

5 Speed Conversion

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PREFACE:

This Swap is not for the faint of heart, nor the mechanically challenged, but with persistence and a fair share of experience (not to mention some patience), can be done by an average guy that doesn't mind getting his hands dirty.

If you can't afford to be without your car for 4 weeks I wouldn't try it, it shouldn't take that long but always expect the unexpected!

THE "LAUNDRY LIST":

1. A 5-Speed tranny with the matching rear diff. and shifter (with the boot) from a Legacy or Impreza (I used an Impreza one), It needs to have a cable activated clutch fork to go with my set-up, hydraulic is possible, but would be much more complicated to install, and add components to the list. I prefer the K.I.S.S. engineering points (Keep It Simple Stupid) to make it as easy as possible.
2. A Manual flywheel from a Legacy (not a turbo) or Impreza (I used one from a Legacy), be sure to get the flywheel bolts and the pressure plate bolts with the flywheel.
3. A manual pedal assembly, including the cable (I used one from a XT-6), I believe that the best match would be the early Legacy pedal assemblies, which from looking at the diagrams seems to be close to the assembly in the SVX, but you will probably have to do some cutting and retrofitting onto the original SVX assembly, as I had to do with mine. On a side note this is where I cut my left middle finger to the bone ([5 Stitches](#)), sort of slowed my progress till my finger healed, so be careful.
4. If you're lucky enough to have the component drive-shaft you can have the front section lengthened 2" (as the manual tranny is 2" shorter than the auto one), if not I advise you order one, I had an extension machined to mount to the front of the rear diff., which also meant I had to relocate the carrier bearing 2" forward, which would not be necessary if I had, had the component drive-shaft instead of the non-component one (you can't disassemble the non-component one to put in a lathe).
5. Of course you'll need a new clutch, pressure plate, throw-out bearing, and a new pilot bearing. I recommend getting a high performance clutch & pressure plate, as the stock Legacy one (which I used), won't handle the extra torque that the 3.3 has under hard driving, but works fine for day to day driving.
6. You'll need some misc. steel, about 18" of ½" solid round Cold Rolled Steel (this is used for

lengthening the shifter rods) and some ¼" plate for making some modified motor mounts. And access to a welder (also for the shifter rods). And a 1" hole saw for cutting the hole in the firewall to run the clutch cable through.

7. Of course you'll need new grease for the tranny and the rear diff. And a couple cans of black paint (you want it to look good don't you!) and a few cans of brake and parts cleaner, along with some hand cleaner (you're going to need it).

I think that's about it for the "What you need " list.

GETTING STARTED:

First off I had to jack up the car and support it with jack stands on all 4 corners, then I started taking off the relative parts, which consisted of:

1. The auto transmission (which could be a paragraph by itself, but any good manual will give you step by step on that).
2. The automatic's flexplate (or flywheel if you prefer).
3. The driver's seat (for better access).
4. The center console.
5. The shifter (you can just take out the row of bolts around the bottom, remove and presto! You've got a big hole in your floor).
6. The steering column (a bit of a pain, but makes the pedals MUCH easier).
7. The dash (I didn't take mine out, so it's not necessary, but would make the removing the pedals that much easier).
8. If you opt not to take out the dash, you'll still need to remove the TCU and CPU (the TCU doesn't get reinstalled) for better access to the pedal assembly.
9. The pedal assembly (unbolt the gas pedal and leave in the car)

THE INSTALLATION:

1. Take your original pedal assembly, lay it and the manual pedal assembly side by side for comparison, if the Legacy set were to have all the same mounting points, you can just swap it in there, the XT-6 one I used didn't. If it's not a direct swap then you need to remove the bolt thru the pedal pivot point, and fit the manual BRAKE pedal in place of the Auto Brake pedal (cutting the sleeve may be necessary), using the longer Manual assemblies pivot bolt, the bolt should stick out on the Clutch pedal side, slide the clutch pedal on the outside of the Original assembly over the exposed bolt. Now you'll have to cut the brackets off the manual pedal assembly that mounts the

clutch cable and supplies the outer support for the clutch pedal, then weld it in place on the original assembly; make sure you use the original brake pedal switch, and also the manual clutch switch. You can now reinstall the finished assembly in to the car.

2. Now you need to drill a hole in the firewall for the clutch cable, The ideal place is directly in line with the clutch pedal, but the brake booster is in the way (main reason I didn't want to use a hydraulic clutch), so I drilled a hole (1" hole saw I believe) approximately 2"(please check for clearance as this is from memory) directly beside the hole for the steering column, this allowing the cable to come out without the brake booster being a problem, it does make an "S" bend in the cable, but not bad enough to be a problem. After drilling the hole, feed the clutch cable through the hole and hook up the pedal end.
3. Now let's crawl under the car, and install the flywheel and clutch (you did remember to get the bolts with the flywheel didn't you? As the flexplate bolts are too short). First install the new pilot bearing in the manual flywheel, and then bolt the flywheel to the motor. Next install the clutch and pressure plate (be sure to align it with the alignment tool, that should have come with the clutch).
4. Next comes the transmission, remember what a pain to remove the auto was, relax the standard is much lighter and smaller, allowing more working room. First install the new throw-out bearing onto the clutch fork, then position the transmission on the jack, then raise it up and slide it into the clutch and pressure plate (using a jack under the front of the motor to raise the front which in turn tilts the rear of the motor down really helps to align the transmission with the motor), if it gets close but not quite close enough, the shaft is probably hitting the pilot bearing and isn't aligned just perfect, my solution to this (from many clutch jobs on muscle cars), is to shake the crap out of it while still applying pressure toward the transmission and it should slip in. Once it is pulled up snug to the motor, torque the bell housing bolts, and install the strut rod to the top of the transmission from the firewall, the transmission will sit unsupported which will allow you to take measurements for the modified mounts to your crossmember.
5. Now let's work on the shifter, I used one from an Impreza and had to lengthen it, a Legacy shifter might have long enough rods, so test fit it by bolting it to the transmission, and seeing how it fits into the hole in the floor (where the auto shifter was). If it needs to be lengthened, cut both rods in the middle of the straight section



then clean up the cut ends, and purchase 2 pieces of ½" round cold rolled steel, about 2" longer than you need to extend the rods, the ½" round bar should slide up inside of the shifter rods rather snugly so you can bolt the shifter back to the transmission and mount the rear shifter brace to the floor behind the opening (you can also see this in the "shifter" picture), now you can get in the car and move the shifter to the position you want it in, then crawl back under the car and tack weld the rods in place. Then remove the shifter assembly and weld the rods up, spray a little paint on them, then reinstall. Now you've got a shifter!

6. At this point you can hook up the transmission end of the clutch cable, reinstall the starter, reinstall the steering column, and the CPU (but NOT the TCU). Then you have to make a jumper for the ignition lock switch at the shifter, the 4 prong plug that you had to unplug from the shifter, is the plug to jump, it's the end 2 wires that need to be jumped.

{Now you need to remove the "Neutral Safety Switch" from the outside of the auto transmission, then plug it into the original wiring harness in the engine bay, and set it to "Neutral" there is a round indentation that will line up with the hole in the side lever on the NSS, to set it to neutral.}

*EDIT TO ORIGINAL INSTALL INSTRUCTIONS: I have now taken the NSS off completely, and now use the clutch position switch to allow the car to start, this ALSO retains the use of your cruise control where the NSS didn't, first thing is check the clutch position switch, it has to be a closed circuit when the clutch is depressed, if not you need a Position switch that does, they come both ways, (I used one off the XT-6's brake pedal) once you've gotten one with the correct function, you need to run the 2 wires through the firewall, and to the smaller of the 2 wire harnesses that hooked up to the auto transmission, the 2 wires need to be spliced into the Black

w/Yellow tracer and the Blue w/White tracer wires of the harness (they are next to each other in one corner of the connector). Now it will start when the clutch is depressed, and will kick the cruise off when the clutch is depressed also. Now reinstall your front axles. At this point you can start the beast (very loud as you've not installed the pipes yet), and run it through the gears to be sure everything is working (clutch, shifter). If so and you're doing this to a FWD SVX then put the pipes back on and dress out your console for the shifter boot then you're done, go out and roast those tires!

7. As for the rest of us with AWD, the next thing is to take the ring and pinion out of the rear diff you got with the 5-speed, and install it into the original LSD rear diff (you have to do this to use the original axles, and to retain the "Limited Slip Differential").

Note: the LSD axles don't have the spring pins to retain them, they just pop out of the rear diff.

Now reinstall the original rear diff with the new gears and fill with LSD grease.

8. Take the front section of the component drive shaft to a machine shop that does drive shafts and have it lengthened 2" (again it wouldn't hurt to check this measurement, in case your transmission is a different length than mine, easiest way would be to measure your original auto transmission and then your 5-speed to calculate the difference). Once you get it back from the machine shop, put the drive shaft back together, and reinstall it into the car. (Don't forget the heat shield that goes above it!)
9. Reinstall the exhaust system. (Wow an easy part!)
10. Fill the Transmission with grease. (Another easy one!)
11. Reinstall the Console, Driver's seat, and dash lower trim panel, the shifter surround needs to be trimmed to accept the manual shifter boot, a Dremel tool works pretty well.
12. Well now for your maiden voyage! Take it for a spin, to see if you need to adjust the clutch (make sure it's out of gear the first time you start it, in case the clutch isn't releasing). It's a good idea to get back under it after a short drive to check for loose bolts, leaks, ETC.

Well it kicks butt, doesn't it!! All the hard work seems worth it on that first drive.

I hope this helps anyone interested in doing a 5-speed swap, either by giving them a guideline to go by, or by convincing them it's too big an undertaking to mess with without a good deal of mechanical experience.

Sheeeesh, my fingers are numb.