Time for Reverse Diagnosis

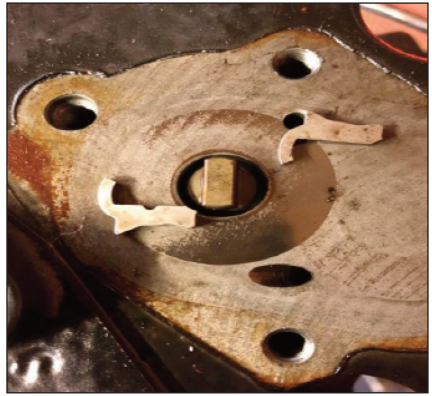
Common rail diesel injection has been around for many years now, and technicians have been familiar with the processes required when diagnosing these systems… until now.

The vehicle in question was a Ford Galaxy 2.0 TDi fitted with a KNWA engine built from 2010. The vehicle cut out while driving, and initial diagnosis revealed a low fuel pressure code P0087.

The technician knew the two types of low-pressure fuel supply.

- Type 1: Fuel is supplied by an in-tank electric pump. This pump will supply fuel under pressure to the high-pressure pump, and is controlled by the Powertrain Control Module (PCM).
- Type 2: The high pressure pump has an internal lift pump. Fuel is drawn under negative pressure from the tank, normally @ 500 mb.

After doing a basic wiring data check, it was showing an in-tank fuel pump fitted. A test of the flow and pressure from the in tank proved no flow.



The pump had seized and snapped the drive mechanism

The electrical circuit was checked, and this proved a supply and ground to the pump was present, but there was still no flow from the in-tank pump. So, the in-tank pump was replaced.

Unfortunately, there was still no fuel delivery from the in-tank pump. So, the pump unit was removed again to check for any issues within the tank. On inspection of the pump unit, all was not as expected.

The in-tank pump was drawing fuel from the return of the high-pressure pump and filling the swirl pot, not the normally expected fuel circuit. Also, the high-pressure pump should have been pulling fuel from the tank at a negative pressure (around 500 millibar negative)

No negative pressure was detected. The pump was removed to check the mechanical condition, and the technician found that the pump was damaged. The pump had seized and snapped the drive mechanism.

As you can see, this system not only employs the usual lift pump incorporated into the high-pressure pump, drawing fuel under negative pressure from the tank, but also an electric in-Tank pump drawing fuel back on the return circuit.

Without this added system knowledge, diagnosis of a low pressure issue could result in a misdiagnosed in-tank fuel pump fault.