COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
TCM, Internal Fault	P0605	ROM checksum or RAM error	Calculated checksum differs from stored.	Number of failed calculations: 2			Immediately Continuous	Immediately
Lost communication with ECM (Engine)	U0100	Frame missing from ECM	Detect no Status CAN frame from ECM		DS_Active_CAN[1] Ignition Emergency mode	TRUE ON >3sec. FALSE	4 sec Continuous	Immediately
Solenoid S1	P0985 P0986	Circuit continuity check	Short-cut ground Not connected or short-cut Ubatt		DS_Active[2] Emergency mode Time after solenoid output change	TRUE FALSE > 25 ms	500 msec Continuous	Immediately
Solenoid S2	P0973 P0974	Circuit continuity check	Short-cut ground Not connected or short-cut Ubatt		DS_Active[2] Emergency mode Time after solenoid output change	TRUE FALSE > 25 ms	500 msec Continuous	Immediately
Solenoid S3	P0976 P0977	Circuit continuity check	Short-cut ground Not connected or short-cut Ubatt		DS_Active[2] Emergency mode Time after solenoid output change	TRUE FALSE > 25 ms	500 msec Continuous	Immediately
Solenoid S4	P0979 P0980	Circuit continuity check	Short-cut ground Not connected or short-cut Ubatt		DS_Active[2] Emergency mode Time after solenoid output change	TRUE FALSE > 25 ms	500 msec Continuous	Immediately
Solenoid S5	P0982 P0983	Circuit continuity check	Short-cut ground Not connected or short-cut Ubatt		DS_Active[2] Emergency mode Time after solenoid output change	TRUE FALSE > 25 ms	500 msec Continuous	Immediately
Torque Converter Clutch Slips	P0741	Comparison of engine speed and transmission input speed	(Engine Speed - Transmission Input Speed)	> 100rpm	No Shifting Control[6] Throttle	> 20%	12 sec Continuous	Immediately

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					abs(1-SpeedABS/Trans. Output Speed)	< 10%		
					abs(1-SpeedABS/Trans. Input Speed)	< 10%		
					Shift Position	RANGE_D, 4, 3, 2, M (defined)		
					Engine Speed	< 4000 rpm		
					SLU target current	>= 1000mA		
					Time after shifting	> 0,5 sec		
					Battery voltage	> 10,5 V		
					DS_Active[2]	TRUE		
					Emergency mode	FALSE		
					Lock-up	TRUE		
					No DTC set	P0501 P0705 P0711 P0712 P0713 P0716 P0717 P0721 P0722 P0786 P0787 P0788 P0961 P0962 P0963 P0973 P0974 P0976 P0977 P0979 P0980 P0982 P0983 P0985 P0986 P1896 P2159 P2762 P2763 P2764		

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
						U0001 U0100 U0121		
Torque Converter Clutch Stuck On	P0742	Comparison of engine speed and transmission input speed	(Engine Speed - Transmission Input speed)	< 50rpm	EngineTorque	>= Egtrq_LUP_FailMap[5]	12 sec	Immediately
					EngineTorque	<= 240 Nm	Continuous	
					Trans. Input Speed	<= 3000rpm		
					Time after changing to Shift position == RANGE_D,4,3,2,M	>8.0 sec		
					Time after IG ON or a reset of the controller	>3 min		
					Time after shifting control	>0.5sec		
					Oil temperature	>= 20°C		
					No Shifting Control[6]			
					Not garage shifting control[7] (N-D)			
					(Shift position	RANGE_D,M,L (defined) **or** >75 sec with over 5km/h and RANDE_D,L (undefined) fulfilled		
					Engine Speed	>= 400 rpm		
					IG voltage	>= 10.5 V		
					DS_Active[2]	TRUE		
					Emergency mode	FALSE		
					No DTC set	P0721 P0722 P0716 P0717 P0705 P0985 P0986 P0973 P0974 P0976 P0977 P0979 P0980 P0982 P0983		

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
						P0961 P0962 P0963 P0786 P0787 P0788 P2762 P2763 P2764 U0001 U0100 P0711 P0712 P0713		
Pressure solenoid SLU	P2764	Circuit continuity check	Short-cut ground or open Current (AD	 <92 mA < 68)	DS_Active^2 Emergency mode	TRUE FALSE	12,5 sec Continuous	Immediately
	P2762		Terminal short Error current	 > 80 mA	Emergency mode Oil temperature System voltage System voltage change Output current target DS_Active^2 No DTC set	FALSE > 20°C 11 -18 V < 0,2V > 853mA and not changed during detection TRUE P0711 P0712 P0713	2,75 sec Continuous	Immediately
	P2763		Short-cut Ubatt Measured Current (AD	 > 1356 mA > 1000)	DS_Active^2 Emergency mode	TRUE FALSE	2 sec Continuous	Immediately
Pressure solenoid SLT	P0962	Circuit continuity check	Short-cut ground or open Current (AD	 <92 mA < 68)	DS_Active^2 Emergency mode	TRUE FALSE	12.5 sec Continuous	Immediately

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
	P0961		Terminal short		Emergency mode	FALSE	2.75 sec	Immediately
			Error current	> 80 mA	Oil temp	> 20°C	Continuous	
					System voltage	11 -18 V		
					System voltage change	< 0,2V		
					Output current target	> 853mA and not changed during detection		
					DS_Active[2]	TRUE		
					No DTC set	P0711		
						P0712		
						P0713		
	P0963		Short-cut Ubatt		DS_Active[2]	TRUE	2 sec	Immediately
			Measured Current	> 1356 mA	Emergency mode	FALSE	Continuous	
			(AD	> 1000)				
Timing solenoid SLS	P0787	Circuit continuity check	Short-cut ground or open		DS_Active[2]	TRUE	12.5 sec	Immediately
			Current	<92 mA	Emergency mode	FALSE	Continuous	
			(AD	< 68)				
	P0786		Terminal short	Error current > 80 mA	Emergency mode	FALSE	2.75 sec	Immediately
					Oil temp	> 20°C	Continuous	
					System voltage	11 -18 V		
					System voltage change	< 0,2V		
					Output current target	> 853mA and not changed during detection		
					DS_Active[2]	TRUE		
					No DTC set	P0711		
						P0712		
						P0713		
	P0788		Short-cut Ubatt		DS_Active[2]	TRUE	2 sec	Immediately
			Measured Current	> 1356 mA	Emergency mode	FALSE	Continuous	
			(AD	> 1000)				

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
Shift Malfunction	P0780	Shift time check	Shift time is too long, too short or “tie up” occurs		No Multiplex Shifting[8]		Detected 5 times during DCY	Immediately
					Oil temperature	> 20°C		
					Emergency mode	FALSE		
					DS_Active[2]	TRUE	Continuous	
					Shift position	D, 4, 3, 2, or M		
					No DTC set	P0721		
						P0722		
						P0716		
						P0717		
						P0705		
						P0985		
						P0986		
						P0973		
						P0974		
						P0976		
						P0977		
						P0979		
						P0980		
						P0982		
						P0983		
						P0961		
						P0962		
						P0963		
						P0786		
						P0787		
						P0788		
						P2762		
						P2763		
						P2764		
						U0001		
						U0100		
						P0711		
						P0712		
						P0713		
						P1896		
						P2159		
						P0501		
						U0121		

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
CAN Bus Off Counter Overrun	U0001	CAN controller continuity check	CAN controller Bus Off is detected		DS_Active_CAN[1]	TRUE	12,7sec (9-5)	Immediately
			Counter reaches	7	Time after Ignition ON or a reset of the controller	>3 sec	28sec (9-3)	
							Continuous	
Transmission input speed sensor	P0717	Circuit continuity check	Condition 1 (no pulse)		No Shifting Control[6]		Speed dependent (e.g 4 sec at 100 km/h)	Immediately
			No of pulses from input sensor	0	Not garage shifting control[7] (N-D)			
			No of pulses from output sensor	3000	B1 not released			
					outRpm * GearRatioExpected	> 600 rpm		
					Shifter position	D,4,3,2,M Range(defined)	Continuous	
			Condition 2 (no pulse)		CurrentGear	>= 2	30sec	
			Transmission Input Speed	0	Time since change from P, R or N to others if vehicle speed <= 66km/h and oiltemp. <= 20°C	>10 sec	Continuous	
			SpeedABS	>20km/h	Time since change from P, R or N to others if vehicle speed >66km/h or oiltemp. > 20°C	>2,5 sec		
					DS_Active[2]	TRUE		
					Emergency mode	FALSE		
					No DTC set	P0705		
						P0721 (only condition 1)		
						P0722 (only condition 1)		
			Condition 3 (no pulse)		DS_Active[2]	TRUE	30sec	
			NCIM-voltage (AD-value)	AD<45 or AD>545	Emergency mode	FALSE	Continuous	
	P0716		Pulses incorrect		No Shifting Control[6]		10 sec	Immediately
					Not garage shifting control[7] (N-D)		Continuous	
			abs(1-SpeedABS/ Transmission Input Speed)	> 15%	B1 not released			
					LockUp	ON		
					abs(1-outRpmABS/ outRpmSP)	< 5%		
					abs(1-outRpmABS/ outRpmEG)	< 5%		
					Time after shifting control	>8 sec		

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					Time after changing to GearSelector = RANGE_D,4,3,2	>8 sec		
					Gear	>= 2ND		
					Range	Other than P and N and R		
					EgRpm	> 400rpm		
					Spinning[11]	FALSE		
					DS_Active[2]	TRUE		
					Emergency mode	FALSE		
					SpeedABS	>30km/h		
					No DTC set	P0705 P0711 P0712 P0713 P0721 P0722 P0741 P0786 P0787 P0788 P0961 P0962 P0963 P0973 P0974 P0976 P0977 P0979 P0980 P0982 P0983 P0985 P0986 P2762 P2763 P2764 U0121		

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
Trans. Output speed sensor	P0722	Circuit continuity check	Condition 1 (No pulse)		Not in Neutral control[9]		6000 pulses	Immediately
			No of pulses from output sensor	0	No Shifting Control[6]			
			No of pulses from input sensor	6000	Not garage shifting control[7] (N-D)		Continuous	
					DS_Active[2]	TRUE		
					Trans.Output Speed calculated from ABS	>300rpm (only Condition 1)		
			Condition 2 (No pulse)		Selected gear	D, 4, 3, 2, M	30 sec	Immediately
					Time since change from P, R or N to others if vehicle speed <= 66km/h and oiltemp. <= 20°C	>10 sec	Continuous	
					Time since change from P, R or N to others if vehicle speed >66km/h or oiltemp. > 20°C	>2,5 sec		
					Emergency mode	FALSE		
			Transmission Output Speed	0				
			SpeedABS	>20km/h	No DTC set	U0121		
						P0705		
						P0716 (only Condition 1)		
						P0717 (only Condition 1)		
			Short to Ubatt or GND		DS_Active[2]	TRUE	30sec	Immediately
					Emergency mode	FALSE	Continuous	
	P0721		Incorrect rpm		B1 not released		10 sec	Immediately
			abs(1-SpeedABS/ Transmission Output Speed)	> 15 %	No Shifting Control[6]		Continuous	
					Not garage shifting control[7] (N-D)			
					abs(1-outRpmABS/ outRpmNC)	< 5 %		
					Time after shifting control[6]	>8 sec		
					Time after changing to GearSelector = RANGE_D,4,3,2	>8 sec		
					Gear	>= 2ND		
					Range	other than P and N and R		
					EgRpm	> 400rpm		
					Spinning[11]	FALSE		
					DS_Active[2]	TRUE		
					Emergency mode	FALSE		

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					SpeedABS	> 30km/h		
					No DTC set	P0716 P0717 P0705 P0985 P0986 P0973 P0974 P0976 P0977 P0979 P0980 P0982 P0983 P0741 P0961 P0962 P0963 P0786 P0788 P2762 P2763 P2764 U0121 P0711 P0712 P0713		
Gear error, hydraulic fault	P0730	Rationality, (Calculation of actual gear ratio is not correct)	**Condition 1** Driving on 4th gear and abs(1-GRCurrent/GRExpected)	 > 20%	No Shifting Control[6] Not garage shifting control[7] (N-D) Transmission Output Speed Time after changing to Shift position == RANGE_D,4,3,2(defined) Time after shifting control Oil temperature Shift position Engine speed IG voltage	 >= 500rpm >8.0 sec >0.5 sec >= 20°C RANGE_D,4,3,2(defined) > 400 rpm >= 10.5 V	12 sec Continuous	Immediately

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					brake	OFF		
					Spinning[11]	FALSE		
					DS_Active[2]	TRUE		
					Emergency mode	FALSE		
			Condition 2		abs(1 - SpeedABS / Throttle	< 10 % > 10 %		
			Driving on 5th gear - gear ratio	1.504 ± 4%				
					No DTC set	P0721		
						P0722		
						P0716		
						P0717		
						P0705		
						P0985		
						P0986		
						P0973		
						P0974		
						P0976		
						P0977		
						P0979		
						P0980		
						P0982		
						P0983		
						P0961		
						P0962		
						P0963		
						P0786		
						P0787		
						P2762		
						P2763		
						P2764		
						U0001		
						U0100		
						P1896		
						P0711		
						P0712		
						P0713		
						P2159		
						P0501		
						U0121		
Transmission range switch	P0705	Check of switch output pattern	Failure combination of signals from Gear Selector range switch		DS_Active[2]	TRUE	5 sec Continuous	Immediately

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
Transmission oil temperature sensor	P0711	Rationality	Case 1: Oil temperature change less than OR Case2: Temperature does not reach 20°C within a driving case dependent time.	10 (AD value)	Oil temp sensor Oil temp DS_Active[2] Emergency mode No DTC set Case 1 only: Vehicle speed Gear Selector	10< AD < 1000 < 20 °C TRUE FALSE P0705 > 40 km/h once ≠ (P, R or N)	Case 1: 10 min Case 2: Driving case dependent Continuous	Two DCY
	P0712	Circuit continuity check	Short-cut ground Voltage (AD	< 50 mV < 10)	DS_Active[2] Emergency mode	TRUE FALSE	1 min Continuous	Two DCY
	P0713	Circuit continuity check	Short-cut Ubat or open circuit AD	> 1010	DS_Active[2] Emergency mode Driving time	TRUE FALSE >1 min	12 sec Continuous	Two DCY
Gear error, hydraulic fault	P0731	Rationality	(Transmission Input Speed - Transmission Output Speed X GRExpected) (Transmission Input Speed - Transmission Output Speed X	>300rpm <100rpm	Not garage shifting control[7] (N-D) IG voltage Engine speed InTorqe_noACC[10] T/M input rev T/M output rev current Gear Time after changing to shift position == RANGE_D,4,3,2 Time after shifting control[7] Oil temperature Engine speed Shiftposition DS_Active[2] Emergency mode No DTC set	>= 10.5V >(T/M input rev + 150) for 150msec continuously. 30Nm <= InTorq_noACC < 200Nm >Table1[4] >Table1[4] 1 >8.0sec >0.5 sec >= 20°C >400rpm RANGE_D,4,3,2(defined) or RANGE_D,4,3,2(undefined) for 75sec. TRUE FALSE P0501 P0705 P0711 P0712 P0713 P0716	10 sec Continuous	Immediately

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
						P0717 P0721 P0722 P0786 P0787 P0788 P0961 P0962 P0963 P0973 P0974 P0976 P0977 P0979 P0980 P0982 P0983 P0985 P0986 P1896 P2159 P2762 P2763 P2764 U0001 U0100 U0121		
	P0732	Rationality	Calculated ratio for 2nd gear difference from expected	>20%	No Shifting Control[6] Not garage shifting control[7] (N-D) Throttle Current gear Time after changing to Shift position == RANGE_D,4,3,2(defined) Time after shifting control[7] Oil temperature Shift position Engine speed IG voltage Brake Spinning[11] DS_Active[2]	 > 10% 2 >8.0 sec >0.5 sec >= 20°C RANGE_D,4,3,2(defined) > 400 rpm >= 10.5 V OFF FALSE TRUE	12 sec Continuous	Immediately

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					Emergency mode	FALSE		
					abs(1 - SpeedABS / Trans. Output Speed)	< 10 %		
					Transmission Output Speed	>= 500rpm		
					No DTC set	P0501 P0705 P0711 P0712 P0713 P0716 P0717 P0721 P0722 P0786 P0787 P0788 P0961 P0962 P0963 P0973 P0974 P0976 P0977 P0979 P0980 P0982 P0983 P0985 P0986 P1896 P2159 P2762 P2763 P2764 U0001 U0100 U0121		
	P0733	Rationality	Calculated ratio for 3rd gear difference from expected	>20%	No Shifting Control[6]		12 sec	Immediately
					Not garage shifting control[7] (N-D)		Continuous	
					Throttle	> 10%		
					Current gear	3		

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					Time after changing to Shift position == RANGE_D,4,3,2(defined)	>8.0 sec		
					Time after shifting control[7]	>0.5 sec		
					Oil temperature	>= 20°C		
					Shift position	RANGE_D,4,3,2(defined)		
					Engine speed	> 400 rpm		
					IG voltage	>= 10.5 V		
					Brake	OFF		
					Spinning[11]	FALSE		
					DS_Active[2]	TRUE		
					Emergency mode	FALSE		
					abs(1 - SpeedABS / Trans. Output Speed)	< 10 %		
					Transmission Output Speed	>= 500rpm		
					No DTC set	P0501 P0705 P0711 P0712 P0713 P0716 P0717 P0721 P0722 P0786 P0787 P0788 P0961 P0962 P0963 P0973 P0974 P0976 P0977 P0979 P0980 P0982 P0983 P0985 P0986 P1896 P2159 P2762 P2763 P2764 U0001 U0100 U0121		

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
	P0734	Rationality	Calculated ratio for 4th gear differendes from expected.	>20%	No Shifting Control[6]		12 sec	Immediately
					Not garage shifting control[7] (N-D)		Continuous	
					Throttle	> 10%		
					Current gear	4		
					Time after changing to Shift position == RANGE_D,4,3,2(defined)	>8.0 sec		
					Time after shifting control[7]	>0.5 sec		
					Oil temperature	>= 20°C		
					Shift position	RANGE_D,4,3,2(defined)		
					Engine speed	> 400 rpm		
					IG voltage	>= 10.5 V		
					Brake	OFF		
					Spinning[11]	FALSE		
					DS_Active[2]	TRUE		
					Emergency mode	FALSE		
					abs(1 - SpeedABS / Trans. Output Speed)	< 10 %		
					Transmission Output Speed	>= 500rpm		
					No DTC set	P0501 P0705 P0711 P0712 P0713 P0716 P0717 P0721 P0722 P0786 P0787 P0788 P0961 P0962 P0963 P0973 P0974 P0976 P0977 P0979 P0980 P0982		

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
						P0983 P0985 P0986 P1896 P2159 P2762 P2763 P2764 U0001 U0100 U0121		
	P0735	Rationality	Calculated ratio for 5th gear difference from expected	>20%	No Shifting Control[6] Not garage shifting control[7] (N-D) Throttle Current gear Time after changing to Shift position == RANGE_D,4,3,2(defined) Time after shifting control[7] Oil temperature Shift position Engine speed IG voltage Brake Spinning[11] DS_Active[2] Emergency mode abs(1 - SpeedABS / Trans. Output Speed) Transmission Output Speed No DTC set	> 10% 5 >8.0 sec >0.5 sec >= 20°C RANGE_D,4,3,2(defined) > 400 rpm >= 10.5 V OFF FALSE TRUE FALSE < 10 % >= 500rpm P0501 P0705 P0711 P0712 P0713 P0716 P0717 P0721 P0722 P0786	12 sec Continuous	Immediately

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
						P0787 P0788 P0961 P0962 P0963 P0973 P0974 P0976 P0977 P0979 P0980 P0982 P0983 P0985 P0986 P1896 P2159 P2762 P2763 P2764 U0001 U0100 U0121		
	P0736	Rationality	Calculated ratio for Reverse gear difference from expected	>20%	No Shifting Control[6] Not garage shifting control[7] (N-R) abs(1 - SpeedABS / Trans. Output Speed) Selected gear A/T oil temp. Throttle Engine speed Time after N-R shift IG voltage Transmission Output Speed Brake DS_Active[2] Emergency mode No DTC set	 < 10 % R > 20°C > 10% > 400 rpm 8 sec > 10,5 V >= 500rpm OFF TRUE FALSE P0501 P0705 P0711 P0712 P0713	6 sec Continuous	Immediately

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
						P0716 P0717 P0721 P0722 P0786 P0787 P0788 P0961 P0962 P0963 P0973 P0974 P0976 P0977 P0979 P0980 P0982 P0983 P0985 P0986 P1896 P2159 P2762 P2763 P2764 U0001 U0100 U0121		
	P1731	Rationality	Calculated ratio for Reverse gear difference from expected	>20%	No Shifting Control[6] Mode Selector Shift position A/T oil temp. Throttle Engine speed Time after shift to D.4.3.2(defined) IG voltage Transmission Output Speed Brake DS_Active[2]	 Triptronic mode **or** Shift position Range_L RANGE_D(defined) > 20°C 0% > 400 rpm 8 sec > 10,5 V 1260rpm >= outRpm >= 500rpm OFF TRUE	12 sec Continuous	Immediately

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					Time after shifting control	>0,5sec		
					Current gear	1st engine brake		
					No DTC set	P0501 P0705 P0711 P0712 P0713 P0716 P0717 P0721 P0722 P0786 P0787 P0788 P0961 P0962 P0963 P0973 P0974 P0976 P0977 P0979 P0980 P0982 P0983 P0985 P0986 P1896 P2159 P2762 P2763 P2764 U0001 U0100 U0121		

Note: All components/system (DTCs) have a test frequency of 30~60ms

[1)] DS_Active_CAN
DS_Active_CAN = TRUE when the start condition for CAN failure detection is fulfilled for 2.0 sec continously.
DS_Active_CAN = FALSE when the permission condition for CAN failure detection is not fulfilled.

Start Condition for CAN failure detection:
Ignition ON and
10.2V < Battery Voltage < 18V and
Not in service mode and
Reading EEPROM finish
Permission condition for CAN failure detection:
Ignition ON and
9.0V < Battery Voltage < 18V and
Not in service mode

2) DS_Active
DS_Active = TRUE when the start condition for failure detection is fulfilled for 2.0 sec continously.
DS_Active = FALSE when the permission condition for failure detection is not fulfilled.
Start Condition for failure detection:
Ignition ON and
10.2V < Battery Voltage < 18V and
Not in service mode and
Reading EEPROM finish and
Egrpm > 400rpm
Permission condition for failure detection:
Ignition ON and
9.0V < Battery Voltage < 18V and
Not in service mode and
Egrpm > 400rpm

4) Table1:

InTorque(Nm)	<=190	230	
InRpm(Rpm)	400	600	
OutRpm(Rpm)	200	300	

5) Egtrq_LUP_FailMap (Nm)

Trans. In. Speed	1000rpm	1500rpm	2500rpm	3000rpm
TrqConv.(217KII)	41	49	80	106
TrqConv.(206KII)	46	56	91	121

6) Shifting Control
"Shifting Control" is activated when the transmission is in between two gears (undefined gear ratio), until applied pressure has reached to full

7) "Garage Shifting"
"Garage Shifting Control" is activated when the range selector changes from N to D or R until appropriate Gear Ratio is detected.

8) "Multiplex Shifting"
If "BestGear" changes in shift control, that shift control is stopped and a new shift control is started.
For example: If "BestGear" changes to 3rd in a 3-4 shift control,the 3-4 shift control is stopped and a 4-3 shift control is started.

9) "Neutral Control"
Neutral Control is activated if the vehicle is at stand still and in range D with the brake pressed for 2 seconds until the brake is released.

10) "InTorque_noACC"
Engine output torque, acceleration inertia torque not included.

11) Spinning
Spinning = 1 if Transversal acceleration > 0.7G (input from ABS signal)
Spinning = 0 if Transversal acceleration parameter < 0.7G for 2sec. Continously. (input from ABS signal)

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
Internal Control Module Memory	P0601	Check Sum Error	Detectin of differences between the result of the checksum calculation executed after IG ON and the correct checksum. If there are differences from the correct checksum value stored in the FLASH ROM, a second calculation is made.		Ignition	OFF->ON (only at Transmission computer initialization function)	2 times	2nd
Lost communication with ECM (Engine)	U0100	Frame missing from ECM	No CAN status frame from ECM detected		Diagnostic Service "Disable Normal Communication" not detected		4 sec Continuous	2nd
					Engine speed	> 400 rpm once within the driving cycle		
					Ignition	ON >3 sec		
					DS_Active_CAN[2]	TRUE		
CAN Bus Off Counter Overrun	U0001	CAN controller continuity check	Receiving “BUS OFF” state from CAN controller		Ignition	ON >3 sec	8 times	2nd
					DS_Active_CAN[2]	TRUE		
Solenoid S1	P0985	Circuit continuity check	Short-cut ground Detected signal of the S1 monitor when S1 driver outputs the “ON”signal (12V)	“OFF” signal (0V)	DS_Active[3]	TRUE	500 msec	2nd
					Time after solenoid output changed	>10 ms	Continuous	
					Emergency mode	FALSE		
	P0986		Not connected or short-cut Ubatt Detected signal of the S1 monitor when S1 driver outputs the “OFF”signal (0V)	“ON” signal (12V)				
Solenoid S2	P0973	Circuit continuity check	Short-cut ground Detected signal of the S2 monitor when S2 driver outputs the “ON”signal (12V)	“OFF” signal (0V)	DS_Active[3]	TRUE	500 msec	2nd
					Time after solenoid output changed	>10 ms	Continuous	
					Emergency mode	FALSE		
	P0974		Not connected or short-cut Ubatt Detected signal of the S2 monitor when S2 driver outputs the “OFF”signal (0V)	“ON” signal (12V)				
Torque Converter Clutch	P0741	Comparison of engine speed and transmission input speed	Converter is slipping with active lock-up on (Engine Speed - Transmission Input Speed)	> 100rpm	DS_Active[3]	TRUE	12 sec	2nd
					Fdetect_inh[4]	FALSE	Continuous	
					Shift position	RANGE_D(defined)		
					Time after N-D shifting control[9] ends	8 sec		
					Engine Torque	>= 0 Nm		
					Engine Speed	< 4000 rpm		
					Time after SLU target current (_ir) >= 1000 mA	3sec		

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					abs(1- SpeedABS / Transmission Output Speed calculated from Transmission Input Speed)	< 10 %		
					Time after shifting control[9] ends	0.5 sec		
					Oil temperature	>= 20°C		
					Lock-up	FALSE		
					No DTC set	P2759 P0716 P0717 P0721 P0722		
	P0742		Abs(EngineSpeed - Transmission Input Speed)	< 30 rpm for 2.0 sec continuously	DS_Active[3]	TRUE	4sec	2nd
					Fdetect_inh[4]	FALSE		
					Shift position	RANGE_D (defined)		
					Time after N-D shifting control[9] end	1.0 sec		
					Time after changing to Shift position = RANGE_D(defined)	8.0 sec		
					Time after shifting control[9] ends	0.5 sec		
					EngineTorque_noACC[8]	>= 60Nm		
					Engine Speed	>1000 rpm < 3000 rpm		
					abs(1- SpeedABS / Transmission Output Speed calculated from Transmission Input Speed)	<10 %		
					Oil temperature	>= 20 °C		
					Time after SLU pressure = 0 kPa	3sec		
					No DTC set	P2759 P0716 P0717 P0721 P0722		
Pressure solenoid SLU	P2764	Circuit continuity check	Short-cut ground or open Current (AD	<23 mA <15)	DS_Active[3] Emergency mode	TRUE FALSE	500 ms Continuous	2nd
					No DTC set	P2763 for 1 sec and over		
	P2763		Short-cut Ubatt (+B) Measured Current (AD	> 1,333 mA > 1000)	DS_Active[3] Emergency mode	TRUE FALSE	500 ms Continuous	2nd

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					No DTC set	P2764 for 1 sec and over		
	P2759		Feed Back Current Stuck(Electrical) sum_ie **"ie" is added to "sum_ie" every 10 msec.** "ie" : Difference of "ir" and "ifb". "ir" : Target current "ifb": Feedback current "sum_ie" is cleared as follows: (1) or (2) or (3) (1): Detection window = FALSE (2): -50 mA <= ie <= 50 mA (3): ie value cahnges from "ie < 0mA" ("ie >0mA") to "ie >0mA" ("ie < 0mA").	>20000	IG voltage Input AD value Emergency mode DS_Active[3] No DTC set	> 10.5 V < 1000(1333mA) FALSE TRUE P2763 P2764	1 sec	2nd
Pressure solenoid SLT	P0962	Circuit continuity check	Short-cut ground or open Current (AD	<23 mA <15)	DS Active[3] Emergency mode No DTC set	TRUE FALSE P0963 for 1 sec and over	500 ms Continuous	2nd
	P0963		Short-cut Ubatt (+B) Measured Current (AD	> 1,333 mA > 1000)	DS_Active[3] Emergency mode No DTC set	TRUE FALSE P0962 for 1 sec and over	500 ms Continuous	2nd
	P0748		Feed Back Current Stuck(Electrical) sum_ie **"ie" is added to "sum_ie" every 10 msec.** "ie" : Difference of "ir" and "ifb". "ir" : Target current "ifb": Feedback current "sum_ie" is cleared as follows: (1) or (2) or (3) (1): Detection window = FALSE (2): -50 mA <= ie <= 50 mA	>20000	IG voltage Input AD value Emergency mode DS_Active[3] No DTC set	> 10.5 V < 1000(1333mA) FALSE TRUE P0962 P0963	1 sec	2nd

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
			(3): ie value cahnges from “ie < 0mA“ (“ie >0mA“) to “ie >0mA“ (“ie < 0mA“).					
Timing solenoid SLC1	P0966	Circuit continuity check	Short-cut ground or open Current (AD	<23 mA <15)	DS_Active[3] Emergency mode No DTC set	TRUE FALSE P0967 for 1 sec and over	500 msec Continuous	2nd
	P0967		Short-cut Ubatt (+B) Measured Current (AD	> 1,333 mA > 1000)	DS_Active[3] Emergency mode No DTC set	TRUE FALSE P0966 for 1 sec and over	500 msec Continuous	2nd
	P0778		Feed Back Current Stuck(Electrical) sum_ie **"ie" is added to “sum_ie” every 10 msec.** “ie” : Difference of “ir” and “ifb”. “ir” : Target current “ifb”: Feedback current “sum_ie” is cleared as follows: (1) or (2) or (3) (1): Detection window = FALSE (2): -50 mA <= ie <= 50 mA (3): ie value cahnges from “ie < 0mA“ (“ie >0mA“) to “ie >0mA“ (“ie < 0mA“).	>20000	IG voltage input AD value Emergency mode DS_Active[3] No DTC set	> 10.5 V < 1000(1333mA) FALSE TRUE P0966 P0967	1 sec	2nd
Timing solenoid SLC2	P0970	Circuit continuity check	Short-cut ground or open Current (AD	<23 mA <15)	DS_Active[3] Emergency mode No DTC set	TRUE FALSE P0971 for 1 sec and over	500 msec Continuous	2nd
	P0971		Short-cut Ubatt (+B) Measured Current (AD	> 1,333 mA > 1000)	DS_Active[3] Emergency mode No DTC set	TRUE FALSE P0970 for 1 sec and over	500 msec Continuous	2nd

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
	P0798		Feed Back Current Stuck(Electrical) sum_ie **"ie" is added to "sum_ie" every 10 msec.** "ie" : Difference of "ir" and "ifb". "ir" : Target current "ifb": Feedback current "sum_ie" is cleared as follows: (1) or (2) or (3) (1): Detection window = FALSE (2): -50 mA <= ie <= 50 mA (3): ie value cahnges from "ie < 0mA" ("ie >0mA") to "ie >0mA" ("ie < 0mA").	>20000	IG voltage Input AD value Emergency mode DS_Active[3] No DTC set	> 10.5 V < 1000(1333mA) FALSE TRUE P0970 P0971	1 sec	2nd
Timing solenoid SLC3	P2720	Circuit continuity check	Short-cut ground or open Current (AD	<23 mA <15)	DS_Active[3] Emergency mode No DTC set	TRUE FALSE P2721 for 1 sec and over	500 msec Continuous	2nd
	P2721		Short-cut Ubatt (+B) Measured Current (AD	> 1,333 mA > 1000)	DS_Active[3] Emergency mode No DTC set	TRUE FALSE P2720 for 1 sec and over	500 msec Continuous	2nd
	P2716		Feed Back Current Stuck(Electrical) sum_ie **"ie" is added to "sum_ie" every 10 msec.** "ie" : Difference of "ir" and "ifb". "ir" : Target current "ifb": Feedback current "sum_ie" is cleared as follows: (1) or (2) or (3) (1): Detection window = FALSE (2): -50 mA <= ie <= 50 mA	>20000	IG voltage Input AD value Emergency mode DS_Active[3] No DTC set	> 10.5 V < 1000(1333mA) FALSE TRUE P2720 P2721	1 sec	2nd

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
			(3): ie value cahnges from “ie < 0mA“ (“ie >0mA“) to “ie >0mA“ (“ie < 0mA“).					
Timing solenoid SLB1	P2729	Circuit continuity check	Short-cut ground or open Current (AD	 <23 mA <15)	DS_Active[3] Emergency mode No DTC set	TRUE FALSE P2730 for 1 sec and over	500 msec Continuous	2nd
	P2730		Short-cut Ubatt (+B) Measured Current (AD	 > 1,333 mA > 1000)	DS_Active[3] Emergency mode No DTC set	TRUE FALSE P2729 for 1 sec and over	500 msec Continuous	2nd
	P2725		Feed Back Current Stuck(Electrical) sum_ie **"ie" is added to “sum_ie” every 10 msec.** “ie” : Difference of “ir” and “ifb”. “ir” : Target current “ifb”: Feedback current “sum_ie” is cleared as follows: (1) or (2) or (3) (1): Detection window = FALSE (2): -50 mA <= ie <= 50 mA (3): ie value cahnges from “ie < 0mA“ (“ie >0mA“) to “ie >0mA“ (“ie < 0mA“).	 >20000	IG voltage Input AD value Emergency mode DS_Active[3] No DTC set	> 10.5 V < 1000(1333mA) FALSE TRUE P2729 P2730	1 sec	2nd
Gear error, hydraulic fault	P0729	Rationality	Calculation of actual gear ratio for 6th gear is not correct. (Condition A or Condition B) **Condition A** abs(1-GRCurrent/GRExpected) **Condition B** abs(1-Gear Ratio Current/ 4th Gear Ratio) **or**	 > 20% <4%	No Shifting Control[9] Not in neutral control[10] Not garage shifting control[11](N-D or N-R) Throttle (A only) Transmission Output Speed (A) Transmission Output Speed (B) Current gear	 >= 10% >= 500rpm >=250rpm 6	12 sec Continuous	2nd

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
			abs(1-Gear Ratio Current/ 5th Gear Ratio)	<4%	Engine Torque_noACC[8] (B only)	>=80Nm		
					DS_Active[3]	TRUE		
					Fdetect_Inh[4]	FALSE		
					Shift position	RANGE_D(defined)		
					Time after changing to Shift position = RANGE_D(defined)	8.0 sec		
					Time after garage shift control[11] end	1.0 sec		
					Time after neutral control[10] end	1.0 sec		
					Time after shifting control[9] end	0.5 sec		
					Oil temperature	>= 20°C		
					Brake	OFF		
					abs(1-SpeedABS/Trans. Output Speed)	< 10%		
					QS_AirSuction[5]	FALSE		
					No DTC set	P0703		
						P0716		
						P0717		
						P0721		
						P0722		
	P0731	Rationality	Calculation of actual gear ratio for 1st gear is not correct.		Not garage shifting control[11](N-D or N-R)		12 sec	2nd
					Not in neutral control[10]		Continuous	
					No Shifting Control[9]			
			abs(1 - GRCurrent/ 2nd GearRatio)	< 4%	Current Gear	GEAR_1ST or GEAR_1STEB		
			or		Transmission Output Speed	1350 rpm >= outRpm >= 250 rpm		
			abs(1 - GRCurrent/ 3rd GearRatio)	< 4%	EngineTorque_noACC[8]	>=100Nm (GEAR_1ST)		
			or		EngineTorque_noACC[8]	>= 80 Nm (GEAR_1STEB)		
			abs(1 - GRCurrent/ 4th GearRatio)	< 4%	DS_Active[3]	TRUE		
					Fdetect_Inh[4]	FALSE		
					Shift position	RANGE_D(defined)		
					Time after changing to Shift position = RANGE_D(defined)	8.0 sec		

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					Time after garage shift control[11] end	1.0 sec		
					Time after neutral control[10] end	1.0 sec		
					Time after shifting control[9] end	0.5 sec		
					Oil temperature	>= 20°C		
					Brake	OFF		
					abs(1-SpeedABS/Trans.Output Speed)	< 10%		
					QS_AirSuction[5]	FALSE		
					No DTC set	P0703 P0716 P0717 P0721 P0722		
	P0732	Rationality	Calculation of actual gear ratio for 2nd gear is not correct. (Condition A or Condition B)		No Shifting Control[9] Not in neutral control[10] Not garage shifting control[11](N-D or N-R)		12 sec Continuous	2nd
			Condition A abs(1-GRCurrent/GRExpected)	>20%	Throttle (A only)	>= 10%		
			Condition B abs(1-Gear Ratio Current/ 1st Gear Ratio)	<4%	Transmission Output Speed (A) Transmission Output Speed (B)	>= 500rpm >=250rpm		
			or abs(1-Gear Ratio Current/ 3rd Gear Ratio)	<4%	Current gear Engine Torque_noACC[8] (B only)	2 >=80Nm		
			or abs(1-Gear Ratio Current/ 4th Gear Ratio)	<4%	DS_Active[3] Fdetect_Inh[4]	TRUE FALSE		
			or abs(1-Gear Ratio Current/ 6th Gear Ratio)	<4%	Shift position Time after changing to Shift position = RANGE_D(defined)	RANGE_D(defined) 8.0 sec		
					Time after garage shift control[11] end	1.0 sec		
					Time after neutral control[10] end	1.0 sec		
					Time after shifting control[9] end	0.5 sec		
					Oil temperature	>= 20°C		
					Brake	OFF		

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					abs(1-SpeedABS/Trans. Output Speed)	< 10%		
					QS_AirSuction[5]	FALSE		
					No DTC set	P0703 P0716 P0717 P0721 P0722		
	P0733	Rationality	Calculation of actual gear ratio for 3rd gear is not correct. (Condition A or Condition B)		No Shifting Control[9] Not in neutral control[10] Not garage shifting control[11](N-D or N-R)		12 sec Continuous	2nd
			Condition A abs(1-GRCurrent/GRExpected)	>20%	Throttle (A only) Transmission Output Speed (A)	>= 10% >= 500rpm		
			Condition B abs(1-Gear Ratio Current/ 1st Gear Ratio)	<4%	Transmission Output Speed (B)	>=250rpm		
			or abs(1-Gear Ratio Current/ 4th Gear Ratio)	<4%	Current gear Engine Torque_noACC[8] (B only)	3 >=80Nm		
			or abs(1-Gear Ratio Current/ 5th Gear Ratio)	<4%	DS_Active[3] Fdetect_Inh[4]	TRUE FALSE		
					Shift position	RANGE_D(defined)		
					Time after changing to Shift position = RANGE_D(defined)	8.0 sec		
					Time after garage shift control[11] end	1.0 sec		
					Time after neutral control[10] end	1.0 sec		
					Time after shifting control[9] end	0.5 sec		
					Oil temperature	>= 20°C		
					Brake	OFF		
					abs(1-SpeedABS/Trans. Output Speed)	< 10%		
					QS_AirSuction[5]	FALSE		
					No DTC set	P0703 P0716 P0717 P0721 P0722		

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
	P0734	Rationality	Calculation of actual gear ratio for 4th gear is not correct. (Condition A or Condition B)		No Shifting Control[9] Not in neutral control[10] Not garage shifting control[11](N-D or N-R)		12 sec Continuous	2nd
			Condition A abs(1-GRCurrent/GRExpected)	>20%	Throttle (A only) Transmission Output Speed (A) Transmission Output Speed (B)	>= 10% >= 500rpm >=250rpm		
			Condition B abs(1-Gear Ratio Current/ 1st Gear Ratio)	<4%	Current gear Engine Torque_noACC[8] (B only) DS_Active[3] Fdetect_Inh[4]	4 >=80Nm TRUE FALSE		
			or abs(1-Gear Ratio Current/ 5th Gear Ratio)	<4%	Shift position Time after changing to Shift position = RANGE_D(defined) Time after garage shift control[11] end Time after neutral control[10] end Time after shifting control[9] end Oil temperature Brake abs(1-SpeedABS/Trans. Output Speed) QS_AirSuction[5]	RANGE_D(defined) 8.0 sec 1.0 sec 1.0 sec 0.5 sec >= 20°C OFF < 10% FALSE		
			or abs(1-Gear Ratio Current/ 6th Gear Ratio)	<4%	No DTC set	P0703 P0716 P0717 P0721 P0722		
	P0735	Rationality	Calculation of actual gear ratio for 4th gear is not correct. (Condition A or Condition B)		No Shifting Control[9] Not in neutral control[10] Not garage shifting control[11](N-D or N-R)		12 sec Continuous	2nd
			Condition A abs(1-GRCurrent/GRExpected)	>20%	Throttle (A only) Transmission Output Speed (A)	>= 10% >= 500rpm		
			Condition B					

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
			abs(1-Gear Ratio Current/ 4th Gear Ratio)	<4%	Transmission Output Speed (B)	>=250rpm		
			or		Current gear	5		
			abs(1-Gear Ratio Current/ 6th Gear Ratio)	<4%	Engine Torque_noACC[8] (B only)	>=80Nm		
					DS_Active[3]	TRUE		
					Fdetect_Inh[4]	FALSE		
					Shift position	RANGE_D(defined)		
					Time after changing to Shift position = RANGE_D(defined)	8.0 sec		
					Time after garage shift control[11] end	1.0 sec		
					Time after neutral control[10] end	1.0 sec		
					Time after shifting control[9] end	0.5 sec		
					Oil temperature	>= 20°C		
					Brake	OFF		
					abs(1-SpeedABS/Trans. Output Speed)	< 10%		
					QS_AirSuction[5]	FALSE		
					No DTC set	P0703		
						P0716		
						P0717		
						P0721		
						P0722		
Transmission Range Sensor Circuit	P0707	Voltage low	POS1 Voltage or POS2 Voltage	< 0.127 (AD value=26) V	Battery voltage	6.0 V < Battery Voltage < 18 V	200ms	2nd
					Diagnosis Service mode	FALSE		
	P0708	Voltage high	Input POS1 Voltage or Input POS2 Voltage	> 4.87 (AD value=997)V	Diagnosis Service mode	FALSE	200 ms	2nd
					Battery voltage	6.0 V < Battery Voltage < 18 V	Continuous	
	P0706	Signal out of range	Input POS1 Voltage + Input POS2 Voltage	<= 5V -0.29V or >= 5V +0.29V	Diagnosis Service mode	FALSE	200 ms	2nd
					Battery voltage	6.0 V < Battery Voltage < 18 V	Continuous	
Output speed sensor circuit	P0722		No pulse		Not in neutral control[10]		Dependent of Speed	2nd
					No Shifting Control[9]			
					Not garage shifting control[11](N-D)			
			Number of pulses from Transmission Output Speed Sensor	0				

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
			Number of pulses from Transmission Input Speed Sensor	16	DS_Active[3] Emergency mode Shift position Time since change from P,R or N range to others if vehicle speed >= 66km/h and oil temperature >20°C Time since change from P,R or N range to others if vehicle speed < 66km/h and oil temperature <= 20°C SpeedABS No DTC set	TRUE FALSE RANGE_D(defined) 2.5sec 10sec > 300 rpm P0501 P0706 P0707 P0708 P0716 P0717 P0748 P0778 P0798 P0962 P0963 P0966 P0967 P0970 P0971 P0973 P0974 P0985 P0986 P2159 P2716 P2720 P2721 P2725 P2729 P2730 U0001 U0121		

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
	P0721		Range/Performance, wrong pulse | 1-SpeedABS/Transmission Output Speed |	> 15 %	Not garage shifting control[11](N-D)		10 sec	2nd
					No Shifting Control[9]			
					CurrentGear	>= 2ND		
					| 1-SpeedABS/ Trans. Output Speed |	< 5%		
					Time after shifting control	8 sec		
					Time after changing to Position	8 sec		
					Shift position	RANGE_D(defined)		
					Engine speed	> 400rpm		
					Speed ABS	>= 30 km/h		
					Spinning[6]	FALSE		
					DS_Active[3]	TRUE		
					Emergency mode	FALSE		
					No DTC set	P0501 P0706 P0707 P0708 P0711 P0712 P0713 P0741 P0742 P0748 P0778 P0798 P0962 P0963 P0966 P0967 P0970 P0971 P0973 P0974 P0985 P0986 P2159 P2716 P2720		

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
						P2721 P2725 P2729 P2730 P2759 P2763 P2764 U0001 U0121		
Transmission input speed sensor	P0717		No pulse No of pulses from Transmission Input Speed Sensor No of pulses from Transmission Output Speed Sensor	 0 24	No Shifting Control[9] Not garage shifting control[11](N-D) DS_Active[3] Emergency mode Trans. Output Speed * CurrentGearRatio Shift position CurrentGear Time since change from P,R or N range to others if vehicle speed >= 66km/h and oil temperature >20°C Time since change from P,R or N range to others if vehicle speed < 66km/h and oil temperature <= 20°C No DTC set	 TRUE FALSE > 600 rpm RANGE_D(defined) >= 2nd gear 2.5sec 10sec P0501 P0706 P0707 P0708 P0721 P0722 P0748 P0778 P0798 P0962 P0963 P0966 P0967 P0970	Dependent of Speed	2nd

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
						P0971 P0973 P0974 P0985 P0986 P2159 P2716 P2720 P2721 P2725 P2729 P2730 U0001 U0121		
	P0716		Wrong Pulse | 1-speedABS/Transmission Input Speed |	> 15 %	No Shifting Control[9] Not garage shifting control[11](N-D) | 1-SpeedABS/Trans. Output Speed | | 1-SpeedABS/Engine Speed | Time after shifting control Time after changing to Position switch = RANGE_D Gear Range Engine speed Spinning[6] DS_Active[3] LockUpActive Emergency mode Speed ABS No DTC set	< 5 % < 5 % 8 sec 8 sec >= 2ND other than P and N and R > 400rpm FALSE TRUE TRUE FALSE > 30 km/h U0001 P0501 P0706 P0707 P0708 P0711 P0712	10 sec	2nd

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
						P0713 P0721 P0722 P0741 P0742 P0748 P0778 P0798 P0962 P0963 P0966 P0967 P0970 P0971 P0973 P0974 P0985 P0986 P2159 P2716 P2720 P2721 P2725 P2729 P2730 P2759 P2763 P2764 U0121		
Transmission oil temperature sensor	P0711	Rationality	Case 1: Oil temperature change less than OR Case2: Temperature does not reach 20°C within a driving case dependent time.	10 (AD value)	Oil temp DS_Active[3] AD value of oil temperature AD value of oil temperature Emergency mode No DTC set Case 1 only:	< 20°C TRUE > 10 < 1010 FALSE P0706 P0707 P0708 P0716 (Case 2) P0717 (Case 2)	Case 1: 10 min Case 2: Driving case dependent	2nd

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					Range Vehicle Speed	≠ (P, R or N) > 40km/h once		
	P0712	Circuit continuity check	Short-cut ground AD value of Oil Temp	< 10 (More than 200 °C).	DS_Active[3]	TRUE	1 min	2nd
	P0713	Circuit continuity check	Short-cut Ubat or open circuit AD value of Oil temperature	> 1010 (Less than -55 °C)	DS_Active[3] DriveTime	TRUE > 1 min	12 sec	2nd
Neutral condition	P1701		**Step 1:** abs(Engine Speed - Transmission Input Speed) Transmission Input Speed (at D range) Transmission Input Speed (at R range) **Step 2:** Transmission Input Speed Engine Speed	<150rpm > Transmission Output Speed x (1st gear ratio at RANGE_D) +400rpm > Transmission Output Speed x (reverse gear ratio at RANGE_R) +1000rpm <200rpm >600rpm	Not garage shifting control[11](N-D or N-R) Not in neutral control[10] No Shifting Control[9] DS_Active[3] Fdetect_Inh[4] Oil temperature Shift position Time after changing to shift position = RANGE_D or R(defined) Time after garage shifting end Time after neutral control end Time after shifting control end Transmission Output Speed SpeedABS Lockup Current gear QS_AirSuction[5] No DTC set	TRUE FALSE (except P0966) >0°C RANGE_D or RANGE_R (defined) 1.0sec 1.0sec 1.0sec 0.5sec <=500rpm <=500rpm FALSE 1 or 2 or 3 or 4 FALSE P0716 P0717 P0721 P0722	**Step1:** at D range: 3.3 sec if (0 <= X <= 1500) 1.3 sec if (1501 <= X <= 3000) 0.8 sec if (3001 <= X) at R range: 1.8 sec if (0 <= Y <= 1500) 1.3 sec if (1501 <= Y <= 3000) 0.8 sec if (3001 <= Y) X = inRpm - outRpm X (1st gear ratio at RANGE_D)	2nd

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
							Y = inRpm - outRpm X (reverse gear ratio at RANGE_R) **Step 2:** 0.1sec	
Neutral control	P1704		C1 apply control Transmission Input Speed C1 pressure	>= (Transmission Input Speed at apply start + 400rpm + Transmission Output Speed x gear ratio) >=3.0kg/cm^2	DS_Active[3] Shift position Fdetect_Inh[4] Oil temperature QS_AirSuction[5] No DTC set	TRUE RANGE_D(defined) FALSE >=10°C FALSE P0716 P0717 P0721 P0722	0.3sec	2nd

[1] Q_NORMAL
Q_NORMAL menas that no failure is detected

[2] DS_Active_CAN
DS_Active_CAN = TRUE when the start condition for CAN failure detection is fulfilled for 2.0 sec continously.
DS_Active_CAN = FALSE when the permission condition for CAN failure detection is not fulfilled.

Start Condition for CAN failure detection:
Ignition ON and
10.2V < Battery Voltage < 18V and
Not in service mode and
Reading EEPROM finish

Permission condition for CAN failure detection:
Ignition ON and
9.0V < Battery Voltage < 18V and
Not in service mode

[3] DS_Active
DS_Active = TRUE when the start condition for failure detection is fulfilled for 2.0 sec continously.
DS_Active = FALSE when the permission condition for failure detection is not fulfilled.

Start Condition for failure detection:

Ignition ON and
10.2V < Battery Voltage < 18V and
Not in service mode and
Reading EEPROM finish and
Egrpm > 400rpm

Permission condition for failure detection:

Ignition ON and
9.0V < Battery Voltage < 18V and
Not in service mode and
Egrpm > 400rpm

[4] Fdetech_Inh = TRUE if: In Emergency mode or spinning6 = TRUE or within 10.0 sec after spinning detection end or
DTC set: P0973, P0974, P0985, P0986, P0966, P0967, P0970, P0971, P2720, P2721, 2729, 2730, P0962, P0963, P2763, P0716, P0717, P0721, P0722, P0706, P0707, P0708, P0562, P0563, U0001, U0100, P0601, P0711, P0712, P0713, P0501, P2159, U0121

[5]QS_AirSuction : Quick stop detection flag for the prevention of failure misdetection for Air suction, is set if the vehicle brakes hard.

[6] Spinning
Spinning = 1 if Transversal acceleration > 0.7G (input from ABS signal)
Spinning = 0 if Transversal acceleration parameter < 0.7G for 2sec. Continously. (input from ABS signal)

[7] Wheel spin condition
(1) 300 rpm < outRpm < 3000rpm
(2) Egtorque_noACC > 0Nm
(3) ABS (vehicle front wheels average speed - vehicle rear wheels average speed) > 5.0 km/h
(4) Throttle > 70 %
(5) outRpmSpeed < -20 rpm/sec
{(1)and(2)and(3)}or{ (1)and(4)and(5)}continuously detected for 300 msec
After that, Wheel spin condition = TRUE continuously 10000 msec

[8] EngineTorque_noACC
Engine output torque, acceleration inertia torque not included.

[9] Shifting Control
"Shifting Control" is activated when the transmission is in between two gears (undefined gear ratio), until applied pressure has reached to full

[10] "Neutral Control"
Neutral Control is activated if the vehicle is at stand still and in range D with the brake pressed for 2 seconds until the brake is released.

[11] "Garage Shifting"
"Garage Shifting Control" is activated when the range selector changes from N to D or R until appropriate Gear Ratio is detected.