This document was prepared in the following main sections (worksheet tabs) for MY13 GM OBD Group 05A Diagnostics for Electronically Regulated Fuel System and optional Front Grille Active Aero Shutters

### Section 1: C101 &XFE

Contains information that is common to all C101 ERFS applications within 13OBDG05A featuring RPO XFE (Extra Fuel Economy) Active Front Grill Air Shutters

with engine RPOs

1) LFX 3.6L High Feature V6 Spark Ignition Direct Injection

with VPPCs

1) A1SL

### Section 2: C101 -XFE

Contains information that is common to all C101 ERFS applications within 13OBDG05A not containing RPO XFE

with engine RPOs

1) LFX 3.6L HFV6 SIDI

with VPPCs

1) P1LL, GMX511, GMX521, Z1LC Police

### Section 3: C202

Contains information that is common to all C202 ERFS applications within 13OBDG05A

with engine RPOs

1) LFW 3.0L HFV6 SIDI, LFX 3.6L HFV6 SIDI, LLT 3.6L HFV6 SIDI

with VPPCs

1) GMX211, GMX206, GMX226, GMX322, GMT561, GMT967, GMT968

Component/	Fault	Monitor Strategy	Malfunction	Threshold	Secondary	Enable	Time	MIL
System		Description	Criteria	Value		Conditions	Required	Illum.
Fuel Rail Pressure (FRP) Sensor Performance (rationality)	FRP) Sensor pressure sensor response stuck within the normal	stuck within the normal	Absolute value of fuel pressure change as sensed during intrusive test.	<= 30 kPa			Frequency: Continuous; 12.5 ms loop. 60 seconds between intrusive tests that pass	DTC Type A 1 trip
							Intrusive test requested if fuel system is clamped for >= 5 seconds or fuel pressure error variance <= typically (0.3 to 0.6) (calculated over a 2.5sec	
					1. FRP Circuit Low DTC (P018C)	Not active	period); otherwise report pass	
				4. FuelPump Circuit High DTC	Not active Not active Not active	Duration of intrusive test is fueling related (5 to 12 seconds).		
					(P0232) 5. FuelPump Circuit Open DTC (P023F)	Not active	Intrusive test is run when fuel flow is below Max allowed fuel flow rate (Typical values in the range of 11 to 50 g/s)	
					(P0641)	Not active	3,2)	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
-					8. Control Module Internal Performance DTC (P0606)	Not active		
					9. Engine run time	>=5 seconds		
					10. Emissions fuel level (PPEI \$3FB)	Not low		
					11. Fuel pump control	Enabled		
					12. Fuel pump control state	Normal or FRP rationality control		
					13. Engine fuel flow	> 0.047 g/s		
					14. ECM fuel control system failure (PPEI \$1ED)	Not failed		
Fuel Rail Pressure (FRP) Sensor Circuit Low Voltage	P018C	This DTC detects if the fuel pressure sensor circuit is shorted low	FRP sensor voltage	< 0.14 V			72 failures out of 80 samples	DTC Type A 1 trip
					Ignition	Run or Crank	1 sample/12.5 ms	
Fuel Rail Pressure (FRP) Sensor Circuit High Voltage		This DTC detects if the fuel pressure sensor circuit is shorted high	FRP sensor voltage	> 4.86 V			72 failures out of 80 samples 1 sample/12.5 ms	DTC Type A 1 trip
					Ignition	Run or Crank		
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			72 test failures in 80 test samples if Fuel Pump	DTC Type A 1 trip
					Ignition OR	Run or Crank	Current <100A	
					HS Comm	enabled		
					OR Fuel Pump Control	enabled	1 sample/12.5 ms	
					AND Ignition Run/Crank Voltage	9V < voltage < 32V		

-		Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions		MIL Illum.
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	0% duty cycle (off)	36 test failures in 40 test samples; 1 sample/12.5ms	DTC Type A 1 trip
					Fuel pump control enable	False	Pass/Fail determination made only once per trip	
					Time that above conditions are met	>=4.0 seconds		
Fuel Pump Control Circuit (Open)	P023F	This DTC detects if the fuel pump control circuit is open	Fuel Pump Current	<=0.5A			72 test failures in 80 test samples; 1 sample/12.5ms	DTC Type A 1 trip
			AND		Ignition OR	Run or Crank		
			Fuel Pump Duty Cycle	>20%	HS Comm OR	enabled		
					Fuel Pump Control AND	enabled		
					Ignition Run/Crank Voltage	9V < voltage < 32V		
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 failures out of 80 samples 1 sample/12.5 ms	DTC Type A 1 trip
					AND PPEI Fuel System Request (\$1ED)	valid		

Component/	Fault	Monitor Strategy	Malfunction	Threshold	Secondary	Enable	Time	MIL
System	Code	Description	Criteria	Value	Parameters	Conditions	Required	Illum.
Mechanical Actuator Performance (Functionality)	P059F	Compare commanded shutter position to sensed position	Failure to achieve commanded position	Two (2) consecutive intrusive tests fail to achieve commanded position.  Intrusive tests are triggered immediately following any failure to achieve a commanded position.	Power mode  2. Shutter Control	Run/Crank  Enabled	Frequency: 1 sample after every shutter movement.  Intrusive test requested if shutter movement is commanded and position feedback differs after 19.5 seconds; otherwise report pass.  Duration of intrusive test is shutter movement related (40 to 80 seconds).	
					3. Ignition Run/Crank Voltage	11V < voltage < 32V		
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 1 trip
Control Module Not Programmed	P0602	Indicates that the FSCM needs to be programmed	This DTC is set via calibration, when KeMEMD_b_NoStartCal		Ignition OR HS Comm	Run or Crank	Runs once at power up	DTC Type A 1 trip

•		Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					OR			
					Fuel Pump Control	enabled		
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	Run or Crank enabled	1 failure Frequency: Once at power-up	DTC Type A 1 trip
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	Fuel Pump Control	enabled	1 failure if it occurs during the first RAM test of the ignition cycle, otherwise 5 failures	DTC Type A 1 trip
					Ignition OR HS Comm OR Fuel Pump Control	Run or Crank enabled enabled	Frequency: Runs continuously in the background.	
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 discriminates the source of the fault )	For all I/O configuration register faults:		i dei i dirip Control	спалеч	Tests 1 and 2 1 failure Frequency: Continuously (12.5ms)	DTC Type A 1 trip
			•Register contents	Incorrect value.	Ignition OR HS Comm OR Fuel Pump Control	Run or Crank enabled enabled		

Component/	Fault	Monitor Strategy	Malfunction	Threshold	Secondary	Enable	Time	MIL
System	Code	Description	Criteria	Value	Parameters	Conditions	Required	Illum.
Processor clock			2. For Processor Clock Fault: •EE latch flag in EEPROM. OR	0x5A5A	For all I/O configuration register faults:     KeMEMD_b_ProcFltCfgRegEn bl	TRUE	Test 3 3 failures out of 15 samples	
test			RAM latch flag.	0x5A	2. For Processor Clock Fault: •KeMEMD_b_ProcFltCLKDiagE nbl	TRUE	1 sample/12.5 ms	
3. External watchdog test			<ul><li>3. For External Watchdog Fault:</li><li>Software control of fuel pump driver</li></ul>	Control Lost	3. For External Watchdog Fault: •KeFRPD_b_FPExtWDogDiag Enbl	TDUE		
					3. For External Watchdog Fault: •Control Module ROM(P0601)	TRUE not active		
					3. For External Watchdog Fault: •Control Module RAM(P0604)			
Control Module Long Term Memory (EEPROM) Performance		Indicates that the NVM Error flag has not been cleared	Last EEPROM write	Did not complete		not active	1 test failure Once on controller power- up	DTC Type A 1 trip
. Grisimanes					Ignition OR	Run or Crank		
					HS Comm OR Fuel Pump Control	enabled enabled		
					ruei rump Contion	enabled		
5Volt Reference P06 Circuit (Short High/Low/Out of Range)	P0641	Detects continuous short or out of range on the #1 5V sensor reference circuit	Reference voltage AND	>= 0.5V	Ignition	Run or Crank	15 failures out of 20 samples 1 sample/12.5 ms	DTC Type A 1 trip
			Output OR Reference voltage AND	inactive >= 5.5V				
			Output	active				

Component/		Monitor Strategy	Malfunction	Threshold	Secondary	Enable	Time	MIL
System	Code	Description	Criteria	Value	Parameters	Conditions	Required	Illum.
			OR Reference voltage AND Output	<= 4.5V				
			OR Reference voltage	> 105% nominal (i.e., 5.25V) OR <95% nominal (i.e., 4.75V)				
Fuel Pump Control Module - Driver Over-temperature 1		This DTC detects if an internal fuel pump driver overtemperature condition exists under normal operating conditions	Pump Driver Temp	> 150C	Ignition OR HS Comm OR Fuel Pump Control	Run or Crank Enabled Enabled	3 failures out of 15 samples 1 sample/12.5 ms	DTC Type B 2 trips
Ignition 1 Switch	P2534	This DTC detects if the	Ignition 1 voltage	<= 6 V	KeFRPD_b_FPOverTempDiag Enbl Ignition Run/Crank Engine	TRUE 9V <voltage<32v Running</voltage<32v 	180 failures out of	DTC
Circuit Low Voltage		Ignition1 Switch circuit is shorted to low or open					200 samples  1 sample/25.0 ms	Type A 1 trip

Component/	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	1	Enable Conditions	Time	MIL Illum.
System		•			Parameters		Required	1
Performance degradation in the (rationality) performance of the	This DTC detects degradation in the performance of the SIDI electronically regulated fuel system	Filtered fuel rail pressure error	<= Low Threshold (tabulated function of desired fuel rail pressure and fuel flow rate 15% of requested Target Pressure )  OR  >= High Threshold (tabulated function of desired fuel rail pressure and fuel flow rate 15% of requested Target Pressure)	1. FRP Circuit Low DTC (P018C)	Not active	Filtered fuel rail pressure error Time Constant = 12.5 seconds  Frequency: Continuous 12.5 ms loop	DTC Type B 2 trips	
				( See Supporting Tables tab )	2. FRP Circuit High DTC	Not active		
					(P018D)  3. Fuel Rail Pressure Sensor Performance DTC (P018B)	Not active		
					(P0231)	Not active		
					5. FuelPump Circuit High DTC (P0232)			
					6. FuelPump Circuit Open DTC (P023F)			
					7. Reference Voltage DTC (P0641)	Not active		
					Driver Over-temperature DTC's (P064A)	Not active		
				9. Control Module Internal Performance DTC (P0606)	Not active			
					10. An ECM fuel control system failure (PPEI \$1ED)	Not occurred		

Component/ System		Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					11. The Barometric pressure (PPEI \$4C1) signal	Valid (for absolute fuel pressure sensor)		
					12. Engine run time	>= 30 seconds		
					13. Emissions fuel level (PPEI \$3FB)	Not low		
					14. Fuel pump control	Enabled	-	
					15. Fuel pump control state	Normal	1	
					16. Battery Voltage	11V<=voltage=<32V	1	
					17. Fuel flow rate ( See Supporting Tables tab )	> 0.047 g/s AND <= Max allowed fuel flow rate as a function of desired rail pressure & Vbatt (Typical values in the range of 11 to 50 g/s)		
					18. Fuel Pressure Control System	Is not responding to an over- pressurization due to pressure build during DFCO or a decreasing desired		
Control Module Communication Bus "A" Off		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	Power mode	Run/Crank	5 failures out of 5 samples ( 5 seconds)	DTC Type B 2 trips
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	Run/Crank	12 failures out of 12 samples (12 seconds)	DTC Type B 2 trips
					2. Ignition Run/Crank Voltage	11V <voltage<32v< td=""><td></td><td></td></voltage<32v<>		
	110001				3. U0073	not active		DTO
Lost Communication With "Actuator"	U0284	Detects loss of communication condition has occurred between ECU and device Active Grill Air Shutter "A" actuator	PWM Message	Undetected	1. Power mode	Run/Crank	Frequency: 100ms 150 failures out of 167 samples	DTC Type B 2 trips
					2. Ignition Run/Crank Voltage	11V < voltage < 32V		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions		MIL Illum.
Fuel Rail Pressure (FRP) Sensor Performance (rationality)		fuel pressure sensor response stuck within	Absolute value of fuel pressure change as sensed during intrusive test.	<= 30 kPa			· ·	DTC Type A 1 trip
							Intrusive test requested if fuel system is clamped for >= 5 seconds or fuel pressure error variance <= typically (0.3 to 0.6) (calculated over a	
					FRP Circuit Low DTC     (P018C)     FRP Circuit High DTC	Not active	2.5sec period); otherwise report pass	
					(P018D) 3. FuelPump Circuit Low DTC (P0231)	Not active	Duration of intrusive test is fueling related (5 to	
					4. FuelPump Circuit High DTC (P0232)	Not active Not active	12 seconds).	
					5. FuelPump Circuit Open DTC (P023F)	Not active	Intrusive test is run when fuel flow is below Max allowed fuel flow rate (Typical values in the range of 11 to 50 g/s)	
					6. Reference Voltage DTC (P0641)	Not active		
					7. Fuel Pump Control Module Driver Over-temperature DTC (P064A)	Not active		
					8. Control Module Internal Performance DTC (P0606)	Not active		
					9. Engine run time	>=5 seconds		
				10. Emissions fuel level (PPEI \$3FB)	Not low			
					11. Fuel pump control	Enabled		
				12. Fuel pump control state	Normal or FRP rationality control			

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					13. Engine fuel flow	> 0.047 g/s		
					14. ECM fuel control system failure (PPEI \$1ED)	Not failed		
Fuel Rail Pressure (FRP) Sensor Circuit Low Voltage	P018C	This DTC detects if the fuel pressure sensor circuit is	FRP sensor voltage	< 0.14 V			72 failures out of 80 samples	DTC Type A 1 trip
		shorted low			Ignition	Run or Crank	1 sample/12.5 ms	
Fuel Rail Pressure (FRP) Sensor Circuit High Voltage		This DTC detects if the fuel pressure sensor circuit is	FRP sensor voltage	> 4.86 V			72 failures out of 80 samples	DTC Type A 1 trip
Ollouit Flight Voltage		shorted high					1 sample/12.5 ms	i uip
					Ignition	Run or Crank		
Fuel Pump Control Circuit Low Voltage	P0231	This DTC detects if the fuel pump control circuit is shorted to	Fuel Pump Current	> 14.48A			72 test failures in 80 test samples if Fuel Pump Current <100A	DTC Type A 1 trip
		low			Ignition OR	Run or Crank		
					HS Comm OR	enabled	1 sample/12.5 ms	
					Fuel Pump Control AND	enabled		
					Ignition Run/Crank Voltage	9V < voltage < 32V		
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	0% duty cycle (off)	36 test failures in 40 test samples; 1 sample/12.5ms	DTC Type A 1 trip
					Fuel pump control enable	False	Pass/Fail determination made only once per trip	
					Time that above conditions are met	>=4.0 seconds		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Fuel Pump Control Circuit (Open)	P023F	This DTC detects if the fuel pump control circuit is open	Fuel Pump Current	<=0.5A			72 test failures in 80 test samples; 1 sample/12.5ms	DTC Type A 1 trip
			AND		Ignition OR	Run or Crank		
			Fuel Pump Duty Cycle	>20%	HS Comm OR	enabled		
				ļ	Fuel Pump Control	enabled		
					Ignition Run/Crank Voltage	9V < voltage < 32V		
Fuel System Control Module Enable Control Circuit	P025A	there is a fault in the fuel pump control	PPEI (PPEI (Powertrain Platform Electrical Interface) Fuel System Request (\$1ED)	≠ Fuel Pump Control Module Enable Control Circuit	Ignition AND	Run or Crank	72 failures out of 80 samples 1 sample/12.5 ms	DTC Type A 1 trip
					PPEI Fuel System Request (\$1ED)	valid		
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			1 failure if it occurs during the first ROM test of the ignition cycle, otherwise 5 failures	DTC Type A 1 trip
				calibration)	Ignition OR	Run or Crank	Frequency: Runs continuously in the background	
					HS Comm OR Fuel Pump Control	enabled enabled		
Control Module Not P0602 Programmed	P0602	FSCM needs to be	This DTC is set via calibration, when		Tuer Fullip Control	енамец	Runs once at power up	DTC Type A
			= TRUE	Ignition OR	Run or Crank		1 trip	
					HS Comm OR	enabled		
				Fuel Pump Control	enabled			

Component/ System		Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions		MIL Illum.
Control Module Long Term Memory Reset	P0603	Non-volatile memory checksum error at controller power-up	Checksum at power-up	≠ checksum at power-down			1 failure  Frequency: Once at power-up	DTC Type A 1 trip
					Ignition OR	Run or Crank	Температура	
					HS Comm OR	enabled		
					Fuel Pump Control	enabled		
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			1 failure if it occurs during the first RAM test of the ignition cycle, otherwise 5 failures	DTC Type A 1 trip
					Ignition OR	Run or Crank	Frequency:	
					HS Comm	enabled	Runs continuously in the background.	
					OR Fuel Pump Control	enabled		
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 discriminates the source of the fault )	For all I/O configuration register faults:				Tests 1 and 2 1 failure Frequency: Continuously (12.5ms)	DTC Type A 1 trip
			•Register contents	Incorrect value.	Ignition OR	Run or Crank		
					HS Comm OR	enabled		
					Fuel Pump Control	enabled		
			<u> </u>	0x5A5A	For all I/O configuration register faults:     *KeMEMD_b_ProcFltCfgRegEn		Test 3 3 failures out of 15 samples	
Processor clock test			OR		bl		1 sample/12.5 ms	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			RAM latch flag.	0x5A	2. For Processor Clock Fault: •KeMEMD_b_ProcFltCLKDiag Enbl	TRUE		
External     watchdog test			Software control of fuel pump driver	Control Lost	3. For External Watchdog Fault: •KeFRPD_b_FPExtWDogDiag Enbl			
					3. For External Watchdog Fault: •Control Module ROM(P0601)	TRUE		
					3. For External Watchdog Fault:	not active		
					•Control Module RAM(P0604)	not active		
Control Module Long Term Memory (EEPROM)	P062F	Indicates that the NVM Error flag has not been cleared	Last EEPROM write	Did not complete			1 test failure Once on controller power-up	DTC Type A 1 trip
Performance					Ignition OR	Run or Crank		
					HS Comm OR	enabled		
					Fuel Pump Control	enabled		
5Volt Reference Circuit (Short High/Low/Out of	P0641	Detects continuous short or out of range on the #1 5V sensor			Ignition	Run or Crank	15 failures out of 20 samples	DTC Type A
Range)		reference circuit	Reference voltage AND	>= 0.5V			1 sample/12.5 ms	1 trip
			Output OR	inactive				
		Reference voltage AND	>= 5.5V					
			Output OR	active				
			Reference voltage AND	<= 4.5V				
l	I		Output	active	I	I		

Component/ System			Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			OR Reference voltage	> 105% nominal (i.e., 5.25V) OR <95% nominal (i.e., 4.75V)	-			
Fuel Pump Control Module - Driver Over-temperature 1	P064A	This DTC detects if an internal fuel pump driver overtemperature condition exists under normal operating conditions	Pump Driver Temp	> 150C	Ignition OR HS Comm OR Fuel Pump Control KeFRPD_b_FPOverTempDiag Enbl	Run or Crank Enabled Enabled TRUE	3 failures out of 15 samples 1 sample/12.5 ms	DTC Type B 2 trips
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	Ignition Run/Crank Engine	9V <voltage<32v Running</voltage<32v 	180 failures out of 200 samples 1 sample/25.0 ms	DTC Type A 1 trip

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Fuel Pump Flow Performance (rationality)	erformance degradation in the pressure en	performance of the SIDI electronically	Filtered fuel rail pressure error	(tabulated function of desired fuel rail pressure and fuel flow rate 15% of requested Target Pressure )  OR  >= High Threshold (tabulated function of desired fuel rail pressure and fuel flow rate 15% of	1. FRP Circuit Low DTC (P018C)	Not active	Filtered fuel rail pressure error Time Constant = 12.5 seconds  Frequency: Continuous 12.5 ms loop	DTC Type B 2 trips
			requested Target Pressure)  ( See Supporting Tables tab )					
				rusies as y				
					2. FRP Circuit High DTC	Not active		
					(P018D)  3. Fuel Rail Pressure Sensor	Not active		
					Performance DTC (P018B)  4. FuelPump Circuit Low DTC	Not active		
					(P0231)			
					5. FuelPump Circuit High DTC (P0232)	Not active		
					6. FuelPump Circuit Open DTC (P023F)	Not active		

Component/ System	Fault Code	0,	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					7. Reference Voltage DTC (P0641)	Not active		
					8. Fuel Pump Control Module Driver Over-temperature DTC's (P064A)	Not active		
					9. Control Module Internal Performance DTC (P0606)	Not active		
					10. An ECM fuel control system failure (PPEI \$1ED)	Not occurred		
					11. The Barometric pressure (PPEI \$4C1) signal	Valid (for absolute fuel pressure sensor)		
					12. Engine run time	>= 30 seconds		
					13. Emissions fuel level (PPEI \$3FB)	Not low		
					14. Fuel pump control	Enabled		
					15. Fuel pump control state	Normal		
					16. Battery Voltage	11V<=voltage=<32V		
					17. Fuel flow rate ( See Supporting Tables tab )	> 0.047 g/s AND <= Max allowed fuel flow rate as a function of desired rail pressure & Vbatt (Typical values in the range of 11 to 50 g/s)		
					18. 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	Power mode	Run/Crank	5 failures out of 5 samples ( 5 seconds)	DTC Type B 2 trips

Component/ System	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Lost Communication With ECM/PCM "A"	Detects that CAN serial data communication has been lost with the ECM	Message \$0C9	Undetected	1. Power mode		12 failures out of 12 samples (12 seconds)	DTC Type B 2 trips
					11V <voltage<32v active<="" not="" td=""><td></td><td></td></voltage<32v>		

	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Fuel Rail Pressure (FRP) Sensor Performance (rationality)	P018B	pressure sensor response stuck within the	Absolute value of fuel pressure change as sensed during intrusive test.	<= 30 kPa			Frequency: Continuous; 12.5 ms loop. 60 seconds between intrusive tests that pass	DTC Type A 1 trip
				1. FRP Circuit Low DTC		Intrusive test requested if fuel system is clamped for >= 5 seconds or fuel pressure error variance <= typically (0.3 to 0.6) (calculated over a 2.5sec period);		
					(P018C) 2. FRP Circuit High DTC (P018D)	Not active  Not active	otherwise report pass	
					<ul><li>3. FuelPump Circuit Low DTC (P0231)</li><li>4. FuelPump Circuit High DTC (P0232)</li></ul>	Not active Not active	Duration of intrusive test is fueling related (5 to 12 seconds).	
					· · ·	Not active	Intrusive test is run when fuel flow is below Max allowed fuel flow rate (Typical values in the range of 11 to 50 g/s)	
					6. Reference Voltage DTC (P0641)	Not active	,	
					7. Fuel Pump Control Module Driver Over- temperature DTC (P064A)	Not active		
					8. Control Module Internal Performance DTC (P0606)			
					9. Engine run time	>=5 seconds		
					10. Emissions fuel level (PPEI \$3FB)	Not low		
					11. Fuel pump control	Enabled		

-	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					12. Fuel pump control	Normal or FRP		
					state	rationality control		
					13. Engine fuel flow	> 0.047 g/s		
					14. ECM fuel control system failure (PPEI \$1ED)	Not failed		
	P018C		FRP sensor voltage	< 0.14 V			72 failures out of 80	DTC
(FRP) Sensor Circuit Low Voltage		fuel pressure sensor circuit is shorted low					samples	Type A 1 trip
Circuit Low Voltage		circuit is shorted low			Ignition	Run or Crank	1 sample/12.5 ms	T tilp
Fuel Rail Pressure	P018D	This DTC detects if the	FRP sensor voltage	> 4.86 V			72 failures out of 80	DTC
(FRP) Sensor		fuel pressure sensor					samples	Type A
Circuit High Voltage		circuit is shorted high					1 sample/12.5 ms	1 trip
							1 Sample/12.5 ms	
					Ignition	Run or Crank		
Fuel Dump Central	P0231	This DTC detects if the	Fuel Pump Current	> 14.48A			72 test failures in 80	DTC
Fuel Pump Control Circuit Low Voltage	P0231	fuel pump control circuit	ruei Pump Current	7 14.40A			test samples if Fuel	Type A
onoun zon vonago		is shorted to low			Ignition OR	Run or Crank	Pump Current <100A	1 trip
					HS Comm	enabled		
					OR		1 sample/12.5 ms	
					Fuel Pump Control	enabled		
					AND			
					Ignition Run/Crank Voltage	9V < voltage < 32V		
Fuel Pump Control	P0232	This DTC detects if the	Voltage measured at fuel	> 3.86 V	Commanded fuel pump	-	36 test failures in 40	DTC
Circuit High Voltage		fuel pump control circuit	pump circuit		output		test samples;	Type A
		is shorted to high					1 sample/12.5ms	1 trip
					Fuel pump control enable	False	Pass/Fail	
							determination made	
		I	I		I	1	only once per trip	I

-	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					Time that above conditions are met	>=4.0 seconds		
Fuel Pump Control Circuit (Open)	P023F	This DTC detects if the fuel pump control circuit is open	Fuel Pump Current	<=0.5A			72 test failures in 80 test samples; 1 sample/12.5ms	DTC Type A 1 trip
			AND		Ignition OR	Run or Crank		
			Fuel Pump Duty Cycle	>20%	HS Comm OR	enabled		
					Fuel Pump Control AND	enabled		
					Ignition Run/Crank Voltage	9V < voltage < 32V		
Control Module Enable Control	P025A	This DTC detects if there is a fault in the fuel pump control enable circuit	PPEI (PPEI (Powertrain Platform Electrical Interface) Fuel System	≠ Fuel Pump Control Module Enable Control			72 failures out of 80 samples	DTC Type A 1 trip
Circuit			Request (\$1ED)	Circuit	Ignition AND	Run or Crank	1 sample/12.5 ms	
					PPEI Fuel System Request (\$1ED)	valid		
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			1 failure if it occurs during the first ROM test of the ignition cycle, otherwise 5 failures	DTC Type A 1 trip
				calibration)	Ignition OR	Run or Crank	Frequency: Runs continuously in	
					HS Comm	enabled	the background	
					OR Fuel Pump Control	enabled		
Control Module Not	P0602	Indicates that the FSCM	This DTC is set via		T don't unip control	Спаріса	Runs once at power up	DTC
Programmed		needs to be programmed	calibration, when KeMEMD_b_NoStartCal		Ignition OR	Run or Crank		Type A 1 trip
						enabled		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					OR Fuel Pump Control	enabled		
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	Trailure Frequency: Once at power-up	DTC Type A 1 trip
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 1 trip
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 discriminates the source of the fault )	For all I/O configuration register faults:      Register contents	Incorrect value.	Ignition OR HS Comm OR Fuel Pump Control	Run or Crank enabled enabled	Tests 1 and 2 1 failure Frequency: Continuously (12.5ms)	DTC Type A 1 trip

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
2. Processor clock			2. For Processor Clock Fault: •EE latch flag in EEPROM. OR	0x5A5A	For all I/O configuration register faults:     KeMEMD_b_ProcFltCfgR egEnbl	TRUE	Test 3 3 failures out of 15 samples	
test			RAM latch flag.	0x5A	2. For Processor Clock Fault: •KeMEMD_b_ProcFltCLK DiagEnbl	TRUE	1 sample/12.5 ms	
3. External watchdog test			For External Watchdog Fault:     Software control of fuel pump driver	Control Lost	3. For External Watchdog Fault: •KeFRPD_b_FPExtWDog DiagEnbl  3. For External Watchdog Fault: •Control Module	TRUE		
					ROM(P0601) 3. For External Watchdog Fault: •Control Module RAM(P0604)	not active		
Control Module Long Term Memory (EEPROM) Performance		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 1 trip
5Volt Reference Circuit (Short High/Low/Out of Range)	P0641	Detects continuous short or out of range on the #1 5V sensor reference circuit	Reference voltage AND Output OR Reference voltage AND Output	>= 0.5V inactive >= 5.5V active	Ignition	Run or Crank	15 failures out of 20 samples 1 sample/12.5 ms	DTC Type A 1 trip

	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			OR Reference voltage AND Output	<= 4.5V				
			OR Reference voltage	> 105% nominal (i.e., 5.25V) OR <95% nominal (i.e., 4.75V)				_
Fuel Pump Control Module - Driver Over-temperature 1	P064A	This DTC detects if an internal fuel pump driver overtemperature condition exists under normal operating conditions (Tier 1 supplier Continental responsibility)	Module Range of Operation	1. Module is within Acceptable Operation Range (Motorola's responsibility - FSCM is in normal operating range for module voltage versus PWM duty cycle. Linear range from 100% @ 12.5V to 70% @ 18V.)			3 failures out of 15 samples 1 sample/12.5 ms	DTC Type B 2 trips
			AND		Ignition OR HS Comm	Run or Crank enabled		
			Fuel pump driver Temp	> 190C	OR Fuel Pump Control KeFRPD_b_FPOverTemp DiagEnbl Ignition Run/Crank	enabled TRUE 9V <voltage<32v< td=""><td></td><td></td></voltage<32v<>		

•	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	·	Enable Conditions	Time Required	MIL Illum.
	P1255		Module Range of Operation	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.)		Run or Crank	3 failures out of 15 samples 1 sample/12.5 ms	DTC Type B 2 trips
			AND		OR	enabled		
			Fuel pump driver Temp	> 190C	KeFRPD_b_FPOverTemp DiagEnbl	enabled TRUE 9V <voltage<32v< td=""><td></td><td></td></voltage<32v<>		
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		Running	samples  1 sample/25.0 ms	DTC Type A 1 trip

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Fuel Pump Flow Performance (rationality)	P2635	This DTC detects degradation in the performance of the SIDI electronically regulated fuel system	Filtered fuel rail pressure error	<= Low Threshold (tabulated function of desired fuel rail pressure and fuel flow rate 15% of requested Target Pressure )  OR >= High Threshold (tabulated function of desired fuel rail pressure and fuel flow rate 15% of requested Target Pressure)  ( See Supporting Tables tab )	1. FRP Circuit Low DTC (P018C)	Not active	Filtered fuel rail pressure error Time Constant = 12.5 seconds  Frequency: Continuous 12.5 ms loop	DTC Type B 2 trips
					2. FRP Circuit High DTC (P018D)	Not active		
					3. Fuel Rail Pressure Sensor Performance DTC (P018B)	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		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL IIIum.
					7. Reference Voltage DTC (P0641)			
					8. Fuel Pump Control Module Driver Over- temperature DTC's (P064A)	Not active		
					9. Control Module Internal Performance DTC (P0606)	Not active		
					10. An ECM fuel control system failure (PPEI \$1ED)	Not occurred	-	
					11. The Barometric pressure (PPEI \$4C1) signal	Valid (for absolute fuel pressure sensor)		
					12. Engine run time	>= 30 seconds		
					13. Emissions fuel level (PPEI \$3FB)	Not low		
					14. Fuel pump control	Enabled		
					15. Fuel pump control state	Normal		
					16. Battery Voltage	11V<=voltage=<32V		
					17. Fuel flow rate ( See Supporting Tables tab )  18. Fuel Pressure Control System	> 0.047 g/s AND <= Max allowed fuel flow rate as a function of desired rail pressure & Vbatt (Typical values in the range of 11 to 50 g/s) Is not responding to an over-pressurization due		
					Cystom	to pressure build during DFCO or a decreasing desired pressure command.		

•	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	Power mode	Run/Crank	5 failures out of 5 samples ( 5 seconds)	DTC Type B 2 trips
Lost Communication With ECM/PCM "A"	U0100	Detects that CAN serial data communication has been lost with the ECM	Message \$0C9	Undetected	Power mode     Ignition Run/Crank     Voltage     U0073	Run/Crank  11V <voltage<32v active<="" not="" td=""><td>12 failures out of 12 samples (12 seconds)</td><td>DTC Type B 2 trips</td></voltage<32v>	12 failures out of 12 samples (12 seconds)	DTC Type B 2 trips

### P2635 Fuel Pump Performance Maximum Fuel Flow map ( grams / s )

### X-axis= Desired Fuel Pressure (kiloPascals)

### Y-axis= Battery voltage (volts)

_		<del>5 · (                                  </del>							
	200	250	300	350	400	450	500	550	600
4.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5
6	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5
7.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5
9	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5
10.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5
12	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5
13.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5
15	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5
16.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5
18	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5
19.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5
21	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5
22.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5
24	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5
25.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5
27	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5
28.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5

### P2635 Fuel Pump Performance Filtered Pressure Error Fault Threshold High map (kiloPascals)

X-axis= Target Fuel Pressure (kiloPascals)

	200	250	300	350	400	450	500	550	600
0	30	37.5	45	52.5	60	67.5	75	82.5	90
1.5	30	37.5	45	52.5	60	67.5	75	82.5	90
3	30	37.5	45	52.5	60	67.5	75	82.5	90
4.5	30	37.5	45	52.5	60	67.5	75	82.5	90
6	30	37.5	45	52.5	60	67.5	75	82.5	90
7.5	30	37.5	45	52.5	60	67.5	75	82.5	90
9	30	37.5	45	52.5	60	67.5	75	82.5	90
10.5	30	37.5	45	52.5	60	67.5	75	82.5	90
12	30	37.5	45	52.5	60	67.5	75	82.5	90
13.5	30	37.5	45	52.5	60	67.5	75	82.5	90
15	30	37.5	45	52.5	60	67.5	75	82.5	90
16.5	30	37.5	45	52.5	60	67.5	75	82.5	90
18	30	37.5	45	52.5	60	67.5	75	82.5	90
19.5	30	37.5	45	52.5	60	67.5	75	82.5	90
21	30	37.5	45	52.5	60	67.5	75	82.5	90
22.5	30	37.5	45	52.5	60	67.5	75	82.5	90
24	30	37.5	45	52.5	60	67.5	75	82.5	90
25.5	30	37.5	45	52.5	60	67.5	75	82.5	90
27	30	37.5	45	52.5	60	67.5	75	82.5	90
28.5	30	37.5	45	52.5	60	67.5	75	82.5	90
30	30	37.5	45	52.5	60	67.5	75	82.5	90
31.5	30	37.5	45	52.5	60	67.5	75	82.5	90
33	30	37.5	45	52.5	60	67.5	75	82.5	90
34.5	30	37.5	45	52.5	60	67.5	75	82.5	90
36	30	37.5	45	52.5	60	67.5	75	82.5	90
37.5	30	37.5	45	52.5	60	67.5	75	82.5	90
39	30	37.5	45	52.5	60	67.5	75	82.5	90
40.5	30	37.5	45	52.5	60	67.5	75	82.5	90
42	30	37.5	45	52.5	60	67.5	75	82.5	90
43.5	30	37.5	45	52.5	60	67.5	75	82.5	90
45	30	37.5	45	52.5	60	67.5	75	82.5	90
46.5	30	37.5	45	52.5	60	67.5	75	82.5	90
48	30	37.5	45	52.5	60	67.5	75	82.5	90

### P2635 Fuel Pump Performance Filtered Pressure Error Fault RePass Threshold High map (kiloPascals)

### X-axis= Target Fuel Pressure (kiloPascals)

0         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           1.5         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           3         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           4.5         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           6         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           7.5         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           10.5         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           10.5         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           12         25.5         31.875	· axio · a	ei i iow ( g								
1.5         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           3         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           4.5         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           7.5         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           7.5         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           9         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           10.5         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           12         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           15         25.5         31.875		200	250	300	350	400	450	500	550	600
3         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           4.5         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           6         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           7.5         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           9         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           10.5         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           10.5         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           12         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           15         25.5         31.875	0	25.5	31.875	38.25	44.625	51	57.375	63.75	70.125	76.5
4.5         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           6         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           7.5         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           9         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           10.5         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           12         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           13.5         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           15         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           16.5         25.5         31.875	1.5	25.5	31.875	38.25	44.625	51	57.375	63.75	70.125	76.5
6         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           7.5         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           9         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           10.5         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           12         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           13.5         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           15         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           16.5         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           18.2         25.5         31.875		25.5	31.875	38.25	44.625	51	57.375	63.75	70.125	76.5
7.5         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           9         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           10.5         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           12         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           13.5         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           15         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           16.5         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           18         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           21         25.5         31.875	4.5	25.5	31.875	38.25	44.625	51	57.375	63.75	70.125	76.5
9         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           10.5         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           12         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           13.5         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           15         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           16.5         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           18         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           19.5         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           21         25.5         31.875	6	25.5	31.875	38.25	44.625	51	57.375	63.75	70.125	76.5
10.5         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           12         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           13.5         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           15         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           16.5         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           18         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           19.5         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           21         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           24         25.5         31.875	7.5	25.5	31.875	38.25	44.625	51	57.375	63.75	70.125	76.5
12         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           13.5         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           15         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           16.5         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           18         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           19.5         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           21         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           21         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           22.5         53         31.875	9	25.5	31.875	38.25	44.625	51	57.375	63.75	70.125	76.5
13.5         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           15         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           16.5         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           18         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           19.5         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           21         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           22.5         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           22.5         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           25.5         31.875         38.25 </td <td>10.5</td> <td>25.5</td> <td>31.875</td> <td>38.25</td> <td>44.625</td> <td>51</td> <td>57.375</td> <td>63.75</td> <td>70.125</td> <td>76.5</td>	10.5	25.5	31.875	38.25	44.625	51	57.375	63.75	70.125	76.5
15         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           16.5         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           18         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           19.5         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           21         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           22.5         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           24         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           24         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           25.5         31.875         38.25	12	25.5	31.875	38.25	44.625	51	57.375	63.75	70.125	76.5
16.5         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           18         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           19.5         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           21         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           22.5         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           22.5         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           24         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           25.5         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           27         25.5         31.875	13.5	25.5	31.875	38.25	44.625	51	57.375	63.75	70.125	76.5
18         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           19.5         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           21         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           22.5         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           24         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           25.5         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           25.5         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           28.5         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           30         25.5         31.875	15		31.875	38.25	44.625	51	57.375	63.75	70.125	76.5
19.5         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           21         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           22.5         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           24         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           25.5         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           25.5         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           27         25.5         31.876         38.25         44.625         51         57.375         63.75         70.125         76.5           30         25.5         31.876         38.25         44.625         51         57.375         63.75         70.125         76.5           31.5         25.5         31.876	16.5	25.5	31.875	38.25	44.625	51	57.375	63.75	70.125	76.5
21         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           22.5         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           24         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           25.5         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           27         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           28.5         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           30         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           31.5         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           31.5         25.5         31.875	18	25.5	31.875	38.25	44.625	51	57.375	63.75	70.125	76.5
22.5         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           24         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           25.5         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           27         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           28.5         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           30         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           31.5         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           31.5         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           32.5         31.875         38.25 </td <td>19.5</td> <td>25.5</td> <td>31.875</td> <td>38.25</td> <td>44.625</td> <td>51</td> <td>57.375</td> <td>63.75</td> <td>70.125</td> <td>76.5</td>	19.5	25.5	31.875	38.25	44.625	51	57.375	63.75	70.125	76.5
24         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           25.5         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           27         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           28.5         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           30         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           31.5         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           33         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           34.5         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           34.5         25.5         31.875	21	25.5	31.875	38.25	44.625	51	57.375	63.75	70.125	76.5
25.5         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           27         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           28.5         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           30         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           31.5         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           33         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           34.5         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           34.5         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           36         25.5         31.875	22.5	25.5	31.875	38.25	44.625	51	57.375	63.75	70.125	76.5
27       25.5       31.875       38.25       44.625       51       57.375       63.75       70.125       76.5         28.5       25.5       31.875       38.25       44.625       51       57.375       63.75       70.125       76.5         30       25.5       31.875       38.25       44.625       51       57.375       63.75       70.125       76.5         31.5       25.5       31.875       38.25       44.625       51       57.375       63.75       70.125       76.5         33       25.5       31.875       38.25       44.625       51       57.375       63.75       70.125       76.5         34.5       25.5       31.875       38.25       44.625       51       57.375       63.75       70.125       76.5         34.5       25.5       31.875       38.25       44.625       51       57.375       63.75       70.125       76.5         37.5       25.5       31.875       38.25       44.625       51       57.375       63.75       70.125       76.5         37.5       25.5       31.875       38.25       44.625       51       57.375       63.75       70.125       76.5 <td>24</td> <td>25.5</td> <td>31.875</td> <td>38.25</td> <td>44.625</td> <td>51</td> <td>57.375</td> <td>63.75</td> <td>70.125</td> <td>76.5</td>	24	25.5	31.875	38.25	44.625	51	57.375	63.75	70.125	76.5
28.5         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           30         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           31.5         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           33         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           34.5         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           36         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           37.5         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           39         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           40.5         25.5         31.875	25.5	25.5	31.875	38.25	44.625	51	57.375	63.75	70.125	76.5
30     25.5     31.875     38.25     44.625     51     57.375     63.75     70.125     76.5       31.5     25.5     31.875     38.25     44.625     51     57.375     63.75     70.125     76.5       33     25.5     31.875     38.25     44.625     51     57.375     63.75     70.125     76.5       34.5     25.5     31.875     38.25     44.625     51     57.375     63.75     70.125     76.5       36     25.5     31.875     38.25     44.625     51     57.375     63.75     70.125     76.5       37.5     25.5     31.875     38.25     44.625     51     57.375     63.75     70.125     76.5       39     25.5     31.875     38.25     44.625     51     57.375     63.75     70.125     76.5       40.5     25.5     31.875     38.25     44.625     51     57.375     63.75     70.125     76.5       42     25.5     31.875     38.25     44.625     51     57.375     63.75     70.125     76.5       43.5     25.5     31.875     38.25     44.625     51     57.375     63.75     70.125     76.5       45	27	25.5	31.875	38.25	44.625	51	57.375	63.75	70.125	76.5
31.5         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           33         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           34.5         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           36         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           37.5         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           39         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           40.5         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           42         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           43.5         25.5         31.875	28.5	25.5		38.25		51	57.375	63.75	70.125	76.5
33     25.5     31.875     38.25     44.625     51     57.375     63.75     70.125     76.5       34.5     25.5     31.875     38.25     44.625     51     57.375     63.75     70.125     76.5       36     25.5     31.875     38.25     44.625     51     57.375     63.75     70.125     76.5       37.5     25.5     31.875     38.25     44.625     51     57.375     63.75     70.125     76.5       39     25.5     31.875     38.25     44.625     51     57.375     63.75     70.125     76.5       40.5     25.5     31.875     38.25     44.625     51     57.375     63.75     70.125     76.5       42     25.5     31.875     38.25     44.625     51     57.375     63.75     70.125     76.5       43.5     25.5     31.875     38.25     44.625     51     57.375     63.75     70.125     76.5       45     25.5     31.875     38.25     44.625     51     57.375     63.75     70.125     76.5       45     25.5     31.875     38.25     44.625     51     57.375     63.75     70.125     76.5       46.5	30	25.5		38.25	44.625	51	57.375	63.75	70.125	76.5
34.5         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           36         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           37.5         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           39         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           40.5         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           42         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           43.5         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           45         25.5         31.875         38.25         44.625         51         57.375         63.75         70.125         76.5           45         25.5         31.875	31.5	25.5	31.875	38.25	44.625		57.375	63.75	70.125	76.5
36     25.5     31.875     38.25     44.625     51     57.375     63.75     70.125     76.5       37.5     25.5     31.875     38.25     44.625     51     57.375     63.75     70.125     76.5       39     25.5     31.875     38.25     44.625     51     57.375     63.75     70.125     76.5       40.5     25.5     31.875     38.25     44.625     51     57.375     63.75     70.125     76.5       42     25.5     31.875     38.25     44.625     51     57.375     63.75     70.125     76.5       43.5     25.5     31.875     38.25     44.625     51     57.375     63.75     70.125     76.5       45     25.5     31.875     38.25     44.625     51     57.375     63.75     70.125     76.5       46.5     25.5     31.875     38.25     44.625     51     57.375     63.75     70.125     76.5       46.5     25.5     31.875     38.25     44.625     51     57.375     63.75     70.125     76.5	33	25.5	31.875	38.25	44.625	51	57.375	63.75	70.125	76.5
37.5     25.5     31.875     38.25     44.625     51     57.375     63.75     70.125     76.5       39     25.5     31.875     38.25     44.625     51     57.375     63.75     70.125     76.5       40.5     25.5     31.875     38.25     44.625     51     57.375     63.75     70.125     76.5       42     25.5     31.875     38.25     44.625     51     57.375     63.75     70.125     76.5       43.5     25.5     31.875     38.25     44.625     51     57.375     63.75     70.125     76.5       45     25.5     31.875     38.25     44.625     51     57.375     63.75     70.125     76.5       46.5     25.5     31.875     38.25     44.625     51     57.375     63.75     70.125     76.5       46.5     25.5     31.875     38.25     44.625     51     57.375     63.75     70.125     76.5	34.5	25.5		38.25	44.625	51	57.375	63.75		76.5
39     25.5     31.875     38.25     44.625     51     57.375     63.75     70.125     76.5       40.5     25.5     31.875     38.25     44.625     51     57.375     63.75     70.125     76.5       42     25.5     31.875     38.25     44.625     51     57.375     63.75     70.125     76.5       43.5     25.5     31.875     38.25     44.625     51     57.375     63.75     70.125     76.5       45     25.5     31.875     38.25     44.625     51     57.375     63.75     70.125     76.5       46.5     25.5     31.875     38.25     44.625     51     57.375     63.75     70.125     76.5       46.5     25.5     31.875     38.25     44.625     51     57.375     63.75     70.125     76.5					44.625					76.5
40.5       25.5       31.875       38.25       44.625       51       57.375       63.75       70.125       76.5         42       25.5       31.875       38.25       44.625       51       57.375       63.75       70.125       76.5         43.5       25.5       31.875       38.25       44.625       51       57.375       63.75       70.125       76.5         45       25.5       31.875       38.25       44.625       51       57.375       63.75       70.125       76.5         46.5       25.5       31.875       38.25       44.625       51       57.375       63.75       70.125       76.5         46.5       25.5       31.875       38.25       44.625       51       57.375       63.75       70.125       76.5		25.5	31.875	38.25	44.625	51	57.375	63.75	70.125	76.5
42     25.5     31.875     38.25     44.625     51     57.375     63.75     70.125     76.5       43.5     25.5     31.875     38.25     44.625     51     57.375     63.75     70.125     76.5       45     25.5     31.875     38.25     44.625     51     57.375     63.75     70.125     76.5       46.5     25.5     31.875     38.25     44.625     51     57.375     63.75     70.125     76.5       46.5     25.5     31.875     38.25     44.625     51     57.375     63.75     70.125     76.5	39	25.5	31.875	38.25		51	57.375	63.75	70.125	76.5
43.5     25.5     31.875     38.25     44.625     51     57.375     63.75     70.125     76.5       45     25.5     31.875     38.25     44.625     51     57.375     63.75     70.125     76.5       46.5     25.5     31.875     38.25     44.625     51     57.375     63.75     70.125     76.5       46.5     25.5     31.875     38.25     44.625     51     57.375     63.75     70.125     76.5	40.5	25.5	31.875	38.25	44.625	51	57.375	63.75	70.125	76.5
45     25.5     31.875     38.25     44.625     51     57.375     63.75     70.125     76.5       46.5     25.5     31.875     38.25     44.625     51     57.375     63.75     70.125     76.5       57.375     63.75     70.125     76.5	42	25.5	31.875	38.25	44.625		57.375	63.75	70.125	76.5
46.5 25.5 31.875 38.25 44.625 51 57.375 63.75 70.125 76.5	43.5	25.5	31.875	38.25	44.625	51	57.375	63.75	70.125	76.5
	45	25.5	31.875	38.25	44.625	51	57.375	63.75	70.125	76.5
48 25.5 31.875 38.25 44.625 51 57.375 63.75 70.125 76.5			31.875	38.25	44.625		57.375	63.75	70.125	76.5
	48	25.5	31.875	38.25	44.625	51	57.375	63.75	70.125	76.5

### P2635 Fuel Pump Performance Filtered Pressure Error Fault Threshold Low map (kiloPascals)

### X-axis= Target Fuel Pressure (kiloPascals)

	er i low ( g								
	200	250	300	350	400	450	500	550	600
0	-260	-210	-160	-110	-60	-67.5	-75	-82.5	-90
1.5	-145	-125	-102.5	-81.25	-60	-67.5	-75	-82.5	-90
3	-30	-37.5	-45	-52.5	-60	-67.5	-75	-82.5	-90
4.5	-30	-37.5	-45	-52.5	-60	-67.5	-75	-82.5	-90
6	-30	-37.5	-45	-52.5	-60	-67.5	-75	-82.5	-90
7.5	-30	-37.5	-45	-52.5	-60	-67.5	-75	-82.5	-90
9	-30	-37.5	-45	-52.5	-60	-67.5	-75	-82.5	-90
10.5	-30	-37.5	-45	-52.5	-60	-67.5	-75	-82.5	-90
12	-30	-37.5	-45	-52.5	-60	-67.5	-75	-82.5	-90
13.5	-30	-37.5	-45	-52.5	-60	-67.5	-75	-82.5	-90
15	-30	-37.5	-45	-52.5	-60	-67.5	-75	-82.5	-90
16.5	-30	-37.5	-45	-52.5	-60	-67.5	-75	-82.5	-90
18	-30	-37.5	-45	-52.5	-60	-67.5	-75	-82.5	-90
19.5	-30	-37.5	-45	-52.5	-60	-67.5	-75	-82.5	-90
21	-30	-37.5	-45	-52.5	-60	-67.5	-75	-82.5	-90
22.5	-30	-37.5	-45	-52.5	-60	-67.5	-75	-82.5	-90
24	-30	-37.5	-45	-52.5	-60	-67.5	-75	-82.5	-90
25.5	-30	-37.5	-45	-52.5	-60	-67.5	-75	-82.5	-90
27	-30	-37.5	-45	-52.5	-60	-67.5	-75	-82.5	-90
28.5	-30	-37.5	-45	-52.5	-60	-67.5	-75	-82.5	-90
30	-30	-37.5	-45	-52.5	-60	-67.5	-75	-82.5	-90
31.5	-30	-37.5	-45	-52.5	-60	-67.5	-75	-82.5	-90
33	-30	-37.5	-45	-52.5	-60	-67.5	-75	-82.5	-90
34.5	-30	-37.5	-45	-52.5	-60	-67.5	-75	-82.5	-90
36	-30	-37.5	-45	-52.5	-60	-67.5	-75	-82.5	-90
37.5	-30	-37.5	-45	-52.5	-60	-67.5	-75	-82.5	-90
39	-30	-37.5	-45	-52.5	-60	-67.5	-75	-82.5	-90
40.5	-30	-37.5	-45	-52.5	-60	-67.5	-75	-82.5	-90
42	-30	-37.5	-45	-52.5	-60	-67.5	-75	-82.5	-90
43.5	-30	-37.5	-45	-52.5	-60	-67.5	-75	-82.5	-90
45	-30	-37.5	-45	-52.5	-60	-67.5	-75	-82.5	-90
46.5	-30	-37.5	-45	-52.5	-60	-67.5	-75	-82.5	-90
48	-30	-37.5	-45	-52.5	-60	-67.5	-75	-82.5	-90

### P2635 Fuel Pump Performance Filtered Pressure Error Fault RePass Threshold Low map (kiloPascals)

### X-axis= Target Fuel Pressure (kiloPascals)

	, ,	u 7 0 7							
	200	250	300	350	400	450	500	550	600
0	-221	-178.5	-136	-93.5	-51	-57.375	-63.75	-70.125	-76.5
1.5	-123.25	-106.25	-87.125	-69.0625	-51	-57.375	-63.75	-70.125	-76.5
3	-25.5	-31.875	-38.25	-44.625	-51	-57.375	-63.75	-70.125	-76.5
4.5	-25.5	-31.875	-38.25	-44.625	-51	-57.375	-63.75	-70.125	-76.5
6	-25.5	-31.875	-38.25	-44.625	-51	-57.375	-63.75	-70.125	-76.5
7.5	-25.5	-31.875	-38.25	-44.625	-51	-57.375	-63.75	-70.125	-76.5
9	-25.5	-31.875	-38.25	-44.625	-51	-57.375	-63.75	-70.125	-76.5
10.5	-25.5	-31.875	-38.25	-44.625	-51	-57.375	-63.75	-70.125	-76.5
12	-25.5	-31.875	-38.25	-44.625	-51	-57.375	-63.75	-70.125	-76.5
13.5	-25.5	-31.875	-38.25	-44.625	-51	-57.375	-63.75	-70.125	-76.5
15	-25.5	-31.875	-38.25	-44.625	-51	-57.375	-63.75	-70.125	-76.5
16.5	-25.5	-31.875	-38.25	-44.625	-51	-57.375	-63.75	-70.125	-76.5
18	-25.5	-31.875	-38.25	-44.625	-51	-57.375	-63.75	-70.125	-76.5
19.5	-25.5	-31.875	-38.25	-44.625	-51	-57.375	-63.75	-70.125	-76.5
21	-25.5	-31.875	-38.25	-44.625	-51	-57.375	-63.75	-70.125	-76.5
22.5	-25.5	-31.875	-38.25	-44.625	-51	-57.375	-63.75	-70.125	-76.5
24	-25.5	-31.875	-38.25	-44.625	-51	-57.375	-63.75	-70.125	-76.5
25.5	-25.5	-31.875	-38.25	-44.625	-51	-57.375	-63.75	-70.125	-76.5
27	-25.5	-31.875	-38.25	-44.625	-51	-57.375	-63.75	-70.125	-76.5
28.5	-25.5	-31.875	-38.25	-44.625	-51	-57.375	-63.75	-70.125	-76.5
30	-25.5	-31.875	-38.25	-44.625	-51	-57.375	-63.75	-70.125	-76.5
31.5	-25.5	-31.875	-38.25	-44.625	-51	-57.375	-63.75	-70.125	-76.5
33	-25.5	-31.875	-38.25	-44.625	-51	-57.375	-63.75	-70.125	-76.5
34.5	-25.5	-31.875	-38.25	-44.625	-51	-57.375	-63.75	-70.125	-76.5
36	-25.5	-31.875	-38.25	-44.625	-51	-57.375	-63.75	-70.125	-76.5
37.5	-25.5	-31.875	-38.25	-44.625	-51	-57.375	-63.75	-70.125	-76.5
39	-25.5	-31.875	-38.25	-44.625	-51	-57.375	-63.75	-70.125	-76.5
40.5	-25.5	-31.875	-38.25	-44.625	-51	-57.375	-63.75	-70.125	-76.5
42	-25.5	-31.875	-38.25	-44.625	-51	-57.375	-63.75	-70.125	-76.5
43.5	-25.5	-31.875	-38.25	-44.625	-51	-57.375	-63.75	-70.125	-76.5
45	-25.5	-31.875	-38.25	-44.625	-51	-57.375	-63.75	-70.125	-76.5
46.5	-25.5	-31.875	-38.25	-44.625	-51	-57.375	-63.75	-70.125	-76.5
48	-25.5	-31.875	-38.25	-44.625	-51	-57.375	-63.75	-70.125	-76.5
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