

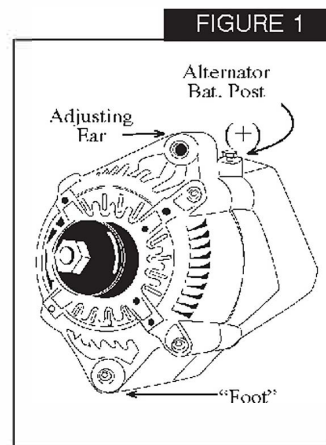
# INSTALLATION INSTRUCTIONS

## Racing Alternator

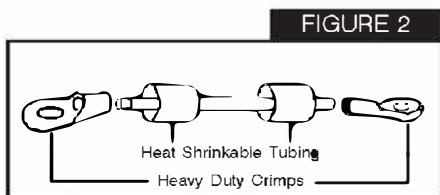
**Notice:** This unit has been built for racing applications. Therefore certain precautions and installation procedures should be followed closely. If you are installing the alternator w/pulley end toward the driver (i.e., supercharger application) be sure to use an alternator designed for CCW cooling.

### PRE-INSTALLATION CHECKS

1. Always use a new or a known fully charged racing battery (12.7-13.0 volts DC). 80-90% of all alternator failures are due to weak or defective batteries.
2. This racing alternator has a black thermal coating which has insulating properties electrically. Care should be taken to insure a good ground at the "foot" of the alternator and "adjusting ear" to the engine block. (See Figure 1).
3. Make sure battery ground (-) is disconnected to prevent sparks or arcing during installation.
4. Carefully check all electrical connections at alternator and battery. Check ground cables and connections. Look for broken or frayed wires and use dielectric grease when making final battery and alternator connections. This keeps oxides from forming and aids electrical contact.



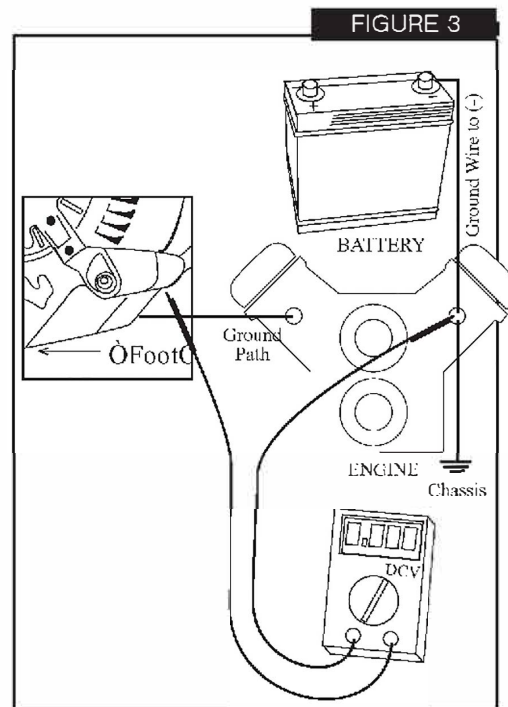
Use only welding type cable (i.e., multi-strand, highly flexible wire) and heavy duty crimps and adhesive sealing heat shrink tubing (See Figure 2).



5. Use care in handling the alternator. Do not drop it, hammer on the case, pry against the case to tighten the belt, etc. The rotor and stator are built to very close tolerances and this could cause internal rubbing and subsequent failure.

### INSTALLATION

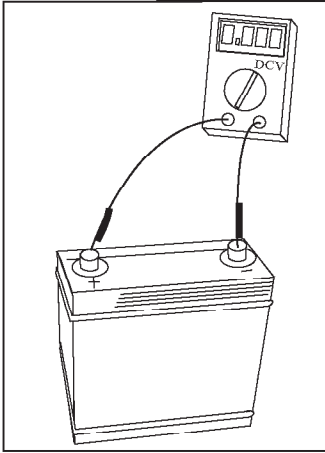
1. Install pulley of your choice and use the pulley nut supplied. (Discard pulley nut spacer.)
2. Install with quality brackets and bolts.
3. Use care when tightening belt. Do not over tighten belt. Allow 1/2" belt deflection.
4. Attach battery (+) cable to alternator B+ output post. Reattach ground wire to the battery.
5. Start engine and apply a moderate load (30 amps approx.) to charging system. With a digital voltmeter set for DC volts and with one test lead on the grounding bolt at the "adjusting ear" and the other test lead on a good grounding point on the engine block, measure to see if you have DC volts present. If you have a reading of 0.10VDC or higher, you have a poor ground connection between alternator and engine block. Recheck your alternator grounding points at the "foot" or "adjusting ear". (See Figure 3).



To check ground voltage drop, set DVM to DC Volts and read voltage between alternator foot bracket or adjusting ear and battery ground (-) terminal. Voltage should be less than 0.10VDC. A higher reading indicates a poor ground.



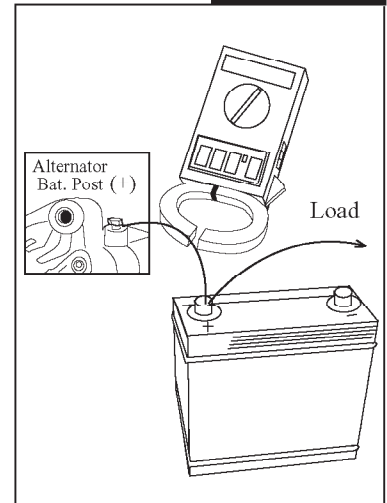
FIGURE 4



To check **charge voltage**, set DVM to DC volts and read voltage. A fully charged battery with engine running will read 14.5-14.9VDC. Voltage will drop.

6. Using the voltmeter, measure the voltage drop between the (+) terminal of the battery and the alternator (+) output terminal (See Figure 5). Voltage should be less than 0.30VDC. If voltage is higher than 0.30VDC, check for poor connections or undersized wire between (+) of alternator (⊕) of battery.
7. With battery fully charged and engine running, check voltage at battery (+) post and ground post (-). (See Figure 4). Voltage should be 14.5-14.9VDC. The voltage could be low for two reasons:
  - s Amp demands are exceeding alternator capacity at this RPM.
  - s Charge wire size too small or poor connections.

FIGURE 5



To check **positive voltage drop**, set DVM to DC volts and with engine running check voltage between alternator battery post and (⊕) battery post on battery. Voltage should be less than 0.40VDC. If greater, replace alternator charge cable.



# DENSO ALTERNATORS



The XSvOLT alternators have a state of the art voltage control system that offers a combination of features and options never before available.

**PLEASE READ ALL INSTRUCTIONS BEFORE INSTALLING YOUR NEW ALTERNATOR.**

## GENERAL INSTRUCTIONS

**\*THIS IS A "ONE WIRE" ALTERNATOR, SO THE BATTERY CHARGE WIRE IS THE ONLY CONNECTION REQUIRED FOR STANDARD ALTERNATOR OPERATION. XSvOLT UNITS COME FACTORY SET AT 14.9V FOR STANDARD USE.**

**Original vehicle wiring-** The import style round factory plug and harness should **NOT** be plugged into the Denso style XSvOLT alternator.

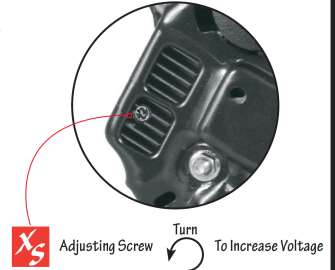
**HIGHER VOLTAGE CANNOT COMPENSATE FOR TOO SMALL AN ALTERNATOR-** The voltage level of the XSvOLT system can only be maintained if the alternator is operating at or below its amperage capability. If the vehicle's amperage load is greater than the alternator's capability, then the supplemental amperage will have to be supplied by the battery, which will cause voltage to fall. Once this situation has occurred, increasing the alternator's voltage set point will not remedy the low voltage.

**EXCESSIVE VOLTAGE CAN DAMAGE ELECTRICAL COMPONENTS-** Increasing the voltage level beyond typical levels can increase certain electrical component performance, but excessively high voltage can be damaging. Refer to the component owner's manual or contact the manufacturer to determine the maximum voltage for safe operation of all aftermarket electrical components. **For all original equipment components, voltage should not be allowed to exceed 15.2 volts. Powermaster is not responsible for damage resulting from voltage levels exceeding component manufacturer's recommendations.**

## OPTIONAL FEATURES [ The following options are available, but their activation is not required ]

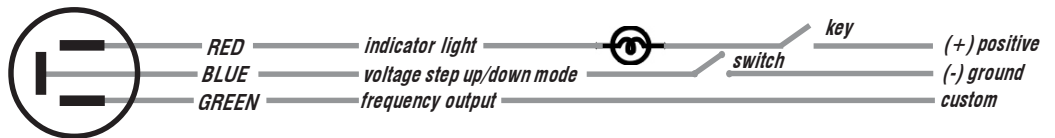
**Adjustable voltage set point-** This feature allows the end user to adjust the voltage level that the alternator sees as its ultimate goal. This is accomplished by turning the small white potentiometer located in the **Heat sink** on the rear of the alternator. Make adjustments with a small Philips or flat screwdriver, taking care not to rotate the potentiometer beyond its physical limitations. The approximate adjustable range is 13.5V through 18.5V and increases with **counter clockwise** rotation.

To adjust, first, **TURN OFF** all nonessential vehicle accessories. Next, confirm the battery is in a charged state by using a hand-held digital voltmeter to test voltage at the battery terminals (12.4V+ if 12 volt system/16.5V+ if 16 volt system). **Start the vehicle** and adjust system voltage (measured at the battery) to the desired level. After the adjustment is set, bring the engine to a fast idle while monitoring the voltage, if voltage increases, readjust to desired voltage level while maintaining a fast idle. (see page 2 for additional instructions and precautions)



**WARNING: MAKE ADJUSTMENTS WITH ALL NONESSENTIAL VEHICLE ACCESORIES OFF. ADJUSTING VOLTAGE WITH AMPLIFIERS, LIGHTS, OR OTHER HIGH AMPERAGE ACCESORIES ON CAN RESULT IN DANGEROUSLY HIGH VOLTAGE WHEN ACCESORIES ARE THEN SWITCHED OFF.**

**NOTE: Activating secondary optional features requires Denso style XSvOLT plug/harness P/N 129. Before inserting, remove plastic cover on rear of alternator.**



**INDICATOR LIGHT-** This is an output for a NO CHARGE indicator light. When this feature is utilized, a light will be illuminated when the key is in the run position and the alternator is not charging. The light will not illuminate when the engine is running and the alternator is charging.

To activate this feature, connect the red wire on the XSvOLT plug/harness to one side of a 250mA bulb (a typical dash light) and connect the other side to a switched **positive (+)** source that is on when the ignition key is in the run position.

**VOLTAGE STEP UP/DOWN MODE-** This feature can be used to remotely step the voltage set point up or down 1.25V from the previously adjusted setting.

To use as a step up mode: Normally ground the blue wire on the XSvOLT plug/harness and use a switch to remove the ground when a 1.25V step up is desired.

To use as a step down mode: Leave the blue wire normally open. Use a switch to apply ground to the blue wire when a 1.25V step down is desired. (see page 2 for additional instructions and applications)

**FREQUENCY OUTPUT-** On the Denso style units, this is a 5 volt digital square wave output, which could be used in custom applications to monitor the alternator.

INSTALLATION INSTRUCTIONS



### APPLICATIONS

**CIRCLE TRACK RACING APPLICATIONS** -- The XSvolt alternator can be setup to create a *Power Saving Mode*. This mode allows the alternator's normal charging to be temporarily reduced to reclaim as much as 50% of the alternator's horsepower requirements. Suggested times for use would include: when qualifying, in straight-aways, and the sprint for the checkered flag at the end of the race. The mode can be triggered with a full throttle activated momentary switch, a dash mounted toggle, or by any other innovative means. To do this, simply ground the blue wire from the XSvolt harness through the inline ON/OFF switch. With the switch in the OFF position (not grounded), adjust the voltage (as directed on page 1) to the preferred battery charge voltage. When the switch is in the ON position (grounded), the voltage will drop 1.25V from its previously set level.

**NOTE:** Activating secondary optional features requires XSvolt plug/harness P/N 129



**DRAG RACING APPLICATIONS** -- The XSvolt alternator can be setup to offer a *High Voltage Quick Recharge Mode*. This mode allows the alternator's normal charge rate to be temporarily boosted to prioritize charging when horsepower is in abundance while in the pits, during staging, and on the return slip. The mode can be triggered with a full throttle activated momentary switch, a dash mounted toggle, or by any other innovative means. To do this, simply ground the blue wire from the XSvolt harness through the inline ON/OFF switch. With the switch in the ON position (grounded), adjust the voltage (as directed on page 1) to optimal voltage desired during the pass. *Keep in mind that higher voltage levels maximize your electronics' performance, while lower voltage settings minimize horsepower requirements from the engine.* When the switch is in the OFF position (not grounded), the voltage will increase 1.25V from its previously set level. Make certain that the highest setting is within safe limits for electronics and the battery.

**NOTE:** Activating secondary optional features requires XSvolt plug/harness P/N 129



**HIGH AMP/ SPL APPLICATIONS** -- The XSvolt alternator can be configured to optimize daily driving voltage, as well as to maximize performance voltage for high amp situations.

Ground the blue wire from the XSvolt harness through an inline ON/OFF switch mounted on the dash. With the switch in the ON position (grounded), adjust the voltage (as directed on page 1) to the preferred *daily driving* level. Next, move the switch to the OFF position (not grounded) and test the voltage at the battery. The resulting voltage should be approximately 1.25V higher than previously tested. Make certain that the highest setting is within safe limits.

**NOTE:** Activating secondary optional features requires XSvolt plug/harness P/N 129



**NOTE:**

\* The above voltage settings will only affect voltage if the alternator is at or below its amperage capabilities. If the amperage requirements become greater than the alternator's capabilities, system voltage will fall. The XSvolt alternator will then automatically maximize its output voltage to compensate, overriding the current voltage set point, until system voltage has once again risen to the preset voltage level.

\* *The XSvolt alternator will turn itself off when the engine stops. Regardless of which features are activated through the XSvolt plug/harness, there will be no residual draw on the battery after the engine is off.*

**Different battery types prefer different charge rates** -- Battery life and performance can be extended if the alternator is adjusted to provide the optimal battery charge voltage measured at the battery. Check with your battery's manufacturer for their recommendations. Battery manufacturers can also supply the maximum safe charge voltages for their batteries, allowing voltage levels to be temporarily boosted to improve electronic components' performance.