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< BASIC INSPECTION > [QR25DE]

BASIC INSPECTION

DIAGNOSIS AND REPAIR WORKFLOW

Work Flow (With GR8-1200 NI)

INFOID:0000000008693425 STR

STARTING SYSTEM DIAGNOSIS WITH GR8-1200 NI

To test the starting system, use the following special service tool:

GR8-1200 NI Multitasking battery and electrical diagnostic station

NOTE:

Refer to the diagnostic station Instruction Manual for proper starting system diagnosis procedures.

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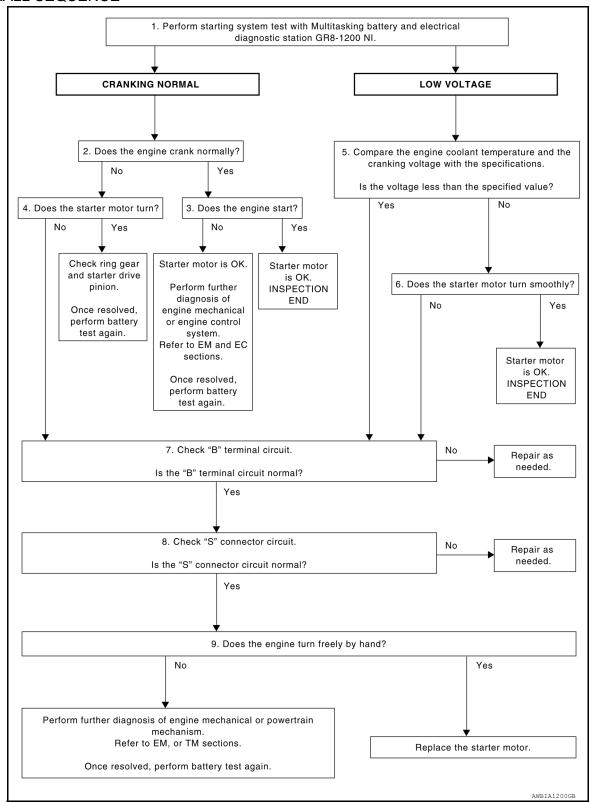
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OVERALL SEQUENCE



DETAILED FLOW

NOTE:

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

1. DIAGNOSIS WITH MULTITASKING BATTERY AND ELECTRICAL DIAGNOSTIC STATION GR8-1200 NI

[QR25DE] < BASIC INSPECTION > Perform the starting system test with Multitasking battery and electrical diagnostic station GR8-1200 NI. For details and operating instructions, refer to diagnostic station Instruction Manual. Α Test result CRANKING NORMAL>>GO TO 2. LOW VOLTAGE>>GO TO 5. STR CHARGE BATTERY>>Perform the slow battery charging procedure. (Initial rate of charge is 10A for 12 hours.) Perform battery test again. Refer to diagnostic station instruction manual. REPLACE BATTERY>>Before replacing battery, clean the battery cable clamps and battery posts. Perform battery test again. Refer to diagnostic station instruction manual. If second test result is "REPLACE BATTERY", then do so. Perform battery test again to confirm repair. 2.CRANKING CHECK D Check that the starter motor operates properly. Does the engine crank normally? Е YES >> GO TO 3. NO >> GO TO 4. 3. ENGINE START CHECK Check that the engine starts. Does the engine start? YES >> Inspection End. >> Perform further diagnosis of engine mechanical or engine control system. Refer to EM and EC NO sections. Once resolved, perform battery test again. 4.STARTER MOTOR ACTIVATION Н Check that the starter motor operates. Does the starter motor turn? YES >> Check ring gear and starter motor drive pinion. Once resolved, perform battery test again. NO >> GO TO 7. ${f 5}.$ COMPARISON BETWEEN ENGINE COOLANT AND CRANKING VOLTAGE Compare the engine coolant temperature and verify the cranking voltage is within specifications. Minimum Specification of Cranking Voltage Referencing Coolant Temperature Engine coolant temperature [°C (°F)] Voltage [V] -30 to -20 (-22 to -4) 8.6 -19 to -10 (-2 to 14) 9.1 9.5 -9 to 0 (16 to 32) 9.9 More than 1 (More than 34) Is the voltage less than the specified value? YES >> GO TO 7. NO >> GO TO 6. **O.**STARTER OPERATION N Check the starter operation. Does the starter motor turn smoothly? YES >> Inspection End. >> GO TO 7. NO 1."B" TERMINAL CIRCUIT INSPECTION Check "B" terminal circuit. Refer to STR-39, "Diagnosis Procedure". Is "B" terminal circuit normal? YES >> GO TO 8.

STR-5 Revision: June 2012 2011 Altima GCC

>> Repair as needed.

 $oldsymbol{8}$. "S" CONNECTOR CIRCUIT INSPECTION

Check "S" connector circuit. Refer to STR-39, "Diagnosis Procedure".

NO

< BASIC INSPECTION > [QR25DE]

Is "S" connector circuit normal?

YES >> GO TO 9.

NO >> Repair as needed.

9. ENGINE ROTATION STATUS

Check that the engine can be rotated by hand.

Does the engine turn freely by hand?

YES >> Replace starter motor.

NO >> Perform further diagnosis of engine mechanical or powertrain mechanism. Once resolved, perform battery test again using Multitasking battery and electrical diagnostic station GR8-1200 NI. Refer to the diagnostic station Instruction Manual for proper testing procedures.

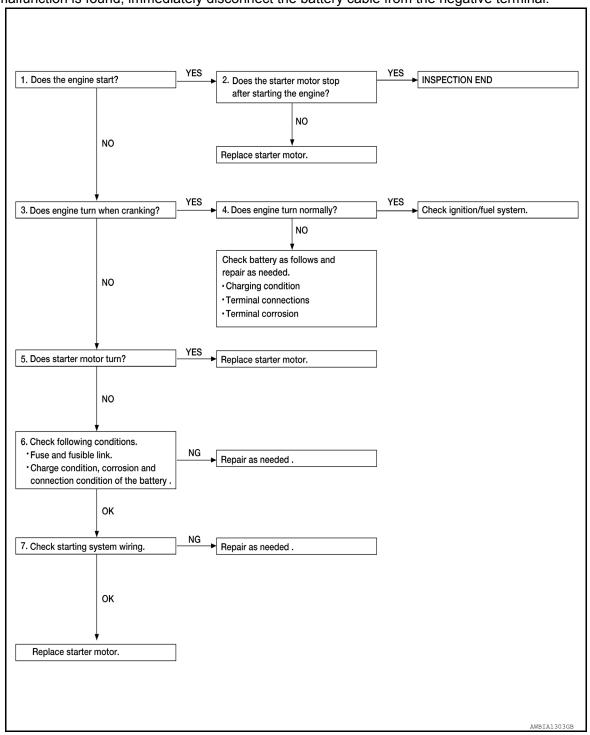
Work Flow (Without GR8-1200 NI)

INFOID:0000000008693426

OVERALL SEQUENCE

[QR25DE] < BASIC INSPECTION >

If any malfunction is found, immediately disconnect the battery cable from the negative terminal



DETAILED FLOW

NOTE:

If any malfunction is found, immediately disconnect the battery cable from the negative terminal.

1. CHECK ENGINE START

Crank the engine and check that the engine starts.

Does the engine start?

YES >> GO TO 2.

NO >> GO TO 3.

2.CHECK THAT THE STARTER MOTOR STOPS

Check that the starter motor stops after starting the engine.

STR-7 Revision: June 2012 2011 Altima GCC

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< BASIC INSPECTION > [QR25DE]

Does the starter motor stop?

YES >> Inspection End.

NO >> Replace starter motor. Refer to STR-30, "Removal and Installation".

3.check that the engine turns when cranking

Check that the engine turns when cranking.

Does engine turn when cranking?

YES >> GO TO 4.

NO >> GO TO 5.

4. CHECK THE ENGINE SPEED WHEN CRANKING

Check that the engine speed is not low when cranking.

Does engine turn normally?

YES >> Check ignition/fuel system.

NO >> Check charge condition, corrosion and connection condition of the battery.

CHECK STARTER MOTOR ACTIVATION

Check that the starter motor runs at cranking.

Does starter motor turn?

YES >> Replace starter motor. Refer to STR-30, "Removal and Installation".

NO >> GO TO 6.

CHECK POWER SUPPLY CIRCUIT

Check the following conditions:

Fuse and fusible link

· Charge condition, corrosion and connection of the battery.

Are these inspection results normal?

YES >> GO TO 7.

NO >> Repair as needed.

7. CHECK STARTING SYSTEM WIRING

Check the following:

- "B" terminal circuit. Refer to STR-39, "Diagnosis Procedure".
- "S" terminal circuit. Refer to STR-41, "Diagnosis Procedure".

Are the inspection results normal?

YES >> Replace starter motor. Refer to <u>STR-30</u>, "Removal and Installation".

NO >> Repair as needed.

[QR25DE]

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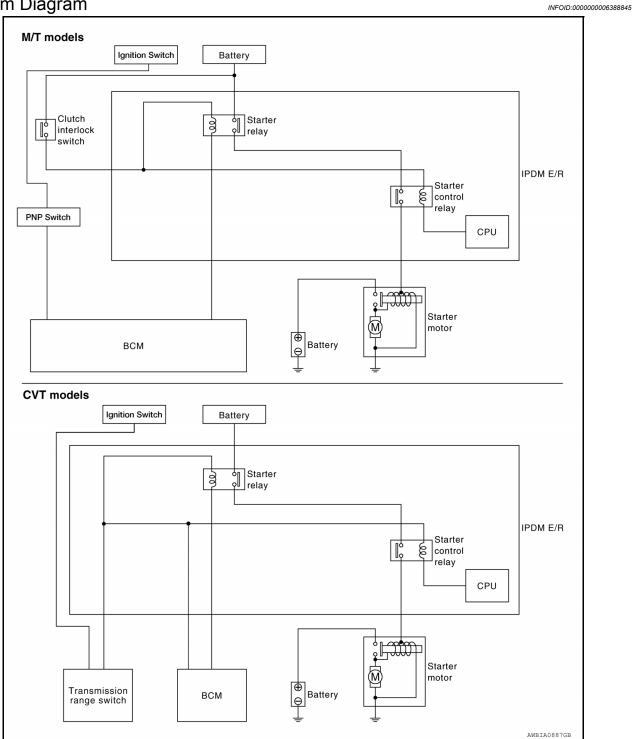
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SYSTEM DESCRIPTION

STARTING SYSTEM

System Diagram



System Description

The starter motor plunger closes and provides a closed circuit between the battery and the starter motor. The starter motor is grounded to the cylinder block. With power and ground supplied, the starter motor operates.

STARTING SYSTEM

< SYSTEM DESCRIPTION >

[QR25DE]

Component Description

INFOID:0000000006388847

Component part	Description
Transmission range switch (CVT models)	Transmission range switch supplies power to the starter relay and starter control relay inside IPDM E/R when the shift selector is placed in the P or N position.
Clutch interlock switch (M/T models)	The switch turns ON and electric power is supplied to the starter relay and starter control relay inside IPDM E/R when the clutch pedal is depressed.
BCM	BCM controls the starter relay inside IPDM E/R.
IPDM E/R	CPU inside IPDM E/R controls the starter control relay.
Starter motor	The starter motor plunger closes and the motor is supplied with battery power, which in turn cranks the engine, when the "S" terminal is supplied with electric power.

[QR25DE]

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DTC/CIRCUIT DIAGNOSIS

B TERMINAL CIRCUIT

Description STR

Terminal "B" is constantly supplied with battery power.

Diagnosis Procedure

Regarding Wiring Diagram information, refer to <u>STR-14, "Wiring Diagram - Coupe With QR25DE"</u> or <u>STR-20, "Wiring Diagram - Sedan With QR25DE"</u>.

CAUTION:

Perform diagnosis under the condition that the engine cannot start by the following procedure.

- 1. Remove fuel pump fuse.
- 2. Crank or start the engine (where possible) until the fuel pressure is released.
- 1. CHECK "B" TERMINAL CIRCUIT
- 1. Turn ignition switch OFF.
- 2. Check that starter motor "B" terminal connection is clean and tight.
- 3. Check voltage between starter motor connector and ground.

	Terminals		Voltage (Approx.)	
(+	•)	()		
Starter motor B terminal	Terminal	(-)		
F27	В	Ground	Battery voltage	

Is the inspection result normal?

YES >> GO TO 2.

NO >> Check harness between battery and starter motor for open circuit.

2.check battery cable connection status (voltage drop test)

- 1. Shift CVT selector lever to P (Park) or N (Neutral) position.
- 2. Check voltage between battery positive terminal and starter motor B terminal.

	Terminals			
	(-)		Condition	Voltage
(+)	Starter motor "B" terminal	Terminal		(Approx.)
Battery positive terminal	F27	В	When the ignition switch is in START position	Less than 0.5V

Is the inspection result normal?

YES >> GO TO 3.

NO >> Check harness between the battery and starter motor for continuity.

3.CHECK GROUND CIRCUIT STATUS (VOLTAGE DROP TEST)

- 1. Shift CVT selector lever to P (Park) or N (Neutral) position.
- Check voltage between starter motor case and battery negative terminal.

Ter	minals	Condition	Voltage (Approx.)	
(+)	(-)	Condition		
Starter motor case	Battery negative terminal	When the ignition switch is in START position	Less than 0.2V	

Is the inspection result normal?

B TERMINAL CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

[QR25DE]

YES >> "B" terminal circuit is OK. Further inspection is necessary. Refer to <u>STR-32</u>, "Work Flow (With <u>GR8-1200 NI)"</u> or <u>STR-35</u>, "Work Flow (Without <u>GR8-1200 NI)"</u>.

NO >> Check the starter motor case to engine mounting for high resistance.

S CONNECTOR CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

[QR25DE]

S CONNECTOR CIRCUIT

Description

The starter motor magnetic switch is supplied with power when the ignition switch is turned to the START position while the selector lever is in the P (Park) or N (Neutral) position.

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Diagnosis Procedure

INFOID:0000000008693432

Regarding Wiring Diagram information, refer to <u>STR-14, "Wiring Diagram - Coupe With QR25DE"</u> or <u>STR-20, "Wiring Diagram - Sedan With QR25DE"</u>.

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CAUTION:

Perform diagnosis under the condition that engine cannot start by the following procedure.

- 1. Remove fuel pump fuse.
- 2. Crank or start the engine (where possible) until the fuel pressure is released.

 ${f 1}$.CHECK "S" CONNECTOR CIRCUIT

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- Turn ignition switch OFF.
- 2. Disconnect starter motor connector.
- 3. Shift selector lever to "P" (Park) or "N" (Neutral) position.
- Check voltage between starter motor harness connector and ground.

(+)	(-)	Condition	Voltage
Connector	Terminal		Condition	(Approx.)
F28	S	Ground	When the ignition switch is in START position	Battery voltage

Is the inspection result normal?

YES >> "S" circuit is OK. Further inspection is necessary. Refer to <u>STR-32</u>, "Work Flow (With GR8-1200 NI)" or <u>STR-35</u>, "Work Flow (Without GR8-1200 NI)".

NO >> GO TO 2.

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2.CHECK HARNESS CONTINUITY (OPEN CIRCUIT)

- 1. Disconnect IPDM E/R connector.
- Check continuity between starter motor harness connector and the IPDM E/R harness connector.

Starter motor ha	Starter motor harness connector		ness connector	Continuity
Connector	Terminal	Connector	Terminal	Continuity
F28	S	F10	80	Yes

Is the inspection result normal?

YES >> Further inspection is necessary. Refer to STR-32, "Work Flow (With GR8-1200 NI)" or STR-35, "Work Flow (Without GR8-1200 NI)".

NO >> Repair or replace the harness or connectors.

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Revision: June 2012 STR-13 2011 Altima GCC

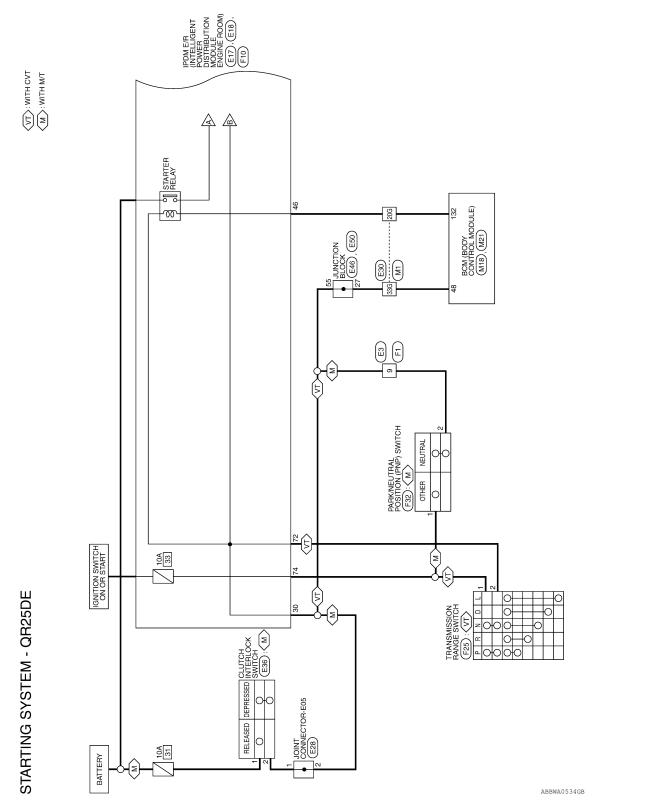
< WIRING DIAGRAM > [QR25DE]

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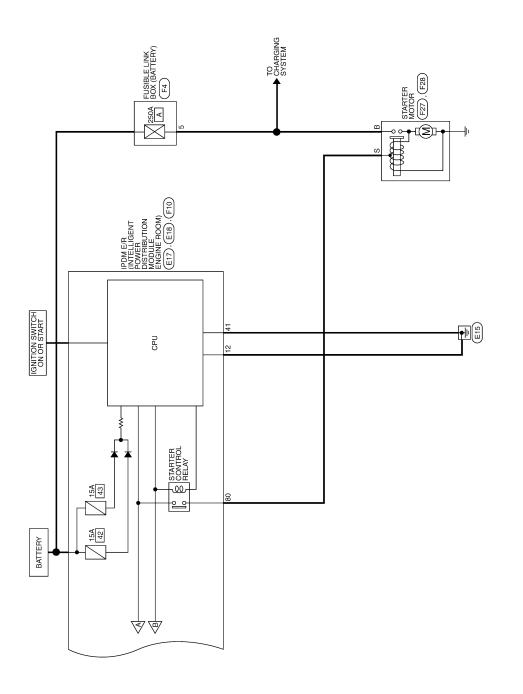
WIRING DIAGRAM

STARTING SYSTEM

Wiring Diagram - Coupe With QR25DE



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GND (SIGNAL) START CONT

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Signal Name

Color of Wire

Terminal No.

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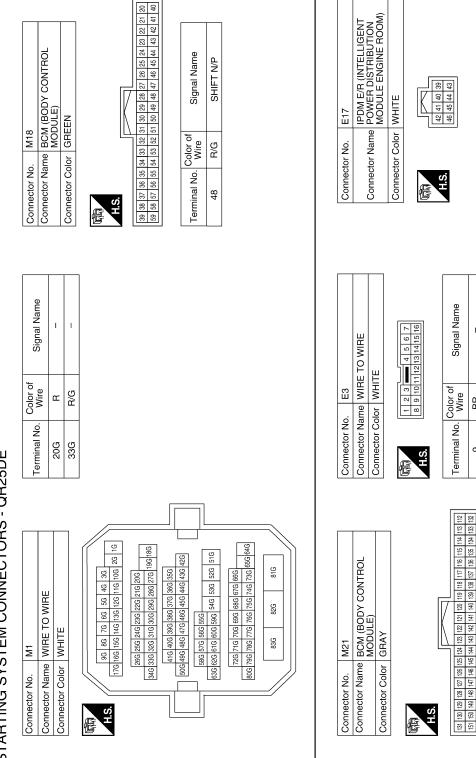
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Signal Name

Color of Wire

Terminal No. 132

STARTING SYSTEM CONNECTORS - QR25DE



STARTING SYSTEM

< WIRING DIAGRAM > [QR25DE]

Revision: June 2012 STR-17 2011 Altima GCC

	IE TO WIRE	TE	13 12 11 10 9 8			Signal Name	1
E E	ame WIF	olor WH	7 6 5 4 6 6 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1			Color of Wire	>
Connector No.	Connector Name WIRE TO WIRE	Connector Color WHITE	H.S.			Terminal No. Wire	6.
Connector No. E50	Connector Name JUNCTION BLOCK	Connector Color WHITE	H.S.	Terminal No. Color of Signal Name	55 BR –		
E46	Connector Name JUNCTION BLOCK	vr WHITE	40 39 38 37 36 35 34 33 22	color of Signal Name	BR –		
Connector No. E46	Connector Nam	Connector Color WHITE	H.S.	Terminal No. Wire	27		

Connector No.	F4	Connector No.	F10	Color of	Color of	Omol Mono
Connector Name	Connector Name FUSIBLE LINK BOX (BATTERY)	Connector Name	IPDM E/R (INTELLIGENT POWER DISTRIBUTION	72	wire W	NPSW
Connector Color	1		MODULE ENGINE ROOM)	74	_	START_IG_EGI
		Connector Color WHITE	WHITE	80	<u>ac</u>	STARTER MOTOR
是 H.S.		H.S.				
		53 54	57 58 69 70 71 72 73 74 75 76 77 78	81 82		
Terminal No. Wire	olor of Signal Name	48 49 50	+	79 80		
2	B/R –					

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STARTER MOTOR			Signal Nam	START
	-	\cdot	Color of Wire	В
ıme	olor		_	_
ctor Name	ctor Color		nal No.	

	F28	STA	ı		Solor of Wire	Я
nnector Nonnector Nonnector Nonnector Connector Connector Connector Connector Connector Connector Connector Connector Nonnector Connector Nonnector Connector Nonnector Nonnecto	·	ame	olor		Š≥	_
	Connector No.	Connector Na	Connector Co	H.S.	Terminal No.	S

	STARTER MOTOR		<u>a</u>	Signal Name	TVB
. F27		lor		Color of Wire	a/a
Connector No.	Connector Name	Connector Color	明 H.S.	Terminal No.	а
			· <u></u>		

	TRANSMISSION RANGE SWITCH	¥	2 1	Signal Name	ı	1
F25	_	or BLACK	2 8 4 3	Color of Wire	_	8
Connector No.	Connector Name	Connector Color	南 H.S.	Terminal No.	-	2

Connector No.	F32
Connector Name	Connector Name PARK/NEUTRAL POSITION (PNP) SWITCH
Connector Color BLACK	BLACK
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Connector Name PARK/NEUTRAL PC (PNP) SWITCH	¥		Signal Na	_	ı
PAHK (PNP)	lor BLACK	2	Color of Wire	Γ	*
Connector Na	Connector Color	(内) H.S.	Terminal No.	-	٥

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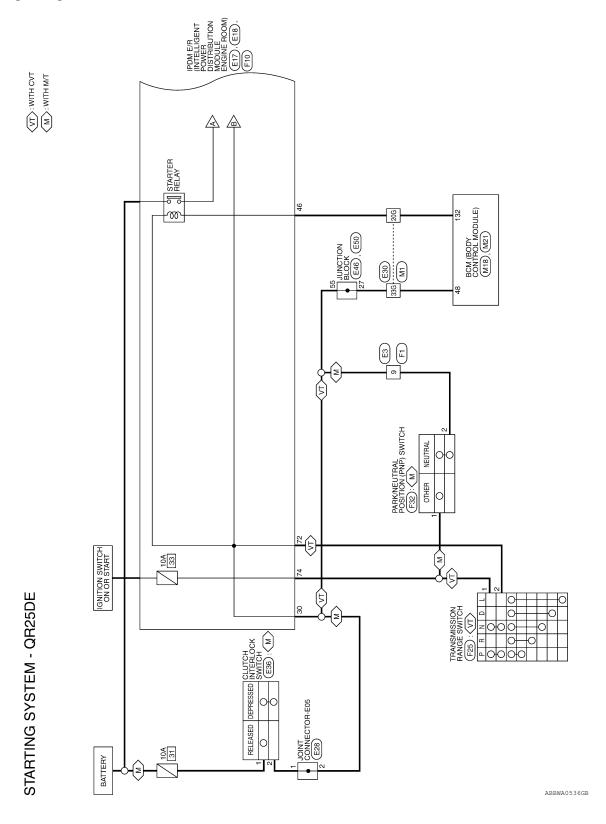
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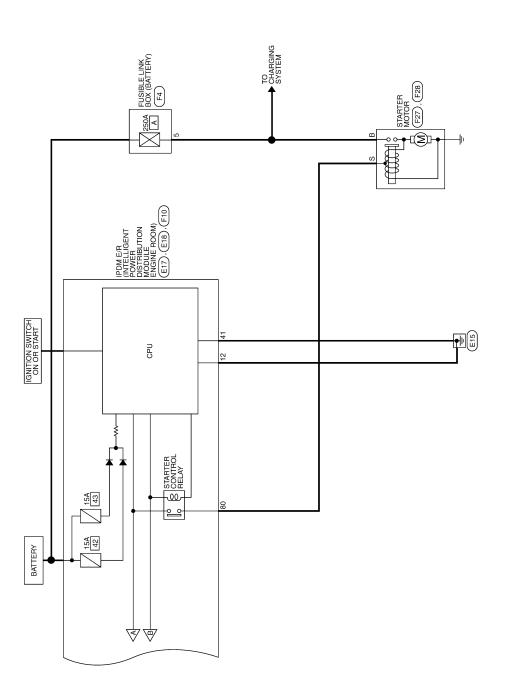
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STR-19 Revision: June 2012 2011 Altima GCC Wiring Diagram - Sedan With QR25DE

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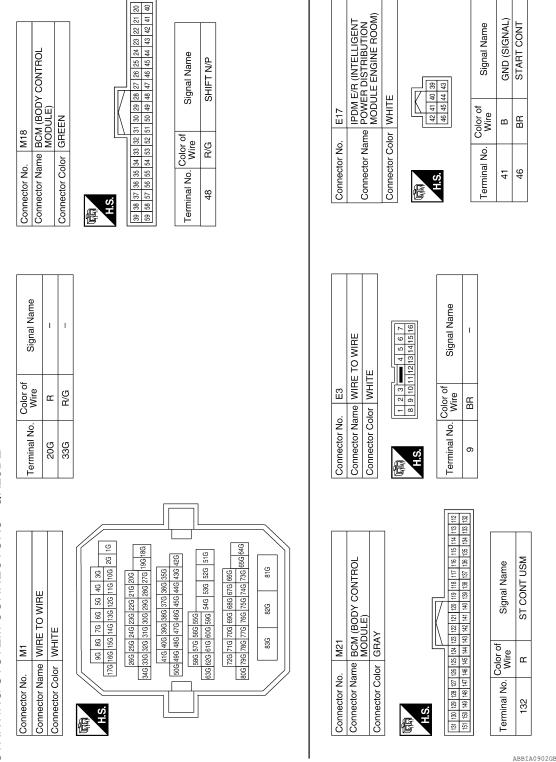
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STARTING SYSTEM CONNECTORS - QR25DE



Connector No. E28	ST C
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Signal Name GND (POWER) CLUTCH J/L SW (WITH M/T) ECM (WITH CVT)	G
Color of Wire BR BR E BR	Н
Terminal No. Col	I
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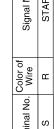
Connector No. F1 Connector Name WIRE TO WIRE Connector Color WHITE	(所)			Terminal No. Wire Signal Name	- M 6
Connector No. E50 Connector Name JUNCTION BLOCK Connector Color WHITE	88	or of Signal Name	BR -		
Connector No. E50 Connector Name JUNCTI Connector Color WHITE	是 H.S.	Terminal No. Wire	55 B		
Connector No. E46 Connector Name JUNCTION BLOCK Connector Color WHITE	31 30 23 28 27 36 35 34 33 32 3	Signal Name	1		
ame JUNC	31 30 29 28 E	Color of Wire	BR		
Connector No. E46 Connector Name JUNCTI	响 H.S.	Terminal No. Wire	27		

ctor N ctor N ctor N 48 48 48 48 48	Connector No. F4 Connector No. F10 Connector No. F10 Connector Name EUSIBLE LINK BOX Connector Name POWER DISTRIBUTION MODULE ENGINE ROOM MODULE ENGINE ROOM MODULE ENGINE ROOM Connector Color WHITE F18 F18
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	Colc
	al No.
形 S.	Ferminal No

F27	Connector Name STARTER MOTOR	_	
Connector No.	Connector Name	Connector Color	

Connector Name STARTER MOTOR
Connector Color –

F28

Connector No.



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tor No. F25	Connector Name TRANSMISSION RANGE SWITCH	Connector Color BLACK	
Connector No.	Connector Na	Connector Co	

Signal Name	1	1
Color of Wire	٦	*
Terminal No.	-	٥

BAT	B/B	В	
Signal Nar	Color of Wire	Terminal No.	

Signal Name	1	1	
Color of Wire	Г	Μ	
Terminal No.	-	2	

Connector No.	F32
Connector Name PARK/NEUTRAI (PNP) SWITCH	PARK/NEUTRAI (PNP) SWITCH
Connector Color BLACK	BLACK
H.S.	2 1

POSITION



Signal N	I	I	
Color of Wire	Г	M	
Terminal No.	1	2	

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STARTING SYSTEM

< SYMPTOM DIAGNOSIS >

[QR25DE]

SYMPTOM DIAGNOSIS

STARTING SYSTEM

Symptom Table

INFOID:0000000006388854

Symptom	Reference
No normal cranking	Refer to STR-3, "Work Flow (With GR8-1200 NI)" or STR-6, "Work
Starter motor does not rotate	Flow (Without GR8-1200 NI)".

PRECAUTIONS

< PRECAUTION > [QR25DE]

PRECAUTION

PRECAUTIONS

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

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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 SR and SB section of this Service Manual.

WARNING:

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 To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.

Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal

injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the 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 Airbag Diagnosis Sensor Unit or other Airbag System sensors with the Ignition ON or engine running, DO NOT use air or electric power tools or strike near the sensor(s) with a hammer. Heavy vibration could activate the sensor(s) and deploy the air bag(s), possibly causing serious injury.

 When using air or electric power tools or hammers, always switch the Ignition OFF, disconnect the battery, and wait at least 3 minutes before performing any service.

Necessary for Steering Wheel Rotation After Battery Disconnect

INFOID:0000000006388856

NOTE:

Before removing and installing any control units, first turn the push-button ignition switch to the LOCK position, then disconnect both battery cables.

 After finishing work, confirm that all control unit connectors are connected properly, then re-connect both battery cables.

 Always use CONSULT to perform self-diagnosis as a part of each function inspection after finishing work. If a DTC is detected, perform trouble diagnosis according to self-diagnosis results.

This vehicle is equipped with a push-button ignition switch and a steering lock unit.

If the battery is disconnected or discharged, the steering wheel will lock and cannot be turned.

If turning the steering wheel is required with the battery disconnected or discharged, follow the procedure below before starting the repair operation.

OPERATION PROCEDURE

1. Connect both battery cables.

NOTE:

Supply power using jumper cables if battery is discharged.

- 2. Carry the Intelligent Key or insert it to the key slot and turn the push-button ignition switch to ACC position. (At this time, the steering lock will be released.)
- 3. Disconnect both battery cables. The steering lock will remain released with both battery cables disconnected and the steering wheel can be turned.
- Perform the necessary repair operation.
- 5. When the repair work is completed, re-connect both battery cables. With the brake pedal released, turn the push-button ignition switch from ACC position to ON position, then to LOCK position. (The steering wheel will lock when the push-button ignition switch is turned to LOCK position.)

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PRECAUTIONS

< PRECAUTION > [QR25DE]

. Perform self-diagnosis check of all control units using CONSULT.

PREPARATION

[QR25DE] < PREPARATION >

PREPARATION

PREPARATION

Special Service Tool INFOID:0000000008655638

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Tool number (Kent-Moore No.) Tool name		Description
— (—) Model GR8-1200 NI Multitasking battery and electrical di- agnostic station	AWIIA12392Z	Tests batteries, starting and charging systems and charges batteries. For operating instructions, refer to diagnostic station instruction manual.

Commercial Service Tool

INFOID:0000000008655639

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

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REMOVAL AND INSTALLATION

STARTER MOTOR

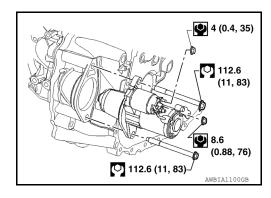
Removal and Installation

INFOID:0000000006388859

M/T Models

Removal

- 1. Disconnect the negative battery terminal.
- 2. Disconnect the starter motor harness connectors.
- 3. Remove the two starter motor bolts using power tools.
- 4. Remove the starter motor.



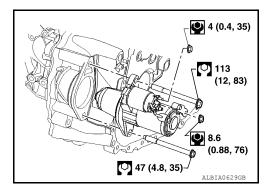
INSTALLATION

Installation is in the reverse order of removal.

CVT Models

REMOVAL

- 1. Remove the battery and battery tray. Refer to <u>PG-69</u>, "<u>Removal and Installation (Battery Tray)</u>" for Coupe, and <u>PG-141</u>, "<u>Removal and Installation (Battery Tray)</u>" for Sedan.
- 2. Disconnect the starter motor harness connectors.
- 3. Remove the starter motor bolts using power tools.
- 4. Remove the starter motor.



INSTALLATION

Installation is in the reverse order of removal.

[QR25DE]

SERVICE DATA AND SPECIFICATIONS (SDS)

STARTER MOTOR

Starter INFOID:0000000006388861

Application		QR25DE		
Application		M/T model	CVT model	
Type *		Melco M000T22272	Melco M000TA0173	
туре		Reduction gear type		
System voltage		12	12V	
No-load	Terminal voltage	11V		
	Current	90A Max.		
	Revolution	2,000 rpm Min.		

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

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< BASIC INSPECTION > [VQ35DE]

BASIC INSPECTION

DIAGNOSIS AND REPAIR WORKFLOW

Work Flow (With GR8-1200 NI)

INFOID:0000000008693427

STARTING SYSTEM DIAGNOSIS WITH GR8-1200 NI

To test the starting system, use the following special service tool:

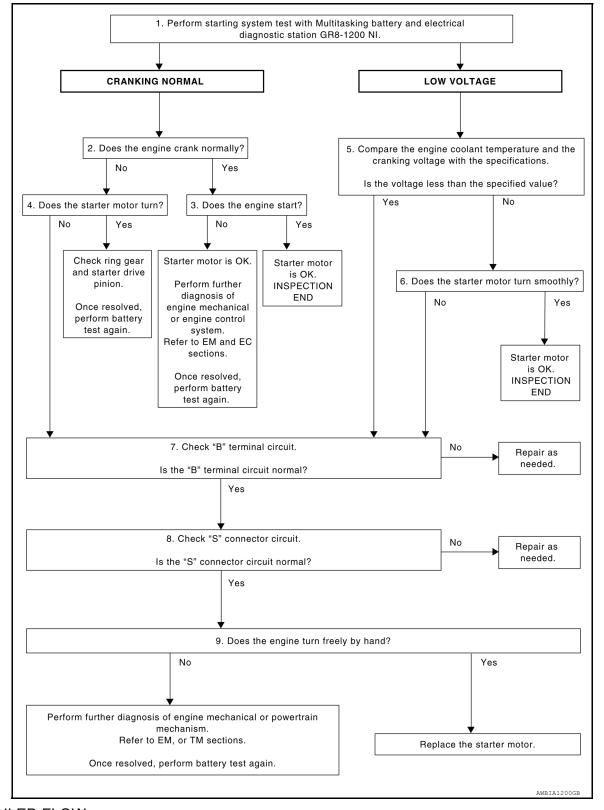
• GR8-1200 NI Multitasking battery and electrical diagnostic station

NOTE:

Refer to the diagnostic station Instruction Manual for proper starting system diagnosis procedures.

< BASIC INSPECTION > [VQ35DE]

OVERALL SEQUENCE



DETAILED FLOW

NOTE

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

 $1.\,\mathrm{diagnosis}$ with multitasking battery and electrical diagnostic station gr8-1200 Ni

Revision: June 2012 STR-33 2011 Altima GCC

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< BASIC INSPECTION > [VQ35DE]

Perform the starting system test with Multitasking battery and electrical diagnostic station GR8-1200 NI. For details and operating instructions, refer to diagnostic station Instruction Manual.

Test result

CRANKING NORMAL>>GO TO 2.

LOW VOLTAGE>>GO TO 5.

CHARGE BATTERY>>Perform the slow battery charging procedure. (Initial rate of charge is 10A for 12 hours.) Perform battery test again. Refer to diagnostic station instruction manual.

REPLACE BATTERY>>Before replacing battery, clean the battery cable clamps and battery posts. Perform battery test again. Refer to diagnostic station instruction manual. If second test result is "REPLACE BATTERY", then do so. Perform battery test again to confirm repair.

2.CRANKING CHECK

Check that the starter motor operates properly.

Does the engine crank normally?

YES >> GO TO 3.

NO >> GO TO 4.

3. ENGINE START CHECK

Check that the engine starts.

Does the engine start?

YES >> Inspection End.

NO >> Perform further diagnosis of engine mechanical or engine control system. Refer to EM and EC sections. Once resolved, perform battery test again.

4.STARTER MOTOR ACTIVATION

Check that the starter motor operates.

Does the starter motor turn?

YES >> Check ring gear and starter motor drive pinion. Once resolved, perform battery test again.

NO >> GO TO 7.

5. COMPARISON BETWEEN ENGINE COOLANT AND CRANKING VOLTAGE

Compare the engine coolant temperature and verify the cranking voltage is within specifications.

Minimum Specification of Cranking Voltage Referencing Coolant Temperature

Engine coolant temperature [°C (°F)]	Voltage [V]
-30 to -20 (-22 to -4)	8.6
-19 to -10 (-2 to 14)	9.1
-9 to 0 (16 to 32)	9.5
More than 1 (More than 34)	9.9

Is the voltage less than the specified value?

YES >> GO TO 7.

NO >> GO TO 6.

6.STARTER OPERATION

Check the starter operation.

Does the starter motor turn smoothly?

YES >> Inspection End.

NO >> GO TO 7.

1. "B" TERMINAL CIRCUIT INSPECTION

Check "B" terminal circuit. Refer to STR-39, "Diagnosis Procedure".

Is "B" terminal circuit normal?

YES >> GO TO 8.

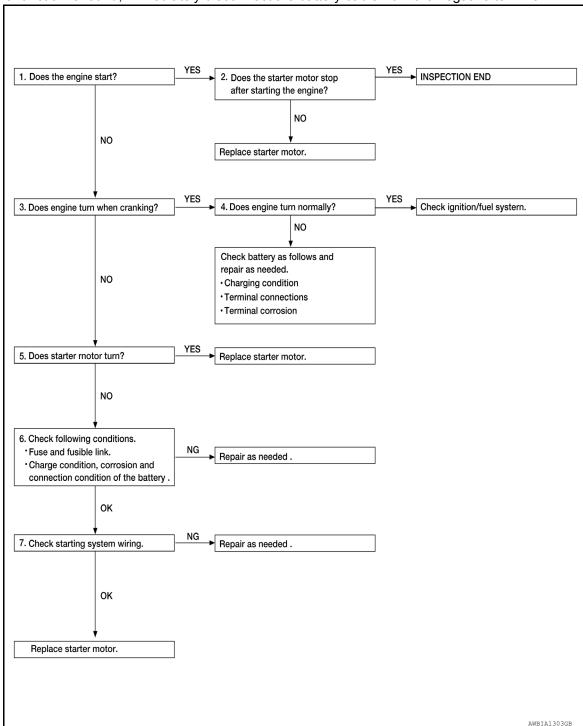
NO >> Repair as needed.

8. "S" CONNECTOR CIRCUIT INSPECTION

Check "S" connector circuit. Refer to STR-39, "Diagnosis Procedure"

DIAGNOSIS AND REPAIR WORKFLOW				
< BASIC INSPECTION >	[VQ35DE]			
Is "S" connector circuit normal?		٨		
YES >> GO TO 9. NO >> Repair as needed.		Α		
9. ENGINE ROTATION STATUS				
Check that the engine can be rotated by hand.		ST		
Does the engine turn freely by hand?				
YES >> Replace starter motor. NO >> Perform further diagnosis of engine mechanical or powertrain mechanism. Once resolved form battery test again using Multitasking battery and electrical diagnostic station GR8-120 Refer to the diagnostic station Instruction Manual for proper testing procedures.		C		
Work Flow (Without GR8-1200 NI)	INFOID:0000000008693428	D		
OVERALL SEQUENCE		Е		
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STR-35 Revision: June 2012 2011 Altima GCC If any malfunction is found, immediately disconnect the battery cable from the negative terminal.



DETAILED FLOW

NOTE:

If any malfunction is found, immediately disconnect the battery cable from the negative terminal.

1. CHECK ENGINE START

Crank the engine and check that the engine starts.

Does the engine start?

YES >> GO TO 2.

NO >> GO TO 3.

2. CHECK THAT THE STARTER MOTOR STOPS

Check that the starter motor stops after starting the engine.

DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION >	[VQ35DE]	
Does the starter motor stop? YES >> Inspection End. NO >> Replace starter motor. Refer to STR-56, "Removal and Installation".		Α
3. CHECK THAT THE ENGINE TURNS WHEN CRANKING		et D
Check that the engine turns when cranking.		STR
Does engine turn when cranking?		
YES >> GO TO 4. NO >> GO TO 5.		С
4. CHECK THE ENGINE SPEED WHEN CRANKING		
Check that the engine speed is not low when cranking.		D
Does engine turn normally?		
YES >> Check ignition/fuel system. NO >> Check charge condition, corrosion and connection condition of the battery.		Е
5. CHECK STARTER MOTOR ACTIVATION		
Check that the starter motor runs at cranking.		F
Does starter motor turn?		
YES >> Replace starter motor. Refer to <u>STR-56, "Removal and Installation"</u> . NO >> GO TO 6.		G
6. CHECK POWER SUPPLY CIRCUIT		0
Check the following conditions:		Н
 Fuse and fusible link Charge condition, corrosion and connection of the battery. 		
Are these inspection results normal?		
YES >> GO TO 7.		
_NO >> Repair as needed.		
7.CHECK STARTING SYSTEM WIRING		J
Check the following: • "B" terminal circuit. Refer to <u>STR-39</u> , " <u>Diagnosis Procedure"</u> .		
"S" terminal circuit. Refer to <u>STR-39. Diagnosis Procedure</u> . "S" terminal circuit. Refer to <u>STR-41, "Diagnosis Procedure"</u> .		K
Are the inspection results normal?		1
YES >> Replace starter motor. Refer to <u>STR-56, "Removal and Installation"</u> . NO >> Repair as needed.		L
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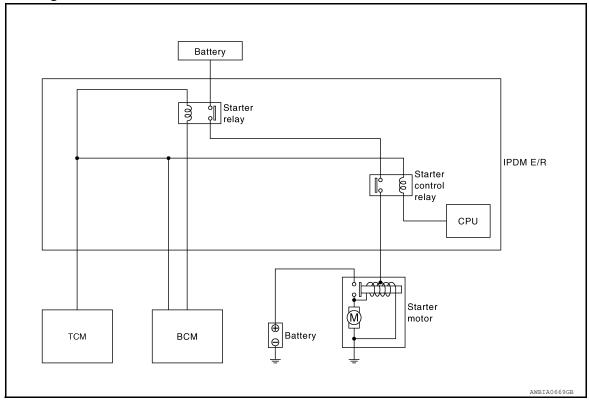
Revision: June 2012 STR-37 2011 Altima GCC

SYSTEM DESCRIPTION

STARTING SYSTEM

System Diagram

INFOID:0000000006388863



System Description

INFOID:0000000006388864

The starter motor plunger closes and provides a closed circuit between the battery and the starter motor. The starter motor is grounded to the cylinder block. With power and ground supplied, the starter motor operates.

Component Description

INFOID:0000000006388865

Component part	Description
TCM	TCM supplies power to the starter relay and starter control relay inside IPDM E/R when the shift selector is placed in the P or N position.
BCM	BCM controls the starter relay inside IPDM E/R.
IPDM E/R	CPU inside IPDM E/R controls the starter control relay.
Starter motor	The starter motor plunger closes and the motor is supplied with battery power, which in turn cranks the engine, when the "S" terminal is supplied with electric power.

[VQ35DE]

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DTC/CIRCUIT DIAGNOSIS

B TERMINAL CIRCUIT

Description STR

Terminal "B" is constantly supplied with battery power.

Diagnosis Procedure

Regarding Wiring Diagram information, refer to <u>STR-42</u>, "Wiring Diagram - Coupe With VQ35DE" or <u>STR-47</u>, "Wiring Diagram - Sedan With VQ35DE".

CAUTION:

Perform diagnosis under the condition that the engine cannot start by the following procedure.

- 1. Remove fuel pump fuse.
- 2. Crank or start the engine (where possible) until the fuel pressure is released.

1. CHECK "B" TERMINAL CIRCUIT

- Turn ignition switch OFF.
- 2. Check that starter motor "B" terminal connection is clean and tight.
- 3. Check voltage between starter motor connector and ground.

	Terminals		V "
(+	·)	()	Voltage (Approx.)
Starter motor B terminal	Terminal	(-)	()
F27	В	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 2.

NO >> Check harness between battery and starter motor for open circuit.

2.check battery cable connection status (voltage drop test)

- 1. Shift CVT selector lever to P (Park) or N (Neutral) position.
- 2. Check voltage between battery positive terminal and starter motor B terminal.

	Terminals			
	(-)		Condition	Voltage
(+)	Starter motor "B" terminal	Terminal		(Approx.)
Battery positive terminal	F27	В	When the ignition switch is in START position	Less than 0.5V

Is the inspection result normal?

YES >> GO TO 3.

NO >> Check harness between the battery and starter motor for continuity.

3.CHECK GROUND CIRCUIT STATUS (VOLTAGE DROP TEST)

- 1. Shift CVT selector lever to P (Park) or N (Neutral) position.
- 2. Check voltage between starter motor case and battery negative terminal.

Ter	minals	Condition	Voltage
(+)	(-)	Condition	(Approx.)
Starter motor case	Battery negative terminal	When the ignition switch is in START position	Less than 0.2V

Is the inspection result normal?

B TERMINAL CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

[VQ35DE]

YES >> "B" terminal circuit is OK. Further inspection is necessary. Refer to STR-32, "Work Flow (With GR8-1200 NI)" or STR-35, "Work Flow (Without GR8-1200 NI)".

NO >> Check the starter motor case to engine mounting for high resistance.

S CONNECTOR CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

[VQ35DE]

S CONNECTOR CIRCUIT

Description INFOID:0000000008693435

The starter motor magnetic switch is supplied with power when the ignition switch is turned to the START position while the selector lever is in the P (Park) or N (Neutral) position.

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Diagnosis Procedure

INFOID:0000000008693436

Regarding Wiring Diagram information, refer to <u>STR-42, "Wiring Diagram - Coupe With VQ35DE"</u> or <u>STR-47, "Wiring Diagram - Sedan With VQ35DE"</u>.

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CAUTION:

Perform diagnosis under the condition that engine cannot start by the following procedure.

- 1. Remove fuel pump fuse.
- 2. Crank or start the engine (where possible) until the fuel pressure is released.

 ${f 1}$.CHECK "S" CONNECTOR CIRCUIT

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- Turn ignition switch OFF.
- 2. Disconnect starter motor connector.
- 3. Shift selector lever to "P" (Park) or "N" (Neutral) position.
- Check voltage between starter motor harness connector and ground.

(+)	(-)	Condition	Voltage
Connector	Terminal		Gondidon	(Approx.)
F28	S	Ground	When the ignition switch is in START position	Battery voltage

Is the inspection result normal?

YES >> "S" circuit is OK. Further inspection is necessary. Refer to <u>STR-32</u>, "Work Flow (With GR8-1200 NI)" or <u>STR-35</u>, "Work Flow (Without GR8-1200 NI)".

NO >> GO TO 2.

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2.CHECK HARNESS CONTINUITY (OPEN CIRCUIT)

- Disconnect IPDM E/R connector.
- Check continuity between starter motor harness connector and the IPDM E/R harness connector.

Starter motor ha	arness connector	IPDM E/R har	ness connector	Continuity
Connector	Terminal	Connector	Terminal	Continuity
F28	S	F10	80	Yes

Is the inspection result normal?

YES >> Further inspection is necessary. Refer to <u>STR-32, "Work Flow (With GR8-1200 NI)"</u> or <u>STR-35, "Work Flow (Without GR8-1200 NI)"</u>.

NO >> Repair or replace the harness or connectors.

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Revision: June 2012 STR-41 2011 Altima GCC

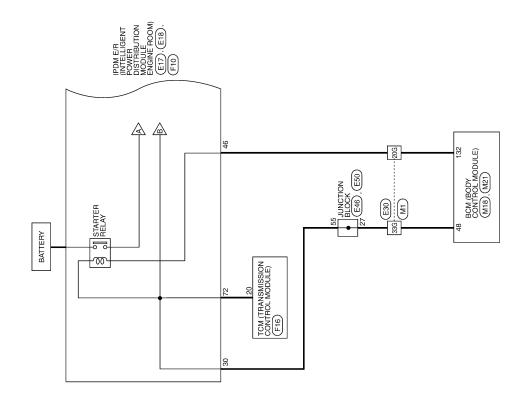
< WIRING DIAGRAM > [VQ35DE]

WIRING DIAGRAM

STARTING SYSTEM

Wiring Diagram - Coupe With VQ35DE

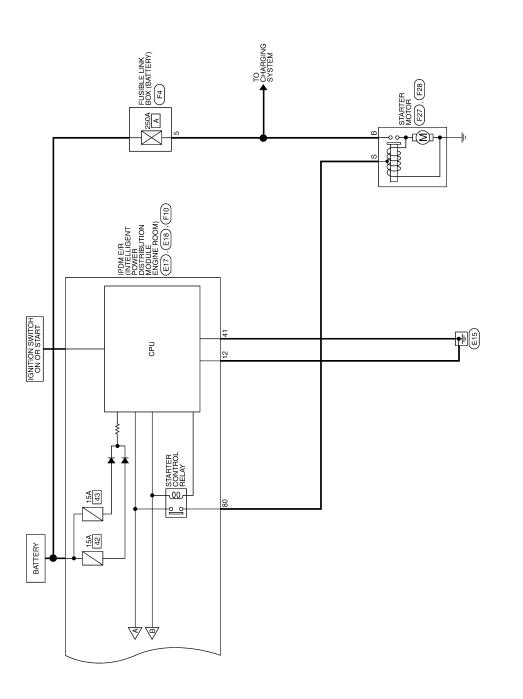
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STARTING SYSTEM - VQ35DE

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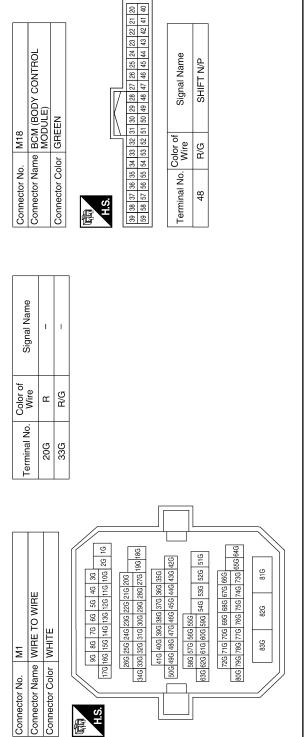
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STARTING SYSTEM CONNECTORS - VQ35DE





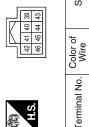
Connector Name BCM (BODY CONTROL MODULE)

M21

Connector No.

GRAY

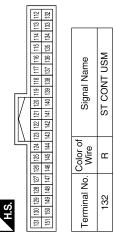
Connector Color



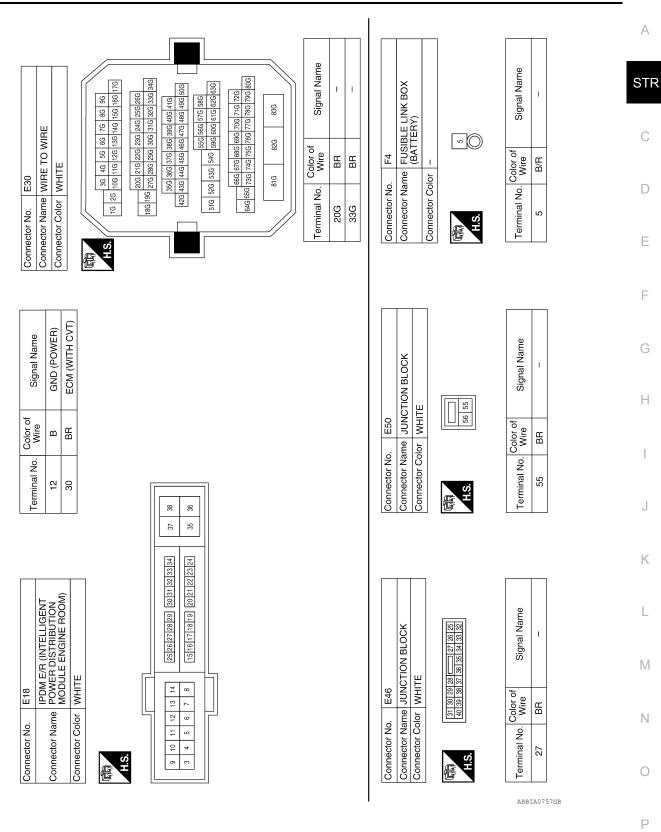
Terminal No.	Color of Wire	Sign
41	В	GND
46	BR	STA

(SIGNAL)

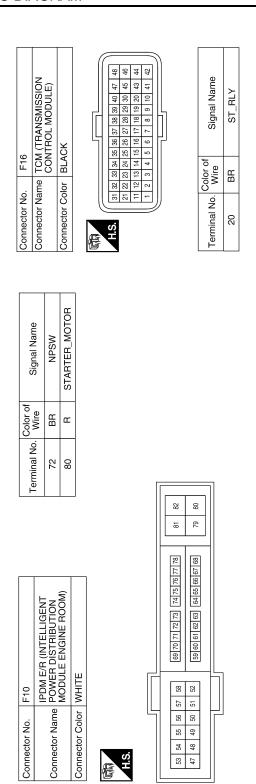
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RTER MOTOR	47		Signal Name	START
me STA	lor GR/		Color of Wire	۳
Connector Na	Connector Col	H.S.	Terminal No.	S
		ı		Ī
FARTER MOTOR			of Signal Name	BAT
ame ST	olor –		Color c Wire	B/R
Connector Na	Connector Co	南 H.S.	Terminal No.	В
	Connector Name STARTER MOTOR Connector Name STARTER MOTOR			Connector Name STARTEF Connector Color GRAY H.S. Terminal No. Color of Wire

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< WIRING DIAGRAM > [VQ35DE]

Wiring Diagram - Sedan With VQ35DE

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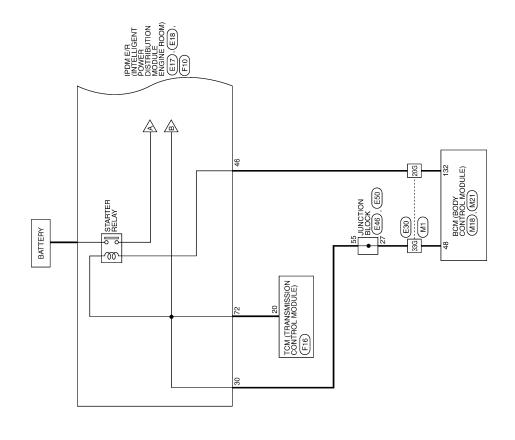
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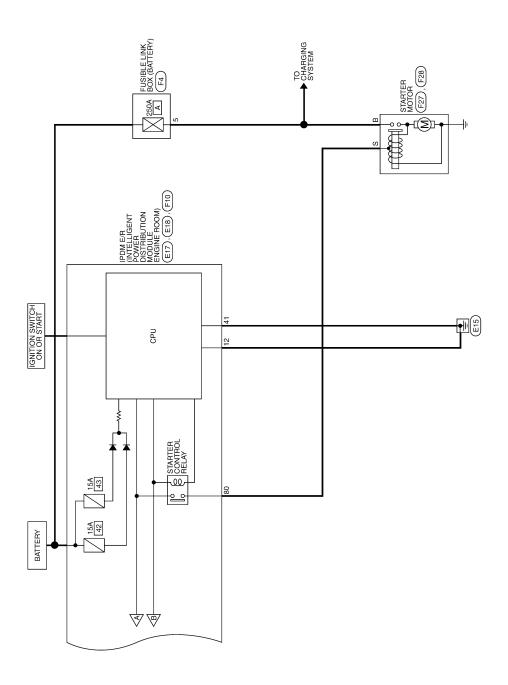
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STARTING SYSTEM - VQ35DE

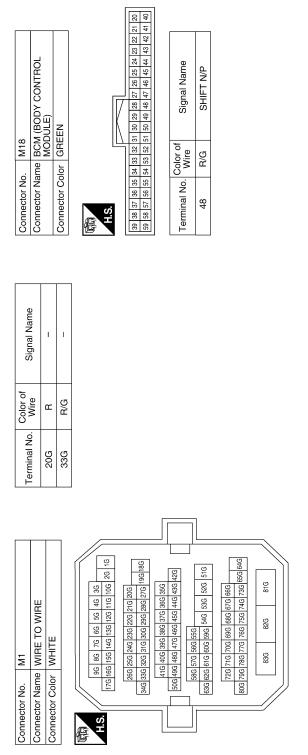


Revision: June 2012



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	Connector Name POWER DISTRIBUTION	MODULE ENGINE ROOM)	E		40 39		Signal Name		GND (SIGNAL)	START CONT
E17	IPDM ne POWE	MODU	or WHIT		42 41 40 39	2	Color of		В	BR
Connector No.	Connector Na		Connector Color WHITE		H.S.		Terminal No.		41	46
	ITROL					8 117 116 115 114 113 112 8 137 136 135 134 133 132			Vame	T USM
M21	BCM (BODY CON MODULE)	GRAY				131 130 129 128 121 128 124 122 122 121 130 119 118 117 115 115 114 113 112 115 115 115 116 118 117 138 138 131 132 132 132 132 133			re Signal Name	ST CONT USM
Connector No.	Connector Name BCM (BODY CONTROL MODULE)	Connector Color GRAY		LS.		131 130 129 128 127 126 125 151 150 149 148 147 146 145		Colo	Terminal No. Wire	132 R

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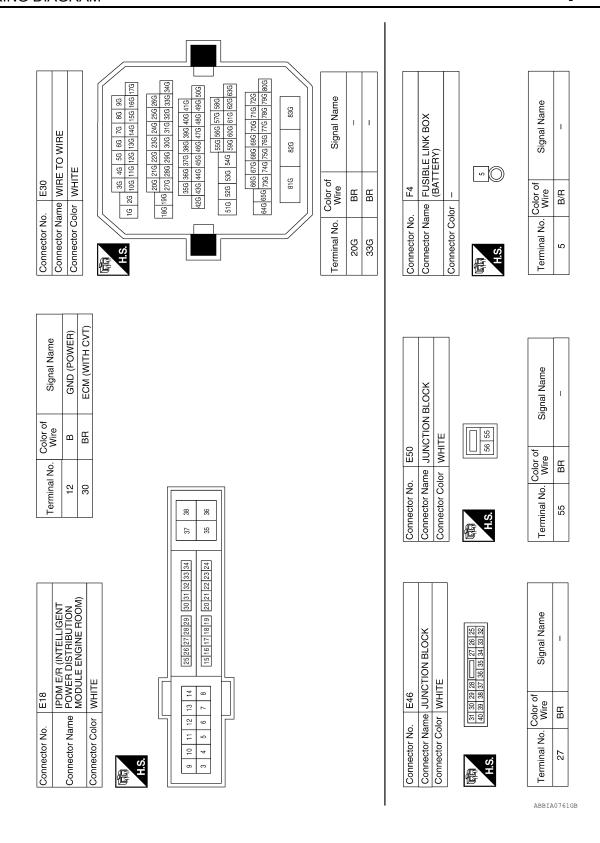
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	Connector Name TCM (TRANSMISSION	ITROL MODULE)	XC XC		35 36 37 38 39 40 47 48 15 16 17 18 19 20 43 44 15 16 17 18 19 20 43 44 17 42 17 38 18 19 10 41 42 18 19 10 41 42 18 19 10 41 42 18 19 10 41 42 18 19 10 41 42 18 19 10 41 42 18 19 10 41 42 18 19 10 41 42 18 19 10 41 42 18 19 10 41 42 18 18 18 18 18 18 18 18 18 18 18 18 18
F16	Je TCM	<u>0</u>	or BLA		22 23 34 35 68 37 22 23 44 25 68 37 22 23 44 5 6 6 7 7 2 3 4 4 5 6 7 7 2 3 4 4 5 8 8 7 7 2 3 4 4 5 8 8 7 7 2 3 4 4 5 8 8 7 7 2 3 4 4 5 8 8 7 7 2 3 4 4 5 8 8 7 7 2 3 4 4 5 8 8 7 7 2 3 4 7 8 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8
Connector No. F16	Connector Nam		Connector Color BLACK		H.S. (31 22 23 24 11 12 13 14 11 12 13 14 11 12 13 14 11 12 13 14 11 12 13 14 11 12 13 14 11 12 13 14 11 12 13 14 11 12 13 14 11 12 13 14 11 12 13 14 11 12 13 14 11 12 13 14 11 12 13 14 11 12 13 14 11 11 11 11 11 11 11 11 11 11 11 11
			1	7	
Signal Namo	Olginal Ivaline	NPSW	STARTER MOTOR	 	
Color of	Wire	BB	œ		
Color of	ellillal NO.	72	80		
					87 77 89 87 87 89 80 87 89 89 89 89 89 89 89 89 89 89 89 89 89
F10	IPDM E/R (INTELLIGENT	Connector Name POWER DISTRIBUTION	MODULE ENGINE ROOM)	WHITE	57 58 68 70 71 72 73 74 75 76 77 78 51 52 75 75 77 78 78 78 78 78 78 78 78 78 78 78 78
Connector No.		onnector Name		Connector Color WHITE	H.S. 147.85 54 55 56 4 47 50 50 50 50 50 50 50 50 50 50 50 50 50

•	Sonnector Name STARTER MOTOR	AY		Signal Name
. F28	me ST,	lor GF		Color of Wire
Connector No. F28	Connector Na	Connector Color GRAY	原 H.S.	Terminal No. Wire
				Signal Name
	Œ			<u></u>
<i>L</i> i	TARTER MOTOR			
Connector No. F27	Connector Name STARTER MOTOR	Connector Color -	۵	Terminal No. Wire Sign

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STARTING SYSTEM

< SYMPTOM DIAGNOSIS >

[VQ35DE]

SYMPTOM DIAGNOSIS

STARTING SYSTEM

Symptom Table

INFOID:0000000006388872

Symptom	Reference
No normal cranking	Refer to STR-32, "Work Flow (With GR8-1200 NI)" or STR-35,
Starter motor does not rotate	"Work Flow (Without GR8-1200 NI)".

PRECAUTIONS

[VQ35DE] < PRECAUTION >

PRECAUTION

PRECAUTIONS

Precaution for Supplemental Restraint System (SRS) "AIR BAG" and "SEAT BELT PRF-TFNSIONER"

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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 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, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.
- Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the 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 Airbag Diagnosis Sensor Unit or other Airbag System sensors with the Ignition ON or engine running, DO NOT use air or electric power tools or strike near the sensor(s) with a hammer. Heavy vibration could activate the sensor(s) and deploy the air bag(s), possibly causing serious injury.
- When using air or electric power tools or hammers, always switch the Ignition OFF, disconnect the battery, and wait at least 3 minutes before performing any service.

Necessary for Steering Wheel Rotation After Battery Disconnect

INFOID:0000000006388874

NOTE:

- Before removing and installing any control units, first turn the push-button ignition switch to the LOCK position, then disconnect both battery cables.
- After finishing work, confirm that all control unit connectors are connected properly, then re-connect both battery cables.
- · Always use CONSULT to perform self-diagnosis as a part of each function inspection after finishing work. If a DTC is detected, perform trouble diagnosis according to self-diagnosis results.

This vehicle is equipped with a push-button ignition switch and a steering lock unit.

If the battery is disconnected or discharged, the steering wheel will lock and cannot be turned.

If turning the steering wheel is required with the battery disconnected or discharged, follow the procedure below before starting the repair operation.

OPERATION PROCEDURE

Connect both battery cables.

NOTE:

Supply power using jumper cables if battery is discharged.

- 2. Carry the Intelligent Key or insert it to the key slot and turn the push-button ignition switch to ACC position. (At this time, the steering lock will be released.)
- 3. Disconnect both battery cables. The steering lock will remain released with both battery cables disconnected and the steering wheel can be turned.
- Perform the necessary repair operation.
- When the repair work is completed, re-connect both battery cables. With the brake pedal released, turn the push-button ignition switch from ACC position to ON position, then to LOCK position. (The steering wheel will lock when the push-button ignition switch is turned to LOCK position.)

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PRECAUTIONS

< PRECAUTION > [VQ35DE]

. Perform self-diagnosis check of all control units using CONSULT.

PREPARATION

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PREPARATION

PREPARATION

Special Service Tool INFOID:0000000008655643

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Tool number (Kent-Moore No.) Tool name		Description
— (—) Model GR8-1200 NI Multitasking battery and electrical diagnostic station	AWIIA12392Z	Tests batteries, starting and charging systems and charges batteries. For operating instructions, refer to diagnostic station instruction manual.

Commercial Service Tool

INFOID:0000000008655644

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

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REMOVAL AND INSTALLATION

STARTER MOTOR

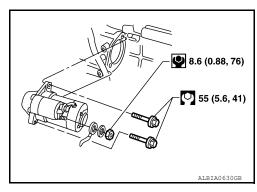
Removal and Installation

INFOID:0000000006388877

CVT Models

REMOVAL

- 1. Remove the battery and battery tray. Refer to <u>PG-68</u>, "<u>Removal and Installation (Battery)</u>" for Coupe, and <u>PG-140</u>, "<u>Removal and Installation (Battery)</u>" for Sedan.
- 2. Disconnect the starter motor harness connectors.
- 3. Remove the starter motor bolts using power tools.
- 4. Remove the starter motor.



INSTALLATION

Installation is in the reverse order of removal.

SERVICE DATA AND SPECIFICATIONS (SDS)

STARTER MOTOR

Starter

Application		VQ35DE	
		CVT model	
Type*		Melco M000TA0072	
		Reduction gear type	
System voltage		12V	
No-load	Terminal voltage	11V	
	Current	90A Max.	
	Revolution	2,400 RPM/Min.	

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

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