

## The Nutty Professor's Service Manual Basic Servicing Part (6) – Exhaust Renewal

Afternoon everyone. As I sit here typing this, the sun is shining outside and it seems summer is truly here at last. One of the more regular jobs that I seem to find myself carrying out on a fairly regular basis is the replacement of the exhaust. And this is definitely the weather to be doing it in. If like me your VW is a daily driver, then you'll probably be an old hand at replacing the exhaust, as they don't last long. In fact, I've got a yoghurt in my fridge that's lasted longer than my exhaust.

As the VW air cooled engine runs considerably hotter than its water-cooled counterparts this tends to cause the exhaust to deteriorate a lot quicker than you would otherwise expect. This coupled with the fact that a lot of the aftermarket exhausts that you can now buy, although cheap, are not particularly good quality and usually only last about a year and a half of daily driving. You can prolong the life of the exhaust a little if you stripe off the paint on the exhaust and spray it with exhaust paint and then wrap it in exhaust paint, but for the extra couple of months of life that this might give you, it's a lot of work and expense (exhaust wrap costs more than the bloody exhaust) for very little gain.

Once again, as per previous articles, this article is based on Kirsty's 1976 1300 air-cooled VW beetle, but most VW's are very similar. And in the case of exhausts, there are loads of different types you can install. In this example we will be removing and installing a stock exhaust.

### Exhaust – Removal and replacement

**Difficulty Rating:** Dead Easy. If you are capable of undoing nuts and bolts, you can do this. It really is that easy!

**Approximate Cost:** New Stock exhaust = £36 (approx), Exhaust fitting kit = £4.50

**Tools Needed:** *Socket set. A open ended spanner set. Screwdrivers both Phillips and flat head, and possibly a junior hacksaw, grinder or other tool capable of cutting bolts. Something like a Dremel Multi-tool is brilliant for the job.*

**A foreword:** Do not in any way be scared of attempting to replace your exhaust your self, and here's why. The first vehicle I owned was a 1975 VW Camper and what I new about mechanics could be expressed in two words "Fuck All". It came to a point where my exhaust was sounding more like a tractor or Shirman Tank than a stock VW exhaust, so I went to my then local Quick Fit to get it fixed. They couldn't give me a price right there and then, so asked me to come back the next day once they had a chance to get a price on the parts. So the next day I popped in to be presented with a quote of £699 including fitting! When I asked why, the guy told me that they are expensive parts and that "*These air cooled engines are very tricky to work on*". Well I told him I'd have to think about it and left, as I had no knowledge mechanics and certainly didn't have that sort of money to spend. I then

decided to find out what was involved in doing the job myself. I was shocked! I could not believe that a garage would charge so much money for something that was so easy to do, and the exhaust only cost me £36, plus a few quid I spent on some tools. After this I had a go at every job I could on my van before considering taking it to a garage. The money I have saved over the years must be thousands, and I actually ended up really enjoying myself in the process.

Right, lets get stuck in. Make sure the exhaust is cold before you begin to save you a trip to the local burns unit. If you can jack up the rear of the vehicle and put it on axle stands, it will make life a whole lot easier for you. You don't have to, but it makes a big difference, as you will be lying under the engine to do this. Also, it is considerably easier to complete this if you have someone to help you. Simply to hold the exhaust in place as you do up the bolts etc. You can do it on your own, and I have many times, but it's better to rope in an assistant. Though getting an unwilling begrunted wife/partner/significant other to assist you will become more of a hindrance than help, as you'll only end up sleeping on the sofa after a blazing argument in front of the all the neighbours.

Once you've raised the rear of the vehicle, open the engine bay and disconnect the big cardboard/plastic hoses that go from the fan housing and the air filter to the tin ware at the back of the engine bay (the back of the engine is nearest you as you look in the engine bay).

You now need to remove the tin ware at the rear of the engine. Firstly remove the engine compartment seal (if you have a van). This runs between the tin ware and the edge of the engine bay to fill the gap and is usually made of foam (you do not need to take it out completely, just the bit around the rear of the engine). Some engine bays have a rubber seal which is connected to the actual body of the vehicle and does not need removing. Now unscrew the screws holding the tin ware in place around the rear of the engine. This is held in with a series of bolts or screws at various points around the engine bay. You could have any number of these from none to about eight. If you have a camper where the rear lower external body panel is removable, remove it now. It will make things so much easier for you. With all the tin ware screws undone, the tin ware should come out. It may well be in two, three, four or even five parts and can be a little fiddly to get out as it is an awkward shape, but with a little waggling back and forth, it should come out. Do NOT bend it! Also, make a mental not of where each piece (if there's more than one) goes in the engine bay, and in what order (they will overlap each other) otherwise you'll be pulling your hair out when it comes to putting them back in.

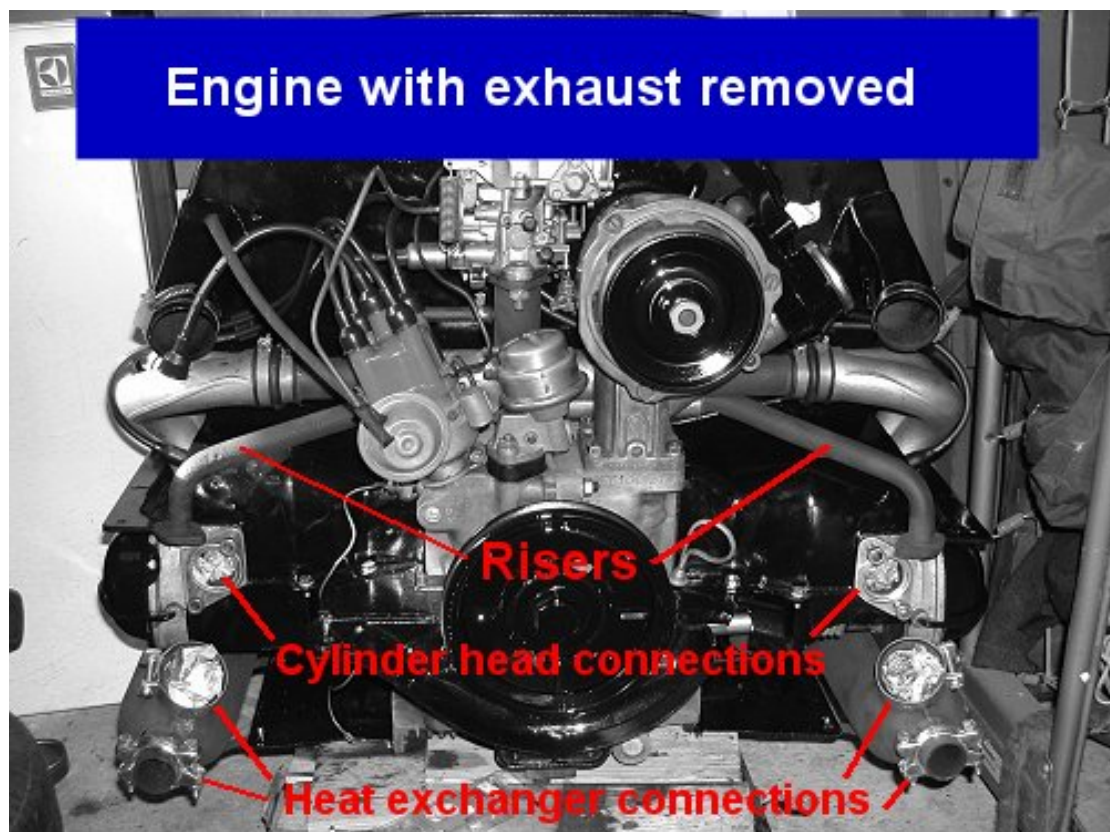
Once you have the tin ware removed, you can see the exhaust through the engine bay. The exhaust is connected to the engine in eight places on a stock exhaust (your exhaust may differ if you have a different exhaust). The two lower connections are on either side and connect to the lower part of the heat exchangers (heat exchangers are the funny fat tube shaped things that run either side of the engine). They are secured with metal clamps, held in place by two bolts on each. Get under the engine with a couple of spanners

or sockets (10mm) and undo these metal bolts and remove the clamps. However, the chances are that these bolts are rusted in place, due to the constant heat of the exhaust. You may well have to cut through the bolts to remove the clamps. You get a new set of clamps and bolts in the exhaust fitting kit so don't worry. I have found that one of those Dremel Multi-tool things is absolutely brilliant for this task as it is small enough to get up under the engine bay to cut through the bolt. A grinder may be too big to get access. You might find that the bolts unscrew easily and don't need to be cut, but this is unlikely.

Just above the two lowest connections, you will have a larger connection to the heat exchanger, usually with a large clamp held in place with a screw. Undo this. There is one on each side of the engine.

Now we need to disconnect the exhaust where it connects to the preheat pipes or risers as they are sometimes called. You may find that there is a small piece of tin ware covering the connections, held in place with a couple of screws. Remove this tin ware to gain access to the nut and bolts underneath. On many engines, this tin ware has long since been lost. With the tin ware removed you will be able to undo the 10mm nut and bolts either side of each preheat pipe. This can be fiddly as there is not a lot of room to get the spanner in there, but you'll get there in the end.

Now remove the 13mm nuts securing the remaining connection to the cylinder heads, either side of the engine. These will again be tight and probably rusted in place, but must come off without damaging the studs that they are on. Try soaking them in WD40 while you go make a cup of tea so they have a chance to loosen a little before attempting to get them off.



You should be able to now pull the exhaust backwards off of the stud, and remove the exhaust out under the vehicle. If it does not want to budge, give it a few taps with the gentle adjuster (hammer) to loosen it. Once the old exhaust is removed, you need to clean up all the points where the exhaust connects to the engine. Make sure all the old gaskets are removed and the areas are thoroughly clear of debris. A wire brush is great for this. The hardest part to clear is the lowest connection to the heat exchangers. This consists of a tube protruding out of the bottom of the heat exchanger. This tube (about an inch in diameter) should be completely straight on the outside. What I mean is you need to slide a new gasket over it, so there must not be any deposit around it. There usually is! This is because where the old clamp was held in place the old connecting gasket welds itself to the outside of the tube over time. If you're lucky, you'll be able to remove the old gasket deposit with a wire brush. If not, you may well have to use a file to rub away the deposit. But be careful not to damage the heat exchanger pipe itself, or you'll be buying a new heat exchanger!

Once all the connecting parts are clean, it's time to fit the new exhaust. It's always a good idea to trial fit the exhaust in position before you bolt it all up, just to make sure everything is going to fit correctly. Now it's time to start swearing. The reason being that, it won't fit right. Let me explain. I've probably fitted somewhere in the region of fifteen exhausts over the last few years and not one of them fit right first time. Due to the inferior manufacturing processes of many of the exhausts on the market now, you usually find that all bar one of the connections will line up, and the last one just requires a bit of brute force and ignorance to hold in place (usually with a breaker bar being used as a crow bar) and a willing assistant to help do up the nuts and bolts while held in the right place. This is why it is a big advantage if you have someone to help you when fitting your exhaust. You can do it on your own, but you may have to be a little inventive when it comes to getting things lined up and putting the bolts in at the same time.

Open up your exhaust fitting kit and take a look at what you get. It should consist of a series of nuts and bolts, gaskets and a couple of clamps. Two of the gaskets are thicker than the rest and are made of what looks like a compressed wire brush material. These go on to the two lower heat exchanger tubes. The old equivalent of these were the ones you were filing off earlier. You will also have a metal angled washer that fits up snug to these gaskets. These must go on first, then the wire gasket, and the clamps clamp over the outside holding the curved lip of the new exhaust against the gasket and metal washer, thus sealing the two pipes together. The test fitting of the exhaust will also show you how far on you need to push the gasket and washer onto the heat exchanger tube. Try not to deform the gasket as you push it on. It should be a tight, but not impossible to move fit. Get all the gaskets in place and the nuts and bolts fitting but not tightened up. Then it's just a matter of gradually tightening up all the nuts and bolts. It really is that easy. Once you are sure you have everything clamped up tight, it's time to refit the engine bay tin ware, connect the air hoses from the fan housing and start the engine. Some people prefer to connect everything up and leave the tin ware out to start with so they can have a good view and access to any potential leaks. It's up to you. When you start the engine it will smoke and

smell a lot. Don't worry it's just a combination of the paint burning off the inside and outside of the exhaust as it heats up, and probably the label that you neglected to peel off the outside smouldering. Leave the engine to warm up for a few minutes and get you willing assistant (slave) to give it a couple of revs while you look at the connections for any sign of leaks. Be careful at this point, as the exhaust gets very hot, very quickly! If you have not yet put your tin ware back in, it's a good idea to wait until the engine has cooled down again before reinserting it.

That's it. You're all done. You will probably find that the exhaust smells a little funny for the first few miles, as the paint, etc burns off. P.S. If you can smell the exhaust while you're driving this means you have a leak (hole) in the heat exchanger, which supplies hot air for your interior heating. It will be a hole on the inside of the heat exchanger that you cannot see! The only real solution is to replace the heat exchangers, which is easy, but means removing the exhaust again.

So go treat yourself to a cup of tea, beer or whatever your particular tippie is, safe in the knowledge that you just saved yourself a hefty garage bill.

Until Next time..

Simon (aka The Nutty Prof)