AIR BAG SIGNAL
16	L	ENGINE COOLANT TEMPERATURE SIGNAL
18	L	AMBIENT SENSOR SIGNAL [Without automatic drive positioner]
18	LG	AMBIENT SENSOR SIGNAL [With automatic drive positioner]
19	R	A/C AUTO AMP. CONNECTION RECOGNITION SIGNAL
20	G	AMBIENT SENSOR GROUND [Without automatic drive positioner]
20	Y	AMBIENT SENSOR GROUND [With automatic drive positioner]
21	L	CAN-L
22	P	CAN-H
23	B	GROUND
24	B	FUEL LEVEL SENSOR GROUND
25	BR	ALTERNATOR SIGNAL [With automatic drive positioner]
25	W	ALTERNATOR SIGNAL [Without automatic drive positioner]
26	BR	PARKING BRAKE SWITCH SIGNAL
27	BE	BRAKE FLUID LEVEL SWITCH SIGNAL [Without automatic drive positioner]
27	Y	BRAKE FLUID LEVEL SWITCH SIGNAL [With automatic drive positioner]
28	V	SECURITY SIGNAL
29	G	WASHER LEVEL SWITCH SIGNAL
31	SB	VEHICLE SPEED SIGNAL [8-PULSE]
32	P	OVERDRIVE CONTROL SWITCH SIGNAL
34	O	FUEL LEVEL SENSOR SIGNAL
35	BR	SEAT BELT BUCKLE SWITCH SIGNAL [DRIVER SIDE] [Without automatic drive positioner]
35	P	SEAT BELT BUCKLE SWITCH SIGNAL [DRIVER SIDE] [With automatic drive positioner]
36	BR	PASSENGER SEAT BELT WARNING SIGNAL

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BASIC INSPECTION

DIAGNOSIS AND REPAIR WORK FLOW

Work Flow (With EXP-800 NI or GR8-1200 NI)

INFOID:0000000012409992

CHARGING SYSTEM DIAGNOSIS WITH EXP-800 NI OR GR8-1200 NI

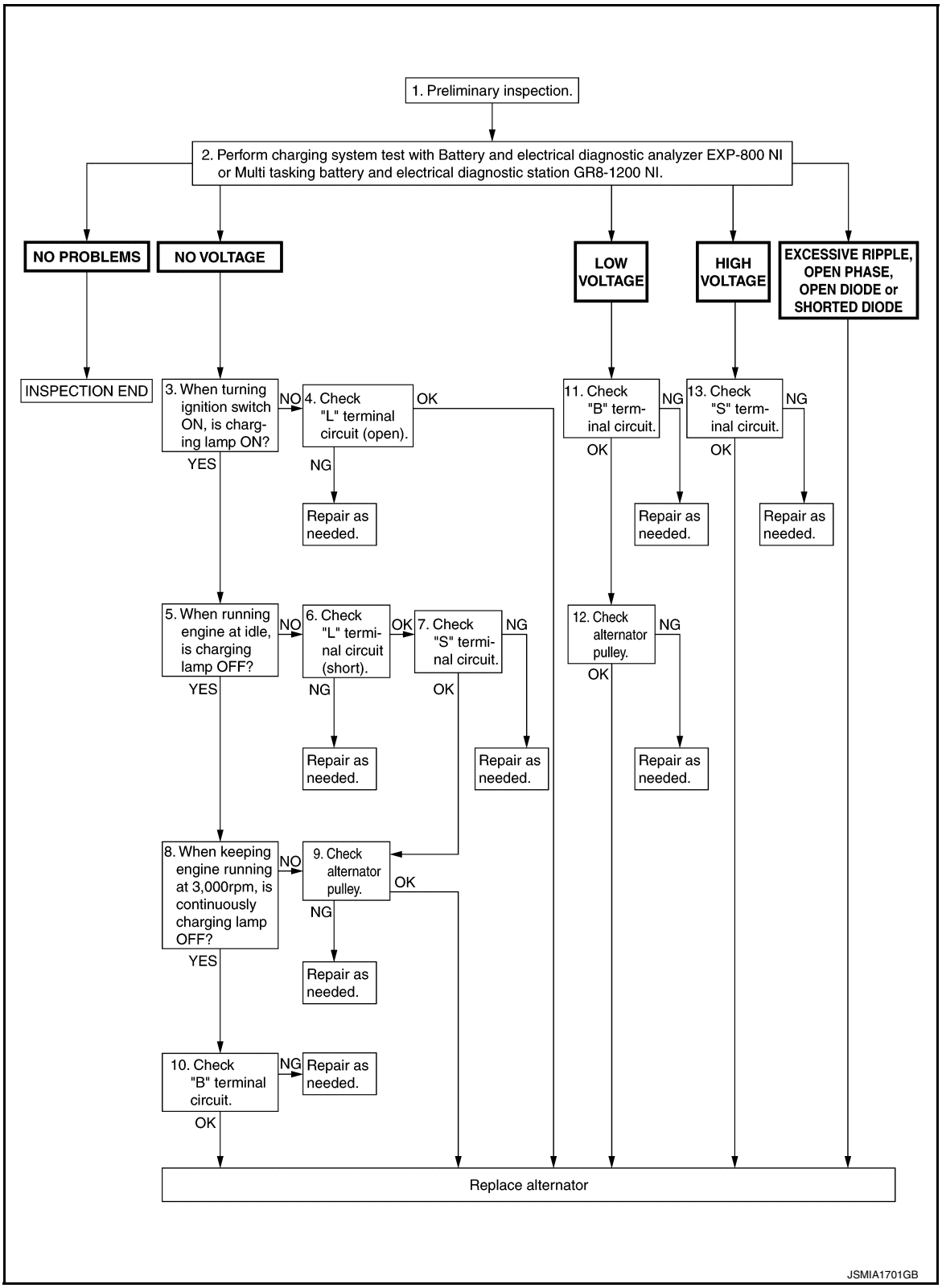
To test the charging system, use the following special service tools:

- EXP-800 NI Battery and electrical diagnostic analyzer
- GR8-1200 NI Multitasking battery and electrical diagnostic station

NOTE:

Refer to the applicable Instruction Manual for proper charging system diagnosis procedures.

OVERALL SEQUENCE



DETAILED FLOW

NOTE:
To ensure a complete and thorough diagnosis, the battery, starter and alternator test segments must be done as a set from start to finish.

1.PRELIMINARY INSPECTION

Perform the preliminary inspection. Refer to CHG-18, "Inspection Procedure".

>> GO TO 2.

2. DIAGNOSIS WITH EXP-800 NI OR GR8-1200 NI

Perform the charging system test using Multitasking battery and electrical diagnostic station GR8-1200 NI or Battery and electrical diagnostic analyzer EXP-800 NI. Refer to the applicable Instruction Manual for proper testing procedures.

Test result

NO PROBLEMS>>Charging system is normal and will also show “DIODE RIPPLE” test result.
NO VOLTAGE>>GO TO 3.
LOW VOLTAGE>>GO TO 11.
HIGH VOLTAGE>>GO TO 13.
EXCESSIVE RIPPLE, OPEN PHASE, OPEN DIODE or SHORTED DIODE>>Replace the alternator. Perform “DIODE RIPPLE” test again using Multitasking battery and electrical diagnostic station GR8-1200 NI or Battery and electrical diagnostic analyzer EXP-800 NI to confirm repair.

3. INSPECTION WITH CHARGE WARNING LAMP (IGNITION SWITCH IS ON)

Turn the ignition switch ON.

Does the charge warning lamp illuminate?

YES >> GO TO 5.
NO >> GO TO 4.

4. “L” TERMINAL CIRCUIT (OPEN) INSPECTION

Check “L” terminal circuit (open). Refer to CHG-20, "Diagnosis Procedure".

Is the “L” terminal circuit normal?

YES >> Replace alternator. Refer to CHG-26, "Removal and Installation".
NO >> Repair as needed.

5. INSPECTION WITH CHARGE WARNING LAMP (IDLING)

Start the engine and run it at idle.

Does the charge warning lamp turn OFF?

YES >> GO TO 8.
NO >> GO TO 6.

6. “L” TERMINAL CIRCUIT (SHORT) INSPECTION

Check “L” terminal circuit (short). Refer to CHG-22, "Diagnosis Procedure".

Is the “L” terminal circuit normal?

YES >> GO TO 7.
NO >> Repair as needed.

7. “S” TERMINAL CIRCUIT INSPECTION

Check “S” terminal circuit. Refer to CHG-23, "Diagnosis Procedure".

Is the “S” terminal circuit normal?

YES >> GO TO 9.
NO >> Repair as needed.

8. INSPECTION WITH CHARGE WARNING LAMP (ENGINE AT 3,000 RPM)

Increase and maintain the engine speed at 3,000 rpm.

Does the charge warning lamp remain off?

YES >> GO TO 10.
NO >> GO TO 9.

9. INSPECTION OF ALTERNATOR PULLEY

Check alternator pulley. Refer to CHG-27, "Inspection".

Is alternator pulley normal?

YES >> Replace alternator. Refer to CHG-26, "Removal and Installation".
NO >> Repair as needed.

10. "B" TERMINAL CIRCUIT INSPECTION

Check "B" terminal circuit. Refer to CHG-19, "Diagnosis Procedure".

Is "B" terminal circuit normal?

YES >> Replace alternator. Refer to CHG-26, "Removal and Installation".
NO >> Repair as needed.

11. "B" TERMINAL CIRCUIT INSPECTION

Check "B" terminal circuit. Refer to CHG-19, "Diagnosis Procedure".

Is "B" terminal circuit normal?

YES >> GO TO 12.
NO >> Repair as needed.

12. INSPECTION OF ALTERNATOR PULLEY

Check alternator pulley. Refer to CHG-27, "Inspection".

Is alternator pulley normal?

YES >> Replace alternator. Refer to CHG-26, "Removal and Installation".
NO >> Repair as needed.

13. "S" TERMINAL CIRCUIT INSPECTION

Check "S" terminal circuit. Refer to CHG-23, "Diagnosis Procedure".

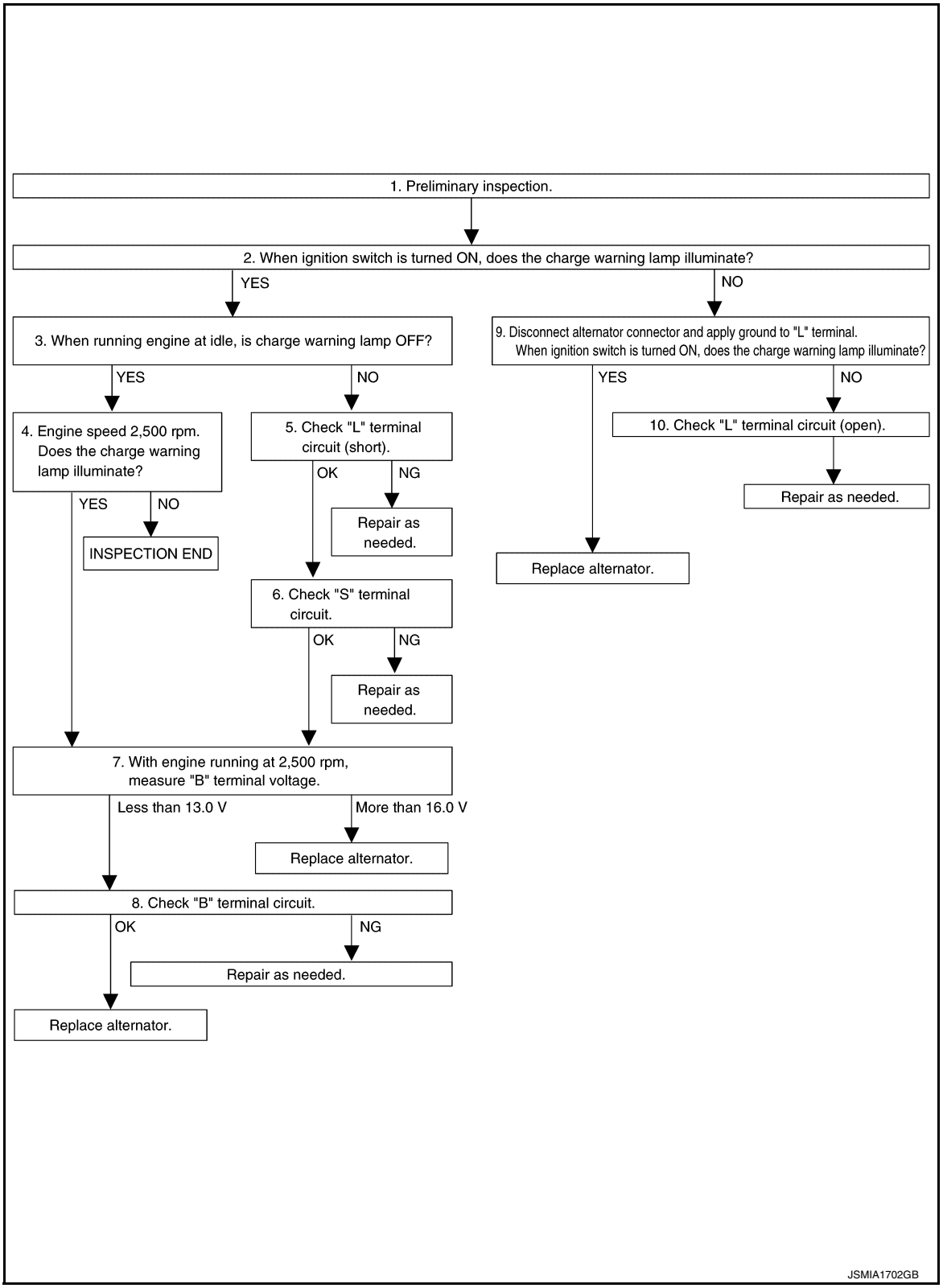
Is the "S" terminal circuit normal?

YES >> Replace alternator. Refer to CHG-26, "Removal and Installation".
NO >> Repair as needed.

Work Flow (Without EXP-800 NI or GR8-1200 NI)

INFOID:0000000012409993

OVERALL SEQUENCE



DETAILED FLOW

1.PRELIMINARY INSPECTION

Perform the preliminary inspection. Refer to CHG-18, "Inspection Procedure".

>> GO TO 2.

2. INSPECTION WITH CHARGE WARNING LAMP (IGNITION SWITCH IS TURNED ON)

When ignition switch is turned ON

Does the charge warning lamp illuminate?

YES >> GO TO 3.
NO >> GO TO 9.

3. INSPECTION WITH CHARGE WARNING LAMP (IDLING)

Start the engine and run it at idle.

Does the charge warning lamp turn OFF?

YES >> GO TO 4.
NO >> GO TO 5.

4. INSPECTION WITH CHARGE WARNING LAMP (ENGINE AT 2,500 RPM)

Increase and maintain the engine speed at 2,500 rpm.

Does the charge warning lamp illuminate?

YES >> GO TO 7.
NO >> INSPECTION END

5. "L" TERMINAL CIRCUIT (SHORT) INSPECTION

Check "L" terminal circuit (short). Refer to CHG-22, "Diagnosis Procedure".

Is the inspection result normal?

YES >> GO TO 6.
NO >> Repair as needed.

6. "S" TERMINAL CIRCUIT INSPECTION

Check "S" terminal circuit. Refer to CHG-23, "Diagnosis Procedure".

Is the inspection result normal?

YES >> GO TO 7.
NO >> Repair as needed.

7. MEASURE "B" TERMINAL VOLTAGE

Start engine. With engine running at 2,500 rpm, measure "B" terminal voltage.

What voltage does the measurement result show?

Less than 13.0 V>>GO TO 8.
More than 16.0 V>>Replace alternator. Refer to CHG-26, "Removal and Installation".

8. "B" TERMINAL CIRCUIT INSPECTION

Check "B" terminal circuit. Refer to CHG-19, "Diagnosis Procedure".

Is the inspection result normal?

YES >> Replace alternator. Refer to CHG-26, "Removal and Installation".
NO >> Repair as needed.

9. INSPECTION WITH CHARGE WARNING LAMP (IGNITION SWITCH IS ON)

1. Disconnect alternator connector and apply ground to "L" terminal.
2. Turn the ignition switch ON.

Does the charge warning lamp illuminate?

YES >> Replace alternator. Refer to CHG-26, "Removal and Installation".
NO >> GO TO 10.

10. CHECK "L" TERMINAL CIRCUIT (OPEN)

Check "L" terminal circuit (open). Refer to CHG-20, "Diagnosis Procedure".

>> Repair as needed.

CHARGING SYSTEM PRELIMINARY INSPECTION

Inspection Procedure

INFOID:0000000012409994

1.CHECK BATTERY TERMINALS CONNECTION

Check if battery terminals are clean and tight.

Is the inspection result normal?

YES >> GO TO 2.
NO >> Repair battery terminals connection.

2.CHECK FUSE

Check for blown fuse and fusible link.

Unit	Power source (Power supply terminals)	Fuse No.
Alternator	Battery (“S” terminal)	38
Combination meter	Ignition switch ON (“L” terminal)	4

Is the inspection result normal?

YES >> GO TO 3.
NO >> Be sure to eliminate the cause of malfunction before installing new fuse.

3.CHECK “E” TERMINAL CONNECTION (ALTERNATOR GROUND)

Check if “E” terminal (alternator ground) is clean and tight.

Is the inspection result normal?

YES >> GO TO 4.
NO >> Repair “E” terminal (alternator ground) connection.

4.CHECK DRIVE BELT TENSION

Check drive belt tension. Refer to EM-15, "Checking".

Is the inspection result normal?

YES >> INSPECTION END
NO >> Repair as needed.

DTC/CIRCUIT DIAGNOSIS

B TERMINAL CIRCUIT

Description

INFOID:0000000012409995

"B" terminal circuit supplies power to charge the battery and to operate the vehicle's electrical system.

Diagnosis Procedure

INFOID:0000000012409996

1.CHECK "B" TERMINAL CONNECTION

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

Is the inspection result normal?

YES >> GO TO 2.
NO >> Repair "B" terminal connection. Confirm repair by performing complete Charging system test using EXP-800 NI or GR8-1200 NI (if available). Refer to the applicable Instruction Manual for proper testing procedures.

2.CHECK "B" TERMINAL CIRCUIT

Check voltage between alternator "B" terminal and ground.

Terminals			Voltage (Approx.)
(+)		(–)	
Alternator "B" terminal	Terminal		
F59	1	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 3.
NO >> 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	F59	1	Less than 0.2 V

Is the inspection result normal?

YES >> "B" terminal circuit is normal. Refer to CHG-12, "Work Flow (With EXP-800 NI or GR8-1200 NI)" or CHG-16, "Work Flow (Without EXP-800 NI or GR8-1200 NI)".
NO >> Check harness between battery and alternator for poor continuity.

L TERMINAL CIRCUIT (OPEN)

Description

INFOID:0000000012409997

The “L” terminal circuit controls the charge warning lamp. The charge warning lamp illuminates when the ignition switch is set to ON or START. When the alternator is providing sufficient voltage with the engine running, the charge warning lamp will go off. If the charge warning lamp illuminates with the engine running, a malfunction is indicated.

Diagnosis Procedure

INFOID:0000000012409998

1.CHECK “L” TERMINAL CONNECTION

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

Is the inspection result normal?

YES >> GO TO 2.
NO >> Repair “L” terminal connection. Confirm repair by performing complete Charging system test using EXP-800 NI or GR8-1200 NI (if available). Refer to the applicable Instruction Manual for proper testing procedures.

2.CHECK “L” TERMINAL CIRCUIT (OPEN)

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

Alternator harness connector	Terminal	Ground	Condition	
			Ignition switch position	Charge warning lamp
F60	3		ON	Illuminate

Does it illuminate?

YES >> “L” terminal circuit is normal. Refer to CHG-12, "Work Flow (With EXP-800 NI or GR8-1200 NI)" or CHG-16, "Work Flow (Without EXP-800 NI or GR8-1200 NI)".
NO >> GO TO 3.

3.CHECK HARNESS CONTINUITY (OPEN CIRCUIT)

1. Disconnect the battery cable from the negative terminal.
2. Disconnect the combination meter connector.
3. Check continuity between alternator harness connector and combination meter harness connector.

Alternator harness connector		Combination meter harness connector		Continuity
Connector No.	Terminal No.	Connector No.	Terminal No.	
F60	3	M34	25	Existed

Is the inspection result normal?

YES >> GO TO 4.
NO >> Repair the harness or connector.

4.CHECK HARNESS CONTINUITY (OPEN CIRCUIT)

Check continuity between combination meter harness connector M34 terminal 2 and 10A fuse [No.4 located in the fuse block (J/B)].

Does continuity exist?

YES >> GO TO 5.
NO >> Repair the harness.

5.CHECK POWER SUPPLY CIRCUIT

1. Connect the battery cable to the negative terminal.
2. Check voltage between combination meter harness connector and ground.

Terminals			Condition	Voltage (Approx.)
(+)		(–)		
Combination meter harness connector	Terminal			
M34	2	Ground	When the ignition switch is in ON position	Battery voltage

Is the inspection result normal?

YES >> Replace combination meter.

NO >> Inspect the power supply circuit. Refer to PG-58, "Wiring Diagram - IGNITION POWER SUPPLY - ".

L TERMINAL CIRCUIT (SHORT)

Description

INFOID:0000000012409999

The “L” terminal circuit controls the charge warning lamp. The charge warning lamp illuminates when the ignition switch is set to ON or START. When the alternator is providing sufficient voltage with the engine running, the charge warning lamp will go off. If the charge warning lamp illuminates with the engine running, a malfunction is indicated.

Diagnosis Procedure

INFOID:0000000012410000

1.CHECK “L” TERMINAL CIRCUIT (SHORT)

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

Does charge warning lamp illuminate?

YES >> GO TO 2.
NO >> Refer to CHG-12, "Work Flow (With EXP-800 NI or GR8-1200 NI)" or CHG-16, "Work Flow (Without EXP-800 NI or GR8-1200 NI)".

2.CHECK HARNESS CONTINUITY (SHORT CIRCUIT)

1. Turn ignition switch OFF.
2. Disconnect the battery cable from the negative terminal.
3. Disconnect combination meter connector.
4. Check continuity between combination meter harness connector and ground.

Combination meter harness connector		Ground	Continuity
Connector No.	Terminal No.		
M34	25		Not existed

Is the inspection result normal?

YES >> Replace combination meter.
NO >> Repair the harness.

S TERMINAL CIRCUIT

Description

INFOID:0000000012410001

The output voltage of the alternator is controlled by the IC voltage regulator at the “S” terminal detecting the input voltage.
The “S” terminal circuit detects the battery voltage to adjust the alternator output voltage with the IC voltage regulator.

Diagnosis Procedure

INFOID:0000000012410002

1.CHECK “S” TERMINAL CONNECTION

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

Is the inspection result normal?

YES >> GO TO 2.
NO >> Repair “S” terminal connection. Confirm repair by performing complete Charging system test using EXP-800 NI or GR8-1200 NI (if available). Refer to the applicable Instruction Manual for proper testing procedures.

2.CHECK “S” TERMINAL CIRCUIT

Check voltage between alternator harness connector and ground.

Terminals			Voltage (Approx.)
(+)		(–)	
Alternator harness connector	Terminal		
F60	4	Ground	Battery voltage

Is the inspection result normal?

YES >> Refer to CHG-12, "Work Flow (With EXP-800 NI or GR8-1200 NI)" or CHG-16, "Work Flow (Without EXP-800 NI or GR8-1200 NI)".
NO >> Check harness for open between alternator and fuse.

SYMPTOM DIAGNOSIS

CHARGING SYSTEM

Symptom Table

INFOID:0000000012410003

Symptom	Reference
Discharged battery	Refer to CHG-12, "Work Flow (With EXP-800 NI or GR8-1200 NI)" or CHG-16, "Work Flow (Without EXP-800 NI or GR8-1200 NI)".
The charge warning lamp does not illuminate when the ignition switch is set to ON.	
The charge warning lamp does not turn OFF after the engine starts.	
The charging warning lamp turns ON when increasing the engine speed.	

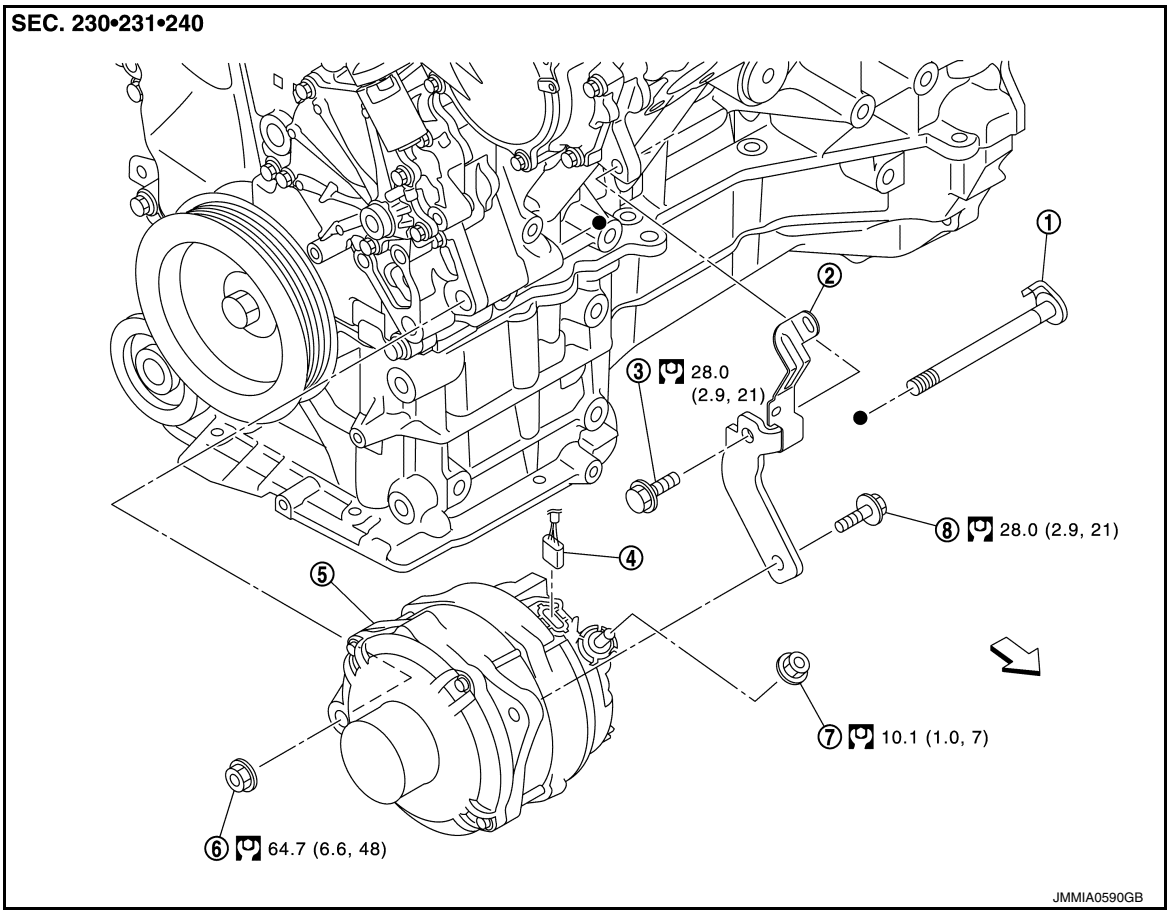
REMOVAL AND INSTALLATION

ALTERNATOR

Exploded View

INFOID:0000000012410004

REMOVAL



1. Alternator mounting bolt (lower)
2. Alternator bracket
3. Alternator bracket mounting bolt
4. Alternator harness connector
5. Alternator
6. Alternator mounting nut (lower)
7. “B” terminal harness nut
8. Alternator mounting bolt (upper)

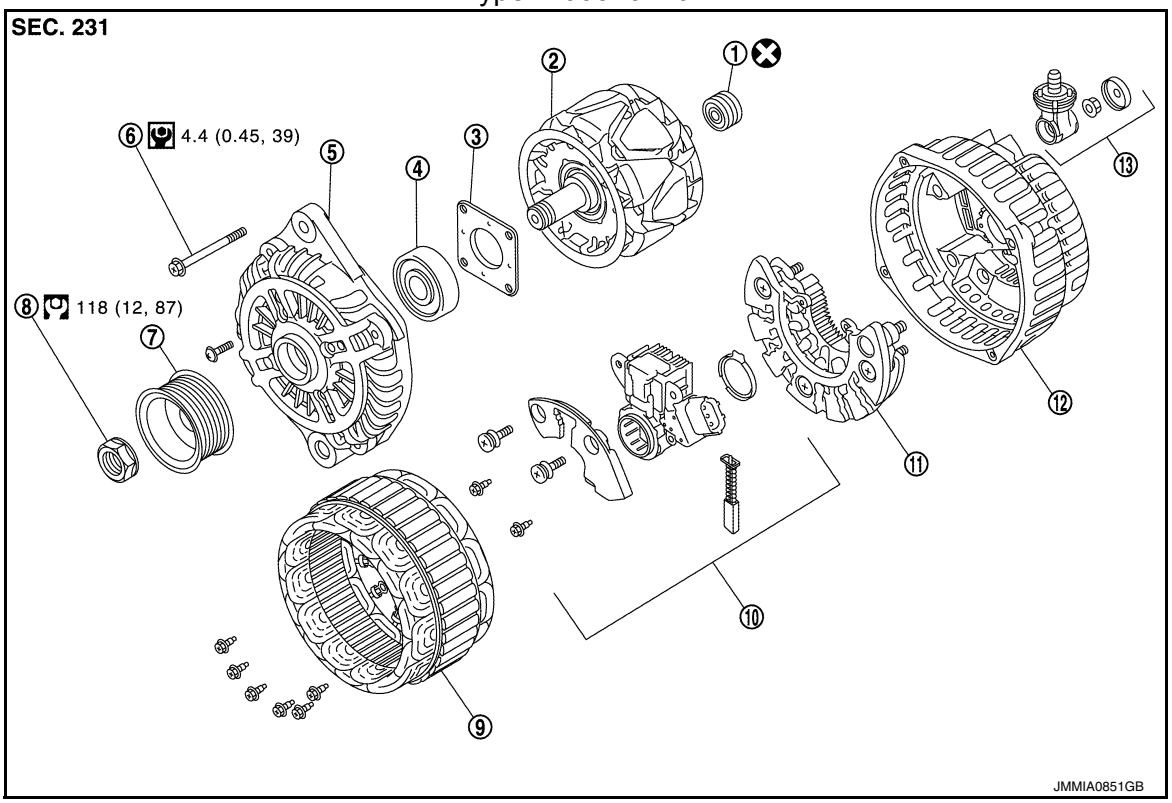
⇦ : Vehicle front

: N·m (kg-m, ft-lb)

● : indicates that the part is connected at points with same symbol in actual vehicle.

DISASSEMBLY

Type: A003TJ1791



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

: Always replace after every disassembly.

: N·m (kg-m, in-lb)

: N·m (kg-m, ft-lb)

Removal and Installation

INFOID:0000000012410005

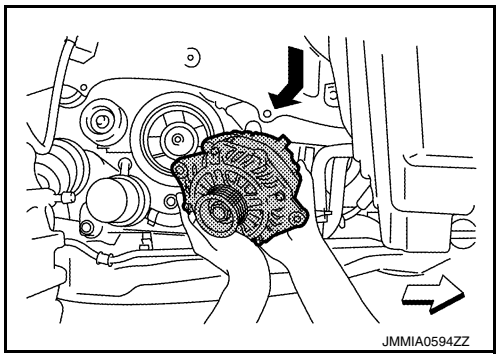
REMOVAL

1. Disconnect the battery cable from the negative terminal. Refer to PG-136, "Removal and Installation".
   CAUTION:
   To prevent damage to the parts, disconnect the battery cable from the negative terminal first.
2. Remove air duct (inlet). Refer to EM-27, "Exploded View".
3. Remove reservoir tank. Refer to CO-14, "Exploded View".
4. Disconnect alternator harness connector.
5. Remove “B” terminal harness nut, and then disconnect “B” terminal harness.
6. Remove alternator mounting bolt (upper).
7. Remove engine under cover. Refer to EXT-28, "Exploded View".
8. Remove front wheel RH.
9. Remove splash guard RH. Refer to EXT-23, "Removal and Installation".
10. Remove drive belt. Refer to EM-14, "Removal and Installation".
11. Remove idler pulley. Refer to EM-14, "Removal and Installation".
12. Remove compressor mounting bolts, and then move compressor to secure work space. Refer to HA-30, "Exploded View".

CAUTION:
Never disconnect low-pressure flexible hose and high-pressure flexible hose from compressor.

13. Remove water pipe mounting bolts, and then move water pipe to secure work space. Refer to LU-12, "Exploded View".
CAUTION:
Never disconnect water hose from water pipe.
14. Remove return tube fixing clamps, and then move return tube to secure work space. Refer to ST-35, "Exploded View".
CAUTION:
Never disconnect return tube from return hose assembly.
15. Remove alternator mounting bolt (lower) and alternator mounting nut (lower).
16. Remove alternator from the right side of the vehicle.
CAUTION:
Be careful not to contact with and damage surrounding parts when removing alternator from the vehicle.

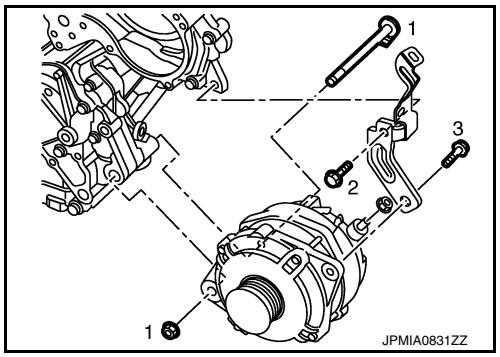
⇦ : Vehicle front



INSTALLATION

Note the following items, and then install in the reverse order of removal.

CAUTION:
- **Temporarily tighten all of alternator bolts and nut. And then tighten them in numerical order shown in the figure.**



- **Install alternator, and check tension of belt. Refer to EM-15, "Checking".**
- **Be careful to tighten “B” terminal nut carefully.**

Inspection

INFOID:0000000012410006

ALTERNATOR PULLEY INSPECTION

Perform the following.
- Make sure that alternator pulley does not rattle.
- Make sure that alternator pulley nut is tight. Refer to CHG-25, "Exploded View".

SERVICE DATA AND SPECIFICATIONS (SDS)

SERVICE DATA AND SPECIFICATIONS (SDS)

Alternator

INFOID:0000000012410007

Type		A003TJ1791 MITSUBISHI make
Nominal rating	[V - A]	12 -130
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 108/2,500 More than 124/5,000
Regulated output voltage	[V]	14.1 - 14.7