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# **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. This system includes seat belt switch inputs and dual stage front air bag modules. The SRS system uses the seat belt switches to determine the front air bag deployment, and may only deploy one front air bag, depending on the severity of a collision and whether the front occupants are belted or unbelted. Information necessary to service the system safely is included in the "SRS AIR BAG" and "SEAT BELT" of this Service Manual.

#### WARNING:

Always observe the following items for preventing accidental activation.

- To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision that would result in air bag inflation, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.
- Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see "SRS AIR BAG".
- Never use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.

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

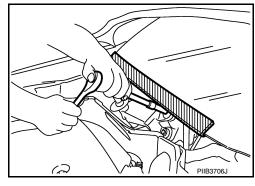
#### **WARNING:**

Always observe the following items for preventing accidental activation.

- When working near the Air Bag Diagnosis Sensor Unit or other Air Bag System sensors with the ignition ON or engine running, never use air or electric power tools or strike near the sensor(s) with a hammer. Heavy vibration could activate the sensor(s) and deploy the air bag(s), possibly causing serious injury.
- When using air or electric power tools or hammers, always switch the ignition OFF, disconnect the battery, and wait at least 3 minutes before performing any service.

Precaution for Procedure without Cowl Top Cover

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



Precautions For Xenon Headlamp Service

INFOID:0000000012409985

INFOID:0000000012409984

### **WARNING:**

Comply with the following warnings to prevent any serious accident.

- Disconnect the battery cable (negative terminal) or the power supply fuse before installing, removing, or touching the xenon headlamp (bulb included). The xenon headlamp contains high-voltage generated parts.
- Never work with wet hands.
- Check the xenon headlamp ON-OFF status after assembling it to the vehicle. Never turn the xenon headlamp ON in other conditions. Connect the power supply to the vehicle-side connector.

### **PRECAUTIONS**

#### < PRECAUTION >

(Turning it ON outside the lamp case may cause fire or visual impairments.)

Never touch the bulb glass immediately after turning it OFF. It is extremely hot.

#### **CAUTION:**

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

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

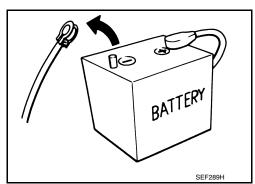
## Precautions for Removing Battery Terminal

When disconnecting the battery terminal, pay attention to the following.

- Always use a 12V battery as power source.
- Never disconnect battery terminal while engine is running.
- When removing the 12V battery terminal, turn OFF the ignition switch and wait at least 30 seconds.
- For vehicles with the engine listed below, remove the battery terminal after a lapse of the specified time:

YS23DDT D4D engine : 20 minutes : 4 minutes HRA2DDT : 12 minutes YS23DDTT : 4 minutes K9K engine : 4 minutes ZD30DDTi : 60 seconds ZD30DDTT : 60 seconds M9R engine : 4 minutes

R9M engine : 4 minutes
V9X engine : 4 minutes
YD25DDTi : 2 minutes



#### NOTE:

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

After high-load driving, if the vehicle is equipped with the V9X engine, turn the ignition switch OFF and wait
for at least 15 minutes to remove the battery terminal.

#### NOTE:

- Turbocharger cooling pump may operate in a few minutes after the ignition switch is turned OFF.
- Example of high-load driving
- Driving for 30 minutes or more at 140 km/h (86 MPH) or more.
- Driving for 30 minutes or more on a steep slope.
- For vehicles with the 2-batteries, be sure to connect the main battery and the sub battery before turning ON the ignition switch.

### NOTE:

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

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

#### NOTE:

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

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Revision: October 2015 CHG-3 2016 Quest

# **PREPARATION**

# **PREPARATION**

# **Special Service Tools**

INFOID:0000000012409987

Tool number (TechMate No. Tool name	.)	Description
— (—) Model GR8-1200 NI Multitasking battery and electrical diagnostic station	AWIIA1239ZZ	Tests batteries, starting and charging systems and charges batteries. For operating instructions, refer to diagnostic station instruction manual.
— (—) Model EXP-800 NI Battery and electrical diagnostic ana- lyzer	JSMIA0806ZZ	Tests batteries and charging systems. For operating instructions, refer to diagnostic analyzer instruction manual.

# **Commercial Service Tools**

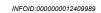
INFOID:0000000012409988

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

# SYSTEM DESCRIPTION

COMPONENT PARTS CHARGING SYSTEM

**CHARGING SYSTEM: Component Parts Location** 



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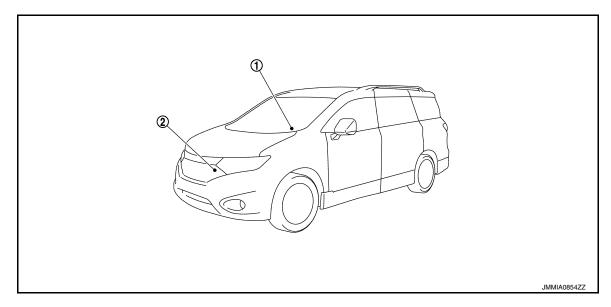
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No.	Component pa	ırt	Description
1.	Combination meter (Charge wa	arning lamp)	The IC voltage regulator warning function activates to illuminate the charge warning lamp, if any of the following symptoms occur while alternator is operating:  • Excessive voltage is produced.  • No voltage is produced.
		"B" terminal	Refer to CHG-19, "Description".
2.	Alternator	"S" terminal	Refer to CHG-23, "Description".
		"L" terminal	Refer to CHG-20, "Description".

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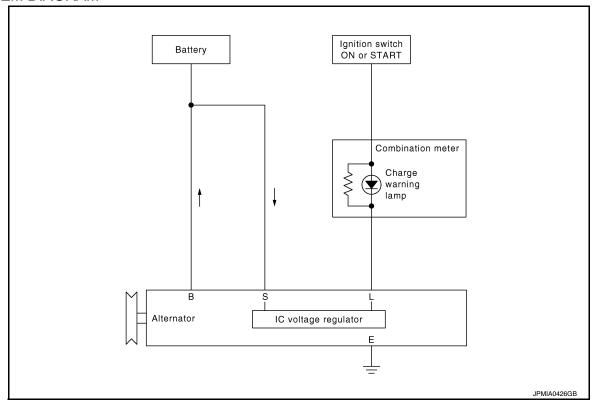
# **SYSTEM**

# **CHARGING SYSTEM**

CHARGING SYSTEM: System Description

INFOID:0000000012409990

# SYSTEM DIAGRAM



## **OUTLINE**

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

# < WIRING DIAGRAM > WIRING DIAGRAM Α **CHARGING SYSTEM** Wiring Diagram INFOID:0000000012409991 В ECM E19 C D To CAN system AS): With automatic slide door OS): Without automatic slide door Е JOINT CONNECTOR-E04 (E123) F G Н J K FUSE BLOCK (J/B) (M8) **₹** CHARGE L M11 E105 IGNITION SWITCH ON or START 4 A CHG (F) (E) Ν CHARGING SYSTEM 0 CPU 2015/09/04 Ρ

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BATTERY

의	YSTEM				0000			
Connector No. B	899	Connector No.	8101	Connector No.	8103	Connector No.	E6	
Connector Name	JOINT CONNECTOR NO2-B01	Connector Name	JOINT CONNECTOR-B02	Connector Name	JOINT CONNECTOR-B17	Connector Name	WIRE TO WIRE	
Connector Type T	TK04FW-J	Connector Type	TK04FW-J	Connector Type	TK04FW-J	Connector Type	TK16MGY-1V	
匮		Œ		匮		Œ		
H.S.	0432	H.S.	043210	H.S.	0 3 2 1 0	Σ.	1 2 3 - 4 5 6 7 8 9 10 11 12 13 14 15 16	
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t		$^{+}$		$^{+}$		$^{+}$		
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4		- I		3		+		
		4	,			4 2 S	, ,	
Connector No.	B100			Connector No.	B104	H		
Connector Name	JOINT CONNECTOR NOZ-802	Connector No.	B102	Connector Name	JOINT CONNECTOR-818	7 6		
- 1		Connector Name	JOINT CONNECTOR-804	Т		+		
1	K04FW-J	Connector Tone	TVOADALI	ı	IKU4FW-J	y 5		
Œ		connector type	-NORTWY-1	Œ		+		
U E		F		<u> </u>		Н		
113	0 4 3 2 0	Š		113	<b>0</b> 3 2 1 <b>0</b>	13 SB		
			0 4 3 2 1 0			15 W		
						Н		
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No. Wire	oignar Name [openiikation]	lei	Signal Name [Specification]	No. Wire	ognal Name [opecintation]	Connector No.	E11	
2 8	,	No. Wire	,	T .		Connector Name	POM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)	
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		3 b					Thorne and	
		4 P				6		
						¥ .		
						13.	42 41 40 39	
							46 45 44 43	
						Terminal Color Of No. Wire	Signal Name [Specification]	
						Н		
						40 L		
						41 B		

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1900   1900	Connector Nume   Wilk E O WIRE   Connector Nume   Conne	Wife TOWNWATOW   No. 20   No	1	Trout CON
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1	Terminal Color Of Ferminal C	Terminal Color Of No. Wire	7.1   R   7.2   R   7.2   7.3   7.3   7.4   7.4   7.5   7.	or Of //re //re P P P P P P P P P P P P P P P P P P P
1	Terminal Color Of No. Wife   Signal Name   Specification		72   4   1   1   1   1   1   1   1   1   1	or of of fire P P P P P P P P P P P P P P P P P P P
1	Terminal Color Of   Term	Terminal Color Of Freminal C	72 Connector Name   1014   3   1   10    Connector Name   1010ff CONNECTOR £63    Connector Type   Trout-Wu-1    Terminal   Color Of   Signal Name   Specification	07 Of fire P P P P P P P P P P P P P P P P P P P
1	18.5   Terminal Color Of Ter		73   68   75   76   75   76   75   76   75   76   75   76   75   76   75   76   76	or of fire   P   P   P   P   P   P   P   P   P
75   54   7   1   1   1   1   1   1   1   1   1	Terminal Color Of Mine Signal Name Experimation   Color Of Mine Signal Name		75   St   St   St   St   St   St   St   S	70 Of P P P P P P P P P P P P P P P P P P
75   58	Terminal Color Of   Term		75   84	or Of //re   P   P   P   P   P   P   P   P   P
77   6   .	Terminal Color Of Signal Name Specification   276   77   78   78   78   78   78   78		77	or of fire P P P P P P P P P P P P P P P P P P P
1	Ferminal   Color Of   Signal Name   Specification   19	Terminal   Color Of	77   6   .	or of fire P P P P P P P P P P P P P P P P P P P
1	Terminal Color Of Signal Name (Specification)   23		28   0   1   1   1   1   1   1   1   1   1	or Of   P   P   P   P   P   P   P   P   P
Signature   Connector Name   Connector	Ferminal Golor Of Warre   Signal Name Specification   Rich Warre   Name Specification   Name Sp	Ferminal   Color Of	Signate   Connector No.   Connector No.   Connector Type   Tr0.4FW.J   Connector Type	fre P P P P P P P P P P P P P P P P P P P
Signature   Connector Name   Connector	March   Specification   Second   Seco	No.   Note   N	Si	F P P P P P P P P P P P P P P P P P P P
S3   R	No.   Warfe   No.   No	10. SHIRLD 10. SH	8.2   1.6	P P P E124 E124
E122   P   P	1 SHEED   1 SHEED   2 SH	2 2 2 3 3 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	E122   Troot-PW-1	m
## E122  ## E122  ## COMMECTOR-E03  ## COMMECTOR	2	2	E122	а а а <u>а</u>
## 15.2   2   2   2   2   2   2   2   2   2	3   8   9   1   1   1   1   1   1   1   1   1	3	E122 Pe JOINT CONNECTOR-E03 TROAFW4	a a g
E122   P   P   P   P   P   P   P   P   P	4	1	E122  P INGAFW-1    TAGAFW-1    TAGAFW-1    TAGAFW-1    TAGAFW-1    TAGAFW-1    TAGAFW-1    TAGAFW-1    TAGAFW-1    TAGAFW-1   TAGAF	
E122   Connector No.   E124   Connector No.   E124   Connector No.   E124   Connector No.   E124   Connector Name   Joint Con   TrodeWuj   Connector Name   Joint Con   TrodeWuj   Connector Type   TrodeWuj   Connector Type   TrodeWuj   Connector Type   TrodeWuj   Con   Connector Type   TrodeWuj   Con   C	1	6 4 7 8 8 8 8 3 3 3 3 4 4 5 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6	E122	م ا
E123   Connector No.   E124	1	6 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	E122  I TICULE-WA-J  TICULE-WA-J  OT Of Signal Name (Specification)	يو ا
Total Manue   Specification   Total Manue   Total Ma	7   R   R   Connector Name   Connector	2 7 8 8 8 8 11 11 11 11 11 11 11 11 11 11 1	I Trodrew.)  I Trodrew.)  I A 3 2 1 I II  Signal Name (Specification)	
TrickFW4    Tric	S   CR   CONTRICTOR ABOVE   CO	8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	Incorety 1  Incorety 1  Incorety 1  Incorety 1	9
Connector Name   TOO-FW-J   Connector Name   JOINT CON	10   V   Cornector Name   Total-W-J   Cornector Name   Total-W-J   Total-W-J	9 9 11 12 12 13 13 13 14 15 15 15 15 15 15 15 15 15 15 15 15 15	S.	9
Connector Name   Conn	10   818   Connector Name   Connector	2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	A. Ocier Of Signal Name (Specification)	
Connector Type   TROGFWJ   Connector Type   TROGFWJ   Connector Type   TROGFWJ   Color Of   Color	10   8   8	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	S.	
Connector Type   TruckPu	11   V   Connector Mye   Trackfivil   Trac	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	A. URAN Securitation Securitation	1
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Cobr Of Signal Name (Specification)  Wire 1	13   W	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Color Of Segmal Name (Specification)	
Coor Of Signal Name (Specification)  Terminal Color Of No. Wire  L	13	2 2 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	Color Of Signal Name (Specification)	QĮ.
Color Of Signal Name (Specification)  Wre Signal Name (Specification)  Terminal Color Of No. Write No. Write 1	14   1   1   1   1   1   1   1   1   1	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Color Of Signal Name (Specification)	金丁
Color Of Signal Name (Specification)  Terminal Color Of No. Wire 1	13   GP   CP   CP   CP   CP   CP   CP   CP	15 15 16 17 18 18 18 18 18 18 18 18 18 18 18 18 18	Color Of Signal Name (Specification)	,
Color Of Signal Name (Specification)  Wre Signal Name (Specification)  Tremmal Color Of No. Write 1	31   GF	3 1 1 1 2 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3	Color Of	
Color Of Signal Name (Specification)  Wire L L No. Wire 1 1 2 P 4 P	23    V   V   V   V   V   V   V   V   V	2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	Color Of	7 + 7
Color Of L         Signal Name [Specification]         Terminal Color Of Nine L         Wire L         Wire L         A P         A         P         A         A         P         A         P         A         A         P         A         P         A         A         P         A         A         P         A	37	3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	Color Of	
Color Of   Signal Name [Specification]	37         BR         Terminal         Terminal         Color Of Low         Signati Name (Specification)         Terminal         Color Of Low         Wite         Application         Terminal         Color Of Low         Wite         Terminal         Color Of Low         Wite         Application         Application         Terminal         Color Of Low         Wite         Application	3.7 3.8 3.9 3.9 4.1 4.1 4.1 4.3 4.3 4.3 4.3 4.3 4.3 4.3 4.3	Color Of	
Wree         Signal Name (Specification)           1         Terminal (Color Of Inc.)           1         No.         Wire           1         .         .         .           1         .         .         .         .           1         .         .         .         .         .           4         .         .         .         .         .         .	38   G	38 39 40 41 42 42 45 46 46 47 47 47 47 47 47 47 47 47 47 47 47 47		
Terminal Color Of	18	38 39 40 41 41 42 45 45 46 49 49 49 51 51 52 53		
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No. 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	40         P         No.         Wire           41         L         3         L         1         P           43         LO         3         L         1         P         P           43         LO         3         L         7         P         P           44         V         4         L         P         P         P           51         BR         -         -         P         P         P           52         C         -         -         -         P         P           54         C         -         -         -         P         P           54         C         -         -         -         P         P           55         V         -         -         -         P         P           54         C         -         -         -         -         P           55         V         -         -         -         -         -           55         V         -         -         -         -         -           56         V         -         -         -         -	40 41 42 43 45 46 47 47 49 51 51 53		Color Of
	41 1 1 1	40 43 43 43 46 46 49 49 49 51 52 53		18000
	41 L	41 42 45 46 46 47 47 49 51 52 53	+	+
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	45 SP	42 43 45 46 47 49 51 52 53	ł	ł
-	43 P P 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	43 45 46 47 49 51 52 53	1	+
	45 46 47 47 47 49 51 52 53 54 56 55	45 46 47 49 51 52 53		
	46 49 49 49 52 52 53 54 54 55	46 47 49 51 52 53		
	47 7 49 49 49 51 51 52 52 54 55 55 55 55 55 55 55 55 55 55 55 55	47 49 51 52 53		
	477 49 49 51 52 53 54 55 56	47 49 51 52 53		
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	Connector Name WIRE TO WIRE Connector Type TX16FGV-1V		Terminal Color Of Signal Name (Specification)   No. Wire   Signal Name (Specification)   1	3 G/R -	5 R .	Н	8 P	11 10	)       	14 B .	16		П		Connector Type NS12FW-CS	Œ	No. of the Control of		120 110 100 90 80 70 60				Terminal Color Of Signal Name [Specification]	NO. WIFE	
Connector No.	TH FUSBLE LINK  Connector Name ALTERNATOR  Connector Type 24340_JA09A	E]@	Sgnal Name [Specification] Terminal Color Of Signal Name [Specification] No. Wire Signal Name [Specification] 1 S/R	Connector No.   F60	IPDIN EAR INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)  Connector Name ALTERNATOR	Connector Type H503FB		STATE OF THE PARTY			Signal Name [Specification] Terminal Color Of Signal Name [Specification]	t	. 4 Y/B	┨											
	Connector Name BATTERY TERMINAL WITH FUSBLE LINK Connector Type 24340_A04D	HS.	Terminal Color Of No. Wire 5 8//R	Connector No. F12	Connector Name IPDM E/R UNTELLIGENT POW	Connector Type TH20FW-CS12-M4		S	Decirio Reservi		Terminal Color Of Signal Na No.	48	49 R/B	+	Н	54 G/W	+	+	H	8/M 69	Н	71 P	+	74 Lb	
$_{\circ}$ $\Box$	Connector Name JOINT CONNECTOR-E07  Connector Type TK04FW-J	H.S. 014 210	Terminal Color Of Signal Name [specification] No. Wire 1	4 1 -	Connector No. E308	١.	Т	唇	(I.S.	7		=	No. Wire Jaguar Marrie Japeunica	┨											

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CHAR	GING	CHARGING SYSTEM						
7C	GR		51	9		œ	SB	TRIP RESET SWITCH SIGNAL [With automatic drive positioner]
3C	U		52	*		10	۵	METER CONTROL SWITCH GROUND
96	>		53	8	,	11	9	ENTER SWITCH SIGNAL
			54	91		12	BR	SELECT SWITCH SIGNAL [With automatic drive positioner]
			25	7	,	12	œ	SELECT SWITCH SIGNAL [Without automatic drive positioner]
Connector No.	No.	M11	26	SHIELD		13	Α	ILLUMINATION CONTROL SWITCH SIGNAL (+) PATITISON automatic drive positioner)
Connector Name	Marma	WIRETOWIRE	61	В		13	٨	(1 воера вое за траничения предуставления при воера под предуставления
mecro	a line	WINE IO WINE	62	M		14	9	(Jave) as so a weight supplies the street of the second se
Connector Type	Type	TH70FW-CS10-M3	63	8		14	۸	Descripted employments state () than 5 hours colling definitions.
			64	M		15	88	AIR BAG SIGNAL
(F		þ	99	W	•	16	7	ENGINE COOLANT TEMPERATURE SIGNAL
Ę			- 67	BR		18	_	AMBIENT SENSOR SIGNAL [Without automatic drive positioner]
2		111 111 111 111	69	Р		18	16	AMBIENT SENSOR SIGNAL [With automatic drive positioner]
			7.1	В		19	ч	A/C AUTO AMP. CONNECTION RECOGNITION SIGNAL
			72	1		20	9	AMBIENT SENSOR GROUND [Without automatic drive positioner]
			73	91		20	Å	AMBIENT SENSOR GROUND [With automatic drive positioner]
			74	Å		21	7	CAN-H
Ferminal	Color Of	Control Name Consideration	75	Å		22	d	CAN-L
No.	Wire	olgian wante [obscurration]	9/	۸		23	8	GROUND
1	SHIELD		7.7	Ь		24	8	FUEL LEVEL SENSOR GROUND
2	Μ		78	BR		25	88	ALTERNATOR SIGNAL [With automatic drive positioner]
3	8		80	Å		25	M	ALTERNATOR SIGNAL [Without automatic drive positioner
4	В		81	M		56	88	PARKING BRAKE SWITCH SIGNAL
9	9		82	1		27	38	(Leosissos arus pracusare anoque) (Marko Swill Dari arus and Calif Estado
7	ч		83	æ		27	>	BRAKE FLUID LEVEL SWITCH SIGNAL (With automatic drive positioner
8	9					28	۸	SECURITY SIGNAL
6	8					29	9	WASHER LEVEL SWITCH SIGNAL
10	В		Connector No.	No.	M34	31	8S	VEHICLE SPEED SIGNAL (8-PULSE)
11	Μ		Connector Manne	Ammo	BETTER NOTENIARIO	32	d	OVERDRIVE CONTROL SWITCH SIGNAL
12	-	- [Without automatic drive positioner]	O Dallier	allie	COMBINATION METER	34	0	FUEL LEVEL SENSOR SIGNAL
12	91	- [With automatic drive positioner]	Connector Type	Type	TH40FW-NH	35	BR	Devotos such autors such stops (1997)
13	g	- [Without automatic drive positioner]	_			35	۵	SEAT BILCIOLE SWITCH SIGNAL (DRIVER SIDE) With automatic drive positioner
13	>	- [With automatic drive positioner]				36	BR	PASSENGER SEAT BELT WARNING SIGNAL
14	_		·					
15	۵		?		7			
31	œ				21 22 23 24 25 25 25 25 25 25 25 25 25 25 25 25 25			
32	97							
37	8R	- [With automatic drive positioner]						
37	*	- [Without automatic drive positioner]						
38	œ		Terminal	Color Of	500000000000000000000000000000000000000			
39	H	- [Without automatic drive positioner]	O	Wire	oignai Name [opecification]			
39	>	- [With automatic drive positioner]	1	0	BATTERY POWER SUPPLY [With automatic drive positioner]			
40	۵		1	Ь	BATTERY POWER SUPPLY [Without automatic drive positioner]			
41			2	9	IGNITION SIGNAL [Without automatic drive positioner]			
42	U		2	>	IGNITION SIGNAL [With automatic drive positioner]			
43	>		е	8	GROUND			
45	۵		4	8	GROUND			
46	>		s	8	ILLUMINATION CONTROL SIGNAL [Without automatic drive positioner]			
47	۳		2	B/P	ILLUMINATION CONTROL SIGNAL [With automatic drive positioner]			
49	9		×	9	TRIP RESET SWITCH SIGNAL [Without automatic drive positioner]			

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### < BASIC INSPECTION >

# **BASIC INSPECTION**

# DIAGNOSIS AND REPAIR WORK FLOW

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

INFOID:0000000012409992

### 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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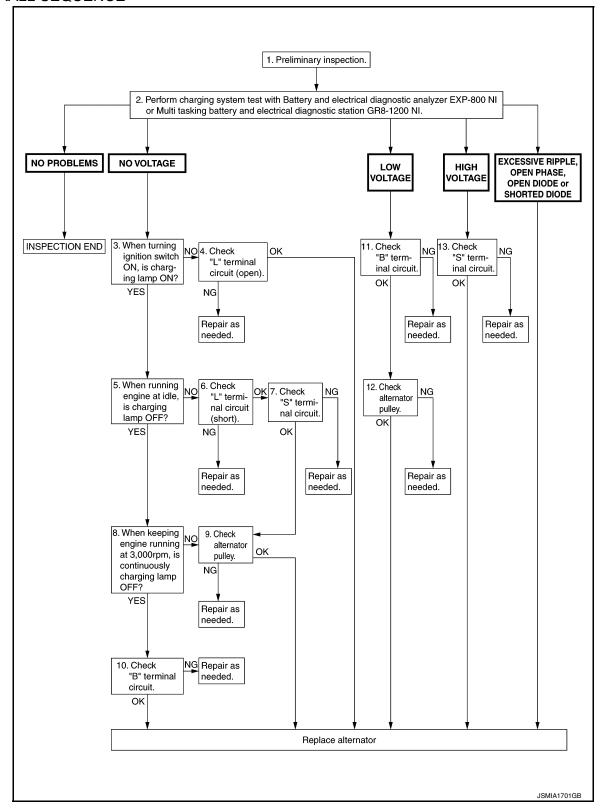
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### < BASIC INSPECTION >

### **OVERALL SEQUENCE**



### **DETAILED FLOW**

#### NOTE

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

# 1. PRELIMINARY INSPECTION

Perform the preliminary inspection. Refer to <a href="CHG-18">CHG-18</a>, "Inspection Procedure".

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#### < BASIC INSPECTION >

>> GO TO 2.

# 2.DIAGNOSIS WITH EXP-800 NI OR GR8-1200 NI

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

#### Test result

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

NO VOLTAGE>>GO TO 3.

LOW VOLTAGE>>GO TO 11.

HIGH VOLTAGE>>GO TO 13.

EXCESSIVE RIPPLE, OPEN PHASE, OPEN DIODE or SHORTED DIODE>>Replace the alternator. Perform "DIODE RIPPLE" test again using Multitasking battery and electrical diagnostic station GR8-1200 NI or Battery and electrical diagnostic analyzer EXP-800 NI to confirm repair.

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

Turn the ignition switch ON.

## Does the charge warning lamp illuminate?

YES >> GO TO 5.

NO >> GO TO 4.

# 4. "L" TERMINAL CIRCUIT (OPEN) INSPECTION

Check "L" terminal circuit (open). Refer to CHG-20, "Diagnosis Procedure".

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

YES >> Replace alternator. Refer to CHG-26, "Removal and Installation".

NO >> Repair as needed.

# $\mathbf{5}.$ INSPECTION WITH CHARGE WARNING LAMP (IDLING)

Start the engine and run it at idle.

### Does the charge warning lamp turn OFF?

YES >> GO TO 8.

NO >> GO TO 6.

# 6."L" TERMINAL CIRCUIT (SHORT) INSPECTION

Check "L" terminal circuit (short). Refer to CHG-22, "Diagnosis Procedure".

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

YES >> GO TO 7.

NO >> Repair as needed.

# 7. "S" TERMINAL CIRCUIT INSPECTION

Check "S" terminal circuit. Refer to CHG-23, "Diagnosis Procedure".

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

YES >> GO TO 9.

NO >> Repair as needed.

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

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

#### Does the charge warning lamp remain off?

YES >> GO TO 10.

NO >> GO TO 9.

## 9 INSPECTION OF ALTERNATOR PULLEY

Check alternator pulley. Refer to CHG-27, "Inspection".

#### Is alternator pulley normal?

YES >> Replace alternator. Refer to CHG-26, "Removal and Installation".

NO >> Repair as needed.

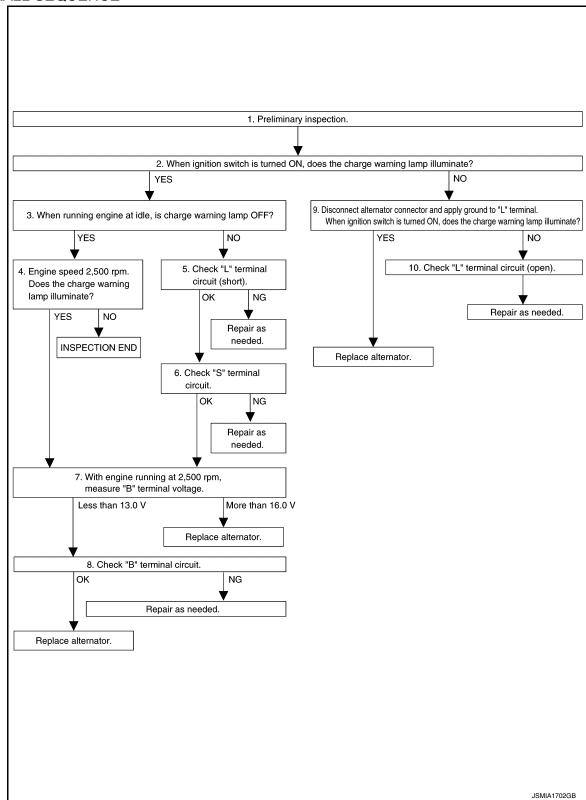
< BASIC INSPECTION >	
10. "B" TERMINAL CIRCUIT INSPECTION	^
Check "B" terminal circuit. Refer to CHG-19, "Diagnosis Procedure".	A
Is "B" terminal circuit normal?	
YES >> Replace alternator. Refer to <u>CHG-26, "Removal and Installation"</u> .  NO >> Repair as needed.	В
11. "B" TERMINAL CIRCUIT INSPECTION	
Check "B" terminal circuit. Refer to CHG-19, "Diagnosis Procedure".	C
Is "B" terminal circuit normal?	
YES >> GO TO 12. NO >> Repair as needed.	D
12.INSPECTION OF ALTERNATOR PULLEY	
Check alternator pulley. Refer to CHG-27, "Inspection".	E
Is alternator pulley normal?	
YES >> Replace alternator. Refer to <a href="CHG-26">CHG-26</a> , "Removal and Installation".  NO >> Repair as needed.	F
13. "S" TERMINAL CIRCUIT INSPECTION	
Check "S" terminal circuit. Refer to CHG-23, "Diagnosis Procedure".	
Is the "S" terminal circuit normal?	
YES >> Replace alternator. Refer to <a href="CHG-26">CHG-26</a> , "Removal and Installation".  NO >> Repair as needed.	Н
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### < BASIC INSPECTION >

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

INFOID:0000000012409993

### **OVERALL SEQUENCE**



### **DETAILED FLOW**

# 1. PRELIMINARY INSPECTION

Perform the preliminary inspection. Refer to <a>CHG-18</a>, "Inspection Procedure"</a>.

< BASIC INSPECTION >	
>> GO TO 2.	
2.INSPECTION WITH CHARGE WARNING LAMP (IGNITION SWITCH IS TURNED ON)	А
When ignition switch is turned ON	
Does the charge warning lamp illuminate?	В
YES >> GO TO 3.	
NO >> GO TO 9.	
3.INSPECTION WITH CHARGE WARNING LAMP (IDLING)	C
Start the engine and run it at idle.	
Does the charge warning lamp turn OFF? YES >> GO TO 4.	D
NO >> GO TO 5.	
4.INSPECTION WITH CHARGE WARNING LAMP (ENGINE AT 2,500 RPM)	_
Increase and maintain the engine speed at 2,500 rpm.	E
Does the charge warning lamp illuminate?	
YES >> GO TO 7.	F
NO >> INSPECTION END	
5."L" TERMINAL CIRCUIT (SHORT) INSPECTION	
Check "L" terminal circuit (short). Refer to CHG-22, "Diagnosis Procedure".	— G
Is the inspection result normal?	
YES >> GO TO 6.	Н
NO >> Repair as needed.  6. "S" TERMINAL CIRCUIT INSPECTION	
Check "S" terminal circuit. Refer to CHG-23, "Diagnosis Procedure".	'
Is the inspection result normal?  YES >> GO TO 7.	
NO >> Repair as needed.	J
7.MEASURE "B" TERMINAL VOLTAGE	
Start engine. With engine running at 2,500 rpm, measure "B" terminal voltage.	K
What voltage does the measurement result show?	
Less than 13.0 V>>GO TO 8.	
More than 16.0 V>>Replace alternator. Refer to CHG-26, "Removal and Installation".	L
8."B" TERMINAL CIRCUIT INSPECTION	
Check "B" terminal circuit. Refer to <u>CHG-19, "Diagnosis Procedure"</u> .	CHG
Is the inspection result normal?	
YES >> Replace alternator. Refer to <u>CHG-26, "Removal and Installation"</u> .  NO >> Repair as needed.	
9.INSPECTION WITH CHARGE WARNING LAMP (IGNITION SWITCH IS ON)	N
Disconnect alternator connector and apply ground to "L" terminal.	
2. Turn the ignition switch ON.	0
Does the charge warning lamp illuminate?	
YES >> Replace alternator. Refer to CHG-26, "Removal and Installation".	Б
NO >> GO TO 10.	Р
10.check "L" terminal circuit (open)	
Check "L" terminal circuit (open). Refer to <a href="CHG-20">CHG-20</a> , "Diagnosis Procedure".	

>> Repair as needed.

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### CHARGING SYSTEM PRELIMINARY INSPECTION

### < BASIC INSPECTION >

# CHARGING SYSTEM PRELIMINARY INSPECTION

# Inspection Procedure

INFOID:0000000012409994

# 1. CHECK BATTERY TERMINALS CONNECTION

Check if battery terminals are clean and tight.

### Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair battery terminals connection.

## 2.CHECK FUSE

Check for blown fuse and fusible link.

Unit	Power source (Power supply terminals)	Fuse No.
Alternator	Battery ("S" terminal)	38
Combination meter	Ignition switch ON ("L" terminal)	4

### Is the inspection result normal?

YES >> GO TO 3.

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

# $3.\mathsf{CHECK}$ "E" TERMINAL CONNECTION (ALTERNATOR GROUND)

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

### Is the inspection result normal?

YES >> GO TO 4.

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

# 4. CHECK DRIVE BELT TENSION

Check drive belt tension. Refer to EM-15, "Checking".

#### Is the inspection result normal?

YES >> INSPECTION END

NO >> Repair as needed.

### **B TERMINAL CIRCUIT**

#### < DTC/CIRCUIT DIAGNOSIS >

# DTC/CIRCUIT DIAGNOSIS

# **B TERMINAL CIRCUIT**

Description INFOID:000000012409995

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

# Diagnosis Procedure

# 1. CHECK "B" TERMINAL CONNECTION

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

### Is the inspection result normal?

YES >> GO TO 2.

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

# 2.CHECK "B" TERMINAL CIRCUIT

Check voltage between alternator "B" terminal and ground.

(+)		( )	Voltage (Approx.)	
Alternator "B" terminal	Terminal	(-)		
F59	1	Ground	Battery voltage	

### Is the inspection result normal?

YES >> GO TO 3.

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

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

- 1. Start engine, then engine running at idle and warm.
- 2. Check voltage between battery positive terminal and alternator "B" terminal.

(+)	(-	(-)	Voltage (Approx.)
(')	Alternator "B" terminal	Terminal	
Battery positive terminal	F59	1	Less than 0.2 V

### Is the inspection result normal?

YES >> "B" terminal circuit is normal. Refer to <a href="CHG-12">CHG-16</a>, "Work Flow (Without EXP-800 NI or GR8-1200 NI)".

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

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Revision: October 2015 CHG-19 2016 Quest

# L TERMINAL CIRCUIT (OPEN)

### < DTC/CIRCUIT DIAGNOSIS >

# L TERMINAL CIRCUIT (OPEN)

Description INFOID:0000000012409997

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

## Diagnosis Procedure

INFOID:0000000012409998

# 1. CHECK "L" TERMINAL CONNECTION

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

### Is the inspection result normal?

YES >> GO TO 2.

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

# 2.CHECK "L" TERMINAL CIRCUIT (OPEN)

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

Alternator harness connector	Terminal	Ground	Condition	
			Ignition switch position	Charge warning lamp
F60	3		ON	Illuminate

### Does it illuminate?

YES >> "L" terminal circuit is normal. Refer to <a href="CHG-12">CHG-16</a>, "Work Flow (Without EXP-800 NI or GR8-1200 NI)" or <a href="GR8-1200 NI">CHG-16</a>, "Work Flow (Without EXP-800 NI or GR8-1200 NI)".

NO >> GO TO 3.

# 3.check harness continuity (open circuit)

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

Alternator harness connector		Combination meter	Continuity	
Connector No.	Terminal No.	Connector No. Terminal No.		Continuity
F60	3	M34	25	Existed

### Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair the harness or connector.

# 4. CHECK HARNESS CONTINUITY (OPEN CIRCUIT)

Check continuity between combination meter harness connector M34 terminal 2 and 10A fuse [No.4 located in the fuse block (J/B)].

## Does continuity exist?

YES >> GO TO 5.

NO >> Repair the harness.

# CHECK POWER SUPPLY CIRCUIT

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

# L TERMINAL CIRCUIT (OPEN)

### < DTC/CIRCUIT DIAGNOSIS >

Terminals				_
(+)			Condition	Voltage (Approx.)
Combination meter harness connector	Terminal	(–)		,
M34	2	Ground	When the ignition switch is in ON position	Battery voltage

### Is the inspection result normal?

YES >> Replace combination meter.

NO >> Inspect the power supply circuit. Refer to PG-58, "Wiring Diagram - IGNITION POWER SUPPLY - "

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# L TERMINAL CIRCUIT (SHORT)

### < DTC/CIRCUIT DIAGNOSIS >

# L TERMINAL CIRCUIT (SHORT)

Description INFOID:000000012409999

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

## Diagnosis Procedure

INFOID:0000000012410000

# 1.check "L" Terminal Circuit (Short)

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

### Does charge warning lamp illuminate?

YES >> GO TO 2.

NO >> Refer to CHG-12, "Work Flow (With EXP-800 NI or GR8-1200 NI)" or CHG-16, "Work Flow (Without EXP-800 NI or GR8-1200 NI)".

# 2.CHECK HARNESS CONTINUITY (SHORT CIRCUIT)

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

Combination meter harness connector			Continuity
Connector No. Terminal No.		Ground	Continuity
M34	25		Not existed

#### Is the inspection result normal?

YES >> Replace combination meter.

NO >> Repair the harness.

## **S TERMINAL CIRCUIT**

### < DTC/CIRCUIT DIAGNOSIS >

# S TERMINAL CIRCUIT

Description INFOID:0000000012410001

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

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

# Diagnosis Procedure

INFOID:0000000012410002

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# 1. CHECK "S" TERMINAL CONNECTION

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

### Is the inspection result normal?

YES >> GO TO 2.

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

# 2.CHECK "S" TERMINAL CIRCUIT

Check voltage between alternator harness connector and ground.

(	+)	(_)	Voltage (Approx.)
Alternator harness connector	Terminal	(-)	
F60	4	Ground	Battery voltage

### Is the inspection result normal?

YES >> Refer to CHG-12, "Work Flow (With EXP-800 NI or GR8-1200 NI)" or CHG-16, "Work Flow (Without EXP-800 NI or GR8-1200 NI)".

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

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Revision: October 2015 CHG-23 2016 Quest

# **CHARGING SYSTEM**

# < SYMPTOM DIAGNOSIS >

# **SYMPTOM DIAGNOSIS**

# **CHARGING SYSTEM**

Symptom Table

INFOID:0000000012410003

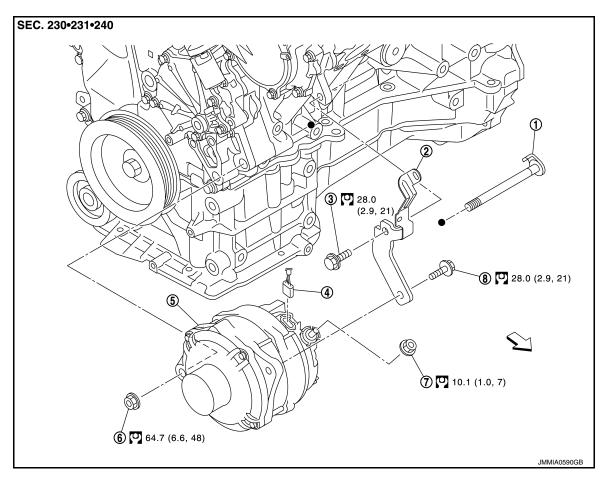
Symptom	Reference		
Discharged battery			
The charge warning lamp does not illuminate when the ignition switch is set to ON.	Refer to CHG-12, "Work Flow (With EXP-800 NI or GR8-1200 NI)"		
The charge warning lamp does not turn OFF after the engine starts.	or CHG-16, "Work Flow (Without EXP-800 NI or GR8-1200 NI)"		
The charging warning lamp turns ON when increasing the engine speed.			

# REMOVAL AND INSTALLATION

# **ALTERNATOR**

**Exploded View** INFOID:0000000012410004

### **REMOVAL**



- Alternator mounting bolt (lower)
- Alternator harness connector
- "B" terminal harness nut
- : N·m (kg-m, ft-lb)
- : indicates that the part is connected at points with same symbol in actual vehicle.

2.

Alternator bracket

Alternator mounting bolt (upper)

Alternator

**DISASSEMBLY** 

- Alternator bracket mounting bolt
- Alternator mounting nut (lower)

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- Rear bearing
- 4. Front bearing
- 7. Pulley
- 10. IC voltage regulator assembly
- 13. Terminal set
- : Always replace after every disassembly.
- : N·m (kg-m, in-lb)
- : N·m (kg-m, ft-lb)

- 2. Rotor assembly
- 5. Front bracket assembly
- 8. Pulley nut
- 11. Diode assembly

- 3. Retainer
- 6. Through bolt
- 9. Stator assembly
- 12. Rear bracket assembly

### Removal and Installation

INFOID:0000000012410005

### **REMOVAL**

Disconnect the battery cable from the negative terminal. Refer to <u>PG-136, "Removal and Installation"</u>.

To prevent damage to the parts, disconnect the battery cable from the negative terminal first.

- 2. Remove air duct (inlet). Refer to EM-27, "Exploded View".
- 3. Remove reservoir tank. Refer to CO-14, "Exploded View".
- Disconnect alternator harness connector.
- 5. Remove "B" terminal harness nut, and then disconnect "B" terminal harness.
- 6. Remove alternator mounting bolt (upper).
- Remove engine under cover. Refer to <u>EXT-28</u>, "<u>Exploded View</u>".
- 8. Remove front wheel RH.
- 9. Remove splash guard RH. Refer to EXT-23, "Removal and Installation".
- 10. Remove drive belt. Refer to EM-14, "Removal and Installation".
- 11. Remove idler pulley. Refer to EM-14, "Removal and Installation".
- 12. Remove compressor mounting bolts, and then move compressor to secure work space. Refer to <u>HA-30</u>, "Exploded View".

## **ALTERNATOR**

#### < REMOVAL AND INSTALLATION >

#### **CAUTION:**

Never disconnect low-pressure flexible hose and high-pressure flexible hose from compressor.

13. Remove water pipe mounting bolts, and then move water pipe to secure work space. Refer to <u>LU-12</u>, <u>"Exploded View"</u>.

#### **CAUTION:**

Never disconnect water hose from water pipe.

14. Remove return tube fixing clamps, and then move return tube to secure work space. Refer to <u>ST-35.</u> <u>"Exploded View"</u>.

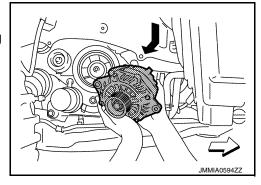
# **CAUTION:**

Never disconnect return tube from return hose assembly.

- 15. Remove alternator mounting bolt (lower) and alternator mounting nut (lower).
- 16. Remove alternator from the right side of the vehicle. **CAUTION:**

Be careful not to contact with and damage surrounding parts when removing alternator from the vehicle.

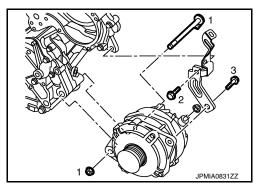
: Vehicle front



#### **INSTALLATION**

Note the following items, and then install in the reverse order of removal. **CAUTION:** 

• Temporarily tighten all of alternator bolts and nut. And then tighten them in numerical order shown in the figure.



- Install alternator, and check tension of belt. Refer to EM-15, "Checking".
- Be careful to tighten "B" terminal nut carefully.

Inspection INFOID:0000000012410006

### ALTERNATOR PULLEY INSPECTION

Perform the following.

- Make sure that alternator pulley does not rattle.
- Make sure that alternator pulley nut is tight. Refer to <a href="CHG-25">CHG-25</a>. "Exploded View".

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Revision: October 2015 CHG-27 2016 Quest

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

< SERVICE DATA AND SPECIFICATIONS (SDS)

# SERVICE DATA AND SPECIFICATIONS (SDS)

SERVICE DATA AND SPECIFICATIONS (SDS)

Alternator INFOID:000000012410007

Туре		A003TJ1791	
		MITSUBISHI make	
Nominal rating	[V - A]	12 -130	
Ground polarity		Negative	
Minimum revolution under no-load (When 13.5 V is applied)	[rpm]	Less than 1,300	
Hot output current (When 13.5 V is applied)	[A/rpm]	More than 108/2,500 More than 124/5,000	
Regulated output voltage	[V]	14.1 - 14.7	