SECTION CHG
CHARGING SYSTEM

CONTENTS

BASIC INSPECTION

DIAGNOSIS AND REPAIR WORKFLOW

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

INFOID:0000000007422128

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

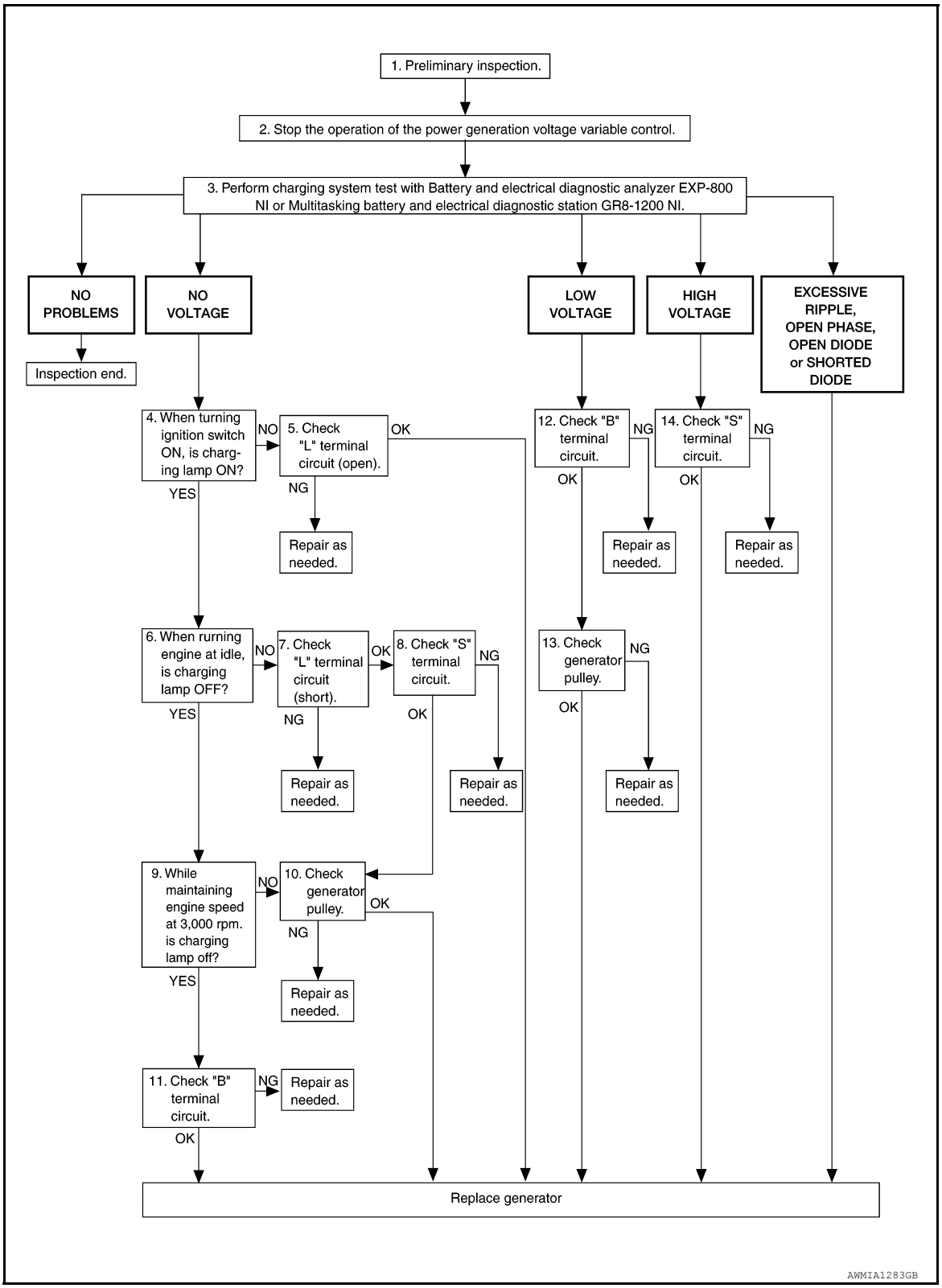
To test the charging system, use the following special service tools:

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

NOTE:

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

OVERALL SEQUENCE



DETAILED FLOW

NOTE:

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

1.PRELIMINARY INSPECTION

Perform the preliminary inspection. Refer to CHG-10, "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” 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-26, "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-13, "Diagnosis Procedure".

Is the “L” terminal circuit normal?

YES >> Replace generator. Refer to CHG-26, "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-15, "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-16, "Diagnosis Procedure".

Is the “S” terminal circuit normal?

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 EM-16, "Checking Drive Belts" (QR25DE) or EM-123, "Checking Drive Belts" (VQ35DE).

Is generator pulley normal?

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

11. "B" TERMINAL CIRCUIT INSPECTION

Check "B" terminal circuit. Refer to CHG-12, "Diagnosis Procedure".

Is "B" terminal circuit normal?

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

12. "B" TERMINAL CIRCUIT INSPECTION

Check "B" terminal circuit. Refer to CHG-12, "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 EM-16, "Checking Drive Belts" (QR25DE) or EM-123, "Checking Drive Belts" (VQ35DE).

Is generator pulley normal?

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

14. "S" TERMINAL CIRCUIT INSPECTION

Check "S" terminal circuit. Refer to CHG-16, "Diagnosis Procedure".

Is the "S" terminal circuit normal?

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

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

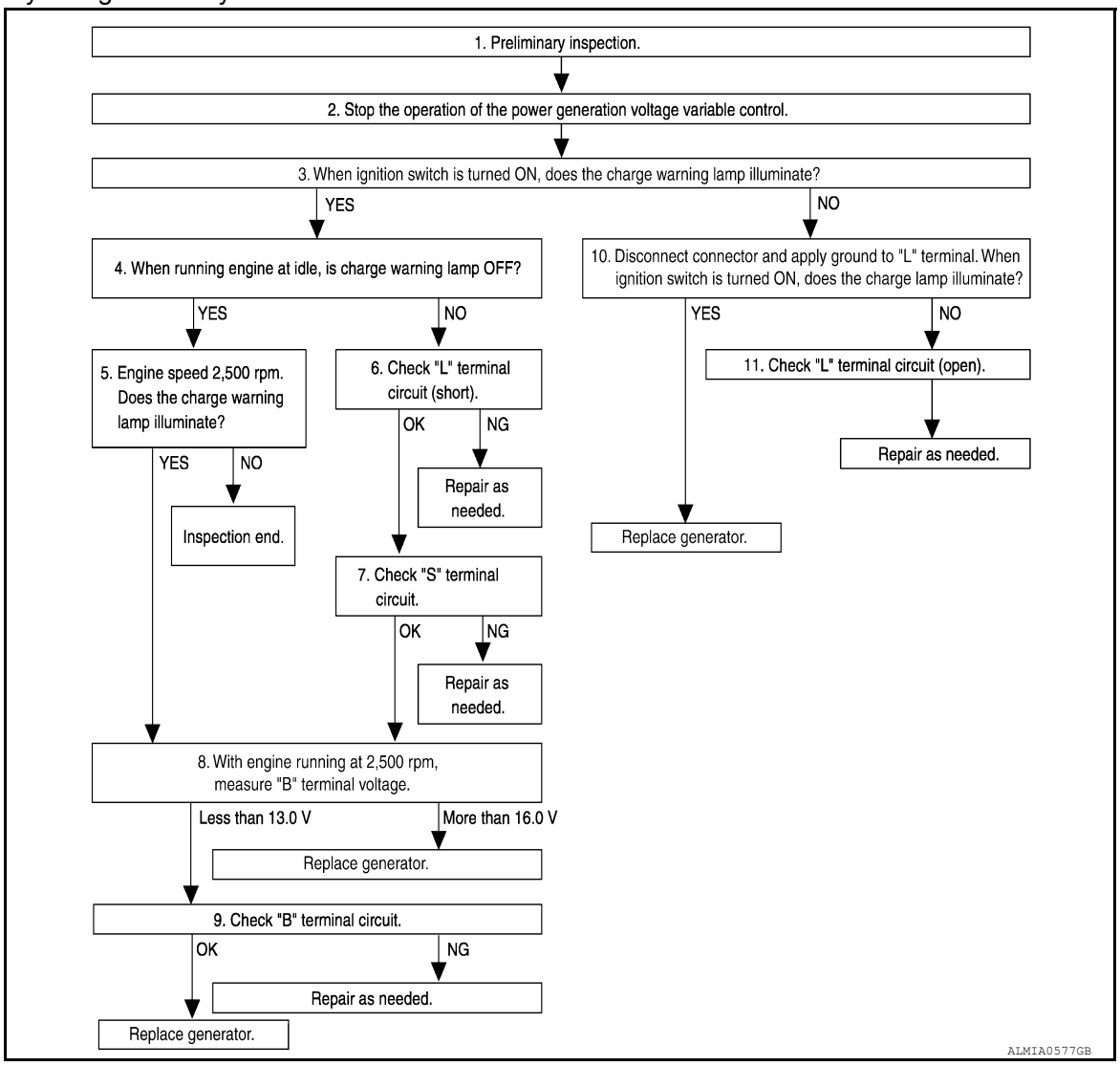
INFOID:0000000009325995

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.

• Use fully charged battery.



DETAILED FLOW

1.PRELIMINARY INSPECTION

Perform the preliminary inspection. Refer to CHG-10, "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?

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-15, "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-16, "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-26, "Removal and Installation".

9. "B" TERMINAL CIRCUIT INSPECTION

Check "B" terminal circuit. Refer to CHG-12, "Diagnosis Procedure".

Is the inspection result normal?

YES >> Replace generator. Refer to CHG-26, "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-26, "Removal and Installation".
NO >> GO TO 11.

11. CHECK "L" TERMINAL CIRCUIT (OPEN)

Check "L" terminal circuit (OPEN). Refer to CHG-13, "Diagnosis Procedure".

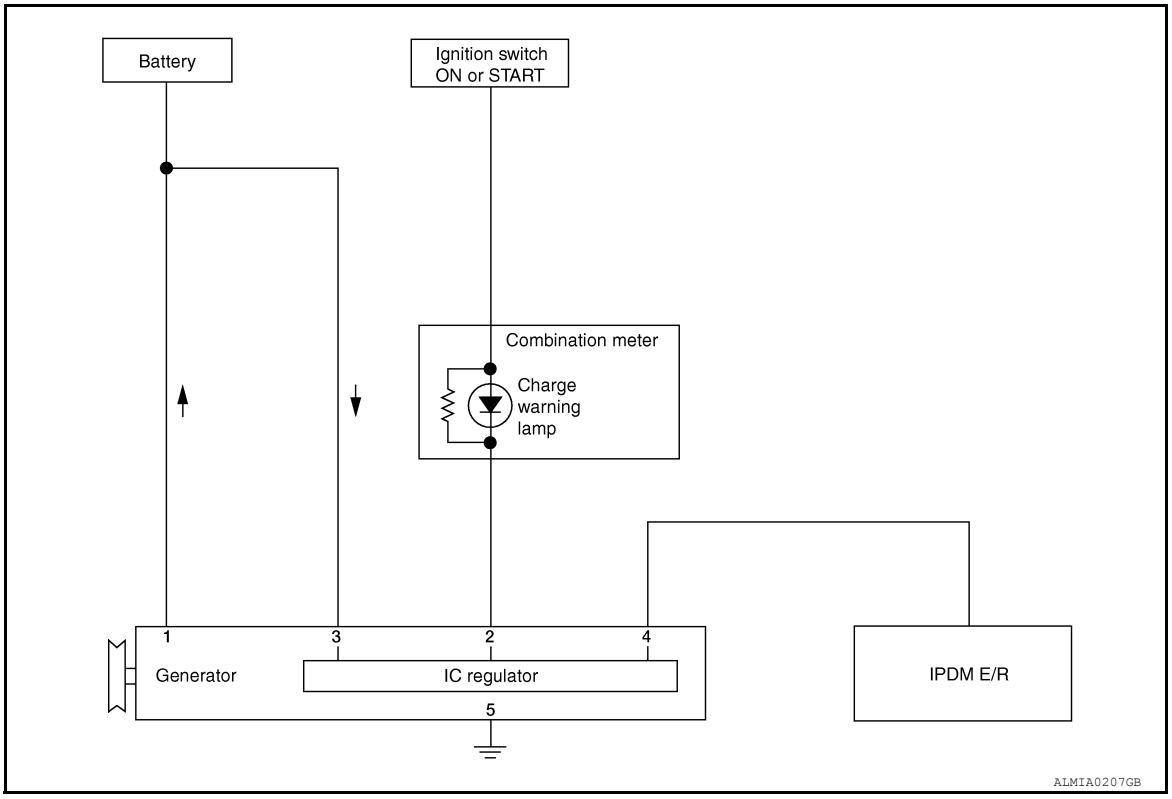
>> Repair as needed.

SYSTEM DESCRIPTION

CHARGING SYSTEM

System Diagram

INFOID:0000000007422129



System Description

INFOID:0000000007422130

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

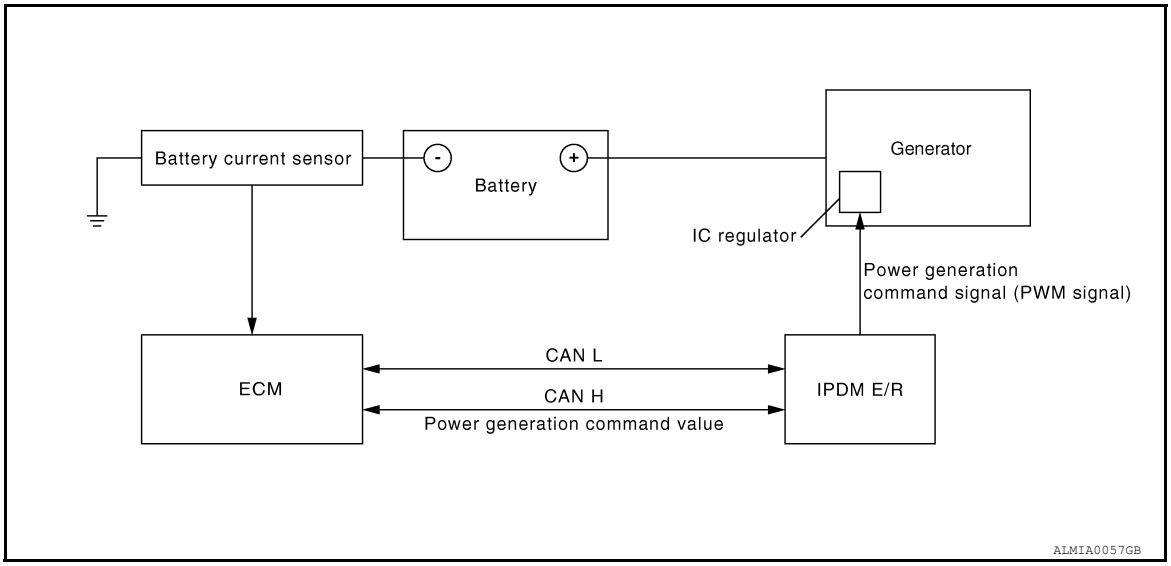
INFOID:0000000007422131

Component part		Description
Generator	Terminal “1”	Refer to CHG-12, "Description".
	Terminal “2”	Refer to CHG-13, "Description".
	Terminal “3”	Refer to CHG-16, "Description".
	Terminal “4”	Used for the power generation voltage variable control system. Refer to CHG-9, "System Description".
Combination meter (Charge warning lamp)		The IC regulator warning function activates to illuminate the charge warning lamp if any of the following symptoms occur while generator is operating: • Excessive voltage is produced. • No voltage is produced.
IPDM E/R		Used for the power generation voltage variable control system. Refer to CHG-9, "System Description".

POWER GENERATION VOLTAGE VARIABLE CONTROL SYSTEM

System Diagram

INFOID:0000000007422132



System Description

INFOID:0000000007422133

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. For more information. Refer to EC-239, "Description".

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:0000000007422134

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

DTC/CIRCUIT DIAGNOSIS

CHARGING SYSTEM PRELIMINARY INSPECTION

Diagnosis Procedure

INFOID:0000000007422135

1.CHECK BATTERY TERMINALS CONNECTION

Check if battery terminals are clean and tight.

Is the inspection result normal?

YES >> GO TO 2
NO >> Repair battery terminals connection. Confirm repair by performing complete Charging system test using EXP-800 NI or GR-8-1200 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 29
	Battery (terminal 1)	Fusible Link **A**
Combination meter	Ignition switch ON (terminal 2)	Fuse 4

Is the inspection result normal?

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

3.CHECK GENERATOR GROUND TERMINAL CONNECTION

Check if connector E230 terminal 5 (generator ground harness) is clean and tight.

Is the inspection result normal?

YES >> GO TO 4
NO >> Repair connection.

4.CHECK DRIVE BELT TENSION

Check drive belt tension. Refer to EM-16, "Checking Drive Belts" (QR25DE) or EM-123, "Checking Drive Belts" (VQ35DE).

Is the inspection result normal?

YES >> Inspection End.
NO >> Repair as needed.

POWER GENERATION VOLTAGE VARIABLE CONTROL SYSTEM OPERATION INSPECTION

Diagnosis Procedure

INFOID:0000000007422136

Regarding Wiring Diagram information, refer to CHG-17, "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 ELECTRICAL LOAD SIGNAL

Perform electrical load tests. Refer to EC-239, "Component Function Check".

Is the inspection result normal?

YES >> GO TO 2

NO >> Check applicable parts, and repair or replace corresponding parts.

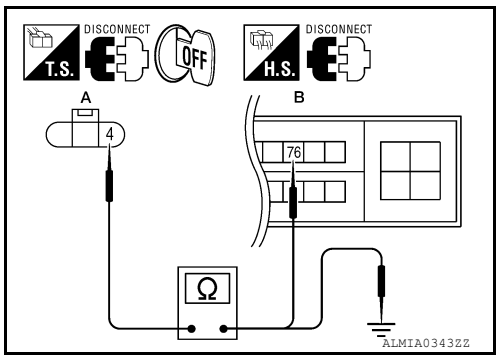
2.CHECK HARNESS BETWEEN GENERATOR AND IPDM E/R

1. Turn ignition switch OFF.
2. Disconnect generator connector and IPDM E/R connector.
3. Check continuity between generator harness connector F7 (A) terminal 4 and IPDM E/R harness connector F10 (B) terminal 76.

4 - 76 Continuity should exist

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

4 - ground Continuity should not exist



Is the inspection result normal?

YES >> Replace IPDM E/R. Refer to PCS-45, "Removal and Installation".

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

B TERMINAL CIRCUIT

Description

INFOID:0000000007422137

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

Diagnosis Procedure

INFOID:0000000007422138

Regarding Wiring Diagram information, refer to CHG-17, "Wiring Diagram".

1.CHECK TERMINAL “1” CONNECTION

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

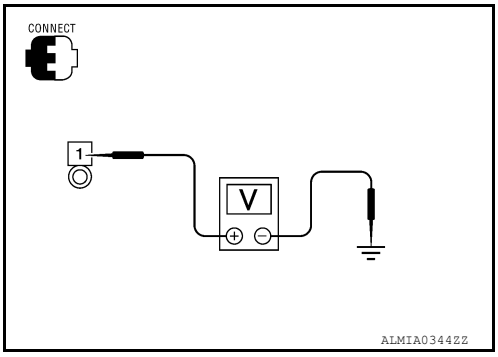
Is the inspection result normal?

YES >> GO TO 2
NO >> Repair terminal “1” connection. Confirm repair by performing complete Charging system test using EXP-800 NI or GR8-1200 NI (if available). Refer to the applicable Instruction Manual for proper testing procedures.

2.CHECK TERMINAL “1” CIRCUIT

Check voltage between generator connector F6 terminal 1 and ground.

1 - ground	**Battery voltage**



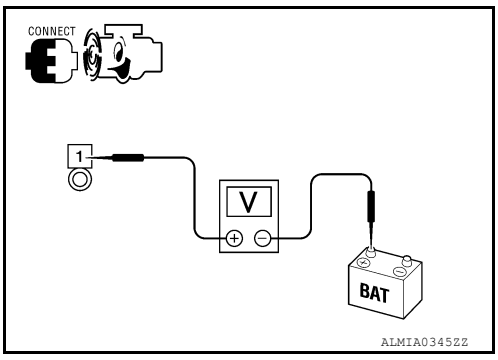
Is the inspection result normal?

YES >> GO TO 3.
NO >> Check harness for open between generator and fusible link.

3.CHECK TERMINAL “1” CONNECTION (VOLTAGE DROP TEST)

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

1 - B+	**Less than 0.2V**



Is the inspection result normal?

YES >> Terminal “1” circuit is normal. Refer to CHG-2, "Work Flow (With EXP-800 NI or GR8-1200 NI)" or CHG-5, "Work Flow (Without EXP-800 NI or GR8-1200 NI)".
NO >> Check harness between battery and generator for high resistance.

L TERMINAL CIRCUIT (OPEN)

Description

INFOID:0000000007422139

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

Diagnosis Procedure

INFOID:0000000007422140

Regarding Wiring Diagram information. Refer to CHG-17, "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-2, "Work Flow (With EXP-800 NI or GR8-1200 NI)" or CHG-5, "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	25	Yes

Is the inspection result normal?

YES >> GO TO 4.
NO >> Repair or replace the harness or connectors.

4.CHECK HARNESS CONTINUITY (OPEN CIRCUIT)

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

Combination meter		Fuse box (J/B)		Continuity
Connector	Terminal	Connector	Terminal	
M24	2	M5	12M	Yes

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

Is the inspection result normal?

YES >> Replace the combination meter. Refer to MWI-139, "Removal and Installation".
NO >> Repair or replace the harness or connectors.

L TERMINAL CIRCUIT (SHORT)

Description

INFOID:0000000009325996

The terminal “2” (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:0000000009325997

Regarding Wiring Diagram information, refer to CHG-17, "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-2, "Work Flow (With EXP-800 NI or GR8-1200 NI)" or CHG-5, "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	25		No

Is the inspection result normal?

YES >> Replace the combination meter. Refer to MWI-139, "Removal and Installation".
NO >> Repair or replace the harness or connectors.

S TERMINAL CIRCUIT

Description

INFOID:0000000007422141

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

Diagnosis Procedure

INFOID:0000000007422142

Regarding Wiring Diagram information, refer to CHG-17, "Wiring Diagram".

1.CHECK “S” TERMINAL CONNECTION

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

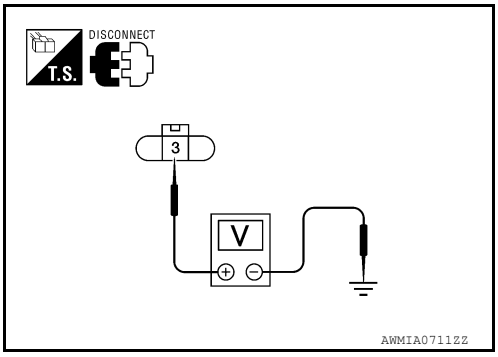
Is the inspection result normal?

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 applicable Instruction Manual for proper testing procedures.

2.CHECK VOLTAGE REGULATOR CIRCUIT

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



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

Does battery voltage exist?

YES >> Refer to CHG-2, "Work Flow (With EXP-800 NI or GR8-1200 NI)" or CHG-5, "Work Flow (Without EXP-800 NI or GR8-1200 NI)".

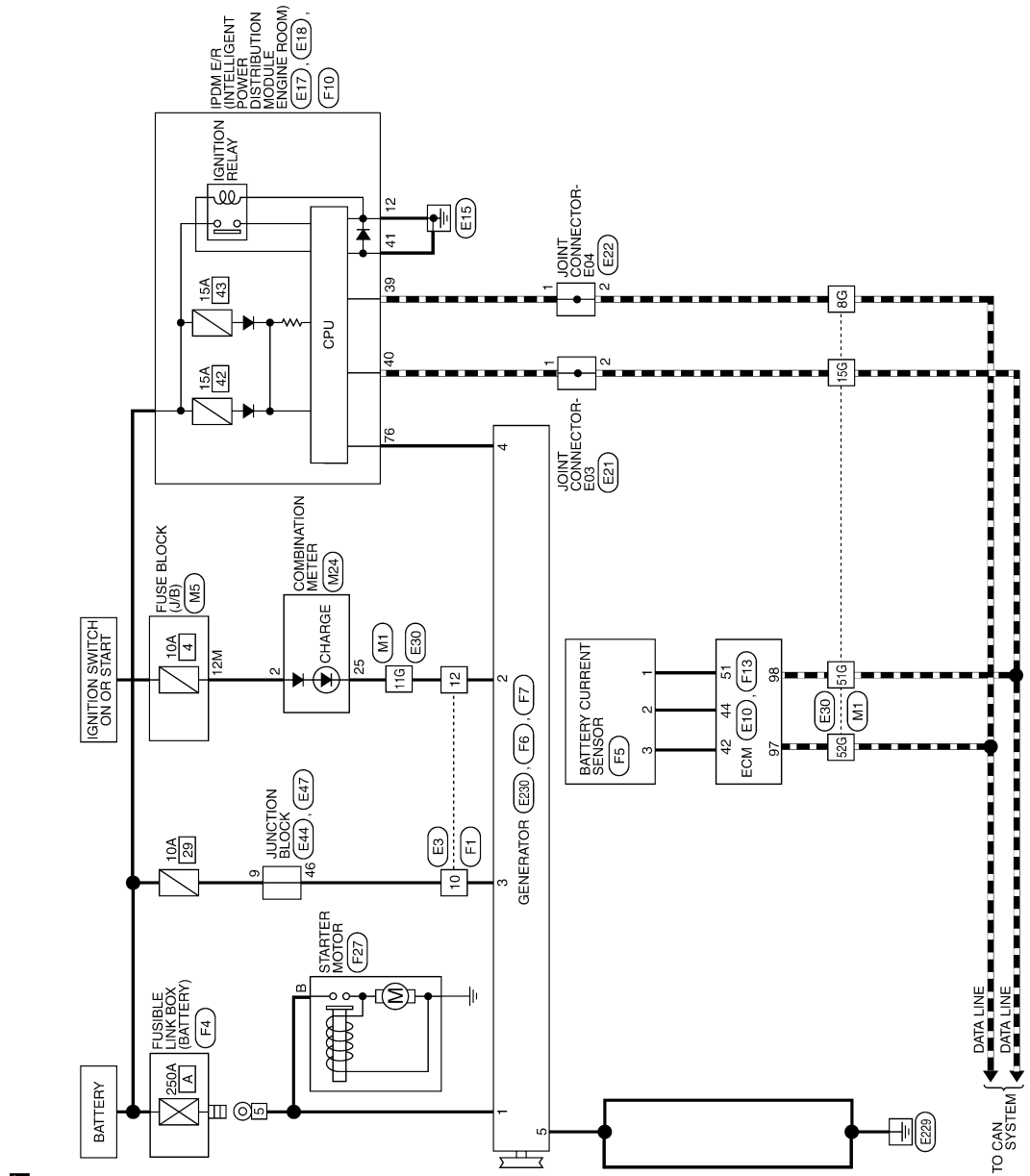
NO >> Check harness for open between generator and fuse.

WIRING DIAGRAM

CHARGING SYSTEM

Wiring Diagram

INFOID:0000000007422143



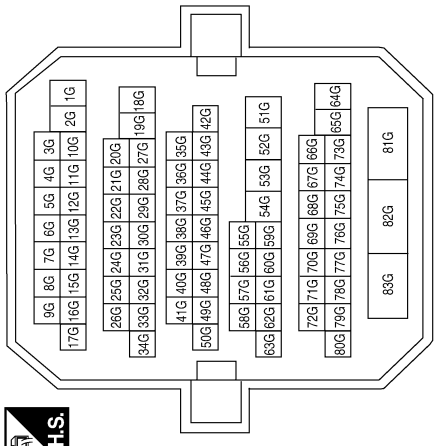
CHARGING SYSTEM

AAMWA0324GB

CHARGING SYSTEM CONNECTORS

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

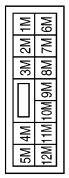
H.S.



Terminal No.	Color of Wire	Signal Name
8G	P	–
11G	BR	–
15G	L	–
51G	L	–
52G	P	–

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

H.S.



Terminal No.	Color of Wire	Signal Name
12M	O	–

Connector No.	M24
Connector Name	COMBINATION METER
Connector Color	WHITE

H.S.

Terminal No.	Color of Wire	Signal Name
2	O	IGN
25	BR	CHG

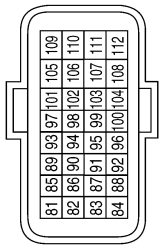
Connector No.	E3
Connector Name	WIRE TO WIRE
Connector Color	WHITE

H.S.

Terminal No.	Color of Wire	Signal Name
10	W	–
12	LG	–

Connector No.	E10
Connector Name	ECM
Connector Color	BLACK

H.S.



Terminal No.	Color of Wire	Signal Name
97	P	CAN-L
98	L	CAN-H

ABMIA1885GB

Connector No.	E17
Connector Name	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector Color	WHITE

H.S.

42 41 40 39
46 45 44 43

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

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

H.S.

9 10 11 12 13 14
3 4 5 6 7 8

25 26 27 28 29 30 31 32 33 34
15 16 17 18 19 20 21 22 23 24

37 38
35 36

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

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

H.S.

4 3 2 1

Terminal No.	Color of Wire	Signal Name
1	L	–
2	L	–

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

H.S.

4 3 2 1

Terminal No.	Color of Wire	Signal Name
1	P	–
2	P	–

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

H.S.

1G 2G 3G 4G 5G 6G 7G 8G 9G
10G 11G 12G 13G 14G 15G 16G 17G
18G 19G 20G 21G 22G 23G 24G 25G 26G
27G 28G 29G 30G 31G 32G 33G 34G
35G 36G 37G 38G 39G 40G 41G
42G 43G 44G 45G 46G 47G 48G 49G 50G
51G 52G 53G 54G 55G 56G 57G 58G
59G 60G 61G 62G 63G
64G 65G 66G 67G 68G 69G 70G 71G 72G
73G 74G 75G 76G 77G 78G 79G 80G
81G 82G 83G

Terminal No.	Color of Wire	Signal Name
8G	P	–
11G	LG	–
15G	L	–
51G	L	–
52G	P	–

ABMIA1886GB

Connector No.	E230
Connector Name	GENERATOR
Connector Color	–

H.S.

5

Terminal No.	Color of Wire	Signal Name
5	B	GND

Connector No.	E47
Connector Name	JUNCTION BLOCK
Connector Color	WHITE

H.S.

42 | 41
46 | 45 | 44 | 43

Terminal No.	Color of Wire	Signal Name
46	W	–

Connector No.	E44
Connector Name	JUNCTION BLOCK
Connector Color	BROWN

H.S.

5 | 4 | 3 | 2 | 1
12 | 11 | 10 | 9 | 8 | 7 | 6

Terminal No.	Color of Wire	Signal Name
9	BR	–

Connector No.	F5
Connector Name	BATTERY CURRENT SENSOR
Connector Color	BLACK

H.S.

1 | 2 | 3

Terminal No.	Color of Wire	Signal Name
1	BR	AVCC1 (WITH QR25DE)
1	P	AVCC1 (WITH VQ35DE)
2	B	GND (WITH QR25DE)
2	O	GND (WITH VQ35DE)
3	Y	SIGNAL (WITH QR25DE)
3	G	SIGNAL (WITH VQ35DE)

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

H.S.

5

Terminal No.	Color of Wire	Signal Name
5	B/R	BATT

Connector No.	F1
Connector Name	WIRE TO WIRE
Connector Color	WHITE

H.S.

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

Terminal No.	Color of Wire	Signal Name
10	G	– (WITH QR25DE)
10	O	– (WITH VQ35DE)
12	BR	–

AAMIA0607GB

Connector No.	F6
Connector Name	GENERATOR
Connector Color	–

H.S.

1

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

Connector No.	F7
Connector Name	GENERATOR
Connector Color	BLACK

H.S.

4 3 2

Terminal No.	Color of Wire	Signal Name
2	BR	CHG
3	G	BATT (WITH QR25DE)
3	O	BATT (WITH VQ35DE)
4	Y	–

Connector No.	F10
Connector Name	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector Color	WHITE

H.S.

53	54	55	56	57	58
47	48	49	50	51	52

69	70	71	72	73	74	75	76	77	78	81	82
59	60	61	62	63	64	65	66	67	68	79	80

Terminal No.	Color of Wire	Signal Name
76	Y	ALT-C

Connector No.	F13
Connector Name	ECM
Connector Color	BROWN

H.S.

33	37	41	45	49	53	57	61	65	69	73	77
34	38	42	46	50	54	58	62	66	70	74	78
35	39	43	47	51	55	59	63	67	71	75	79
36	40	44	48	52	56	60	64	68	72	76	80

Terminal No.	Color of Wire	Signal Name
42	Y	CURSEN (WITH QR25DE)
42	G	CURSEN (WITH VQ35DE)
44	B	GNDA-CURSEN (WITH QR25DE)
44	O	GNDA-CURSEN, INTPRES1 (WITH VQ35DE)
51	BR	AVCC1-CURSEN (QR25DE)
51	P	AVCC1-CURSEN, INTPRES1 (WITH VQ35DE)

Connector No.	F27
Connector Name	STARTER MOTOR
Connector Color	–

H.S.

B

Terminal No.	Color of Wire	Signal Name
B	B/R	BATT

AAMIA0608GB

SYMPTOM DIAGNOSIS

CHARGING SYSTEM

Symptom Table

INFOID:0000000007422144

Symptom	Reference
Battery discharged	Refer to CHG-2, "Work Flow (With EXP-800 NI or GR8-1200 NI)" or CHG-5, "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.	

PRECAUTION

PRECAUTIONS

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

INFOID:0000000007422145

The Supplemental Restraint System such as “AIR BAG” and “SEAT BELT PRE-TENSIONER”, used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. This system includes seat belt switch inputs and dual stage front air bag modules. The SRS system uses the seat belt switches to determine the front air bag deployment, and may only deploy one front air bag, depending on the severity of a collision and whether the front occupants are belted or unbelted.
Information necessary to service the system safely is included in the SR and SB section of this Service Manual.

WARNING:

- **To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.**
- **Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the SR section.**
- **Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.**

PRECAUTIONS WHEN USING POWER TOOLS (AIR OR ELECTRIC) AND HAMMERS

WARNING:

- **When working near the Airbag Diagnosis Sensor Unit or other Airbag System sensors with the Ignition ON or engine running, DO NOT use air or electric power tools or strike near the sensor(s) with a hammer. Heavy vibration could activate the sensor(s) and deploy the air bag(s), possibly causing serious injury.**
- **When using air or electric power tools or hammers, always switch the Ignition OFF, disconnect the battery, and wait at least 3 minutes before performing any service.**

Precaution Necessary for Steering Wheel Rotation After Battery Disconnect

INFOID:0000000007422146

NOTE:

- Before removing and installing any control units, first turn the push-button ignition switch to the LOCK position, then disconnect both battery cables.
- After finishing work, confirm that all control unit connectors are connected properly, then re-connect both battery cables.
- Always use CONSULT to perform self-diagnosis as a part of each function inspection after finishing work. If a DTC is detected, perform trouble diagnosis according to self-diagnosis results.

This vehicle is equipped with a push-button ignition switch and a steering lock unit.
If the battery is disconnected or discharged, the steering wheel will lock and cannot be turned.
If turning the steering wheel is required with the battery disconnected or discharged, follow the procedure below before starting the repair operation.

OPERATION PROCEDURE

1. Connect both battery cables.
   NOTE:
   Supply power using jumper cables if battery is discharged.
2. Carry the Intelligent Key or insert it to the key slot and turn the push-button ignition switch to ACC position. (At this time, the steering lock will be released.)
3. Disconnect both battery cables. The steering lock will remain released with both battery cables disconnected and the steering wheel can be turned.
4. Perform the necessary repair operation.

5. When the repair work is completed, re-connect both battery cables. With the brake pedal released, turn the push-button ignition switch from ACC position to ON position, then to LOCK position. (The steering wheel will lock when the push-button ignition switch is turned to LOCK position.)
6. Perform self-diagnosis check of all control units using CONSULT.

Precaution for Power Generation Voltage Variable Control System

INFOID:0000000007422147

CAUTION:

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

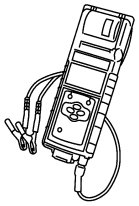
PREPARATION

PREPARATION

Special Service Tool

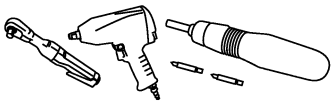
INFOID:0000000007422148

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

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

Commercial Service Tool

INFOID:0000000007422149

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

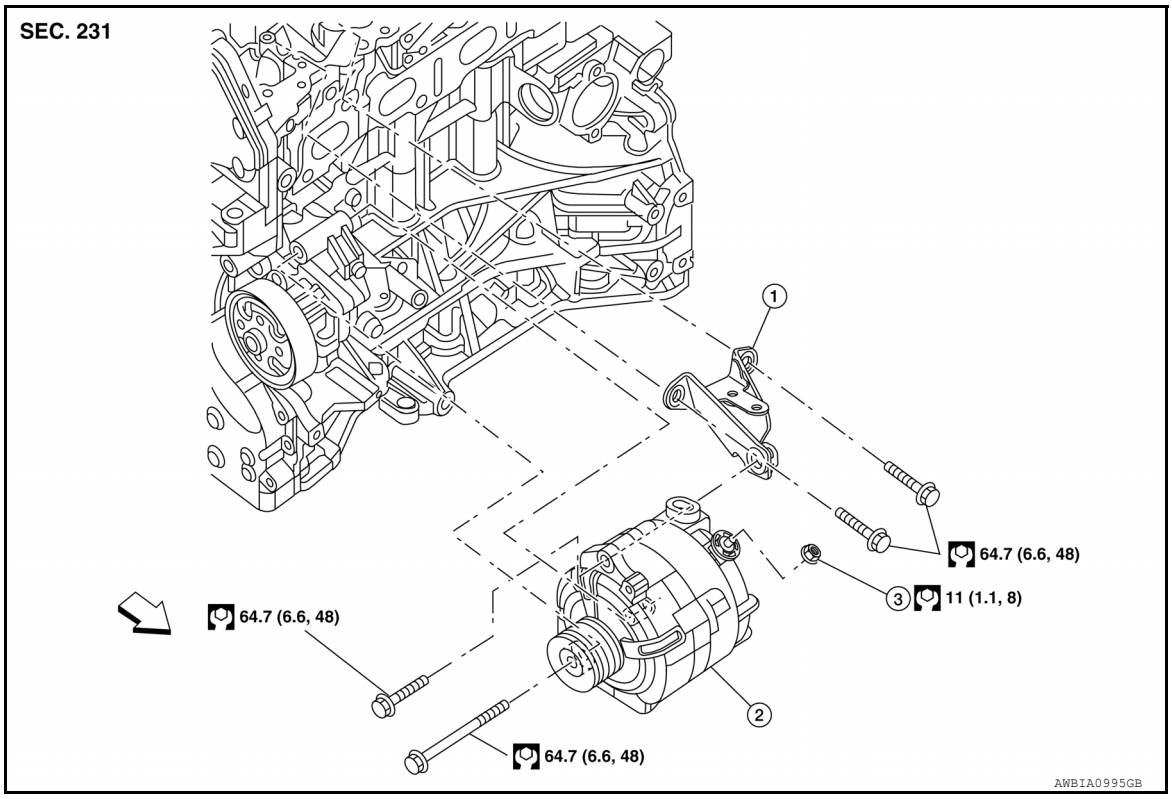
REMOVAL AND INSTALLATION

GENERATOR

Removal and Installation

INFOID:0000000007422150

QR25DE



1. Generator bracket
2. Generator
3. B terminal nut

⇦ Front

Removal

1. Disconnect the battery negative terminal. Refer to PG-68, "Removal and Installation (Battery)" (Coupe models) or PG-140, "Removal and Installation (Battery)" (Sedan models).
2. Remove fender protector side cover (RH). Refer to EXT-22, "Removal and Installation" (Coupe models) or EXT-46, "Removal and Installation" (Sedan models).
3. Remove drive belt. Refer to EM-16, "Removal and Installation".
4. Remove engine room cover.
5. Remove “B” terminal nut.
6. Disconnect the generator harness connectors.
7. Remove the generator bolts, using power tools.
8. Remove the generator assembly upward.

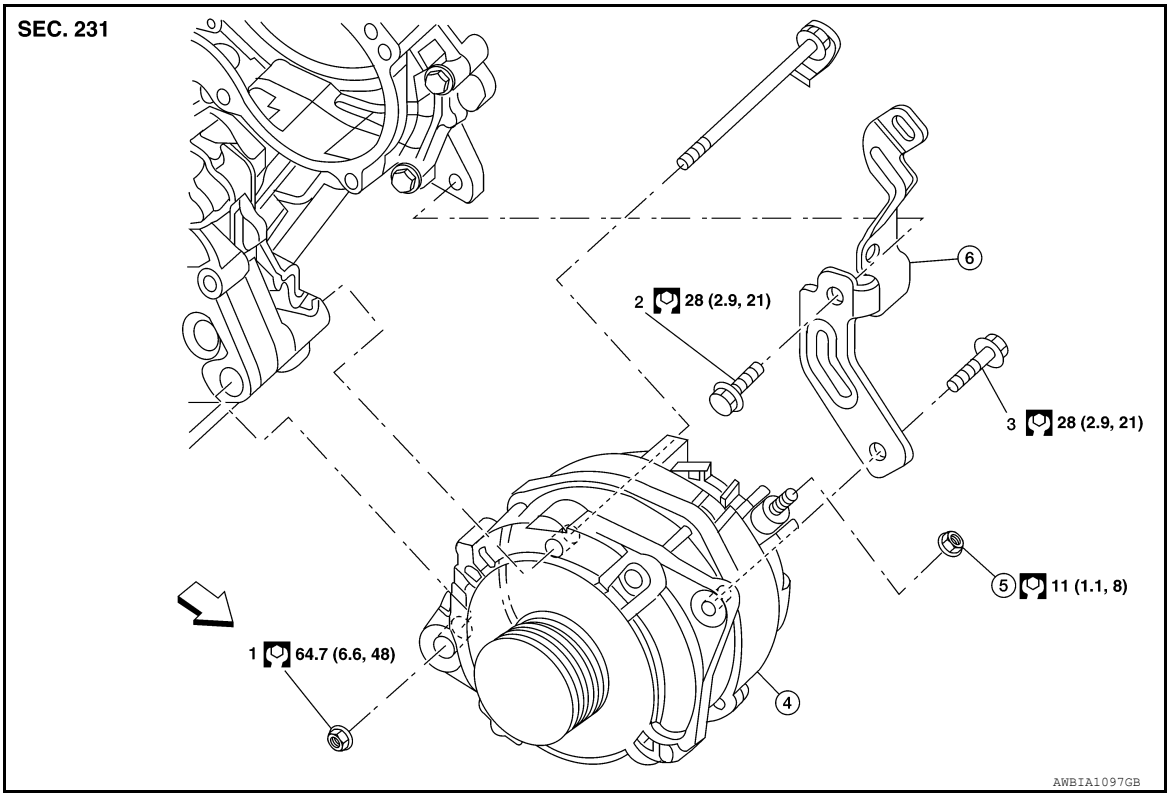
Installation

Installation is in the reverse order of removal.

CAUTION:

Be sure to tighten “B” terminal nut carefully.

- Check tension of drive belt. Refer to EM-16, "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-9, "System Description".



1.-3. Tightening order
4. Generator
5. B terminal nut
6. Generator bracket
⇦ Front

Removal

1. Disconnect the battery negative terminal. Refer to PG-68, "Removal and Installation (Battery)" (Coupe models) or PG-140, "Removal and Installation (Battery)" (Sedan models).
2. Remove engine undercover. Refer to EXT-16, "Removal and Installation - Coupe" (Coupe models) or EXT-40, "Removal and Installation" (Sedan models).
3. Partially drain engine coolant. Refer to CO-36, "Changing Engine Coolant".
4. Remove engine room cover.
5. Remove RH front wheel and tire assembly. Refer to WT-68, "Adjustment".
6. Remove fender protector side cover (RH). Refer to EXT-22, "Removal and Installation" (Coupe models) or EXT-46, "Removal and Installation" (Sedan models).
7. Remove air cleaner and duct assembly. Refer to EM-132, "Removal and Installation".
8. Remove battery tray and bracket. Refer to PG-69, "Removal and Installation (Battery Tray)" (Coupe models) or PG-141, "Removal and Installation (Battery Tray)" (Sedan models).
9. Remove cooling fan assembly and shroud. Refer to CO-41, "Removal and Installation".
10. Remove drive belt. Refer to EM-123, "Removal and Installation".
11. Release the clip and reposition power steering tube.
12. Remove the A/C compressor. Refer to HA-32, "Removal and Installation for Compressor - VQ35DE Models".
13. Remove the A/C idler pulley.
14. Disconnect the oil pressure switch.
15. Disconnect the generator harness connectors.
16. Remove the generator bracket, using power tools.
17. Remove the generator bolt and nuts, using power tools.
18. Slide the generator out and remove.

Installation

Installation is in the reverse order of removal.

CAUTION:

Be sure to tighten “B” terminal nut carefully.

- Check tension of drive belt. Refer to EM-123, "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-9, "System Description".

SERVICE DATA AND SPECIFICATIONS (SDS)

SERVICE DATA AND SPECIFICATIONS (SDS)

Generator

INFOID:0000000007422151

Engine application	QR25DE	VQ35DE
Manufacturer	Valeo	Mitsubishi
Model*	2611894	A003TJ3691ZC
Nominal rating	14V - 110A	13.5V - 130A
Ground polarity	Negative	
Minimum revolution under no-load	1,200 rpm	1,000 rpm
Hot output current (When 13.5 volts is applied)	More than 46A @ 1,500 rpm More than 68A @ 1,800 rpm More than 91A @ 2,500 rpm More than 105A @ 5,000 rpm	More than 66A @ 1,500 rpm More than 108A @ 2,500 rpm More than 124A @ 5,000 rpm
Regulated output voltage @ 20° C (68° F)	13.5V @ 5,000 rpm	14.4 ± 0.3V
Adjustment range of power generation variable voltage control	11.4 - 15.6V	11.4 - 15.6V

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