INSTALLATION INSTRUCTIONS

ELECTRIC SPEEDOMETER

2650-1521-00

General Information

NOTE: The odometer on this speedometer may show some mileage less than 5 miles (8 km). This is a result of factory testing to insure optimum quality.

Speedometer Senders

The speedometer is designed to operate with an electrical speed sender. The speed sender signal range must be between 500 and 400,000 pulses/mile (310 and 248,500 pulses/km). Any speed sender or electronic module that meets the following two conditions can be used:

1. Pulse rate generated is proportional to vehicle speed.
2. Output voltage within the ranges listed below:
   - Hall effect sender, 3-wire (5 to 16V)
   - Sine wave generator, 2-wire (1.4 VAC min.)
   - 5V Square wave (CMOS)

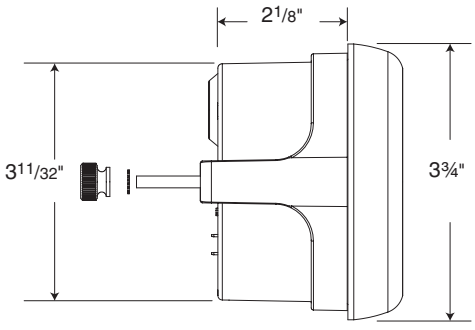
Recommended – Auto Meter Hall effect sender, 3-wire 16 pulses/revolution.

5291	Standard 7/8 – 18 thread
5292	Ford, plug in

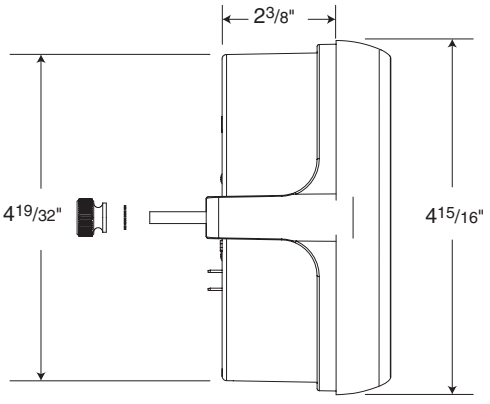
Mounting

1. Mount a 3 3/8" speedometer in a 3 3/8" dia. hole and a 5" speedometer in a 4 5/8" dia. hole. Be careful not to cut the hole too large.
2. Cut a 3/8" dia. hole in the firewall for the speedometer wires. Place a rubber grommet in the hole and route the wires through the grommet to the engine compartment.
3. Connect the speedometer wires as shown in the wiring sections.
4. Secure the speedometer to the dashboard using the provided bracket and hardware.

3 3/8" Models



5" Models



Testing

Once the speedometer is mounted and wired into the vehicle, the speedometer should be tested to verify that the electrical connections are working properly. First, watch the speedometer's pointer as the power is applied. The pointer should first move to a midrange position, then down to the 0 position on the dial. This action verifies that power is properly connected to the speedometer. The vehicle should be driven some distance to verify the Vehicle Speed Sender (VSS) is connected properly and that the pointer moves. If the pointer does not move off of the zero position, verify that the VSS is connected properly. In some cases calibration may be needed if the pointer does not register speed. Follow the calibration procedure and retest.

Calibration (Electric Speedometer calibration made easy!)

To calibrate your electric speedometer:

1. Connect the Calibration button to the “CAL” & “GND” tabs on the back of the speedometer.
2. With the power off, push and hold the Calibration button. While holding the button, start the vehicle and continue to hold the button until the pointer sweeps to full scale and stays at full scale. You may now release the button.
3. Drive to the beginning of a pre-marked 2 mile (2 kilometer) distance and stop. It does not matter how far away it is to get to this pre-marked 2 mile (2 kilometer) mile distance. DO NOT SHUT THE ENGINE OFF. Push and release the Calibration button. The pointer will drop to half scale.
4. Drive the 2 mile (2 kilometer) distance. The pointer will remain at the half scale position no matter what speed you drive. If you have to stop during the calibration, that is o.k. The speedometer will simply stop counting pulses during this time.
5. At the end of the 2 mile (2 kilometer) distance, stop and press and release the Calibration button. The pointer will drop to 0 and the calibration is stored. You are now finished. Remember the accuracy of your 2 mile (2 kilometer) distance will directly affect the accuracy of your speedometer.

The following list contains factors that can affect speedometer accuracy and how to minimize them during calibration.

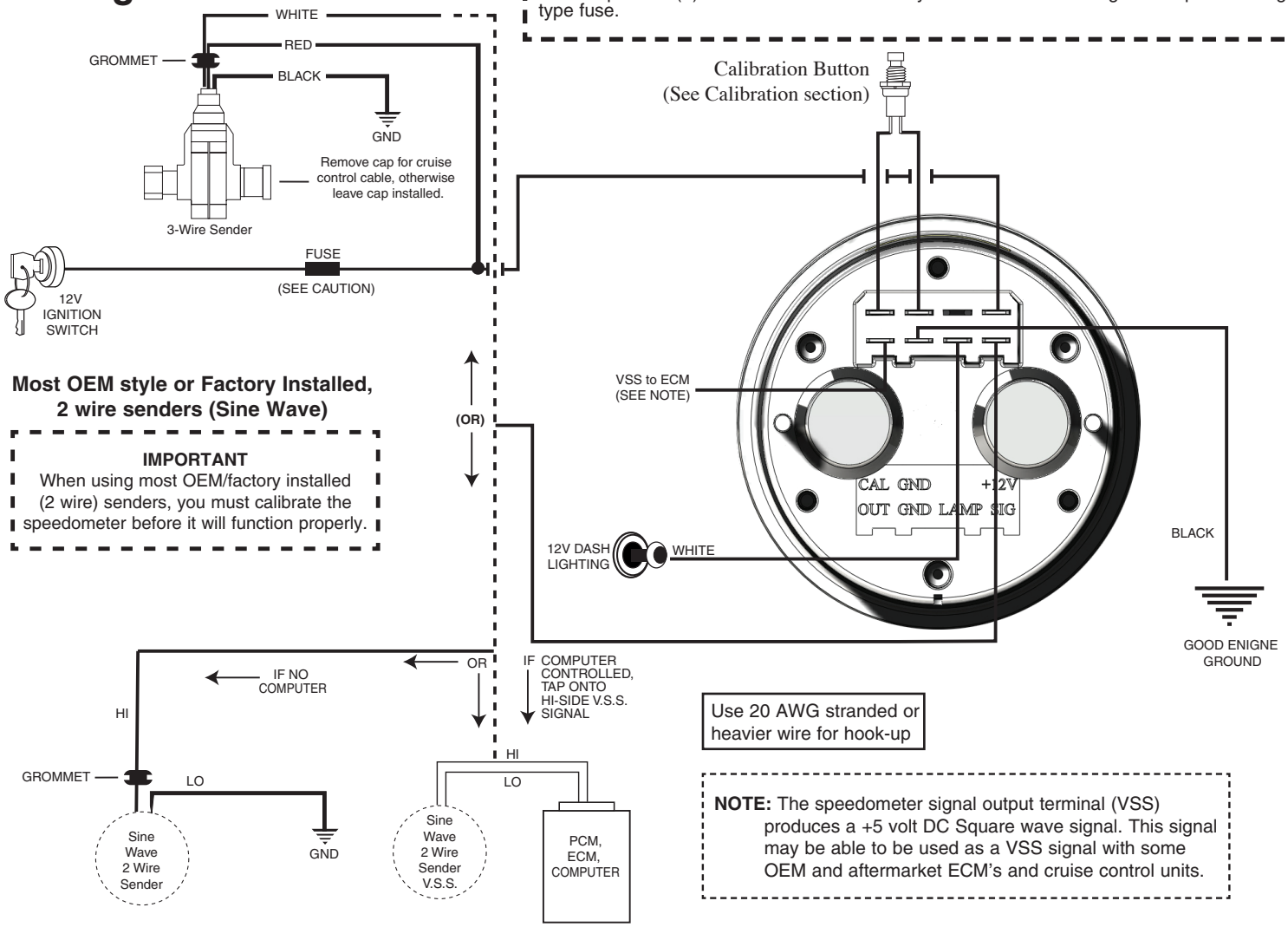
1. Tire diameter increases slightly as vehicle speed increases. To minimize this error drive at an average speed of 45 MPH (75 KPH) during calibration.
2. Tire diameter increases slightly as tire air pressure is increases. To minimize this error, check the vehicle’s tires to ensure correct air pressure.
3. Tire diameter changes with vehicle load. Minimize this error by having an average load in the vehicle during calibration.
4. Minimize tire slippage error by not breaking traction during calibration.

Note: Always recalibrate speedometer after any tire size or differential ratio change.

Wiring

CAUTION!

As a safety precaution, the power wire to this product should be fused before connecting it to the positive (+) side of the 12 VDC battery. We recommend using a 1 Amp fast-acting type fuse.



Most OEM style or Factory Installed, 2 wire senders (Sine Wave)

IMPORTANT

When using most OEM/factory installed (2 wire) senders, you must calibrate the speedometer before it will function properly.

Use 20 AWG stranded or heavier wire for hook-up

NOTE: The speedometer signal output terminal (VSS) produces a +5 volt DC Square wave signal. This signal may be able to be used as a VSS signal with some OEM and aftermarket ECM’s and cruise control units.

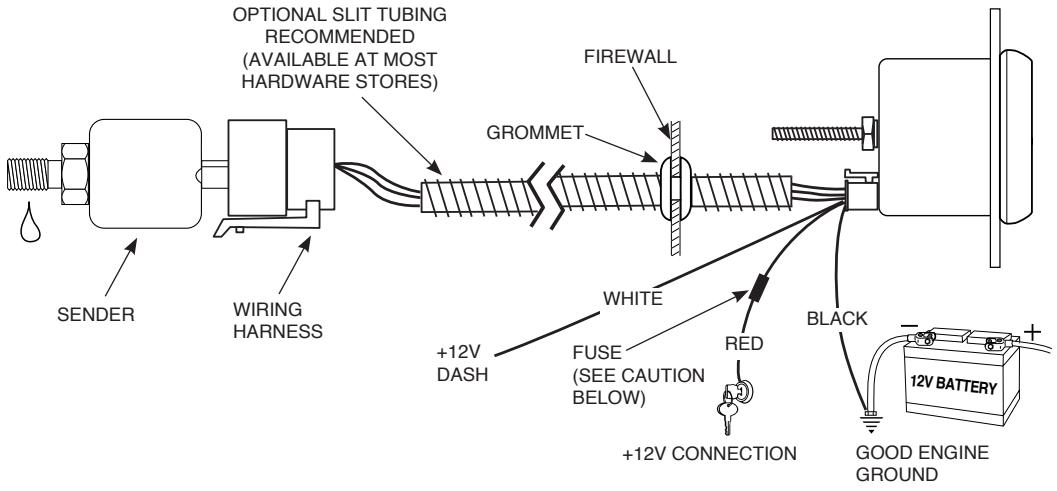
INSTALLATION INSTRUCTIONS

FULL SWEEP ELECTRIC PRESSURE GAUGES

2650-1162

IMPORTANT
WEAR SAFETY GLASSES

Use teflon sealing compound where symbol indicates. (Tape not recommended on these threads.)



CAUTION!
As a safety precaution, the +12V terminal of this product should be fused before connecting to the 12V ignition switch. We recommend using a 1 Amp, 3AG fast-acting type cartridge fuse (Littlefuse® # 312 001 or an equivalent).

Installation

1. Check that you have all parts required for installation, and the engine is cool.
2. Disconnect the negative (-) battery cable.
3. Gauge mounts in a 2 1/16" hole. Use supplied brackets and nuts to secure gauge to dash.
4. Drill 1" diameter hole where wires pass through sheet metal (such as firewall) and install rubber grommet provided. (Grommet will require slit.)
5. Connect the white wire to dash lighting or switchable 12V light source. [**For oil pressure gauge** installation, an optional 1/4" NPT adapter is included.]

CAUTION:
If you will be working with the fuel system, take care to insure no sparks or flames occur. Do not smoke while installing the fuel pressure sender.

6. [**For fuel pressure gauge**, install the 1/8" NPT pressure sender into the fuel system (See warning in next column). For Ford fuel injected applications with a Schrader valve in the fuel rail, use adapter 3275 between the fuel rail and pressure sender.]
   If unit is to be installed on a high vibration application such as a full race engine or engine capable of high RPM, it is strongly recommended that the sender be remote mounted to either the fenderwell or firewall, to insulate from vibration. Failure to remote-locate pressure senders on such an application could result in gauge failure and potential damage to vehicle and /or operator injury. Braided stainless steel lines are sold separately by Auto Meter, and can be used to accomplish this.
7. Reconnect negative (-) battery cable.

NOTE: Test all fittings and hoses for any leakage. If any leaks are detected, determine the cause of the leak and repair. Do not operate vehicle if any leaks are detected.

WARNING:
The fuel system is pressurized and often retains this pressure for an extended period of time. Properly vent your fuel system before installing the fuel pressure sender. If you are not familiar with the proper method of venting, you MUST have this done by an experienced mechanic.

NOTE: When the ignition is off the pointer may not always rest at zero.

WARNING: Not compatible with Nitromethane, Methanol, or 100% MTBE.

Power-Up

The pointer will move backward to the stop pin and then move to the zero box. This procedure is an auto-calibration function and is performed on every power-up. While this test is being performed, the gauge may make a clicking sound. This is normal.

INSTALLATION INSTRUCTIONS

SHORT SWEEP ELECTRIC GAUGES

2650-1079-00 Rev. C

IMPORTANT
WEAR SAFETY GLASSES

CAUTION FOR ALL GAUGE INSTALLATION (AMMETERS EXCLUDED)

As a safety precaution, the +12V wire attached to the positive I (+) terminal of the gauge should be fused before connecting to the positive (+) output side of the ignition switch. We recommend using a 3 Amp, automotive type fuse inline between the power supply source and the I (+) terminal on the gauge.

NOTE: Some late model vehicles use electronic sensors in their pressure and temperature senders for engine control functions. Before removing the original sender, we recommend that you contact your automotive dealer to be sure no critical functions will be disrupted. With pressure gauges it is beneficial to add a T-fitting to install your new gauge and to keep the warning light operational. This allows you to monitor the pressure and still have a warning light to indicate emergency conditions.

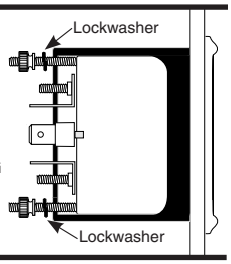
NOTE:: Disconnect negative (-) battery cable before installation.

CAUTION: Do not touch ignition wire to the sender (S) terminal on back of gauge or the sender may be damaged.

Mounting

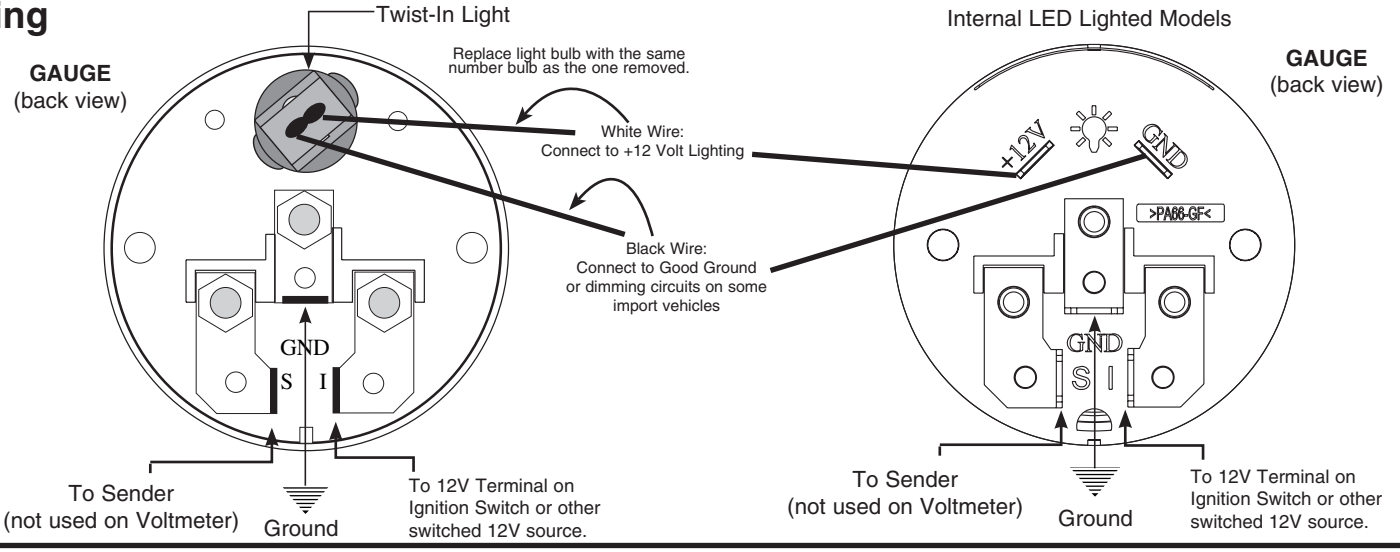
These gauges can be mounted in-dash or in Auto Meter mounting solutions (panels, cups, pods, etc.). 2⅛" diameter gauges mount in 2⅛" hole, 2⅝" diameter gauges mount in 2⅝" hole. Fasten with brackets supplied as shown. (Hookup wire is required.) To assure proper functioning of this instrument, please read instructions thoroughly before installing.

Metric Adapters



FRONT MOUNTING (BOTTOM VIEW)

Wiring

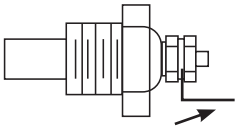


Temperature Gauges

1. Install temperature sender.
   - **A. Water Temp:** Install temperature sender (included). Purchase of additional fittings such as metric or hose adapters may be required.
   - **B. Oil & Trans. Temp:** Hole may have to be drilled and adapter nut (included) welded or brazed in pan. Be sure there is adequate internal clearance for nut and sender. Sender should automatically be grounded when installed. If not, proper ground connections should be made. May use #2260 weld on bung on steel pans (not included).
   - **C. Cylinder Head Temp:** Head must be drilled and tapped for ⅛" NPT hole. Sender should be grounded automatically when installed. If not, proper ground connections should be made. Be sure not to drill all the way through.
   - **D. Diff. Temp:** Install temperature sender in ⅛" NPT sender port on cover if available. If cover does not have a port, remove cover and drill and tap a ⅛" NPT hole or, drill and weld, or braze, adapter nut (included) in cover. Proper ground connections should be made by running ground wire from bolt in cover to chassis, being sure to leave enough slack in wire for suspension travel.
2. Route 18-gage wire through firewall. If a new hole is drilled in the firewall a grommet is recommended. Connect one end to terminal post on temperature sender, and opposite end to sender (S) terminal on back of gauge.
3. Route 18-gage wire from center terminal GND (-) on back of gauge to good ground near sender.
4. Connect wire from ignition switch to ignition (I) terminal on back of gauge.
5. Reconnect negative (-) battery cable.

USE TEFLON SEALING COMPOUND ON PIPE THREADS

TEMPERATURE SENDER



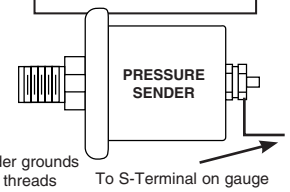
To S-Terminal on gauge

Note: Sender grounds through threads

Pressure Gauges

1. Install sender into pressure port of appropriate type. **If unit is to be installed on a high vibration application such as a full race engine or engine capable of high RPM, it is strongly recommended that the sender be remote mounted to either the fenderwell or firewall, to insulate from vibration. Failure to remote-locate pressure senders on such an application could result in gauge failure and potential damage to vehicle and/or operator injury.** Braided stainless steel lines are sold separately by Auto Meter, and can be used to accomplish this. Sender features ⅛" NPT male fitting and comes with ¼"NPT adapter. Sender should automatically be grounded when installed. If not, or if remote relocation of sender is required, a ground connection to sender "body" may need to be made.
2. Route 18-gage wire through firewall. If a new hole is drilled in the firewall a grommet is recommended. Connect one end to terminal post on pressure sender, and opposite end to sender (S) terminal on back of gauge.
3. Connect wire from center terminal GND (-) on back of gauge to good engine ground near sender.
4. Connect wire from ignition switch to ignition (I) terminal on back of gauge.
5. Reconnect negative (-) battery cable.

USE TEFLON SEALING COMPOUND ON PIPE THREADS



Note: Sender grounds through threads

To S-Terminal on gauge

Ammeter

Read **before** installing: **Must be installed by experienced technician.**

WARNING

Have your maximum alternator output tested. Choice of improper ammeter rating and/or wire size, and any loose connections can cause dangerous overheating, which could lead to a fire in the vehicle. Ammeter and wire should have a capacity of at least 10 amps more than your vehicle's maximum alternator output.

1. 10-gage wire or larger must be used.
2. **IMPORTANT:** Verify that base nuts on both meter terminals are tight. Tighten base nuts prior to installing terminal lugs and wires. Connect ammeter as shown.

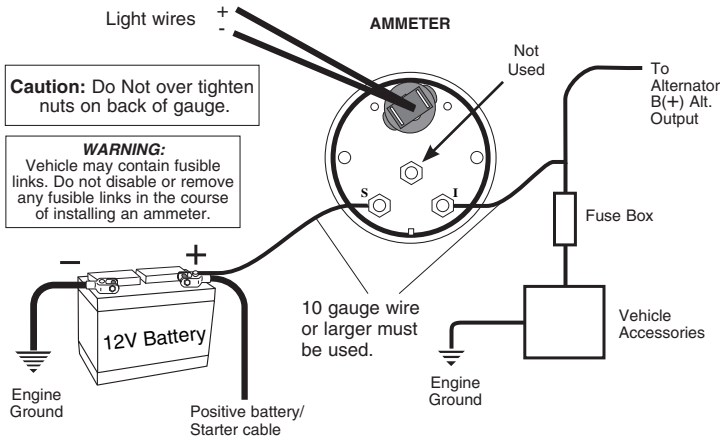
CAUTION:

DO NOT CONNECT THE AMMETER ACROSS THE BATTERY.

3. **IMPORTANT:** Terminal lugs must be BOTH crimped and soldered to wire; star lockwashers must be used on both sides of terminal lugs.
4. Tighten terminal nuts to compress star lockwashers into terminal lugs.
5. Verify that **none** of the ammeter connections are to ground.
6. Reconnect negative (-) battery cable.
7. Leaving engine **off**, turn on lights. Indicator should read negative (-). If it reads positive (+), disconnect neg. battery terminal and reverse the wires on back of meter, then reconnect neg. battery terminal. **Before** starting engine, double check that all connections are tight. After starting engine, check wiring connections for hot spots. Be prepared to shut engine off **immediately** if hot spots are detected.

Wiring

Example wiring of a typical Ammeter installation. Consult vehicle Mfr. for specific wiring details and safety considerations.



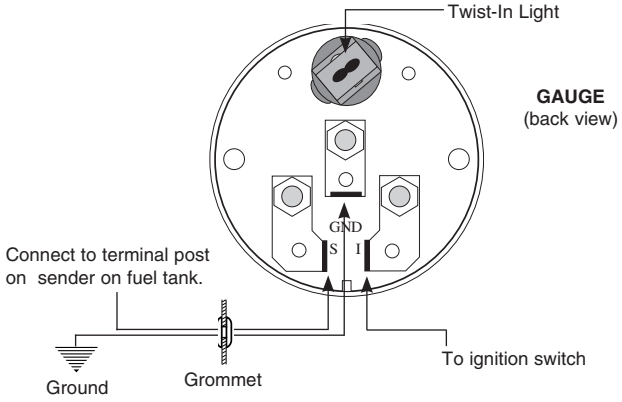
Fuel Level

Contact Auto Meter service if help is needed in determining your sender resistance.

Note: Before beginning installation, check to make sure stated resistance range for the gauge matches your sending unit value for proper operation. The chart below may be helpful in determining what resistance range of gauge to use. For further assistance please contact Tech Support at 866-248-6357.

	SENDER RESISTANCE (OHMS)	
	EMPTY	FULL
For most GM vehicles to 1997	0	90
For most Ford and Chrysler vehicles	73	8-12
Use 3262 Fuel level sender	240	33
For most GM vehicles before 1965	0	30
Most '89 and newer Fords	16	158

1. Gauge connects to fuel sender on fuel tank. Existing wires may be used, or route proper length of 18 gage, wire from fuel tank to gauge. If a new hole is drilled in the firewall a grommet is recommended. Connect one end to terminal post on fuel level sender and the opposite end to the sender (S) terminal spade on back of gauge.
2. Connect ground wire from ground post on gauge to suitable chassis ground.
3. Connect wire from ignition switch to the positive I (+) terminal on the back of gauge. See figure right.
4. Reconnect negative (-) battery cable.
5. Be sure that body or mounting flange of sender is grounded to suitable chassis ground.



NOTE: Failure to ground sender as in step 5 may result in inoperable gauge.

Voltmeter

1. Using 18 gage wire, route one length through firewall. If a new hole is drilled in the firewall a grommet is recommended. Attach one end to the negative GND (-) spade terminal on back of gauge, and the opposite end to a good engine ground. See illustration at right.
2. Attach one length of wire to the positive I (+) terminal on back of gauge and opposite end to 12V terminal on ignition switch or other 12V switched power source.
3. Reconnect negative (-) battery cable.