Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL illum.
Internal Control Module Read Only Memory Check Sum Error	P0601	This DTC checks accuracy of the ROM	To detect caluclated checksum is defferent from correct checksum value stored in flash ROM	1 time	-	-	1 failure	Type A
Internal Control Module Random Access Memory (RAM) Error	P0604	This DTC checks accuracy of the RAM	To detect different value between write and read (Step1 and Step2, Step3 and Step4) in initialize routine for checking all RAM from step1 to step4	-Step 1: TCM write 0xAAAAAAAA data in the RAM -Step 2: TCM read 0xAAAAAAAA data from the RAM -Step 3: TCM write 0x55555555 data in the RAM -Step 4: TCM read 0x55555555 data from the RAM	-	-	1 failure	Type B
Internal Control Module Keep Alive Memory (KAM) Error	P062F	This DTC checks accuracy of the KAM	To detect calculated check sum in RAM is different from all check sum value in EEPROM	1 time	-	-	1 failure	Type A
					Time after the all following conditions are satisfied A voltage condition Ignition switch is in crank or run position Not in service mode Reading EEPROM finish Engine speed	2.0 sec continuously 10.2V < Battery voltage <= 18.0V ON (SID$10-subfunc$02, SID$28, SID$AE) > 400rpm		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL illum.
Transmission Range Switch Mulfunction	P0705	To detect no signal of Transmission range switch circuit	All switches are OFF	> 2 sec continuously	Not in Limp home mode(refer to attachment#3) Vehicle Speed (calculated by output No active DTC	>= 30 km/h TCM : U0073, U0100 P0974, P0973, P0963, P0962, P0748, P0967, P0966, P0778, P0971, P0970, P0798, P2761, P0722, P077D, P077C, P0717, P07C0, P07BF, P0706, P0705, P0601, P0562, P0563, P2534, P0604, P0602, P0776, P0747, P0746, P0777, P0797, P0796 ECM : Engine speed failure, Accelerator Effective Position failure, Engine Non-Transmission Regulated Steady State Torque failure	28 sec continuously	Type B
Transmission Range Switch Range/Performance	P0706	To detect 2 or more signals of Transmission range switch circuit	more than or equal to 2 switches are ON	> 1 sec continuously	Time after the all following conditions are satisfied A voltage condition Ignition switch is in crank or run position	2.0 sec continuously 10.2V < Battery voltage <= 18.0V ON	5 failures	Type B

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL illum.
					Not in service mode Reading EEPROM finish	(SID$10-subfunc$02, SID$28, SID$AE)		
		[Case 1] This DTC detect performance error of Transmission Fluid Temperature Sensor by Input A/D value	Input A/D value of Transmission Fluid Temperature	Refer to Flow chart of Attachment#1.1	Time after the all following conditions are satisfied A voltage condition Ignition switch is in crank or run position Not in service mode Reading EEPROM finish Engine speed Input A/D value of Transmission Fluid Temperature Not in Limp home mode(refer to attachment#3) No active DTC	2.0 sec continuously 10.2V < Battery voltage <= 18.0V ON (SID$10-subfunc$02, SID$28, SID$AE) > 400rpm 10 <= Input A/D value <= 1010 TCM : U0073, U0100 P0974, P0973, P0963, P0962, P0748, P0967, P0966, P0778, P0971, P0970, P0798, P2761, P0722, P077D, P077C, P0717, P07C0, P07BF, P0706, P0705, P0601, P0562, P0563, P2534,		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL illum.
Transmission Fluid Temperature Sensor Circuit Range/Performance	P0711					P0604, P0602, P0776, P0747, P0746, P0777, P0797, P0796 P0713, P0712 ECM : Engine speed failure, Accelerator Effective Position failure, Engine Non-Transmission Regulated Steady State Torque failure	1 failure of Case 1 or 2 (Refer to Flow chart of Attachments#1.1 or #1.2 For details)	Type A
		[Case 2] This DTC detect performance error of Transmission Fluid Temperature Sensor by the calorific value of the torque converter	Calorific value of the torque converter	Refer to Flow chart of Attachment#1.2	Time after the all following conditions are satisfied A voltage condition Ignition switch is in crank or run position Not in service mode Reading EEPROM finish Engine speed Input A/D value of Transmission Fluid Temperature Not in Limp home mode(refer to attachment#3) No active DTC	2.0 sec continuously 10.2V < Battery voltage <= 18.0V ON (SID$10-subfunc$02, SID$28, SID$AE) > 400rpm 10 <= Input A/D value <= 1010 TCM : U0073, U0100 P0974, P0973, P0963, P0962, P0748, P0967, P0966, P0778, P0971, P0970, P0798, P2761, P0722, P077D, P077C, P0717,		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL illum.
						P07C0, P07BF, P0706, P0705, P0601, P0562, P0563, P2534, P0604, P0602, P0776, P0747, P0746, P0777, P0797. P0796 P0713, P0712 ECM : Engine speed failure, Accelerator Effective Position failure, Engine Non-Transmission Regulated Steady State Torque failure		
Transmission Fluid Temperature Sensor Circuit Low	P0712	This DTC detects a short to ground in Transmission Fluid Temperature Sensor circuit	Input A/D value of Transmission Fluid Temperature	< 10	Time after the all following conditions are satisfied A voltage condition Ignition switch is in crank or run position Not in service mode Reading EEPROM finish	2.0 sec continuously 10.2V < Battery voltage <= 18.0V ON (SID$10-subfunc$02, SID$28, SID$AE)	6 failures 10 sec continuously(per 1 failure)	Type A
					Time after the all following conditions are satisfied A voltage condition	2.0 sec continuously 10.2V < Battery voltage <= 18.0V		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL illum.
Transmission Fluid Temperature Sensor Circuit High	P0713	This DTC detects a short to high or open in Transmission Fluid Temperature Sensor circuit	Input A/D value of Transmission Fluid Temperature	> 1010	Ignition switch is in crank or run position Not in service mode Reading EEPROM finish Engine speed Drive time (as the following 1 condition) Transmission range switch Not in Limp home mode(refer to attachment#3) No active DTCs	ON (SID$10-subfunc$02, SID$28, SID$AE) > 400rpm > 1 min cumulatively Except for P or N range TCM : U0073, U0100 P0974, P0973, P0963, P0962, P0748, P0967, P0966, P0778, P0971, P0970, P0798, P2761, P0722, P077D, P077C, P0717, P07C0, P07BF, P0706, P0705, P0601, P0562, P0563, P2534, P0604, P0602, P0776, P0747, P0746, P0777, P0797, P0796 ECM : Engine speed failure, Accelerator Effective Position failure,	12 failures 1 sec continuously(per 1 failure)	Type A

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL illum.
						Engine Non-Transmission Regulated Steady State Torque failure		
Input Speed Sensor Circuit No Signal	P0717	This DTC detect No Pulse of Input Speed Sensor Circuit	The pulse of Input shaft speed (while TCM detect 38 pulses of output shaft speed)	No pulse	Time after the all following conditions are satisfied A voltage condition Ignition switch is in crank or run position Not in service mode Reading EEPROM finish Engine speed Not in Limp home mode(refer to attachment#3) No active DTC	2.0 sec continuously 10.2V < Battery voltage <= 18.0V ON (SID$10-subfunc$02, SID$28, SID$AE) > 400rpm TCM : U0073, U0100 P0974, P0973, P0963, P0962, P0748, P0967, P0966, P0778, P0971, P0970, P0798, P2761, P0722, P077D, P077C, P0717, P07C0, P07BF, P0706, P0705, P0601, P0562, P0563, P2534, P0604, P0602, P0776, P0747, P0746, P0777, P0797. P0796 ECM : Engine speed failure, Accelerator Effective Position failure,	500 failures (1 failure is no pulse of input shaft speed while TCM detect 38pulses of output shaft speed)	Type A

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL illum.
						Engine Non-Transmission Regulated Steady State Torque		
						failure		
					Transmission range switch	D or 2 or L		
					Not during Neutral control			
					Time after Neutral control	1000 msec (time are different by Transmission Fluid Temp)		
					Not during shifting			
					Time after shifting	500 msec (time are different by Transmission Fluid Temp)		
					Not during garage control			
					Time after garage control	1000 msec (time are different by Transmission Fluid Temp)		
					Not during C1 OFF control(*1)			
					Time after C1 OFF control(*1)	1000 msec (time are different by Transmission Fluid Temp)		
					Current gear	>=2nd gear		
					Output shaft speed	>=300rpm		
					Time after shift to safe gear	500 msec (time are different by Transmission Fluid Temp)		
					Time after the all following conditions are satisfied	2.0 sec continuously		
					A voltage condition	10.2V < Battery voltage <= 18.0V		
					Ignition switch is in crank or run position	ON		
					Not in service mode	(SID$10-subfunc$02, SID$28, SID$AE)		
					Reading EEPROM finish			
					Engine speed	> 400rpm		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL illum.
Output Speed Sensor Circuit No Signal	P0722	This DTC detect No Pulse of Output Speed Sensor Circuit	The pulse of Output shaft speed (while TCM detect 13 pulses of Input shaft speed)	No pulse	Not in Limp home mode(refer to attachment#3)		500 failures (1 failure is no pulse of Output shaft speed while TCM detect 13pulses of Input shaft speed)	Type A
					No active DTC	TCM : U0073, U0100 P0974, P0973, P0963, P0962, P0748, P0967, P0966, P0778, P0971, P0970, P0798, P2761, P0722, P077D, P077C, P0717, P07C0, P07BF, P0706, P0705, P0601, P0562, P0563, P2534, P0604, P0602, P0776, P0747, P0746, P0777, P0797, P0796 ECM : Engine speed failure, Accelerator Effective Position failure, Engine Non-Transmission Regulated Steady State Torque failure		
					Transmission range switch	D or 2 or L		
					Not during Neutral control			
					Time after Neutral control	1000 msec (time are different by Transmission Fluid Temp)		
					Not during shifting			
					Time after shifting	500 msec (time are different by Transmission Fluid Temp)		
					Not during garage control			
					Time after garage control	1000 msec (time are different by Transmission Fluid Temp)		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL illum.
					Not during C1 OFF control(*1)			
					Time after C1 OFF control(*1)	1000 msec (time are different by Transmission Fluid Temp)		
					Output shaft speed calculated by Input shaft speed	>=300rpm		
					Time after shift to safe gear	500 msec (time are different by Transmission Fluid Temp)		
					Time after the all following conditions are satisfied	2.0 sec continuously		
					A voltage condition	10.2V < Battery voltage <= 18.0V		
					Ignition switch is in crank or run position	ON		
					Not in service mode	(SID$10-subfunc$02, SID$28, SID$AE)		
					Reading EEPROM finish			
					Engine speed	> 400rpm		
					Not in Limp home mode(refer to attachment#3)			
					Not during garage control			
					Time after garage control	1000 msec (time are different by Transmission Fluid Temp)		
					Not during shifting			
					Time after shifting	500 msec (time are different by Transmission Fluid Temp)		
					Transmission range switch	D or 2 or L		
					Time after changing to transmission range switch	8 sec		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL illum.
Torque Converter Clutch Circuit Performance/Stuck Off	P0741	This DTC detect Torque Converter Clutch Circuit Stuck Off	Engine speed - Input shaft speed (when TCM does a lock up ON command)	> 100 rpm for 2 sec continuously	Engine Actual Steady State Torque	>= 0Nm	6 failures	Type B
					Engine speed	< 4000rpm		
					Transmission Fluid Temperature	>= ~~20~~ -7deg.C		
					Time after SLU commanded pressure > 511kpa (calculated by line pressure)	3sec		
					No active DTC	TCM : U0073, U0100 P0974, P0973, P0963, P0962, P0748, P0967, P0966. P0778. P0971, P0970, P0798, P2761, P0722, P077D, P077C, P0717, P07C0, P07BF, P0706, P0705, P0601, P0562, P0563, P2534, P0604, P0602, P0776, P0747, P0746, P0777, P0797, P0796, P0713, P0712, P0711, P2763, P2764 ECM : Engine speed failure, Accelerator Effective Position failure, Engine Non-Transmission Regulated Steady State Torque failure		
					Current gear	Not 1st gear with engine brake		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL illum.
					Time after the all following conditions are satisfied	2.0 sec continuously		
					A voltage condition	10.2V < Battery voltage <= 18.0V		
					Ignition switch is in crank or run position	ON		
					Not in service mode	(SID$10-subfunc$02, SID$28, SID$AE)		
					Reading EEPROM finish			
					Engine speed	> 400rpm		
					Not in Limp home mode(refer to attachment#3)			
					Not during garage control			
					Time after garage control	1000 msec (time are different by Transmission Fluid Temp)		
					Not during shifting			
					Time after shifting	500 msec (time are different by Transmission Fluid Temp)		
					Transmission range switch	D or 2 or L		
					Not during Neutral control			
			[Case 1] Calculation of actual gear ratio for current (2nd or 3rd) gear is not correct.	> 400 rpm for 1.0 sec continuously (revolution value are	Time after Neutral control	1000 msec (time are different by Transmission Fluid Temp)		
					Transmission Fluid Temperature	>=-20deg.C		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL illum.
			| Input shaft speed – Output shaft speed x Current Gear Ratio |	different by Output shaft speed and Current gear)	Air Suction	OFF	5 failures (1 failure is concluded by the combination of Case 1 and Case 2) (Combination details refer to attachment#2)	
					Time after shift to safe gear	500 msec (time are different by Transmission Fluid Temp)		
					No active DTC	TCM : U0073, U0100		
						P0974, P0973, P0963, P0962, P0748, P0967, P0966, P0778,		
						P0971, P0970, P0798, P2761, P0722, P077D, P077C, P0717,		
						P07C0, P07BF, P0706, P0705, P0601, P0562, P0563, P2534,		
						P0604, P0602, P0776, P0747, P0746, P0777, P0797, P0796,		
						P0713, P0712, P0711		
						ECM :		
						Engine speed failure, Accelerator Effective Position failure,		
						Engine Non-Transmission Regulated Steady State Torque		
						failure		
					Current gear	2nd gear or 3rd gear		
					Output shaft speed	>=500rpm		
					Time after the all following conditions are satisfied	2.0 sec continuously		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL illum.
Pressure Control Solenoid (SLC1) Performance/Stuck Off	P0746	This DTC detect Pressure Control Solenoid (SLC1) Stuck Off	[Case 2] Calculation of actual gear ratio for 4th gear is correct. | Input shaft speed – Output shaft speed x Current Gear Ratio |	< 115 rpm for 1.0 sec continuously (revolution value are different by Output shaft speed) *This is gear ratio normal judgment	A voltage condition Ignition switch is in crank or run position Not in service mode Reading EEPROM finish Engine speed Not in Limp home mode(refer to attachment#3) Not during garage control Time after garage control Not during shifting Time after shifting Transmission range switch Not during Neutral control Time after Neutral control Transmission Fluid Temperature Air Suction Time after shift to safe gear No active DTC	10.2V < Battery voltage <= 18.0V ON (SID$10-subfunc$02, SID$28, SID$AE) > 400rpm 1000 msec (time are different by Transmission Fluid Temp) 500 msec (time are different by Transmission Fluid Temp) D or 2 or L 1000 msec (time are different by Transmission Fluid Temp) >=-20deg.C OFF 500 msec (time are different by Transmission Fluid Temp) TCM : U0073, U0100 P0974, P0973, P0963, P0962, P0748, P0967, P0966, P0778, P0971, P0970, P0798, P2761, P0722, P077D, P077C, P0717, P07C0, P07BF, P0706, P0705, P0601, P0562, P0563, P2534,		Type B

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL illum.
						P0604, P0602, P0776, P0747, P0746, P0777, P0797. P0796. P0713, P0712, P0711 ECM : Engine speed failure, Accelerator Effective Position failure, Engine Non-Transmission Regulated Steady State Torque failure		
					Current gear	4th gear		
					Output shaft speed	>=250rpm		
					Engine Actual Steady State Torque	> 60 Nm		
					Time after the all following conditions are satisfied	2.0 sec continuously		
					A voltage condition	10.2V < Battery voltage <= 18.0V		
					Ignition switch is in crank or run position	ON		
					Not in service mode	(SID$10-subfunc$02, SID$28, SID$AE)		
					Reading EEPROM finish			
					Engine speed	> 400rpm		
					Not in Limp home mode(refer to attachment#3)			
					Transmission Fluid Temperature	>=~~0~~ -7deg.C		
					Not during garage control			

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL illum.
			[Case 3] Calculation of actual gear ratio for current (1st or 2nd or 3rd) gear is not correct. Input shaft speed - Output shaft speed x 1st Gear Ratio	3.3 sec continuously (time are different by difference between actual gear ratio and current gear ratio)	Time after garage control Not during shifting Time after shifting Transmission range switch Time after changing to transmission range switch Not during Neutral control Time after Neutral control No active DTC	1000 msec (time are different by Transmission Fluid Temp) 500 msec (time are different by Transmission Fluid Temp) D or 2 or L 1sec 1000 msec (time are different by Transmission Fluid Temp) TCM : U0073, U0100 P0974, P0973, P0963, P0962, P0748, P0967, P0966, P0778, P0971, P0970, P0798, P2761, P0722, P077D, P077C, P0717, P07C0, P07BF, P0706, P0705, P0601, P0562, P0563, P2534, P0604, P0602, P0776, P0747, P0746, P0777, P0797, P0796, P0713, P0712, P0711 ECM : Engine speed failure, Accelerator Effective Position failure,	2 failures	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL illum.
						Engine Non-Transmission Regulated Steady State Torque failure		
					Current gear	1st gear or 2nd gear or 3rd gear		
					Output shaft speed calculated by output speed sensor	<= 500rpm		
					Current Lock up	OFF		
					Air Suction	OFF		
					| Engine speed - Input shaft speed |	< 150 rpm		
					Input shaft speed	> Output shaft speed x 1st Gear Ratio + 400 rpm		
					Prohibit Neutral Judgment flag (*2)	FALSE		
					Time after the all following conditions are satisfied	2.0 sec continuously		
					A voltage condition	10.2V < Battery voltage <= 18.0V		
					Ignition switch is in crank or run position	ON		
					Not in service mode	(SID$10-subfunc$02, SID$28, SID$AE)		
					Reading EEPROM finish			
					Engine speed	> 400rpm		
					Not in Limp home mode(refer to attachment#3)			
					Not during garage control			
					Time after garage control	1000 msec (time are different by Transmission Fluid Temp)		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL illum.
					Transmission range switch	D or 2 or L		
					Not during Neutral control			
					Time after Neutral control	1000 msec (time are different by Transmission Fluid Temp)		
					Not during wheel spin condition (*3)			
					Output shaft speed	>300rpm		
					Transmission Fluid Temperature	>=-20deg.C		
					Time after shift to safe gear	500 msec (time are different by Transmission Fluid Temp)		
			Not detected shift beginning(i.e. Input shaft speed change dose not occur) *The up shifting from a normal gear to the gear which is not normal	1 time	No active DTC	TCM : U0073, U0100 P0974, P0973, P0963, P0962, P0748, P0967, P0966, P0778, P0971, P0970, P0798, P2761, P0722, P077D, P077C, P0717, P07C0, P07BF, P0706, P0705, P0601, P0562, P0563, P2534, P0604, P0602, P0776, P0747, P0746, P0777, P0797, P0796, P0713, P0712, P0711 ECM : Engine speed failure, Accelerator Effective Position failure,		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL illum.
Pressure Control Solenoid (SLC1) Stuck On	P0747	This DTC detect Pressure Control Solenoid (SLC1) Stuck On				Engine Non-Transmission Regulated Steady State Torque	5 failures	Type B
						failure		
					During Up shift	2-4 or 3-4 shift		
					Time after Torque phase B control beginning (*4)	>=500 + 300 msec (time are different by Transmission Fluid Temp and Estimated turbine torque)		
					Command pressure to engage	> 245 kpa		
					Max of Input shaft speed flare ratio	<=50rpm		
					Either following conditions is satisfied			
					The gear before shifting is normal			
					The gear at beginning of the shift is normal			
					Estimated turbine torque without inertia	>=~~30~~ 20Nm or <=-20Nm		
					Time after the all following conditions are satisfied	2.0 sec continuously		
					A voltage condition	10.2V < Battery voltage <= 18.0V		
					Ignition switch is in crank or run position	ON		
					Not in service mode	(SID$10-subfunc$02, SID$28, SID$AE)		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL illum.
			Calculation of actual gear ratio for 4th gear is not correct. | Input shaft speed - Output shaft speed x 2nd Gear Ratio |	< 230 rpm for 0.5 sec continuously (revolution value are different by Output shaft speed)	Reading EEPROM finish			
					Engine speed	> 400rpm		
					Not in Limp home mode(refer to attachment#3)			
					Not during garage control			
					Time after garage control	1000 msec (time are different by Transmission Fluid Temp)		
					Not during shifting			
					Time after shifting	500 msec (time are different by Transmission Fluid Temp)		
					Transmission range switch	D or 2 or L		
					Not during Neutral control			
					Time after Neutral control	1000 msec (time are different by Transmission Fluid Temp)		
					Transmission Fluid Temperature	>=-20deg.C		
					Air Suction	OFF		
					Time after shift to safe gear	500 msec (time are different by Transmission Fluid Temp)		
					No active DTC	TCM : U0073, U0100 P0974, P0973, P0963, P0962, P0748, P0967, P0966, P0778, P0971, P0970, P0798, P2761, P0722, P077D, P077C, P0717,		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL illum.
			Calculation of actual gear ratio for 4th gear is not correct. | Input shaft speed - Output shaft speed x 3rd Gear Ratio |	< 150 rpm for 0.5 sec continuously (revolution value are different by Output shaft speed)		P07C0, P07BF, P0706, P0705, P0601, P0562, P0563, P2534, P0604, P0602, P0776, P0747, P0746, P0777, P0797, P0796, P0713, P0712, P0711 ECM : Engine speed failure, Accelerator Effective Position failure, Engine Non-Transmission Regulated Steady State Torque failure		
					Current gear Output shaft speed Estimated turbine torque	4th gear >=250rpm >=~~30~~ 20Nm or <=-20Nm		
			[Case 1] Sum of the difference (absolute value) of target current and feedback current *renewed every 10msec	>= 20000	Time after the all following conditions are satisfied A voltage condition Ignition switch is in crank or run position Not in service mode Reading EEPROM finish	2.0 sec continuously 10.2V < Battery voltage <= 18.0V ON (SID$10-subfunc$02, SID$28, SID$AE)	>= 60000	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL illum.
Pressure Control Solenoid (SLC1) Electrical	P0748	This DTC detect difference of target current and feedback current			Battery voltage Feedback current Not in Limp home mode(refer to attachment#3) No active DTC	>10.5V for 500msec continuously < 1358mA TCM : U0073, U0100 P0974, P0973, P0963, P0962, P0748, P0967, P0966, P0778, P0971, P0970, P0798, P2761, P0722, P077D, P077C, P0717, P07C0, P07BF, P0706, P0705, P0601, P0562, P0563, P2534, P0604, P0602, P0776, P0747, P0746, P0777, P0797. P0796 ECM : Engine speed failure, Accelerator Effective Position failure, Engine Non-Transmission Regulated Steady State Torque failure		Type A
			[Case 2] Difference (absolute value) of target current and feedback current	> 50mA for 2 sec continuously			> 50mA for 3 sec continuously	
					Time after the all following conditions are satisfied A voltage condition Ignition switch is in crank or run position	2.0 sec continuously 10.2V < Battery voltage <= 18.0V ON		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL illum.
					Not in service mode	(SID$10-subfunc$02, SID$28, SID$AE)		
					Reading EEPROM finish			
					Engine speed	> 400rpm		
					Not in Limp home mode(refer to attachment#3)			
					Not during garage control			
					Time after garage control	1000 msec (time are different by Transmission Fluid Temp)		
					Not during shifting			
					Time after shifting	500 msec (time are different by Transmission Fluid Temp)		
					Transmission range switch	D or 2 or L		
					Not during Neutral control			
					Time after Neutral control	1000 msec (time are different by Transmission Fluid Temp)		
			[Case 1] Calculation of actual gear ratio for current (3rd or 4th) gear is not correct. | Input shaft speed – Output shaft speed x Current Gear Ratio |	> 400 rpm for 1.0 sec continuously (revolution value are different by Output shaft speed and Current gear)	Transmission Fluid Temperature	>=-20deg.C		
					Air Suction	OFF		
					Time after shift to safe gear	500 msec (time are different by Transmission Fluid Temp)		
					No active DTC	TCM : U0073, U0100 P0974, P0973, P0963, P0962, P0748, P0967, P0966, P0778, P0971, P0970, P0798, P2761, P0722, P077D, P077C, P0717,		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL illum.
						P07C0, P07BF, P0706, P0705, P0601, P0562, P0563, P2534, P0604, P0602, P0776, P0747, P0746, P0777, P0797, P0796, P0713, P0712, P0711 ECM : Engine speed failure, Accelerator Effective Position failure, Engine Non-Transmission Regulated Steady State Torque failure		
					Current gear	3rd gear or 4th gear		
					Output shaft speed	>=500rpm		
					Time after the all following conditions are satisfied	2.0 sec continuously		
					A voltage condition	10.2V < Battery voltage <= 18.0V		
					Ignition switch is in crank or run position	ON		
					Not in service mode	(SID$10-subfunc$02, SID$28, SID$AE)		
					Reading EEPROM finish			
					Engine speed	> 400rpm		
					Not in Limp home mode(refer to attachment#3)			
					Not during garage control			

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL illum.
Pressure Control Solenoid (SLC2) Performance/Stuck Off	P0776	This DTC detect Pressure Control Solenoid (SLC2) Performance/Stuck Off	[Case 2] Calculation of actual gear ratio for 2nd gear is correct. | Input shaft speed – Output shaft speed x Current Gear Ratio |	< 230 rpm for 1.0 sec continuously (revolution value are different by Output shaft speed) *This is gear ratio normal judgment	Time after garage control Not during shifting Time after shifting Transmission range switch Not during Neutral control Time after Neutral control Transmission Fluid Temperature Air Suction Time after shift to safe gear No active DTC	1000 msec (time are different by Transmission Fluid Temp) 500 msec (time are different by Transmission Fluid Temp) D or 2 or L 1000 msec (time are different by Transmission Fluid Temp) >=-20deg.C OFF 500 msec (time are different by Transmission Fluid Temp) TCM : U0073, U0100 P0974, P0973, P0963, P0962, P0748, P0967, P0966, P0778, P0971, P0970, P0798, P2761, P0722, P077D, P077C, P0717, P07C0, P07BF, P0706, P0705, P0601, P0562, P0563, P2534, P0604, P0602, P0776, P0747, P0746, P0777, P0797. P0796. P0713, P0712, P0711 ECM : Engine speed failure, Accelerator Effective Position failure,	5 failures (1 failure is concluded by the combination of Case 1, Case 2 and Case 3) (Combination details refer to attachment#2)	Type B

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL illum.
						Engine Non-Transmission Regulated Steady State Torque failure		
					Current gear	2nd gear (2nd by the Neutral condition is excluded)		
					Output shaft speed	>=250rpm		
					Engine Actual Steady State Torque	>= 60 Nm		
					Time after the all following conditions are satisfied	2.0 sec continuously		
					A voltage condition	10.2V < Battery voltage <= 18.0V		
					Ignition switch is in crank or run position	ON		
					Not in service mode	(SID$10-subfunc$02, SID$28, SID$AE)		
					Reading EEPROM finish			
					Engine speed	> 400rpm		
					Not in Limp home mode(refer to attachment#3)			
					Not during garage control			
					Time after garage control	1000 msec (time are different by Transmission Fluid Temp)		
					Not during shifting			
					Time after shifting	500 msec (time are different by Transmission Fluid Temp)		
					Transmission range switch	D or 2 or L		
					Not during Neutral control			

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL illum.
					Time after Neutral control	1000 msec (time are different by Transmission Fluid Temp)		
			[Case 3] Calculation of actual gear ratio for 1st gear is correct. | Input shaft speed – Output shaft speed x Current Gear Ratio |	< 400 rpm for 1.0 sec continuously (revolution value are different by Output shaft speed) *This is gear ratio normal judgment	Transmission Fluid Temperature	>=-20deg.C		
					Air Suction	OFF		
					Time after shift to safe gear	500 msec (time are different by Transmission Fluid Temp)		
					No active DTC	TCM : U0073, U0100 P0974, P0973, P0963, P0962, P0748, P0967, P0966, P0778, P0971, P0970, P0798, P2761, P0722, P077D, P077C, P0717, P07C0, P07BF, P0706, P0705, P0601, P0562, P0563, P2534, P0604, P0602, P0776, P0747, P0746, P0777, P0797, P0796, P0713, P0712, P0711 ECM : Engine speed failure, Accelerator Effective Position failure, Engine Non-Transmission Regulated Steady State Torque failure		
					Current gear	1st gear		
					Output shaft speed	>=250rpm		
					Engine Actual Steady	>= 60 Nm		
					Input shaft speed	<= 6000rpm		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL illum.
					Time after the all following conditions are satisfied	2.0 sec continuously		
					A voltage condition	10.2V < Battery voltage <= 18.0V		
					Ignition switch is in crank or run position	ON		
					Not in service mode	(SID$10-subfunc$02, SID$28, SID$AE)		
					Reading EEPROM finish			
					Engine speed	> 400rpm		
					Not in Limp home mode(refer to attachment#3)			
					Not during garage control			
					Time after garage control	1000 msec (time are different by Transmission Fluid Temp)		
					Transmission range switch	D or 2 or L		
					Not during Neutral control			
					Time after Neutral control	1000 msec (time are different by Transmission Fluid Temp)		
					Not during wheel spin condition (*3)			
					Output shaft speed	>300rpm		
					Transmission Fluid Temperature	>=-20deg.C		
			Not detected shift beginning(i.e. Input shaft speed change dose not occur)		Time after shift to safe gear	500 msec (time are different by Transmission Fluid Temp)		
				1 time	No active DTC	TCM :		
			*The up shifting from a not normal gear to the			U0073, U0100		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL illum.
			gear which is not normal			P0974, P0973, P0963, P0962, P0748, P0967, P0966, P0778, P0971, P0970, P0798, P2761, P0722, P077D, P077C, P0717, P07C0, P07BF, P0706, P0705, P0601, P0562, P0563, P2534, P0604, P0602, P0776, P0747, P0746, P0777, P0797. P0796. P0713, P0712, P0711 ECM : Engine speed failure, Accelerator Effective Position failure, Engine Non-Transmission Regulated Steady State Torque failure		
					During Up shift	1-2 shift		
					3rd gear ratio fulfilled at the beginning of the shift	1 sec continuously		
					Command pressure to engage	> ~~196~~ 245 kpa		
					Estimated turbine torque without inertia	>=~~30~~ 20Nm or <=-20Nm		
					Time after the all following conditions are satisfied	2.0 sec continuously		
					A voltage condition	10.2V < Battery voltage <= 18.0V		
					Ignition switch is in crank or run position	ON		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL illum.
					Not in service mode	(SID$10-subfunc$02, SID$28, SID$AE)		
					Reading EEPROM finish			
					Engine speed	> 400rpm		
					Not in Limp home mode(refer to attachment#3)			
					Not during garage control			
					Time after garage control	1000 msec (time are different by Transmission Fluid Temp)		
					Transmission range switch	D or 2 or L		
					Not during Neutral control			
					Time after Neutral control	1000 msec (time are different by Transmission Fluid Temp)		
					Not during wheel spin condition (*3)			
					Output shaft speed	>300rpm		
					Transmission Fluid Temperature	>=-20deg.C		
					Time after shift to safe gear	500 msec (time are different by Transmission Fluid Temp)		
					No active DTC	TCM :		
						U0073, U0100		
			Not detected shift beginning(i.e. Input shaft speed change dose not occur)	1 time		P0974, P0973, P0963, P0962, P0748, P0967, P0966, P0778, P0971, P0970, P0798, P2761, P0722, P077D, P077C, P0717,		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL illum.
			*The down shifting from a normal gear to the gear which is not normal			P07C0, P07BF, P0706, P0705, P0601, P0562, P0563, P2534, P0604, P0602, P0776, P0747, P0746, P0777, P0797, P0796, P0713, P0712, P0711 ECM : Engine speed failure, Accelerator Effective Position failure, Engine Non-Transmission Regulated Steady State Torque failure		
					During down shifting	3-2 or 4-2 shift		
					Time after down shift beginning	> 1000 msec (time are different by Transmission Fluid Temp and Estimated turbine torque)		
					Time after down shift beginning	> 1500 msec (time are different by Transmission Fluid Temp and Output shaft speed)		
					Command pressure to engage(Estimated turbine torque without inertia<~~40~~ 100 Nm)	> 294 kpa		
Pressure Control Solenoid (SLC2) Stuck On	P0777	This DTC detect Pressure Control Solenoid (SLC2) Stuck On			Command pressure to engage(Estimated turbine torque without inertia>=~~40~~ 100 Nm)	> 196 kpa	5 failures	Type B
					Min of Input shaft speed flare ratio	>= -50rpm		
					Either following conditions is satisfied The gear before shifting is normal			

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL illum.
					The gear at beginning of the shift is normal			
					Estimated turbine torque without inertia	>=~~30~~ 20Nm or <=-20Nm		
					Time after the all following conditions are satisfied	2.0 sec continuously		
					A voltage condition	10.2V < Battery voltage <= 18.0V		
					Ignition switch is in crank or run position	ON		
					Not in service mode	(SID$10-subfunc$02, SID$28, SID$AE)		
					Reading EEPROM finish			
					Engine speed	> 400rpm		
					Not in Limp home mode(refer to attachment#3)			
					Not during garage control			
					Time after garage control	1000 msec (time are different by Transmission Fluid Temp)		
					Not during shifting			
					Time after shifting	500 msec (time are different by Transmission Fluid Temp)		
					Transmission range switch	D or 2 or L		
					Not during Neutral control			
					Time after Neutral control	1000 msec (time are different by Transmission Fluid Temp)		
			Calculation of actual gear ratio for 1st gear is	< 150 rpm for 1 sec	Transmission Fluid Temperature	>=-20deg.C		

<table>
<tr><th>Component/ System</th><th>Fault Code</th><th>Monitor Strategy Description</th><th>Malfunction Criteria</th><th>Threshold Value</th><th>Secondary Parameters</th><th>Enable Conditions</th><th>Time Required</th><th>MIL illum.</th></tr>
<tr><td></td><td></td><td></td><td>not correct.

| Input shaft speed – Output shaft speed x 3rd Gear Ratio |</td><td>continuously (revolution value are different by Output shaft speed)</td><td>Air Suction</td><td>OFF</td><td></td><td></td></tr>
<tr><td></td><td></td><td></td><td></td><td></td><td>Time after shift to safe gear</td><td>500 msec (time are different by Transmission Fluid Temp)</td><td></td><td></td></tr>
<tr><td></td><td></td><td></td><td></td><td></td><td>No active DTC</td><td>TCM :
U0073, U0100
P0974, P0973, P0963, P0962, P0748, P0967, P0966, P0778,
P0971, P0970, P0798, P2761, P0722, P077D, P077C, P0717,
P07C0, P07BF, P0706, P0705, P0601, P0562, P0563, P2534,
P0604, P0602, P0776, P0747, P0746, P0777, P0797, P0796,
P0713, P0712, P0711
ECM :
Engine speed failure, Accelerator Effective Position failure,
Engine Non-Transmission Regulated Steady State Torque
failure</td><td></td><td></td></tr>
<tr><td></td><td></td><td></td><td></td><td></td><td>Current gear</td><td>1st gear</td><td></td><td></td></tr>
<tr><td></td><td></td><td></td><td></td><td></td><td>Output shaft speed</td><td>>=250rpm</td><td></td><td></td></tr>
<tr><td></td><td></td><td></td><td></td><td></td><td>Engine Actual Steady State Torque</td><td>>= 60Nm</td><td></td><td></td></tr>
<tr><td></td><td></td><td></td><td></td><td></td><td>Input shaft speed</td><td><= 6000rpm</td><td></td><td></td></tr>
<tr><td></td><td></td><td></td><td></td><td></td><td>Time after the all following conditions are satisfied</td><td>2.0 sec continuously</td><td></td><td></td></tr>
</table>

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL illum.
			Calculation of actual gear ratio for 2nd gear is not correct. | Input shaft speed – Output shaft speed x 3rd Gear Ratio |	< 150 rpm for 0.5 sec continuously (revolution value are different by Output shaft speed)	A voltage condition	10.2V < Battery voltage <= 18.0V		
					Ignition switch is in crank or run position	ON		
					Not in service mode	(SID$10-subfunc$02, SID$28, SID$AE)		
					Reading EEPROM finish			
					Engine speed	> 400rpm		
					Not in Limp home mode(refer to attachment#3)			
					Not during garage control			
					Time after garage control	1000 msec (time are different by Transmission Fluid Temp)		
					Not during shifting			
					Time after shifting	500 msec (time are different by Transmission Fluid Temp)		
					Transmission range switch	D or 2 or L		
					Not during Neutral control			
					Time after Neutral control	1000 msec (time are different by Transmission Fluid Temp)		
					Transmission Fluid Temperature	>=-20deg.C		
					Air Suction	OFF		
					Time after shift to safe gear	500 msec (time are different by Transmission Fluid Temp)		
					No active DTC	TCM : U0073, U0100 P0974, P0973, P0963, P0962, P0748, P0967, P0966, P0778, P0971, P0970, P0798, P2761, P0722, P077D, P077C, P0717,		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL illum.
			Calculation of actual gear ratio for 2nd gear is not correct. | Input shaft speed – Output shaft speed x 4th Gear Ratio |	< 115 rpm for 0.5 sec continuously (revolution value are different by Output shaft speed)		P07C0, P07BF, P0706, P0705, P0601, P0562, P0563, P2534, P0604, P0602, P0776, P0747, P0746, P0777, P0797, P0796, P0713, P0712, P0711 ECM : Engine speed failure, Accelerator Effective Position failure, Engine Non-Transmission Regulated Steady State Torque failure		
					Current gear Output shaft speed Estimated turbine torque	2nd >=250rpm >=~~30~~ 20Nm or <=-20Nm		
			[Case 1] Sum of the difference (absolute value) of target current and feedback current *renewed every 10msec	>= 20000	Time after the all following conditions are satisfied A voltage condition Ignition switch is in crank or run position Not in service mode Battery voltage Feedback current Not in Limp home mode(refer to attachment#3)	2.0 sec continuously 10.2V < Battery voltage <= 18.0V ON (SID$10-subfunc$02, SID$28, SID$AE) >10.5V for 500msec continuously < 1358mA	>= 60000	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL illum.
Pressure Control Solenoid (SLC2) Electrical	P0778	This DTC detect difference of target current and feedback current			No active DTC	TCM : U0073, U0100 P0974, P0973, P0963, P0962, P0748, P0967, P0966, P0778, P0971, P0970, P0798, P2761, P0722, P077D, P077C, P0717, P07C0, P07BF, P0706, P0705, P0601, P0562, P0563, P2534, P0604, P0602, P0776, P0747, P0746, P0777, P0797, P0796 ECM : Engine speed failure, Accelerator Effective Position failure, Engine Non-Transmission Regulated Steady State Torque failure		Type A
			[Case 2] Difference (absolute value) of target current and feedback current	> 50mA for 2 sec continuously			> 50mA for 3 sec continuously	
Output Speed Sensor Circuit Low	P077C	This DTC detects a short to ground or open in the Output Speed Sensor Circuit	Input A/D value of Output Speed Sensor Circuit	< 45 (0.206V)	Time after the all following conditions are satisfied A voltage condition Ignition switch is in crank or run position Not in service mode	2.0 sec continuously 10.2V < Battery voltage <= 18.0V ON (SID$10-subfunc$02, SID$28, SID$AE)	10 failures 100ms continuously(per 1 failure)	Type A

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL illum.
					Reading EEPROM finish			
Output Speed Sensor Circuit High	P077D	This DTC detects a short to high in the Output Speed Sensor Circuit	Input A/D value of Output Speed Sensor Circuit	> 545 (2.727V)	Time after the all following conditions are satisfied A voltage condition Ignition switch is in crank or run position Not in service mode Reading EEPROM finish	2.0 sec continuously 10.2V < Battery voltage <= 18.0V ON (SID$10-subfunc$02, SID$28, SID$AE)	10 failures 100ms continuously(per 1 failure)	Type A
					Time after the all following conditions are satisfied A voltage condition Ignition switch is in crank or run position Not in service mode Reading EEPROM finish Engine speed Not in Limp home mode(refer to attachment#3) Not during garage control Time after garage control Not during shifting	2.0 sec continuously 10.2V < Battery voltage <= 18.0V ON (SID$10-subfunc$02, SID$28, SID$AE) > 400rpm 1000 msec (time are different by Transmission Fluid Temp)		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL illum.
			[Case 1] Calculation of actual gear ratio for current (2nd or 4th) gear is not correct. | Input shaft speed – Output shaft speed x Current Gear Ratio |	> 400 rpm for 1.0 sec continuously (revolution value are different by Output shaft speed and Current gear)	Time after shifting	500 msec (time are different by Transmission Fluid Temp)		
					Transmission range switch	D or 2 or L		
					Not during Neutral control Time after Neutral control	1000 msec (time are different by Transmission Fluid Temp)		
					Transmission Fluid Temperature	>=-20deg.C		
					Air Suction	OFF		
					Time after shift to safe gear	500 msec (time are different by Transmission Fluid Temp)		
					No active DTC	TCM : U0073, U0100 P0974, P0973, P0963, P0962, P0748, P0967, P0966, P0778, P0971, P0970, P0798, P2761, P0722, P077D, P077C, P0717, P07C0, P07BF, P0706, P0705, P0601, P0562, P0563, P2534, P0604, P0602, P0776, P0747, P0746, P0777, P0797, P0796, P0713, P0712, P0711 ECM : Engine speed failure, Accelerator Effective Position failure, Engine Non-Transmission Regulated Steady State Torque		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL illum.
						failure		
					Current gear	2nd gear or 4th gear		
					Output shaft speed	>=500rpm		
					Time after the all following conditions are satisfied	2.0 sec continuously		
					A voltage condition	10.2V < Battery voltage <= 18.0V		
					Ignition switch is in crank or run position	ON		
					Not in service mode	(SID$10-subfunc$02, SID$28, SID$AE)		
					Reading EEPROM finish			
					Engine speed	> 400rpm		
					Not in Limp home mode(refer to attachment#3)			
					Not during garage control			
					Time after garage control	1000 msec (time are different by Transmission Fluid Temp)		
					Not during shifting			
					Time after shifting	500 msec (time are different by Transmission Fluid Temp)		
					Transmission range switch	D or 2 or L		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL illum.
Pressure Control Solenoid (SLB1) Performance/Stuck Off	P0796	This DTC detect Pressure Control Solenoid (SLB1) Performance/Stuck Off	[Case 2] Calculation of actual gear ratio for 3rd gear is correct. | Input shaft speed – Output shaft speed x Current Gear Ratio |	< 150 rpm for 1.0 sec continuously (revolution value are different by Output shaft speed) *This is gear ratio normal judgment	Not during Neutral control Time after Neutral control Transmission Fluid Temperature Air Suction Time after shift to safe gear No active DTC Current gear Output shaft speed	1000 msec (time are different by Transmission Fluid Temp) >=-20deg.C OFF 500 msec (time are different by Transmission Fluid Temp) TCM : U0073, U0100 P0974, P0973, P0963, P0962, P0748, P0967, P0966, P0778, P0971, P0970, P0798, P2761, P0722, P077D, P077C, P0717, P07C0, P07BF, P0706, P0705, P0601, P0562, P0563, P2534, P0604, P0602, P0776, P0747, P0746, P0777, P0797, P0796, P0713, P0712, P0711 ECM : Engine speed failure, Accelerator Effective Position failure, Engine Non-Transmission Regulated Steady State Torque failure 3rd gear >=250rpm	5 failures (1 failure is concluded by the combination of Case 1, Case 2 and Case 3) (Combination details refer to attachment#2)	Type B

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL illum.
					Engine Actual Steady State Torque	>= 60 Nm		
			[Case 3] Calculation of actual gear ratio for 1st gear is correct.	< 400 rpm for 1.0 sec continuously (revolution value are different by Output shaft speed)	Time after the all following conditions are satisfied	2.0 sec continuously		
					A voltage condition	10.2V < Battery voltage <= 18.0V		
					Ignition switch is in crank or run position	ON		
					Not in service mode	(SID$10-subfunc$02, SID$28, SID$AE)		
					Reading EEPROM finish			
					Engine speed	> 400rpm		
					Not in Limp home mode(refer to attachment#3)			
					Not during garage control			
					Time after garage control	1000 msec (time are different by Transmission Fluid Temp)		
					Not during shifting			
					Time after shifting	500 msec (time are different by Transmission Fluid Temp)		
					Transmission range switch	D or 2 or L		
					Not during Neutral control			
					Time after Neutral control	1000 msec (time are different by Transmission Fluid Temp)		
					Transmission Fluid Temperature	>=-20deg.C		
					Air Suction	OFF		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL illum.
			| Input shaft speed – Output shaft speed x Current Gear Ratio |	*This is gear ratio normal judgment	Time after shift to safe gear	500 msec (time are different by Transmission Fluid Temp)		
					No active DTC	TCM : U0073, U0100 P0974, P0973, P0963, P0962, P0748, P0967, P0966, P0778, P0971, P0970, P0798, P2761, P0722, P077D, P077C, P0717, P07C0, P07BF, P0706, P0705, P0601, P0562, P0563, P2534, P0604, P0602, P0776, P0747, P0746, P0777, P0797, P0796, P0713, P0712, P0711 ECM : Engine speed failure, Accelerator Effective Position failure, Engine Non-Transmission Regulated Steady State Torque failure		
					Current gear	1st gear		
					Output shaft speed	>=250rpm		
					Engine Actual Steady State Torque	>= 60 Nm		
					Input shaft speed	<= 6000rpm		
					Time after the all following conditions are satisfied	2.0 sec continuously		
					A voltage condition	10.2V < Battery voltage <= 18.0V		
					Ignition switch is in crank or run position	ON		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL illum.
					Not in service mode	(SID$10-subfunc$02, SID$28, SID$AE)		
					Reading EEPROM finish			
					Engine speed	> 400rpm		
					Not during garage control			
					Time after garage control	1000 msec (time are different by Transmission Fluid Temp)		
					Transmission range switch	D or 2 or L		
					Not during Neutral control			
					Time after Neutral control	1000 msec (time are different by Transmission Fluid Temp)		
					Not during wheel spin condition (*3)			
					Output shaft speed	>300rpm		
					Transmission Fluid Temperature	>=-20deg.C		
			Not detected shift beginning(i.e. Input shaft speed change dose not occur)		Time after shift to safe gear	500 msec (time are different by Transmission Fluid Temp)		
					No active DTC	TCM :		
				1 time		U0073, U0100		
			*The up shifting from a not normal gear to the gear which is not normal			P0974, P0973, P0963, P0962, P0748, P0967, P0966, P0778,		
						P0971, P0970, P0798, P2761, P0722, P077D, P077C, P0717,		
						P07C0, P07BF, P0706, P0705, P0601, P0562, P0563, P2534,		
						P0604, P0602, P0776, P0747, P0746, P0777, P0797. P0796. P0713, P0712, P0711		
						ECM :		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL illum.
						Engine speed failure, Accelerator Effective Position failure, Engine Non-Transmission Regulated Steady State Torque failure		
					During Up shift	1-3 shift		
					2nd gear ratio fulfilled at the beginning of the shift	1 sec for continuously		
					Command pressure to engage	> ~~196~~ 245 kpa		
					Estimated turbine torque without inertia	>=~~30~~ 20Nm or <=-20Nm		
					Time after the all following conditions are satisfied	2.0 sec continuously		
					A voltage condition	10.2V < Battery voltage <= 18.0V		
					Ignition switch is in crank or run position	ON		
					Not in service mode	(SID$10-subfunc$02, SID$28, SID$AE)		
					Reading EEPROM finish			
					Engine speed	> 400rpm		
					Not during garage control			
					Time after garage control	1000 msec (time are different by Transmission Fluid Temp)		
					Transmission range switch	D or 2 or L		
					Not during Neutral control			
					Time after Neutral control	1000 msec (time are different by Transmission Fluid Temp)		
					Not during wheel spin condition (*3)			
					Output shaft speed	>300rpm		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL illum.
					Transmission Fluid Temperature	>=-20deg.C		
					Time after shift to safe gear	500 msec (time are different by Transmission Fluid Temp)		
					No active DTC	TCM : U0073, U0100 P0974, P0973, P0963, P0962, P0748, P0967, P0966, P0778, P0971, P0970, P0798, P2761, P0722, P077D, P077C, P0717, P07C0, P07BF, P0706, P0705, P0601, P0562, P0563, P2534, P0604, P0602, P0776, P0747, P0746, P0777, P0797, P0796, P0713, P0712, P0711 ECM : Engine speed failure, Accelerator Effective Position failure, Engine Non-Transmission Regulated Steady State Torque failure		
			Not detected shift beginning(i.e. Input shaft speed change dose not occur) *The up shifting from a normal gear to the gear which is not normal	1 time	During Up shift	2-3 shift		
					Time after Torque phase B control beginning (*4)	>=500 + 300 msec (time are different by Transmission Fluid Temp and Estimated turbine torque)		
					Command pressure to engage	> 245 kpa		
					Max of Input shaft speed flare ratio	<=50rpm		
					Either following conditions is satisfied			

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL illum.
					The gear before shifting is normal			
					The gear at beginning of the shift is normal			
					Estimated turbine torque without inertia	>=~~30~~ 20Nm or <=-20Nm		
					Time after the all following conditions are satisfied	2.0 sec continuously		
					A voltage condition	10.2V < Battery voltage <= 18.0V		
					Ignition switch is in crank or run position	ON		
					Not in service mode	(SID$10-subfunc$02, SID$28, SID$AE)		
					Reading EEPROM finish			
					Engine speed	> 400rpm		
					Not during garage control			
					Time after garage control	1000 msec (time are different by Transmission Fluid Temp)		
					Transmission range switch	D or 2 or L		
					Not during Neutral control			
					Time after Neutral control	1000 msec (time are different by Transmission Fluid Temp)		
					Not during wheel spin condition (*3)			
					Output shaft speed	>300rpm		
					Transmission Fluid Temperature	>=-20deg.C		
					Time after shift to safe gear	500 msec (time are different by Transmission Fluid Temp)		
					No active DTC	TCM : U0073, U0100		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL illum.
			Not detected shift beginning(i.e. Input shaft speed change dose not occur) *The down shifting from a normal gear to the gear which is not normal	1 time		P0974, P0973, P0963, P0962, P0748, P0967, P0966, P0778, P0971, P0970, P0798, P2761, P0722, P077D, P077C, P0717, P07C0, P07BF, P0706, P0705, P0601, P0562, P0563, P2534, P0604, P0602, P0776, P0747, P0746, P0777, P0797, P0796, P0713, P0712, P0711 ECM : Engine speed failure, Accelerator Effective Position failure, Engine Non-Transmission Regulated Steady State Torque failure		
					During down shifting	4-3 shift		
					Time after down shift beginning	> 1000 msec (time are different by Transmission Fluid Temp and Estimated turbine torque)		
					Time after down shift beginning	> 1500 msec (time are different by Transmission Fluid Temp and Output shaft speed)		
					Command pressure to engage(Estimated turbine torque without inertia<~~40~~ 100 Nm)	> 294 kpa		
					Command pressure to engage(Estimated turbine torque without inertia>=~~40~~ 100 Nm)	> 196 kpa		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL illum.
Pressure Control Solenoid (SLB1) Stuck On	P0797	This DTC detect Pressure Control Solenoid (SLB1) Stuck On			Min of Input shaft speed flare ratio	>= -50rpm	5 failures	Type B
					Either following conditions is satisfied			
					The gear before shifting is normal			
					The gear at beginning of the shift is normal			
					Estimated turbine torque without inertia	>=~~30~~ 20Nm or <=-20Nm		
					Time after the all following conditions are satisfied	2.0 sec continuously		
					A voltage condition	10.2V < Battery voltage <= 18.0V		
					Ignition switch is in crank or run position	ON		
					Not in service mode	(SID$10-subfunc$02, SID$28, SID$AE)		
					Reading EEPROM finish			
					Engine speed	> 400rpm		
					Not in Limp home mode(refer to attachment#3)			
					Not during garage control			
					Time after garage control	1000 msec (time are different by Transmission Fluid Temp)		
					Not during shifting			
					Time after shifting	500 msec (time are different by Transmission Fluid Temp)		
					Transmission range switch	D or 2 or L		
					Not during Neutral control			
					Time after Neutral control	1000 msec (time are different by Transmission Fluid Temp)		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL illum.
			Calculation of actual gear ratio for 1st gear (with engine brake) is not correct. | Input shaft speed – Output shaft speed x 2nd Gear Ratio |	< 230 rpm for ~~0.5~~ 1.0 sec continuously (revolution value are different by Output shaft speed)	Transmission Fluid Temperature	>=-20deg.C		
					Air Suction	OFF		
					Time after shift to safe gear	500 msec (time are different by Transmission Fluid Temp)		
					No active DTC	TCM : U0073, U0100 P0974, P0973, P0963, P0962, P0748, P0967, P0966, P0778, P0971, P0970, P0798, P2761, P0722, P077D, P077C, P0717, P07C0, P07BF, P0706, P0705, P0601, P0562, P0563, P2534, P0604, P0602, P0776, P0747, P0746, P0777, P0797, P0796, P0713, P0712, P0711 ECM : Engine speed failure, Accelerator Effective Position failure, Engine Non-Transmission Regulated Steady State Torque failure		
					Current gear	1st gear with engine brake		
					Output shaft speed	>=250rpm		
					Engine Actual Steady State Torque	>= ~~60~~ 40Nm		
					Input shaft speed	<= 6000rpm		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL illum.
			Calculation of actual gear ratio for 1st gear is not correct. | Input shaft speed – Output shaft speed x 2nd Gear Ratio |	< 230 rpm for 1 sec continuously (revolution value are different by Output shaft speed)	Time after the all following conditions are satisfied	2.0 sec continuously		
					A voltage condition	10.2V < Battery voltage <= 18.0V		
					Ignition switch is in crank or run position	ON		
					Not in service mode	(SID$10-subfunc$02, SID$28, SID$AE)		
					Reading EEPROM finish			
					Engine speed	> 400rpm		
					Not in Limp home mode(refer to attachment#3)			
					Not during garage control			
					Time after garage control	1000 msec (time are different by Transmission Fluid Temp)		
					Not during shifting			
					Time after shifting	500 msec (time are different by Transmission Fluid Temp)		
					Transmission range switch	D or 2 or L		
					Not during Neutral control			
					Time after Neutral control	1000 msec (time are different by Transmission Fluid Temp)		
					Transmission Fluid Temperature	>=-20deg.C		
					Air Suction	OFF		
					Time after shift to safe gear	500 msec (time are different by Transmission Fluid Temp)		
					No active DTC	TCM : U0073, U0100 P0974, P0973, P0963, P0962, P0748, P0967, P0966, P0778,		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL illum.
						P0971, P0970, P0798, P2761, P0722, P077D, P077C, P0717, P07C0, P07BF, P0706, P0705, P0601, P0562, P0563, P2534, P0604, P0602, P0776, P0747, P0746, P0777, P0797, P0796, P0713, P0712, P0711 ECM : Engine speed failure, Accelerator Effective Position failure, Engine Non-Transmission Regulated Steady State Torque failure		
					Current gear Output shaft speed Engine Actual Steady State Torque Input shaft speed	1st gear >= 250rpm >= 60Nm <= 6000rpm		
					Time after the all following conditions are satisfied A voltage condition Ignition switch is in crank or run position Not in service mode Reading EEPROM finish	2.0 sec continuously 10.2V < Battery voltage <= 18.0V ON (SID$10-subfunc$02, SID$28, SID$AE)		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL illum.
			Calculation of actual gear ratio for 3rd gear is not correct. | Input shaft speed – Output shaft speed x 2nd Gear Ratio |	< 230 rpm for 0.5 sec continuously (revolution value are different by Output shaft speed)	Engine speed	> 400rpm		
					Not in Limp home mode(refer to attachment#3)			
					Not during garage control			
					Time after garage control	1000 msec (time are different by Transmission Fluid Temp)		
					Not during shifting			
					Time after shifting	500 msec (time are different by Transmission Fluid Temp)		
					Transmission range switch	D or 2 or L		
					Not during Neutral control			
					Time after Neutral control	1000 msec (time are different by Transmission Fluid Temp)		
					Transmission Fluid Temperature	>=-20deg.C		
			Calculation of actual gear ratio for 3rd gear is not correct. | Input shaft speed – Output shaft speed x 4th Gear Ratio |	< 115 rpm for 0.5 sec continuously (revolution value are different by Output shaft speed)	Air Suction	OFF		
					Time after shift to safe gear	500 msec (time are different by Transmission Fluid Temp)		
					No active DTC	TCM : U0073, U0100 P0974, P0973, P0963, P0962, P0748, P0967, P0966, P0778, P0971, P0970, P0798, P2761, P0722, P077D, P077C, P0717, P07C0, P07BF, P0706, P0705, P0601, P0562, P0563, P2534, P0604, P0602, P0776, P0747, P0746, P0777, P0797, P0796, P0713, P0712, P0711		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL illum.
						ECM : Engine speed failure, Accelerator Effective Position failure, Engine Non-Transmission Regulated Steady State Torque failure		
					Current gear Output shaft speed Estimated turbine torque	3rd gear >=250rpm >=~~30~~ 20Nm or <=-20Nm		
Pressure Control Solenoid (SLB1) Electrical	P0798	This DTC detect difference of target current and feedback current	[Case 1] Sum of the difference (absolute value) of target current and feedback current *renewed every 10msec	>= 20000	Time after the all following conditions are satisfied A voltage condition Ignition switch is in crank or run position Not in service mode Reading EEPROM finish Battery voltage Feedback current Not in Limp home mode(refer to attachment#3) No active DTC	2.0 sec continuously 10.2V < Battery voltage <= 18.0V ON (SID$10-subfunc$02, SID$28, SID$AE) >10.5V for 500msec continuously < 1358mA TCM : U0073, U0100 P0974, P0973, P0963, P0962, P0748, P0967, P0966, P0778,	>= 60000	Type A

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL illum.
			[Case 2] Difference (absolute value) of target current and feedback current	> 50mA for 2 sec continuously		P0971, P0970, P0798, P2761, P0722, P077D, P077C, P0717, P07C0, P07BF, P0706, P0705, P0601, P0562, P0563, P2534, P0604, P0602, P0776, P0747, P0746, P0777, P0797, P0796 ECM : Engine speed failure, Accelerator Effective Position failure, Engine Non-Transmission Regulated Steady State Torque failure	> 50mA for 3 sec continuously	
Input Speed Sensor Circuit Low	P07BF	This DTC detects a short to ground or open in the Input Speed Sensor Circuit	Input A/D value of Input Speed Sensor Circuit	< 45 (0.206V)	Time after the all following conditions are satisfied A voltage condition Ignition switch is in crank or run position Not in service mode Reading EEPROM finish	2.0 sec continuously 10.2V < Battery voltage <= 18.0V ON (SID$10-subfunc$02, SID$28, SID$AE)	10 failures 100ms continuously(per 1 failure)	Type A
					Time after the all following conditions are satisfied	2.0 sec continuously		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL illum.
Input Speed Sensor Circuit High	P07C0	This DTC detects a short to high in the Input Speed Sensor Circuit	Input A/D value of Input Speed Sensor Circuit	> 545 (2.727V)	A voltage condition Ignition switch is in crank or run position Not in service mode Reading EEPROM finish	10.2V < Battery voltage <= 18.0V ON (SID$10-subfunc$02, SID$28, SID$AE)	10 failures 100ms continuously(per 1 failure)	Type A
Pressure Control Solenoid (SLC1) Control Circuit Low	P0962	This DTC detects a short to ground or open in the Pressure Control Solenoid (SLC1) circuit	Feedback current of Pressure Control Solenoid (SLC1)	< 20mA	Time after the all following conditions are satisfied A voltage condition Ignition switch is in crank or run position Not in service mode Reading EEPROM finish Not in Limp home mode(refer to attachment#3) No active DTC	2.0 sec continuously 10.2V < Battery voltage <= 18.0V ON (SID$10-subfunc$02, SID$28, SID$AE) TCM : U0073, U0100 P0974, P0973, P0963, P0962, P0748, P0967, P0966, P0778,	5 failures 100ms continuously(per 1 failure)	Type A

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL illum.
						P0971, P0970, P0798, P2761, P0722, P077D, P077C, P0717, P07C0, P07BF, P0706, P0705, P0601, P0562, P0563, P2534, P0604, P0602, P0776, P0747, P0746, P0777, P0797, P0796 ECM : Engine speed failure, Accelerator Effective Position failure, Engine Non-Transmission Regulated Steady State Torque failure		
					Time after the all following conditions are satisfied A voltage condition Ignition switch is in crank or run position Not in service mode Reading EEPROM finish Not in Limp home mode(refer to attachment#3)	2.0 sec continuously 10.2V < Battery voltage <= 18.0V ON (SID$10-subfunc$02, SID$28, SID$AE)		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL illum.
Pressure Control Solenoid (SLC1) Control Circuit High	P0963	This DTC detects a short to high in the Pressure Control Solenoid (SLC1) circuit	Feedback current of Pressure Control Solenoid (SLC1)	>= 1358mA	No active DTC	TCM : U0073, U0100 P0974, P0973, P0963, P0962, P0748, P0967, P0966, P0778, P0971, P0970, P0798, P2761, P0722, P077D, P077C, P0717, P07C0, P07BF, P0706, P0705, P0601, P0562, P0563, P2534, P0604, P0602, P0776, P0747, P0746, P0777, P0797, P0796 ECM : Engine speed failure, Accelerator Effective Position failure, Engine Non-Transmission Regulated Steady State Torque failure	5 failures 100ms continuously(per 1 failure)	Type A
					Time after the all following conditions are satisfied	2.0 sec continuously		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL illum.
Pressure Control Solenoid (SLC2) Control Circuit Low	P0966	This DTC detects a short to ground or open in the Pressure Control Solenoid (SLC2) circuit	Feedback current of Pressure Control Solenoid (SLC2)	< 20mA	A voltage condition Ignition switch is in crank or run position Not in service mode Reading EEPROM finish Not in Limp home mode(refer to attachment#3) No active DTC	10.2V < Battery voltage <= 18.0V ON (SID$10-subfunc$02, SID$28, SID$AE) TCM : U0073, U0100 P0974, P0973, P0963, P0962, P0748, P0967, P0966, P0778, P0971, P0970, P0798, P2761, P0722, P077D, P077C, P0717, P07C0, P07BF, P0706, P0705, P0601, P0562, P0563, P2534, P0604, P0602, P0776, P0747, P0746, P0777, P0797, P0796 ECM : Engine speed failure, Accelerator Effective Position failure, Engine Non-Transmission Regulated Steady State Torque failure	5 failures 100ms continuously(per 1 failure)	Type A
					Time after the all following conditions are satisfied A voltage condition	2.0 sec continuously 10.2V < Battery voltage <= 18.0V		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL illum.
Pressure Control Solenoid (SLC2) Control Circuit High	P0967	This DTC detects a short to high in the Pressure Control Solenoid (SLC2) circuit	Feedback current of Pressure Control Solenoid (SLC2)	>= 1358mA	Ignition switch is in crank or run position Not in service mode Reading EEPROM finish Not in Limp home mode(refer to attachment#3) No active DTC	ON (SID$10-subfunc$02, SID$28, SID$AE) TCM : U0073, U0100 P0974, P0973, P0963, P0962, P0748, P0967, P0966, P0778, P0971, P0970, P0798, P2761, P0722, P077D, P077C, P0717, P07C0, P07BF, P0706, P0705, P0601, P0562, P0563, P2534, P0604, P0602, P0776, P0747, P0746, P0777, P0797. P0796 ECM : Engine speed failure, Accelerator Effective Position failure, Engine Non-Transmission Regulated Steady State Torque failure	5 failures 100ms continuously(per 1 failure)	Type A
					Time after the all following conditions are satisfied	2.0 sec continuously		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL illum.
Pressure Control Solenoid (SLB1) Control Circuit Low	P0970	This DTC detects a short to ground or open in the Pressure Control Solenoid (SLB1) circuit	Feedback current of Pressure Control Solenoid (SLB1)	< 20mA	A voltage condition Ignition switch is in crank or run position Not in service mode Reading EEPROM finish Not in Limp home mode(refer to attachment#3) No active DTC	10.2V < Battery voltage <= 18.0V ON (SID$10-subfunc$02, SID$28, SID$AE) TCM : U0073, U0100 P0974, P0973, P0963, P0962, P0748, P0967, P0966. P0778. P0971, P0970, P0798, P2761, P0722, P077D, P077C, P0717, P07C0, P07BF, P0706, P0705, P0601, P0562, P0563, P2534, P0604, P0602, P0776, P0747, P0746, P0777, P0797, P0796 ECM : Engine speed failure, Accelerator Effective Position failure, Engine Non-Transmission Regulated Steady State Torque failure	5 failures 100ms continuously(per 1 failure)	Type A
					Time after the all following conditions are satisfied	2.0 sec continuously		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL illum.
Pressure Control Solenoid (SLB1) Control Circuit High	P0971	This DTC detects a short to high in the Pressure Control Solenoid (SLB1) circuit	Feedback current of Pressure Control Solenoid (SLB1)	>= 1358mA	A voltage condition Ignition switch is in crank or run position Not in service mode Reading EEPROM finish Not in Limp home mode(refer to attachment#3) No active DTC	10.2V < Battery voltage <= 18.0V ON (SID$10-subfunc$02, SID$28, SID$AE) TCM : U0073, U0100 P0974, P0973, P0963, P0962, P0748, P0967, P0966, P0778, P0971, P0970, P0798, P2761, P0722, P077D, P077C, P0717, P07C0, P07BF, P0706, P0705, P0601, P0562, P0563, P2534, P0604, P0602, P0776, P0747, P0746, P0777, P0797. P0796 ECM : Engine speed failure, Accelerator Effective Position failure, Engine Non-Transmission Regulated Steady State Torque failure	5 failures 100ms continuously(per 1 failure)	Type A
					Time after the all following conditions are satisfied A voltage condition	2.0 sec continuously 10.2V < Battery voltage <= 18.0V		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL illum.
Shift Solenoid (S1) Control Circuit Low	P0973	This DTC detects a short to ground in the Shift Solenoid (S1) circuit	S1 monitor (when TCM command "ON" signal (<=9.5V) to shift solenoid (S1))	"OFF" signal (> 9.5V)	Ignition switch is in crank or run position Not in service mode Reading EEPROM finish Not in Limp home mode(refer to attachment#3) No active DTC TCM command "ON" signal to Shift Solenoid (S1) Time after the command of shift solenoid (S1) changed	ON (SID$10-subfunc$02, SID$28, SID$AE) TCM : U0073, U0100 P0974, P0973, P0963, P0962, P0748, P0967, P0966, P0778, P0971, P0970, P0798, P2761, P0722, P077D, P077C, P0717, P07C0, P07BF, P0706, P0705, P0601, P0562, P0563, P2534, P0604, P0602, P0776, P0747, P0746, P0777, P0797, P0796 ECM : Engine speed failure, Accelerator Effective Position failure, Engine Non-Transmission Regulated Steady State Torque failure 10ms	5 failures 100ms continuously(per 1 failure)	Type A
					Time after the all following conditions are satisfied	2.0 sec continuously		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL illum.
Shift Solenoid (S1) Control Circuit High	P0974	This DTC detects a short to high or open in the Shift Solenoid (S1) circuit	S1 monitor (when TCM command "OFF" signal (>9.5V) to shift solenoid (S1))	"ON" signal (<=9.5V)	A voltage condition	10.2V < Battery voltage <= 18.0V	5 failures 100ms continuously(per 1 failure)	Type A
					Ignition switch is in crank or run position	ON		
					Not in service mode	(SID$10-subfunc$02, SID$28, SID$AE)		
					Reading EEPROM finish			
					Not in Limp home mode(refer to attachment#3)			
					No active DTC	TCM : U0073, U0100 P0974, P0973, P0963, P0962, P0748, P0967, P0966, P0778, P0971, P0970, P0798, P2761, P0722, P077D, P077C, P0717, P07C0, P07BF, P0706, P0705, P0601, P0562, P0563, P2534, P0604, P0602, P0776, P0747, P0746, P0777, P0797, P0796 ECM : Engine speed failure, Accelerator Effective Position failure, Engine Non-Transmission Regulated Steady State Torque failure		
					TCM command "OFF" signal to Shift Solenoid (S1)			
					Time after the command of shift solenoid (S1) changed	10ms		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL illum.
Ignition Switch Run/Start Position Circuit Low	P2534	This DTC checks the Ignition Switch Run/Start Position Circuit voltage for electrical integrity	IG input	OFF (<= 0.2 * Battery voltage)	Battery voltage Engine Controller Run Crank Terminal Status Engine Running TCM can receive frame ECM TCM does not receive “BUS OFF” state from CAN controller No active DTCs	>= 9 V Active TRUE TCM : U0073 , U0100	20 failures 1000 ms continuously(per 1 failure)	Type A
Torque			[Case 1] Sum of the difference (absolute value) of target current and feedback current *renewed every 10msec	>= 20000	Time after the all following conditions are satisfied A voltage condition Ignition switch is in crank or run position Not in service mode Reading EEPROM finish Battery voltage Feedback current Not in Limp home mode(refer to attachment#3) No active DTC	2.0 sec continuously 10.2V < Battery voltage <= 18.0V ON (SID$10-subfunc$02, SID$28, SID$AE) >10.5V for 500msec continuously < 1358mA TCM :	>= 60000	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL illum.
Converter Clutch Pressure Control Solenoid (SLU) Control Circuit/Open	P2761	This DTC detect difference of target current and feedback current				U0073, U0100		Type A
			[Case 2] Difference (absolute value) of target current and feedback current	> 50mA for 2 sec continuously		P0974, P0973, P0963, P0962, P0748, P0967, P0966, P0778, P0971, P0970, P0798, P2761, P0722, P077D, P077C, P0717, P07C0, P07BF, P0706, P0705, P0601, P0562, P0563, P2534, P0604, P0602, P0776, P0747, P0746, P0777, P0797, P0796, P2763, P2764 ECM : Engine speed failure, Accelerator Effective Position failure, Engine Non-Transmission Regulated Steady State Torque failure	> 50mA for 3 sec continuously	
					Time after the all following conditions are satisfied A voltage condition Ignition switch is in crank or run position Not in service mode Reading EEPROM finish Not in Limp home mode(refer to attachment#3) No active DTC	2.0 sec continuously 10.2V < Battery voltage <= 18.0V ON (SID$10-subfunc$02, SID$28, SID$AE) TCM :		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL illum.
Torque Converter Clutch Pressure Control Solenoid (SLU) Circuit High	P2763	This DTC detects a short to high in the Torque Converter Clutch Pressure Control Solenoid (SLU) circuit	Feedback current of Torque Converter Clutch Pressure Control Solenoid (SLU)	>= 1358mA		U0073, U0100 P0974, P0973, P0963, P0962, P0748, P0967, P0966. P0778. P0971, P0970, P0798, P2761, P0722, P077D, P077C, P0717, P07C0, P07BF, P0706, P0705, P0601, P0562, P0563, P2534, P0604, P0602, P0776, P0747, P0746, P0777, P0797. P0796 ECM : Engine speed failure, Accelerator Effective Position failure, Engine Non-Transmission Regulated Steady State Torque failure	5 failures 100ms continuously(per 1 failure)	Type B
					Time after the all following conditions are satisfied A voltage condition Ignition switch is in crank or run position Not in service mode Reading EEPROM finish Not in Limp home mode(refer to attachment#3) No active DTC	2.0 sec continuously 10.2V < Battery voltage <= 18.0V ON (SID$10-subfunc$02, SID$28, SID$AE) TCM : U0073, U0100		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL illum.
Torque Converter Clutch Pressure Control Solenoid (SLU) Circuit Low	P2764	This DTC detects a short to ground or open in the Torque Converter Clutch Pressure Control Solenoid (SLU) circuit	Feedback current of Torque Converter Clutch Pressure Control Solenoid (SLU)	< 20mA		P0974, P0973, P0963, P0962, P0748, P0967, P0966, P0778, P0971, P0970, P0798, P2761, P0722, P077D, P077C, P0717, P07C0, P07BF, P0706, P0705, P0601, P0562, P0563, P2534, P0604, P0602, P0776, P0747, P0746, P0777, P0797, P0796 ECM : Engine speed failure, Accelerator Effective Position failure, Engine Non-Transmission Regulated Steady State Torque failure	5 failures 100ms continuously(per 1 failure)	Type B
Control Module Communication Bus A Off	U0073	This DTC monitors for BUS OFF condition	BUS ON/OFF state from CAN Controller	="BUS OFF"	Time after the all following conditions are satisfied A voltage condition Ignition switch is in crank or run position Not in service mode Reading EEPROM finish	2.0 sec continuously 10.2V < Battery voltage <= 18.0V ON (SID$10-subfunc$02, SID$28, SID$AE)	500 msec continuously	Type A
					Time after the all following conditions are satisfied	2.0 sec continuously		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL illum.
Lost Communication with ECM	U0100	This DTC monitors for a loss of communication with ECM	TCM cannot detect any frame of ECM (ID$0BE, $0C9, $191, $1A1, $3E9, $4C1)	> 200 msec continuously	A voltage condition Ignition switch is in crank or run position Not in service mode Reading EEPROM finish TCM does not receive “BUS OFF” state from CAN controller No active DTC	10.2V < Battery voltage <= 18.0V ON (SID$10-subfunc$02, SID$28, SID$AE) TCM : U0073	50 failures	Type A

[Notes]

*1: C1 OFF control
When Pressure Control Solenoid (SLC1) MIN pressure stuck failure returned, the control that a car prevents from accelerating suddenly

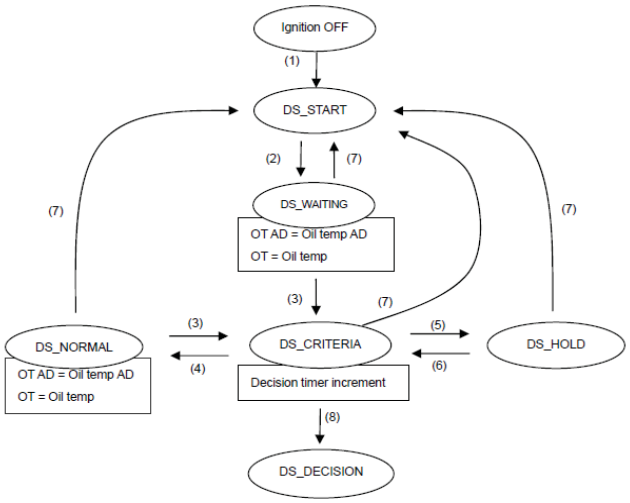
*2: Prohibit Neutral Judgment flag
The following Criteria is met, Prohibit Neutral Judgment flag = TRUE

Criteria: 1 and 2 and 3 and 4 and 5 and 6 and 7, continuously 100 msec
1. Current gear <= 3rd gear
2. Transmission range switch D or 2 or L
3. Engine speed - Input shaft speed > 500 rpm
4. Output shaft speed = 0 rpm
5. Not during Neutral control
6. Not during shifting
7. 600 msec after garage control

*3: wheel spin condition
If following condition (1 and 2 and 3) detected for 300 msec continuously, set “wheel spin
1. 300 rpm < Output shaft speed < 3000 rpm
2. Accelerator position > 70 %
3. Change speed of Output shaft speed < -50 rpm/sec

*4: Torque phase A, Torque phase B
It is one step of up shifting control, which is on torque phase
And it divides two steps (A and B)

*[CASE No.1] DETECTION CRITERIA of TFT Sensor Performance



Condition

(1) Ignition ON
(2) Window1 is satisfied
(3) OT <= 20 deg.C or OT_base <= 20 deg.C AND
Except for Range P or R or N AND
VS flag = TRUE
(4) | OT AD - Oil temp AD | > 10 (A/D value) OR
| OT_base AD - Oil temp AD | > 10 (A/D value)
(5) Range P or R or N
(6) Except for Range P or R or N
(7) Window1 is not satisfied
(8) Decision timer for 10 min continuously

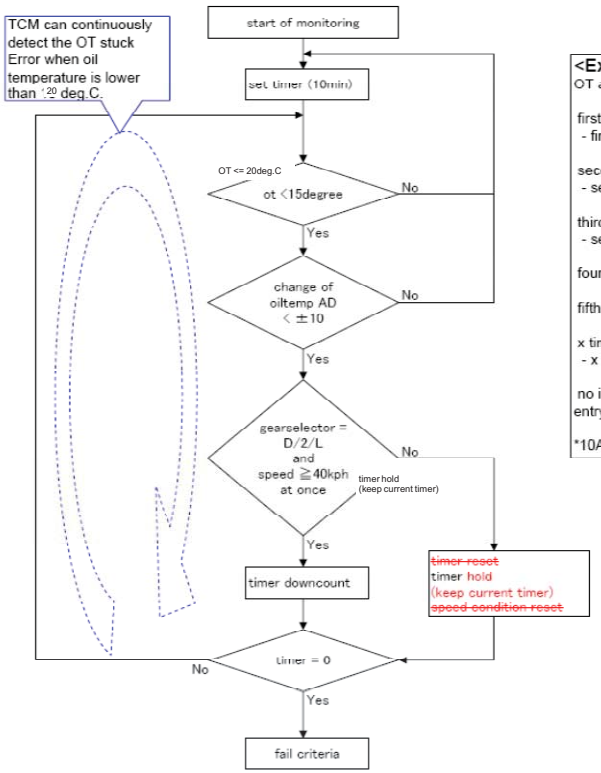
VS flag: This flag becomes TRUE, when vehicle speed >= 40 km/h at least once.
Oil temp AD: A/D value of Oil temp
OT: Current Oil temp for failure detection / OT_AD: A/D value of OT
OT base: Base Oil temp for failure detection / OT baseAD: A/D value of OT base

Action

(1) OT_base = Oil temp, OT_base_AD = Oil temp AD, OT = 20 deg.C, OT_AD = 0, VS flag = FALSE, Decision timer clear
(2) None
(3) None
(4) Decision timer clear, OT_base = Oil temp, OT_base AD = Oil temp AD, VS flag = FALSE
(5) None
(6) None
(7) Decision timer clear, VS flag = FALSE
(8) Decision timer clear

*[CASE No.1] DETECTION CRITERIA of TFT Sensor Performance

Flowchart of detection specification of oil temperature failure (STUCK)



<Example>
OT at start -10 deg.C*

first check while OT increase from -10 deg.C - to -7 deg.C
- first time stuck check performed P0711

second check while OT increase from -4 deg.C - to -1 deg.C
- second time stuck check performed P0711

third check while OT increase from -1 deg.C - to 2 deg.C
- second time stuck check performed P0711

fourth check....

fifth check....

x times check (<=20°C) while OT increase from y°C - to Z °C
- x time stuck check performed P0711

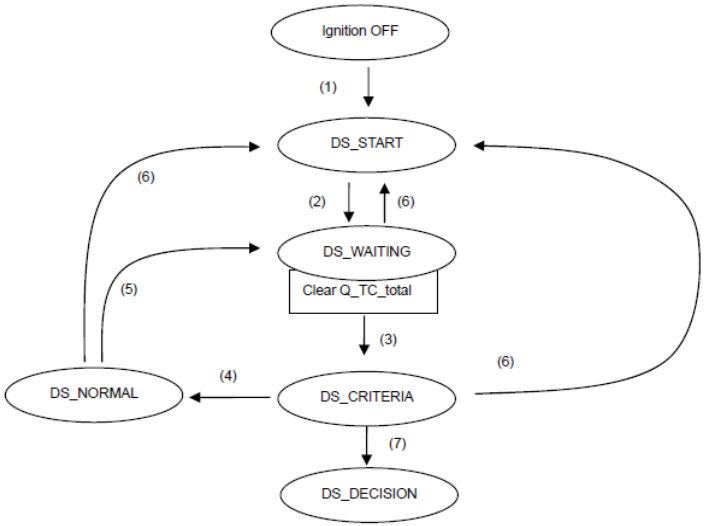
no increase of OT because of stuck to < 15°C -> P-Code entry

*10AD is about 2 to 5 deg.C

*[CASE No.2] DETECTION CRITERIA of TFT Sensor Performance

Following actions are executed every 100 msec.

- Calculate Q_TC (*1)
- Q_TC_total = Q_TC_total + Q_TC (This calculation is carried out only when Q_TC value is more than 0)



Condition

(1) Ignition ON
(2) Window2 is satisfied
(3) Oil temp < 20 deg.C
(4) Oil temp >= 20 deg.C
(5) Oil temp < 20 deg.C
(6) Window2 is not satisfied
(7) Q_TC_total [kJ] >= ctal_map [kJ]

Action

(1) Clear Q_TC_total, Clear otcal_map
(2) None
(3) octal_map(*2) = Necessary calorific value calculated from Oil temp
(4) None
(5) None
(6) None
(7) None

*1: Q_TC [kJ] : The calorific value of the torque converter.

Q_TC = (Acons X TC_Capacity X EGrpm^2 X (EGrpm – (inRpm X TC_trqRatio))) / 10

(Q_TC is calculated only in the case of outRpm >= 150 rpm)

Acons : Coefficient of unit alignment

TC_Capacity : Torque Converter Capacity [Nm/rpm^2]

TC_trqRatio : Torque Ratio

Label	Value
Acons	1.050×10^{-4}

*2: otcal_map:

Necessary calorific value is calibrated by each vehicle to reach the 20deg.C from start temperature.

Oiltemp	-20	-10	0	10	19
Necessary calorific value [kJ] *	837	624	429	234	60

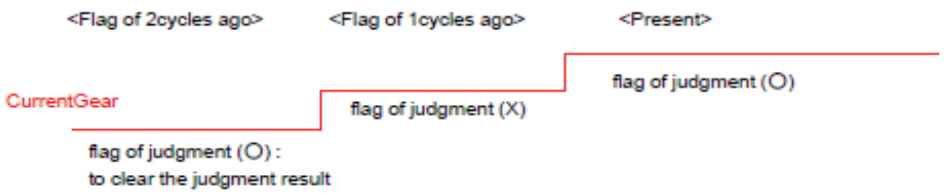
* To be determined by vehicle evaluation

*Pressure Control Solenoid MIN stuck

<Pattern of count_spec_fail_XX>

- To count up the count_spec_fail_[C1,C2,B1] according the following pattern
- ○ means the pass criteria gear ratio : flag_spec_pass [1st,2nd,3rd,4th]
- × means the fail detection gear ratio : flag_spec_fail [2nd,3rd,4th]
- To clear the judgment before 2 cycles.

Cycles



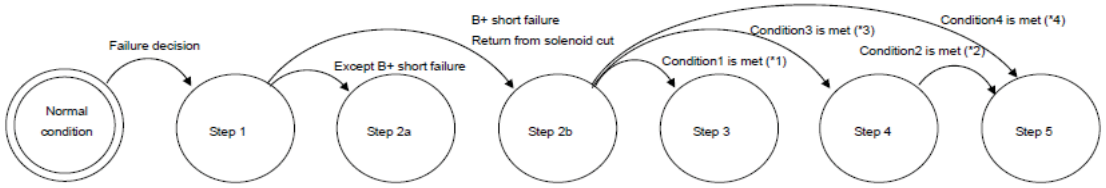
Increment pattern of counter

Pattern		Specific counter	1st	2nd	3rd	4th
A	SLC1	count_spec_fail_C1	–	–	×	○
B			–	×	–	○
C			–	×	×	–
D	SLC2	count_spec_fail_C2	–	–	×	×
E			–	○	–	×
F			–	○	×	–
G			○	–	×	–
H	SLB1	count_spec_fail_B1	–	–	○	×
I			–	×	–	×
J			–	×	○	–
K			○	×	–	–

*Limp Home Mode 1

: DTCs that Limp home mode 1 as "fail safe" are;
P0963 P0962 P0748 P0967 P0966 P0778 P0971 P0970 P0798 P2761

Limp home mode 1:
Pressure Control Solenoid (SLC1,SLC2,SLB1) B+/GND short, Feedback current Stick, Torque Converter Clutch Pressure Control Solenoid (SLU) Feedback current Stick



Limp home mode 1			Step 1		Step 2a (limp home gear)		Step 2b		Step 3 (limp home gear)		Step 4		Step 5 (limp home gear)	
			Control	Torque limitation	Control	Torque limitation	Control	Torque limitation	Control	Torque limitation	Control	Torque limitation	Control	Torque limitation
Gear condition at failure decision	Reverse		Keep condition	Solenoid cut (Shift to 3rd) (*5)	Keep condition	(*5)	Keep condition	(*5)	Keep condition	(*5)	Keep condition	(*5)	Keep condition	(*5)
	C1	1st					Shift to 2nd		Shift to 2nd		Keep gear (*7)		Keep gear (*7)	
		2nd					Shift to 3rd				Shift to 4th		Shift to 2nd (*7)	
		3rd												
		4th												
	C2	1st					Shift to 3rd		Shift to 3rd		Shift to 1st		Shift to 2nd	
		2nd									Shift to 2nd			
		3rd												
		4th					Keep gear							
	B1	1st					Shift to 2nd		Shift to 2nd		Shift to 1st		Shift to 3rd	
		2nd									Shift to 3rd			
		3rd					Shift to 4th							
		4th												
	SLU	ALL					-		-		-		-	
Reverse control(*6)			Impossible		Impossible		Possible		Possible		Possible		Possible	

*1: Condition 1
(1 ~~or~~ and ((2 and 3) or 4)) are fulfilled
1. Gear ratio is normal
2. Vehicle speed <= 20 kph
3.(EGtrq_noAcc <= 30 Nm and
No detection of Control Module Communication Bus A Off and
No detection of Lost communication with ECM and
No detection of Engine Non-Transmission Regulated Steady State Torque Validity)
4. Vehicle speed <= 10 kph

*2: Condition 2
((1 and 2) or 3) are fulfilled
1. Vehicle speed <= 20 kph
2.(EGtrq_noAcc <= 30 Nm and
No detection of Control Module Communication Bus A Off and
No detection of Lost communication with ECM and
No detection of Engine Non-Transmission Regulated Steady State Torque Validity)
3. Vehicle speed <= 10 kph

*3: Condition 3
(1 and 2) are fulfilled
1. Gear ratio is not normal
2. Condition 2 is not fulfilled

*4: Condition 4
(1 and 2) are fulfilled
1. Gear ratio is not normal
2. Condition 2 is fulfilled

*5: Torque limitation in Emergency mode 1 (step 1 to 5)
Torque limitation = (T/M limit torque) / (T/C torque ratio)

T/M limit torque value

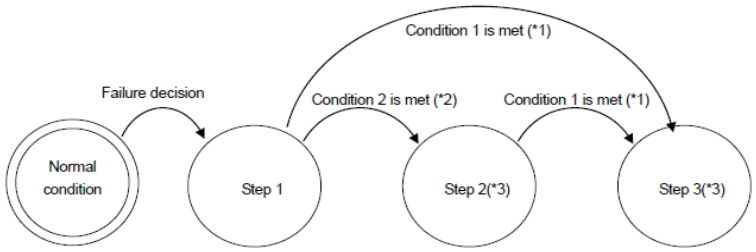
Range	Gear		
D range	1ST	(Nm)	100
	2ND	(Nm)	100
	3RD	(Nm)	100
	4TH	(Nm)	100
R range	-	(Nm)	100

*6: Reverse control
It is the control for safety
When it puts into Range R over 11 km/h, it is not to go to reverse, but keep neutral

*7: Special 2nd gear for failsafe

*Limp Home Mode 2

: DTCs that Limp home mode 2 as "fail safe" are;
P0722 P0776 P0747 P0746 P0777 P0797 P0796



Limp home mode 2		Step 1		Step 2		Step 3 (limp home gear)	
		Control	Torque limitation	Control	Torque limitation	Control	Torque limitation
Gear condition at failure decision	C1 MAX	Keep gear.	(*4)	keep gear	(*4)	Shift to 2nd	(*4)
	C1 MIN			keep gear		Shift to 2nd (*6) or 4th	
	C2 MAX			keep gear		Shift to 3rd	
	C2 MIN / S1 MAX			Shift to 2nd		Shift to 2nd	
	B1 MAX			keep gear		Shift to 2nd	
	B1 MIN			Shift to 3rd		Shift to 3rd	
	No Pulse (*5)			keep gear		Shift to 4th	
Reverse control		Possible(*7)		Possible(*7)		Possible(*7)	

*1: Condition 1
((1 and 2) or 3) are fulfilled
1. Vehicle speed <= 20 kph
2.(EGtrq_noAcc <= 30 Nm and
No detection of Control Module Communication Bus A Off and
No detection of Lost communication with ECM and
No detection of Engine Non-Transmission Regulated Steady State Torque Validity)
3. Vehicle speed <= 10 kph
*2: Condition 2 (Judgment of the over revolution): outRpm < 6000 rpm / limp home gear ratio + -100 (every gear step can set value) rpm
*3: Return to Step 1, when transmission range switch changed except forward range (D or 2 or L)
*4: Torque limitation in Emergency mode 4 2 (step 1 to 3)
Torque limitation = (T/M limit torque) / (T/C torque ratio)

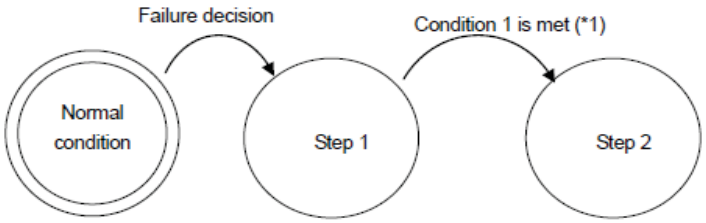
T/M limit torque value

Range	Gear		
D range	1ST	(Nm)	100
	2ND	(Nm)	100
	3RD	(Nm)	100
	4TH	(Nm)	100
R range	-	(Nm)	100

*5: Output Speed Sensor No Pulse
*6: Special 2nd gear for failsafe
*7: In the case of Output Speed Sensor No Pulse failure, reverse control is impossible.

*Limp Home Mode 3

: DTCs that Limp home mode 3 as "fail safe" are;
P077D P077C P0717 P07C0 P07BF P0706 P0705 P0601 P0563 P0604 P0602 U0073 U0100



Limp home mode 3		Step 1		Step 2 (limp home gear)	
		Control	Torque limitation	Control	Torque limitation
Gear condition at failure decision	Reverse	Keep condition	(*2)	Keep condition	(*2)
	1st gear	Keep gear.		Shift to 2nd(*3)	
	2nd gear				
	3rd gear				
	4th gear				
Reverse control		Possible(*4)		Possible(*4)	

*1: Condition 1
((1 and 2) or 3) are fulfilled
1. Vehicle speed <= 20 4 kph
2.(EGtrq_noAcc <= 30 Nm and
No detection of Control Module Communication Bus A Off and
No detection of Lost communication with ECM and
No detection of Engine Non-Transmission Regulated Steady State Torque Validity)
3. Vehicle speed <= 10 0 kph

*2: Torque limitation in Emergency mode 3 (step 1 to 2)
Torque limitation = (T/M limit torque) / (T/C torque ratio)
T/M limit torque value

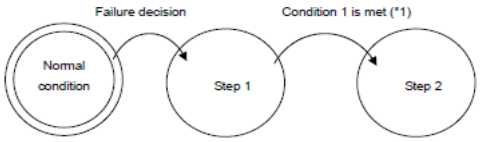
Range	Gear		
D range	1ST	(Nm)	100
	2ND	(Nm)	100
	3RD	(Nm)	100
	4TH	(Nm)	100
R range	-	(Nm)	100

*3: In the case of Transmission Range Switch GND short, Open failure, shift to 3rd gear. (Not 2nd gear)
*4: In the case of Output Speed Sensor B+/GND short failure, reverse control is impossible.

*Limp Home Mode 4

: DTCs that Limp home mode 4 as "fail safe" are;
P0974 P0973

Limp home mode 4:
Shift Solenoid (S1) B+/GND short



Limp home mode 4		Step 1		Step 2 (limp home gear)	
		Control	Torque limitation	Control	Torque limitation
Gear condition at failure decision	Reverse	Keep condition	(*2)	Keep condition	(*2)
	1st gear	Keep gear		Shift to 2nd	
	2nd gear				
	3rd gear	Shift to 3rd			
	4th gear				
Reverse control		Possible		Possible	

*1: Condition 1
((1 and 2) or 3) are fulfilled
1. Vehicle speed <= 20 kph
2. (EGtrq_noAcc < 30 Nm and
No detection of Control Module Communication Bus A Off and
No detection of Lost communication with ECM and
No detection of Engine Non-Transmission Regulated Steady State Torque Validity)
3. Vehicle speed <= 10 kph

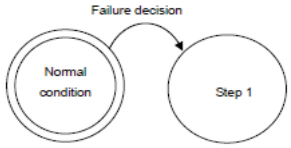
*2: Torque limitation in Emergency mode 4 (step 1 to 2)
Torque limitation = (T/M limit torque) / (T/C torque ratio)
T/M limit torque value

Range	Gear		
D range	1ST	(Nm)	100
	2ND	(Nm)	100
	3RD	(Nm)	100
	4TH	(Nm)	-
R range	-	(Nm)	100

*Limp Home Mode 5

: DTCs that Limp home mode 5 as "fail safe" are;
P0562 P2534

Limp home mode 5:
System Voltage Low voltage, Ignition Switch Run/Start Position



Limp home mode 5		Step 1 (limp home gear)	
		Control	Torque limitation
Gear condition at failure decision	Reverse	keep condition	(*1)
	1st gear	Shift to 3rd	
	2nd gear		
	3rd gear		
	4th gear		
Reverse control		Impossible	

*1: Torque limitation in Emergency mode 5 (step 1)
Torque limitation = (T/M limit torque) / (T/C torque ratio)

T/M limit torque value

Range	Gear		
D range	1ST	(Nm)	-
	2ND	(Nm)	-
	3RD	(Nm)	100 *2
	4TH	(Nm)	-
R range	-	(Nm)	100 *2

*2: T/M limit torque value = MIN(D range 3RD, R range)

Gear state matrix

Current Gear	S1		SLC1		SLC2		SLB1		SLU	
	stuck at MAX pressure	stuck at MIN pressure	stuck at MAX pressure	stuck at MIN pressure	stuck at MAX pressure	stuck at MIN pressure	stuck at MAX pressure	stuck at MIN pressure	stuck at MAX pressure	stuck at MIN pressure
P or N	P or N	P or N	P or N	P or N	P or N	P or N	P or N	P or N	P or N	P or N
1st(OFF/ON)	1st_Lup _OFF	1st(OFF/ON)	1st(OFF/ON)	Neutral	3rd(OFF/ON)	1st (OFF/ON)	2nd(OFF/ON)	1st(OFF/ON)	1st_Lup _ON	1st_Lup _OFF
2nd(OFF/ON)	2nd_Lup_OFF	2nd(OFF/ON)	2nd(OFF/ON)	Neutral (only B1)	3rd(OFF/ON) or 4th(OFF/ON)	2nd (OFF/ON)	2nd(OFF/ON)	1st (like Neutral)	2nd_L-up_ON	2nd Lup_OFF
3rd(OFF/ON)	[Case A] 1st_Lup _OFF (like Neutral) / [Case B] 3rd_Lup_OFF	3rd(OFF/ON)	3rd(OFF/ON)	Neutral (only C2)	3rd(OFF/ON)	1st (like Neutral)	2nd(OFF/ON) or 4th(OFF/ON)	3rd(OFF/ON)	3rd_L-up_ON	3rd Lup_OFF
4th(OFF/ON)	[Case A] Neurtal(only B1) / [Case B] 4th_Lup_OFF	4th(OFF/ON)	2nd(OFF/ON) or 3rd(OFF/ON)	4th(OFF/ON)	4th(OFF/ON)	Neutral (only B1)	4th(OFF/ON)	Netural (only C2)	4th_L-up_ON	4th Lup_OFF
1st gear with engine brake	1st gear with engine brake	3rd_L-up_ON	1st gear with engine brake	Neutral (Only B3)	1st gear with engine brake	1st (like Neutral)	2nd_Lup _OFF	1st gear with engine brake	1st gear with engine brake	1st (like Neutral)
Rev	Rev	Rev	Rev	Rev	Rev	Rev	Rev	Rev	Rev	Rev
Reverse control	Reverse control	Reverse control	Reverse control	Reverse control	Rev	Reverse control	Reverse control	Reverse control	Reverse control	Rev

Green cells: Current Gear and L-up are in condition that these are different from an order.
"(OFF/ON)": To depended on L-up control

Solenoid pattern matrix

POSITION		SOLENOID					CLUTCH			BRAKE		O.W.C
		SLC1 (N/O)	SLC2 (N/O)	SLD1 (N/C)	SLU (N/C)	S1 (N/C)	C-1	C-2	C-3	B-1	B-3	F-2
P		○	□	×	×	○	×	×	×	×	×	×
R	V≦Y	○	□	×	×	○	×	×	○	×	○	×
	V>Y	○	○	×	○	○	×	×	○	×	×	×
N		○	□	×	×	○	×	×	×	×	×	×
D/2/L	1ST	△(□)	○	×	◎	○(V≦X) / ×(V>X)	○	×	×	×	×	○
	E/G BRAKE 2ND	△(□)	△	×	○	○	○	×	×	×	○	○
		△(□)	○	○	◎	○(V≦X) / ×(V>X)	○	×	×	○	×	×
	N cont	△(□)	○	△	×	○	△	×	×	△	×	○
	3RD	△	△(□)	×	◎	×	○	○	×	×	×	×
	4TH	○	△(□)	△	◎	×	×	○	×	○	×	×
Remarks	○	ON(N/O: Close, N/C: Open)					APPLIED					
	×	OFF(N/O: Open, N/C: Close)					RELEASE					
	◎	ON: L-UP ON / OFF: L-UP OFF					-					
	△	CONTROLED					NEUTRAL CONTROL					
	□	CONTROLED(LINE PRESSURE)					CONTROL					

※ V,X,Y is vehicle speed.