INSTALLATION INSTRUCTIONS
ELECTRICAL GAUGES/KITS

1 PREPARATION FOR INSTALLATION

This section *must* be read and followed before installation of the gauge is performed.

1. Read instructions completely before installation.
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 and follow it's safety precautions before any test or service procedure is performed.
5. Disconnect negative (-) battery cable before installing gauges (**do not forget to reconnect battery after installation is complete**).
6. Locate the vehicle's oil pressure and/or coolant temperature sending units, and verify the vehicle's sending unit port thread size is compatible with the thread size on the gauge's sending unit and/or the supplied adapters. DO NOT DRILL ANY HOLES IN DASH BEFORE ENSURING COMPATIBILITY. See the following notes.

NOTES:

- If the vehicle's original temperature sending unit is used by the vehicle's computer for engine control functions, DO NOT REPLACE. Consult the dealer (or a professional) to determine if the new sending unit can be installed in an alternate location on the engine. If no suitable location is found, this gauge is not suitable for your application. (See below for oil pressure gauge.)
- For oil pressure gauges, a T-fitting (sold separately) may be used to accommodate the new gauge sending unit, and to keep the vehicle's original sender operational.

7. Determine a mounting location for the gauge. Choose a location that does not impair visibility or interfere with driving. Check behind the mounting location for any wiring or components before drilling. Also take into consideration the routing and length of the lead wires from gauge to engine sender port.

WARNING: Follow vehicle manufacturer's service recommendations. Check and maintain the vehicle's engine regularly (cooling system level and condition, oil system level and condition, charging system condition, etc.). Never rely on the gauges as the ONLY means of protection.

2 MOUNTING AND INSTALLATION

A. PANEL INSTALLATION

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

1. Determine mounting location (see section 1, step 7).
2. Using gauge panel as a template, mark locations for screws.
3. Drill small holes for the screws.
4. Mount panel in place and secure with screws and flat washers provided.

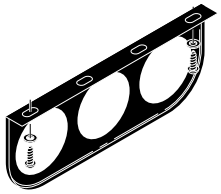

Figure 1. Gauge Panel

B. IN-DASH MOUNTING

1. Using a hole template, cut out a 1-1/2", 2" or 2-5/8" (3,81 cm, 5,08 cm, or 6,67 cm) hole, as necessary, through the dashboard.
2. Using a round file, 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, as applicable.
2. Hold gauge case and rotate gauge, as needed, until gauge dial face is properly positioned in front of dashboard/panel. Secure gauge in place.
3. Tighten locking ring on gauge in clockwise direction until gauge is tight against dashboard/panel. Tighten locking ring HAND TIGHT ONLY.

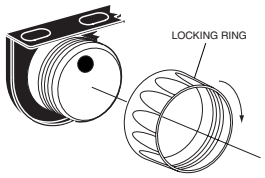

Figure 2. Gauge Equipped with Locking Ring

3 GAUGE LIGHT INSTALLATION AND CONNECTION

NOTE: Depending on the model of gauge, backlighting color may be changed to either red, green or blue by installing the optional color filter over the bulb (not available for all gauge kits).

1. Insert the light bulb and socket assemblies into the light receptacles on the back of the gauge and press firmly to snap/lock into place.

   NOTE: Wire for gauge lights must be purchased separately. Use size 18-20 AWG stranded copper wire.
2. Splice the RED or WHITE wire from the gauge light(s) into the vehicle's lighting circuit, between the dimmer control switch and the dash lights (consult the vehicle's service manual for proper wire).
3. Connect light socket BLACK wire to a good chassis ground.
4. Insulate all connections with shrink tubing to prevent shorting.

   WARNING: For bulb replacement use <u>only</u> part # 161 Instrument/Indicator wedge type bulbs available at most auto parts stores. DO NOT USE ANY OTHER PART NUMBER SINCE THE HEAT PRODUCED BY A HIGHER WATTAGE BULB WILL MELT THE GAUGE CASE AND CREATE A FIRE HAZARD.

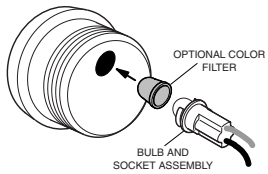

Figure 3. Light Bulb Installation

4 GAUGE CONNECTION

A. ELECTRICAL OIL PRESSURE

1. Determine routing for gauge lead wires. Use an existing firewall grommet, or drill a 3/8" (9,53 mm) hole through firewall to accommodate lead wires. Install a rubber grommet (purchased separately) in hole, and use shrink tubing to protect lead wires from chaffing or other damage.
2. Remove existing oil pressure sender. Install oil pressure sender provided with gauge and tighten securely using proper wrench.

   NOTE: Two types of oil pressure senders are used on oil pressure gauge kits. Both senders work basically the same but the letter markings to identify the "Sender" terminal and the "Warning Light" terminal on the senders are different. Make connections as applicable.

   NOTE: Oil pressure sender must ground to vehicle chassis. Do not use sealing compound or Teflon tape on sender threads.
3. Crimp or solder ¼" (6,35 mm) female spade connectors (included) on gauge positive (+), negative (-), and sender (S) wires.

   NOTE: Wire must be purchased separately. Use 18-20 AWG stranded copper wire.
4. Crimp or solder bullet/spade connector (provided) on remaining end of sender wire.
5. Connect lead wires to gauge positive (+), negative (-), and sender (S) spade posts. Route sender wire through grommet in firewall.
6. Connect negative (-) lead wire to a good bare metal electrical chassis ground.

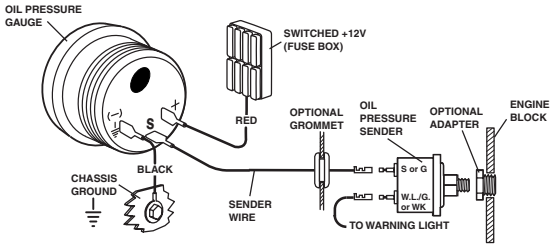

Figure 4. Electrical Oil Pressure Gauge Connections

7. Connect positive (+) lead wire into an existing switched (hot only when the ignition switch is in the "ON" position) positive (+) accessory line in vehicle fuse block. Insulate splices with electrical tape to prevent shorting.
8. Connect sender (S) lead wire to sender "S" or "G" terminal (as applicable) on oil pressure sender.
9. If desired (or mandatory), existing oil pressure warning light can be used in conjunction with the Electrical Oil Pressure Gauge. (Only compatible with **some** original equipment sending units that have only one lead wire. See note following for details.)

   - Disconnect warning light lead wire from vehicle's existing oil pressure sending unit, and crimp or solder bullet/spade connector on warning light lead wire. Connect the warning light lead wire to warning light "W.L./G." or "WK" terminal (as applicable) on the oil pressure sender.

A. ELECTRICAL OIL PRESSURE (Cont)

NOTE: If the oil pressure warning light stays on when the engine is started (step 11), or if your vehicle's original oil pressure sending unit has two or more lead wires, this method will not work, and a T-fitting adapter (purchased separately) MUST be used to keep your existing oil pressure sender and warning light operational.

10. Secure lead wires along their route to prevent damage from sharp edges, moving parts or hot engine components.
11. Reconnect negative (-) battery cable. Start and run engine for approximately 30 seconds. Turn off engine and check gauge installation for leaks. Tighten joints as needed and retest.

B. ELECTRICAL WATER TEMPERATURE

1. Determine routing for gauge lead wires. Use an existing firewall grommet, or drill a 3/8" (9.53 mm) hole through firewall to accommodate lead wires. Install a rubber grommet (purchased separately) in hole, and use shrink tubing to protect lead wires from chaffing or other damage.
2. With engine cold, drain coolant below the level of existing temperature sender (dispose of coolant properly). Remove existing water temperature sender. Install water temperature sender provided with gauge and tighten securely.

   NOTE: Temperature sender must ground to vehicle chassis. Do not use sealing compound or Teflon tape on sender threads.
3. Crimp or solder ¼" (6.35 mm) female spade connectors (included) on one end of gauge positive (+), negative (-), and sender (S) wires.

   NOTE: Wire must be purchased separately. Use 18-20 AWG stranded copper wire.
4. Crimp or solder bullet connector (provided) on remaining end of sender wire.
5. Connect lead wires to gauge positive (+), negative (-), and sender (S) spade posts. Route sender wire through grommet in firewall.
6. Connect negative (-) lead wire to a good electrical chassis ground.

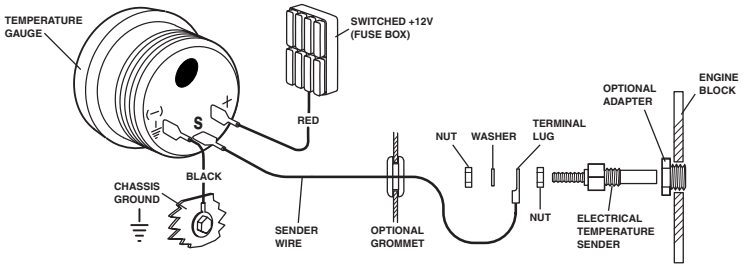

Figure 5. Electric Water Temperature Gauge Connections

7. Splice positive (+) lead wire into an existing switched (hot only when the ignition switch is in the "ON" position) positive (+) accessory line in vehicle's fuse panel. Insulate the splices with electrical tape to prevent shorting.
8. Connect sender lead wire terminal lug to water temperature sender using two nuts and one washer provided.
9. Secure lead wires along their route to prevent damage from sharp edges, moving parts or hot engine components.
10. Refill radiator. Reconnect negative (-) battery cable. Start and run engine and check gauge installation for leaks. Tighten joints as needed and retest.

C. FUEL LEVEL GAUGE

Fuel Level Gauges do not include a fuel level sending unit. These gauges are made to be used in combination with the vehicles existing fuel level sending unit (not applicable for all vehicle models). Ensure that the gauge matches vehicle's fuel level sending unit specifications as described in the "Fuel Gauge Application Table" below before installation.

- Fuel Level Gauges utilize a variable resistance sending unit located inside the fuel tank for operation. The variable resistor in the fuel level sending unit is designed to change it's resistance value (higher or lower) whenever the fuel level in the fuel tank changes. The range and value of the variable resistors that are used on sending units vary depending on the vehicle manufacturer, vehicle model and/or year.
- **Three types of fuel level gauges are available, and each gauge is calibrated to be compatible *only* with the manufacturer's sending units that have the specifications shown in the "Fuel Gauge Application Table" below.**

FUEL GAUGE APPLICATION TABLE

- **To determine a vehicle's fuel level sending unit specifications, disconnect the vehicle's sending unit wire from the vehicle's Fuel Gauge. Measure the resistance between the sending unit and chassis ground when the fuel tank is empty, and again when the fuel tank is full. Match the results obtained to the specifications listed below**

	Sender Range Specifications (±10 Ohms)	
Gauge Type	**When empty, must read**	**When full, must read**
General Motors*	0 Ohms	90 Ohms
Ford and Chrysler	73 Ohms	10 Ohms
AMC and S/W	240 Ohms	33 Ohms

*An optional sending unit that matches the General Motors fuel level gauge is available through your local distributor (NOT available for Ford, Chrysler or AMC gauges).

1. Determine routing for gauge lead wires. Use an existing firewall grommet, or drill a 3/8" (9.53 mm) hole through firewall to accommodate lead wires. Install a rubber grommet (purchased separately) in hole, and use shrink tubing to protect lead wires from chaffing or other damage.

   NOTE: Fuel level gauge lead wires must be purchased separately. Use size 18-20 AWG stranded copper wire.

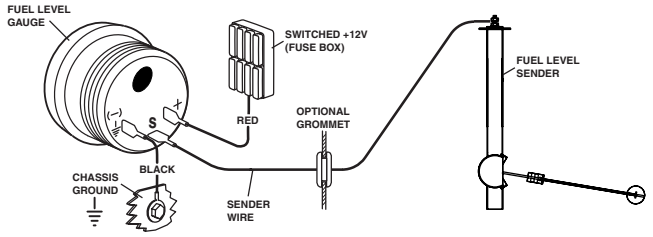

Figure 6. Fuel Level Gauge Connections

2. Crimp or solder ¼" (6.35 mm) female spade connectors (included) on one end of gauge positive (+), negative (-), and sender (S) wires.
3. Connect lead wires to gauge positive (+), negative (-), and sender (S) spade posts.
4. Connect negative (-) lead wire to a good bare metal electrical chassis ground.
5. Splice positive lead wire into an existing switched (hot only when the ignition switch is turned to the "ON" position) positive (+) accessory line in the vehicle's fuse panel. Insulate the splices with electrical tape or shrink tubing to prevent shorting.
6. Route sender wire through grommet in firewall.
7. Connect sender(s) lead wire to output or 'S' post on vehicle's existing fuel level sender.
8. Secure lead wires along their route to prevent damage from sharp edges, moving parts or hot engine components. Reconnect negative (-) battery cable. Turn ignition on and verify that fuel level gauge indicates proper fuel level.