

The Mother of all Brake Pad Reviews

For obvious reasons, dragging brake pads can be bad for fuel economy and pad longevity. To find the problem, it helps to have an obsessive-compulsive personality

Story and Photos by David Booth



Trust me when I tell you that this didn't start out to be a product test. Really, it didn't. All I wanted to do was install a set of new brake pads.

I was in a hurry and I was heading to Montreal in the morning and, for whatever reason that happenstance always occurs at the most inopportune time, I checked my front brakes.

I found the brake pads thin. Dangerously thin. Not nearly enough pad material to get me through a 10-day, 2,000-km sojourn. Not the way I like to exercise twin Tokico monobloc calipers.

So, at 10 p.m. at night, I slapped in a pair of new EBC FA379 HH pads – a surprisingly easy process except for a couple of brake-pad holding pins made stubborn by corrosion – I just happened to have lying around because, well, preparation is really just paranoia put into action. In bed by midnight after a quick test around the block, I was ready for the long haul the next morning.

What a Drag

Except that halfway to Montreal, I noticed that fuel economy, usually a steadfastly reliable 6.0 L/100 km on the highway, was about 0.5 L/100 km high. Curious that something was amiss, I checked the front discs at the next gas stop and, yup, the front discs were warm even though I had made sure not to use them to stop at the pumps. I had me some brake drag.

So, I popped the big Strom on its centre stand, unweighted the front wheel and gave the tire a spin. Barely a single revolution. I didn't know how freely it should spin or how freely it had spun before I changed the pads, but I was pretty sure this was not good news.

Once ensconced in Quebec cottage country, instead of immediately dipping into mandatory mojitos, I popped the EBCs out again. I figured that in my hurry to get some shut-eye the night before, I hadn't cleaned the exposed portions of the piston and some grit was lodged in the seals. So, spare toothbrush seconded to – don't tell the wife – motorcycle repair, I pushed the



While it's near impossible to see in a photo, there is a small ridge where the original brake pad surface stops. It could be that if the aftermarket pad is not mounted in the exact same place on the backing plate as the OEM pad then this could make the new pads drag.

pistons out (a couple of squeezes of brake caliper without the pads in place) and soaped the hell out of them. Once again pristine, I pushed them back into the caliper – thank you, Speedbleeders, for making piston relocation easy without letting any air into the brake lines – and once again slapped the EBCs into the Tokicos.

Unfortunately, there was still no joy. Damned wheel wouldn't spin even one turn, no matter how forcefully I ratcheted it round. Okay, this was going to need serious garage time when I got home because I must have somehow scored some pistons with that dirt. Jesus, what a newb.

Except that when I got home, the brake pistons looked pristine. No corrosion from sitting all winter. No bad scratching that would seem worthy of brake debilitation. In went all new OEM seals – no All Balls for this boy – anyway. I'd had enough dicking around with these damned brakes, so I wasn't leaving anything to chance.

Turn to the Internet

And nothing changed. So, now fully flummoxed – if it wasn't seals and it wasn't the pistons, well, there isn't much more to brakes, is there? – I turned to the forums, V-Strom and otherwise. Went through all the top-rated posts, but all counselled the steps already taken. Oh, one post mentioned that pushing the pistons all the way back into the caliper can send too much fluid back to the master cylinder,

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overpressuring the system and (semi) locking pad onto disc. But that didn't pan out. Neither did checking for disc warpage.

Desperate, I took to the internet, googled “motorcycle,” “new pads,” and “brake drag” and into the dark side of blogosphere. Delving deeper into the world wide web – that's me going past page two – I came upon about half a dozen posts that, surprise, surprise, had brake drag associated with newly-installed EBC HH-rated sintered pads.

The first few I ignored as just guys not mechanically inclined enough to find the real problem, but by the time I got to the tenth or so mention, I started paying attention. And while none of the post specifically blamed EBC as the source of the problem, like the old joke about the difference between the



New pads installed, tested and removed, and then documented in an effort to try and make sense of why some pads drag while others don't.

chicken and the pig when it comes to ham and eggs, they were involved in the discussion. So hoping to kill two variables with one stone, I ordered a set of Galfer (different brand) FD325G1054 GG-rated organic carbon (different material) front brake pads for a 2018 V-Strom 1000, the whole time fully expecting – because it still didn't make any sense to me – that nothing would come of the change.

This is Getting Serious Now

And that, folks, is when the s&t got serious – as they say – and this process turned into a product test. Not just any quick and dirty torque-and-tickle either. But the mother of all product tests with caliper measurements, grinding of brake pads and, as you'll later read, the purchase of some TiN-coated titanium brake pistons that really should be in a MotoGP bike.

Because as soon as I put the Galfer G1054 pads into the Tokicos, my gold anodized DID wheels began spinning around again like they had been greased by the god of bearings himself. Three-and-a-half turns with my by now torque-calibrated arm. Not quite free as a bird, but no longer were my stainless-steel discs heating up, even when they were free-wheeling. I may have still been confounded as to why the big change, but at least I could ride without grinding pad and disc to powder.

But, as much as I could barely believe that a specific pad was causing all this mischief, I still didn't know if the problem was related to the EBC brake pads specifically or to sintered pads in general. So, I did what any ordinary obsessive-compulsive would do and ordered a third set of pads – in this case, a set of Galfer sintered FD325G1375 pads. And they spun

pretty nicely too, although not quite as freely as their organic siblings.

So did a pair of DP Brakes sintered Sport SDP947HH+ pads, which spun even more freely than either of the Galfers. (I think that, 900 words in, you're beginning to understand how obsession coupled to a healthy wallet leads to compulsive spending.)

Then, in went a set of Ferodo SinterGrips and back we were to Square 1, brakes as blocked as an opiate addict's colon after an extra-large triple-cheese pizza. So, with all five pads on my workbench – all labelled with the specific positions, of course, since they were bedded into specific discs – I pulled out the vernier calipers.

And Yet More Pads

And, voila, problem solved. Using a brand-new set of OEM Suzuki pads as reference – like I said, compulsive

spending – it became obvious that the problem wasn't complicated chemical composition; rather, it was good, old-fashioned dimensional quality control. The Galfers, if you're sussing this out, pretty much matched the stock Tokico pads in every way: the backing plates were identical, as was the surface area of the pad itself. Ditto the DP Brakes pads, which actually had a slightly smaller pad surface area.

Not the EBCs. Even though each backing plate was within spec, the pad surface rode about a millimetre lower than the stock pad's braking surface. And while that would have been all well and fine on pristine new discs, my discs were well worn in. In other words, part of the EBC brake pad was constantly rubbing on a raised ridge untouched by the original pad. And, even if that area was small, it was creating enough drag that even without brakes applied, the friction was generating a serious amount of heat. And, yes, just to be sure my ham-handed mechanical ability wasn't what caused

the friction, I re-installed the EBCs each time I finished testing the other pads and the problem returned.

There's a Lesson in There Somewhere

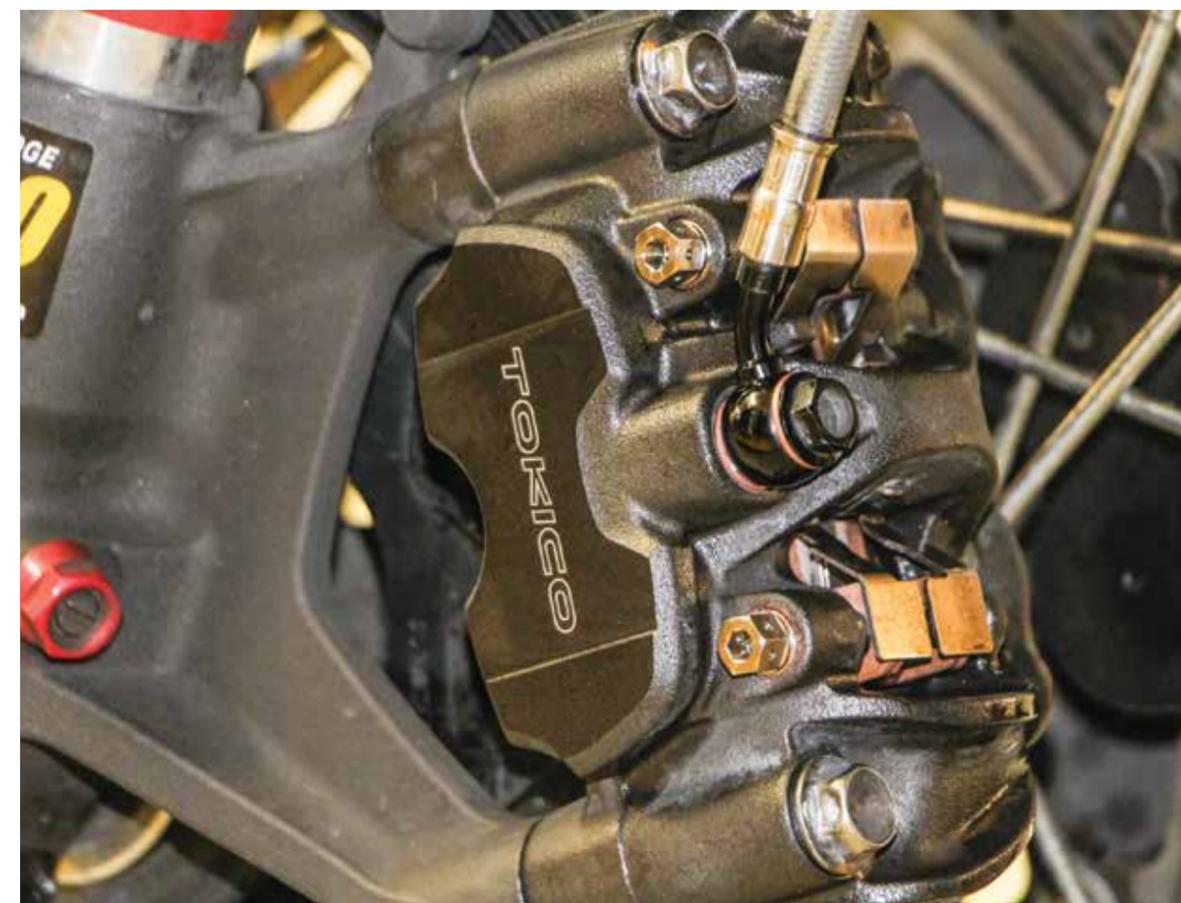
So, what have we learned from this – other than, of course, that Dave has a personality disorder? Well, despite my problems with pads, the first thing to check if your brakes are dragging are the seals and pistons. Going all deep-dive anal-retentive serves no purpose if the problem is a simple case of damaged seals or scored caliper pistons.

The second thing to note is that I am not saying that you should not buy EBC HH pads. I've used them on many bikes. In fact, my CB1100RC has a set in it right now that are performing very well indeed, and they fit perfectly. Am I saying that EBC pads drag worse than their competitors? Not hardly. But, the set I bought were definitely not dimensionally identical to the OEM pads they were supposed to replace.

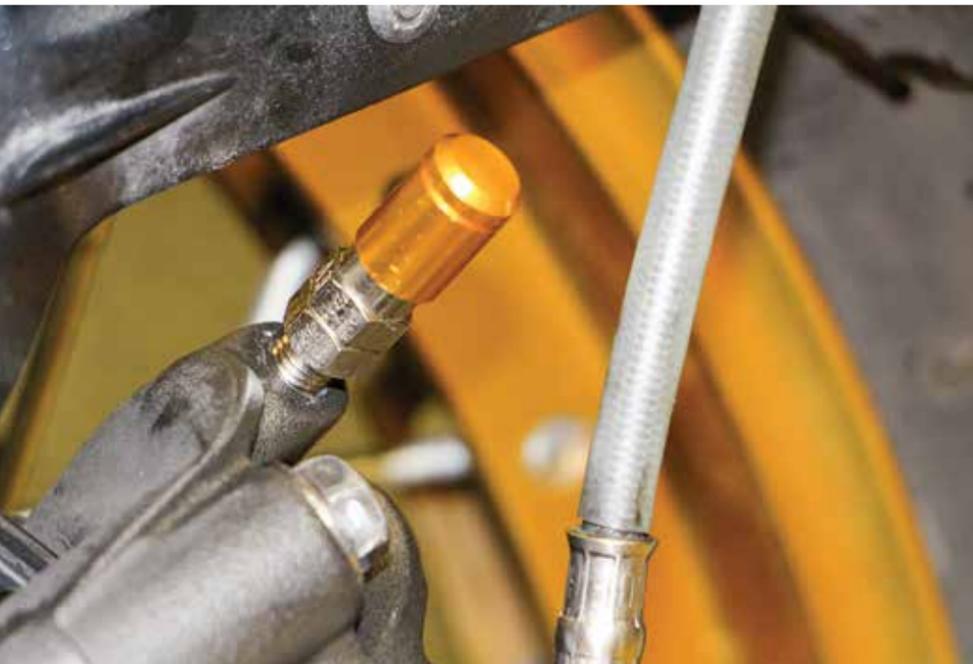
On the other hand, as I found out in my Internet searching, having trouble

I DID WHAT ANY ORDINARY OBSESSIVE-COMPULSIVE WOULD DO AND ORDERED A THIRD SET OF PADS

with dragging brakes after installing new brakes pads is not a rare issue and a number of the afflicted had the issue continue, like me, even after a complete brake rebuild. Perhaps the biggest lesson, though, is the reaffirmation of the first law of diagnosing mechanical faults: When you have eliminated the impossible, whatever remains, however improbable, must be the issue. If I had just compared the dimensions as



It makes sense that by disturbing the pistons in a caliper they could hang up and make the new pads drag a bit. In the end even a complete overhaul didn't help this situation.



A one-way speed bleeding nipple can help the sometimes onerous job of bleeding motorcycle brakes by not letting air in and making the job go a little easier.

soon as it became obvious there was a problem with my specific set of pads, I might have saved you folks an endless diatribe... and myself a big whack-load of money.

The Actual Brake Pad Test

Enough with all this stuff about brake drag. How did all these pads actually perform? Well, as you can hopefully tell, I didn't get to put on anywhere near enough mileage to test their respective durability. But I can tell you that despite all the problems I had with the EBC FA379HH pads, they sure do bite like the dickens. These surely are high-performance pads and, if they don't cause brake drag on your bike, they really do stop bigly.

Galfer Pads

The Galfer G1054 Semi Metallic pads surprised me. I expected to get notably less performance out of the organic pad material. They are, after all, GG-rated (the lettered nomenclature represents a brake pad's friction coefficient, and HH is grippier than GG). In actual use, the G1054 pads proved quite up to the job of stopping my V-Strom XT with plenty of power and a surprising amount of feedback. They were also relatively cheap, which means the only reason for

not buying them is that they shed brake dust very quickly, coating the front wheel, which had been, until they were installed, almost pristine. I can't even imagine how much brake dust would be in the calipers had I left them in for 30,000 clicks.

The sintered Galfer G1375 pads, on the other hand, didn't shed at all. They had no more brake drag than their organic G1054s siblings, and they would, according to Galfer, prove fade-free - thanks to the backing plate's

ceramic coating, which is supposed to prevent heat from being transferred to the brake pistons and then to the hydraulic fluid. All that said, the G1375 pads didn't stop much harder than the G1054s, which is the whole reason to move up to a sintered pad in the first place.

OEM Pads

As for the OEM Suzuki parts: although brake-pad build quality is not something to be (completely) judged on



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Bleeding Your Brakes

For everyone who's ever had a hard time bleeding their brakes after a full strip - and what DIYer hasn't? - there is a foolproof way to rid your lines of unwanted air in just five minutes. Guaranteed. First time, every time. Unfortunately, the process is expensive: you need an air compressor, a pneumatic brake-bleeding tool and, to finish the job off perfectly, some speed-bleeding valves for your calipers. Here's the absolutely guaranteed, never fail way to bleed brakes in less than five minutes:

First off, install speed-bleeding valve(s) on the offending caliper(s). The cheapest are from Speedbleeder.com, which also provides an excellent fitment chart so you don't have to measure thread pitch. Nonetheless, I prefer the more expensive version from Stahlbus.com, because while the Speedbleeders are one piece (which means if you overtighten them, you strip the caliper), the Stahlbus versions are built in two pieces, which means overtightening the valve itself only strips its base and not the threads in the caliper. Both Speedbleeders and Stahlbuses operate the same way: a spring-loaded ball valve allows brake fluid to flow only one way. That means you can pump your brakes repeatedly without having to loosen and tighten the bleed valve each time.

The second thing I'd get is a banjo bolt/brake bleeder combination for the master cylinder. Invariably, the last bubbles in a brake line are in the master cylinder (not the calipers) and the bleeder combo is a cheap solution. I got mine from Spielger in the U.S.

The expensive bits are, of course, an air compressor and a pneumatic vacuum bleeder, the latter a perfectly serviceable Bikemaster unit costing \$54.99 from Fortnine. If you can't afford an air compressor, a manual vacuum unit like those from MityVac are handy, although they will require more patience.

Loosen one speedbleeder at a time. Turn them out more than the half- or full turn normally used by manual brake bleeding so there's less restriction. Then bleed that line with the vacuum bleeder. Don't forget to fill the master cylinder before it runs out or you'll introduce more air into the system. If you're using an air compressor for suction, a helper can make this go even more quickly. A vacuum system will pull brake fluid through the lines so quickly that if you have a second person continuously feeding the caliper reservoir, you can probably do one caliper and line in less than a minute.

Repeat, if you're doing a twin brake setup, with the other caliper. In both cases, when you're done, don't forget to tighten the brake bleeder.

You will almost assuredly still have some air in the system, so loosen each speedbleeder again, this time by half- to three-quarters of a turn. Pump the brakes about 10 times and, by then, if you had done a good job with the pneumatic bleeder, you should not see any more bubbles.

There may still be a few recalcitrant air pockets in the master cylinder, so use a tie-wrap - to the handlebar for the front brake and perhaps the centre stand for the rear - to hold the brake lever in the fully squeezed position.

Let the bike stand overnight. In the morning, give two or three quick pumps with that master cylinder banjo bolter/bleeder combo I mentioned, and the last of the air will be released.

Even though you had to leave everything overnight, the entire process really should take no more than five minutes. Considering that doing the whole process manually with stock bleed valves without check balls can take hours of frustration, I'd suggest the expense of proper tools is well worth it.

looks alone, it must be said that the Tokico pads are visually the epitome of tight quality control, their construction perfect, the edges of the pad area well defined and they came with an excellent anti-squeal plate. And, lest you think that aftermarket is always better than OEM, the Tokico pads are also HH-rated, producing noticeably more bite than the sintered Galfers. Lesson learned? Do not dismiss OEM pads out of hand.

DP Brakes

Nonetheless, the winners - at least, in my painfully long test - were the DP Brakes SDP947HH+ pads. They didn't drag; they didn't shed dust like a Husky in the middle of a Saharan

summer; and they had even more bite than both the vaunted EBCs and the stock Tokicos. The backing plates were even ceramic-coated to prevent heat from the discs being transferred to the calipers (the cause of brake fade). The DPs will be staying in my V-Strom XT, so the bike now stops with the assurance of a Multistrada with Brembos. If only I'd just bought them in the first place.

Oh, and by the way, I really did install a set of TiN-coated titanium pistons - £90 a set from Titan Classics in the U.K. I can't really claim they make any appreciable performance improvement, but the inner smugness they generate every time I hit the front binders is worth every penny I spent. **MM**

SO, WITH ALL FIVE PADS ON MY WORKBENCH, I PULLED OUT THE VERNIER CALIPERS