The 4F27E transmission family has been around for more than ten years, and has become a fairly common sight in today’s shops. Ford calls this transmission the 4F27E; it comes in the Focus and Transit Connect. Mazda also has their version: Called the FN4A-EL, it comes in the Mazda 2, Mazda 3, and Mazda 5. Then you have the 5-speed FNR5 that comes in the Ford Fusion and Mazda 6.

These units have some very common wear areas, which can cause some very common problems. In this article, we’ll look at how to test for that wear, using air testing, vacuum testing, and wet air testing procedures. These tests will help you identify problem areas and repair them... before they become a bigger problem.

We’ll look at the servo pin bore, pressure regulator valve, solenoid pressure regulator valve, converter relief valve, and the rear cover.

Servo Pin Bore

While it’s called a 2-4 band, the servo and band operation are critical for 2nd, 3rd, and 4th gears. Here’s why: The band is applied in 2nd and 4th gears. But on the 2-3 upshift, direct apply oil is sent to the back of the 2-4 servo.

For that shift, the 2-4 servo acts as a 3rd gear accumulator, because it still has the 2nd gear oil applied to the front of the servo. Spring pressure combined with 3rd apply oil overcome the band apply oil and the band releases as the direct clutches come on.

On the 3-4 shift, forward clutch oil is released. That cuts off the servo release oil, so the band reapplies for 4th gear.

When the servo pin bore wears, direct clutch apply oil leaks to the sump. This can cause the direct clutches to fail.

Testing the servo pin bore is easy and takes very little time:
• Remove the valve body.
• Locate the 2-4 band release port (figure 1).
• Apply air to the servo release during teardown.

You shouldn’t see any signs of a leak between the servo band pin and the inside of the case. The servo shown had a large leak around the pin bore that needed to be addressed (figure 2).
There are aftermarket kits available for servo pin bore wear. Check with your aftermarket suppliers for the repair.

**Torque Converter Clutch Performance**

A common problem is code P0741 — TCC stuck off. Let’s talk about this code. Just a little testing before the transmission hits the bench will save time and money.

Look at the freeze frame data when the code sets; usually you’ll see the torque converter clutch solenoid commanded on. The solenoid and valve are functioning normally, but the converter can’t keep the slip rate down. The two areas you should check are the TCC circuit and the converter itself.

The torque converter clutch circuit has a problem built into it: It uses two bushings in the pump stator support to separate the torque converter clutch release oil and converter apply pressure. Worse yet, the bushings are close together.

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together and wear quickly because they have so little support (figure 3). To test the bushings, first you’ll need to plug the hole in the stator support (figure 4).

- Slide the stator support onto the input drum.
- Pour ATF into the input shaft.
- Apply low air pressure into the tip of input shaft.

There should be no oil or air leaking around the shaft and bushings (Figure 5).

You can also check the stator support bushings with a vacuum test stand:
- Clean and dry the shaft and the stator support.
- Plug the hole in the stator support.
- Apply a vacuum to the tip of the input shaft.

Testing with vacuum will give you numbers to work with and lets you keep track of pass and fail results. After you install new bushings in the stator support, repeat the test to confirm your fix.

Valve Body

Let’s test the pressure regulator valve and converter relief valve in the main section of valve body (figure 6).

The pressure regulator valve is almost always worn on this transmission. Here’s an easy, quick test:
- Pour ATF into the test port.
- Cover the test location.
- Apply low air pressure.

If ATF and air leak into the passages next to the test port (figure 7), the bore needs to be addressed.

If you like to compare test results, you can perform a simple vacuum test on the same test port. This can save you time and money, because it’ll show what valves need to be repaired and where you can save money on unneeded repairs.
**Chrysler solenoid repair kits:**
- S-70 Repair Kit A604 Solenoid Pack 1989-98
- S-304 Repair Kit A604 Solenoid 2000-Up
- S-305 Repair Kit A606 Solenoid 1993-Up
- D92933 4419478 92933 Wire Harness Repair Kit A604 (Input and Output Sensors) 1989-Up
- 4854 Solenoid Repair Kit 45RFE 5-45RFE, 68RFE  2004-Up
- DK22954B   4617463   Solenoid Kit A518 A618 {Includes Overdrive & Lockup | Governer Pressure Sensor} 1996-99

**Filter screens**

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More profits for shops is why Toledo Transkit™ rebuild kits include solenoid filter screens and/or solenoid orings where required. Toledo Transkit™ brand kits contain the components that are needed to complete the rebuild which prevents the technician from having to stop and order missing parts. Saving time and money means more profits for shops.
Wear in the pressure regulator valve may cause unstable line pressure, hard shifts, and problems with converter pressure and lube.

The converter relief valve has two ports that need to be tested. When worn, this valve will affect the torque converter clutch apply and release, and may set converter slip codes.

A vacuum or wet air test at both locations will show whether this bore needs to be repaired. When testing the converter relief valve port A, you’re only checking one valve bore land; when checking location B you’re testing two valve bore lands at the same time. So test port B will always leak more than A; this is normal.

**Upper Valve Body**

In this section of the valve body you need to pay attention to the solenoid pressure regulator valve. A worn solenoid pressure regulator valve will cause low line pressure and low clutch pressure. This valve commonly wears out and sticks.

The test locations (figure 8) can be vacuum or wet air tested.

There are two locations to test; at location B you’ll need to block the passage on the back of the valve body while testing. The test at location B is measuring the wear at two valve bore lands at the same time, so test port B will always leak more than A; this is normal.

**End Cover**

Check the ring lands on the end cover closely, because wear in this area is very common. Figure 9 shows a worn cover at the top ring land. Also inspect the direct drum for ring land wear. This will cause a 2-3 flare or cause a slip in 3rd gear.

By testing these areas and identifying wear, you’ll be able to target the root cause of the condition, instead of simply guessing. Because testing is more effective... and more profitable... than guessing, any day!

Check ring lands for side wear on rear cover.
Can You See the Difference?

We didn’t think so. The fact is, with remanufactured valve bodies, what you see isn’t always what you get. Two valve bodies may look the same, but it’s the work that goes into the remanufacturing process that determines how well they perform.

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