In 2007, Dodge introduced the 68RFE to their truck lines. The 68RFE is a heavy duty transmission used for such applications. Some of its features include:

- Real-time, adaptive, closed loop shift and pressure control.
- Electronic shift and torque converter clutch controls to help protect the transmission from damage due to high temperatures, which can occur under severe operating conditions.

By altering shift schedules, line pressure, and converter clutch control, these controls reduce heat generation and increase transmission cooling.

The 68RFE is somewhat unusual in its components: To help reduce pressure losses, the transmission includes a dual-stage transmission fluid pump with electronic output pressure control. Under most driving conditions, pump output greatly exceeds what’s needed to keep the clutches applied.

The 68RFE pressure control system monitors input torque and adjusts the pressure accordingly. The primary stage of the pump works continuously; the second stage is bypassed when demand is low. The control system also monitors input and output speeds: If the computer sees the clutches slipping, it adjusts the duty cycle to the pressure control solenoid, increasing pressure in proportion to demand.

A high-travel torque converter damper assembly allows the torque converter clutch to engage sooner, to reduce slip. Needle-type thrust bearings reduce internal friction. The 68RFE is packaged in a one-piece die-cast aluminum case. To reduce noise and vibration, the case is very stiff in all directions. Dual filters protect the pump and other components.

The main sump filter has a cooler return filter added to it. Independent

Meet the 68RFE

<table>
<thead>
<tr>
<th>Shift Lever</th>
<th>Gear</th>
<th>Applied Input Clutch</th>
<th>Applied Holding Clutch</th>
<th>Gear Ratios</th>
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<td>Park</td>
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<td>5</td>
<td>6</td>
<td>OD</td>
<td>0,625</td>
</tr>
</tbody>
</table>

Figure 1

Figure 2

Figure 3
lubrication and cooler circuits assure ample pressure for normal transmission operation even if the cooler is obstructed or the fluid flow is restricted due to extremely low temperatures.

The hydraulic control system design (without electronic assist) provides the transmission with park, reverse, neutral, and fourth gears, based solely on driver shift lever selection. This design allows the vehicle to be driven in limp-in mode in case of an electronic control system failure, or a situation the Transmission Control Module (TCM) considers potentially damaging to the transmission.

The 68RFE has a design change that allows for full-time 6-speed and increased torque ratios (figure 1). The 4C on the 45/545RFE held the annulus as the planet was driven by the sun gear. On the 68RFE the 4C holds the sun gear, causing the planetary to drive the annulus.

* When output speed is greater than 150 rpm the L/R clutch is released and the ORC is the holding element before the 1-2 shift.

** Failsafe is 3rd gear on the 45/545RFE and 4th gear on the 68RFE. Vehicles that have Electronic Range Select (ERS) won’t have a manual low 2nd gear while in failsafe.

** Fluid Level**

The fluid level for this unit depends on fluid temperature. Proper fill requires using a scan tool to verify actual transmission temperature (figure 2).

To avoid overfilling the transmission, always follow this procedure for checking the fluid level:
1. Remove dipstick and insert a clean funnel in transmission fill tube.
2. Add this initial quantity of Mopar® ATF +4 to the transmission:
   a. If you only changed the fluid and filter, add 5 quarts of ATF +4 to transmission.
   b. If you rebuilt the transmission and replaced or drained...
the torque converter, add 12 quarts of ATF +4 to transmission.

The only recommended fluid for the 68RFE is MOPAR +4 oil. Using any other blend may cause shift problems that can only be fixed by using the proper oil (figure 3).

### Pressure Tests

To pressure test this transmission, you must have an accurate tachometer and pressure gauge. Test gauges must have a 300 PSI maximum range wherever pressures exceed 100 PSI.

The torque converter clutch apply and release ports are located on the right side of the transmission case.

There are two methods of testing line pressure. The first method requires using a scan tool and adapter that allows you to monitor perceived pressure (scan data) vs actual pressure (pressure gauge).

The second method (not available on all applications because of mounting issues) requires a special adapter oil pan that allows you to tap into each clutch pressure port located on the valve body (figure 4).

The scan tool can be used to read line pressure from the line pressure sensor. The second method is to install Line Pressure Adapter 8259 into the transmission case and then install the pressure gauge and the original sensor into the adapter.

This will allow you to compare the scan tool and gauge readings to determine the accuracy of the line pressure sensor. The scan tool line pressure reading should be within 10 PSI of the gauge reading.

Another method of testing hydraulic line pressure involves removing the valve body pressure test ports and installing the parts of the valve body pressure tap adapter and one or more 300 PSI pressure gauges (Miller Special Tool #8258-A and #C-3293SP) (figure 5 and 6).

With methods 1 or 2, here’s how to test the pressure:

- Check the transmission fluid level and condition (you can only test the condition with the oil pan removed).
- Check the shift cable adjustment.
- Raise the vehicle, and install the pressure gauge and adapter.
- Install a tachometer to monitor engine RPM.
- Check line pressure with the engine at 1500 RPM, while shifting the transmission into park, reverse and drive.

Compare the scan tool line pressure reading with the desired line pressure and gauge reading. All three readings should agree.

If the gauge reading doesn’t match the scan tool reading, you’re dealing with a line pressure sensor problem.

If the scan tool reading doesn’t match the desired line pressure, look for a pressure control problem (Figure 7) (oil level, filter, pump regulator valve, PCS solenoid, etc.).

Actual line pressure while in gear will vary, based on minimum learned line pressure. Minimum line pressure starts at 40 PSI and “learns up” to the minimum pressure to hold the clutches in an applied state.

That’s all for now; look for more as the 68RFE becomes a more common sight in the transmission bays.
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