

# KAD Big Brake Kits 2003



KAD's Big brake upgrades are intended for owners of powerful road cars who regularly find that the OE brake system is just not capable enough of stopping under extreme use, whether in performance road or track usage.

The aim of the big brake kit is to handle the terrific heat generated through repeated stops from high speed and to provide consistent and reassuring brake pedal feel so that the driver may concentrate on the driving without worrying that the pads will go off or the pedal drop to the floor at the next bend.

A blend of careful design, the very best materials and KAD's renown precision engineering are the ingredients which combine to enhance the performance of your vehicle.





## What is in the kit and why KAD?

**Calipers:** KAD 6 pot calipers are CNC machined from 7075T6 aluminium billet. The use of super stiff 7075 for the caliper bodies ensures that caliper body deflection is reduced to a minimum without incurring the weight penalty of using lower strength alloys where increased section widths and hence extra weight is required to reduce flexing in the caliper bodies. This gives KAD calipers a solid and consistent pedal feel whether at the start or the end of a track session. The choice of six pistons over four is preferred as this gives good initial bite and progressive feel and provides even pressure across the brake pad. It allows the swept profile of the caliper to be reduced in size which assists in wheel clearance and removes the need for wheel spacers which can adversely affect handling and reduce wheel bearing life as well as presenting wheel arch clearance issues.

The pistons are differentially sized to compensate for pad taper wear and pad end load and have the pressure seals fitted to the base of the pistons, keeping them away from the heat generated by the brake pads. Anti knock back springs are fitted as standard further improving pedal feel and consistency. Captive dust seals are fitted to the calipers to keep brake dust and road debris from entering the piston bores. These will not lift out under extreme heat unlike the caliper boot type seals used by other manufacturers.

The caliper halves are joined by six M8, 12.9 quality Unbrako capscrews. These are very high quality fasteners which show higher tensile strength and hence less stretch than the cheaper bolts used by others. The calipers are of the radial mounting type which gives a more rigid mounting than the lug mounts of standard brakes and enables the calipers to be adapted to fit a wide variation in the suspension leg mount.

**Caliper mountings:** Machined from either 6082 or 7075 to achieve rigid caliper mounting without excess weight. The caliper and mountings are hollow dowelled to allow precise realignment if the caliper is removed from the mounting. The caliper bolts to the mounting by two M10 Unbrako capscrews.

**Discs:** Along with the brake pads these are the heart of the braking system, the discs must be able to absorb and dissipate the heat generated by braking friction whilst remaining thermally stable. KAD use precision ground, curved vane grey iron discs which have been heat treated during manufacture. Grinding the discs after turning ensures the discs remain totally flat and have minimum thickness variation. The fine finish produced by grinding reduces bedding in time. This with careful balancing assists in removing two of the causes of brake juddering developing. The curved vane disc is able to run cooler as it can pump a greater quantity of air through the vents than cheaper to produce straight vane OE type discs and increases the thermal stability of the discs greatly reducing both deflection of the unsupported section of cast iron between the vanes and the likelihood of cracking developing. The discs are all of the flat rotor type and use a separate alloy mounting bell or top hat which allows radial expansion of the disc without thermally induced distortion and aids heat dissipation. Four or eight tangential grooves are machined into the friction faces which keep the pad friction face clear of dust and assist in dispersing the gasses that build up during braking. We do not favour cross drilling of discs as drilled or cast holes provide stress raising points which will eventually lead to cracks developing.

**Disc bells:** By mounting the flat rotor on an aluminium disc bell or top hat, the disc is able to expand and contract evenly, unhindered by the top hat portion of a one piece disc. This also allows a significant weight advantage over the one piece type. The design and manufacture of the disc bell is vital if disc runout and juddering is to be avoided. 12.9 quality capscrews with a plain shank section are used with self locking nuts.

**Brake lines:** Stainless steel braided PTFE brake lines ensure that valuable line pressure is not lost through expansion of the standard rubber brake hoses. KAD use Goodridge stainless steel braided hose kits which are specifically designed for use in both road and track conditions.

**Brake fluid:** KAD supplies each kit with a litre of DOT 5.1 brake fluid which is sufficient to bleed and refill the average brake system. This has a 272 degree dry boiling point when newly installed. As brake fluid is hygroscopic (it readily absorbs moisture from the air), this absorption of water lowers the effective boiling point and this absorption of moisture starts the minute the container is opened. For this reason, to maintain the brake systems performance, the fluid should be changed at least on six monthly intervals.

**Brake pads:** KAD supplies each kit with either Mintex M1144, Mintex M1155 or Pagid RS 4-2 brake pads according to user preference and anticipated use.

Mintex M1144 is EC Reg 90 approved and is a good road pad but pad material deposition and hence brake judder will occur if the maximum temperature is exceeded which can occur in track use. Low noise and disc friendly.

Mintex M1155 pad does not comply with EC Reg 90 and as such is NOT recommended for road use. Despite this, these are an excellent pad compound with good cold friction and stable friction characteristics up to 700 degrees C. They are not aggressive disc eaters but can produce squealing at low line pressures and speeds typical of crawling through traffic. This is an intermittent condition which will disappear with a few hard applications.

The Pagid is Reg 90 approved and is reportedly noise free. It has less temperature tolerance than the M1155 and is equally disc friendly. In terms of replacement costs, the Pagid is twice the price of the Mintex pads.



## Brake kits available as at July 2003

Part no.	Car	Wheel	Disc
1012595	Audi A4/VW Golf/Seat	17"	330x28
1012600	BMW E46	17"	330x28
1012605	BMW Mini	16"	304x28
1012610	BMW Mini	17"	330x28
1012590	Ford XR4x4	16"	304x28
1012583	Honda Civic Type R	17"	330x28
1012585	Honda Civic Type R	18"	356x32
1012587	Honda Integra Type R	17"	330x28
1012570	Mitsubishi FTO	17"	330x28
1012580	Mitsubishi Evo 7	17"	330x28
1012575	Mitsubishi Evo 7	18"	356x32
1012577	Mitsubishi VR4	17"	330x28
1012500	Nissan Pulsar GTiR	16"	304x28
1012505	Nissan Pulsar GTiR	17"	330x28
1012510	Nissan Skyline GTR	17"	330x28
1012515	Nissan Skyline GTR	18"	356x32
1012550	Subaru Impreza	16"	304x28
1012540	Subaru Impreza	17"	330x28
1012555	Subaru Impreza	18"	356x32
1012560	Subaru Impreza	18"	372x32
1012525	Toyota Celica VVT	17"	330x28
1012523	Toyota Corolla VVT	18"	356x32
1012527	Toyota Supra	18"	356x32
1012520	Toyota Supra	19"	378x32
1012530	TVR Cerbera	19"	378x32