

## 08 GRP11 Two - Mode Hybrid Fuel System Control Module (FSCM)

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL illum.
Fuel Rail Pressure (FRP) Sensor Performance (Rationality)	P0191	This DTC detects if the fuel pressure sensor is stuck within the normal operating range	Absolute value of change in fuel pressure as sensed during intrusive test.	<= 30 kPa	1. FRP Circuit Low DTC (P0192) 2. FRP Circuit High DTC (P0193) 3. FuelPump Circuit Low DTC (P0231)  4. FuelPump Circuit High DTC (P0232)  5. FuelPump Circuit Open DTC (P023F)  6. Reference Voltage DTC (P0641) 7. Reference Voltage DTC (P06A6) 8. Fuel Pump Control Module Driver Over-temperature DTC's (P064A, P1255) 9. Control Module Internal Performance DTC (P0606) 10. Engine run time 11. Emissions fuel level (PPEI \$3FB) 12. Fuel pump control 13. Fuel pump control state  14. Engine fuel flow 15. ECM fuel control system failure (PPEI \$1ED)	not active not active not active  not active  not active not active not active  not active  >=5 seconds not low enabled normal or FRP Rationality control  > 0.195 g/s failure has not occurred	<u>Frequency:</u> Continuous; 12.5 ms loop. 60 seconds between intrusive tests that pass  Intrusive test requested if fuel system is clamped or fuel pressure error <= 2 kPa for >= 5 seconds; otherwise report pass  Duration of intrusive test is fueling related (5 to 12 seconds).	DTC Type A
Fuel Rail Pressure (FRP) Sensor Circuit Low Voltage	P0192	This DTC detects if the fuel pressure sensor circuit is shorted to low	FRP sensor voltage	< 0.1 V	Ignition AND Reference Voltage DTC P0641	Run or Crank  not active	72 test failures in 80 test samples; 1 sample/12.5ms	DTC Type B
Fuel Rail Pressure (FRP) Sensor Circuit High Voltage	P0193	This DTC detects if the fuel pressure sensor circuit is shorted to high	FRP sensor voltage	> 4.9 V	Ignition AND Reference Voltage DTC P0641	Run or Crank  not active	72 test failures in 80 test samples; 1 sample/12.5ms	DTC Type B

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Fuel Pump Control Circuit Low Voltage	P0231	This DTC detects if the fuel pump control circuit is shorted to low	Fuel Pump Current	> 14.48A	Ignition OR  HS Comm OR Fuel Pump Control AND Ignition Run/Crank Voltage	Run or Crank  enabled  enabled  9V < voltage < 18V	72 test failures in 80 test samples if Fuel Pump Current <100A  3 test failures in 15 test samples if Fuel Pump Current >=100A  1 sample/12.5 ms	DTC Type A
Fuel Pump Control Circuit High Voltage	P0232	This DTC detects if the fuel pump control circuit is shorted to high	Voltage measured at fuel pump circuit	> 3.86 V	Commanded fuel pump output   Fuel pump control enable  Time that above conditions are met	0% duty cycle (off)  False  >=4.0 seconds	36 test failures in 40 test samples; 1 sample/12.5ms  Pass/Fail determination made only once per AutoStop & end of trip	DTC Type A
Fuel Pump Control Circuit (Open)	P023F	This DTC detects if the fuel pump control circuit is open	Fuel Pump Current  AND Fuel Pump Duty Cycle	<=0.5A  >20%	Ignition OR HS Comm OR Fuel Pump Control AND Ignition Run/Crank Voltage	Run or Crank  enabled  enabled  9V < voltage < 18V	72 test failures in 80 test samples; 1 sample/12.5ms	DTC Type A
Fuel System Control Module Enable Control Circuit	P025A	This DTC detects if there is a fault in the fuel pump control enable circuit	PPEI (PPEI (Powertrain Platform Electrical Interface) Fuel System Request (\$1ED)	≠ Fuel Pump Control Module Enable Control Circuit	Ignition AND PPEI Fuel System Request (\$1ED)	Run or Crank  valid	72 test failures in 80 test samples; 1 sample/12.5ms	DTC Type A
Control Module Read Only Memory (ROM)	P0601	This DTC will be stored if any software or calibration check sum is incorrect	Calculated Checksum (CRC16)	≠ stored checksum for any of the parts (boot, software, application calibration, system calibration)	Ignition	Run or Crank	1 failure if it occurs during the first ROM test of the ignition cycle, otherwise 5 failures	DTC Type A

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					OR  HS Comm OR Fuel Pump Control	enabled  enabled	Frequency: Runs continuously in the background	
Control Module Not Programmed	P0602	Indicates that the FSCM needs to be programmed	This DTC is set via calibration, when KeMEMD_b_NoStartCal	TRUE	Ignition OR HS Comm OR Fuel Pump Control	Run or Crank  enabled  enabled	Runs once at power up	DTC Type A
Control Module Long Term Memory Reset	P0603	Non-volatile memory checksum error at controller power-up	Checksum at power-up	≠ checksum at power-down	Ignition OR HS Comm OR Fuel Pump Control	Run or Crank  enabled  enabled	1 failure  Frequency: Once at power-up	DTC Type A
Control Module Random Access Memory (RAM)	P0604	Indicates that control module is unable to correctly write and read data to and from RAM	Data read	≠ Data written	Ignition OR HS Comm  OR Fuel Pump Control	Run or Crank  enabled  enabled	1 failure if it occurs during the first RAM test of the ignition cycle, otherwise 5 failures  Frequency: Runs continuously in the background.	DTC Type A
Control Module Internal Performance 1. Main Processor Configuration Register Test	P0606	This DTC indicates the FSCM has detected an internal processor fault or external watchdog fault (PID 2032 can tell what causes the fault.)	1. For all I/O configuration register faults:  •Register contents	Incorrect value.	Ignition OR HS Comm OR	Run or Crank  enabled	Tests 1 and 2 1 test failure Frequency: Continuously (12.5ms)	DTC Type A

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2. Processor clock test  3. External watchdog test			2. For Processor Clock Fault:           •EE latch flag in EEPROM. OR  • RAM latch flag.  3. For External Watchdog Fault: • Software control of viper chip.	0x5A5A 0x5A  Control Lost	Fuel Pump Control 1. For all I/O configuration register faults: •KeMEMD_b_ProcFitCfgRegEnbl  2. For Processor Clock Fault: •KeMEMD_b_ProcFitCLKDiagEnbl 3. For External Watchdog Fault: •KeFRPD_b_FPExtWDogDiagEnbl  3. For External Watchdog Fault: •Control Module ROM(P0601)  3. For External Watchdog Fault: •Control Module RAM(P0604)	enabled  TRUE  TRUE  TRUE  not active  not active	Test 3 3 test failures in 15 test samples Frequency: 1 sample/12.5 ms	
Control Module Long Term Memory (EEPROM) Performance	P062F	Indicates that the NVM Error flag has not been cleared	Last EEPROM write	Did not complete	Ignition OR HS Comm OR Fuel Pump Control	Run or Crank  enabled  enabled	1 test failure Once on controller power-up	DTC Type A
5 Volt Reference Circuit (Short High/Low)	P0641	Detects a continuous short on the #1 5V sensor reference circuit	Reference voltage   AND Output OR Reference voltage   AND  Output OR Reference voltage AND Output	>= 0.5V inactive  >= 5.5V  active  <= 4.5V active	Ignition	Run or Crank	15 test failures in 20 test samples  1 sample/12.5 ms	DTC Type A

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Fuel Pump Control Module Performance - Driver Over Temperature 1	P064A	This DTC detects if an internal fuel pump driver overtemperature condition exists under normal operating conditions. (Motorola's responsibility)	Module Range of Operation  <b>AND</b>  Viper Temp	Normal (- FSCM is in normal operating range for module voltage versus PWM duty cycle. Linear range from 100% @ 12.5V to 70% @ 18V.)  >190C	Ignition OR HS Comm OR Fuel Pump Control KeFRPD_b_FPOverTempDiagEnbl Ignition Run/Crank	Run or Crank  enabled  enabled TRUE 9V<voltage<18V	3 test failures in 15 test samples  1 sample/12.5 ms	DTC Type B
5 Volt Reference Circuit (Out of Range)	P06A6	Detects that the #1 5 V sensor reference circuit is out of range	Reference voltage	> 102.5% nominal (i.e. 5.125V)  OR < 97.5% nominal (i.e. 4.875V)	Ignition	Run or Crank	72 test failures in 80 test samples  1 sample/12.5 ms	DTC Type A
Fuel Pump Control Module - Driver Over-temperature 2	P1255	This DTC detects if an internal fuel pump driver overtemperature condition exists under extreme operating conditions (GM's responsibility )	Module Range of Operation  <b>AND</b>  Viper Temp	Outside normal range ( FSCM is NOT in normal operating range for module voltage versus PWM duty cycle. Linear range from 100% @ 12.5V to 70% @ 18V.)  > 190C	Ignition OR HS Comm OR Fuel Pump Control KeFRPD_b_FPOverTempDiagEnbl Ignition Run/Crank	Run or Crank  enabled  enabled TRUE 9V<voltage<18V	3 test failures in 15 test samples  1 sample/12.5 ms	DTC Type B
Ignition 1 Switch Circuit Low Voltage	P2534	This DTC detects if the Ignition1 Switch circuit is shorted to low or open	Ignition 1 voltage	<= 6 V	Engine	Running	144 test failures in 160 test samples  1 sample/12.5 ms	DTC Type A



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					19. Fuel Pressure Control System	Is not responding to an over-pressurization due to pressure build during DFCO or a decreasing desired pressure command.		
Control Module Communication Bus "A" Off	U0073	Detects that a CAN serial data bus shorted condition has occurred to force the CAN device driver to enter a bus-off state	Bus Status	Off	1. Power mode	Run/Crank	5 test failures in 5 samples ( 5 seconds)	DTC Type B
Lost Communication With ECM/PCM "A"	U0100	Detects that CAN serial data communication has been lost with the ECM	Message \$0C9	Undetected	1. Power mode  2. Ignition Run/Crank Voltage 3. U0073	Run/Crank  (11 – 18 V) not active	12 test failures in 12 samples (12 seconds)	DTC Type B