

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 Engine speed Ignition DS_Active_CAN <sup>2</sup>	> 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 <sup>2</sup>	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 <sup>2</sup> 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 <sup>3</sup> 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 <sup>3</sup> Time after solenoid output 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)				

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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 <sup>3</sup>  Fdetect_inh <sup>4</sup> Shift position Time after N-D shifting control <sup>9</sup> 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 <sup>9</sup> ends  Oil temperature Lock-up  No DTC set	TRUE  FALSE RANGE_D(defined) 8 sec >= 0 Nm  < 4000 rpm 3sec  < 10 %  0.5 sec  >= 20°C FALSE  P2759 P0716 P0717 P0721 P0722	12 sec  Continuous	2nd
	P0742		Abs(EngineSpeed - Transmission Input Speed)	< 30 rpm for 2.0 sec continuously	DS_Active <sup>3</sup> Fdetect_inh <sup>4</sup> Shift position Time after N-D shifting control <sup>9</sup> end Time after changing to Shift position = RANGE_D(defined) Time after shifting control <sup>9</sup> ends EngineTorque_noACC <sup>8</sup> Engine Speed  abs( 1- SpeedABS / Transmission Output Speed calculated from Transmission Input Speed)  Oil temperature	TRUE FALSE RANGE_D (defined) 1.0 sec 8.0 sec 0.5 sec >= 60Nm >1000 rpm < 3000 rpm <10 %  >= 20°C	4sec	2nd

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					Time after SLU pressure = 0 kPa No DTC set	3sec P2759 P0716 P0717 P0721 P0722		
Pressure solenoid SLU	P2764	Circuit continuity check	Short-cut ground or open Current (AD)	<23 mA <15)	DS_Active <sup>3</sup> Emergency mode No DTC set	TRUE FALSE P2763 for 1 sec and over	500 ms Continuous	2nd
	P2762		Terminal short Error current	> 80 mA	No Shifting Control <sup>9</sup> Emergency mode Oil temperature System voltage change System voltage SLU Output current target  DS_Active <sup>3</sup> No DTC set	FALSE > 20°C < 0,2V 11 -18 V > 835mA and constant.  TRUE P0711 P0712 P0713	2,75 sec Continuous	2nd
	P2763		Short-cut Ubatt (+B) Measured Current (AD)	> 1,333 mA > 1000)	DS_Active <sup>3</sup> Emergency mode No DTC set	TRUE FALSE P2764 for 1 sec and over	500 ms Continuous	2nd
	P2759		Feed Back Current Stuck(Electrical)  sum_ie "ie" is added to "sum_ie" every "ie" : Difference of "ir" and "ifb". "ir" : Target current "ifb": Feedback current "sum_ie" is cleared as follows: (1) or (2) or (3)	>20000 10 msec.	IG voltage  Input AD value Emergency mode DS_Active <sup>3</sup> No DTC set	> 10.5 V  < 1000(1333mA) FALSE TRUE P2763 P2764	1 sec	2nd

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			(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 <sup>3</sup> 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 <sup>9</sup> Emergency mode Oil temperature System voltage change System voltage SLT Output current target  DS_Active <sup>3</sup>  No DTC set	FALSE > 20°C < 0,2V 11 -18 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 <sup>3</sup> 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 10 msec.	IG voltage  Input AD value Emergency mode DS_Active <sup>3</sup>  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 <sup>3</sup> Emergency mode	TRUE FALSE	500 msec Continuous	2nd

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					No DTC set	P0967 for 1 sec and over		
	P0965		Terminal short Error current	> 80 mA	No Shifting Control <sup>9</sup> Emergency mode Oil temperature System voltage change System voltage SLC1 Output current target  DS_Active <sup>3</sup>  No DTC set	FALSE > 20°C < 0,2V 11 -18 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 <sup>3</sup> Emergency mode  No DTC set	TRUE FALSE  P0966 for 1 sec and over	500 msec Continuous	2nd
	P0778		Feed Back Current Stuck(Electrical) sum ie "ie" is added to "sum_ie" every 10 msec. "ie" : Difference of "ir" and "ifb". "ir" : Target current "ifb": Feedback current "sum_ie" is cleared as follows: (1) or (2) or (3) (1): Detection window = FALSE (2): -50 mA <= ie <= 50 mA (3): ie value cahnges from "ie < 0mA" ("ie >0mA") to "ie >0mA" ("ie < 0mA").	>20000	IG voltage  input AD value Emergency mode DS_Active <sup>3</sup>  No DTC set	> 10.5 V  < 1000(1333mA) FALSE TRUE  P0966 P0967	1 sec	2nd
Timing solenoid SLC2	P0970	Circuit continuity check	Short-cut ground or open Current (AD	<23 mA <15)	DS_Active <sup>3</sup> 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 <sup>9</sup> Emergency mode	FALSE	2.75 sec Continuous	2nd

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					Oil temperature System voltage change System voltage SLC2 Output current target  DS_Active <sup>3</sup>  No DTC set	> 20°C < 0,2V 11 -18 V > 835mA and constant.  TRUE  P0711 P0712 P0713		
	P0971		Short-cut Ubatt (+B) Measured Current (AD	> 1,333 mA > 1000)	DS_Active <sup>3</sup> 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 <sup>3</sup>  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 <sup>3</sup> 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 <sup>9</sup> Emergency mode Oil temperature System voltage change System voltage	FALSE  > 20°C < 0,2V 11 -18 V	2.75 sec Continuous	2nd

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					SLC3 Output current target  DS_Active <sup>3</sup>  No DTC set	> 835mA and constant.  TRUE  P0711 P0712 P0713		
	P2721		Short-cut Ubatt (+B) Measured Current (AD	> 1,333 mA > 1000)	DS_Active <sup>3</sup> Emergency mode  No DTC set	TRUE FALSE  P2720 for 1 sec and over	500 msec Continuous	2nd
	P2716		Feed Back Current Stuck(Electrical)  sum ie "ie" is added to "sum_ie" every 10 msec. "ie" : Difference of "ir" and "ifb". "ir" : Target current "ifb": Feedback current "sum_ie" is cleared as follows: (1) or (2) or (3) (1): Detection window = FALSE (2): -50 mA <= ie <= 50 mA (3): ie value cahnges from "ie < 0mA" ("ie >0mA") to "ie >0mA" ("ie < 0mA").	>20000	IG voltage  Input AD value Emergency mode DS_Active <sup>3</sup>  No DTC set	> 10.5 V  < 1000(1333mA) FALSE TRUE  P2720 P2721	1 sec	2nd
Timing solenoid SLB1	P2729	Circuit continuity check	Short-cut ground or open Current (AD	<23 mA <15)	DS_Active <sup>3</sup> Emergency mode  No DTC set	TRUE FALSE  P2730 for 1 sec and over	500 msec Continuous	2nd
	P2728		Terminal short Error current	> 80 mA	No Shifting Control <sup>9</sup> Emergency mode  Oil temperature System voltage change System voltage SLB1 Output current target  DS_Active <sup>3</sup>	FALSE  > 20°C < 0,2V 11 -18 V > 835mA and constant.  TRUE	2.75 sec Continuous	2nd

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					No DTC set	P0711 P0712 P0713		
	P2730		Short-cut Ubatt (+B) Measured Current (AD)	> 1,333 mA > 1000)	DS_Active <sup>3</sup> 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 <sup>3</sup>  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)  <b>Condition A</b> abs(1-GRCurrent/GRExpected) <b>Condition B</b> abs(1-Gear Ratio Current/ 4th Gear Ratio)  <b>or</b> abs(1-Gear Ratio Current/ 5th Gear Ratio)	> 20%  <4%  <4%	No Shifting Control <sup>9</sup> Not in neutral control <sup>10</sup>  Not garage shifting control <sup>11</sup> (N-D or N-R) Throttle (A only) Transmission Output Speed (A) Transmission Output Speed (B)  Current gear Engine Torque_noACC <sup>8</sup> (B only)  DS_Active <sup>3</sup> Fdetect_Inh <sup>4</sup> Shift position Time after changing to Shift position = RANGE_D(defined)  Time after garage shift control <sup>11</sup> end Time after neutral control <sup>10</sup> end	TRUE FALSE RANGE_D(defined) 8.0 sec  1.0 sec  1.0 sec	12 sec Continuous	2nd

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					Time after shifting control <sup>9</sup> end Oil temperature Brake abs(1-SpeedABS/Trans. Output Speed) QS_AirSuction <sup>5</sup> No DTC set	0.5 sec >= 20°C OFF < 10% FALSE P0703 P0716 P0717 P0721 P0722		
	P0731	Rationality	Calculation of actual gear ratio for 1st gear is not correct.  abs( 1 - GRCurrent/ 2nd GearRatio) <b>or</b> abs(1 - GRCurrent/ 3rd GearRatio) <b>or</b> abs(1 - GRCurrent/ 4th GearRatio)	< 4%  < 4%  < 4%	Not garage shifting control <sup>11</sup> (N-D or N-R) Not in neutral control <sup>10</sup> No Shifting Control <sup>9</sup> Current Gear  Transmission Output Speed  EngineTorque_noACC <sup>8</sup>  EngineTorque_noACC <sup>8</sup>  DS_Active <sup>3</sup> Fdetect_Inh <sup>4</sup> Shift position Time after changing to Shift position = RANGE_D(defined) Time after garage shift control <sup>11</sup> end Time after neutral control <sup>10</sup> end  Time after shifting control <sup>9</sup> end Oil temperature Brake abs(1-SpeedABS/Trans.Output Speed) QS_AirSuction <sup>5</sup> No DTC set	GEAR_1ST or GEAR_1STEB  1350 rpm >= outRpm >= 250 rpm  >=100Nm (GEAR_1ST)  >= 80 Nm (GEAR_1STEB)  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	12 sec Continuous	2nd

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	P0732	Rationality	Calculation of actual gear ratio for 2nd gear is not correct. (Condition A or Condition B)  <b>Condition A</b> abs(1-GRCcurrent/GRExpected) <b>Condition B</b> abs(1-Gear Ratio Current/ 1st Gear Ratio) <b>or</b> abs(1-Gear Ratio Current/ 3rd Gear Ratio) <b>or</b> abs(1-Gear Ratio Current/ 4th Gear Ratio) <b>or</b> abs(1-Gear Ratio Current/ 6th Gear Ratio)	>20%   <4%  <4%  <4%	No Shifting Control <sup>9</sup> Not in neutral control <sup>10</sup>  Not garage shifting control <sup>11</sup> (N-D or N-R) Throttle (A only) Transmission Output Speed (A) Transmission Output Speed (B)  Current gear Engine Torque_noACC <sup>8</sup> (B only)  DS Active <sup>3</sup> Fdetect_Inh <sup>4</sup>  Shift position Time after changing to Shift position = RANGE_D(defined)  Time after garage shift control <sup>11</sup> end  Time after neutral control <sup>10</sup> end Time after shifting control <sup>9</sup> end Oil temperature Brake abs(1-SpeedABS/Trans. Output Speed)  OS AirSuction <sup>5</sup>  No DTC set	>= 10% >= 500rpm  >=250rpm >=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	12 sec Continuous	2nd
	P0733	Rationality	Calculation of actual gear ratio for 3rd gear is not correct. (Condition A or Condition B)  <b>Condition A</b> abs(1-GRCcurrent/GRExpected) <b>Condition B</b>	>20%	No Shifting Control <sup>9</sup> Not in neutral control <sup>10</sup>  Not garage shifting control <sup>11</sup> (N-D or N-R) Throttle (A only) Transmission Output Speed (A)	>= 10% >= 500rpm	12 sec Continuous	2nd

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			abs(1-Gear Ratio Current/ 1st Gear Ratio)  <b>or</b> abs(1-Gear Ratio Current/ 4th Gear Ratio)  <b>or</b> abs(1-Gear Ratio Current/ 5th Gear Ratio)	<4%  <4%  <4%	Transmission Output Speed (B)  Current gear Engine Torque_noACC <sup>8</sup> (B only)  DS_Active <sup>3</sup> Fdetect_Inh <sup>4</sup>  Shift position Time after changing to Shift position = RANGE_D(defined)  Time after garage shift control <sup>11</sup> end  Time after neutral control <sup>10</sup> end Time after shifting control <sup>9</sup> end Oil temperature Brake abs(1-SpeedABS/Trans. Output Speed) QS_AirSuction <sup>5</sup>  No DTC set	>=250rpm 3 >=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		
	P0734	Rationality	Calculation of actual gear ratio for 4th gear is not correct. (Condition A or Condition B)  <b>Condition A</b> abs(1-GRCcurrent/GRExpected)  <b>Condition B</b> abs(1-Gear Ratio Current/ 1st Gear Ratio)  <b>or</b> abs(1-Gear Ratio Current/ 5th Gear Ratio)  <b>or</b> abs(1-Gear Ratio Current/ 6th Gear Ratio)	>20%  <4%  <4%  <4%	No Shifting Control <sup>9</sup> Not in neutral control <sup>10</sup>  Not garage shifting control <sup>11</sup> (N-D or N-R) Throttle (A only) Transmission Output Speed (A) Transmission Output Speed (B)  Current gear Engine Torque_noACC <sup>8</sup> (B only)  DS_Active <sup>3</sup> Fdetect_Inh <sup>4</sup>  Shift position	>= 10%  >= 500rpm  >=250rpm 4 >=80Nm  TRUE FALSE  RANGE_D(defined)	12 sec Continuous	2nd

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					Time after changing to Shift position = RANGE_D(defined)	8.0 sec		
					Time after garage shift control <sup>11</sup> end	1.0 sec		
					Time after neutral control <sup>10</sup> end	1.0 sec		
					Time after shifting control <sup>9</sup> end	0.5 sec		
					Oil temperature	>= 20°C		
					Brake	OFF		
					abs(1-SpeedABS/Trans. Output Speed)	< 10%		
					QS_AirSuction <sup>5</sup>	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 <sup>9</sup> Not in neutral control <sup>10</sup>		12 sec Continuous	2nd
			<b>Condition A</b> abs(1-GRCURRENT/GRExpected)	>20%	Not garage shifting control <sup>11</sup> (N-D or N-R) Throttle (A only)	>= 10%		
			<b>Condition B</b> abs(1-Gear Ratio Current/ 4th Gear Ratio)	<4%	Transmission Output Speed (A) Transmission Output Speed (B)	>= 500rpm >=250rpm		
			<b>or</b> abs(1-Gear Ratio Current/ 6th Gear Ratio)	<4%	Current gear Engine Torque_noACC <sup>8</sup> (B only)	5 >=80Nm		
					DS_Active <sup>3</sup> Fdetect_Inh <sup>4</sup> Shift position	TRUE FALSE RANGE_D(defined)		
					Time after changing to Shift position = RANGE_D(defined)	8.0 sec		
					Time after garage shift control <sup>11</sup> end	1.0 sec		
					Time after neutral control <sup>10</sup> end	1.0 sec		
					Time after shifting control <sup>9</sup> end	0.5 sec		
					Oil temperature	>= 20°C		
					Brake	OFF		

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					abs(1-SpeedABS/Trans. Output Speed) QS_AirSuction <sup>5</sup> No DTC set	< 10% FALSE 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  Ignition DS_Active_CAN <sup>2</sup> Emergency mode  No DTC set	ON >3 sec TRUE FALSE U0100	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
	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 <sup>10</sup> No Shifting Control <sup>9</sup> Not garage shifting control <sup>11</sup> (N-D)  DS_Active <sup>3</sup> 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	TRUE FALSE RANGE_D(defined)  2.5sec	Dependent of Speed	2nd

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					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	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 P2725 P2728 P2729 P2730 U0001 U0121		
	P0721		Range/Performance, wrong pulse   1-SpeedABS/Transmission Output Speed	> 15 %	Not garage shifting control <sup>11</sup> (N-D)  No Shifting Control <sup>9</sup> CurrentGear   1-SpeedABS/ Trans. Output Speed   Time after shifting control Time after changing to Position Shift position Engine speed Speed ABS	>= 2ND  < 5% 8 sec 8 sec RANGE_D(defined) > 400rpm >= 30 km/h	10 sec	2nd

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					Spinning <sup>6</sup> DS_Active <sup>3</sup> Emergency mode  No DTC set	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		
Transmission input speed sensor	P0717		No pulse  No of pulses from Transmission Input Speed Sensor	0	No Shifting Control <sup>9</sup> Not garage shifting control <sup>11</sup> (N-D)  DS_Active <sup>3</sup>	TRUE	Dependent of Speed	2nd

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
			No of pulses from Transmission Output Speed Sensor	24	Emergency mode Trans. Output Speed * CurrentGearRatio  Shift position CurrentGear Time since change from P,R or N range to others if vehicle speed >= 66km/h and oil temperature >20°C  Time since change from P,R or N range to others if vehicle speed < 66km/h and oil temperature <= 20°C  No DTC set	FALSE > 600 rpm  RANGE_D(defined) >= 2nd gear  2.5sec  10sec 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		

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
	P0716		Wrong Pulse   1-speedABS/Transmission Input Speed	> 15 %	No Shifting Control <sup>9</sup> Not garage shifting control <sup>11</sup> (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 <sup>6</sup> DS_Active <sup>3</sup> 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 P0741 P0742 P0748 P0778 P0798 P0961 P0962 P0963 P0965 P0966 P0967 P0969 P0970 P0971 P0973 P0974 P0985 P0986 P1820 P1895	10 sec	2nd

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 DS_Active <sup>3</sup> 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 <sup>3</sup>	TRUE	300sec	2nd
	P0713	Circuit continuity check	Short-cut Ubat or open circuit AD value of Oil temperature	> 1000 ( -43 °C)	DS_Active <sup>3</sup> 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 DS_Active_CAN <sup>2</sup> Emergency mode  No DTC set	ON > 3sec TRUE FALSE U0100	4 sec	2nd
Neutral condition	P1701		<b>Step 1:</b> abs(Engine Speed - Transmission Input Speed) Transmission Input Speed (at D range)	<150rpm  > Transmission Output Speed x (1st gear ratio at RANGE_D) +400rpm	Not garage shifting control <sup>11</sup> (N-D or N-R) Not in neutral control <sup>10</sup>  No Shifting Control <sup>9</sup> DS_Active <sup>3</sup>	TRUE	<b>Step1:</b>  at D range: 3.3 sec if (0 <= X <= 1500)	2nd

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
			Transmission Input Speed (at R range)  <b>Step 2:</b> Transmission Input Speed Engine Speed	> Transmission Output Speed x (reverse gear ratio at RANGE_R) +1000rpm  <200rpm >600rpm	Fdetect_Inh <sup>4</sup>  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 <sup>5</sup>  No DTC set	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	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)  <b>Step 2:</b> 0.1sec	
Neutral control	P1704		C1 apply control Transmission Input Speed  C1 pressure	>= (Transmission Input Speed at apply start + 400rpm + Transmission Output Speed x gear ratio)  >=3.0kg/cm <sup>2</sup>	DS_Active <sup>3</sup> Shift position  Fdetect_Inh <sup>4</sup> Oil temperature QS_AirSuction <sup>5</sup>  No DTC set	TRUE  RANGE_D(defined)  FALSE >=10°C FALSE  P0716 P0717 P0721 P0722	0.3sec	2nd

## 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<sup>1</sup>

**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<sup>1</sup>

## 4) Fdetech\_Inh = TRUE if:

In Emergency mode **or**

spinning<sup>6</sup> = 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,

## 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)  $300 \text{ rpm} < \text{outRpm} < 3000 \text{ rpm}$   
(2)  $\text{Egtorque\_noACC} > 0 \text{ Nm}$   
(3)  $\text{ABS (vehicle front wheels average speed - vehicle rear wheels average speed)} > 5.0 \text{ km/h}$   
(4)  $\text{Throttle} > 70 \%$   
(5)  $\text{outRpmSpeed} < -20 \text{ rpm/sec}$   
 $\{(1)\text{and}(2)\text{and}(3)\}\text{or}\{(1)\text{and}(4)\text{and}(5)\}$  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.