

How to Safely Change a Battery



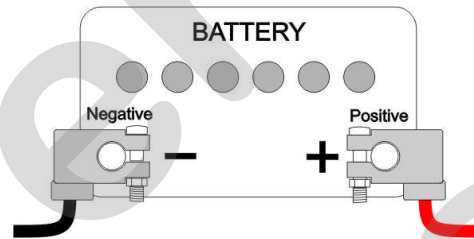
WHEN YOU WORK NEAR LEAD-ACID BATTERIES:

1. Someone should be within range of your voice or close enough to come to your aid if you have an accident.
2. Have plenty of fresh water and soap nearby in case battery acid contacts eyes, skin or clothing.
3. Wear complete eye protection and protective clothing. Avoid touching your eyes while working near a battery. If battery acid contacts your skin or clothing, wash immediately with soap and water. If acid enters an eye, immediately flood the eye with running cold water for at least 10 minutes and get medical attention as soon as possible.

4. Be extra cautious when handling metal tools around a battery. If you drop a metal tool near a battery it might spark or create a short circuit between the battery terminals and some other metal part. Either event may cause a dangerous electrical-shock hazard, a fire or even an explosion.
5. Remove all personal metal items such as rings, bracelets, necklaces and watches when working with a lead-acid battery. A lead-acid battery can produce a short-circuited current high enough to weld a metal ring or other piece of jewelry, causing a severe burn.
6. Work in a well ventilated area away from sparks and open flames. **DO NOT SMOKE.**

Items required:

- New Battery
- Wrench
- Wire Brush
- Safety Goggles
- Rubber Gloves



1. **Important:** Disconnecting the battery will erase security codes and settings from radios and navigation systems. Engine and transmission electronic control modules may lose settings they have learned. Check the owner's manual to see which devices and systems may be affected. Using a tool known as a *memory keeper* can prevent this. *Memory keepers* plug into the cigarette lighter and provide enough power to preserve the memory of onboard electronics. Most parts stores or automotive tool suppliers sell this tool. If you do not have access to a *memory keeper*, be sure to write down the security codes so that they can be restored after the battery change.
2. **Identify the battery terminals.** Usually the **POSITIVE** battery post is slightly larger and has a red cable attached to it. The symbol for **POSITIVE** is +. The **NEGATIVE** post usually has a black cable attached to it. The symbol for **NEGATIVE** is -.
3. **Disconnect the battery cables.** Always disconnect the **NEGATIVE** cable first. Since the **NEGATIVE** cable connects directly to the chassis, this avoids the possibility of creating a dangerous short circuit from the **POSITIVE** battery terminal through the wrench to the chassis. Always disconnect the **NEGATIVE** cable first and reconnect it last!
4. **Remove the old battery.** Remove any hold-down clamps or devices and remove the old battery. Inspect the hold-down hardware and battery support bracket for signs of corrosion and replace if necessary. Light corrosion can be removed with a mixture of baking soda and water. Protect with a rust-preventative paint such as Rust-Oleum®.
5. **Install the new battery.** Don't forget the hold-down hardware. Batteries must be securely fastened or early failure will result from excessive jarring. An unsecured battery is also a safety hazard as the positive terminal can contact the chassis and start a fire.
6. **Reattach the cables.** Reattach the **POSITIVE** cable first and then the **NEGATIVE**. Treat the terminals with an anti-corrosion spray to ensure long life and reliability. Enter security codes for electronic devices or remove *memory keeper* if present.
7. **Properly dispose of the old battery.** In 1985, the EPA declared lead-acid batteries a hazardous waste. Hazardous waste requires special disposal. In most communities, it is a crime to dispose of a lead-acid battery in any manner other than through a battery dealer or approved collection/recycling center. Protect yourself—dispose of the battery at an approved facility and get a receipt to prove it.

For more information concerning used lead-acid batteries, please call 1-800-CLEAN-UP.

Testing Safety and Warnings

- Never disconnect the battery while the engine is running.
- Alternators are designed to maintain batteries, not recharge them from dead.
- Keep hands and test-leads away from belts, fans and other moving parts.
- Be sure belts are not worn and are adjusted properly.
- Start all tests with a fully charged battery.
- Clean and inspect all wires and connections.
- Be sure that all grounding surfaces are cleaned to bare metal.
- Verify that alternator amperage is adequate for the vehicle loads.
- Be sure all mounting fasteners are tight.
- Do not over tighten alternator or battery cable connections.
- Ensure automatic tensioners operate properly. The tension spring should not bind, and the pulley bearing should operate smoothly without excessive free play.
- Ensure the transmission is in park or neutral during all tests, and the parking brake is set.
- Disconnect the battery before removing the starter or alternator.
- When removing the alternator, always disconnect the voltage-regulator plug first and reconnect it last.
- Always disconnect battery negative before battery positive and install in reverse order.
- Never use a battery charger as a power supply to test a starter motor.
- When replacing a starter motor, always inspect the ring gear for worn or damaged teeth.
- Always clean the starter mounting-surface to ensure the starter mounts properly.
- Always ensure all starter or alternator mounting bolts are properly torqued.
- Clean and inspect all connections to the starter, solenoid, alternator and battery when removing and replacing cables.
- Use dielectric gel in all plug connections to avoid future corrosion and water penetration.
- Be sure to replace all original brackets, air ducts, etc to ensure proper support and cooling.
- Some applications require the electronic control module codes to be cleared and reset before a replacement alternator will operate properly. If the proper scan-tool is not available, this will require a trip to either the dealer or a well-equipped electrical shop.
- Always test and charge batteries in a well ventilated area. The gasses emitted by batteries are highly explosive.
- Always wear eye protection when working with a battery, and avoid getting the electrolyte on skin and clothing. The electrolyte is sulfuric acid and is highly corrosive.
- When working with active circuits, be careful to avoid accidentally grounding circuits or contacting wires and terminals with rings, watches or other jewelry. For example, contact from the battery terminal to a wrench and a ring on the hand could cause a short if the ring came into contact with the frame or fender.

Special Note

- The electronic control module may need to be reset using a scan-tool if the “Check Engine” light remains on after any repair.
- Be sure to supply the Vehicle Identification Number (VIN) and Accessory Number before replacing a starter or alternator.