

# Changing Brake Pads in Porsche 996 Turbo (and other "Big Red" installations)

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After I ran my car on the track the first time, I decided I wanted to switch to a more aggressive pad for the track. On the advice of others I chose [Pagid Oranges](#). Installation of pads is very simple, but the anti-rattle hardware alters the "quick change" story a bit. Still, after having done it now 4 times (Pagids in to bed them with no anti-rattle clips, street pads back in with anti-rattle clips, Pagids in for the track with anti-rattle clips, and finally post-track, back to street pads, again with anti-rattle clips. Porsche would like you to cough up a few hundred bucks for new anti-rattle clips each time - I can see no reason for this.

This is easy - it requires no special tools, and does not require you to bleed your brakes. The first time it may take you a few hours.

## What You'll Need

- Jack
- Jack stand(s) - not shown
- Torque wrench
- Porsche wheel lock socket
- Plenty of rubber gloves (you need to get in and out of the car after each wheel, and you may want to take your dirty gloves off for that. They also tear easily.)

- Needle nose pliers
- A punch to drive the pad retaining spring retaining pin out (It doesn't take a lot of pressure - but I ground the tip off an old Phillips screwdriver to make a larger surface anyway. A plain old Phillips screwdriver will do in a pinch.)
- A hammer or mallet to do the tapping. (You see I'm using a carpenters hammer - it ONLY contacts the screwdriver handle, so this is OK. You do NOT want to hammer on your calipers! If you have a soft mallet this is a good place to use it.)
- Water-pump pliers or other large adjustable-jaw-size pair - I use them between the pad backing plates to spread the calipers. Of course you COULD go out and get a real caliper spreader, but you'll find most of them are designed to work AFTER the pads are out - and if the anti-rattle clips are installed (as they will be on a stock car) you won't be able to use it anyway. Trust me - this works fine.
- A stout thin object to separate the anti-rattle hardware from the pads while in the calipers. I used an X-Acto handle with a long blade, which I purposely dulled on my belt sander before use. A putty knife would work here too.
- Some high-temp adhesive if you plan to re-use the backing plates.
- Brake cleaner (do NOT use other cleaners, which may introduce harmful chemicals. Use ONLY brake cleaner for this purpose. )
- An indelible marking pen to mark the pads as they come out if you intend to re-use them - they should go back to the same location.
- Newspaper to spread under work area, a few rags you don't mind ruining.



### **Step 1: Loosen the Lugs, Jack the Car**

Loosen the lug nuts so you won't spin the wheel trying once it is off the floor. Use the factory jacking points to raise the car. Place a jack stand underneath for safety. The photo shows a good location in the front.

Remove the wheel. This photo shows the right front brake. The job will be much easier if you turn the steering wheel to the left to provide better access. Now would be a good time to spray some brake cleaner on the area and clean the caliper up a bit. (By the way, my rotors' rusty appearance is normal - I had washed the car several hours before doing this job. As soon as it is driven, the rust will be worn away.)





## Step 2: Remove the Low-Pad-Warning Sensors

Grasp the plastic bit, not the wire, and pull gently while wiggling it a bit. They are held in with a light friction fit and should come out pretty easily. You can just let them hang out of the way.



## Step 3: Remove the "Pad Retaining Spring Retaining Pin Retaining Clip" ...

Yeah, that little thing. It just pulls straight out. **Don't lose it!**

The name is long - but the clip retains the pin which in turn retains the spring.



#### **Step 4: Drive the Pad Retaining Spring Retaining Pin Out**

This pin has a shoulder on it, and can only come out one way - toward the inside. If you have very strong fingers, and the pad retaining spring's retaining pin slides easily, you can simply compress the pad retaining spring with your fingers and pull the pin. I found this difficult to do with the front brakes, but easy with the back ones. I also had one caliper where the pin's fit was tight enough that I had to drive it out even though I could compress the spring. Tap gently - the tool you use will take place of the pin and keep the pad retaining spring from popping out. Once you get the pin near to the inside edge, be careful as it will come out the rest of the way easily and go flying.



Once the pin is out, place your hand over the pad retaining spring so it doesn't go flying either, and remove your tool.

Remove the pad retaining spring and put it with the pin and clip from Step 3 - which will make it easier to find later. I spray a little brake cleaner on these parts and wipe them with a rag as well.



## Step 5: Spread the Pads

Before installing new pads, the pistons in the caliper (you can't see 'em yet) need to be pushed all the way back until they're flush with the caliper housing (the red part) - otherwise there won't be enough clearance to get the anti-rattle clips out, nor will there be enough to get the new pads in.

My method is unorthodox, but it works, and I've used it safely on many cars. I place the water pump pliers between the "ears" of the pads, trying to get as much surface of the pliers on each as possible. Then I pull the handles apart. This takes a constant strong pressure, because in order for the pistons to retract they have to force brake fluid back up to the reservoir through a small passage - be patient - maintain pressure until they stop moving.

Note that if your pads are way down, and you've added brake fluid, by the time you do this on all four corners you may force enough fluid back up into the reservoir for it to overflow. Keep an eye on the fluid and make sure this doesn't happen. I recommend in Step 12 below that you pump the pedal back up after every wheel. If you need to, draw some fluid out of the reservoir with a syringe or turkey baster. Do not re-use this fluid, and do not spill any on your paint.

The brake system remains "closed" - as long as there is fluid in the reservoir, we have only forced fluid from the pistons back up there - we have not introduced any air. For this reason, you do NOT need to bleed your brakes.

## Step 6: Separate Anti-Rattle Clips From Pads

Because I haven't yet needed to replace the anti-rattle clips I don't know for sure, but it looks like they come with some sort of peel-the-backing-off sticky stuff to adhere the clip to the



pad's backing plate. In any case, you can't pull the pads out until you separate them from the anti-rattle clips. This will be much more obvious once you get them out, so just trust me for a moment.

I used the knife I described above - but a stiff piece of plastic, a putty knife, or similar object would also work. The adhesive is not stout - it won't take much to separate the clip from the pad.



### **Step 7: Remove, Inspect and Mark Pads**

Remove the pads, clean the backs, and mark them. The rear pads are smaller than the fronts and easily distinguished - so you don't need to mark "front" and "rear". Just mark "RI" for "right inner" and "RO" for "right outer", for example. If these pads are ever to go back in the car, you want to put them back in the same place they came from.

The pad in this photo is one of the Pagid Oranges after track use. In 250 track miles I used about 1/3 (a guess - I didn't measure them) and the high temps burned away any trace of the orange paint they came with. Interestingly, although I followed the manufacturers bed-in procedures to the letter, the heat generated then was not sufficient to burn the paint or alter the color of the pad material much.



### **Step 8: Remove and Clean Anti-Rattle Clips**

The back of the anti-rattle clips protrude a good distance into the pistons. Now you know why they eliminate the "quick change" aspect of our brakes, and why you need a lot of clearance to get them out. The rear anti-rattle clips are different - they look like this:



In either case, note that the inner diameter of the upper piston is bigger than the lower one, so there are two different size anti-rattle clips. You might not notice this until you try to reinstall them. So I thought I'd point it out now.

Clean the anti-rattle clips with brake cleaner and a rag. Remove any old adhesive.

### Step 9: Install Anti-rattle Clips

If you bought new ones, and instructions came with them, follow the instructions. I haven't seen them, so can't comment. I wonder though how you get the pad back in without it sticking to the anti-rattle clip before it is fully in place.



If you want to re-use the old clips, it is probably a good idea to reproduce the adhesive effect of the originals. I used this old tube of Permatex Ultra-copper High Temp Silicone Gasket compound - just smear a thin layer where the old stuff was. I did this one out of the caliper to make the photo, but it is then a little tricky to get them back into place without getting adhesive on the rotor or caliper. A little won't hurt anything, but an alternative (and what I usually do) is to put a little of the goo on a gloved finger tip and apply it with the anti-rattle clip already in place. I guess it depends on whether you have skinny fingers.....

*If you're installing race pads, they are going to squeak whatever you do. You can leave the anti-rattle clips out entirely. The noise on the street is deafening - but on the track, who cares? If you need to drive with the pads on the street, the anti-rattle clips DO help. I managed to get about 300 miles on the race pads after running them on the track before they started to squeak.*



## **Step 10 - Install Pads, Pad Retaining Spring, Pad Retaining Spring Retaining Pin**

Assembly is pretty much the reverse of the steps you already did.

Note the orientation of the pad retaining spring so that the strain relief clip for the low pad sensor wires is toward the bottom. You will have to hold it down to get the pin in. Remember to align the pin so that the hole for the little clip is facing out.



### **Step 11: Install Pad Retaining Spring Retaining Pin Retaining Clip, and sensors.**

The sensors go back into place with a little pressure. Sometimes you can get them in with your fingers, some times you need the needle-nose pliers. Be sure to grab the plastic part and position the pliers so that they won't bottom out before the sense is fully seated. Make sure they are fully seated and that the wires are back in their strain reliefs in the retaining spring and the caliper itself

*If you're installing race pads, they may not have a hole for*

*the sensors. You can drill one - or you can simply cable tie the wires out of the way and leave them out until you put your street pads back in.*



### **Step 12: Mount the Wheel, Lower the Car, Torque the Lug Bolts, Pump the Brake Pedal**

NOW! Before you forget! Proper torque on our cars is about 95 ft-lbs. You should always do this in two passes, rather than tightening one bolt all the way while its neighbor is still loose. Further, you should torque every other bolt as you move around the circle - in other words, 1-3-5-2-4, not 1-2-3-4-5.

To reduce the risk of overflowing the reservoir, now is a good time to pump the brake pedal until the pistons push the pads far enough to reach the wheel with no space between the piston, anti-rattle clips and rotor. Slowly depress the pedal - it will go all the way to the floor. Release it slowly - over a few seconds, and do this again. Do not rush, just be gentle and firm. Within a few strokes you should feel the pedal firm up before it hits the floor. Pump it a few more times to be sure.

If the pads you're installing have *less* material than the ones you removed, this will lower the brake fluid level in the reservoir.



Keep an eye on the reservoir - if you let it run dry you *will* have to bleed the brakes. Top up only with fresh, clean fluid.

### Repeat For the Other 3 Wheels

The rears are handled in the same way as the fronts, however because you can't steer the wheels you'll find it will be a little harder to see the anti-rattle clips to put them back. You can get your head in there, but if you're a little older than you care to admit (like me) you might not be able to focus as close as the caliper is to your face. With plenty of good light and patience though, this is not a difficult job.

The photograph to the right shows a good jack stand location.



### Road Test, and Bed In Those Pads!

I said above my bedding-in procedure for the Pagids may not have been as thorough as it should have been. Recently I read what I consider to be the [definitive article on brakes](#), care and feeding and brake problems. I would probably work harder next time to get even more heat into the pads during the bed-in process. If you're installing street pads you might get by without any bed-in procedure at all.

**If, on the other hand, you're installing race pads, you must bed them in!!** Failure to do so can cause "green fade" on the track - this is bad news, potentially life threatening. At a minimum, failure to follow proper bed-in procedure dramatically increases the likelihood of uneven transfer of material between pad and rotor, leading to hot spots, vibration, and rotor damage. Read this article!

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Feel free to share this information. It is free! Your mileage may vary.

Questions? Email me! [greg@heumann.com](mailto:greg@heumann.com) (Sorry, you can no longer click my email address. I've changed it to an image to reduce SPAM.)

[More pictures of Greg's 996TT](#)