

# BANKS DYNAFACT PYROMETER INSTALLATION INSTRUCTIONS

**IMPORTANT!** Anytime the vehicle is raised off its wheels, it should be supported by safety stands or ramps of adequate capacity for the vehicle's weight. Never perform any work under a vehicle supported only by its service jack or a hydraulic jack. Do not use concrete blocks or other masonry items that may collapse under the vehicle weight.

Position wires and hoses away from exhaust heat, moving parts, and sharp edges that may cause cuts or other damage. Route or tie all wires a minimum of 6 inches from hot exhaust parts; eight or more inches is recommended where possible.

## SELECTING PYROMETER SENSOR LOCATION

There are two methods of exhaust gas temperature measurement on turbocharged engines. Both methods are accurate if done properly, but will commonly differ by as much as 300°F on the same engine.

**TURBINE INLET TEMPERATURE** — Measured in the exhaust stream before the turbine wheel of the turbo (in the exhaust manifold). The tip of the pyrometer sensor should not contact the metal surface of the manifold.

Mark a position on the exhaust manifold to locate the pyrometer sensor. It may be helpful to remove the turbocharger to avoid a buildup of metal chips during the drilling and tapping process.

Drill through the manifold at the location previously marked. Use a  $\frac{7}{16}$ " drill, keeping the drill perpendicular to the manifold surface.

Tap the drilled hole with a  $\frac{1}{4}$ " NPT pipe tap. Check the thread depth as you tap by periodically removing the tap and screwing the sensor fitting into the tapped hole. The sensor should thread in three to three-and-a-half turns hand-tight.

Remove as many loose chips as possible from the exhaust manifold using a shop vacuum, small brush, or fingers. **CAUTION: Make sure exhaust manifold is free of foreign matter prior to engine startup!**

Install the sensor in the manifold. Anti-seize on the threads is recommended. Inspect the gaskets for the oil drain and the turbine inlet and replace if necessary.

Reinstall the turbo following factory service recommendations if previously removed.

**TURBINE OUTLET TEMPERATURE** — Measured in the exhaust stream after the turbine wheel (in the turbine outlet pipe). The pyrometer sensor should be located as close to the outlet of the turbo as possible.

Locate a portion of the thin-walled exhaust tubing that is easily accessible with a drill and as close to the engine as possible (not in the actual manifold).

Drill a  $\frac{5}{16}$ " hole in the exhaust tubing. Weld the  $\frac{1}{4}$ " NPT bung provided to the pipe centered over the hole. Install the pyrometer sensor into the bung.

## WIRING INSTALLATION

All gauge wiring should be routed away from heat sources such as exhaust manifolds or piping, and away from sharp edges. Avoid sharp bends or kinks. Secure the wiring to other wiring inside the engine compartment with cable ties.

When passing through the firewall, either make a hole in a factory grommet or drill a hole and use a new grommet. If a hole needs to be drilled, drill a  $\frac{5}{16}$ " hole and deburr it on both sides, so that the

wiring or tubing does not get cut as it passes through the hole. For added protection, wrap the wiring with several layers of electrical tape in the area where it passes through the hole. When drilling, check the backside to make sure that there are no components blocking the back side of the hole that would be damaged by drilling.

On the sensor end, connect the wires to the sensor with the supplied screws. The wires are different lengths to prevent cross-connecting. Make sure that the screws are tight.

Slide the heat shrink tubing provided over the connections and apply heat to the tubing with a heat-gun or other heat source.

## GAUGE INSTALLATION

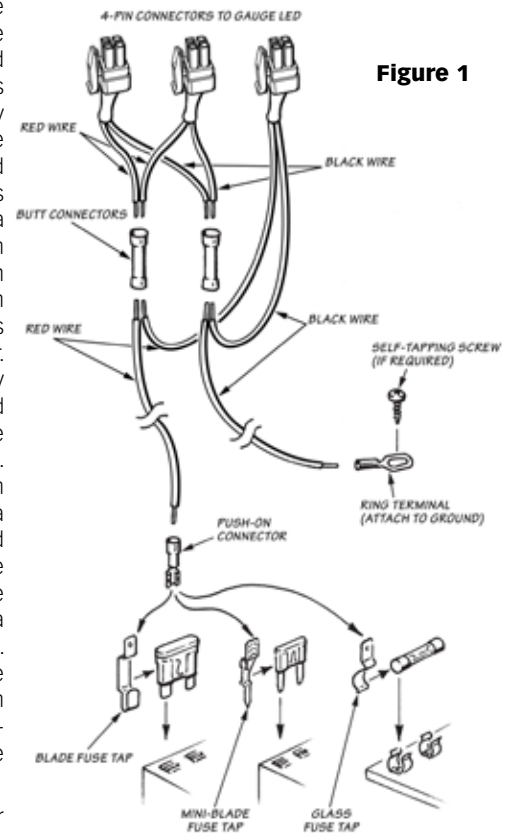
Position the gauge through the console or gauge panel. Slip the plastic U-clip, provided with the pyrometer, over the studs on the rear of the gauge and tighten the nuts, provided.

**NOTE:** If it is necessary to replace one of the terminal ends, use a crimp-tool only. Do not solder the wires.

## GAUGE LIGHTING

Connect the 4-pin male connector to the 4-pin female connector on the back of the gauge. Using the wiring kit provided, strip and connect one end of each of the six-foot wires to wires on the 4-pin connector assembly with the butt connectors, using an appropriate crimp tool. Make sure to connect the red wires to the (+) terminal and the black wires to the ground. Incorrect wiring will result in a non-working LED. See **Figure 1**. If more than one gauge is being used, the wires from other 4-pin connectors may be doubled up in the butt connector. No more than two wires should be in either end of the butt connector. Route the red wire to the fuse panel. Identify the circuit for the dashboard lights and remove the fuse. Install the appropriate fuse tap under the non-powered leg of the fuse. This is the socket that has no power when the dash light switch is on, as tested with a test-light or multi-meter. Cut and strip the red wire to an appropriate length and install the female push-on connector. Connect the wire to the fuse tap. Route the black wire to a location where a good ground can be found. Cut and strip the wire to an appropriate length and crimp the ring terminal under an existing bolt or washer, or use the self-tapping screw provided to connect to the ground.

Route all wiring away from any pedals or other moving components. Using the cable ties supplied, secure the wiring under the dash.



**Figure 1**