



*INTERACTIVE*  
TECHNICAL & SALES GUIDE

ABOUT MSB

BRANDS

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TECHNICAL & WEB

## A SNAPSHOT OF MSB

MSB (Motorsport Brakes) is the Exclusive Authorised Australian Distributor for WinmaX Brakes, CIRCO Brakes and Hosetechnik Brake Hoses. Established in 2012, MSB continues to be one of the primary suppliers for many motorsport categories, teams and enthusiasts ever since. We have unrivalled experience in a massive cross section of car types, racing categories and braking products from almost all of the manufacturers in the market today. We know what works, and what doesn't.

MSB strives to provide EASY TO USE product systems for our dealers including a B2B system with Vehicle Product Finder, live inventory levels, marketing assistance and more.

### Meet your main sales contacts:

**Jason Hore** has been in the Automotive industry for 20 years and is a car person to his core. He has worked in the racing and parts industry for all of time and has a massive cross-section of experience when it comes to product supply. Jason is a honest as they come, so you can 100% rely on receiving not only the best advice, but also service. Jason has competed in many motorpsort categories including Formula Ford, F3 and also rallying!

Contact details: Phone: **0434 240 033**

Email: [sales@motorsportbrakes.com.au](mailto:sales@motorsportbrakes.com.au)



**Marty Beckton** comes from a rally driving background and has been involved in the aftermarket and racing braking industry for 24 years. He has worked in every main motorsport category you can think of and has experience working wth many brands including PWR, Ferodo, Brembo, Alcon, Pagid, Project-Mu and of course WinmaX and CIRCO! He has enoumous experience in braking so is a great person to speak to when you need the right advice for what ACTUALLY works!

Contact details: Phone: **0404 023 535**

Email: [marty@motorsportbrakes.com.au](mailto:marty@motorsportbrakes.com.au)



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WinmaX is Japan's oldest high-performance brake parts brand, established in 1984 by MK Kashiya Co., Ltd., which has been manufacturing brake pads for over 50 years! WinmaX remains one of the largest friction material manufacturers in Japan.

WinmaX's greatest strength is that it conducts R&D and manufacturing of friction materials in-house. Utilising the raw material analysis and optimal compounding technology that was cultivated since the founding of the company, WinmaX is able to offer a large range of compounds suitable for all types of applications all over the world.

*All WinmaX products are manufactured 100% in Japan to World leading industry standards and practices.*



CIRCO BRAKES is a manufacturer of high performance and competition friction materials and brake fluids. CIRCO Group Global P/L brake pad products are manufactured in Japan to exacting standards, with the absolute best quality raw materials in a high technology manufacturing plant with ISO9001 standards. CIRCO Racing Brake Fluid is formulated and manufactured in the UK to specifications suitable for competition use. Utilising knowledge acquired within the racing brake business for over 20+ years in many categories including GT3 and GT4 Endurance Racing, Rally including WRC, R5, GpA and Historic, Open Wheel Racing, TCR / WTCC / BTCC, Production Racing, Historic Circuit Racing, Asian GT, Supercars, Rallycross, Off Road / Endurance, Stockcar including Nascar, Truck and TA2 Global, ALMS, One-make control brakes.



Hosetechnik brake lines are made with UK sourced and manufactured 303 stainless steel machined end fittings to eliminate the often seen early corrosion which occurs on many standard OEM fittings. The use of a PVC outer coated, ASI 304 high tensile stainless steel braid with a virgin PTFE resin inner hose and a burst pressure of 321 Bar ensures that a long lasting and durable flexible brake line is created for ultimate safety.




















Hosetechnik pressure test each line to 3500 psi and have been independently tested to FMVSS 106 certification standards which meets ADR rules.

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# PAD COMPOUND SELECTION GUIDE

Use this guide to select the pad compound that is best for your requirement and then [click on the pad compound](#) for more information.

		<i>Good</i>	<i>Better</i>	<i>Best</i>
Street	Low dust & Noise OEM Upgrade			
Heavy Duty	Heavy Duty 4x4 Towing			
Performance	Light Track Hill runs			
Trackday	Medium bite Cold friction			
Club Race / Rally	Tarmac / Circuit Gravel			
Professional Racing	Tarmac / Circuit Gravel			
Other compounds:				
				

## Selecting Front / Rear Combinations

FWD	<i>Small</i>	Front W1 W3 W5 W6.5 M119 M207 Rear W1 W1 W1 W3 W3 W3	<i>Medium / Large</i>	Front W1 W3 W5 W6.5 M119 M207 Rear W1 W1 W3 W3 W5 W5
	<i>Small</i>	Front W1 W3 W5 W6.5 M119 M207 Rear W1 W1 W3 W5 W5 W5	<i>Medium / Large</i>	Front W1 W3 W5 W6.5 M119 M207 Rear W1 W1 W3 W5 W5 M119
AWD	<i>Small</i>	Front W1 W3 W5 W6.5 M119 M207 Rear W1 W3 W5 W6.5 M119 M207	<i>Medium / Large</i>	Front W1 W3 W5 W6.5 M119 M207 Rear W1 W3 W5 W5 W5 M207



WinmaX



CIRCO

-  Stocked at MSB in all popular applications and thickness'
-  Only stocked in limited fitments

Note: If not in stock, all shapes are available to special order on a 4 week lead time.

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**Compound: Non-metal, organic**

**Friction: 0.29 – 0.32**

**Temp range: 0 – 450degC**

**Price Range: \$199 - \$286**

**OEM upgrade brake pads for performance minded drivers.  
Performance pads, not racing pads.**

**This pad is ideal for:**

**Everyday Street use**

**Mountain runs**

**Enthusiast track days with small cars**

**Features and benefits:**

- **Non-steel material brake pad are perfect for upgrade from factory**
- **Low dust and quiet operation like OE pads, but more torque**
- **For drivers wanting more stopping power from standard braking system**
- **Works instantly from ambient temperatures**
- **Provides long lasting pad life and rotor wear**

**Notes:**

**Organic material is used for low noise and dust, but these pads are still a performance pad.**

**W1 is a generally stocked products in a large range of applications for street OE calipers with limited aftermarket shapes.**

**If not in stock in a required application, W1 can be backordered in any pad shape in the entire range.**

**Switch to W1 if they currently use:**

- **Ferodo DS Performance**
- **Pmu NS**
- **Bendix Ultimate**
- **DBA Street Performance**

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**Compound: Low-Metallic Carbon**

**Friction: 0.36 – 0.39 $\mu$**

**Temp range: 0 – 600degC**

**Price Range: \$255 - \$352**

**OEM upgrade brake pads for Heavy-Duty applications. e.g Toyota 79 Series with loads but no brake upgrades.**

**This pad is ideal for:**

**4x4 High Performance Upgrade**

**High Friction**

**Designed for GVM upgrade and towing vehicles**

**Features and benefits:**

- **Non-steel material brake pad are perfect for upgrade from factory**
- **Operation like OE pads, but more torque**
- **For drivers wanting more stopping power from standard braking system without upgrading hardware**
- **Works instantly from ambient temperatures**

**Notes:**

**Works from low temperatures and fade resistant so is suitable for heavy duty and GVM upgrade vehicles.**

**WinmaX WP2 brake pads are a low-steel carbon based compound and will work much harder than other ‘heavy duty’ pad options with lower pedal pressure required to pull up those big loads.**

**Whilst WP2 can be more noisy and dusty than standard pads, this high friction pad often negates the need for a caliper / booster upgrade.**

**Switch to WP2 if they currently use:**

- **Bendix Heavy-Duty**
- **DBA Xtreme Performance**

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**Compound: Semi-metallic**

**Friction: 0.34 – 0.37 $\mu$**

**Temp range: 0 – 600degC**

**Price Range: \$255 - \$352**

**Extreme Performance Street / Trackday Pad**  
**Performance pads, low level Motorsport**

**This pad is ideal for:**

**High Performance Street Use**  
**Track Days, Hill Climbs, Rally**  
**Serious enthusiast driving**

**Features and benefits:**

- **Designed for use in application where low temperature friction is required**
- **Very high levels of modulation**
- **Excellent all-round brake pad suitable for daily street use in high performance applications.**
- **Works instantly from ambient temperatures**
- **Provides long lasting pad life and rotor wear.**

**Notes:**

**Winmax W3 brake pads are a semi-steel-based compound suitable for regular high-performance driving and club level competition such as track day, drag, hill runs and more.**

**W3 is a generally stocked products in a large range of applications for street OE calipers with limited aftermarket shapes.**

**If not in stock in a required application, W3 can be backordered in any pad shape in the entire range.**

**Switch to W3 if they currently use:**

- **Ferodo DS2500**
- **Endless MX72, Pmu HC+**
- **Bendix SRT**
- **Endless MX72**

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**Compound: Semi Metallic**

**Friction: 0.40 – 0.43 $\mu$**

**Temp range: 100 – 750degC**

**Price Range: \$286 - \$393**

**Performance upgrade brake pads for trackday / sprint racing.  
Competition, Performance pads.**

**This pad is ideal for:**

**Circuit / Rally / Hill climb**

**Tarmac Rally for medium sized cars**

**Track days for all vehicles**

**Features and benefits:**

- **Made with high steel ingredients, for club to pro level motorsport**
- **Very resistant to fade**
- **For drivers wanting more stopping power and ‘feel’ (modulation)**
- **Works from low temperatures so suitable for rally / sprint / hill climb**

**Notes:**

**Made with high-steel ingredients but perfectly balanced for club level circuit racing and rally, W5 is the choice for seasoned track enthusiasts who race at the budget level.**

**W5 is a generally stocked products in a large range of applications for street OE calipers with limited aftermarket shapes.**

**If not in stock in a required application, W5 can be backordered in any pad shape in the entire range.**

**Switch to W5 if they currently use:**

- **Ferodo DS3000**
- **Pmu RC09 Club Racer**
- **Hawk DTC-60**
- **Pagid RS14**

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**Compound: Semi-metallic**  
**Friction: 0.47 – 0.50 $\mu$**   
**Temp range: 50 – 800degC**  
**Price Range: \$367 - \$600**

**Competition brake pads for rally, sprint and hillclimb  
Motorsport pads, Tarmac and Gravel.**

**This pad is ideal for:**

**Tarmac Rallying**  
**Gravel Rallying**  
**Circuit racing, Motor Events, Sprints**  
**Sprint racing for small to medium cars**

**Features and Benfits:**

- **Designed for use in application where low temperature friction is required**
- **Very high levels of modulation**
- **Excellent all-round brake pad**
- **Provides long lasting pad life and rotor wear.**

**Notes:**

**The WinmaX W6.5 compound was developed by taking the very best characteristics from the original W7 compound to create a pad that is long lasting, has mid-high friction and works from very low right through to extreme temperatures around 800.**

**W6.5 is a generally stocked products in a large range of applications for street OE calipers with limited aftermarket shapes.**

**If not in stock in a required application, W6.5 can be backordered in any pad shape in the entire range.**

**Switch to W6.5 if they currently use:**

- **Ferodo DS1.11**
- **Pagid RST5E**
- **Pmu H16-03**
- **Hawk DTC70**
- **Endless ME20**

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# S88

Compound: Low-Metallic Carbon

Friction: 0.38 – 0.40 $\mu$

Temp range: 0 – 650degC

Price Range: \$264 - \$466

Performance upgrade brake pads for trackday / enthusiast / Heavy Duty.

This pad is ideal for:

High Performance Street Use  
Track Days, Hill Climbs, Rally  
Serious enthusiast driving

Features and Benefits:

- 100% made in Japan with world best practices
- Designed for use in application where low temperature friction is required
- Very high levels of modulation
- Excellent all-round brake pad suitable for daily street use in high performance applications.
- Works instantly from ambient temperatures
- Provides long lasting pad life and rotor wear.

CIRCO S88 is a low-steel carbon based compound suitable for heavy duty, performance and light enthusiast track day use. Low steel properties make this pad popular for those looking to upgrade to exceptional performance without compromising on too much comfort. 100% made in Japan with world best practices and designed for use in application where low temperature friction is required along with very high levels of modulation. Excellent all-round brake pad suitable for daily street use in high performance applications. Works instantly from ambient temperatures and provides long lasting pad life and rotor wear.

Switch to S88 if they currently use:

- Endless MX72
- Ferodo DS2500
- Pmu HC+

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## M119



Compound: Carbon Metallic

Friction: 0.48-0.51 $\mu$

Temp: 50-800°C

Price Range: \$379 - \$887

Competition brake pads suitable for a wide range of applications from circuit to rally, sprint and hillclimb. Easy bedding-in and great driver feel.

This pad is ideal for:

High level circuit Racing and Rally

Enthusiats high-end Eg Porsche trackday

Features and Benfits:

- 100% made in Japan with world best practices
- Circuit and Rally Pad
- Excellent Low temp bite
- Good modulation
- Consistant from low to high temps
- Easy Bed In Procedure

CIRCO M119 is a specially formulated brake pad for Rally and Circuit racing use. M119 has an easy bed-in procedure and offers confidence inspiring levels of low temperature friction. The compound has been rigorously tested in top level machinery including WRC, TCR, GT4, GpN as well as historic rally and race cars. M119 displays excellent resistance to fade and is the market leader for driver modulation and control. The other benefit of M119 is the very low wear rate which makes this pad very popular in many circuit endurance racing categories.

Switch to M119 if they currently use:

- Endless ME20
- Ferodo DS1.11
- Pmu H16-03
- Pagid RST5

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## M207

Compound: Carbon Metallic

Friction: 0.45-0.56 $\mu$

Temp: 250-920 $^{\circ}$ c

Price Range: \$459 - \$1436

Professional competition brake pads designed for Heavy Duty applications including Endurance Racing.

This pad is ideal for:

High level circuit racing

Endurance, Stock Car, GT

Features and Benefits:

- 100% made in Japan with world best practices
- Circuit Racing
- Heavy Duty Race
- Good modulation
- High Friction
- Very good resistance to face

CIRCO M207 is the Heavy-Duty sprint and mid-enduro compound in the CIRCO range with exceptionally consistent torque characteristics at all temperatures making it a must have for professional circuit racing at the very highest levels. M207 is extremely capable at higher temperatures where other compounds simply give up. Suitable for sprint, mid distance and Endurance racing with very low wear at high temperatures and is very kind to disc condition.

Switch to M207 if they currently use:

- Endless MA, YZ
- Ferodo DS2.11
- Pmu H21
- Pagid RSL
- PFC01 or 11

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**Note:**

These pad types are not generally stocked so are all special order, except for limited applications which may be kept on the shelf.

Check with [sales@motorsportbrakes.com.au](mailto:sales@motorsportbrakes.com.au) or 07 3412 3643

## WinmaX W2



Compound: Low metal, organic

Friction: 0.32 – 0.35 $\mu$

Temp range: 0 – 500degC

- OEM upgrade pads for High performance
- Performance pads, light trackwork ok.

## WinmaX W4



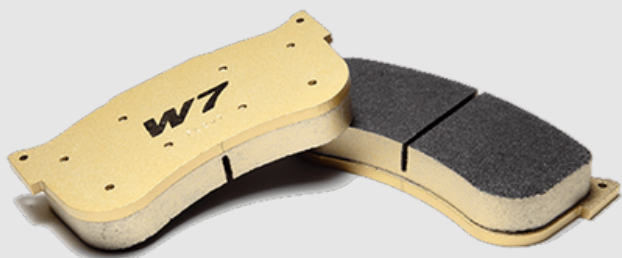
Compound: Semi Metallic

Friction: 0.37 – 0.40 $\mu$

Temp range: 50 – 700degC

- Track and enthusiast racing.
- Ideal for small to medium track cars
- Low-Mid level motorsport

## WinmaX W7



Compound: Metallic

Friction: 0.48 – 0.53 $\mu$

Temp range: 100 – 850degC

- High-Friction
- Competition only Brake Pads
- Semi-Professional motorsport use only

## CIRCO S83



Friction Summary: 0.32-0.36 $\mu$

Temperature Range: 0-600°C

- Low-metallic Carbon
- Rear Race Pad for RWD
- Entry level trackday
- Good modulation
- Low-Medium friction

## CIRCO S99



Friction Summary: 0.40-0.43 $\mu$

Temperature Range: 100-700°C

- Semi-Metallic
- Club Level Race and Rally Pad
- Good initial bite
- Consistent torque

## CIRCO M220



Friction Summary: 0.37-0.41 $\mu$

Temperature Range: 200-900°C

- Carbon Metallic
- GT Endurance Racing Front
- Medium Friction
- High resistance to fade
- Very kind to disc rotor

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# BRAKE FLUIDS

# CIRCO

**RACING  
BRAKE  
FLUID**



## CIRCO MF1200+ Racing Brake Fluid Info

- Typical Dry Boiling Point: 328°C (623°F).
- Typical Wet Boiling Point: 204°C (399°F).
- Sold individually (500ml bottle) or by the box of 24.

Circo MF1200+ Racing Brake Fluid has been specially formulated in Europe to provide the highest performance under racing conditions where braking systems must operate at extremely high temperatures making it suitable for all top levels of motorsport from GT3, NASCAR, WRC down to performance production cars.

MF1200+ conforms to and exceeds the current specification U.S. FMVSS No.116 DOT 4 and is street legal in every country including the USA and Canada.

Recent laboratory testing has also confirmed that CIRCO brake fluid is superior to even the most renowned of racing brake fluids. The testing took place against a very common, very well known product used extensively in motorsport around the world. The pedal travel results speak for themselves!

# Winmax

**BRAKE  
FLUID**

Dot 5.1 OEM upgrade brake fluid for performance minded drivers and perfect for performance and track.

- Dry Boiling Point: 338°C / 640°F
- Wet Boiling Point: 212°C / 413°F
- Sold individually (1 ltr bottle) or by the box of 12.

Consistent brake pedal

Very high resistance to boiling

New manufacturing method meaning lower rate of moisture absorption.

Longer service life than other race fluids.

Fantastic all round brake fluid



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**hosetechnik**

## BRAKE HOSES

*Why should I change my brake lines to Braided Stainless Steel ones?*

- Better brake pedal feel – firmer under pressure
- More efficient braking- the PTFE lined, Stainless steel brake lines will not expand under load unlike OEM rubber hoses
- Long Lasting- PVC outer and Stainless-Steel end fittings will outlast the standard Mild Steel and rubber lines many times
- Available in many outer colour options to compliment your vehicle
- Rigorously tested and approved to the FMVSS 106 / ADR certification standards
- Price Range: \$219 - \$349

Hosetechnik brake lines are produced in the UK with UK sourced and manufactured 303 stainless steel machined end fittings to eliminate the often seen early corrosion which occurs on many standard OEM fittings.

The use of a PVC outer coated, ASI 304 high tensile stainless steel braid with a virgin PTFE resin inner hose and a burst pressure of 321 Bar ensures that a long lasting and durable flexible brake line is created for ultimate safety. Machined stainless steel end fittings are secured into place using a crimped ferrule at 8 diametrically opposite points which in our opinion is the only truly secure and permanent method of building a hydraulic line.

Hosetechnik pressure test each line to 3500 psi and independently test to FMVSS 106 certification standards which meets ADR rules.

### Range of colours

Generally MSB keeps common colours in stock such as clear, black or grey. However, by special order your customer can customise to match their car with a colour choice of Clear, Black, Red, Blue, Purple, Orange, Green, Yellow, Transparent Red, Transparent Blue



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# SELLING TIPS

At MSB, we are acutely aware that our dealers are the people who's job is to explain to the end user why they should be buying our products. This task can be extremely confusing when dealing with a customer on the phone who you haven't met, and don't know exactly the pad type they will need. Here are a few tips that may help:

## ***SPECIFY THE RIGHT PAD TYPE:***

1. Ask what car they have.
2. Does the car have the original calipers or aftermarket options?
3. What is the main purpose of the car? I.e Street performance or track etc
4. What products do you currently use and do they work ok?
5. What would you like to achieve with new pads? Upgrade or same?
6. Any issues experienced you need to consider? Eg. noise, dust?

From here you can get a pretty good idea of the brake pad product level to go for. To confirm this, go to the [Pads Menu](#)

## ***FIND THE RIGHT PRODUCT ON MSBGARAGE.COM:***

1. Log in to [B2B](#) (If you don't have access, contact us)
2. Use the search options and filters at the top of the page to find the product.
3. Choose if the order is to be delivered to you or Dropshipped.
4. Place the order

## ***Notes on msbgarage.com parts finder:***

- The vehicle finder also includes Cross-Refs for Alcon, AP and more.
- Many of the products have tags applied to them that help with cross-referencing other brands of brake pads. So if you have the part number of a competitor brake pad (Eg DB1170) you can type this in the search bar and the site will drop down the equivalent option from our stock.

## **BACKORDERS:**

If the product you need is not in stock, we can order it for you and have it delivered within 4 weeks. However, there is a good chance we already have more stock on order therefore and shorter lead time, so please [contact us](#) if unsure.

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# PART NUMBERING

Most parts manufacturers have part numbering systems that suit them, but make no sense to anyone else. We are no different, so here is an explainer that may help you understand what you are looking at and make your life slightly more simple, hopefully.

WinmaX Sku example: WMP1099SH-17-W6.5

WMP = Winmax Pad

1099 = Pad shape number

SH = Shim included (or SN = No top tab, S = Sensor slot allowance)

17 = Overall thickness of each brake pad when new, incl backplate

W6.5 = Material compound type

CIRCO Sku example: MB1658SN-18-M207

MB = Prefix indicating it is a CIRCO brake pad

1658 = Pad shape number

SN = No top tab (or SH = Shim included, S = Sensor slot allowance)

18 = Overall thickness of each brake pad when new, incl backplate

M207 = Material compound type

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# BRAKE BEDDING

## BEFORE BEDDING BRAKE PADS:

Please be aware that if you are using a new set of brake pads on a used set of discs the bedding procedure will take longer as the pads must clean the material deposited on the disc and create a new friction material layer on it. This process can be accelerated if you resurface the brake discs in advance.

Make sure the disc surface is clean and grease free.

## BRAKE PAD BEDDING:

Correct brake pad bedding procedure is essential to ensure maximum performance of the brake system on the car. Incorrect bedding can lead to excessive decrease in pad and disc life, as well as a general lack of performance. Correct bedding is achieved by slowly increasing the temperature on the pads and discs.

Potential issues such as overheating and glazing the friction surfaces should be avoided as much as possible, so it is important that the process is slow. Make sure the pads are correctly installed in the car. Optional heat shield plates and left foot braking should not be used during the bedding procedure. Using 60 – 80% of pedal pressure, decrease the car speed from 80kph to 20kph.

Repeat the 7 – 9 times. (Do not come to a complete stop during this process as this will increase the temperature rapidly in the pads). Repeat the procedure from 1 20kph down to 80kph. Repeat the procedure once again this time from 120kph down to 20kph. Following each set of stops, allow some time without braking to cool the discs and pads before increasing brake force. After each set of stops you should feel an improvement in the brake performance. If you have access to temperature recording equipment, the brake temperature should be in the range of 400degC. Do a visual check on the discs to make sure the friction material of the pad is deposited homogeneously and if not, repeat the process. Once complete perform some high pressure braking to ensure the system is working correctly.

You may also want to re-bleed the brake fluid to ensure maximum results.

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# BRAKE FADE vs LONG PEDAL

## SUMMARY:

**BRAKE FADE** is where your brake pedal is still 'up', but the car won't slow down which is caused by a loss of friction. A **LONG BRAKE PEDAL** is where the pedal travel increases which can result in losing braking caused by fluid boiling or mechanical issue.

## MORE INFORMATION:

**Difference between Brake fade (Pad fade) and Fluid fade (Long pedal):**

Many people mix these two up! It's not uncommon to hear someone at the track complaining about the wrong thing when they have brake issues.

"My pads are no good because my pedal is going long!"

"My car won't stop no matter how hard I press!"

Unless there has been some sort of mechanical failure in your brake system, the only way a brake pedal can 'go long' – which is a horrible feeling – and can end in disaster – is by pushing your brake fluid past its boiling point. If the fluid is over-heated it will develop small gas bubbles which unlike the fluid is compressible. This compression is what will cause the long pedal known as brake fluid fade.

If your pedal is still solid or 'normal' but the car won't stop, this is brake pad fade caused by the temperature levels of the friction material too high. This also can cause gas to form but this time between the disc and pad which reduces friction, hence stopping power.

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# BRAKE NOISE / SQUEAL

This topic is one of the most talked about issues in the aftermarket performance braking industry. This is because a majority of drivers want all the performance in the world, but the comfort levels of a base road brake pad. Fair enough too!

In the industry we call this the 'Unicorn Pad' because despite what some less conscientious sellers will tell you - it doesn't exist. Not yet anyway.

**Important: Higher friction / performance = higher likelihood of squeal.**

## ***PADS WORN OUT***

This sounds fairly obvious, but sometimes brake noise is just the fact you've worn them out! Cars that do not have electronic sensors for pad wear installed will normally be fitted with pads that have small clips attached to the steel backing plate that will rub on the disc when your brake pads are ready for replacement.

## ***FOREIGN MATERIAL IN YOUR BRAKES***

Sometimes brakes can end up with dirt, stones, grit or whatever in them. These materials can get lodged in the caliper or around the brake area and can make plenty of noise! This is normally easy to identify as these materials tend to leave marks, scratches etc on the disc surface. This is just a matter of removing the debris and cleaning the brakes. If the brakes are damaged, you'll need to repair or replace them.

## ***HIGH FRICTION VIBRATION CAUSED BY FRICTION***

As already mentioned, brake squeal is a high-frequency vibration which is instigated by the brake pads friction material contacting the brake disc surface when you put your foot on the brake pedal. Of course, this is what slows the car – brake pads on opposing sides of the disc, with pressure applied to them by the pistons in the brake caliper which squeezes the rotating disc which causes the friction and temperature that forces the car to slow.

Even though the friction between the pad friction surface and disc face is the instigator of brake squeal, it is not always that location that is squealing. To get scientific (I'm not a scientist) vibration is caused by the rapid motion of materials or particles, oscillating back and forth. One of the by-products of this motion is noise – normally a type of squealing sound and occasionally a kind of groaning. This sound can be emanating from the discs or other components around the brake system.

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# BRAKE VIBRATION

There are number of possible causes for brake vibration (or judder).

## **INCORRECT BRAKE BEDDING**

As discussed in brake pad bedding, pads and rotors need to be ‘bedded’ in order to achieve optimal performance. If bedding is carried out incorrectly and the brake discs have uneven pad deposition around them, this can cause irregular friction levels or high-points on the discs which results in uneven friction levels as the disc rotates. The other cause of these high-spots can be pitstops during a race when the driver keeps brake pressure after the car is stopped with very hot brakes. The vibration caused will transfer through the brake pedal, but mainly via the steering wheel. If really bad this problem can feel very violent and is normally only fixed by cleaning the disc surface and re-bedding the brakes.

## **PAD ‘CONTAMINATION’**

If your discs have already been used on a different brake pad material and you put new pads over the top, you run the risk of the two materials being incompatible and causing a build up on the disc. This will have an identical effect as incorrect pad bedding. Always ‘clean’ the used disc with some emery paper to loosen the existing material on the dic as this will reduce the possibility of contamination and resultant vibration.

## **DTV (Disc Thickness Variation)**

If the brake disc has been manufactured outside tolerances and is effectively thicker in some sections of the disc than others, this will also cause the vibration issue. This vibration is more commonly felt through the brake pedal, and partly via the steering wheel. This is only fixed by machining the disc flat or replacing it.

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