SECTION CHG
CHARGING SYSTEM

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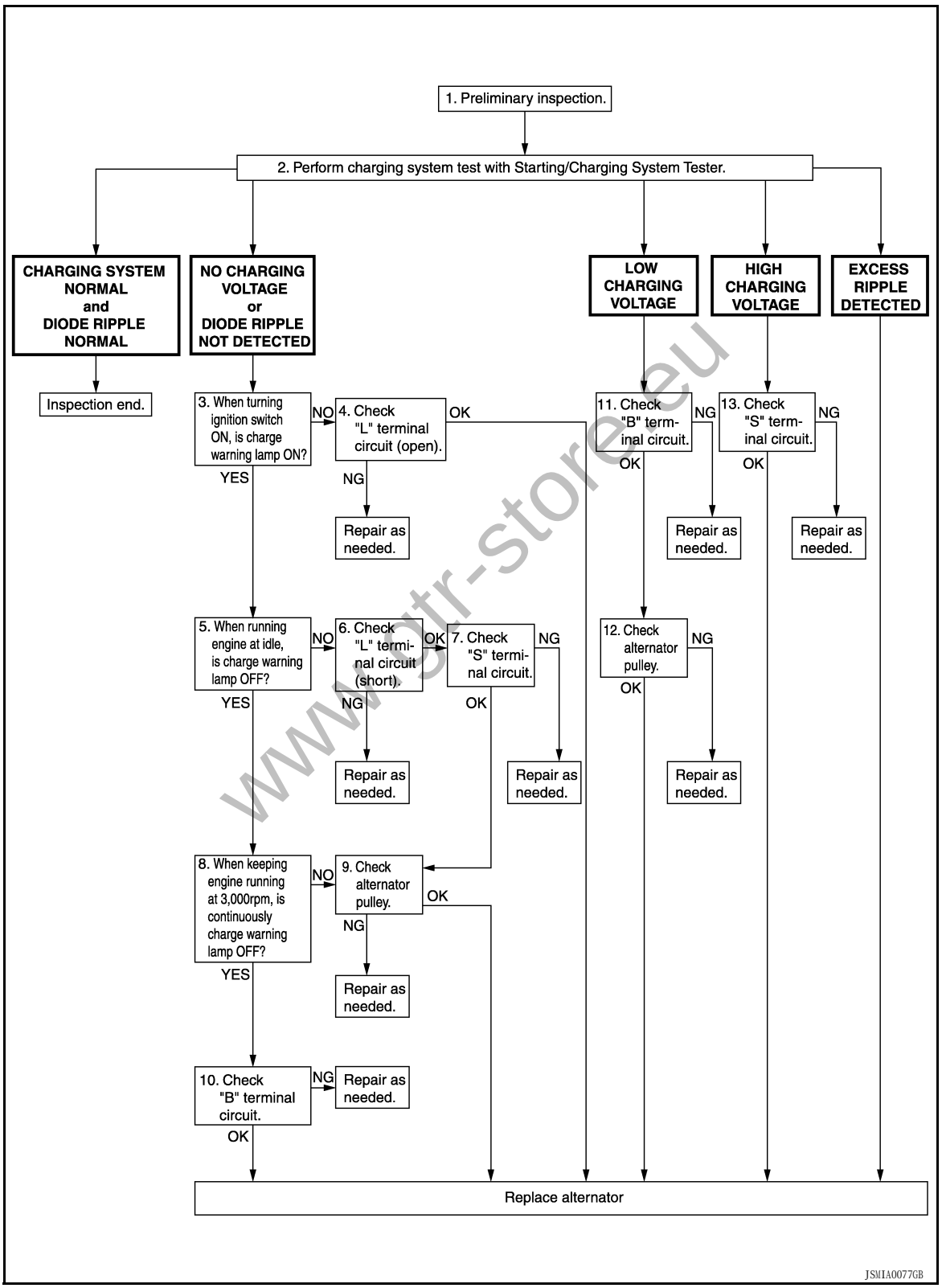
BASIC INSPECTION

DIAGNOSIS AND REPAIR WORKFLOW

Work Flow

INFOID:0000000003897163

OVERALL SEQUENCE



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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-18, "Inspection Procedure".

>> GO TO 2.

2.DIAGNOSIS WITH STARTING/CHARGING SYSTEM TESTER

Perform the charging system test using Starting/Charging System Tester (SST: J-44373). For details and operating instructions, refer to Technical Service Bulletin.

Test result

CHARGING SYSTEM NORMAL>>Charging system is normal and will also show “DIODE RIPPLE” test result.
NO CHARGING VOLTAGE>>GO TO 3.
LOW CHARGING VOLTAGE>>GO TO 11.
HIGH CHARGING VOLTAGE>>GO TO 13.
DIODE RIPPLE NORMAL>>Diode ripple is OK and will also show “CHARGING VOLTAGE” test result.
EXCESS RIPPLE DETECTED>>Replace the alternator. Perform “DIODE RIPPLE” test again using Starting/Charging System Tester (SST: J-44373) to confirm repair.
DIODE RIPPLE NOT DETECTED>>GO TO 3.

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-8, "Diagnosis Procedure".

Is the “L” terminal circuit normal?

YES >> Replace alternator.
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-10, "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-11, "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.

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NO >> GO TO 9.

9. INSPECTION OF ALTERNATOR PULLEY

Check alternator pulley. Refer to CHG-21, "Inspection (GT-R certified NISSAN dealer)".

Is alternator pulley normal?

YES >> Replace alternator.
NO >> Repair as needed.

10. "B" TERMINAL CIRCUIT INSPECTION

Check "B" terminal circuit. Refer to CHG-7, "Diagnosis Procedure".

Is "B" terminal circuit normal?

YES >> Replace alternator.
NO >> Repair as needed.

11. "B" TERMINAL CIRCUIT INSPECTION

Check "B" terminal circuit. Refer to CHG-7, "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-21, "Inspection (GT-R certified NISSAN dealer)".

Is alternator pulley normal?

YES >> Replace alternator.
NO >> Repair as needed.

13. "S" TERMINAL CIRCUIT INSPECTION

Check "S" terminal circuit. Refer to CHG-11, "Diagnosis Procedure".

Is the "S" terminal circuit normal?

YES >> Replace alternator.
NO >> Repair as needed.

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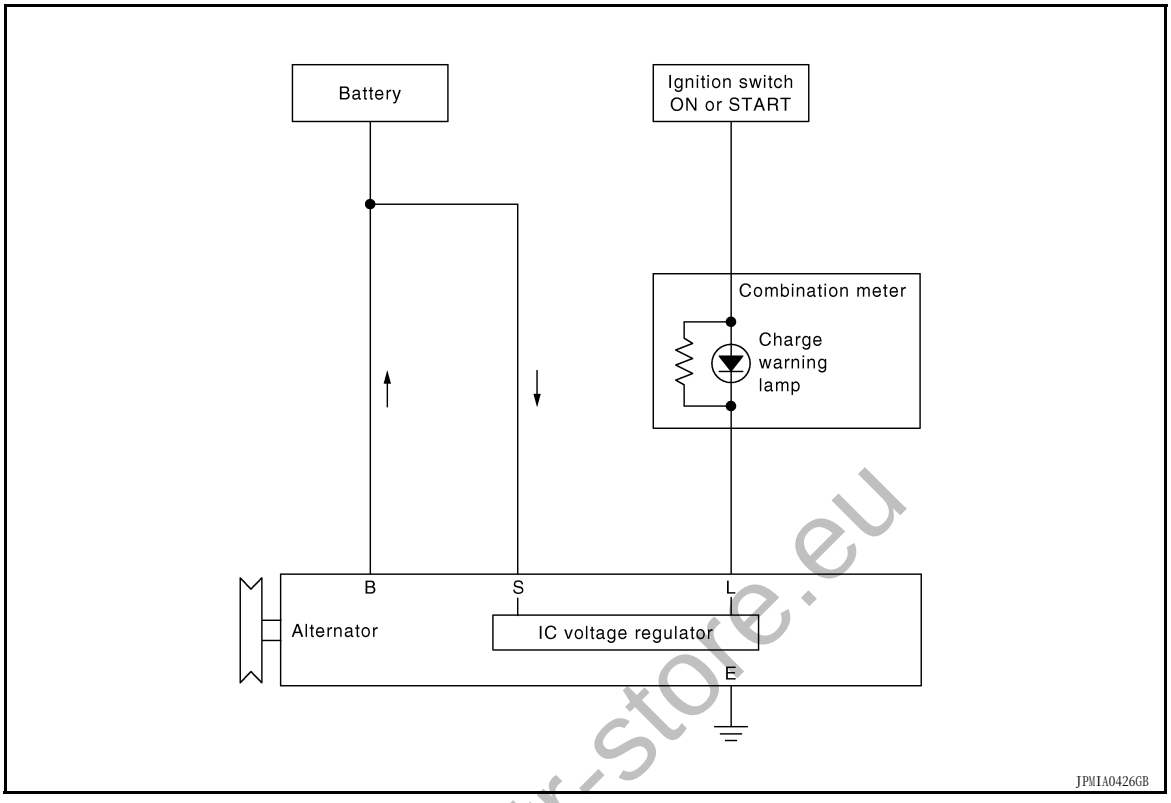
FUNCTION DIAGNOSIS

CHARGING SYSTEM

System Diagram

INFOID:0000000003897164



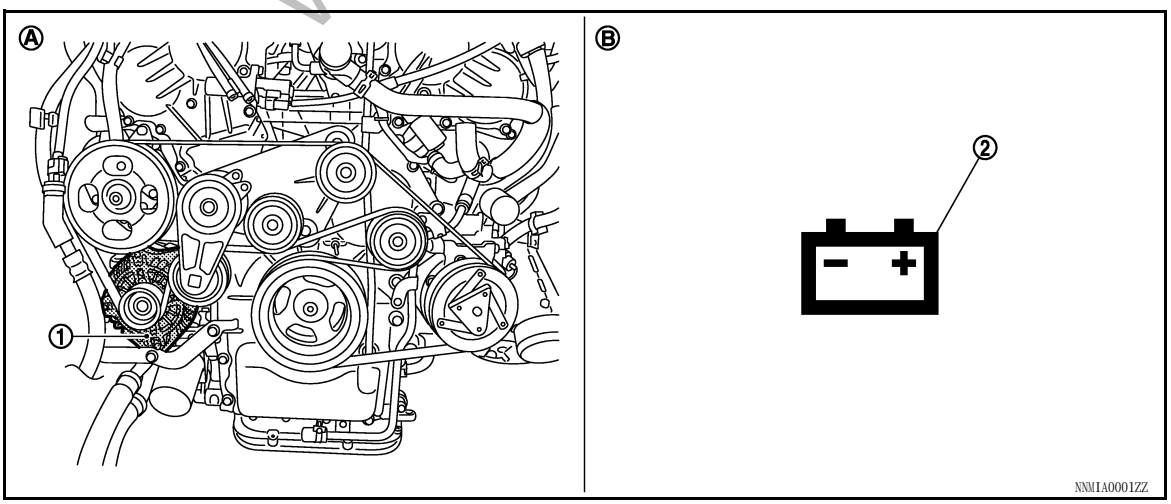
System Description

INFOID:0000000003897165

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

INFOID:0000000003897166



1. Alternator
2. Charge warning lamp

A. Cylinder block (bank 1) side
B. Combination meter

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Component Description

INFOID:0000000003897167

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: • Excessive voltage is produced. • No voltage is produced.

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COMPONENT DIAGNOSIS

B TERMINAL CIRCUIT

Description

INFOID:0000000003897172

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

Diagnosis Procedure

INFOID:0000000003897173

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 Starting/Charging system test. Refer to Technical Service Bulletin.

2.CHECK "B" TERMINAL CIRCUIT

Check voltage between alternator "B" terminal and ground.

Terminals			Voltage (Approx.)
(+)		(–)	
Alternator "B" terminal	Terminal		
E254	1	Ground	Battery voltage

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.)
(+)	(–)		
	Alternator "B" terminal	Terminal	
Battery positive terminal	E254	1	Less than 0.2 V

Is the inspection result normal?

YES >> "B" terminal circuit is normal. Refer to CHG-2, "Work Flow".
NO >> Check harness between battery and alternator for poor continuity.

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L TERMINAL CIRCUIT (OPEN)

Description

INFOID:0000000003897174

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:0000000003897175

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 Starting/Charging system test. Refer to Technical Service Bulletin.

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
E254	2		ON	Illuminate

Does it illuminate?

YES >> “L” terminal circuit is normal. Refer to CHG-2, "Work Flow".
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.	
E254	2	M53	28	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.

5.CHECK POWER SUPPLY CIRCUIT

1. Connect the battery cable to the negative terminal.

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2. Check voltage between combination meter harness connector and ground.

Terminals			Condition	Voltage (Approx.)
(+)		(–)		
Combination meter harness connector	Terminal			
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-45, "Wiring Diagram - IGNITION POWER SUPPLY - ".

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L TERMINAL CIRCUIT (SHORT)

Description

INFOID:0000000003897176

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:0000000003897177

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-2, "Work Flow".

2.CHECK HARNESS CONTINUITY (SHORT CIRCUIT)

1. Turn the 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.		
M53	28		Not existed

Is the inspection result normal?

YES >> Replace combination meter.
NO >> Repair the harness.

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S TERMINAL CIRCUIT

Description

INFOID:0000000003897178

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:0000000003897179

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 Starting/Charging system test. Refer to Technical Service Bulletin.

2.CHECK “S” TERMINAL CIRCUIT

Check voltage between alternator harness connector and ground.

Terminals			Voltage (Approx.)
(+)		(–)	
Alternator harness connector	Terminal		
E254	3	Ground	Battery voltage

Is the inspection result normal?

YES >> Refer to CHG-2, "Work Flow".
NO >> Check harness for open between alternator and fuse.

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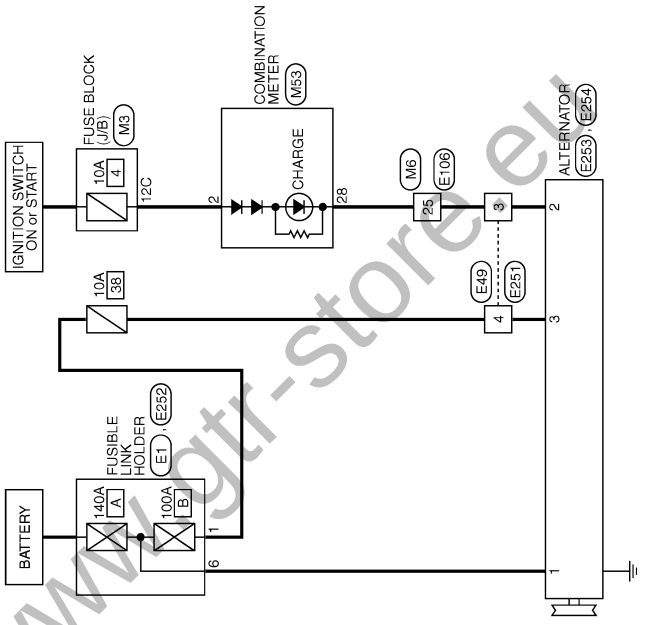
CHARGING SYSTEM

Wiring Diagram - CHARGING SYSTEM -

INFOID:0000000003897180



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CHARGING SYSTEM

2008/03/14

JCMWA2114GB

CHARGING SYSTEM

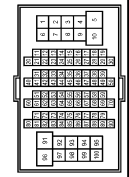
Connector No.	E1
Connector Name	FUSIBLE LINK HOLDER
Connector Type	L02FBR-MC

Terminal No.	Color of Wire	Signal Name [Specification]
1	W	–

Connector No.	E49
Connector Name	WIRE TO WIRE
Connector Type	RH08MB

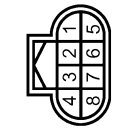
Terminal No.	Color of Wire	Signal Name [Specification]
3	BR	–
4	P	–

Connector No.	E106
Connector Name	WIRE TO WIRE
Connector Type	TH80FW-CS16-TM4



Terminal No.	Color of Wire	Signal Name [Specification]
25	BR	–

Connector No.	E251
Connector Name	WIRE TO WIRE
Connector Type	RH08FB



Terminal No.	Color of Wire	Signal Name [Specification]
3	BR	–
4	V	–

Connector No.	E252
Connector Name	FUSIBLE LINK HOLDER
Connector Type	24340 79905

Terminal No.	Color of Wire	Signal Name [Specification]
6	B	–

Connector No.	E253
Connector Name	ALTERNATOR
Connector Type	24340 65F45

Terminal No.	Color of Wire	Signal Name [Specification]
1	B	B

Connector No.	E254
Connector Name	ALTERNATOR
Connector Type	HS03FB

Terminal No.	Color of Wire	Signal Name [Specification]
2	BR	L
3	V	S

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

Terminal No.	Color of Wire	Signal Name [Specification]
12C	W	–

JCMWA2115GB

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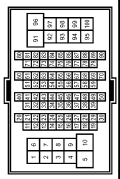
CHARGING SYSTEM

Connector No.	M6
Connector Name	WIRE TO WIRE
Connector Type	TH80MW-CS16-TM4

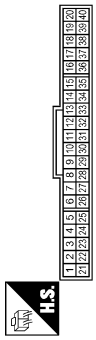
H.S.



Terminal No.	Color of Wire	Signal Name [Specification]
25	BR	–

Connector No.	M53
Connector Name	COMBINATION METER
Connector Type	SAB40FW

H.S.



Terminal No.	Color of Wire	Signal Name [Specification]
2	W	IGNITION POWER SUPPLY
28	BR	ALTERNATOR

JCMWA2116GB

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SYMPTOM DIAGNOSIS

CHARGING SYSTEM

Symptom Table

INFOID:0000000003897181

Symptom	Reference
Discharged battery	Refer to CHG-2, "Work Flow".
The charge warning lamp does not illuminate when the ignition switch is set to ON.	
The charge warning lamp does not turn OFF after the engine starts.	
The charging warning lamp turns ON when increasing the engine speed.	

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PRECAUTION

PRECAUTIONS

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

INFOID:0000000003897182

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 AIRBAG” and “SEAT BELT” 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 “SRS AIRBAG”.**
- **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.**

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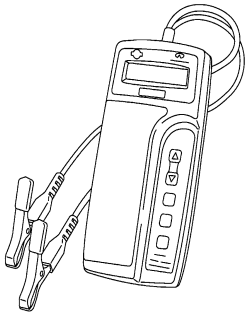
PREPARATION

PREPARATION

Special Service Tools

INFOID:0000000003897184

Tool number (Kent-Moore No.) Tool name	Description
— (J-44373 Model MCR620) Starting/Charging System Tester  SEL403X	Tests starting and charging systems. For operating instructions, refer to Technical Service Bulletin.

Commercial Service Tools

INFOID:0000000003897185

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

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ON-VEHICLE MAINTENANCE

CHARGING SYSTEM PRELIMINARY INSPECTION

Inspection Procedure

INFOID:0000000003897186

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)	38
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 DRIVE BELT TENSION

Check drive belt tension. Refer to EM-13, "Checking".

Is the inspection result normal?

YES >> INSPECTION END
NO >> Repair as needed.

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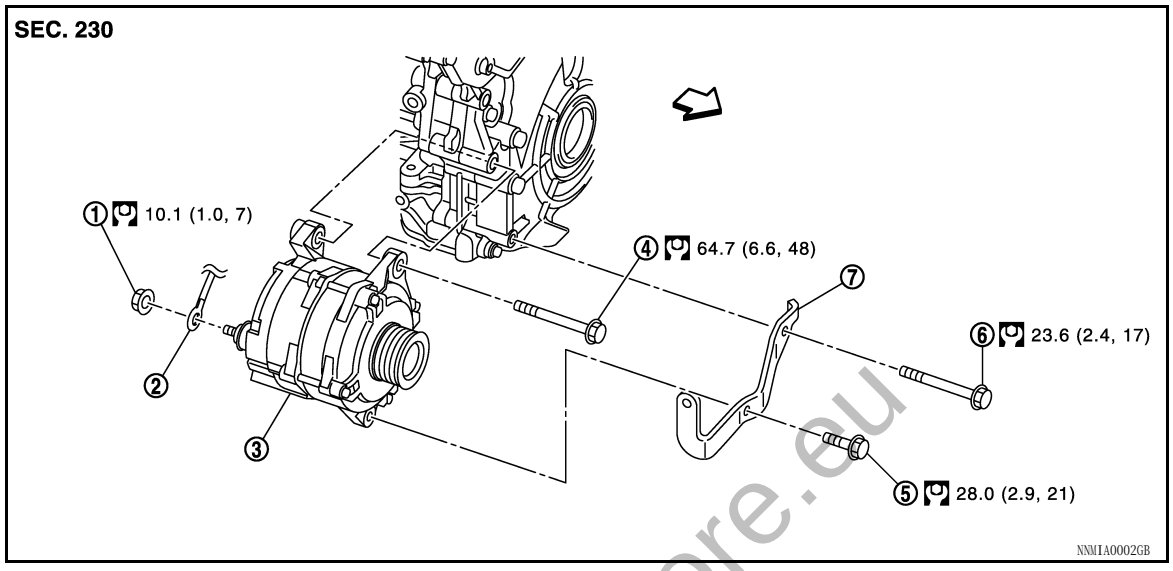
ON-VEHICLE REPAIR

ALTERNATOR

Exploded View (GT-R certified NISSAN dealer)

INFOID:0000000003897188

REMOVAL



1. “B” terminal nut
2. “B” terminal harness
3. Alternator
4. Alternator mounting upper bolt
5. Alternator mounting lower bolt
6. Alternator stay mounting bolt
7. Alternator stay

⇦ : Engine front

Refer to GI-4, "Components" for symbols in the figure.

DISASSEMBLY

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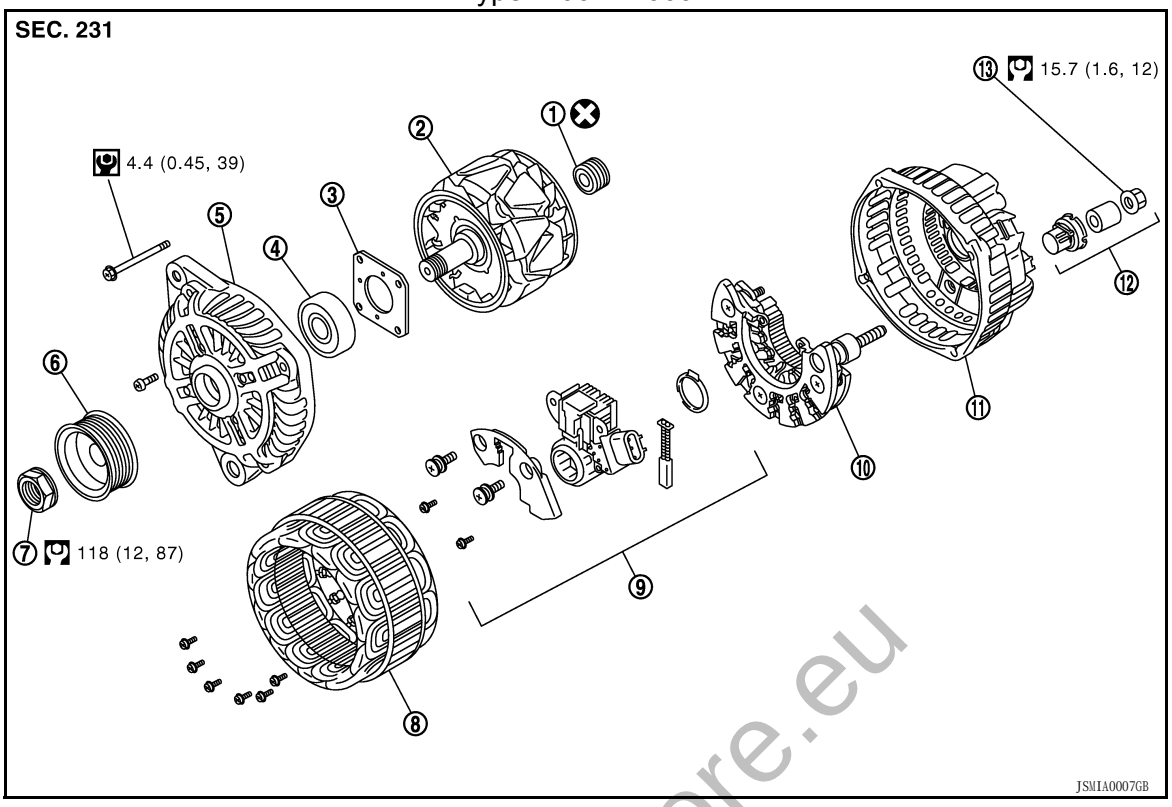
Type: A002TX0091



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

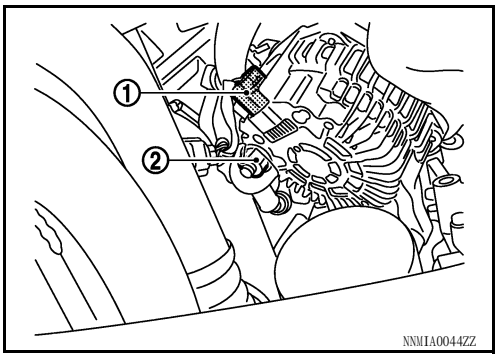
Refer to GI-4, "Components" for symbols in the figure.

Removal and Installation (GT-R certified NISSAN dealer)

INFOID:0000000003897189

REMOVAL

1. Disconnect the battery cable from the negative terminal.
2. Remove drive belt. Refer to EM-13, "Removal and Installation (GT-R certified NISSAN dealer)".
3. Remove drive belt auto tensioner and idler pulley bracket side. Refer to EM-25, "Exploded View".
4. Remove engine front undercover, using power tools.
5. Remove alternator mounting upper bolt.
6. Disconnect oil pressure switch connector.
7. Pull up alternator, and then disconnect alternator connector (1).
8. Remove “B” terminal nut (2).



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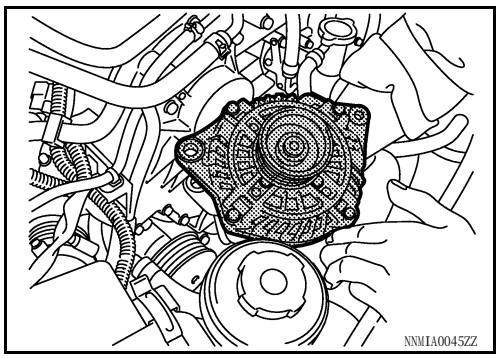
9. Remove alternator assembly upward from the vehicle.



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-13, "Checking".

Inspection (GT-R certified NISSAN dealer)

INFOID:0000000003897191

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-19, "Exploded View (GT-R certified NISSAN dealer)".

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SERVICE DATA AND SPECIFICATIONS (SDS)

SERVICE DATA AND SPECIFICATIONS (SDS)

Alternator

INFOID:0000000003897195

Type		A002TX0091
		MITSUBISHI make
Nominal rating	[V - A]	12 -150
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 57/1,500 More than 126/2,500 More than 152/5,000
Regulated output voltage	[V]	14.1 - 14.7
Minimum length of brush	[mm (in)]	More than 5.00 (0.197)
Brush spring pressure	[N (g, oz)]	4.1 - 5.3 (418 - 541, 14.7 - 19.1)
Slip ring minimum outer diameter	[mm (in)]	More than 22.1 (0.870)
Rotor (Field coil) resistance	[Ω]	1.8 - 2.2

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