



4L30E Band Failure

Since 1991 the 4L30E has been used by many manufacturers, including Isuzu, Honda, Acura, BMW and Cadillac. For the most part it's been a reliable transmission except for one major complaint: repeat band failure. In this edition of *Transmission Therapy*, we'll cover diagnosis, the root causes, and the fixes for this common problem, many of which were developed by Mike Van Dyke right here at ATRA.

The Theory...

In all forward ranges, line pressure is supplied to the apply side of the servo. This applies the band in 1st and 2nd gear. In 3rd and 4th gear the band must release. Instead of exhausting the servo apply pressure, pressure applies to the release side of the servo. With the help of the servo release spring, this release pressure overcomes the apply pressure and releases the band during the 2-3 upshift.

In 3rd gear, 3rd clutch apply pressure is also servo release pressure (figure 1). Since this oil is restricted by orifice 16e, any leaks in the 3rd clutch apply circuit will reduce servo release pressure. If this release pressure is low enough, the servo will stay partially applied, burning the band.

In 4th gear, 2nd clutch apply pressure is also fed by orifice 16e (figure 2). Leaks in the 2nd clutch apply circuit will reduce pressure to the servo release circuit, allowing the band to stay partially applied, but only in 4th gear.

Here's what that means:

- If the band is burning in 3rd and 4th gear, it's being caused by a leak in the 3rd clutch apply circuit or the servo pin bore.

DRIVE RANGE - THIRD GEAR

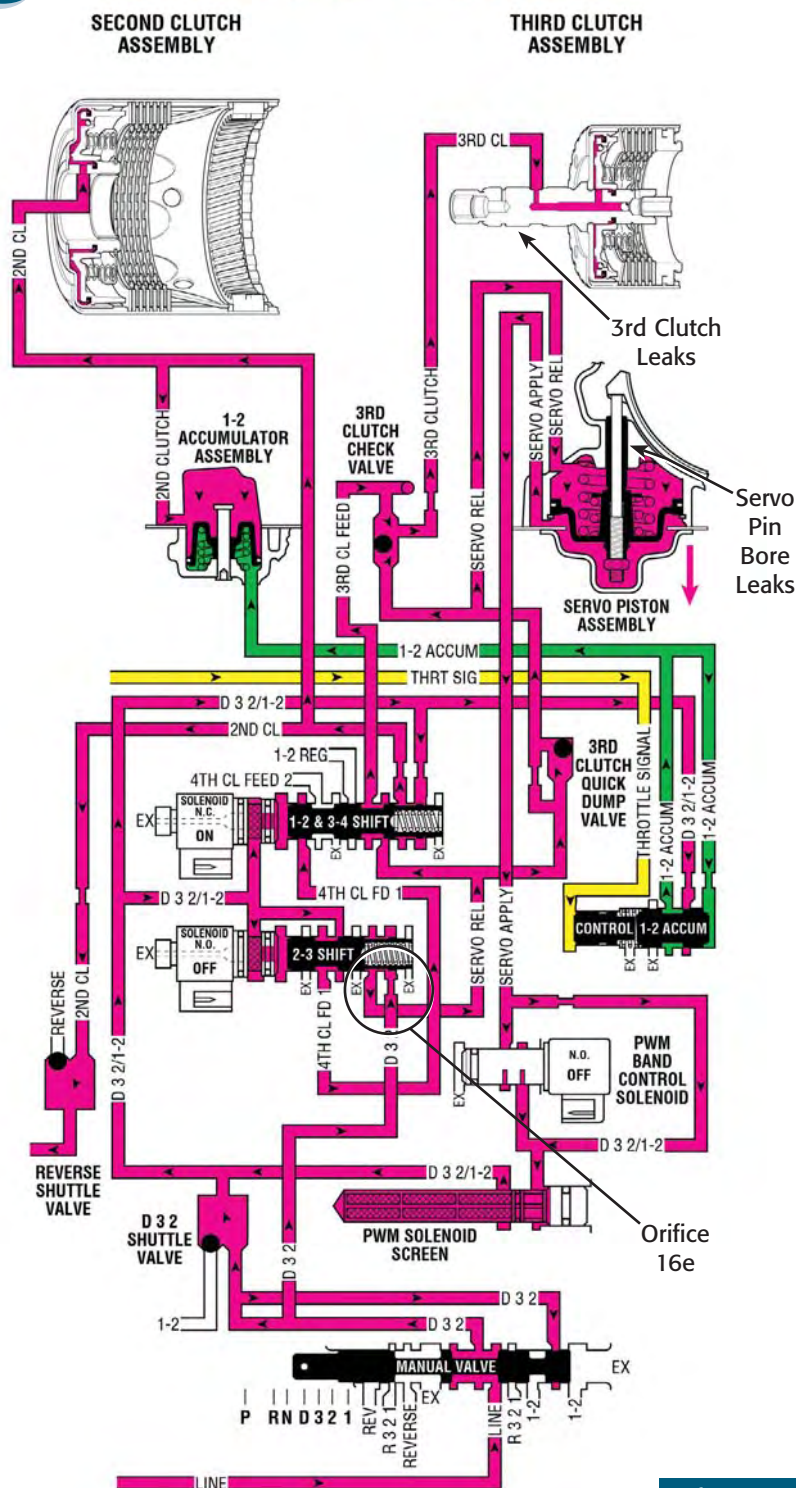
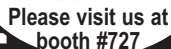


Figure 1

Torque Converter Clutch Applied



1. Drill into the circuit as straight as possible using a 1/8" drill. This hole should protrude into the bottom of the servo bore (figure 4).



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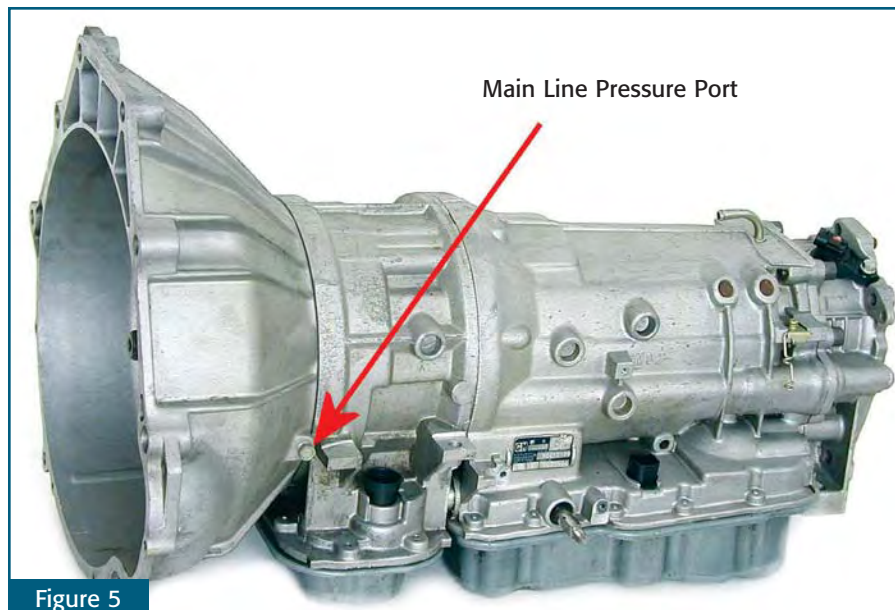


Figure 5

2. Enlarge the hole with a 21/64" drill, deep enough to thread the hole with a 1/8" pipe tap.

Because band failure is becoming such a common problem, you should install this pressure port on every rebuild, even if the transmission didn't come in with a burnt band.

Then, after every rebuild, you should put a gauge on mainline (figure 5) and another on the servo release tap you installed. Get the transmission hot and compare the readings in 3rd and 4th gears. If servo release pressure is 10 PSI or more below line pressure, there's a leak in the release circuit.

Remember, if the problem is in 3rd and 4th gear, it's caused by a leak in the 3rd clutch apply circuit or the servo pin

bore. If the problem only appears in 4th gear, it's caused by a leak in the 2nd clutch apply circuit.

2nd Clutch Drum

A leak in the 2nd clutch drum will cause a problem with servo release pressure in 4th gear, so always inspect the 2nd clutch drum for leaks. While bad lip seals and sealing rings can cause leaks, the most common problem is a cracked drum

(figure 6). The crack will normally appear along the chamfered edge and can be so small that you may not be able to see it without a magnifying glass.

Adapter Housing and Center Support

A warped adapter housing or center support can cause a leak in either circuit, so they can cause a servo release problem in 3rd gear, 4th gear or both. Always check the adapter housing and the center support with a straightedge and a 0.0015" feeler gauge (figures 7 and 8). If the feeler

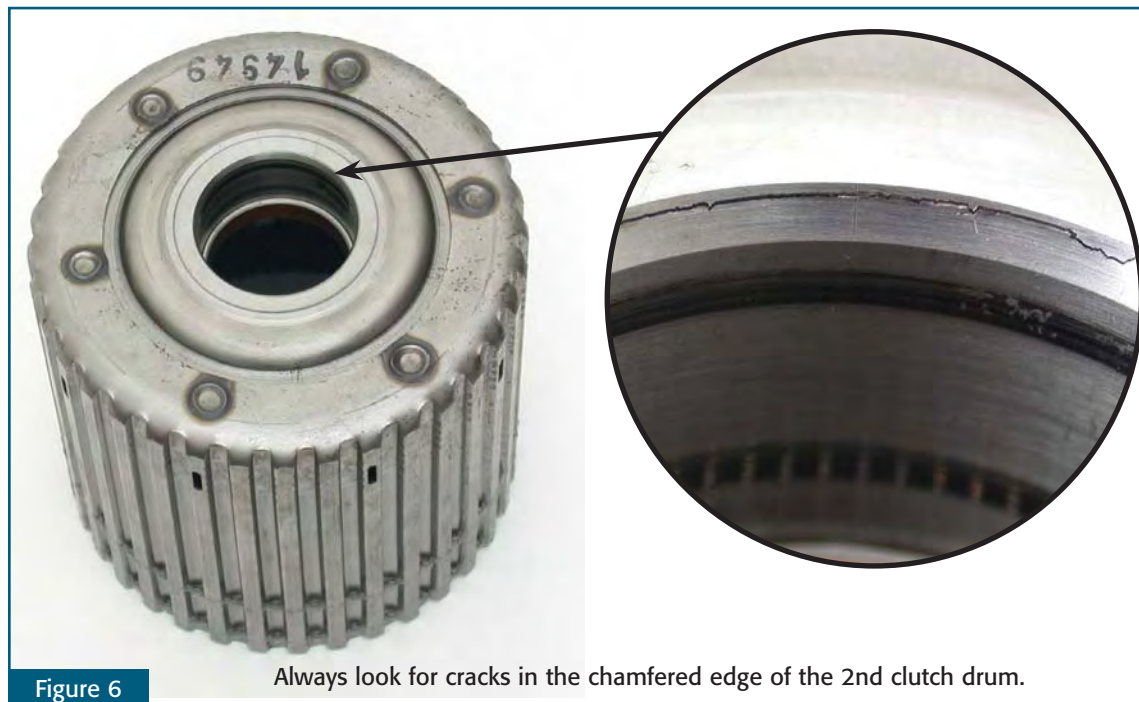


Figure 6

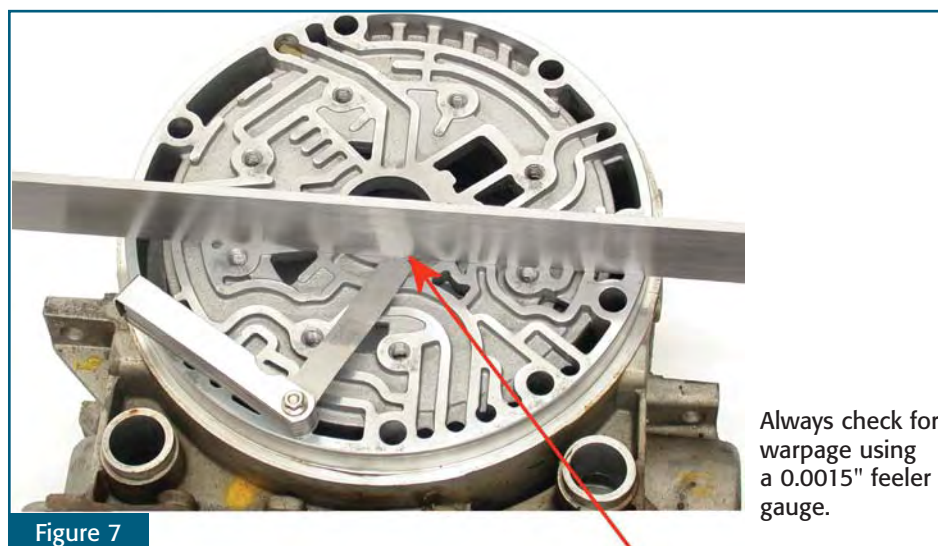


Figure 7

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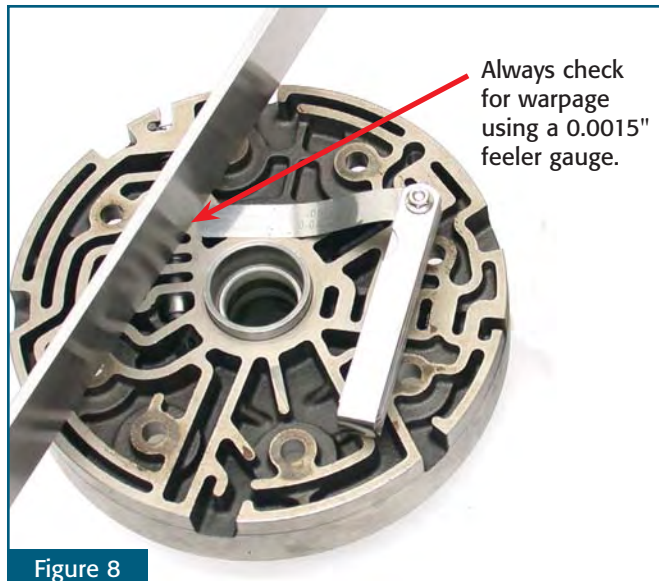


Figure 8

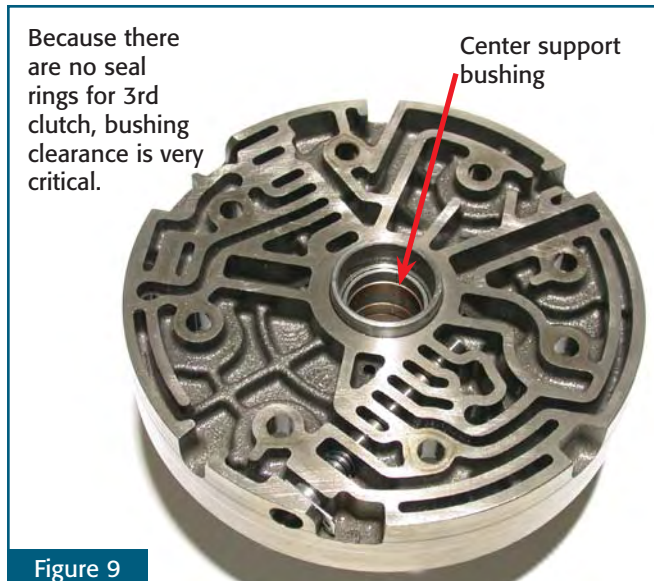


Figure 9

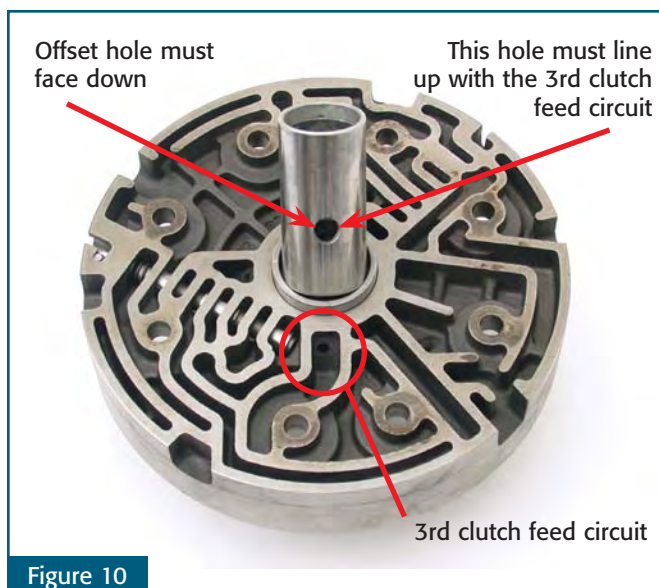


Figure 10

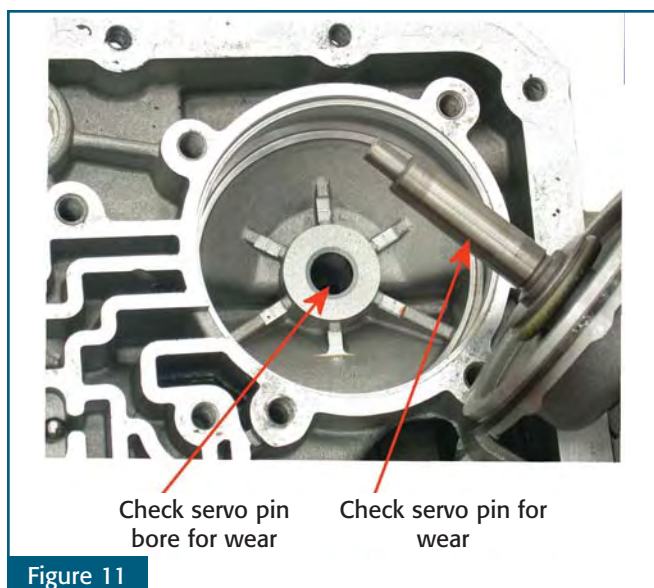


Figure 11

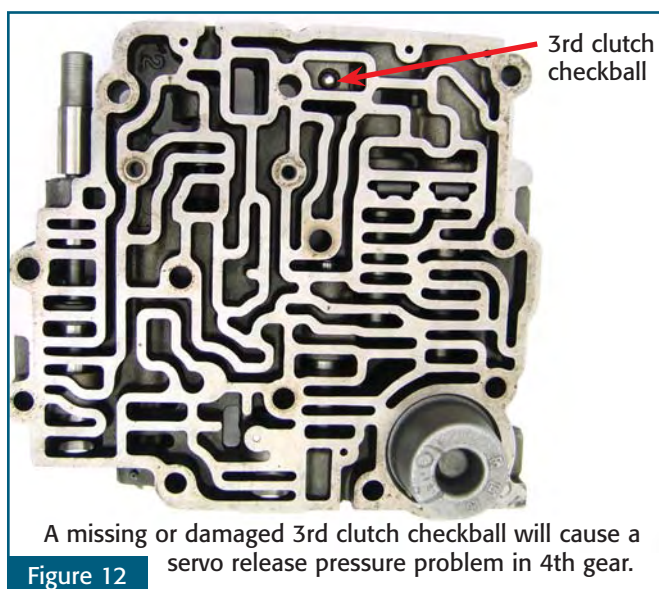


Figure 12

gauge slides freely between the center support and the straight-edge, the support is warped and will create leaks in the 2nd or 3rd clutch circuits.

The bolt holes in the center support are a common high spot, so always check them before replacing the support. If the bolt holes are high, flat file them down and recheck the support.

3rd Clutch Drum

The center support bushing seals 3rd clutch apply oil to the 3rd clutch drum shaft (figure 9). Because there are no sealing rings for the 3rd clutch, bushing clearance is critical. More than 0.002" bushing clearance will cause a leak in 3rd clutch apply pressure.

To check the bushing clearance, apply a thin piece of Scotch tape on the side of the shaft. If the shaft goes into the bushing without scraping the tape off, the bushing is worn. This will cause a servo release problem in 3rd and 4th gears.

If you have excessive bushing clearance and decide to install a new bushing, there are three things to keep in mind:

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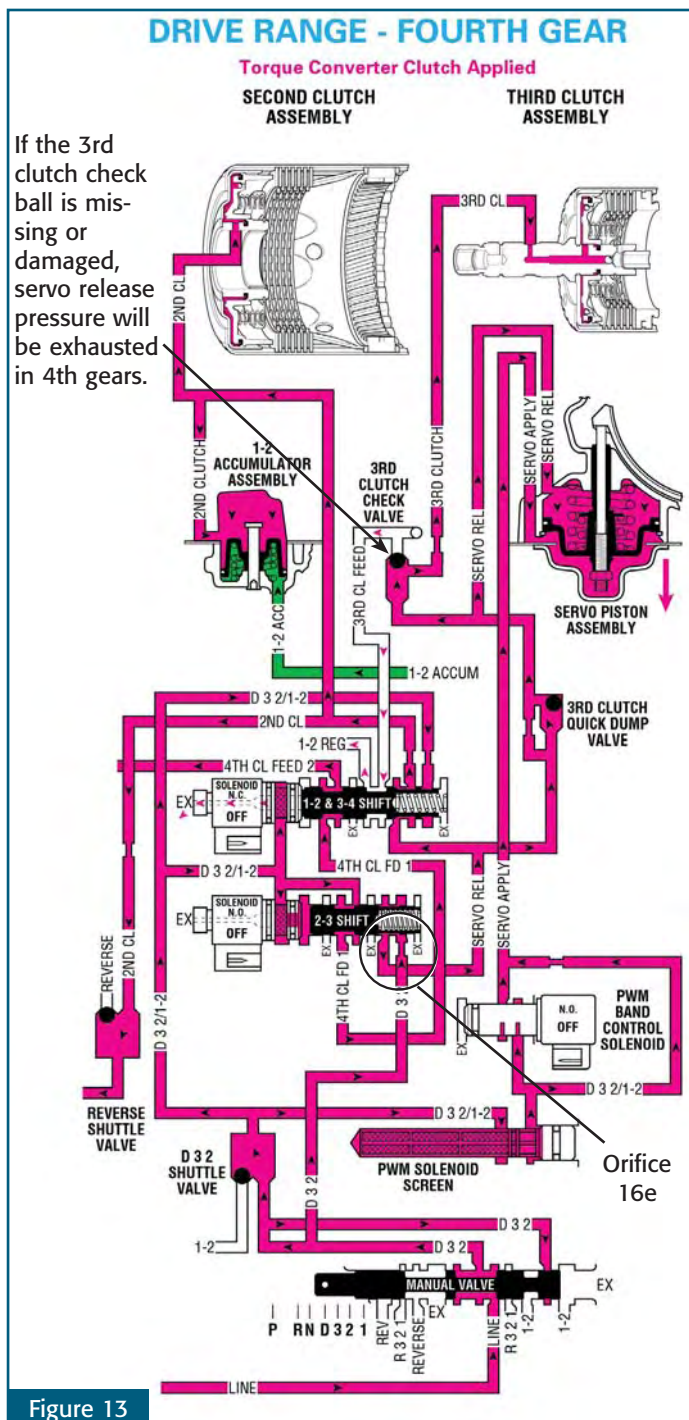


Figure 13

1. The bushing has a tight press fit. Always hold the center support as close to the bore as possible while pressing the old bushing out and the new one in; failure to do so will warp the casting.

2. The 3rd clutch feed hole in the bushing must line up with the 3rd clutch feed circuit in the center support (figure 10). Improper alignment will cause a bindup in 2nd gear because lube oil will apply the 3rd clutch.

pressure problem in 3rd and 4th gear. You can check the clearance by putting a thin piece of Scotch tape on the side of the pin. If the pin goes into the bore without scraping the tape off, the pin bore is worn.

Pin clearance greater than 0.002" will cause a leak in the servo release circuit and should always be fixed. As far as we know only one company offers a pin bore repair kit for this transmission: Northland Transmissions (715)458-2617.

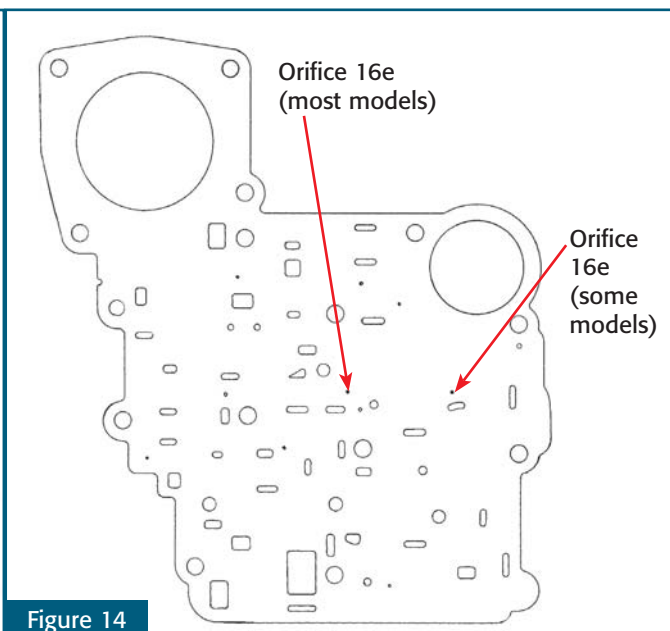


Figure 14

3. Some after-market bushings will fit looser than the original one, so always recheck the fit after you install the bushing. It may be necessary to replace the center support with one that has a good bushing.

Servo Pin Bore

Servo pin bore wear is another common cause of band burn up (figure 11). A leak in this area will cause a servo release

3rd Clutch Checkball

The 3rd clutch checkball must be installed in the valve body (figure 12). If the 3rd clutch checkball is missing or has a bad seat, 3rd clutch apply pressure will exhaust in 4th gear (figure 13). A problem in this area will cause a servo release pressure problem in 4th gear only.

Orifice Hole 16e

Because there are a lot of circuits fed by orifice 16e, you can enlarge it to 0.090" [note: There are two possible locations for orifice 16e](figure 14). This will help prevent the normal small leaks in the combined circuits from causing a problem with servo release pressure.

Remember, this is a common problem and you can't drill the servo release pressure tap while the transmission is in the vehicle. Even if the unit didn't come in with a burnt band, always drill and tap the circuit during the rebuild. And always install a pressure gauge in the mainline and servo release taps to compare the two readings during diagnosis and after a rebuild.

These problems tend to be more pronounced with higher temperatures, so always check the pressures with the transmission hot. Knowing what parts of the transmission can affect which characteristics of servo release pressure, you can eliminate many of them with this one easy test.



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