Component/	Fault	Monitor Strategy	Malfunction		Thres	shold	Secondary	Enable		Time	е	Mil
System	Code	Description	Criteria		Val	lue	Malfunction	Conditions		Requi	red	Illum.
Transmission Control Module (TCM)	P0601	Transmission Electro- Hydraulic Control Module Read Only Memory	Incorrect program/calibrati ons checksum	=	TRUE	Boolean			>=	5	Fail Counts	One Trip
						Disable Conditions:	MIL not Illuminated for DTC's:					
Transmission Control Module (TCM)	P0603	Transmission Electro- Hydraulic Control Module Long-Term Memory Reset	Non-volatile memory (static or dynamic) checksum failure at Powerup	=	TRUE	Boolean			F	Runs Co	ontinously	One Trip
						Disable Conditions:						
Transmission Control Module (TCM)	P0604	Transmission Electro- Hydraulic Control Module Random Access Memory	RAM Read/Write Failure (Single Word)	=	TRUE	Boolean			>=	5	Fail Counts Sample	One Trip
						Disable Conditions:			=	16	Counts	
Transmission Control Module (TCM)	P062F	Transmission Electro- Hydraulic Control Module Long Term Memory Performance	TCM Non- Volatile Memory bit Incorrect flag at Powerdown	=	TRUE	Boolean			F	Runs Co	ontinously	One Trip

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria		Thres Val		Secondary Malfunction		Enable Condition			Time Requir		Mil Illum.
						Disable Conditions:	MIL not Illuminated for DTC's:	TCM: I						
Transmission Control Module (TCM)	P0634	Transmission Electro- Hydraulic Control Module Internal Temperature Too High	Fail Case Substrate 1 Temperature		42.1016	°C					>=	5	Fail Time (Sec)	One Trip
			Fail Substrate Case Temperature	>=	50	°C					>=	2	Fail Time (Sec)	
			Ignition Voltage  Note: either fail case can set the DTC		18	Volts	Ignition Voltage Lo	>=	8.6	Volts				
							Ignition Voltage Hi Substrate Temp Lo Substrate Temp Hi Substrate Temp Between Temp Range for Time	>= <= >=	32 0 170 0.25 Test Failed This Key On or Fault Active	Volts °C °C Sec				

Component/ System	Fault Code	Monitor Strategy  Description	Malfunction Criteria	Threshold Value	Secondary Malfunction	Enable Conditions	Time Required	Mil Illum.
- Systom	0040	2000	51.05114			TCM: None		
High Side Driver 1	P0658	Actuator Supply Voltage Circuit Low	The HWIO reports a low voltage (open or ground short) error flag	= TRUE Boolean			>= 4 Fail Counts  out 6 Sample Counts	One Trip
					P0658 Status is not	Test Failed This = Key On or Fault Active	o, Gourne	
				Disable Conditions:				
Transmission Control Module (TCM)	P0667	TCM Internal Temp (substrate) Sensor Circuit Range/Performance	If transmission oil temp to substrate temp Δ					Two Trips
			If TCM substrate temp to power up temp Δ	Refer to Table 20 in oC supporting documents				

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Malfunction		ible itions		Time Requir		Mil Illum.
Cystom	3340	Becompain		- 1445							
			Both conditions above required to increment fail counter					>=	3000	Fail Counts (100ms loop)	
			Note: table reference temp = to the median temp of trans oil temp, substrate temp and power up temp.					Out of	3750	Sample Counts (100ms loop)	
			Non-continuous (intermittent) fail conditions will delay resetting fail counter until					>=	700	Pass Counts (100ms loop)	
								Out of	875	Sample Counts (100ms loop)	
					Engine Torque Signal Valid	= TRU	E Boolean				
					Accelerator Position Signal Valid Ignition Voltage Lo	= TRU					
					Ignition Voltage Hi Engine Speed Lo Engine Speed Hi	>= 400	Volts RPM				
					Engine Speed is within the allowable limits for	>= 5	Sec				
					Brake torque active Below describes the brake torque entry criteria	= FALS	SE				
					Engine Torque Throttle	>= 90 >= 30					
					Transmission Input Speed	<= 200	) RPM				

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Malfunction	I	Enable Condition		Time Required	Mil Illum.
System	Code	Description	Citteria	Value	Vehicle Speed Transmission Range		8 Park	Kph	required	
					Transmission Range	≠	Neutral			
					РТО	=	Not Active			
					Set Brake Torque Active TRUE if above conditions are met for:	>=	7	sec		
					Below describes the brake torque exit criteria					
					Brake torque entry criteria	=	Not Met Clutch			
					Clutch hydraulic pressure	≠	Hydrau lic Air Purge Event CeTFT			
					Clutch used to exit brake torque active		D_e_C 3_Ratl Enbl			
					The above clutch pressure is greater than this value for one loop	>=	600	kpa		
					Set Brake Torque Active FALSE if above conditions are met for:	>=	20	Sec		
					P0667 Status is	≠	Test Failed This Key On or Fault Active			

Component/	Fault	Monitor Strategy	Malfunction	Threshold	Secondary	Enable	Time	Mil
System	Code	Description	Criteria	Value	Malfunction	Conditions	Required	Illum.
				Disabl Conditions		TCM: P0658, P0668, P0669, P06AD, P06AE, P0716, P0712, P0713, P0717, P0722, P0723, P0962, P0963, P0966, P0967, P0970, P0971, P215C, P2720, P2721, P2729, P2730  ECM: P0101, P0102, P0103, P0104, P0103, P0106, P0107, P0108, P0171, P0172, P0174, P0175, P0201, P0202, P0203, P0204, P0205, P0206, P0207, P0208, P0300, P0301, P0302, P0303, P0304, P0305, P0306, P0307, P0308, P0401, P042E		
Transmission Control Module (TCM)	P0668	TCM internal temperature (substrate) thermistor failed at a low voltge	Type of Sensor Used  If TCM Substrate Temperature Sensor = Direct Proportional and Temp If TCM Substrate Temperature Sensor = Indirect Proportional and Temp Either condition above will satisfy the fail		Ignition Voltage Lo Ignition Voltage Hi Engine Speed Lo Engine Speed Hi	<= 32 Volts >= 400 RPM	Fail >= 60 Time (Sec	r

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Thres Val		Secondary Malfunction	Enable Conditio			Time		Mil Illum.
- Cyclom		2000	5110111			Engine Speed is within the allowable limits for		Sec		•		
						P0668 Status is	Test Failed This ≠ Key On or Fault Active					
					Disable Conditions:		TCM: None ECM: None					
Transmission Control Module (TCM)	P0669	TCM internal temperature (substrate) thermistor failed at a high voltage	Type of Sensor Used	rectProp								Two Trips
			If TCM Substrate Temperature Sensor = Direct Proportional and Temp If TCM Substrate Temperature		°C							
			Sensor = Indirect Proportional and Temp	<= 249	°C							
			Either condition above will satisfy the fail						>=	60	Fail Timer (Sec)	
						Ignition Voltage Lo Ignition Voltage Hi Engine Speed Lo Engine Speed Hi Engine Speed is	>= 400	Volts Volts RPM RPM				
						within the allowable limits for	>= 5	Sec				

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Malfunction	Enable Conditions	Time Required	Mil Illum.
		•			P0669 Status is	Test Failed This ≠ Key On or Fault Active		
					For Hybrids, below conditions must also be met Estimated Motor Power Loss Estimated Motor	>= 0 kW		
					Power Loss greater than limit for time Lost Communication with Hybrid Processor Control Module	>= 0 Sec		
				Disable	Estimated Motor Power Loss Fault  MIL not Illuminated	= FALSE TCM: P0716, P0717,		
				Conditions:		P0722, P0723 ECM: None		
Transmission Control Module (TCM)	P06AC	TCM Power-up Temp Sensor Circuit Range/Performance	If TCM power-up temp to substrate temp Δ	Refer to Table 20 in °C supporting documents				Two Trips
			If transmission oil temp to power up temp Δ	Refer to Table 18 in °C supporting documents				

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Malfunction		Enable Condition			Time Requir		Mil Illum.
Gystem	Code	Description	Ontona	3 3 3 3								
			Both conditions above required to increment fail counter						>=	3000	Fail Counts (100ms loop)	
			Note: table reference temp = to the median temp of trans oil temp, substrate temp and power up temp.						Out of	3750	Sample Counts (100ms loop)	
			Non-continuous (intermittent) fail conditions will delay resetting fail counter until						>=	700	Pass Counts (100ms loop)	
									Out of	875	Sample Counts (100ms loop)	
					Engine Torque Signal Valid	=	TRUE	Boolean				
					Accelerator Position Signal Valid	=	TRUE	Boolean				
					Ignition Voltage Lo	>=	8.6	Volts	l			
					Ignition Voltage Hi Engine Speed Lo	<= >=	32 400	Volts RPM	l			
					Engine Speed Hi		7500	RPM	l			
					Engine Speed is within the allowable		_	0	l			
					within the allowable limits for	>=	5	Sec	l			
					Brake torque active	=	FALSE					
					Below describes the							
					brake torque entry criteria							
					Engine Torque	>=	90	N*m				
					Throttle	>=	30	Pct				
					Transmission Input Speed	<=	200	RPM				
					Vehicle Speed	<=	8	Kph				

Mil Illum.	Time Required		Enable Condition		Secondary Malfunction	Threshold Value	Malfunction Criteria	Monitor Strategy Description	Fault Code	Component/ System
	rtoquired	-	Park	<b>≠</b>	Transmission Range	Value	Officia	Description	Code	System
			Neutral		Transmission Range					
			Not Active	=	РТО					
		sec	7	>=	Set Brake Torque Active TRUE if above conditions are met for:					
					Below describes the brake torque exit criteria					
			Not Met	=	Brake torque entry criteria					
			Clutch Hydrau lic Air Purge Event		Clutch hydraulic pressure					
			CeTFT D_e_C 3_Ratl Enbl		Clutch used to exit brake torque active					
		kpa	600	>=	The above clutch pressure is greater than this value for one loop					
		Sec	20	>=	Set Brake Torque Active FALSE if above conditions are met for:					
			Test Failed This Key On or Fault Active	≠	P06AC Status is					
		000	Test Failed This Key On or Fault		met for:					

Component/	Fault	Monitor Strategy	Malfunction	Threshold	Secondary	Enable	Time	Mil
System	Code	Description	Criteria	Value	Malfunction	Conditions	Required	Illum.
				Disable Conditions		TCM: P0658, P0668, P0669, P0669, P06AD, P06AE, P0716, P0712, P0713, P0717, P0722, P0723, P0962, P0963, P0966, P0967, P0970, P0971, P215C, P2720, P2721, P2729, P2730  ECM: P0101, P0102, P0103, P0106, P0107, P0108, P0171, P0172, P0174, P0175, P0201, P0202, P0203, P0204, P0205, P0206, P0207, P0208, P0300, P0301, P0302, P0303, P0304, P0305, P0306, P0307, P0308, P0401, P042E		
Transmission Control Module (TCM)	P06AD	TCM power-up thermistor circuit voltage low	Power Up Temp	<= -59 °C	Ignition Voltage Lo Ignition Voltage Hi Engine Speed Lo Engine Speed Hi Engine Speed is within the allowable limits for  P06AD Status is  For Hybrids, below conditions must also be met Estimated Motor Power Loss	>= 400 RPM <= 7500 RPM >= 5 Sec Test Failed This ≠ Key On or Fault Active	>= 60 Time (Sec)	Two Trips

Component/	Fault	Monitor Strategy	Malfunction	Т	hreshold Value	Secondary Malfunction		Enable Conditio			Time Requir		Mil Illum.
System	Code	Description	Criteria		value	Estimated Motor Power Loss greater than limit for time Lost Communication with Hybrid	>=	0	Sec		Kequii	eu	mum.
						Processor Control Module Estimated Motor Power Loss Fault		FALSE					
					Disable Conditions:		TCM: P( P0722, ECM: N	P0723	0717,				
Transmission Control Module (TCM)	P06AE	TCM power-up thermistor circuit voltage high	Power Up Temp	>= 16	4 °C					>=	60	Fail Time (Sec)	Two Trips
		volkago (Ingil				Ignition Voltage Lo Ignition Voltage Hi Engine Speed Lo Engine Speed Hi Engine Speed is within the allowable limits for	>= <= >=	8.6 32 400 7500 5 Test Failed This Key On or	Volts Volts RPM RPM			(366)	
					Disable Conditions:	MIL not Illuminated for DTC's:							

Component/	Fault	Monitor Strategy	Malfunction	Threshold Value	Secondary Malfunction	Enable Conditions	Time Required	Mil Illum.
System  Transmission Fluid Temperature Sensor (TFT)	P0711	Description  Trans Fluid Temp Sensor Circuit Range/Performance	Criteria  If transmission oil temp to substrate temp $\Delta$	Refer to Table 19 in oC supporting	Waltunction	Conditions	Required	Two Trips
		rvange/i enomiance	If transmission oil temp to power up temp Δ	Refer to				
			Both conditions above required to increment fail counter Note: table				>= 3000 Fail Counts (100ms loop)	_
			reference temp = to the median temp of trans oil temp, substrate temp and power up temp.				Out of 3750 Sample Counts (100ms loop)	
			Non-continuous (intermittent) fail conditions will delay resetting fail counter until				>= 700 Pass Counts (100ms loop)	
							Out 875 Sample Counts (100ms loop)	
					Engine Torque Signal Valid Accelerator Position Signal Valid	= TRUE Boolean		

Component/	Fault	Monitor Strategy	Malfunction	Threshold	Secondary		Enable		Time	Mil
System	Code	Description	Criteria	Value	Malfunction		Conditio	ns	Required	Illum.
					Ignition Voltage Lo	>=	8.6	Volts		
					Ignition Voltage Hi	<=	32	Volts		
					Engine Speed Lo	>=	400	RPM		
					Engine Speed Hi	<=	7500	RPM		
					Engine Speed is					
					within the allowable	>=	5	Sec		
					limits for					
					Brake torque active		FALSE			
					Below describes the					
					brake torque entry					
					criteria					
					Engine Torque	>=	90	N*m		
					Throttle	>=	30	Pct		
					Transmission Input	<=	200	RPM		
					Speed	<=	200	IXE IVI		
					Vehicle Speed		8	Kph		
					Transmission Range	≠	Park			
					Transmission Range	≠	Neutral			
					РТО	=	Not Active			
					Set Brake Torque Active TRUE if above conditions are met for:	>=	7	sec		
					Below describes the					
					brake torque exit					
					criteria					
					Brake torque entry		Not			
					criteria	=	Met			
							Clutch			1
					Clutch hydraulic pressure	≠	Hydrau lic Air Purge			
							Event			I
							CeTFT			
					Clutch used to exit		D_e_C			
					brake torque active		3_Ratl			I
							Enbl			ĺ
					The above clutch					ĺ
					pressure is greater	>=	600	kpa		1
					than this value for					1
					one loop					

Component/	Fault	Monitor Strategy	Malfunction	Threshold Value	Secondary Malfunction	Enable Conditions	Time Required	Mil Illum.
System	Code	Description	Criteria	value	Set Brake Torque Active FALSE if above conditions are met for:  P0711 Status is	>= 20 Sec  Test Failed This	Required	
				Disable Conditions:		TCM: P0658, P0668, P0669, P06AD, P06AE, P0716, P0712, P0713, P0717, P0722, P0723, P0962, P0963, P0966, P0967, P0970, P0971, P215C, P2720, P2721, P2729, P2730  ECM: P0101, P0102, P0103, P0104, P0103, P0106, P0107, P0108, P0171, P0172, P0174, P0175, P0201, P0202, P0203, P0204, P0205, P0206, P0207, P0208, P0300, P0301, P0302, P0303, P0304, P0305, P0306, P0307, P0308, P0401, P042E		
Transmission Fluid Temperature Sensor (TFT)	P0712	Transmission fluid temperature thermistor failed at a low voltage	Type of Sensor Used If Transmission Fluid Temperature Sensor = Direct Proportional and Temp	rectProp				Two Trips

Component/	Fault	Monitor Strategy	Malfunction	Threshold	Secondary Malfunction	Enable Conditions	Time	Mil Illum.
System	Code	Description	Criteria	Value	Manufiction	Conditions	Required	mum.
			If Transmission Fluid Temperature Sensor = Indirect Proportional and	>= -74 °C				
			Temp Either condition above will satisfy the fail				Fail >= 60 Time (Sec)	
					Ignition Voltage Lo Ignition Voltage Hi Engine Speed Lo Engine Speed Hi Engine Speed is	<= 32 Volts >= 400 RPM <= 7500 RPM	()	
					within the allowable limits for			
					P0712 Status is	Failed This		
					For Hybrids, below conditions must also be met			
					Estimated Motor Power Loss Estimated Motor	>= 0 kW		
					Power Loss greater than limit for time Lost Communication			
					with Hybrid Processor Control Module	= FALSE		
					Estimated Motor Power Loss Fault	I = FALSE		
				Disable Conditions	MIL not Illuminated for DTC's:	TCM: P0716, P0717, P0722, P0723		
						ECM: None		

Component/	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Malfunction	Enable Conditions	Time Required	Mil Illum.
System Transmission Fluid Temperature Sensor (TFT)		Transmission fluid temperature thermistor failed at a high voltage	Type of Sensor Used	CeTFTI_e		Conditions	rtoquilou	Two Trips
			If Transmission Fluid Temperature Sensor = Direct Proportional and Temp	>= 174 °C				
			If Transmission Fluid Temperature Sensor = Indirect Proportional and Temp Either condition	<= 174 °C			Fail	
			above will satisfy the fail				>= 60 Time (Sec)	
					Ignition Voltage Lo Ignition Voltage Hi Engine Speed Lo Engine Speed Hi Engine Speed is within the allowable limits for	<= 32 Volts >= 400 RPM <= 7500 RPM >= 5 Sec  Test Failed This		
				Disable Conditions:		TCM: P0713, P0716, P0717, P0722, P0723 ECM: None		

Transmission Input  Pozzle Input Speed Sensor	Component/	Fault	Monitor Strategy	Malfunction	Threshold Value	Secondary Malfunction	l	Enabl Condition			Time		Mil Illum.
P0716   P071	System	Code	Description	Criteria		Walturiction		Condition	ons		Requir		
Engine Speed	Transmission Input Speed Sensor (TISS)	P0716		Input Speed	>= 900 RPM					>=	0.8	Time	
Active						Engine Torque is Engine Speed Engine Speed is within the allowable limits for Vehicle Speed is Throttle Position is Transmission Input Speed is The previous requirement has been satisfied for The change (loop to loop) in transmission input speed is The previous requirement has been satisfied for Throttle Position Signal Valid Engine Torque Signal Valid Ignition Voltage		8192 400 7500 5 10 0 0 8192 0 TRUE 8.6 32 Test Failed This Key On or Fault	N*m RPM RPM Sec Kph Pct RPM Sec  RPM/Loo p Sec Boolean Boolean Volts				
								ACTIVE					

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Thres Val		Secondary Malfunction	Enal Condi			Time Requir		Mil Illum.
					Disable Conditions:		TCM: P0717, P0973, P0974 ECM: P0101,	ļ				
							P0103, P012 <sup>2</sup> P0123					
Transmission Input Speed Sensor (TISS)	P0717	Input Speed Sensor Circuit Low Voltage	Fail Transmission Case Input Speed is		RPM				>=	4.5	Fail Time (Sec)	One Trip
			Fail When P0722 Case DTC Status equal to Test Failed and Transmission	< 653.125	RPM	Controller uses a single power supply for the speed sensors	= 1	Boolean				
						Engine Torque is Engine Torque is Vehicle Speed Engine Torque Signal Valid	<= 8192 >= 12 = TRUE	Kph Boolean				
						Ignition Voltage Ignition Voltage Engine Speed Engine Speed Engine Speed is	<= 32 >= 400 <= 7500	Volts Volts RPM RPM				
						within the allowable limits for	>= 5	Sec				
						P0717 Status is not	Test Failed This = Key On o Fault Active	d r				
					Disable Conditions:	MIL not Illuminated for DTC's:						

Component/	Fault	Monitor Strategy	Malfunction		Thr	eshold	Secondary		Enabl	е		Time	9	Mil
System	Code	Description	Criteria		V	alue	Malfunction		Condition	ons		Requi	ed	Illum.
Transmission Output Speed Sensor (TOSS)	P0722	Output Speed Sensor Circuit Low Voltage	Transmission Output Speed Sensor Raw Speed	<=	35	RPM					>=	4.5	Fail Time (Sec)	One Trip
							P0722 Status is not	=	Test Failed This Key On or Fault Active					
							Transmission Input Speed Check	=	TRUE	Boolean				
							Engine Torque Check	=	TRUE	Boolean				
							Throttle Position	>=	8	Pct				
							Transmission Fluid Temperature	>=	-40	°C				
							Disable this DTC if the PTO is active	=	1	Boolean				
							Engine Torque Signal Valid	=	TRUE	Boolean				
							Throttle Position Signal Valid	=	TRUE	Boolean				
							Ignition Voltage is	>=	8.6	Volts				
							Ignition Voltage is	<=	32	Volts				
							Engine Speed is	>=	400	RPM				
							Engine Speed is	<=	7500	RPM				
							Engine Speed is			_				
							within the allowable limits for	>=	5	Sec				
							Cookle Class							
							Enable_Flags Defined Below							
							The Engine Torque Check is TRUE, if either of the two following conditions are TRUE							
							Engine Torque Condition 1							

Component/	Fault	Monitor Strategy	Malfunction	Threshold	Secondary Malfunction		Enable Condition		Time	Mil Illum.
System	Code	Description	Criteria	Value	Walturiction			ons	Required	mum.
					Range Shift Status OR	≠	Range shift comple ted	ENUM		
					Transmission Range is	=	Park or Neutral			
					Engine Torque is Engine Torque is		8192 8192	N*m N*m		
					Engine Torque Condition 2 Engine Torque is Engine Torque is	>= <=	54 8192	N*m N*m		
					The Transmission Input Speed (TIS) Check is TRUE, if either of the two following conditions					
					are TRUE					
					Transmission Input Speed is	>=	653.1	RPM		
					Transmission Input Speed is	<=	5350	RPM		
					TIS Check Condition 2 Engine Speed					
					without the brake applied is Engine Speed with	>=	3200	RPM		
					the brake applied is Engine Speed is	>= <=	3200 8192	RPM RPM		
					Controller uses a single power supply for the speed sensors	=	1	Boolean		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria			shold Ilue	Secondary Malfunction		Enable Condition			Tim Requi		Mil Illum.
							Powertrain Brake Pedal is Valid	=	TRUE	Boolean				
						Disable Conditions:		P0723 ECM: F	P0101, P , P0121,	0102,				
Transmission Output Speed Sensor (TOSS)	P0723	Output Speed Sensor Circuit Intermittent	Transmission Output Speed Sensor Raw Speed	>=	105	RPM					>=	0	Enable Time (Sec)	One Trip
			Output Speed Delta	<=	8192	RPM					>=	0	Enable Time (Sec) Output Speed	
			Output Speed Drop	>	650	RPM					>=	1.5	Drop Recover y Fail Time (Sec)	
			AND Transmission Range is		Driven range (R,D)								,	
							Range_Disable	=	FALSE	See Below				
							Neutral_Range_Ena ble And	=	TRUE	See Below				
							Neutral_Speed_Ena ble are TRUE concurrently	=	TRUE	See Below				

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Malfunction		Enable Condition		Time Required	Mil Illum
-		-			Transmission_Rang e_Enable Transmission_Input_ Speed_Enable	=	TRUE TRUE	See Below See Below		
					No Change in Transfer Case Range (High <-> Low) for	>=	5	Seconds		
					P0723 Status is not	=	Test Failed This Key On or Fault Active			
					Disable this DTC if the PTO is active	=	1 8.6	Boolean Volts		
					Ignition Voltage is Ignition Voltage is Engine Speed is Engine Speed is	>= <= >= <=	32 400 7500	Volts RPM RPM		
					Engine Speed is within the allowable limits for	>=	5	Sec		
					Enable_Flags Defined Below					
					Transmission_Input_ Speed_Enable is TRUE when either TIS Condition 1 or TIS Condition 2 is TRUE:					
					TIS Condition 1 is TRUE when both of the following conditions are satsified for	>=	0	Enable Time (Sec)		
					Input Speed Delta Raw Input Speed	<= >=	4096 500	RPM RPM		

Component/	Fault	Monitor Strategy	Malfunction	Threshold	Secondary Malfunction	Enable	Time	Mil
System	Code	Description	Criteria	Value		Conditions	Required	Illum.
					TIS Condition 2 is			
					TRUE when ALL of			
					the next two conditions are			
					satisfied			
					Input Speed	= 0 RPM		
					A Single Power	- 0 111111		
					Supply is used for all	= TRUE Boolean		
					speed sensors			
					Neutral_Range_Ena			
					ble is TRUE when			
					any of the next 3			
					conditions are TRUE			
					Transmission Range is	= Neutral ENUM		
					10	Revers		
						e/Neut		
					Transmission Range	= ral ENUM		
					is	Transit		
						onal		
						Neutral		
					Transmission Range	= /Drive ENUM		
					is	i ransit		
						ional		
					And when a drop			
					occurs Loop to Loop Drop of			
					Transmission Output	> 650 RPM		
					Speed is	> 030 KT W		
					Range_Disable is			1 I
					TRUE when any of			
					the next three			
					conditions are TRUE			
					Transmission Range	= Park ENUM		
					IS			
					Transmission Range	Park/R everse		
					is	= ENUM		
					13	onal		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Malfunction	Enable Conditions	Time Required	Mil Illum.
,,,,,,		•			Input Clutch is not	ON (Fully Applie d)	NUM	
					Neutral_Speed_Ena ble is TRUE when All of the next three conditions are satsified for	> 1.5 Sec	conds	
					Transmission Output Speed	> 130 R	PM	
					The loop to loop change of the Transmission Output Speed is	< 20 R	PM	
					The loop to loop change of the Transmission Output Speed is	> -10 R	PM	
					Transmission_Rang e_Enable is TRUE when one of the next six conditions is TRUE			
					Transmission Range is	= Neutral EN	NUM	
					Transmission Range is	Revers e/Neut = ral EN Transit ional	NUM	
					Transmission Range is	Neutral /Drive Transit ional	NUM	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Malfunction	Enable Conditions	Time Required	Mil Illum.
					Time since a driven range (R,D) has been selected	>= to Sec	·	
					Transmission Output Speed Sensor Raw Speed Output Speed when a fault was detected	>= 500 RPM		
				Disable Conditions:	MIL not Illuminated for DTC's:	TCM: P0973, P0974, P0976, P0977 ECM: P0101, P0102, P0103, P0121, P0122, P0123		
Torque Converter Clutch (TCC)	P0741	TCC System Stuck OFF	TCC Pressure Either Condition (A) or (B) Must be Met	ŕ			Enable >= 2 Time (Sec)	Trips
			(A) TCC Slip Error @ TCC On Mode	>= Supporting RPM			Fail >= 5 Time (Sec)	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Malfunction	Ena Cond			Tim Requi		Mil Illum.
2,000		200	(B) TCC Slip @ Lock On Mode	. 420 DDM				>=	5	Fail Time (Sec)	
			If Above Conditions Have been Met, and Fail Timer Expired, Increment Fail Counter					>=	2	TCC Stuck Off Fail Counter	
					TCC Mode	= On o					
					Ignition Voltage Lo	>= 8.6	Volts				
					Ignition Voltage Hi		Volts RPM				
					Engine Speed Engine Speed						
					Engine Speed is within the allowable limits for	>= 5	Sec				
					Engine Torque Lo	>= 50	N*m				
					Engine Torque Hi	<= 819	2 N*m				
					Throttle Position Lo	>= 8	Pct				
					Throttle Position Hi 2nd Gear Ratio Lo	<= 100 >= 2.19					
					2nd Gear Ratio Lo	<= 2.19 <= 2.52					
					3rd Gear Ratio Lo	>= 1.42					
					3rd Gear Ratio High	<= 1.63					
					4th Gear Ratio Lo	>= 1.06					
					4th Gear Ratio High 5th Gear Ratio Lo	<= 1.23 >= 0.79					
					5th Gear Ratio Eo	<= 0.73					
					6th Gear Ratio Lo	>= 0.62	3 Ratio				
					6th Gear Ratio High	<= 0.71	7 Ratio				
					Transmission Fluid Temperature Lo	>= -6.65	6 °C				
					Transmission Fluid Temperature Hi	<= 130					
					PTO Not Active	= TRU	E Boolean				
					Engine Torque Signal Valid	= TRU	E Boolean				
					Throttle Position Signal Valid	= TRU	E Boolean				

Component/	Fault	Monitor Strategy	Malfunction	Threshold	Secondary Malfunction	Enable Conditions	Time	Mil Illum.
System	Code	Description	Criteria	Value	Dynamic Mode		Required	mum.
					P0741 Status is	Test Failed This		
				Disabl Conditions		TCM: P0716, P0717, P0722, P0723, P0742, P2763, P2764 ECM: P0101, P0102, P0103, P0106, P0107, P0108, P0171, P0172, P0174, P0175, P0201,		
						P0202, P0203, P0204, P0205, P0206, P0207, P0208, P0300, P0301, P0302, P0303, P0304, P0305, P0306, P0307, P0308, P0401, P042E		
Torque Converter Clutch (TCC)	P0742	TCC System Stuck ON	TCC Slip Speed	>= -50 RPM				One Trip
			TCC Slip Speed	<= 13 RPM				
			If Above				Fail >= 1.5 Time (Sec)	
			Conditions Have been Met, and Fail Timer Expired, Increment Fail Counter				>= 6 Fail Countel	ſ
					TCC Mode Enable test if Cmnd Gear = 1stFW and value true	= 1 Boolean		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Malfunction		Enable Condition		Time Required	Mil Illum.
					Enable test if Cmnd Gear = 2nd and value true	=	0	Boolean		
					Engine Speed Hi Engine Speed Lo Vehicle Speed HI Vehicle Speed Lo	<= >= <= >=	6000 500 511 1	RPM RPM KPH KPH		
					Engine Torque Hi Engine Torque Lo	<= >=	8192 80	Nm Nm		
					Current Range	<b>≠</b>	Neutral	Range		
					Current Range	<b>≠</b>	Revers e	Range		
					Transmission Sump Temperature	<=	130	°C		
					Transmission Sump Temperature	>=	18	°С		
					Throttle Position Hyst High AND	>=	5	Pct		
					Max Vehicle Speed to Meet Throttle	<=	8	KPH		
					Once Hyst High has been met, the enable will remain while Throttle	>=	2	Pct		
					Disable for Throttle Position	>=	75	Pct		
					Disable if PTO active and value true	=	1	Boolean		
					Disable if in D1 and value true	=	1	Boolean		
					Disable if in D2 and value true	=	1	Boolean		
					Disable if in D3 and value true	=	1	Boolean		
					Disable if in D4 and value true	=	1	Boolean		
					Disable if in D5 and value true	=	1	Boolean		
					Disable if in MUMD and value true	=	1	Boolean		

Component/	Fault	Monitor Strategy	Malfunction	Threshold	Secondary		Enable		Time	Mil
System	Code	Description	Criteria	Value	Malfunction		Condition	ons	Required	Illum.
					Disable if in TUTD	=	1	Boolean		
					and value true	_	1	Doolean		1
					4 Wheel Drive Low	_	EVICE	Boolean		1
					Active	=	FALSE	boolean		1
					Disable if Air Purge		0	Daalaaa		
					active and value	=	0	Boolean		
					RVT Diagnostic		E41.0E			
					Active	=	FALSE	Boolean		
					Ignition Voltage		8.6	V		1
					Ignition Voltage		32	V		1
					Vehicle Speed		511	KPH		
					Engine Speed		400	RPM		
					Engine Speed		7500	RPM		I
					Engine Speed is	`-	. 500	1 31 191		I
					within the allowable	>=	5	Sec		I
					limits for		0	000		1
					Engine Torque					
					Signal Valid	=	TRUE	Boolean		1
					Throttle Position					
						=	TRUE	Boolean		1
					Signal Valid		<b>-</b> .			
							Test			
							Failed			
							This			
					P0742 Status is	≠	Key			
							On or			
							Fault			
							Active			1
										1
				Disable	MIL not Illuminated	TCM:	P0716, P	0717,		
				Conditions:	for DTC's:	P0722	, P0723,	P0741,		
						P2763	8, P2764			1
							P0101, F			
						P0103	s, P0106,	P0107,		
							B, P0171,			
						P0174	, P0175,	P0201,		I
						P0202	, P0203,	P0204,		I
							, P0206,			I
							B, P0300,			
						P0302	, P0303,	P0304,		I
						P0305	, P0306,	P0307,		
						P0308	, P0401,	P042E		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria		Thres Val		Secondary Malfunction		Enable Condition			Tim Requi		Mil Illum.
Mode 2 Multiplex Valve	P0751	Shift Solenoid Valve A Stuck Off	Commaned Gear Slip Commanded Gear	>=	400 1st Lock	RPM				-		- 1	-	Two Trips
			Gear Ratio	<=	1.209595						>=	0.2	Fail Tmr	
			Gear Ratio If the above parameters are		1.09436						=	5	Fail Counts	
			true								<b>≠</b>	0	Neutral Timer (Sec) Fail	
											>=	0.3	Timer (Sec)	
							Ignition Voltage Lo Ignition Voltage Hi Engine Speed Lo Engine Speed Hi Engine Speed is within the allowable limits for Transmission Fluid Temperature Range Shift State	>= <= >= <= >= >=	8.6 32 400 7500 5 -6.656 Range Shift Completed	Volts Volts RPM RPM Sec	>=	8	Counts	
							TPS OR Output Speed Throttle Position Signal Valid from	>= >= =	0.5 67 TRUE	% RPM Boolean				
							ECM Engine Torque Signal Valid from ECM, High side High-Side Driver is Enabled		TRUE	Boolean				

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria		reshold /alue	Secondary Malfunction	Enable Conditions	Time Required	Mil Illum.
.,						Input Speed Sensor fault Output Speed Sensor fault Default Gear Option is not present	= FALSE Boolean = FALSE Boolean = TRUE		
					Disable Conditions:	MIL not Illuminated for DTC's:	P0722, P0723, P182E		
							ECM: P0101, P0102, P0103, P0106, P0107, P0108, P0171, P0172, P0174, P0175, P0201, P0202, P0203, P0204, P0205, P0206, P0207, P0208, P0300, P0301, P0302, P0303, P0304, P0305, P0306, P0307,		
							P0308, P0401, P042E		
Mode 2 Multiplex Valve	P0752	Shift Solenoid Valve A Stuck On	Gear Box Slip	>= 400	RPM				One Trip
			Commanded Gear		Gear				
			Commanded Gear has Achieved 1st Locked OR 1st Free-Wheel OR 2nd with Mode 2 Sol. Commanded On	= TRUE	E Boolean				
			If the above parameters are true						

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Malfunction	Ena Condi			Time Require		Mil Illum.
								>= S	Please Refer to Table 16 in Supporti ng Docume nts	Neutral Timer (Sec)	
			Command 4th Gear once Output Shaft	<= 400 RPM							
			If Gear Ratio And Gear Ratio	>= 3.825684							
			And Gear Railo	<= 4.220394				>=	1.5 5	Fail Timer (Sec) Counts	
					Ignition Voltage Lo	>= 8.6	Volts	/=	5	Courits	
					Ignition Voltage Hi		Volts				
					Engine Speed Lo Engine Speed Hi						
					Engine Speed in	<= 7500	KEIVI				
					within the allowable limits for	>= 5	Sec				
					High-Side Driver is Enabled	= TRU	Boolean				
					Throttle Position Signal Valid from ECM	= TRU	E Boolean				
					Output Speed OR	>= 67	RPM				
					TPS	>= 0.5 Rang					
					Range Shift State	= Shift Comp etect	ol EINOIVI				
					Transmission Fluid Temperature	>= -6.65					
					Input Speed Sensor fault	= FALS	E Boolean				

Component/	Fault	Monitor Strategy	Malfunction	Threshold	Secondary	Enable	Time	Mil
System	Code	Description	Criteria	Value	Malfunction	Conditions	Required	Illum.
					Output Speed Sensor fault Default Gear Option is not present	= FALSE Boolean = TRUE		
				Disable Conditions:	MIL not Illuminated for DTC's:	TCM: P0716, P0717, P0722, P0723, P182E		
						ECM: P0101, P0102, P0103, P0106, P0107, P0108, P0171, P0172, P0174, P0175, P0201, P0202, P0203, P0204, P0205, P0206, P0207, P0208, P0300, P0301, P0302, P0303, P0304, P0305, P0306, P0307, P0308, P0401, P042E		
Mode 2 Multiplex Valve	P0756	Shift Solenoid Valve B Stuck Off	<u>Fail</u> Commanded <u>Case</u> Gear	= 1st Locked				One Trip
			– Gear Box Slip	>= 400 RPM			Please Refer to Table 5 in Supporti ng Docume nts  Neutral Timer (Sec)	
			Intrusive Shift to 2nd Commanded Gear Previous	= 1st Locked Gear				
			Gear Ratio	<= 2.482178				
			Gear Ratio	>= 2.24585				

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Malfunction		Enable Condition			Tim Requi		Mil Illum.
		·	If the above parameters are true						>= >=	1 3	sec counts	
					Ignition Voltage Lo Ignition Voltage Hi Engine Speed Lo Engine Speed Hi Engine Speed is within the allowable limits for Output Speed OR TPS	>= <= >=	8.6 32 400 7500 5 67	Volts Volts RPM RPM Sec RPM	<i>&gt;</i> =	3	Counts	
					Range Shift State		Range Shift Compl eted	ENUM				
					Transmission Fluid Temperature High-Side Driver is Enabled	>=	-6.656 TRUE	°C Boolean				
					Throttle Position Signal Valid from ECM Input Speed Sensor	=	TRUE	Boolean				
					fault Output Speed Sensor fault	=		Boolean Boolean				
					Default Gear Option is not present	II	TRUE					

Component/	Fault	Monitor Strategy	Malfunction	Threshold	Secondary	Enable	Time	Mil
System	Code	Description	Criteria	Value	Malfunction	Conditions	Required	Illum.
				Disa Conditio	ole MIL not Illuminated for DTC's:	TCM: P0716, P0717, P0722, P0723, P182E		
						ECM: P0101, P0102, P0103, P0106, P0107, P0108, P0171, P0172, P0174, P0175, P0201, P0202, P0203, P0204, P0205, P0206, P0207, P0208, P0300, P0301, P0302, P0303, P0304, P0305, P0306, P0307, P0308, P0401, P042E		
Variable Bleed Solenoid (VBS)	P0776	Pressure Control (PC) Solenoid B Stuck Off [C35R]	Fail Case: Steady Case State 3rd Gear					One Trip
		[00011]	<u>·</u> Commanded Gear					
			Gearbox Slip	>= 400 RPM				
							Please Refer to Table 16 in Supporti ng Docume nts	
			Command 4th Gear once Output Shaft	<= 400 RPM				
			If Gear Ratio	>= 1.09436				
			And Gear Ratio	<= 1.209595			Fail	
							>= 3 Timer (Sec)	

Component/	Fault	Monitor Strategy	Malfunction	Threshold Value	Secondary Malfunction	Enable Conditions	Time Required	Mil Illum.
System	Code	Description	Criteria  It the above condiations are true, Increment 3rd gear fail counter	Value	Manufiction	Conditions	>= 3 Gear Fail Counts	mum.
			and C35R Fail counter				or 3-5R Clutch Fail Counts	
			<u>Fail</u> Case: Steady <u>Case</u> State 5th Gear					
			- Commanded Gear	= 5th Gear			Please Refer to	
			Gearbox Slip	>= 400 Rpm			Table 5 Table 5 in Timer Supporti ng Docume nts	
			Intrusive Test: Command 6th Gear					
			If attained Gear=6th gear Time	Please refer to Shift Time supporting documents				
			It the above condiations are true, Increment 5th gear fail counter				5th Sear Fail Counts or	

Component/	Fault	Monitor Strategy	Malfunction	Threshold	Secondary	1	Enable			Time		Mil
System	Code	Description	Criteria	Value	Malfunction		Conditio	ns		Requir		Illum.
			and C35R Fail counter						>=	14	3-5R Clutch Fail Counts	
					PRNDL State defaulted inhibit RVT IMS fault pending indication TPS validity flag Hydraulic System Pressurized Minimum output speed for RVT A OR B (A) Output speed enable (B) Accelerator Pedal enable Common Enable Criteria Ignition Voltage Lo Ignition Voltage Hi Engine Speed Lo Engine Speed Is within the allowable limits for Throttle Position Signal valid HSD Enabled Transmission Fluid Temperature	= = = = = = = = = = = = = = = = = = = =	FALSE FALSE TRUE TRUE 67 67 0.5  8.6 32 400 7500 5  TRUE TRUE TRUE -6.656	Boolean Boolean Boolean Boolean RPM RPM Pct  Volts Volts RPM RPM Sec  Boolean Boolean	\".	14	Fail	
					Input Speed Sensor fault Output Speed Sensor fault Default Gear Option is not present	= =		Boolean Boolean				

Component/	Fault	Monitor Strategy	Malfunction	Threshold	Secondary	Enable	Time	Mil
System	Code	Description	Criteria	Value	Malfunction	Conditions	Required	Illum.
				Disable Conditions:		TCM: P0716, P0717, P0722, P0723, P182E  ECM: P0101, P0102, P0103, P0106, P0107, P0108, P0171, P0172, P0174, P0175, P0201, P0202, P0203, P0204, P0205, P0206, P0207, P0208, P0300, P0301, P0302, P0303, P0304, P0305, P0306, P0307, P0308, P0401, P042E		
Variable Bleed Solenoid (VBS)	P0777	Pressure Control (PC) Solinoid B Stuck On [C35R] (Steady State)	Attained Gear slip  If the Above is True for Time  Intrusive test: (CBR1 clutch exhausted) Gear Ratio Gear Ratio If the above parameters are	>= 400 RPM  Table Based Time Please Enable Refer to Table 4 in supporting documents  <= 1.608643 >= 1.455444				One Trip
			true				Fail >= 1.1 Timer (Sec)	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Malfunction	Enable Conditions	Time Required	Mil Illum.
							Fail >= 2 Count in 1st Gear	
							or Total >= 3 Fail Counts	
			Fail Case: Steady Case State 2nd gear					
			Max Delta Output Speed Hysteresis	>= Refer to rpm/sec				
			Min Delta Output Speed Hysteresis	>= Refer to rpm/sec				

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Malfunction	Enable Conditions	Time Required	Mil Illum.
		·	If the Above is True for Time	Table Based Time Please Sec Refer to Table 17 in supporting documents				
			Intrusive test: (CB26 clutch exhausted)					
			Gear Ratio	<= 1.608643				
			Gear Ratio	>= 1.455444				
			If the above parameters are true					
							Fail >= 1.1 Timer (Sec) Fail	
							>= 3 Count in 2nd Gear	
							or Total >= 3 Fail Counts	
			Fail Case: Steady  Case State 4th gear					

Component/ System	Fault Code	Monitor Strategy  Description	Malfunction Criteria	Threshold Value	Secondary Malfunction	Enable Conditions	Time Required	Mil Illum.
•		·	Max Delta Output Speed Hysteresis	>= Refer to rpm/sec				
			Min Delta Output Speed Hysteresis	>= Refer to rpm/sec				
			If the Above is True for Time	Table Based Time Please Sec Refer to Table 17 in supporting documents				
			Intrusive test: (C1234 clutch exhausted)					
				<= 0.894653 >= 0.809448				

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Malfunction	Enable Conditions	Time Required	Mil Illum.
			If the above parameters are true				>= 1.1 Fail Timer (Sec) Fail Count in 4th Gear or Total >= 3 Fail Counts	
			Fail Case: Steady Case State 6th gear				Counts	-
			Max Delta Output Speed Hysteresis	>= Refer to rpm/sec				
			Min Delta Output Speed Hysteresis	>= Refer to rpm/sec				

Component/	Fault	Monitor Strategy	Malfunction	Threshold	Secondary	Enable		Tim		Mil
System	Code	Description	Criteria	Value	Malfunction	Conditions		Requi	red	Illum.
			If the Above is True for Time	Table Based Time Please Refer to Table 17 in supporting documents						
			Intrusive test: (CB26 clutch exhausted)						Fail	
			Gear Ratio	<= 0.894653			>=	1.1	Timer (Sec)	
			Gear Ratio	>= 0.809448			>=	3	counts	
			If the above parameters are true							
			udo				>=	1.1	Fail Timer (Sec) Fail	
							>=	3	Count in 6th Gear	
							>=	3	or Total Fail Counts	
					PRNDL State defaulted	= FALSE Boolean				
					inhibit RVT IMS fault pending indication	= FALSE Boolean = FALSE Boolean				
					output speed TPS validity flag HSD Enabled	>= 0 RPM = TRUE Boolear = TRUE Boolear				
					Hydraulic_System_P ressurized A OR B	= TRUE Boolear	1			

Component/	Fault	Monitor Strategy	Malfunction	Threshold	Secondary		Enable		Time	Mil
System	Code	Description	Criteria	Value	Malfunction		Condition	ons	Required	Illum.
					(A) Output speed enable	>=	67	Nm		
					(B) Accelerator	>=	0.5	Nm		
					Pedal enable Ignition Voltage Lo	>=	8.6	Volts		
					Ignition Voltage Hi		32	Volts		
					Engine Speed Lo		400	RPM		
					Engine Speed Hi		7500	RPM		
					Engine Speed is		_			
					within the allowable		5	Sec		
					limits for if Attained Gear=1st					
					FW Accelerator		5	Pct		
					Pedal enable		Ü	1 00		
					if Attained Gear=1st					
					FW Engine Torque		5	Nm		
					Enable					
					if Attained Gear=1st					
					FW Engine Torque		8192	Nm		
					Enable Transmission Fluid					
					Temperature		-6.656	°С		
					Input Speed Sensor		E41.0E			
					fault	=	FALSE	Boolean		
					Output Speed	=	FALSE	Boolean		
					Sensor fault		TALOL	Booloan		
					MIL not Illuminated	TCM:	P0716, P	0717,		
				Conditions:	for DTC's:	P0722	2, P0723,	P182E		
						ECM:	P0101, P	0102,		
							B, P0106,			
							3, P0171,			
							4, P0175, 2, P0203,			
							z, P0203, 5, P0206,			
							3, P0300,			
						P0302	2, P0303,	P0304,		
							5, P0306,			
						P0308	3, P0401,	P042E		1

Component/	Fault	Monitor Strategy	Malfunction	Threshold	Secondary	Enable	Time	Mil
System	Code	Description	Criteria	Value	Malfunction	Conditions	Required	Illum.
Variable Bleed Solenoid (VBS)	P0777	Pressure Control (PC) Solenoid B StuckOn [C35R] (Dymanic)	Primary Offgoing Clutch is exhausted (See Table 12 in Supporting Documents for Exhaust Delay Timers)	= TRUE Boolean				One Trip
			Primary Oncoming Clutch Pressure Command Status	= pressurize				
			Primary Offgoing Clutch Pressure Command Status	= exhaust				
			Range Shift Status	Control				
			Attained Gear Slip	<= 40 RPM				
			If the above conditions are true run appropriate Fail 1 Timers Below:					
			fail timer 1 (3-1 shifting with Closed Throttle) fail timer 1	>= 0.5 Fail Time (Sec)				
			(3-2 shifting with Throttle)	>= 0.299805 Fall Time				
			fail timer 1 (3-2 shifting with Closed Throttle)	(Sec)				
			fail timer 1 (3-4 shifting with Throttle)					
			fail timer 1 (3-4shifting with Closed Throttle)					

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Malfunction	Enable Conditions	Time Required	Mil Illum.
		·	fail timer 1 (3-5 shifting with Throttle)	>= 0.299805 Fall Time				
			fail timer 1 (3-5 shifting with Closed Throttle)	>= 0.5 Fall Time				
			fail timer 1 (5-3 shifting with Throttle)	>= 0.299805 Fall Time				
			fail timer 1 (5-3 shifting with Closed Throttle)	>= 0.5 Fall Time				
			fail timer 1 (5-4 shifting with Throttle)	>= 0.299805 Fall Time				
			fail timer 1 (5-4 shifting with Closed Throttle)	>= 0.5 Fall Time				
			fail timer 1 (5-6 shifting with Throttle)	>= 0.299805 Fall Time				
			fail timer 1 (5-6 shifting with Closed Throttle)	>= 0.5 Fall Time				

Component/	Fault	Monitor Strategy	Malfunction	Threshold Value	Secondary Malfunction	Enable Conditions	Time Required	Mil Illum.
System	Code	Description	Criteria	value	Manunction	Conditions	Required	mum.
			If Attained Gear Slip is Less than Above Cal Increment Fail Timers				Total Fail Time = (Fail 1 + Fail 2) See Enable Timers for Fail >= Timer 1, sec and Referenc e Supporti ng Table 15 for Fail Timer 2	
			If fail timer is greater than threshold increment corresponding gear fail counter and total fail counter					
			3rd gear fail counter				3rd gear >= 3 fail counts OR	
			5th gear fail counter				5th gear >= 3 fail counts	
			Total fail counter		T		OR >= 5 total fail counts	
					TUT Enable temperature	>= -6.656 °C		

Component/	Fault	Monitor Strategy	Malfunction	Threshold	Secondary Malfunction	Enable	Time	Mil Illum.
System	Code	Description	Criteria	Value	Input Speed Sensor	Conditions	Required	illum.
					fault	= FALSE Boolean		
					Output Speed Sensor fault	= FALSE Boolean		
					Command / Attained Gear	≠ 1st Boolean		
					High Side Driver ON	= TRUE Boolean		
					output speed limit for TUT	>= 100 RPM		
					input speed limit for TUT	>= 150 RPM		
					PRNDL state defaulted	= FALSE Boolean		
					IMS Fault Pending	= FALSE Boolean		
					Service Fast Learn Mode	= FALSE Boolean		
					HSD Enabled	= TRUE Boolean		
					Default Gear Option is not present	= TRUE		
				Disable Conditions:	MIL not Illuminated for DTC's:	TCM: P0716, P0717, P0722, P0723, P182E		
						ECM: P0101, P0102, P0103, P0106, P0107, P0108, P0171, P0172, P0174, P0175, P0201, P0202, P0203, P0204, P0205, P0206, P0207, P0208, P0300, P0301, P0302, P0303, P0304,		
						P0305, P0306, P0307, P0308, P0401, P042E		

Component/	Fault	Monitor Strategy	Malfunction	Threshold	Secondary	Enable	Time	Mil
System	Code	Description	Criteria	Value	Malfunction	Conditions	Required	Illum.
Variable Bleed Solenoid (VBS)	P0796	Pressure Control (PC) Solenoid C Stuck Off [C456] (Steady State)	Fail Case: Steady Case State 4th Gear					One Trip
			Gear slip Intrusive test:	>= 400 RPM			Please See Table 5 For Neutral Time Cal  Please Neutral Timer (Sec)	
			commanded 5th gear					
			If attained Gear ≠5th for time					
			if the above conditions have been met					
			Increment 4th Gear Fail Counter				>= 3 4th Gear Fail Count OR	
			and C456 Fail Counters				C456 >= 14 Fail Counts	
			Fail Case: Steady Case State 5th Gear					
			Gear slip	>= 400 RPM			Please See Table 5 For Neutral Neutral Time Cal	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Malfunction	Enable Conditions	Time Required	Mil Illum.
System	Code	Description	Intrusive test: commanded 6th gear		mananonon	Conditions	Required	
			If attained Gear ≠ 6th for time					
			if the above conditions have been met					
			Increment 5th Gear Fail Counter				>= 3 Gear Fail Count OR	
			and C456 Fail Counters				C456 >= 14 Fail Counts	
			Fail Case: Steady Case State 6th Gear					
			Gear slip	>= 400 RPM			Please See Table 5 For Neutral Timer (Sec) Time Cal	
			Intrusive test: commanded 5th gear					
			If attained Gear ≠ 5th for time	Please refer to Table 3 in Shift Time Supporting (Sec) Document s				

Component/	Fault	Monitor Strategy	Malfunction	Threshold Value	Secondary Malfunction		Enable Condition			Tim Requi		Mil Illum.
System	Code	Description	Criteria	value	Walluffelion		Conditio	ons		Requi	rea	mum.
			if the above conditions have been met Increment 6th Gear Fail Counter and C456 Fail						>=	3	6th Gear Fail Count	
			and C456 Fail Counter						>=	14	OR C456 Fail Counts	
					PRNDL State defaulted	=	FALSE	Boolean				
					inhibit RVT	=	FALSE	Boolean				
					IMS fault pending indication	=	FALSE	Boolean				
					TPS validity flag	=	TRUE	Boolean				
					Hydraulic System Pressurized	=	TRUE	Boolean				
					Minimum output speed for RVT A OR B	>=	67	RPM				
					(A) Output speed enable	>=	67	RPM				
					(B) Accelerator Pedal enable	>=	0.5	Pct				
					Common Enable Criteria							
					Ignition Voltage Lo Ignition Voltage Hi Engine Speed Lo Engine Speed Hi	>=	8.6 32 400 7500	Volts Volts RPM RPM				
					Engine Speed is within the allowable limits for	>=	5	Sec				
					Throttle Position Signal valid HSD Enabled	=		Boolean Boolean				
					Transmission Fluid Temperature	>=	-6.656	°С				
					Input Speed Sensor fault	=	FALSE	Boolean				

Component/	Fault	Monitor Strategy	Malfunction	Threshold	Secondary	Enable	Time	Mil
System	Code	Description	Criteria	Value	Malfunction	Conditions	Required	Illum.
					OutputSpeed Sensor fault Default Gear Option is not present	= FALSE Boolean = TRUE		
				Disable Conditions:	MIL not Illuminated for DTC's:	TCM: P0716, P0717, P0722, P0723, P182E		
						ECM: P0101, P0102, P0103, P0106, P0107, P0108, P0171, P0172, P0174, P0175, P0201, P0202, P0203, P0204,		
						P0205, P0206, P0207, P0208, P0300, P0301, P0302, P0303, P0304, P0305, P0306, P0307, P0308, P0401, P042E		
Variable Bleed Solenoid (VBS)	P0797	Pressure Control (PC) Solenoid C Stuck On [C456] (Steady State)	Fail Case: Steady Case State 1st Attained Gear	>= 400 RPM				One Trip
			If the Above is True for Time					
			Intrusive test: (CBR1 clutch exhausted) Gear Ratio	<= 1.209595				

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Malfunction	Enable Conditions	Time Required	Mil Illum.
			Gear Ratio If the above parameters are true					
							Fail >= 1.1 Timer (Sec)	
							Fail >= 2 Count in 1st Gear	
							or Total >= 3 Fail Counts	
			Fail Case Steady Case State 2nd					
			Max Delta Output Speed Hysteresis	>= Refer to rpm/sec				
			Min Delta Output Speed Hysteresis	>= Refer to rpm/sec				

Component/ System	Fault Code	Monitor Strategy  Description	Malfunction Criteria	Threshold Value	Secondary Malfunction	Enable Conditions	Time Required	Mil Illum.
		·	If the Above is True for Time	Table Based Time Please Sec Refer to Table 17 in supporting documents				
			Intrusive test: (CB26 clutch exhausted)					
				<= 1.209595				
			Gear Ratio If the above parameters are true					
							Fail >= 1.1 Timer (Sec) Fail	
							>= 3 Count in 2nd Gear or	
							>= 3 Total fail counts	
			Fail Case Steady  Case State 3rd					

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Malfunction	Enable Conditions	Time Required	Mil Illum.
Cycloni	9346	Бооприон	Max Delta Output	Table Based value Please >= Refer to rpm/sec				
			Min Delta Output Speed Hysteresis	>= Refer to rpm/sec				
			If the Above is True for Time	Table Based Time Please Sec Refer to Table 17 in supporting documents				
			Intrusive test: (C35R clutch exhausted)					
				>= 1.09436				

Component/	Fault	Monitor Strategy	Malfunction	Threshold Value	Secondary Malfunction	Enable Conditions	Time Required	Mil Illum.
System	Code	Description	Criteria  If the above parameters are true	Value	Malfunction	Conditions	Required  Fail  >= 1.1 Timer (Sec) Fail  >= 3 Count in 3rd Gear OR Total	
					PRNDL State defaulted inhibit RVT IMS fault pending indication output speed TPS validity flag HSD Enabled Hydraulic_System_P ressurized A OR B (A) Output speed enable (B) Accelerator Pedal enable Ignition Voltage Lo Ignition Voltage Hi Engine Speed Lo Engine Speed Hi Engine Speed is within the allowable limits for if Attained Gear=1st FW Accelerator Pedal enable if Attained Gear=1st FW Engine Torque Enable	= FALSE Boolea = FALSE Boolea = FALSE Boolea = FALSE Boolea = TRUE Boolea >= 67 Nm >= 0.5 Nm >= 8.6 Volts <= 32 Volts >= 400 RPM <= 7500 RPM >= 5 Sec >= 5 Pct		

Component/	Fault	Monitor Strategy	Malfunction	Threshold	Secondary	Enable	Time	Mil
System	Code	Description	Criteria	Value	Malfunction	Conditions	Required	Illum.
					if Attained Gear=1st FW Engine Torque Enable	<= 8192 Nm		
					Transmission Fluid Temperature	>= -6.656 %		
					Input Speed Sensor fault	= FALSE Boolean		
					Output Speed Sensor fault	= FALSE Boolean		
					Default Gear Option is not present			
				Disab Conditions	e MIL not Illuminated :: for DTC's:	TCM: P0716, P0717, P0722, P0723, P182E		
						ECM: P0101, P0102, P0103, P0106, P0107, P0108, P0171, P0172,		
						P0174, P0175, P0201, P0202, P0203, P0204, P0205, P0206, P0207,		
						P0208, P0300, P0301, P0302, P0303, P0304, P0305, P0306, P0307, P0308, P0401, P042E		
						1 0300, 1 0401, 1 0420		
			Primary Offgoing Clutch is					One Trip
Variable Bleed Solenoid (VBS)	P0797	Pressure Control (PC) Solenoid C Stuck On [C456] (Dynamic)	exhausted (See Table 11 in Supporting Documents for Exhaust Delay Timers)	= TRUE Boolean				
			Primary Oncoming Clutch Pressure Command Status	Maximum				

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Malfunction	Enable Conditions	Time Required	Mil Illum.
		·	Primary Offgoing Clutch Pressure Command Status	= exhaust				
			Range Shift Status					
			Attained Gear Slip					
			If the above conditions are true increment appropriate Fail 1 Timers Below:					
			fail timer 1 (4-1 shifting with throttle)	>= 0.299805 Fail Time (Sec)				
			fail timer 1 (4-1 shifting without throttle)	>= 0.5 Fail Time (Sec)				
			fail timer 1 (4-2 shifting with throttle)	>= 0.299805 Fail Time (Sec)				
			fail timer 1 (4-2 shifting without throttle)	>= 0.5 Fail Time (Sec)				
			fail timer 1 (4-3 shifting with throttle)	>= 0.299805 Fail Time				
			fail timer 1 (4-3 shifting without throttle)	(Sec)				
			fail timer 1 (5-3 shifting with throttle)	>= 0.299805 Fall Time				
			fail timer 1 (5-3 shifting without throttle)	(Sec)				
			fail timer 1 (6-2 shifting with throttle)					

Component/	Fault	Monitor Strategy	Malfunction	Threshold	Secondary Malfunction	Enable	Time	Mil Illum.
System	Code	Description	Criteria	Value	Manunction	Conditions	Required	mum.
			fail timer 1 (6-2 shifting without throttle)	>= 0.5 Fall Time				
			If Attained Gear Slip is Less than Above Cal Increment Fail Timers				Total Fail Time = (Fail 1 + Fail 2) See Enable Timers for Fail >= Timer 1, sec and Referenc e Supporti ng Table 15 for Fail Timer 2	
			If fail timer is greater than threshold increment corresponding gear fail counter and total fail counter					
			4th gear fail counter				Fail Counter >= 3 From 4th Gear OR	
			5th gear fail counter				Fail Counter >= 3 From 5th Gear OR	

Component/	Fault	Monitor Strategy	Malfunction	Threshold Value	Secondary Malfunction	Enable Conditions		Time Require	4	Mil Illum.
System	Code	Description	<b>Criteria</b> 6th gear fail counter	Value	Mananetten	Conditions	>=		Fail Counter From 6th Gear OR	
			Total fail counter				>=	5	Total Fail Counter	
					TUT Enable temperature	>= -6.656 °C				
					Input Speed Sensor fault Output Speed	= FALSE Boolean = FALSE Boolean				
					Sensor fault Command / Attained Gear	≠ 1st Boolean				
					High Side Driver ON output speed limit for	= TRUE Boolean >= 100 RPM				
					TUT input speed limit for TUT	>= 150 RPM				
					PRNDL state defaulted IMS Fault Pending	= FALSE Boolean = FALSE Boolean				
					Service Fast Learn Mode	= FALSE Boolean				
				Disable Conditions:	HSD Enabled  MIL not Illuminated  for DTC's:	= TRUE Boolean TCM: P0716, P0717, P0722, P0723, P182E				
						ECM: P0101, P0102, P0103, P0106, P0107, P0108, P0171, P0172, P0174, P0175, P0201,				
						P0202, P0203, P0204, P0205, P0206, P0207, P0208, P0300, P0301, P0302, P0303, P0304, P0305, P0306, P0307, P0308, P0401, P042E				

Component/	Fault	Monitor Strategy	Malfunction			shold	Secondary	1	Enable			Tim		Mil
System	Code	Description	Criteria		Va	lue	Malfunction		Condition	ons		Requi	red	Illum.
Variable Bleed Solenoid (VBS)	P0961	Pressure Control (PC) Solenoid A Control Circuit Rationality Test (Line Pressure VBS)	The HWIO reports an invalid voltage (out of range) error flag	=	TRUE	Boolean					>=	4.4	Fail Time (Sec)	Two Trips
											out of	5	Sample Time (Sec)	
							Ignition Voltage Ignition Voltage Engine Speed Engine Speed Engine Speed is within the allowable Iimits for	>=	8.6 32 400 7500	Volts Volts RPM RPM				
						Disable Conditions:	MIL not Illuminated for DTC's:	TCM:						
Variable Bleed Solenoid (VBS)	P0962	Pressure Control (PC) Solenoid A Control Circuit Low Voltage (Line Pressure VBS)	The HWIO reports a low voltage (ground short) error flag	=	TRUE	Boolean					>=	1.5	Fail Time (Sec)	One Trip
											out of	1.875	Sample Time (Sec)	
							Ignition Voltage Ignition Voltage Engine Speed Engine Speed Engine Speed is within the allowable	>=	8.6 32 400 7500	Volts Volts RPM RPM				
						Disable Conditions:	limits for  MIL not Illuminated for DTC's:		None					

Component/	Fault	Monitor Strategy	Malfunction Criteria	Threshold Value	Secondary Malfunction		able ditions		Tim Requi		Mil Illum.
Variable Bleed Solenoid (VBS)	P0963	Pressure Control (PC) Solenoid A Control Circuit High Voltage (Line Pressure VBS)	The HWIO reports a high voltage (open or power short) error flag	= TRUE Boolea		e >= 8.6 e <= 32 d >= 40 d <= 750	6 Volts 2 Volts 0 RPM	>= out of	4.4 5	Fail Time (Sec) Sample Time (Sec)	Two Trips
				Di Condii	within the allowable limits fo	e >= 5 r I TCM: None	Sec				
Variable Bleed Solenoid (VBS)	P0966	Pressure Control (PC) Solenoid B Control Circuit Low Voltage (C35R VBS)	The HWIO reports a low voltage (ground short) error flag	= TRUE Boolea				>= out of	0.3	Fail Time (Sec) Sample Time (Sec)	One Trip
					Ignition Voltage Ignition Voltage Engine Speed Engine Speed is within the allowable	e <= 32 d >= 40 d <= 750 e >= 5	Volts RPM RPM			(550)	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Malfunction	Enable Conditions	Time Required	Mil Illum.
- Cyclom					P0966 Status is not	Test Failed This = Key On or Fault Active	·	
				Disable Conditions:	MIL not Illuminated for DTC's:			
Variable Bleed Solenoid (VBS)	P0967	Pressure Control (PC) Solenoid B Control Circuit High Voltage (C35R VBS)	The HWIO reports a high voltage (open or power short) error flag	= TRUE Boolean			Fail >= 0.3 Time (Sec)	One Trip
							out Sample of 0.375 Time of (Sec)	
					Ignition Voltage Ignition Voltage Engine Speed Engine Speed Engine Speed is within the allowable limits for	<= 32 Volts >= 400 RPM <= 7500 RPM >= 5 Sec		
					P0967 Status is not	Test Failed This = Key On or Fault Active		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria			shold llue	Secondary Malfunction		ible itions		Time Requi		Mil Illum.
- Cycloni						Disable Conditions:	MIL not Illuminated for DTC's:	TCM: None ECM: None			•		
Variable Bleed Solenoid (VBS)	P0970	Pressure Control (PC) Solenoid C Control Circuit Low Voltage (C456/CBR1 VBS)	The HWIO reports a low voltage (ground short) error flag	=	TRUE	Boolean				>= out of	0.3	Fail Time (Sec) Sample Time (Sec)	One Trip
							P0970 Status is not  Ignition Voltage Ignition Voltage Engine Speed Engine Speed Engine Speed is within the allowable limits for	On Fau Actir >= 8.6 <= 32 >= 400 <= 750	ed s v or lt ve Volts Volts ORPM			(Sec)	
						Disable Conditions:	MIL not Illuminated for DTC's:	TCM: None ECM: None					
Variable Bleed Solenoid (VBS)	P0971	Pressure Control (PC) Solenoid C Control Circuit High Voltage (C456/CBR1 VBS)	The HWIO reports a high voltage (open or power short) error flag	=	TRUE	Boolean				>=	0.3	Fail Time (Sec)	One Trip
										out of	0.375	Sample Time (Sec)	

Component/	Fault	Monitor Strategy	Malfunction	Threshold	Secondary Malfunction	Enable Conditions	Time Poguired	Mil Illum.
System	Code	Description	Criteria	Value Disable Conditions:	P0971 Status is not  Ignition Voltage Ignition Voltage Engine Speed Engine Speed Engine Speed is within the allowable limits for  MIL not Illuminated for DTC's:	Test     Failed     This     = Key     On or     Fault     Active     >= 8.6 Volts     <= 32 Volts     >= 400 RPM     <= 7500 RPM     >= 5 Sec  TCM: None	Required	Illum.
Shift Solinoid	P0973	Shift Solenoid A Control Circuit Low (Mode 2 Solenoid)	The HWIO reports a low voltage (ground short) error flag	TDUE Declare		Test Failed This = Key On or Fault Active >= 8.6 Volts <= 32 Volts >= 400 RPM <= 7500 RPM >= 5 Sec	>= 1.2 Time (Sec)  out Sample of 1.5 Time (Sec)	One Trip

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria		eshold alue	Secondary Malfunction	Enable Conditions		Tim Requi		Mil Illum.
					Disable Conditions:	MIL not Illuminated for DTC's:					
Shift Solinoid	P0974	Shift Solenoid A Control Circuit High (Mode 2 Solenoid)	The HWIO reports a high voltage (open or power short) error flag	= TRUE	Boolean			>= out of	1.2	Fail Time (Sec) Sample Time (Sec)	Two Trips
						P0974 Status is not	Test Failed This = Key On or Fault Active				
						Ignition Voltage Ignition Voltage Engine Speed Engine Speed Engine Speed is within the allowable limits for	<= 32 Volts >= 400 RPM <= 7500 RPM >= 5 Sec				
					Disable Conditions:	MIL not Illuminated for DTC's:	TCM: None				
Mode 3 Multiplex Valve	P0977	Shift Solenoid B Control Circuit High (Mode 3 Solenoid)	The HWIO reports a high voltage (open or power short) error flag	= TRUE	Boolean			>=	1.2	Sec	One Trip
			3					out of	1.5	Sec	

Component/	Fault	Monitor Strategy	Malfunction	Threshold	Secondary Malfunction	Enable	Time	Mil Illum.
System	Code	Description	Criteria	Value	Maitunction	Conditions	Required	IIIum.
					P0977 Status is not	Test Failed This = Key On or Fault Active		
					Ignition Voltage Ignition Voltage Engine Speed Engine Speed Engine Speed is within the allowable limits for	>= 8.6 Volts <= 32 Volts >= 400 RPM <= 7500 RPM		
				Disable Conditions:		TCM: None ECM: None		
Internal Mode Switch (IMS)	P182E	Internal Mode Switch - Invalid Range	Fail Case 1 Current range	Transition = 1 (bit state Range 1110)				One Trip
			Previous range	CeTRGR_ ≠ e_PRNDL Range _Drive6				
			Previous range	CeTRGR_ ≠ e_PRNDL Range _Drive4				
			Range Shift State					
			Absolute Attained Gear					
			Attained Gear	<= Sixth				
			Attained Gear	>= First				

Component/	Fault	Monitor Strategy	Malfunction	Threshold	Secondary	Enable	Time	Mil
System	Code	Description	Criteria	Value	Malfunction	Conditions	Required	Illum.
			Throttle Position Available					
			Throttle Position	n >= 8.000183 pct				
			Output Speed	d >= 200 rpm				
			Engine Torque	e >= 50 Nm				
				e <= 8191.75 Nm				
			If the above conditions are met then Increment Fail Timer	e n il			Fail >= 1 Second s	
			If Fail Timer has Expired then Increment Fail Counter	n il			>= 5 Fail Counts	
			Fail Case Output Speed The following PRNDL sequence events occur in this exact order:	g L s s				
			PRNDL state	Drive 6 (bit				
			PRNDL state = Drive 6 for					
			PRNDL state	Transition e = 8 (bit state Range 0111)				
			PRNDL state	Drive 6 (bit e = state Range 0110)				

Component/	Fault	Monitor Strategy	Malfunction	Threshold Value	Secondary Malfunction	Enable Conditions	Time Required	Mil Illum.
System	Code	Description	Above sequencing occurs in	Transition = 1 (bit state Range 1110)	Malfunction	Conditions	Required	Illum.
			Neutral Idle If all conditions above are met Increment delay Timer If the below two conditions are met Increment Fail Timer delay timer				Fail >= 3 Second s	
			Input Speed If Fail Timer has Expired then Increment Fail Counter				>= 2 Fail Counts	
			Fail Case 3 Current range	Transition = 13 (bit Range state 0010)	Previous range	CeTR GR_e_ ≠ PRND L_Driv e2		
			Engine Torque	>= -8192 Nm	Previous range	CeTR GR_e_ ≠ PRND L_Driv e1		
			Engine Torque	<= 8191.75 Nm	IMS is 7 position configuration	= 1 Boolean		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Malfunction	Enable Conditions	Time Required	Mil Illum.
			If the above conditions are met then, Increment Fail Timer		If the "IMS 7 Position config" = 1 then the "previous range" criteria above must also be satsified when the "current range" = "Transition 13"		>= 0.225 Second s	
			If Fail Timer has Expired then Increment Fail Counter				>= 15 Fail Counts	
			Fail Case 4 Current range	Transition = 8 (bit state Range 0111)	Disable Fail Case 4 if last positive range was Drive 6 and current range is transition 8			
			Inhibit bit (see definition)	= FALSE	Set inhibit bit true if PRNDL = 1100 (rev) or 0100 (Rev-Neu transition 11) Set inhibit bit false if PRNDL = 1001 (park)			
			Steady State Engine Torque Steady State Engine Torque If the above	<= 8191.75 Nm	(1-5)			
			conditions are met then Increment Fail Timer				>= 0.225 Second s	
			If the above Condtions have been met, Increment Fail Counter				>= 15 Fail Counts	
			Fail Throttle Position Case Available					

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Malfunction	Enable Conditions	Time Required	Mil Illum.
		·	The following PRNDL sequence events occur in this exact order:					
			PRNDL State	1100)				
			PRNDL State	Transition = 11 (bit Range state 0100)				
			PRNDL State	Neutral (bit = state Range 0101)				
			PRNDL State	Transition = 11 (bit state 0100)				
			Above sequencing occurs in Then delay timer increments	<= 1 Sec				
			Delay timer	>= 5 sec				
			Range Shift State					
			Absolute Attained Gear					
			Attained Gear	<= Sixth				
			Attained Gear	>= First				
			Throttle Position	>= 8.000183 pct				
			Output Speed	>= 200 rpm				

Component/ System	Fault Code	Monitor Strategy  Description	Malfunction Criteria	Thresi Valu		Secondary Malfunction	Enable Condition			Time Requi		Mil Illum.
System	Code	Безсприон	If the above conditions are met Increment Fail Timer						>=	20	Second s	
			Fail Case 6 Current range	= Illegal (bit state 0000 or 1000 or 0001)		A Open Circuit Definition (flag set false if the following conditions are met):						
			and A Open Circuit			Current Range	Transit ion 11  ≠ (bit state 0100)					
			(See Definition)	= FALSE	Boolean	or	Noutral					
						Last positive state	Neutral (bit state 0101)					
						Previous transition state	Transit ion 8 ≠ (bit state 0111)					
						Fail case 5 delay timer	= 0	sec				
			If the above Condtions are met then, Increment Fail timer						>=	6.25	Second s	
			Fail Case Current PRNDL T State	_	Range							
			and Previous PRNDL state	PRNDL circuit ABCP =1111	Range							

Component/ System	Fault Code	Monitor Strategy  Description	Malfunction Criteria		Thres Va	shold ue	Secondary Malfunction		Enabl Condition			Time Requi		Mil Illum
,		·	Input Speed	>=	150	RPM								
			Reverse Trans Ratio	<=	2.845825	ratio								
			Reverse Trans Ratio	>=	3.27417	ratio								
			If the above Condtions are											
			met then,								>=	6.25	Second s	
			Increment Fail timer											=
			P182E will report											
			test fail when any											
			of the above 7 fail cases are											
							Ignition Voltage Lo		8.6	Volts				
							Ignition Voltage Hi Engine Speed Lo		32 400	Volts RPM				
							Engine Speed Hi	<=	7500	RPM				
							Engine Speed is within the allowable		5	Sec				
							limits for Engine Torque		TRUE	Boolean				
							Signal Valid		11102	Booloan				
							MIL not Illuminated	TCM: I	P0716, P	0717,				
						Conditions:	for DTC's:	P0722 P07BF	, P0723, F, P077C	P07C0, , P077D				
									P0101, I					
									, P0106, , P0171,					
								P0174	, P0175, , P0203,	P0201,				
								P0205	, P0206,	P0207,				
									, P0300, , P0303,					
								P0305	, P0306,					

Component/	Fault Code	Monitor Strategy	Malfunction Criteria			shold lue	Secondary Malfunction		Enable Condition			Time Require		Mil Illum.
System	Code	Description Internal Mode Switch	Criteria		Va	ilue	Mananction		Condition	J115		Require	<del></del>	One
Internal Mode Switch (IMS)	P1915	Doos Not Indicate	PRNDL State is	<b>≠</b>	Park or Neutral	Enumeratio n								Trip
		·	The following events must occur Sequentially											
			Initial Engine speed	<=	50	RPM					>=	0.25	Enable Time (Sec)	
			Then Engine Speed Between Following Cals Engine Speed Lo Hist		50	RPM								
			Engine Speed Hi Hist	<=	480	RPM					>= (	0.06875	Enable Time (Sec)	
			Then Final Engine Speed Final	>=	525	RPM							Fail	
			Transmission Input Speed		100	RPM					>=	1.25	Time (Sec)	
							DTC has Ran this Key Cycle?	=	FALSE	Boolean				
							Ignition Voltage Lo Ignition Voltage Hi	>= <=	6 32	V V				
							Ignition Voltage Hyst High (enables above this value)	>=	5	V				
							Ignition Voltage Hyst Low (disabled below this value) Transmission Output	<=	2	V				
							Speed	<=	90	rpm				

Component/	Fault	Monitor Strategy	Malfunction		shold	Secondary Malfunction	Enable		Time		Mil
System	Code	Description	Criteria	Va	lue	P1915 Status is	Test Failed This  ≠ Key On or Fault Active		Requir	red	Illum.
					Disable Conditions:	MIL not Illuminated for DTC's:					
Transmission Control Module (TCM)	P2534	Ignition Switch Run/Start Position Circuit Low	TCM Run crank active (based on voltage thresholds	= FALSE	Boolean						One Trip
			Ignition Voltage High Hyst (run crank goes true when above this value)	5	Volts			>=	280	Fail Counts (25ms loop)	
			Ignition Voltage Low Hyst (run crank goes false when below this value)	2	Volts			Out of	280	Sample Counts (25ms loop)	
			·			ECM run/crank active status ECM run/crank active status	= TRUE Boolean				
					Disable Conditions:	MIL not Illuminated for DTC's:					
Transmission Control Module (TCM)	P2535	Ignition Switch Run/Start Position Circuit High	TCM Run crank active (based on voltage thresholds	= TRUE	Boolean						One Trip

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria		eshold alue	Secondary Malfunction	Enable Condition		Time Require		Mil Illum.
			Ignition Voltage High Hyst (run crank goes true when above this value)	5	Volts			>=	280	Fail Counts (25ms loop)	
			Ignition Voltage Low Hyst (run crank goes false when below this value)	2	Volts			Out of	280	Sample Counts (25ms loop)	
			,			ECM run/crank active status ECM run/crank active status	= TRUE = FALSE				
					Disable Conditions:		TCM: None ECM: None				
Variable Bleed Solenoid (VBS)	P2714	Pressure Control (PC) Solenoid D Stuck Off [CB26]	Fail Case: Steady Case State 2nd Gear								One Trip
			Gear slip	>= 400	RPM				Please See Table 5 For Neutral Time Cal	Neutral Timer (Sec)	
			Intrusive test: commanded 3rd gear								

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Malfunction	Enable Conditions	Time Required	Mil Illum.
		·	If attained Gear = 3rd for Time	Table Based Time Please see Enable Table 2 in Time (Sec) Supporting Document s				
			If Above Conditions have been met					
			Increment 2nd gear fail count				2nd Gear >= 3 Fail Count or	
			and CB26 Fail Count				CB26 >= 14 Fail Count	
			Fail Case: Steady Case State 6th Gear  Gear slip				Please See Table 5 For Neutral (Sec) Time Cal	
			Intrusive test: commanded 5th gear					

Component/	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Malfunction		Enable			Time		Mil Illum.
System	Code	Description	Cilleria	¥ uluç			Jonata	J113		Acquii		
			If attained Gear = 5th For Time									
			If Above Conditions have been met, Increment 5th gear fail counter						>=	3	5th Gear Fail Count or	
			and CB26 Fail Count						>=	14	CB26 Fail Count	
					PRNDL State defaulted	=	FALSE	Boolean				
					inhibit RVT	=	FALSE	Boolean				
					IMS fault pending indication	=	FALSE	Boolean				
					TPS validity flag	=	TRUE	Boolean				
					Hydraulic System Pressurized	=	TRUE	Boolean				
					Minimum output speed for RVT	>=	0	RPM				
					A OR B (A) Output speed enable	>=	67	RPM				
					(B) Accelerator Pedal enable	>=	0.5	Pct				
					Common Enable Criteria							
					Ignition Voltage Lo Ignition Voltage Hi	>= <=	8.6 32	Volts Volts				
					Engine Speed Lo	>=	400	RPM				
					Engine Speed Hi	<=	7500	RPM				

Component/	Fault	Monitor Strategy	Malfunction	Threshold	Secondary	Ena		Time	Mil
System	Code	Description	Criteria	Value	Malfunction	Condi	tions	Required	Illum.
					Engine Speed is within the allowable limits fo	>= 5	Sec		
					Throttle Positior Signal valid	TRU	E Boolean		
					HSD Enabled Transmission Fluid Temperature	. 665	E Boolean 6 °C		
					Input Speed Senso	r _ EALS	E Boolean		
					Output Speed Sensor faul	t = FALS	E Boolean		
					Default Gear Option is not presen		≣		
					isable MIL not Illuminated	TCM: P0716,	P0717,		
				Cond	itions: for DTC's	: P0722, P072	3, P182E		
						ECM: P0101, P0103, P010	6, P0107,		
						P0108, P017 P0174, P017 P0202, P020	5, P0201,		
						P0205, P020 P0208, P030	6, P0207,		
						P0302, P0303 P0305, P0304 P0308, P040	6, P0307,		
			Primary Offgoing Clutch is						One Trip
Variable Bleed Solenoid (VBS)	P2715	Pressure Control (PC) Solenoid D Stuck On [CB26] (Dynamic)	exhausted (See Table 13 in Supporting Documents for Exhaust Delay	= TRUE Boole	an				
			Timers) Primary Oncoming Clutch Pressure Command Status	Maximum = pressurize d					

Component/ System	Fault Code	Monitor Strategy  Description	Malfunction Criteria	Threshold Value	Secondary Malfunction	Enable Conditions	Time Required	Mil Illum.
			Primary Offgoing Clutch Pressure Command Status	= exhaust				
			Range Shift Status	Control				
			Attained Gear Slip					
			If above coditons are true, increment appropriate Fail 1 Timers Below:					
			fail timer 1 (2-1 shifting with throttle)	>= 0.299805 Fail Time				
			fail timer 1 (2-1 shifting without throttle)	>= 0.5 Fail Time (Sec)				
			fail timer 1 (2-3 shifting with throttle)	>= 0.299805 Fail Time (Sec)				
			fail timer 1 (2-3 shifting without throttle)	>= 0.5 Fail Time (Sec)				
			fail timer 1 (2-4 shifting with throttle)	>= 0.299805 Fail Time (Sec)				
			fail timer 1 (2-4 shifting without throttle)	>= 0.5 Fail Time (Sec)				
			fail timer 1 (6-4 shifting with throttle)	>= 0.299805 Fail Time (Sec)				
			fail timer 1 (6-4 shifting without throttle)	>= 0.5 Fail Time (Sec)				
			fail timer 1 (6-5 shifting with throttle)					

Component/	Fault	Monitor Strategy	Malfunction	Threshold Value	Secondary Malfunction	Enable Conditions	Time Required	Mil Illum.
System	Code	Description	Criteria fail timer 1		Waltuffction	Conditions	Required	mum.
			(6-5 shifting without throttle)	>= 0.5 Fall Time				
			If Attained Gear Slip is Less than Above Cal Increment Fail Timers				Total Fail Time = (Fail 1 + Fail 2) See Enable Timers for Fail >= Timer 1, sec and Referenc e Supporti ng Table 15 for Fail Timer 2	
			If fail timer is greater than threshold increment corresponding gear fail counter and total fail counter					
			2nd gear fail counter				Fail Counter >= 3 From 2nd Gear OR	
			6th gear fail counter				Fail Counter >= 3 From 6th Gear	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Malfunction		Enable Condition			Tim Requi		Mil Illum
System	Code	Description	Ontena	Value			Oomanii			rtoqui	OR	
			total fail counter						>=	5	Total Fail Counter	
					TUT Enable temperature Input Speed Sensor	>=	-6.656	°C				
					fault Output Speed Sensor fault			Boolean Boolean				
					Command / Attained Gear High Side Driver ON	≠ =	1st TRUE	Boolean Boolean				
					output speed limit for TUT	>=	100	RPM				
					input speed limit for TUT PRNDL state	>=	150	RPM Boolean				
					defaulted IMS Fault Pending Service Fast Learn	=	FALSE	Boolean				
					Mode HSD Enabled	=		Boolean Boolean				
				Disable Conditions:	MIL not Illuminated for DTC's:	TCM: F P0722,	P0716, P P0723,	0717, P182E				
						P0103, P0108, P0174, P0202,	P0101, P P0106, P0171, P0175, P0203, P0206,	P0107, P0172, P0201, P0204,				
						P0208, P0302, P0305,	P0300, P0303, P0306, P0401,	P0301, P0304, P0307,				

Component/	Fault	Monitor Strategy	Malfunction	Threshold Value	Secondary Malfunction	Enable Conditions	Time	Mil Illum.
System	Code	Description	Criteria	value	Manufiction	Conditions	Required	
Variable Bleed Solenoid (VBS)	P2715	Pressure Control (PC) Solenoid D Stuck On [CB26] (Steady State)	Case Case: Steady State 1st					One Trip
			Attained Gear slip					
			If the Above is True for Time	Table Based Time Please Enable Refer to Time (Sec) Table 4 in supporting documents				
			Intrusive test: (CBR1 clutch exhausted)					
			Gear Ratio	<= 2.482178				
			Gear Ratio	>= 2.24585				
			If the above parameters are					
			true				Fail >= 1.1 Timer (Sec)	
							Fail >= 5 Count ii 1st Gea	
							or Total >= 5 Fail Counts	6
			Fail Case: Steady Case State 3rd Gear					

Component/ System	Fault Code	Monitor Strategy  Description	Malfunction Criteria	Threshold Value	Secondary Malfunction	Enable Conditions	Time Required	Mil Illum.
Oystem	Odde	Description	Max Delta Output Speed Hysteresis	Table Based value Please >= Refer to rpm/sec				
			Min Delta Output Speed Hysteresis	>= Refer to rpm/sec				
			If the Above is True for Time	Table Based Time Please Sec Refer to Table 17 in supporting documents				
			Intrusive test: (C35R clutch exhausted)					
				>= 2.24585				

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Malfunction	Enable Conditions	Time Required	Mil Illum.
		·	If the above parameters are true				>= 1.1 Fail >= 1.1 Timer (Sec) Fail Count in 3rd Gear or Total >= 5 Fail Counts	
			Fail Case: Steady Case State 4rd Gear  Max Delta Output Speed Hysteresis	Table Based value Please >= Refer to rpm/sec			Oduno	
			Min Delta Output Speed Hysteresis	>= Refer to rpm/sec				

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Malfunction	Enable Conditions	Time Required	Mil Illum.
			If the Above is True for Time	Table Based Time Please Sec Refer to Table 17 in supporting documents				
			Intrusive test: (C1234 clutch exhausted)					
			Gear Ratio	<= 0.700317				
			Gear Ratio	>= 0.633667				
			If the above parameters are true					
							Fail >= 1.1 Timer (Sec)	
							Fail Count in 4th Gear	
							or Total >= 5 Fail Counts	
			Fail Case: Steady Case State 5th Gear					

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Malfunction	Enable Conditions	Time Required	Mil Illum.
		•	Max Delta Output Speed Hysteresis	>= Refer to rpm/sec				
			Min Delta Output Speed Hysteresis	>= Refer to rpm/sec				
			If the Above is True for Time	Table Based Time Please Sec Refer to Table 17 in supporting documents				
			Intrusive test: (C35R clutch exhausted)					
				<= 0.700317 >= 0.633667				

Component/	Fault	Monitor Strategy	Malfunction Criteria	Threshold Value	Secondary Malfunction		nable nditions		Tim Requi		Mil Illum.
System	Code	Description	If the above	value	Walluffction	Co	nations		Kequi	rea	mum.
			parameters are true								
			uue					>=	1.1	Fail Timer (Sec)	
										Fail Count in	
								>=	3	5th Gear	
								>=	5	or Total Fail	
								_	3	Counts	
					PRNDL State defaulted	= F/	ALSE Boolean				
					inhibit RVT	= FA	ALSE Boolean	l			
					IMS fault pending indication	= FA	ALSE Boolean				
					output speed TPS validity flag		0 RPM RUE Boolean				
					HSD Enabled Hydraulic_System_P ressurized		RUE Boolean RUE Boolean				
					A OR B (A) Output speed enable	>=	67 Nm				
					(B) Accelerator Pedal enable	>=	0.5 Nm				
					Ignition Voltage Lo Ignition Voltage Hi		8.6 Volts 32 Volts				
					Engine Speed Lo	>= 4	100 RPM	1			
					Engine Speed Hi Engine Speed is	<= 7	500 RPM	1			
					within the allowable limits for	>=	5 Sec				
					if Attained Gear=1st FW Accelerator Pedal enable	>=	5 Pct				
					if Attained Gear=1st FW Engine Torque Enable	>=	5 Nm				

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Malfunction	Enable Conditions	Time Required	Mil Illum.
					if Attained Gear=1st FW Engine Torque Enable Transmission Fluid Temperature Input Speed Sensor fault Output Speed Sensor fault Default Gear Option is not present	<= 8192 Nm  >= -6.656 °C  = FALSE Boolean  = FALSE Boolean  - TRUE		
				Disable Conditions:		TCM: P0716, P0717, P0722, P0723, P182E  ECM: P0101, P0102, P0103, P0106, P0107, P0108, P0171, P0172, P0174, P0175, P0201, P0202, P0203, P0204, P0205, P0206, P0207, P0208, P0300, P0301, P0302, P0303, P0304, P0305, P0306, P0307, P0308, P0401, P042E		
Variable Bleed Solenoid (VBS)	P2720	Pressure Control (PC) Solenoid D Control Circuit Low (CB26 VBS)	The HWIO reports a low voltage (ground short) error flag	= TRUE Boolean			>= 0.3 Fail Time (Sec)  out	One Trip
					P2770 Status is not	Test Failed This = Key On or Fault Active		

Component/	Fault	Monitor Strategy	Malfunction	Threst		Secondary		Enable			Time		Mil
System	Code	Description	Criteria	Valu	ıe	Malfunction		Conditio	ns		Requi	red	Illum.
						Ignition Voltage Ignition Voltage Engine Speed Engine Speed Engine Speed is within the allowable limits for	>= <=	8.6 32 400 7500	Volts Volts RPM RPM				
					Disable Conditions:	MIL not Illuminated for DTC's:	TCM:						
Variable Bleed Solenoid (VBS)	P2721	Pressure Control (PC) Solenoid D Control Circuit High (CB26 VBS)	The HWIO reports a high voltage (open or power short) error flag	= TRUE	Boolean					>=	0.3	Fail Time (Sec)	One Trip
										out of	0.375	Sample Time (Sec)	
						P2721 Status is not	=	Test Failed This Key On or Fault Active					
						Ignition Voltage Ignition Voltage Engine Speed Engine Speed Engine Speed is within the allowable	<= >=	8.6 32 400 7500	Volts Volts RPM RPM				
					Disable Conditions:	limits for  MIL not Illuminated for DTC's:	TCM:   ECM:	None					

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Malfunction	Enable Conditions	Time Required	Mil Illum.
Variable Bleed Solenoid (VBS)	P2723	Pressure Control (PC) Solenoid E Stuck Off	Fail Case: Steady Case State 1st Gear					One Trip
			Gear slip	>= 400 RPM			Please See Table 5 For Neutral Neutral Time Cal	
			Intrusive test: commanded 2nd gear					
			If attained Gear ≠ 2nd for Time	Please refer to Table 3 in Shift Time Supporting (Sec) Document s				
			If Above Conditions have been met, Increment 1st gear fail counter				1st Gear >= 3 Fail Count	
			and C1234 fail counter				or C1234 Clutch >= 14 Fail Count	
			Fail Case: Steady Case State 2nd Gear					
			Gear slip	>= 400 RPM			Please See Table 5 For Neutral Neutral Timer (Sec) Time Cal	

Component/	Fault	Monitor Strategy	Malfunction	Threshold	Secondary Malfunction	Enable	Time	Mil Illum.
System	Code	Description	Criteria	Value	Mairunction	Conditions	Required	illum.
			Intrusive test: commanded 3rd gear					
			If attained Gear ≠ 3rd for Time	Please refer to Table 3 in Shift Time Supporting (Sec) Document S				
			If Above Conditions have been met, Increment 2nd gear fail counter				2nd Sear Sear Fail Count or	
			and C1234 fail counter				C1234 Clutch Fail Count	
			Fail Case: Steady  State 3rd Gear					
			Gear slip	>= 400 RPM			Please See Table 5 For Neutral Neutral Time Cal	
			Intrusive test: commanded 4th gear					
			If attained Gear ≠ 4th for time	Please refer to Table 3 in Shift Time Supporting (Sec) Document s				

Component/	Fault	Monitor Strategy	Malfunction	Threshold	Secondary	Enable	Time	Mil
System	Code	Description	Criteria	Value	Malfunction	Conditions	Required	Illum.
			If Above Conditions have been met, Increment 3rd gear fail counter				3rd Gear Fail Count	
			and C1234 fail counter				or C1234 Clutch Fail Count	
			Fail Case: Steady Case State 4th Gear					
			Gear slip	>= 400 RPM			Please See Table 5 For Neutral Neutral Time Cal	
			Intrusive test: commanded 5th gear					
			If attained Gear = 5th For Time	Please refer to Table 3 in Shift Time Supporting (Sec) Document s				
			If Above Conditions have been met, Increment 4th gear fail counter				4th Sear Fail Count	
			and C1234 fail counter		DDVD 6		or C1234 Clutch Fail Count	
					PRNDL State defaulted	= FALSE Boolean		

Component/	Fault	Monitor Strategy	Malfunction	Threshold Value	Secondary Malfunction				Time Required	Mil Illum.
System	Code	Description	Criteria	value					Required	mum.
					inhibit RVT	=	FALSE	Boolean		
					IMS fault pending indication	=	FALSE	Boolean		
					TPS validity flag	=	TRUE	Boolean		
					Hydraulic System Pressurized	=	TRUE	Boolean		
					Minimum output speed for RVT	>=	0	RPM		
					A OR B (A) Output speed enable	>=	67	RPM		
					(B) Accelerator Pedal enable	>=	0.5	Pct		
					Common Enable Criteria					
					Ignition Voltage Lo	>=	8.6	Volts		
					Ignition Voltage Hi		32 400	Volts		
					Engine Speed Lo		7500	RPM		
					Engine Speed Hi Engine Speed is	<=	7500	RPM		
	1 1				within the allowable		5	Sec		
					limits for	>=	5	Sec		
					Throttle Position Signal valid	=	TRUE	Boolean		
					HSD Enabled		TRUE	Boolean		
					Transmission Fluid Temperature	>=	-6.656	°C		
					Input Speed Sensor fault	=	FALSE	Boolean		
					Output Speed Sensor fault	=	FALSE	Boolean		
					Default Gear Option is not present	=	TRUE			

Component/	Fault	Monitor Strategy	Malfunction	Thres		Secondary	Enable	Time	Mil
System	Code	Description	Criteria	Val		Malfunction	Conditions	Required	Illum.
					Disable Conditions:	MIL not Illuminated for DTC's:	TCM: P0716, P0717, P0722, P0723, P182E		
							ECM: P0101, P0102, P0103, P0106, P0107, P0108, P0171, P0172, P0174, P0175, P0201, P0202, P0203, P0204, P0205, P0206, P0207, P0208, P0300, P0301, P0302, P0303, P0304, P0305, P0306, P0307, P0308, P0401, P042E		
Variable Bleed Solenoid (VBS)	P2724	Pressure Control (PC) Solenoid E Stuck On (Dynamic)	Primary Offgoing Clutch is exhausted (See Table 10 in Supporting Documents for Exhaust Delay Timers) Primary Oncoming Clutch Pressure	Maximum = pressurize					One Trip
			Command Status Primary Offgoing Clutch Pressure Command Status Range Shift Status Attained Gear Slip If the above conditions are	Clutch = exhaust command Initial	RPM				
			true increment appropriate Fail 1 Timers Below:						

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Malfunction	Enable Conditions	Time Required	Mil Illum.
		·	fail timer 1 (2-6 shifting with throttle)	>= 0.299805 sec				
			fail timer 1 (2-6 shifting without throttle)	>= 0.5 sec				
			fail timer 1 (3-5 shifting with throttle)	>= 0.299805 sec				
			fail timer 1 (3-5 shifting without throttle)	>= 0.5 sec				
			fail timer 1 (4-5 shifting with throttle)	>= 0.299805 sec				
			fail timer 1 (4-5 shifting without throttle)	>= 0.5 sec				
			fail timer 1 (4-6 shifting with throttle)	>= 0.299805 sec				
			fail timer 1 (4-6 shifting without throttle)	>= 0.5 sec				

Component/	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Malfunction	Enable Conditions	Time Required	Mil Illum.
System	Code	Description	If Attained Gear Slip is Less than Above Cal Increment Fail Timers	value		Conditions	Total Fail Time = (Fail 1 + Fail 2) See Enable Timers for Fail >= Timer 1, sec and Referenc e Supporti ng Table 15 for Fail Timer 2	
			If fail timer is greater than threshold increment corresponding gear fail counter and total fail counter  2nd gear fail counter				Fail Counter >= 3 From 2nd Gear	
			3rd gear fail counter				Fail Counter >= 3 From 3rd Gear	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Malfunction		Enable Condition			Tim Requ		Mil Illum.
			4th gear fail counter						>=	3	Fail Counter From 4th Gear	
			total fail counter						>=	5	Total Fail Counter	
		1			TUT Enable temperature		-6.656	°C				
		1			Input Speed Sensor fault		FALSE	Boolean				
					Output Speed Sensor fault	=	FALSE	Boolean				
		!			Command / Attained Gear		1st	Boolean				
	'	1	1	1	High Side Driver ON	=	TRUE	Boolean				
		1			output speed limit for TUT		100	RPM				
					input speed limit for TUT		150	RPM				
		1			PRNDL state defaulted		FALSE	Boolean				
	'	1	1	1	IMS Fault Pending	=	FALSE	Boolean				
	'	1			Service Fast Learn Mode	=	FALSE	Boolean				
1	'	1	1	1	HSD Enabled	=	TRUE	Boolean				
		'										

Component/	Fault	Monitor Strategy	Malfunction	Threshold	Secondary	Enable	Time	Mil
System	Code	Description	Criteria	Value	Malfunction	Conditions	Required	Illum.
System	Code	Description	Criteria		MIL not Illuminated for DTC's:	TCM: P0716, P0717, P0722, P0723, P182E ECM: P0101, P0102, P0103, P0106, P0107, P0108, P0171, P0172, P0174, P0175, P0201, P0202, P0203, P0204, P0205, P0206, P0207, P0208, P0300, P0301, P0302, P0303, P0304,	Required	mum.
Variable Bleed Solenoid (VBS)	P2724	Pressure Control (PC) Solenoid E Stuck On (Steady State)	Fail Case Case: 5th Gear  1  Max Delta Output Speed Hysteresis	Table Based value Please >= Refer to rpm/sec		P0305, P0306, P0307, P0308, P0401, P042E		One Trip
			Min Delta Output Speed Hysteresis	>= Refer to rpm/sec				

Component/ System	Fault Code	Monitor Strategy  Description	Malfunction Criteria	Threshold Value	Secondary Malfunction	Enable Conditions	Time Required	Mil Illum.
			If the Above is True for Time	Table Based Time Please Sec Refer to Table 17 in supporting documents				
			Intrusive test: (C35R clutch exhausted)					
			Gear Ratio	<= 1.209595				
			Gear Ratio	>= 1.09436				
			If the above parameters are true					
							Fail >= 1.1 Timer (Sec)	
							Fail Count in 5th Gear	
							OR Total >= 3 Fail Counts	
			<u>Fail</u> <u>Case</u> Case: 6th Gear <u>2</u>					

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Malfunction	Enable Conditions	Time Required	Mil Illum.
Cycloni	9346	Бооприон	Max Delta Output	Table Based value Please >= Refer to rpm/sec				
			Min Delta Output Speed Hysteresis	>= Refer to rpm/sec				
			If the Above is True for Time	Table Based Time Please Sec Refer to Table 17 in supporting documents				
			Intrusive test: (CB26 clutch exhausted)					
				<= 1.209595 >= 1.09436				

Component/	Fault	Monitor Strategy	Malfunction	Threshold Value	Secondary Malfunction		able ditions		Tim Requi		Mil Illum.
System	Code	Description	Criteria If the above	value	Manufiction	Cor	aitions		Kequi	rea	mum.
			parameters are true								
								>=	1.1	Fail Timer (Sec)	
								>=	3	Fail Count in 6th	
										Gear OR	
								>=	3	Total Fail Counts	
					PRNDL State defaulted		SE Boolean				
					inhibit RVT IMS fault pending indication		SE Boolean SE Boolean				
					output speed TPS validity flag	= TR	RPM UE Boolean UE Boolean				
					HSD Enabled Hydraulic_System_P ressurized		UE Boolean UE Boolean				
					A OR B (A) Output speed enable	>= 6	7 Nm				
					(B) Accelerator Pedal enable	>= 0					
					Ignition Voltage Lo Ignition Voltage Hi Engine Speed Lo	>= 8 <= 3 >= 4	2 Volts				
					Engine Speed Hi Engine Speed is	<= 75					
					within the allowable limits for	>=	5 Sec				
					if Attained Gear=1st FW Accelerator Pedal enable	>=	5 Pct				
					if Attained Gear=1st FW Engine Torque Enable	>=	5 Nm				

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Malfunction	Enable Conditions	Time Required	Mil Illum.
						<= 8192 Nm  >= -6.656 °C  = FALSE Boolean  = FALSE Boolean  = TRUE		
Variable Bleed Solenoid (VBS)	P2729	Pressure Control (PC) Solenoid E Control Circuit Low (C1234 VBS)	The HWIO reports a low voltage (ground short) error flag	= TRUE Boolean			>= 0.3 Tim (Se out Sam of 0.375 Tim (Se	ne Trip c) ple
					P2729 Status is not	On or Fault Active		~,

Component/	Fault	Monitor Strategy	Malfunction	Threshold	Secondary	Enable	Time	Mil
System	Code	Description	Criteria	Value	Malfunction	Conditions	Required	Illum.
					Ignition Voltage Engine Speed Engine Speed Engine Speed is within the allowable limits for	>= 400 RPM <= 7500 RPM >= 5 Sec		
				Disable Conditions:	MIL not Illuminated for DTC's:			
Variable Bleed Solenoid (VBS)	P2730	Pressure Control (PC) Solenoid E Control Circuit High (C1234 VBS)	The HWIO reports a high voltage (open or power short) error flag	= TRUE Boolean			Fail >= 0.3 Time (Sec)	One Trip
						Total	out Sample of 0.375 Time (Sec)	
					P2730 Status is not	Test Failed This = Key On or Fault Active		
					Ignition Voltage Ignition Voltage Engine Speed Engine Speed Engine Speed is within the allowable limits for	>= 8.6 Volt <= 32 Volt >= 400 RPM <= 7500 RPM >= 5 Sec		
				Disable Conditions:				

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria			shold lue	Secondary Malfunction		Enabl Condition			Tim Requi		Mil Illum.
Variable Bleed Solenoid (VBS)	P2763	Torque Converter Clutch Pressure High	The HWIO reports a low pressure/high voltage (open or power short) error flag	=	TRUE	Boolean					>=	4.4	Fail Time (Sec)	Two Trips
											out of	5	Sample Time (Sec)	
							P2763 Status is not	П	Test Failed This Key On or Fault Active					
							Ignition Voltage Ignition Voltage Engine Speed Engine Speed	<= >=	8.6 32 400 7500	Volt Volt RPM RPM				
							Engine Speed is within the allowable limits for High Side Driver	>=	5 TRUE	Sec Boolean				
						Disable Conditions:	Enabled  MIL not Illuminated for DTC's:		P0658, P					
Variable Bleed Solenoid (VBS)	P2764	Torque Converter Clutch Pressure Control Solenoid Control Circuit Low	The HWIO reports a high pressure/low voltage (ground short) error flag	=	TRUE	Boolean					>=	4.4	MPH	One Trip
			shorty chor hag								out of	5	MPH	

Component/	Fault	Monitor Strategy	Malfunction		eshold	Secondary Malfunction		nable		Tim		Mil
System	Code	Description	Criteria	Va	Disable Conditions:	Ignition Voltage Ignition Voltage Ignition Voltage Ignition Voltage Engine Speed Engine Speed Engine Speed is within the allowable limits for High Side Driver Enabled  MIL not Illuminated for DTC's:	T Fa	est siled chis key n or ault ctive 3.6 Volt 32 Volt 300 RPM 500 RPM 50		Requi	red	Illum.
Communication	U0073	Controller Area Network Bus Communication Error	CAN Hardware Circuitry Detects a Low Voltage Error		Conditions:		ECM: Non	e	>=	62	Fail counts (≈ 10 seconds ) Sample Counts	
			Delay timer	>= 0.1125		Stabilization delay Ignition Voltage Ignition Voltage Power Mode MIL not Illuminated for DTC's:	>= { <= : = F		Out	70	(≈ 11 seconds	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value		Secondary Malfunction	Enable Conditions			Time Required			Mil Illum.
Communication	U0100	Lost Communications with ECM (Engine Control Module)	CAN messages from ECM are not received by the TCM	=	TRUE Boolean					>=	12	sec	One Trip
						Stabilization delay Ignition Voltage Ignition Voltage Power Mode	>= <=	3 8.6 32 Run	sec Volt Volt				
					Disable Conditions:								

## **Supporting Documents - 2D Tables**

#### Table 1

Axis	0.00	64.00	128.00	192.00	256.00	320.00	384.00	448.00	512.00	N*m
Curve	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	RPM

#### Table 2

Axis	-6.67	-6.66	40.00	٥С
Curve	409.59	2.00	2.00	Sed

#### Table 3

Axis	-6.67	-6.66	40.00	٥С
Curve	409.59	4.00	4.00	Sec

#### Table 4

Axis	-6.67	-6.66	40.00	٥С
Curve	409.59	2.00	2.00	Sec

#### Table 5

Axis	-6.67	-6.66	40.00	٥С
Curve	409.59	3.00	3.00	Sec

#### Table 6

Axis	-6.67	-6.66	40.00	80.00	120.00 °C	;
Curve	409.00	3.60	1.60	1.40	1.40 Se	ЭС

#### Table 7

Axis	-6.67	-6.66	40.00	80.00	120.00	°C
Curve	409.00	3.40	1.40	1.30	1.20	Sec

# **Supporting Documents - 2D Tables**

#### Table 8

Axis	-6.67	-6.66	40.00	80.00	120.00 °C	
Curve	409.00	3.60	1.60	1.50	1.40 Sec	С

#### Table 9

Axis	-6.67	-6.66	40.00	80.00	120.00	٥С
Curve	409.00	3.30	1.30	1.20	1.10	Sec

#### Table 10

Axis	-40.00	-20.00	0.00	30.00	110.00	٥С
Curve	3.03	1.86	1.00	0.75	0.58	Sec

#### <u>Table 11</u>

Axis	-40.00	-20.00	0.00	30.00	110.00	٥С
Curve	1.72	1.11	0.60	0.36	0.22	Sec

#### Table 12

Axis	-40.00	-20.00	0.00	30.00	110.00	°C
Curve	2.12	1.39	0.84	0.64	0.33	Sec

#### Table 13

Axis	-40.00	-20.00	0.00	30.00	110.00	°C
Curve	2.51	0.95	0.50	0.29	0.13	Sec

#### Table 14

Axis	-40.00	-20.00	0.00	30.00	110.00	°C
Curve	2.97	0.82	0.47	0.20	0.13	Sec

# **Supporting Documents - 2D Tables**

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Axis	-40.00	-30.00	-20.00	-10.00	0.00	10.00	20.00	30.00	40.00 °C	2
Curve	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00 S	ec

#### **Table 16**

Axis	-6.67	-6.66	40.00	٥С
Curve	409.59	2.50	2.50	Sec

#### Table 17

Axis	-6.67	-6.66	40.00	٥С
Curve	0.40	0.35	0.30	Sec

#### Table 18

Axis	-40.10	-40.00	-20.00	0.00	30.00	60.00	100.00	149.00	149.10	°C
Curve	256.00	50.00	45.00	40.00	34.00	25.00	20.00	20.00	256.00	°C

#### Table 19

Axis	-40.10	-40.00	-20.00	0.00	30.00	60.00	100.00	149.00	149.10	οС
Curve	256.00	50.00	45.00	40.00	34.00	25.00	20.00	20.00	256.00 °	οС

#### Table 20

Axis	-40.10	-40.00	-20.00	0.00	30.00	60.00	100.00	149.00	149.10	٥С
Curve	256.00	10.00	8.00	8.00	8.00	8.00	8.00	8.00	256.00	٥С

#### **Table 21**

Axis	-40.00	-20.00	40.00	O,
Curve	5.00	3.00	1.00	Sec

# **Supporting Documents - 3D Tables**

#### 3D\_Table 1

X-Axis Calibration	%
Y-Axis Calibration	°C
Table Calibration	RPM/Sec

	0.00	2.00	5.00	25.00	100.00
-6.67	8191.75	8191.75	8191.75	8191.75	8191.75
-6.66	8191.75	8191.75	8191.75	8191.75	8191.75
40.00	8191.75	8191.75	8191.75	8191.75	8191.75

#### 3D\_Table 2

X-Axis Calibration	%
Y-Axis Calibration	°C
Table Calibration	RPM/Sec

	0.00	2.00	5.00	25.00	100.00
-6.67	8191.75	8191.75	8191.75	8191.75	8191.75
-6.66	500.00	500.00	300.00	300.00	300.00
40.00	500.00	500.00	300.00	300.00	300.00