INSTRUCTION SHEET

1G OVERSIZE

We want to help! If you have any comments or difficulty with this product, please contact technical support at

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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.**

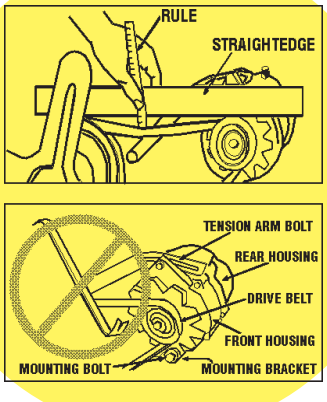
DISCONNECT THE BATTERY.

REMOVE THE OLD ALTERNATOR. See the factory service manual for more details. Be sure to label all wires before removing to assure proper reinstallation and location.

INSTALL THE NEW ALTERNATOR.

- If the belt system on the vehicle is not compatible with the Powermaster 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. 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.

FIGURE 1



- Tighten all other bolts.
- Reconnect all wires and check labeling for correct location. Refer to the "Wiring Instructions" below.

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 the a bare 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

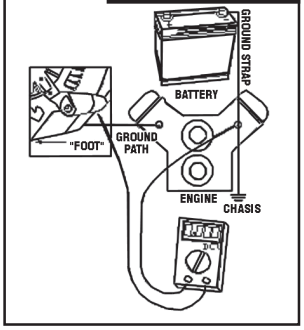
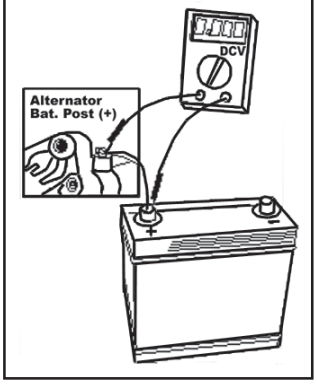


FIGURE 3



- 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 current amperage needs of the vehicle at this engine speed.

- Using the voltmeter, measure the voltage drop between the batty positive post (+) and the alternator output post (See figure 3). Voltage should be less that 0.40VDC. If voltage is higher that 0.40VDC, check for poor connections between the alternator and the battery. Possible causes are unsized battery cables, loose or improperly crimped terminals, and corroded connections.

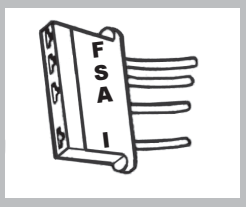
WIRING INSTRUCTIONS

Battery connection when using the alternator in a single battery charging system- To take advantage of the alternator's dual rectifiers, keep the supplied dual output bridge cable in place. Connect the battery's charge post to either of the unit's output post. If your vehicle's original alternator is the same design and had a ground wire that originally went to a small terminal on the alternator, **do not** reconnect this ground wire (it is not needed and could cause a short).

Battery connection when using the alternator in an isolated / dual battery charging system- Remove the supplied jumper wire from the alternator's two output posts and discard. Connect each battery's charge wire to either of the two alternator output posts. The unit's rated amperage will be distributed between the two outputs. For example, if the primary battery requires only 40 amps, the secondary battery/batteries will have the alternator's remaining amperage available.

External voltage regulator and wiring

If your vehicle already has a compatible alternator plug, simply plug it in. Locate the external voltage regulator and replace it with the supplied Powermaster heavy duty regulator.



Custom installations and wiring- If your vehicle is not already set up for this alternator, carefully follow these wiring instructions using the supplied alternator pigtail and external voltage regulator. Your local retailer will have a pigtail connector the for voltage regulator if required.

The **F** terminal on the supplied regulator should be connected to the *yellow* wire on the alternator pigtail, which corresponds to the FLD pin on the alternator.

The **S** terminal on the supplied regulator should be connected to the *green* wire on the alternator pigtail, which corresponds to the STA pin on the alternator.

The **A** terminal on the supplied regulator should be connected to the positive post of the primary battery using a 14 AWG or larger wire.

The **I** terminal on the supplied regulator should be connected to one side of either a typical 250 mA dash indicator light **OR** a resistor (Radio Shack P/N 271-1105). Ignition switched +12 volts should be supplied to the other side of the light or resistor. This is the circuit that switches the alternator and regulator on with the car.

The case of the supplied regulator must be mounted to a bare metal location on the vehicle's body that offers a ground path to battery ground. This is a required ground connection for the regulator.

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 counter-clockwise direction.

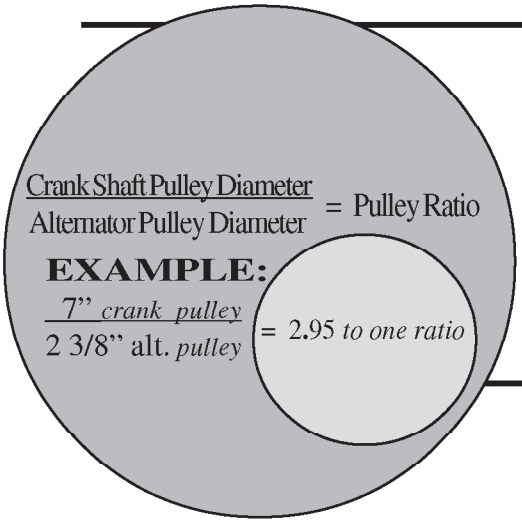
Install the V-belt pulley, lock washer, and nut by hand.

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

WARNING

This alternator should not be allowed to exceed 18000 RPMs at any time. Alternator components are not designed to withstand the increased stress resulting from excessive RPMs.

Powermaster recommends that you calculate your pulley ratio and multiply it times your highest expected engine RPM to determine if your alternator will operate within the acceptable range.



To calculate a vehicle's pulley ratio, the engine's crank pulley diameter should be divided by the alternator's pulley diameter. This ratio should then be multiplied times the highest expected engine RPMs. The result will be that vehicle's maximum alternator RPM.

(Pulley Ratio) **x** (Max. Engine RPM) = Max. Alternator RPM

2.95 **x** 6000 *max. rpm* = 17700 *max. alternator rpm*

If your situation allows for greater than 18000 alternator RPMs, Powermaster recommends increasing the alternator pulley diameter or decreasing the crank pulley diameter to compensate. Powermaster has various pulleys available to help. If pulley ratio compensation is not an option, installing a rev limiter on the engine is recommended.

Excessive RPMs can cause the alternator fan to flex and contact the drive belt. This could cause property damage and/or personal injury. In addition to RPMs, there are other factors that will substantially increase the likelihood of alternator fan-to-belt contact.

☑ ***ALTERNATOR BRACKET ALIGNMENT AND STABILITY*:**
Alternator brackets can be misaligned in such a way that the clearance between the alternator fan and belt is reduced. Loose or nonrigid brackets can also increase the likelihood of contact.

☑ ***WORN OR LOOSE BELTS*:**
Belts that allow for side-to-side movement or deflection will decrease the effective gap between the fan and belt and increase the likelihood of contact.

☑ ***IMPROPER BELTS*:**
Powermaster supplied V-type pulleys are designed to accommodate up to a 10mm or 3/8" belt. Larger belts will not seat into the pulley groove properly and will increase the likelihood of belt-to-fan contact. If the application requires a belt of greater than 10mm or 3/8" width, Powermaster recommends the original equipment pulley be used instead of the supplied pulley.

NOTE: Powermaster is not responsible for vehicle damage or any other damage resulting from improper use of this product.

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WE WANT TO HELP YOU!

Returning this product is expensive and time consuming for you, your retailer and for us, the manufacturer.
Should you encounter any problems with your new product, please refer to the included instructions.

If you still need assistance, call our tech line at:
(630) 849-7754
(in the USA)

You may also contact us by e-mail at tech@powermasterperformance.com

Thank You!