21 Battery check, maintenance and charging

Check and maintenance

Warning:
Certain precautions must be followed when checking and servicing the battery. Hydrogen gas, which is highly flammable, is always present in the battery cells, so keep lighted tobacco and all other flames and sparks away from it. The electrolyte inside the battery is actually dilute sulfuric acid, which will cause injury if splashed on your skin or in your eyes. It will also ruin clothes and painted surfaces. When removing the battery cables, always detach the negative cable first and hook it up last!

1 Battery maintenance is an important procedure which will help ensure that you are not stranded because of a dead battery. Several tools are required for this procedure **(see illustration)** .

21.1 Tools and materials required for battery maintenance

1 Face shield/safety goggles - When removing corrosion with a brush, the acidic particles can easily fly up into your eyes

2 Baking soda - A solution of baking soda and water can be used to neutralize corrosion

3 Petroleum jelly - A layer of this on the battery posts will help prevent corrosion

4 Battery post/cable cleaner - This wire brush cleaning tool will remove all traces of corrosion from the battery posts and cable clamps

5 Treated felt washers - Placing one of these on each post, directly under the cable clamps, will help prevent corrosion

6 Puller - Sometimes the cable clamps are very difficult to pull off the posts, even after the nut/bolt has been completely loosened. This tool pulls the clamp straight up and off the post without damage

7 Battery post/cable cleaner - Here is another cleaning tool which is a slightly different version of Number 4 above, but it does the same thing

8 Rubber gloves - Another safety item to consider when servicing the battery; remember that's acid inside the battery!

2 Before servicing the battery, always turn the engine and all accessories off and disconnect the cable from the negative terminal of the battery. The battery is located under the hood on four-cylinder 3-Series models and on 1996 Z3 models. On six-cylinder models and on 1997 and later Z3 models, the battery is located in the trunk **(see illustration) . Caution:** *If the radio in your vehicle is equipped with an anti-theft system, make sure you have the correct activation code before disconnecting the battery.*

21.2 The battery is located in the luggage compartment on six-cylinder 3-Series models and on 1997 and later Z3 models; it's under the first aid kit (shown) on 3-Series models, under a battery cover on Z3 models

3 The battery may either be a no-maintenance or a low-maintenance type. If it is a no-maintenance type, it will not be possible to remove the cell caps and check the level of electrolyte.

4 Remove the caps and check the electrolyte level in each of the battery cells **(see illustration)** . It must be above the plates. There's usually a split-ring indicator in each cell to indicate the correct level. If the level is low, add distilled water only, then install the cell caps. **Caution:** *Overfilling the cells may cause electrolyte to spill over during periods of heavy charging, causing corrosion and damage to nearby components.*

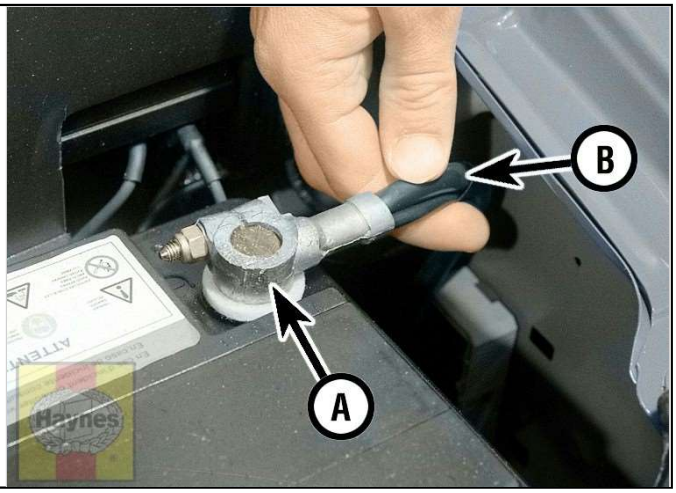
21.4 Remove the cell caps to check the water level in the battery - if the level is low, add distilled water only

5 If the positive terminal and cable clamp on your vehicle's battery is equipped with a rubber protector, make sure that it's not torn or damaged. It should completely cover the terminal.

6 The external condition of the battery should be checked periodically. Look for damage such as a cracked case.

7 Check the tightness of the battery cable clamps to ensure good electrical connections and inspect the entire length of each cable, looking for cracked or abraded insulation and frayed conductors **(see illustration)** .

21.7 Check the tightness of the battery cable clamps (A) to ensure good electrical connections. You should not be able to move them. Also check each cable (B) for cracks and frayed connections



8 If corrosion (visible as white, fluffy deposits) is evident, remove the cables from the terminals, clean them with a battery brush and reinstall them **(see illustrations)** . Corrosion can be kept to a minimum by installing specially treated washers available at auto parts stores or by applying a layer of petroleum jelly or grease to the terminals and cable clamps after they are assembled **(see illustration)** .

21.8a If corrosion (white, fluffy deposits) is evident, remove the cables from the battery terminals and clean the terminals . . .

21.8b . . . and the cable clamps

21.8c Battery corrosion can be kept to a minimum by applying a thin film of petroleum jelly to the clamps and terminals after they are reconnected

9 Make sure that the battery carrier is in good condition and that the hold-down clamp bolt is tight. If the battery is removed (see Chapter 5 for the removal and installation procedure), make sure that no parts remain in the bottom of the carrier when it's reinstalled. When reinstalling the hold-down clamp, don't overtighten the bolt.

10 Corrosion on the carrier, battery case and surrounding areas can be removed with a solution of water and baking soda. Apply the mixture with a small brush, let it work, then rinse it off with plenty of clean water.

11 Any metal parts of the vehicle damaged by corrosion should be coated with a zinc-based primer, then painted.

12 Additional information on the battery and jump starting can be found in Chapter 5 and the front of this manual.

Charging

Note:
The manufacturer recommends the battery be removed from the vehicle for charging because the gas which escapes during this procedure can damage the paint or interior, depending on the model. Fast charging with the battery cables connected can result in damage to the electrical system.

13 Remove all of the cell caps (if equipped) and cover the holes with a clean cloth to prevent spattering electrolyte. Disconnect the negative battery cable and hook the battery charger leads to the battery posts (positive to positive, negative to negative), then plug in the charger. Make sure it is set at 12-volts if it has a selector switch. **Caution:** *If the radio in your vehicle is equipped with an anti-theft system, make sure you have the correct activation code before disconnecting the battery.*

14 If you're using a charger with a rate higher than two amps, check the battery regularly during charging to make sure it doesn't overheat. If you're using a trickle charger, you can safely let the battery charge overnight after you've checked it regularly for the first couple of hours.

15 If the battery has removable cell caps, measure the specific gravity with a hydrometer every hour during the last few hours of the charging cycle. Hydrometers are available inexpensively from auto parts stores - follow the instructions that come with the hydrometer. Consider the battery charged when there's no change in the specific

gravity reading for two hours and the electrolyte in the cells is gassing (bubbling) freely. The specific gravity reading from each cell should be very close to the others. If not, the battery probably has a bad cell(s).

16 Some batteries with sealed tops have built-in hydrometers on the top that indicate the state of charge by the color displayed in the hydrometer window. Normally, a bright-colored hydrometer indicates a full charge and a dark hydrometer indicates the battery still needs charging. Check the battery manufacturer's instructions to be sure you know what the colors mean.

17 If the battery has a sealed top and no built-in hydrometer, you can hook up a voltmeter across the battery terminals to check the charge. A fully charged battery should read 12.6-volts or higher.

18 Further information on the battery and jump starting can be found in Chapter 5 and at the front of this manual.