

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:000000012591624

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, it is recommended that all maintenance and repair be performed by an authorized NISSAN/INFINITI dealer.
- Improper repair, 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 or batteries, and wait at least three minutes before performing any service.

Precaution for Power Generation Voltage Variable Control System

INFOID:000000012591625

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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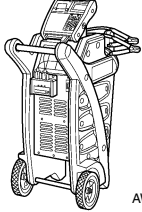

PREPARATION

PREPARATION

Special Service Tool


INFOID:000000012591626

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;">AWI1A1239ZZ</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;">JSMIA0806ZZ</p>	<p>Tests batteries and charging systems. For operating instructions, refer to diagnostic analyzer instruction manual.</p>

Commercial Service Tool

INFOID:000000012591627

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

COMPONENT PARTS

< SYSTEM DESCRIPTION >

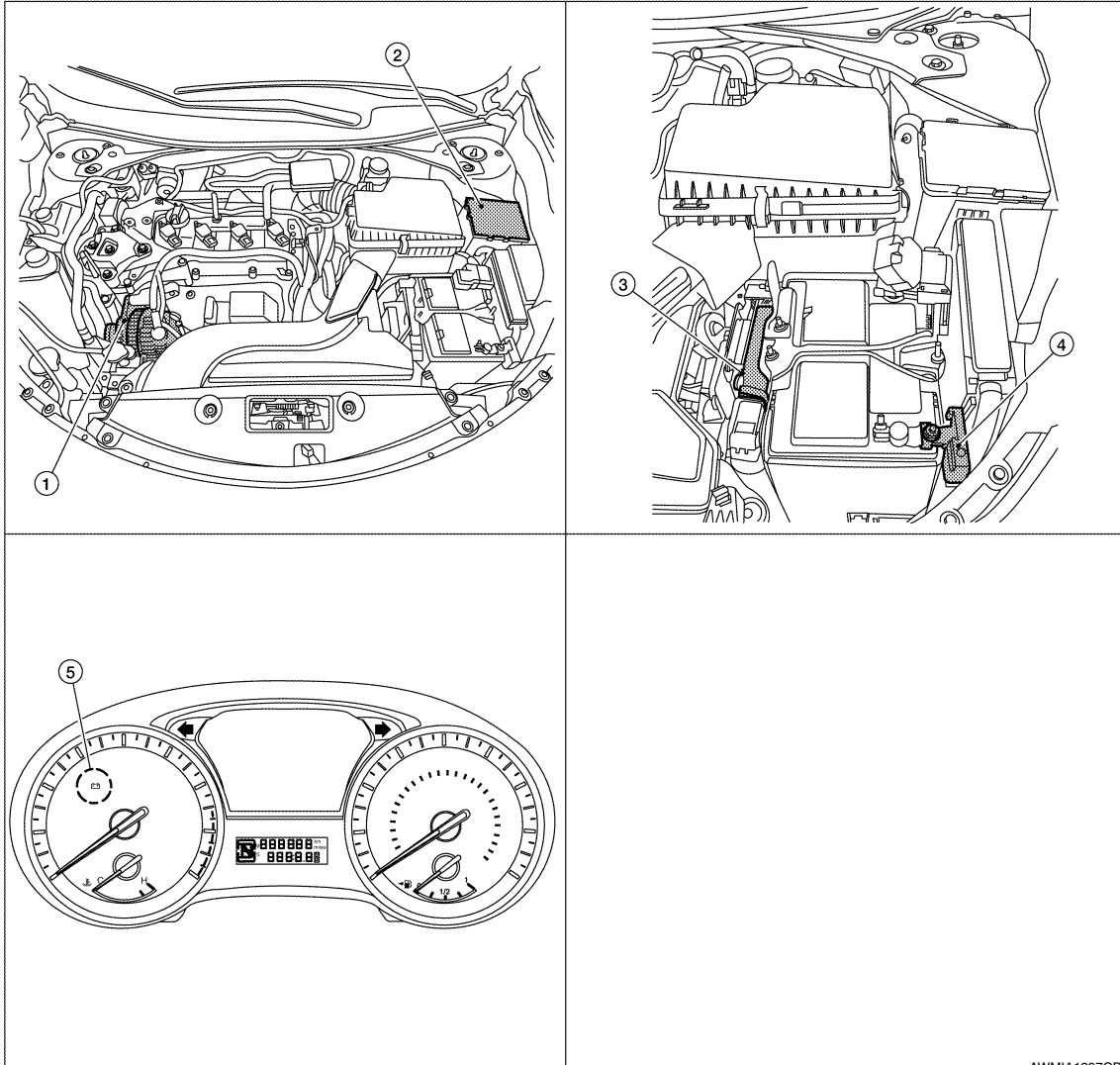
SYSTEM DESCRIPTION

COMPONENT PARTS

QR25DE

QR25DE : Component Parts Location

INFOID:000000012591628



- | | | |
|---------------------------|----------------------------------|--------|
| 1. Generator | 2. IPDM E/R | 3. ECM |
| 4. Battery current sensor | 5. Charge warning lamp indicator | |

AWMIA1297GB

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COMPONENT PARTS

< SYSTEM DESCRIPTION >

QR25DE : Component Description

INFOID:000000012591629

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>

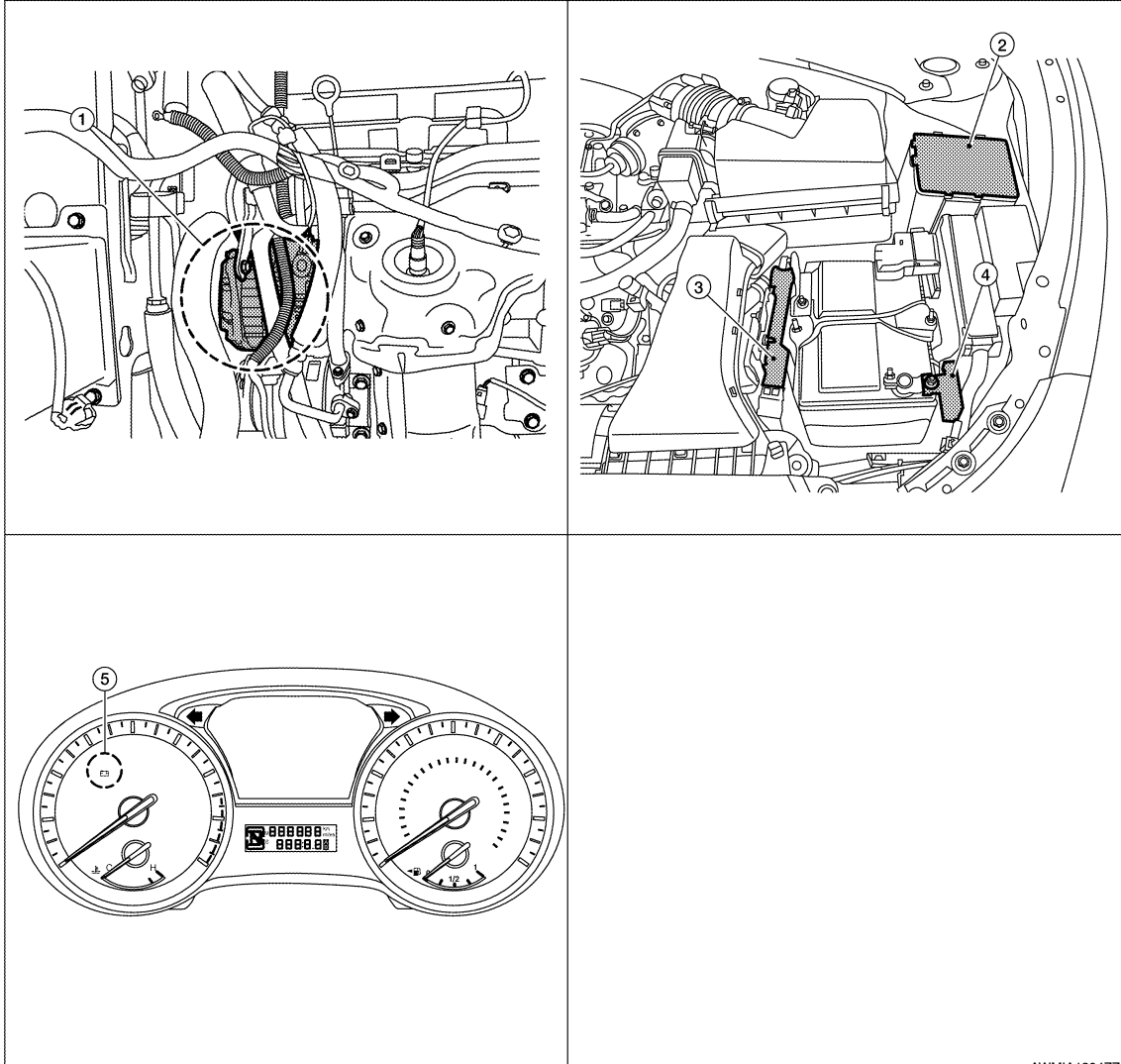
VQ35DE

COMPONENT PARTS

< SYSTEM DESCRIPTION >

VQ35DE : Component Parts Location

INFOID:000000012591630



- | | | |
|---------------------------|----------------------------------|--------|
| 1. Generator | 2. IPDM E/R | 3. ECM |
| 4. Battery current sensor | 5. Charge warning lamp indicator | |

AWMIA1304ZZ

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COMPONENT PARTS

< SYSTEM DESCRIPTION >

VQ35DE : Component Description

INFOID:000000012591631

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>

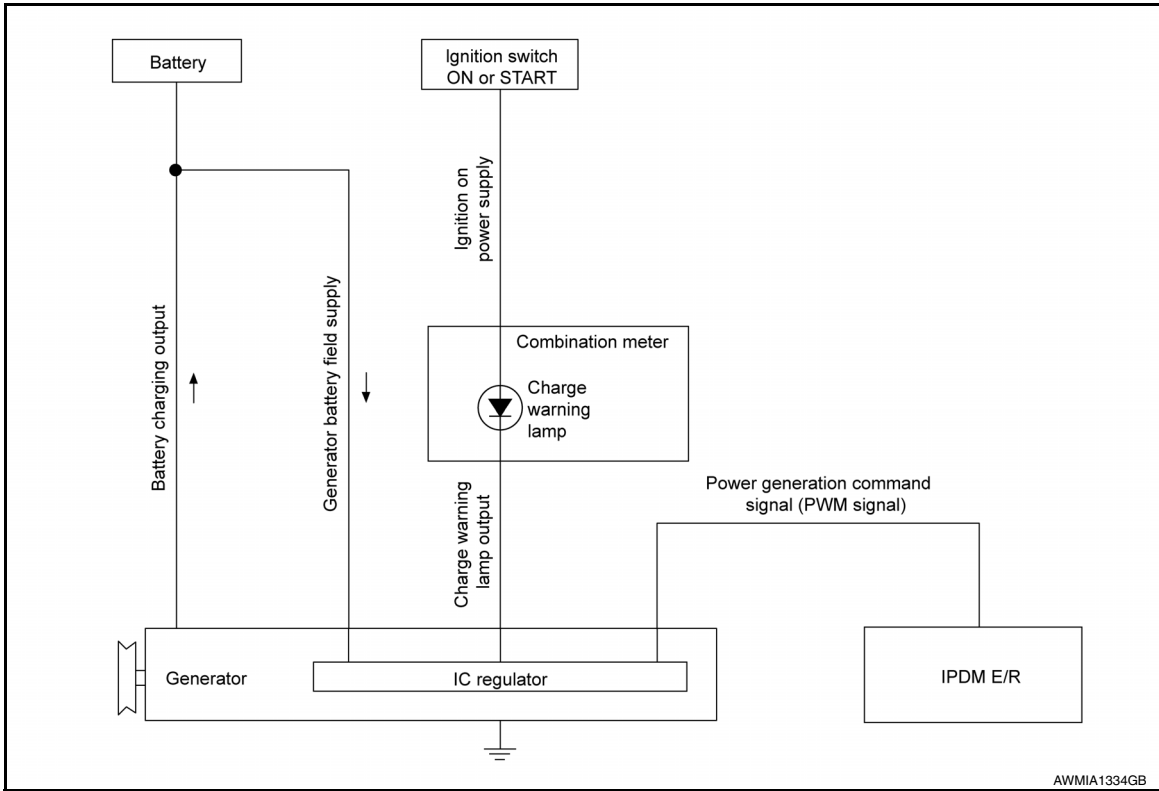
CHARGING SYSTEM

< SYSTEM DESCRIPTION >

CHARGING SYSTEM

System Diagram

INFOID:000000012591632



System Description

INFOID:000000012591633

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:000000012591634

Component part	Description	
Generator	Terminal "1"	Refer to CHG-26, "Description" .
	Terminal "2"	Refer to CHG-27, "Description" .
	Terminal "3"	Refer to CHG-30, "Description" .
	Terminal "4"	Used for the power generation voltage variable control system. Refer to CHG-10, "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-10, "System Description" .	

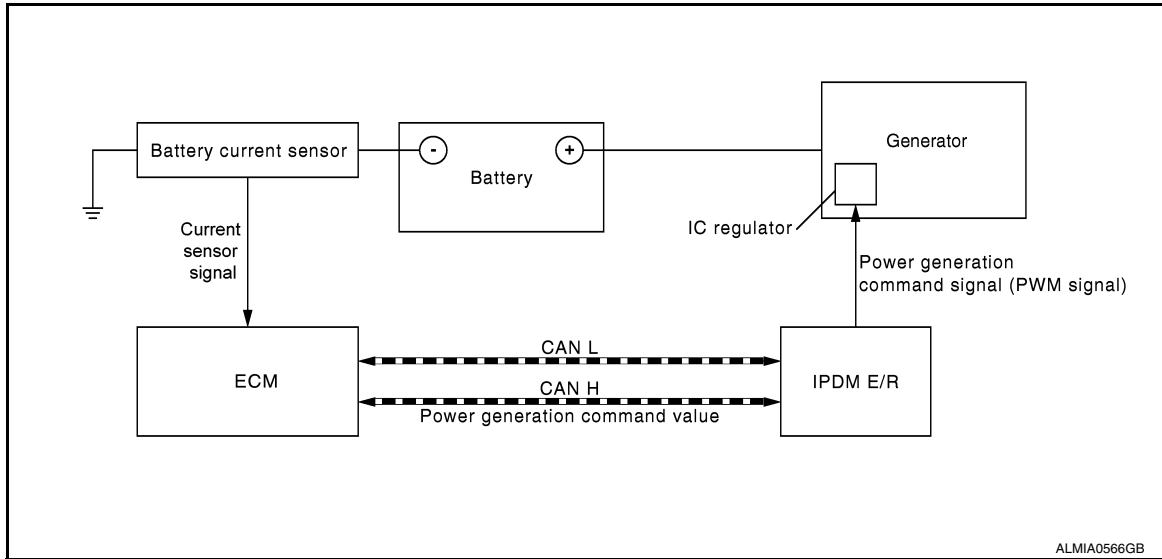
POWER GENERATION VOLTAGE VARIABLE CONTROL SYSTEM

< SYSTEM DESCRIPTION >

POWER GENERATION VOLTAGE VARIABLE CONTROL SYSTEM

System Diagram

INFOID:000000012591635



System Description

INFOID:000000012591636

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:000000012591637

Component part	Description
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.
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.

POWER GENERATION VOLTAGE VARIABLE CONTROL SYSTEM

< SYSTEM DESCRIPTION >

Component part	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.
Battery current sensor	The battery current sensor is located on the 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.

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CHARGING SYSTEM

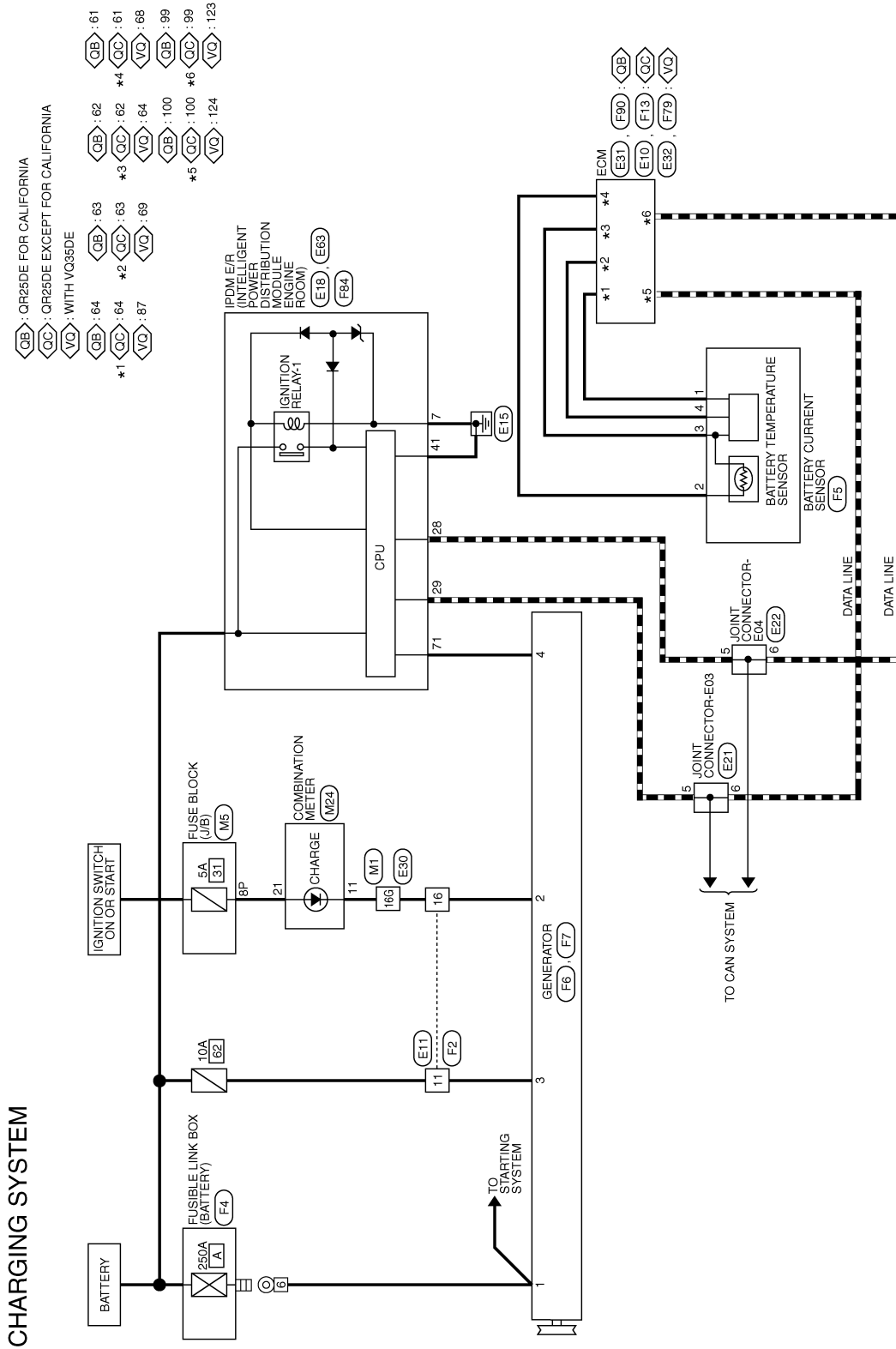
< WIRING DIAGRAM >

WIRING DIAGRAM

CHARGING SYSTEM

Wiring Diagram

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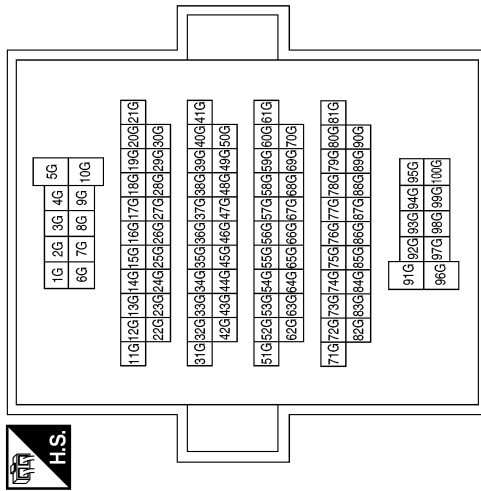


CHARGING SYSTEM

< WIRING DIAGRAM >

CHARGING SYSTEM CONNECTORS

Connector No.	M1
Connector Name	WIRE TO WIRE
Connector Color	WHITE



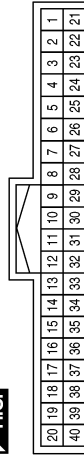
Terminal No.	Color of Wire	Signal Name
16G	R	-

Connector No.	M5
Connector Name	FUSE BLOCK (J/B)
Connector Color	WHITE



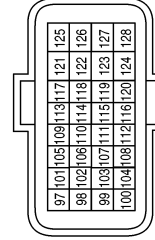
Terminal No.	Color of Wire	Signal Name
8P	BR	-

Connector No.	M24
Connector Name	COMBINATION METER
Connector Color	WHITE



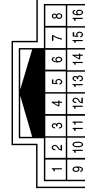
Terminal No.	Color of Wire	Signal Name
11	R	ALTERNATOR (CHARGE)
21	BR	IGN

Connector No.	E10
Connector Name	ECM (OR25DE EXCEPT FOR CALIFORNIA)
Connector Color	GRAY



Terminal No.	Color of Wire	Signal Name
99	P	CAN-L
100	L	CAN-H

Connector No.	E11
Connector Name	WIRE TO WIRE
Connector Color	WHITE



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

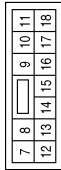
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CHARGING SYSTEM

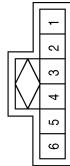
< WIRING DIAGRAM >

Connector No.	E18
Connector Name	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector Color	WHITE



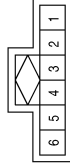
Terminal No.	Color of Wire	Signal Name
7	B	GND (POWER)

Connector No.	E21
Connector Name	JOINT CONNECTOR-E03
Connector Color	GRAY



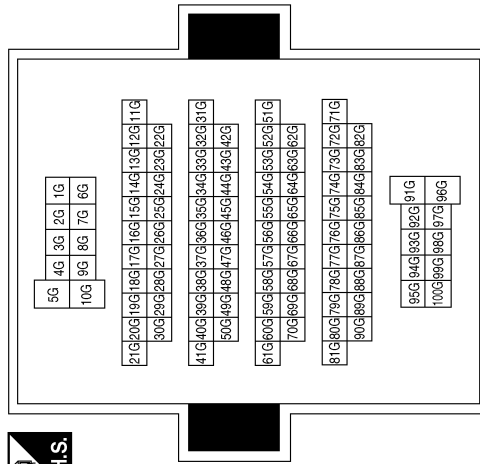
Terminal No.	Color of Wire	Signal Name
5	L	-
6	L	-

Connector No.	E22
Connector Name	JOINT CONNECTOR-E04
Connector Color	GRAY



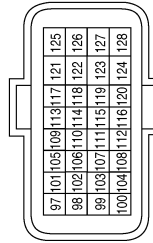
Terminal No.	Color of Wire	Signal Name
5	P	-
6	P	-

Connector No.	E30
Connector Name	WIRE TO WIRE
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
16G	G	-

Connector No.	E31
Connector Name	ECM (QR25DE FOR CALIFORNIA)
Connector Color	GRAY

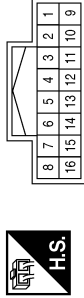


Terminal No.	Color of Wire	Signal Name
99	P	CAN-L
100	L	CAN-H

CHARGING SYSTEM

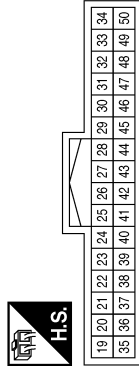
< WIRING DIAGRAM >

Connector No.	F2
Connector Name	WIRE TO WIRE
Connector Color	WHITE



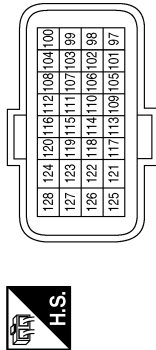
Terminal No.	Color of Wire	Signal Name
11	Y	-
16	V	-

Connector No.	E63
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.	E32
Connector Name	ECM (WITH VQ35DE)
Connector Color	BLACK



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

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	O	-(WITH QR25DE)
1	LG	-(WITH VQ35DE)
2	W	-(WITH QR25DE)
2	Y	-(WITH VQ35DE)
3	R	-(WITH QR25DE)
3	G	-(WITH VQ35DE)
4	G	-(WITH QR25DE)
4	W	-(WITH VQ35DE)

Connector No.	F4
Connector Name	FUSIBLE LINK BOX (BATTERY)
Connector Color	-



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

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CHARGING SYSTEM

< WIRING DIAGRAM >

Connector No.	F7
Connector Name	GENERATOR
Connector Color	BLACK



Terminal No.	Color of Wire	Signal Name
2	V	-
3	Y	-
4	SB	-(WITH QR25DE)
4	LG	-(WITH VQ35DE)

Connector No.	F13
Connector Name	ECM (QR25DE EXCEPT FOR CALIFORNIA)
Connector Color	BROWN



49	53	57	61	65	69	73	77	81	85	89	93
50	54	58	62	66	70	74	78	82	86	90	94
51	55	59	63	67	71	75	79	83	87	91	95
52	56	60	64	68	72	76	80	84	88	92	96

Terminal No.	Color of Wire	Signal Name
61	W	BATTERY TEMPERATURE SENSOR
62	R	SENSOR GROUND
63	G	BATTERY CURRENT SENSOR
64	O	SENSOR POWER SUPPLY

Connector No.	F79
Connector Name	ECM (WITH VQ35DE)
Connector Color	BLACK



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	G	SENSOR GROUND
68	Y	BATTERY TEMPERATURE SENSOR
69	W	BATTERY CURRENT SENSOR
87	LG	SENSOR POWER SUPPLY

Connector No.	F84
Connector Name	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector Color	WHITE



62	63	64	65	66	67
68	69	70	71	72	73

Terminal No.	Color of Wire	Signal Name
71	SB	ALT C (WITH QR25DE)
71	LG	ALT C (WITH VQ35DE)

Connector No.	F90
Connector Name	ECM (QR25DE FOR CALIFORNIA)
Connector Color	BROWN



49	53	57	61	65	69	73	77	81	85	89	93
50	54	58	62	66	70	74	78	82	86	90	94
51	55	59	63	67	71	75	79	83	87	91	95
52	56	60	64	68	72	76	80	84	88	92	96

Terminal No.	Color of Wire	Signal Name
61	W	BATTERY TEMPERATURE SENSOR
62	R	SENSOR GROUND
63	G	BATTERY CURRENT SENSOR
64	O	SENSOR POWER SUPPLY

DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION >

BASIC INSPECTION

DIAGNOSIS AND REPAIR WORKFLOW

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

INFOID:0000000012591639

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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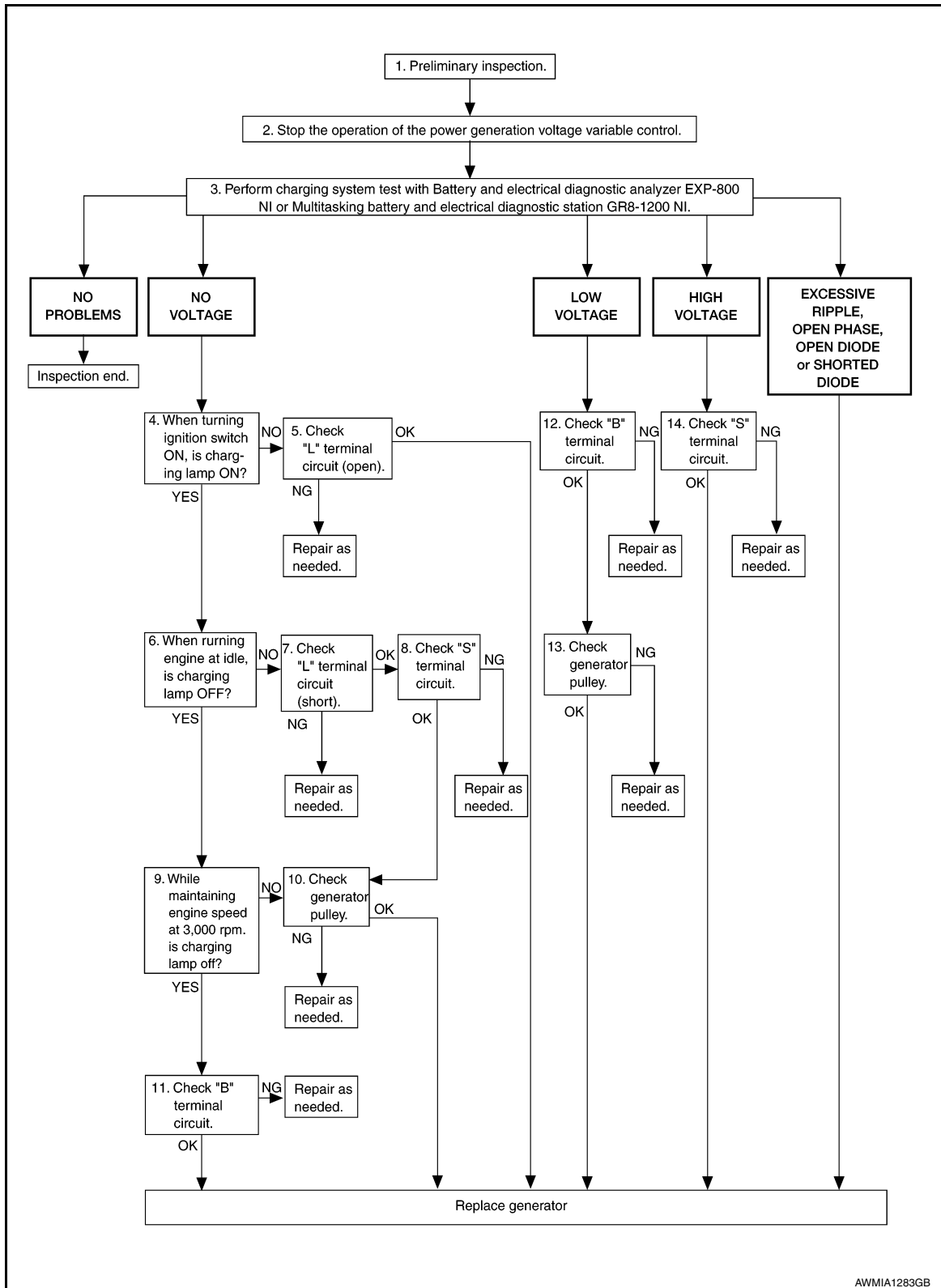
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DIAGNOSIS AND REPAIR WORKFLOW

< 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-23, "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 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-32. "QR25DE : Removal and Installation"](#) (QR25DE) or [CHG-34. "VQ35DE : Removal and Installation"](#) (VQ35DE). 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-27. "Diagnosis Procedure"](#).

Is the “L” terminal circuit normal?

YES >> Replace generator. Refer to [CHG-32. "QR25DE : Removal and Installation"](#) (QR25DE) or [CHG-34. "VQ35DE : Removal and Installation"](#) (VQ35DE).

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-29. "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-30. "Diagnosis Procedure"](#).

Is the “S” terminal circuit normal?

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DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION >

- YES >> GO TO 10.
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-32, "QR25DE : Removal and Installation"](#) (QR25DE) or [CHG-34, "VQ35DE : Removal and Installation"](#) (VQ35DE).

Is generator pulley normal?

- YES >> Replace generator. Refer to [CHG-32, "QR25DE : Removal and Installation"](#) (QR25DE) or [CHG-34, "VQ35DE : Removal and Installation"](#) (VQ35DE).
NO >> Repair as needed.

11. "B" TERMINAL CIRCUIT INSPECTION

Check "B" terminal circuit. Refer to [CHG-26, "Diagnosis Procedure"](#).

Is "B" terminal circuit normal?

- YES >> Replace generator. Refer to [CHG-32, "QR25DE : Removal and Installation"](#) (QR25DE) or [CHG-34, "VQ35DE : Removal and Installation"](#) (VQ35DE).
NO >> Repair as needed.

12. "B" TERMINAL CIRCUIT INSPECTION

Check "B" terminal circuit. Refer to [CHG-26, "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-32, "QR25DE : Removal and Installation"](#) (QR25DE) or [CHG-34, "VQ35DE : Removal and Installation"](#) (VQ35DE).

Is generator pulley normal?

- YES >> Replace generator. Refer to [CHG-32, "QR25DE : Removal and Installation"](#) (QR25DE) or [CHG-34, "VQ35DE : Removal and Installation"](#) (VQ35DE).
NO >> Repair as needed.

14. "S" TERMINAL CIRCUIT INSPECTION

Check "S" terminal circuit. Refer to [CHG-30, "Diagnosis Procedure"](#).

Is the "S" terminal circuit normal?

- YES >> Replace generator. Refer to [CHG-32, "QR25DE : Removal and Installation"](#) (QR25DE) or [CHG-34, "VQ35DE : Removal and Installation"](#) (VQ35DE).
NO >> Repair as needed.

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

INFOID:000000012591640

OVERALL SEQUENCE

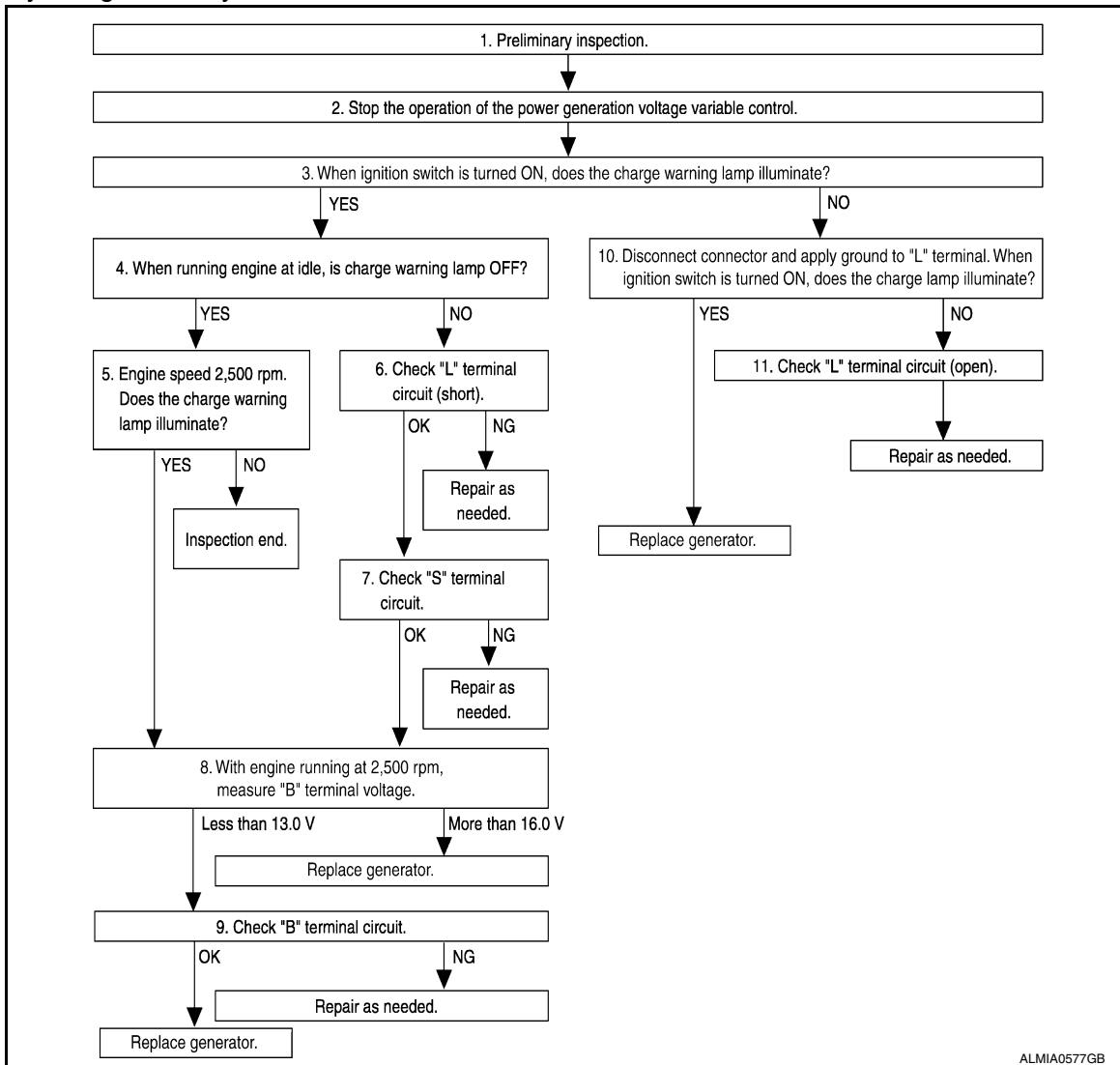
Before performing a generator test, make sure that the battery is fully charged. A 30-volt voltmeter and suitable test probes are necessary for the test.

- Before starting, inspect the fusible link.

DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION >

- Use fully charged battery.



DETAILED FLOW

1. PRELIMINARY INSPECTION

Perform the preliminary inspection. Refer to [CHG-23, "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 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.

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-29, "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-30, "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-32, "QR25DE : Removal and Installation"](#) (QR25DE) or [CHG-34, "VQ35DE : Removal and Installation"](#) (VQ35DE).

9.“B” TERMINAL CIRCUIT INSPECTION

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

Is the inspection result normal?

YES >> Replace generator. Refer to [CHG-32, "QR25DE : Removal and Installation"](#) (QR25DE) or [CHG-34, "VQ35DE : Removal and Installation"](#) (VQ35DE).
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-32, "QR25DE : Removal and Installation"](#) (QR25DE) or [CHG-34, "VQ35DE : Removal and Installation"](#) (VQ35DE).
NO >> GO TO 11.

11.CHECK “L” TERMINAL CIRCUIT (OPEN)

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

>> Repair as needed.

CHARGING SYSTEM PRELIMINARY INSPECTION

< DTC/CIRCUIT DIAGNOSIS >

DTC/CIRCUIT DIAGNOSIS

CHARGING SYSTEM PRELIMINARY INSPECTION

Diagnosis Procedure

INFOID:0000000012591641

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 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 FUSE

Check for blown fuse and fusible link.

Unit	Power source (Power supply terminals)	Fuse or Fusible Link
Generator	Battery (terminal 3)	Fuse 62
	Battery (terminal 1)	Fusible Link A
Combination meter	Ignition switch ON or START (terminal 2)	Fuse 31

Is the inspection result normal?

YES >> GO TO 3.

NO >> Replace the blown fuse or fusible link after repairing the affected circuit.

3. CHECK GENERATOR GROUND TERMINAL CONNECTION

Check if connector F7 terminal 4 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-32, "QR25DE : Removal and Installation"](#) (QR25DE) or [CHG-34, "VQ35DE : Removal and Installation"](#) (VQ35DE).

Is the inspection result normal?

YES >> Inspection End.

NO >> Repair as needed.

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POWER GENERATION VOLTAGE VARIABLE CONTROL SYSTEM OPERATION INSPECTION

< DTC/CIRCUIT DIAGNOSIS >

POWER GENERATION VOLTAGE VARIABLE CONTROL SYSTEM OPERATION INSPECTION

Diagnosis Procedure

INFOID:000000012591642

Regarding Wiring Diagram information. Refer to [CHG-12. "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-79. "CONSULT Function"](#) (QR25DE) or [EC-642. "CONSULT Function"](#) (VQ35DE).

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 "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 "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 "Self Diagnostic Result" of "IPDM E/R" 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 and IPDM E/R harness connector.

POWER GENERATION VOLTAGE VARIABLE CONTROL SYSTEM OPERATION INSPECTION

< DTC/CIRCUIT DIAGNOSIS >

Generator		IPDM E/R		Continuity
Connector	Terminal	Connector	Terminal	
F7	4	F84	71	Yes

4. Check continuity between generator harness connector and ground.

Generator		—	Continuity
Connector	Terminal		
F7	4	Ground	No

Is the inspection result normal?

YES >> Replace IPDM E/R. Refer to [PCS-47, "Removal and Installation"](#).

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

CHG

B TERMINAL CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

B TERMINAL CIRCUIT

Description

INFOID:000000012591643

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

Diagnosis Procedure

INFOID:000000012591644

Regarding Wiring Diagram information. Refer to [CHG-12, "Wiring Diagram"](#).

1. CHECK "B" TERMINAL CONNECTION

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

Is the inspection result normal?

YES >> GO TO 2.

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

2. CHECK "B" TERMINAL CIRCUIT

Check voltage between generator "B" terminal and ground.

(+)		(-)	Voltage (Approx.)
Generator			
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 "B" TERMINAL CONNECTION (VOLTAGE DROP TEST)

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

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

Is the inspection result normal?

YES >> "B" terminal circuit is normal. Refer to [CHG-17, "Work Flow \(With EXP-800 NI or GR8-1200 NI\)"](#) or [CHG-20, "Work Flow \(Without EXP-800 NI or GR8-1200 NI\)"](#).

NO >> Check harness between battery and generator for continuity.

L TERMINAL CIRCUIT (OPEN)

< DTC/CIRCUIT DIAGNOSIS >

L TERMINAL CIRCUIT (OPEN)

Description

INFOID:0000000012591645

The "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:0000000012591646

Regarding Wiring Diagram information. Refer to [CHG-12, "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-17, "Work Flow \(With EXP-800 NI or GR8-1200 NI\)"](#) or [CHG-20, "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	
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 and fuse block (J/B).

Combination meter		Fuse block (J/B)		Continuity
Connector	Terminal	Connector	Terminal	
M24	21	M5	8P	Yes

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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	21	Ground	When the ignition switch is in ON position	Battery voltage

Is the inspection result normal?

YES >> Replace the combination meter. Refer to [MWI-83. "Removal and Installation"](#).

NO >> Repair or replace the harness or connectors.

L TERMINAL CIRCUIT (SHORT)

< DTC/CIRCUIT DIAGNOSIS >

L TERMINAL CIRCUIT (SHORT)

Description

INFOID:000000012591647

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:000000012591648

Regarding Wiring Diagram information, refer to [CHG-12, "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-17, "Work Flow \(With EXP-800 NI or GR8-1200 NI\)"](#) or [CHG-20, "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		
M24	11		No

Is the inspection result normal?

YES >> Replace the combination meter. Refer to [MWI-83, "Removal and Installation"](#).

NO >> Repair or replace the harness or connectors.

CHG

S TERMINAL CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

S TERMINAL CIRCUIT

Description

INFOID:0000000012591649

The output voltage of the generator is controlled by the IC regulator at terminal "S" detecting the input voltage from battery.

The "S" terminal circuit detects the battery voltage to adjust the generator output voltage with the IC voltage regulator.

Diagnosis Procedure

INFOID:0000000012591650

Regarding Wiring Diagram information. Refer to [CHG-12, "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 and ground.

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

Is the inspection result normal?

YES >> Refer to [CHG-17, "Work Flow \(With EXP-800 NI or GR8-1200 NI\)"](#) or [CHG-20, "Work Flow \(Without EXP-800 NI or GR8-1200 NI\)"](#).

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

CHARGING SYSTEM

< SYMPTOM DIAGNOSIS >

SYMPTOM DIAGNOSIS

CHARGING SYSTEM

Symptom Table

INFOID:0000000012591651

Symptom	Reference
Battery discharged	Refer to CHG-17, "Work Flow (With EXP-800 NI or GR8-1200 NI)" or CHG-20, "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 >

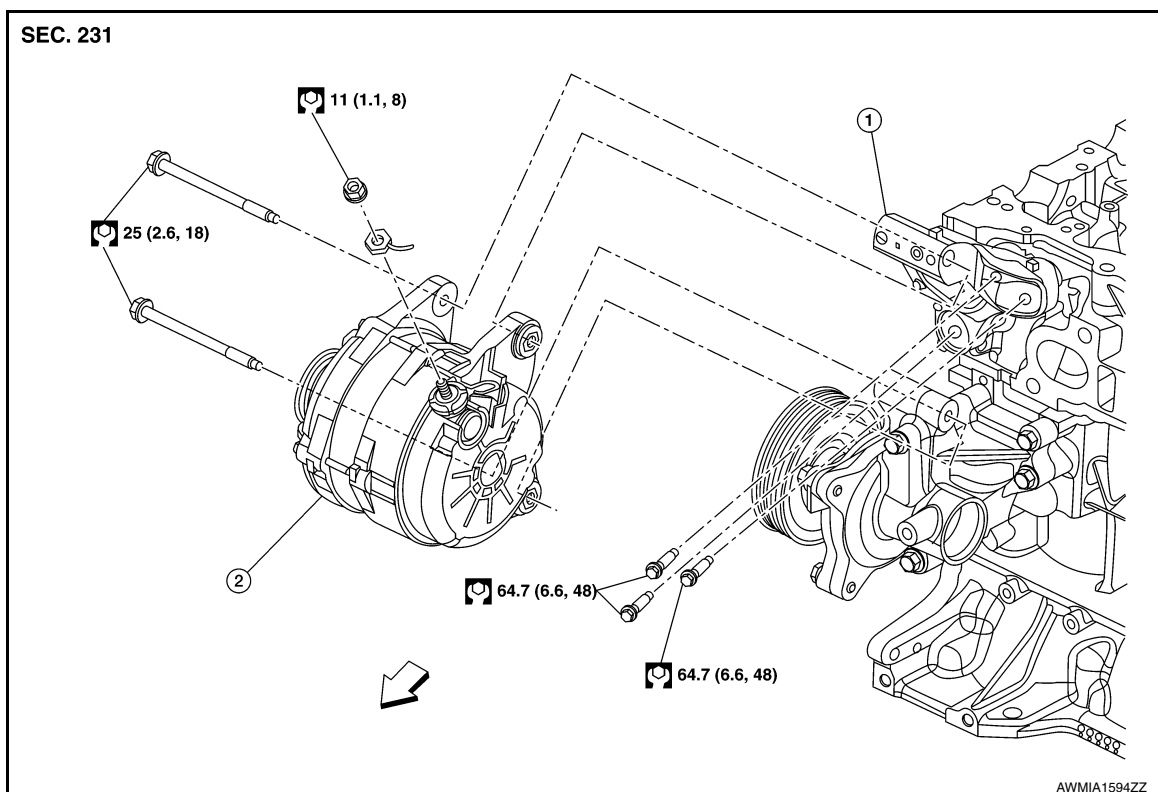
REMOVAL AND INSTALLATION

GENERATOR

QR25DE

QR25DE : Exploded View

INFOID:0000000012591652



1. Generator bracket

2. Generator

← Front

QR25DE : Removal and Installation

INFOID:0000000012591653

REMOVAL

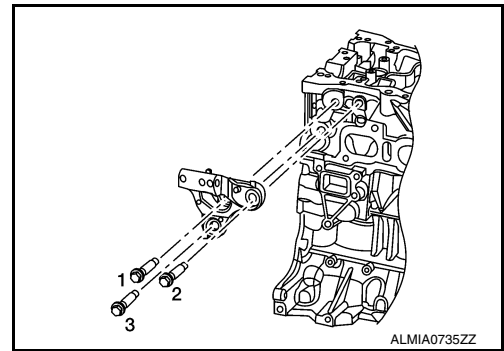
1. Disconnect the battery negative terminal. Refer to [PG-82, "Exploded View"](#).
2. Remove fender protector side cover (RH). Refer to [EXT-36, "FENDER PROTECTOR : Removal and Installation"](#).
3. Remove drive belt. Refer to [EM-19, "Removal and Installation"](#).
4. Remove engine room cover. Refer to [EM-28, "Removal and Installation"](#).
5. Remove "B" terminal nut.
6. Disconnect the harness connectors from the generator.
7. Remove generator bolts using power tool.
8. Remove generator assembly upward.
9. Remove generator bracket bolts using power tool.
10. Remove generator bracket.

INSTALLATION

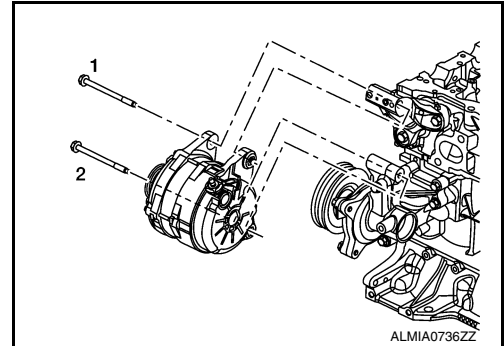
GENERATOR

< REMOVAL AND INSTALLATION >

1. Install generator bracket and tighten bolts in the numerical order as shown.



2. Install generator and temporarily tighten bolts in the reverse numerical order as shown.
3. Tighten generator bolts in the numerical order as shown.



4. Installation of remaining components is in the reverse order of removal.

CAUTION:

Be sure to tighten "B" terminal nut carefully.

NOTE:

- Install generator and check tension of belt. Refer to [EM-19. "Checking Drive Belts"](#).
- This model is equipped with a power generation voltage variable control system. Therefore, perform an inspection of the power generation voltage variable control system operation after replacing the generator. Refer to [CHG-10. "System Description"](#).

VQ35DE

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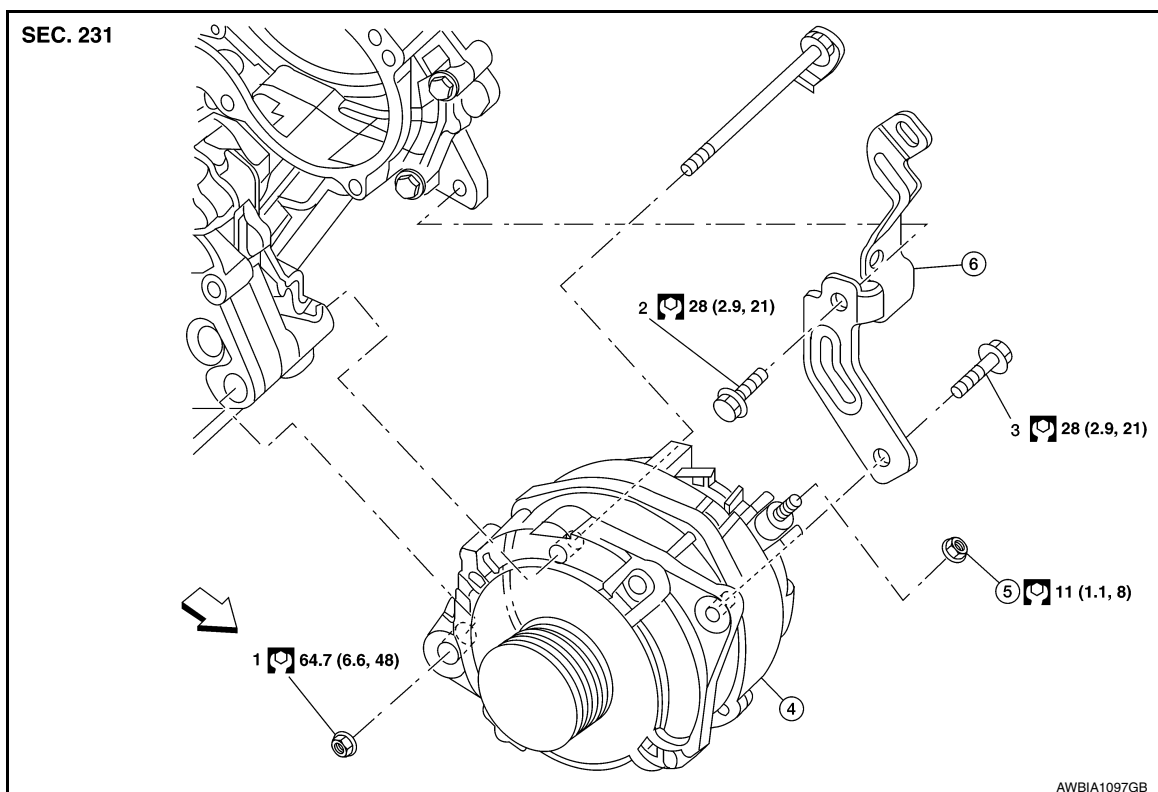
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GENERATOR

< REMOVAL AND INSTALLATION >

VQ35DE : Exploded View

INFOID:000000012591654



1 - 3 Tightening sequence

4. Generator

5. B terminal nut

6. Generator bracket

⇐ Front

VQ35DE : Removal and Installation

INFOID:000000012591655

REMOVAL

NOTE:

When removing components such as hoses, tubes/lines, etc., cap or plug openings to prevent fluid from spilling.

1. Remove battery tray. Refer to [PG-80, "Removal and Installation"](#).
2. Partially drain engine coolant. Refer to [CO-35, "Changing Engine Coolant"](#).
3. Remove front wheel and tire (RH) using power tool. Refer to [WT-54, "Adjustment"](#).
4. Remove fender protector side cover (RH). Refer to [EXT-36, "FENDER PROTECTOR : Removal and Installation"](#).
5. Remove cooling fan assembly and shroud. Refer to [CO-39, "Removal and Installation"](#).
6. Release clip and reposition power steering tube. Refer to [ST-39, "Exploded View"](#).
7. Remove the A/C compressor. Refer to [HA-30, "COMPRESSOR : Removal and Installation"](#).
8. Disconnect oil pressure switch. Refer to [EM-230, "Exploded View"](#).
9. Disconnect the harness connectors from the generator.
10. Remove the generator bracket.
11. Remove the generator bolts and nut using power tool.
12. Slide the generator out and remove.

INSTALLATION

Installation is in the reverse order of removal.

CAUTION:

Be sure to tighten "B" terminal nut carefully.

NOTE:

GENERATOR

< REMOVAL AND INSTALLATION >

- Perform "Throttle Valve Closed Position Learning". Refer to [EC-731, "Description"](#).
- Perform "Accelerator Pedal Release Position Learning". Refer to [EC-730, "Description"](#).
- Install generator and check tension of belt. Refer to [EM-136, "Checking Drive Belt"](#).
- This model is equipped with a power generation voltage variable control system. Therefore, perform an inspection of the power generation voltage variable control system operation after replacing the generator. Refer to [CHG-10, "System Description"](#).

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SERVICE DATA AND SPECIFICATIONS (SDS)

< SERVICE DATA AND SPECIFICATIONS (SDS)

SERVICE DATA AND SPECIFICATIONS (SDS)

SERVICE DATA AND SPECIFICATIONS (SDS)

Generator

INFOID:0000000012591656

Application	QR25DE	VQ35DE
Manufacturer	Mitsubishi	Mitsubishi
Part number*	A002TJ1881ZC	A003TJ3691ZC
Nominal rating	12V-110A	12V-130A
Ground polarity	Negative	
Minimum revolution	1,000 rpm	1,000 rpm
Hot output current (When 13.5 volts is applied)	More than 95A/2,500 rpm More than 116A/5,000 rpm	More than 108A/2,500 rpm More than 124A/5,000 rpm
Regulated output voltage @ 20°C	14.1V - 14.7V	14.1V - 14.7V
Adjustment range of power generation variable voltage control	11.3V - 15.6V	11.3V - 15.6V

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