

Brake Servicing

The areas we are going to explore in this Tech Stop are:

- Brake Pads
- Disc Rotors



Brake Pads

The first thing is safety. Through legislation asbestos was banned in the production of brake friction material, so does this mean we don't have to worry about it in the work place? **NO**

Warning: There are still some older cars driving around with asbestos contaminated brake friction material.

So treat all brake friction material with the utmost of respect and **DO NOT** use compressed air to de-dust the brakes. Even though there may be no asbestos present, you do not want to breath in the fine dust created by the wearing down of the brake material.

Checking The Pads

The customer wants a report on the brake pads and you tell him/her they should be good until the next service, how do you know that?

It is far more professional to give the customer a definitive answer.

Using the **Pedders Brake Pad Thickness Gauge**, you can give a precise answer in millimetres, as it is colour coded, you can show the customer the reason why you are recommending a pad change or why you think they will last to the next service.

It has been known that mistakes have been made when a brake check has been performed. The report says all is good, pads are OK. A week later the customer comes back with a brake noise, Why? Because when a car is fitted with floating calipers (which is the majority today), the inside pad is sometimes hard to see, so the technician assumed the inside pad would have the same wear rate as the outside pad, which was really good. This was not the case and the inside pad had greater wear as this is the first reaction pad, it comes into contact with the rotor first and therefore has a tendency to wear quicker. Pull the wheels off and have a good look.



**Pedders Brake Pad
Thickness Gauge**

Changing Brake Pads

To remove the brake pads, we first have to remove the caliper.

Once those bolts are removed, lift the caliper off the brake rotor. It will still be connected to the vehicle via the brake line. This is really important - don't let the caliper hang by the brake hose. This can cause damage to the line and may lead to brake failure. Instead, secure the caliper to a nearby suspension component using a piece of hanger wire. Make sure that the brake line is slack and not twisted or kinked.

Check for fluid leaks, condition of caliper to piston dust seals. If it is a floating caliper inspect, clean and lubricate the slides.

Prior to fitting the new pads, the piston in the caliper has to be pushed back to create clearance for the new pad.

The procedure is as follows:

- Place a bleed pipe onto the bleed nipple
- Clamp the flexible brake hose
- Open the bleed nipple
- Push the piston back into the caliper
- The excess old fluid will now be forced into the container
- When the piston is all the way home, close the bleed nipple
- Remove the bleed hose and container
- Remove the flexible pipe clamp
- Place the new pads into the caliper, including any abutment shims and/or clips
- Refit the caliper

When all the calipers have been fitted to the vehicle, pump the brake pedal until a "Good" pedal is achieved, top up the master cylinder reservoir with the correct "Dot" brake fluid. (This should be written on the reservoir cap, if unsure check O.E.M. specifications).

Replace the wheels and tighten the wheel nuts in the correct sequence and torque, road test the vehicle and "Bed in" the pads.

Process for "Bedding-In" Brake Pads

"Bedding-in" is the process of mating a new pad's surface onto the surface brake disc rotors. Under a microscope, the surface of the pads and rotors are uneven, with high and low points and varying surface areas (think hills and valleys). Until these parts are mated, only the peaks will be making contact, using the brakes hard without bedding-in the brakes, can run the risk of overheating and carbonising the surface of the pad. A glazed surface will likely develop, followed by unnecessary and annoying brake noise. Poor performance from newly installed brake pads is usually the result of an incorrect bed-in procedure.

Bedding-in Procedure:

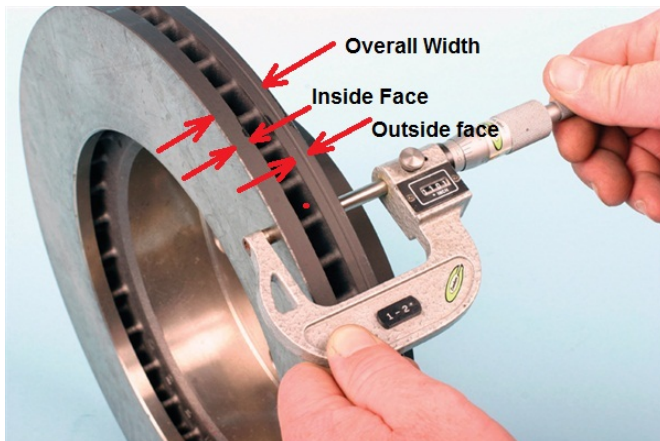
After installing your new set of Pedders Ceramic Brake Pads, follow these simple steps:

1. Find an open stretch of road that will allow you to safely stop your vehicle multiple times.
2. Accelerate to 55kph and apply moderate brake pressure to reduce your speed to 10-15kph
3. Repeat this process 3-4 times, the goal is to warm up your brake pads
4. Now increase your speed to 75kph and braking down to 20kph
5. Repeat this process 3-4 times
6. Your bedding in session is now complete. Park the car and allow the brakes to cool for an hour.

Disc Rotors

A pulsating brake pedal, which also may be accompanied by a shuddering stop during normal braking, usually means a warped rotor or an out-of-round drum. But it can sometimes be caused by loose wheel bearings, a bent axle shaft or loose brake parts. If the vehicle is equipped with ABS, some pedal feedback and noise is normal during panic stops or when braking on wet or slick surfaces. But you should not experience any ABS pedal feedback when braking normally on dry firm surfaces.

The faces of a disc brake rotor must be parallel and flat (no more than .06mm of run out). When the brakes are applied a pulsation or vibration may be felt in the brake pedal as the rotor alternately grabs and slips.



Overheating can also cause rotors to warp. Overheating may be the result of severe abuse or dragging brakes. Defects in the rotor casting, such as thick and thin areas can also cause uneven cooling that leads to the rotor warping. Hard spots in the metal due to casting impurities can be yet another cause.

You can sometimes see a warp in a brake rotor by simply looking at it. If the rotor has tell-tale glazed or discoloured patches on its face, chances are it is warped. Measuring it with a dial indicator and checking it for flatness with a straight edge will confirm the diagnosis.

Measuring this is accomplished using a dial indicator on a fixed rigid base, with the tip perpendicular to the brake disc's face. It is typically measured about 1/2" (12 mm) from the outside diameter of the disc. The disc is then

rotated. The difference between minimum and maximum value on the dial indicator is called lateral run out. Typical hub/disc assembly run out specifications for passenger vehicles are around 0.0020" or 50 micrometers.



Vibrations from New Rotors

There have been instances where a customer has returned to the place of repair complaining about a brake pedal vibration, why? The car has just had new rotors and pads fitted.

The answer is more than likely that the new rotor is not running "true", because the technician did not clean the two mating surfaces and dirt, grit or grime has been sandwiched between the rotor and the hub flange.

When fitting new disc rotors to the vehicle there is a procedure to follow:

- Thoroughly clean the mounting surface of the new rotor
- Thoroughly clean the corresponding surface on the hub



Dirty Hub Face



Clean Hub Face

BRAKE SERVICING PADS AND ROTORS PART ONE

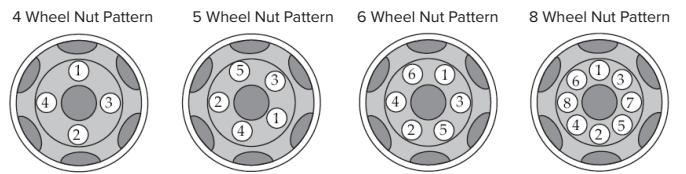
SHOCK ABSORBER, SUSPENSION, BRAKES, TOWBARS
AND WHEEL ALIGNMENT SPECIALISTS

Another reason that rotors become warped, is that the wheel nuts have been tightened incorrectly, in two ways:

- Not in the correct sequence
- Not to the correct torque

The use of air tools to fasten wheel nuts or studs is extremely bad practice, unless a torque tube is also used. The vehicle manual will indicate the proper pattern for tightening as well as a torque rating for the bolts. Wheel nuts should never be tightened in a circle. Some vehicles are sensitive to the force the bolts apply and tightening should be done with a torque wrench.

Using the air gun to run the wheel nuts up to contact in the recommended sequence is not an issue. The problem arises when the person doing the job uses the full force of the air gun on each wheel nut in a circular pattern.



Recommended Sequence for Tightening Wheel Nuts

PEDDERS
4X4/SUV BRAKE PADS
CERAMIC TECHNOLOGY



PEDDERS
SLOTTED BRAKE ROTOR
GEOMET COATED



Features	Advantages
Pedders own brand, unique compound formula	Consumers and trade cannot do a price comparison
Ceramic Technology	Improved performance
Positive moulded and use a scorching process	The pad is placed under pressure whilst undergoing the curing (Heat & Pressure)
These pads are an ideal upgrade or replacement solution	For all types of vehicles
Friction material formula specifically designed for the vehicle	The weight and wheel size is taken into account when friction material is formulated
Shimtech™ Shims, unique manufacturing process bonds titanium alloy to a thick layer of synthetic rubber	Results with the shim interacting directly with both the caliper and backing plate
Friction material is slotted and chamfered	For "Noise Vibration Harshness" control

Features	Advantages
Made from the highest grade raw materials	Manufactured to the highest possible standards
Curved slotted brake rotor design	No gas build up between the pad and the rotor. Keeps the pad surface clean
Geomet coated	Superior anti-corrosive protection
High wear resistance	Longer time between rotor changes
Improved design of ventilation between the two friction surfaces	Improved heat dissipation
All rotors have a final manufacturing process of being "Balanced"	This process provides optimal vibration free operation of the rotors

