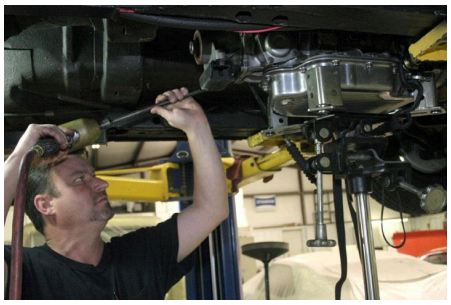
INSTALLING A 4L80E TRANSMISSION INTO A 2ND GENERATION TRANS AM

A trend in the automotive world is to take older muscle cars and retrofit them with modern technology for a more reliable and comfortable ride. To that end we are swapping this GM 4L80e electronic transmission into a customer's 1974 Pontiac Trans Am.

The first thing I'd like to say is that this is no way a bolt it in and go operation. There is going to be some fabrication involved. Some creative thinking will be required before it's done.

The first order of business is to remove the old TH400.

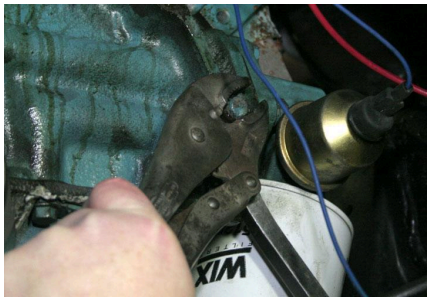


The next step is removing the flex plate. It has to come off to mount the transmission adapter plate since modern electronic transmissions do not have a BOP bolt pattern. This aluminum Reactor flexplate won't work with the new setup due to its thickness so it will be replaced with a stock flexplate.

Since we're using an adapter plate

to mount the transmission the old locating dowels have to be removed and new, longer dowels installed. The part number is Moroso 37932. The first dowel comes out with vice grips and a twist.

The second one was a bit harder to remove, and took drilling it to get it out.

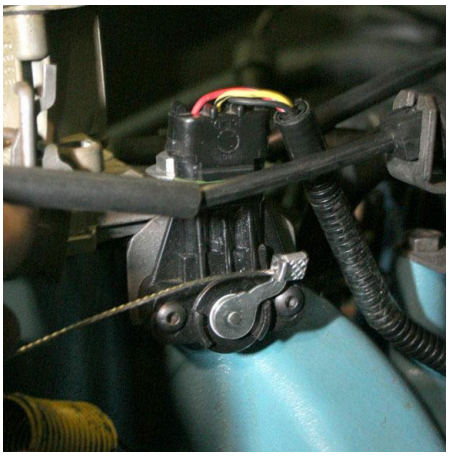


With the new dowels in place the adapter plate from TCI bolted right in, no problems at all. That part is TCI 230001. Be sure to read the instructions on which way the plate faces and how to measure the pull on the transmission. You MUST use the supplied washers.

The next item was to drill a hole in the transmission tunnel to route the wiring harness from the TCU (Transmission Control Unit) we intend to locate under the console. The main connector has a 1 5/8 inch diameter so the hole has to be that big. The wires coming through include the main connector, the transmission input speed sensor (TISS), the transmission output speed sensor (TOSS), the throttle position sensor (TPS) and a ground wire that needs a direct connection to the (-) pole of the battery. I'm bringing all this through the

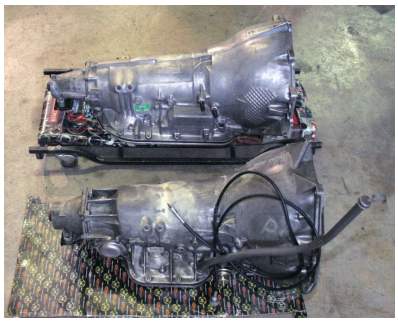
tunnel as I'm placing the transmission control unit (TCU) under the center console.

The throttle position sensor seen here is critical to this install. It helps the TCU to determine where shift points should be and when to lock up the overdrive. A bracket was fabricated on the rear of the Quadrajet mount and set up to use a pull wire via the throttle linkage on the driver's side of the carburetor.



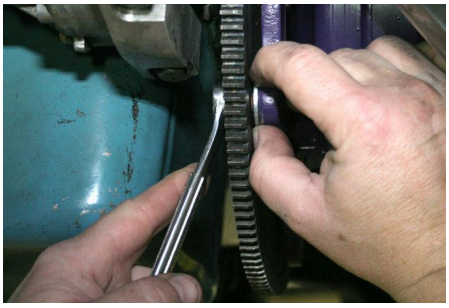
Here's the stock flex plate installed along with a Trans Dapt torque converter pilot bushing we were led to believe we needed. Maybe some other folks do need it. We did not. When we bolted up the transmission with it in place it jammed the converter snout so tightly we couldn't turn the converter by hand. We pulled it all apart, threw it aside. With that out of the way it all came together like a dream. For those who might need it, Summit Racing sells it and the part number is TD-055.

The complaints against the 4L80e is that it's huge, heavy and sucks up horsepower. In the below photo you can see that the 80e is much larger.



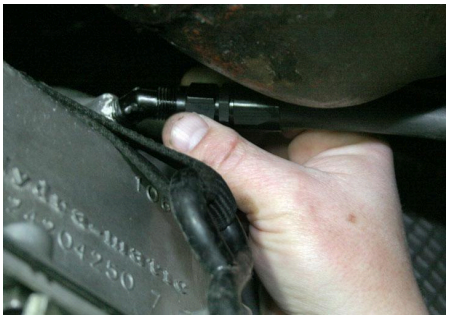
We didn't weigh them but others have and the 80e outweighs the TH400 next to it by 45 pounds, sans converter. Most of those complaining of the weight will admit that the bulk of the extra weight is in the stock converter, a huge, heavy duty piece for towing and big trucks. Our customer is using a small, performance converter so the actual weight gain is going to be around that 45 pound mark. As for huge, cut off the two transfer "ears" on each side of the case and it will fit your F-body's tunnel with no modifications. Here's a shot of the transmission going in with the smaller, performance converter in place.

Remember the preface to read the instructions on the TCI transmission adapter? It includes using these hardened washers when you bolt down the converter. You have to measure the pull back from the transmission towards the flex plate. The margin of error is about 1/8 inch to still be functional. Oh, don't forget you'll need metric torque converter bolts. They are 10mm x 1.5 thread.



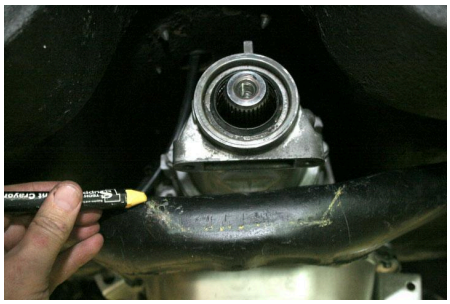
This next shot is a little hard to see but I'm trying to show you the -6AN fittings being used for cooler lines along with the flexible cooler lines. You can use

hard lines but the bigger transmission makes it a VERY tight fit in there. I found that using the 3/8 NPT to -6AN fittings made routing this stuff a lot easier. Even then you might have to dimple the floor pan for clearance.



With the transmission bolted in, converter on and cooler lines routed we moved to the electrical connections. It's all plug and play here. They're all weather pack connections and can only go on one way.

Now we get into the fun part. No one builds a cross member for this swap It's fabrication time. With the cross member from the TH400 flipped around backwards it appears we can reuse it with some cutting and welding. A grease pencil and some sketching gave us a starting point.



No matter what we did on the cross member, that mounting tab has to be on the other side, so a cut off wheel was used to lop it off.

I'll pause here to mention to you folks that I'm leaving out some minor stuff, like finding a new throttle return spring because the factory one interfered with the TPS setup and building some brackets to help route the cooling lines. Minor stuff like that is part of any project like this. One big item is the drive shaft. The drive shaft had to be shortened by 3.25 inches. Also, the TH400 yoke with its 32 spline count will work with the 2 wheel drive version output shaft on the 4L80e. Another item to be dealt with is the speedometer. We've elected to convert to an electronic gauge setup.

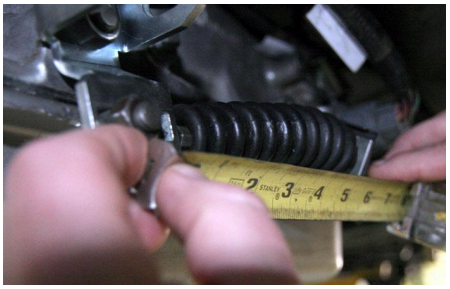
Back to the swap. The customer is using the ShiftWorks kit to convert the stock, factory TA shifter. We found that the kit does not work well with what people call the factory "rally" shifter that came in some of these cars. For those who don't know what I'm talking about, these shifters allowed you to push the shifter to the right and forward against a stop for each gear. This allowed you to aggressively shift the car through the gears manually.

The Shiftworks kit replaces the stock detent plate to allow for the extra gear. What we discovered was that the rally shifter had 2 ears that needed to slide back under the detent plate when used in the non-rally mode. With the new plate they would simply jam and would bind rendering the shifter useless. We found a non-rally shifter to use and the kit is working well.

Next is connecting the shift cable. The key to this working correctly, according to the instructions, is that the amount of cable, measured from the cable attaching bracket to the center of the pin that attaches to the transmission gear selector at 5 7/8 inches. That's where we set it and the car did seem to shift through the gears properly. We'll see if it needs tweaking later.

For now, we are ignoring the linkage and brackets for the neutral safety switch. I'm looking at a mechanical solution for that based on modifying the linkage

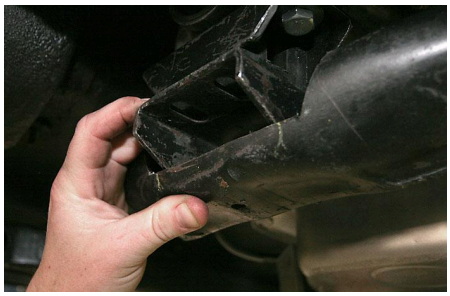
that came with the transmission. It's out of a 93 Suburban, I'm told. If that doesn't work, I may have to look into some type of microswitch setup.



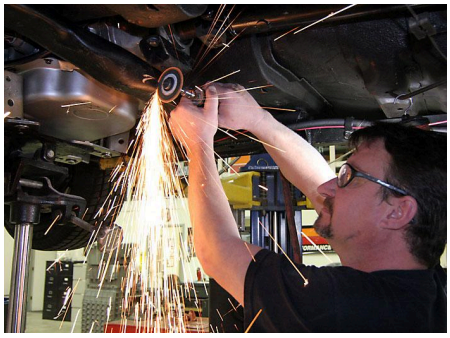
Next up was determining the proper transmission height/pinion angle so we could finish modifying the crossmember. The drive shaft fit like a glove. We had measured a 1-2 degree pinion angle prior to starting this project so placed the angle finder at the same spot we measured from initially.

Then we dropped the car down onto the wheel stands. Once the weight of the car is on the wheels, bounce it a few times to settle the suspension and then check the angle. We then slid a floor jack under the back of the transmission and found the right position for the proper pinion angle. We marked it so we could raise the car in the air again to finish the fab work.

Back under the car we used our guide marks...

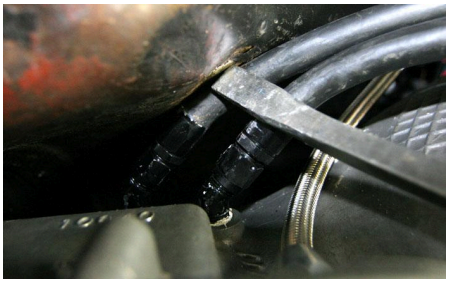


...and whacked the excess out of the way with a cut off wheel.



Now we have the tab where we want it. Once it's welded into place all that's left is replacing the drive shaft and exhaust.

With the transmission now set at the ride height we discovered that the cooling lines were a tight fit. A little massaging with a pry bar and a hammer gave us the clearance we needed.



Now we move inside the car where a laptop was connected to TCU. The software from TCI was very intuitive and a basic profile was created using parameters specified by the wizard that walks you through the setup. Our shift points were very high to begin with but kudos to TCI and their support. When the customer still had problems after extensive phone support one of their technicians, Russell Culver, drove to his house and provided tuning help. This was a 2.5 hour trip for Russell, one way. That my friends is customer support!

If you have questions regarding this transmission swap or any other modifications associated with it, feel free to call us or drop an email to our office. We'd be happy to help you with all your automotive needs.