

## Draining and Flushing the ZF 5HP24 Transmission Oil.

1. Position the vehicle horizontally on a hoist or jackstands and apply the handbrake.

**CAUTION: IF THE VEHICLE IS ON JACKSTANDS, BE SURE TO PLACE CONCRETE BLOCKS OR OTHER DEVICES TO MAKE SURE VEHICLE WILL NOT FALL IF ONE OR MORE JACKSTANDS FAIL.**

2. To drain the transmission pan, position a catch basin under the oil pan, remove the drain plug, and allow the ATF to drain into the catch basin. About 4-5 quarts of ATF will drain from the pan, so make sure the pan has a large enough capacity to contain all the old fluid.
3. If you are going to do a filter change, go to the section on changing the filter before refilling the oil pan.
4. Reinstall the drain plug, and remove the fill plug. Remove the catch basin with the old ATF.
5. Fill the oil pan with fresh ATF of the proper type until a thin stream begins to leak from the fill hole. Reinstall the fill plug, but do not fully tighten it.
6. Locate the transmission oil cooler near the radiator. There are two large hoses connected to the transmission oil cooler. They should be located at the bottom of the oil cooler.
7. Trace the hoses back to the transmission and make a note of which is the inlet line to the cooler. The cooler inlet line should be the upper of the two hoses.
8. The hoses are connected with push-type connectors which can be loosened with a special tool (available from auto supply stores). Remove the cooler inlet hose and position over a catch basin.
9. With the parking brake set, have an assistant start the car and shift the transmission into neutral. ATF will flow from the inlet line into the catch basin until the oil pan is emptied. Shut off the engine and refill the oil pan with fresh ATF. Repeat this step until the ATF runs clear (this may take five or six repetitions).
10. When the ATF is sufficiently clear, shut off the engine and re-connect the oil cooler inlet hose.
11. To finish refilling the transmission, follow the topping off procedure.

## 5HP24 Transmission Oil Filling (Topping Off) Procedure

1. Position the vehicle horizontally on a hoist or jackstands and apply the handbrake.

**CAUTION: IF THE VEHICLE IS ON JACKSTANDS, BE SURE TO PLACE CONCRETE BLOCKS OR OTHER DEVICES TO MAKE SURE VEHICLE WILL NOT FALL IF ONE OR MORE JACKSTANDS FAIL.**

2. Start the engine (large consumers, such as A/C should be switched on).
3. Idle speed should be 650 to 950 rpm (according to vehicle manufacturer's directive).

4. Let engine run until transmission oil temperature is between 86° and 122°F (30°...50°C). Use an infrared thermometer or computer connected to the diagnostic port to monitor oil temperature.
5. Select R and D, then through gears with engine running at idle speed.
6. Hold each gear for 3 seconds, then shift into Park.
7. With the engine stopped, add ATF through the fill hole up to the edge of the overflow hole. When a thin stream of ATF leaks out, transmission is full. Install fill plug.

**(Note: I did this with the engine running and in gear to make sure as much fluid as possible was circulating in the valve body, TC and oil cooler system. If you do this, be very careful when crawling underneath the car.)**

8. Restart the engine.
9. Shift through gears with engine at idle speed. Hold each gear for 3 seconds and shift into Park. Shut off the engine and remove the fill plug.
10. Top off ATF as necessary.

**(Note: Once again I did this with the engine running and in gear to make sure as much fluid as possible was circulating in the valve body, TC and oil cooler system. If you do this, be very careful when crawling underneath the car.)**

11. When transmission is full, reinstall the fill plug.

### **Changing the 5HP24 transmission oil filter.**

1. Follow the procedure to drain the oil pan, but do not add any ATF at this time.
2. Remove the 24 Torx screws securing the oil pan to the transmission housing. Carefully lower the pan and place it out of the way. Discard the old pan gasket.
3. Remove the two Torx screws securing the filter, then remove and discard the old filter.
4. Install the new O-ring on the filter neck and position the new filter. Install the retaining screws and tighten to 7 ft-lbs (10N-m).
5. Place a new gasket on the oil pan and position the oil pan. Insert and tighten all the Torx screws to 7 ft-lbs (10N-m)

### **Some Notes:**

1. This procedure was checked on a 9/98 build E38 equipped with the 5HP24 transmission. If you are has an earlier build date or has the 5HP30 transmission, there may be some variation in the location of oil cooler components.

2. I found that doing a flush and refill this way requires about 12-13 quarts of ATF. Topping off may require a bit more, so I recommend buying 15 or 16 quarts of ATF. Any left-over ATF can be stored for alter use. I have used a quart of it in my power steering reservoir.
3. The oil pan can hold about 5 quarts of ATF, so the catch basin should be at least a 2 gallon size.
4. You will need a small hand pump to transfer ATF from the bottles to the transmission. Inexpensive hand pumps can be purchased at any auto parts store.
5. Also look for the tool to remove push-lok type oil cooler hose connectors. Such connectors can be released with other tools but it is clumsy.
6. You will need some metric Allen wrenches for the fill and drain plugs. I don't remember the exact size but I think it is 6 or 8 mm hex.
7. When reinstalling the oil pan, the transmission pan gasket can be easily located by tying it in place with a few pieces of thread. Position the gasket on the pan and insert the thread through the bolt holes, and tie off. Three or four threads should be sufficient to hold the gasket in place until a few pan Torx screws are inserted and hand tightened.
8. When re-using oil pan Torx screws, place a small bead of non-hardening thread locking compound on each screw before insertion. Be sure the screws are clean before applying the locking compound.
9. Normally I suggest replacing Torx screws with hex head bolts, but the oil pan has a flange around the edge which will interfere with a wrench socket. If you still want to replace the Torx screws, you will have to use socket head cap screws.