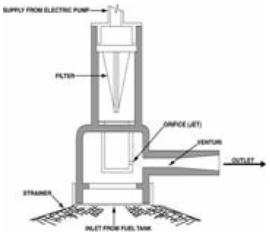
Fuel system technical bulletin (Fuel pump failures)

Fuel systems have came a long way from the days of mechanical pumps and venturi-effect fuel delivery systems. Modern electric fuel pumps have not changed much since the mid 70's, yet the control of hydrocarbon emissions have resulted in a change in the supply and delivery methods. For example; A vehicle equipped with an electric fuel pump suspended inside a fuel tank from the top, could starve for fuel during turns when tank is low. This results in misfire and increased emissions.


MRA Type Fuel Pump



To solve that problem, the Modular Reservoir Assembly (MRA) type fuel pump designs where introduced, typically in 1996. These bottom referencing pumps typically use a small "Jet Pump" that taps high pressure fuel from the pump to introduce a venturi-effect at the bottom of the MRA pump to draw fuel inside even when the tank is almost empty. This allows for pump cooling, lubrication and un-aerated fuel under most driving conditions, reducing volume losses due to aeration, pressure issues and misfires. The MRA type pumps have two inlet filters, one outside & one inside.

Over a period of time, contaminated fuel maybe introduced thru refueling sources and the EVAP system. Contaminated fuel maybe powder-like dirt, fine sand, rust or even other chemicals.

Fuel has to be examined as a component...if broken, it needs replaced!

Excessive ethanol is a contaminate in systems that are not designed to operate with more than ASTM E-10. Fuel pumps that are designed to operate in a corrosive environment like ASTM E-85 are specially designed high-carbon content commutators.

If the vehicle has the wrong fuel pump for the application, problems will occur. Inform your customers that ASTM E-85 should not be substituted for regular fuel or ASTM E-10 as the life of the fuel pump will be short lived.

FUEL PUMP CONNECTORS ACDelco

FUEL PUMP PART #	FUEL PUMP SERVICE NAME	CONNECTOR PART #	CONNECTOR SERVICE NAME
MU1140	MODULE KIT,F/TNK F/PMP	PT1452	CONNECTOR,MDL-F/TNK F/PMP
MU1142	MODULE KIT,F/TNK F/PMP	PT1452	CONNECTOR,MDL-F/TNK F/PMP
MU1144	MODULE KIT,F/TNK F/PMP	PT1452	CONNECTOR,MDL-F/TNK F/PMP
MU1157	MODULE KIT,F/TNK F/PMP	PT1452	CONNECTOR,MDL-F/TNK F/PMP
MU1158	MODULE KIT,F/TNK F/PMP	PT918	CONNECTOR,MOT-F/PMP
MU1162	MODULE,F/TNK F/PMP (SENDER & PUMP)	PT1452	CONNECTOR,MOT-F/PMP
MU1182	MODULE,F/TNK F/PMP (SENDER & PUMP)	PT918	CONNECTOR,MOT-F/PMP
MU1157	MODULE KIT,F/TNK F/PMP	PT223	CONNECTOR,MOT-F/PMP
MU1157	MODULE KIT,F/TNK F/PMP	PT918	CONNECTOR,MOT-F/PMP

A vehicle that experiences a fuel pump failure is on average 9 years old. If diagnostics lead you to replace the fuel pump, several factors need to be taken into consideration, like "Symptom or Cause"? If the pump fails, is it the symptom of outside forces like contamination, electrical control, fuel pressure regulator failure, electrical terminal pin fit, or age? We have to answer that question thru inspection and diagnostics like voltage drop and fuel pressure activity. Let's say the pump is old and just plain wore out. Easy...Right? To be sure, a complete inspection is required. Inspect the electrical connectors to the pump. If burnt or signs of melted plastic on either side of the connector, additional parts are required. The connector can easily be damaged by careless electrical testing without the proper terminal test adaptors.

The ACDelco fuel pump catalog has a chart that indicates the proper pump / connector application.

Pressure check the fuel pressure regulator, voltage drop thru the relay, visually inspect connectors and **then inspect the fuel in the tank for dust, dirt and other contamination by visually checking the old pump!**

How do you get the fuel out of the tank? GM service information offers exact information to direct the service technician on how to remove the fuel from the tank by year, make and model. No more guessing that may lead to EVAP system damage or lost time.

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Inspection: Once the pump is out it is time to do one more thing in the diagnostic process. (Inspect!) Start by removing the CPA, then the connector. Locate, then push-in the locating tabs on the reservoir. Remove the bucket and then inspect the pump, secondary strainer and check for debris inside the reservoir. If there is contamination inside where the pump is located, the fuel tank needs cleaned or replaced!

If this is ignored, the prognosis is grim for the life of the new fuel pump.

Fuel pumps with contamination are not returnable for warranty credit.

To reduce if not eliminate comebacks or premature failures, call the customer and up-sell a new tank or cleaning.

The use of a fuel "caddy" will assist the tech to remove the bulk of the fuel inside the tank safely. An in-line filter can be installed with the fuel caddy to capture clean fuel to be returned to the vehicle after service. GM Powertrain directs the service technician to flush the tank with hot water, vigorously rock the tank back & forth, then dispose of the fuel/water mixture according to state, local and EPA laws. Remove and dry as much of the moisture from the tank, then place back into service with a new ACDelco fuel pump and filter.

TECH TIP: Monitor the fuel pressure to pass judgment on the existing fuel pressure regulator. Remember; if the vehicle's fuel pump is old, so is the regulator. It should be replaced with the pump at the same time to insure proper fuel pressure control and reduce the possibility of "sticking" which will damage a new pump.

Remember to look for the answer inside the tank and fuel pump. Remember, the filters are white & clean when new as first installed. If dirty, the contamination came from somewhere.

TECH TIP: Sulfur content in gasoline varies from areas to markets. The problem with high sulfur content is damage to the fuel sender. This causes gas gauge problems or inaccuracy. Try the **ACDelco Fuel System Treatment Plus p/n 10-3004** (12oz) or 10-3003 (20oz) used at an rate of 1oz per estimated gallon of fuel in tank. Fuel System Treatment Plus cleans and protects the entire fuel system from carbon deposit build-up and harmful sulfur contamination. High sulfur fuel can damage the ceramic fuel sender card, causing erratic gauge operation. Two tanks of clean gas with ACDelco fuel system treatment plus may cure the sender unit. Give it a try!.

(Note; Avoid fuel system treatments that contain high amounts of peroxide. This will damage the fuel pump by attacking the copper components)

Following these best practices will help eliminate fuel pump comebacks.