

SECTION

STR

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STARTING SYSTEM

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BASIC INSPECTION

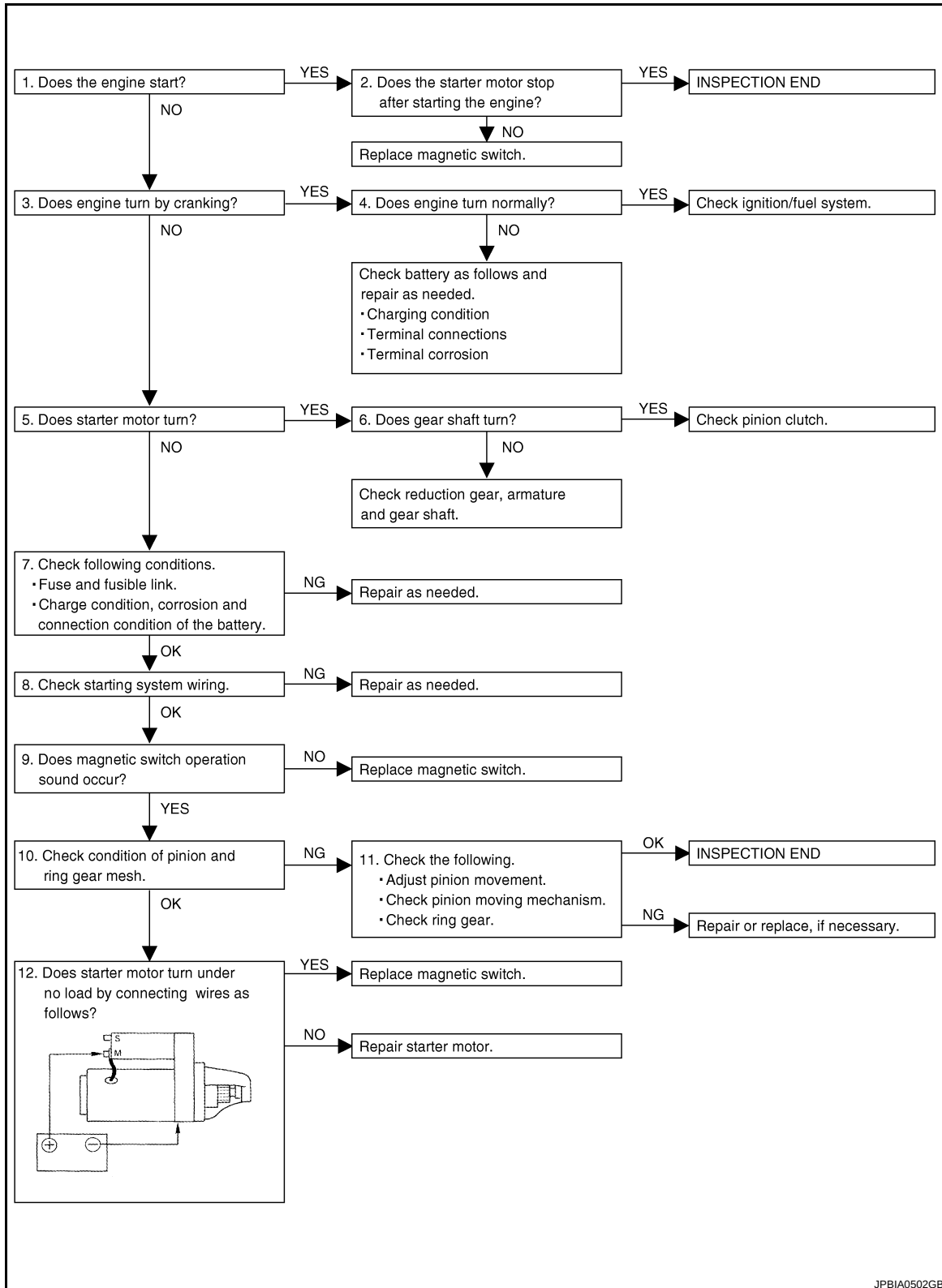
DIAGNOSIS AND REPAIR WORKFLOW

Work Flow

INFOID:000000001728600

STR

OVERALL SEQUENCE



DETAILED FLOW

< BASIC INSPECTION >

NOTE:

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

1.CHECK ENGINE START

Crank the engine and check that the engine starts.

Does the engine start?

YES >> GO TO 2

NO >> GO TO 3

2.CHECK THAT THE STARTER MOTOR STOPS

Check that the starter motor stops after starting the engine.

Does the starter motor stop?

YES >> INSPECTION END.

NO >> Replace magnetic switch.

3.CHECK THE ENGINE SPEED WITH CRANKING

Check that the engine runs at cranking.

Does engine turn by cranking?

YES >> GO TO 4

NO >> GO TO 5

4.CHECK THE ENGINE SPEED WITH CRANKING

Check that the engine speed is not low at cranking.

Does engine turn normally?

YES >> Check ignition/fuel system.

NO >> Check charge condition, corrosion and connection condition of the battery. Refer to [PG-3, "How to Handle Battery"](#).

5.CHECK STARTER MOTOR ACTIVATION

Check that the starter motor runs at cranking.

Does starter motor turn?

YES >> GO TO 6

NO >> GO TO 7

6.CHECK STARTER MOTOR UNIT

1. Remove starter motor.

2. Check that the gear shaft of starter motor rotates.

Does gear shaft turn?

YES >> • Check pinion clutch.

NO >> Check reduction gear, armature and gear shaft.

7.CHECK POWER SUPPLY CIRCUIT

Check the following conditions.

- Fuse and fusible link
- Charge condition, corrosion and connection condition of the battery. Refer to [PG-3, "How to Handle Battery"](#).

Are these inspection results normal?

YES >> GO TO 8

NO >> Repair as needed.

8.CHECK STARTING SYSTEM WIRING

Check the following.

- "B" terminal circuit. Refer to [STR-8, "Description"](#).
- "S" terminal circuit. Refer to [STR-9, "Description"](#).

Are these inspection results normal?

YES >> GO TO 9

NO >> Repair as needed.

< BASIC INSPECTION >

9.CHECK MAGNETIC SWITCH OPERATION SOUND

Check that a magnetic switch operation sound can be heard when the ignition switch is set at the starting position.

Does magnetic switch operation sound occur?

YES >> GO TO 10

NO >> Replace magnetic switch.

10.PINION AND RING GEAR ENGAGEMENT CHECK

Check condition of pinion and ring gear mesh.

Is the inspection result normal?

YES >> GO TO 12

NO >> GO TO 11

11.CHECK STARTER MOTOR UNIT

Check the following.

- Adjust pinion movement.
- Check pinion moving mechanism.
- Check ring gear.

Are these inspection results normal?

YES >> INSPECTION END

NO >> Repair or replace, if necessary.

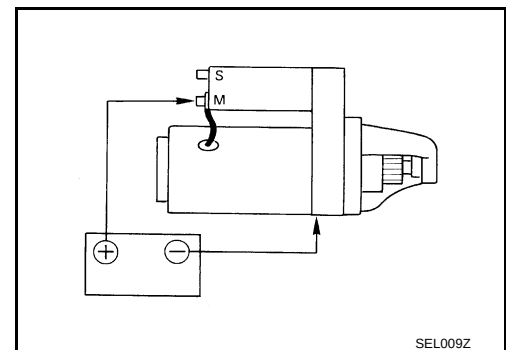
12.CHECK STARTER MOTOR UNIT

Check that the starter motor runs when connecting the positive terminal (12 V) to starter motor terminal M and the negative terminal (ground) to starter motor body.

Does the starter motor run?

YES >> Replace magnetic switch.

NO >> Repair starter motor.

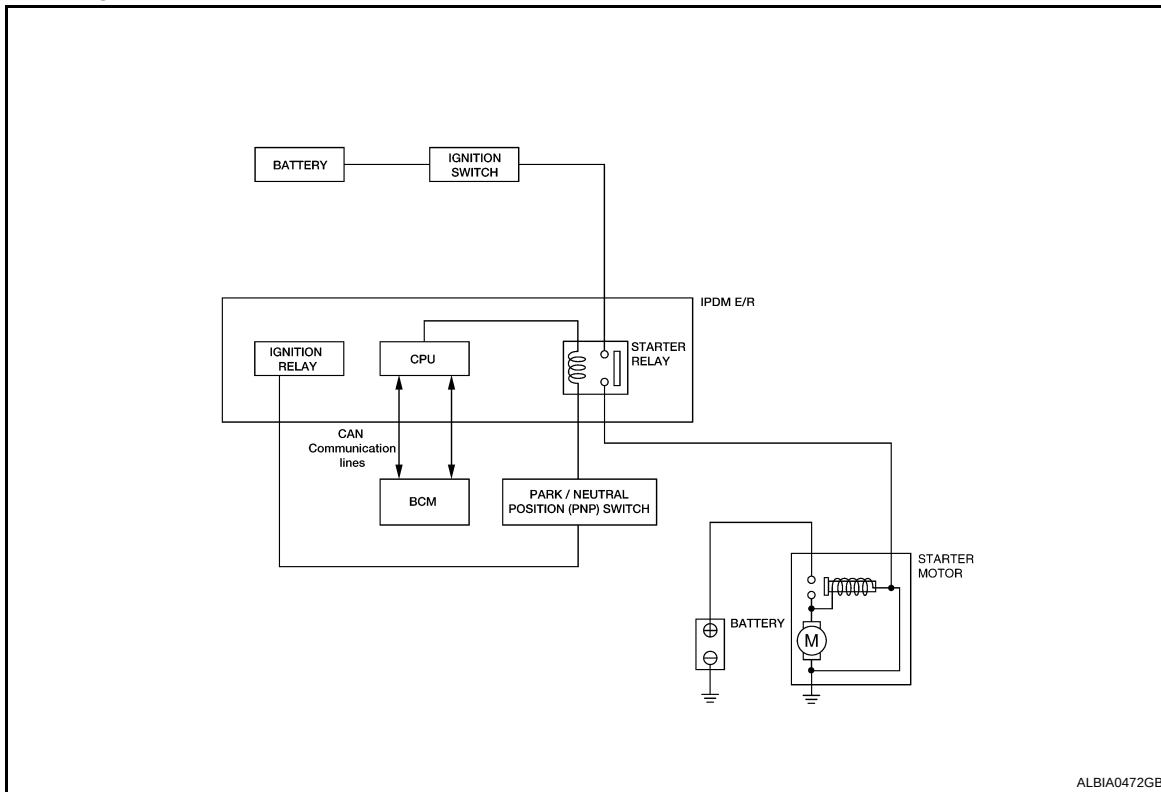


FUNCTION DIAGNOSIS

STARTING SYSTEM

System Diagram

INFOID:000000001712878



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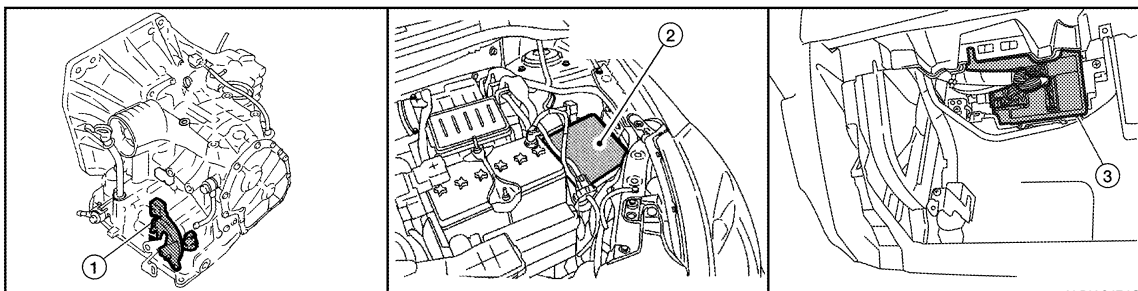
System Description

INFOID:000000001712879

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:000000001712880



ALBIA0474GB

1. Park/Neutral position (PNP) switch F25
2. IPDM E/R E44, E45, E46
3. BCM M18 (view with glove box removed)

STARTING SYSTEM

< FUNCTION DIAGNOSIS >

[HR16DE]

Component Description

INFOID:000000001712881

Component part	Description
PNP switch	PNP switch supplies power to the starter relay 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.

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COMPONENT DIAGNOSIS

B TERMINAL CIRCUIT

Description

INFOID:000000001712882

Terminal "2" (B) is constantly supplied with battery power.

Diagnosis Procedure

INFOID:000000001712883

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

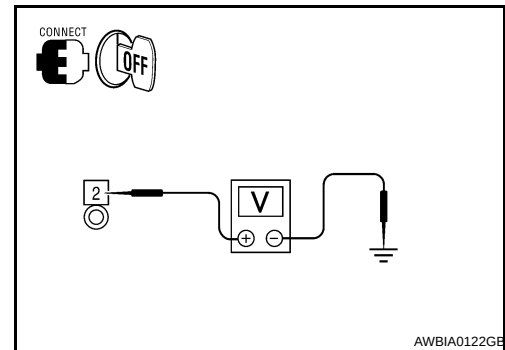
1. Turn ignition switch OFF.
2. Make sure that starter motor connector F27 terminal 2 connection is clean and tight.
3. Check voltage between starter motor connector F27 terminal 2 and ground.

(+)		(-)	Condition	Voltage
Connector	Terminal			
F27	2	Ground	While cranking the engine	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)**

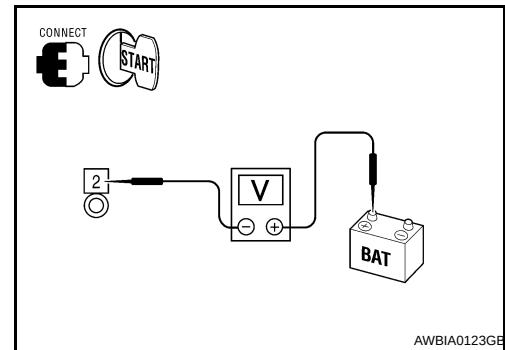
1. Shift the transmission into park or neutral.
2. Check voltage between battery positive terminal and starter motor connector F27 terminal 2 while cranking the engine.

(+)		(-)	Condition	Voltage
Connector	Terminal			
F27	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.

**3. CHECK GROUND CIRCUIT STATUS (VOLTAGE DROP TEST)**

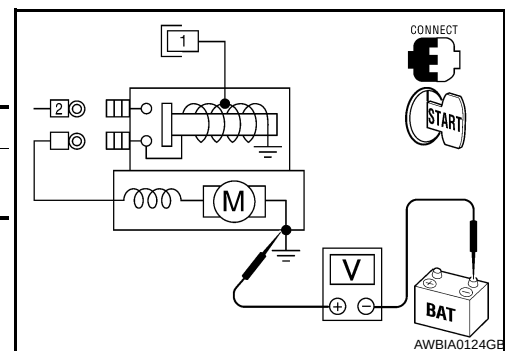
Check voltage between starter motor case and battery negative terminal while cranking the engine.

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

Is the voltage drop less than 0.2V?

YES >> Terminal 2 circuit is OK. Further inspection necessary. Refer to [STR-3, "Work Flow"](#).

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



S CONNECTOR CIRCUIT

< COMPONENT DIAGNOSIS >

[HR16DE]

S CONNECTOR CIRCUIT

Description

INFOID:000000001712884

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.

Diagnosis Procedure

INFOID:000000001712885

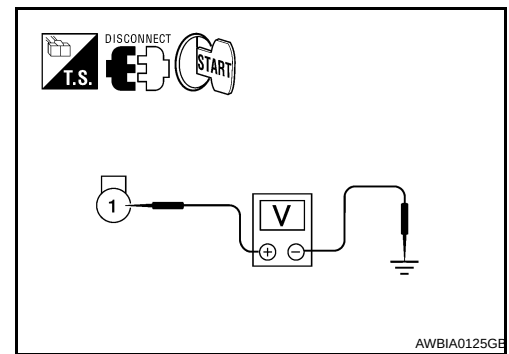
CAUTION:

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 F28.
3. Shift transmission into park or neutral.
4. Check voltage between starter motor harness connector F28 terminal 1 and ground with the ignition in START.



(+) Connector		(-)	Condition	Voltage
Terminal				
F28	1	Ground	While cranking the engine	Battery voltage

Is battery voltage present?

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

NO >> GO TO 2

2.CHECK CONNECTOR

1. Turn ignition switch OFF.
2. Check the IPDM E/R harness connector E44 and starter motor harness connector F28 for damage, bent pins and loose connections.

Is the inspection result normal?

YES >> GO TO 3

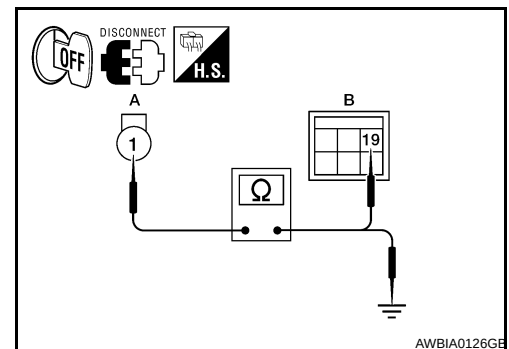
NO >> Repair the terminal and connector.

3.CHECK HARNESS CONTINUITY (OPEN CIRCUIT)

1. Disconnect IPDM E/R connector E44 and starter motor connector F28.
2. Check continuity between starter motor harness connector F28 (A) terminal 1 and IPDM E/R harness connector E44 (B) terminal 19.

A		B		Continuity
Connector	Terminal	Connector	Terminal	
F28	1	E44	19	Yes

3. Check continuity between starter motor harness connector F28 (A) terminal 1 and ground.



A		—	Continuity
Connector	Terminal		
F28	1	Ground	No

Are the continuity test results as specified?

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

NO >> Repair the harness.

STARTING SYSTEM

Wiring Diagram

INFOID:000000001712886

**NO
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SYMPTOM DIAGNOSIS

STARTING SYSTEM

Symptom Table

INFOID:000000001712887

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Symptom	Reference
No normal cranking	Refer to <u>XX-XX, "*****"</u> .
Starter motor does not rotate	

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PRECAUTION

PRECAUTIONS

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

INFOID:0000000001689454

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. 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.

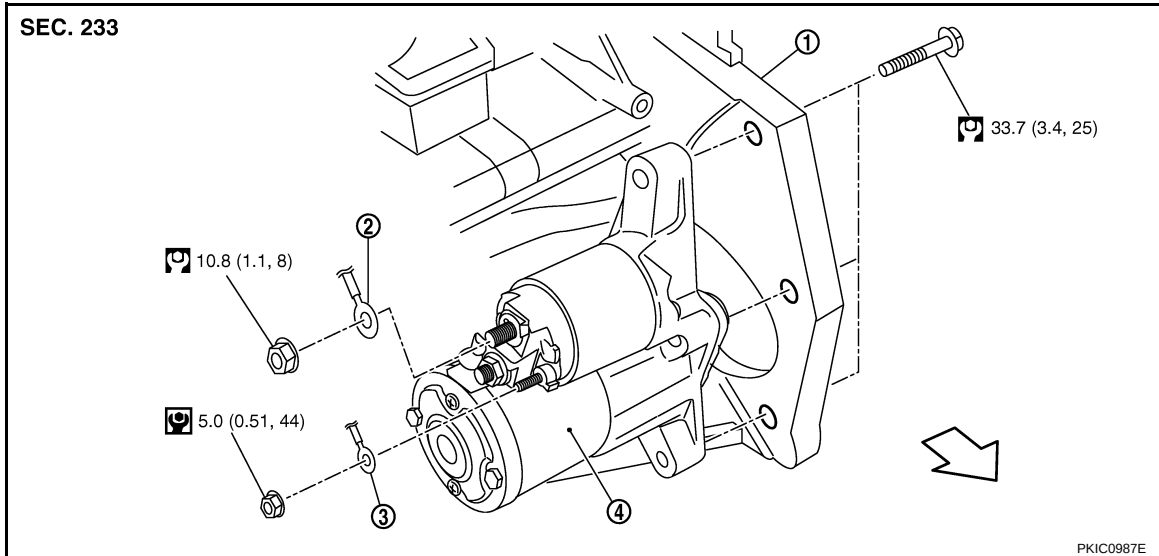
ON-VEHICLE REPAIR

STARTER MOTOR

Removal and Installation

INFOID:000000001689433

STR



1. Cylinder block

2. "B" terminal harness

3. "S" terminal harness

4. Starter motor

← Vehicle front

REMOVAL

1. Disconnect the battery cable from the negative terminal.
2. Remove "B" terminal nut and "B" terminal harness.
3. Remove "S" terminal nut and "S" terminal harness.
4. Remove starter motor bolts.
5. Remove starter motor upward from the vehicle.

INSTALLATION

Installation is in the reverse order of removal.

CAUTION:

Be sure to tighten "B" terminal nut carefully.

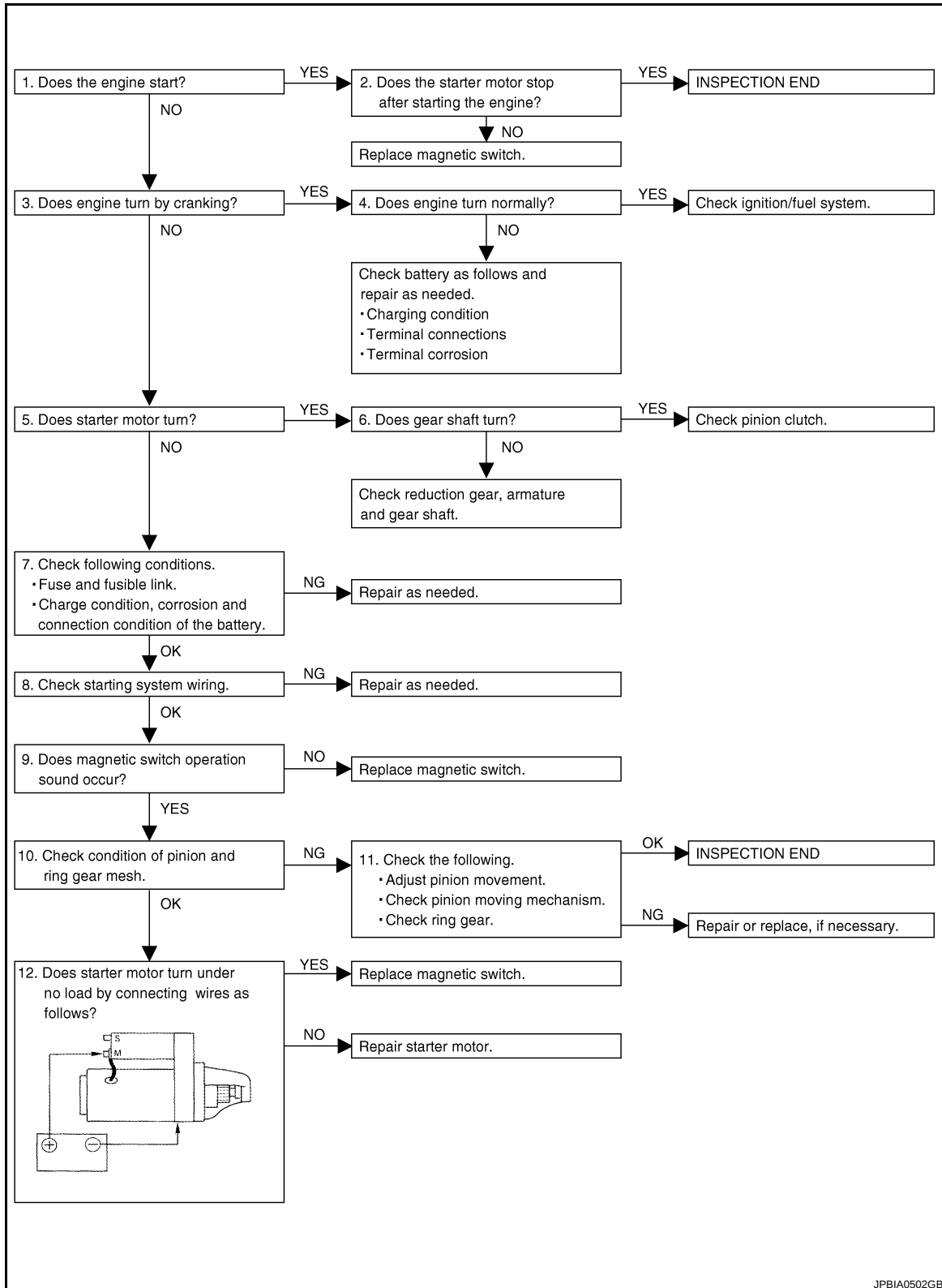
BASIC INSPECTION

DIAGNOSIS AND REPAIR WORKFLOW

Work Flow

INFOID:000000001728603

OVERALL SEQUENCE



JPBIA0502GB

DETAILED FLOW

DIAGNOSIS AND REPAIR WORKFLOW

[MR18DE]

< BASIC INSPECTION >

NOTE:

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

1.CHECK ENGINE START

Crank the engine and check that the engine starts.

Does the engine start?

YES >> GO TO 2

NO >> GO TO 3

2.CHECK THAT THE STARTER MOTOR STOPS

Check that the starter motor stops after starting the engine.

Does the starter motor stop?

YES >> INSPECTION END.

NO >> Replace magnetic switch.

3.CHECK THE ENGINE SPEED WITH CRANKING

Check that the engine runs at cranking.

Does engine turn by cranking?

YES >> GO TO 4

NO >> GO TO 5

4.CHECK THE ENGINE SPEED WITH CRANKING

Check that the engine speed is not low at cranking.

Does engine turn normally?

YES >> Check ignition/fuel system.

NO >> Check charge condition, corrosion and connection condition of the battery. Refer to XX-XX.

5.CHECK STARTER MOTOR ACTIVATION

Check that the starter motor runs at cranking.

Does starter motor turn?

YES >> GO TO 6

NO >> GO TO 7

6.CHECK STARTER MOTOR UNIT

1. Remove starter motor.

2. Check that the gear shaft of starter motor rotates.

Does gear shaft turn?

YES >> • Check pinion clutch. .

NO >> Check reduction gear, armature and gear shaft.

7.CHECK POWER SUPPLY CIRCUIT

Check the following conditions.

• Fuse and fusible link

• Charge condition, corrosion and connection condition of the battery. Refer to PG-3, "How to Handle Battery".

Are these inspection results normal?

YES >> GO TO 8

NO >> Repair as needed.

8.CHECK STARTING SYSTEM WIRING

Check the following.

• "B" terminal circuit. Refer to STR-19, "Description".

• "S" terminal circuit. Refer to STR-20, "Description".

Are these inspection results normal?

YES >> GO TO 9

NO >> Repair as needed.

< BASIC INSPECTION >

9. CHECK MAGNETIC SWITCH OPERATION SOUND

Check that a magnetic switch operation sound can be heard when the ignition switch is set at the starting position.

Does magnetic switch operation sound occur?

YES >> GO TO 10

NO >> Replace magnetic switch.

10. PINION AND RING GEAR ENGAGEMENT CHECK

Check condition of pinion and ring gear mesh.

Is the inspection result normal?

YES >> GO TO 12

NO >> GO TO 11

11. CHECK STARTER MOTOR UNIT

Check the following.

- Adjust pinion movement.
- Check pinion moving mechanism.
- Check ring gear.

Are these inspection results normal?

YES >> INSPECTION END

NO >> Repair or replace, if necessary.

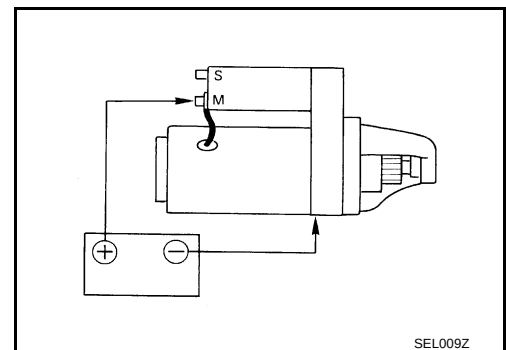
12. CHECK STARTER MOTOR UNIT

Check that the starter motor runs when connecting the positive terminal (12 V) to starter motor terminal M and the negative terminal (ground) to starter motor body.

Does the starter motor run?

YES >> Replace magnetic switch.

NO >> Repair starter motor.

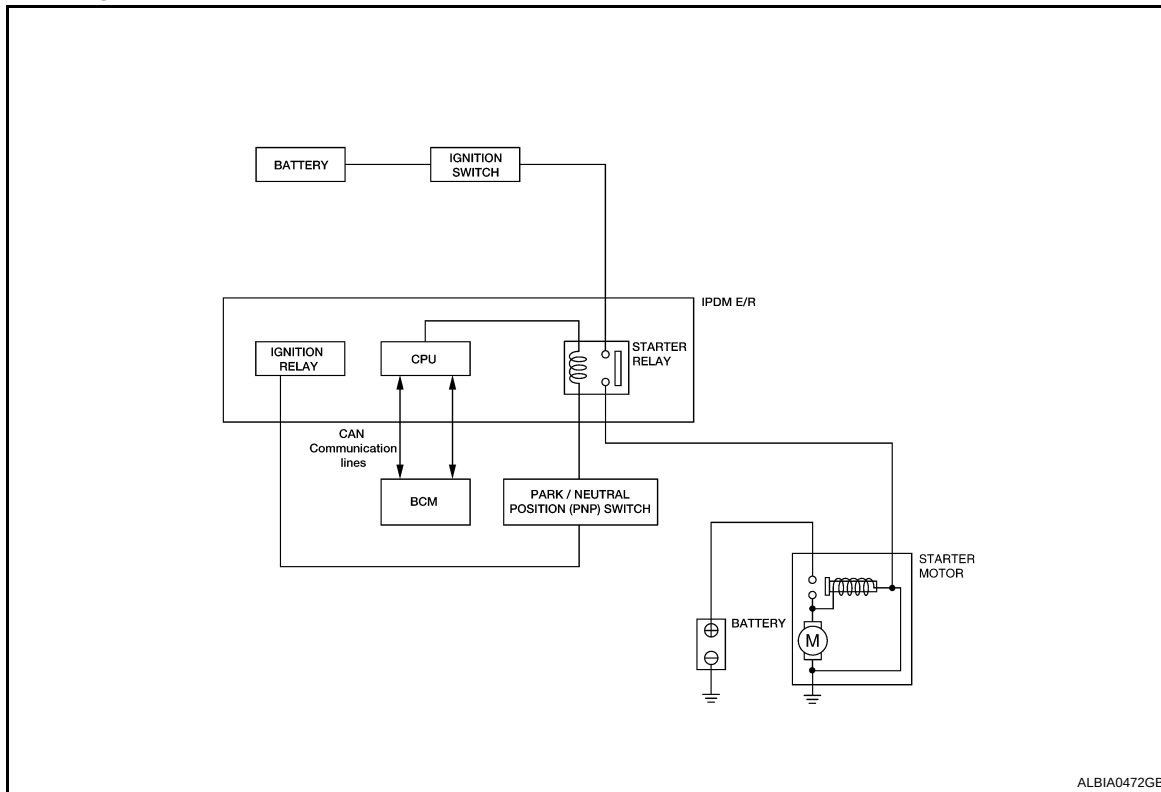


FUNCTION DIAGNOSIS

STARTING SYSTEM

System Diagram

INFOID:000000001728563



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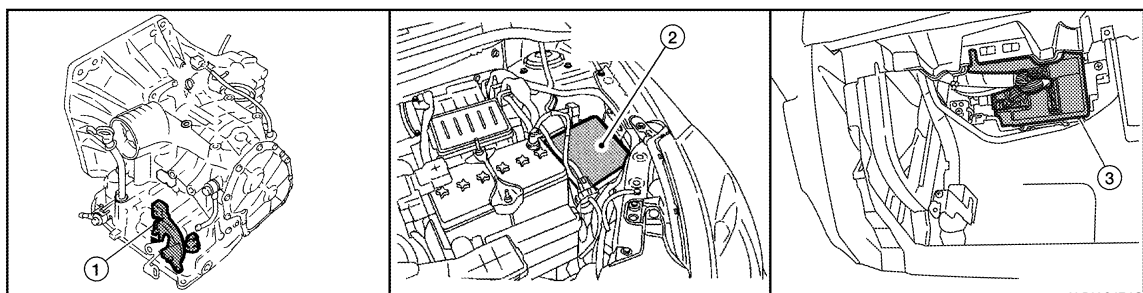
System Description

INFOID:000000001728564

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:000000001728565



ALBIA0474GB

1. Park/Neutral position (PNP) switch F25
2. IPDM E/R E44, E45, E46
3. BCM M18 (view with glove box removed)

STARTING SYSTEM

< FUNCTION DIAGNOSIS >

[MR18DE]

Component Description

INFOID:000000001728566

Component part	Description
PNP switch	PNP switch supplies power to the starter relay 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.

COMPONENT DIAGNOSIS

B TERMINAL CIRCUIT

Description

INFOID:000000001728567

Terminal "2" (B) is constantly supplied with battery power.

Diagnosis Procedure

INFOID:000000001728568

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

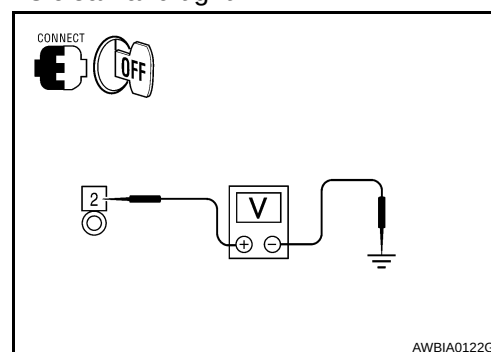
1. Turn ignition switch OFF.
2. Make sure that starter motor connector F27 terminal 2 connection is clean and tight.
3. Check voltage between starter motor connector F27 terminal 2 and ground.

(+)		(-)	Condition	Voltage
Connector	Terminal			
F27	2	Ground	While cranking the engine	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)**

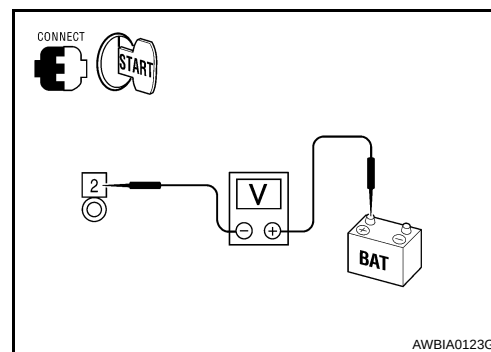
1. Shift the transmission into park or neutral.
2. Check voltage between battery positive terminal and starter motor connector F27 terminal 2 while cranking the engine.

(+)		(-)	Condition	Voltage
Connector	Terminal			
F27	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.

**3.CHECK GROUND CIRCUIT STATUS (VOLTAGE DROP TEST)**

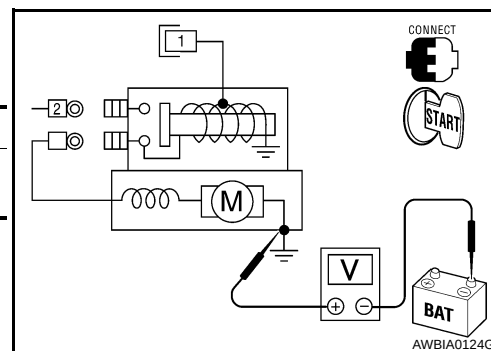
Check voltage between starter motor case and battery negative terminal while cranking the engine.

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

Is the voltage drop less than 0.2V?

YES >> Terminal 2 circuit is OK. Further inspection necessary. Refer to [STR-14, "Work Flow"](#).

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



S CONNECTOR CIRCUIT

Description

INFOID:000000001728569

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.

Diagnosis Procedure

INFOID:000000001728570

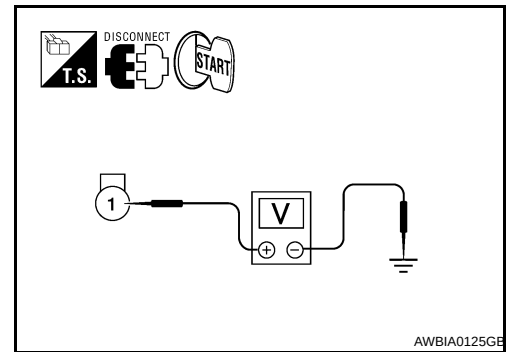
CAUTION:

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 F28.
3. Shift transmission into park or neutral.
4. Check voltage between starter motor harness connector F28 terminal 1 and ground with the ignition in START.



(+)		(-)	Condition	Voltage
Connector	Terminal			
F28	1	Ground	While cranking the engine	Battery voltage

Is battery voltage present?

- YES >> Magnetic switch circuit is OK. Further inspection necessary. Refer to [STR-14, "Work Flow"](#).
 NO >> GO TO 2

2.CHECK CONNECTOR

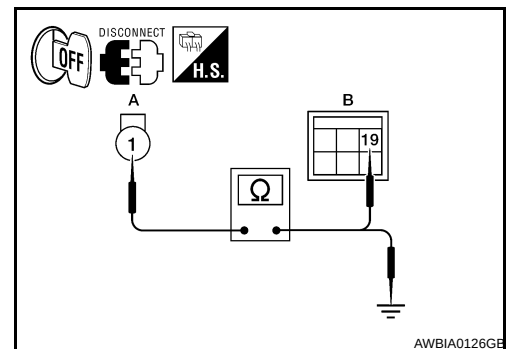
1. Turn ignition switch OFF.
2. Check the IPDM E/R harness connector E44 and starter motor harness connector F28 for damage, bent pins and loose connections.

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 E44 and starter motor connector F28.
2. Check continuity between starter motor harness connector F28 (A) terminal 1 and IPDM E/R harness connector E44 (B) terminal 19.



A		B		Continuity
Connector	Terminal	Connector	Terminal	
F28	1	E44	19	Yes

3. Check continuity between starter motor harness connector F28 (A) terminal 1 and ground.

A		—	Continuity
Connector	Terminal		
F28	1	Ground	No

Are the continuity test results as specified?

- YES >> Further inspection necessary. Refer to [STR-14, "Work Flow"](#).
 NO >> Repair the harness.

STARTING SYSTEM

Wiring Diagram

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INFOID:000000001728571

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SYMPTOM DIAGNOSIS

STARTING SYSTEM

Symptom Table

INFOID:000000001728572

Symptom	Reference
No normal cranking	Refer to STR-14. "Work Flow" .
Starter motor does not rotate	

PRECAUTION

PRECAUTIONS

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

INFOID:000000001689455

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. 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.

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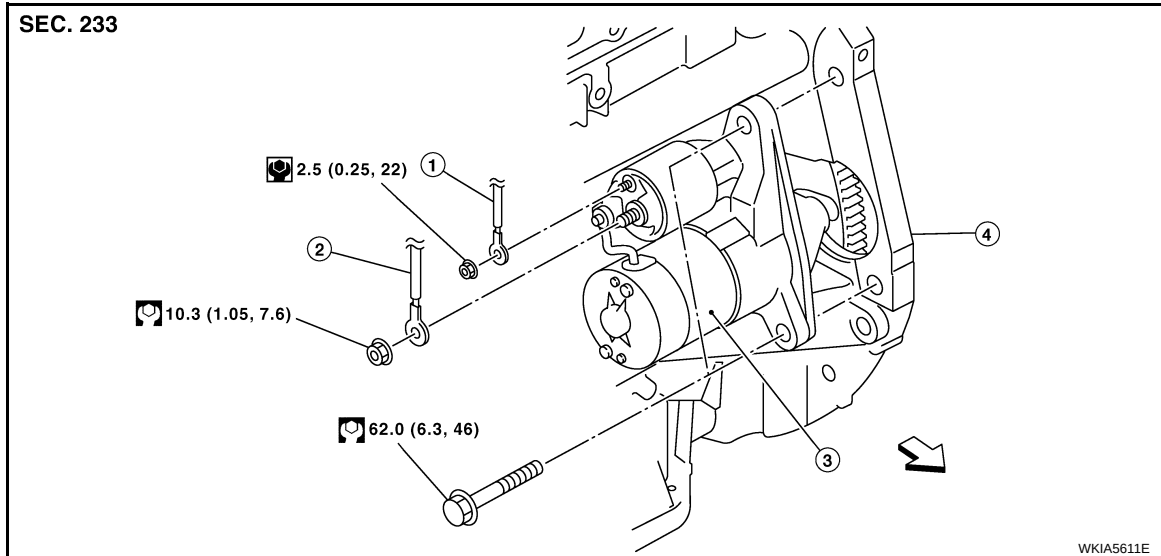
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ON-VEHICLE REPAIR

STARTER MOTOR

Removal and Installation

INFOID:000000001689442



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| 1. "S" terminal harness | 2. "B" terminal harness | 3. Starter motor |
| 4. Cylinder block | ⇐ Engine front | |

REMOVAL

1. Disconnect the battery cable from the negative terminal.
2. Disconnect the oil pressure switch connector.
3. Remove "B" terminal nut and "B" terminal harness.
4. Remove "S" terminal nut and "S" terminal harness.
5. Remove starter motor bolts.
6. Remove starter motor upward from the vehicle.

CAUTION:

Never damage oil pressure switch when removing starter motor.

INSTALLATION

Installation is in the reverse order of removal.

CAUTION:

Be sure to tighten "B" terminal nut carefully.

BASIC INSPECTION

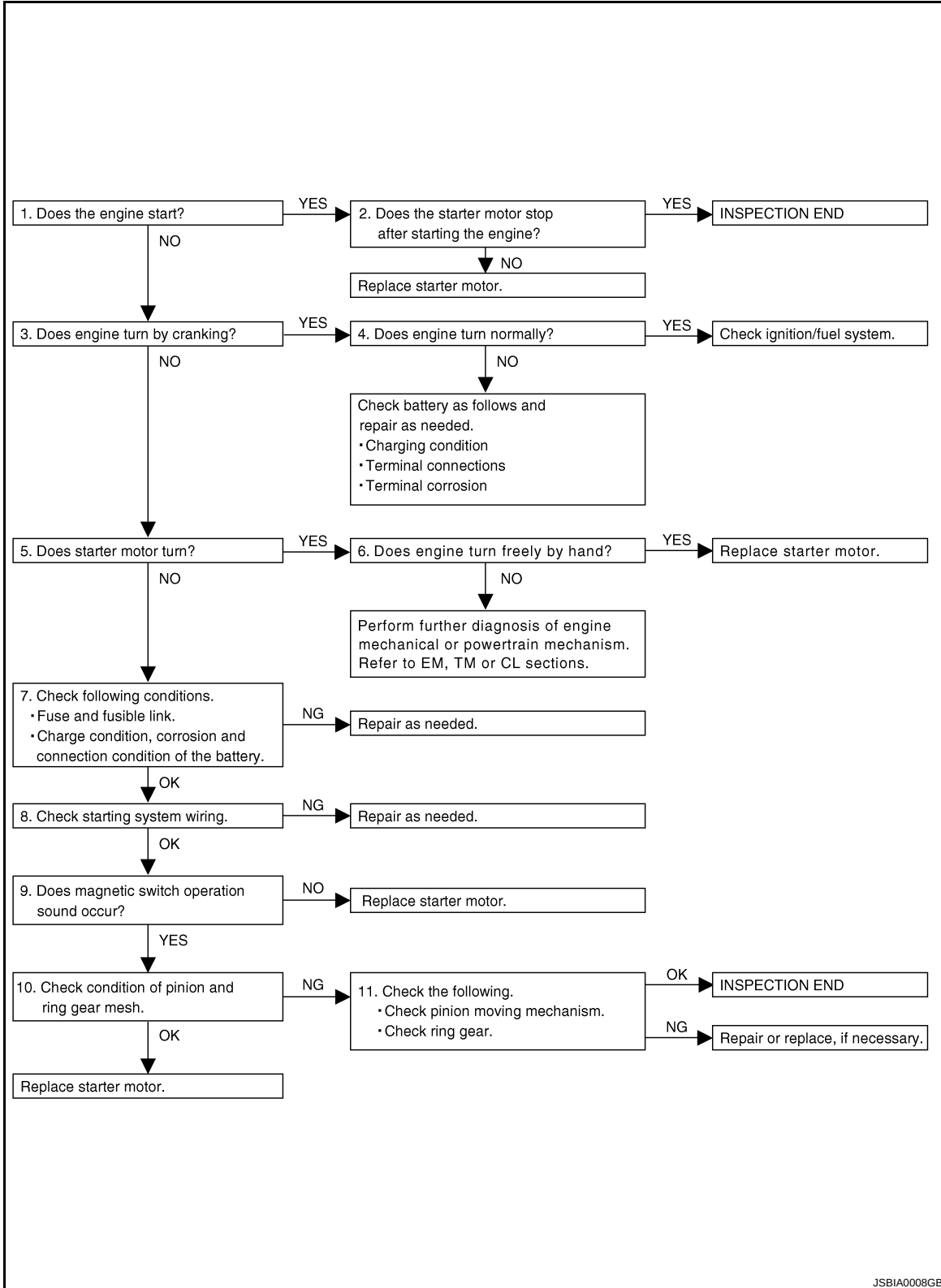
DIAGNOSIS AND REPAIR WORKFLOW

Work Flow

INFOID:000000001728601

STR

OVERALL SEQUENCE



DETAILED FLOW

< BASIC INSPECTION >

NOTE:

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

1.CHECK ENGINE START

Crank the engine and check that the engine starts.

Does the engine start?

YES >> GO TO 2

NO >> GO TO 3

2.CHECK THAT THE STARTER MOTOR STOPS

Check that the starter motor stops after starting the engine.

Does the starter motor stop?

YES >> INSPECTION END.

NO >> Replace starter motor.

3.CHECK THE ENGINE SPEED WITH CRANKING

Check that the engine runs at cranking.

Does engine turn by cranking?

YES >> GO TO 4

NO >> GO TO 5

4.CHECK THE ENGINE SPEED WITH CRANKING

Check that the engine speed is not low at cranking.

Does engine turn normally?

YES >> Check ignition/fuel system.

NO >> Check charge condition, corrosion and connection condition of the battery. Refer to [STR-25, "Work Flow"](#).

5.CHECK STARTER MOTOR ACTIVATION

Check that the starter motor runs at cranking.

Does starter motor turn?

YES >> GO TO 6

NO >> GO TO 7

6.ENGINE ROTATION STATUS

Check that the engine can be rotated by hand.

Does engine turn freely by hand?

YES >> Replace starter motor.

NO >> Perform further diagnosis of engine mechanical or powertrain mechanism. Refer to EM, TM or CL sections.

7.CHECK POWER SUPPLY CIRCUIT

Check the following conditions.

- Fuse and fusible link
- Charge condition, corrosion and connection condition of the battery. Refer to [STR-25, "Work Flow"](#).

Are these inspection results normal?

YES >> GO TO 8

NO >> Repair as needed.

8.CHECK STARTING SYSTEM WIRING

Check the following.

- "B" terminal circuit. Refer to [STR-30, "Description"](#)
- "S" terminal circuit. Refer to [STR-31, "Description"](#)

Are these inspection results normal?

YES >> GO TO 9

NO >> Repair as needed.

DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION >

[K9K]

9.CHECK MAGNETIC SWITCH OPERATION SOUND

Check that a magnetic switch operation sound can be heard when the ignition switch is set at the starting position.

Does magnetic switch operation sound occur?

YES >> GO TO 10

NO >> Replace starter motor.

10.PINION AND RING GEAR ENGAGEMENT CHECK

Check condition of pinion and ring gear mesh.

Is the inspection result normal?

YES >> Replace starter motor.

NO >> GO TO 11

11.CHECK STARTER MOTOR UNIT

Check the following.

- Check pinion moving mechanism.
- Check ring gear.

Are these inspection results normal?

YES >> INSPECTION END.

NO >> Repair or replace, if necessary.

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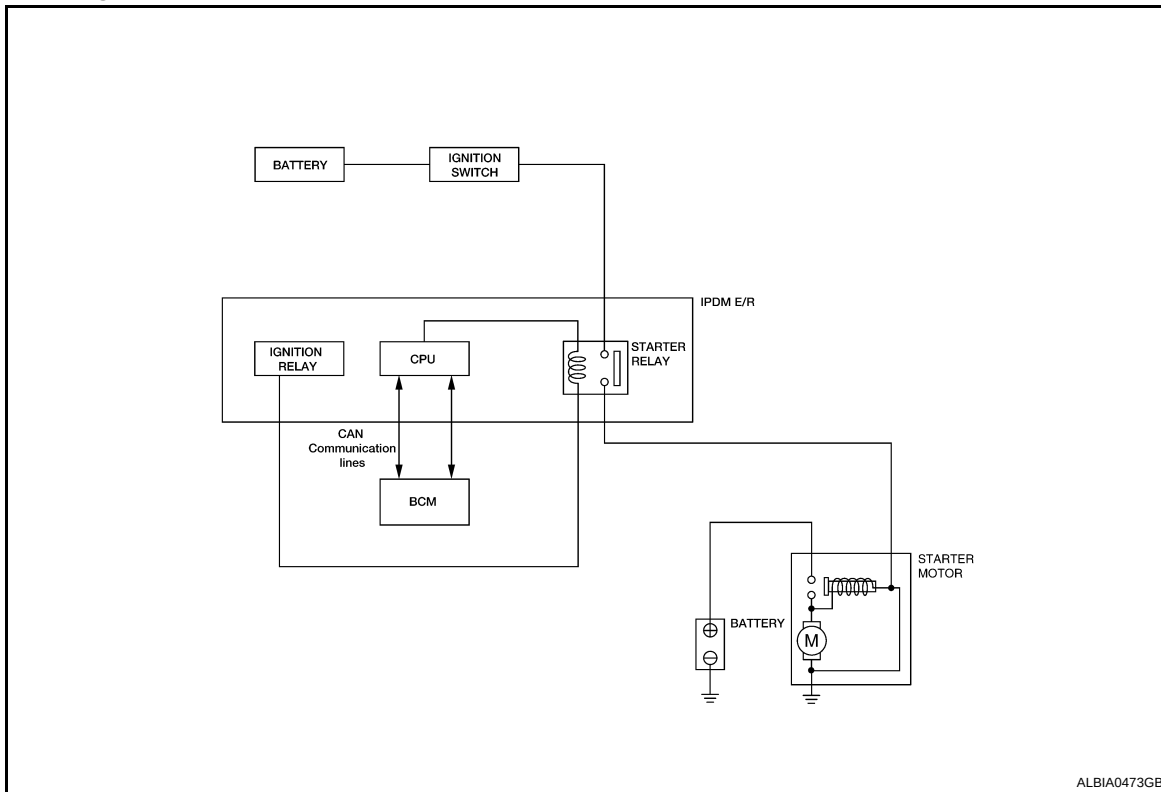
P

FUNCTION DIAGNOSIS

STARTING SYSTEM

System Diagram

INFOID:000000001728574



ALBIA0473GB

System Description

INFOID:000000001728575

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:000000001728576



ALBIA0475GB

1. IPDM E/R E44, E45, E46
2. BCM M18 (view with glove box removed)

STARTING SYSTEM

< FUNCTION DIAGNOSIS >

[K9K]

Component Description

INFOID:000000001728577

Component part	Description
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.

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COMPONENT DIAGNOSIS

B TERMINAL CIRCUIT

Description

INFOID:000000001728578

Terminal "2" (B) is constantly supplied with battery power.

Diagnosis Procedure

INFOID:000000001728579

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

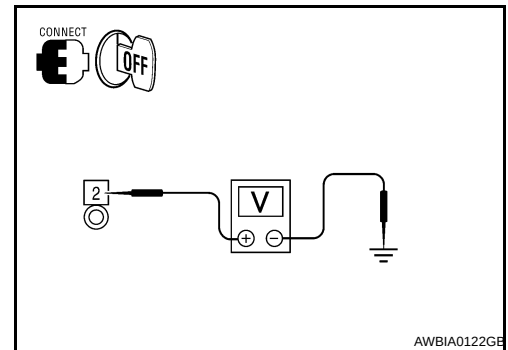
1. Turn ignition switch OFF.
2. Make sure that starter motor connector F27 terminal 2 connection is clean and tight.
3. Check voltage between starter motor connector F27 terminal 2 and ground.

(+)		(-)	Condition	Voltage
Connector	Terminal			
F27	2	Ground	While cranking the engine	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)

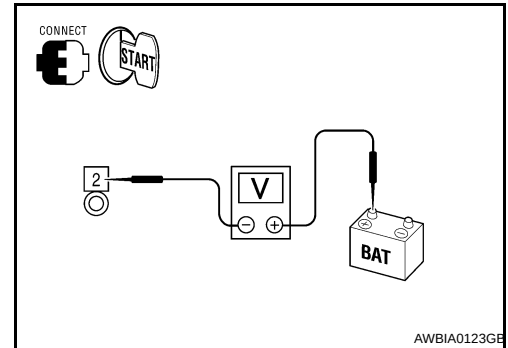
1. Shift the transmission into park or neutral.
2. Check voltage between battery positive terminal and starter motor connector F27 terminal 2 while cranking the engine.

(+)		(-)	Condition	Voltage
Connector	Terminal			
F27	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.



3.CHECK GROUND CIRCUIT STATUS (VOLTAGE DROP TEST)

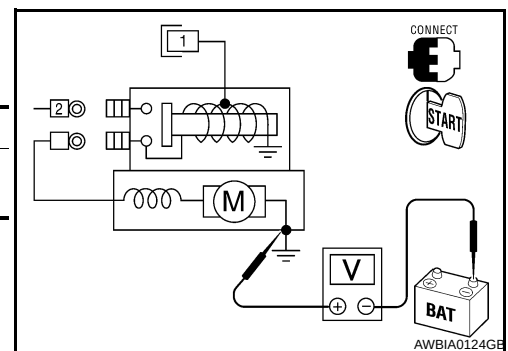
Check voltage between starter motor case and battery negative terminal while cranking the engine.

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

Is the voltage drop less than 0.2V?

YES >> Terminal 2 circuit is OK. Further inspection necessary. Refer to [STR-25, "Work Flow"](#).

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



S CONNECTOR CIRCUIT

< COMPONENT DIAGNOSIS >

[K9K]

S CONNECTOR CIRCUIT

Description

INFOID:000000001728580

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.

Diagnosis Procedure

INFOID:000000001728581

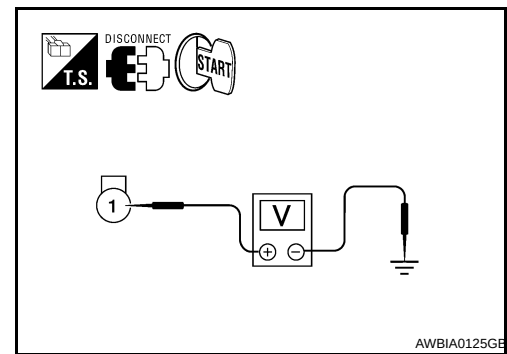
CAUTION:

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 F28.
3. Shift transmission into park or neutral.
4. Check voltage between starter motor harness connector F28 terminal 1 and ground with the ignition in START.



(+)		(-)	Condition	Voltage
Connector	Terminal			
F28	1	Ground	While cranking the engine	Battery voltage

Is battery voltage present?

YES >> Magnetic switch circuit is OK. Further inspection necessary. Refer to [STR-25, "Work Flow"](#).

NO >> GO TO 2

2.CHECK CONNECTOR

1. Turn ignition switch OFF.
2. Check the IPDM E/R harness connector E44 and starter motor harness connector F28 for damage, bent pins and loose connections.

Is the inspection result normal?

YES >> GO TO 3

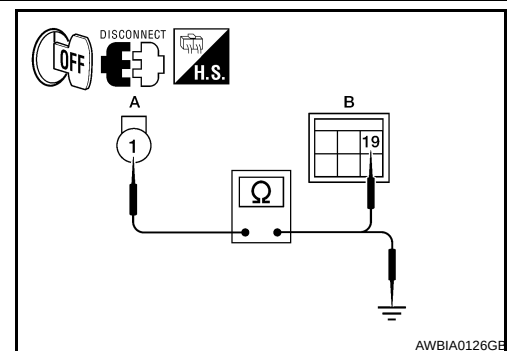
NO >> Repair the terminal and connector.

3.CHECK HARNESS CONTINUITY (OPEN CIRCUIT)

1. Disconnect IPDM E/R connector E44 and starter motor connector F28.
2. Check continuity between starter motor harness connector F28 (A) terminal 1 and IPDM E/R harness connector E44 (B) terminal 19.

A		B		Continuity
Connector	Terminal	Connector	Terminal	
F28	1	E44	19	Yes

3. Check continuity between starter motor harness connector F28 (A) terminal 1 and ground.



A		—	Continuity
Connector	Terminal		
F28	1	Ground	No

Are the continuity test results as specified?

YES >> Further inspection necessary. Refer to [STR-25, "Work Flow"](#).

NO >> Repair the harness.

STARTING SYSTEM

Wiring Diagram

INFOID:000000001728582

**NO
DATA**

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SYMPTOM DIAGNOSIS

STARTING SYSTEM

Symptom Table

INFOID:000000001728583

STR

Symptom	Reference
No normal cranking	Refer to STR-25, "Work Flow" .
Starter motor does not rotate	

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PRECAUTION

PRECAUTIONS

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

INFOID:0000000001689456

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. 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.

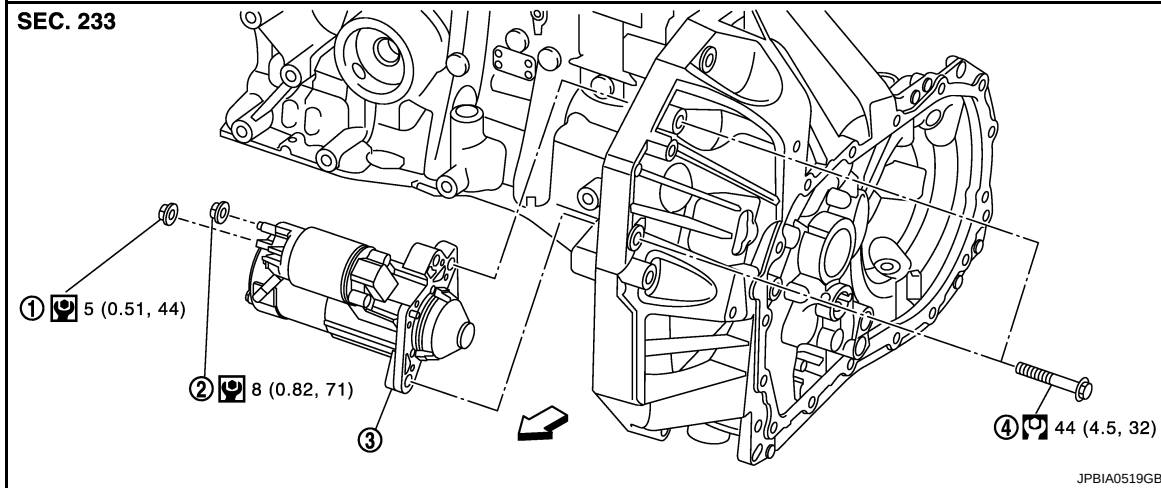
ON-VEHICLE REPAIR

STARTER MOTOR

Removal and Installation

INFOID:000000001689441

STR



- | | | |
|-----------------------|---------------------|------------------|
| 1. "S" terminal nut | 2. "B" terminal nut | 3. Starter motor |
| 4. Starter motor bolt | ⇒ Vehicle front | |

REMOVAL

1. Disconnect the battery cable from the negative terminal.
2. Remove "S" terminal nut and "S" terminal harness.
3. Remove "B" terminal nut and "B" terminal harness.
4. Remove starter motor bolts.
5. Remove starter motor upward from the vehicle.

INSTALLATION

Installation is in the reverse order of removal.

CAUTION:

Be sure to tighten "B" terminal nut carefully.