

SECTION CHG

CHARGING SYSTEM

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DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION >

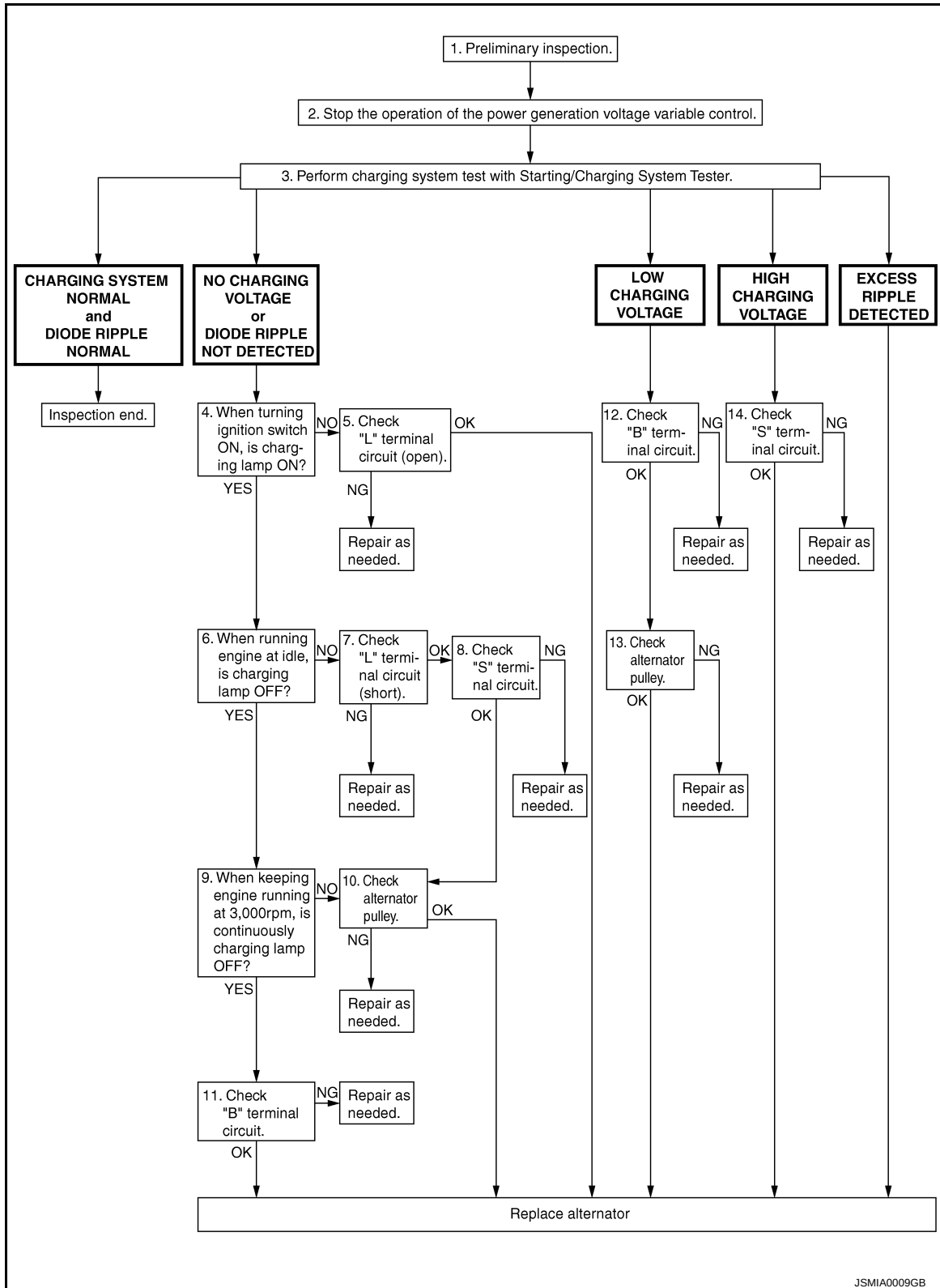
BASIC INSPECTION

DIAGNOSIS AND REPAIR WORKFLOW

Work Flow

INFOID:000000005514975

OVERALL SEQUENCE



DETAILED FLOW

DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION >

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-24, "Inspection Procedure"](#).

>> GO TO 2.

2. STOP POWER GENERATION VOLTAGE VARIABLE CONTROL SYSTEM

Stop the operation of the power generation voltage variable control in either of the following procedures.

- After selecting "ENGINE" of "SELECT SYSTEM" using CONSULT-III, set the DUTY value of "ALTERNATOR DUTY" to 0 % by selecting "ALTERNATOR DUTY" of "Active Test". Continue "Active Test" until the end of inspection. (When the DUTY value is 0 or 100 %, the normal power generation is performed according to the characteristic of the IC voltage regulator of the alternator.)
- Turn the ignition switch OFF, and disconnect the battery current sensor connector. [However, DTC (P1550 - P1554) of the engine might remain. After finishing the inspection, connect the battery current sensor connector and erase the self-diagnostic results history of the engine using CONSULT-III.]

>> GO TO 3.

3. 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 4.

LOW CHARGING VOLTAGE>>GO TO 12.

HIGH CHARGING VOLTAGE>>GO TO 14.

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 4.

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

Turn the ignition switch ON.

Does the charge warning lamp illuminate?

YES >> GO TO 6.

NO >> GO TO 5.

5. "L" TERMINAL CIRCUIT (OPEN) INSPECTION

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

Is the "L" terminal circuit normal?

YES >> Replace alternator.

NO >> Repair as needed.

6. INSPECTION WITH CHARGE WARNING LAMP (IDLING)

Start the engine and run it at idle.

Does the charge warning lamp turn OFF?

YES >> GO TO 9.

NO >> GO TO 7.

7. "L" TERMINAL CIRCUIT (SHORT) INSPECTION

Check "L" terminal circuit (short). Refer to [CHG-13, "Diagnosis Procedure"](#).

Is the "L" terminal circuit normal?

YES >> GO TO 8.

NO >> Repair as needed.

DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION >

8. "S" TERMINAL CIRCUIT INSPECTION

Check "S" terminal circuit. Refer to [CHG-14, "Diagnosis Procedure"](#).

Is the "S" terminal circuit normal?

YES >> GO TO 10.

NO >> Repair as needed.

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

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

Does the charge warning lamp remain off?

YES >> GO TO 11.

NO >> GO TO 10.

10. INSPECTION OF ALTERNATOR PULLEY

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

Is alternator pulley normal?

YES >> Replace alternator.

NO >> Repair as needed.

11. "B" TERMINAL CIRCUIT INSPECTION

Check "B" terminal circuit. Refer to [CHG-10, "Diagnosis Procedure"](#).

Is "B" terminal circuit normal?

YES >> Replace alternator.

NO >> Repair as needed.

12. "B" TERMINAL CIRCUIT INSPECTION

Check "B" terminal circuit. Refer to [CHG-10, "Diagnosis Procedure"](#).

Is "B" terminal circuit normal?

YES >> GO TO 13.

NO >> Repair as needed.

13. INSPECTION OF ALTERNATOR PULLEY

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

Is alternator pulley normal?

YES >> Replace alternator.

NO >> Repair as needed.

14. "S" TERMINAL CIRCUIT INSPECTION

Check "S" terminal circuit. Refer to [CHG-14, "Diagnosis Procedure"](#).

Is the "S" terminal circuit normal?

YES >> Replace alternator.

NO >> Repair as needed.

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CHG

CHARGING SYSTEM

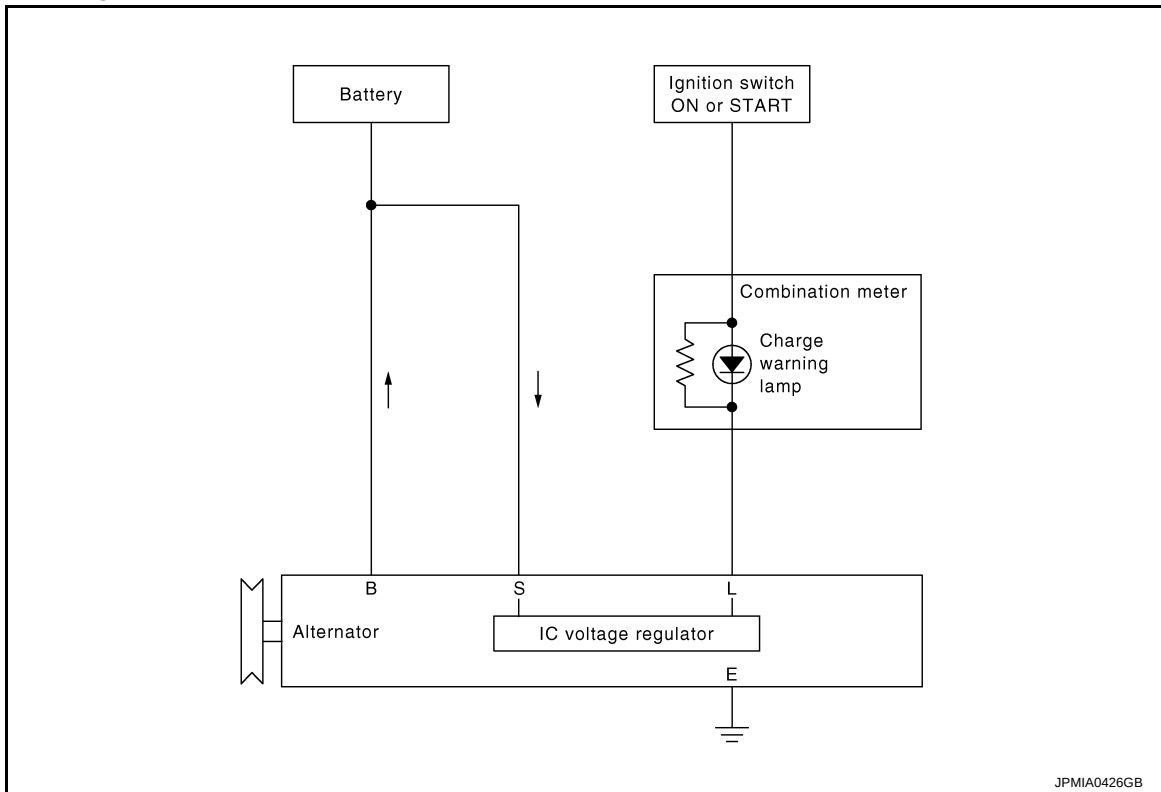
< SYSTEM DESCRIPTION >

SYSTEM DESCRIPTION

CHARGING SYSTEM

System Diagram

INFOID:000000005514976



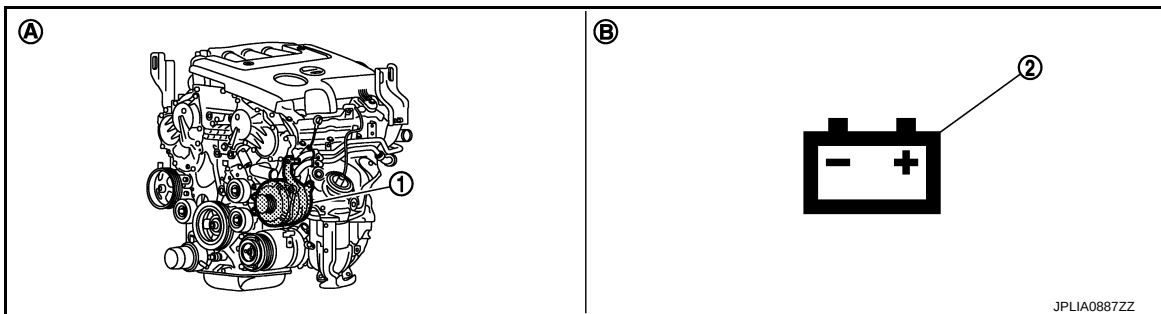
System Description

INFOID:000000005514977

The voltage output is controlled by the IC voltage regulator.

Component Parts Location

INFOID:000000005514978



- | | |
|-----------------------------|------------------------|
| 1. Alternator | 2. Charge warning lamp |
| A. Cylinder block left side | B. Combination meter |

Component Description

INFOID:000000005514979

CHARGING SYSTEM

< SYSTEM DESCRIPTION >

Component part	Description
Alternator	The alternator provides DC voltage to operate the vehicle's 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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CHG

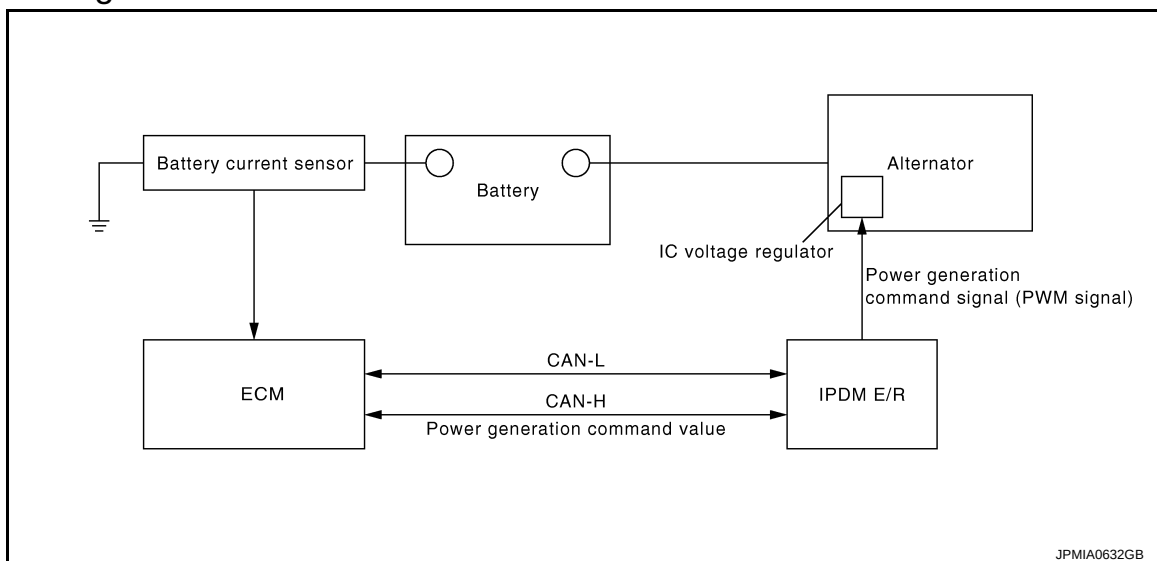
POWER GENERATION VOLTAGE VARIABLE CONTROL SYSTEM

< SYSTEM DESCRIPTION >

POWER GENERATION VOLTAGE VARIABLE CONTROL SYSTEM

System Diagram

INFOID:000000005514980



System Description

INFOID:000000005514981

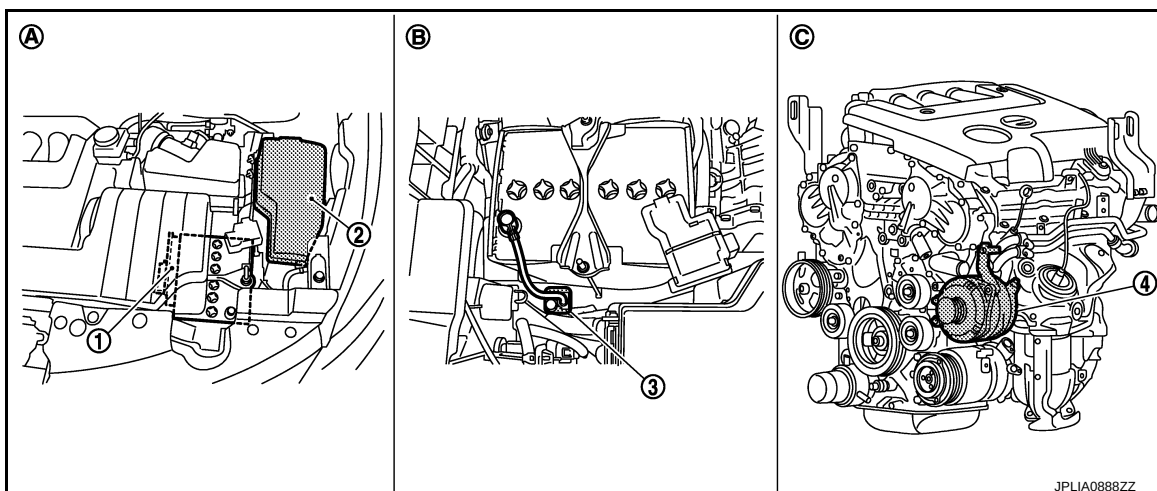
By performing the power generation voltage variable control, the engine load due to the power generation of the alternator is reduced and fuel consumption is decreased.

NOTE:

When any malfunction is detected in the power generation voltage variable control system, the power generation is performed according to the characteristic of the IC voltage regulator of the alternator.

Component Parts Location

INFOID:000000005514982



1. ECM

2. IPDM E/R

3. Battery current sensor

4. Alternator

A. Engine room dash panel (LH)

B. Battery

C. Cylinder block left side

POWER GENERATION VOLTAGE VARIABLE CONTROL SYSTEM

< SYSTEM DESCRIPTION >

Component Description

INFOID:000000005514983

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

CHG

B TERMINAL CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

DTC/CIRCUIT DIAGNOSIS

B TERMINAL CIRCUIT

Description

INFOID:000000005514984

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

Diagnosis Procedure

INFOID:000000005514985

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	
F59	1		Ground

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	F59	1	Less than 0.2 V

Is the inspection result normal?

YES >> "B" terminal circuit is normal. Refer to [CHG-3, "Work Flow"](#).

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

L TERMINAL CIRCUIT (OPEN)

< DTC/CIRCUIT DIAGNOSIS >

L TERMINAL CIRCUIT (OPEN)

Description

INFOID:000000005514986

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:000000005514987

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
F60	3		ON	illuminate

Does it illuminate?

YES >> "L" terminal circuit is normal. Refer to [CHG-3, "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.	
F60	3	M34	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.	
M34	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.

L TERMINAL CIRCUIT (OPEN)

< DTC/CIRCUIT DIAGNOSIS >

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

Terminals		Condition	Voltage (Approx.)
(+)	(-)		
Combination meter harness connector	Terminal		
M34	2	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-67, "Wiring Diagram - IGNITION POWER SUPPLY - "](#)

L TERMINAL CIRCUIT (SHORT)

< DTC/CIRCUIT DIAGNOSIS >

L TERMINAL CIRCUIT (SHORT)

Description

INFOID:000000005514988

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:000000005514989

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"](#).

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.		
M34	25		Not existed

Is the inspection result normal?

YES >> Replace combination meter.

NO >> Repair the harness.

CHG

S TERMINAL CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

S TERMINAL CIRCUIT

Description

INFOID:000000005514990

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:000000005514991

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		
F60	4	Ground	Battery voltage

Is the inspection result normal?

YES >> Refer to [CHG-3, "Work Flow"](#).

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

CHARGING SYSTEM

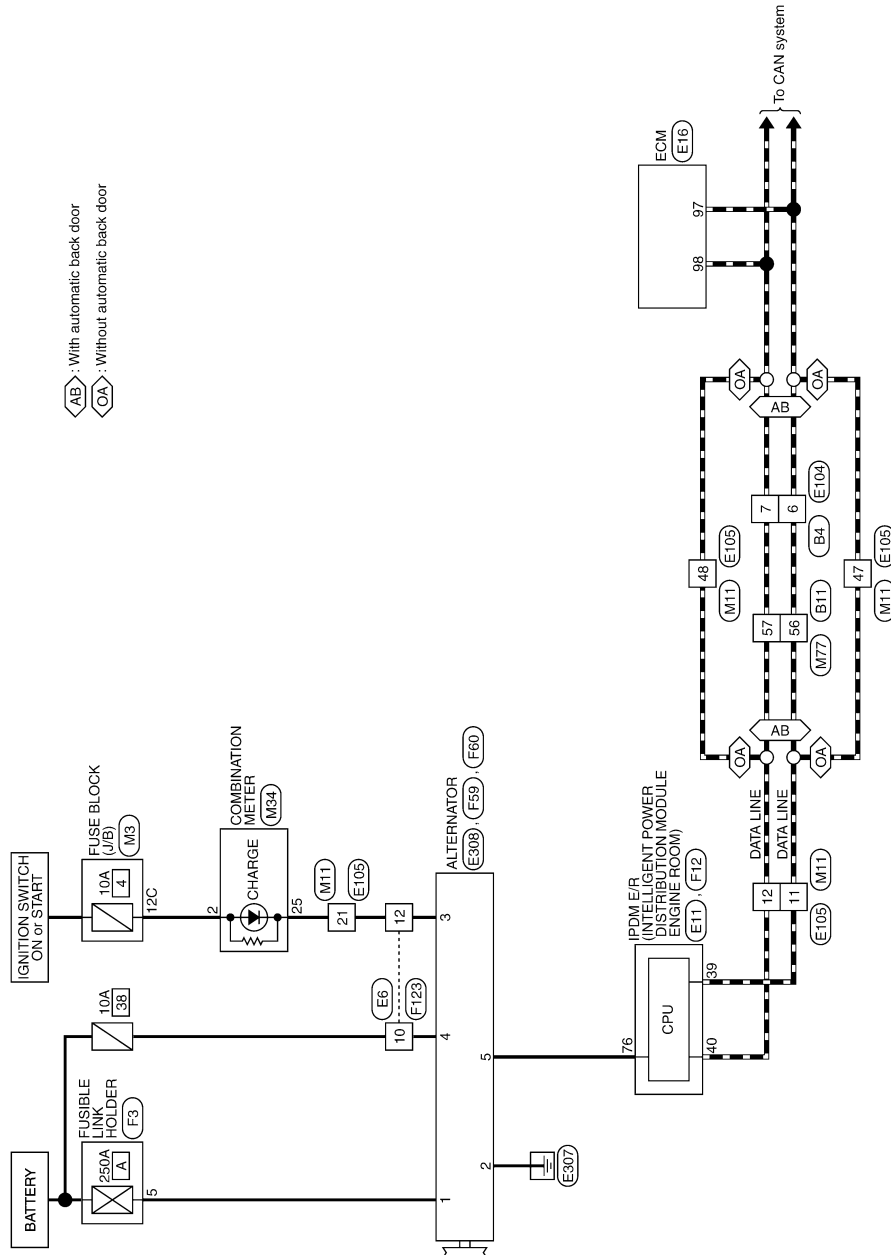
< DTC/CIRCUIT DIAGNOSIS >

CHARGING SYSTEM

Wiring Diagram - CHARGING SYSTEM -

INFOID:000000005514992

CHARGING SYSTEM



2008/09/23

JCMWM3186GB

CHG

CHARGING SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

CHARGING SYSTEM

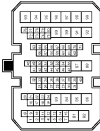
Connector No.	B4
Connector Name	WIRE TO WIRE
Connector Type	HS16MW-CS



1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21

Terminal No.	Color of Wire	Signal Name [Specification]
1	SB	-
2	W	-
3	W	-
4	R	-
5	O	-
6	P	-
7	L	-
8	B	-
9	LG	-
10	V	-
11	L	-
12	BR	-
13	P	-
14	BR	-
15	O	-
16	G	-

Connector No.	B11
Connector Name	WIRE TO WIRE
Connector Type	TH80MW-CS13



Terminal No.	Color of Wire	Signal Name [Specification]
1	SHIELD	-
2	B	-
3	R/L	-
4	R/W	-
5	SB	-
6	P	-

7	V	-
8	SHIELD	-
9	BR/L	-
10	V/G	-
11	L	-
12	W/L	-
13	L	-
14	BR	-
15	SB	-
16	BR	-
17	V	-
18	SB	-
19	R	-
20	P	-
21	LG	-
22	W	-
23	Y	-
24	GR	-
25	Y	-
26	V	-
27	W/L	-
28	P	-
29	O	-
30	BR	-
31	SB	-
32	SHIELD	-
33	L/O	-
34	Y	-
35	GR	-
36	G	-
37	LG	-
38	O	-
39	Y	-
40	BR	-
41	G	-
42	SB	-
43	G	-
44	BR	-
45	L	-
46	GR	-
47	V	-
48	GR	- [With rear view camera and telephone]
49	Y	- [With rear view camera without telephone]
50	SHIELD	-
51	B	-
52	B	-
53	Y	-
54	LG	-
55	BR	-
56	P	-
57	L	-
58	R	-
59	SHIELD	-
60	B	-
61	R/L	-
62	R/W	-



1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21

Connector No.	E6
Connector Name	WIRE TO WIRE
Connector Type	TK16MGY-IV

1	L	-
3	Y	-
4	R	-
5	GR	-
6	V	-
8	P	-
10	W	-
11	G	-
12	BR	-
13	SB	-
14	B	-
15	O	-

Connector No.	E11
Connector Name	IPWME'S INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM
Connector Type	TH08FW-NH



42	41	40	39
46	45	44	43

Terminal No.	Color of Wire	Signal Name [Specification]
39	P	-
40	L	-
41	B	-
42	SB	-
43	Y	-
44	W	-
45	O	-
46	BR	-

JCMWM4898GB

CHARGING SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

CHARGING SYSTEM

Connector No.	E16
Connector Name	ECM
Connector Type	RN24FB-R28-L-LH



81	85	89	93	97	101	105	109
82	86	90	94	98	102	106	110
83	87	91	95	99	103	107	111
84	88	92	96	100	104	108	112

Terminal No.	Color of Wire	Signal Name [Specification]
81	W	APSI1
82	O	APSI2
83	BR	AVCG1-APSI
84	B	GND4-APSI
85	Y	ASCD SW
86	SB	FTPRES
87	GR	AVCG2-APSI2
88	O	KLINE
91	L	AVCG2-FTPRES
92	BR	GND4-ASCD SW
93	BR	IGN SW
94	GR	TACHO(CABIN)
95	Y	TF
96	GR	GND4-FTPRES
97	P	VEHCAN-L
98	L	VEHCAN-H
100	G	GND4-APSI2
102	R	NEUT-H
104	SB	GND4-TF
105	V	VER
106	SB	BRAKE
107	B	GND
108	B	GND
109	W	CDCV
110	G	BNGSW
111	B	GND
112	B	GND

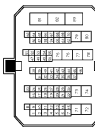
Connector No.	E104
Connector Name	WIRE TO WIRE
Connector Type	NS(EFT)-CS



7	6	5	4	3	2	1
16	15	14	13	12	11	10
9	8	7	6	5	4	3
2	1	0	9	8	7	6

Terminal No.	Color of Wire	Signal Name [Specification]
1	Y	-
2	SB	-
3	L	-
4	R	-
5	L	-
6	P	-
7	L	-
8	B/W	-
9	SB	-
10	GR	-
11	R	-
12	W	-
13	P	-
14	V	-
15	Y	-
16	L	-

Connector No.	E105
Connector Name	WIRE TO WIRE
Connector Type	TH7(DMH)-CS(0-M3)



Terminal No.	Color of Wire	Signal Name [Specification]
2	BR	-
3	Y	-
4	W	-
5	LG	-
6	GR	-
8	G	-

Connector No.	E308
Connector Name	ALTERNATOR
Connector Type	-



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

Connector No.	F3
Connector Name	FUSIBLE LINK HOLDER
Connector Type	-



Terminal No.	Color of Wire	Signal Name [Specification]
5	B/R	-

11	P	-
12	L	-
13	Y	-
14	O	-
15	BR	-
20	Y	-
21	BR	-
22	P	-
23	P	-
24	L	-
25	O	-
26	G	-
27	V	-
28	SB	-
29	W	-
30	Y	-
47	P	-
48	L	-
49	SB	-
50	GR	-
51	LG	-
52	V	-
53	GR	-
54	BR	-
55	Y	-
56	W/L	-
60	V	-
61	BR	-
62	O	-
63	L/O	-
64	SHIELD	-
66	W	-
67	BR	-
68	Y	-
69	SB	-
70	GR	-
71	SB	-
72	Y	-
73	L	-
74	W	-
75	BR	-
76	GR	-
77	O	-
78	V	-
79	Y	-
80	R	-
81	W	-
82	LG	-
83	O	-

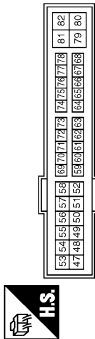
JCMWM4899GB

CHARGING SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

CHARGING SYSTEM

Connector No.	F12
Connector Name	SMALL INTELLIGENT POWER DISTRIBUTION MODULE (ENGINE ROOM)
Connector Type	TH20FW-CS12-M4



Terminal No.	Color of Wire	Signal Name [Specification]
48	W	-
49	R/B	-
51	LG	-
52	Y/G	-
53	R/W	-
54	G/W	-
55	W/L	-
56	R/Y	-
57	O	-
58	Y	-
69	W/B	-
70	O	-
72	R/B	-
75	LG	-
76	SB	-
77	GR	-
80	B	-

Connector No.	F19
Connector Name	ALTERNATOR
Connector Type	-



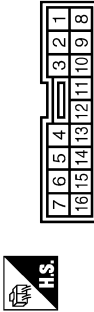
Terminal No.	Color of Wire	Signal Name [Specification]
1	B/R	-

Connector No.	F10
Connector Name	ALTERNATOR
Connector Type	HS02FB



Terminal No.	Color of Wire	Signal Name [Specification]
3	BR	-
4	Y/B	-
5	SB	-

Connector No.	F123
Connector Name	WIRE TO WIRE
Connector Type	TK1BFGY-1V



Terminal No.	Color of Wire	Signal Name [Specification]
1	L	-
3	G/R	-
4	G/B	-
5	R	-
8	L/R	-
8	P	-
10	Y/B	-
11	BR/W	-
12	BR	-
13	G	-
14	B	-
15	O	-

Connector No.	M3
Connector Name	FUSE BLOCK (U/B)
Connector Type	HS12FW-CS



Terminal No.	Color of Wire	Signal Name [Specification]
8C	BR	-
7C	B	-
8C	G	-
9C	GR	-
10C	SB	-
11C	R	-
12C	O	-

Connector No.	M11
Connector Name	WIRE TO WIRE
Connector Type	TH10FW-CS10-M3



Terminal No.	Color of Wire	Signal Name [Specification]
2	L	-
3	P	-
4	O	-
5	O	-
6	G	-
8	R	-
11	P	-
12	L	-
13	V	-
14	Y	-
15	R	-
20	Y	-
21	BR	-
22	G	-
23	P	-

24	Y	-
25	L	-
26	L	-
27	O	-
28	BR	-
29	L	-
30	R	-
47	P	-
48	L	-
49	W	-
50	GR	-
51	LG	-
52	Y	-
53	V	-
54	SS	-
55	P	-
56	SB	-
60	V	-
61	GR	-
62	O	-
63	V	-
64	SHIELD	-
66	W	-
67	R	-
68	W	-
69	P	-
70	G	-
71	G	-
72	BR	-
73	L	-
74	W	-
75	BR	-
76	R	-
77	G	-
78	Y	-
79	G	-
80	R	-
81	W	-
82	W	-
83	O	-

CHARGING SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

CHARGING SYSTEM

Connector No.	M34
Connector Name	COMBINATION METER
Connector Type	TH4CPV-NH



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

CHARGING SYSTEM

< SYMPTOM DIAGNOSIS >

SYMPTOM DIAGNOSIS

CHARGING SYSTEM

Symptom Table

INFOID:000000005514993

Symptom	Reference
Discharged battery	Refer to CHG-3, "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.	

PRECAUTIONS

< PRECAUTION >

PRECAUTION

PRECAUTIONS

FOR USA AND CANADA

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

INFOID:000000005681479

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:

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

FOR USA AND CANADA : Precaution for Power Generation Voltage Variable Control System

INFOID:000000005514995

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.

FOR MEXICO

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

INFOID:000000005716648

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:

- 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.

PRECAUTIONS

< PRECAUTION >

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

FOR MEXICO : Precaution for Power Generation Voltage Variable Control System

INFOID:0000000005681512

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 >

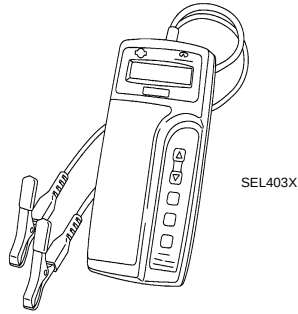
PREPARATION

PREPARATION

Special Service Tools

INFOID:000000005514996

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



Commercial Service Tools

INFOID:000000005514997

Tool name	Description
Power tool	Loosening bolts, nuts and screws



CHG

CHARGING SYSTEM PRELIMINARY INSPECTION

< PERIODIC MAINTENANCE >

PERIODIC MAINTENANCE

CHARGING SYSTEM PRELIMINARY INSPECTION

Inspection Procedure

INFOID:000000005514998

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.

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 "E" TERMINAL CONNECTION

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

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair "E" terminal connection.

4.CHECK DRIVE BELT TENSION

Check drive belt tension. Refer to [EM-17. "Checking"](#).

Is the inspection result normal?

YES >> INSPECTION END

NO >> Repair as needed.

POWER GENERATION VOLTAGE VARIABLE CONTROL SYSTEM OPERATION INSPECTION

< PERIODIC MAINTENANCE >

POWER GENERATION VOLTAGE VARIABLE CONTROL SYSTEM OPERATION INSPECTION

Inspection Procedure

INFOID:000000005514999

CAUTION:

When performing this inspection, always use a charged battery that has completed the battery inspection. (When the charging rate of the battery is low, the response speed of the voltage change will become slow. This can cause an incorrect inspection.)

1. CHECK ECM (CONSULT-III)

Perform ECM self-diagnosis with CONSULT-III. Refer to [EC-116, "CONSULT-III Function"](#).

Self-diagnostic results content

No malfunction detected>> GO TO 2.

Malfunction detected>> Check applicable parts, and repair or replace corresponding parts.

2. CHECK OPERATION OF POWER GENERATION VOLTAGE VARIABLE CONTROL SYSTEM

1. Connect CONSULT-III and start the engine.
2. The selector lever is in "P" or "N" position and all of the electric loads and A/C, etc. are turned OFF.
3. Select "ALTERNATOR DUTY" at "Active Test" of "ENGINE", and then check the value of "BATTERY VOLT" monitor when DUTY value of "ALTERNATOR DUTY" is set to 40.0 %.

"BATTERY VOLT"

2 seconds after setting the
DUTY value of "ALTERNA-
TOR DUTY" to 40.0 % : 12 - 13.6 V

4. Check the value of "BATTERY VOLT" monitor when DUTY value of "ALTERNATOR DUTY" is set to 80.0%.

"BATTERY VOLT"

20 seconds after setting
the DUTY value of "ALTER-
NATOR DUTY" to 80.0 % : +0.5 V or more against
the value of "BATTERY
VOLT" monitor when
DUTY value is 40.0 %

Is the measurement value within the specification?

YES >> INSPECTION END

NO >> GO TO 3.

3. CHECK IPDM E/R (CONSULT-III)

Perform IPDM E/R self-diagnosis with CONSULT-III. Refer to [PCS-12, "CONSULT-III Function \(IPDM E/R\)"](#).

Self-diagnostic results content

No malfunction detected>> GO TO 4.

Malfunction detected>> Check applicable parts, and repair or replace corresponding parts.

4. CHECK HARNESS BETWEEN ALTERNATOR AND IPDM E/R

1. Turn ignition switch OFF.
2. Disconnect alternator connector and IPDM E/R connector.
3. Check continuity between alternator harness connector and IPDM E/R harness connector.

Alternator harness connector		IPDM E/R harness connector		Continuity
Connector	Terminal	Connector	Terminal	
F60	5	F12	76	Existed

4. Check continuity between alternator harness connector and ground.

POWER GENERATION VOLTAGE VARIABLE CONTROL SYSTEM OPERATION INSPECTION

< PERIODIC MAINTENANCE >

Alternator harness connector		Ground	Continuity
Connector	Terminal		
F60	5		Not existed

Is the inspection result normal?

YES >> Replace IPDM E/R.

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

ALTERNATOR

< REMOVAL AND INSTALLATION >

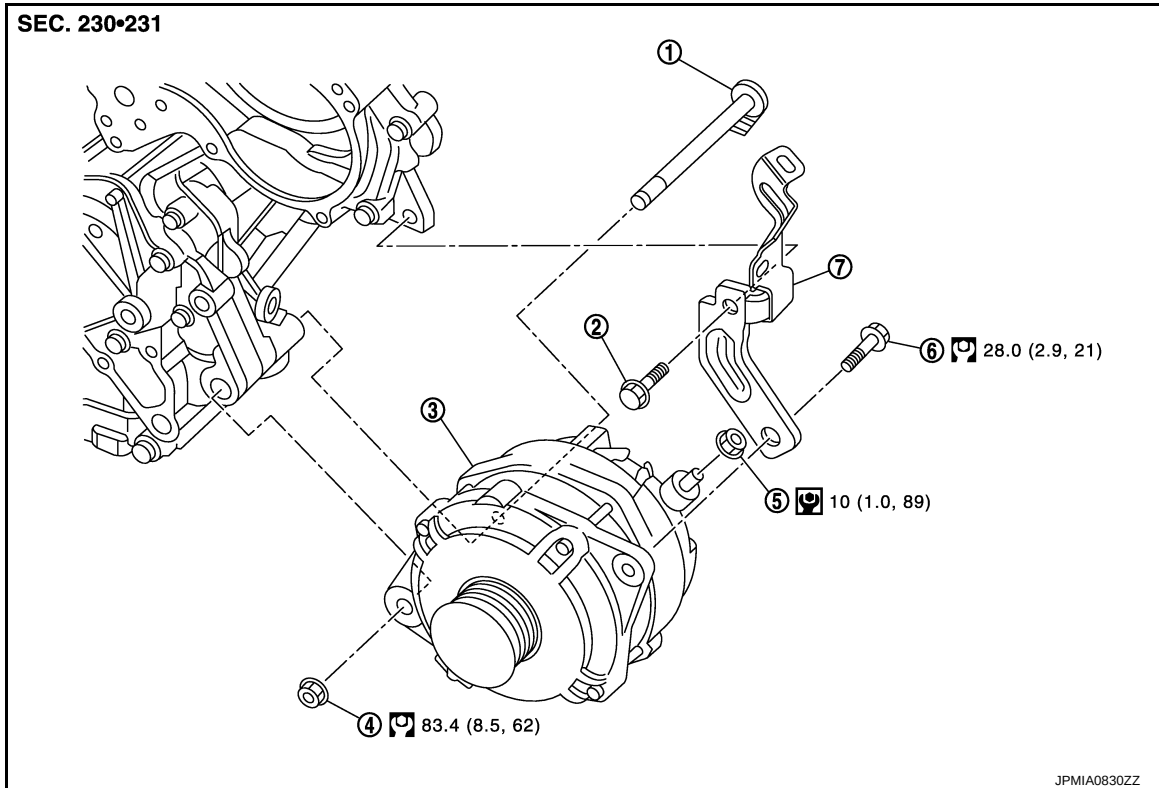
REMOVAL AND INSTALLATION

ALTERNATOR

Exploded View

INFOID:000000005515000

REMOVAL



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

Refer to [GI-4, "Components"](#) for symbols in the figure.

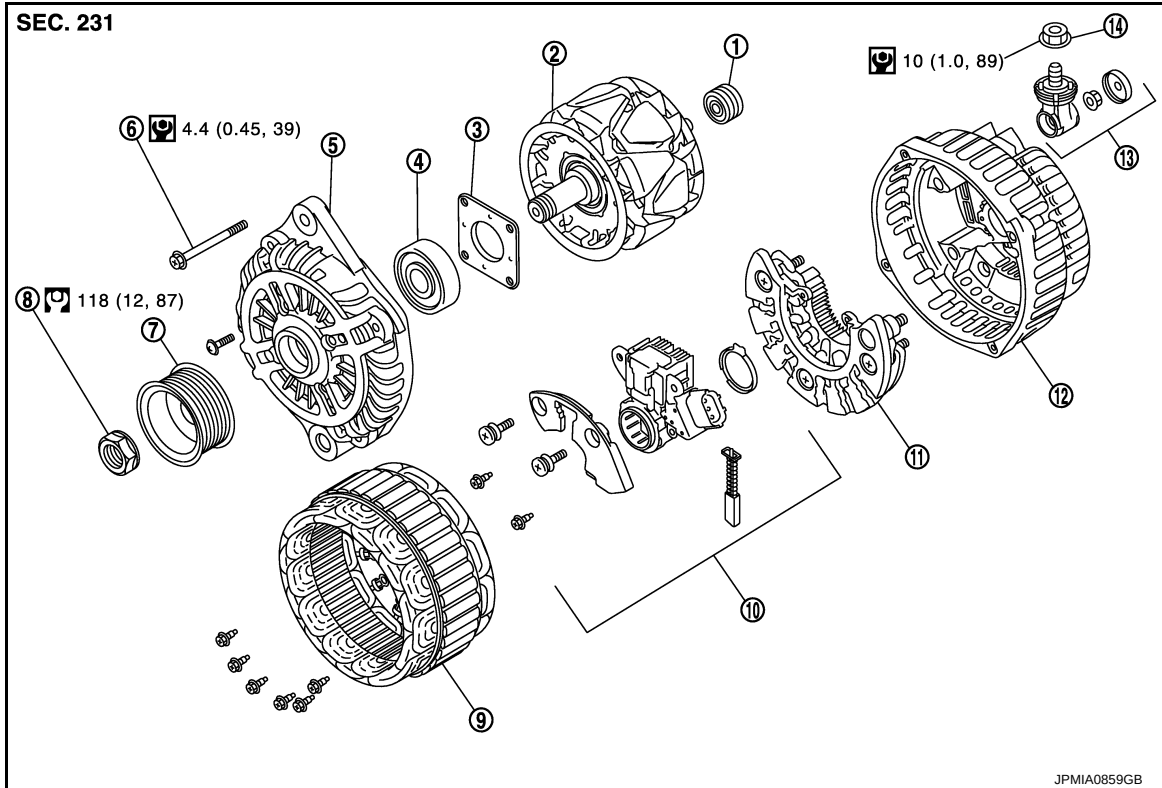
DISASSEMBLY

Type: A003TJ1791

CHG

ALTERNATOR

< REMOVAL AND INSTALLATION >



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

Refer to [GI-4, "Components"](#) for symbols in the figure.

Removal and Installation

INFOID:000000005515001

REMOVAL

1. Disconnect the negative battery terminal.
2. Remove engine cover.
3. Remove front wheel and tire (RH).
4. Remove splash guard (RH) Refer to [EXT-24, "FENDER PROTECTOR : Exploded View"](#).
5. Remove air cleaner and air duct assembly. Refer to [EM-31, "Removal and Installation"](#).
6. Remove drive belt. Refer to [EM-17, "Removal and Installation"](#).
7. Remove A/C compressor. Refer to [HA-37, "Removal and Installation"](#).
8. Remove idler pulley.
9. Disconnect the oil pressure switch.
10. Disconnect the alternator harness connectors.
11. Remove the alternator bolt and nuts, using power tools.
12. Slide the alternator out and remove.

INSTALLATION

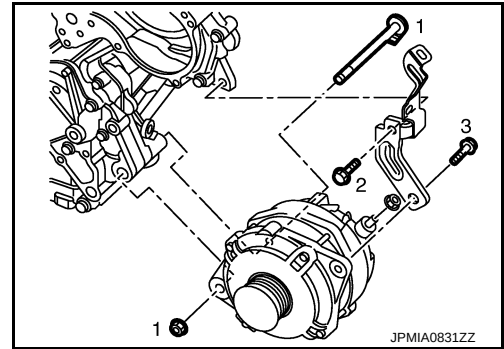
Installation is in the reverse order of removal.

CAUTION:

ALTERNATOR

< REMOVAL AND INSTALLATION >

- Temporarily tighten all of alternator bolt and nuts. And then tighten them in numerical order shown in the figure.



- Be sure to tighten "B" terminal nut carefully.
- Install alternator and check tension of belt. Refer to [EM-30, "Exploded View"](#).
- For this model, the power generation voltage variable control system that controls the power generation voltage of the alternator has been adopted. Therefore, the power generation voltage variable control system operation inspection should be performed after replacing the alternator, and then make sure that the system operates normally. Refer to [CHG-25, "Inspection Procedure"](#).

Inspection

INFOID:000000005515002

ALTERNATOR PULLEY INSPECTION

Perform the following.

- Make sure that alternator pulley does not rattle.
- Make sure that alternator pulley nut is tight.

A
B
C
D
E
F
G
H
I
J
K
L
N
O
P

CHG

SERVICE DATA AND SPECIFICATIONS (SDS)

< SERVICE DATA AND SPECIFICATIONS (SDS)

SERVICE DATA AND SPECIFICATIONS (SDS)

SERVICE DATA AND SPECIFICATIONS (SDS)

Alternator

INFOID:000000005515003

Type		A003TJ1791
		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 61/1,500 More than 109/2,500 More than 129/5,000
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

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