Component/	Fault	Monitor Strategy	Malfunction	Threshold	Secondary	Enable	Time	MIL
System	Code	Description	Criteria	Value	Parameters	Conditions	Required	Illumination
Control Module Read Only Memory (ROM)	P0601	This DTC will be stored if any software or calibration check sum is incorrect		≠ stored checksum for any of the parts (boot, software, application calibration, system calibration)				DTC Type A 1 trip
				,	Ignition switch OR	Run or Crank		
							Frequency: Runs continuously in the background	
					Ignition switch	Accessory		
Control Module Not Programmed	P0602	Indicates that the ECU needs to be programmed	Calibration KeMEMD_b_NoStartCal	= TRUE			Runs once at power up	DTC Type A 1 trip
					Ignition switch OR	Run or Crank		
					Ignition switch	Accessory		
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 switch OR	Run or Crank	1 failure Frequency: Once at power-up	DTC Type A 1 trip
					Ignition switch	Accessory		
					OR Ignition switch	Accessory	Frequency: Runs continuously in the background.	
Control Module Internal Performance	P0606	Indicates the ECU has detected an internal processor fault or external watchdog fault (PID \$2032			Ignition switch OR Ignition switch	(Run or Crank) OR Accessory		DTC Type A 1 trip

Component/	Fault	Monitor Strategy	Malfunction	Threshold	Secondary	Enable	Time	MIL
System	Code	Description	Criteria	Value	Parameters	Conditions	Required	Illumination
		discriminates the						
		source of fault)						
4 Mail Burney			4.1/0		4. Familia III (O. anno Carrona Carrona anno Carrona C		4 4 6 9	
1. Main Processor			1. I/O configuration		For all I/O configuration register faults:     Calibration		1. 1 failure	
Configuration Register Test			register faults:		KeMEMD_b_ProcFltCfgRegEnbl		Frequency: Continuously	
rest			•Register contents	=Incorrect value	ReivielviD_b_FlocFitCigRegelibi	TRUE	(12.5ms)	
			-register contents	-incorrect value		TROL	(12.51113)	
External watchdog test			3. External Watchdog		For External Watchdog Fault:		3. 3 failures out of	
5. External watchdog test			Fault:		Calibration		15 samples	
			i duit.	Control Lost	KeFRPD_b_FPExtWDogDiagEnbl	TRUE	To Samples	
			Software control of fuel	2001	AND		1 sample/12.5 ms	
			pump driver			Not active		
					AND			
					<ul><li>Control Module RAM(P0604)</li></ul>	Not active		
Control Module Long Term	P062F	Indicates that the	Last EEPROM write	Did not complete	Ignition switch	(Run or Crank)	1 test failure	DTC Type A
Memory (EEPROM)		NVM Error flag has			OR	OR	Once on controller	1 trip
Performance		not been cleared			Ignition switch	Accessory	power-up	
			Reference voltage	> 105% nominal				-
			ivererence voltage	OR				
				< 95% nominal				
				( i.e., > 5.25v				
				OR < 4.75v)				
				- /	†			1

Commonanti	Fault	Manitar Stratagy	Malfunction	Threshold	Secondami	Enable	Time	MIL
	Fault Code		Criteria	Value		Conditions		Illumination
		Detects if an		<u> </u>				
Fuel Pump Control Module Driver 1 Over-temperature	P064A	internal fuel pump	Pump Driver Temp	> 150C	Ignition switch OR	(Run or Crank) OR	3 failures out of 15 samples	DTC Type B
Driver i Over-temperature		driver				Accessory	samples	2 trips
		overtemperature			Igrillori Switch	Accessory	1 sample/12.5 ms	
		condition exists					1 3ampio/12.0 ms	
		under normal						
		operating						
		conditions						
1								
					KeFRPD_b_FPOverTempDiagEnbl	TRUE		
	1		1					I

Component/ System	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters  Ignition Run_Crank terminal	Enable Conditions 9V <voltage<32v< th=""><th>Time Required</th><th>MIL Illumination</th></voltage<32v<>	Time Required	MIL Illumination
Cylinder Deactivation Exhaust Flow Valve Control Circuit/Open	Monitors for open circuit faults in the AFM valve PWM control circuit	Open circuit fault status AFM_VIvCntrlCktOpenFlt	== Faulted	1. Diagnostic enabled (K_b_AFM_VIvCntrlOpenEnbI) AND 2. Diagnostic system disablement not requested (DiagSystemDisable) AND 3. AFM Valve Initialization complete (AFM_ValveInitDlyCmpt) AND 4. AFM exhaust valve control not disabled remainder of trip due to output driver short circuit fault (AFMV_FaultTripDsbI) AND 5. AFM control circuit Open circuit fault status (AFM_VIvCntrlCktOpenFlt)	1. = TRUE AND 2. <> TRUE AND 3. = TRUE AND 4. <> TRUE AND 5. <> INDETERMINATE	20 failures out of 40 samples 1 sample/25 ms	DTC Type B 2 trips

Component/ System  Cylinder Deactivation Exhaust Flow Valve Control Circuit Low	Fault Code P12E4	Monitor Strategy Description  Monitors for short- to-ground faults in the AFM valve PWM control circuit	Malfunction Criteria Short-to-ground fault status AFM_VIvCntrlCktGshtFlt		Secondary Parameters  1. Diagnostic enabled (K_b_AFM_VIvCntrlGshtEnbI) AND 2. Diagnostic system disablement not requested (DiagSystemDisable) AND 3. AFM Valve Initialization complete (AFM_ValveInitDlyCmpt)	Enable Conditions  1. = TRUE AND 2. <> TRUE AND 3. = TRUE AND 4. <> TRUE AND	Time Required  20 failures out of 40 samples  1 sample/25 ms	MIL Illumination DTC Type B 2 trips
					AND 4. AFM exhaust valve control not disabled for remainder of trip due to output driver short circuit fault (AFMV_FaultTripDsbl) AND 5. AFM control circuit Short-to-ground fault status not indeterminate (AFM_VIvCntrlCktGshtFlt)	5. <> INDETERMINATE		
Cylinder Deactivation Exhaust Flow Valve Control Circuit High	P12E5	Monitors for short- to-power faults in the AFM valve PWM control circuit	Short-to-power fault status AFM_VIvCntrlCktPshtFlt		Diagnostic enabled (K_b_AFM_VIvCntrlPshtEnbl) AND     Diagnostic system disablement not requested (DiagSystemDisable) AND     AFM Valve Initialization complete (AFM_ValveInitDlyCmpt) AND     AFM exhaust valve control not disabled remainder of trip due to output driver short circuit fault (AFMV_FaultTripDsbl) AND     AFM control circuit Short-to-power fault status not indeterminate (AFM_VIvCntrlCktPshtFlt)	1. = TRUE AND 2. <> TRUE AND 3. = TRUE AND 4. <> TRUE AND 5. <> INDETERMINATE	20 failures out of 40 samples 1 sample/25 ms	2 trips
Cylinder Deactivation Exhaust Flow Valve Feeback Circuit Low Duty Cycle (Bank 1)	P12E7	range low duty	AFM valve 1 diagnostic PWM feedback signal AFM_Valve1FdbkDC	oThrsh)	Diagnostic enabled (K_b_AFM_VIv1PstnLoDiagEnbl) AND     AFM valve initialization complete (AFM_ValveInitDlyCmpt) AND     Diagnostic system disablement not requested (DiagSystemDisable)	1. = TRUE AND 2. = TRUE AND 3. <> TRUE	20 failures out of 40 samples 1 sample/25 ms	DTC Type B 2 trips

Component/ System  Cylinder Deactivation Exhaust Flow Valve Feedback Circuit High	Fault Code P12E8	range high duty cycle values on the	Malfunction Criteria  AFM valve 1 diagnostic PWM feedback signal AFM_Valve1FdbkDC	Threshold Value > K_Pct_AFM_Vlv1PstnH iThrsh	Secondary Parameters  1. Diagnostic enabled (K_b_AFM_Vlv1PstnHiDiagEnbl) AND	Enable   Conditions   1. = TRUE   AND   2. = TRUE	20 failures out of 40 samples	MIL Illumination DTC Type B 2 trips
Duty Cycle (Bank 1)		AFM valve 1 diagnostic PWM feedback signal			AFM valve initialization completed (AFM_ValveInitDlyCmpt)     AND     Diagnostic system disablement not requested (DiagSystemDisable)	AND 3. <> TRUE	1 sample/25 ms	
Cylinder Deactivation Exhaust Flow Valve Open Position (Bank 1)	P12E9	Monitors the sensed AFM valve 1 position for values that are out- of-range low	AFM_Valve1State	<= ValvePstnOOR_Low)	1. Diagnostic enabled (K_b_AFM_VIv1PstnOOR_LoEnbl) AND 2. AFM valve initialization period completed (AFM_ValveInitDlyCmpt) AND 3. Diagnostic system disablement not requested (DiagSystemDisable) AND 4. AFM valve 1 position sensor circuit low diagnostic not faulted (AFM_Valve1PstnLoFP) AND 5. AFM valve 1 position sensor circuit high diagnostic not faulted (AFM_Valve1PstnHiFP)	1. = TRUE AND 2. = TRUE AND 3. <> TRUE AND 4. <> TRUE AND 5. <> TRUE	20 failures out of 40 samples 1 sample/25 ms	DTC Type B 2 trips
Cylinder Deactivation Exhaust Flow Valve Closed Position (Bank 1)	P12EA	Monitors the sensed AFM valve 1 position for values that are out- of-range high	AFM_Valve1State	>= ValvePstnOOR_High)	1. Diagnostic enabled (K_b_AFM_VIv1PstnOOR_LoEnbl) AND 2. AFM valve initialization completed (AFM_ValveInitDlyCmpt) AND 3. Diagnostic system disablement not requested (DiagSystemDisable) AND 4. AFM valve 1 position sensor circuit low diagnostic not faulted (AFM_Valve1PstnLoFP) AND 5. AFM valve 1 position sensor circuit high diagnostic not faulted (AFM_Valve1PstnHiFP)	1. = TRUE AND 2. = TRUE AND 3. <> TRUE AND 4. <> TRUE AND 5. <> TRUE	20 failures out of 40 samples 1 sample/25 ms	DTC Type B 2 trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions		MIL Illumination
Cylinder Deactivation Exhaust Flow Valve Feedback Circuit Low Frequency (Bank 1)	P12EB	Monitors for out-of- range high period (i.e. out-of-range low frequency) values on the AFM valve 1 diagnostic PWM feedback signal	Diagnostic PWM feedback signal_AFM_Valve1DiagF dbkSt	>= DiagFdbkPrdHigh)	Diagnostic enabled (K_b_AFM_VIv1FdbkHiDiagEnbl) AND     AFM valve initialization completed (AFM_ValveInitDlyCmpt) AND     Diagnostic system disablement not requested (DiagSystemDisable)	1. = TRUE AND 2. = TRUE AND 3. <> TRUE	20 failures out of 40 samples 1 sample/25 ms	DTC Type B 2 trips
Cylinder Deactivation Exhaust Flow Valve Feedback Circuit High Frequency (Bank 1)	P12EC	Monitors for out-of- range low period (i.e. out-of range high frequency) values on the AFM valve 1 diagnostic PWM feedback signal	Diagnostic PWM feedback signal_AFM_Valve1DiagF dbkSt	< = DiagFdbkPrdLow)	Diagnostic enabled (K_b_AFM_Vlv1FdbkLoDiagEnbl) AND     AFM valve initialization completed (AFM_ValveInitDlyCmpt) AND     Diagnostic system disablement not requested (DiagSystemDisable)	1. = TRUE AND 2. = TRUE AND 3. <> TRUE	20 failures out of 40 samples 1 sample/25 ms	DTC Type B 2 trips
Cylinder Deactivation Exhaust Flow Valve Feedback Circuit Incorrect Frequency (Bank 1)	P12ED	Monitors for in- range errors that result when the sensed period of the diagnostic PWM feedback signal for AFM valve 1 is neither out-of-range low nor out-of-range high and does not fall within any of the calibrated ranges defined for diagnostic feedback data	Diagnostic PWM feedback signal_AFM_Valve1DiagF dbkSt	= DiagFdbkPrdInRngErr)	Diagnostic enabled (K_b_AFMV1FdbkInvldDiagEnbl) AND     AFM valve initialization completed (AFM_ValveInitDlyCmpt) AND     Diagnostic system disablement not requested (DiagSystemDisable)	1. = TRUE AND 2. = TRUE AND 3. <> TRUE	20 failures out of 40 samples 1 sample/25 ms	DTC Type B 2 trips
Cylinder Deactivation Exhaust Flow Valve Stuck Closed (Bank 1)	P12EF	Monitors position feedback to determine if AFM valve 1 is stuck in	Position feedback AFM_Valve1State	<> AFM_ValveCmd	AFM valve1 stuck diagnostics enabled (K_b_AFM_VIv1StuckDiagEnbl) AND      Ignition voltage (IgnitionVoltage) AND      AFM Valve initialization (AFM_ValveInitDlyCmpt)  AND	1. = TRUE AND  2. >= 10.2V AND  3. = TRUE AND	20 failures out of 40 samples 1 sample/25 ms	DTC Type B 2 trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illumination
<del> </del>		Josephon			A. AFM valve control circuit short-to- power diagnostic fault not active (AFM_VlvCntrlPshtFA)     AND	4. <> TRUE AND	- Troquiros	
					5. AFM valve control circuit short-to- ground diagnostic fault not active (AFM_VlvCntrlGshtFA) AND	5. <> TRUE AND		
					6. AFM valve control circuit open diagnostic fault not active (AFM_VlvCntrlOpenFA) AND	6. <> TRUE AND		
					7. AFM valve1 position sensor circuit low diagnostic fault not active (AFM_Valve1PstnLoFA) AND	7. <> TRUE AND		
					8. AFM valve1 position sensor circuit high diagnostic fault not active (AFM_Valve1PstnHiFA) AND	8. <> TRUE AND		
					9. AFM valve1 position out-of-range low diagnostic fault not active (AFM_Vlv1PstnOOR_LoFA) AND	9. <> TRUE AND		
					10. AFM valve1 position out-of-range high diagnostic fault not active (AFM_Vlv1PstnOOR_HiFA) AND	10. <> TRUE AND		
					11. Diagnostic system disablement (DiagSystemDisable) AND	11. <> TRUE AND		
					12. AFM exhaust valve control not disabled for remainder of trip due to output driver short circuit fault (AFMV_FaultTripDsbl) AND	12. <> TRUE AND		
					13. AFM valve command (AFM_ValveCmd) AND	13. ( = OPEN OR = CLOSED) AND		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters  14. AFM valve command not changed (AFM_ValveCmd) AND	Enable Conditions 14. = AFM_ValveCmdPrev AND		MIL Illumination
					15. AFM valve response time (AFM_Valve1ResponseTmr ≥ Ke_t_AFM_Valve1ResponseTm) AND	15. >= 1 sec AND		
					16. AFM valve position not out-of-range (AFM_Valve1State)	16. (<> ValvePstnOOR_Low AND <> ValvePstnOOR_High)		
Cylinder Deactivation Exhaust Flow Valve Stuck Open (Bank 1)	P12F0	Monitors position feedback to determine if AFM valve 1 is stuck in	(AFM valve command AND AFM_Valve1State) OR     (AFM valve command)	1. (= Open AND =ValveInTransition) OR 2. (= Closed AND =	The AFM valve 1 stuck diagnostics are enabled through calibration     (K_b_AFM_Vlv1StuckDiagEnbl = TRUE)     AND	1. = TRUE AND	20 failures out of 40 samples 1 sample/25 ms	DTC Type B 2 trips
					2. Ignition voltage is greater than or equal to the minimum value required to enable diagnostic execution (IgnitionVoltage ≥	2. >= 10.2 V		
						3. = TRUE AND		
					An AFM valve control circuit short-to- power diagnostic fault is not active (AFM_VlvCntrlPshtFA = FALSE)  AND	4. <> TRUE AND		
					5. An AFM valve control circuit short-to- ground diagnostic fault is not active (AFM_VlvCntrlGshtFA = FALSE) AND	5. <> TRUE AND		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illumination
, , , , , , ,					6. An AFM valve control circuit open	6. <> TRUE AND		
					7. An AFM valve 1 position sensor circuit low diagnostic fault is not active (AFM_Valve1PstnLoFA = FALSE) AND	7. <> TRUE AND		
					An AFM valve 1 position sensor circuit high diagnostic fault is not active (AFM_Valve1PstnHiFA = FALSE)  AND	8. <> TRUE AND		
					9. An AFM valve 1 position out-of-range low diagnostic fault is not active (AFM_VIv1PstnOOR_LoFA = FALSE) AND	9. <> TRUE AND		
					10. An AFM valve 1 position out-of- range high diagnostic fault is not active (AFM_Vlv1PstnOOR_HiFA = FALSE) AND	10. <> TRUE AND		
					11. Diagnostic system disablement is not being requested (DiagSystemDisable = FALSE) AND	11. <> TRUE AND		
					12. Control of the AFM exhaust valve has not been disabled for the remainder of the trip due to an output driver short circuit fault (AFMV_FaultTripDsbl = FALSE) AND	12. <> TRUE AND		
					13. The AFM valve is currently being commanded to the open or closed state (AFM_ValveCmd = Open OR AFM_ValveCmd = Closed) AND	13. (= OPEN OR = CLOSED) AND		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Parameters  14. The commanded state of the AFM valve has not changed (AFM_ValveCmd = AFM_ValveCmdPrev)  AND	Enable Conditions 14. <> AFM_ValveCmdPrev AND		MIL Illumination
					15. Sufficient time has been allowed for the AFM valve to respond to a change in the commanded AFM valve state (AFM_Valve1ResponseTmr ≥ Ke_t_AFM_Valve1ResponseTm) AND 16. The sensed position of the AFM valve is not out-of-range (AFM_Valve1State ≠ ValvePstnOOR_Low	16. ( <> ValvePstnOOR_Low AND		
Cylinder Deactivation Exhaust Flow Valve Position Not Learned (Bank 1)	P12F1	Monitors diagnostic feedback from AFM valve 1 to	AFM valve diagnostic feedback status (AFM_Valve1DiagFdbkSt)	= AlignmentNotComplete	Diagnostic enabled (K_b_AFM_Vlv1NotLrndEnbl) AND     AFM valve initialization completed (AFM_ValveInitDlyCmpt) AND	1. = TRUE AND 2. = TRUE AND	20 failures out of 40 samples 1 sample/25 ms	DTC Type B 2 trips
					AND 4. Diagnostic PWM feedback signal	3. <> TRUE AND 4. <> DiagFdbkPrdLow AND		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters  5. Diagnostic PWM feedback signal AFM valve1 Not out-of-range high (AFM_Valve1DiagFdbkSt) AND	Enable Conditions  5. <> DiagFdbkPrdHigh AND	Time Required	MIL Illumination
					6. Diagnostic PWM feedback signal Not out-of-range low, Not out-of-range high AND andNot within any calibrated feedback data range (AFM_Valve1DiagFdbkSt) AND 7. AFM valve state (AFM_Valve1DiagFdbkSt)	6. <> DiagFdbkPrdInRngErr AND  7. <> ActuatorFaulted		
Cylinder Deactivation Exhaust Flow Valve Actuator Performance (Bank1)	P12F2	Monitors diagnostic feedback from AFM valve 1 to	AFM valve command (AFM_ValveCmd) AND Position feedback	( = Closed AND	AND	1. = TRUE AND  2. = TRUE AND  3. <> TRUE	20 failures out of 40 samples 1 sample/25 ms	DTC Type B 2 trips
					4. AFM exhaust valve control Not disabled for remainder of trip due to output driver short circuit fault (AFMV_FaultTripDsbl)  AND	4. <> TRUE AND		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value		Enable Conditions	MIL Illumination
					AFM valve1 not out-of-range low (AFM_Valve1DiagFdbkSt) AND 6. Diagnostic PWM feedback signal	5. <> DiagFdbkPrdLow AND 6. <> DiagFdbkPrdHigh AND	
					Not out-of-range low, Not out-of-range	7. <> DiagFdbkPrdInRngErr AND	
					8. AFM valve fault state (AFM_Valve1DiagFdbkSt)	8. <> FaultStIndeterminate	

-,	Fault Code P12F4	Description  Monitors for out-of-range low duty	Malfunction Criteria AFM valve 2 diagnostic PWM feedback signal AFM_Valve2FdbkDC	Threshold Value  K_Pct_AFM_Vlv2PstnL oThrsh)	Secondary Parameters  1. Diagnostic enabled (K_b_AFM_Vlv2PstnLoDiagEnbl) AND 2. AFM valve initialization completed (AFM_ValveInitDlyCmpt) AND 3. Diagnostic system disablement not requested (DiagSystemDisable)	Enable Conditions  1. = TRUE AND  2. = TRUE AND  3. <> TRUE	Time Required  20 failures out of 40 samples  1 sample/25 ms	MIL Illumination DTC Type B 2 trips
Cylinder Deactivation Exhaust Flow Valve Feedback Circuit High Duty Cycle (Bank 2)	P12F5	range high duty	AFM valve 2 diagnostic PWM feedback signal AFM_Valve2FdbkDC	iThrsh)	Diagnostic enabled (K_b_AFM_VIv2PstnHiDiagEnbl) AND     AFM valve initialization complete (AFM_ValveInitDlyCmpt) AND     Diagnostic system disablement not requested (DiagSystemDisable)	1. = TRUE AND 2. = TRUE AND 3. <> TRUE	20 failures out of 40 samples 1 sample/25 ms	DTC Type B 2 trips
Cylinder Deactivation Exhaust Flow Valve Open Position (Bank 2)	P12F6	Monitors the sensed AFM valve 2 position for values that are out- of-range low	AFM_Valve2State		1. Diagnostic enabled (K_b_AFM_VIv2PstnOOR_LoEnbl) AND 2. AFM valve initialization complete (AFM_ValveInitDlyCmpt) AND 3. Diagnostic system disablement not requested (DiagSystemDisable) AND 4. AFM valve 2 position sensor circuit low diagnostic not faulted (AFM_Valve2PstnLoFP) AND 5. AFM valve2 position sensor circuit high diagnostic unfaulted (AFM_Valve2PstnHiFP)	1. = TRUE AND 2. = TRUE AND 3. <> TRUE AND 4. <> TRUE AND 5. <> TRUE	20 failures out of 40 samples 1 sample/25 ms	DTC Type B 2 trips

Component/ System  Cylinder Deactivation Exhaust Flow Valve Closed Position (Bank 2)				= ValvePstnOOR_High	Secondary Parameters  1. Diagnostic enabled (K_b_AFM_VIv2PstnOOR_HiEnbl) AND 2. AFM valve initialization complete (AFM_ValveInitDlyCmpt) AND 3. Diagnostic system disablement not	Enable Conditions  1. = TRUE AND 2. = TRUE AND 3. <> TRUE AND 4. <> TRUE	Required 20 failures out of 40	MIL Illumination DTC Type B 2 trips
					requested (DiagSystemDisable)	AND 5. <> TRUE		
Cylinder Deactivation Exhaust Flow Valve Feedback Circuit Low Frequency (Bank 2)	P12F8	range high period	Diagnostic PWM feedback signal AFM_Valve2DiagFdbkSt		Diagnostic enabled (K_b_AFM_VIv2FdbkHiDiagEnbl) AND     AFM valve initialization complete (AFM_ValveInitDlyCmpt) AND     Diagnostic system disablement not requested (DiagSystemDisable)	1. = TRUE AND 2. = TRUE AND 3. <> TRUE	20 failures out of 40 samples 1 sample/25 ms	DTC Type B 2 trips
Cylinder Deactivation Exhaust Flow Valve Feedback Circuit High Frequency (Bank 2)		range low period	signal AFM_Valve2DiagFdbkSt		Diagnostic enabled through calibration (K_b_AFM_VIv2FdbkLoDiagEnbl) AND     AFM valve initialization period has completed (AFM_ValveInitDlyCmpt) AND     Diagnostic system disablement is not being requested (DiagSystemDisable)	1. = TRUE AND 2. = TRUE AND 3. <> TRUE	20 failures out of 40 samples 1 sample/25 ms	DTC Type B 2 trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions		MIL Illumination
Cylinder Deactivation Exhaust Flow Valve Feedback Circuit Incorrect Frequency (Bank 2)	P12FA	Monitors for in- range errors that result when the sensed period of the diagnostic PWM feedback signal for AFM valve 2 is neither out-of-range low nor out-of-range high and does not fall within any of the calibrated ranges defined for diagnostic feedback data	Diagnostic PWM feedback signal_AFM_Valve2DiagF dbkSt	= DiagFdbkPrdInRngErr)	Diagnostic enabled (K_b_AFMV2FdbkInvldDiagEnbl) AND     AFM valve initialization period complete (AFM_ValveInitDlyCmpt) AND     Diagnostic system disablement not requested (DiagSystemDisable)	1. = TRUE AND 2. = TRUE AND 3. <> TRUE	20 failures out of 40 samples  1 sample/25 ms	DTC Type B 2 trips
Cylinder Deactivation Exhaust Flow Valve Stuck Closed (Bank 2)	P12FC	Monitors position feedback to determine if AFM valve 2 is stuck in the closed position	AFM valve command AND AFM Valve2 State (AFM_ValveCmd AND AFM_Valve2State)	( = Open AND = ValvePstnClosed)	AFM valve2 stuck diagnostics enabled (K_b_AFM_Vlv2StuckDiagEnbl) AND	1. = TRUE AND	20 failures out of 40 samples 1 sample/25 ms	DTC Type B 2 trips
					IgnitionVoltage ≥ K_U_AFM_VIv2StuckMinVolt AND     AFM valve initialized	2. V >= 10.2 V AND 3. = TRUE		
					(AFM_ValveInitDlyCmplt) AND	AND		
					AFM valve control circuit short-to- power diagnostic fault (AFM_VIvCntrlPshtFA)  AND	4. <> TRUE AND		
					AFM valve control circuit short-to- ground diagnostic fault (AFM_VIvCntrlGshtFA)  AND	5. <> TRUE AND		
				AFM valve control circuit open diagnostic fault (AFM_VlvCntrlOpenFA)     AND	6. <> TRUE AND			
				7. AFM valve2 position sensor circuit low diagnostic fault (AFM_Valve2PstnLoFA) AND	7. <> TRUE AND			

Component/	Fault	Monitor Strategy	Malfunction	Threshold		Enable	-	MIL
System	Code	Description	Criteria	Value	Parameters	Conditions	Required	Illumination
						8. <> TRUE AND		
					9. AFM valve2 position out-of-range low	9. <> TRUE AND		
					10. AFM valve2 position out-of-range high diagnostic fault (AFM_VIv2PstnOOR_HiFA) AND	10. <> TRUE AND		
					requested (DiagSystemDisable) AND	11. <> TRUE AND		
					12. AFM exhaust valve control Not disabled for remainder of trip due to output driver short circuit fault (AFMV_FaultTripDsbl) AND	12. <> TRUE AND		
						13. ( = Open OR = Closed) AND		
					(AFM_ValveCmd)	14. = AFM_ValveCmdPrev AND		
					15. AFM valve response time (AFM_Valve2ResponseTmr) AND	15. >= 1 sec AND		
					16. AFM valve position Not out-of-range (AFM_Valve2State AND AFM_Valve2State)	16. ( <> ValvePstnOOR_Low AND <> ValvePstnOOR_High)		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illumination
Cylinder Deactivation Exhaust Flow Valve Stuck Open (Bank 2)	P12FD	feedback to determine if AFM valve 2 is stuck in	AFM_Valve2State ) OR	1. (= Open AND = ValveInTransition) OR 2. (= Closed AND = ValvePstnOpen) OR 3. (= Closed AND = ValveInTransition)	AFM valve2 stuck diagnostics enabled (K_b_AFM_Vlv2StuckDiagEnbl) AND	1. = TRUE AND	20 failures out of 40 samples 1 sample/25 ms	DTC Type B 2 trips
						2. V >= 10.2 V AND		
					AFM valve initialization time complete (AFM_ValveInitDlyCmpt)     AND	AND		
					AFM valve control circuit short-to- power diagnostic fault (AFM_VlvCntrlPshtFA)  AND	4. <> TRUE AND		
						5. <> TRUE AND		
					AFM valve control circuit open diagnostic fault (AFM_VIvCntrlOpenFA)     AND	6. <> TRUE AND		
						7. <> TRUE AND		
					8. AFM valve2 position sensor circuit	8. <> TRUE AND		
					9. AFM valve2 position out-of-range low diagnostic fault (AFM_VIv2PstnOOR_LoFA)	AND		
					AFM valve2 position out-of-range high diagnostic fault (AFM_VIv2PstnOOR_HiFA)	10. <> TRUE AND		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions		MIL Illumination
					11. Diagnostic system disablement (DiagSystemDisable) AND 12. AFM exhaust valve control not disabled for remainder of trip due to output driver short circuit fault (AFMV_FaultTripDsbl) AND 13. AFM valve command (AFM_ValveCmd) AND 14. AFM valve command unchanged (AFM_ValveCmd) AND 15. AFM valve command response time (AFM_Valve2ResponseTmr) AND 16. AFM valve position not out-of-range (AFM_Valve2State)	11. <> TRUE AND  12. <> TRUE AND  13. (= Open OR = Closed) AND 14. = AFM_ValveCmdPrev AND 15. >= 1 sec AND  16. (<> ValvePstnOOR_Low AND <> ValvePstnOOR_High)		
Cylinder Deactivation Exhaust Flow Valve Position Not Learned (Bank 2)	P12FE	Monitors diagnostic feedback from AFM valve 2 to determine if the valve end stops have not been learned	AFM Valve Diagnostic Status enumeration (AFM_Valve2DiagFdbkSt)	= AlignmentNotComplete)	AFM valve initialization complete     (AFM_ValveInitDlyCmpt)	1. = TRUE AND 2. = TRUE AND 3. <> TRUE AND 4. <> DiagFdbkPrdLow AND	20 failures out of 40 samples 1 sample/25 ms	DTC Type B 2 trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters  5. AFM Valve2 diagnostic PWM feedback signal not out-of-range high (AFM_Valve2DiagFdbkSt) AND 6. AFM Valve2 diagnostic PWM feedback signal Not out-of-range low, Not out-of-range high AND Not in any calibrated feedback data range (AFM_Valve1DiagFdbkSt) AND 7. AFM valve diagnostic feedback state (AFM_Valve2DiagFdbkSt)	Enable Conditions  5. <> DiagFdbkPrdHigh AND 6. <> DiagFdbkPrdInRngErr AND 7. <> Actuator Faulted	Time Required	MIL Illumination
Cylinder Deactivation Exhaust Flow Valve Actuator Performance (Bank2)	P12FF	the AFM valve is stuck in the end	(AFM Valve2     Diagnostic Status AND     AFM Valve Command)     OR     (AFM Valve2     Diagnostic Status AND	OR	Diagnostic enabled (K_b_AFM_VIv2PerfDiagEnbI) AND	1. = TRUE AND	20 failures out of 40 samples 1 sample/25 ms	DTC Type B 2 trips
					2. AFM valve initialization completed (AFM_ValveInitDlyCmpt) AND 3. Diagnostic system disablement (DiagSystemDisable) AND 4. AFM exhaust valve control not disabled for remainder of trip due to output driver short circuit fault (AFMV_FaultTripDsbl) AND 5. Diagnostic PWM feedback signal AFM Valve2 not out-of-range low (AFM_Valve2DiagFdbkSt) AND 6. Diagnostic PWM feedback signal AFM Valve2 not out-of-range high (AFM_Valve2DiagFdbkSt) AND AND 6. Diagnostic PWM feedback signal AFM Valve2 not out-of-range high (AFM_Valve2DiagFdbkSt) AND	2. = TRUE AND 3. <> TRUE AND 4. <> TRUE AND 5. <> DiagFdbkPrdLow AND 6. <> DiagFdbkPrdHigh AND		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions		MIL Illumination
					7. Liagileone i Tim leedback i tet eat e.	7. <> DiagFdbkPrdInRngErr AND		
					8. AFM valve fault state (AFM_Valve2DiagFdbkSt)	8. <> FaultStIndeterminate		
Ignition 1 Switch Circuit Low Voltage	P2534	Detects if the Ignition1 Switch circuit is shorted to low or open	Ignition 1 voltage	<= 6 V	Engine	Running	180 failures out of 200 samples 1 sample/25.0 ms	DTC Type A 1 trip
lgnition 1 Switch Circuit High Voltage	P2535	Detects if the Ignition1 Switch circuit is shorted to vehicle supply voltage	Ignition 1 voltage	> 11.7 V	Ignition Run_Crank terminal	Off	180 failures out of 200 samples 1 sample/25.0 ms	DTC Type A 1 trip
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  2. Ignition Run/Crank Voltage 3. 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

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illumination
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)			1 failure if it occurs during the first ROM test of the ignition cycle, otherwise 5 failures	DTC Type A 1 trip
					Ignition switch OR Ignition switch	Run or Crank Accessory	Frequency: Runs continuously in the background	
Control Module Not Programmed	P0602	Indicates that the ECU needs to be programmed	Calibration KeMEMD_b_NoStartCal	= TRUE	Ignition switch OR Ignition switch	Run or Crank Accessory	Runs once at power up	DTC Type A 1 trip
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 switch	Run or Crank	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			1 failure if it occurs during the first RAM test of the ignition cycle, otherwise 5 failures	DTC Type A 1 trip
					Ignition switch OR Ignition switch	Run or Crank Accessory	Frequency: Runs continuously in the background.	
Control Module Internal Performance	P0606	Indicates the ECU has detected an internal processor fault or external watchdog fault (PID \$2032 discriminates the source of fault)			Ignition switch OR Ignition switch	(Run or Crank) OR Accessory		DTC Type A 1 trip

Commonanti	Fault	Monitor Strategy	Malfunction	Threshold	Sacar dam.	Enable	Time	MIL
Component/ System	Fault Code	Description	Criteria	Value	Secondary Parameters	Conditions	Required	Illumination
Main Processor     Configuration Register     Test	Code	bescription	I. I/O configuration register faults:     Register contents		1. For all I/O configuration register faults:     Calibration     •KeMEMD_b_ProcFltCfgRegEnbl	TRUE	1. 1 failure Frequency: Continuously (12.5ms)	
2. Processor clock test			2. Processor Clock Fault:  • EE latch flag in EEPROM OR • RAM latch flag.	0x5A5A 0x5A	2. For Processor Clock Fault: Calibration •KeMEMD_b_ProcFltCLKDiagEnbl	TRUE	2. 1 failure Frequency: Continuously (12.5ms)	
3. External watchdog test			External Watchdog     Fault:      Software control of fuel pump driver	Control Lost	3. For External Watchdog Fault: Calibration •KeFRPD_b_FPExtWDogDiagEnbl AND •Control Module ROM(P0601) AND •Control Module RAM(P0604)	TRUE  Not active  Not active	<ul><li>3. 3 failures out of</li><li>15 samples</li><li>1 sample/12.5 ms</li></ul>	
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 switch OR Ignition switch	(Run or Crank) OR Accessory	1 test failure Once on controller power-up	DTC Type A 1 trip
			Reference voltage	> 105% nominal OR < 95% nominal (i.e., > 5.25v OR < 4.75v)				
Fuel Pump Control Module Driver 1 Over-temperature	P064A	Detects if an internal fuel pump driver overtemperature condition exists under normal operating conditions	Pump Driver Temp	> 150C	Ignition switch OR Ignition switch	(Run or Crank) OR Accessory	3 failures out of 15 samples 1 sample/12.5 ms	DTC Type B 2 trips
					KeFRPD_b_FPOverTempDiagEnbl Ignition Run_Crank terminal	TRUE 9V <voltage<32v< td=""><td></td><td></td></voltage<32v<>		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illumination
Cylinder Deactivation Exhaust Flow Valve Control Circuit/Open	P12E3	Monitors for open circuit faults in the AFM valve PWM control circuit	Open circuit fault status AFM_VIvCntrlCktOpenFlt	== Faulted	1. Diagnostic enabled (K_b_AFM_VIvCntrlOpenEnbl) AND 2. Diagnostic system disablement not requested (DiagSystemDisable) AND 3. AFM Valve Initialization complete (AFM_ValveInitDlyCmpt) AND 4. AFM exhaust valve control not disabled remainder of trip due to output driver short circuit fault (AFMV_FaultTripDsbl) AND 5. AFM control circuit Open circuit fault status (AFM_VIvCntrlCktOpenFlt)	1. = TRUE AND 2. <> TRUE AND 3. = TRUE AND 4. <> TRUE AND 5. <> INDETERMINATE	20 failures out of 40 samples 1 sample/25 ms	DTC Type B 2 trips
Cylinder Deactivation Exhaust Flow Valve Control Circuit Low	P12E4		Short-to-ground fault status AFM_VIvCntrlCktGshtFlt	== Faulted	1. Diagnostic enabled (K_b_AFM_VIvCntrlGshtEnbl) AND 2. Diagnostic system disablement not requested (DiagSystemDisable) AND 3. AFM Valve Initialization complete (AFM_ValveInitDlyCmpt) AND 4. AFM exhaust valve control not disabled for remainder of trip due to output driver short circuit fault (AFMV_FaultTripDsbl) AND 5. AFM control circuit Short-to-ground fault status not indeterminate (AFM_VIvCntrlCktGshtFlt)	1. = TRUE AND 2. <> TRUE AND 3. = TRUE AND 4. <> TRUE AND 5. <> INDETERMINATE	20 failures out of 40 samples 1 sample/25 ms	DTC Type B 2 trips

Component/ System Cylinder Deactivation	Fault Code	Monitor Strategy Description Monitors for short-	Malfunction Criteria Short-to-power fault status	Threshold Value == Faulted	Secondary Parameters  1. Diagnostic enabled	Enable Conditions	Time Required 20 failures out of 40	MIL Illumination
Exhaust Flow Valve Control Circuit High	FIZES		AFM_VIvCntrlCktPshtFlt	i aulieu	I. Dragnostic enabled (K_b_AFM_VIvCntrlPshtEnbl) AND 2. Diagnostic system disablement not requested (DiagSystemDisable) AND 3. AFM Valve Initialization complete (AFM_ValveInitDlyCmpt) AND 4. AFM exhaust valve control not disabled remainder of trip due to output driver short circuit fault (AFMV_FaultTripDsbl) AND 5. AFM control circuit Short-to-power fault status not indeterminate (AFM_VIvCntrlCktPshtFlt)	1 INOL AND 2. <> TRUE AND 3. = TRUE AND 4. <> TRUE AND 5. <> INDETERMINATE		2 trips
Cylinder Deactivation Exhaust Flow Valve Feeback Circuit Low Duty Cycle (Bank 1)	P12E7	range low duty	AFM valve 1 diagnostic PWM feedback signal AFM_Valve1FdbkDC	< K_Pct_AFM_VIv1PstnL oThrsh)	Diagnostic enabled (K_b_AFM_VIv1PstnLoDiagEnbl) AND     AFM valve initialization complete (AFM_ValveInitDlyCmpt) AND     Diagnostic system disablement not requested (DiagSystemDisable)	1. = TRUE AND 2. = TRUE AND 3. <> TRUE	20 failures out of 40 samples 1 sample/25 ms	DTC Type B 2 trips
Cylinder Deactivation Exhaust Flow Valve Feedback Circuit High Duty Cycle (Bank 1)	P12E8	range high duty	AFM valve 1 diagnostic PWM feedback signal AFM_Valve1FdbkDC	> K_Pct_AFM_Vlv1PstnHi Thrsh	Diagnostic enabled (K_b_AFM_VIv1PstnHiDiagEnbl) AND     AFM valve initialization completed (AFM_ValveInitDlyCmpt) AND     Diagnostic system disablement not requested (DiagSystemDisable)	1. = TRUE AND 2. = TRUE AND 3. <> TRUE	20 failures out of 40 samples 1 sample/25 ms	DTC Type B 2 trips

Component/ System  Cylinder Deactivation Exhaust Flow Valve Open Position (Bank 1)	Fault Code P12E9		Malfunction Criteria  AFM_Valve1State	Threshold Value <= ValvePstnOOR_Low)	Secondary Parameters  1. Diagnostic enabled (K_b_AFM_VIv1PstnOOR_LoEnbl) AND 2. AFM valve initialization period completed (AFM_ValveInitDlyCmpt) AND 3. Diagnostic system disablement not requested (DiagSystemDisable) AND 4. AFM valve 1 position sensor circuit low diagnostic not faulted (AFM_Valve1PstnLoFP) AND 5. AFM valve 1 position sensor circuit high diagnostic not faulted (AFM_Valve1PstnLoFP)	Enable Conditions  1. = TRUE AND 2. = TRUE AND 3. <> TRUE AND 4. <> TRUE AND 5. <> TRUE	Time Required  20 failures out of 40 samples  1 sample/25 ms	MIL Illumination DTC Type B 2 trips
Cylinder Deactivation Exhaust Flow Valve Closed Position (Bank 1)	P12EA	Monitors the sensed AFM valve 1 position for values that are out-of-range high	AFM_Valve1State	>= ValvePstnOOR_High)	1. Diagnostic enabled (K_b_AFM_VIv1PstnOOR_LoEnbl) AND 2. AFM valve initialization completed (AFM_ValveInitDlyCmpt) AND 3. Diagnostic system disablement not requested (DiagSystemDisable) AND 4. AFM valve 1 position sensor circuit low diagnostic not faulted (AFM_Valve1PstnLoFP) AND 5. AFM valve 1 position sensor circuit high diagnostic not faulted (AFM_Valve1PstnLoFP)	1. = TRUE AND 2. = TRUE AND 3. <> TRUE AND 4. <> TRUE AND 5. <> TRUE	20 failures out of 40 samples 1 sample/25 ms	DTC Type B 2 trips
Cylinder Deactivation Exhaust Flow Valve Feedback Circuit Low Frequency (Bank 1)	P12EB	range high period	Diagnostic PWM feedback signal_AFM_Valve1DiagFd bkSt	>= DiagFdbkPrdHigh)	Diagnostic enabled (K_b_AFM_VIv1FdbkHiDiagEnbl) AND     AFM valve initialization completed (AFM_ValveInitDlyCmpt) AND     Diagnostic system disablement not requested (DiagSystemDisable)	1. = TRUE AND 2. = TRUE AND 3. <> TRUE	20 failures out of 40 samples 1 sample/25 ms	DTC Type B 2 trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illumination
Cylinder Deactivation Exhaust Flow Valve Feedback Circuit High Frequency (Bank 1)	P12EC	range low period	Diagnostic PWM feedback signal_AFM_Valve1DiagFd bkSt	< = DiagFdbkPrdLow)	Diagnostic enabled (K_b_AFM_VIv1FdbkLoDiagEnbl) AND     AFM valve initialization completed (AFM_ValveInitDlyCmpt) AND     Diagnostic system disablement not requested (DiagSystemDisable)	1. = TRUE AND 2. = TRUE AND 3. <> TRUE	20 failures out of 40 samples 1 sample/25 ms	DTC Type B 2 trips
Cylinder Deactivation Exhaust Flow Valve Feedback Circuit Incorrect Frequency (Bank 1)	P12ED	Monitors for in- range errors that result when the sensed period of the diagnostic PWM feedback signal for AFM valve 1 is neither out-of-range low nor out-of-range high and does not fall within any of the calibrated ranges defined for diagnostic feedback data	Diagnostic PWM feedback signal_AFM_Valve1DiagFd bkSt		Diagnostic enabled (K_b_AFMV1FdbkInvldDiagEnbl) AND     AFM valve initialization completed (AFM_ValveInitDlyCmpt) AND     Diagnostic system disablement not requested (DiagSystemDisable)	1. = TRUE AND 2. = TRUE AND 3. <> TRUE	20 failures out of 40 samples 1 sample/25 ms	DTC Type B 2 trips
Cylinder Deactivation Exhaust Flow Valve Stuck Closed (Bank 1)	P12EF	Monitors position feedback to determine if AFM valve 1 is stuck in the closed position	Position feedback AFM_Valve1State	<> AFM_ValveCmd	1. AFM valve1 stuck diagnostics enabled (K_b_AFM_Vlv1StuckDiagEnbl) AND  2. Ignition voltage (IgnitionVoltage) AND  3. AFM Valve initialization (AFM_ValveInitDlyCmpt) AND  4. AFM valve control circuit short-to-power diagnostic fault not active (AFM_VlvCntrlPshtFA) AND  5. AFM valve control circuit short-to-ground diagnostic fault not active (AFM_VlvCntrlGshtFA) AND  6. AFM valve control circuit short-to-ground diagnostic fault not active (AFM_VlvCntrlGshtFA) AND	1. = TRUE AND  2. >= 10.2V AND  3. = TRUE AND  4. <> TRUE AND  5. <> TRUE AND	20 failures out of 40 samples  1 sample/25 ms	DTC Type B 2 trips

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		Monitor Strategy	Malfunction	Threshold	Secondary	Enable	Time	MIL
System	Code	Description	Criteria	Value	Parameters	Conditions	Required	Illumination
					<ol><li>AFM valve control circuit open</li></ol>	6. <> TRUE		
					diagnostic fault not active	AND		
					(AFM_VlvCntrlOpenFA)			
					AND			
					7. AFM valve1 position sensor circuit low			
					diagnostic fault not active	AND		
					(AFM_Valve1PstnLoFA) AND			
						0 TDUE		
					8. AFM valve1 position sensor circuit	8. <> TRUE AND		
					high diagnostic fault not active (AFM_Valve1PstnHiFA)	AND		
					AND			
					9. AFM valve1 position out-of-range low	9 ATRUE		
1					diagnostic fault not active	AND		
1					(AFM_Vlv1PstnOOR_LoFA)	7.1.12		
					AND			
					10. AFM valve1 position out-of-range	10. <> TRUE		
ı					high diagnostic fault not active	AND		
					(AFM_Vlv1PstnOOR_HiFA)			
					AND			
					<ol> <li>Diagnostic system disablement</li> </ol>	11. <> TRUE		
					(DiagSystemDisable)	AND		
					AND			
					12. AFM exhaust valve control not	12. <> TRUE		
					disabled for remainder of trip due to	AND		
					output driver short circuit fault			
					(AFMV_FaultTripDsbl) AND			
						13. ( = OPEN OR =		
I					13. AFM valve command (AFM_ValveCmd)	CLOSED)		
					AND	AND		
					14. AFM valve command not changed	14. =	-	
					(AFM_ValveCmd)	AFM_ValveCmdPrev		
					AND	AND		
					15. AFM valve response time	15. >= 1 sec		
					(AFM_Valve1ResponseTmr ≥	AND		
					Ke_t_AFM_Valve1ResponseTm)			
					AND			
					16. AFM valve position not out-of-range	16. (<>		
					(AFM_Valve1State)	ValvePstnOOR_Low AND		
						<> ValvePstnOOR_High)		
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Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value		Enable Conditions	Time Required	MIL Illumination
Cylinder Deactivation Exhaust Flow Valve Stuck Open (Bank 1)	feedback to determine if AFM Valve 1 is stuck in an open position  AND AFM OR  2. (AFM v AND AFM OR  3. (AFM v	(AFM valve command AND AFM_Valve1State) OR     (AFM valve command AND AFM_Valve1State)	1. (= Open AND =ValveInTransition) OR 2. (= Closed AND = ValvePositionOpen) OR 3. (= Closed AND =ValveInTransition)	The AFM valve 1 stuck diagnostics	1. = TRUE AND	20 failures out of 40 samples 1 sample/25 ms		
					Ignition voltage is greater than or equal to the minimum value required to enable diagnostic execution (IgnitionVoltage ≥ K_U_AFM_VIv1StuckMinVolt)  AND	2. >= 10.2 V		
						3. = TRUE AND		
						4. <> TRUE AND		
						5. <> TRUE AND		
						6. <> TRUE AND		
			7. An AFM valve 1 position sensor circuit low diagnostic fault is not active (AFM_Valve1PstnLoFA = FALSE) AND	7. <> TRUE AND				
			8. An AFM valve 1 position sensor circuit high diagnostic fault is not active (AFM_Valve1PstnHiFA = FALSE) AND	8. <> TRUE AND				

		Monitor Strategy	Malfunction	Threshold	Secondary	Enable	Time	MIL
System	Code	Description	Criteria	Value	Parameters	Conditions	Required	Illumination
						9. <> TRUE AND		
					(AFM_Vlv1PstnOOR_HiFA = FALSE) AND	AND		
					11. Diagnostic system disablement is not being requested (DiagSystemDisable = FALSE) AND	11. <> TRUE AND		
					12. Control of the AFM exhaust valve has not been disabled for the remainder of the trip due to an output driver short circuit fault (AFMV_FaultTripDsbl = FALSE) AND	12. <> TRUE AND		
					commanded to the open or closed state	13. (= OPEN OR = CLOSED) AND		
					valve has not changed (AFM_ValveCmd	14. <> AFM_ValveCmdPrev AND		
					the AFM valve to respond to a change in the commanded AFM valve state (AFM_Valve1ResponseTmr ≥ Ke_t_AFM_Valve1ResponseTm) AND	15. >= 1 sec AND		
					16. The sensed position of the AFM valve is not out-of-range (AFM_Valve1State ≠ ValvePstnOOR_Low AND AFM_Valve1State ≠ ValvePstnOOR_High)	16. ( <> ValvePstnOOR_Low AND <> ValvePstnOOR_High)		

Component/	Fault	Monitor Strategy	Malfunction	Threshold	Secondary	Enable	Time	MIL
System	Code	Description	Criteria	Value		Conditions	Required	Illumination
Cylinder Deactivation Exhaust Flow Valve Position Not Learned (Bank 1)	P12F1		AFM valve diagnostic feedback status (AFM_Valve1DiagFdbkSt)	= AlignmentNotComplete	Diagnostic enabled	1. = TRUE AND	20 failures out of 40 samples 1 sample/25 ms	DTC Type B 2 trips
						2. = TRUE AND 3. <> TRUE AND		
					Diagnostic PWM feedback signal AFM valve1 Not out-of-range low (AFM_Valve1DiagFdbkSt)     AND     Diagnostic PWM feedback signal	AND  5. <> DiagFdbkPrdHigh		
					AFM valve1 Not out-of-range high (AFM_Valve1DiagFdbkSt) AND 6. Diagnostic PWM feedback signal Not	AND 6. <>		
					out-of-range low, Not out-of-range high AND andNot within any calibrated feedback data range (AFM_Valve1DiagFdbkSt) AND	DiagFdbkPrdInRngErr AND		
					7. AFM valve state (AFM_Valve1DiagFdbkSt)	7. <> ActuatorFaulted		
Cylinder Deactivation Exhaust Flow Valve Actuator Performance (Bank1)	P12F2	feedback from AFM valve 1 to determine if an	AFM valve command (AFM_ValveCmd) AND Position feedback (AFM_Valve1State)	( = Closed  AND  = ValveInTransition)	Diagnostic enabled     (K_b_AFM_VIv1PerfDiagEnbl)     AND	1. = TRUE AND	20 failures out of 40 samples 1 sample/25 ms	DTC Type B 2 trips
					AFM valve initialization completed     (AFM_ValveInitDlyCmpt)     AND	2. = TRUE AND		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illumination
oyatem —		эсээлрион	Ontonia		3. Diagnostic system disablement Not requested (DiagSystemDisable) AND 4. AFM exhaust valve control Not disabled for remainder of trip due to output driver short circuit fault (AFMV_FaultTripDsbl) AND 5. Diagnostic PWM feedback signal AFM valve1 not out-of-range low (AFM_Valve1DiagFdbkSt) AND 6. Diagnostic PWM feedback signal AFM valve1 Not out-of-range high (AFM_Valve1DiagFdbkSt) AND 7. Diagnostic PWM feedback signal Not out-of-range low, Not out-of-range high AND Not in any calibrated feedback data range (AFM_Valve1DiagFdbkSt) AND 8. AFM valve fault state			
Cylinder Deactivation Exhaust Flow Valve Feedback Circuit Low Duty Cycle (Bank 2)	P12F4	range low duty	AFM valve 2 diagnostic PWM feedback signal AFM_Valve2FdbkDC	< K_Pct_AFM_VIv2PstnL oThrsh)	(AFM_Valve1DiagFdbkSt)  1. Diagnostic enabled (K_b_AFM_Vlv2PstnLoDiagEnbl) AND  2. AFM valve initialization completed (AFM_ValveInitDlyCmpt) AND  3. Diagnostic system disablement not requested (DiagSystemDisable)	1. = TRUE AND 2. = TRUE AND 3. <> TRUE	20 failures out of 40 samples 1 sample/25 ms	DTC Type B 2 trips
Cylinder Deactivation Exhaust Flow Valve Feedback Circuit High Duty Cycle (Bank 2)	P12F5	range high duty	AFM valve 2 diagnostic PWM feedback signal AFM_Valve2FdbkDC	> K_Pct_AFM_VIv2PstnHi Thrsh)	1. Diagnostic enabled (K_b_AFM_VIv2PstnHiDiagEnbl) AND 2. AFM valve initialization complete (AFM_ValveInitDlyCmpt) AND 3. Diagnostic system disablement not requested (DiagSystemDisable)	1. = TRUE AND 2. = TRUE AND 3. <> TRUE	20 failures out of 40 samples 1 sample/25 ms	DTC Type B 2 trips

Component/ System  Cylinder Deactivation Exhaust Flow Valve Open Position (Bank 2)	Fault Code P12F6	Description	Malfunction Criteria AFM_Valve2State	Threshold Value = ValvePstnOOR_Low	Secondary Parameters  1. Diagnostic enabled (K_b_AFM_VIv2PstnOOR_LoEnbl) AND 2. AFM valve initialization complete (AFM_ValveInitDlyCmpt) AND 3. Diagnostic system disablement not requested (DiagSystemDisable) AND 4. AFM valve 2 position sensor circuit low diagnostic not faulted (AFM_Valve2PstnLoFP) AND 5. AFM valve2 position sensor circuit	Enable Conditions  1. = TRUE AND 2. = TRUE AND 3. <> TRUE AND 4. <> TRUE AND 5. <> TRUE	Time Required  20 failures out of 40 samples  1 sample/25 ms	MIL Illumination DTC Type B 2 trips
Cylinder Deactivation Exhaust Flow Valve Closed Position (Bank 2)	P12F7	Monitors the sensed AFM valve 2 position for values that are out- of-range high	AFM_Valve2State	= ValvePstnOOR_High	high diagnostic unfaulted (AFM_Valve2PstnHiFP)  1. Diagnostic enabled (K_b_AFM_Vlv2PstnOOR_HiEnbl) AND 2. AFM valve initialization complete (AFM_ValveInitDlyCmpt) AND 3. Diagnostic system disablement not requested (DiagSystemDisable) AND 4. AFM valve 2 position sensor circuit low diagnostic unfaulted (AFM_Valve2PstnLoFP) AND 5. AFM valve 2 position sensor circuit high diagnostic unfaulted (AFM_Valve2PstnHiFP)	1. = TRUE AND 2. = TRUE AND 3. <> TRUE AND 4. <> TRUE AND 5. <> TRUE	20 failures out of 40 samples 1 sample/25 ms	DTC Type B 2 trips
Cylinder Deactivation Exhaust Flow Valve Feedback Circuit Low Frequency (Bank 2)	P12F8		Diagnostic PWM feedback signal AFM_Valve2DiagFdbkSt	>= DiagFdbkPrdHigh)	1. Diagnostic enabled (K_b_AFM_VIv2FdbkHiDiagEnbl) AND 2. AFM valve initialization complete (AFM_ValveInitDlyCmpt) AND 3. Diagnostic system disablement not requested (DiagSystemDisable)	1. = TRUE AND 2. = TRUE AND 3. <> TRUE	20 failures out of 40 samples 1 sample/25 ms	DTC Type B 2 trips

Component/ System  Cylinder Deactivation Exhaust Flow Valve Feedback Circuit High Frequency (Bank 2)	Fault Code P12F9	range low period (i.e. out-of-range high frequency) values on the AFM valve 2 diagnostic PWM feedback signal	Malfunction Criteria  Diagnostic PWM feedback signal  AFM_Valve2DiagFdbkSt	Threshold Value < DiagFdbkPrdLow)	Secondary Parameters  1. Diagnostic enabled through calibration (K_b_AFM_VIv2FdbkLoDiagEnbl) AND 2. AFM valve initialization period has completed (AFM_ValveInitDlyCmpt) AND 3. Diagnostic system disablement is not being requested (DiagSystemDisable)	Enable Conditions  1. = TRUE AND 2. = TRUE AND 3. <> TRUE	samples 1 sample/25 ms	MIL Illumination DTC Type B 2 trips
Cylinder Deactivation Exhaust Flow Valve Feedback Circuit Incorrect Frequency (Bank 2)	P12FA	Monitors for in- range errors that result when the sensed period of the diagnostic PWM feedback signal for AFM valve 2 is neither out-of-range low nor out-of-range high and does not fall within any of the calibrated ranges defined for diagnostic feedback data	Diagnostic PWM feedback signal_AFM_Valve2DiagFd bkSt		Diagnostic enabled (K_b_AFMV2FdbkInvldDiagEnbl) AND     AFM valve initialization period complete (AFM_ValveInitDlyCmpt) AND     Diagnostic system disablement not requested (DiagSystemDisable)	1. = TRUE AND 2. = TRUE AND 3. <> TRUE	20 failures out of 40 samples 1 sample/25 ms	DTC Type B 2 trips
Cylinder Deactivation Exhaust Flow Valve Stuck Closed (Bank 2)	P12FC	Monitors position feedback to determine if AFM valve 2 is stuck in the closed position	AFM valve command AND AFM Valve2 State (AFM_ValveCmd AND AFM_Valve2State)	( = Open AND = ValvePstnClosed)	1. AFM valve2 stuck diagnostics enabled (K_b_AFM_Vlv2StuckDiagEnbl) AND  2. IgnitionVoltage ≥ K_U_AFM_Vlv2StuckMinVolt AND  3. AFM valve initialized (AFM_ValveInitDlyCmplt) AND  4. AFM valve control circuit short-to-power diagnostic fault (AFM_VlvCntrlPshtFA) AND	1. = TRUE AND  2. V >= 10.2 V AND  3. = TRUE AND  4. <> TRUE AND	20 failures out of 40 samples 1 sample/25 ms	DTC Type B 2 trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illumination
<u></u>		Jacon pass.			5. AFM valve control circuit short-to- ground diagnostic fault (AFM_VlvCntrlGshtFA) AND	5. <> TRUE AND	, required	
					AFM valve control circuit open diagnostic fault (AFM_VIvCntrlOpenFA) AND	6. <> TRUE AND		
					7. AFM valve2 position sensor circuit low diagnostic fault (AFM_Valve2PstnLoFA) AND	7. <> TRUE AND		
					8. AFM valve2 position sensor circuit high diagnostic fault (AFM_Valve2PstnHiFA) AND	8. <> TRUE AND		
					- · · · -	9. <> TRUE AND		
					10. AFM valve2 position out-of-range high diagnostic fault (AFM_Vlv2PstnOOR_HiFA) AND	10. <> TRUE AND		
					Diagnostic system disablement Not requested (DiagSystemDisable)     AND	11. <> TRUE AND		
					12. AFM exhaust valve control Not disabled for remainder of trip due to output driver short circuit fault (AFMV_FaultTripDsbl) AND	12. <> TRUE AND		
					13. AFM valve command (AFM_ValveCmd) AND	13. ( = Open OR = Closed) AND		
					<ol> <li>AFM valve command Not changed (AFM_ValveCmd)</li> <li>AND</li> </ol>	14. = AFM_ValveCmdPrev AND		
					15. AFM valve response time (AFM_Valve2ResponseTmr) AND	15. >= 1 sec AND		
					16. AFM valve position Not out-of-range (AFM_Valve2State AND AFM_Valve2State)	16. ( <> ValvePstnOOR_Low AND <> ValvePstnOOR_High)		

Component/ System		Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illumination
Cylinder Deactivation Exhaust Flow Valve Stuck Open (Bank 2)	thaust Flow Valve Stuck pen (Bank 2)  feedback to determine if AFM valve 2 is stuck in an open position  feedback to determine if AFM OR  2. (AFM_Valve2State)  AFM_Valve2State)  OR  OR	OR 2. (AFM_ValveCmd AND AFM_Valve2State) OR 3. (AFM_ValveCmd AND	1. (= Open AND = ValveInTransition) OR 2. (= Closed AND = ValvePstnOpen) OR 3. (= Closed AND = ValveInTransition)	AFM valve2 stuck diagnostics enabled (K_b_AFM_VIv2StuckDiagEnbl) AND	1. = TRUE AND	20 failures out of 40 samples 1 sample/25 ms	DTC Type B 2 trips	
				(AFM_VIvCntrlPshtFA) AND 5. AFM valve control circuit short-to- ground diagnostic fault (AFM_VIvCntrlGshtFA) AND 6. AFM valve control circuit open diagnostic fault (AFM_VIvCntrlOpenFA) AND 7. AFM valve2 position sensor circuit low diagnostic fault (AFM_Valve2PstnLoFA)	AND  4. <> TRUE AND  5. <> TRUE AND  6. <> TRUE AND			
					high diagnostic fault (AFM_Valve2PstnHiFA) AND 9. AFM valve2 position out-of-range low diagnostic fault (AFM_Vlv2PstnOOR_LoFA) AND 10. AFM valve2 position out-of-range	8. <> TRUE AND  9. <> TRUE AND  10. <> TRUE		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illumination
					11. Diagnostic system disablement (DiagSystemDisable) AND 12. AFM exhaust valve control not disabled for remainder of trip due to output driver short circuit fault (AFMV_FaultTripDsbl) AND 13. AFM valve command (AFM_ValveCmd) AND 14. AFM valve command unchanged (AFM_ValveCmd) AND 15. AFM valve command response time (AFM_Valve2ResponseTmr) AND 16. AFM valve position not out-of-range (AFM_Valve2State)	11. <> TRUE AND  12. <> TRUE AND  13. (= Open OR = Closed) AND  14. = AFM_ValveCmdPrev AND  15. >= 1 sec AND  16. (<> ValvePstnOOR_Low AND <> ValvePstnOOR High)		
Cylinder Deactivation Exhaust Flow Valve Position Not Learned (Bank 2)	P12FE	Monitors diagnostic feedback from AFM valve 2 to determine if the valve end stops have not been	AFM Valve Diagnostic Status enumeration (AFM_Valve2DiagFdbkSt)	= AlignmentNotComplete)	1. Diagnostic enabled (K_b_AFM_VIv2NotLrndEnbl) AND 2. AFM valve initialization complete (AFM_ValveInitDlyCmpt) AND	1. = TRUE AND 2. = TRUE AND 3. <> TRUE AND	20 failures out of 40 samples 1 sample/25 ms	DTC Type B 2 trips
		learned			Diagnostic system disablement not requested (DiagSystemDisable)     AND     AFM Valve2 diagnostic PWM feedback not out-of-range low (AFM_Valve2DiagFdbkSt)     AND	4. <> DiagFdbkPrdLow AND		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Parameters	Enable Conditions	Time Required	MIL Illumination
					feedback signal not out-of-range high (AFM_Valve2DiagFdbkSt) AND 6. AFM Valve2 diagnostic PWM	5. <> DiagFdbkPrdHigh AND 6. <> DiagFdbkPrdInRngErr AND 7. <> Actuator Faulted		
Cylinder Deactivation Exhaust Flow Valve Actuator Performance (Bank2)	P12FF	feedback from AFM valve 2 to determine if an internal actuator fault is present or if the AFM valve is stuck in the end stop learning mode	OR 2. (AFM Valve2 Diagnostic Status AND AFM Valve Command)	OR 2. (= OpenEndStopLearned AND <> OpenEndStopLearn) OR 3. (=	(K_b_AFM_VIv2PerfDiagEnbl) AND	1. = TRUE AND	20 failures out of 40 samples 1 sample/25 ms	DTC Type B 2 trips
					(AFM_ValveInitDlyCmpt) AND 3. Diagnostic system disablement (DiagSystemDisable) AND 4. AFM exhaust valve control not disabled for remainder of trip due to output driver short circuit fault (AFMV_FaultTripDsbl) AND 5. Diagnostic PWM feedback signal AFM Valve2 not out-of-range low (AFM_Valve2DiagFdbkSt) AND 6. Diagnostic PWM feedback signal	2. = TRUE AND 3. <> TRUE AND 4. <> TRUE AND 5. <> DiagFdbkPrdLow AND 6. <> DiagFdbkPrdHigh AND		

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Component/	Fault	0,	Malfunction	Threshold		Enable	Time	MIL
System	Code	Description	Criteria	Value		Conditions	Required	Illumination
					7. ∆iagnostic PWM feedback Not out-of-			
					range low, Not out-of-range high AND not			
					within any of the calibrated feedback data	AND		
					range (AFM_Valve2DiagFdbkS) AND			
						8. <> FaultStIndeterminate		
					(AFM_Valve2DiagFdbkSt)			
Transmission Cooling Fan	D194C	Detects if the	Transmission Cooling Fan	== Faulted	Diagnostic enabled	1) == TRUE	10 FAILURES OUT	DTC Type B
Control Circuit Open	F 104C	transmission	Circuit status enumeration	== Faulteu		2] <> TRUE	OF 16 SAMPLES	2 trips
Control Circuit Open		cooling fan control	onean status enumeration			3] 9v < System V > 32v	OI TO ON WIN ELEC	Z tripo
		circuit is open			3] System Voltage		1sample / 500ms	
Transmission Cooling Fan	P184D	Detects if the	Transmission Cooling Fan	== Faulted		1) == TRUE	10 FAILURES OUT	, , ,
Control Circuit Low		transmission	Circuit status enumeration			2] <> TRUE	OF 16 SAMPLES	2 trips
		cooling fan control				3] 9v < System V > 32v		
		circuit is shorted to low			3] System Voltage		1sample / 500ms	
Transmission Cooling Fan	D10/E	Detects if the	Transmission Cooling Fan	== Faulted	Diagnostic enabled	1) == TRUE	10 FAILURES OUT	DTC Type P
Control Circuit High	F 104L	transmission	Circuit status enumeration	I aulteu		2] <> TRUE	OF 16 SAMPLES	2 trips
Control Choult riigh		cooling fan control	Onean status enameration			3] 9v < System V > 32v	OI TO ON WIN ELEC	Z tripo
		circuit is shorted to			3] System Voltage		1sample / 500ms	
		high			1 - 7			
Transmission Cooling Fan	P184F		Rear Powertrain Cooling	== Faulted		1) == TRUE	10 FAILURES OUT	DTC Type B
Performance		transmission	Fan Rationality Fault			2] <> TRUE	OF 16 SAMPLES	2 trips
		3	Status			3] 9v < System V > 32v		
		feedback is stuck			,	4) == TRUE	1sample / 500ms	
		in range				5) == On		
					5) Rear Powertrain Cooling Fan Status			
Ignition 1 Switch Circuit	P2534	Detects if the	Ignition 1 voltage	<= 6 V	Engine	Running	180 failures out of	DTC Type A
Low Voltage		Ignition1 Switch circuit is shorted to					200 samples	1 trip
		low or open					1 sample/25.0 ms	

Component/ System	Fault Code	0,	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illumination
Ignition 1 Switch Circuit High Voltage	P2535	Detects if the Ignition1 Switch circuit is shorted to vehicle supply voltage	Ignition 1 voltage	> 11.7 V	Ignition Run_Crank terminal	Off	180 failures out of 200 samples 1 sample/25.0 ms	DTC Type A 1 trip
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		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