

How we got here

So what do you do when you're driving to work and you take off from a like and go to shift into second and hear a loud pop and the shift refuses to advance into the gear? If you're like me you go, "What the ___," and try repeatedly to get the car into the right gear. Then after several expletives, you either; A limp onward to work, or B limp back home and swap out for another mode of transport. I was fortunate enough to have my truck also available.

Now here sits my precious old noise maker with a rapidly deteriorating transmission confined to the driveway only being moved as little as possible due to the frightening number of noises she is making in even in neutral. I had a decision to make which took a couple of weeks to weight the costs versus the benefits. At the end of the debate I decided I would replace the 400,000+ miles, 36 year old M40 gear box with the Mustang T-5 I had pulled at a pick a part on a whim. I had read about the swap and had toyed with the idea but never seriously considered it even after getting the transmission. Oh how things change.

I spent the next 2 months accumulating the parts necessitated by this project and used little hints gleaned from the VPD website to locate and source all the parts locally which could be had from stock applications. I had initially contacted VPD for the parts required by the swap which are custom made but after no response for 2 months in regards to springs I purchased from him I gave up on the new purchase after waiting 2 weeks for a reply (eight months later have still have yet to receive my springs). Thankfully I discovered quite by accident Avalanche Performances adapter plate and after speaking with Dale, who responded as if he was waiting for the email to arrive, I decided to purchase his plate and wait the 3 weeks for it to be machined. One month later I had my plate and a slew of parts from various cars to make the T-5 fit into my little 145, the list of parts and where they herald from will be included at the end.

Needless to say the project was going to be fun and aggravating all at the same time. Having swapped my 1985 S-10 Blazer from 700R4 to T-5 a couple years ago I knew how complicated this could wind up being. We would be doing all the work with mostly hand tools laying on my back under the car sitting on jack stands and ramps in my driveway. As soon as I had the speedometer drive gears for the transmission and the shifter I installed both on the T-5. On the car first thing I had to do was confirm the holes were already present to move the transmission cross member back far enough to accommodate mounting the T-5, Volvo was kind enough to provide both sets of holes, threaded and ready for use. After several sessions measuring transmissions and various other things disassembly began, having the green book for the car helped in a few spots. (Yes I have dual exhaust on a four cylinder, when I got the car it was like that and I couldn't bring myself to change it back to single. Just had to be different I guess.)





Disclaimer

First and foremost these pages are not intended to be a technical instruction manual or step by step guide for swapping these transmissions. At some point in the future it may be rewritten with such a purpose. Today, though, it is meant to be used as a reference with, hopefully, a bit of useful information to make things easier for those interested in attempting this job.

Disassembly



Disconnected the battery and pulled the 940 turbo mini starter. Removed the driveline, disconnected the clutch cable, speedometer cable, and brakelight switch. Removed the cross member and clutch return spring. Unbolted the transmission from the bell housing, little bugger doesn't hardly weight a thing

compared to the T-5, removed the bell housing after a little coaxing with a mallet. Removed the pressure plate and disc, then unbolted the flywheel. Discovered after getting the flywheel off, that at some point someone had been kind enough to update the rear main seal and housing to the new style, no leaks so I felt it was best left alone, also explains why the bolts on the back of the pan were different when I did the pan gasket a few months back. Found the flywheel was a bit rough, the clutch had only been changed once up to this point and my love of driving in the mountains probably was not helping. When it came to removing the pilot bearing, a blind hole bearing tool with its mini slide hammer made life easy, loaner from Autozone.



[Next Page, the fun begins...](#)

All contained images and text are property of the page creator and may not be used for monetary gain without permission from the creator. Brand names are property of their respective companies. [contact](#)

Reassembly and Fabrication

Now the fun begins, fitting the 5.0L transmission behind the tiny B20F. That adapter from Avalanche fit perfectly with the socket head bolts from the local bolt store. We heaved the transmission in once without clutch and flywheel to test the fitment of the plate, all good.



Next step, the clutch fork. Tapping into my grandfathers 30+ years of machining experience I provide him with the fork, release bearing and a vague idea of what we needed to accomplish and he provided a simple yet surprisingly effective solution. To increase the diameter of the pins to fit the bearing he found a piece of 3/8" stainless steel tubing which we cut down and then pressed over the pin with a C clamp bringing the pin diameter to nearly dead on for the bearing channel. The next step was to grind and then hand file the pins with shims down until the gap between them was a few thousandths bigger than the diameter of the bearing at its narrowest. A dial caliper helps in checking measurements, the objects was the leave clearance for a little variation in bearing construction but still be a good fit.



With the Fork sorted out assembly could begin. Clutch was assembled as one does making sure to not snap off the bolts due to over tightening. Next came the Bell housing and plate, then the joys of clearing the transmission past the exhaust AND lining up the input shaft, needless to say we have become quite good at this part. To make life easier a 24" 3/8" extension with a flexible 3/8" extension on the bolt end were used to tighten the transmission to bell housing bolts snug, then the flexible extension was removed and dual universal joints on a 6" extension were used for the final torque of the bolts. The Flexible extension allowed for two shallow bends around the casing of the transmission without binding which the universal joints do in the same position and the 24" extension allowed the ratchet to be brought out into the open area behind the tail shaft.



After all that fun I still had to fabricate a mount to keep this thing in place. I spent quite a bit of time toying with the possible configurations before deciding on an attempt to attach to the stock position on the cross member. I then bent a 8" x 6" piece of 1/4" plate steel (probably overkill) with hand tools to the angle close to the stock set up. This was accomplished by clamping the steel to a very sturdy mount, the frame of my Grandfather's Freightline, and using a 24" crescent wrench with a three foot pipe over the

handle to bend the metal. Not the most efficient way, cost effective yes, practical no. It's not pretty but it works, although, if you have access or fund available, machines are your friend. At first I was going to use a pair of stock mounts but after considering how well the energy suspension mounts have held up on my truck I decided to go with the spare poly transmission mount which I had for another project.



Now that I had everything relatively where it needed to be the driveline needed adjustment. I took a few measurements and went to the local driveline shop to have the length shortened and while I was at it a new carrier bearing installed as well as the Ford yoke and new u-joints. The Ford slip yoke requires a larger joint than the stock drive line uses, thankfully the shop had a conversion joint which allowed for mating the two different breeds together. Also don't let the shop talk you into a one piece shaft if you have a 140, the parking brake cables and a structural cross member would get in the way of a single piece shaft if it had to articulate down any measurable distance. Once the driveline was completed I was able to determine I had to drill a hole lower on the cross member to get the driveline lined up correctly. Since the mounting location is lower I made a 1/4" thick reinforcement plate to be welded in place once all adjustments are completed. Now with the mounting completed final assembly and functional checks begin.



[Next Page, Murphy Strikes...](#)

[Previous](#)

All contained images and text are property of the page creator and may not be used for monetary gain without permission from the creator. Brand names are property of their respective companies.[contact](#)

The Home Stretch

We lower the car onto the ground, reinstalled the shift arm onto the shifter and proceed to move the shift through the gears with not a hint of resistance. This point should have been when I realised things were going way too easily. Put her in neutral and try to start the car. She fired up, YAY! Try to put her in first, the shifter would not go into gear. Shut down and the shifter goes in, start the car foot on clutch barely fires, release the clutch and she move but something doesn't feel or sound right. Spent two days playing with the clutch cable and even shimmed the clutch fork pivot thinking it was a lack of engagement. After Several attempts at shimming the fork pivot we called it a night.

Then a breakthrough at the point of giving up, thinking about it at heaven knows when in the middle of the night I ran over what we found. When we tried to roll the car in neutral something was dragging. A thought had come to me, was something hitting the clutch disc? Was something holding pressure on it, keeping it pressed to the flywheel? The next day I had time to get to it peering through the Clutch fork hole revealed little. We disconnected the rear shaft section and while holding the clutch pedal an attempt was made to turn the driveline, it wouldn't move even in neutral. Pulled the transmission for the N'th time in the project and took the alignment tool for the clutch and slid it into the clutch and marked the position in relation to the clutch disk splined hub. Then compared to the input shaft. The tool slid into the clutch approximately 1/16" further than the sleeve on the input shaft would allow, inserted a ruler to verify. The Input Shaft sleeve was hitting the center hub of the clutch disk and pressing the disc into the flywheel. Simple solution, pipe cutter the shave off 1/8" from the sleeve and then the transmission is reinstalled, checked by turning the driveline in gear with clutch pedal pressed, problem solved. With the Car back on the ground, engine running, release the clutch pedal, she moves.



After a few weeks of driving without a speedometer I located a local speedometer shop and he made a cable the same length as the stock cable but with the correct ends to use in the T-5 without using the VSS. The cable comes out the fire wall and instead of crossing over the transmission, loops down the driver's side along the clutch cable then loops up into the transmission. The floor near where the cable meets the transmission was dimpled to allow for movement of the transmission. The speedometer is still a bit optimistic, by about 5 mph at 40, but a few gear choices are still available.



began to notice thumps on the floor and tried adjusting the transmissions position several times with little resolution. After driving another week or so I noticed the banging on the floor getting worse car but I couldn't pin it down. Then one day going to work the problems source was revealed, the noise became almost constant and after work I jacked up the car to find the driveline had slid backwards on the slip yoke and the yolk was hitting the floor. Through the clever use of zip ties I got the car home that night. Next day off I took the car to the exhaust shop and since he wasn't busy was able to put the car in the air for a better view of everything. While in the air he adjusted the cross member to clear the exhaust and vice versa and then I came up the idea to put a brace on the rear of the carrier bearing bushing to hold it in place and keep it from moving. Improvised braces in place I drove for another week with intermittent thumps and then put the car back up in the air. The problem was the slip yoke allowed the driveline to move back enough for the ears of the yoke to hit the narrow sides of the transmission tunnel. With a quick measurement of how much length was needed to put the yoke within a 1/4" of the seal on the transmission I took the driveline back up to have the front shaft lengthened. Problem solved.



This is probably not the prettiest or most professional swap but I was shooting for function over form. With the exception of the driveline and cross member every attempt was made to make this swap completely reversible. Even the backup light switch is hooked up by using male quick connects spliced onto the ford switch wires to allow the stock wires to just plug in.



After a few days driving in December it became a bit uncomfortable to hold onto the shifter with ice cold drafts shooting in the opening left in the boot, so I got creative using a pilot bushing left over from the clutch kit for my Blazer, the bushing doesn't fit my truck but fits another vehicle the clutch kit fits. I placed an o-ring in the beveled part of the bushing with a washer and second nut on top sealing the shifter boot to the shaft, making an altogether cleaner look. Not fancy but it works.



To be honest though after driving with the T-5 in the car I can't see a reason to go back, I mean nothing beats the look on a kids face when you blast past him, in his Honda Civic, doing 90 in the fast lane when you're in a 38 year old Volvo station wagon and the car doesn't sound like a plane trying to take off. I was lucky enough to find a transmission which the 1st through 4th gear ratios were nearly identical to the stock M40 gears so I didn't lose my hill climbing ability, which makes it truly enjoyable to drive the mountains again.



Mid September on Glendora Mountain Road

[Next Page, The technical bits.](#)

[Previous](#)

All contained images and text are property of the page creator and may not be used for monetary gain without permission from the creator. Brand names are property of their respective companies. [contact](#)

The Technical bits

Locating the gearbox

The Transmission used was located purely by dumb luck at a Pick a Part. It came from a 1991 Ford Mustang GT with a 5.0L. Some one had started to remove it and gave up due to rain, we built a little island under the car and yanked her out after hack sawing through the driveline and exhaust.

Gear Ratios

With 195 60R15 tires on 740 Draco rims and the wagons 4.30 rear end ratio I have no problems with the overdrive gear ratio, but then again on Southern California freeways who drives the speed limit anymore?

	1st	2nd	3rd	4th	5th	Reverse
M40	3.41	1.99	1.36	1.00		3.25
T-5	3.35	1.99	1.33	1.00	0.68	3.15

The Parts and Prices

These are the part numbers and costs based on my invoices and receipts from local parts houses. Some odds and ends are not listed either because I have no invoice or the parts were sourced through mine or my grandfathers supplies. Brands are provided where available. The part which took the most time to locate was the pilot bearing, many searches through the various catalogues led to the little guy listed below. I hope these part numbers or vehicles can help those who want to do this swap locate the parts quickly and more cost effectively. Prices are included as a reference on potential cost in USD. Not included is my second trip to the drive line shop and a second pilot bearing which was purchased when we had troubles getting the transmission in at one point. turned out to be installer error not damage to the part.

Qty	Item #	Description	Unit Price	Line Total
1.00	1352-199	1991 Ford Mustang GT T-5 5 Speed Manual Transmission	\$155.17	\$155.17
1.00	SC242	1978 Volvo 240 Sachs Clutch Pressure Plate	\$107.27	\$107.27
1.00	SD1220(Sachs part # given)	1980 Ford Mustang 2.3L Valeo Clutch Disc	\$46.00	\$46.00
1.00	614014	1991 Ford Mustang GT Timken Clutch Release Bearing	\$21.99	\$21.99
1.00	103CC	1985 Peugeot 505 National Pilot bearing	\$14.95	\$14.95
1.00	n/a	Avalanche Performance Volvo B20 to T-5 Adapter Plate	\$195.00	\$195.00
1.00	3.1108G	Energy Suspension GM transmission Mount	\$29.99	\$29.99
1.00	n/a	Speedometer Cable	\$69.00	\$69.00
1.00	n/a	Mustang T-5 Short Shifter	\$57.36	\$57.36
1.00	n/a	Ford T-5 Speedometer gears	\$30.00	\$30.00
1.00	1018-21	Ford Mustang Delrin Shift Knob	\$36.98	\$36.98

2.00	n/a	Clutch fork shim		
1.00	n/a	Flywheel Machineing	\$30.00	\$30.00
1.00	n/a	Steel plate 8" x 6"	\$3.39	\$3.39
1.00	6009-2RSJ	SKF Carrier Bearing	\$16.80	\$16.80
1.00	427 53008 500(IMP)	Carrier Bearing Bushing	\$26.80	\$26.80
1.00	428 53003 674(IMP)	Carrier Bearing Support Spring	\$2.00	\$2.00
1.00	428 53004 674(IMP)	Carrier Bearing Support Spring Washer	\$2.00	\$2.00
2.00	1-0153DG	Duralast Gold/Brute Force U- Joints	\$15.99	\$31.98
1.00	n/a	Driveline Shortenting and Combination U-joint	\$81.00	\$81.00
1.00	7296S	91 ford Mustang GT Timken Transmission Rear Seal	\$7.99	\$7.99
1.00	n/a	1976 Volvo 242 Shifter Boot	\$2.00	\$2.00

As a final note just wanted to thank the the guys where these parts and services were obtained:

Avalanche Performance, Canada
 Ed's Auto Parts, Covina, CA
 Southwestern Foreign and Domestic, West Covina, CA
 Autozone 5477, Covina, CA
 Steve's Import Machine, Glendora, CA
 Drive Shaft Specialist, Azusa, CA
 Valley Speedometer and Tach, El Monte, CA

Also have to thank my friend Z, without his help I would never have been able to hoist the transmission in and out of the car, by hand, the fifteen times we did it.

The End

[Previous](#)

All contained images and text are property of the page creator and may not be used for monetary gain without permission from the creator. Brand names are property of their respective companies. [contact](#)