

**1999 2.2L (LN2) S-truck (includes Isuzu Hombre)
4L60-E TRANSMISSION DIAGNOSTIC PARAMETERS**

99t224_S__aT.DOC

SENSED PARAMETER	FAULT CODE	MONITOR STRATEGY DESCRIPTION	MALFUNCTION CRITERIA AND THRESHOLD VALUE(S)	SECONDARY PARAMETERS AND ENABLE CONDITIONS	TIME LENGTH AND FREQUENCY	MIL ILLUMINATION TYPE
Vehicle Speed Sensor - Low input	P0502	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 (2 mph)	- 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 > 50% - Engine Torque: 40 to 400 ft-lbs - Throttle Position > 15% - Engine Speed > 3000 RPM	3.0 seconds Continuous	DTC Type B
Vehicle Speed Sensor - Intermittent	P0503	0 RPM to 6000 RPM This DTC detects an unrealistic large drop in vehicle speed.	In P/N: Output Speed drop > 8000 RPM Not P/N: Output Speed drop >1300 RPM	- Time since last Gear Range Change > 6 Seconds - Engine Speed > 450 rpm for 5 seconds and not in fuel cutoff - No Output Speed rise > 600 rpm within 6 seconds - No PSA DTC set	In park or neutral for 409 seconds. Not in park or neutral for 3 seconds.	DTC Type B
TCC Enable Solenoid Electrical	P0740	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: 8 to 18 volts - Engine Speed > 450 rpm for 5 seconds and not in fuel cutoff	Continuous	DTC Type A
TCC System Stuck ON	P0742	This DTC detects low torque converter slip when the TCC is commanded off.	TCC Slip: -20 to +30 RPM for > 5.0 seconds Slip Counter >=3	- Engine Speed > 450 rpm for 5 seconds and not in fuel cutoff - No Range change within 6 sec. - No MAP low and high DTC set - No TP high or low sensor DTC's - No VSS DTC's - No TCC Enable Sol. DTC's - No TCC Control Sol. DTC's -No PSA DTC set - Eng Torque: 40 to 400 ft-lbs - Vacuum: 0 to 105 kPa - Commanded Gear is not 1st - Gear Range is D4 - Throttle Position: 15% to 60% - TCC is commanded off - Engine Speed: 1000 to 3000 rpm - Speed Ratio: 0.65 to 1.25 - Vehicle Speed: 20 to 65 mph	5.0 seconds Continuous	DTC Type B

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Shift Solenoid A Performance	P0751	This DTC detects abnormal shift patterns: Stuck OFF: 2-2-3-3 pattern Stuck ON: 1-1-4-4 pattern	Fail Counter >=3 . The fail counter is incremented when the following fail cases are true: Stuck OFF: 1,2,3,& 4 Stuck ON: 1,2,3, & 5	<u>General</u> -Engine Speed > 450 rpm for 5 seconds and not in fuel cutoff -Gear range is D4 -No TP high or low DTC's -No VSS low or intermittent DTC's -No Solenoid electrical DTC's -No DTC 742 -No PSA DTC set -Time since last shift is >0 sec -Vehicle speed >5 mph -Trans Temp.: 20 C to 130 C <u>Fail Case 1</u> - Commanded 1-2 shift - TPS: 10% to 50% - TPS constant within +/- 6% - Vehicle Speed: 5 to 35 mph - After 2 seconds, engine speed in 2nd gear must be 80 rpm > last speed in 1st gear <u>Fail Case 2</u> - Commanded 2-3 shift - TPS: 10% to 50% - TPS constant within +/- 7% - Vehicle Speed: 15 to 60 mph - After 2 sec, engine speed in 3rd gear must be 100 rpm < last speed in 2nd gear <u>Fail Case 3</u> - Commanded 3-4 shift - TPS: 10% to 50% - TPS constant within +/- 7% - Vehicle speed: 30 to 65 mph - After 2.5 seconds, engine speed in 4th gear must be 10 rpm > last speed in 3rd gear <u>Fail Case 4</u> - Commanded 4th gear - TCC commanded ON - TPS: 10% to 50% - Speed Ratio: 0.95 to 1.25 - TCC Slip: 400 to 1200 rpm for > 4 sec <u>Fail Case 5</u> - Commanded 4th gear - TCC commanded ON - TPS: 10% to 50% - Speed Ratio: .65 to 0.80 - TCC Slip: -20 to +50 rpm for > 4 sec	Continuous	DTC Type A
Shift Solenoid A Electrical	P0753	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: 8 to 18 volts - Engine Speed > 450 rpm for 5 seconds and not in fuel cutoff	Continuous	DTC Type B

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Shift Solenoid B Performance	P0756	This DTC detects abnormal shift patterns: Stuck OFF: 4-3-3-4 pattern Stuck ON: 1-2-2-1 pattern	Fail Counter >=3 . The fail counter is incremented when the following fail cases are true: Stuck OFF: 1 and 3, or 2 and 3 Stuck ON: 3 and 4	<ul style="list-style-type: none"> - Engine Speed > 450 rpm for 5 seconds and not in fuel cutoff - Gear Range is D4 - No TPS DTC's - No VSS DTC's - No solenoid electrical DTC's - No TCC Stuck On DTC. - No PSA DTC set - Trans Temp: 20 C to 130 C - Vehicle Speed > 5 MPH <p><u>Fail Case 1</u></p> <ul style="list-style-type: none"> - 1st gear commanded > 2.0 sec. - Engine Torque: 40 to 400 ft lbs - Vacuum: 0 to 105 kpa - Output Speed: 400 to 1500 rpm - Speed Ratio: 0.70 to 3.0 - Throttle Position > 25% - TCC Slip: -3000 to -100 rpm for > 1.5 seconds <p><u>Fail Case 2</u></p> <ul style="list-style-type: none"> - 2nd gear command > 409.5 sec - Engine Torque: 40 to 400 ft lbs - Vacuum: 0 to 105 kpa - TCC Slip: 8191 to 8191 rpm - Output speed: 8191 to 8191 rpm - Speed Ratio: 8 to 8 - Throttle Position > 99.9% - Fail Timer > 409.5 sec <p><u>Fail Case 3</u></p> <ul style="list-style-type: none"> - Time with 3rd gear commanded: 2.0 to 6.0 seconds - TPS: 10% to 50% - TPS constant within +/- 7% - Engine Torque: 40 to 400 ft lbs - Vacuum: 0 to 105 kpa - Speed Ratio in Third gear does not drop more than 0.35 from the last Speed Ratio in Second gear - TCC Slip in Third gear remains > 300 rpm higher than the last TCC Slip in Second gear - Fail Timer > 1.5 sec <p><u>Fail Case 4</u></p> <ul style="list-style-type: none"> - 4th Gear commanded for > 1 sec - Engine Torque: 0 to 400 ft lbs - Vacuum: 0 to 105 kpa - Output Speed: 1400 to 3000 rpm - Speed Ratio: 1.68 to 3.5 - Throttle Position > 10% - TCC Slip: 1000 to 4000 rpm for > 1.0 sec 	Continuous	DTC Type A
Shift Solenoid B Electrical	P0758	0V to 12V This DTC detects a continuous open or short to ground in the SSB circuit or the SSB solenoid	Fail Counter >43 Counts out of 50 Total Counts	<ul style="list-style-type: none"> - System Voltage: 8 to 18 volts - Engine Speed > 450 rpm for 5 seconds and not in fuel cutoff 	Continuous	DTC Type A

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3-2 Downshift Solenoid Electrical	P0785	0V to 12V This DTC detects a continuous open or short to ground in the SSB circuit or the SSB solenoid	Fail Counter >43 Counts out of 50 Total Counts	- System Voltage: 8 to 18 volts - Engine Speed > 450 rpm for 5 seconds and not in fuel cutoff	Continuous	DTC Type A
PSA Circuit Malfunction	P1810	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.	Fail Case 1 - Engine Speed > 450 rpm for 5 seconds and not in fuel cutoff - System Voltage: 8 to 18 volts Fail Case 2 - System Voltage: 8 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 600 rpm for > .08 seconds, then, 3. Engine Speed > 600 rpm Fail Case 3 - 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 450 ft-lbs - Vacuum: 0 to 105 kPa - TCC ON - No VSS DTC's - Speed Ratio: 0.65 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
TCC PWM Solenoid Electrical	P1860	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: 8 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

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Transmission Component Slipping	P1870	This DTC detects excessive TCC slip when the torque converter clutch should be engaged.	<p>If TCC slip is: 300 to 1000 rpm for 7 seconds, then increment the Trans Slip Counter by one. When the counter reaches 3, set the code.</p>	<ul style="list-style-type: none"> - Engine Speed > 450 rpm for 5 seconds and not in fuel cutoff - Gear is not 1st - Gear Range is D4 - 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: 12% to 50% - Trans temp.: 20 C to 130C - Engine Torque: 40 to 450 ft-lbs - Speed ratio: 0.64 to .95 - Engine Speed: 1500 to 3500 rpm - Vehicle Speed: 35 to 65 mph <p>Fail Case 1 - TCC commanded on for > 5 seconds, then : - TCC at max duty cycle for > 5 seconds</p> <p>Fail Case 2 - Run fail case 2 immediately after fail case 1 increments the trans slip counter to either 1or 2. Discontinue fail case 2 if the TCC is commanded OFF at any time. - TPS: 7% to 40%</p> <p>Criteria A If : 200 rpm < TCC slip < 1000 rpm for 7 seconds, then: Go to max pressure freeze adapts go to criteria B</p> <p>Criteria B If : 200 rpm < TCC slip < 1000 rpm for 7 seconds, then: Command TCC OFF for 1.5 seconds go to criteria C</p> <p>Criteria C If : 200 rpm < TCC slip < 1000 rpm for 7 seconds, then: Set code p1870</p>	Continuous	DTC Type B

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