Porsche 5 Speed In Yor Bug

by Steve Arndt
2002-08-14

Having a Porsche 5 speed in a beetle is one of the cooler modifications that you can do. Close Ratio gears are required to keep a high performance engine in its power band. The 5th gear ratio will still allow easy highway cruising. The Porsche transaxle is strong from the start because it is engineered for the power of a flat six engine!

Michael Ghia and Bonekar provided me with the inspiration to take on a project like this in August 1999. I contacted Rob at DC Automotive and purchased a good used 1969 Porsche 901 5 speed gear box. From my readings it looked like this 5 speed install wasn't going to be easy, but it was possible. Perfectly smooth shifting is important to me so that will be a long adventure getting that worked out.

An IRS rear suspension setup is required rather than a swing axle setup. I found a 73 bug with a nice floor pan which would serve as a donor for an IRS pan. I had the bare pan sand blasted then I welded in new Pan Halves from http://www.aircooled.net/. We do this type of rust repair all the time.

The first step is to adapt the Beetle rear trans mounts to the 901. This is done by drilling holes in the trans to match the holes in the original beetle transaxle. I use a spare set of Urethane rear pad mounts because they do not have studs (they use nuts and bolts) so you can place the mount right over the area and mark it perfectly. Once the holes are marked, drill them. Use a bit that is just larger than 8mm so that the mounts fit nice and tight.

The nice thing about handling the rear mount first is that it gives you a static point to work off of for fitment. Now that the the transaxle can be coupled to the floorpan, we can start clearancing and further fitment.

When you first lift up the 901 and try to fit it using the rear mounts as reference to where it needs to be, you then realize what a larger and longer tranny it really is! Place a straight edge parallel to the ground and on top of the input shaft as a reference then measure to the torsion tube one foot from the center on each side. With the beetle trans this measurement was 22.75 inches. It is important to have the 5 speed as far forward as possible because it is about 1 inch longer than the beetle trans. Next, clearance the frame horns for the sides of the gearbox and for the clutch tube bracket off the side of the box. Mark the areas to be clearanced using a paint pen or marker. It is good to clearance as little as possible to keep some strength in the frame horns. The input for the shifter on the 901 exits the bottom of the trans rather than the middle like a beetle. A hole must be cut into the bottom of the pan. In order to get the rear of the 901 as close to 22.75" back from the torsion tube. I lightly clearanced the front of the trans and also the torsion tube. Do not remove any more material than necessary!

Clearancing for clutch bowden tube bracket

Clearancing for right-front of trans case

With the rear mounts bolted down and a floor jack supporting the front of the trans, start to figure out the front mounting system. Keep using the straight edge on the bell housing and measure to the torsion tube to keep the bell housing parallel and true. It is helpful to have the floor pan upside down at this point for obvious reasons. It is possible to adapt the original 911 front mount. I elected to build my own mount system because the 911 mount needed over four inches added to its width to fit the way I wanted. I determined that a mount built from scratch would look and fit best. I used Volvo trans mounts. These are quite generic and I found at least four different brands. I selected the hardest rubber versions. The mounts will make it very easy to swap in solid aluminum mounts for the strip just like the Gene Berg intermediate mount. I welded ears to the outside of each frame horn for the Volvo trans mount studs to bolt to. With the mount position determined, and the trans in a static position, build a front mount.

Note the clearancing to the trans case.

Bottom view of fabricated front trans mount

With the front and rear mounts complete, it is time for shift linkage! There are three options for shift linkage. Adapt the Porsche parts, adapt the VW parts, or full custom. I chose to use the 911 components to have a proper reverse lockout and to retain the "Porsche Look". It is hard to mistake the 911 shift lever!

The parts needed are the shifter, the shifter to shift rod connection link, the actual shift rod, and the special rear coupler. http://www.pelicanparts.com/ sells the bushings to tighten everything up.

The first step is to modify the frame tunnel so that the 911 shifter can bolt down. It is best to have the actual clip of the tunnel from a 911 but I didn't have this option. The 911 shifter uses two front bolts and one rear. The tunnel is flat and wide enough for the rear mounting bolt to fit; simply drill and tap. The front, however, is more of a challenge! The tunnel curves down too abruptly for the shifter to bolt down. The solution is to weld in some material to box this area in. Cut pie like slits into the metal needing to be boxed in. Next, pull the metal out and using body tools form it into a box shape. Next, a scrap piece of 14 gauge steel was welded in. Weld up the pie cuts and the piece of strip steel then dress off.

The problem; flat shifter base-flange vs. round tunnel.

Tunnel boxed in, rough.

Here the welds are ground smooth.

The shifter now fits the tunnel!

Repeat the above outlined shifter flange steps again for the right side of the tunnel. The curve of the tunnel and shifter flange area is less abrupt on the right side so less work is required. With this step finished the shifter now bolts down to the frame tunnel.

The next step is to connect the shifter to the transaxle. The Porsche shift rod is a much nicer piece than the Beetle shift rod. The Porsche rod has a pivoting rear coupler with splines that telescope in the actual shift rod for for/aft adjustment.

The front of the shift rod uses a right-angle link piece that connects it to the bottom of the shifter. The shift rod is almost six inches too short to work right from the start with a 68+ pan (remember early pans have the shifter further foward). It also does not have enough S-bend down to interface with the transaxle. The rod must both be S-bent down and also lengthened.

5.5" length of 1" OD pipe to extend the shift rod.

The shift rod after S-bending and lengthening.

Close-up picture of the extra length welded in.

Polished 911 rear shift coupler with new rubbers

Once you have the tweaked shift rod installed inside the tunnel it is time to build a shift rod bushing support. I bought a new shift rod bushing from Pelican Parts and built a sheet metal bracket to host it. The bracket has to be welded inside the tunnel exactly like the stock beetle support. You can't use the beetle part because the 911 shift rod is 1" OD vs. the Beetles .75" OD (approximate, actual numbers are metric). I cut a window in the side of the tunnel to position the shift rod support, and welded it in place. It helps to drill holes through the top of the tunnel and pseudo spot weld through them (welding upside down through the window cut in the side of the tunnel isn't easy).

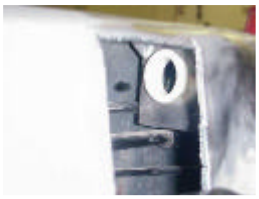
911 shift rod bushing left, Beetle right.

Layout the pieces for the new bushing support

Fabricated shift rod bushing support to be welded into the tunnel.

Bushing support tach welded in place.

View of the bushing support from side.



Now the shifter is installed, the shift rod is in place and positioned in the bushing and all is hooked up. At this point your shift rod will probably be a bit too long or two short to work. It needs to be fine tuned. Bugpack Products 5528 is an adjustable shift rod kit. It works just like an adjustable pushrod so that you can have a small amount of adjustment. You can purchase one or built your own. Hopefully you can get all five gears plus reverse now!

You can use stock length axles with the 901 because it is close to the same width as a stock transaxle (unlike a Bus tranny conversion). This makes the conversion simple in one respect at least. The flanges on the early 901 transaxles are sized the same as a Beetle T1. The difference is they have four bolts and two dowels. The easiest solution here is to Timesert the flange so that it uses six bolts. This must happen if using the early small flanges or the late 911/01 (930 size) flanges. It is also possible to weld, drill, and tap the holes which formerly hosted dowel pins. The last choice is to drill out the CV joints and use dowel pins. The simplest is to just Timesert the flange.

T-II on the left and Lobro 930 on the right.

T-II left, 930 right. 930 CVs are thick!

- Option 1:
  901 flanges, beetle CV Joints inside and outside, beetle stub axles, and beetle axles. It doesn't get much simpler than that!
- Option 2:
  901 flanges, beetle axles, Beetle CVs on the inner, and Bus on the outer. To use Type 2 (Bus) outer CVs you need early Porsche 944, Type 181, or aftermarket stub axles. The outer T2 joint is slightly thicker. The solution is to machine the joint to a thinner dimension, modify the axle, or just buy full floating beetle length Sway-A-Way axles which don't have the problem (because of full floating splines).
- Option 3:
  911/01 flanges, Sway-A-Way beetle length axles with Porsche splines (unlike the above two choices which are VW splines), 930 joints, and ERCO aftermarket Chromo. stub axles. This is the strongest solution, but also the most expensive and heaviest.

Here are other Porsche transaxle articles.

Typ Vier Zentral Porsche Transaxle Installation

Michael Ghia's 901 Installation

Cal-Look.com Porsche 901 article

Any question, comments, or suggestions ? Send them to me.

Steve Arndt
stevearndt@cableone.net

Print this article (pdf)