

SECTION **SC**  
STARTING & CHARGING SYSTEM

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# PRECAUTIONS

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## SERVICE INFORMATION

### PRECAUTIONS

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

INFOID:000000007329881

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 SRS 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 SRS 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 Necessary for Steering Wheel Rotation After Battery Disconnect

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#### **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

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.

## PRECAUTIONS

### < SERVICE INFORMATION >

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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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# PREPARATION

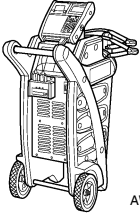
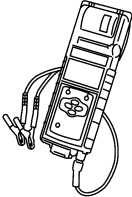
< SERVICE INFORMATION >

## PREPARATION

### Special Service Tool


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

Tool number (Kent-Moore No.) Tool name	Description
<p>— (—) Model GR8-1200 NI Multitasking battery and electrical diagnostic station</p>  <p style="text-align: right;">AWIIA1239ZZ</p>	<p>Tests batteries, starting and charging systems and charges batteries. For operating instructions, refer to diagnostic station instruction manual.</p>
<p>— (—) Model EXP-800 NI Battery and electrical diagnostic analyzer</p>  <p style="text-align: right;">JSMIA0806ZZ</p>	<p>Tests batteries and charging systems. For operating instructions, refer to diagnostic analyzer instruction manual.</p>

### Commercial Service Tool

INFOID:000000007329884

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

# BATTERY

< SERVICE INFORMATION >

## BATTERY

### How to Handle Battery

INFOID:000000007784197

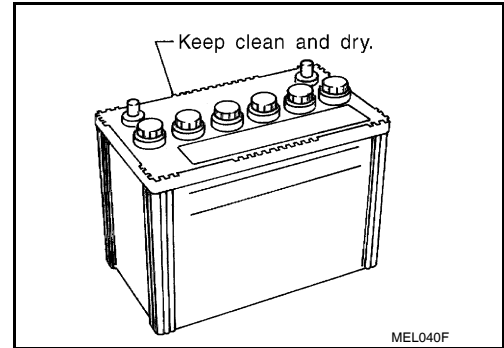
#### CAUTION:

- If it becomes necessary to start the engine with a booster battery and jumper cables, use a 12-volt booster battery.
- After connecting battery cables, ensure that they are tightly clamped to battery terminals for good contact.
- Never add distilled water through the hole used to check specific gravity.

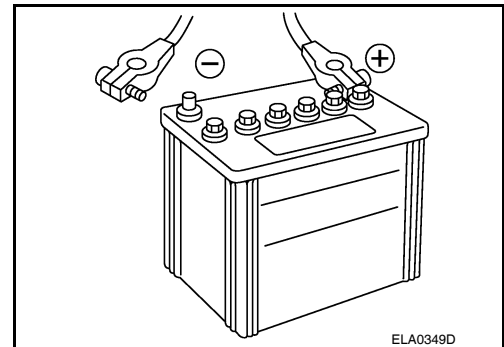
### METHODS OF PREVENTING OVER-DISCHARGE

The following precautions must be taken to prevent over-discharging a battery.

- The battery surface (particularly its top) should always be kept clean and dry.
- The terminal connections should be clean and tight.
- At every routine maintenance, check the electrolyte level.  
This also applies to batteries designated as "low maintenance" and "maintenance-free".



- When the vehicle is not going to be used over a long period of time, disconnect the battery cable from the negative terminal. (If the vehicle has an extended storage switch, turn it off.)



### Work Flow

INFOID:000000007784198

#### BATTERY DIAGNOSIS WITH EXP-800 NI OR GR8-1200 NI

To diagnose and confirm the condition of the battery, use the following special service tools:

- EXP-800 NI Battery and electrical diagnostic analyzer
- GR8-1200 NI Multitasking battery and electrical diagnostic station

#### NOTE:

Refer to the applicable Instruction Manual for proper battery diagnosis procedures.

#### BATTERY DIAGNOSIS WITHOUT EXP-800 NI OR GR8-1200 NI

##### Checking Electrolyte Level

#### WARNING:

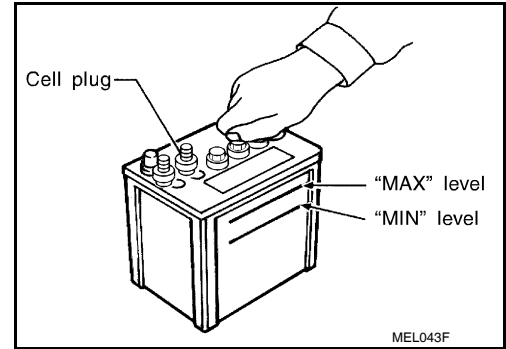
Never allow battery fluid to come in contact with skin, eyes, fabrics, or painted surfaces. After touching a battery, never touch or rub your eyes until you have thoroughly washed your hands. If acid contacts eyes, skin or clothing, immediately flush with water for 15 minutes and seek medical attention. Failure to do this may cause personal injury or damage to clothing or the painted surfaces.

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# BATTERY

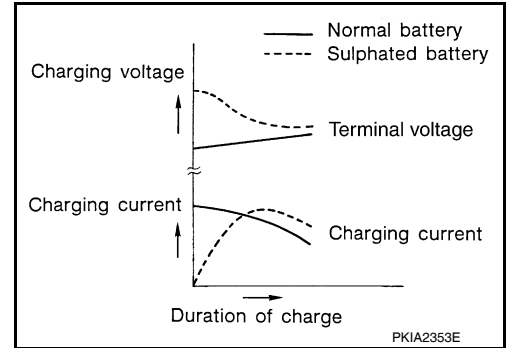
## < SERVICE INFORMATION >

- Remove the cell plug using a suitable tool.
- Add distilled water up to the MAX level.



### SULFATION

- **A battery will be completely discharged if it is left unattended for a long time and the specific gravity will become less than 1.100. This may result in sulfation on the cell plates.**
- **To determine if a battery has been “sulfated”, note its voltage and current when charging it. As shown in the figure, less current and higher voltage are observed in the initial stage of charging sulfated batteries.**
- **A sulfated battery may sometimes be brought back into service by means of a long, slow charge, 12 hours or more, followed by a battery capacity test.**



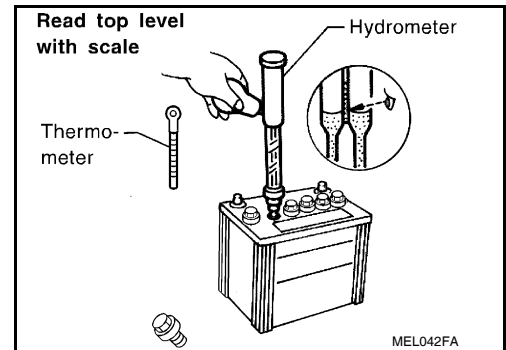
### Specific Gravity Check

#### NOTE:

Check the charge condition of the battery.

Periodically check the specific gravity of the electrolyte. Keep a close check on charge condition to prevent over-discharge.

1. Read hydrometer and thermometer indications at eye level.
2. Use the chart below to correct your hydrometer reading according to electrolyte temperature.



### Hydrometer Temperature Correction

Battery electrolyte temperature [°C (°F)]	Add to specific gravity reading
71 (160)	0.032
66 (150)	0.028
60 (140)	0.024
54 (130)	0.020
49 (120)	0.016
43 (110)	0.012
38 (100)	0.008
32 (90)	0.004
27 (80)	0
21 (70)	-0.004
16 (60)	-0.008
10 (50)	-0.012

# BATTERY

## < SERVICE INFORMATION >

Battery electrolyte temperature [°C (°F)]	Add to specific gravity reading
4 (40)	-0.016
-1 (30)	-0.020
-7 (20)	-0.024
-12 (10)	-0.028
-18 (0)	-0.032

Corrected specific gravity	Approximate charge condition
1.260 - 1.280	Fully charged
1.230 - 1.250	3/4 charged
1.200 - 1.220	1/2 charged
1.170 - 1.190	1/4 charged
1.140 - 1.160	Almost discharged
1.110 - 1.130	Completely discharged

### Charging The Battery

#### **CAUTION:**

- **Never “quick charge” a fully discharged battery.**
- **Keep the battery away from open flame while it is being charged.**
- **When connecting the charger, connect the leads first, then turn on the charger. Never turn on the charger first, as this may cause a spark.**
- **If battery electrolyte temperature rises above 55 °C (131 °F), stop charging. Always charge battery at a temperature below 55 °C (131 °F).**

#### Charging Rates (Standard Charge)

Approximate charge condition	Charge current (A)	Charge time (h)
Fully charged	7	2
3/4 charged		2.5
1/2 charged		5
1/4 charged		7.5
Almost discharged		9
Completely discharged		10

#### Charging Rates (Quick Charge)

Approximate charge condition	Charge current (A)	Charge time (h)
Fully charged	—	—
3/4 charged	16	0.5
1/2 charged	33	
1/4 charged		
Almost discharged	—	—
Completely discharged		

#### **NOTE:**

The ammeter reading on your battery charger will automatically decrease as the battery charges. This indicates that the voltage of the battery is increasing normally as the state of charge improves. The charging amps indicated above refer to initial charge rate.

- If, after charging, the specific gravity of any two cells varies more than 0.050, the battery should be replaced.

## Removal and Installation

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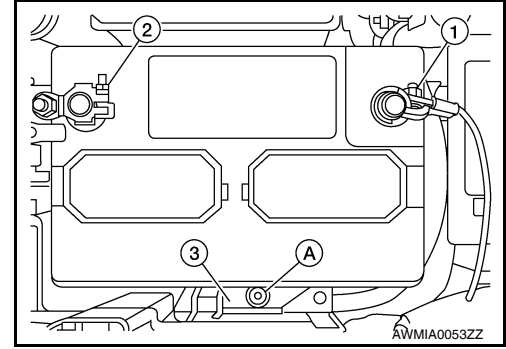
EQUIPPED WITH M/T OR A/T

# BATTERY

## < SERVICE INFORMATION >

### Removal

1. Disconnect battery negative (1) and positive (2) terminals.  
**CAUTION:**  
**Disconnect the battery negative terminal first.**
2. Remove battery hold-down wedge bolt (A) and remove battery hold-down wedge bracket (3).
3. Remove battery cover.
4. Remove battery.



### Installation

Installation is in the reverse order of removal.

#### **CAUTION:**

**Connect the battery positive terminal first.**

**Battery wedge bracket bolt : 14.2 N·m (1.4 kg-m, 10 ft-lb)**

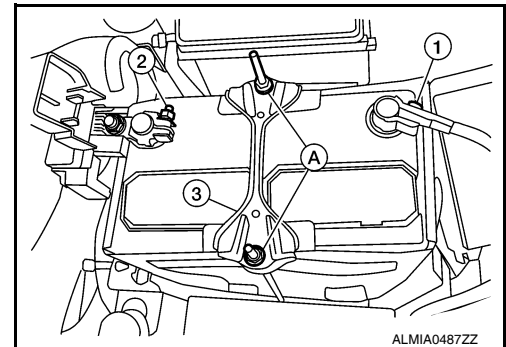
**Battery terminal nut : 5.4 N·m (0.55 kg-m, 48 in-lb)**

Reset electronic systems as necessary. Refer to [SC-8, "Required Procedure After Battery Disconnection"](#).

## EQUIPPED WITH CVT

### Removal

1. Disconnect battery negative (1) and positive (2) terminals.  
**CAUTION:**  
**Disconnect the battery negative terminal first.**
2. Remove battery hold-down frame bolts (A) and remove battery hold-down frame (3).
3. Remove battery cover.
4. Remove battery.



### Installation

Installation is in the reverse order of removal.

#### **CAUTION:**

**Connect the battery positive terminal first.**

**Battery hold-down frame bolt : 14.2 N·m (1.4 kg-m, 10 ft-lb)**

**Battery terminal nut : 5.4 N·m (0.55 kg-m, 48 in-lb)**

Reset electronic systems as necessary. Refer to [SC-8, "Required Procedure After Battery Disconnection"](#).

## Required Procedure After Battery Disconnection

INFOID:000000007329888

System	Item	Reference
Engine Control	Idle Air Volume Learning	<a href="#">EC-87</a>
Glasses, Window System & Mirrors	Power Window System Initialization	<a href="#">GW-29</a>
Roof	Sunroof Memory Reset/Initialization	<a href="#">RF-11</a>
Audio, Visual, Navigation & Telephone	Audio (Radio Preset)	Refer to Owner's Manual.
	Navigation System	Refer to Owner's Manual.



# STARTING SYSTEM

< SERVICE INFORMATION >

## STARTING SYSTEM

### System Description

INFOID:000000007329889

#### M/T Models

Power is supplied at all times

- to starter motor terminal B, and
- through 40A fusible link (letter **h**, located in the fuse and fusible link box)
- to ignition switch terminal B.

With the ignition switch in the START position, power is supplied

- from ignition switch terminal ST
- to IPDM E/R terminal 21.

With the ignition switch in the ON or START position, power is supplied

- through 10A fuse (No. 49, located in the IPDM E/R)
- to the clutch interlock switch terminal 1.

With the clutch pedal depressed, power is supplied

- through the clutch interlock switch terminal 2
- to IPDM E/R terminal 35.

Ground is supplied at all times

- to IPDM E/R terminals 39 and 59
- through body grounds E15 and E24.

If the IPDM E/R receives a starter relay request ON signal from the BCM over the CAN communication lines, the IPDM E/R grounds the starter relay and power is supplied

- through terminal 19 of the IPDM E/R
- to terminal S of the starter motor.

The starter motor magnetic switch energizes closing the circuit between the battery and the starter motor. The starter motor is case ground through the cylinder block. With power and ground supplied, the starter motor operates.

#### A/T Models

Power is supplied at all times

- to starter motor terminal B, and
- through 40A fusible link (letter **h**, located in the fuse and fusible link box)
- to ignition switch terminal B.

With the ignition switch in the START position, power is supplied

- from ignition switch terminal ST
- to IPDM E/R terminal 21.

With the ignition switch in the ON or START position, power is supplied

- through 10A fuse (No. 54, located in the IPDM E/R)
- to transmission range switch terminal 1.

With the selector lever in the P or N position, power is supplied

- through transmission range switch terminal 2
- to IPDM E/R terminal 35.

Ground is supplied at all times

- to IPDM E/R terminals 39 and 59
- through body grounds E15 and E24.

If the IPDM E/R receives a starter relay request ON signal from the BCM over the CAN communication lines, the IPDM E/R grounds the starter relay and power is supplied

- through terminal 19 of the IPDM E/R
- to terminal S of the starter motor.

The starter motor magnetic switch energizes closing the circuit between the battery and the starter motor. The starter motor is case ground through the cylinder block. With power and ground supplied, the starter motor operates.

#### CVT Models

Power is supplied at all times

- to starter motor terminal B, and
- through 40A fusible link (letter **h**, located in the fuse and fusible link box)
- to ignition switch terminal B.

With the ignition switch in the ON or START position, power is supplied

- through 10A fuse (No. 49, located in the IPDM E/R)

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- to transmission range switch terminal 1.
- With the selector lever in the P or N position, power is supplied
- through transmission range switch terminal 2
  - to IPDM E/R terminal 35.

Ground is supplied at all times

- to IPDM E/R terminals 39 and 59
- through body grounds E15 and E24.

If the IPDM E/R receives a starter relay request ON signal from the BCM over the CAN network, the IPDM E/R grounds the starter relay and power is supplied

- through terminal 19 of the IPDM E/R
- to terminal S of the starter motor.

The starter motor magnetic switch energizes closing the circuit between the battery and the starter motor. The starter motor is case ground through the cylinder block. With power and ground supplied, the starter motor operates.

# STARTING SYSTEM

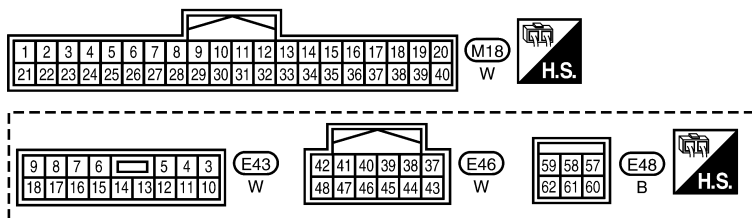
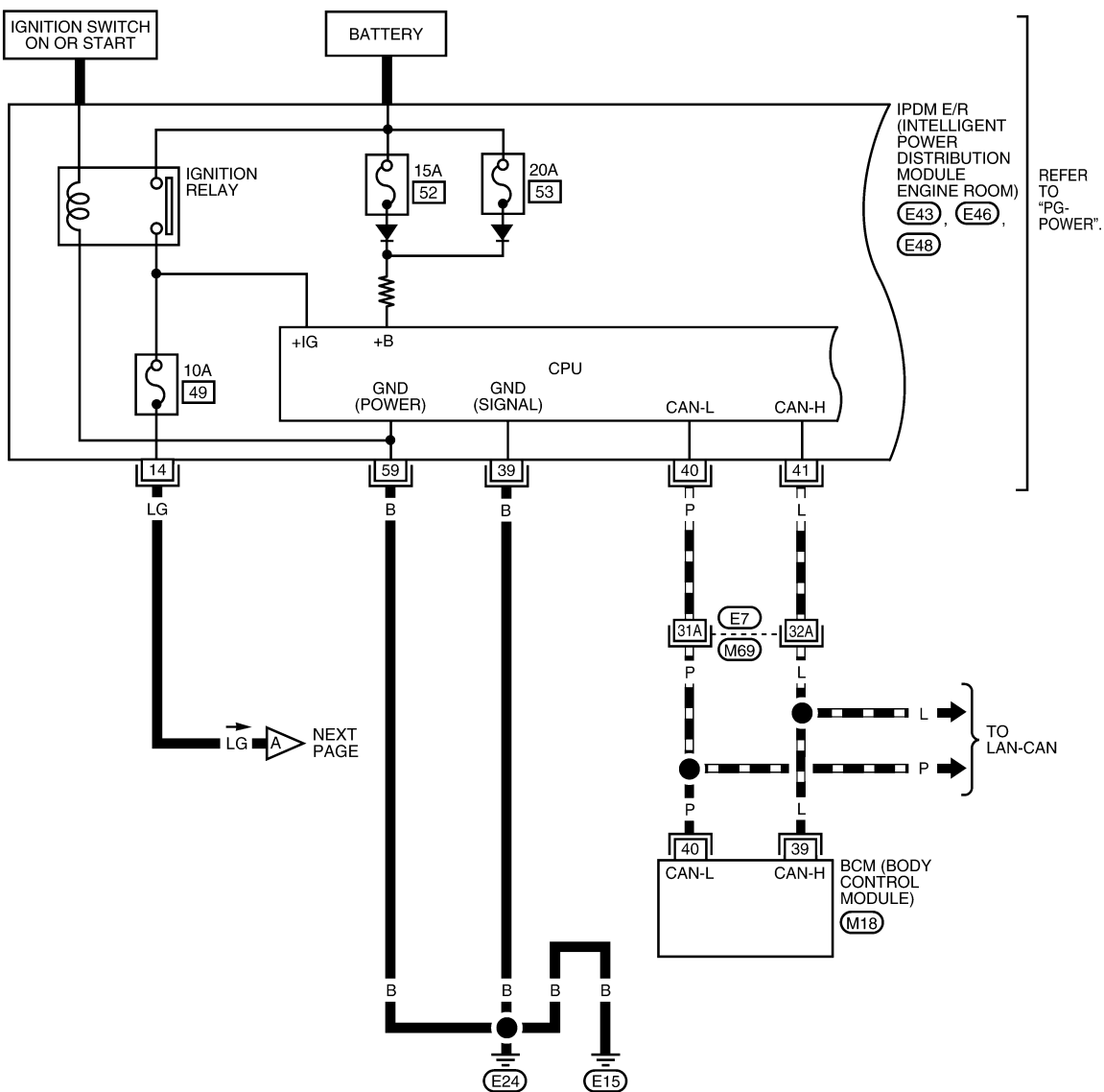
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## Wiring Diagram - START -

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M/T Models

### SC-START-01

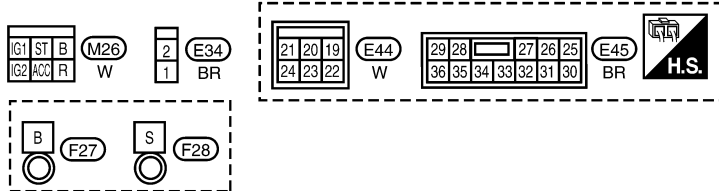
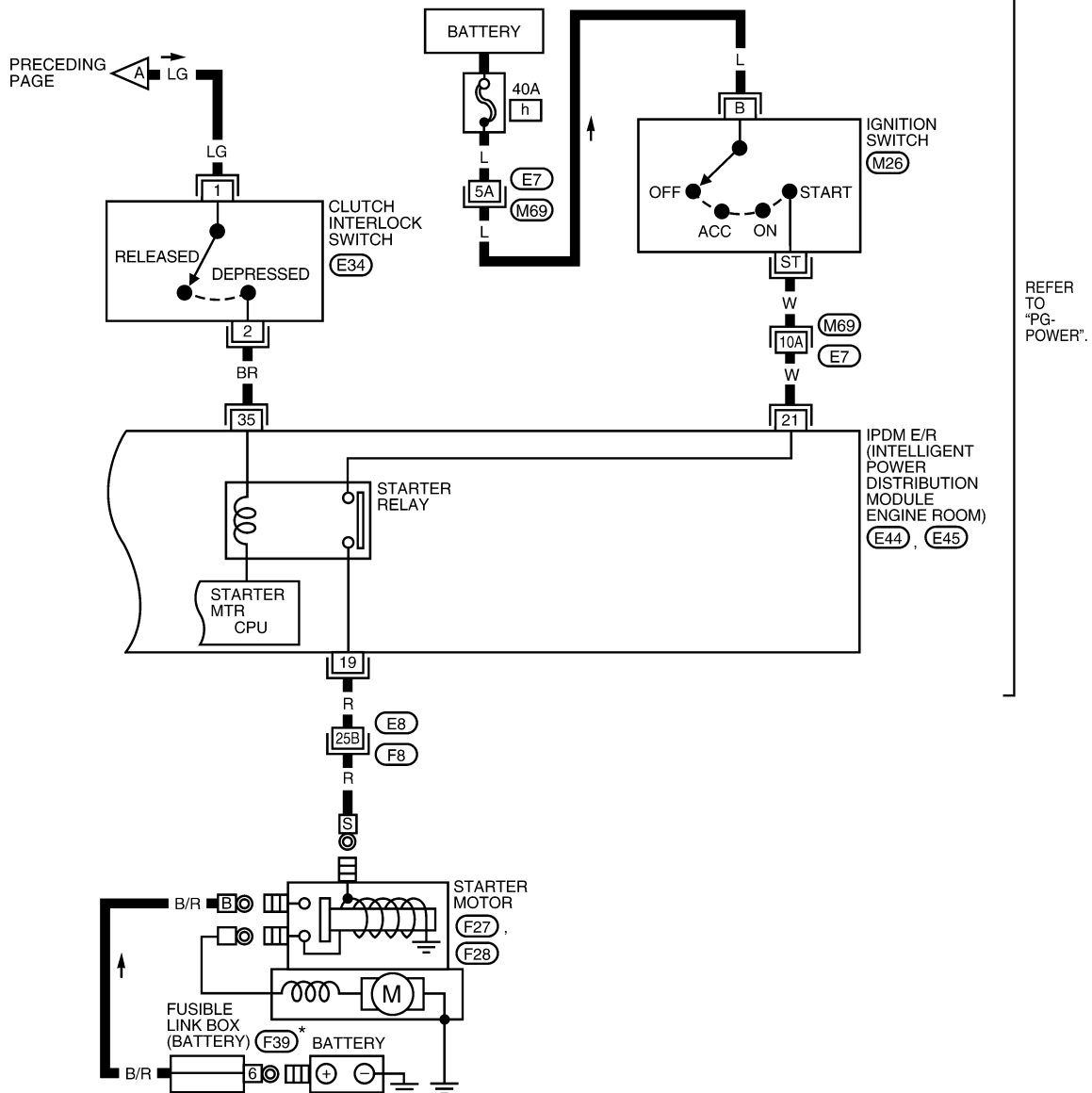


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# STARTING SYSTEM

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SC-START-02



REFER TO THE FOLLOWING.  
 (M69), (F8) - SUPER  
 MULTIPLE JUNCTION (SMJ)

\* : (F39) IS AN INTEGRAL PART OF FUSIBLE LINK BOX (BATTERY) ASSEMBLY.

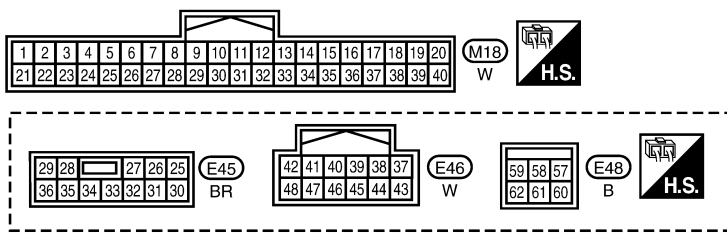
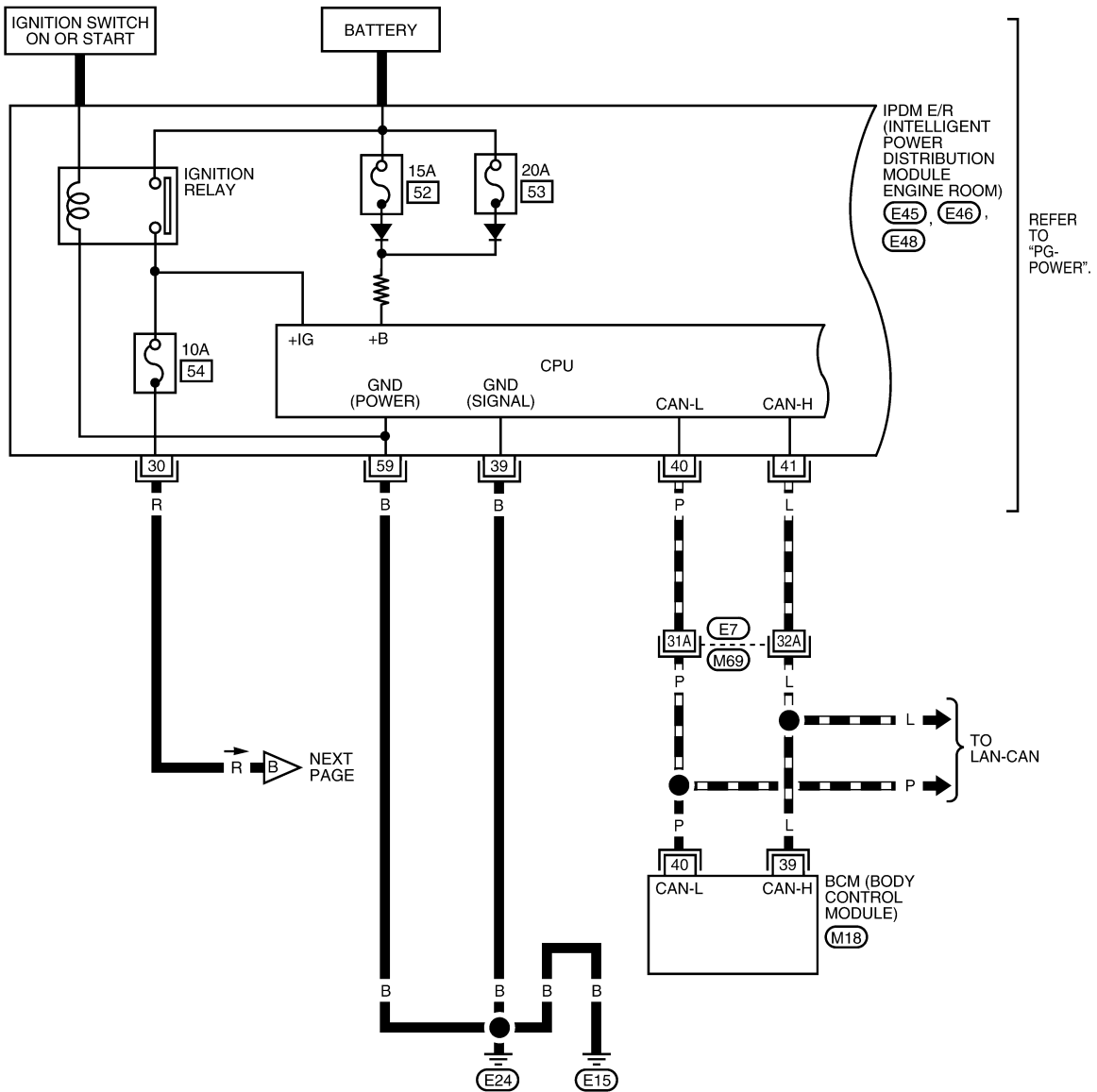
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# STARTING SYSTEM

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A/T Models

SC-START-03



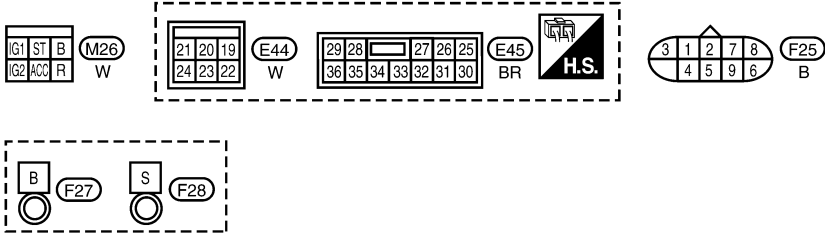
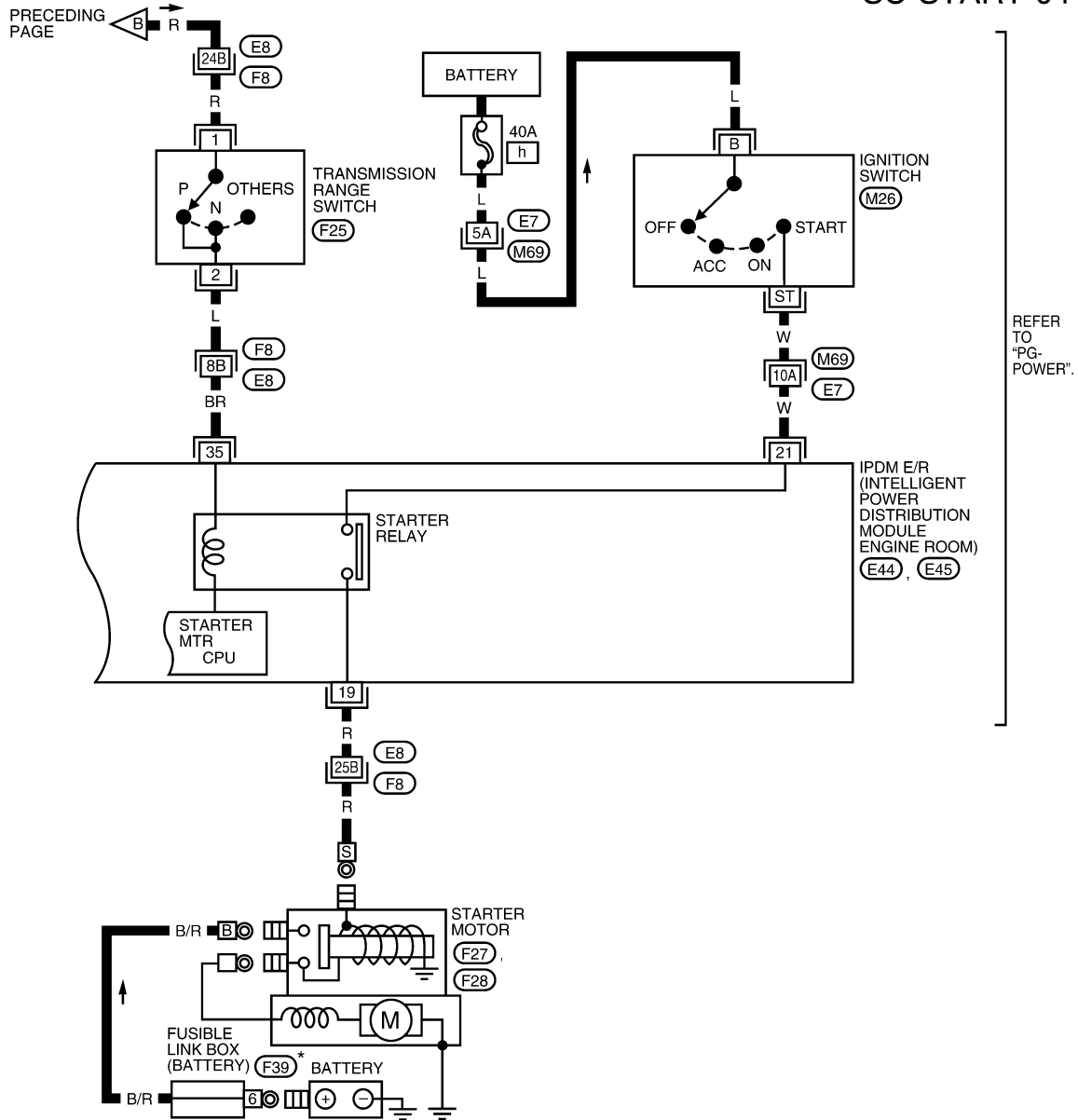
REFER TO THE FOLLOWING.  
 (M69) - SUPER MULTIPLE JUNCTION (SMJ)

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# STARTING SYSTEM

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SC-START-04



REFER TO THE FOLLOWING.  
 (M69), (F8) - SUPER  
 MULTIPLE JUNCTION (SMJ)

\* : (F39) IS AN INTEGRAL PART OF FUSIBLE LINK BOX (BATTERY) ASSEMBLY.

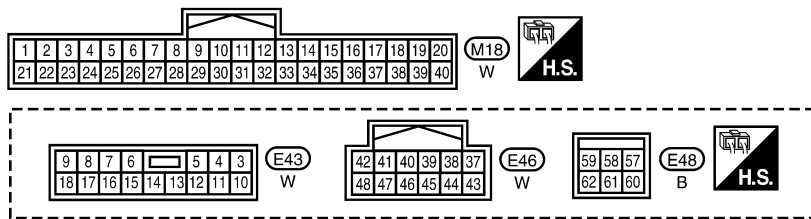
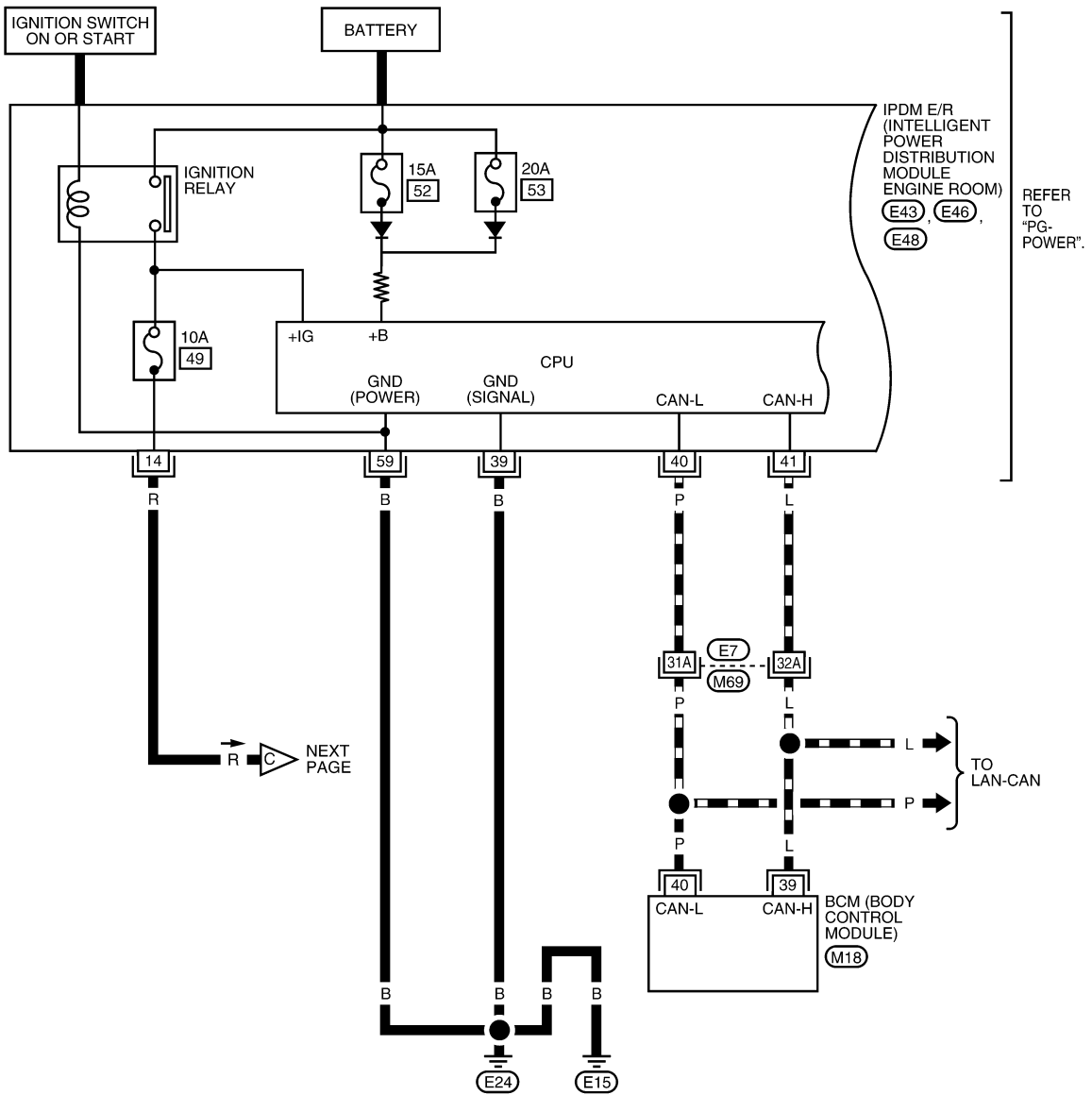
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# STARTING SYSTEM

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CVT Models

SC-START-05



REFER TO THE FOLLOWING.

(M69) - SUPER MULTIPLE JUNCTION (SMJ)

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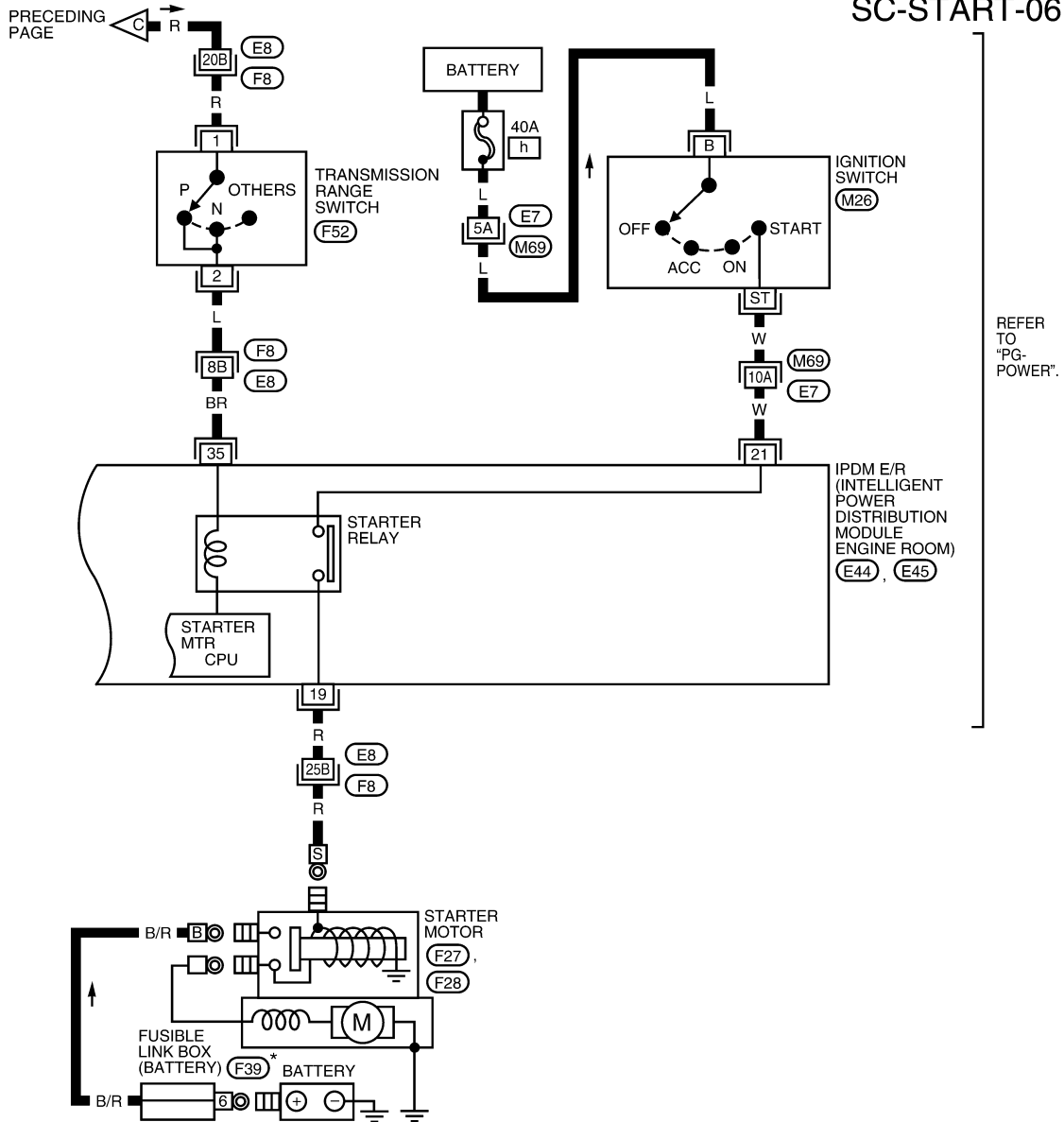
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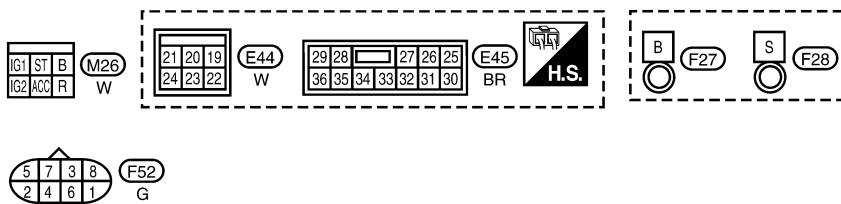
# STARTING SYSTEM

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SC-START-06



REFER TO "PG-POWER".



REFER TO THE FOLLOWING.  
(M69), (F8) - SUPER MULTIPLE JUNCTION (SMJ)

\* : (F39) IS AN INTEGRAL PART OF FUSIBLE LINK BOX (BATTERY) ASSEMBLY.

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## Trouble Diagnosis with Multitasking Battery Diagnostic Station

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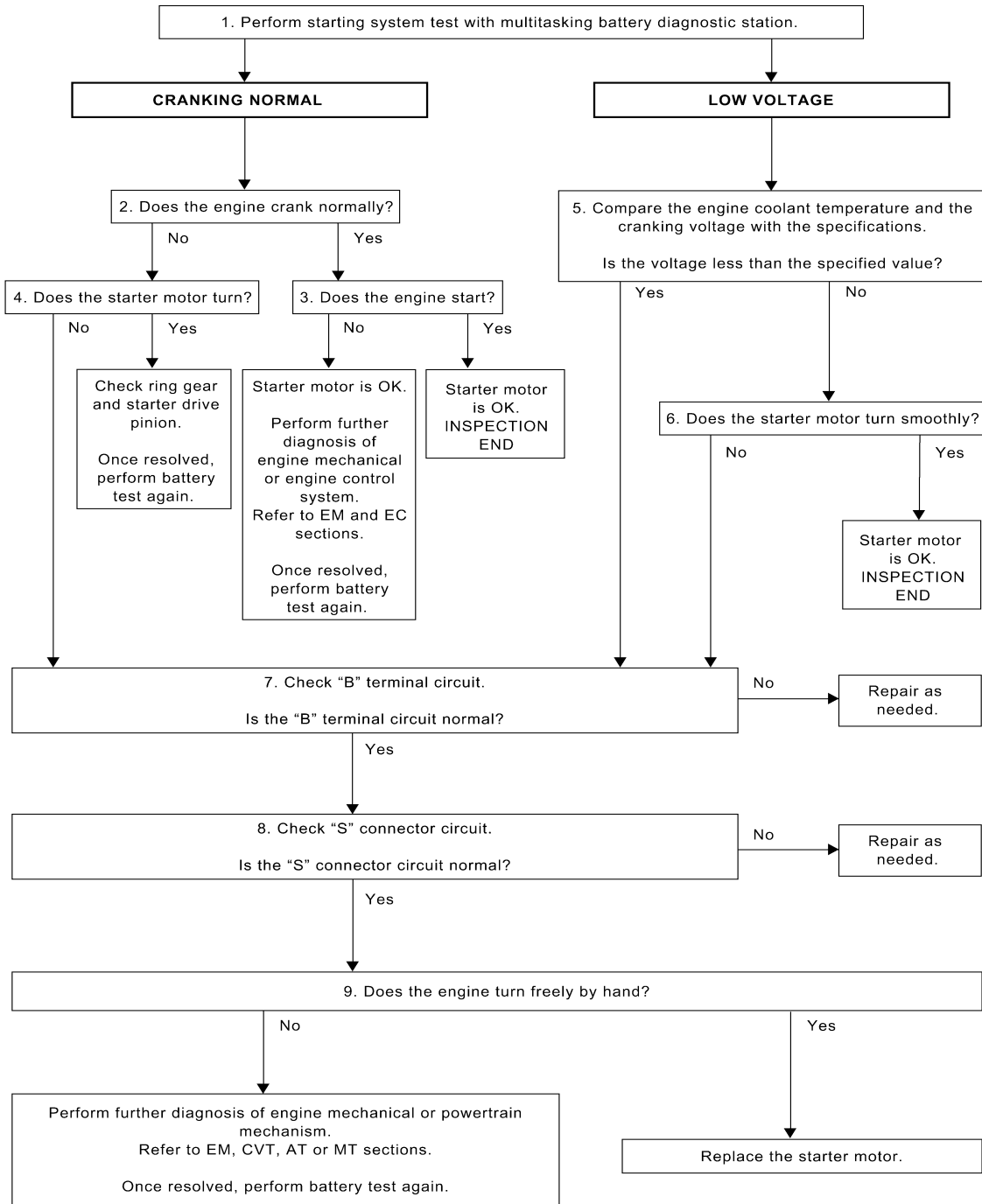
Refer to diagnostic station instruction manual.

### WORK FLOW



# STARTING SYSTEM

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## DIAGNOSTIC PROCEDURE 1

### Check Starter Motor Circuit

#### 1. CHECK POWER SUPPLY TO STARTER MOTOR

1. Remove the fuel pump fuse.
2. Crank or start the engine (where possible) until the fuel pressure is released.
3. Turn the ignition switch OFF.
4. Check that the starter motor connector F27 connection is clean and tight.

# STARTING SYSTEM

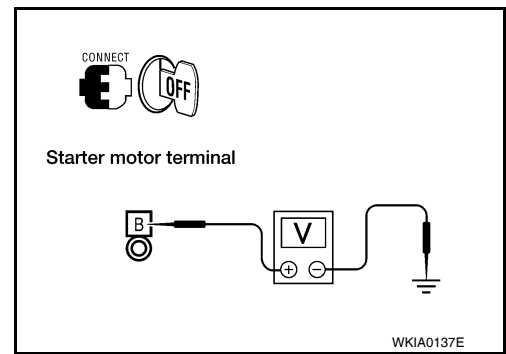
## < SERVICE INFORMATION >

- Check voltage between starter motor connector F27 terminal B and ground using a digital circuit tester.

**Battery voltage should exist**

### OK or NG

- OK >> GO TO 2.  
 NG >> Check harness between the battery and the starter motor for open circuit.



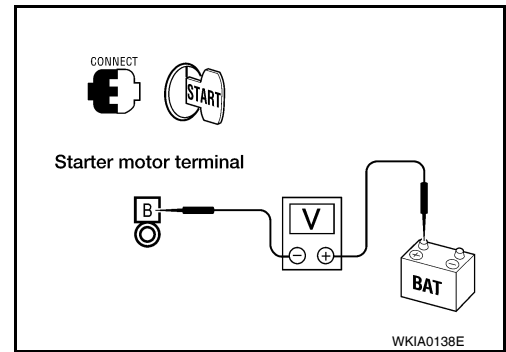
## 2. CHECK VOLTAGE DROP ON STARTER MOTOR CIRCUIT

- Check voltage between starter motor connector F27 terminal B and battery positive terminal using a digital circuit tester.

**Ignition switch in START : Less than 0.2V**

### OK or NG

- OK >> GO TO 3.  
 NG >> Check harness between the battery and the starter motor for poor continuity.



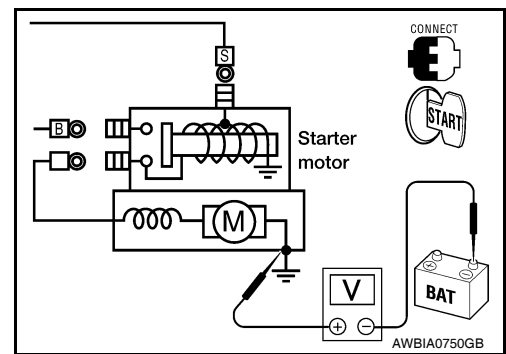
## 3. CHECK VOLTAGE DROP ON STARTER MOTOR GROUND CIRCUIT

- Check voltage between starter motor case and battery negative terminal using a digital circuit tester.

**Ignition switch in START : Less than 0.2V**

### OK or NG

- OK >> Starter motor ground circuit is OK. Further inspection is necessary. Refer to "WORK FLOW".  
 NG >> Check harness between the starter motor case and ground for poor continuity.



## DIAGNOSTIC PROCEDURE 2

Check Magnetic Switch Circuit

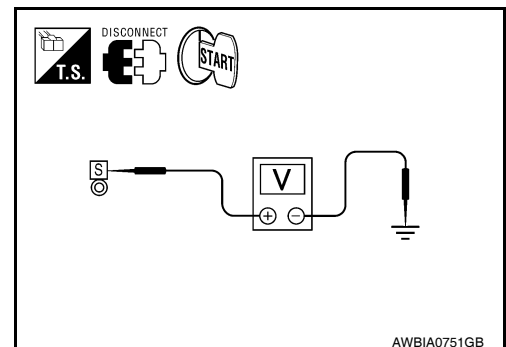
### 1. CHECK POWER SUPPLY TO MAGNETIC SWITCH

- Remove the fuel pump fuse.
- Crank or start the engine (where possible) until the fuel pressure is released.
- Turn the ignition switch OFF.
- Disconnect starter motor connector F28.
- Check voltage between starter motor connector F28 terminal S and ground using a digital circuit tester.

**Ignition switch in START : Battery voltage**

### OK or NG

- OK >> GO TO 2.  
 NG >> Check the following:
- 40A fusible link (letter **h**, located in fuse and fusible link box)



# STARTING SYSTEM

## < SERVICE INFORMATION >

- 10A fuse (No. 49, M/T models, located in the IPDM E/R)
- 15A fuse (No. 52, located in the IPDM E/R)
- 20A fuse (No. 53, located in the IPDM E/R)
- Transmission range switch, clutch interlock switch or TCM depending on equipment
- Ignition switch
- Ignition relay IPDM E/R
- Starter relay IPDM E/R
- Starter relay request ON signal from BCM
- Harness for open or short circuit

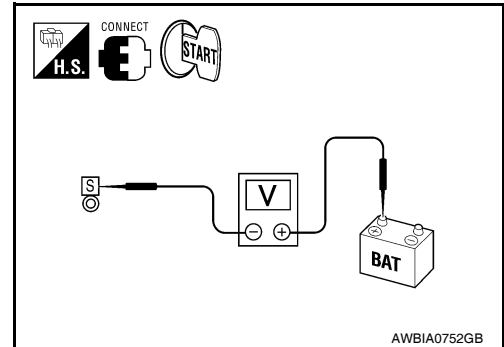
## 2. CHECK VOLTAGE DROP ON MAGNETIC SWITCH CIRCUIT

1. Connect starter motor connector F28.
2. Check voltage between starter motor connector F28 terminal S and battery positive terminal using a digital circuit tester.

**Ignition switch in START : Less than 1V**

### OK or NG

- OK >> Magnetic switch circuit is OK. Further inspection is necessary. Refer to "WORK FLOW".
- NG >> Check harness, components and connections between the battery and the magnetic switch for poor continuity.

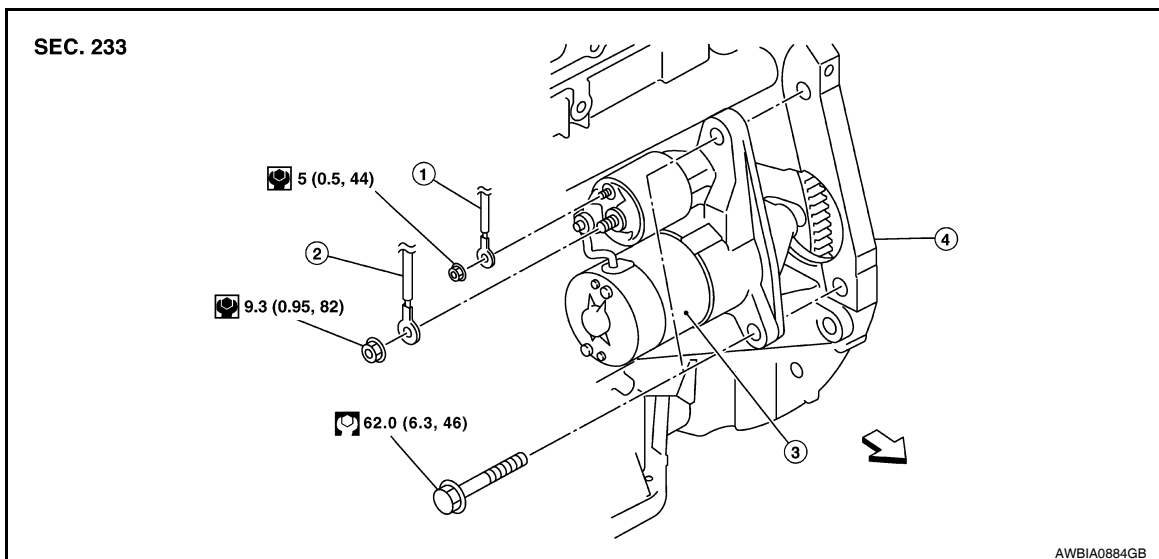


## MINIMUM SPECIFICATION OF CRANKING VOLTAGE REFERENCING COOLANT TEMPERATURE

Engine coolant temperature	Voltage V
-30°C to -20°C (-22°F to -4°F)	8.4
-19°C to -10°C (-2°F to 14°F)	8.9
-9°C to 0°C (16°F to 32°F)	9.3
More than 1°C (More than 34°F)	9.7

## Removal and Installation

INFOID:000000007329893



1. "S" terminal harness
  2. "B" terminal harness
  3. Starter motor
  4. Cylinder block
- ↶ Front

## STARTING SYSTEM

### < SERVICE INFORMATION >

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#### REMOVAL

1. Disconnect the battery negative terminal. Refer to [SC-7, "Removal and Installation"](#).
2. Remove air duct (inlet). Refer to [EM-16, "Removal and Installation"](#).
3. Remove reservoir tank. Refer to [CO-15, "Component"](#).
4. Remove "S" terminal nut.
5. Remove "B" terminal nut.
6. Remove starter motor bolts.
7. Remove starter motor.

#### INSTALLATION

Installation is in the reverse order of removal.

**CAUTION:**

**Be sure to tighten terminal nuts carefully.**

# CHARGING SYSTEM

< SERVICE INFORMATION >

## CHARGING SYSTEM

### System Description

INFOID:000000007329894

The generator provides DC voltage to operate the vehicle's electrical system and to keep the battery charged. The voltage output is controlled by the IC regulator.

Power is supplied at all times to generator terminal 3 through

- 10A fuse (No. 29, located in the fuse and fusible link box).

Power is supplied through terminal 1 to charge the battery and operate the vehicle's electrical system. Output voltage is monitored at terminal 3 by the IC regulator. The charging circuit is protected by the 120A fusible link [letter **a** , located in the fusible link box (battery)].

Ground is supplied

- to generator terminal 5
- through body ground F5, and
- through the generator case to the cylinder block

With the ignition switch in the ON or START position, power is supplied

- through 10A fuse [No. 3, located in the fuse block (J/B)]
- to combination meter terminal 28 for the charge warning lamp.

The IC regulator controls ground to terminal 38 of the combination meter through terminal 2 of the generator.

When the ignition is turned on and power becomes available at terminal 2, this "wakes up" the regulator. The regulator monitors charge output and grounds terminal 2 or leaves it open depending on charge output. With power and ground supplied, the charge warning lamp will illuminate. When the generator is providing sufficient voltage, the ground is opened and the charge warning lamp will go off.

If the charge warning lamp illuminates with the engine running, a malfunction is indicated.

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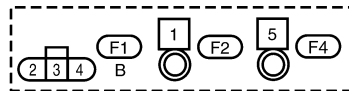
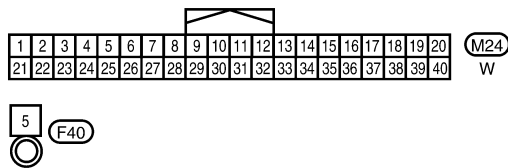
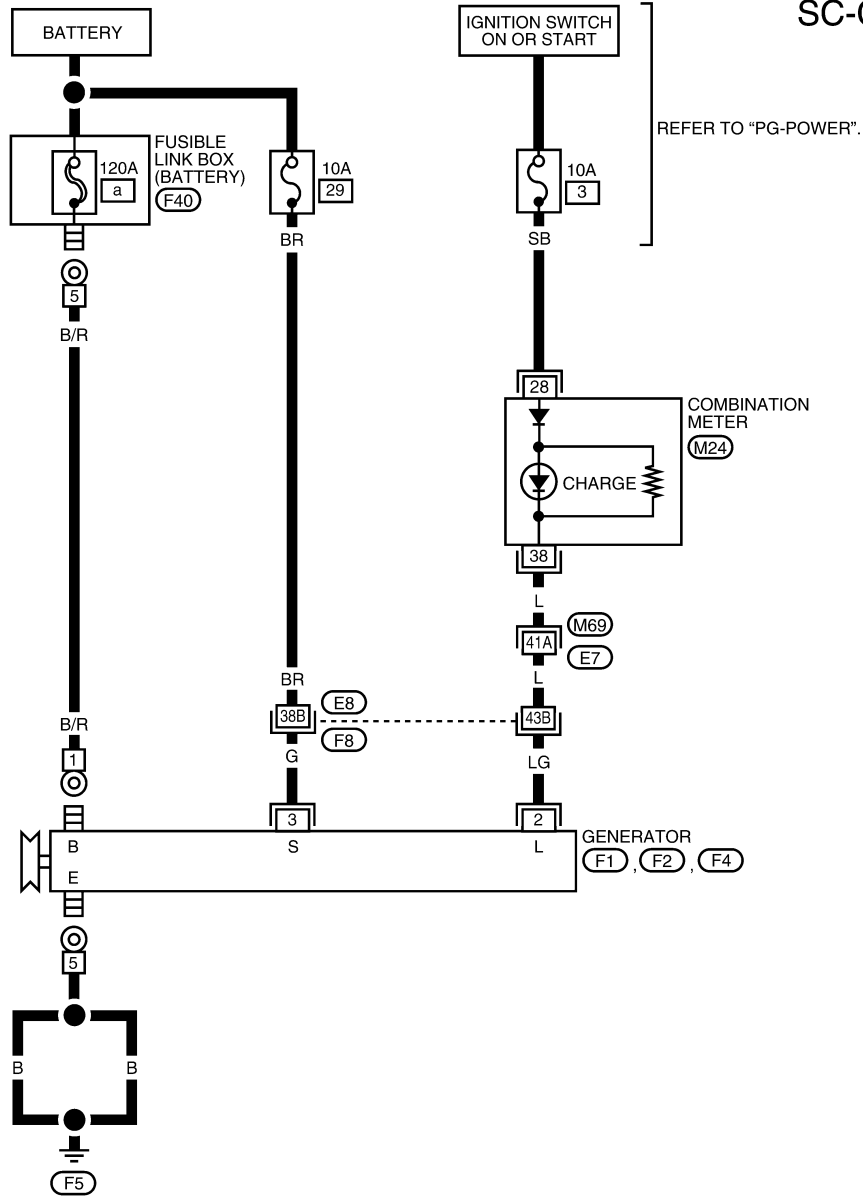
# CHARGING SYSTEM

< SERVICE INFORMATION >

## Wiring Diagram - CHARGE -

INFOID:000000007329895

### SC-CHARGE-01



REFER TO THE FOLLOWING.  
 (M69), (F8) - SUPER  
 MULTIPLE JUNCTION (SMJ)

WKWA4970E

## Trouble Diagnosis with Multitasking Battery Diagnostic Station

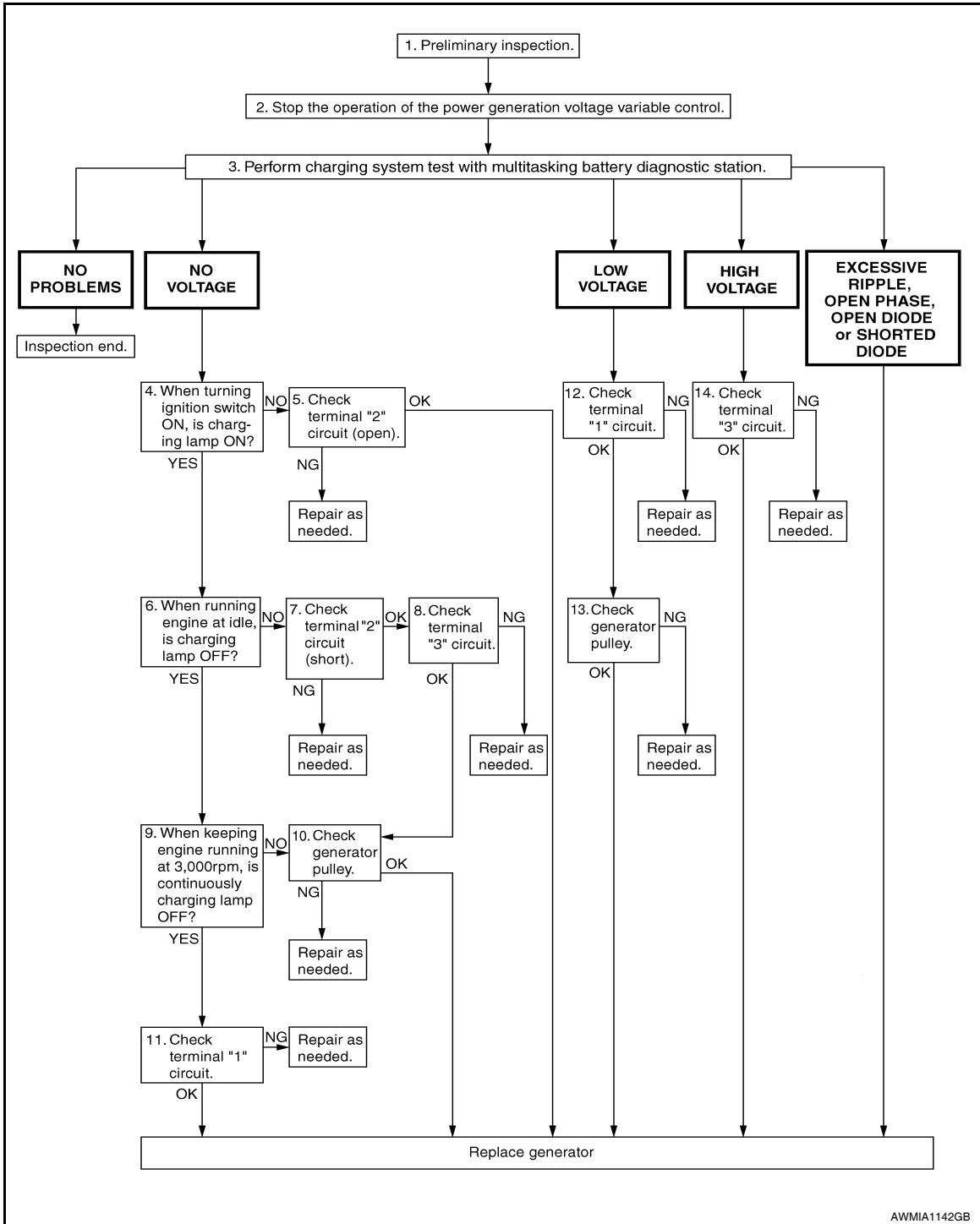
INFOID:000000007329896

Refer to diagnostic station instruction manual.

# CHARGING SYSTEM

< SERVICE INFORMATION >

## WORK FLOW



### DIAGNOSTIC PROCEDURE 1

Check Charge Warning Lamp Circuit

#### 1. CHECK CHARGE WARNING LAMP CIRCUIT CONNECTION

Check to see if terminal 2 is clean and tight.

**OK or NG**

OK >> GO TO 2.

NG >> Repair terminal 2 connection. Confirm repair by performing complete Starting/Charging system test. Refer to diagnostic station instruction manual.

# CHARGING SYSTEM

< SERVICE INFORMATION >

## 2. CHECK CHARGE WARNING LAMP CIRCUIT

1. Disconnect generator connector F1.
2. Apply ground to generator connector F1 terminal 2 with the ignition switch in the ON position.

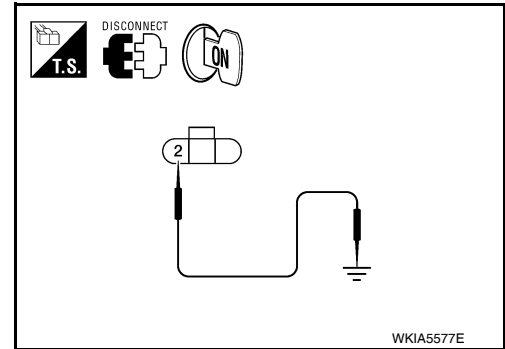
**CHARGE lamp should light up.**

### OK or NG

OK >> GO TO "WORK FLOW" .

NG >> Check the following.

- 10A fuse [No. 3, located in fuse block (J/B)]
- CHARGE lamp
- Harness for open or short between combination meter and fuse
- Harness for open or short between combination meter and generator



## DIAGNOSTIC PROCEDURE 2

Check Battery Circuit

## 1. CHECK BATTERY CIRCUIT CONNECTION

Check to see if terminal 1 is clean and tight.

### OK or NG

OK >> GO TO 2.

NG >> Repair terminal 1 connection. Confirm repair by performing complete Starting/Charging system test. Refer to diagnostic station instruction manual.

## 2. CHECK BATTERY CIRCUIT

Check voltage between generator connector F2 terminal 1 and ground using a digital circuit tester.

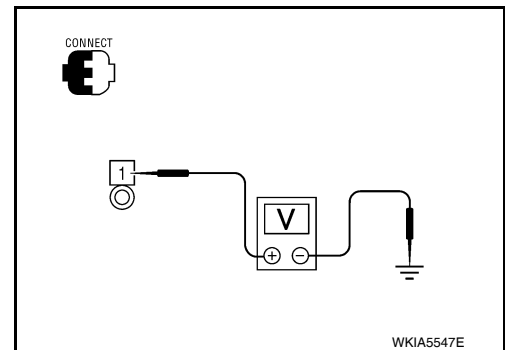
**Battery voltage should exist.**

### OK or NG

OK >> GO TO 3.

NG >> Check the following.

- 120A fusible link [letter a , located in fusible link box (battery)]
- Harness for open or short between generator and fusible link



## 3. CHECK VOLTAGE DROP ON BATTERY CIRCUIT

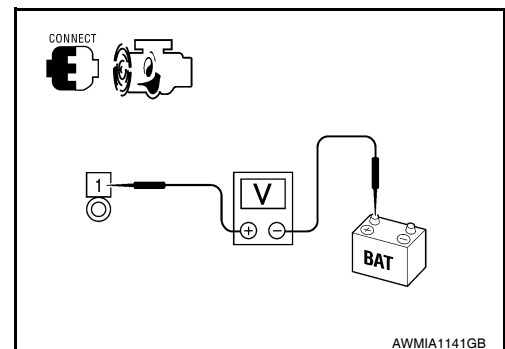
Check voltage between generator connector F2 terminal 1 and battery positive terminal using a digital circuit tester.

**With engine running : Less than 0.2V  
at idle and warm**

### OK or NG

OK >> Replace the generator. Refer to [SC-25. "Removal and Installation"](#) . Confirm repair by performing complete Starting/Charging system test. Refer to diagnostic station instruction manual.

NG >> Check harness between the battery and the generator for poor continuity.



## DIAGNOSTIC PROCEDURE 3

Check Voltage Regulator Circuit



# CHARGING SYSTEM

## < SERVICE INFORMATION >

### 1. CHECK VOLTAGE REGULATOR CIRCUIT CONNECTION

Check to see if terminal 3 is clean and tight.

#### OK or NG

OK >> GO TO 2.

NG >> Repair terminal 3 connection. Confirm repair by performing complete Starting/Charging system test. Refer to diagnostic station instruction manual.

### 2. CHECK VOLTAGE REGULATOR CIRCUIT

Check voltage between generator connector F1 terminal 3 and ground using a digital circuit tester.

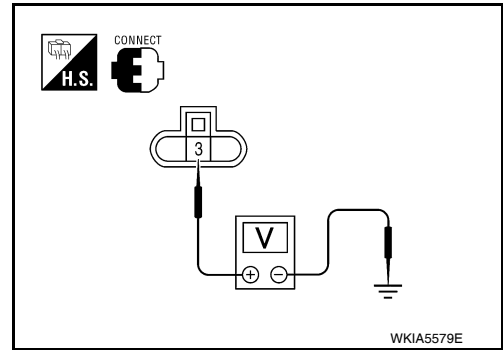
**Battery voltage should exist.**

#### OK or NG

OK >> GO TO 3.

NG >> Check the following.

- 10A fuse (No. 29, located in fuse and fusible link box)
- Harness for open or short between generator and fuse



WKIA5579E

### 3. CHECK VOLTAGE DROP ON VOLTAGE REGULATOR CIRCUIT

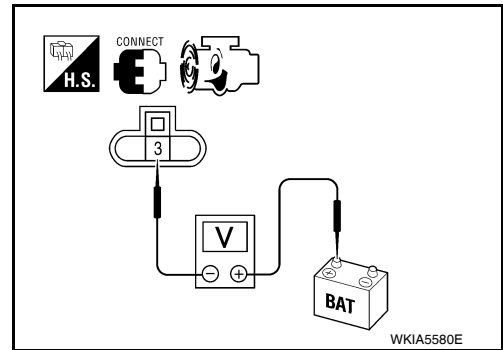
Check voltage between generator connector F1 terminal 3 and battery positive terminal using a digital circuit tester.

**With engine running : Less than 0.2V  
at idle and warm**

#### OK or NG

OK >> Replace the generator. Refer to [SC-25, "Removal and Installation"](#) . Confirm repair by performing complete Starting/Charging system test. Refer to diagnostic station instruction manual.

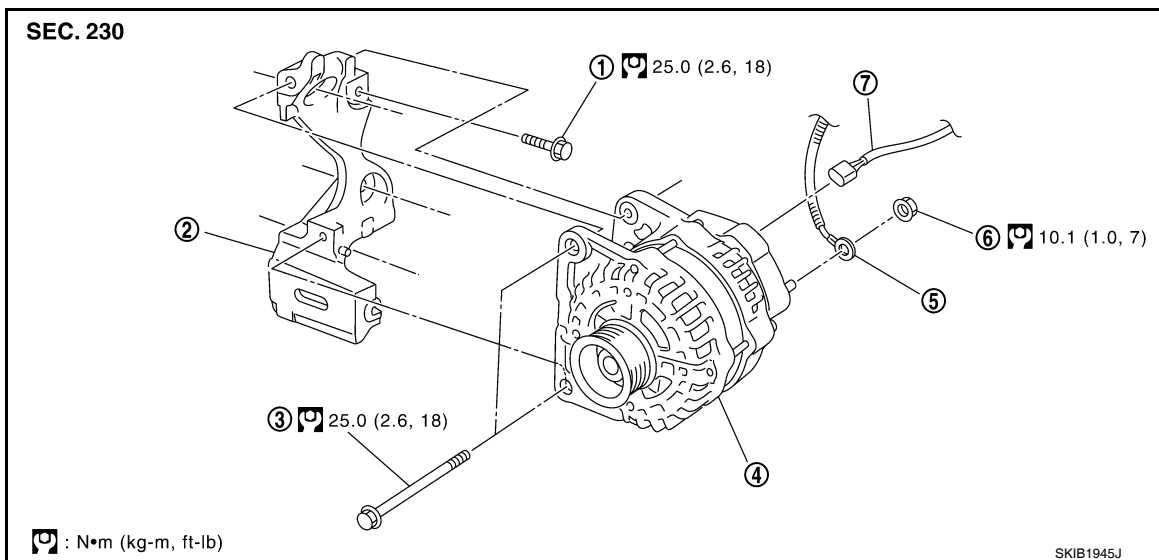
NG >> Check harness between the battery and the generator for poor continuity.



WKIA5580E

## Removal and Installation

INFOID:000000007329897



## CHARGING SYSTEM

### < SERVICE INFORMATION >

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- |                           |                                   |                     |
|---------------------------|-----------------------------------|---------------------|
| 1. Generator bracket bolt | 2. Generator bracket              | 3. Generator bolt   |
| 4. Generator              | 5. Generator "B" terminal harness | 6. "B" terminal nut |
| 7. Generator connector    |                                   |                     |

### REMOVAL

1. Disconnect the battery negative terminal. Refer to [SC-7, "Removal and Installation"](#).
2. Remove drive belt. Refer to [EM-13, "Removal and Installation"](#).
3. Remove radiator reservoir tank. Refer to [CO-15, "Removal and Installation"](#).
4. Disconnect generator connector.
5. Remove "B" terminal nut.
6. Remove generator bolts.
7. Remove generator assembly from the vehicle.

### GENERATOR PULLEY INSPECTION

- Check that the generator pulley does not rattle.
- Check that the generator pulley nut is properly tightened.

**Generator pulley nut : 118 N·m (12.0 kg-m, 87 ft-lb)**

### INSTALLATION

Installation is in the reverse order of removal.

#### **CAUTION:**

**Be sure to tighten "B" terminal nut carefully.**

# SERVICE DATA AND SPECIFICATIONS (SDS)

< SERVICE INFORMATION >

## SERVICE DATA AND SPECIFICATIONS (SDS)

### Battery

INFOID:000000007329898

Applied model	M/T and A/T	CVT
Type*	T4	Gr.51 R
20 hours rate capacity	12 V - 47 AH	12 V - 43 AH
Cold Cranking Amps (CCA) at -18°C (0°F)	470 amp	410 amp

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

### Starter

INFOID:000000007329899

Applied model	MR18DE	
Type*	S114-955	
	HITACHI	
	Reduction gear type	
System voltage	12 V	
No-load	Terminal voltage	11 V
	Current	Less than 110 A
	Revolution	More than 3,000 rpm

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

### Generator

INFOID:000000007329900

Applied model	MR18DE
Type*	A002TG1581AC
	MITSUBISHI
Nominal rating	12 V - 100 A
Ground polarity	Negative
Minimum revolution under no-load (when 13.5 V is applied)	Less than 1,000 rpm
Hot output current (when 13.5 V is applied)	More than 16 A/1,300 rpm More than 82 A/2,500 rpm More than 97 A/5,000 rpm
Regulated output voltage	14.1 - 14.7 V

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

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