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SECTION

STARTING SYSTEM

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CONTENTS

QR25DE	Precaution for Supplemental Restraint System (SRS) "AIR BAG" and "SEAT BELT PRE-TENSIONER"	25
BASIC INSPECTION	PREPARATION	26
DIAGNOSIS AND REPAIR WORKFLOW	PREPARATION	26
Work Flow	Special Service Tool	26
FUNCTION DIAGNOSIS	Commercial Service Tool	26
STARTING SYSTEM	ON-VEHICLE REPAIR	27
System Diagram	STARTER MOTOR	27
System Description	Removal and Installation	27
Component Description	Disassembly and Assembly	27
COMPONENT DIAGNOSIS	SERVICE DATA AND SPECIFICATIONS (SDS)	30
B TERMINAL CIRCUIT	STARTER MOTOR	30
Description	Starter	30
Diagnosis Procedure	VQ35DE	
S CONNECTOR CIRCUIT	BASIC INSPECTION	31
Description	DIAGNOSIS AND REPAIR WORKFLOW	31
Diagnosis Procedure	Work Flow	31
STARTING SYSTEM	FUNCTION DIAGNOSIS	34
WIRING DIAGRAM	STARTING SYSTEM	34
STARTING SYSTEM	System Diagram	34
SEDAN	System Description	34
SEDAN : Wiring Diagram	Component Description	35
COUPE	COMPONENT DIAGNOSIS	36
COUPE : Wiring Diagram	B TERMINAL CIRCUIT	36
SYMPTOM DIAGNOSIS	Description	36
STARTING SYSTEM	Diagnosis Procedure	36
Symptom Table	S CONNECTOR CIRCUIT	38
PRECAUTION	Description	38
PRECAUTIONS		

Diagnosis Procedure	38	Precaution for Supplemental Restraint System (SRS) "AIR BAG" and "SEAT BELT PRE-TENSIONER"	53
STARTING SYSTEM	39	PREPARATION	54
WIRING DIAGRAM	40	PREPARATION	54
STARTING SYSTEM	40	Special Service Tool	54
COUPE	40	Commercial Service Tool	54
COUPE : Wiring Diagram - Coupe	40	ON-VEHICLE REPAIR	55
SEDAN	45	STARTER MOTOR	55
SEDAN : Wiring Diagram - Sedan	46	Removal and Installation	55
SYMPTOM DIAGNOSIS	52	SERVICE DATA AND SPECIFICATIONS (SDS)	56
STARTING SYSTEM	52	STARTER MOTOR	56
Symptom Table	52	Starter	56
PRECAUTION	53		
PRECAUTIONS	53		

DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION >

[QR25DE]

BASIC INSPECTION

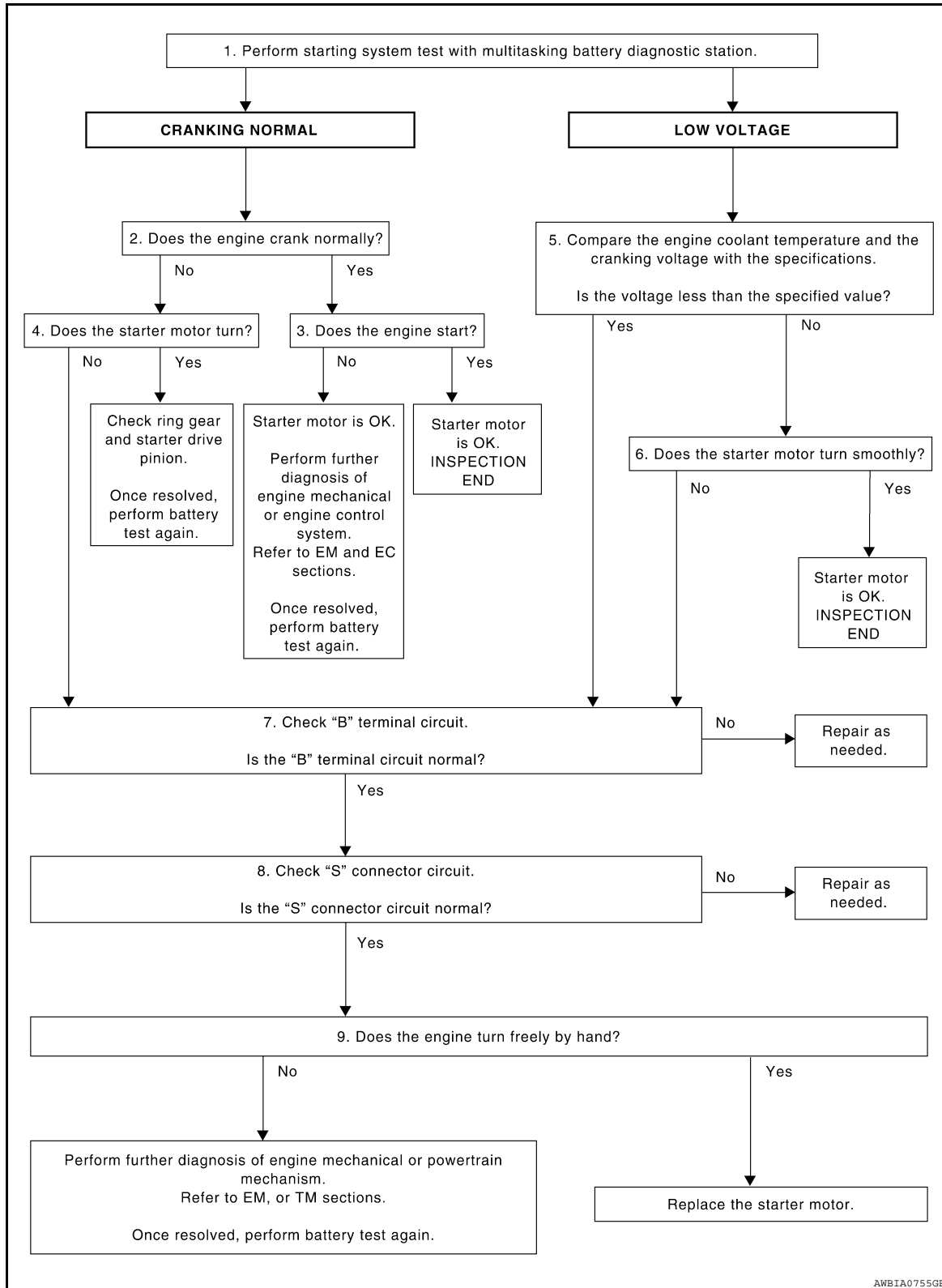
DIAGNOSIS AND REPAIR WORKFLOW

Work Flow

INFOID:000000005434551

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OVERALL SEQUENCE



DETAILED FLOW

DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION >

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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 DIAGNOSTIC STATION

Perform the starting system test with multitasking battery diagnostic station. 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 >> Starter motor is OK. 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 >> Starter motor is OK. Inspection end.

NO >> GO TO 7

7. "B" TERMINAL CIRCUIT INSPECTION

Check "B" terminal circuit. Refer to [STR-8, "Diagnosis Procedure"](#).

Is "B" terminal circuit normal?

DIAGNOSIS AND REPAIR WORKFLOW

[QR25DE]

< BASIC INSPECTION >

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

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8. "S" CONNECTOR CIRCUIT INSPECTION

Check "S" connector circuit. Refer to [STR-10. "Diagnosis Procedure"](#).

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Is "S" connector circuit normal?

- YES >> GO TO 9
- NO >> Repair as needed.

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9. ENGINE ROTATION STATUS

Check that the engine can be rotated by hand.

Does the engine turn freely by hand?

D

- YES >> Replace starter motor.
- NO >> Perform further diagnosis of engine mechanical or powertrain mechanism. Refer to EM, TM or CL sections. Once resolved, perform battery test again. Refer to diagnostic station instruction manual.

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STARTING SYSTEM

< FUNCTION DIAGNOSIS >

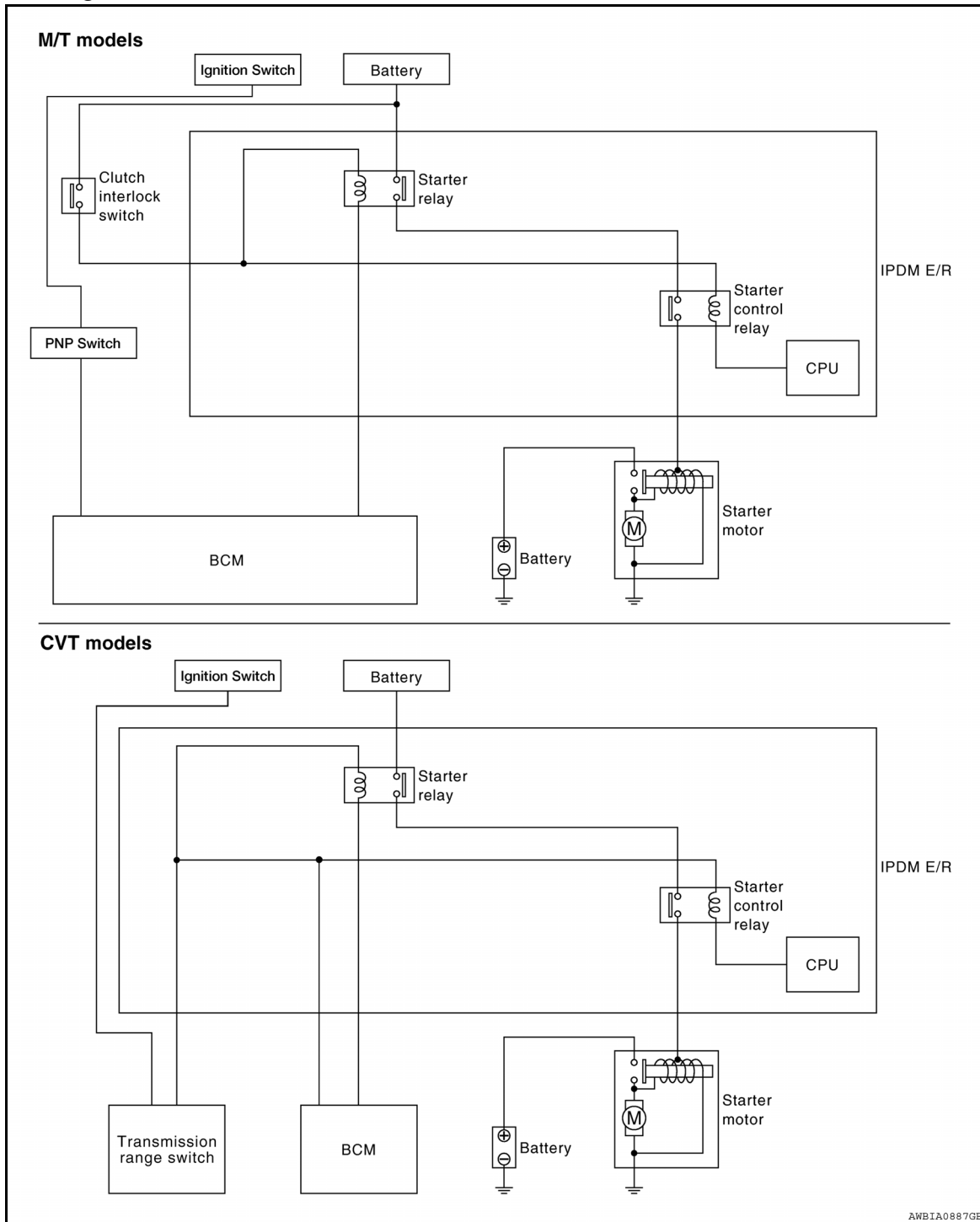
[QR25DE]

FUNCTION DIAGNOSIS

STARTING SYSTEM

System Diagram

INFOID:000000005434552



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System Description

INFOID:000000005434553

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

< FUNCTION DIAGNOSIS >

[QR25DE]

Component Description

INFOID:000000005434554

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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)	Clutch interlock switch supplies power 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.

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COMPONENT DIAGNOSIS

B TERMINAL CIRCUIT

Description

INFOID:000000005434555

The "B" terminal is constantly supplied with battery power.

Diagnosis Procedure

INFOID:000000005434556

Regarding Wiring Diagram information, refer to [STR-18. "COUPE : Wiring Diagram"](#) or [STR-12. "SEDAN : Wiring Diagram"](#).

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 depleted.

1. CHECK TERMINAL B POWER SUPPLY VOLTAGE

1. Turn ignition switch OFF.
2. Make sure that starter motor connector F27 terminal B connection is clean and tight.
3. Check voltage between starter motor connector F27 terminal B and ground.

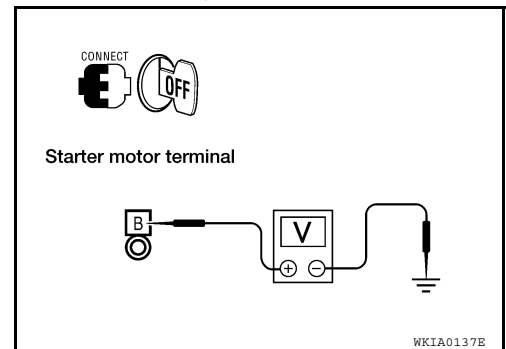
B - ground

Battery voltage

Is there battery voltage present?

YES >> GO TO 2

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



2. CHECK BATTERY CABLE (VOLTAGE DROP TEST)

1. Shift CVT selector lever to "P" or "N" position. (CVT models)
Press and hold the clutch pedal fully with the control lever in neutral. (M/T models)
2. Check voltage between battery positive terminal and starter motor connector F27 terminal B while cranking the engine.

While cranking the engine

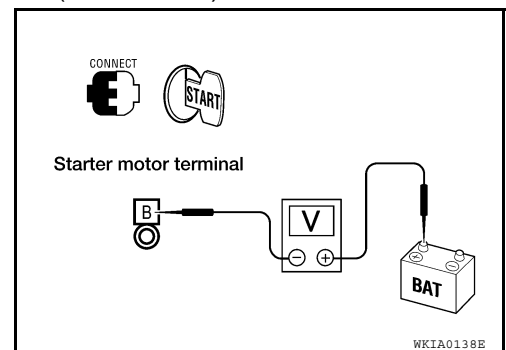
Terminal B - B+ terminal

Less than 0.5V

Is the voltage drop less than 0.5V?

YES >> GO TO 3

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



3. CHECK GROUND CIRCUIT STATUS (VOLTAGE DROP TEST)

1. Shift CVT selector lever to "P" or "N" position. (CVT models)
Press and hold the clutch pedal fully with the control lever in neutral. (M/T models)

B TERMINAL CIRCUIT

[QR25DE]

< COMPONENT DIAGNOSIS >

2. Check voltage between starter motor case and battery negative terminal while cranking the engine.

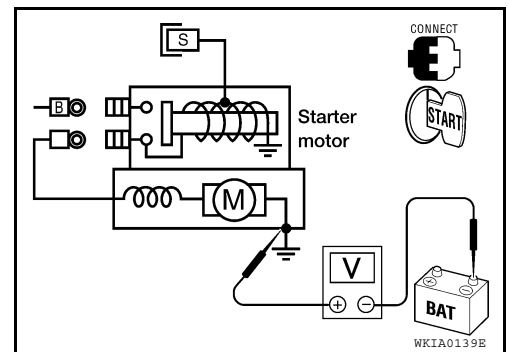
While cranking the engine

Starter case - B- terminal

Less than 0.2V

Is the voltage drop less than 0.2V?

- YES >> Terminal B circuit is OK. Further inspection necessary.
Refer to [STR-3. "Work Flow"](#).
- NO >> Check the starter motor case to engine mounting for high resistance.



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S CONNECTOR CIRCUIT

< COMPONENT DIAGNOSIS >

[QR25DE]

S CONNECTOR CIRCUIT

Description

INFOID:000000005434557

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 or N position (CVT models) or the clutch pedal is fully depressed (M/T models).

Diagnosis Procedure

INFOID:000000005434558

Regarding Wiring Diagram information, refer to [STR-18. "COUPE : Wiring Diagram"](#) or [STR-12. "SEDAN : Wiring Diagram"](#).

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.

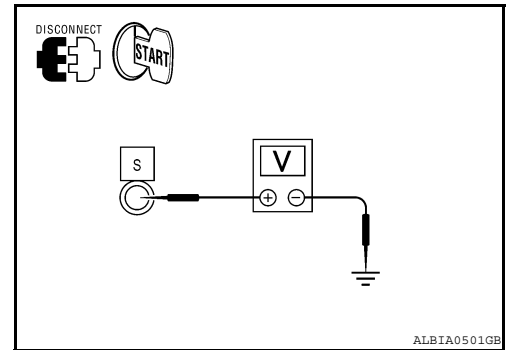
1. CHECK "S" CONNECTOR CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect starter motor connector F28.
3. Shift CVT selector lever to "P" or "N" position. (CVT models)
Press and hold the clutch pedal fully with the control lever in neutral. (M/T models)
4. Check voltage between starter motor harness connector F28 terminal S and ground with the ignition in START.

With ignition switch in START

S - ground

Battery voltage



Is battery voltage present?

YES >> "S" circuit is OK. Further inspection necessary. Refer to [STR-3. "Work Flow"](#).

NO >> GO TO 2

2. CHECK CONNECTOR

1. Turn ignition switch OFF.
2. Check the following terminals and connectors for damage, bent pins and loose connections.
 - IPDM E/R harness connector F10
 - Starter motor harness connector F28

Is the inspection result normal?

YES >> GO TO 3

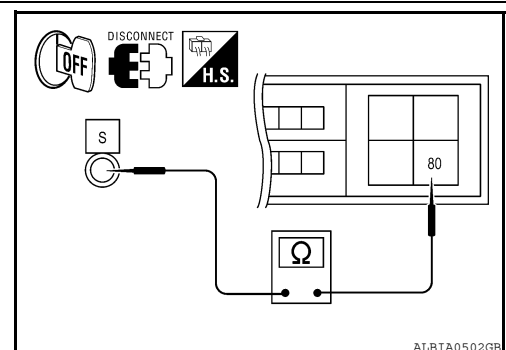
NO >> Repair the terminal and connector.

3. CHECK HARNESS CONTINUITY (OPEN CIRCUIT)

1. Disconnect the following harness connectors.
 - IPDM E/R connector F10
 - Starter motor connector F28
2. Check continuity between starter motor harness connector F28 terminal S and IPDM E/R harness connector F10 terminal 80.

S - 80

Continuity exists



Is there proper continuity between the two pins?

YES >> Further inspection necessary. Refer to [STR-3. "Work Flow"](#).

NO >> Repair the harness.

STARTING SYSTEM

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STARTING SYSTEM

< WIRING DIAGRAM >

[QR25DE]

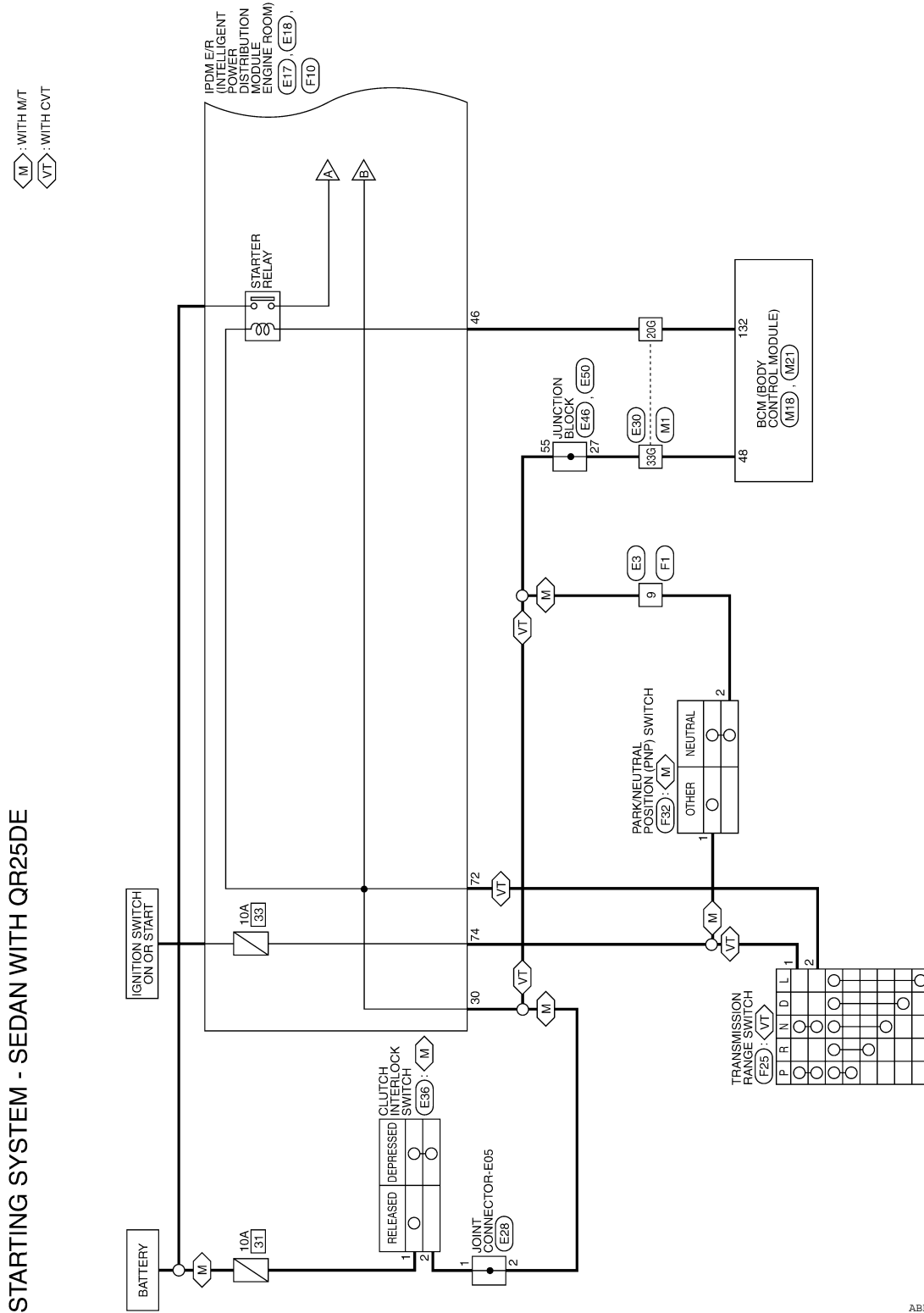
WIRING DIAGRAM

STARTING SYSTEM

SEDAN

SEDAN : Wiring Diagram

INFOID:000000005434560

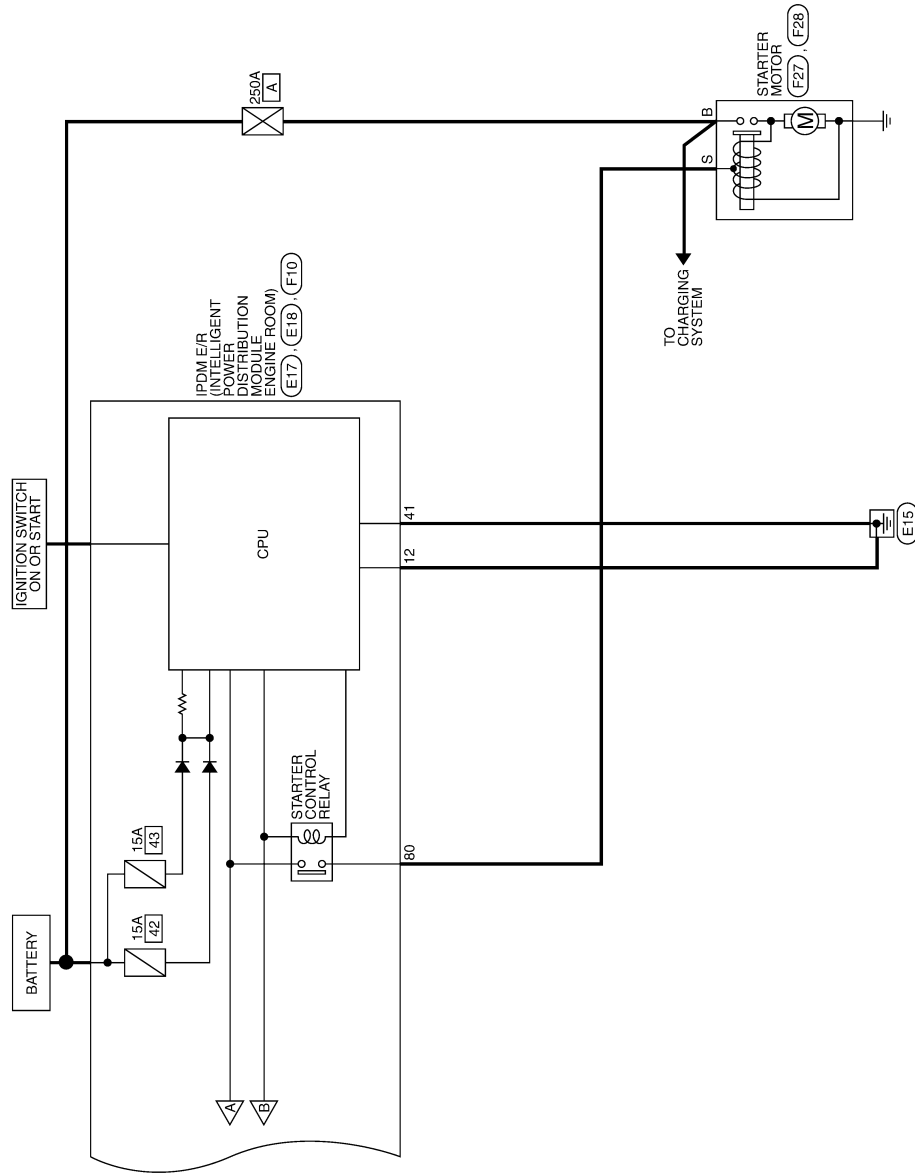


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STARTING SYSTEM

< WIRING DIAGRAM >

[QR25DE]

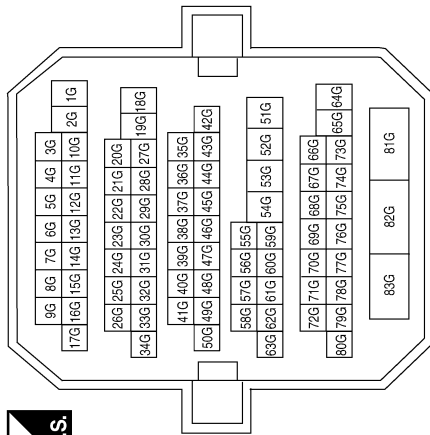


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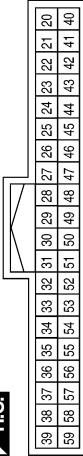
STARTING SYSTEM CONNECTORS - SEDAN WITH QR25DE

Connector No.	M1
Connector Name	WIRE TO WIRE
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
20G	R	-
33G	R/G	-

Connector No.	M18
Connector Name	BCM (BODY CONTROL MODULE)
Connector Color	GREEN



Terminal No.	Color of Wire	Signal Name
48	R/G	SHIFT_N/P

Connector No.	M21
Connector Name	BCM (BODY CONTROL MODULE)
Connector Color	GRAY



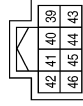
Terminal No.	Color of Wire	Signal Name
132	R	ST_CONT_USM

Connector No.	E3
Connector Name	WIRE TO WIRE
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
9	BR	-

Connector No.	E17
Connector Name	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector Color	WHITE



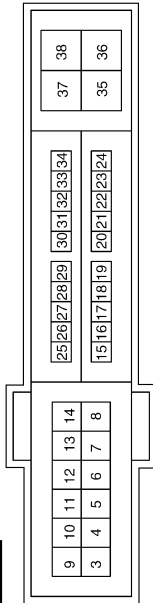
Terminal No.	Color of Wire	Signal Name
41	B	GND (SIGNAL)
46	R	START_CONT

STARTING SYSTEM

< WIRING DIAGRAM >

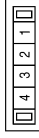
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Connector No.	E18
Connector Name	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector Color	WHITE



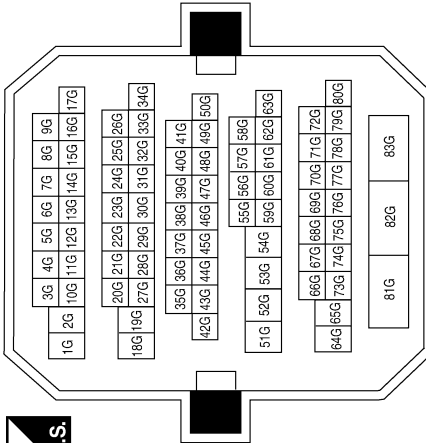
Terminal No.	Color of Wire	Signal Name
12	B	GND (POWER)
30	R	CLUTCH I/L SW (WITH M/T)
30	BR	ECM (WITH CVT)

Connector No.	E28
Connector Name	JOINT CONNECTOR-E05
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
1	R	-
2	R	-

Connector No.	E30
Connector Name	WIRE TO WIRE
Connector Color	WHITE



Connector No.	E36
Connector Name	CLUTCH INTERLOCK SWITCH
Connector Color	BROWN



Terminal No.	Color of Wire	Signal Name
1	W	-
2	R	-

Connector No.	E46
Connector Name	JUNCTION BLOCK
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
27	BR	-

Terminal No.	Color of Wire	Signal Name
20G	BR	-
33G	BR	-

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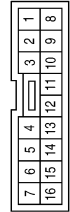
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Connector No.	E50
Connector Name	JUNCTION BLOCK
Connector Color	WHITE



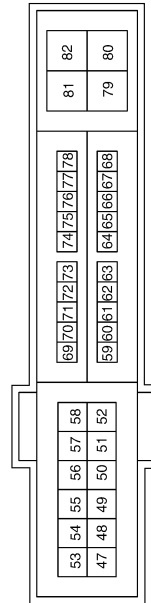
Terminal No.	55	Color of Wire	BR	Signal Name	-
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Connector No.	F1
Connector Name	WIRE TO WIRE
Connector Color	WHITE



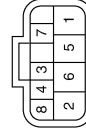
Terminal No.	9	Color of Wire	W	Signal Name	-
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Connector No.	F10
Connector Name	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector Color	WHITE



Terminal No.	72	Color of Wire	W	Signal Name	NPSW
	74	Color of Wire	L	Signal Name	START_IG-EGI
	80	Color of Wire	R	Signal Name	STARTER_MOTOR

Connector No.	F25
Connector Name	TRANSMISSION RANGE SWITCH
Connector Color	BLACK



Terminal No.	1	Color of Wire	L	Signal Name	-
	2	Color of Wire	W	Signal Name	-

STARTING SYSTEM

< WIRING DIAGRAM >

[QR25DE]

Connector No.	F32
Connector Name	PARK/NEUTRAL POSITION (PNP) SWITCH
Connector Color	BLACK



Terminal No.	Color of Wire	Signal Name
1	L	-
2	W	-

Connector No.	F28
Connector Name	STARTER MOTOR
Connector Color	-



Terminal No.	Color of Wire	Signal Name
S	R	START

Connector No.	F27
Connector Name	STARTER MOTOR
Connector Color	-



Terminal No.	Color of Wire	Signal Name
B	B/R	BAT

COUPE

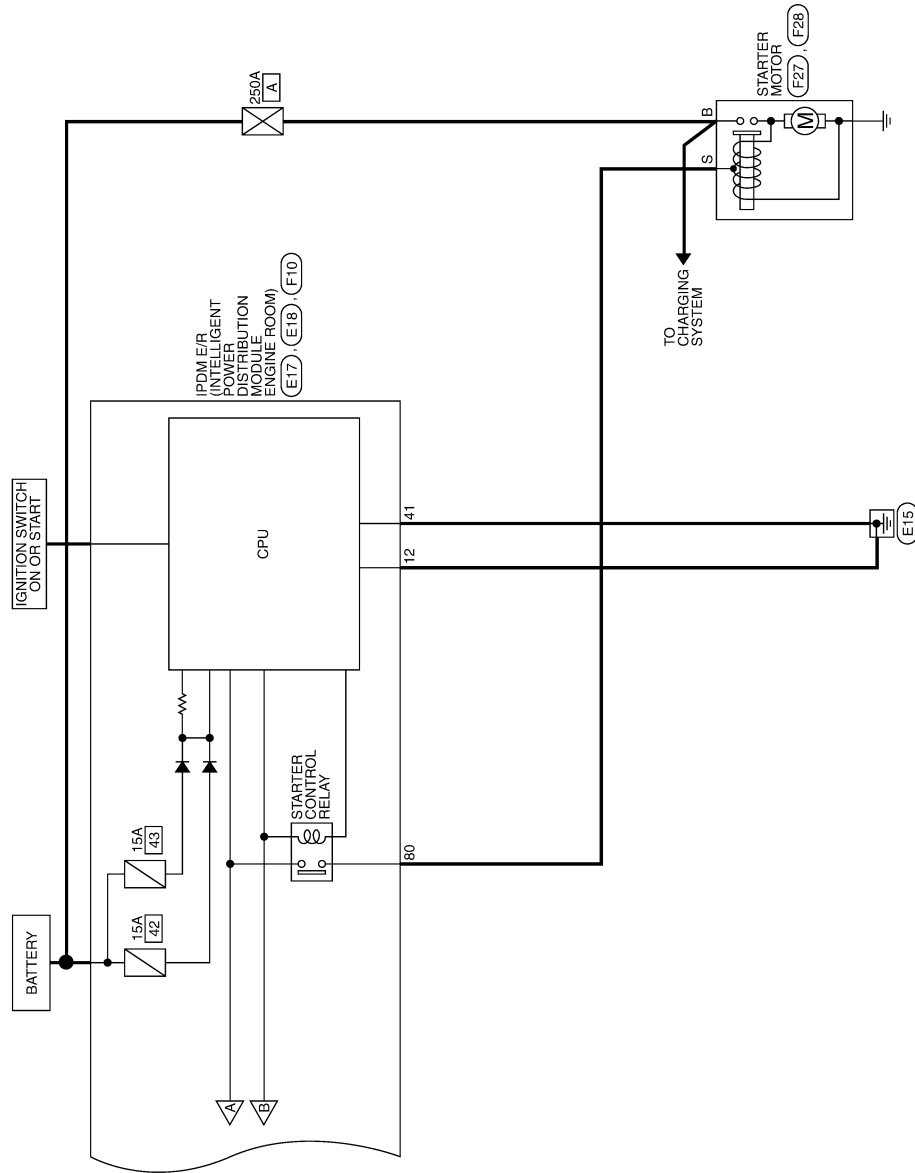
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STARTING SYSTEM

< WIRING DIAGRAM >

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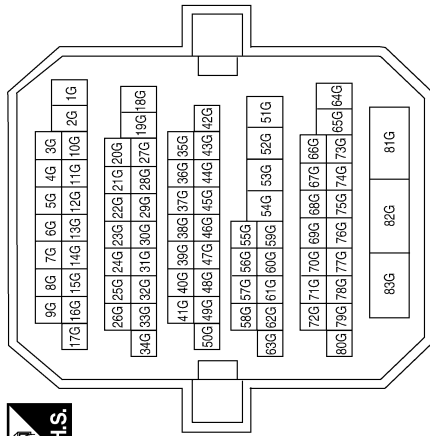


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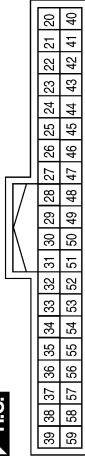
STARTING SYSTEM CONNECTORS - COUPE WITH QR25DE

Connector No.	M1
Connector Name	WIRE TO WIRE
Connector Color	WHITE



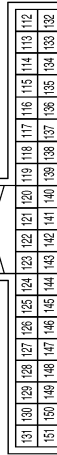
Terminal No.	Color of Wire	Signal Name
20G	R	-
33G	R/G	-

Connector No.	M18
Connector Name	BCM (BODY CONTROL MODULE)
Connector Color	GREEN



Terminal No.	Color of Wire	Signal Name
48	R/G	SHIFT_N/P

Connector No.	M21
Connector Name	BCM (BODY CONTROL MODULE)
Connector Color	GRAY



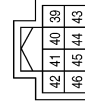
Terminal No.	Color of Wire	Signal Name
132	R	ST_CONT_USM

Connector No.	E3
Connector Name	WIRE TO WIRE
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
9	BR	-

Connector No.	E17
Connector Name	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector Color	WHITE



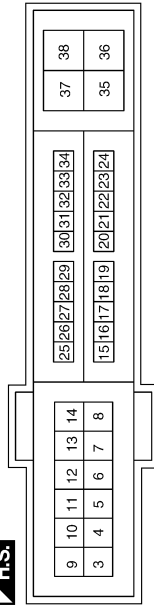
Terminal No.	Color of Wire	Signal Name
41	B	GND (SIGNAL)
46	R	START_CONT

STARTING SYSTEM

< WIRING DIAGRAM >

[QR25DE]

Connector No.	E18
Connector Name	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector Color	WHITE



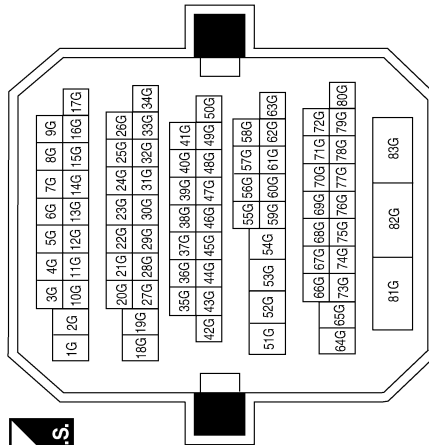
Terminal No.	Color of Wire	Signal Name
12	B	GND (POWER)
30	R	CLUTCH I/L SW (WITH M/T)
30	BR	ECM (WITH CVT)

Connector No.	E28
Connector Name	JOINT CONNECTOR-E05
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
1	R	-
2	R	-

Connector No.	E30
Connector Name	WIRE TO WIRE
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
20G	BR	-
33G	BR	-

Connector No.	E36
Connector Name	CLUTCH INTERLOCK SWITCH
Connector Color	BROWN



Terminal No.	Color of Wire	Signal Name
1	W	-
2	R	-

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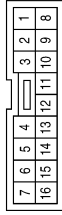
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STARTING SYSTEM

< WIRING DIAGRAM >

[QR25DE]

Connector No.	F1
Connector Name	WIRE TO WIRE
Connector Color	WHITE



Terminal No.	9	Color of Wire	W	Signal Name	-
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Connector No.	E50
Connector Name	JUNCTION BLOCK
Connector Color	WHITE



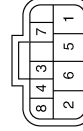
Terminal No.	55	Color of Wire	BR	Signal Name	-
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Connector No.	E46
Connector Name	JUNCTION BLOCK
Connector Color	WHITE



Terminal No.	27	Color of Wire	BR	Signal Name	-
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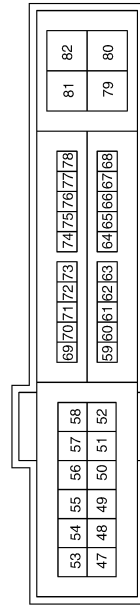
Connector No.	F25
Connector Name	TRANSMISSION RANGE SWITCH
Connector Color	BLACK



Terminal No.	1	Color of Wire	L	Signal Name	-
	2	Color of Wire	W	Signal Name	-

Terminal No.	72	Color of Wire	W	Signal Name	NPSW
	74	Color of Wire	L	Signal Name	START_IG-EGI
	80	Color of Wire	R	Signal Name	STARTER_MOTOR

Connector No.	F10
Connector Name	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector Color	WHITE



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STARTING SYSTEM

< WIRING DIAGRAM >

[QR25DE]

Connector No.	F32
Connector Name	PARK/NEUTRAL POSITION (PNP) SWITCH
Connector Color	BLACK



Terminal No.	Color of Wire	Signal Name
1	L	-
2	W	-

Connector No.	F28
Connector Name	STARTER MOTOR
Connector Color	-



Terminal No.	Color of Wire	Signal Name
S	R	START

Connector No.	F27
Connector Name	STARTER MOTOR
Connector Color	-



Terminal No.	Color of Wire	Signal Name
B	B/R	BAT

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ABBIA0726GB

SYMPTOM DIAGNOSIS

STARTING SYSTEM

Symptom Table

INFOID:000000005434561

Symptom	Reference
No normal cranking	Refer to STR-3, "Work Flow" .
Starter motor does not rotate	

PRECAUTION

PRECAUTIONS

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

INFOID:000000005778741

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.

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PREPARATION

< PREPARATION >

[QR25DE]


PREPARATION

PREPARATION

Special Service Tool

INFOID:000000005434564

Tool number (Kent Moore No.) Tool name	Description
— (—) Model GR-8 Multitasking Battery Diagnostic Station	Tests Batteries, starting and charging system. For operating instructions, refer to diagnostic station instruction manual.

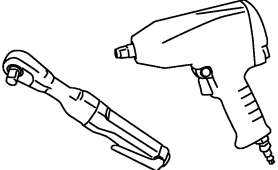


AWIIA1239ZZ

Commercial Service Tool

INFOID:000000005434565

Tool name	Description
Power tool	Loosening bolts and nuts



PBIC0190E

ON-VEHICLE REPAIR

STARTER MOTOR

Removal and Installation

INFOID:000000005434566

STR

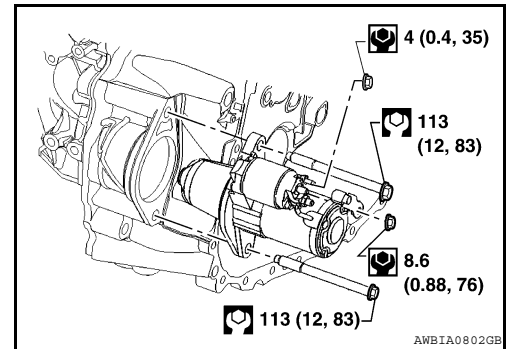
M/T MODELS

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.



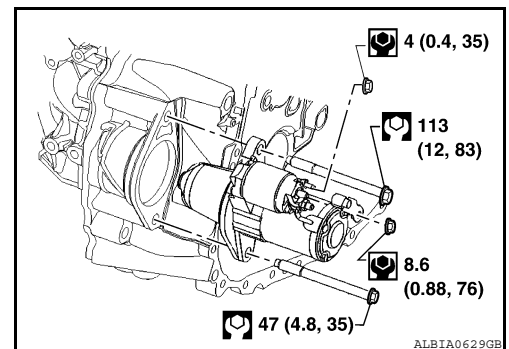
CVT Models

REMOVAL

1. Remove the battery and battery tray bracket. For Sedan Refer to [PG-142. "Removal and Installation \(Battery\)"](#) For Coupe Refer to [PG-70. "Removal and Installation \(Battery\)"](#)
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.



Disassembly and Assembly

INFOID:000000005434566

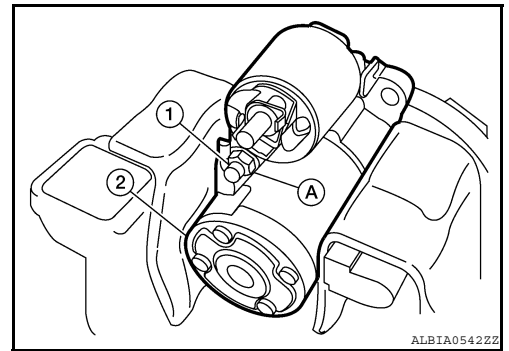
DISASSEMBLY

STARTER MOTOR

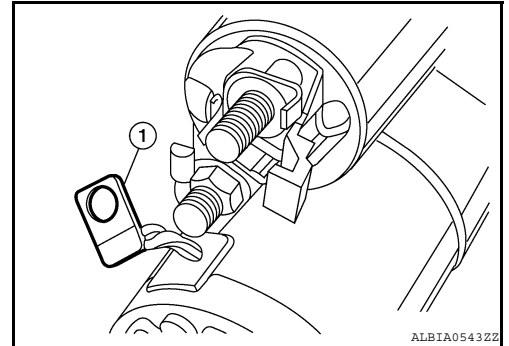
[QR25DE]

< ON-VEHICLE REPAIR >

1. Set the starter motor assembly (2) onto a suitable tool using a soft cloth as shown.
2. Remove the terminal "M" nut (A) from terminal "M" (1).



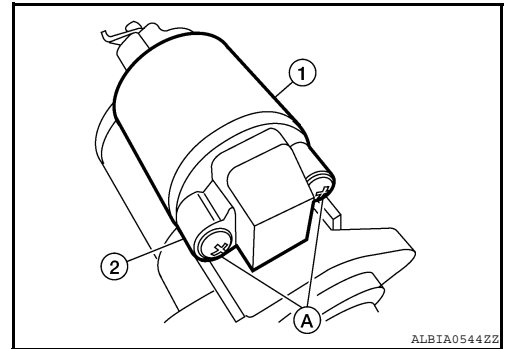
3. Disconnect terminal "M" connector (1).



4. Remove the two magnet switch assembly screws (A) and remove the magnet switch assembly (1).

CAUTION:

Magnet switch assembly (1) may pop out from starter motor assembly (2) while loosening magnet switch assembly screws.

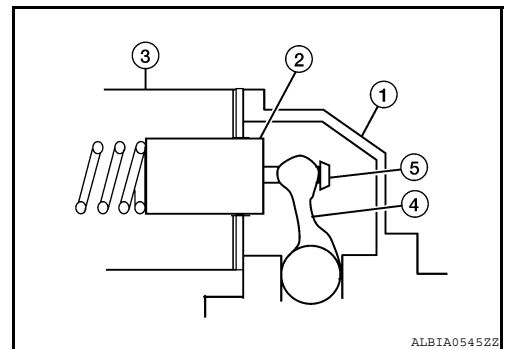


ASSEMBLY

1. Install magnet switch assembly (3) onto starter motor assembly (1).
 - Pull rod (5) of magnet switch assembly (3) should be engaged with shift lever (4) as shown.

CAUTION:

- Do not damage the sliding surface (2) of magnet switch assembly (3).
- Do not leave any dirt on the sliding surface (2) of the magnet switch assembly (3).
- Confirm the terminal location.



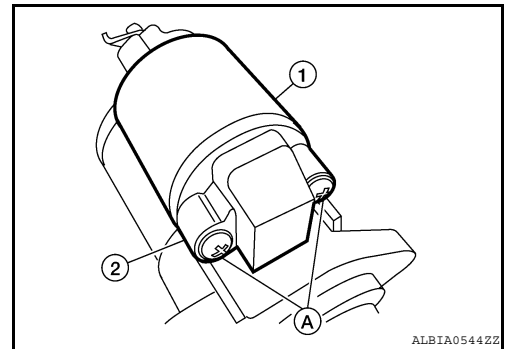
STARTER MOTOR

[QR25DE]

< ON-VEHICLE REPAIR >

2. Tighten the two magnet switch assembly screws (A) to specification.
 - Magnetic switch assembly (1)
 - Starter motor assembly (2)

Magnet switch assembly screws (A) : 5.9 N·m (0.6 kg-m, 8 lb-ft)

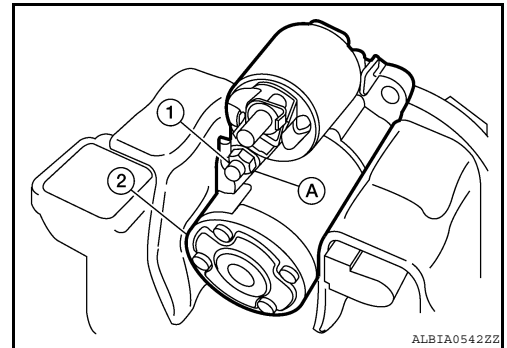


3. Connect the terminal "M" connector and tighten terminal "M" nut (A) to specification.
 - Starter motor assembly (2)

CAUTION:

The connector for terminal "M" (1) may rotate easily while tightening terminal "M" nut (A). Hold the connector in place while tightening terminal "M" nut (A).

Terminal "M" nut (A) : 10.8 N·m (1.1 kg-m, 15 lb-ft)



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STARTER MOTOR

< SERVICE DATA AND SPECIFICATIONS (SDS)

[QR25DE]

SERVICE DATA AND SPECIFICATIONS (SDS)

STARTER MOTOR

Starter

INFOID:000000005434569

Application		QR25DE	
		M/T model	CVT model
Type *		M000T22272ZC	M000TA0173ZC
		Reduction gear type	
System voltage		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.

DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION >

[VQ35DE]

BASIC INSPECTION

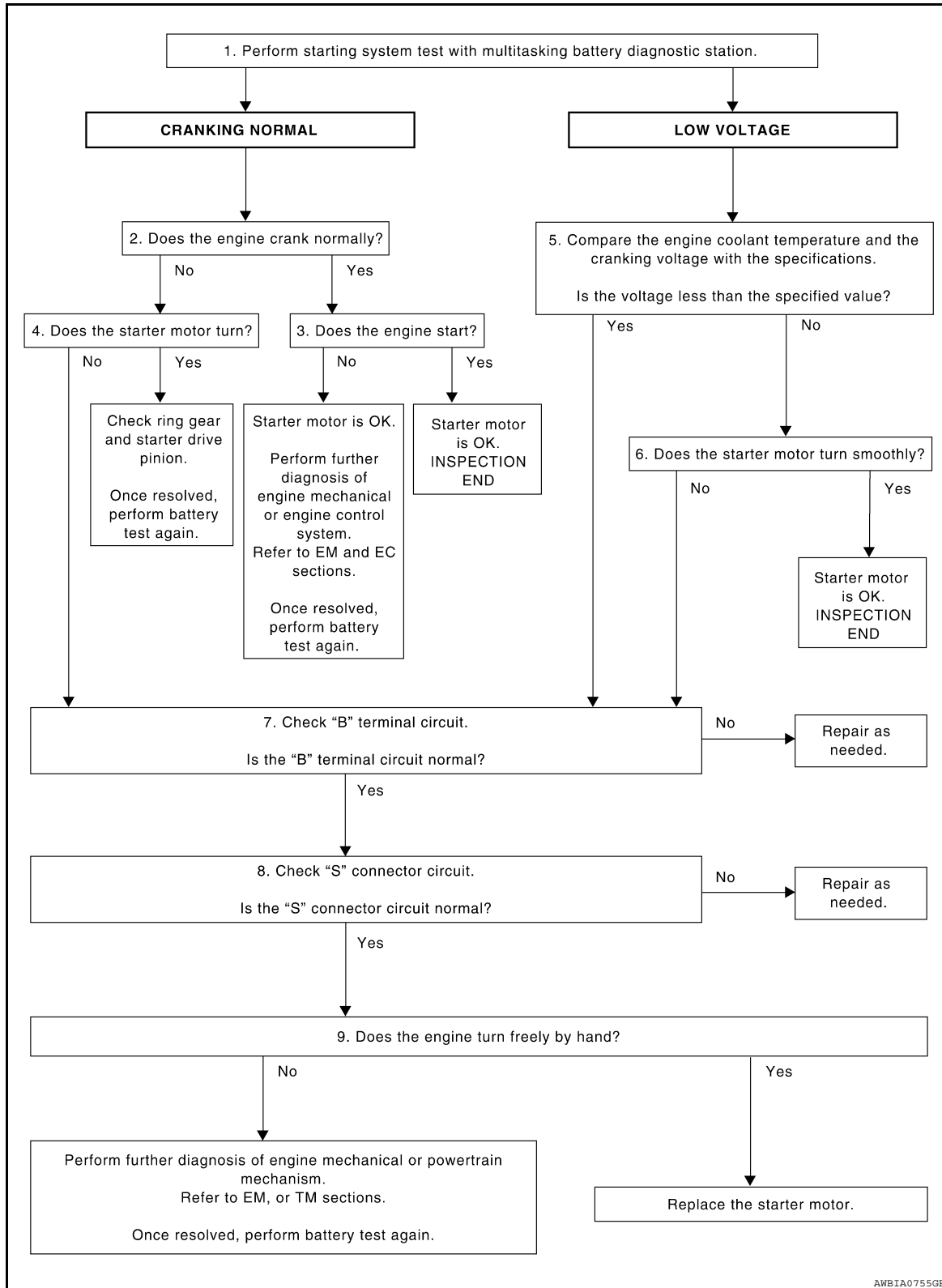
DIAGNOSIS AND REPAIR WORKFLOW

Work Flow

INFOID:000000005434570

STR

OVERALL SEQUENCE



DETAILED FLOW

DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION >

[VQ35DE]

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 DIAGNOSTIC STATION

Perform the starting system test with multitasking battery diagnostic station. 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 >> Starter motor is OK. 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 specification.

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 >> Starter motor is OK. Inspection end.

NO >> GO TO 7

7. "B" TERMINAL CIRCUIT INSPECTION

Check "B" terminal circuit. Refer to [STR-36, "Diagnosis Procedure"](#).

Is "B" terminal circuit normal?

DIAGNOSIS AND REPAIR WORKFLOW

[VQ35DE]

< BASIC INSPECTION >

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

A

8. "S" CONNECTOR CIRCUIT INSPECTION

Check "S" connector circuit. Refer to [STR-38. "Diagnosis Procedure"](#).

Is "S" connector circuit normal?

- YES >> GO TO 9
- NO >> Repair as needed.

STR

C

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. Refer to EM, TM or CL sections. Once resolved, perform battery test again. Refer to diagnostic station instruction manual.

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STARTING SYSTEM

< FUNCTION DIAGNOSIS >

[VQ35DE]

Component Description

INFOID:000000005434573

A

Component part	Description
TCM (CVT models)	TCM supplies power to the starter relay and starter control relay inside IPDM E/R when the selector lever is shifted to the P or N position.
Clutch interlock switch (M/T models)	Clutch interlock switch supplies power 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.

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COMPONENT DIAGNOSIS

B TERMINAL CIRCUIT

Description

INFOID:000000005434574

The "B" terminal is constantly supplied with battery power.

Diagnosis Procedure

INFOID:000000005434575

Regarding Wiring Diagram information, refer to [STR-40. "COUPE : Wiring Diagram - Coupe"](#) or [STR-46. "SEDAN : Wiring Diagram - Sedan"](#).

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 depleted.

1. CHECK TERMINAL B POWER SUPPLY VOLTAGE

1. Turn ignition switch OFF.
2. Make sure that starter motor connector F27 terminal B connection is clean and tight.
3. Check voltage between starter motor connector F27 terminal B and ground.

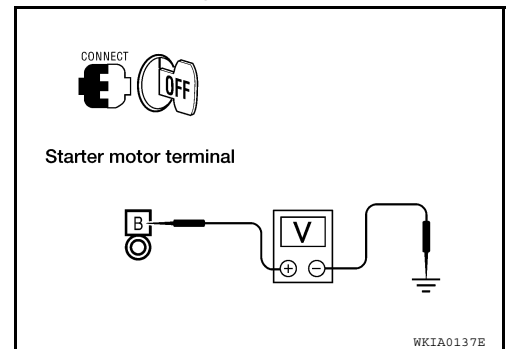
B - ground

Battery voltage

Is there battery voltage present?

YES >> GO TO 2

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



2. CHECK BATTERY CABLE (VOLTAGE DROP TEST)

1. Shift CVT selector lever to "P" or "N" position. (CVT models)
Press and hold the clutch pedal fully with the control lever in neutral. (M/T models)
2. Check voltage between battery positive terminal and starter motor connector F27 terminal B while cranking the engine.

While cranking the engine

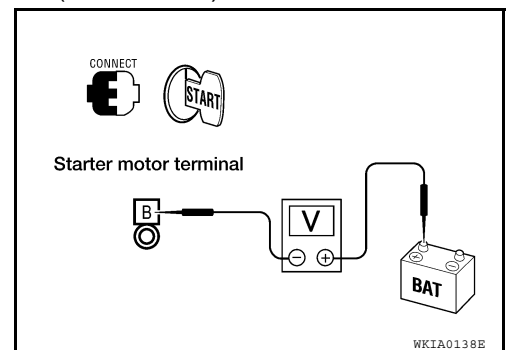
Terminal B - B+ terminal

Less than 0.5V

Is the voltage drop less than 0.5V?

YES >> GO TO 3

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



3. CHECK GROUND CIRCUIT STATUS (VOLTAGE DROP TEST)

1. Shift CVT selector lever to "P" or "N" position. (CVT models)
Press and hold the clutch pedal fully with the control lever in neutral. (M/T models)

B TERMINAL CIRCUIT

[VQ35DE]

< COMPONENT DIAGNOSIS >

2. Check voltage between starter motor case and battery negative terminal while cranking the engine.

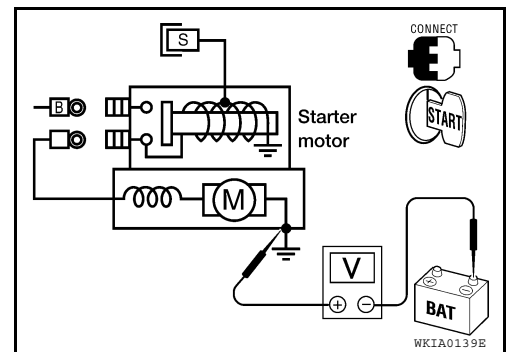
While cranking the engine

Starter case - B- terminal

Less than 0.2V

Is the voltage drop less than 0.2V?

- YES >> Terminal B circuit is OK. Further inspection necessary.
Refer to [STR-31. "Work Flow"](#).
- NO >> Check the starter motor case to engine mounting for high resistance.



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S CONNECTOR CIRCUIT

< COMPONENT DIAGNOSIS >

[VQ35DE]

S CONNECTOR CIRCUIT

Description

INFOID:000000005434576

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 or N position (CVT models) or the clutch pedal is fully depressed (M/T models).

Diagnosis Procedure

INFOID:000000005434577

Regarding Wiring Diagram information, refer to [STR-40. "COUPE : Wiring Diagram - Coupe"](#) or [STR-46. "SEDAN : Wiring Diagram - Sedan"](#).

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.

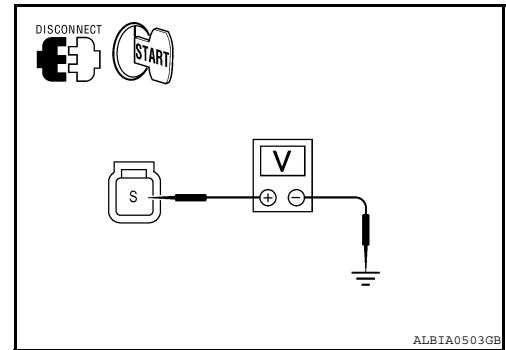
1. CHECK "S" CONNECTOR CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect starter motor connector F28.
3. Shift CVT selector lever to "P" or "N" position. (CVT models)
Press and hold the clutch pedal fully with the control lever in neutral. (M/T models)
4. Check voltage between starter motor harness connector F28 terminal S and ground with the ignition in START.

With ignition switch in START

S - ground

Battery voltage



Is battery voltage present?

YES >> "S" circuit is OK. Further inspection necessary. Refer to [STR-31. "Work Flow"](#).

NO >> GO TO 2

2. CHECK CONNECTOR

1. Turn ignition switch OFF.
2. Check the following terminals and connectors for damage, bent pins and loose connections.
 - IPDM E/R harness connector F10
 - Starter motor harness connector F28

Is the inspection result normal?

YES >> GO TO 3

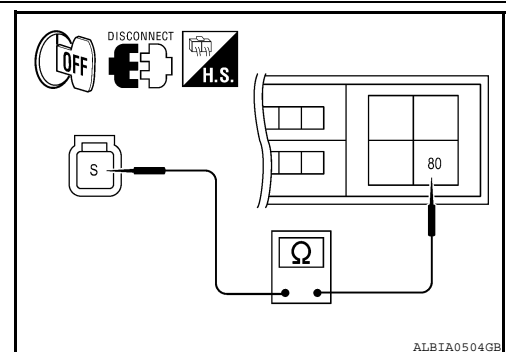
NO >> Repair the terminal and connector.

3. CHECK HARNESS CONTINUITY (OPEN CIRCUIT)

1. Disconnect the following harness connectors.
 - IPDM E/R connector F10
 - Starter motor connector F28
2. Check continuity between starter motor harness connector F28 terminal S and IPDM E/R harness connector F10 terminal 80.

S - 80

Continuity exists



Is there proper continuity between the two pins?

YES >> Further inspection necessary. Refer to [STR-31. "Work Flow"](#).

NO >> Repair the harness.

STARTING SYSTEM

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STARTING SYSTEM

< WIRING DIAGRAM >

[VQ35DE]

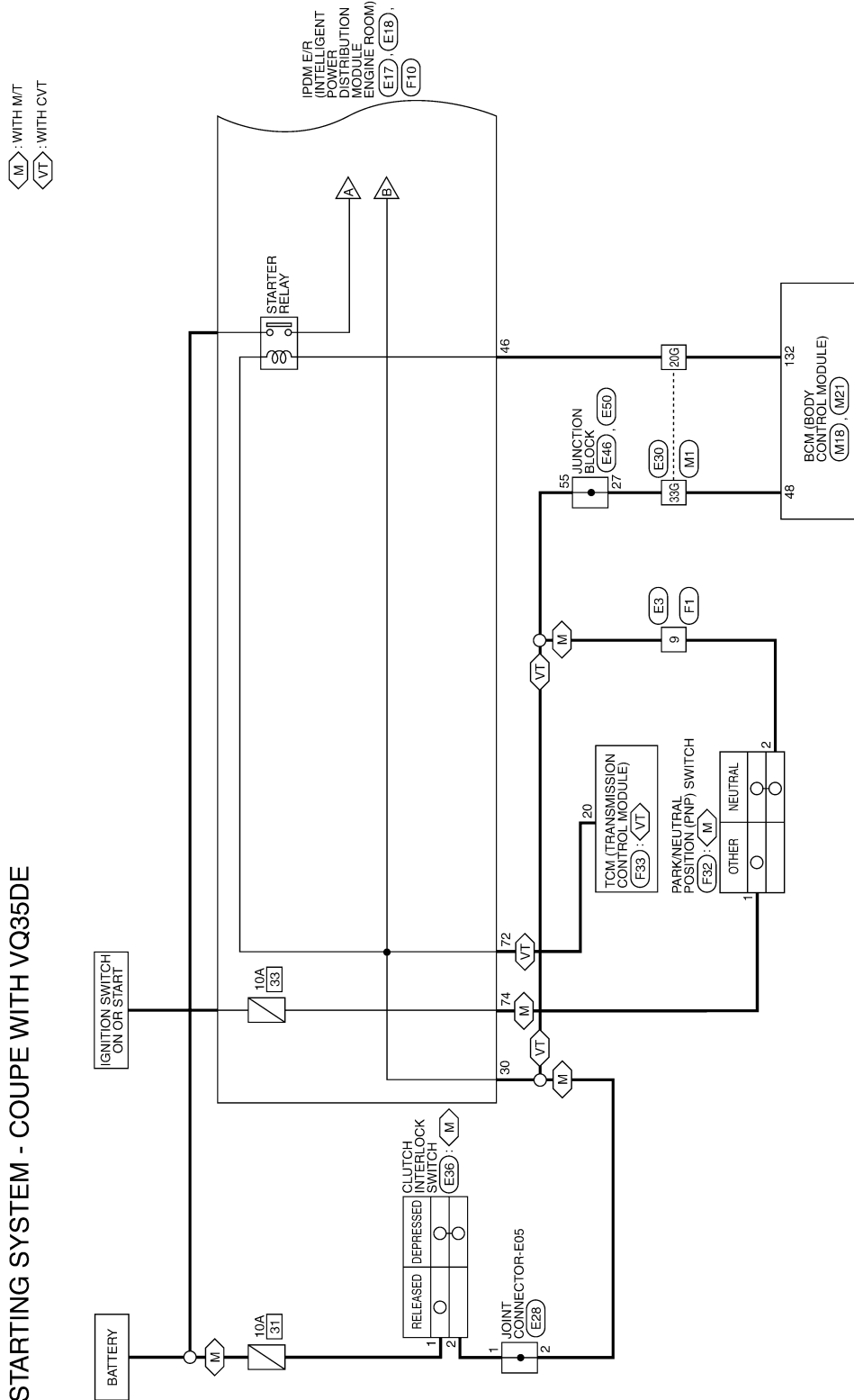
WIRING DIAGRAM

STARTING SYSTEM

COUPE

COUPE : Wiring Diagram - Coupe

INFOID:000000005434578

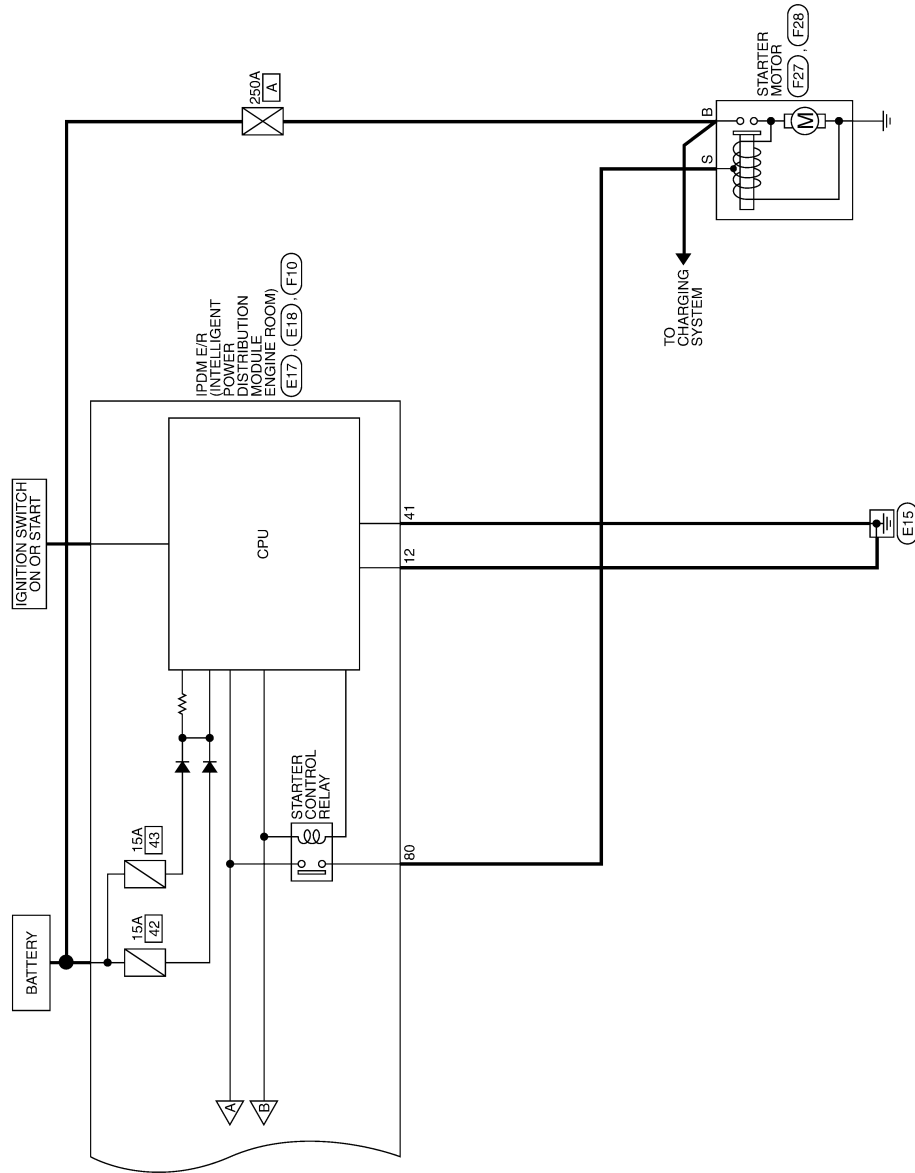


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STARTING SYSTEM

< WIRING DIAGRAM >

[VQ35DE]

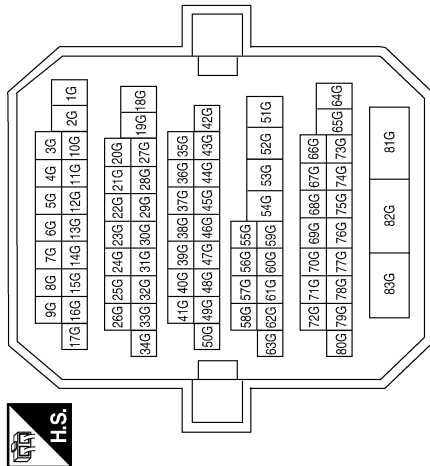


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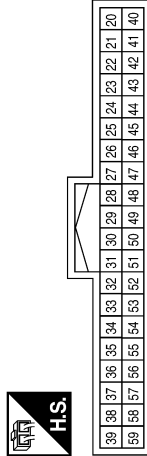
STARTING SYSTEM CONNECTORS - COUPE WITH VQ35DE

Connector No.	M1
Connector Name	WIRE TO WIRE
Connector Color	WHITE



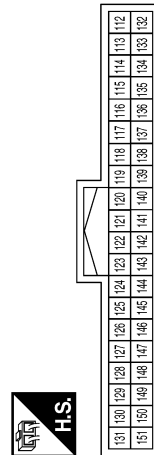
Terminal No.	Color of Wire	Signal Name
20G	R	-
33G	R/G	-

Connector No.	M18
Connector Name	BCM (BODY CONTROL MODULE)
Connector Color	GREEN



Terminal No.	Color of Wire	Signal Name
48	R/G	SHIFT_N/P

Connector No.	M21
Connector Name	BCM (BODY CONTROL MODULE)
Connector Color	GRAY



Terminal No.	Color of Wire	Signal Name
132	R	ST_CONT_USM

Connector No.	E3
Connector Name	WIRE TO WIRE
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
9	BR	-

Connector No.	E17
Connector Name	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector Color	WHITE



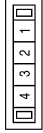
Terminal No.	Color of Wire	Signal Name
41	B	GND (SIGNAL)
46	R	START_CONT

STARTING SYSTEM

< WIRING DIAGRAM >

[VQ35DE]

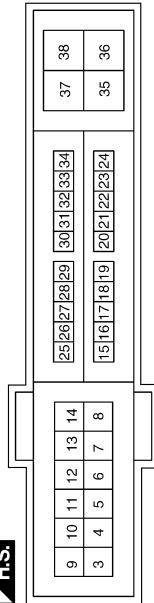
Connector No.	E28
Connector Name	JOINT CONNECTOR-E05
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
1	R	-
2	R	-

Terminal No.	Color of Wire	Signal Name
12	B	GND (POWER)
30	R	CLUTCH I/L SW (WITH M/T)
30	BR	ECM (WITH CVT)

Connector No.	E18
Connector Name	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector Color	WHITE



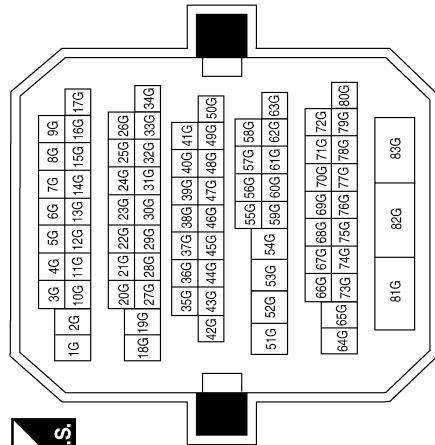
Connector No.	E36
Connector Name	CLUTCH INTERLOCK SWITCH
Connector Color	BROWN



Terminal No.	Color of Wire	Signal Name
1	W	-
2	R	-

Terminal No.	Color of Wire	Signal Name
20G	BR	-
33G	BR	-

Connector No.	E30
Connector Name	WIRE TO WIRE
Connector Color	WHITE



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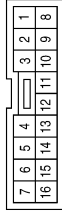
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STARTING SYSTEM

< WIRING DIAGRAM >

[VQ35DE]

Connector No.	F1
Connector Name	WIRE TO WIRE
Connector Color	WHITE



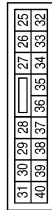
Terminal No.	9	Color of Wire	W	Signal Name	-
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Connector No.	E50
Connector Name	JUNCTION BLOCK
Connector Color	WHITE



Terminal No.	55	Color of Wire	BR	Signal Name	-
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Connector No.	E46
Connector Name	JUNCTION BLOCK
Connector Color	WHITE



Terminal No.	27	Color of Wire	BR	Signal Name	-
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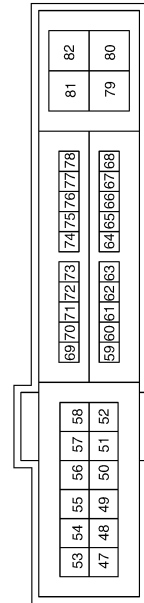
Connector No.	F27
Connector Name	STARTER MOTOR
Connector Color	-



Terminal No.	B	Color of Wire	B/R	Signal Name	BAT
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Terminal No.	72	Color of Wire	BR	Signal Name	NPSW
74	L			START_IG-EGI	
80	R			STARTER_MOTOR	

Connector No.	F10
Connector Name	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector Color	WHITE



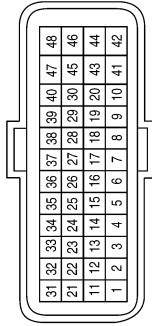
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STARTING SYSTEM

< WIRING DIAGRAM >

[VQ35DE]

Connector No.	F33
Connector Name	TCM (TRANSMISSION CONTROL MODULE) (WITH VQ35DE)
Connector Color	BLACK



Terminal No.	Color of Wire	Signal Name
20	BR	ST RLY

Connector No.	F32
Connector Name	PARK/NEUTRAL POSITION (PNP) SWITCH
Connector Color	BLACK



Terminal No.	Color of Wire	Signal Name
1	L	-
2	W	-

Connector No.	F28
Connector Name	STARTER MOTOR
Connector Color	-



Terminal No.	Color of Wire	Signal Name
S	R	START

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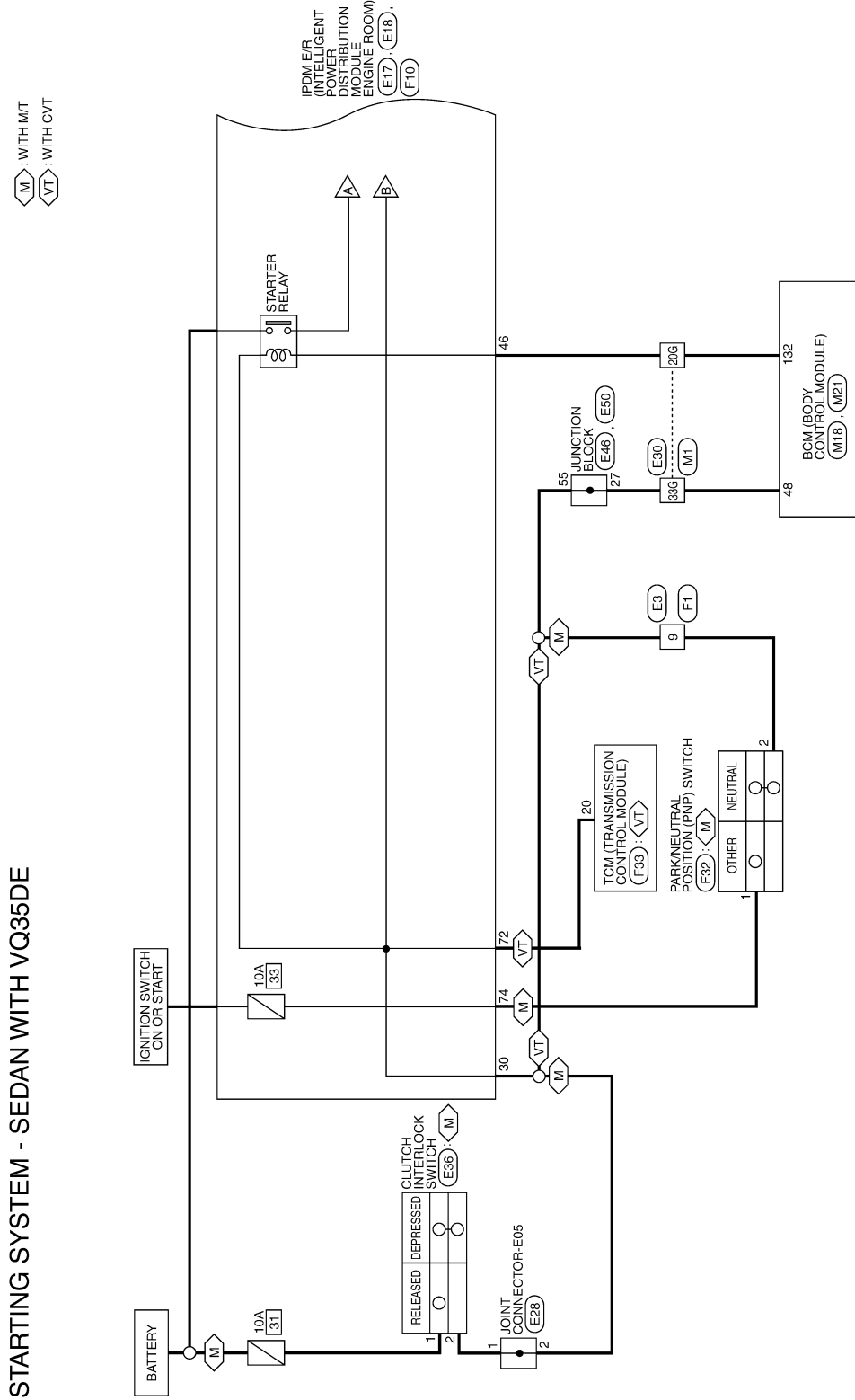
STARTING SYSTEM

< WIRING DIAGRAM >

[VQ35DE]

SEDAN : Wiring Diagram - Sedan

INFOID:000000005434579

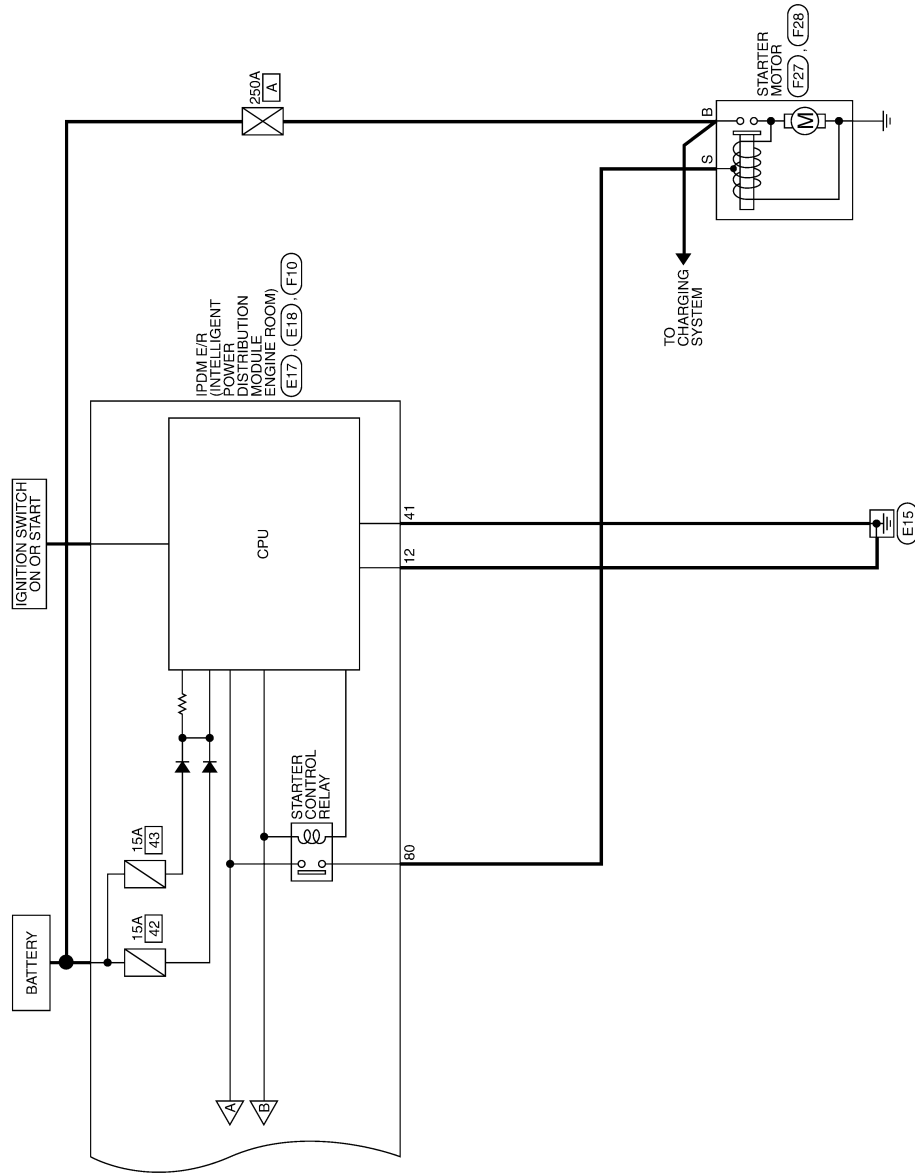


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STARTING SYSTEM

< WIRING DIAGRAM >

[VQ35DE]

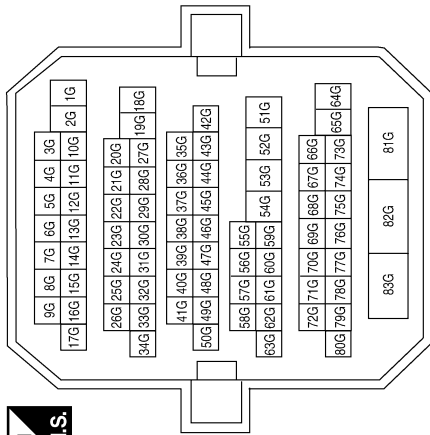


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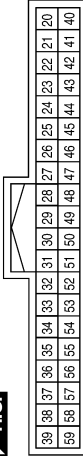
STARTING SYSTEM CONNECTORS - SEDAN WITH VQ35DE

Connector No.	M1
Connector Name	WIRE TO WIRE
Connector Color	WHITE



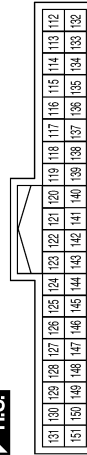
Terminal No.	Color of Wire	Signal Name
20G	R	-
33G	R/G	-

Connector No.	M18
Connector Name	BCM (BODY CONTROL MODULE)
Connector Color	GREEN



Terminal No.	Color of Wire	Signal Name
48	R/G	SHIFT_N/P

Connector No.	M21
Connector Name	BCM (BODY CONTROL MODULE)
Connector Color	GRAY



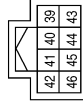
Terminal No.	Color of Wire	Signal Name
132	R	ST_CONT_USM

Connector No.	E3
Connector Name	WIRE TO WIRE
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
9	BR	-

Connector No.	E17
Connector Name	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector Color	WHITE



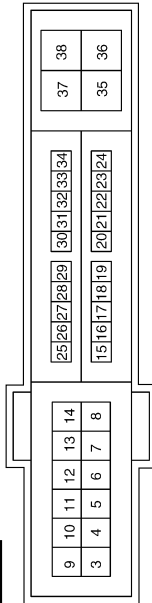
Terminal No.	Color of Wire	Signal Name
41	B	GND (SIGNAL)
46	R	START_CONT

STARTING SYSTEM

< WIRING DIAGRAM >

[VQ35DE]

Connector No.	E18
Connector Name	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector Color	WHITE



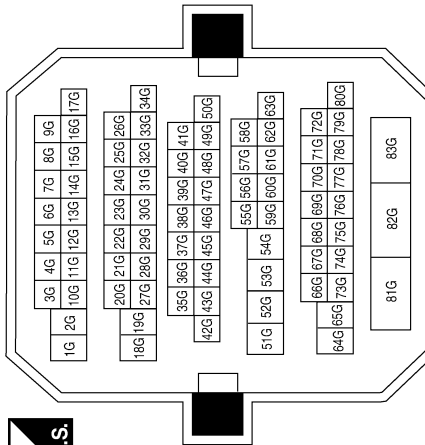
Terminal No.	Color of Wire	Signal Name
12	B	GND (POWER)
30	R	CLUTCH I/L SW (WITH MT)
30	BR	ECM (WITH CVT)

Connector No.	E28
Connector Name	JOINT CONNECTOR-E05
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
1	R	-
2	R	-

Connector No.	E30
Connector Name	WIRE TO WIRE
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
20G	BR	-
33G	BR	-

Connector No.	E36
Connector Name	CLUTCH INTERLOCK SWITCH
Connector Color	BROWN



Terminal No.	Color of Wire	Signal Name
1	W	-
2	R	-

Connector No.	E46
Connector Name	JUNCTION BLOCK
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
27	BR	-

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STARTING SYSTEM

< WIRING DIAGRAM >

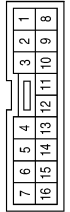
[VQ35DE]

Connector No.	E50
Connector Name	JUNCTION BLOCK
Connector Color	WHITE



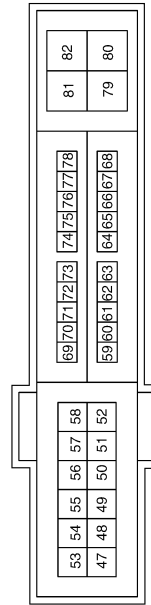
Terminal No.	55	Color of Wire	BR	Signal Name	-
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Connector No.	F1
Connector Name	WIRE TO WIRE
Connector Color	WHITE



Terminal No.	9	Color of Wire	W	Signal Name	-
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Connector No.	F10
Connector Name	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector Color	WHITE



Terminal No.	72	Color of Wire	BR	Signal Name	NPSW
74	L	START_IG-EGI			
80	R	STARTER_MOTOR			

Connector No.	F27
Connector Name	STARTER MOTOR
Connector Color	-



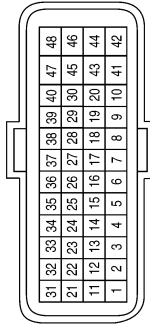
Terminal No.	B	Color of Wire	B/R	Signal Name	BATT
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STARTING SYSTEM

< WIRING DIAGRAM >

[VQ35DE]

Connector No.	F33
Connector Name	TCM (TRANSMISSION CONTROL MODULE) (WITH VQ35DE)
Connector Color	BLACK



Terminal No.	Color of Wire	Signal Name
20	BR	ST_RLY

Connector No.	F32
Connector Name	PARK/NEUTRAL POSITION (PNP) SWITCH
Connector Color	BLACK



Terminal No.	Color of Wire	Signal Name
1	L	-
2	W	-

Connector No.	F28
Connector Name	STARTER MOTOR
Connector Color	-



Terminal No.	Color of Wire	Signal Name
S	R	START

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STARTING SYSTEM

< SYMPTOM DIAGNOSIS >

[VQ35DE]

SYMPTOM DIAGNOSIS

STARTING SYSTEM

Symptom Table

INFOID:000000005434580

Symptom	Reference
No normal cranking	Refer to STR-31. "Work Flow" .
Starter motor does not rotate	

PRECAUTION

PRECAUTIONS

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

INFOID:000000005778742

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.

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PREPARATION

< PREPARATION >

[VQ35DE]

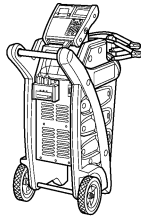
PREPARATION

PREPARATION

Special Service Tool

INFOID:000000005434583

Tool number (Kent Moore No.) Tool name	Description
— (—) Model GR-8 Multitasking Battery Diagnostic Station	Tests Batteries, starting and charging system. For operating instructions, refer to diagnostic station instruction manual.

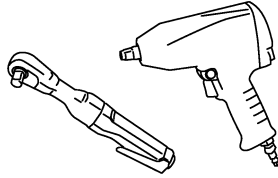


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Commercial Service Tool

INFOID:000000005434584

Tool name	Description
Power tool	Loosening bolts and nuts



PBIC0190E

ON-VEHICLE REPAIR**STARTER MOTOR****Removal and Installation**

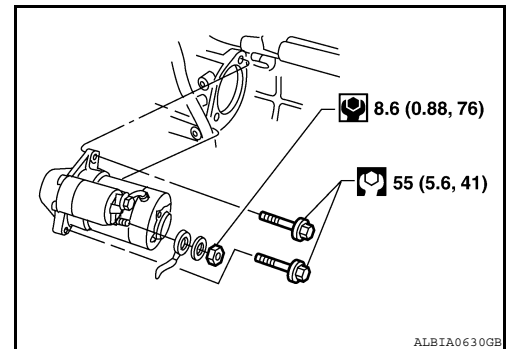
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STR

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.

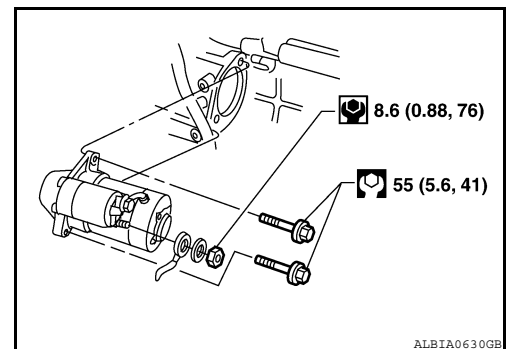
CVT Models

REMOVAL

1. Disconnect the negative and positive battery terminals.
2. Remove the battery tray. For Sedan Refer to [PG-142. "Removal and Installation \(Battery\)"](#). For Coupe Refer to [PG-70. "Removal and Installation \(Battery\)"](#)
3. Disconnect the starter motor harness connectors.
4. Remove the two starter motor bolts, using power tools.
5. Remove the starter motor.

INSTALLATION

Installation is in the reverse order of removal.



STARTER MOTOR

< SERVICE DATA AND SPECIFICATIONS (SDS)

[VQ35DE]

SERVICE DATA AND SPECIFICATIONS (SDS)

STARTER MOTOR

Starter

INFOID:000000005434587

Application		VQ35DE	
		M/T model	CVT model
Type *		Mitsubishi M000T88782ZC	Mitsubishi M000TA0072ZC
		Reduction gear type	
System voltage		12V	
No-load	Terminal voltage	11V	
	Current	90A Max.	
	Revolution	2,800 rpm Min.	2,400 rpm Min.

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