

EZ-FUEL

Vehicle Mounted Fuel Dispensing System

U.S. Pat. No. 5,964,988

MODEL P-250
INSTALLATION
AND
OPERATING GUIDE

READ THESE PRECAUTIONS
BEFORE PROCEEDING WITH
THE INSTALLATION

IF YOU DOUBT YOUR ABILITY TO PROPERLY INSTALL YOUR EZ-FUEL SYSTEM TAKE IT TO AN AUTHORIZED INSTALLATION CENTER OR A PROFESSIONAL AUTO MECHANIC.

THIS SYSTEM USUALLY INSTALLS IN LESS THAN ONE HOUR.

To avoid injuries do not attempt to install EZ-Fuel on a warm or hot engine.

Do not start installation until vehicles ignition key is secured away from the vehicle, we recommend that you disconnect the vehicles battery for maximum safety

Do not smoke or attempt this installation around any open flame or ignition source.

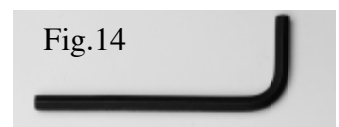
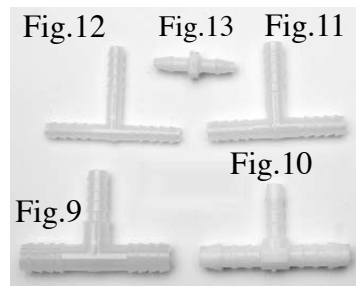
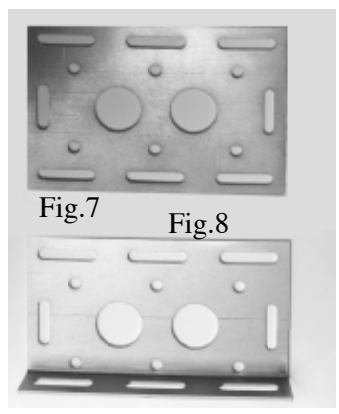
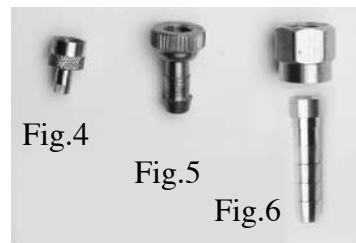
If gasoline is spilled, clean up any fuel immediately and dispose clean-up materials according to hazardous waste disposal regulations.

Installation Kit Parts List

NOTE: This kit contains installation parts for different vehicle types

Quantity and Description of parts kit

- (Fig.1) 1-EZ-FUEL ready to mount, quick connect plastic (QCPE) enclosure (pre-fitted with quick connects)
- (Fig.2) 1 coil of 5/32 ID X 6 foot - vacuum hose (black)
- (Fig.3) 1 coil of 1/4 ID X 7 foot - high pressure fuel supply hose (yellow)
- (Fig.4) 1 Schraeder valve removal tool
- (Fig.5) 1 Ford test port fitting
- (Fig.6) 1 GM/ Chrysler/Jeep test port fitting
- (Fig.7) 1 Flat toggle plate bracket for QCPE
- (Fig.8) 1-90 degree angle bracket for QCPE
- (Fig.9) 1- Universal fuel Line T-fitting 3/8x1/4x3/8 O.D.
- (Fig.10) 1-Universal fuel line T fitting 5/16 X 1/4 X 5/16
- (Fig.11) 1-Universal fuel line T fitting 1/4x1/4x1/4 O.D.
- (Fig.12) 1-Vacuum line T-fitting
- (Fig.13) 1-Vacuum puncture fitting
- (Fig.14) Allen wrench
- (Fig.15) 4-1/4-16X 2" bolts
- (Fig.16) 1/4- 16 X 3" bolts
- (Fig.17) 4-1/4-16 X 4 " bolts
- (Fig.18) 4-sets-1/4-16 X 1" bolts with nuts and washers
- (Fig.19) 4-3 inch pieces of split scuff guard
- (Fig.20) 4-1/4 X 1 inch, Self drilling bolts
- (Fig.21) 1-In-line shut-off valve
- (Fig.22) 6-Stainless steel hose-clamps
- (Fig.23) 12-Cable ties



SECTION A

Installing the EZ-Fuel, quick connect enclosure

The EZ-Fuel quick connect enclosure can be installed anywhere under the hood where it's safe (Fig 1) or almost anywhere on the outside of the vehicle (Fig 2)

The mounting brackets are designed to allow an infinite number of possible configurations. The holes and slots allow for total flexibility in the many possible mounting locations and combinations. Combined with the various length bolts and the self tapping screws provided there should be little problem in finding a suitable bracket / mounting combination.

The brackets have the exact same mounting holes and slots, However, the quick connect plastic enclosure has none of the holes or slots drilled. Therefore you will need a 1/4 inch drill bit to drill the holes through the enclosure to mount it.

If you are using self tapping screws you will need a 5/16 nut driver for your drill. Use the flat toggle bracket to check for placement / alignment of the through the grill mounting location.

Note: there should be sufficient clearance for the hoses that attached to the back of the enclosure. There should be enough clearance to pass through the grill and then make a gentle bend so as to not kink the hoses. Make sure the hoses do not rub on any of the behind the grill or through the engine compartment components. Do not allow the hoses to touch the spinning pulleys or belts. Route all hoses away from any hot engine surfaces, especially the exhaust manifolds.

Tip: uncoil the two supplied hoses in advance. This will straighten them and make an easier installation.

For most of the under-the-hood installations the quick connect enclosure (QCE) is usually mounted in a horizontal position (Figure 3). For example; the 90-degree (part-H) bracket could be mounted onto a fender well using the self tapping screws with the angle bracket facing up. For this you would use the 1/4- 20 x 1" bolts to attach the enclosure after the angle bracket is installed. Or the flat toggle bracket may be mounted in an off set position and the enclosure mounted to it.

To install QCE on bumpers, bed-rails or other level surfaces mount the QCE in a vertical position using the (part-G), 90 degree angle bracket (Fig. 4).

The QCE can be grill-mounted on most any vehicles. It may be necessary to remove the grill from the front of your vehicle or to at least loosen it to facilitate installation. Using the correct length 1/4 - 20 X 1" or 2" or 3" or 4" bolts and the (part-I) flat toggle plate. This type of mounting is known as a sandwich mounting. In this case the grill of the vehicle is sandwiched between the QCPE and the flat toggle plate using up to four of the 1/4 inch bolt sets.

Besides accurately positioning the bolt locations clearance needs to be given to the hoses that also pass through the grill. In some circumstance only two or three of the through bolts will line up to pass between the grill slots, this will be sufficient as long as the location of these bolts are spaced at opposite sides of the case. As a last choice the self tapping screws may be used and will in fact eliminate the need for the flat toggle plate to be used as a sandwich plate on the back of the grill. When using the self tapping screws set the slip clutch low on your screw gun so as not to strip the holes out after the screws bottom out, this is less necessary when drilling and self tapping into steel versus the plastic grill.

Step 1: Grill mounting

Start by holding the flat toggle plate (part-I) in front of the grill to locate the correct mounting holes or slots to allow both of the hoses and mounting bolts to pass between the grill slots. Thought should also be given to clearance behind the grill so as not to bend the hoses so tightly as to cause them to kink. A piece of the scuff guard (j) should be cable tied (q) to the fuel supply hose if it rubs against the radiator or any other components. Note that the holes and slots in the flat toggle plate and even the 90 degree bend

plate all line up correctly with the support plate located inside the back of the QCPE.

Step 2: Locate the holes

Use the flat toggle plate as a template to identify the QCPE mount location. Using a marker, mark the location of where you would bolt the flat toggle plate with the through bolts.

Step 3: Transfer marks

Transfer these marks to the inside of the QCPE bracket. Double check your marks.

Step 4: Drill holes

Drill 4 holes through the back of the plastic to match the marked holes in the toggle plate.

Step 5: Test assemble onto grill

Using the correct length bolts test assemble the two components onto the grill. Tighten the nuts and bolts hand tight and check if there will be adequate clearance (3 inches) behind the grill.

Step 6: Disassemble

When you are satisfied with the hole locations and are sure that there is sufficient room between the grill slats for the hoses to pass through, disassemble the enclosure.

Step 7: Connect hoses

Connecting the hoses to the QCPE. There are two coiled hoses that are supplied in your installation kit, one black and one yellow. On the back of the quick connect plastic enclosure (QCPE) there are two hose barbs that protrude. The fuel supply barb is the larger of the two and the vacuum / vapor recovery is the smaller. The yellow fuel supply line is fairly difficult to press onto the hose barb with out a lubricant being applied. We recommend any type of motor oil (can be wiped off of your oil dipstick as a last resort) and the fuel supply hose will always be secured with the supplied hose clamps. These clamps will always be tightened to snug. The vacuum/ vapor hose is an easy push on and need no hose clamps. The fuel supply hose is fairly rigid and needs to be routed as to avoid kinking as this will impair fuel flow. The yellow fuel supply hose should always be routed away from any hot engine or exhaust manifold surfaces. Lubricate the large hose barb and the inside tip of the yellow fuel supply line and push it firmly onto the barb until fully seated. Use one of the supplied hose clamps to secure the yellow fuel supply line to the 1/4" hose barb located on the back of the QCE. Then push the black hose onto the smaller hose barb until fully seated

Step 8: Mounting to the grill

For flat mounting on angled grills the 90-degree bend angle bracket (part H) may be installed between the back of the

QCPE and the grill thus flattening the QCPE. This angled plate should be installed with the bend opening facing toward the back of the QCPE mounting plate in order to adjust the QCPE to be perpendicular with the ground. For work vehicles a simplified mounting can be achieved using the self tapping screws could be used to screw the QCPE directly to the grill.

Note, this will leave holes if and when the system is de-installed.

Section B: Connecting the fuel lead

Vehicles with fuel system test ports

Step 1: Locate the fuel system test port The fuel system test port is found on the fuel rail (Fig. 5). The fuel rail is easily identified as it provides fuel to the individual fuel injectors and usually wraps around the top of the engine slightly above the fuel injectors / intake manifold.

Step 2: Connecting to the test port

Once the fuel rail test port is located unscrew the dust cover and use the (supplied) tire valve stem remover to unscrew and extract the valve core from the test port. Depending on your vehicle type compare and then install the appropriate fuel lead adapter on to the test port. Save both the dust cap and the valve core for you may want to relocate the EZ-Fuel system onto your next vehicle.

Step 3: Route the yellow fuel

Route the yellow fuel supply hose from the previously installed QCPE to the test port. Keep the fuel supply hose at least seven (7) inches away from any hot engine surface and secure them to adjacent hoses or supports with the cable ties. Use the scuff guard provided to insulate the Yellow fuel supply line from any rub spots, cut the scuff guard as necessary and use the tie wraps to secure the scuff guard to the Yellow hose. Sufficient hose is provided for safe and efficient routing and a small amount of slack should exist from the engine to the first chaise mounted cable tie as to allow for some engine movement.

Step 4: Location of the in line shut off valve

The shut off valve should be placed in an easy to access location. You may want to manually shut off the system (For example, if a front end collision ripped off the hoses causing a leak).

Step 5: Connecting to the test port

When you are satisfied as to your routing then and only then should the yellow fuel supply hose be lubricated and installed onto the test port (or t fitting, see non-test port install). Do not forget to first install the hose clam onto the hose before it is pushed onto the test port adaptor. Lubricate the end of the fuel supply line, slip a hose clamp over it and insert it completely onto the test port adapter. Then tighten but do not over tighten the hose clamp.

Step 6: Installing the in-line shut off valve

Once you are comfortable with the fuel supply line routing and have chosen a location for the in line shut off valve cut the yellow fuel supply line and install the emergency fuel shut off valve using the supplied hose clamps. The in line valve should be supported with a couple of cable ties so as to support its weight, we recommend locating the valve parallel to another hose or component inside of the engine compartment. This valve should be installed where it is reachable from the front of your vehicle. There should be more than sufficient hose available for optimum hose routing as the valve will itself take up space. It is provided in case there is damage to the quick connectors and there is leaking fuel. In that case the shut off valve lever should be rotated perpendicular to the valve which will shut off the fuel flow. It is not necessary to close this valve between EZ-Fuel use's as the system is designed so that gasoline cannot be siphoned from the system while the vehicle is parked.

Vehicles without fuel system test ports:

NOTE: If you are not capable of performing this part of the installation do not attempt it yourself. Bring your vehicle to an auto repair professional to complete the installation

Step 1: Locating the fuel supply line

Locate the fuel system inlet hose, which is one of two hoses connecting to the fuel rail. Some of the fuel supply systems only have one hose to the fuel supply rail, this makes locating it easier. If there are two fuel supply hoses the inlet hose is usually the larger of the two. It is also the one that is connected between the fuel injection rail and the fuel filter. If you are not sure consult with your vehicles shop manual or consult with a professional auto mechanic.

Step 2: Cutting the line

Wrap this line with some paper towels or other absorbent materials. Cut the fuel inlet line and install the "T-fitting" adapter.

Note this line will have a small amount of pressurized gasoline in it. Do not perform this step with a hot engine; use rags to collect and to wipe up any spilled gasoline.

Choose the proper tee fitting by comparing it with the fuel inlet line I.D. there are three fuel tees provided for 1/4, 5/16 and 3/8 fuel supply lines. It should be a snug fit and you will need to lubricate the fuel tee. Use the stainless steel hose clamps to secure the tee fitting into the fuel line you just cut.

Note: the hose clamps should be slipped over the fuel lines before the hoses are pushed onto the hose barbs. Point the center barb of the tee fitting in a direction that will allow for an interference free routing of the EZ-Fuel Yellow fuel supply hose. Slide a clamp over the Yellow fuel supply hose, lubricate it and push it fully onto the tee fitting and locate and tighten the stainless steel clamp, snug.

Remember you are inserting the upper stems of the "T" fitting into both ends of the cut fuel inlet hose. Install the EZ-Fuel lead onto the leg of the "T" and secure all connections with the stainless steel hose clamps, tighten tight. Follow the installation instruction for Hose Routing from the test port installation section.

Section C

Connecting the vacuum hose

Step 1: locate a vacuum supply

This connection is made into any vacuum hose containing manifold vacuum. The easiest way to check for manifold vacuum is to follow the vacuum line into the intake manifold. Any vacuum hoses that connect to the intake manifold after the throttle body will provide engine vacuum.

Step 2: Connecting to the vacuum

Cut the vacuum line and insert both stems of the (Part-E) vacuum "T" into the vacuum hose, no hose clamps are needed. Safely route the vacuum from the back of the QCPE through the engine compartment to your vacuum t fitting. Insert the vacuum lead from the EZ-Fuel adapter into the leg of the "T".

(optional)

Step 3: Connecting to the PCV hose

An alternative vacuum connection point and for most General Motors cars is to puncture the large vacuum line that connects to the PCV valve located in one of the valve covers to the engines intake system. Then to push in the puncture connector (Part-F) For G.M products that do not have exposed vacuum lines. First drill a 1/8" hole in the rubber sleeve on the PCV tube, usually directly above the PCV valve located on the driver's side, valve cover. Push one end of the (Part-F) puncture fitting, into the hole and install the vacuum lead from the EZ-Fuel adapter (QCE) onto the opposite end of the union, no clamps required

Section D Checking the installation

BEFORE YOU START THE ENGINE CHECK THAT NEITHER THE YELLOW FUEL SUPPLY HOSE OR THE BLACK VACUUM HOSE TOUCH ANY MOVING PARTS SUCH AS PULLEYS-BELTS NOR ARE THEY TOUCHING OR ARE CLOSE TO (closer than seven inches) FROM THE ENGINES EXHAUST MANIFOLDS. Wipe any spilled gasoline from the engine, if previously disconnected carefully reconnect the battery with the ground lead being the last lead to reconnect. Then with the help of a friend start the vehicle and immediately inspect for any fuel leaks at the test port, fuel line tee or at the back of the QCPE.

With the engine running at idle examine the fuel line connections for signs of leakage. If the installation instructions are followed correctly there should be no sign of any fuel leakage. If a fuel leak is detected shut off the engine immediately. Correct the problem and repeat the inspection process until no leakage exists. Check vacuum connections for leakage and correct as needed.

SECTION E Purging the system of air

NOTE: The EZ-Fuel system can not function unless the engine is running.

Step 1 Open the EZ-Fuel carrying case, remove the safety nozzle and hose assembly, put on your safety glasses and proceed.

Step 2 Start the engine and let it idle.

Step 3 Connect the dispensing hose assembly to the EZ-Fuel quick connect plastic enclosure (QCPE). Note that the hoses are coded male female and cannot be incorrectly installed. The vapor recovery hose uses a simple

push to connect connector and the fuel supply hose (yellow) uses a, retract the outer sleeve, to connect connector. To properly connect the fuel supply connector, firmly retract the outer sleeve and with it retracted push it firmly onto the fuel barb that is in the QCPE. Do not let go until till the female connector in your hand is fully engaged with the male vehicle side connector. Don't worry once you get the hang of it it will be effortless forever. Occasionally spraying the connectors with WD-40 will insure easy connections with a long life for the connectors.

Step 4 Purging the air out of your EZ-Fuel system, this is a one time operation. To purge the air from the fuel lines, pick up the fuel nozzle, insert the nozzle tip into a suitable tank or vessel and depress the side safety, while squeezing the fueling lever very slowly. The lever is designed to travel well past the safety before fuel flow will begin. This feature allows for a one handed fueling operation. Should the lever be released or the nozzle dropped the safety interlock will re-engage immediately causing the lever to be inoperable (Fig. ?). Purging air from the system may cause the engine to stall. If this happens, re-start the engine and continue. When all of the air is purged from EZ-Fuel System it is now time to adjust the flow adjuster to allow for maximum fuel flow. Note for absolute-maximize fuel flow, we suggest that you start with a new OEM fuel filter.

SECTION E Adjusting the fuel flow

This step is also performed only once

Step 1: Locate the 5/32 inch Allen wrench that is provided with your EZ-Fuel installation kit, you will need it to adjust your fuel flow.

Step 2: Start by removing the flow adjuster dust plug located under the vapor recovery (yellow) bellows on the front of the fueling nozzle. You will see the Allen fitting, this is the flow adjuster which is pre-set at a low flow rate from the factory. The EZ-Fuel fuel nozzle has a safety lever interlock which must be released before the nozzle lever can be depressed. *Note, the nozzle lever can be pulled back past the safety interlock before fuel will flow, this was done to allow for one handed nozzle operation*

Step 3: Either find a suitable piece of gasoline powered equipment that needs gasoline or go to the host vehicles gas tank filler neck to begin the flow adjusting procedure. Position the nozzle so that it is sufficiently inserted and insert the short side of the Allen wrench into the flow adjuster, release the safety and begin fueling while slowly turning the flow adjuster counter clockwise. As you proceed the

flow will increase, continue to increase the flow until the engine's idle starts to become unstable or rough. Should the engine stall, turn the flow adjuster in 1/2 turn from where you left off and restart the engine and begin again. Once the engine's idle begins to become rough, slowly turn the flow adjuster in (clockwise) 1/8 turn at a time until the engine's idle stabilizes, then in 1/8 turn further. Release the fuel nozzle lever and start filling and stopping a couple of times to check for proper flow adjustment. If the engine idles rough or stalls while fueling turn the adjuster in slightly (1/8 turn) and try again.

Step 4 Once the flow rate has been maximized re-install the flow adjuster dust cover. When fueling is finished, shut off the engine and depress the fueling nozzle lever then disconnect the quick connect fuel and vapor recovery couplers. To disconnect the vapor hose push the outer collar of the vapor quick connect (auto side) forward or away from you and the lines will pop open. To disconnect the fuel supply hose retract the collar towards you and pull the connector straight back gently, this may take a few practices to feel natural. Always disconnect the vacuum side first. Always store your EZ-Fuel nozzle and hose assembly including safety glasses in its protective carrying case.

SECTION F

Maintenance

To insure trouble-free service lubricate the fuel and vacuum couplers with WD-40 or CRC at least twice per year and keep the dispensing hose assembly in its protective case when not in use.

Trouble Shooting

EZ-Fuel does not effect the integrity of vehicle's fuel system and vacuum systems but it may reveal defects within these systems. Engine stalling and/or low fuel flow rates when using EZ-Fuel may mean a clogged fuel filter, a defective MAP sensor or a clogged or failing fuel pump. These types of defects often go unnoticed under day-to-day driving conditions. If found to be defective these items should be replaced in order to ensure maximum performance from your vehicle and the EZ-Fuel system.

