

SECTION

CHG

CHARGING SYSTEM

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PRECAUTIONS

< PRECAUTION >

PRECAUTION

PRECAUTIONS

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

INFOID:0000000011559734

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 SR and SB 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 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 SR section.
- 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 Airbag Diagnosis Sensor Unit or other Airbag 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 three minutes before performing any service.

Precaution for Power Generation Variable Voltage Control System

INFOID:0000000011559735

CAUTION:

For this model, the battery current sensor that is installed to the negative battery cable measures the charging/discharging current of the battery and performs various engine controls. If an electrical component is connected directly to the negative battery terminal, the current flowing through that component will not be measured by the battery current sensor. This condition may cause a malfunction of the engine control system and battery discharge may occur. Do not connect an electrical component or ground wire directly to the battery terminal.

PREPARATION

< PREPARATION >

PREPARATION

PREPARATION

Special Service Tool

INFOID:0000000011559736

The actual shape of the tools may differ from those illustrated here.

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

Commercial Service Tool

INFOID:0000000011559737

Tool name	Description
Power tool	Loosening nuts, screws and bolts

CHG

DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION >

BASIC INSPECTION

DIAGNOSIS AND REPAIR WORKFLOW

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

INFOID:0000000011559738

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

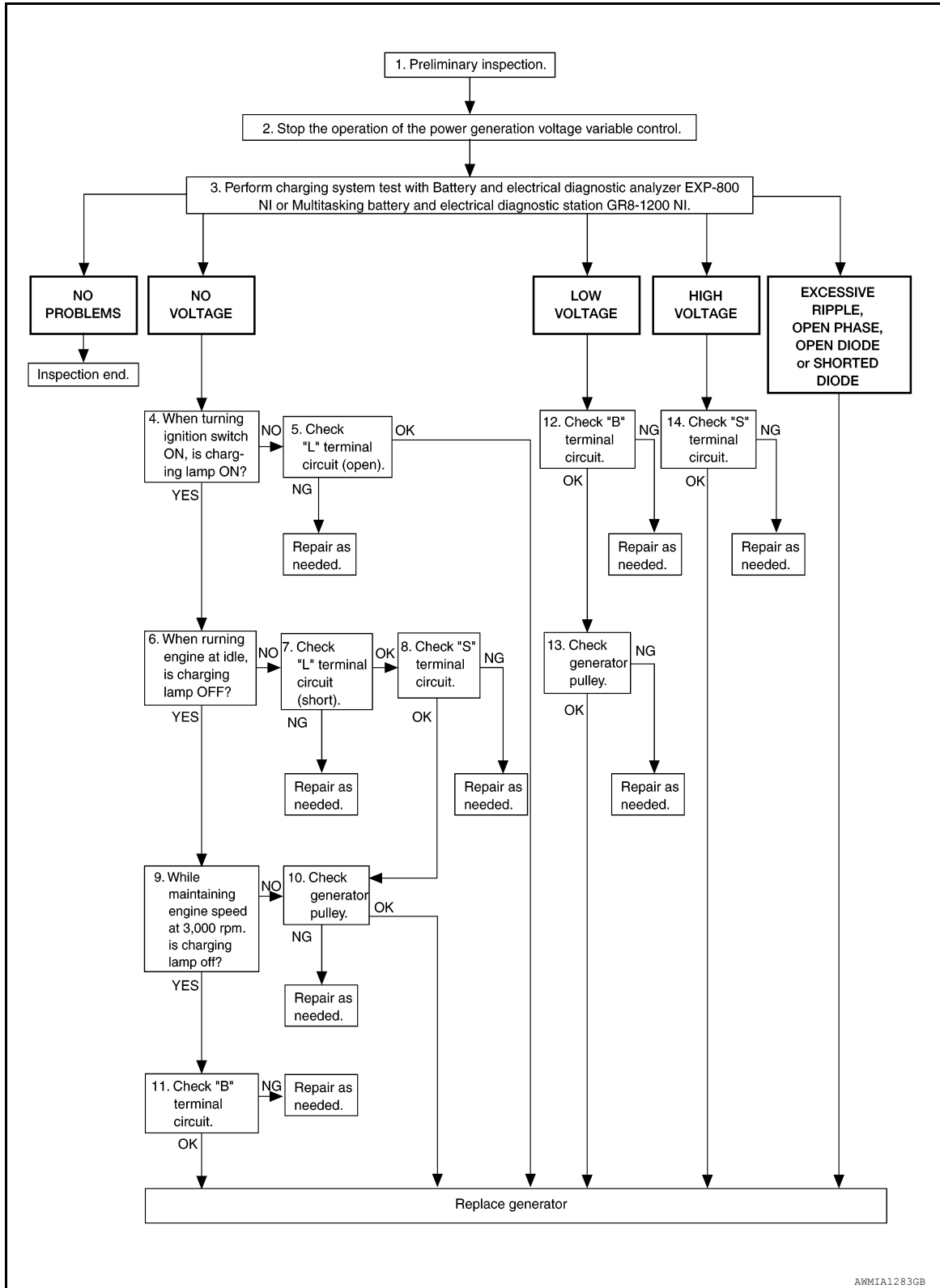
NOTE:

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

DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION >

OVERALL SEQUENCE



DETAILED FLOW

NOTE:

To ensure a complete and thorough diagnosis, the battery, stator and generator test segments must be done as a set from start to finish.

1. PRELIMINARY INSPECTION

Perform the preliminary inspection. Refer to [CHG-12. "Inspection Procedure"](#).

DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION >

>> GO TO 2.

2. STOP POWER GENERATION VOLTAGE VARIABLE CONTROL SYSTEM

Stop the operation of the power generation voltage variable control in either of the following procedures:

- After selecting “ENGINE” using CONSULT, set the DUTY value of “ALTERNATOR DUTY” to 0 % by selecting “ALTERNATOR DUTY” of “Active Test”. Continue “Active Test” until the end of inspection. (When the DUTY value is 0 or 100 %, the normal power generation is performed according to the characteristic of the IC regulator of the generator.)
- Turn the ignition switch OFF, and disconnect the battery current sensor connector. [However, DTC (P1550–P1554) of the engine might remain. After finishing the inspection, connect the battery current sensor connector and erase the self diagnosis results history of the engine using CONSULT.]

>> GO TO 3.

3. 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 4.

LOW VOLTAGE>>GO TO 12.

HIGH VOLTAGE>>GO TO 14.

EXCESSIVE RIPPLE, OPEN PHASE, OPEN DIODE or SHORTED DIODE>>Replace the generator. Refer to [CHG-28, "Removal and Installation"](#). 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.

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

Turn the ignition switch ON.

Does the charge warning lamp illuminate?

YES >> GO TO 6.

NO >> GO TO 5.

5. “L” TERMINAL CIRCUIT (OPEN) INSPECTION

Check “L” terminal circuit (open). Refer to [CHG-16, "Diagnosis Procedure"](#).

Is the “L” terminal circuit normal?

YES >> Replace generator. Refer to [CHG-28, "Removal and Installation"](#).

NO >> Repair as needed.

6. INSPECTION WITH CHARGE WARNING LAMP (IDLING)

Start the engine and run it at idle.

Does the charge warning lamp turn OFF?

YES >> GO TO 9.

NO >> GO TO 7.

7. “L” TERMINAL CIRCUIT (SHORT) INSPECTION

Check “L” terminal circuit (short). Refer to [CHG-18, "Diagnosis Procedure"](#).

Is the “L” terminal circuit normal?

YES >> GO TO 8.

NO >> Repair as needed.

8. “S” TERMINAL CIRCUIT INSPECTION

Check “S” terminal circuit. Refer to [CHG-19, "Diagnosis Procedure"](#).

Is the “S” terminal circuit normal?

YES >> GO TO 10.

DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION >

NO >> Repair as needed.

9.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 11.

NO >> GO TO 10.

10.INSPECTION OF GENERATOR PULLEY

Check generator pulley. Refer to [CHG-28. "Removal and Installation"](#).

Is generator pulley normal?

YES >> Replace generator. Refer to [CHG-28. "Removal and Installation"](#).

NO >> Repair as needed.

11.“B” TERMINAL CIRCUIT INSPECTION

Check “B” terminal circuit. Refer to [CHG-15. "Diagnosis Procedure"](#).

Is “B” terminal circuit normal?

YES >> Replace generator. Refer to [CHG-28. "Removal and Installation"](#).

NO >> Repair as needed.

12.“B” TERMINAL CIRCUIT INSPECTION

Check “B” terminal circuit. Refer to [CHG-15. "Diagnosis Procedure"](#).

Is “B” terminal circuit normal?

YES >> GO TO 13.

NO >> Repair as needed.

13.INSPECTION OF GENERATOR PULLEY

Check generator pulley. Refer to [CHG-28. "Removal and Installation"](#).

Is generator pulley normal?

YES >> Replace generator. Refer to [CHG-28. "Removal and Installation"](#).

NO >> Repair as needed.

14.“S” TERMINAL CIRCUIT INSPECTION

Check “S” terminal circuit. Refer to [CHG-19. "Diagnosis Procedure"](#).

Is the “S” terminal circuit normal?

YES >> Replace generator. Refer to [CHG-28. "Removal and Installation"](#).

NO >> Repair as needed.

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

INFOID:0000000011559739

OVERALL SEQUENCE

Before performing a generator test, make sure that the battery is fully charged. A 30-volt voltmeter and suitable test probes are necessary for the test.

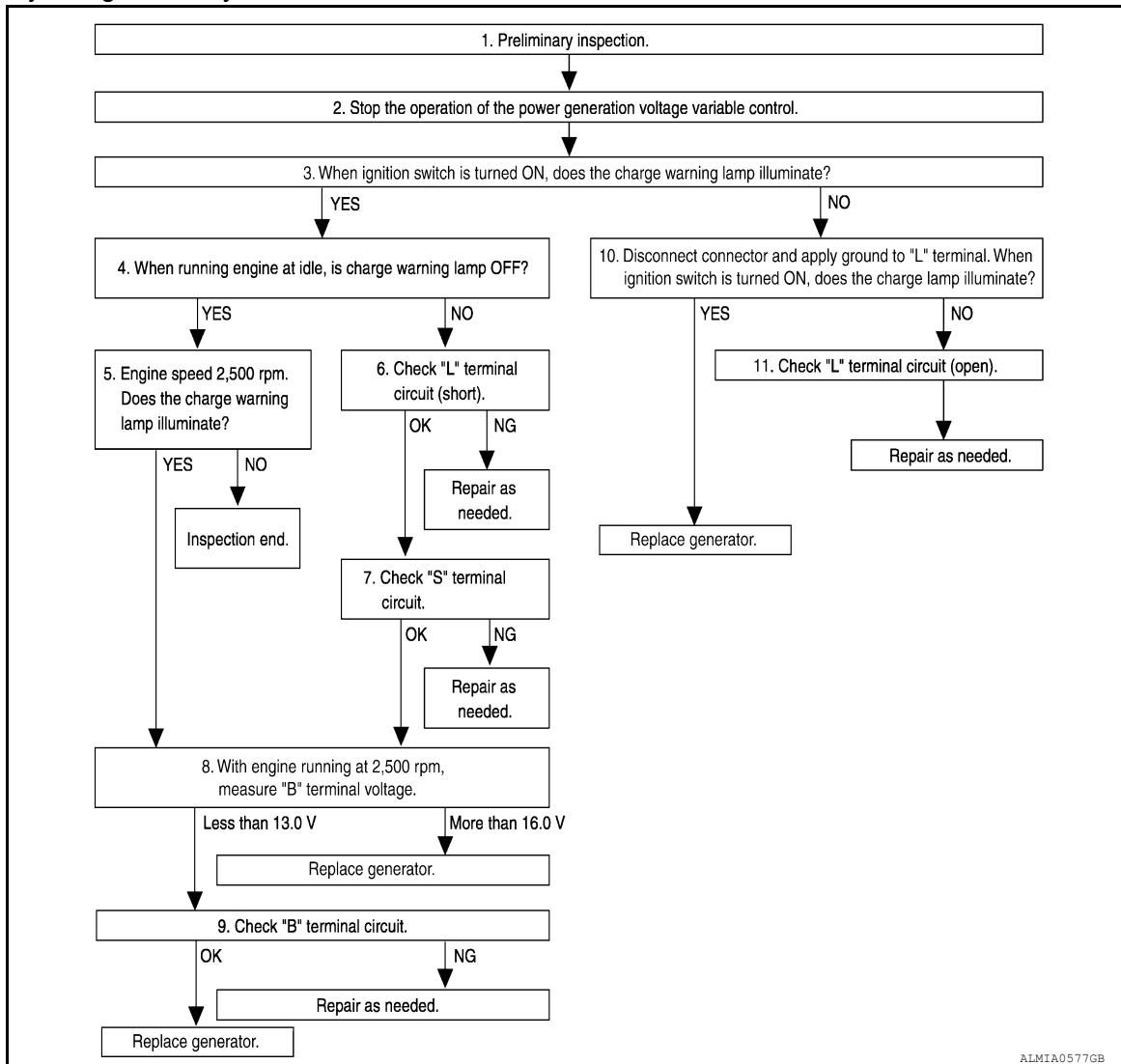
- Before starting, inspect the fusible link.

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DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION >

- Use fully charged battery.



DETAILED FLOW

1. PRELIMINARY INSPECTION

Perform the preliminary inspection. Refer to [CHG-12, "Inspection Procedure"](#).

>> GO TO 2.

2. STOP POWER GENERATION VOLTAGE VARIABLE CONTROL SYSTEM

Stop the operation of the power generation voltage variable control in either of the following procedures:

- After selecting "ENGINE" using CONSULT, set the DUTY value of "ALTERNATOR DUTY" to 0 % by selecting "ALTERNATOR DUTY" with "Active Test". Continue "Active Test" until the end of inspection. (When the DUTY value is 0 or 100 %, the normal power generation is performed according to the characteristic of the IC regulator of the generator.)
- Turn the ignition switch OFF, and disconnect the battery current sensor connector. [However, DTC (P1550 - P1554) of the engine might remain. After finishing the inspection, connect the battery current sensor connector and erase the self-diagnostic results history of the engine using CONSULT.]

>> GO TO 3.

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

When ignition switch is turned ON.

Does the charge warning lamp illuminate?

DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION >

YES >> GO TO 4.
NO >> GO TO 10.

A

4.INSPECTION WITH CHARGE WARNING LAMP (IDLING)

Start the engine and run it at idle

B

Does the charge warning lamp turn OFF?

YES >> GO TO 5.
NO >> GO TO 6.

C

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

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

D

Does the charge warning lamp illuminate?

YES >> GO TO 8.
NO >> Inspection End.

E

6.“L” TERMINAL CIRCUIT (SHORT) INSPECTION

Check terminal “L” circuit for (short). Refer to [CHG-18, "Diagnosis Procedure"](#).

Is the inspection result normal?

F

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

7.“S” TERMINAL CIRCUIT INSPECTION

G

Check terminal “S” circuit. Refer to [CHG-19, "Diagnosis Procedure"](#).

Is the inspection result normal?

H

YES >> GO TO 8.
NO >> Repair as needed.

8.MEASURE “B” TERMINAL VOLTAGE

I

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

What voltage does the measurement result show?

J

Less than 13.0 V>>GO TO 9.
More than 16.0 V>>Replace generator. Refer to [CHG-28, "Removal and Installation"](#).

9.“B” TERMINAL CIRCUIT INSPECTION

K

Check “B” terminal circuit. Refer to [CHG-15, "Diagnosis Procedure"](#).

Is the inspection result normal?

L

YES >> Replace generator. Refer to [CHG-28, "Removal and Installation"](#).
NO >> Repair as needed.

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

CHG

1. Disconnect generator connector and apply ground to “L” terminal.
2. Turn the ignition switch ON.

Does the charge warning lamp illuminate?

N

YES >> Replace generator. Refer to [CHG-28, "Removal and Installation"](#).
NO >> GO TO 11.

11.CHECK “L” TERMINAL CIRCUIT (OPEN)

O

Check “L” terminal circuit (OPEN). Refer to [CHG-16, "Diagnosis Procedure"](#).

>> Repair as needed.

P

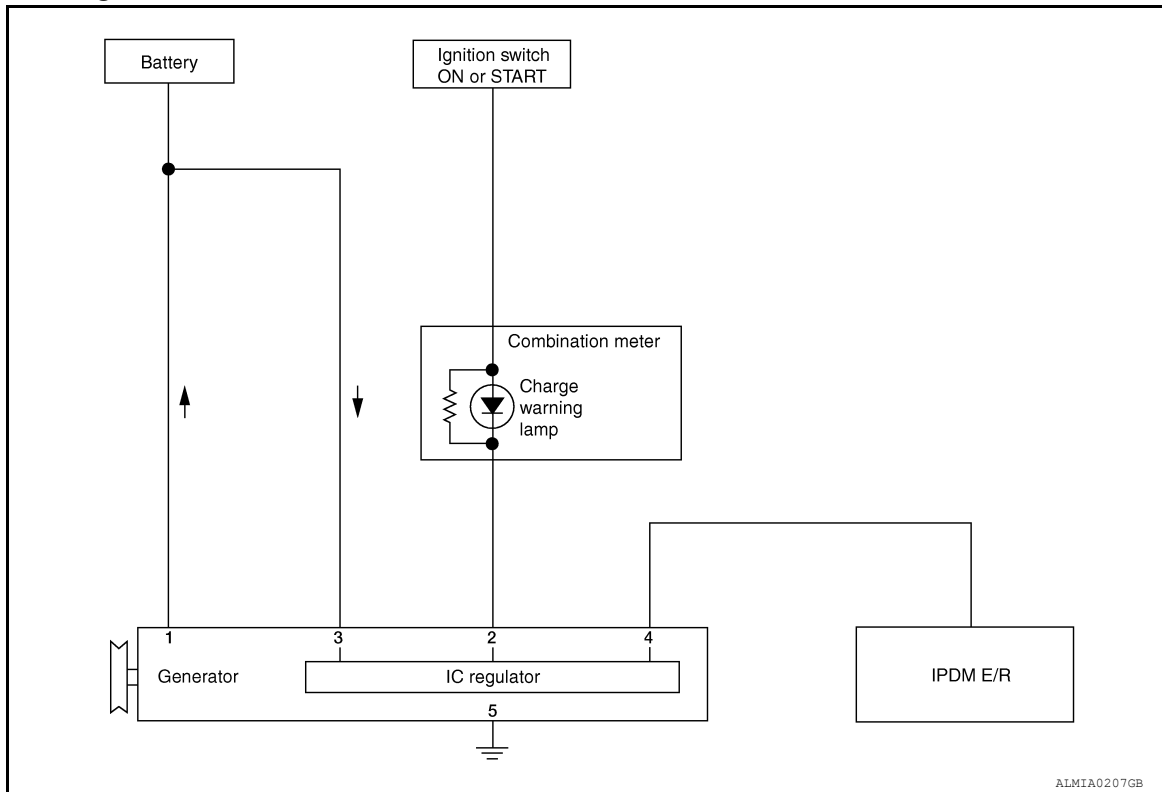
CHARGING SYSTEM

< SYSTEM DESCRIPTION >

SYSTEM DESCRIPTION

CHARGING SYSTEM

System Diagram



System Description

INFOID:0000000011559741

The generator 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.

Component Description

INFOID:0000000011559742

Component part		Description
Generator	Terminal "1"	Refer to CHG-15, "Description" .
	Terminal "2"	Refer to CHG-16, "Description" .
	Terminal "3"	Refer to CHG-19, "Description" .
	Terminal "4"	Used for the power generation voltage variable control system. Refer to CHG-11, "System Description" .
Combination meter (Charge warning lamp)		The IC regulator warning function activates to illuminate the charge warning lamp if any of the following symptoms occur while generator is operating: - Excessive voltage is produced. - No voltage is produced.
IPDM E/R		Used for the power generation voltage variable control system. Refer to CHG-11, "System Description" .

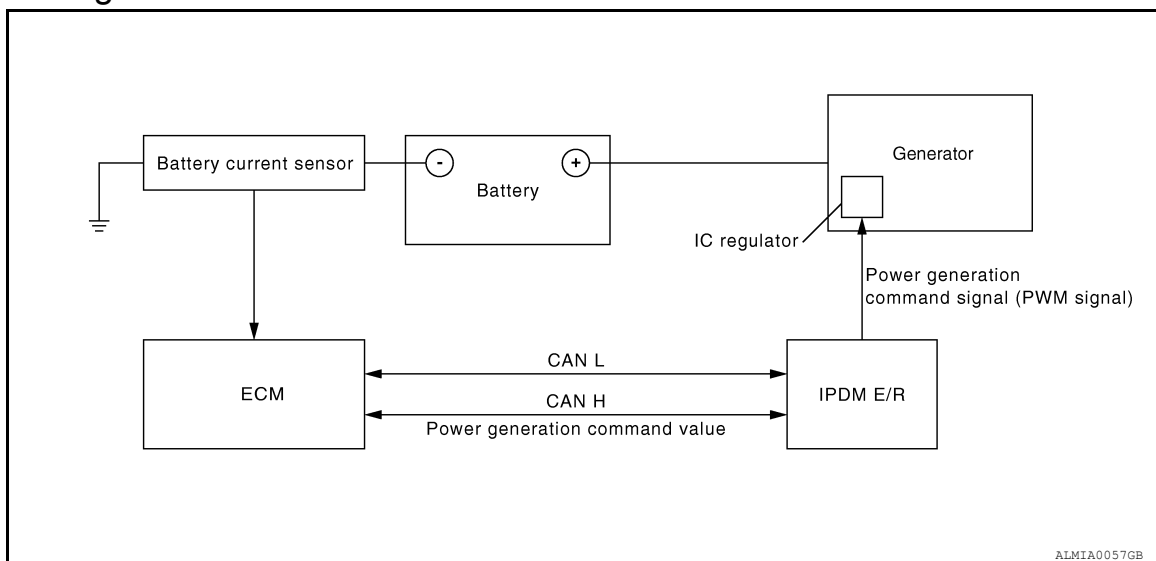
POWER GENERATION VOLTAGE VARIABLE CONTROL SYSTEM

< SYSTEM DESCRIPTION >

POWER GENERATION VOLTAGE VARIABLE CONTROL SYSTEM

System Diagram

INFOID:0000000011559743



System Description

INFOID:0000000011559744

Power generation variable voltage control system has been adopted. By varying the voltage to the generator, engine load due to power generation of the generator is reduced and fuel consumption is decreased.

NOTE:

When any malfunction is detected in the power generation variable voltage control system, power generation is performed according to the characteristic of the IC regulator in the generator.

Component Description

INFOID:0000000011559745

Component part	Description
Battery current sensor	The battery current sensor is installed on the battery cable at the negative terminal. The battery current sensor detects the charging/discharging current of the battery and sends a voltage signal to the ECM according to the current value detected.
ECM	The battery current sensor detects the charging/discharging current of the battery. The ECM judges the battery condition based on this signal. The ECM judges whether to request more output via the power generation voltage variable control according to the battery condition. When performing the power generation voltage variable control, the ECM calculates the target power generation voltage according to the battery condition and sends the calculated value as the power generation command value to the IPDM E/R.
IPDM E/R	The IPDM E/R converts the received power generation command value into a pulse width modulated (PWM) command signal and sends it to the IC regulator.
Generator (IC regulator)	The IC regulator controls the power generation voltage by the target power generation voltage based on the received PWM command signal. When there is no PWM command signal, the generator performs the normal power generation according to the characteristic of the IC regulator.

CHARGING SYSTEM PRELIMINARY INSPECTION

< DTC/CIRCUIT DIAGNOSIS >

DTC/CIRCUIT DIAGNOSIS

CHARGING SYSTEM PRELIMINARY INSPECTION

Inspection Procedure

INFOID:0000000011559746

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 or Fusible Link
Generator	Battery (terminal 3)	Fuse 30
	Battery (terminal 1)	Fusible Link A
Combination meter	Ignition switch ON (terminal 2)	Fuse 14

Is the inspection result normal?

YES >> GO TO 3.

NO >> Be sure to eliminate cause of malfunction before installing new fuse or fusible link.

3.CHECK GENERATOR GROUND TERMINAL CONNECTION

Verify connector E206 terminal 5 (generator ground harness) is clean and tight.

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair connection.

4.CHECK DRIVE BELT TENSION

Check drive belt tension. Refer to [EM-13. "Checking Drive Belts"](#).

Is the inspection result normal?

YES >> Inspection End.

NO >> Repair as needed.

POWER GENERATION VOLTAGE VARIABLE CONTROL SYSTEM OPERATION INSPECTION

< DTC/CIRCUIT DIAGNOSIS >

POWER GENERATION VOLTAGE VARIABLE CONTROL SYSTEM OPERATION INSPECTION

Inspection Procedure

INFOID:0000000011559747

Regarding Wiring Diagram information, refer to [CHG-20, "Wiring Diagram"](#).

CAUTION:

When performing this inspection, always use a charged battery that has completed the battery inspection. (When the charging rate of the battery is low, the response speed of the voltage change will become slow. This can cause an incorrect inspection.)

1. CHECK ECM (CONSULT)

Perform ECM self-diagnosis with CONSULT. Refer to [EC-49, "CONSULT Function"](#).

Self-diagnostic results content

No malfunction detected>> GO TO 2.

Malfunction detected>> Check applicable parts, and repair or replace corresponding parts.

2. CHECK OPERATION OF POWER GENERATION VOLTAGE VARIABLE CONTROL SYSTEM

1. Connect CONSULT and start the engine.
2. The selector lever is in "P" or "N" position and all of the electric loads and A/C, etc. are turned OFF.
3. Select "ALTERNATOR DUTY" in "Active Test" of "ENGINE", and then check the value of "BATTERY VOLT" monitor when DUTY value of "ALTERNATOR DUTY" is set to 40.0 %.

"BATTERY VOLT"

2 seconds after setting the
DUTY value of "ALTERNA-
TOR DUTY" to 40.0 % : 12 - 13.6 V

4. Check the value of "BATTERY VOLT" monitor when DUTY value of "ALTERNATOR DUTY" is set to 80.0%.

"BATTERY VOLT"

20 seconds after setting
the DUTY value of "ALTER-
NATOR DUTY" to 80.0 % : +0.5 V or more against
the value of "BATTERY
VOLT" monitor when
DUTY value is 40.0 %

Is the measurement value within specification?

YES >> Inspection End.

NO >> GO TO 3.

3. CHECK IPDM E/R (CONSULT)

Perform IPDM E/R self-diagnosis with CONSULT. Refer to [PCS-13, "CONSULT Function \(IPDM E/R\)"](#).

Self-diagnostic results content

No malfunction detected>> GO TO 4.

Malfunction detected>> Check applicable parts, and repair or replace corresponding parts.

4. CHECK HARNESS BETWEEN GENERATOR AND IPDM E/R

POWER GENERATION VOLTAGE VARIABLE CONTROL SYSTEM OPERATION INSPECTION

< DTC/CIRCUIT DIAGNOSIS >

1. Turn ignition switch OFF.
2. Disconnect generator connector E205 and IPDM E/R connector E122.
3. Check continuity between generator harness connector E205 (A) terminal 4 and IPDM E/R harness connector E122 (B) terminal 37.

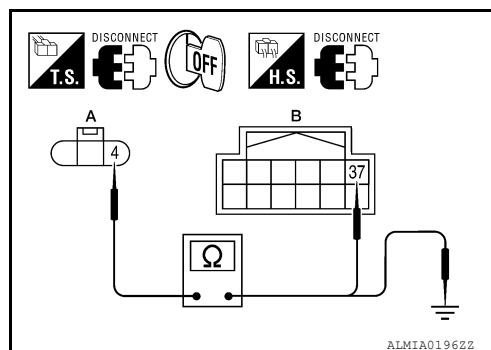
A		B		Continuity
Connector	Terminal	Connector	Terminal	
E205	4	E122	37	Yes

4. Check continuity between generator harness connector E205 (A) terminal 4 and ground.

A		—	Continuity
Connector	Terminal		
E205	4	Ground	No

Are the continuity test results as specified?

- YES >> Replace IPDM E/R. Refer to [PCS-28, "Removal and Installation of IPDM E/R"](#).
- NO >> Repair harness or connector between IPDM E/R and generator.



B TERMINAL CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

B TERMINAL CIRCUIT

Description

INFOID:0000000011559748

The terminal "1" (B) circuit supplies power to charge the battery and operate the vehicles electrical system.

Diagnosis Procedure

INFOID:0000000011559749

Regarding Wiring Diagram information, refer to [CHG-20, "Wiring Diagram"](#).

1.CHECK TERMINAL "1" CONNECTION

1. Turn ignition switch OFF.
2. Verify terminal "1" is clean and tight.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair terminal "1" 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 TERMINAL "1" CIRCUIT

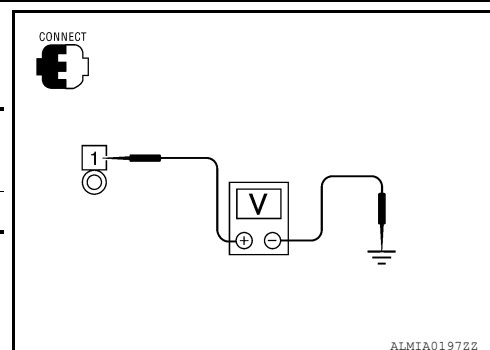
Check voltage between generator connector E204 terminal 1 and ground.

(+)		(-)	Voltage
Connector	Terminal		
E204	1	Ground	Battery voltage

Is voltage reading as specified?

YES >> GO TO 3.

NO >> Check harness for open between generator and fusible link.



3.CHECK TERMINAL "1" CONNECTION (VOLTAGE DROP TEST)

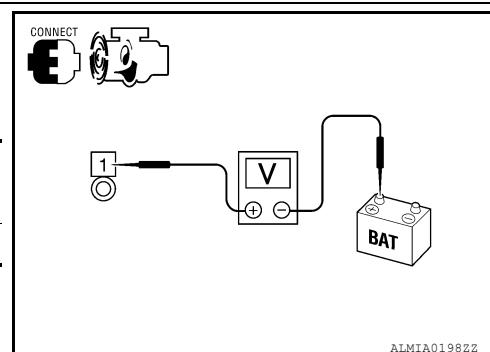
1. Start engine, then engine running at idle and warm.
2. Check voltage between battery positive terminal and generator connector E204 terminal 1.

(+)		(-)	Voltage
Connector	Terminal		
E204	1	Battery positive terminal	Less than 0.2V

Is the voltage reading as specified?

YES >> Terminal "1" circuit is normal. Refer to [CHG-4, "Work Flow \(With EXP-800 NI or GR8-1200 NI\)"](#) or [CHG-7, "Work Flow \(Without EXP-800 NI or GR8-1200 NI\)"](#).

NO >> Check harness between battery and generator for high resistance.



L TERMINAL CIRCUIT (OPEN)

< DTC/CIRCUIT DIAGNOSIS >

L TERMINAL CIRCUIT (OPEN)

Description

INFOID:0000000011559750

The "2" (L) terminal circuit controls the charge warning lamp. The charge warning lamp turns ON when the ignition switch is set to ON or START. When the generator is providing sufficient voltage with the engine running, the charge warning lamp turns OFF. If the charge warning lamp illuminates with the engine running, a malfunction is indicated.

Diagnosis Procedure

INFOID:0000000011559751

Regarding Wiring Diagram information. Refer to [CHG-20, "Wiring Diagram"](#).

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 applicable Instruction Manual for proper testing procedures.

2.CHECK "L" TERMINAL CIRCUIT (OPEN)

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

Generator		Ground	Condition	
Connector	Terminal		Ignition switch position	Charge warning lamp
E205	2		ON	Illuminate

Does it illuminate?

YES >> "L" terminal circuit is normal. Refer to [CHG-4, "Work Flow \(With EXP-800 NI or GR8-1200 NI\)"](#) or [CHG-7, "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 generator harness connector and combination meter harness connector.

Generator		Combination meter		Continuity
Connector	Terminal	Connector	Terminal	
E205	2	M25	45	Yes

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace the harness or connectors.

4.CHECK HARNESS CONTINUITY (OPEN CIRCUIT)

Check continuity between combination meter harness connector and fuse block (J/B).

Combination meter		Fuse box (J/B)		Continuity
Connector	Terminal	Connector	Terminal	
M24	24	M4	5P	Yes

L TERMINAL CIRCUIT (OPEN)

< DTC/CIRCUIT DIAGNOSIS >

Is the inspection result normal?

- YES >> GO TO 5.
NO >> Repair or replace the harness or connectors.

5.CHECK POWER SUPPLY CIRCUIT

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

(+)		(-)	Condition	Voltage (Approx.)
Combination meter				
Connector	Terminal			
M24	24	Ground	When the ignition switch is in ON position	Battery voltage

Is the inspection result normal?

- YES >> Replace the combination meter. Refer to [MWI-95. "Removal and Installation"](#).
NO >> Repair or replace the harness or connectors.

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L TERMINAL CIRCUIT (SHORT)

< DTC/CIRCUIT DIAGNOSIS >

L TERMINAL CIRCUIT (SHORT)

Description

INFOID:0000000011559752

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

Diagnosis Procedure

INFOID:0000000011559753

Regarding Wiring Diagram information, refer to [CHG-20, "Wiring Diagram"](#).

1.CHECK "L" TERMINAL CIRCUIT (SHORT)

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

Does charge warning lamp illuminate?

YES >> GO TO 2.

NO >> Refer to [CHG-4, "Work Flow \(With EXP-800 NI or GR8-1200 NI\)"](#) or [CHG-7, "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 the combination meter harness connector and ground.

Combination meter		Ground	Continuity
Connector	Terminal		
E205	2		No

Is the inspection result normal?

YES >> Replace the combination meter. Refer to [MWI-95, "Removal and Installation"](#).

NO >> Repair or replace the harness or connectors.

S TERMINAL CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

S TERMINAL CIRCUIT

Description

INFOID:0000000011559754

The output voltage of the generator is controlled by the IC regulator at terminal "3" (S) detecting the input voltage. Terminal "3" circuit detects the battery voltage to adjust the generator output voltage with the IC regulator.

Diagnosis Procedure

INFOID:0000000011559755

Regarding Wiring Diagram information, refer to [CHG-20, "Wiring Diagram"](#).

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 terminal "S" 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 VOLTAGE REGULATOR CIRCUIT

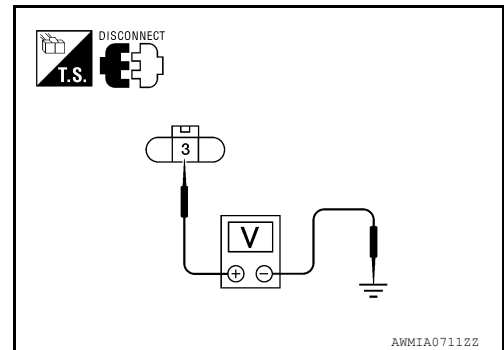
Check voltage between generator harness connector E205 terminal 3 and ground.

(+)		(-)	Voltage (approx.)
Connector	Terminal		
E205	3	Ground	Battery voltage

Does battery voltage exist?

YES >> Refer to [CHG-4, "Work Flow \(With EXP-800 NI or GR8-1200 NI\)"](#) or [CHG-7, "Work Flow \(Without EXP-800 NI or GR8-1200 NI\)"](#).

NO >> Check harness for open between generator and fuse.



CHARGING SYSTEM

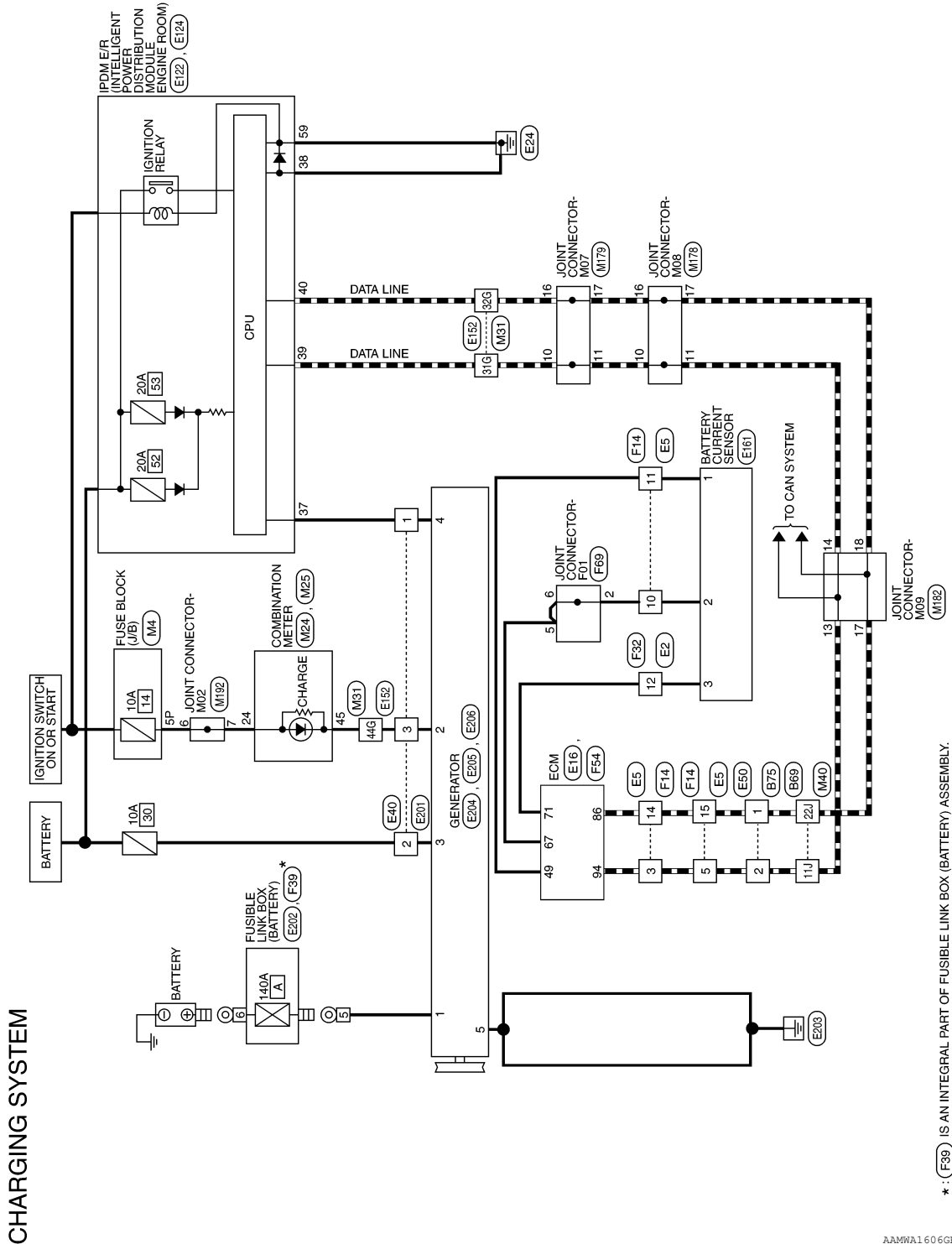
< WIRING DIAGRAM >

WIRING DIAGRAM

CHARGING SYSTEM

Wiring Diagram

INFOID:0000000011559756



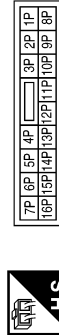
AAMWA1606GB

CHARGING SYSTEM

< WIRING DIAGRAM >

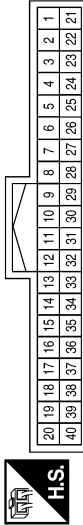
CHARGING SYSTEM CONNECTORS

Connector No.	M4
Connector Name	FUSE BLOCK (J/B)
Connector Color	WHITE



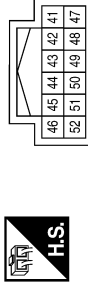
Terminal No.	Color of Wire	Signal Name
5P	O/L	-

Connector No.	M24
Connector Name	COMBINATION METER
Connector Color	WHITE



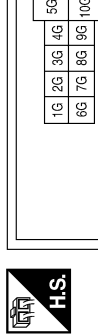
Terminal No.	Color of Wire	Signal Name
24	O/L	RUN/START

Connector No.	M25
Connector Name	COMBINATION METER
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
45	BRW	CHARGE IN

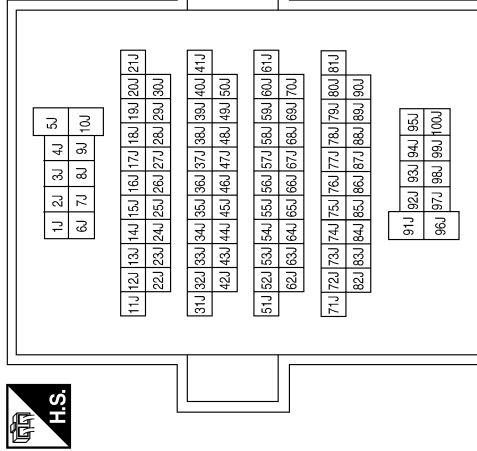
Connector No.	M31
Connector Name	WIRE TO WIRE
Connector Color	WHITE



11G	12G	13G	14G	15G	16G	17G	18G	19G	20G	21G
22G	23G	24G	25G	26G	27G	28G	29G	30G		
31G	32G	33G	34G	35G	36G	37G	38G	39G	40G	41G
42G	43G	44G	45G	46G	47G	48G	49G	50G		
51G	52G	53G	54G	55G	56G	57G	58G	59G	60G	61G
62G	63G	64G	65G	66G	67G	68G	69G	70G		
71G	72G	73G	74G	75G	76G	77G	78G	79G	80G	81G
82G	83G	84G	85G	86G	87G	88G	89G	90G		
91G	92G	93G	94G	95G						
96G	97G	98G	99G	100G						

Terminal No.	Color of Wire	Signal Name
31G	L	-
32G	P	-
44G	BRW	-

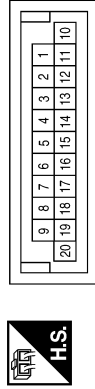
Connector No.	M40
Connector Name	WIRE TO WIRE
Connector Color	WHITE



11J	12J	13J	14J	15J	16J	17J	18J	19J	20J	21J
22J	23J	24J	25J	26J	27J	28J	29J	30J		
31J	32J	33J	34J	35J	36J	37J	38J	39J	40J	41J
42J	43J	44J	45J	46J	47J	48J	49J	50J		
51J	52J	53J	54J	55J	56J	57J	58J	59J	60J	61J
62J	63J	64J	65J	66J	67J	68J	69J	70J		
71J	72J	73J	74J	75J	76J	77J	78J	79J	80J	81J
82J	83J	84J	85J	86J	87J	88J	89J	90J		
91J	92J	93J	94J	95J						
96J	97J	98J	99J	100J						

Terminal No.	Color of Wire	Signal Name
11J	L	-
22J	P	-

Connector No.	M178
Connector Name	JOINT CONNECTOR-M08
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
10	L	-
11	L	-
16	P	-
17	P	-

ABMIA404 9GB

A B C D E F G H I J K L CHG N O P

CHARGING SYSTEM

< WIRING DIAGRAM >

Connector No.	M179
Connector Name	JOINT CONNECTOR-M07
Connector Color	WHITE



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Terminal No.	Color of Wire	Signal Name
10	L	-
11	L	-
16	P	-
17	P	-

Connector No.	M182
Connector Name	JOINT CONNECTOR-M09
Connector Color	GREEN



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Terminal No.	Color of Wire	Signal Name
13	L	-
14	L	-
17	P	-
18	P	-

Connector No.	M192
Connector Name	JOINT CONNECTOR-M02
Connector Color	GREEN



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Terminal No.	Color of Wire	Signal Name
6	O/L	-
7	O/L	-

Connector No.	E2
Connector Name	WIRE TO WIRE
Connector Color	WHITE



1	2	3	4	5	6	7		
8	9	10	11	12	13	14	15	16

Terminal No.	Color of Wire	Signal Name
12	R	-

Connector No.	E5
Connector Name	WIRE TO WIRE
Connector Color	WHITE



1	2	3	4	5	6	7	8	9	10	11		
12	13	14	15	16	17	18	19	20	21	22	23	24

Terminal No.	Color of Wire	Signal Name
3	L	-
5	L	-
10	B	-
11	R/Y	-
14	P	-
15	P	-

Connector No.	E16
Connector Name	ECM
Connector Color	BLACK



116	115	114	89	88	87	86	85	84	83	82
118	117	97	96	95	94	93	92	91	90	
121	120	119	113	112	111	110	109	108	107	106

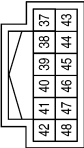
Terminal No.	Color of Wire	Signal Name
86	P	CAN-L
94	L	CAN-H

ABMIA6070GB

CHARGING SYSTEM

< WIRING DIAGRAM >

Connector No.	E122
Connector Name	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
37	Y	ALT-C CONT
38	B	GND (SIGNAL)
39	L	CAN-H
40	P	CAN-L

Connector No.	E50
Connector Name	WIRE TO WIRE
Connector Color	BROWN



Terminal No.	Color of Wire	Signal Name
1	P	-
2	L	-

Connector No.	E40
Connector Name	WIRE TO WIRE
Connector Color	BLACK

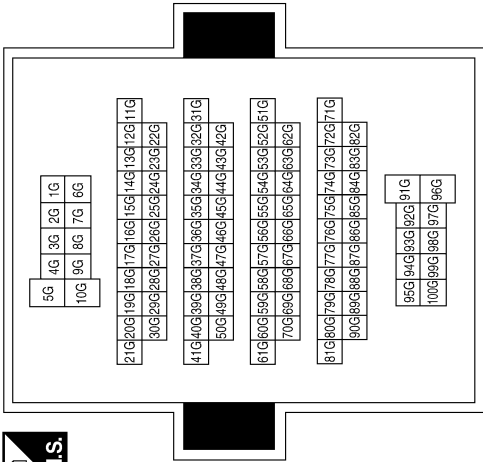


Terminal No.	Color of Wire	Signal Name
1	Y	-
2	Y/B	-
3	BR/W	-

Terminal No.	Color of Wire	Signal Name
31G	L	-
32G	P	-
44G	BR/W	-

Connector No.	E152
Connector Name	WIRE TO WIRE
Connector Color	WHITE





Connector No.	E124
Connector Name	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector Color	BLACK



Terminal No.	Color of Wire	Signal Name
59	B	GND (POWER)

CHARGING SYSTEM

< WIRING DIAGRAM >

Connector No.	E202
Connector Name	FUSIBLE LINK BOX (BATTERY)
Connector Color	—



Terminal No.	5	Color of Wire	B/R	Signal Name	—
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Connector No.	E201
Connector Name	WIRE TO WIRE
Connector Color	BLACK



Terminal No.	Color of Wire	Signal Name
1	Y	—
2	Y/B	—
3	BR/W	—

Connector No.	E161
Connector Name	BATTERY CURRENT SENSOR
Connector Color	BLACK



Terminal No.	Color of Wire	Signal Name
1	R/Y	—
2	B	—
3	R	—

Connector No.	E206
Connector Name	GENERATOR
Connector Color	—



Terminal No.	5	Color of Wire	B	Signal Name	—
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Connector No.	E205
Connector Name	GENERATOR
Connector Color	BLACK



Terminal No.	Color of Wire	Signal Name
2	BR/W	—
3	Y/B	—
4	Y	—

Connector No.	E204
Connector Name	GENERATOR
Connector Color	—



Terminal No.	1	Color of Wire	B/R	Signal Name	—
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ABMIA4052GB

CHARGING SYSTEM

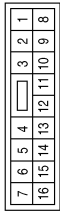
< WIRING DIAGRAM >

Connector No.	F39
Connector Name	FUSIBLE LINK BOX (BATTERY)
Connector Color	—



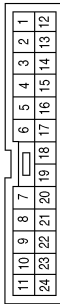
Terminal No.	Color of Wire	Signal Name
6	BR	—

Connector No.	F32
Connector Name	WIRE TO WIRE
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
12	R	—

Connector No.	F14
Connector Name	WIRE TO WIRE
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
3	L	—
5	L	—
10	B	—
11	R/Y	—
14	P	—
15	P	—

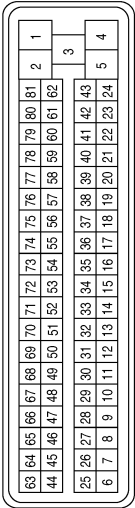
Connector No.	F69
Connector Name	JOINT CONNECTOR-F01
Connector Color	GRAY



Terminal No.	Color of Wire	Signal Name
2	B	—
5	B	—
6	B	—

Terminal No.	Color of Wire	Signal Name
49	R/Y	AVCC (PDPRES)
67	B	GND-A
71	R	CURSEN

Connector No.	F54
Connector Name	ECM
Connector Color	BLACK



ABMIA6071GB

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CHG

CHARGING SYSTEM

< WIRING DIAGRAM >

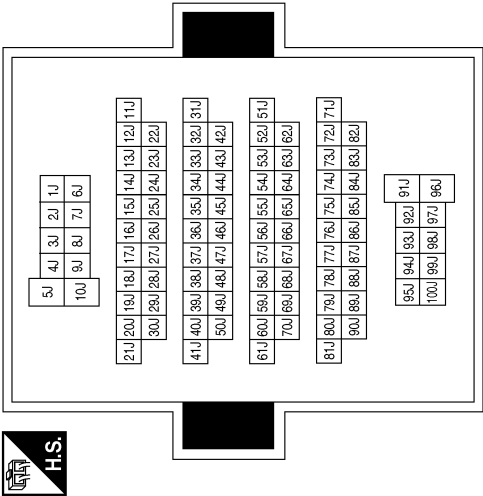
Connector No.	B75
Connector Name	WIRE TO WIRE
Connector Color	BROWN



Terminal No.	Color of Wire	Signal Name
1	P	-
2	L	-

Terminal No.	Color of Wire	Signal Name
11J	L	-
22J	P	-

Connector No.	B69
Connector Name	WIRE TO WIRE
Connector Color	WHITE



ABMIA6072GB

< SYMPTOM DIAGNOSIS >

CHARGING SYSTEM

Symptom Table

INFOID:0000000011559757

Symptom	Reference
Battery discharged	Refer to CHG-4, "Work Flow (With EXP-800 NI or GR8-1200 NI)" or CHG-7, "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.	

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GENERATOR

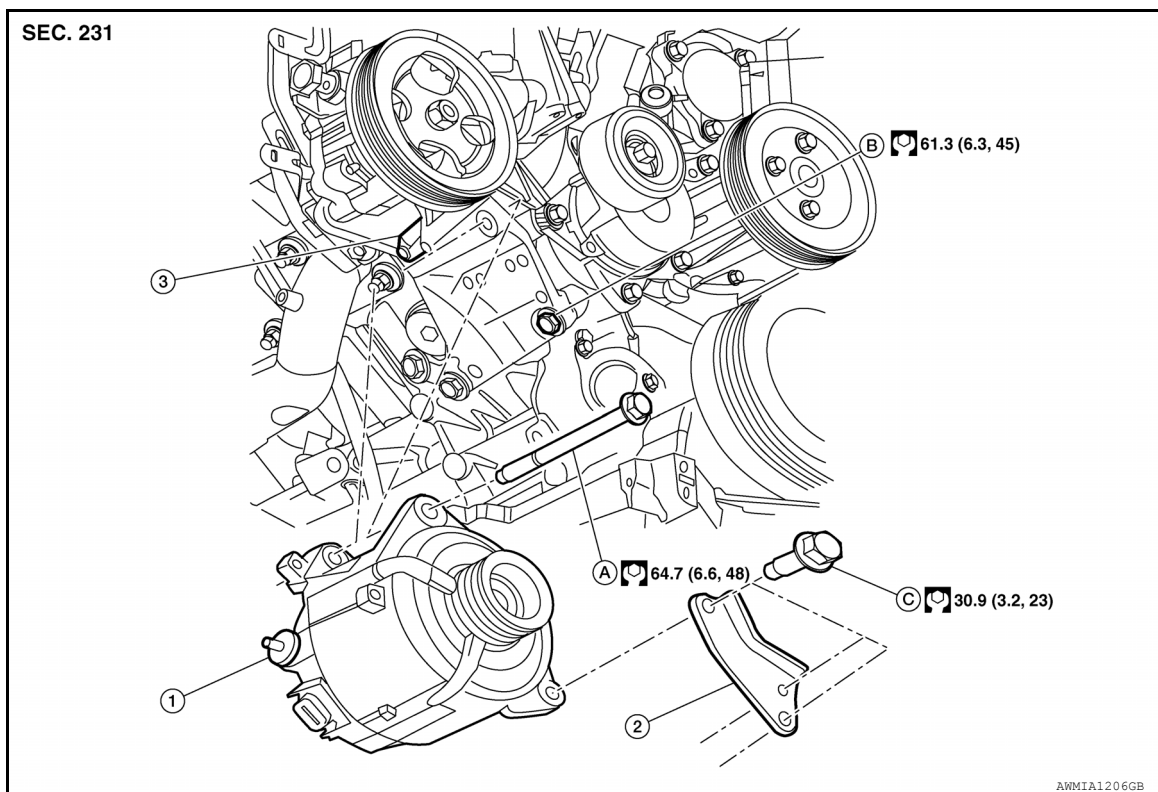
< REMOVAL AND INSTALLATION >

REMOVAL AND INSTALLATION

GENERATOR

Removal and Installation

INFOID:0000000011559758



- | | | |
|----------------|-----------------------|-----------------------|
| 1. Generator | 2. Lower bracket | 3. Upper bracket |
| A. Upper bolts | B. Upper bracket bolt | C. Lower bracket bolt |

REMOVAL

1. Disconnect the negative battery terminal. Refer to [PG-85. "Removal and Installation"](#).
2. Remove the engine under cover (without off-road package) or skid plate (with off-road package) (if equipped) using power tool. Refer to [EXT-18. "Removal and Installation"](#).
3. Remove air duct and resonator assembly. Refer to [EM-25. "Removal and Installation"](#).
4. Remove the drive belt. Refer to [EM-13. "Removal and Installation"](#).
5. Remove lower bracket bolts using suitable tool.
6. Remove the upper bolt using suitable tool.
7. Disconnect the generator harness connectors.
8. Remove the generator.

INSTALLATION

Installation is in the reverse order of removal.

- This model includes the variable voltage control system. Therefore be sure to inspect the variable voltage control system after replacing the generator to ensure the system operates normally.
- Install the generator and check the tension of the drive belt. Refer to [EM-13. "Checking Drive Belts"](#).

CAUTION:

Tighten terminal nut carefully.

Terminal nut : 10.8 N·m (1.1 kg-m, 8 ft-lb)

GENERATOR

< SERVICE DATA AND SPECIFICATIONS (SDS)

SERVICE DATA AND SPECIFICATIONS (SDS)

GENERATOR

Generator

INFOID:0000000011559759

Model*	TG15S192
Manufacturer	Valeo
Nominal rating	14V-130A
Ground polarity	Negative
Minimum revolution under no-load	1,200 rpm
Hot output current (When 13.5 volts is applied)	More than 52A/1,500 rpm More than 82A/1,800 rpm More than 115A/2,500 rpm More than 130A/5,000 rpm
Regulated output voltage	13.5V @ 5,000 rpm @ 20°C (68°F)
Adjustment range of power generation variable voltage control	11.4 - 15.6V

*: Always check with the Parts Department for the latest parts information.

CHG