

INSTALLATION INSTRUCTIONS



BOSCH

GENERAL MOUNTING INSTRUCTIONS

The manufacturer produces a full line of gauges with many different styles.

- 1-1/2" Gauges
- 2" Gauges
- 2-5/8" Gauges

Gauges allow you to monitor the condition of your vehicle and tell how well it is performing. If there are any problems, you can detect them immediately before they become severe. Warning lights only tell you when the problem already requires immediate attention. You will find that the addition of these gauges will add to your peace of mind and driving comfort.

MICROPROCESSOR-CONTROLLED ENGINES

Many newer vehicles employ microprocessors that control most of the engine and electrical functions. Microprocessors are very sensitive electrical components. Before installing any aftermarket equipment consult the vehicle's manufacturer or shop manual to make certain that no damage will result.

Some of these newer vehicles use electric cooling fans or microprocessor engine controls that depend on readings from the original equipment

sending units for correct operation. If your vehicle is one of these you CANNOT replace the sender(s) with any other. You can add an additional oil pressure sender with a "Tee Adapter Kit," but the only possible way to install a non OEM water temperature sender is to install the new sender in a different location, retaining the OEM unit in its original location. Check with the vehicle's manufacturer or dealer to see if this is possible.

INSTALLATION & SAFETY PRECAUTIONS

1. Read the entire instructions for your gauge before proceeding.
2. Be sure the gauge is suitable for your vehicle:
 - Does the gauge's range cover the vehicle's operating range?
 - Will the tubing of the mechanical gauges reach from the engine connection point to the gauge (temperature gauges cannot be lengthened)?
 - Is the vehicle's electrical system 12 volt and negatively grounded?
3. It is recommended that the battery ground cable be disconnected before any electrical work is performed, especially when installing Ammeters or Voltmeters.
4. Route all wiring and gauge tubing away from linkages, high heat or moving parts.
5. Never smoke while working on your vehicle and always keep a fire extinguisher nearby. It should be rated for gas/chemical/electrical fires.
6. Never lay tools on top of the battery or wear jewelry during electrical work to avoid severe electrical shorts.

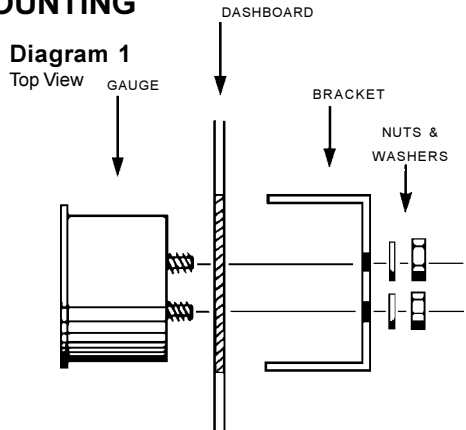
GAUGE MOUNTING

All gauges can be mounted into a surface of your choice or into a panel. Single, dual & triple gauge mounting panels are produced for all size gauges. Some panels are in black or chrome finishes. A fully chromed mounting cup is available for the 2-5/8" gauges.

1. Choose a location to mount the gauge where it will be viewable from a normal driving position (fuel pressure gauges should never be mounted within the interior of the vehicle).
2. If you are using a mounting panel, mount it at the chosen location with the screws provided.

If you are creating a hole, use the following sizes:

<u>Gauge Style</u>	<u>Hole Size</u>
1-1/2"	1-5/8" (41 mm)
2"	2-1/16" (53 mm)
2-5/8"	2-5/8" (67 mm)

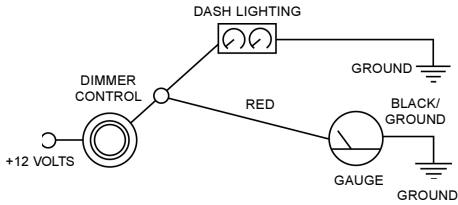


3. Dimmer Control.

For dash lighting dimmers that control the positive side (Diagram 2A) of the lighting circuit:

Diagram 2A

For Positive Dimmer Controls



- For Two-wire Bulb Holder -

Connect the red wire into the circuit between the dimmer control and the dash lights. Connect the black wire to a good electrical ground.

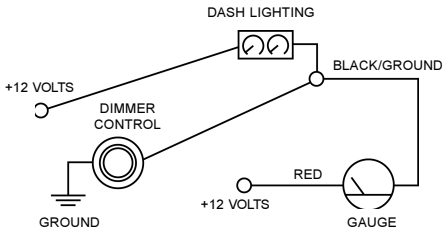
- For One-wire Bulb Holder -

Connect the one wire into the circuit between the dimmer control and the dash lights. Obtain a length of 18-gauge insulated copper wire and connect one end of the wire to a good electrical ground and the other end to one of the mounting bracket posts.

For dash lighting dimmers that control the grounded side (Diagram 2B) of the lighting circuit:

Diagram 2B

For Ground Dimmer Controls



- For Two-wire Bulb Holder -

Connect the black wire into the circuit between the dimmer control and the dash lights. Connect the red wire to the fuse box so that the wire only receives +12-volt power when the dash lights are turned on.

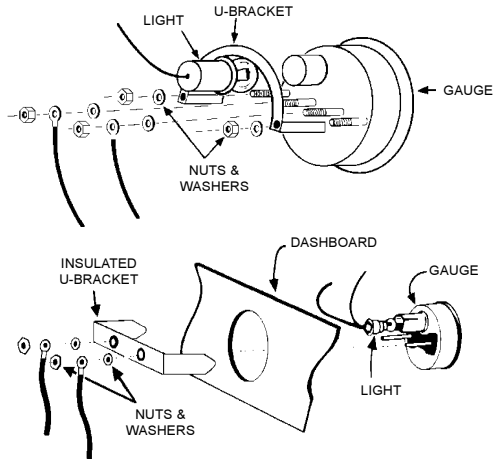
- For One-wire Bulb Holder -

Connect the wire to the fuse box so it receives only +12-volt power when the dash lights are on. Obtain a length of 18-gauge insulated copper wire and connect one end to the gauge mounting bracket or panel. Connect the other end of the wire into the circuit between the dimmer control and the dash lights. **Insulate the gauge and bracket from grounded surfaces.**

4. Refer to specific instructions for the gauge you are installing. They explain the other connections that should be made before mounting is completed.
5. Insert the gauge into the mounting panel or hole.
6. Insert the bulb holder into the bulb socket on the back of the gauge.
7. Install the appropriate mounting bracket (Diagram 1: insulated or non-insulated) over the mounting posts (Diagram 3), slide on washer, plus a lock washer if supplied, and tighten the nut with only light pressure. If the gauge is an electrical model, be sure you use a bracket that has grommets to insulate the posts from the mounting bracket. This does not apply to gauges using separate bracket mounting posts from the posts used for wire connections.
8. Position the gauge for best visibility and appearance, then tighten the bracket nuts with moderate pressure. Do not over-tighten these nuts when using an insulated bracket. Excess pressure can distort the grommets causing them to crack and short the wiring, even months after installation.
9. Refer to the specific instructions for the gauge you are now installing to complete any other connections.

Diagram 3

Electrical Gauges Shown



VACUUM/ECONOMETER/BOOST GAUGE INSTRUCTIONS

These types of gauges measure the vacuum and/or pressure existing within the intake manifold of the vehicle. Different ranges or markings cover different needs and applications. A vacuum or econometer gauge measures the vacuum created as the engine draws air into its cylinders. A boost gauge measures the same vacuum as well as the pressure when an external turbocharger or supercharger pushes air into the engine. An engine that is not supercharged or turbocharged will generally have a vacuum reading between 12" and 18" Hg (inches of mercury) at idle. Check the manufacturer's specifications for more exact readings for your engine at idle speed and other RPM. All of these gauges can aid you in monitoring engine efficiency, achieving the best fuel economy and noticing engine malfunctions immediately.

PRECAUTIONS

1. Be sure the source of vacuum you pick is a direct source and not in the brake booster or other accessory line, otherwise the reading may be inaccurate or unsteady.
2. Be sure your tubing and fitting connections are complete and sealed, for a vacuum leak will cause rough engine operation at idle, and inaccurate readings.

INSTALLATION

For Gauges with a Barbed Fitting:

1. Find a location on your intake manifold where you can either unscrew a plug in the manifold or find a vacuum hose you can cut to splice in a barbed T-Fitting.
2. From the tubing kit, either screw in the barbed manifold fitting or splice the barbed T-Fitting into a suitable vacuum line. This is done by cleanly cutting the tubing and then pressing each cut end of the tubing tightly into the opposing barbs of the T-Fitting.
3. Unroll a few feet of vacuum tubing and press the end tightly into the remaining barb of the T-Fitting.
4. Route the remaining tubing through the fire wall into the gauge, leaving at least one 3" or larger loop in the tubing before it enters the fire wall and protect the tubing from any rough edges of the fire wall. Press the tubing tightly onto the barb on the back of the gauge.
5. Start the engine and check for proper gauge operation. Refer to the **How To Use** section on the next page.

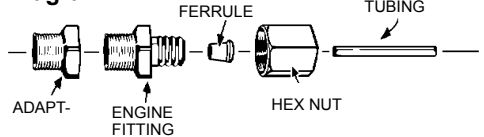
For Gauges with 1/8" NPT (threaded) Fitting:

1. Find a location on your intake manifold where

you can screw in the engine fitting directly or using the adapter included with the gauge. Manifolds often have removable plugs.

2. Screw in the adapter (if needed) and engine fitting into the manifold at the location you selected.
3. Uncoil a few feet of tubing and slide a

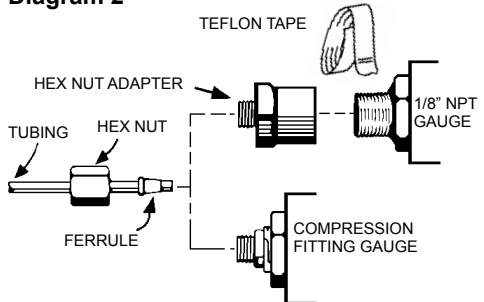
Diagram 1



hex nut and ferrule over the end of the tubing as show in Diagram 1.

4. Insert the tubing into the engine fitting and then tighten the hex nut into the engine fitting.
5. Route the remaining tubing through the fire wall to the gauge, leaving at least one 3" or larger loop in the tubing before it enters the fire wall and protecting the tubing from any rough edges of the fire wall.
6. If the hex nut adapter is not attached to the gauge, then wrap Teflon tape around the adapter's threads and attach the hex nut adapter. Attach the tubing as in Steps 3 and 4. Refer to Diagram 2.

Diagram 2



7. Complete the mounting of the gauge.
8. Start the engine and check for proper gauge operation. Refer to the **How To Use** section on the next page. For boost gauges, you will need to consult manufacturer's specifications for the RPM and pressure values that provide the maximum boost and for the RPM value that transfers to boost from vacuum.

TROUBLESHOOTING

1. If your engine idles roughly, check the tubing and fittings for leaks. Sealing tape or compound can usually be used to solve these leaks.

2. If the gauge vacuum readings changes when the brake pedal is pressed, then you will need to select another vacuum attachment point.

HOW TO USE

An Econometer is merely a vacuum gauge with different markings to directly indicate the economy benefits of each area of vacuum operations.

POOR: 0-10" Hg — Acceleration or Load requires

a more open throttle position. Open throttle means more air and gas flow for more horsepower, reducing vacuum and fuel economy.

NORMAL: 10-20" Hg — Cruise condition, fairly steady throttle position, most useful economy range.

DECELERATION: 20-30" Hg — Throttle is nearly closed, momentum of vehicle or downhill grade carry vehicle forward. Little horsepower required, least fuel used.