VOLVO 850 TRANSMISSION SOLENOID REPLACEMENT DIY

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by **polskamafia mjl** » Thu Aug 28, 2014 4:18 pm

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This is a write up for replacing the shift solenoids in the AW50-42 transmission on a Volvo 850. My particular car is a 1995 model and the S1 and S2 solenoids are different. Earlier models had S1 and S2 as the same solenoid. This explains why many Volvo parts vendors have the same part number for S1 and S2. On 95 and later model cars with Aw50-42 auto transmissions, S1 should be 5040310002N, S2 is 6843783 and the lock up solenoid is 6843784. Most vendors have the solenoids for $100+ online; I got mine from Trans Parts Direct. Their's are $23- $25 so much, much cheaper.

Trans Parts Direct AW50-42 solenoids:
http://transpartsdirect.com/advanced_se ... ries_id=81

This write up has a lot of great information:
http://www.matthewsvolvosite.com/forums ... =1&t=47779
Pages 3 and 4 have more detailed information about the differences between the S1 and S2 solenoids.

I would also like to personally thank forum member daversm who helped me out a lot with his posts on his experience performing this same repair. His tips saved me a couple of times.

Tools Required:
Metric Socket Sets (Short and Deep)
3/8" Drive T40 Bit (I had a short one and a slightly longer one, I found both were very helpful)

1/4" Drive T40 Bit
3/8" Drive Ratchet
1/4" Drive Ratchet
Metric Set of Open/Box End Wrenches (7mm and up)
24mm Box End Wrench
22mm Open End Wrench and/or Crowfoot Wrench
Mix of long and short extensions for the ratches
U joints
Snap Ring Pliers
Needle Nose Pliers
Flat Head Screw Drivers (Long and Short)
T25 driver or socket
Floor Jack
Jack Stands
Scissors/Tin Snips
Torque Wrench
Magnet Tool

Tools

Other Helpful Items:
Zipties
1/32 inch gasket paper
Cheater Pipe
Catch Pan
ATF Drain Plug Gasket/Crush Washer
Blocks of Wood

1. Start by removing the battery, fresh air snorkel, and airbox. For turbo cars, the TCV/BCS must be removed. My BCS was secured to the airbox with 2 T25 screws.

2. Remove the 2 12mm bolts securing the battery tray and pry it towards the passenger side of the car to release it from the fender.

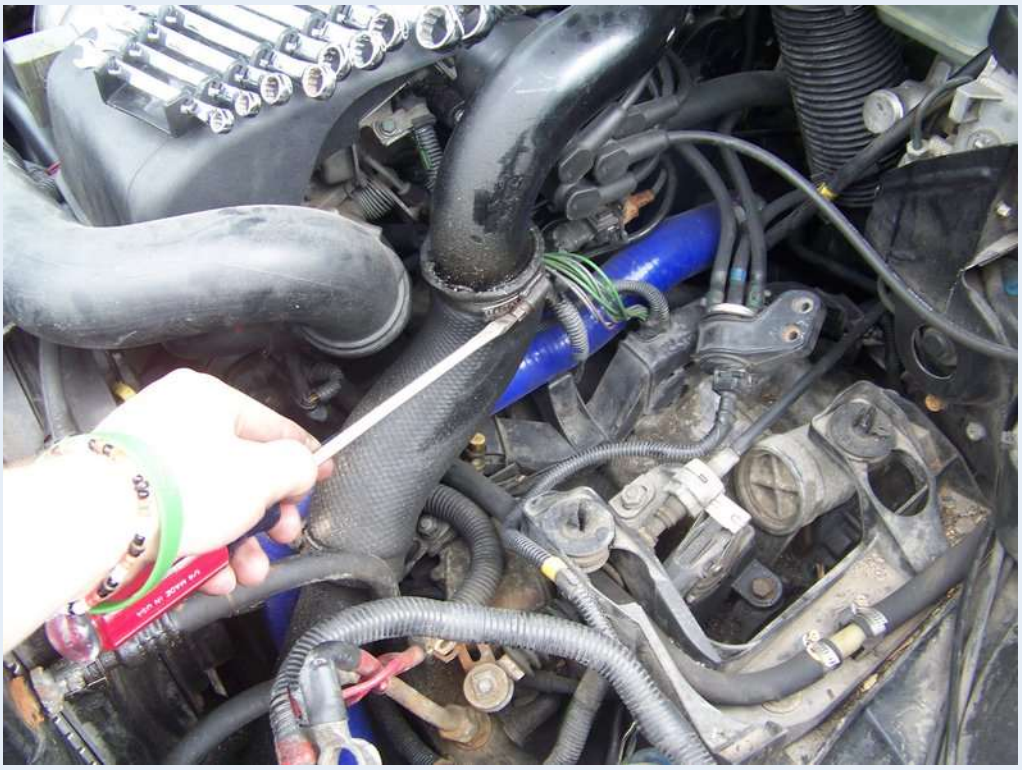
3. Flipping the battery tray over reveals the cruise control pump (if equipped). Remove the electrical connector and slide the vacuum hose off as well. Set the battery tray aside.

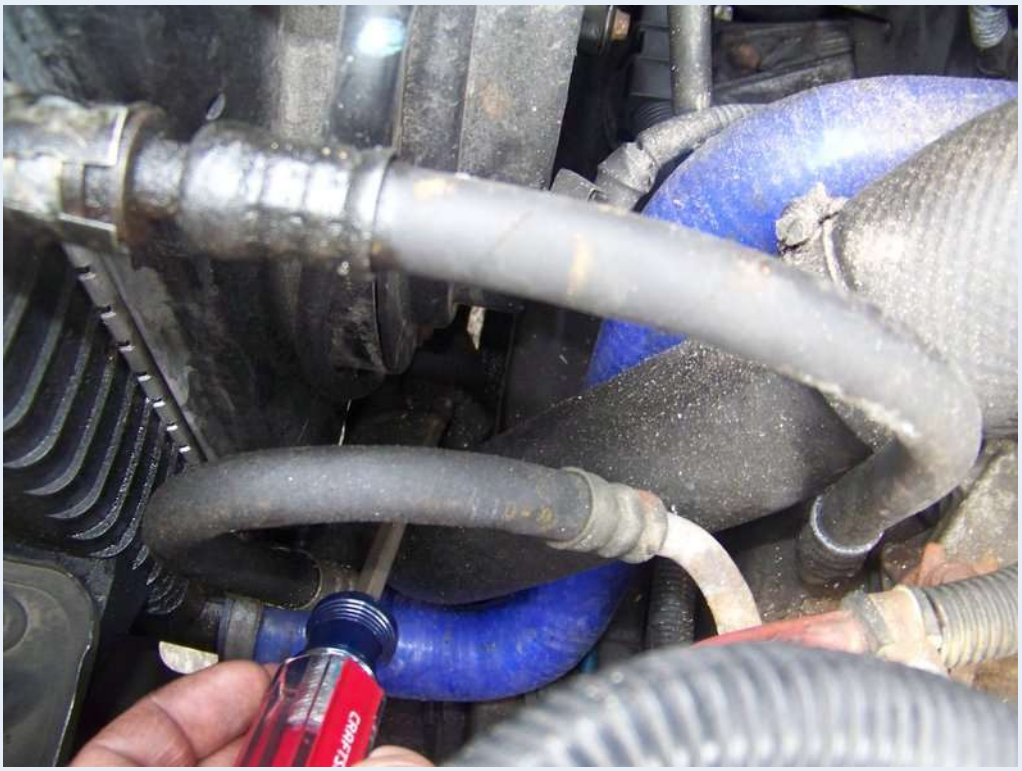
4. Using a 19mm socket and cheater pipe, loosen the front driver side wheel lug nuts. Jack the drivers side of the car up and place jack stands beneath the frame to support the weight. Never work under a car supported by a jack alone, always use jack stands.

5. Remove the 2 plastic fasteners that secure the inner wheel well liner and pull the wheel well liner out to gain better access to the valve body cover.

6. Remove the 10mm bolt on the driver side of the car that supports the air guide.

7. Remove the turbo to intercooler pipe by loosening the 2 7mm clamp bolts. If possible, loosen the bottom clamp at the intercooler itself, this will give much better access to 2 very difficult bolts on the valve body cover.

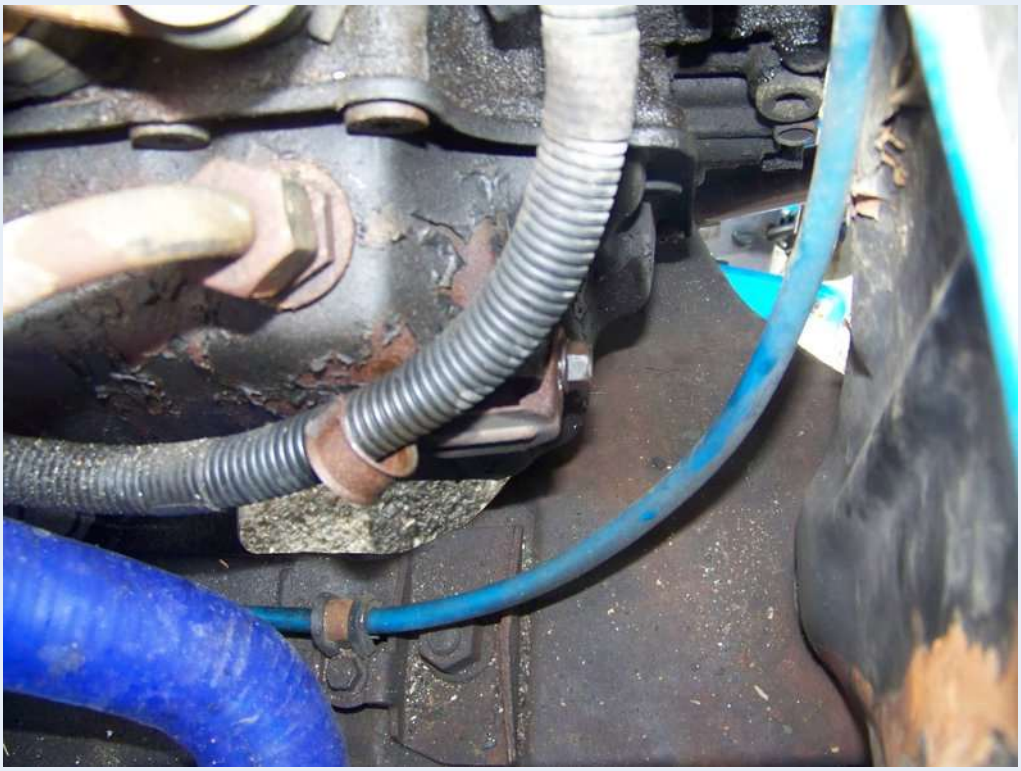




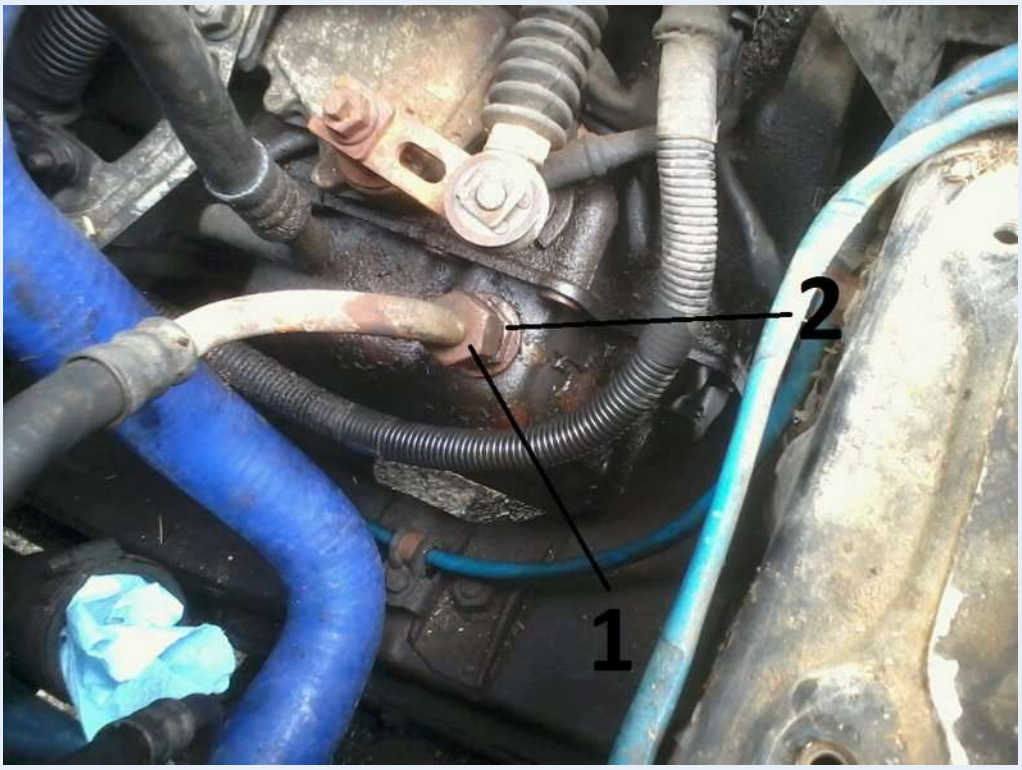
Lower Hose Released At Intercooler

8. Remove the 2 18mm bolts securing the transmission mount to the sub frame. Next, remove the 14mm bolt securing the front motor mount to the transmission. This will make it easier to jack the transmission up a few inches. Using a floor jack and a block of wood, carefully jack the transmission up a few inches so the valve body cover will clear the subframe.

9. On the driver side of the valve body cover there is a 10mm bolt securing a bracket for the transmission wiring. Remove this 10mm and the bracket.



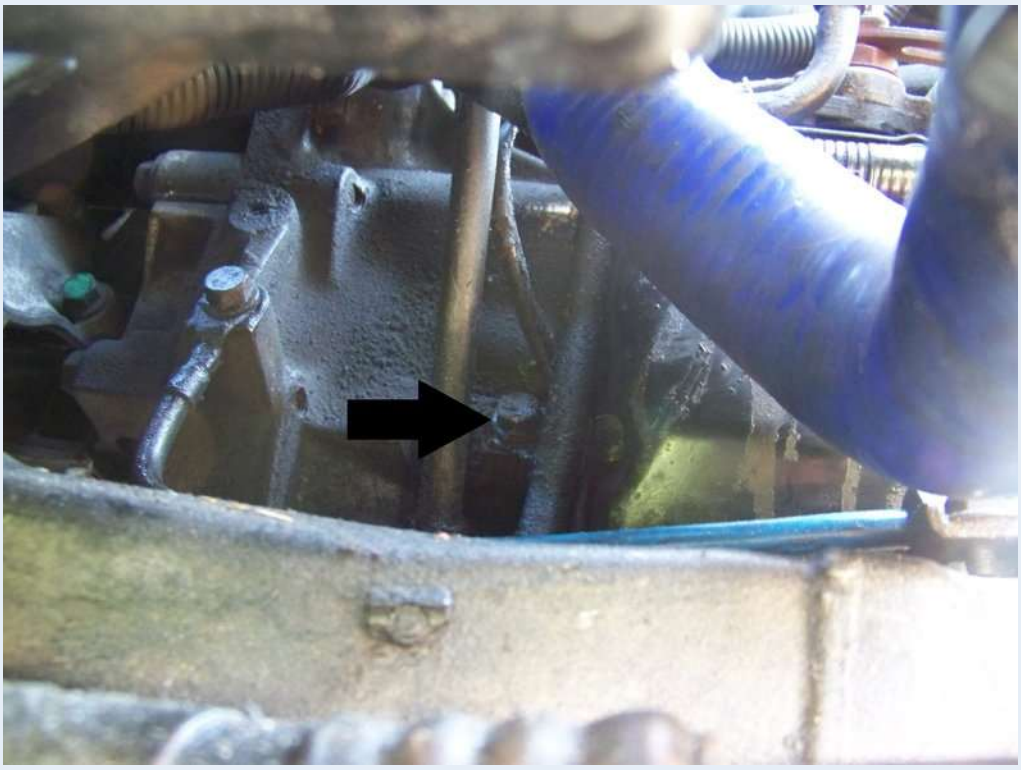
10. If possible, use a 22mm open end wrench or crowfoot wrench and loosen the 22mm bolt securing the upper transmission cooler line to the valve body cover. In my case this bolt wouldn't move so I used snap ring pliers to remove this hose at the radiator.



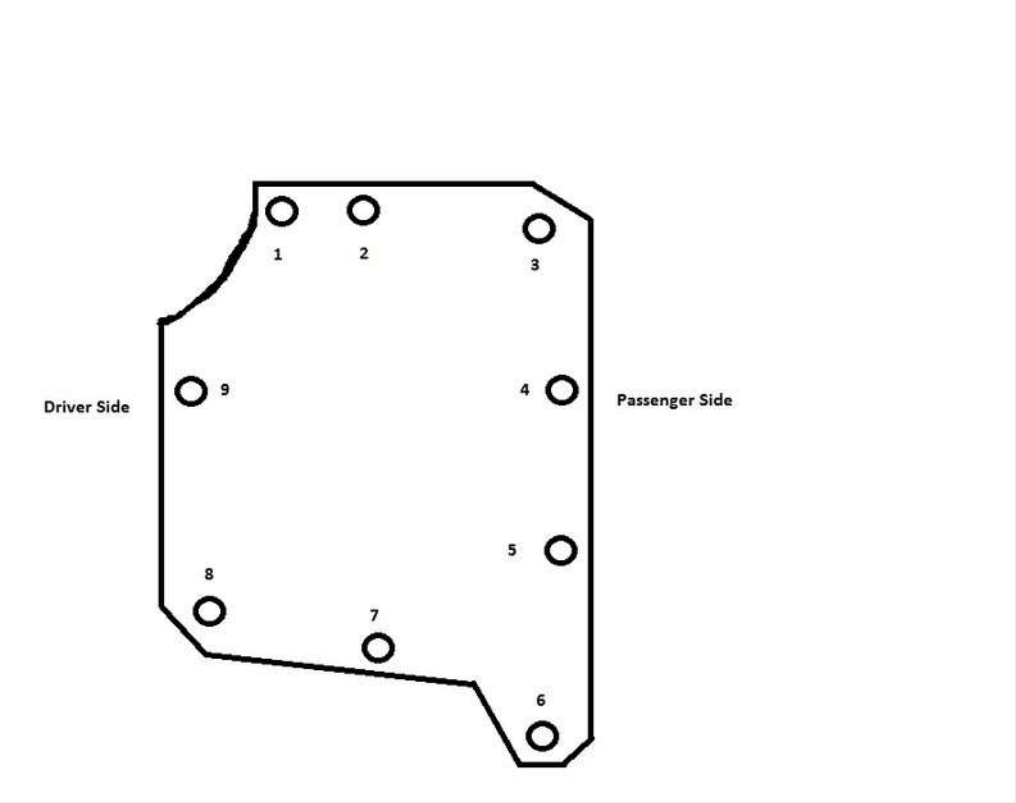
Ignore The Numbers

11. Place a catch pan under the car to catch any ATF that starts to drip from the hose or radiator. This is also a great time to drain the transmission. This will reduce the mess later when we remove the valve body cover. Use a 24mm box end wrench on the ATF drain plug and have a new crush washer handy when you put the plug back in.

12. Using snap ring pliers, remove the upper ATF cooler line from the radiator. Beneath the car, use a 10mm socket to remove the cooler line from the transmission itself. Next, remove the bracket bolt that holds the upper ATF cooler line in place. This bolt is hard to see with all of the oil and crud that builds up in there. By removing this bolt you can pull the entire cooler line out of the car. This will free up a lot of room to get to bolts 4 & 5 shown in the next step. Also, this is a good time to pull the ATF temp sensor wiring out of the way. There is excess wire near the PNP switch on top of the transmission, feed this excess down towards the bottom of the transmission to gain better access to these hard to reach bolts.

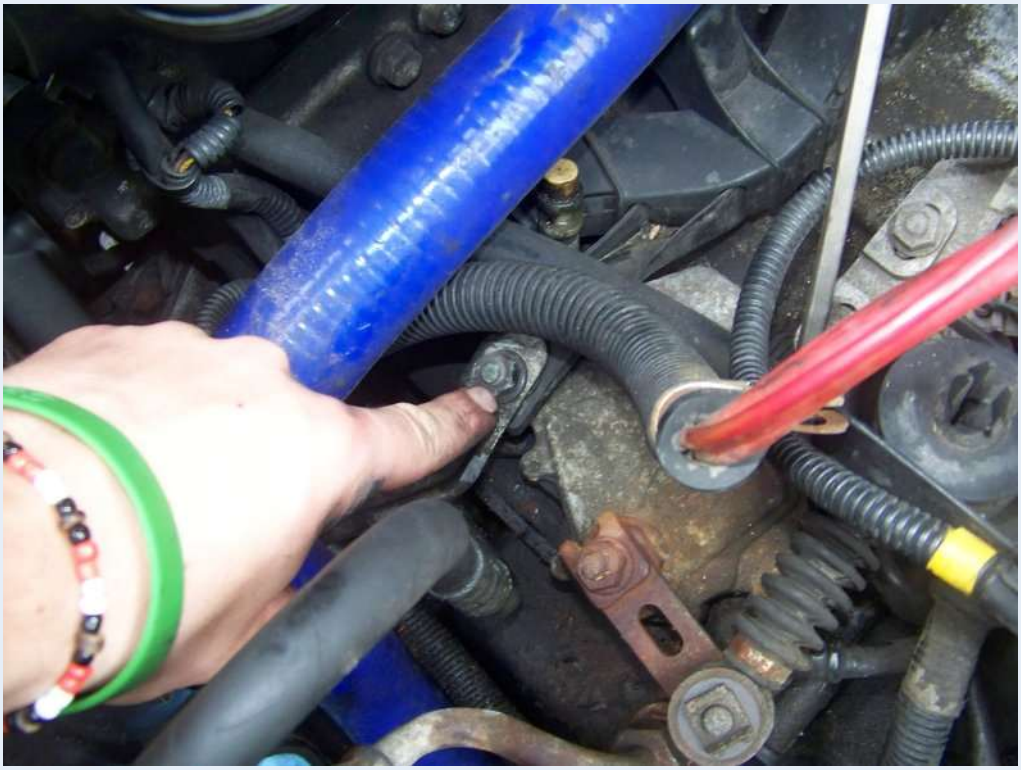


13. Begin removing the 9 T40 bolts on the valve body cover. Bolt number 8 on the driver side is easily accessed through the wheel well with a 1/4" ratch and T40 bit. Bolts 7 & 8 can be accessed from under the car. Bolts 1, 2, 3, & 9 are accessible from above. Bolts 4 & 5 are the really tricky ones. These two T40 screws are recessed into the pan and are right between the engine and transmission. With a U-joint and extensions bolt 5 can be accessed from below the car. A short extension and a longer T40 bit will allow you to reach bolt 4 from above. Another method for bolt 4 is to go in through the front of the car. With the lower intercooler pipe out of the way you should be able to stick a long extension in through the front of the car to access bolt 4. Be careful with these 9 screws as many people have had issues removing them. Spray them with PB Blaster and let it soak for a while.



13. Remove the 10mm bolt securing the negative battery cable to the inner fender.

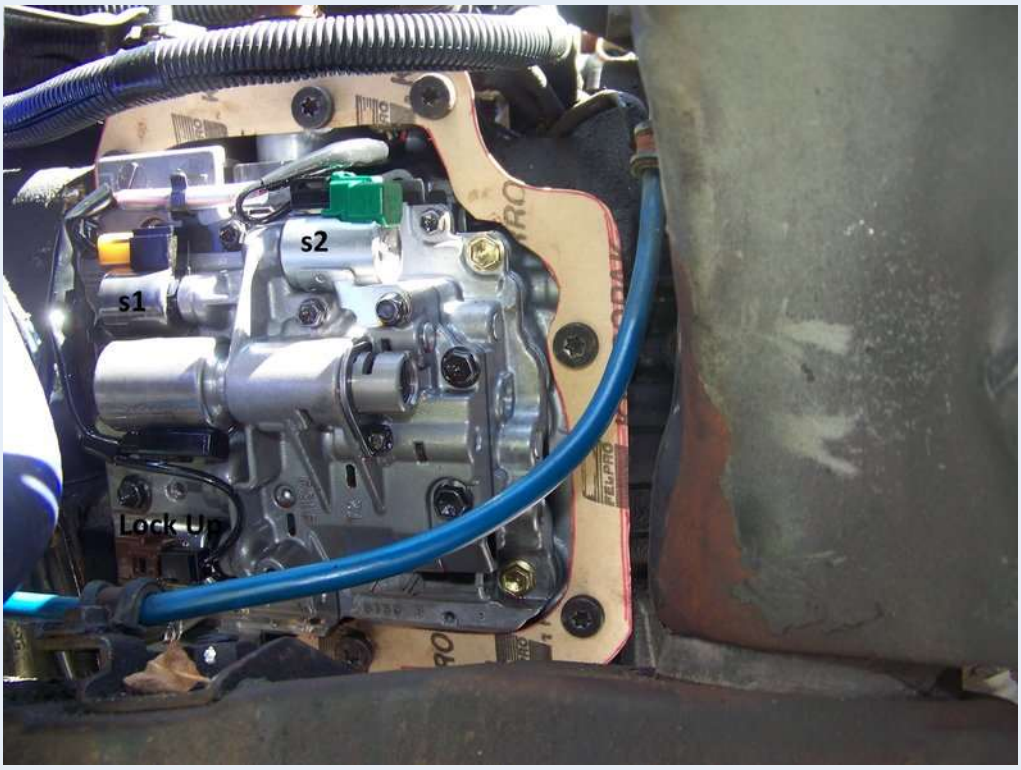
14. Remove the 13mm bolt securing the transmission dip stick bracket.



15. Wiggle, wiggle, and wiggle the valve body cover some more until it slides up and off the transmission. If you were able to remove the 22mm nut on the top of the cover then the ATF cooler hose will be out of the way making this easier. If not then you'll have to lower the pan cover later to clear the PNP switch wiring cable, not a big deal, just a heads up. Daversm had a great tip to loosen the

8mm bolt securing the lock up solenoid from underneath the car. The pan cover has a tendency to snag on the lock up solenoid. By loosening this bolt the solenoid has some play which allows the cover to slip over the solenoid without damaging it. While all of this is going on you'll have to push and pull the lower radiator hose out of the way so the pan can come up and out. This step is one of the harder ones but it can be done, the pan cover will eventually clear everything and you can remove it from the car.

16. Replace whatever solenoids are toast. S1 and S2 are at the top while the lock up solenoid is at the bottom of the valve body. Each solenoid is held in place with a single 8mm bolt and an electrical connector. They are very easy to remove and install.



17. With the solenoids replaced you can now move onto gasket making. This was surprisingly difficult for me and I made 3 gaskets until I was happy. The first gasket was made with 1/32 inch cork paper. This gasket did not work and I had ATF leaking out quickly. I had to take everything apart again and I made a second gasket with 1/32 inch gasket paper. This gasket was much better but still didn't look good enough and after my first experience I wasn't about to take a chance here so I made a 3rd gasket. No special tricks here really. Using the pan cover as a guide, I traced the shape out. Then I marked where the holes should go and cut everything out roughly. When I was satisfied I placed it on the transmission side mating surface and made corrections as needed, cutting out a little excess material here and there. From my first try I also learned that the holes need to be as close to perfect as possible to ensure the T40 bolts fit nicely on the first try without damaging the gasket material as you try to force them in. I did a test fit and secured the gasket to the transmission side with all 9 bolts to make sure they would go in nicely. This also gave me an opportunity to practice putting the hard to reach bolts back in.

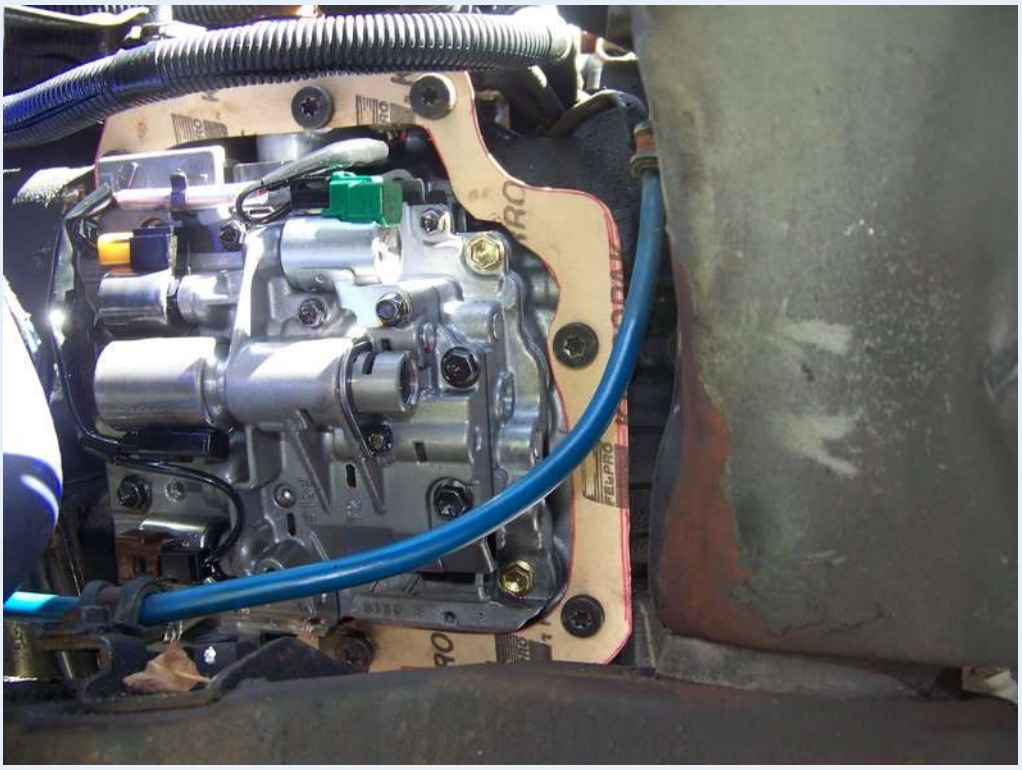
This was the first gasket I made. You can see how thin and poorly fitted it was. I should have been more careful.

1st try at making a gasket.

The third one was much better and seems to be working well so far.


KARRO-PAK
Part No. 3046
COMICS & PUZZLES
WEST SHORE


Part No. 3046
Sharpie



18. With the gasket prepared you can wiggle the pan cover back into place. Again you'll have to fight the lower radiator hose and the lock up solenoid for space but it will go back in. Trust me, I made it work twice.

19. Begin putting the T40 screws back in. I snugged them all up and then went around in a roughly star pattern to tighten them down all the way. No torque spec available that I could find. Once the pan is bolted back on to the transmission you'll want to fill it up with transmission fluid again to make sure your new gasket isn't leaking. My first time around I did this step last once I had re-installed everything only to find I had a huge leak around the new gasket. You don't want to have to remove everything again to fix this so do this step now. Be

careful and make sure the ATF dipstick has not popped out of the transmission while you were pushing it out of the way.

20. Drop the engine/trans slowly making sure the mounts line up correctly and then re-istall the 18mm and 14mm bolts for the transmission and front engine mount respectively. Torque them the correct amount. Haines listed 37ft lbs for the engine mount and 27ft lbs + 60 degrees for the transmission mount.

21. Slide the turbo to intercooler hose back into place and secure the 7mm bolts on the clamps. Be extra careful with the bottom clamp. Many people have had this hose blow off under boost after removing it because they didn't tighten it down enough.

22. Slide the ATF cooler hose back in and secure the 12mm bracket bolt. Slide the top end into the radiator, secure the clamp and use a ziptie to keep it tight. Underneath the car, re-install the green O-ring and put the 10mm bolt back. Be **very careful** with this bolt, I accidentally broke the head off from over tightening it.

23. Re-install the other ATF cooler hose, negative battery cable bolt, PNP wiring bracket bolt, and any other parts you may have removed. Put the air guide back on, hook up the cruise control pump again and then re-install the battery tray. Put the airbox in and the fresh air snorkel and then re-install the battery.

23. Clear any left over transmission codes and start the engine. You'll want to check the fluid level to verify it is in the safe range. Robert has a great video on that here: http://www.youtube.com/watch?v=kyM3Z-RWvcw#t=427

This job can certainly be done in a weekend in the drive way by the average weekend warrior. No special tools required and you do **NOT** have to drop the subframe. I happened to have the bumper off to paint and repair the plastic so this gave me a lot of extra room. It's not hard to remove so you may want to consider going that route as well to gain extra space. Also, while you don't have to remove the lower radiator hose it would free up some room, so if you want to combine this repair with a coolant flush or radiator hose replacement it would certainly make both jobs easier. With the rad hose out of the way the pan will slip in and out more easily and with the battery and airbox out of the way already you'll have great access to both ends of the radiator hose. I hope you guys find this helpful; feel free to comment.

- Marcin

P.S. A furry friend can make this more fun...