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SECTION STR

STR

STARTING SYSTEM

C

CONTENTS

D

PRECAUTION	2	Diagnosis Procedure - VK56DE	11	F
PRECAUTIONS	2	S CONNECTOR CIRCUIT	13	
Precaution for Supplemental Restraint System (SRS) "AIR BAG" and "SEAT BELT PRE-TENSIONER"	2	Description	13	G
Precaution for Power Generation Variable Voltage Control System	2	Diagnosis Procedure - VQ40DE	13	
Precaution Necessary for Steering Wheel Rotation After Battery Disconnect	2	Diagnosis Procedure - VK56DE	14	
Precaution for Work	3	WIRING DIAGRAM	16	H
PREPARATION	4	STARTING SYSTEM	16	
PREPARATION	4	Wiring Diagram - VQ40DE	16	I
Special Service Tool	4	Wiring Diagram - VK56DE	20	
Commercial Service Tool	4	SYMPTOM DIAGNOSIS	24	J
BASIC INSPECTION	5	STARTING SYSTEM	24	
DIAGNOSIS AND REPAIR WORKFLOW	5	Symptom Table	24	K
Work Flow	5	REMOVAL AND INSTALLATION	25	
SYSTEM DESCRIPTION	8	STARTER MOTOR	25	L
STARTING SYSTEM	8	VQ40DE	25	
System Diagram	8	VQ40DE : Exploded View	25	M
System Description	8	VQ40DE : Removal and Installation	25	
Component Parts Location	8	VK56DE	26	N
Component Description	9	VK56DE : Exploded View	26	
DTC/CIRCUIT DIAGNOSIS	10	VK56DE : Removal and Installation	26	O
B TERMINAL CIRCUIT	10	SERVICE DATA AND SPECIFICATIONS (SDS)	28	
Description	10	STARTER MOTOR	28	P
Diagnosis Procedure - VQ40DE	10	Starter	28	

PRECAUTIONS

< PRECAUTION >

PRECAUTION

PRECAUTIONS

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

INFOID:000000006752638

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.

Precaution for Power Generation Variable Voltage Control System

INFOID:000000006245746

CAUTION:

For this model, the battery current sensor that is installed to the negative battery cable measures the charging/discharging current of the battery and performs various engine controls. If an electrical component is connected directly to the negative battery terminal, the current flowing through that component will not be measured by the battery current sensor. This condition may cause a malfunction of the engine control system and battery discharge may occur. Do not connect an electrical component or ground wire directly to the battery terminal.

Precaution Necessary for Steering Wheel Rotation After Battery Disconnect

INFOID:000000006245747

NOTE:

- This Procedure is applied only to models with Intelligent Key system and NATS (NISSAN ANTI-THEFT SYSTEM).
- Remove and install all control units after disconnecting both battery cables with the ignition knob in the "LOCK" position.
- Always use CONSULT-III to perform self-diagnosis as a part of each function inspection after finishing work. If DTC is detected, perform trouble diagnosis according to self-diagnostic results.

For models equipped with the Intelligent Key system and NATS, an electrically controlled steering lock mechanism is adopted on the key cylinder.

For this reason, if the battery is disconnected or if the battery is discharged, the steering wheel will lock and steering wheel rotation will become impossible.

If steering wheel rotation is required when battery power is interrupted, follow the procedure below before starting the repair operation.

OPERATION PROCEDURE

PRECAUTIONS

< PRECAUTION >

1. Connect both battery cables.
NOTE:
Supply power using jumper cables if battery is discharged.
2. Use the Intelligent Key or mechanical key to turn the ignition switch to the "ACC" position. At this time, the steering lock will be released.
3. Disconnect both battery cables. The steering lock will remain released and the steering wheel can be rotated.
4. Perform the necessary repair operation.
5. When the repair work is completed, return the ignition switch to the "LOCK" position before connecting the battery cables. (At this time, the steering lock mechanism will engage.)
6. Perform a self-diagnosis check of all control units using CONSULT-III.

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STR

C

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Precaution for Work

INFOID:000000006752639

- When removing or disassembling each component, be careful not to damage or deform it. If a component may be subject to interference, be sure to protect it with a shop cloth.
- When removing (disengaging) components with a screwdriver or similar tool, be sure to wrap the component with a shop cloth or vinyl tape to protect it.
- Protect the removed parts with a shop cloth and prevent them from being dropped.
- Replace a deformed or damaged clip.
- If a part is specified as a non-reusable part, always replace it with new one.
- Be sure to tighten bolts and nuts securely to the specified torque.
- After installation is complete, be sure to check that each part works properly.
- Follow the steps below to clean components.
- Water soluble dirt: Dip a soft cloth into lukewarm water, and wring the water out of the cloth to wipe the dirty area.
Then rub with a soft and dry cloth.
- Oily dirt: Dip a soft cloth into lukewarm water with mild detergent (concentration: within 2 to 3%), and wipe the dirty area.
Then dip a cloth into fresh water, and wring the water out of the cloth to wipe the detergent off. Then rub with a soft and dry cloth.
- Do not use organic solvent such as thinner, benzene, alcohol, or gasoline.
- For genuine leather seats, use a genuine leather seat cleaner.

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PREPARATION

< PREPARATION >


PREPARATION

PREPARATION

Special Service Tool

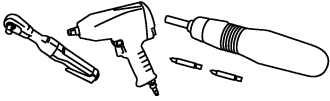
INFOID:000000008185222

The actual shapes of Kent-Moore tools may differ from those of special service tools illustrated here.

Tool number (Kent-Moore No.) Tool name	Description
<p>— (—) Model GR8-1200 NI Multitasking battery and electrical diagnostic station</p>  <p style="text-align: right; font-size: small;">AWIIA12392Z</p>	<p>Tests batteries, starting and charging systems and charges batteries. For operating instructions, refer to diagnostic station instruction manual.</p>

Commercial Service Tool

INFOID:000000008185223

Tool name	Description
<p>Power tool</p>  <p style="text-align: right; font-size: small;">PIIB1407E</p>	<p>Loosening bolts, screws and nuts.</p>

DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION >

BASIC INSPECTION

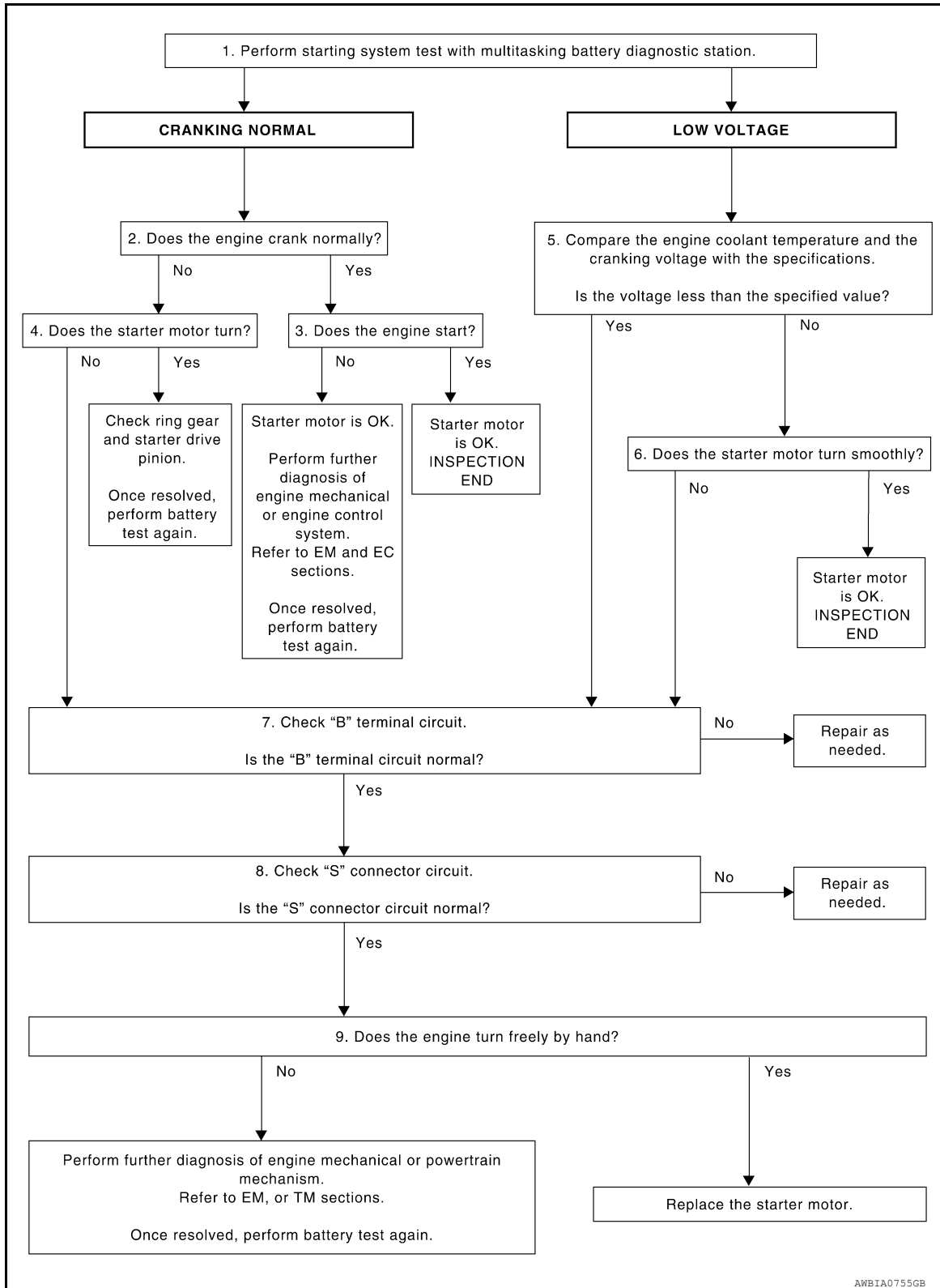
DIAGNOSIS AND REPAIR WORKFLOW

Work Flow

INFOID:000000006245750

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OVERALL SEQUENCE



DETAILED FLOW

DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION >

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-10, "Diagnosis Procedure - VQ40DE"](#) (VQ40DE) or [STR-11, "Diagnosis Procedure - VK56DE"](#) (VK56DE).

DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION >

Is "B" terminal circuit normal?

YES >> GO TO 8

NO >> Repair as needed.

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8. "S" CONNECTOR CIRCUIT INSPECTION

Check "S" connector circuit. Refer to [STR-13. "Diagnosis Procedure - VQ40DE"](#) (VQ40DE) or [STR-14. "Diagnosis Procedure - VK56DE"](#) (VK56DE).

STR

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.

D

Does the engine turn freely by hand?

YES >> Replace starter motor. Refer to [STR-25. "VQ40DE : Removal and Installation"](#).

E

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

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STARTING SYSTEM

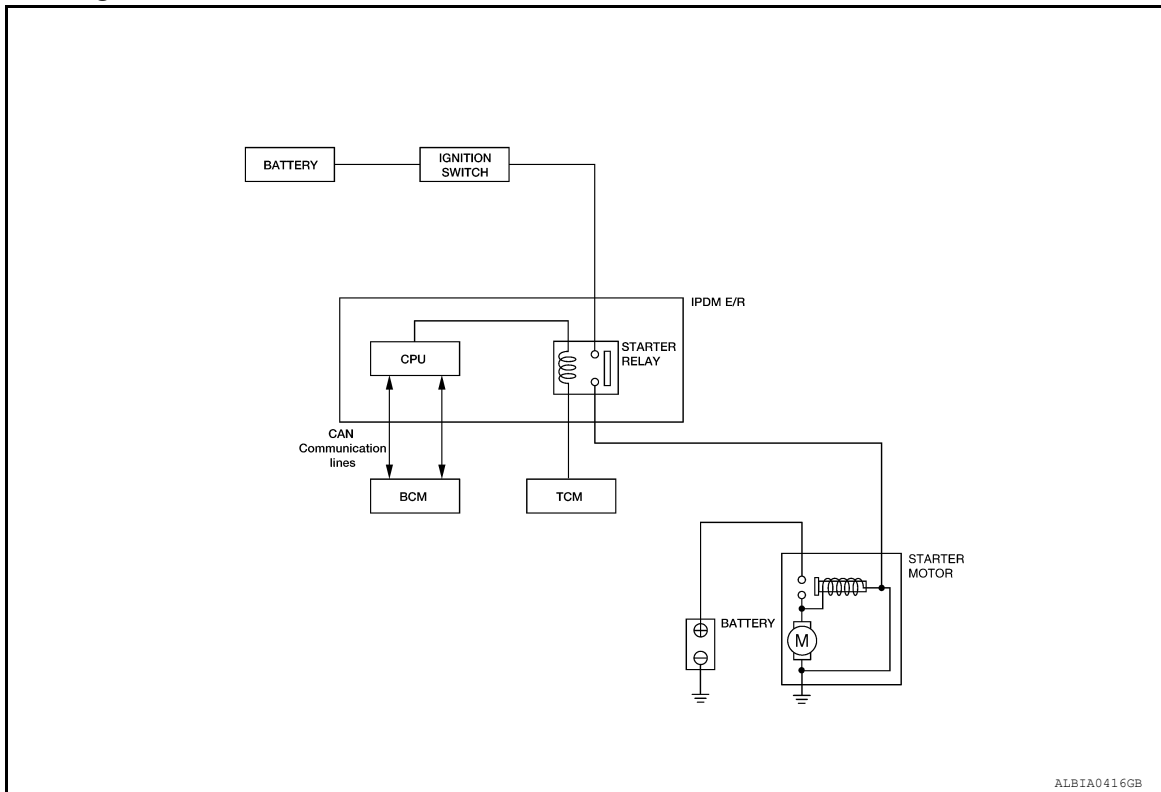
< SYSTEM DESCRIPTION >

SYSTEM DESCRIPTION

STARTING SYSTEM

System Diagram

INFOID:000000006245751



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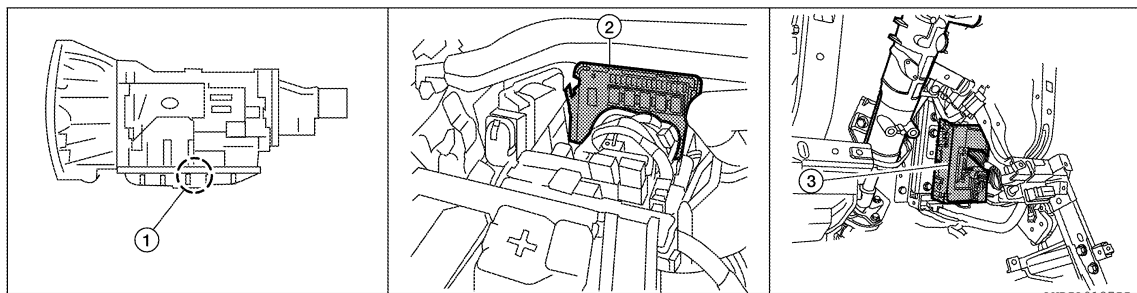
System Description

INFOID:000000006245752

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 Parts Location

INFOID:000000006245753



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1. A/T assembly F9 (with built in TCM F502)

2. IPDM E/R E120, E122, E124

3. BCM M18 (view with instrument panel lower LH panel removed)

STARTING SYSTEM

< SYSTEM DESCRIPTION >

Component Description

INFOID:000000006245754

Component part	Description
TCM	TCM supplies power to the starter relay inside the IPDM E/R when the selector lever is shifted to the P or N position.
BCM	BCM sends a starter request signal to the CPU of the IPDM E/R over the CAN communication lines.
IPDM E/R	CPU inside IPDM E/R operates the starter relay at the request of the BCM over the CAN communication lines.
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.

A

STR

C

D

E

F

G

H

I

J

K

L

M

N

O

P

B TERMINAL CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

DTC/CIRCUIT DIAGNOSIS

B TERMINAL CIRCUIT

Description

INFOID:000000006245755

For vehicles equipped with V6 engine (VQ40DE), terminal "2" (B) is constantly supplied with battery power.
For vehicles equipped with V8 engine (VK56DE), terminal "1" (B) is constantly supplied with battery power.

Diagnosis Procedure - VQ40DE

INFOID:000000006706128

Regarding Wiring Diagram information, refer to [STR-16, "Wiring Diagram - VQ40DE"](#).

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 2 POWER SUPPLY VOLTAGE

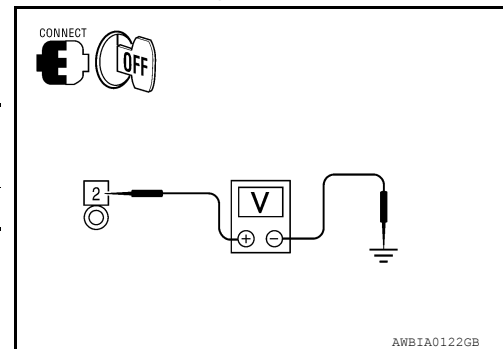
1. Turn ignition switch OFF.
2. Make sure that starter motor connector E210 terminal 2 connection is clean and tight.
3. Check voltage between starter motor connector E210 terminal 2 and ground.

(+)		(-)	Voltage
Connector	Terminal		
E210	2	Ground	Battery voltage

Is there battery voltage present?

YES >> GO TO 2

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



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2. CHECK BATTERY CABLE (VOLTAGE DROP TEST)

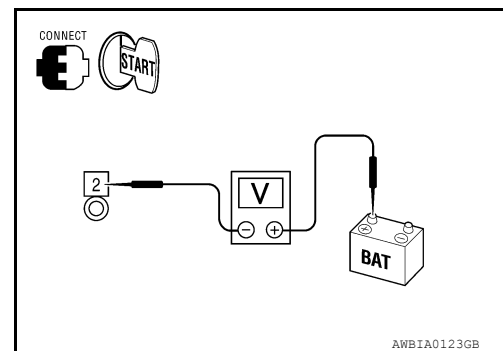
1. Shift the transmission into park or neutral.
2. Check voltage between battery positive terminal and starter motor connector E210 terminal 2 while cranking the engine.

(-)		(+)	Condition	Voltage
Connector	Terminal			
E210	2	Battery (+) terminal	While cranking the engine	Less than 0.2V

Is the voltage drop less than 0.2V?

YES >> GO TO 3

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



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3. CHECK GROUND CIRCUIT STATUS (VOLTAGE DROP TEST)

B TERMINAL CIRCUIT

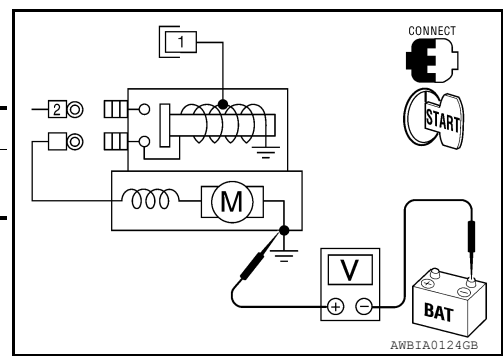
< DTC/CIRCUIT DIAGNOSIS >

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

(+)	(-)	Condition	Voltage
Starter motor case	Battery (-) terminal	While cranking the engine	Less than 0.2V

Is the voltage drop less than 0.2V?

- YES >> Terminal 2 circuit is OK. Further inspection necessary. Refer to [STR-5. "Work Flow"](#).
- NO >> Check the starter motor case to engine mounting for high resistance.



Diagnosis Procedure - VK56DE

INFOID:000000006706129

Regarding Wiring Diagram information, refer to [STR-20. "Wiring Diagram - VK56DE"](#).

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 1 POWER SUPPLY VOLTAGE

1. Turn ignition switch OFF.
2. Make sure that starter motor connector F34 terminal 1 connection is clean and tight.
3. Check voltage between starter motor connector F34 terminal 1 and ground.

(+) Connector		(-) Terminal	Voltage
F34	1	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 the transmission into park or neutral.
2. Check voltage between battery positive terminal and starter motor connector F34 terminal 1 while cranking the engine.

(-) Connector		(+) Terminal	Condition	Voltage
F34	1	Battery (+) terminal	While cranking the engine	Less than 0.2V

Is the voltage drop less than 0.2V?

- 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)

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

(+)	(-)	Condition	Voltage
Starter motor case	Battery (-) terminal	While cranking the engine	Less than 0.2V

Is the voltage drop less than 0.2V?

B TERMINAL CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

- YES >> Terminal 1 circuit is OK. Further inspection necessary. Refer to [STR-5. "Work Flow"](#).
- NO >> Check the starter motor case to engine mounting for high resistance.

S CONNECTOR CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

S CONNECTOR CIRCUIT

Description

INFOID:000000006245757

For vehicles equipped with V6 engine (VQ40DE), terminal "1" (S) is the power supply for the starter motor magnetic switch. Terminal 1 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.

For vehicles equipped with V8 engine (VK56DE), terminal "2" (S) is the power supply for the starter motor magnetic switch. Terminal 2 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.

Diagnosis Procedure - VQ40DE

INFOID:000000006245758

Regarding Wiring Diagram information, refer to [STR-16. "Wiring Diagram - VQ40DE"](#).

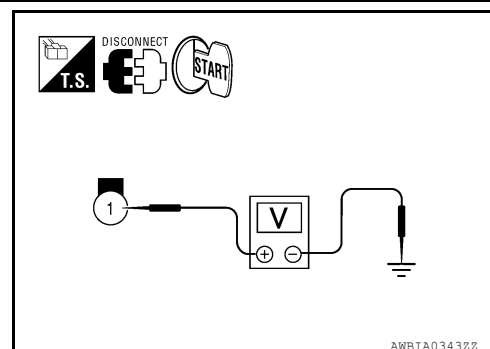
CAUTION:

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 STARTER MOTOR MAGNETIC SWITCH CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect starter motor connector E207.
3. Shift transmission into park or neutral.
4. Check voltage between starter motor harness connector E207 terminal 1 and ground with the ignition in START.



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(+)		(-)	Condition	Voltage
Connector	Terminal			
E207	1	Ground	While cranking the engine	Battery voltage

Is battery voltage present?

- YES >> Magnetic switch circuit is OK. Further inspection necessary. Refer to [STR-5. "Work Flow"](#).
 NO >> GO TO 2

2. CHECK CONNECTOR

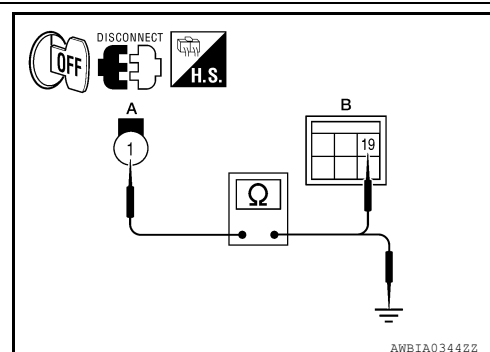
1. Turn ignition switch OFF.
2. Check the IPDM E/R harness connector E120 and starter motor harness connector E207 for damage, bent pins and loose connections.

Is the inspection result normal?

- YES >> GO TO 3
 NO >> Repair the terminal and connector.

3. CHECK HARNESS CONTINUITY (OPEN CIRCUIT)

1. Disconnect IPDM E/R connector E120.
2. Check continuity between starter motor harness connector E207 (A) terminal 1 and IPDM E/R harness connector E120 (B) terminal 19.



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Starter motor		IPDM E/R		Continuity
Connector	Terminal	Connector	Terminal	
E207 (A)	1	E120 (B)	19	Yes

3. Check continuity between starter motor harness connector E207 (A) terminal 1 and ground.

S CONNECTOR CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

Starter motor		—	Continuity
Connector	Terminal		
E207 (A)	1	Ground	No

Are the continuity test results as specified?

- YES >> Further inspection necessary. Refer to [STR-5, "Work Flow"](#).
 NO >> Repair the harness.

Diagnosis Procedure - VK56DE

INFOID:000000006245759

Regarding Wiring Diagram information, refer to [STR-20, "Wiring Diagram - VK56DE"](#).

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 STARTER MOTOR MAGNETIC SWITCH CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect starter motor connector F17.
3. Shift transmission into park or neutral.
4. Check voltage between starter motor harness connector F17 terminal 2 and ground with the ignition in START.

(+) Connector		Terminal	(-)	Condition	Voltage
F17	2				

Is battery voltage present?

- YES >> Magnetic switch circuit is OK. Further inspection necessary. Refer to [STR-5, "Work Flow"](#).
 NO >> GO TO 2

2. CHECK CONNECTOR

1. Turn ignition switch OFF.
2. Check the IPDM E/R harness connector E120 and starter motor harness connector F17 for damage, bent pins and loose connections.

Is the inspection result normal?

- YES >> GO TO 3
 NO >> Repair the terminal and connector.

3. CHECK HARNESS CONTINUITY (OPEN CIRCUIT)

1. Disconnect IPDM E/R connector E120.
2. Check continuity between starter motor harness connector F17 terminal 2 and IPDM E/R harness connector E120 terminal 19.

Starter motor		IPDM E/R		Continuity
Connector	Terminal	Connector	Terminal	
F17	2	E120	19	Yes

3. Check continuity between starter motor harness connector F17 terminal 2 and ground.

Starter motor		—	Continuity
Connector	Terminal		
F17	2	Ground	No

S CONNECTOR CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

Are the continuity test results as specified?

YES >> Further inspection necessary. Refer to [STR-5, "Work Flow"](#).

NO >> Repair the harness.

A

STR

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STARTING SYSTEM

< WIRING DIAGRAM >

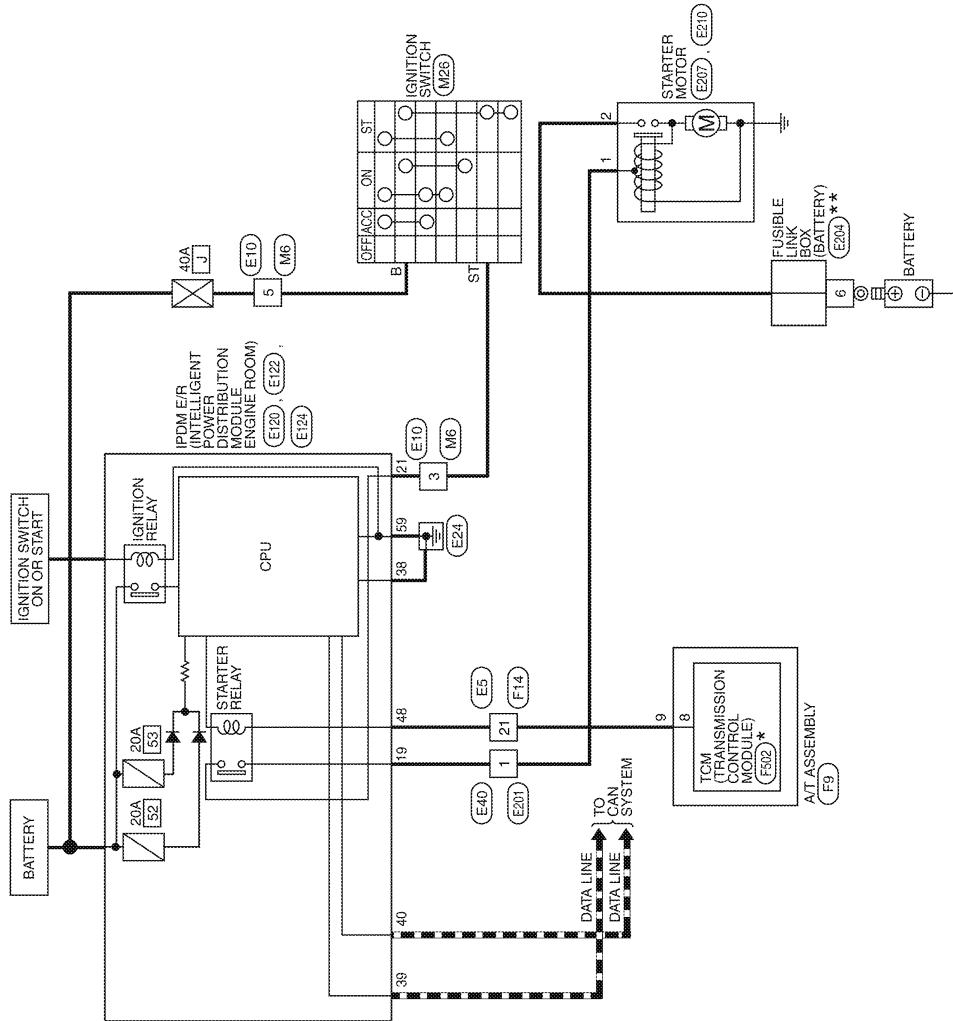
WIRING DIAGRAM

STARTING SYSTEM

Wiring Diagram - VQ40DE

INFOID:000000006542252

STARTING SYSTEM - VQ40DE



* : THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT" OF PG SECTION.
 ** : (E201) IS AN INTEGRAL PART OF FUSIBLE LINK BOX (BATTERY) ASSEMBLY.


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STARTING SYSTEM

< WIRING DIAGRAM >

STARTING SYSTEM CONNECTORS - VQ40DE

Connector No.	M6
Connector Name	WIRE TO WIRE
Connector Color	WHITE



4	3	2	1
8	7	6	5

Terminal No.	Color of Wire	Signal Name
3	GR	--
5	G	--


Connector No.	M26
Connector Name	IGNITION SWITCH
Connector Color	WHITE



B	ST	IG
R	ACC	IG2

Terminal No.	Color of Wire	Signal Name
B	G	--
ST	GR	--


Connector No.	E5
Connector Name	WIRE TO WIRE
Connector Color	WHITE



1	2	3	4	5	6	7	8	9	10	11	12
13	14	15	16	17	18	19	20	21	22	23	24

Terminal No.	Color of Wire	Signal Name
21	R	--


Connector No.	E10
Connector Name	WIRE TO WIRE
Connector Color	WHITE



1	2	3	4
5	6	7	8

Terminal No.	Color of Wire	Signal Name
3	GR	--
5	G	--


Connector No.	E40
Connector Name	WIRE TO WIRE
Connector Color	GRAY



1	2	3	4	5
6	7	8	9	

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

Connector No.	E120
Connector Name	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector Color	WHITE



21	20	19
24	23	22

Terminal No.	Color of Wire	Signal Name
19	W	STARTER MTR
21	GR	IGN SW (ST)

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A
STR
C
D
E
F
G
H
I
J
K
L
M
N
O
P

STARTING SYSTEM

< WIRING DIAGRAM >

Connector No.	E201
Connector Name	WIRE TO WIRE
Connector Color	GRAY



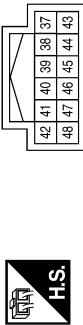
Terminal No.	Color of Wire	Signal Name
1	W	-

Connector No.	E124
Connector Name	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector Color	BLACK



Terminal No.	Color of Wire	Signal Name
59	B	GND (POWER)

Connector No.	E122
Connector Name	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
38	B	GND (SIGNAL)
39	L	CAN-H
40	P	CAN-L
48	R	RANGE SW

Connector No.	F9
Connector Name	A/T ASSEMBLY
Connector Color	GREEN



Terminal No.	Color of Wire	Signal Name
9	R	-

Connector No.	E210
Connector Name	STARTER MOTOR
Connector Color	BLACK



Terminal No.	Color of Wire	Signal Name
2	B/R	-

Connector No.	E207
Connector Name	STARTER MOTOR
Connector Color	GRAY



Terminal No.	Color of Wire	Signal Name
1	W	-

ABBIA0870GB

STARTING SYSTEM

< WIRING DIAGRAM >

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STR

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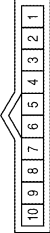
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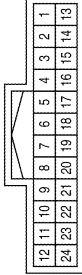
P

Connector No.	F502
Connector Name	TCM (TRANSMISSION CONTROL MODULE)
Connector Color	GRAY

Terminal No.	8	Color of Wire	G	Signal Name	START-RLY
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Connector No.	F14
Connector Name	WIRE TO WIRE
Connector Color	WHITE

Terminal No.	21	Color of Wire	R	Signal Name	-
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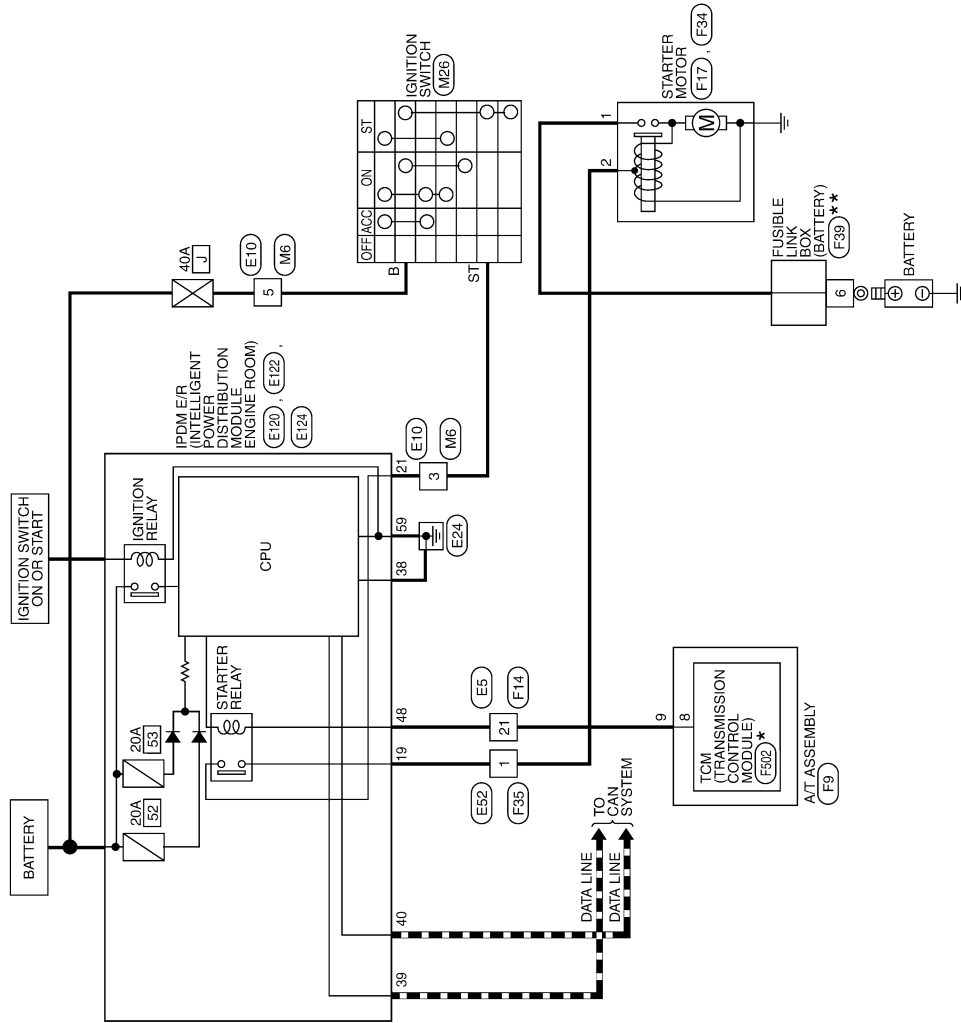
STARTING SYSTEM

< WIRING DIAGRAM >

Wiring Diagram - VK56DE

INFOID:000000006542253

STARTING SYSTEM - VK56DE



* : THIS CONNECTOR IS NOT SHOWN IN "HARNES LAYOUT" OF PG SECTION.
 ** : (E20) IS AN INTEGRAL PART OF FUSIBLE LINK BOX (BATTERY) ASSEMBLY.


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STARTING SYSTEM

< WIRING DIAGRAM >

STARTING SYSTEM CONNECTORS - VK56DE

Connector No.	M6
Connector Name	WIRE TO WIRE
Connector Color	WHITE



4	3	2	1
8	7	6	5

Terminal No.	Color of Wire	Signal Name
3	GR	-
5	G	-


Connector No.	M26
Connector Name	IGNITION SWITCH
Connector Color	WHITE



B	ST	IG
R	ACC	R2

Terminal No.	Color of Wire	Signal Name
B	G	-
ST	GR	-


Connector No.	E5
Connector Name	WIRE TO WIRE
Connector Color	WHITE



1	2	3	4	5	6	7	8	9	10	11	12
13	14	15	16	17	18	19	20	21	22	23	24

Terminal No.	Color of Wire	Signal Name
21	R	-

Connector No.	E10
Connector Name	WIRE TO WIRE
Connector Color	WHITE



1	2	3	4
5	6	7	8

Terminal No.	Color of Wire	Signal Name
3	GR	-
5	G	-


Connector No.	E52
Connector Name	WIRE TO WIRE
Connector Color	WHITE



1	2
---	---

Terminal No.	Color of Wire	Signal Name
1	W	-

Connector No.	E120
Connector Name	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector Color	WHITE



21	20	19
24	23	22

Terminal No.	Color of Wire	Signal Name
19	W	STARTER MTR
21	GR	IGN SW (ST)

STARTING SYSTEM

< WIRING DIAGRAM >

Connector No.	F9
Connector Name	A/T ASSEMBLY
Connector Color	GREEN



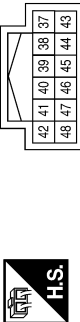
Terminal No.	9	Color of Wire	R	Signal Name	-
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Connector No.	E124
Connector Name	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector Color	BLACK



Terminal No.	59	Color of Wire	B	Signal Name	GND (POWER)
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Connector No.	E122
Connector Name	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector Color	WHITE



Terminal No.	38	Color of Wire	B	Signal Name	GND (SIGNAL)
	39		L		CAN-H
	40		P		CAN-L
	48		R		RANGE SW

Connector No.	F34
Connector Name	STARTER MOTOR
Connector Color	BLACK



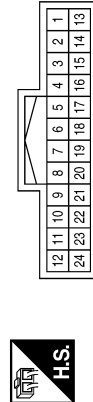
Terminal No.	1	Color of Wire	B/R	Signal Name	-
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Connector No.	F17
Connector Name	STARTER MOTOR
Connector Color	GRAY



Terminal No.	2	Color of Wire	W	Signal Name	-
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Connector No.	F14
Connector Name	WIRE TO WIRE
Connector Color	WHITE



Terminal No.	21	Color of Wire	R	Signal Name	-
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STARTING SYSTEM

< WIRING DIAGRAM >

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Connector No.	F502
Connector Name	TCM (TRANSMISSION CONTROL MODULE)
Connector Color	GRAY



Terminal No.	8	Color of Wire	G	Signal Name	START-RLY
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Connector No.	F35
Connector Name	WIRE TO WIRE
Connector Color	WHITE



Terminal No.	1	Color of Wire	W	Signal Name	--
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STARTING SYSTEM

< SYMPTOM DIAGNOSIS >

SYMPTOM DIAGNOSIS

STARTING SYSTEM

Symptom Table

INFOID:000000006245762

Symptom	Reference
No normal cranking	Refer to STR-5, "Work Flow" .
Starter motor does not rotate	

STARTER MOTOR

< REMOVAL AND INSTALLATION >

REMOVAL AND INSTALLATION

STARTER MOTOR

VQ40DE

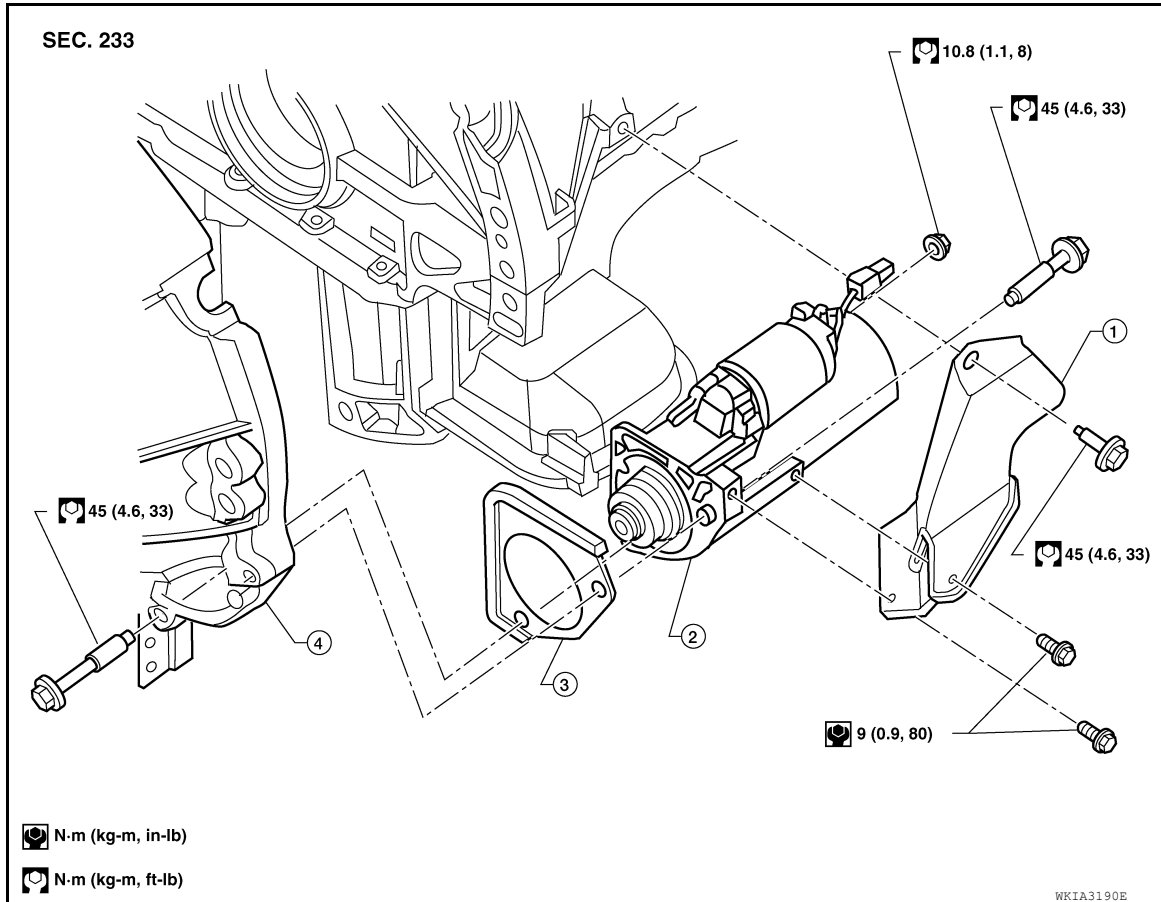
VQ40DE : Exploded View

INFOID:000000006245763

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VQ40DE Models



1. Starter cover
2. Starter motor assembly
3. Starter cover plate (rear)
4. Transmission housing

VQ40DE : Removal and Installation

INFOID:000000006245764

VQ40DE MODELS

Removal

1. Disconnect the negative battery terminal.
2. Remove starter cover bolts and starter cover.

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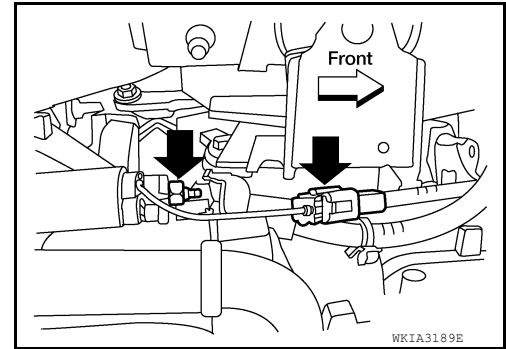
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STARTER MOTOR

< REMOVAL AND INSTALLATION >

3. Disconnect terminal "S" connector and terminal "B" nut.
4. Remove the two starter bolts, using power tools.
5. Remove the starter.



Installation

Installation is in the reverse order of removal.

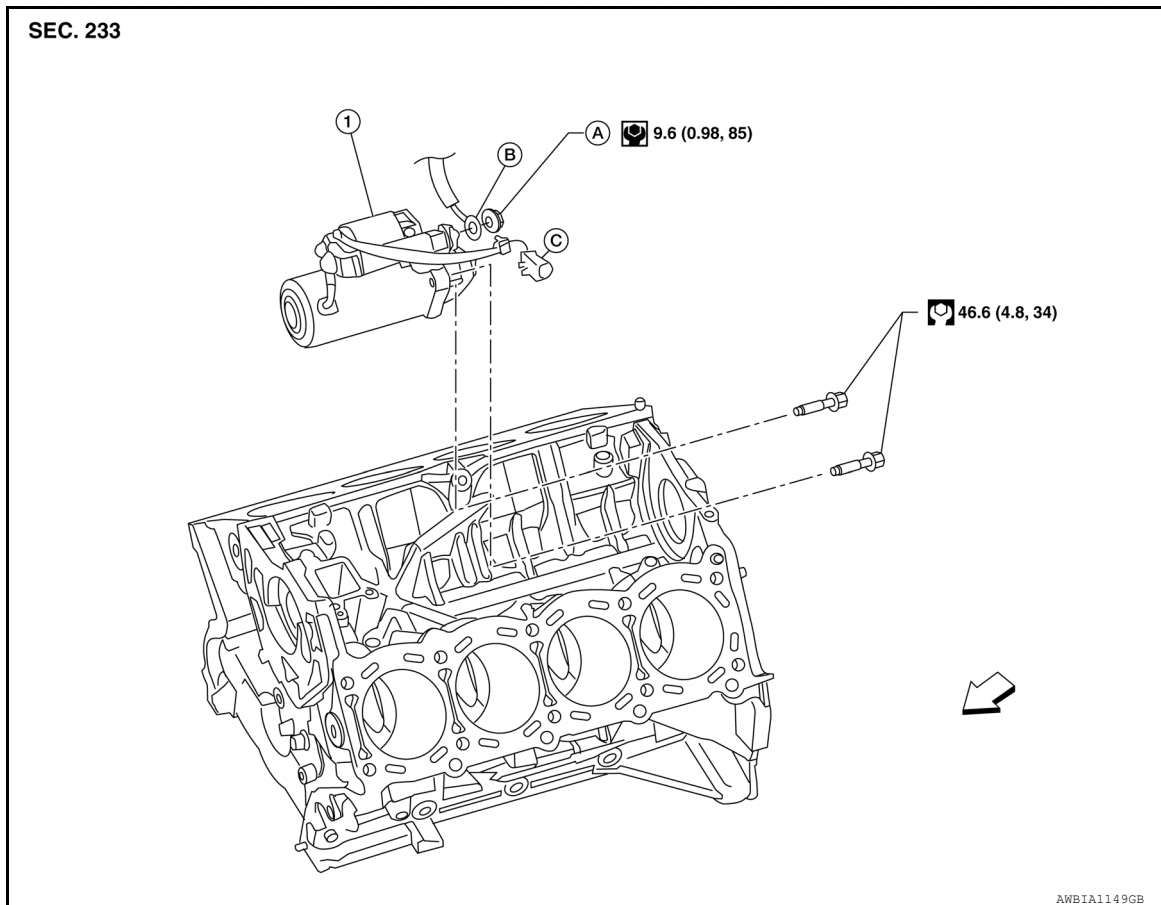
CAUTION:

Tighten terminal "B" nut carefully.

VK56DE

VK56DE : Exploded View

INFOID:000000008185207



1. Starter motor assembly
- C. Terminal "2" (S) connector

A. Terminal "1" (B) nut

← Vehicle front

B. Terminal "1" (B) cable

VK56DE : Removal and Installation

INFOID:000000008185208

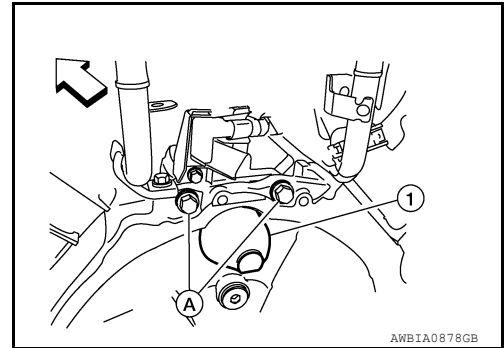
REMOVAL

1. Remove the intake manifold. Refer to [EM-166. "Removal and Installation"](#).

STARTER MOTOR

< REMOVAL AND INSTALLATION >

2. Remove the starter motor assembly harness terminal "1" (B) nut and terminal "1" (B) cable.
3. Disconnect terminal "2" (S) connector.
4. Remove terminal "2" (S) harness clips from brackets.
5. Remove the two starter motor assembly bolts (A), using power tools.
↳: Vehicle front
6. Remove the starter motor assembly (1).



INSTALLATION

Installation is in the reverse order of removal.

CAUTION:

Tighten terminal "1" (B) nut carefully.

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STARTER MOTOR

< SERVICE DATA AND SPECIFICATIONS (SDS)

SERVICE DATA AND SPECIFICATIONS (SDS)

STARTER MOTOR

Starter

INFOID:000000006245765

Application		VQ40DE	VK56DE
Type*		Mitsubishi M001TA0072	Mitsubishi M001T30671
		Reduction gear type	
System voltage		12V	
	Terminal voltage	11V	
No-load	Current	Less than 120A	Less than 120A
	Revolution	More than 3,100 rpm	More than 3,220 rpm

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