

SECTION **CHG**
CHARGING SYSTEM

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PRECAUTIONS

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PRECAUTION

PRECAUTIONS

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

INFOID:000000008487411

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 dual stage front air bag modules. The SRS system may only deploy one front air bag, depending on the severity of a collision and whether the front passenger seat is occupied. 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 3 minutes before performing any service.

Precaution for Power Generation Voltage Variable Control System

INFOID:000000007911071

CAUTION:

For this model, the battery current sensor that is installed to the battery cable at the negative terminal measures the charging/discharging current of the battery, and performs various controls. If the electrical component or the ground wire is connected directly to the battery terminal, the current other than that being measured with the battery current sensor is charging to or discharging from the battery. This condition causes the malfunction of the control, and then the battery discharge may occur. Do not connect the electrical component or the ground wire directly to the battery terminal.

PREPARATION

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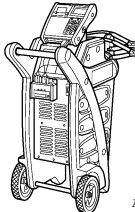
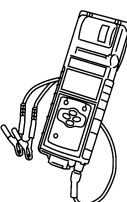
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PREPARATION

Special Service Tool


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

Tool number (Kent-Moore No.) Tool name	Description
<p>— (←) Model GR8-1200 NI Multitasking battery and electrical diagnostic station</p>  <p style="text-align: center;">AWIIA1239ZZ</p>	<p>Tests batteries, starting and charging systems and charges batteries. For operating instructions, refer to diagnostic station instruction manual.</p>
<p>— (←) Model EXP-800 NI Battery and electrical diagnostic analyzer</p>  <p style="text-align: center;">JSMIA0806ZZ</p>	<p>Tests batteries and charging systems. For operating instructions, refer to diagnostic analyzer instruction manual.</p>

Commercial Service Tool

INFOID:000000007911073

Tool name	Description
<p>Power tool</p>  <p style="text-align: center;">PIIB1407E</p>	<p>Loosening nuts, screws, and bolts</p>

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COMPONENT PARTS

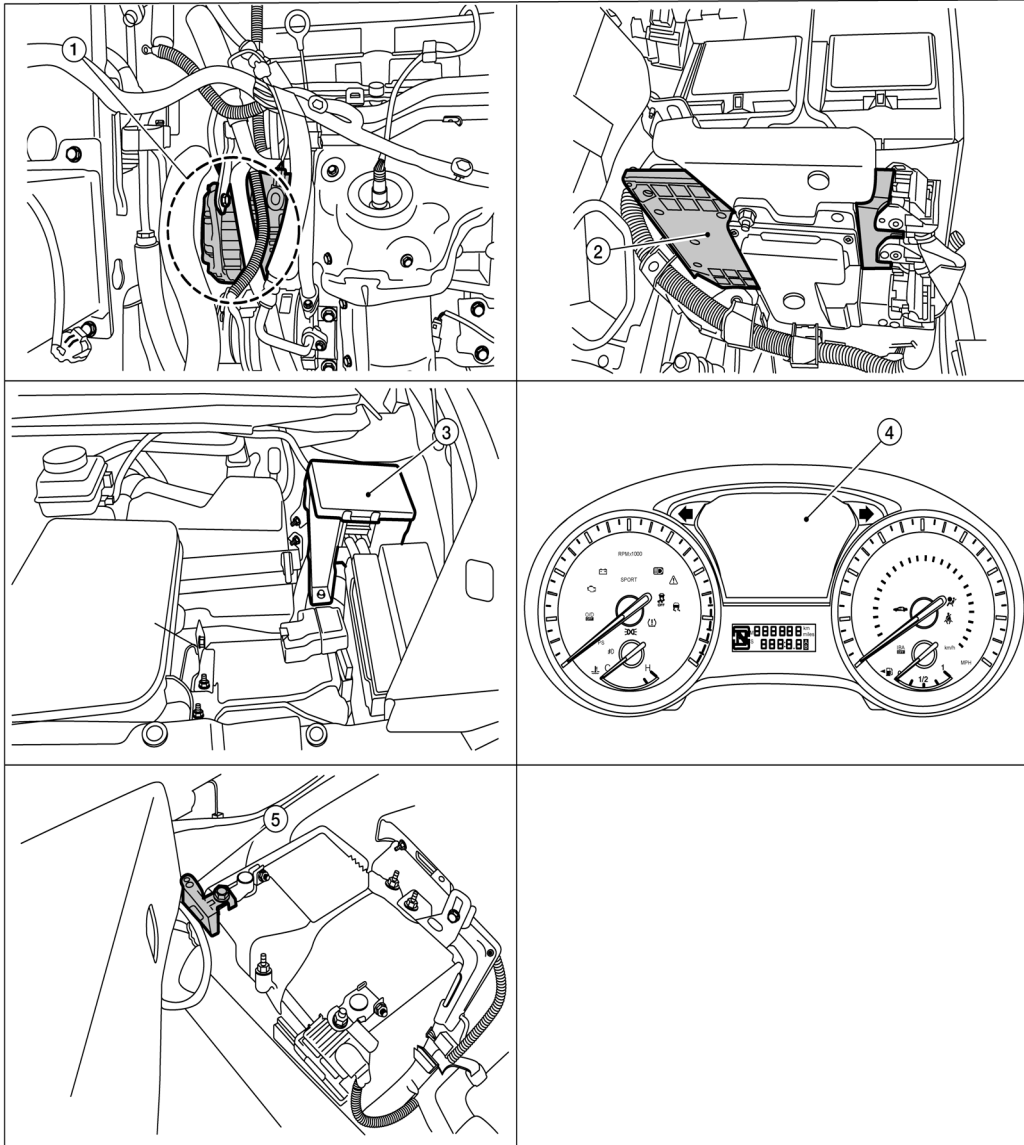
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SYSTEM DESCRIPTION

COMPONENT PARTS

Component Parts Location

INFOID:000000008117085



1. Generator

2. ECM

3. IPDM E/R

4. Combination Meter

5. Battery current sensor

COMPONENT PARTS

< SYSTEM DESCRIPTION >

Component Description

INFOID:000000008177538

Component part	Description
Generator (IC regulator)	<p>The IC regulator controls the power generation voltage by the target power generation voltage based on the received PWM command signal.</p> <p>When there is no PWM command signal, the generator performs the normal power generation according to the characteristic of the IC regulator.</p>
ECM	<p>The battery current sensor detects the charging/discharging current of the battery. The ECM judges the battery condition based on this signal.</p> <p>The ECM judges whether to request more output via the power generation voltage variable control according to the battery condition.</p> <p>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.</p>
IPDM E/R	<p>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.</p>
Combination meter (charge warning lamp)	<p>The IC regulator warning function activates to illuminate the charge warning lamp if any of the following symptoms occur while generator is operating:</p> <ul style="list-style-type: none"> ·Excessive voltage is produced. ·No voltage is produced.
Battery current sensor	<p>The battery current sensor is located on the negative battery cable 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.</p>

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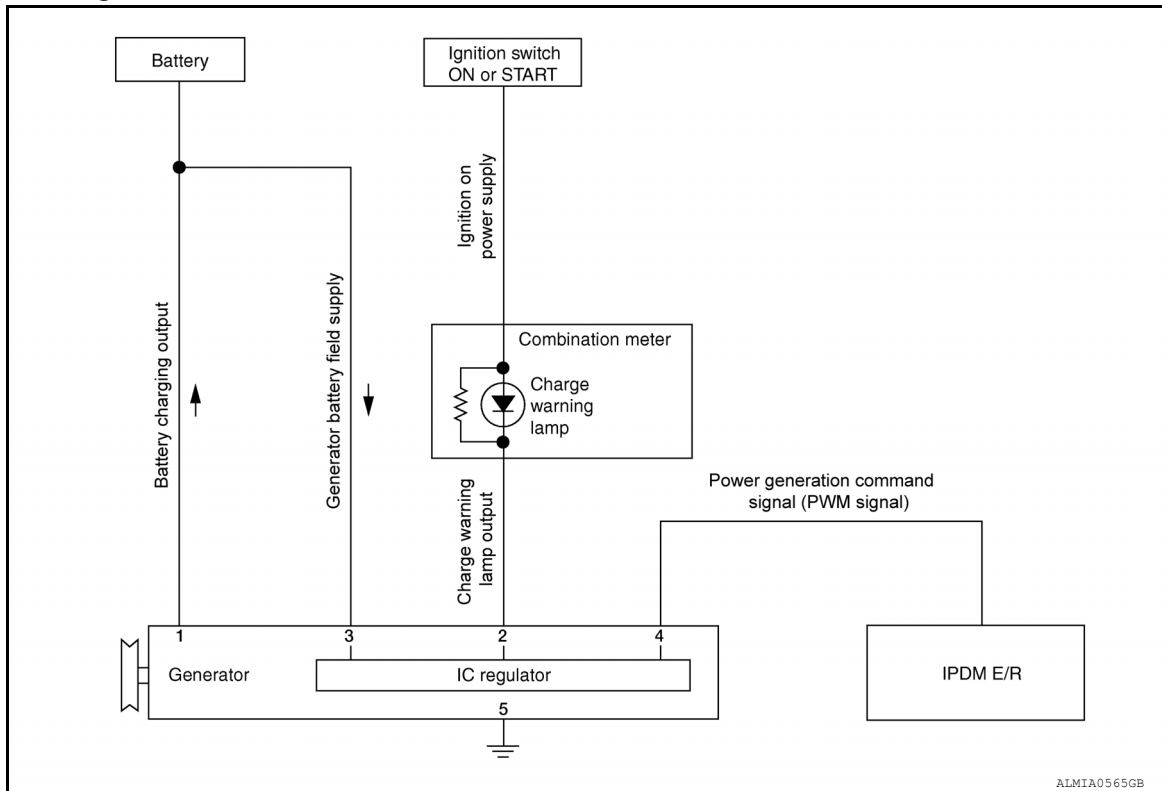
CHARGING SYSTEM

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CHARGING SYSTEM

System Diagram

INFOID:000000007911054



System Description

INFOID:000000007911055

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

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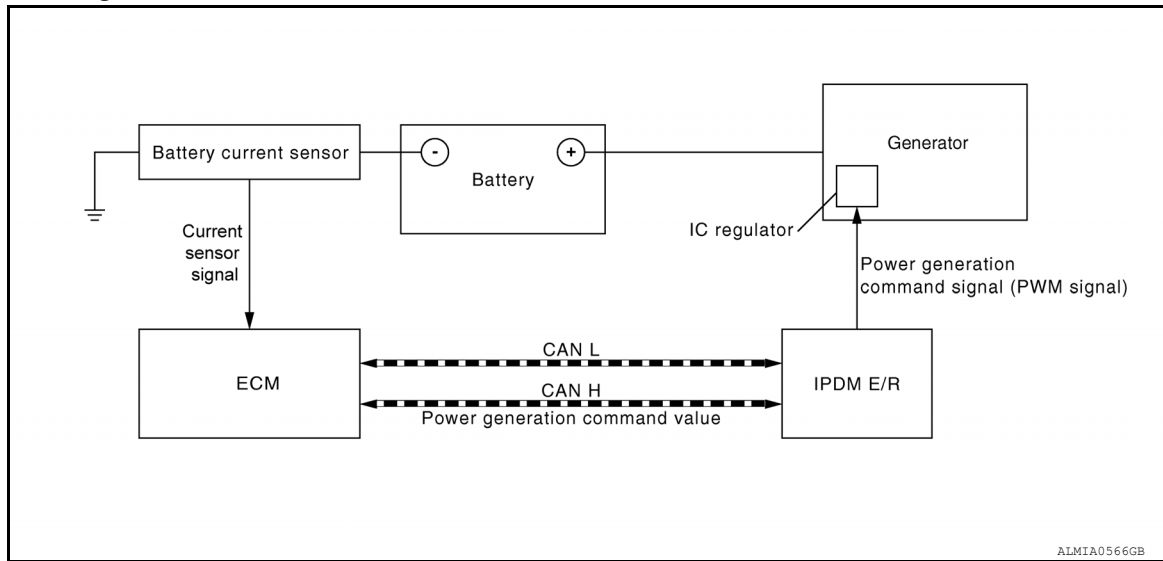
Component part		Description
Generator	Terminal "1"	Refer to CHG-23, "Description" .
	Terminal "2"	Refer to CHG-24, "Description" .
	Terminal "3"	Refer to CHG-25, "Description" .
	Terminal "4"	Used for the power generation voltage variable control system. Refer to CHG-7, "System Description" .
Combination 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: <ul style="list-style-type: none"> Excessive voltage is produced. No voltage is produced.
IPDM E/R		Used for the power generation voltage variable control system. Refer to CHG-7, "System Description" .

POWER GENERATION VOLTAGE VARIABLE CONTROL SYSTEM

< SYSTEM DESCRIPTION >

POWER GENERATION VOLTAGE VARIABLE CONTROL SYSTEM

System Diagram



System Description

INFOID:000000007911058

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.

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CHARGING SYSTEM

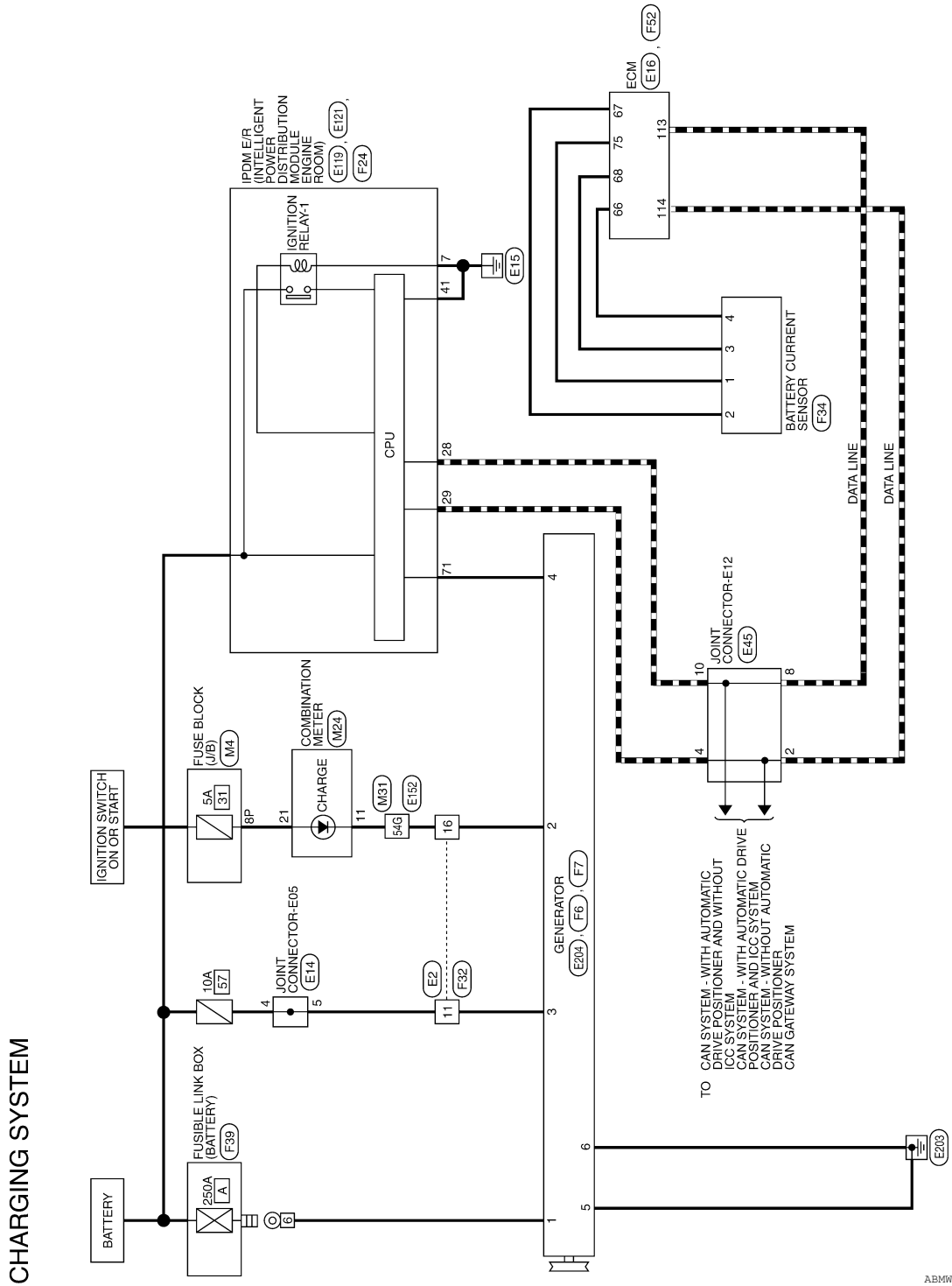
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WIRING DIAGRAM

CHARGING SYSTEM

Wiring Diagram

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CHARGING SYSTEM

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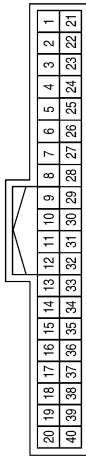
CHARGING SYSTEM CONNECTORS

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



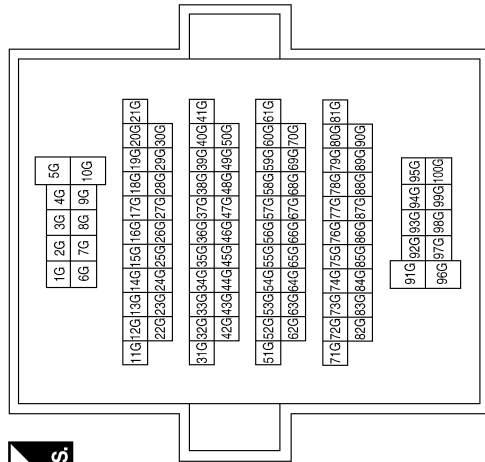
Terminal No.	Color of Wire	Signal Name
8P	BG	-

Connector No.	M24
Connector Name	COMBINATION METER
Connector Color	WHITE

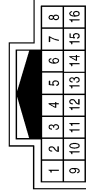


Terminal No.	Color of Wire	Signal Name
11	BG	ALTERNATOR (CHARGE)
21	BG	IGN

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



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



Terminal No.	Color of Wire	Signal Name
11	LG	-
16	P	-

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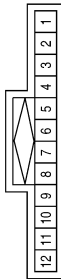
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CHARGING SYSTEM

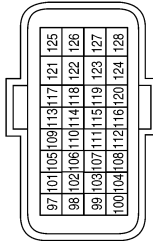
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Connector No.	E14
Connector Name	JOINT CONNECTOR-E05
Connector Color	BLACK



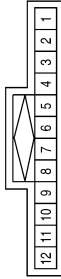
Terminal No.	Color of Wire	Signal Name
4	LG	-
5	LG	-

Connector No.	E16
Connector Name	ECM
Connector Color	GRAY



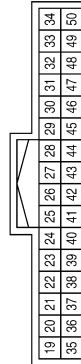
Terminal No.	Color of Wire	Signal Name
113	P	CAN-L
114	L	CAN-H

Connector No.	E45
Connector Name	JOINT CONNECTOR-E12
Connector Color	BLUE



Terminal No.	Color of Wire	Signal Name
2	L	-
4	L	-
8	P	-
10	P	-

Connector No.	E119
Connector Name	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
28	P	CAN-L
29	L	CAN-H
41	B	GND(SIGNAL)

Connector No.	E121
Connector Name	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector Color	WHITE

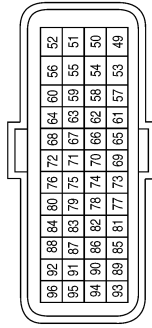


Terminal No.	Color of Wire	Signal Name
7	B	GND(POWER)

CHARGING SYSTEM

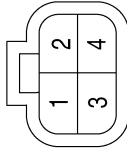
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Connector No.	F52
Connector Name	ECM
Connector Color	BROWN



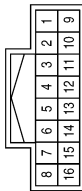
Terminal No.	Color of Wire	Signal Name
66	W	CURSEN
67	Y	TBATT
68	G	GNDA - CURSEN
75	LG	AVCCT1 - CURSEN

Connector No.	F34
Connector Name	BATTERY CURRENT SENSOR
Connector Color	GRAY



Terminal No.	Color of Wire	Signal Name
1	LG	-
2	Y	-
3	G	-
4	W	-

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



Terminal No.	Color of Wire	Signal Name
11	Y	-
16	GR	-

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DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION >

BASIC INSPECTION

DIAGNOSIS AND REPAIR WORKFLOW

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

INFOID:000000008197408

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:

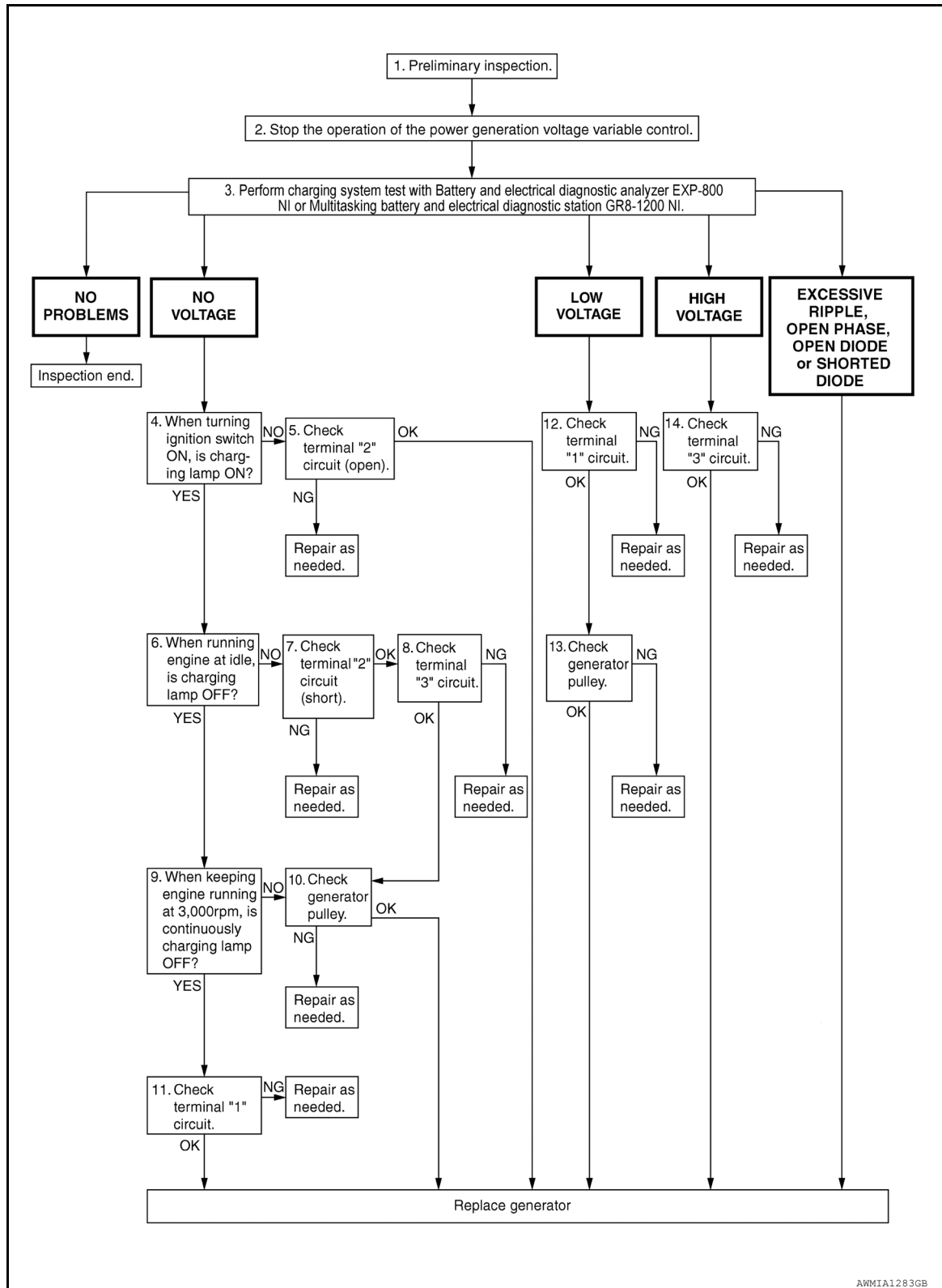
Refer to the applicable Instruction Manual for proper charging system diagnosis procedures.

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DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION >

OVERALL SEQUENCE



DETAILED FLOW

1. PRELIMINARY INSPECTION

Perform the preliminary inspection. Refer to [CHG-20, "Diagnosis Procedure"](#).

>> GO TO 2.

DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION >

2. DISABLE THE POWER GENERATION VOLTAGE VARIABLE CONTROL SYSTEM

Disable the power generation voltage variable control with either of the following procedures.

- After selecting "ENGINE" on the "SELECT SYSTEM" screen of CONSULT, set the "ALTERNATOR DUTY" value 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, disconnect the battery current sensor connector and leave it disconnected during the course of the test.

NOTE:

Running the engine with the battery current sensor disconnected will cause DTCs (P1550-P1554) to set. 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. DIAGNOSIS WITH EXP-800 NI OR GR8-1200 NI

Perform 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.

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-27, "Removal and Installation"](#).

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-24, "Diagnosis Procedure"](#).

Is the "L" terminal circuit normal?

YES >> Replace generator. Refer to [CHG-27, "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-24, "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-25, "Diagnosis Procedure"](#).

Is the "S" terminal circuit normal?

YES >> GO TO 10.

NO >> Repair as needed.

DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION >

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. "Inspection"](#).

Is generator pulley normal?

YES >> Replace generator. Refer to [CHG-27. "Removal and Installation"](#).

NO >> Repair as needed.

11. "B" TERMINAL CIRCUIT INSPECTION

Check "B" terminal circuit. Refer to [CHG-23. "Diagnosis Procedure"](#).

Is "B" terminal circuit normal?

YES >> Replace generator. Refer to [CHG-27. "Removal and Installation"](#).

NO >> Repair as needed.

12. "B" TERMINAL CIRCUIT INSPECTION

Check "B" terminal circuit. Refer to [CHG-23. "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. "Inspection"](#).

Is generator pulley normal?

YES >> Replace generator. Refer to [CHG-27. "Removal and Installation"](#).

NO >> Repair as needed.

14. "S" TERMINAL CIRCUIT INSPECTION

Check "S" terminal circuit. Refer to [CHG-25. "Diagnosis Procedure"](#).

Is the "S" terminal circuit normal?

YES >> Replace generator. Refer to [CHG-27. "Removal and Installation"](#).

NO >> Repair as needed.

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

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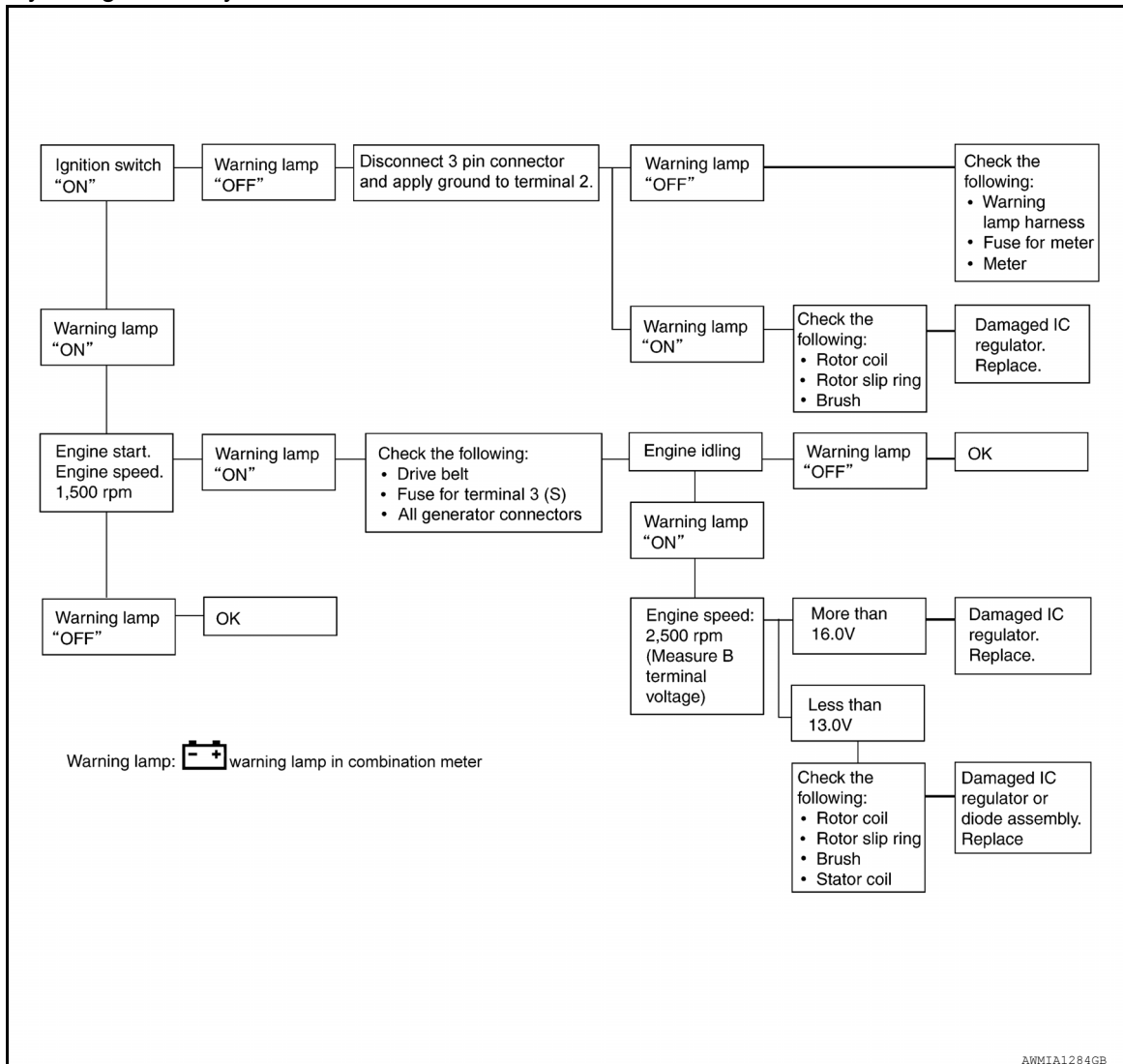
Before performing a generator test, make sure that the battery is fully charged. A 30-volt voltmeter and suitable test probes are necessary for the test.

- Before starting, inspect the fusible link.

DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION >

- Use fully charged battery.



- If the inspection result is OK even though the charging system is malfunctioning, check the “B” terminal connection. (Check the tightening torque and voltage drop).

DETAILED FLOW

NOTE:

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

1. PRELIMINARY INSPECTION

Perform the preliminary inspection. Refer to [CHG-20, "Diagnosis Procedure"](#).

>> GO TO 2.

2. DISABLE THE POWER GENERATION VOLTAGE VARIABLE CONTROL SYSTEM

Disable the power generation voltage variable control with either of the following procedures.

- After selecting “ENGINE” on the “SELECT SYSTEM” screen of CONSULT, set the “ALTERNATOR DUTY” value 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, disconnect the battery current sensor connector and leave it disconnected during the course of the test.

NOTE:

DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION >

Running the engine with the battery current sensor disconnected will cause DTCs (P1550-P1554) to set. 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 ON)

Turn the ignition switch ON.

Does the charge warning lamp illuminate?

YES >> GO TO 5.

NO >> GO TO 4.

4. TERMINAL "2" (OPEN) CIRCUIT INSPECTION

Check terminal "2" circuit for open circuits. Refer to [CHG-25. "Diagnosis Procedure"](#).

Is the terminal "2" circuit normal?

YES >> Replace generator. Refer to [CHG-27. "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. TERMINAL "2" (SHORT) CIRCUIT INSPECTION

Check terminal "2" circuit for short to ground. Refer to [CHG-24. "Diagnosis Procedure"](#).

Is the terminal "2" circuit normal?

YES >> GO TO 7.

NO >> Repair as needed.

7. TERMINAL "3" CIRCUIT INSPECTION

Check terminal "3" circuit. Refer to [CHG-25. "Diagnosis Procedure"](#).

Is the terminal "3" circuit normal?

YES >> Replace generator. Refer to [CHG-27. "Removal and Installation"](#).

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 GENERATOR PULLEY

Check generator pulley.

Is generator pulley normal?

YES >> Replace generator. Refer to [CHG-27. "Removal and Installation"](#).

NO >> Repair as needed.

10. TERMINAL "1" CIRCUIT INSPECTION

Check terminal "1" circuit. Refer to [CHG-23. "Diagnosis Procedure"](#).

Is terminal "1" circuit normal?

YES >> GO TO 11.

NO >> Repair as needed.

11. TERMINAL "3" CIRCUIT INSPECTION

Check terminal "3" circuit. Refer to [CHG-25. "Diagnosis Procedure"](#).

DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION >

Is the terminal "3" circuit normal?

YES >> GO TO 12.

NO >> Repair as needed.

12.INSPECTION OF GENERATOR PULLEY

Check generator pulley.

Is generator pulley normal?

YES >> Replace generator. Refer to [CHG-27, "Removal and Installation"](#).

NO >> Repair as needed.

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CHARGING SYSTEM PRELIMINARY INSPECTION

< DTC/CIRCUIT DIAGNOSIS >

DTC/CIRCUIT DIAGNOSIS

CHARGING SYSTEM PRELIMINARY INSPECTION

Diagnosis Procedure

INFOID:000000007911060

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 AND FUSIBLE LINK

Check for blown fuse and fusible link.

Unit	Power source (Power supply terminals)	Fuse or Fusible Link
Generator	Battery (terminal 3)	Fuse 57
	Battery (terminal 1)	Fusible Link A
Combination meter	Ignition switch ON (terminal 2)	Fuse 31

Is the fuse or fusible link blown?

YES >> Replace the blown fuse or fusible link after repairing the affected circuit.

NO >> GO TO 3.

3. CHECK GENERATOR GROUND TERMINAL CONNECTION

Check if connector E204 terminal 5 and 6 (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 [CHG-28. "Inspection"](#).

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

Diagnosis Procedure

INFOID:000000007911061

Regarding Wiring Diagram information, refer to [CHG-8, "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-78, "CONSULT Function"](#).

Is the inspection result normal?

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 "ALTERNATOR 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 "ALTERNATOR DUTY" to 80.0 % : +0.5 V or more against the value of "BATTERY VOLT" monitor when DUTY value is 40.0 %

Is the inspection result normal?

YES >> Inspection End.

NO >> GO TO 3

3. CHECK IPDM E/R (CONSULT)

Perform IPDM E/R self-diagnosis with CONSULT. Refer to [PCS-9, "CONSULT Function \(IPDM E/R\)"](#).

Is the inspection result normal?

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

1. Turn ignition switch OFF.
2. Disconnect generator connector and IPDM E/R connector.
3. Check continuity between generator harness connector F7 terminal 4 and IPDM E/R harness connector F10 terminal 71.

POWER GENERATION VOLTAGE VARIABLE CONTROL SYSTEM OPERATION INSPECTION

< DTC/CIRCUIT DIAGNOSIS >

Generator		IPDM E/R		Continuity
Connector	Terminal	Connector	Terminal	
F7	4	F10	71	Yes

4. Check continuity between generator harness connector F7 terminal 4 and ground.

Generator		—	Continuity
Connector	Terminal		
F7	4	Ground	No

Is the inspection result normal?

- YES >> Replace IPDM E/R. Refer to [PCS-32, "Removal and Installation"](#).
- NO >> Repair harness or connector between IPDM E/R and generator.

B TERMINAL CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

B TERMINAL CIRCUIT

Description

INFOID:000000008200906

The terminal "1" circuit supplies power to charge the battery and operate the vehicle's electrical system.

Diagnosis Procedure

INFOID:000000008200907

Regarding Wiring Diagram information, refer to [CHG-8, "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 the EXP-800 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 F6 terminal 1 and ground.

(+)		(-)	Voltage (Approx.)
Connector	Terminal		
F6	1	Ground	Battery voltage

Is the inspection result normal?

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 F6 terminal 1.

(+)		(-)	Voltage (Approx.)
Connector	Terminal		
F6	1	Battery positive terminal	Less than 0.2V

Is the inspection result normal?

YES >> Terminal "1" circuit is normal. Refer to [CHG-13, "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 generator for high resistance.

L TERMINAL CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

L TERMINAL CIRCUIT

Description

INFOID:000000008200908

The terminal "2" circuit controls the charge warning lamp. The charge warning lamp illuminates 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 will go off. If the charge warning lamp illuminates with the engine running, a malfunction is indicated.

Diagnosis Procedure

INFOID:000000008200909

Regarding Wiring Diagram information, refer to [CHG-8, "Wiring Diagram"](#).

1. CHECK CHARGE WARNING LAMP CIRCUIT CONNECTION

Verify generator connector F7 terminal 2 is clean and tight.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair the 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 CHARGE WARNING LAMP CIRCUIT

1. Disconnect generator connector F7.

2. Apply ground to generator harness connector F7 terminal 2 with the ignition switch in the ON position.

Is the inspection result normal?

YES >> Check generator function. Refer to [CHG-13, "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

1. Turn ignition switch OFF.

2. Disconnect the combination meter connector M24.

3. Check continuity between generator harness connector F7 terminal 2 and combination meter harness connector M24 terminal 11.

Generator		Combination meter		Continuity
Connector	Terminal	Connector	Terminal	
F7	2	M24	11	Yes

4. Check continuity between generator harness connector F7 terminal 2 and ground.

Generator		—	Continuity
Connector	Terminal		
F7	2	Ground	No

Is the inspection result normal?

YES >> Replace the combination meter. Refer to [MWI-93, "Removal and Installation"](#).

NO >> Repair the harness or connector.

S TERMINAL CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

S TERMINAL CIRCUIT

Description

INFOID:000000008200910

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

Diagnosis Procedure

INFOID:000000008200911

Regarding Wiring Diagram information, refer to [CHG-8. "Wiring Diagram"](#).

1. CHECK VOLTAGE REGULATOR CIRCUIT CONNECTION

Check to see if connector F7 terminal 3 is clean and tight.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair 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 VOLTAGE REGULATOR CIRCUIT

Check voltage between generator harness connector F7 terminal 3 and ground.

(+)		(-)	Voltage (Approx.)
Connector	Terminal		
F7	3	Ground	Battery voltage

Is the inspection result normal?

YES >> Refer to [CHG-13. "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 generator and fuse.

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CHARGING SYSTEM

< SYMPTOM DIAGNOSIS >

SYMPTOM DIAGNOSIS

CHARGING SYSTEM

Symptom Table

INFOID:000000007911069

Symptom	Reference
Battery discharged	Refer to CHG-13, "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.	

GENERATOR

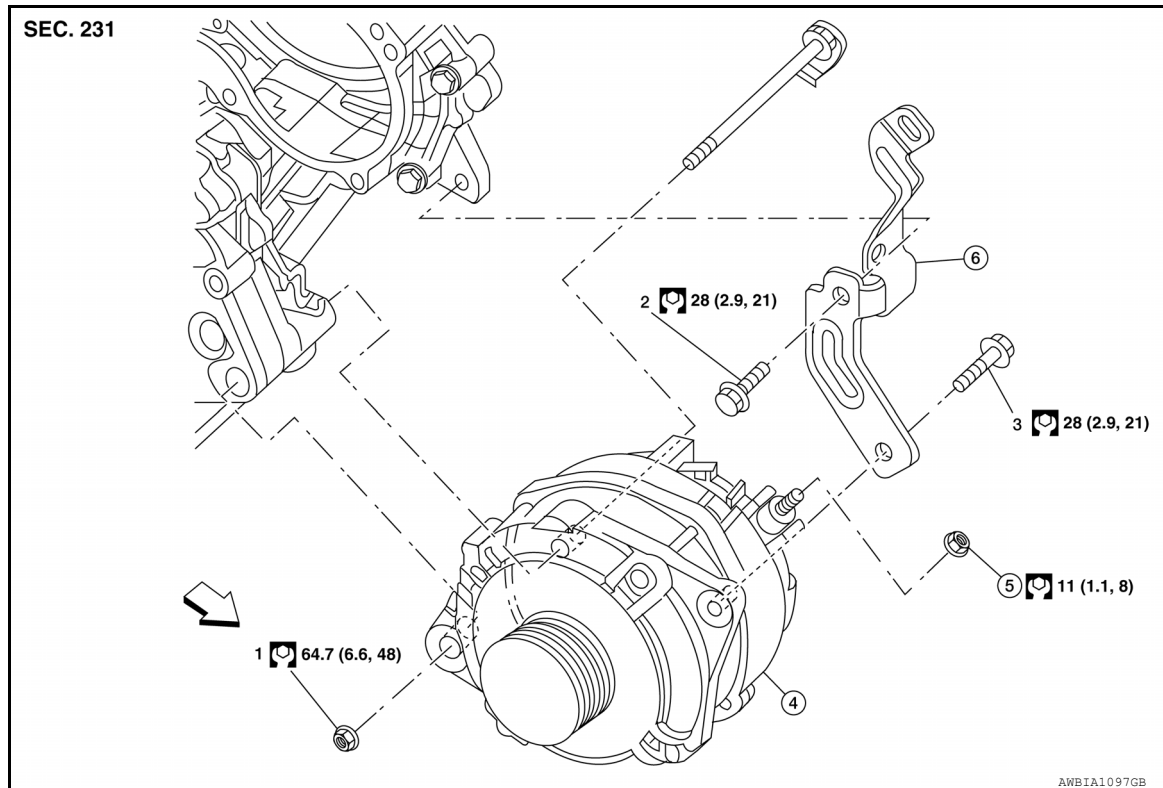
< REMOVAL AND INSTALLATION >

REMOVAL AND INSTALLATION

GENERATOR

Exploded View

INFOID:000000007911074



1 - 3 Tightening order

4. Generator

5. B terminal nut

6. Generator bracket

← Front

Removal and Installation

INFOID:000000007911075

REMOVAL

1. Remove front RH wheel and tire. Refer to [WT-52, "Adjustment"](#).
2. Remove radiator assembly. Refer to [CO-15, "Removal and Installation"](#).
3. Remove cooling fan assembly. Refer to [CO-17, "Removal and Installation"](#).
4. Remove drive belt auto-tensioner assembly. Refer to [EM-14, "Removal and Installation of Drive Belt Auto-tensioner"](#).
5. Disconnect generator wiring harness.
6. Disconnect harness retainers.
7. Remove bolts and generator bracket.
8. Remove generator.

INSTALLATION

Installation is in the reverse order of removal. Refer to [CHG-27, "Exploded View"](#)

- Temporarily tighten bolts and nut then tighten nut and bolts in the specified numerical order.

CAUTION:

Be sure to tighten "B" terminal nut carefully.

- Install generator and check tension of belt. Refer to [EM-12, "Checking Drive Belt"](#).
- For this model, the power generation voltage variable control system that controls the power generation voltage of the generator has been adopted. Therefore, the power generation voltage variable control system

GENERATOR

< REMOVAL AND INSTALLATION >

operation inspection should be performed after replacing the generator, and then make sure that the system operates normally. Refer to [CHG-6, "System Description".WT-52, "Adjustment"](#)

Inspection

INFOID:000000007911076

GENERATOR PULLEY INSPECTION

Perform the following.

- Make sure that generator pulley does not rattle.
- Make sure that generator pulley nut is tight.

NOTE:

Replace the generator as an assembly if necessary.

SERVICE DATA AND SPECIFICATIONS (SDS)

< SERVICE DATA AND SPECIFICATIONS (SDS)

SERVICE DATA AND SPECIFICATIONS (SDS)

SERVICE DATA AND SPECIFICATIONS (SDS)

Generator

INFOID:000000007911077

Application	VQ35DE
Type*	A3TJ3991ZC
	Mitsubishi
Nominal rating	12V-150A
Ground polarity	Negative
Minimum revolution under no-load	1,000 rpm
Hot output current (when 13.5 volts are applied)	More than 31A/1,500 rpm More than 122A/2,500 rpm More than 144A/5,000 rpm
Regulated output voltage	14.1 - 14.7V @ 20°C (68°F)
Adjustment range of power generation voltage variable control	11.4 - 15.6 V

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

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