

**2005 4L60E** when used with: 4.3L (LU3), 4.8L (LR4), 5.3L (L59 - Flex Fuel), 5.3L (LM7), 5.3L (L33), 6.0L (LQ4)

in these vehicles: Astro, Safari, Silverado, Sierra, Blazer, Jimmy, Tahoe, Yukon, Express, Savana, Escalade, Suburban, Avalanche, Denali, Hummer H2

### TRANSMISSION DIAGNOSTIC PARAMETERS

2005trans6\_4L60E.doc

SENSED PARAMETER	FAULT CODE	SENSOR SIGNAL TYPE	ACCEPTABLE OPERATING RANGE AND RATIONALITY	PRIMARY MALF DETECTION PARAMETERS	SECONDARY MONITORING PARAMETERS AND CONDITIONS	FAIL MONITORING TIME LENGTH AND FREQUENCY OF CHECK	MIL ILLUM. TYPE
Vehicle Speed Sensor  - Low input	<b>P0502</b>	Analog	0 RPM to 6000 RPM This DTC detects a low vehicle speed when the vehicle has a large engine speed in a drive gear range.	Output Speed < 150 rpm	- Gear Range is not Park/Neutral - No TPS high or low DTC's set - No Map Sensor DTC's set - No PSA DTC set - Vacuum 25 to 60 KPA - Throttle Position 20 to 50% - Engine Speed 3200 to 4775 RPM	3 seconds  Continuous	DTC Type B
Vehicle Speed Sensor  - Intermittent	<b>P0503</b>	Analog	0 RPM to 6000 RPM This DTC detects an unrealistic large drop in vehicle speed.	In P/N: Output Speed drop > 8192 RPM  Not P/N: Output Speed drop >1300 RPM	- Time since last Gear Range Change > 6 Seconds - Engine Speed >450 rpm - No Output Speed rise > 600 rpm within 2 seconds - No PSA DTC set - Time since 4WDL State Change > 6 seconds	In park or neutral 409 seconds  Not in park or neutral 3 seconds	DTC Type B

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Trans Fluid Temp Sensor Circuit - Performance Test	<b>P0711</b>	Analog	.24V to 5.0V The DTC detects an unrealistically large change in transmission temperature or a value which remains constant for a period of time in which a measurable amount of change is expected.	1) Failure 1 is true for $\geq$ 409 seconds  2) Failure 2 happens $\geq$ 14 times in 7 sec.	- System Voltage: 10 and 18 volts - No VSS DTC's - Raw TTS counts: 10 to 251 - No DTC 1870 - Trans Temp at startup: -40 C to 21 C - Engine Running $\geq$ 409 sec. - Vehicle Speed $\geq$ 5 mph for $\geq$ 409 sec. cumulative this ignition cycle. - Torque Converter Slip $\geq$ 120 rpm for $\geq$ 409 sec. cumulative this ignition cycle. - Coolant Temp $\geq$ 70 C and has changed by $\geq$ 50 C since startup.  1) Trans Temp has not changed $\geq$ 2.25 C (absolute value) since startup  2) Trans Temp changes $\geq$ 20 C (absolute value) in 200 msec.	1) 409 seconds  2) 7 seconds  continuous	DTC Type C
Trans Fluid Temp Sensor Circuit - Low input (high temp)	<b>P0712</b>	Analog	.24V to 5.0V The DTC detects a continuous short to ground in the TTS signal circuit or the TTS sensor	Raw TTS count < 10	- System Voltage: 10 to 18 volts - Ignition "on"	10 seconds Continuous	DTC Type C
Trans Fluid Temp. Sensor Circuit - High Input (Low temp)	<b>P0713</b>	Analog	.24V to 5.0V The DTC detects a continuous open or short to high in the TTS signal circuit or the TTS sensor	Raw TTS counts > 250	- System Voltage: 10 to 18 volts - Ignition "on"	400 seconds Continuous	DTC Type C

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TCC Enable Solenoid Electrical	<b>P0740</b>	Analog	0V to 12V This DTC detects a continuous open or short to ground in the TCC circuit or the TCC solenoid	Fail Counter >43 Counts out of 50 Total Counts	- System Voltage: 10 to 18 volts - Engine Speed > 450 rpm for 5 seconds and not in fuel cutoff	Continuous	DTC Type B
TCC System Stuck OFF	<b>P0741</b>	Software	This DTC detects high torque converter slip when the TCC is commanded on.	TCC slip > 130 rpm for 20 seconds	- Engine Speed > 450 rpm for 5 seconds and not in fuel cutoff - Gear Range is D2 or D3 or D4 - No PSA DTC's set - No TPS High or Low DTC's - No VSS DTC's - No TCC solenoid electrical DTC's - No TCC Performance P0742 TCC Stuck ON DTC set - No range change in last 6 sec - TPS: 20% to 99% - Trans temp.: 20 C to 150 C - Gear ratio: 0.89 to 1.02 - TCC commanded on for 5 sec - TCC duty cycle >= 40%	TCC must be commanded off for at least 0.1 seconds between on cycles	DTC Type B







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Shift Solenoid A Electrical	<b>P0753</b>	Analog	0V to 12V This DTC detects a continuous open or short to ground in the SSA circuit or the SSA solenoid	Fail Counter >43 Counts out of 50 Total Counts	- System Voltage: 10 to 18 volts - Engine Speed > 450 rpm for 5 seconds and not in fuel cutoff	Continuous	DTC Type B





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3-2 Downshift Solenoid Electrical	<b>P0785</b>	Analog	0V to 12V This DTC detects a continuous open or short to ground in the D32 solenoid circuit or the D32 solenoid	Fail Counter >43 Counts out of 50 Total Counts	- System Voltage: 10 to 18 volts - Engine Speed > 450 rpm for 5 seconds and not in fuel cutoff	Continuous	DTC Type B
PSA Circuit Malfunction	<b>P1810</b>	Digital	0V to 12V This DTC detects an invalid state of the PSA sensor or the PSA circuit by deciphering the PSA inputs.	Fail Case 1 Illegal Trans Pressure Switch State (111) or (101)  Fail Case 2 Gear range is D2, D4, or Reverse during engine startup.  Fail Case 3 Gear range is Park or Neutral when operating in D4.	<u>Fail Case 1</u> - Engine Speed > 450 rpm for 5 seconds and not in fuel cutoff - System Voltage: 10 to 18 volts  <u>Fail Case 2</u> - System Voltage: 10 to 18 volts - No VSS DTC's - Vehicle Speed <2 mph  1. Engine Speed < 80 rpm for > 0.1 seconds, then, 2. Engine Speed: 80 to 550 rpm for > 0.07 seconds, then, 3. Engine Speed > 550 rpm  <u>Fail Case 3</u> - Engine Speed > 450 rpm for 5 seconds and not in fuel cutoff - System Voltage: 8 to 18 volts - 4th gear commanded - Engine Torque: 40 to 400 ft-lbs - Vacuum: 0 to 105 kPa - TCC Locked On - No VSS DTC's - Speed Ratio: 0.60 to 0.75` - TPS: 10% to 50%	Fail Case 1 60 seconds Fail Case 2 5 Seconds Fail Case 3 10 seconds  Continuous	DTC Type B

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TCC PWM Solenoid Electrical	<b>P1860/P2761</b>	Analog	0V to 12V This DTC detects a continuous open or short to ground in the TCC PWM circuit or the TCC PWM sensor	Fail Counter >43 Counts out of 50 Total Counts	- System Voltage: 10 to 18 volts - Engine Speed > 450 rpm for 5 seconds and not in fuel cutoff - Commanded Gear is 1st - TCC Duty Cycle < 10% or > 90%	Continuous	DTC Type B
Transmission Component Slipping	<b>P1894</b>	Software	This DTC detects excessive TCC slip when the torque converter clutch should be engaged.	If TCC slip is:  130 to 800 rpm  for 7 seconds,  then increment the Trans Slip Counter by one.  When the counter reaches 3, set the code  OR  When fail case 2 is true.	- Engine Speed > 450 rpm for 5 seconds and not in fuel cutoff - Gear is not 1st - Gear Range is D4 - No PSA DTC's set - No TPS High or Low DTC's - No VSS DTC's - No solenoid electrical DTC's - Shift Solenoid Performance Diagnostic counters are all zero - TPS: 20% to 99% - Trans temp.: 20 C to 150C - No Engine Torque Default - Engine Torque: 50 to 400 ft-lbs - Vac: 0 to 105 kpa - Speed ratio: 0.69 to 0.88 - Engine Speed: 1500 to 3000 rpm - Vehicle Speed: 30 to 82 mph  Fail Case 1 - TCC commanded on for > 5 sec - TCC commanded to 40% for > 5 seconds  <i>(continued on next page)</i>	Continuous	DTC Type B

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Transmission Component Slipping	<b>P1894</b>	Software	This DTC detects excessive TCC slip when the torque converter clutch should be engaged.		<p><i>(continued from previous page)</i></p> <p>Fail Case 2                      - Run fail case 2 immediately after fail case 1 increments the trans slip counter to either 1 or 2. Discontinue fail case 2 if the TCC is commanded OFF at any time.                      - TPS: 20% to 99%</p> <p>Criteria A                      If : 130 rpm &lt; TCC slip &lt; 800 rpm for 7 seconds,                      then: Go to max pressure                      freeze adapts                      go to criteria B</p> <p>Criteria B                      If : 130 rpm &lt; TCC slip &lt; 800 rpm for 7 seconds,                      then: Command TCC OFF for 1.5 seconds                      go to criteria C</p> <p>Criteria C                      If : 130 rpm &lt; TCC slip &lt; 800 rpm for 7 seconds,                      then: Set code p1870</p>	Continuous	DTC Type B

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Four Wheel Drive Low Circuit Performance	<b>P1875</b> <b>P2771</b>	Digital	0V to 12V This DTC detects a continuous open or short to ground in the Four Wheel Drive low Circuit	Stuck On Engine Spd Divided by Transfer Case Output Spd Ratio: .8 to 1.2  Stuck Off Engine Spd Divided by Transfer Case Output Spd Ratio: 2.5 to 2.9	- Engine Speed > 450 rpm for 5 seconds and not at fuel cut off - No TPS DTC's set - No PSA DTC's set - Gear Range is D4 - Shift Solenoid Performance Counters are zero - No VSS Low DTC's set - No TCC Enable Sol. DTC's set - No TCC Control Sol. DTC's set - No SSA Sol. DTC's set - No SSB Sol. DTC's set - No TCC DTC's set - Eng Torque: 40 to 400 ftlbs - VAC: 0 to 105 kpa - Trans Temp: 20C to 130C - Vehicle Speed > 7 MPH - TPS: 17% to 50%  Stuck ON - 4wd Low switch in 4wd Low - Transfer case not in 4wd Low  - TCC Slip: -3000 to -50 rpm  Stuck OFF - 4wd Low switch not in 4wd Low - Transfer case is in 4wd Low - TCC ON - TCC Slip: 100 to 3000 rpm	Stuck ON: 5 Seconds 1 Occurrence  Stuck OFF: 10 Seconds 1 Occurrence  Continuous	DTC Type B