



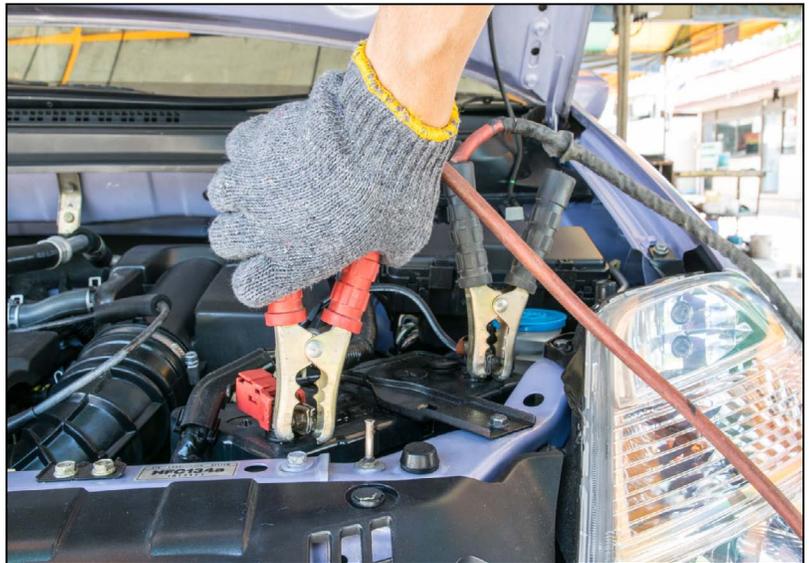
Explosive hydrogen....Acidic liquids and vapors....Electrical burns....Strains, sprains, hernias and compressed discs. All of these hazards arise when servicing, charging, or jumping the common lead-acid battery found in cars and trucks. The hazards can be minimized by following a few common sense safety rules.

**Eye Protection:** First, always wear safety goggles or a face shield when working around a battery. Batteries contain corrosive acids that are capable of eating away metals. It takes just one droplet to cause serious eye damage. Just popping open the vent cap may throw out a droplet. A short or faulty regulator can cause the electrolyte to boil, releasing acid vapors. A fault within the battery could cause it to explode, throwing fragments of the case and acid.

**Fire Protection:** Lead-acid batteries produce flammable hydrogen gas while being charged. This highly explosive gas, generated within the cells, will expand and seep out of the vent caps. A cigarette, tool, or spark from any source could ignite the gas, causing the battery to explode. Always charge in a well ventilated area. Remember too that the battery is receiving a charge and releasing hydrogen when the car is running, not just when hooked up to a battery charger.

**Jump Starting:** Dead batteries in cars and trucks are not uncommon, particularly in winter. The first thought is to get a jump start. When jumping a battery, remember the following safeguards:

- Be sure all electrical equipment is off.
- Check the battery fluid level. If the plates are exposed, add water until they are covered. Never add acid.
- Make sure both batteries are of the same voltage.
- Make sure vent caps are in place to prevent electrolyte splash.
- Use good quality jumper cables-at least 10-gauge wire.
- Always be sure of your polarity when arranging the jumper cables:
  1. Connect the first cable to the positive (+) terminal of the good battery; then attach the other end of that cable to the positive (+) terminal of the dead battery.
  2. Next, attach the second cable to the negative (-) terminal of the good battery, and make the fourth and last connection to a clean metal part, such as the engine block of the car being energized, rather than to its negative battery terminal. This completes the electrical circuit, as if it were connected to the dead battery, but if sparks are produced, it serves to keep them away from any explosive battery gases.
  3. Never lay your tools on top of the battery. They could come in contact with both posts, or the positive post and ground, creating a short.



**Protect Your Back:** Batteries are heavy. If you must move one, use a battery strap as a handle, keep your back straight don't bend at the waist--and tighten your stomach muscles as you lift. Don't twist your spine as you lift or move it.

IMPORTANT NOTICE - The information and suggestions presented by Michigan Millers Mutual Insurance Company in this Safety Talks Toolkit Bulletin are for your consideration in your loss prevention efforts. They are not intended to be complete or definitive in identifying all hazards associated with your business, preventing workplace accidents, or complying with any safety related, or other, laws or regulations. You are encouraged to alter them to fit the specific hazards of your business and to have your legal counsel review all of your plans and company policies.