

OWNERS MANUAL

...with installation instructions

Banks DynaFact[®] PYROMETER GAUGE

THIS MANUAL IS FOR USE WITH SYSTEM 64001, 64002 AND 64007

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BANKS

Dear Customer,

If you have any questions concerning the installation of the Banks DynaFact Pyrometer Gauge please call our Technical Service Hotline at (888) 839-2700 between 7:00 am and 5:00 pm (PT). If you have any questions relating to shipping or billing, please contact our Customer Service Department at (888) 839-5600.

Thank you.

General Installation Practices

1. This manual is an installation guide for all Banks DynaFact pyrometer gauges. For ease of installation and to determine what additional tools or materials you will need, read the entire 8–page manual before starting any work. **NOTE: there are portions of the installation procedure and certain illustrations matched to specific vehicle types.** For proper installation, select the text and illustrations that most closely correspond to your vehicle. If you cannot correspond your vehicle to the text provided, please contact Customer Service at (626) 969-9600 for assistance.

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.

2. 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 six (6) inches from hot exhaust parts; eight (8) or more inches is recommended where possible.

Gauge Panel Installation

Choose a suitable location under the lower edge of the dash panel for mounting the instrument panel, or on top of the dash for the molded instrument console. Be certain the instruments can be viewed conveniently by the driver.

UNDER DASH: Using the panel as a template, drill two $\frac{3}{16}$ " diameter holes in the dash and mount the panel with two No. 10 x $\frac{1}{2}$ " machine screws, nuts, and star-washers provided.

ON TOP OF DASH: Wipe the dash-top with an alcohol pad or other surface cleaner. Remove the backing from the adhesive Velcro tape on the bottom of the console adapter, position the console adapter and press down firmly. Once the gauges are wired and secured to the console according to the following instructions, attach the console assembly to the console adapter using the two machine screws provided.

Selecting Pyrometer Sensor Location

Maximum allowable exhaust gas temperatures for diesel engines can vary substantially, depending on the engine and turbocharger configuration. Refer to the Owners Manual for your Banks system to determine maximum temperature specifications for your specific application.

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.

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.

Chevrolet/GMC 6.2L/6.5L diesel, naturally aspirated: 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.

Chevrolet/GMC 6.2L/6.5L diesel with Banks Sidewinder turbo:

Install the threaded pyrometer sensor into the $\frac{1}{4}$ " NPT threaded hole in the right exhaust manifold. Use anti-seize compound on the threads. See **Figure 1**.

Chevrolet/GMC 6.5L diesel with factory turbo: **TURBINE INLET TEMPERATURE:** Disconnect both the compressor inlet and outlet hose joint connections. Loosen the V-band at the turbo outlet, the four bolts/nuts at the turbine inlet and the two bolts in the oil drain flange. Remove the turbo from the engine.

Figure 1

CHEVY/ GMC 6.2L/6.5L



Mark a position on the exhaust manifold to locate the pyrometer sensor. Stuff a small shop towel or rag four to five inches into the exhaust manifold through the turbo mounting flange to prevent chips from entering the manifold while drilling and tapping.

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. Remove the rag using a welding rod or coat hanger bent into a hook.

CAUTION: Make sure exhaust manifold is free of foreign matter prior to reinstallation of the turbo!

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.

TURBINE OUTLET TEMPERATURE:

Locate a position in the turbine outlet pipe that is accessible with a drill. Drill a $\frac{5}{16}$ " hole in the pipe. Weld the $\frac{1}{4}$ " NPT bung provided to the pipe centered over the hole. Install the pyrometer sensor into the bung.

Cummins B5.9L/C8.3L diesel with factory turbo:

TURBINE INLET TEMPERATURE: The Cummins engines use a divided exhaust manifold and turbo. The pyrometer sensor must be installed to sample exhaust temperature in one of the two

exhaust passages. Typically the exhaust temperature will not differ appreciably between the two passages.

Select the location that will simplify the routing of the sensor wiring. Disconnect both the compressor inlet and outlet hose joint connections. Loosen the V-band at the turbo outlet, the four bolts and nuts at the turbine inlet and the two bolts in the oil drain flange. Remove the turbo from the engine.

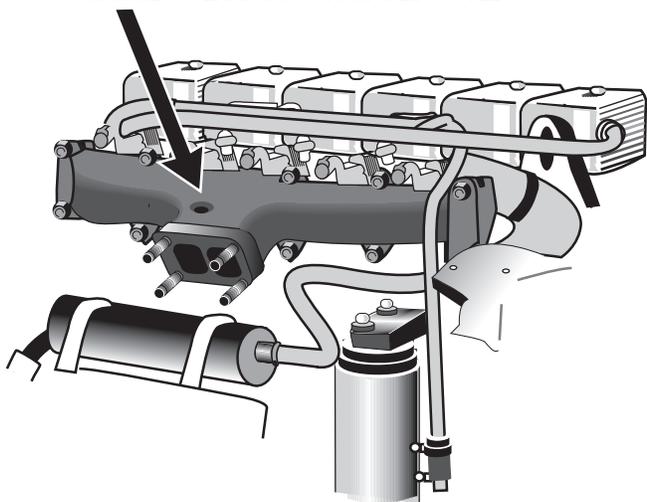
Mark a position on the exhaust manifold to locate the pyrometer sensor. (See **Figure 2**). Stuff a small shop towel or rag four to five inches into the selected exhaust manifold passage through the turbo mounting flange, to prevent chips from entering the manifold while drilling and tapping.

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

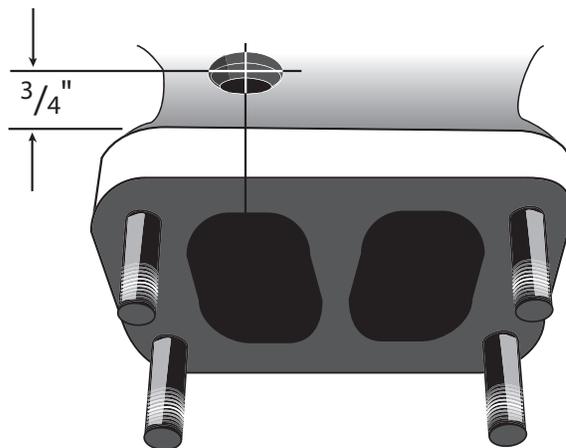
Figure 2

CUMMINS B5.9L/C8.3L

DRILL AND TAP $\frac{1}{4}$ " NPT PORT REAR PASSAGE OF EXHAUST MANIFOLD OUTLET



LOCATE PORT $\frac{3}{4}$ INCH BEHIND FLANGE CENTERED OVER REAR EXHAUST MANIFOLD PASSAGE



Tap the drilled hole with a ¼" 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. Remove the rag using a welding rod or coat hanger bent into a hook. **CAUTION: Make sure exhaust manifold is free of foreign matter prior to reinstallation of the turbo!**

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.

TURBINE OUTLET TEMPERATURE: Locate a position in the turbine outlet pipe that is accessible with a drill. Drill a 5/16" hole in the pipe. Weld the ¼" NPT bung provided to the pipe centered over the hole. Install the pyrometer sensor into the bung.

Ford/Navistar 6.9L/7.3L IDI diesel, naturally aspirated: 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 5/16" hole in the exhaust tubing. Weld the ¼" NPT bung provided to the pipe centered over the hole. Install the pyrometer sensor into the bung.

Ford/Navistar 6.9L/7.3L IDI diesel, naturally aspirated with Banks Stinger: Install the pyrometer sensor into the ¼" NPT bung provided on the headpipe. Anti-seize on the threads is recommended.

Ford/Navistar 6.9L/7.3L IDI diesel with Banks Sidewinder turbo: Install the pyrometer sensor into the ¼" NPT bung provided in the turbine inlet casting. Anti-seize on the threads is recommended.

Ford/Navistar 7.3L IDI diesel, with factory turbo: Locate a portion of exhaust pipe behind the turbo that is easily accessible with a drill and as close to the engine as possible. Drill a 5/16" hole in the exhaust tubing. Weld the ¼" NPT bung provided to the pipe centered over the hole. Install the pyrometer sensor into the bung.

Ford/Navistar 7.3L IDI diesel, with factory turbo and Banks PowerPack: Install the pyrometer sensor into the ¼" NPT bung provided in the turbine outlet pipe. Anti-seize on the threads is recommended.

Ford/Navistar 7.3L Power Stroke diesel with factory turbo: **TURBINE OUTLET TEMPERATURE:** Locate a portion of the exhaust pipe that is easily accessible with a drill and as close to the engine as possible. ***NOTE: it may be necessary to move as far downstream as the inlet to the catalytic converter to locate a portion of tubing that will allow the sensor to clamp properly.***

Drill a 5/16" hole in the exhaust tubing. Weld the ¼" NPT bung provided to the pipe centered over the hole. Install the pyrometer sensor into the bung.

Ford/Navistar 7.3L DI Power Stroke, with factory turbo and Banks Stinger, Stinger Plus, or PowerPack: Install the pyrometer sensor into the ¼" NPT bung provided in the turbine outlet pipe. Anti-seize on the threads is recommended.

Pyrometer Kit 64002 (TOP clamp) Installation:

Select a location on the Turbine Outlet Pipe (TOP) with enough clearance from the vehicle frame, engine, etc. to safely mount the EGT probe and clamp assembly. Center-punch the probe location and drill a ¼" hole into the TOP. Separate the ends of the clamp and install the probe into the TOP hole. Reassemble and tighten the clamp around the TOP.

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-clamp, 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

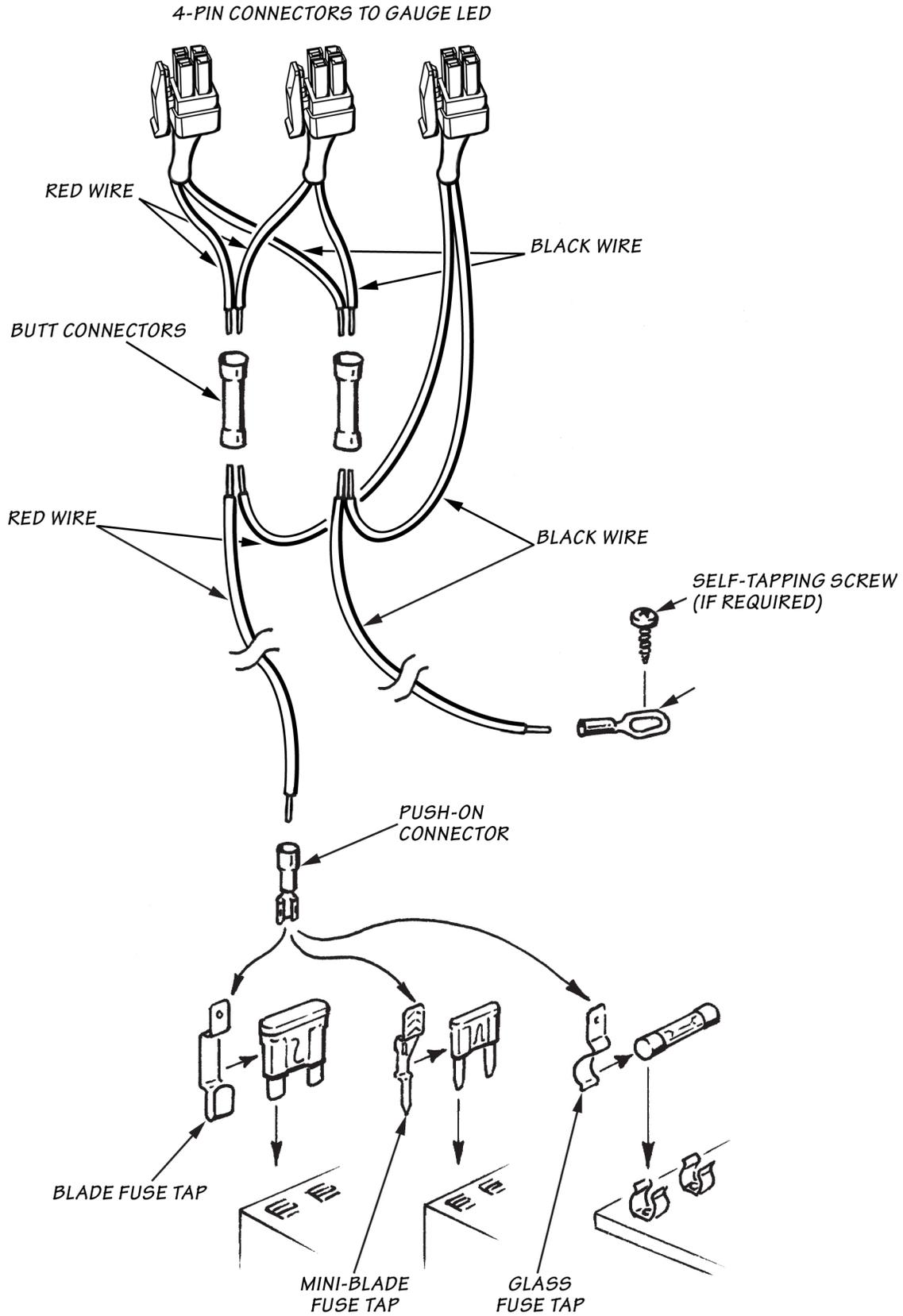
Connect the 4-pin male connector to the 4-pin female connector on the back of the gauge. Using the wiring kit provided, strip and connect one end of each of the six-foot wires to wires on the 4-pin connector assembly with the butt connectors, using an appropriate crimp tool. Make sure to connect the red wires to the (+) terminal and the black wires to the ground. Incorrect wiring will result in a non-working LED. (See **Figure 3**). If more than one gauge is being used, the wires from other 4-pin

connectors may be doubled up in the butt connectors. 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 to the wire. Install 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 3



BILL OF MATERIALS

COMPONENT	64001	64002	64007
PYROMETER GAUGE p/n 63430	✓	✓	✓
SENSOR, pyrometer p/n 63042	✓		✓
SENSOR, pyrometer p/n 63043		✓	
LEAD WIRE, 55' p/n 63058	-		✓
LEAD WIRE, 10' p/n 63056	✓	✓	-
WIRE KIT, lighting p/vn 62150	✓	✓	✓
OWNERS MANUAL p/n 96325	✓	✓	✓

OPTIONAL INSTRUMENT CONSOLES

Chevrolet/GMC

3-GAUGE ADAPTER ('79-87) p/n 63110
2-GAUGE ADAPTER ('88-94) p/n 63111
3-GAUGE ADAPTER ('88-94) p/n 63112
2-GAUGE CONSOLE & ADAPTER ('95-98) p/n 63119
3-GAUGE CONSOLE & ADAPTER ('95-98) p/n 63121

Dodge/Cummins

2-GAUGE ADAPTER ('89-93) p/n 63108
3-GAUGE ADAPTER ('89-93) p/n 63106
4-GAUGE ADAPTER ('89-93) p/n 63113
4-GAUGE ADAPTER ('94-97) p/n 63117
2-GAUGE CONSOLE & ADAPTER ('94-97) p/n 63119
3-GAUGE CONSOLE & ADAPTER ('94-97) p/n 63121
4-GAUGE CONSOLE & ADAPTER ('94-97) p/n 63123
2-GAUGE CONSOLE & ADAPTER ('98) p/n 63120
3-GAUGE CONSOLE & ADAPTER ('98) p/n 63122

Ford

2-GAUGE ADAPTER ('87-91) p/n 63102
3-GAUGE ADAPTER ('87-91) p/n 63104
2-GAUGE ADAPTER ('92-97) p/n 63109
3-GAUGE ADAPTER ('92-97) p/n 63107

Universal (for flat surfaces)

2-GAUGE ADAPTER p/n 63115
3-GAUGE ADAPTER p/n 63116

OPTIONAL INSTRUMENT MOUNTING PANELS

1-GAUGE p/n 63001
2-GAUGE p/n 63002
3-GAUGE p/n 63003
4-GAUGE p/n 63004

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