



B-751
115048
Rev 2: 10/13/05

PRECAUTIONS:

- ❑ Read ALL instructions before installing instrument.
- ❑ Follow ALL safety precautions when working on vehicle-wear safety glasses!
- ❑ ALWAYS disconnect (-) negative battery cable before making electrical connections.

HELP?:

- ❑ If after reading these instructions you don't fully understand how to install your instrument(s), contact your local Stewart Warner distributor, or contact our Technical Support Team toll free at **1-866-797-7223 (SWP-RACE)**.
- ❑ Additional applications information may be found at www.SW-Performance.com.

GENERAL APPLICATION:

- ❑ 12-volt DC negative (-) ground electrical systems (11-16 VDC operating voltage).
- ❑ Input: 0 to 1 volt from most factory and aftermarket oxygen sensors.

Installation Instructions
Air/Fuel Ratio Gauge 2" & 2-5/8"



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GAUGE MOUNTING (Figure 1):

NOTE: Instructions apply to 2" & 2-5/8" gauges (nominal SAE diameters). Be careful when making panel cut-out!

- ❑ Recommended panel cut-out (hole size) for 2" nominal gauge is 2.098" +/- .02".
- ❑ Recommended panel cut-out (hole size) for 2-5/8" nominal gauge is 2.670" +/- .03".
- ❑ Secure the gauge in the hole using the supplied retaining bracket, lock washers and #8-32 nuts. Maximum torque for mounting screws is 6 in. lbs.

TIP: It may be easier to pre-wire gauge before installing!

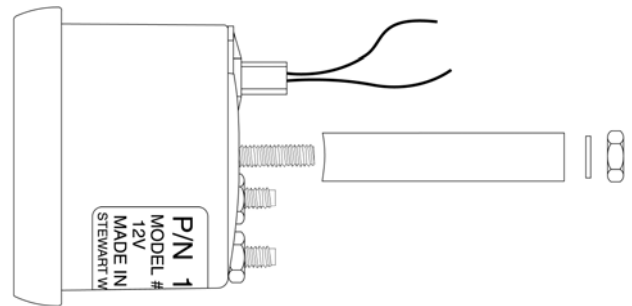


Figure 1

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AIR/FUEL RATIO GAUGE WIRING (Figure 2):

1. Disconnect negative (-) battery cable.
2. Using 18-ga. wire, connect the (-) terminal to a clean (rust/paint-free) engine ground.
3. Using 18-ga. wire, connect the (+) terminal to a switched +12V source.
4. Using 18-ga. wire, connect the (S) sender terminal to the signal wire from the oxygen sensor (refer to your vehicle service manual or your dealer for hookup location information).

NOTE: If you are hooking the signal wire at the oxygen sensor, connect to the vehicle wire harness, not the wires from the sensor.

5. Connect one (1) of the light wires (WHITE) to the dash lighting circuit or to a +12V switched circuit.
6. Connect other light wire (BLACK) to chassis ground.
7. Reconnect the negative (-) battery cable & test instrument to ensure that it is working.

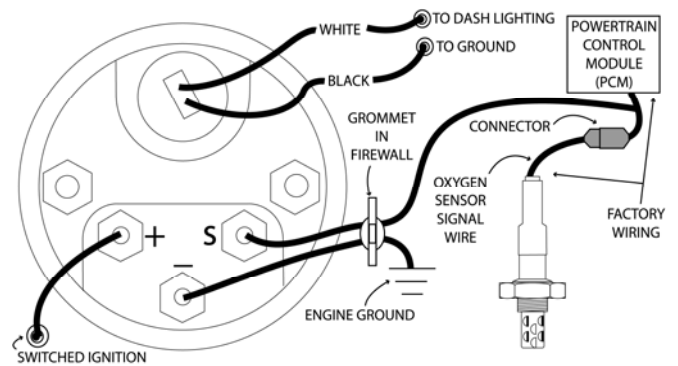


Figure 2

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OXYGEN SENSOR INFORMATION (Figure 3 & 4):

There are two (2) types of oxygen sensors, heated and unheated. The oxygen sensor needs to be at least 600°F in order to produce a signal. The unheated sensor relies on exhaust gases for heat. It can take several minutes to reach 600°F, and may drop below operating temperature while idling. The heated sensor has an internal heating element, which quickly reaches and maintains operating temperature.

- ❑ The unheated sensor has 1 or possibly 2 wires (figure 3).
- ❑ The 1-wire sensor has only the signal wire, which goes to the (S) terminal on the gauge.
- ❑ The 2-wire sensor has an additional wire for the signal-ground. The signal-ground wire connects along with the gauge (-) wire to the engine ground.
- ❑ The heated sensor generally has 3 or 4 wires (figure 4).
- ❑ On a 3-wire sensor there are generally 2 wires (the same color) for the heater. Connect one wire to ground and the other to a switched 12V source. The third wire is the signal wire, which goes to the (S) terminal on the gauge.
- ❑ The 4-wire sensor is essentially the same as the three 3 wire version except for the additional signal-ground wire which gets connected along with the gauge (-) wire to the engine ground.

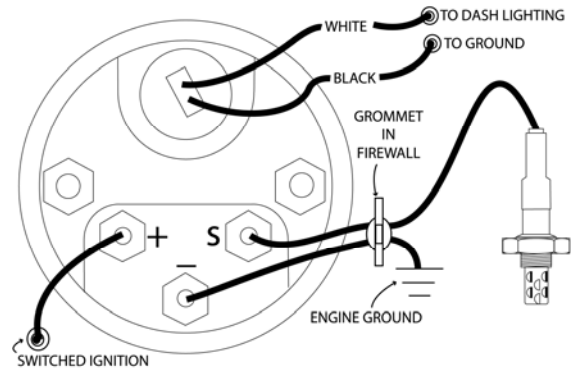


Figure 3

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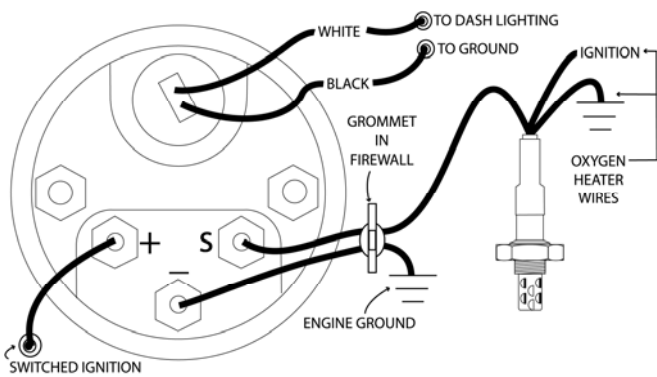


Figure 4

USING THE AIR/FUEL RATIO GAUGE:

- ❑ The Air/Fuel Ratio Gauge is essentially a voltmeter that displays the voltage output of an *oxygen sensor* in order to determine the richness or leanness of the exhaust mixture. It provides four red LEDs (for *lean* status), ten yellow LEDs (*stoichiometric*), and six green LEDs (*rich*). The first LED comes on at .05V, the second at .10V and so on, in increments of .05V.
- ❑ The Air/Fuel Ratio Gauge is wired to an oxygen sensor, a device that measures the presence of oxygen in the exhaust. More oxygen in the exhaust is a result of a lean air fuel mixture and less oxygen is the result of a rich mixture. The "perfect" ratio (not rich or lean) of air and fuel is called the Stoichiometric (STOICH) ratio. Once the STOICH Air/Fuel ratio is achieved, the oxygen sensor will be very sensitive (accurate). Although it can not measure exact richness or leanness, the Air/Fuel Ratio Gauge is an excellent indicator of dangerous conditions. For example, a vacuum leak or a drop in fuel pressure could cause a detrimental lean condition. The Air/Fuel Ratio Gauge will show this condition before damage occurs.

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USING THE AIR FUEL RATIO GAUGE CONTINUED:

- ❑ When used in a fuel injected application, the PCM (Powertrain Control Module) uses the oxygen sensor to keep the engine running close to the STOICH ratio. It does this by continually leaning the mixture until the sensor shows lean, then richening the mixture until it shows rich. This continuous loop keeps the air/fuel mixture near the STOICH ratio. Under heavy acceleration the PCM will richen the mixture for optimum power and under deceleration the PCM will lean the mixture for low emissions and economy. The Air/Fuel Ratio Gauge is an excellent choice for monitoring PCM operation.
- ❑ Although the Air/Fuel Ratio Gauge is a monitoring device, it can be used with a carburetor as a tuning aid. Start with rich jetting, then gradually lean the mixture out until the Air/Fuel Ratio Gauge shows lean, then richen the carburetor back up slightly until there is a rich reading. This should produce the best power, but as always, the final jetting should be verified by inspecting the spark plugs.

CLEANING DIRECTIONS:

- ❑ For proper cleaning of instrumentation/accessories, use a glass cleaner or mild detergent with a spray on and wipe method.

WARRANTY INFORMATION:

TWO (2) YEAR LIMITED WARRANTY. SWP products are warranted against defects in workmanship and materials for a period of two (2) years from the date of purchase. Proof-of-purchase is required; otherwise, the warranty period shall default to two (2) years from date-of-manufacture (as indicated by the date code on the product). See detailed Warranty Policy for other Terms & Conditions.

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1-866-SWP-RACE (797-7223)
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