

All I needed was a brake job

By Wes Fleming #87301



THERE ARE A number of ways to upgrade the brakes on your motorcycle. The easiest way to improve your brakes is simply to

flush the system with fresh brake fluid and give it a good bleed; we've addressed bleeding technique in a number of Nicht Uber Max columns in the past. There are, of course, a number of other options ranging from rebuilding your calipers to replacing the master cylinders and brake lines.

The option I chose for my brake system upgrade was to upgrade the stock brake rotors. This isn't the place most folks start looking to upgrade or update their brakes, but it's where I started simply because of expedience. We had a customer who ordered a set of brake rotors for their bike, then sold the bike before they came in. Instead of putting them on the shelf and letting them sit, I paid for them and decided to put them on my 2005 R 1200 GS. At the same time, I put on new brake pads. I wasn't really due for new pads, but most manufacturers recommend new pads when installing new rotors.

The new brake rotors I used are Wave rotors made by Braking. Braking is an Italian company making brake components and other motorcycle parts, and they're the ones who first came up with the wave-style brake rotor concept. The idea is

simple: eliminate the parts of the brake rotor the brake pads don't come into contact with. Because the edges of the brake pads are more or less straight, there's a lot of wasted space on the typically round rotor.



This rear view of the Wave brake rotor shows the contoured outer edge and one of the cutouts that helps cool and clean the pads.

Wasted space means excess metal, and excess metal on a motorcycle means excess weight—in this case, unsprung weight (that is, weight not held up by the suspension of the bike). Reducing unsprung weight improves handling, and thus the Wave brake rotor was born. Braking claims the slots and gaps in the rotor aid in keeping the

pads clean, dry and cool as well.

I chose brake pads made by Scandinavian Brake Systems, a Danish company. SBS came out with a new brake pad for motorcycles, and the 796 SP pads are the proper fitment for my GS. These are sintered pads and part of SBS's Street Excel line, meaning they are meant for high-performance street use. I don't know if my riding lives up to the term "high performance," but I often ride in the I-95 corridor near Washington, D.C., so I also often need immediate and reliable stopping power.

You might wonder, like I did, what a "sintered" brake pad is. My research turned up two types of brake pads for motorcycles, sintered and organic, with a hybrid called "semi-sintered." Sintering is a process, not a material. Sintered pads are made by putting a powdered mix of metals into a mold, then subjecting the powder to heat and pressure in specific, measured amounts to create the brake pad. Organic pads are made in a similar fashion, but they use organic materials like carbon and resins mixed with fibers like Kevlar to create the pad. Semi-sintered are what you'd expect, a blend of materials used in both sintered and organic pads.

If you ride an Airhead, you may well have organic brake pads (or shoes) on your bike. They feel a certain way; to my hand and foot, they have a more gradual feel, coming in a slower, more measured fashion. They may not stop you in a hurry, but they will stop you, so you have to understand how they work and use your brakes accordingly.

When you absolutely, positively must stop as quickly as possible, you should be looking at sintered pads. They have quick,

immediate bite letting you know you've hit the brakes. They can feel grabby, especially when first installed, and so your braking technique becomes important in the initial stages of slowing down. Sintered pads may take longer to wear down, but they're harder on rotors than organic pads, so it's best not to use sintered pads with rotors meant for organics. (They'll still work, but you'll wear

want to get a set of new rotor bolts for each rotor from your BMW dealer; BMW states the bolts are single use only, so they should be replaced every time you take them out. It helps that BMW prepares each bolt with thread locking compound, which is why a heat gun comes in handy when taking the bolts out.

Two common tools make this job easier.



Use an old tire to make a stand for working on your front wheel. Avoid putting the brake rotors directly on a hard surface such as a metal work table or concrete floor.

out the rotor more quickly.)

Having satisfied myself I made a good choice with SBS's new sintered pads, I went about changing out my old rotors (which were thinner than BMW says they should be) for the new Braking Wave rotors.

As far as upgrading your motorcycle goes, changing the brake rotors and brake pads is a job most of us can handle in our garage or driveway. Whenever you work on brakes, you should wear gloves and be careful not to breathe in brake dust; that stuff can cause all sorts of health problems.

The new rotors came with all the washers they needed, and only the front rotors get the washers. The rear rotor for my GS bolts to the same star-shaped flange the wheel bolts to, just on the opposite side. You'll



Modified long-necked T40 bit for the bolts on the rear rotor. It's not an absolutely necessary tool, but it makes the job easier.

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The first, a heat gun, is easy to come by. The second isn't required, but it helps when changing the rear brake rotor on bikes where the rotor is part of the final drive assembly rather than attached to the wheel. For my generation of bike, the place where the T40 bit fits in is small, too small for you to use a standard T40 socket. A T40 with a long neck makes the job easier, and you still have to be careful the edges of your long-necked T40 socket don't scratch and scrape up your final drive housing. I took a hint from my boss, George Mangicaro, and had a friend with a lathe make the neck round for several inches and thin it out a bit so I could use it more easily. The key is to take your time; the more you slow down, the less likely you are to damage your final drive housing.

Fitting the new rotor is a little fiddly, so take the time to puzzle it out. Install the rotor bolts one at a time, running them in far enough so you can rotate the assembly without the heads catching. Once you've gotten them all started, snug each one gently as you go around the circle. BMW specs two torque values for these; one is lightly set, the other is the final torque. Do the lower setting all the way around, then the higher one. Being methodical prevents any warping of the rotor. Be sure to use your torque wrench!

Removing the front rotors is straightforward, and you can use any tools you want as long as they fit. Hit one of the bolts with a heat gun for about a minute, and it should spin right out. Make sure you remove all the existing washers and check the threads in the wheel for dirt or bits of old thread lock. Clean out anything in there—gently!—with a pick. Refer to the assembly instructions with your new rotor to see what order the washers go in. Don't forget which side of the wheel the ABS ring goes on or where it goes in relation to the rotor. I like to take a photo with my



The cutout on the final drive makes accessing the rear brake rotor bolts one at a time possible, but it's a tight fit. Using a standard (short) T40 bit could result in stripping out the heads of the bolts.



Installation is the reverse of removal, so pay close attention to the order of the components. Mixing up where the ABS sensor ring goes could adversely affect the functioning of your ABS unit. Even what order the washers are in is important.



The thin metal arm that fits into the caliper and over the pads keeps pressure on the pads and prevents them from vibrating, thus cutting down on noise.

phone as a reference before I take things apart; that little tip has saved me more than once.

Fitting new brake pads, at least on the front calipers, would be easier if you had three hands, but regular two-handed people can get it done quickly enough. If it's been a while since you replaced the pads, you might find it worth your time and money to get what BMW calls a "pin kit." It's a little bag of parts that includes some metal pieces to keep pressure on the pads, a cotter pin or two, and a new brake pad pin. It's this last bit that's especially handy, because the brake pads slide along it. If yours are rusty like mine were you're going to have to take the time to clean them off. Rusty pins are not conducive to maximum brake performance. Don't forget to lightly lubricate the pins before reinstalling them along with your new brake pads.

With both new brake rotors and new brake pads in place, I carefully test rode my bike, being sure to gradually apply the brakes. Common wisdom is you should take it easy for the first couple of hundred miles any time you change brake components to allow them to bed in—that is, to allow the components an opportunity to fully settle into place and against each other and start to operate at peak efficiency. I also like to check all the important fasteners the next day to make sure I torqued them all properly, especially those wheel, axle and pinch bolts.

I was amazed at how much the Wave rotors and SBS pads improved my braking. Once I felt the components were sufficiently bedded in, I headed to a public school parking lot on a Sunday to practice quick stops. The pads showed little or no fade after a solid 30 minutes of hard, short stops, and I feel SBS got it right with the compound of these pads. Initial bite is strong and predictable; I never felt they were grabby at all. They didn't perform any differently after they got hot, and I'm confident they'll continue to perform well in any conditions I might find myself riding.

The Wave rotors look fantastic, but I'm not sure what the ratio of performance improvement between the rotors and the pads are. This is my first ever set of



Always balance your wheel after doing anything to the wheel. Even if all you do is remove the rotors to clean them and put them right back on, balance the wheel. You may not have put the rotors on in exactly the same orientation as they were in when you took them off. (Thanks to Dave Carmean of Moto Europa near Richmond, Virginia, for the shop space and assistance.)



Inspect, clean and replace rusty components and again, pay attention to what order the parts are in when they come off. ALWAYS use a torque wrench and look up the torque specifications for things like the fork pinch bolt and front axle, shown here.

non-OEM brake rotors, so I expected improved performance, but I'm not sure how to measure it. I probably should have started with my old pads on, but I doubt I'd have had the patience for a lengthy experiment of that sort. I feel confident with my new brake components, and I wouldn't

hesitate to recommend either of these products to any rider who asked my opinion on what to put on their bike.

There's a video, of course, and you can watch it by pointing your web browser to tinyurl.com/R1200GSBrakes. ☺