08 GRP07 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 System Control Module:								
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 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

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL illum.
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
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 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	Run or Crank	72 test failures in 80 test samples; 1 sample/12.5ms	DTC Type A

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL illum.
					AND PPEI Fuel System Request ($1ED)	valid		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL illum.
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 OR HS Comm OR Fuel Pump Control	Run or Crank enabled enabled	1 failure if it occurs during the first ROM test of the ignition cycle, otherwise 5 failures Frequency: Runs continuously in the background	DTC Type A
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

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL illum.
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 Fuel Pump Control 1. For all I/O configuration register faults: •KeMEMD_b_ProcFltCfgRegEnbl	Run or Crank enabled enabled TRUE	Tests 1 and 2 1 test failure Frequency: Continuously (12.5ms) Test 3 3 test failures in 15 test samples Frequency: 1 sample/12.5 ms	DTC Type A
2. Processor clock test			2. For Processor Clock Fault: •EE latch flag in EEPROM. OR • RAM latch flag.	0x5A5A 0x5A	2. For Processor Clock Fault: •KeMEMD_b_ProcFltCLKDiagEnbl	TRUE		
3. External watchdog test			3. For External Watchdog Fault: • Software control of viper chip.	Control Lost	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)	TRUE not active not active		
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

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL illum.
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
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 **AND** 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

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL illum.
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 **AND** 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

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL illum.
Fuel Pump Flow Performance	P2635	This DTC detects degradation in the performance of the electronic return-less fuel system	Filtered fuel rail pressure error	<= Low Threshold (function of desired fuel rail pressure and fuel flow rate. Typical values in the range of -28.4 to -193.5 kPa.) **OR**	1. FRP Circuit Low DTC (P0192)	not active	Filtered fuel rail pressure error Time Constant = 12.5 seconds Frequency: Continuous 100 ms loop	DTC Type B
				> High Threshold (function of desired fuel rail pressure and fuel flow rate. Typical values in the range of 19.5 to 166.5 kPa.)	2. FRP Circuit High DTC (P0193)	not active		
					3. Fuel Rail Pressure Sensor Performance DTC (P0191)	not active		
					4. FuelPump Circuit Low DTC (P0231)	not active		
					5. FuelPump Circuit High DTC (P0232)	not active		
					6. FuelPump Circuit Open DTC (P023F)	not active		
					7. Reference Voltage DTC (P0641)	not active		
					8. Reference Voltage DTC (P06A6)	not active		
					9. Fuel Pump Control Module Driver Over-temperature DTC's (P064A, P1255)	not active		
					10. Control Module Internal Performance DTC (P0606)	not active		
					11. An ECM fuel control system failure (PPEI $1ED)	has not occurred		
					12. The Barometric pressure (PPEI $4C1) signal	valid (for absolute fuel pressure sensor)		
					13. Engine run time	>= 30 seconds		
					14. Emissions fuel level (PPEI $3FB)	not low		
					15. Fuel pump control	enabled		
					16. Fuel pump control state	normal		
					17. Battery Voltage	11V<=voltage=<18V		
					18. Fuel flow rate	> 0.195 g/s **AND** <= Max allowed fuel flow rate as a function of desired rail pressure (Typical values in the range of 10.6 to 29.7 g/s)		
					19. Fuel Pressure Control System	Is not responding to an over-pressurization due to pressure build during DFCO or a decreasing desired pressure command.		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL illum.
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

LOOK-UP TABLES

Battery Voltage (volts)	200	250	300	350	400	450	500	550	600
4.5	33.60156	33.60156	32.14844	29.88281	26.75	24.6875	22.60938	19.78125	17.42188
6	33.60156	33.60156	32.14844	29.88281	26.75	24.6875	22.60938	19.78125	17.42188
7.5	33.60156	33.60156	32.14844	29.88281	26.75	24.6875	22.60938	19.78125	17.42188
9	33.60156	33.60156	32.14844	29.88281	26.75	24.6875	22.60938	19.78125	17.42188
10.5	33.60156	33.60156	32.14844	29.88281	26.75	24.6875	22.60938	19.78125	17.42188
12	33.60156	33.60156	33.60156	33.60156	33.60156	32.41406	30.34375	27.28906	24.82813
13.5	33.60156	33.60156	33.60156	33.60156	33.60156	33.60156	33.60156	33.60156	32.28125
15	33.60156	33.60156	33.60156	33.60156	33.60156	33.60156	33.60156	33.60156	33.60156
16.5	33.60156	33.60156	33.60156	33.60156	33.60156	33.60156	33.60156	33.60156	33.60156
18	33.60156	33.60156	33.60156	33.60156	33.60156	33.60156	33.60156	33.60156	33.60156
19.5	33.60156	33.60156	33.60156	33.60156	33.60156	33.60156	33.60156	33.60156	33.60156
21	33.60156	33.60156	33.60156	33.60156	33.60156	33.60156	33.60156	33.60156	33.60156
22.5	33.60156	33.60156	33.60156	33.60156	33.60156	33.60156	33.60156	33.60156	33.60156
24	33.60156	33.60156	33.60156	33.60156	33.60156	33.60156	33.60156	33.60156	33.60156
25.5	33.60156	33.60156	33.60156	33.60156	33.60156	33.60156	33.60156	33.60156	33.60156
27	33.60156	33.60156	33.60156	33.60156	33.60156	33.60156	33.60156	33.60156	33.60156
28.5	33.60156	33.60156	33.60156	33.60156	33.60156	33.60156	33.60156	33.60156	33.60156

Gasoline (LMF):

Desired Rail Pressure (kPa)

Voltage (volts)	200	250	300	350	400	450	500	550	600
4.5	29.60156	29.60156	29.60156	29.60156	26.98438	24.79688	22.54688	19.92188	17.59375
6	29.60156	29.60156	29.60156	29.60156	26.98438	24.79688	22.54688	19.92188	17.59375
7.5	29.60156	29.60156	29.60156	29.60156	26.98438	24.79688	22.54688	19.92188	17.59375
9	29.60156	29.60156	29.60156	29.60156	26.98438	24.79688	22.54688	19.92188	17.59375
10.5	29.60156	29.60156	29.60156	29.60156	26.98438	24.79688	22.54688	19.92188	17.59375
12	29.60156	29.60156	29.60156	29.60156	29.60156	29.60156	29.60156	27.53906	25.07813
13.5	29.60156	29.60156	29.60156	29.60156	29.60156	29.60156	29.60156	29.60156	29.60156
15	29.60156	29.60156	29.60156	29.60156	29.60156	29.60156	29.60156	29.60156	29.60156
16.5	29.60156	29.60156	29.60156	29.60156	29.60156	29.60156	29.60156	29.60156	29.60156
18	29.60156	29.60156	29.60156	29.60156	29.60156	29.60156	29.60156	29.60156	29.60156

LOOK-UP TABLES

Battery										
	19.5	29.60156	29.60156	29.60156	29.60156	29.60156	29.60156	29.60156	29.60156	29.60156
	21	29.60156	29.60156	29.60156	29.60156	29.60156	29.60156	29.60156	29.60156	29.60156
	22.5	29.60156	29.60156	29.60156	29.60156	29.60156	29.60156	29.60156	29.60156	29.60156
	24	29.60156	29.60156	29.60156	29.60156	29.60156	29.60156	29.60156	29.60156	29.60156
	25.5	29.60156	29.60156	29.60156	29.60156	29.60156	29.60156	29.60156	29.60156	29.60156
	27	29.60156	29.60156	29.60156	29.60156	29.60156	29.60156	29.60156	29.60156	29.60156
	28.5	29.60156	29.60156	29.60156	29.60156	29.60156	29.60156	29.60156	29.60156	29.60156

Failure Threshold when estimated rail pressure is ABOVE desired rail pressure
(Error=Desired Rail Pressure-Estimated Rail Pressure)

Both Gasoline (LMF) and E85 (LMF+N15):

Desired Rail Pressure (kPa)

uel Flow (g/sec)	200	250	300	350	400	450	500	550	600
0	-34.5625	-34.5625	-34.5625	-31.46875	-28.40625	-28.40625	-28.40625	-28.40625	-28.40625
1.5	-63	-63	-63	-73.5	-84	-84	-84	-84	-84
3	-64.5	-80.625	-96.75	-112.875	-129	-145.125	-161.25	-177.375	-193.5
4.5	-64.5	-80.625	-96.75	-112.875	-129	-145.125	-161.25	-177.375	-193.5
6	-64.5	-80.625	-96.75	-112.875	-129	-145.125	-161.25	-177.375	-193.5
7.5	-64.5	-80.625	-96.75	-112.875	-129	-145.125	-161.25	-177.375	-193.5
9	-64.5	-80.625	-96.75	-112.875	-129	-145.125	-161.25	-177.375	-193.5
10.5	-64.5	-80.625	-96.75	-112.875	-129	-145.125	-161.25	-177.375	-193.5
12	-64.5	-80.625	-96.75	-112.875	-129	-145.125	-161.25	-177.375	-193.5
13.5	-64.5	-80.625	-96.75	-112.875	-129	-145.125	-161.25	-177.375	-193.5
15	-64.5	-80.625	-96.75	-112.875	-129	-145.125	-161.25	-177.375	-193.5
16.5	-64.5	-80.625	-96.75	-112.875	-129	-145.125	-161.25	-177.375	-193.5
18	-64.5	-80.625	-96.75	-112.875	-129	-145.125	-161.25	-177.375	-193.5
19.5	-64.5	-80.625	-96.75	-112.875	-129	-145.125	-161.25	-177.375	-193.5
21	-64.5	-80.625	-96.75	-112.875	-129	-145.125	-161.25	-177.375	-193.5
22.5	-64.5	-80.625	-96.75	-112.875	-129	-145.125	-161.25	-177.375	-193.5

LOOK-UP TABLES

Instantaneous F									
24	-64.5	-80.625	-96.75	-112.875	-129	-145.125	-161.25	-177.375	-193.5
25.5	-64.5	-80.625	-96.75	-112.875	-129	-145.125	-161.25	-177.375	-193.5
27	-64.5	-80.625	-96.75	-112.875	-129	-145.125	-161.25	-177.375	-193.5
28.5	-64.5	-80.625	-96.75	-112.875	-129	-145.125	-161.25	-177.375	-193.5
30	-64.5	-80.625	-96.75	-112.875	-129	-145.125	-161.25	-177.375	-193.5
31.5	-64.5	-80.625	-96.75	-112.875	-129	-145.125	-161.25	-177.375	-193.5
33	-64.5	-80.625	-96.75	-112.875	-129	-145.125	-161.25	-177.375	-193.5
34.5	-64.5	-80.625	-96.75	-112.875	-129	-145.125	-161.25	-177.375	-193.5
36	-64.5	-80.625	-96.75	-112.875	-129	-145.125	-161.25	-177.375	-193.5
37.5	-64.5	-80.625	-96.75	-112.875	-129	-145.125	-161.25	-177.375	-193.5
39	-64.5	-80.625	-96.75	-112.875	-129	-145.125	-161.25	-177.375	-193.5
40.5	-64.5	-80.625	-96.75	-112.875	-129	-145.125	-161.25	-177.375	-193.5
42	-64.5	-80.625	-96.75	-112.875	-129	-145.125	-161.25	-177.375	-193.5
43.5	-64.5	-80.625	-96.75	-112.875	-129	-145.125	-161.25	-177.375	-193.5
45	-64.5	-80.625	-96.75	-112.875	-129	-145.125	-161.25	-177.375	-193.5
46.5	-64.5	-80.625	-96.75	-112.875	-129	-145.125	-161.25	-177.375	-193.5
48	-64.5	-80.625	-96.75	-112.875	-129	-145.125	-161.25	-177.375	-193.5

Failure Threshold when estimated rail pressure is BELOW desired rail pressure
(Error=Desired Rail Pressure-Estimated Rail Pressure)

Both Gasoline (LMF) and E85 (LMF+N15):

	Desired Rail Pressure (kPa)								
	200	250	300	350	400	450	500	550	600
0	55.5	69.375	83.25	97.125	111	124.875	138.75	152.625	166.5
1.5	55.5	69.375	83.25	97.125	111	124.875	138.75	152.625	166.5
3	55.5	69.375	83.25	97.125	111	124.875	138.75	152.625	166.5
4.5	55.5	69.375	83.25	97.125	111	124.875	138.75	152.625	166.5
6	55.5	69.375	83.25	97.125	111	124.875	138.75	152.625	166.5

LOOK-UP TABLES

Instantaneous Fuel Flow (g/sec)										
7.5	55.5	69.375	83.25	97.125	111	124.875	138.75	152.625	166.5
9	55.5	69.375	83.25	97.125	111	124.875	138.75	152.625	166.5
10.5	55.5	69.375	83.25	97.125	111	124.875	138.75	152.625	166.5
12	55.5	69.375	83.25	97.125	111	124.875	138.75	152.625	166.5
13.5	55.5	69.375	83.25	97.125	111	124.875	138.75	152.625	166.5
15	55.5	69.375	83.25	97.125	111	124.875	138.75	152.625	166.5
16.5	55.5	69.375	83.25	97.125	111	124.875	138.75	152.625	166.5
18	55.5	69.375	83.25	97.125	111	124.875	138.75	152.625	166.5
19.5	55.5	69.375	83.25	97.125	111	124.875	138.75	152.625	166.5
21	43.9375	69.375	83.25	97.125	111	124.875	138.75	152.625	166.5
22.5	31.9375	69.375	83.25	97.125	111	124.875	138.75	152.625	166.5
24	19.5	54.92188	83.25	97.125	111	124.875	138.75	152.625	166.5
25.5	19.5	39.92188	83.25	97.125	111	124.875	138.75	152.625	166.5
27	19.5	24.375	65.90625	97.125	111	124.875	138.75	152.625	166.5
28.5	19.5	24.375	47.89063	97.125	111	124.875	138.75	152.625	166.5
30	19.5	24.375	29.25	76.90625	111	124.875	138.75	152.625	166.5
31.5	19.5	24.375	29.25	55.875	87.92188	125.0469	131.9844	138.9219	145.8594
33	19.5	24.375	29.25	34.125	64.85938	125.2188	125.2188	125.2188	125.2188
34.5	19.5	24.375	29.25	34.125	64.85938	125.2188	125.2188	125.2188	125.2188
36	19.5	24.375	29.25	34.125	64.85938	125.2188	125.2188	125.2188	125.2188
37.5	19.5	24.375	29.25	34.125	64.85938	125.2188	125.2188	125.2188	125.2188
39	19.5	24.375	29.25	34.125	64.85938	125.2188	125.2188	125.2188	125.2188
40.5	19.5	24.375	29.25	34.125	64.85938	125.2188	125.2188	125.2188	125.2188
42	19.5	24.375	29.25	34.125	64.85938	125.2188	125.2188	125.2188	125.2188
43.5	19.5	24.375	29.25	34.125	64.85938	125.2188	125.2188	125.2188	125.2188
45	19.5	24.375	29.25	34.125	64.85938	125.2188	125.2188	125.2188	125.2188
46.5	19.5	24.375	29.25	34.125	64.85938	125.2188	125.2188	125.2188	125.2188
48	19.5	24.375	29.25	34.125	64.85938	125.2188	125.2188	125.2188	125.2188