

To DIY or Not to DIY?

By Jack Harding

While an article in the HOD newsletter is certainly no comparison to the work of Shakespeare, at least not when written by this author, I can't help but mimic Hamlet's soliloquy with my own twist "To DIY or not to DIY, that is the question." I'm using the DIY acronym in the popular sense, Do It Yourself. Why would a person want to do it themselves when it comes to Porsche maintenance and repair?

There are many reasons I imagine, but for me it's a sense of interest and involvement with my beloved automobile that keeps me passionate about doing my own automotive work. An example that helps me to explain my interest is to think of driving a manual transmission. Some enthusiasts really desire to have an extra level of connection and control with their car. The pleasure of rowing through the gears is a key element of their driving excitement. People like this couldn't bear to have an automatic transmission do all the shifting for them. That's how it is for me when it comes to working on my own cars, I don't do it because I have to, but because I love the technical learning and hands-on engagement. When I've completed a project, I have a sense of satisfaction with having taken good care of the car.

My dad, being a nuclear machinist for the Naval Shipyard, was good at mechanical work. He passed his skills for tinkering on to me. He did all his own work, and I was usually required to help him. In high school I took an automotive repair class, where I learned how all the systems in a car function. After high school I earned an electronics degree from a local technical college and followed a career as a traveling electronics service technician. That led into a career of working for a major boat manufacturer as an electrical engineering technician. At Bayliner I learned to transition my electronics education from fixing stuff to designing electrical systems. That is where my 25-year career of electrical engineering design started, although that has transitioned to Boeing and NASA over the years. For me the question of "To DIY or not to DIY" hasn't really been much of a question at all. I feel like I was born to DIY, I've worked on all the cars I've ever owned, including my 911.

While this is not the case for everyone, there are three parameters that I believe to influence a decision to perform our own maintenance. I call them the three “T’s”: Time, Talent and, Tools. The first attribute is Time. We’ve all got the same 24 hours in a day, but we have different responsibilities and priorities, so assessing if you have the time is the first step in deciding to do your own work.

The second attribute is Talent. Talent for the task is widely variable among people as well, but a willingness to try often earns the experience that matures into talent.

The last attribute is Tools. Having the tools to complete a job is another factor of working on your own projects. I tend to offset the cost of tools with the savings on labor when I do my own work, so lack of tools usually doesn’t slow me down. These three “T’s” typically lead me to doing things myself. If I don’t have the talent, then it’s just a matter of learning and being willing to try something new. If I don’t have the tools, then its just a matter of budgeting and getting those tools. Budgeting for tools is really no different than budgeting for expenses when paying a shop to do the work. If I don’t have the time, then it’s just a matter of understanding the priorities in my life. Perhaps I do need help from someone else or maybe my task can wait until it fits my schedule a little better.

An enjoyable part of working on your own vehicle is to better understand how it works. There are a number of places to gain this knowledge. You can find a lot of information on internet forums; Rennlist.com is a good one for Porsche. Another great online resource for maintenance procedures is ecarguides.com. They have a number of Porsche maintenance procedures just waiting for you to use them. Your local library might also be a great free resource, as they have a variety of printed service manuals and automotive technical books to learn from.

A super helpful resource at Alabama libraries is the use of Chilton online manuals. Modern Porsches are limited in this offering, but most other manufacturers and some older Porsches have full service manuals with electrical diagrams. This is available at your fingertips. All you have to do to use the free Chilton service manuals is to log in via your library’s website, from the comfort of your own home. I use this resource a lot for the non-Porsches in my garage.

Of course, we can't forget the obvious YouTube. There is a lot of free content available there. I use this resource as well. In fact, I even post many of my projects on my own YouTube channel <http://www.youtube.com/@jackharding98>. One recent project I posted to my YouTube Porsche playlist is the PDK transmission service. My 991.1 has a Porsche recommendation to service this transmission at 10 years or 100K miles. While I only have 50K miles on my 2012 911, it was due for service. I began researching what it would take to complete the job. I used three key resources. Ecarguides.com was a late find, but turned out to be very helpful. I also used a digital copy of the Porsche service manual that someone shared online several years ago. Last but not least, I learned a lot from a really informative YouTube channel, one that every Boxster owner especially should know about, <http://www.youtube.com/@jeffrichardson7677>.

Servicing my PDK was somewhat similar to many other transmissions I have serviced. However, I teamed up with Richard from our club and we made a bit of a research project out of it. It took longer, but it was a good time together. Before I began, I familiarized myself with the Porsche procedure ensuring I understood the specific fluids and the capacity of each required. I also ensured I had any special tools needed. A quick note on this is that most manufacturers will be very specific on factory tools required and Porsche is no different. Often however, these tools can be substituted by a common tool. A good example for this procedure is the fluid pump. Sucking fluid out of a bottle is not rocket science and any fluid pump will do, no Porsche specific tool required for that, although they do specify one.

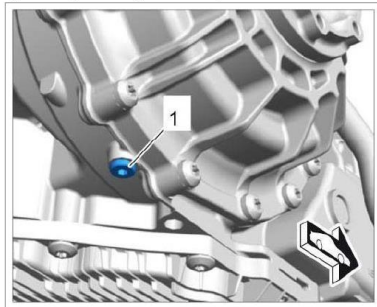
The following is an overview of the process I performed; it is not a complete procedure. If you'd like a complete procedure I would refer you to the Porsche section of ecarguides.com. This process wasn't a difficult task for me, but you should consider your own skillset and determine if you're comfortable undertaking a task like this before you begin. It's also fair warning to share that I've heard stories of Porsche dealers and service shops that allegedly had difficulty with this process, resulting in destruction of extremely expensive PDK transmissions. That ought to scare the jeepers out of anyone! My overall results have been good so far, although my experience wasn't without issue. Read on to learn more about that.

With the process instructions printed out and all the fluids on hand, I began by loosening the fill bolt for the transmission final drive gear. I did this first to ensure I would be able to refill the transmission after draining it. I didn't want to drain all the fluid and then discover an unexpected reason I couldn't refill it. The second reason I always do this step first is to check if my fluid was at the proper level before I drained it (This will matter when I measure it later).

My PDK transmission has two fluids inside it: a final drive gear oil (75W-90) and an automatic trans fluid that Porsche refers to as "clutch oil"; it's a Pentosin FFL-3 spec. I chose to drain the final drive gear oil first because the process involves idling the wheels at slow speed, while the PDK fluid needs to be filled with the trans warm but not hot.

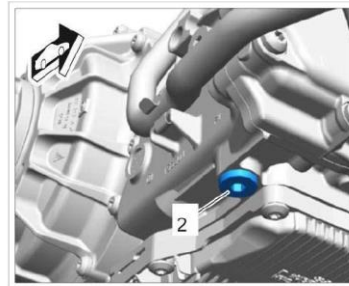
Draining the gear oil involves removing two different drain bolts.

Fig 2: Removing Oil Drain Plug For Differential Space



Courtesy of PORSCHE CARS NORTH AMERICA, INC.

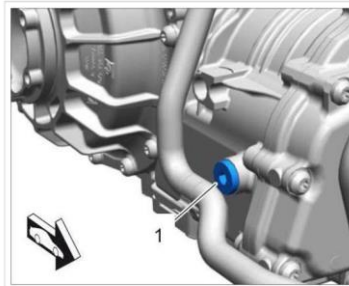
Fig 3: Removing Oil Drain Plug For Gearwheel



Courtesy of PORSCHE CARS NORTH AMERICA, INC.

After draining the gear oil from both drain ports into a clean container that I could also use to measure how much came out, I re-installed the drain plugs. At the fill port, I used a fluid pump to pump in three liters of Motul Gear 300 75W-90 racing oil that I purchased on Amazon. Then I re-installed the fill plug.

Fig 1: Removing Oil Filler Screw/Inspection Plug



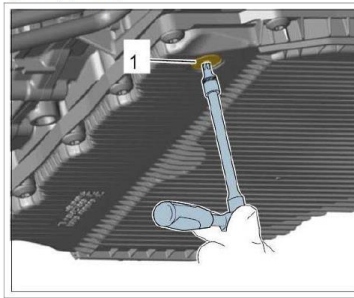
Courtesy of PORSCHE CARS NORTH AMERICA, INC.

After elevating the wheels, I started the car and put the transmission into manual first gear and began idling the transmission for two minutes. While allowing the wheels to rotate at engine idle, I monitored the transmission temperature on my

scan tool. Because the oil expands at warmer temperatures, you're supposed to perform your final fluid level check with the transmission warm at a range of 89-104 F. Ensuring my temp was where I wanted it, I returned the car to a level position and removed the fill plug to check the gear oil fill level. The gear oil should flow out in a small trickle when the plug is removed, that's how you know it's at the correct level.

After the gear oil was replaced, then I moved on to the PDK fluid. I removed the fill plug from the transmission first for the same reason as already explained, then I removed the drain bolt from the transmission pan.

Fig 1: Identifying Drain Plug



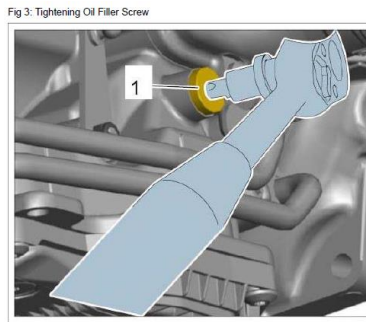
Courtesy of PORSCHE CARS NORTH AMERICA, INC.

It's worth noting that on a 991.1 PDK, this pan has a filter built in and Porsche recommends replacing this pan at the service interval. This pan is about \$400 on Pelican parts. There is a Beck/Arnley aftermarket filter available on Amazon for \$90. I purchased the Beck/Arnley filter to compare it against my factory filter. My intention was to return this part if it didn't appear to be as good as my factory filter. It looked equivalent to me in every way, so after making a YouTube video comparing the two, I installed it.

There are 13 aluminum pan head bolts that secure the pan in place. I learned that Porsche isn't joking about needing to replace them with the new pan. They are very weak and not designed for a second use. Before removing these bolts, it's best to treat them top and bottom with penetrating fluid. Then I carefully removed them. While I was very careful, I still had three bolts that broke on me. That was stressful and I had to very carefully drill them out and re-tap those holes. Thankfully it all turned out fine, but I definitely was sweating it for a bit. When I re-installed the pan, I chose to use steel bolts that had the same dimensional specs as the factory aluminum bolts. The steel bolts are stronger and won't break next time I perform this service. I purchased them on Amazon.

My PDK has a six-liter fluid capacity, however not all of the PDK fluid comes out during the service. I drained the fluid into a clean container so I could measure exactly how much came out and so that I could visually inspect the old fluid (I did this with the gear oil, too). I inspected for color and smell that might indicate something other than normal wear.

After I drained the PDK fluid and replaced the transmission pan, I pumped in 4.3 liters of Porsche PDK FFL-3 fluid that I purchased from Pelican Parts online. Then I re-installed the fill plug.



To check the level, I started the car and shifted between P, R, N, D a few times with my foot on the brake. This actuated the shift solenoids and got fluid where it needs to be while warming it up a bit. Of course, I monitored my scan tool and ensured the transmission was in the proper temperature range of 89-104 F. Shutting the car off, I got back under the 911 to remove the fill plug. Fluid began to flow out in a small trickle so I knew it was at the proper level.

Having replaced the same amount of fluid as I took out was an extra measure of comfort for me. That is why I like to check that my level is correct on the original fluid before I begin, then I measure what comes out so that I have a reference of what I need to put back in. Capacity specs aren't often what's required on transmission fluid changes because a fluid drain doesn't get all the old fluid out. It's typical for fluid to be trapped in torque converters, valve bodies and fluid spaces inside the transmission.