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**4L30E**

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Checkball Location

3rd Clutch Checkball Missing

A bindup or slip condition in 4th gear may be caused by a missing or leaking 3rd Clutch Checkball. When this Checkball is missing, 1-2 Servo release pressure can leak in 4th gear causing the 1-2 band to apply.
Checkball Location (continued)

D 3 2 Shuttle Ball Missing:
A missing D 3 2 Shuttle Ball will cause low mainline pressure in D4 and Manual Low and have normal pressure in D3 and Manual 2.

3rd Clutch Quick Dump Ball Missing:
A missing 3rd Clutch Quick Dump Ball will cause a 3-2 down shift clunk or bind on the 3-2 down shift.
Checkball Location (continued)

Reverse Shuttle Ball Missing:
A missing Reverse Shuttle Ball will cause a no lockup condition in all forward ranges. In Reverse, a missing Reverse Shuttle Ball can cause the 2nd Clutch to partially apply, burning the 2nd Clutch and possibly causing a bind in Reverse.

2 Holes = Ball
1 Hole = No Ball

Reverse Shuttle Ball
Pressure Taps

<table>
<thead>
<tr>
<th>Pressures:</th>
<th>Idle</th>
<th>Stall</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drive</td>
<td>45-55</td>
<td>150-160</td>
</tr>
<tr>
<td>Reverse</td>
<td>65-75</td>
<td>210-225</td>
</tr>
</tbody>
</table>

The Servo Release Pressure should be equal to mainline pressure in 3rd and 4th gears and zero in all other gears including Park and Neutral.

Pilot Drill: 1/8"
Tap Drill: “Q” or 21/64"
Tap: 1/8” NPT
Line Pressure Taps

2nd Clutch Pressure:
The 2nd Clutch pressure should be equal to mainline pressure in 2nd, 3rd and 4th gear and zero in all other gears including Park and Neutral.

4th Clutch Pressure:
The 4th Clutch pressure should be equal to mainline pressure in 4th gear and zero in all other gears including Park and Neutral.

Servo Apply Pressure:
The Servo Apply pressure should be equal to mainline pressure in all forward ranges and zero in Park, Reverse and Neutral.

Pilot Drill: 1/8"
Tap Drill: “Q” or 21/64”
Tap: 1/8” NPT
Pressure Tap Circuits

When you are drilling the pressure taps, take notice of the correct circuit locations prior to drilling.
Input Sprag Rotation

No Reverse, No Drive Engagement, Bind in 2nd Gear

If you install the Input Sprag incorrectly or if the sprag has failed; the symptoms that will follow are no reverse, no drive engagement and a bind in 2nd gear. Check the transmission in all ranges, if you have Manual Low, look for the Sprag as the root of the problem.

Sun Gear Freewheels
Counter Clockwise

Hold
Hold
3rd Clutch Drum Disassembly

Tools and Procedures

The correct tool for disassembling the 3rd Clutch Drum assembly is expensive and most technicians do not have this tool. Unfortunately the only other method is using a pick and putting your finger tips and thumbs in jeopardy. The following procedure is an easy inexpensive way around harming yourself.

The Bobby pins may have to be ground in the location shown to fit between the drum and the plate.

Install the Bobby pins here
3rd Clutch Drum Disassembly

Tools and Procedures (continued)

In order to remove the sprag assembly to gain access to the clutches you must first remove the internal snap ring holding the sprag race assembly to the drum. To do this, start with one end of the snap ring, push in on the snap ring with a scribe and slide a bobby pin between the drum and the snap ring, keeping that portion of the snap ring out of the groove. Work your way around the drum installing several bobby pins until the snap ring is completely out of the groove.

Install several Bobby pins around the 3rd Clutch Drum.
Once you have all of the Bobby pins in place, simply use two screw drivers to pop the race out of the drum.

Pry the Sprag Race out with two screw drivers.
3rd Clutch Drum Assembly

Pressure Plate Installation

The 3rd Clutch Cushion Plate should be installed as shown for proper operation. If the 3rd Clutch Cushion Plate is installed incorrectly a harsh 3rd gear will occur. There is no factory specifications for clutch clearance.

Try to maintain 0.008”-0.010” per disc.
Binds in 2nd Gear

Bushing Installation

Installation of the 3rd Clutch Bushing is very important. If the feed hole is not aligned properly, 3rd clutch failure will occur. It will also cause a bind in 2nd due to the 3rd clutch staying on.

NOTE:
The offset hole **MUST** face down

This hole must line up with the 3rd Clutch Feed Circuit

3rd Clutch Feed
Center Support Washer

Isuzu Washers

Center Supports that use a “no-tab” style thrust washer tend to fail because the plastic washer is allowed to spin on the support. If you choose to machine the “no-tab” style Center Support you can use the 3 tab washers and they are more adjustable for endplay. These washers are also used for the Pump to adjust Overdrive housing endplay.

<table>
<thead>
<tr>
<th>Thickness</th>
<th>Color</th>
<th>Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.064”</td>
<td>Yellow</td>
<td>8-96013-761-0</td>
</tr>
<tr>
<td>0.070”</td>
<td>Red</td>
<td>8-96013-762-0</td>
</tr>
<tr>
<td>0.077”</td>
<td>Black</td>
<td>8-96013-763-0</td>
</tr>
<tr>
<td>0.084”</td>
<td>White</td>
<td>8-96013-764-0</td>
</tr>
<tr>
<td>0.094”</td>
<td>Green</td>
<td>8-96013-765-0</td>
</tr>
<tr>
<td>0.100”</td>
<td>Blue</td>
<td>8-96013-766-0</td>
</tr>
</tbody>
</table>

Main Case Endplay
0.014”-0.031”

O/D Case Endplay
0.004”-0.030”

Refer to the Blue Print on the following page
Center Support Washer

Isuzu Washers (continued)

Do not use a drill press to machine the Center Support. It should only be machined on a milling machine. Use this schematic as a reference to machine the Center support area for the three tab washer.

120 Degrees

1.190” Radius +/- 0.005”

7/16” Diameter
0.200” Deep +/- 0.010”
Computer Types

**Type 1**
1990-1993 Isuzu Rodeo and Trooper

**Type 1b**
1992-1995 BMW w/4L30E

**Type 2**
1994-1995 Isuzu Rodeo, Trooper, Amigo and Honda Passport

**Type 3**
1996-1999 Isuzu Rodeo, Trooper, Amigo, Vehicross, Honda Passport and Acura SLX

**Type 4**
2000-up Isuzu Rodeo, Trooper, Amigo, Vehicross, Honda Passport and Acura SLX

**Type 5**
1997-1998 Cadillac Catera

**Type 6**
1996-2001 BMW w/4L30E
1999-2001 Cadillac Catera
1990-1991 Isuzu Troopers used a two-terminal diagnostic connector. To display codes, simply jump the two terminals together.

1992-1995 Isuzu Troopers have a three-terminal diagnostic connector. To display codes, jump the two outer terminals together.

*Ground the Yellow w/Black stripe wire on the 2 or 3 pin connector*
Type 1

Codes

17 1-2/3-4 Solenoid shorted to ground
21 TPS Voltage too high
22 TPS Voltage too low
23 Engine coolant switch voltage high
25 1-2/3-4 Solenoid open or shorted to B+
26 2-3 Solenoid shorted to ground
28 2-3 Solenoid open or shorted to B+
29 TCC Solenoid shorted to ground
31 No engine RPM signal
32 Force Motor circuit amperage too low (Less than 0.095A)
33 Force Motor circuit amperage too high (Higher than 1.5A)
34 Band Apply Solenoid open or shorted to B+
35 Band Apply Solenoid open or shorted to ground
36 TCC Solenoid open or shorted to B+
39 No VSS
41 Gear ratio error
43 Solenoid ground supply circuit open, shorted to ground or shorted to B+
46 Down shift error
48 Low battery voltage (Below 9.0V)
49 High battery voltage (Above 16V)
55 EPROM failure
56 Transmission range switch input incorrect
65 Trans Temp sensor shorted to ground
66 Trans Temp sensor open or shorted to B+
77 Kickdown switch stuck closed (shorted to ground)
82 Transmission range switch input incorrect
Type 2

Codes

11  No VSS
13  No engine RPM signal
15  Trans Temp Sensor open or shorted to B+
16  Trans Temp Sensor shorted to ground
21  TPS Voltage too high
22  TPS Voltage too low
23  TPS connector disconnected
25  Low battery voltage (Below 9.0V)
26  High battery voltage (Above 16V)
31  1-2/3-4 Solenoid open or shorted to ground
32  2-3 Solenoid open or shorted to ground
33  TCC Solenoid open or shorted to B+
34  Band Apply Solenoid open or shorted to ground
35  Force Motor open or shorted
36  Solenoid B+ supply circuit open or shorted to ground
37  Torque management serial line fault
41  1-2/3-4 Solenoid shorted to B+
42  2-3 Solenoid shorted to B+
43  TCC Solenoid shorted to ground
44  Band Apply Solenoid shorted to B+
46  Solenoid B+ supply circuit shorted to B+
51  Engine Coolant Switch open, shorted to ground or shorted to B+
52  Kickdown Switch stuck closed (shorted to ground)
53  Transmission range switch input incorrect in P, N or R position
54  Transmission range switch input incorrect
55  Brake Switch open or shorted to ground
56  Brake Switch shorted to B+
61  Gear ratio error
62  Downshift protection
63  EPROM failure
64  TCC valve stuck on
65  TCC valve stuck off
82  Shift or Band Apply Solenoids faulty during driving
Type 3

Codes

- P0218 Transmission fluid over temp
- P0560 System voltage malfunction
- P0705 Transmission range switch illegal position
- P0706 Transmission range switch performance
- P0711 TFT sensor performance
- P0712 TFT sensor circuit low
- P0713 TFT sensor circuit high
- P0719 Brake switch stuck on
- P0722 Output speed sensor
- P0723 Output speed sensor intermittent
- P0724 Brake switch stuck off
- P0730 Gear ratio error
- P0742 TCC stuck on
- P0748 Force motor electrical fault
- P0751 SSA (1-2/3-4 solenoid) stuck on or stuck off
- P0753 SSA (1-2/3-4 solenoid) electrical fault
- P0756 SSB (2-3 solenoid) stuck on or stuck off
- P0758 SSB (2-3 solenoid) electrical fault
- P1790 ROM check sum error
- P1792 EEPROM check sum error
- P1835 Kickdown switch stuck on
- P1850 Band apply solenoid electrical fault
- P1860 TCC solenoid electrical fault
- P1870 Transmission component slipping
Type 4

Codes

P0218 Transmission fluid over temp
P0502 No VSS signal
P0562 System voltage low
P0563 System voltage high
P0601 PCM/ECM memory checksum
P0602 PCM/ECM programming error
P0604 PCM/ECM RAM error
P0606 Internal performance
P0705 Transmission range switch illegal position
P0706 Transmission range switch performance
P0711 TFT sensor performance
P0712 TFT sensor circuit low
P0713 TFT sensor circuit high
P0719 Brake switch stuck on
P0722 Output speed sensor
P0723 Output speed sensor intermittent
P0724 Brake switch stuck off
P0730 Gear ratio error
P0742 TCC stuck on
P0748 Force motor electrical fault
P0751 SSA (1-2/3-4 solenoid) stuck off
P0752 SSA (1-2/3-4 solenoid) stuck on
P0753 SSA (1-2/3-4 solenoid) electrical fault
P0756 SSB (2-3 solenoid) stuck off
P0757 SSB (2-3 solenoid) stuck on
P0758 SSB (2-3 solenoid) electrical fault
Type 4

Codes

P1120   TPS1 circuit
P1220   TPS2 circuit
P1221   TPS1-TPS2 correlation (circuit performance)
P1271   APS1-APS2 correlation (circuit performance)
P1272   APS2-APS3 correlation (circuit performance)
P1273   APS1-APS3 correlation (circuit performance)
P1275   APS1 circuit
P1280   APS2 circuit
P1285   APS3 circuit
P1790   ROM check sum error
P1792   EEPROM check sum error
P1835   Kickdown switch stuck on
P1850   Band apply solenoid electrical fault
P1860   TCC solenoid electrical fault
P1870   Transmission component slipping
### Type 5 & 6 (Except BMW)

#### Codes

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<th>Code</th>
<th>Description</th>
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<td>P0218</td>
<td>Transmission fluid over temp</td>
</tr>
<tr>
<td>P0560</td>
<td>System voltage malfunction</td>
</tr>
<tr>
<td>P0601</td>
<td>TCM internal error</td>
</tr>
<tr>
<td>P0703</td>
<td>Brake switch circuit</td>
</tr>
<tr>
<td>P0705</td>
<td>Transmission range switch illegal position</td>
</tr>
<tr>
<td>P0706</td>
<td>Transmission range switch performance</td>
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<tr>
<td>P0711</td>
<td>Transmission fluid over temp</td>
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<tr>
<td>P0712</td>
<td>TFT sensor circuit low</td>
</tr>
<tr>
<td>P0713</td>
<td>TFT sensor circuit high</td>
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<tr>
<td>P0722</td>
<td>Output speed sensor</td>
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<tr>
<td>P0725</td>
<td>Engine RPM signal</td>
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<td>P0727</td>
<td>Engine RPM signal</td>
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<tr>
<td>P0730</td>
<td>Gear ratio error</td>
</tr>
<tr>
<td>P0742</td>
<td>TCC stuck on</td>
</tr>
<tr>
<td>P0743</td>
<td>TCC solenoid electrical fault</td>
</tr>
<tr>
<td>P0748</td>
<td>Force motor electrical fault</td>
</tr>
<tr>
<td>P0751</td>
<td>SSA (1-2/3-4 solenoid) stuck off</td>
</tr>
<tr>
<td>P0752</td>
<td>SSA (1-2/3-4 solenoid) stuck on</td>
</tr>
<tr>
<td>P0753</td>
<td>SSA (1-2/3-4 solenoid) electrical fault</td>
</tr>
<tr>
<td>P0756</td>
<td>SSB (2-3 solenoid) stuck off</td>
</tr>
<tr>
<td>P0757</td>
<td>SSB (2-3 solenoid) stuck on</td>
</tr>
<tr>
<td>P0758</td>
<td>SSB (2-3 solenoid) electrical fault</td>
</tr>
<tr>
<td>P1560</td>
<td>TCM voltage interrupted</td>
</tr>
<tr>
<td>P1600</td>
<td>Transmission power relay circuit (Solenoid B+ supply)</td>
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</table>
### Type 5 & 6 (Except BMW)

#### Codes

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<th>Code</th>
<th>Description</th>
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<tbody>
<tr>
<td>P1605</td>
<td>TCM internal error</td>
</tr>
<tr>
<td>P1621</td>
<td>TCM internal error</td>
</tr>
<tr>
<td>P1625</td>
<td>Transmission power relay circuit (Main Case Solenoid B+ supply)</td>
</tr>
<tr>
<td>P1705</td>
<td>P/N output circuit from ECM to TCM (not the trans range sensor)</td>
</tr>
<tr>
<td>P1740</td>
<td>Torque management circuit</td>
</tr>
<tr>
<td>P1743</td>
<td>TPS signal invalid from ECM to TCM</td>
</tr>
<tr>
<td>P1760</td>
<td>Keep alive power circuit fault</td>
</tr>
<tr>
<td>P1740</td>
<td>Torque management circuit</td>
</tr>
<tr>
<td>P1792</td>
<td>Engine coolant circuit</td>
</tr>
<tr>
<td>P1800</td>
<td>Transmission power relay circuit (Main Case Solenoid B+ supply)</td>
</tr>
<tr>
<td>P1835</td>
<td>Kickdown switch stuck on (info from ECM on some models)</td>
</tr>
<tr>
<td>P1844</td>
<td>TCS torque reduction request circuit</td>
</tr>
<tr>
<td>P1845</td>
<td>Gear ratio output to ABS</td>
</tr>
<tr>
<td>P1850</td>
<td>Band apply solenoid electrical fault</td>
</tr>
<tr>
<td>P1870</td>
<td>Transmission component slipping</td>
</tr>
<tr>
<td>P1890</td>
<td>ECM to TCM data input circuit (TPS data incorrect on some models)</td>
</tr>
<tr>
<td>P1895</td>
<td>Engine torque delivered circuit (TCM to traction control module)</td>
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<tr>
<td>U2100</td>
<td>CAN bus circuit</td>
</tr>
<tr>
<td>U2104</td>
<td>CAN bus circuit</td>
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<td>U2105</td>
<td>CAN bus circuit</td>
</tr>
<tr>
<td>U2108</td>
<td>CAN bus circuit</td>
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