



**Important** Pyrometers are sensitive, high accuracy instruments. They must be handled and installed with care to insure proper performance. Carefully read and follow these instructions, and your pyrometer will provide you with a long and accurate life.

## Product Overview

This kit consists of three main components, a pyrometer gauge, an exhaust gas thermocouple probe, and an extension module. This kit includes the required mounting hardware. Installation involves mounting the gauge in the dash panel, mounting the thermocouple in the engine exhaust, and mounting the extension module near the engine compartment and thermocouple.

Once these components are mounted, wiring is a straight forward procedure. This involves providing ground and switched power to the gauge and extension module, connecting the thermocouple to the extension module, and connecting the output of the extension module to

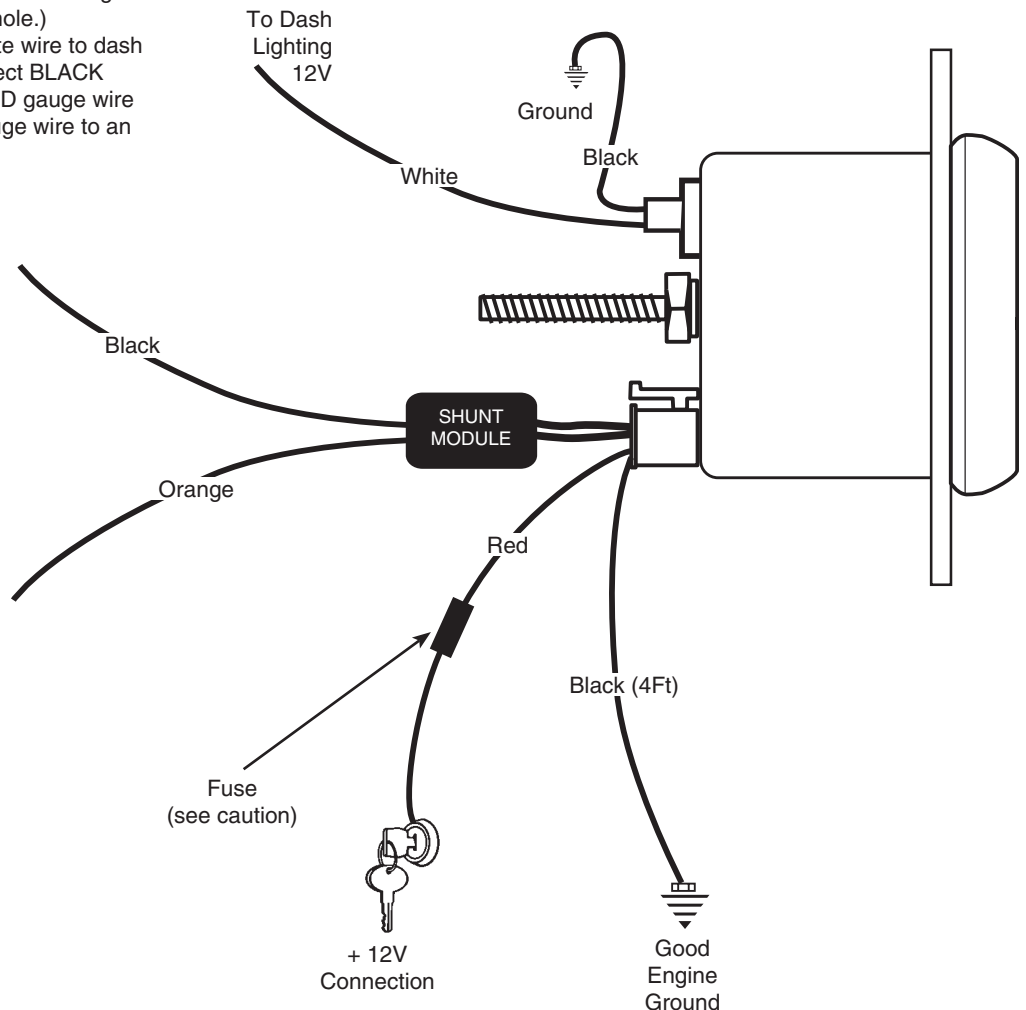
the gauge harness with user supplied wiring (2 wires up to 75 feet).

The extension module contains a thermocouple amplifier which produces a current loop output. This method provides a noise immune signal between the engine and dash mounted gauge in larger vehicles and vessels. The dynamic operating range of the extension module limits the lowest temperature signal to approximately 160°F. This is a design limitation. All temperatures measured by the EGT probe at or below this limit will result in a minimum reading on the pyrometer gauge at approximately 160°F.

## Gauge Installation

1. Disconnect the negative (-) battery cable.
2. The 2 5/8" gauges may be mounted in a 2 5/8" diameter hole. The 2 1/16" gauges may be mounted in a 2 1/8" diameter hole. The hole may be either a hole in the dash, a gauge panel or an AutoMeter Gauge Pod. (It is best to connect all wiring to the gauge before mounting it into the gauge hole.)
3. Install light in back of gauge and connect white wire to dash lighting circuit or to any 12-volt source. Connect BLACK light socket wire to good ground. Connect RED gauge wire to switched 12V source. Connect BLACK gauge wire to an **ENGINE GROUND**.

4. Verify that all wire connections are correct and secure. Secure gauge in hole with mounting bracket supplied.
5. Reconnect the negative (-) battery cable.



### CAUTION!

As a safety precaution, the +12V terminal of this product should be fused before connecting to the 12V ignition switch. We recommend using a 3 Amp, automotive type fuse.

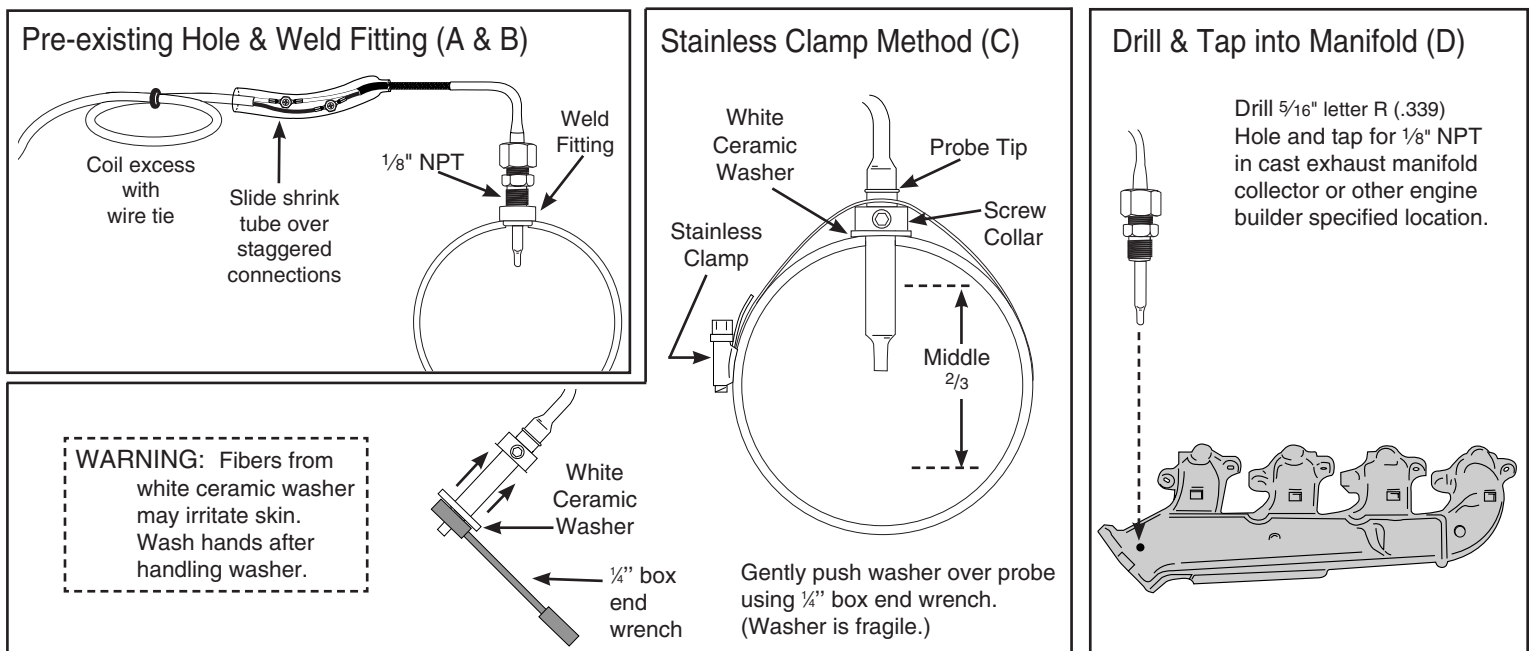
# Light Replacement

Using needle nose pliers, rotate the twist-lock lamp socket counterclockwise to remove. Replace old bulb with GE 168 bulb or AutoMeter model 3220.

**NOTE:** This Marine product is not waterproof, however has been built to be water resistant. Please try to avoid submerging this product in water.

# Probe Installation

- Begin by installing the Thermocouple in the exhaust. For turbo engines, install the probe 1-2 inches from the turbo exhaust outlet or you may install the probe prior to the turbo. You may consult an engine builder or tuner for recommendations for which probe location is best for you. If installing pre-turbo, removal of the pipe or manifold may be necessary to avoid metal shavings in the turbo. For non-turbo engines, install the probe 1-2 inches from the cylinder head. The probe can be mounted three different ways, so please use the method best suited for your needs.
  - Pre-existing 1/8" NPT Threaded Hole:** Simply screw the threaded fitting into the hole, insert the probe and tighten the nut already on the probe from the factory. Make sure the probe is oriented so the wires do not come in contact with, or become too close to, the manifold or other hot engine parts.
  - Weld Fitting:** Drill a 9/16" hole and weld in the supplied bushing being careful not to distort the bushing. The bushing must be welded and not braised into the manifold or exhaust header. Screw the threaded fitting into the hole, insert the probe and tighten the nut already on the probe. Make sure the probe is oriented so the wires do not come into contact with, or become too close to, the manifold or other hot engine parts.
  - Stainless Clamp Method:** This method is for the applications that require frequent removal of the manifold or the header for service, or just faster and easier installation. Drill a 1/4" diameter hole about 6" down from the junction of the the exhaust pipe to manifold junction. Remove the 1/8" NPT bushing from the probe and replace it with the stainless clamp and set screw collar provided. Undo the clamp and slide the probe into the 1/4" hole in the clamp. Slide the set screw collar onto the probe. Before tightening the collar in position make sure that when inserted, the probe will have it's tip in the middle two-thirds of the exhaust stream. (It is not necessary to go beyond the half way point.) Once screw collar is tightened in the correct position, **gently** (washer is fragile) push the white ceramic washer over the probe using a 1/4" box end wrench. Push the washer on until it is up against the screw collar. Hold the clamp open when inserting the probe into the 1/4" hole. Re-join the clamp ends and tighten in position so the wires will not get close to the hot manifold/exhaust pipe. See the Illustration below for details.
  - Drill & Tap into Manifold Method:** You may drill a cast iron manifold with a 5/16" letter R (.339) drill bit and follow through with a 1/8" NPT pipe tap.
- With your probe installed, attach the staggered end of the probe harness with the small (No. 6) ring terminals to the probe using the #6 screw and self locking nuts. Attach them Red to Red and Yellow to Yellow. Slide the shrink tube over the staggered connections to protect them, do not shrink this tube until after the installation is complete, & correct operation is verified. If a heat source is not available the open ends may be closed with wire ties.
- The probe harness is an integral part of the pyrometer calibration. It may not be shortened or lengthened without effecting the gauge calibration. You'll need to determine a suitable location to coil the excess and tie it loosely with a wire tie. (Loosely tying the excess coil prevents embrittlement caused by vibration.)



The connections to the PEM are made through the terminal strip on the TCA. The following table describes the connections:

| Terminal | Signal       | Description                             |
|----------|--------------|---|
| 1        | Loop Output  | Signal to Shunt Module (Orange)         |
| 2        | Loop Ground  | Signal Return from Shunt Module (Black) |
| 3        | 12V          | Switched power from vehicle             |
| 4        | Ground       | Vehicle ground                          |
| 5        | TC+ (Yellow) | Thermocouple + (Yellow)                 |
| 6        | TC- (Red)    | Thermocouple - (Red)                    |

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## Installation, TCA Module (black case)

The TCA (black case) should be mounted securely in a location for convenient connections to the exhaust gas thermocouple being used. The TCA is not to be mounted where it is exposed to the outside elements. Looking at the terminal strip on the TCA from the side the wires are inserted, and the screws up, the terminals are numbered from left to right, 1 to 6.



1. The thermocouple wires from the pyrometer probe are to be connected to terminals #5 and #6. Strip 1/8" to 3/16" insulation from each wire of the probe harness. Connect the Yellow wire to #5, and the Red wire to #6.
2. Connect terminal #4 to a good chassis ground, engine ground or the negative of the battery. Connect terminal #3 to a switched (12V) power supply. We recommend 18 AWG wire for this.

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## Shunt Module Wiring

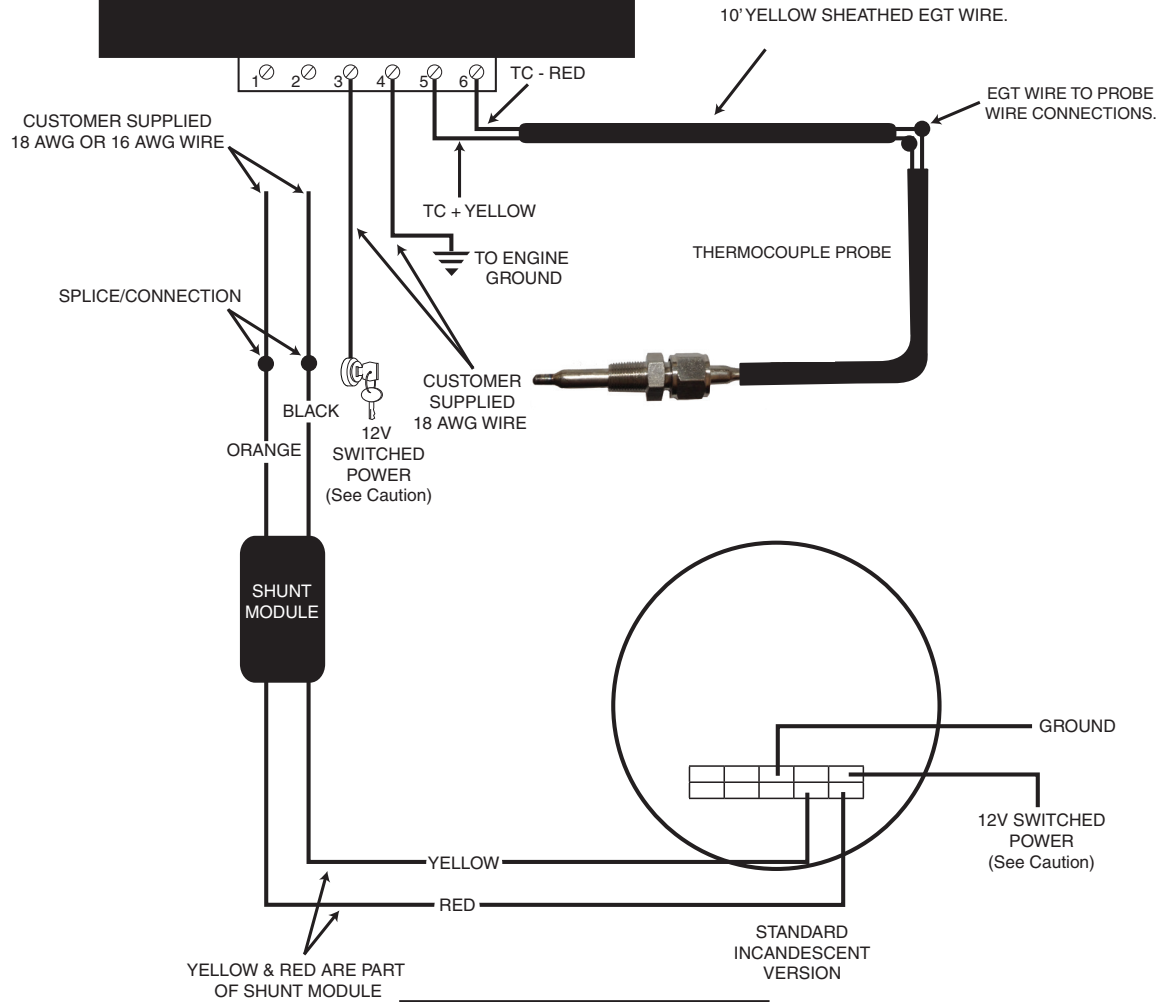
The Shunt Module is a part of the harness that plugs into the pyrometer gauge mounted in the dash.

The Shunt Module needs to be connected to the TCA Module with user provided wire. The use of 18AWG or 16AWG wire is recommended. Two closed end crimp splices are provided to make the connections to the

extension wire. It is recommended to use black and orange wire colors for the extension wires in order to be certain of the connections to the TCA are correct. If another wire color is used, be sure the connections to the TCA are the correct polarity. Your newly extended orange wire goes to terminal #1, and the newly extended black wire goes to terminal #2 of the module. This is illustrated in the wiring diagram on the next page.

# EXTENSION MODULE


**CAUTION:**  
The pyrometer extension module included in this kit is not sealed and should be mounted in a location that is not protected from the elements to follow these guidelines may result in premature failure and void the manufacturer's warranty.



**CAUTION:**  
The 12V wire for the module and the gauge should be fused before connecting to power. We recommend an automotive 3A fuse. You may run both powers through the same fuse, or through their own independent fuses.

## SERVICE

For service send your product to AutoMeter in a well packed shipping carton. Please include a note explaining what the problem is along with your phone number. If you are sending product back for Warranty adjustment, you must include a copy (or original) of your sales receipt from the place of purchase.

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