2005 5L50E when used with 4.6L (LH2)
in these vehicles: XLR, STS, SRX
TRANSMISSION DIAGNOSTIC PARAMETERS

2005trans8.doc

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	FAULT CODE STORAGE AND MIL ILLUMI-NATION
Throttle Position Signal No Valid Signal CAN	**P0120**	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	DTC Type B
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	DTC Type C
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	DTC Type A
No Start Calibration	**P0602**	This DTC indicates the flash memory has not been programmed	KbINFD_NoStartCal = TRUE	none	immediate	DTC Type A
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	DTC Type A
RAM Test	**P0604**	This DTC tests the read/write capability of each RAM location	Read and write each RAM location	none	immediate	DTC Type A

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Trans Fluid Temp Sensor Circuit Performance Test	**P0711**	0 to 75 KOhms. The DTC detects an unrealistically large change in transmission temperature, or, a value that remains constant for a period of time in which a measurable amount of change is expected.	When fail case 1 or fail case 2 is true. OR When fail case 3 is true. <u>Fail case 1 & 2:</u> Trans temp delta ≤ 2 C <u>Fail case 3:</u> fail counter ≥ 14 over sample period	- Ignition voltage: 8 V to 18 V - No ECT DTC P1792 - No TISS P0716, P0717, or TOSS P0722. P0723 DTC's - P0711 has not passed this ignition cycle - Engine speed: 450 to 6800 RPM for at least 5 seconds - Trans temp: -39 C to 149 C <u>Fail case 1 and 2:</u> - Engine coolant temp ≥ 70 C - Engine coolant temp delta ≥ 50 C since start up - Trans slip speed ≥ 120 RPM for at least 600 cumulative sec <u>Fail case 1:</u> - Vehicle speed ≥ 8 KPH for at least 900 cumulative sec - Trans temp at startup: -40 C to 21 C <u>Fail case 2:</u> - Vehicle speed ≥ 8 KPH for at least 600 cumulative sec - Trans temp at startup: 129 C to 150 C <u>Fail case 3:</u> Trans temp delta ≥ 20 C (absolute value) over 250 msec, increment fail counter	Continuous <u>Fail case 1 & 2:</u> 100 seconds since test enabled <u>Fail case 3:</u> 7 second sample period	DTC Type C
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	DTC Type C

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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	DTC Type C
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	DTC Type B
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	5 second sample period Continuous	DTC Type B

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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	DTC Type B
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	DTC Type B
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	DTC Type B

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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.	DTC Type B

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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	DTC Type B

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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: 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 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	DTC Type B

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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: 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 <u>Fail Case 3</u> - 2nd gear commanded for time ≥ 1.0 second - TPS ≥10% - Engine torque: 32 Nm to 450 Nm - Gear ratio: 3.33 to 3.50 <u>Fail Case 4</u> - 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 <u>Fail Case 3</u> 2 seconds <u>Fail Case 4</u> 5 seconds	DTC Type B

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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 ≥ 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 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 2.8 seconds Fail Case 6 1 seconds	DTC Type B

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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: 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 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	DTC Type B

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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: 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 <u>Fail Case 9</u> - 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 <u>Fail Case 9</u> 4 seconds	DTC Type B

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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: 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 <u>Fail Case 10</u> - 5th gear commanded for time ≥ 1.0 second - TPS ≥10% - Engine torque: 36 Nm to 450 Nm - 2nd or 3rd gear commanded for time ≥ 3.0 seconds - Gear ratio: 0.98 to 1.03	Continuous <u>Fail Case 10</u> 3.5 seconds	DTC Type B
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	DTC Type B

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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	DTC Type B
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	DTC Type B
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	DTC Type B
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	DTC Type B

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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	DTC Type B
Power down copy of RAM to NVM	**P1621**	This DTC detects an error in the RAM copy to NVM @ power down	Checksum calculation algorithm RAM to NVM copy	None	immediate	DTC Type A
IMS Start in Wrong Range	**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.	DTC Type B
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	DTC Type B

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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	DTC Type B
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	DTC Type B
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	DTC Type B
IMS Circuit C High	**P1826**	0V to 12V This DTC detects an IMS circuit C power short.	IMS Circuit B 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 (1st) OR 2.16 to 2.27 (2nd) OR 1.56 to 1.64 (3rd) OR 0.98 to 1.03 (4th) OR 0.73 to 0.77 (5th) - P1826 not passed this ignition cycle	3.0 seconds Fail Counter ≥ 1	DTC Type B

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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	DTC Type B
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	DTC Type B
Torque Reduction Signal Circuit CAN	**P2544**	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	DTC Type B
Engine Torque Signal Circuit No Valid Signal CAN	**P2637**	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	DTC Type B
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	DTC Type B

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TCC PWM Solenoid Electrical (open or ground short)	**P2764**	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	DTC Type B
CAN Bus Error ECU	**U0100**	This DTC detects a communication problem between the TCM and ECU	No valid ECU CAN message for 2.0 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 ≥ 2.0 sec AND no ECU engine coolant temp and baro for time ≥ 2.0 sec AND no ECU wheel speed for time ≥ 50 mS	Continuous	DTC Type B