

  
**Prestolite**  
electric

**LOADHANDLER®**

A Prestolite Electric Product

# ALL-ELECTRONIC ALTERNATOR SYSTEM INSTALLATION INSTRUCTIONS

## 12V 105A



**IMPORTANT: NEVER DISCONNECT  
ANY WIRING FROM BATTERY OR  
ALTERNATOR WHILE ALTERNATOR  
IS OPERATING.**

### GENERAL INFORMATION

This heavy duty, all-electronic alternator system is designed for use with 12 volt positive/negative ground electrical systems. This package includes the alternator, (with Integral regulator) and installation instructions. Alternator mounting kits and pulleys may be purchased from a Prestolite distributor.

Alternator is capable of producing an output of 105 Amps (at 14.2 volts). The alternator has a completely enclosed brush assembly to prevent slip ring contamination and shield any arcing for operation in a hazardous atmosphere. Three positive and three negative diodes rated at 50 Amps each are contained in the rectifier assembly to provide more than ample current handling capability. The stator is varnish coated to provide maximum protection against shorting of windings to the laminations. The stator winding is Delta connected. The AC terminal can be used for driving alternator type tachometers.

The Voltage Regulator is self excited and externally adjustable.

Prestolite fully transistorized integral voltage regulator performs all of the necessary operations for complete control of the alternator output. The system is temperature compensated to permit the ideal charging rate at all temperatures. In the regulator, transistors replace the relays, contacts and springs which are components contributing to most of the failures in conventional electro-mechanical voltage regulators. It is capable of operating in an ambient temperature of 225°F.

The manufacturer recommends the use of a good quality 100-0-100 ammeter to indicate proper functioning of this alternator system. Two types are available, direct connected and shunt types. If the direct type (where heavy current passes through the meter) is selected, a sufficient quantity of heavy wire (to run from the output terminal of the alternator up to the meter and back to battery) may be supplied with the meter or may have to be obtained. (See Table 1 for proper wire size for length you may require). If the remote or shunt type is used, probably no additional wire will be needed.

## I. PULLEY & MOUNTING ADAPTERS

Several pulleys are available from your Prestolite distributor or dealer to fit a wide variety of applications. There are single and double grooved pulleys which fit standard belt sizes from 3.8" to 1". Pulley blanks, into which grooves must be cut to fit special belt sizes, are also available. Consult your local PRESTOLITE dealer for pulley and Mounting Adapters selections.

## II. MOUNTING OF ALTERNATOR

Several mounting assemblies, including a mounting bracket and mounting hardware, are available from your Prestolite dealer to fit a wide variety of applications. Consult your local Prestolite dealer.

After the alternator mounting location has been determined, loosely attach the mounting bracket to the engine with the mounting bracket bolts. Position the alternator mounting foot on the mounting brackets with the alternator mounting bolt. Align the alternator pulley with the engine drive pulley as shown in Figure 2 and tighten the bracket mounting bolts, securing the mounting bracket to the engine. Loosely attach the alternator adjustment bracket to the the alternator adjustment ear with the 5/16" bolt, lockwasher, and flatwasher. Tighten the fan belt by applying pressure to the alternator front housing only and tighten the 5/16" bolt to the adjusting ear. Tighten the alternator mounting bolts and retighten all other bolts to secure the installation.

**SET BELT TENSION PER MANUFACTURER'S RECOMMENDED SPECIFICATIONS AND TIGHTEN ALL REMAINING BOLTS. IF MANUFACTURER'S SPECIFICATIONS ARE NOT READILY AVAILABLE, SET BELT TENSION TIGHT ENOUGH SO THAT THE BELT ON ALTERNATOR FAN PULLEY WILL NOT SLIP WHEN ATTEMPTING TO ROTATE ALTERNATOR FAN BY HAND.**

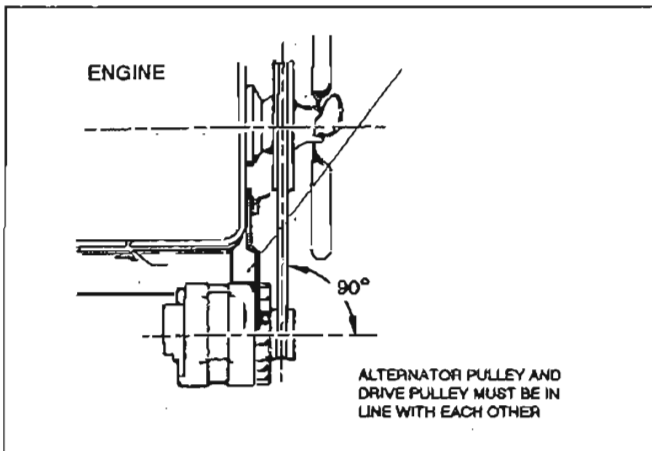


FIGURE 2 - ALTERNATOR MOUNTING

**CAUTION: ALTERNATOR WILL BE PERMANENTLY DAMAGED IF PRESSURE IS APPLIED TO REAR HOUSING. TIGHTEN THE FAN BELT BY PRESSING AGAINST FRONT HOUSING (CASTING NEAREST ALTERNATOR FAN).**

## III. ELECTRICAL CONNECTIONS

Disconnect cables from battery before making following electrical connections. Negative Ground Installation (See Figure 3).

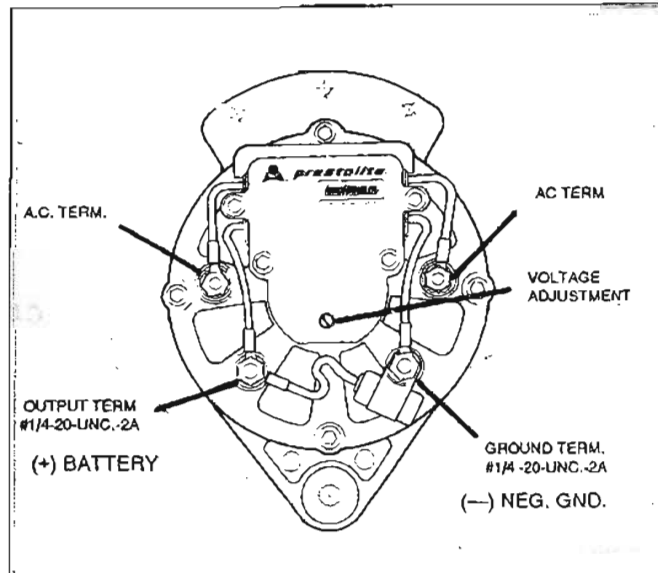


FIGURE 3 - WIRING DIAGRAM - NEGATIVE GROUND

1. Connect the existing output wire to the positive output terminal of the alternator. Be certain that heavy enough wire is used to carry full output current of alternator from positive output terminal to the battery. If an ammeter is used with the system, wire of sufficient size must be used. Consult table 1.
2. Connect a ground wire from the negative ground terminal of the alternator to a good ground on the engine block/frame wire gage size should be the same as the output wire; consult Table 1.

RECOMMENDED MINIMUM WIRE SIZES FOR OUTPUT CURRENT OF 90 AMP ALTERNATORS	
Total Length Of Wire In Feet	Wire Size
5 or less	No. 8
5 to 10	No. 6
10 to 20	No. 4

TABLE 1

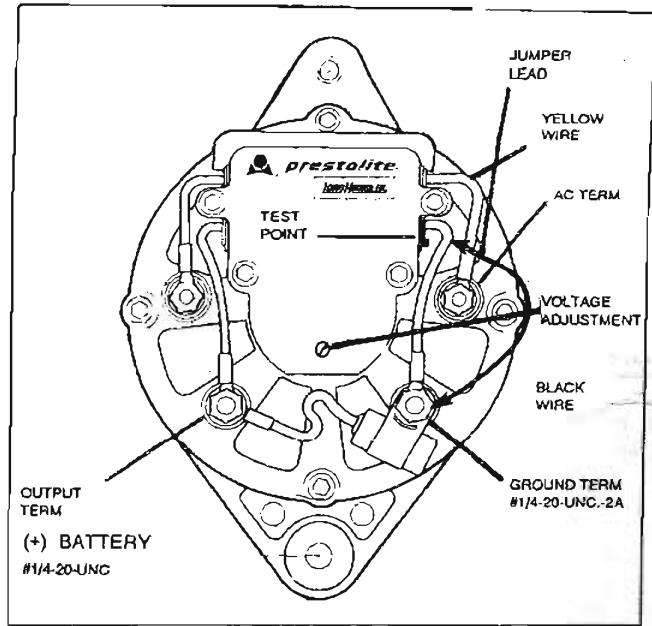


FIGURE 4

**WARNING:** REVERSE POLARITY OF BATTERY CONNECTIONS WILL CAUSE DAMAGE TO THE RECTIFIER DIODES IN THE ALTERNATOR. BE SURE TO CHECK WIRING BEFORE MAKING BATTERY CONNECTIONS. AFTER INSTALLATION HAS BEEN COMPLETED, CHECK FOR PROPER OPERATION AS FOLLOWS.

**CAUTION:** ALTERNATOR DRIVING BELTS DO STRETCH, PARTICULARLY WHEN THEY ARE NEW. RECHECK BELT TENSION FROM TIME TO TIME. BELT SLIPPAGE IS MORE APT TO OCCUR WITH AN ALTERNATOR BECAUSE OF HEAVY CHARGE RATE POSSIBLE AT ENGINE IDLE.

3. Turn off all switches and electrical loads. Replace one cable on battery. Momentarily touch second terminal to other battery post. A very small or no spark should occur. If okay, fasten cables to battery posts. If a heavy flash occurs, recheck polarity of battery, and all above steps until the fault is found.

With ignition switch off, turn on headlights. Ammeter should now show discharge. If it shows charge, ammeter connections are reversed. Correct. Start engine; ammeter should indicate charge.

**INITIAL EXCITATION**

In some cases, the alternator may not self excite after the installation, this may be due to the loss of residual magnetism; therefore the field must be flashed. Use the following procedure:

1. Ensure the alternator is properly wired
2. Start engine, run at idle
3. Using a jumper lead with a paper clip attached momentarily short the test point to ground (See Figure 4.)

This procedure will start the charging process and residual magnetism is restored.

Remove the jumper lead.

Field flashing is no longer required.

**IV. PROPER AMMETER INDICATION**

After engine is started, the ammeter will usually show a rather heavy charge for a short time. The transistor regulator is permitting the alternator to charge heavily to replace the power taken from the battery during starting.

As the engine continues to operate, the amperes of charge will gradually drop to 0 to 4 amps as the battery becomes fully charged. This may take anywhere from 15 minutes to a few hours and will depend on size and condition of battery.

If a heavy electrical load (like a number of floodlights, an electric hoist motor, etc.) is turned on, the ammeter may show less charge or even discharge for a while. This is a normal condition; even if the load is only 40 to 50 amps.

If the load remains on, the amount of discharge will decrease and soon the ammeter will show a slight charge. If the load is now turned off, the ammeter will show a heavy charge for a short while and then gradually return to near zero. This is also a normal condition.

If the ammeter shows a continuing high charge rate, 10 to 20 or more amperes, for long periods of time, hours of continuous operation, the condition of the batteries should be checked with a hydrometer. If the hydrometer reads below a full charge (1.260 approximately), the condition is

normal - the alternator is just charging the batteries. If the hydrometer shows full charge (1.270 to 1.280), the voltage regulator may be defective.

If the ammeter shows a slight discharge consistently when the engine is operating at normal speeds, turn off all electrical loads, except ignition, for a few seconds. If ammeter jumps up to 30 to 85 amps charge, system is normal - the electrical loads are just absorbing all the alternator can generate. However, if ammeter should still show a slight discharge of 2 to 8 amps, there is a problem in the charging system. It is likely that the drive belt is either slipping or broken. If belt is OK, check for loose or broken electrical wires.

If the engine is required to run at slow idle for long periods while heavy electrical loads are demanded, the ammeter should be observed from time to time. If the ammeter shows heavy discharge (more than 10 amps), it would be wise to increase the idle speed of the engine sufficiently to bring the ammeter to zero or to show a slight charge.

Keep in mind that when the batteries are normal and well charged, the ammeter should rest near zero or show a very slight charge. With the Prestolite transistor voltage regulator, there may be very little or no motion of the ammeter needle. This also is normal because the transistors maintain the voltage very constantly and smoothly.

## **V. VOLTAGE ADJUSTMENT**

The voltage regulator is factory preset at  $14.4 \pm .2$  v.

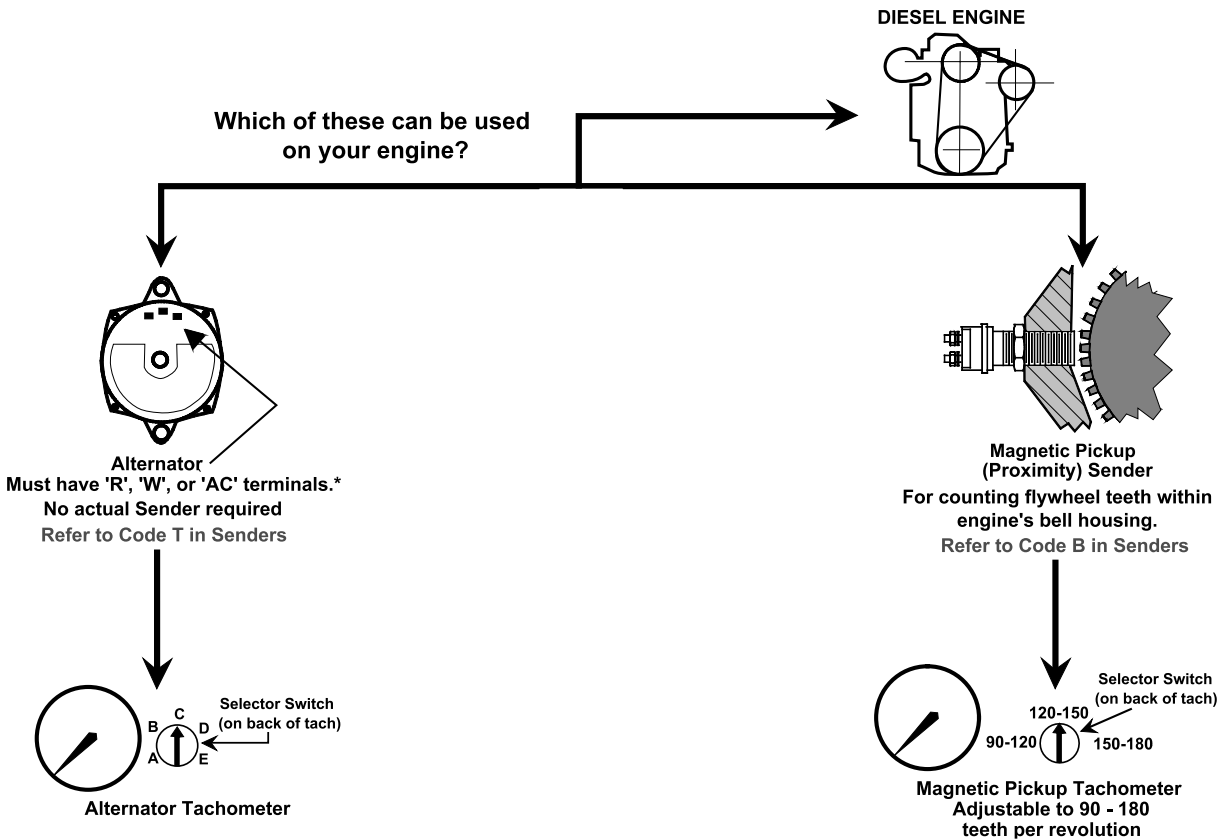
If further adjustment is required, the following steps are required:

- A. To increase voltage, turn voltage adjustment clockwise. (CW)
- B. To decrease voltage, turn voltage adjustment counter clockwise (CCW)
- C. An accurate voltmeter should be connected across the battery to monitor voltage while adjustments are made.

**Caution:** Do not force voltage adjustment past the stops or the voltage regulator will be damaged.

# Teleflex Marine Instruments

## Tachometers (Diesel)



## Tachometer Guide (Diesels)

**Diesel tachs may require a sender, depending on the engine. These tachs are offered in “dedicated” (specific sender type) versions. Diesel Tach/Hourmeters are offered in a “programmable” versions (Heavy Duty) which accommodate several sender types or “dedicated” versions (Lido Pro).**

### 1. Engine has No Provision for Tach Sender:

**Use Diesel Alternator Tachometer (CODE “T”).** Diesel Alternator tachs read the alternator signal. **Alternator must have an AC tap**, usually marked “AC”, “R” or “W”. If there’s no tap, a local alternator repair shop can usually add one at a small cost. You **need to know the number of magnetic poles** in your alternator. Consult the alternator maker or local alternator repair shop if in doubt. Also, **calculate the pulley ratio from crankshaft to alternator.** Determine **Switch Setting**, based on Number of Alternator Poles and Crankshaft-to-Alternator Pulley Ratio, calculated as follows:

$$\frac{\text{Crank Pulley Dia.}}{\text{Alternator Pulley Dia.}} = \text{Pulley Ratio}$$

(Match number of poles and pulley ratio to the appropriate switch position setting on the chart below.)

DIESEL ALTERNATOR TACH SWITCH SETTING CHART						
(RATIO = Crank Pulley Diameter to Alternator Pulley Diameter)						
NUMBER OF ALTERNATOR POLES:	8	10	12	14	16	SWITCH SETTING
<b>TACH WITH 5-POSITION SWITCH:</b>						
RATIO	1.5:1	1.2:1	1:1	0.857:1	0.75:1	A
RATIO	2.25:1	1.8:1	1.5:1	1.28:1	1.125:1	B
RATIO	3:1	2.4:1	2:1	1.71:1	1.5:1	C
RATIO	3.75:1	3:1	2.5:1	2.14:1	1.875:1	D
RATIO	4.5:1	3.6:1	3:1	2.57:1	2.25:1	E

*The switch is typically set to “B” for Universal Diesel engines, “C” for Yanmar engines if they have the original equipment alternator. Aftermarket alternators will likely require different settings.*

**NOTE:** Tachometers are factory calibrated for several combinations of poles and pulley ratios, but in almost all cases you will need a Portable Master Shop Tachometer for initial calibration. Both OEM and our replacement alternators have 12 poles. If you use the original pulley on our replacement alternator, no tachometer adjustment should be necessary.

### 2. Engine has Magnetic Proximity Sender Mount:

**Use Diesel Magnetic Pickup Tach with Magnetic Pickup Sender (CODE “B”).** The sender mounts in a 3/4-16 threaded hole, usually in the bell housing. As each gear tooth passes the sender, a pulse signal is generated. Works with 90 to 180 teeth on gear.

CODE B  
MAGNETIC  
PROXIMITY  
SENDER

