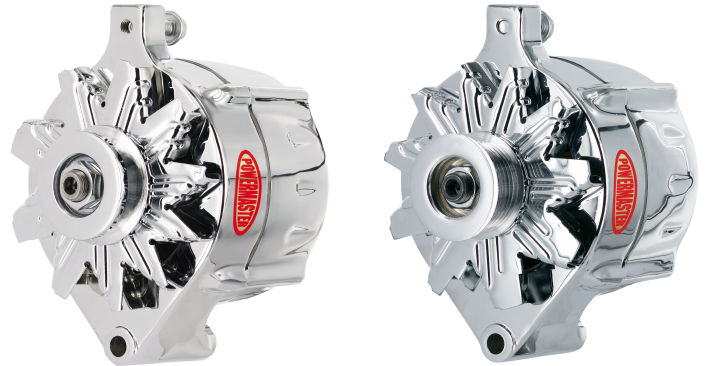


# INSTRUCTION SHEET

## Ford Upgrade One Wire Alternators



The box contains: (1) alternator, (1) adjusting bolt

### PLEASE KEEP IN MIND...

- ALWAYS wear eye protection when working around batteries.
- ALWAYS disconnect battery ground terminal and cable assembly before replacing electrical components.
- NEVER disconnect a battery cable or alternator cable and wires when engine is running. Transient voltages (spikes) are produced when this occurs and some of these voltages exceed 200 volts. This can cause alternator voltage regulator or engine computer failure.
- AVOID short circuits. When working with live circuits, never jumper between terminals or from terminals to ground, nor try to trouble shoot by "sparking" terminals. Always use a quality voltmeter to check the operation of live circuits.
- CHECK the battery. Alternators and batteries work together. It is important that the battery be in good condition and fully charged when replacing the alternator. Do use an alternator to charge a dead battery.

## INSTALLATION

These instructions are provided as supplementary information to the factory service manual instructions for alternator replacement.

### DISCONNECT THE BATTERY.

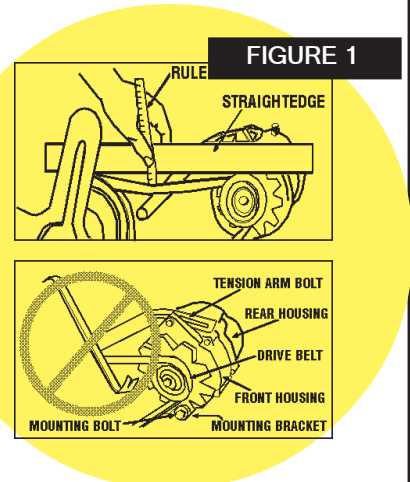
**REMOVE THE OLD ALTERNATOR.** See the factory service manual for more details.

### INSTALL THE NEW ALTERNATOR.

- ◆ If the belt system on the vehicle is not compatible with the Power-

master alternator, change pulleys per the instructions on the reverse side of this form. For optimum performance use the pulley that is installed on the Powermaster alternator. In many cases the OE pulley can be reused on the Powermaster alternator if necessary.

- ◆ Mount the alternator and check for interference with the brackets or other engine components. *Start the bolts but do not tighten them at this time.*
  - ◆ Check for proper belt alignment. Proper alignment is critical for serpentine belts. In cases where the supplied alternator pulley has more grooves than necessary, seat the belt as close as possible to the alternator.
  - ◆ Adjust belt tension and tighten belt tension bolt as illustrated in Figure 1. Do not use heavy tools to pry on alternator case; hand pressure is adequate. Most serpentine belt system use a spring loaded automatic belt tensioner. When an automatic tensioner system is not installed as is common with "V" belts, tension the belt to the engine manufacture's specification. This is typically half an inch of deflection.
  - ◆ Tighten all other bolts.
  - ◆ Run a new 8 AWG stranded wire suitable for automotive use from the alternator to the positive post of the battery or the battery side of the starter relay. Be sure this wire is secured in the engine compartment and out of the way of moving parts. Your speed shop has Powermaster charge wires for this purpose. The Powermaster charge wire should be used in place of the OE. If the vehicle has an external voltage regulator, this should be unplugged.
- Note that this Powermaster alternator is a "one wire" alternator. This means that it only requires the battery cable to operate.



Additional wires connected to the alternator provide optional features such as charging system indicator light function but are not required.

## CONNECT THE BATTERY.

### SYSTEM CHECK

- ◆ Apply a moderate load to the charging system (i.e., high beam headlights and A/C for example) and bring the engine to 1,500rpm. Using a digital voltmeter measure the DC voltage from a metal point on the case of the alternator to the negative battery terminal. Readings higher than 0.10VDC indicate a poor ground connection. Check the ground path including any paint or anodizing on the brackets, the engine ground strap, and the ground cable from the frame to the battery. (See figure 2).

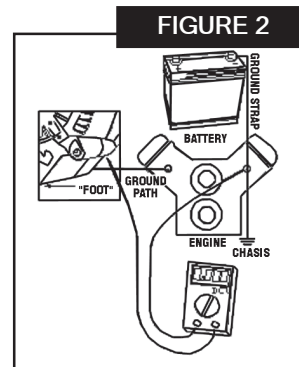


FIGURE 2

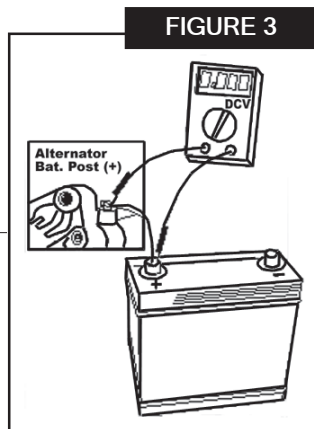


FIGURE 3

- ◆ With battery fully charged and engine running at 1,500rpm, measure the voltage at battery positive post (+) and the ground post (-). Voltage should be 13.8~14.5VDC. Readings above 15.5VDC indicate a defective alternator and readings below 12.7VDC indicate that the alternator is not functioning or cannot supply the present amperage needs of the vehicle at this engine speed.
- ◆ Using the voltmeter, measure the voltage drop between the battery positive post (+) and the alternator output post (See figure 3). Voltage should be less than 0.40VDC. If voltage is higher than 0.40VDC, check for poor connections between the alternator and the battery. Possible causes are under sized battery cables, loose or improperly crimped terminals, and corroded connections.

### A Word About "Indicator Lights"...

Some Fords came OE with an indicator light on the dash to signal the alternator's state during operation. Under normal operation the light should come on any time the ignition switch is on and the engine is stopped. When the alternator is not functioning and the engine is running, the light will come on to warn the driver of this condition. OE alternators require that this circuit function for proper alternator function whereas Powermaster alternators do not require this. The light will simply be off at all times.

Optionally this indicator light function can be used on a Powermaster alternator in vehicles with a factory voltmeter by removing the black rubber cover on the side of the alternator and connecting the indicator light circuit to the #1 terminal of the Powermaster alternator. **Vehicles with a factory ammeter cannot use this function.**

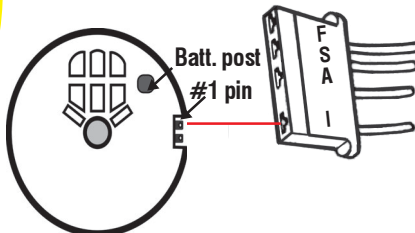
### Need to change a pulley?

To remove the alternator pulley, use an air impact wrench to loosen the nut with one hand, while holding the alternator pulley with the other. It is recommended that protective gloves and eyewear be used. If an air impact wrench is not available, a 5/16" hex bit socket and ratchet can be used to hold the alternator shaft, while a typical 15/16" boxed-end wrench can be used to loosen the nut. The pulley nut uses standard, right-hand threads. So to remove, rotate in a counterclockwise direction.

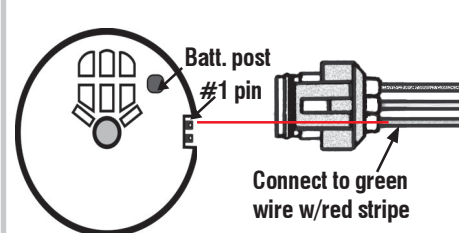
Install the replacement pulley, lock washer, and nut by hand.

Torque the pulley nut to 70 ft. lbs. and be certain the lock washer is completely closed. Do not over tighten.

### 1966~1985 WITH EXTERNAL REGULATOR AND FACTORY VOLTMETER



### 1986~1993 WITH INTERNAL REGULATOR AND FACTORY VOLTMETER



### Why is my voltage low when I'm cruising around at a show or sitting at a traffic light?

All alternators have an output curve that increases with RPM. In other words, your alternator cannot provide as many amps at idle as it can at higher speeds. If your car demands more amperage than the alternator can supply at idle, the remaining amps must come from the battery thus a decrease in voltage results. Any after market pulleys that slow the alternator relative to the engine [i.e. power pulleys] can greatly magnify this problem.

### Why does my voltage test good at the alternator but low at the battery and fuse box?

Any resistance in the electrical path will decrease voltage. This includes all positive and negative conductors and connections between the alternator and the second test point. All connections must be secure and free of corrosion. All ground points must be free of paint and rust. Charging wires must be of adequate size for the amperage capabilities of your alternator. Improving any weak points in the electrical paths should bring voltage readings to within 0.5 volts of each other.

### So what is the difference between a one wire and a "three wire" hookup?

The difference is the way the alternator is switched on. With one wire operation the alternator internally senses its rotation and switches its self on. With "three wire" operation an external exciter wire switches on the alternator. Three wire operation is as your vehicle's original manufacture intended and assures that the alternator is switched on anytime the engine is running. "Three wire" is an industry term that describes a situation that in most cases can be accomplished using only two wires [the exciter wire and the charge wire].