BMW AG Presse

Programm '97

Bayerische Motoren Werke
Aktiengesellschaft

BMW AG Presse

Programm '97
Model Range '97
La Gamme '97
La Gamma '97
Programma '97
Программа '97
'97 年モデル

Stand: 10/96

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CONTENTS

1 **SUMMARY OF BMW INNOVATIONS FOR THE 1997 MODEL YEAR:**
Even more dynamic and comfortable than before:
The new BMW K 1200 RS sports tourer sets new standards once again
For even more riding pleasure on the road:
The new F 650 ST fun bike from BMW

2 **THE F 650 SINGLE-CYLINDER MODELS:**
New F 650 ST fun bike
Facelift for the successful F 650 funduro

3 **THE FOUR-CYLINDER K SERIES MODELS:**
The new K 1200 RS sports tourer sets new standards once again
The K 1100 LT Highline, a new, special version of the luxury tourer

4 **THE R 1100 RT:**
The tourer of the future exceeds expectations
Entering the 1997 model year without any changes

5 **THE R 1100 R AND R 850 R:**
Roadster models in great demand
Entering the 1997 model year without any changes

6 **THE R 1100 GS:**
The enduro continues the successful story of the GS
Entering the 1997 model year without any changes

7 **THE R 1100 RS:**
Now with an adjustable spring strut at the front

8 **THE 1997 COLOUR RANGE**

9 **SPECIFICATIONS AND GRAPHS**

1 SUMMARY OF BMW INNOVATIONS FOR THE 1997 MODEL YEAR

Even more dynamic and comfortable than before:
The new BMW K 1200 RS sports tourer sets new standards once again

For even more riding pleasure on the road:
The new F 650 ST fun bike from BMW

After BMW's highly successful model offensive with the new two-cylinder Boxer generation, with worldwide sales already amounting to more than 75,000 units after the model launch in spring 1993, the appealing new motorcycles launched by BMW in the 1997 model year - the F 650 ST fun bike and the K 1200 RS sports tourer - once again come from the single- and four-cylinder model range.

Making its debut at the Cologne Motorcycle and Bicycle Show from 2-6 October 1996, the new K 1200 RS certainly comes in the forefront of this significant development.

Taking up the 20-year heritage of the legendary R 100 RS

Exactly 20 years after the introduction of the legendary R 100 RS, the first production motorcycle in the world with a fairing developed in the wind tunnel, BMW is now introducing a new model, the K 1200 RS, which, like the K 100 RS in 1983 and the R 1100 RS in 1993, again sets new standards in the sports tourer class.

While the "heart" of the former model, the four-cylinder power unit of the K 1100 RS, lives on even bigger and more powerful in the K 1200 RS, the running gear has been modified almost entirely and the model fitments are totally new. Even at first sight, the K 1200 RS is a brand-new, very arousing motorcycle, as you will see right from the beginning, admiring its dynamic, sporting and powerful, but by no means aggressive, styling.

For the first time ever: an engine developing more than 100 bhp

After a further increase in size to 1171 cc, the engine of the K 1200 RS is the largest and most powerful machine ever featured in the history of BMW motorcycles. And, as another first-ever achievement, the K 1200 RS comes not only with an engine limited in output to 100 bhp, but also with an even more powerful engine developing no less than 96 kW/130 bhp at 8750 rpm.

Power limited in Germany and France to 98 bhp

It remains to be seen whether the anticipated introduction of EU-wide homologation standards for motorcycles will dictate an output limit or not. Until the time such a general regulation comes into force in the member states of the European Union, BMW will be limiting supply in countries such as France, with its statutory 100-bhp limit, or Germany, with a voluntary 100-bhp restrictions imposed by manufacturers and importers, to just one version developing a maximum output of 72 kW/98 bhp, which also reflects the insurance categories in force in Germany. This engine develops its maximum output at just 7000 rpm.

Maximum torque increased again by approximately 10 per cent

Torque, which was already very good in the past, has been increased on both versions of the engine by approximately 10 per cent. Accordingly, the 98-bhp version develops its maximum torque of 118 Nm or 87 lb-ft at a mere 5500 rpm, the 130-bhp power unit reaches its peak of 117 Nm or 86 lb-ft at 6750 rpm.

The refinement and free-revving performance of the four-cylinder have also been improved, ram-charge air supply ensuring a better flow of air to the engine, two water and one oil cooler keeping operating temperatures at a very healthy level.

Featuring an electronic choke for the first time

While electronic engine management is still the exception with motorcycles, unlike cars, BMW is now introducing the third-generation of Digital Motor Electronics for the motorcycle, after the K 100 Series paved the way in this area back in 1983. The new Motronic MA 2.4 offers the additional benefit of

being the first electronic engine management system with electronic choke control, the old, omnipresent choke lever now being dropped once and for all.

Mobi Dic - the first Mobile Diagnosis System

The new electronic "brain" also allows the introduction of Mobi Dic, the first Mobile Diagnosis Computer which, via a diagnostic plug used by the workshop, allows a complete examination of all electronic and electrical components, shortening service and repair times accordingly.

Two fully-controlled catalysts for the first time ever - a standard feature worldwide

The sophisticated Motronic system also provides an ideal starting point for the new reduced-emission concept featured worldwide as standard on the K 1200 RS - and for the first time incorporating two fully controlled three-way catalytic converters.

New six-speed transmission

Dynamic performance is also ensured by the newly developed six-speed transmission combining a good, smooth gearshift with superior precision.

New cast aluminium frame for vibration-free riding comfort and supreme riding stability

Despite the increase in engine size and its exceptional "muscle", the new K 1200 RS also excels through the fact that it spares both the rider and passenger all the annoying vibration otherwise so unpleasant.

While the four-cylinder power unit used to be a load-bearing component within the frame of the motorcycle, it now rests on rubber mounts within an all-new cast aluminium frame without even the slightest transmission of vibrations, the frame itself closely enveloping the engine. Forming a stiff backbone, the frame guarantees supreme riding stability.

BMW Telelever featured for the first time in a K-model

One of the most outstanding innovations in running gear technology is now to be admired for the first time in the front subframe of a K-model: the BMW Telelever. This unique front-wheel guidance and spring system has already impressively proven its merits in the new generation of BMW Boxers.

Perfect interaction with ABS fitted as standard

As with BMW's other models, the Telelever not only ensures supreme riding comfort, but also, through its anti-dive effect and the highly efficient brake system carried over from the K 1100 RS, guarantees perfect interaction with the ABS anti-lock brake system featured as standard on the K 1200 RS worldwide (as with the K 1100 LT and R 1100 RT).

The rear wheel - like the front wheel now in stylish five-double-spoke design - runs as usual on a BMW Paralever swinging arm, ie, the proven double-joint single-arm configuration.

Offering the very best in aesthetic design, function, and ergonomics

The new K 1200 RS excels not only through its "inner values", but also to the outside in its dynamic, unmistakable design clearly bearing testimony to the aesthetic looks, functional superiority and ergonomic excellence so typical of BMW. As an example, its fairing optimised in the wind tunnel ensures good protection from wind and weather, especially as the windshield is adjustable to two different positions.

To guarantee genuine riding pleasure, the handlebar, seat, shift lever and footrests are all individually adjustable.

New dual headlights with "double-eye effect"

Another outstanding feature is the new tandem headlight not only providing far better illumination of the road ahead, but also, through its "double-eye effect" with the low beam on, helping to make the K 1200 RS a genuine "face in the crowd" easily distinguished as something very special on the road.

The K 1200 RS is even more dynamic, sporting, and comfortable than the K 1100 RS, at the same time offering the same superiority and touring quali-

ties - naturally also with motorcycle cases and a luggage rack. Accordingly, apart from weighing 285 kg or 628 lb in road trim, the new machine is able to carry a load of no less than 215 kg or 474 lb.

Performance K 1200 RS-style means in particular absolute superiority in the development of power with huge, virtually effortless muscle. This superiority is reflected by the dynamic running gear, providing highly accurate and remarkably agile handling in bends as well as absolute stability even at very high speeds. And, last but not least, the brake system equipped as standard with ABS ensures maximum safety at all times.

The final point to be emphasised is that with its fully-controlled twin-catalyst the K 1200 RS gives the rider a good conscience about the environment - which means equally good riding pleasure wherever you go ...

The special K 1100 LT Highline:
Sophisticated looks and model features

The second four-cylinder in the range, the K 1100 LT, is entering the 1997 model year without any changes in technology. Now, however, there is also the new Highline special version of this luxury tourer excelling in particular through its sophisticated looks and model features.

Facelift for the successful F 650 funduro

To celebrate the fourth birthday of the F 650, this single-cylinder motorcycle launched in November 1993 and sold more than 30,000 times in the meantime (making it BMW's best seller) is now receiving a facelift around the fairing as well as a higher, clear-view windshield.

Even more dynamic: the new F 650 ST fun bike

Entering the 1997 model year, the F 650 funduro also suitable for off-road riding where conditions are not too tough, is being joined by the F 650 ST fun bike. This pure-bred road model offering even more riding pleasure on hard tarmac is also powered by the 35 kW/48 bhp single-cylinder optionally available in Germany and Italy with an output of 25 kW/34 bhp.

Reflecting its more sporting, dynamic standard, the F 650 ST, unlike the F 650 (with figures in brackets), comes with a smaller 18-inch front wheel (19-inch), a

somewhat shorter 760 mm/29.92" (800 mm/31.50") handlebar raked further to the front, and a modified spring strut with only 120 mm/4.72" (165 mm/6.49") spring travel. It also has a somewhat shorter wheelbase and castor, and seat height has been reduced to 785 mm/30.91" (800 mm/31.50"). A retrofittable kit for lowering both models allows a further reduction in seat height by 50 mm or 1.97".

The new F 650 ST has also become more sporting and dynamic in its looks, featuring, inter alia, a small cockpit fairing and engine spoiler.

R 1100 RS now with adjustable spring strut at the front

The R 1100 RS also comes with two improvements: First, its front spring strut may now be adjusted infinitely also on the outward stroke by an adjustment bolt. Second, the rear spring strut now features hydraulic spring pre-tension, damping action on the outward stroke being infinitely adjustable by an adjustment bolt as in the past.

All other BMW motorcycles are entering the 1997 model year without any technical modifications, but in some cases in new colours.

2 THE F 650 SINGLE-CYLINDER MODELS

New F 650 ST fun bike

Facelift for the successful F 650 funduro

Within not quite three years, sales of the F 650 launched in November 1993 have exceeded the 30,000-unit mark by autumn 1996. This makes this single-cylinder not only the absolute best seller within the BMW range, but also one of the best-selling motorcycles quite generally in many countries.

Twenty-seven years after the legendary R 27, BMW has therefore once again taken up its heritage of single-cylinder motorcycles with overwhelming success, sales of such one-cylinder machines between 1925 and 1966 amounting to approximately 230,000 units ranging in engine size from 200 to 400 cc.

At the same time BMW is adding an attractive 650-cc entry-level model to the range, with engine output of 35 kW/48 bhp and an additional version in Germany and Italy developing a maximum output of 25 kW/34 bhp. Benefitting from its relatively low weight of only 191 kg or 421 lb and its low seat height, the F 650 is particularly popular among newcomers and re-entrants in the motorcycle market as well as with female riders.

A genuine European on two wheels

BMW also took a new approach in the development and production of the F 650, which may really be called a "genuine European on two wheels". As part of a European joint venture, the F 650 was developed jointly by BMW and Italian motorcycle manufacturer Aprilia, applying the original concept, quality standards and design provided by the white-and-blue marque. The F 650 comes with a single-cylinder Bombardier-Rotax power unit modified by BMW and manufactured by the Austrian engine company in the town of Gunskirchen. Assembly of the F 650, in turn, is in Aprilia's modern production plant in the Italian town of Noale. And last but not least, worldwide sales go through BMW's dealer network, starting also in the USA and Canada as of the 1997 model year.

The F 650 clearly stands out from other motorcycles not only through its heritage and unmistakable looks, but also in its unique concept. And offering practical qualities quite outstanding for a single-cylinder (for example its ability to carry both the rider and passenger, its touring qualities, and its environmental compatibility ensured by a catalytic converter either optional or standard in Germany, Austria, Switzerland, and the USA), making it a genuine BMW.

The suspension and running gear come between that of a fun bike and an enduro - which is why BMW refers to the F 650 as a funduro, on account of this combination and new concept.

Now, introducing the 1997 model year, BMW is setting the stage for a continuation of this successful story:

Having been given the "once over", the F 650 now comes with a styling facelift, while the running gear and engine remain technically unchanged.

A further significant point is that the F 650 funduro is now being joined by the new F 650 ST, a genuine fun bike and pure-bred road model.

And last but not least, it is important to note that the F 650 ST is powered by the same four-valve single-cylinder as the F 650 (see also the description of the engine).

The F 650 funduro:
Celebrating its fourth birthday with a new fairing

To celebrate its fourth birthday, the F 650 funduro now comes with a re-designed fairing extending up from the cockpit to the instrument level. The radiator cutout, in turn, is narrower than before, the direction indicators are fitted on "short arms", and no longer in the fairing itself. In all, this helps to slim down the fairing at the front, giving the F 650 an even more dynamic, slimmer look.

New radiator and cylinder cover

The radiator and cylinder covers have now been combined to form one re-designed unit starting out a bit higher up on the cockpit and forming a spoiler

around the radiator nozzle, from where it merges into the cylinder cover. This dynamic styling of the spoiler also comes out very clearly from the side.

A higher windshield for even better protection

The new, higher and fully transparent windshield offers even better protection from wind and weather, while in the cockpit itself an analogue-face clock replaces the old coolant temperature gauge, since excessive water temperature is now displayed by a warning light. Formerly removable, the tank cap now rests in the filler manifold and swings open when required.

Re-designed seat lowered by 10 mm

The seat already relatively low for a motorcycle of this kind at 810 mm or 31.9" has now been lowered by another 10 mm thanks to its new design, thus reducing seat height to 800 mm or 31.5" without in any way detracting from the high standard of riding comfort.

Special kit reducing seat height by 50 mm

A special, retrofittable kit available for lowering the seat position serves to reduce seat height on the F 650 by 50 mm to 750 mm or 29.5". This kit comprises modified swinging-arm levers, a different spring strut rest point, and shorter main and side-stands.

New side-stand even more comfortable and safer

The new side-stand is even more comfortable and safer than before, allowing the rider to move it into position also when seated and no longer folding back by itself. An ignition interruption switch makes it impossible for the rider to set out before retracting the side-stand. And ever since the 1996 model year, the F 650 has come as standard with a main stand.

The new F 650 ST fun bike:
Ensuring even more riding pleasure on the road

Three years after the launch of the F 650, a second model, as mentioned, is now joining this very successful single-cylinder as of the 1997 model year. Unlike the F 650 funduro very suitable for comfortable touring on long distances - alone or with a passenger - and for riding off-track as well as in -

not too rugged - terrain, the F 650 ST fun bike appeals more to riders with a penchant for a somewhat more sporting style and focusing to a greater extent on road use.

Differences in the suspension and running gear, fitments and looks

Accordingly, the two models in the F 650 range differ above all through their running gear, as well as through modifications in their features and looks.

Smaller front wheel and shorter spring travel at the rear

Compared with the F 650 (with data shown in brackets), the suspension and running gear of the F 650 ST is even more agile and sporting thanks to the smaller 18-inch front wheel (19-inch), road tyres, slightly modified suspension geometry with wheelbase reduced to 1465 mm/57.7" (1480 mm/58.3"), castor measuring 110 mm/4.3" (116 mm/4.6"), as well as the rear-wheel spring strut with modified damper action and 120 mm/4.7" (165 mm/6.5") spring travel. Spring travel on the front wheel, in turn, remains the same as on the F 650 at 170 mm or 6.7".

Seat height reduced if desired from 785 mm/30.9" to 735 mm/28.9"

The lowered suspension also reduces seat height to 785 mm/30.9" (800 mm/31.5"). Indeed, the lowering kit retrofittable if desired (see also description of the F 650) serves to reduce seat height even further to just 735 mm or 28.9". Clearly, this is a particular advantage for newcomers and somewhat shorter riders.

Overall weight of the F 650 ST in road trim is 191 kg/421 lb, ie, the same as with the F 650.

Narrower handlebar and thrilling handling on the road

Obviously, the new handlebar now slightly slimmer than before with the handles 760 mm/29.9" (800 mm/31.5") apart, angled further to the front, and without the typical enduro crossbar of the F 650, provides an even better seating position for riding on the road, at the same time ensuring even greater agility and supreme handling.

Small cockpit fairing and silver-painted engine spoiler

The new F 650 ST looks more sporting and dynamic right from the start, featuring a small cockpit fairing instead of the higher, transparent windshield typical of the F 650. This small fairing provides the perfect frame around the instruments with their re-designed dials illuminated from behind.

Unlike the matte-black paintwork on the F 650, the radiator and cylinder cover on the F 650 ST is painted silver. And contrary to the matte-black engine protection cover on the F 650 safeguarding the engine from stone-throw in rough terrain, the F 650 ST comes with an aerodynamic engine spoiler also painted in silver. The front mudguard, in turn, is narrower than before and there are no covers on the slide tubes.

Last but not least, the range of different body colours available (see appropriate section of this press kit) again distinguishes the F 650 ST from its "older" brother.

Optionally available: touring kit with higher windshield and hand protectors

In accordance with his personal taste, the customer may also order his F 650 ST with the higher, transparent windshield featured on the F 650 and hand protectors. Then he also needs a modified handlebar, all of these accessories being combined within one touring kit.

Same options and accessories as with the F 650

It hardly needs emphasising that the F 650 ST - optionally available in Germany and Italy with 25 kW/34 bhp engine output - is available also with catalytic converter (standard in Germany, Austria, Switzerland, and the USA). Other special equipment includes engine protection hoops, case supports, side-cases, a topcase, a power socket, heated handles, and an anti-theft warning system.

POWER UNIT

Water-cooled four-valve power unit with superior torque

Like the R 27, BMW's last single-cylinder produced until 1966 (250 cc, 18 bhp, air cooling), the F 650 and F 650 ST again feature a single-cylinder four-stroke power unit in upright arrangement. Developed jointly by BMW and Rotax in accordance with the original concept from BMW, the new liquid-cooled four-valve engine displaces 652 cc (39.77 cu in) and develops an output of 48 bhp (35 kW) at 6500 rpm. Maximum torque is 57 Nm (42 ft-lb) at 5200 rpm. In accordance with the new two-tier driving licence regulations in Europe, the F 650 and F 650 ST are naturally also available with an output of 34 bhp (25 kW) at 5700 rpm in which case it has a maximum torque of 48 Nm or 35 lb-ft at 4200 rpm.

Gearbox integrated in the engine housing

The five-speed gearbox is integrated within the two-piece light-alloy engine housing separated vertically into two halves. The engine housing covers with the clutch at the rear left and alternator at the rear right are also made of light alloy, while the chain pinion cover is plastic.

Box-type piston optimised for low weight

Made of cast light-alloy and designed in box configuration, the low-weight piston features three piston rings and is cooled at the bottom by splash oil. Pre-defined balance serves to reduce vibrations on the weight-optimised crankshaft made of heat-treated nitrate steel. The crankshaft runs in two high-load anti-friction bearings, just like the forged connecting rods.

Overhead camshafts and cup tappets

The two overhead camshafts (DOHC) made of forged steel run in anti-friction bearings directly on the cylinder head and are driven by a timing chain straight from the crankshaft. A plastic tensioning bar and a hydraulic chain tensioner ensure a smooth and unproblematic flow of power. Direct power transmission from the camshaft via cup tappets to the valves allows fast valve acceleration and keeps the engine revving smoothly even at high speeds.

Compensation shaft for superior smoothness and refinement

To reduce engine vibrations and increase running smoothness accordingly, the F 650 comes with a special compensation shaft. This shaft runs in two grooved ball bearings and is driven by gear drive with a direct 1:1 transmission ratio straight from the crankshaft. The drive gear on the compensation shaft is designed as a spur gear to compensate for any gear flank tolerance and thus efficiently reduce any noise.

Oil reservoir in tubular frame

Oil is supplied to the engine by an intake pump and a high-pressure pump. Featuring dry sump lubrication, the engine of the F 650 does not have an oil sump as such. Instead, the oil reservoir required of about 1.5 litres is incorporated in the upper part of the tubular frame.

Easy-to-service intake system

Intake air is drawn into the engine behind the rear side panel and beneath the seat. The foam-material filter is easily accessible, fully washable and therefore easy-to-service. The air intakes leading into the intake air silencer (which also serves to purge air from the engine) have been carefully designed for extra torque and minimum noise; the overall capacity of the intake air silencer is approximately 6.5 litres.

Two Mikuni carburettors

Fuel is supplied through two Mikuni constant-depression carburettors with a venturi measuring 33 mm (1.30") in width. Identical in design and configuration, the two carburettors have an idle, part load and full throttle system. The automatic choke is integrated in the left-hand carburettor.

Two spark plugs for better combustion

The contact-free high-tension capacitor ignition is masterminded by a special control map and features electronic ignition feedback control. Ignition timing is also controlled electronically as a function of engine speed. The use of two spark plugs serves to shorten flame travel, minimising pre-ignition, improving combustion under part load, and reducing the emission of pollutants.

Stainless-steel exhaust system

As on all BMW motorcycles, the exhaust system is made of stainless steel polished at all visible points. Silencer volume is approximately 7.5 litres.

Gearbox and clutch

The dog-type five-speed gearbox is integrated within the engine where the shafts and gears are lubricated by splash oil. Engine power is transmitted by a multi-plate clutch running in an oil bath.

Standard, non-controlled catalytic converter now standard or optional

As an option the F 650 is available with a standard, non-controlled catalytic converter (a standard fitment in Germany, Austria, Switzerland, and the USA) fitted at the entry gate leading into the silencer for an optimum temperature level. This ensures a long service life and quick catalyst response, in this way converting pollutants quickly and efficiently into harmless substances.

The catalytic converter does not in any way affect engine output, torque and fuel consumption.

10,000-km (6,200-mile) service intervals

Like the new Boxer generation and all K-models, the F 650 comes with service intervals of 10,000 km or 6,200 miles substantially reducing the cost of ownership.

RUNNING GEAR:

Single-loop frame with load-bearing engine

The "backbone" of the F 650 is formed by a single-loop frame made of pressed section pieces and square tubing, the upper half of the frame housing the oil reservoir for dry sump lubrication of the engine. The frame is further reinforced by bolted-on round tubing, and the engine serves to provide an additional load-bearing function.

Rear wheel fitted on delta-box swinging arm

The front wheel runs on a conventional telescopic fork with stabiliser and a fixed tube diameter of 41 mm or 1.61". The rear wheel, in turn, is suspended on a delta-box swinging arm combining supreme rigidity with low weight.

Hydraulically adjustable spring strut

The centrally mounted spring strut is infinitely adjustable for spring pretension and outward-stroke damping. Spring pretension is adjusted hydraulically by means of an easily accessible adjustment wheel. The spring strut itself is connected to the rear-wheel swinging arm at its lower mounting point by way of a system of levers, the kinematic conditions obtained in this way providing progressive spring action.

Driven by a low-wear O-ring chain

The rear wheel of the F 650 is driven by an O-ring chain running at a transmission ratio of 1:2.93 (teeth ratio 16:47). This specific type of drive chain comprises a permanent lubricant filling in the rollers, O-rings between the rollers and the outer covers preventing the lubricant from escaping. Properly maintained, an O-ring chain therefore guarantees optimum smoothness and minimum wear. Rubber mounts for compensating load change forces are integrated in the rear wheel chain gear support.

Disc brakes front and rear

The brake system consists of a single-disc brake (diameter 300 mm/11.81") with a two-piston floating calliper at the front and a single-disc brake (diameter 240 mm/ 9.45") with a single-piston floating calliper at the rear.

With full tank and in road trim, the F 650 models weigh a mere 191 kg (421 lb).

3 THE FOUR-CYLINDER K SERIES MODELS:

The new K 1200 RS sports tourer sets new standards once again

The K 1100 LT Highline, a new, special version of the luxury tourer

Clearly, the highlight in BMW's 1997 model range, making its world debut at the International Motorcycle and Bicycle Show in Cologne in early October 1996, is the new K 1200 RS. Like its predecessors, this BMW sports tourer once again sets new standards. Please read on for a detailed description of the new motorcycle.

BMW's second four-cylinder, the K 1100 LT, is entering the 1997 model year without any changes in technology. However, there is now also a downscaled version of this luxury tourer as well as a new special model with particularly elaborate twin-tone paintwork and the full range of equipment, the K 1100 LT Highline. A detailed description of these K 1100 LT models follows after the presentation of the K 1200 RS.

From revolution to evolution:
The success story of the K-models - production already exceeding 200,000 units

Launching the brand-new K 100 Series in autumn 1983, BMW started a dual production strategy for the first time. Accordingly, the proven two-cylinder R Series was now joined by modern, high-performance four-cylinder models displacing 987 cc and developing a maximum output of 90 bhp at 8000 rpm and maximum torque of 86 Nm or 63 lb-ft at 6000 rpm.

As much as BMW motorcycles have been characterised ever since 1923 by the two-cylinder Boxer, the Company is also typified by the four-cylinder inline engine of the K-models. For in presenting the BMW Compact Drive System in 1983 in the K 100 Series, the white-and-blue brand launched an all-new drive concept remaining unique to this very day: The engine is fitted in flat configuration facing to the left, the crankshaft runs on the right-hand side, lengthwise in the direction of travel.

Same benefits as with the Boxer

The five-speed transmission and drive shaft coming out of the engine provide a direct flow of power to the rear wheels, as on the Boxer models. Further advantages are the low centre of gravity and the extremely service-friendly accessibility of the engine, giving the Compact Drive System fortes similar to the Boxer.

The forerunner in engine electronics

The K 100 power unit introduced in 1983 was revolutionary in another respect, too: More consistently than all other manufacturers, BMW focused even back then on the use of electronic systems - not only on BMW cars, but also on BMW motorcycles. Accordingly, Bosch LE-Jetronic took over electronic management of the ignition and fuel injection, also for the first time offering overrun control on a motorcycle.

This far-sighted decision soon proved to be a step in the right direction, making it no coincidence that BMW's 1997 motorcycles are already very well prepared today for the environmental requirements of the future.

The first models in the range, the K 100 without fairing and the K100 RS sports tourer, were followed in spring 1984 by the K 100 RT tourer then replaced in 1986 by the K 100 LT luxury tourer.

Derived from the four-cylinder models, more than 67,000 units of the three-cylinder K 75 were built from 1985 until the end of production in summer 1996, displacing 740 cc and developing maximum output of 55 kW/75 bhp at 8500 rpm as well as maximum torque of 68 Nm or 50 lb-ft at 6750 rpm.

The K 1 - BMW's spearhead in image and technology

Following this revolution in 1983, the ongoing story of BMW's four-cylinder K-models was characterised by a steady process of evolution. Accordingly, the three 90-bhp two-valve K 100 models were joined in 1989 by the K 1 with its particularly aerodynamic fairing and a four-valve power unit. This was also the first motorcycle to feature Digital Motor Electronics, Motronic MA 2.1 by Bosch, with maximum output of 74 kW/100 bhp at 8000 rpm and maximum torque of 100 Nm or 74 lb-ft at 6750 rpm.

The K 1 successfully fulfilled its role as BMW's spearhead in image-building and technology, with sales amounting to approximately 7,000 units until the end of production in late 1993.

In 1990 the K 100 RS received the various innovations introduced initially on the K 1, that is the four-valve power unit, Paralever suspension, and brake system.

ABS and fully-controlled three-way catalytic converter - two world-first achievements

Back in 1988 BMW became the first motorcycle manufacturer in the world to introduce ABS anti-lock brakes, at the time on the K 100 and K 75 models. And starting in 1991, BMW likewise became the first manufacturer to offer a fully-controlled three-way catalytic converter on the motorcycle, at the time for the K 1 and K 100 RS. Both of these innovations, which set new standards in riding safety and environmental protection, were warmly received by customers the world over.

K 1100 LT and K 1100 RS:
A larger engine for extra torque

The next step in this evolution and model update process followed in 1992, the engine being "beefed" up once again - this time by increasing engine bore from 67 to 70.5 mm and, accordingly, enlarging engine capacity to 1092 cc. Introduced first in the K 1100 LT, then in the K 1100 RS, this larger engine served not so much to provide extra power (100 bhp now at 7500 rpm), but rather to generate more torque, with maximum torque increasing to 107 Nm or 79 lb-ft at 5500 rpm. Motronic MA 2.2 was also introduced on this occasion and service intervals were increased to 10,000 km.

Offering a perfect blend of styling features, the almost "classic" upper half of the K 100 RS fairing was now combined with new side panels, an engine spoiler, and new battery covers. At the same time BMW's engineers reinforced the frame and improved riding characteristics to an even higher level by a new combination of telescopic fork and spring strut. The K 1100 LT was also updated significantly in 1992, more details on this motorcycle being provided in connection with the 1997 version of this large luxury tourer.

Last but certainly not least, the 13-year success of BMW's four-cylinder K-models is reflected by an impressive figure, ie, the total production volume of more than 135,000 units by autumn 1996. Together with the 67,000 three-cylinder models, this adds up to a very substantial total number of 202,000 K-models.

The new K 1200 RS sports tourer:

New design, even better performance and all the virtues accumulated in 20 years of the RS

Twenty years ago, in 1976, BMW launched the first production motorcycle in the world with aerodynamic fairing developed in the wind tunnel. And whether it was the K 100 RS in 1983 or the R 1100 RS in 1993, BMW's sports tourers then set new standards time and again, quickly becoming the most successful machines of their type. Accordingly, with sales amounting to more than 60,000 units, the RS versions are the best-selling models within the four-cylinder K Series.

Since, as the old saying goes, all good things come in sets of three, BMW is now, for the 1997 model year, launching the new K 1200 RS as the third and so far most significant evolutionary step in the 13-year career of this sports tourer. Not only the "heart" of the K 1100 RS, the four-cylinder power unit, has now become even larger and more powerful, but rather the suspension is almost brand-new and the motorcycle features have been renewed entirely from the ground up - meaning that the K 1200 RS is an all-new motorcycle also in terms of its looks.

The K 1200 RS excels through its dynamic, emotional, unmistakable design. Even at very first sight, therefore, it clearly reveals its high standard in terms of function and ergonomics.

The debut of the Telelever in a K-model, a new frame concept with the engine totally separated to avoid any vibration, a new six-speed gearbox, standard fitment worldwide of a fully-controlled dual catalyst and ABS, the adjustable windshield, handlebar, seat, and rider footrests - these are the most outstanding innovations featured on the K 1200 RS.

The K 1200 RS is even more dynamic, sporting, and comfortable than the K 1100 RS, while at the same time it retains the superiority and touring quality so typical of BMW. Weighing 285 kg or 628 lb in road trim, for example, and with a maximum permissible weight of 500 kg or 1102 lb, BMW's new machine offers a service load of no less than 215 kg or 474 lb.

Dynamic performance K 1200 RS-style means in particular superior muscle at all speeds, ultra-powerful and seemingly effortless torque and acceleration,

and freedom from any vibrations possibly affecting the driver and passenger. This is also reflected by the dynamic behaviour of the running gear, the motorcycle's precise and agile handling in bends, and its virtually perfect stability in all situations on the road. And last but not least, this supremacy also comes out in a brake system which, thanks to ABS, offers optimum safety at all times.

Conclusion: Like its RS predecessor in the last 20 years, the K 1200 RS now sets a new standard once again in the sports tourer segment ...

THE POWER UNIT:

The biggest and most powerful so far in the history of BMW motorcycles

For the second time BMW's development engineers have enlarged the size of their four-cylinder power unit. Increasing stroke from 70 to 75 mm (2.76-2.95"), they have enlarged the overall displacement of the engine to 1171 cc, making the power unit of the K 1200 RS the largest - and most powerful - in the history of BMW motorcycles so far.

Another first-time achievement: an engine developing more than 100 bhp

The launch of the K 1200 RS also marks another first-ever achievement, this being the first BMW motorcycle engine in the history of the Company to exceed the voluntary limit imposed so far of 74 kW/100 bhp. For now there is also a special version developing no less than 96 kW/130 bhp at 8750 rpm.

98 bhp remains the limit in Germany and France

It still remains to be seen whether the anticipated introduction of EU-wide homologation regulations for motorcycles will impose a power limit or not. Pending the introduction of such a general rule within the member states of the European Union, BMW will naturally remain within the statutory 100-bhp limit in countries such as France, and will stick to the voluntary 100 bhp gentlemen's agreement made by manufacturers and importers in Germany, offering only one version with a maximum output of 72 kW/98 bhp in line with the appropriate insurance categories in the German market. This less powerful engine of the K 1200 RS develops its maximum output at a lower speed of just 7000 rpm.

In the lower engine speed range the power curves of the two engines are relatively similar, rising quickly and steadily to 6000 rpm, from where the 96 kW/130 bhp version rapidly adds even more power up to almost 9000 rpm, giving the K 1200 RS very substantial thrust. The engine is not switched off electronically until it reaches 9400 rpm, while on the K 1100 RS the electronic speed governor cuts in at 9000 rpm.

Maximum torque up once again by approximately 10 per cent

Both versions of the engine benefit from an increase in maximum torque by approximately 10 per cent - certainly a very significant point, considering that maximum torque was already most substantial at 107 Nm or 79 lb-ft at 5500 rpm. Indeed, the entire torque curve has become "beefier", both versions of the engine now developing 100 Nm or 74 lb-ft from just 3500 rpm.

The 72 kW/98 bhp engine develops torque even more rapidly from a speed of 3500 rpm, reaching its peak of 118 Nm or 87 lb-ft, like the K 1100 RS, at just 5500 rpm, which means fascinating power and pulling force from moderate engine speeds.

The even more dynamic sports version developing a maximum output of 96 kW/130 bhp achieves not only this higher power at higher engine speed, but also requires higher engine speed to develop its maximum torque of 117 Nm or 86 lb-ft, a peak reached at 6750 rpm.

In technical terms the 130-bhp version differs from its 98-bhp counterpart by shorter intake manifolds with a larger diameter and a modified control map for the electronic engine management.

Refinement and free-revving performance also improved

As a result of the increase in engine size and the wish to improve not only the engine's performance, but also its running smoothness, refinement, response and free-revving riding characteristics, several modifications were obviously required.

To begin with, all moving parts inside the engine were checked with utmost care for any possible reduction in weight. After all, every single gram above the minimum limit means less agility, refinement, and smoothness. Accordingly, shaft diameter of the 16 valves has been reduced from 6 to 5 mm in order to save weight and reduce flow resistance in the intake duct. The new box-type pistons with lighter piston pins, in turn, also help to reduce the masses accelerated when giving gas.

With engine size being increased by a larger stroke, an obvious requirement was to use a new crankshaft which also had to be stronger and stiffer than the

old one. And this also meant using pistons with shorter compression lift, while the connecting rods are still made of forged steel, as before.

Engine compression has increased from 11.0:1 to 11.5:1, serving not only to provide extra power, but also more torque - and at the same time this enhances the engine's thermal efficiency, which means greater fuel economy, too. Valve timing, the valve drive system, the auxiliary shaft and air purge from the engine block have also been changed completely, the auxiliary shaft bearings have been modified, and the volume of the airbox increased from 6 to 7 litres.

Ram charge effect ensuring an optimum supply of air

Since an optimum supply of fuel and air to the cylinders is absolutely essential for genuine power and performance, the engine of the K 1200 RS uses the ram charge effect to draw air into the intake system. In other words, the engine draws in the air required for combustion through an opening in the front end of the fairing, a procedure which provides two advantages: First, the air at this point is cooler than the air, say, beneath the tank and therefore contains more oxygen molecules. Second, the air rushing by the motorcycle is pressed (or "rammed") even more efficiently and with greater force into the intake system.

Two radiators and one oil cooler guarantee healthy operating temperatures

The radiator of the new, even more powerful engine has also been modified in the interest of maximum efficiency and function. As a result, the K 1200 RS comes with a twin-radiator system (previously only one radiator), the two radiators being positioned at exactly the right point for an optimum flow of air. So while the overall radiator surface as such is smaller, overall efficiency of the radiator system is a lot better than before. Whenever necessary, two fans cut in automatically at low speeds or when the machine is at a standstill. Warm air coming out of the radiators flows through discharge grids on both sides of the fairing, thus passing by the rider without creating any unpleasant effect.

Another new feature is the oil cooler with thermostat control, ensuring not only that the engine quickly reaches its normal operating temperature, but also that the oil itself never gets too hot when running under full load or in hot summer weather.

The third generation of Digital Motor Electronics: Motronic MA 2.4

While electronic engine management is still quite unusual with motorcycles - as opposed to cars - BMW is now introducing the third generation of its Digital Motor Electronics on the power unit of the K 1200 RS. This sophisticated control system is indeed absolutely ideal in meeting important requirements such as the reduction of fuel consumption and exhaust emissions, and obviously provides exactly the right technical foundation for the use of a fully-controlled three-way catalytic converter.

Over and above these improvements, the new Motronic MA 2.4 offers a number of trendsetting innovations certainly worth mentioning.

First-ever electronically controlled automatic choke

The K 1200 RS is the first motorcycle in the world incorporating an automatic choke with electronically controlled throttle butterfly adjustment (TBA). Since, therefore, there is no longer the usual choke lever, the rider benefits from even greater comfort and control ease, optimum idle speed stability, and the good feeling that he cannot make any mistakes in controlling the choke.

Last but not least, the automatic choke significantly improves the engine's emission behaviour in the warm-up phase.

Mobi Dic: the first-ever mobile diagnosis computer

Introducing Motronic MA 2.4, BMW is also becoming the first manufacturer in the world to use a mobile diagnosis computer (Mobi Dic), a laptop-size tester, for the motorcycle. In the workshop, the BMW dealer connects Mobi Dic to the motorcycle by way of a diagnostic plug and is able, as a result, to perform a 100 per cent check of all electronic modules and the electrical system. After selecting the items he wishes to consider, the mechanic is guided by the display and a catalogue of symptoms all the way to a clear analysis of any defects, receiving all the technical information he needs in the process. And at the same time the diagnosis system presents the individual steps to be taken by the mechanic.

BMW Mobi Dic is not only a diagnosis and measuring system, but also an electronic information unit helping to speed up service and repair work.

Alternator even more powerful

Electric power supply on the K 1200 RS is now even more efficient and substantial than before, the optimised alternator delivering 720 W in order to meet all requirements.

Dual catalytic converter fitted as standard worldwide

Creating the exhaust and silencer systems of the K 1200 RS, BMW's development engineers have really established a new benchmark. For this sophisticated system not only fulfills the strictest noise emission standards in the world, but also combines optimum power and torque characteristics with equally outstanding emission control - and it does this equally well with both versions of the engine.

Enlarged in their diameter, the four exhaust pipes form one fan-shaped manifold exactly tuned to the new engine. In each case two of the stainless-steel pipes merge straight into the two fully-controlled three-way metal-based catalytic converters positioned directly next to each other. Introducing this dual-catalyst concept featured worldwide as standard on the K 1200 RS, BMW is indeed once again paving the way into the future of emission management technology.

The extra-large rear muffler also made of stainless steel comes complete with an aluminium cover easy to replace whenever necessary.

Newly developed six-speed transmission

The K 1200 RS is the first-ever BMW motorcycle to feature a six-speed transmission. With increments between gears on this new transmission developed by the South German company Getrag obviously being smaller, the result is an even smoother, more direct flow of power from one gear to the next. Shift comfort and precision have also been improved significantly, the new gear lever mechanism supporting the rider's shift movements and allowing the gears to come into mesh with even greater precision.

Another advantage of the new gearbox is its optimised noise control, the Paralever rear-wheel swinging arm now resting on the central frame, and no longer in the gearbox housing. The gearbox itself is more compact, noise-

emitting surfaces are far smaller. And the service intervals for the gearbox have been doubled from 20,000 to 40,000 km.

RUNNING GEAR:

All new with the exception of the brakes

A significant innovation from the new Boxer generation: the BMW Telelever

One of the most significant innovations in running gear technology is now featured for the first time also in a K-model: the BMW Telelever.

This unique front-wheel guidance system made its very successful debut back in 1993 in the R 1100 RS and has clearly substantiated its merits in the meantime in the subsequent models of BMW's new Boxer generation.

A detailed technical description of the design and functions of the BMW Telelever, as well as its important advantages, is provided in Chapter 7 (R 1100 RS) of this report.

Clearly, the Telelever had to be modified in order to provide a perfect match for the four-cylinder power unit, the forks and longitudinal control arms being all-new. With the longitudinal arms resting in this case not on the engine block - as with the Boxer - but rather on the frame of the motorcycle (for details, see the technical description of the new frame), the arms are rectangular in shape, and no longer look like a letter A.

As on the Boxer models, a central gas-pressure spring strut provides both the necessary spring and damping action, with spring travel measured vertically to the road of 115 mm or 4.53".

Anti-dive compensation on the K 1200 RS, as on the R 1100 GS, is 90 per cent - which is much more than on the new Boxers for road use only, with anti-dive compensation reduced to just 70 per cent.

Although 100 per cent anti-dive compensation would have been possible in technical terms, BMW's development engineers intentionally did not go this

far, since they believe that while braking the rider should still receive certain feedback telling him how great the anti-dive effect really is.

Handlebar damper almost entirely free of friction in the interest of optimum riding safety

The newly developed handlebar damper suppresses all vibrations around the handlebar centrepoint, which might otherwise have a negative effect on riding safety. The special feature in this context is that the handlebar damper is almost entirely free of friction, meaning that the motorcycle offers optimum directional and tracking stability, handling and agility.

All this is made possible by the special design of the dual piston: whenever the handlebar is moved slowly, oil flows through both parts of the two-piece piston. With the flow cross-section being relatively large and hydraulic damper forces small, the dynamic inner pressure within the handlebar damper and, accordingly, pressure behind the seal crucial to friction on the piston rod remain at a minimum.

As soon as handlebar movements exceed a certain level, on the other hand, the two halves of the dual piston merge with one another, significantly restricting the flow cross-section and increasing the hydraulic damper forces.

Improved once again: the BMW Paralever

Featured for the first time in the R 100 GS back in 1987, the Paralever now fitted on all BMW motorcycles - with the exception of the chain-driven single-cylinder F 650 models - ensures optimum guidance of the rear wheel. A double swinging arm, it substantially reduces the load change response of the drive shaft, in this way ensuring optimum traction of the rear wheel at all times.

On the K 1200 RS the Paralever swinging arm rests on the new frame, and no longer on the transmission housing itself.

Like the new Boxers, the K 1200 RS features a gas-pressure spring strut resting on the frame on the right-hand side, slightly offset from the centrepoint of the motorcycle. On the opposite side, in turn, the spring strut is now connected to the frame at roughly the same point as the swinging arm itself, and no longer rests on the final drive, as is the case with the K 1100 RS. This configuration and the inclined position of the spring strut ensures ideal pro-

gression in spring and damper action, the entire rear wheel suspension responding more sensitively and significantly improving riding comfort. The gas-pressure spring strut allows 150 mm or 5.91" of spring travel and can be adjusted for spring pre-tension and outward-stroke damping with the help of the tools in the kit.

Entirely new frame concept to avoid vibrations and maintain supreme riding stability

As already mentioned when describing the engine of the K 1200 RS, the increase in engine capacity means even more power than with the former four-cylinder models. Given the previous design concept of the K-models, where the engine was connected firmly to the frame as one of the load-bearing components, it was impossible to separate the engine perfectly by means of elastic mounts in order to avoid vibrations, since this would have detracted from the motorcycle's riding stability.

Seeking to solve this conflict of interests between riding comfort and riding safety, ie, trying to avoid unpleasant vibrations on the one hand and achieve supreme riding stability on the other, BMW's development engineers eventually created an all-new frame concept.

Cast aluminium frame forming a stiff backbone between the Telelever and Paralever
Engine specially mounted to avoid vibrations

A compact cast aluminium frame fitting snugly around the engine now resting on special mounting points to avoid vibrations altogether, forms the flexurally and torsionally-stiff backbone between the Telelever and the Paralever. At the rear, the frame incorporates the so-called "silent blocks", extra-large rubber mounting points for the engine, as well as the rear frame section made of steel pipes and the Paralever swinging arm. At the front the Telelever longitudinal arm rests on a swivelling bearing point; this is also where the silent blocks on the front engine mounts are supported on the frame head by steel bars.

Welded out of four sections, the die-cast aluminium frame is referred to in technical terms as a "free-form casting" allowing in each case an optimum design making full use of the space available in the interest of supreme stiffness and rigidity. The thickness of each wall, for example, may be varied according to specific strength and stability requirements. The hollow frame, in

turn, features reinforcement baffles inside forming a kind of honeycomb structure maintaining maximum rigidity within the most compact dimensions.

Engine fitted higher up to allow an even more extreme riding angle in bends

In the interest of sporting performance with riders leaning over to an extreme angle in bends (up to 50 ° on the K 1200 RS as opposed to 46 ° with the K 1100 RS), the engine is now fitted approximately three centimetres higher.

Beautiful and light: new wheels in five-spoke design

The new, lighter 17-inch cast aluminium wheels in almost delicate (but very sturdy) five-double-spoke design provide a perfect match for the all-new looks of the K 1200 RS.

Brake system carried over from the K 1100 RS

Offering virtually perfect function and optimum efficiency, the brake system of the K 1100 RS also featured on the new Boxer series has been carried over to the new motorcycle without any significant modifications.

Accordingly, the front wheel features a hydraulically operated double-disc brake with four-piston fixed callipers. Mounted in floating configuration, the stainless-steel discs measuring 305 mm or 12.00" in diameter are however, in the interest of lower weight and, as a result, lower unsprung masses, fastened directly to the spokes of the aluminium wheel, and no longer to a brake disc support. The rear wheel, in turn, comes with a single-disc brake featuring two-piston fixed callipers and a brake disc measuring 285 mm or 11.22" in diameter.

ABS standard worldwide

Like the R 1100 RT and K 1100 LT, the K 1200 RS also comes as standard worldwide with BMW's second-generation ABS originally launched in 1992.

With BMW becoming the first motorcycle manufacturer in the world to introduce an electrohydraulic anti-lock brake system back in 1988, more than 120,000 BMW motorcycles have been equipped with this safety technology in the meantime.

Ideal partnership of the Telelever and ABS

Since brake forces at the contact point between the front tyre and the road can only be used in full with wheel load at a maximum, the Telelever featuring the only really effective anti-dive concept provides ideal conditions for perfect interaction with ABS. In other words, as long as the suspension and dampers have their full effect even when applying the brakes on a bumpy surface, the wheel thus maintaining its full contact with the ground, the brakes will ensure optimum deceleration and stopping power.

DESIGN AND FEATURES:

Brand-new

In terms of both looks and model features, the K 1200 RS is brand-new in every respect.

In its design it nevertheless hints discreetly at its successful sports tourer predecessors, the K 100 RS and K 1100 RS, by intentionally taking over K-RS design features now re-interpreted in their styling. The new design excels through its well-balanced overall concept avoiding any one-sided extremes and exuding an air of superior, independent style instead of any short-lived trendiness. The lines of the machine are soft and smooth, clear and comprehensible, but not aggressive.

Once again a distinct face in the crowd

From the front, the K 1200 RS looks sporty and muscular. And, as is appropriate for a BMW, it once again has a new, different and unmistakable face - quite simply, a distinct face in the crowd. The typical K-RS design features come out again in the windshield pillars and hand protectors with their integrated direction indicators, as well as the aerodynamically optimised front area.

New headlight with "double-eye effect"

The face of the machine is dominated by the new tandem headlight offering innovative light technology to be explained in greater detail later after this description of the motorcycle's design. With the low beam switched on, the headlight also offers the beholder a powerful image of the motorcycle coming closer, creating a kind of "double-eye effect". You might even say that it looks a bit like the face of the rider behind the visor in his integral helmet, revealing only the eyes and nose.

A powerful and dynamic appearance

Seen from the side, the new K 1200 RS again looks powerful and dynamic. At the front the complex unit formed by the fairing and the fuel tank follows immediately behind the front wheel with its delicate-looking five double spokes. This is where the touring character of the machine comes out most clearly, showing the direct interaction of ergonomics, wind and weather protection.

A harmonious blend of function, ergonomics, and aesthetic design

Whether it's the transition from the tank to the seat, the particular design of the tank cover and fairing reflecting the anatomy of the rider's knee, or the side radiator air nozzles indicative of the perfect flow of air - the side view of the K 1200 RS reflects the harmonious blend of function, ergonomics, and aesthetic design.

Two small, shop-window-like cutouts on either side of the fairing show once again quite clearly that this is where the four-cylinder K-engine with its unique looks does a reliable job, as usual. Right behind the fairing, the rear section of the new cast aluminium frame with the footrests at the bottom provides a technical highlight blending perfectly with the overall styling of the machine. Rising slightly from front to rear, the seat has a slender look particularly where the passenger sits, merging into the high, somehow light-looking rear end. And last but not least, the passenger grab handle, direction indicators, rear light and number plate support form one compact unit creating a particularly clear-cut design around the rear wheel really accentuating the machine´s styling in this way with its muscular stance on the road.

Right in front of the rear subframe on the left-hand side, the cylindrical, large-volume rear muffler again follows a clear line, characterising the sporting side of the K 1200 RS. Even the case supports, the cases themselves and the luggage rack available as an option blend harmoniously with the overall looks of this sports tourer.

Three colour variants, each providing a highly individual touch

The three different colour schemes available for the new K 1200 RS give the machine a very distinctive, characteristic look in each case.

The dakar-yellow and arctic-grey-metallic version, for example, will catch your eye at first sight, the twin-tone paintwork with appliqués emphasizing the motorcycle's sporting, dynamic character. Particularly this paintwork accentuates the lines of the machine, creating an image both extravagant and convincing in one.

Marrakech-red non-metallic is an almost classic colour for a sports tourer from BMW. Exuding strength, sportiness and self-confidence, this paintwork arouses powerful emotions.

The third paintwork variant, dolphin-blue-metallic, is of more reserved, discreet elegance. The flowing lines of the dolphin express dynamism and aesthetic looks again reminiscent, if we may say so, of the unmistakable styling of the K 1200 RS.

Optimum ergonomics and streamlining

Inter alia, BMW motorcycles excel through their carefully conceived, ergonomic design and outstanding tourer comfort. You might indeed say that this reflects the consistent development of BMW motorcycles using all high-tech facilities available at BMW AG's Research and Development Centre.

As an example, BMW's motorcycle development specialists use the most advanced computer simulation methods in the interest of optimum ergonomics. This allows them to systematically examine the basic concept as well as all kinds of modifications right from the beginning, in the first step of the development process. Accordingly, not only the windshield, handlebar, clutch pedal, brake pedal, and seat are adjustable on the K 1200 RS, but also the rider footrests as well as the gearshift lever.

In optimising the machine's streamlining, wind and weather protection, it is above all the painstaking attention to detail in the wind tunnel and comprehensive road tests that ultimately ensure the high quality of BMW motorcycles also in this area.

For your well-being and active safety

The fundamental point behind this development process is BMW's philosophy to see man and machine as one homogeneous unit. For we are convinced that the rider's comfort and well-being have a great influence on his stamina, concentration and response, and are therefore crucial to active safety on the road.

Fairing with an adjustable windshield

With its somewhat smaller frontal area, the fairing of the K 1200 RS looks more delicate than that of the K 1100 RS, but nevertheless offers good protection from wind and weather. With the rider leaning forward on the motorcycle, overall air resistance Cd x A is 0.38, while with the rider sitting upright the overall drag factor is 0.42.

The windshield adjusts easily and conveniently to two different positions: a more dynamic, sporting position and a higher, more upright setting for comfortable touring. In this position, the special design of the windshield at the upper edge efficiently deflects the flow of air away from your shoulders in the interest of extra comfort.

As on various other BMW motorcycles, the direction indicators on the K 1200 RS also serve as hand protectors. And thanks to the sporting, slimmer and more dynamic design of the fairing, the rear-view mirrors can be perfectly positioned on the handlebar to provide optimum visibility to the rear.

Greater light intensity thanks to the new tandem headlight

Right in the middle of the fairing comes the headlight with its new light technology, the tandem headlight representing a genuine highlight in the most direct sense of the word.

While conventional headlights incorporate a parabolic reflector with a scatter lens to eliminate any deficiencies, the headlight reflector used here applies

free-form technology calculated and designed with utmost precision by a computer. The H 7 bulb for the low beam comes right in the middle, with a small spot reflector incorporating an H 3 bulb for the high beam just in front and added on to the low beam whenever required.

It is this configuration with the high beam in front of the low-beam reflector that leads to the term "tandem headlight". On the road, it ensures not only better illumination to the side and round bends, but also a much higher standard of light intensity in general.

Apart from this important safety aspect, the tandem headlight also creates - as a kind of additional feature - the "double-eye effect" already mentioned in the context of motorcycle design, in this way helping to give the K 1200 RS a unique look also in this respect.

A cockpit telling the rider everything he needs to know

Again totally re-designed, the cockpit is clear and logical in its structure and graphic presentation, giving the rider all the information he needs to know at first glance. As the largest instrument, the rev counter next to the speedometer dominates the cockpit, emphasizing the sporting character of the K 1200 RS. The faces of both instruments have intentionally been arranged in such a way that both the optimum engine speed range as well as the 100 km/h mark are shown right at the top in the middle, that is in the "12 o'clock" position.

Two further analogue-face instruments show you the coolant temperature and fuel level. And apart from a digital clock and gear display there are several telltales and warning lights, one of which comes on when the fuel level in the 21-litre (4.6 Imp gal) fuel tank drops to four litres (0.9 Imp gals).

Adjustable handlebar for sports riding or comfortable touring

Measuring 700 mm or 27.6" across, the handlebar of the K 1200 RS is adjustable to three different fore-and-aft and height positions, the adjustment process as such being very simple and requiring only the tools already on board. Accordingly, the rider can choose between a more sporting or touring-oriented seating position, as is befitting for a genuine sports tourer.

Optimised handlebar controls

The new K 1200 RS also comes with a new generation of BMW handlebar controls. Proceeding from the existing ergonomic concept, the arrangement of the controls and switches has been optimised where necessary, thus ensuring even greater comfort than before. On the left-hand side, for example, the push button for the horn is now placed in an even better and more ergonomic position, while the - now illuminated - switch for the hazard warning flashers fitted as standard has moved from the cockpit to the handlebar and is therefore even easier to reach. On the right-hand side, in turn, the light switch is in a new, again even more accessible, position. And the switch for the heated handles available as an option is now integrated into the handlebar control unit on the right.

The logical position of the thumb-operated direction indicator switch, on the other hand, remains unchanged, ie, on the left-hand side of the handlebar for the left, on the right-hand side of the handlebar for the right direction indicator. And both direction indicators are cancelled, as before, by the switch on the right. There is also, as in the past, an automatic indicator cancelling function activated out of town at speeds over 50 km/h after about 10 seconds or in town after a distance of approximately 210 metres.

The clutch and brake pedals are anatomically designed and may now be adjusted to no less than four different positions. Hydraulic operation of the clutch keeps operating forces consistently at a low, comfortable level.

Seat and footrests also individually adjustable

The contoured design of the comfortable seat around the rider and the way the seat merges into the tank and fairing gives you the feeling of sitting not so much on the motorcycle, but right inside the machine. The rider has more body contact with the K 1200 RS and, accordingly, feels even more a part of it. Even when accelerating and braking all-out, this relieves a lot of pressure from your body.

Once again, the height of the single-piece seat may easily be adjusted in the rider's area between 770 and 800 mm (30.3 and 31.5"). In conjunction with the footrests also adjustable by way of three bolts, the rider may choose his knee angle according to his own personal taste, the overall range of adjustment being 30 mm or 1.18" in horizontal and 26 mm or 1.02" in vertical

direction. The specific position of the footrests for the passenger also ensures superior seating comfort, giving the passenger a comfortable ride even on long distances.

SPECIAL EQUIPMENT AND ACCESSORIES:

From the baggage range all the way to the anti-theft warning system

Although the K 1200 RS comes with a very wide range of standard features to begin with, it is nevertheless available with an attractive choice of special equipment and accessories. Just some examples are the case supports with luggage rack, cases, heated handles, an anti-theft warning system, a tank bag, as well as inner bags for the side cases.

THE K 1100 LT LUXURY TOURER

Both model versions fitted as standard with ABS

In the 1997 model year the K 1100 LT luxury tourer comes in two versions, the "standard" K 1100 LT and the special K 1100 LT Highline. It almost goes without saying that both models, as the only luxury tourers in the world, again come as standard with ABS and, as an option, with a fully-controlled three-way catalytic converter (a standard feature in Germany, Switzerland, Japan, and the USA).

"Basic" version of the K 1100 LT without pannier cases and topcase

Versus last year's model, the "basic" version of the K 1100 LT now comes without the pannier cases, topcase support, and topcase. And instead of the former saddle-type seat, it now features (with the exception of Germany) a folding seat as well as grab handles for the passenger. Obviously, these fitments now no longer fitted as standard are still available as options.

The special K 1100 LT Highline with elaborate looks and features

Following in the footsteps of the Special Edition models in the last two years there is now a new special model, the K 1100 LT Highline combining particularly elaborate looks with equally elaborate model features.

As an example, this special model comes with two-colour paintwork in fjord-grey-metallic and canyon-red-metallic also comprising the covers of the pannier cases and topcase, plus double silver lining along the tank and fairing. The cylinder head cover and crankcase cover on the engine are finished in high-gloss chrome, the fork tubes come in a high-gloss polished finish, the windshield support and spring strut at the front are painted silver. Indeed, even the clutch and brake levers are silver-polished and eloxy-plated, while the tank cover is finished in a silver-powder coating.

Other features fitted as standard include a saddle seat in black, a cassette radio with aerial and four loudspeakers, two pannier cases and one topcase with backrest for the passenger.

The story of the K 1100 LT:
A larger engine for extra torque

Even the model designation - K 1100 LT - shows that in updating this luxury tourer for the 1992 model year BMW (the actual launch of the K 1100 LT was in February 1992) went a step beyond the K 1 and K 100 RS: Engine capacity of the four-cylinder power unit was increased by more than 10 per cent from 987 cc (60.2 cu in) to 1092 cc (66.6 cu in) by increasing engine bore from 67 mm (2.64") to 70.5 mm (2.78"), the largest growth in engine size up to that time in the history of BMW motorcycles. Otherwise identical with the 16-valve power unit of the K 1100 RS, the four-valve power unit also develops 100 bhp (74 kW), this time however at a relatively low 7500 rpm. More importantly, the increase in engine size helped to boost torque significantly.

The K 1100 LT features Digital Motor Electronics (Motronic MA 2.2) for optimum fuel efficiency and as the ideal technology for the fully controlled three-way catalytic converter available as an option (and standard in Germany, Switzerland, Japan, and the USA).

Another outstanding feature of the K 1100 LT is BMW's proven five-speed gearbox. The 5th gear transmission ratio, as on the K 1100 RS, is 1.61, while the final drive ratio is 2.81:1 ever since the 1994 model year.

Inspection intervals are 10,000 km or 6,000 miles.

In creating the K 1100 LT, BMW's engineers followed the same policy as two years before when updating the K 100 RS, thus taking over important innovations and features from the K 1. Examples are the BMW Paralever, the highly efficient double disc brake with four-piston fixed callipers on the front wheel, the three-spoke light-alloy wheels, the slightly modified telescopic fork with 135 mm (5.31") spring travel already featured on the K 100 RS, the stainless-steel silencer, and the central ignition and handlebar lock.

Yet another special feature of the K 1100 LT is the spring strut with progressive spring action, infinitely variable outward stroke damping and base spring pretension adjustable to five different positions. Spring travel is 120 mm or 4.72".

Fairing with electrically adjustable windshield

The fairing, seat and storage compartments of the K 1100 LT present the most conspicuous innovations versus the K 100 LT. Indeed, BMW's large tourer fairings developed in the wind tunnel have always set standards in the luxury touring range, for example on the R 100 RT in 1978 and the K 100 RT in 1984.

In the meantime the fairing has been optimised to provide the best conceivable protection from wind and weather. First, it comes with new panels at the side supplemented as the second new feature by electric adjustment of the windshield itself: By means of two adjustment rails arranged at an angle to one another, the transparent windshield can be moved up and down by 75 mm (2.95") and swivelled for angle by 24°, in this way providing a total height adjustment range of 112 mm (4.41").

Topcase and touring cases with a total capacity of 101 ltr or 3.5 cu ft

The topcase has a capacity of 35 litres or 1.2 cu ft. The integral cases have a capacity of 33 ltr or 1.16 cu ft each, providing a total capacity together with the topcase of 101 litres (3.54 cu ft).

The world's only luxury tourer with ABS and catalytic converter

The K 1100 LT is the only luxury tourer in the world fitted as standard with ABS and available as an option with fully controlled three-way catalytic converter (also standard in Germany, Switzerland, Japan, and the USA).

4 THE R 1100 RT

The tourer of the future exceeds expectations
Entering the 1997 model year without any changes

As the fourth model in its new generation of Boxer machines, BMW launched the R 1100 RT tourer in autumn 1995. With more than 12,000 deliveries to customers worldwide, the new machine exceeded expectations right from the start in its very first year. Now, the R 1100 RT is entering the 1997 model year without any changes.

Combining traditional virtues with future-oriented innovations

Like all of BMW's new Boxers, this full-fairing tourer follows in the footsteps of its predecessor: Launching the R 100 RT in 1978, BMW became the first manufacturer to introduce a genuine production tourer with full fairing developed in the wind tunnel, in this way establishing the tourer segment. Up to the end of the 1995 model year, production of the R 100 RT and R 80 RT amounted to more than 50,000 units - a clear sign of outstanding success in the market.

Applying vast experience and competence in this area, BMW has now re-defined the tourer concept in general. Proven virtues of the classic RT models such as excellent protection in wind and weather as well as ideal riding characteristics for long distances, plus the robust design and reliability of the machine have been maintained, future-oriented innovations have been added.

As a result, the new machine meets the highest standards also in terms of up-to-date engine technology combining superior performance with environmental compatibility, active riding safety and road comfort naturally also meeting the highest standards. And last but not least, the R 1100 RT establishes a new benchmark in the tourer market through its outstanding agility and supreme handling.

The R 1100 RT is surprisingly nimble and light-footed in dense city traffic, while offering sporting performance on winding country roads. Indeed, it is also very agile on Alpine passes and offers extreme riding comfort on long stretches of motorway.

Given all these qualities, the R 1100 RT may therefore rightly claim to be the tourer of the future in every respect.

The drive train and running gear of the R 1100 RT come primarily from the wide range of high-tech components introduced for BMW's new generation of Boxer machines. Reference is made in the following primarily to the specific model highlights of the R 1100 RT.

THE POWER UNIT:

Same performance data and characteristics as the R 1100 RS

In terms of its performance data and characteristics, the power unit of the R 1100 RT is identical to that of the R 1100 RS: The air- and oil-cooled two-cylinder Boxer machine displacing 1085 cc, with four valves per cylinder and Digital Motor Electronics (Bosch Motronic 2.2), develops a maximum output of 66 kW (90 bhp) at 7250 rpm and a maximum torque of 95 Nm (70 lb-ft) at 5500 rpm.

The five-speed gearbox and clutch are also the same as on the R 1100 RS, the only difference being the final drive ratio of 1:2.91 on the R 1100 RT, compared with 1:2.81 on the RS model.

The chrome-plated exhaust system made of rustproof stainless steel is also the same as on the R 1100 RS.

Fully-controlled catalytic converter either standard or optional

In Germany, Austria, Switzerland, Japan and the USA a fully-controlled catalytic converter is fitted as standard. In all other countries it is available as an option.

RUNNING GEAR:

Telelever and Paralever ensure superior riding safety and road comfort

Like the other models in the range, the R 1100 RT benefits from the outstanding riding safety and road comfort provided by the BMW Telelever, an entirely new front wheel suspension concept, as well as the BMW Paralever, the proven double-joint swinging arm on the rear wheel propelled by drive shaft.

The front wheel features the same central spring strut as the roadster model, while the central spring strut at the rear, as on the GS, can be adjusted for spring tension hydraulically by a hand wheel and for outward damping by an adjustment bolt (infinite adjustment in both cases). This ensures optimum adaptation of the suspension to various loads.

Spring travel, as on all of BMW's new road Boxers, is 120 mm (4.72") at the front and 135 mm (5.31") at the rear.

The main components of the R 1100 RT's frame come from the R 1100 GS, the rear subframe and supports for the pillion footrests are the same as on the R 1100 RS.

The suspension geometry, on the other hand, ie, wheelbase, caster, and steering assembly angle (see the section on specifications), have been slightly modified versus the other models.

Brakes fitted as standard with ABS

Like all new Boxers in the BMW range, the front wheel comes with a double-disc brake featuring four-piston fixed callipers and floating stainless steel discs measuring 305 mm or 12.00" in diameter. The rear wheel, as on the enduro and roadster models, is fitted with a single-disc brake (disc diameter 276 mm or 10.87") and a two-piston floating calliper.

To ensure optimum use of this highly efficient braking system in all situations, the R 1100 RT (like the K 1100 LT as of the 1996 model year) comes worldwide with ABS or, to be more specific, the special electrohydraulic anti-lock brake system developed by BMW. To be even more specific, this is of course

ABS II, BMW's second generation of ABS brakes introduced in 1993 first on the R 1100 RS and then on the K 1100 models.

MODEL FITMENTS:

Full fairing for perfect form and function

In its styling and design, the R 1100 RT ensures supreme harmony of form and function. Full fairing, for example, provides not only excellent protection from wind and weather, but also an unmistakable, elegant look at first sight.

With its integrated headlight rounded off at the corners and the oil cooler in BMW's discreet "kidney" look, the fairing was developed and optimised in its streamlining in BMW's wind tunnel. With the windshield in its lowest position and the system cases fitted as standard, overall air drag (Cd x A) is only 0.494 - an excellent figure considering the very good protection from wind and weather offered by the fairing.

Windshield electrically adjustable

The extra-large windshield is electrically adjustable for rake by 22° and for height by 155 mm or 6.10", thus guaranteeing an optimum, individualised riding position depending on the height of the rider and his style of riding. Adjustment is just as easy as on the K 1100 LT by means of a toggle switch on the left of the handlebars.

The two rear-view mirrors are fully integrated in the fairing, serving at the same time to protect the rider's hands. The front direction indicators are fitted directly in the mirror housings.

Warm air supply to the handles

The fairing of the R 1100 RT features a special warm air supply with individual on/off control: Warm air emerging from the oil cooler can be directed as an option straight to the two handles, air flow being controlled by two flaps in the cockpit opening and closing according to the rider's individual requirements. A small, lockable storage compartment on the left-hand side of the fairing also serves to accommodate a cassette radio available as special equipment.

26-litre fuel tank providing a long cruising range

As befits a genuine tourer, the R 1100 RT comes with a large fuel tank with a capacity of 26 litres or 5.7 Imp gals providing a long cruising range. As soon as the fuel level drops to about four litres, a telltale comes on and the bottom light in the rider information display (RID) goes out to inform the rider accordingly.

Made of forged aluminium and highly stable steel tubes, the two-piece tourer handlebars are 775 mm or 30 1/2" wide, feature ideal ergonomic design and therefore allow an upright, comfortable and fatigue-free riding position. As on the R 1100 R and R 1100 GS (see description of those models), the handlebars are mounted separately to avoid vibrations. The handbrake lever, in turn, may be adjusted to four different positions.

System cases and luggage rack fitted as standard

As you would expect of a genuine, sophisticated tourer, the R 1100 RT comes as standard with case supports and a luggage rack, plus two system cases each with a capacity of 33 litres or 1.16 cu ft.

Like the storage compartment, the central ignition and handlebar lock, and the seat lock (where the rider may also fasten his helmet), these cases can be opened and closed with one single key.

It almost goes without saying that the R 1100 RT comes with standard features such as a main stand, side-stand with automatic starter interruption, hazard warning flashers, a socket (power take-off), on-board toolkit, and a tyre service kit.

In road trim, that is with fuel, oil, cases and tools - as well as with ABS fitted as standard (which, in all, means an extra 7 kg) - the R 1100 RT weighs 282 kg or 622 lb. Given its maximum permissible weight of 490 kg or 1080 lb, this means a service load of 208 kg or 459 lb.

Options and special equipment

Over and above the wide range of standard fitments, the options available from the factory include heated handles as well as a radio installation kit including two loudspeakers and a second power take-off. And a very important feature not to be forgotten is the fully-controlled catalytic converter, unless it is already fitted as standard.

Special equipment available from the BMW dealer comprises an anti-theft warning system, a second power take-off, a cassette radio, soft rubber handles, and a cylinder protection hoop. Then, for taking along ample luggage, there's also a topcase with inner bag with a capacity of 30 litres or 1.1 cu ft, inner bags for the system cases fitted as standard, and a tank bag.

5 THE R 1100 R AND R 850 R

Roadster models in great demand
Entering the 1996 model year without modifications

As the third model in the new Boxer generation, BMW introduced the R 1100 R in autumn 1994, thus launching a roadster version representing the classic, "naked bike" without a fairing. You might therefore call this a genuine, grass-roots machine of the type BMW has always offered in all model series. Technically and optically almost identical with the R 1100 R, the R 850 R entered the market at the same time as the first model of a new Boxer generation with a downsized engine.

Above all thanks to their muscular acceleration and magnificent handling, both roadster models have received top marks in the international motorcycle press.

This, in turn, has had a very positive effect on customer demand, production of the two roadster models exceeding 17,000 units by autumn 1996.

Both roadster models are entering the 1997 model year without any changes or modifications.

Same high torque as the R 1100 GS

In principle, the drive system and running gear of the R 1100 R are based on the technical features of the R 1100 RS and R 1100 GS. Once again, therefore, this new machine is driven by BMW's air- and oil-cooled flat-twin Boxer featuring Digital Motor Electronics (Bosch Motronic MA 2.2) with a displacement of 1085 cc and four valves per cylinder.

Like the R 1100 GS, the R 1100 R features a power unit built not so much for maximum output (as in the case of the R 1100 RS), but rather for extra torque and pulling force. And it also comes with the high-rise exhaust system of the R 1100 GS.

The change in power and output characteristics versus the R 1100 RS is provided by the same measures as on the R 1100 GS (for details, see the description of the R 1100 GS).

Accordingly, the engine specifications of the R 1100 R are the same as those of the R 1100 GS, that is a maximum output of 59 kW (80 bhp) at 6750 rpm and a maximum torque of 97 Nm (71 lb-ft) at just 5250 rpm.

In Germany both the R 1100 R and the R 1100 GS are optionally available for insurance reasons with a maximum output of 57 kW/78 bhp.

In contrast to the R 1100 RS, RT and GS, where the oil cooler is integrated beneath the headlight, the R 1100 R comes with two smaller oil coolers left and right above the cylinders.

The R 850 R: BMW's first new Boxer with a downsized engine

The R 850 R, the entry-level model leading into the new Boxer generation, comes with an 848-cc power unit almost identical in technical terms with the engine of the 1100 cc models. Maximum output is 52 kW or 70 bhp at 7000 rpm, maximum torque 77 Nm (57 lb-ft) at 5500 rpm. And in accordance with European driving licence regulations, a 25 kW (34 bhp) version has been available since spring 1995.

The final drive ratio of the R 850 R is 1:3.36 (R 1100 R 1:3.00). Another difference between the two models is the diameter of the intake and outlet valves in the engine, while all other technical features, data, dimensions and weights are the same on both the R 1100 R and R 850 R. Accordingly, there is no need for specific reference to the R 850 R in the following description.

A totally unique and independent look

The R 1100 R roadster not only offers superior power and performance, but also looks great in its unique, unmistakable appearance. Among other things, it comes with a rounded steel plate fuel tank with a capacity of 21 litres (4.6 Imp gals).

Adjustable seat with a minimum height of only 760 mm (29.9")

The two-piece stick-on seat offers ample space plus excellent riding comfort for both the rider and passenger. And as with the other models of the new Boxer generation, the rider's seat is again adjustable for height: from 760 to

780 and 800 mm (29.9 - 30.7 - 31.5"). Otherwise, the features and model fitments on the R 1100 R are limited to the essential.

The speedometer and telltales are positioned right in the middle, above the chrome-plated round headlight of the R 1100 R. In addition, there are three switches slightly at the left, one switch operating the hazard warning flashers fitted as standard, the two others being for the optional heated handlebar handles and the anti-lock brake system (cancellation switch). Both a rev counter and clock are optionally available (fitted as standard in Germany) as separate round instruments positioned at the side.

Wider handlebar for easy handling

Made of forged aluminium, the two-piece handlebar is 729 mm (28.7") wide and contributes to the rider's ergonomic seating position while at the same time making the motorcycle very easy to handle. As on the R 1100 GS, the handlebar is mounted separately to avoid vibrations and may be tilted to the front (see also the description of the R 1100 GS).

Weighing 235 kg or 518 lb in road trim, the R 1100 R comes with the three-spoke light-alloy wheels of the R 1100 RS. Wheel and tyre dimensions are also the same as on the R 1100 RS, and are described in greater detail in the specifications.

Cross-spoke wheels available as an option

As an option, the R 1100 R is available with the cross-spoke wheels of the R 1100 GS, although in this case front wheel diameter is not 19 inches (as on the GS), but rather 18 inches.

The front wheel brake operated by a handbrake lever adjustable to four different positions is the same as on the R 1100 RS, while the rear wheel brake comes from the R 1100 GS (again, details are to be found in the descriptions of these two models).

Advantages of the BMW Telelever

It goes without saying that the R 1100 R offers all the advantages of the BMW Telelever, the new front wheel suspension described in detail in the chapter covering the R 1100 RS. A central spring strut is fitted at both front and rear,

respectively, outward-stroke damping on the rear spring strut being infinite, while spring pretension may be set to 7 different positions. Spring travel is the same as on the R 1100 RS and R 1100 RT, that is 120 mm/ 4.72" at the front and 135 mm/5.31" at the rear.

Due to the lower front wheel load, a handlebar damper is fitted on the R 1100 R to improve ride comfort on extremely bad roads.

In terms of its major components, the frame of the R 1100 R comes from the R 1100 GS.

Optionally available with ABS and catalytic converter

The R 1100 R also meets the strictest demands in terms of riding safety and environmental compatibility and is available as an option with ABS anti-lock brakes as well a fully controlled catalytic converter (the latter being fitted as standard in Germany, Switzerland, and the USA).

Options and accessories

Options available from the factory are heated handles, cross-spoke wheels, a case rack, a windshield, and, as additional instruments, a rev counter and a clock (the latter being fitted as standard in Germany). As a further option, as on the R 1100 RS and GS, the Telelever track control arm, alternator cover, crankcase left/right, gearbox housing, oil cooler lines, and starter cover all come finished in black.

Accessories available from the BMW dealer include a windshield, and an anti-theft warning system, the same cases as on the R 1100 GS, inner bags for these cases, soft rubber handles, and cylinder protection hoops.

6 THE R 1100 GS

The enduro continues the successful story of the GS
Entering the 1997 model year without any changes

As the second model in the new Boxer generation, BMW launched the R 1100 GS at the Frankfurt Motor Show in September 1993, this new machine then entering the market in spring 1994.

The enduro version of the new Boxer has continued the successful story of BMW's GS models and immediately became a best-seller in the market, the R 1100 GS taking over the No 1 position in the plus-750 cc enduro segment in Germany. By autumn 1996 production amounted to more than 22,000 units.

The R 1100 GS is entering the 1997 model year without any changes or modifications.

The No 1 enduro in terms of engine size and torque

By and large, the R 1100 GS is based on the technical concept and design of the R 1100 RS successfully launched in spring 1993. The heart of this new machine is therefore once again the air/oil-cooled two-cylinder Boxer with four valves per cylinder, high-camshaft control and 1100 cc displacement. The engine has nevertheless been modified for somewhat less power at high speeds, but more torque and pulling force in the medium range. Accordingly, output of the R 1100 GS is 59 kW (80 bhp) at just 6750 rpm, the maximum torque being 97 Nm (72 ft-lb) at a low 5250 rpm.

For insurance reasons, the R 1100 GS is optionally available in Germany with a maximum output of 57 kW/78 bhp at 6500 rpm.

This makes the R 1100 GS not only the largest enduro in the market, but also the most powerful off-road machine in terms of torque.

It almost goes without saying that the R 1100 GS is also available with fully controlled catalytic converter fitted as standard in Germany, Switzerland, Japan, and the USA.

This modification of the engine's torque and power is made possible by an adjustment to the Motronic MA 2.2 engine management system, modified camshafts, different valve timing, modified exhaust manifolds and silencers (now made of stainless steel), different pistons also providing a reduction in the compression ratio from 10.7 to 10.3:1, and a final drive ratio of 1:2.81 instead of 1:3.00 (as with the R 1100 RS starting in the 1994 model year).

Like the R 1100 RS, the R 1100 GS comes with a three-piece frame concept on the same scale as before, the engine and transmission housing forming one load-bearing unit. Front wheel suspension is once again ensured by BMW's novel Telelever with its central spring strut also offering all its benefits in the enduro version (see also the description of the R 1100 RS).

Front spring strut adjustable

Due to the very different conditions under which an off-road machine must prove its merits, the front, centrally mounted spring strut with 190 mm/7.48" spring travel allows spring pretension to be adjusted to five different levels by means of a hook spanner in the on-board toolkit.

The 820-mm (32.3") wide handlebar of the R 1100 GS is mounted separately, the fork bridge and handlebar being connected with the fixed-position tubes of the Telelever through two ball joints in the fork bridge and thus not following any tilt motion of the Telelever. Unlike the handlebar of the GS model rising upwards at a steeper angle, such tilt or swivel motions are hardly perceptible, anyway, with the sports-style handlebar of the R 1100 RS, which therefore does not have to be mounted separately.

Hydraulic adjustment of the rear spring strut

Like its RS counterpart, the GS comes with its rear wheel running in a Para-lever swinging arm with central spring strut and (200 mm/7.87") spring travel. Spring pretension is infinitely adjustable by way of a setting bolt, outward-stroke damping also being infinitely adjustable by way of a hydraulic adjustment wheel.

Like the R 100 GS, the R 1100 GS also features BMW's patented cross-spoke wheels excelling not only through their superior stability on the road, but also through the possibility to exchange spokes individually and use tubeless tyres.

Modified brake system on the rear wheel

While the front wheel features the double-disc brake of the R 1100 RS with four-piston fixed callipers and floating stainless-steel discs measuring 305 mm or 12.00" in diameter, the brake system on the rear wheel features a single-disc brake measuring 276 mm or 10.87" in diameter and equipped with two-piston floating callipers.

ABS with optional deactivation for riding off-road

As an option the R 1100 GS is available with BMW's further improved ABS II already featured on the R 1100 RS.

Contrary to regular riding conditions on the road, where ABS always offers the advantage of preventing the wheels from locking and thus helping the rider to avoid a fall, it may well be desirable when riding off-road or on loose gravel to lock the wheel completely. Precisely this is why ABS II, as featured on the R 1100 GS, may be deactivated by the rider.

Deactivation is only possible before setting out by pressing the ABS deactivation switch and firing the ignition at the same time. The rider is then informed by the ABS telltale that the anti-lock brake system is currently not in operation. To re-activate the system, all the rider has to do is switch off the ignition and then switch it on again.

MODEL FEATURES:

The R 1100 GS comes with a 25-litre (5.5 Imp gal) fuel tank. The front wheel cover is fitted directly to the cockpit fairing and makes a significant contribution to the motorcycle's exceptional looks. The lower wheel cover, in turn, is fitted to the lower fork bridge, thus following the steering and acting as a mudguard. The rear wheel, finally, is covered by a separate plastic mudguard fitted directly to the rear wheel drive.

Fitted as standard: adjustable windshield and seat

Like the R 1100 RS, the R 1100 GS is available with a special ergonomics package: The windshield may be adjusted infinitely by 13° (using the toolkit)

and the two-piece seat may be set to a height of either 860 mm (33.86") or 840 mm (33.07"), this latter height being remarkably low for an off-road machine.

Another feature common to the R 1100 GS is the integrated ignition and handlebar lock. The ignition key, which may be turned round and inserted from both sides, also locks the tank cap, seat and helmet fastening catch. The instruments, controls and switches are the same as on the R 1100 RS, while the handbrake lever may also be set to four different positions. Further standard features are the main stand and side support with starter interrupter function, the plastic cylinder protector, the aluminium protection plate beneath the engine, the hazard warning flashers and luggage rack.

Luggage rack enlargeable

A special feature is that after removing the rear half of the two-piece seat normally intended for the passenger, the rider may enlarge the luggage rack accordingly. The grab handle for the passenger may also be removed and there is a separate box for the on-board toolkit beneath the luggage rack.

Options and accessories

Reflecting BMW's usual philosophy, the R 1100 GS is available with a wide range of options and accessories. The options available straight from the factory range from ABS II, a fully controlled catalytic converter (standard in Germany and Switzerland), and a rider information display all the way to case supports and heated handles. Accessories include various cases and panniers, an anti-theft warning system, soft-foam handles, hand protectors, a handlebar impact protector, and cylinder protection hoops.

7 THE R 1100 RS

Now with an adjustable spring strut at the front

Entering the 1997 model year, the R 1100 RS comes with two improvements:

First, the front spring strut is now infinitely adjustable on the outward stroke by way of an adjustment bolt. Second, the rear spring strut, as on the R 1100 RT and GS, is also adjustable hydraulically for spring pretension (outward stroke damping, as in the past, is infinitely adjustable by an adjustment bolt).

A sports tourer winning prizes the world over

The beginning of 1993 marked the start of a new era in BMW's 70-year motorcycle history: On the Spanish island of Lanzarote, BMW presented the R 1100 RS, the first model in an all-new Boxer generation, to the international motorcycle press. This sports tourer then entered the market in spring 1993, creating quite a stir in the motorcycle world.

In the USA, Japan, and Australia, as well as in several European countries, the R 1100 RS quickly became a prizewinner and was voted "Motorcycle of the Year", the innovative BMW Telelever being lauded as a unique achievement in motorcycle technology. By autumn 1996, production of the R 1100 RS amounted to more than 20,000 units.

POWER UNIT:

Environmentally compatible and easy to service

BMW's motorcycle managers and engineers started considering in the mid-eighties what an all-new BMW Boxer for the future should look like. And naturally, this also meant an all-new engine.

One point obvious from the very beginning was that the new Boxer was to offer more power and torque than its predecessor. Accordingly, there was no doubt that it had to have four - and no longer two - valves per cylinder. Top priority was also given to the improvement of fuel economy, the minimisation of exhaust emissions and engine noise, as well as the ease of maintenance offered by the new machine.

90 bhp from 1085 cc

The air- and oil-cooled two-cylinder Boxer combines even more power with an even better torque curve from low engine speeds. Its specifications are therefore most impressive: 1085 cc capacity, 90 bhp (66 kW) at 7250 rpm, maximum torque 95 Nm (70 ft-lb) at 5500 rpm.

There was no doubt from the very beginning that only a four-valve power unit would be able to provide the superior performance, emission management and fuel economy taken for granted with the new engine. Accordingly, two intake valves in each cylinder guarantee an optimum cylinder charge and fuel/air flow.

Thanks to the symmetrical arrangement of the two outlet valves, the spark plugs with their three electrodes have ample room in the middle of the cylinder head. Featuring specially contoured pressure edges at the sides, the roof-shaped combustion chambers are extremely compact. Through its very design, a four-valve power unit offers far more output and torque than a two-valve engine. Providing a better cylinder charge, a four-valve engine capitalises on the energy yield provided by the fuel, thus helping to maximise engine output or, alternatively, reduce fuel consumption for the same output.

Oil cooling along the cylinders between the outlet valves

To ensure optimum cooling particularly on the hot exhaust section, the outlet valves in the cylinder head are tilted to the front in the direction of travel, thus having the full benefit of the air flowing around the cylinders. For even greater efficiency, the cylinder bank developing temperatures of up to 300°C (570°F) is cooled by oil flowing between the two outlet valves.

The advantage of this additional oil cooling is that both the valves and valve seat rings now have a much longer service life. In addition, the intervals between valve adjustment are up from 7500 to 10000 km. To avoid coking along the hot cooling ducts after switching off the engine, the ducts are designed to remain filled with cooling oil at all times. Thanks to this efficient combination of air and oil cooling, the engine is far more resistant to high temperatures and hot weather, runs more quietly, and offers an even longer service life.

New valve control keeping the engine slender and compact in design

Since the valve control system used on the former Boxer (featuring a central camshaft, tappets, very long push rods and rocker arms) would have been quite unsuitable for a four-valve power unit on account of its inadequate strength and stiffness, BMW's engineers had to take a new approach in designing the valve drive system.

Classic valve drive systems with one overhead camshaft (OHC) or a double overhead camshaft (DOHC) and cup tappets, as used on BMW's K Series engines, had to be ruled out from the start since they would have increased the width of the Boxer engine by approximately 4 centimetres, in this way making it quite impossible for the rider to take bends at an angle of up to 49°, as required in the brief given to BMW's engineers.

A vertical drive shaft, in turn, would have been too elaborate, difficult to service and expensive. Accordingly, BMW's engineers eventually opted for the following solution:

Via a chain, an auxiliary shaft with a reduced ratio of 2:1 is driven directly from the crankshaft. Located deep within the engine beneath the crankshaft, this auxiliary shaft running at half the crankshaft speed incorporates a further chain

on either side driving the respective camshafts running within the right and left-hand cylinder heads at the back next to the inlet valves.

While the use of an auxiliary shaft may appear to be a kind of "detour", the advantage in this case is that the sprocket within the cylinder head is smaller than usual and therefore keeps the cylinder head slender (although even so, space within the cylinder head is very limited). A light-alloy sub-frame is bolted directly to the cylinder head to accommodate the valve drive.

The camshaft and rocker arms run directly on the sub-frame. Contrary to the conventional design, the camshaft is no longer made in one single piece - instead, the cams are sintered and forced on to the specially hardened and heat-treated steel shaft.

Working against the cup tappets, the rotating cams transmit the forces converted from a rotary to an up-and-down motion via push rods to the forged rocker arms. The rocker arms, in turn, transmit this drive force to the valves to be opened with a pressure of 27 kg or 59 ½ lb. They also feature adjustment bolts for the pivoting slides driving the valves in pairs.

This special valve control system referred to as a high-camshaft design offers yet another advantage with the new Boxer: It makes the engine look particularly dynamic with its wedge-shaped cylinder heads pointing downwards like an arrow.

The two typical Boxer cylinders sticking out at the sides are made of cast light alloy. To obtain a larger outside surface and thus to dissipate heat more efficiently, they have special cooling fins on the outside.

Inside, the cylinders are finished with a high-strength, low-wear, extra-smooth layer of Gilnisil, a special nickel silicon lining ("Gil" stands for the manufacturer, the Italian company Gilardoni) minimising frictional losses on metal surfaces running against each other. Further advantages of this design are minimum oil consumption, high strength and stability also at high speeds and, as a result, a long running life.

Modern piston design

Each featuring three piston rings (one for removing the oil, two for compression and sealing), the two pistons in box shape are made of cast light alloy. Measuring 99 mm (3.9") in diameter, the pistons weigh almost a third less than the former pistons in the old Boxer. This slim design reduces mass forces and allows higher running speeds, a pleasant side-effect being the reduction of vibrations.

Sintered connecting rods for less vibration

The connecting rods link the pistons with the crankshaft and are made of sintered and forged steel with BMW's new Boxer engine. Compared with the old steel conrods merely forged but not sintered, the new conrods have much more accurate dimensions, a better surface contour and, quite generally, a higher standard of quality at the surface. Precisely this gives the connecting rods one of their main advantages, sintered conrods having virtually exactly the same weight following production, without any deviation from one rod to another. While the old steel connecting rods had to be subsequently machined and then categorised in 7 weight groups, the new far more precisely manufactured sintered rods all come in one and the same weight group. Thanks to this almost perfect balance of weight from one connecting rod to the other, the counterweights on the crankshaft ensure optimum compensation of all mass forces.

A world innovation in motorcycle technology: the intentionally fractured conrod boss

The connecting rods of the new Boxer are made with the fracture or crack technology introduced for the first time on BMW cars. Accordingly, this is the first time in the history of motorcycle engine production that the large conrod boss encompassing the crankshaft is intentionally fractured and not simply sawn in half.

The advantage is that the two surfaces along this intentional fracture provide a perfect fit when subsequently re-joined.

Indeed, when subsequently bolted together the fracture lines provided by this cracking technology form a larger common surface with even better alignment of the two halves than with a sawn conrod. Unlike the former design, there is

no need for adjustment pins or bolts to provide a perfect fit. The substantial advantages of this new crack technology are therefore greater precision, a better fit, lower weight, quicker machining, and easier fitting.

The crankshaft running in two bearings

Representing the "heart" of the new engine, the crankshaft is made of one piece of top-quality heat-treated steel and runs in two slide bearings, the rear bearing being of double collar design. The advantage in the event of repairs is that there is no need for time-consuming alignment of the bearing and crankshaft.

The crankshaft drives the alternator and the layshaft controlling the valves and the two oil pumps, and extends directly into the five-speed gearbox.

Intake system

Through a snorkel beneath the tank, fresh air is drawn into the intake system air chamber, where it is cleaned by a paper filter. From the pure air chamber downstream of the filter, the air then flows on through two specially designed intake manifolds via the intake valves into the two combustion chambers. In their length and shape, the intake manifolds are designed to provide superior output and an optimum torque curve thanks to the resonance within the intake system.

Digital Motor Electronics

To further enhance engine output and torque while at the same time reducing fuel consumption and exhaust emissions, it was obviously necessary from the start to equip the engine with an electronic management system. Doing this, BMW's engineers were able to resort to the Digital Motor Electronics already featured on the four-valve power units of the K 100 - to be more precise, they have decided to use Bosch Motronic MA 2.2 also featured on the K 1100 RS and K 1100 LT as of the 1994 model year.

The advantages of the new engine with electronic fuel injection are obvious:

- Improved performance thanks to the special design of the intake system
- Better engine response ensured by the significant reduction of flow losses within the intake manifold

- Superior economy and reduction of fuel consumption: whenever the throttle butterfly is closed and when the engine is in overrun above 2000 rpm, the supply of fuel is totally interrupted
- Grid control for extra smoothness and refinement
- Superior ease of service provided by a diagnostic chip memorising any defects subsequently read out by the BMW Diagnostic Tester
- Superior reliability and failsafe functions built into the Motronic system, allowing further - albeit restricted - operation of the engine in the event of a deficiency
- Absolutely no wear in the case of electronic systems
- Ideal conditions for using a fully controlled catalytic converter

Motronic and its systems:

The fuel supply system

Housed in the fuel tank, the electric fuel pump conveys fuel to the electromagnetic injection valves within the throttle butterfly manifold, a pressure regulator keeping the pressure required for the injection process consistent. Fuel is discharged into the two intake manifolds through the two electronically controlled intake valves. It is injected intermittently, ie, once every rotation of the crankshaft simultaneously into the two intake manifolds. The compression ratio of 10.7.1 requires unleaded premium fuel (95 ROM).

The ignition

The ignition system consists of the terminal stage and coils. The ignition angle specified by the control unit is communicated by the system as a high-voltage pulse to the two spark plugs.

The control unit and sensors

The sensors determine the engine's current operating conditions, the information obtained in this way being fed into the control unit where it is compared with the data stored in the CPU's (Central Processing Unit's) EPROM. This comparison of data shows the exact amount of fuel required and the duration of the injection period.

Three-way catalytic converter available as an option

The three-way catalytic converter fitted as an option (and standard in Germany, Switzerland, the USA and Japan) is the most efficient emission control system available today. The process of conversion, reduction and oxidation is however only possible as long as the lambda 1 engine data are strictly observed. This stochiometric ratio between the amount of fuel actually supplied and the amount of fuel theoretically required is based on an air:fuel mixture of 14:1. To maintain this mixture regardless of running conditions, the oxygen sensor (sometimes also referred to as the lambda probe) measures the amount of oxygen in the exhaust gas emitted by the engine.

Oxygen sensor fitted upstream of the catalytic converter

On the engine of the new Boxer the oxygen sensor is fitted upstream of the catalytic converter and is therefore activated quickly and efficiently. The optimum operating temperature of the ceramic probe is 600°C or 1112°F, temperatures in the region of 300°C ensuring that the sensor will be activated within seconds. To provide an even faster response, the sensor is heated by a 12 W heating system.

Immediately after the engine has been started, the oxygen sensor is switched off until the engine reaches its normal operating temperature, the fuel/air mixture being enriched in this start or warm-up phase in order to make the engine run smoothly. When the engine is in this operating condition, engine speed is increased by the choke adjusting the position of the throttle butterfly. As soon as the engine has reached its normal operating temperature, this assistance is of course no longer required.

The catalytic converter is recyclable

The three-way catalytic converter used on the new engine is already well known from the K 100 Series, the precious metals required for oxidation (platinum and palladium) as well as reduction (rhodium) being applied to a metal substrate. As is generally known, oxidation converts carbon monoxides into carbon dioxide, and hydrocarbons into carbon dioxide and water. The withdrawal of oxygen then allows the breakdown of nitric oxides into nitrogen and carbon dioxide.

Compared with a ceramic-based catalytic converter, the metallic converter offers advantages in terms of both space and time: It is smaller and responds more quickly, since the metal substrate is more efficient in absorbing the heat from the exhaust gas.

The catalytic converters are recyclable and are taken back after their service life by BMW workshops.

Stainless-steel exhaust system

Made completely of stainless steel and chrome-plated in addition, the exhaust system is extremely resistant to corrosion.

Measured according to the ECE standard, the new engine develops a noise level of 79 dB(A), the current limit in the European Union (EU) being 80 dB(A).

The clutch and gearbox

The clutch is a single-plate dry clutch with the lowest possible inertia for a smooth and easy gearshift. Made of metal plate, the flywheel incorporates the starter gear.

The dog-shift five-speed gearbox is derived from the gearbox already featured on the K-models.

New 700-W alternator

The new generation of BMW Boxers comes with a new alternator offering particularly high output: Operating with regulator voltage of 14 V, the new alternator develops 50 amps equal to an output of 700 Watt. A particularly important point is that the new alternator generates a surplus output of up to 70 Watt even at idling speed, in this way ensuring a very good battery charge at all times. This, in turn, makes sure that the motorcycle will always start easily and smoothly, at the same time giving the battery an extra-long service life.

RUNNING GEAR:

The BMW Telelever - a brand-new front wheel suspension concept

The progressive design of the running gear is hardly visible from the front, but stands out clearly from the side, where the first thing to catch your eye is the BMW Telelever, an all-new front-wheel alignment and bearing system providing a synthesis, as it were, of the telescopic fork and swinging arm.

Design and function of the BMW Telelever

With its main tube measuring only 35 mm or 1.38" in diameter, the telescopic fork pivots on a ball joint in a slide tube on the longitudinal control arm at the bottom and a fork bridge within the frame of the motorcycle at the top. A central spring strut providing 120 mm (4.72") spring travel measured perpendicular to the road, connects the longitudinal control arm with the front section of the frame. As of the 1997 model year, the spring strut is infinitely adjustable on the output stroke by way of an adjustment bolt.

The telescopic fork shafts now only contain fluid to lubricate the two tubes running inside one another, and no longer comprise any spring or damper components. As a result, the response of the telescopic fork to road and riding conditions is particularly smooth and soft, the fixed tubes running in slide bushes with teflon coating for minimum friction.

The maintenance-free ball joints running without any play within the slide tube and fork bridge efficiently transmit the steering movements on the telescopic fork. The other ball joint bolted on to the longitudinal control arm feeds most of the forces generated when applying the brakes into the stable engine housing. The longitudinal control arm, in turn, is fitted on a swivel mount on either side of the engine housing, meaning that the telescopic fork on the BMW Telelever system is only required for guiding the front wheel and, of course, for steering (maximum lock angle 32° on each side).

The advantages of the BMW Telelever

- Compared with conventional wheel guidance systems, the wheel alignment geometry achieved in this way substantially reduces the dive effect of the telescopic fork. In fact, it works like a mechanical anti-dive system, ensuring that spring travel remains adequate even when braking in an extreme situation.

- Even with the springs strongly compressed, the wheelbase and castor remain largely unchanged throughout the motorcycle's spring travel. This guarantees superior stability in all situations, ie, also when applying the brakes in a bend.

- The substantial overlap of the fixed-position tubes and long slide tubes further enhances the Telelever's outstanding stability.

- The absence of fork springs no longer required helps to minimise frictional forces and ensures an excellent response of the telescopic fork.

- Compared with a conventional telescopic fork, the centrally mounted spring strut allows greater flexibility in tuning the springs and dampers and provides a progressive kinematic response of the entire spring and damper system.

- With its anti-dive and superior longitudinal rigidity, the BMW Telelever offers ideal conditions for anti-lock brakes and excellent ABS control.

- Since the space between the front wheel and the engine is smaller than with a conventional telescopic fork, the entire power unit has been moved further to the front to provide optimum front-to-rear weight distribution (52.7 per cent at the front, 47.3 per cent at the rear).

- The entire Telelever system requires no maintenance or oil change. Only the ball joints have to be checked after 100,000 km or 62,000 miles.

The BMW Paralever - proven rear wheel geometry

The rear wheel suspension is already well-known to the connoisseur, since it features BMW's proven Paralever concept. The double-joint swinging arm made of aluminium, which debuted in BMW's new off-road GS models in 1987, reduces the load change response of the drive shaft and therefore ensures optimum rear wheel grip at all times.

Unlike BMW's existing models with Paralever technology, the spring strut is mounted in this case in a central position, allowing spring travel of 135 mm or 5.31". Damper action on the outward stroke is adjusted by a bolt, spring pretension is infinitely adjustable (hydraulic).

THE FRAME:

Engine and transmission housing with load-bearing function

The entire front end of the frame is made of chill-cast aluminium for extra stability. Securely fastened to the engine housing, the front sub-frame holds the central spring strut of the Telelever in position. The frame itself is very light, easy and inexpensive to produce, and allows maximum precision in production. It also offers ideal conditions for the Telelever, as only direct forces have to be transmitted at this point (and not any twisting forces generating torque in one or the other direction). The big advantage of this concept is that it allows numerous variations of the motorcycle's suspension geometry, the front subframe being additionally supported by two steel tubes leading to the rear end of the engine housing.

The rear subframe is a steel-tube structure connected both to the transmission and engine housing. A transverse bridge between the upper tubes of the frame supports the spring strut at the top, while at the bottom the spring strut is connected directly to the monolever swinging arm. The rear subframe is also easy to manufacture and therefore particularly practical.

Brakes with ABS fitted as an option

The highly efficient Brembo brake system is the same as on the K 100 models, meaning that the front wheel features the same hydraulically operated double-disc brake with four-piston fixed callipers. Mounted in floating arrangement, the stainless-steel discs with compensation for uneven wear and sintered metal brake linings to eliminate fading even in wet conditions measure 305 mm (12.00") in diameter and 5 mm (0.20") across. The swept area is 100 cm^2, brake piston diameter 32 and 34 mm (1.26 and 1.34"), respectively.

The rear wheel features a single-disc brake with two-piston fixed callipers (diameter: 38 mm/1.50"). The disc measures 285 mm (11.22") in diameter and 5 mm (0.20") in width; its total swept area is 40 cm^2. BMW ABS anti-lock brakes are available as an option to significantly increase safety when applying the brakes.

Excellent riding characteristics

The ideal centre of gravity of the Boxer engine, the relatively low weight for a sports tourer of just 239 kg/527 lb with tools, tyre service kit, fuel and oil, the light but ultra-stable frame, and the new Telelever combined with the proven Paralever and its centrally mounted spring strut, all come together to provide excellent riding characteristics. Handling is smooth, crisp and secure, tracking stability absolutely excellent.

As is appropriate for a sports tourer of this calibre, the R 1100 RS allows a sporting style of riding without requiring the rider or passenger to compromise on riding comfort or touring amenities. The maximum load of 211 kg/465 lb is another outstanding feature, again making the machine very suitable even for long tours.

FEATURES, STYLING AND COLOURS:

Sports fairing developed in the wind tunnel

True to its concept as a sports tourer, the BMW R 1100 RS comes with a fairing developed for perfect streamlining in BMW's wind tunnel. The particular advantage of this fairing is that it combines relatively small dimensions with very low air drag and relatively good protection from wind and weather. Fitted as standard, the fairing improves the motorcycle's drag coefficient (Cd x A) to 0.400 with the rider leaning forwards, and to 0.439 with the rider sitting upright.

All fairing components are marked to indicate the specific type of synthetic material used, and can be fully recycled.

As an option the R 1100 RS is also available with a full all-round fairing extending down beneath the cylinders and largely encompassing the engine housing. In this case there is also an additional panel in front of the slide tubes.

The fuel pump with fuel level sensor and fuel filter is fitted in the 23-litre (5.1 Imp gal) fuel tank.

Central lock with two-sided key

An advantageous feature carried forward from the K 1100 Series is the combined ignition/handlebar lock in the upper fork bridge, allowing the front wheel to be secured both in left and right-hand lock after removing the key. A new improvement is the two-sided key, which may be inserted into the lock on either side. The same key also fits the tank cap and seat lock, and touring cases may be ordered with the same locks allowing the rider to use one key all round.

The ergonomics package

One of the most outstanding innovations on the R 1100 RS is the ergonomics package fitted as standard. In this way the motorcycle can be modified individually for the rider, different purposes and riding conditions, and various ergonomic requirements.

In all, the ergonomics package comprises three components:

1. **Adjustable fairing windshield**
   The fairing windshield is adjustable by means of a rotating knob throughout a range of 20° and is streamlined to minimise drag resistance. The lowest position is intended above all for cruising on highways and country roads, the topmost position offers optimum wind protection at high speeds.

2. **Adjustable handlebar**
   Incorporating forged precision teeth, the adjustment mechanism allows adjustment of the handlebar in 7 stages by up to 20 mm (0.79"), plus three adjustment angles at increments of 6° each. The adjustment mechanism is easily accessible, requiring the rider to merely loosen one bolt.

3. **Adjustable seat**
   The adjustable seat is subdivided into two sections. The rider's section may be adjusted in three stages by a total of 40 mm (1.57"), thus allowing the rider to choose a seat height of 780 mm (30.71"), 800 mm (31.50"), or 820 mm (32.28").

Easy-to-read instruments and warning lights

Clearly standing out as the two most important instruments, the speedometer and rev counter are fitted right in the middle of the cockpit, exactly in the rider's line of vision.

An instrument cluster with numerous functions is fitted a bit lower down, providing a clear indication of the following items:
Direction indicators, idling speed, high-beam headlight, fuel reserve (as soon as the fuel level has dropped to approximately 4 ltr/0.9 Imp gals), oil pressure, battery on charge (from the alternator), ABS telltale.

Information display with oil temperature and fuel gauges, telltale for the gear in mesh, and clock

The R 1100 RS also comes as standard with BMW's rider information display: In a special housing fitted in the right-hand interior fairing panel, this liquid-crystal display indicates the oil temperature, fuel level, time, and the gear currently in mesh. The interior fairing panel on the left, in turn, houses three switches for the hazard warning flashers, heated handles and ABS cancellation switch standard ever since the 1994 model year.

8 THE 1997 COLOUR RANGE

R-models:

R 1100 R and R 850 R:	dolphin blue metallic mystic red metallic ascot green metallic twin-tone paintwork: aspen silver metallic/ night black	seat in classic red or black
R 1100 GS:	night black marrakech red kalahari yellow	seat in trinidad red or black
R 1100 RS:	night black marrakech red cobalt blue macao yellow metallic	seat in red or black seat in black or red seat in black or red
R 1100 RT:	sinus blue metallic siena red metallic glacier green metallic	all models: seat black or rider's seat terracotta/ passenger's seat black

K-models:

K 1100 RS:	dolphin blue metallic marrakech red twin-tone paintwork: dakar yellow/arctic grey metallic	
K 1100 LT:	graphite metallic morea green metallic mystic red metallic	
K 1100 LT Highline:	twin-tone paintwork: fjord grey metallic/ canyon red metallic	
F 650:	deep black auro white flame red majala yellow	seat in orange or black
F 650 ST:	orlando orange midnight blue aura white	 seat in blue or black seat in orange or black

Note: Wherever the colour is not mentioned, the seat always comes in **black**

	SPECIFICATIONS BMW MOTORCYCLES		F 650	F 650 25 kW/34 bhp	F 650 ST	
Engine	Cubic capacity	cc	652			
	Bore/stroke	mm	100/83			
	Max output	kW/bhp	35/48	25/34		
	at	rpm	6500	5700		
	Max torque	Nm	57	48		
	at	rpm	5200	4200		
	Design					
	No of cylinders		1			
	Compression ratio/fuel grade		9.7/S			
	Valve control		DOHC			
	Valves per cylinder		4			
	Intake/outlet dia	mm	36/31			
	Fuel supply		Mikuni-Carburettor			
	No of carburettors/dia		2/33			
Electrical system	Ignition		contact-free high-tension capacitor ignition			
	Alternator	W	280			
	Battery	V/Ah	12/12			
	Headlight	W	H 4 55/60			
	Starter	kW	0.9			
Power transmission, Gearbox	Gearbox		5-speed gearbox with dog-type shift			
	Gear ratios	I	2.75/2.94			
		II	1.75/2.94			
		III	1.31/2.94			
		IV	1.05/2.94			
		V	0.88/2.94			
Suspension	Rear-wheel drive		O-ring chain 5/8 x 1/4			
	Clutch		Multi-plate clutch in oil bath			
	Type of frame		Single-loop tabular frame			
	Spring travel front/rear	mm	170/165		170/120	
	Wheel castor	mm	116		110	
	Wheelbase	mm	1480		1465	
	Steering assembly angle	°	62			
	Brakes	Front	single disc brake, dia 300 mm			
		Rear	single disc brake, dia 240 mm			
	Wheels		wire spoke wheels			
		front	2.15 x 19		2,15 x 18	
		rear	3.00 x 17		3,00 x 17	
	Tyres	front	100/90-19 57 S		100/90 – 18 56	
		rear	130/80-17 65 S		130/80 – 17 65	
			pneumatic tyre			
Dimensions and weights	Length, overall	mm	2180		2160	
	Width with mirrors	mm	880		880	
	Handlebar width	mm	800		760	
	Seat height	mm	800		785	
	Weight, unladen with full tank	kg	191		191	
	Max permissible weight	kg	371		371	
	Fuel tank (reserve)	ltr	17.5/2		17,5/2	
Performance	Fuel consumption					
	90 km/h (56 mph)	ltr	3.8	3.8		
	120 km/h (75 mph)	ltr	5.3	6.3		
	Acceleration					
	0–100 km/h (62 mph)	sec	6.2	–		
	standing-start km	sec	28.9	–		
	Top speed	km/h	163	145		

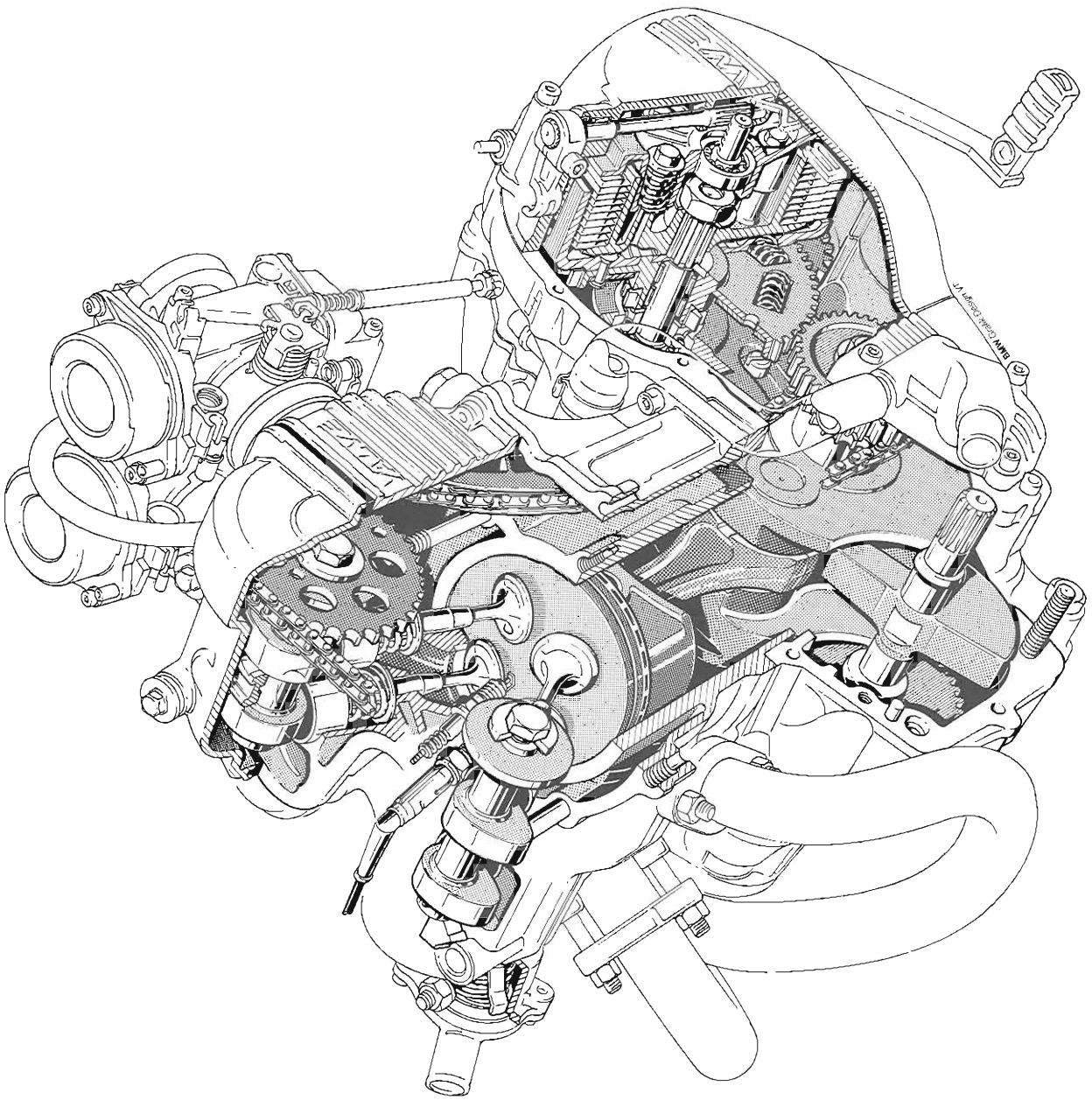
	SPECIFICATIONS BMW MOTORCYCLES		R 1100 GS	R 1100 R	R 850 R	
Engine	Cubic capacity	cc	1085	1085	848	
	Bore/stroke	mm	99/70.5	99/70.5	87.5/70.5	
	Max output	kW/bhp	59/80	59/80	52/70	
	at	rpm	6750	6750	7000	
	Max torque	Nm	97	97	77	
	at	rpm	5250	5250	5500	
	Design		flat-twin	flat-twin	flat-twin	
	No of cylinders		2	2	2	
	Compression ratio/fuel grade		10.3/S	10.3/S	10.3/S	
	Valve control		HC	HC	HC	
	Valves per cylinder		4	4	4	
	Intake/outlet dia	mm	36/31	36/31	32/27	
	Fuel supply		Motronic MA 2.2.	Motronic MA 2.2.	Motronic MA 2.2.	
Electrical system	Alternator	W	700	700	700	
	Battery	V/Ah	12/19	12/19	12/19	
	Headlight	W	H 4 55/60	H 4 55/60	H 4 55/60	
	Starter	kW	1.1	1.1	1.1	
Power transmission, Gearbox	Gearbox		5-speed gearbox with dog-type shift			
	Gear ratios	I	4.16/3.00	4.16/3.00	4.16/3.36	
		II	2.91/3.00	2.91/3.00	2.91/3.36	
		III	2.13/3.00	2.13/3.00	2.13/3.36	
		IV	1.74/3.00	1.74/3.00	1.74/3.36	
		V	1.45/3.00	1.45/3.00	1.45/3.36	
Suspension	Rear-wheel drive		BMW Paralever			
	Clutch		Single-plate dry clutch rotating in opposite direction, dia 180 mm			
	Type of frame		Tubular space frame, engine serving as loadbearing component			
	Spring travel front/rear	mm	190/200	120/135	120/135	
	Wheel castor	mm	115	127	127	
	Wheelbase	mm	1509	1487	1487	
	Steering assembly angle	°	64	63	63	
	Brakes	Front	dual-disc brake, dia 305 mm	dual-disc brake, dia 305 mm	dual-disc brake, dia 305 mm	
		Rear	single-disc brake, dia 276 mm	single-disc brake, dia 276 mm	single-disc brake, dia 276 mm	
	Wheels		Cross-spoke wheels	Light-alloy wheels	Light-alloy wheels	
		front	2.5 x 19	3.50 – 17	3.50 – 17	
		rear	4.0 x 17	4.50 – 18	4.50 – 18	
	Tyres	front	110/80 H 19 TL	120/70 – ZR 17	120/70 – ZR 17	
		rear	150/70 H 17 TL tubeless	160/60 – ZR 18	160/60 – ZR 18	
Dimensions and weights	Length, overall	mm	2196	2197	2197	
	Width with mirrors	mm	920	898	898	
	Handlebar width	mm	820	729	729	
	Seat height	mm	840/860	760/780/800	760/780/800	
	Weight, unladen with full tank	kg	243	235	235	
	Max permissible weight	kg	450	450	450	
	Fuel tank	ltr	25	21	21	
Performance	Fuel consumption					
	90 km/h (56 mph)	ltr	4.6	4,6	4.6	
	120 km/h (75 mph)	ltr	5.9	5,9	5.7	
	Acceleration					
	0–100 km/h (62 mph)	sec	4.3	4.3	5.0	
	standing-start km	sec	24.7	24.6	26.0	
	Top speed	km/h	195	197	187	

	SPECIFICATIONS BMW MOTORCYCLES		R 1100 RS	R 1100 RT		
Engine	Cubic capacity	cc	1085			
	Bore/stroke	mm	99/70.5			
	Max output	kW/bhp	66/90			
	at	rpm	7250			
	Max torque	Nm	95			
	at	rpm	5500			
	Design		flat-twin			
	No of cylinders		2			
	Compression ratio/fuel grade		10.7/S			
	Valve control		HC			
	Valves per cylinder		4			
	Intake/outlet dia	mm	36/31			
	Fuel supply		Motronic MA 2.2.			
Electrical system	Alternator	W	700			
	Battery	V/Ah	12/19			
	Headlight	W	H 4 55/60			
	Starter	kW	1.1			
Power transmission, Gearbox	Gearbox					
	Gear ratios	I	4.16/2.81	4.16/2.91		
		II	2.91/2.81	2.91/2.91		
		III	2.13/2.81	2.13/2.91		
		IV	1.74/2.81	1.74/2.91		
		V	1.45/2.81	1.45/2.91		
Suspension	Rear-wheel drive		BMW Paralever			
	Clutch		Single-plate dry clutch rotating in opposite direction, dia 180 mm			
	Type of frame		Tubular space frame, engine serving as loadbearing component			
	Spring travel front/rear	mm	120/135	120/135		
	Wheel castor	mm	111	122		
	Wheelbase	mm	1473	1485		
	Steering assembly angle	°	65.9	62.8		
	Brakes	Front	dual-disc brake, dia 305 mm	dual-disc brake, dia 305 mm		
		Rear	single-disc brake, dia 285 mm	single-disc brake, dia 276 mm		
	Wheels		Light-alloy wheels			
		front	3.50 – 17			
		rear	4.50 – 18			
	Tyres	front	120/70 – ZR 17			
		rear	160/60 – ZR 18			
			tubeless			
Dimensions and weights	Length, overall	mm	2175	2195		
	Width with mirrors	mm	920	898		
	Handlebar width	mm	738	898		
	Seat height	mm	780/800/820	780/800/820		
	Weight, unladen with full tank	kg	239	282		
	Max permissible weight	kg	450	490		
	Fuel tank	ltr	23	26		
Performance	Fuel consumption					
	90 km/h (56 mph)	ltr	4.3	4.7		
	120 km/h (75 mph)	ltr	5.2	5.6		
	Acceleration					
	0–100 km/h (62 mph)	sec	4.1	4.3		
	standing-start km	sec	23.7	24.3		
	Top speed	km/h	215	196		

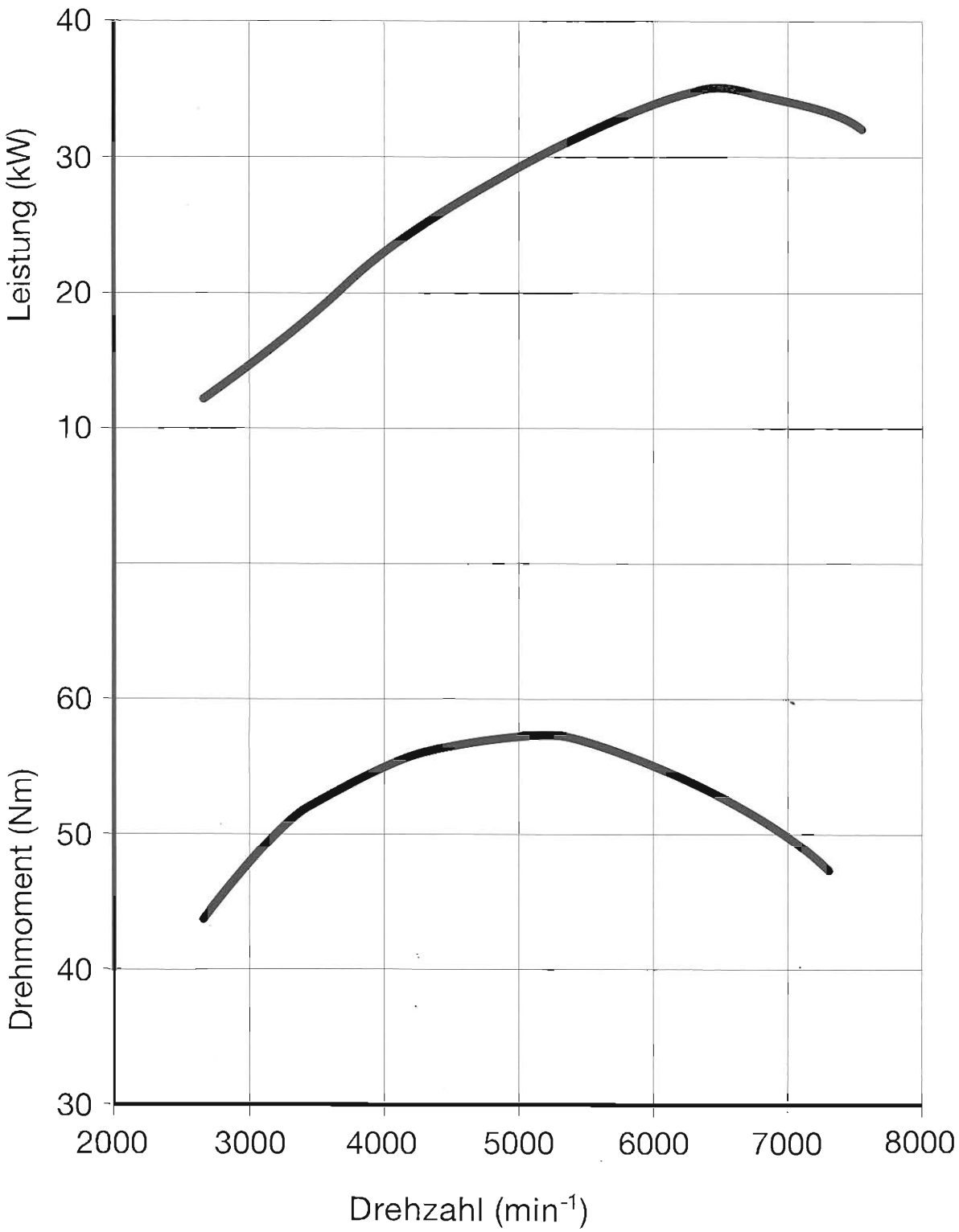
	SPECIFICATIONS BMW MOTORCYCLES		K 1100 LT	K 1200 RS	K 1200 RS	
Engine	Cubic capacity	cc	1092	1171		
	Bore/stroke	mm	70.5/70	70,5/75		
	Max output	kW/bhp	74/100	72/98	96/130	
	at	rpm	7500	7000	8750	
	Max torque	Nm	107	118	117	
	at	rpm	5500	5500	6750	
	Design		inline	inline		
	No of cylinders		4	4		
	Compression ratio/fuel grade		11.0/S	11,5/S		
	Valve control		DOHC	DOHC		
	Valves per cylinder		4	4		
	Intake/outlet dia	mm	26.5/23	26,5/23		
	Fuel supply		Motronic MA 2.2.	Motronic MA 2.2.		
Electrical system	Alternator	W	700	720		
	Battery	V/Ah	12/19	12/19		
	Headlight	W	H 4 55/60	H 7/55 W H 3/55 W		
	Starter	kW	0.7	0,7		
Power transmission, Gearbox	Gearbox					
	Gear ratios	I	4.50/2.81	3,86/2,75		
		II	2.96/2.81	3,02/2,75		
		III	2.30/2.81	2,39/2,75		
		IV	1.88/2.81	1,96/2,75		
		V	1.61/2.81	1,70/275		
		VI		1,51/2,75		
Suspension	Rear-wheel drive		BMW Paralever			
	Clutch		Single-plate dry clutch rotating in, dia 180 mm	dia 165 mm		
	Type of frame		Tubular space frame, engine serving as loadbearing component	cast aluminium frame		
	Spring travel front/rear	mm	135/120	115/150		
	Wheel castor	mm	101	124		
	Wheelbase	mm	1565	1555		
	Steering assembly angle	°	64	62,75		
	Brakes	Front	dual-disc brake, dia 305 mm			
		Rear	disk brake, dia 285 mm			
	Wheels		Light-alloy wheels	Light-alloy wheels		
		ront	2.50 x 18 MTH 2	3,50 x 17 MTH 2		
		rear	3.00 x 17 MTH 2	5,00 x 17 MTH 2		
	Tyres	front	110/80-VR 18	120/70-ZR 17		
		rear	140/80-VR 17	170/60-ZR 17		
			tubeless	tubeless		
Dimensions and weights	Length, overall	mm	2250	2250		
	Width with mirrors	mm	915	850		
	Handlebar width	mm	765	680		
	Seat height	mm	810	770/800		
	Weight, unladen with full tank	kg	290	285		
	Max permissible weight	kg	500	500		
	Fuel tank	ltr	22	21		
Performance	Fuel consumption					
	90 km/h (56 mph)	ltr	4.9	4,9		
	120 km/h (75 mph)	ltr	5.8	5,8		
	Acceleration					
	0–100 km/h (62 mph)	sec	4.3	4,1	3,7	
	standing-start km	sec	24.3	–	–	
	Top speed	km/h	more than 210	225	245	

BMW F 650 und F 650 ST

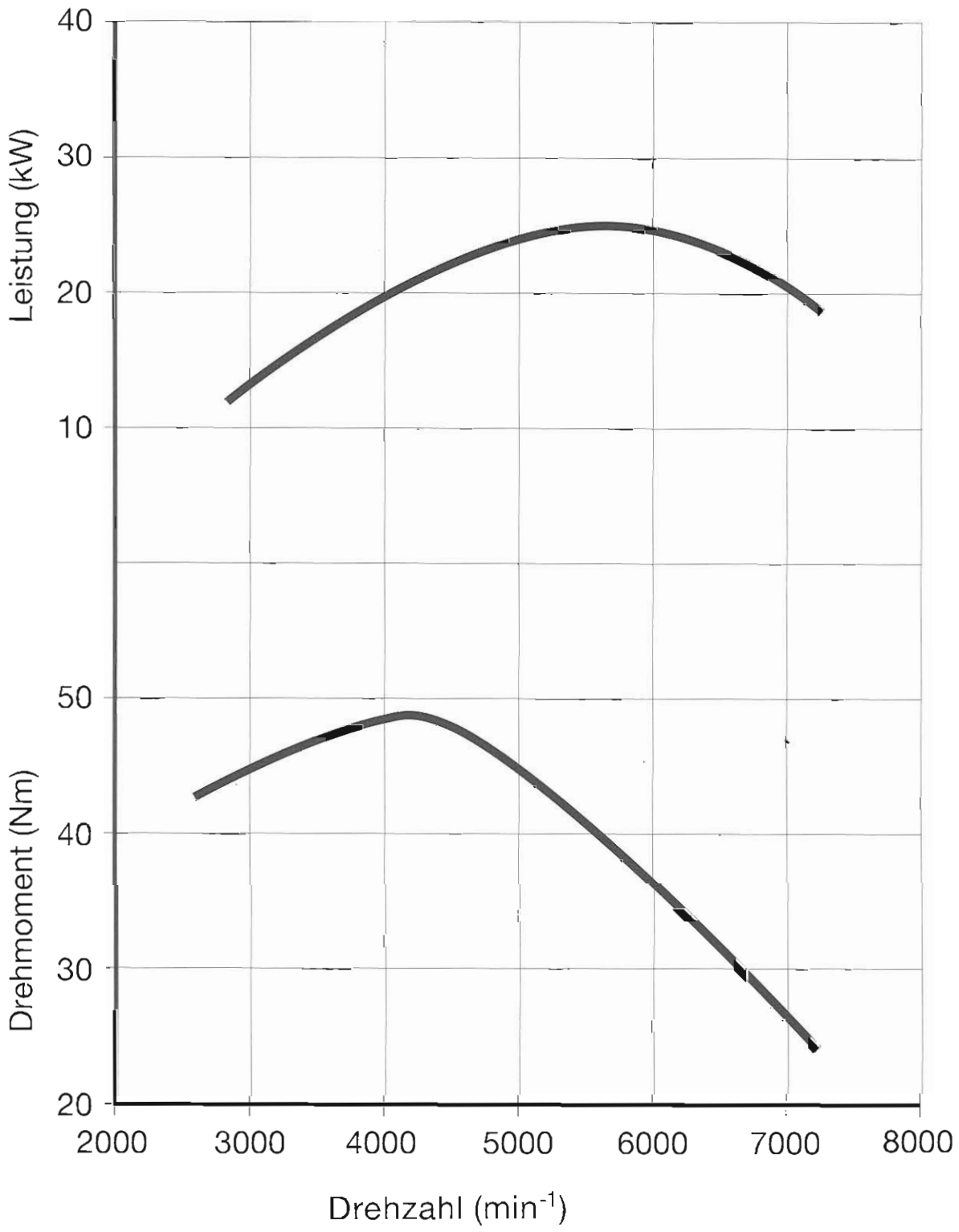
M 97/1



BMW F 650 und F 650 ST	35 kW/48 PS	M 97/2

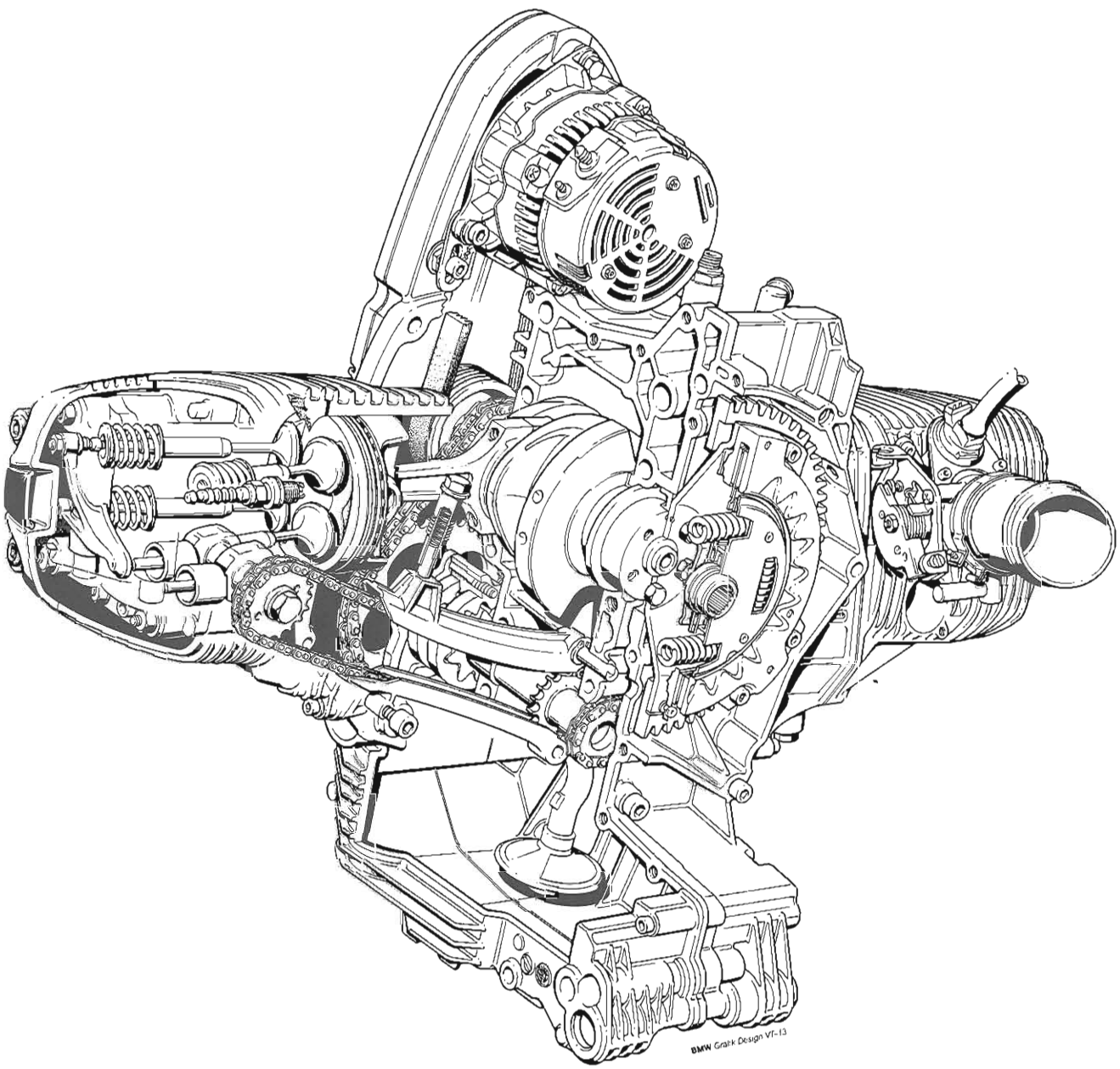


BMW F 650 und F 650 ST	25 kW/34 PS	M 97/3



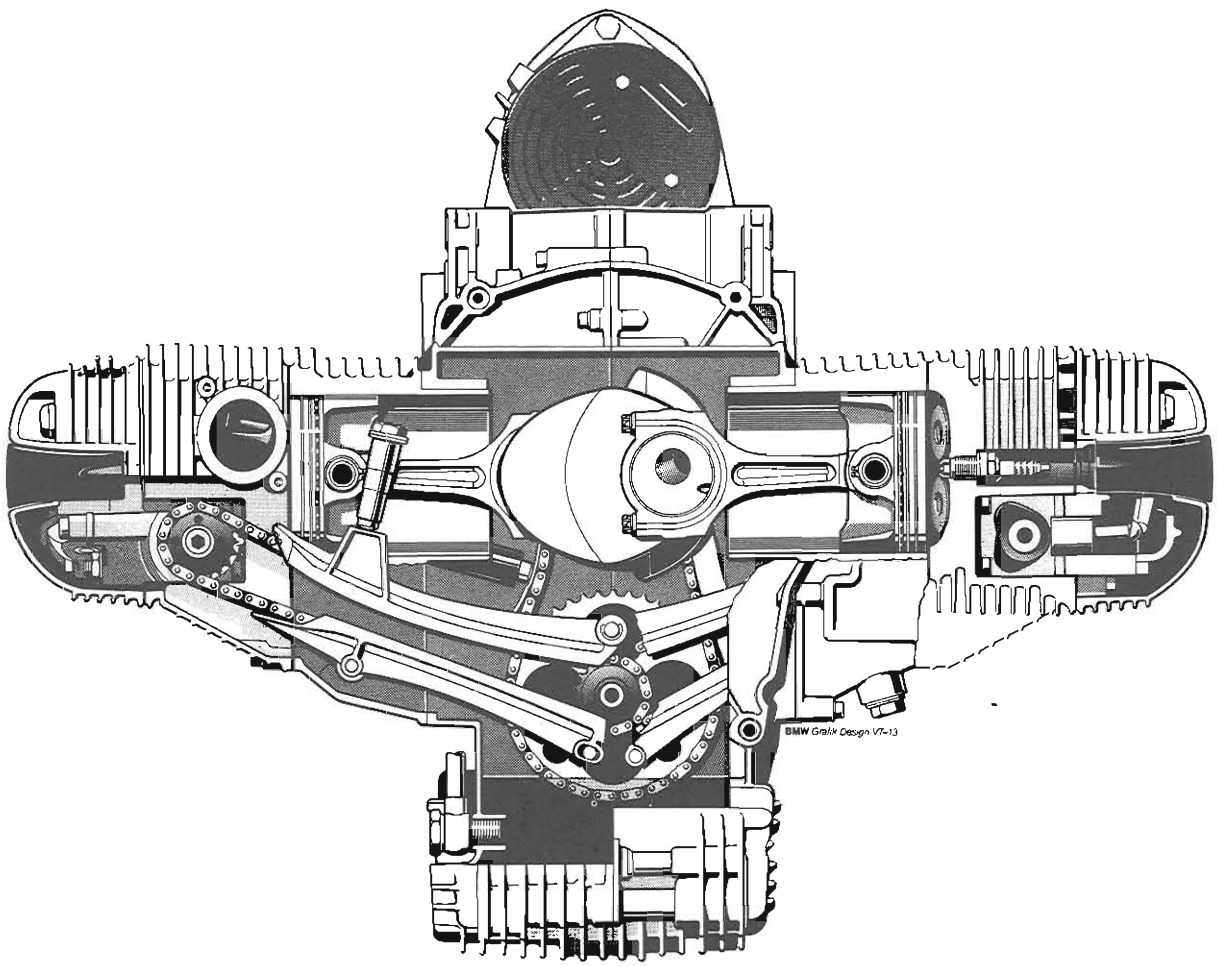
BMW R 1100

M 97/4

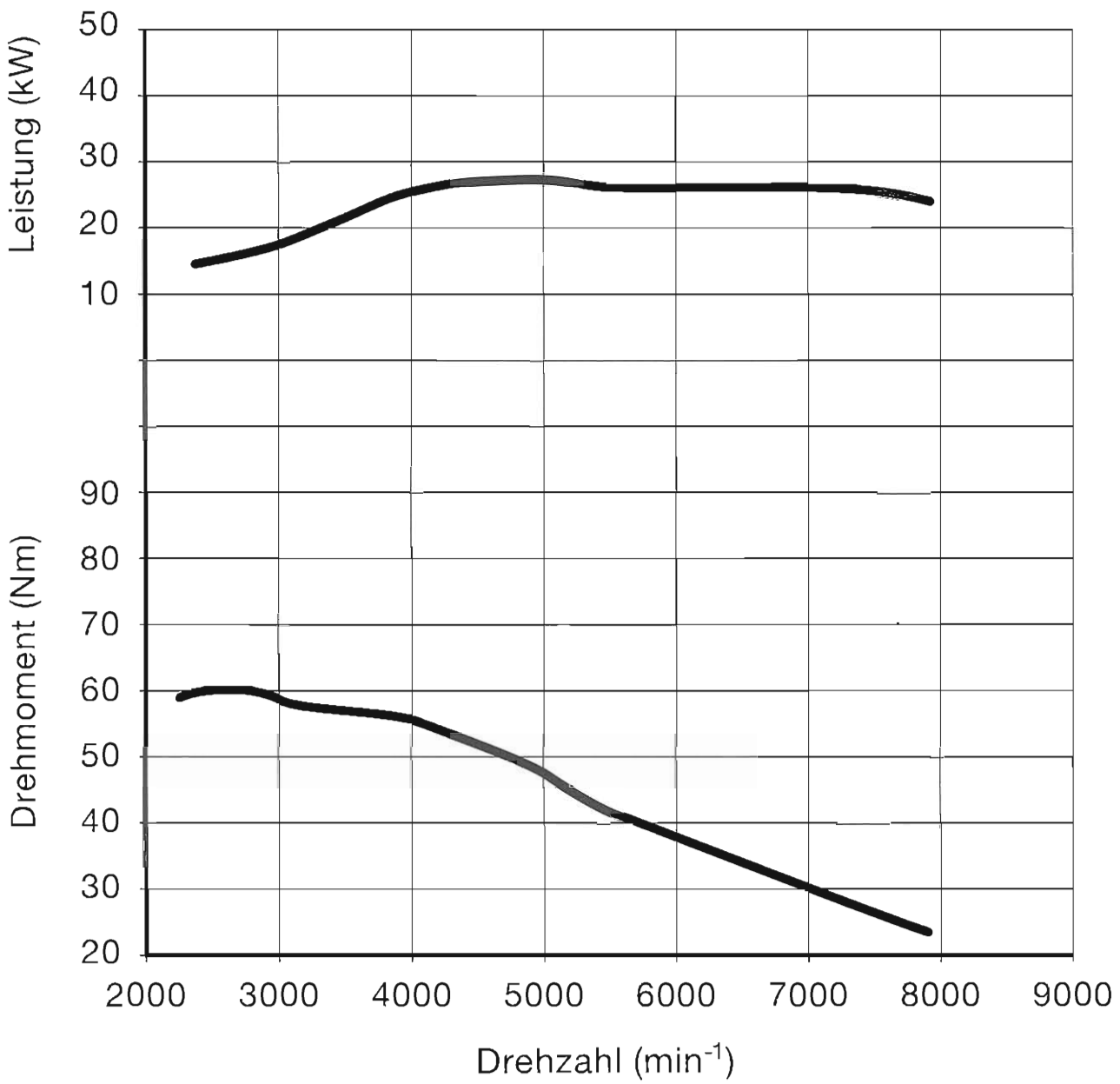


BMW R 1100

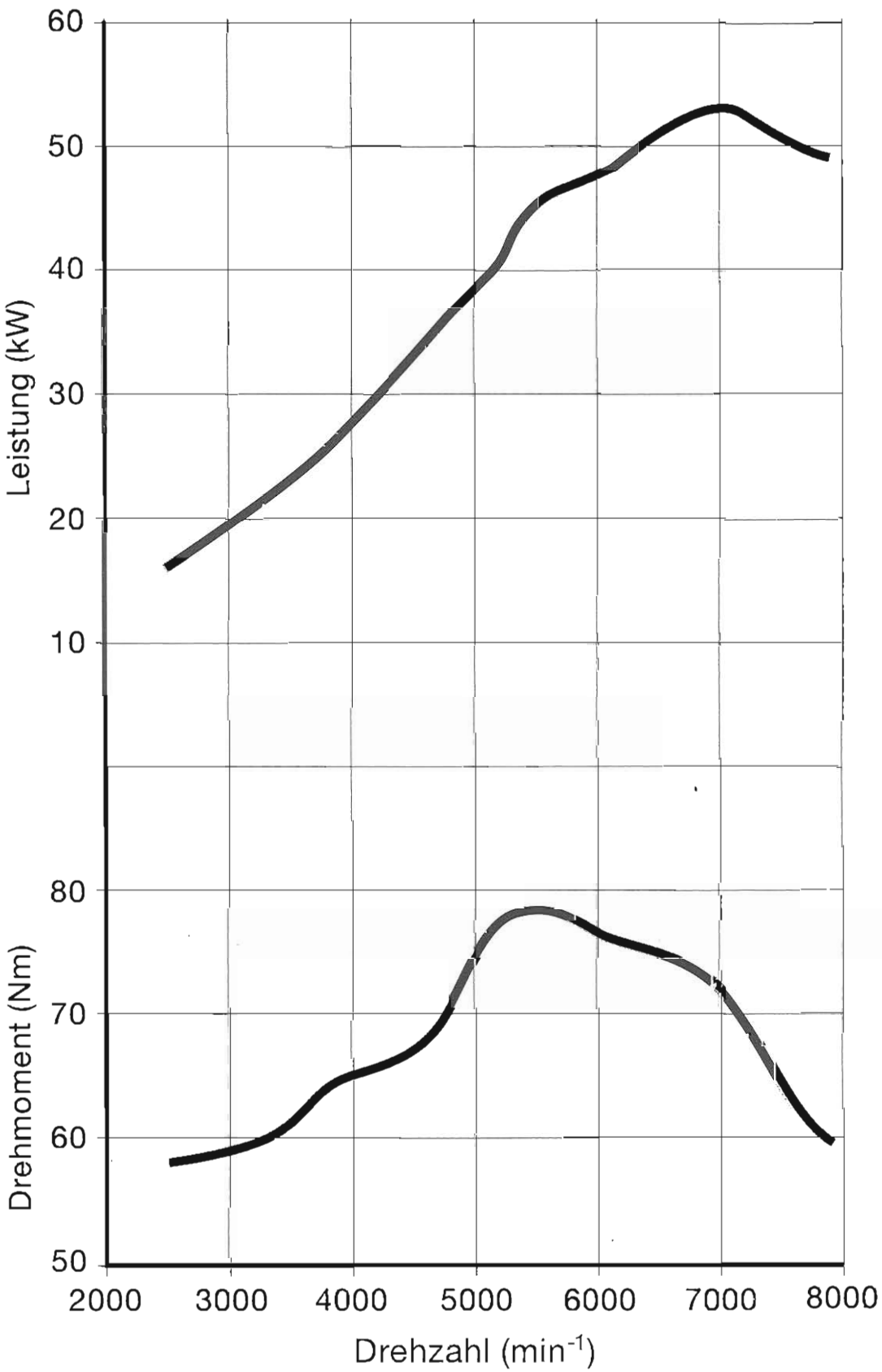
M 97/5



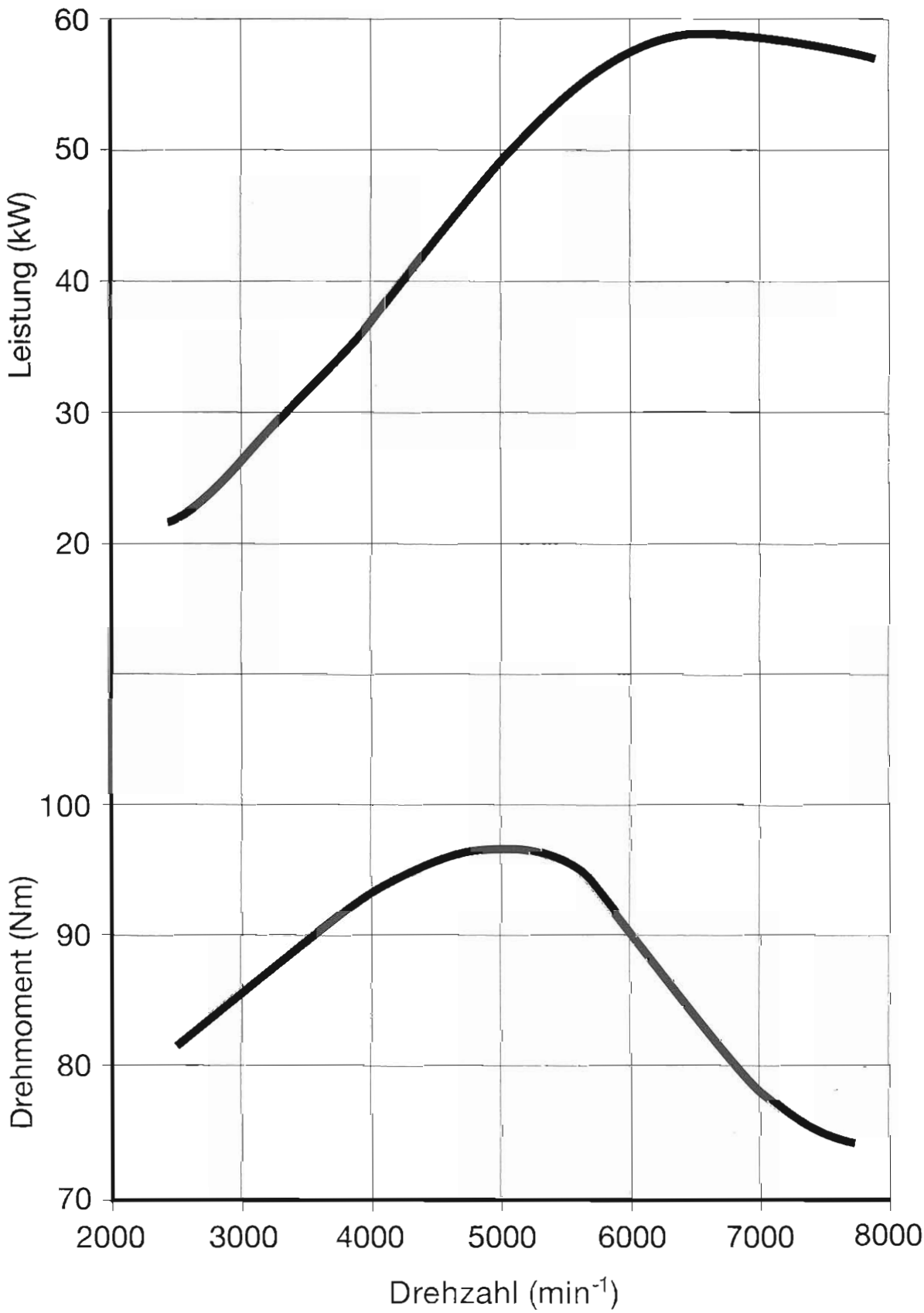
BMW R 850 R	25 kW/34 PS	M 97/6



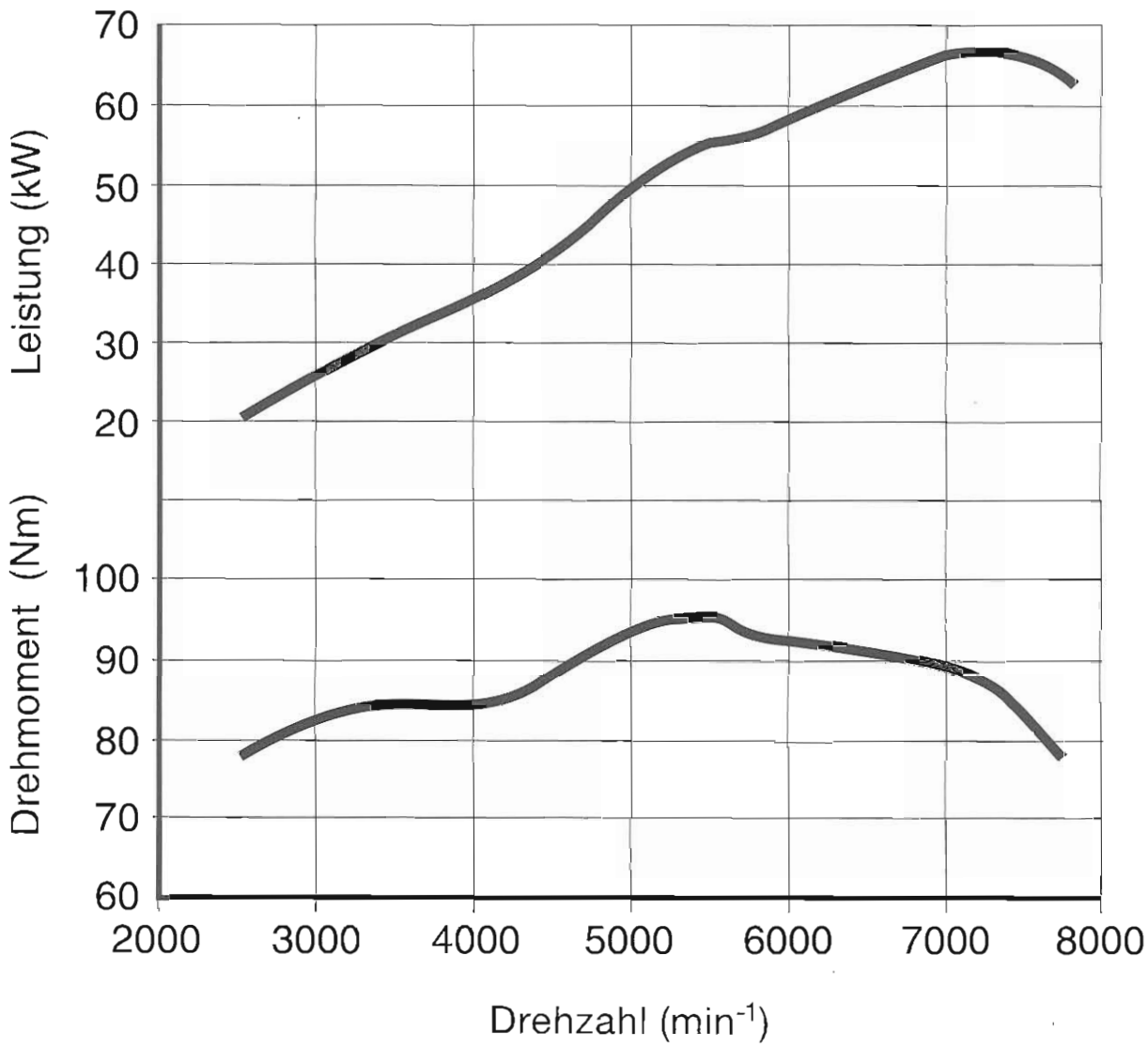
BMW R 850 R	52 kW/70 PS	M 97/7



BMW R 1100 GS und R 1100 R | M 97/8

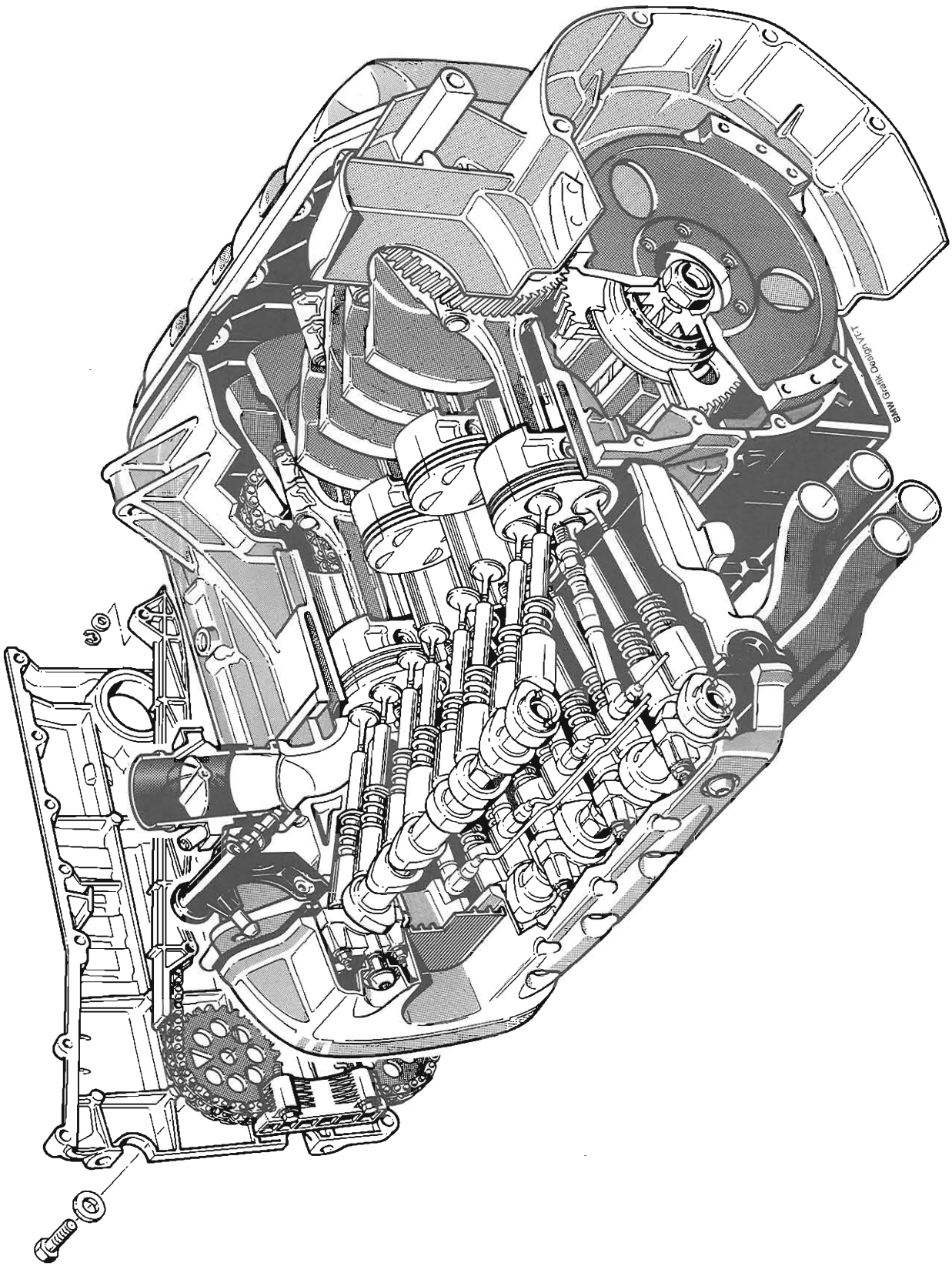


BMW R 1100 RS und R 1100 RT | M 97/9



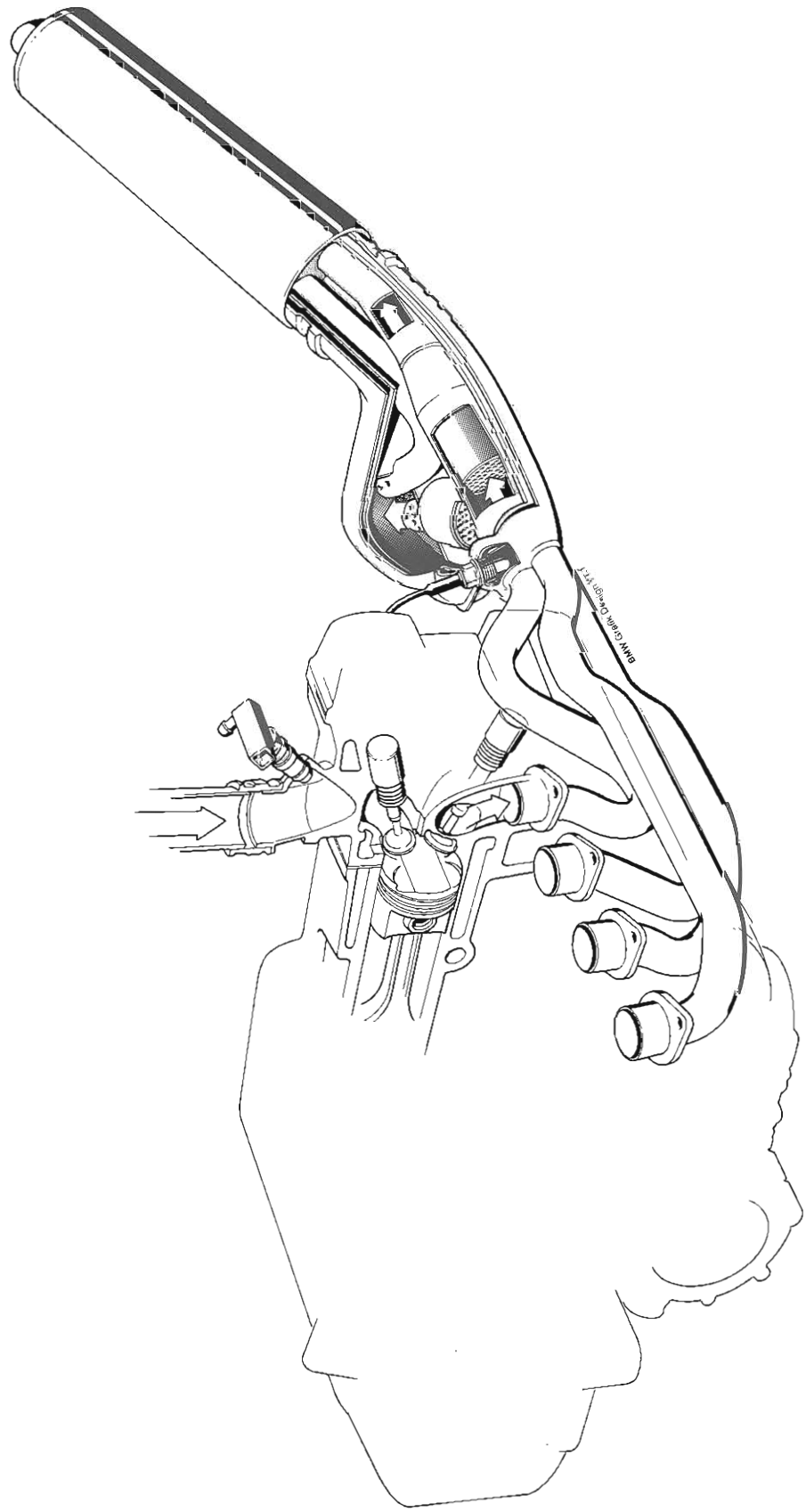
BMW K 1200 RS

M 97/10



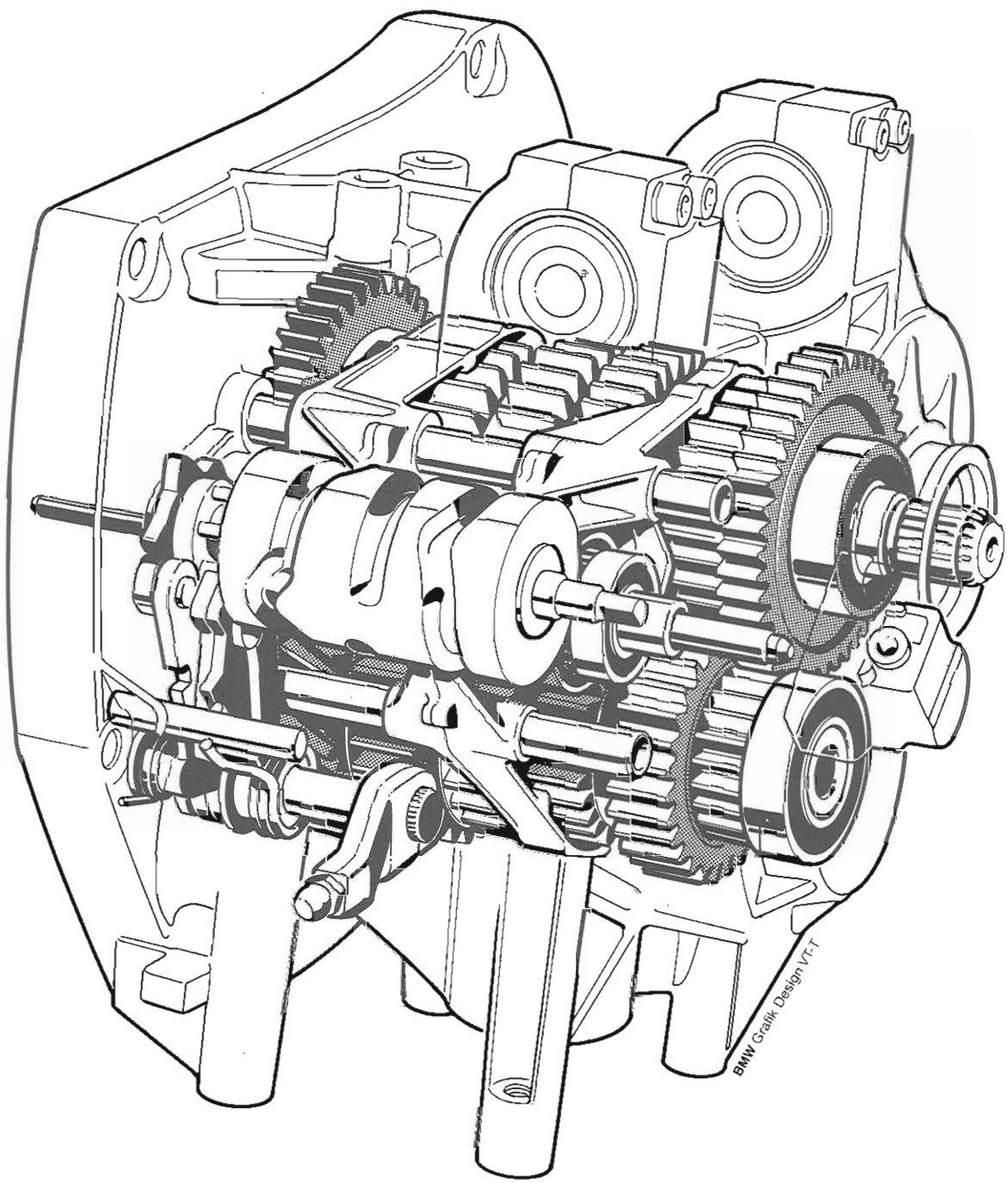
BMW K 1200 RS

M 97/11



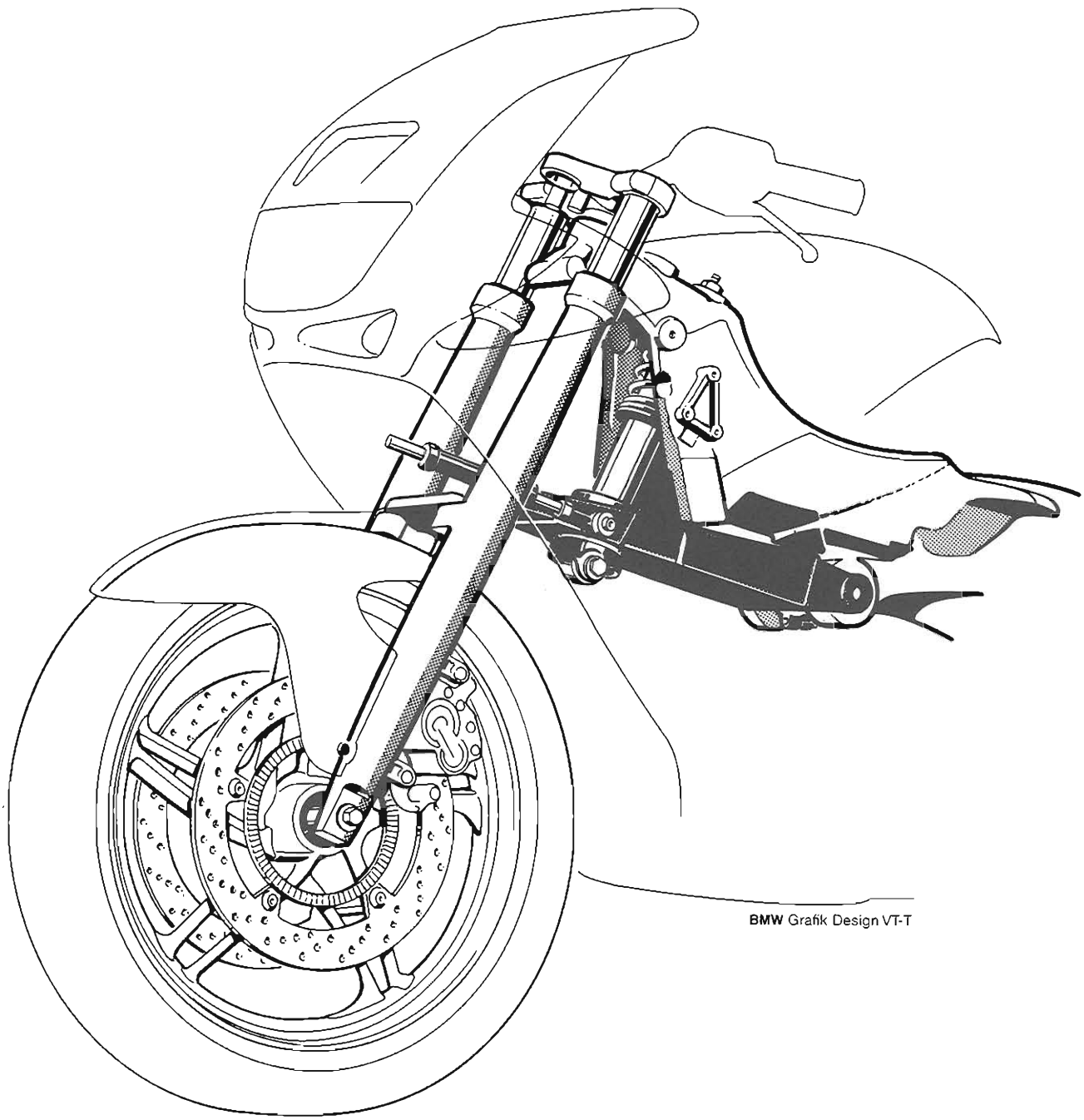
BMW K 1200 RS

M 97/12



BMW K 1200 RS

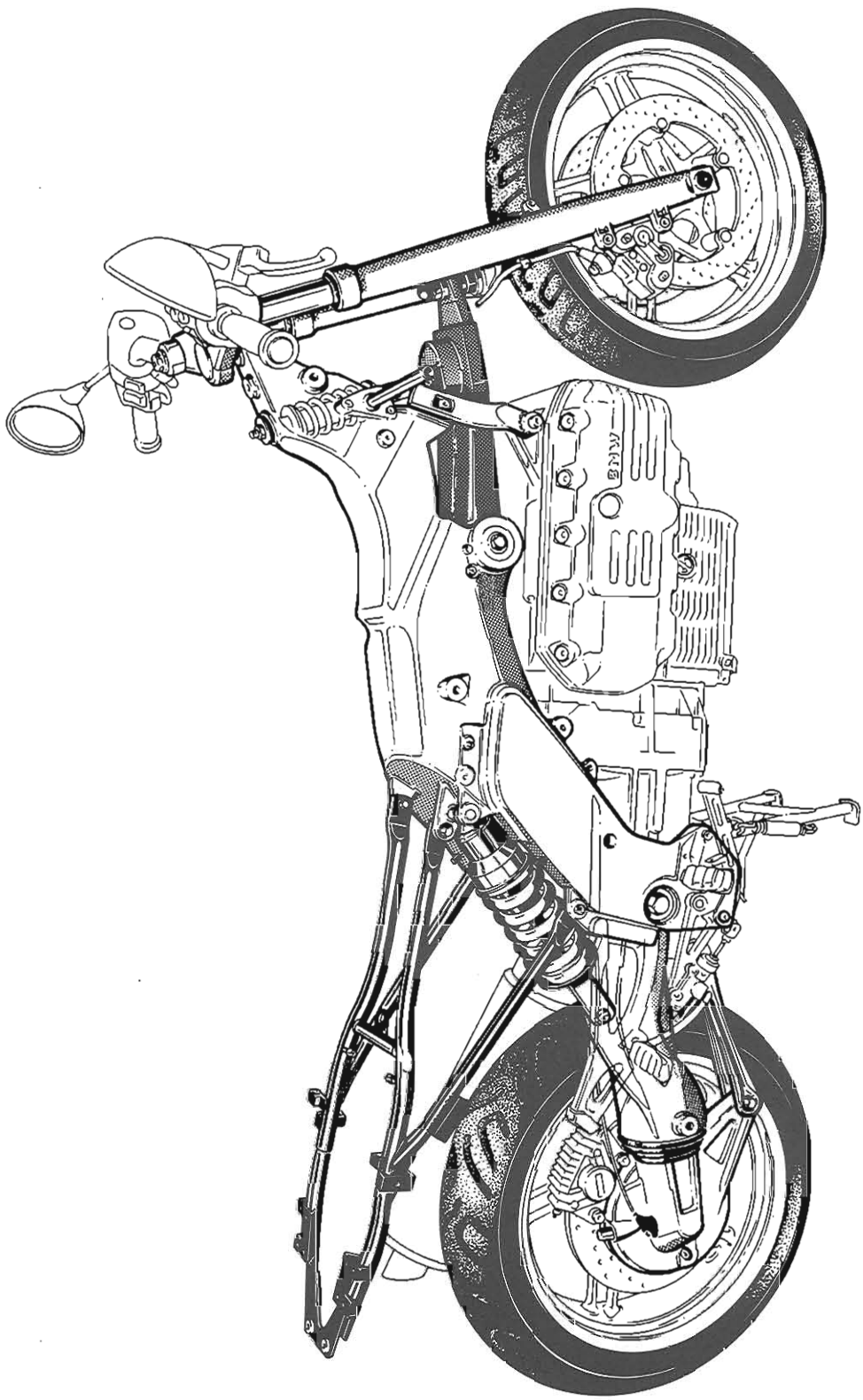
M 97/13



BMW Grafik Design VT-T

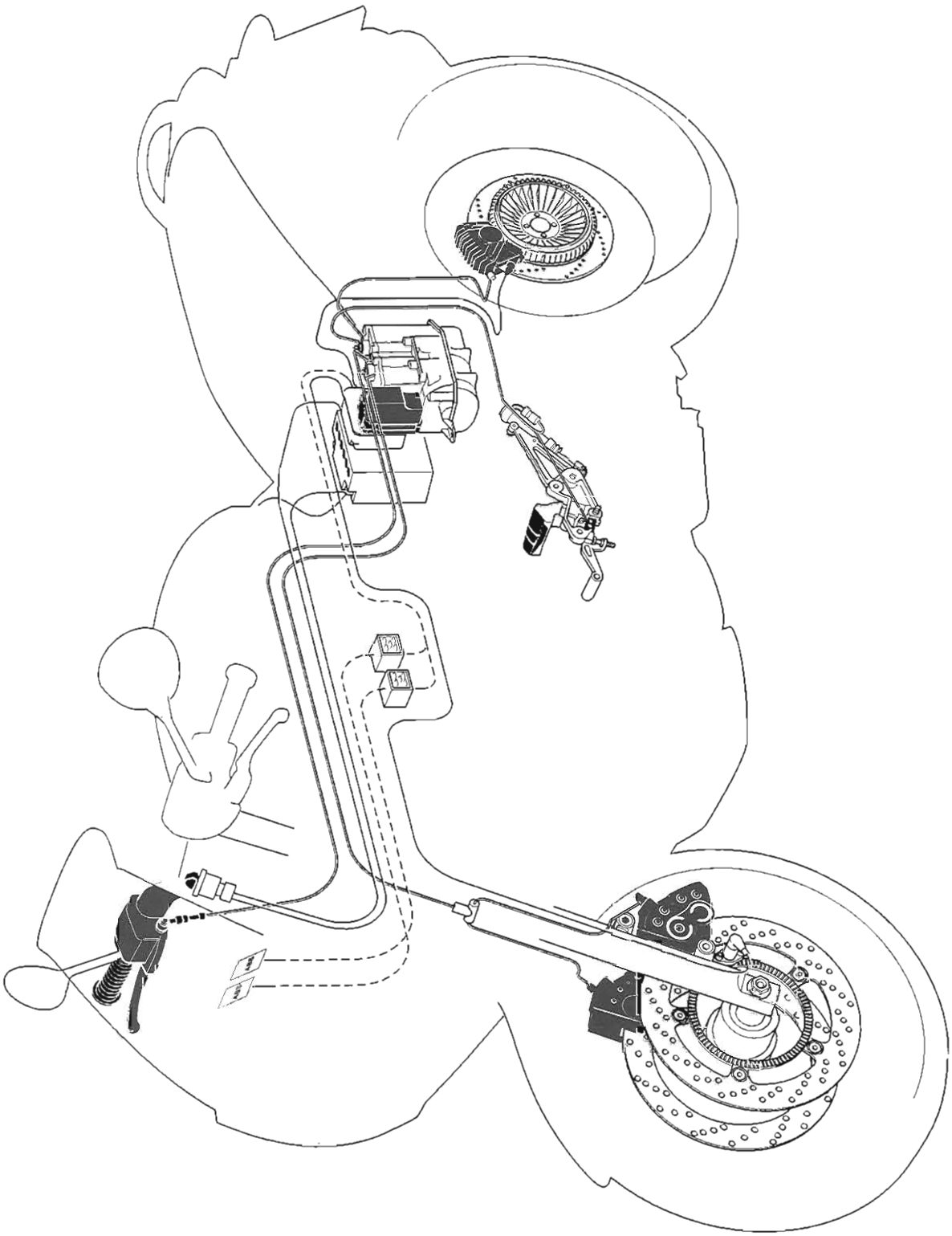
BMW K 1200 RS

M 97/14

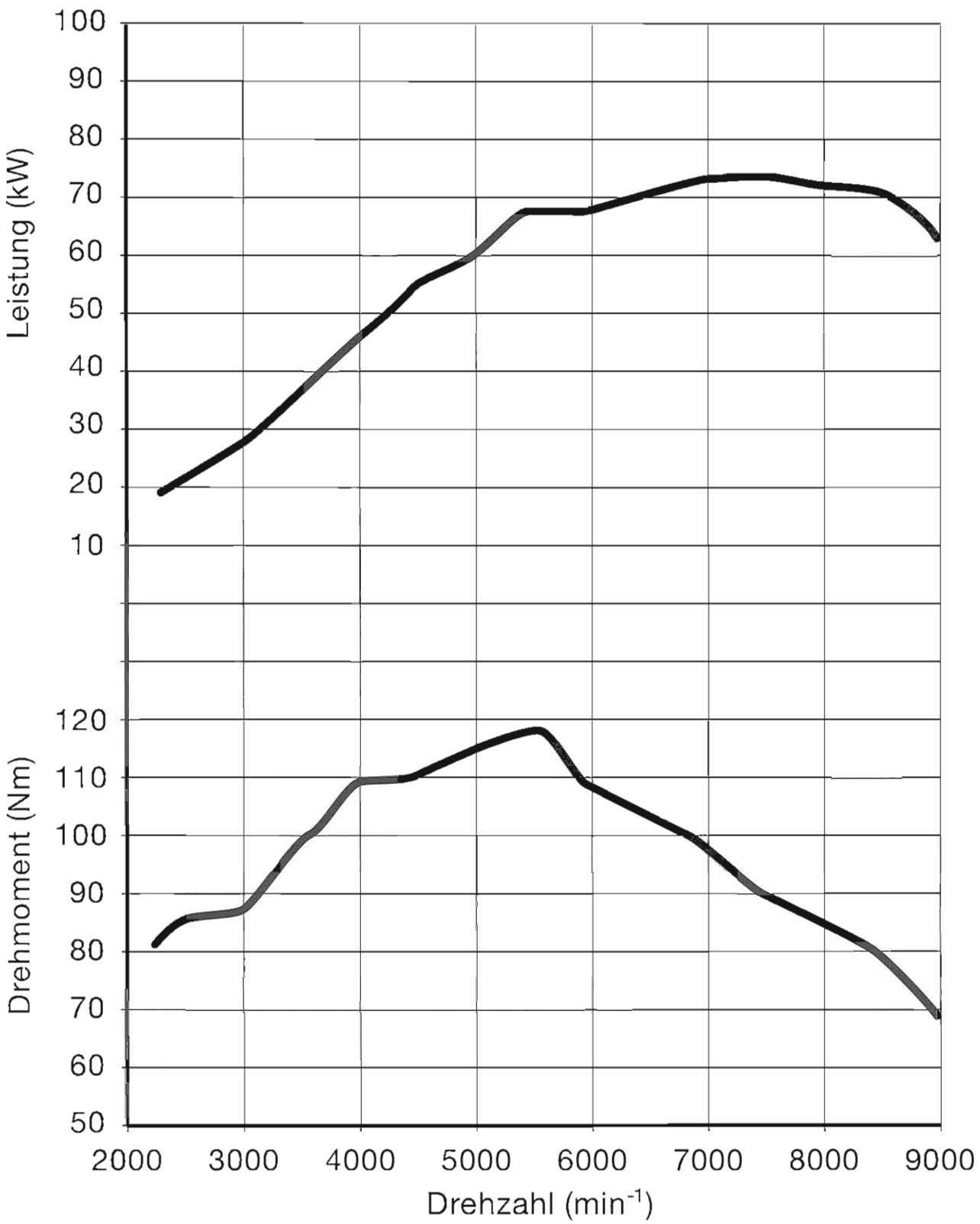


BMW K 1200 RS ABS

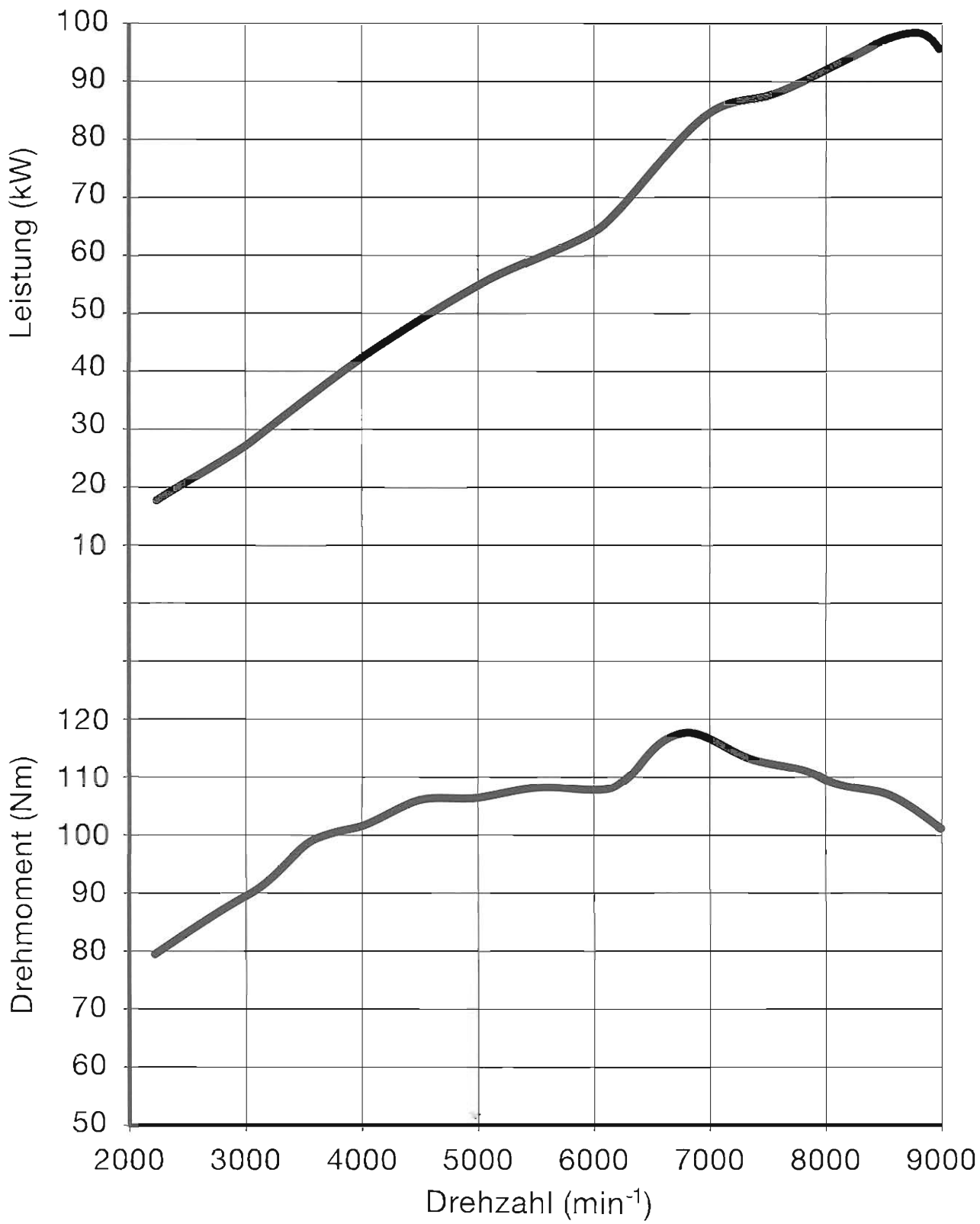
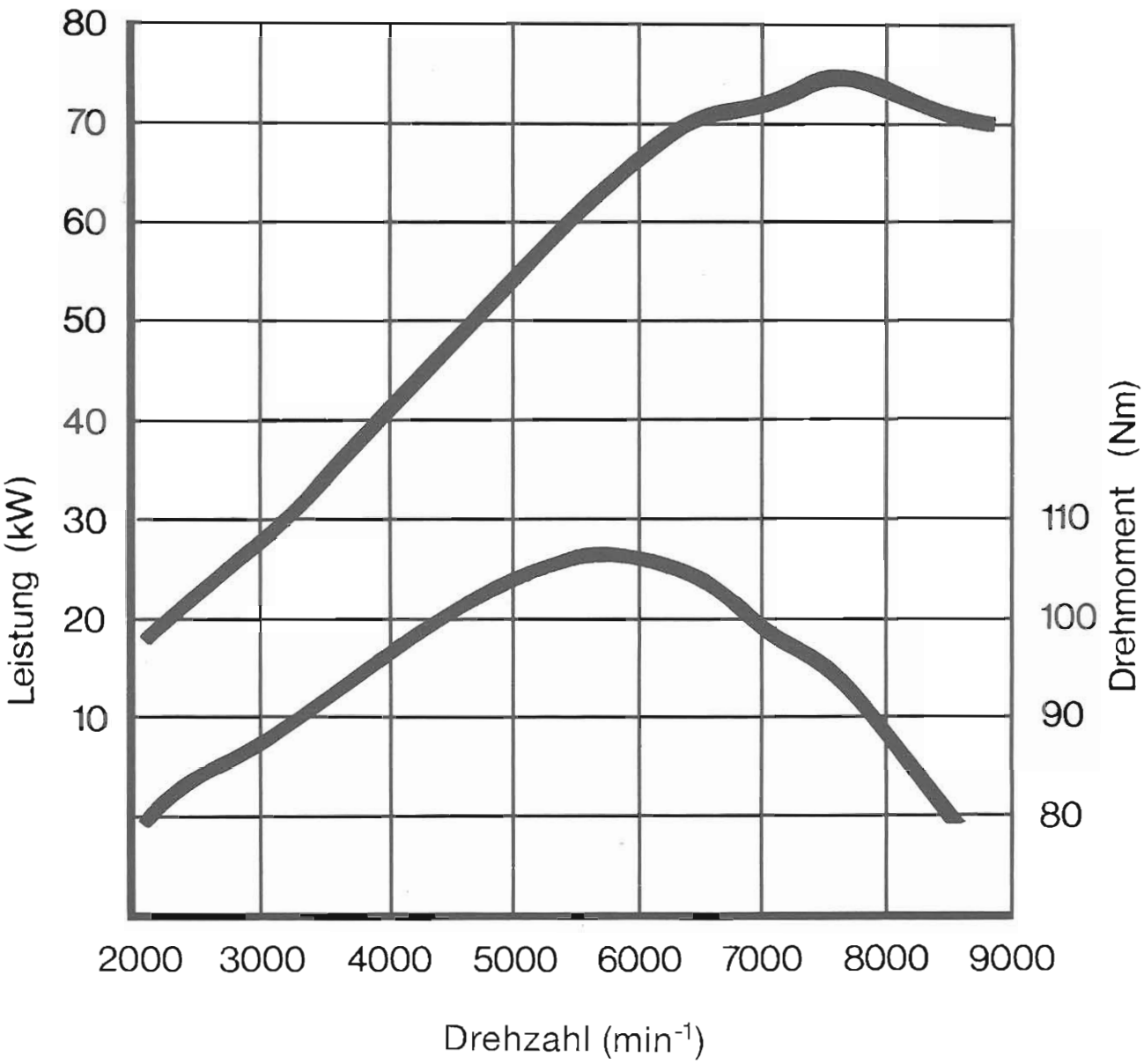
M 97/15



BMW K 1200 RS	72 kW/98 PS	M 97/16



BMW K 1200 RS	96 kW/130 PS	M 97/17



BMW K 1100 LT | M 97/18