

SECTION **CHG**
CHARGING SYSTEM

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CONTENTS

| | | | |
|--------------------------------------------------------------------------------------------------|----|------------------------------------------------------------------------------------|----|
| PRECAUTION | 3 | Work Flow (With EXP-800 NI or GR8-1200 NI) | 14 |
| PRECAUTIONS | 3 | Work Flow (Without EXP-800 NI or GR8-1200 NI)..... | 17 |
| Precaution for Supplemental Restraint System (SRS) "AIR BAG" and "SEAT BELT PRE-TENSIONER" | 3 | DTC/CIRCUIT DIAGNOSIS | 20 |
| Precaution for Power Generation Voltage Variable Control System | 3 | CHARGING SYSTEM PRELIMINARY INSPECTION | 20 |
| PREPARATION | 4 | Diagnosis Procedure | 20 |
| PREPARATION | 4 | POWER GENERATION VOLTAGE VARIABLE CONTROL SYSTEM OPERATION INSPECTION | 21 |
| Special Service Tool | 4 | Diagnosis Procedure | 21 |
| Commercial Service Tool | 4 | B TERMINAL CIRCUIT | 23 |
| SYSTEM DESCRIPTION | 5 | Diagnosis Procedure | 23 |
| COMPONENT PARTS | 5 | L TERMINAL CIRCUIT (OPEN) | 24 |
| Component Parts Location | 5 | Diagnosis Procedure | 24 |
| Component Description | 6 | L TERMINAL CIRCUIT (SHORT) | 26 |
| SYSTEM | 7 | Diagnosis Procedure | 26 |
| CHARGING SYSTEM | 7 | S TERMINAL CIRCUIT | 27 |
| CHARGING SYSTEM : SYSTEM DIAGRAM | 7 | Diagnosis Procedure | 27 |
| CHARGING SYSTEM : System Description | 7 | SYMPTOM DIAGNOSIS | 28 |
| CHARGING SYSTEM : Component Description..... | 7 | CHARGING SYSTEM | 28 |
| POWER GENERATION VOLTAGE VARIABLE CONTROL SYSTEM | 7 | Symptom Table | 28 |
| POWER GENERATION VOLTAGE VARIABLE CONTROL SYSTEM : SYSTEM DIAGRAM | 8 | REMOVAL AND INSTALLATION | 29 |
| POWER GENERATION VOLTAGE VARIABLE CONTROL SYSTEM : System Description | 8 | GENERATOR | 29 |
| WIRING DIAGRAM | 9 | Exploded View | 29 |
| CHARGING SYSTEM | 9 | Removal and Installation | 29 |
| Wiring Diagram | 9 | Inspection | 30 |
| BASIC INSPECTION | 14 | SERVICE DATA AND SPECIFICATIONS (SDS) | 31 |
| DIAGNOSIS AND REPAIR WORKFLOW | 14 | SERVICE DATA AND SPECIFICATIONS (SDS) | 31 |

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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:000000011573881

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. 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 Voltage Variable Control System

INFOID:000000011217562

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.

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PREPARATION

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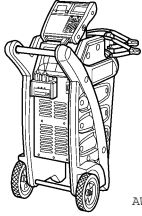
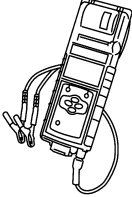
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PREPARATION

Special Service Tool


INFOID:000000011217563

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

| Tool number (TechMate No.) Tool name | Description |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>— (165-GR8-1200KIT-NI) Nissan battery and electronics tester</p>  <p style="text-align: right; font-size: small;">AWIIA12392Z</p> | <p>Tests batteries, starting and charging systems and charges batteries. For operating instructions, refer to diagnostic station instruction manual.</p> |
| <p>— (165-EXP-800-NI) Midtronic hand-held battery tester</p>  <p style="text-align: right; font-size: small;">JSMIA08062Z</p> | <p>Tests batteries and charging systems. For operating instructions, refer to diagnostic analyzer instruction manual.</p> |

Commercial Service Tool

INFOID:000000011217564

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

COMPONENT PARTS

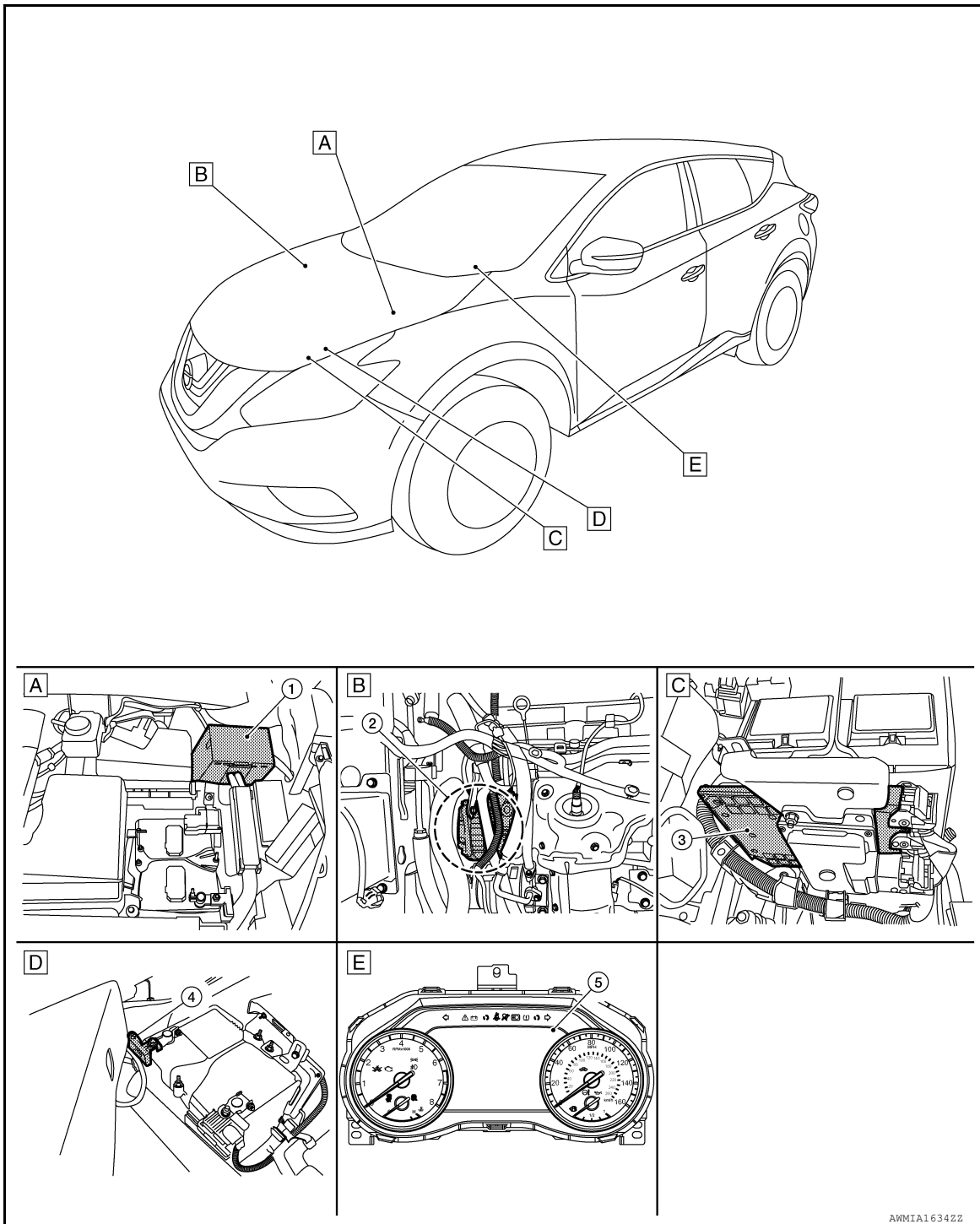
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SYSTEM DESCRIPTION

COMPONENT PARTS

Component Parts Location

INFOID:0000000011217565



A. Engine room right side
D. Engine room left side

B. Engine room left side
E. Combination meter

C. Engine room left side

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COMPONENT PARTS

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Component Description

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| No. | Component part | Description |
|-----|-----------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. | 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. |
| 2. | 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. |
| 3. | 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. |
| 4. | Battery current sensor | 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. |
| 5. | 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. |

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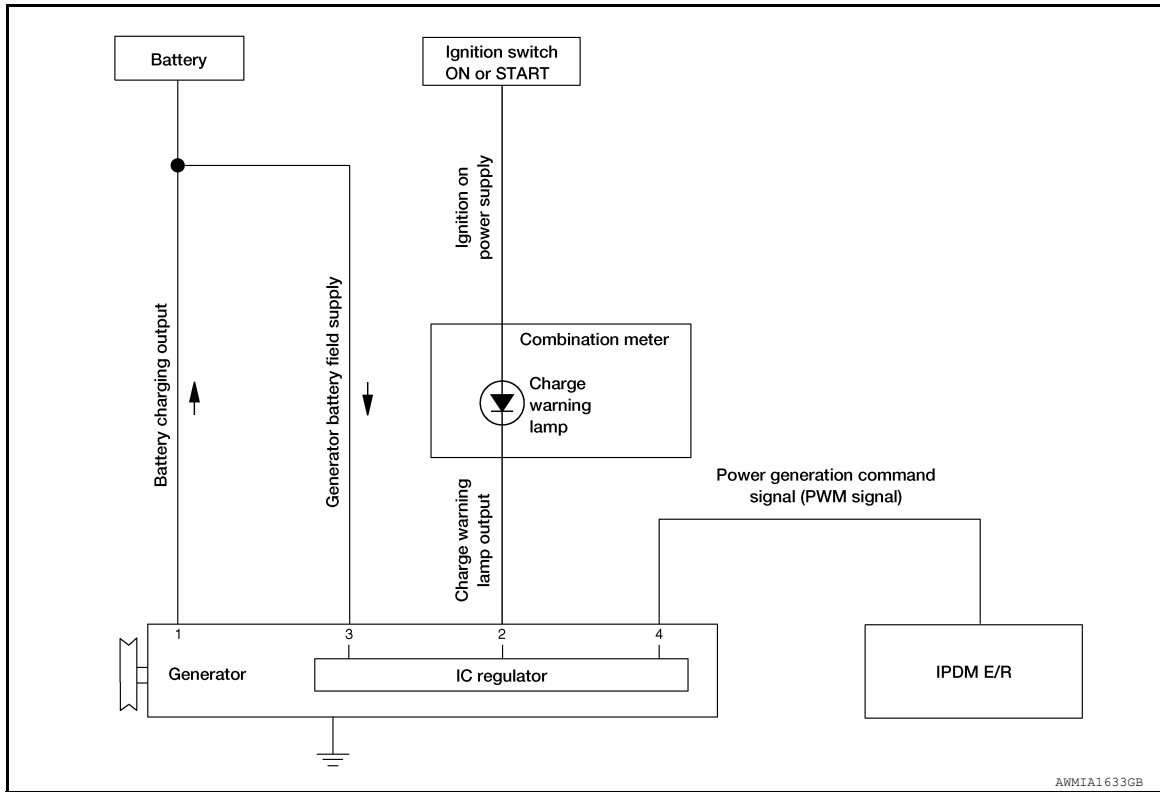
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SYSTEM

CHARGING SYSTEM

CHARGING SYSTEM : SYSTEM DIAGRAM

INFOID:000000011217567



AWMIA1633GB

CHARGING SYSTEM : System Description

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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.

CHARGING SYSTEM : Component Description

INFOID:000000011217569

| Component part | | Description |
|-----------------------------------------|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Generator | Terminal "1" | Refer to CHG-8, "POWER GENERATION VOLTAGE VARIABLE CONTROL SYSTEM : System Description" . |
| | Terminal "2" | Refer to CHG-8, "POWER GENERATION VOLTAGE VARIABLE CONTROL SYSTEM : System Description" . |
| | Terminal "3" | Refer to CHG-8, "POWER GENERATION VOLTAGE VARIABLE CONTROL SYSTEM : System Description" . |
| | Terminal "4" | Used for the power generation voltage variable control system. Refer to CHG-8, "POWER GENERATION VOLTAGE VARIABLE CONTROL SYSTEM : 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-8, "POWER GENERATION VOLTAGE VARIABLE CONTROL SYSTEM : System Description" . |

POWER GENERATION VOLTAGE VARIABLE CONTROL SYSTEM

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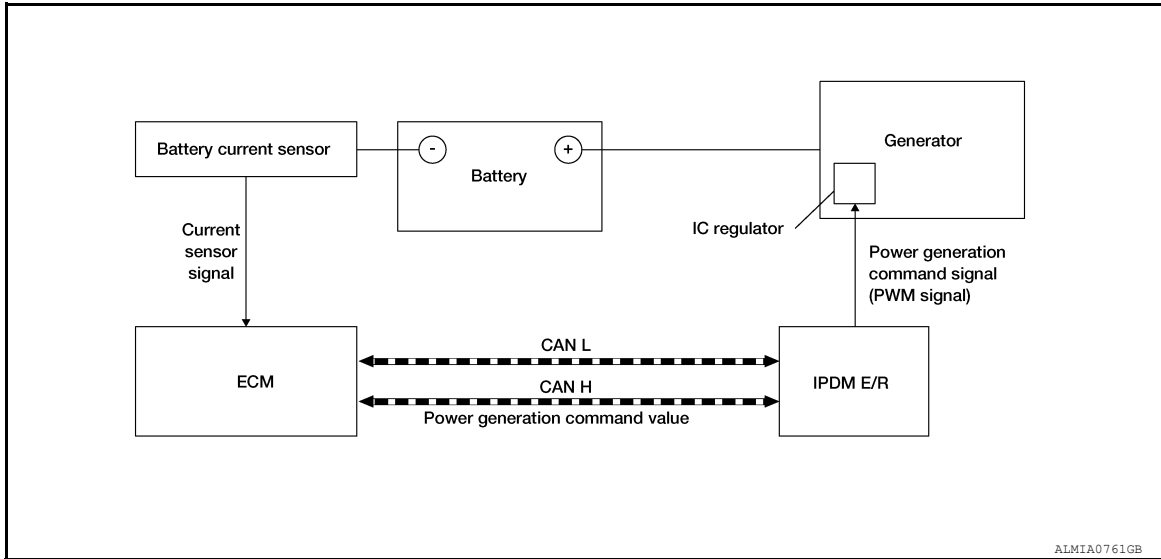
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POWER GENERATION VOLTAGE VARIABLE CONTROL SYSTEM : SYSTEM DIAGRAM

INFOID:000000011217570



POWER GENERATION VOLTAGE VARIABLE CONTROL SYSTEM : System Description

INFOID:000000011217571

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 characteristics of the IC regulator in the generator.

CHARGING SYSTEM

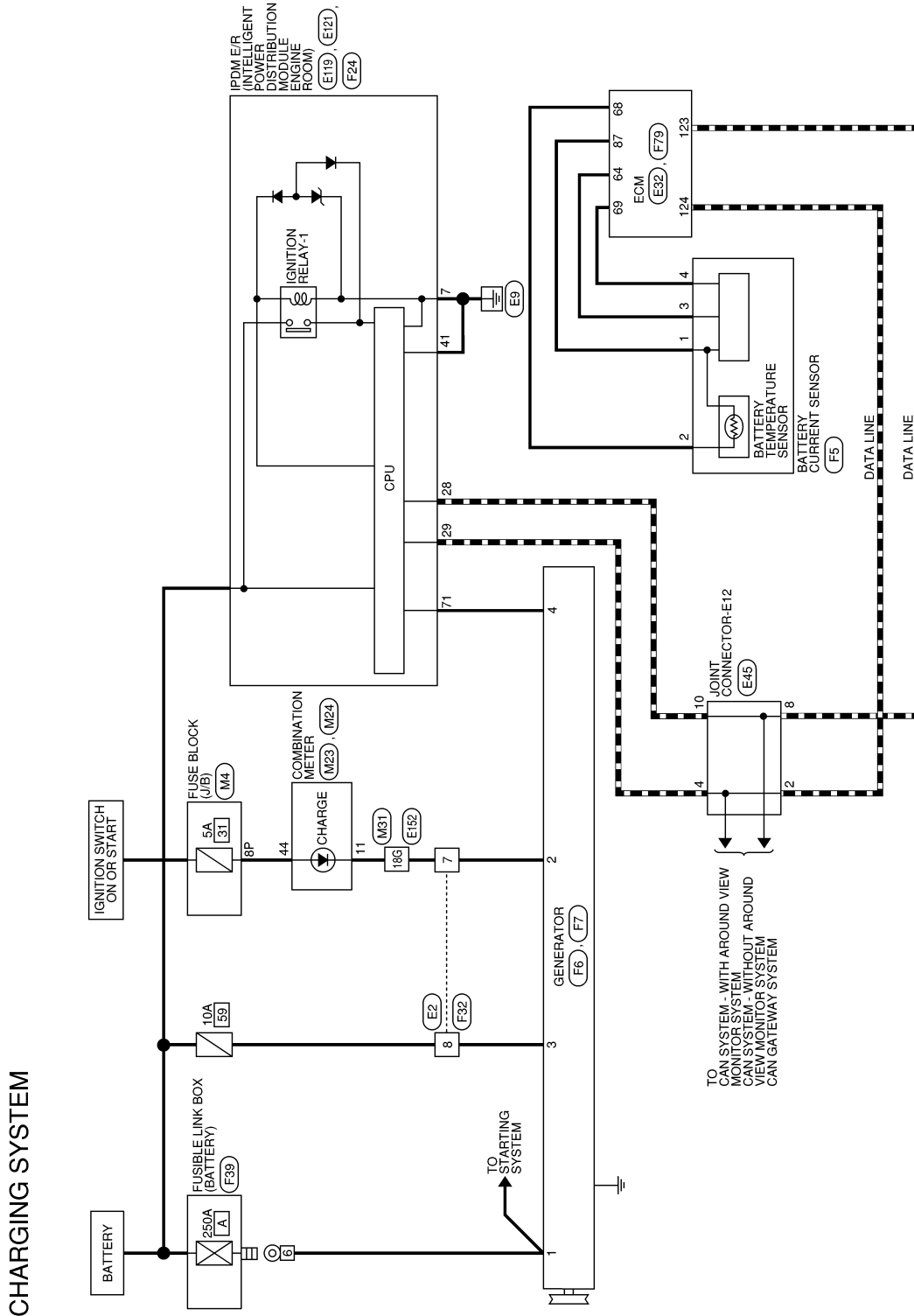
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WIRING DIAGRAM

CHARGING SYSTEM

Wiring Diagram

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TO CAN SYSTEM - WITH AROUND VIEW MONITOR SYSTEM
TO CAN SYSTEM - WITHOUT AROUND VIEW MONITOR SYSTEM
TO CAN GATEWAY SYSTEM

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CHARGING SYSTEM

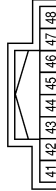
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CHARGING SYSTEM CONNECTORS

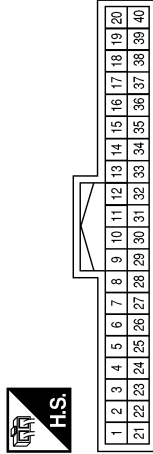
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|-----------------|------------------|
| Connector No. | M4 |
| Connector Name | FUSE BLOCK (J/B) |
| Connector Color | WHITE |



| | |
|-----------------|-------------------|
| Connector No. | M23 |
| Connector Name | COMBINATION METER |
| Connector Color | WHITE |



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|-----------------|-------------------|
| Connector No. | M24 |
| Connector Name | COMBINATION METER |
| Connector Color | WHITE |

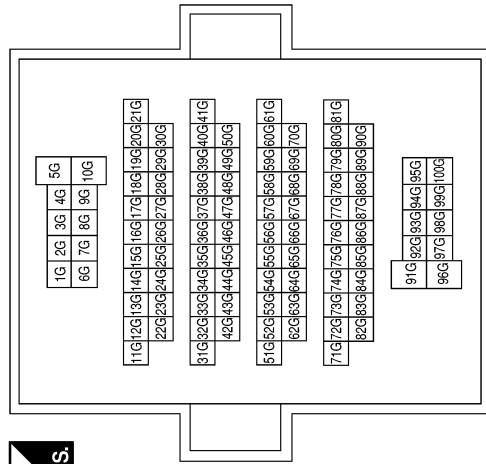


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| Terminal No. | 8P | Color of Wire | BG | Signal Name | - |
|--------------|----|---------------|----|-------------|---|

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|--------------|----|---------------|----|-------------|-------------|
| Terminal No. | 44 | Color of Wire | BG | Signal Name | POWER (IGN) |
|--------------|----|---------------|----|-------------|-------------|

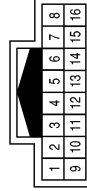
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|--------------|----|---------------|----|-------------|--------|
| Terminal No. | 11 | Color of Wire | BG | Signal Name | CHARGE |
|--------------|----|---------------|----|-------------|--------|

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



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|--------------|-----|---------------|----|-------------|---|
| Terminal No. | 18G | Color of Wire | BG | Signal Name | - |
|--------------|-----|---------------|----|-------------|---|

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



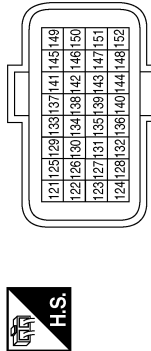
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| Terminal No. | 7 | Color of Wire | P | Signal Name | - |
| Terminal No. | 8 | Color of Wire | LG | Signal Name | - |

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CHARGING SYSTEM

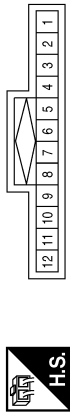
< WIRING DIAGRAM >

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| Connector No. | E32 |
| Connector Name | ECM |
| Connector Color | BLACK |



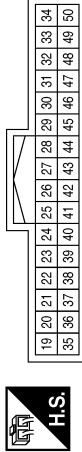
| Terminal No. | Color of Wire | Signal Name |
|--------------|---------------|-------------|
| 123 | P | CAN-L |
| 124 | L | CAN-H |

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



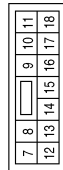
| Terminal No. | Color of Wire | Signal Name |
|--------------|---------------|-------------|
| 2 | L | - |
| 4 | L | - |
| 8 | P | - |
| 10 | P | - |

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



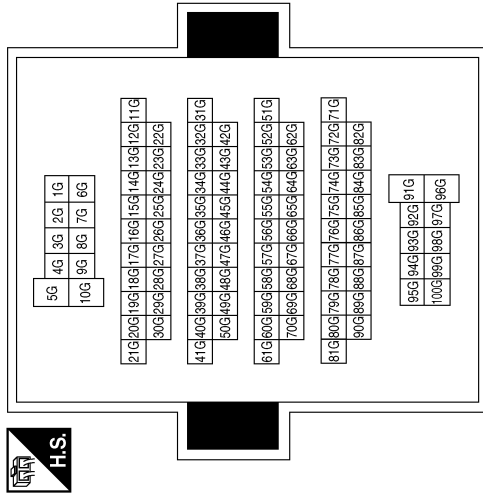
| Terminal No. | Color of Wire | Signal Name |
|--------------|---------------|-------------|
| 28 | P | CAN-L |
| 29 | L | CAN-H |
| 41 | B | S-GND |

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|-----------------|--------------------------------------------------------------|
| 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 | P-GND |

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



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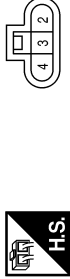
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CHARGING SYSTEM

< WIRING DIAGRAM >

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|-----------------|-----------|
| Connector No. | F7 |
| Connector Name | GENERATOR |
| Connector Color | BLACK |



| Terminal No. | Color of Wire | Signal Name |
|--------------|---------------|-------------|
| 2 | GR | - |
| 3 | BR | - |
| 4 | LG | - |

| | |
|-----------------|-----------|
| Connector No. | F6 |
| Connector Name | GENERATOR |
| Connector Color | - |



| Terminal No. | Color of Wire | Signal Name |
|--------------|---------------|-------------|
| 1 | B/R | - |

| | |
|-----------------|------------------------|
| Connector No. | F5 |
| Connector Name | BATTERY CURRENT SENSOR |
| Connector Color | GRAY |



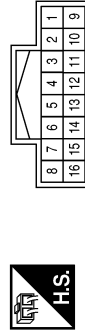
| Terminal No. | Color of Wire | Signal Name |
|--------------|---------------|-------------|
| 1 | LG | - |
| 2 | Y | - |
| 3 | L | - |
| 4 | W | - |

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



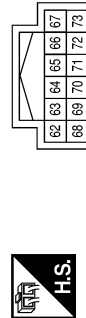
| Terminal No. | Color of Wire | Signal Name |
|--------------|---------------|-------------|
| 6 | B/R | - |

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



| Terminal No. | Color of Wire | Signal Name |
|--------------|---------------|-------------|
| 7 | GR | - |
| 8 | BR | - |

| | |
|-----------------|--------------------------------------------------------------|
| Connector No. | F24 |
| Connector Name | IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM) |
| Connector Color | WHITE |



| Terminal No. | Color of Wire | Signal Name |
|--------------|---------------|-------------|
| 71 | LG | ALT C |

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CHARGING SYSTEM

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| Connector No. | F79 |
| Connector Name | ECM |
| Connector Color | BLACK |



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|----|----|----|----|----|----|----|----|-----|-----|-----|-----|-----|
| 56 | 61 | 66 | 71 | 76 | 81 | 86 | 91 | 96 | 101 | 106 | 111 | 116 |
| 57 | 62 | 67 | 72 | 77 | 82 | 87 | 92 | 97 | 102 | 107 | 112 | 117 |
| 58 | 63 | 68 | 73 | 78 | 83 | 88 | 93 | 98 | 103 | 108 | 113 | 118 |
| 59 | 64 | 69 | 74 | 79 | 84 | 89 | 94 | 99 | 104 | 109 | 114 | 119 |
| 60 | 65 | 70 | 75 | 80 | 85 | 90 | 95 | 100 | 105 | 110 | 115 | 120 |

| Terminal No. | Color of Wire | Signal Name |
|--------------|---------------|----------------------------------------------|
| 64 | L | SENSOR GROUND (BATTERY CURRENT SENSOR) |
| 68 | Y | BATTERY TEMPERATURE SENSOR |
| 69 | W | BATTERY CURRENT SENSOR |
| 87 | LG | SENSOR POWER SUPPLY (BATTERY CURRENT SENSOR) |

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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:000000011217573

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

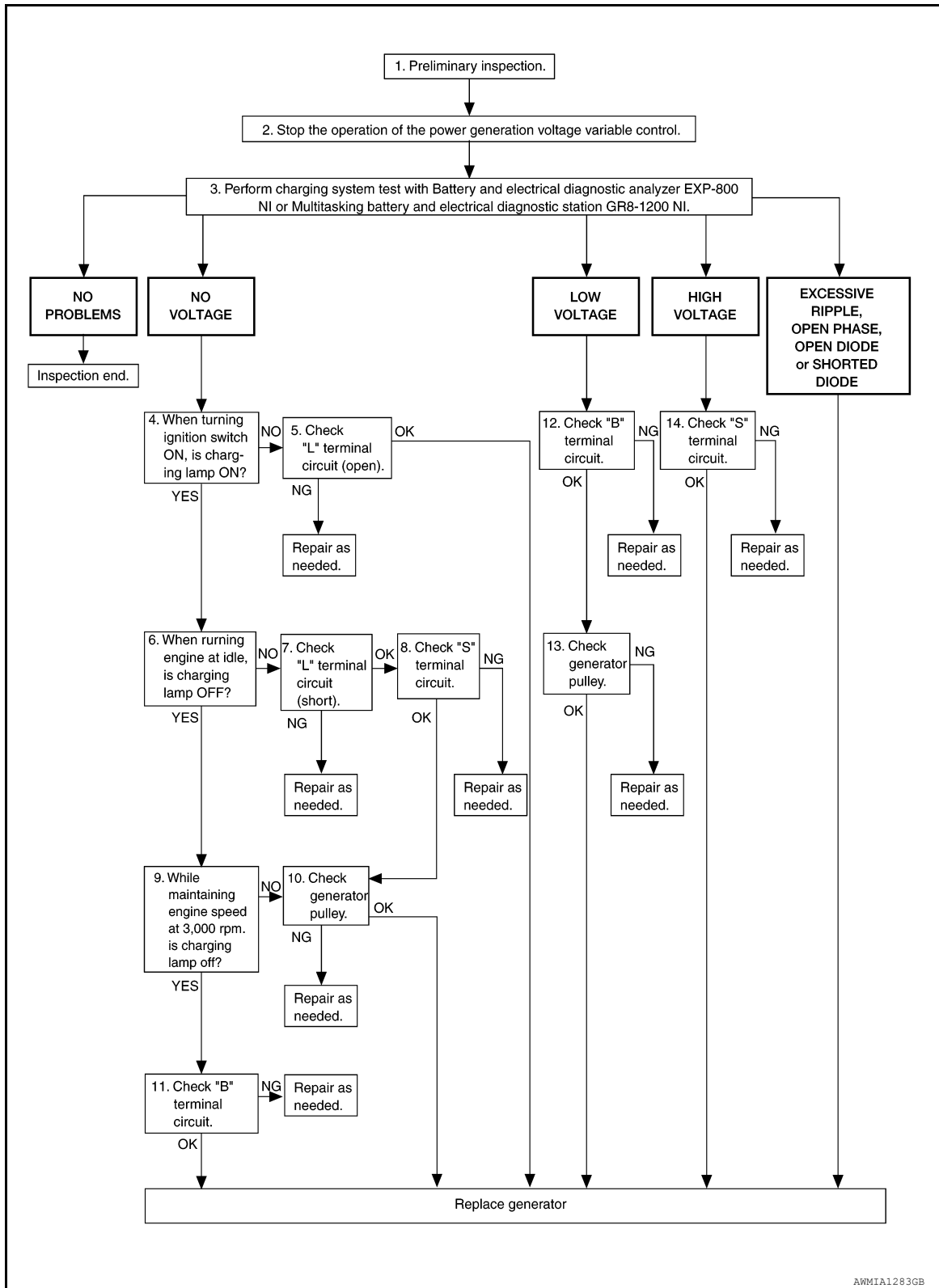
NOTE:

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-20. "Diagnosis 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 diagnostic result 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-29. "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-24. "Diagnosis Procedure"](#).

Is the “L” terminal circuit normal?

YES >> Replace generator. Refer to [CHG-29. "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-26. "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-27. "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-30. "Inspection"](#).

Is generator pulley normal?

YES >> Replace generator. Refer to [CHG-29. "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-29. "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-30. "Inspection"](#).

Is generator pulley normal?

YES >> Replace generator. Refer to [CHG-29. "Removal and Installation"](#).

NO >> Repair as needed.

14."S" TERMINAL CIRCUIT INSPECTION

Check "S" terminal circuit. Refer to [CHG-27. "Diagnosis Procedure"](#).

Is the "S" terminal circuit normal?

YES >> Replace generator. Refer to [CHG-29. "Removal and Installation"](#).

NO >> Repair as needed.

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

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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.

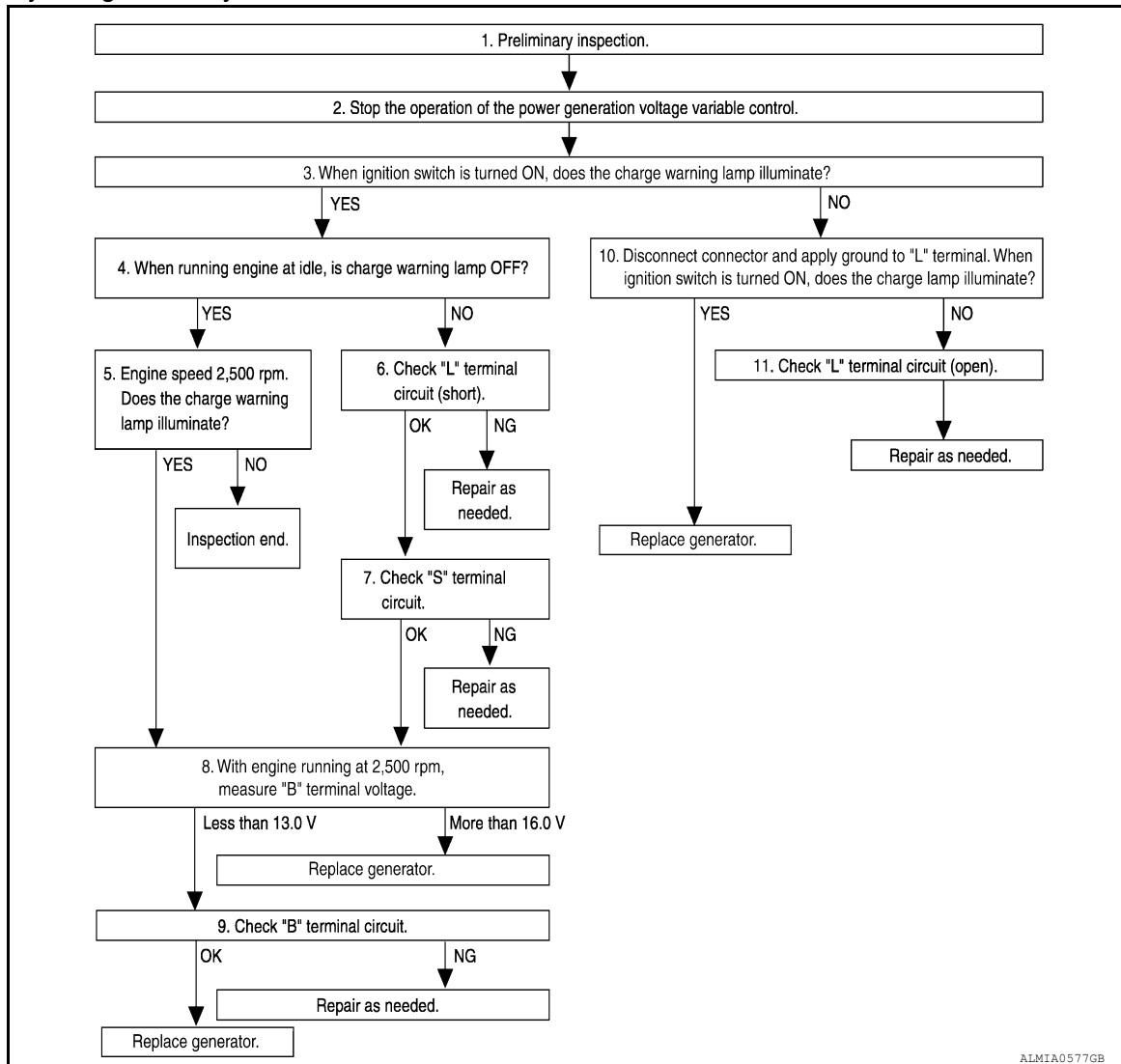
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DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION >

- Use fully charged battery.



DETAILED FLOW

1. PRELIMINARY INSPECTION

Perform the preliminary inspection. Refer to [CHG-20, "Diagnosis 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 characteristics 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)

Turn the ignition switch ON.

Does the charge warning lamp illuminate?

DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION >

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

4.INSPECTION WITH CHARGE WARNING LAMP (IDLING)

Start the engine and run it at idle.

Does the charge warning lamp turn OFF?

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

5.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 8.
NO >> Inspection End.

6.“L” TERMINAL CIRCUIT (SHORT) INSPECTION

Check terminal “L” circuit for short. Refer to [CHG-26, "Diagnosis Procedure"](#).

Is the inspection result normal?

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

7.“S” TERMINAL CIRCUIT INSPECTION

Check terminal “S” circuit. Refer to [CHG-27, "Diagnosis Procedure"](#).

Is the inspection result normal?

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

8.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 9.
More than 16.0 V>> Replace generator. Refer to [CHG-29, "Removal and Installation"](#).

9.“B” TERMINAL CIRCUIT INSPECTION

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

Is the inspection result normal?

YES >> Replace generator. Refer to [CHG-29, "Removal and Installation"](#).
NO >> Repair as needed.

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

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

Does the charge warning lamp illuminate?

YES >> Replace generator. Refer to [CHG-29, "Removal and Installation"](#).
NO >> GO TO 11.

11.CHECK “L” TERMINAL CIRCUIT (OPEN)

Check “L” terminal circuit open. Refer to [CHG-24, "Diagnosis Procedure"](#).

>> Repair as needed.

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CHARGING SYSTEM PRELIMINARY INSPECTION

< DTC/CIRCUIT DIAGNOSIS >

DTC/CIRCUIT DIAGNOSIS

CHARGING SYSTEM PRELIMINARY INSPECTION

Diagnosis Procedure

INFOID:000000011217575

1. CHECK BATTERY TERMINAL CONNECTIONS

Check if battery terminals are clean and tight.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair battery terminals 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 FUSE AND FUSIBLE LINK

Check for blown fuse and fusible link.

| Unit | Power source (power supply terminal) | Fuse or fusible link |
|-------------------|--------------------------------------|----------------------|
| Generator | Battery (terminal 3) | Fuse 59 |
| | 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

Check if generator case ground is clean.

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair connection.

4. CHECK DRIVE BELT TENSION

Check drive belt tension. Refer to [CHG-30, "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:0000000011217576

Regarding Wiring Diagram information, refer to [CHG-9, "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-71, "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-10, "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 and IPDM E/R harness connector F24.

POWER GENERATION VOLTAGE VARIABLE CONTROL SYSTEM OPERATION INSPECTION

< DTC/CIRCUIT DIAGNOSIS >

| Generator | | IPDM E/R | | Continuity |
|-----------|----------|-----------|----------|------------|
| Connector | Terminal | Connector | Terminal | |
| F7 | 4 | F24 | 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-37, "Removal and Installation"](#).

NO >> Repair harness or connector between IPDM E/R and generator.

B TERMINAL CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

B TERMINAL CIRCUIT

Diagnosis Procedure

INFOID:000000011217578

Regarding Wiring Diagram information, refer to [CHG-9. "Wiring Diagram"](#).

1. CHECK TERMINAL "B" CONNECTION

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

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair terminal "B" connection. Confirm repair by performing complete charging system test using the EXP-800 NI or GR8-1200 NI (if available). Refer to the applicable instruction manual for proper testing procedures.

2. CHECK TERMINAL "B" CIRCUIT

Check voltage between generator connector F6 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 "B" CONNECTION (VOLTAGE DROP TEST)

1. Start engine, engine should be running at idle and warm.
2. Check voltage between battery positive terminal and generator connector F6.

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

Is the inspection result normal?

YES >> Terminal "B" circuit is normal. Refer to [CHG-14. "Work Flow \(With EXP-800 NI or GR8-1200 NI\)"](#) or [CHG-17. "Work Flow \(Without EXP-800 NI or GR8-1200 NI\)"](#).

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

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L TERMINAL CIRCUIT (OPEN)

< DTC/CIRCUIT DIAGNOSIS >

L TERMINAL CIRCUIT (OPEN)

Diagnosis Procedure

INFOID:000000011217580

Regarding Wiring Diagram information. Refer to [CHG-9. "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 |
| F7 | 2 | | ON | Illuminate |

Does it illuminate?

YES >> "L" terminal circuit is normal. Refer to [CHG-14. "Work Flow \(With EXP-800 NI or GR8-1200 NI\)"](#) or [CHG-17. "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 F7 and combination meter harness connector M24.

| Generator | | Combination meter | | Continuity |
|-----------|----------|-------------------|----------|------------|
| Connector | Terminal | Connector | Terminal | |
| F7 | 2 | M24 | 11 | 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 M23 and fuse block (J/B) M4.

| Combination meter | | Fuse block (J/B) | | Continuity |
|-------------------|----------|------------------|----------|------------|
| Connector | Terminal | Connector | Terminal | |
| M23 | 44 | M4 | 8P | Yes |

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair or replace the harness or connectors.

5. CHECK POWER SUPPLY CIRCUIT

L TERMINAL CIRCUIT (OPEN)

< DTC/CIRCUIT DIAGNOSIS >

1. Connect the battery cable to the negative terminal.
2. Check voltage between combination meter harness connector M23 and ground.

| (+) | | (-) | Condition | Voltage (Approx.) |
|-------------------|----------|--------|--------------------------------------------|-------------------|
| Combination meter | | | | |
| Connector | Terminal | | | |
| M23 | 44 | Ground | When the ignition switch is in ON position | Battery voltage |

Is the inspection result normal?

- YES >> Replace the combination meter. Refer to [MWI-78. "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)

Diagnosis Procedure

INFOID:000000011217582

Regarding Wiring Diagram information, refer to [CHG-9, "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-14, "Work Flow \(With EXP-800 NI or GR8-1200 NI\)"](#) or [CHG-17, "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 M23 and ground.

| Combination meter | | Ground | Continuity |
|-------------------|----------|--------|------------|
| Connector | Terminal | | |
| M23 | 44 | | No |

Is the inspection result normal?

YES >> Replace the combination meter. Refer to [MWI-78, "Removal and Installation"](#).

NO >> Repair or replace the harness or connectors.

S TERMINAL CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

S TERMINAL CIRCUIT

Diagnosis Procedure

INFOID:000000011217584

Regarding Wiring Diagram information. Refer to [CHG-9, "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 "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 generator harness connector F7 and ground.

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

Is the inspection result normal?

YES >> Refer to [CHG-14, "Work Flow \(With EXP-800 NI or GR8-1200 NI\)"](#) or [CHG-17, "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:000000011217585

| Symptom | Reference |
|------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Battery discharged | Refer to CHG-14, "Work Flow (With EXP-800 NI or GR8-1200 NI)" or CHG-17, "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 charge warning lamp turns ON when increasing the engine speed. | |

GENERATOR

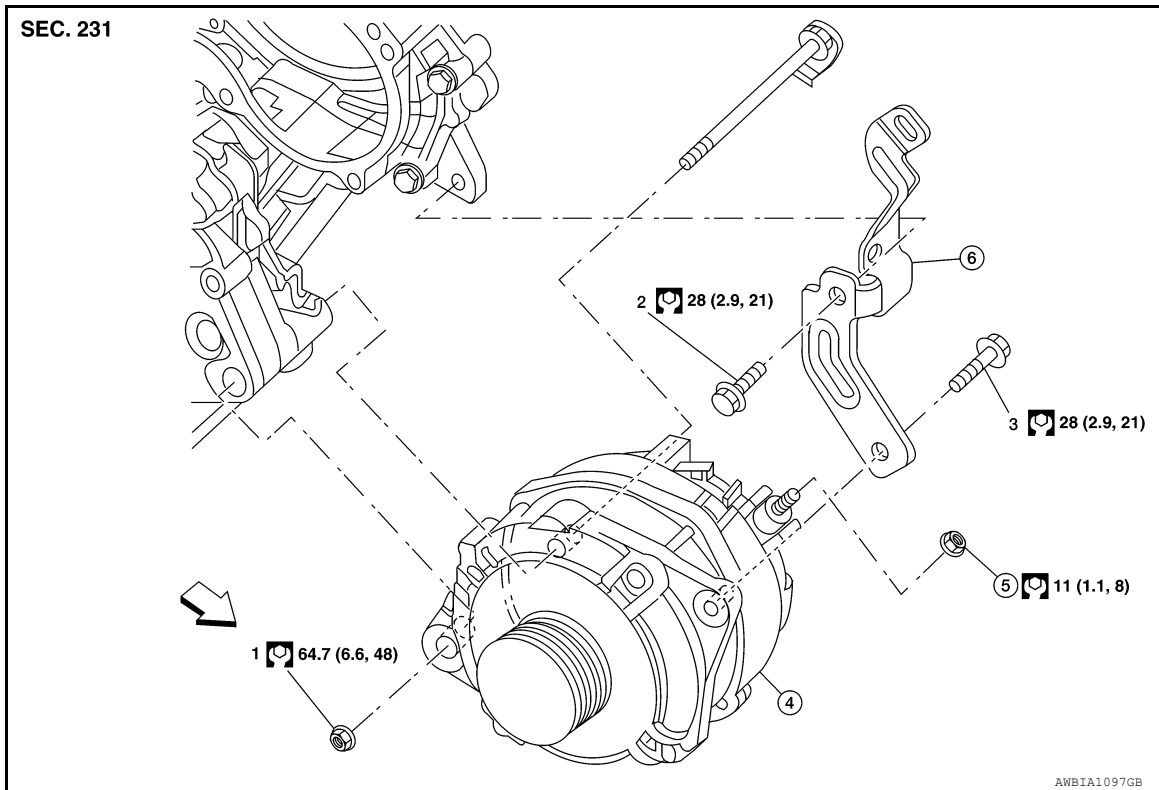
< REMOVAL AND INSTALLATION >

REMOVAL AND INSTALLATION

GENERATOR

Exploded View

INFOID:0000000011217586



1 - 3 Tightening order

6. Generator bracket

4. Generator

← Front

5. "B" terminal nut

Removal and Installation

INFOID:0000000011217587

REMOVAL

1. Remove radiator assembly. Refer to [CO-13, "Removal and Installation"](#).
2. Remove cooling fan assembly. Refer to [CO-15, "Removal and Installation"](#).
3. Remove drive belt auto-tensioner assembly. Refer to [EM-16, "Removal and Installation of Drive Belt Auto-tensioner"](#).
4. Disconnect the harness connectors from the generator.
5. Remove generator bracket.
6. Remove generator bolts and nut using power tools.
7. Slide the generator out and remove.

INSTALLATION

Installation is in the reverse order of removal. Refer to [CHG-29, "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-14, "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 operation inspection should be performed after replacing the generator, and then make sure that the system operates normally. Refer to [CHG-7, "CHARGING SYSTEM : System Description"](#).

GENERATOR

< REMOVAL AND INSTALLATION >

Inspection

INFOID:000000011217588

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:0000000011217589

| | |
|---------------------------------------------------------------|------------------------------------------------------|
| Application | VQ35DE |
| Type* | A003TJ3991ZC |
| | 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 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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