

STR

SECTION STR
STARTING SYSTEM

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PRECAUTIONS

< PRECAUTION >

PRECAUTION

PRECAUTIONS

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

INFOID:0000000007358897

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:0000000007358898

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:0000000007358899

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 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.

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Precaution for Work

- 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 >

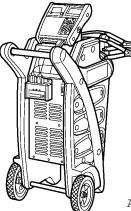
PREPARATION

PREPARATION

Special Service Tool

INFOID:0000000007358901

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

Tool number (Kent-Moore No.)	Description
— — Model GR8-1200 NI Multitasking battery and electrical diagnostic station	 AWIIA1239ZZ

Commercial Service Tool

INFOID:0000000007358902

Tool name	Description
Power tool	 PIIB1407E

DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION >

BASIC INSPECTION

DIAGNOSIS AND REPAIR WORKFLOW

Work Flow (With GR8-1200 NI)

INFOID:000000008802647

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STARTING SYSTEM DIAGNOSIS WITH GR8-1200 NI

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

- GR8-1200 NI Multitasking battery and electrical diagnostic station

NOTE:

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

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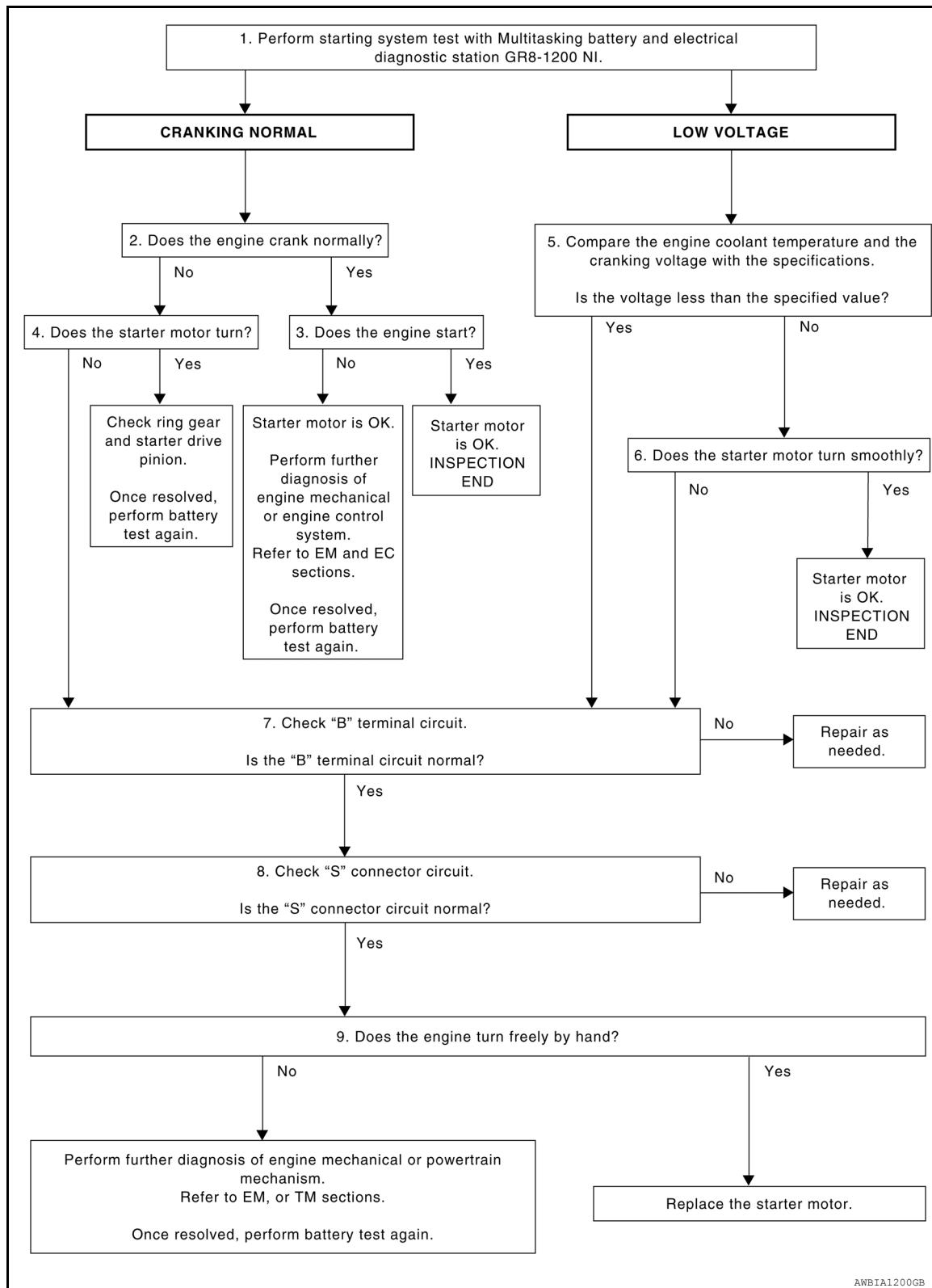
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DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION >

OVERALL SEQUENCE



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DETAILED FLOW

NOTE:

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

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

DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION >

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

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.

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2.CRANKING CHECK

Check that the starter motor operates properly.

Does the engine crank normally?

YES >> GO TO 3.

NO >> GO TO 4.

3.ENGINE START CHECK

Check that the engine starts.

Does the engine start?

YES >> Inspection End.

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

4.STARTER MOTOR ACTIVATION

Check that the starter motor operates.

Does the starter motor turn?

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

NO >> GO TO 7.

5.COMPARISON BETWEEN ENGINE COOLANT AND CRANKING VOLTAGE

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

Minimum Specification of Cranking Voltage Referencing Coolant Temperature

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

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Is the voltage less than the specified value?

YES >> GO TO 7.

NO >> GO TO 6.

6.STARTER OPERATION

Check the starter operation.

Does the starter motor turn smoothly?

YES >> Inspection End.

NO >> GO TO 7.

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7.“B” TERMINAL CIRCUIT INSPECTION

Check “B” terminal circuit. Refer to [STR-13, "Diagnosis Procedure - VQ40DE"](#) (VQ40DE) or [STR-14, "Diagnosis Procedure - VK56DE"](#) (VK56DE).

Is “B” terminal circuit normal?

YES >> GO TO 8.

NO >> Repair as needed.

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8.“S” CONNECTOR CIRCUIT INSPECTION

DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION >

Check "S" connector circuit. Refer to [STR-16, "Diagnosis Procedure - VQ40DE"](#) (VQ40DE) or [STR-17, "Diagnosis Procedure - VK56DE"](#) (VK56DE).

Is "S" connector circuit normal?

YES >> GO TO 9.

NO >> Repair as needed.

9. ENGINE ROTATION STATUS

Check that the engine can be rotated by hand.

Does the engine turn freely by hand?

YES >> Replace starter motor.

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

DIAGNOSIS AND REPAIR WORKFLOW

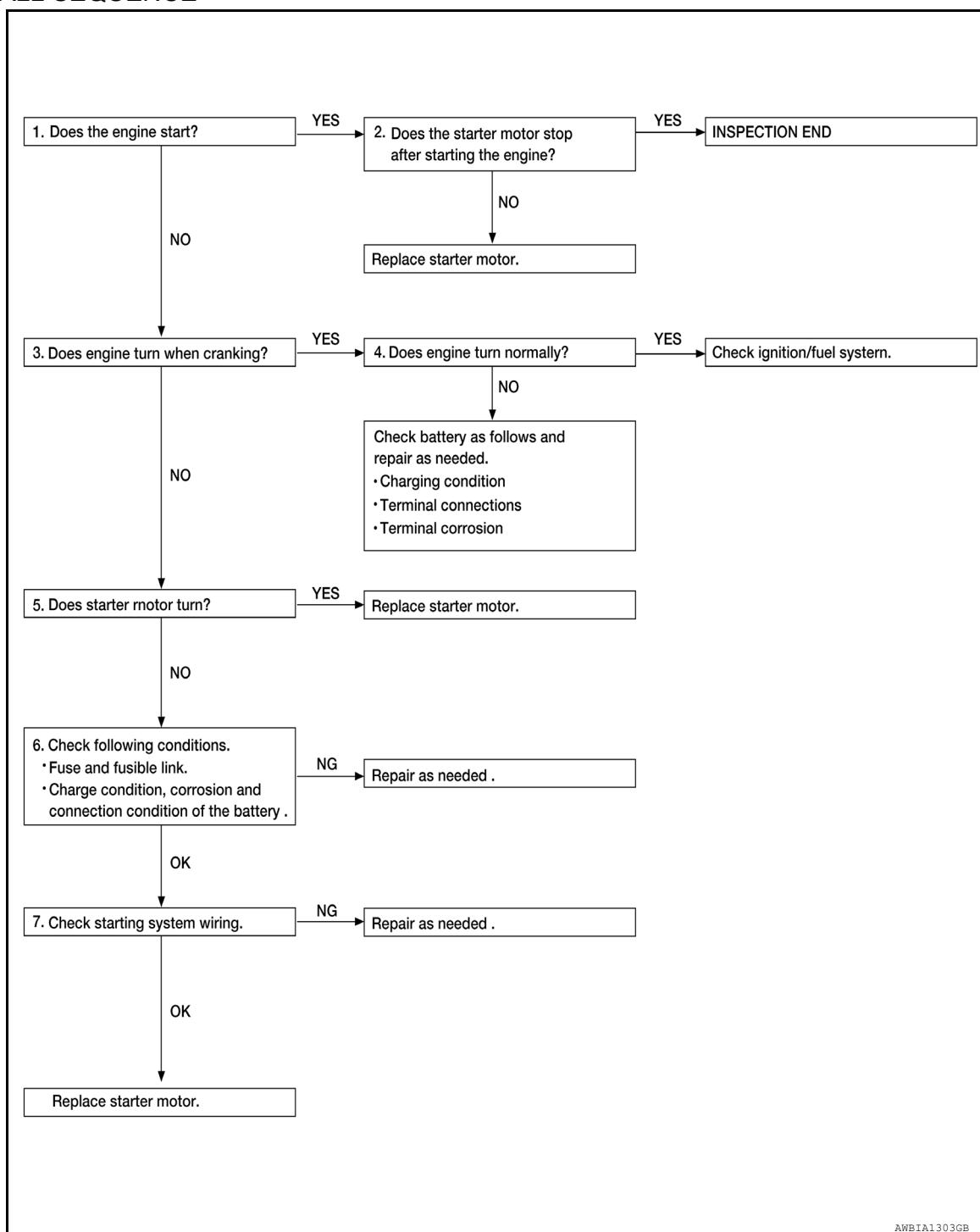
< BASIC INSPECTION >

Work Flow (Without GR8-1200 NI)

INFOID:000000008802648

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OVERALL SEQUENCE



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DETAILED FLOW

NOTE:

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

1. CHECK ENGINE START

Crank the engine and check that the engine starts.

Does the engine start?

- YES >> GO TO 2.
- NO >> GO TO 3.

DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION >

2.CHECK THAT THE STARTER MOTOR STOPS

Check that the starter motor stops after starting the engine.

Does the starter motor stop?

YES >> Inspection End.

NO >> Replace starter motor. Refer to [STR-28, "Removal and Installation"](#).

3.CHECK THAT THE ENGINE TURNS WHEN CRANKING

Check that the engine turns when cranking.

Does engine turn when cranking?

YES >> GO TO 4.

NO >> GO TO 5.

4.CHECK THE ENGINE SPEED WHEN CRANKING

Check that the engine speed is not low when cranking.

Does engine turn normally?

YES >> Check ignition/fuel system.

NO >> Check charge condition, corrosion and connection condition of the battery. Refer to [PG-5, "How to Handle Battery"](#).

5.CHECK STARTER MOTOR ACTIVATION

Check that the starter motor runs at cranking.

Does starter motor turn?

YES >> Replace starter motor. Refer to [STR-28, "Removal and Installation"](#).

NO >> GO TO 6.

6.CHECK POWER SUPPLY CIRCUIT

Check the following conditions:

- Fuse and fusible link
- Charge condition, corrosion and connection of the battery.

Are these inspection results normal?

YES >> GO TO 7.

NO >> Repair as needed.

7.CHECK STARTING SYSTEM WIRING

Check the following:

- "B" terminal circuit. Refer to [STR-13, "Diagnosis Procedure - VQ40DE"](#) (VQ40DE) or [STR-14, "Diagnosis Procedure - VK56DE"](#) (VK56DE).
- "S" terminal circuit. Refer to [STR-16, "Diagnosis Procedure - VQ40DE"](#) (VQ40DE) or [STR-17, "Diagnosis Procedure - VK56DE"](#) (VK56DE).

Are the inspection results normal?

YES >> Replace starter motor. Refer to [STR-28, "Removal and Installation"](#).

NO >> Repair as needed.

STARTING SYSTEM

< SYSTEM DESCRIPTION >

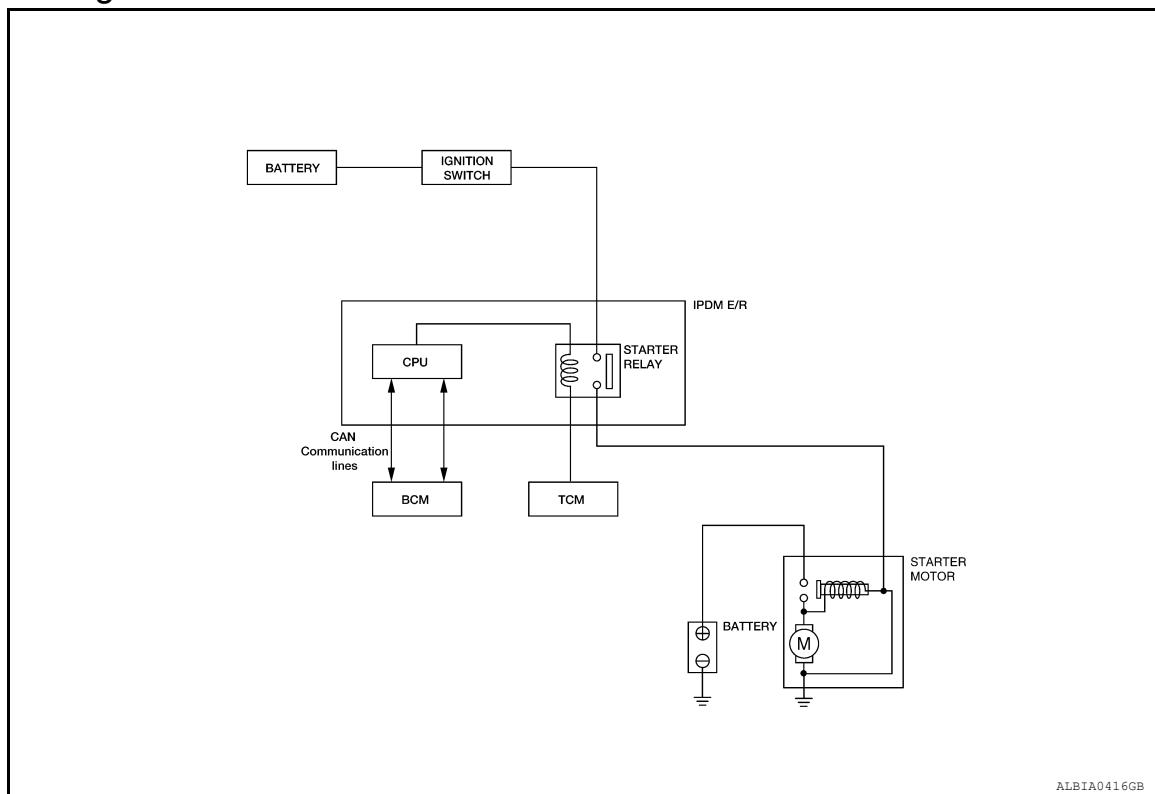
SYSTEM DESCRIPTION

STARTING SYSTEM

System Diagram

INFOID:000000007358904

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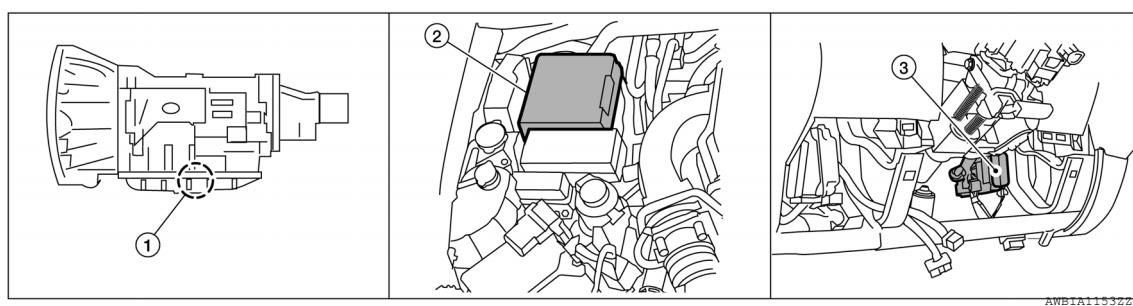
System Description

INFOID:000000007358905

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:000000007358906



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:000000007358907

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.

B TERMINAL CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

DTC/CIRCUIT DIAGNOSIS

B TERMINAL CIRCUIT

Description

INFOID:000000007358908

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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:000000007358909

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Regarding Wiring Diagram information, refer to [STR-19, "Wiring Diagram - VQ40DE".](#)

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CAUTION:

Before testing, perform the following procedure to ensure the engine cannot start.

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

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1.CHECK TERMINAL 2 POWER SUPPLY VOLTAGE

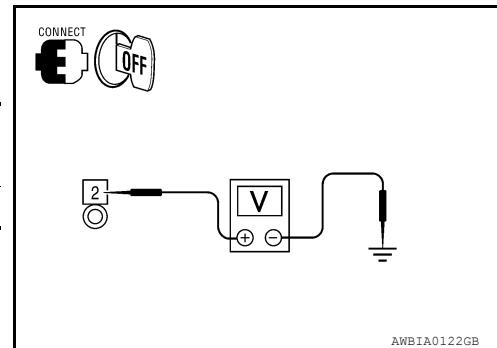
1. Turn ignition switch OFF.
2. Make sure that starter motor connector E210 terminal 2 connection is clean and tight.
3. Check voltage between starter motor connector E210 terminal 2 and ground.

F

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

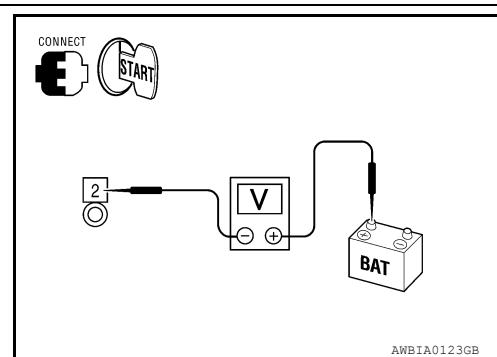
1. Shift the transmission into park or neutral.
2. Check voltage between battery positive terminal and starter motor connector E210 terminal 2 while cranking the engine.

H

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

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B TERMINAL CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

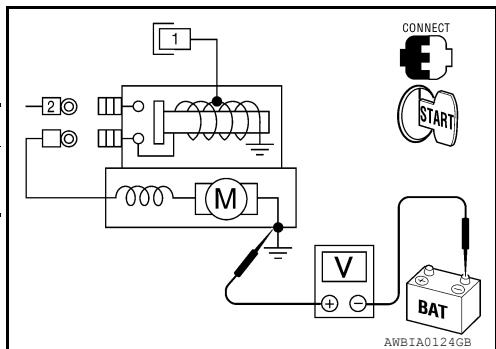
Check voltage between starter motor case and battery negative terminal while cranking the engine.

(+)	(-)	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 \(With GR8-1200 NI\)"](#) or
[STR-9, "Work Flow \(Without GR8-1200 NI\)"](#).

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



INFOID:0000000007358910

Diagnosis Procedure - VK56DE

Regarding Wiring Diagram information, refer to [STR-23, "Wiring Diagram - VK56DE"](#).

CAUTION:

Before testing, perform the following procedure to ensure the engine cannot start.

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

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 \(With GR8-1200 NI\)"](#) or [STR-9, "Work Flow \(Without GR8-1200 NI\)"](#).
NO >> Check the starter motor case to engine mounting for high resistance.

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S CONNECTOR CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

S CONNECTOR CIRCUIT

Description

INFOID:0000000007358911

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:0000000007358912

Regarding Wiring Diagram information, refer to [STR-19, "Wiring Diagram - VQ40DE"](#).

CAUTION:

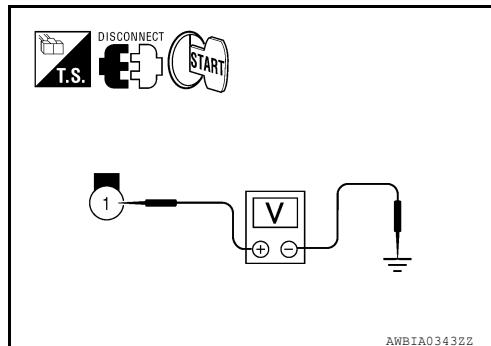
Before testing, perform the following procedure to ensure the engine cannot start.

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.

(+)		(-)	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 \(With GR8-1200 NI\)"](#) or [STR-9, "Work Flow \(Without GR8-1200 NI\)"](#).

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

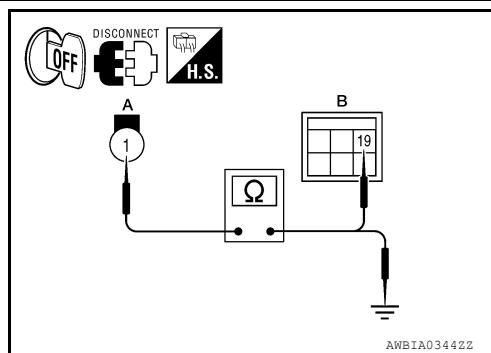
NO >> Repair the terminal and connector.

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.

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

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Are the continuity test results as specified?

C

YES >> Further inspection necessary. Refer to [STR-5, "Work Flow \(With GR8-1200 NI\)"](#) or [STR-9, "Work Flow \(Without GR8-1200 NI\)"](#).

D

NO >> Repair the harness.

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Diagnosis Procedure - VK56DE

INFOID:000000007358913

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Regarding Wiring Diagram information, refer to [STR-23, "Wiring Diagram - VK56DE"](#).

G

CAUTION:

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Before testing, perform the following procedure to ensure the engine cannot start.

I

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

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1.CHECK STARTER MOTOR MAGNETIC SWITCH CIRCUIT

K

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.

L

(+)	(-)	Condition	Voltage
Connector	Terminal		
F17	2	Ground	While cranking the engine
			Battery voltage

M

Is battery voltage present?

N

YES >> Magnetic switch circuit is OK. Further inspection necessary. Refer to [STR-5, "Work Flow \(With GR8-1200 NI\)"](#) or [STR-9, "Work Flow \(Without GR8-1200 NI\)"](#).

O

NO >> GO TO 2

P

2.CHECK CONNECTOR

R

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.

S

Is the inspection result normal?

T

YES >> GO TO 3

U

NO >> Repair the terminal and connector.

3.CHECK HARNESS CONTINUITY (OPEN CIRCUIT)

V

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.

S CONNECTOR CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

Starter motor		—	Continuity
Connector	Terminal		
F17	2	Ground	No

Are the continuity test results as specified?

YES >> Further inspection necessary. Refer to [STR-5, "Work Flow \(With GR8-1200 NI\)"](#) or [STR-9, "Work Flow \(Without GR8-1200 NI\)".](#)

NO >> Repair the harness.

STARTING SYSTEM

< WIRING DIAGRAM >

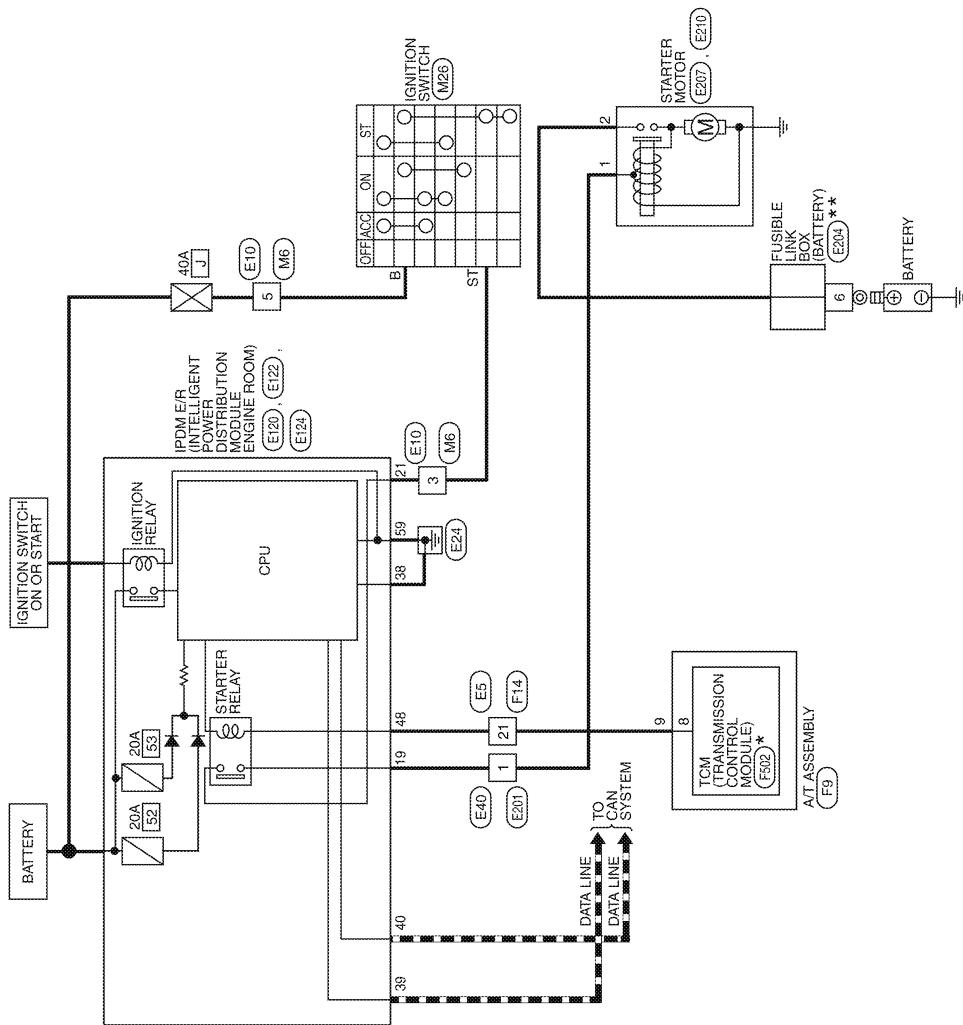
WIRING DIAGRAM STARTING SYSTEM

Wiring Diagram - VQ40DE

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STARTING SYSTEM - VQ40DE



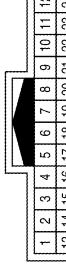
* : THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT" OF PG SECTION.
** : (E204) IS AN INTEGRAL PART OF FUSIBLE LINK BOX (BATTERY) ASSEMBLY.

ABBWA0186GB

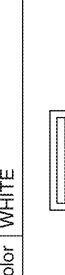
STARTING SYSTEM

< WIRING DIAGRAM >

STARTING SYSTEM CONNECTORS - VQ40DE

Connector No.	M6	Connector No.	M26
Connector Name	WIRE TO WIRE	Connector Name	IGNITION SWITCH
Connector Color	WHITE	Connector Color	WHITE
			
			
Terminal No.	Color of Wire	Signal Name	
3	GR	—	
5	G	—	

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

Connector No.	E10	Connector No.	E40
Connector Name	WIRE TO WIRE	Connector Name	WIRE TO WIRE
Connector Color	WHITE	Connector Color	GRAY
			
			
Terminal No.	Color of Wire	Signal Name	
3	GR	—	
5	G	—	

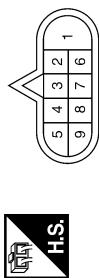
Terminal No.	Color of Wire	Signal Name	
3	GR	—	
5	G	—	

ABBIA0398GB

STARTING SYSTEM

< WIRING DIAGRAM >

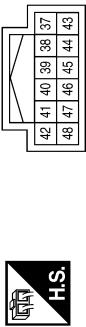
Connector No.	E124
Connector Name	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector Color	WHITE



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

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
1	W	-

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

Terminal No.	Color of Wire	Signal Name
1	W	-

Terminal No.	Color of Wire	Signal Name
1	W	-

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

Terminal No.	Color of Wire	Signal Name
1	W	-

Terminal No.	Color of Wire	Signal Name
1	W	-

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

Terminal No.	Color of Wire	Signal Name
1	W	-

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

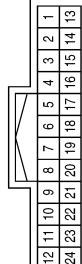
STARTING SYSTEM

< WIRING DIAGRAM >

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

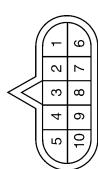


Connector No.	F14
Connector Name	WIRE TO WIRE
Connector Color	WHITE



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

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



5	4	3	2	1
10	9	8	7	6

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

ABBIA1214GB

STARTING SYSTEM

< WIRING DIAGRAM >

Wiring Diagram - VK56DE

INFOID:000000007358915

A

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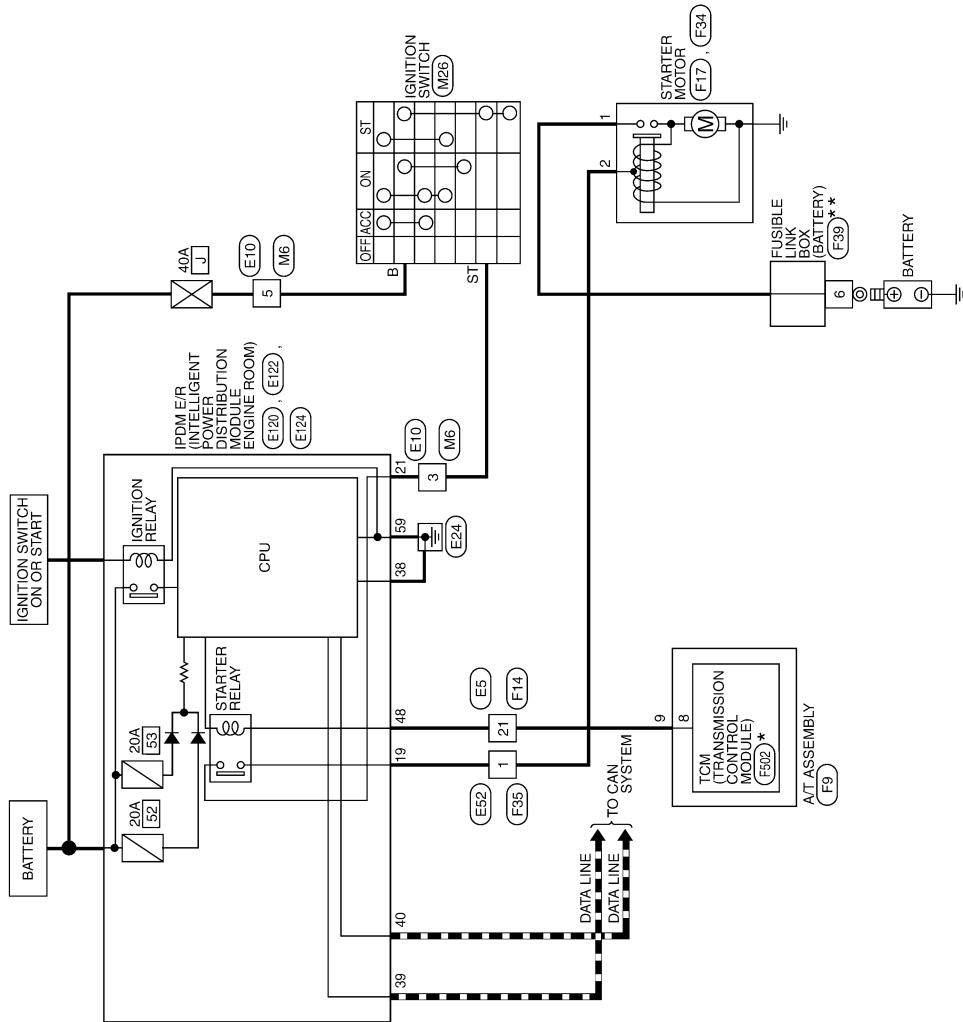
M

Z

O

P

STARTING SYSTEM - VK56DE



* : THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT" OF PG SECTION.
** : (F39) IS AN INTEGRAL PART OF FUSIBLE LINK BOX (BATTERY) ASSEMBLY.

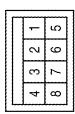
ABBWA0836GB

STARTING SYSTEM

< WIRING DIAGRAM >

STARTING SYSTEM CONNECTORS - VK56DE

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



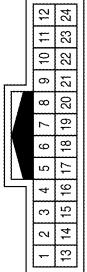
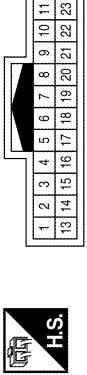
Connector No.	M26
Connector Name	IGNITION SWITCH
Connector Color	WHITE



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

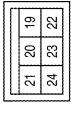
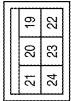
Terminal No.	Color of Wire	Signal Name
B	G	-
ST	GR	-

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



Terminal No.	Color of Wire	Signal Name
21	R	-

Terminal No.	Color of Wire	Signal Name
21	R	-



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



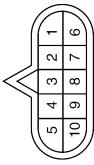
Terminal No.	Color of Wire	Signal Name
1	W	-

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

STARTING SYSTEM

< WIRING DIAGRAM >

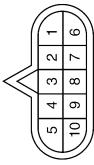
Connector No.	E122
Connector Name	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector Color	WHITE



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.	E124
Connector Name	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector Color	BLACK



Terminal No.	Color of Wire	Signal Name
9	R	-



Terminal No.	Color of Wire	Signal Name
9	R	-



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



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



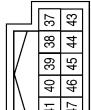
Terminal No.	Color of Wire	Signal Name
2	W	-



Terminal No.	Color of Wire	Signal Name
2	W	-

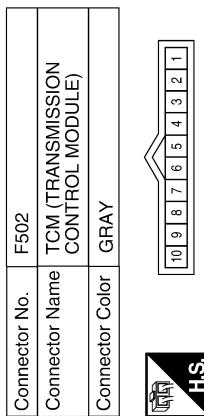


Connector No.	F14
Connector Name	WIRE TO WIRE
Connector Color	WHITE

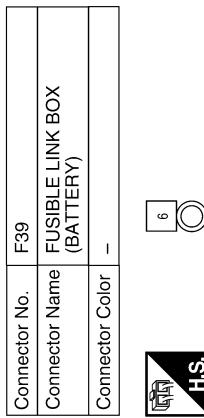


STARTING SYSTEM

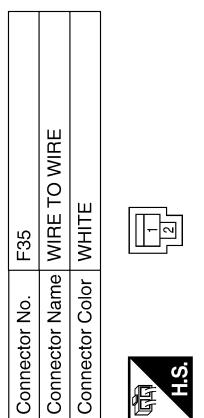
< WIRING DIAGRAM >



Terminal No.	Color of Wire	Signal Name
8	G	START-RLY



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



Terminal No.	Color of Wire	Signal Name
1	W	-

ABBIA1215GB

STARTING SYSTEM

< SYMPTOM DIAGNOSIS >

SYMPTOM DIAGNOSIS

STARTING SYSTEM

Symptom Table

INFOID:000000007358916

STR

Symptom	Reference
No normal cranking	Refer to STR-5, "Work Flow (With GR8-1200 NI)" or STR-9, "Work Flow (Without GR8-1200 NI)" .
Starter motor does not rotate	

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M

N

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P

STARTER MOTOR

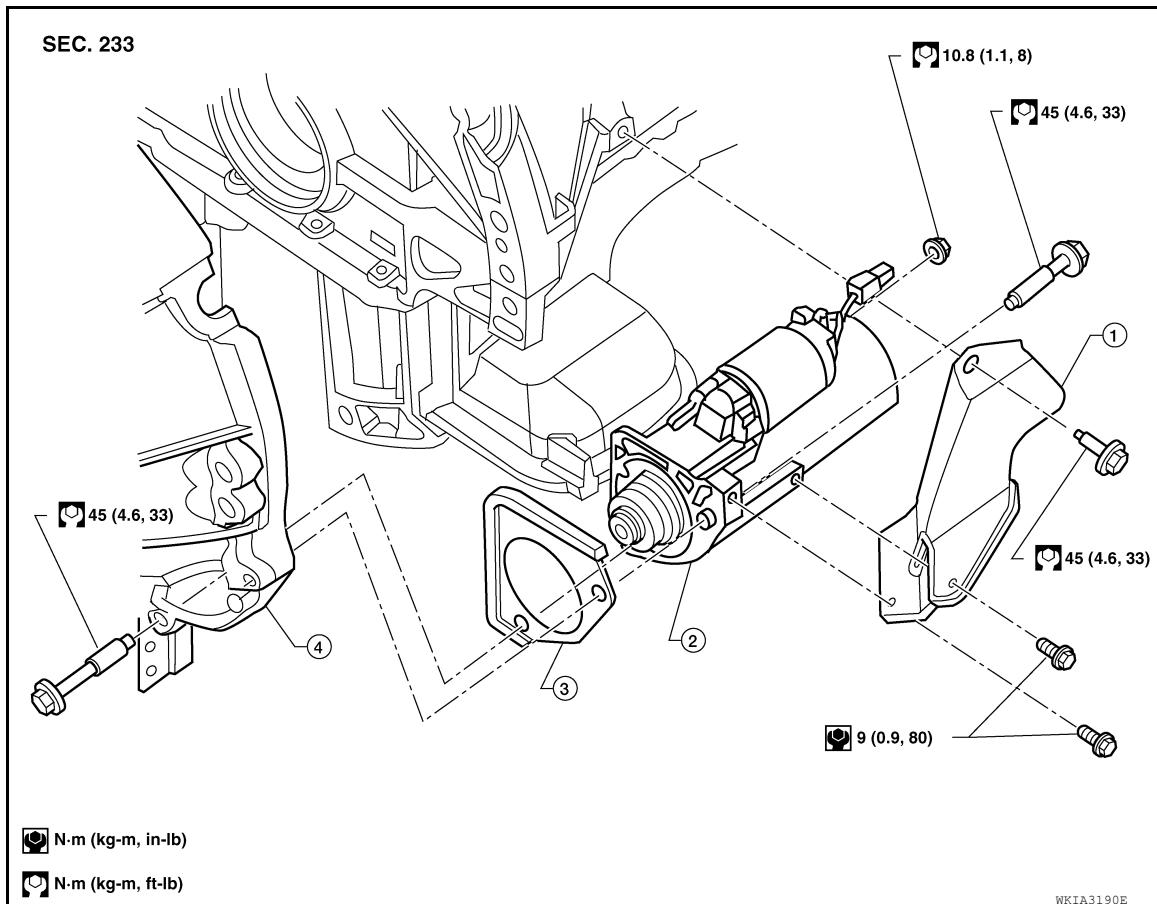
< REMOVAL AND INSTALLATION >

REMOVAL AND INSTALLATION STARTER MOTOR

Removal and Installation

INFOID:0000000007358918

VQ40DE Models

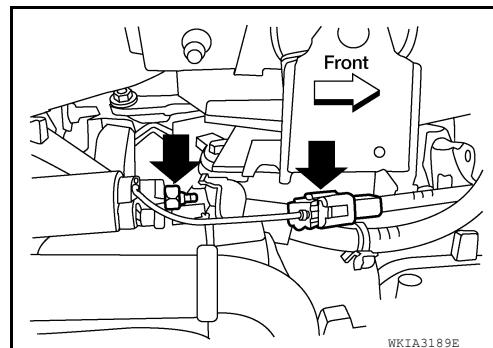


1. Starter cover
2. Starter motor assembly
3. Starter cover plate (rear)
4. Transmission housing

VQ40DE MODELS

Removal

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

STARTER MOTOR

< REMOVAL AND INSTALLATION >

Tighten terminal "B" nut carefully.

A

STR

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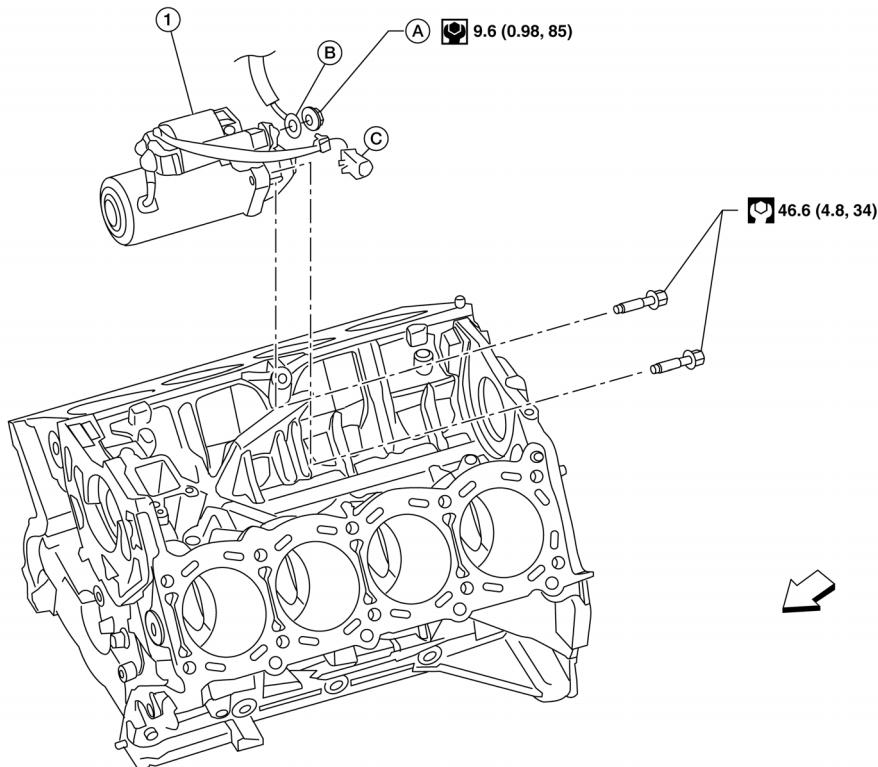
O

P

VK56DE Models

SEC. 233

STR



AWBIA1149GB

- 1. Starter motor assembly
- A. Terminal (B) nut
- C. Terminal (S) connector
- B. Terminal (B) cable

VK56DE MODELS

Removal

1. Remove the intake manifold. Refer to [EM-165, "Removal and Installation"](#).
2. Disconnect terminal "S" connector and terminal "B" nut.
3. Remove the two starter bolts, using power tools.
4. Remove the starter.

Installation

Installation is in the reverse order of removal.

CAUTION:

Tighten terminal "B" nut carefully.

STARTER MOTOR

< SERVICE DATA AND SPECIFICATIONS (SDS)

SERVICE DATA AND SPECIFICATIONS (SDS)

STARTER MOTOR

Starter

INFOID:000000007358919

Application	VQ40DE	VK56DE
Type*	Mitsubishi M001TA0072	Mitsubishi M001T30671
	Reduction gear type	
System voltage	12V	
No-load	Terminal voltage	11V
	Current	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.