

Transmission Des(re)pair

Zsa Zsa Gabor, the iconic femme fatale¹ spokes person for AAmco Transmission, the premier automatic rebuilders of the 1950s and 1960s, was a cunning lady who practiced not shifting for herself. Hence; she cycled through nine husbands, systematically shifting life's tribulations to them and collecting half their wealth upon departure; thus making life's ride boulevard smooth.



Source, <https://www.youtube.com/watch?v=7neGQ5PIGNo>

Recently I fielded a rash of questions from readers and Chapter members about automatic transmission care. Questions such as: (1) what does lifetime transmission fluid mean? (2) Can I change the fluid myself? (3) The fluid is original and the vehicle has been driven 100+K miles, will changing the fluid ruin my transmission? (4) Should I use synthetic fluid?

Coincidentally, the mighty V8 XC90 @240K miles experienced a mild shutter (again) between 2nd and 3rd and 4th and 5th gears. I checked the maintenance log and the fluid was changed 125K miles earlier (18 months of driving). So on the last warm day of October, I changed the fluid and 2000 miles later, the shutter disappeared, making the ride boulevard smooth. Zsa Zsa would be pleased.

¹ An attractive and seductive woman, especially one who will ultimately bring disaster to a man who becomes involved with her.

Here is my response to each question.

Q What does lifetime transmission fluid mean? What life? Whose life?

A. The keyword is "lifetime," a marketing phrase invoked to imply the vehicle, regardless of make, is economical to own and operate. In truth, lifetime means the length of the manufacturer's warranty. If you intend to keep a vehicle beyond the warranty period, the transmission fluid should be changed every 50,000 miles, and should you tow a boat, horse or heavy trailer, every 30,000 miles. Modern transmissions lack an internal oil filter, the suspended contaminants (clutch particles) are deposited in/on the internal components making them function erratically until the unit fails. Therefore, it is imperative to change fluid periodically or at the first hint of trouble. (The vehicle "talks" and you need to pay attention!)

Q. Can I change the fluid myself?

A. Yes you can.

But it's a "sealed" unit, there is no dipstick and no visible oil fill plug. There is always a way, pay attention grasshopper and you'll learn.

Q. If the fluid is original and there are 100+K miles on it, will changing the fluid ruin my transmission?

A. No, as long as you use the method described herein and presuming the transmission is not irreparably compromised. The prime directive is do no harm: never..never..never permit the transmission to be flushed. Pushing a chemical bath through the system dislodges particle build-up (clumps) which can be deposited in the narrow passages of the hydraulic shifting system (valve body) rendering the transmission inoperative.

I prefer the benign approach, where 2-3 liters are drained and replaced with a like amount of fresh fluid; repeat the process until the fluid removed has the same color as the replacement fluid. Three gallons of fresh fluid are necessary to complete an exchange.

Q. Should I use synthetic fluid?

A. It does not make a difference because synthetic does not alter the fluid change interval. Fluid is exhausted when it is either burned (got too hot) or filled with suspended particles. If you choose to use synthetic fluid, install an external full flow filter in the line. An external filter which removes particles >6 microns will extend the change interval to 100,000 miles, less if the fluid is overheated and burned.

From personal experience, I can state that a funky shifting transmission may be cured with fresh fluid. This does not happen immediately. The vehicle may have to be driven 5000 miles or more until the gremlins depart. In severe circumstances, it may be necessary to perform one or two more fluid exchanges every 2500 miles. Why? The cleaning agents in the fresh fluid scour the old deposits and place them into suspension. In one case, I had to drive a new "used" acquisition 10,000 miles before the shutter completely disappeared. You must be patient; drive-ability improvements are not instantaneous; take care not to "hot-rod" it.

Absent an internal filter, the only way to remove contaminants is to change the fluid. If this is too burdensome or you choose to use synthetic fluid, install a full flow oil filter in the oil line from the transmission to the radiator oil cooler. (Buyers Hydraulic Return Filter Assembly: 15 GPM Return, Up to 200 PSI, Model# HFA11025)

Technique:

I have used the following automatic transmission fluid exchange procedure on my 740, 760, 960, V70 AWD, XC70s and XC90 without a problem; with respect to the XC90, the shutter was cured each time. *Your experience may not be the same, but it likely will!*

Tools:

Bad news, you have to make your own and it involves a trip to the local U-Pull-It auto salvage yard. Find a donor Volvo and remove one hose and fitting (metal tube w/o-rings) from the radiator and cut the rubber hose. Always save the green locking mechanism; it's worth its weight in gold.

At home, cut the compression fitting without damaging the tube and remove the rubber hose. Visit the local hardware store and purchase 36" of clear plastic tubing and slide it over the end of the tube; bend the tubing to <math><90^\circ</math> facilitates installation.



Next, cut a 6"-8" length of tubing and jam it over the spout of a small funnel, like so.



Fluid Exchange:

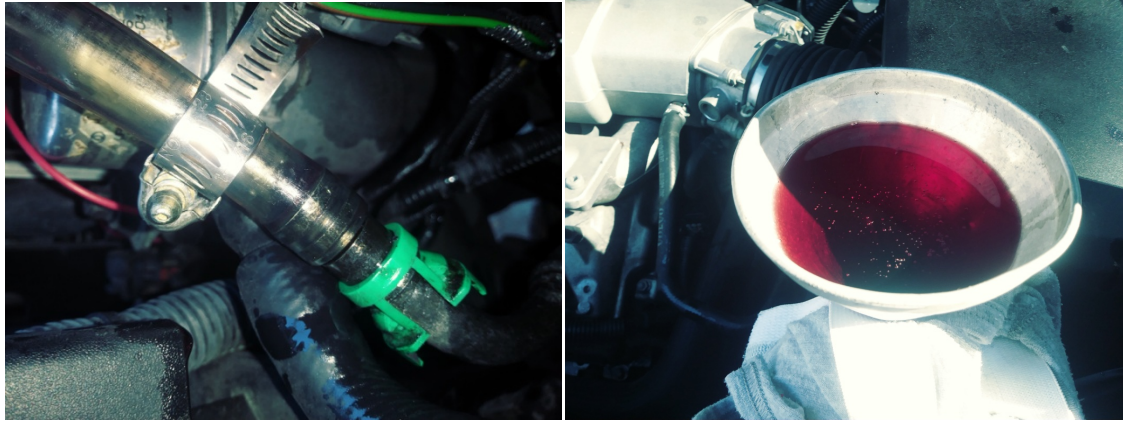
Three gallons of transmission fluid are needed to complete the exchange and it must be **Volvo compliant**. The fine print on the jug must specify Volvo transmission compatibility, if not specifically stated, don't buy it. I have used Castrol Transmax and AutoZone's brand, because both stated the fluid was Volvo compliant. You must ALWAYS check compliance before purchase as formulations change; a non compliant fluid will make you wish you had done so.

1. Drive the vehicle on automotive ramps, raising it off the driveway to gain access to the underside. Make certain the transmission is warm, but not hot.
2. Remove the lower plastic shield and place a catch basin/container below the radiator at the transmission cooler side.
3. Remove the upper oil line from the transmission cooler by squeezing the green tabs and pulling and rotating the tube. Don't break the green tabs as it prevents the oil line from popping out when the system is under pressure. If it breaks (its plastic) replace it; otherwise the oil line will pop out stranding the driver and making a mess of the engine bay.
4. Insert the new drain tube w/clear plastic in the upper orifice of the transmission cooler.

The fluid enters the cooler at the bottom, travels upward and returns at the top. Thread the plastic tubing along the radiator to the ground. Place the tube end in an empty one gallon motor oil jug to catch the old fluid.

5. Start the vehicle; let it run until all fluid is pumped out. (~30 seconds). Stop the engine and examine the site gauge on the gallon jug to determine the amount of fluid evacuated. Note the color, muddy brown denotes heat damaged and particle full fluid. If the particles resemble glitter, critical transmission components are damaged and the unit must be replaced. Empty jug into an oil recycling container for proper disposal; then insert the tube in the jug.

6. Push the funnel's plastic tube over the oil return tube after removing the two O-rings; pour an amount of fresh fluid into the funnel equivalent to the amount evacuated.



WARNING: There is no fill plug on the transmission case. There are bolts that resemble fill plugs, but fasten internal components to the inside of the case. Removal will disengage a couple of gears, like 1st and reverse; a sure cure for any transmission ills because removal guarantees a transmission rebuild or replacement

7. Repeat step 5 and 6 until the color of the evacuated fluid is the same as the new fluid and refill transmission the last time.

8. Remove the fluid exchange apparatus and insert the transmission fluid return line into the oil cooler making certain the green locking ring is secure. Pop the green locking ring in place to secure the inlet tube to the cooler. Start the engine and check for leaks.

Optional:

Depending how confident you are with your fluid exchange measurements, checking the transmission fluid level is not critical, especially if you plan to another change after 2500 miles. If not, then make certain you did not over/under fill the transmission.

Procedure:

Allow the transmission to warm to 50°C or 125°F. Use an infrared thermometer to ascertain the temperature of the case. Examine the transmission case bottom for the drain plug (see picture). Remove #2 screw to drain excess fluid to the level of the tube top #1, the proper amount.



Source: aussiefrogs

If no fluid drains, add some until it does, then replace the plug #2. Shops typically fill transmissions from the bottom through hole #2 with fluid under pressure.

The described fill and replace procedure can be modified by removing the drain plug (#1) and measuring the drain amount, replacing the plug and refilling the transmission with an equivalent amount prior to executing step #5.

As an initial procedure, large contaminants are removed. However you must check the fluid level upon exchange completion to verify proper fluid level.

A special tool is needed to remove the transmission drain plug; it is available on eBay.

[WILMAR VW DRAIN PLUG SOCKET W80681](#)



If you purchase a Volvo with 100,000 miles or more, change the transmission fluid at the earliest opportunity to assure or restore trouble free performance.

BTW, I plan to build a low cost appliance to add transmission fluid directly without the need for a funnel to make the operation easier to manage. Look for those details in a future article. If you cannot wait, contact me.

Bob lives in Cary, NC and is co-chairman of the Blue Ridge Chapter of VCOA. Contact him at rfsepe@gmail.com or 919-417-5019. He'll respond pleasantly to questions about your Volvo.