

Attachment 3

Aston Martin DBX: Driving Dynamics

Driving Dynamics Highlights:

- **New all-wheel drive system with electronically controlled centre and rear differentials deliver precise distribution of torque whatever the situation**
- **New adaptive triple volume air suspension with adjustable ride height and spring rate provides highly versatile suspension package**
- **New 48-volt electronic anti-roll control system helps DBX achieve sports car levels of grip and handling**
- **New 'Terrain' driving modes ensure confidence off-road**
- **Bespoke quick ratio steering system means DBX feels alert and responsive**
- **New range of Pirelli P-Zero tyres cater for all driving conditions**
- **High levels of grip but also fun and engaging handling**
- **New Electronic Stability Control (ESC) system allows a more integrated approach to stability control**

As a luxury SUV the new Aston Martin DBX has been developed to deliver supreme confidence whatever the terrain it is tackling. As befits a car wearing the Aston Martin wings on its bonnet, DBX also has the ability to deliver a dynamic and emotional experience akin to the brand's iconic sports cars.

The bespoke all-aluminium body structure provides the perfect underpinning for a versatile SUV, with its incredible stiffness giving an exceptional foundation for both suspension and drivetrain to work from. The rigidity of the platform with its aluminium body structure and cast aluminium suspension mountings allows the double wishbone, split-link front and a multi-link rear suspension to work with exceptional accuracy whatever the terrain. The same can be said of the bespoke quick-ratio steering system, the stiffness of the structure ensuring that loads are communicated precisely back to the driver, imparting both confidence and highly responsive control.

Allied to this fundamentally secure base are a range of technologies to ensure DBX's versatility. The adaptive triple volume air suspension allows the ride height to be raised up to 45mm or lowered by 50mm to aid access for passengers or when parked. With the ride height raised the approach angle also increases from 22.2 to 25.7 degrees, while the departure angle rises from 24.3 to 27.1 degrees

and the breakover angle increases from 15.1 to 18.8 degrees. This not only gives the car the ability to tackle terrain that no Aston Martin has contemplated before, but ensures DBX is a highly capable vehicle in a range of challenging off-road environments.

Whatever the ride height, one of the key new pieces of technology is the 48-volt electronic anti-roll control (eARC) system. This replaces the need for traditional anti-roll bars and is crucial in not only allowing DBX to drive with the dynamism of a sports car but also achieve the level of ride comfort expected of a luxury SUV. In its most aggressive setting, the eARC can reduce body roll to levels comparable with a DB11. However, when appropriate, the eARC can also allow individual wheels the freedom to make the most of the available wheel travel. This is beneficial for soaking up bumps and isolating occupants from poor road surfaces, but also helps when tackling challenging off-road terrain where greater wheel articulation is required.

In combination with the eARC system, the 14.4:1 steering ratio gives DBX the agility to put the driver in mind of a sports car. The quick ratio steering works with the tempering effect of the long wheelbase to provide a dynamism that is both exciting and confidence inspiring. Also key to the dynamic feel of the car are the three different tyres that have been developed with Pirelli, the official technical partner for tyre development. A summer P Zero tyre will be the default fitment with Pirelli Scorpion Zero all-season and Scorpion Winter tyres also available. Whichever tyre is fitted, DBX retains a broad spread of ability both on and off road.

Of course, it is not only the suspension, steering and tyres that give DBX its confidence. The all-wheel drive system allows the power from the twin-turbo V8 to be transmitted smoothly to the terrain. The electronically controlled active centre transfer case allows torque to be moved between the front and rear axles depending on the traction requirements at any given moment. The distribution of torque between front and rear axles is constantly varied depending on the driving conditions and drive mode. When required, the active centre transfer case can vary between 47% front and 53% rear to nearly 100% percent of the torque being sent to the rear axle if required. That rear torque can then be distributed between the left and right rear wheels by an electronically controlled limited-slip differential to maximise traction or dynamic response depending on the driving conditions.

In addition to the active differentials, torque vectoring is available via braking. With six-piston aluminium calipers and vented, grooved steel brake discs measuring 410x38mm at the front and 390x32mm at the rear, DBX has braking performance on par with the mighty DBS Superleggera. By automatically slowing individual wheels, the agility of the car can be increased appreciably, particularly when entering corners.

A feature not seen on an Aston Martin before is hill descent control (HDC). This utilises engine braking alongside the anti-lock braking system (ABS) to enable DBX to negotiate steep, potentially slippery slopes in a controlled manner. There is also a new electronic stability control (ESC) system for DBX, including roll-over stability control. This new ESC system is supplied by Bosch and rather than individual systems working independently it uses a central information core that collects data from all available inputs to optimise the braking performance in all conditions.

Six driving modes are available on DBX, adjusting the active differentials, adaptive air suspension, eARC and ESC, amongst other things, to tailor the car to certain situations. Four modes, including Sport and Sport+, are specifically for on-road driving, with two new modes, Terrain and Terrain+, ensuring that DBX is primed to tackle off-road driving. While these modes ensure clear, distinct settings for each requirement, fully customisable settings are also available. Tailored to the driver's preference, these can be linked to individual keys to allow instant setup for multiple users of the same DBX.

DBX's off-road capabilities include the ability to wade through water up to a depth of 500mm. One of the adaptations that have been made to facilitate rear wading is a breather pipe on the electronic rear differential. This is particularly necessary for situations such as reversing a trailer into water while launching a boat.

As DBX brings a new dimension to the dynamic capabilities across the range of Aston Martin cars, Matt Becker, Chief Engineer - Vehicle Attribute Engineering, and his team have had to introduce new dynamic & durability testing protocols alongside all the usual tests carried out with Aston Martin's sports cars. DBX prototypes were still required to do an 8000km enthusiastic driver test with the Nürburgring used for brake and tyre development. However, a significant amount of time has been dedicated to off-road testing at a variety of locations. One of these was the famous Walters Arena rally stage, which has previously formed part of the demanding World Rally Championship Rally GB and lies just to the north of the St. Athan manufacturing facility in South Wales where DBX will be built.

DBX delivers a driving experience with extraordinary breadth and capability, possessing huge levels of grip, with a naturally fun and engaging driving experience. The quick-ratio steering instils an agility that is rare in any SUV, while the soundtrack, is pure sports car and matches the impressive straight-line performance. It will confidently wade through water and tackle terrain that no Aston Martin has before, while maintaining the capacity to cover long distances with the refinement of the best Grand Tourers and deal with the rigors of everyday life. In short, it is the most confident, versatile vehicle that Aston Martin has ever produced, reflecting established qualities expected of an Aston Martin as well as introducing a host of new ones.

Chief Engineer - Vehicle Attribute Engineering, Matt Becker said: "In testing, the lateral grip numbers that we have seen on tarmac have been genuinely incredible. Our on-track and on-road performance has seen us push the boundaries of what is possible for an SUV and in many instances, we have seen performance credentials more likely seen in one of our sports car models. Yet, in terms of off-road performance, with the suspension we've designed and with the wheel travel we've achieved, we have also ended up with a car that has exceeded our aims in that arena."