

Rapid Halt

Mods to make your road car stop better on a budget.

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Punting hard is good fun - no doubt about it! But unless you're into quarter mile performance and nothing else, it makes sense to be able to stop well too. Until you jump in a car with good brakes you can't possibly realise the performance advantage that comes from being able to stop so hard that your eyes bulge. As well as impressing your girlfriend (after all, bulging eyes are pretty sexy right?), it will mean that you're much less likely to get into trouble - the sort of trouble that results in a direct ticket to heaven (or perhaps in the other direction!).

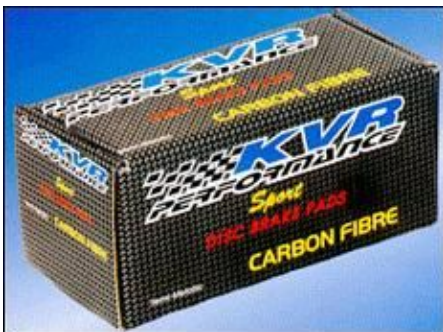
By far the cheapest way of getting better braking it is to optimise the brake system that you already have. The factory spent good money setting up a system with the right front/rear brake bias, durable and strong components, and good parts availability. If your under-bonnet power-up is of the 30-40 per cent sort, then making the standard system work well is your best bet. Before you even think of spending megabucks on something all-new, think about what you've already got.

Pads



First up, pads. There are pads and then there're pads (just ask the girls!). The difference between the standard pads (or maybe the dodgy discount store pads the previous owner had put in) and hi-po pads is simply immense. High performance pads will bite hard, bite harder when hot, and give stopping distances metres shorter than poor alternatives. The difference really can be that dramatic.

If you're on a budget and drive a relatively common car, look for pads advertised as suitable for towing. It doesn't matter if your car hasn't even got a towbar - a pad designed to haul down maybe 3 tonnes of boat and car works pretty well with just the car on the road! They'll probably be billed as 'metal' or 'heavy duty' and come from a reputable manufacturer.



Next up are competition pads. Look to a form of motorsport where your car is used and then talk to the manufacturer who makes pads for them. Hi-po pads will tend to last a shorter time than factory pads and wear out the discs or drums faster due to their more abrasive action. That's the price you have to pay. Talking about prices, good aftermarket pads are often cheaper than factory-supplied replacement items... Make sure when you're talking to the retailer or manufacturer you specify that you want the pads for a road car - otherwise the cold braking may be marginal. That's when you head out and find yourself having to stomp hard on the picks because the pads won't come up to temp in normal intermittent braking.

Brake Cooling



Go for a quick drive and brake heavily a few times. Then hop out of the car and feel the temp of the wheels and brakes. Ouch - they're bloody hot, aren't they?! Brakes lose their effectiveness when they get overly hot - so the trick is to keep them relatively cool. Fitting an open-design alloy wheel will let a heap more cool air circulate past the disc or drum, while the alloy material will better conduct the heat away.

However, if you're really serious about getting your brake temps down, brake ducting will do it better than any other way. Sure, there are aftermarket drilled discs available out there, but if you want a similar result on a tighter budget, nothing beats ducting. Adding brake ducts is well within the scope of the average do-it-yourselfer - although it is still harder than it might first appear. It's the front brakes that need to be cooled the most (since they do most of the work) and so it's more than likely you'll be working with disc brakes.

First cut a hole in the backing plate behind the disc, and if it's a round hole that means the whole of the brake disc, caliper, etc needs to come off first. However, you can cheat by bending part of the backing plate away from the disc and then cutting two slots in it. The flap that is then formed can then be bent back 90 degrees to form an attachment bracket, with the backing plate then bent back into its normal position.

So what do you attach to the flap? You'll need to use a flexible tube of preferably at least 5cm diameter. It needs to be flexible because as the wheels turn when you go around a corner, so do the brakes! Be careful coz it's easy to forget this... The clearance between the wheel, tyres, suspension members and bodywork is generally very tight, so measure the gaps before you go out and buy the flexible tube. Even 3cm diameter tube will be a lot better than nothing.



Before the brake duct will flow air it needs to be pressurised by the car's forward movement. This means that the mouth of the duct needs to be in clean airflow, and it helps if this opening is larger than the tube itself.



The easiest way to do this is to use plastic downpipe and gutter adaptors to give a fairly large rectangular opening that can be positioned under the front bumper or spoiler. You can buy these from your local hardware store and then paint them black with a spraycan.

Brake Fluid



Good quality DOT 4 brake fluid has a boiling point of about 290 degrees Celsius. "So what?" you ask. Well, brake fluid only works when it stays as a fluid. When it turns into a gas (that's when it has boiled because of the hot brakes) it becomes compressible - and that means that when you put your foot down nothin' much happens. Just s-q-u-i-s-h. Okay, so while the fluid is still new it won't boil until the temp of the fluid inside the brake cylinder reaches 290 degrees - pretty bloody hot.

Aah, but this is where the plot thickens. With 1 per cent water in the system that same fluid's boiling point has dropped to 245 degrees, with 2 per cent it's 220 degrees, 3 per cent 210 degrees, and four per cent 185 degrees C! And that's DOT 4 fluid - the best of the lot! DOT 3 fluid with 4 per cent water has a boiling point down at 150 degrees - nearly as cold as a dog's nose! And 4 per cent's the amount of water you'd expect in your brake fluid after just two years!

So it makes sense that if you use DOT 4 fluid you should change it every two years, and with DOT 3 fluid have a transfusion every year.

Brake Hoses



Most factory cars have plastic or rubber flexible hoses in the braking system. Yuck. These things can go either brittle or soft and this can lead to both leaking fluid and/or excessive ingress of moisture into the lines. Another problem is that they expand and bulge when brake pressure is applied, which gives an even spongier pedal feel. The answer?



Braided or competition hoses. But check out the legalities of braided hoses before you stick 'em on. Both of these types of hose reduce or virtually eliminate the bulging that occurs with the stockie hoses and you can get a vastly improved brake pedal.

Master Cylinder Support Bracket



When you push the brake pedal extra hard all that effort gets transmitted through the firewall before finally moving onto the brakes. So if there's any flexing of the firewall there will be reduced efficiency. Just like if your pedal lever was made out of rubber, somehow your pedal effort wouldn't make it to each caliper. Thankfully pedals aren't made of rubber, but the firewall on some modern cars might just as well be.

One aftermarket item we've seen recently appear on the market (from MRT for example) is a brake master cylinder brace, which prevents the assembly from flexing on its mounts. By keeping the master cylinder stable, the pedal effort in high braking applications is reduced and there is also better pedal feedback. What more could you ask for from such a simple device?

So there you go - if you've got an under-braked hi-po road car there're no more excuses!

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