Fuel System Diagnosis

Correctly Diagnosing a Low Pressure, Low Volume or No-Fuel Problem

A lack of fuel to the engine may signal a failed fuel pump. But don't immediately assume that the pump is the problem. Other issues may be causing the no-fuel situation.

The two leading causes of electric fuel pump failure are:

1. Fuel contamination
2. Low/no voltage to the pump due to overheated connectors, loose connections, poor grounds and other electrical problems

Review these easy-to-diagnose issues before you install a new pump:

Is there fuel in the tank?
Faulty fuel gauges or low levels of fuel may lead you to think that the pump is faulty when all you need is to add some gasoline to allow the pump to charge the fuel line. Put in two gallons of fuel and test it again.

Clogged external fuel filters and bent fuel lines can restrict flow.
Obviously, even the best fuel pump can't overcome restrictions upstream. Make sure these areas have been inspected, and replace the fuel filter if you suspect it is restricting fuel flow. Restricted fuel filters will reduce fuel flow volume and cause the pump to work harder, drawing amperage beyond its design limits, causing wiring and connectors to melt, and the pump to fail prematurely. Fuel filters should be replaced as per the manufacturer's mileage or time recommendations, but may require more frequent replacement in dusty conditions. Fuel filters are frequently ignored during vehicle service. If you're not sure when the filter was replaced last, do it now; it may save you a lot of time and trouble. Then retest the system. Failure to replacein-line fuel filters at the time of pump replacement will void the warranty.

Voltage supply issues may lead you to think the pump has failed.
When electrical connections fail, voltage to the pump will be reduced. The pump will run inefficiently, producing below-required pressures and noise. The vehicle will perform poorly and the pump will fail prematurely. So check the vehicle's harness plugs for black soot or burned wires. Check the pump module/hanger plug for melted plastic or loose terminals on the flange. Burned wires, melted plastic, loose terminals, or connectors showing signs of black soot must be replaced to provide a consistent voltage supply to the pump. To find the problem areas, perform a voltage drop test across all electrical connectors and all electrical components involved with the fuel pump. Also check the wires from the pump to the hanger flange when replacing a pump-only application. You may need to repair wiring harness damage that, if not serviced, will cause the pump you are replacing to fail prematurely. Depending on your application, Carter® replacement parts 888-103, 888-536 (in-tank harness), 888-543, 888-544 or 888-553 (top-of- pump harness, outside of tank) can solve this problem.

Clean the tank.
The importance of cleaning the fuel tank cannot be overemphasized. Carter® Fuel Delivery Systems' unique gradient-density electric fuel pump strainers filter to a particle size one-half the size allowed by OEM strainers. But even the smallest particles will still accumulate inside a pump and eventually cause a failure. Many fuel pumps fail because of sediment in the tank fouling the pump mechanism or plugging the strainer. Not even the best designed fuel pump and strainer will last very long in a dirty tank. So to avoid a problem down the road, always have the tank professionally cleaned before replacing the pump, or if desired, clean the tank yourself, carefully following the instructions in TEC Bulletin #1620. Always properly dispose of contaminated fuel. Never reuse contaminated fuel or your replacement pump will fail quickly. Fuel contamination will void the pump warranty.

Install a new strainer.
A new strainer must be installed any time a new pump is installed. NEVER reuse a strainer. Failure to install a new strainer will void your warranty. Most module units come with the strainer already installed on the unit. Replacement hanger assemblies or pump-only applications will require the strainer to be installed during the replacement process. Replacement fuel pumps will fail from contamination if a new strainer is not installed with them. Strainers should be pushed straight onto the fuel inlet by hand. Do not use a screw-on motion, hammer on the strainer or press the strainer against hard surfaces to install. Hand pressure should be sufficient.

Caution: Do not skip steps in this procedure. Doing so may cause a misdiagnosis and unnecessary replacement of functional components.

In the event that you have a diagnosis indicating a fuel pump problem, please review in sequence the charts and figures on the right. As you will see, many other factors can lead to unnecessary fuel pump replacement. Remember, these are typical procedures for EFI systems. The vehicle you are diagnosing may have components other than those listed. (Check the appropriate service manual for the exact procedure.)