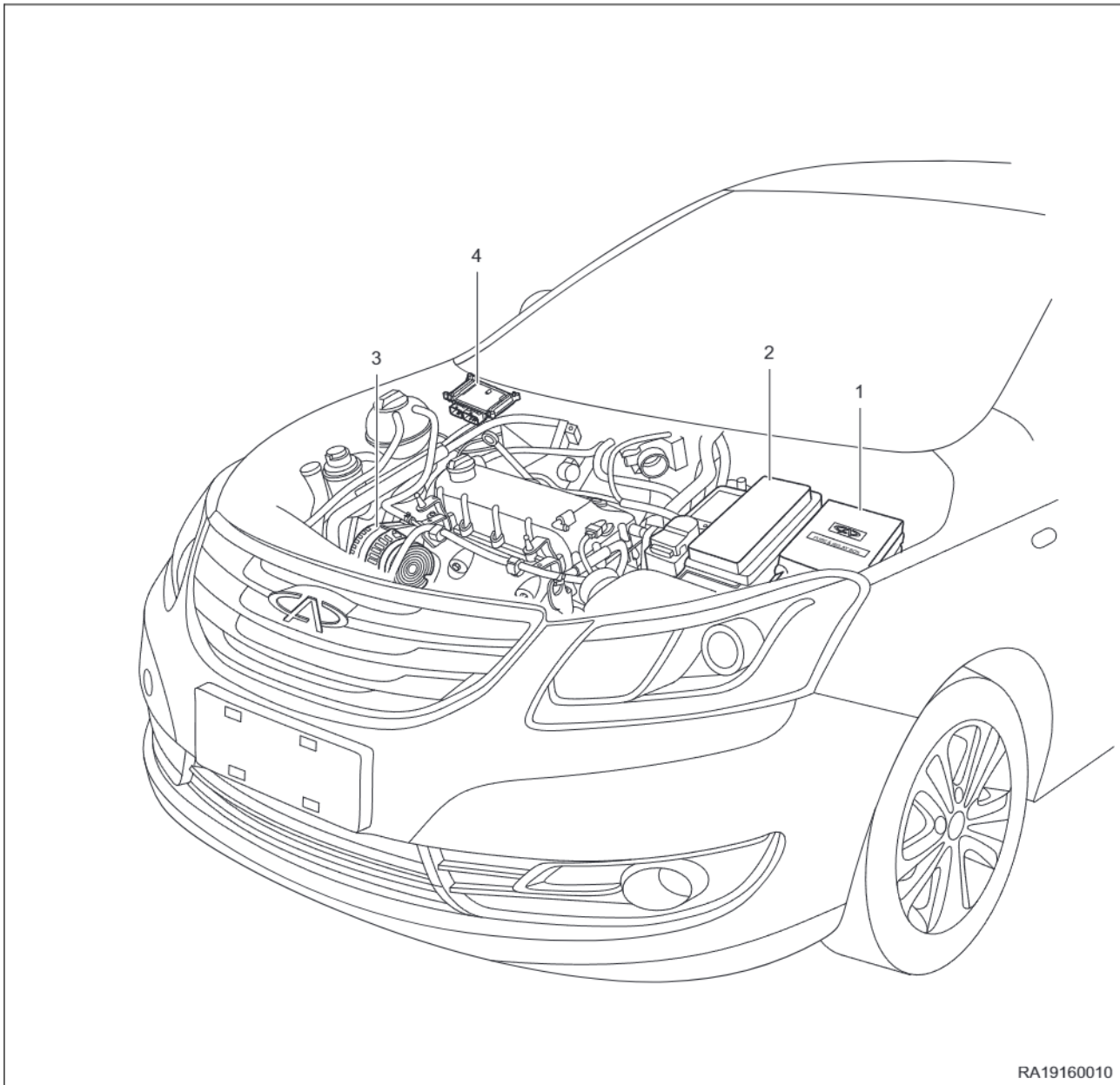

SQR477F CHARGING SYSTEM

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GENERAL INFORMATION

Description



RA19160010

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1 - Fuse and Relay Box	2 - Battery
3 - Generator	4 - ECM

The generator is a key component of charging system. It is a device that converts mechanical energy into electrical energy and generates DC voltage as one of main power sources of the vehicle. The generator operates as a complete assembly. If the generator fails for any reason, the entire assembly must be replaced.

Generator Operation

The generator is a silicon rectifying generator, which mainly consists of rotor, stator and rectifier.

When direct current flows to the rotor winding, rotor claw establishes magnetic field to produce alternating induced electromotive force. The stator is installed on the outside of the rotor, and it is secured together with the front and rear end covers of generator. When the generator rotor is rotated by the drive belt, magnetic pole lines cuts the stator winding, causing a change in the magnetic flux of the stator winding; thus, the stator winding generates alternating induced electromotive force, producing alternating current. The three-phase alternating current generated by the generator is converted to direct current from alternating current by the rectifier and transmitted to the vehicle electrical system and battery.

Specifications

Torque Specifications

Description	Torque (N·m)
Battery Pressure Plate Fixing Bolt	7 ± 1.5
Coupling Bolt Between Battery Tray and Air Filter Assembly	7 ± 1.5
Battery Tray Fixing Bolt	25 ± 4
Generator Output Cable Fixing Nut	18 - 22
Generator Field Wiring Harness Fixing Nut	8 ± 1
Generator Fixing Bolt	20 ± 5
Generator Bracket Fixing Nut	40 ± 5
Generator Bracket Fixing Bolt	40 ± 5

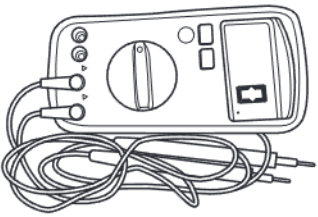
Battery Specification

Name	Type	Specification
SQR477F	L2 400	12 V, 60 Ah, 480 A

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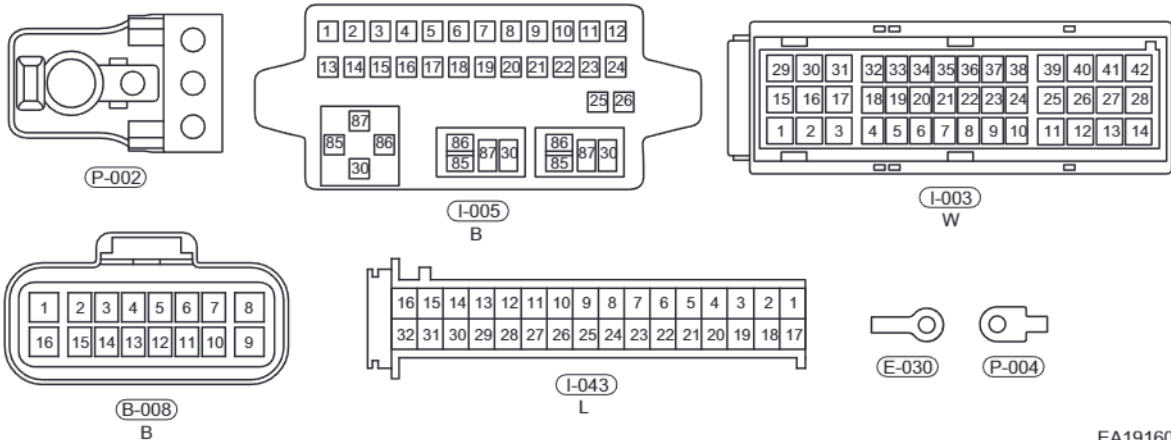
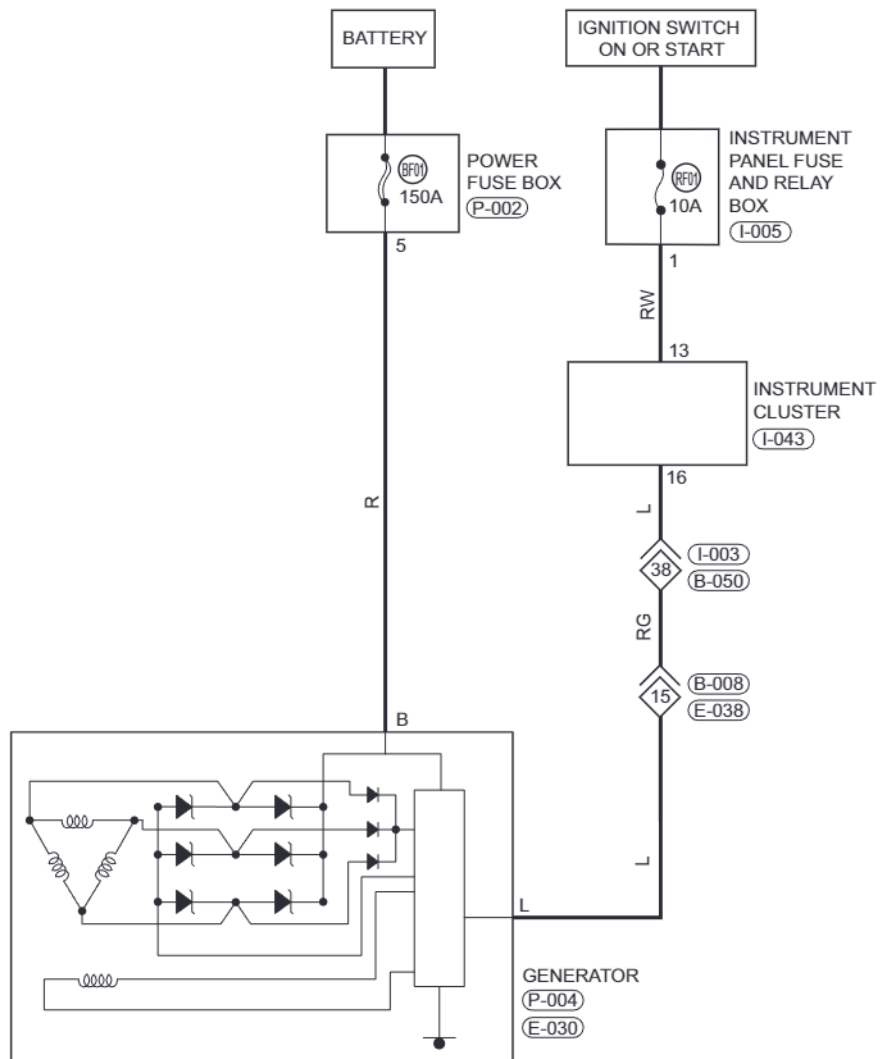
Tool

General Tool

Digital Multimeter	 RCH0000002
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Circuit Diagram

Charging System



EA19160010

DIAGNOSIS & TESTING

Problem Symptoms Table

HINT:

Use the table below to help determine the cause of problem symptoms. Check each suspected area in sequence. Repair or replace the faulty components, or adjust them as necessary.

Symptom	Suspected area	See page
Charging system warning light comes on after engine starts	Generator	16-9
	Instrument cluster	36-34
	Wire harness	-
Noises are heard from generator after engine starts	Fixing bolt (loose)	16-4
	V-ribbed belt (misaligned, loose or fault)	07-21
	Generator	16-9

Charging System Charging Voltage Inspection

1. Leave the vehicle under no load test condition and idle the engine. Measure the battery voltage with the digital multimeter.
Standard voltage: 13 ± 0.3 V
If the result is not as specified, replace the generator ([See page 16-9](#)).
2. Leave the vehicle under load test condition and idle the engine. Measure the battery voltage with the digital multimeter.
Load test condition:
 - Set headlight to high beam;
 - Turn on the blower and switch the blower speed switch to "4" position;
 - Turn on the "A/C" switch;
 - Turn the cold and hot switch to set the temperature of outlet to the highest.
 Standard voltage: 13 ± 0.3 V
If the result is not as specified, replace the generator ([See page 16-9](#)).

CAUTION

- If the charging system warning light comes on, the charging system may have a malfunction.
- If noises are heard from the generator or generating capacity is extremely high or low, repair or replace the generator assembly.

ON-VEHICLE SERVICE

Battery

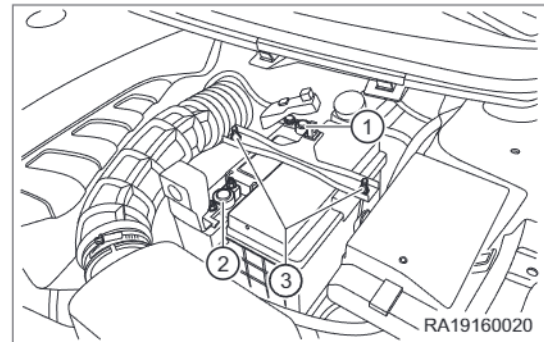
Inspection

1. Check that the battery terminals are not loose or corroded.
If the battery terminals are corroded, clean them.
2. Check the battery for damage, deformation or leakage. If serious damage, deformation or leakage is found, replace the battery.
3. Check the battery voltage.
Turn the ignition switch to ON, and turn it off 20 to 30 seconds after turning on the headlights. This will eliminate the electric charge on the surface of battery. Measure the battery voltage with the digital multimeter.

Testing Temperature	Specification
20°C	12 - 13 V

Removal

1. Turn off all the electrical equipment and ignition switch.
2. Remove the battery.
 - a. Open the negative battery terminal cover, loosen the negative battery cable locking nut, and remove the negative (-) battery cable (1).
 - b. Open the positive battery terminal cover, loosen the positive battery cable locking nut, and remove the positive (+) battery cable (2).
 - c. Remove 2 battery pressure plate fixing bolts (3) and remove the battery pressure plate and the fixing rod.
(Tightening torque: $7 \pm 1.5 \text{ N}\cdot\text{m}$)



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CAUTION

- Please be careful to prevent metal tools from contacting both electrodes of battery at the same time or accidentally touching the positive electrode and vehicle body.

- d. Remove the battery.

Installation

Installation is in the reverse order of removal.

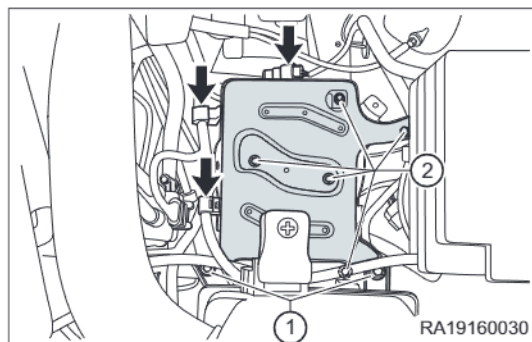
CAUTION

- Replace the battery with one that has the same specification.
- The used battery contains sulfuric acid and lead, so never discard it at will. Please dispose of it at a qualified local waste treatment station.

Battery Tray

Removal

1. Turn off all the electrical equipment and ignition switch.
2. Disconnect the negative battery cable ([See page 16-7](#)).
3. Remove the battery tray.
 - a. Disconnect the connecting clamps (arrow) between wire harness and battery tray.
 - b. Remove 2 connecting bolts (1) between battery tray and air filter assembly.
(Tightening torque: $7 \pm 1.5 \text{ N}\cdot\text{m}$)
 - c. Remove 5 battery tray fixing bolts (2).
(Tightening torque: $25 \pm 4 \text{ N}\cdot\text{m}$)



- d. Remove the battery tray.

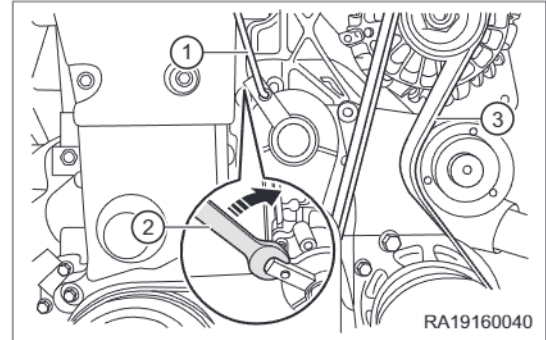
Installation

Installation is in the reverse order of removal.

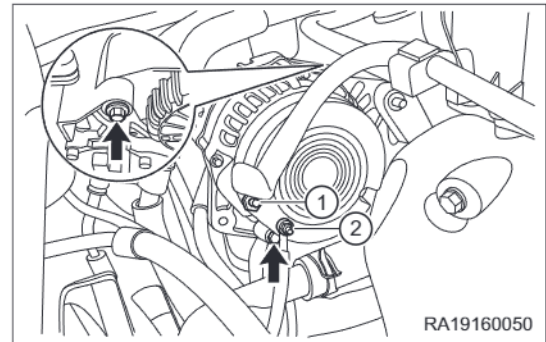
Generator and Generator Bracket

Removal

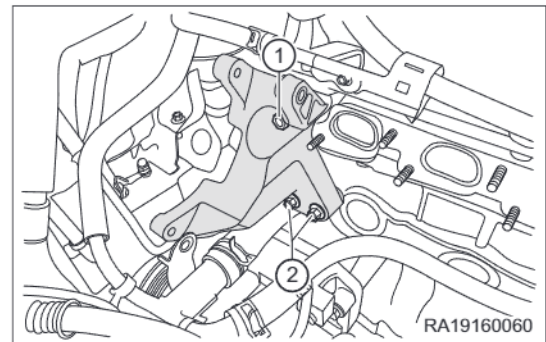
1. Turn off all the electrical equipment and ignition switch.
2. Disconnect the negative battery cable.
3. Remove the engine trim cover.
4. Loosen the V-ribbed belt.
 - a. Rotate the V-ribbed belt tensioner in the direction of arrow with the wrench (2) to align the locking holes of tensioner and bracket. Insert the locking pin (1) to lock the tensioner at the same time.
 - b. Move away the V-ribbed belt (3).



5. Remove the generator.
 - a. Move away the terminal cap, remove the generator output cable fixing nut (1) and move away the generator output cable. (Tightening torque: 18 - 22 N·m)
 - b. Remove the generator field wire harness fixing nut (2) and move away the generator field wire harness. (Tightening torque: 8 ± 1 N·m)
 - c. Remove 2 generator fixing bolts (arrow). (Tightening torque: 20 ± 5 N·m)



- d. Remove the generator.
6. Remove the generator bracket.
 - a. Remove the idle pulley ([See page 07-25](#)).
 - b. Remove the tensioner ([See page 07-27](#)).
 - c. Remove the generator bracket fixing nut (1) and 2 fixing bolts (2). (Tightening torque for nut: 40 ± 5 N·m)
(Tightening torque for bolt: 40 ± 5 N·m)



Installation

Installation is in the reverse order of removal.

