SENSED PARAMETER	FAULT CODE	ACCEPTABLE OPERATING RANGE AND RATIONALITY	PRIMARY MALF DETECTION PARAMETERS	SECONDARY MONITORING PARAMETERS AND CONDITIONS	FAIL MONITORING TIME LENGTH AND FREQUENCY OF CHECK	PRIMARY PASS DETECTION PARAMETERS	PASS SECONDARY MONITORING PARAMETERS AND CONDITIONS	PASS MONITORING TIME LENGTH AND FREQUENCY OF CHECK	ACTIONS	FAULT CODE STORAGE AND MIL ILLUMI-NATION	Fault Instructions	Special Instructions
Can Engine Coolant Temperature Fault No Valid Signal CAN	**P0115 Was P1792**	This DTC detects an invalid engine coolant temperature value from the ECU to the TCM	ECU CAN message does not contain a valid engine coolant temperature value for 2.0 seconds	- Ignition voltage: 8 V to 18 V - Engine speed: 450 to 6800 RPM for at least 5 seconds - No CAN error in process	Continuous	ECU CAN message contains a valid engine coolant temperature value for 2.0 seconds	- Ignition voltage: 8 V to 18 V - Engine speed: 450 to 6800 RPM for at least 5 seconds - No CAN error in process	Continuous	Default engine coolant temperature to 25 C FaultActive	DTC Type C	**Tested with CAN TOOL** SEND: Message 510, 40 00 00 00 00, at 100msec.	
Throttle Position Signal (Accelerator Effective Position Validity) No Valid Signal CAN	**P0120 Was P1791**	This DTC detects an invalid throttle position value from the ECU to the TCM	ECU CAN message does not contain a valid throttle position value for 2.0 seconds	- Ignition voltage: 8 V to 18 V - Engine speed: 450 to 6800 RPM for at least 5 seconds - No CAN error in process	Continuous	ECU CAN message contains a valid throttle position value for 2.0 seconds	- Ignition voltage: 8 V to 18 V - Engine speed: 450 to 6800 RPM for at least 5 seconds - No CAN error in process	Continuous	**FREEZE ADAPTS** **PCS OFF (max line pressure)** **TCC OFF** **TCC Solenoid Inhibit Action** **HSD1 OFF** **Throt Pstn Fault** (Default throttle to 35%) TFTKO	DTC Type B	**Tested with CAN TOOL** SEND: Message 110, 00 00 00 00 80 00 00 00, at 5msec.	
Transmission Fluid Overtemperature	**P0218**	This DTC detects a high transmission temperature for a long period of time	TTS ≥ 132 C	Trans temp: -39 C to 149 C for at least 5 seconds, Ignition voltage: 8 V to 18 V	600 seconds Continuous	TTS ≤ 129 C	Trans temp: -39 C to 149 C for at least 5 seconds	5 seconds Continuous	**FREEZE ADAPTS** FaultActive	DTC Type C	**BREAKOUT BOX SETUP** Open Trans Temp Hi (15) Open Trans Temp Lo (26) Install Pot to TCM Side of both.Set pot to yieldTrans Temp above 133 and below 148. ≅ 50 Ω	
System Voltage Low	**P0562**	This DTC detects a low ignition voltage at the TCM.	Ignition voltage ≤ 11 V	Engine Speed ≥ 1200 RPM	10 seconds Continuous	Ignition voltage > 11 V	Engine Speed ≥ 1200 RPM	12 seconds Continuous	none	DTC Type C	**Set by changing Calibration, KePMDD_U_ RunCranklgn MinThrsh**	Prior to starting vehicle, set cal to 18
System Voltage High	**P0563**	This DTC detects a high ignition voltage at the TCM.	Ignition voltage ≥ 18 V	none	10 seconds Continuous	Ignition voltage > 18 V	None	12 seconds Continuous	none	DTC Type C	**Set by changing Calibration, KePMDD_U_ RunCranklgn MaxThrsh**	Prior to starting vehicle, set cal to 11

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Brake Switch "Stuck Off"	**P0572**	This DTC detects the BASS Brake Switch Failure, "Open or Shorted to Ground".	The brake is OFF for 1200 of 1500 sample counts in the time of 375 seconds without going on.	- Ignition voltage: 8 V to 18 V - Engine speed: 450 to 6800 RPM for at least 5 seconds	Continuous	The brake is not OFF for 1200 of 1500 sample counts in the time of 375 seconds without going on.	- Ignition voltage: 8 V to 18 V - Engine speed: 450 to 6800 RPM for at least 5 seconds	Continuous	**INHIBIT AUTOGRADE BRAKING** TFTKO	DTC Type C	**BREAKOUT BOX SETUP** Open Brake Switch (38) and short TCM Side to GND (7)	
Brake Switch "Stuck On"	**P0573**	This DTC detects the BASS Brake Switch Failure, "Shorted to Voltage".	The brake is ON for 1200 of 1500 sample counts in the time of 375 seconds without going on.	- Ignition voltage: 8 V to 18 V - Engine speed: 450 to 6800 RPM for at least 5 seconds	Continuous	The brake is not ON for 1200 of 1500 sample counts in the time of 375 seconds without going on.	- Ignition voltage: 8 V to 18 V - Engine speed: 450 to 6800 RPM for at least 5 seconds	Continuous	**INHIBIT AUTOGRADE BRAKING** TFTKO	DTC Type C	**BREAKOUT BOX SETUP** **Case 1** Open Brake Switch (38) **Case 2** Open Brake Switch (38) and short TCM Side to Battery (27)	
TCM ROM Test	**P0601**	This DTC detects an error in the flash memory containing the program and calibration	Checksum calculation algorithm of flash memory	none	immediate	Checksum calculation algorithm of flash memory	None	immediate	**HSD 1 OFF** **HSD 2 OFF** **TCC OFF** **FREEZE ADAPTS** **MAX GEAR HOT INHIBIT** **PCS OFF - MAX LINE PRESSURE** **IMMEDIATE LANDING**	DTC Type A	Tested on Bench by EI&S	
No Start Calibration	**P0602**	This DTC indicates the flash memory has not been programmed	KbINFD_NoStart Cal = TRUE	none	immediate	KbINFD_NoStart Cal = FALSE	None	immediate	**HSD 1 OFF** **HSD 2 OFF** **TCC OFF** **FREEZE ADAPTS** **MAX GEAR HOT INHIBIT** **PCS OFF - MAX LINE PRESSURE** **IMMEDIATE LANDING**	DTC Type A	Tested on Bench by EI&S	

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Power up copy of NVM to RAM	**P0603**	This DTC detects an error in the RAM copy of NVM @ power up	Checksum calculation algorithm of NVM copy	none	immediate	Checksum calculation algorithm of NVM copy	None	immediate	**HSD 1 OFF** **HSD 2 OFF** **TCC OFF** **FREEZE ADAPTS** **MAX GEAR HOT INHIBIT** **PCS OFF - MAX LINE PRESSURE** **IMMEDIATE LANDING**	DTC Type A	Tested on Bench by EI&S	
RAM Test	**P0604**	This DTC tests the read/write capability of each RAM location	Read and write each RAM location	none	immediate	Read and write each RAM location	None	immediate	**HSD 1 OFF** **HSD 2 OFF** **TCC OFF** **FREEZE ADAPTS** **MAX GEAR HOT INHIBIT** **PCS OFF - MAX LINE PRESSURE** **IMMEDIATE LANDING**	DTC Type A	Tested on Bench by EI&S	
Power down copy of RAM to NVM	**P062F Was P1621**	This DTC detects an error in the RAM copy to NVM @ power down	Checksum calculation algorithm RAM to NVM copy	None	immediate	Checksum calculation algorithm RAM to NVM copy	none	immediate	**FREEZE ADAPTS** **HSD 1 OFF** **PCS OFF (max line pressure)** TFTKO	DTC Type A	Tested on Bench by EI&S	

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Trans Fluid Temp Sensor Circuit Range/ Performance	**P0711**	The DTC detects the following failure modes of the transmission fluid temperature sensor: 1) A sensor that remains at a constant value 2) A sensor that remains at a value 4) Transmission fluid temperature remains below 20° C for a calibrated time as a function of startup transmission fluid temperature.	**Fail Case 1** vehicle speed >= 8 KPH for time >= 300 seconds cumulative, TCC slip > 120 RPM for time >= 300 seconds cumulative, -40.0 <= TFT<= 20.0 DegC, engine coolant temperature >= 70.0 DegC, engine coolant temperature delta from start up >= 55.0 DegC TFT delta < 2.0 DegC for time >= 100 seconds **Fail Case 2** vehicle speed >= 8 KPH for time >= 300 seconds cumulative, TCC slip > 120 RPM for time >= 300 seconds cumulative, 129 DegC <= TFT <= 150 DegC, engine coolant temperature >= 70.0 DegC, engine coolant temperature delta from start up >= 55.0 DegC, **TFT delta < 2.0 DegC for time >= 100 seconds** **Fail Case 3** TFT Δ >= 20 DegC, Delta occurs 14 times over a 7 second sample period **Fail Case 4** TFT$\Delta \leq$ 20° C after a calibrated amount of time based on a 2D lookup table. **TFT delta>2.0 DegC**	For fail case 1, 2, and 4: P0711, P0716, P0717, P0722, P0723 not FA or TFTKO,engine coolant temperature valid, ignition voltage enable, engine speed enable, P0711 not TPTKO, -39 <= TCM internal temperature <= 149 DegC Fail case 1: -40 deg C <= trans fluid temp <= +20 C at startup, Engine coolant => 70 deg C, Engine Coolant has changed => 50 deg C since startup, Vehicle speed since startup => 8 KPH for time => 300 seconds (cumulative timer) Fail case 2: +129 deg C <= trans fluid temp <= +149 C at startup, Engine coolant => 70 deg C, Engine Coolant has changed => 50 deg C since startup, Vehicle speed since startup => 8 KPH for time => 600 seconds (cumulative timer) Fail case 3: **System Voltage is between 8 – 18 Volts.** Engine Speed 450-7500 for 5 seconds. Fail case 4: Acceleration position valid, engine torque accurate, engine speed accurate, ECT accurate, No soft landing default action present, No immediate landing default action present, 50<=engine torque<= 1492Nm, 8 <= TPS <= 100%, 511 kph>=vehicle speed>= 8 kph, 6800>= engine speed >= 500 RPM, 149 DegC>=Coolant>=-39 DegC	Fail case 1: Time => 80 seconds Continuous Fail case 2: Time => 80 seconds Continuous Fail case 3: Time => 7.0 seconds 14 counts	Trans temp has changed > 2 C since startup and fail case 3 fail counter = 0 during sample period	Same as secondary monitoring parameters and conditions used for fail logic.	5 sec sample period Pass run once per ignition cycle	**Trans Temp Flt Action** (Default TFT based on engine run time, ECT and MAT at startup) **FREEZE ADAPTS** Fault Active	DTC Type C	**BREAKOUT BOX SETUP** Open circuit Tran Temp Hi (15) Open circuit Tran Temp Lo (26) Install Pot to TCM Side Tran Temp Hi to TCM side Tran Temp Lo **Case 1** Set pot to yield trans Temp approx 10 C (≈ 5847 ohms) **Case 2** Set pot to yield trans Temp between 129-131 C (≈ 77 ohms) **Case 4** Set pot to yield trans Temp approx 10 C ((≈ 5847 ohms). Then after the engine starts adjust yemperature up a minimum of 2.5°C. Ensure the final temperature does not exceed 20°C.	

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Trans Fluid Temp Sensor Circuit Low input (high temp)	**P0712**	0 to 97 Kohms The DTC detects a continuous short to ground in the TTS signal circuit or the TTS sensor	Resistance ≤ 46.18 Ohms	- Ignition voltage: 8 V to 18 V - Engine speed: 450 to 6800 RPM for at least 5 seconds	10 seconds Continuous	Resistance ≥ 50.38 Ohms	None	2 seconds Continuous	Default TFT based on engine run time, ECT and MAT at startup. **FREEZE ADAPTS** **TRANS TEMP** FaultActive	DTC Type C	**BREAKOUT BOX SETUP** Open Trans. Temp HI (15) and Short TCM Side of Harness to GND (7)	
Trans Fluid Temp. Sensor Circuit High input (low temp)	**P0713**	0 to 97 Kohms The DTC detects a continuous open or short to high in the TTS signal circuit or the TTS sensor	Resistance ≥ 111.605 k Ohms	- Ignition voltage: 8 V to 18 V - Engine speed: 450 to 6800 RPM for at least 5 seconds - No TISS P0716, P0717, or TOSS P0722. P0723 DTC's - TOSS ≥ 200 RPM for at least 200 seconds cumulative - Trans slip speed ≥ 120 RPM for at least 200 seconds cumulative	25 seconds Continuous	Resistance < 105.088 k Ohms	- System Voltage: 8 to 18 volts	12.5 seconds Continuous	Default TFT based on engine run time, ECT and MAT at startup. **FREEZE ADAPTS** **TRANS TEMP** FaultActive	DTC Type C	**BREAKOUT BOX SETUP** Open Tran Temp HI (15)	
Transmission Input Speed Sensor performance, signal drop	**P0716**	0 RPM to 6800 RPM This DTC detects an unrealistic large drop in transmission input speed.	Trans input speed delta ≥ 1000 RPM during sample period	- Ignition voltage: 8 V to 18 V - Engine speed: 450 to 6800 RPM for at least 5 seconds - No throttle system P1791, P1795 DTC's - No TISS P0716 FA or TFTKO - No TISS P0717 DTC - No TOSS P0722, P0723 DTC's - No shift solenoid A performance DTC P0752 - No shift solenoid A electrical DTC's P1842 or P1843 - No Engine Torque DTC's - Vehicle speed ≥ 16 KPH - TPS ≥ 12 % - Trans input speed > 1050 RPM for time ≥ 2 seconds - Positive trans input speed delta ≥ 500 RPM for time ≥ 2 seconds OR Negative trans input speed delta for a time ≥ 2 seconds	4 second sample period	Transmission input speed delta ≤ 500 rpm and transmission input speed is > 550 rpm over sample period	- Ignition voltage: 8 V to 18 V - No TISS P0717 DTC	2 second sample period Continuous	**HSD 1 OFF** **TCC OFF** **FREEZE ADAPTS** **MAX GEAR HOT INHIBIT** **PCS OFF - MAX LINE PRESSURE** **INHIBIT TORQUE MANAGEMENT** **INPUT SPD FAULT ACTION** TFTKO	DTC Type B	**BREAKOUT BOX SETUP** OPEN Circuit TISS HI (10) when input speed is above 1050 RPM and Throttle is above 12%.	

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Transmission Input Speed Sensor Low input, no activity	**P0717**	0 RPM to 6800 RPM This DTC detects a low transmission input speed when the vehicle is moving in a drive gear range.	Trans input speed < 100 RPM over sample period	- Ignition voltage: 8 V to 18 V - Engine speed: 450 to 6800 RPM for at least 5 seconds - No Engine Torque DTC's - No TOSS P0722, P0723 DTC's - Vehicle speed ≥ 16 KPH - No TISS 717 FA or TFTKO - Eng Torq >= 50Nm and torque valid from ECM	5 second sample period Continuous	Input Speed > 500 RPM over sample period	- Ignition voltage: 8 V to 18 V - Engine speed: 450 to 6800 RPM for at least 5 seconds	2 second sample period Continuous	**HSD 1 OFF** **TCC OFF** **FREEZE ADAPTS** **MAX GEAR HOT INHIBIT** **PCS OFF - MAX LINE PRESSURE** **INHIBIT TORQUE MANAGEMENT** **INPUT SPD FAULT ACTION** TFTKO	DTC Type B	**BREAKOUT BOX SETUP** **Case 1** Open TISS HI (10) **Case 2** Open TISS HI (10) and Short TCM side to GND (7) **Case 3** Open TISS HI (10) and Short TCM side to Battery (27)	
Vehicle Speed Sensor Low input	**P0722**	0 RPM to 6800 RPM This DTC detects a low vehicle speed when the vehicle has a large engine speed in a drive gear range.	Transmission output speed ≤ 100 RPM	- Ignition voltage: 8 V to 18 V - Engine speed: 450 to 6800 RPM for at least 5 seconds - No engine torque default - No TISS P0716 or P0717 DTC's - No TPS DTC's - No P0723 DTC - P0722 not FA or TFTKO - Engine Torque: 70 to 450 Nm - Throttle position ≥ 12% - TISS: 1500 to 6800 RPM	3 seconds Continuous	Output Speed ≥ 500 RPM	No P0723 DTC	2 seconds Continuous	**HSD 1 OFF** **FREEZE ADAPTS** **PCS OFF - MAX LINE PRESSURE** **VSS FAULT ACTION** **INHIBIT AUTOGRADE BRAKING** TFTKO	DTC Type B	**BREAKOUT BOX SETUP** **Case 1** Open TOSS HI (1) **Case2** Open TOSS HI (1) and short TCM Side to Ground (7) **Case3** Open TOSS HI (1) and short TCM Side to Battery (27)	Use P0502 Fault Info
Vehicle Speed Sensor Intermittent	**P0723**	0 RPM to 6800 RPM This DTC detects an unrealistic large drop in vehicle speed.	Transmission output speed drop ≥ 1300 RPM during sample period	- Ignition voltage: 8 V to 18 V - Engine speed: 450 to 6800 RPM for at least 5 seconds - No TISS P0716, P0717 DTC's - No shift solenoid A electrical DTC P1843 - Trans input speed change between samples ≤ 500 RPM for time ≥ 2 seconds - Trans output speed > 1400 RPM for a time ≥ 2 seconds - Positive trans output speed delta ≤ 500 RPM for a time ≥ 2 seconds OR Negative trans output speed delta for a time ≥ 2 seconds	3 second sample period	Output speed drop ≤ 650 rpm and output speed is ≥ 750 rpm over sample period	- Ignition voltage: 8 V to 18 V - Engine speed: 450 to 6800 RPM for at least 5 seconds - No TISS P0716, P0717 DTC's - No shift solenoid A electrical DTC P1843 - Trans input speed change between samples ≤ 500 RPM for time ≥ 2 seconds	2 second sample period	**HSD 1 OFF** **FREEZE ADAPTS** **PCS OFF - MAX LINE PRESSURE** **VSS FAULT ACTION** **INHIBIT AUTOGRADE BRAKING** TFTKO	DTC Type B	**BREAKOUT BOX SETUP** **Case 1** Open TOSS HI (1) **Case2** Open TOSS HI (1) and short TCM Side to Ground (7) **Case3** Open TOSS HI (1) and short TCM Side to Battery (27)	Use P0503 Fault Info

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Engine Speed Sensor Circuit No Valid Signal CAN	**P0727**	This DTC detects an invalid engine speed value from the ECU to the TCM	ECU CAN message does not contain a valid engine speed value for 2 seconds	- Ignition voltage: 8 V to 18 V	Continuous	ECU CAN message contains a valid engine speed value for 2 seconds	- Ignition voltage: 8 V to 18 V	Continuous	**PCS OFF (max line pressure)** TFTKO	DTC Type B	**BREAKOUT BOX SETUP** Tested with CAN TOOL SEND: Message 110, 03 00 00 00 00 00 00, at 5msec.	
TCC System Stuck OFF	**P0741**	This DTC detects high torque converter slip when the TCC is commanded on.	Increment fail counter when: TCC slip ≥ f(engine torque) for time ≥ 8 seconds, where f(engine torque) is 150 to 250 RPM Fail counter ≥ 2	- Ignition voltage: 8 V to 18 V - Engine speed: 450 to 6800 RPM for at least 5 seconds - No IMS range DTC's - No throttle system P1791, P1795 DTC's - No engine torque default - No TISS P0716, P0717 DTC's - No TOSS P0722, P0723 DTC's - IMS range is D2, D3, D4 or D5 - No TCC solenoid electrical P1866, P1867 DTC's - No TCC stuck ON P0742 TCC DTC set - No IMS range change in last 6 seconds - TPS: 10% to 90% - Trans temp.: 20 C to 130 C - Engine torque: 55 Nm to 450 Nm - 3rd gear ratio: 1.56 to 1.64 or 4th gear ratio: 0.98 to 1.03 or 5th gear ratio: 0.73 to 0.77 - TCC LOCKED or ON - TCC commanded pressure ≥ 200 kPa for time ≥ 2 seconds - TCC duty cycle ≥ 80% for time ≥ 2 seconds	Run fail only once per TCC ON cycle, at a max rate of 100 mS.	Increment pass counter when: TCC slip -20 to 75 RPM for 4 seconds Pass counter ≥ 1	- Ignition voltage: 8 V to 18 V - Engine speed: 450 to 6800 RPM for at least 5 seconds - No IMS range DTC's - No throttle system P1791, P1795 DTC's - No engine torque default - No TISS P0716, P0717 DTC's - No TOSS P0722, P0723 DTC's - IMS range is D2, D3, D4 or D5 - No TCC solenoid electrical P1866, P1867 DTC's - No TCC stuck ON P0742 TCC DTC set - No IMS range change in last 6 seconds - TPS: 12% to 90% - Trans temp: 20C to 130C - Engine torque: 55 Nm to 450 Nm - 3rd gear ratio: 1.56 to 1.64 or 4th gear ratio: 0.98 to 1.03 or 5th gear ratio: 0.73 to 0.77 - TCC LOCKED or ON	Every TCC ON cycle at a max rate of 100 mS.	**FREEZE ADAPTS** **MAX GEAR HOT INHIBIT (Inhibit 5th if trans hot)** **TCC Solenoid Inhibit Action** TFTKO	DTC Type B	**BREAKOUT BOX SETUP** Open circuit TCC Solenoid (4) Install dummy solenoid from TCM side to Battery (27)	

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TCC System Stuck ON	**P0742**	This DTC detects low torque converter slip when the TCC is commanded off.	Increment fail counter when: TCC Slip: -20 to +20 RPM for time ≥ 3.5 seconds Fail Counter ≥ 3	- Ignition voltage: 8 V to 18 V - Engine speed: 450 to 6800 RPM for at least 5 seconds - No IMS range DTC's - No throttle system P1791, P1795 DTC's - No engine torque default - No TISS P0716, P0717 DTC's - No TOSS P0722, P0723 DTC's - IMS range is D5 - No TCC solenoid electrical P1866, P1867 DTC's - No TCC stuck OFF P0741 TCC DTC set - Not in 1st gear - Trans temp: 20 C to 130 C - Engine torque: 80 Nm to 450 Nm - Throttle position: 12% to 90% - Engine speed: 500 to 6800 RPM - Vehicle speed ≥ 15 KPH - Gear ratio: 0.73 to 2.27 - TCC is commanded OFF	100 mS continuous	Increment pass counter when: TCC Slip: 130 to 1500 RPM for time ≥ 2.5 seconds	- Ignition voltage: 8 V to 18 V - Engine speed: 450 to 6800 RPM for at least 5 seconds - No IMS range DTC's - No throttle system P1791, P1795 DTC's - No engine torque default - No TISS P0716, P0717 DTC's - No TOSS P0722, P0723 DTC's - IMS range is D5 - No TCC solenoid electrical P1866, P1867 DTC's - No TCC stuck OFF P0741 TCC DTC set - Not in 1st gear - Trans temp: 20 C to 130 C - Engine torque: 80 Nm to 450 Nm - Throttle position: 15% to 90% - Engine speed: 500 to 6800 RPM - Vehicle speed ≥ 15 KPH - TCC is commanded OFF	100 mS continuous	**FREEZE ADAPTS** **INHIBIT MAX GEAR HOTMODE ACTION** TFTKO	DTC Type B	**BREAKOUT BOX SETUP** Open circuit TCC Solenoid (4) Install dummy solenoid from TCM side to Battery (27) Short TCC Solenoid (4) Harness side to GND (7)	Test on 16% Hill
Pressure Control Solenoid Ckt Electrical	**P0748**	0V to 12V This DTC detects a continuous open or short to ground in the PCS circuit or the PCS sensor	PCS DC commanded yields actual current outside acceptable range for time ≥ 1.2 seconds	Ignition voltage: 8 V to 18 V Disable the diagnostic if system voltage falls below 10.5 volts at low temp (-40 C) or 11.5 volts at high temp (150 C). The diagnostic will be enabled again when system voltage increases above 11 volts at low temp (-40 C) or 12 volts at high temp (150 C). Note: The disable and enable voltage values are determined by linear interpolation when the transmission fluid temperature is between the low and high values.	Continuous	PCS DC commanded yields actual current within a acceptable range	Ignition voltage: 8 V to 18 V	Continuous	**PCS OFF (max line pressure)** **FREEZE ADAPTS** TFTKO	DTC Type C	**BREAKOUT BOX SETUP** **Case 1** Open LPCS LO (29) **Case 2** Open LPCS LO (29) and short to GND (7)	

SENSED PARAMETER	FAULT CODE	ACCEPTABLE OPERATING RANGE AND RATIONALITY	PRIMARY MALF DETECTION PARAMETERS	SECONDARY MONITORING PARAMETERS AND CONDITIONS	FAIL MONITORING TIME LENGTH AND FREQUENCY OF CHECK	PRIMARY PASS DETECTION PARAMETERS	PASS SECONDARY MONITORING PARAMETERS AND CONDITIONS	PASS MONITORING TIME LENGTH AND FREQUENCY OF CHECK	ACTIONS	FAULT CODE STORAGE AND MIL ILLUMI-NATION	Fault Instructions	Special Instructions
Shift Solenoid A Performance	**P0751**	This DTC detects abnormal shift pattern **Stuck ON: 2-2-3-3-3 pattern**	The fail counter is incremented when the following fail cases are true: **Stuck ON fail case 1 AND fail case 2** Fail Counter ≥ 2	**General** - Ignition voltage: 8 V to 18 V - Engine speed: 450 to 6800 RPM for at least 5 seconds - No TPS DTC's - No IMS range DTC's - No engine torque default - No shift solendoid electrical DTC's: P0973, P0974, P0976, P0977, P0979, P0980 - No TCC stuck ON DTC P0742 - No TISS P0716, P0717 DTC's - No TOSS P0722, P0723 DTC's - IMS range not park or neutral or reverse - Trans temp: 20 C to 130 C - Trans input speed: 200 to 6800 RPM - Trans output speed ≥ 100 RPM **Fail Case 1** - 1st gear commanded for time ≥ 1.25 second - TPS ≥10% - Engine torque: 40 Nm to 450 Nm - Gear ratio: 2.16 to 2.27 **Fail Case 2** - 4th or 5th gear commanded for time ≥ 5.0 second - TPS ≥ 10% - Engine torque: 36 Nm to 450 Nm - Gear ratio: 1.56 to 1.64	Continuous **Fail Case 1** **1.25** seconds **Fail Case 2** 5 seconds	The pass counter is incremented when the following pass cases are true: **Stuck ON pass case 1 AND pass case 4 AND pass case 5** Pass Counter ≥ 2	**General** - Ignition voltage: 8 V to 18 V - Engine speed: 450 to 6800 RPM for at least 5 seconds - No TPS DTC's - No IMS range DTC's - No engine torque default - No shift solendoid electrical DTC's: P1842, P1843, P1845, P1847 P1864, P1865 - No TCC stuck ON DTC P0742 - No TISS P0716, P0717 DTC's - No TOSS P0722, P0723 DTC's - IMS range not park or neutral or reverse - Trans temp: 20 C to 130 C - Trans input speed: 200 to 6800 RPM - Trans output speed ≥ 100 RPM **Pass Case 1** - 1st gear commanded for time ≥ 1.0 second - TPS ≥ 10% - Engine torque: 40 to 450 ft lbs - Gear ratio: 3.38 to 3.52 **Pass Case 4** - 4th gear commanded for time ≥ 1.0 second - TPS ≥ 10% - Engine torque: 36 to 350 ft lbs - Gear ratio: 0.99 to 1.03 **Pass Case 5** - 5th gear commanded for time ≥ 1.0 second - TPS ≥ 10% - Engine torque: 36 to 350 ft lbs - Gear ratio: 0.74 to 0.77	Continuous **Pass Case 1** **1.0** second **Pass Case 4** **1.0** second **Pass Case 5** **1.0** second	**FREEZE ADAPTS** **PCA PRESSURE OFFSET** **INHIBIT TAP ACTION** **INHIBIT MUMD** (NAO only) **INHIBIT AUTOGRADE BRAKING** TFTKO	DTC Type B	**BREAKOUT BOX SETUP** OPEN SHIFT SOL A (30) Short harness side to GND (7) Install dummy solenoid from SOL A (30) TCM side to Battery (27)	Fail Case 1 Conduct hard launch to stay in 1st gear

SENSED PARAMETER	FAULT CODE	ACCEPTABLE OPERATING RANGE AND RATIONALITY	PRIMARY MALF DETECTION PARAMETERS	SECONDARY MONITORING PARAMETERS AND CONDITIONS	FAIL MONITORING TIME LENGTH AND FREQUENCY OF CHECK	PRIMARY PASS DETECTION PARAMETERS	PASS SECONDARY MONITORING PARAMETERS AND CONDITIONS	PASS MONITORING TIME LENGTH AND FREQUENCY OF CHECK	ACTIONS	FAULT CODE STORAGE AND MIL ILLUMI-NATION	Fault Instructions	Special Instructions
Shift Solenoid A Performance	**P0752**	This DTC detects abnormal shift pattern **Stuck OFF: 1-1-4-4-5 pattern**	The fail counter is incremented when the following fail cases are true: **Stuck OFF fail case 3 AND fail case 4** Fail Counter ≥ 2	**General** - Ignition voltage: 8 V to 18 V - Engine speed: 450 to 6800 RPM for at least 5 seconds - No TPS DTC's - No IMS range DTC's - No engine torque default - - No shift solendoid electrical DTC's: P0973, P0974, P0976, P0977, P0979, P0980 - No TCC stuck ON DTC P0742 - No TISS P0716, P0717 DTC's - No TOSS P0722, P0723 DTC's - IMS range not park or neutral or reverse - Trans temp: 20 C to 130 C - Trans input speed: 200 to 6800 RPM - Trans output speed ≥ 100 RPM **Fail Case 3** - 2nd gear commanded for time ≥ 1.0 second - TPS ≥10% - Engine torque: 32 Nm to 450 Nm - Gear ratio: 3.33 to 3.50 **Fail Case 4** - 3rd gear commanded for time ≥ 1.0 second - TPS ≥ 10% - Engine torque: 32 Nm to 450 Nm - Gear ratio: 0.98 to 1.03	Continuous **Fail Case 3** **2** seconds **Fail Case 4** **3** seconds	The pass counter is incremented when the following pass cases are true: **Stuck OFF pass case 2 AND pass case 3** Pass Counter ≥ 2	**General** - Ignition voltage: 8 V to 18 V - Engine speed: 450 to 6800 RPM for at least 5 seconds - No TPS DTC's - No IMS range DTC's - No engine torque default - No shift solendoid electrical DTC's: P1842, P1843, P1845, P1847 P1864, P1865 - No TCC stuck ON DTC P0742 - No TISS P0716, P0717 DTC's - No TOSS P0722, P0723 DTC's - IMS range not park or neutral or reverse - Trans temp: 20 C to 130 C - Trans input speed: 200 to 6800 RPM - Trans output speed ≥ 100 RPM **Pass Case 2** - 2nd gear commanded for time ≥ 1.0 second - TPS ≥ 10% - Engine torque: 32 to 450 ft lbs - Gear ratio: 2.19 to 2.28 **Pass Case 3** - 3rd gear commanded for time ≥ 1.0 second - TPS ≥ 10% - Engine torque: 32 to 450 ft lbs - Gear ratio: 1.58 to 1.65	Continuous **Pass Case 2** **1.0** second **Pass Case 3** **1.0** second	**FREEZE ADAPTS** **PCS OFF (max line pressure)** **INHIBIT TAP ACTION** **INHIBIT MUMD** (NAO only) **POWERTRAIN BRAKING INHIBIT** **FORCE HSD1 OFF** Inhibit 32 down shift until vehicle speed ≤ 8 KPH TFTKO	DTC Type B	**BREAKOUT BOX SETUP** OPEN SHIFT SOL A (30) Install dummy solenoid from SOL A (30) TCM side to Battery (27)	

SENSED PARAMETER	FAULT CODE	ACCEPTABLE OPERATING RANGE AND RATIONALITY	PRIMARY MALF DETECTION PARAMETERS	SECONDARY MONITORING PARAMETERS AND CONDITIONS	FAIL MONITORING TIME LENGTH AND FREQUENCY OF CHECK	PRIMARY PASS DETECTION PARAMETERS	PASS SECONDARY MONITORING PARAMETERS AND CONDITIONS	PASS MONITORING TIME LENGTH AND FREQUENCY OF CHECK	ACTIONS	FAULT CODE STORAGE AND MIL ILLUMI-NATION	Fault Instructions	Special Instructions
Shift Solenoid B Performance	**P0756**	This DTC detects abnormal shift pattern **Stuck OFF: 5-3-3-4-5 pattern**	The fail counter is incremented when the following fail cases are true: **Stuck OFF fail case 5 AND fail case 6** Fail Counter ≥ 3	**General** - Ignition voltage: 8 V to 18 V - Engine speed: 450 to 6800 RPM for at least 5 seconds - No TPS DTC's - No IMS range DTC's - No engine torque default - - No shift solendoid electrical DTC's: P0973, P0974, P0976, P0977, P0979, P0980 - No TCC stuck ON DTC P0742 - No TISS P0716, P0717 DTC's - No TOSS P0722, P0723 DTC's - IMS range not park or neutral or reverse - Trans temp: 20 C to 130 C - Trans input speed: 200 to 6800 RPM - Trans output speed ≥ 200 RPM **Fail Case 5** - 1st gear commanded for time ≥ 1.0 second - TPS ≥10% - Engine torque: 40 Nm to 450 Nm - Trans output speed ≥ 200 RPM - Gear ratio: 0.73 to 0.77 **Fail Case 6** - 2nd gear commanded for time ≥ 1.0 second - TPS ≥ 10% - Engine torque: 36 Nm to 450 Nm - Gear ratio: 1.56 to 1.64	Continuous **Fail Case 5** **1.2** seconds **Fail Case 6** **1.2** seconds	The pass counter is incremented when the following pass cases are true: **Stuck OFF pass case 1 AND pass case 2** Pass Counter ≥ 1	**General** - Ignition voltage: 8 V to 18 V - Engine speed: 450 to 6800 RPM for at least 5 seconds - No TPS DTC's - No IMS range DTC's - No engine torque default - No shift solendoid electrical DTC's: P1842, P1843, P1845, P1847 P1864, P1865 - No TCC stuck ON DTC P0742 - No TISS P0716, P0717 DTC's - No TOSS P0722, P0723 DTC's - IMS range not park or neutral or reverse - Trans temp: 20 C to 130 C - Trans input speed: 200 to 6800 RPM - Trans output speed ≥ 200 RPM **Pass Case 1** - 1st gear commanded for time ≥ 1.0 second - TPS ≥ 10% - Engine torque: 40 to 450 ft lbs - Gear ratio: 3.38 to 3.52 **Pass Case 2** - 2nd gear commanded for time ≥ 1.0 second - TPS ≥ 10% - Engine torque: 32 to 450 ft lbs - Gear ratio: 2.19 to 2.28	Continuous **Pass Case 1** **1.0** second **Pass Case 2** **1.0** second	**HSD 1 OFF** **FREEZE ADAPTS** **POWERTRAIN BRAKING INHIBIT** **PCS OFF - MAX LINE PRESSURE** **INHIBIT TAP ACTION** **INHIBIT MUMD** (NAO only) TFTKO	DTC Type B	**BREAKOUT BOX SETUP** OPEN SHIFT SOL B (18) Install dummy solenoid from SOL B (18) TCM side to Battery (27)	

SENSED PARAMETER	FAULT CODE	ACCEPTABLE OPERATING RANGE AND RATIONALITY	PRIMARY MALF DETECTION PARAMETERS	SECONDARY MONITORING PARAMETERS AND CONDITIONS	FAIL MONITORING TIME LENGTH AND FREQUENCY OF CHECK	PRIMARY PASS DETECTION PARAMETERS	PASS SECONDARY MONITORING PARAMETERS AND CONDITIONS	PASS MONITORING TIME LENGTH AND FREQUENCY OF CHECK	ACTIONS	FAULT CODE STORAGE AND MIL ILLUMI-NATION	Fault Instructions	Special Instructions
Shift Solenoid B Performance	**P0757**	This DTC detects abnormal shift pattern **Stuck ON: 1-2-2-1-1 pattern**	The fail counter is incremented when the following fail cases are true: **Stuck OFF fail case 7 AND fail case 8** Fail Counter ≥ 1	**General** - Ignition voltage: 8 V to 18 V - Engine speed: 450 to 6800 RPM for at least 5 seconds - No TPS DTC's - No IMS range DTC's - No engine torque default - - No shift solendoid electrical DTC's: P0973, P0974, P0976, P0977, P0979, P0980 - No TCC stuck ON DTC P0742 - No TISS P0716, P0717 DTC's - No TOSS P0722, P0723 DTC's - IMS range not park or neutral or reverse - Trans temp: 20 C to 130 C - Trans input speed: 200 to 6800 RPM - Trans output speed ≥ 100 RPM **Fail Case 7** - 3rd gear commanded for time ≥ 1.0 second - TPS ≥10% - Engine torque: 20 Nm to 450 Nm - Trans output speed ≥ 200 RPM - Gear ratio: 2.16 to 2.27 **Fail Case 8** - 4th or 5th gear commanded for time ≥ 1.0 second - TPS ≥ 10% - Engine torque: 12 Nm to 450 Nm - Gear ratio: 3.33 to 3.50	Continuous **Fail Case 7** **2** seconds **Fail Case 8** **2** seconds	The pass counter is incremented when the following pass cases are true: **Stuck OFF pass case 3 AND pass case 4 and pass case 5** Pass Counter ≥ 1	**General** - Ignition voltage: 8 V to 18 V - Engine speed: 450 to 6800 RPM for at least 5 seconds - No TPS DTC's - No IMS range DTC's - No engine torque default - No shift solendoid electrical DTC's: P1842, P1843, P1845, P1847 P1864, P1865 - No TCC stuck ON DTC P0742 - No TISS P0716, P0717 DTC's - No TOSS P0722, P0723 DTC's - IMS range not park or neutral or reverse - Trans temp: 20 C to 130 C - Trans input speed: 200 to 6800 RPM - Trans output speed ≥ 100 RPM **Pass Case 3** - 3rd gear commanded for time ≥ 1.0 second - TPS ≥ 10% - Engine torque: 32 to 350 ft lbs - Gear ratio: 1.58 to 1.65 **Pass Case 4** - 4th gear commanded for time ≥ 1.0 second - TPS ≥ 10% - Engine torque: 36 to 350 ft lbs - Gear ratio: 0.99 to 1.03 **Pass Case 5** - 5th gear commanded for time ≥ 1.0 second - TPS ≥ 10% - Engine torque: 36 to 350 ft lbs - Gear ratio: 0.74 to 0.77	Continuous **Pass Case 3** **1.0** second **Pass Case 4** **1.0** second **Pass Case 5** **1.0** second	**HSD 1 OFF** **FREEZE ADAPTS** **INHIBIT 4TH AND 5TH GEAR** **POWERTRAIN BRAKING INHIBIT** **PCS OFF - MAX LINE PRESSURE** **INHIBIT TAP ACTION** **INHIBIT MUMD** (NAO only) **INHIBIT AUTOGRADE BRAKING** TFTKO	DTC Type B	**BREAKOUT BOX SETUP** Open Shift Sol B (18) and Short Harness Side to GND (7) Install Dummy Solenoid from Sol B (18) TCM Side to Battery (27)	

SENSED PARAMETER	FAULT CODE	ACCEPTABLE OPERATING RANGE AND RATIONALITY	PRIMARY MALF DETECTION PARAMETERS	SECONDARY MONITORING PARAMETERS AND CONDITIONS	FAIL MONITORING TIME LENGTH AND FREQUENCY OF CHECK	PRIMARY PASS DETECTION PARAMETERS	PASS SECONDARY MONITORING PARAMETERS AND CONDITIONS	PASS MONITORING TIME LENGTH AND FREQUENCY OF CHECK	ACTIONS	FAULT CODE STORAGE AND MIL ILLUMI-NATION	Fault Instructions	Special Instructions
Shift Solenoid C Performance	**P0761**	This DTC detects abnormal shift pattern **Stuck OFF: 1-2-3-5-5 pattern**	The fail counter is incremented when the following fail cases are true: **Stuck OFF fail case 9** Fail Counter ≥ 2	**General** - Ignition voltage: 8 V to 18 V - Engine speed: 450 to 6800 RPM for at least 5 seconds - No TPS DTC's - No IMS range DTC's - No engine torque default - - No shift solendoid electrical DTC's: P0973, P0974, P0976, P0977, P0979, P0980 - No TCC stuck ON DTC P0742 - No TISS P0716, P0717 DTC's - No TOSS P0722, P0723 DTC's - IMS range not park or neutral or reverse - Trans temp: 20 C to 130 C - Trans input speed: 200 to 6800 RPM - Trans output speed ≥ 100 RPM **Fail Case 9** - 4th gear commanded for time ≥ 1.0 second - TPS ≥10% - Engine torque: 36 Nm to 450 Nm - Gear ratio: 0.73 to 0.77	Continuous **Fail Case 9** **4** seconds	The pass counter is incremented when the following pass cases are true: **Stuck OFF pass case 4** Pass Counter ≥ 2	**General** - Ignition voltage: 8 V to 18 V - Engine speed: 450 to 6800 RPM for at least 5 seconds - No TPS DTC's - No IMS range DTC's - No engine torque default - No shift solendoid electrical DTC's: P1842, P1843, P1845, P1847 P1864, P1865 - No TCC stuck ON DTC P0742 - No TISS P0716, P0717 DTC's - No TOSS P0722, P0723 DTC's - IMS range not park or neutral or reverse - Trans temp: 20 C to 130 C - Trans input speed: 200 to 6800 RPM - Trans output speed ≥ 100 RPM **Pass Case 4** - 4th gear commanded for time ≥ 1.0 second - TPS ≥ 10% - Engine torque: 36 to 350 ft lbs - Gear ratio: 0.99 to 1.03	Continuous **Pass Case 4** **1.0** second	**FREEZE ADAPTS** **POWERTRAIN BRAKING INHIBIT** **PCS PRESSURE OFFSET** **INHIBIT TAP ACTION** **INHIBIT MUMD** (NAO only) **INHIBIT AUTOGRADE BRAKING** TFTKO	DTC Type B	**BREAKOUT BOX SETUP** Open Shift Sol C (19) and Install Dummy Solenoid from Sol C (19) TCM Side to Battery (27)	

SENSED PARAMETER	FAULT CODE	ACCEPTABLE OPERATING RANGE AND RATIONALITY	PRIMARY MALF DETECTION PARAMETERS	SECONDARY MONITORING PARAMETERS AND CONDITIONS	FAIL MONITORING TIME LENGTH AND FREQUENCY OF CHECK	PRIMARY PASS DETECTION PARAMETERS	PASS SECONDARY MONITORING PARAMETERS AND CONDITIONS	PASS MONITORING TIME LENGTH AND FREQUENCY OF CHECK	ACTIONS	FAULT CODE STORAGE AND MIL ILLUMI-NATION	Fault Instructions	Special Instructions
Shift Solenoid C Performance	**P0762**	This DTC detects abnormal shift pattern **Stuck ON: 1-2-3-4-4 pattern**	The fail counter is incremented when the following fail cases are true: **Stuck ON fail case 10** Fail Counter ≥ 2	**General** - Ignition voltage: 8 V to 18 V - Engine speed: 450 to 6800 RPM for at least 5 seconds - No TPS DTC's - No IMS range DTC's - No engine torque default - - No shift solendoid electrical DTC's: P0973, P0974, P0976, P0977, P0979, P0980 - No TCC stuck ON DTC P0742 - No TISS P0716, P0717 DTC's - No TOSS P0722, P0723 DTC's - IMS range not park or neutral or reverse - Trans temp: 20 C to 130 C - Trans input speed: 200 to 6800 RPM - Trans output speed ≥ 100 RPM **Fail Case 10** - 5th gear commanded for time ≥ 1.0 second - TPS ≥10% - Engine torque: 36 Nm to 450 Nm - - Gear ratio: 0.98 to 1.03 Fail Case 11 - 2nd or 3rd gear commanded for time ≥ 3.0 seconds	Continuous **Fail Case 10** **3.5** seconds **Fail Case 11** **3.0** seconds	The pass counter is incremented when the following pass cases are true: **Stuck ON pass case 5** Pass Counter ≥ 1	**General** - Ignition voltage: 8 V to 18 V - Engine speed: 450 to 6800 RPM for at least 5 seconds - No TPS DTC's - No IMS range DTC's - No engine torque default - No shift solendoid electrical DTC's: P1842, P1843, P1845, P1847 P1864, P1865 - No TCC stuck ON DTC P0742 - No TISS P0716, P0717 DTC's - No TOSS P0722, P0723 DTC's - IMS range not park or neutral or reverse - Trans temp: 20 C to 130 C - Trans input speed: 200 to 6800 RPM - Trans output speed ≥ 100 RPM **Pass Case 5** - 5th gear commanded for time ≥ 1.0 second - TPS ≥ 10% - Engine torque: 36 to 350 ft lbs - Gear ratio: 0.74 to 0.77	Continuous **Pass Case 5** **1.0** second	**FREEZE ADAPTS** **POWERTRAIN BRAKING INHIBIT** **PRESSURE OFFSET ACTION** **INHIBIT TAP ACTION** **INHIBIT MUMD** (NAO only) TFTKO	DTC Type B	**BREAKOUT BOX SETUP** Open Shift Sol C (19) and Short Harness Side to GND (7) Install Dummy Solenoid from Sol C (19) TCM Side to Battery (27)	
Transmission Upshift Switch Circuit STUCK ON	**P0815**	This DTC detects a manual Upshift Switch Circuit malfunction where manual mode is or is not possible	When fail case 1 and fail case 2 are true. **Fail case 1 & 2** **In any PRDNL Range the switch is stuck on.**	General - Ignition voltage: 8 V to 18 V - Engine speed: 450 to 6800 RPM for at least 5 seconds - **No IMS range DTCs** - **Range change Timer > 6 seconds** - **No P1898 or P0826 DTC's** - **Both Fail Case 1 & 2 are TRUE** **Fail case 1** **Upshift switch is Stuck On for 1 second** **Fail case 2** **Upshift switch is Stuck On for 600 seconds**	Continuous	Tap Upshift Circuit is not active for 10 seconds	When fail case 1 and fail case 2 are not true.	Continuous	**INHIBIT TAP ACTION** **INHIBIT MUMD** (NAO only) TFTKO	DTC Type C	**BREAKOUT BOX SETUP** Shift into Tap Mode, Press and hold Shift Lever forward for a Tap Upshift until DTC sets.	

SENSED PARAMETER	FAULT CODE	ACCEPTABLE OPERATING RANGE AND RATIONALITY	PRIMARY MALF DETECTION PARAMETERS	SECONDARY MONITORING PARAMETERS AND CONDITIONS	FAIL MONITORING TIME LENGTH AND FREQUENCY OF CHECK	PRIMARY PASS DETECTION PARAMETERS	PASS SECONDARY MONITORING PARAMETERS AND CONDITIONS	PASS MONITORING TIME LENGTH AND FREQUENCY OF CHECK	ACTIONS	FAULT CODE STORAGE AND MIL ILLUMI-NATION	Fault Instructions	Special Instructions
Transmission Downshift Switch Circuit STUCK ON	**P0816**	This DTC detects manual Downshift Switch Circuit malfunction where manual mode is or, is not possible	When fail case 1 and fail case 2 are true. **Fail case 1 & 2** **In any PRDNL Range the switch is stuck on.**	General - Ignition voltage: 8 V to 18 V - Engine speed: 450 to 6800 RPM for at least 5 seconds - **No IMS range DTCs** - **Range change Timer > 6 seconds** - **No P1898 or P0826 DTC's** - **Both Fail Case 1 & 2 are TRUE** **Fail case 1** **Downshift switch is Stuck On for 1 second** **Fail case 2** **Downshift switch is Stuck On for 600 seconds**	Continuous	Tap Circuit is not active for 10 seconds	none	Continuous	**INHIBIT TAP ACTION** **INHIBIT MUMD** (NAO only) TFTKO	DTC Type C	**BREAKOUT BOX SETUP** Shift into Tap Mode, Press and hold Shift Lever rearward for a Tap Downshift until DTC sets.	
Tap circuit reads an INVALID VOLTAGE RANGE	**P0826**	This DTC checks for Voltages that are too low or too high indicating the signal is INVALID	The Tap Up Tap Down circuit is in an invalid voltage state for 5 seconds	General - Ignition voltage: 8 V to 18 V Engine speed: 450 to 6800 RPM for at least 5 seconds	Continuous	The Tap Up Tap Down circuit is in a valid state for 4 seconds	Same as Fail Enable conditons	Continuous	**INHIBIT TAP ACTION** **INHIBIT MUMD** (NAO only) TFTKO	DTC Type C	**BREAKOUT BOX SETUP** **Case 1** Open Tap Switch (TUTD) (14) **Case 2** Open Tap Switch (TUTD) (14), short to GND (7) **Case 3** Open Tap Switch (TUTD) (14), short to Battery (27)	
Transmission Fluid Life	**P0897 Was P1868**	This DTC checks if the percentage of transmission fluid life remaining is below a certain value.	Transmission fluid percent of life remaining ≤ 10 **%**	- Ignition voltage: 8 V to 18 V - No TFT DTC's P0218, P0711, P0712, or P0713 set	Continuous	Transmission fluid percent of life remaining > 10 **%**	- Ignition voltage: 8 V to 18 V - No TFT DTC's P0218, P0711, P0712, or P0713 set	Continuous	none	DTC Type C	**BREAKOUT BOX SETUP** Tested with CAL Change. Raise Calibration KfTFQC_Pct_TransFldLifeChange above the value VfTFQC_Pct_TransFldLifeLeft	Turned on for Cadillac and Holden apps only

SENSED PARAMETER	FAULT CODE	ACCEPTABLE OPERATING RANGE AND RATIONALITY	PRIMARY MALF DETECTION PARAMETERS	SECONDARY MONITORING PARAMETERS AND CONDITIONS	FAIL MONITORING TIME LENGTH AND FREQUENCY OF CHECK	PRIMARY PASS DETECTION PARAMETERS	PASS SECONDARY MONITORING PARAMETERS AND CONDITIONS	PASS MONITORING TIME LENGTH AND FREQUENCY OF CHECK	ACTIONS	FAULT CODE STORAGE AND MIL ILLUMI-NATION	Fault Instructions	Special Instructions
Shift Solenoid A Electrical (open or ground short)	**P0973**	0V to 12V This DTC detects a continuous short to ground or open on shift solenoid A circiut	Fail counter ≥ 43 counts out of 50 total counts	- Ignition voltage: 8 V to 18 V - Engine speed: 450 to 6800 RPM for at least 5 seconds - High side driver 2 is commanded on - Shift solenoid is commanded on and an open is detected by hardware OR Shift solenoid is commanded off and a short to ground is detected by hardware	Continuous	Pass counter ≥ 43 counts out of 50 total counts	- Ignition voltage: 8 V to 18 V - Engine speed: 450 to 6800 RPM for at least 5 seconds - High side driver 2 is commanded on - Shift solenoid is commanded on and an open is not detected by hardware OR Shift solenoid is commanded off and a short to ground is not detected by hardware	Continuous	**HSD 1 OFF** **TCC OFF** **FREEZE ADAPTS** **IMMEDIATE LANDING ACTION** **INHIBIT POWERTRAIN BRAKING** **PCS OFF - MAX LINE PRESSURE** **TCC SOLENOID INHIBIT ACTION** **INHIBIT TAP ACTION** TFTKO	DTC Type B	BREAKOUT BOX SETUP **Case 1** Start Engine then set fault Open Circuit Shift Sol A (30) **Case 2** Start Engine then set fault Open Circuit Shift Sol A (30), Short circuit Shift Sol A (30) to GND (7)	
Shift Solenoid A Electrical (power short)	**P0974**	0V to 12V This DTC detects a continuous short to voltage on shift solenoid A circiut	Fail counter ≥ 43 counts out of 50 total counts	- Ignition voltage: 8 V to 18 V - Engine speed: 450 to 6800 RPM for at least 5 seconds - High side driver 2 is commanded on - Shift solenoid is commanded on and a short to voltage is detected by hardware	Continuous	Pass counter ≥ 43 counts out of 50 total counts	- Ignition voltage: 8 V to 18 V - Engine speed: 450 to 6800 RPM for at least 5 seconds - High side driver 2 is commanded on - Shift solenoid is commanded on and a short to voltage is detected by hardware	Continuous	**HSD 1 OFF** **FREEZE ADAPTS** **INHIBIT 3-2 DOWNSHIFT UNTIL VEHICLE SPEED ≤ 8 KPH** **POWERTRAIN BRAKE INHIBIT ACTION** **PCS OFF - MAX LINE PRESSURE** **INHIBIT TAP ACTION** TFTKO	DTC Type B	**BREAKOUT BOX SETUP** Note: Set Fault before starting engine Open Shift Sol A (30) and Short to Battery (27)	

SENSED PARAMETER	FAULT CODE	ACCEPTABLE OPERATING RANGE AND RATIONALITY	PRIMARY MALF DETECTION PARAMETERS	SECONDARY MONITORING PARAMETERS AND CONDITIONS	FAIL MONITORING TIME LENGTH AND FREQUENCY OF CHECK	PRIMARY PASS DETECTION PARAMETERS	PASS SECONDARY MONITORING PARAMETERS AND CONDITIONS	PASS MONITORING TIME LENGTH AND FREQUENCY OF CHECK	ACTIONS	FAULT CODE STORAGE AND MIL ILLUMI-NATION	Fault Instructions	Special Instructions
Shift Solenoid B Electrical (open or ground short)	**P0976**	0V to 12V This DTC detects a continuous short to ground or open on shift solenoid B circiut	Fail counter ≥ 43 counts out of 50 total counts	- Ignition voltage: 8 V to 18 V - Engine speed: 450 to 6800 RPM for at least 5 seconds - High side driver 2 is commanded on - Shift solenoid is commanded on and an open is detected by hardware OR Shift solenoid is commanded off and a short to ground is detected by hardware	Continuous	Pass counter ≥ 43 counts out of 50 total counts	- Ignition voltage: 8 V to 18 V - Engine speed: 450 to 6800 RPM for at least 5 seconds - High side driver 2 is commanded on - Shift solenoid is commanded on and an open is not detected by hardware OR Shift solenoid is commanded off and a short to ground is not detected by hardware	Continuous	**HSD 1 OFF** **HSD 2 OFF** **TCC OFF** **FREEZE ADAPTS** **POWERTRAIN BRAKING INHIBIT** **IMMEDIATE LANDING** **PCS OFF - MAX LINE PRESSURE** **TCC SOLENOID INHIBIT ACTION** **INHIBIT TORQUE MANAGEMENT** **INHIBIT TAP ACTION** TFTKO	DTC Type B	**BREAKOUT BOX SETUP** **Case 1** Start Engine, then set fault Open circuit Sol B (18) **Case 2** Start Engine, then set fault Short circuit Sol B (18) to GND (7)	
Shift Solenoid B Electrical (power short)	**P0977**	0V to 12V This DTC detects a continuous short to voltage on shift solenoid B circiut	Fail counter ≥ 43 counts out of 50 total counts	- Ignition voltage: 8 V to 18 V - Engine speed: 450 to 6800 RPM for at least 5 seconds - High side driver 2 is commanded on - Shift solenoid is commanded on and a short to voltage is detected by hardware	Continuous	Pass counter ≥ 43 counts out of 50 total counts	- Ignition voltage: 8 V to 18 V - Engine speed: 450 to 6800 RPM for at least 5 seconds - High side driver 2 is commanded on - Shift solenoid is commanded on and a short to voltage is detected by hardware	Continuous	**HSD 1 OFF** **FREEZE ADAPTS** **INHIBIT 1ST GEAR** **PCS OFF - MAX LINE PRESSURE** **INHIBIT TAP ACTION** TFTKO	DTC Type B	**BREAKOUT BOX SETUP** Note: Set Fault before starting engine! Open Shift Sol B (18) and short to Battery (27)	

SENSED PARAMETER	FAULT CODE	ACCEPTABLE OPERATING RANGE AND RATIONALITY	PRIMARY MALF DETECTION PARAMETERS	SECONDARY MONITORING PARAMETERS AND CONDITIONS	FAIL MONITORING TIME LENGTH AND FREQUENCY OF CHECK	PRIMARY PASS DETECTION PARAMETERS	PASS SECONDARY MONITORING PARAMETERS AND CONDITIONS	PASS MONITORING TIME LENGTH AND FREQUENCY OF CHECK	ACTIONS	FAULT CODE STORAGE AND MIL ILLUMI-NATION	Fault Instructions	Special Instructions
Shift Solenoid C Electrical (open or ground short)	**P0979**	0V to 12V This DTC detects a continuous short to ground or open on shift solenoid C circiut	Fail counter ≥ 43 counts out of 50 total counts	- Ignition voltage: 8 V to 18 V - Engine speed: 450 to 6800 RPM for at least 5 seconds - High side driver 2 is commanded on - Shift solenoid is commanded on and an open is detected by hardware OR Shift solenoid is commanded off and a short to ground is detected by hardware	Continuous	Pass counter ≥ 43 counts out of 50 total counts	- Ignition voltage: 8 V to 18 V - Engine speed: 450 to 6800 RPM for at least 5 seconds - High side driver 2 is commanded on - Shift solenoid is commanded on and an open is not detected by hardware OR Shift solenoid is commanded off and a short to ground is not detected by hardware	Continuous	**FORCE TCC OFF** **FREEZE ADAPTS** **IMMEDIATE LANDING** **INHIBIT POWERTRAIN BRAKING ACTION** **INHIBIT TCC SOLENOID ACTION** **PCA PRESSURE OFFSET ACTION** **INHIBIT TAP ACTION** TFTKO	DTC Type B	**BREAKOUT BOX SETUP** **Case 1** Start Engine,then set fault Open circuit Sol C (19) **Case 2** Start Engine then set fault Short circuit Sol C (19) to GND (7)	
Shift Solenoid C Electrical (power short)	**P0980**	0V to 12V This DTC detects a continuous short to voltage on shift solenoid C circiut	Fail counter ≥ 43 counts out of 50 total counts	- Ignition voltage: 8 V to 18 V - Engine speed: 450 to 6800 RPM for at least 5 seconds - High side driver 2 is commanded on - Shift solenoid is commanded on and a short to voltage is detected by hardware	Continuous	Pass counter ≥ 43 counts out of 50 total counts	- Ignition voltage: 8 V to 18 V - Engine speed: 450 to 6800 RPM for at least 5 seconds - High side driver 2 is commanded on - Shift solenoid is commanded on and a short to voltage is detected by hardware	Continuous	**FORCE TCC OFF** **FREEZE ADAPTS** **IMMEDIATE LANDING** **INHIBIT POWERTRAIN BRAKING ACTION** **INHIBIT TCC SOLENOID ACTION** **PCA PRESSURE OFFSET ACTION** **INHIBIT TAP ACTION**	DTC Type B	**BREAKOUT BOX SETUP** Note: Set Fault before starting engine Open Sol C (19) and short circuit to Battery (27), must drive to exercise Solenoid	

SENSED PARAMETER	FAULT CODE	ACCEPTABLE OPERATING RANGE AND RATIONALITY	PRIMARY MALF DETECTION PARAMETERS	SECONDARY MONITORING PARAMETERS AND CONDITIONS	FAIL MONITORING TIME LENGTH AND FREQUENCY OF CHECK	PRIMARY PASS DETECTION PARAMETERS	PASS SECONDARY MONITORING PARAMETERS AND CONDITIONS	PASS MONITORING TIME LENGTH AND FREQUENCY OF CHECK	ACTIONS	FAULT CODE STORAGE AND MIL ILLUMI-NATION	Fault Instructions	Special Instructions
Wheel Speed Sensor Signal No Valid Signal CAN	**P1793**	This DTC detects an invalid wheel speed value from the ECU to the TCM	ECU CAN message does not contain a valid wheel speed value for 2.0 seconds	- Ignition voltage: 8 V to 18 V - Engine speed: 450 to 6800 RPM for at least **6.0** seconds - No CAN error in process	Continuous	ECU CAN message contains a valid wheel speed value for 2.0 seconds	- Ignition voltage: 8 V to 18 V - Engine speed: 450 to 6800 RPM for at least 5 seconds - No CAN error in process	Continuous	**INHIBIT AUTOGRADE BRAKING** TFTKO	DTC Type C	**BREAKOUT BOX SETUP** Tested with CAN TOOL SEND any one or more of the following: 1. Message 280, 04 00 00 00 00 00 00 00, at 1msec. LF 2. Message 280, 00 00 00 00 04 00 00 00, at 1msec. RF 3. Message 280, 04 00 00 00 00 00 00 00, at 1msec. LR 4. Message 280, 00 00 00 00 04 00 00 00, at 1msec. RR	
IMS Circuit A Low	**P1820**	0V to 12V This DTC detects an IMS circuit A ground short.	IMS Circuit A open flag is not set, increment fail counter.	- Ignition voltage: 8 V to 18 V - Engine speed: 450 to 6800 RPM for at least 5 seconds - No engine torque default - Engine torque: **55 to 450 Nm** - IMS range is Park for time ≥ 1.0 seconds - A transitional IMS state is present for time ≥ 4.0 seconds	Fail Co unter ≥ 1	IMS Circuit A open flag is set.	- Ignition voltage: 8 V to 18 V - Engine speed: 450 to 6800 RPM for at least **0.025** seconds	0.025 seconds	**FREEZE ADAPTS** **PCS OFF - MAX LINE PRESSURE** **DEFAULT TRANSMISSION TO D5 SHIFT PATTERN** - *Note: This is a Cal in TRGI Software Ring. Therefore, it does not show up in the calibratable Default Actions.* TFTKO	DTC Type B	**BREAKOUT BOX SETUP** Open IMS A Switch (36) and Short IMS A (36) TCM Side to GND (7) NOTE: *RUN IN D5	

SENSED PARAMETER	FAULT CODE	ACCEPTABLE OPERATING RANGE AND RATIONALITY	PRIMARY MALF DETECTION PARAMETERS	SECONDARY MONITORING PARAMETERS AND CONDITIONS	FAIL MONITORING TIME LENGTH AND FREQUENCY OF CHECK	PRIMARY PASS DETECTION PARAMETERS	PASS SECONDARY MONITORING PARAMETERS AND CONDITIONS	PASS MONITORING TIME LENGTH AND FREQUENCY OF CHECK	ACTIONS	FAULT CODE STORAGE AND MIL ILLUMI-NATION	Fault Instructions	Special Instructions
IMS Circuit B High	**P1822**	0V to 12V This DTC detects an IMS circuit B power short.	IMS Circuit B open flag is set, increment fail counter.	- Ignition voltage: 8 V to 18 V - Engine speed: 450 to 6800 RPM for at least 5 seconds - No engine torque default - Engine torque: **55** Nm to 450 Nm - IMS range is Park for time ≥ **1.0** seconds - A transitional IMS state is present for time ≥ **4.0)**seconds	Fail Counter ≥ 1	IMS Circuit B open flag is not set.	- Ignition voltage: 8 V to 18 V - Engine speed: 450 to 6800 RPM for at least 5 seconds	0.025 seconds	**FREEZE ADAPTS** **PCS OFF - MAX LINE PRESSURE** **DEFAULT TRANSMISSION TO D5 SHIFT PATTERN** - *Note: This is a Cal in TRGI Software Ring. Therefore, it does not show up in the calibratable Default Actions.* TFTKO	DTC Type B	**BREAKOUT BOX SETUP** Open Switch IMS B (24) NOTE: *RUN IN D5 and brake torq	
IMS Circuit P Low	**P1823**	0V to 12V This DTC detects an IMS circuit P ground short.	IMS Circuit P open flag is not set, increment fail counter.	- Ignition voltage: 8 V to 18 V - Engine speed: 450 to 6800 RPM for at least 5 seconds - No engine torque default - Engine torque: **25** Nm to 450 Nm - IMS range is Park for time ≥ **1.0** seconds - A transitional IMS state is present for time ≥ **5.0** seconds	Fail Counter ≥ 1	IMS Circuit P open flag is set.	- Ignition voltage: 8 V to 18 V - Engine speed: 450 to 6800 RPM for at least 5 seconds	0.025 seconds	**FREEZE ADAPTS** **PCS OFF - MAX LINE PRESSURE** **DEFAULT TRANSMISSION TO D5 SHIFT PATTERN** - *Note: This is a Cal in TRGI Software Ring. Therefore, it does not show up in the calibratable Default Actions.* TFTKO	DTC Type B	**BREAKOUT BOX SETUP** Open Switch IMS P (37) short to TCM Side to GND (7) NOTE: *RUN IN D5	

SENSED PARAMETER	FAULT CODE	ACCEPTABLE OPERATING RANGE AND RATIONALITY	PRIMARY MALF DETECTION PARAMETERS	SECONDARY MONITORING PARAMETERS AND CONDITIONS	FAIL MONITORING TIME LENGTH AND FREQUENCY OF CHECK	PRIMARY PASS DETECTION PARAMETERS	PASS SECONDARY MONITORING PARAMETERS AND CONDITIONS	PASS MONITORING TIME LENGTH AND FREQUENCY OF CHECK	ACTIONS	FAULT CODE STORAGE AND MIL ILLUMI-NATION	Fault Instructions	Special Instructions
IMS Illegal Range	**P1825**	0V to 12V This DTC detects an IMS "illegal" range value.	IMS range value converted is not a valid value.	- Ignition voltage: 8 V to 18 V - Engine speed: 450 to 6800 RPM for at least 5 seconds	5.0 seconds Continuous	IMS range value converted is a valid value.	- Ignition voltage: 8 V to 18 V - Engine speed: 450 to 6800 RPM for at least 5 seconds	5.0 seconds Continuous	**FREEZE ADAPTS** **PCS OFF - MAX LINE PRESSURE** **DEFAULT TRANSMISSION TO D5 SHIFT PATTERN** - *Note: This is a Cal in TRGI Software Ring. Therefore, it does not show up in the calibratable Default Actions.* TFTKO	DTC Type B	**BREAKOUT BOX SETUP** Start Vehicle IN PARK, OPEN Switch IMS A (36) and short to Ground (7)	
IMS Circuit C High	**P1826**	0V to 12V This DTC detects an IMS circuit C power short.	IMS Circuit C open flag is set, increment fail counter.	- Ignition voltage: 8 V to 18 V - No TOSS DTC's - No engine torque default - Engine torque ≥ 20 Nm - Vehicle speed ≥ 8.0 KHP - Gear ratio: 3.33 to 3.50 (1^{st}) OR 2.16 to 2.27 (2^{nd}) OR 1.56 to 1.64 (3^{rd}) OR 0.98 to 1.03 (4^{th}) OR 0.73 to 0.77 (5^{th}) - P1826 not passed this ignition cycle	3.0 seconds Fail Counter ≥ 1	IMS Circuit C open flag is not set, increment pass counter.	- Ignition voltage: 8 V to 18 V - No TOSS DTC's - No engine torque default - Engine torque ≥ 20 Nm - Vehicle speed ≥ 8.0 KHP - Gear ratio: 3.33 to 3.52 (1^{st}) OR 2.16 to 2.27 (2^{nd}) OR 1.56 t0 1.64 (3^{rd}) OR 0.98 to 1.03 (4^{th}) OR 0.73 to 0.77 (5^{th}) - P1826 not passed this ignition cycle	3.0 seconds Pass Counter ≥ 1	**FREEZE ADAPTS** **PCS OFF - MAX LINE PRESSURE** **DEFAULT TRANSMISSION TO D5 SHIFT PATTERN** - *Note: This is a Cal in TRGI Software Ring. Therefore, it does not show up in the calibratable Default Actions.* TFTKO	DTC Type B	**BREAKOUT BOX SETUP** Start Vehicle IN D5, OPEN Switch IMS C (25)	
High Side Driver 1 Ground Short	**P1831**	0V to 12V This DTC detects a continuous short to ground on the high side driver circiut	Fail counter ≥ 21 counts out of 25 total counts	- Ignition voltage: 8 V to 18 V - Engine speed: 450 to 6800 RPM for at least 5 seconds - High side driver 1 is commanded on and ground short is detected by hardware	Continuous	Pass counter ≥ 21 counts out of 25 total counts	- Ignition voltage: 8 V to 18 V - Engine speed: 450 to 6800 RPM for at least 5 seconds - High side driver 1 is commanded on and short to ground is not sesned by hardware	Continuous	**FREEZE ADAPTS** **HSD 1 OFF** **PCS OFF (max line pressure)** TFTKO	DTC Type C	**BREAKOUT BOX SETUP** Do not open Break Out Box switch. Short HSD 1 (3) to GND (7) (use 10A Fuse) Then start car.	

SENSED PARAMETER	FAULT CODE	ACCEPTABLE OPERATING RANGE AND RATIONALITY	PRIMARY MALF DETECTION PARAMETERS	SECONDARY MONITORING PARAMETERS AND CONDITIONS	FAIL MONITORING TIME LENGTH AND FREQUENCY OF CHECK	PRIMARY PASS DETECTION PARAMETERS	PASS SECONDARY MONITORING PARAMETERS AND CONDITIONS	PASS MONITORING TIME LENGTH AND FREQUENCY OF CHECK	ACTIONS	FAULT CODE STORAGE AND MIL ILLUMI-NATION	Fault Instructions	Special Instructions
High Side Driver 1 Power Short	**P1832**	0V to 12V This DTC detects a continuous short to power on the high side driver circiut	immediate	- TCM powered - Hardware monitor detects voltage ≥ 6.4 V on high side driver 1 circuit	Continuous	immediate	- Hardware monitor detects voltage ≤ 6.4 V on high side driver 1 circuit	Continuous	**FREEZE ADAPTS** **HSD 1 OFF** **PCS OFF (max line pressure)** TFTKO	DTC Type C	**BREAKOUT BOX SETUP** Do not open Break Out Box switch, Short HSD 1 (3) to Battery (27) then start car.	
High Side Driver 2 Ground Short	**P1833**	0V to 12V This DTC detects a continuous short to ground on the high side driver circiut	Fail counter ≥ 21 counts out of 25 total counts	- Ignition voltage: 8 V to 18 V - Engine speed: 450 to 6800 RPM for at least 5 seconds - High side driver 2 is commanded on and ground short is detected by hardware	Continuous	Pass counter ≥ 21 counts out of 25 total counts	- Ignition voltage: 8 V to 18 V - Engine speed: 450 to 6800 RPM for at least 5 seconds - High side driver 2 is commanded on and short to ground is not sesned by hardware	Continuous	**HSD 1 OFF** **HSD 2 OFF** **TCC OFF** **FREEZE ADAPTS** **IMMEDIATE LANDING ACTION** **PCS OFF - MAX LINE PRESSURE** **TCC SOLENOID INHIBIT ACTION** TFTKO	DTC Type B	**BREAKOUT BOX SETUP** Do not open Break Out Box switch, Short HSD 2 (8)to GND (7), then start car.	
High Side Driver 2 Power Short	**P1834**	0V to 12V This DTC detects a continuous short to power on the high side driver circiut	immediate	- TCM powered - Hardware monitor detects voltage ≥ 6.4 V on high side driver 2 circuit	Continuous	immediate	- Hardware monitor detects voltage ≤ 6.4 V on high side driver 2 circuit	Continuous	**HSD 1 OFF** **HSD 2 OFF** **TCC OFF** **FREEZE ADAPTS** **IMMEDIATE LANDING ACTION** **PCS OFF - MAX LINE PRESSURE** **TCC SOLENOID INHIBIT ACTION** TFTKO	DTC Type B	**BREAKOUT BOX SETUP** Do not open Break Out Box switch, Short HSD 2 (8) to Battery (27), then start car.	

SENSED PARAMETER	FAULT CODE	ACCEPTABLE OPERATING RANGE AND RATIONALITY	PRIMARY MALF DETECTION PARAMETERS	SECONDARY MONITORING PARAMETERS AND CONDITIONS	FAIL MONITORING TIME LENGTH AND FREQUENCY OF CHECK	PRIMARY PASS DETECTION PARAMETERS	PASS SECONDARY MONITORING PARAMETERS AND CONDITIONS	PASS MONITORING TIME LENGTH AND FREQUENCY OF CHECK	ACTIONS	FAULT CODE STORAGE AND MIL ILLUMI-NATION	Fault Instructions	Special Instructions
TAP Up and Down Shift Switch Performance	**P1876**	This DTC detects a mismatch between the Tap Mode Enable Switch and the IMS Range indication.	The Tap Enable Switch is Active and, the Range does not equal D5 for 5 counts of 12 seconds	- Ignition voltage: 8 V to 18 V - Engine speed: 450 to 6800 RPM for at least 5 seconds - No CAN error in process - No Tap Codes set P0815, P0816, P0826 - No IMS Range Codes set P1815,P1820,P1822, P1823, P1825, P1826	Continuous	The Tap Enable Switch is Active and, the Range is equal D5 for 2 counts of 1 second	- Ignition voltage: 8 V to 18 V - Engine speed: 450 to 6800 RPM for at least 5 seconds - No CAN error in process - No Tap Codes set P0815, P0816, P0826 - No IMS Range Codes set P1815,P1820,P1822, P1823, P1825, P1826	Continuous	**INHIBIT TAP ACTION**	DTC Type C	**BREAKOUT BOX SETUP** Engine running, Tap enabled the Vehicle "Shift into Tap Mode", then Open IMS C (25).	
IMS Start in Wrong Range	**P1915 Was P1815**	0V to 12V This DTC detects an invalid state of the IMS during engine start up.	IMS position remains in a transitional state during the sequential period of the test.	- Run once per ignition cycle - Ignition voltage: 6 V to 18 V - No TOSS P0722, P0723 DTC's - Trans output speed ≤ 100 RPM - Engine speed ≤ 60 RPM for time ≥ **0.25** seconds - Sequentially: Engine speed **81 to 625** RPM for time ≥ 0.15 seconds Then Engine speed ≥ 651 RPM and input speed ≥ 200 RPM for time ≥ 1.5 seconds	Once per ignition cycle during engine start up.	IMS position remains in park or neutral during the sequential period of the test.	- Run once per ignition cycle - Ignition voltage: 6 V to 18 V - No TOSS P0722, P0723 DTC's - Trans output speed ≤ 100 RPM - Engine speed ≤ 60 RPM for time ≥ 0.3 seconds - Sequentially: Engine speed **81 to 625** RPM for time ≥ **0.01875** seconds Then Engine speed ≥ 651 RPM for time ≥ 0.0125 seconds	Once per ignition cycle during engine start up.	**FREEZE ADAPTS** **PCS OFF - MAX LINE PRESSURE** **DEFAULT TRANSMISSION TO D5 SHIFT PATTERN** - *Note: This is a Cal in TRGI Software Ring. Therefore, it does not show up in the calibratable Default Actions.* TFTKO	DTC Type B	**BREAKOUT BOX SETUP** Note: Set fault before starting engine. Open Switch IMS C (25) and short TCM side to GND (7)	

SENSED PARAMETER	FAULT CODE	ACCEPTABLE OPERATING RANGE AND RATIONALITY	PRIMARY MALF DETECTION PARAMETERS	SECONDARY MONITORING PARAMETERS AND CONDITIONS	FAIL MONITORING TIME LENGTH AND FREQUENCY OF CHECK	PRIMARY PASS DETECTION PARAMETERS	PASS SECONDARY MONITORING PARAMETERS AND CONDITIONS	PASS MONITORING TIME LENGTH AND FREQUENCY OF CHECK	ACTIONS	FAULT CODE STORAGE AND MIL ILLUMI-NATION	Fault Instructions	Special Instructions
Ignition Run Crank Relay Open Circuit Diagnostic	**P2534**	This DTC detects an OPEN or Sort to GND on the Ignition/Run /Crank Input to the TCM	Fail counter ≥ 400 counts out of 480 total counts. Note: Every 25 msec, the counters are incremented.	- The ECM sends an Engine is Running Status Message - The TCM is not in Diagnostic Reset	Continuous	Pass counter ≥ 400 counts out of 480 total counts Note: Every 25 msec, the counters are incremented.	- The ECM sends an Engine is Running Status Message - The TCM is not in Diagnostic Reset	Continuous	**HSD 1 OFF** **HSD 2 OFF** **TCC OFF** **FREEZE ADAPTS** **IMMEDIATE LANDING ACTION** **PCS OFF - MAX LINE PRESSURE** **TCC SOLENOID INHIBIT ACTION** **TORQUE MANAGEMENT INHIBIT** **POWERTRAIN BRAKE INHIBIT** TFTKO	DTC Type A	**BREAKOUT BOX SETUP** **Case 1** Open circuit Ignition/Run/Crank (9) **Case 2** Open circuit Ignition/Run/Crank (9) and Short TCM Side to GND (7)	
Torque Reduction Signal Circuit CAN	**P2544 Was P1780**	This DTC detects a failed torque reduction requested by the ECU to the TCM	ECU CAN torque request fail flag is true for 2.0 seconds	- Ignition voltage: 8 V to 18 V - Engine speed: 450 to 6800 RPM for at least 5 seconds - No CAN error in process	Continuous	ECU CAN torque request fail flag is cleared for 2.0 seconds	- Ignition voltage: 8 V to 18 V - Engine speed: 450 to 6800 RPM for at least 5 seconds - No CAN error in process	Continuous	**FREEZE ADAPTS** **PCS OFF - MAX LINE PRESSURE** TFTKO	DTC Type B	**BREAKOUT BOX SETUP** Tested with CAN TOOL SEND: Message 124, 80 00 00 00 00 00 00 00, at 10msec.	
Engine Torque Signal Circuit No Valid Signal CAN	**P2637 Was P1779**	This DTC detects an invalid engine torque value from the ECU to the TCM	ECU CAN message does not contain a valid engine torque value for 2.0 seconds	- Ignition voltage: 8 V to 18 V - Engine speed: 450 to 6800 RPM for at least 5 seconds - No CAN error in process	Continuous	ECU CAN message contains a valid engine torque value for 2.0 seconds	- Ignition voltage: 8 V to 18 V - Engine speed: 450 to 6800 RPM for at least 5 seconds - No CAN error in process	Continuous	**FREEZE ADAPTS** **PCS OFF - MAX LINE PRESSURE** **INHIBIT AUTOGRADE BRAKING** **INHIBIT SHIFT STABILIZATION** TFTKO	DTC Type B	**BREAKOUT BOX SETUP** Tested with CAN TOOL SEND: Message 124, Unmgnd Torq (Eng Airflow SS Torq Validity) 00 00 08 00 00 00 00 00, at 10msec. Mngnd Torq (Eng Actual SS Torq Validity) 08 00 00 00 00 00 00 00, at 10msec.	

SENSED PARAMETER	FAULT CODE	ACCEPTABLE OPERATING RANGE AND RATIONALITY	PRIMARY MALF DETECTION PARAMETERS	SECONDARY MONITORING PARAMETERS AND CONDITIONS	FAIL MONITORING TIME LENGTH AND FREQUENCY OF CHECK	PRIMARY PASS DETECTION PARAMETERS	PASS SECONDARY MONITORING PARAMETERS AND CONDITIONS	PASS MONITORING TIME LENGTH AND FREQUENCY OF CHECK	ACTIONS	FAULT CODE STORAGE AND MIL ILLUMI-NATION	Fault Instructions	Special Instructions
TCC PWM Solenoid Electrical (power short)	**P2763**	0V to 12V This DTC detects a continuous short to power on TCC PWM circiut	Fail counter ≥ 43 counts out of 50 total counts	- Ignition voltage: 8 V to 18 V - Engine speed: 450 to 6800 RPM for at least 5 seconds - High side driver 2 is commanded on - TCC duty cycle ≥ 45 % AND power short is detected by hardware	Continuous	Pass counter ≥ 43 counts out of 50 total counts	- Ignition voltage: 8 V to 18 V - Engine speed: 450 to 6800 RPM for at least 5 seconds - High side driver 2 is commanded on - TCC duty cycle ≥ 40 % AND power short is not detected by hardware	Continuous	**TCC OFF** **FREEZE ADAPTS** **MAX GEAR HOT INHIBIT** **TCC SOLENOID INHIBIT ACTION** TFTKO	DTC Type B	**BREAKOUT BOX SETUP** Set fault before starting engine. Open TCC Sol (4) and short TCC Sol Circuit (4) using 10 Amp fusable link I to Battery (27)	
TCC PWM Solenoid Electrical (open or ground short)	**P2764 was P1866**	0V to 12V This DTC detects a continuous short to ground or open on TCC PWM circiut	Fail counter ≥ 43 counts out of 50 total counts	- Ignition voltage: 8 V to 18 V - Engine speed: 450 to 6800 RPM for at least 5 seconds - High side driver 2 is commanded on - Ground short detection: TCC duty cycle ≥ 20 % OR TCC duty cycle ≤ 50 % AND ground short is detected by hardware - Open detection: TCC duty cycle ≥ 20 % AND open is detected by hardware	Continuous	Pass counter ≥ 43 counts out of 50 total counts	- Ignition voltage: 8 V to 18 V - Engine speed: 450 to 6800 RPM for at least 5 seconds - High side driver 2 is commanded on - TCC duty cycle ≥ 36 % AND ground short or open is not detected by hardware	Continuous	**HSD 1 OFF** **HSD 2 OFF** **TCC OFF** **FREEZE ADAPTS** **IMMEDIATE LANDING ACTION** **PCS OFF - MAX LINE PRESSURE** **TCC SOLENOID INHIBIT ACTION** TFTKO	DTC Type B	**BREAKOUT BOX SETUP** **Case 1** Start Engine then set fault Open circuit Sol TCC Sol (4) **Case 2** Start Engine then set fault Open circuit Sol TCC Sol (4) & Short to GND (7)	
CAN Bus Short	**U0073** Was U2100	This DTC detects a Short on the CAN Bus	Fail Counter = 5 out of 5 counts. (1 second counts)	- Ignition voltage: 8 V to 18 V	Continuous	Fail Counter < 5 out of 5 counts. (1 second counts)	Ignition voltage: 8 V to 18 V	Continuous	**FREEZE ADAPTS** **PCS OFF - MAX LINE PRESSURE** **TPS - THROTTLE POSITION FAULT ACTION** TFTKO	DTC Type B	**BREAKOUT BOX SETUP** **Case 1** Short CAN HI 1 (32) to CAN LO 1 (33) **Case 2** Short CAN HI 2 (20) to CAN LO 2 (21)	Fault reads C073

SENSED PARAMETER	FAULT CODE	ACCEPTABLE OPERATING RANGE AND RATIONALITY	PRIMARY MALF DETECTION PARAMETERS	SECONDARY MONITORING PARAMETERS AND CONDITIONS	FAIL MONITORING TIME LENGTH AND FREQUENCY OF CHECK	PRIMARY PASS DETECTION PARAMETERS	PASS SECONDARY MONITORING PARAMETERS AND CONDITIONS	PASS MONITORING TIME LENGTH AND FREQUENCY OF CHECK	ACTIONS	FAULT CODE STORAGE AND MIL ILLUMI-NATION	Fault Instructions	Special Instructions
CAN Bus Error ECU	**U0100** Was U2105	This DTC detects a communicatio n problem between the TCM and ECU	No valid ECU CAN message for 12.0 seconds	- Ignition voltage: 8 V to 18 V - no ECU engine speed and torque message for time ≥ 50 mS AND no ECU throttle position message for time ≥ 50 mS AND no ECU general status message for time ≥ 12.0 sec AND no ECU engine coolant temp and baro for time ≥ 12.0 sec AND no ECU wheel speed for time ≥ 50 mS	Continuous	Valid ECU CAN message for 12.0 seconds	- Ignition voltage: 8 V to 18 V - ECU engine speed and torque message recieve rate time < 50 mS AND no ECU throttle position message receive rate time < 50 mS AND no ECU general status message receive rate time < 2.0 sec AND no ECU engine coolant temp and baro receive rate time < 2.0 ses AND no ECU wheel speed receive rate time ≥ 50 mS	Continuous	**FREEZE ADAPTS** **PCS OFF - MAX LINE PRESSURE** **TPS - THROTTLE POSITION FAULT ACTION** TFTKO	DTC Type B	**BREAKOUT BOX SETUP** **For 320 and 265** **Start Engine** Open Battery Switch (27) on Break Out Box – Apply power (12V) with External power source to TCM side of battery switch – Pull ECM/ Battery Fuse – engine will die – DTC will set in 12 seconds **For 295/020/023** **Case 1** OPEN & Short CAN HI 1 (32) to Battery (27) **Case 2** OPEN & Short CAN HI 2 (20) to Battery (27)	Fault Reads C100