

SECTION CHG

CHARGING SYSTEM

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< PRECAUTION >

PRECAUTION

PRECAUTIONS

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

INFOID:0000000014388597

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 SR and SB section of this Service Manual.

WARNING:

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

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

WARNING:

- **When working near the 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 or batteries, and wait at least three minutes before performing any service.**

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PREPARATION

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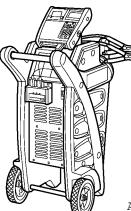
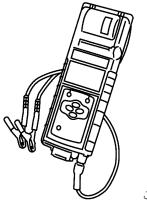
PREPARATION

PREPARATION

Special Service Tool

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

Tool number (TechMate No.) Tool name	Description
— (165-GR8-1200KIT-NI) Nissan battery and electronics tester	 AWIIIA1239ZZ
— (165-EXP-800-NI) Midtronic hand-held battery tester	 JSMIA0806ZZ

Commercial Service Tool

INFOID:0000000014388599

Tool name	Description
Power tool	 PIIB1407E

COMPONENT PARTS

< SYSTEM DESCRIPTION >

SYSTEM DESCRIPTION

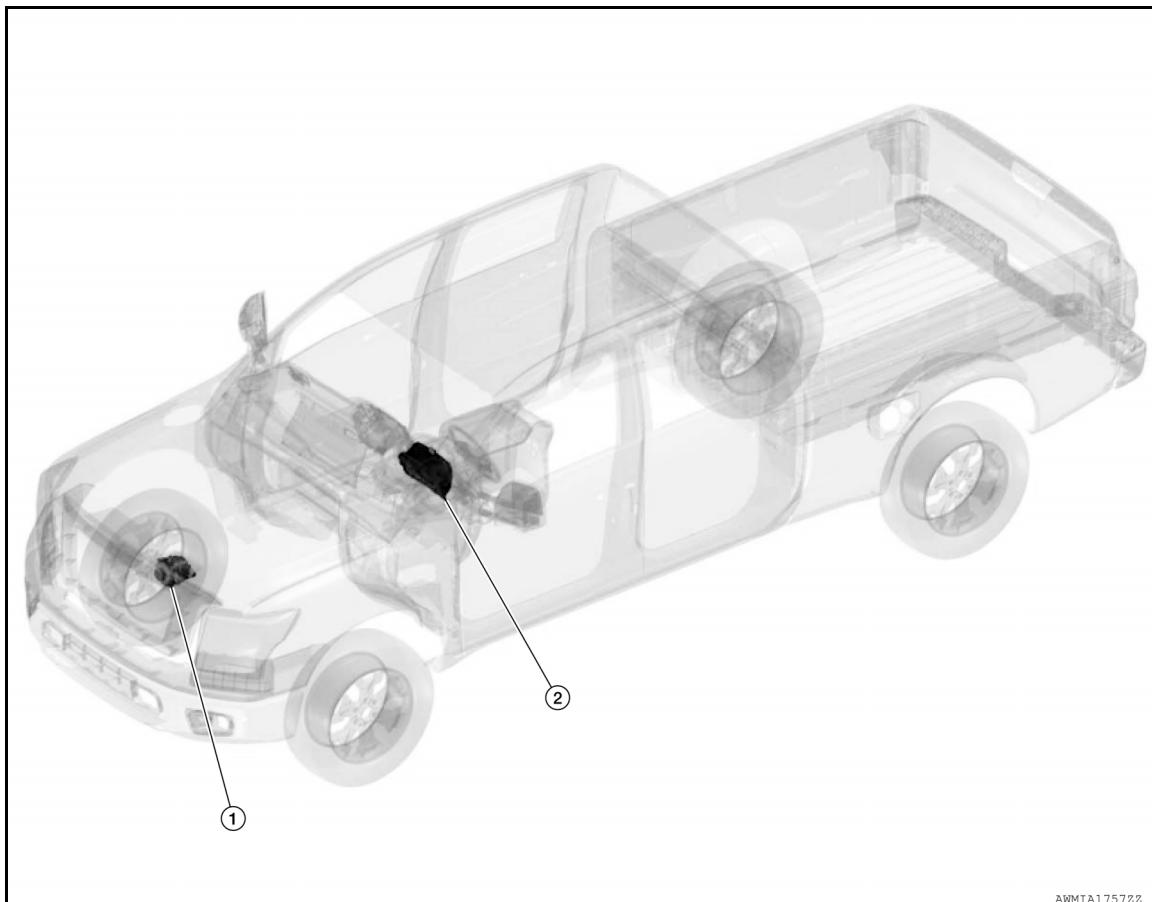
COMPONENT PARTS

CHARGING SYSTEM

CHARGING SYSTEM : Component Parts Location

INFOID:0000000014388600

WITH CUMMINS 5.0L



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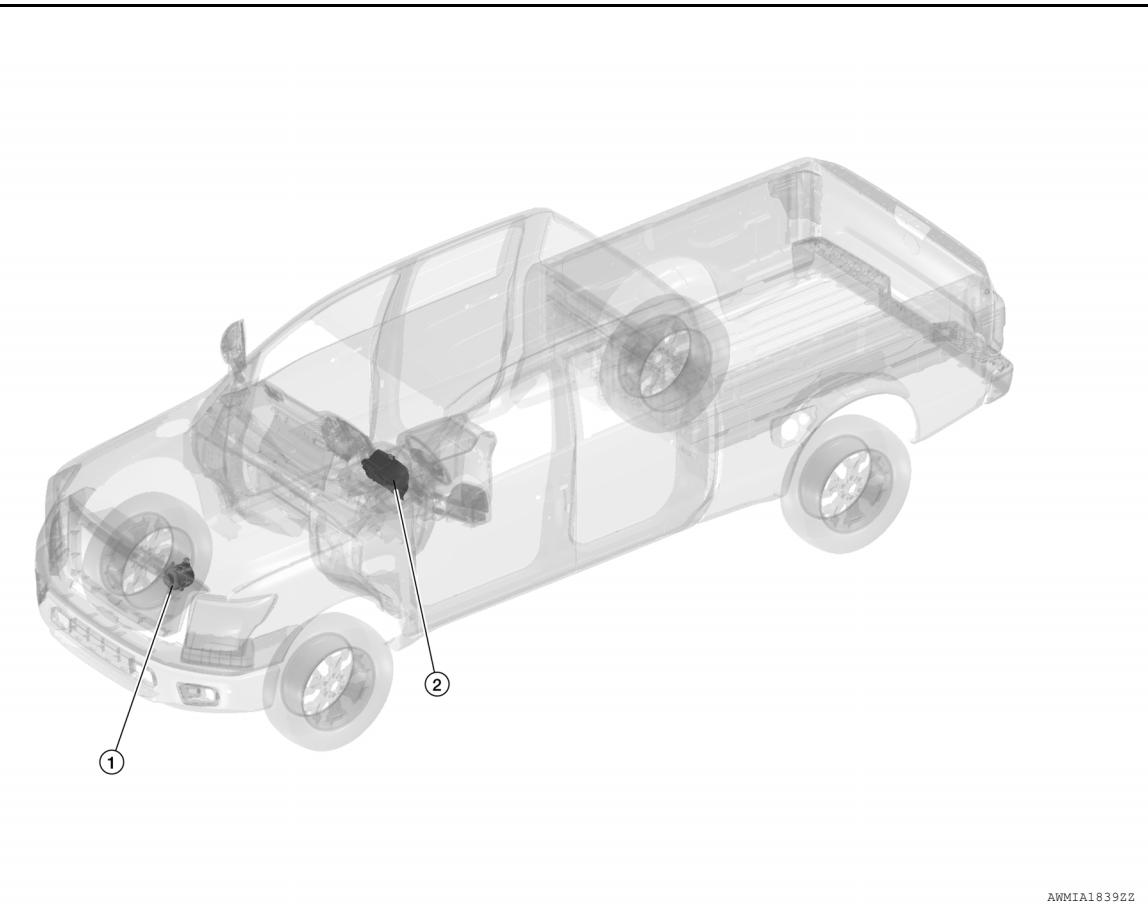
No.	Component	Function
1.	Generator	Refer to CHG-6, "CHARGING SYSTEM : Generator".
2.	Combination meter (Charge warning lamp)	The IC voltage regulator warning function activates to illuminate the charge warning lamp, if any of the following symptoms occur while generator is operating: <ul style="list-style-type: none">• Excessive voltage is produced.• No voltage is produced.

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COMPONENT PARTS

< SYSTEM DESCRIPTION >

WITH VK56VD



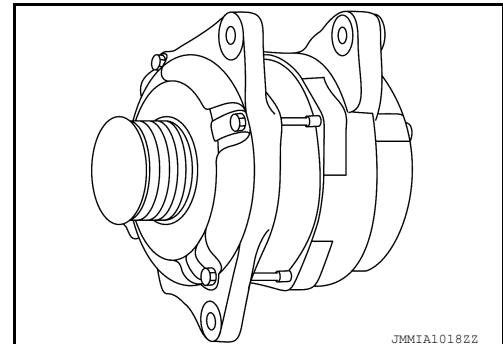
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No.	Component	Function
1.	Generator	Refer to CHG-6, "CHARGING SYSTEM : Generator".
2.	Combination meter (Charge warning lamp)	The IC voltage regulator warning function activates to illuminate the charge warning lamp, if any of the following symptoms occur while generator is operating: <ul style="list-style-type: none">• Excessive voltage is produced.• No voltage is produced.

CHARGING SYSTEM : Generator

INFOID:00000001438601

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



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POWER GENERATION VOLTAGE VARIABLE CONTROL SYSTEM

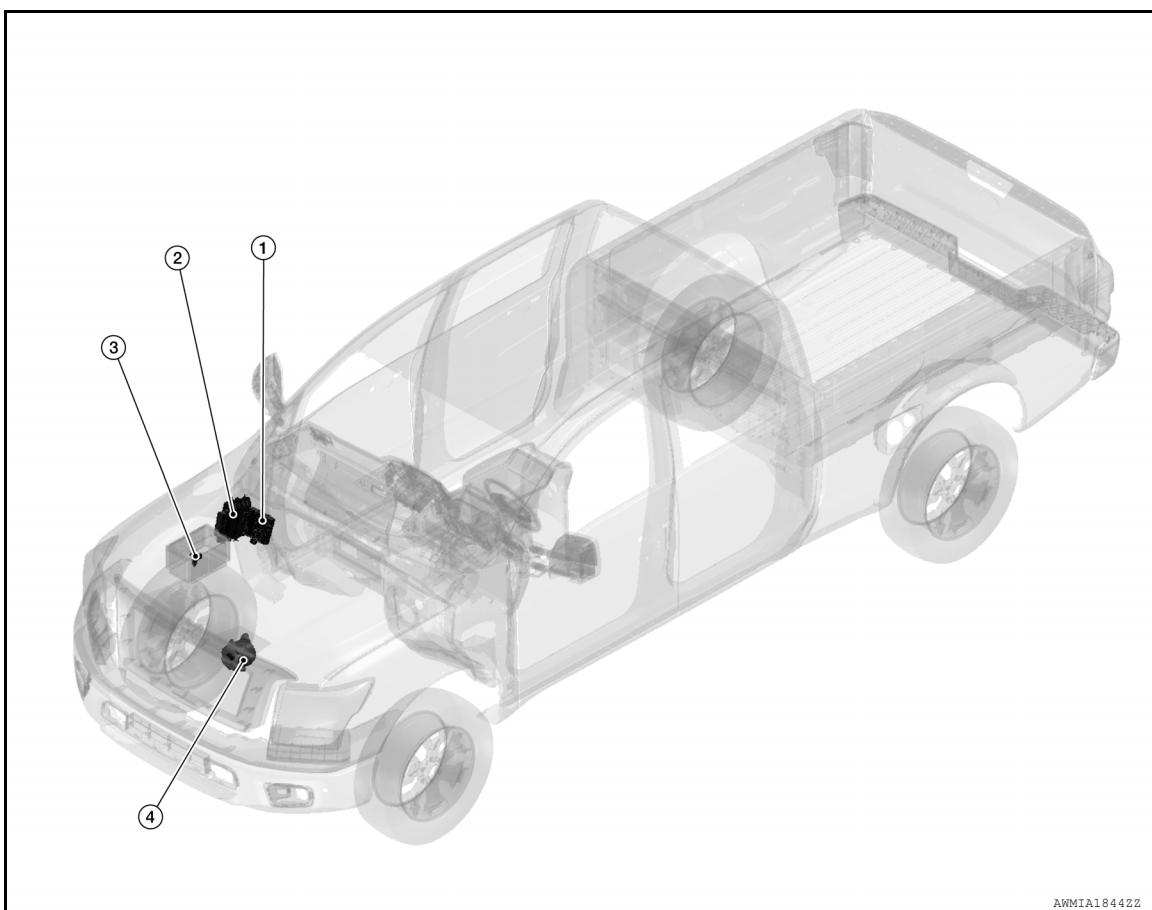
POWER GENERATION VOLTAGE VARIABLE CONTROL SYSTEM : Component

COMPONENT PARTS

< SYSTEM DESCRIPTION >

Parts Location- with VK56VD

INFOID:000000014388602



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No.	Component	Function
1.	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. Refer to PCS-5, "Component Parts Location" for detailed installation location.
2.	ECM	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 signal to IPDM E/R. Refer to EC-43, "ECM" for detailed installation location.
3.	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.
4.	Generator (IC voltage regulator)	Refer to CHG-7, "POWER GENERATION VOLTAGE VARIABLE CONTROL SYSTEM : Generator (IC voltage regulator)" .

POWER GENERATION VOLTAGE VARIABLE CONTROL SYSTEM : Generator (IC

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COMPONENT PARTS

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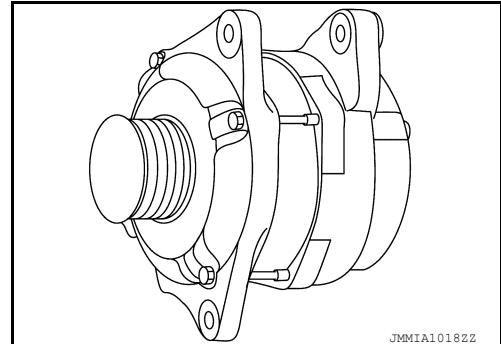
voltage regulator)

INFOID:000000014388603

The output voltage of the generator is controlled by the IC voltage regulator inside the generator.

IC voltage regulator controls the power generation voltage by the target power generation voltage based on the received power generation command signal (PWM signal).

When there is no power generation command signal (PWM signal), the generator performs the normal power generation according to the characteristic of the IC voltage regulator.



SYSTEM

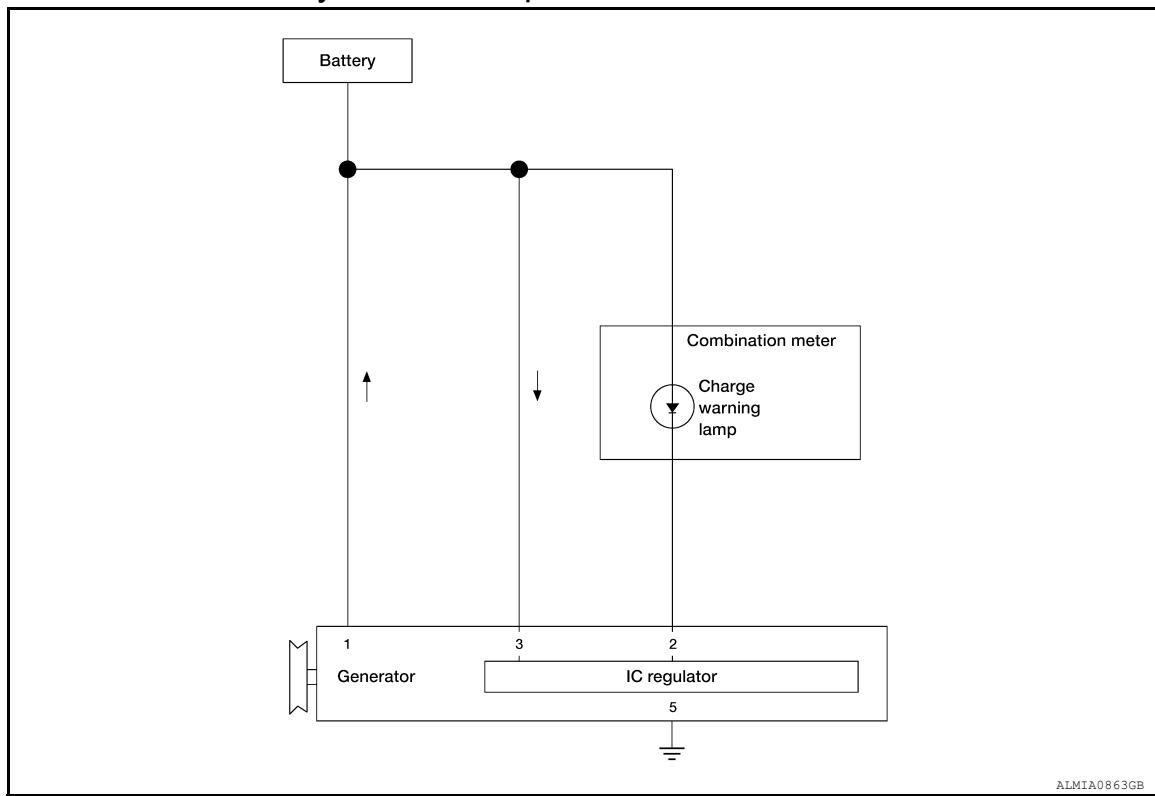
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SYSTEM

CHARGING SYSTEM

CHARGING SYSTEM : System Description- with Cummins 5.0L

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

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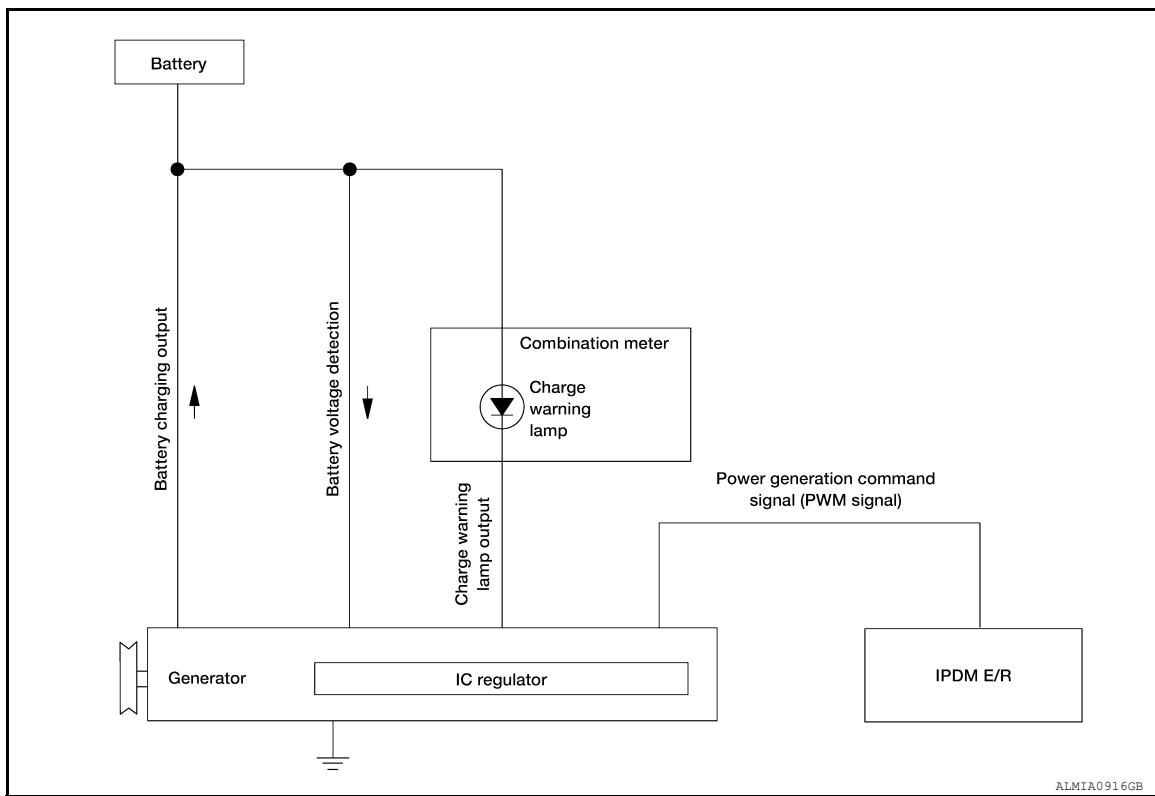
SYSTEM

< SYSTEM DESCRIPTION >

CHARGING SYSTEM : System Description- with VK56VD

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SYSTEM DIAGRAM



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SYSTEM DESCRIPTION

- "B" terminal circuit supplies power to charge the battery and to operate the vehicle's electrical system.
- "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 generator 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.
- "S" terminal circuit detects the battery voltage to adjust the generator output voltage with the IC voltage regulator.

POWER GENERATION VOLTAGE VARIABLE CONTROL SYSTEM

POWER GENERATION VOLTAGE VARIABLE CONTROL SYSTEM : System De-

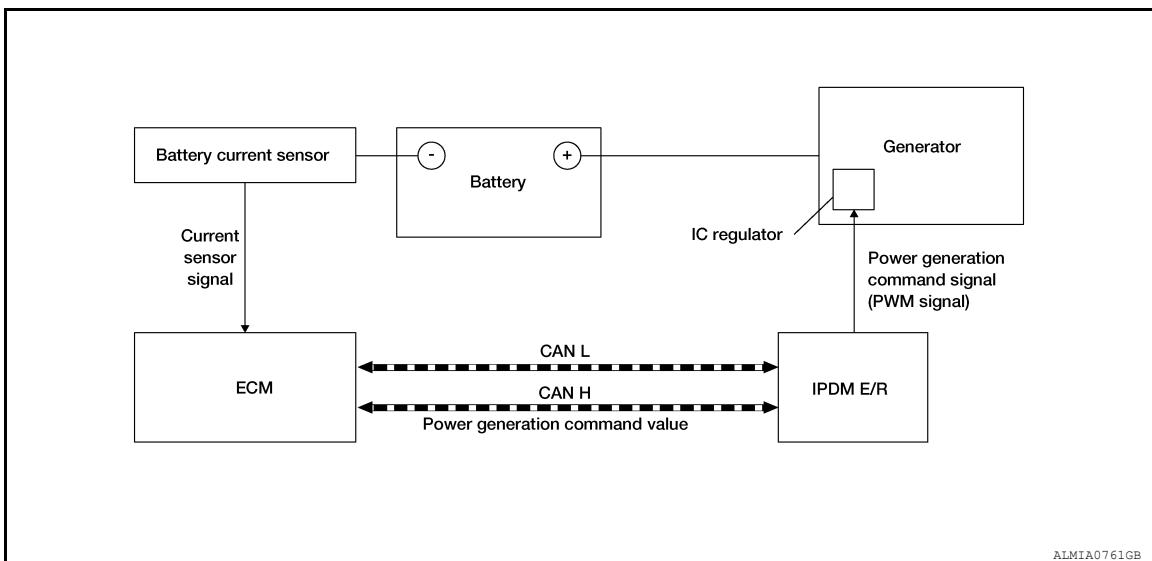
SYSTEM

< SYSTEM DESCRIPTION >

Description

INFOID:000000014388606

SYSTEM DIAGRAM



SYSTEM DESCRIPTION

By performing the power generation voltage variable control, the engine load due to the power generation of the generator 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 generator.

WARNING/INDICATOR/CHIME LIST

WARNING/INDICATOR/CHIME LIST : Warning Lamps/Indicator Lamps

INFOID:000000014388607

Item	Design	Reference
Charge warning lamp		For layout, refer to MWI-11, "METER SYSTEM : Design" (with Type A meter), or MWI-117, "METER SYSTEM : Design" (with Type B meter). For function, refer to MWI-12, "METER SYSTEM : Combination Meter" (with Type A meter), or MWI-118, "METER SYSTEM : Combination Meter" (with Type B meter).

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CHARGING SYSTEM

< WIRING DIAGRAM >

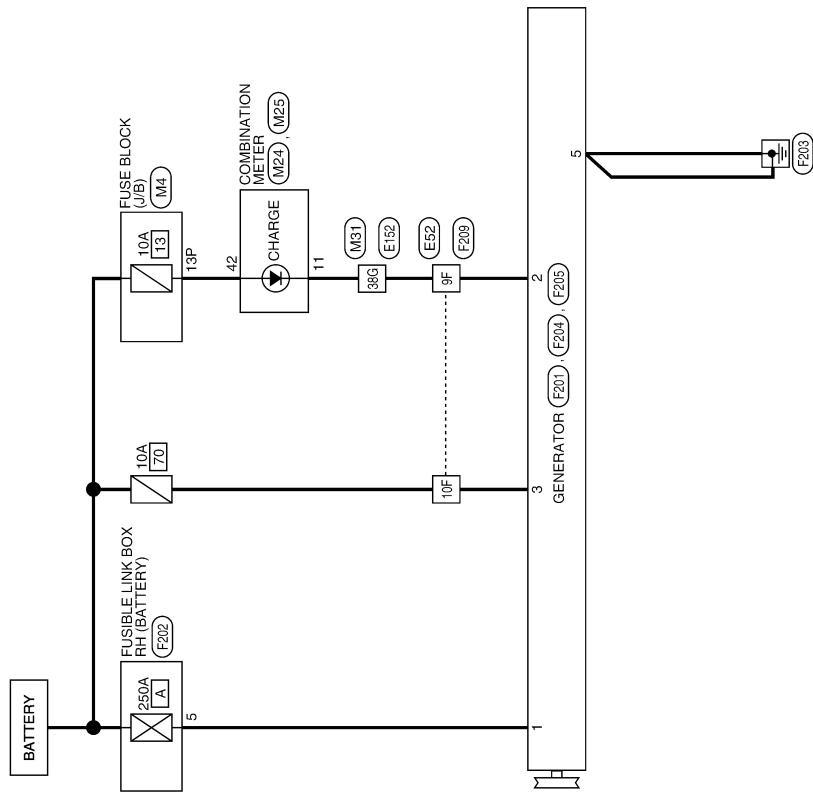
WIRING DIAGRAM

CHARGING SYSTEM

Wiring Diagram- with Cummins 5.0L

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CHARGING SYSTEM - WITH Cummins 5.0L



CHARGING SYSTEM

< WIRING DIAGRAM >

CHARGING SYSTEM CONNECTORS - WITH Cummins 5.0L

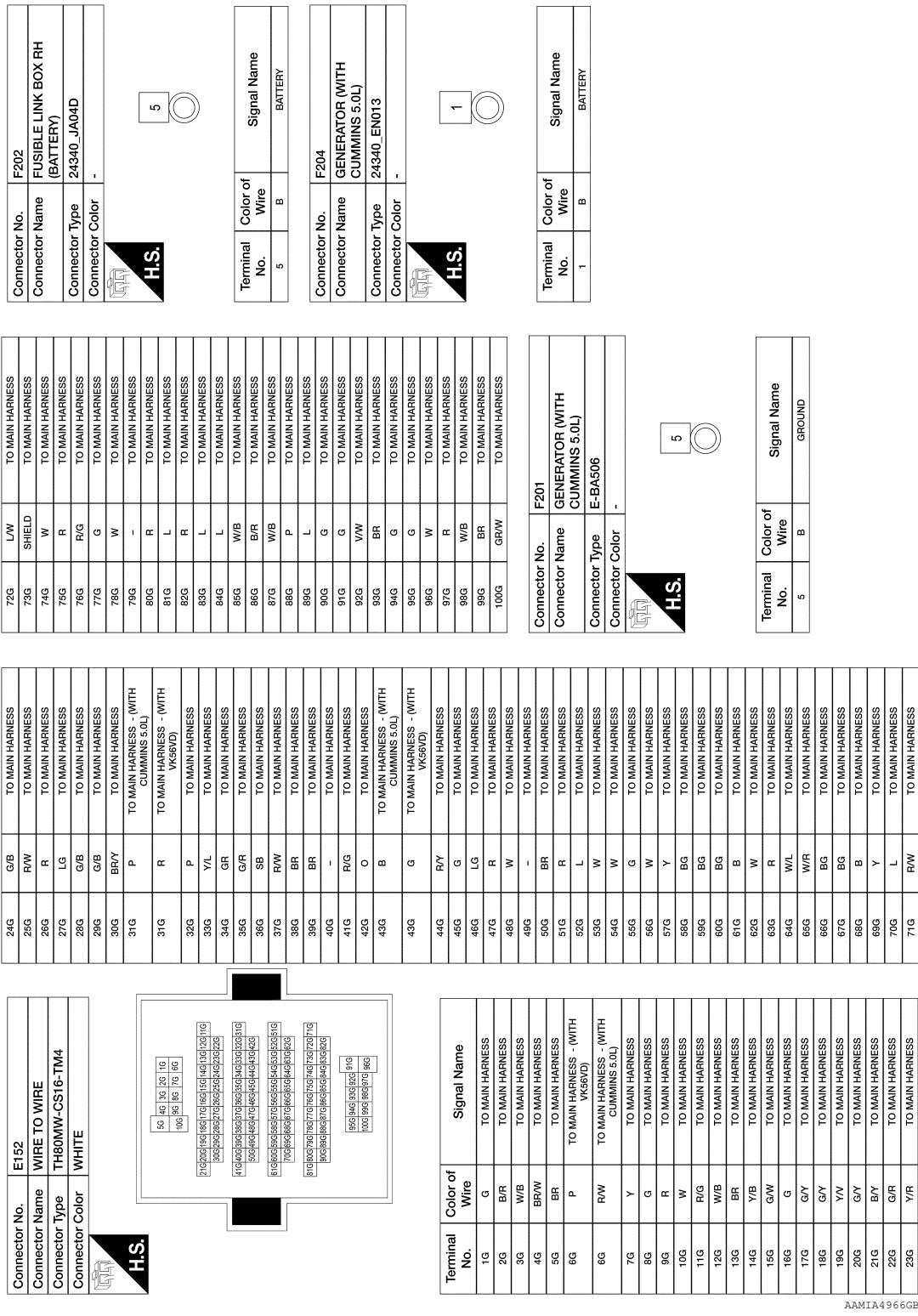
Connector No.	EG52	21F	U/R	TO ENGINE CONTROL NO. 2 HARNESS	52F	BR	TO ENGINE CONTROL NO. 2 HARNESS
Connector Name	WIRE TO WIRE	22F	L/W	TO ENGINE CONTROL NO. 2 HARNESS			
Connector Type	RK26FGY-RS20-X6	23F	R/L	TO ENGINE CONTROL NO. 2 HARNESS			
Connector Color	GRAY	24F	W/L	TO ENGINE CONTROL NO. 2 HARNESS			
H.S.							
Terminal No.	Color of Wire	Signal Name					
1F	Y	TO ENGINE CONTROL NO. 2 HARNESS					
2F	B	TO ENGINE CONTROL NO. 2 HARNESS					
3F	BR	TO ENGINE CONTROL NO. 2 HARNESS					
4F	W/R	TO ENGINE CONTROL NO. 2 HARNESS					
5F	BR	TO ENGINE CONTROL NO. 2 HARNESS					
6F	O	TO ENGINE CONTROL NO. 2 HARNESS					
7F	GR/Y	TO ENGINE CONTROL NO. 2 HARNESS					
8F	V	TO ENGINE CONTROL NO. 2 HARNESS					
9F	BR	TO ENGINE CONTROL NO. 2 HARNESS					
10F	Y/B	TO ENGINE CONTROL NO. 2 HARNESS					
11F	L	TO ENGINE CONTROL NO. 2 HARNESS					
12F	R	TO ENGINE CONTROL NO. 2 HARNESS					
13F	Y	TO ENGINE CONTROL NO. 2 HARNESS					
14F	V	TO ENGINE CONTROL NO. 2 HARNESS					
15F	SB	TO ENGINE CONTROL NO. 2 HARNESS					
16F	P	TO ENGINE CONTROL NO. 2 HARNESS					
17F	Y/R	TO ENGINE CONTROL NO. 2 HARNESS					
18F	R	TO ENGINE CONTROL NO. 2 HARNESS					
19F	V	TO ENGINE CONTROL NO. 2 HARNESS					
20F	BR	TO ENGINE CONTROL NO. 2 HARNESS					

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CHARGING SYSTEM

< WIRING DIAGRAM >

CHARGING SYSTEM CONNECTORS - WITH Cummins 5.0L

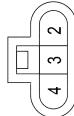


CHARGING SYSTEM

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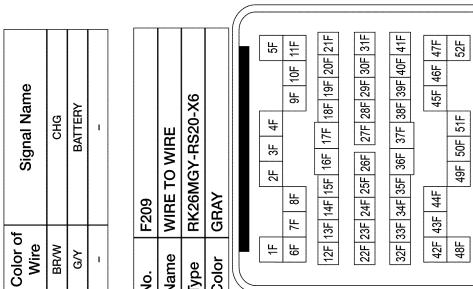
CHARGING SYSTEM CONNECTORS - WITH Cummins 5.0L

Connector No.	F205
Connector Name	GENERATOR (WITH CUMMINS 5.0L)
Connector Type	HS03FB
Connector Color	BLACK



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14F	V/W	TO ENGINE ROOM HARNESS
15F	LG	TO ENGINE ROOM HARNESS
16F	RY/Y	TO ENGINE ROOM HARNESS
17F	BRY/Y	TO ENGINE ROOM HARNESS
18F	R	TO ENGINE ROOM HARNESS
19F	V	TO ENGINE ROOM HARNESS
20F	BR	TO ENGINE ROOM HARNESS
21F	L/R	TO ENGINE ROOM HARNESS
22F	L/G	TO ENGINE ROOM HARNESS
23F	SB	TO ENGINE ROOM HARNESS
24F	WL	TO ENGINE ROOM HARNESS
25F	WB/B	TO ENGINE ROOM HARNESS
26F	BY/Y	TO ENGINE ROOM HARNESS
27F	Y	TO ENGINE ROOM HARNESS
28F	WR	TO ENGINE ROOM HARNESS
29F	L/O	TO ENGINE ROOM HARNESS
30F	B	TO ENGINE ROOM HARNESS
31F	B	TO ENGINE ROOM HARNESS
32F	V	TO ENGINE ROOM HARNESS
33F	BG	TO ENGINE ROOM HARNESS
34F	L/R	TO ENGINE ROOM HARNESS
35F	R/W	TO ENGINE ROOM HARNESS
36F	L/B	TO ENGINE ROOM HARNESS
37F	L/O	TO ENGINE ROOM HARNESS
38F	Y/W	TO ENGINE ROOM HARNESS
39F	RY	TO ENGINE ROOM HARNESS
40F	GB	TO ENGINE ROOM HARNESS
41F	W	TO ENGINE ROOM HARNESS
42F	Y	TO ENGINE ROOM HARNESS
43F	B/P	TO ENGINE ROOM HARNESS
44F	Y/B	TO ENGINE ROOM HARNESS
45F	L/Y	TO ENGINE ROOM HARNESS
46F	O	TO ENGINE ROOM HARNESS
47F	WL	TO ENGINE ROOM HARNESS
48F	L	TO ENGINE ROOM HARNESS
49F	BR	TO ENGINE ROOM HARNESS
50F	SHIELD	TO ENGINE ROOM HARNESS
51F	L	TO ENGINE ROOM HARNESS
52F	BR	TO ENGINE ROOM HARNESS



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Terminal No.	Color of Wire	Signal Name
1F	V/R	TO ENGINE ROOM HARNESS
2F	B	TO ENGINE ROOM HARNESS
3F	B/Y	TO ENGINE ROOM HARNESS
4F	W/R	TO ENGINE ROOM HARNESS
5F	B/R	TO ENGINE ROOM HARNESS
6F	O/L	TO ENGINE ROOM HARNESS
7F	GR	TO ENGINE ROOM HARNESS
8F	P	TO ENGINE ROOM HARNESS
9F	BR/W	TO ENGINE ROOM HARNESS
10F	G/Y	TO ENGINE ROOM HARNESS
11F	L/W	TO ENGINE ROOM HARNESS
12F	R/W	TO ENGINE ROOM HARNESS
13F	G/Y	TO ENGINE ROOM HARNESS

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7	V	SECURITY
8	-	-
9	EG	AS BELT SW (WITH ODS)
10	LG	TOW MODE SW
11	ER	CHG
12	BR	LED HEAD LAMP (R)
13	W	LED HEAD LAMP (L)
14	R	ACC SW
15	W	OUTSIDE TEMP SENSOR (WITH VGS81D)
16	O	AIR BAG
17	-	-
18	P	TRIP/RESET SW
19	-	-
20	R	OUTSIDE TEMP GND (WITH VGS81D)
21	-	-
22	P	STRG SW A
23	R	STRG SW B
24	W	WASHER SW
25	-	-
26	G	PKB SW
27	P/L	AS BELT SW (WITH ODS)
28	O/B	DR BELT SW
29	-	-
30	-	-
31	-	-
32	BR	AT SHIFT UP
33	V/W	AT SHIFT DOWN
34	-	-
35	-	-
36	W	ILL UP SW
37	R	ILL DOWN SW
38	G	8PR OUTPUT
39	-	-
40	-	-



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Terminal No.	Color of Wire	Signal Name
1P	R	IGNITION
2P	Y	IGNITION
3P	G	IGNITION RELAY OUT
4P	BW	RTR DEF RLY
5P	BW	RR DEF RLY
6P	O	RR DEF RLY OUT
7P	G	IGNITION
8P	W	IGNITION
9P	L	BATTERY
10P	-	-
11P	-	-
12P	-	-
13P	R	BATTERY
14P	Y	BATTERY
15P	Y/L/G	BATTERY
16P	W	FLOWER FAN RELAY OUT



H.S.



CHARGING SYSTEM

< WIRING DIAGRAM >

Connector No.	M25	27G	LG	TO ENGINE ROOM HARNESS
Connector Name	COMBINATION METER (WITH TYPE A)	28G	G/B	TO ENGINE ROOM HARNESS
Connector Type	TH80FW-CSV16-TM4	29G	G/B	TO ENGINE ROOM HARNESS
Connector Color	WHITE	30G	B/Y	TO ENGINE ROOM HARNESS
Connector Color	WHITE	31G	R	TO ENGINE ROOM HARNESS
		32G	R	TO ENGINE ROOM HARNESS
		33G	Y/L	TO ENGINE ROOM HARNESS
		34G	GR	TO ENGINE ROOM HARNESS
		35G	GR	TO ENGINE ROOM HARNESS
		36G	SB	TO ENGINE ROOM HARNESS
		37G	R/W	TO ENGINE ROOM HARNESS
		38G	BR	TO ENGINE ROOM HARNESS
		39G	BR	TO ENGINE ROOM HARNESS
		40G	-	TO ENGINE ROOM HARNESS
		41G	R/G	TO ENGINE ROOM HARNESS
		42G	O	TO ENGINE ROOM HARNESS
		43G	G	TO ENGINE ROOM HARNESS
		44G	R/Y	TO ENGINE ROOM HARNESS
		45G	G	TO ENGINE ROOM HARNESS
		46G	LG	TO ENGINE ROOM HARNESS
		47G	R	TO ENGINE ROOM HARNESS
		48G	W	TO ENGINE ROOM HARNESS
		49G	-	TO ENGINE ROOM HARNESS
		50G	BR	TO ENGINE ROOM HARNESS
		51G	R	TO ENGINE ROOM HARNESS
		52G	L	TO ENGINE ROOM HARNESS
Terminal	Color of Wire No.	Signal Name	Color of Wire No.	Signal Name
41	W	IGN	1G	G
42	R	BAT	2G	B/R
43	Y/N	FUEL SENSOR GND	3G	W
44	GR	ILL. CONT. OUTPUT	4G	B/R/W
45	P	CAN-L	5G	-
46	L	CAN-H	6G	-
47	B	G1	7G	Y
48	BRY	FUEL SENSOR	8G	G
49	-	-	9G	R
50	-	-	10G	W
51	LG	M CAN-L	11G	R/G
52	SB	M CAN-H	12G	W/B
			13G	BR
			14G	Y/B
			15G	G/W
			16G	G
			17G	O
			18G	G/Y
			19G	Y/Y
			20G	G/Y
			21G	B/Y
			22G	G/R
			23G	Y/R
			24G	G/B
			25G	R/W
			26G	R

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CHARGING SYSTEM CONNECTORS - WITH Cummins 5.0L

Terminal	Color of Wire No.	Signal Name	Terminal	Color of Wire No.	Signal Name
1G	G	TO ENGINE ROOM HARNESS	1G	G	TO ENGINE ROOM HARNESS
2G	B/R	TO ENGINE ROOM HARNESS	2G	W	TO ENGINE ROOM HARNESS
3G	W	TO ENGINE ROOM HARNESS	4G	B/R/W	TO ENGINE ROOM HARNESS
5G	-	TO ENGINE ROOM HARNESS	5G	-	TO ENGINE ROOM HARNESS
6G	R/W	TO ENGINE ROOM HARNESS	6G	R/W	TO ENGINE ROOM HARNESS
7G	Y	TO ENGINE ROOM HARNESS	8G	G	TO ENGINE ROOM HARNESS
9G	R	TO ENGINE ROOM HARNESS	10G	W	TO ENGINE ROOM HARNESS
11G	R/G	TO ENGINE ROOM HARNESS	11G	R/G	TO ENGINE ROOM HARNESS
12G	W/B	TO ENGINE ROOM HARNESS	13G	BR	TO ENGINE ROOM HARNESS
14G	Y/B	TO ENGINE ROOM HARNESS	14G	Y/B	TO ENGINE ROOM HARNESS
15G	G/W	TO ENGINE ROOM HARNESS	15G	G/W	TO ENGINE ROOM HARNESS
16G	G	TO ENGINE ROOM HARNESS	16G	G	TO ENGINE ROOM HARNESS
17G	O	TO ENGINE ROOM HARNESS	17G	O	TO ENGINE ROOM HARNESS
18G	G/Y	TO ENGINE ROOM HARNESS	18G	G/Y	TO ENGINE ROOM HARNESS
19G	Y/Y	TO ENGINE ROOM HARNESS	19G	Y/Y	TO ENGINE ROOM HARNESS
20G	G/Y	TO ENGINE ROOM HARNESS	20G	G/Y	TO ENGINE ROOM HARNESS
21G	B/Y	TO ENGINE ROOM HARNESS	21G	B/Y	TO ENGINE ROOM HARNESS
22G	G/R	TO ENGINE ROOM HARNESS	22G	G/R	TO ENGINE ROOM HARNESS
23G	Y/R	TO ENGINE ROOM HARNESS	23G	Y/R	TO ENGINE ROOM HARNESS
24G	G/B	TO ENGINE ROOM HARNESS	24G	G/B	TO ENGINE ROOM HARNESS
25G	R/W	TO ENGINE ROOM HARNESS	25G	R/W	TO ENGINE ROOM HARNESS
26G	R	TO ENGINE ROOM HARNESS	26G	R	TO ENGINE ROOM HARNESS

CHARGING SYSTEM

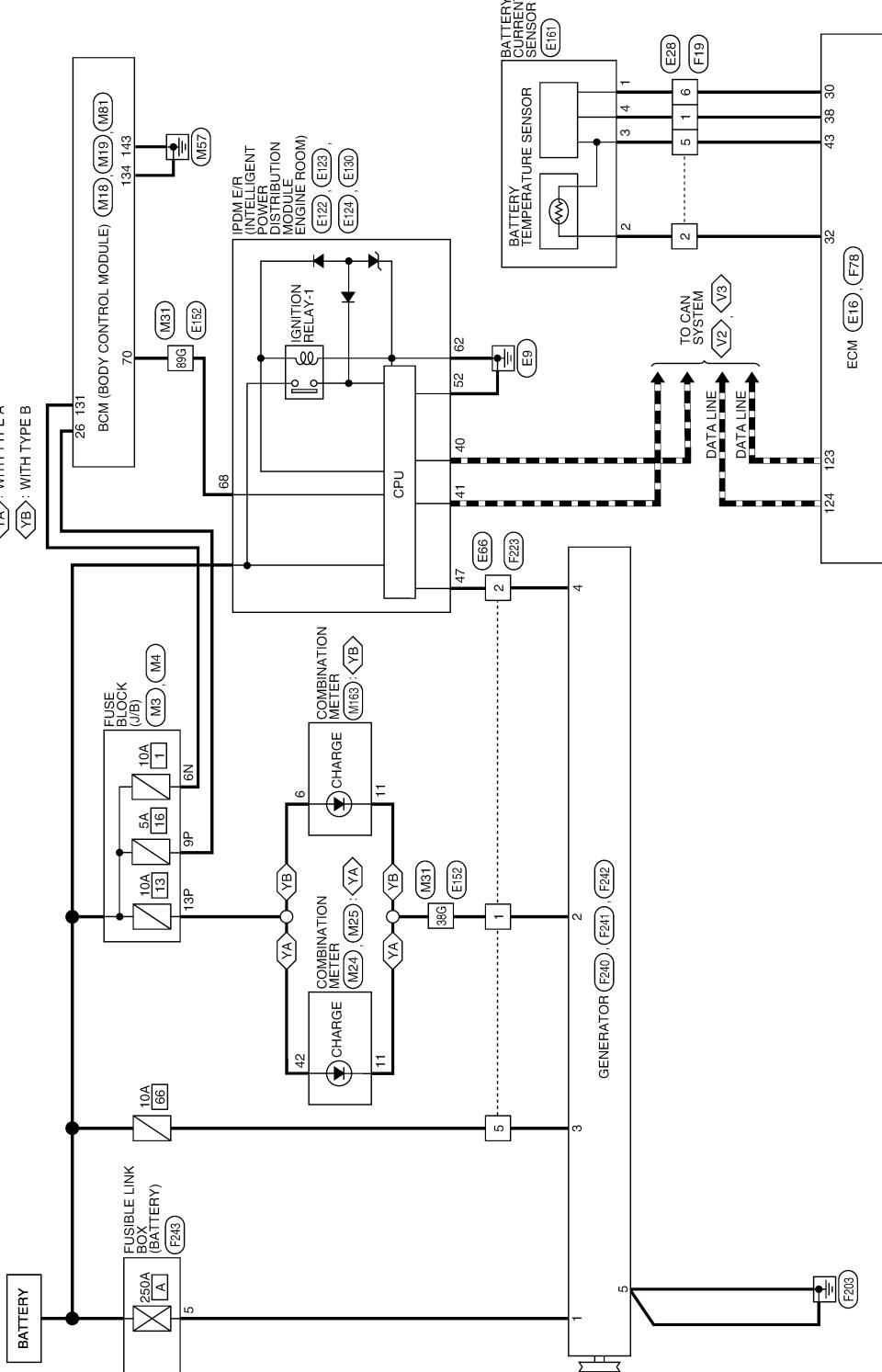
< WIRING DIAGRAM >

Wiring Diagram- with VK56VD

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CHARGING SYSTEM - WITH VK56VD

- : CAN COMMUNICATION LINE FOR DIAGNOSIS
- : WITH VK56VD AND WITH DRIVER ASSISTANCE SYSTEM
- : WITH VK56VD AND WITHOUT DRIVER ASSISTANCE SYSTEM



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CHARGING SYSTEM

< WIRING DIAGRAM >

CHARGING SYSTEM CONNECTORS - WITH VK56VD

Connector No.	E16
Connector Name	ECM (WITH VK56VD)
Connector Type	IMA24FB-MEAB-RH
Connector Color	BLACK
Diagram	

Terminal No.	Color of Wire	Signal Name	Signal Name
121	OB	EVAP CONTROL SYSTEM PRESSURE SENSOR	V TO ENGINE CONTROL HARNESS
122	-	-	G TO ENGINE CONTROL HARNESS
123	P	CAN COMMUNICATION LINE (CANL)	3 TO ENGINE CONTROL HARNESS
124	L	CAN COMMUNICATION LINE (CANH)	4 TO ENGINE CONTROL HARNESS
125	SB	SENSOR POWER SUPPLY	5 TO ENGINE CONTROL HARNESS
126	-	-	6 TO ENGINE CONTROL HARNESS
127	-	-	7 TO ENGINE CONTROL HARNESS
128	VW	FUEL TEMPERATURE SENSOR	8 TO ENGINE CONTROL HARNESS
129	-	-	-
130	RW	FUEL PUMP CONTROL MODULE (FPCM) CHECK	-
131	-	-	-
132	-	-	-
133	W	IGNITION SWITCH	-
134	GR	ASCD STEERING SWITCH	-
135	BY	SENSOR GROUND	-
136	GR	FUEL PUMP CONTROL MODULE (FPCM)	-
137	RW	ENG COMMUNICATION LINE	-

Connector No.	E122																
Connector Name	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)																
Connector Type	TH12PWH-NH																
Connector Color	WHITE																
Diagram																	
Table	<table border="1"> <tr> <td>55</td> <td>-</td> <td>-</td> <td>-</td> </tr> <tr> <td>56</td> <td>-</td> <td>-</td> <td>-</td> </tr> <tr> <td>59</td> <td>58</td> <td>57</td> <td>-</td> </tr> <tr> <td>62</td> <td>61</td> <td>60</td> <td>-</td> </tr> </table>	55	-	-	-	56	-	-	-	59	58	57	-	62	61	60	-
55	-	-	-														
56	-	-	-														
59	58	57	-														
62	61	60	-														

Connector No.	E28								
Connector Name	WIRE TO WIRE								
Connector Type	RH05MB								
Connector Color	BLACK								
Diagram									
Table	<table border="1"> <tr> <td>1</td> <td>2</td> <td>3</td> <td>4</td> </tr> <tr> <td>5</td> <td>6</td> <td>7</td> <td>8</td> </tr> </table>	1	2	3	4	5	6	7	8
1	2	3	4						
5	6	7	8						

Terminal No.	Color of Wire	Signal Name	Signal Name
1	V	TO ENGINE CONTROL HARNESS	-
2	G	-	TO ENGINE CONTROL HARNESS
3	-	-	TO ENGINE CONTROL HARNESS
4	L	TO ENGINE CONTROL HARNESS	-
5	R	TO ENGINE CONTROL HARNESS	37 WIPER AUTO STOP SW
6	SB	TO ENGINE CONTROL HARNESS	38 WIPER AUTO STOP SW
7	L	TO ENGINE CONTROL HARNESS	39 WIPER AUTO STOP SW
8	P	TO ENGINE CONTROL HARNESS	40 P
43	-	-	41 CAN-L
44	-	-	42 CAN-H
45	-	-	43 DTRL RLY
46	-	-	44 START CONT
47	-	-	45 GR
48	RW	TO ENGINE CONTROL HARNESS	46 Y
49	-	-	47 Y
50	-	-	48 Y
51	-	-	49 ALT C (WITH VK56VD)
52	-	-	50 RND
53	-	-	51 -
54	-	-	52 -

CHARGING SYSTEM

< WIRING DIAGRAM >

CHARGING SYSTEM CONNECTORS - WITH VK56VD

Connector No.	E130	Connector No.	E152
Connector Name	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)	Connector Name	WIRE TO WIRE
Connector Type	TH80MW-CS16-TM4	Connector Color	WHITE
Connector Type	TH10FB-NH	Connector Color	BLACK
			

Terminal No.	Color of Wire	Signal Name
63	-	-
64	R	DETENT SW
65	-	-
66	P	PUSH START SW
67	-	-
68	L	IGN SIGNAL
69	-	-
70	-	-
71	SB	HOOD SW2
72	W	E-CPLG - (WITH VK56VD)

24G	G/B	TO MAIN HARNESS
25G	R/W	TO MAIN HARNESS
26G	R	TO MAIN HARNESS
27G	LG	TO MAIN HARNESS
28G	G/B	TO MAIN HARNESS
29G	G/B	TO MAIN HARNESS
30G	BR/Y	TO MAIN HARNESS
31G	P	TO MAIN HARNESS - (WITH CUMMINS 5.0L)
31G	R	TO MAIN HARNESS - (WITH VK56VD)
32G	P	TO MAIN HARNESS
33G	Y/L	TO MAIN HARNESS
34G	GR	TO MAIN HARNESS
35G	GR	TO MAIN HARNESS
36G	SB	TO MAIN HARNESS
37G	R/W	TO MAIN HARNESS
38G	BR	TO MAIN HARNESS
39G	BR	TO MAIN HARNESS
40G	-	TO MAIN HARNESS
41G	R/G	TO MAIN HARNESS
42G	O	TO MAIN HARNESS
43G	B	TO MAIN HARNESS - (WITH CUMMINS 5.0L)
43G	G	TO MAIN HARNESS - (WITH VK56VD)
44G	R/Y	TO MAIN HARNESS
45G	G	TO MAIN HARNESS
46G	LG	TO MAIN HARNESS
47G	R	TO MAIN HARNESS
48G	W	TO MAIN HARNESS
49G	-	TO MAIN HARNESS
50G	BR	TO MAIN HARNESS
51G	R	TO MAIN HARNESS
52G	L	TO MAIN HARNESS
53G	W	TO MAIN HARNESS
54G	W	TO MAIN HARNESS
55G	G	TO MAIN HARNESS
56G	W	TO MAIN HARNESS
57G	Y	TO MAIN HARNESS
58G	BG	TO MAIN HARNESS
59G	BG	TO MAIN HARNESS
60G	BG	TO MAIN HARNESS
61G	B	TO MAIN HARNESS
62G	W	TO MAIN HARNESS
63G	R	TO MAIN HARNESS
64G	W/L	TO MAIN HARNESS
65G	W/R	TO MAIN HARNESS
66G	BG	TO MAIN HARNESS
67G	BG	TO MAIN HARNESS
68G	B	TO MAIN HARNESS
69G	Y	TO MAIN HARNESS
70G	L	TO MAIN HARNESS
71G	R/W	TO MAIN HARNESS

72G	L/W	TO MAIN HARNESS
73G	SHIELD	TO MAIN HARNESS
74G	W	TO MAIN HARNESS
75G	R	TO MAIN HARNESS
76G	R/G	TO MAIN HARNESS
77G	G	TO MAIN HARNESS
78G	W	TO MAIN HARNESS
79G	-	TO MAIN HARNESS
80G	R	TO MAIN HARNESS
81G	L	TO MAIN HARNESS
82G	R	TO MAIN HARNESS
83G	L	TO MAIN HARNESS
84G	L	TO MAIN HARNESS
85G	W/B	TO MAIN HARNESS
86G	BR	TO MAIN HARNESS
87G	W/B	TO MAIN HARNESS
88G	P	TO MAIN HARNESS
89G	L	TO MAIN HARNESS
90G	G	TO MAIN HARNESS
91G	G	TO MAIN HARNESS
92G	W/V	TO MAIN HARNESS
93G	BR	TO MAIN HARNESS
94G	G	TO MAIN HARNESS
95G	G	TO MAIN HARNESS
96G	W	TO MAIN HARNESS
97G	R	TO MAIN HARNESS
98G	W/B	TO MAIN HARNESS
99G	BR	TO MAIN HARNESS
100G	GR/W	TO MAIN HARNESS

Terminal No.	Color of Wire	Signal Name
1	SB	SENSOR POWER SUPPLY
2	G	BATTERY TEMPERATURE SENSOR
3	R	SENSOR GROUND
4	V	BATTERY CURRENT SENSOR



CHG

CHARGING SYSTEM

< WIRING DIAGRAM >

CHARGING SYSTEM CONNECTORS - WITH VK56VD

Terminal No.	Color of Wire	Signal Name	Connector No.	Color of Wire	Signal Name
12	L/Y	REFRIGERANT PRESSURE SENSOR	56	B	ECM GROUND
13	W/L	SHIELD	14	W/L	SENSOR GROUND
14	SHIELD		15	W	KNOCK SENSOR (BANK 1)
16	-		17	V	EXHAUST GAS TEMPERATURE SENSOR (BANK 2)
18	W	KNOCK SENSOR (BANK 2)	19	G/R	EXHAUST GAS TEMPERATURE SENSOR (BANK 1)
20	SHIELD		21	-	
22	L/Y	ENGINE OIL TEMPERATURE SENSOR	23	L/Y	ENGINE OIL PRESSURE SENSOR
24	P/G/R	POWER STEERING PRESSURE SENSOR	25	V/W	FUEL RAIL PRESSURE SENSOR
26	-		27	W/G	SENSOR POWER SUPPLY
28	Y/R	SENSOR POWER SUPPLY	29	SB	SENSOR POWER SUPPLY
30	SB	SENSOR POWER SUPPLY	31	BR	COOLING FAN SPEED
32	LG	BATTERY TEMPERATURE SENSOR	33	R/W	CRANKSHAFT POSITION SENSOR (POS)
34	-		35	R/W	ENGINE COOLANT TEMPERATURE SENSOR 1
36	G/O	INTAKE AIR TEMPERATURE SENSOR	37	G/B	MASS AIR FLOW SENSOR
38	V	BATTERY CURRENT SENSOR	39	-	
40	L/R	CAMSHAFT POSITION SENSOR (PHASE) (BANK 1)	41	P	EXHAUST VALVE TIMING CONTROL POSITION SENSOR (BANK 1)
42	R	SENSOR GROUND	43	R	SENSOR GROUND
44	G/W	SENSOR GROUND	45	B/RW	SENSOR GROUND
46	SB	HIGH PRESSURE FUEL PUMP DRIVER POWER SUPPLY	47	BR	HIGH PRESSURE FUEL PUMP DRIVER POWER SUPPLY
48	Y	FUEL INJECTOR NO. 1 (L/H)	49	L	FUEL INJECTOR NO. 1 (L/H)
50	B	ECM GROUND	51	P	HIGH PRESSURE FUEL PUMP DRIVER POWER SUPPLY
52	R	FUEL INJECTOR NO. 6 (L/H)	53	V	FUEL INJECTOR NO. 6 (L/H)
54	W	FUEL INJECTOR NO. 7 (L/H)			

AAMIA4971GB

CHARGING SYSTEM

< WIRING DIAGRAM >

CHARGING SYSTEM CONNECTORS - WITH VK56VD

Connector No.	F243
Connector Name	FUSIBLE LINK BOX (BATTERY) (WITH VK56VD)
Connector Type	NS16FW-CS
Connector Color	WHITE
Connector Color	-
	
	5

7	-	-	43	-	-
8	-	-	44	-	-
9	-	-	45	-	-
10	SB	COMBI SW IN 5	46	-	-
11	GY	COMBI SW IN 4	47	-	-
12	Y	COMBI SW IN 3	48	R	HIGH SIDE START SW/LED
13	GB	COMBI SW IN 2	49	-	-
14	V	COMBI SW IN 1	50	-	-
15	-	-	51	-	-
16	-	-	52	W	AUDIO DONGLE
17	P	GND RF AVL	53	-	-
18	V	SECURITY INDICATOR	54	WL	PW/UART
19	-	-	55	WB	L&R SENSOR K-LINE
20	R	SHIFT P	56	-	-
21	R/W	STEP LAMP/CONT	57	-	-
22	-	-	58	-	-
23	Y	AIRCON SW	59	P	CAN-L
24	-	-	60	L	CAN-H
25	W	RAKE SW/EUFE	61	O	REAR DEFOGGER RELAY OUT
26	L	SHOR IN/TIN INPUT	62	W	STARTER RELAY OUT
27	R/G	RAKE SW/LAMP	63	-	-
28	-	-	64	P	BUZZER OUT
29	W	BLOWER FAN SW	65	-	-
30	P	DR/DOOR LOCK STATUS	66	W	BLOWER FAN RELAY OUT
31	-	-	67	G	IGN/ELEC RELAY OUT 2
32	Y	REAR DEFOGGER SW	68	L	M/R OUTPUT
33	-	-	69	R/B	AT/DEVICE OUT
34	-	-	70	P	IGN/ISM OUT 1
35	R/G	REVERSE SW	71	O	DR/REQUEST SW
36	W/B	HAZARD SW	72	G	AS/REQUEST SW
37	-	-	73	-	-
38	-	-	74	-	-
39	B/R	SHIFT N/P	75	L	COMBI SW OUT 5
40	-	-	76	P	COMBI SW OUT 4

Connector No.	M18
Connector Name	BCM (BODY CONTROL MODULE)
Connector Type	TH40FG-NH
Connector Color	GREEN
	

Connector No.	M19
Connector Name	BCM (BODY CONTROL MODULE)
Connector Type	TH40FB-NH
Connector Color	BLACK
	

Terminal No.	1	Color of Wire	3N	Signal Name	IGNITION
2	-	-	2N	-	-
3N	W	BATTERY	2N	-	-
4N	V	BLOWER FAN RELAY OUT	3N	-	-
5N	Y	BATTERY	4N	-	-
6N	W	BATTERY	5N	-	-
7N	L	ACC RELAY OUT	6N	-	-
8N	W	IGNITION	7N	-	-

AAMIA4972GB

CHARGING SYSTEM

< WIRING DIAGRAM >

CHARGING SYSTEM CONNECTORS - WITH VK56VD

Terminal	Color of Wire	Signal Name
1	B	GND(SATELLITE SW/GND)
2	-	-
3	-	-
4	-	-
5	-	-
6	-	-
7	V	SECURITY
8	-	-
9	BG	AS BELT SW(W/O ODS)
10	LG	TOW MODE SW
11	BR	CHG
12	BR	LED HEAD LAMP (R)
13	W	LED HEAD LAMP (L)
14	R	ACC SW
15	W	OUTSIDE TEMP SENSOR (WITH VK56VD)
16	O	AIR BAG
17	-	-
18	P	TRIP RESET SW
19	-	-
20	R	OUTSIDE TEMP GND (WITH VK56VD)
21	-	-
22	P	STRO SWA
23	R	STRO SW B
24	W	WASHER SW
25	-	-
26	G	PKG SW
27	P/L	AS BELT SW (WITH ODS)
28	O/B	DR BELT SW
29	-	-
30	-	-
31	-	-
32	BR	AT SHIFT UP
33	V/W	AT SHIFT DOWN
34	-	-
35	-	-
36	W	ILL UP SW

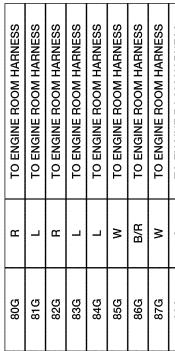
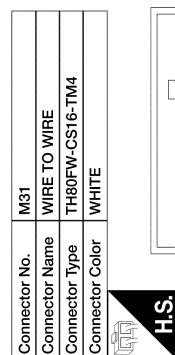
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CHARGING SYSTEM

< WIRING DIAGRAM >

CHARGING SYSTEM CONNECTORS - WITH VK56VD

Terminal No.	Color of Wire	Signal Name	Terminal No.	Color of Wire	Signal Name
1G	G	TO ENGINE ROOM HARNESS	51G	R	TO ENGINE ROOM HARNESS
2G	BR	TO ENGINE ROOM HARNESS	52G	R	TO ENGINE ROOM HARNESS
29G	G/B	TO ENGINE ROOM HARNESS	82G	R	TO ENGINE ROOM HARNESS
30G	BR/Y	TO ENGINE ROOM HARNESS	83G	L	TO ENGINE ROOM HARNESS
31G	R	TO ENGINE ROOM HARNESS	84G	L	TO ENGINE ROOM HARNESS
32G	R	TO ENGINE ROOM HARNESS	85G	W	TO ENGINE ROOM HARNESS
33G	Y/L	TO ENGINE ROOM HARNESS	86G	BR	TO ENGINE ROOM HARNESS
34G	GR	TO ENGINE ROOM HARNESS	87G	W	TO ENGINE ROOM HARNESS
35G	G/R	TO ENGINE ROOM HARNESS	88G	G	TO ENGINE ROOM HARNESS
36G	SB	TO ENGINE ROOM HARNESS	89G	P	TO ENGINE ROOM HARNESS
37G	R/W	TO ENGINE ROOM HARNESS	90G	G	TO ENGINE ROOM HARNESS
38G	BR	TO ENGINE ROOM HARNESS	91G	P	TO ENGINE ROOM HARNESS
39G	BR	TO ENGINE ROOM HARNESS	92G	W/W	TO ENGINE ROOM HARNESS
40G	-	TO ENGINE ROOM HARNESS	93G	BR	TO ENGINE ROOM HARNESS
41G	R/G	TO ENGINE ROOM HARNESS	94G	B	TO ENGINE ROOM HARNESS
42G	O	TO ENGINE ROOM HARNESS	95G	G	TO ENGINE ROOM HARNESS
43G	G	TO ENGINE ROOM HARNESS	96G	R	TO ENGINE ROOM HARNESS
44G	R/Y	TO ENGINE ROOM HARNESS	97G	R	TO ENGINE ROOM HARNESS
45G	G	TO ENGINE ROOM HARNESS	98G	W/R	TO ENGINE ROOM HARNESS
46G	LG	TO ENGINE ROOM HARNESS	99G	R	TO ENGINE ROOM HARNESS
47G	W	TO ENGINE ROOM HARNESS	100G	G/R/W	TO ENGINE ROOM HARNESS
48G	-	TO ENGINE ROOM HARNESS			
50G	BR	TO ENGINE ROOM HARNESS			
51G	R	TO ENGINE ROOM HARNESS			
52G	L	TO ENGINE ROOM HARNESS			
54G	W	TO ENGINE ROOM HARNESS			
55G	G	TO ENGINE ROOM HARNESS			
56G	W	TO ENGINE ROOM HARNESS			
57G	Y	TO ENGINE ROOM HARNESS			
58G	B/G	TO ENGINE ROOM HARNESS			
59G	B/G	TO ENGINE ROOM HARNESS			
60G	B/G	TO ENGINE ROOM HARNESS			
61G	O	TO ENGINE ROOM HARNESS			
62G	W	TO ENGINE ROOM HARNESS			
63G	O	TO ENGINE ROOM HARNESS			
64G	W/L	TO ENGINE ROOM HARNESS	129	R/G	BATTERY SAVER OUT
65G	W/R	TO ENGINE ROOM HARNESS	130	LG	SUPER LOCK/DOOR UNLOCK AS
66G	B/G	TO ENGINE ROOM HARNESS	131	W	BAT BOM FUSE
67G	O	TO ENGINE ROOM HARNESS	132	Y	DOOR LOCK AS/FRL
68G	B	TO ENGINE ROOM HARNESS	133	BR	DOOR UNLOCK AS/FRL
69G	Y	TO ENGINE ROOM HARNESS	134	B	GND2
70G	L	TO ENGINE ROOM HARNESS	135	O	DOOR LOCK DIS/FRL
71G	R/W	TO ENGINE ROOM HARNESS	136	L	ROOM LAMP CONT
72G	L/W	TO ENGINE ROOM HARNESS	137	V	DOOR UNLOCK DIS/FRL
73G	SHIELD	TO ENGINE ROOM HARNESS	138	V	BAT REAR DOOR
74G	W	TO ENGINE ROOM HARNESS	139	W	BAT-POWER F/L
75G	R	TO ENGINE ROOM HARNESS	140	LG	P/W POWER SUPPLY IGN
76G	R/G	TO ENGINE ROOM HARNESS	141	V	P/W POWER SUPPLY BAT
77G	B/G	TO ENGINE ROOM HARNESS	142	Y	BAT FRONT DOOR
78G	P	TO ENGINE ROOM HARNESS	143	B	GND1
79G	-	TO ENGINE ROOM HARNESS			



CHG

CHARGING SYSTEM

< WIRING DIAGRAM >

CHARGING SYSTEM CONNECTORS - WITH VK56VD

Connector No.	M163
Connector Name	COMBINATION METER (WITH TYPE B)
Connector Type	TH40FW-NH
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
1	B	GND (ILL)
2	B	GND (CIRCUIT)
3	B	GND (POWER)
4	-	-
5	-	-
6	R	BAT
7	V	SECURITY
8	W	IGN
9	BG	AS BELT SW (W/O ODS)
10	LG	TOW MODE SW
11	BR	CHG
12	B	SATELLITE SW GND
13	B	STRG SW GND
14	R	ACC
15	W	OUTSIDE TEMP SENSOR
16	O	AIR BAG
17	-	-
18	P	TRIP RESET SW
19	-	-
20	R	OUTSIDE TEMP GND
21	-	-
22	P	STRG SW A
23	R	STRG SW B
24	W	WASHER SW
25	-	-
26	G	PKB SW
27	P/L	AS BELT SW (WITH ODS)
28	O/B	DR BELT SW
29	-	-
30	YV	FUEL SENSOR GND
31	BR/Y	FUEL SENSOR
32	BR	AT SHIFT UP
33	V/W	AT SHIFT DOWN
34	L	CAN-H
35	P	CAN-L
36	W	ILL UP SW
37	R	ILL DOWN SW
38	G	8PR OUTPUT

AAMIA5059GB

DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION >

BASIC INSPECTION

DIAGNOSIS AND REPAIR WORKFLOW

Work Flow (With EXP-800 NI or GR8-1200 NI) (with Cummins 5.0L)

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A

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

C

NOTE:

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

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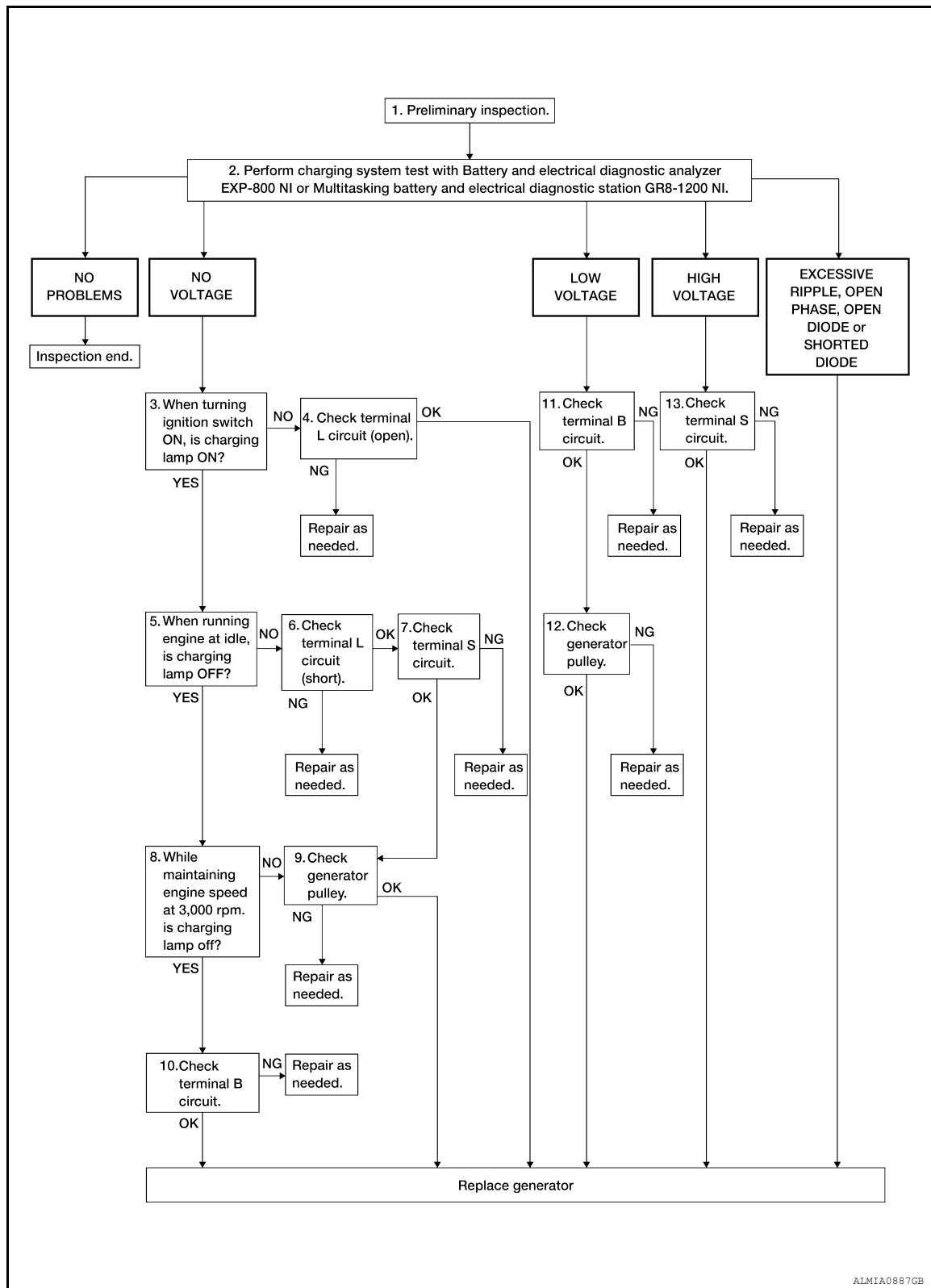
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P

DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION >

OVERALL SEQUENCE



ALMIA0887GB

DETAILED FLOW

NOTE:

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

1. PRELIMINARY INSPECTION

Perform the preliminary inspection. Refer to [CHG-36. "Inspection Procedure"](#).

DIAGNOSIS AND REPAIR WORKFLOW

< 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 generator. Refer to [CHG-48, "Removal and Installation: Cummins 5.0L"](#). 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. TERMINAL L CIRCUIT (OPEN) INSPECTION

Check terminal L circuit (open). Refer to [CHG-40, "Diagnosis Procedure"](#).

Is the terminal L circuit normal?

YES >> Replace generator. Refer to [CHG-48, "Removal and Installation: Cummins 5.0L"](#).

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. TERMINAL L CIRCUIT (SHORT) INSPECTION

Check terminal L circuit (short). Refer to [CHG-43, "Diagnosis Procedure"](#).

Is the terminal L circuit normal?

YES >> GO TO 7.

NO >> Repair as needed.

7. TERMINAL S CIRCUIT INSPECTION

Check terminal S circuit. Refer to [CHG-44, "Diagnosis Procedure"](#).

Is the terminal S circuit normal?

YES >> GO TO 9.

NO >> Repair as needed.

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

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

Does the charge warning lamp remain off?

YES >> GO TO 10.

NO >> GO TO 9.

9. INSPECTION OF GENERATOR PULLEY

Check generator pulley. Refer to [CHG-48, "Removal and Installation: Cummins 5.0L"](#).

Is generator pulley normal?

YES >> Replace generator. Refer to [CHG-48, "Removal and Installation: Cummins 5.0L"](#).

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DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION >

NO >> Repair as needed.

10. TERMINAL B CIRCUIT INSPECTION

Check terminal B circuit. Refer to [CHG-39, "Diagnosis Procedure"](#).

Is terminal B circuit normal?

YES >> Replace generator. Refer to [CHG-48, "Removal and Installation: Cummins 5.0L"](#).

NO >> Repair as needed.

11. TERMINAL B CIRCUIT INSPECTION

Check "B" terminal circuit. Refer to [CHG-39, "Diagnosis Procedure"](#).

Is "B" terminal circuit normal?

YES >> GO TO 12.

NO >> Repair as needed.

12. INSPECTION OF GENERATOR PULLEY

Check generator pulley. Refer to [CHG-48, "Removal and Installation: Cummins 5.0L"](#).

Is generator pulley normal?

YES >> Replace generator. Refer to [CHG-48, "Removal and Installation: Cummins 5.0L"](#).

NO >> Repair as needed.

13. TERMINAL S CIRCUIT INSPECTION

Check terminal S circuit. Refer to [CHG-44, "Diagnosis Procedure"](#).

Is the terminal S circuit normal?

YES >> Replace generator. Refer to [CHG-48, "Removal and Installation: Cummins 5.0L"](#).

NO >> Repair as needed.

Work Flow (With EXP-800 NI or GR8-1200 NI) (with VK56VD)

INFOID:0000000014388611

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

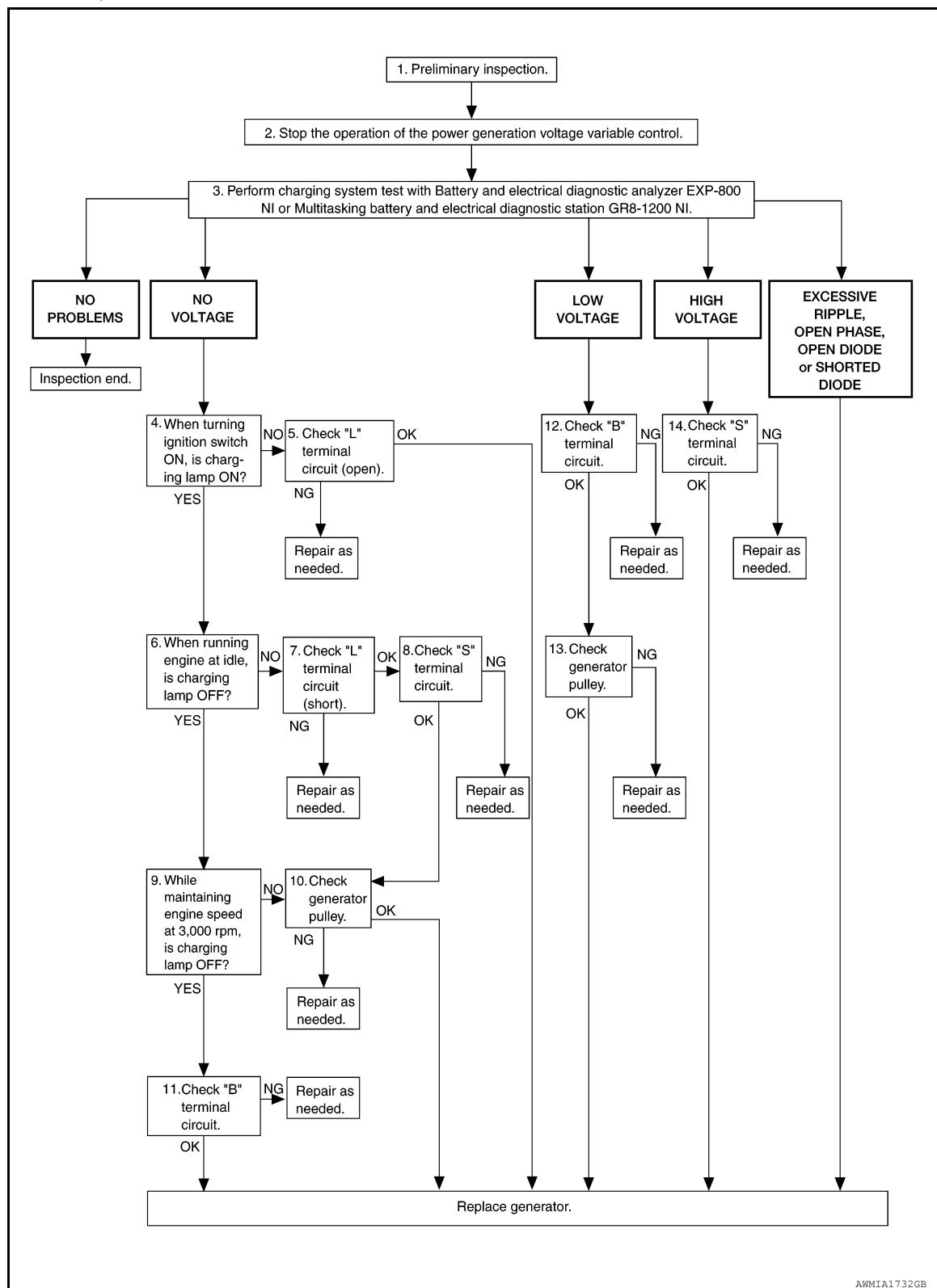
NOTE:

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

DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION >

OVERALL SEQUENCE



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DETAILED FLOW

NOTE:

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

1. PRELIMINARY INSPECTION

Perform the preliminary inspection. Refer to [CHG-36, "Inspection Procedure"](#).

DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION >

>> GO TO 2.

2. STOP POWER GENERATION VOLTAGE VARIABLE CONTROL SYSTEM

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

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

>> GO TO 3.

3. DIAGNOSIS WITH EXP-800 NI OR GR8-1200 NI

Perform the charging system test using Multitasking battery and electrical diagnostic station GR8-1200 NI or Battery and electrical diagnostic analyzer EXP-800 NI. Refer to the applicable Instruction Manual for proper testing procedures.

Test result

NO PROBLEMS>>Charging system is normal and will also show “DIODE RIPPLE” test result.

NO VOLTAGE>>GO TO 4.

LOW VOLTAGE>>GO TO 12.

HIGH VOLTAGE>>GO TO 14.

EXCESSIVE RIPPLE, OPEN PHASE, OPEN DIODE or SHORTED DIODE>>Replace the generator. Refer to [CHG-46, "Removal and Installation: VK56VD"](#). Perform “DIODE RIPPLE” test again using Multitasking battery and electrical diagnostic station GR8-1200 NI or Battery and electrical diagnostic analyzer EXP-800 NI to confirm repair.

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

Turn the ignition switch ON.

Does the charge warning lamp illuminate?

YES >> GO TO 6.

NO >> GO TO 5.

5. “L” TERMINAL CIRCUIT (OPEN) INSPECTION

Check “L” terminal circuit (open). Refer to [CHG-40, "Diagnosis Procedure"](#).

Is the “L” terminal circuit normal?

YES >> Replace generator. Refer to [CHG-46, "Removal and Installation: VK56VD"](#).

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-43, "Diagnosis Procedure"](#).

Is the “L” terminal circuit normal?

YES >> GO TO 8.

NO >> Repair as needed.

8. “S” TERMINAL CIRCUIT INSPECTION

Check “S” terminal circuit. Refer to [CHG-44, "Diagnosis Procedure"](#).

Is the “S” terminal circuit normal?

YES >> GO TO 10.

DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION >

NO >> Repair as needed.

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

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

Does the charge warning lamp remain off?

YES >> GO TO 11.

NO >> GO TO 10.

10. INSPECTION OF GENERATOR PULLEY

Check generator pulley. Refer to [CHG-46, "Removal and Installation: VK56VD"](#).

Is generator pulley normal?

YES >> Replace generator. Refer to [CHG-46, "Removal and Installation: VK56VD"](#).

NO >> Repair as needed.

11. "B" TERMINAL CIRCUIT INSPECTION

Check "B" terminal circuit. Refer to [CHG-39, "Diagnosis Procedure"](#).

Is "B" terminal circuit normal?

YES >> Replace generator. Refer to [CHG-46, "Removal and Installation: VK56VD"](#).

NO >> Repair as needed.

12. "B" TERMINAL CIRCUIT INSPECTION

Check "B" terminal circuit. Refer to [CHG-39, "Diagnosis Procedure"](#).

Is "B" terminal circuit normal?

YES >> GO TO 13.

NO >> Repair as needed.

13. INSPECTION OF GENERATOR PULLEY

Check generator pulley. Refer to [CHG-46, "Removal and Installation: VK56VD"](#).

Is generator pulley normal?

YES >> Replace generator. Refer to [CHG-46, "Removal and Installation: VK56VD"](#).

NO >> Repair as needed.

14. "S" TERMINAL CIRCUIT INSPECTION

Check "S" terminal circuit. Refer to [CHG-44, "Diagnosis Procedure"](#).

Is the "S" terminal circuit normal?

YES >> Replace generator. Refer to [CHG-46, "Removal and Installation: VK56VD"](#).

NO >> Repair as needed.

Work Flow (Without EXP-800 NI or GR8-1200 NI) (with Cummins 5.0L)

INFOID:000000014388612

OVERALL SEQUENCE

Before performing a generator test, make sure that the battery is fully charged. A 30-volt voltmeter and suitable test probes are necessary for the test.

- Before starting, inspect the fusible link.

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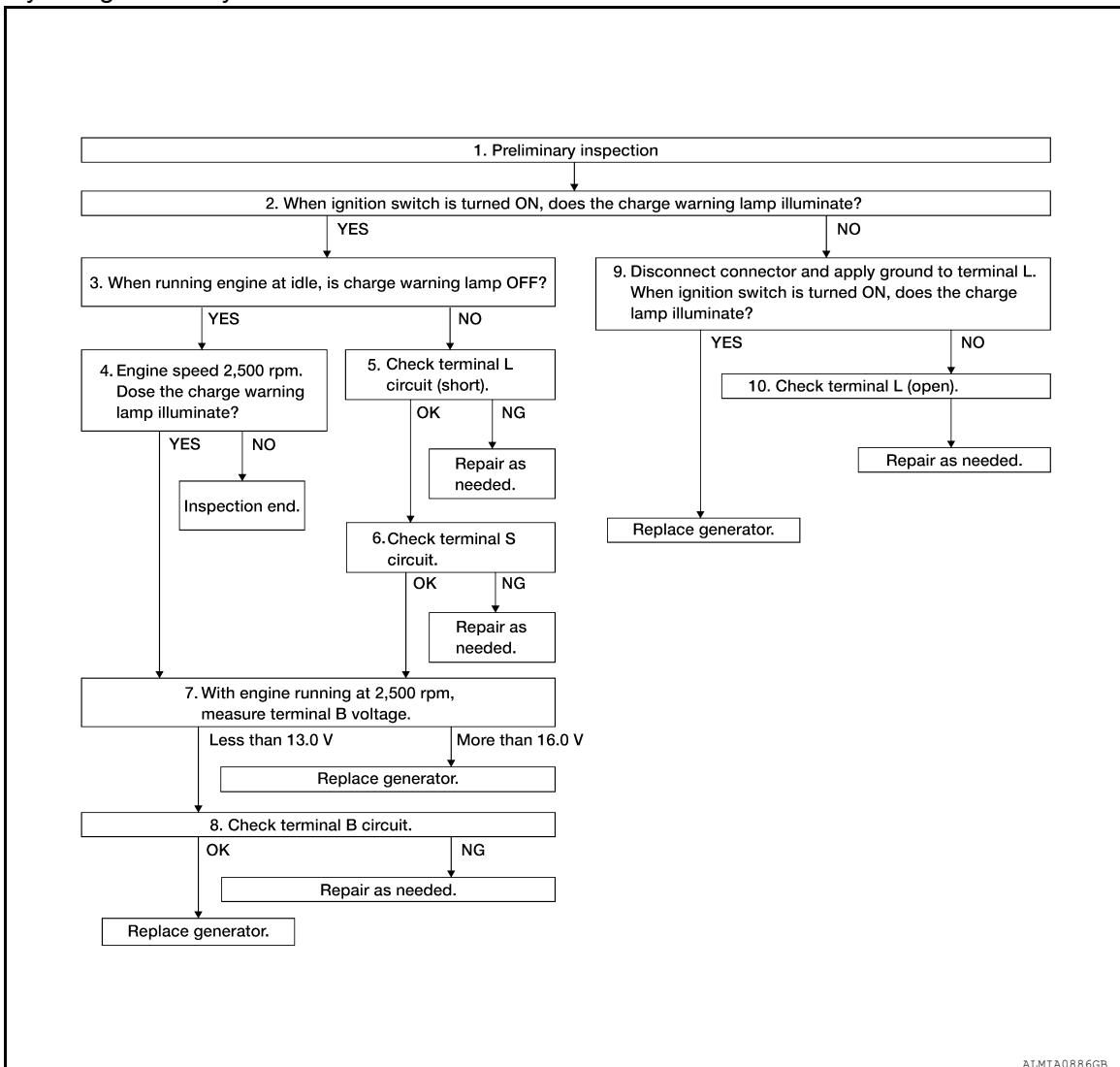
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DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION >

- Use fully charged battery.



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DETAILED FLOW

1. PRELIMINARY INSPECTION

Perform the preliminary inspection. Refer to [CHG-36, "Inspection Procedure"](#).

>> GO TO 2.

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

Turn the ignition switch 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?

DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION >

YES >> GO TO 7.

NO >> Inspection End.

A

5. TERMINAL L CIRCUIT (SHORT) INSPECTION

Check terminal L circuit for short. Refer to [CHG-43, "Diagnosis Procedure"](#).

B

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair as needed.

C

6. TERMINAL S CIRCUIT INSPECTION

Check terminal S circuit. Refer to [CHG-44, "Diagnosis Procedure"](#).

D

Is the inspection result normal?

YES >> GO TO 7.

NO >> Repair as needed.

E

7. MEASURE TERMINAL B VOLTAGE

Start engine. With engine running at 2,500 rpm, measure terminal B voltage.

F

What voltage does the measurement result show?

Less than 13.0 V>> GO TO 8.

More than 16.0 V>> Replace generator. Refer to [CHG-48, "Removal and Installation: Cummins 5.0L"](#).

G

8. TERMINAL B CIRCUIT INSPECTION

Check "B" terminal circuit. Refer to [CHG-39, "Diagnosis Procedure"](#).

H

Is the inspection result normal?

YES >> Replace generator. Refer to [CHG-48, "Removal and Installation: Cummins 5.0L"](#).

NO >> Repair as needed.

I

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

1. Disconnect generator connector and apply ground to terminal L.

J

2. Turn the ignition switch ON.

K

Does the charge warning lamp illuminate?

L

YES >> Replace generator. Refer to [CHG-48, "Removal and Installation: Cummins 5.0L"](#).

NO >> GO TO 10.

M

10. CHECK TERMINAL L CIRCUIT (OPEN)

N

Check terminal L circuit open. Refer to [CHG-40, "Diagnosis Procedure"](#).

O

>> Repair as needed.

P

Work Flow (Without EXP-800 NI or GR8-1200 NI) (with VK56VD)

INFOID:000000014388613

CHG

OVERALL SEQUENCE

N

Before performing a generator test, make sure that the battery is fully charged. A 30-volt voltmeter and suitable test probes are necessary for the test.

O

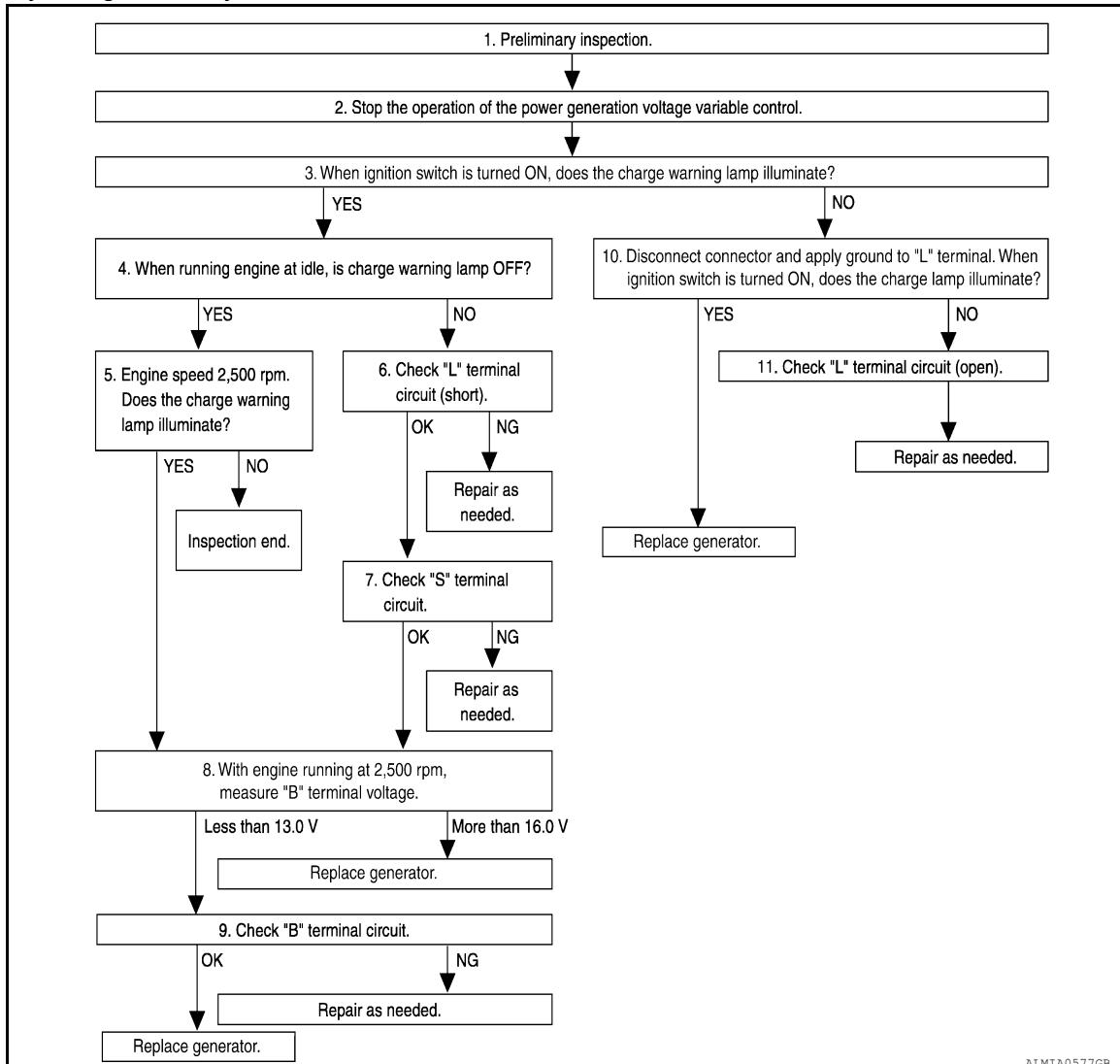
- Before starting, inspect the fusible link.

P

DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION >

- Use fully charged battery.



DETAILED FLOW

1. PRELIMINARY INSPECTION

Perform the preliminary inspection. Refer to [CHG-36, "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” using CONSULT, set the DUTY value of “ALTERNATOR DUTY” to 0 % by selecting “ALTERNATOR DUTY” with “Active Test”. Continue “Active Test” until the end of inspection. (When the DUTY value is 0 or 100 %, the normal power generation is performed according to the characteristic of the IC regulator of the generator.)
- Turn the ignition switch OFF, and disconnect the battery current sensor connector. [However, DTC (P1550 - P1554) of the engine might remain. After finishing the inspection, connect the battery current sensor connector and erase the self-diagnostic results history of the engine using CONSULT.]

>> GO TO 3.

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

When ignition switch is turned ON.

Does the charge warning lamp illuminate?

DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION >

YES >> GO TO 4.
NO >> GO TO 10.

A

4. INSPECTION WITH CHARGE WARNING LAMP (IDLING)

Start the engine and run it at idle

B

Does the charge warning lamp turn OFF?

YES >> GO TO 5.
NO >> GO TO 6.

C

5. INSPECTION WITH CHARGE WARNING LAMP (ENGINE AT 2,500 RPM)

Increase and maintain the engine speed at 2,500 rpm.

D

Does the charge warning lamp illuminate?

YES >> GO TO 8.
NO >> Inspection End.

E

6. "L" TERMINAL CIRCUIT (SHORT) INSPECTION

Check terminal "L" circuit for (short). Refer to [CHG-43, "Diagnosis Procedure"](#).

F

Is the inspection result normal?

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

G

7. "S" TERMINAL CIRCUIT INSPECTION

Check terminal "S" circuit. Refer to [CHG-44, "Diagnosis Procedure"](#).

H

Is the inspection result normal?

YES >> GO TO 8.
NO >> Repair as needed.

I

8. MEASURE "B" TERMINAL VOLTAGE

Start engine. With engine running at 2,500 rpm, measure "B" terminal voltage.

J

What voltage does the measurement result show?

Less than 13.0 V >> GO TO 9.
More than 16.0 V >> Replace generator. Refer to [CHG-46, "Removal and Installation: VK56VD"](#).

K

9. "B" TERMINAL CIRCUIT INSPECTION

L

Check "B" terminal circuit. Refer to [CHG-39, "Diagnosis Procedure"](#).

M

Is the inspection result normal?

YES >> Replace generator. Refer to [CHG-46, "Removal and Installation: VK56VD"](#).
NO >> Repair as needed.

N

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

CHG

1. Disconnect generator connector and apply ground to "L" terminal.
2. Turn the ignition switch ON.

O

Does the charge warning lamp illuminate?

YES >> Replace generator. Refer to [CHG-46, "Removal and Installation: VK56VD"](#).
NO >> GO TO 11.

P

11. CHECK "L" TERMINAL CIRCUIT (OPEN)

Check "L" terminal circuit (OPEN). Refer to [CHG-40, "Diagnosis Procedure"](#).

>> Repair as needed.

CHARGING SYSTEM PRELIMINARY INSPECTION

< BASIC INSPECTION >

CHARGING SYSTEM PRELIMINARY INSPECTION

Inspection Procedure

INFOID:000000001438614

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:

With Cummins 5.0L

Unit	Power source (Power supply terminals)	Fuse or Fusible Link
Generator	Battery (terminal 3)	Fuse 70 (10 A)
	Battery (terminal 1)	Fusible Link A (250 A)
Combination meter	Ignition switch ON or START (terminal 2)	Fuse 13 (10 A)

With VK56VD

Unit	Power source (Power supply terminals)	Fuse or Fusible Link
Generator	Battery (terminal 3)	Fuse 66 (10 A)
	Battery (terminal 1)	Fusible Link A (250 A)
Combination meter	Ignition switch ON or START (terminal 2)	Fuse 13 (10 A)

Is the inspection result normal?

YES >> GO TO 3.

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

3. CHECK GENERATOR GROUND TERMINAL CONNECTION

Verify connector F201 (generator ground harness) terminal 5 is clean and tight.

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair connection.

4. CHECK DRIVE BELT TENSION

Check drive belt tension. Refer to [CHG-46, "Removal and Installation: VK56VD"](#).

Is the inspection result normal?

YES >> Inspection End.

NO >> Repair as needed.

POWER GENERATION VOLTAGE VARIABLE CONTROL SYSTEM OPERATION INSPECTION

< DTC/CIRCUIT DIAGNOSIS >

DTC/CIRCUIT DIAGNOSIS

POWER GENERATION VOLTAGE VARIABLE CONTROL SYSTEM OPERATION INSPECTION

Diagnosis Procedure

INFOID:000000014388615

Regarding Wiring Diagram information, refer to [CHG-17. "Wiring Diagram- with VK56VD".](#)

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)

Perform ECM self-diagnosis with CONSULT. Refer to [EC-94. "CONSULT 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 and start the engine.
2. The A/T shift selector is in "P" or "N" position and all of the electric loads and A/C, etc. are turned OFF.
3. Select "ALTERNATOR DUTY" in "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 "ALTERNATOR DUTY" to 40.0 %

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 "ALTERNATOR 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)

Perform IPDM E/R self-diagnosis with CONSULT. Refer to [PCS-11. "CONSULT 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 GENERATOR AND IPDM E/R

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

POWER GENERATION VOLTAGE VARIABLE CONTROL SYSTEM OPERATION INSPECTION

< DTC/CIRCUIT DIAGNOSIS >

Generator		IPDM E/R		Continuity
Connector	Terminal	Connector	Terminal	
F242	4	E122	47	Yes

4. Check continuity between generator harness connector and ground.

Generator		-	Continuity
Connector	Terminal		
F242	4	Ground	No

Is the inspection result normal?

YES >> Replace IPDM E/R. Refer to [PCS-43, "Removal and Installation of IPDM E/R"](#).

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

B TERMINAL CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

B TERMINAL CIRCUIT

Description

INFOID:0000000014388616

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

Diagnosis Procedure

INFOID:0000000014388617

Regarding Wiring Diagram information, refer to [CHG-12, "Wiring Diagram- with Cummins 5.0L"](#), or [CHG-17, "Wiring Diagram- with VK56VD"](#).

1. CHECK TERMINAL "B" CONNECTION

1. Turn ignition switch OFF.
2. Verify terminal "B" is clean and tight.

Is the inspection result normal?

YES >> GO TO 2."

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

2. CHECK TERMINAL "B" CIRCUIT

Check voltage between generator connector and ground.

Connector	(+)	(-)	Voltage (Approx.)
Terminal			
F204 (with Cummins 5.0L) F241 (with VK56VD)	1	Ground	Battery voltage

Is voltage reading as specified?

YES >> GO TO 3.

NO >> Check harness for open between generator and fusible link.

3. CHECK TERMINAL "B" CONNECTION (VOLTAGE DROP TEST)

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

Connector	(+)	(-)	Voltage (Approx.)
Terminal			
F204 (with Cummins 5.0L) F241 (with VK56VD)	1	Battery positive terminal	Less than 0.2V

Is the voltage reading as specified?

YES >> Terminal "B" circuit is normal. Refer to [CHG-25, "Work Flow \(With EXP-800 NI or GR8-1200 NI \(with Cummins 5.0L\)\)"](#), [CHG-28, "Work Flow \(With EXP-800 NI or GR8-1200 NI \(with VK56VD\)\)"](#), [CHG-31, "Work Flow \(Without EXP-800 NI or GR8-1200 NI\) \(with Cummins 5.0L\)"](#), or [CHG-33, "Work Flow \(Without EXP-800 NI or GR8-1200 NI\) \(with VK56VD\)"](#).

NO >> Check harness between battery and generator for high resistance.

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L TERMINAL CIRCUIT (OPEN)

< DTC/CIRCUIT DIAGNOSIS >

L TERMINAL CIRCUIT (OPEN)

Description

INFOID:0000000014388618

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

Diagnosis Procedure

INFOID:0000000014388619

Regarding Wiring Diagram information. Refer to [CHG-12, "Wiring Diagram- with Cummins 5.0L"](#), or [CHG-17, "Wiring Diagram- with VK56VD"](#).

1. CHECK TERMINAL "L" CONNECTION

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

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair terminal "L" connection. Confirm repair by performing complete Charging system test using EXP-800 NI or GR8-1200 NI (if available). Refer to applicable Instruction Manual for proper testing procedures.

2. CHECK TERMINAL "L" CIRCUIT (OPEN)

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

Generator		Ground	Condition	
Connector	Terminal		Ignition switch position	Charge warning lamp
F205 (with Cummins 5.0L)	2		ON	Illuminate
F242 (with VK56VD)				

Does it illuminate?

YES >> Terminal "L" circuit is normal. Refer to [CHG-25, "Work Flow \(With EXP-800 NI or GR8-1200 NI \(with Cummins 5.0L\)\)"](#), [CHG-28, "Work Flow \(With EXP-800 NI or GR8-1200 NI \(with VK56VD\)\)"](#), [CHG-31, "Work Flow \(Without EXP-800 NI or GR8-1200 NI \(with Cummins 5.0L\)\)"](#), or [CHG-33, "Work Flow \(Without EXP-800 NI or GR8-1200 NI \(with VK56VD\)\)"](#).

NO >> GO TO 3.

3. CHECK HARNESS CONTINUITY (OPEN CIRCUIT)

1. Disconnect the battery cable from the negative terminal.
2. Disconnect the combination meter connector.
3. Check continuity between generator harness connector and combination meter harness connector.

With Cummins 5.0L

Generator		Combination meter		Continuity
Connector	Terminal	Connector	Terminal	
F205	2	M25	11	Yes

With VK56VD (with type A combination meter)

Generator		Combination meter		Continuity
Connector	Terminal	Connector	Terminal	
F242	2	M25	11	Yes

L TERMINAL CIRCUIT (OPEN)

< DTC/CIRCUIT DIAGNOSIS >

With VK56VD (with type B combination meter)

Generator		Combination meter		Continuity
Connector	Terminal	Connector	Terminal	
F242	2	M163	11	Yes

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace the harness or connectors.

4. CHECK HARNESS CONTINUITY (OPEN CIRCUIT)

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

With Cummins 5.0L

Combination meter		Fuse box (J/B)		Continuity
Connector	Terminal	Connector	Terminal	
M24	42	M4	13P	Yes

With VK56VD (with type A combination meter)

Combination meter		Fuse box (J/B)		Continuity
Connector	Terminal	Connector	Terminal	
M24	42	M4	13P	Yes

With VK56VD (with type B combination meter)

Combination meter		Fuse box (J/B)		Continuity
Connector	Terminal	Connector	Terminal	
M163	6	M4	13P	Yes

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair or replace the harness or connectors.

5. CHECK POWER SUPPLY CIRCUIT

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

With Cummins 5.0L

(+)		(-)	Condition	Voltage (Approx.)
Combination meter	Terminal			
Connector	Terminal			
M24	42	Ground	When the ignition switch is in ON position	Battery voltage

With VK56VD (with type A combination meter)

(+)		(-)	Condition	Voltage (Approx.)
Combination meter	Terminal			
Connector	Terminal			
M24	42	Ground	When the ignition switch is in ON position	Battery voltage

With VK56VD (with type B combination meter)

(+)		(-)	Condition	Voltage (Approx.)
Combination meter	Terminal			
Connector	Terminal			
M163	6	Ground	When the ignition switch is in ON position	Battery voltage

Is the inspection result normal?

YES >> Replace the combination meter. Refer to [MWI-108, "Removal and Installation"](#).

L TERMINAL CIRCUIT (OPEN)

< DTC/CIRCUIT DIAGNOSIS >

NO >> Repair or replace the harness or connectors.

L TERMINAL CIRCUIT (SHORT)

< DTC/CIRCUIT DIAGNOSIS >

L TERMINAL CIRCUIT (SHORT)

Description

INFOID:000000001438620

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

Diagnosis Procedure

INFOID:000000001438621

Regarding Wiring Diagram information, refer to [CHG-12, "Wiring Diagram- with Cummins 5.0L"](#), or [CHG-17, "Wiring Diagram- with VK56VD"](#).

1. CHECK TERMINAL "L" CIRCUIT (SHORT)

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

Does charge warning lamp illuminate?

YES >> GO TO 2.

NO >> Refer to [CHG-25, "Work Flow \(With EXP-800 NI or GR8-1200 NI\) \(with Cummins 5.0L\)"](#), [CHG-28, "Work Flow \(With EXP-800 NI or GR8-1200 NI\) \(with VK56VD\)"](#), [CHG-31, "Work Flow \(Without EXP-800 NI or GR8-1200 NI\) \(with Cummins 5.0L\)"](#), or [CHG-33, "Work Flow \(Without EXP-800 NI or GR8-1200 NI\) \(with VK56VD\)"](#).

2. CHECK HARNESS CONTINUITY (SHORT CIRCUIT)

1. Turn ignition switch OFF.
2. Disconnect the battery cable from the negative terminal.
3. Disconnect combination meter connector.
4. Check continuity between the combination meter harness connector and ground.

With Cummins 5.0L

Combination meter		Ground	Continuity
Connector	Terminal		
M25	11		No

With VK56VD (with type A combination meter)

Combination meter		Ground	Continuity
Connector	Terminal		
M25	11		No

With VK56VD (with type B combination meter)

Combination meter		Ground	Continuity
Connector	Terminal		
M163	11		No

Is the inspection result normal?

YES >> Replace the combination meter. Refer to [MWI-108, "Removal and Installation"](#).

NO >> Repair or replace the harness or connectors.

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S TERMINAL CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

S TERMINAL CIRCUIT

Description

INFOID:000000001438622

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

Diagnosis Procedure

INFOID:000000001438623

Regarding Wiring Diagram information, refer to [CHG-12, "Wiring Diagram- with Cummins 5.0L"](#), or [CHG-17, "Wiring Diagram- with VK56VD"](#).

1. CHECK TERMINAL "S" CONNECTION

- 1.Turn ignition switch OFF
- 2.Check if terminal "S" is clean and tight.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair terminal "S" 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 VOLTAGE REGULATOR CIRCUIT

Check voltage between generator harness connector and ground.

(+) Connector		(-)	Voltage (Approx.)
Connector	Terminal		
F205 (with Cummins 5.0L) F242 (with VK56VD)	3	Ground	Battery voltage

Does battery voltage exist?

YES >> Refer to [CHG-25, "Work Flow \(With EXP-800 NI or GR8-1200 NI\) \(with Cummins 5.0L\)"](#), [CHG-28, "Work Flow \(With EXP-800 NI or GR8-1200 NI\) \(with VK56VD\)"](#), [CHG-31, "Work Flow \(Without EXP-800 NI or GR8-1200 NI\) \(with Cummins 5.0L\)"](#), [CHG-33, "Work Flow \(Without EXP-800 NI or GR8-1200 NI\) \(with VK56VD\)"](#).

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

< SYMPTOM DIAGNOSIS >

SYMPTOM DIAGNOSIS

CHARGING SYSTEM

Symptom Table

INFOID:000000014388624

Symptom	Reference
Battery discharged	
The charge warning lamp does not illuminate when the ignition switch is set to ON.	Refer to CHG-25, "Work Flow (With EXP-800 NI or GR8-1200 NI (with Cummins 5.0L))" or CHG-31, "Work Flow (Without EXP-800 NI or GR8-1200 NI (with Cummins 5.0L))" .
The charge warning lamp does not turn OFF after the engine starts.	
The charging warning lamp turns ON when increasing the engine speed.	

A

B

C

D

E

F

G

H

I

J

K

L

CHG

N

O

P

GENERATOR

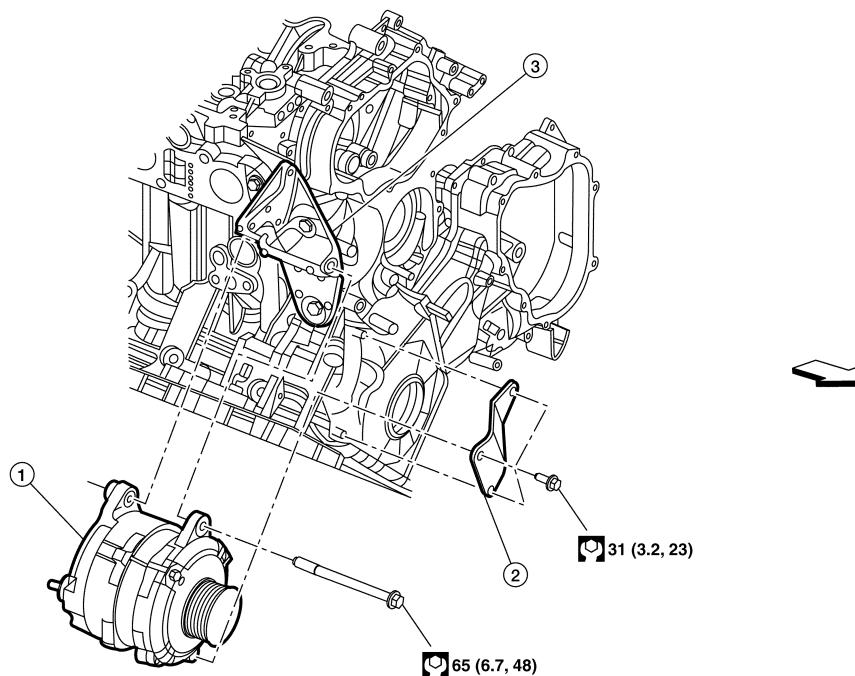
< REMOVAL AND INSTALLATION >

REMOVAL AND INSTALLATION GENERATOR

Removal and Installation: VK56VD

INFOID:00000001438625

SEC. 230 • 231



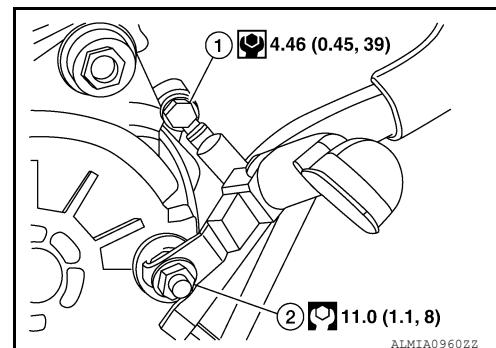
ALMIA0959ZZ

1. Generator
2. Generator front bracket
3. Generator rear bracket

Front

REMOVAL

1. Disconnect the battery or batteries negative terminal(s). Refer to [PG-185, "Battery Disconnect"](#).
2. Remove the drive belt. Refer to [EM-23, "Removal and Installation"](#).
3. Remove the front wheel and tire (RH) using power tool. Refer to [WT-69, "Removal and Installation"](#).
4. Rotate steering wheel to full RH stop.
5. Remove the front fender protector (RH). Refer to [EXT-41, "Removal and Installation - Front Fender Protector"](#).
6. Remove terminal nut (2) and harness cable from back of generator.
7. Remove bolt (1) and generator ground wire from back of generator. Move harness aside.



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8. Disconnect harness connector from bottom of generator.
9. Remove bolts from the generator front bracket.

GENERATOR

< REMOVAL AND INSTALLATION >

10. Remove the bolt from the generator rear bracket.

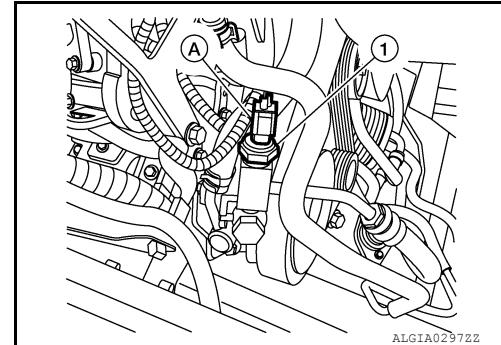
11. Remove generator.

NOTE:

If it is necessary to remove the generator rear bracket, the power steering oil pump must be removed first.

12. Drain power steering fluid. Refer to [ST-34, "Draining and Refilling"](#).

13. Disconnect the harness connector (A) from the power steering pressure switch (1).



NOTE:

When removing components such as hoses, tubes, lines, etc., cap or plug openings to prevent fluid from spilling.

14. Disconnect the power steering pressure line from power steering oil pump. Discard the copper sealing washers.

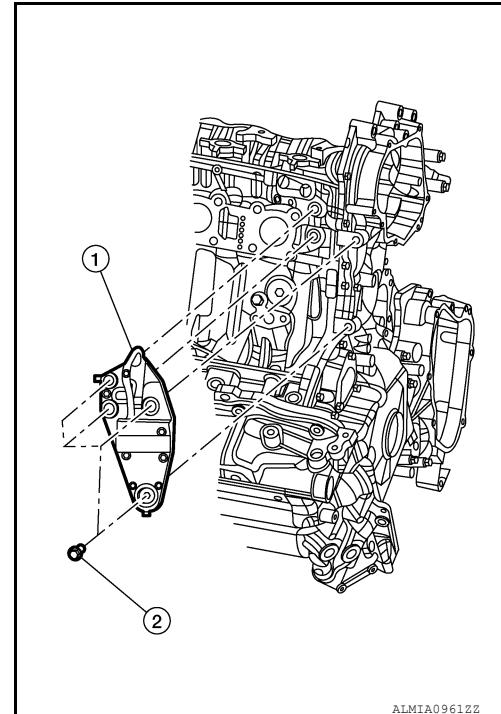
CAUTION:

Do not reuse the copper sealing washers.

15. Disconnect the power steering suction hose from power steering oil pump.

16. Remove bolts and power steering oil pump.

17. Remove bolts (2) and generator rear bracket (1).



INSTALLATION

Installation is in the reverse order of removal.

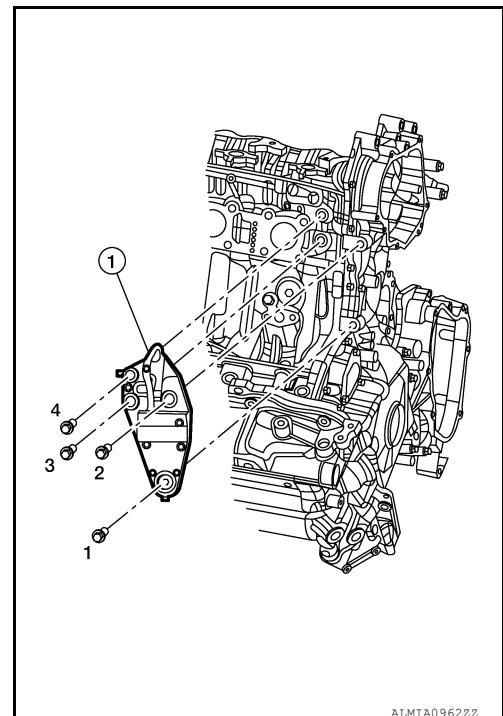
- Hand-tighten bolts, then torque to specification.

GENERATOR

< REMOVAL AND INSTALLATION >

- Torque generator rear bracket (1) bolts in the sequence shown.

Generator rear bracket bolts : 61.3 N·m (6.3 kg·m, 45 ft-lb)



- Fill power steering system with fluid. Refer to [ST-34, "Draining and Refilling"](#).

CAUTION:

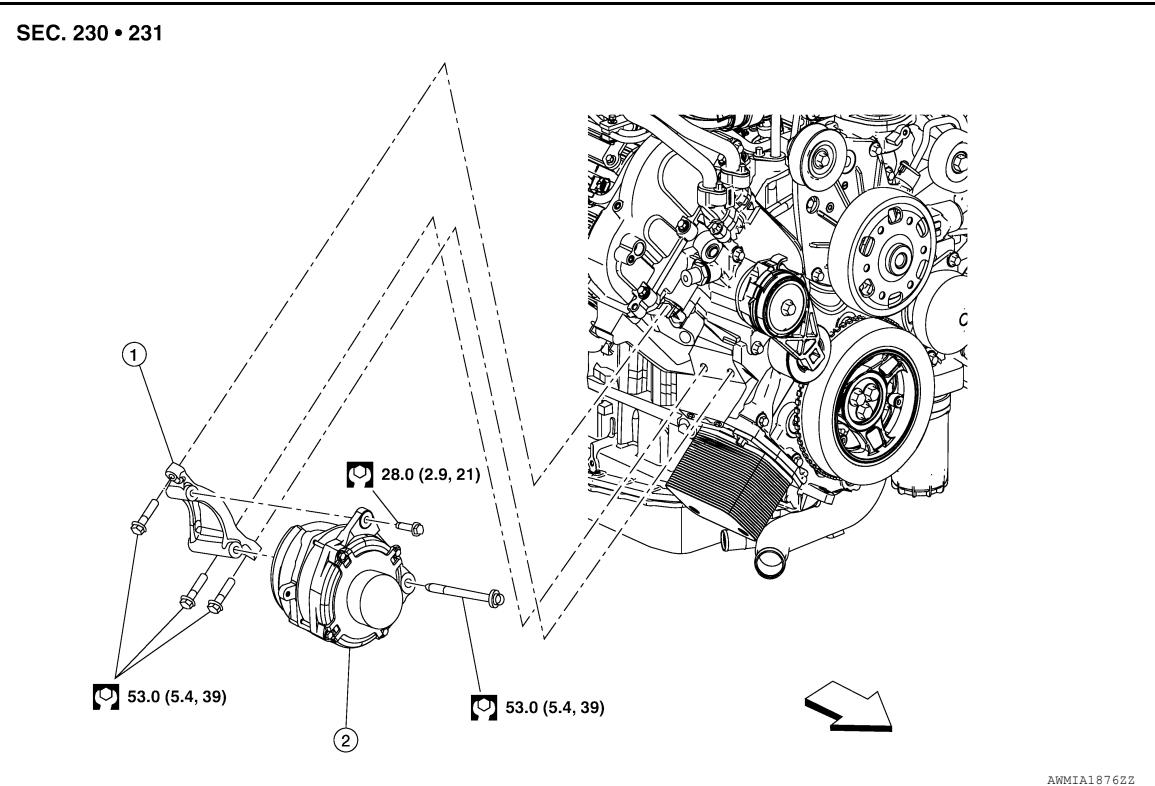
Do not reuse drained power steering fluid.

- Bleed air from power steering system. Refer to [ST-34, "Air Bleeding Hydraulic System"](#).

- Check for power steering system leaks. Refer to [ST-16, "Fluid Leak Inspection"](#).

Removal and Installation: Cummins 5.0L

INFOID:0000000014388626



1. Generator bracket

2. Generator

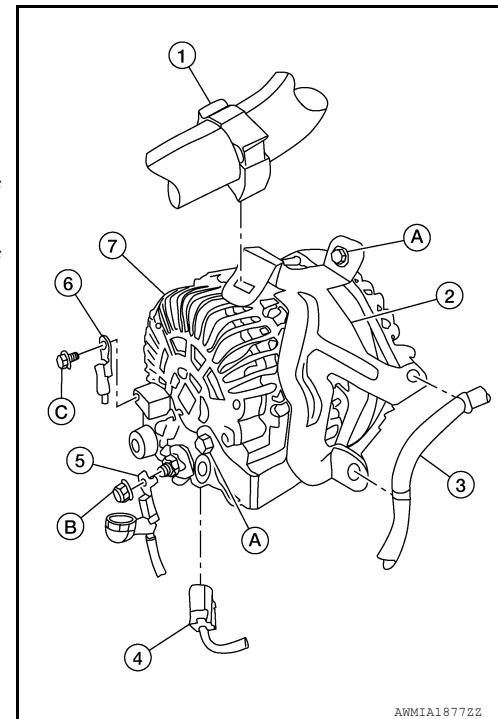
Front

GENERATOR

< REMOVAL AND INSTALLATION >

REMOVAL

1. Disconnect the battery or batteries negative terminal(s). Refer to [PG-185, "Battery Disconnect"](#).
2. Remove the drive belt. Refer to [EM-198, "Removal and Installation - Drive Belt"](#).
3. Remove the front wheel and tire (RH) using power tool. Refer to [WT-69, "Removal and Installation"](#).
4. Remove the front fender protector (RH). Refer to [EXT-41, "Removal and Installation - Front Fender Protector"](#).
5. Disconnect the engine harness retainer (1) from the engine harness bracket (2) and move aside.
6. Disconnect negative battery cable (3) from engine harness bracket (2) and move aside.
7. Disconnect harness connector (4) from bottom of generator (7).
8. Remove bolt (C) and generator ground wire (6) from back of generator (7).
9. Remove terminal nut (B) and harness cable (5) from back of generator (7).
10. Remove bolts (A) and engine harness bracket (2) from generator (7) (if necessary).



11. Remove upper and lower bolts, and generator from vehicle.
12. Remove three bolts, and generator bracket from engine (if necessary).

INSTALLATION

Installation is in the reverse order of removal.

- Hand-tighten generator bracket bolts, then tighten to specified torque. This model includes the variable voltage control system. Be sure to inspect the variable voltage control system after replacing the generator to ensure the system operates normally.
- Hand-tighten generator bolts, then tighten to specified torque.
- Hand-tighten terminal nut (B) and bolt (C), then tighten to specified torque.

CAUTION:

Tighten terminal nut carefully.

Terminal nut : 11.0 N·m (1.1 kg-m, 8 ft-lb)
Terminal bolt : 4.46 N·m (0.45 kg-m, 39 in-lb)

CHG

GENERATOR

< SERVICE DATA AND SPECIFICATIONS (SDS)

SERVICE DATA AND SPECIFICATIONS (SDS)

GENERATOR

Generator

INFOID:00000001438627

Model*	
VK56VD	A003TX2191ZC
Cummins 5.0L	A003TX2291ZC
Manufacturer	Mitsubishi
Nominal rating	13.5V-200A
Ground polarity	Negative
Minimum revolution under no-load	1,000 rpm
Hot output current (When 13.5 volts is applied)	More than 155A/2,500 rpm More than 197A/5,000 rpm
Regulated output voltage	14.4V @ 20°C (68°F)

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