

The new BMW F 800 GS. The new BMW F 650 GS. Contents.



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1. Concept, claim and characteristics.



With the two completely new enduro models, the F 800 GS and F 650 GS BMW Motorrad is not only expanding its range of products available but also presenting a worthy successor to the totally successful F 650 GS with its single-cylinder engine. Even when it's parked, the amazingly offroad-capable F 800 GS travel enduro, with its sturdy appearance and long spring travel, indicates what it can do off-road. The signals it gives off are clear yet diverse: fun driving on all types of road, and stamina on journeys even when the destination can only be reached by gravel tracks.

The F 800 GS's little sister, the F 650 GS, which also has a straight two-cylinder engine, is, in contrast, aimed at people who do not need quite as much spring travel and are looking for a little less adventure. With its lower seat height, it is an outstanding all-rounder; it is easy to control, provides plenty of power combined with economy, and is ideal for everyday use.

A high level of stability combined with playful handling are features shared by both the new GS models. Both the model variants offer high-quality workmanship, safe chassis and impressive engines for maximum driving enjoyment.

The straight two-cylinder drive comes from the well-known F 800 model series, but beyond this, the enduro models have been completely redesigned. A completely new frame and new wheel suspensions with new spring-shock absorber elements are used, for example, which will surpass the expectations of even the most demanding enduro riders. The belt drive and single-strut swing arm, which are ideal for pure on-road use, have been replaced by a light chain drive, which, in combination with a very stable, attractive aluminium profile double-strut swing arm, offers particular advantages in offroad driving in particular. The new GS is thus not only in its element on roads – it will also always find a way through off-road too.

The F 800 GS combines road and touring capabilities with superior offroad characteristics. It thus combines the two worlds in a way that has never before been achieved in this class and offer the maximum possible freedom in terms of its areas of use. BMW Motorrad has positioned the dynamic travel enduro at an attractive price, thus adding a real asset to the market.

The new F 650 GS differs from its big sister in its lower seat height, lower weight and reduced engine power. It is thus ideal for newcomers to the genre or as a sturdy all-round motorcycle for all eventualities. Compared with its predecessor, the F 650 GS with single-cylinder engine, the new model is an improvement in every day. Despite its designation, which apparently refers to the engine size, the F 650 GS has the same 800 cc straight two-cylinder engine as the F 800 GS. With a slightly reduced engine power (71 instead of 85 HP), the focus for the F 650 GS is on the high torque at lower engine speeds and excellent economy. And yet it offers over 20 HP more power than its predecessor. The F 650 GS thus also guarantees driving enjoyment wherever it goes.

2. Vehicle characteristics and technology.



For BMW Motorrad, the abbreviation "GS" is not an empty promise. This will be demonstrated in the future by the F 800 GS too, in continuation of a long tradition. The new model not only offers the typical qualities of a travel enduro – it also offers superb offroad driving capabilities. Whilst large-capacity enduros sometimes reach their limits because of their weight and overall design, the new F 800 GS is completely unstoppable. The overall package combines balance power and weight, excellent ground clearance, long spring travel, precise wheel guidance and sophisticated ergonomics, giving excellent offroad driving and excellent long-distance performance.

The chassis combines all the ingredients that a real enduro needs: a sturdy steel tube frame that allows a steering lock of 42 degrees, a rigid upside-down fork with 230 mm spring travel, a sturdy aluminium double-strut swing arm with a path-dependent cushioned spring strut and 215 mm spring travel and solid wire-spoke wheels. A 211" front wheel in the classic enduro dimensions of 90/90-21 gives running stability in slow offroad driving, whilst the rear wheel, with dimensions 150/70-17 ensures that the engine power is always transferred securely to the track.

The drive system is the parallel twin from the F 800 S modified for the new usage, with its cylinders now only inclined 8.3 degrees forward. The strong, liquid-cooled four-valve two-cylinder is particularly convincing because of its spontaneous response, its impressive torque and its low fuel consumption. Nominally, the engine provides 63 kW/85 HP at 7 500 min⁻¹ and, at 5 750 min⁻¹ sends a torque of 83 Newton metres to the sliding bearing based crankshaft. Thanks to the regulated three-way catalytic converter and secondary air system, the Twin releases its power in a way that is absolutely environmentally friendly. The mass balance is provided by a system that is unique in standard motorcycle design: an additional swivel con-rod balances the first and second level mass forces and ensures that the two-cylinder functions with the minimum of vibrations.

The low dry weight of 178 kg makes a major contribution to the dynamic driving properties. When filled with petrol and ready to drive, the F 800 GS weighs in at just 207 kg.

The F 650 GS, which is 8 kg lighter and with a much lower seat height, is the ideal motorcycle for newcomers. Technically, it is based on its big sister, but the cast metal wheels and lower ground clearance indicate at first glance that it prefers on-road motoring. Other distinguishing features are the smooth-surfaced side fairings, the low wind screen, other spring elements and the lower engine power. With 52 kW/71 HP at 7 000 min⁻¹ and a maximum torque of 75 Nm even at 4 500 min⁻¹, there's still plenty of power in this variant too. Because of the reduced power, there is no need for a secondary air system, since fewer uncombusted gases enter the exhaust system. A 25 kW/34 HP version is also available for drivers who have only just passed their test.

Both models offer an excellent level of seat comfort for both driver and pillion passenger, along with a high standard of safety features. If required, the enduros can be fitted ex factory with a two-channel ABS that can be switched off. In addition, the extensive range of BMW accessories meets the further individual wishes of our demanding customers, as always.

Overview of the main features of the new GS models:

- F 800 GS as mid-class travel enduro with excellent offroad properties and long-distance capabilities.
- F 650 GS as the all-round variant ideal for newcomers, designed to be slightly stronger in on-road use and easier to control.
- Liquid-cooled parallel twin with 798 cc capacity, four-valve technology and unique mass balance.
- Rev-proof DOHC valve drive via cam followers.
- Manifold injection with electronic engine management BMS-KP, lambda probe and regulated three-way catalytic converter plus secondary air system (last only for F 800 GS).
- Closely stepped six-gear transmission for excellent driving performance.
- Dirt-resistant secondary drive via O-ring chain.
- Torsion-resistant tubular steel frame with unusual gusset plate reinforcement of steering head.
- Easy handling and extremely tight turning circle.

- Stable telescopic fork, USD fork with upright tube diameter 45 mm (F 800 GS) or 43 mm telescopic fork (F 650 GS).
- Double-strut swing arm in die-cast aluminium.
- Spring strut with adjustable spring pre-tension and adjustable rebound damping, F 800 GS has WAD function (path-dependent damping as in the R 1200 GS).
- Long spring travel for comfort and offroad suitability in the F 800 GS.
- Excellent seat comfort for driver and pillion passenger.
- Tank underneath seat, for best centre of gravity, with easily accessible fill opening.
- Powerful braking system, with ABS if required.
- Air filter and battery positioned behind steering head for easy maintenance.
- Wide range of accessories for offroad and touring use.

The most important differences at a glance:

BMW F 800 GS

63 kW/85 HP
Valve timings like F 800 S
Wide cooler
Offroad-look fairings
High windscreen
USD telescopic fork
WAD spring strut
Spoked wheels
21" front wheel
Double-disc brake, floating, front
Aluminium handlebar
880/850 mm seat height
Ready-to-drive weight 207 kg

BMW F 650 GS

52 kW/71 HP
Power-reducing valve timings
Narrow F 800 S cooler
Street-look fairings
Low windscreen
Conventional telescopic fork
Gas pressure spring strut
Cast metal wheels
19" front wheel
Single-disc brake, front
Steel handlebar
820/790 mm seat height
Ready-to-drive weight 199 kg
Lowering kit (765 mm)
Power reduction

Modified two-cylinder.

The parallel twin familiar from the F 800 S/ST models forms the basis for the GS drive. For the new usage, however, some aspects of the engine have been modified. In order to allow long spring travels with a wheel spacing that remains moderate, plus an ideal distribution of weight, the cylinders are now only angled forward by 8.3 degrees instead of the 30 degrees with the F 800 S/ST. This solution has been made possible by a new design for the lower engine housing section made from die-cast aluminium. It contains application points for the engine protection plate and provides the ideal working conditions for the semi-dry sump lubrication. In addition, the cylinder head has been reinforced in the area of the frame connection at the front on the right. The GS engine has a modified clutch cover which creates more space in the footrest area and more room for a new oil dipstick and a changed clutch release shaft. Finally, the water pump housing and cooling hose connections have been adapted to the new position of the engine. The side-effect of these modifications is that the engine is a kilogram lighter than the unit used in the S/ST model series.

Like the famous F 800 engine, the transverse parallel twin works with an even firing order (360° ignition offset) without crank offset on the crankshaft. Because there is one firing cycle for each crankshaft rotation, the sound is deliberately like that of boxer engines which work with an identical firing offset. Most importantly, however, the even firing sequences creates the best conditions for a balance load change with high torque yield.

Unique mass balance.

The mass forces are offset by a balancing mechanism that is unique in series engine design. Instead of having conventional counterweight shafts, the oscillating mass forces are balanced by a joint system on the centre of the crankshaft with deliberately positioned counterweight masses: an eccentric on the crankshaft offset against the crank pins by 180° carries what is known as a balancing correcting rod. This connecting rod is hinged to an approximately horizontal balancing rocker. The kinematics are designed in such a way that the balancing connecting rod moves contrary to the two engine connecting rods. Because of being guided through the relatively long rocker, an almost linear swivel movement of the connecting rod head is achieved – to put it precisely, the small connecting rod eye describes a slightly curving path. The mass distribution at the connecting rod head and rocker is chosen in such a way that the mass forces resulting from the swinging movement combat, in every crankshaft position, the oscillating mass forces from the crank drive (piston and con-rod proportion). This means that first and second order mass forces are almost completely eliminated, resulting in low-vibration engine running.

Lubrication system.

The oil circulation system also includes a number of sophisticated details. In order to prevent punch losses, a semi-dry sump lubrication system has been designed which works without any separate engine oil tank. Lubricant coming from the main bearings collects in a tray which also holds the balancing system and which is sealed off from the actual oil tray. Engine in this area is constantly vacuumed up by an oil pump and transported to the transmission housing, before running from there, under no pressure, via openings in the crank housing into the oil tray. The oil pressure pump supplies the lubricating oil system from this reservoir.

Camshafts matched to enduro requirements.

The cylinders in the GS engines are fitted with a high-tech cylinder head. As in the new engines in the K model range, here too, two upper camshafts driven by a toothed chain rotate and control four valves per cylinder via cam followers. The F 800 GS, unlike the S/ST models, uses slightly modified camshafts which help the engine develop its power in a way that is ideal for enduros: with excellent torque, even and easily controllable. The power reduction of the F 650 GS is via camshafts with different cams which reduce the lift and changed valve timings which result in a shorter valve overlap. The valve drive via cam followers is low-wear, only produces minimal friction losses and is particular rev-proof. The valve play therefore only needs to be checked after 20,000 km at the earliest.

Valve timings	BMW F 800 GS	BMW F 650 GS
Intake opens	14° after OT	28° after OT
Intake closes	18° after UT	4° after UT
Outlet opens	18° after UT	4° after UT
Outlet closes	14° before OT	28° before OT
Valve lift	9.64 mm	7.2 mm

Mixture preparation.

Other features that are typical of BMW include the mixture preparation, which is via a manifold injection with BMS-KP engine control and two 46 mm throttle valves. The injection quantity is determined by the specially tuned engine control, not only via the injection period but also via the pressure that the petrol pump provides, depending on the power requirement. The fuel system operates without return and only carries the quantity that the engine actually needs. Because of this economical, patented regulation system, the fuel pressure can be modified within a wide range so that the mixture is always ideal. To measure the fuel quantity supplied, not only the well-known

parameters such as load, engine speed and temperature are used, but also the residual oxygen content in the exhaust gas. The corresponding information is provided by a lambda probe positioned at the point where the manifolds join. This is followed immediately by the three-way catalytic converter, provided as standard, which quickly warms up after the cold start and can thus start its conversion work quickly.

The air necessary to form the mixture reaches the new suction silencers via suction snorkels positioned in the cool air stream. The positioning well above the engine, which is good for both on-road and off-road driving, and the large volume, which supports torque were made possible by the positioning of the tank under the seat. Whilst the suction snorkels of the F 800 GS are visible as a design element, in the F 650 GS, they are concealed behind the front fairing.

Exhaust system.

The completely new, weight-optimised exhaust gas system is made completely from high-grade steel and weighs in at just 8.5 kg. The single-wall manifold system is connected with the silencer via a plug connection with tension spring. The attachment of a slip-on silencer is therefore easy and cheap, especially since the catalytic converter is integrated into the manifold. The end silencer provided as standard is constructed as a two-chamber silencer in a combined absorption/reflection design, offers a gas flow volume of 8 litres and is mounted on the left side of the vehicle, half way up. The F 800 GS is fitted with a secondary air system which, in combination with the regulated catalytic converter, reduces the emission of pollutants to EU3 requirements. Because of the modified valve timings and the associated lower raw emissions, there is no need for a SA system for the F 650 GS.

High-revving with great torque.

It is not only the modern injection system that ensures a prompt response from the F 800 GS twin; its low centrifugal mass also contributes to its agile power development. Even at the bottom of its rev range, the four-valver, which, with a bore-stroke ratio of 82 to 75.6 mm, is not particularly short-stroked, soon speeds up and releases a good 90% of the maximum torque in the broad range between 4 000 and 7 500 min⁻¹. Between 5 000 and 8 000 min⁻¹, the engine develops its power dynamically, accompanied by a unique sound. The nominal performance data of the 798 cc twin – 63 kW/85 HP at 7 500 min⁻¹ and 83 Nm at 5 750 min⁻¹ – therefore give an incomplete picture of the potential that is available in practice.

In combination with the low total weight and closely stepped six-gear transmission, the engine accelerates from 0–100 km/h in about 4 seconds, and the top speed is over 200 km/h.

In this area, the F 650 GS comes close on the heels of its sister model. It copes with acceleration from 0–100 km/h in less than 5 seconds, and also reaches an impressive top speed of 185 km/h.

But it is not only the acceleration of the new GS models that is impressive; their traction is also remarkable. The BMW development engineers have focussed quite deliberately on the smooth, confident development of power in the mid engine speed range rather than on absolute peak performance. Sporting drivers will be bowled over by the engine's acceleration, whilst tourers will enjoy the twin's strong traction with minimal shifting.

The parallel twin, which has been optimised for enduro operation, not only manages to walk the tightrope between powerful torsion and dynamic acceleration. It also proves that good driving performance does not necessarily involve high fuel consumption. Driven over country roads, a consumption of well below 5 litres of Super petrol per 100 km is perfectly possible. If required, the F 800 GS can also be fitted for use with normal petrol, which, however, reduces the peak performance by 1.5 kW/2 HP and increases fuel consumption slightly. This modification is carried out by calling up a characteristic map in the control software, and can be cancelled again at any time. The F 650 GS is designed in any case for operation with lead-free normal petrol.

BMW Motorrad can also provide ex factory, at no extra cost, a throttle version of the F 650 GS with 25 kW/34 HP at 5 000 min⁻¹ and 57 Nm at 3 000 min⁻¹, aimed specially at new drivers with graded driving licences. The power reduction is via a modified throttle valve.

The sophisticated engine concept shows additional technical finesse in its peripherals. The water pump, for example, is on the right of the cylinder head and is driven by a cog wheel unit on the camshaft. The advantageous positioning of the pump – directly behind the cooler with integrated thermostat – means that only short hose connections are needed. The engine therefore looks particularly compact and tidy. An oil-water heat exchanger next to the easily accessible oil filter ensures that the engine warms up particularly quickly after a cold start. In addition, the heat exchange also limits the engine oil temperatures.

Rear wheel drive via robust O-ring chain.

Because motorcycles suitable for off-road use are often used on roads that are unfinished, they need a secondary drive that is not sensitive to dirt.

Both GS models therefore have an O-ring chain with a division of 5/8 x 5/16.

A chain guide rail protects the aluminium rocker from damage. Four asymmetrical drive dampers provide shock absorption for the chain wheel bearer which is taken exactly over the full-floating axle via a grooved ball bearing.

Whilst the six-gear transmission is taken from the F 800 S/ST models and only the transmission output shaft has had to be modified to the chain drive, the end transmission ratio has been changed for both GS variants and modified for each model. The F 800 GS thus works with a transmission ratio of 1:2.625 (16/42 Z), and the F 650 GS with a ratio of 1:2.412 (17/41 Z).

A sturdy tubular steel frame.

The tubular steel frame designed specially for the new GS models, built in as a tubular space frame, offers a whole range of interesting details which improve the extraordinary off-road qualities of the GS models. The slim steering head, for example, which is integrated with total stability into the frame structure allows a steering lock stop of 40 (F 650 GS) or 42 (F 800 GS) degrees. The steering head is fixed using a completely new lay-out of gusset plates which have considerably reduced the design width without affecting the stability of the frame. The steering lock is also improved by the fact that the steering lock is positioned in front of the handlebar. Off-road, the small turning circle of the GS models is particularly advantages when the bike has to drive through trial sections at walking speed.

The tubular space frame in manganese-alloy steel integrates the engine as a bearing element into the framework. The frame tubes are brought together in the area of the rocker bearings in forged steel parts. The frame tail made from rectangular steel pipe is taken up by the main frame via four screw connections and carries the new fuel tank (capacity 16 litres) which is positioned under the seat. The new design was not only required because of the modified engine. In the front part of the bench seat, not only are the main frame and frame end very narrow – the seat itself and the covering of the suction silencer are very streamlined. This means that, in relation to the seat height, an incredibly short arc has been realised, which is the decisive dimension for being able to touch the ground. The result is that the GS models provide perfect seating both for giants of the road and for smaller drivers, particular since with the F 650 GS the seat height can be reduced to 790 mm (with lowering kit: 765 mm).

Made-to-measure telescopic forks for both models.

Because of the very long spring travel of 230 mm, an upside-down telescopic fork is the best choice for the F 800 GS. The overlapping of the fixed and sliding tubes is particular large with this design, particular since the fixed

tube diameter of 45 mm ensures excellent bending strength. Plastic deflextors combined with the front wheel covers provide protection against stones. In the F 650 GS, a conventional telescopic fork with 43 mm fixed tubes is used, providing a spring travel of 180 mm.

Aluminium double-strut swing arm at rear.

The rear wheel suspension of the GS models is similarly robust, with real slave qualities. It is based on an aluminium double-strut swing, die-cast in a single piece. Whilst the F 800 GS uses a directly hinged central spring strut with path-dependent damping and a spring travel of 215 mm, the F 650 GS is fitted with a convention gas pressure spring strut with a spring travel of 170 mm. The spring pre-tensioning can be adjusted on both spring strut elements using a handwheel, so that the rear wheel suspension can easily be adjusted for one- and two-person use. The tension stroke of the suspension can also easily be adjusted to individual requirements in both models.

Wheels and tyres for the required purpose.

The wheels are another point of difference. The F 800 GS travels on aluminium spoked wheels, size 21 x 2.15 at the front and 17 x 4.25 at the rear. The front wheel size of 21", which is normal in enduro sports, gives greater riding stability because of the greater gyroscopic forces, which can be an inestimable advantage on loose ground. In contrast, the road-oriented F 650 GS, designed as a starter model, features cast aluminium wheels measuring 19 x 2.5 at the front and 17 x 3.5 at the rear. The smaller front wheel is a particular advantage on asphalt in particular, especially since the cast wheels are slightly lighter than the spoked wheels. Both wheels come with road-capable enduro tyres as standard. For the F 800 GS, tyres with a marked stud profile are also approved, and refitting is easy if the motorcycle is to be used mainly offroad.

The tyre sizes are also proof that both vehicles have been tailored to their preferred area of use. The F 650 GS, for example, is fitted with tyres measuring 110/80-19 at the front and 140/80-17 at the rear. In contrast, the F 800 GS travels on tyres measuring 90/90-21 at the front and 150/70-17 at the rear. Whilst the front wheel supports easy handling and minimises braking torque, the two rear wheel tyres take account of the higher engine power.

Braking systems matched to each model.

The braking systems in each model are also matched to the intended purpose. Because the F 800 GS reaches higher speeds, the front wheel has two fully floating brake discs 300 mm in diameter and double-piston sliding callipers. The F 650 GS's single-disc brake of the same size also fulfils its

requirements with bravura, since it can also be set optimally. At the front the steel-reinforced brake lines are laid in such a way that they do not push through the cockpit fairing when the telescopic fork is compressed. At the rear wheel, both GS variants are slowed down by an identical 265 mm disc brake with single-piston sliding callipers.

Modern two-channel ABS with improved rear wheel lift-off detection.

If required, the GS models can be fitted ex-factory with a two-channel ABS. The current generation of BMW Motorrad ABS is characterised not only by its compact design and low weight, but also by its very short braking paths. The pressure modulator controls the optimum braking pressure in the regulating range via intake valves that are adjusted on a linear basis and is characterised by its very fast, fine regulating intervals. The valves with infinitely variable cross-section openings also ensure that the driver only perceives a slight pulsing in the brake levers. In addition the BMW Motorrad ABS offers expanded diagnosis functions: the wheel rev sensors monitor their distance from the sensor wheel automatically and thus contribute to the vehicle's outstanding safety. Riders who routinely drive off-road can deactivate the ABS system before off-road use.

On-board electrics with CAN bus and immobiliser.

The electrical systems in the new GS models are also at the top of the range, and work with an innovative CAN bus system. As in the sister models in the F 800 model series, the single-wire system (SWS) has many advantages: it reduces the amount of cable required, allows all control devices to be networked and thus simplifies the preparation of comprehensive diagnoses. In addition, there is no need for conventional fuse cut-outs, since the system automatically switches off the component in question in the event of a malfunction.

Since the introduction of CAN bus technology, an electronic immobiliser has been part of the standard equipment on BMW motorcycles. More than the right key bit is needed to start the engine – in addition, the chip integrated into the BMW key must report the right code to the ring antenna of the combined steering and ignition lock. Only then does the engine control allow the vehicle to be started. This technology offers the safest, most reliable protection against vehicle theft available today.

The electrical plug connections are waterproof and thus unsusceptible to faults. A 14 ampere-hour battery and a 400 W generator ensure a reliable power supply.

The cockpit with its analogue instruments arranged above each other and its information display including on-board clock provides the driver with information at a glance. As an item of special equipment, BMW offers an on-board computer with further functions such as gear display and stopwatch.

The asymmetrical double headlight with glass-clear plastic cover give the GS models the characteristic face of the youngest BMW generation. The reflectors, familiar from the BMW R 1200 GS and loved by night-time drivers because of their superb use of light, are enclosed in a new plastic housing and are fitted with two H7 headlight bulbs. On switching to full beam, the dipped beam remains active. The headlights are fixed using an unbreakable, lightweight plastic support which also takes the cockpit and the sturdy plastic cladding made from high-strength polypropylene.

Optimum seat design for touring and offroad use.

Although the long spring travel in an enduro generally result in higher seats, drivers of the new GS models will easily be able to touch the ground with their feet, although the F 650 GS is even more suitable for smaller people because of its lower seat height.

The strongly waisted seat is offered in two heights for both models, with seat heights of 880 or 850 mm available for the F 800 GS and 820 or 790 mm for the F 650 GS (with lowering kit: 765 mm). As regards the arc length, the lowered F 650 GS corresponds to the single-cylinder predecessor model with lowering kit.

The low arc length is also due to the frame, which is very streamlined in the critical area. The seat is locked at the front in a vibration-absorbing holder. This layout means that there is an uninterrupted transition between the fairing, the frame and the seat.

For relaxed driving the new GS models have a vibration-absorbent handlebar – made from conically shaped aluminium tubing, in the case of the 800 model – and folding, wide steel footrests with hollow-chamber rubber surfaces. To be able to stand securely in the footrests offroad, the rubber surfaces can also be removed.

The wide, upswept handlebars are fitted with easy-to-reach fittings; the grip width of the levers can be adjusted. The combined ignition/steering lock is also conveniently positioned in front of the handlebars.

As one might expect from a travel motorcycle, the GS also provide excellent comfort for the passenger. The seat length and footrest position allow the passenger to relax, whilst the long side holder brackets at the rear provide a secure grip. Last but not least, the fairing discs offer moderate wind protection, thus helping the passenger to travel in comfort. The higher series windscreen on the F 800 GS can also be mounted on the F 650 GS if required. Both windscreens with their M-shaped design have been optimised in a wind tunnel.

The 16-litre tank under the seat has proved a great advantage on long trips. Not only because long distances can be travelled, thanks to the motorcycle's low fuel consumption, but also because the tank rucksack – which does not entirely deserve its name here – can be left in place as the tank is filled. Because the lockable filler nozzle is easily accessible on the right-hand side of the vehicle level with the pillion seat.

The colour variants chosen underline the character of the new offroad bike. For the market launch, the F 800 GS will be appearing in plain Sunset Yellow/Black or Dark Magnesium Metallic Matt. The F 650 GS can be ordered in Azure Blue Metallic, plain Flame Red or Iceberg Silver Metallic.

3. Range of equipment.



Special equipment and special accessories.

BMW meets the need for personalisation not only through its special equipment, mounted at the factory in Berlin, but also subsequently through the special accessories that the local dealer or the customer himself adds later. The special equipment and very extensive range of special accessories have been tailored to suit the new F 800 GS and F 650 GS enduro models, so that the customer can buy high-quality, perfectly matching products that are in line with the character of his vehicle.

Special equipment.

- BMW Motorrad ABS (can be switched off).
- Heated grips.*
- On-board computer.
- Main stand.*
- Low driver's seat (850 mm for F 800 GS/790 mm seat for F 650 GS, no extra cost).*
- White indicator lights.*
- Theft alarm.*
- Power reduction to 25 kW/34 HP (only for F 650 GS, no extra cost).*
- Characteristic map modification for 91 RON for F 800 GS (no extra cost).
- RDC (only for F 650 GS).*
- Lower positioning unit (only for F 650 GS).

Products marked with * are also available as special accessories from BMW motorcycle dealers.

On-board computer completes the range of information available.

The on-board computer expands the range of information that can be displayed on the clear display in the combined instrument panel, adding the following details: tank display, gear display, coolant temperature, average fuel consumption, range, outside temperature and stop watch time. A button on the left handlebar fitting allows the driver to switch through the displays and to select the information required. It is also used to operate the stop watch.

Low seat and lowering kit.

In order to offer shorter drivers optimum ergonomics and the ability to reach the ground, BMW Motorrad is able to provide a lower seat. It reduces the seat height in the F 800 GS to 850 mm or 790 mm for the F 650 GS. If it is ordered ex factory, the customer is not charged any extra. The lowering kit for the F 650 GS consists of the lower seat and a shortened spring strut.

Playing it safe with a theft alarm.

Once it has been activated, the theft alarm reacts to any change in position of the parked motorcycle with very clear visual and audible signals. The extremely effective system can be deactivated via a remote control or using the ignition key.

Practical main stand allows easy propping up.

The main stand means that the motorcycle can be propped up with very little effort. Thanks to the wide standing surface, the GS models will stand safely if, for example, the rear wheel has to be removed or the chain lubricated.

Special accessories.

- Luggage bridge, small.
- Luggage rest, large, for Vario topcase.
- Vario topcase, black.
- Case holder for Vario case.
- Vario case, black.
- Inside pockets for Vario case and Vario topcase.
- Back cushion for Vario topcase.
- Tank rucksack, waterproof.
- Softbag Sport, small.
- Softbag Sport, large.
- Heated grips.*
- Low seat.*
- White indicator lights.*
- Main stand.*
- BMW Motorrad Navigator II.
- Navigator holder, cable and attachment kit.
- Navigator Function bag.
- Theft alarm.*
- Tyre pressure check RDC (only F 650 GS).*
- Hand protection bars.
- Protectors (small and large) for hand protection bars.
- Add-on spoiler for Protector, large.

- Underbody protection (standard for F 800 GS).
- Engine protection bars.
- Splash protection extension, rear.
- High windscreen (standard for F 800 GS).
- Low windscreen (standard for F 650 GS).
- Touring windscreen (only F 800 GS).
- High windscreen, tinted.
- Akrapovic sports silencer.
- Wind deflector kit.
- Service tool kit.
- Enduro tail bag.
- Power reduction to 25 kW/34 HP (only F 650 GS).*

Products marked with * are also available ex factory.

Flexible storage space with Vario cases and Vario topcase.

The well-known, variable-volume cases (on left: 19–29 litre/on right: 28–38 litre) have been modified to the new GS models. Thanks to the carefully conceived carrier system, the cases can be attached and removed in a moment. Those who want to take even more luggage with them can also add the 25–35 litre topcase, which has plenty of room for a helmet, for example. If required, the comfort of the pillion rider can be improved by attaching a back cushion to the topcase. The inside pockets for the cases reliably protect luggage from dirt and damage.

Tank rucksack for small items of luggage.

The tank rucksack is a truly practical travelling companion. Because the tank is positioned underneath the seat, it does not need to be removed in filling stations. The tank rucksack has a variable capacity of 14 to 26 litres and has a waterproof inside pocket so that no extra covering is required when travelling in the rain. The equipment also includes a waterproof map compartment and a store for small tools which can be accessed via the main compartment from the inside.

BMW Motorrad Navigator II.

With this navigation system, the driver selects an address, a city, a tourist destination or a way point. The BMW Motorrad Navigator II guides him, with detailed instructions, safely and effortlessly to his destination – by the fastest or shortest route, as he requires, or directly (“as the crow flies”). The display can be varied too: the driver can choose a map display, a combination of map and instructions, a roadbook or a compass function that displays the distance and direction to the next way point. A zoom function makes rapid orientation easier, at intersections, for example. Voice guidance using a helmet installation kit is possible in nine languages.

Hand protector with spoiler.

The three-part hand protector made from impact-resistant, continuously dyed plastic can take on a variety of protective functions, since individual modification is possible with the modular system. The hand protection bar deflects damage to the handlebar and handlebar fittings. The protector attachment is available in two sizes and protects hands from stones, whilst the spoiler provides additional protection against the cold and wet.

Underbody protection and engine protection bars.

The underbody protection is part of the standard equipment for the F 800 GS and can be retrofitted to the F 650 GS. A sturdy engine protection bar provides additional protection against damage in everyday use or during offroad travel.

Akrapovic sports silencer.

The sports silencer in titanium and carbon made by Akrapovic fits without problems onto the original manifold system, which is fitted as standard with a regulated catalytic converter. It is a slip-on silencer fixed in place with springs. Using this silencer can save around 2 kg in weight compared with the standard system.

Enduro tail bag.

This special tail bag attached behind the seat resists even the tough loads off-road. It contains several compartments and its outer fabric is not sensitive to dirt.

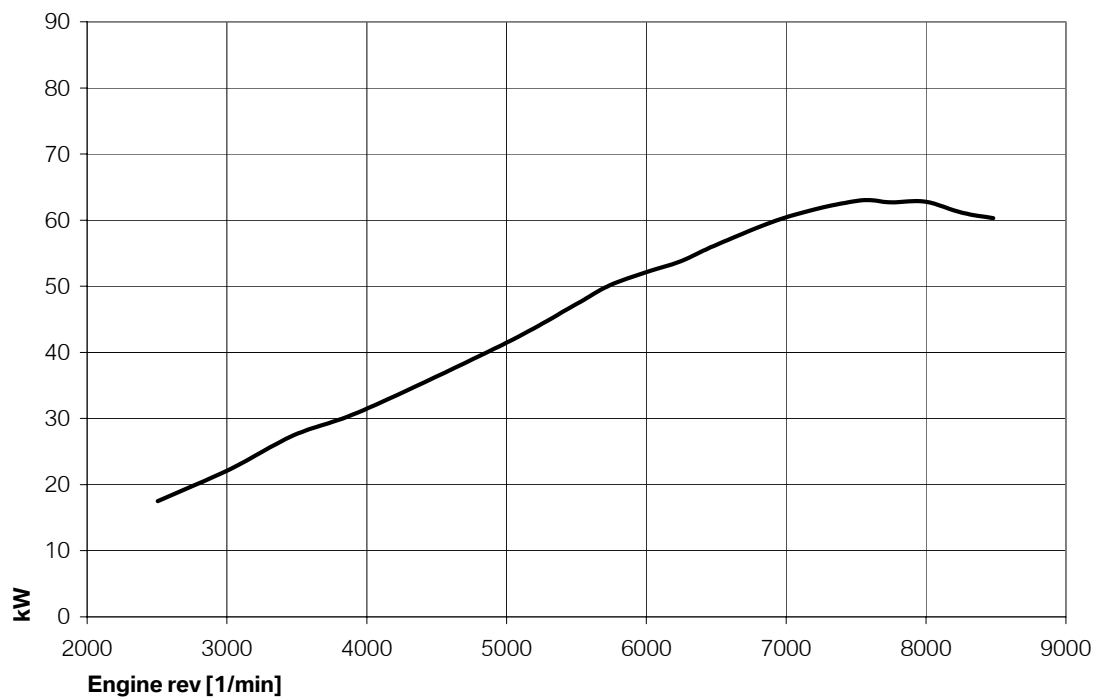
4. Colours.

	Colour	Seat
BMW F 800 GS	Sunset Yellow/Black	Black
BMW F 800 GS	Dark Magnesium Metallic Matt	Black
BMW F 650 GS	Azure Blue Metallic	Black
BMW F 650 GS	Plain Flame Red	Black
BMW F 650 GS	Iceberg Silver Metallic	Black

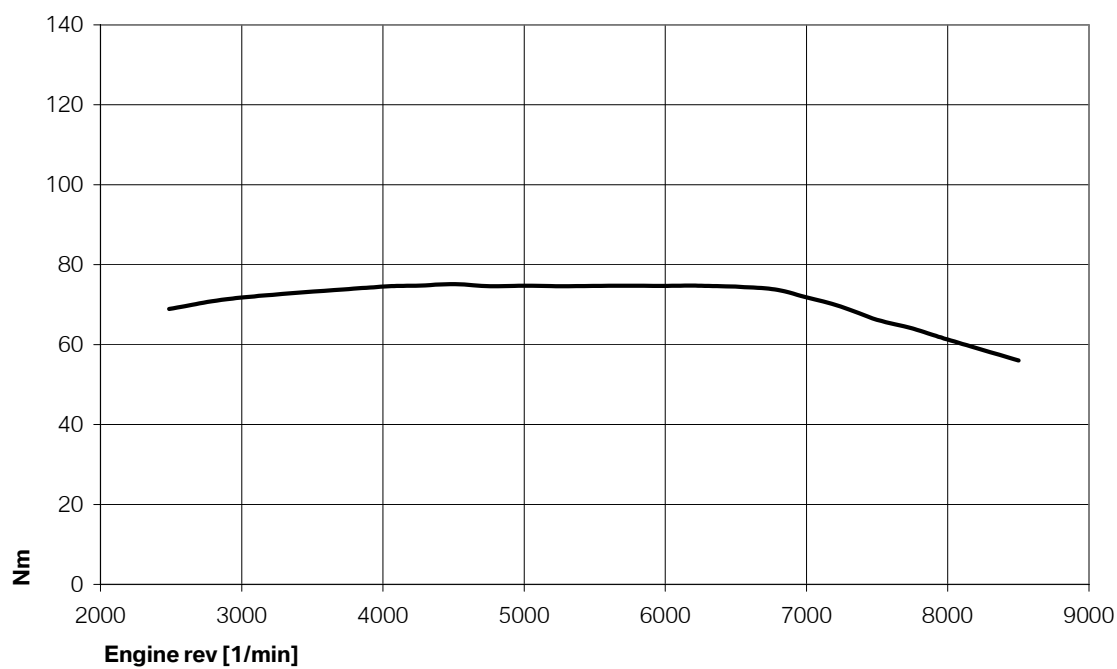
5. Engine output and torque.

BMW F 800 GS

Engine output (to 95/1/EG in the version 2002/41/EG)

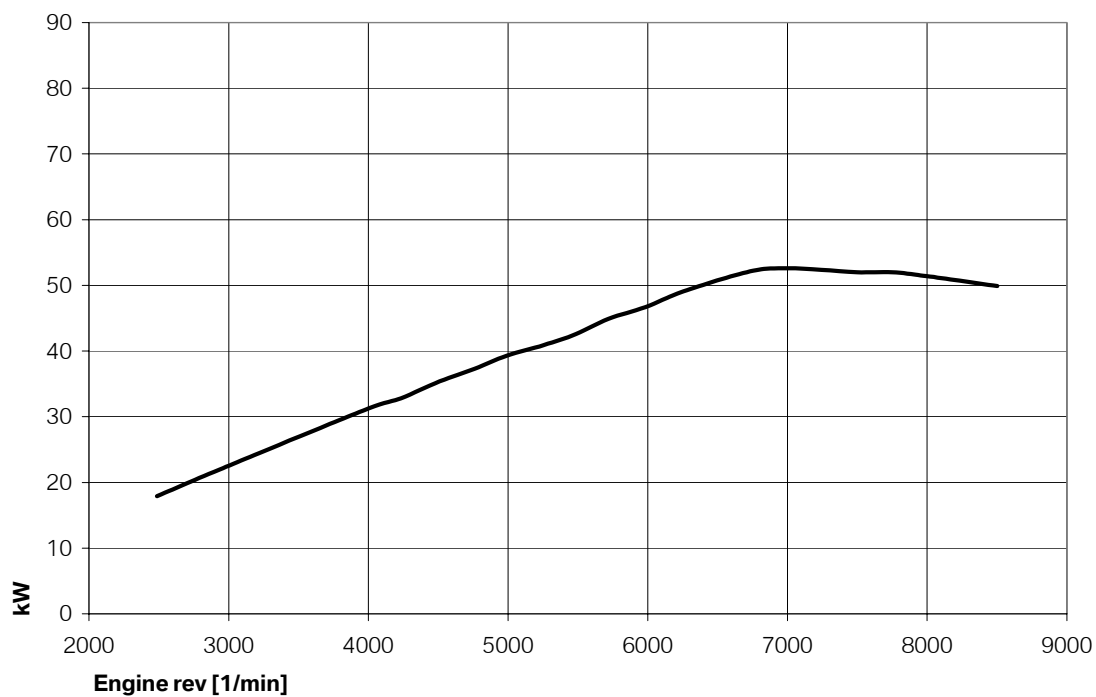


Torque (to 95/1/EG in the version 2002/41/EG)

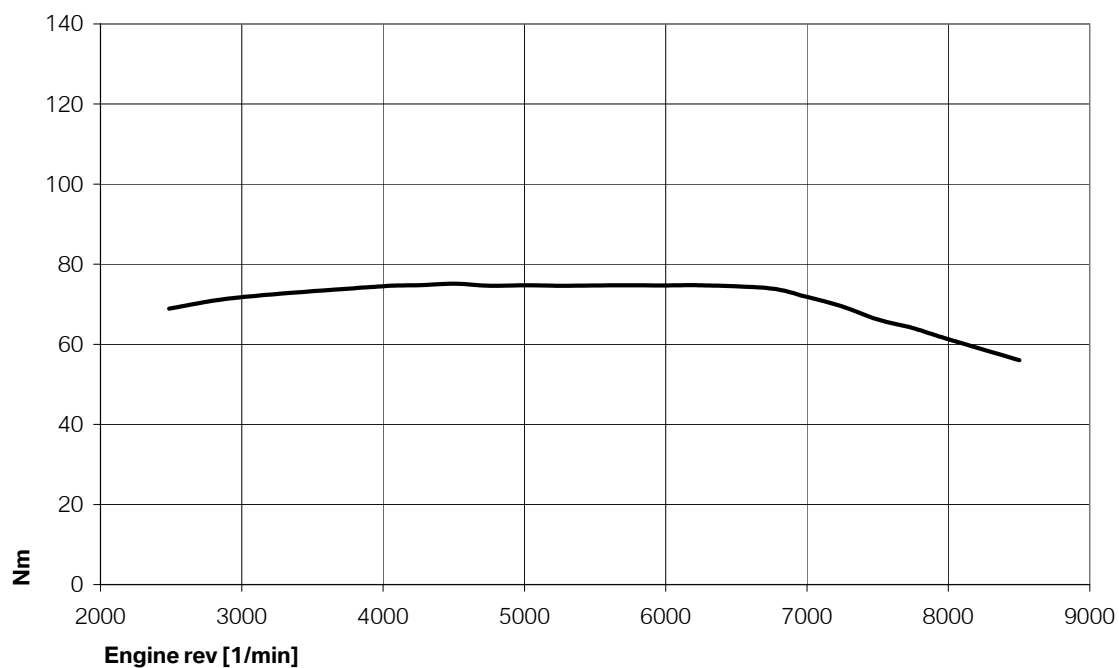


BMW F 650 GS

Engine output (to 95/1/EG in the version 2002/41/EG)



Torque (to 95/1/EG in the version 2002/41/EG)



6. Technical data.

BMW F 800 GS, F 650 GS.

		BMW F 800 GS	BMW F 650 GS
Engine			
Capacity	cm ³	798	
Bore/lift	mm	82/75,6	
Power	kW/HP	63/85	52/71
at engine speed	min ⁻¹	7 500	7 000
Torque	Nm	83	75
at engine speed	min ⁻¹	5 750	4 500
No. of cylinders		2	
Compression/fuel	:1	12.0/Super unleaded (95 RON)	12.0/Normal unleaded (91 RON)
Valve/gas control		dohc (double overhead camshaft)	
Valves per cylinder		4	
Diam. inlet/outlet	mm	32/27,5	
Throttle valve diameter	mm	46	
Mixture preparation		Electronic manifold injection, engine management BMS-KP	
Electrical system			
Generator	W	400	
Battery	V/Ah	12/14	
Headlights/rear light	W	55 (full/dipped beam) 5 parking light	LED (braking/rear light)
Starter	kW	0,9	
Power transmission/gears			
Clutch		Multidisc clutch in oil bath, mechanically activated	
Gears		Dog-coupled six-gear transmission	
Primary transmission		1:1.943	
Transmission, gear stages	I	1:2.462	
	II	1:1.750	
	III	1:1.381	
	IV	1:1.174	
	V	1:1.042	
	VI	1:0.960	
Rear wheel drive		Endless-O-ring chain drive with back damping in wheel hub	
Transmission ratio		1:2.625 (16/42)	1:2.412 (17/41)
Chassis			
Frame design		Tubular frame in steel, partly carrying the engine	
Wheel suspension, front wheel		Upside-down telescopic fork, fixed tube Ø 45 mm	Telescopic fork, fixed tube Ø 43 mm
Wheel suspension, rear wheel		Double-strut swing arm, aluminium cast in one piece	
Spring travel front/rear	mm	230/215	180/170
Castor	mm	117	97
Wheel spacing	mm	1578	1575
Steering head angle	°	64.0	64.0
Brakes	front	Double-disc brake Ø 300 mm	Single-disc brake Ø 300 mm
	rear	Single-disc brake Ø 265 mm	Single-disc brake Ø 265 mm
		on request: BMW Motorrad ABS, disconnectable	
Wheels		Spoked wheels with aluminium rims	Cast aluminium wheels
	front	2.15x21	2.50x19
	rear	4.25x17	3.50x17
Tyres	front	90/90-21 54 V	110/80-R19 59 H
	rear	150/70-R17 69 V	140/80-R17 69 H
Dimensions and weights			
Total length	mm	2 320	2 280
Total width with mirrors	mm	945	890
Total width without mirrors	mm	870	845
Seat height	mm	880 (SA 850)	820 (SA 790)
Dry weight	kg	178	171
DIN tare, ready to drive	kg	207	199
Perm. total weight	kg	443*	436*
Tank capacity	l	16	16
Travel data			
Fuel consumption	90 km/h l/100 km	3,8	3,7
	120 km/h l/100 km	5,2	5,2
Acceleration	0–100 km/h s	4,1	4,3
Maximum speed	km/h	over 200	189

*with lowering kit: payload 150 kg