

1997 2.2L (LN2) S-truck (includes Isuzu Hombre)
4L60-E TRANSMISSION DIAGNOSTIC PARAMETERS

97t224_S_aT.doc

| SENSED PARAMETER | FAULT CODE | MONITOR STRATEGY DESCRIPTION | PRIMARY MALF DETECTION PARAMETERS | SECONDARY MONITORING PARAMETERS AND CONDITIONS | TIME REQUIRED AND FREQUENCY | MIL ILLUM. 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 < 2 MPH | Gear Range is not Park/Neutral No TP high or low sensor DTC's set 20% < Throttle Position < 50% No Map Sensor High or Low DTC's set No PSA DTC set 25 KPA < MAP sensor < 45 KPA 0ft-lbs < Engine Torque < 1500 ft-lbs 3200 < Engine Speed < 4800 RPM | 3 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. | Output Speed drop > 1600 RPM in P/N or Output Speed drop > 1300 RPM not in P/N | Time since last Gear Range Change > 6. Sec Engine Speed > 450 rpm for 8 sec and not in fuel cutoff No Output Speed rise > 500 rpm within 6 sec No PSA DTC set | In park or neutral 3 sec Not in park or neutral 3 sec | DTC Type B |
| Trans Fluid Temp Sensor Circuit - Range / Performance | P0711 | .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 ≥ 409 sec. 2) Failure 2 happens ≥ 14 times in 7 sec. | No VSS DTC's 10 < Raw TTS counts < 250 No DTC 1870 System Voltage between 10 and 16 volts Engine Running ≥ 409 sec. Vehicle Speed ≥ 5 mph for ≥ 409 sec. cumulative this ignition cycle. Torque Converter Slip ≥ 120 rpm for ≥ 409 sec. cumulative this ignition cycle. Trans Temp at startup between -40 and 21 deg. C Coolant Temp ≥ 70 deg. C and has changed by ≥ 50 deg. C since startup. 1) Trans Temp has not changed ≥ 1.5 deg C (absolute value) since startup 2) Trans Temp changes ≥ 20 deg. C (absolute value) in 200 msec. | 1) 409 seconds continuous. 2) 7 seconds continuous | DTC Type B |

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| 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 between 10 and 16 volts Engine Speed > 450 rpm for 8 sec & 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. | 2 occurrences of the TCC Slip between -20 rpm and 20 rpm for the duration of the fail timer | Engine Speed > 450 rpm for 8 sec and not in fuel cutoff 50 ft-lbs < Eng Torque < 400 ft-lbs 0 kPa < VAC < 105 kPa Commanded Gear is not 1st Gear Range is D4 Throttle Position between 15% and 60% TCC is commanded off Engine Speed between 1000 rpm and 3000 rpm Speed Ratio between 0.65 and 1.25 Vehicle Speed between 20 mph and 65 mph No Range change within 6 sec. No MAP low and high DTC set No TP high or low sensor DTC's No VSS Low or Intermittent DTC's No TCC Enable Sol. DTC's No TCC Control Sol. DTC's No PSA DTC set | 5 seconds Continuous | DTC Type B |

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|------------------------------|------------|---|---|--|-----------------------------|-----------------|
| Shift Solenoid A Performance | P0751 | This DTC detects 2-2-3-3 or a 1-1-4-4 shift pattern | Fail Counter ≥ 3 . The fail counter is incremented if fail cases (1,2,3,& 4) or (1,2,3, & 5) are true | <p>General Engine Speed > 450 rpm for 8 sec and & not in fuel cutoff Gear range is D4 Vehicle speed > 5 mph 20 C < Trans. Temp. < 130 C No TP high or low DTC's No Vss low or intermittent DTC's No Sol electrical DTC's No DTC 742 No PSA DTC set Time since last shift is > 0 sec</p> <p>Fail Case 1 Commanded 1-2 shift 10% < TPS < 50% TPS constant within +/- 6% 5 mph < VSS < 35 mph In 2 seconds, engine speed in 2nd gear must be 100 rpm > last speed in 1st gear</p> <p>Fail Case 2 Commanded 2-3 shift 10% < TPS < 50% TPS constant within +/- 7% 15 mph < VSS < 60 mph In 2 sec, engine speed in 3rd gear must be 100 rpm < last speed in 2nd gear</p> <p>Fail Case 3 Commanded 3-4 shift 10% < TPS < 50% TPS constant within +/- 7% 30 mph < VSS < 65 mph In 2.5 seconds, engine speed in 4th gear must be 20 rpm > last speed in 3rd gear</p> | Continuous | DTC Type A |

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|------------------------------|-------------------|---|---|---|------------------------------------|------------------------|
| Shift Solenoid A Performance | P0751 | This DTC detects 2-2-3-3 or a 1-1-4-4 shift pattern | Fail Counter ≥ 3 . The fail counter is incremented if fail cases (1,2,3,& 4) or (1,2,3, & 5) are true | <u>Fail Case 4</u> Commanded 4th gear TCC on $10\% < \text{TPS} < 50\%$ $0.95 < \text{Speed Ratio} < 1.25$ $400 < \text{TCC Slip} < 1200$ for $> 4\text{sec}$ <u>Fail Case 5</u> Commanded 4th gear TCC on $10\% < \text{TPS} < 50\%$ $0.65 < \text{Speed Ratio} < 0.8$ $-20 < \text{TCC Slip} < 40$ 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 between 10 and 16 volts Engine Speed > 450 rpm for 8 sec & not in fuel cutoff | Continuous | DTC Type A |

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| Shift Solenoid B Performance | P0756 | This DTC detects a 1-2-2-1 or a 4-3-3-4 shift pattern | The Stuck On Fail counter has reached a value of 3 or the Stuck Off Fail counter has reached a value of 3. The Stuck On counter is incremented when both Fail Case 3 & Fail Case 4 are true. The Stuck Off counter is incremented when both Fail Case 1 & Fail Case 3 are true or when both Fail Case 2 & Fail Case 3 are true. | Engine Speed > 450 rpm for 8 sec and not in fuel cutoff Vehicle Speed > 4 MPH Gear Range is D4 20 C < Trans Temp < 130 C 5 < Engine Torque < 400 ft-lbs 0 < VAC < 105 KPa No TPS sensor High or Low DTC's No VSS Low or Intermittent DTC's No Trans solenoid electrical DTC's No TCC Stuck On DTC. No PSA DTC set <u>Fail Case 1</u> First gear commanded for > 2 sec. -3000 rpm < TCC Slip < -100 rpm 400 rpm < Output Speed < 1500 rpm 0.7 < Speed Ratio < 3 Throttle Position > 25% Fail Timer > 1.5 sec <u>Fail Case 2</u> Second gear commanded for > 409.5 sec 0 rpm < TCC Slip < 0 rpm 8191.75 rpm < Output Speed < 8191.75 rpm 0 < Speed Ratio < 0 Throttle Position > 99.9% Fail Timer > 409.5 sec | Continuous | DTC Type A |

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|------------------------------|------------|---|---|---|-----------------------------|-----------------|
| Shift Solenoid B Performance | P0756 | This DTC detects a 1-2-2-1 or a 4-3-3-4 shift pattern | The Stuck On Fail counter has reached a value of 3 or the Stuck Off Fail counter has reached a value of 3. The Stuck On counter is incremented when both Fail Case 3 & Fail Case 4 are true. The Stuck Off counter is incremented when both Fail Case 1 & Fail Case 3 are true or when both Fail Case 2 & Fail Case 3 are true. | Engine Speed > 450 rpm for 8 sec and not in fuel cutoff Vehicle Speed > 4 MPH Gear Range is D4 20 C < Trans Temp < 130 C 5 < Engine Torque < 400 ft-lbs 0 < VAC < 105 KPa No TPS sensor High or Low DTC's No VSS Low or Intermittent DTC's No Trans solenoid electrical DTC's No TCC Stuck On DTC. No PSA DTC set <u>Fail Case 3</u> 2 sec < time with Third gear commanded < 5.95 sec 10% < Throttle Position < 50% TPS constant within +/- 5% Speed Ratio in Third gear does not drop more than 0.2 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 > 2 sec <u>Fail Case 4</u> Fourth Gear commanded for > 1 sec 1500 rpm < TCC Slip < 4000 rpm 1400 < Output Speed < 2500 2.0 < Speed Ratio < 3.0 Throttle Position > 10% Fail Timer > 2 sec | Continuous | DTC Type A |

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| 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 | System Voltage between 10 and 16 volts Engine Speed > 450 rpm for 8 sec & not in fuel cutoff | Continuous | DTC Type A |
| 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 between 10 and 16 volts Engine Speed > 450 rpm for 8 sec & not in fuel cutoff | Continuous | DTC Type A |

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| 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 Fail Case 2 Gear range is D2, D4, Rev Fail Case 3 Gear range is P/N | Fail Case 1 Engine Speed > 450 rpm for 8 sec & not in fuel cutoff System Voltage between 10 and 16 volts Fail Case 2 System Voltage between 10 and 16 volts No VSS DTC's Engine Speed < 80 rpm for > .1 sec then Engine Speed > 80 rpm and < 600 rpm for > .08 sec then Engine Speed > 600 rpm Vehicle Speed <2 mph Fail Case 3 Engine Speed > 450 rpm for 8 sec & not in fuel cutoff System Voltage between 10 and 16 volts 4th gear commanded 0.65<Speed Ratio<0.75 10 < TPS < 50% 40 < Engine Torque < 400 ft-lbs 0 < Vacuum < 105 KPA TCC Locked On No VSS DTC's | 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 between 10 and 16 volts Engine Speed > 450 rpm for 8 sec & not in fuel cutoff Commanded Gear is 1st TCC Duty Cycle < 10% or > 90% | Continuous | DTC Type A |

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| Transmission Component Slipping | P1870 | This DTC detects excessive TCC slip when the torque converter clutch should be engaged. | If TCC slip is between 300 rpm and 1000 rpm for 7 sec, then increment the Trans Slip Counter by one. When the counter reaches 3, set the code. | Engine Speed > 450 rpm for 8 sec and not in fuel cutoff Gear is not 1st 16.0% < TPS < 50% 20 C < Trans. Temp. < 130C 40 ft-lbs < Eng Torque < 400 ft-lbs 0 < Vacuum < 105 KPA Gear Range is D4 TCC at Max Apply for > 5 sec TCC commanded on for > 5 sec 0.65 < Speed Ratio < 0.95 1500 rpm < Engine Speed < 3500 rpm 35 mph < Vehicle Speed < 65 mph No TPS sensor High or Low DTC's No VSS Low or Intermittent DTC's No Trans solenoid electrical DTC's Shift Solenoid Performance Diagnostic counters are all zero | Continuous | DTC Type B |