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Coding Information

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Title: MaxxFORCE DT, 9 & 10 electric fuel pump and fuel system diagnostic information**Applies To: EPA 2010 and later MaxxFORCE DT, 9 & 10**

-Navistar has recently discovered that low fuel pressure DTC's 94-1 and 94-17 are being erroneously set. See IK1201055.

DESCRIPTION

The EPA 2010 and later DT, 9 & 10 engines use a fuel module that incorporates many features, including an electric fuel pump and fuel pump strainer.

The fuel strainer can be seen when the pump is removed from the filter module. The strainer should be serviced at the filter replacement interval (30K miles / 43K Km / or 12 months). The strainer P/N is 1899335C91

-About 50% of the fuel pumps returned to Navistar are not defective

(Any part that is found to perform to the original manufacturer's specification is subject to chargeback of the entire claim amount)

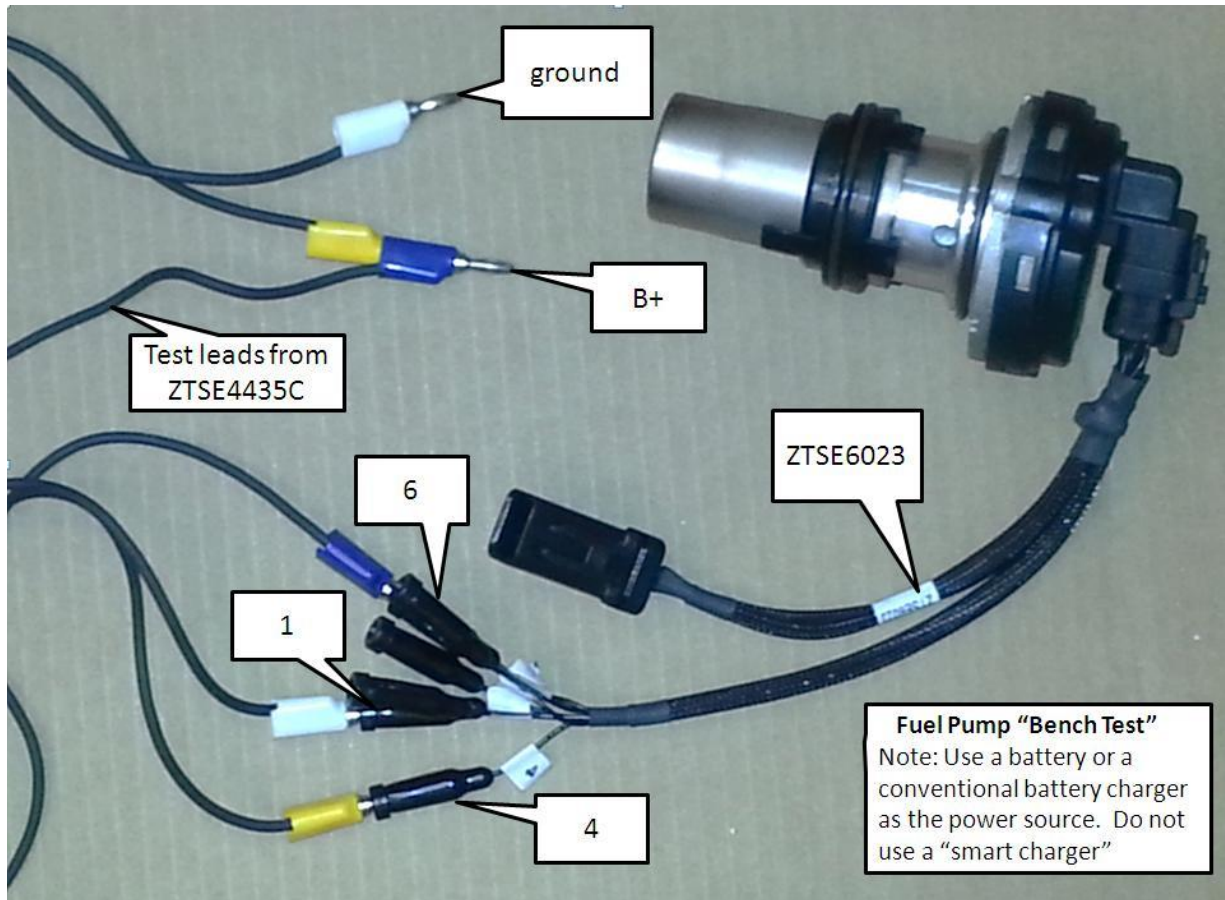
-Some low fuel pressure complaints are caused by a worn fuel pressure regulator valve & spring. A kit for this is available.

-When this fuel pump fails it usually builds no pressure

The following are common causes of low fuel pressure. Each should be inspected or tested before replacing the electric fuel pump (in this order):

- Is the fuel filter plugged
- Is the pressure regulator valve performing correctly- perform flow test in [diagnostic manual](#) (a kit is available from Parts to service this- the regulator for the 2010 is unique)
- Does the pump meet the pressure and flow specifications
 - Fuel pressures above 60 psi will not cause low power or performance complaints on this engine
- Is the fuel pump strainer restricted or plugged (replacement P/N 1899335C91)
- Is the pump receiving 9 volts or more at pin 4 and pin 6 (see below)
 - pin 4 and pin 6 must both be powered at the same time with 12 volts
 - pin 1 must be grounded

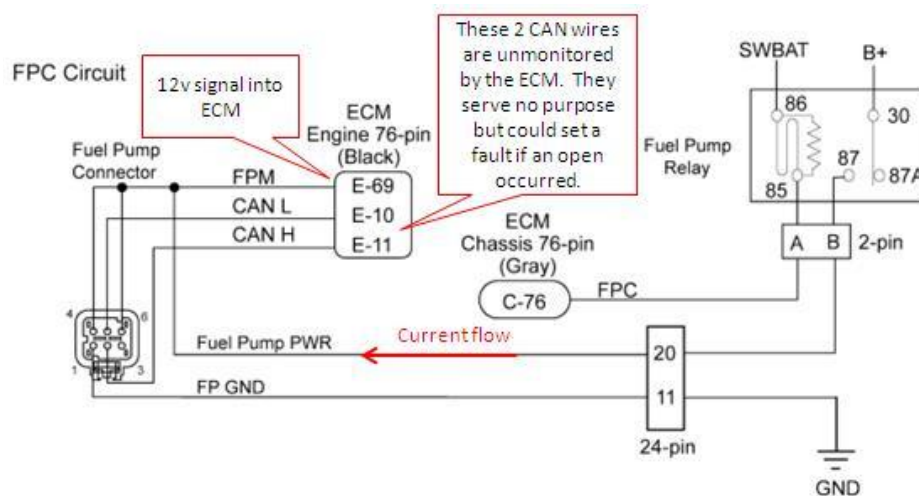
- Use and ZTSE6023 fuel pump breakout tee and male banana test leads from ZTSE4435C to bench test the fuel pump
 - **Bench test a suspect pump before replacing it**



- Does fuel inlet restriction exceed 8.14" Hg. / -4 psi, causing the pump to draw too much current and shut off or behave erratically (this could be caused by an intermittent fuel restriction in the fuel tank or anywhere in the line). Use ZTSE6009 adaptor to attach a vacuum gauge to the fuel inlet.

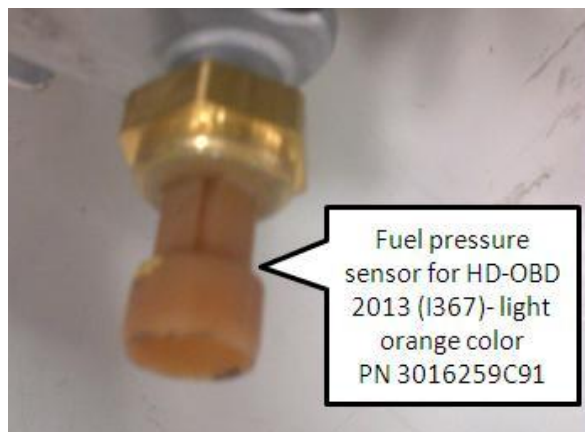
ELECTRIC FUEL PUMP OVERVIEW

At key ON, the ECM closes the fuel pump relay (provides ground via pin [C-76](#)) and battery voltage is supplied to the pump. The pump will run for ten seconds (time varies with coolant temperature) and then shuts off. During the run time if the ECM does not detect crankshaft rotation it switches the fuel pump relay off. **The key must be OFF for at least 10 seconds and then cycled ON before the ECM will restart the fuel pump.** The ECM receives a 12 volt signal on pin [E-69](#) that informs it that power is being provided to the fuel pump.

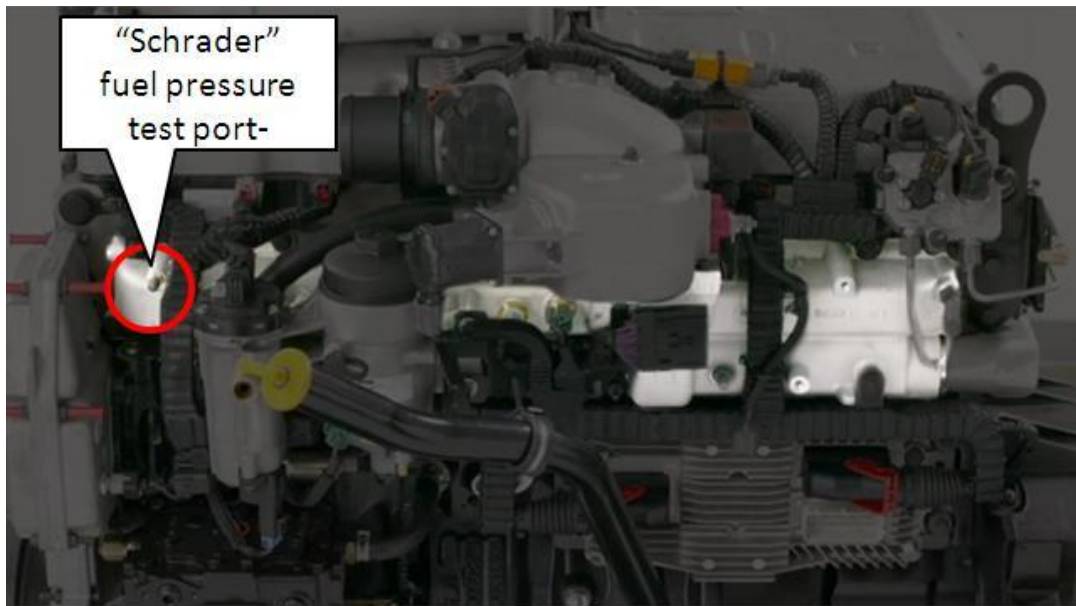


The pump is capable of operating from 9V to 14V and relies on a clean strainer (see image below) and a properly functioning regulator valve (serviceable) in order to maintain system pressure. The pump has internal overload protection that turns the pump off under overload (high current draw situations). High current draw can be caused by high inlet restriction or excessive fuel back pressure. When current limiting protection is triggered, the pump will cycle on and off causing the system pressure to fluctuate until the overload condition is resolved. The pump may eventually turn itself off. This situation can occur without a fault code being set. **When the ignition key is cycled OFF and ON the pump will restart.**

The ECM monitors the fuel delivery pressure sensor located on the bottom of the fuel filter housing. If the ECM determines that the pressure is low a diagnostic trouble code is set. EPA 2010 (I334) and HD-OBD 2013 (I367) use different fuel pressure sensors. **They cannot be interchanged.**



There are two fuel pressure test ports on the engine. The first port is a Compuchek and is located on the front of the filter module (unfiltered fuel pressure) The second port is a Schrader™ valve located on the front of the intake manifold (filtered fuel pressure). The Schrader port can also be used to bleed air out of the system. **Note- Double check any below spec. pressure reading from this port as a poor connection can cause a low pressure reading (but fuel rail pressure could be ok).**



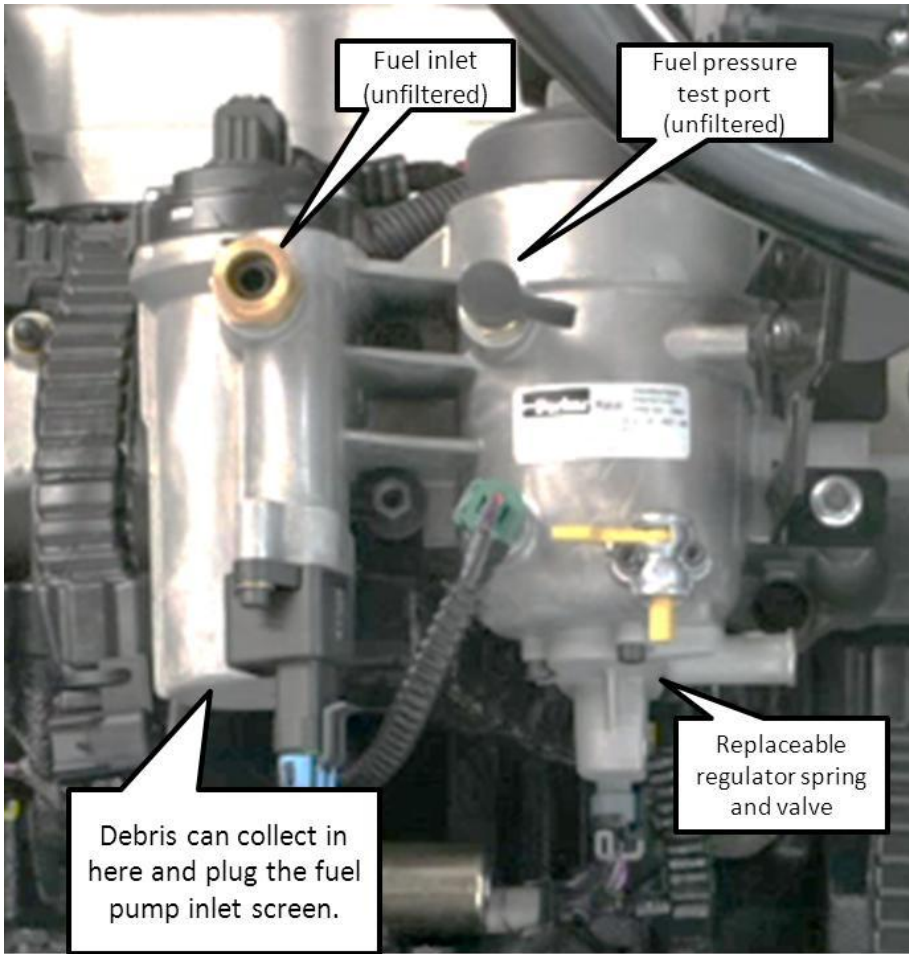
SYMPTOMS

Erratic engine performance, engine stall, hard start/ no start, low power complaints, low fuel pressure faults, aftertreatment fault codes relating to low fuel pressure

Likely causes:

- Clogged fuel pump strainer (see image below)
- Worn fuel pressure regulator valve (serviceable)
- Plugged fuel filter element
- High fuel inlet restriction caused by plugged strainer, kinked fuel line, fuel pickup tube interference with fuel tank bottom, or tank debris
- Low voltage to fuel pump

Common DTCs associated with an issue with the fuel pump are SPN 94-1 and 94-17. These codes can be caused by a variety of issues and should be investigated before servicing the pump.





These vehicles need the strainers replaced

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