2007 - 2009 Cadillac XLR: Service Bulletin: #PIC5375: Fuel Gauge / Pump Diagnostic Tests - (Oct 13, 2010)

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Subject:	Fuel Gauge/Pump Diagnostic Tests
Models:	2007 - 2009 Cadillac XLR 2007 - 2011 Chevrolet Corvette Except Corvette ZR1 with LS9 engine

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The following diagnosis might be helpful if the vehicle exhibits the symptom(s) described in this PI.

Condition/Concern:

There have been past concerns that may result in the ECM commanding the fuel gauge to empty or the vehicle running out of fuel without using all the fuel in the tanks. As solutions have been identified, they have been addressed in service bulletins. Service Manual diagnostics and Service Bulletins should be checked to ensure that the customers concern has been properly diagnosed before any repairs are performed.

The vehicle may have a concern of the fuel gauge dropping to empty and DTC P1431 (Fuel Level Sensor 2 Performance) present in

Corvette and P2636 in the XLR or the vehicle may run out of fuel while still indicating 1/2 tank on the gauge.

The fuel system is designed to use the fuel in the RH (secondary) tank first and then the fuel in the LH (primary) tank. Moving from gage "Full" to "Empty", the RH sender voltage will go from 0.7 volts (Full) to 2.5 volts (Empty), and then the LH sender will go from 0.7v (Full) to 2.5 V (Empty). If at any time the RH sender voltage is lower than 2.1v (greater than Empty) while the LH is higher than 0.8v (less than Full), there is probably a jet pump transfer or stuck float issue. The lack of jet transfer could be due to the lack of system pressure or a clogged or inefficient jet pump. This should be determined prior to servicing to avoid replacing the incorrect part.

When the fuel gauge is indicating approximately half full or lower, all of the fuel should be in the LH tank and the right hand tank will be empty under normal operating conditions. When reading the Tech2 data in the ECM the sensors must indicate the appropriate fuel level for the ECM to correctly display the actual fuel level accurately.

The following information can be used to diagnose the fuel transfer process which takes place within the fuel system on these two vehicles.

Note: Starting on November 25, 2002 with vehicle identification number 35111542 all Corvettes and all 2004 XLR use the FFS fuel system. The 1997 through 2002 and early built 2003 Corvettes without the FFS system did not have a secondary regulator which prevents the siphoning of fuel (LH to RH) after the vehicle is turned off. The siphoning could "balance" the fuel such that, at start-up, the sender voltages could be similar. That is why there is a 40 minute timer on the P1431 DTC on these vehicles to allow the fuel to transfer to the LH tank after start-up.

Recommendation/Instructions:

Fuel Gauge/Clogged Jet Pump Diagnostic Tests

Diagnostic Test Option A:

1. Add enough fuel to ensure fuel gage level is at approximately three quarters (¾) full.
2. With Tech2, check for and record Diagnostic Trouble Codes (DTCs), and monitor fuel level sensors for both tanks for remainder of procedure.
3. Start vehicle. Run vehicle long enough to confirm RH fuel level decreases while LH remains full (0.7v).

Diagnostic Test Option B (Draining Fuel):

1. With Tech2, check for and record Diagnostic Trouble Codes (DTCs) and monitor fuel level sensors for both tanks for remainder of procedure.
2. If RH level is less than 2.1 V while LH level is higher than .8 V, there may be a jet transfer issue - continue procedure to confirm issue.
3. Add enough fuel to ensure fuel gage level is approximately three quarters (¾) full.
4. Install Kent-Moore pressure gage/ drain hose to Schrader valve at fuel rail with drain valve closed.
5. Start car and verify pressure is 55-62 psi (Pressure varies depending on Model Year and Engine RPO). If pressure is not at this level correct as necessary.
6. Open drain valve and drain fuel from rail into empty 5-gallon container. The gage pressure should be at least 51 psi. (The RH regulator will close at 350 kPa (51 psi)
7. Drain fuel. Monitor both level sensors. Drain until RH sensor level voltage increases .2V or more. Verify that LH stays at .7V

while RH increases. If RH sensor does not move and LH level sensor decreases, increase gage pressure to 55 psi by closing the drain valve. See if RH sensor starts to decrease. If not, there is a jet transfer issue that needs to be resolved.

8. With vehicle/fuel pump still running, close drain valve, and verify system rail pressure returns to 55-62 psi.
9. Shut off vehicle, remove Kent-Moore tool and verify Schrader valve has fully closed. (key-on vehicle to verify). Replace Schrader cap.

Replace/repair components as required.

Possible causes:

SI should be followed to determine the root cause. If the fuel gage is intermittent or dropped to empty due to a fuel system issue, there should be a DTC set. Follow SI symptom diagnostics for DTC.

Please follow this diagnostic or repair process thoroughly and complete each step. If the condition exhibited is resolved without completing every step, the remaining steps do not need to be performed.