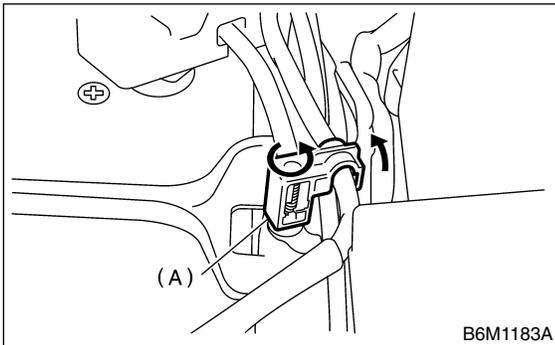


# BATTERY

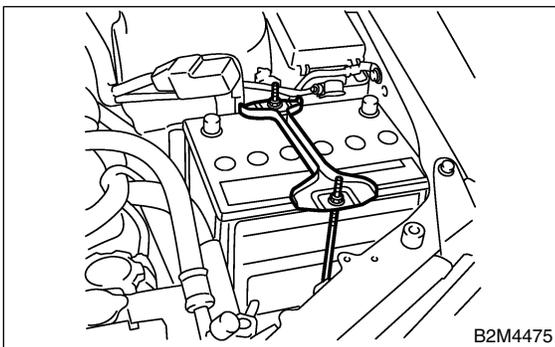
## 4. Battery S149011

### A: REMOVAL S149011A18

- 1) Remove battery cable holder (A) from battery rod.



- 2) Disconnect the positive (+) terminal after disconnecting the negative (-) terminal of battery.
- 3) Remove flange nuts from battery rods and take off battery holder.



- 4) Remove battery.

### B: INSTALLATION S149011A11

Install in the reverse order of removal.

#### **Tightening torque:**

**3.4 N·m (0.35 kgf·m, 2.5 ft·lb)**

#### **NOTE:**

- Clean battery cable terminals and apply grease to retard the formation of corrosion.
- Connect the positive (+) terminal of battery and then the negative (-) terminal of the battery.

### C: INSPECTION S149011A10

#### **WARNING:**

- Electrolyte has toxicity; be careful handling the fluid.
- Avoid contact with skin, eyes or clothing. Especially at contact with eyes, flush with water for 15 minutes and get prompt medical attention.
- Batteries produce explosive gasses. Keep sparks, flame, cigarettes away.
- Ventilate when charging or using in enclosed space.
- For safety, in case an explosion does occur, wear eye protection or shield your eyes when working near any battery. Never lean over a battery.
- Do not let battery fluid contact eyes, skin, fabrics, or paint-work because battery fluid is corrosive acid.
- To lessen the risk of sparks, remove rings, metal watch-bands, and other metal jewelry. Never allow metal tools to contact the positive battery terminal and anything connected to it while you are at the same time in contact with any other metallic portion of the vehicle because a short circuit will be caused.

#### **1. EXTERNAL PARTS: S149011A1001**

Check for the existence of dirt or cracks on the battery case, top cover, vent plugs, and terminal posts. If necessary, clean with water and wipe with a dry cloth.

Apply a thin coat of grease on the terminal posts to prevent corrosion.

#### **2. ELECTROLYTE LEVEL: S149011A1002**

Check the electrolyte level in each cell. If the level is below MIN LEVEL, bring the level to MAX LEVEL by pouring distilled water into the battery cell. Do not fill beyond MAX LEVEL.

#### **3. SPECIFIC GRAVITY OF ELECTROLYTE: S149011A1003**

1) Measure specific gravity of electrolyte using a hydrometer and a thermometer.

Specific gravity varies with temperature of electrolyte so that it must be corrected at 20°C (68°F) using the following equation:

$$S_{20} = St + 0.0007 \times (t - 20)$$

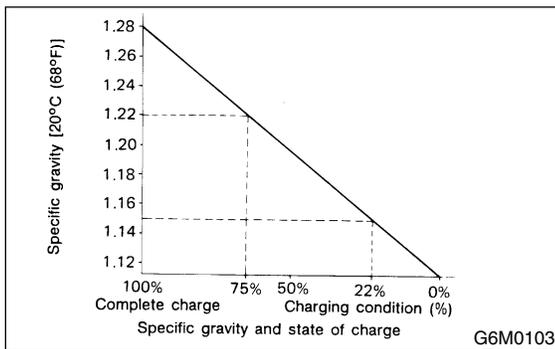
$S_{20}$ : Specific gravity corrected at electrolyte temperature of 20°C

$St$ : Measured specific gravity

$t$ : Measured temperature (°C)

Determine whether or not battery must be charged, according to corrected specific gravity.

Standard specific gravity: 1.220 — 1.290 [at 20°C (68°F)]



2) Measuring the specific gravity of the electrolyte in the battery will disclose the state of charge of the battery. The relation between the specific gravity and the state of charge is as shown in figure.

## D: MEASUREMENT S149011A14

### WARNING:

- Do not bring an open flame close to the battery at this time.

### CAUTION:

- Prior to charging, corroded terminals should be cleaned with a brush and common baking soda solution.
- Be careful since battery electrolyte overflows while charging the battery.
- Observe instructions when handling battery charger.
- Before charging the battery on vehicle, disconnect battery ground terminal. Failure to follow this rule may damage alternator's diodes or other electrical units.

## 1. JUDGMENT OF BATTERY IN CHARGED CONDITION S149011A1401

- Specific gravity of electrolyte is held at a specific value in a range from 1.250 to 1.290 for more than one hour.
- Voltage per battery cell is held at a specific value in a range from 2.5 to 2.8 volts for more than one hour.

## 2. CHECK HYDROMETER FOR STATE OF CHARGE S149011A1402

Hydrometer indicator	State of charge	Required action
Green dot	Above 65%	Load test
Dark dot	Below 65%	Charge battery
Clear dot	Low electrolyte	Replace battery* (If cranking complaint)

\*: Check electrical system before replacement.

## 3. NORMAL CHARGING S149011A1403

Charge the battery at current value specified by manufacturer or at approximately 1/10 of battery's ampere-hour rating.

## 4. QUICK CHARGING S149011A1404

Quick charging is a method in which the battery is charged in a short period of time with a relatively large current by using a quick charger. Since a large current flow raises electrolyte temperature, the battery is subject to damage if the large current is used for prolonged time. For this reason, the quick charging must be carried out within a current range that will not increase the electrolyte temperature above 40°C (104°F). It should be also remembered that the quick charging is a temporary means to bring battery voltage up to a fair value and, as a rule, a battery should be charged slowly with a low current.

### CAUTION:

- Observe the items in 1. NORMAL CHARGING.
- Never use more than 10 amperes when charging the battery because that will shorten battery life.

# BATTERY

Starting/Charging Systems

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**MEMO:**