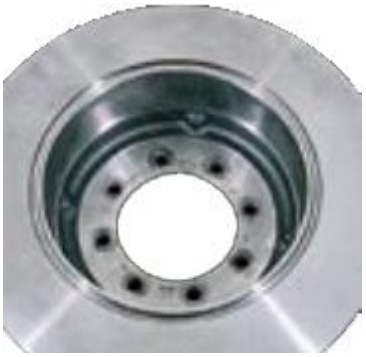
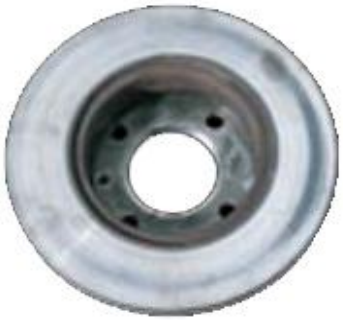
Fault diagnosis and remedies – DISCS

Appearance:	The contact point on the hub is cracked around the fitment holes or the surface is distorted
Cause:	The correct sequence for tightening was not followed and not enough torque was used
Effect:	Driver feels vibration as soon as new discs have been fitted
Remedy:	Replace distorted or cracked discs and use the correct tightening sequence and torque settings advised by the vehicle manufacturer



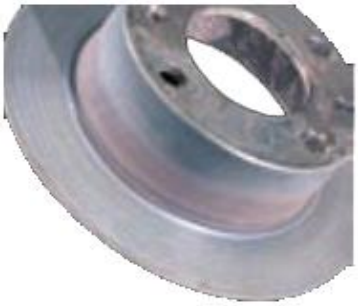
Hub surface distortion

Appearance:	Discoloured spots on the disc surface, often blue in colour caused by overheating.
Cause:	Excessive hub run-out (> 0.03mm). When the disc to pad contact is uneven, it will cause
Effect:	Vibration and noise that will increase if not dealt with
Remedy:	Correct the wheel hub run-out to <0.03mm before fitting a new disc



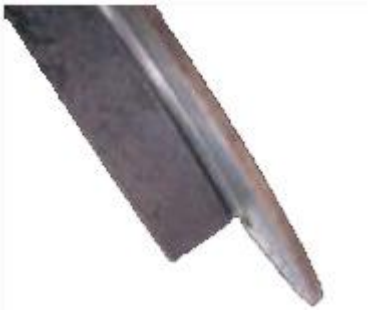
Blue discs

Appearance:	Grooves on the surface of the worn disc
Cause:	Brake pads allowed to wear down to the back plate will score the disc as it is metal touching metal and ruin the disc surface
Effect:	Poor performance and efficiency and a noisy “grind” of metal on metal
Remedy:	Replace the discs and pads. If a wear indicator is in place, check the circuit is working properly



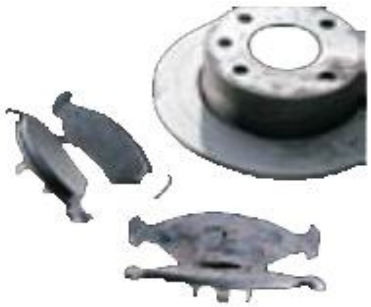
Surface grooves

Appearance:	Grooves formed between the hat and disc surface
Cause:	The back plate of a very worn brake pad may be lose in the caliper and come into contact with the hat.
Effect:	Poor braking performance and efficiency and noise from the metal on metal
Remedy:	Replace discs and pads. Check and, if necessary, repair the caliper



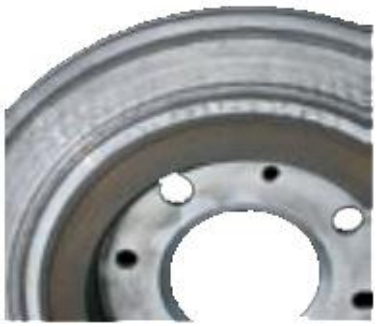
Grooves between the hat and disc

Appearance:	Friction wear that is more pronounced on one pad compared to the other
Cause:	A seized caliper, forcing one pad to be touching the disc constantly – causing increased wear of one pad compared to the other. Scoring of the disc can occur if the material has worn down to the metal back plate
Effect:	Poor braking performance and a constant grinding noise as the plate scores the disc. Vehicle may pull to one side under braking due to the imbalance.
Remedy:	Check and replace or repair the caliper if necessary. Replace the discs and pads.

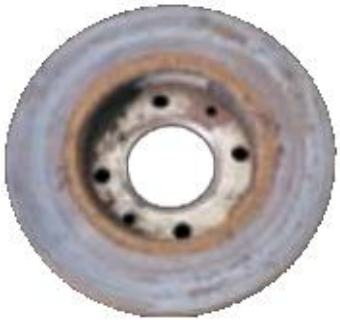


Uneven pad wear

Appearance:	Grooving on the disc friction surface material
Cause:	Deep grooves are caused by foreign objects and dirt coming in between the pad and disc and the particles being forced into the disc under braking.
Effect:	Lower braking efficiency due to a reduced contact surface and noise during braking.
Remedy:	Replace pads and discs



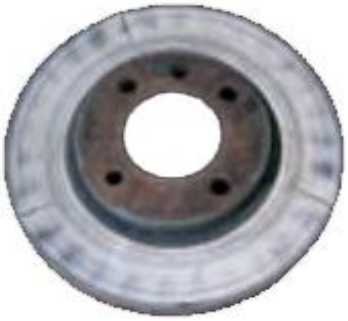
Grooved disc

Appearance:	Glazing and dark spots on the disc surface	 **Contamination of disc surface**
Cause:	Material from the brake pads have deposited onto the disc surface – generally from low-cost pads that have not been mixed and cured correctly.	
Effect:	Poor braking performance, a stiff pedal feel and vibration	
Remedy:	Installing good quality brake pads from a reputable manufacturer	

Appearance:	No longer a smooth surface of the disc. Blue spots and possible cracks on the friction surface of the disc	 **Uneven wear, cracks and blue spots**
Cause:	Assembly issues. The caliper or pad being in the wrong place will cause uneven wear and hot spots (blue spots) when the pad is constantly in contact with the disc	
Effect:	The hot spots will slowly cause vibrations and a poorer braking performance	
Remedy:	Check and, if necessary, repair the caliper. Replace pads, checking type and shape are correct for application and if the pads are handed	

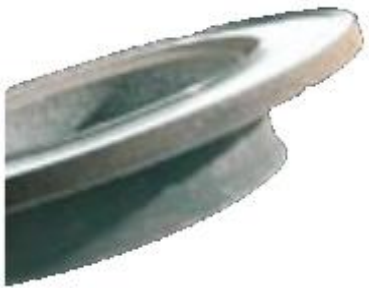
Appearance:	Colours on the friction surface of the disc (various shades of violet, blue or gold)	 **Coloured discs**
Cause:	Not following correct bedding in procedure. Newly fitted discs can have slight variations on the friction surface. If the discs aren't carefully bedded in, a metallurgical change will occur on the friction surface, causing the discolouration	
Effect:	Reduced braking performance due to decreased friction. Vibrations can happen and become worse over the life of the disc.	
Remedy:	Replace the discs and adhere to the correct bedding in procedure of gentle braking (no heavy braking) for the first 200 to 300 miles.	

Appearance:	Radial fractures or blue spots in line with the venting frames
Cause:	The spots are the result of rising cracks, caused from a metallurgical change in the friction material which makes it stiff and brittle. Overloading the car, an aggressive driving style or intensive use could cause this.
Effect:	Poor braking performance, noise, vibrations and brake fade
Remedy:	Replace the discs and after correctly bedding in the new discs avoid aggressive driving and use the engine to reduce speed as well as the brake system



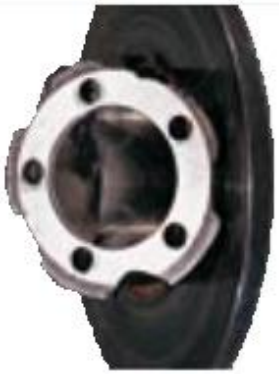
Fractures / spots on surface material

Appearance:	Extensive wear. Disc thickness lower than the recommended minimum thickness
Cause:	Discs not checked regularly and not replaced at appropriate time
Effect:	Reduced performance vibration and noise while braking. Dangerous to drive
Remedy:	Full inspection of braking system and associated components. Replace any failed components and fit new discs observing manufacturer's recommended torque and sequence during tightening. Maintain regular checks of the pads and discs



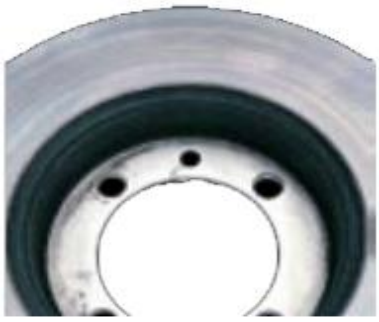
Worn discs

Appearance:	Hub contact surface is detached from the main disc or distorted
Cause:	Over tightening when mounting discs. Failure to adhere to correct torque settings
Effect:	Detachment of disc friction surface. Complete brake failure and very dangerous to drive
Remedy:	Complete inspection of braking system and associated components. Replace any failed components. Replace discs observing correct torque settings and sequence



Detached hub

Appearance:	Distorted hub contact surface and/or cracks
Cause:	Over tightening the positioning screw
Effect:	Vibration under braking that will get progressively worse
Remedy:	Replace discs and follow correct torque settings. Do not over tighten positioning screw

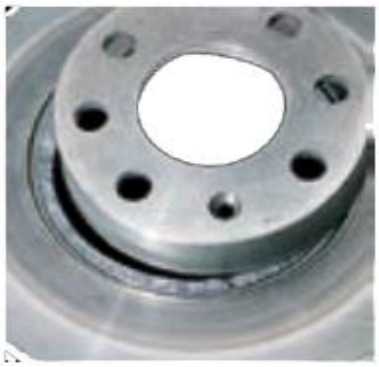


Distorted hub

Appearance:	Dirty marks and/or rust on hub surface
Cause:	Improper cleaning of the hub leading to contamination, misalignment and DTV
Effect:	Disc Thickness Variation, pads not touching the discs evenly and resulting in noisy and vibrating brakes which will get progressively worse
Remedy:	Meticulously and carefully clean the hub surfaces, eliminating all rust and other debris. Check the run out and replace if hub has been damaged. Replace discs following correct torque settings and checking for run out

Dirt and rust on hub

Appearance:	Detachment of the disc hat from the braking surface
Cause:	Stress due to incorrect assembly or positioning of the caliper. Results in uneven wear of the surface causing detachment
Effect:	Loud noise under braking and vibrations. Total brake failure after detachment
Remedy:	Full inspection of braking system and associated components. Replace failed components and replace discs, carefully following correct torque settings and sequence. Check caliper is working well before fitting pads.



Detachment of the hat

Regular inspection of the brake discs and pads is essential. It is recommended to change pads at the same time as discs to ensure even wear and smooth braking!!