

INSTALLATION INSTRUCTIONS AIR / FUEL RATIO GAUGE KITS

1 INTRODUCTION

The Air/Fuel Ratio Gauge reads and interprets the voltage output signals from the vehicle's oxygen sensor(s) to give an indication of air/fuel ratio while driving; either **Optimal**, **Lean** or **Rich**.

IMPORTANT: The Air/Fuel Ratio Gauge is designed to work with the vehicle's existing oxygen sensor. The gauge will work **ONLY** with oxygen sensors that generate voltage output signals from 0 to 1 volt. See your vehicle's service manual for oxygen sensor operating voltage specifications.

If your vehicle is not equipped with this type of sensor, or is not equipped with *any* oxygen sensor, it may be possible to install an after-market heated oxygen sensor. See a professional to determine if a suitable oxygen sensor can be installed on your vehicle.

3 MOUNTING AND INSTALLATION

When selecting a location to install the gauge, take into consideration that the gauge's signal wires must be routed through the firewall when making the gauge connections. Choose a location that will allow routing of the gauge wiring through an existing firewall grommet.

If an existing firewall grommet is not accessible, drill a 3/8" (9,5 mm) diameter hole through the firewall. Install a rubber grommet (purchased separately) in drilled hole to protect lead wires from chaffing or other damage.

A. PANEL INSTALLATION

For On-Dash or Under-Dash mounting (panel is optional with some gauge models and must be purchased separately).

1. Determine the mounting location for the gauge.
2. Using gauge panel as a template, mark locations for screws.
3. Drill small holes for the screws and secure panel with screws and flat washers provided.

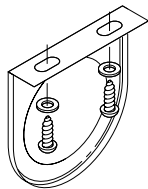


Figure 1. Gauge Panel

4 GAUGE CONNECTION

Install Air/Fuel Ratio Gauge as described in Section 3, MOUNTING AND INSTALLATION.

Refer to Figure 3 (on back page) and make gauge connections as follows.

NOTE: Wiring is not provided with gauge kit. Wire and connectors to suit your particular installation must be purchased separately. Use 20-22 AWG stranded copper wire.

1. After determining the wire length needed,
2. Crimp or solder 1/4" (6,35 mm) female spade terminals (included) on one end of gauge positive (+) and negative (±) wires.
3. Connect gauge positive and negative wires to positive (+) and negative (±) spade posts.
4. Connect the negative (±) lead wire to a good (bare metal) chassis ground.
5. Connect the positive (+) lead wire into a switched (hot only when the ignition key is turned to the On position) 12 volt positive source.
6. Connect the signal wires (see figure 3) to the Air/Fuel Ratio Gauge and the vehicle's oxygen sensor(s) SIGNAL circuit(s) as follows:

2 PREPARATION FOR INSTALLATION

1. Read instructions completely before installation. Seek the advice of a professional if you are not familiar with the installation of vehicle instrumentation or the functions of related vehicle systems.
2. Install gauges only when engine is cool and ignition is off.
3. Make sure all necessary tools, materials, and parts are on hand.
4. Always read the vehicle's service manual before any test or service is performed, and follow it's safety precautions.
5. Disconnect negative (-) battery cable before installing gauges (**do not forget to reconnect battery after installation is complete**).

NOTE: It may be necessary to reprogram your radio, clock, etc. after reconnecting the battery.

B. IN-DASH MOUNTING OPTION

1. Determine a location on the dashboard that can be cut out without striking any objects behind the dash.
2. Use a hole template to cut out a 1-1/2", 2" or 2-5/8" (3,81 mm, 5,08 mm or 6,67 mm) hole, as necessary, through the dashboard.
3. Use a round file to smooth out the rough edges around the drilled hole.

C. INSTALLING GAUGE INTO GAUGE PANEL OR IN-DASH

1. Insert gauge through front of panel or hole in dashboard.
2. Hold gauge case and rotate gauge, as needed, until gauge face is properly positioned in front of dashboard/panel.
3. Tighten locking ring on gauge in clockwise direction until gauge is tight against dashboard/panel. Tighten locking ring **HAND TIGHT ONLY**.

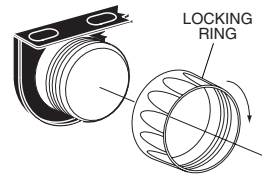


Figure 2. Gauge Equipped with Locking Ring

- If your vehicle has *only one* pre-catalytic converter oxygen sensor, crimp or solder a wire to the large female spade terminal (included with gauge kit) and connect the terminal over the two small male spade signal posts on back of the gauge. Connect the other end of the wire to the oxygen sensor signal circuit. This allows the LEDs on both sides of the gauge to display the air/fuel ratio for one oxygen sensor.
- If your vehicle is equipped with two pre-catalytic converter Oxygen sensors, crimp or solder two wires to the two small female spade terminals (included in gauge kit), and connect the terminals to the two small male spade signal posts on back of the gauge. Splice one of the loose ends of the gauge signal wires to the signal circuit of the oxygen sensor on Bank 1 of the engine, splice the other signal wire to the oxygen sensor signal circuit on Bank 2 of the engine. This allows the LEDs on the right side of the gauge to display the air/fuel ratio for Bank 1 oxygen sensor and the LEDs on the Left side of the gauge to display the Air/Fuel Ratio for Bank 2 oxygen sensor (see figure 3).

CAUTION: Some oxygen sensors use shielded wires. Make your SIGNAL wire connections on the signal circuit, away from the shielded wire and after the oxygen sensor connector. **DO NOT** make connections on the shielded wire itself.

4 GAUGE CONNECTION (continued)

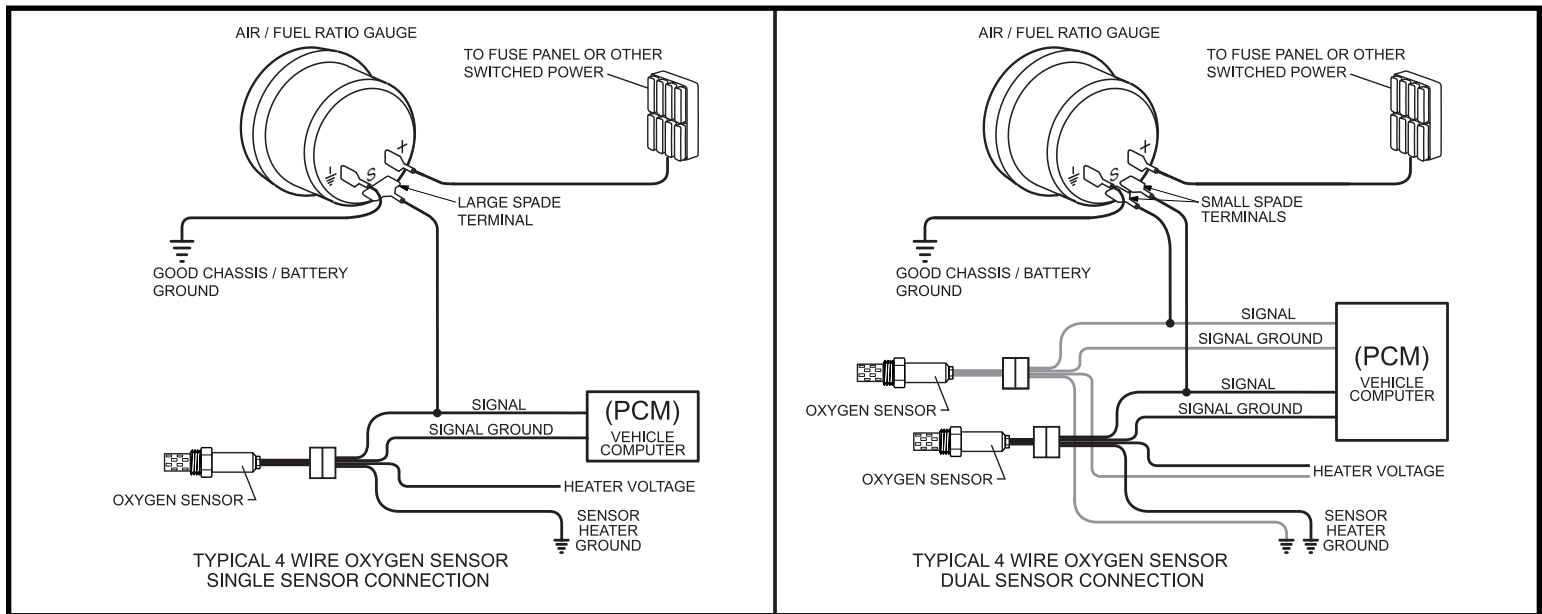


Figure 3. Air/Fuel Ratio Gauge Connections

5 GAUGE OPERATION (See Figure 4)

The Air/Fuel Ratio Gauge face has two columns of 10 colored LEDs. Each LED lights in response to a specific output voltage signal level from the oxygen sensor(s). The LED colors represent the current air/fuel ratio condition; Red to indicate a LEAN condition, Green to indicate OPTIMAL, and Yellow to indicate a RICH condition.

The Air/Fuel Ratio Gauge indication should change, depending on the current driving conditions, as described below:

- At engine warm up, the engine runs in a RICH mode until the oxygen sensor reaches operating temperature. The oxygen sensor does not operate until it reaches a minimum of 600° F.
- At cruising speed, the oxygen sensor output voltage continually fluctuates up and down. The gauge LEDs light accordingly, cycling between slightly lean and slightly rich. This condition is considered OPTIMAL (normal) operation.
- When the vehicle is accelerated rapidly, the vehicle's computer enriches the air/fuel mixture. The gauge indicates this very rich condition by gravitating mostly into the RICH (Yellow LEDs) area..
- On deceleration, the computer cuts most of the fuel to the engine. The gauge indicates this very lean condition by gravitating towards the LEAN (Red LEDs) area.

IMPORTANT: The four operating conditions described above represent a normally operating engine and engine management system. These conditions are considered normal. If a condition

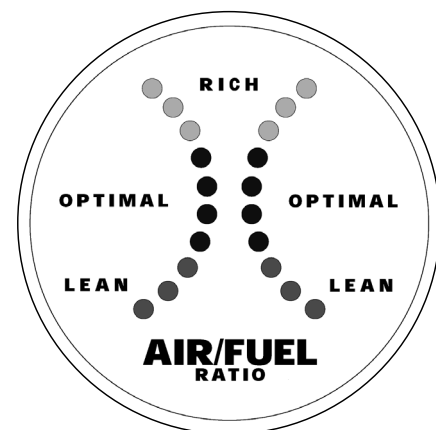


Figure 4. Gauge Operation

exists where the engine runs in the RICH or LEAN area most of the time, even at cruising speed, a problem may be indicated. Visually inspect components in the engine compartment for defective or disconnected vacuum hoses, or broken components. See your vehicle's repair manual to conduct appropriate tests related to that particular condition.