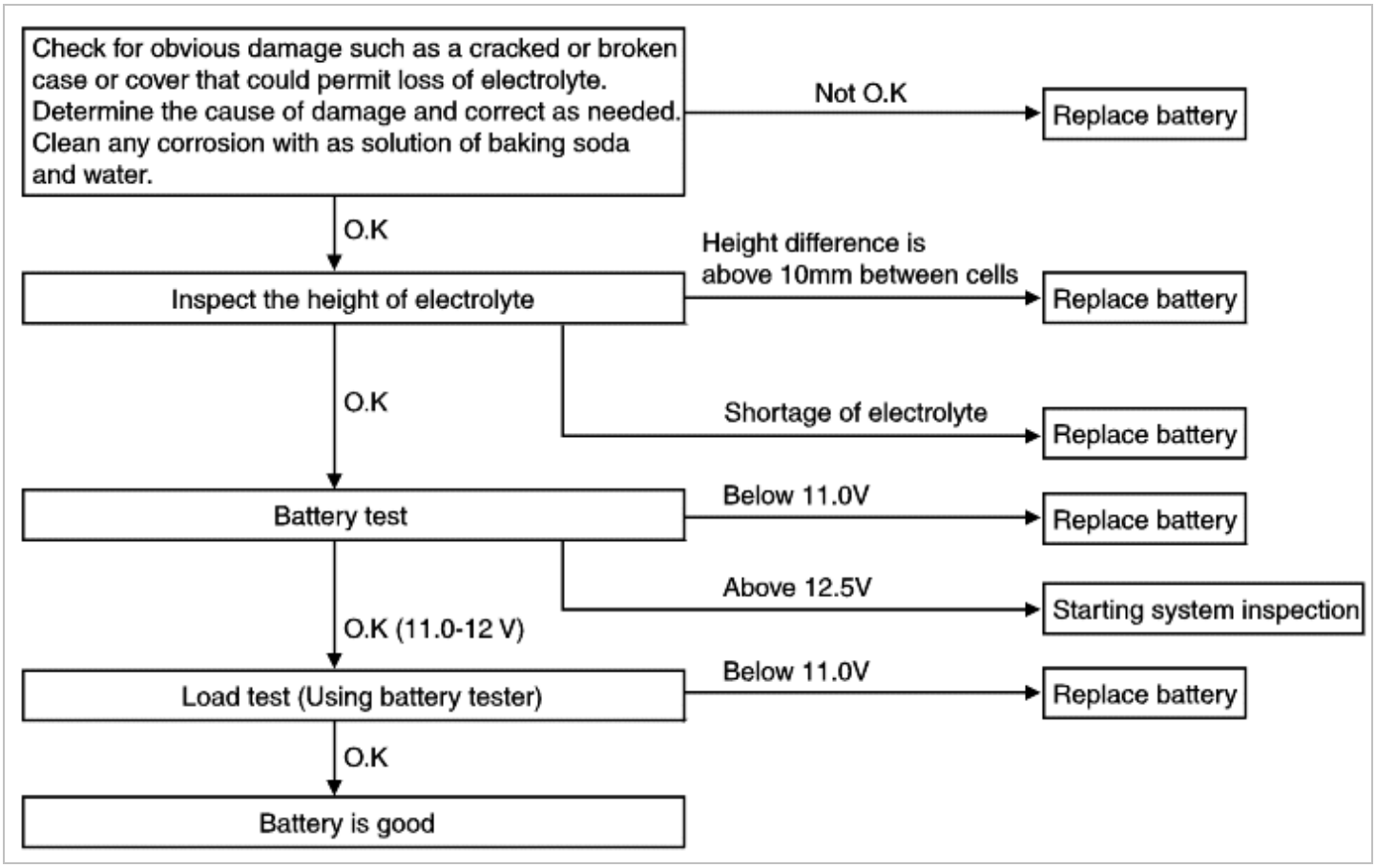
## BATTERY VISUAL INSPECTION (1)

### 1. CHECKING FLOW




### 2. CHECKING SHEET

| Item | Trouble | Cause | Remedy | Responsibility | |
|---|---|---|---|---|---|
| | | | | User | Manufacturer |
| 1. Visual inspection | * Battery terminal damage | * Carelessness<br>* Over tightening the battery cable | Replace | O | |
| | Cover Breakage | * Carelessness | Replace | O | |
| | * Electrolyte leakage<br>- Cover breakage<br>- Cover leakage | <br>* Carelessness<br>* Bad cover seal | <br>Replace<br>Replace | O | <br><br>O |
| 2. Electrolyte height inspection | * Electrolyte height between cells is over 10mm | * Cell shorted electrically | Replace | | O |
| | | * Vaporization caused by excessive temperature | Replace | O | |
| | * Shortage of electrolyte | * Electrolyte loss caused by over-charge | Replace | O | |
| 3. Voltage inspection | 1. Battery voltage >13.2V | 1. Over charge | Replace<br>* Check the electric system | O | |
| | 2. 12.5V < Battery voltage < 12.9V | 2. Normal | | | |
| | 3. 12.0V < Battery voltage < 12.4V (Simple discharge) | 1. Insufficient charge | * Battery Load Test (Refer to Load Test below) | O | |
| | 4. 11.0 V < Battery voltage < 12.0V (Over discharge) | 2. Internal failure | | O | |
| | 5. Battery voltage : 11.0V or less | 1. Charge condition failure | Replace | O | |
| | | 2. Battery discharged for a long period | | O | |
| | | 3. Internal circuit open | | | O |

## 3. LOAD TEST

1. When discharging the battery during 15 seconds at half currency of Cold Cranking Power (CCP), the voltage of the battery should be as shown below.

**Regulating Voltage Table**

| Ambient Temperature | Voltage |
|---|---|
| above 20°C | 9.6V |
| ~ 18°C | 9.5V |
| ~ 10°C | 9.4V |

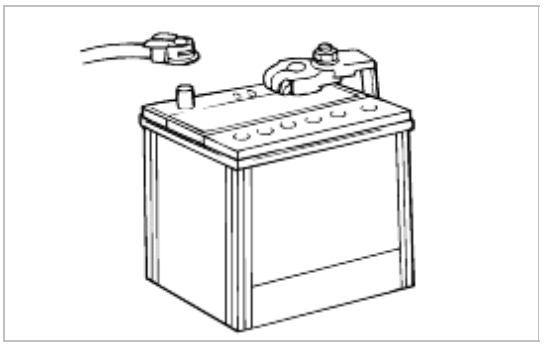
| | |
|---|---|
| ~ 4°C | 9.3V |
| ~ -1°C | 9.1V |
| ~ -7°C | 8.9V |
| ~ -12°C | 8.7V |

2. When the voltage is not within specification, repeat the load test again, and re-charge.
3. If the battery is left alone for 2 hours after re-charging and its output is over 12.5V, and the voltage after a load test is over the standard value,the battery can be used.

## BATTERY VISUAL INSPECTION (2)

1. Make sure the ignition switch and all accessories are in the OFF position.
2. Disconnect the battery cables (negative first).
3. Remove the battery from the vehicle.

> CAUTION
>
> Care should be taken in the event the battery case is cracked or leaking, to protect your skin from the electrolyte. Heavy rubber gloves (not the householdtype) should be worn when removing the battery.



4. Inspect the battery carrier for damage caused by the loss of electrolyte. If acid damage is present, it will be necessary to clean the area with a solution of clean warm water and baking soda. Scrub the area with a stiff brush andwipe off with a cloth moistened with baking soda and water.
5. Clean the top of the battery with the same solution as described in Step(4).
6. Inspect the battery case and cover for cracks. If cracks are present, the battery must be replaced.
7. Clean the battery posts with a suitable battery post tool.
8. Clean the inside surface of the terminal clamps with a suitable battery cleaning tool. Replace damaged or frayed cables and broken terminal clamps.
9. Install the battery in the vehicle.
10. Connect the cable terminals to the battery post, making sure the tops of the terminals are flush with the tops of the posts.
11. Tighten the terminal nuts securely.
12. Coat all connections with light mineral grease after tightening.

> CAUTION
>
> When batteries are being charged, an explosive gas forms beneath the cover of each cell. Do not smoke near batteries being charged or which have recently been charged. Do not break live circuits at the terminals of batteries being charged. A spark will occur when the circuit is broken. Keep open flamesaway from the battery.