SECTION CHG
CHARGING SYSTEM

CONTENTS

PRECAUTION

PRECAUTIONS

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

INFOID:0000000012850780

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

WARNING:

- **To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, 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:0000000012850781

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.

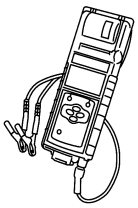
PREPARATION

PREPARATION

Special Service Tool

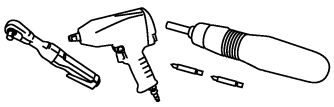
INFOID:0000000012850782

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

Tool number (TechMate No.) Tool name	Description
— (—) Model GR8-1200 NI Multitasking battery and electrical diagnostic station  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:0000000012850783

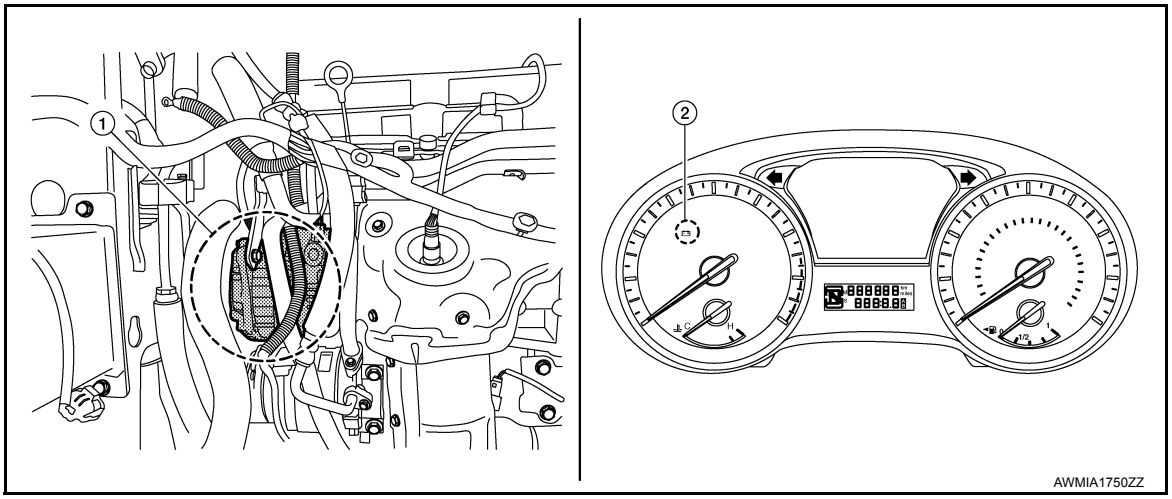
Tool name	Description
Power tool  PIIB1407E	Loosening nuts, screws and bolts

SYSTEM DESCRIPTION

COMPONENT PARTS

Component Parts Location

INFOID:0000000012850784



1. Generator
2. Combination meter

Component Description

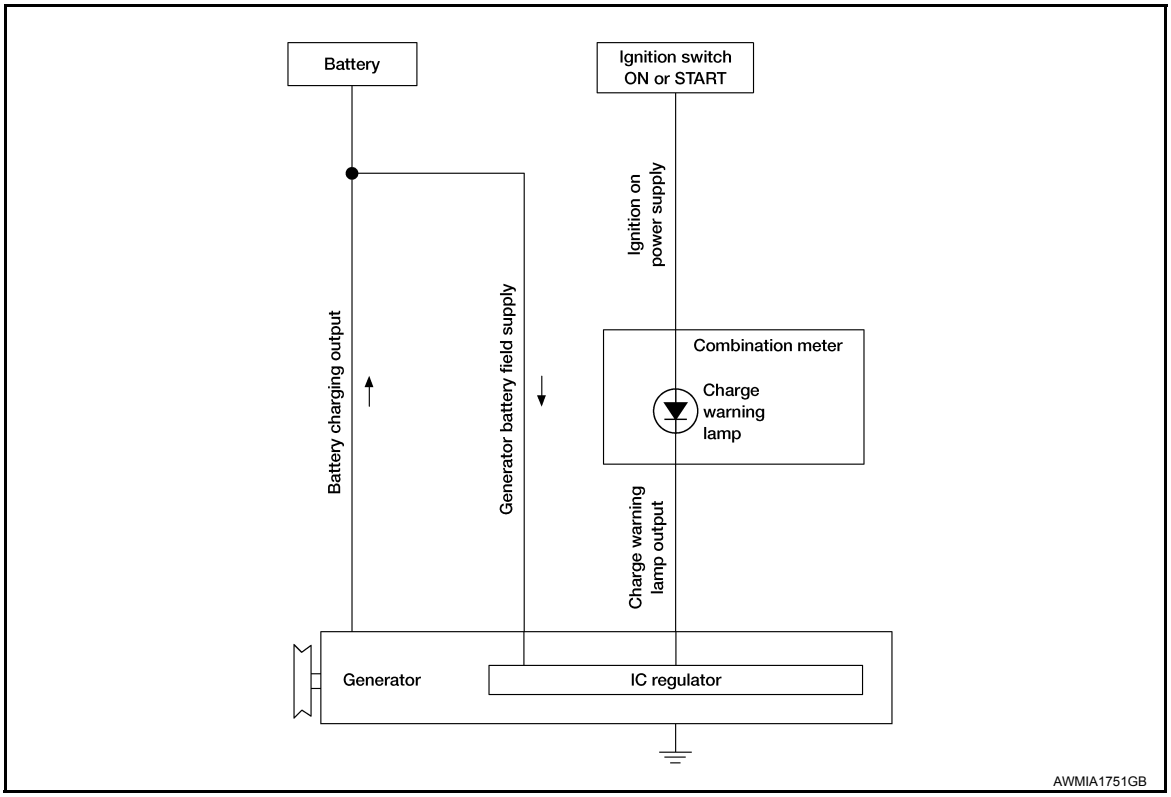
INFOID:0000000012850785

Component part	Description
Generator (IC regulator)	The IC regulator controls the generator 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.
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.

CHARGING SYSTEM

System Diagram

INFOID:0000000012850786



System Description

INFOID:0000000012850787

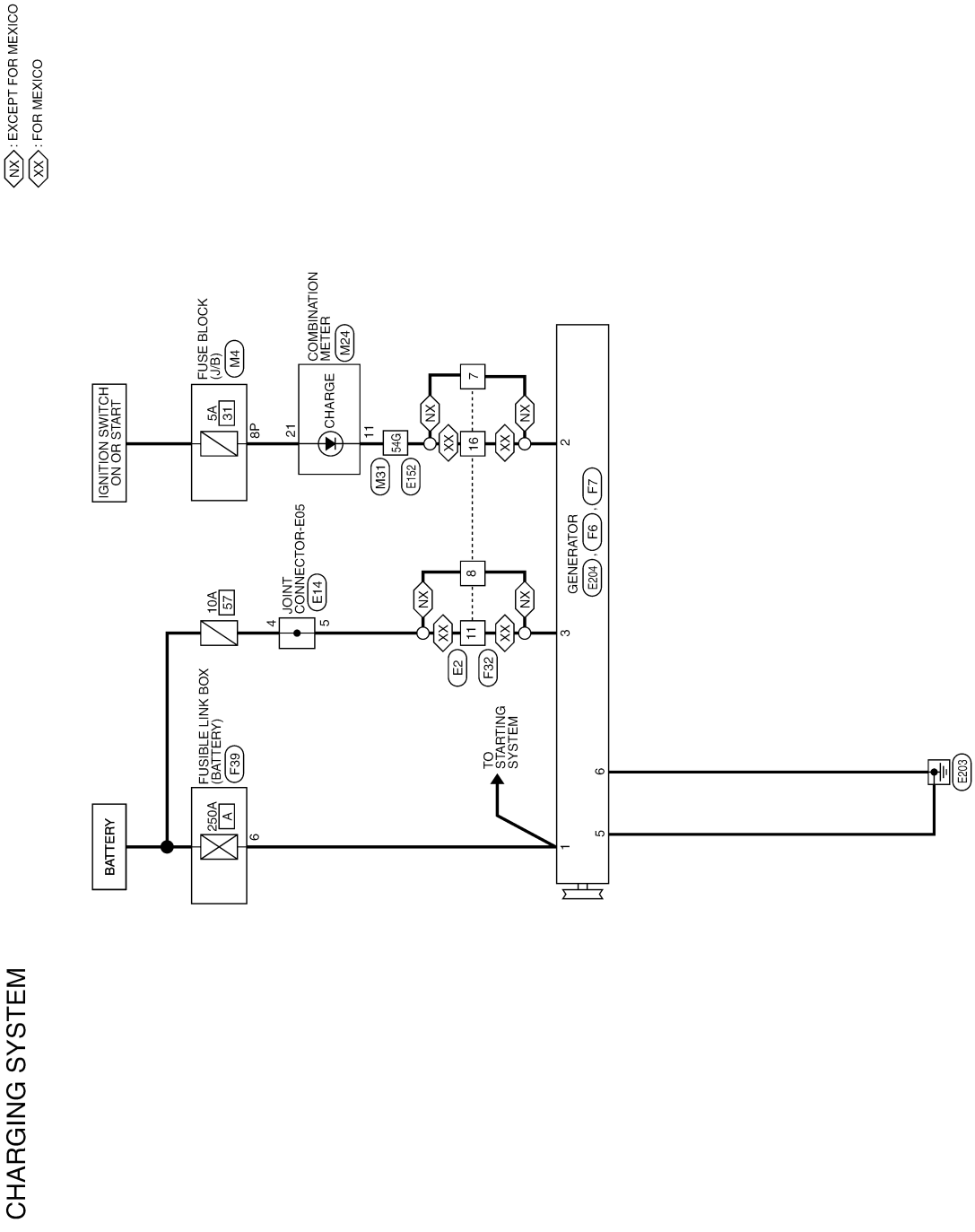
The generator provides DC voltage to operate the vehicle's electrical system and to keep the battery charged. The voltage output is controlled by the IC regulator.

WIRING DIAGRAM

CHARGING SYSTEM

Wiring Diagram

INFOID:0000000012850788



CHARGING SYSTEM CONNECTORS

Connector No.	E2
Connector Name	WIRE TO WIRE
Connector Type	TH16MW-NH
Connector Color	WHITE

H.S.

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

Terminal No.	Color of Wire	Signal Name
1	R	TO ENGINE CONTROL HARNESS - (EXCEPT FOR MEXICO)
1	G	TO ENGINE CONTROL HARNESS - (FOR MEXICO)
2	W	TO ENGINE CONTROL HARNESS
3	W	TO ENGINE CONTROL HARNESS - (EXCEPT FOR MEXICO)
3	L	TO ENGINE CONTROL HARNESS - (FOR MEXICO)
4	L	TO ENGINE CONTROL HARNESS - (EXCEPT FOR MEXICO)
4	SB	TO ENGINE CONTROL HARNESS - (FOR MEXICO)
5	GR	TO ENGINE CONTROL HARNESS
6	L	TO ENGINE CONTROL HARNESS
7	P	TO ENGINE CONTROL HARNESS
8	LG	TO ENGINE CONTROL HARNESS
9	P	TO ENGINE CONTROL HARNESS
10	L	TO ENGINE CONTROL HARNESS
11	LG	TO ENGINE CONTROL HARNESS
12	Y	TO ENGINE CONTROL HARNESS
13	LG	TO ENGINE CONTROL HARNESS
14	V	TO ENGINE CONTROL HARNESS
15	GR	TO ENGINE CONTROL HARNESS - (EXCEPT FOR MEXICO)
15	R	TO ENGINE CONTROL HARNESS - (FOR MEXICO)
16	P	TO ENGINE CONTROL HARNESS - (FOR MEXICO)
16	B	TO ENGINE CONTROL HARNESS - (EXCEPT FOR MEXICO)

Connector No.	E14
Connector Name	JOINT CONNECTOR-E05
Connector Type	A12FB
Connector Color	BLACK

H.S.

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

Terminal No.	Color of Wire	Signal Name
1	W	CLUTCH I/L SW
2	W	CLUTCH I/L SW
3	W	CLUTCH I/L SW
4	LG	BATTERY
5	LG	BATTERY
6	LG	BATTERY
7	Y	BATTERY
8	Y	BATTERY
9	Y	BATTERY
10	GR	GND
11	SHIELD	SHIELD
12	–	–

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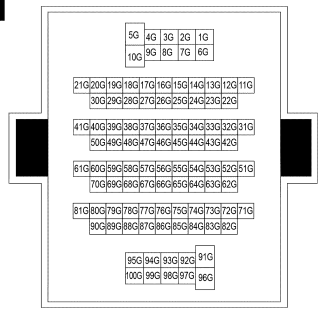
CHARGING SYSTEM CONNECTORS

Connector No.	E152
Connector Name	WIRE TO WIRE
Connector Type	TH80MW-CS16-TM4
Connector Color	WHITE

H.S.



Terminal No.	Color of Wire	Signal Name
1G	G	TO MAIN HARNESS
2G	W	TO MAIN HARNESS
3G	P	TO MAIN HARNESS
4G	R	TO MAIN HARNESS
5G	P	TO MAIN HARNESS
6G	W	TO MAIN HARNESS
7G	SHIELD	TO MAIN HARNESS
8G	G	TO MAIN HARNESS
9G	LG	TO MAIN HARNESS
10G	P	TO MAIN HARNESS
11G	G	TO MAIN HARNESS
12G	P	TO MAIN HARNESS
13G	W	TO MAIN HARNESS
14G	BG	TO MAIN HARNESS
15G	W	TO MAIN HARNESS
16G	R	TO MAIN HARNESS
17G	B	TO MAIN HARNESS
18G	SHIELD	TO MAIN HARNESS
19G	W	TO MAIN HARNESS
20G	G	TO MAIN HARNESS
21G	P	TO MAIN HARNESS
22G	B	TO MAIN HARNESS
23G	SHIELD	TO MAIN HARNESS
24G	R	TO MAIN HARNESS
25G	W	TO MAIN HARNESS
26G	SHIELD	TO MAIN HARNESS
27G	W	TO MAIN HARNESS
28G	R	TO MAIN HARNESS
29G	B	TO MAIN HARNESS
30G	G	TO MAIN HARNESS
31G	L	TO MAIN HARNESS
32G	LG	TO MAIN HARNESS
33G	LG	TO MAIN HARNESS
34G	W	TO MAIN HARNESS
35G	P	TO MAIN HARNESS
36G	L	TO MAIN HARNESS
37G	BG	TO MAIN HARNESS
38G	W	TO MAIN HARNESS
39G	W	TO MAIN HARNESS
40G	Y	TO MAIN HARNESS
41G	BG	TO MAIN HARNESS
42G	P	TO MAIN HARNESS
43G	R	TO MAIN HARNESS
44G	W	TO MAIN HARNESS
45G	Y	TO MAIN HARNESS
46G	SB	TO MAIN HARNESS
47G	V	TO MAIN HARNESS
48G	BR	TO MAIN HARNESS
49G	W	TO MAIN HARNESS
50G	G	TO MAIN HARNESS
51G	B/W	TO MAIN HARNESS
52G	BR	TO MAIN HARNESS
53G	L	TO MAIN HARNESS
54G	P	TO MAIN HARNESS
55G	BR	TO MAIN HARNESS
56G	R	TO MAIN HARNESS
57G	P	TO MAIN HARNESS
58G	BG	TO MAIN HARNESS
59G	W	TO MAIN HARNESS
60G	B	TO MAIN HARNESS
61G	SHIELD	TO MAIN HARNESS
62G	P	TO MAIN HARNESS
63G	L	TO MAIN HARNESS
64G	R	TO MAIN HARNESS
65G	G/R	TO MAIN HARNESS
66G	R	TO MAIN HARNESS
67G	BG	TO MAIN HARNESS
68G	LG/R	TO MAIN HARNESS
69G	W	TO MAIN HARNESS
70G	G	TO MAIN HARNESS
71G	GR	TO MAIN HARNESS
72G	–	TO MAIN HARNESS
73G	–	TO MAIN HARNESS
74G	–	TO MAIN HARNESS
75G	G	TO MAIN HARNESS
76G	Y	TO MAIN HARNESS
77G	BR	TO MAIN HARNESS
78G	–	TO MAIN HARNESS
79G	P	TO MAIN HARNESS
80G	G	TO MAIN HARNESS
81G	R	TO MAIN HARNESS
82G	–	TO MAIN HARNESS
83G	–	TO MAIN HARNESS
84G	–	TO MAIN HARNESS
85G	–	TO MAIN HARNESS
86G	–	TO MAIN HARNESS
87G	–	TO MAIN HARNESS
88G	–	TO MAIN HARNESS
89G	R	TO MAIN HARNESS
90G	L	TO MAIN HARNESS
91G	L	TO MAIN HARNESS
92G	–	TO MAIN HARNESS
93G	–	TO MAIN HARNESS
94G	Y	TO MAIN HARNESS
95G	W	TO MAIN HARNESS
96G	–	TO MAIN HARNESS
97G	–	TO MAIN HARNESS
98G	–	TO MAIN HARNESS
99G	–	TO MAIN HARNESS
100G	SHIELD	TO MAIN HARNESS

Connector No.	E204
Connector Name	GENERATOR
Connector Type	E-LA6
Connector Color	-

H.S.

Terminal No.	Color of Wire	Signal Name
5	B	GROUND
6	B	GROUND

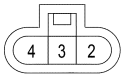
Connector No.	F6
Connector Name	GENERATOR
Connector Type	24340_JA09A
Connector Color	-

H.S.

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

Connector No.	F7
Connector Name	GENERATOR
Connector Type	HS03FB
Connector Color	BLACK

H.S.



Terminal No.	Color of Wire	Signal Name
2	GR	ALT
3	Y	BATTERY
4	–	–

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CHARGING SYSTEM CONNECTORS

Connector No.	F32
Connector Name	WIRE TO WIRE
Connector Type	TH16FW-NH
Connector Color	WHITE

H.S.

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

Terminal No.	Color of Wire	Signal Name
1	L	TO ENGINE ROOM HARNESS - (EXCEPT FOR MEXICO)
1	BR	TO ENGINE ROOM HARNESS - (FOR MEXICO)
2	Y	TO ENGINE ROOM HARNESS
3	R	TO ENGINE ROOM HARNESS - (EXCEPT FOR MEXICO)
3	L	TO ENGINE ROOM HARNESS - (FOR MEXICO)
4	L	TO ENGINE ROOM HARNESS - (EXCEPT FOR MEXICO)
4	W	TO ENGINE ROOM HARNESS - (FOR MEXICO)
5	B	TO ENGINE ROOM HARNESS
6	L	TO ENGINE ROOM HARNESS
7	GR	TO ENGINE ROOM HARNESS
8	Y	TO ENGINE ROOM HARNESS
9	P	TO ENGINE ROOM HARNESS
10	L	TO ENGINE ROOM HARNESS
11	Y	TO ENGINE ROOM HARNESS
12	Y	TO ENGINE ROOM HARNESS - (EXCEPT FOR MEXICO)
12	P	TO ENGINE ROOM HARNESS - (FOR MEXICO)
13	SB	TO ENGINE ROOM HARNESS
14	V	TO ENGINE ROOM HARNESS
15	B	TO ENGINE ROOM HARNESS - (EXCEPT FOR MEXICO)
15	L	TO ENGINE ROOM HARNESS - (FOR MEXICO)
16	GR	TO ENGINE ROOM HARNESS - (FOR MEXICO)
16	B	TO ENGINE ROOM HARNESS - (EXCEPT FOR MEXICO)

Connector No.	F39
Connector Name	FUSIBLE LINK BOX (BATTERY)
Connector Type	24340-79906
Connector Color	-

H.S.

6

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

Connector No.	M4
Connector Name	FUSE BLOCK (J/B)
Connector Type	NS16FW-CS
Connector Color	WHITE

H.S.

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

Terminal No.	Color of Wire	Signal Name
1P	R	IGNITION
2P	LG	IGNITION
3P	G	IGN ELEC RELAY OUT 2
4P	-	-
5P	P	IGNITION
6P	BG	REAR DEFOGGER RELAY OUT
7P	LG	IGNITION
8P	BG	IGNITION
9P	L	BATTERY
10P	BR	IGNITION
11P	-	-
12P	-	-
13P	W	BATTERY
14P	Y	BATTERY
15P	L	BATT
16P	W	BLOWER FAN RELAY OUT

Connector No.	M24
Connector Name	COMBINATION METER
Connector Type	TH40FW-NH
Connector Color	WHITE

H.S.

20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
40	39	38	37	36	35	34	33	32	31	30	29	28	27	26	25	24	23	22	21

Terminal No.	Color of Wire	Signal Name
1	B	GND1
2	B	GND2
3	P	STRG SW INPUT 1
4	BG	STRG SW INPUT 2
5	P	ACC
6	V	SECURITY
7	R	AIR BAG
8	G	AS BELT
9	Y	DR BUCKLE SW
10	-	-
11	BG	ALTERNATOR (CHARGE)
12	G	PKB
13	-	-
14	G	STRG SW OUTPUT 1
15	W	STRG SW OUTPUT 2
16	B	STRG SW OUTPUT GND
17	-	-
18	-	-
19	-	-
20	-	-
21	BG	IGN
22	W	BAT
23	B	ILLUMI CONT OUT
24	R	STRG SW GND
25	G	BRAKE OIL SW
26	R	FUEL SENSOR GND
27	W	FUEL SENSOR
28	-	-
29	-	-
30	-	-
31	-	-
32	-	-
33	BR	SPEED 2 P/R
34	BG	SPEED 8 P/R
35	-	-
36	-	-
37	-	-
38	P	CAN-L
39	L	CAN-H
40	-	-

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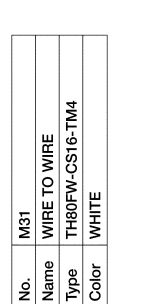
CHARGING SYSTEM CONNECTORS

Connector No.	M31
Connector Name	WIRE TO WIRE
Connector Type	TH80FW-CS16-TM4
Connector Color	WHITE

H.S.



Terminal No.	Color of Wire	Signal Name
1G	SB	TO ENGINE ROOM HARNESS - (WITHOUT CLIMATE CONTROLLED SEAT)
1G	P	TO ENGINE ROOM HARNESS - (WITH CLIMATE CONTROLLED SEAT)
2G	W	TO ENGINE ROOM HARNESS
3G	P	TO ENGINE ROOM HARNESS
4G	G	TO ENGINE ROOM HARNESS
5G	P	TO ENGINE ROOM HARNESS
6G	SB	TO ENGINE ROOM HARNESS - (WITHOUT CLIMATE CONTROLLED SEAT)
6G	R	TO ENGINE ROOM HARNESS - (WITH CLIMATE CONTROLLED SEAT)
7G	SHIELD	TO ENGINE ROOM HARNESS
8G	G	TO ENGINE ROOM HARNESS
9G	BG	TO ENGINE ROOM HARNESS
10G	W	TO ENGINE ROOM HARNESS
11G	R	TO ENGINE ROOM HARNESS
12G	G	TO ENGINE ROOM HARNESS
13G	G	TO ENGINE ROOM HARNESS
14G	V	TO ENGINE ROOM HARNESS
15G	W	TO ENGINE ROOM HARNESS
16G	R	TO ENGINE ROOM HARNESS
17G	B	TO ENGINE ROOM HARNESS
18G	SHIELD	TO ENGINE ROOM HARNESS
19G	SB	TO ENGINE ROOM HARNESS
20G	LG	TO ENGINE ROOM HARNESS
21G	R	TO ENGINE ROOM HARNESS
22G	B	TO ENGINE ROOM HARNESS
23G	SHIELD	TO ENGINE ROOM HARNESS
24G	W	TO ENGINE ROOM HARNESS
25G	R	TO ENGINE ROOM HARNESS
26G	SHIELD	TO ENGINE ROOM HARNESS
27G	B	TO ENGINE ROOM HARNESS
28G	W	TO ENGINE ROOM HARNESS
29G	G	TO ENGINE ROOM HARNESS
30G	R	TO ENGINE ROOM HARNESS
31G	L	TO ENGINE ROOM HARNESS
32G	G	TO ENGINE ROOM HARNESS
33G	G	TO ENGINE ROOM HARNESS
34G	G	TO ENGINE ROOM HARNESS
35G	P	TO ENGINE ROOM HARNESS
36G	L	TO ENGINE ROOM HARNESS
37G	L	TO ENGINE ROOM HARNESS
38G	W	TO ENGINE ROOM HARNESS
39G	R	TO ENGINE ROOM HARNESS
40G	Y	TO ENGINE ROOM HARNESS
41G	L	TO ENGINE ROOM HARNESS
42G	P	TO ENGINE ROOM HARNESS
43G	W	TO ENGINE ROOM HARNESS
44G	G	TO ENGINE ROOM HARNESS
45G	R	TO ENGINE ROOM HARNESS
46G	Y	TO ENGINE ROOM HARNESS
47G	Y	TO ENGINE ROOM HARNESS
48G	LG	TO ENGINE ROOM HARNESS
49G	P	TO ENGINE ROOM HARNESS
50G	L	TO ENGINE ROOM HARNESS
51G	B/W	TO ENGINE ROOM HARNESS
52G	BR	TO ENGINE ROOM HARNESS
53G	L	TO ENGINE ROOM HARNESS
54G	BG	TO ENGINE ROOM HARNESS
55G	G	TO ENGINE ROOM HARNESS
56G	P	TO ENGINE ROOM HARNESS
57G	P	TO ENGINE ROOM HARNESS
58G	L	TO ENGINE ROOM HARNESS
59G	B	TO ENGINE ROOM HARNESS
60G	W	TO ENGINE ROOM HARNESS
61G	SHIELD	TO ENGINE ROOM HARNESS
62G	G	TO ENGINE ROOM HARNESS
63G	P	TO ENGINE ROOM HARNESS
64G	W	TO ENGINE ROOM HARNESS
65G	G/R	TO ENGINE ROOM HARNESS
66G	R	TO ENGINE ROOM HARNESS
67G	W	TO ENGINE ROOM HARNESS
68G	LG/R	TO ENGINE ROOM HARNESS
69G	P	TO ENGINE ROOM HARNESS
70G	BG	TO ENGINE ROOM HARNESS
71G	GR	TO ENGINE ROOM HARNESS
72G	-	TO ENGINE ROOM HARNESS
73G	-	TO ENGINE ROOM HARNESS
74G	-	TO ENGINE ROOM HARNESS
75G	G	TO ENGINE ROOM HARNESS
76G	Y	TO ENGINE ROOM HARNESS
77G	BR	TO ENGINE ROOM HARNESS
78G	-	TO ENGINE ROOM HARNESS
79G	R	TO ENGINE ROOM HARNESS
80G	W	TO ENGINE ROOM HARNESS
81G	G	TO ENGINE ROOM HARNESS
82G	P	TO ENGINE ROOM HARNESS
83G	P	TO ENGINE ROOM HARNESS
84G	P	TO ENGINE ROOM HARNESS
85G	P	TO ENGINE ROOM HARNESS
86G	P	TO ENGINE ROOM HARNESS
87G	P	TO ENGINE ROOM HARNESS
88G	P	TO ENGINE ROOM HARNESS
89G	R	TO ENGINE ROOM HARNESS
90G	P	TO ENGINE ROOM HARNESS
91G	L	TO ENGINE ROOM HARNESS
92G	P	TO ENGINE ROOM HARNESS
93G	P	TO ENGINE ROOM HARNESS
94G	O	TO ENGINE ROOM HARNESS
95G	B	TO ENGINE ROOM HARNESS
96G	P	TO ENGINE ROOM HARNESS
97G	P	TO ENGINE ROOM HARNESS
98G	P	TO ENGINE ROOM HARNESS
99G	P	TO ENGINE ROOM HARNESS
100G	SHIELD	TO ENGINE ROOM HARNESS

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BASIC INSPECTION

DIAGNOSIS AND REPAIR WORKFLOW

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

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

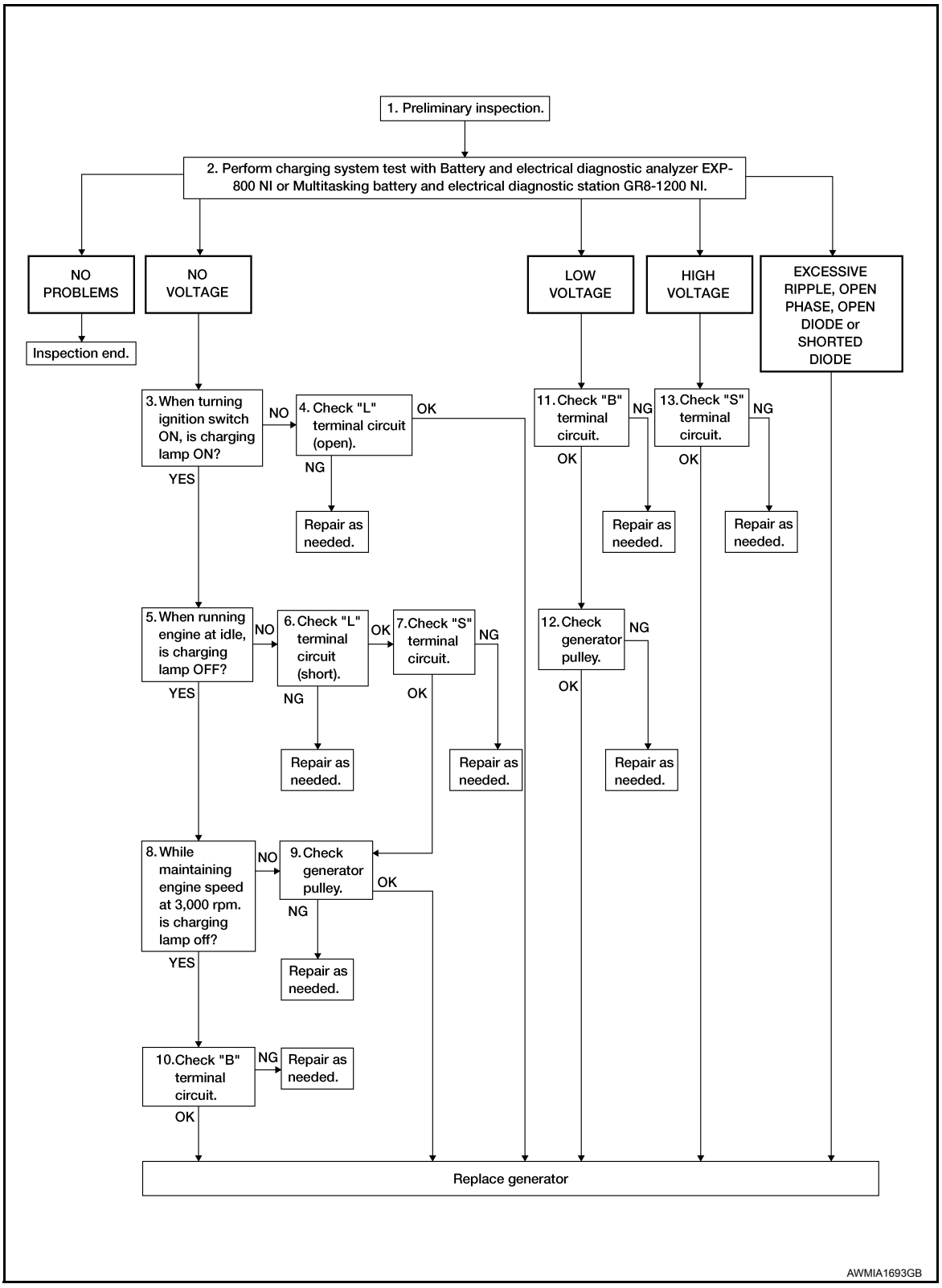
To test the charging system, use the following special service tools:

- 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-17, "Diagnosis Procedure".

>> GO TO 2.

2.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 3.
LOW VOLTAGE>>GO TO 11.
HIGH VOLTAGE>>GO TO 13.
EXCESSIVE RIPPLE, OPEN PHASE, OPEN DIODE or SHORTED DIODE>>Replace the generator. Refer to CHG-24, "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.

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

Turn the ignition switch ON.

Does the charge warning lamp illuminate?

YES >> GO TO 5.
NO >> GO TO 4.

4.“L” TERMINAL CIRCUIT (OPEN) INSPECTION

Check “L” terminal circuit (open). Refer to CHG-19, "Diagnosis Procedure".

Is the “L” terminal circuit normal?

YES >> Replace generator. Refer to CHG-24, "Removal and Installation".
NO >> Repair as needed.

5.INSPECTION WITH CHARGE WARNING LAMP (IDLING)

Start the engine and run it at idle.

Does the charge warning lamp turn OFF?

YES >> GO TO 8.
NO >> GO TO 6.

6.“L” TERMINAL CIRCUIT (SHORT) INSPECTION

Check “L” terminal circuit (short). Refer to CHG-21, "Diagnosis Procedure".

Is the “L” terminal circuit normal?

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

7.“S” TERMINAL CIRCUIT INSPECTION

Check “S” terminal circuit. Refer to CHG-22, "Diagnosis Procedure".

Is the “S” terminal circuit normal?

YES >> GO TO 9.
NO >> Repair as needed.

8.INSPECTION WITH CHARGE WARNING LAMP (ENGINE AT 3,000 RPM)

Increase and maintain the engine speed at 3,000 rpm.

Does the charge warning lamp remain off?

YES >> GO TO 10.
NO >> GO TO 9.

9.INSPECTION OF GENERATOR PULLEY

Check generator pulley. Refer to CHG-25, "Inspection".

Is generator pulley normal?

YES >> Replace generator. Refer to CHG-24, "Removal and Installation".

NO >> Repair as needed.

10. "B" TERMINAL CIRCUIT INSPECTION

Check "B" terminal circuit. Refer to CHG-18, "Diagnosis Procedure".

Is "B" terminal circuit normal?

YES >> Replace generator. Refer to CHG-24, "Removal and Installation".
NO >> Repair as needed.

11. "B" TERMINAL CIRCUIT INSPECTION

Check "B" terminal circuit. Refer to CHG-18, "Diagnosis Procedure".

Is "B" terminal circuit normal?

YES >> GO TO 12.
NO >> Repair as needed.

12. INSPECTION OF GENERATOR PULLEY

Check generator pulley. Refer to CHG-25, "Inspection".

Is generator pulley normal?

YES >> Replace generator. Refer to CHG-24, "Removal and Installation".
NO >> Repair as needed.

13. "S" TERMINAL CIRCUIT INSPECTION

Check "S" terminal circuit. Refer to CHG-22, "Diagnosis Procedure".

Is the "S" terminal circuit normal?

YES >> Replace generator. Refer to CHG-24, "Removal and Installation".
NO >> Repair as needed.

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

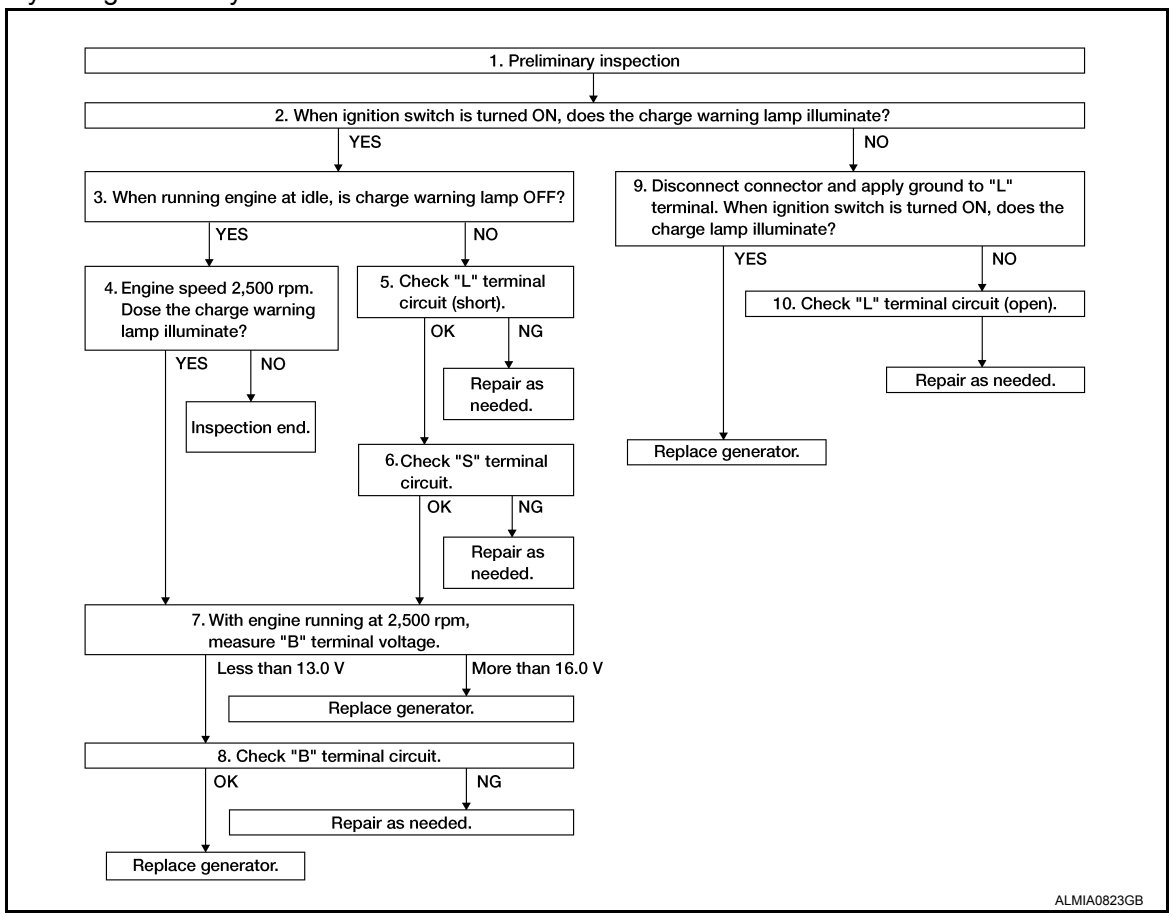
INFOID:0000000012850790

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-17, "Diagnosis Procedure".

>> GO TO 2.

2.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 3.
NO >> GO TO 9.

3.INSPECTION WITH CHARGE WARNING LAMP (IDLING)

Start the engine and run it at idle

Does the charge warning lamp turn OFF?

YES >> GO TO 4.
NO >> GO TO 5.

4.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 7.
NO >> Inspection End.

5.“L” TERMINAL CIRCUIT (SHORT) INSPECTION

Check terminal “L” circuit for (short). Refer to CHG-21, "Diagnosis Procedure".

Is the inspection result normal?

YES >> GO TO 6.
NO >> Repair as needed.

6. "S" TERMINAL CIRCUIT INSPECTION

Check terminal "S" circuit. Refer to CHG-22, "Diagnosis Procedure".

Is the inspection result normal?

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

7. 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 8.
More than 16.0 V>>Replace generator. Refer to CHG-24, "Removal and Installation".

8. "B" TERMINAL CIRCUIT INSPECTION

Check "B" terminal circuit. Refer to CHG-18, "Diagnosis Procedure".

Is the inspection result normal?

YES >> Replace generator. Refer to CHG-24, "Removal and Installation".
NO >> Repair as needed.

9. 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-24, "Removal and Installation".
NO >> GO TO 10.

10. CHECK "L" TERMINAL CIRCUIT (OPEN)

Check "L" terminal circuit (OPEN). Refer to CHG-19, "Diagnosis Procedure".

>> Repair as needed.

DTC/CIRCUIT DIAGNOSIS

CHARGING SYSTEM PRELIMINARY INSPECTION

Diagnosis Procedure

INFOID:0000000012850791

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 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 terminals)	Fuse or Fusible Link
Generator	Battery (terminal 3)	Fuse 57
	Battery (terminal 1)	Fusible Link **A**
Combination meter	Ignition switch ON or START (terminal 2)	Fuse 31

Is the fuse or fusible link blown?

YES >> Replace the blown fuse or fusible link after repairing the affected circuit.
NO >> GO TO 3.

3.CHECK GENERATOR GROUND TERMINAL CONNECTION

Check if connector E204 terminal 5 and 6 (generator ground harness) is clean and tight.

Is the inspection result normal?

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

4.CHECK DRIVE BELT TENSION

Check drive belt tension. Refer to CHG-25, "Inspection".

Is the inspection result normal?

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

B TERMINAL CIRCUIT

Description

INFOID:0000000012850792

The terminal “1” circuit supplies power to charge the battery and operate the vehicle’s electrical system.

Diagnosis Procedure

INFOID:0000000012850793

Regarding Wiring Diagram information, refer to CHG-6, "Wiring Diagram".

1.CHECK TERMINAL “1” CONNECTION

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

Is the inspection result normal?

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

2.CHECK TERMINAL “1” CIRCUIT

Check voltage between generator connector F6 terminal 1 and ground.

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

Is the inspection result normal?

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

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

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

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

Is the inspection result normal?

YES >> Terminal “1” circuit is normal. Refer to CHG-11, "Work Flow (With EXP-800 NI or GR8-1200 NI)" or CHG-14, "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:0000000012850794

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:0000000012850795

Regarding Wiring Diagram information. Refer to CHG-6, "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-11, "Work Flow (With EXP-800 NI or GR8-1200 NI)" or CHG-14, "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	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

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-94, "Removal and Installation".
NO >> Repair or replace the harness or connectors.

L TERMINAL CIRCUIT (SHORT)

Description

INFOID:0000000012850796

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:0000000012850797

Regarding Wiring Diagram information, refer to CHG-6, "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-11, "Work Flow (With EXP-800 NI or GR8-1200 NI)" or CHG-14, "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-94, "Removal and Installation".
NO >> Repair or replace the harness or connectors.

S TERMINAL CIRCUIT

Description

INFOID:0000000012850798

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:0000000012850799

Regarding Wiring Diagram information. Refer to CHG-6, "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.

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

Is the inspection result normal?

YES >> Refer to CHG-11, "Work Flow (With EXP-800 NI or GR8-1200 NI)" or CHG-14, "Work Flow (Without EXP-800 NI or GR8-1200 NI)".
NO >> Check harness for open between generator and fuse.

SYMPTOM DIAGNOSIS

CHARGING SYSTEM

Symptom Table

INFOID:0000000012850800

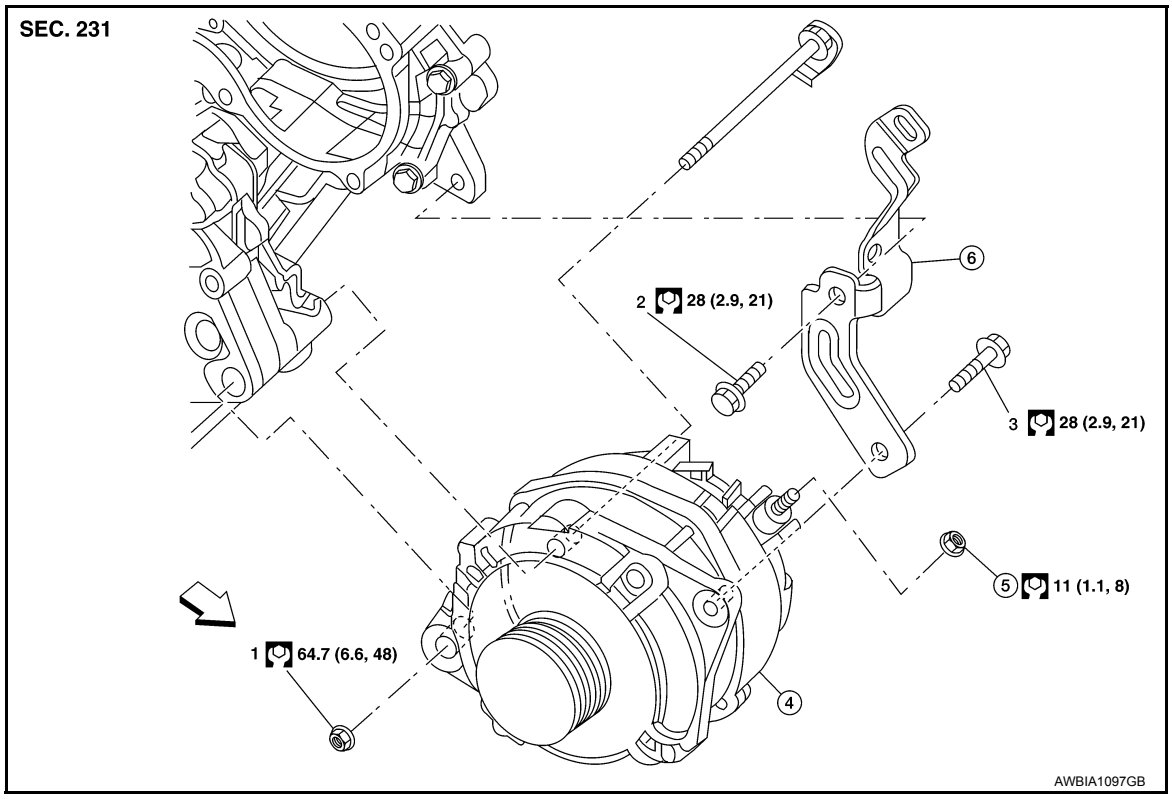
Symptom	Reference
Battery discharged	Refer to CHG-11, "Work Flow (With EXP-800 NI or GR8-1200 NI)" or CHG-14, "Work Flow (Without EXP-800 NI or GR8-1200 NI)".
The charge warning lamp does not illuminate when the ignition switch is set to ON.	
The charge warning lamp does not turn OFF after the engine starts.	
The charging warning lamp turns ON when increasing the engine speed.	

REMOVAL AND INSTALLATION

GENERATOR

Exploded View

INFOID:0000000012850801



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

Removal and Installation

INFOID:0000000012850802

REMOVAL

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

INSTALLATION

Installation is in the reverse order of removal.

- Temporarily tighten bolts and nut then tighten nut and bolts in the specified numerical order. Refer to CHG-24, "Exploded View".

CAUTION:

Be sure to tighten “B” terminal nut carefully.

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

operation inspection should be performed after replacing the generator, and then make sure that the system operates normally. Refer to CHG-5, "System Description".

Inspection

INFOID:0000000012850803

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)

Generator

INFOID:0000000012850804

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.