

# Battery Safety

**I**mproper battery handling is responsible for more than 20,000 injuries nationwide each year.

The most common cause of injury is use of incorrect jump starting procedures. As the weather cools and you begin to use equipment that may have been in storage, jump starting equipment can become a more common task.

A battery stores electricity chemically within the lead plates via sulfuric acid and water. This acid/water mixture, called electrolyte, is very corrosive. Any time you work around batteries, you should wear rubber gloves and eye protection.

It pays to conduct routine maintenance on the battery when you take a piece of equipment out of storage. The following are some basic procedures you should follow when maintaining batteries.

### Battery Maintenance

First, check the electrolyte level. If needed, add *only* distilled water and to the level the manufacturer recommends. Never put in electrolyte after the initial set up because it can result in a chemical reaction that could cause serious skin and eye injury.

To remove or replace a battery, use a chemistry lab apron because clothing will disintegrate if the electrolyte contacts it. Use baking soda and water to wash off any electrolyte you spill on the equipment frame or engine.

The electrolyte normally remains sealed in the battery. When a stored battery is charging, the current drives sulfuric acid out of the lead plates. If the charging rate is excessive, some of the current breaks down water into hydrogen and oxygen gas. Because hydrogen is a light gas, it bubbles to the surface where a stray spark or flame can ignite it.

Make sure there are no ignition sources in the area, including lit cigarettes, when you are working. If the battery you are working with has a vent cap for each cell, check the electrolyte level with an explosion-proof flashlight or switch on the light *away* from the battery.

### Jump Starting Procedures

Following proper jump starting procedures will help prevent accidents. Jump starting is not an everyday event, so employees often forget the procedure. Post the steps to follow in a convenient location and tie a laminated copy to the jumper cables.

When a vehicle needs a jump start, bring a helper vehicle with a battery of the same voltage as the disabled vehicle. Use insulated jumper cables with adequate cable length. The vehicles must not touch.

Set the parking brakes on both vehicles and put the shift lever into neutral. Then, turn off both master switches. Put on safety equipment, such as safety goggles and rubber gloves. If it is dark where you are working, turn on the flashlight away from the batteries. Then,

*If the battery you are working with has a vent cap for each cell, check the electrolyte level with an explosion-proof flashlight or switch on the light away from the battery.*



Charging and starting problems can be detected early with a battery tester.  
Photo courtesy: Associated Equipment Corporation, St. Louis, MO.

open the hood of the vehicle.

Check the electrolyte in the disabled vehicle's battery. If ice is present, *do not* attempt to add water. Otherwise, fill with distilled water only to the level the manufacturer recommends.

Do not replace the vent caps. Cover the vent holes with a water-soaked rag, but don't allow the rag to touch the battery terminals.

To jump start the battery, attach the red clamp to the positive (red, + or pos marking) post of the dead battery. Clamp the other end of the same cable to the positive post of the helper battery.

Next, clamp the other cable to the negative (black, —, or neg marking) post of the helper battery. Attach the second cable's negative end to the engine block or frame of the disabled vehicle.

(Locate it as far away from the dead battery as possible.)

Start the helper vehicle and let its engine run for a few moments. Then, start the disabled vehicle.

Disconnect the jumper cables in the exact reverse order of attachment. First disconnecting the negative cable from the previously disabled vehicle. Then, remove the negative clamp from the helper battery. The last step is to remove the positive clamp from the helper battery and then from the other vehicle's battery.

Remove and discard the damp rag and reinstall the vent caps. Close the hoods, switch off the flashlight and remove your safety equipment.

Allow the previously disabled vehicle battery to recharge or take it back to the shop for diagnosis. □

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