Component/	Fault	Monitor Strategy	Malfunction		Thres		Secondary	Enable	Tir		Mil
System	Code	Description	Criteria		Val	ue	Malfunction	Conditions	Requ	iired	Illum.
Transmission Control Module (TCM)	P0601	Transmission Electro- Hydraulic Control Module Read Only Memory	Incorrect program/calibrations checksum		TRUE	Boolean			>= 5	Fail Counts	One Trip
						Disable Conditions:	MIL not Illuminated for DTC's:	TCM: P0601 ECM: None			
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			Runs Contino usly	)	One Trip
						Disable Conditions:	MIL not Illuminated for DTC's:	TCM: P0603 ECM: None			
Transmission Control Module (TCM)	P0604	Transmission Electro- Hydraulic Control Module Random Access Memory	RAM Read/Write Failure (Single Word)	=	TRUE	Boolean			>= 5	Fail Counts	One Trip
									= 16	Sample Counts	
						Disable Conditions:	MIL not Illuminated for DTC's:	TCM: P0604 ECM: None			
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			Runs Contino usly	)	One Trip

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria		Thresi Valu		Secondary Malfunction		nable nditions		Tin Requ		Mil Illum.
System	Code	Description	Cinteria		Valu		MIL not Illuminated for DTC's:		iditions		Requ	ired	mum.
Transmission Control Module (TCM)	P0634	Transmission Electro- Hydraulic Control Module Internal Temperature Too High	Fail Case Substrate Temperature	>=	142.10156	°C				>=	5	Fail Time (Sec)	One Trip
			Fail Case Substrate Temperature 2	>=	50	°C				>=	2	Fail Time (Sec)	
			Ignition Voltage  Note: either fail case can set the DTC		18	Volts							
							Ignition Voltage Lo Ignition Voltage Hi Substrate Temp Lo Substrate Temp Hi Substrate Temp Between Temp	<= 31.9 >= ( <= 17	999 Volts °C 0 °C				
							Range for Time	>= 0 Te Fai	st led Key or ult				
						Disable Conditions:	MIL not Illuminated for DTC's:	TCM: None ECM: 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				>=	3	Fail Counts	One Trip

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Malfunction	Enable Conditions		Tim Requ		Mil Illum.
							out of	5	Sample Counts	
					P0658 Status is not High Side Driver 1 On	Fault Active				
				Disable Conditions:	MIL not Illuminated for DTC's:	TCM: None ECM: None				
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 $\Delta$							
			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.				Ou t of	3750	Sample Counts (100ms loop)	

Component/	Fault	Monitor Strategy	Malfunction Criteria	Threshold	Secondary Malfunction		Enable			Time		Mil
System	Code	Description	Non-continuous	Value	wanunction		Condition	ons	, R	Requi	red Pass	Illum.
			(intermittent) fail conditions will delay resetting fail counter until						>= 7	700	Counts (100ms loop)	
									Ou t of	875	Sample Counts (100ms loop)	
					Engine Torque Signal Valid	=	TRUE	Boolean				
					Accelerator Position Signal Valid	=	TRUE	Boolean				
					Ignition Voltage Lo	>=	8.59961	Volts				
					Ignition Voltage Hi	<=	31.999	Volts				
					Engine Speed Lo Engine Speed Hi	>= <=	400 7500	RPM RPM				
					Engine Speed is within the allowable limits for	>=	5	Sec				
					Brake torque active	=	FALSE					
					Below describes the brake torque entry criteria							
					Engine Torque	>=	90	N*m				
					Throttle	>=	30.0003	Pct				
					Transmission Input Speed Vehicle Speed	<=	200 8	RPM Kph				
					Transmission Range	<= ≠	Park	крп				
					Transmission Range	<i>≠</i>	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					

Component/ System	Fault Code	Monitor Strategy  Description	Malfunction Criteria	Threshold Value	Secondary Malfunction	Enable Conditions	Time Required	Mil Illum.
					Clutch hydraulic pressure	Clutch Hydraulic ≠ Air Purge Event		
					Clutch used to exit brake torque active	CeTFTD_ = e_C3_Ra tlEnbl		
					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:			
					P0667 Status is	Test Failed This Key ≠ On or Fault Active		
				Disable Conditions:	MIL not Illuminated for DTC's:			
						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,		

Component/	Fault	Monitor Strategy	Malfunction	Threshold	Secondary	Enable	Time	Mil
System	Code	Description	Criteria	Value	Malfunction	Conditions	Required	Illum
						P0106, P0107, P0108, P0171,		
						P0172, P0174, P0175, P0201, P0202, P0203, P0204, P0205,		
						P0202, P0203, P0204, P0205, P0206, P0207, P0208, P0300,		
						P0301, P0302, P0303, P0304,		
						P0305, P0306, P0307, P0308,		
						P0401, P042E		
Transmission Control		TCM internal temperature		CeTFTI_e_				Two
Fransmission Control Module (TCM)		(substrate) thermistor failed	Type of Sensor Used	= VoltageDire				Trips
viodule (10ivi)		at a low voltge		ctProp				
			If TCM Substrate					
			Temperature Sensor =	<= -249 °C				
			Direct Proportional and					
			Temp					
			If TCM Substrate					
			Temperature Sensor =	>= -249 °C				
			Indirect Proportional and Temp					
			Tomp				F	
			Either condition above will				Fai >= 60 Tim	
			satisfy the fail conditions				(Se	
					Ignition Voltage Lo	>= 8.59961 Volts	,	<del>'</del>
					Ignition Voltage Hi			
					Engine Speed Lo			
					Engine Speed Hi			
					Engine Speed is within the	>= 5 Sec		
					allowable limits for	/- 5 Sec		
						Test		
						Failed		
					P0668 Status is	This Key		
					1 0000 010100 10	On or		
						Fault Active		
						VOUAG		

Component/	Fault	Monitor Strategy	Malfunction	Threshold	Secondary Malfunction	Enable	Time	Mil
System	Code	Description	Criteria	Value		Conditions	Required	Illum.
				Conditions	e MIL not Illuminated for DTC's: :	ECM: None		
Transmission Control Module (TCM)	P0669	TCM internal temperature (substrate) thermistor failed at a high voltage	Type of Sensor Used  If TCM Substrate Temperature Sensor = Direct Proportional and Temp  If TCM Substrate Temperature Sensor =	ctProp >= 249 °C				Two Trips
			Indirect Proportional and Temp  Either condition above will satisfy the fail conditions				Fail >= 60 Timer (Sec)	-
					Ignition Voltage Lo Ignition Voltage Hi Engine Speed Lo Engine Speed Hi Engine Speed is within the allowable limits for	<= 31.999 Volts >= 400 RPM <= 7500 RPM		-
					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 Power Loss greater than limit for time Lost Communication with Hybrid Processor Control Module	>= 0 kW >= 0 Sec		

Fault	Monitor Strategy	Malfunction	Threshold	Secondary	Enable	Time	Mil
Code	Description	Criteria	Value	Malfunction	Conditions	Required	Illum
				Estimated Motor Power Loss Fault	= FALSE		
			Disable Conditions:	MIL not Illuminated for DTC's:	TCM: P0716, P0717, P0722, P0723		
					ECM: None		
							Two Trips
		If transmission oil temp to power up temp $\Delta$					
		Both conditions above required to increment fail counter				>= 3000 Coun (100m	s Is
		= to the median temp of				Ou 3750 Count t of (100m	s s
		(intermittent) fail conditions will delay resetting fail				>= 700 Coun (100m	s Is
						Ou 875 Count t of (100m	s s
	Code P06AC	Code Description	Code       Description       Criteria         P06AC       TCM Power-up Temp Sensor Circuit Range/Performance       If TCM power-up temp to substrate temp Δ         If transmission oil temp to power up temp Δ         Both conditions above required to increment fail counter         Note: table reference temp = to the median temp of trans oil temp, substrate temp and power up temp.         Non-continuous (intermittent) fail conditions will delay resetting fail	Code       Description       Criteria       Value         P06AC       TCM Power-up Temp Sensor Circuit Range/Performance       If TCM power-up temp to substrate temp Δ       > Refer to Table 20 in supporting documents         If transmission oil temp to power up temp Δ       > Refer to Table 18 in supporting documents         Both conditions above required to increment fail counter       Note: table reference temp = to the median temp of trans oil temp, substrate temp and power up temp.         Non-continuous (intermittent) fail conditions	Code     Description     Criteria     Value     Malfunction       P06AC     TCM Power-up Temp Sensor Circuit Range/Performance     If TCM power-up temp to substrate temp \( \Delta \) = Table 20 in supporting documents     Refer to Table 20 in supporting documents       Both conditions above required to increment fail counter     Both conditions above required to increment fail counter       Note: table reference temp = to the median temp of trans oil temp, substrate temp and power up temp and power up temp.     Non-conditions above required to increment fail counter       Non-conditions alove in temp and power up temp and power up temp.     Non-conditions above required to increment fail counter       Non-conditions will delay resetting fail     Non-conditions above required to increment fail remp and power up temp.	Code         Description         Criteria         Value         Malfunction         Conditions           P06AC         TCM Power-up Temp Sensor Circuit Range/Performance         If TCM power-up temp to power up temp to power up temp to power up temp Δ         > Refer to Table 20 in supporting documents         TCM Power-up Temp Sensor Circuit Range/Performance         Both conditions above required to increment fail conditions above temp and power up temp Δ         Refer to Table 18 in supporting documents         TCM Power-up Temp A Description Reference temp a to the median temp of trans oil temp, substrate temp and power up temp.         Refer to Table 18 in supporting documents         TCM Power-up Temp A Description Reference temp and power up temp.         Refer to Table 18 in supporting documents         TCM Power-up Temp A Description Reference temp and power up temp.         Refer to Table 18 in supporting a Description Reference temp and power up temp.         TCM Power-up Temp A Description Reference temp and power up temp.         Refer to Table 18 in supporting a Description Reference temp and power up temp.         TCM Power-up Temp A Description Reference temp and power up temp.         TCM Power-up Temp A Description Reference temp and power up temp.         TCM Power-up Temp A Description Reference temp and power up temp.         TCM Power-up Temp A Description Reference temp and power up temp.         TCM Power-up Temp A Description Reference temp and power up temp.         TCM Power-up Temp A Description Reference temp and power up temp.         TCM Power-up Temp A Description Reference temp and power up temp.         TCM Power-up Temp A Description Reference temp and power up temp.         TCM P	Code         Description         Criteria         Value         Malfunction         Conditions         Required           POAC         TCM Power-up Temp Sensor Circuit Range/Performance         If ITCM power-up temp to substrate temp Δ substrate temp Δ focuments         Refer to Table 20 in Supporting of documents         TCM Power-up Temp Power up temp to Supporting of Countries         Refer to Table 20 in Supporting of Countries         Table 20 in Supporting of Countries         Temper to Table 18 in Supporting of Countries         Tempe

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Malfunction		Enable Conditio		Time Required	Mil Illum
					Accelerator Position Signal Valid		TRUE	Boolean		
					Ignition Voltage Lo	>=	8.59961	Volts		1
					Ignition Voltage Hi	<=	31.999	Volts		1
					Engine Speed Lo	>=	400	RPM		1
					Engine Speed Hi	<=	7500	RPM		
					Engine Speed is within the allowable limits for		5	Sec		
					Brake torque active	=	FALSE			
					Below describes the brake					1
					torque entry criteria					
					Engine Torque	>=	90	N*m		
					Throttle	>=	30.0003	Pct		1
					Transmission Input Speed	<=	200	RPM		
					Vehicle Speed	<=	8	Kph		
					Transmission Range		Park			
					Transmission Range	¥	Neutral			
					PTO	=	Not			
					PIO	=	Active			
					Set Brake Torque Active TRUE if above conditions are met for:		7	sec		
					Below describes the brake					1
					torque exit criteria					
					Brake torque entry criteria	=	Not Met			
					Clutch hydraulic pressure	≠	Clutch Hydraulic Air Purge Event			
					Clutch used to exit brake torque active	_ =	CeTFTD_ e_C3_Ra tlEnbl			
					The above clutch pressure is greater than this value for one loop	>=	600	kpa		

Component/ System	Fault Code	Monitor Strategy  Description	Malfunction Criteria	Thres Val		Secondary Malfunction	Enabl Conditi		R	Time equired	Mil Illum.
-						Set Brake Torque Active FALSE if above conditions are met for:		Sec		-	
						P06AC Status is	Test Failed This Key On or Fault Active				
					Disable Conditions:		TCM: P0658, P066 P06AD, P06AE, P0 P0713, P0717, P0 P0962, P0963, P0 P0970, P0971, P2 P2721, P2729, P2	0716, P0712, 722, P0723, 966, P0967, 15C, P2720,			
							ECM: P0101, P01 P0106, P0107, P0 P0172, P0174, P0 P0202, P0203, P0 P0206, P0207, P0 P0301, P0302, P0 P0305, P0306, P0 P0401, P042E	108, P0171, 175, P0201, 204, P0205, 208, P0300, 303, P0304,			
Transmission Control Module (TCM)	P06AD	TCM power-up thermistor circuit voltage low	Power Up Temp	<= -59	°C				>=	Fail Time	Two Trips
						Ignition Voltage Lo Ignition Voltage Hi Engine Speed Lo Engine Speed Hi Engine Speed is within the allowable limits for	<= 7500 >= 5	Volts Volts RPM RPM Sec			

Component/ System	Fault Code	Monitor Strategy  Description	Malfunction Criteria	Thresh Value		Secondary Malfunction		Enable Conditio			Time equired	Mil Illum.
System	Code	Description	Ontena	Value	5	P06AD Status is	<b>≠</b>	Test Failed This Key On or Fault Active	113	K		
						For Hybrids, below conditions must also be met Estimated Motor Power Loss Estimated Motor Power Loss greater than limit for time	>=	0	kW Sec			
						Lost Communication with Hybrid Processor Control Module Estimated Motor Power Loss	=	FALSE FALSE				
					Disable Conditions:		P0723		7, P0722,			
Transmission Control Module (TCM)	P06AE	TCM power-up thermistor circuit voltage high	Power Up Temp	>= 164	°C		ECM:	None		>= 6	0 Fail Time (Sec)	Two Trips
						Ignition Voltage Lo Ignition Voltage Hi Engine Speed Lo Engine Speed Hi Engine Speed is within the allowable limits for	>=	8.59961 31.999 400 7500	Volts Volts RPM RPM Sec			
						P06AE Status is	≠	Test Failed This Key On or Fault Active				

Component/ System	Fault Code	Monitor Strategy  Description	Malfunction Criteria	Threshold Value	Secondary Malfunction	Enable Conditions	Time Required	Mil Illum.
System	Code	Description	Ontena		MIL not Illuminated for DTC's:		Required	
Transmission Fluid Temperature Sensor (TFT)	P0711	Trans Fluid Temp Sensor Circuit Range/Performance	If transmission oil temp to substrate temp $\Delta$					Two Trips
			If transmission oil temp to power up temp $\Delta$					
			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.				Ou t of Sample Counts (100ms loop)	
			Non-continuous (intermittent) fail conditions will delay resetting fail counter until				>= 700 Pass Counts (100ms loop)	
							Ou Counts (100ms loop)	
					Engine Torque Signal Valid Accelerator Position Signal Valid Ignition Voltage Lo	= TRUE Boolean		

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Component/	Fault	Monitor Strategy	Malfunction	Threshold	Secondary		Enable		Time	Mil
System	Code	Description	Criteria	Value	Malfunction		Conditio		Required	Illum.
					Ignition Voltage Hi	<=	31.999	Volts		1
					Engine Speed Lo	>=	400	RPM		1
					Engine Speed Hi	<=	7500	RPM		1
					Engine Speed is within the allowable limits for	>=	5	Sec		
					Brake torque active	=	FALSE			1
					Below describes the brake torque entry criteria					
					Engine Torque	>=	90	N*m		1
					Throttle	>=	30.0003	Pct		1
					Transmission Input Speed	<=	200	RPM		1
					Vehicle Speed	<=	8	Kph		1
					Transmission Range	<b>≠</b>	Park			1
					Transmission Range		Neutral			1
							Not			1
					PTO	=	Active			
					Set Brake Torque Active TRUE if above conditions are met for:	>=	7	sec		
					Below describes the brake					
					torque exit criteria					1
					Brake torque entry criteria	=	Not Met			1
					Clutch hydraulic pressure	<b>≠</b>	Clutch Hydraulic Air Purge Event			
					Clutch used to exit brake torque active	=	CeTFTD_ e_C3_Ra tlEnbl			
					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		

Component/	Fault	Monitor Strategy	Malfunction	Threshold	Secondary	Enable	Time	Mil
System	Code	Description	Criteria	Value	Malfunction	Conditions	Required	Illum.
					P0711 Status is	Test Failed This Key ≠ On or Fault Active		
				Disable Conditions	MIL not Illuminated for DTC's:	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, 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	CeTFTI_e_ = VoltageDire ctProp				Two Trips
			If Transmission Fluid Temperature Sensor = Direct Proportional and Temp	∠− 7/ °C				
			If Transmission Fluid Temperature Sensor = Indirect Proportional and Temp	>= -74 °C				
			Either condition above will satisfy the fail conditions				>= 60 Fail Time (Sec)	;
					Ignition Voltage Lo	>= 8.59961 Volts		

Component/	Fault	Monitor Strategy	Malfunction		Thresi	nold	Secondary		Enable	)	Time	Mil
System	Code	Description	Criteria		Valu	ie	Malfunction		Conditio	ns	Required	Illum.
							Ignition Voltage Hi	<=	31.999	Volts		
							Engine Speed Lo	>=	400	RPM		
							Engine Speed Hi	<=	7500	RPM		
							Engine Speed is within the allowable limits for	>=	5	Sec		
							P0712 Status is	<b>≠</b>	Test Failed This Key On or Fault Active			
							For Hybrids, below conditions must also be met					
							Estimated Motor Power Loss	>=	0	kW		
							Estimated Motor Power Loss greater than limit for time		0	Sec		
							Lost Communication with Hybrid Processor Control Module	=	FALSE			
							Estimated Motor Power Loss Fault	=	FALSE			
						Disable Conditions:	MIL not Illuminated for DTC's:	TCM: I P0723		7, P0722,		
								ECM:	None			
Transmission Fluid Temperature Sensor (TFT)	P0713	Transmission fluid temperature thermistor failed at a high voltage	Type of Sensor Used		CeTFTI_e_ VoltageDire ctProp							Two Trips
			If Transmission Fluid Temperature Sensor = Direct Proportional and Temp	>=	174	°C						
			If Transmission Fluid Temperature Sensor = Indirect Proportional and Temp	<=	174	°C						

Component/	Fault	Monitor Strategy	Malfunction	Threshold	Secondary	Enable	Time	Mil
System	Code	Description	Criteria	Value	Malfunction	Conditions	Required	Illum
			Either condition above will satisfy the fail conditions				>= 60 Fail Tin	
					Ignition Voltage Lo Ignition Voltage Hi Engine Speed Lo Engine Speed Hi Engine Speed is within the allowable limits for	i <= 31.999 Volts >= 400 RPM i <= 7500 RPM  >= 5 Sec  Test Failed This Key		
				Disab Condition	le MIL not Illuminated for DTC's: s:	Fault Active		
ransmission Input Speed Sensor (TISS)	P0716	Input Speed Sensor Performance	Transmission Input Speed Sensor Drops	>= 900 RPM			>= 0.8 Fail Tin (Sec)	
					Engine Torque is Engine Torque is Engine Speed Engine Speed Engine Speed is within the allowable limits for Vehicle Speed is Throttle Position is Transmission Input Speed is The previous requirement has	s       <=		

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Component/ System	Fault Code	Monitor Strategy  Description	Malfunction Criteria	Thres Val		Secondary Malfunction		nable nditions	Time Required	Mil Illum.
- Oystelli	Odde	Description	Ontena	Val		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 Ignition Voltage P0716 Status is not	< 819 >= ( = TR = TR >= 8.59 <= 31.  Te Fai This = Or Fa	1.88 RPM/Loop  Sec  UE Boolean Boolean Volts Volts Set led Key or ult ive	rveyuneu	
Transmission Input Speed Sensor (TISS)	P0717	Input Speed Sensor Circuit Low Voltage	Fail Case Transmission Input Speed	< 67	RPM		ECM: P0101 P0121, P012	, P0102, P0103, 2, P0123	>= 4.5 Fail T	
			Fail When P0722 DTC Status Case equal to Test Failed and Transmission Input Speed is		RPM	Controller uses a single power supply for the speed sensors	= ′	l Boolean		
						Engine Torque is Engine Torque is Vehicle Speed Engine Torque Signal Valid Ignition Voltage Ignition Voltage Engine Speed	<= 819 >= 1 = TR >= 8.59 <= 31.	6 Kph UE Boolean 1961 Volts		

Component/	Fault	Monitor Strategy	Malfunction	Threshold	Secondary		Enable			me	Mil
System	Code	Description	Criteria	Value	Malfunction		Condition		Requ	uired	Illum
					Engine Speed		7500	RPM			
					Engine Speed is within the allowable limits for		5	Sec			
					P0717 Status is not	=	Test Failed This Key On or Fault Active				
				Disabl Conditions	e MIL not Illuminated for DTC's:		P0722, P072 P0101, P010				
Fransmission 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		8.00018	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		8.59961	Volts			
					Ignition Voltage is		31.999	Volts			
					Engine Speed is		400	RPM			
					Engine Speed is	<=	7500	RPM			

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Component/	Fault	Monitor Strategy	Malfunction	Threshold	Secondary	Enable	Time	Mil
System	Code	Description	Criteria	Value	Malfunction	Conditions	Required	Illum.
					Engine Speed is within the	>= 5 Sec		
					allowable limits for			
					Enable Flore Defined Polesy			_
					Enable_Flags Defined Below			
					The Engine Torque Check is			
					TRUE, if either of the two			
					following conditions are TRUE			
					lonowing containone are Tree			
					Engine Torque Condition 1			
					Engine resque contaitem s	Range		
						chift		
					Range Shift Status	≠ complete ENUI	1	
						d		
					OR			
						Park or		
					Transmission Range is	= Neutral		
					Engine Torque is			
					Engine Torque is			
					Lingino rorquo io	0101110		
					Engine Torque Condition 2			
					Engine Torque is			
					Engine Torque is			
						0.00		
					The Transmission Input Speed			
					(TIS) Check is TRUE, if either of			
					the two following conditions are			
					TRUE			
					TIS Check Condition 1		1	
					Transmission Input Speed is	>= 653.125 RPM		
					Transmission Input Speed is			
					, ,		1	
					TIS Check Condition 2		1	
					Engine Speed without the brake	0000	1	
					applied is	>= 3200 RPN	1	
					Engine Speed with the brake	. 2002	1	
					applied is		1	

Component/	Fault	Monitor Strategy	Malfunction	Th	hreshold	Secondary		Enab	le		Tir	ne	Mil
System	Code	Description	Criteria		Value	Malfunction		Condit		ı	Requ		Illum.
						Engine Speed is  Controller uses a single power supply for the speed sensors  Powertrain Brake Pedal is Valid	=	8191.88 1 TRUE	RPM Boolean Boolean				
					Disable Conditions:		ECM:		102, P0103,				
Transmission Output Speed Sensor (TOSS)	P0723	Output Speed Sensor Circuit Intermittent	Transmission Output Speed Sensor Raw Speed	>= 10	05 RPM					>=	0	Enable Time (Sec)	One Trip
			Output Speed Delta	<= 81	92 RPM					>=	0	Enable Time (Sec)	
			Output Speed Drop	> 65	50 RPM					>=	1.5	Output Speed Drop Recover y Fail Time (Sec)	
			AND										
			Transmission Range is	= Driv range	ven (R,D)								
						Range_Disable OR		FALSE	See Below				
						Neutral_Range_Enable And				ı			
		l				Neutral_Speed_Enable	=	TRUE	See Below				

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Component/	Fault	Monitor Strategy	Malfunction	Threshold	Secondary	Enable	Time	Mi
System	Code	Description	Criteria	Value	Malfunction	Conditions	Required	IIIu
					are TRUE concurrently			Т
					Transmission_Range_Enable	= TRUE See E	Below	
					Transmission_Input_Speed_En able		Below	
					No Change in Transfer Case Range (High <-> Low) for		onds	
					P0723 Status is not	Test Failed This Key On or Fault Active		
					Disable this DTC if the PTO is active	<b>1</b> 1 Boo	lean	
					Ignition Voltage is	>= 8.59961 Vo	Its	
					Ignition Voltage is	<= 31.999 Vo	lts	1
					Engine Speed is	>= 400 RF	PM	1
					Engine Speed is	<= 7500 RF	PM	
					Engine Speed is within the allowable limits for	\ E 0.	ес	
					Enable_Flags Defined Below			
					Transmission_Input_Speed_En able 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	e Time ec)	
					Input Speed Delta	<= 4095.88 RF	PM	
					Raw Input Speed			
					TIS Condition 2 is TRUE when ALL of the next two conditions are satisfied			
					Input Speed		DN/	

Component/	Fault	Monitor Strategy	Malfunction	Threshold	Secondary	Enable	Time	Mi
System	Code	Description	Criteria	Value	Malfunction	Conditions	Required	Illun
-					A Single Power Supply is used for all speed sensors			
					Neutral_Range_Enable is TRUE when any of the next 3 conditions are TRUE			
					Transmission Range is	Reverse/		
					Transmission Range is	= Neutral ENUM Transiton al Neutral/D		
					Transmission Range is	rivo		
					And when a drop occurs  Loop to Loop Drop of  Transmission Output Speed is	> 650 DDM		
					Range_Disable is TRUE when any of the next three conditions are TRUE			
					Transmission Range is	= Park ENUM Park/Rev		
					Transmission Range is	= erse ENUM Transiton al		
					Input Clutch is not	= ON (Fully ENUM Applied)		
					Neutral_Speed_Enable is TRUE when All of the next three conditions are satsified for	> 1.5 Seconds		
					Transmission Output Speed The loop to loop change of the			

Component/	Fault	Monitor Strategy	Malfunction Criteria	Threshold	Secondary Malfunction	Enable	Time	Mil Illum.
System	Code	Description	Criteria	Value	The loop to loop change of the Transmission Output Speed is		Required	mum.
					Transmission_Range_Enable is TRUE when one of the next six conditions is TRUE			
					Transmission Range is	= Neutral ENUM		
					Transmission Range is	Reverse/ = Neutral ENUM Transition al		
					Transmission Range is	Neutral/D rive ENUM Transition al		
					Time since a driven range (R,D) has been selected			
					Transmission Output Speed Sensor Raw Speed			
					Output Speed when a fault was detected			
				Disable Conditions:	MIL not Illuminated for DTC's:	TCM: P0973, P0974, P0976, P0977 ECM: P0101, P0102, P0103, P0121, P0122, P0123		

Component/ System	Fault Code	Monitor Strategy  Description	Malfunction Criteria	Threshold Value	Secondary Malfunction	Enable Conditions		Tin Requ		Mil Illum.
System	Code	Description	Officeria	value	Manunction	Conditions		nequ		Two
Torque Converter Clutch (TCC)	P0741	TCC System Stuck OFF	TCC Pressure	>= 750 Kpa			>=	2	Enable Time (Sec)	Trips
			Either Condition (A) or (B) Must be Met							
			(A) TCC Slip Error @ TCC On Mode				>=	6	Fail Time (Sec)	
			(B) TCC Slip @ Lock On Mode	>= 130 RPM			>=	6	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 or Lock				
					Ignition Voltage Lo	>= 8.59961 Volts				
					Ignition Voltage Hi	<= 31.999 Volts				
					Engine Speed	>= 400 RPM				
					Engine Speed	<= 7500 RPM				
					Engine Speed is within the allowable limits for					
					Engine Torque Lo	>= 50 N*m				
					Engine Torque Hi	<= 8191.88 N*m				
					Throttle Position Lo					
					Throttle Position Hi					
					2nd Gear Ratio Lo					
					2nd Gear Ratio High					
					3rd Gear Ratio Lo					
					3rd Gear Ratio High					
					4th Gear Ratio Lo					
					4th Gear Ratio High					
					5th Gear Ratio Lo					
					5th Gear Ratio Hi	<= 0.90955 Ratio				l .

Component/	Fault	Monitor Strategy	Malfunction		Thres	shold	Secondary		Enabl	e		Tim	ie l	Mil
System	Code	Description	Criteria		Val		Malfunction		Condition		1	Requi		Illum.
.,							6th Gear Ratio Lo	>=	0.62305	Ratio		- 1		
							6th Gear Ratio High		0.71692	Ratio	ı			
							Transmission Fluid Temperature Lo	>=	-6.65625	°C				
							Transmission Fluid Temperature Hi	<=	130	°C				
							PTO Not Active	=	TRUE	Boolean	ı			
							Engine Torque Signal Valid		TRUE	Boolean	1			
							Throttle Position Signal Valid		TRUE	Boolean	ı			
							Dynamic Mode	=	FALSE	Boolean	1			
							P0741 Status is	≠	Test Failed This Key On or Fault Active					
						Disable Conditions:	MIL not Illuminated for DTC's:	P0723	P0716, P071 , P0742, P2 P0101, P01	763, P2764				
								P0106 P0172 P0202 P0206 P0301	6, P0107, P01 6, P0174, P01 7, P0203, P02 7, P0207, P02 7, P0302, P03 8, P0306, P03	108, P0171, 175, P0201, 204, P0205, 208, P0300, 303, P0304,				
									, P042E					
Torque Converter Clutch (TCC)	P0742	TCC System Stuck ON	TCC Slip Speed	>=	-50	RPM								One Trip
			TCC Slip Speed	<=	13	RPM								
											>=	1.5	Fail Time (Sec)	
			If Above Conditions Have been Met, and Fail Timer Expired, Increment Fail Counter								>=	6	Fail Counter	

Component/	Fault	Monitor Strategy	Malfunction	Threshold	Secondary		Enable		Time	Mil
System	Code	Description	Criteria	Value	Malfunction		Condition	ons	Required	Illun
					TCC Mode	=	Off			
					Enable test if Cmnd Gear = 1stFW and value true	=	1	Boolean		
					Enable test if Cmnd Gear = 2nd and value true	_	0	Boolean		
					Engine Speed Hi		6000	RPM		
					Engine Speed Lo		500	RPM		
					Vehicle Speed HI		511	KPH		
					Vehicle Speed Lo		1	KPH		
					Engine Torque Hi		8191.88	Nm		
					Engine Torque Lo		80	Nm		
					Current Range		Neutral	Range		
					Current Range		Reverse	Range		
					Transmission Sump Temperature		130	°C		
					Transmission Sump Temperature		18	°C		
					Throttle Position Hyst High		5.00031	Pct		
					AND					1
					Max Vehicle Speed to Meet Throttle Enable	<=	8	KPH		
					Once Hyst High has been met, the enable will remain while Throttle Position	>=	2.00043	Pct		
					Disable for Throttle Position	>=	75	Pct		1
					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		
					Disable if in TUTD and value true	=	1	Boolean		
					4 Wheel Drive Low Active	=	FALSE	Boolean		

Component/	Fault	Monitor Strategy	Malfunction Criteria		Thresh		Secondary Malfunction		Enabl			Tim		Mil Illum.
System	Code	Description	Criteria		Valu	е			Condition	ons		Requi	rea	mum.
							Disable if Air Purge active and value false	=	0	Boolean				
							RVT Diagnostic Active		FALSE	Boolean				
							Ignition Voltage		8.59961	V				
							Ignition Voltage		31.999	V				
							Vehicle Speed		511	KPH				
							Engine Speed		400	RPM				
							Engine Speed		7500	RPM				
							Engine Speed is within the allowable limits for	>=	5	Sec				
							Engine Torque Signal Valid	=	TRUE	Boolean				
							Throttle Position Signal Valid	=	TRUE	Boolean				
							P0742 Status is	≠	Test Failed This Key On or Fault Active					
						Disable Conditions:		P0723 ECM: P0106 P0172 P0202 P0206 P0301 P0305	P0716, P071 , P0741, P27 , P0101, P01 , P0107, P07 , P0174, P07 , P0203, P07 , P0207, P07 , P0302, P07 , P0306, P07 , P042E	763, P2764 02, P0103, 108, P0171, 175, P0201, 204, P0205, 208, P0300, 303, P0304,				
	D0754	Shift Solenoid Valve A	0 10 01		400	DDM								Two
Mode 2 Multiplex Valve	P0751	Stuck Off	Commaned Gear Slip	>=	400	RPM								Trips
			Commanded Gear	=	1st Lock	rpm								
			Gear Ratio	<=	1.2095947						>=	0.2	Fail Tmr	
			Gear Ratio	>=	1.0943604						=	5	Fail Counts	

Component/	Fault	Monitor Strategy	Malfunction	Threshold	Secondary	Enak			Tin		M
System	Code	Description	Criteria	Value	Malfunction	Condit	ions		Requ	ired	Illu
			If the above parameters are true								
									0	Neutral	
								≠	0	Timer (Sec)	
								>=	0.3	Fail Timer	
									0.3	(Sec)	
								>=	8	Counts	
					Ignition Voltage Lo	>= 8.59961	Volts				
					Ignition Voltage Hi Engine Speed Lo	<= 31.999 >= 400	Volts RPM				ı
					Engine Speed Hi	<= 7500	RPM				ı
					Engine Speed is within the allowable limits for	>= 5	Sec				
					Transmission Fluid Temperature	>= -6.65625	°C				
					Range Shift State	Range = Shift Complete d	ENUM				
					TPS	>= 0.50049	%				
					OR Output Speed	>= 67	RPM				
					Throttle Position Signal Valid from ECM	= TRUE	Boolean				
					Engine Torque Signal Valid from ECM, High side driver is enabled	= TRUE	Boolean				
					High-Side Driver is Enabled		Boolean				ı
					Input Speed Sensor fault		Boolean				
					Output Speed Sensor fault Default Gear Option is not present	= FALSE = TRUE	Boolean				

Component/	Fault	Monitor Strategy	Malfunction		Thres	shold	Secondary	Enable	Time	Mil
System	Code	Description	Criteria		Val	lue	Malfunction	Conditions	Require	d 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		
Mode 2 Multiplex Valve	P0752	Shift Solenoid Valve A Stuck On	Gear Box Slip	>=	400	RPM				One Trip
			Commanded Gear	=	3rd	Gear				
			Commanded Gear has Achieved 1st Locked OR 1st Free-Wheel OR 2nd with Mode 2 Sol. Commanded On	=	TRUE	Boolean				
			If the above parameters are true							
									>= 16 In T	eutral ïmer Sec)
			Command 4th Gear once Output Shaft Speed If Gear Ratio And Gear Ratio	>=	400 3.825683 4.228393					
			Aliu Geal Maliu		7.2200301	v			>= 1.5 T	Fail ïmer Sec)

Component/ System	Fault Code	Monitor Strategy  Description	Malfunction Criteria	Threshold Value	Secondary Malfunction	Enable Conditions		Tim Requi		Mil Illum
System	Code	Description	Onteria	value	Walletietieti	Conditions	>=	5	Counts	mam
					Ignition Voltage Lo Ignition Voltage Hi Engine Speed Lo	i <= 31.999 Volts >= 400 RPM				
					Engine Speed Hi Engine Speed is within the allowable limits for	; - 5				
					High-Side Driver is Enabled		ı			
					Throttle Position Signal Valid from ECM					
					Output Speed OR	1				
					TPS Range Shift State	Range Shift				
					Transmission Fluid Temperature	\- 6.6560E 90				
					Input Speed Sensor fault					
					Output Speed Sensor fault Default Gear Option is not present	t = 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			me	Mil
System	Code	Description	Criteria	Value	Malfunction	Condition	s	Req	uired	Illum.
Mode 2 Multiplex Valve	P0756	Shift Solenoid Valve B Stuck Off	Fail Case Commanded Gear	= 1st Locked						One Trip
			Gear Box Slip	>= 400 RPM				Pleas Refer to Table in >= Suppo ing Docur ents	5 Neutral Timer (Sec)	
			Intrusive Shift to 2nd Commanded Gear Previous Gear Ratio Gear Ratio If the above parameters are true	= 1st Locked Gear <= 2.4821777 >= 2.2458496						
			are true					>= 1	sec	
								>= 3	counts	
					Ignition Voltage Lo	>= 8.59961	Volts			
					Ignition Voltage Hi		Volts			
					Engine Speed Lo	>= 400	RPM			
					Engine Speed Hi		RPM			
					Engine Speed is within the allowable limits for	>= 5	Sec			
					Output Speed	>= 67	RPM			
					OR	7 - 01	TXI IVI			
					TPS	>= 0.50049	%			
					Range Shift State	Range Shift Complete d	ENUM			
					Transmission Fluid Temperature	>= -6.65625	°C			

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Component/	Fault	Monitor Strategy	Malfunction	Thresi	hold	Secondary	Ena	hle	Time	Mil
System	Code	Description	Criteria	Valu		Malfunction		itions	Required	Illum.
Gyotom	Jour	Боотраон	- Thoma	Vale		High-Side Driver is Enabled			rtoquirou	
						Throttle Position Signal Valid				
						from ECM	= TRUE	Boolean		
						Input Speed Sensor fault	= FALSE	Boolean		
						Output Speed Sensor fault				
						Default Gear Option is not	= TRUE			
						present	- IRUE			
					Disable Conditions:	MIL not Illuminated for DTC's:		0717, P0722,		
					Conditions:		P0723, P182E			
							ECM: P0101, P			
							P0106, P0107,			
							P0172, P0174,			
							P0202, P0203, P0206, P0207,			
							P0301, P0302,			
							P0305, P0306,			
							P0401, P042E			
Variable Bleed Solenoid		Pressure Control (PC)	Fail Cook Stoods State 2nd							One
(VBS)	P0776	Solenoid B Stuck Off	Case: Steady State 3rd Gase: Steady State 3rd Gear							Trip
(100)		[C35R]	<b>l</b> ∸							
			Commanded Gear		Gear					
			Gearbox Slip	>= 400	RPM					
									DI.	
									Please Refer to	
									Table	
									16 in Neu	
									>- Support	
									ing (Se	C)
									Docum	
									ents	
			Command 4th Coor area							
			Command 4th Gear once Output Shaft Speed		RPM					
				>= 1.0943604						
				<= 1.2095947						
		I	And Ocal Natio	- 1.2000047					1	

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Component/ System	Fault Code	Monitor Strategy  Description	Malfunction Criteria	Threshold Value	Secondary Malfunction	Enable Conditions	Time Required	Mil Illum
System	Code	Description	Citteria	Value	Wallunction	Conditions	Fail >= 3 Timer (Sec)	
			It the above condiations are true, Increment 3rd gear fail counter				3rd Gear >= 3 Fail Counts	
			and C35R Fail counter				or 3-5R Clutch Fail Counts	
			Fail CaseCase: Steady State 5th2GearCommanded Gear					
			Gearbox Slip	>= 400 Rpm			Please Refer to Table 5 in Timer Support ing Docum ents	
			Intrusive Test: Command 6th Gear					
			If attained Gear=6th gear Time	Please refer to Table 3 >= in (Sec) supporting documents				
			It the above condiations are true, Increment 5th gear fail counter				5th Gear >= 3 Fail Counts	

Component/ System	Fault Code	Monitor Strategy  Description	Malfunction Criteria	Threshold Value	Secondary Malfunction		Enabl Condition		Time Require	,	Mil Illum.
System	Code	Description	and C35R Fail counter		Manunction		Condition	UIIS	14 C	i-5R lutch Fail ounts	
					PRNDL State defaulted inhibit RVT IMS fault pending indication TPS validity flag	= = =	FALSE FALSE FALSE TRUE	Boolean Boolean Boolean Boolean			
					Hydraulic System Pressurized  Minimum output speed for RVT  A OR B	= >=	TRUE 0	Boolean RPM			
					(A) Output speed enable (B) Accelerator Pedal enable Common Enable Criteria Ignition Voltage Lo	>= >= >=	67 0.50049 8.59961	RPM Pct Volts			
					lgnition Voltage Hi Engine Speed Lo Engine Speed Hi	<= >= <=	31.999 400 7500	Volts RPM RPM			
					Engine Speed is within the allowable limits for Throttle Position Signal valid HSD Enabled	>= = =	5 TRUE TRUE	Sec Boolean Boolean			
					Transmission Fluid Temperature Input Speed Sensor fault	>=	-6.65625 FALSE	°C Boolean			
					Output Speed Sensor fault  Default Gear Option is not  present	=	FALSE TRUE	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)	Fail Case Case: Steady State 1st 1 Attained Gear slip					One Trip
			If the Above is True for Time					
			Intrusive test: (CBR1 clutch exhausted) Gear Ratio Gear Ratio If the above parameters are true	<= 1.6086426 >= 1.4554443				
			are true				Fail >= 1.1 Timer (Sec) Fail >= 2 Count ir 1st Gea	
							or	

Component/	Fault	Monitor Strategy	Malfunction	Threshold	Secondary	Enable	Time	Mil
System	Code	Description	Criteria	Value	Malfunction	Conditions	Required	Illum.
			T-3				>= 3 Total Fail Counts	
			Fail Case: Steady State 2nd 2 gear					
			Max Delta Output Speed Hysteresis	Table Based value Please Refer to 3D Table 1 in supporting documents				
			Min Delta Output Speed Hysteresis	Table Based value Please Refer to 3D Table 2 in supporting documents				
			If the Above is True for Time	Table Based Time Please >= Refer to Sec Table 17 in supporting documents				
			Intrusive test: (CB26 clutch exhausted)					
				<= 1.6086426 >= 1.4554443				

Component/	Fault	Monitor Strategy	Malfunction	Threshold	Secondary	Enable	Time	Mil
System	Code	Description	Criteria	Value	Malfunction	Conditions	Required	Illum.
			If the above parameters are true				Fail >= 1.1 Timer	
							(Sec)	
							Fail >= 3 Count in 2nd Gear	
							or >= 3 Total Fail Counts	
			Fail CaseCase: Steady State 4th3gear					
			Max Delta Output Speed Hysteresis	Table Based value Please Refer to 3D Table 1 in supporting documents				
			Min Delta Output Speed Hysteresis	Table Based value Please Refer to 3D Table 2 in supporting documents				

Component/	Fault	Monitor Strategy	Malfunction	Threshold	Secondary	Enable	Time	Mil
System	Code	Description	Criteria	Value	Malfunction	Conditions	Required	Illum.
-		·	If the Above is True for Time					
				<= 0.8946533 >= 0.8094482			Fail >= 1.1 Timer (Sec) Fail >= 3 Count in	
			<u>Fail</u> <u>Case</u> Case: Steady State 6th <u>4</u> gear				4th Geal or >= 3 Total Fai Counts	il
			Max Delta Output Speed Hysteresis					

Component/	Fault	Monitor Strategy	Malfunction	Threshold	Secondary	Enable	Time	Mil
System	Code	Description	Criteria	Value	Malfunction	Conditions	Required	Illum.
			Min Delta Output Speed Hysteresis	Table Based value Please Refer to 3D Table 2 in supporting documents				
			If the Above is True for Time					
			Intrusive test: (CB26 clutch exhausted)					
			Gear Ratio	<= 0.8946533			>= 1.1 Fail Timer (Sec)	
			Gear Ratio	>= 0.8094482			>= 3 counts	
			If the above parameters are true					
							Fail >= 1.1 Timer (Sec)	
							Fail >= 3 Count ir 6th Gea	
							or >= 3 Total Fa Counts	

Component/	Fault	Monitor Strategy	Malfunction	Threshold	Secondary		Enable		Time	Mil
System	Code	Description	Criteria	Value	Malfunction		Condition		Required	Illum.
					PRNDL State defaulted	=	FALSE	Boolean		
					inhibit RVT	=	FALSE	Boolean		
					IMS fault pending indication	=	FALSE	Boolean		
					output speed		0	RPM		
					TPS validity flag		TRUE	Boolean		
					HSD Enabled	=	TRUE	Boolean		
					Hydraulic_System_Pressurized	=	TRUE	Boolean		
					A OR B					
					(A) Output speed enable	>=	67	Nm		
					(B) Accelerator Pedal enable	>=	0.50049	Nm		1
					Ignition Voltage Lo		8.59961	Volts		
					Ignition Voltage Hi	<=	31.999	Volts		
					Engine Speed Lo	>=	400	RPM		
					Engine Speed Hi	<=	7500	RPM		
					Engine Speed is within the allowable limits for	>=	5	Sec		
					if Attained Gear=1st FW Accelerator Pedal enable	>=	5.00031	Pct		
					if Attained Gear=1st FW Engine Torque Enable	>=	5	Nm		
					if Attained Gear=1st FW Engine Torque Enable	<=	8191.88	Nm		
					Transmission Fluid Temperature	>=	-6.65625	°C		
					Input Speed Sensor fault	=	FALSE	Boolean		1
					Output Speed Sensor fault	=	FALSE	Boolean		

Component/	Fault	Monitor Strategy	Malfunction		Thresh		Secondary	Enable	Time	Mil
System	Code	Description	Criteria		Valu		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)	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	_ =	Maximum pressurized					
			Primary Offgoing Clutch Pressure Command Status	-	Clutch exhaust command					
			Range Shift Status	<b>≠</b>	Initial Clutch 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)		0.5	Fail Time (Sec)				
			fail timer 1 (3-2 shifting with Throttle)	>= (	0.2998047	Fail Time (Sec)				

Component/ System	Fault Code	Monitor Strategy  Description	Malfunction Criteria		nreshold Value	Secondary Malfunction	Enable Conditions	Time Required	Mil Illum.
			fail timer 1 (3-2 shifting with Closed Throttle)	>= 0.	5 Fail Time (Sec)				
			fail timer 1 (3-4 shifting with Throttle)	>= 0.299	Pail Time (Sec)				
			fail timer 1 (3-4shifting with Closed Throttle)	>= 0.	.5 Fail Time (Sec)				
			fail timer 1 (3-5 shifting with Throttle)	>= 0.299	Pail Time (Sec)				
			fail timer 1 (3-5 shifting with Closed Throttle)	>= 0.	.5 Fail Time (Sec)				
			fail timer 1 (5-3 shifting with Throttle)	>= 0.299	Pail Time (Sec)				
			fail timer 1 (5-3 shifting with Closed Throttle)	>= 0.	.5 Fail Time (Sec)				
			fail timer 1 (5-4 shifting with Throttle)	>= 0.299	Pail Time (Sec)				
			fail timer 1 (5-4 shifting with Closed Throttle)	>= 0.	.5 Fail Time (Sec)				
			fail timer 1 (5-6 shifting with Throttle)	>= 0.299	Pail Time (Sec)				
			fail timer 1 (5-6 shifting with Closed Throttle)		.5 Fail Time (Sec)				

Component/	Fault	Monitor Strategy	Malfunction Criteria	Threshold	Secondary Malfunction	Enable	Time	Mil Illum.
System	Code	Description	Griteria	Value	Manunction	Conditions	Required	ıııum.
			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 sec 1, and Referen ce Support ing 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				OR >= 5 total fail counts	
					TUT Enable temperature	>= -6.65625 °C		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Malfunction		Enabl Condition		Time Required	Mil Illum.
System	Code	Description	Officeria	value					Required	indin.
					Input Speed Sensor 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:		P0716, P071 , P182E	7, P0722,		
						P0106 P0172 P0202 P0206 P0301 P0305	P0101, P010, P0107, P0 , P0174, P0 , P0203, P0; P0207, P0; P0302, P0; P0306, P0; P042E	108, P0171, 175, P0201, 204, P0205, 208, P0300, 303, P0304,		
Variable Bleed Solenoid (VBS)	P0796	Pressure Control (PC) Solenoid C Stuck Off [C456] (Steady State)	Fail Case: Steady State 4th 1 Gear							One Trip

Component/	Fault	Monitor Strategy	Malfunction	Threshold	Secondary	Enable	Time	Mil
System	Code	Description	Gear slip  Intrusive test: commanded 5th gear  If attained Gear ≠5th for time  if the above conditions have been met  Increment 4th Gear Fail Counter	>= 400 RPM  Please refer to Table 3 Shift Time (Sec) Documents	Malfunction	Conditions	Required  Please See Table 5 Neutral >= For Timer Neutral (Sec) Time Cal  4th Gear >= 3 Fail Count OR C456	Illun
			and C456 Fail Counters  Fail Case Case: Steady State 5th Gear  Gear slip  Intrusive test: commanded 6th gear	>= 400 RPM			>= 14 Fail Counts  Please See Table 5 Neutral >= For Timer Neutral (Sec) Time Cal	-

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

Component/ System	Fault Code	Monitor Strategy  Description	Malfunction Criteria	Threshold Value	Secondary Malfunction		Enabl Condition			Tim Requ		Mil Illum.
Oystein	Joue	Description		v aluc	mananoton		Jonath	J113		veda		
			Increment 6th Gear Fail Counter and C456 Fail Counter						>=	3	6th Gear Fail Count	
											OR	
			and C456 Fail Counter						>=	1/	C456 Fail	
										17	Counts	
					PRNDL State defaulted	=	FALSE	Boolean				1
					inhibit RVT	=	FALSE	Boolean				
					IMS fault pending indication	=	FALSE	Boolean				l
					TPS validity flag	=	TRUE	Boolean				l
					Hydraulic System Pressurized	=	TRUE	Boolean				
					Minimum output speed for RVT	>=	0	RPM				
					A OR B							l
					(A) Output speed enable		67	RPM				
					(B) Accelerator Pedal enable	>=	0.50049	Pct				l
					Common Enable Criteria							l
					Ignition Voltage Lo	>=	8.59961	Volts				l
					Ignition Voltage Hi	<=	31.999	Volts				l
					Engine Speed Lo	>=	400	RPM				l
					Engine Speed Hi	<=	7500	RPM				l
					Engine Speed is within the allowable limits for	>=	5	Sec				
					Throttle Position Signal valid	=	TRUE	Boolean				
					HSD Enabled	=	TRUE	Boolean				l
					Transmission Fluid Temperature	>=	-6.65625	°C				
					Input Speed Sensor fault	=	FALSE	Boolean				
					OutputSpeed Sensor fault	=	FALSE	Boolean				
					Default Gear Option is not present	=	TRUE					

Component/	Fault	Monitor Strategy	Malfunction	Thres	hold	Secondary	Enable	Time	Mil
System	Code	Description	Criteria	Valu	16	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)	P0797	Pressure Control (PC) Solenoid C Stuck On [C456] (Steady State)	<u>Fail</u> <u>Case</u> Case: Steady State 1st 1						One Trip
			Attained Gear slip	>= 400	RPM				
			If the Above is True for Time	Table Based Time Please >= Refer to Table 4 in supporting documents	Enable Time (Sec)				
			Intrusive test: (CBR1 clutch exhausted) Gear Ratio Gear Ratio Gear Ratio If the above parameters are true	>= 1.0943604				Fail >= 1.1 Timer (Sec)	

Component/ System	Fault Code	Monitor Strategy  Description	Malfunction Criteria	Threshold Value	Secondary Malfunction	Enable Conditions	Time Required	Mil Illum.
		2000				33.13.13	Fail >= 2 Count in 1st Gear	
			<u>Fail</u>				or >= 3 Total Fail Counts	
			Case Case Steady State 2nd 2	Table				
			Max Delta Output Speed Hysteresis	Based value Please Refer to 3D Table 1 in supporting documents				
			Min Delta Output Speed Hysteresis	Table Based value Please Refer to 3D Table 2 in supporting documents				
			If the Above is True for Time	Table Based Time Please >= Refer to Sec Table 17 in supporting documents				

Component/	Fault	Monitor Strategy	Malfunction	Threshold	Secondary	Enable	Time	Mil
System	Code	Description	Criteria	Value	Malfunction	Conditions	Required	Illum.
-			Intrusive test: (CB26 clutch exhausted) Gear Ratio Gear Ratio If the above parameters are true	>= 1.0943604			Fail >= 1.1 Timer (Sec) Fail >= 3 Count in 2nd Gea or >= 3 Total fail counts	r I
			Fail Case Case Steady State 3rd 3  Max Delta Output Speed Hysteresis	Table Based value Please				

Component/	Fault	Monitor Strategy	Malfunction	Threshold	Secondary	Enable	Time	Mi
System	Code	Description	Criteria	Value	Malfunction	Conditions	Required	IIIt
			Min Delta Output Speed Hysteresis					
			If the Above is True for Time	Table Based Time Please >= Refer to Sec Table 17 in supporting documents				
			Intrusive test: (C35R clutch exhausted) Gear Ratio Gear Ratio	<= 1.2095947 >= 1.0943604				
			If the above parameters are true				Fail >= 1.1 Timer (Sec)	
							Fail >= 3 Count ir 3rd Gea	
							>= 3 Total Fa	
					PRNDL State defaulted inhibit RVT IMS fault pending indication	= FALSE Boolean = FALSE Boolean = FALSE Boolean		

Component/	Fault	Monitor Strategy	Malfunction	Threshold	Secondary		Enabl	е	Time	Mil
System	Code	Description	Criteria	Value	Malfunction		Condition	ons	Required	Illum.
					output speed	>=	0	RPM		
					TPS validity flag	=	TRUE	Boolean		1 1
					HSD Enabled	=	TRUE	Boolean		1 1
					Hydraulic_System_Pressurized	=	TRUE	Boolean		
					A OR B					1 1
					(A) Output speed enable	>=	67	Nm		1 1
					(B) Accelerator Pedal enable	>=	0.50049	Nm		1 1
					Ignition Voltage Lo	>=	8.59961	Volts		1 1
					Ignition Voltage Hi	<=	31.999	Volts		1 1
					Engine Speed Lo	>=	400	RPM		1 1
					Engine Speed Hi	<=	7500	RPM		1 1
					Engine Speed is within the allowable limits for	>=	5	Sec		
					if Attained Gear=1st FW Accelerator Pedal enable	>=	5.00031	Pct		
					if Attained Gear=1st FW Engine Torque Enable	>=	5	Nm		
					if Attained Gear=1st FW Engine Torque Enable	<=	8191.88	Nm		
					Transmission Fluid Temperature	>=	-6.65625	°C		
					Input Speed Sensor fault	=	FALSE	Boolean		1 1
					Output Speed Sensor fault	=	FALSE	Boolean		1 1
					Default Gear Option is not present	=	TRUE			

Component/	Fault	Monitor Strategy	Malfunction		Thresh		Secondary	Enable	Time	Mil
System	Code	Description	Criteria		Valu		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)		Pressure Control (PC) Solenoid C Stuck On [C456] (Dynamic)	Primary Offgoing Clutch is exhausted (See Table 11 in Supporting Documents for Exhaust Delay Timers)	=	TRUE	Boolean				One Trip
			Primary Oncoming Clutch Pressure Command Status	=	Maximum pressurized					
			Primary Offgoing Clutch Pressure Command Status		Clutch exhaust command					
			Range Shift Status	≠	Initial Clutch Control					
			Attained Gear Slip	<=	40	RPM				
			If the above conditions are true increment appropriate Fail 1 Timers Below:							
			fail timer 1 (4-1 shifting with throttle)	>=	0.2998047	Fail Time (Sec)				

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria		Thresho Value		Secon Malfun	Enable Condition	Time Required	Mil Illum.
			fail timer 1 (4-1 shifting without throttle)	>=		Fail Time (Sec)				
			fail timer 1 (4-2 shifting with throttle)	>= 0.		Fail Time (Sec)				
			fail timer 1 (4-2 shifting without throttle)	>=		Fail Time (Sec)				
			fail timer 1 (4-3 shifting with throttle)	>= 0.		Fail Time (Sec)				
			fail timer 1 (4-3 shifting without throttle)	>=		Fail Time (Sec)				
			fail timer 1 (5-3 shifting with throttle)	>= 0.		Fail Time (Sec)				
			fail timer 1 (5-3 shifting without throttle)	>=		Fail Time (Sec)				
			fail timer 1 (6-2 shifting with throttle)	>= 0.		Fail Time (Sec)				
			fail timer 1 (6-2 shifting without throttle)	>=		Fail Time (Sec)				

Component/	Fault	Monitor Strategy	Malfunction	Threshold	Secondary Malfunction	Enable	Time	Mil
System	Code	Description	If Attained Gear Slip is Less than Above Cal Increment Fail Timers	Value	Malfunction	Conditions	Total Fail Time = (Fail 1 + Fail 2) See Enable Timers for Fail >= Timer sec 1, and Referen ce Support ing Table 15 for Fail Timer 2	Illum.
			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	
			5th gear fail counter				OR Fail >= 3 Counter From 5th Gear OR	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Thres Val		Secondary Malfunction		Enable Condition			Tim Requi		Mil Illum.
- Gyotom		Deconp.ion	6th gear fail counter						<i></i>	>=	3	Fail Counter From 6th Gear	
			Total fail counter							>=	5	OR Total Fail Counter	
						TUT Enable temperature Input Speed Sensor fault Output Speed Sensor fault Command / Attained Gear	= = ≠	-6.65625 FALSE FALSE 1st TRUE	°C Boolean Boolean Boolean				
						High Side Driver ON output speed limit for TUT input speed limit for TUT PRNDL state defaulted IMS Fault Pending	>= >= =	100 150 FALSE FALSE	RPM RPM Boolean				
						Service Fast Learn Mode HSD Enabled	=	FALSE TRUE	Boolean Boolean				
					Disable Conditions:		P0723,	, P182E					
							P0106, P0172, P0202, P0206, P0301, P0305,	P0101, P010 , P0107, P01 , P0174, P01 , P0203, P02 , P0207, P02 , P0302, P03 , P0306, P03	108, P0171, 175, P0201, 204, P0205, 208, P0300, 803, P0304,				
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

	- "								1010				
Component/	Fault	Monitor Strategy	Malfunction		shold	Secondary		Enabl		Ι.	Tim		Mil
System	Code	Description	Criteria	Vā	alue	Malfunction		Condition	ons	-	Requ		Illum.
										out of	5	Sample Time (Sec)	
						Ignition Voltage Ignition Voltage Engine Speed Engine Speed Engine Speed is within the allowable limits for	<= >= <=	8.59961 31.999 400 7500 5	Volts Volts RPM RPM Sec				
					Disable Conditions:		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		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 limits for	<= >= <=	8.59961 31.999 400 7500	Volts Volts RPM RPM Sec				
					Disable Conditions:	MIL not Illuminated for DTC's:	TCM:						
Variable Bleed Solenoid (VBS)		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	Boolean					>=	4.4	Fail Time (Sec)	Two Trips

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Component/ System	Fault Code	Monitor Strategy  Description	Malfunction Criteria	Threshold Value	Secondary Malfunction	Enable Conditions		me uired	Mil Illum.
		·					out 5	Sample Time (Sec)	
					Ignition Voltage Ignition Voltage Engine Speed Engine Speed Engine Speed is within the allowable limits for	<= 31.999 Volts >= 400 RPM <= 7500 RPM			
				Disable Conditions:	MIL not Illuminated for DTC's:	TCM: None ECM: None			
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 Boolean			>= 0.3	Fail Time (Sec)	One Trip
							out of 0.375	Sample Time (Sec)	
					Ignition Voltage Ignition Voltage Ignition Voltage Engine Speed Engine Speed is within the allowable limits for	<= 31.999 Volts >= 400 RPM <= 7500 RPM >= 5 Sec  Test Failed This Key			
					FUSUU Status is not	On or Fault Active			

Component/	Fault Code	Monitor Strategy Description	Malfunction Criteria	Thres Val		Secondary Malfunction	Enable Conditions	Time Required	Mil Illum.
System	Code	Description	Criteria	Vai		MIL not Illuminated for DTC's:		Required	mum.
Variable Bleed Solenoid (VBS)		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			>= 0.3 Fail Time (Sec)  out of 0.375 Time (Sec)	
						Ignition Voltage Ignition Voltage Engine Speed Engine Speed Engine Speed is within the allowable limits for	<= 31.999 Volts >= 400 RPM <= 7500 RPM	(000)	
						P0967 Status is not	Test Failed This Key On or Fault Active		
					Disable Conditions:	MIL not Illuminated for DTC's:	TCM: None ECM: None		
Variable Bleed Solenoid (VBS)		Pressure Control (PC) Solenoid C Control Circuit Low Voltage (C456/CBR1 VBS)	The HWIO reports a low voltage (ground short) error flag	= TRUE	Boolean			>= 0.3 Fail Time (Sec)	One Trip
								out Sample of O.375 Time (Sec)	

Component/ System	Fault Code	Monitor Strategy  Description	Malfunction Criteria	Threshold Value	Secondary Malfunction	Enable Conditions	Time Required	Mil Illum.
					P0970 Status is not	Test Failed		
					Ignition Voltage Ignition Voltage Engine Speed Engine Speed	<= 31.999 Volts >= 400 RPM		
					Engine Speed is within the allowable limits for	\-		
				Disable Conditions		TCM: None ECM: None		
Variable Bleed Solenoid (VBS)		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 Sample Out O.375 Time (Sec)	
					P0971 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	<= 31.999 Volts >= 400 RPM <= 7500 RPM		

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Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Thres Va	shold	Secondary Malfunction	Enable Conditions		Time quired	Mil Illum.
Gyddain	Jour	Boompaon	Citiona	•		MIL not Illuminated for DTC's:			1411-04	
Shift Solinoid	P0973	Shift Solenoid A Control Circuit Low (Mode 2 Solenoid)	The HWIO reports a low voltage (ground short) error flag	= TRUE	Boolean			>= 1.2 out 1.5	(Sec) Sample	Imp
						P0973 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	<= 31.999 Volts >= 400 RPM <= 7500 RPM			
					Disable Conditions:	MIL not Illuminated for DTC's:	TCM: None ECM: None			
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			>= 1.2 out 1.5	(Sec) Sample	Про

Fault	Monitor Strategy	Malfunction	Thresh	old	Secondary		Enable			Tim	е	Mil
Code	Description	Criteria			Malfunction							Illum.
	·				P0974 Status is not	=	Test Failed This Key On or Fault Active			-		
					Ignition Voltage	<=	8.59961 31.999 400	Volts Volts RPM				
					Engine Speed Engine Speed is within the allowable limits for	<= >=	7500 5	RPM Sec				
				Disable Conditions:								
P0977	Shift Solenoid B Control Circuit High (Mode 3 Solenoid)	voltage (open or power	= TRUE	Boolean						1.2	Sec	One Trip
									out of	1.5	Sec	
					P0977 Status is not	=	Test Failed This Key On or Fault Active					
					Ignition Voltage Engine Speed	<= >= <=	8.59961 31.999 400 7500	Volts Volts RPM RPM Sec				
		Code Description  Shift Solenoid B Control Circuit High	Code Description Criteria  Shift Solenoid B Control Circuit High Crown of Poper State of Poper S	Code Description Criteria Valu    Poggraphic	Code Description Criteria Value    Code   Description   Criteria   Code   Code	Code     Description     Criteria     Value     Malfunction       P0974 Status is not     Ignition Voltage Ignition Voltage Ingrison Voltage Engine Speed is within the allowable limits for Engine Speed is within the allowable limits for Conditions:       P0977 (Mode 3 Solenoid)     The HWIO reports a high voltage (open or power short) error flag     TRUE Boolean       P0977 Status is not Ignition Voltage Ignition Voltage Ignition Voltage Ignition Voltage Ignition Voltage Ignition Speed Ignition Ignit	Code   Description   Criteria   Value   Malfunction	Code   Description   Criteria   Value   Malfunction   Condition	Code   Description   Criteria   Value   Malfunction   Conditions	Code   Description   Criteria   Value   Malfunction   Conditions	Code   Description   Criteria   Value   Malfunction   Conditions   Requirement	Conditions

Component/	Fault	Monitor Strategy	Malfunction		Thres		Secondary		Enabl		Tim		Mil
System	Code	Description	Criteria		Valu		Malfunction	TOM 1	Condition	ons	Requ	ired	Illum.
						Conditions:	MIL not Illuminated for DTC's:	ECM: N					
Internal Mode Switch (IMS)	P1915	Internal Mode Switch Does Not Indicate Park/Neutral (P/N) During Start	PRNDL State is	<b>≠</b>	Park or Neutral	Enumeration							One 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					>= 0.0688	Enable Time (Sec)	
			Then Final Engine Speed	>=	525	RPM							
			Final Transmission Input Speed	>=	200	RPM					>= 1.25	Fail Time (Sec)	
							DTC has Ran this Key Cycle?	=	FALSE	Boolean			
							Ignition Voltage Lo		6	V			
							lgnition Voltage Hi Ignition Voltage Hyst High		31.999	V			
							(enables above this value)	>=	5	V			
							Ignition Voltage Hyst Low (disabled below this value)	<=	2	V			
							Transmission Output Speed	<=	90	rpm			

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria		Thres Valu		Secondary Malfunction	Enab Condit			Tim Requi		Mil Illum.
							P1915 Status is	Test Failed					
						Disable Conditions:	MIL not Illuminated for DTC's:	TCM: P0722, P07 ECM: None	23				
Transmission Control Module (TCM)	P2534	Ignition Switch Run/Start Position Circuit Low	TCM Run crank active (based on voltage thresholds below)		FALSE	Boolean							One Trip
			lgnition 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				Ou t of	280	Sample Counts (25ms loop)	
							ECM run/crank active status available	- 12115	Boolean				
							ECM run/crank active status	= TRUE	Boolean				
						Disable Conditions:	MIL not Illuminated for DTC's:	TCM: None ECM: None					
Transmission Control Module (TCM)	P2535	Ignition Switch Run/Start Position Circuit High	TCM Run crank active (based on voltage thresholds below)	=	TRUE	Boolean							One Trip

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Malfunction	Enable Conditions	Time Required	Mil Illum.
System	Code	Description	Ignition Voltage High Hyst (run crank goes true when above this value)	5 Volts	Walldliction	Conditions	>= 280 Fail Counts (25ms loop)	
			Ignition Voltage Low Hyst (run crank goes false when below this value)	2 Volts			Ou 280 Sample Counts (25ms loop)	
					ECM run/crank active status available ECM run/crank active status	= IRUE Boolean		
				Disable Conditions:	MIL not Illuminated for DTC's:	TCM: None ECM: None		
Variable Bleed Solenoid (VBS)	P2714	Pressure Control (PC) Solenoid D Stuck Off [CB26]	<u>Fail</u> <u>Case</u> Case: Steady State 2nd 1 Gear					One Trip
			Gear slip	>= 400 RPM			Please See Table 5 Neutral >= For Timer Neutral (Sec) Time Cal	
			Intrusive test: commanded 3rd gear					
			If attained Gear = 3rd for Time	>=				

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					
			been met					
			Increment 2nd gear fail				2nd Gear	
			count				>= 3 Fail Count	
							or	
			and CB26 Fail Count				CB26 >= 14 Fail	
			dild OBZO i dii Oodiit				Count	
			Fail Case: Steady State 6th					1
			Case Case: Steady State 6th Gear					
			<u> </u>					
							Please See	
							Table 5 Neutral	
			Gear slip	>= 400 RPM			>= For Timer	
							Neutral (Sec) Time	
							Cal	
			Intrusive test:					
			commanded 5th gear					
				Table				
				Based Time				
			If attained Gear = 5th For					
			Time	Table 2 in (Sec) Supporting				
				Documents				
			If Above Conditions have				5th Gear	
			been met, Increment 5th gear fail counter				>= 3 Fail Count	
			godi idil oddillor					
							or	

Component/	Fault	Monitor Strategy	Malfunction	Threshold	Secondary Malfunction		Enabl			Time		Mil
System	Code	Description	Criteria	Value	Maitunction		Condition	ons	K	equir		Illum.
			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	>=	0.50049	Pct				
					Common Enable Criteria							
					Ignition Voltage Lo	>=	8.59961	Volts				
					Ignition Voltage Hi	<=	31.999	Volts				
					Engine Speed Lo	>=	400	RPM				
					Engine Speed Hi	<=	7500	RPM				
						\_	7300	KEM				
					Engine Speed is within the allowable limits for	>=	5	Sec				
					Throttle Position Signal valid	=	TRUE	Boolean				
					HSD Enabled	=	TRUE	Boolean				
					Transmission Fluid Temperature	>=	-6.65625	°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		Threshold		Secondary	Enable	Time	Mil
System	Code	Description	Criteria		Value		Malfunction	Conditions	Required	Illum.
					Dis Conditi		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)		Pressure Control (PC) Solenoid D Stuck On [CB26] (Dynamic)	Primary Offgoing Clutch is exhausted (See Table 13 in Supporting Documents for Exhaust Delay Timers)	=	TRUE Boolean					One Trip
			Primary Oncoming Clutch Pressure Command Status	_	Maximum essurized					
			Primary Offgoing Clutch Pressure Command Status	= (	Clutch exhaust ommand					
			Range Shift Status	<b>≠</b>	Initial Clutch Control					
			Attained Gear Slip	<=	40 RPM					
			If above coditons are true, increment appropriate Fail 1 Timers Below:							
			fail timer 1 (2-1 shifting with throttle)	>= 0.	.2998047 Fail Time (Sec)	Э				
			fail timer 1 (2-1 shifting without throttle)		0.5 Fail Time (Sec)	Э				
			fail timer 1 (2-3 shifting with throttle)	>= 0.	.2998047 Fail Time (Sec)	Э				

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria		Thresh Valu		Secondary Malfunction	Enable Conditions	Time Required	Mil Illum.
			fail timer 1 (2-3 shifting without throttle)	>=		Fail Time (Sec)				
			fail timer 1 (2-4 shifting with throttle)	>=		Fail Time (Sec)				
			fail timer 1 (2-4 shifting without throttle)	>=		Fail Time (Sec)				
			fail timer 1 (6-4 shifting with throttle)	>=		Fail Time (Sec)				
			fail timer 1 (6-4 shifting without throttle)	>=		Fail Time (Sec)				
			fail timer 1 (6-5 shifting with throttle)			Fail Time (Sec)				
			fail timer 1 (6-5 shifting without throttle)	>=		Fail Time (Sec)				
			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 sec 1, and Referen ce Support ing Table 15 for Fail Timer 2	

Component/ System	Fault Code	Monitor Strategy  Description	Malfunction Criteria	Threshold Value	Secondary Malfunction		Enable Condition			Tir Requ		Mil Illum.
			If fail timer is greater than threshold increment corresponding gear fail counter and total fail counter						>=	3	Fail Counter From 2nd Gear	
			6th gear fail counter						>=	3	OR Fail Counter From 6th Gear OR Total Fail	
			total fail counter						>=	5	Counter	
					TUT Enable temperature		-6.65625	°C				
					Input Speed Sensor fault		FALSE	Boolean				
					Output Speed Sensor fault		FALSE	Boolean				
					Command / Attained Gear		1st	Boolean				
					High Side Driver ON output speed limit for TUT		TRUE	Boolean 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				

Component/	Fault	Monitor Strategy	Malfunction	Thres	shold	Secondary	Enable	Time	Mil
System	Code	Description	Criteria	Val	ue	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)	P2715	Pressure Control (PC) Solenoid D Stuck On [CB26] (Steady State)	Fail Case Case: Steady State 1st 1 Attained Gear slip	>= 400	RPM				One Trip
			If the Above is True for Time	Table Based Tim Please >= Refer to Table 4 ir supporting document	Enable Time (Sec)				
			Intrusive test: (CBR1 clutch exhausted) Gear Ratio Gear Ratio If the above parameters are true	>= 2.245849				Fo	
								Fa >= 1.1 Tim (Se Fa >= 3 Cour 1st G	er c) I t in
								(Se Fa >= 3 Cour	l t e

Component/	Fault	Monitor Strategy	Malfunction	Threshold	Secondary Malfunction	Enable	Time	Mil
System	Code	Description	Criteria	Value	Manunction	Conditions	Required	Illum.
							>= 3 Total Fail Counts	
			Fail Case Case: Steady State 3rd Gear					
			Max Delta Output Speed Hysteresis	Table Based value Please Refer to 3D Table 1 in supporting documents				
			Min Delta Output Speed Hysteresis	Table Based value Please Refer to 3D Table 2 in supporting documents				
			If the Above is True for Time	Table Based Time Please >= Refer to Sec Table 17 in supporting documents				
			Intrusive test: (C35R clutch exhausted)					
				<= 2.4821777 >= 2.2458496				

Component/ System	Fault Code	Monitor Strategy  Description	Malfunction Criteria	Threshold Value	Secondary Malfunction	Enable Conditions	Time Required	Mil Illum.
System	Code	Description	If the above parameters are true		Walluffelion	Conditions	Fail >= 1.1 Timer (Sec) Fail >= 3 Count in 3rd Gear	,
			Fail Case Steady State 4rd 3 Gear  Max Delta Output Speed Hysteresis	Table Based value			>= 3 Counts	
			Min Delta Output Speed Hysteresis	Table Based value Please Refer to 3D Table 2 in supporting documents				

Component/	Fault	Monitor Strategy	Malfunction	Threshold	Secondary	Enable	Time	Mil
System	Code	Description	Criteria	Value	Malfunction	Conditions	Required	Illum.
			If the Above is True for Time					
			Intrusive test: (C1234 clutch exhausted)					
			Gear Ratio If the above parameters					
			are true				Fail >= 1.1 Timer (Sec)	
							Fail >= 3 Count in 4th Gear	
							or >= 3 Total Fail Counts	
			<u>Fail</u> <u>Case</u> Case: Steady State 5th <u>4</u> Gear					
			Max Delta Output Speed Hysteresis	Table Based value Please Refer to 3D Table 1 in supporting documents				

Component/	Fault	Monitor Strategy	Malfunction	Threshold	Secondary	Enable	Time	Mi
System	Code	Description	Criteria	Value	Malfunction	Conditions	Required	IIIu
			Min Delta Output Speed Hysteresis					
			If the Above is True for Time	Table Based Time Please >= Refer to Sec Table 17 in supporting documents				
				<= 0.7003174 >= 0.633667				
			are true				Fail >= 1.1 Timer (Sec)	
							Fail >= 3 Count ir 5th Gea	
							or >= 3 Total Fa Counts	
					PRNDL State defaulted inhibit RVT IMS fault pending indication	= FALSE Boolean = FALSE Boolean = FALSE Boolean		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Malfunction		Enable Condition		Time Required	Mil Illum
System	Code	Description	Officeria	value					Required	IIIdiii
					output speed TPS validity flag		0 TRUE	RPM Boolean		
					HSD Enabled		TRUE	Boolean		
					Hydraulic_System_Pressurized	=	TRUE	Boolean		
					A OR B					
					(A) Output speed enable	>=	67	Nm		
					(B) Accelerator Pedal enable	>=	0.50049	Nm		
					Ignition Voltage Lo	>=	8.59961	Volts		
					Ignition Voltage Hi	<=	31.999	Volts		
					Engine Speed Lo	>=	400	RPM		
					Engine Speed Hi	<=	7500	RPM		
					Engine Speed is within the allowable limits for	>=	5	Sec		
					if Attained Gear=1st FW Accelerator Pedal enable	>=	5.00031	Pct		
					if Attained Gear=1st FW Engine Torque Enable	>=	5	Nm		
					if Attained Gear=1st FW Engine Torque Enable	<=	8191.88	Nm		
					Transmission Fluid Temperature	>=	-6.65625	°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	Threshold	Secondary	Enable	Time	Mil
System	Code	Description	Criteria	Value	Malfunction	Conditions	Required	Illum.
				Disa Conditio	ole MIL not Illuminated for DTC's: ns:	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)	One Trip
							out Sample of 0.375 Time (Sec)	
					P2770 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	<= 31.999 Volts >= 400 RPM <= 7500 RPM		
				Disa Conditio	ole MIL not Illuminated for DTC's: ns:	TCM: None ECM: None		

Component/	Fault	Monitor Strategy	Malfunction		Thres		Secondary	Enable		Tin		Mil
System	Code	Description	Criteria		Valu	ue	Malfunction	Condition	ons	Requ	ired	Illum.
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	= 7	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 limits for	<= 31.999 >= 400 <= 7500	Volts Volts RPM RPM Sec			
						Disable Conditions:	MIL not Illuminated for DTC's:	TCM: None ECM: None				
Variable Bleed Solenoid (VBS)	P2723	Pressure Control (PC) Solenoid E Stuck Off	<u>Fail</u> <u>Case</u> Case: Steady State 1st 1 Gear									One Trip
			Gear slip	>=	400	RPM				Please See Table 5 >= For Neutral Time Cal	Neutral Timer	
			Intrusive test: commanded 2nd gear									

Component/	Fault	Monitor Strategy	Malfunction	Threshold	Secondary	Enable	Time	Mil
System	Code	Description	Criteria	Value	Malfunction	Conditions	Required	Illum.
		·	If attained Gear ≠ 2nd for Time	Please refer				
			If Above Conditions have been met, Increment 1st gear fail counter				1st Gear >= 3 Fail Count or	
			and C1234 fail counter				C1234 >= 14 Clutch Fail Count	
			Fail Case: Steady State 2nd 2 Gear				Please See Table 5 Neutral	
			Gear slip Intrusive test: commanded 3rd gear				>= For Timer Neutral (Sec) Time Cal	
			If attained Gear ≠ 3rd for Time	Please refer to Table 3 in Shift Time				
			If Above Conditions have been met, Increment 2nd gear fail counter				2nd Gear >= 3 Fail Count or	

Component/	Fault	Monitor Strategy	Malfunction	Threshold	Secondary	Enable	Time	Mil
System	Code	Description	Criteria	Value	Malfunction	Conditions	Required	Illum.
			and C1234 fail counter				C1234 >= 14 Clutch Fail Count	
			Fail Case Case: Steady State 3rd Gear					
			Gear slip	>= 400 RPM			Please See Table 5 Neutral >= For Timer Neutral (Sec) Time Cal	
			Intrusive test: commanded 4th gear					
			If attained Gear ≠ 4th for time	Please refer to Table 3 Shift Time >= in (Sec) Supporting Documents				
			If Above Conditions have been met, Increment 3rd gear fail counter				3rd Gear >= 3 Fail Count	r
			and C1234 fail counter				or C1234 >= 14 Clutch Fail Count	
			Fail Case Case: Steady State 4th 4 Gear					

Component/ System	Fault Code	Monitor Strategy  Description	Malfunction Criteria	Threshold Value	Secondary Malfunction	Ena Condi		Tim Requi		Mil Illum.
System	Code	Безсприон	Gear slip		Manufiction	Condi	uons	Please See	Neutral Timer (Sec)	
			Intrusive test: commanded 5th gear							
			If attained Gear  = 5th For Time	Please refer to Table 3 Shift Time in Supporting Documents						
			If Above Conditions have been met, Increment 4th gear fail counter					>= 3	4th Gear Fail Count or	
			and C1234 fail counter					>= 14	C1234 Clutch Fail Count	
					PRNDL State defaulted					
					inhibit RVT					
					IMS fault pending indication TPS validity flag					
					Hydraulic System Pressurized					
					Minimum output speed for RVT	>= 0	RPM			
					A OR B					
					(A) Output speed enable	>= 67	RPM			
					(B) Accelerator Pedal enable					
					Common Enable Criteria					
					Ignition Voltage Lo					
					Ignition Voltage Hi	<= 31.999	Volts			

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Component/	Fault	Monitor Strategy	Malfunction	Thresh		Secondary		Enabl		Time	Mil
System	Code	Description	Criteria	Valu	е	Malfunction		Conditi		Required	Illum
						Engine Speed Lo	>=	400	RPM		
						Engine Speed Hi		7500	RPM		
						Engine Speed is within the allowable limits for	>=	5	Sec		
						Throttle Position Signal valid		TRUE	Boolean		
						HSD Enabled	=	TRUE	Boolean		
						Transmission Fluid Temperature	>=	-6.65625	°C		
						Input Speed Sensor fault	=	FALSE	Boolean		
						Output Speed Sensor fault	=	FALSE	Boolean		
						Default Gear Option is not present	=	TRUE			
					Disable Conditions:		P0723 ECM:	, P182E P0101, P010	02, P0103,		
									108, P0171, 175, P0201,		
									204, P0205,		
							P0206	, P0207, P0	208, P0300,		
									303, P0304,		
								, P0306, P0 , P042E	307, P0308,		
							1 0401	, 1 0+2L			One
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)	= TRUE	Boolean						Trip
			Primary Oncoming Clutch Pressure Command Status								
			Primary Offgoing Clutch Pressure Command Status	Clutch = exhaust command							

Component/	Fault	Monitor Strategy	Malfunction		Thres	hold	Secondary	Enable	Time	Mil
System	Code	Description	Criteria		Valu	ıe	Malfunction	Conditions	Required	Illum.
			Range Shift Status	<b>≠</b>	Initial Clutch Control					
			Attained Gear Slip	<=	40	RPM				
			If the above conditions are true increment appropriate Fail 1 Timers Below:							
			fail timer 1 (2-6 shifting with throttle)		0.2998047	sec				
			fail timer 1 (2-6 shifting without throttle)	>=	0.5	sec				
			fail timer 1 (3-5 shifting with throttle)	>=	0.2998047	sec				
			fail timer 1 (3-5 shifting without throttle)	>=	0.5	sec				
			fail timer 1 (4-5 shifting with throttle)	>=	0.2998047	sec				
			fail timer 1 (4-5 shifting without throttle)		0.5	sec				
			fail timer 1 (4-6 shifting with throttle)	>=	0.2998047	sec				
			fail timer 1 (4-6 shifting without throttle)		0.5	sec				

Component/	Fault	Monitor Strategy	Malfunction Critoria	Threshold	Secondary Malfunction	Enable Conditions	Time	Mil
System	Code	Description	If Attained Gear Slip is Less than Above Cal Increment Fail Timers	Value	Malfunction	Conditions	Total Fail Time = (Fail 1 + Fail 2) See Enable Timers for Fail >= Timer sec 1, and Referen ce Support ing Table 15 for Fail Timer 2	Illum.
			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 Geal	
			3rd gear fail counter				Fail >= 3 Counter From 3rd Gear	

Component/	Fault	Monitor Strategy	Malfunction	Threshold	Secondary Malfunction	Enable		me	Mil
System	Code	Description	Criteria	Value	waitunction	Conditions	Requ	uired	Illum.
			4th gear fail counter				>= 3	Fail Counter From 4th Gear	
			total fail counter				>= 5	Total Fail Counter	
					TUT Enable temperature				
					Input Speed Sensor fault				
					Output Speed Sensor fault Command / Attained Gear				
					High Side Driver ON				
					output speed limit for TUT				
					input speed limit for TUT				
					PRNDL state defaulted				
					IMS Fault Pending				
					Service Fast Learn Mode				
					HSD Enabled	= TRUE Boolean			
					MIL not Illuminated for DTC's:				
				Conditions:		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 (Steady State)	Fail Case Case: 5th Gear 1						One Trip

Component/	Fault	Monitor Strategy	Malfunction	Threshold	Secondary	Enable	Time	Mil
System	Code	Description	Criteria	Value	Malfunction	Conditions	Required	Illum.
			Max Delta Output Speed Hysteresis					
			Min Delta Output Speed Hysteresis	Table Based value Please Refer to 3D Table 2 in supporting documents				
			If the Above is True for Time	Table Based Time Please >= Refer to Sec Table 17 in supporting documents				
			Intrusive test: (C35R clutch exhausted) Gear Ratio Gear Ratio If the above parameters are true	<= 1.2095947 >= 1.0943604			Fail >= 1.1 Timer	
							>= 1.1 Timer (Sec)	

Component/	Fault	Monitor Strategy	Malfunction	Threshold	Secondary	Enable	Time	Mil
System	Code	Description	Criteria	Value	Malfunction	Conditions	Required	Illum.
							Fail >= 3 Count in 5th Gear OR	
							>= 3 Total Fail Counts	
			Fail Case Case: 6th Gear 2					
			Max Delta Output Speed Hysteresis	Table Based value Please Refer to 3D Table 1 in supporting documents				
			Min Delta Output Speed Hysteresis	Table Based value Please Refer to 3D Table 2 in supporting documents				
			If the Above is True for Time	Table Based Time Please >= Refer to Sec Table 17 in supporting documents				
			Intrusive test: (CB26 clutch exhausted) Gear Ratio					

Component/	Fault	Monitor Strategy	Malfunction	Threshold	Secondary	Enal			Tin -		Mil
System	Code	Description	Criteria	Value	Malfunction	Condi	ions		Requ	ired	Illun
				>= 1.0943604							
			If the above parameters are true					ı			
			are true					ı		Fail	
								>=	1.1	Timer	
										(Sec)	
								>=	3	Fail Count in	
								_	3	6th Gear	
								ı			
										OR	
									2	Total Fail	
								>=	3	Counts	
					PRNDL State defaulted	= FALSE	Boolean				
					inhibit RVT		Boolean	ı			
					IMS fault pending indication		Boolean	ı			
					output speed	>= 0	RPM	ı			
					TPS validity flag		Boolean	ı			
					HSD Enabled	= TRUE	Boolean	ı			
					Hydraulic_System_Pressurized	= TRUE	Boolean	ı			
								ı			
					A OR B (A) Output speed enable	>= 67	Nm	ı			
					(B) Accelerator Pedal enable			ı			
					Ignition Voltage Lo		Volts	1			
					Ignition Voltage Hi		Volts	1			
					Engine Speed Lo		RPM	1			
					Engine Speed Hi	<= 7500	RPM	1			
					Engine Speed is within the	>= 5	Sec				
					allowable limits for	<b>7</b>	000	1			
					if Attained Gear=1st FW Accelerator Pedal enable	>= 5.00031	Pct				
					if Attained Gear=1st FW Engine		Nm				
					Torque Enable if Attained Gear=1st FW Engine						
					Torque Enable		Nm				

Component/	Fault	Monitor Strategy	Malfunction	Threshold	Secondary	Enable	Time	Mil
System	Code	Description	Criteria	Value	Malfunction	Conditions	Required	Illum.
System	Code	Description	Ontena		Transmission Fluid Temperature Input Speed Sensor fault Output Speed Sensor fault Default Gear Option is not present  MIL not Illuminated for DTC's:	>= -6.65625 °C = FALSE Boolean = FALSE Boolean = TRUE	Required	
Variable Bleed Solenoid (VBS)		Pressure Control (PC) Solenoid E Control Circuit Low (C1234 VBS)	The HWIO reports a low voltage (ground short) error flag	= TRUE Boolean		1 0701,1 072	>= 0.3 Fail Time (Sec)  out Sample of 0.375 Time (Sec)	
					P2729 Status is not  Ignition Voltage Ignition Voltage Engine Speed Engine Speed Engine Speed Engine Speed is within the	Fault Active  >= 8.59961 Volt <= 31.999 Volt >= 400 RPM <= 7500 RPM		

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Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria		Thres Valu		Secondary Malfunction	Enable Conditions		ime Juired	Mil Illum.
		·					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			>= 0.3 out 0.37	(Sec) Sample	
							P2730 Status is not Ignition Voltage	Fault Active >= 8.59961 Volt		, ,	
							Ignition Voltage Engine Speed Engine Speed Engine Speed is within the allowable limits for	>= 400 RPM <= 7500 RPM			
						Disable Conditions:	MIL not Illuminated for DTC's:	TCM: None ECM: None			
Variable Bleed Solenoid (VBS)		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 5 of	Sample Time (Sec)	

Component/	Fault	Monitor Strategy	Malfunction	Threshold	Secondary	Enable	Time	Mil
System	Code	Description	Criteria	Value	Malfunction	Conditions	Required	Illum.
					P2763 Status is not	Test Failed		
					Ignition Voltage Ignition Voltage Engine Speed Engine Speed	<= 31.999 Volt >= 400 RPM		
					Engine Speed is within the allowable limits for High Side Driver Enabled	>= 5 Sec		
				Disable Conditions:		TCM: P0658, P0659 ECM: None		
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
							out 5 MPH of	
					P2764 Status is not	Test Failed This Key On or Fault Active		
					Ignition Voltage Ignition Voltage Engine Speed Engine Speed Engine Speed is within the	<= 31.999 Volt >= 400 RPM <= 7500 RPM		
					allowable limits for High Side Driver Enabled	)- 5 Sec		

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Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria		eshold ′alue	Secondary Malfunction	Enable Conditions		Tir Requ		Mil Illum.
					Disable Conditions:	MIL not Illuminated for DTC's:	TCM: P0658, P0659 ECM: None				
Communication	U0073	Controller Area Network Bus Communication Error	CAN Hardware Circuitry Detects a Low Voltage Error	= TRUE	E Boolean			>=	62	Fail counts (≈ 10 seconds)	One Trip
			Delay timer	>= 0.112	5 sec			Ou t of	70	Sample Counts (≈ 11 seconds)	
						Stabilization delay Ignition Voltage Ignition Voltage Power Mode	>= 8.59961 Volt <= 31.999 Volt				
					Disable Conditions:	MIL not Illuminated for DTC's:	TCM: None ECM: None				
Communication	U0100	Lost Communications with ECM (Engine Control Module)	CAN messages from ECM are not received by the TCM	= TRUE	E Boolean			>=	12	sec	One Trip
						Stabilization delay Ignition Voltage Ignition Voltage Power Mode	<= 31.999 Volt				

Component/	Fault	Monitor Strategy	Malfunction	Threshold	Secondary	Enable	Time	Mil
System	Code	Description	Criteria	Value	Malfunction	Conditions	Required	Illum.
				Disable	MIL not Illuminated for DTC's:	TCM: U0073		
				Conditions:				
						ECM: None		

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

Т	a	bl	le	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	Sec

## 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	°С
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	Sec

## Table 7

Axis	-6.67	-6.66	40.00	80.00	120.00	٥С
Curve	409.00	3.40	1.40	1.30	1.20	Sec

## Table 8

Axis	-6.67	-6.66	40.00	80.00	120.00	٥С
Curve	409.00	3.60	1.60	1.50	1.40	Sec

## Table 9

Axis	-6.67	-6.66	40.00	80.00	120.00 °C	
Curve	409.00	3.30	1.30	1.20	1.10 Se	С

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

Τa	ab	le	1	(
16	w			•

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

#### Table 11

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	°С
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	٥С
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	С
Curve	2.97	0.82	0.47	0.20	0.13 S	ec

#### **Table 15**

Axis	-40.00	-30.00	-20.00	-10.00	0.00	10.00	20.00	30.00	40.00	°C
Curve	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Sec

## 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	°C
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	°С
Curve	256.00	50.00	45.00	40.00	34.00	25.00	20.00	20.00	256.00	°C

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

## Table 19

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 20**

Axis	-40.10	-40.00	-20.00	0.00	30.00	60.00	100.00	149.00	149.10	°C
Curve	256.00	10.00	8.00	8.00	8.00	8.00	8.00	8.00	256.00	°C

## <u>Table 21</u>

Axis	-40.00	-20.00	40.00	,C
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
	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
Г	-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

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria		Thres Val		Secondary Malfunction	Enable Condition			Tim Requi		Mil Illum.
Mode Switch	P071A	Transmission Mode Switch A Circuit	Tow Haul Mode Switch state	=	TRUE	Boolean				>=	600	Fail Time (Sec)	Special No MIL
							Ignition Voltage Lo Ignition Voltage Hi Engine Speed Lo Engine Speed Hi Engine Speed is within the allowable limits for	8.59961 31.999 400 7500	Volts Volts RPM RPM Sec				
						Disable Conditions:	DTC's:	P1762 None					
Tap Up Tap Down Switch (TUTD)	P0815	Upshift Switch Circuit	Fail Tap Up Switch Stuck in the Case 1 Up Position in Range 1 Enabled	=	0	Boolean							Special No MIL
			Tap Up Switch Stuck in the Up Position in Range 2 Enabled	=	0	Boolean							
			Tap Up Switch Stuck in the Up Position in Range 3 Enabled		0	Boolean							
			Tap Up Switch Stuck in the Up Position in Range 4 Enabled	=	0	Boolean							
			Tap Up Switch Stuck in the Up Position in Range 5 Enabled	=	0	Boolean							
			Tap Up Switch Stuck in the Up Position in Range 6 Enabled	=	0	Boolean							
			Tap Up Switch Stuck in the Up Position in Neutral Enabled	=	1	Boolean							

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria		Thres Val		Secondary Malfunction	Enable Conditions	Time Required	Mil Illum.
			Tap Up Switch Stuck in the Up Position in Park Enabled	=	1	Boolean				
			Tap Up Switch Stuck in the Up Position in Reverse Enabled	=	0	Boolean				
			Tap Up Switch ON	=	TRUE	Boolean			>= 1 Fail Time (Sec)	
			Fail Tap Up Switch Stuck in the Case 2 Up Position in Range 1 Enabled	=	1	Boolean				
			Tap Up Switch Stuck in the Up Position in Range 2 Enabled		1	Boolean				
			Tap Up Switch Stuck in the Up Position in Range 3 Enabled		1	Boolean				
			Tap Up Switch Stuck in the Up Position in Range 4 Enabled	=	1	Boolean				
			Tap Up Switch Stuck in the Up Position in Range 5 Enabled		1	Boolean				
			Tap Up Switch Stuck in the Up Position in Range 6 Enabled	=	1	Boolean				
			Tap Up Switch Stuck in the Up Position in Neutral Enabled		0	Boolean				
			Tap Up Switch Stuck in the Up Position in Park Enabled	=	0	Boolean				
			Tap Up Switch Stuck in the Up Position in Reverse Enabled		0	Boolean				
1			Tap Up Switch ON	=	TRUE	Boolean				

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Malfunction	Enable Conditions	Time Required	Mil Illum.
			NOTE: Both Failcase1 and Failcase 2 Must Be Met				>= 600 Fail Time (Sec)	
					T. 0	Enable		
					Time Since Last Range Change Ignition Voltage Lo	>= 1 Time (Sec)		
					Ignition Voltage Hi	<= 31.999 Volts		
					Engine Speed Lo Engine Speed Hi			
					Engine Speed is within the allowable limits for	. F Coo		
					P0815 Status is	Test Failed This Key ≠ On or Fault Active		
				Disable Conditions:		TCM: P0816, P0826, P182E, P1876, P1877, P1915, P1761		
						ECM: None		

Component/	Fault	Monitor Strategy	Malfunction		shold	Secondary Malfunction	Enable Conditions	Time	Mil Illum.
System	Code	Description	Criteria	va	lue	Wianunction	Conditions	Required	
Tap Up Tap Down Switch (TUTD)	P0816	Downshift Switch Circuit	Fail Tap Down Switch Stuck in Case 1 the Down Position in Range 1 Enabled	0	Boolean				Special No MIL
			Tap Down Switch Stuck in the Down Position in Range 2 Enabled	0	Boolean				
			Tap Down Switch Stuck in the Down Position in Range 3 Enabled	0	Boolean				
			Tap Down Switch Stuck in the Down Position in Range 4 Enabled	0	Boolean				
			Tap Down Switch Stuck in the Down Position in = Range 5 Enabled	0	Boolean				
			Tap Down Switch Stuck in the Down Position in Range 6 Enabled	0	Boolean				
			Tap Down Switch Stuck in the Down Position in = Range Neutral Enabled	1	Boolean				
			Tap Down Switch Stuck in the Down Position in = Range Park Enabled	1	Boolean				
			Tap Down Switch Stuck in the Down Position in = Range Reverse Enabled	0	Boolean				
			Tap Down Switch ON =	TRUE	Boolean			>= 1 sec	
			Fail Tap Down Switch Stuck in Case 2 the Down Position in Range 1 Enabled	1	Boolean				
			Tap Down Switch Stuck in the Down Position in Range 2 Enabled	1	Boolean				
			Tap Down Switch Stuck in the Down Position in = Range 3 Enabled	1	Boolean				

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria		Thres Val		Secondary Malfunction		Enable Conditio		Time Require		Mil Illum.
			Tap Down Switch Stuck in the Down Position in Range 4 Enabled		1	Boolean							
			Tap Down Switch Stuck in the Down Position in Range 5 Enabled		1	Boolean							
			Tap Down Switch Stuck in the Down Position in Range 6 Enabled		1	Boolean							
			Tap Down Switch Stuck in the Down Position in Neutral Enabled	=	0	Boolean							
			Tap Down Switch Stuck in the Down Position in Park Enabled	=	0	Boolean							
			Tap Down Switch Stuck in the Down Position in Reverse Enabled	=	0	Boolean							
			Tap Down Switch ON	=	TRUE	Boolean							
			NOTE: Both Failcase1 and Failcase 2 Must Be Met								>= 600	sec	
							Time Since Last Range Change	>=	1	Enable Time (Sec)			
							Ignition Voltage Lo	>=	8.59961	Volts			
							Ignition Voltage Hi Engine Speed Lo	<= >=	31.999 400	Volts RPM			
							Engine Speed Hi		7500	RPM			

Component/ System	Fault Code		Malfunction Criteria	Threshold Value	Secondary Malfunction	Enable Conditions	Time Required	Mil Illum.
					Engine Speed is within the allowable limits for			
					P0816 Status is	Test Failed This Key Øn or Fault Active		
				Disab Condition		TCM: P0815, P0826, P182E, P1876, P1877, P1915, P1761		
						ECM: None		
Tap Up Tap Down Switch (TUTD)	P0826	Up and Down Shift Switch Circuit	TUTD Circuit Reads Invalid Voltage	= TRUE Boolean			>= 60 Fail Time (Sec)	Special No MIL
					Ignition Voltage Lo Ignition Voltage Hi Engine Speed Lo Engine Speed Hi Engine Speed is within the allowable limits for	<= 31.999 Volts >= 400 RPM <= 7500 RPM		
					P0826 Status is	Test Failed This Key ≠ On or Fault Active		
				Disab Condition				

Component/	Fault Code	Monitor Strategy	Malfunction Criteria		shold lue	Secondary Malfunction	,	Enabl Conditi			Tim Requi		Mil Illum.
System Tap Up Tap Down Switch (TUTD)	P1761	Description  Tap Up and Down switch signal circuit (rolling count)	Rolling count value received from BCM does not match expected value		Boolean	Manufection		Sonatu	ons	>=	3	Fail Counter	Special No MIL
										>	10	Sample Timer (Sec)	
						Tap Up Tap Down Message Health	=	TRUE	Boolean				
						Engine Speed Lo	>=	400	RPM				
						Engine Speed Hi Engine Speed is within the allowable limits for		7500 5	RPM Sec				
					Disable Conditions:		TCM: N	lone					
							ECM: N	lone					
Mode Switch	P1762	Transmission Mode Switch Signal Circuit (rolling count)	Rolling count value received from BCM does not match expected value	= TRUE	Boolean					>=	3	Fail Counter	Special No MIL
										>	10	Sample Timer (Sec)	
						Pattern Switch Message Health	=	TRUE	Boolean				
						Engine Speed Lo Engine Speed Hi	>= <=	400 7500	RPM RPM				
						Engine Speed is within the allowable limits for	\	5	Sec				
					Disable Conditions:		TCM: N ECM: N						

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria		Thresi Valu		Secondary Malfunction	Enable Conditions		Time equired	Mil Illum.
Internal Mode Switch (IMS)	P182E	Internal Mode Switch - Invalid Range	Fail Case 1 Current range	=	Transition 1 (bit state 1110)					<b>. .</b>	One Trip
			Previous range	≠	CeTRGR_e						
			Previous range	≠	CeTRGR_e _PRNDL_Dr ive5						
			Range Shift State	=	Range Shift Completed	ENUM					
			Absolute Attained Gear Slip			rpm					
			Attained Gear Attained Gear	<=							
			Throttle Position Available	=	TRUE						
			Throttle Position Output Speed Engine Torque Engine Torque	>= >=	200 50	pct rpm Nm Nm					
			If the above conditions are met then Increment Fail Timer						>=	1 Fai Secor	
			If Fail Timer has Expired then Increment Fail Counter						>=	5 Fai Cour	
			Fail Case 2 Output Speed	<=	70	rpm					
			The following PRNDL sequence events occur in this exact order:								
			PRNDL state	=	Drive 6 (bit state 0110)	Range					
			PRNDL state = Drive 6 for	>=	1	Sec					

Component/	Fault	Monitor Strategy	Malfunction		Thres Valu		Secondary Malfunction		Enable Condition			Time Requir		Mil Illum
System	Code	Description	Criteria	-			Walluffction		Conditio	1115	<u> </u>	Kequii	eu	illulli
			PRNDL state	=	Transition 8 (bit state 0111)									
			PRNDL state	=	Drive 6 (bit state 0110)	Range								
			PRNDL state	=	Transition 1 (bit state 1110)	Range								
			Above sequencing occurs in	<=	1	Sec								
			Neutral Idle Mode	=	Inactive									
			If all conditions above are met Increment delay Timer											
			If the below two conditions are met Increment Fail Timer								>=	3	Fail Seconds	
			delay timer		1	Sec								
			Input Speed		400	Sec								
			If Fail Timer has Expired then Increment Fail Counter								>=	2	Fail Counts	
			Fail Case 3 Current range	=	Transition 13 (bit state 0010)	Range	Previous range	<b>≠</b>	CeTRG R_e_PR NDL_Dri ve2					
			Engine Torque	>=	-8192	Nm	Previous range	≠	CeTRG R_e_PR NDL_Dri ve1					
			Engine Torque	<=	8191.75	Nm	IMS is 7 position configuration	=	1	Boolean				
			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	Seconds	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria		Thresh Valu		Secondary Malfunction	Enable Conditions	F	Time Required	Mil Illum
			If Fail Timer has Expired then Increment Fail Counter						>=	15 Fo	
			Fail Case 4 Current range		Transition 8 (bit state 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	>=	100	Nm					
			Steady State Engine Torque	<=	8191.75	Nm					
			If the above conditions are met then Increment Fail Timer						>=	0.225 Sec	onds
			If the above Condtions have been met, Increment Fail Counter	į					>=	15 Fo	
			Fail Case 5 Throttle Position Available	=	TRUE	Boolean					
			The following PRNDL sequence events occur in this exact order:								
			PRNDL State	=	Reverse (bit state 1100)	Range					
			PRNDL State	=	Transition 11 (bit state 0100)	Range					
			PRNDL State	=	Neutral (bit state 0101)	Range					

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria		Thresi Valu		Secondary Malfunction		Enable Conditions	Tim Requi		Mil Illum
			PRNDL State	=	Transition 11 (bit state 0100)	Range						
			Above sequencing occurs in	<=	1	Sec						
			Then delay timer increments									
			Delay timer			sec						
			Range Shift State	=	Range Shift Complete							
			Absolute Attained Gear Slip	<=	50	rpm						
			Attained Gear		Sixth							
			Attained Gear		First							
			Throttle Position									
			Output Speed	>=	200	rpm						
			If the above conditions are met Increment Fail Timer							>= 20	Seconds	
			<u>Fail</u> <u>Case 6</u> Current range	=	Illegal (bit state 0000 or 1000 or 0001)		A Open Circuit Definition (flag set false if the following conditions are met):					
			and				Current Range	≠	Transitio n 11 (bit state 0100)			
			A Open Circuit (See Definition)	=	FALSE	Boolean	or					
							Last positive state	<b>≠</b>	Neutral (bit state 0101)			
							or					

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Malfunction	Enable Conditions	Time Required	Mil Illum
•		<b>,</b>			Previous transition state	Transitio ≠ n 8 (bit state 0111)		
					Fail case 5 delay timer	= 0 sec		
	Ш		If the above Condtions are met then, Increment Fail timer				>= 6.25 Seconds	
			<u>Fail</u> <u>Case 7</u> Current PRNDL State	PRNDL = circuit ABCP Range = 1101				
			and					
			Previous PRNDL state	PRNDL = circuit ABCP Range =1111				
				>= 150 RPM <= 2.8458252 ratio >= 3.27416992 ratio				
			If the above Condtions are met then, Increment Fail timer				>= 6.25 Seconds	=
								-
			P182E will report test fail when any of the above 7 fail cases are met					
					Ignition Voltage Lo Ignition Voltage Hi Engine Speed Lo Engine Speed Hi	<= 31.999 Volts >= 400 RPM		
					Engine Speed is within the allowable limits for	S- 5 Soc		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Malfunction	Enable Conditions	Time Required	Mil Illum.
					Engine Torque Signal Valid	= TRUE Boolean		
				Disable Conditions:	DTC's:	TCM: P0716, P0717, P0722, P0723, P07C0, P07BF, P077C, P077D  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/ System	Fault	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum
Transmission Fluid 1		•	Manufiction Officeria	Tillesilola Value	Secondary Farameters	Eliable Collutions	Time Required	mam
Transmission Fluid Temperature Sensor Circuit Range/Performance	P0711		All 5 Cases		Not Test Failed This Key On	P0711 P0716 P0717 P0721 P0722 P0742		В
		values.			No Fault Pending DTCs for this drive cycle			
					No Pass DTCs for this drive cycle			
					No Fault Active DTC	P0711		
					Components powered AND			
					Battery Voltage between	9 V and 18 V		
					Engine Speed between for	200 RPM and 7500 RPM 5 seconds		
					Start-up transmission fluid temperature is available Transmission fluid temperature between ECT is not defaulted	-39 deg. C and 149		
			Case 1 (Stuck sensor after cold start-up)	s= 2 dog C		40 dog C === 24	300 seconds	
			Start-up temperature change for a time		Start-up transmission fluid temperature between			
			AND	. OKDU		>= 120 RPM >= 300 seconds		
			Vehicle speed for a time	>= 8 KPH >= 300 seconds.	engine coolant temperature	>= 70 deg. C		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MII Illui
					AND			
					engine coolant temperature			
					change from start-up	>= 15 deg. C		
			Case 2 (Stuck sensor after		-	-	300 seconds	
			warm start-up)					
			Start-up temperature	<= 3 deg. C	Start-up transmission fluid			
			change		temperature between	deg. C.		
			for a time	>= 100 seconds				
			AND		TCC Slip	>= 120 RPM		
						>= 300 seconds		
					engine coolant temperature			
					AND			
			Vehicle speed		engine coolant temperature			
			for a time	>= 300 seconds.	change from start-up	>= 55 deg. C		
			Case 3 (Noisy sensor)				7 seconds	
			Change from previous	>= 20 deg. C				
			temperature	44				
				14 events < 7 seconds.				
			Case 4 (Doesn't warm up	< / seconds.			2200 seconds	
			to at least 20 deg. C)		net engine torque	>= 150 Nm	2200 3600103	
			Time Enabled Criteria			<= 1492 Nm		
			met AND		ana	110211111		
			AND		vehicle speed	>= 22 KPH		
			Transmission Fluid	< 20 deg. C.		<= 512 KPH		
			Temperature	-				
						>= 10.5%		
			Time Enabled Criteria is		and	<= 100%		
			determined by a lookup	start-up temperature				
			table ranging from	is >= 20 deg. C				
					engine speed	>= 500 RPM		
			to	2200 seconds when		<= 6500 RPM		
				start-up temperature	engine coolant temperature			
				is <= -40 deg. C.		<= 149 deg. C		
				j				
			Case 5 (Reasonableness				2 seconds	
			at start-up):		Intake Air Temperature is not			
			Engine Speed		defaulted			
			AND					

0	Fault	Monitor Strategy	Malfore ettere Outtoute	Thursday Id Volum	O a a a a da a a Barrara da a a	Frankla Oanditiana	Time Demoined	MIL
Component/ System	Code	Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	Illum
			Engine Coolant Temperature					
			•	< 50 deg. C				
				>= 2 seconds				
			AND					
			((ABS(IAT-ECT)	_				
			AND					
			, , , , , , , , , , , , , , , , , , , ,	> 40 deg. C				
			OR (ABS(IAT-ECT)	> 6 deg   C				
			AND					
			(TFT-ECT)))	> 60 deg. C.				
	P0712	Out of range low.			Not Test Failed This Key On		2.5 seconds	В
Temperature Sensor			transmission fluid			P0712		
Circuit Low Input			temperature	> 2.5 seconds.		P0713		
			ioi a time	2.5 seconds.	Components powered			
					AND			
					Battery Voltage between	9 V and 18 V		
					Engine Speed between	200 RPM and 7500		
					Engine opeca between	RPM		
					for	5 seconds		
	P0713	Out of range high.			Not Test Failed This Key On		2.5 seconds	В
Temperature Sensor			transmission fluid			P0712		
Circuit High Input			temperature	> 2.5 seconds		P0713		
			ioi a time	2.5 seconds	Components powered			
					AND			
					Battery Voltage between	9 V and 18 V		
					Engine Speed between			
						RPM		
					for	5 seconds		
					IF Engine run time	<= 600 seconds		
					THEN			
					Engine Coolant Temperature	must be > 20 deg. C		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum
					AND not defaulted for a time			
Speed Sensors					not deladited for a time	>= 20 seconds.		_
	P0716	This test detects large changes in Input Speed and noisy Input Speed by comparing to calibration values.	All cases		Not Test Failed This Key On	P0716 P0717 P0721 P0722		A
					No Fault Pending DTCs for this drive cycle.	P0722		
			Case 1: (Unrealistically large changes in input speed) Change of Input Speed between samples for		Shifting complete Input Speed for	> 200 RPM >= 0.5 seconds	0.15 seconds	
			Case 2: (Noisy Input Speed) For sample size IF the change in Input Speed THEN the Low Counter is incremented	<= -800 RPM	Input Speed for	> 200 RPM >= 0.5 seconds	2 seconds	
			IF the change in Input Speed THEN the High Counter is incremented This test fails if both the					
			Low Counter and the High Counter OR Low Counter OR High Counter	>= 5 >= 5				
			For Case 3: (Wires to speed sensors swapped)		Input speed AND	> 100 RPM	4 seconds	

	Fault	Monitor Strategy						MIL
Component/ System		Description	Malfunction Criteria	Threshold Value	Secondary Parameters	<b>Enable Conditions</b>	Time Required	Illum
			Increment counter when		Engine speed	> 100 RPM		
			range attained and range		for a time	>= 0.2 seconds		
			commanded are neutral for					
			a time	<= 3.5 seconds				
			AND		Hydraulic system pressurized			
			,		riyaraano oyotom proceanzea			
			when ratio of engine speed					
			and input speed					
			Arm test when counter	>=20				
			OR					
			when time	> 3.5 seconds				
			Malfunction is reported					
			when, for a time					
			the range commanded is					
			NOT neutral					
			AND					
			the on-coming clutch					
			control is complete					
			AND					
			input speed					
			AND					
Lead Official Control	D0747	This is a late of	engine speed		No. 17 of Fall of The King On	D0747	4	_
Input/Turbine Speed Sensor Circuit No		This test detects	Failure pending if		Not Test Failed This Key On		1 second	Α
Signal		unrealistically low value of input/turbine speed or	transmission input speed	< 61 RPM		P0729		
Signal		unrealistically large				P0731		
		changes in input/turbine	This test fails if input speed	< 61 DDM		P0732		
		speed.	This test fails if input speed	< 01 KFW		P0/32		
		opoou.	AND			P0733		
			output speed			P0734		
				> 1 second.		P0735		
			ioi a time	/ 1 3000Hd.		P0736		
						P0721		
						P0722		
						. 0722		
					No Fault Pending DTCs	P0721		
						P0722		
					Reverse-to-Neutral shift not in			
					process			

Component/System	Fault Code	Monitor Strategy	Malfunction Critoria	Threshold Value	Sacandam, Darametera	Enable Conditions	Time Deguired	MIL
Component/ System	Code	Description	Malfunction Criteria	inresnoid value	Secondary Parameters		Time Required	Illum
					Shifting complete Range attained is not neutral			
					Range attained is not neutral			
					Transmission fluid temperature	> -25 dea. C		
					Engine speed			
					Transmission output speed	>= 150 RPM		
Output Speed Sensor	P0721	•	Case 1: (Unrealistically		All Cases		Case 1:	Α
Circuit		output speed sensor or	large change in output		Not Test Failed This Key On	P0716	0.65 seconds	
Range/Performance		circuit by detecting large changes in output		500 DDM		D0747		
		speed.	Change in output speed			P0717 P0721		
		оросси.	for a time	>= 0.15 seconds		P0721 P0722		
			Case 2: (Noisy output			0722	Case 2:	
			speed)				0400 2.	
			For sample size	80	No Fault Pending DTCs for this	P0716	2 seconds	
					drive cycle	P0717		
			IF the change in output	<= -500 RPM				
			speed					
			THEN the Low Counter is		0.10.100001			
			incremented.  IF the change in output	>= 500 DDM	Output Speed	> 200 RPM >= 0.5 seconds		
			speed	>= 500 KFW		>= 0.5 Seconds		
			THEN the High Counter is					
			incremented.		Shift complete			
			Test fails if both the Low		AND			
			Counter and the High	>= 5	range attained NOT neutral			
			OR					
			the Low Counter	>= 5				
			OR the High Counter	<b>&gt;-</b> 5				
Output Speed Sensor	P0722	This test detects	All Cases	7-3	All Cases			Α
Circuit No Signal	0722	unrealistically low value	7 111 00000		Not Test Failed This Key On	P0721		
J S		of output speed or						
		unrealistically large	Case 1: (Unrealistically		Test enabled when output		1 second	
		change in output speed.	large change in output		speed	>= 600 RPM		
			speed)					
			Failure pending if		for a time	>= 1 seconds		
			change in output speed		Tank disability to be a set of			
			Failure sets if range attained is Neutral		Test disabled when output	<= 600 RPM		
			attained is Neutral		•	> 1 seconds		
		I			ioi a time	- i Seconds		J !

	Fault	Monitor Strategy						MIL
Component/ System	Code	Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	Illum
			Case 2: (Unrealistically				4 seconds	
			low value of output speed)					
			Failure pending if output	< 61 RPM	Not Test Failed This Key On	P0731		
			speed	COTICI IVI	Not restrailed This Key Off	1 07 51		
			Failure sets if not			P0732		
			monitoring for low speed			P0733		
			neutral and output speed	< 61 RPM		P0734		
			AND range is 3rd, 4th, 5th, or			P0735 P0736		
			farige is 3rd, 4th, 5th, 6th			F0730		
				> 1 second		P0716		
						P0717		
			Failure sets if not					
			monitoring for low speed		No Fault Pending DTCs for this			
			neutral and output speed		drive cycle	P0717		
			AND	< 61 RPM		1 07 17		
			((net engine torque		Engine is running			
			OR		Shift not in process			
			net engine torque)	> 100 Nm	Range attained is not Neutral			
			OR		Reverse to Neutral shift not in			
			(turbine speed	> 1500 RPM	process			
			AND		Transmission fluid temperature	> -25 deg. C		
			range is 2nd))		Transmission input speed	>= 1050 RPM		
				>= 4 seconds.	Not waiting for Manual			
					Selector Valve to attain			
					forward range			
					PRNDL State is NOT D4, NOT			
					Transitional D4			
Range Verification								
Gear 1 Incorrect	P0731	This test verifies	Pending failure occurs		Not Toot Foiled This Var. On		2.25 seconds	Α
Ratio		transmission operating ratio while 1st range is	when accumulated event timer	>= 2 second	Not Test Failed This Key On	PU011		
		commanded by	Timer accumulates when	/- Z Second		P0878		
		comparing computed	transmission is in forward			P0721		
		ratio to the commanded	or reverse range			P0722		
		ratio.	AND			P0716		
1			output speed	>= 100 RPM		P0717		

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Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum
			AND gear slip	> 100 RPM	No Fault Pending DTC for this drive cycle.	P0717		
			In response to pending failure, a diagnostic response range is commanded.		No range switch response active			
			During this command, this test fails if Abs(Converter		Hydraulic System Pressurized			
				>= 230 RPM > 10 samples.	Shift complete			
					Output speed	>= 200 RPM		
					No hydraulic default condition present			
					Normal powertrain shutdown not in process			
					Normal powertrain initialization is complete			
Gear 2 Incorrect Ratio		This test verifies transmission operating ratio while 2nd range is	Pending failure occurs when accumulated event timer		Not Test Failed This Key On	P0877	2.25 seconds	Α
		commanded by comparing computed ratio to the commanded	Timer accumulates when transmission is in forward	>= 2 second		P0878 P0721		
		ratio.	or reverse range AND			P0722 P0716		
				>= 100 RPM		P0717		
				> 100 RPM	No Fault Pending DTC for this drive cycle.	P0717		
			In response to pending failure, a diagnostic response range is commanded.		No range switch response active			
			During this command, this test fails if Abs(Converter Slip)		Hydraulic System Pressurized			
				> 10 samples.	Shift complete			
					Output speed	>= 200 RPM		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum
					No hydraulic default condition present Normal powertrain shutdown not in process Normal powertrain initialization is complete			
Gear 3 Incorrect Ratio	P0733	This test verifies transmission operating ratio while 3rd range is commanded by comparing computed ratio to the commanded ratio.	Timer accumulates when transmission is in forward or reverse range AND output speed AND	> 100 RPM >= 230 RPM	Not Test Failed This Key On  No Fault Pending DTC for this drive cycle.  No range switch response active  Hydraulic System Pressurized  Shift complete  Output speed  No hydraulic default condition present  Normal powertrain shutdown not in process	P0877 P0878 P0721 P0722 P0716 P0717 P0717	2.25 seconds	A
Gear 4 Incorrect Ratio		This test verifies transmission operating ratio while 4th range is commanded by comparing computed ratio to the commanded ratio.	Pending failure occurs when accumulated event timer Timer accumulates when transmission is in forward or reverse range	>= 2 second	Normal powertrain initialization is complete  Not Test Failed This Key On		2.25 seconds	Α

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Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum
. ,		·	AND		,	P0716	·	
				>= 100 RPM		P0717		
			AND		No Foult Donding DTC for this	D0747		
			gear slip	> 100 RPM	No Fault Pending DTC for this drive cycle.	P0/1/		
			In response to pending					
			failure, a diagnostic		No range switch response			
			response range is commanded.		active			
			During this command, this		Hydraulic System Pressurized			
			test fails if Abs(Converter		Trydraulic Gystelli i Tessurized			
				>= 230 RPM				
			for	> 10 samples.	Shift complete			
					Output speed	>= 200 RPM		
					No budwoulie default condition			
					No hydraulic default condition present			
					Normal powertrain shutdown			
					not in process			
					Normal powertrain initialization is complete			
Gear 5 Incorrect	P0735	This test verifies	Pending failure occurs				2.25 seconds	Α
Ratio		transmission operating	when accumulated event		Not Test Failed This Key On	P0877		
		ratio while 5th range is commanded by		>= 2 second				
		comparing computed	Timer accumulates when transmission is in forward			P0878 P0721		
		ratio to the commanded	or reverse range			P0721		
		ratio.	AND			P0716		
				>= 100 RPM		P0717		
			AND	> 100 RPM	No Fault Pending DTC for this	P0717		
			gear slip	> 100 Ki Wi	drive cycle.	1 07 17		
			In response to pending		· ·			
			failure, a diagnostic		No range switch response			
			response range is commanded.		active			
			During this command, this		Hydraulic System Pressurized			
			test fails if Abs(Converter					
				>= 230 RPM > 10 samples.	Shift complete			
1		I	ior	- 10 samples.	Shirt complete			

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum
					Output speed  No hydraulic default condition present Normal powertrain shutdown not in process Normal powertrain initialization is complete			
Reverse Incorrect Ratio	P0736	This test verifies transmission range while reverse range is commanded by comparing computed ratio to the commanded ratio.	Accumulated event timer  Timer accumulates when transmission is in forward or reverse range  AND output speed  AND gear slip	>= 100 RPM		P0878 P0721 P0722 P0716 P0717  P0717  >= 200 RPM	2 seconds	A
Gear 6 Incorrect Ratio		This test verifies transmission operating ratio while 6th range is commanded by comparing computed ratio to the commanded ratio.	Pending failure occurs when accumulated event timer Timer accumulates when transmission is in forward or reverse range	>= 2 second	is complete  Not Test Failed This Key On		2.25 seconds	A

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Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum
Component/ System	Code	Description	AND		Secondary Parameters	P0716	Time Required	illulli
			output speed			P0716 P0717		
			AND					
			gear slip	> 100 RPM	No Fault Pending DTC for this	P0717		
			In recognition to ponding		drive cycle.			
			In response to pending failure, a diagnostic		No range switch response			
			response range is		active			
			commanded.					
			During this command, this test fails if Abs(Converter		Hydraulic System Pressurized			
				>= 230 RPM				
			for		Shift complete			
					Output speed	>= 200 RPM		
					No hydraulic default condition			
					present			
					Normal powertrain shutdown			
					not in process Normal powertrain initialization			
					is complete			
Torque Converter Clutch								
	P0741	This test detects the					15 seconds	В
Clutch Circuit Performance or		torque converter being stuck off (unlocked).		>= 80 RPM	Not Test Failed This Key On	P2761		
Stuck Off		stuck off (ufflocked).	for a time	>= 15 seconds.		P2763 P2764		
						P0721		
						P0722		
						P0716		
						P0717		
					No Fault Pending DTCs for this	P2761		
					drive cycle.	P2763		
						P2764		
						P0721 P0722		
						P0716		1
						P0717		
					Components powered			

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum
					AND Battery Voltage between	9 V and 18 V		
					Engine Speed between	200 RPM and 7500 RPM		
					for	5 seconds		
					Must be in forward range			
					% Throttle	> 10 % and <= 90 %		
					Transmission fluid temperature	> 5 deg. C and < 130 deg. C		
					Time Since Range Change AND			
					TCC apply is complete AND			
					TCC pressure	>= 1000 kPa		
Torque Converter Clutch Circuit Stuck On		This test detects the torque converter being stuck on (locked).	Case 1: (High Torque condition)		Not Test Failed This Key On	P2761	Case 1:	В
			Set fault pending when throttle	>= 70%		P2763	2 Seconds	
			AND			P2764		
			net engine torque	>= 275 Nm.		P0721 P0722		
			Report malfunction when			P0716		
			fault pending exists continuously			P0717		
			for a time	>= 2 seconds.		U0100		
			Case 2: (High		No Fault Pending DTCs for this	P2761	Case 2:	
			Acceleration condition)		drive cycle.		5 Seconds	
			Set fault pending when output shaft acceleration	> - 400 DDM/ssssrd		P2764 P0721		
				>= 100 RPM/second		P0722		
			Report malfunction when			P0716		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum
			fault pending exists			P0717		
			continuously					
			for a time	>= 5 seconds.	Components powered	U0100		
			Case 3: (Accel/Decel/Accel		Components powered AND		Case 3:	
			condition)		Battery Voltage between	9 V and 18 V	4 Seconds	
			Report malfunction when					
			output acceleration event is followed by output		Engine Speed between	200 RPM and 7500 RPM		
			deceleration event and		for	5 seconds		
			followed by another output		101	o seconds		
			acceleration event. An		Must be in forward range			
			output acceleration event occurs when output shaft					
			acceleration					
			4000.0.44.0	>= 40 RPM/second				
			for a time	>= 4 seconds	TCC is commanded off			
					TCC Slip	>=-20 RPM and <=		
			An output deceleration event occurs when output			20 RPM		
			shaft acceleration is					
				<=-40 RPM/second				
			for a time	>= 2.5 seconds.	% Throttle	>= 25%		
					Net Engine Torque			
						<= 3500 RPM		
					Input speed Output speed	<= 3500 RPM >= 100 RPM		
Pressure Switches					Output specu	2 - 100 Ki Wi		
Pressure Switch	P0842	This test compares the	Pending failure occurs				100 ms	Α
Solenoid 1 Circuit		commanded valve	when PS1 pressure switch		S1 valve is destroked			
_OW		position to the PS1	indicates stroked for a time	> 0.08 seconds				
		pressure switch feedback. (part of S1						
		valve integrity test)			NOT Cold initialization unless			
		1 2 3 3, 15 1,			transmission fluid temperature	> -25 deg. C		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum
,p.:					Shutdown is NOT in process			
			In response to the pending failure, S1 valve is retried by triggering S1 valve command to stroked and back to destroked. If PS1 pressure switch continues to indicate stroked, then one of three malfunction cases exists:					
			For Case 1 (electrical malfunction), SS1 Circuit Low reports failure, also.	P0793				
			For Case 2 (mechanical malfunction), Shift Solenoid 1 (SS1) Valve Performance – Stuck On reports failure, also.	P0752				
			For Case 3 (intermittent malfunction), SS1 valve retry attempted AND PS1 pressure switch continues to indicate stroked.					
Shift Solenoid 1 (SS1) Valve Performance – Stuck Off		This test compares the change of state of the valve command to the change of state of the PS1 pressure switch feedback. (part of the S1 valve timeout test)	S1 valve is commanded from destroked to stroked and the PS1 pressure switch indication remains destroked for a time	>= 5 seconds	S1 valve commanded from destroked to stroked.		5 seconds	А

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum
			WITH transmission fluid temperature	>= 0 deg. C				
			(Time increases as temperature decreases with maximum time	12 seconds				
			at transmission fluid temperature)	<u> </u>				
Shift Solenoid 1 (SS1) Valve Performance – Stuck On		This test compares the change of state of the valve command to the change of state of the PS1 pressure switch feedback. (part of the S1 valve timeout test).	S1 valve commanded from stroked to destroked and the PS1 pressure switch indication remains stroked for a time	> 6.2 seconds	S1 valve changes from stroked to destroked		6.6 seconds	A
			WITH transmission fluid temperature	>= 0 deg. C.				
			(Time increases as temperature decreases with maximum time	11 seconds				
			at transmission fluid temperature)	_				
Pressure Switch Solenoid 1 Circuit High		This test compares the commanded valve position to the PS1 pressure switch	Pending failure occurs when PS1 pressure switch indicates destroked for a time	> 0.07 seconds	S1 valve is stroked		70 ms	А
		feedback. (part of S1 valve integrity test)	IF a main pressure dropout is suspected then time limit increases to	5 seconds	NOT Cold initialization unless transmission fluid temperature			
			In response to the pending failure, S1 valve is retried		Shutdown NOT in process			

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Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum
omponent cyclem		2000	by triggering S1 valve command to destroked and back to stroked. If the PS1 pressure switch continues to indicate destroked, then one of three malfunction cases exists.				ortoquilou	
			For Case 1 (electrical malfunction), SS1 Control Circuit Low reports failure, also.	P0793				
			For Case 2 (mechanical malfunction), Shift Solenoid 1 (SS1) Valve Performance – Stuck Off reports failure,	P0751				
			For Case 3 (intermittent malfunction), S1 valve retry attempted AND					
			PS1 pressure switch continues to indicate destroked.					
Pressure Switch Solenoid 2 Circuit Low		This test compares the commanded valve position to the PS2 pressure switch	Pending failure occurs when PS2 pressure switch indicates stroked for a time	> 0.04004 seconds	S2 valve is destroked		40 ms	Α
		feedback (part of the S2 valve integrity test).			NOT Cold initialization unless transmission fluid temperature			
			In response to the pending failure, S2 valve is retried by triggering S2 valve command to stroked and		Shutdown is NOT in process			

	Fault	Monitor Strategy						MIL
Component/ System	Code	Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	Illum
		Becomplien	back to destroked. If PS2 pressure switch continues to indicate stroked, then one of three malfunction cases exists.  For Case 1 (electrical malfunction), SS2 Control Circuit Low reports failure, also.  For Case 2 (mechanical malfunction), Shift Solenoid 2 Valve Performance – Stuck On reports failure, also.  For Case 3 (intermittent malfunction), S2 valve retry attempted AND PS2 pressure switch	P0976 P0757 2 times				
			continues to indicate					
			stroked.					
Shift Solenoid 2 Valve Performance – Stuck Off		This test compares the change of state of the valve command to the change of state of the PS2 pressure switch feedback (part of the S2 valve timeout test).	If the S2 valve is commanded from destroked to stroked and the PS2 pressure switch indication remains destroked for a time  WITH transmission fluid temperature  (Time increases as temperature decreases with maximum time	>= 5 seconds >= 0 deg. C. 12 seconds	S2 valve commanded from destroked to stroked.		5 seconds	A

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum
			transmission fluid temperature)	<u> </u>				
Shift Solenoid 2 Valve Performance – Stuck On		This test compares the commanded valve position to the PS2 pressure switch feedback (part of the S2 valve timeout test).	S2 valve commanded from stroked to destroked and the PS2 pressure switch does not indicate destroked for a time  WITH transmission fluid temperature  (Time increases as temperature decreases with maximum time at transmission fluid temperature)	>= 7 seconds >= 0 deg. C. 22 seconds	S2 valve changes from stroked to destroked		6.4 seconds	A
Pressure Switch Solenoid 2 Circuit High		This test compares the commanded valve position to the PS2 pressure switch feedback (part of the S2 valve integrity test).	Pending failure occurs when PS2 pressure switch indicates destroked for a time  IF a main pressure dropout is suspected, THEN time limit increases to  In response to the pending failure, S2 valve is retried by triggering S2 valve command to destroked and back to stroked. If PS2 pressure switch	> 0.30 seconds 5 seconds	S2 valve is stroked  NOT Cold initialization unless transmission fluid temperature  Shutdown NOT in process	> -25 deg. C	300 ms	A

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum
			destroked, then one of three malfunction cases exists.					
			For Case 1 (electrical malfunction),					
			SS2 Control Circuit Low reports failure, also.	P0976				
			For Case 2 (mechanical malfunction), Shift Solenoid 2 Valve Performance – Stuck Off reports failure, also.	P0756				
			For Case 3 (intermittent malfunction), S2 valve retry attempted AND					
			PS2 pressure switch continues to indicate destroked.					
Pressure Switch Solenoid 3 Circuit Low		This test compares the commanded valve position to the PS3 pressure switch	Pending failure occurs when PS3 pressure switch indicates stroked for a time		S3 valve is destroked		20 ms	Α
		feedback. (part of S3 valve integrity test)			NOT Cold initialization unless transmission fluid temperature			
			In response to the pending failure, S3 valve is retried by triggering S3 valve command to stroked and back to destroked. If PS3 pressure switch continues		Shutdown is NOT in process			

	Fault	Monitor Strategy						MIL
Component/ System	Code	Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	Illum
			to indicate stroked, then one of three malfunction cases exists.  For Case 1 (electrical malfunction), SS3 Control Circuit Low reports failure, also.					
			For Case 2 (mechanical malfunction), Shift Solenoid 3 Valve Performance – Stuck On reports failure, also. For Case 3 (intermittent malfunction),	P0762				
			S3 valve retry attempted AND PS3 pressure switch continues to indicate stroked.					
Shift Solenoid 3 Valve Performance – Stuck Off	P0761	This test compares the change of state of the valve command to the change of state of the PS3 pressure switch feedback. (part of the S3 valve timeout test)	If the S3 valve is commanded from destroked to stroked and the PS3 pressure switch indication remains destroked for a time  WITH transmission fluid temperature	>= 5 seconds >= 0 deg. C.	S3 valve commanded from destroked to stroked.		5 seconds	A
			(Time increases as temperature decreases with maximum time at transmission fluid temperature)	12 seconds				

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum
Shift Solenoid 3 Valve Performance – Stuck On		This test compares the commanded valve position to the PS3 pressure switch feedback (part of the S3 valve timeout test).	S3 valve commanded from stroked to destroked and the PS3 pressure switch does not indicate destroked for a time		S3 valve changes from stroked to destroked		6.6 seconds	А
			WITH transmission fluid temperature	_				
			(Time increases as temperature decreases with maximum time					
			at transmission fluid temperature)					
Pressure Switch Solenoid 3 Circuit High		This test compares the commanded valve position to the pressure switch PS3 feedback. (part of S3 valve integrity	Pending failure occurs when PS3 pressure switch indicates destroked for a time		S3 valve is stroked		300 ms	А
		test)	IF a main pressure dropout is suspected THEN time limit increases to		NOT Cold initialization unless transmission fluid temperature  Shutdown NOT in process	> -25 deg. C		
			In response to the pending failure, S3 valve is retried by triggering S3 valve command to destroked and back to stroked. If PS3 pressure switch continues to indicate destroked, then one of the three malfunction cases exists.		Gridia Will 140 1 III process			
			For Case 1 (electrical malfunction),					

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum
Component System	Code	Description	SS3 Control Circuit Low		Jecondary Farameters	Lilable Colluitions	Time Required	mum
			reports failure, also.	1 0070				
			For Case 2 (mechanical					
			malfunction),					
			Shift Solenoid 3 Valve	P0761				
			Performance – Stuck Off	0701				
			reports failure, also.					
			<u> </u>					
			For Case 3 (intermittent malfunction),					
			S3 valve retry	2 times				
			attempted					
			AND					
			PS3 pressure switch continues to indicate					
			destroked.					
Pressure Switch	P0877	This test detects			All Cases		5 seconds	Α
Reverse Circuit Low		Reverse Pressure	Case 1: (Forward range)		Not Test Failed This Key On	P0877		
		Switch closed indication		400		D0070		
		by comparing the Reverse Pressure	For a sample size (if dropout suspected, NLT			P0878 P0708		
		Switch state to the	or N02 cmded, use sample			F0700		
		PRNDL switch state.	size)					
					No Fault Pending DTCs for this			
			PRNDL is P, D1, D2, D3,		drive cycle			
			D4, D5, D6, T8, or T4 AND		Engine is Running			
			71140		Linginio is realitining			
			RPS indicates Reverse		Components powered AND			
			for a time	>= 1 seconds	Battery Voltage between	9 V and 18 V		
			(if dropout suspected,					
			NLT ()		<b>.</b>	000 0014 17500		
			or N02 cmded, use time)	30 seconds	Engine Speed between	RPM and 7500		
			Case 2: (Range indefinite)		for	5 seconds		
			For a sample size,	20 samples				
			net engine torque		Transmission Fluid	>= 0 deg. C		

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	Fault	Monitor Strategy						MIL
Component/ System	Code	Description	Malfunction Criteria	Threshold Value	Secondary Parameters	<b>Enable Conditions</b>	Time Required	Illum
			AND PRNDL is indefinitely D3 or another forward range		Temperature Hydraulic System Pressurized			
			for a time	> 1 second	Reverse Pressure Switch State indicates REVERSE			
Pressure Switch Reverse Circuit High	P0878	This test detects the Reverse Pressure switch	All Cases		Transmission Fluid Temperature	>= 0 deg. C		Α
		being stuck in the open position by comparing to the PRNDL switch state	Case 1: (RPS State and		Not Test Failed This Key On		3 seconds	
		and detects the Reverse Pressure switch stuck open at shutdown.	For sample size PRNDL is REVERSE AND			P0878 P0708		
			RPS indicates NOT REVERSE after a time	>= 1 second	No Fault Pending DTC for this drive cycle.	P0708		
					Battery Voltage between	9 V and 18 V		
					No range switch response active			
			For Case 2: (RPS Shutdown Test)		Ignition Key State is NOT RUN		60 seconds	
				> 40 seconds	Engine Stopped or Stalled			
			at transmission fluid temperature during engine shutdown		End of Trip timer	>= 5 seconds		
			This time varies with transmission fluid temperature, from time		Engine had been cranking or running this drive cycle			
			at transmission fluid temperature to time	> 35 deg. C 60 seconds	Engine speed	< 50 RPM		
			at transmission fluid temperature		Turbine speed	< 50 RPM		
					Output speed	< 50 RPM		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum
On-coming/Off-		2000.191.011			occomular, runametere			
going Ratio	D0700	This tost data was in as if	Donding failure accura				2.25 accords	_
Pressure Control Solenoid 1 Controlled Clutch Stuck Off	P2723	This test determines if the on-coming clutch energized by Pressure	Pending failure occurs when accumulated event timer	>= 2 seconds	Not Test Failed This Key On	P0721	2.25 seconds	A
		Control Solenoid 1 engages during a forward range shift.	(For rough road conditions, use)	2 seconds		P0722		
		l and a range come	<b>T</b>			P0716		
			Timer accumulates when transmission is shifting,			P0717 P0877		
			output speed AND commanded gear slip speed	> 75 RPM		P0878		
			(For rough road conditions, use)		Output Speed	>= 125 RPM		
			, ,		Turbine Speed	>= 60 RPM		
			In response of pending failure, a diagnostic		Hydraulic System Pressurized			
			response range is commanded. During this command, this test fails if ABS(Converter slip)	>= 230 PPM	Normal powertrain shutdown not in process			
			for sample size		Normal or Cold powertrain initialization is complete			
					No range switch response active			
					No Cold Mode operation			
					No abusive garage shift to 1st range detected			
					On-coming clutch control enabled			
					Power downshift abort to previous range NOT active			

Component/ System	Fault	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum
					Secondary Parameters	Enable Conditions		
Pressure Control Solenoid 2 Controlled Clutch Stuck Off	P0776	This test determines if the on-coming clutch energized by Pressure	Pending failure occurs when accumulated event timer	>= 2 seconds	Not Test Failed This Key On	P0721	2.25 seconds	A
		Control Solenoid 2 engages during a forward range shift.	(For rough road conditions, use)			P0722 P0716		
			Timer accumulates when transmission is shifting,			P0717 P0877		
			output speed AND commanded gear slip			P0878		
			speed (For rough road conditions, use)		Output Speed Turbine Speed			
			In response of pending failure, a diagnostic response range is		Hydraulic System Pressurized			
			commanded. During this command, this test fails if ABS(Converter slip)		Normal powertrain shutdown not in process			
			for sample size	> 10 samples	Normal or Cold powertrain initialization is complete			
					No range switch response active			
					No Cold Mode operation			
					No abusive garage shift to 1st range detected			
					On-coming clutch control enabled			
					Power downshift abort to previous range NOT active			

Component/ System	Fault	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum
Pressure Control	P2724	This test determines if	Walluffelion Offeria	Tillesiloid value	Secondary Farameters	Litable Colluitions	3 seconds	A
Solenoid 1 Controlled Clutch Stuck On		the off-going clutch energized by Pressure	Accumulated fail timer	>= 0.2998 seconds	Not Test Failed This Key On	P0721	3 Seconds	
States States Str		Control solenoid 1 remains engaged during	for forward range upshift;			P0722		
		a forward range shift.	OR accumulated fail timer	>= 3.0 seconds		P0716		
			for direction change shifts;			P0717		
			OR accumulated fail timer	>= 0.500 seconds		P0877		
			for forward range closed throttle downshift;			P0878		
			OR accumulated fail timer	>= 1.0 second	No Fault Pending DTC for this drive cycle.	P0717		
			for forward downshifts above closed throttle.		•			
			Fail timer accumulates		Output Speed Turbine Speed			
			during range to range shifts when attained gear slip speed	<= 25 RPM	Normal powertrain shutdown not in process	2 - 200 KI W		
					Normal or Cold powertrain initialization is complete			
					No range switch response active			
					No Cold Mode operation			
					No abusive garage shift to 1st range detected			
Pressure Control Solenoid 2 Controlled		This test determines if the off-going clutch	Accumulated fail timer	>= 0.2998 seconds	Not Test Failed This Key On	P0721	3 seconds	Α
Clutch Stuck On		energized by Pressure Control solenoid 2 remains engaged during	for forward range upshift;			P0722		
		a forward range shift.	OR accumulated fail timer	>= 3.0 seconds		P0716		

	Fault	Monitor Strategy						MIL
Component/ System	Code	Description	Malfunction Criteria	Threshold Value	Secondary Parameters	<b>Enable Conditions</b>	Time Required	Illum
			for direction change shifts;			P0717		
			OR accumulated fail timer	>= 0.500 seconds		P0877		
			OR accumulated fall times	>= 0.500 seconds		F0077		
			for forward range closed			P0878		
			throttle downshift;		N 5 " B " BTO ( " "	D0747		
			OR accumulated fail timer	>= 1.0 second	No Fault Pending DTC for this drive cycle.			
			for forward downshifts		unve eyele.			
			above closed throttle.					
			E-10		Output Speed			
			Fail timer accumulates during range to range		Turbine Speed	>= 200 RPM		
			shifts when attained gear	<= 25 RPM	Normal powertrain shutdown			
			slip speed		not in process			
					Normal or Cold powertrain			
					initialization is complete			
					No range switch response			
					active			
					No Cold Mode operation			
					No abusive garage shift to 1st			
					range detected			
DDNDI //MA								
PRNDL/IMS Transmission Range	P0708	This test monitors the				I		Α
Sensor High Input	0700	transmission range	For Case 1 (No		Components powered		Case 1:	
		switch for invalid input	Information):					
		conditions and parity errors occurring over	Illegal electrical state for a		AND		1 second	
		consecutive ignition	time		Battery Voltage between	9 V and 18 V		
		cycles.	For Case 2 (Long-term		= 3.113. j		Case 2:	
			Parity):		<b>.</b>		4h	
			There are 3 counters for long-term parity. These		Engine Speed between	200 RPM and 7500 RPM	5 <sup>th</sup> occurrence	
			counters are updated at			5 seconds		
			the end of each drive					

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum
Component System	Code	Безсприоп	cycle, immediately prior to TCM shutdown.  For Counter 1, increment counter IF Parity Error Detected; decrement counter IF No Parity Error Detected AND No Motion Detected.	>= 15 counts	Secondary Parameters	Enable Conditions	Time Kequired	
			AND Valid Drive Detected AND Motion Detected.  IF Counter 2, THEN report failure.  For Counter 3, increment Counter 3 IF Parity Error Detected while in Reverse AND No Valid Reverse Detected AND Motion Detected. Decrement Counter 3 IF No Parity Error Detected AND Valid Reverse Detected AND Valid Reverse Detected AND Motion Detected.					

	Fault	Monitor Strategy						MIL
Component/ System	Code	Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	Illum
			IF Counter 3, THEN report failure.					
			Where Parity Error Detected is defined as a failure of the 4- bit PRNDL input such that					
			the sum of those bits yields an odd result for a time;	>= 30 seconds;				
			Motion Detected is defined as output speed for a time;					
			Valid Drive Detected is defined as the 4-bit DL indicates Valid Drive for a time;					
			Valid Park Detected is defined as the 4-bit PRNDL indicates Valid Park for a time and output speed;	>= 0.2 seconds				
			Valid Reverse Detected is defined as the 4-bit PRNDL indicates Valid Reverse					
			Valid Neutral Detected is defined as the 4-bit PRNDL indicates Valid Neutral					
			for a time and output speed OR for a time.					

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum
Transmission Range Sensor Circuit Range/Performance	P0706	This test monitors the transmission range switch inputs at engine start to determine that it	For sample size, PRNDL C input is closed OR PRNDL P is NOT	> 7 samples	Not Test Failed This Key On	P0706	200 ms	В
		is indicating a valid starting position (Park or Neutral).	closed.		Battery voltage between			
					Powertrain State is READY or CRANKING			
					Engine speed	> 100 RPM and < 350 RPM.		
Solenoid Electrical								
Main Modulation/Line Pressure Control Solenoid Control	P0960	This test detects solenoid electrical open circuit malfunctions.	Fault pending is set at single hardware fault occurrence		Not Test Failed This Key On	P0657	1050 ms	A
Circuit Open			IF hardware fault is present for a sample size	>= 40 samples		P0658 P0659		
			AND Engine speed	>= 15 RPM	Components powered AND			
			THEN initiate intrusive test by opening low side driver		Battery voltage between	9V and 18V		
			IF intrusive test indicates			< 4 seconds		
			no short to ground exists for a sample size, THEN report malfunction		AND Battery Voltage			
					High Side Driver 1 Enabled			
Main Modulation/Line Pressure Control Solenoid Control Circuit Performance		This test detects the performance of the solenoid by comparing desired current to actual duty cycle	Case 1:  Desired current  AND  Actual Duty Cycle  For a sample size,  THEN report malfunction	>= 40% >= 40 samples	Not Test Failed This Key On	P0657 P0658 P0659 P0960 P0961 P0962	1000 ms	A

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum
			Case 2: Desired current AND		No Fault Pending DTC for this drive cycle.			
			Actual Duty Cycle For a sample size, THEN report malfunction	<= 10% >= 40 samples	Components powered AND Battery voltage between			
			THEN TEPOR MAINUNCTION		If Engine Cranking, then Crank Time AND Battery Voltage High Side Driver 1 Enabled	< 4 seconds > 10 V		
					Shift Complete  Lockup Apply Complete  OR  Lockup Release Complete			
Main Modulation/Line Pressure Control Solenoid Control	P0962	This test detects solenoid electrical ground circuit	Fault pending is set at single hardware fault occurrence		Not Test Failed This Key On		1050 ms	А
Circuit Low		malfunctions.	IF hardware fault is present for a sample size			P0658 P0659		
			AND Engine speed THEN initiate intrusive test by opening low side driver.	>= 15 RPM	Components powered AND Battery voltage between			
			IF intrusive test indicates short to ground exists for a sample size	>= 2 samples	AND	< 4 seconds		
			THEN report malfunction		Battery Voltage	> 10 V		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum
Component Cystem	Joue	Bescription	Mananotion Ontena	Thioshold Value	High Side Driver 1 Enabled		. mic Required	mam
Main Modulation/Line Pressure Control Solenoid Control Circuit High	P0963	This test detects solenoid electrical short to power circuit malfunctions.	Short to power is present for AND Engine speed	samples	Not Test Failed This Key On		75 ms	A
					Components powered AND Battery voltage between If Engine Cranking, then Crank Time AND Battery Voltage	9V and 18V < 4 seconds		
					High side driver 1 enabled			
Pressure Control Solenoid 2 Control Circuit Open	P0964	This test detects solenoid electrical open circuit malfunctions.	Fault pending is set a single hardware fault occurrence  IF hardware fault is		Not Test Failed This Key On	P2669 P2670	225 ms	A
			present for a sample size  AND Engine speed  THEN initiate intrusive test by opening low side driver.	>= 15 RPM	Components powered AND Battery voltage between If Engine Cranking, then	9V and 18V		
			IF intrusive test indicates no short to ground exists for a sample size,	>= 3 samples	AND Battery Voltage	> 10 V		
December Constrail	Doocs	This to at data at the	04:		High Side Driver 2 Enabled		050	
Pressure Control Solenoid 2 Control Circuit Performance	P0965	This test detects the performance of the solenoid by comparing desired current to actual duty cycle	Case 1: Desired current AND Actual Duty Cycle For a sample size,	>= 40%	Not Test Failed This Key On	P2669 P2670 P2671 P0964	250ms	A

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum
oomponent cystem	Odde	Bescription	THEN report malfunction  Case 2:  Desired current  AND  Actual Duty Cycle  For a sample size,  THEN report malfunction	>= 500 mA <= 15% >= 10 samples	No Fault Pending DTC for this drive cycle.  Components powered AND Battery voltage between  If Engine Cranking, then	P0965 P0966  P0964 P0966  9V and 18V  < 4 seconds > 10 V	Time Required	
					Lockup Apply Complete OR Lockup Release Complete			
Pressure Control Solenoid 2 Control Circuit Low		This test detects solenoid electrical ground circuit malfunctions.	Fault pending is set at single hardware fault occurrence IF hardware fault is present for a sample size  AND Engine speed	>= 6 samples	Components powered	P2670 P2671	200 ms	A
			THEN initiate intrusive test by opening low side driver.  IF intrusive test indicates short to ground exists for a sample size THEN report malfunction.	>= 2 samples	AND Battery Voltage between  If Engine Cranking, then Crank Time  AND	9 V and 18 V < 4 seconds		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum
					Battery Voltage	> 10 V		
					High Side Driver 2 Enabled			
Pressure Control Solenoid 2 Control Circuit High		This test detects solenoid electrical short to power circuit malfunctions.	Short to power is present for AND Engine speed	samples	Not Test Failed This Key On	P2669 P2670 P2671 P0967	75 ms	A
					AND	9 V and 18 V < 4 seconds		
					Battery Voltage	> 10 V		
			- " "		High Side Driver 2 Enabled			<u> </u>
Pressure Control Solenoid 1 Control Circuit Open	P2727	This test detects solenoid electrical open circuit malfunctions.	Fault pending is set a single hardware fault occurrence IF hardware fault is		Not Test Failed This Key On	P0658	200 ms	А
			AND Engine speed THEN initiate intrusive test by opening low side driver.  IF intrusive test indicates no short to ground exists for a sample size, THEN report malfunction	>= 15 RPM >= 3 samples	Components powered AND Battery Voltage between If Engine Cranking, then Crank Time AND Battery Voltage	9 V and 18 V < 4 seconds		
					High side driver 1 enabled			

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum
Pressure Control Solenoid 1 Control Circuit Performance	P2728	This test detects the performance of the solenoid by comparing desired current to actual duty cycle	Case 1:  Desired current  AND  Actual Duty Cycle  For a sample size,  THEN report malfunction	<= 50 mA >= 40% >= 10 samples	Not Test Failed This Key On		250ms	А
			Case 2:  Desired current AND Actual Duty Cycle For a sample size,  THEN report malfunction	<= 15% >= 10 samples	No Fault Pending DTC for this drive cycle.  Components powered AND Battery voltage between  If Engine Cranking, then Crank Time AND Battery Voltage  High Side Driver 1 Enabled  Shift Complete  Lockup Apply Complete OR Lockup Release Complete	P2729  9V and 18V  < 4 seconds		
Pressure Control Solenoid 1 Control Circuit Low		This test detects solenoid electrical ground circuit malfunctions.	Fault pending is set at single hardware fault occurrence  IF hardware fault is present for a sample size  AND  Engine speed  THEN initiate intrusive test by opening low side driver.	>= 5 samples >= 15 RPM	Not Test Failed This Key On  Components powered AND Battery Voltage between	P0658 P0659	175 ms	A

Component/ Suctor	Fault	Monitor Strategy	Malfunation Cuitari-	Three hold Malus	Cocondon, Donomotor-	Enghla Canditiana	Time Described	MIL
Component/ System	Code	Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	Illum
			IF intrusive test indicates short to ground exists for a sample size		If Engine Cranking, then Crank Time	< 4 seconds		
			THEN report malfunction	>= 2 samples	AND			
					Battery Voltage	> 10 V		
	D0700				High side driver 1 enabled			
Pressure Control Solenoid 1 Control Circuit High	P2730	This test detects solenoid electrical short to power circuit	Short to power is present	3 consecutive samples	Not Test Failed This Key On	P0657	75 ms	A
oout.v.ng.		malfunctions.	AND Engine speed	·		P0658 P0659 P2730		
					Components powered AND			
					Battery Voltage between	9 V and 18 V		
						< 4 seconds		
					AND Battery Voltage			
					High side driver 1 enabled			
Shift Solenoid 1 Control Circuit Open		This test detects solenoid electrical open circuit malfunctions.	Fault pending is set a single hardware fault occurrence		Not Test Failed This Key On	P2669	325 ms	А
			IF hardware fault is present for a sample size			P2670 P2671		
			AND Engine speed		Components powered AND			
			THEN initiate intrusive test by opening low side driver.		Battery Voltage between			
			IF intrusive test indicates no short to ground exists for a sample size,		If Engine Cranking, then Crank Time AND	< 4 seconds		

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Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum
			THEN report malfunction		Battery Voltage	> 10 V		
					High side driver 2 enabled			
Shift Solenoid 1 Control Circuit Low	P0973	This test detects solenoid electrical ground circuit	Fault pending is set at single hardware fault occurrence		Not Test Failed This Key On	P2669	300 ms	A
		malfunctions.	IF hardware fault is present for a sample size	>= 10 samples		P2670 P2671		
			AND Engine speed		Components powered			
			THEN initiate intrusive test by opening low side driver.		AND Battery Voltage between			
		IF intrusive test indicates short to ground exists for a sample size	>= 2 samples	If Engine Cranking, then Crank Time	< 4 seconds			
			THEN report malfunction		AND			
					Battery Voltage	> 10 V		
					High side driver 2 enabled			
Shift Solenoid 1 Control Circuit High	P0974	This test detects solenoid electrical short to power circuit malfunctions.	Short to power is present for AND	samples	Not Test Failed This Key On	P2669 P2670	75 ms	A
			Engine speed	>= 15 RPM		P2671 P0974		
					Components powered AND			
					Battery Voltage between	9 V and 18 V		
					AND	< 4 seconds		
					Battery Voltage			
					High side driver 2 enabled			

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum
Shift Solenoid 2 Control Circuit Open	P0975	This test detects solenoid electrical open circuit malfunctions.	Fault pending is set a single hardware fault occurrence		Not Test Failed This Key On		325 ms	А
			IF hardware fault is present for a sample size			P2670 P2671		
			AND Engine speed	>= 15 RPM	Components powered AND			
			THEN initiate intrusive test by opening low side driver.		Battery Voltage between	9 V and 18 V		
			IF intrusive test indicates no short to ground exists for a sample size,		If Engine Cranking, then Crank Time AND	< 4 seconds		
			THEN report malfunction		Battery Voltage	> 10 V		
					High side driver 2 enabled			
Shift Solenoid 2 Control Circuit Low		This test detects solenoid electrical ground circuit	Fault pending is set at single hardware fault occurrence		Not Test Failed This Key On	P2669	300 ms	А
		malfunctions.	IF hardware fault is present for a sample size	>= 10 samples		P2670 P2671		
			AND Engine speed	>= 15 RPM	Components powered AND			
			THEN initiate intrusive test by opening low side driver.		Battery Voltage between	9 V and 18 V		
		IF intrusive test indicates short to ground exists for a sample size	>= 2 samples	If Engine Cranking, then Crank Time	< 4 seconds			
			THEN report malfunction		AND			
					Battery Voltage	> 10 V		
					High side driver 2 enabled			

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum
Shift Solenoid 2 Control Circuit High		This test detects solenoid electrical short to power circuit malfunctions.	Short to power is present for AND Engine speed	samples	Not Test Failed This Key On	P2669 P2670 P2671 P0977	75 ms	А
					Components powered AND Battery Voltage between  If Engine Cranking, then Crank Time	9 V and 18 V		
Shift Solenoid 3	P0979	This test detects	Fault pending is set at		AND Battery Voltage High side driver 2 enabled		150 ms	A
Control Circuit Low		solenoid electrical ground circuit malfunctions.	single hardware fault occurrence  IF hardware fault is present for a sample size		Not Test Failed This Key On	P2669 P2670 P2671	130 1115	^
			AND Engine speed THEN report malfunction	>= 15 RPM	Components powered	P0979		
					Battery Voltage between  If Engine Cranking, then Crank Time AND Battery Voltage	< 4 seconds		
					High side driver 2 enabled  Commanded gear NOT Reverse Trim, NOT 5th, NOT 6th			

Component/ System	Fault	Monitor Strategy	Malfunction Criteria	Threshold Value	Sacandan / Davamatava	Enable Conditions	Time Required	MIL
		Description This test detects	Manunction Criteria	Threshold value	Secondary Parameters	Enable Conditions		Illum
Shift Solenoid 3 Control Circuit High		This test detects solenoid electrical short to power circuit	Short to power is present for	3 consecutive samples	Not Test Failed This Key On	P2669	75 ms	A
		malfunctions.	AND			P2670		
			Engine speed	>= 15 RPM		P2671 P0980		
					Components powered AND			
					Battery Voltage between			
					If Engine Cranking, then Crank Time	< 4 seconds		
					AND			
					Battery Voltage	> 10 V		
					High side driver 2 enabled			
					Commanded gear NOT			
					Reverse Trim, NOT 5th, NOT 6th			
Actuator Supply 1 (HSD1) Voltage Open		This test detects if the voltage measured at the HSD1 detection circuit	Report malfunction when the number of failure events		Not Test Failed This Key On	P0657	75 ms	A
		shows that multiple low side detection circuits indicate open, but the	AND Engine speed		HSD1 is commanded ON			
		high side detection circuit indicates high	A failure event occurs		Components powered			
		voltage.	when the number of failed		AND			
			solenoids connected to HSD1	>= 2	Battery Voltage between	9 V and 18 V		
			AND					
			HSD1 voltage	>= 6V		< 4 seconds		
					AND Battery Voltage			
Actuator Supply 1 (HSD1) Voltage Low	P0658	This test detects low voltage when high voltage is expected	Report malfunction when short to ground is detected		Not Test Failed This Key On	P0658	75 ms	А
		indicating a short to ground at the circuit.	for a number of events		HSD1 is commanded ON			

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	Fault	Monitor Strategy						MIL
Component/ System	Code	Description	Malfunction Criteria	Threshold Value	Secondary Parameters	<b>Enable Conditions</b>	Time Required	Illum
			AND Engine speed		Components powered			
					AND Battery Voltage between	9 V and 18 V		
					If Engine Cranking, then Crank Time AND	< 4 seconds		
					Battery Voltage	> 10 V		
Actuator Supply 1 (HSD1) Voltage High	P0659	This test detects if the voltage measured at the HSD 1 detection circuit indicates high during initialization (when the circuit is off)	During initialization, report malfunction when the number of failure events	>= 3 times	During initialization		18.75 ms	А
		S	A failure event occurs when HSD1 voltage					
Actuator Supply2 (HSD2) Voltage Open	P2669	This test detects if the voltage measured at the HSD2 detection circuit shows that multiple low	Report malfunction when the number of failure events	>= 3	Not Test Failed This Key On	P2669	75 ms	А
		side detection circuits indicate open, but the	AND Engine speed		HSD2 is commanded ON			
		high side detection circuit indicates high voltage.	A failure event occurs when the number of failed		Components powered AND			
		voltage.	solenoids connected to HSD2		Battery Voltage between	9 V and 18 V		
			AND HSD2 voltage		If Engine Cranking, then Crank Time AND	< 4 seconds		
					Battery Voltage	> 10 V		
Actuator Supply2 P26' 'HSD2) Voltage Low	P2670	This test detects low voltage when high voltage is expected	Report malfunction when short to ground is detected		Not Test Failed This Key On		50 ms	Α
		indicating a short to ground at the circuit.	for a number of events		HSD2 is commanded ON			
			AND Engine speed		Components powered			

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Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum
					AND Battery Voltage between			
					If Engine Cranking, then Crank Time AND	< 4 seconds		
					Battery Voltage			
Actuator Supply 2 (HSD2) Voltage High	P2671	This test detects if the voltage measured at the HSD 2 detection circuit indicates high during initialization (when the circuit is off)	During initialization, report malfunction when the number of failure events A failure event occurs when HSD1 voltage	>= 3 times	During initialization		18.75 ms	A
TCC Pressure Control Solenoid Control Circuit Open	P2761	This test detects torque converter solenoid electrical open circuit malfunctions.	Fault pending is set a single hardware fault occurrence IF hardware fault is present for a sample size		Not Test Failed This Key On	P0657 P0658 P0659	3075 ms	В
			AND Engine speed THEN initiate intrusive test by opening low side driver.	>= 15 RPM	Components powered AND Battery Voltage between			
			IF intrusive test indicates no short to ground exists for a sample size, THEN report malfunction	>= 3 samples	If Engine Cranking, then Crank Time AND Battery Voltage	< 4 seconds		
					High side driver 1 enabled			
TCC Pressure Control Solenoid Control Circuit Performance	P2762	This test detects the performance of the solenoid by comparing desired current to actual duty cycle	Case 1:  Desired current  AND  Actual Duty Cycle  For a sample size,	>= 40%	Not Test Failed This Key On	P0657 P0658 P0659 P2761	1000 ms	В

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Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum
			THEN report malfunction  Case 2:	>= 500 mA <= 10% >= 40 samples	No Fault Pending DTC for this drive cycle.  Components powered AND Battery voltage between  If Engine Cranking, then	P2762 P2763  P2761 P2763  9V and 18V  < 4 seconds > 10 V		
TCC Pressure Control Solenoid Control Circuit High	P2763	This test detects solenoid electrical short to power circuit malfunctions.	Short to power is present for AND Engine speed	samples	Components powered AND Battery Voltage between If Engine Cranking, then	P0658 P0659 P2763  9 V and 18 V  < 4 seconds > 10 V	75 ms	В

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum
TCC Pressure	P2764	This test detects	Fault pending is set at		Secondary Parameters	Eliable Colluitions	3050 ms	В
Control Solenoid Control Circuit Low	F2704	solenoid electrical ground circuit	single hardware fault occurrence		Not Test Failed This Key On	P0657	3030 HIS	Ь
		malfunctions.	IF hardware fault is present for a sample size	>= 120 samples		P0658 P0659		
			AND Engine speed	>= 15 RPM	Components powered AND			
			THEN initiate intrusive test by opening low side driver		Battery Voltage between	9 V and 18 V		
			IF intrusive test indicates short to ground exists for a sample size	>= 2 samples	If Engine Cranking, then Crank Time	< 4 seconds		
			THEN report malfunction		AND			
					Battery Voltage	> 10 V		
					High side driver 1 enabled			
Miscellaneous								
4 Wheel Drive Low Switch Circuit Malfunction	P2771	abnormal conditions for the four-wheel drive	Case 1 (Stuck Off) This test fails when, for number of occurrences,	>= 200	All Cases Not Test Failed This Key On	P2771 P0721	5 seconds	В
		indication switch input by comparing switch state range to calculated range.	the transfer case 4WD switch indicates High range and the calculated transfer case range is Low range for a time	>= 5 seconds	No Fault Active DTCs for this drive cycle			
			Č			P0722		
			Case 2 (Stuck On) This test fails when, for		No Fault Pending DTCs for this drive cycle			
			number of occurrences, the transfer case 4WD switch indicates Low range and the calculated transfer case range is High range for a time	r>= 200	Output Speed Transfer Case is NOT Neutral	> 60 RPM		
			.5. 5 11110					

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Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum
				>= 5 seconds.	Transmission fluid temperature	> 20 deg. C and < 130 deg. C		
					Engine Speed between	200 RPM and 7500 RPM		
					Shift complete AND range attained NOT Neutral			
Transmission Component Slipping		This test detects the number of turbine slip events during the Neutral Locked Turbine	For this ignition cycle, when the number of Neutral Locked Turbine (NLT) Slip events,	>= 3	Components powered AND		8075 ms	В
		(NLT) request from engine controller.	then report fail Where number of NLT Slip events for this ignition cycle = Number of accumulated NLT Slip events - Number of NLT Slip events from previous ignition cycles. And, where number of accumulated NLT Slip events is incremented when commanded gear or attained gear is NLT  AND turbine speed for a time		Battery Voltage between Engine Speed between for			
Ignition Switch Run/Start Circuit	P2534	Out of range low.	Ignition voltage for a time	< 5 volts >= 30 seconds		9 V and 18 V	35 seconds	A

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Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum
GMLAN Bus Reset Counter Overrun		This test detects if the GMLAN bus is off for a calibration duration.	CANB_bus is off for a time	>= 3 seconds	Components powered AND Battery Voltage between	9 V and 18 V	8 seconds	В
					Engine Speed between	200 RPM and 7500 RPM 5 seconds		
GMLAN ECM Controller State of Health Failure		This test detects CAN (GMLAN) bus failures by detecting State of Health failures in GMLAN message \$191 from ECM.	Case 1 (x out of y):	>= 5 samples 7 samples > 0 counts < 5 samples	All Cases Components powered AND Battery Voltage between Engine Speed between for Ignition Key State is RUN GMLAN message \$191 is received from ECM Enable criteria met for a time	200 RPM and 7500 RPM 5 seconds	8 seconds	В
Brake Switch Circuit		This test counts how many vehicle acceleration events occur while the brake switch indicates "ON" or the number of vehicle deceleration events while the brake switch indicates "OFF"	Case 1: The number of vehicle accelerations with the brake switch "on"  Case 2: The number of vehicle decelerations with the brake switch "off"	>= 10	All Cases Not Test Failed This Key On No Fault Pending DTCs Components powered AND Battery Voltage between	P0721 P0722 P0721 P0722	10 Acceleration Events 10 Deceleration Events	С

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Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum
					Engine Speed between	200 RPM and 7500 RPM 5 seconds		
Brake Pedal Possition Switch Signal Rolling Count		This test detects rolling count failures for the Brake Switch GMLAN Message	The failure count increments when the GMLAN message is not received or the rolling counter does not agree with the expected value  When the failure counter is for a time of Report Failure	> 5 > 10 seconds	Components powered AND Battery Voltage between Engine Speed between	9 V and 18 V	15 seconds	С
Trans Mode Switch A		This test detects the trans mode switch A ON	The switch is active continuously for a time		Not test failed this key on  Components powered AND Battery Voltage between Engine Speed between for	P071A 9 V and 18 V	25 seconds	С
Upshift Switch Circuit		This test detects the upshift switch ON	AND upshift switch state is ON	>= 2.5 seconds >= 3 seconds.	Not Test Failed This Key On  Components powered AND  Battery Voltage between	P0708	603 seconds	С

	Fault	Monitor Strategy						MIL
Component/ System	Code	Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	Illum
			When PRNDL state is a forward range and has been unchanged for a time AND upshift switch state is ON	>= 2.5 seconds	Engine Speed between for	200 RPM and 7500 RPM 5 seconds		
			for a time	>= 600 seconds.				
Downshift Switch Circuit	P0816	This test detects the downshift switch ON.	When PRNDL state is N, P or R and has been unchanged		Not Test Failed This Key On		603 Seconds	С
			for a time AND downshift switch state is ON		Components powered AND			
			for a time.		Battery Voltage between	9 V and 18 V		
			AND When PRNDL state is a forward range and has been unchanged for a time	>= 2.5 seconds		200 RPM and 7500 RPM 5 seconds		
			AND downshift switch state is					
			ON for a time	>= 600 seconds.				
Up and Down Shift Switch Circuit	P0826	This test detects upshift/downshift switch circuit at an illegal state.	Switch state is ILLEGAL for a time	>= 10 seconds.	Not Test Failed This Key On  Components powered  AND		10 seconds	С
					Battery Voltage between	9 V and 18 V		
					Engine Speed between for	200 RPM and 7500 RPM 5 seconds		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum
Upshift and Downshift Switch Signal Rolling Count		This test detects rolling count failures for the Upshift and Downshift GMLAN Message	The failure count increments when the GMLAN message is not received or the rolling counter does not agree with the expected value		Components powered AND Battery Voltage between		15 seconds	С
			When the failure counter is for a time of Report Failure	> 10 seconds	Engine Speed between	200 RPM and 7500 RPM 5 seconds		
Trans Mode Switch A Signal Rolling Count		This test detects rolling count failures for the Trans Mode Switch A GMLAN Message	The failure count increments when the GMLAN message is not received or the rolling counter does not agree with the expected value		Components powered AND Battery Voltage between		15 seconds	С
			When the failure counter is for a time of Report Failure	> 10 seconds	Engine Speed between	200 RPM and 7500 RPM 5 seconds		