COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
Transmission Control Module (TCM) Read Only Memory (ROM)	P0601	To detect that the value of check sum calculations(stored in ROM memory) executed after Ignition switch is in crank or run position	If there are a difference from the correct check sum value stored in flash ROM, the second calculation is made differences twice detection is criteria	1 time	-	-	1 failure	Type A
Transmission Control Module (TCM) Random Access Memory (RAM)	P0604	To detect that the value of RAM memory executed after Ignition switch is in crank or run position	TCM cannot carry out all RAM from Step 1 to Step 4 in initialize routine.	-Step 1: TCM write 0x5A5A5A5A data in the RAM. -Step 2: TCM read 0x5A5A5A5A data from the RAM. -Step 3: TCM write 0xA5A5A5A5 data in the RAM. -Step 4: TCM read 0xA5A5A5A5 data from the RAM.	-	-	1 failure	Type B
Transmission Range Sensor Circuit Malfunction (No Signal)	P0705	To detect no signal of transmission range sensor circuit.	All switches are OFF	> 2 seconds	A voltage condition Engine Speed Ignition switch is in crank or run position Not in emergency mode(see the attachment#3) Vehicle Speed No active DTC	10.2V < Battery voltage < 18.0V for 2sec >400rpm ON for 2sec >= 30 km/h TCM : U0001 (High Speed CAN Communication Bus) U0100 (Lost Communication with ECM) P0974, P0973, P0977, P0976, P0788 P0787, P0963, P0962, P0601, P2533	28 seconds continuously	Type B
Transmission Range Sensor Circuit Malfunction (Short)	P0706	To detect 2 or more signals of transmission range sensor circuit	more than or equal to 2 switches are ON	> 2 seconds	A voltage condition	10.2V < Battery voltage < 18.0V for 2sec	2 seconds continuously (per 1	

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					Engine Speed Ignition switch is in crank or run position Not in emergency mode(see the attachment#3) No active DTC	>400rpm ON for 2sec TCM : U0001 (High Speed CAN Communication Bus) U0100 (Lost Communication with ECM) P0974, P0973, P0977, P0976, P0788 P0787, P0963, P0962, P0601, P2533	failure) 5 failures	Type B
Transmission Fluid Temperature (TFT) Sensor Performance	P0711	[Detection Case No.1] To detect Transmission Fluid Temperature (TFT) Sensor circuit by Comparison of Sensor Voltage and Input A/D value.	Comparison of Sensor Voltage and Input A/D value	Refer to Flow chart of Attachment#1.1	A voltage condition Engine Speed Ignition switch is in crank or run position Not in emergency mode(see the attachment#3) Input A/D value of TFT No active DTC	10.2V < Battery voltage < 18.0V for 2sec >400rpm ON for 2sec 10 (0.05V) <= Input A/D value <= 1010 (4.94V) TCM : U0001 (High Speed CAN Communication Bus) U0100 (Lost Communication with ECM)	1 failure of Detection Case No.1 or No.2 (Refer to Flow chart of Attachments#1 or #2 For details)	

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
						P0974, P0973, P0977, P0976, P0788 P0787, P0963, P0962, P0601, P2533 P0705, P0706		Type B
		[Detection Case No.2] To detect Transmission Fluid Temperature (TFT) Sensor circuit by Comparison of Sensor Voltage and Estimation value.	Comparison of Sensor Voltage and Estimation value	Refer to Flow chart of Attachment#1.2	A voltage condition Engine Speed Ignition switch is in crank or run position Not in emergency mode(see the attachment#3) Input A/D value of TFT No active DTC	10.2V < Battery voltage < 18.0V for 2sec >400rpm ON for 2sec 10 (0.05V) <= Input A/D value <= 1010 (4.94V) TCM : U0001 (High Speed CAN Communication Bus) U0100 (Lost Communication with ECM) P0974, P0973, P0977, P0976, P0788 P0787, P0963, P0962, P0601, P2533 P0717		
Transmission Fluid Temperature (TFT) Sensor Circuit Low Voltage	P0712	This DTC detects a short to ground in Transmission Fluid Temperature (TFT) Sensor circuit	Input A/D value of TFT	< 10 (0.05V)	A voltage condition Engine Speed Ignition switch is in crank or run position Not in emergency mode(see the attachment#3)	10.2V < Battery voltage < 18.0V for 2sec >400rpm ON for 2sec	10 seconds continuously(per 1 failure) 6 failures	

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					No active DTC	TCM : U0001 (High Speed CAN Communication Bus) U0100 (Lost Communication with ECM) P0974, P0973, P0977, P0976, P0788 P0787, P0963, P0962, P0601, P2533		Type B
Transmission Fluid Temperature (TFT) Sensor Circuit High Voltage	P0713	This DTC detects a short to high or open in Transmission Fluid Temperature (TFT) Sensor circuit	Input A/D value of TFT	> 1010 (4.94V)	A voltage condition Engine Speed Ignition switch is in crank or run position Not in emergency mode(see the attachment#3) Drive time (as the following 1 condition) Transmission range sensor No active DTCs	10.2V < Battery voltage < 18.0V for 2sec >400rpm ON for 2sec > 1 min Except for P or N range for 10min TCM : P0705, P0706 U0001 (High Speed CAN Communication Bus) U0100 (Lost Communication with ECM) P0974, P0973, P0977, P0976, P0788 P0787, P0963, P0962, P0601, P2533	1 seconds continuously(per 1 failure) 12 failures	Type B
Input Speed Sensor	P0717	To detect Input shaft speed sensor circuit	The pulse of Input shaft speed sensor (while TCM detect 4 pulses of output shaft speed sensor)	No pulse	A voltage condition Engine Speed Ignition switch is in crank or run position	10.2V < Battery voltage < 18.0V for 2sec >400rpm ON for 2sec	500 failures (1 failure is no pulse of input shaft speed sensor while TCM detect 4pulses of output shaft speed	

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					Not in emergency mode(see the attachment#3) No active DTC Time of selection lever position change from P,R or N range to others Vehicle Speed calculated by output Speed sensor >= 66km/h or TFT>=20deg.C Output Shaft Speed	 TCM : U0001 (High Speed CAN Communication Bus) U0100 (Lost Communication with ECM) P0974, P0973, P0977, P0976, P0788 P0787, P0963, P0962, P0601, P2533 P0722 P0705, P0706 >=10sec >=2.5sec >= 600 rpm	sensor.)	Type A
Output Speed Sensor	P0722	To detect Output shaft speed sensor circuit	The pulse of Output shaft speed sensor (while TCM detect 178 pulses of input shaft speed sensor.)	No pulse	A voltage condition Engine Speed Ignition switch is in crank or run position Not in emergency mode(see the attachment#3) No active DTC	10.2V < Battery voltage < 18.0V for 2sec >400rpm ON for 2sec TCM : U0001 (High Speed CAN Communication Bus) U0100 (Lost Communication with ECM) P0974, P0973, P0977, P0976, P0788 P0787, P0963, P0962, P0601, P2533 P0717 P0705, P0706	500 failures (1 failure is no pulse of output shaft speed sensor while TCM detect 178pulses of input shaft speed sensor.)	Type A

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					Not in emergency mode(see the attachment#3)			
					Time of selection lever position change from P,R or N range to others	>=10sec		
					Vehicle Speed calculated by input Speed sensor >= 66km/h or TFT>=20deg.C	>=2.5sec		
					Input revolution (rpm) / Gear ratio (For Gear ratio information, refer to Attachment#2.1)	>= 300 rpm		
Torque Converter Clutch (TCC) System –Stuck OFF	P0741	Determines if the TCC System is stuck off within the normal operating range	Comparison of Shift Solenoid Voltage and Input/Output shaft speed calculation.	Refer to CONDITON OF TCC SOLENOID STUCK OFF/ON of attachment#2.2	Refer to CONDITON OF TCC SOLENOID STUCK OFF/ON of attachment#2.2		1 failure	
					A voltage condition	10.2V < Battery voltage < 18.0V for 2sec	(Refer to CONDITON OF TCC SOLENOID STUCK OFF/ON of attachment#2.2)	
					Engine Speed	>400rpm		
					Ignition switch is in crank or run position	ON for 2sec		
					Not in emergency mode(see the attachment#3)			
					No active DTC	TCM :		
						U0001 (High Speed CAN Communication Bus)		
						U0100 (Lost Communication with ECM)		
						P0974, P0973, P0977, P0976, P0788 P0787, P0963, P0962, P0601, P2533		Type B
						P0717, P0722		
						P0705, P0706		
						P2769, P2770		
						P0711, P0712, P0713		
						ECM :		

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
						P0101, P0102, P0103, P16F3, P0106 P0107, P0108, P16F3, P0171, P0172 P0201, P0202, P0203, P00B7, P0116, P0117, P0118, P0128		
					Time after selection lever position from P,R,N,2,L to D	4.0sec		
					Time after gear changed	2.0 sec		
					TCC Solenoid	Enabled		
					Time after TCC Solenoid from Disabled to Enabled.	2.0 sec		
					Engine Coolant Temperature	>= 60 deg		
					Transmission Oil Temperature	>= 20 deg		
					Accelerator Effective Position	>=10%		
Torque Converter Clutch (TCC) System –Stuck ON	P0742	Determines if the TCC System is stuck on within the normal operating range	Comparison of Shift Solenoid Voltage and Input/Output shaft speed calculation.	Refer to CONDITON OF TCC SOLENOID STUCK OFF/ON of attachment#2.2	Refer to CONDITON OF TCC SOLENOID STUCK OFF/ON of attachment#2.2		1 failure (Refer to CONDITON OF TCC SOLENOID STUCK OFF/ON of attachment#2.2)	Type B
					A voltage condition	10.2V < Battery voltage < 18.0V for 2sec		
					Engine Speed	>400rpm		
					Ignition switch is in crank or run position	ON for 2sec		
					Not in emergency mode(see the attachment#3)			
					No active DTC	TCM : U0001 (High Speed CAN Communication Bus) U0100 (Lost Communication with ECM) P0974, P0973, P0977, P0976, P0788 P0787, P0963, P0962, P0601, P2533 P0717, P0722 P0705, P0706		

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
						P2769, P2770 P0711, P0712, P0713 ECM : P0101, P0102, P0103, P16F3, P0106 P0107, P0108, P16F3, P0171, P0172 P0201, P0202, P0203, P0204, P0300 P00B7, P0116, P0117, P0118, P0128		
					Time after selection lever position from P,R,N,2,L to D	4.0sec		
					Time after gear changed	2.0 sec		
					TCC Solenoid	Disabled		
					Time after TCC Solenoid from Enabled to Disabled.	2.0 sec		
					Engine Coolant Temperature	>= 60 deg		
					Transmission Oil Temperature	>= 20 deg		
					Accelerator Effective Position	>=10%		
Shift Solenoid 1 Performance –Stuck OFF	P0751	Determines if the Shift Solenoid 1 is stuck off within the normal operating range	Compare Shift Solenoid Output and Input/Output Speed Revolution calculation	Refer to CONDITION OF SHIFT SOLENOID MALFUNCTION of Attachment #2.1	Refer to CONDITION OF SHIFT SOLENOID MALFUNCTION of attachment#2.1		1 failure	
					A voltage condition	10.2V < Battery voltage < 18.0V for 2sec	(Refer to CONDITION OF SHIFT	
					Engine Speed	>400rpm	SOLENOID MALFUNCTION of	
					Ignition switch is in crank or run position Not in emergency mode(see the attachment#3)	ON for 2sec	attachment#2.1)	
					No active DTC	TCM : U0001 (High Speed CAN Communication Bus) U0100 (Lost Communication with ECM)		

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
						P0974, P0973, P0977, P0976, P0788 P0787, P0963, P0962, P0601, P2533 P0717, P0722 P0705, P0706 P0711, P0712, P0713 ECM : P00B7, P0116, P0117, P0118, P0128		Type B
					Time after selection lever position from P,R,N,2,L to D	>=5.0sec		
					Time after gear changed	>=2.0 sec		
					Vehicle Speed	>= 20 km/h		
					Engine Coolant Temperature	>= 60 deg		
					Transmission Oil Temperature	>= 20 deg		
Shift Solenoid 1 Performance –Stuck ON	P0752	Determines if the Shift Solenoid 1 is stuck on within the normal operating range	Compare Shift Solenoid Output and Input/Output Speed Revolution calculation	Refer to CONDITION OF SHIFT SOLENOID MALFUNCTION of Attachment #2.1	Refer to CONDITION OF SHIFT SOLENOID MALFUNCTION of attachment#2.1		1 failure	
					A voltage condition	10.2V < Battery voltage < 18.0V for 2sec	(Refer to CONDITION OF	
					Engine Speed	>400rpm	SOLENOID MALFUNCTION of	
					Ignition switch is in crank or run position	ON for 2sec	attachment#2.1)	
					Not in emergency mode(see the attachment#3)			
					No active DTC	TCM : U0001 (High Speed CAN Communication Bus) U0100 (Lost Communication with ECM) P0974, P0973, P0977, P0976, P0788 P0787, P0963, P0962, P0601, P2533 P0717, P0722 P0705, P0706		Type B

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
						P0711, P0712, P0713 ECM : P00B7, P0116, P0117, P0118, P0128		
					Time after selection lever position from P,R,N,2,L to D	>= 5.0sec		
					Time after gear changed	>= 2.0 sec		
					Vehicle Speed	>= 20 km/h		
					Engine Coolant Temperature	>= 60 deg		
					Transmission Oil Temperature	>= 20 deg		
Shift Solenoid 2 Performance –Stuck OFF	P0756	Determines if the Shift Solenoid 2 is stuck off within the normal operating range	Shift Solenoid stuck OFF	Refer to CONDITION OF SHIFT SOLENOID MALFUNCTION of attachment#2.1	Refer to CONDITION OF SHIFT SOLENOID MALFUNCTION of attachment#2.1		1 failure	Type B
					A voltage condition	10.2V < Battery voltage < 18.0V for 2sec	(Refer to CONDITION OF SHIFT SOLENOID MALFUNCTION of attachment#2.1)	
					Engine Speed	>400rpm		
					Ignition switch is in crank or run position Not in emergency mode(see the attachment#3)	ON for 2sec		
					No active DTC	TCM : U0001 (High Speed CAN Communication Bus) U0100 (Lost Communication with ECM) P0974, P0973, P0977, P0976, P0788 P0787, P0963, P0962, P0601, P2533 P0717, P0722 P0705, P0706 P0711, P0712, P0713 ECM : P00B7, P0116, P0117, P0118, P0128		
					Time after selection lever position from P,R,N,2,L to D	5.0sec		

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
					Time after gear changed	2.0 sec		
					Vehicle Speed	>= 20 km/h		
					Engine Coolant Temperature	>= 60 deg		
					Transmission Oil Temperature	>= 20 deg		
Shift Solenoid 2 Performance –Stuck ON	P0757	Determines if the Shift Solenoid 2 is stuck on within the normal operating range	Shift Solenoid stuck ON	Refer to CONDITION OF SHIFT SOLENOID MALFUNCTION of attachment#2.1	Refer to CONDITION OF SHIFT SOLENOID MALFUNCTION of attachment#2.1		1 failure	Type B
					A voltage condition	10.2V < Battery voltage < 18.0V for 2sec	(Refer to CONDITION OF SHIFT	
					Engine Speed	>400rpm	SOLENOID MALFUNCTION of	
					Ignition switch is in crank or run position	ON for 2sec	attachment#2.1)	
					Not in emergency mode(see the attachment#3)			
					No active DTC	TCM :		
						U0001 (High Speed CAN Communication Bus)		
						U0100 (Lost Communication with ECM)		
						P0974, P0973, P0977, P0976, P0788		
						P0787, P0963, P0962, P0601, P2533		
						P0717, P0722		
						P0705, P0706		
						P0711, P0712, P0713		
						ECM :		
						P00B7, P0116, P0117, P0118, P0128		
					Time after selection lever position from P,R,N,2,L to D	5.0sec		
					Time after gear changed	2.0 sec		
					Vehicle Speed	>= 20 km/h		
					Engine Coolant Temperature	>= 60 deg		
					Transmission Oil Temperature	>= 20 deg		

COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
Timing Solenoid (ST) Electrical (GND short)	P0787	This DTC detects a short to ground in the Timing Solenoid circuit.	Timing Solenoid Voltage (when TCM command “ON” signal (12V) to timing solenoid.)	=0V (“OFF” signal)	A voltage condition Ignition switch is in crank or run position Not in emergency mode(see the attachment#3) No active DTC Time after Shift solenoid output changed	10.2V < Battery voltage < 18.0V for 2sec ON for 2sec TCM : P0974, P0973, P0977, P0976, P0788 P0787, P0963, P0962, P0601, P2533 25ms	3 failures 500ms continuously(per 1 failure)	Type A
Timing Solenoid (ST) Electrical (open, IG short)	P0788	This DTC detects a short to high or open in the Timing Solenoid circuit.	Timing Solenoid Voltage (when TCM command “OFF” signal (0V) to timing solenoid.)	=12V (“ON” signal)	A voltage condition Ignition switch is in crank or run position Not in emergency mode(see the attachment#3) No active DTC Time after Shift solenoid output changed	10.2V < Battery voltage < 18.0V for 2sec ON for 2sec TCM : P0974, P0973, P0977, P0976, P0788 P0787, P0963, P0962, P0601, P2533 25ms	3 failures 500ms continuously(per 1 failure)	Type A
Pressure Control (PC) Solenoid Control Circuit Low Voltage	P0962	This DTC detects a short to ground or open in the Pressure Control Solenoid circuit.	Input A/D value of Pressure Control Solenoid	< 68(0.018V)	A voltage condition Ignition switch is in crank or run position Not in emergency mode(see the attachment#3) No active DTC	10.2V < Battery voltage < 18.0V for 2sec ON for 2sec TCM : P0974, P0973, P0977, P0976, P0788 P0787, P0963, P0962, P0601, P2533	25 failures 500ms continuously(per 1 failure)	Type A

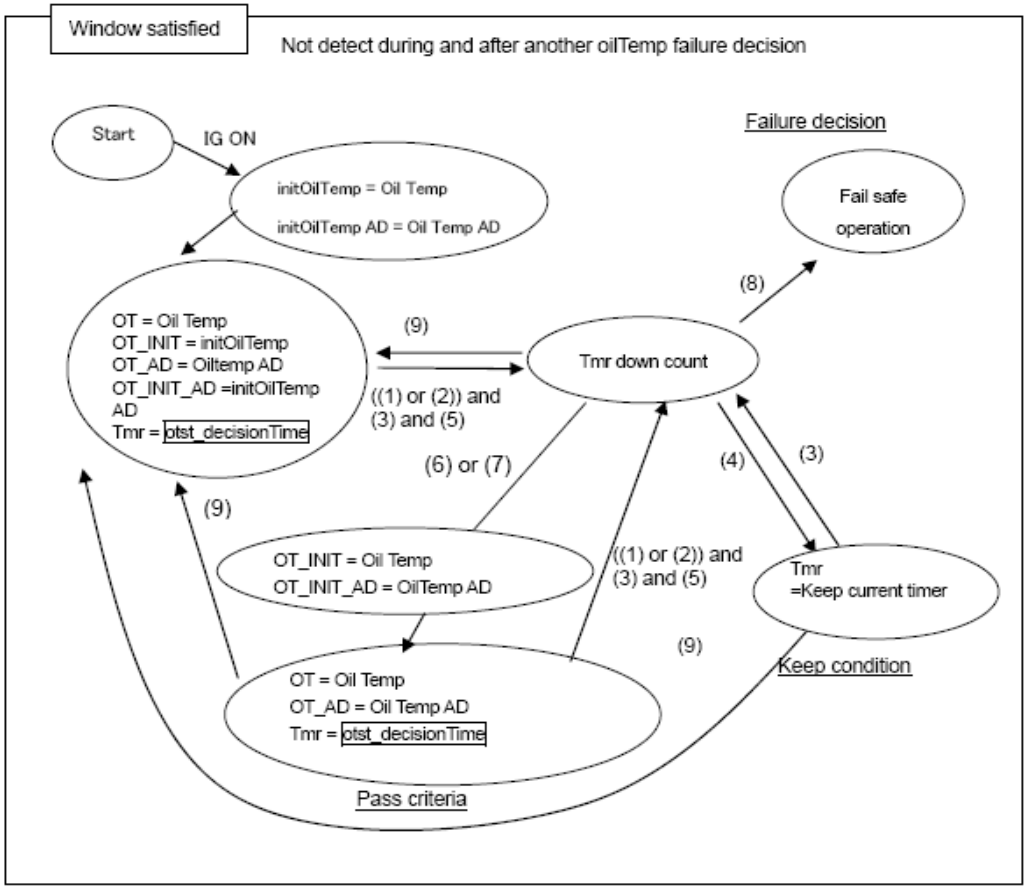
COMPONENT/ SYSTEM	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA	THRESHOLD VALUE	SECONDARY PARAMETERS	ENABLE CONDITIONS	TIME REQUIRED	MIL ILLUM.
Pressure Control (PC) Solenoid Control Circuit High Voltage	P0963	This DTC detects a short to high in thePressure Control Solenoid circuit.	Input A/D value of Pressure Control Solenoid	>= 1000(0.257V)	A voltage condition Ignition switch is in crank or run position Not in emergency mode(see the attachment#3) No active DTC	10.2V < Battery voltage < 18.0V for 2sec ON for 2sec TCM : P0974, P0973, P0977, P0976, P0788 P0787, P0963, P0962, P0601, P2533	1 failure 500ms continuously(per 1 failure)	Type A
Shift Solenoid 1 Control Circuit Low Voltage	P0973	This DTC detects a short to ground in the Shift Solenoid 1 circuit.	Shift Solenoid 1 Voltage (when TCM command “ON” signal (12V) to shift solenoid 1.)	=0V (“OFF” signal)	A voltage condition Ignition switch is in crank or run position Not in emergency mode(see the attachment#3) No active DTC Time after Shift solenoid output changed	10.2V < Battery voltage < 18.0V for 2sec ON for 2sec TCM : P0974, P0973, P0977, P0976, P0788 P0787, P0963, P0962, P0601, P2533 25ms	1 failure 500ms continuously(per 1 failure)	Type A
Shift Solenoid 1 Control Circuit High Voltage	P0974	This DTC detects a short to high or open in the Shift Solenoid 1 circuit.	Shift Solenoid 1 Voltage (when TCM command “OFF” signal (0V) to shift solenoid 1.)	=12V (“ON” signal)	A voltage condition Ignition switch is in crank or run position Not in emergency mode(see the attachment#3) No active DTC Time after Shift solenoid output changed	10.2V < Battery voltage < 18.0V for 2sec ON for 2sec TCM : P0974, P0973, P0977, P0976, P0788 P0787, P0963, P0962, P0601, P2533 25ms	1 failure 500ms 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.
Shift Solenoid 2 Control Circuit Low Voltage	P0976	This DTC detects a short to ground in the Shift Solenoid 2 circuit.	Shift Solenoid 2 Voltage (when TCM command “ON” signal (12V) to shift solenoid 2.)	=0V (“OFF” signal)	A voltage condition Ignition switch is in crank or run position Not in emergency mode(see the attachment#3) No active DTC Time after Shift solenoid output changed	10.2V < Battery voltage < 18.0V for 2sec ON for 2sec TCM : P0974, P0973, P0977, P0976, P0788 P0787, P0963, P0962, P0601, P2533 25ms	1 failure 500ms continuously(per 1 failure)	Type A
Shift Solenoid 2 Control Circuit High Voltage	P0977	This DTC detects a short to high or open in the Shift Solenoid 2 circuit.	Shift Solenoid 2 Voltage (when TCM command “OFF” signal (0V) to shift solenoid 2.)	=12V (“ON” signal)	A voltage condition Ignition switch is in crank or run position Not in emergency mode(see the attachment#3) No active DTC Time after Shift solenoid output changed	10.2V < Battery voltage < 18.0V for 2sec ON for 2sec TCM : P0974, P0973, P0977, P0976, P0788 P0787, P0963, P0962, P0601, P2533 25ms	1 failure 500ms continuously(per 1 failure)	Type A
IG Voltage	P2533	This DTC checks the Ignition Voltage circuit for electrical integrity.	Ignition Circuit Voltage	=0V	Not in emergency mode(see the attachment#3) No active DTCs Engine Speed Battery voltage	TCM : U0001 , U0100 P0974, P0973, P0977, P0976, P0788 P0787, P0963, P0962, P0601, P2533 > 400 rpm. > 9 V	20 failures 1000 ms 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.
Ignition Accessory Switch Circuit	P2536	This DTC checks the Ignition Accessory Voltage circuit for electrical integrity.	Ignition Accessory Switch Circuit Voltage	=0V	A voltage condition Engine Speed Ignition switch is in crank or run position No active DTCs	10.2V < Battery voltage < 18.0V for 2sec >400rpm ON for 2sec TCM : U0001 , U0100	20 failures 1000 ms continuously(per 1 failure)	Special Type C
Torque Converter Clutch (TCC) Enable Solenoid Control Circuit Low Voltage	P2769	This DTC detects a short to ground in the TCC Enable Solenoid Control circuit.	TCC Enable Solenoid Voltage (when TCM command “ON” signal (12V) to TCC Enable Solenoid.)	=0V (“OFF” signal)	A voltage condition Ignition switch is in crank or run position Not in emergency mode(see the attachment#3) No active DTC Time after TCC Enable solenoid output changed	10.2V < Battery voltage < 18.0V for 2sec ON for 2sec TCM : P0974, P0973, P0977, P0976, P0788 P0787, P0963, P0962, P0601, P2533 25ms	1 failure 500ms continuously(per 1 failure)	Type B
Torque Converter Clutch (TCC) Enable Solenoid Control Circuit High Voltage	P2770	This DTC detects a short to high or open in the TCC Enable Solenoid Control circuit.	TCC Enable Solenoid Voltage (when TCM command “OFF” signal (0V) to TCC Enable Solenoid.)	=12V (“ON” signal)	A voltage condition Ignition switch is in crank or run position Not in emergency mode(see the attachment#3) No active DTC Time after TCC Enable solenoid output changed	10.2V < Battery voltage < 18.0V for 2sec ON for 2sec TCM : P0974, P0973, P0977, P0976, P0788 P0787, P0963, P0962, P0601, P2533 25ms	1 failure 500ms continuously(per 1 failure)	Type B
High Speed CAN Communication Bus	U0001	This DTC monitors for BUS OFF condition	BUS ON/OFF state from CAN Controller	=“BUS OFF”	A voltage condition	10.2V < Battery voltage < 18.0V for 2sec	7 failures (Bus OFF from CAN Controller.)	Type A

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	Message(ID 0x0C9 or 0x191 or 0x1A1 or 0x4C1) is not received from ECM for this many seconds	200ms continuously	A voltage condition No active DTC	10.2V < Battery voltage < 18.0V for 2sec TCM : U0001	10 failures 200ms continuously(per 1 failure)	Type A
Lost Communication with Body Control Module (IPC)	U0140	This DTC monitors for a loss of communication with IPC	Message(ID 0x0F1, 0x1F1, 0x1F3) is not received from IPC for this many seconds	200ms continuously	A voltage condition No active DTC	10.2V < Battery voltage < 18.0V for 2sec TCM : U0001	10 failures 200ms continuously(per 1 failure)	Type C

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



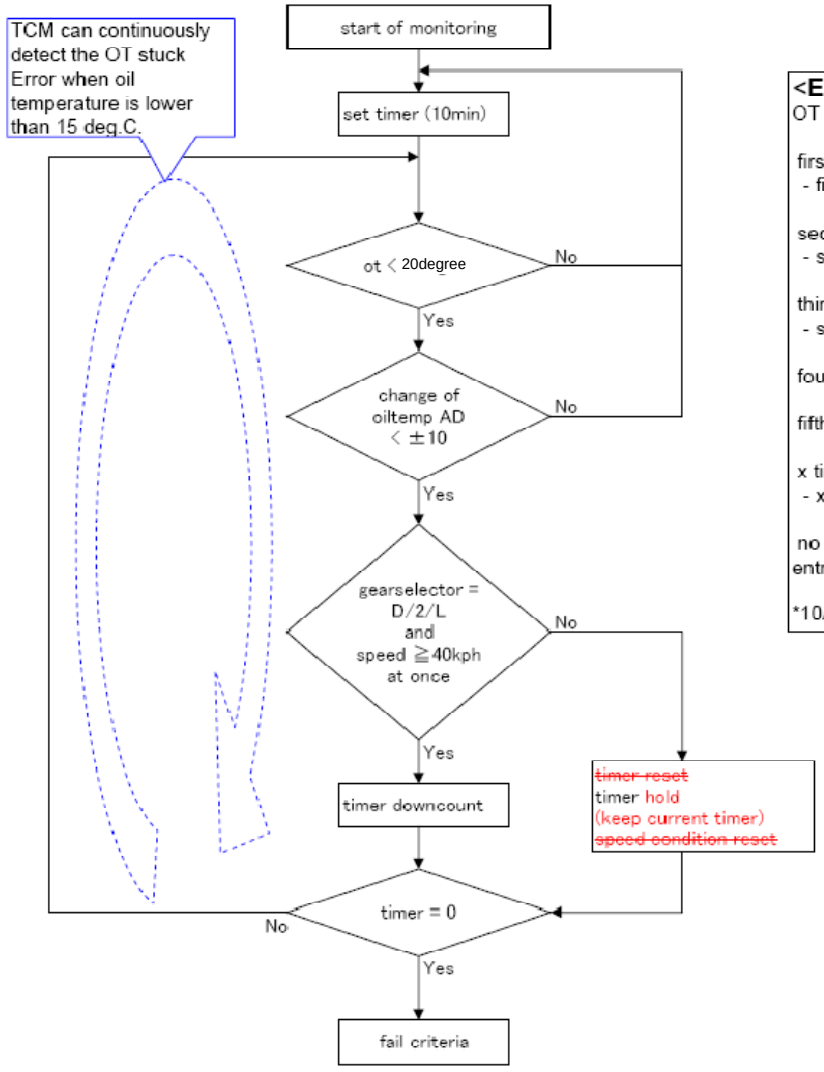
Condition

(1) Oil Temperature < 20 °C
(2) Oil Temperature init < 20 °C
(3) D range or 2 range or L range
(4) P range or R range or N range
(5) Vehicle Speed >= 40 km/h at 1 time
(6) (Oil Temperature AD value − Old Oil Temperature AD value) > 10(0.05V) (AD Value)
(7) (Oil Temperature AD value − Oil Temperature init AD value) > 10(0.05V) (AD Value)
(8) Timer = 0 sec
(9) Detection window is not satisfied

otst_decisionTime : 10min

*[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....

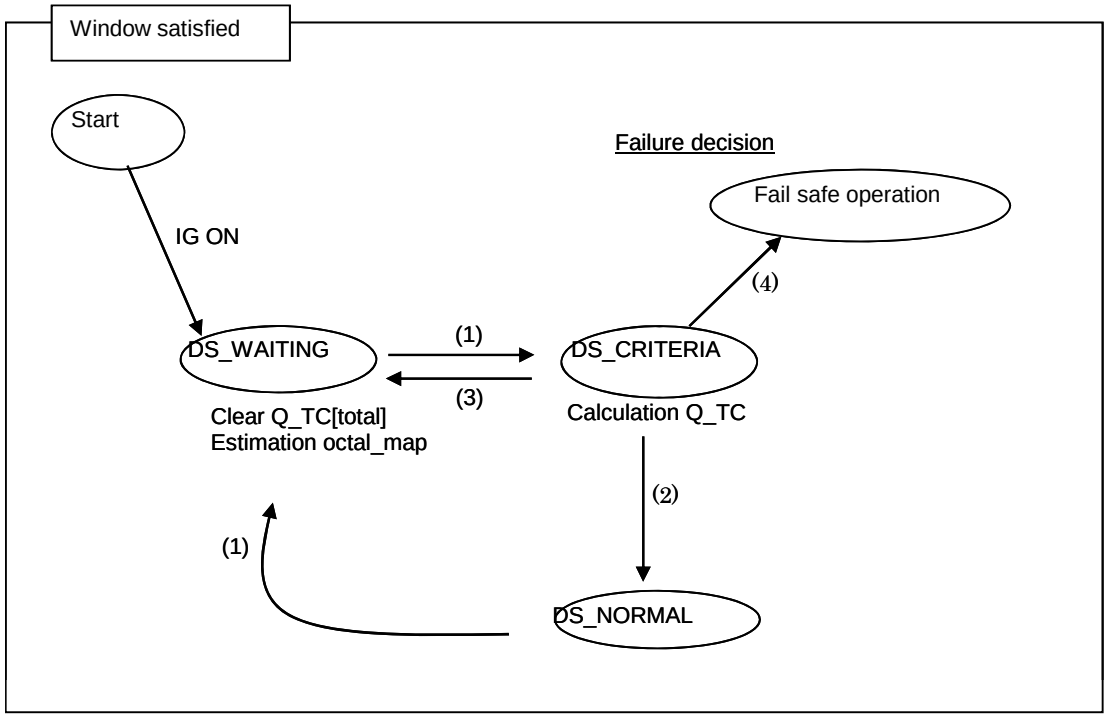
fifth check....

x times check 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



Condition
(1) Transmission Oil temperature < 20 deg.C
(2) Transmission Oil temperature >= 20 deg.C
(3) OT_base(*3) > Transmission Oil temperature
(4) 20 deg.C > Transmission Oil Temperature and Q_TC(*2) [total] >= otcal_map(*1)

*1 otcal_map : Calorific value is calibrated by the total amount of Q_TC when oil temperature rises from OT_base to 20deg.C at the driving conditions(ex LA#4).
This necessary calorific value is calibrated by each vehicle.

OT_base(*3)	-25	-20	0	10	19
Estimated calorific value(KJ)	3000	1400	510	280	115

*2 Q_TC [Total] : The total amount of calorific values calculated by actual driving conditions of each vehicle.
Q_TC = Acons X A_TC X TC_Capacity* X EgRpm2 X (EgRpm – (inRpm X TC_trqRatio**))
* TC_Capacity : T/C Capacity
** TC_trqRatio : Torque Ratio

Label	Value	Unit
Acons	1.050×10^{-4}	-
A_TC	1	-

*3 OT_base : Oil temperature when octal_map is estimated.

*CONDITION OF SHIFT SOLENOID MALFUNCTION

		Gear position (Sol. Output)	Throttle openings map (%)			Vehicle speed (km/h)		Prhbt. Time*1 (*0.1sec)	Detection Condition of Gear Position *1	Decision Time (*0.1sec)	Decision counter*2
						Min	Max				
S1	Stuck on Failure	3	Ni	500	6000	20	-	20	2nd Gear	20	1
			Th	8	22						
	Stuck on Normal	3	Ni	500	6000				3rd Gear	10	1
			Th	8	22						
	Stuck off Failure	2	Ni	500	6000				3rd Gear	20	1
			Th	8	22						
	Stuck off Normal	2	Ni	500	6000				2nd Gear	10	1
			Th	8	22						
S2	Stuck on Failure	3	Ni	500	6000				4th Gear	20	1
			Th	8	22						
	Stuck on Normal	3	Ni	500	6000				3rd Gear	10	1
			Th	8	22						
	Stuck off Failure	4	Ni	500	6000				3rd Gear	50	1
			Th	8	22						
	Stuck off Normal	4	Ni	500	6000				4th Gear	10	1
			Th	8	22						

Detection Area of the Gear Position (81-40LE)

Gear Position	Gear Ratio	Detection Area o Gear Ratic	
		Minimum	Maximum
1st Gear	2.875	2.674	3.076
2nd Gear	1.568	1.458	1.678
3rd Gear	1	0.93	1.07
4th Gear	0.697	0.648	0.746

*1 The prohibit time is started when shift changes
*2 This counter can be increment after shifting

*CONDITION OF TCC SOLENOID STUCK ON/OFF

		Gear position (Sol. Output)	Throttle openings (*0.1%)	E/G torque map (Nm)			T/M input speed (rpm)		Prohibit time*1 (*0.1sec)	Relationship of Ne and Ni (*10rpm)	Detection time (*0.1sec)	Decision counter*2
							Min	Max				
SL	Stuck on Failure	3 L-upOFF	Th≧ 100	Ni	1000	2000	925	6000	20	|Ne-Ni| < 5	10	6
	Stuck on Normal	3 L upOFF	Th≧ 100	Te	50	50				|Ne-Ni| > 10	10	1
	Stuck off Failure	4 L-upON	Th≧ 100	Ni	1000	3000	150	4000	20	|Ne-Ni| > 10	20	6
				Te	50	50						
	Stuck off Normal	4 L-upON	Th≧ 140	Ni	1000	3000	150	4000		|Ne-Ni| < 5	12	1
				Te	50	50						

*1 The prohibit time is started when shift change or L-up full or

*2 This counter can be increment after shifting

E/G torque: Drivers Torque

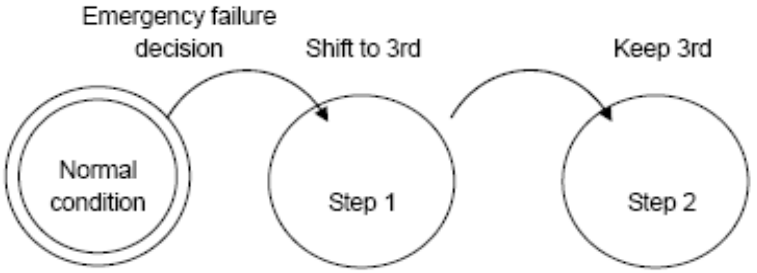
*Emergency mode

: TCM command "OFF" signal to all solenoid(as follows).

1:Shift Solenoid 1
2:Shift Solenoid 2
3:Timing Solenoid
4:Torque Converter Clutch Enable Solenoid
5:Pressure Control Solenoid

: DTCs that take Emergency mode like Limp home mode as "fail safe" are;

P0974	P0973
P0977	P0976
P0788	P0787
P0963	P0962
P0601	
P2533	



Normal	Emergency mode	Emergency mode
Reverse	Reverse	
1st gear	L, 2, D range	3rd gear Solenoid cut off
2nd gear		
3rd gear		
4th gear		