MEDIA RELEASE

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Greater front bias makes the car more stable under braking but increases the risk of understeer. Having greater rear bias helps the car turn into corners but there's more chance of oversteer.

Bendix explains brake

Brake bias or brake balance describes the split of brake force between the front and rear wheels when the brakes are applied.

In road going vehicles, brake bias is set from the factory, with cars typically having a front bias owing to most of them having the engine located up front, and therefore, more weight over the front wheels. If a front wheel drive car, this bias towards the front brakes is also greater.

But it's just not front wheel drives where bias favours the front. Think of some of the best sellers on Australian roads, dual cab utilities, most of these are rear wheel drive (with selectable 4x4), but the nature of these vehicles with their rear tubs or trays, means that when unladen, most of the weight is at the front, even more so if fitted with bullbar and other accessories.

Another factor that leads OEMs to favour front bias, is that in most driving situations, stopping forward momentum means forward weight transfer, it's the main reason why front disc brake rotors are normally a larger diameter than at the rear.

While brake bias is 'set' on road going vehicles, newer technology such as Electronic Stability Control (ESC) – which is mandatory for all new cars sold in Australia – can control how the vehicle distributes brake force in emergency situations, applying the brakes to individual wheels to stabilise the car, particularly when negotiating corners. The system works by picking up the driver's steering wheel inputs, especially sudden movements, and automatically applies selective braking to reduce the likelihood of oversteer and overcorrection.

In the Bendix Racing Team Camaro, driver Nick adjusts front and rear brake bias using a lever/rotary dial to the left of the gear shifter. Being able to make adjustments while driving depending on severity of the corner, fuel load and tyre wear, can help bring down lap times.

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Manual brake bias adjustment in racing cars

Most professional racing categories, including Supercars, use technology that allows drivers to manually adjust brake bias themselves. This makes for a busy operating environment given these heavy tin tops already need a lot of driver input to extract maximum performance.

In the case of Supercars, there are a couple of different systems to adjust brake bias. In the Bendix Racing Team Camaro piloted by Nick Percat, adjustment is actioned using a hand lever to the left of the gear shifter – forward movement on the shifter moves bias to the front and rear movement to the rear wheels. More delicate adjustments are made using a rotary dial on the end of the level.

Nick Percat said the ability to adjust brake bias in his race car to suit conditions was critical in achieving faster lap times and staying at the pointy end of the pack.

"When the difference between making a podium or finishing mid field comes down to split seconds, it's vital that the car's kept in optimum racing trim," Nick explained.

"Making set-up changes to areas such as sway bar stiffness and brake bias, allows drivers to adjust on the go, to try and best keep the car handling at its peak.

"Greater front brake bias will make the car more stable under braking but increases the risk of understeer or brake lock up. Having more rear brake bias will allow the car to turn more easily when braking, however too much and there's more chance of oversteering.

"There are a lot of variables that affect the performance and overall balance of the racecar, and this can change from corner to corner as the race progresses. Factors such as tyre degradation, fuel levels, track temperatures and rain will all affect the car's balance and handling characteristics – this is why you'll see Supercar drivers regularly go to the brake bias lever multiple times in a lap," Nick said.

Changing gears and adjusting brake bias many times per lap makes for a busy driving environment for drivers such as Nick.

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