

a 700R4 to a 4T65E to a 5R55N

Hot Q&A tips are provided by the ATRA Technical Department. These tips are gathered from the members. We'll bring them out to you as soon as we can.

The names and towns have been changed to protect the innocent.

700R4 - Why Drill?

My name is Joe, from Columbus, Ohio. I work on a lot of 700R4 transmissions and have been told several times to drill the TV balance hole to prevent high line pressure and late upshifts. This works most of the time on several types of transmissions. Why does this need to be done? These transmissions obviously worked for thousands of miles and many didn't have this problem before the rebuild. What am I missing? Can you explain the theory to me?

Hi Joe, let's look at a hydraulic diagram for a 700R4 TV valve (figure 1). TV limit oil, indicated in orange, enters between land #2 and #3. This pressure now becomes TV pressure, indicated in yellow on the diagram.

TV oil gets routed through a small TV balance orifice to land #1. Balance oil pushes the TV valve to a position which blocks the feed from TV limit oil (figure 2). The valve will float back and forth to regulate pressure.

When you press the throttle, the throttle linkage moves the throttle plunger, increasing spring tension. This makes it harder for the TV balance oil to push the TV valve far enough to cut off the feed, which raises TV pressure.

If the TV balance oil leaks more oil than the small TV balance orifice allows to flow, the

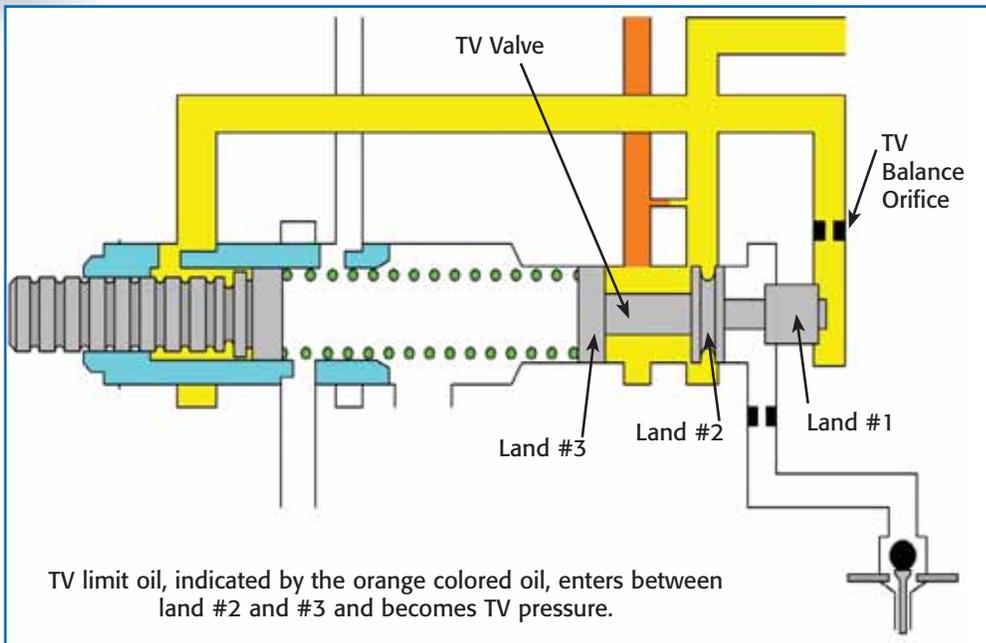


Figure 1

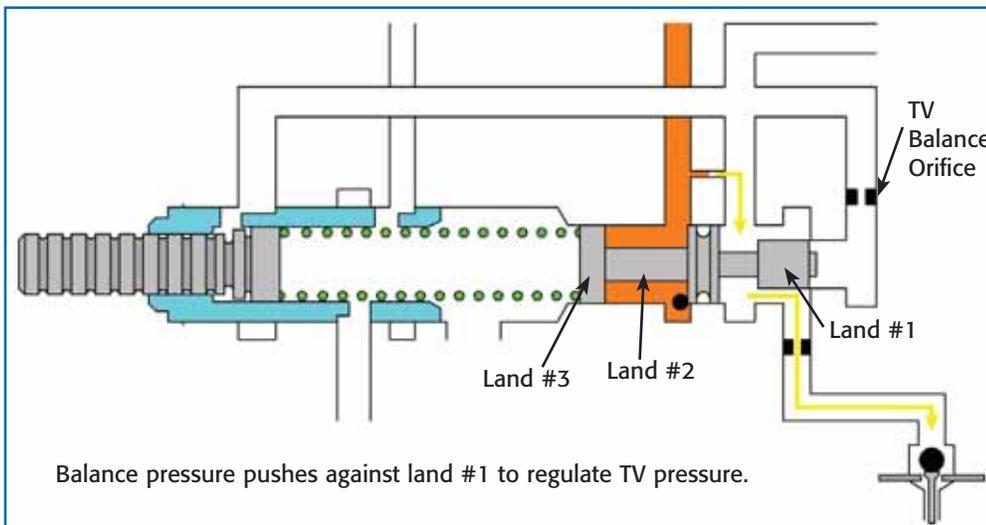


Figure 2



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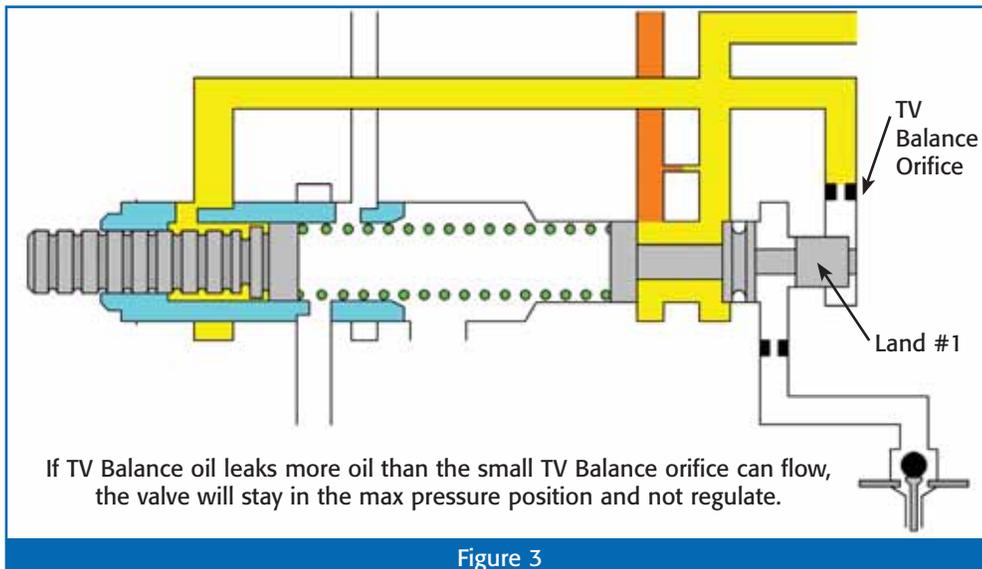


Figure 3

Valve bodies wear over time causing leaks between the valve lands and the bore.

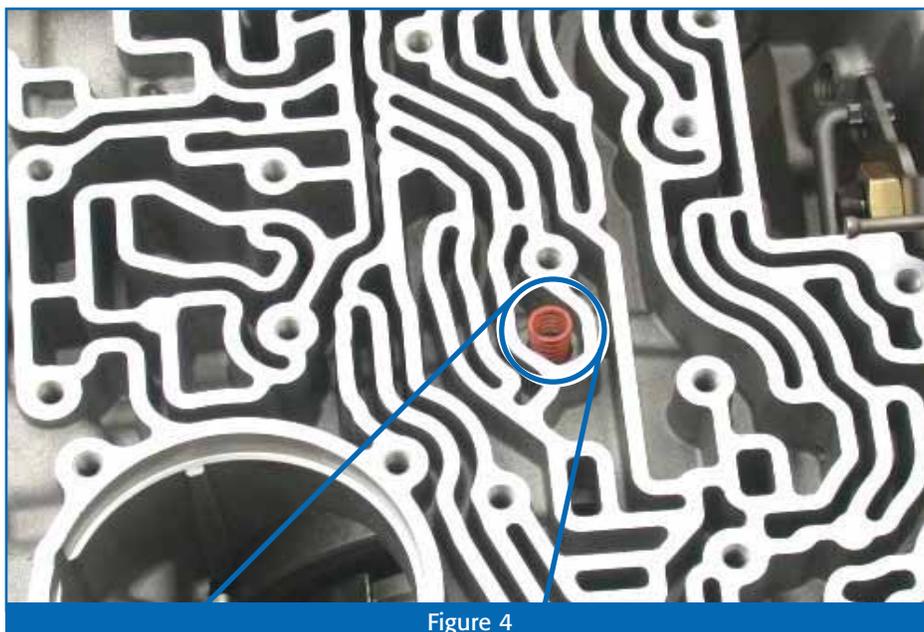


Figure 4

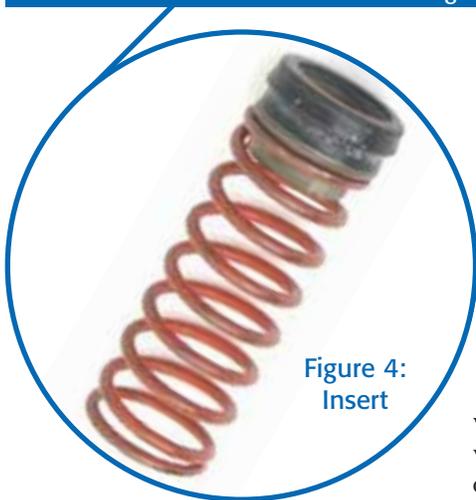


Figure 4: Insert

valve stays in the maximum pressure position and won't regulate (figure 3). With the TV valve hydraulically blocked in this position, line pressure rises to maximum and causes late shifts.

Valve bodies wear over time, causing leaks between the valve lands and the bore. When these high-mileage transmissions come to your shop, many of these leaks are actually sealed by a thick residue packed in the valve body. The cleaner you get the valve body, the more you're actually opening leaks in the worn valves. So doing a great job cleaning these transmissions could be partially to blame for this problem. Not that you should stop cleaning valve bodies; that would

create different problems.

So how do you handle these leaks? That's easy: Just enlarge the TV balance hole to about 0.055". This allows more oil into the balance circuit to overcome these small leaks.

In most transmissions, TV balance holes are easy to find. They're usually located in the separator plate, directly over the balance circuit in the valve body casting. Finding them first in an oil circuit diagram makes them even easier to locate in the valve body and separator plate. Keep in mind that some of these holes are located in one of the casting walls, while others are in the valve itself.

5R55N - Fighting a 2-3 Flare

Hi, I'm John from Springfield, Missouri. I've been fighting a 2-3 flare in 2001 Lincoln LS with a 5R55N transmission. I've changed both servos and repaired the servo pin bores. Line pressure is good and I've installed a new solenoid body. What am I overlooking?

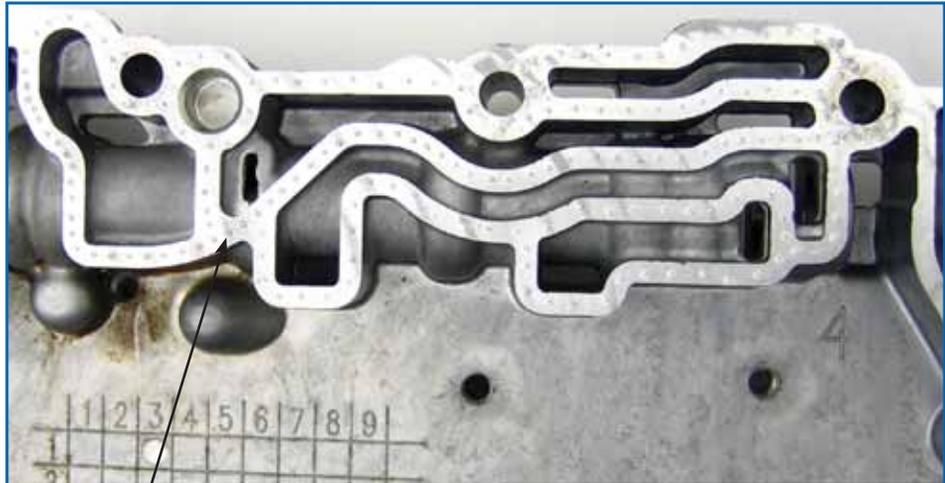
You may be overlooking the spring-loaded intermediate clutch tube seal in the case (figure 4). The seal is actually

GM has updated the channel casting gaskets several times; the latest part number is 24220217. Start with that.

press fit into the case; you have to tap it in with a drift punch and hammer. If the seal isn't seated all the way, intermediate clutch apply pressure will leak. And a leak in this area will cause a 2-3 flare or a 2-3 neutral.

4T65E - Blown Channel Casting Gaskets

Hi, my name is Bob, and I'm from Red Bluff, CA. I've had a few 4T65E transmissions come back with blown channel casting gaskets. The case and channel casting are both flat and I'm torquing the bolts to factory specs. Is there any way to prevent this from happening?



Punching several indentations 1/8" to 3/16" apart will give the gasket something to bite into and prevent gasket blow out.

Figure 5

Bob, GM has updated the channel casting gaskets several times; the latest part number is 24220217. Start with that. Then, with a hammer and a sharp punch, place a series of dots about 1/8" to 3/16" apart down the center of each wall (figure 5). They don't need to be very deep; just deep enough to raise the surface slightly. This will give the gasket something to bite into.

Torque the bolts to factory specs and walk away for about an hour. Then come back and retorquing them after the gasket and metal surfaces have had time to compress. That should take care of your channel casting gasket problems, once and for all.



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