

SECTION **CHG**
CHARGING SYSTEM

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CHG

Inspection 29

**SERVICE DATA AND SPECIFICATIONS
(SDS) 30**

**SERVICE DATA AND SPECIFICATIONS
(SDS) 30**

Alternator 30

DIAGNOSIS AND REPAIR WORK FLOW

< BASIC INSPECTION >

BASIC INSPECTION

DIAGNOSIS AND REPAIR WORK FLOW

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

INFOID:0000000011916841

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

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

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

NOTE:

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

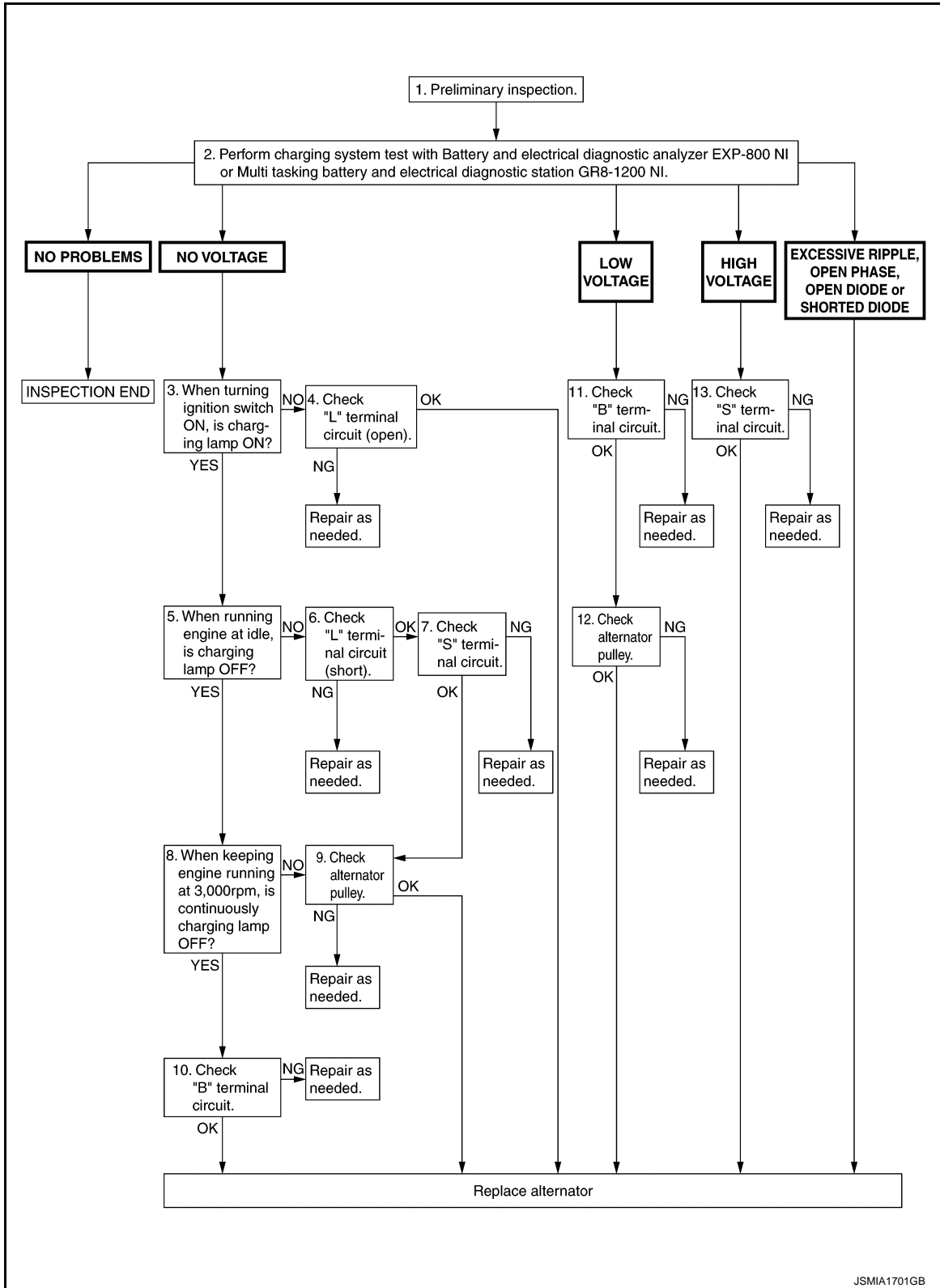
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DIAGNOSIS AND REPAIR WORK FLOW

< BASIC INSPECTION >

OVERALL SEQUENCE



DETAILED FLOW

NOTE:

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

1. PRELIMINARY INSPECTION

Perform the preliminary inspection. Refer to [CHG-26, "Inspection Procedure"](#).

DIAGNOSIS AND REPAIR WORK FLOW

< BASIC INSPECTION >

>> 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 alternator. 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-12. "Diagnosis Procedure"](#).

Is the "L" terminal circuit normal?

YES >> Replace alternator. Refer to [CHG-28. "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-14. "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-15. "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 ALTERNATOR PULLEY

Check alternator pulley. Refer to [CHG-29. "Inspection"](#).

Is alternator pulley normal?

YES >> Replace alternator. Refer to [CHG-28. "Removal and Installation"](#).

NO >> Repair as needed.

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DIAGNOSIS AND REPAIR WORK FLOW

< BASIC INSPECTION >

10. "B" TERMINAL CIRCUIT INSPECTION

Check "B" terminal circuit. Refer to [CHG-11, "Diagnosis Procedure"](#).

Is "B" terminal circuit normal?

YES >> Replace alternator. Refer to [CHG-28, "Removal and Installation"](#).

NO >> Repair as needed.

11. "B" TERMINAL CIRCUIT INSPECTION

Check "B" terminal circuit. Refer to [CHG-11, "Diagnosis Procedure"](#).

Is "B" terminal circuit normal?

YES >> GO TO 12.

NO >> Repair as needed.

12. INSPECTION OF ALTERNATOR PULLEY

Check alternator pulley. Refer to [CHG-29, "Inspection"](#).

Is alternator pulley normal?

YES >> Replace alternator. Refer to [CHG-28, "Removal and Installation"](#).

NO >> Repair as needed.

13. "S" TERMINAL CIRCUIT INSPECTION

Check "S" terminal circuit. Refer to [CHG-15, "Diagnosis Procedure"](#).

Is the "S" terminal circuit normal?

YES >> Replace alternator. Refer to [CHG-28, "Removal and Installation"](#).

NO >> Repair as needed.

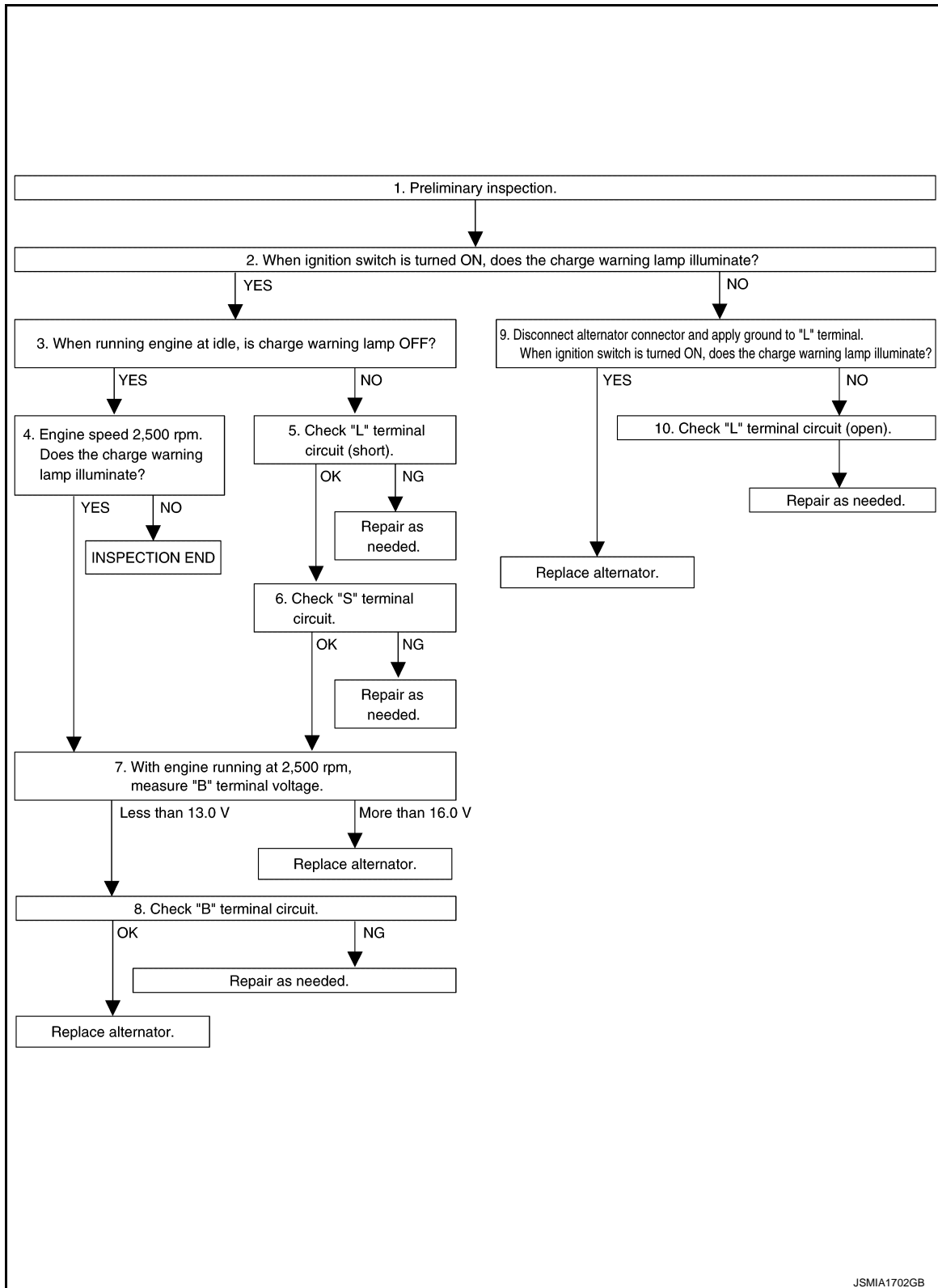
DIAGNOSIS AND REPAIR WORK FLOW

< BASIC INSPECTION >

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

INFOID:000000011916842

OVERALL SEQUENCE



DETAILED FLOW

1. PRELIMINARY INSPECTION

Perform the preliminary inspection. Refer to [CHG-26, "Inspection Procedure"](#).

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DIAGNOSIS AND REPAIR WORK FLOW

< BASIC INSPECTION >

>> 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 “L” terminal circuit (short). Refer to [CHG-14, "Diagnosis Procedure"](#).

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair as needed.

6.“S” TERMINAL CIRCUIT INSPECTION

Check “S” terminal circuit. Refer to [CHG-15, "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 alternator. Refer to [CHG-28, "Removal and Installation"](#).

8.“B” TERMINAL CIRCUIT INSPECTION

Check “B” terminal circuit. Refer to [CHG-11, "Diagnosis Procedure"](#).

Is the inspection result normal?

YES >> Replace alternator. Refer to [CHG-28, "Removal and Installation"](#).

NO >> Repair as needed.

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

1. Disconnect alternator connector and apply ground to “L” terminal.

2. Turn the ignition switch ON.

Does the charge warning lamp illuminate?

YES >> Replace alternator. Refer to [CHG-28, "Removal and Installation"](#).

NO >> GO TO 10.

10.CHECK “L” TERMINAL CIRCUIT (OPEN)

Check “L” terminal circuit (open). Refer to [CHG-12, "Diagnosis Procedure"](#).

>> Repair as needed.

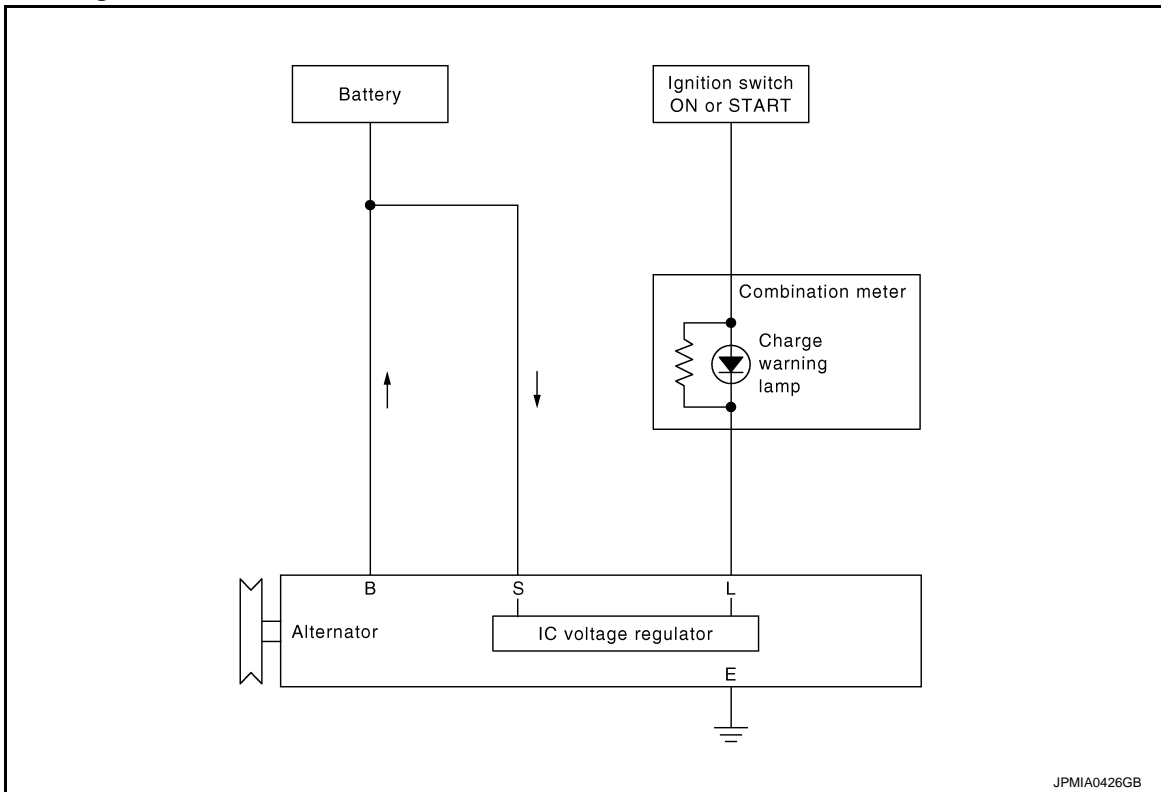
CHARGING SYSTEM

< SYSTEM DESCRIPTION >

SYSTEM DESCRIPTION

CHARGING SYSTEM

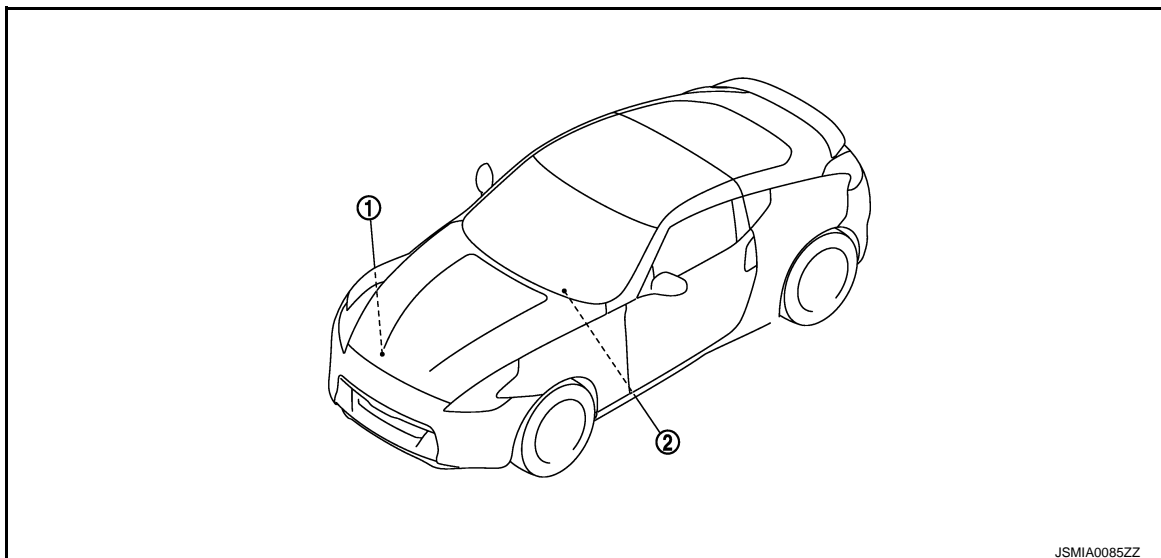
System Diagram



System Description

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

Component Parts Location



1. Alternator

2. Charge warning lamp (On the combination meter)

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CHARGING SYSTEM

< SYSTEM DESCRIPTION >

Component Description

INFOID:000000011738729

Component part	Description
Alternator	The alternator provides DC voltage to operate the vehicle electrical system and to keep the battery charged.
Combination meter (Charge warning lamp)	The IC voltage regulator warning function activates to illuminate the charge warning lamp, if any of the following symptoms occur while alternator is operating: <ul style="list-style-type: none">• Excessive voltage is produced.• No voltage is produced.

B TERMINAL CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

DTC/CIRCUIT DIAGNOSIS

B TERMINAL CIRCUIT

Description

INFOID:0000000011738734

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

Diagnosis Procedure

INFOID:0000000011738735

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 "B" 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 "B" TERMINAL CIRCUIT

Check voltage between alternator "B" terminal and ground.

Terminals			Voltage (Approx.)
(+)	(-)		
Alternator "B" terminal	Terminal	Ground	Battery voltage
E203	1		

Is the inspection result normal?

YES >> GO TO 3.

NO >> Check harness for open between alternator 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 alternator "B" terminal.

Terminals			Voltage (Approx.)
(+)	(-)		
Battery positive terminal	Alternator "B" terminal	Terminal	Less than 0.2 V
	E203	1	

Is the inspection result normal?

YES >> "B" terminal circuit is normal. Refer to [CHG-3, "Work Flow \(With EXP-800 NI or GR8-1200 NI\)"](#) or [CHG-7, "Work Flow \(Without EXP-800 NI or GR8-1200 NI\)"](#).

NO >> Check harness between battery and alternator for poor continuity.

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L TERMINAL CIRCUIT (OPEN)

< DTC/CIRCUIT DIAGNOSIS >

L TERMINAL CIRCUIT (OPEN)

Description

INFOID:000000011738736

The "L" terminal circuit controls the charge warning lamp. The charge warning lamp illuminates when the ignition switch is set to ON or START. When the alternator is providing sufficient voltage with the engine running, the charge warning lamp will go off. If the charge warning lamp illuminates with the engine running, a malfunction is indicated.

Diagnosis Procedure

INFOID:000000011738737

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 the applicable Instruction Manual for proper testing procedures.

2. CHECK "L" TERMINAL CIRCUIT (OPEN)

1. Disconnect alternator connector.
2. Apply ground to alternator harness connector terminal.
3. Check condition of the charge warning lamp with the ignition switch in the ON position.

Alternator harness connector	Terminal	Ground	Condition	
			Ignition switch position	Charge warning lamp
F36	2		ON	Illuminate

Does it illuminate?

YES >> "L" terminal circuit is normal. Refer to [CHG-3, "Work Flow \(With EXP-800 NI or GR8-1200 NI\)"](#) or [CHG-7, "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 alternator harness connector and combination meter harness connector.

Alternator harness connector		Combination meter harness connector		Continuity
Connector No.	Terminal No.	Connector No.	Terminal No.	
F36	2	M54	25	Existed

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair the harness or connector.

4. CHECK HARNESS CONTINUITY (OPEN CIRCUIT)

Check continuity between combination meter harness connector and fuse block.

Combination meter harness connector		Fuse block		Continuity
Connector No.	Terminal No.	Connector No.	Terminal No.	
M53	2	M3	12C	Existed

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair the harness.

L TERMINAL CIRCUIT (OPEN)

< DTC/CIRCUIT DIAGNOSIS >

5. CHECK POWER SUPPLY CIRCUIT

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

Terminals		(-)	Condition	Voltage (Approx.)
(+)	Terminal			
Combination meter harness connector				
M53	2	Ground	When the ignition switch is in ON position	Battery voltage

Is the inspection result normal?

YES >> Replace combination meter.

NO >> Inspect the power supply circuit. Refer to [PG-39. "Wiring Diagram - IGNITION POWER SUPPLY -](#)

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L TERMINAL CIRCUIT (SHORT)

< DTC/CIRCUIT DIAGNOSIS >

L TERMINAL CIRCUIT (SHORT)

Description

INFOID:000000011738738

The "L" terminal circuit controls the charge warning lamp. The charge warning lamp illuminates when the ignition switch is set to ON or START. When the alternator is providing sufficient voltage with the engine running, the charge warning lamp will go off. If the charge warning lamp illuminates with the engine running, a malfunction is indicated.

Diagnosis Procedure

INFOID:000000011738739

1. CHECK "L" TERMINAL CIRCUIT (SHORT)

1. Turn ignition switch OFF.
2. Disconnect alternator connector.
3. Turn ignition switch ON.

Does charge warning lamp illuminate?

YES >> GO TO 2.

NO >> Refer to [CHG-3, "Work Flow \(With EXP-800 NI or GR8-1200 NI\)"](#) or [CHG-7, "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 combination meter harness connector and ground.

Combination meter harness connector		Ground	Continuity
Connector No.	Terminal No.		
M54	25		Not existed

Is the inspection result normal?

YES >> Replace combination meter.

NO >> Repair the harness.

S TERMINAL CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

S TERMINAL CIRCUIT

Description

INFOID:000000011738740

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

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

Diagnosis Procedure

INFOID:000000011738741

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 alternator harness connector and ground.

Terminals		Voltage (Approx.)
(+)	(-)	
Alternator harness connector	Terminal	
F36	3	Battery voltage

Is the inspection result normal?

YES >> Refer to [CHG-3, "Work Flow \(With EXP-800 NI or GR8-1200 NI\)"](#) or [CHG-7, "Work Flow \(Without EXP-800 NI or GR8-1200 NI\)"](#).

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

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CHARGING SYSTEM

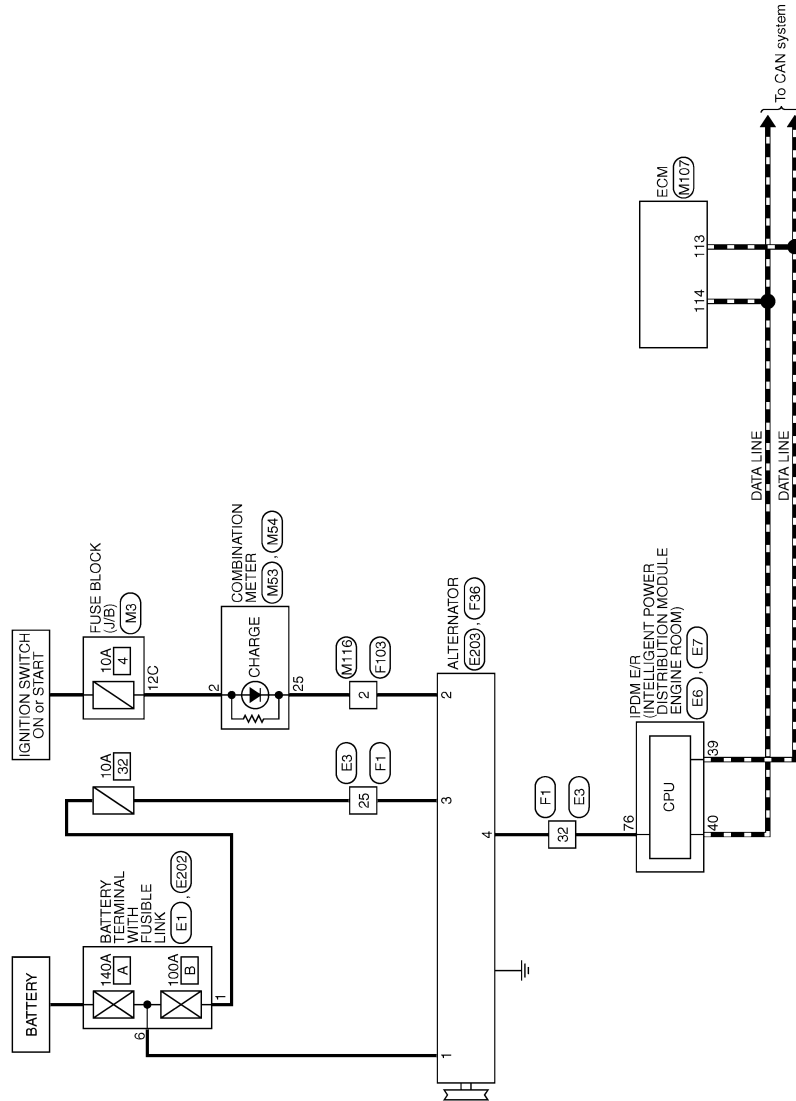
< DTC/CIRCUIT DIAGNOSIS >

CHARGING SYSTEM

Wiring Diagram - CHARGING SYSTEM -

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CHARGING SYSTEM



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JCMWM4775GB

CHARGING SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

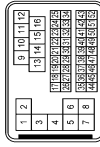
CHARGING SYSTEM

Connector No.	E1
Connector Name	BATTERY TERMINAL WITH FUSIBLE LINK
Connector Type	02ZBR-MC



Terminal No.	1	2
Color Of Wire	R	W
Signal Name (Specification)	-	-

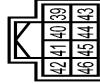
Connector No.	E3
Connector Name	WIRE TO WIRE
Connector Type	5AAS8FB-RSS-SHZ8



Terminal No.	1	2	3	4	5	7	8	9	10	11	12	13	14	15	16	17	18
Color Of Wire	L/Y	SHIELD	L/R	SHIELD	BR	G	W	W	Y	V	SHIELD	L	G	R	LG	GR	Y
Signal Name (Specification)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Terminal No.	19	20	21	22	23	24	25	27	28	29	30	31	32	33	34	36	37	38	39	40	41	42	43	45	46	47	48	49	50	51	52
Color Of Wire	BG	B	5B	G	5B	GR	V	GR	V	L	R	BR	Y	5B	BG	GR	SHIELD	L	P	R	W	LG	5B	SHIELD	W	BR	G	B	5B	R	
Signal Name (Specification)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

Connector No.	E5
Connector Name	POWER/INTELLIGENT POWER DISTRIBUTION MIDDLE ENGINE (MOBILE)
Connector Type	1H08W-NH



Terminal No.	39	40	41	42	43	44	45	46
Color Of Wire	P	L	B/W	Y	5B	W	G	V
Signal Name (Specification)	-	-	-	-	-	-	-	-

Connector No.	E7
Connector Name	POWER/INTELLIGENT POWER DISTRIBUTION MOBILE ENGINE (MOBILE)
Connector Type	1H2DFW-C312-MH



Terminal No.	48	49	51	53	54	55	56	57	58	69	70	72	73	74	75	76	77	80
Color Of Wire	L	RG	Y	W	V	5B	LG	G	P	BR	RG	GR	GR	G	5B	Y	R	W
Signal Name (Specification)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Connector No.	E202
Connector Name	BATTERY TERMINAL WITH FUSIBLE LINK
Connector Type	24340_79905



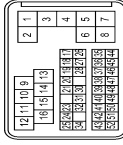
Terminal No.	5
Color Of Wire	B/GY
Signal Name (Specification)	-

Connector No.	E203
Connector Name	ALTERNATOR
Connector Type	24340_55445



Terminal No.	1
Color Of Wire	B/GY
Signal Name (Specification)	B

Connector No.	F1
Connector Name	WIRE TO WIRE
Connector Type	5AAS8FB-RSS-SHZ8



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CHARGING SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

CHARGING SYSTEM

Terminal No.	Color Of Wire	Signal Name [Specification]
1	L/Y	-
2	SHIELD	-
3	L/B	-
4	SHIELD	-
5	BR	-
7	G	-
8	W	-
9	W	-
10	G	-
11	R	-
12	P	-
13	O	-
14	LG	-
15	BR	-
16	Y	-
17	W	-
18	LG	-
19	P	-
20	BR	-
21	CG	-
22	Y	-
23	Y	-
24	LG	-
25	V	-
27	GR	-
28	BR	-
29	L	-
30	R	-
31	P	-
32	W	-
33	SB	-
34	O	-
36	GR	-
37	SHIELD	-
38	W	-
39	Y	-
40	G	-
41	B	-
42	GR	-
43	R	-
45	SB	-
46	SHIELD	-
47	W/L	-
48	LG	-
49	O/L	-
50	W/L	-
51	W/L	-
52	LG	-

Connector No.	F36
Connector Name	ALTERNATOR
Connector Type	H503FB



Terminal No.	Color Of Wire	Signal Name [Specification]
2	G	L
3	V	S
4	W	C

Connector No.	F303
Connector Name	WIRE TO WIRE
Connector Type	T135FW-N510



Terminal No.	Color Of Wire	Signal Name [Specification]
2	G	-
3	W	-
4	R	-
5	B	-
8	L	-
9	Y	-
10	GR	-
19	O	-
20	Y	-
28	B	-
29	LG	-
30	R	-
31	O	-
39	W	-
42	G	-
43	P	-
44	L	-

45	Y	-
46	V	-

Connector No.	M3
Connector Name	FUSE BLOCK (1/B)
Connector Type	NS12FW-CS



Terminal No.	Color Of Wire	Signal Name [Specification]
10C	L	-
11C	LG	-
12C	O	-
13C	B	-
14C	D	-
15C	R	-

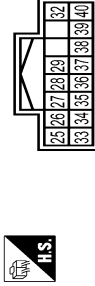
Connector No.	M53
Connector Name	COMBINATION METER
Connector Type	TH24FW-NH



Terminal No.	Color Of Wire	Signal Name [Specification]
1	V	BATTERY POWER SUPPLY
2	O	IGNITION SIGNAL
3	L	VEHICLE SPEED SIGNAL (2-PULSE)
4	Y	VEHICLE SPEED SIGNAL (8-PULSE) [For Mexico]
5	B	VEHICLE SPEED SIGNAL (8-PULSE) [For Mexico]
6	BR	ILLUMINATION CONTROL SIGNAL
7	BR	ROOF STATUS SIGNAL
8	BR	COMMUNICATION SIGNAL (WIRE METER)
10	L	COMMUNICATION SIGNAL (THREE METER-METER)

12	G	S-MODE SWITCH SIGNAL
15	L	ACC POWER SUPPLY
16	R	AIR BAG SIGNAL
17	B	GROUND
18	V	AMBIENT SENSOR SIGNAL
19	G	A/C-AUTO AMP CONNECTION RECOGNITION SIGNAL
20	GR	AMBIENT SENSOR GROUND
21	L	CAN-L
22	P	CAN-H
23	B	GROUND
24	Y	FUEL LEVEL SENSOR GROUND

Connector No.	M54
Connector Name	COMBINATION METER
Connector Type	TH16FW-NH



Terminal No.	Color Of Wire	Signal Name [Specification]
25	W	ALTERNATOR SIGNAL
26	O	PARKING BRAKE SWITCH SIGNAL
27	LG	BRAKE FLUID LEVEL SWITCH SIGNAL
28	Y	SECURITY SIGNAL
29	GR	WASHER LEVEL SWITCH SIGNAL
32	G	PADDLE SHIFTER DOWN SIGNAL
33	O	PADDLE SHIFTER UP SIGNAL
34	BR	FUEL LEVEL SENSOR SIGNAL
35	L	SEAT BELT BUCKLE SWITCH SIGNAL (DRIVER SIDE)
36	P	PASSENGER SEAT BELT WARNING SIGNAL [except for Mexico]
37	G	NON-MANUAL MODE SIGNAL
38	V	MANUAL MODE SHIFT DOWN SIGNAL
39	L	MANUAL MODE SHIFT UP SIGNAL
40	W	MANUAL MODE SIGNAL

CHARGING SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

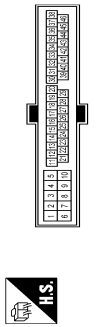
CHARGING SYSTEM

Connector No.	M107
Connector Name	ECM
Connector Type	RH24CF-R28-R-LH-Z



Terminal No.	Color Of Wire	Signal Name (Specification)
97	R	ACCELERATOR PEDAL POSITION SENSOR 1
98	P	ACCELERATOR PEDAL POSITION SENSOR 2
99	L	SENSOR POWER SUPPLY
100	W	SENSOR GROUND
101	SB	ASCD STEERING SWITCH
102	GR	EVAP CONTROL SYSTEM PRESSURE SENSOR
103	G	SENSOR POWER SUPPLY
104	GR	SENSOR GROUND
105	GR	RENGER GROUND
106	W	FUEL TANK TEMPERATURE SENSOR
107	BR	SENSOR POWER SUPPLY
108	Y	SENSOR GROUND
109	G	PMP SIGNAL
110	R	ENGINE SPEED OUTPUT SIGNAL
112	SB	SENSOR GROUND
113	P	CAN COMMUNICATION LINE
114	L	CAN COMMUNICATION LINE
117	Y	DATA LINK CONNECTOR
121	LG	EVAP CANISTER VENT CONTROL VALVE
122	P	STOP LAMP SWITCH
123	B	ECM GROUND
124	B	ECM GROUND
125	R	POWER SUPPLY FOR ECM
126	BR	ASCD BRAKE SWITCH
127	B	ECM GROUND
128	B	ECM GROUND

Connector No.	M115
Connector Name	WIRE TO WIRE
Connector Type	TK3BMW-N510



Terminal No.	Color Of Wire	Signal Name (Specification)
2	W	-
3	BG	- [Coupe models]
3	O	- [Reader models]
4	W	-
5	B	-
8	L	-
9	L	-
10	R	-
20	G	-
28	B	-
29	LG	-
30	LG	-
31	O	-
39	G	-
42	G	-
43	P	-
44	L	-
45	BR	-
46	V	-

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CHARGING SYSTEM

< SYMPTOM DIAGNOSIS >

SYMPTOM DIAGNOSIS

CHARGING SYSTEM

Symptom Table

INFOID:000000011738743

Symptom	Reference
Discharged battery	Refer to CHG-3, "Work Flow (With EXP-800 NI or GR8-1200 NI)" or CHG-7, "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.	

PRECAUTIONS

< PRECAUTION >

PRECAUTION

PRECAUTIONS

EXCEPT FOR MEXICO

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

INFOID:000000011738744

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 "SRS AIR BAG" and "SEAT BELT" of this Service Manual.

WARNING:

Always observe the following items for preventing accidental activation.

- To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision that 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 "SRS AIR BAG".
- Never 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:

Always observe the following items for preventing accidental activation.

- When working near the Air Bag Diagnosis Sensor Unit or other Air Bag System sensors with the ignition ON or engine running, never 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.

EXCEPT FOR MEXICO : Precaution for Battery Service

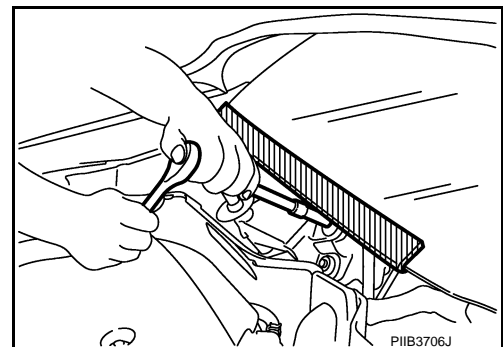
INFOID:000000011738745

Before disconnecting the battery, lower both the driver and passenger windows. This will prevent any interference between the window edge and the vehicle when the door is opened/closed. During normal operation, the window slightly raises and lowers automatically to prevent any window to vehicle interference. The automatic window function will not work with the battery disconnected.

EXCEPT FOR MEXICO : Precaution for Procedure without Cowl Top Cover

INFOID:000000011738747

When performing the procedure after removing cowl top cover, cover the lower end of windshield with urethane, etc to prevent damage to windshield.



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PRECAUTIONS

< PRECAUTION >

EXCEPT FOR MEXICO : Precautions For Xenon Headlamp Service

INFOID:000000011738748

WARNING:

Comply with the following warnings to prevent any serious accident.

- Disconnect the battery cable (negative terminal) or the power supply fuse before installing, removing, or touching the xenon headlamp (bulb included). The xenon headlamp contains high-voltage generated parts.
- Never work with wet hands.
- Check the xenon headlamp ON-OFF status after assembling it to the vehicle. Never turn the xenon headlamp ON in other conditions. Connect the power supply to the vehicle-side connector. (Turning it ON outside the lamp case may cause fire or visual impairments.)
- Never touch the bulb glass immediately after turning it OFF. It is extremely hot.

CAUTION:

Comply with the following cautions to prevent any error and malfunction.

- Install the xenon bulb securely. (Insufficient bulb socket installation may melt the bulb, the connector, the housing, etc. by high-voltage leakage or corona discharge.)
- Never perform HID circuit inspection with a tester.
- Never touch the xenon bulb glass with hands. Never put oil and grease on it.
- Dispose of the used xenon bulb after packing it in thick vinyl without breaking it.
- Never wipe out dirt and contamination with organic solvent (thinner, gasoline, etc.).

EXCEPT FOR MEXICO : Precautions for Removing Battery Terminal

INFOID:000000011738749

- When removing the 12V battery terminal, turn OFF the ignition switch and wait at least 30 seconds.

NOTE:

ECU may be active for several tens of seconds after the ignition switch is turned OFF. If the battery terminal is removed before ECU stops, then a DTC detection error or ECU data corruption may occur.

- For vehicles with the 2-batteries, be sure to connect the main battery and the sub battery before turning ON the ignition switch.

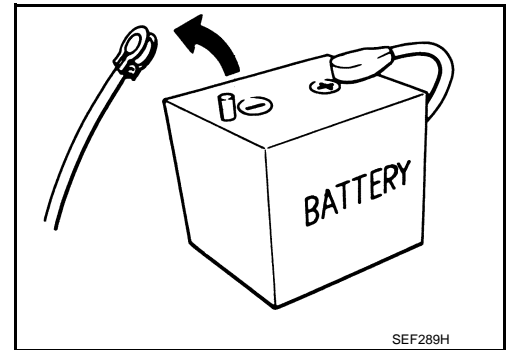
NOTE:

If the ignition switch is turned ON with any one of the terminals of main battery and sub battery disconnected, then DTC may be detected.

- After installing the 12V battery, always check "Self Diagnosis Result" of all ECUs and erase DTC.

NOTE:

The removal of 12V battery may cause a DTC detection error.



FOR MEXICO

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

INFOID:000000011738750

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 "SRS AIR BAG" and "SEAT BELT" of this Service Manual.

WARNING:

Always observe the following items for preventing accidental activation.

- To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision that 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 "SRS AIR BAG".
- Never 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

PRECAUTIONS

< PRECAUTION >

WARNING:

Always observe the following items for preventing accidental activation.

- When working near the Air Bag Diagnosis Sensor Unit or other Air Bag System sensors with the ignition ON or engine running, never 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.

FOR MEXICO : Precaution for Battery Service

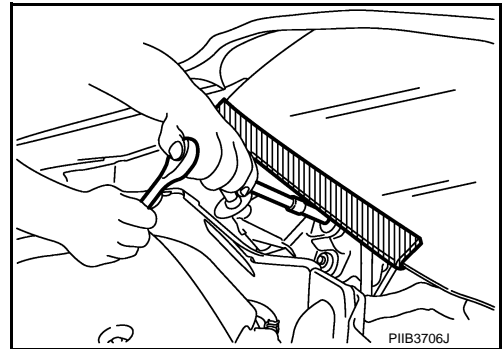
INFOID:000000011738751

Before disconnecting the battery, lower both the driver and passenger windows. This will prevent any interference between the window edge and the vehicle when the door is opened/closed. During normal operation, the window slightly raises and lowers automatically to prevent any window to vehicle interference. The automatic window function will not work with the battery disconnected.

FOR MEXICO : Precaution for Procedure without Cowl Top Cover

INFOID:000000011738753

When performing the procedure after removing cowl top cover, cover the lower end of windshield with urethane, etc to prevent damage to windshield.



FOR MEXICO : Precautions For Xenon Headlamp Service

INFOID:000000011738754

WARNING:

Comply with the following warnings to prevent any serious accident.

- Disconnect the battery cable (negative terminal) or the power supply fuse before installing, removing, or touching the xenon headlamp (bulb included). The xenon headlamp contains high-voltage generated parts.
- Never work with wet hands.
- Check the xenon headlamp ON-OFF status after assembling it to the vehicle. Never turn the xenon headlamp ON in other conditions. Connect the power supply to the vehicle-side connector. (Turning it ON outside the lamp case may cause fire or visual impairments.)
- Never touch the bulb glass immediately after turning it OFF. It is extremely hot.

CAUTION:

Comply with the following cautions to prevent any error and malfunction.

- Install the xenon bulb securely. (Insufficient bulb socket installation may melt the bulb, the connector, the housing, etc. by high-voltage leakage or corona discharge.)
- Never perform HID circuit inspection with a tester.
- Never touch the xenon bulb glass with hands. Never put oil and grease on it.
- Dispose of the used xenon bulb after packing it in thick vinyl without breaking it.
- Never wipe out dirt and contamination with organic solvent (thinner, gasoline, etc.).

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PRECAUTIONS

< PRECAUTION >

FOR MEXICO : Precautions for Removing Battery Terminal

INFOID:000000011738755

- When removing the 12V battery terminal, turn OFF the ignition switch and wait at least 30 seconds.

NOTE:

ECU may be active for several tens of seconds after the ignition switch is turned OFF. If the battery terminal is removed before ECU stops, then a DTC detection error or ECU data corruption may occur.

- For vehicles with the 2-batteries, be sure to connect the main battery and the sub battery before turning ON the ignition switch.

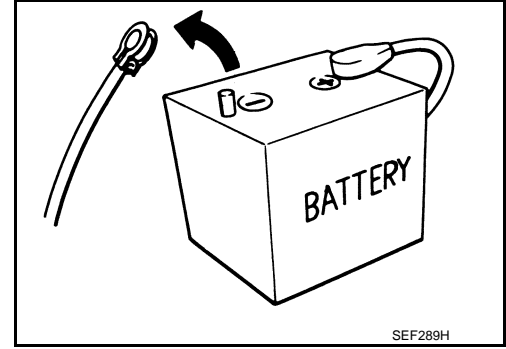
NOTE:

If the ignition switch is turned ON with any one of the terminals of main battery and sub battery disconnected, then DTC may be detected.

- After installing the 12V battery, always check "Self Diagnosis Result" of all ECUs and erase DTC.

NOTE:

The removal of 12V battery may cause a DTC detection error.



PREPARATION

< PREPARATION >

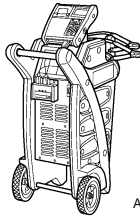
PREPARATION

PREPARATION

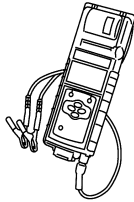
Special Service Tools

INFOID:000000011738756

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



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Commercial Service Tools

INFOID:000000011738757

Tool name	Description
<p>Power tool</p>	<p>Loosening bolts, nuts and screws</p>



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CHARGING SYSTEM PRELIMINARY INSPECTION

< PERIODIC MAINTENANCE >

PERIODIC MAINTENANCE

CHARGING SYSTEM PRELIMINARY INSPECTION

Inspection Procedure

INFOID:000000011738758

1. CHECK BATTERY TERMINALS CONNECTION

Check if battery terminals are clean and tight.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair battery terminals connection.

2. CHECK FUSE

Check for blown fuse and fusible link.

Unit	Power source (Power supply terminals)	Fuse No.
Alternator	Battery ("S" terminal)	32
Combination meter	Ignition switch ON ("L" terminal)	4

Is the inspection result normal?

YES >> GO TO 3.

NO >> Be sure to eliminate the cause of malfunction before installing new fuse.

3. CHECK "E" TERMINAL CONNECTION (ALTERNATOR GROUND)

Check if "E" terminal (alternator ground) is clean and tight.

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair "E" terminal (alternator ground) connection.

4. CHECK DRIVE BELT TENSION

Check drive belt tension. Refer to [EM-16. "Checking"](#).

Is the inspection result normal?

YES >> INSPECTION END

NO >> Repair as needed.

ALTERNATOR

< REMOVAL AND INSTALLATION >

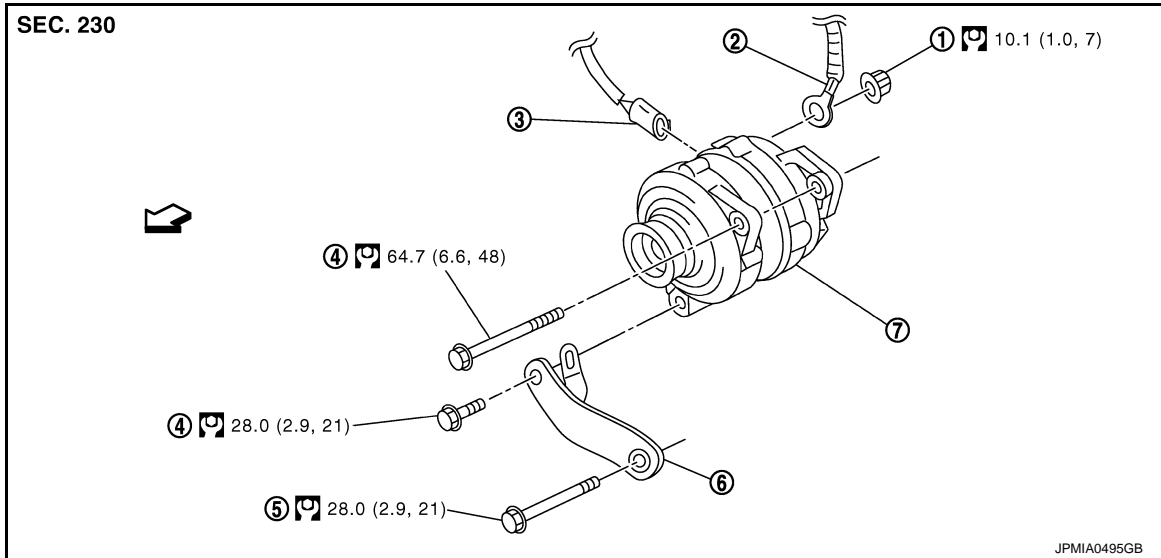
REMOVAL AND INSTALLATION

ALTERNATOR

Exploded View

INFOID:000000011738760

REMOVAL



- | | | |
|-----------------------------|----------------------------------|-------------------------|
| 1. "B" terminal nut | 2. "B" terminal harness | 3. Alternator connector |
| 4. Alternator mounting bolt | 5. Alternator stay mounting bolt | 6. Alternator stay |
| 7. Alternator | | |

↔ : Engine front

⊞ : N·m (kg-m, ft-lb)

DISASSEMBLY

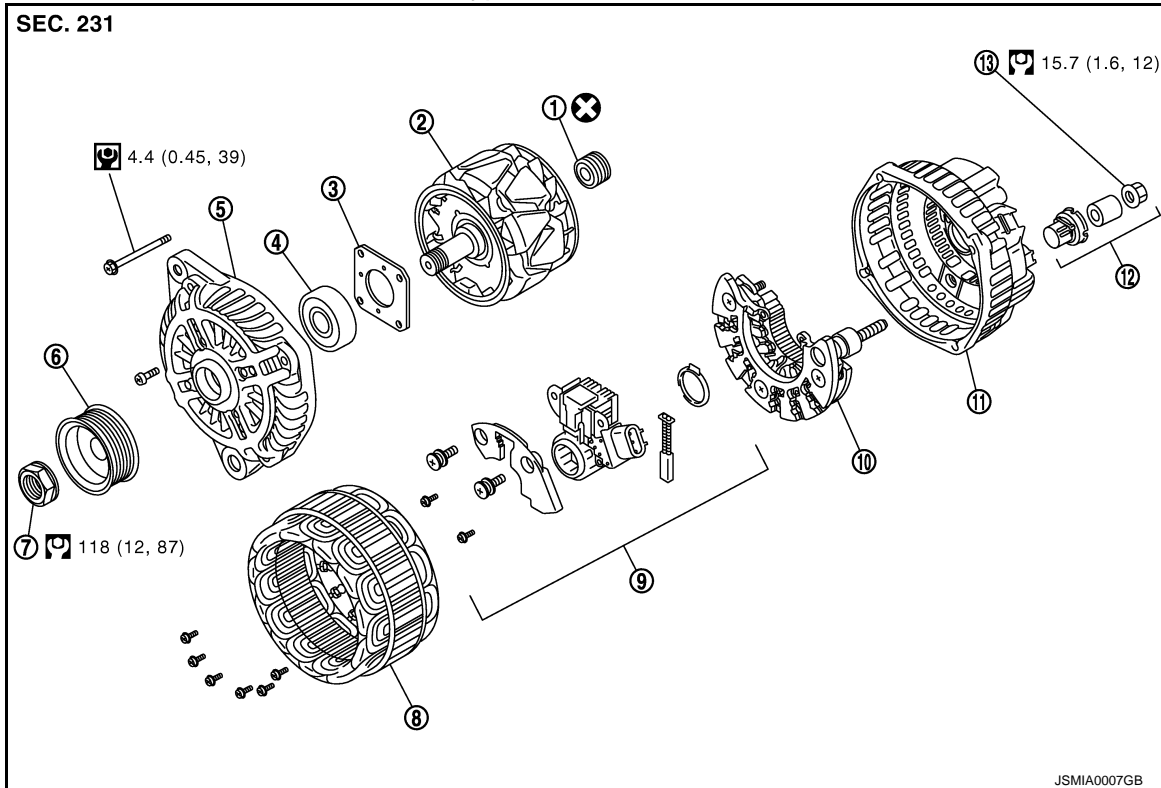
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ALTERNATOR

< REMOVAL AND INSTALLATION >

Type: A003TJ1991B



- | | | |
|----------------------|---------------------------|----------------------------------|
| 1. Rear bearing | 2. Rotor assembly | 3. Retainer |
| 4. Front bearing | 5. Front bracket assembly | 6. Pulley |
| 7. Pulley nut | 8. Stator assembly | 9. IC voltage regulator assembly |
| 10. Diode assembly | 11. Rear bracket assembly | 12. Terminal set |
| 13. "B" terminal nut | | |

⊗ : Always replace after every disassembly.

☞ : N·m (kg·m, ft·lb)

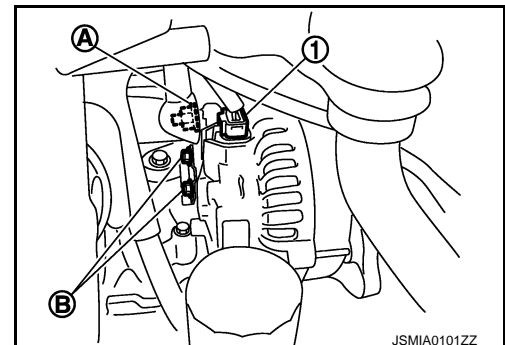
☞ : N·m (kg·m, in·lb)

Removal and Installation

INFOID:000000011738761

REMOVAL

1. Disconnect the battery cable from the negative terminal. Refer to [PG-106. "Removal and Installation"](#).
2. Remove engine front undercover, using power tools.
3. Remove radiator cooling fan assembly. Refer to [CO-22. "Exploded View"](#).
4. Remove drive belt. Refer to [EM-16. "Removal and Installation"](#).
5. Disconnect alternator connector (1).
6. Remove "B" terminal nut (A).
7. Remove the harness bracket bolts (B).

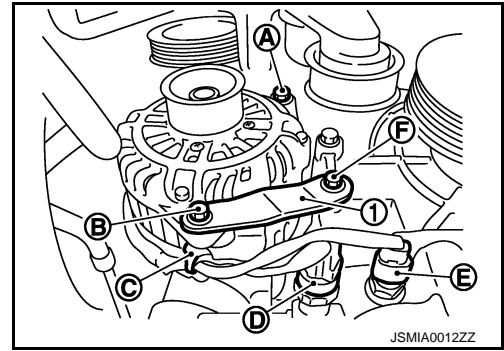


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ALTERNATOR

< REMOVAL AND INSTALLATION >

8. Remove oil pressure switch harness clip (C) from alternator stay (1).
9. Disconnect oil pressure switch connector (D) and oil temperature sensor connector (E).
10. Remove alternator mounting bolt (B) and alternator stay mounting bolt (F) using power tools, then remove alternator stay.
11. Remove alternator mounting bolt (A), using power tools.



12. Remove alternator assembly downward from the vehicle.

INSTALLATION

Install in the reverse order of removal.

CAUTION:

Be sure to tighten "B" terminal nut carefully.

- Install alternator, and check tension of belt. Refer to [EM-16. "Checking"](#).

Inspection

INFOID:0000000011738762

ALTERNATOR PULLEY INSPECTION

Perform the following.

- Make sure that alternator pulley does not rattle.
- Make sure that alternator pulley nut is tight. Refer to [CHG-27. "Exploded View"](#).

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SERVICE DATA AND SPECIFICATIONS (SDS)

< SERVICE DATA AND SPECIFICATIONS (SDS)

SERVICE DATA AND SPECIFICATIONS (SDS)

SERVICE DATA AND SPECIFICATIONS (SDS)

Alternator

INFOID:000000011738763

Type		A003TJ1991B
		MITSUBISHI make
Nominal rating	[V - A]	12 -130
Ground polarity		Negative
Minimum revolution under no-load (When 13.5 V is applied)	[rpm]	Less than 1,300
Hot output current (When 13.5 V is applied)	[A/rpm]	More than 108/2,500 More than 124/5,000
Regulated output voltage	[V]	14.1 - 14.7*

*: Adjustment range of power generation voltage variable control is 11.4 - 15.6 V.