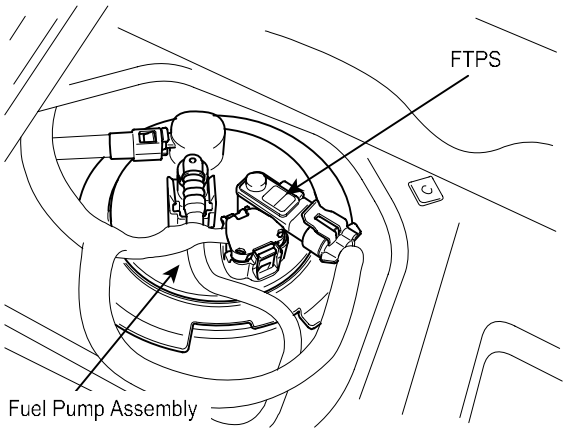
DTC P0451 EVAP. EMISSION SYSTEM-PRESSURE SENSOR RANGE / PERFORMANCE

COMPONENT LOCATION E326DFCC



EGRF990M

GENERAL DESCRIPTION EC3FB9C2

The Fuel Tank Pressure Sensor(FTPS) converts fuel tank pressure to a proportional analog voltage signal which is read by the engine controller for evaluation during execution of the Evaporative System Diagnostic. The Tank Pressure may be below atmospheric pressure (ie. a vacuum) or above atmospheric pressure.
The fuel tank pressure is used to measure the difference between the air pressure (or vacuum) in the fuel tank and the ambient air pressure. The Powertrain Control Module (ECM) supplies a 5-volt reference and a ground to the sensor, which allows the sensor' s output voltage to range from 0.1 to 4.9 volts. When the air pressure in the fuel tank is equal to the ambient air pressure, as when the fuel cap is removed, the output voltage of the sensor will be from 1.3 to 1.7 volts.

DTC DESCRIPTION EA2C047B

The Tank Pressure Sensor Stuck Diagnostic continuously monitors the fuel tank pressure sensor output for a stuck condition. It does this by comparing the maximum and minimum raw tank pressure voltages. If the difference between the two values exceeds a threshold, then the diagnostic is considered to have passed. The diagnostic is not allowed to fail unless (a) a significant portion of the EVPD(Evaporative Diagnostics) tank draw has occurred or (b) the tank pressure has not changed after purge transitions off from a flow level high enough to cause a change in the tank pressure.
Checking output signals of tank pressure under detecting condition, if the tank pressure difference between maximum and minimum is low than 0.9996 for 60 sec, PCM sets P0451 MIL(Malfunction Indicatin Lamp) turns on when the malfunction lasts till cosecutive 2 driving cycle.

DTC DETECTING CONDITION E5D97EE4

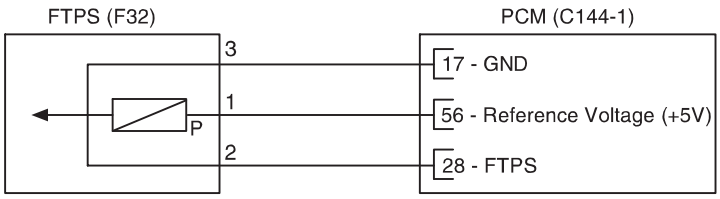
Item		Detecting Condition	Possible cause
DTC Strategy		• Continuously monitors the fuel tank pressure sensor output for a stuck condition	• Poor connection • Open or short in FTPS circuit • Faulty FTPS • Faulty PCM
Enable Conditions	Case 1	Transiton Monitor LogicEnable Conditions when test is run during Normal Purge • The type of canister purge duty cycle calculation and used as an input for the vent valve solenoid status = Not equal to 2 • EVAP system value during previous loop =0 • Required minimum purge flow rate immediately prior to a purge off transition to trigger the transition monitor portion of the tank pressure stuck diagnostic > 0.5g/s	
	Case 2	Diagnostic Mode Logic: • The stuck diag completed during EVPD operation = False • The type of canister purge duty cycle calculation and used as an input for the vent valve solenoid status = Not equal to 2	
Thresh-old value	Case 1	Transiton Monitor Logic • Minimum change in tank pressure required to pass the stuck diagnostic < 0.9995 • For Time period After Purge Duty Cycle is transitioned Off > 60sec.	
	Case 2	Diagnostic Mode Logic • The signed vacuum integral increment used to calculate the signed incremented vacuum integral > 0.95 • Minimum change in tank pressure required to pass the stuck diagnostic < 0.9995	
Diagnosis Time		• Continuous (More than 15 seconds failure for every 32 seconds test)	
MIL On Condition		• 2 Driving Cycles	

SPECIFICATION E0880224

Pressure (kPa)	Output Voltage (V)
-2.5 kPA	0.5V
0 kPA	2.5V
2.5 kPa	4.5V

SCHEMATIC DIAGRAM ED20D545

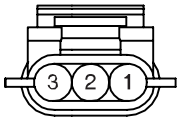
[CIRCUIT DIAGRAM]



[CONNECTION INFORMATION]

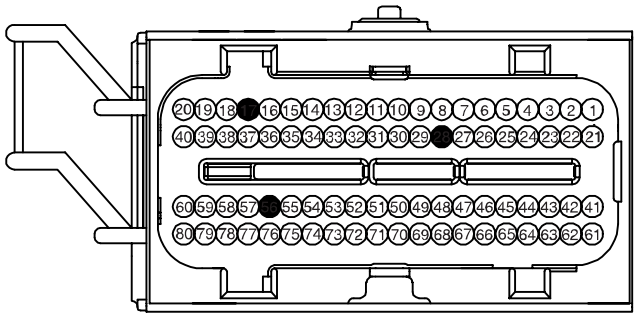
Terminal	Connected to	Funtion
1	PCM C144-1 (56)	Reference Voltage (+5V)
2	PCM C144-1 (28)	FTPS signal
3	PCM C144-1 (17)	Sensor ground

[HARNESS CONNECTORS]



F32

FTPS



C144-1

PCM

EGRF263A

MONITOR SCANTOOL DATA E11D56C2

1. IG "OFF" & connect scantool.
2. ENG "ON" and warm -up the engine to normal operating temperature.
3. Monitor "FTPS" parameter on the service data.

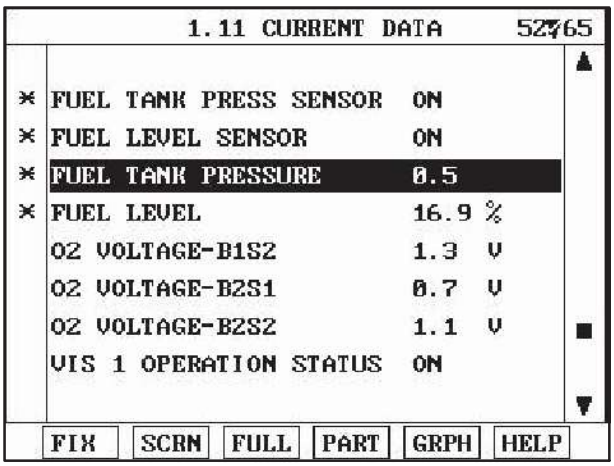


Fig. 1

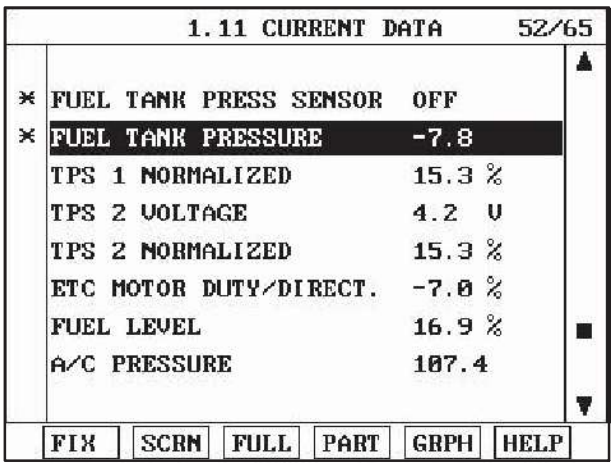


Fig. 2

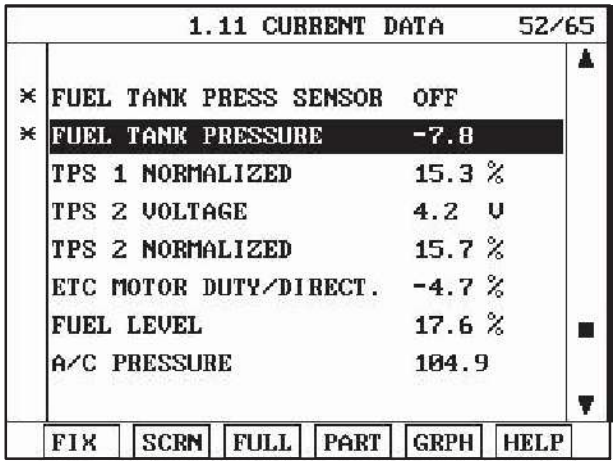


Fig. 3

Fig.1: Normal at idle
Fig.2: Open at idle

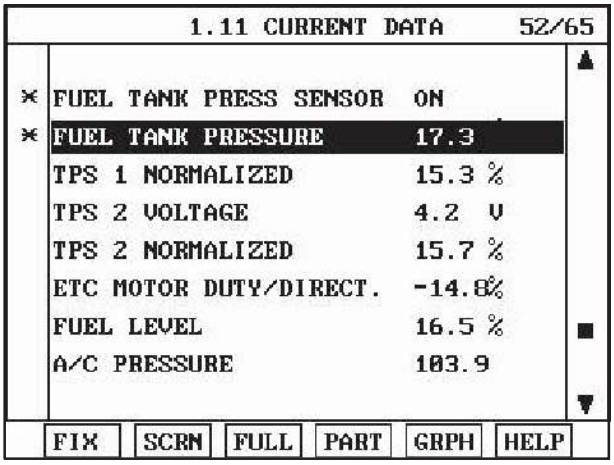


Fig. 3

Fig.3: Short to ground at idle
Fig.4: Shrot to 5V at idle

EGRF860A

4. Is the "FTPS" data displayed correctly ?

YES

▶ Fault is intermittent caused by poor contact in the sensor' s and/or PCM' s connector or was repaired and PCM memory was not cleared. Thoroughly check connectors for looseness, poorconnection, ending, corrosion, contamination, deterioration, or damage. Repair or replace asnecessary and go to "Verification of Vehicle Repair" procedure

NO

▶ Go to "Terminal and Connector Inspection" procedure

TERMINAL AND CONNECTOR INSPECTION E7A5471D

1. Many malfunctions in the electrical system are caused by poor harness and terminals. Faults can also be caused by interference from other electrical systems, and mechanical or chemical damage.

2. Thoroughly check connectors for looseness, poor connection, bending, corrosion, contamination, deterioration, or damage.

3. Has a problem been found?

YES

▶ Repair as necessary and go to "Verification of Vehicle Repair" procedure

NO

▶ Go to " Power Circuit Inspection " procedure.

POWER CIRCUIT INSPECTION E46D0670

1. IG "OFF" and disconnect FTPS connector.
2. IG "ON" & ENG "OFF"
3. Measure voltage between terminal 1 of FTPS harness connector and chassis ground.

Specification : Approx. 5V

4. Is the measured voltage within specification ?

YES

▶ Go to "Ground circuit inspection" procedure.

NO

▶ Repair or replace as necessary and go to "Verification of Vehicle Repair" procedure.

GROUND CIRCUIT INSPECTION E364FEEE

1. IG "OFF" and disconnect FTPS connector.
2. Measure voltage between terminal 1 of FTPS harness connector and chassis ground.
3. Measure voltage between terminal 1 and 3 of FTPS harness connector.

Specification : Voltage difference between Measurement "A" and "B" is below 200mV.

4. Is the measured voltage within specification ?

YES

▶ Go to "Signal Circuit Inspection" procedure.

NO

▶ Repair contact reistance or open in harness and then go to "Verification of Vehicle Repair" procedure.

SIGNAL CIRCUIT INSPECTION E08B02E0

1. Check voltage.
   1) IG "OFF" and disconnect FTPS connector.

2) IG "ON" & ENG "OFF"

3) Measure voltage between terminal 2 of FTPS harness connector and chassis ground.

Specification : Approx. 0V

4) Is the measured voltage within specification ?

YES

▶ Go to "Component Inspection" procedure.

NO

▶ Repair or replace as necessary and go to "Verification of Vehicle Repair" procedure.

COMPONENT INSPECTION ED73DAF9

1. Check FTPS.

1) IG "OFF" and connect scatool to DLC(Data Link Connector).

2) Monitor "FTPS" parameter with accelleration on service data.

SPECIFICATION

Pressure (kPa)	Output Voltage (V)
-2.5 kPA	0.5V
0 kPA	2.5V
2.5 kPa	4.5V

3) Does the "FTPS" parameter with accelleraton on the service data change ?

YES

▶ Go to "Check PCM" as follows.

NO

▶ Substitute with a known - good FTPS and check for proper operation.
▶ If the problem is corrected, replace FTPS and go to "Verification of Vehicle Repair" procedure.

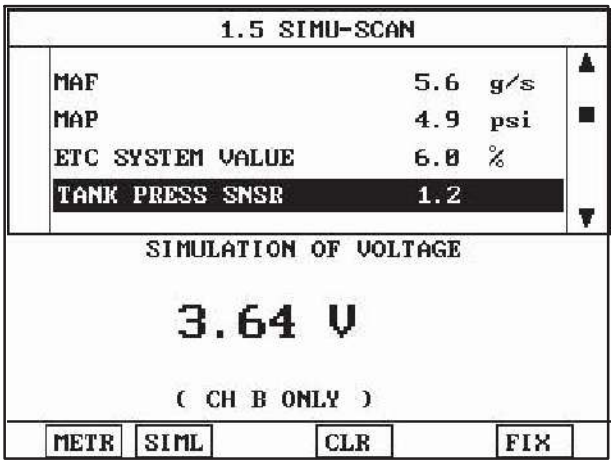
2. Check PCM.

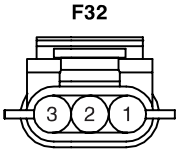
1) IG "OFF" disconnect FTPS connector

2) Connect Scantool and IG "ON" & ENG "OFF"

3) Select simulation function on scantool.

4) Simulate voltage at terminal 2 of FTPS harness connector.





1. FTPS Power
2. FTPS Signal
3. FTPS Ground

EGRF864A

5) Does the signal value of FTP sensor change according to simulation voltage ?

YES

▶ Thoroughly check connectors for looseness, poor connection, bending, corrosion, contamination, deterioration, or damage. Repair or replace as necessary and go to "Verification of Vehicle Repair" procedure.

NO

▶ Substitute with a known - good PCM and check for proper operation.
If the problem is corrected, replace PCM and go to "Verification of Vehicle Repair" procedure.

NOTE

There is a memory reset function on scantool that can erase optional parts automatically detected and memorized by PCM
Before or after testing PCM on the vehicle, use this function to reuse the PCM on the others

VERIFICATION OF VEHICLE REPAIR EE4C35B6

After a repair, it is essential to verify that the fault has been corrected.

1. Monitor and record the Freeze Frame Data for the Diagnostic Trouble Code(DTC) which has been diagnosed.
2. Using a Scantool, Clear the DTCs
3. Operate the vehicle within conditions noted in the freeze frame data or enable conditions
4. Monitor that all rediness test have been verified as " Complete "
5. Are any DTCs present ?

YES

▶ Go to the applicable troubleshoooting procedure.

NO

▶ System is performing to specification at this time.