2008MY SAAB OBD II CERTIFICATION

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Required	MIL Illumin.	Extra Prep
System Voltage	P0562	Low Supply	IG voltage	< 8.68 V	Ignition Emergency mode Transmission Input Speed No DTC set	ON FALSE > 800rpm P0716 P0717	20 sec Continuous	2nd	
	P0563	High Supply	IG voltage	> 18 V	Ignition Emergency mode Transmission Input Speed No DTC set	ON FALSE > 800rpm P0716 P0717	20 sec Continuous	2nd	
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 Engine speed Ignition DS Active CAN[2]	 > 400 rpm once within the driving cycle ON >3 sec TRUE	4 sec Continuous	2nd	
CAN Bus Off Counter Overrun	U0001	CAN controller continuity check	Receiving “BUS OFF” state from CAN controller		Ignition DS Active CAN[2]	ON >3 sec TRUE	8 times	2nd	
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 Emergency mode Ignition DS Active CAN[2] No DTC set	 FALSE ON >3 sec TRUE U0100	4 sec Continuous	2nd	
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] Time after solenoid output changed Emergency mode	TRUE >10 ms FALSE	500 msec Continuous	2nd	
	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] Time after solenoid output changed Emergency mode	TRUE >10 ms FALSE	500 msec Continuous	2nd	
	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] Fdetect inh[4] Shift position Time after N-D shifting contro[9] ends Engine Torque Engine Speed Time after SLU target current (_ir) >= abs(1- SpeedABS / Transmission Output Speed calculated from Transmission Input	TRUE FALSE RANGE_D(defined) 8 sec >= 0 Nm < 4000 rpm 3sec < 10 %	12 sec Continuous	2nd	

					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			
	P2762		Terminal short Error current	> 80 mA	No Shifting Control[8]		2,75 sec	2nd	
					Emergency mode	FALSE	Continuous		
					Oil temperature	> 20°C			
					System voltage change	< 0,2V			
					System voltage	11 -16 V			
					SLU Output current target	> 835mA and constant.			
					DS Active[3]	TRUE			
					No DTC set	P0711 P0712 P0713			
	P2763		Short-cut Ubatt (+B) Measured Current (AD	> 1,333 mA > 1000)	DS Active[3] Emergency mode	TRUE FALSE	500 ms Continuous	2nd	
					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)	>20000	IG voltage Input AD value Emergency mode DS Active[3]	> 10.5 V < 1000(1333mA) FALSE TRUE	1 sec	2nd	
					No DTC set	P2763 P2764			

			(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 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	
	P0961		Terminal short Error current	> 80 mA	No Shifting Control[β] Emergency mode Oil temperature System voltage change System voltage SLT Output current target DS_Active[3] No DTC set	 FALSE > 20°C < 0,2V 11 -16 V > 835mA and constant. TRUE P0711 P0712 P0713	2.75 sec 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 (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 P0962 P0963	1 sec	2nd	
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	
	P0965		Terminal short Error current	> 80 mA	No Shifting Control[β] Emergency mode Oil temperature System voltage change System voltage SLC1 Output current target DS_Active[3] No DTC set	 FALSE > 20°C < 0,2V 11 -16 V > 835mA and constant. TRUE P0711 P0712 P0713	2.75 sec 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	 >20000	IG voltage input AD value Emergency mode DS_Active[3]	> 10.5 V < 1000(1333mA) FALSE TRUE	1 sec	2nd	

			"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").		No DTC set	P0966 P0967			
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	
	P0969		Terminal short Error current	> 80 mA	No Shifting Control[8] Emergency mode Oil temperature System voltage change System voltage SLC2 Output current target DS_Active[3] No DTC set	 FALSE > 20°C < 0,2V 11 -16 V > 835mA and constant. TRUE P0711 P0712 P0713	2.75 sec 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	
	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	
	P2719		Terminal short Error current	> 80 mA	No Shifting Control[8] Emergency mode Oil temperature System voltage change System voltage SLC3 Output current target DS_Active[3] No DTC set	 FALSE > 20°C < 0,2V 11 -16 V > 835mA and constant. TRUE P0711 P0712 P0713	2.75 sec 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)		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	<23 mA	Emergency mode	FALSE	Continuous		
			(AD	<15)					
					No DTC set	P2730 for 1 sec and over			
	P2728		Terminal short		No Shifting Control[8]		2.75 sec	2nd	
			Error current	> 80 mA	Emergency mode	FALSE	Continuous		
					Oil temperature	> 20°C			
					System voltage change	< 0,2V			
					System voltage	11 -16 V			
					SLB1 Output current target	> 835mA and constant.			
					DS_Active[3]	TRUE			
					No DTC set	P0711			
						P0712			
						P0713			
	P2730		Short-cut Ubatt (+B)		DS_Active[3]	TRUE	500 msec	2nd	
			Measured Current	> 1,333 mA	Emergency mode	FALSE	Continuous		
			(AD	> 1000)					
					No DTC set	P2729 for 1 sec and over			
	P2725		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	P2729			
			"sum_ie" is cleared as follows:			P2730			
			(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").						
Gear error, hydraulic fault	P0729	Rationality	Calculation of actual gear ratio for 6th gear is not correct.		No Shifting Control[8]		12 sec	2nd	
			(Condition A or Condition B)		Not in neutral control[10]		Continuous		
			Condition A		Not garage shifting contro[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/ 4th Gear Ratio)	<4%	Transmission Output Speed (B)	>=250rpm			
			or		Current gear	6			
			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 =	8.0 sec			
					Time after garage shift control[1] end	1.0 sec			
					Time after neutral control[10] end	1.0 sec			
					Time after shifting contro[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 contro[11](N-D or N-R) Not in neutral control[10] No Shifting Control[9]		12 sec Continuous	2nd	
		abs(1 - GRCurrent/ 2nd GearRatio) **or**	< 4%	Current Gear Transmission Output Speed	GEAR_1ST or 1350 rpm >= outRpm >= 250 rpm			
		abs(1 - GRCurrent/ 3rd GearRatio) **or**	< 4%	EngineTorque_noACC[8] EngineTorque_noACC[8]	>=100Nm (GEAR_1ST) >= 80 Nm (GEAR_1STEB)			
		abs(1 - GRCurrent/ 4th GearRatio)	< 4%	DS Active[3] Fdetect Inh[4] Shift position Time after changing to Shift position = RANGE_D(defined) Time after garage shift control[1] end Time after neutral control[10] end Time after shifting contro[9] end Oil temperature Brake abs(1-SpeedABS/Trans.Output Speed) QS AirSuction[5] No DTC set	TRUE FALSE RANGE_D(defined) 8.0 sec 1.0 sec 1.0 sec 0.5 sec >= 20°C OFF < 10% FALSE 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 contro[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) **or** abs(1-Gear Ratio Current/ 3rd Gear Ratio) **or** abs(1-Gear Ratio Current/ 4th Gear Ratio) **or** abs(1-Gear Ratio Current/ 6th Gear Ratio)	<4% <4% <4% <4%	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[1] end Time after neutral contro[10] end Time after shifting contro[9] end Oil temperature Brake abs(1-SpeedABS/Trans. Output Speed) QS AirSuction[5] No DTC set	>= 500rpm >=250rpm 2 >=80Nm TRUE FALSE RANGE_D(defined) 8.0 sec 1.0 sec 1.0 sec 0.5 sec >= 20°C OFF < 10% FALSE 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 contro[11](N-D or N-R)		12 sec Continuous	2nd	
		Condition A 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			
				Shift position	RANGE_D(defined)			
				Time after changing to Shift position =	8.0 sec			
				Time after garage shift contro[11] end	1.0 sec			
				Time after neutral contro[10] end	1.0 sec			
				Time after shifting contro[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[8]		12 sec Continuous	2nd	
				Not in neutral control[10]				
		Condition A		Not garage shifting contro[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 =	8.0 sec			
				Time after garage shift contro[11] end	1.0 sec			
				Time after neutral contro[10] end	1.0 sec			
				Time after shifting contro[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			
P0735	Rationality	Calculation of actual gear ratio for 4th gear is not correct. (Condition A or Condition B)		No Shifting Control[8]		12 sec Continuous	2nd	
				Not in neutral control[10]				
		Condition A		Not garage shifting contro[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/ 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 =	8.0 sec			
				Time after garage shift contro[11] end	1.0 sec			
				Time after neutral contro[10] end	1.0 sec			
				Time after shifting contro[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			
Engine speed signal	P0725	Signal from ECM stated as unreliable	Engine Speed Validity	"Invalid"	Diagnostic Service "Disable Normal Communication" not detected		4 sec	2nd	
					Ignition	ON >3 sec	Continuous		
					DS_Active_CAN[2]	TRUE			
					Emergency mode	FALSE			
					No DTC set	U0100			
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 < 15.5 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 < 15.5 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 < 15.5 V	Continuous		
Output speed sensor circuit	P0722		No pulse		Not in neutral control[10]		Dependent of Speed	2nd	
					No Shifting Control[8]				
			Number of pulses from Transmission Output Speed Sensor	0	Not garage shifting contro[11](N-D)				
			Number of pulses from Transmission Input Speed Sensor	16	DS Active[3]	TRUE			
					Emergency mode	FALSE			
					Shift position	RANGE_D(defined)			
					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			
					SpeedABS	> 300 rpm			
					No DTC set	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 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[8] CurrentGear | 1-SpeedABS/ Trans. Output Speed | Time after shifting control Time after changing to Position Shift position Engine speed Speed ABS Spinning[6] DS_Active[3] Emergency mode No DTC set	>= 2ND < 5% 8 sec 8 sec RANGE_D(defined) > 400rpm >= 30 km/h FALSE TRUE FALSE 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 P2159 P2716 P2719 P2720 P2721 P2725 P2728 P2729 P2730 P2759 P2762 P2763 P2764 U0001 U0121	10 sec	2nd	
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[8] Not garage shifting contro[11](N-D) DS_Active[3] Emergency mode Trans. Output Speed * CurrentGearRatio Shift position CurrentGear	 TRUE FALSE > 600 rpm RANGE_D(defined) >= 2nd gear	Dependent of Speed	2nd	

					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 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[8] Not garage shifting contro[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 P0713 P0721 P0722 P0725	10 sec	2nd	

						P0741 P0742 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	Oil Temperature at initialization = the highest oil temperature during 10 min ± 4 (AD value)	Oil temp at initialization Engine coolant temp at initialization AD value of oil temperature AD value of oil temperature Range	< 50°C < 70°C < 1000 > 10 D,R(defined)	10 min	2nd	

					No DTC set	P0706 P0707 P0708			
	P0712	Circuit continuity check	Short-cut ground AD value of Oil Temp	< 10*1 (More than 200 OC).	DS_Active[3]	TRUE	300sec	2nd	
	P0713	Circuit continuity check	Short-cut Ubat or open circuit AD value of Oil temperature	> 1000*1 (-43 OC)	DS_Active[3] DriveTime Engine CoolantTemperature No DTC set	TRUE > 15 min > 50°C P0116 U0100 U0001	12 sec	2nd	
Invalid signal from ECM	P1820	Accelerator pedal position signal i invalid	Accelerator Position Validity	"Invalid"	Diagnostic Service "Disable Normal Communication" not detected Ignition DS Active CAN[2] Emergency mode No DTC set	 ON > 3sec TRUE FALSE U0100	4 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 contro[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) Y = inRpm - outRpm X (reverse gear ratio at RANGE_R) **Step 2:** 0.1sec	2nd	
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 < 15.5V and
Not in service mode and
Reading EEPROM finish
Permission condition for CAN failure detection:
Ignition ON and
9.0V < Battery Voltage < 16.5V 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 < 15.5V 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 < 16.5V and
Not in service mode and
Egrpm > 400rpm and Egrpm = Q_NORMAL[1]

[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. 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.