

09OBDG06 TRANS Diagnostics

FWD Section
1 of 2 Sections

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	TRUE	4 sec	Immediately
					Ignition	ON >3sec.	Continuous	
					Emergency mode	FALSE		
Invalid data from ECM	P1895	Engine Torque signal is indicated invalid	Invalid Torque data from ECM		DS_Active_CAN ¹	TRUE	4 sec	Immediately
					Ignition	ON >3sec.	Continuous	
					Emergency mode	FALSE		
					No DTC set	U0100		
Solenoid S1	P0985	Circuit continuity check	Short-cut ground		DS_Active ²	TRUE	500 msec	Immediately
	P0986				Emergency mode	FALSE	Continuous	
					Time after solenoid output change	> 25 ms		
Solenoid S2	P0973	Circuit continuity check	Short-cut ground		DS_Active ²	TRUE	500 msec	Immediately
	P0974				Emergency mode	FALSE	Continuous	
					Time after solenoid output change	> 25 ms		
Solenoid S3	P0976	Circuit continuity check	Short-cut ground		DS_Active ²	TRUE	500 msec	Immediately
	P0977				Emergency mode	FALSE	Continuous	
					Time after solenoid output change	> 25 ms		
Solenoid S4	P0979	Circuit continuity check	Short-cut ground		DS_Active ²	TRUE	500 msec	Immediately
	P0980				Emergency mode	FALSE	Continuous	
					Time after solenoid output change	> 25 ms		
Solenoid S5	P0982	Circuit continuity check	Short-cut ground		DS_Active ²	TRUE	500 msec	Immediately
	P0983				Emergency mode	FALSE	Continuous	
					Time after solenoid output change	> 25 ms		
Torque Converter Clutch Slips	P0741	Comparison of engine speed and transmission input speed	(Engine Speed - Transmission Input Speed)	> 100rpm	No Shifting Control ⁶		12 sec	Immediately
					Throttle	> 20%	Continuous	
					abs(1-SpeedABS/Trans. Output	< 10%		
					abs(1-SpeedABS/Trans. Input	< 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		

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					No DTC set	P0501 P0705 P0711 P0712 P0713 P0716 P0717 P0721 P0722 P0725 P0786 P0787 P0788 P0961 P0962 P0963 P0973 P0974 P0976 P0977 P0979 P0980 P0982 P0983 P0985 P0986 P1820 P1895 P1896 P2159 P2762 P2763 P2764 U0001 U0100 U0121		
Torque Converter Clutch Stuck On	P0742	Comparison of engine speed and transmission input speed	(Engine Speed - Transmission Input speed)	< 50rpm	EngineTorque >= EngineTorque <= 240 Nm Trans. Input Speed <= 3000rpm Time after changing to Shift >8.0 sec Time after IG ON or a reset of the >3 min Time after shifting control >0.5sec Oil temperature >= 20°C No Shifting Control ⁶ Not garage shifting control ⁷ (N-D)	12 sec Continuous	Immediately	

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					(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 P0961 P0962 P0963 P0786 P0787 P0788 P2762 P2763 P2764 U0001 U0100 P1820 P0725 P1895 P0711 P0712 P0713		
Pressure solenoid SLU	P2764	Circuit continuity check	Short-cut ground or open		DS_Active ²	TRUE	12,5 sec	Immediately
			Current (AD	<92 mA < 68)	Emergency mode	FALSE	Continuous	
	P2762		Terminal short		Emergency mode	FALSE	2,75 sec	Immediately
			Error current	> 80 mA	Oil temperature	> 20°C	Continuous	
					System voltage	11 -18 V		
					System voltage change	< 0,2V		

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					Output current target	> 853mA and not changed during detection		
					DS Active ²	TRUE		
					No DTC set	P0711		
						P0712		
						P0713		
	P2763		Short-cut Ubatt		DS Active ²	TRUE	2 sec	Immediately
			Measured Current	> 1356 mA	Emergency mode	FALSE	Continuous	
			(AD)	> 1000)				
Pressure solenoid SLT	P0962	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)				
	P0961	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							
	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							

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
	P0788		Short-cut Ubatt Measured Current (AD)	> 1356 mA > 1000)	DS_Active ² Emergency mode	TRUE FALSE	2 sec Continuous	Immediately
Shift Malfunction	P0780	Shift time check	Shift time is too long, too short or "tie up" occurs		No Multiplex Shifting ⁸ Oil temperature Emergency mode DS_Active ² Shift position No DTC set	> 60°C FALSE TRUE D, 4, 3, L, or M 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 P1820 P0725 P1895 P0711 P0712 P0713 P1896 P2159 P0501 U0121	Detected 5 times during DCY Continuous	Immediately
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

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						P0711		
						P0712		
						P0713		
						P0721		
						P0722		
						P0725		
						P0741		
						P0786		
						P0787		
						P0788		
						P0961		
						P0962		
						P0963		
						P0973		
						P0974		
						P0976		
						P0977		
						P0979		
						P0980		
						P0982		
						P0983		
						P0985		
						P0986		
						P1820		
						P1895		
						P2762		
						P2763		
						P2764		
						U0121		
Invalid signal from ECM	P1820	Accelerator pedal position signal is invalid	Data from ECM indicated as invalid		DS_Active ² Time after Ignition ON or reset of CAN controller. Emergency mode No DTC set	TRUE >3 sec FALSE U0100	4 sec Continuous	Immediately
Trans. Output speed sensor	P0722	Circuit continuity check	Condition 1 (No pulse) No of pulses from output sensor No of pulses from input sensor	0 6000	Not in Neutral control ⁹ No Shifting Control ⁶ Not garage shifting control ⁷ (N-D) DS_Active ² Trans.Output Speed calculated from ABS Selected gear Time since change from P, R or N to others if vehicle speed <= 66km/h and oiltemp. <= 20°C Time since change from P, R or N to others if vehicle speed >66km/h or oiltemp. > 20°C	TRUE >300rpm (only Condition 1) D, 4, 3, 2, M >10 sec >2,5 sec	6000 pulses Continuous 30 sec Continuous	Immediately Immediately

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
			Transmission Output Speed	0	Emergency mode	FALSE		
			SpeedABS	>20km/h	No DTC set	U0121 P0705 P0716 (only Condition 1) P0717 (only Condition 1)		
			Short to Ubatt or GND		DS_Active ² Emergency mode	TRUE FALSE	30sec Continuous	Immediately
	P0721 (only Saab 9-3)		Incorrect rpm abs(1-SpeedABS/ Transmission Output Speed)	> 15 %	B1 not released No Shifting Control ⁶ Not garage shifting control ⁷ (N-D)		10 sec Continuous	Immediately
					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		
					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		

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
						P2764 P1820 P0725 P1895 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 brake Spinning ¹¹ DS_Active ² Emergency mode	>= 500rpm >8.0 sec >0.5 sec >= 20°C RANGE_D_4,3,2(defined) > 400 rpm >= 10.5 V OFF FALSE TRUE FALSE	12 sec Continuous	Immediately
			Condition 2 Driving on 5th gear - gear ratio	1.504 ± 4%	abs(1 - SpeedABS / SpeedSP) Throttle No DTC set	< 10 % > 10 % P0721 P0722 P0716 P0717 P0705 P0985 P0986 P0973 P0974 P0976 P0977 P0979 P0980 P0982 P0983 P0961 P0962 P0963 P0786 P0787 P2762 P2763		

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
						P2764		
						U0001		
						U0100		
						P1820		
						P0725		
						P1895		
						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
Transmission oil temperature sensor	P0711	Rationality	Oil temperature change less than	10 (AD value)	Oil temp sensor	10< AD < 1000	10 min Continuous	Two DCY
					Oil temp	< 20 °C		
					Gear Selector	≠ (P, R or N)		
					DS_Active ²	TRUE		
					Emergency mode	FALSE		
					Vehicle speed	> 40 km/h once		
					No DTC set	P0705		
P0712	Circuit continuity check	Short-cut ground			DS_Active ²	TRUE	5 min	Two DCY
		Voltage (AD)	< 50 mV < 10)		Emergency mode	FALSE	Continuous	
P0713	Circuit continuity check	Short-cut Ubat or open circuit			DS_Active ²	TRUE	12 sec	Two DCY
		AD	> 1000		Emergency mode	FALSE	Continuous	
					Driving time	>10 min		
Gear error, hydraulic fault	P0731	Rationality	(Transmission Input Speed - Transmission Output Speed X GRExpected)	>300rpm	Not garage shifting control ⁷ (N-D)		10 sec	Immediately
					IG voltage	>= 10.5V	Continuous	
					Engine speed	>(T/M input rev + 150) for 150msec continuously.		
				<100rpm	InTorqe_noACC ¹⁰	30Nm <= InTorq_noACC < 200Nm		
					T/M input rev	>Table1 ⁴		
					T/M output rev	>Table1 ⁴		
					current Gear	1		
		Time after changing to shift position == RANGE_D,4,3,2	>8.0sec					

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					Time after shifting control ⁷	>0.5 sec		
					Oil temperature	>= 20°C		
					Engine speed	>400rpm		
					Shiftposition	RANGE_D,4,3,2(defined) or RANGE_D,4,3,2(undefined) for 75sec.		
					DS_Active ²	TRUE		
					Emergency mode	FALSE		
					No DTC set	P0501 P0705 P0711 P0712 P0713 P0716 P0717 P0721 P0722 P0725 P0786 P0787 P0788 P0961 P0962 P0963 P0973 P0974 P0976 P0977 P0979 P0980 P0982 P0983 P0985 P0986 P1820 P1895 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	> 10%	12 sec Continuous	Immediately

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					Current gear	2		
					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		
						P0725		
						P0786		
						P0787		
						P0788		
						P0961		
						P0962		
						P0963		
						P0973		
						P0974		
						P0976		
						P0977		
						P0979		
						P0980		
						P0982		
						P0983		
						P0985		
						P0986		
						P1820		
						P1895		
						P1896		
						P2159		
						P2762		

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
						P2763		
						P2764		
						U0001		
						U0100		
						U0121		
	P0733	Rationality	Calculated ratio for 3rd 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% 3 >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 P0725 P0786 P0787 P0788 P0961 P0962 P0963 P0973 P0974 P0976 P0977 P0979 P0980	12 sec Continuous	Immediately

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						P0982 P0983 P0985 P0986 P1820 P1895 P1896 P2159 P2762 P2763 P2764 U0001 U0100 U0121		
	P0734	Rationality	Calculated ratio for 4th gear differendes from expected.	>20%	No Shifting Control ⁶ Not garage shifting control ⁷ (N-D) Throttle > 10% Current gear 4 Time after changing to Shift position == RANGE_D,4,3,2(defined) 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		12 sec Continuous	Immediately
						No DTC set P0501 P0705 P0711 P0712 P0713 P0716 P0717 P0721 P0722 P0725 P0786 P0787 P0788		

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
						P0961 P0962 P0963 P0973 P0974 P0976 P0977 P0979 P0980 P0982 P0983 P0985 P0986 P1820 P1895 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 > 10% Current gear 5 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		12 sec Continuous	Immediately
						P0501 P0705 P0711 P0712		

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						P0713		
						P0716		
						P0717		
						P0721		
						P0722		
						P0725		
						P0786		
						P0787		
						P0788		
						P0961		
						P0962		
						P0963		
						P0973		
						P0974		
						P0976		
						P0977		
						P0979		
						P0980		
						P0982		
						P0983		
						P0985		
						P0986		
						P1820		
						P1895		
						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	6 sec Continuous	Immediately

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						P0705		
						P0711		
						P0712		
						P0713		
						P0716		
						P0717		
						P0721		
						P0722		
						P0725		
						P0786		
						P0787		
						P0788		
						P0961		
						P0962		
						P0963		
						P0973		
						P0974		
						P0976		
						P0977		
						P0979		
						P0980		
						P0982		
						P0983		
						P0985		
						P0986		
						P1820		
						P1895		
						P1896		
						P2159		
						P2762		
						P2763		
						P2764		
						U0001		
						U0100		
						U0121		
	P1731	Rationality	Calculated ratio for Reverse gear difference from expected	>20%	No Shifting Control ^b Mode Selector	Triptronic mode or Shift position Range_L	12 sec Continuous	Immediately
					Shift position	RANGE_D(defined)		
					A/T oil temp.	> 20°C		
					Throttle	0%		
					Engine speed	> 400 rpm		
					Time after shift to D.4.3.2(defined)	8 sec		
					IG voltage	> 10.5 V		
					Transmission Output Speed	1260rpm >= outRpm >= 500rpm		
					Brake	OFF		
					DS_Active ²	TRUE		

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					Time after shifting control	>0,5sec		
					Current gear	1st engine brake		
					No DTC set	P0501		
						P0705		
						P0711		
						P0712		
						P0713		
						P0716		
						P0717		
						P0721		
						P0722		
						P0725		
						P0786		
						P0787		
						P0788		
						P0961		
						P0962		
						P0963		
						P0973		
						P0974		
						P0976		
						P0977		
						P0979		
						P0980		
						P0982		
						P0983		
						P0985		
						P0986		
						P1820		
						P1895		
						P1896		
						P2159		
						P2762		
						P2763		
						P2764		
						U0001		
						U0100		
						U0121		
Engine speed signal	P0725	Signal from ECM stated as unreliable	Engine Speed Validity	Invalid	Not lost communication with ECM		4 sec	Immediately
					Ignition	ON > 3 sec		
					DS_Active_CAN ¹	TRUE	Continuous	
					Transmissio input speed	>500rpm (only Saab 9-5)		
					Emergency mode	FALSE		
				Battery voltage	> 10,2 V			
Note: All components/system (DTCs) have a test frequency of 30~60ms								

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
		1) DS_Active_CAN						
		DS_Active_CAN = TRUE when the start condition for CAN failure detection is fulfilled for 2.0 sec continuously.						
		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 continuously.						
		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		>=270				
InRpm(Rpm)	400	600		800				
OutRpm(Rpm)	200	300		400				
		5) Egtrq_LUP_FailMap (Nm)						
Trans. In. Speed	1000rpm	1500rpm	2000rpm	2500rpm	3000rpm			

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
TrqConv.(217KII)	41	49	59	80	106			
TrqConv.(206KII)	46	56	66	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. Continuously. (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	> 400 rpm once within the driving cycle	4 sec Continuous	2nd	
					Engine speed				
					Ignition				
CAN Bus Off Counter Overrun	U0001	CAN controller continuity check	Receiving "BUS OFF" state from CAN controller		DS_Active_CAN ²	ON >3 sec	8 times	2nd	
					Ignition	TRUE			
Invalid data from ECM	P1895	Engine Torque signal is indicated invalid	TCM receives Engine Torque Actual Validity	"Invalid"	Diagnostic Service "Disable Normal Communication" not detected	ON >3 sec	4 sec Continuous	2nd	
					Emergency mode				FALSE
					Ignition				ON >3 sec
					DS_Active_CAN ²				TRUE
Solenoid S1	P0985	Circuit continuity check	Short-cut ground	"OFF" signal (0V)	DS_Active ³	TRUE	500 msec	2nd	
			Detected signal of the S1 monitor when S1 driver outputs the "ON" signal (12V)		Time after solenoid output changed	>10 ms			
	P0986		Not connected or short-cut Ubatt	"ON" signal (12V)	Emergency mode	FALSE			
			Detected signal of the S1 monitor when S1 driver outputs the "OFF" signal (0V)						
Solenoid S2	P0973	Circuit continuity check	Short-cut ground	"OFF" signal (0V)	DS_Active ³	TRUE	500 msec	2nd	
			Detected signal of the S2 monitor when S2 driver outputs the "ON" signal (12V)		Time after solenoid output changed	>10 ms			
	P0974		Not connected or short-cut Ubatt	"ON" signal (12V)	Emergency mode	FALSE			
			Detected signal of the S2 monitor when S2 driver outputs the "OFF" signal (0V)						
Torque Converter Clutch	P0741	Comparison of engine speed and transmission input speed	Converter is slipping with active lock-up on.	> 100rpm	DS_Active ³	TRUE	12 sec	2nd	
			(Engine Speed - Transmission Input Speed)		Fdetect_inh ⁴	FALSE	Continuous		
					Shift position	RANGE D(defined)			

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					Time after N-D shifting control ⁹ ends Engine Torque Engine Speed Time after SLU target current (_ir) >= 1000 mA abs(1- SpeedABS / Transmission Output Speed calculated from Transmission Input Speed) Time after shifting control ⁹ ends Oil temperature Lock-up No DTC set	8 sec >= 0 Nm < 4000 rpm 3sec >= 1000 mA < 10 % 0.5 sec >= 20°C FALSE P2759 P0716 P0717 P0721 P0722		
	P0742		Abs(EngineSpeed - Transmission Input Speed)	< 30 rpm for 2.0 sec continuously	DS_Active ³ Fdetect_inh ⁴ Shift position Time after N-D shifting control ⁹ end Time after changing to Shift position = RANGE_D(defined) Time after shifting control ⁹ ends EngineTorque_noACC ⁸ Engine Speed abs(1- SpeedABS / Transmission Output Speed calculated from Transmission Input Speed) Oil temperature Time after SLU pressure = 0 kPa No DTC set	TRUE FALSE RANGE_D (defined) 1.0 sec 8.0 sec 0.5 sec >= 60Nm >1000 rpm < 3000 rpm <10 % >= 20 °C 3sec P2759 P0716 P0717 P0721 P0722	4sec	2nd
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

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					No DTC set	P2763 for 1 sec and over		
	P2762		Terminal short		No Shifting Control ⁹		2,75 sec	2nd
			Error current	> 80 mA	Emergency mode	FALSE	Continuous	
					Oil temperature	> 20°C		
					System voltage change	< 0,2V		
					System voltage	11 -18 V		
					SLU Output current target	> 835mA and constant.		
					DS_Active ³	TRUE		
					No DTC set	P0711 P0712 P0713		
	P2763		Short-cut Ubatt (+B)		DS_Active ³	TRUE		500 ms
			Measured Current (AD)	> 1,333 mA > 1000)	Emergency mode	FALSE	Continuous	
					No DTC set	P2764 for 1 sec and over		
	P2759		Feed Back Current Stuck(Electrical)		IG voltage	> 10.5 V	1 sec	2nd
			sum_ie	>20000	Input AD value	< 1000(1333mA)		
			"ie" is added to "sum_ie" every 10 msec.		Emergency mode	FALSE		
			"ie" : Difference of "ir" and "ifb".		DS_Active ³	TRUE		
			"ir" : Target current					
			"ifb": Feedback current		No DTC set	P2763 P2764		
			"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").					
Pressure solenoid SLT	P0962	Circuit continuity check	Short-cut ground or open		DS_Active ³	TRUE	500 ms	2nd
			Current (AD)	<23 mA <15)	Emergency mode	FALSE	Continuous	
			No DTC set	P0963 for 1 sec and over				
		P0961		Terminal short		No Shifting Control ⁹		2,75 sec
	Error current			> 80 mA	Emergency mode	FALSE	Continuous	
					Oil temperature	> 20°C		
					System voltage change	< 0,2V		
					System voltage	11 -18 V		
					SLT Output current target	> 835mA and constant.		
			DS_Active ³	TRUE				

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					No DTC set	P0711		
						P0712		
						P0713		
	P0963		Short-cut Ubatt (+B)		DS_Active ³	TRUE	500 ms	2nd
			Measured Current (AD)	> 1,333 mA > 1000)	Emergency mode	FALSE	Continuous	
					No DTC set	P0962 for 1 sec and over		
	P0748		Feed Back Current Stuck(Electrical)		IG voltage	> 10.5 V	1 sec	2nd
			sum_ie	>20000	Input AD value	< 1000(1333mA)		
			"ie" is added to "sum_ie" every 10 msec.		Emergency mode	FALSE		
			"ie" : Difference of "ir" and "ifb".		DS_Active ³	TRUE		
			"ir" : Target current					
			"ifb": Feedback current		No DTC set	P0962		
			"sum_ie" is cleared as follows:			P0963		
			(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").					
Timing solenoid SLC1	P0966	Circuit continuity check	Short-cut ground or open		DS_Active ³	TRUE	500 msec	2nd
			Current (AD)	<23 mA <15)	Emergency mode	FALSE	Continuous	
					No DTC set	P0967 for 1 sec and over		
	P0965		Terminal short		No Shifting Control ⁹		2.75 sec	2nd
			Error current	> 80 mA	Emergency mode	FALSE	Continuous	
					Oil temperature	> 20°C		
					System voltage change	< 0,2V		
					System voltage	11 -18 V		
					SLC1 Output current target	> 835mA and constant.		
					DS_Active ³	TRUE		
					No DTC set	P0711		
						P0712		
						P0713		
	P0967		Short-cut Ubatt (+B)		DS_Active ³	TRUE	500 msec	2nd
			Measured Current (AD)	> 1,333 mA > 1000)	Emergency mode	FALSE	Continuous	
					No DTC set	P0966 for 1 sec and over		
	P0778		Feed Back Current Stuck(Electrical)		IG voltage	> 10.5 V	1 sec	2nd

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.	
			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	input AD value Emergency mode DS_Active ³ No DTC set	< 1000(1333mA) FALSE TRUE P0966 P0967			
Timing solenoid SLC2	P0970	Circuit continuity check	Short-cut ground or open		DS_Active ³	TRUE	500 msec	2nd	
			Current (AD)	<23 mA <15)	Emergency mode	FALSE	Continuous		
					No DTC set	P0971 for 1 sec and over			
	P0969		Terminal short Error current	> 80 mA	No Shifting Control ⁹		FALSE	2.75 sec	2nd
					Emergency mode		FALSE	Continuous	
					Oil temperature		> 20°C		
					System voltage change		< 0.2V		
					System voltage		11 -18 V		
					SLC2 Output current target		> 835mA and constant.		
					DS_Active ³		TRUE		
	No DTC set		P0711 P0712 P0713						
	P0971		Short-cut Ubatt (+B) Measured Current (AD)	> 1,333 mA > 1000)	DS_Active ³		TRUE	500 msec	2nd
Emergency mode						FALSE	Continuous		
No DTC set						P0970 for 1 sec and over			
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	>20000	IG voltage		> 10.5 V	1 sec	2nd	
				Input AD value		< 1000(1333mA)			
				Emergency mode		FALSE			
				DS_Active ³		TRUE			
				No DTC set		P0970 P0971			

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 SLC3	P2720	Circuit continuity check	Short-cut ground or open		DS_Active ³	TRUE	500 msec	2nd	
			Current (AD)	<23 mA <15)	Emergency mode	FALSE	Continuous		
					No DTC set	P2721 for 1 sec and over			
	P2719		Circuit continuity check	Terminal short		No Shifting Control ⁹		2.75 sec	2nd
				Error current	> 80 mA	Emergency mode	FALSE	Continuous	
						Oil temperature	> 20°C		
						System voltage change	< 0,2V		
						System voltage	11 -18 V		
						SLC3 Output current target	> 835mA and constant.		
	P2721		Circuit continuity check	Short-cut Ubatt (+B)		DS_Active ³	TRUE		500 msec
				Measured Current (AD)	> 1,333 mA > 1000)	Emergency mode	FALSE	Continuous	
						No DTC set	P2720 for 1 sec and over		
P2716		Circuit continuity check	Feed Back Current Stuck(Electrical)		IG voltage	> 10.5 V	1 sec	2nd	
			sum_ie	>20000	Input AD value	< 1000(1333mA)			
			"ie" is added to "sum_ie" every 10 msec.		Emergency mode	FALSE			
			"ie" : Difference of "ir" and "ifb".		DS_Active ³	TRUE			
			"ir" : Target current						
			"ifb" : Feedback current		No DTC set	P2720			
			"sum_ie" is cleared as follows:			P2721			
			(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").									
Timing solenoid SLB1	P2729	Circuit continuity check	Short-cut ground or open		DS_Active ³	TRUE	500 msec	2nd	
			Current (AD)	<23 mA <15)	Emergency mode	FALSE	Continuous		
					No DTC set	P2730 for 1 sec and over			
	P2728		Circuit continuity check	Terminal short		No Shifting Control ⁹		2.75 sec	2nd
				Error current	> 80 mA	Emergency mode	FALSE	Continuous	
						Oil temperature	> 20°C		

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					System voltage change System voltage SLB1 Output current target DS_Active ³ No DTC set	< 0,2V 11 -18 V > 835mA and constant. TRUE P0711 P0712 P0713		
	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-GRCcurrent/GRExpected) Condition B abs(1-Gear Ratio Current/ 4th Gear Ratio) or abs(1-Gear Ratio Current/ 5th Gear Ratio)	> 20% <4% <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 Engine Torque_noACC ⁸ (B only) DS_Active ³ Fdetect_Inh ⁴ Shift position Time after changing to Shift position = RANGE_D(defined) Time after garage shift control ¹¹ end	>= 10% >= 500rpm >=250rpm 6 >=80Nm TRUE FALSE RANGE_D(defined) 8.0 sec 1.0 sec	12 sec Continuous	2nd

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					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		
					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		No Shifting Control ⁹		12 sec	2nd

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
			2nd gear is not correct. (Condition A or Condition B)		Not in neutral control ¹⁰		Continuous	
			Condition A		Not garage shifting control ¹¹ (N-D or N-R)			
			abs(1-GRCurrent/GRExpected)	>20%	Throttle (A only)	>= 10%		
			Condition B		Transmission Output Speed (A)	>= 500rpm		
			abs(1-Gear Ratio Current/ 1st Gear Ratio)	<4%	Transmission Output Speed (B)	>=250rpm		
			or		Current gear	2		
			abs(1-Gear Ratio Current/ 3rd Gear Ratio)	<4%	Engine Torque_noACC ⁸ (B only)	>=80Nm		
			or		DS_Active ³	TRUE		
			abs(1-Gear Ratio Current/ 4th Gear Ratio)	<4%	Fdetect_Inh ⁴	FALSE		
			or		Shift position	RANGE_D(defined)		
			abs(1-Gear Ratio Current/ 6th Gear Ratio)	<4%	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		
	P0733	Rationality	Calculation of actual gear ratio for 3rd gear is not correct. (Condition A or Condition B)		No Shifting Control ⁹		12 sec	2nd
					Not in neutral control ¹⁰		Continuous	
			Condition A		Not garage shifting control ¹¹ (N-D or N-R)			
			abs(1-GRCurrent/GRExpected)	>20%	Throttle (A only)	>= 10%		
			Condition B		Transmission Output Speed (A)	>= 500rpm		
			abs(1-Gear Ratio Current/ 1st Gear Ratio)	<4%	Transmission Output Speed (B)	>=250rpm		
			or		Current gear	3		
			abs(1-Gear Ratio Current/ 4th Gear Ratio)	<4%	Engine Torque_noACC ⁸ (B only)	>=80Nm		
			or		DS_Active ³	TRUE		
			abs(1-Gear Ratio Current/ 5th Gear Ratio)	<4%	Fdetect_Inh ⁴	FALSE		

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					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		
	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		12 sec Continuous	2nd
			Condition A		Not garage shifting control ¹¹ (N-D or N-R)			
			abs(1-GRCurrent/GRExpected)	>20%	Throttle (A only)	>= 10%		
			Condition B		Transmission Output Speed (A)	>= 500rpm		
			abs(1-Gear Ratio Current/ 1st Gear Ratio)	<4%	Transmission Output Speed (B)	>=250rpm		
			or		Current gear	4		
			abs(1-Gear Ratio Current/ 5th Gear Ratio)	<4%	Engine Torque_noACC ⁸ (B only)	>=80Nm		
			or		DS_Active ³	TRUE		
			abs(1-Gear Ratio Current/ 6th Gear Ratio)	<4%	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		

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
						P0717 P0721 P0722		
	P0735	Rationality	Calculation of actual gear ratio for 4th gear is not correct. (Condition A or Condition B) Condition A abs(1-GRCurrent/GRExpected) >20% Condition B abs(1-Gear Ratio Current/ 4th Gear Ratio) <4% or abs(1-Gear Ratio Current/ 6th Gear Ratio) <4%		No Shifting Control ⁹ Not in neutral control ¹⁰ Not garage shifting control ¹¹ (N-D or N-R) Throttle (A only) >= 10% Transmission Output Speed (A) >= 500rpm Transmission Output Speed (B) >=250rpm Current gear 5 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		12 sec Continuous	2nd
Engine speed signal	P0725	Signal from ECM stated as unreliable	Engine Speed Validity	"Invalid"	Diagnostic Service "Disable Normal Communication" not detected Ignition ON >3 sec DS_Active_CAN ² TRUE Emergency mode FALSE No DTC set		4 sec Continuous	2nd
Transmission Range Sensor Circuit	P0707	Voltage low	POS1 Voltage or POS2 Voltage	< 0.127 (AD value=26) V	Battery voltage Diagnosis Service mode	6.0 V < Battery Voltage < 18 V FALSE	200ms	2nd
	P0708	Voltage high	Input POS1 Voltage or Input POS2 Voltage	> 4.87 (AD value=997)V	Diagnosis Service mode Battery voltage	FALSE 6.0 V < Battery Voltage < 18 V	200 ms Continuous	2nd

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
	P0706	Signal out of range	Input POS1 Voltage + Input POS2 Voltage	<= 5V -0.29V or >= 5V +0.29V	Diagnosis Service mode Battery voltage	FALSE 6.0 V < Battery Voltage < 18 V	200 ms Continuous	2nd
Output speed sensor circuit	P0722		No pulse Number of pulses from Transmission Output Speed Sensor Number of pulses from Transmission Input Speed Sensor	 0 16	Not in neutral control ¹⁰ No Shifting Control ⁹ Not garage shifting control ¹¹ (N-D) 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 P0961 P0962 P0963 P0965 P0966 P0967 P0969 P0970 P0971 P0973 P0974 P0985 P0986 P1895 P2159 P2716 P2719 P2720 P2721	Dependent of Speed	2nd

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
						P2725 P2728 P2729 P2730 U0001 U0121		
	P0721		Range/Performance, wrong pulse 1-SpeedABS/Transmission Output Speed	> 15 %	Not garage shifting control ¹¹ (N-D) 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		10 sec	2nd
						P0501 P0706 P0707 P0708 P0711 P0712 P0713 P0725 P0741 P0742 P0748 P0778 P0798 P0961 P0962 P0963 P0965 P0966 P0967 P0969 P0970 P0971 P0973 P0974 P0985 P0986 P1820 P1895		

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
						P2159 P2716 P2719 P2720 P2721 P2725 P2728 P2729 P2730 P2759 P2762 P2763 P2764 U0001 U0121		
Transmission input speed sensor	P0717		No pulse		No Shifting Control ⁹ Not garage shifting control ¹¹ (N-D)		Dependent of Speed	2nd
			No of pulses from Transmission Input Speed Sensor	0	DS_Active ³	TRUE		
			No of pulses from Transmission Output Speed Sensor	24	Emergency mode	FALSE		
					Trans. Output Speed *	> 600 rpm		
					CurrentGearRatio			
					Shift position	RANGE_D(defined)		
					CurrentGear	>= 2nd gear		
					Time since change from P,R or N range to others if vehicle speed >= 66km/h and oil temperature >20°C	2.5sec		
					Time since change from P,R or N range to others if vehicle speed < 66km/h and oil temperature <= 20°C	10sec		
					No DTC set	P0501 P0706 P0707 P0708 P0721 P0722 P0748 P0778 P0798 P0961 P0962 P0963 P0965 P0966 P0967 P0969		

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
						P0970 P0971 P0973 P0974 P0985 P0986 P1895 P2159 P2716 P2719 P2720 P2721 P2725 P2728 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 < 5 % 1-SpeedABS/Engine Speed < 5 % Time after shifting control 8 sec Time after changing to Position switch = RANGE_D 8 sec Gear >= 2ND Range other than P and N and R Engine speed > 400rpm Spinning ⁶ FALSE DS_Active ³ TRUE LockUpActive TRUE Emergency mode FALSE Speed ABS > 30 km/h No DTC set	U0001 P0501 P0706 P0707 P0708 P0711 P0712 P0713 P0721 P0722 P0725 P0741 P0742	10 sec	2nd

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
						P0748 P0778 P0798 P0961 P0962 P0963 P0965 P0966 P0967 P0969 P0970 P0971 P0973 P0974 P0985 P0986 P1820 P1895 P2159 P2716 P2719 P2720 P2721 P2725 P2728 P2729 P2730 P2759 P2762 P2763 P2764 U0121		
Transmission oil temperature sensor	P0711	Rationality	Oil temperature change less than	10 (AD value)	Oil temp DS_Active ³ AD value of oil temperature AD value of oil temperature Emergency mode Range Vehicle Speed No DTC set	< 20°C TRUE > 10 < 1000 FALSE # (P, R or N) > 40km/h once P0706 P0707 P0708	10 min	2nd
	P0712	Circuit continuity check	Short-cut ground AD value of Oil Temp	< 10 (More than 200 °C).	DS_Active ³	TRUE	300sec	2nd
	P0713	Circuit continuity check	Short-cut Ubat or open circuit AD value of Oil temperature	> 1000 (-43 °C)	DS_Active ³ DriveTime	TRUE > 10 min	12 sec	2nd
Invalid signal from ECM	P1820	Accelerator pedal position signal is invalid	Accelerator Position Validity	"Invalid"	Diagnostic Service "Disable Normal Communication" not detected Ignition	ON > 3sec	4 sec	2nd

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					DS_Active_CAN ² Emergency mode No DTC set	TRUE FALSE U0100		
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 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) Y = inRpm - outRpm X (reverse gear ratio at RANGE_R) Step 2: 0.1sec	2nd
Neutral control	P1704		C1 apply control Transmission Input Speed	>= (Transmission Input Speed at	DS_Active ³ Shift position	TRUE RANGE_D(defined)	0.3sec	2nd

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
				apply start + 400rpm + Transmission Output Speed x gear ratio)	Fdetect_Inh ⁴	FALSE		
			C1 pressure	>=3.0kg/cm ²	Oil temperature	>=10°C		
					QS_AirSuction ⁵	FALSE		
					No DTC set	P0716		
						P0717		
						P0721		
						P0722		
¹) Q_NORMAL Q_NORMAL means 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 continuously. 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 continuously. 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 and Egrpm = Q_NORMAL ¹								
Permission condition for failure detection: Ignition ON and 9.0V < Battery Voltage < 18V and Not in service mode and Egrpm > 400rpm and Egrpm = Q_NORMAL ¹								

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
		4) Fdetech_Inh = TRUE if: In Emergency mode or spinning ⁶ = 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, P1820, P1895, P0725, 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. Continuously. (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.						