
**Lead / Acid
Batteries**

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INTRODUCTION

PURPOSE OF THE BATTERY

The battery provides electrical energy for starting the engine and powering the accessories when the engine is not running.

PARTS OF THE BATTERY

Get the battery cutaway model from the shelf and refer to it while reading the rest of this section.



CELLS

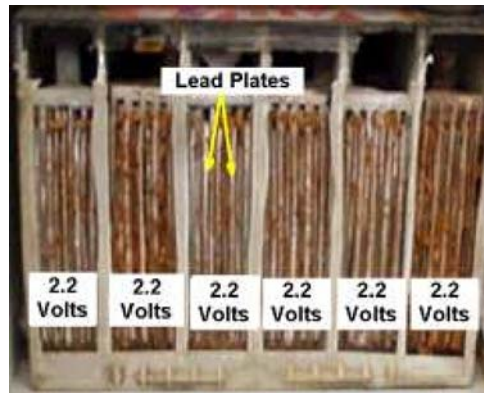
Notice the battery is divided into six compartments called cells.

In a functional battery, each cell is filled with a mixture of sulphuric acid and water.

This mixture is called electrolyte.

The sulphuric acid reacts with the lead plates to produce electricity.

Each cell of the battery produces 2.2 volts. The cells are connected in series so their voltages add up to a total of 13.2 volts.



ELECTROLYTE



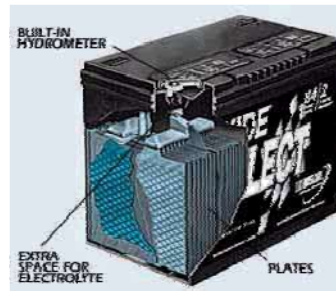
The chemical reactions inside the battery and normal evaporation cause the water to evaporate out of the electrolyte.

If the electrolyte level becomes too low it exposes the battery plates to the air and damages the battery.

It is very important that the electrolyte be kept topped up.



Some batteries are designed so the water which evaporates from the electrolyte condenses and drips back into the electrolyte. These batteries are called "Maintenance Free".



Maintenance Free batteries have no removable caps, you cannot top up the electrolyte of this type of battery.

As a battery discharges, the sulphuric acid in the electrolyte is converted to water.

In a completely discharged battery the electrolyte is almost all water.

Discharged batteries are at risk of freezing if left out during winter.

Charging the battery converts the water back to sulphuric acid.

TERMINALS

The terminals on the battery can be identified by a (+) and (-) or (POS) (NEG) signs on the case of the battery.

Positive connections are usually red in color and negative connections are usually black.



SAFETY CONSIDERATIONS

When a battery is operating it produces very explosive hydrogen gas.

Any spark near the battery may cause the battery to blow up. For this reason it is important to wear safety glasses and avoid producing sparks near a battery.



The acid in battery electrolyte will damage clothes and painted surfaces. For this reason take care when handling and moving batteries.

To avoid creating sparks near the battery:

Disconnect the negative terminal first when removing the battery.

Connect the negative terminal last when installing the battery connections.

An easy way to remember: negative is "first off and last on".

QUESTIONS

QUESTIONS

- 1) The part of the battery indicated in the diagram is a:

A) cell
B) post
C) terminal
D) plate



- 2) What type of explosive gas is produced by a battery?
- 3) The electrolyte in a discharged battery is mostly:
- A) sulphuric acid
B) water
C) paste
D) none of the above
- 4) What is the actual voltage of a fully charged 12 volt battery.
- 5) When removing a battery the negative terminal should be disconnected first.

True or False

----- End Of Questions -----

Be prepared to explain to the instructor the safety precautions which must be followed when working with batteries.



Stop here until the instructor has checked your work.

**Instructor's
Initial**