

8. FUEL TRANSFER PUMP SYSTEM

8.1. CIRCUIT FUNCTIONS

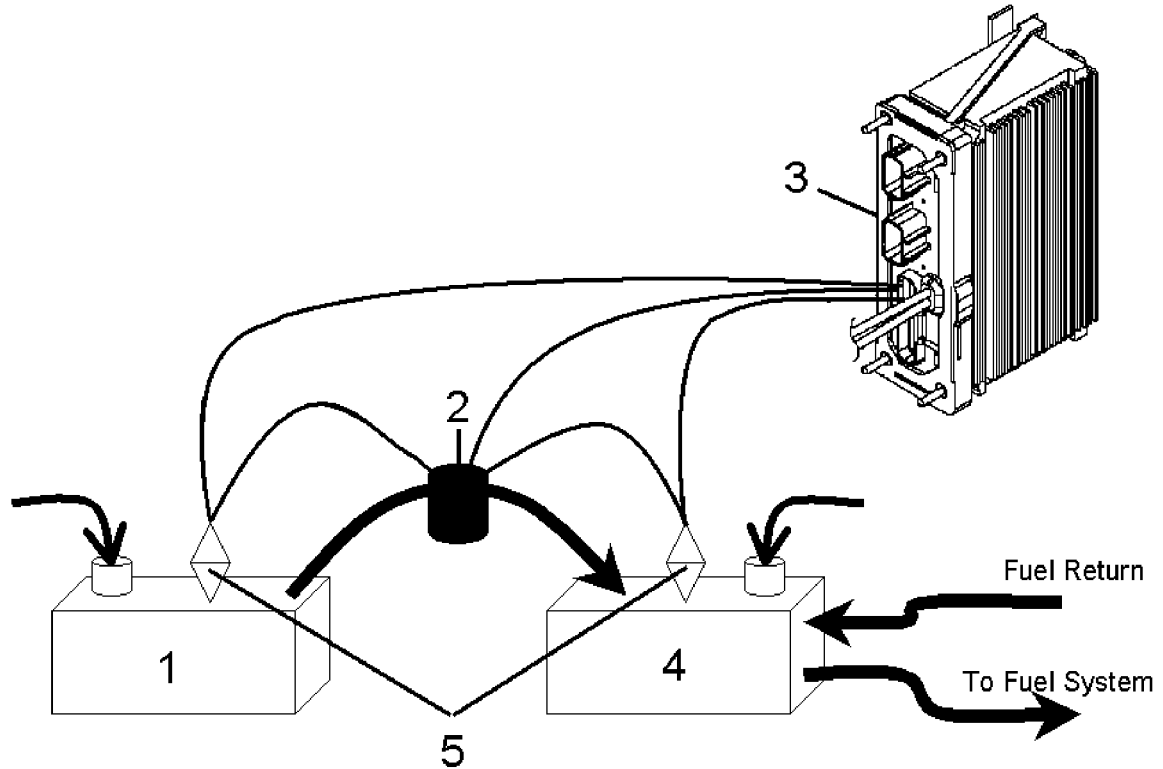


Figure 338 Fuel Transfer Pump Function Diagram

1. LEFT FUEL TANK
2. FUEL TRANSFER PUMP
3. ESC
4. RIGHT FUEL TANK
5. FUEL LEVEL SENSORS

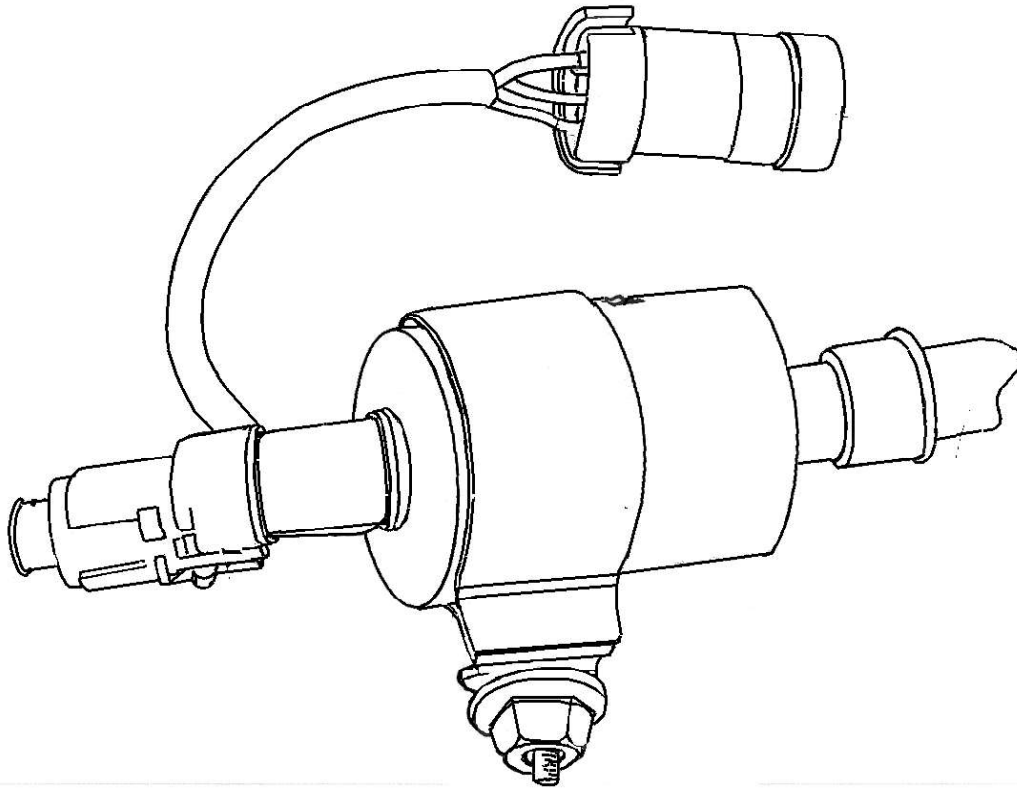


Figure 339 Fuel Transfer Pump (5 pin pump)

Refer to the Fuel Transfer Pump Function Diagram.

With two fuel tanks on the same truck, there is an equalizing pump that balances the fuel between the two tanks. The pump can only move the fuel from the left tank to the right tank and only when the engine is running.

The dual tank, fuel sensing and display feature takes data from two fuel level sensors located on the top of each of the fuel tanks. The data displayed on the fuel gauge is the reading from the sensor in the right tank only. The sensors are connected to inputs on the ESC and to the fuel transfer pump module. The same fuel level sensors are used, regardless of the size, number and shape of the fuel tanks on the vehicle, however the position of the sensors in the tanks and the lengths of the swing-arms change.

There are several error conditions that can occur with the fuel sensor circuits or the sensor itself:

- An open condition where the resistance is infinite across the two sensor terminals.
- A short condition where the resistance is zero across the two sensor terminals.
- An open in circuits N37A or J37D between the pump and the ESC.

There are mechanical problems that can occur with the fuel sensor:

- A float falls off the sensor (The sensor will read empty permanently)
- The sensor arm sticks in one position.

NOTE – The transfer pump pumps from the left (driver side tank) to the right tank and is mounted above the right tank. A sticker with an arrow indicating flow direction will be on the pump. The words "in" and "out" are also stamped on appropriate ends of the pump.

8.2. DIAGNOSTICS

Fuel Transfer Pump Preliminary Check

Table 231 Fuel Transfer Pump Circuits Preliminary Check

STEP	KEY	ACTION	TEST POINTS	SPEC.	YES - IN SPEC.	NO - OUT OF SPEC.
1.	On	Verify fuel transfer pump is inoperative.	Check fuel level between tanks.	Fuel level in each tank is approximately the same.	Fuel transfer pump is operating. Problem does not exist or is intermittent.	Go to next step.

Table 231 Fuel Transfer Pump Circuits Preliminary Check (cont.)

STEP	KEY	ACTION	TEST POINTS	SPEC.	YES - IN SPEC.	NO - OUT OF SPEC.
2.	On	Determine if any other features are malfunctioning that may have common circuits. (Example: Missing ground common to several features.)	Visually check for other malfunctioning features.	No other features are malfunctioning.	Go to next step.	Identify and repair condition causing several features to be inoperative.
3.	On	Check for diagnostic trouble codes. (See Diagnostic Trouble Codes, page 692)	Read display on odometer.	No fuel level sensor diagnostic trouble codes are active.	Go to Fuel Transfer Pump Fault Detection (5 pin pump). (See FUEL TRANSFER PUMP FAULT DETECTION MANAGEMENT (5 pin pump), page 696) Go to Fuel Transfer Pump Fault Detection (2 pin pump). (See FUEL TRANSFER PUMP FAULT DETECTION MANAGEMENT (2 pin pump), page 702)	Go to Fuel Level Sensor Fault Detection Management (5 pin pump). (See FUEL LEVEL SENSOR FAULT DETECTION MANAGEMENT (5 pin pump), page 693) Go to Fuel Level Sensor Fault Detection Management (2 pin pump). (See FUEL LEVEL SENSOR FAULT DETECTION MANAGEMENT (2 pin pump), page 699)

Diagnostic Trouble Codes

To display diagnostic codes, set the parking brake and turn the Ignition key "ON". Then press the Cruise "ON" switch and the Cruise "Resume" switch simultaneously. If no faults are present, the cluster odometer will display "NO FAULT". If faults are present, the gauge cluster display will show each diagnostic trouble code for 10 seconds and then automatically scroll to the next entry and continue to cycle through the faults. To manually cycle through the fault list, press the cluster display selector button. The last character of the diagnostic trouble code will end in "A" for active faults or "P" for previously active faults. Turning the ignition key off will take the ESC and the gauge cluster out of the diagnostic mode.

After all repairs have been made, the diagnostic trouble codes may be cleared by putting the key switch in the accessory position, turning on the left turn signal and pressing the cruise on and set switches simultaneously.

Table 232 Fuel Level Sensor Diagnostic Trouble Codes

DIAGNOSTIC TROUBLE CODE	FAULT DESCRIPTION
612 14 23 1	Fuel level sensor out of range low for single tanks This code applies to the driver side tank with dual fuel tanks. Shorted to ground
612 14 23 2	Fuel level sensor out of range high for single tanks This code applies to the driver side tank with dual fuel tanks. Shorted high or open circuit
612 14 25 1	Passenger side fuel level sensor out of range low with dual fuel tanks. Shorted to ground
612 14 25 2	Passenger side fuel level sensor out of range high with dual fuel tanks. Shorted high or open circuit

8.3. FUEL LEVEL SENSOR FAULT DETECTION MANAGEMENT (5 PIN PUMP)

A fault in the fuel sensor circuits will be apparent when fuel sensor diagnostic trouble codes are present. This will also prevent the fuel transfer pump from working correctly.

Problems in sensor circuits could be the result of open or shorted sensors, open circuits, shorted circuits, a short in the fuel transfer pump module, or a failed ESC.