

Media Information

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World's Most Powerful BMW Six-Cylinder Diesel Engine set to arrive in Singapore.

Debut of BMW M Performance Automobiles Range: BMW X6 M50d and BMW X5 M50d.

Singapore. BMW Asia will soon debut its top-of-the-line 3.0-litre six-cylinder diesel engine with Tri-turbo charging, via its BMW X6 M50d and BMW X5 M50d of the new BMW M Performance Automobiles range.

The arrival of this powerful engine has altered the conventional paradigm once again, by proving that both performance and efficiency can co-exist harmoniously. Despite the ability to generate up to 381hp with a maximum torque of 740Nm from 2,000 to 3,000 rpm on tap, the Advanced Diesel engine with triple-turbo technology of the BMW X5 M50d maintains at a low fuel efficiency of 7.5litres/100km and CO2 emissions of 199 g/km (in the EU combined cycle).

“Powered by the M Performance TwinPower Turbo technology, this impressive engine is equipped with three turbochargers and advanced common-rail injection system for the first time. With its outstanding abilities, we trust it will only be a matter of time before this new engine enjoys the highest level of recognition just as its fellow award-winning ‘siblings’ have,” said Mr Neil Fiorentinos, Managing Director of BMW Group Asia.

World's most powerful six-cylinder in-line diesel engine:

M Performance TwinPower Turbo with three turbochargers and advanced common-rail injection system for the first time.

Backed by impressive statistics, the advanced diesel engines are capable of significantly generating a maximum torque that has won over even the performance-minded drivers.

The high efficiency of diesel technology also ensures extremely low fuel consumption and CO2 emissions. BMW has played a major role in the burgeoning appeal of the diesel engine,

developing units which have time and again raised the bar in terms of sports performance and efficiency. The company's record of diesel engine development, which began in 1983 with the launch of its first diesel model, now continues into another fascinating dimension.

The first of the new BMW M Performance Automobiles – founding a product category focusing on sporty driving pleasure – are powered by a diesel engine. The 3.0-litre six-cylinder in-line unit, whose cover bears the M Performance badge, has all the necessary tools to fulfill the brief handed to the new breed: technology without parallel worldwide, the highest output ever achieved by a BMW diesel engine and outstanding levels of efficiency.

The BMW X5 M50d and BMW X6 M50d:

An imposing presence in both the acceleration and efficiency rankings.

Outstanding powertrain and chassis technology in combination with xDrive intelligent all-wheel drive allow the BMW X5 Sports Activity Vehicle and BMW X6 Sports Activity Coupe to display extraordinary poise and assurance. The BMW M Performance Automobiles based on the two BMW X models take these character traits to a whole new level. Thanks to the most powerful diesel engine in the BMW engine range, allied to the optimised power transfer, handling properties and aerodynamic balance for which M cars are renowned, the BMW X5 M50d and BMW X6 M50d set new standards in their respective classes in terms of sportiness, conceptual harmony and efficiency.

With its maximum output of 381 hp and peak torque of 740Nm the engine developed for the BMW M Performance Automobiles also brings a level of performance to the two BMW X models which no other diesel-powered car in their segments can match. The BMW X5 M50d accelerates from 0 to 100 km/h in 5.4 seconds, the BMW X6 M50d in just 5.3 seconds, while average fuel consumption in the EU test cycle stands at 7.5 litres/100km for the Sports Activity Vehicle and 7.7 litres/100 km for the Sports Activity Coupé – only slightly above the figures for the existing diesel variants of the two models. CO₂ emissions are 199g/km for the BMW X5 M50d and 204 g/km for the BMW X6 M50d.

M Performance TwinPower Turbo Technology:

More pressure, more output, more torque.

The coordinated interplay of turbochargers of different sizes endows an engine with instantaneous responsiveness at low revs and allows charge pressure to be increased according to need when the engine is placed under greater loads.

And now the company is set to become the world's first carmaker to present a diesel engine which expands the principle of multi-stage turbocharging to incorporate a third turbocharger. The engine developed for the BMW M Performance Automobiles will, for the first time, see two comparatively small high-pressure chargers working with a larger low-pressure unit. The integration of an additional high-pressure turbo increases the engine's capability when it comes to generating charge pressure, a key ingredient in taking the engine's power output to the next level.

The M Performance TwinPower Turbo technology – including the requisite charge air cooling – is, like its predecessor, integrated into a small space in the main unit. Its compact construction puts the engine in a position to meet future pedestrian protection stipulations, while the arrangement of the three turbochargers is also part of an extremely intelligent system. Both the exhaust inflow to drive the turbos and the supply of fresh air, plus the channelling of compressed air to the combustion chambers, have been designed to ensure that the three compression units work as a team as effectively as possible at all engine speeds. Efficiency is further optimised by the variable turbine geometry of the two high-pressure chargers, which allows them to react even more precisely to the driver's power needs.

Instantaneous responsiveness and precisely coordinated interplay.

One of the two small turbos is activated at engine speeds just above idle. Its low moment of inertia allows it to respond without delay to the slightest movements of the accelerator and therefore supply the combustion chambers with compressed air at an early stage. As revs increase, the flow of exhaust gas also reaches the larger turbocharger, which announces its arrival with the engine spinning at just 1,500 rpm. Working together with the small charger, it ensures that the impressive peak torque of 740Nm is generated at this low engine speed and maintained up to 3,000 rpm. To further increase the performance of the large turbocharger, a greater volume of exhaust gas is required at around 2,700 rpm. If the driver calls up additional power, a vacuum-modulated exhaust flap instantly opens up another supply route, allowing extra exhaust gas to flow past the already active high-pressure charger to the large low-pressure turbo. The third turbocharger – integrated

into this bypass line – also has a low moment of inertia and variable compressor geometry, which allow it to spring into action as soon as the exhaust flap opens. The result is additional charge pressure, generated by two sources at the same time. The large turbocharger is able to deliver its full output, while the second small turbo builds on the effect of its two active colleagues by supplying even more compressed air to the combustion chambers. This arrangement allows the turbocharging system to drive the engine with forceful and sustained thrust to its maximum output of 381 hp, which it notches up between 4,000 and 4,400 rpm. The maximum engine speed of the new diesel powerplant is 5,400 rpm.

In order to ensure that charge pressure is developed as effectively as possible, not to mention efficiently, both the exhaust flow and supply of fresh air to the turbos and the channelling of compressed air into the combustion chambers is regulated with maximum precision. If the large turbocharger is spinning at particularly high speeds, a vacuum regulator opens a wastegate valve to relieve the pressure and so avoid unwanted exhaust backpressure. The supply of fresh air is also controlled according to need by means of pneumatically activated flaps. For example, at low revs a bypass flap ensures that the air is channelled directly to the high-pressure charger, which spins into action very early. At less than 2,700 rpm a change-over flap keeps the air away from the third turbo, which is not yet active, to prevent unnecessary fluctuations in pressure.

Indirect charge air cooling enables the temperature of the air compressed by the three turbos to be reduced to the optimum level for increasing engine output. Both the main radiator positioned immediately in front of the combustion chambers and the intercooler behind the low-pressure charger are supplied by a low-temperature water circuit with separate electric pump.

Detailed optimisation enables higher combustion pressure, increased output and enhanced efficiency.

The new torquey and high-revving diesel engine also breaks new ground with its specific output of 93.6 kW per litre of displacement. However, the output possible using M Performance TwinPower Turbo technology is generated not in the turbochargers but in the core of the basic engine, which has therefore also been extensively modified. Maximum combustion pressure has risen from the 185 bar of the most powerful diesel engine in the existing BMW line-up to 200 bar. As part of this development, the crankcase in the new 3.0-litre diesel engine features an innovative tie rod concept for the assembly of the main bearing caps and cylinder head. The sintered main bearing caps are given extra strength by a central screw. Like the crankcase, the cylinder head is also subjected to a special high-pressure compression process. This “HiPen”

manufacturing concept sees the aluminium castings heated to solution annealing temperature and the casting pores created during manufacturing welded under high pressure. This process gives the finished component additional strength. A double diagonal bore ensures the interbore bridges have high thermal stability.

The geometry of the crankshaft and connecting rods has been further optimised and they are now made from higher-strength materials. Added to which, hub bushings and bowl rim remelting enhance the effect of the increase in piston compression height.

Higher pressure also raises the efficiency of the injection system.

The injection system of the new six-cylinder in-line diesel engine has also benefited from a rigorous process of further development. The common-rail direct injection system plays its part in enhancing the engine's efficiency and promoting clean combustion by sending extremely precise quantities of fuel into the cylinders. The upgraded system raises the injection pressure of the piezo injectors to 2,200 bar. During each power stroke, three pre-injections, one main injection and four post-injections of fuel take place. An ultra-high-performance pump channels the fuel to the combustion chambers through a common rail made from forged stainless steel.

The output and capacity of the cooling system have been given another boost, too. An additional low-temperature circuit supplied by an electric water pump controls the temperature of the intercoolers. The exhaust treatment system includes a diesel particulate filter and oxidation catalytic converter, which is located close to the engine in the same casing. More efficient exhaust cooling, meanwhile, minimises the formation of nitrogen oxides.

New six-cylinder engine with three turbochargers – a milestone in the glittering history of BMW diesel engines.

The engine developed for the BMW M Performance Automobiles represents a new high water mark in the illustrious history of diesel engines at BMW. The premium carmaker has offered customers diesel-powered models since 1983. The BMW 524td that kicked off this fine tradition quickly earned itself the status of the sportiest diesel model on the market. Its engine developed 115 hp and delivered the best performance yet also the lowest fuel consumption of any car in its class. Since then, diesel BMWs have regularly emerged as the most efficient models in head-to-head tests. A host of prestigious awards – such as the Engine of the Year Award – and the impressive success of diesel-powered BMW models on the track headline the company's unrivalled expertise in the development of diesel technology.

And so it is entirely in keeping with the company's proud heritage that the first BMW M Performance Automobiles are now set to line up with a diesel engine under the bonnet. The unit developed to power them fulfils its sporting brief with leading performance in a range of disciplines and, in so doing, dismantles the historic contradiction between driving pleasure and economy even more effortlessly than ever.

More power, easy control – building on a fine tradition.

The origins of BMW M GmbH lie in the development and production of racing cars, which wasted no time in achieving head-turning success – notably in touring car competition. The clear sporting potential that filtered down into standard roadgoing BMW models whetted many customers' appetites for extra power. Just a few years after BMW Motorsport GmbH was founded, in 1972, the first BMW 5 Series models gained the necessary engine, power transfer and chassis modifications to respond to those owners' wishes. Then, in 1980, a new model was added to the BMW 5 Series range; the BMW M535i was powered by a 3.5-litre straight-six engine developing 218 hp and only previously available for the BMW 6 Series and BMW 7 Series. To make the most of its significant power advantage, this model also came in for precisely judged modifications to its chassis, brakes, gearbox and rear differential, as well as special tyres and rims, sports seats and a leather steering wheel. Aerodynamically optimised front and rear spoilers could also be specified as an option.

A BMW M535i was also developed on the basis of the second-generation BMW 5 Series and went on sale from 1984 to 1987. With its increased output channelled seamlessly into dynamic flair and aerodynamically optimised body components setting it apart stylistically from its 5 Series siblings, the M535i introduced drivers to a whole new level of driving pleasure yet also provided unrestricted everyday usability. This concept enjoyed sustained success over many years, even after the high-performance BMW M5 sports car was unveiled in 1985. And now it has been revived in a fresh and contemporary new form with the arrival of the BMW M Performance Automobiles.

“With the BMW M Performance Automobiles, we will be targeting at customers who are looking for more emotionality and greater performance, without wanting to forgo the everyday usability of their cars. By leveraging on the full expertise of BMW M GmbH and its decades of motor sport experience, we are now able to translate outstanding engine power into excellent dynamics as demonstrated through the BMW M Performance Automobiles,” concluded Mr Fiorentinos.

Both the BMW X6 M50d and BMW X5 M50d are slated to arrive in Singapore later in November 2012.

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The BMW Group

The BMW Group is one of the most successful manufacturers of automobiles and motorcycles in the world with its BMW, MINI, Husqvarna Motorcycles and Rolls-Royce brands. As a global company, the BMW Group operates 25 production and assembly facilities in 14 countries and has a global sales network in more than 140 countries.

In 2011, the BMW Group sold about 1.67 million cars and more than 113,000 motorcycles worldwide. The profit before tax for the financial year 2010 was euro 4.8 billion on revenues amounting to euro 60.5 billion. At 31 December 2010, the BMW Group had a workforce of approximately 95,500 employees.

The success of the BMW Group has always been built on long-term thinking and responsible action. The company has therefore established ecological and social sustainability throughout the value chain, comprehensive product responsibility and a clear commitment to conserving resources as an integral part of its strategy. As a result of its efforts, the BMW Group has been ranked industry leader in the Dow Jones Sustainability Indexes for the last eight years.

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