

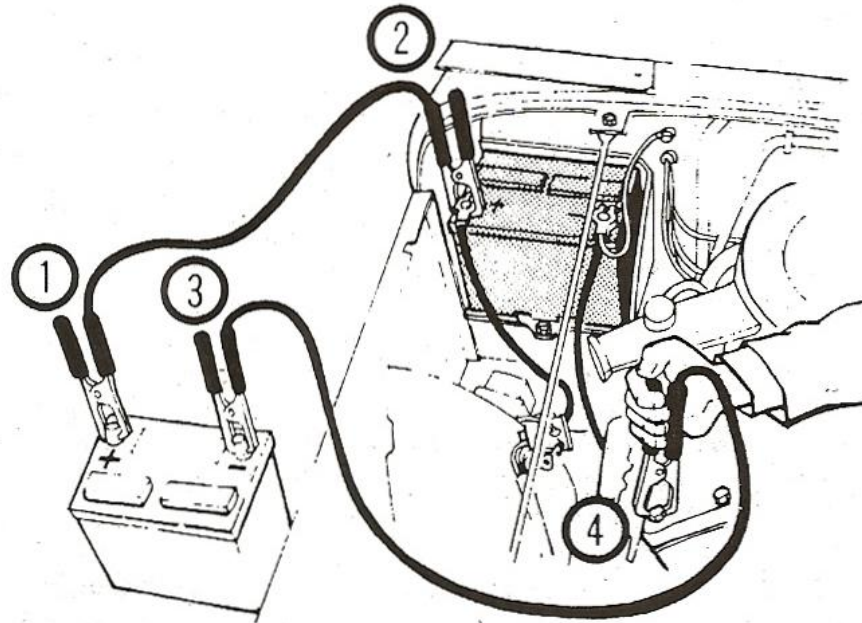
BACK COUNTRY DRIVING SCHOOL



Battery Usage & Maintenance Guide

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Battery Jump Starting



Make the booster battery cable connections in the numerical order shown (note that the negative cable of the booster battery is **NOT attached to the negative terminal of the dead battery)**

Observe these precautions when using a booster battery or another vehicle to start a vehicle with a dead battery:

- A) Before connecting the booster battery, make sure the ignition switch is in the off position.
- B) Turn off the lights, heater and other electrical loads.
- C) Your eyes should be shielded. Safety goggles strongly recommended.
- D) Make sure the booster battery is the same voltage as the dead one in the vehicle.
- E) The two vehicles **MUST NOT TOUCH** each other!
- F) Make sure the transmission is in Neutral (manual) or Park (automatic).
- G) If the booster battery is one a maintenance-free type, remove the vent caps and lay a cloth of the vent holes.

1) Connect the **red** jumper cable to the positive (+) terminals of each battery.

2) Connect one end of the **black** jumper cable to the negative (-) terminal of the booster battery, The other end of the cable should be connected to a good ground on the vehicle to be started, such as a bolt or bracket on the engine block (**see illustration**). Make sure the cable(s) will not come into contact with the fan, drive belts or other moving parts of the engine.

3) Depending on how low the voltage of the dead battery is, you may need to let the booster vehicle run slightly above idle for a few minutes to begin to charge low battery.

4) Start the engine using the booster battery, then with the engine running at idle speed; disconnect the jumper cables in the reverse order of connection.

Batteries are potentially dangerous, improper jumpstarting and maintenance procedures of batteries is one of the three leading causes of accidental blindness among males in the US over the age of 15.

Battery Maintenance



Battery with heavy corrosion on the terminals is a sign of a battery leaking explosive gases from the vent caps, extreme caution should be used when working with such a battery: never smoke and always minimize creating a spark when making any connections or performing maintenance. Eye protection is highly recommended.

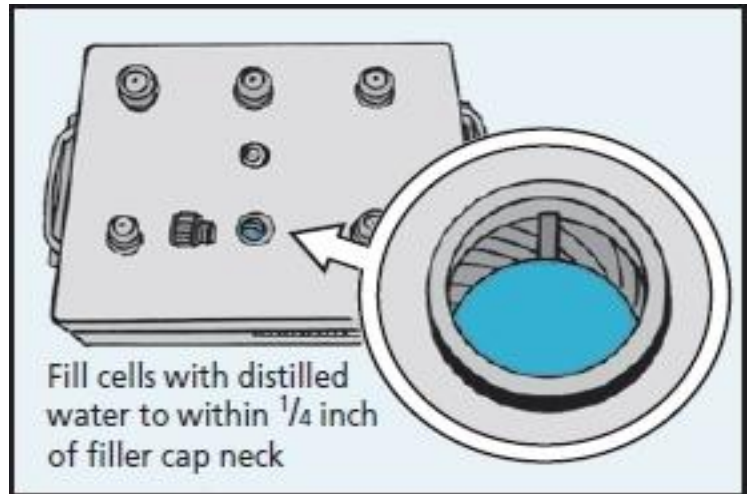
From time to time it is normal for battery terminals to require cleaning. More often than not, electrical malfunctions of a vehicle are the direct cause of corrosion and or lose terminal connections. To perform routine cleaning of terminals or to Remove and Replace a battery follow the steps below.

- A) Disconnect the electrical leads from the old battery, negative (earth) first (look for a '-' sign near the battery terminal, the negative wire should be BLACK and the opposite end will be connected to the frame of the vehicle).

- B) Clean terminals and terminal ends with a wire brush, knife or abrasive paper, as necessary. The terminals of the battery and interior of ends (where contact is made) should be cleaned as thoroughly possible.
- C) Protect the terminals and terminal ends against corrosion by smearing them with grease, petroleum jelly or using an anti-corrosion spray. It is ok to have this coating between the connection surfaces, it will only aid in conductivity.
- D) Reconnect electrical leads in reverse order, positive first and negative (earth) last. Ensure that the terminals end is tight and cannot be rotated or moved by hand once installed.

Note: some models of vehicles, IE: Land Rover may have reverse polarity and therefore you will remove and replace terminals in reverse order.

Batteries over time will lose some of the fluids (electrolytes) from the cells through evaporation, spills or leaks. The cells should be checked monthly and "Topped Off" within a ¼ inch of the top with distilled water. Generally an ounce or less is needed. If a cell is to be found extremely low or emptied it should not be filled all at once but yet gradually over time. IE: An ounce of distilled water added to the battery every two hours of vehicle run time. Adding more than two ounces of water at any one time will greatly increase the possibility of the cell not being able to hold a charge and potentially disabling the cell from taking a charge all together.



Temperature effects on a battery.

