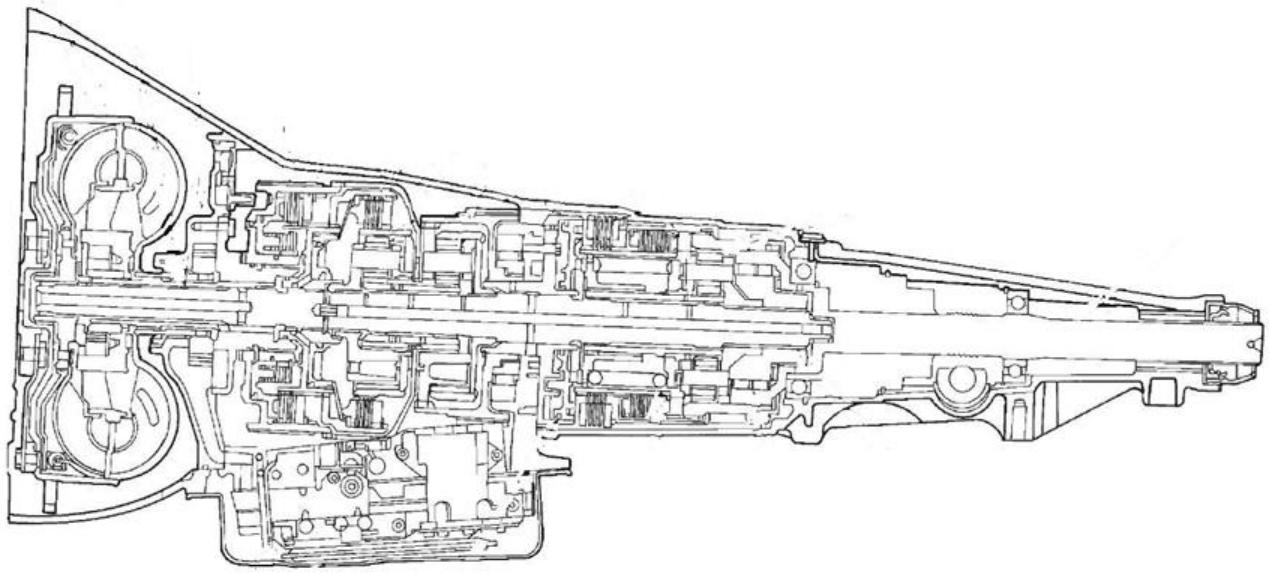
DODGE RAM 46RE TRANSMISSION TEARDOWN/REBUILD HELP MANUAL



DODGE 46RE Transmission Teardown/Rebuild

March 2009

I recently removed, disassemble and rebuilt my 46RE transmission on my 1996 Dodge Ram. This tutorial is designed to be a help guide used in conjunction with the Dodge Shop Manual (a must have).

Pre-Removal:

I) Soak all exhaust bolts in PB Blaster a week before you remove the tranny!!! It makes the removal much easier. Especially the hangar bolts along the exhaust pipes, since you will have to remove the entire exhaust system.

II) Remove the spark plugs BEFORE you jack the truck up (just makes it easier to reach)!!! The only reason you remove the spark plugs is the make turning the crank easier when you remove the flywheel bolts.

III) Cut your exhaust behind the CAT. This will save time trying to pry it apart!

Special Tools/Items:

I) Transmission jack! Harbor freight has a nice scissor type jack for around $80 that really works well.

II) Air ratchet. This is a huge time saver. Many bolts that are in hard to reach places are easy to take off with an air ratchet.

III) Foot lbs and inch lbs torque wrenches. Again, Harbor Freight has these fairly inexpensively.

IV) Get a 1 1/4" socket for the front crank (so you can turn the crank when you need to remove the flywheel bolts).

V) Have plenty of lights available. A magnetic light(s) works great. You can stick it to the frame rail and position it where you want!

VI) Have a digital camera ready! A picture is worth a thousand words when it comes to re-installation.

VII) Get several large boxes (computer paper boxes work good) to separate all your parts into each section. For example, all overdrive section parts go into the box labeled "OVERDRIVE" etc… This makes reassembly simple.

VIII) Various extension drives for your ratchets. To get the bellhousing bolts and exhaust header bolts out, you will need 15-20" of extension.

IX) At least ½ a dozen spray cans of brake cleaner. This stuff works great cleaning the exterior of the tranny as well as cleaning out little nooks/crannies of the valve body and some gears.

X) Plenty of bench space. I had a 10' bench that was 2' deep and still could have used more space. You will need space as you take things apart, to store the new parts, to hold the book/manual as you read it etc… The more space the better.

XI) Several old towels for soaking up spills, cleaner etc..

XII) If you can get the video (I have a copy. 'cdgobbell@fedex.com') it is extremely helpful, especially on the overdrive unit. Further, having a DVD player on your workbench is extremely valuable also as you can watch, pause, rewind etc…as you go along. Worth every penny.

XIII)

Removal:

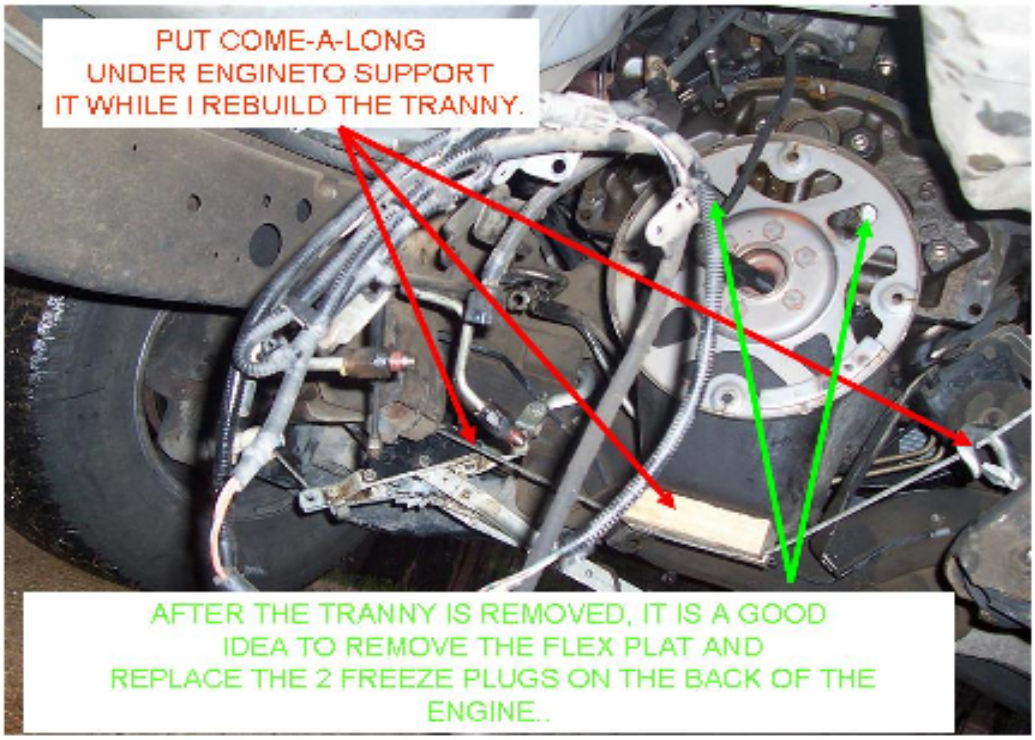
I) Follow all the steps from the shop manual

II) Concerning a transmission jack, the lower the better. I got a scissor type jack from harborfreight for $80 and it worked like a charm. Its main benefit was that it only had a 7-8" height when collapsed. This meant that I didn't have to raise the truck so high to remove the tranny.

III) When removing the top bolts from the bell-housing (10 o'clock and 2 o'clock), lower the tranny about an inch so you see into the cavity above the bell-housing. It just makes it easier!

IV) You will also have to remove the oil filter (there is one bell-housing bolt that is behind the filter)

V) After the tranny is removed, you will need to support the weight of the engine either by a jack or by a sling. In my case, I opted for a sling because I wanted to move the truck out of my garage until I got the tranny back together. This picture shows what I am referring to. I used a come-a-long to support the engine in the interim.



VI) Once the tranny is removed, several issues need to be addressed before you install the rebuilt tranny. They are:

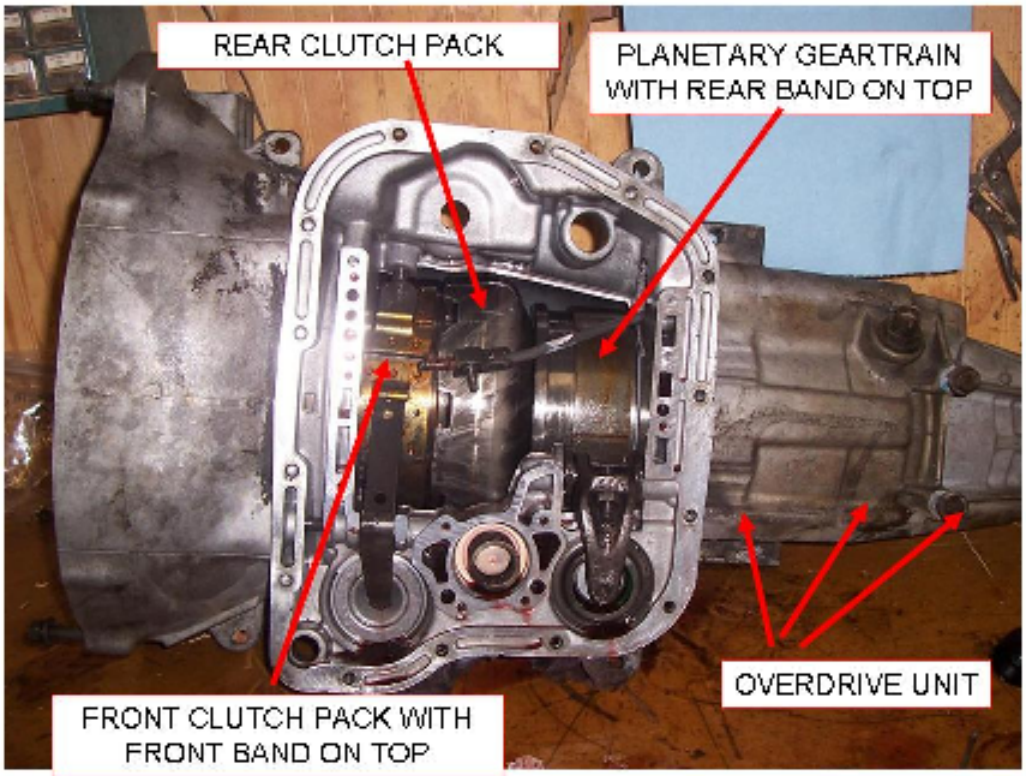
a) Remove or Replace the check valve in the trans-cooler line. This check valve will collect dirt/grime over the years and not allow sufficient fluid to return to the tranny, thus causing a rebuild. There is a procedure on the dodgeforum.com to remove this line.

b) Flush the cooler lines. There is a product in a blue spray can called "Trans-Flush" that allows you to connect to the cooler lines and flush them out. This is not a transmission flush, but rather a line flush (to get all the debris out after you drop your tranny). It works great. Just hook it up to outbound line and put a collection pan under the inbound and let 'er rip.

c) Remove and replace the 2 freeze plugs on the back of your engine. Even if they are not leaking, now is the time to do this job!!!! If you are feeling really froggy, go ahead and replace the 2 freeze plugs in the cylinder heads also. They are much harder to get to though. I opted to pass on this exercise!

Teardown:

I) Get familiar with the different parts of the tranny and what they are called. This is a must so you can keep track of everything mentally when the book/video is referencing something. Here is a pic of the major remaining components in the tranny. Note that valve body has been removed so you can see the front and rear clutch packs and the planetary geartrain.



II) At this point I HIGHLY recommend having the following at your disposal before proceeding.
   a) Several boxes of gallon and sandwich size Ziploc bags. Go to the dollar store and get the no-name brand. If you can get the type with a "writing surface", that's even better. Remember that when you write on these bags, you will be touching them with fluids, cleaners etc…so some of the marker may rub off.
   b) Sharpie permanent marker
   c) Medium to large boxes mentioned earlier. Old copy paper boxes work great.

III) Follow the recommended steps per the manual for removing each component.

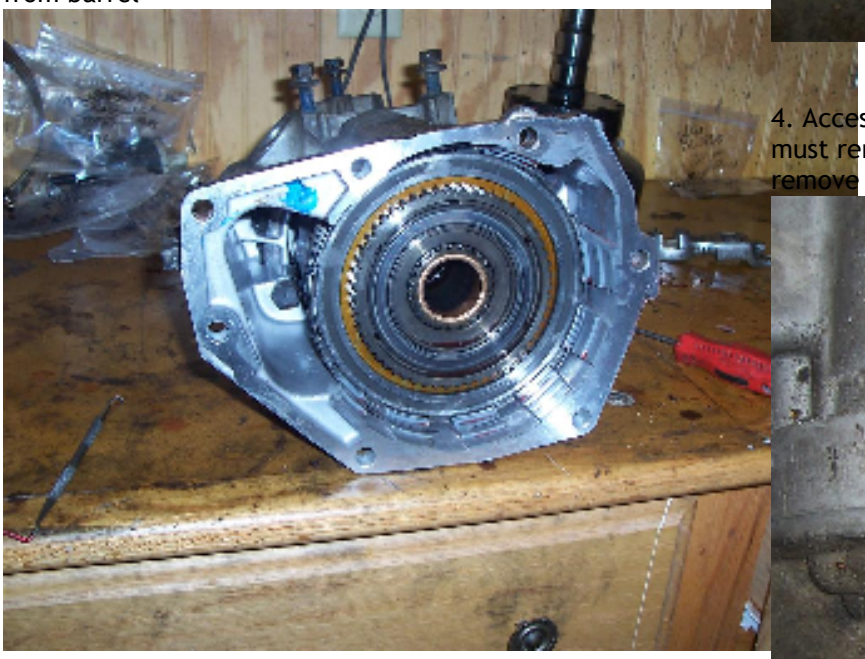
IV) You can either a) teardown the whole tranny and then reassemble later or b) teardown each section then assemble each section in order. It's your choice…each has its own pros/cons.

V) As you remove each piece of the tranny, do the following:
   a) Put it in a plastic bag
   b) Label the bag with the removal step # and part name (i.e. Step 1 – oil pump, step 2 – thrust washer etc…). This may sound tedious, but when you get ready to reassemble, the step # along with the part name will tell you the order of how everything came apart. Trust me, all the little parts get confusing if you've never done it before.
   c) Put all the bags in a box for that section. You should have a section for a) front clutch, b) rear clutch, c) intermediate shaft/planetaries, d) overdrive, e) valve body and f) all else

Overdrive Unit:

1. Speed Reference Sensor

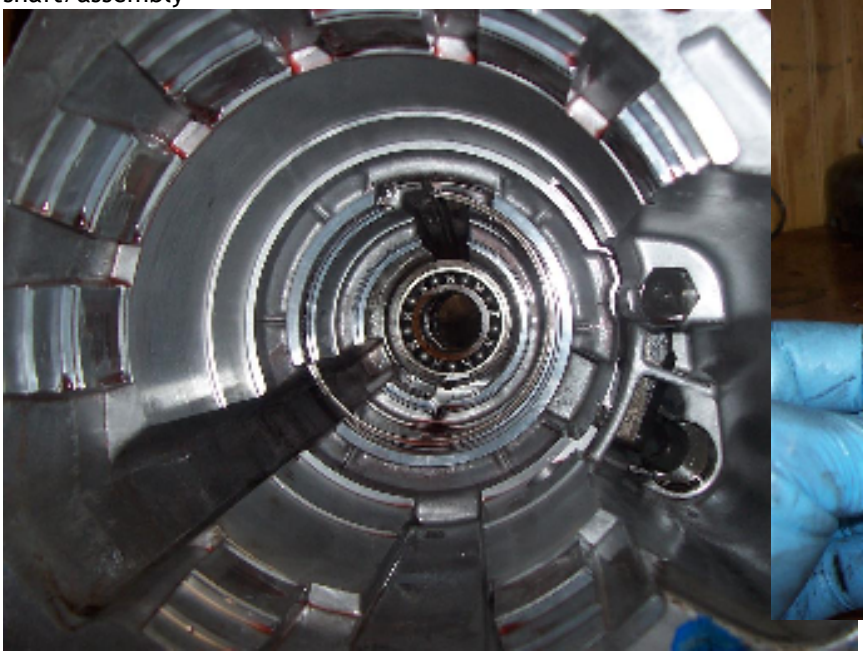
2. Looking into overdrive unit once it has been removed from barrel



3. Overdrive clutch pack. This is the first set of clutches you see in the OD unit. When you remove them, keep them in order and put tape around them so you will know the order they go into when you reassemble. Each clutch pack will have a front and back plate that is thicker than the steel plates in the middle.

4. Access cover on the outside of the OD case. You must remove this cover and spread the snap ring out to remove the OD planetaries from the OD case

5. Inside of OD case without the internal shaft/assembly



6. Overdrive thrust bearing which rides on top of the huge annulus gear

6. OD assembly that is inside the OD unit case. This is the assembly that has the 800 pound spring in it.

7. Back end of OD unit, showing rear bearing and snap ring. The shaft you see is what actually exits from the rear of the tranny. The worm gear at the top of the pic is for the speedo gear.

8. OD unit in a press getting ready to remove the snap rings that hold the 800lb spring

9. Post spring removal. The rear of the annulus gear with the 800lb spring exposed and sungear.

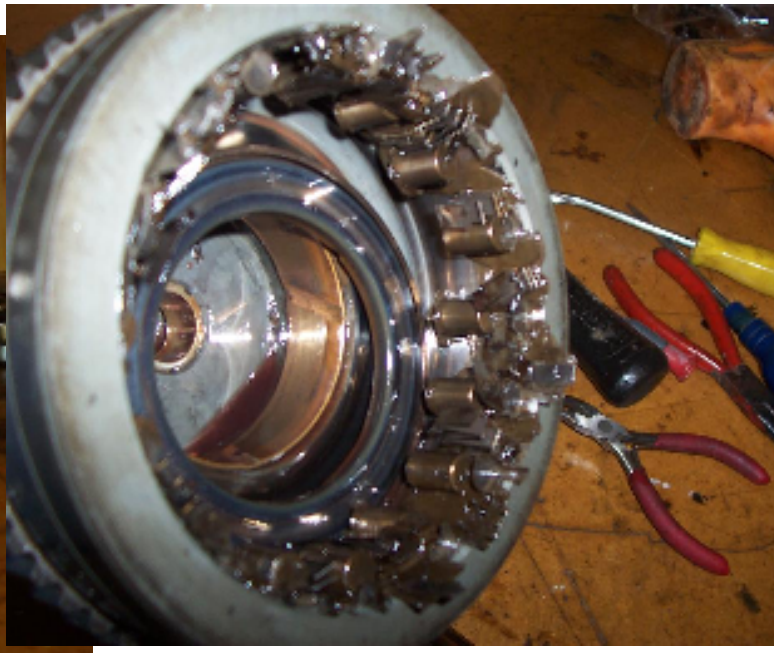
10. OD clutch pack underneath the 800lb spring. The clutches go inside the shell you see up top.

11. OD planetary that sits underneath the clutch pack.

12. Looking into the butt end of the OD unit after the planetary has been removed. It's hard to make out, but the over-running clutch (large needle bearings and housing) is destroyed.

13. My OD overrunning clutch assembly (or what's left of it)

14. Now you can see all the remaining debris of my OD overrunning clutch assembly.



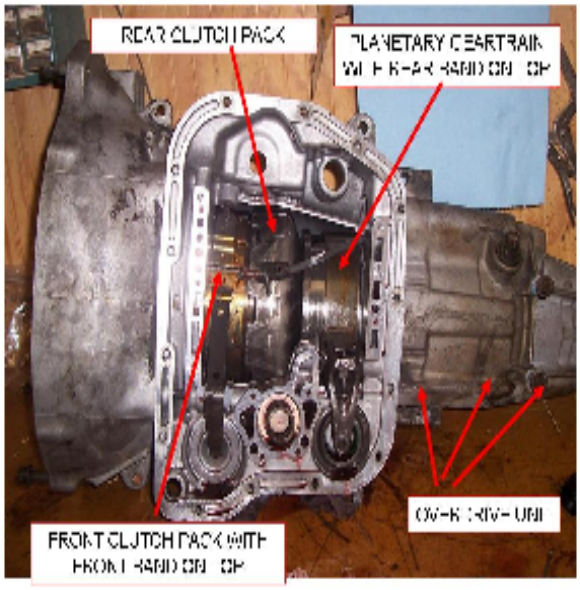
Two very important note on the rebuild of the OD unit.

1. Ask you local tranny shop if they have a beat-up 518 intermediate shaft you can use to align the OD section. This will keep things aligned until you mate the OD with the barrel. I got one from a tranny shop for $0

2. Before you mate the OD unit with the barrel, you must have the front/rear clutches, intermediate shaft , bands etc installed in the barrel. I know for a fact that if you don't have the rear band on (including the pins) then you will have to remove the OD section or back it off a little.

Barrel Teardown:

1. The barrel less the valve body. Get familiar with the names of the different components inside the barrel.

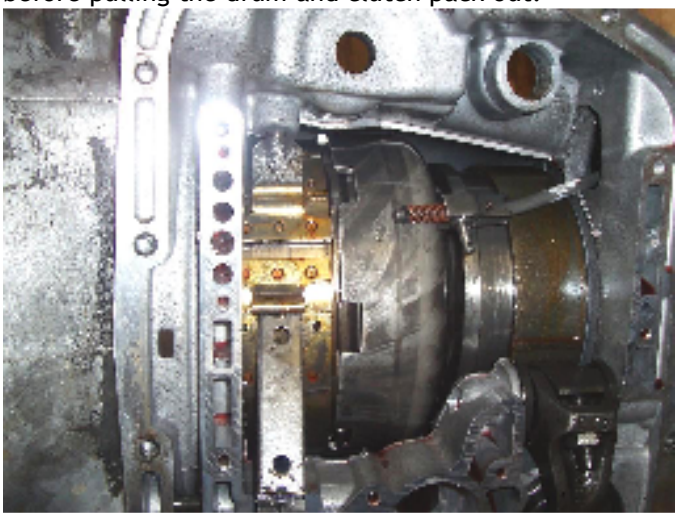


2. This the oil pump as it sat inside the bellhousing. The threaded rod (3/8" I think) will screw into 2 ports on the oil pump. Then you can make a similar mechanism that we made whereby as you tighten the nuts on the rod (against the punched angle) it will slowly pull the oil pump from the bellhousing. Make sure all the oil pump bolts are removed first.

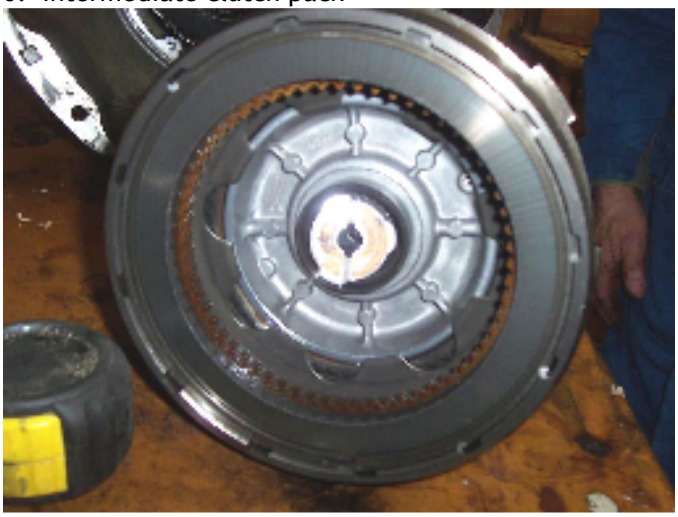
3. Reaction shaft support of the oil pump

4. Reaction shaft being put back into oil pump. Note there are only a few parts here. Make sure the gears are smooth and clean no junk in the channels.

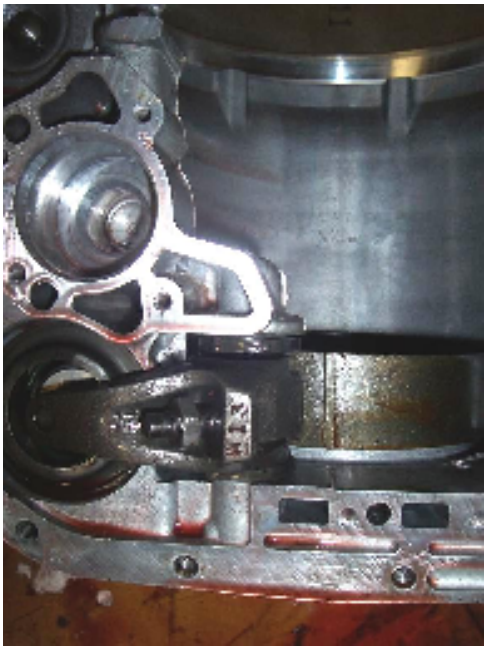
5. A look at the front band. You must loosen this band before pulling the drum and clutch pack out.



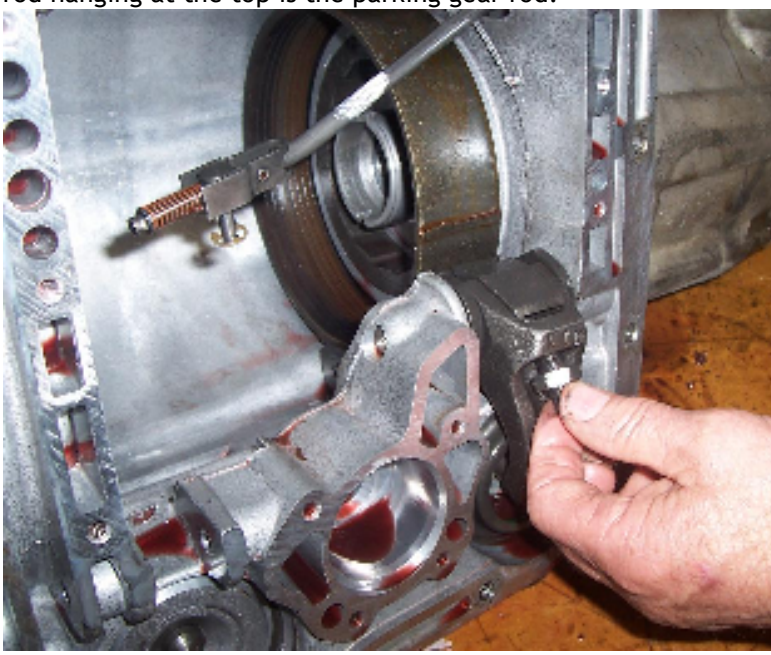
6. Intermediate clutch pack



7. Barrel minus the font band, drum and intermediate clutch pack.



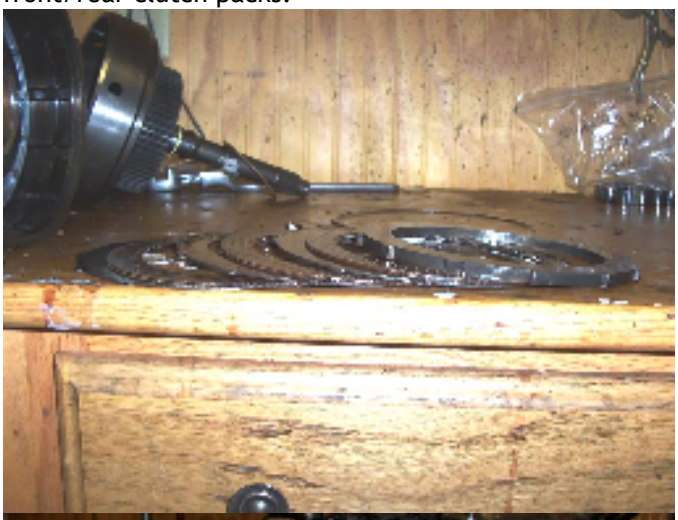
8. Rear band and adjustment mechanism. Note the rod hanging at the top is the parking gear rod.

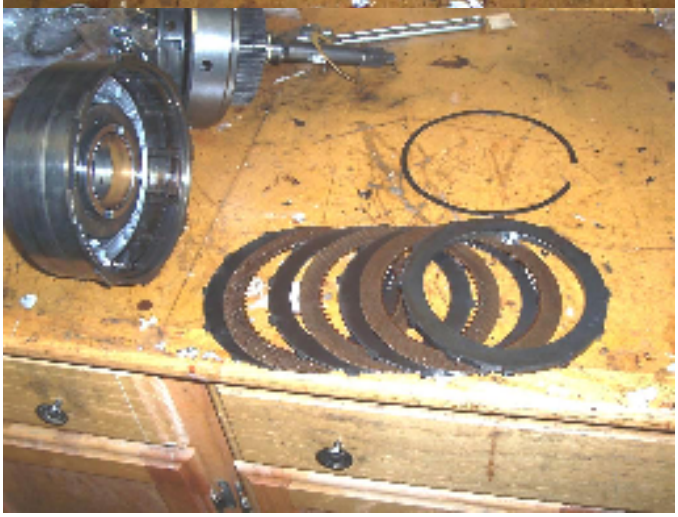


Front and Rear Clutches:

1. Front clutch assemble (drum), splined gear and rear clutch assembly

2. Misc pictures of the frictions and steels from the front/rear clutch packs.





Planetary Geartrain Teardown:

1. Looking into the barrel from the bellhousing with front/rear clutch packs removed, showing the driving shell.

2. Looking into the barrel with the driving shell removed.

3. The driving shell, with the circlip removed (hanging). Also note that behind the circlip is a planetary gear set.

4. The planetary removed and spread apart.

5. Side view of planetary.

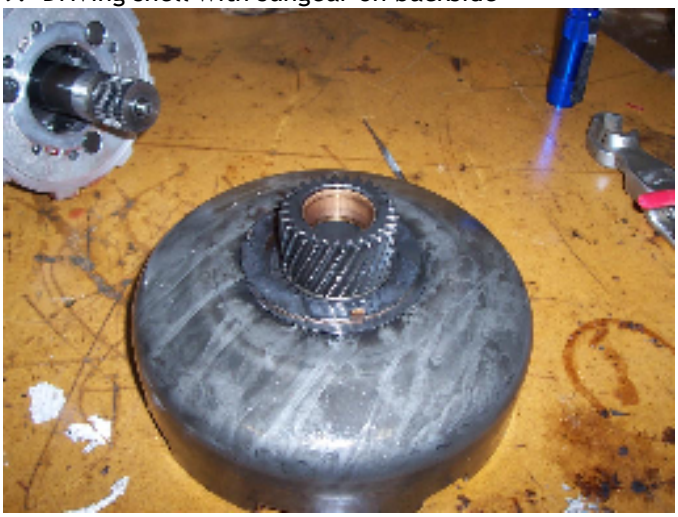
6. Annulus gear that rides around the planetary

6. Front view of planetary. Check for wobble of the planetary gears.

7. The driving shell after the planetary has been removed.

8. Cross section of the driving shell and the second planetary

9. Driving shell with sungear on backside



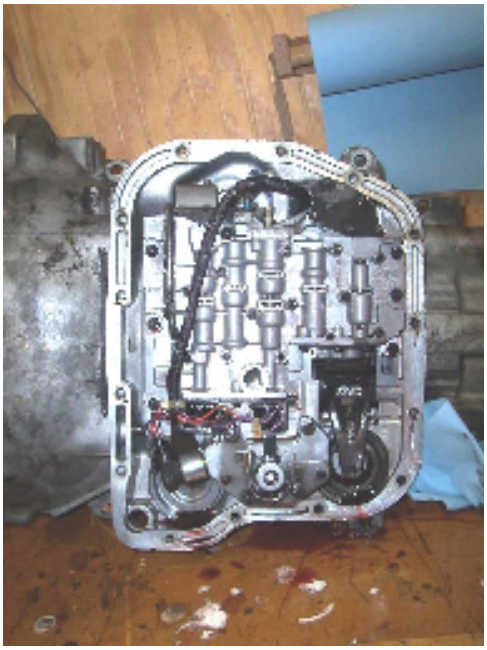
10. Planetary on backside of driving shell

11. Planetary and annulus gear separated

Valve Body Teardown:

1. Filter still on valve body

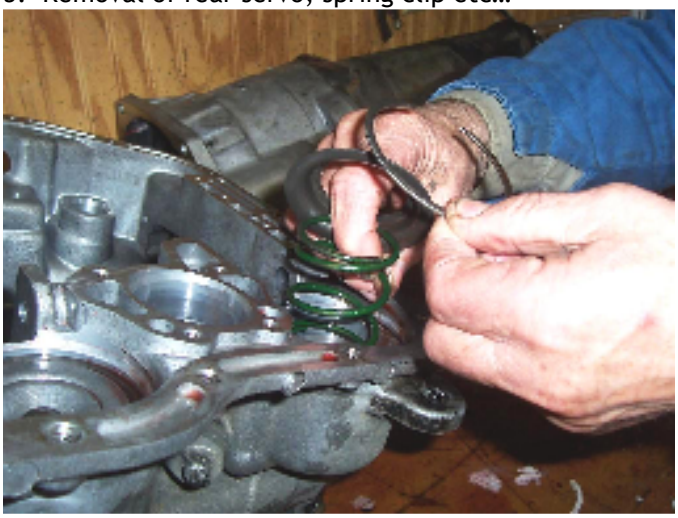
2. Filter removed



3. Valve body bolts (10). Note the different lengths of each bolt and take a picture so you can remember which location they go into.

4. Removal of front servo and spring

5. Removal of rear servo, spring clip etc…

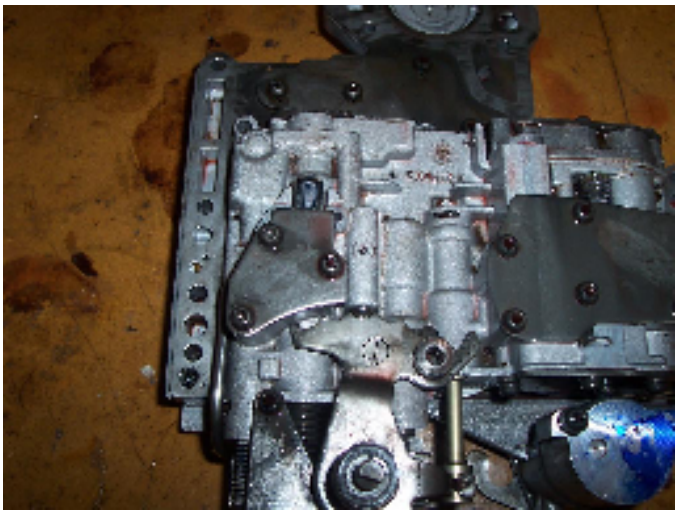


6. Governor pressure sensor removal

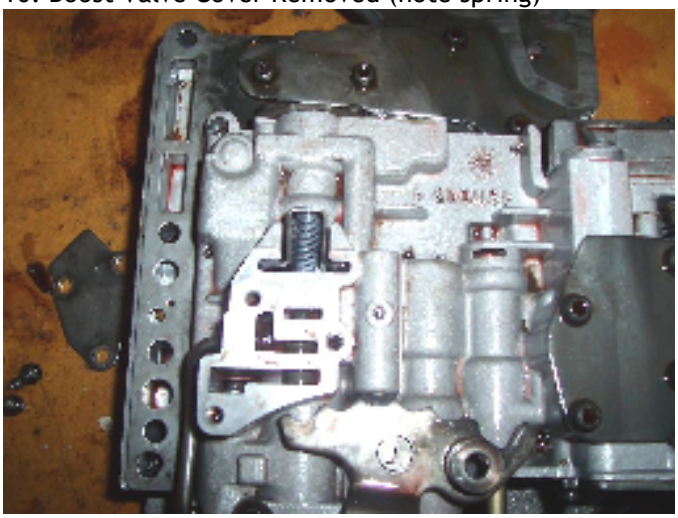
7. Solenoid Case Connector

8. Overdrive Solenoid wiring loop

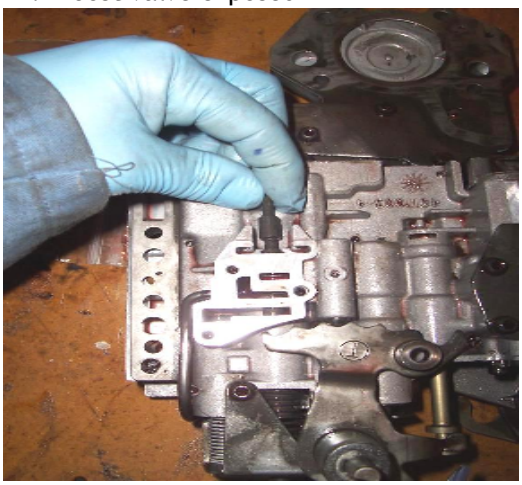
9. Boost Valve Cover



10. Boost Valve Cover Removed (note spring)

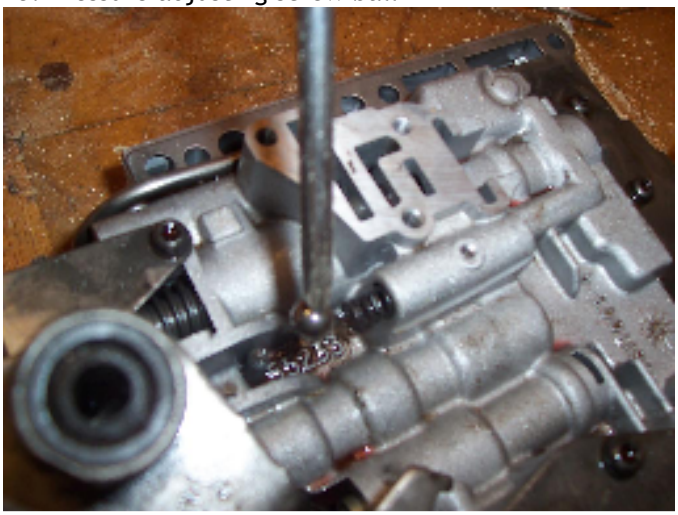


11. Boost valve exposed

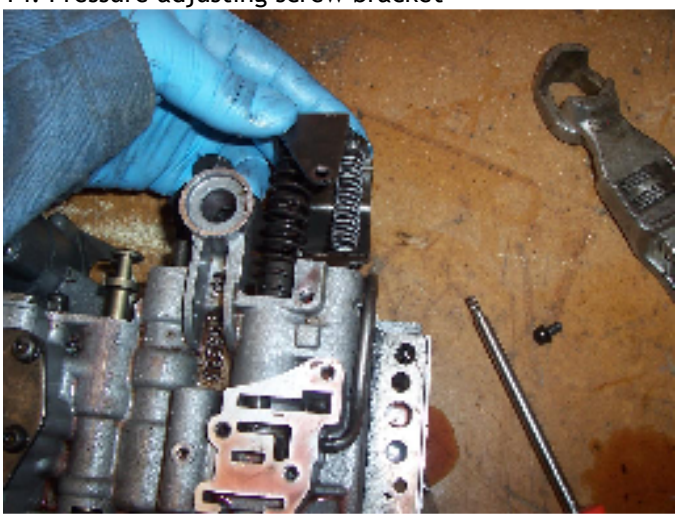


12. Gear selector mechanism

13. Pressure adjusting screw ball

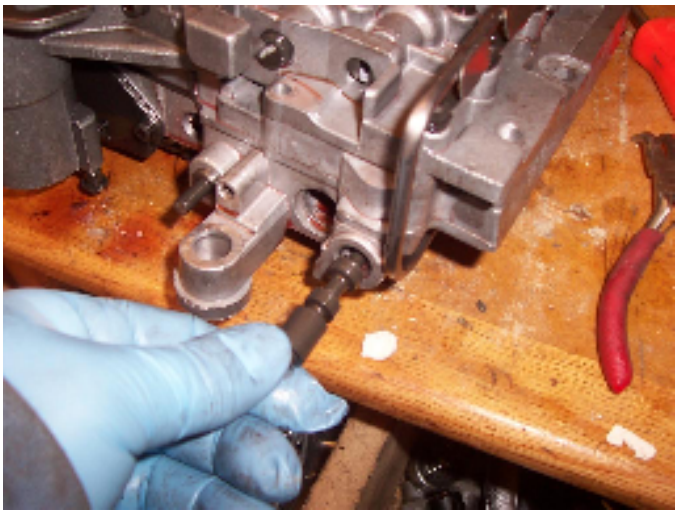


14. Pressure adjusting screw bracket

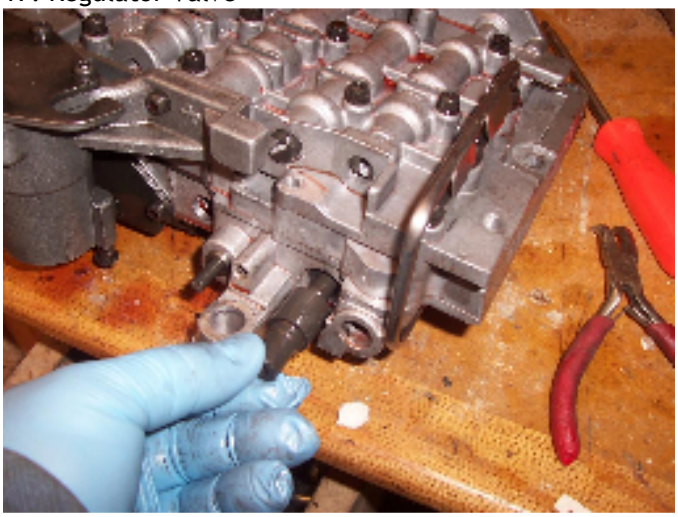


15. Manual Valve

16. Switch valve



17. Regulator Valve



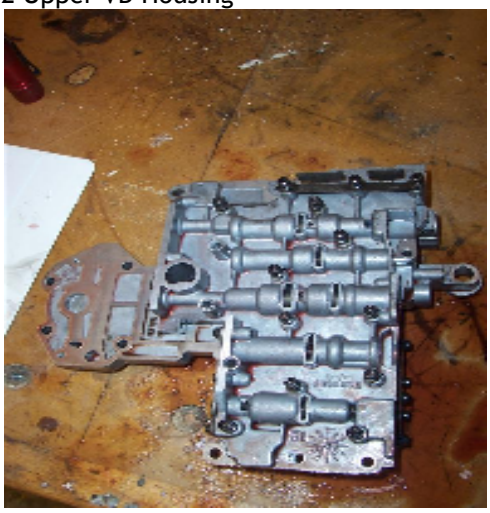
18. Kickdown Valve

19. Converter Clutch Valve Spring

20. Boost Valve Tube

21. Upper and Lower Valve body housing (still mated)

22 Upper VB Housing



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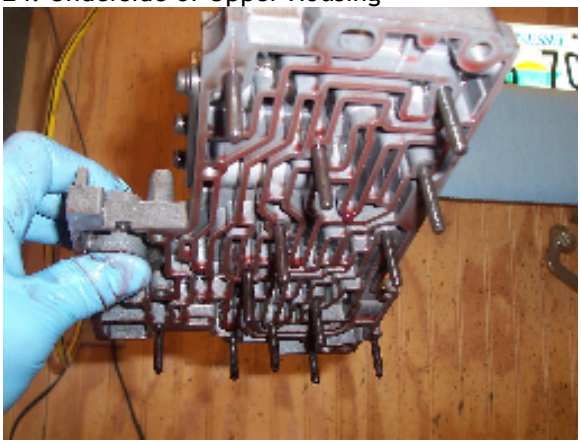
23. Separation of Upper and Lower Housings

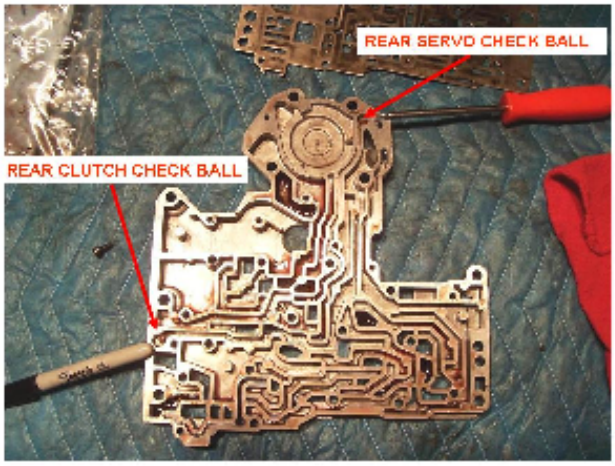
24. Underside of Upper Housing



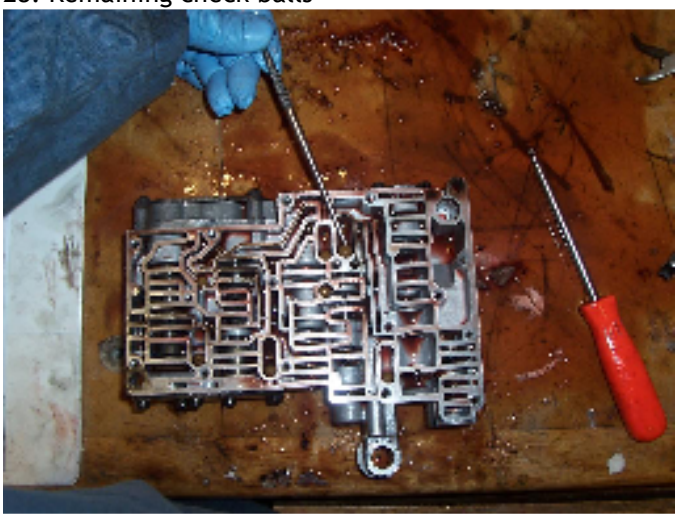
25. VB Separator Plate

26. Separator Plate Brace

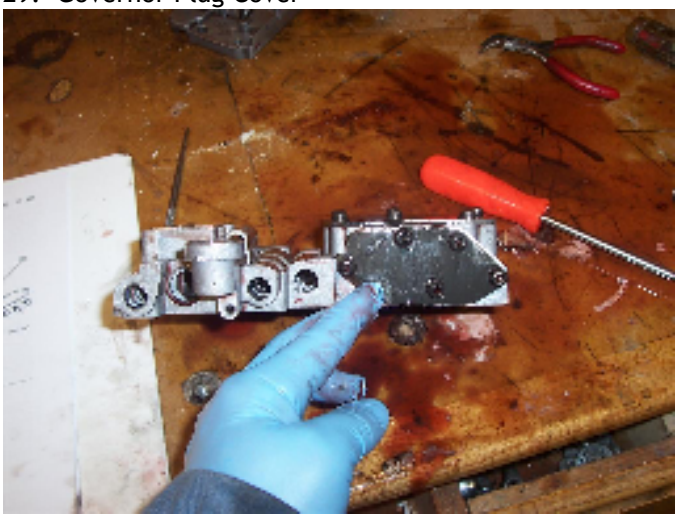
27. Rear Clutch and Rear Servo Check Balls



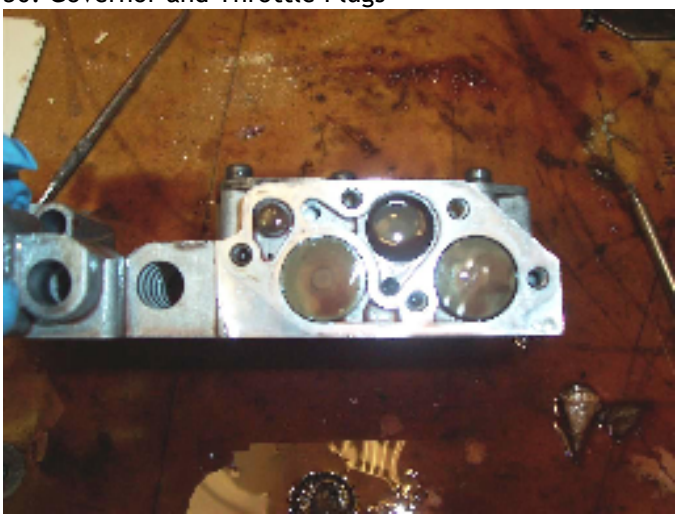
28. Remaining check balls



29. Governor Plug Cover

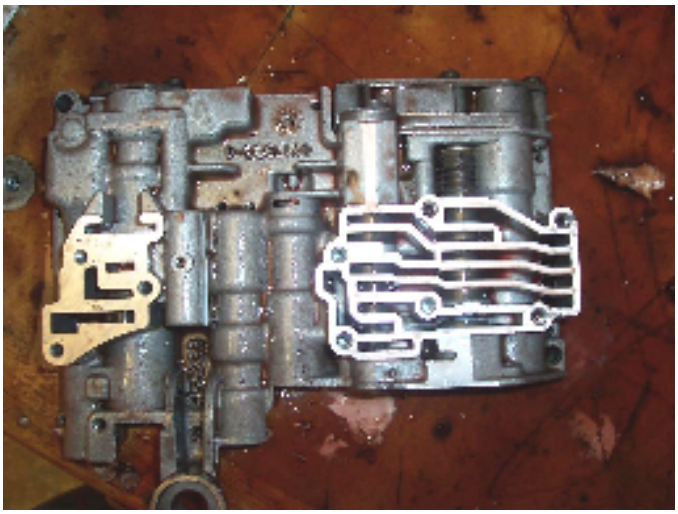


30. Governor and Throttle Plugs

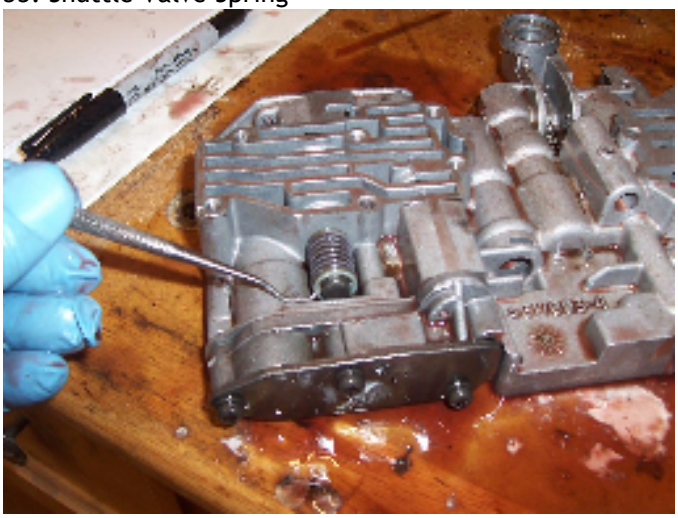


31. Shuttle Valve Cover

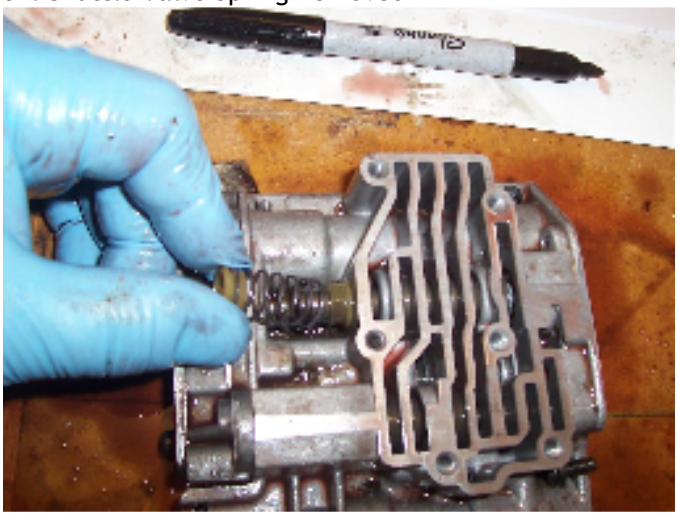
32. Shuttle Valve Cover Removed



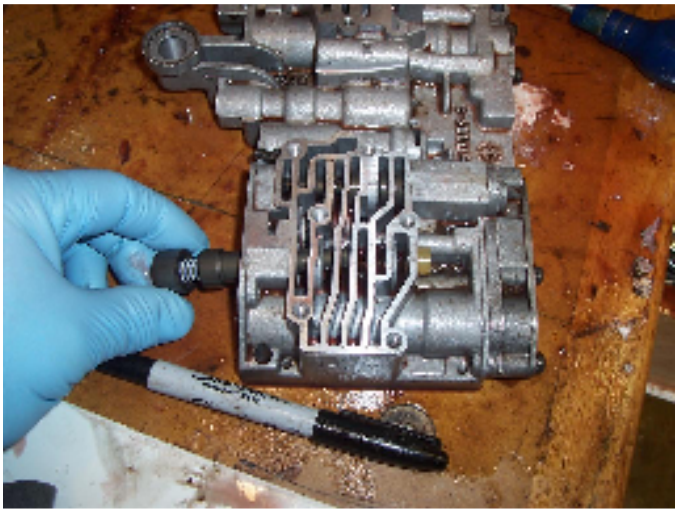
33. Shuttle Valve Spring



34. Shuttle Valve Spring Removed

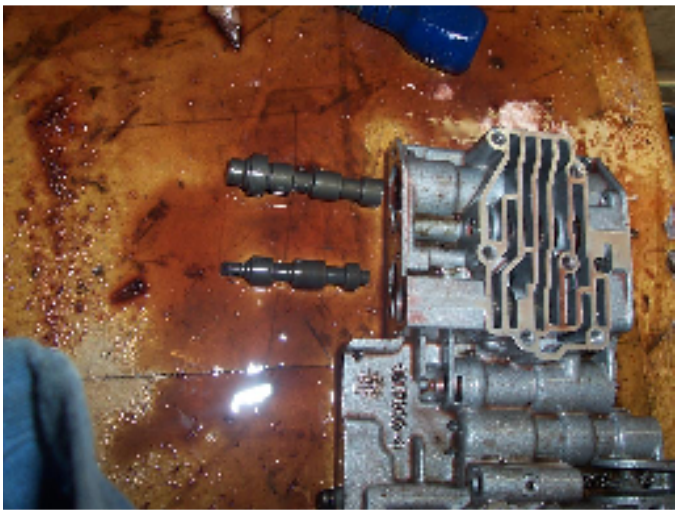


35. Shuttle Valve Removed



36. Limit Valve Housing

37. Shift Valves



38. Shift Control Valve

39. Throttle Pressure Valve

At this point, you will have the entire Valve Body disassembled and in a bunch of separate bags. Using the Shop manual (and these pics for added help). Re-assemble the VB. As you reassemble each piece, clean it with mineral spirits and compressed air!