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#### **PRECAUTIONS**

#### < PRECAUTION >

# **PRECAUTION**

#### **PRECAUTIONS**

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

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

INFOID:0000000012546645

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	AWIIA12392Z	Tests batteries, starting and charging systems and charges batteries. For operating instructions, refer to diagnostic station instruction manual.
— (165-EXP-800-NI) Midtronic hand-held battery tester	JSMIA08062Z	Tests batteries and charging systems. For operating instructions, refer to diagnostic analyzer instruction manual.

# **Commercial Service Tool**

INFOID:0000000012546646

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

#### **COMPONENT PARTS**

#### < SYSTEM DESCRIPTION >

# SYSTEM DESCRIPTION

# COMPONENT PARTS CHARGING SYSTEM

**CHARGING SYSTEM: Component Parts Location** 

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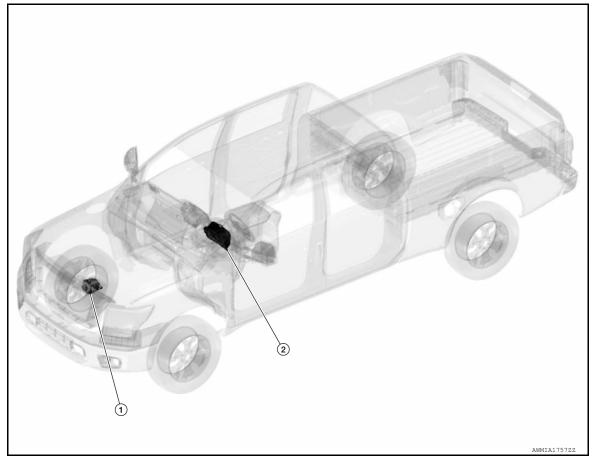
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WITH CUMMINS 5.0L



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

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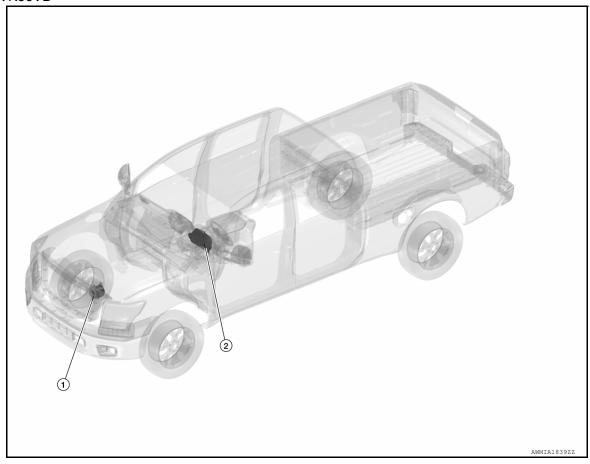
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#### WITH VK56VD

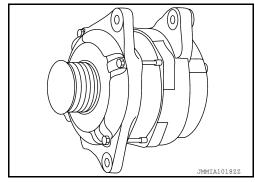


No.	Component	Function
1.	Generator	Refer to CHG-6, "CHARGING SYSTEM : Generator".
2.	Combination meter (Charge warning lamp)	The IC voltage regulator warning function activates to illuminate the charge warning lamp, if any of the following symptoms occur while generator is operating:  • Excessive voltage is produced.  • No voltage is produced.

# **CHARGING SYSTEM: Generator**

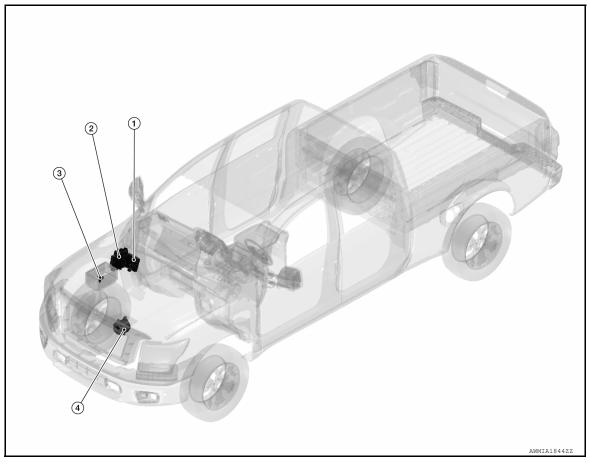
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The generator provides DC voltage to operate the vehicle's electrical system and to keep the battery charged. The voltage output is controlled by the IC voltage regulator.



POWER GENERATION VOLTAGE VARIABLE CONTROL SYSTEM POWER GENERATION VOLTAGE VARIABLE CONTROL SYSTEM : Component

# Parts Location- with VK56VD



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-1276, "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**

#### < SYSTEM DESCRIPTION >

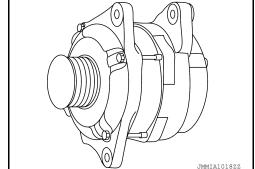
#### voltage regulator)

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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).

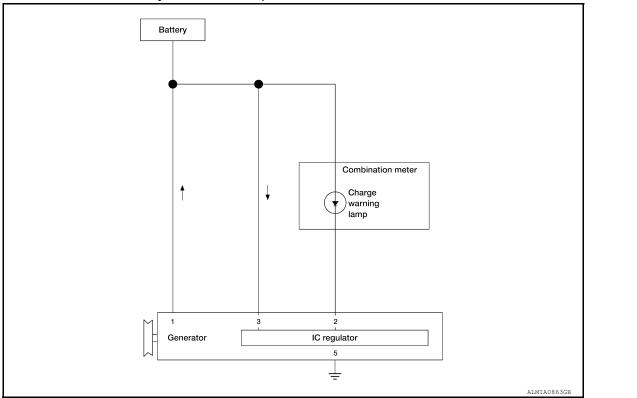
When there is no power generation command signal (PWM signal), the generator performs the normal power generation according to the characteristic of the IC voltage regulator.



# **SYSTEM**

## **CHARGING SYSTEM**

CHARGING SYSTEM: System Description- with Cummins 5.0L



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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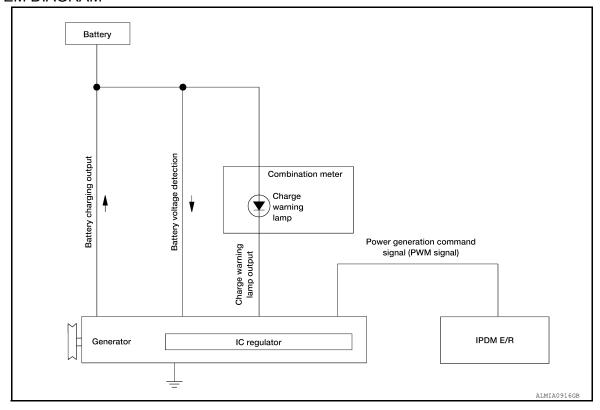
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### CHARGING SYSTEM: System Description- with VK56VD

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#### SYSTEM DIAGRAM



#### SYSTEM DESCRIPTION

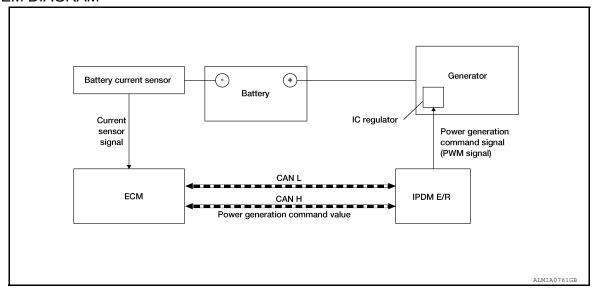
- "B" terminal circuit supplies power to charge the battery and to operate the vehicle's electrical system.
- "L" terminal circuit controls the charge warning lamp. The charge warning lamp illuminates when the ignition switch is set to ON or START. When the generator is providing sufficient voltage with 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-

scription INFOID:0000000013828743

#### 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:0000000013828744

Item	Design	Reference
Charge warning lamp	- <del>-</del>	For layout, refer to MWI-11, "METER SYSTEM : Design" (with Type A meter), or MWI-117, "METER SYSTEM : Design" (with Type B meter).
Charge warning lamp	لنت	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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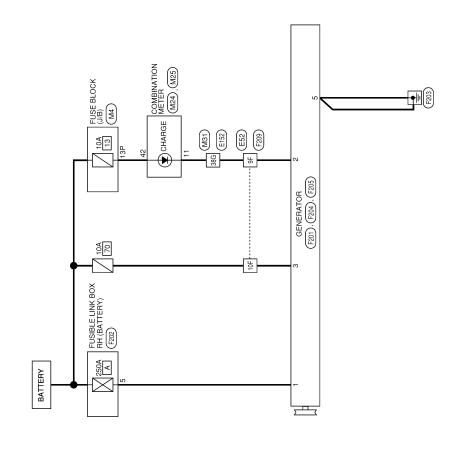
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# WIRING DIAGRAM

# **CHARGING SYSTEM**

Wiring Diagram- with Cummins 5.0L

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CHARGING SYSTEM - WITH Cummins 5.0L

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TO ENGINE CONTROL NO. 2 HARNESS

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# CHARGING SYSTEM CONNECTORS - WITH Cummins 5.0L

Connector No.	No.	E52	21F	5	TO ENGINE CONTROL NO. 2 HARNESS	52F
Connector Name	Name	WIRE TO WIRE	22F	M	TO ENGINE CONTROL NO. 2 HARNESS	
Connector Type Connector Color	Type	RK26FGY-RS20-X6 GRAY	23F	P/L	TO ENGINE CONTROL NO. 2 HARNESS	
F			24F	W/L	TO ENGINE CONTROL NO. 2 HARNESS	
H.S.	9F	4F 3F 2F	25F	W/R	TO ENGINE CONTROL NO. 2 HARNESS	
	±	111   101   9F   3F   3F   3F   3F   3F   3F   3F	26F	B/B	TO ENGINE CONTROL NO. 2 HARNESS	
	, ,	101 101 101 141 101	27F	>	TO ENGINE CONTROL NO. 2 HARNESS	
		31F 30F 29F 28F 27F   26F 25F 24F 23F 22F	28F	W/R	TO ENGINE CONTROL NO. 2 HARNESS	
	41F	0F 39F 38F 37F 36F 35F 34F 33F	29F	9	TO ENGINE CONTROL NO. 2 HARNESS	
	47F 52F	46F     45F     45F     42F       51F     50F     49F     48F	30F	В	TO ENGINE CONTROL NO. 2 HARNESS	
			31F	В	TO ENGINE CONTROL NO. 2 HARNESS	
Terminal No.	Color of Wire	Signal Name	32F	W/W	TO ENGINE CONTROL NO. 2 HARNESS	
4	>	TO ENGINE CONTROL NO. 2 HARNESS	33F	GR	TO ENGINE CONTROL NO. 2 HARNESS	
2F	8	TO ENGINE CONTROL NO. 2 HARNESS	34F	5	TO ENGINE CONTROL NO. 2 HARNESS	
3F	BB	TO ENGINE CONTROL NO. 2	35F	B/W	TO ENGINE CONTROL NO. 2 HARNESS	
4F	W/R	TO ENGINE CONTROL NO. 2 HABNESS	36F	B/I	TO ENGINE CONTROL NO. 2 HARNESS	
5F	B/B	TO ENGINE CONTROL NO. 2 HARNESS	37F	_	TO ENGINE CONTROL NO. 2 HARNESS	
-6F	0	TO ENGINE CONTROL NO. 2	38F	RV	TO ENGINE CONTROL NO. 2 HARNESS	
7F	GR/Y	TO ENGINE CONTROL NO. 2 HARNESS	39F	R/Y	TO ENGINE CONTROL NO. 2 HARNESS	
8F	>	TO ENGINE CONTROL NO. 2 HARNESS	40F	B/B	TO ENGINE CONTROL NO. 2 HARNESS	
96	BB	TO ENGINE CONTROL NO. 2 HARNESS	41F	8	TO ENGINE CONTROL NO. 2 HARNESS	
10F	A//B	TO ENGINE CONTROL NO. 2	42F	<b>&gt;</b>	TO ENGINE CONTROL NO. 2 HARNESS	
11F	_	TO ENGINE CONTROL NO. 2 HARNESS	43F	В/Р	TO ENGINE CONTROL NO. 2 HARNESS	
12F	œ	TO ENGINE CONTROL NO. 2 HARNESS	44F	Y/B	TO ENGINE CONTROL NO. 2 HARNESS	
13F	>	TO ENGINE CONTROL NO. 2 HARNESS	45F	Š	TO ENGINE CONTROL NO. 2 HARNESS	
14F	>	TO ENGINE CONTROL NO. 2 HARNESS	46F	0	TO ENGINE CONTROL NO. 2 HARNESS	
15F	SB	TO ENGINE CONTROL NO. 2 HARNESS	47F	W/R	TO ENGINE CONTROL NO. 2 HARNESS	
16F	۵	TO ENGINE CONTROL NO. 2 HARNESS	48F	٦	TO ENGINE CONTROL NO. 2 HARNESS	
17F	Υ/R	TO ENGINE CONTROL NO. 2 HARNESS	49F	BB	TO ENGINE CONTROL NO. 2 HARNESS	
₩ AAMI	œ	TO ENGINE CONTROL NO. 2 HARNESS	50F	SHIELD	TO ENGINE CONTROL NO. 2 HARNESS	
<b>46</b> A4566	>	TO ENGINE CONTROL NO. 2 HARNESS	51F	7	TO ENGINE CONTROL NO. 2 HARNESS	
i G	6	o or continued transfer				

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# CHARGING SYSTEM CONNECTORS - WITH Cummins 5.0L

WHITE TO WHITE	Connector No	F152		G/D	I O INIAIN TIANNESS			000000000000000000000000000000000000000	Connector No	-2.5
MYHTE   1		Т	25G	B/W	TO MAIN HARNESS	73G	SHIELD	TO MAIN HARNESS		7.00
	nnector Nam	$\neg$	26G	ж	TO MAIN HARNESS	74G	Μ	TO MAIN HARNESS	Connector Name	FUSIBLE LINK BOX RH
WHITE	nnector Type		27G	97	TO MAIN HARNESS	75G	œ	TO MAIN HARNESS		(BALLERY)
	nector Colo		28G	G/B	TO MAIN HARNESS	76G	B/G	TO MAIN HARNESS	Connector Type	24340_JA04D
			29G	G/B	TO MAIN HARNESS	776	g	TO MAIN HARNESS	Connector Color	
	A.		306	BR/Y	TO MAIN HARNESS	78G	Α	TO MAIN HARNESS		
	Ú		31G	۵	TO MAIN HARNESS - (WITH	796	-	TO MAIN HARNESS		
					CUMMINS 5.0L)	80G	œ	TO MAIN HARNESS	SH	ų
		56 46 36 26 16	31G	œ	TO MAIN HARNESS - (WITH	816	7	TO MAIN HARNESS		· (
		100 96 96 96	300	۵	TO MAIN HABNESS	826	œ	TO MAIN HARNESS		C
		216/206 196 186 176 166 156 146 136 126 116		. 5	OSINGALI MAM OF	83G	7	TO MAIN HARNESS		))
		30G 29G 28G 27G 28G 25G 24G 23G 22G	28	2 5	COMMUNICATION OF	84G	_	TO MAIN HARNESS		
Part   Color of the Part		410 400 1390 1390 1370 1960 1350 1340 1330 1370 1310		5 6	TO WAILY HARMESO	85G	W/B	TO MAIN HABNESS	H	
The property proper		506496486476466456446436426	35G	G/R	IO MAIN HARNESS	986	B/B	TO MAIN HABNESS		
Part		or local conference and conference a	36G	SB	IO MAIN HARNESS	876	W/B	TO MAIN HABNESS		
Properties   Pro		0.1000000000000000000000000000000000000	376	R/W	TO MAIN HARNESS	5 8		COMPANIA CT		BATTERY
Connector No.   Connector No		200	38G	BB	TO MAIN HARNESS	500	٠.	O MAIN HARNESS		
Contractor   Color of   Color o		81G80679G77677G76G75G74G73G77G	39G	H	TO MAIN HARNESS	5 60	, ,	TO MAIN DARINESS	Connector No	E204
Contraction		970,500,516,000,510,510,510,510,510,510,510,510,510	40G	-	TO MAIN HARNESS	506	5	TO MAIN HARNESS	COLLINGO NO.	1204
Commercial Page   Commercial		000 000 000 000 000 000 000 000 000 00	41G	R/G	TO MAIN HARNESS	916	g	TO MAIN HARNESS	Connector Name	GENERALOR (WITH
Commetcro Type   Stora Name		1000 990 980 980	42G	0	TO MAIN HARNESS	92G	MΛ	TO MAIN HARNESS		COMMINS 5.0L)
Councertor Color of the Color			43G	8	TO MAIN HARNESS - (WITH	93G	ВВ	TO MAIN HARNESS	Connector Type	24340_EN013
Color of   Signat Name					CUMMINS 5.0L)	94G	g	TO MAIN HARNESS	Connector Color	1
Miles   Signat Name   According   Signat Name   According   According   Signat Name   According   A			43G	g	TO MAIN HARNESS - (WITH	95G	9	TO MAIN HARNESS		
Color of Maria         Signal Name and seaso of a color of a colo					VKS6VD)	596	*	TO MAIN HARNESS	NEAT .	
Wire         Signal Name         465         G         TO MAIN HARRESS         TO MAIN HARRESS </td <td>Н</td> <td></td> <td>446</td> <td>₽</td> <td>TO MAIN HARNESS</td> <td>976</td> <td>œ</td> <td>TO MAIN HARNESS</td> <td><b>V</b></td> <td>_</td>	Н		446	₽	TO MAIN HARNESS	976	œ	TO MAIN HARNESS	<b>V</b>	_
G	_		45G	g	TO MAIN HARNESS	586	W/B	TO MAIN HARNESS	6	_
BFW         TO MAIN HARRISS         47G         R         TO MAIN HARRESS         100G         GPW         TO MAIN HARRESS           BFW         TO MAIN HARRESS         46G         -         TO MAIN HARRESS         Connector Name         GENERATOR (WITH COLOR OF Name         To MAIN HARRESS           BFW         TO MAIN HARRESS         46G         -         TO MAIN HARRESS         Connector Name         GENERATOR (WITH DOLLAR NAMES)         To MAIN HARRESS           FWW         TO MAIN HARRESS         46G         -         TO MAIN HARRESS         Connector Color         -         To MAIN HARRESS           FWW         TO MAIN HARRESS         6G         0         TO MAIN HARRESS         Connector Color         -         To MAIN HARRESS           FW         TO MAIN HARRESS         6G         TO MAIN HARRESS         6G         TO MAIN HARRESS         F         F           FW         TO MAIN HARRESS         6G         TO MAIN HARRESS         6G         TO MAIN HARRESS         F         TO MAIN HARRESS         F         <			46G	Pe	TO MAIN HARNESS	986	BB	TO MAIN HARNESS		K
Fig. 10 MAIN HARRESS   GO			47G	ж	TO MAIN HARNESS	1000	GR/W	TO MAIN HARNESS		
Mary   10 Marin Harriess   446   -   10 Marin Harriess   510     1			48G	W	TO MAIN HARNESS					)
Pay	1		49G	,	TO MAIN HARNESS		Ī			
P   TO MAIN HARNESS   FIG   R   TO MAIN HARNESS     P   TO MAIN HARNESS   FIG   R   TO MAIN HARNESS     P   TO MAIN HARNESS   FIG   R   TO MAIN HARNESS     P   TO MAIN HARNESS   FIG   R   TO MAIN HARNESS     P   TO MAIN HARNESS   FIG   R   TO MAIN HARNESS     P   TO MAIN HARNESS   FIG   R   TO MAIN HARNESS     P   TO MAIN HARNESS   FIG   R   TO MAIN HARNESS     P   TO MAIN HARNESS   FIG   R   TO MAIN HARNESS     P   TO MAIN HARNESS   FIG   R   TO MAIN HARNESS     P   TO MAIN HARN			500	BB	TO MAIN HARNESS	Connector		201	$\vdash$	
Pyw         TO MAIN HARNESS - WITH VICANUM HARNESS - WITH AGAINSS - WITH AGAINSS - WITH AGAINS S. 0.1)         52G         L         TO MAIN HARNESS - WITH AGAINS S. 0.1)         TO MAIN HARNESS - WITH AGAIN AGAINS S. 0.1)         TO MAIN HARNESS - WITH AGAINS S.			516	ж	TO MAIN HARNESS	Connector		ENERATOR (WITH		
RW         TO MAIN HARNESS         GONDECTOR Type         E-BA506           Y         TO MAIN HARNESS         6G         TO MAIN HARNESS         Connector Type         E-BA506           G         TO MAIN HARNESS         6G         G         TO MAIN HARNESS         FG         TO MAIN HARNESS           G         TO MAIN HARNESS         6G         BG         TO MAIN HARNESS         FG         TO MAIN HARNESS           W         TO MAIN HARNESS         6G         BG         TO MAIN HARNESS         FG         TO MAIN HARNESS           WB         TO MAIN HARNESS         6G         BG         TO MAIN HARNESS         FG         WITHOUT HARNESS           G         TO MAIN HARNESS         GGG         W         TO MAIN HARNESS         FG         B         GROUND           G         TO MAIN HARNESS         GGG         BG         TO MAIN HARNESS         F         B         GROUND           G         TO MAIN HARNESS         GGG         BG         TO MAIN HARNESS         F         B         GROUND           G         TO MAIN HARNESS         GGG         BG         TO MAIN HARNESS         F         B         GROUND           G         TO MAIN HARNESS         GGG         B         TO MA			52G	7	TO MAIN HARNESS			UMMINS 5.0L)	-	
TO MAIN HARNESS   Fig. 2		+	53G	Α	TO MAIN HARNESS	Connector	_	-BA506		
Y   TO MANN HARNESS   56G   W   TO MANN HARNESS   56G   W   TO MANN HARNESS   56G   W   TO MANN HARNESS   56G   BG   TO MANN HARNESS   56G   W/R   TO MANN HARNESS   56G   BG   TO MANN HARNESS   56G   TO MANN HARNESS   56G   TO MANN HARNESS   5			54G	W	TO MAIN HARNESS	Connector	Color -			
G   TO MAIN HARNESS   56G   W   TO MAIN HARNESS   57G   Y   TO MAIN HARNESS   57G   Y   TO MAIN HARNESS   58G   BG   TO MAIN HARNESS   58G   W/R   TO MAIN HARNESS   58G   BG   TO MAIN HARNESS   58G   TO MAIN HARNESS			55G	g	TO MAIN HARNESS					
R         TO MAIN HARNESS         57G         Y         TO MAIN HARNESS         LLS.           BG         TO MAIN HARNESS         58G         BG         TO MAIN HARNESS         60G         BG         TO MAIN HARNESS         100 MAIN HARNESS			56G	Α	TO MAIN HARNESS	NATA T				
W         TO MAIN HARNESS         56G         BG         TO MAIN HARNESS         FIRST           PVG         TO MAIN HARNESS         59G         BG         TO MAIN HARNESS         FIRST           WB         TO MAIN HARNESS         61G         B         TO MAIN HARNESS         FIRST           GW         TO MAIN HARNESS         62G         W         TO MAIN HARNESS         FIRST           GW         TO MAIN HARNESS         65G         WR         TO MAIN HARNESS         FIRST           GW         TO MAIN HARNESS         65G         WR         TO MAIN HARNESS         FIRST           GW         TO MAIN HARNESS         65G         WR         TO MAIN HARNESS         FIRST           GW         TO MAIN HARNESS         65G         WR         TO MAIN HARNESS         FIRST           GW         TO MAIN HARNESS         65G         WG         TO MAIN HARNESS         FIRST           GW         TO MAIN HARNESS         65G         BG         TO MAIN HARNESS         FIRST           GW         TO MAIN HARNESS         65G         WG         TO MAIN HARNESS         FIRST           GM         TO MAIN HARNESS         65G         TO MAIN HARNESS         FIRST           GM         <			576	>	TO MAIN HARNESS	<b>1</b>				
R/G         TO MAIN HARNESS         99G         BG         TO MAIN HARNESS           BR         TO MAIN HARNESS         60G         BG         TO MAIN HARNESS           G/W         TO MAIN HARNESS         63G         W         TO MAIN HARNESS           G/W         TO MAIN HARNESS         63G         W/L         TO MAIN HARNESS         F           G/Y         TO MAIN HARNESS         66G         W/R         TO MAIN HARNESS         F           G/Y         TO MAIN HARNESS         66G         W/R         TO MAIN HARNESS         F           G/Y         TO MAIN HARNESS         67G         D         TO MAIN HARNESS         F           G/Y         TO MAIN HARNESS         67G         B         TO MAIN HARNESS         F           G/Y         TO MAIN HARNESS         69G         B         TO MAIN HARNESS         F           G/R         TO MAIN HARNESS         69G         B         TO MAIN HARNESS         F           G/R         TO MAIN HARNESS         69G         B         TO MAIN HARNESS         F			58G	BG	TO MAIN HARNESS	Ö		- O		
W/B         TO MAIN HARNESS         60G         BG         TO MAIN HARNESS         FIG         B         TO MAIN HARNESS           G/W         TO MAIN HARNESS         63G         W         TO MAIN HARNESS         63G         W/L         TO MAIN HARNESS         COlor of MIT           G/W         TO MAIN HARNESS         63G         W/R         TO MAIN HARNESS         65G         W/R         TO MAIN HARNESS         S           G/W         TO MAIN HARNESS         66G         BG         TO MAIN HARNESS         66G         BG         TO MAIN HARNESS         S           G/W         TO MAIN HARNESS         66G         BG         TO MAIN HARNESS         66G         BG         TO MAIN HARNESS           G/W         TO MAIN HARNESS         66G         BG         TO MAIN HARNESS         66G         BG         TO MAIN HARNESS           G/W         TO MAIN HARNESS         69G         W         TO MAIN HARNESS         69G         W         TO MAIN HARNESS           G/R         TO MAIN HARNESS         69G         Y         TO MAIN HARNESS         TO MAIN HARNESS			596	BG	TO MAIN HARNESS			K		
BR         TO MAIN HARNESS         61G         B         TO MAIN HARNESS         FEZG         W         TO MAIN HARNESS         CEZG         W         TO MAIN HARNESS         COIOT of FEMAL			509	88	TO MAIN HABNESS			)		
V/B         TO MAIN HARNESS         62G         W         TO MAIN HARNESS         Terminal         Color of No.           G/W         TO MAIN HARNESS         64G         W/L         TO MAIN HARNESS         64G         W/L         TO MAIN HARNESS         S         B           G/Y         TO MAIN HARNESS         65G         W/R         TO MAIN HARNESS         67G         B         TO MAIN HARNESS           G/Y         TO MAIN HARNESS         67G         B         TO MAIN HARNESS         67G         B         TO MAIN HARNESS           B/Y         TO MAIN HARNESS         69G         Y         TO MAIN HARNESS         69G         Y         TO MAIN HARNESS           G/R         TO MAIN HARNESS         69G         Y         TO MAIN HARNESS         R         TO MAIN HARNESS			616	8	TO MAIN HABNESS					
GAW         TO MAIN HARNESS         63G         R         TO MAIN HARNESS         Color of MINE           GA         TO MAIN HARNESS         64G         W/L         TO MAIN HARNESS         5         B           GAY         TO MAIN HARNESS         65G         W/R         TO MAIN HARNESS         67         B           GY         TO MAIN HARNESS         67G         B         TO MAIN HARNESS         68G         B         TO MAIN HARNESS           BY         TO MAIN HARNESS         68G         B         TO MAIN HARNESS         69G         Y         TO MAIN HARNESS           GAR         TO MAIN HARNESS         69G         Y         TO MAIN HARNESS         TO MAIN HARNESS			589	8	TO MAIN HABNESS					
G         TO MAIN HARNESS         64G         W/L         TO MAIN HARNESS         6 G         W/R         TO MAIN HARNESS         S         B           G/Y         TO MAIN HARNESS         66G         W/R         TO MAIN HARNESS         6 G         W/R         TO MAIN HARNESS         B         TO MAIN HARNESS           G/Y         TO MAIN HARNESS         6 G         F         TO MAIN HARNESS         6 G         Y         TO MAIN HARNESS           B/Y         TO MAIN HARNESS         6 G         Y         TO MAIN HARNESS         C         TO MAIN HARNESS           G/R         TO MAIN HARNESS         6 G         Y         TO MAIN HARNESS         C         TO MAIN HARNESS			63G	: «	TO MAIN HABNESS	Terminal	Color of	Cional Mamo		
G/Y         TO MAIN HARNESS         65G         W/R         TO MAIN HARNESS         6         BG         TO MAIN HARNESS           G/Y         TO MAIN HARNESS         66G         BG         TO MAIN HARNESS         66G         BG         TO MAIN HARNESS           G/Y         TO MAIN HARNESS         66G         Y         TO MAIN HARNESS         66G         Y         TO MAIN HARNESS           G/R         TO MAIN HARNESS         70G         L         TO MAIN HARNESS         TO MAIN HARNESS			646	l/M	TO MAIN HABNESS	No.	Wire	O'G'I'AI IVAIIG		
G/Y         TO MAIN HARNESS         68G         BG           Y/V         TO MAIN HARNESS         67G         BG           G/Y         TO MAIN HARNESS         68G         B           B/Y         TO MAIN HARNESS         68G         Y           G/R         TO MAIN HARNESS         70G         Y			65G	W/R	TO MAIN HARNESS	r.	В	GROUND		
Y/V         TO MAIN HARNESS         67G         BG           G/Y         TO MAIN HARNESS         68G         B           B/Y         TO MAIN HARNESS         68G         Y           G/R         TO MAIN HARNESS         70G         L			999	98	TO MAIN HARNESS					
G/Y         TO MAIN HARNESS         68G         B           B/Y         TO MAIN HARNESS         69G         Y           G/R         TO MAIN HARNESS         70G         L			676	BG	TO MAIN HARNESS					
B/Y   TO MAIN HARNESS   66G   Y   6   6   6   6   6   6   6   6   6			989		TO MAIN HABNESS					
G/R TO MAIN HARNESS 70G L			D69	>	TO MAIN HABNESS					
			5 0	-	OSUNDALI MAMOT					
	+		5	7	I O MAIN PANNEGO					

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# CHARGING SYSTEM CONNECTORS - WITH Cummins 5.0L

Connector No	ESOR	14F	ΜΛ	TO ENGINE ROOM HARNESS	Connector No	2		>	SECURITY
SCIOI NO.	UZUS UTILIAN CICTACTION	15F	LG	TO ENGINE ROOM HARNESS	Collinector No.		8	-	-
Connector Name	GENERALOR (WITH	16F	R/Y	TO ENGINE ROOM HARNESS	Connector Name	a l	6	BG	AS BELT SW (W/O ODS)
	COMMING STORY	17F	BR/Y	TO ENGINE ROOM HARNESS	Connector Type		10	FC	TOW MODE SW
Connector lype	HS03FB	18F	ш	TO ENGINE ROOM HARNESS	Connector Color	or WHITE	=	BB	CHG
Connector Color	BLACK	19F	>	TO ENGINE ROOM HARNESS	E		12	BB	LED HEAD LAMP (R)
		20F	BB	TO ENGINE ROOM HARNESS			13	*	LED HEAD LAMP (L)
		21F	5	TO ENGINE ROOM HARNESS	ν H.	4, 1	14	œ	ACC SW
S. H		22F	VLG	TO ENGINE ROOM HARNESS	_	6P 5P 4P 3P 2	2P 1P 15		
1	+	23F	SB	TO ENGINE ROOM HARNESS	16	16P   15P   14P   13P   12P   11P   10P   9	JP 8P	0	AIR BAG
	(4   3   2)	24F	M/L	TO ENGINE ROOM HARNESS			17		
		25F	W/B	TO ENGINE ROOM HARNESS			18	۵	TRIP RESET SW
		26F	B∕√	TO ENGINE ROOM HARNESS	H		19	1	1
l.		27F	>	TO ENGINE ROOM HARNESS	┏	Color of Signal Name	20	œ	OUTSIDE TEMP GND
Terminal Color of	of Signal Name	28F	W/R	TO ENGINE ROOM HARNESS	1	g	23	1	1
+		29F	S	TO ENGINE ROOM HARNESS			22	۵	STRG SW A
DH/W		30F	8	TO ENGINE ROOM HARNESS			23	œ	STRG SW B
5		31F	В	TO ENGINE ROOM HARNESS	-	IGNI	24	*	WASHER SW
1	-	32F	>	TO ENGINE ROOM HARNESS	1		25		
		33F	BB	TO ENGINE BOOM HABNESS		B/W RR DEF RLY	98	ď	PKB SW
Connector No.	F209	34F	2	TO FNGINE BOOM HABNESS	еь	O RR DEF RLY OUT	72	l/d	AS BELT SW
Connector Name	WIRE TO WIRE	385	Wa	TO ENGINE BOOM HABINESS	7P	GIGNITION	i 8	8/0	ND BEIT SW
Name of the second	200 Mile 10 Wille	100	2	TO TAKE HOOM HARINESS	88	W IGNITION	8	200	On BELL SW
Connector Type	RK26MGY-RS20-X6	361	87	I O ENGINE ROOM HARNESS		L BATTERY	62		
Connector Color	GRAY	37F	8	TO ENGINE ROOM HARNESS	10P	-	8	'	
		386	W.	TO ENGINE ROOM HARNESS	110		E	-	NOT M RANGE
' L =		39F	₽Y	TO ENGINE ROOM HARNESS	9		32	BB	AT SHIFT UP
<u>+</u>	= 2F 3F 4F 5F	40F	G/B	TO ENGINE ROOM HARNESS	1	1	33	W/W	AT SHIFT DOWN
Ç.	= 7F 8F 9F 10F 11F	41F	W	TO ENGINE ROOM HARNESS	-		34	-	-
L		42F	>	TO ENGINE ROOM HARNESS	+		38	1	
12F	12F 13F 14F 15F 16F 17F 18F 19F 20F 21F	43F	B/P	TO ENGINE ROOM HARNESS	1	(5	98	^	ILL UP SW
		44F	Y/B	TO ENGINE ROOM HARNESS	16P	W BLOWER FAN RELAY OUT	37	œ	ILL DOWN SW
122	22F 23F 24F 25F 26F 27F 28F 29F 30F 31F	45F	Š	TO ENGINE ROOM HARNESS			38	g	8P/R OUTPUT
325	32F 33F 34F 35F 36F 37F 38F 30F 40F 41F	46F	0	TO ENGINE ROOM HARNESS	Connector No.	M24	30	-	-
20	20 20 20 20 20 20 40	47F	W/I	TO FNGINE BOOM HABNESS	Connector Name	1	40		
426	42E 43E 47E		-	TO ENGINE BOOM HABINESS	COLLECTOR IVAIL		2		
#  <sup>§</sup>		ģ	1 6	TO TAKE HOOM HARINESS		Ť			
45	F 52F 50F 51F 52F	T04	Y O	TO ENGINE ROOM HARINESS	Connector lype	T			
		50F	SHELD	TO ENGINE ROOM HARNESS	Connector Color	or WHITE			
T.	-	51F	7	TO ENGINE ROOM HARNESS	T.				
No. Wire	Signal Name	52F	#	TO ENGINE ROOM HARNESS	NATA.				
	TO ENGINE BOOM HABNESS				SH				
8	$\vdash$				Ŀ	8 9 10 11 12	17 18 19 20		
ا د	ŀ				21 22	1 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36	33 34 35 36 37 38 39 40		
5 2	+								
0,0	+								
5	+				H				
$\frac{1}{1}$	+				<u></u>	Color of Signal Name			
7F GR	+				No.	Wire			
۵	+				-	B GND(STRG/SATELLITE SW GND)	(QN		
	/ TO ENGINE ROOM HARNESS				2	1			
10F G/Y	TO ENGINE ROOM HARNESS				8	1			
11F L/W	TO ENGINE ROOM HARNESS				4	-			
	-				+ vo		Τ		
13F G/Y	TO ENGINE ROOM HARNESS				9		Τ		

Revision: March 2016 CHG-15 2016 Titan NAM

# CHARGING SYSTEM CONNECTORS - WITH Cummins 5.0L

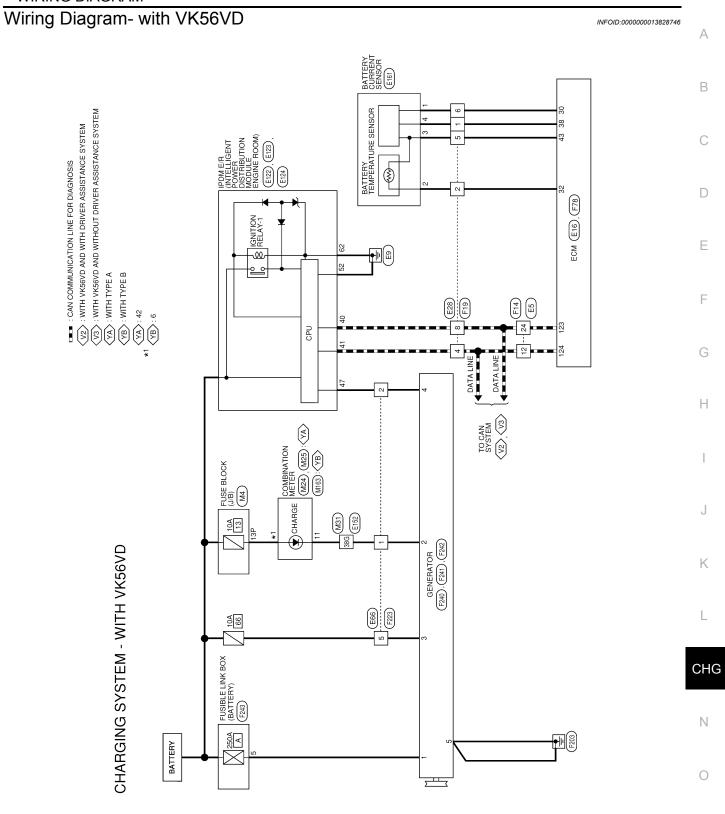
Connector No.		M31	27G	9	TO ENGINE ROOM HARNESS	80G	œ	TO ENGINE ROOM HARNESS
		1000	28G	G/B	TO ENGINE ROOM HARNESS	81G	٦	TO ENGINE ROOM HARNESS
Connector Name	$\forall$	WIRE TO WIRE	29G	G/B	TO ENGINE ROOM HARNESS	82G	œ	TO ENGINE ROOM HARNESS
Connector Type		TH80FW-CS16-TM4	300	BR/Y	TO ENGINE ROOM HARNESS	83G	_	TO ENGINE ROOM HARNESS
Connector Color		WHITE	31G	œ	TO ENGINE ROOM HARNESS	84G	٦	TO ENGINE ROOM HARNESS
E			32G	В	TO ENGINE ROOM HARNESS	85G	W	TO ENGINE ROOM HARNESS
ALT.			33G	Y/L	TO ENGINE ROOM HARNESS	86G	B/B	TO ENGINE ROOM HARNESS
H.S.			34G	æ	TO ENGINE ROOM HARNESS	876	×	TO ENGINE ROOM HARNESS
		16 26 36 46 56	35G	G/R	TO ENGINE ROOM HARNESS	88G	5	TO ENGINE ROOM HARNESS
		66 76 86 96 106	36G	SS	TO ENGINE ROOM HARNESS	89G	۵	TO ENGINE ROOM HARNESS
			37G	R/W	TO ENGINE ROOM HARNESS	900	9	TO ENGINE ROOM HARNESS
	<u></u>	116126136146156166176186196206216	38G	BR	TO ENGINE ROOM HARNESS	91G	Д	TO ENGINE ROOM HARNESS
L	_	575052015200520052005005	396	H	TO ENGINE ROOM HARNESS	926	W/A	TO ENGINE ROOM HARNESS
	3	11G 32G 33G 34G 35G 36G 37G 38G 39G 40G 41G	40G	-	TO ENGINE ROOM HARNESS	93G	BR	TO ENGINE ROOM HARNESS
	_	42G43G44G45G46G47G48G49G50G	41G	B/G	TO ENGINE ROOM HARNESS	94G	В	TO ENGINE ROOM HARNESS
	2	1652953954955956870589599609619	42G	0	TO ENGINE ROOM HARNESS	95G	g	TO ENGINE ROOM HARNESS
		62G 63G 64G 65G 66G 67G 68G 69G 70G	43G	9	TO ENGINE ROOM HARNESS	96G	В	TO ENGINE ROOM HARNESS
	342	G72G73G74G75G77G77G78G79G80G81G	44G	R/Y	TO ENGINE ROOM HARNESS	976	œ	TO ENGINE ROOM HARNESS
		826836846856866876886896906	45G	9	TO ENGINE ROOM HARNESS	986	W/B	TO ENGINE ROOM HARNESS
			46G	97	TO ENGINE ROOM HARNESS	996	œ	TO ENGINE ROOM HARNESS
		916 926 936 946 956	47G	œ	TO ENGINE ROOM HARNESS	100G	GR/W	TO ENGINE ROOM HARNESS
		96G 97G 98G 99G 100G	48G	W	TO ENGINE ROOM HARNESS			
			49G	-	TO ENGINE ROOM HARNESS			
			50G	BB	TO ENGINE ROOM HARNESS			
			51G	ч	TO ENGINE ROOM HARNESS			
Terminal	Color of	ä	52G	7	TO ENGINE ROOM HARNESS			
No	Wire	Signal Name	53G	*	TO ENGINE ROOM HARNESS			
16	g	TO ENGINE ROOM HARNESS	54G	W	TO ENGINE ROOM HARNESS			
26	B/B	TO ENGINE ROOM HARNESS	55G	5	TO ENGINE ROOM HARNESS			
36	W	TO ENGINE ROOM HARNESS	56G	8	TO ENGINE ROOM HARNESS			
4G	BR/W	TO ENGINE ROOM HARNESS	579	>	TO ENGINE ROOM HARNESS			
56	BB	TO ENGINE ROOM HARNESS	58G	BG	TO ENGINE ROOM HARNESS			
99	R/W	TO ENGINE ROOM HARNESS	59G	BG	TO ENGINE ROOM HARNESS			
76	>	TO ENGINE ROOM HARNESS	509	BG	TO ENGINE ROOM HARNESS			
98	9	TO ENGINE ROOM HARNESS	619	0	TO ENGINE ROOM HARNESS			
96	æ	TO ENGINE ROOM HARNESS	62G	W	TO ENGINE ROOM HARNESS			
10G	W	TO ENGINE ROOM HARNESS	63G	0	TO ENGINE ROOM HARNESS			
116	R/G	TO ENGINE ROOM HARNESS	64G	W/L	TO ENGINE ROOM HARNESS			
12G	W/B	TO ENGINE ROOM HARNESS	65G	W/R	TO ENGINE ROOM HARNESS			
136	BB	TO ENGINE ROOM HARNESS	599	BG	TO ENGINE ROOM HARNESS			
14G	Y/B	TO ENGINE ROOM HARNESS	676	0	TO ENGINE ROOM HARNESS			
156	W/S	TO ENGINE BOOM HABNESS	989	8	TO ENGINE ROOM HARNESS			
166		TO ENGINE BOOM HABNESS	569	>	TO ENGINE ROOM HARNESS			
176	c	TO ENGINE BOOM HABNESS	700	_	TO ENGINE ROOM HARNESS			
5 9	, ,	TO ENGINE DOOM HADNESS	716	BW	TO ENGINE BOOM HARNESS			
2 6	3 3	TO ENGINE DOOM LABRIESS	72G	8	TO ENGINE BOOM HABNESS			
5	١,٧	I O ENGINE HOOM HARINESS	1 2		TO ENDINE DOOM HADNIESS			
200	ďλ	TO ENGINE ROOM HARNESS	130	OTHER M	TO ENGINE BOOM LABINESS			
21G	B∕	TO ENGINE ROOM HARNESS	74G	8	IO ENGINE ROOM HARNESS			
22G	G/R	TO ENGINE ROOM HARNESS	75G	۳	TO ENGINE ROOM HARNESS			
23G	Y/R	TO ENGINE ROOM HARNESS	769	B/G	TO ENGINE ROOM HARNESS			
24G	G/B	TO ENGINE ROOM HARNESS	5//	50	IO ENGINE ROOM HARNESS			
25G	R/W	TO ENGINE ROOM HARNESS	78G	۵	TO ENGINE ROOM HARNESS			
000		COLUMN TO COLUMN	796		TO ENGINE BOOM HABNESS			

Color of Signal Name	G TO ENGINE ROOM HARNESS	B/R TO ENGINE ROOM HARNESS	W TO ENGINE ROOM HARNESS	BR/W TO ENGINE ROOM HARNESS	BR TO ENGINE ROOM HARNESS	R/W TO ENGINE ROOM HARNESS	Y TO ENGINE ROOM HARNESS	G TO ENGINE ROOM HARNESS	R TO ENGINE ROOM HARNESS	W TO ENGINE ROOM HARNESS	R/G TO ENGINE ROOM HARNESS	W/B TO ENGINE ROOM HARNESS	BR TO ENGINE ROOM HARNESS	Y/B TO ENGINE ROOM HARNESS	G/W TO ENGINE ROOM HARNESS	G TO ENGINE ROOM HARNESS	O TO ENGINE ROOM HARNESS	G/Y TO ENGINE ROOM HARNESS	Y/V TO ENGINE ROOM HARNESS	G/Y TO ENGINE ROOM HARNESS	B/Y TO ENGINE ROOM HARNESS	G/R TO ENGINE ROOM HARNESS	Y/R TO ENGINE ROOM HARNESS	G/B TO ENGINE ROOM HARNESS	
Terminal Co	16	2G	36	4G	56	99	52	98	96	10G	11G	12G	13G	14G	15G	16G	17G	18G	196	20G	21G	22G	23G	24G	0.0

Connector No.	M25
Connector Name	COMBINATION METER (WITH TYPE A)
Connector Type	TH12FW-NH
Connector Color	WHITE
H.S.	46 44 43 47

Signal Name	IGN	BAT	FUEL SENSOR GND	ILL CONT OUTPUT	CAN-L	CAN-H	G	FUEL SENSOR		-	M CAN-L	M CAN-H
Color of Wire	W	В	٨٨	GB.	Ь	_	8	BR/Y	-	-	FIG	SB
Terminal No.	41	42	43	44	45	46	47	48	49	20	51	52

AAMIA4569GB



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ALT C - (WITH VK56VD) HORN RLY CONT

FUEL RLY CONT START CONT HOOD SW

M/B

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2 4 <del>8</del> 4 45 4 4 48

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WIRE TO WIRE RS06FGY-PR GRAY

WIPER AUTO STOP SW
CAN-L
CAN-H
DTRL RLY

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98 9

IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)

Connector Name

Connector No.

Connector No.

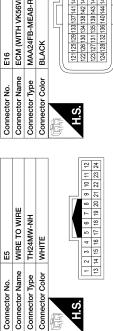
TH12FW-NH

Connector Type

Connector Color

H.S.

# CHARGING SYSTEM CONNECTORS - WITH VK56VD



				J
ECM (WITH VK56VD)	Connector Name	_	WIRE TO WIRE	
MAA24FB-MEA8-RH	Connector Type		RH08MB	
3LACK	Connector Color		ВГАСК	
	F			
121 (126) (129) (138) (137) (141 (145) (49) (122) (126) (130) (134) (135) (139) (134	H.S.		2 1 2 9 4 4 8 4 4 4 4 8 4 4 4 4 8 4 4 4 4 8 4	
		J		
Signal Name	Terminal No.	Color of Wire	Signal Name	
EVAP CONTROL SYSTEM	-	>	TO ENGINE CONTROL HARNESS	
PRESSURE SENSOR	2	g	TO ENGINE CONTROL HARNESS	_
1	e	,	TO ENGINE CONTROL HARNESS	
CAN COMMUNICATION LINE (CAN-L)	4	٦	TO ENGINE CONTROL HARNESS	_
SAN COMMINICATION	2	œ	TO ENGINE CONTROL HARNESS	
(CAN-H)	9	SB	TO ENGINE CONTROL HARNESS	_
SENSOR POWER SUPPLY	7	_	TO ENGINE CONTROL HARNESS	
1	8	۵	TO ENGINE CONTROL HARNESS	_
1				
FUEL TEMPERATURE SENSOR	Connector No		E66	_

Terminal Color of

Signal Name

Color of

# > S > R

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BR W

| ≥ | 8

Signal Name

Color of Wire

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Wire	>	g	,	_	æ	SB	_	۵		S N		Name	adk	Color								Color	Wire	8	>	ē	g	W/L	5	4/8	Š				
No.	-	2	8	4	2	9	7	8		Connector No	Compositor Nome	Connector	edimector type	Connector Color	E	ATT.	SH					Torminal	N C	-	2	c	າ	4		n	9				
Signal Name	EVAP CONTROL SYSTEM	PRESSURE SENSOR	1	CAN COMMUNICATION LINE	CAN COMMINICATION LINE	(CAN-H)	SENSOR POWER SUPPLY	ı	ı	FUEL TEMPERATURE SENSOR	-	FUEL PUMP CONTROL MODULE	(rPCM) CHECK	1	1	IGNITION SWITCH	ASCD STEERING SWITCH	SENSOR GROUND	FUEL PUMP CONTROL MODULE (FPCM)	ENG COMMUNICATION LINE	ENG COMMUNICATION LINE	STOP LAMP SWITCH	BRAKE PEDAL POSITION SWITCH	EVAP CANISTER VENT CONTROL VALVE	SENSOR POWER SUPPLY	ACCELERATOR PEDAL POSITION	SENSOR GROUND	POWER SUPPLY FOR ECM	SENSOR POWER SUPPLY	ECM GROUND	SENSOR GROUND	ECM GROUND	ACCELERATOR PEDAL POSITION SENSOR 1	SENSOR GROUND	ECM GROUND
Wire	0/B			۵	-		SB		-	W/W	-	R/W				8	ĕ	B√	8	B/W	8	B/G	ζV	>	8	0	P/L	W	M/G	8	н	В	W/R	R/Y	В
No.	121		122	123	124	į	125	126	127	128	129	130	i i	131	132	133	134	135	136	137	138	139	140	141	142	143	144	145	146	147	148	149	150	151	152
																								_											
Signal Name	TO ENGINE CONTROL HARNESS	TO ENGINE CONTROL HARNESS	TO ENGINE CONTROL HARNESS	TO ENGINE CONTROL HARNESS	TO ENGINE CONTROL HARNESS	TO ENGINE CONTROL HARNESS																													

> B/R R X B

1 2 4

	Color	Wire	H	>		SB		W/L	1	4/k	Ś				
	Terminal	No.	-	2		3		4		n	9				
ENG COMMUNICATION LINE	STOP LAMP SWITCH	BRAKE PEDAL POSITION SWITCH	EVAP CANISTER VENT CONTROL VALVE	SENSOR POWER SUPPLY	ACCELERATOR PEDAL POSITION	SENSOR 2	SENSOR GROUND	POWER SUPPLY FOR ECM	SENSOR POWER SUPPLY	ECM GROUND	SENSOR GROUND	ECM GROUND	ACCELERATOR PEDAL POSITION SENSOR 1	SENSOR GROUND	ECM GROUND
W	R/G	ďγ	>	M	0		T//d	W	9/M	В	œ	В	W/R	R/Y	В
38	39	40	41	42	43		44	45	46	47	48	49	50	51	52

TO ENGINE CONTROL NO. 2
HARNESS
TO ENGINE CONTROL NO. 2
HARNESS
TO ENGINE CONTROL NO. 2
TARRESS
TO ENGINE CONTROL NO. 2
TARRESS
TO ENGINE CONTROL NO. 2
HARNESS
TO ENGINE CONTROL NO. 2
HARNESS
TO ENGINE CONTROL NO. 2
HARNESS

TO ENGINE CONTROL NO. 2 HARNESS Signal Name

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Connector No.	F123	Connector No.		25-						
2 :	2		Т		25G	R/W	TO MAIN HARNESS	73G	SHIELD	TO MAIN HARNESS
Connector Name	IPDM E/R (INTELLIGENT	Connector Name		WIRE TO WIRE	26G	æ	TO MAIN HARNESS	74G	*	TO MAIN HARNESS
	POWER DISTRIBUTION	Connector Type		TH80MW-CS16-TM4	27G	FG	TO MAIN HARNESS	75G	ď	TO MAIN HARNESS
	MODULE ENGINE ROOM)	Connector Color		WHITE	000	9/0	TO MAIN LABNIESS	092	9/0	TO MAIN UADMICE
Connector Type	NS08FBR-CS					3 6	TO MONTH OF THE POST OF		2	O DINITION OF
Connector Color	BBOWN				562	9	I O INIAIIN HARINESS	5	5	I O INIMIN FIMESO
		\			306	BH/Y	IO MAIN HARNESS	786	8	IO MAIN HARNESS
		S.H.			316	۵	TO MAIN HARNESS - (WITH	79G	_	TO MAIN HARNESS
				The second second			CUMMINS 5.0L)	808	œ	TO MAIN HARNESS
				56 46 36 26 16	31G	Œ	TO MAIN HARNESS - (WITH	81G	_	TO MAIN HARNESS
	00 10			106 96 86 76 66			VASBVD	826	α	TO MAIN HARNESS
	56 55 54 53 52			000	326	1	I O MAIN HARNESS	C	-	COLIMBALI MIAMA OT
			17	216.206196196176196136146136126116	336	Y/L	TO MAIN HARNESS	500	1	I O INIAIIN DARINESS
			_	2010/23/01/2010/2010/2010/2010/2010/2010	34G	GR	TO MAIN HARNESS	84G	7	TO MAIN HARNESS
			410	840G 39G 38G 37G 36G 35G 34G 33G 32G 31G	285	0/5	TO MAIN HABNESS	85G	W/B	TO MAIN HARNESS
2				506 496 486 476 466 456 446 436 426	000	5 6	OF MAIN INCOME.	986	B/B	TO MAIN HARNESS
2010	OI Signal Name		į		5000	a	IO MAIN HANNESS	070	O/W	O MAIN HABINESS
Wire			9	816.806.986.986.976.986.936.946.936.926.916	376	R/W	TO MAIN HARNESS	5	9/4	I O INIMINI I IMINESS
Y/B	A/C COMP - (WITH CUMMINS	,		9709509495090999709989980907	386	BB	TO MAIN HARNESS	588	<u>-</u>	TO MAIN HARNESS
	5.0L)		108	806736786776766756746736726716	396	BB	TO MAIN HABNESS	89G	٦	TO MAIN HARNESS
GR/R	A/C COMP - (WITH VK56VD)			90G89G88G87G86G85G84G83G82G	900		TO MAIN LABNIESS	906	5	TO MAIN HARNESS
æ	TRAII FB TOW				507	_	I O MAIN HARMESS	9	ď	TO MAIN HABNESS
				95G 94G 93G 92G 91G	416	R/G	TO MAIN HARNESS		, ,	OCTIVIDATE OF
'	-			100G 99G 98G 97G 96G	426	0	TO MAIN HARNESS	926	M//	IO MAIN HARNESS
В	S-GND				43G	В	TO MAIN HARNESS - (WITH	93G	BB	TO MAIN HARNESS
'	1				1	1	CUMMINS 5.0L)	94G	5	TO MAIN HARNESS
'	1				43G	g	TO MAIN HARNESS - (WITH	95G	5	TO MAIN HARNESS
	-						VK56VD)	596	3	TO MAIN HARNESS
					44G	R/Y	TO MAIN HARNESS	222	: 0	O MAIN LADINGS
		lerminal	Color of	Signal Name	45G	9	TO MAIN HARNESS	5 8		TO MAIN HABNESS
		NO.	wire	,	46G	EG.	TO MAIN HARNESS	500	2/4	O INITIALIA DI
Connector No.	E124	10	g	TO MAIN HARNESS	476	æ	TO MAIN HABNESS	566	100	IO MAIN HARNESS
Connector Name	IPDM E/R (INTELLIGENT	56	B/R	TO MAIN HARNESS	486	3	TO MAIN HABNESS	5000	W/H5	IO MAIN HARNESS
	POWER DISTRIBUTION	36	M/B	TO MAIN HARNESS	2 8		TO MAIN HABNESS			
	MODULE ENGINE ROOM)	46	BR/W	TO MAIN HARNESS	5 6	2	OCTIVITY OF	Connector No.		E161
Confort Time	MOSED I	55	88	TO MAIN HABNESS	506	PH	I O MAIN HARNESS		T,	Tivida io your
adk.	NOO! D-C	9	۵	TO MAIN HABNESS - WITH	516	œ	TO MAIN HARNESS	Collifector Name	_	DALLERY CORRENI
Connector Color	BLACK			VK56VD)	52G	_	TO MAIN HARNESS		Ť	רטפאו
		9	B/W	TO MAIN HARNESS - (WITH	536	8	TO MAIN HARNESS	Connector Type		SAZ04FGY
			:	CUMMINS 5.0L)	54G	W	TO MAIN HARNESS	Connector Color		GRAY
		26	>	TO MAIN HABNESS	25.5	ď	TO MAIN HABNESS	d		
	000	S	C	SOUNDALI MIAM OT			000000000000000000000000000000000000000			
	3	8 8	5 1		500	*	I O MAIN DARINESS			
	09   19   79	5		I O INIAIIN FIANINESS	5/6	<b>,</b>	I O MAIN HARNESS	υ. 		
		10G	W	TO MAIN HARNESS	586	Bg	TO MAIN HARNESS			( 1 2 )
		116	R/G	TO MAIN HARNESS	596	BG	TO MAIN HARNESS			6
		12G	W/B	TO MAIN HARNESS	509	BG	TO MAIN HABNESS			+
Color of		000	00	SSENDALI NIAM CT			COLINGENIA			
Wire	Signal Name	50	r o	I O IMAIIN DARINESS	5 6 6 6 6	8	IO MAIN HARNESS			
0//4/		14G	A//B	TO MAIN HARNESS	626	W	TO MAIN HARNESS			
M/B	+	15G	g/w	TO MAIN HARNESS	63G	н	TO MAIN HARNESS	Termina	Color of	Signal Name
88	FUEL PUMP - (WITH CUMMINS	16G	g	TO MAIN HARNESS	64G	W/L	TO MAIN HARNESS	No.	Wire	
à	(200)	176		TO MAIN HABNESS	656	W/B	TO MAIN HABNESS	-	SB	VCC
P/4	FUEL PUMP - (WITH VK56VD)	5	3	SOUNDALI MIAM OT				2	g	TEMP OUT
1	1	58	5	IO MAIN HARNESS	599	BG	TO MAIN HARNESS			and a
'	1	19G	٨٨	TO MAIN HARNESS	67G	BG	TO MAIN HARNESS	,,	r	GND
		20G	%	TO MAIN HARNESS	989	В	TO MAIN HARNESS	4	>	CURRENT OUT
٥	CNO	21G	B∕	TO MAIN HARNESS	569	>	TO MAIN HARNESS			
					I					
		22G	g/R	TO MAIN HARNESS	2002	_	TO MAIN HARNESS			

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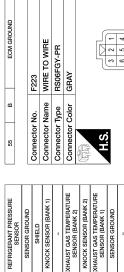
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# CHARGING SYSTEM CONNECTORS - WITH VK56VD



					Г	
Signal Name	TO ENGINE ROOM HARNESS					
Color of Wire	В	<b>*</b>	SB	M/L	A//B	Š
Terminal No.	-	2	3	4	2	9

Connector No.	ė	F240
Connector Name	Name	GENERATOR (WITH VK56VD)
Connector Type	Type	E-LA6
Connector Color	Color	
H.S.		(a)
Terminal	Color of	Cignal Namo
No.	Wire	Signal Name
2	٥	

	12	Š	HEFHIGEHANI PHESSURE SENSOR	
	13	W/L	SENSOR GROUND	(
	14	SHIELD	SHIELD	3
	15	W	KNOCK SENSOR (BANK 1)	ၓ
	16	-	_	ŏ
	17	۸	EXHAUST GAS TEMPERATURE SENSOR (BANK 2)	ၓ႞
	18	м	KNOCK SENSOR (BANK 2)	
	19	GR/R	EXHAUST GAS TEMPERATURE SENSOR (BANK 1)	
	20	SHIELD	SENSOR GROUND	•
	21	-	-	
	22	٨	ENGINE OIL TEMPERATURE SENSOR	
	23	Š	ENGINE OIL PRESSURE SENSOR	
	24	P/GR	POWER STEERING PRESSURE SENSOR	Ε
	25	N/N	FUEL RAIL PRESSURE SENSOR	
	26		1	
	27	9/M	SENSOR POWER SUPPLY	
	28	Y/R	SENSOR POWER SUPPLY	
	59	SB	SENSOR POWER SUPPLY	
	30	SB	SENSOR POWER SUPPLY	
	31	BR	FAN CLUTCH ASSEMBLY SIGNAL	
	32	9	BATTERY TEMPERATURE SENSOR	ဝိ
	33	R/W	CRANKSHAFT POSITION SENSOR (POS)	<u>გ</u>
	34	1	1	2 ا
	35	W.	ENGINE COOLANT TEMPERATURE SENSOR 1	3 8
_	36	0/0	INTAKE AIR TEMPERATURE SENSOR	UF
	37	G/B	MASS AIR FLOW SENSOR	_
_	38	>	BATTERY CURRENT SENSOR	_
	39	-	-	
	40	K.	CAMSHAFT POSITION SENSOR (PHASE) (BANK 1)	
=	41	۵	EXHAUST VALVE TIMING CONTROL POSITION SENSOR (BANK 1)	F
	42	В	SENSOR GROUND	
	43	В	SENSOR GROUND	
	44	G/W	SENSOR GROUND	
	45	BR/W	SENSOR GROUND	
	46	88	HIGH PRESSURE FUEL PUMP DRIVER POWER SUPPLY	
	47	BB	FUEL INJECTOR NO. 1, 6 (HI)	
	48	>	FUEL INJECTOR NO. 1 (LO)	
	49	٦	FUEL INJECTOR NO. 4 (LO)	
	20	а	ECM GROUND	
	51	۵	HIGH PRESSURE FUEL PUMP	

Connector Color BLACK		Color of Wire	Terminal No.
Color of Wire V V LG	TO ENGINE ROOM HARNESS  TO ENGINE ROOM HARNESS	-   -	5 4
inal Color of Wire	TO ENGINE ROOM HARNESS  TO ENGINE ROOM HARNESS	වු <sub>'</sub>	3 2
S.   4   4   8   8   1   1   1   1   1   1   1   1	TO ENGINE ROOM HARNESS  TO ENGINE ROOM HARNESS	> P	1 2
8 7 6 7 6 8 7 6 7 6 9 7 6		Color of Wire	Terminal No.
	2 3 2 2 2		
	BLACK		Connector 原列 H.S.
Connector Type RH08FB	RH08FB BLACK		Connector Connector H.S.
0	WIRE TO WIRE RH08FB BLACK		Connector Connector Connector H.S.

													.11	
Signal Name	TO ENGINE ROOM HARNESS	F78	ECM (WITH VK56VD)	MAB35FB-MEB20-LH	BLACK									
Color of Wire	>	5		_	æ	SB	_	۵		_				_
Terminal No.	-	2	8	4	5	9	7	8	Connector No.	Connector Name	Connector Type	Connector Color		

Connector Name		ECM (WITH VK56VD)	
Connector Type		MAB35FB-MEB20-LH	
Connector Color		BLACK	
E	L		
\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	-	6 11 16 21 26 31 36 41 46 51	
Ġ.	2 7	7 12 17 22 27 32 37 42 52	
	е	18 23 28 33 38	
	4	9 49 54	
	5 1	20 25 30 35 40	
Terminal No.	Color of Wire	Signal Name	
-	œ	FUEL INJECTOR DRIVER POWER SUPPLY	
5	SB	HIGH PRESSURE FUEL PUMP DRIVER POWER SUPPLY	
8	B/R	FUEL INJECTOR NO. 8 (LO)	
,		O D C ON GOTOTI MI ITILI	

Signal Name	FUEL INJECTOR DRIVER POWER SUPPLY	HIGH PRESSURE FUEL PUMP DRIVER POWER SUPPLY	FUEL INJECTOR NO. 8 (LO)	FUEL INJECTOR NO. 3 (LO)	FUEL INJECTOR NO. 2, 3 (HI)	FUEL INJECTOR DRIVER POWER SUPPLY	FUEL INJECTOR NO. 5, 8 (HI)	FUEL INJECTOR NO. 5 (LO)	Z# T-ſNI	ECM GROUND	-
Color of Wire	œ	SB	B/R	0	g	Œ	N/B	B/W	B/W	В	-
Terminal No.	-	2	3	4	5	9	7	8	6	10	11

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Connector No.	ö	<u>ш</u>	<u> 4</u>									
Connector Name	ame	>	₩	ш	2	WIRE TO WIRE	뿞					
Connector Type	) de	-	呈	4	l≱	TH24FW-NH	_					
Connector Color	olor	>	WHITE	Щ	١							
唇												
SH					Ш	1	W	117	$\Box$			
	12 11	=	9	6	œ	7	9	2	4	က	2	-
	24	23	23	72	20	24 23 22 21 20 19 18 17 16 15	18	17	16	15	4	13

Terminal No.	Color of Wire	Signal Name
1	L/R	TO ENGINE ROOM HARNESS
2	BB	TO ENGINE ROOM HARNESS
ဧ	^	TO ENGINE ROOM HARNESS
4	0/1	TO ENGINE ROOM HARNESS
2	Α	TO ENGINE ROOM HARNESS
9	B/B	TO ENGINE ROOM HARNESS
2	Y/R	TO ENGINE ROOM HARNESS
8	ВВ	TO ENGINE ROOM HARNESS
6	W/L	TO ENGINE ROOM HARNESS
10	М	TO ENGINE ROOM HARNESS
11	SB	TO ENGINE ROOM HARNESS
12	7	TO ENGINE ROOM HARNESS
13	W/R	TO ENGINE ROOM HARNESS
14	٨	TO ENGINE ROOM HARNESS
15	В	TO ENGINE ROOM HARNESS
16	В	TO ENGINE ROOM HARNESS
21	ш	TO ENGINE ROOM HARNESS
18	В	TO ENGINE ROOM HARNESS
19	B/R	TO ENGINE ROOM HARNESS
20	GR	TO ENGINE ROOM HARNESS
21	N/R	TO ENGINE ROOM HARNESS
22	SHIELD	TO ENGINE ROOM HARNESS
23	SHIELD	TO ENGINE ROOM HARNESS
24	Ь	TO ENGINE ROOM HARNESS

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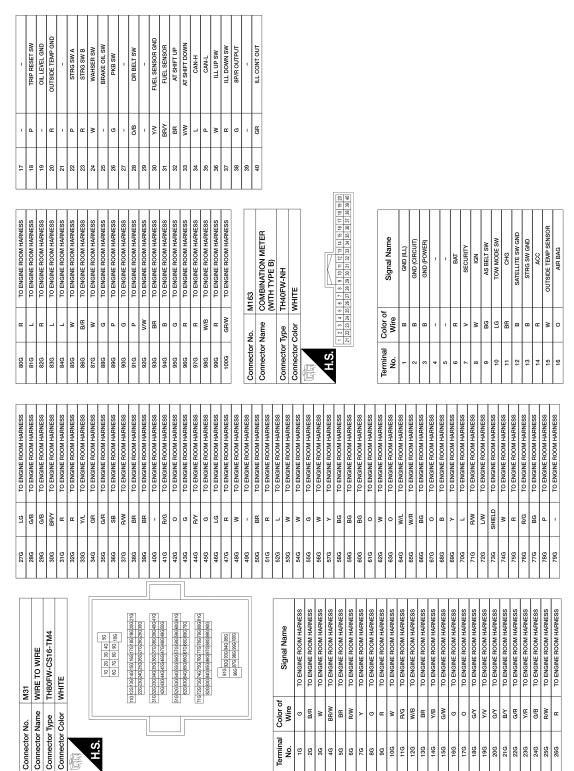
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Connector No.   M4   Connector No.	old sotoods	F0244	9 9	1	9	,		42	ш	BAT
Connector No.   MAE BLOCK (MB)   STATEMY (MM)	Confinector No.	1741			9			43	۸×	FUEL SENSOR GND
1	nnector Name	GENERATOR (WITH		3	7	>	SECURITY	44	GR	ILL CONT OUTPUT
1		VK56VD)	Collinector No.	1	80	,	1	45	۵	CAN-L
Connector Type   NS16PW-CS   The Connector Type   Connector Type   Connector Type   The Con	nnector Type	24340_EG00A	Connector Name	FUSE BLOCK (J/B)	o	BB	AS BELT SW (W/O ODS)	46	_	CAN-H
1	nector Color		Connector Type	NS16FW-CS	ç	2	TOW MODE SW	47	ď	5
1			Connector Color	WHITE	: =	8	9HO	. 84	BBV	ELIEL SENSOB
1   1   1   1   1   1   1   1   1   1					:   ç	5 6	(i) dwy i dwin di i			
The color of Signal Name	٤	[,			2 5	5	LED HEAD LAMP (1)	£ 2		
This is a connector No.   This   This is a connector No.   This	į.		L		2 :	:	(a) IIII GETI GETI	3		
False   Signal Name   Terminal   Color of   Signal Name   Terminal   Terminal   Color of   Signal Name   Terminal				p 5p 4p - 3p 2p 1p	4	¥	ACC SW	5	2	M CAN-L
F242   Signal Name		0	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	0 140 130 130 140 100 00 00	15		1	52	SB	M CAN-H
F242   Signal Name   No.   Wire   Signal Name   F243   Signal Name   F245   Signal Name   Signal N		)	יון אַטן	14   14   15   15   11   10   3L   0L	16	0	AIR BAG			
Figure   Signal Name   Figure   Figur					17	,	1			
Signal Name	$\vdash$				18	۵	TRIP RESET SW			
F242   Signal Name   Color of Signal Name   Color of Signal Name   Color of Signal Name   Color of Signal Name   F242			ı		19	,	1			
F242   Signal Name   Connector Older   Color of Signal Name   Colo					2 6	•	OLITSIDE TEMB CND			
PE242   PE24	1 B	1			3 8		COLSIDE LEWIY GIND			
F242   P   P   P   P   P   P   P   P   P				IGNITION	5	'				
Connector Name				NOILINGI	22	۵	STRG SW A			
CENEFATOR (WITH House)   Connector Now Fight   Connector Now Figh   Connector Now Figh   Connector Now Figh   Connector Now Figh	nector No.	F242	1	TIO VAIDE NOITING	23	œ	STRG SWB			
NKG6VD    NKG6	nector Name	GENERATOR (WITH	+	IGNITION NEEDS CO.	24	W	WASHER SW			
HS03FB   HS MEF RIV OUT   SE		VK56VD)		KK DEF KLY	52	,	1			
BLACK   SIGNAL   SI	nector Tyne	HS03FB	-	RR DEF RLY	96	ď	PKBSW			
BLACK   BLOWER FAN PELAY   Signal Name   S	odf. ionom			RR DEF RLY OUT		, 2	WO FILL OV			
Partier   Part	nector Color	BLACK		IGNITION	17	1 6	AS BELL SW			
Partiery				IGNITION	9	900	DR BELL SW			
19P   -   -   22   23   24   -   25   25   25   25   25   25   25				BATTERY	59	'	1			
10	ď				30	,	1			
12   12   14   15   15   15   15   15   15   15	2		+		34	1	NOT M RANGE			
12P		ď	1	-	32	BB	AT SHIFT UP			
Terminal   Color of Signal Name   Term			+	1	33	W/A	AT SHIFT DOWN			
14P   VLG   BATTERY   Signal Name   15P   VLG   Signal Name   15P   VLG   VL				BALLEHY	34		1			
15P   VIG   BATTERY   Signal Name   15P   VIG   BATTERY   Signal Name   15P   VIG   BATTERY   Signal Name   15P   VIG			1		35		1			
Signal Name   16P   W   BLOWER FAN PELAY OUT   37   R   R     Connector Name   COMBINATION METER   Connector Name   Connect				-	8 8	W	Wo di i ii			
Connector No.   M24   Signal Name   Color of Color of Signal Name   Color of Color				BLOWER FAN RELAY OUT	8 8	A (	ILL OP SW			
Connector No.   M24   38   -					37	¥ .	ILL DOWN SW			
Connector Name	1	1			88	5	8P/R OUTPUT			
F243   Connector Name   COMBINATION METER   40		-	Connector No.	M24	39	,	1			
PE243   Connector Type   TH40FW-NH   Connector No.   Connector No.   Connector Name   Con		1	Connector Name	COMBINATION METER	40	,	1			
F243   Connector Type   TH40FW-NH   Connector No.   Connector Type   Connector No.   Connector Color   Connector No.   Conne				(WITH TYPE A)						
FUSIBLE LINK BOX   Connector Color   WHITE   Connector Name   Connector Name   Connector Name   Connector Name   Connector Type   Connector Type   Connector Type   Connector Type   Connector Color   Connector Type   Connector	nector No.	F243	Connector Type	TH40FW-NH	A software	Г	u			
FUSILE LINK BOX   Connector Name   CASTERN (WITH WK56VD)   Connector Name   CASTERN (WITH WK56VD)   Connector Name   Connector Type   Connec		200	Company	WHITE	Collifector		23			
124340_79906	nector Name	FUSIBLE LINK BOX		AA	Connector N		OMBINATION METER			
Connector Type   TH12PW		(DAILERT) (WILL VASOVD)				Š	/ITH TYPE A)			
-	nector Type	24340_79906			Connector		112FW-NH			
1   2   3   4   5   7   8   9   9   9   9   9   9   9   9   9	nector Color					Ť				
S	1000		_	/	_			_		
S			7 2 3 4	5 6 / 8 9 10 11 12 13 14 15 16 1/ 18 19 20 1 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40						
Color of Signal Name			22 22 22 12	04 05 05 05 05 05 05 05 05 05 05 05 05 05						
Terminal   Color of   Signal Name     Terminal   Color of   Signal Name     Terminal   Color of     Terminal   Color of     Terminal   Color of     Terminal   Color of	S	uc.			Ų.					
Terminal   Color of   Signal Name   Reminal   Color of   Signal Name   Reminal   Rem	1	o (			į					
Signal Name   Signal Name   Terminal   Color of   Signal Name   Signal			$\vdash$				46 45 44 43 42 41			
1   B   GND(STRG/SATELLITE SW GND)   2   2   2   2   2   2   2   2   2							52 51 50 49 48 47			
Color of Signal Name 2 - Terminal Color of Terminal Color of Terminal Color of Color			t	+						
Color of Signal Name 3 Terminal Color of	ı			GIND(STRG/SALELLITE SW GIND)						
West Olympia Wallio			1	1	$\vdash$	Color of	:			
Wire No. Wire	No. Wire		1	-		Wire	Signal Name			
l				•				т.		
					- 4	>	NSI.	_		

Revision: March 2016 CHG-21 2016 Titan NAM

# CHARGING SYSTEM CONNECTORS - WITH VK56VD



#### < BASIC INSPECTION >

# **BASIC INSPECTION**

## DIAGNOSIS AND REPAIR WORKFLOW

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

#### INFOID:0000000012546647

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

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

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

#### NOTE:

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

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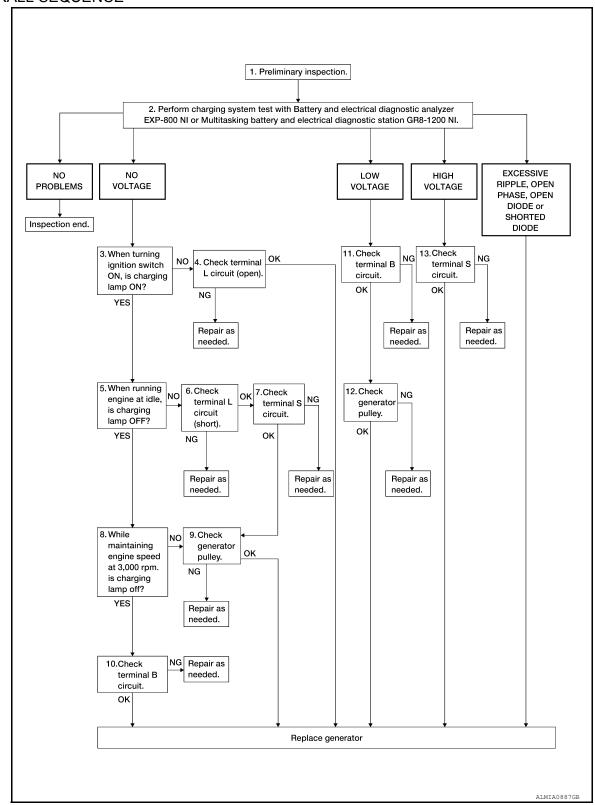
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#### **OVERALL SEQUENCE**



#### **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 <a href="CHG-34">CHG-34</a>. "Inspection Procedure".

#### < BASIC INSPECTION >

YES

<b>2.</b> DIAG	SNOSIS WITH EXP-800 NI OR GR8-1200 NI
Perform Battery	the charging system test using Multitasking battery and electrical diagnostic station GR8-1200 NI or and electrical diagnostic analyzer EXP-800 NI. Refer to the applicable Instruction Manual for proper procedures.
NO PF	COBLEMS>>Charging system is normal and will also show "DIODE RIPPLE" test result.  DLTAGE>>GO TO 3.  OLTAGE>>GO TO 11.
EXCES	VOLTAGE>>GO TO 13. SSIVE RIPPLE, OPEN PHASE, OPEN DIODE or SHORTED DIODE>>Replace the generator. Refer to <a href="CHG-45">CHG-45</a> , "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.INSF	ECTION WITH CHARGE WARNING LAMP (IGNITION SWITCH IS ON)
	e ignition switch ON. e charge warning lamp illuminate? >> GO TO 5. >> GO TO 4.
4.TERI	MINAL L CIRCUIT (OPEN) INSPECTION
	erminal L circuit (open). Refer to CHG-38, "Diagnosis Procedure".
YES NO	rminal L circuit normal?  >> Replace generator. Refer to CHG-45, "Removal and Installation: Cummins 5.0L".  >> Repair as needed.
5.INSF	PECTION WITH CHARGE WARNING LAMP (IDLING)
	e engine and run it at idle.
Does th YES	e charge warning lamp turn OFF? >> GO TO 8.
NO	>> GO TO 6.
6.TER	MINAL L CIRCUIT (SHORT) INSPECTION
Check to	erminal L circuit (short). Refer to CHG-41, "Diagnosis Procedure".
	rminal L circuit normal?
YES NO	>> GO TO 7. >> Repair as needed.
_	MINAL S CIRCUIT INSPECTION
	erminal S circuit. Refer to CHG-42, "Diagnosis Procedure".
Is the te	rminal S circuit normal?
YES	>> GO TO 9.
NO 8.INSF	>> Repair as needed. PECTION WITH CHARGE WARNING LAMP (ENGINE AT 3,000 RPM)
	e and maintain the engine speed at 3,000 rpm.
	e charge warning lamp remain off?
YES	>> GO TO 10.
NO O was	>> GO TO 9. PECTION OF GENERATOR PULLEY
	YELLIUM DE GENERATOR PITTEY

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>> Replace generator. Refer to <a href="CHG-45">CHG-45</a>, "Removal and Installation: Cummins 5.0L".

#### < BASIC INSPECTION >

NO >> Repair as needed.

# 10. TERMINAL B CIRCUIT INSPECTION

Check terminal B circuit. Refer to CHG-37, "Diagnosis Procedure".

#### Is terminal B circuit normal?

YES >> Replace generator. Refer to CHG-45, "Removal and Installation: Cummins 5.0L".

NO >> Repair as needed.

# 11. TERMINAL B CIRCUIT INSPECTION

Check "B" terminal circuit. Refer to CHG-37, "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-45, "Removal and Installation: Cummins 5.0L".

#### Is generator pulley normal?

YES >> Replace generator. Refer to CHG-45, "Removal and Installation: Cummins 5.0L".

NO >> Repair as needed.

# 13. TERMINAL S CIRCUIT INSPECTION

Check terminal S circuit. Refer to CHG-42, "Diagnosis Procedure".

#### Is the terminal S circuit normal?

YES >> Replace generator. Refer to CHG-45, "Removal and Installation: Cummins 5.0L".

NO >> Repair as needed.

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

INFOID:0000000013828747

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

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

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

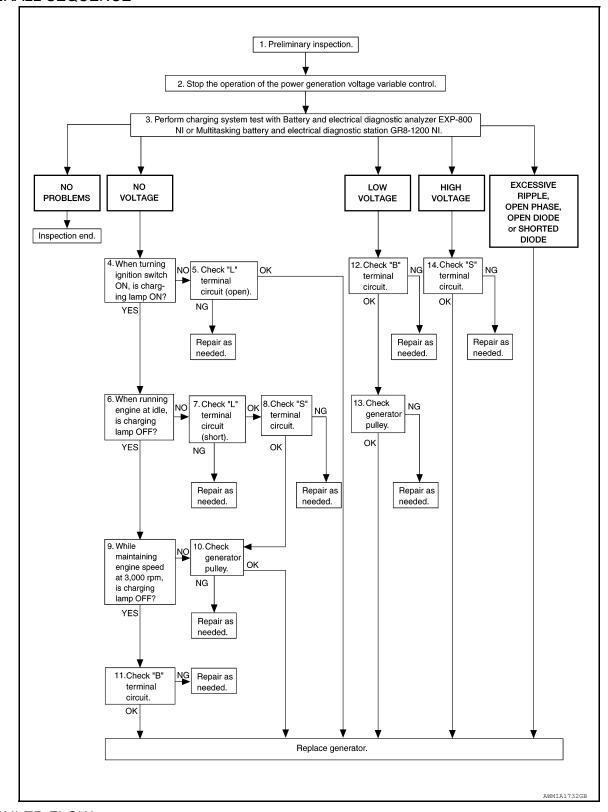
#### NOTE:

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

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#### < BASIC INSPECTION >

#### **OVERALL SEQUENCE**



#### **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 <a href="CHG-34">CHG-34</a>, "Inspection Procedure".

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#### < BASIC INSPECTION >

>> GO TO 2.

# $2.\mathsf{stop}$ 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 <a href="CHG-44">CHG-44</a>, "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-38, "Diagnosis Procedure".

#### Is the "L" terminal circuit normal?

YES >> Replace generator. Refer to CHG-44, "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-41, "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-42, "Diagnosis Procedure".

#### Is the "S" terminal circuit normal?

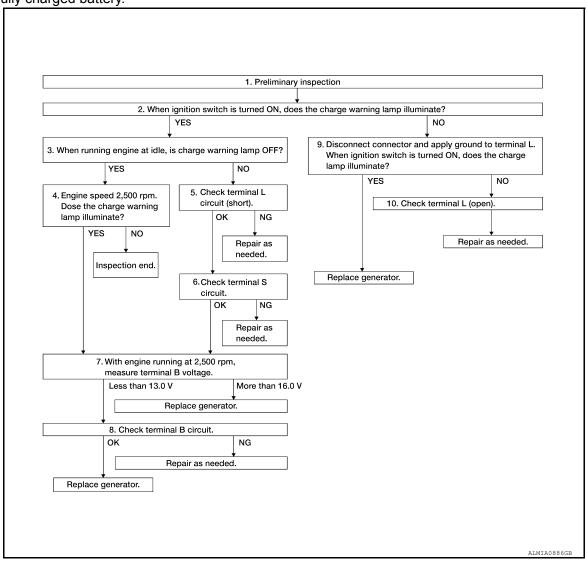
YES >> GO TO 10.

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-44, "Removal and Installation: VK56VD".	
Is generator pulley normal?	
YES >> Replace generator. Refer to <u>CHG-44, "Removal and Installation: VK56VD"</u> .  NO >> Repair as needed.	
11. "B" TERMINAL CIRCUIT INSPECTION	
Check "B" terminal circuit. Refer to CHG-37, "Diagnosis Procedure".	_
Is "B" terminal circuit normal?	
YES >> Replace generator. Refer to <u>CHG-44</u> , " <u>Removal and Installation: VK56VD</u> ".  NO >> Repair as needed.	
12."B" TERMINAL CIRCUIT INSPECTION	
Check "B" terminal circuit. Refer to <u>CHG-37, "Diagnosis Procedure"</u> .	_
s "B" terminal circuit normal?	
YES >> GO TO 13.	
NO >> Repair as needed.	
13.INSPECTION OF GENERATOR PULLEY	_
Check generator pulley. Refer to CHG-44, "Removal and Installation: VK56VD".	
Is generator pulley normal?	
YES >> Replace generator. Refer to <u>CHG-44, "Removal and Installation: VK56VD"</u> NO >> Repair as needed.	
14. "S" TERMINAL CIRCUIT INSPECTION	
Check "S" terminal circuit. Refer to CHG-42, "Diagnosis Procedure".	_
Is the "S" terminal circuit normal?	
YES >> Replace generator. Refer to <u>CHG-44, "Removal and Installation: VK56VD"</u> .  NO >> Repair as needed.	
Work Flow (Without EXP-800 NI or GR8-1200 NI) (with Cummins 5.0L)	126
OVERALL SEQUENCE	
Before performing a generator test, make sure that the battery is fully charged. A 30-volt voltmeter and sui	t-
able test probes are necessary for the test.	•
Before starting, inspect the fusible link.	

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#### < BASIC INSPECTION >

· Use fully charged battery.



#### **DETAILED FLOW**

# 1. PRELIMINARY INSPECTION

Perform the preliminary inspection. Refer to <a href="CHG-34">CHG-34</a>, "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.

f 4. INSPECTION WITH CHARGE WARNING LAMP (ENGINE AT 2,500 RPM)

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

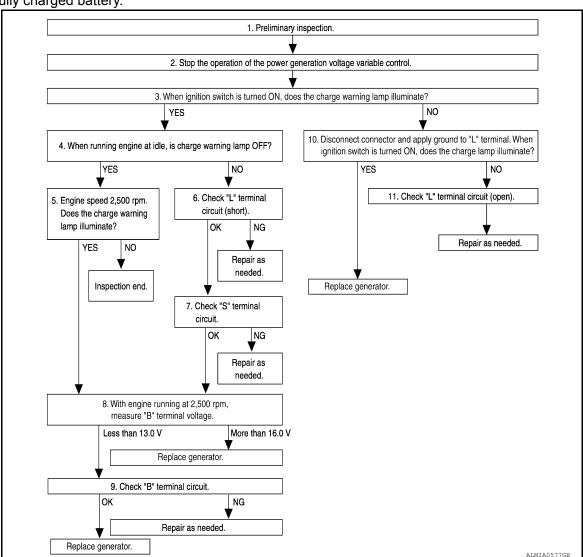
Does the charge warning lamp illuminate?

YES >> GO TO 7. NO >> Inspection End.	
TERMINAL L CIRCUIT (SHORT) INSPECTION	
Check terminal L circuit for short. Refer to CHG-41, "Diagnosis Procedure".  So the inspection result normal?  YES >> GO TO 6.  NO >> Repair as needed.	
TERMINAL S CIRCUIT INSPECTION	
check terminal S circuit. Refer to <a href="CHG-42">CHG-42</a> , "Diagnosis Procedure".  S the inspection result normal?  YES >> GO TO 7.  NO >> Repair as needed.	
.MEASURE TERMINAL B VOLTAGE	
tart engine. With engine running at 2,500 rpm, measure terminal B voltage. <u>Vhat voltage does the measurement result show?</u> Less than 13.0 V>> GO TO 8. More than 16.0 V>> Replace generator. Refer to <u>CHG-45, "Removal and Installation: Cum</u> n	nins 5 OI "
TERMINAL B CIRCUIT INSPECTION	iiii 3 J.UL
Check "B" terminal circuit. Refer to <a href="CHG-37">CHG-37</a> , "Diagnosis Procedure".  So the inspection result normal?  YES >> Replace generator. Refer to <a href="CHG-45">CHG-45</a> , "Removal and Installation: Cummins 5.0L  NO >> Repair as needed.	<u>"</u> .
INSPECTION WITH CHARGE WARNING LAMP (IGNITION SWITCH IS ON)	
<ul> <li>Disconnect generator connector and apply ground to terminal L.</li> <li>Turn the ignition switch ON.</li> <li>loes the charge warning lamp illuminate?</li> <li>YES &gt;&gt; Replace generator. Refer to CHG-45, "Removal and Installation: Cummins 5.0L</li> </ul>	п
NO >> GO TO 10.	<b>-</b> '
O.CHECK TERMINAL L CIRCUIT (OPEN)	
check terminal L circuit open. Refer to <u>CHG-38, "Diagnosis Procedure"</u> .	
>> Repair as needed.	
Vork Flow (Without EXP-800 NI or GR8-1200 NI) (with VK56VD)	INFOID:0000000013828748
OVERALL SEQUENCE sefore performing a generator test, make sure that the battery is fully charged. A 30-volt volble test probes are necessary for the test.  Before starting, inspect the fusible link.	oltmeter and suit-

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#### < BASIC INSPECTION >

· Use fully charged battery.



#### **DETAILED FLOW**

#### 1. PRELIMINARY INSPECTION

Perform the preliminary inspection. Refer to CHG-34, "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.

# ${f 3.}$ inspection with charge warning lamp (ignition switch is turned on)

When ignition switch is turned ON.

Does the charge warning lamp illuminate?

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< BASIC INSPECTION >	
YES >> GO TO 4.	
NO >> GO TO 10.	А
4.INSPECTION WITH CHARGE WARNING LAMP (IDLING)	
Start the engine and run it at idle	В
Does the charge warning lamp turn OFF?	
YES >> GO TO 5. NO >> GO TO 6.	
_ ` ` ` ` ` ` ` ` ` ` ` ` ` ` ` ` ` ` `	С
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.	
6."L" TERMINAL CIRCUIT (SHORT) INSPECTION	Е
Check terminal "L" circuit for (short). Refer to CHG-41, "Diagnosis Procedure".	
Is the inspection result normal?	_
YES >> GO TO 7.	F
NO >> Repair as needed.	
7. "S" TERMINAL CIRCUIT INSPECTION	G
Check terminal "S" circuit. Refer to CHG-42, "Diagnosis Procedure".	
Is the inspection result normal?	1.1
YES >> GO TO 8.	Н
NO >> Repair as needed.	
8.MEASURE "B" TERMINAL VOLTAGE	I
Start engine. With engine running at 2,500 rpm, measure "B" terminal voltage.	
What voltage does the measurement result show?	
Less than 13.0 V>>GO TO 9.	J
More than 16.0 V>>Replace generator. Refer to <u>CHG-44, "Removal and Installation: VK56VD"</u> .	
9. "B" TERMINAL CIRCUIT INSPECTION	K
Check "B" terminal circuit. Refer to CHG-37, "Diagnosis Procedure".	
Is the inspection result normal?	
YES >> Replace generator. Refer to <u>CHG-44, "Removal and Installation: VK56VD"</u> .	L
NO >> Repair as needed.	
10.INSPECTION WITH CHARGE WARNING LAMP (IGNITION SWITCH IS ON)	CHG
<ol> <li>Disconnect generator connector and apply ground to "L" terminal.</li> <li>Turn the ignition switch ON.</li> </ol>	0110
Does the charge warning lamp illuminate?	N
YES >> Replace generator. Refer to <u>CHG-44, "Removal and Installation: VK56VD"</u> .  NO >> GO TO 11.	1.4
11.check "L" terminal circuit (open)	0
Check "L" terminal circuit (OPEN). Refer to CHG-38, "Diagnosis Procedure".	
>> Repair as needed.	Р

#### CHARGING SYSTEM PRELIMINARY INSPECTION

#### < BASIC INSPECTION >

#### CHARGING SYSTEM PRELIMINARY INSPECTION

#### Inspection Procedure

INFOID:0000000013387428

# 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		
Concretor	Battery (terminal 3)	Fuse 70 (10 A)		
Generator	Battery (terminal 1)	Fusible Link A (250 A)		
Combination meter	Ignition switch ON or START (terminal 2)	Fuse 13 (10 A)		
Vith VK56VD				
Unit	Power source (Power supply terminals)	Fuse or Fusible Link		
Generator	Battery (terminal 3)	Fuse 66 (10 A)		
Generator	Battery (terminal 1)	Fusible Link <b>A</b> (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-44, "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 OPER-ATION INSPECTION

Diagnosis Procedure

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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-1325, "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

- Connect CONSULT and start the engine.
- The A/T shift selector is in "P" or "N" position and all of the electric loads and A/C, etc. are turned OFF. 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 : 12 - 13.6 V **DUTY value of "ALTERNA-TOR DUTY" to 40.0 %** 

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

#### "BATTERY VOLT"

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

#### Is the measurement value within the specification?

YES >> Inspection End.

NO >> GO TO 3.

#### ${f 3.}$ 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.

f 4.CHECK HARNESS BETWEEN GENERATOR AND IPDM E/R

1. Turn ignition switch OFF.

Revision: March 2016

- 2. Disconnect generator connector and IPDM E/R connector.
- Check continuity between generator harness connector and IPDM E/R harness connector.

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#### POWER GENERATION VOLTAGE VARIABLE CONTROL SYSTEM OPERATION **INSPECTION**

#### < DTC/CIRCUIT DIAGNOSIS >

Gen	erator	IPDN	M E/R	Continuity
Connector	Terminal	Connector Terminal		Continuity
F242	4	E122	47	Yes

4. Check continuity between generator harness connector and ground.

Gen	erator	_	Continuity
Connector	Terminal	_	Continuity
F242	4	Ground	No

#### Is the inspection result normal?

>> Replace IPDM E/R. Refer to <u>PCS-43, "Removal and Installation of IPDM E/R"</u>. >> Repair harness or connector between IPDM E/R and generator. YES

NO

#### **B TERMINAL CIRCUIT**

#### < DTC/CIRCUIT DIAGNOSIS >

#### **B TERMINAL CIRCUIT**

Description INFOID:000000012546657

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

#### Diagnosis Procedure

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.

(+)		(-)	Voltage	
Connector	Connector Terminal		(Approx.)	
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.

# ${f 3.}$ 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.

(+)		(-)	Voltage	
Connector	Terminal	(-)	(Approx.)	
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 <a href="CHG-23">CHG-23</a>, "Work Flow (With EXP-800 NI or GR8-1200 NI) (with Cummins 5.0L)", CHG-26. "Work Flow (With EXP-800 NI or GR8-1200 NI) (with VK56VD)", CHG-29. "Work Flow (Without 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 VK56VD)".

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

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Revision: March 2016 CHG-37 2016 Titan NAM

#### L TERMINAL CIRCUIT (OPEN)

#### < DTC/CIRCUIT DIAGNOSIS >

# L TERMINAL CIRCUIT (OPEN)

Description INFOID.000000012546659

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:0000000012546660

Regarding Wiring Diagram information. Refer to <u>CHG-12</u>, "Wiring <u>Diagram- with Cummins 5.0L"</u>, or <u>CHG-17</u>, "Wiring <u>Diagram- with VK56VD"</u>.

# 1. CHECK TERMINAL "L" CONNECTION

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

#### Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair to

>> 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)

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

Gene	erator		Co	ondition
Connector	Terminal	_	Ignition switch position	Charge warning lamp
F205 (with Cummins 5.0L) F242 (with VK56VD)	2	Ground	ON	Illuminate

#### Does it illuminate?

YES

>> Terminal "L" circuit is normal. Refer to <a href="CHG-23">CHG-23</a>. "Work Flow (With EXP-800 NI or GR8-1200 NI) (with Cummins 5.0L)", <a href="CHG-26">CHG-26</a>. "Work Flow (Without EXP-800 NI or GR8-1200 NI) (with Cummins 5.0L)", or <a href="CHG-31">CHG-29</a>. "Work Flow (Without EXP-800 NI or GR8-1200 NI) (with VK56VD)".

NO >> GO TO 3.

# 3.CHECK HARNESS CONTINUITY (OPEN CIRCUIT)

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

#### With Cummins 5.0L

Gen	erator	Combination meter		Continuity	
Connector	Terminal	Connector Terminal		Continuity	
F205	2	M25	11	Yes	
With VK56VD (with type	e A combination meter)				
Gen	Generator		tion meter	Continuity	
Connector	Terminal	Connector	Terminal	Continuity	
F242	2	M25	11	Yes	

# L TERMINAL CIRCUIT (OPEN)

#### < DTC/CIRCUIT DIAGNOSIS >

With VK56VD (with type				
Gene		Com	bination meter	
Connector	Terminal	Connector	Terminal	Continuity
F242	2	M163	11	Yes
CHECK HARNESS	replace the harness CONTINUITY (OPI	EN CIRCUIT)	tor and fuse block (J/B).	
ith Cummins 5.0L		nor named comic	tor and rado brook (0/2).	
Combination	on meter	Fuse	e box (J/B)	
Connector	Terminal	Connector	Terminal	Continuity
M24	42	M4	13P	Yes
ith VK56VD (with type A cor	mbination meter)			
Combination		Fuse	e box (J/B)	Continuity
Connector	Terminal	Connector	Terminal	Continuity
M24	42	M4	13P	Yes
ith VK56VD (with type B cor	mbination meter)			
Combination			e box (J/B)	Continuity
Connector	Terminal	Connector	Terminal	
M163	6	M4	13P	Yes
s the inspection result YES >> GO TO 5. NO >> Repair or r	eplace the harness	or connectors.		
YES >> GO TO 5. NO >> Repair or r  CHECK POWER SI  Connect the batter	replace the harness  UPPLY CIRCUIT  ry cable to the nega		ector and ground.	
YES >> GO TO 5. NO >> Repair or r  CHECK POWER SU  Connect the batter Check voltage beto	replace the harness  UPPLY CIRCUIT  ry cable to the nega	tive terminal.	ector and ground.	Vallace
YES >> GO TO 5. NO >> Repair or r  CHECK POWER SI  Connect the batter Check voltage between the community of	replace the harness UPPLY CIRCUIT ry cable to the nega ween combination n	tive terminal.	ector and ground.  Condition	Voltage (Approx.)
YES >> GO TO 5. NO >> Repair or r  CHECK POWER SI  Connect the batter Check voltage betw With Cummins 5.0L	replace the harness UPPLY CIRCUIT ry cable to the nega ween combination n	tive terminal. neter harness conne		
YES >> GO TO 5. NO >> Repair or r  O.CHECK POWER SI  Connect the batter Check voltage between the component of the component	replace the harness UPPLY CIRCUIT ry cable to the negar ween combination n	tive terminal. neter harness conne		
YES >> GO TO 5. NO >> Repair or r  O.CHECK POWER SI  Connect the batter Check voltage between the companion of the companion	replace the harness UPPLY CIRCUIT ry cable to the negaween combination n n meter Terminal	tive terminal. neter harness conne (-)	Condition  When the ignition	(Approx.)
YES >> GO TO 5. NO >> Repair or r  CHECK POWER SU  Connect the batter Check voltage betw With Cummins 5.0L  (+)  Combinatio  Connector  M24	replace the harness UPPLY CIRCUIT ry cable to the negaween combination n n meter Terminal	tive terminal. neter harness conne (-)	Condition  When the ignition	(Approx.)  Battery voltage
YES >> GO TO 5. NO >> Repair or r  O.CHECK POWER SI  Connect the batter Check voltage between the companion of the companion	replace the harness UPPLY CIRCUIT ry cable to the nega ween combination n n meter Terminal 42 A combination meter)	tive terminal. neter harness conne (-)	Condition  When the ignition	(Approx.)  Battery voltage  Voltage
YES >> GO TO 5. NO >> Repair or r  CHECK POWER SI  Connect the batter Check voltage betw With Cummins 5.0L  (+)  Combinatio  Connector  M24  With VK56VD (with type  (+)	replace the harness UPPLY CIRCUIT ry cable to the nega ween combination n n meter Terminal 42 A combination meter)	tive terminal. neter harness conne (-) Ground	Condition  When the ignition switch is in ON position	(Approx.)  Battery voltage
YES >> GO TO 5. NO >> Repair or r  O.CHECK POWER SI  Connect the batter Check voltage between the combination of the combinatio	replace the harness UPPLY CIRCUIT ry cable to the negative of combination in n meter Terminal 42 A combination meter)	tive terminal. neter harness conne (-) Ground	Condition  When the ignition switch is in ON position	(Approx.)  Battery voltage  Voltage
YES >> GO TO 5. NO >> Repair or r  O.CHECK POWER SI  Connect the batter Check voltage between the combination of the combinatio	replace the harness UPPLY CIRCUIT ry cable to the negative of combination in meter Terminal 42 A combination meter) In meter Terminal 42 42 42	tive terminal. neter harness conne	Condition  When the ignition switch is in ON position  Condition  When the ignition	(Approx.)  Battery voltage  Voltage (Approx.)
YES >> GO TO 5. NO >> Repair or r  O.CHECK POWER SI  Connect the batter Check voltage between the composition of the compositio	replace the harness UPPLY CIRCUIT ry cable to the negative of combination in meter Terminal 42 A combination meter) In meter Terminal 42 42 42	tive terminal. neter harness conne	Condition  When the ignition switch is in ON position  Condition  When the ignition	(Approx.)  Battery voltage  Voltage (Approx.)  Battery voltage
YES >> GO TO 5. NO >> Repair or r  O.CHECK POWER SI  Connect the batter Check voltage between the companion of the companion	replace the harness UPPLY CIRCUIT ry cable to the negative of combination in meter Terminal 42 A combination meter) In meter Terminal 42 B combination meter)	tive terminal. neter harness conne	Condition  When the ignition switch is in ON position  Condition  When the ignition	(Approx.)  Battery voltage  Voltage (Approx.)  Battery voltage
YES >> GO TO 5. NO >> Repair or r  O.CHECK POWER SI  Connect the batter Check voltage between the composition of the compositio	replace the harness UPPLY CIRCUIT ry cable to the negative of combination in meter Terminal 42 A combination meter) In meter Terminal 42 B combination meter)	tive terminal. neter harness conne  (-)  Ground  (-)  Ground	Condition  When the ignition switch is in ON position  Condition  When the ignition switch is in ON position	(Approx.)  Battery voltage  Voltage (Approx.)  Battery voltage

Is the inspection result normal?

YES >> Replace the combination meter. Refer to MWI-108, "Removal and Installation".

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# L TERMINAL CIRCUIT (OPEN)

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NO >> Repair or replace the harness or connectors.

#### L TERMINAL CIRCUIT (SHORT)

#### < DTC/CIRCUIT DIAGNOSIS >

# L TERMINAL CIRCUIT (SHORT)

Description INFOID:0000000012546661

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:0000000012546662

Continuity

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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)

- Turn ignition switch OFF.
- Disconnect generator connector. 2.
- Turn ignition switch ON.

#### Does charge warning lamp illuminate?

YES >> GO TO 2.

NO

>> Refer to CHG-23, "Work Flow (With EXP-800 NI or GR8-1200 NI) (with Cummins 5.0L)", CHG-26, "Work Flow (With EXP-800 NI or GR8-1200 NI) (with VK56VD)", CHG-29, "Work Flow (Without 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 VK56VD)".

# 2.CHECK HARNESS CONTINUITY (SHORT CIRCUIT)

Combination meter

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

With Cummins 5.0L

Connector	Terminal	Ground	Continuity	
M25	11		No	
With VK56VD (with type A com	bination meter)			
Combina	tion meter		Continuity	
Connector	Terminal	Ground	Continuity	
M25	11	1		
With VK56VD (with type B com	bination meter)			
Combina	tion meter		Continuity	
Connector	Terminal	Ground	Continuity	
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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**CHG-41** 

#### S TERMINAL CIRCUIT

#### < DTC/CIRCUIT DIAGNOSIS >

#### S TERMINAL CIRCUIT

Description INFOID:000000012546663

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:0000000012546664

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.

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

#### Does battery voltage exist?

YES

- >> Refer to CHG-23, "Work Flow (With EXP-800 NI or GR8-1200 NI) (with Cummins 5.0L)", CHG-26, "Work Flow (With EXP-800 NI or GR8-1200 NI) (with VK56VD)", CHG-29, "Work Flow (Without EXP-800 NI or GR8-1200 NI) (with Cummins 5.0L)", CHG-31, "Work Flow (Without EXP-800 NI or GR8-1200 NI) (with VK56VD)".
- NO >> Check harness for open between generator and fuse.

#### **CHARGING SYSTEM**

#### < SYMPTOM DIAGNOSIS >

# SYMPTOM DIAGNOSIS

# **CHARGING SYSTEM**

Symptom Table

Symptom	Reference	,
Battery discharged		(
The charge warning lamp does not illuminate when the ignition switch is set to ON.	Refer to CHG-23, "Work Flow (With EXP-800 NI or GR8-1200 NI)	ı
The charge warning lamp does not turn OFF after the engine starts.	(with Cummins 5.0L)" or CHG-29, "Work Flow (Without EXP-800 NI or GR8-1200 NI) (with Cummins 5.0L)".	
The charging warning lamp turns ON when increasing the engine speed.		-

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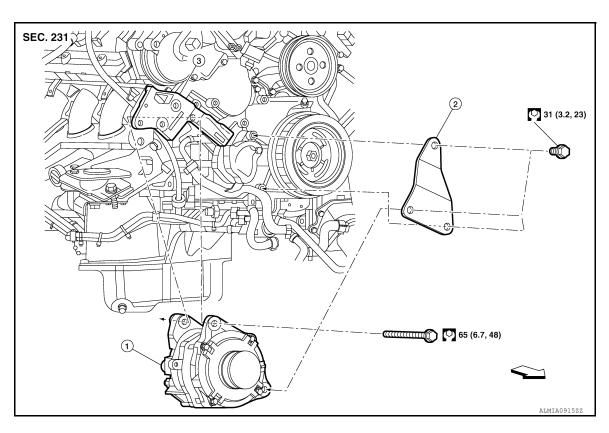
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# REMOVAL AND INSTALLATION

#### **GENERATOR**

Removal and Installation: VK56VD



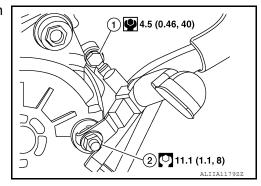
- 1. Generator
- ← Front

- Generator front bracket
- 3. Generator rear bracket

INFOID:0000000012546667

#### **REMOVAL**

- 1. Disconnect the battery. Refer to PG-174, "Battery Disconnect".
- 2. Remove drive belt. Refer to EM-23, "Removal and Installation".
- 3. Remove the wheel and tire (RH) using a power tool. Refer to WT-69, "Removal and Installation".
- 4. Position the front wheels to the RH stop.
- 5. Remove the RH front fender protector. Refer to <u>EXT-32</u>, "Removal and Installation Front Fender Protector".
- 6. Disconnect the generator harness connector (2) and position aside.
- 7. Remove the generator ground wire (1).



- 8. Remove generator front bracket mounting bolt.
- 9. Remove generator rear bracket mounting bolt.

10. Remove the generator.

#### **INSTALLATION**

Installation is in the reverse order of removal.

Hand-tighten generator bracket mounting bolts, then tighten to specified torque.

#### Removal and Installation: Cummins 5.0L

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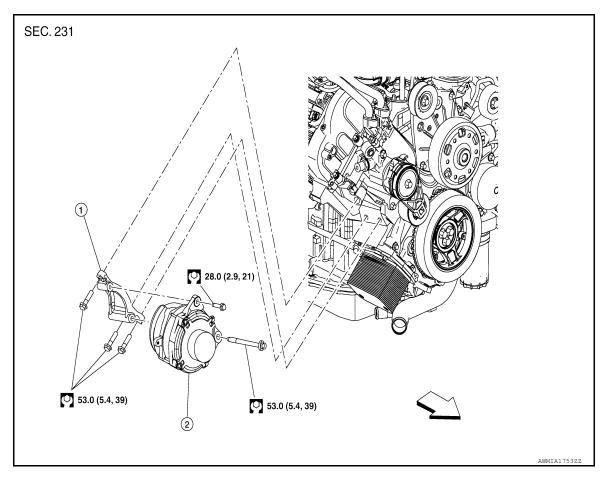
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- 1. Generator
- A. Upper bolts

- 2. Lower bracket
- B. Upper bracket bolt
- 3. Upper bracket
- C. Lower bracket bolt

#### **REMOVAL**

- 1. Disconnect the battery or batteries. Refer to <a href="PG-174">PG-174</a>, "Battery Disconnect".
- Remove the drive belt. Refer to <u>EM-190, "Removal and Installation Drive Belt"</u>.
- 3. Remove the wheel and tire (RH) using power tool. Refer to WT-69, "Removal and Installation".
- 4. Remove the front mudguard (RH). Refer to EXT-36, "Removal and Installation".
- 5. Remove the front fender protector (RH). Refer to <u>EXT-32</u>, "Removal and Installation Front Fender Protector".

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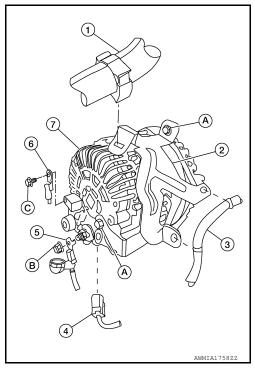
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#### **GENERATOR**

#### < REMOVAL AND INSTALLATION >

- 6. Disconnect the engine harness retainer (1) from the engine harness bracket (2) and position aside.
- 7. Disconnect negative battery cable (3) from engine harness bracket (2) and push aside
- 8. Disconnect engine harness connector (4) from bottom of generator (7).
- 9. Remove bolt (C) and engine harness cable (6) from back of generator (7).
- 10. Remove terminal nut (B) and engine harness cable (5) from back of generator (7).
- Remove upper and lower mounting bolts and generator from vehicle.
- 12. Remove three mounting bolts and generator bracket from engine (if necessary).
- 13. Remove two bolts (A) and engine harness bracket (2) from generator (7) (if necessary).



#### INSTALLATION

Installation is in the reverse order of removal.

- Hand-tighten generator bracket mounting bolts, then tighten to specified torque. This model includes the variable voltage control system. Therefore be sure to inspect the variable voltage control system after replacing the generator to ensure the system operates normally.
- Hand-tighten generator mounting 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 : 10.8 N·m (1.1 kg-m, 8 ft-lb)
Terminal bolt : 4.46 N·m (0.45 kg-m, 39 in-lb)

#### **GENERATOR**

< SERVICE DATA AND SPECIFICATIONS (SDS)

# SERVICE DATA AND SPECIFICATIONS (SDS)

## **GENERATOR**

Generator INFOID:000000012546668

Model* VK56VD Cummins 5.0L	A003TX2191ZC 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)		

<sup>\*:</sup> Always check with the Parts Department for the latest parts information.

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