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## 4R44E, 5R55E case-wall movement and comebacks

I've heard complaints of blown-out valve body gaskets, loose valve body bolts and various otherwise unexplained symptoms due to cross leaks in Ford 4R44E through 5R55E units. These problems are usually accompanied by an odd wear pattern or "fuzzing" visible on valve body gaskets and witness marks on the separator plate (see Figure 1).

instant with throttle position, load or gear range causing rapid back-and-forth movement of the case wall. Over time, the constant movement wears away at the valve body gasket and commonly leads to loosening of the valve body bolts in this area. Loose bolts eventually lead to gasket blow-out or circuit cross leaks. This definitely seems like a place where the casting could

Figure 1:



Visible marks on the separator plate are created from case-wall movement.

The cause is the case oil passage worm track walls, which are susceptible to side-to-side movement due to large surface area and few reinforcements. The longest passage is line pressure, which varies from 70 – 350 psi. The adjacent long passage that runs parallel is "CC" converter oil, where pressure is limited to about 80 psi by the vertical blow-off valve/spring in the CC passage near the front of the valve body. The large surface area and pressure difference between these long passages is the major cause of case wall movement. For example, just part of one section of the worm-track wall is roughly 1 1/4 x 5", which works out to a surface area larger than most servos. Calculating the pressure differences between these two oil circuits shows the forces pushing on the case wall can be over 1,000 pounds in drive and more than 1,500 pounds in reverse.

Just as significant, these forces can change in an



Figure 2: Set screws. 3/8-16 x 3/8" at left, 5/16-18 x 5/16" in center, #10-24 x 1/4" at right.

have been reinforced, but that never happened in production.

The fix for the problem is surprisingly simple and inexpensive. Inserting common set screws (see Figure 2) sideways into the case gives additional stability to the case walls and is not a significant restriction to oil flow. Refer to Figures 3 through 5 for step-by-step procedures to install the set screws. Just a couple will act as a bridge and make a big improvement. You can add additional screws as necessary, but be cau-

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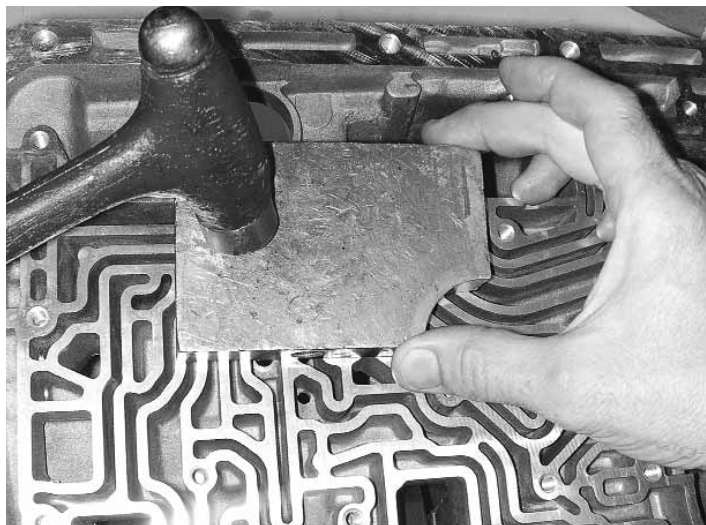
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*Figure 3: Place set screws horizontally over passages.*

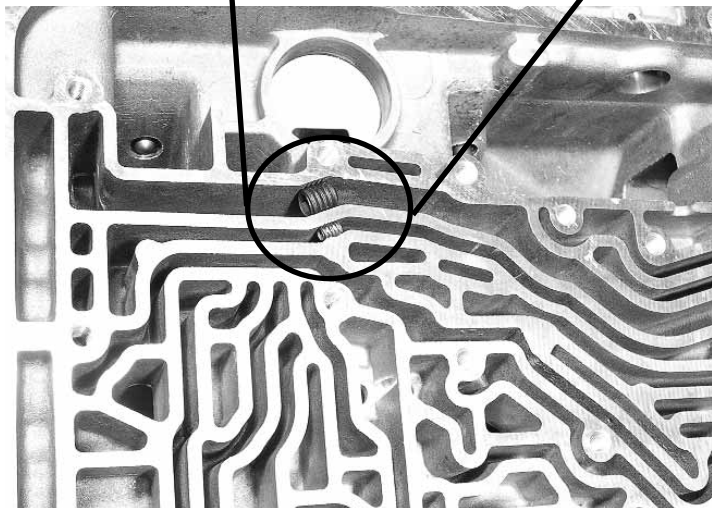
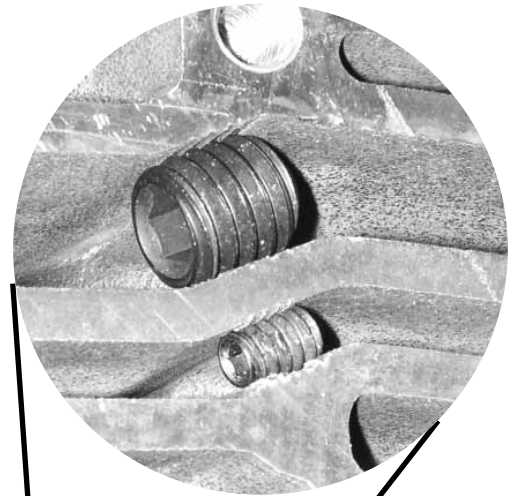


*Figure 4: Use a flat steel plate to drive the set screws flush with the case.*

tious about selecting the right size for the gap so that there is no chance of cracking a wall. I admit, this approach is a bit odd, but once you try it, I am sure you will see how simple and effective it really is.

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*Figure 5: Set screws installed. Additional locations can be added as desired.*