

Battery Care & Maintenance

BE CAREFUL

WARNING: Batteries produce explosive gases. Keep sparks, flames and cigarettes away from batteries at all times. Protect your eyes at all times. Never lean over battery when jump starting or performing other maintenance.



CHECK STATE OF CHARGE

There are two styles of battery ... **non-accessible maintenance free types and accessible maintainable types with removable vent caps.**

Before adding water to a **maintainable battery**, take an open circuit voltage reading and/or hydrometer reading of one cell. Use a different cell each time. If the readings are above 12.4 volts or 1.225 SG, the battery is fine. If the readings are below 12.4 volts or 1.225 SG, charge the battery. If the electrolyte level is too low to read with a hydrometer, add water and take the hydrometer reading the following day, after the vehicle has been driven and the water has had an opportunity to mix. Check electrolyte levels in all cells. If necessary, add only clear, odorless drinking water to bring the liquid level to the level indicator or to (13mm) 1/2" above the top of the separators. Distilled water is preferred, especially if the water in your area has high iron. **Do not overfill any cells.** Excess electrolyte may be forced from an overfilled cell and cause corrosion on adjacent metal parts, reduce performance, and shorten life. In cold weather, do not fill cells with water and let stand without running engine or driving the vehicle long enough to allow water to mix with acid. Otherwise, freezing might occur and the battery may crack.

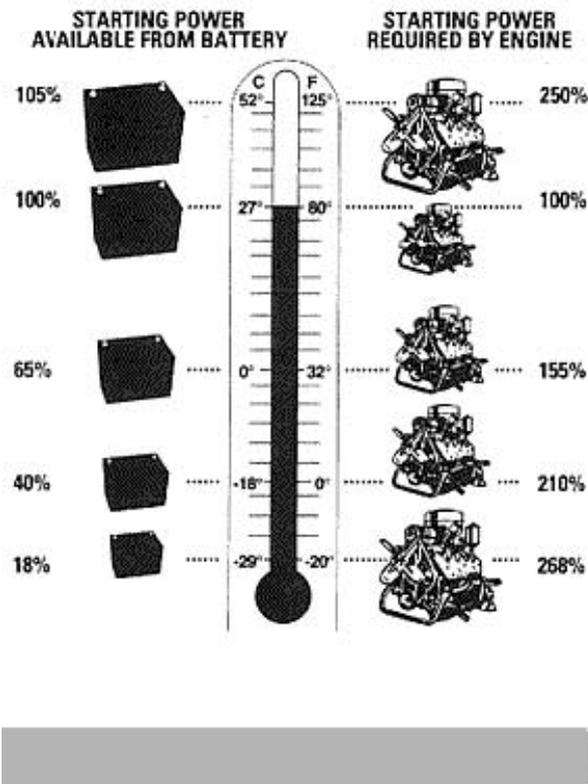
Maintenance-free, **non-accessible batteries** are designed to eliminate the need to add water. Yet the volume of electrolyte above plates may eventually become depleted due to abnormal conditions such as high heat or improper regulator setting. Use a voltmeter to check the state of charge. See chart under "CHARGING TIPS" to determine if charging is necessary. **DO NOT OPEN FLUSH COVER BATTERIES! If opened, serious personal injury can result.**

SELECT THE PROPER SIZE BATTERY

Always select a battery that has enough cranking power and reserve capacity to get the job done. Consider the vehicle manufacturer's recommended capacity to be a minimum capacity guideline.

Along with electrical accessories, temperature also has a dramatic effect on battery performance. Vehicles that are operated in extremely hot or cold climates will need a battery that's rated well above the minimum O. E recommendation. *Remember, you can't select a battery with too much power!*

Temperature has a dramatic effect on a battery's ability to crank an engine. Not only does cold rob batteries of power, it also stiffens motor oil, making engines harder to start. **And heat can damage batteries** by causing internal components to wear out quickly while also making engines difficult to start. So do yourself a favour, select the higher capacity, more powerful batteries you'll need to tackle demanding climates.



IN VEHICLE SERVICE TIPS

Remember... always wear safety glasses when working around batteries!

The first step to routinely servicing a battery is to make a visual inspection. Look for defective cables loose connectors corrosion, cracked cases or covers, loose hold-downs and deformed or loose terminal posts.

Remove and replace a battery at once if there are cracks in cover or case. Place the leaking battery in a plastic bag and take it to a Lion Depot for proper recycling.

To remove corrosion and dirt from terminal posts, hold-downs, tray or hold-down parts, scrape or brush it off. Use a corrosion removing spray or immerse the part in an alkaline solution such as baking soda in the proportions of 1/2kg : 4ltrs. The corrosion is neutralized when the solution stops bubbling. Wash the part with water, dry, replace and apply a prepared corrosion protection spray.

ALWAYS LOAD TEST

Follow-up your hydrometer or open circuit voltage test with an adjustable load test to determine if the battery had adequate electrical performance. Follow the instructions on the tester or ask your Battery Town dealer to load test your battery. If the battery maintains a minimum "on load" voltage of 9.6 volts or 30 seconds, it is in good condition. If not, recharge and load test again. If it fails a second time, **REPLACE THE BATTERY IMMEDIATELY.**

Remember to keep sparks and flames away. **ALWAYS WEAR EYE PROTECTION** when working around batteries.

INSTALLATION TIPS

Wear safety glasses. Special care must be taken when installing a battery to avoid a serious explosion or accident.

If available, a computer memory saver should be used to save the vehicle's memory and avoid having to program. Follow the manufacturer's directions to carefully avoid damage to the computer and/or electrical system.

- 1 Mark the positive (POS) cable. Turn off all electrical accessories. Disconnect hood and trunk bulb if opened to cut off all current.
- 2 Carefully remove old battery, **disconnecting the ground cable first**, to avoid any dangerous sparking around the battery.
- 3 Battery tray should be thoroughly cleaned and inspected for defects. Use a paste made from baking soda and water to neutralize any acid or corrosion. Repaint if necessary. It should be held fast to supporting members to prevent vibration and road shock. Replace tray if necessary.
- 4 The battery should rest level in the tray. Be sure terminals will clear bonnet, mudguard etc.
- 5 The hold-down must be tightened until it is snug. Do not overtighten. Too much pressure on the battery case will cause damage to it internally and externally... causing an acid leak.
- 6 Cable terminals should be brushed until shiny and spread wide so that they will slip over the battery post without force. Do not hammer on them. Be sure marked POS cable is connected to POS (+) terminal. **Connect NEG(-) cable last to prevent dangerous sparks. DO NOT OVERTIGHTEN!** Its a good idea to install special corrosion retarding fibre washers around terminals to help extend terminal life.
- 7 Side terminal batteries need special care. **Overtightening the terminal bolts will severely damage the battery and could cause a dangerous explosion.** Use a special side terminal torque tool to avoid this hazard.
- 8 Coat the terminals and exposed metal parts around the battery with a good quality protective spray.

CHECK THE CHARGING SYSTEM

The voltage regulator should be checked every 10,000 kms or every time you change oil. It should be checked immediately if the battery is hot to the touch, if electrolyte is bubbling or spewing from the vents, if your hydrometer reading is below 1.225 or above 1.300, or if the open circuit voltage is below 12.4 volts or above 12.9 volts. Overcharging is evident by excessive water consumption and/or spewing or bubbling of electrolyte out of the vents. Undercharging is evident by slow cranking or lights dimming at idle.

CHARGING TIPS

Leave vent cap in place while charging.

Batteries should be charged if hydrometer reading is below 1.225 SG, or 12.4 open circuit volts, or the load test is below 9.6 volts.

Do not leave a battery on charge for more than 48 hours.

Stop the charge when two hydrometer or voltage readings recorded two hours apart indicate no increase. Further charging would be useless and may damage the battery and shorten its life. If the battery won't come up to full charge (1.260 SG or 12.6 volts), replace it.

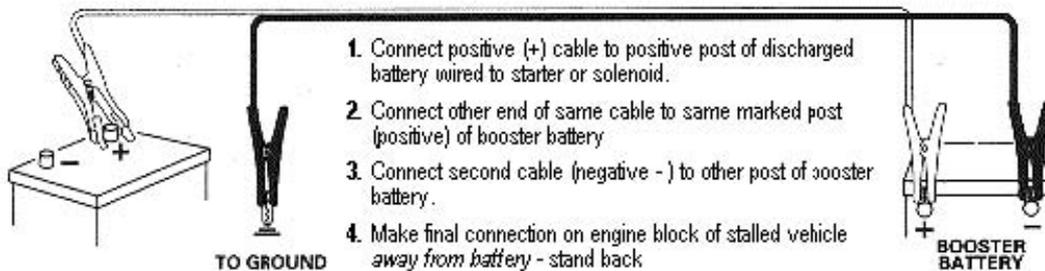
If violent gassing or spewing of electrolyte occurs or the battery case feels hot, reduce or temporarily halt charging to avoid damaging the battery.

NEVER attempt to charge a frozen battery! Allow it to warm to 60°F (15.5°C) before placing on charge. **Otherwise a dangerous explosion can occur.** NEVER leave a battery on a trickle charger longer than 48 hours. Otherwise, serious damage will occur. **Always leave vent caps in place to avoid explosion.**

12 VOLT BATTERY CHARGING TIME TO FULL CHARGE @27° C/80° F					
BATTERY VOLTAGE	STATE OR CHARGE	MAXIMUM RATE@			
		50 AMPS	30 AMPS	20 AMPS	10 AMPS
12.6	100%	— FULL CHARGE —			
12.4	75%	20 min.	35 min.	48 min.	90 min.
12.2	50%	45 min.	75 min.	95 min.	180 min.
12.0	25%	65 min.	115 min.	145 min.	280 min.
11.8	0%	85 min.	150 min.	195 min.	370 min.

JUMP STARTING YOUR BATTERY SAFELY

Shield eyes and face from batteries at all times! Be sure vent caps are tight and level. Place damp cloth over vent caps on both batteries. Be sure vehicles do not touch. Use a good quality spike protected booster cable set.



1. Connect positive (+) cable to positive post of discharged battery wired to starter or solenoid.
2. Connect other end of same cable to same marked post (positive) of booster battery
3. Connect second cable (negative -) to other post of booster battery.
4. Make final connection on engine block of stalled vehicle away from battery - stand back
5. Start both vehicles and remove cables in reverse order of connection. Discard the rags.

Source: Battery Council International.

