On the ATRA Technical HelpLine we receive several calls a week about oil leaking from the vent. There are many styles of vents used by different manufacturers, but they can be broken down into two basic types: Those where the vented circuit is routed through the pump, and those that aren’t. In this edition of Transmission Therapy, we’ll cover several examples of both vent types. We’ll also cover the reasons they leak, and some really cool tricks you can use to keep venting problems to a minimum.

One cause for vent leaks is overfilling the transmission. While you probably know the right way to check the fluid level, there are a few things even the most experienced technician can overlook, especially on older vehicles that have had work done by several different shops over the years. For example, an underfilled or overfilled condition can take place when the wrong dipstick or dipstick tube is installed.

Overfilling can obviously cause a venting problem, but did you know that underfilling a transmission can also cause a vent leak? That’s because the pump will pull air through the filter and aerate the fluid, making it foamy. When
the fluid gets foamy it expands, which raises the fluid level after the vehicle’s been driven for a while.

So, if your shop gets a vehicle that’s leaking from the vent, first make sure it has the right dipstick and tube, and the fluid level is correct.

Another condition that can cause the transmission to be overfilled intermittently is if the torque converter loses charge. Most transmissions only charge the converter when the pump volume is high enough to maintain proper line pressure. If pump volume isn’t high enough, the pressure regulator valve will cut off converter charge. At this point, much of the oil from the converter will end up in the pan, overfilling the transmission.

While we aren’t going to cover the reasons for this, it’s something you’ll need to address if a vehicle comes in with vent leaks. Because this situation can come up intermittently, you’ll have to test for it while the problem occurs. To do so, drive the vehicle until the problem occurs, then:

- Pull over immediately to the side of the road.
- Put the shifter in park and shut the engine off.
- Check the fluid level as quickly as you can.

If the fluid level is very high, either the fluid is foaming or the transmission lost converter charge.

If the fluid level is correct when the problem occurs, check the vent location. If the vent is routed through the pump, these examples of common vent problems will help you understand the reasons for leaks. With these vent types, the problem is always caused by a warped or cracked pump.

**THM400 Pump Passages**

In the THM400 pump (figure 1), the vent circuit runs along the converter charge circuit and the lube circuit. So, when the pump is warped, converter charge and cooler return pressure will leak into the vent circuit.

**4R100 Pump Passages**

In the 4R100 pump (figure 2), the vent circuit is next to the EPC pressure circuit. This is a very large pump and is made out of aluminum, so it’s very

Clean the walls surrounding the vented circuit thoroughly with brake cleaner or acetone, and apply a thin coat of Loctite 518 around the vent circuit.
This pump is made out of aluminum, and quite frankly these transmissions are often used in applications that deliver more abuse than the transmission can handle.

prone to warping and crossleaks. When the pump is warped, EPC pressure will leak into the vent circuit.

**4L60/4L60E Pump Passages**

In 4L60/4L60E pumps (figure 3), the vent circuit runs along the converter charge circuit and the cooler circuit. This pump is made out of aluminum, and quite frankly these transmissions are often used in applications that deliver more abuse than the transmission can handle. This produces very high temperatures, which often causes the pump to warp. When the pump warps, converter charge and cooler pressure leaks into the vent circuit.

All crossleaks get worse with heat, especially where aluminum is involved. During the rebuild, always flat file the pump body around the threaded bolt holes. Many times you’ll find the threads have pulled up, creating high spots. After flat filing the pump, use a straight edge and a 0.0015” feeler gauge to check for warping. If the pump is warped more than 0.0015”, have the pump machined or replace both castings.

One way to help prevent future vent problems is to clean the walls surrounding the vented circuit thoroughly with brake cleaner or acetone, and apply a thin coat of Loctite™ 518 around the vent circuit (figure 4). You can find Loctite™ 518 at NAPA Auto Parts, part #765-1189.

**Note:** It’s important to torque the inner and outer pump bolts as quickly as possible after applying Loctite™ 518.
Now you can get OE-quality transmission oil cooler assemblies right from your parts store. You don’t have to source them from OE dealers and pay higher prices. You don’t have to order from multiple suppliers. And you don’t have to wait on the dealer’s delivery schedule to get your jobs done. You can reduce costs, save time and improve margins. Fewer hoops, bigger treats.

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This will insure that it doesn’t dry and create high spots between the castings. You should also allow 12-24 hours for curing time before running the transmission.

If the vent isn’t routed through the pump, there are only two possibilities for fluid leaking out the vent:
1. Oil is being sprayed at the vent by an internal leak or slung at the vent by a rotating part.
2. The area where the vent is located is being flooded.

Here are some examples to help illustrate some of these common problems.

**5R55W**
In early versions of the 5R55W, there were two transmission vents. The rear one is located on top of the case, just in front of the tail housing. The second vent is located about 5 inches forward of the rear vent.

Why Ford put the second vent here is a mystery, because this placed it right above the drive shell which slings a lot of oil right at the vent (figure 5). What’s worse is the top of the vent hose runs inside the top of the bellhousing (figure 6). When the vent hose fills with oil, it appears as if the transmission has a front seal leak.

The fix? Since you really don’t need two vents, simply use a cup plug or set screw to plug the front vent.

**CD4E**
Because the vent on the CD4E is located on top of the side cover, it’s hard to believe the problem can even exist (figure 7). Sometimes oil from the EPC solenoid is being sprayed directly at the vent. If this is the case, you can make a simple baffle to shroud the vent.

But other times, cracks in the solenoid body leak so much oil that the entire side cover fills up and starts pouring oil out the vent, once it reaches the top (figure 8). The best way to test for this is to run the transmission with the side cover off. This will show you where the oil is coming from, and it’s a trick you can use on several types of transmissions.

**4T65E**
On the 4T65E, the vent is located above the channel casting (figure 9). If the gasket blows out, line pressure sprays into the vent channel. This is another situation where running the transmission with the side cover off can help you find the problem. You’ll know right away that the gasket is blown and, if you’re feeling really adventurous, you can probably fix it in the vehicle.

Always examine the vent circuit and consider how oil can reach it. Look for crossleaks, poor vent design, rotating parts, oil spraying, and interchange problems. One or more of these problems could ruin your day and take weeks to solve. But with a little common sense and careful detective work, these problems can be much easier to fix.
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