SECTION STR
STARTING SYSTEM

CONTENTS

PRECAUTION

PRECAUTIONS

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

INFOID:0000000006915216

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.**

PREPARATION

PREPARATION

Special Service Tool

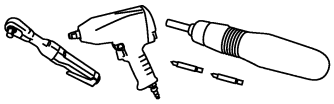
INFOID:0000000006751573

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

Tool number (Kent Moore No.) Tool name	Description
— (—) Model GR8-1200 NI Multitasking battery and electrical diagnostic station  AWIIA1239ZZ	Tests Batteries, starting and charging system and changes batteries. For operating instructions, refer to diagnostic station instruction manual.

Commercial Service Tool

INFOID:0000000006751574

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

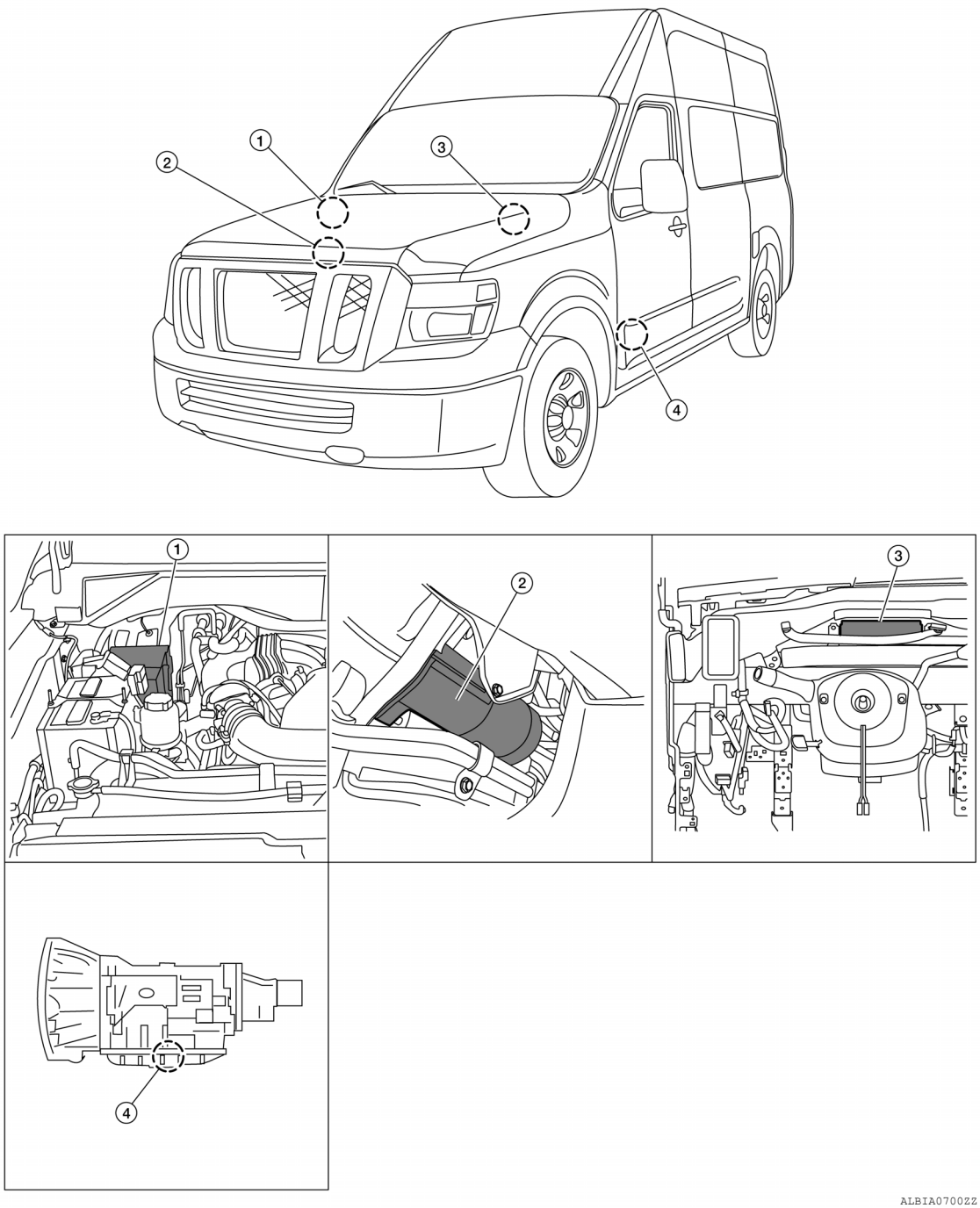
SYSTEM DESCRIPTION

COMPONENT PARTS

VQ40DE

VQ40DE : Component Parts Location

INFOID:0000000006923486



1. IPDM E/R
2. Starter motor
3. BCM (view with instrument panel removed)
4. A/T assembly (with built in TCM)

VQ40DE : Component Description

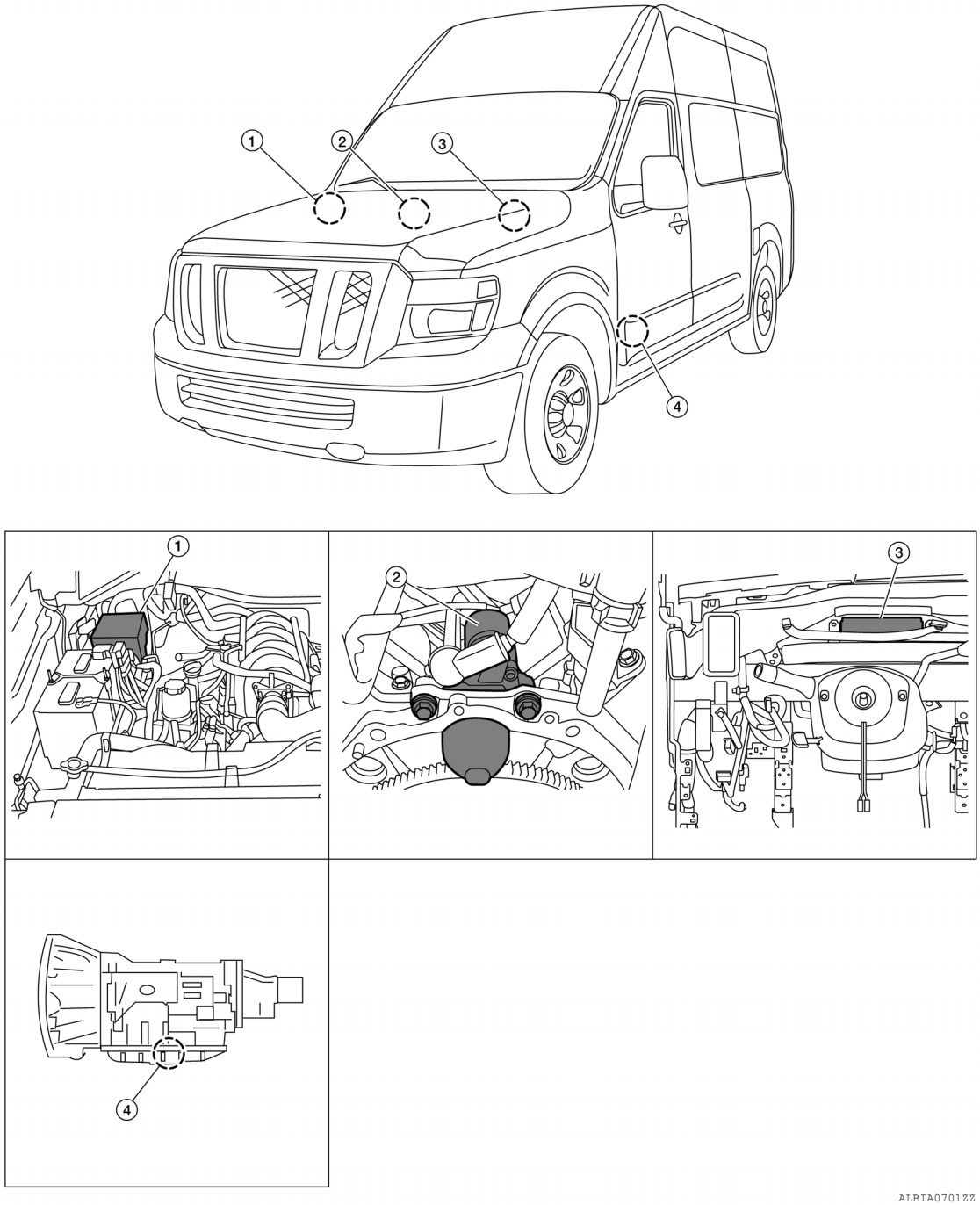
INFOID:0000000006923487

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.

VK56DE

VK56DE : Component Parts Location

INFOID:0000000006751578



1. IPDM E/R
2. Starter motor (view with intake manifold removed)
3. BCM (view with instrument panel removed)
4. A/T assembly (with built in TCM)

VK56DE : Component Description

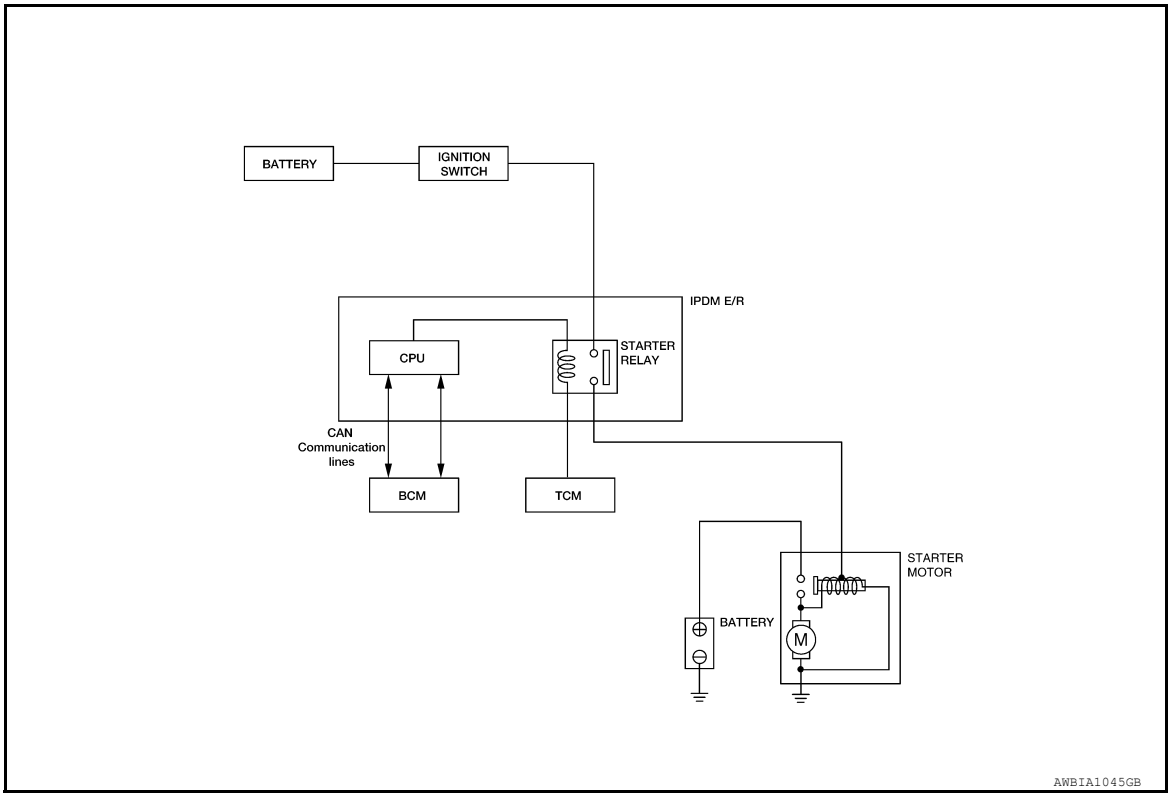
INFOID:0000000006751579

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.

SYSTEM

System Diagram

INFOID:0000000006751576



System Description

INFOID:0000000006751577

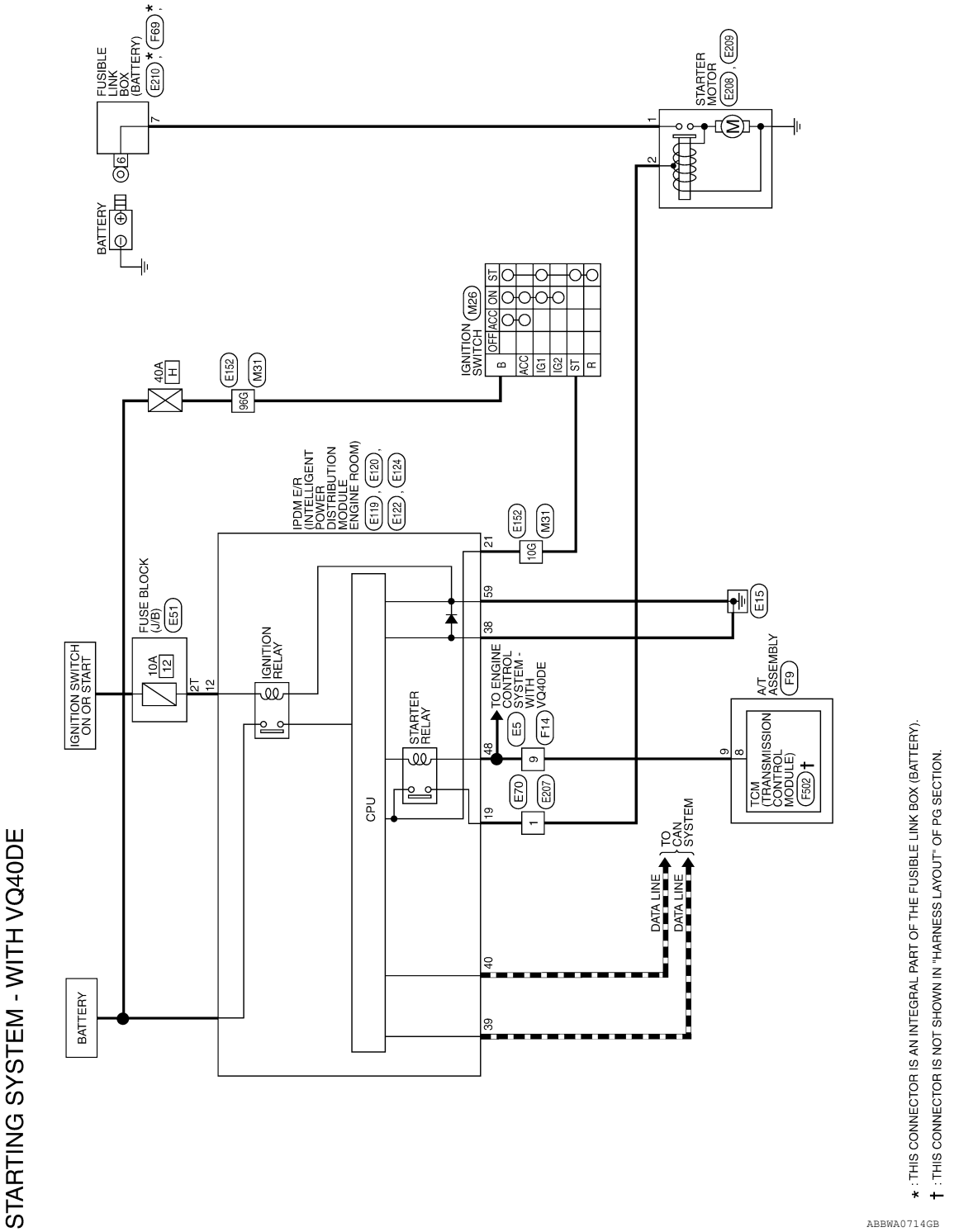
The starter motor plunger closes and provides a closed circuit between the battery and the starter motor. The starter motor is grounded to the cylinder block. With power and ground supplied, the starter motor operates.

WIRING DIAGRAM

STARTING SYSTEM

Wiring Diagram - With VQ40DE

INFOID:0000000006923488



STARTING SYSTEM CONNECTORS - WITH VQ40DE

Connector No.	M26
Connector Name	IGNITION SWITCH
Connector Color	WHITE

H.S.

B	ST	IG1
R	ACC	IG2

Terminal No.	Color of Wire	Signal Name
B	G	–
ST	Y	–

Connector No.	M31
Connector Name	WIRE TO WIRE
Connector Color	WHITE

H.S.

1G	2G	3G	4G	5G
6G	7G	8G	9G	10G

11G	12G	13G	14G	15G	16G	17G	18G	19G	20G	21G
22G	23G	24G	25G	26G	27G	28G	29G	30G		

31G	32G	33G	34G	35G	36G	37G	38G	39G	40G	41G
42G	43G	44G	45G	46G	47G	48G	49G	50G		

51G	52G	53G	54G	55G	56G	57G	58G	59G	60G	61G
62G	63G	64G	65G	66G	67G	68G	69G	70G		

71G	72G	73G	74G	75G	76G	77G	78G	79G	80G	81G
82G	83G	84G	85G	86G	87G	88G	89G	90G		

91G	92G	93G	94G	95G
96G	97G	98G	99G	100G

Terminal No.	Color of Wire	Signal Name
10G	Y	–
96G	G	–

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

H.S.

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
9	BR	–

Connector No.	E51
Connector Name	FUSE BLOCK (J/B)
Connector Color	WHITE

H.S.

2T		1T
6T	5T	4T	3T

Terminal No.	Color of Wire	Signal Name
2T	W	–

Connector No.	E70
Connector Name	WIRE TO WIRE
Connector Color	GRAY

H.S.

1	2	3	4	5
6	7	8	9	

Terminal No.	Color of Wire	Signal Name
1	W	–

Connector No.	E119
Connector Name	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector Color	WHITE

H.S.

9	8	7	6		5	4	3
18	17	16	15	14	13	12	11	10

Terminal No.	Color of Wire	Signal Name
12	W	IGN SW(IG1)

ABBIA0899GB

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

H.S.

21	20	19
24	23	22

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

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

H.S.

42	41	40	39	38	37
48	47	46	45	44	43

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

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

H.S.

59	58	57
62	61	60

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

Connector No.	E152
Connector Name	WIRE TO WIRE
Connector Color	WHITE

H.S.

Terminal No.	Color of Wire	Signal Name
10G	Y	–
96G	G	–

Connector No.	E207
Connector Name	WIRE TO WIRE
Connector Color	GRAY

H.S.

5	4	3	2	1
9	8	7	6	

Terminal No.	Color of Wire	Signal Name
1	W	–

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Connector No.	E208
Connector Name	STARTER MOTOR
Connector Color	–

H.S.

Terminal No.	Color of Wire	Signal Name
1	B/R	–

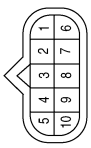
Connector No.	E209
Connector Name	STARTER MOTOR
Connector Color	GRAY

H.S.

Terminal No.	Color of Wire	Signal Name
2	W	–

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

H.S.



Terminal No.	Color of Wire	Signal Name
9	BR	–

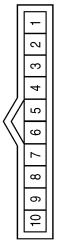
Connector No.	F14
Connector Name	WIRE TO WIRE
Connector Color	WHITE

H.S.

Terminal No.	Color of Wire	Signal Name
9	BR	–

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

H.S.



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

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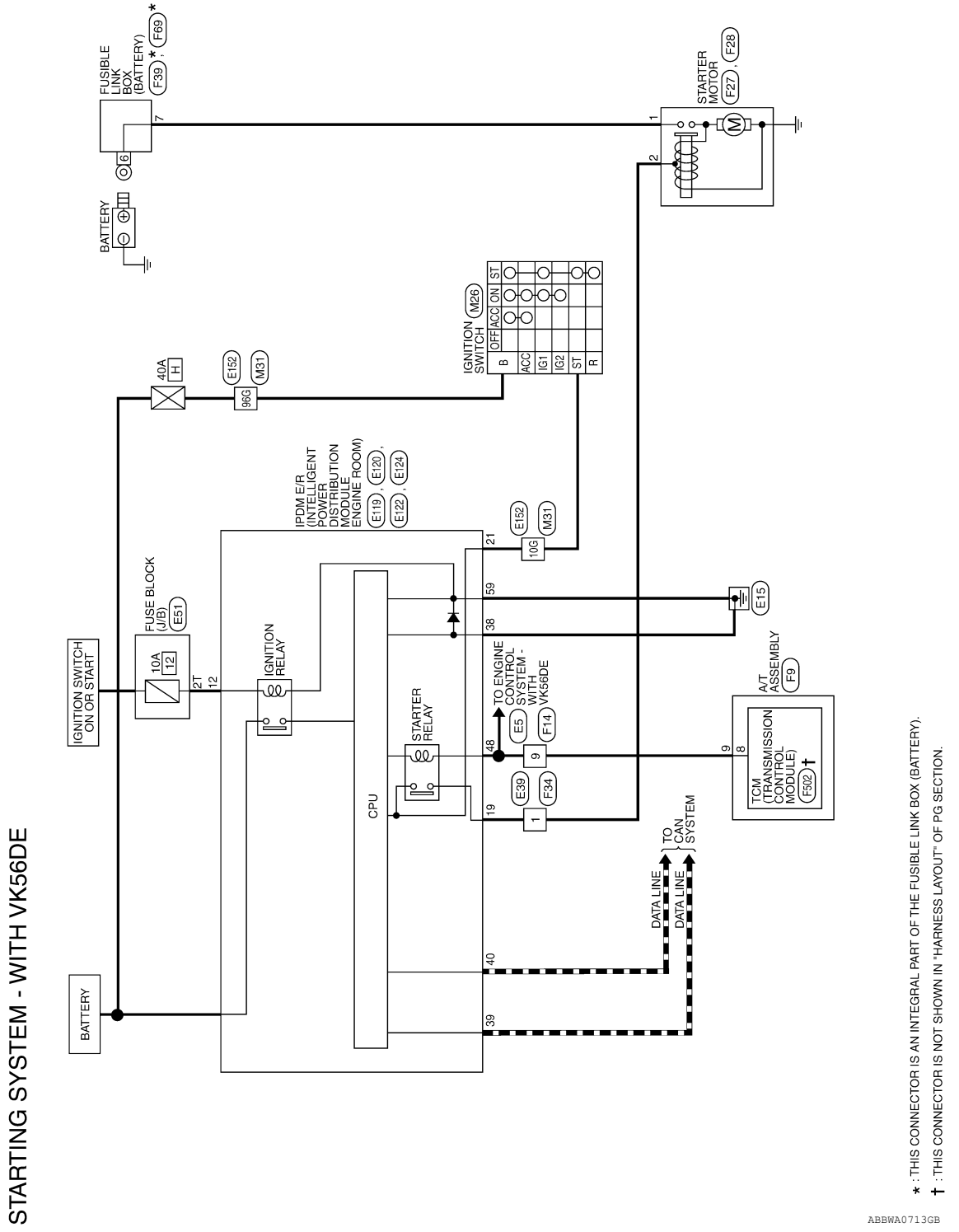
Wiring Diagram - With VK56DE

INFOID:0000000006751584



STARTING SYSTEM CONNECTORS - WITH VK56DE

Connector No.	M26
Connector Name	IGNITION SWITCH
Connector Color	WHITE

H.S.

B ST IG1
R ACC IG2

Terminal No.	Color of Wire	Signal Name
B	G	–
ST	Y	–

Connector No.	M31
Connector Name	WIRE TO WIRE
Connector Color	WHITE

H.S.

1G 2G 3G 4G 5G
6G 7G 8G 9G 10G

11G 12G 13G 14G 15G 16G 17G 18G 19G 20G 21G
22G 23G 24G 25G 26G 27G 28G 29G 30G

31G 32G 33G 34G 35G 36G 37G 38G 39G 40G 41G
42G 43G 44G 45G 46G 47G 48G 49G 50G

51G 52G 53G 54G 55G 56G 57G 58G 59G 60G 61G
62G 63G 64G 65G 66G 67G 68G 69G 70G

71G 72G 73G 74G 75G 76G 77G 78G 79G 80G 81G
82G 83G 84G 85G 86G 87G 88G 89G 90G

91G 92G 93G 94G 95G
96G 97G 98G 99G 100G

Terminal No.	Color of Wire	Signal Name
10G	Y	–
96G	G	–

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

H.S.

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
9	BR	–

Connector No.	E39
Connector Name	WIRE TO WIRE
Connector Color	WHITE

H.S.

1
2

Terminal No.	Color of Wire	Signal Name
1	W	–

Connector No.	E51
Connector Name	FUSE BLOCK (J/B)
Connector Color	WHITE

H.S.

2T 1T
6T 5T 4T 3T

Terminal No.	Color of Wire	Signal Name
2T	W	–

Connector No.	E119
Connector Name	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector Color	WHITE

H.S.

9 8 7 6 5 4 3
18 17 16 15 14 13 12 11 10

Terminal No.	Color of Wire	Signal Name
12	W	IGN SW(IG1)

ABBIA0896GB

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

H.S.

21	20	19
24	23	22

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

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

H.S.

42	41	40	39	38	37
48	47	46	45	44	43

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

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

H.S.

59	58	57
62	61	60

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

Connector No.	E152
Connector Name	WIRE TO WIRE
Connector Color	WHITE

H.S.

5G	4G	3G	2G	1G
10G	9G	8G	7G	6G

21G	20G	19G	18G	17G	16G	15G	14G	13G	12G	11G
30G	29G	28G	27G	26G	25G	24G	23G	22G		
41G	40G	39G	38G	37G	36G	35G	34G	33G	32G	31G
50G	49G	48G	47G	46G	45G	44G	43G	42G		
61G	60G	59G	58G	57G	56G	55G	54G	53G	52G	51G
70G	69G	68G	67G	66G	65G	64G	63G	62G		
81G	80G	79G	78G	77G	76G	75G	74G	73G	72G	71G
90G	89G	88G	87G	86G	85G	84G	83G	82G		
95G	94G	93G	92G	91G						
100G	99G	98G	97G	96G						

Terminal No.	Color of Wire	Signal Name
10G	Y	–
96G	G	–

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

H.S.

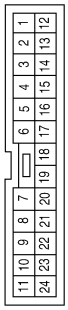
5	4	3	2	1
10	9	8	7	6

Terminal No.	Color of Wire	Signal Name
9	BR	–

ABBIA0897GB

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

H.S.



Terminal No.	Color of Wire	Signal Name
9	BR	–

Connector No.	F27
Connector Name	STARTER MOTOR
Connector Color	–

H.S.

Terminal No.	Color of Wire	Signal Name
1	B/R	–

Connector No.	F28
Connector Name	STARTER MOTOR
Connector Color	GRAY

H.S.

Terminal No.	Color of Wire	Signal Name
2	W	–

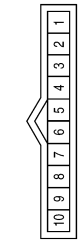
Connector No.	F34
Connector Name	WIRE TO WIRE
Connector Color	WHITE

H.S.

Terminal No.	Color of Wire	Signal Name
1	W	–

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

H.S.



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

ABBIA0898GB

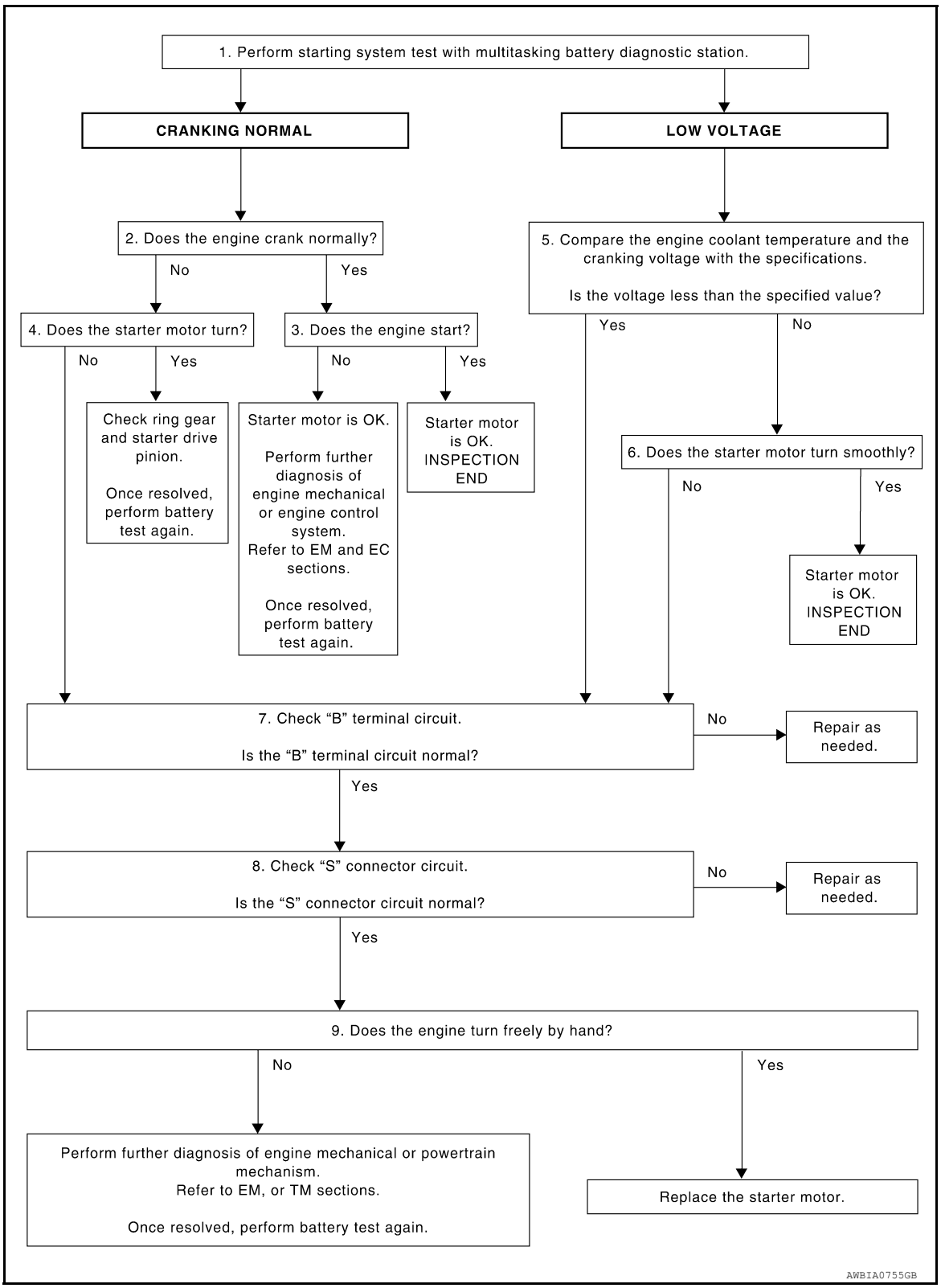
BASIC INSPECTION

DIAGNOSIS AND REPAIR WORKFLOW

Work Flow

INFOID:0000000006751575

OVERALL SEQUENCE



DETAILED FLOW

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

1.DIAGNOSIS WITH MULTITASKING BATTERY 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-20, "Diagnosis Procedure".

Is “B” terminal circuit normal?

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

8. "S" CONNECTOR CIRCUIT INSPECTION

Check "S" connector circuit. Refer to STR-21, "Diagnosis Procedure".

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

DTC/CIRCUIT DIAGNOSIS

B TERMINAL CIRCUIT

Description

INFOID:0000000006751580

Terminal "1" (B) is constantly supplied with battery power.

Diagnosis Procedure

INFOID:0000000006751581

Regarding Wiring Diagram information, refer to STR-9, "Wiring Diagram - With VQ40DE" or STR-13, "Wiring Diagram - With 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 E208 (VQ40DE) or F27 (VK56DE) terminal 1 connection is clean and tight.
3. Check voltage between starter motor connector E208 (VQ40DE) or F27 (VK56DE) terminal 1 and ground.

(+)		(-)	Voltage
Connector	Terminal		
E208 (VQ40DE)	1	Ground	Battery voltage
F27 (VK56DE)			

Is the inspection result normal?

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 P (Park) or N (Neutral).
2. Check voltage between battery positive terminal and starter motor connector E208 (VQ40DE) or F27 (VK56DE) terminal 1 while cranking the engine.

(+)		(-)	Condition	Voltage
Connector	Terminal			
E208 (VQ40DE)	1	Battery (+) terminal	While cranking the engine	Less than 0.2V
F27 (VK56DE)				

Is the inspection result normal?

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 inspection result normal?

YES >> Terminal 1 circuit is OK. Further inspection necessary. Refer to STR-17, "Work Flow".
NO >> Check the starter motor case to engine mounting for high resistance.

S CONNECTOR CIRCUIT

Description

INFOID:0000000006751582

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 (Park) or N (Neutral) position.

Diagnosis Procedure

INFOID:0000000006751583

Regarding Wiring Diagram information, refer to STR-9, "Wiring Diagram - With VQ40DE" or STR-13, "Wiring Diagram - With 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 E209 (VQ40DE) or F28 (VK56DE).
3. Shift transmission into park or neutral.
4. Check voltage between starter motor connector E209 (VQ40DE) or F28 (VK56DE) terminal 2 and ground with the ignition in START.

(+)		(-)	Condition	Voltage
Connector	Terminal			
E209 (VQ40DE)	2	Ground	Ignition switch in START position	Battery voltage
F28 (VK56DE)				

Is the inspection result normal?

YES >> Magnetic switch circuit is OK. Further inspection is necessary. Refer to STR-17, "Work Flow".

NO >> GO TO 2

2.CHECK CONNECTOR

1. Turn ignition switch OFF.
2. Check the IPDM E/R connector E120 and starter motor connector E209 (VQ40DE) or F28 (VK56DE) 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 and starter motor connector E209 (VQ40DE) or F28 (VK56DE).
2. Check continuity between starter motor connector E209 (VQ40DE) or F28 (VK56DE) terminal 2 and IPDM E/R connector E120 terminal 19.

Connector	Terminal	Connector	Terminal	Continuity
E209 (VQ40DE)	2	E120	19	Yes
F28 (VK56DE)				

3. Check continuity between starter motor connector E209 (VQ40DE) or F28 (VK56DE) terminal 2 and ground.

Connector	Terminal	—	Continuity

E209 (VQ40DE) F28 (VK56DE)	2	Ground	No

Is the inspection result normal?

YES >> Further inspection necessary. Refer to STR-17, "Work Flow".
NO >> Repair the harness.

SYMPTOM DIAGNOSIS

STARTING SYSTEM

Symptom Table

INFOID:0000000006751585

Symptom	Reference
No normal cranking	Refer to STR-17, "Work Flow".
Starter motor does not rotate	

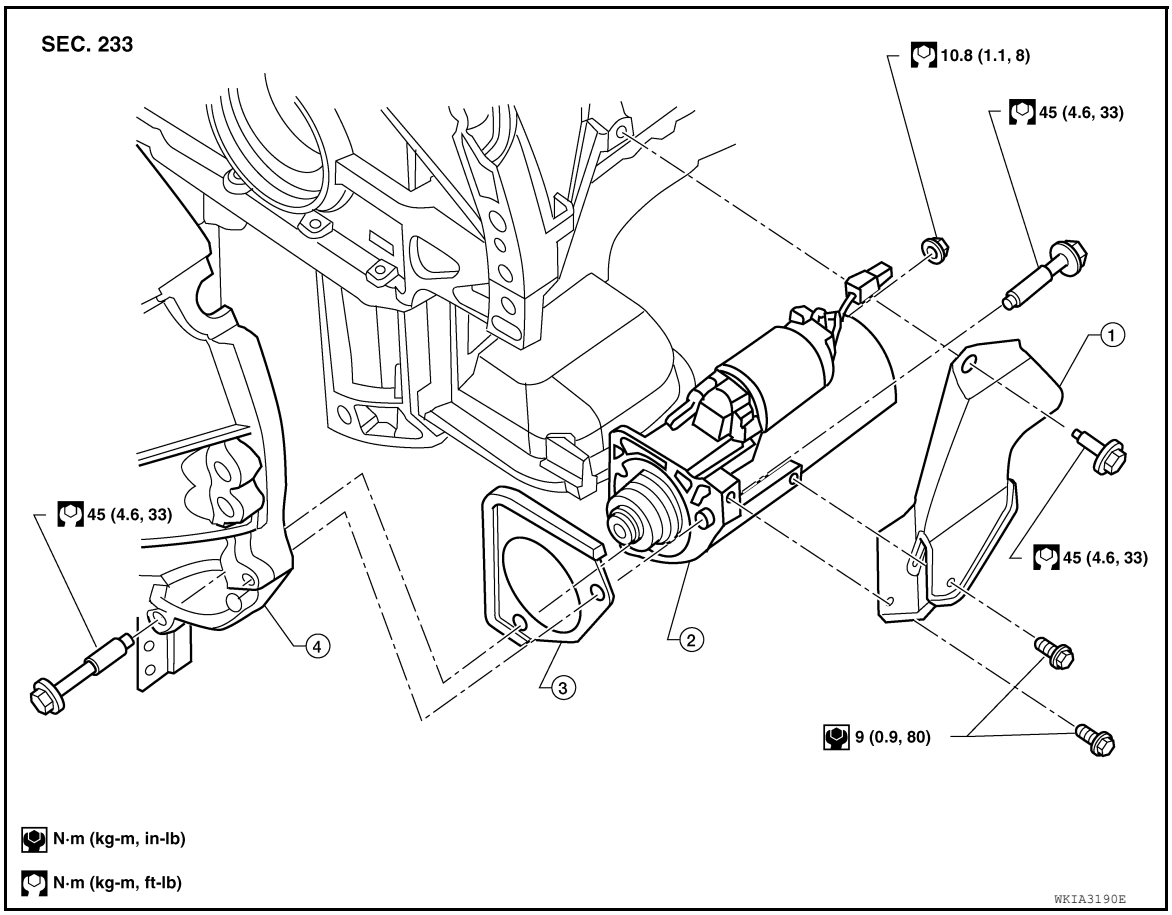
REMOVAL AND INSTALLATION

STARTER MOTOR

VQ40DE

VQ40DE : Exploded View

INFOID:0000000006915219



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

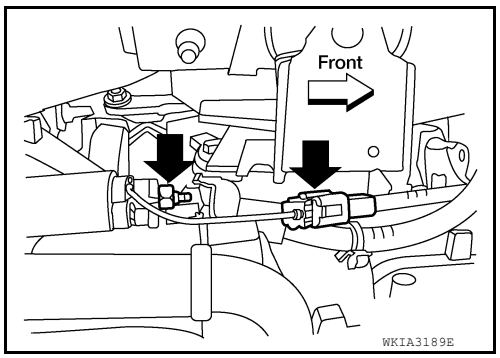
VQ40DE : Removal and Installation

INFOID:0000000006915218

Removal

1. Disconnect the negative battery terminal. Refer to PG-90, "Removal and Installation".
2. Remove the front RH wheel and tire assembly using power tool.
3. Remove the front RH fender protector. Refer to EXT-33, "Removal and Installation".
4. Remove the exhaust manifold heat shield bolts and reposition the heat shield.
5. Remove starter cover bolts and starter cover.

6. Disconnect terminal S connector and terminal B nut.
7. Remove the two starter bolts, using power tools.
8. Remove the starter.



Installation

Installation is in the reverse order of removal.

- Tighten the front RH wheel and tire assembly to specification. Refer to WT-63, "Adjustment".

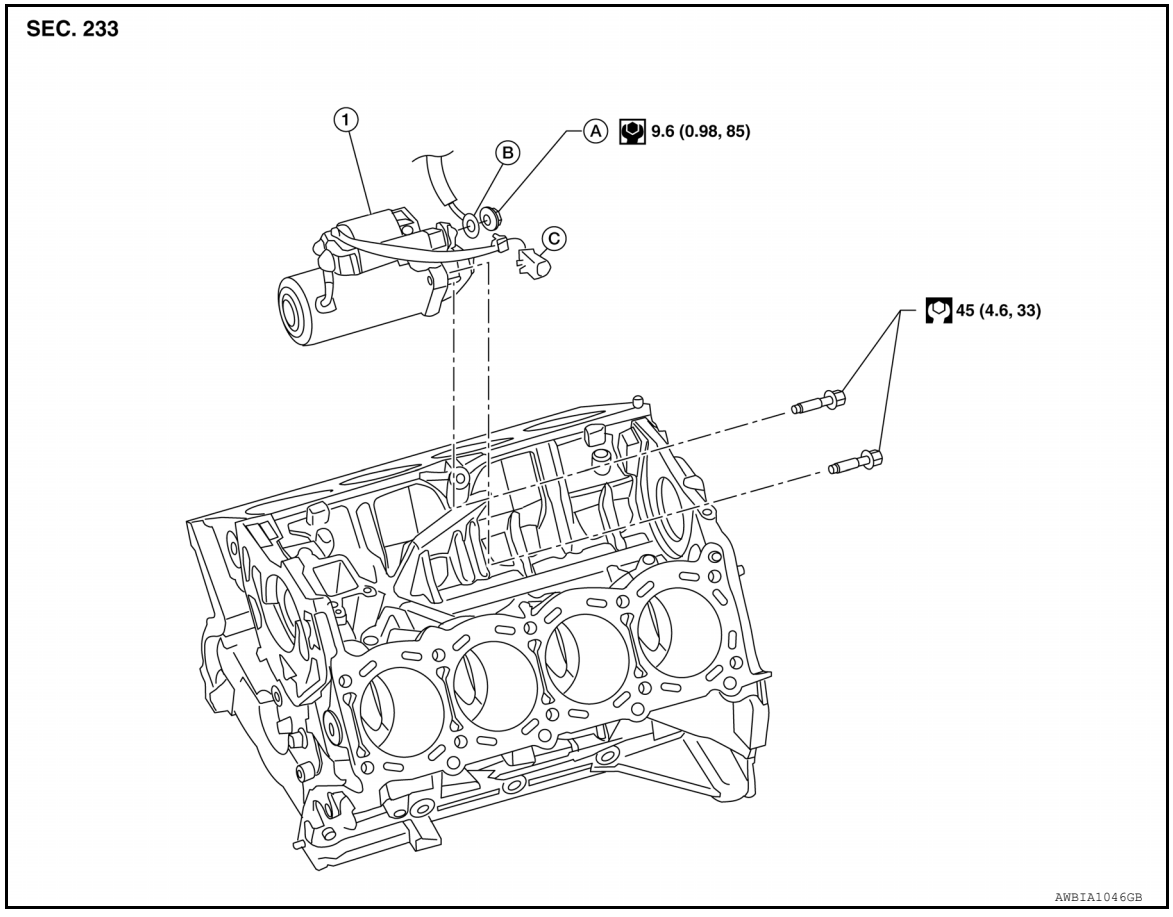
CAUTION:

Tighten terminal B nut carefully.

VK56DE

VK56DE : Exploded View

INFOID:0000000006953171



1. Starter motor assembly
A. Terminal B nut
B. Terminal B cable
C. Terminal S connector
⇦ Engine front

VK56DE : Removal and Installation

INFOID:0000000006953170

REMOVAL

1. Remove the intake manifold. Refer to EM-165, "Removal and Installation".

2. Remove the starter harness terminal B nut, and terminal B cable.
3. Disconnect terminal S connector.
4. Remove terminal S harness clips from brackets.
5. Remove the two starter bolts, using power tools.
6. Remove the starter.

INSTALLATION

Installation is in the reverse order of removal.

CAUTION:

Tighten terminal B nut carefully.

SERVICE DATA AND SPECIFICATIONS (SDS)

STARTER MOTOR

Starter

INFOID:0000000006751587

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

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