

4.40. FUEL LEVEL GAUGE

Circuit Function

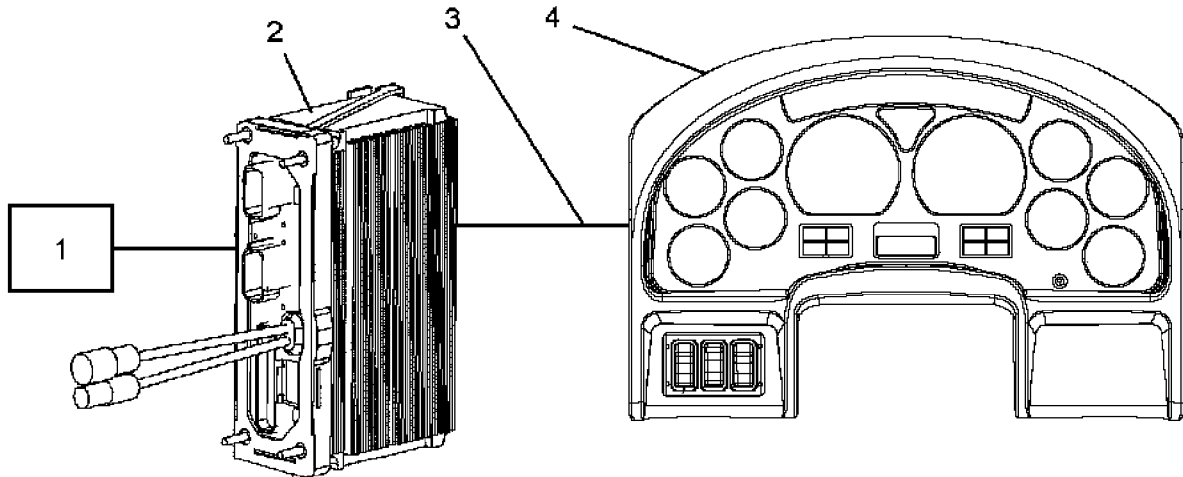


Figure 129 Fuel Level Gauge Function Diagram

1. FUEL LEVEL SENSOR
2. ELECTRICAL SYSTEM CONTROLLER
3. DRIVE TRAIN 1939 DATA LINK
4. ELECTRONIC GAUGE CLUSTER (EGC)

Information driving the fuel level gauge is provided on the Drivetrain 1939 data link from the ESC. The ESC generates this information based on input from the fuel level sensor.

Diagnostics

The pointer in a small gauge, pointing to the six o'clock position, indicates that there is a sensor error for that gauge. A gauge pointing to 10 o'clock is connected to an unprogrammed connector on the EGC circuit board.

The service tool (EZ-Tech) running the "INTUNE" diagnostic software can be used to check operation of the gauge.

Problems with the fuel level gauge can be caused by a malfunctioning gauge, a malfunction in EGC circuitry, an incorrect connection inside the EGC, a loss of programming, a problem in the ESC, a problem with the fuel level sensor or a problem with wiring to the sensor. The following procedures will provide guidance for determining why the gauge is malfunctioning.

Table 76 Fuel Level Gauge Preliminary Check

STEP	KEY	ACTION	TEST POINTS	SPEC.	YES-IN SPEC.	NO-OUT OF SPEC.
1.	Off/On	Does the fuel level gauge operate during the gauge sweep?		Gauge performs during gauge sweep.	Go to next step.	Replace gauge and check jumper harness. If problem persists, replace EGC circuit board. Refer to Remove and Install.
2.	On	Check for fuel level gauge diagnostic trouble codes. (See Diagnostic Trouble Codes (DTC), page 260)	Read display on odometer.	Fuel level gauge diagnostic trouble codes are active.	Go to fault detection management. (See Fault Detection/ Management, page 262)	Go to next step.
3.	Off/On	Connect diagnostic tool (EZ-Tech) to the diagnostic connector. Turn key to accessory position. Start the "ICAP" programming software. Verify gauge and gauge inputs are programmed correctly.		Gauge and gauge inputs are programmed correctly.	Go to next step.	Program the gauge with the "ICAP" software. Refer to the ICAP programming software manual for details.
4.	On	Attempt to exercise the gauge with the "INTUNE" diagnostic software.		Gauge responds to "INTUNE" diagnostic input.	Go to next step.	Insure gauge operates during gauge sweep. Insure jumper harness between gauge and circuit board is in correct location. If jumper is correct, replace EGC circuit board.
5.	Consider replacing ESC. (See ESC REPLACEMENT, page 124)					

Diagnostic Trouble Codes (DTC)

To display diagnostic codes, put the vehicle in diagnostic mode. Set the parking brake and turn the Ignition key "ON". Then press the Cruise "ON" switch and the Cruise "Resume" switch. If no diagnostic trouble codes are present, the cluster odometer will display "NO FAULT". If diagnostic trouble codes are present, the gauge cluster will display the total number of faults and cycle to the next diagnostic trouble code after 10 seconds. To manually cycle through the diagnostic trouble code list, press the cluster display select/reset button. The last character of the diagnostic trouble code will end in "A" for active diagnostic trouble codes or "P" for previously active diagnostic trouble codes. Turning the ignition key off or releasing the park brake will take the ESC and the gauge cluster out of the diagnostic mode.

The previously active diagnostic trouble codes may be cleared, while in the diagnostic mode, by turning on the left turn signal and pressing the cruise on and set switches simultaneously.

Table 77 Fuel Level Gauge Diagnostic Trouble Codes

DIAGNOSTIC TROUBLE CODE	FAULT DESCRIPTION
612 14 23 1	Driver fuel level sensor out of range low Short to ground
612 14 23 2	Driver fuel sensor out of range high Shorted high or open circuit
612 14 25 1	Passenger fuel level sensor out of range low Short to ground
612 14 25 2	Passenger fuel level sensor out of range high Shorted high or open circuit
1705 14 107 3 (EGC Version 8.7)	EGC gauge location 7 (fuel level) out of range high Data for this gauge is above the value that the gauge can display. For example: a value exceeding the gauge maximum scale value.
1705 14 107 4 (EGC Version 8.7)	EGC gauge location 7 (fuel level) out of range low Data for this gauge is below the minimum value the gauge can display. For example: the lowest scale value on the gauge.
1705 14 107 5 (EGC Version 8.7)	EGC gauge location 7 (fuel level) sensor fault There is a problem with the sensor that provides the data for this gauge.
1705 14 107 6 (EGC Version 8.7)	EGC gauge location 7 (fuel level) data unavailable The data that this gauge displays should be, but is not available at this time.
2023 14 107 5 or 2023 14 207 5 (EGC Version 9.3 and later)	Fuel gauge sensor fault to primary EGC (107) or secondary EGC (207) There is a problem with the sensor that provides the data for this gauge.
2023 14 107 6 or 2023 14 207 6 (EGC Version 9.3 and later)	Fuel gauge data unavailable to primary EGC (107) or secondary EGC (207) The data that this gauge displays should be, but is not available at this time.
2023 14 107 7 or 2023 14 207 7 (EGC Version 9.3 and later)	Fuel gauge data missing to primary EGC (107) or secondary EGC (207) The data for this gauge is not being transmitted on the datalink.

Fault Detection/ Management

NOTE – The testing method for troubleshooting the electrical systems portrayed in this manual is a basic voltage test. An alternative method of checking for voltage drops within a given circuit may be a quicker method of identifying an exact problem.

NOTE – For vehicles with dual fuel tanks refer to the Fuel Transfer section of this manual. (See FUEL TRANSFER PUMP SYSTEM, page 689) The transfer pump circuits can affect fuel gauge operation.

A fault in the fuel sensor circuits will be apparent when the fuel gauge points straight down. Fuel sensor diagnostic trouble codes will also be present.

Problems in sensor circuits could be the result of open or shorted sensors, open circuits, shorted circuits, or a failure in the ESC.

Refer to Fuel Sensor Circuits.