

## ALTERNATOR INSTALLATION INSTRUCTIONS

Please read the following warnings and instructions to ensure a successful installation. Failure to follow these instructions may damage your alternator and void your warranty.

### SAFETY TIPS

- Do not disconnect any electrical cables or wiring while the engine is in operation.
- Wear appropriate safety gear when working on a vehicles' electrical and charging system. Battery acid is caustic and may become explosive.
- Alternator damage can occur if the battery is not fully charged or is defective.
- Disconnect the negative battery cable prior to performing work on the vehicle's electrical and charging system.
- Prior to performing a repair, ensure the vehicle is in park or neutral (manual transmission). Ensure the emergency brake is set and the wheels are chocked.
- Do not perform work on the vehicle while it is in operation.
- Keep hands, shirt sleeves and tools away from moving and/or rotating parts.

### PRIOR TO REMOVAL

#### **THE BATTERY:**

The battery is the most important component of the electrical system. A bad or undercharged battery will cause premature alternator failure. A fully charged battery will have a voltage reading of 12.6 volts or higher. In order for the alternator to function properly the battery must have a minimum voltage reading of 12.4 volts (75%) or higher. To verify the battery's ability to produce sufficient power, a load or conductance test should be performed (ask your parts store professional for details).



Battery Test

#### **CABLES AND CONNECTIONS:**

Corroded, loose or spliced connections are a common cause of problems. Replace bad cables and clean all corrosion prior to starter replacement. Check fuses and fusible links.



Corroded Cable Connection

#### **EXTERNAL VOLTAGE REGULATORS:**



Many older vehicles use a remote mounted voltage regulator. The remote voltage regulator will usually be mounted on the firewall or the fender well. It is a good practice to always change the external voltage regulator at time of alternator replacement. (See the unit specific Tech Tip for more information)

### **REVIEW ANY ADDITIONAL ENCLOSED INSTALLATION OR TECH TIPS**

## **ALTERNATOR REMOVAL**

### **1. Disconnect negative battery cable**

Ensure battery and cable ends are clean and free of corrosion.



Corroded Battery



Battery without corrosion

#### **TIP!**

Use a memory keeper for your car's electronic devices. Disconnecting the battery will erase the vehicles computer memory, PIN codes and settings for the radio and other electronic devices, unless you use a memory keeper. Temporarily remove the cigarette lighter and plug the memory keeper into the lighter socket. If you do not have this device make sure you have all of the PIN numbers for your electronic equipment before you start.



Example of Memory Keeper

### **2. Remove cable and wire connections from alternator**

Note location of each wire for proper reconnection on replacement alternator.

### **3. Remove alternator**

- **With adjustment ear on alternator-** Loosen pivot and adjusting bolt, rotate alternator and remove belt. Remove bolts and alternator.
- **With automatic tensioner-** Remove belt using proper tool to release belt tension, then remove mounting bolts and alternator.
- **With manual tensioner-** Loosen tensioner nut then loosen adjusting bolt to remove belt. Remove mounting bolts and alternator.

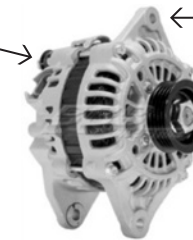
### PRIOR TO INSTALLATION

#### **1. Compare replacement unit with original**

Is the plug the same?



Are the mounting holes the same?



Is the pulley the same?

#### **2. Inspect belts**

Belts should be changed every 60,000 miles or 5 years whichever comes first. Inspect belts for wear, cracks, fraying, uneven wear, abrasions, piling, fluid contamination, damage or glazing (shiny). Replace if necessary.

#### **3. Clean all mounting surfaces**

Mounting surfaces provide the electrical ground to the alternator.

#### **4. Make sure the pulleys on the old and on the replacement alternators are the same.**

If necessary, exchange pulleys, noting spacer and washer locations. Use a 1/2" impact gun to ensure pulley nut is tight (torque to 65-80 ft. lbs.).

## **INSTALLATION**

### **1. Install Alternator**

Install unit onto alternator bracket and install mounting hardware. For vehicles with belt tensioner, tighten bolts. For alternators with adjusting ear install bolts, tighten only finger tight.

### **2. Install Belt**

- **With adjustment ear on alternator-** Position belt(s) on pulley(s). Apply leverage to alternator front housing to achieve correct belt tension as per manufactures specifications. Typical belt deflection is 3/8" to 1/2" when pressed midway between the two farthest pulleys. Tighten mounting bolts.

- **With automatic belt tensioner-** Use proper tool to release tensioner. Position belt on pulleys as per under hood diagram. Allow tensioner to tighten belt.

- **With manual belt tensioner-** Place belt over correct pulleys and tighten tensioner until belt tension meets the manufacturers requirements. Tighten tensioner lock nut.

### **3. Re-connect alternator electrical connections.**

Tighten the battery post nut to 50-70 inches per pound.

*DO NOT OVERTIGHTEN THE BATTERY POST NUT.*

### **4. Inspect installation**

Inspect wiring, connections and fuse links for worn insulation, breaks or corrosion. Bad connections and corrosion can cause a good alternator to overcharge due to resistance. Repair as necessary. Make sure that all wires have been connected correctly and that there are no pinched wires or shorts the to ground. Verify that belts are properly installed.

### **5. Connect negative battery cable**

### **6. Start Engine**

Run engine at idle for 10 minutes. Increase engine speed to 2000 RPM and check voltage at the battery with a voltmeter. Typical voltage with no loads on should be between 13.5 and 15.2 volts. Check charging system lamp and gauge on instrument panel for proper operation. Refer to basic trouble shooting section if any problems are indicated.

### **7. Recheck belt tension**

Turn off engine and recheck for proper belt tension.

## **BASIC TROUBLE SHOOTING**

All trouble-shooting tests must be performed with a known good battery. It is not possible to properly perform these tests without a fully charged battery.

### **Charge Indicator Lamp On**

**Clear any stored trouble codes on computer controlled systems** – If codes are not cleared the indicator light will remain on.

**Check fuses** – A fuse protects most charge indicator lamps.

**If externally regulated, check regulator as per manufacturer's instructions.**

## **High Voltage**

**If externally regulated, check regulator as per manufacturer's instructions.**

**If internally regulated check for loose or corroded connections, poor vehicle grounds or a loose or corroded voltage regulator plug.**

**Perform voltage drop test as described below.**

## **Low Voltage**

**If externally regulated, check regulator as per manufacturer's instructions.**

**Inspect all connections** – Bad cable connections or a weak battery usually causes bad voltage readings. Perform cable voltage drop test on both the positive and negative circuits.

## **VOLTAGE DROP TEST**

**Negative voltage drop** –Connect negative lead of voltmeter to alternator case, connect positive lead of voltmeter to battery negative post. Crank engine and run at 2000 RPM with headlights on. Record the voltmeter reading. Total voltage drop should not exceed 0.25 volts. If greater than 0.25 volts, repair or replace cables as necessary.



Negative Voltage Drop Test

**Positive voltage drop** – Connect positive lead of voltmeter to alternator positive post. Connect negative lead of voltmeter to battery positive post. Crank engine and run at 2000 RPM with headlights on. Record voltmeter reading. Total voltage drop should not exceed 0.25 volts. If voltage drop is greater than 0.25 volts, the cables are likely damaged. Repair or replace cables as necessary.



Positive Voltage Drop Test

## **CHECKLIST**

1. Using a volt meter, voltage should be 12.6 or higher prior to starting and at least 14.2 after starting (with all accessories off) [Voltage on some units may take a minute or so to stabilize]
2. Battery load tested and/or replaced
3. Correct alternator for the Year, Make, Model and Engine Size
4. Battery and load carrying cables are clean and free of corrosion
5. Check for loose grounds and wire connections
6. Check alternator wiring connections for corrosion
7. Reset onboard computer
8. Check belt, tensioner and idler pulley for wear and belt for correct tension