SECTION SC
STARTING & CHARGING SYSTEM

CONTENTS

SERVICE INFORMATION

PRECAUTIONS

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

INFOID:0000000001851836

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:

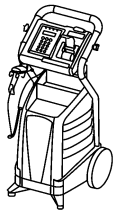
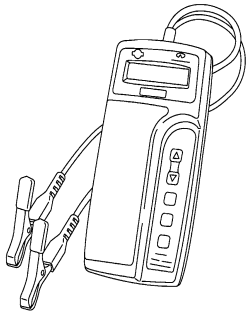
- **To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.**
- **Improper maintenance, including incorrect removal 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.**

PREPARATION

Special Service Tool

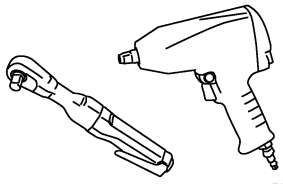
INFOID:0000000001851837

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
— (J-48087) Battery Service Center  WKIA5280E	Tests battery. For operating instructions, refer to Technical Service Bulletin and Battery Service Center User Guide.
— (J-44373) Model 620 Starting/Charging System Tester  SEL403X	Tests starting and charging systems. For operating instructions, refer to Technical Service Bulletin.

Commercial Service Tool

INFOID:0000000001851838

Tool name	Description
Power tool  PBIC0190E	Loosening bolts and nuts

BATTERY

How to Handle Battery

INFOID:0000000001851839

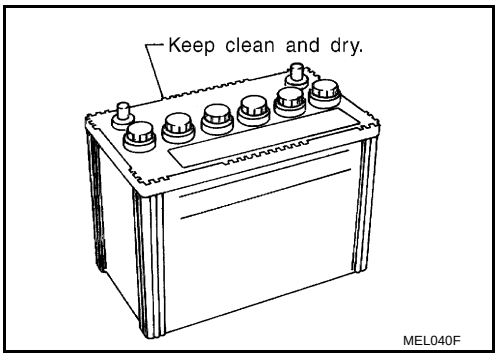
CAUTION:

- **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.**

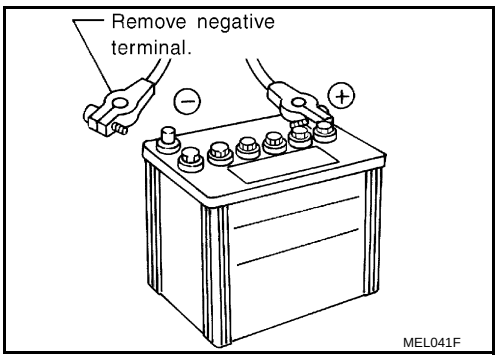
METHODS OF PREVENTING OVER-DISCHARGE

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

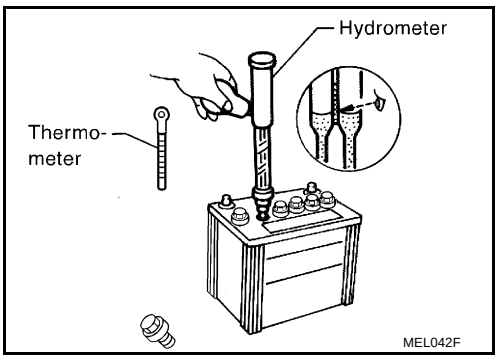
- The battery surface (particularly its top) should always be kept clean and dry.
- The terminal connections should be clean and tight.
- At every routine maintenance, check the electrolyte level.
  This also applies to batteries designated as “low maintenance” and “maintenance-free”.



- When the vehicle is not going to be used over a long period of time, disconnect the negative battery terminal.



- 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.

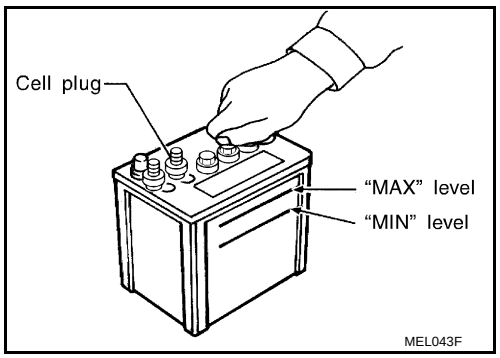


CHECKING ELECTROLYTE LEVEL

WARNING:

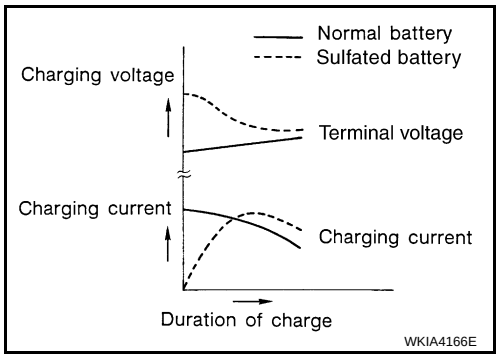
Do not allow battery fluid to come in contact with skin, eyes, fabrics, or painted surfaces. After touching a battery, do not touch or rub your eyes until you have thoroughly washed your hands. If acid contacts eyes, skin or clothing, immediately flush with water for 15 minutes and seek medical attention.

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



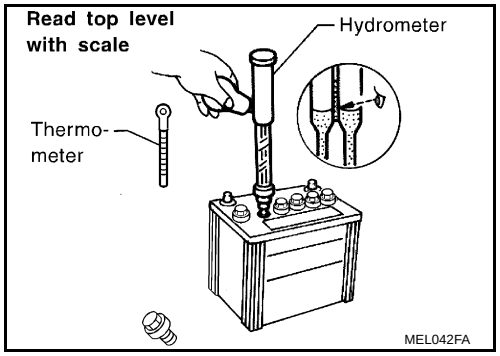
Sulfation

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. Less current and higher voltage are observed in the initial stage of charging sulfated batteries, as shown.
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

1. Read hydrometer and thermometer indications at eye level.
2. Use the following chart 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
4 (40)	–0.016
–1 (30)	–0.020

Battery electrolyte temperature °C (°F)	Add to specific gravity reading
–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:

- **Do not "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. Do not 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

Amps	Time
50	1 hour
25	2 hours
10	5 hours
5	10 hours

Do not charge at more than 50 ampere rate.

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.

Trouble Diagnosis with Battery Service Center

INFOID:0000000001851840

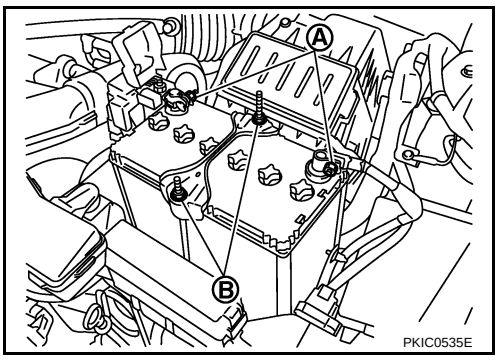
For battery testing, use Battery Service Center (J-48087). For details and operating instructions, refer to Technical Service Bulletin and/or Battery Service Center User Guide.

Removal and Installation MR20DE

INFOID:0000000001851841

REMOVAL MR20DE

1. Loosen battery terminal nuts (A), and disconnect both negative and positive battery cables from battery terminals.
   CAUTION:
   When disconnecting, disconnect the battery cable from the negative terminal first.
2. Remove battery frame nuts (B) and battery frame.
3. Remove battery shield.
4. Remove battery.



INSTALLATION

Installation is in the reverse order of removal.

CAUTION:

When connecting, connect the battery cable to the positive terminal first.

Battery frame nuts : 3.9 N·m (0.55 kg-m, 48 in-lb)

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

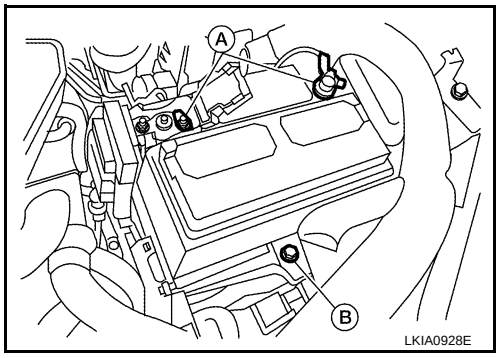
Reset electronic systems as necessary. Refer to SC-7, "Required Procedures After Battery Disconnection".

Removal and Installation QR25DE

INFOID:0000000001851842

REMOVAL

1. Loosen battery terminal nuts (A), and disconnect both negative and positive battery cables from battery terminals.
   CAUTION:
   When disconnecting, disconnect the battery cable from the negative terminal first.
2. Remove battery hold-down wedge bolt (B) and battery wedge bracket.
3. Remove battery.



INSTALLATION

Installation is in the reverse order of removal.

CAUTION:

When connecting, connect the battery cable to the positive terminal first.

Battery wedge bracket bolt : 30 N·m (3.1 kg-m, 22 ft-lb)

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

Reset electronic systems as necessary. Refer to SC-7, "Required Procedures After Battery Disconnection".

Required Procedures After Battery Disconnection

INFOID:0000000003038207

SYSTEM	ITEM	Reference
Engine Control	Accelerator Pedal Released Position Learning	EC-81 (MR20DE) or EC-590 (QR25DE)
	Throttle Valve Closed Position Learning	EC-81 (MR20DE) or EC-590 (QR25DE)
	Idle Air Volume Learning	EC-81 (MR20DE) or EC-590 (QR25DE)
Glasses, Window & Mirrors	Power Window System Initialization	GW-75
Roof	Sunroof Memory Reset/Initialization	RF-10
Audio-visual System	Audio (Radio Preset)	—

STARTING SYSTEM

System Description

INFOID:0000000001851843

M/T Models with MR20DE

Power is supplied at all times
- through 225A fusible link [letter **a**, located in the fusible link box (battery) or
- to starter motor terminal B and
- through 40A fusible link (letter **m**, 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. 12, located in the fuse block (J/B)]
- to the clutch interlock switch terminal 2.

With the clutch pedal depressed, power is supplied
- through the clutch interlock switch terminal 1
- to IPDM E/R terminal 35.

Ground is supplied at all times
- to IPDM E/R terminals 39 and 59
- through body grounds E9, 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.

M/T Models with QR25DE

Power is supplied at all times
- through fusible link box (battery)
- to starter motor terminal B and
- through 40A fusible link (letter **m**, 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. 12, located in the fuse block (J/B)]
- to clutch interlock switch terminal 2.

With the clutch pedal depressed, power is supplied
- through clutch interlock switch terminal 1
- to IPDM E/R terminal 35.

Ground is supplied at all times
- to IPDM E/R terminals 39 and 59
- through body grounds E9 and E15.

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 with MR20DE

Power is supplied at all times
- through 225A fusible link [letter **a**, located in the fusible link box (battery)]
- to starter motor terminal B, and
- through 40A fusible link (letter **m**, 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. 12, located in the fuse block (J/B)]
• to park/neutral position (PNP) switch terminal 7.
With the selector lever in the P or N position, power is supplied
• through PNP switch terminal 6
• to IPDM E/R terminal 35.
Ground is supplied at all times
• to IPDM E/R terminals 39 and 59
• through body grounds E9, 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 with QR25DE

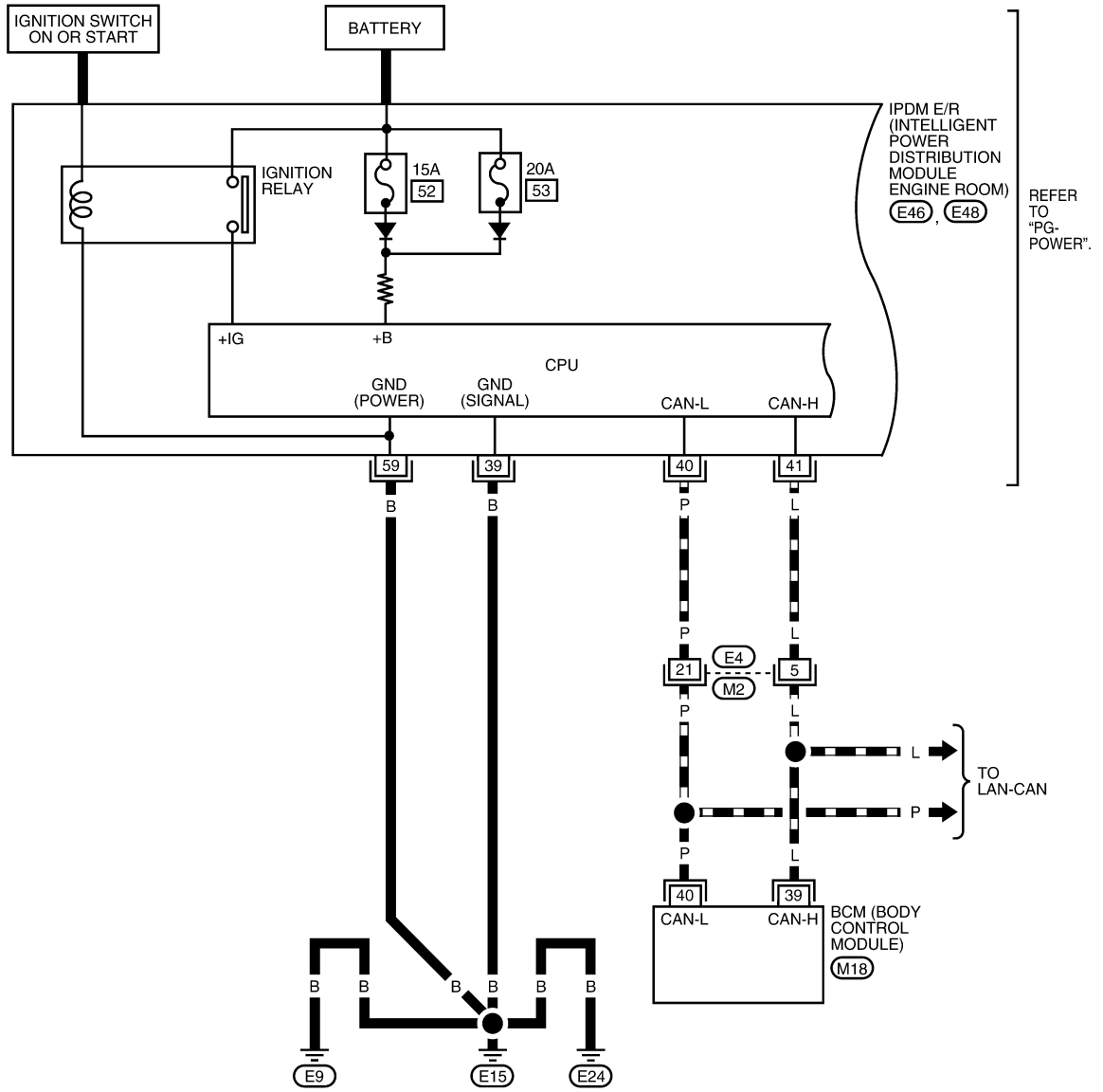
Power is supplied at all times
• through fusible link box (battery)
• to starter motor terminal B, and
• through 40A fusible link (letter **m**, located in the fuse and fusible link box)
• to ignition switch terminal B.
With the ignition switch in the START position, power is supplied
• from ignition 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. 12, located in the fuse block (J/B)]
• to park/neutral position (PNP) switch terminal 7.
With the selector lever in the P or N position, power is supplied
• through PNP switch terminal 6
• to IPDM E/R terminal 35.
Ground is supplied at all times
• to IPDM E/R terminals 39 and 59
• through body grounds E9 and E15.
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.

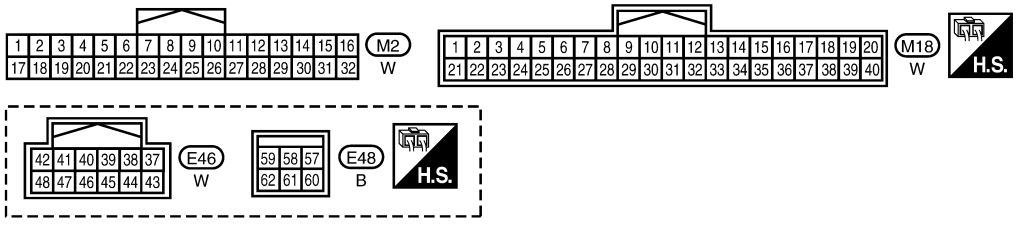
Wiring Diagram - START -

INFOID:0000000001851844

M/T Models - MR20DE

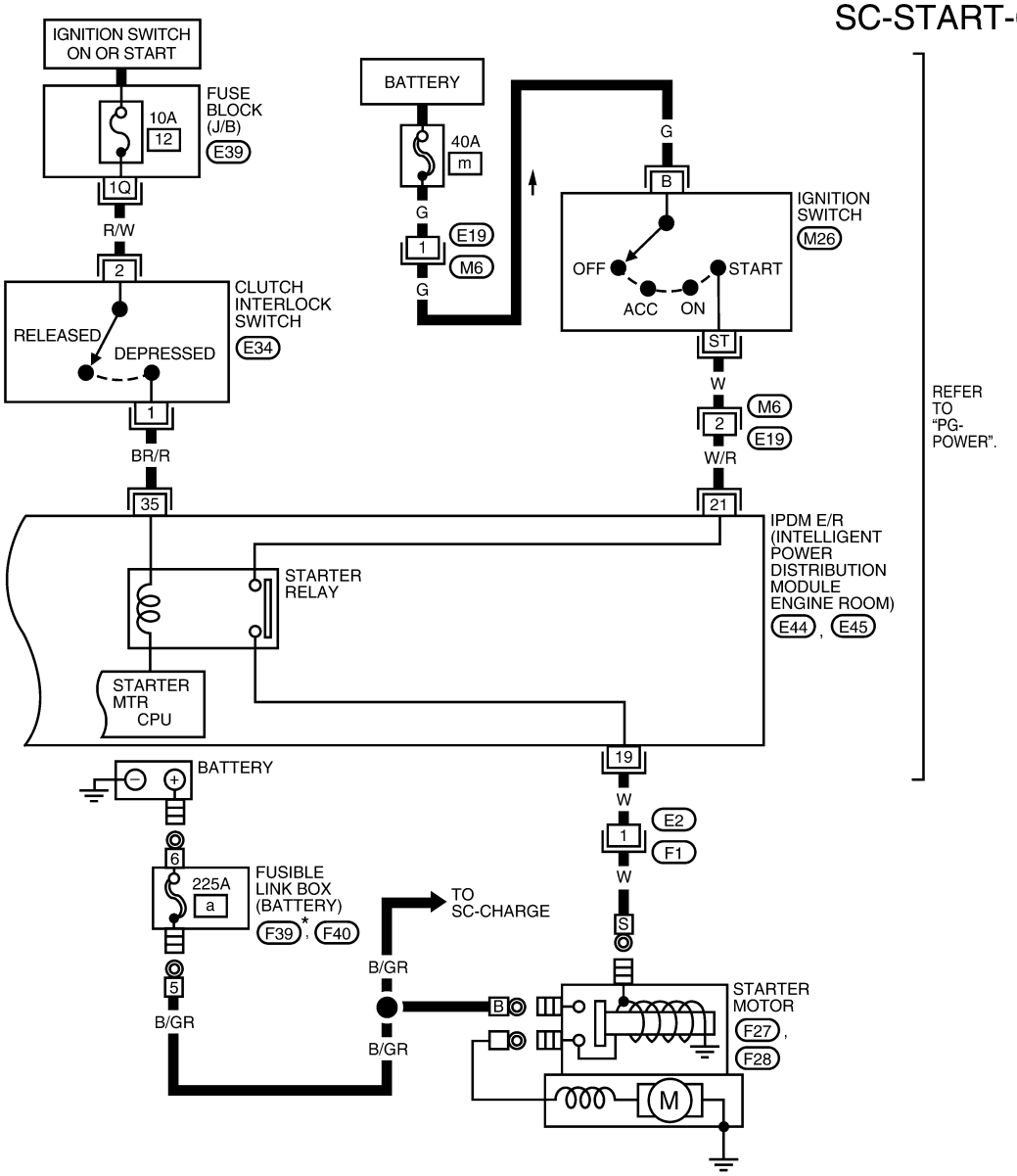
SC-START-01

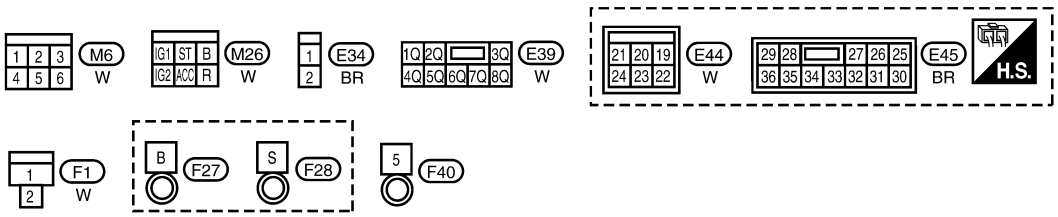




WKWA5772E

SC-START-02

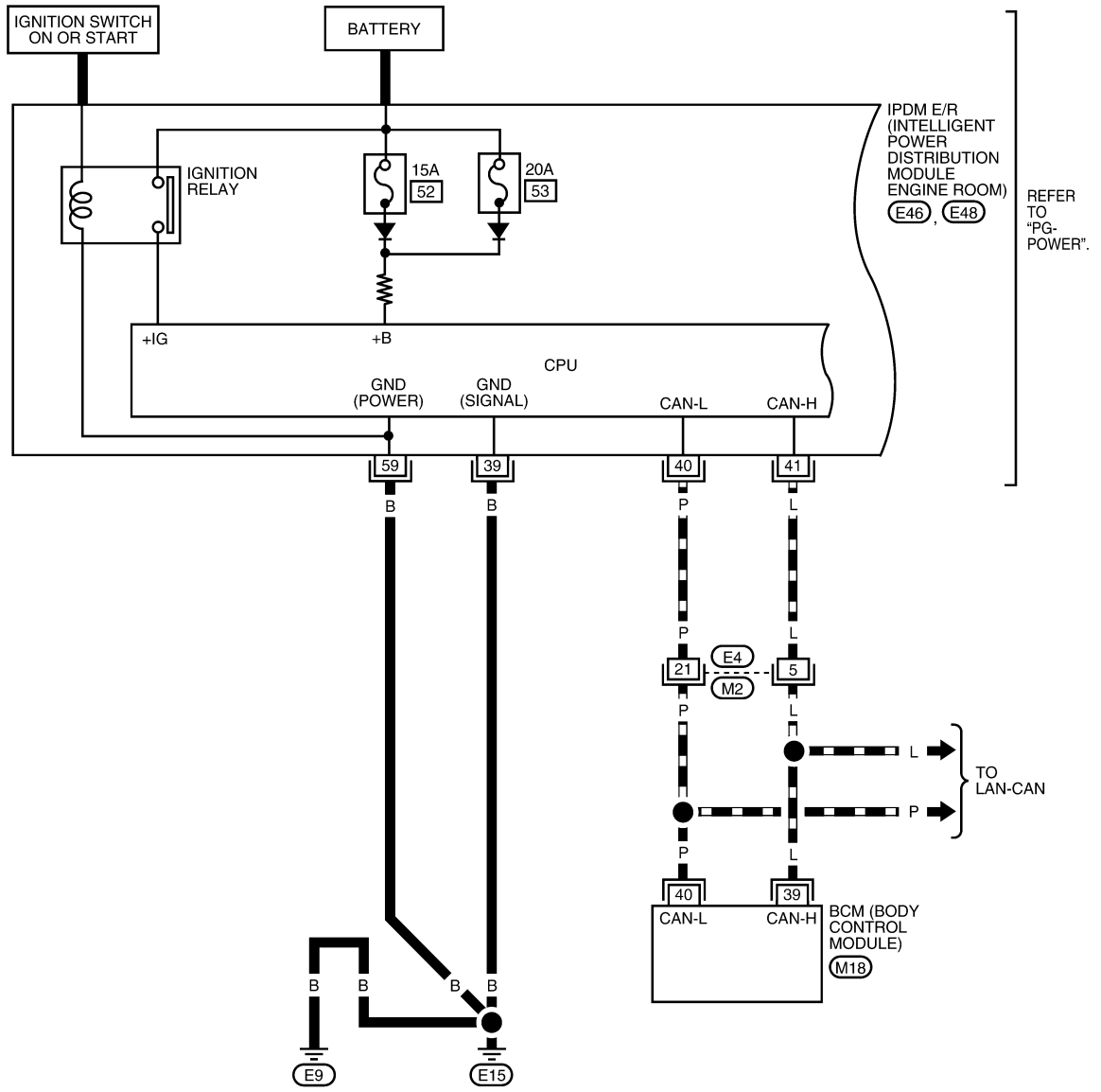


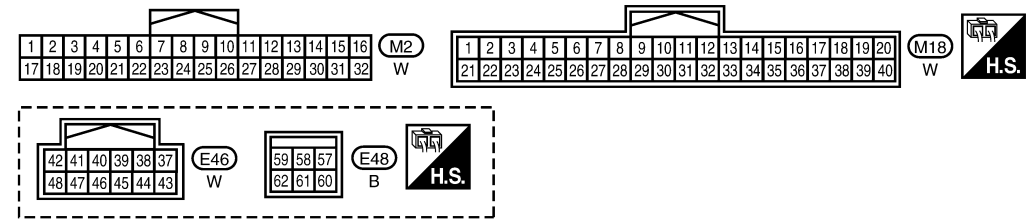


* : F39 IS AN INTEGRAL PART OF FUSIBLE LINK BOX (BATTERY) ASSEMBLY

BKWA0739E

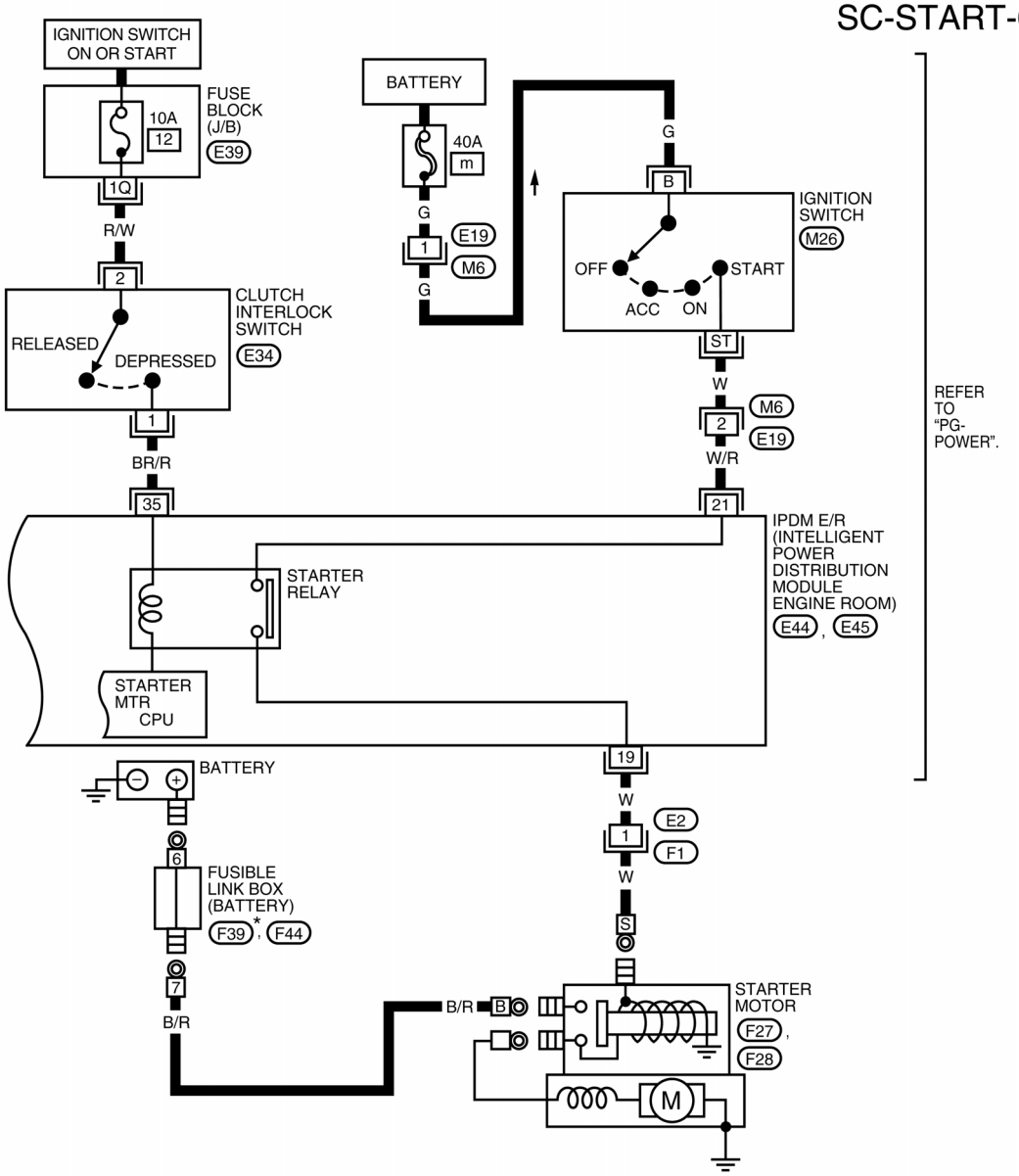
SC-START-03

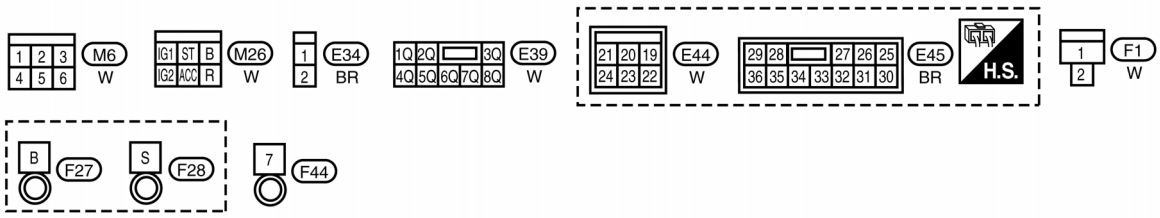




WKWA5773E

SC-START-04

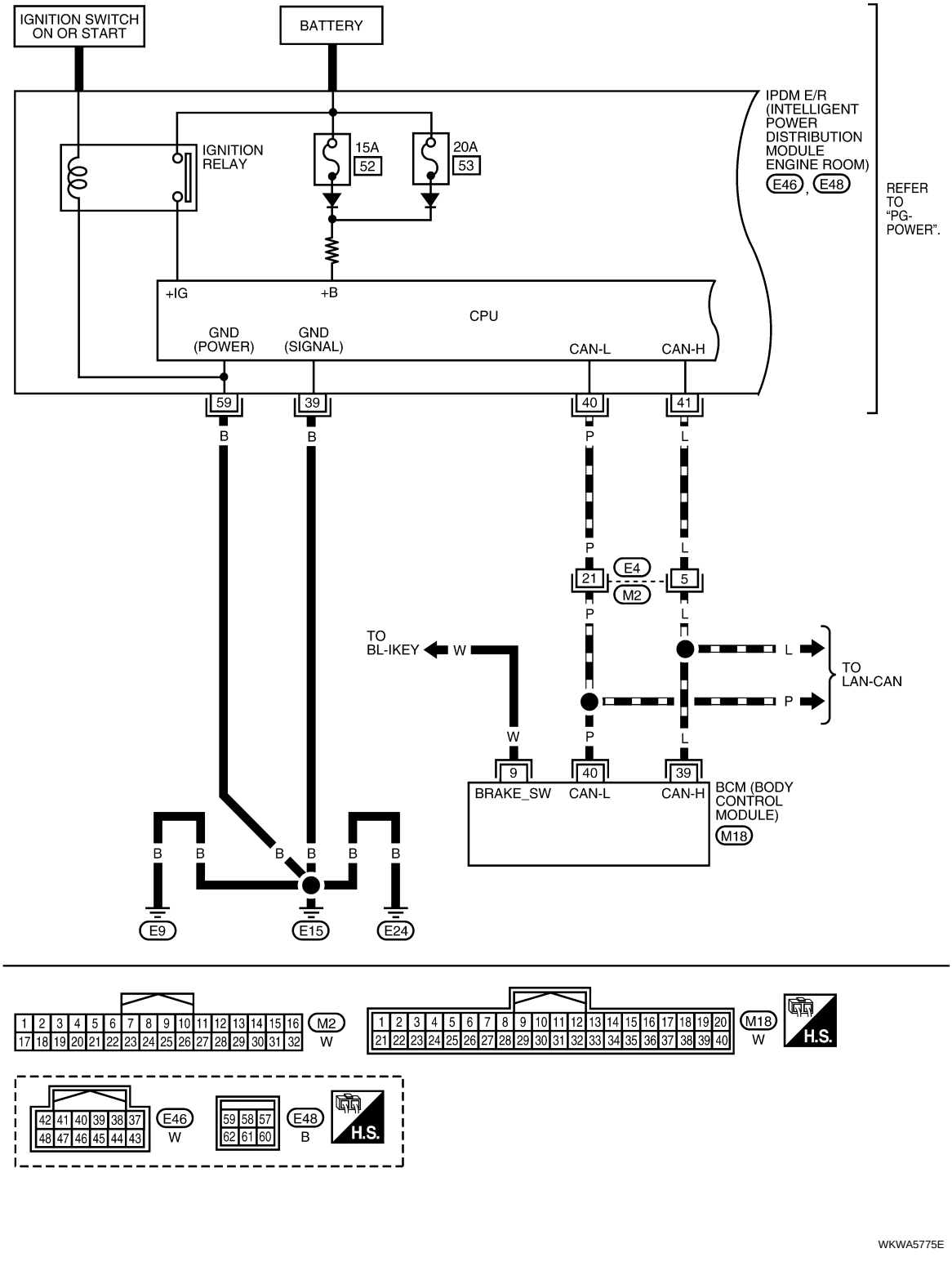




★ : F39 IS AN INTEGRAL PART OF FUSIBLE LINK BOX (BATTERY) ASSEMBLY

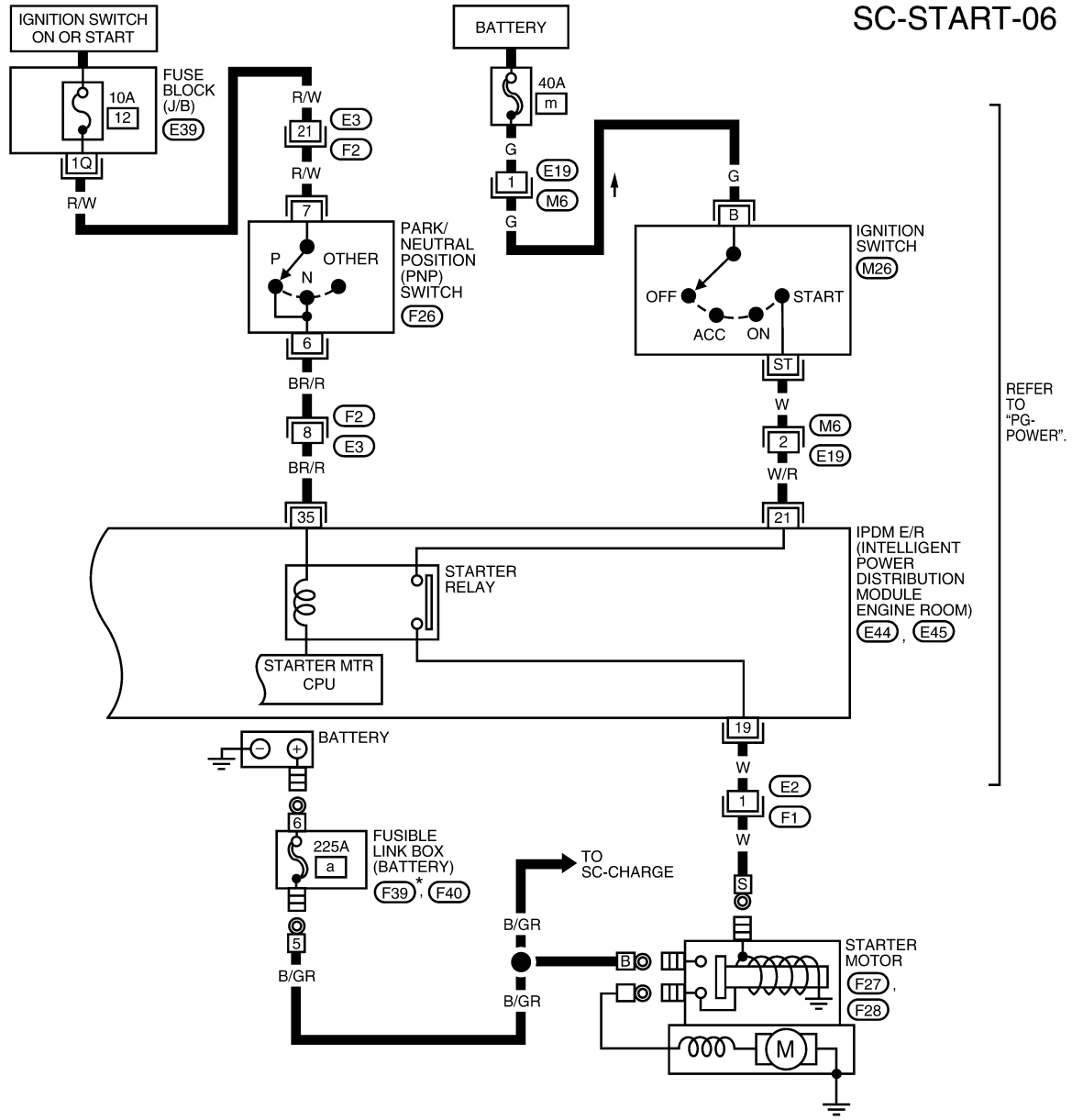
WKWA5774E

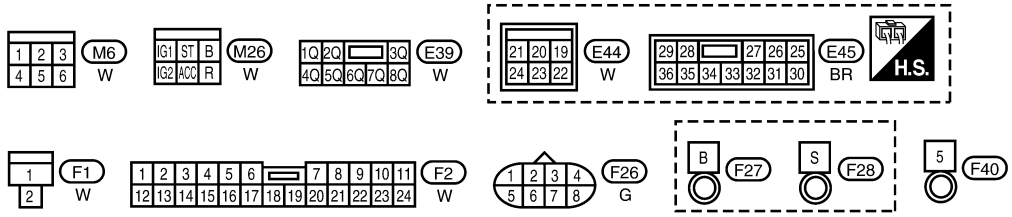
SC-START-05



WKWA5775E

SC-START-06

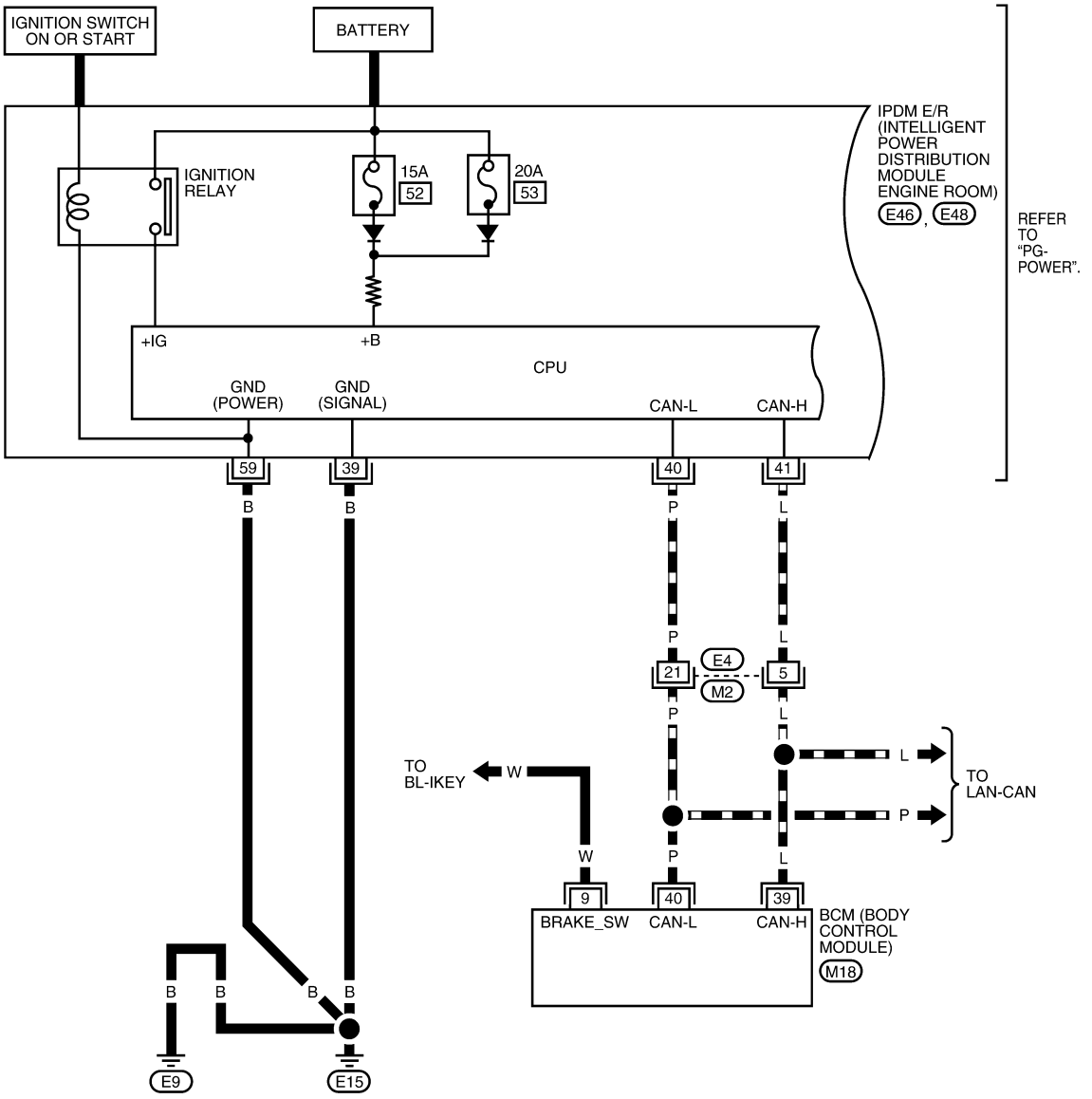


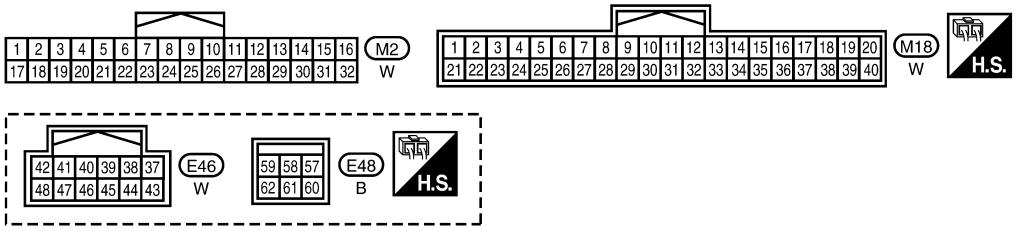


* : F39 IS AN INTEGRAL PART OF FUSIBLE LINK BOX (BATTERY) ASSEMBLY

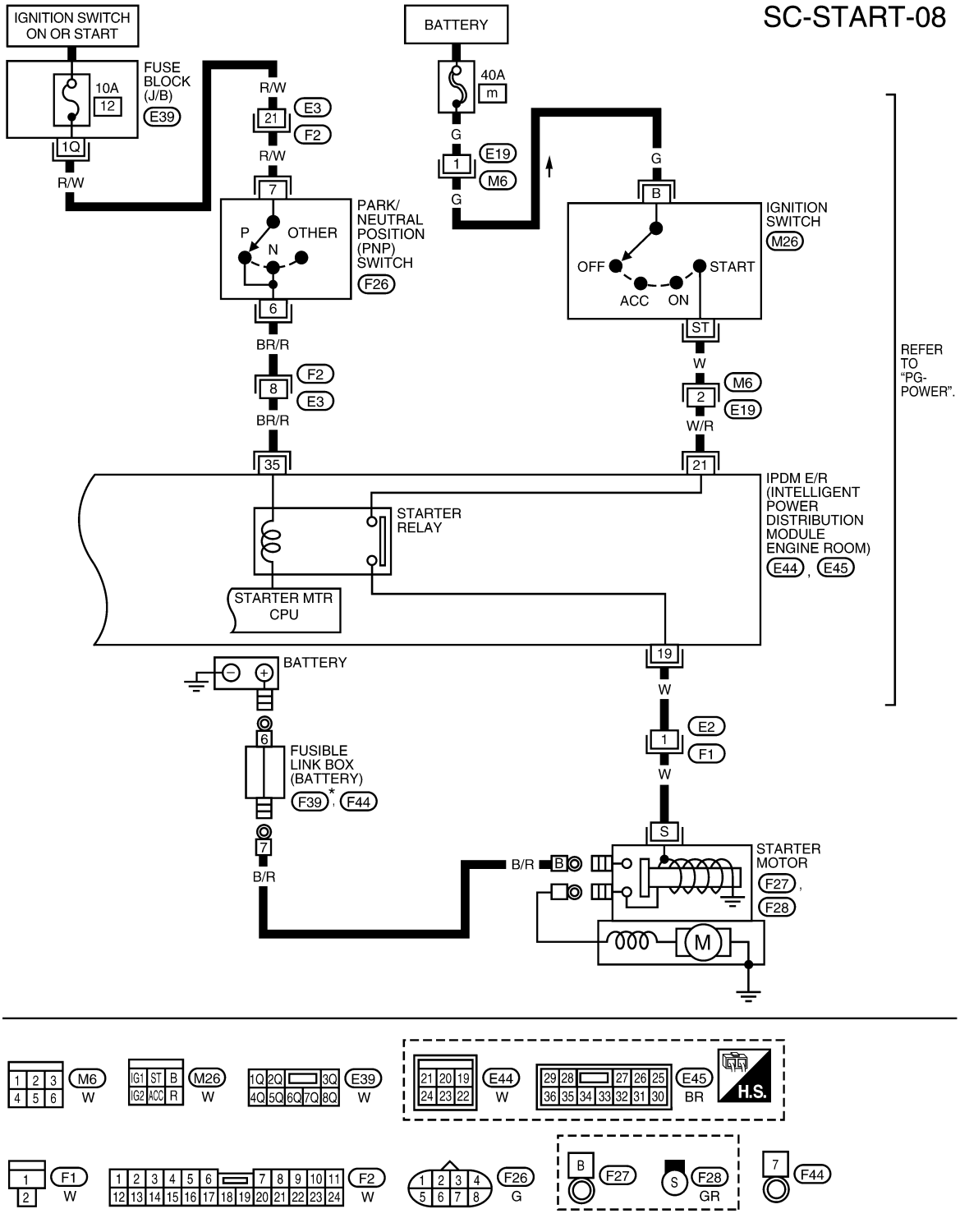
WKWA5776E

SC-START-07





WKWA5777E



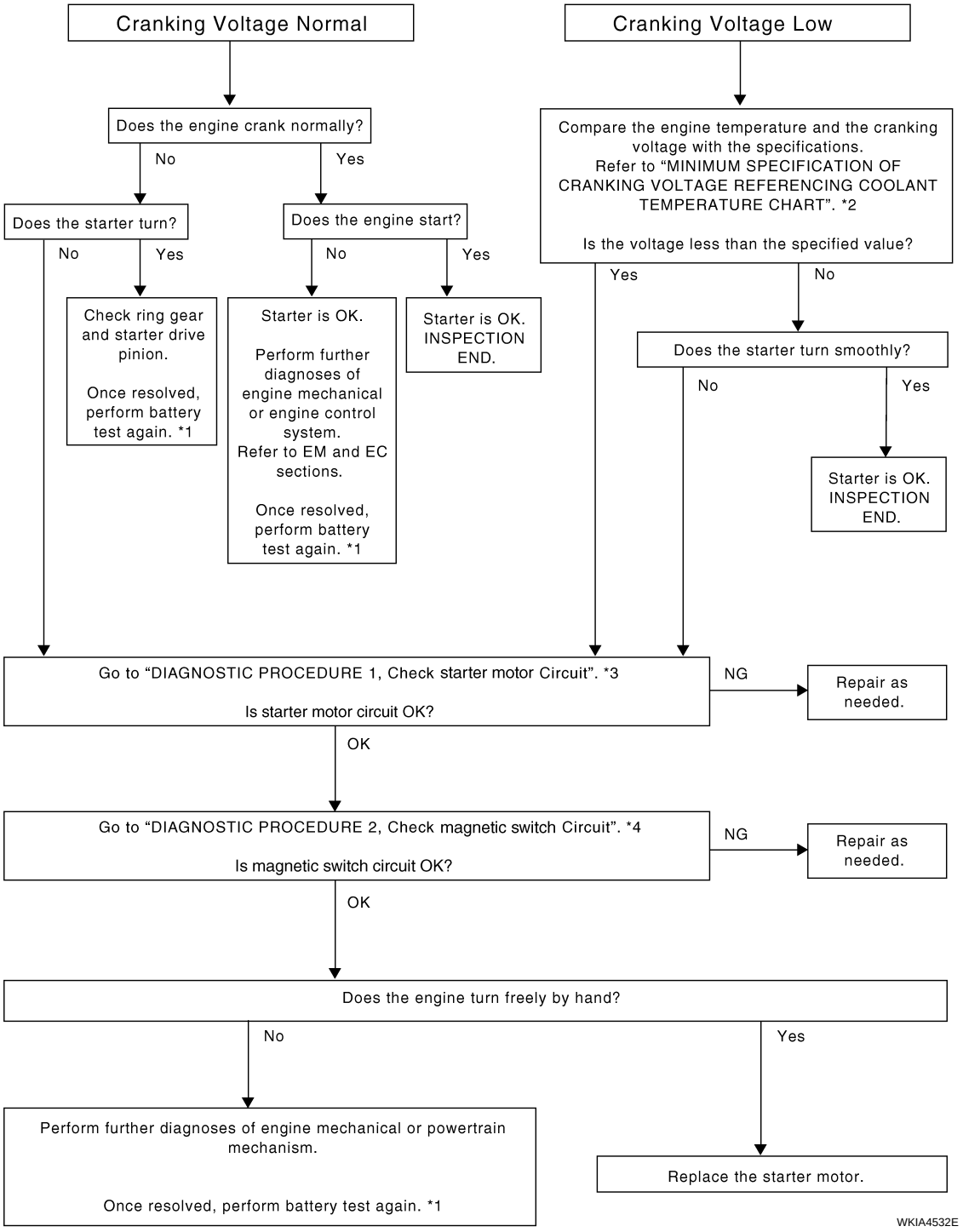
* : F39 IS AN INTEGRAL PART OF FUSIBLE LINK BOX (BATTERY) ASSEMBLY

AWBWA0066GI

Trouble Diagnosis with Starting/Charging System Tester (Starting)

INFOID:0000000001851845

For starting system testing, use Starting/Charging System Tester (J-44373). For details and operating instructions, refer to Technical Service Bulletin.



*1 For battery testing, use Battery Service Center (J-48087).
For details and operating instructions, refer to Technical Service Bulletin and/or Battery Service Center User Guide.

*2 "MINIMUM SPECIFICATION OF CRANKING VOLTAGE REFERENCING COOLANT TEMPERATURE"

*3 "Check Starter Motor Circuit"

*4 "Check Magnetic Switch Circuit"

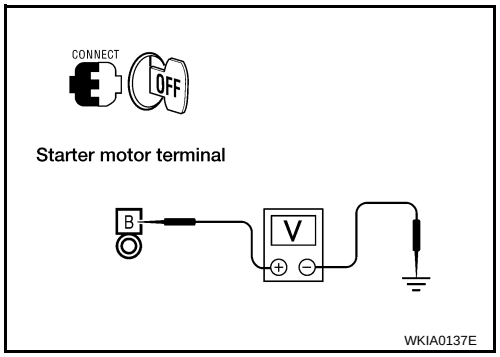
DIAGNOSTIC PROCEDURE 1

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

Battery voltage should exist



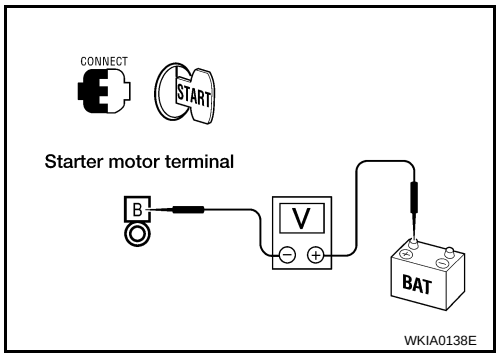
OK or NG

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



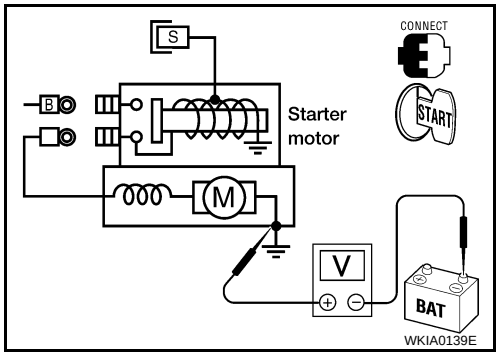
OK or NG

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 "Trouble Diagnoses with Starting/ Charging System Tester (Starting)".
NG >> Check harness between the starter motor case and ground for poor continuity.

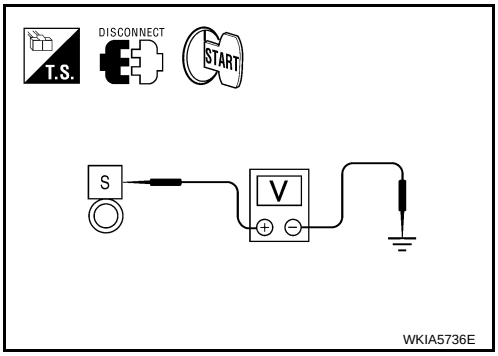
DIAGNOSTIC PROCEDURE 2

Check Magnetic Switch Circuit

1.CHECK POWER SUPPLY TO MAGNETIC SWITCH

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. Disconnect starter motor connector F28.

5. Check voltage between starter motor connector F28 terminal S and ground using a digital circuit tester.



Ignition switch in START : Battery voltage

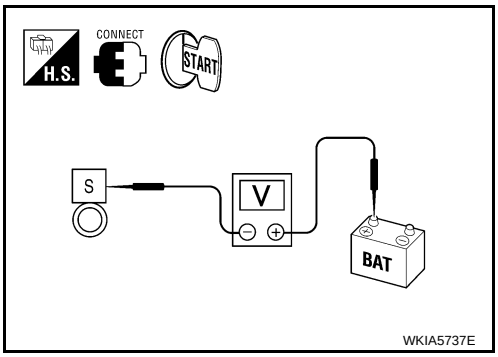
OK or NG

OK >> GO TO 2.

NG >> Check the following:
- 40A fusible link (letter **m**, located in the fuse and fusible link box)
- 10A fuse [No. 12, located in the fuse block (J/B)]
- 15A fuse (No. 52, located in the IPDM E/R)
- 20A fuse (No. 53, located in the IPDM E/R)
- PNP switch (CVT models) or clutch interlock switch (M/T models)
- 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 "Trouble Diagnoses with Starting/ Charging System Tester (Starting)".

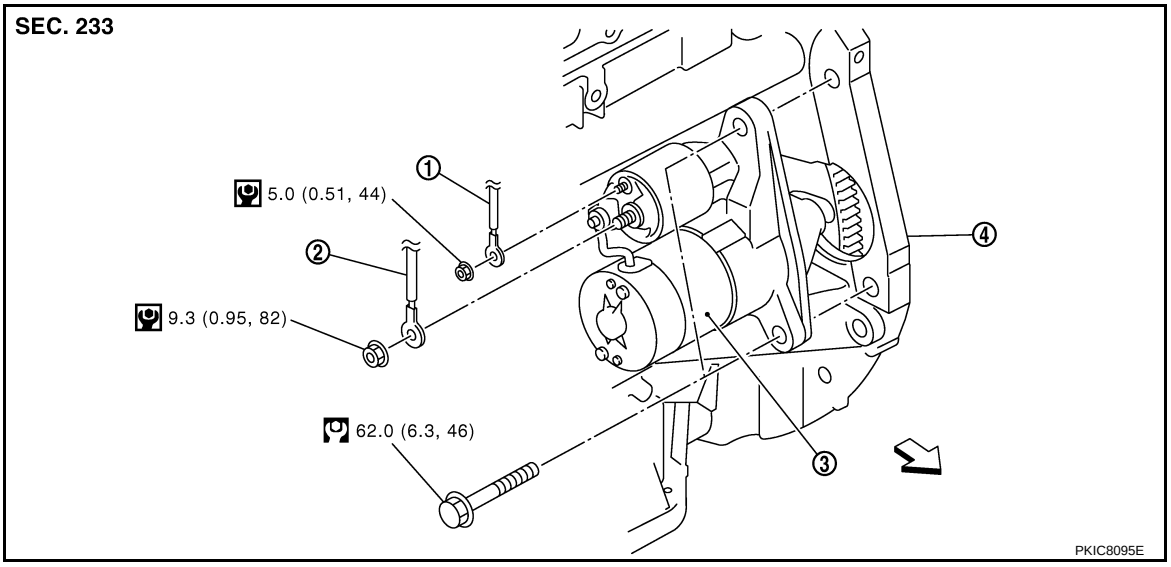
NG >> Check harness, components and connections between the battery and the magnetic switch for poor continuity.

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 MR20DE

INFOID:0000000001851846



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

⇦ Engine front

REMOVAL

1. Disconnect the battery negative terminal.
2. Remove air duct (inlet). Refer to EM-16.
3. Remove "S" terminal nut.
4. Remove “B” terminal nut.
5. Remove starter motor bolts.
6. Remove starter motor.

INSTALLATION

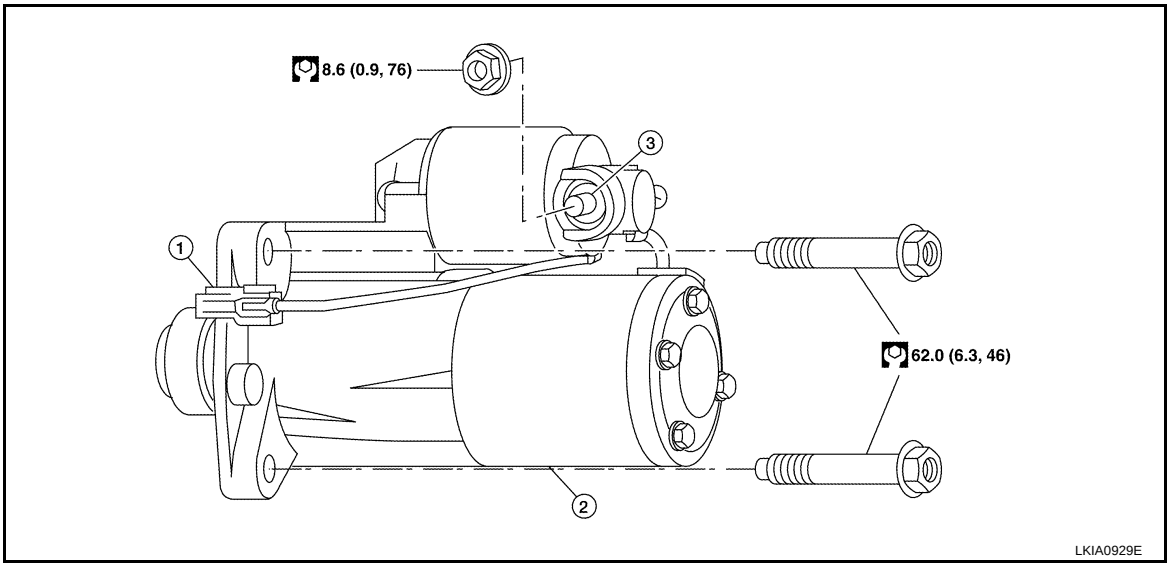
Installation is in the reverse order of removal.

CAUTION:

Be sure to tighten “B” terminal nut carefully.

Removal and Installation QR25DE

INFOID:0000000001851847



1. "S" terminal harness
2. Starter motor
3. "B" terminal

REMOVAL

1. Disconnect the battery negative terminal.
2. Raise vehicle.
3. Remove “S” terminal connector.
4. Remove “B” terminal nut.
5. Remove starter motor bolts.
6. Remove starter motor.

INSTALLATION

Installation is in the reverse order of removal.

CAUTION:

Be sure to tighten “B” terminal nut carefully.

CHARGING SYSTEM

System Description

INFOID:0000000001851848

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. 26, located in the fuse block (J/B)].

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 225A fusible link [letter **a**, located in the fusible link box (battery)].
Ground is supplied
- to generator terminal 5
- through body ground F5 (MR20DE)
- through body ground E62 (QR25DE) 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. 14, located in the fuse block (J/B)]
- to combination meter terminal 2 for the charge warning lamp.

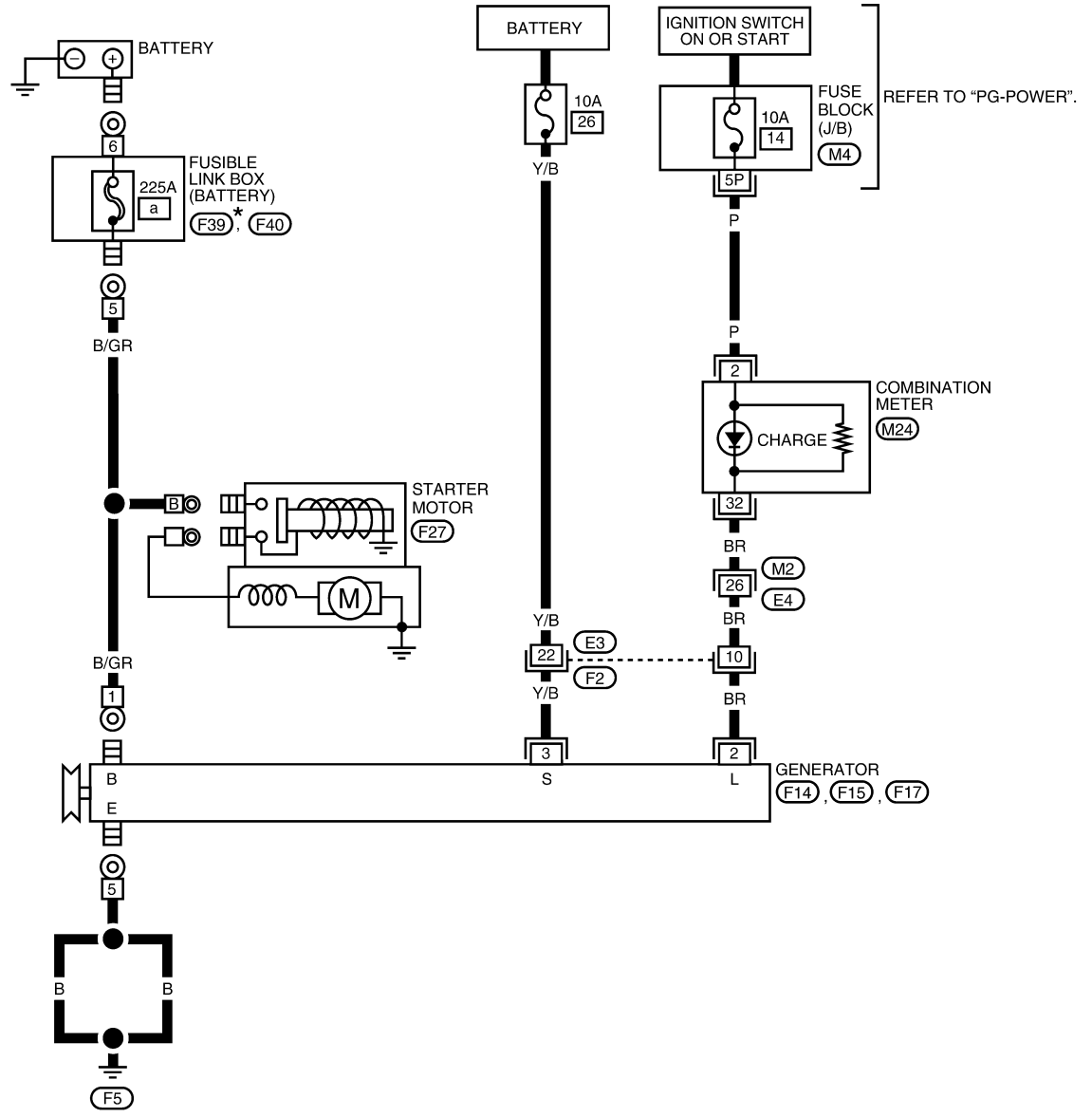
The IC regulator controls ground to terminal 32 of the combination meter through terminal 2 of the generator. When the ignition is turned on and power becomes available at terminal 2, this "wakes up" the regulator. The regulator monitors charge output and grounds terminal 2 or leaves it open depending 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.

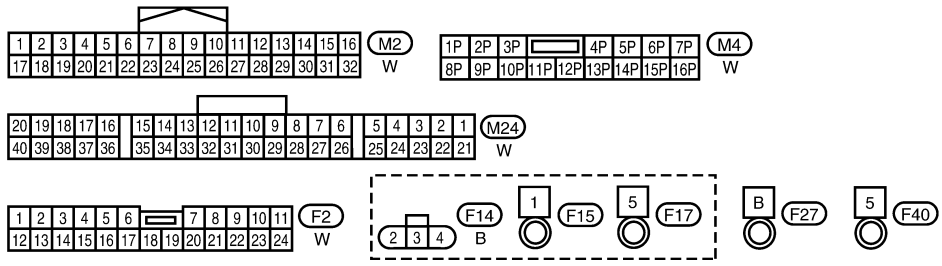
Wiring Diagram - CHARGE -

INFOID:0000000001851849

MR20DE

SC-CHARGE-01

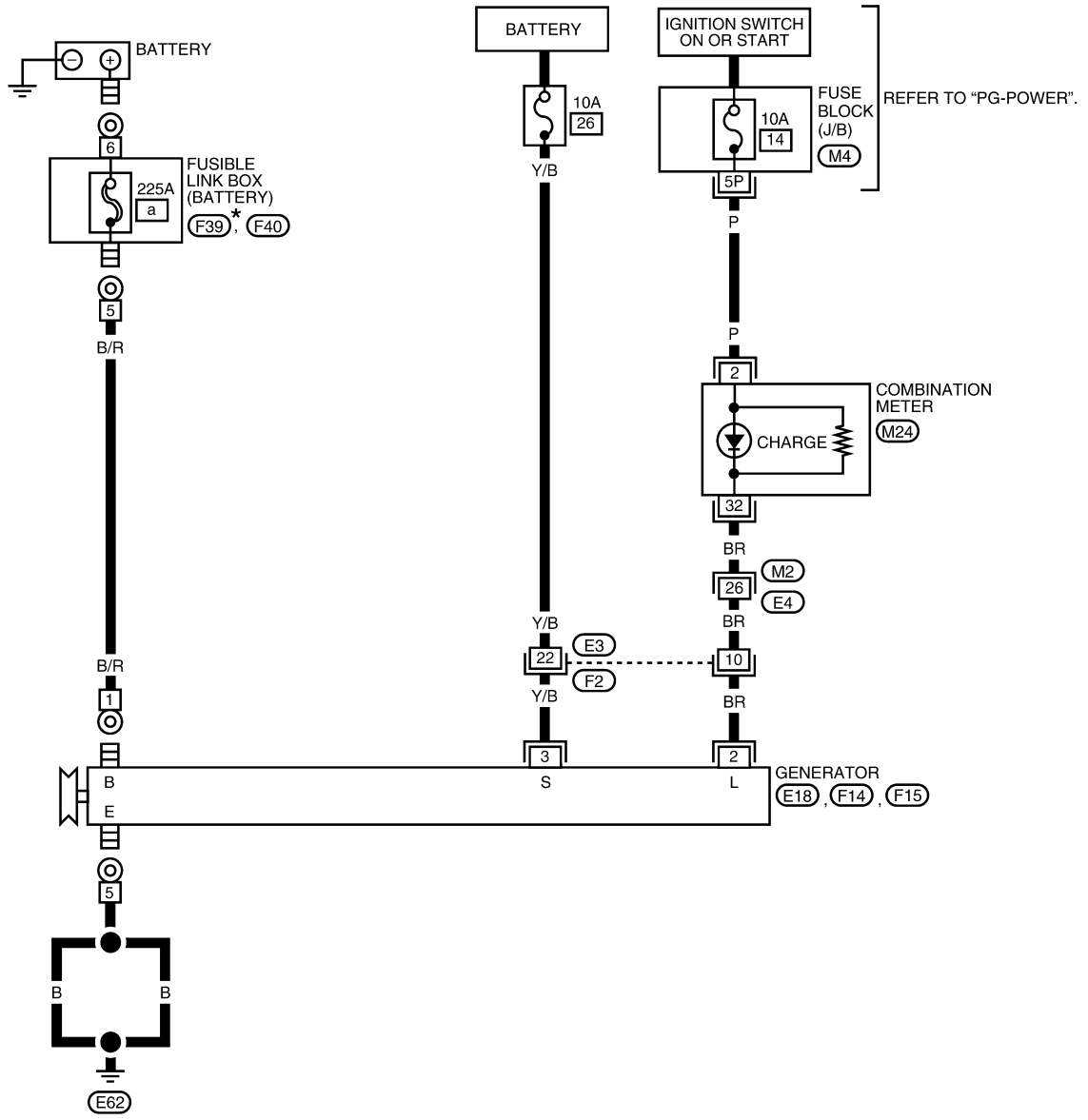


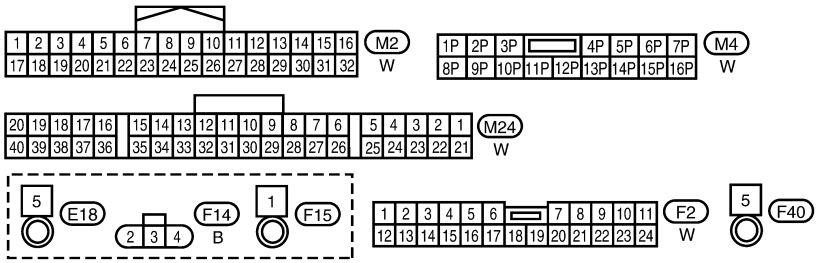


*: F39 IS AN INTEGRAL PART OF FUSIBLE LINK BOX (BATTERY) ASSEMBLY

WKWA5779E

SC-CHARGE-02





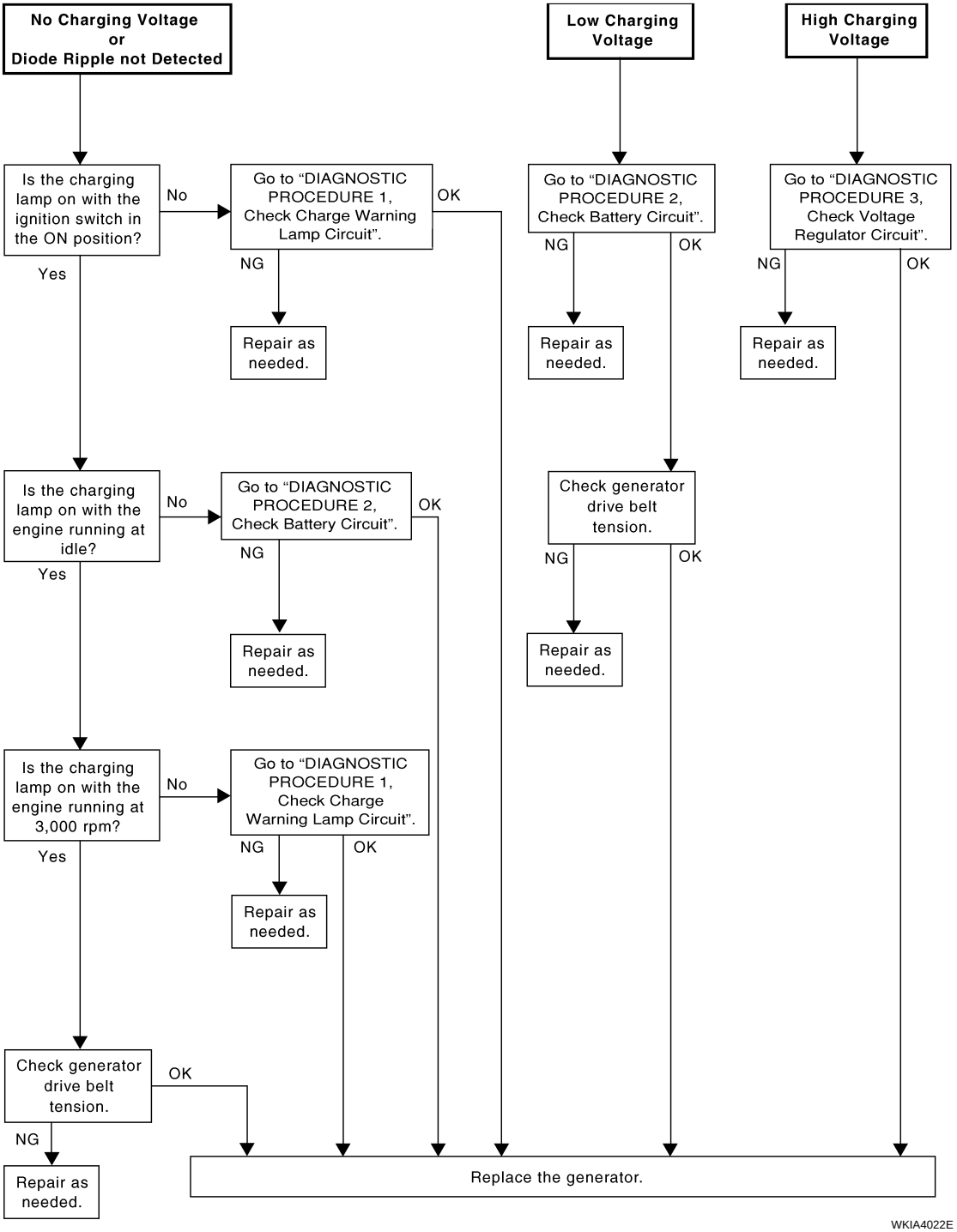
*: F39 IS AN INTEGRAL PART OF FUSIBLE LINK BOX (BATTERY) ASSEMBLY

WKWA5780E

Trouble Diagnosis with Starting/Charging System Tester (Charging)

INFOID:0000000001851850

For charging system testing, use Starting/Charging System Tester (J-44373). For details and operating instructions, refer to Technical Service Bulletin.



DIAGNOSTIC PROCEDURE 1

Check Charge Warning Lamp Circuit

1. CHECK CHARGE WARNING LAMP CIRCUIT CONNECTION

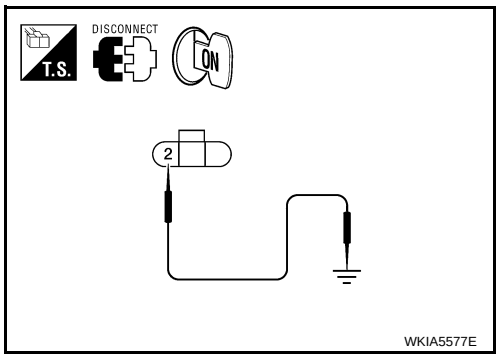
Check to see if terminal 2 is clean and tight.

OK or NG

OK >> GO TO 2.
NG >> Repair terminal 2 connection. Confirm repair by performing complete Starting/Charging system test. Refer to Technical Service Bulletin.

2.CHECK CHARGE WARNING LAMP CIRCUIT

1. Disconnect generator connector F14.
2. Apply ground to generator connector F14 terminal 2 with the ignition switch in the ON position.



CHARGE lamp should light up.

OK or NG

OK >> GO TO "Trouble Diagnoses with Starting/Charging System Tester (Charging)".
NG >> Check the following.
- 10A fuse [No. 14, 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

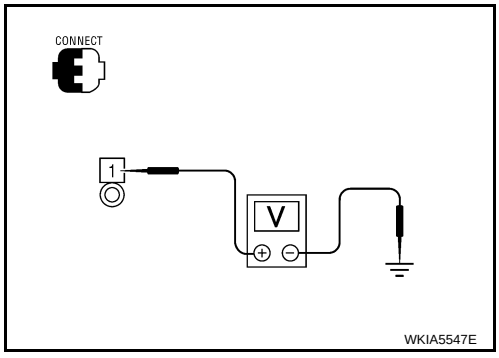
Check to see if connector F15 terminal 1 is clean and tight.

OK or NG

OK >> GO TO 2.
NG >> Repair connector F15 terminal 1 connection. Confirm repair by performing complete Starting/Charging system test. Refer to Technical Service Bulletin.

2.CHECK BATTERY CIRCUIT

Check voltage between generator connector F15 terminal 1 and ground using a digital circuit tester.



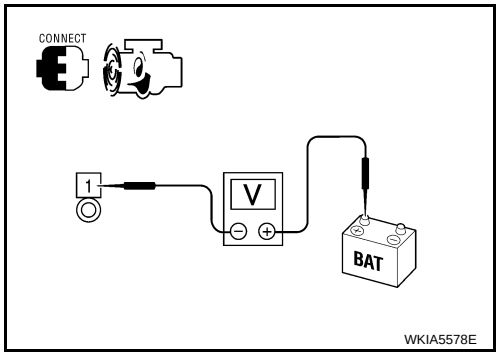
Battery voltage should exist.

OK or NG

OK >> GO TO 3.
NG >> Check the following.
- 225A 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 F15 terminal 1 and battery positive terminal using a digital circuit tester.



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

OK or NG

OK >> Replace the generator. Refer to SC-29, "Removal and Installation MR20DE". Confirm repair by performing complete Starting/Charging system test. Refer to Technical Service Bulletin.
NG >> Check harness between the battery and the generator for poor continuity.

DIAGNOSTIC PROCEDURE 3

Check Voltage Regulator Circuit

1.CHECK VOLTAGE REGULATOR CIRCUIT CONNECTION

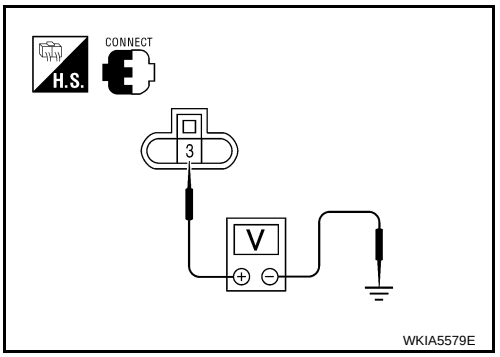
Check to see if connector F14 terminal 3 is clean and tight.

OK or NG

OK >> GO TO 2.
NG >> Repair connector F14 terminal 3 connection. Confirm repair by performing complete Starting/Charging system test. Refer to Technical Service Bulletin.

2.CHECK VOLTAGE REGULATOR CIRCUIT

Check voltage between generator connector F14 terminal 3 and ground using a digital circuit tester.



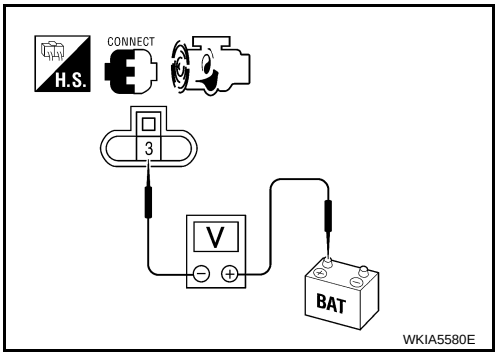
Battery voltage should exist.

OK or NG

OK >> GO TO 3.
NG >> Check the following.
- 10A fuse [No. 26, located in fuse block (J/B)]
- Harness for open or short between generator and fuse

3.CHECK VOLTAGE DROP ON VOLTAGE REGULATOR CIRCUIT

Check voltage between generator connector F14 terminal 3 and battery positive terminal using a digital circuit tester.



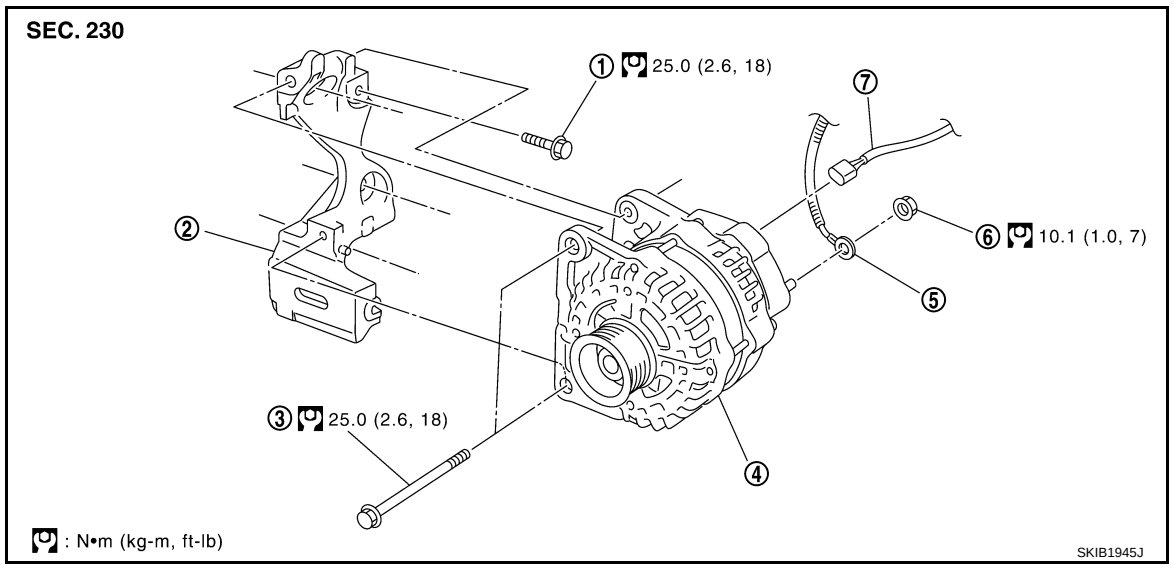
With engine running at idle and warm : Less than 0.2V

OK or NG

OK >> Replace the generator. Refer to SC-29, "Removal and Installation MR20DE". Confirm repair by performing complete Starting/Charging system test. Refer to Technical Service Bulletin.
NG >> Check harness between the battery and the generator for poor continuity.

Removal and Installation MR20DE

INFOID:0000000001851851



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 cable from the negative terminal.
2. Remove drive belt. Refer to EM-13, "Removal and Installation".
3. Disconnect generator connector.
4. Remove “B” terminal nut.
5. Remove generator bolts.
6. Remove generator assembly from the vehicle.

INSTALLATION

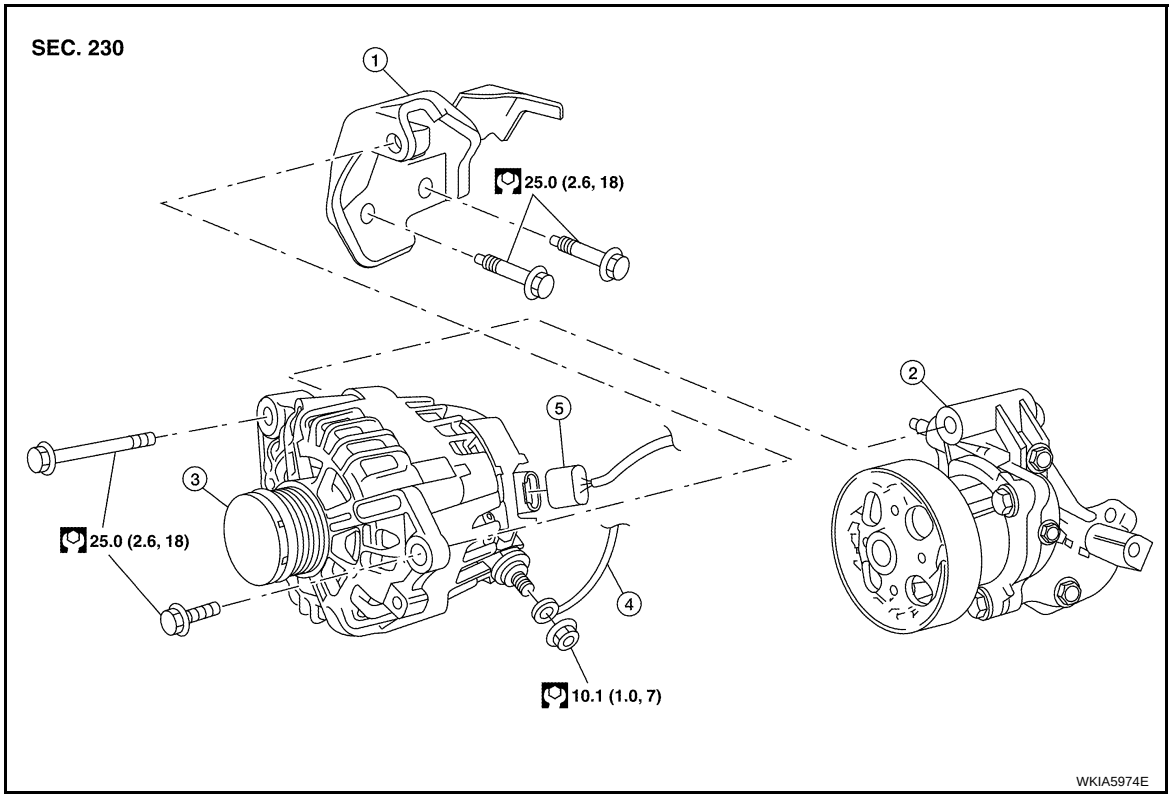
Installation is in the reverse order of removal.

CAUTION:

Be sure to tighten “B” terminal nut carefully.

Removal and Installation QR25DE

INFOID:0000000001851852



1. Generator bracket
2. Water pump
3. Generator
4. Generator "B" terminal harness
5. Generator connector

REMOVAL

1. Disconnect the battery cable from the negative terminal.
2. Remove drive belt. Refer to EM-13, "Removal and Installation".
3. Disconnect generator connector.
4. Remove “B” terminal nut.
5. Remove harness bracket and position aside.
6. Remove generator bolts.
7. Remove generator assembly from the vehicle.

INSTALLATION

Installation is in the reverse order of removal.

CAUTION:

Be sure to tighten “B” terminal nut carefully.

Generator Pulley Inspection

INFOID:0000000001851853

GENERATOR PULLEY INSPECTION

One-Way Clutch Pulley Check

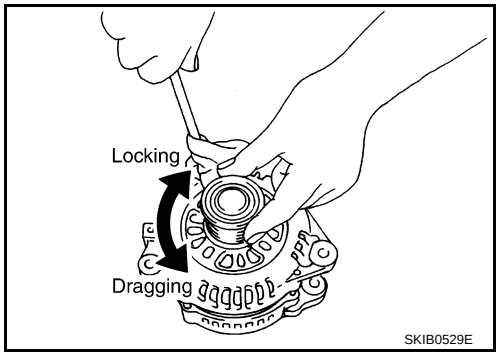
CAUTION:

Be careful not to damage rotor

NOTE:

Secure rotor using suitable tool and a rolled shop towel.

1. Check for locking; (Outer ring is turned clockwise when viewed from front.)
   • If it rotates in both directions, replace pulley.
2. Check for dragging. (Outer ring is turned counterclockwise when viewed from front.)
   • If it locks or unusual resistance is felt, replace pulley.



SERVICE DATA AND SPECIFICATIONS (SDS)

Battery

INFOID:0000000001851854

	USA/CAN	
Type	Gr.21 R	40R
20 hours rate capacity	12 V - 47 AH	12V 60 AH
Cold Cranking Amps. (CCA)	470	550

Starter

INFOID:0000000001851855

Engine		MR20DE	QR25DE
Type		S114 - 902	M000TA0271ZC
		HITACHI	MITSUBISHI
		Reduction gear type	
System voltage		12 V	
No-load	Terminal voltage	11 V	
	Current	Less than 110 A	Less than 90A
	Revolution	More than 3,000 rpm	More than 2,400 rpm
Minimum diameter of commutator		28.0 mm (1.102 in)	—
Minimum length of brush		10.5 mm (0.413 in)	—
Brush spring tension		16.2 N (1.65 kg, 3.64 lb)	—
Clearance between bearing metal and armature shaft		Less than 0.2 mm (0.008 in)	—
Movement “L” in height of pinion assembly		0.3 - 2.5 mm (0.012 - 0.098 in)	—

Alternator

INFOID:0000000001851856

Type	A2TJ0281ZC	TG012C032
	MITSUBISHI	
Nominal rating	12 V - 110 A	
Ground polarity	Negative	
Minimum revolution under no-load (when 13.5 V is applied)	Less than 1,300 rpm	Less than 1,100 rpm
Hot output current (when 13.5 V is applied)	More than 27 A/1,300 rpm More than 95 A/2,500 rpm More than 116 A/5,000 rpm	More than 27 A/1,500 rpm More than 90 A/2,500 rpm More than 112 A/5,000 rpm
Regulated output voltage	14.1 - 14.7 V	14.2 - 14.6 V
Minimum length of brush	More than 5.00 mm (0.197 in)	4.4 mm (0.173 in)
Brush spring pressure	4.1 - 5.3 N (418 - 541 g, 14.8 - 19.1 oz)	1.8 - 3.1 N (0.184 - 0.320 kg, 0.40 - 0.70 lbs)
Slip ring minimum outer diameter	More than 22.1 mm (0.870 in)	More than 12.0 mm (0.47 in)
Rotor (field coil) resistance	1.8 - 2.2 Ω	2.3 Ω