

# INSTRUCTION SHEET

**GM CS Series Performance Alternators**  
17802, 17861, 37802, 37861, 48206, 48208, 48229

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.

## 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. Remove the belt noting its routing and then remove the alternator. Be sure to label all wires before removing to assure proper reinstallation and location. Compare the new alternator to the old alternator.

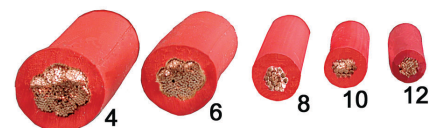
The "clocking" or the location of the back housing of the alternator when compared to the front housing should be the same. If not, refer to the clocking instructions on the reverse side of this form.

### 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. Tighten all the bolts.
- ◆ 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.
- ◆ Install the belt per the factory service manual instructions.
- ◆ Reconnect all wires and check labeling for correct location. If the Powermaster alternator is of a higher amperage than the alternator that came OE on the vehicle then Powermaster recommends upgrading the battery output cable from the alternator. Your local speed shop has optional charge wires for this purpose.

### CONNECT THE BATTERY.

AMPS	Recommended Charging Cable Gauge Size				
	Up to 4'	4' - 7'	7' - 10'	10' - 13'	13' - 16'
125-150	6	6	4	2	2
175-200	4	4	2	2	0



## 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 1).
- ◆ 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.

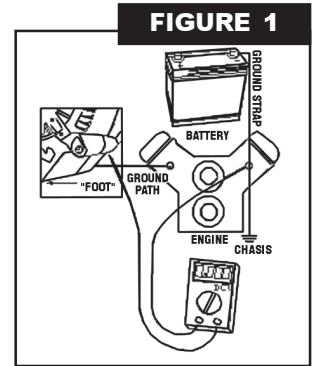


FIGURE 1

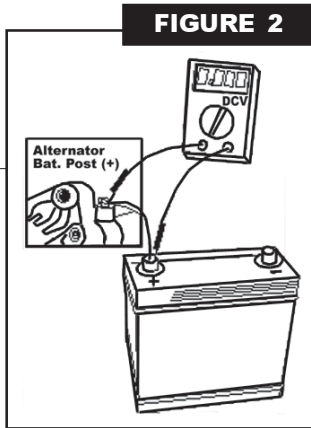


FIGURE 2

- ◆ Using the voltmeter, measure the voltage drop between the batty positive post (+) and the alternator output post (See figure 2). 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.

## GENERAL CLOCKING INSTRUCTIONS

Some vehicle applications may require the rear housing of the alternator to be “re-locked” or turned relative to the front housing. Powermaster ships all alternators clocked to fit most applications, however, it may be necessary for the installer to re-clock the unit to accommodate rear brackets or to allow the factory harness to reach.

### Recommended Re-clocking instructions:

1. Remove the pulley using an impact wrench (rotate the nut in a counter-clockwise direction to remove). Remove the nut, lock washer, pulley, fan, and the shaft spacer. Stand the alternator up on the pulley shaft with the output post of the alternator toward you.
2. Remove the four bolts that hold the two housings together.
3. Using a rubber mallet, tap the front housing downward while keeping the unit resting on its pulley shaft. The steel stator ring between the housings will stay with the rear housing. The shaft and rotor assembly should also stay with the rear housing. *Note: there is a second shaft spacer between the front housing and the rotor assembly. Make certain that this spacer remains in place. DO NOT allow the pulley shaft to come out of the rear housing as this may release the brushes.*
4. Turn the front housing to the required position in relation to the rear housing.
5. Reinstall the housing bolts and tighten evenly. Do not over tighten.
6. Reinstall the spacer, fan, pulley, lock washer, and nut in that order.
7. Tighten nut with impact wrench until lock washer is completely closed and nut is tight.

### ***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.

### **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?**

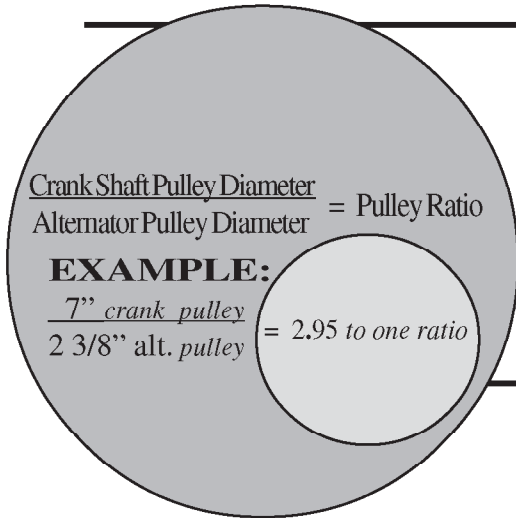
Any resistance in the electrical path will decrease voltage. This includes all positive *and* negative conductors and connections between the alternator and the second test point. All connections must be secure and free of corrosion. All ground points must be free of paint and rust. Charging wires must 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.



# 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.

$$(\text{Pulley Ratio}) \times (\text{Max. Engine RPM}) = \text{Max. Alternator RPM}$$

$$2.95 \times 6000 \text{ max. rpm} = 17700 \text{ max. alternator rpm}$$

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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## **CHRYSLER UPGRADE INSTRUCTIONS**

Model # 8-37529, 8-47529, 8-57529, 8-37539, 8-47539, & 8-57539

### **GENERAL INSTRUCTIONS**

This alternator upgrade is designed to give early model Chrysler owners a high amp option to Mopar early style alternators. This upgrade works on applications where the Mopar style unit uses a spacer between the ears on the saddle mounting foot. If this unit does not fit your application, please contact Powermaster tech at 1-800-862-7223 ext. 208.

The aluminum spacer supplied should be installed between the engine head and the large 2" mounting ear on the new alternator. Install the original bolt through the stock triangular bracket, the alternator mount, the supplied spacer, and then into the engine head.

**140 amp unit-** After installation, the alternator's fan may slightly contact the factory bracket when turned. If this is the case, remove material from the side of the bracket using a grinder or belt sander.

**200 amp unit-** This unit should bolt on with no bracket modification. The threaded bushing in the outside mounting ear of the alternator should be rotated with a wrench until it offers the greatest possible clearance between the alternator fan and the factory bracket. This should be done prior to tightening the threaded alternator mount.

## *INSTALLATION INSTRUCTIONS*

1. Disconnect the negative cable from the battery.
2. Remove the wiring from the original alternator.
3. Remove the belts, the mounting bolts, and the alternator.
4. Install the Powermaster alternator using the long bolt that was removed from the original alternator for the main mount, and the supplied bolt for the threaded alternator mount.
5. Reinstall the belts and tighten all bolts.
  - The original belts can be used if they are not worn and are of correct length to allow proper belt tension.
  - If the belts are worn, too long, or too short, they should be replaced with the proper belts for the application.
6. Install the charge wire from the alternator to the battery and make all connections.
  - This is a “one wire” alternator, so the battery charge wire is the only connection required for operation.
  - Powermaster recommends the battery charge wire be upgraded to an 8 AWG wire for the 140 amp unit and a 6 AWG wire for the 200 amp unit. Inline ammeters must also be upgraded to handle the alternators rated power if they are to be used (Powermaster recommends that ammeters be replaced with a voltmeter).
7. Reconnect the negative battery cable. Before starting the engine, make sure the battery is fully charged (12.5V or higher). Do not use the alternator to charge a battery that is severely discharged.
8. Start the engine. Accelerate the engine to a fast idle and check the voltage using a hand held digital voltmeter.
  - Voltage at the alternator should read 14.0-14.5 with the meter’s positive probe on the gold charge post and the negative probe on a bare metal or chrome position on the alternator’s case.Voltage measured at the battery should yield a reading that is within 0.4 of the alternator’s voltage. Measure the battery’s voltage with the meter’s probes on the positive and negative posts. If the difference is greater than 0.4 of a volt, check to see if the charge wire and ground path to the battery are adequate.