09OBDG04 TRANS Diagnostics

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	Detection 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		
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		4 sec Continuous	2nd
					Emergency mode	FALSE		
					Ignition	ON >3 sec		
					DS_Active_CAN[2]	TRUE		
					No DTC set	U0100		
Solenoid S1	**P0985**	Circuit continuity check	Short-cut ground		DS_Active[3]	TRUE	500 msec	2nd
			Detected signal of the S1 monitor when S1 driver outputs the “ON”signal (12V)	“OFF” signal (0V)	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		DS_Active[3]	TRUE	500 msec	2nd
			Detected signal of the S2 monitor when S2 driver outputs the “ON”signal (12V)	“OFF” signal (0V)	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.		DS_Active[3]	TRUE	12 sec	2nd
			(Engine Speed - Transmission Input Speed)	> 100rpm	Fdetect_inh[4]	FALSE	Continuous	
					Shift position	RANGE_D(defined)		
					Time after N-D shifting control[9] ends	8 sec		

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					Engine Torque	>= 0 Nm		
					Engine Speed	< 4000 rpm		
					Time after SLU target current (_ir) >= 1000 mA	3sec		
					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		DS_Active[3]	TRUE	500 ms	2nd
			Current	<23 mA	Emergency mode	FALSE	Continuous	
			(AD	<15)				
					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	

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					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	2nd
			Measured Current	> 1,333 mA	Emergency mode	FALSE	Continuous	
			(AD	> 1000)				
					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		
			"sum_ie" is cleared as follows:			P2764		
			(1) or (2) or (3)					
			(1): Detection window = FALSE					
			(2): -50 mA <= ie <= 50 mA					
			(3): ie value changes 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	<23 mA	Emergency mode	FALSE	Continuous	
			(AD	<15)				
					No DTC set	P0963 for 1 sec and over		
	P0961		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		
					SLT Output current target	> 835mA and constant.		
					DS_Active[3]	TRUE		
					No DTC set	P0711		
						P0712		
						P0713		
	P0963		Short-cut Ubatt (+B)		DS_Active[3]	TRUE	500 ms	2nd
			Measured Current	> 1,333 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.
					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 changes 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	<23 mA	Emergency mode	FALSE	Continuous	
			(AD	<15)				
					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	> 1,333 mA	Emergency mode	FALSE	Continuous	
			(AD	> 1000)				
					No DTC set	P0966 for 1 sec and over		
	P0778		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	P0966		
			"sum_ie" is cleared as follows:			P0967		

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
			(1) or (2) or (3)					
			(1): Detection window = FALSE					
			(2): -50 mA <= ie <= 50 mA					
			(3): ie value changes from “ie < 0mA“ (“ie >0mA“) to “ie >0mA“ (“ie < 0mA“).					
Timing solenoid SLC2	**P0970**	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	P0971 for 1 sec and over		
	P0969		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		
					SLC2 Output current target	> 835mA and constant.		
					DS_Active[3]	TRUE		
					No DTC set	P0711		
						P0712		
						P0713		
	P0971		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	P0970 for 1 sec and over		
	P0798		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	P0970		
			“sum_ie” is cleared as follows:			P0971		
			(1) or (2) or (3)					
			(1): Detection window = FALSE					
			(2): -50 mA <= ie <= 50 mA					
			(3): ie value changes 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	<23 mA	Emergency mode	FALSE	Continuous	
			(AD	<15)				
					No DTC set	P2721 for 1 sec and over		
	P2719		Terminal short		No Shifting Control[9]		2.75 sec	2nd

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
			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.		
					DS_Active[3]	TRUE		
					No DTC set	P0711		
						P0712		
						P0713		
	P2721		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	P2720 for 1 sec and over		
	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 changes 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[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		
					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

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
			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 changes 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. (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/ 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 = 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		
	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 2nd gear is not correct.		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	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		

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
			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		
					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		

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
						P0721		
						P0722		
	P0734	Rationality	Calculation of actual gear ratio for 4th 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	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		
						P0717		
						P0721		
						P0722		
	P0735	Rationality	Calculation of actual gear ratio for 5th 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/ 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		

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					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		
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 < 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]			
			Number of pulses from Transmission Output Speed Sensor	0	Not garage shifting control[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		

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					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		Not garage shifting control[11](N-D)		10 sec	2nd
			| 1-SpeedABS/Transmission Output Speed |	> 15 %	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)		

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					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		
						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		
Transmission input speed	**P0717**		No pulse		No Shifting Control[9]		Dependent of	2nd

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
sensor					Not garage shifting control[11](N-D)		Speed	
			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 * CurrentGearRatio	> 600 rpm		
					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		
						P0970		
						P0971		
						P0973		
						P0974		
						P0985		
						P0986		
						P1895		
						P2159		
						P2716		
						P2719		
						P2720		
						P2721		
						P2725		
						P2728		
						P2729		
						P2730		
						U0001		

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
						U0121		
	P0716		Wrong Pulse		No Shifting Control[9]		10 sec	2nd
			| 1-speedABS/Transmission Input Speed |	> 15 %	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		
						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		
						U0121		
Transmission oil temperature sensor	**P0711**	Rationality	Oil temperature change less than	10 (AD value)	Oil temp	< 20°C	10 min	2nd
					DS_Active[3]	TRUE		
					AD value of oil temperature	> 10		
					AD value of oil temperature	< 1000		
					Emergency mode	FALSE		
					Range	≠ (P, R or N)		
					Vehicle Speed	> 40km/h once		
					No DTC set	P0706		
						P0707		
						P0708		
	P0712	Circuit continuity check	Short-cut ground		DS_Active[3]	TRUE	300sec	2nd
			AD value of Oil Temp	< 10 (More than 200 °C).				
	P0713	Circuit continuity check	Short-cut Ubat or open circuit		DS_Active[3]	TRUE	12 sec	2nd
			AD value of Oil temperature	> 1000 (-43 °C)	DriveTime	> 10 min		
Invalid signal from ECM	**P1820**	Accelerator pedal position signal is invalid	Accelerator Position Validity	"Invalid"	Diagnostic Service "Disable Normal Communication" not detected		4 sec	2nd
					Ignition	ON > 3sec		
					DS_Active_CAN[2]	TRUE		
					Emergency mode	FALSE		
					No DTC set	U0100		
Neutral condition	**P1701**		**Step 1:**		Not garage shifting control[11](N-D or N-R)		**Step1:**	2nd
			abs(Engine Speed - Transmission Input Speed)	<150rpm	Not in neutral control[10]		at D range:	
			Transmission Input Speed (at D range)	> Transmission Output Speed x (1st gear ratio at RANGE_D) +400rpm	No Shifting Control[9]		3.3 sec if (0 <= X <= 1500)	
					DS_Active[3]	TRUE		
			Transmission Input Speed (at R range)	> Transmission Output Speed x (reverse gear ratio at RANGE_R) +1000rpm	Fdetect_Inh[4]	FALSE (except P0966)		
							1.3 sec if (1501 <= X <= 3000)	
			Step 2:		Oil temperature	>0°C		
			Transmission Input Speed	<200rpm	Shift position	RANGE_D or RANGE_R (defined)		
			Engine Speed	>600rpm			0.8 sec if (3001 <= X)	
					Time after changing to shift position = RANGE_D or	1.0sec		

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					Time after garage shifting end	1.0sec	at R range:	
					Time after neutral control end	1.0sec	1.8 sec if (0 <= Y <= 1500)	
					Time after shifting control end	0.5sec		
					Transmission Output Speed	<=500rpm		
					SpeedABS	<=500rpm	1.3 sec if (1501 <= Y <= 3000)	
					Lockup	FALSE		
					Current gear	1 or 2 or 3 or 4		
					QS_AirSuction[5]	FALSE	0.8 sec if (3001 <= Y)	
					No DTC set	P0716		
						P0717		
						P0721	X = inRpm - outRpm X (1st gear ratio at RANGE_D)	
						P0722		
							Y = inRpm - outRpm X (reverse gear ratio at RANGE_R)	
							Step 2:	
							0.1sec	
Neutral control	**P1704**		C1 apply control		DS_Active[3]	TRUE	0.3sec	2nd
			Transmission Input Speed	>= (Transmission Input Speed at apply start + 400rpm + >=3.0kg/cm^2	Shift position	RANGE_D(defined)		
					Fdetect_Inh[4]	FALSE		
			C1 pressure		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

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
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]								
[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								

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
(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.								