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SUMMARY OF BMW INNOVATIONS FOR THE 1995 MODEL YEAR:

The R 1100 R and R 850 R: roadster versions of BMW's new generation of Boxers
Four "farewell models" bidding goodbye to the "old" Boxer series

BMW's 1995 model year is highlighted by the Boxer. For while the "old" Boxers are slowly but surely retiring for some well-deserved peace and quiet, the new generation of Boxer machines is coming in more successfully all the time.

With this in mind, BMW is presenting no less than four "farewell models" commemorating the "conventional" R Series with their two-valve power units as well as two further models of the new Boxer generation with four-valve engines at the Cologne Bicycle and Motorcycle Show from 7 - 9 October 1994.

R 1100 R and R 850 R almost identical in technical and optical terms

18 months after the successful launch of the new Boxer generation BMW is now introducing a "grass roots" road machine following in the footsteps of the R 1100 RS sports tourer and R 1100 GS enduro: the R 1100 R roadster. Technically and optically almost identical to the R 1100 R, the R 850 R is also entering the market as the first version of a new, downsized Boxer generation.

Engine redesigned for extra torque and pulling force

In principle, both the drive system and running gear of the new R 1100 R are based on the technical features of the R 1100 RS and GS. It is therefore no surprise that this model also comes with BMW's air- and oil-cooled two-cylinder Boxer engine featuring Digital Motor Electronics and a displacement of 1085 cc.
As with the R 1100 GS, the engine of the R 1100 R is designed not so much for maximum power (as it is with the R 1100 RS), but rather for extra torque and pulling force. Accordingly, the R 1100 R's engine specifications correspond to those of the R 1100 GS, maximum output being 59 kW or 80 bhp at 6750 rpm, maximum torque 97 Nm or 71 lb-ft at 5250 rpm.

R 850 R also planned with 34 bhp power unit

The R 850 R, the entry-level model into the new Boxer generation, features an 848-cc power unit almost identical in technical terms to the engine in the 1100-cc models. Maximum output is 52 kW or 70 bhp at 7000 rpm, maximum torque 77 Nm or 57 lb-ft at 5500 rpm. In accordance with European driving licence regulations, a 25 kW/34 bhp version is planned for spring 1995.

Unmistakable in its style

The two new roadster models are really convincing not only in terms of engine power and performance, but also in their looks, since they also excel through their completely independent, unique and unmistakable appearance. They come with a sleek, rounded 21-litre (4.6 Imp gal) fuel tank and a newly designed, two-piece, highly comfortable seat.

Adjustable rider seat with seat height lowered to just 760 mm (29.9")

As on the other models in the new Boxer generation, the rider's seat is adjustable for height from 760 to 780 and 800 mm (29.9 - 30.7 - 31.5"). The remarkably low height of 760 mm or 29.9" is of course particularly accommodating for the short rider. In all other respects, the features of the new roadster models are limited to the essential, the two-piece handlebar made of forged aluminium rising up behind the cockpit with its centrally positioned speedometer and telltales. Measuring 729 mm or 28.7" in width, this handlebar contributes to the motorcycle's easy and smooth handling.

Cross-spoke wheels available as an option

The R 1100 R and R 850 R both come on the same three-spoke light-alloy wheels as the R 1100 RS. As an option, however, they are available with the cross-spoke wheels otherwise to be admired on the R 1100 GS. The highly efficient brake system comes at the front from the R 1100 RS, at the rear from the R 1100 GS, while the spring struts and spring travel are the same as on the R 1100 RS.

Also available with ABS and catalytic converter

Referring now to the wide range of options and special equipment, mention should be made above all of the second-generation ABS and the fully controlled catalytic converter. And reflecting BMW's usual standard, there is also a wide range of accessories. The colours available are arctic grey metallic (with the seat in classic red) and mystic red metallic (with the seat in black).

Roadster models with all-round talents

The new R 1100 R and R 850 R roadster models are motorcycles with genuine all-round talents. Weighing 235 kg or 518 lb with full tank, they are among the lightest machines in the grass-roots, unfaired motorcycle segment, where machines are also referred to as "naked bikes". And their ability to carry a load of 215 kg or 474 lb underlines their touring qualities. The progressive running gear technology of BMW's new generation of Boxers, the BMW Telelever on the front wheel and the Paralever at the rear, ensures maximum stability and excellent riding comfort. And thanks to their magnificent handling, BMW's new roadsters are particularly at home above all on winding country roads.

Classic models of the "old" Boxer generation for the connoisseur and collector

While the roadster versions of the new Boxer generation are now entering the market, the "old" Boxer models are starting their final lap:
Introducing the 1995 model year there are four "farewell models" with BMW's 1000 cc power unit. These are the three classic models, the R 100 R, R 100 GS PD, and R 100 RT modified only slightly versus their predecessors, plus the R 100 R Mystic launched in spring 1994. Not only fans of the "old" Boxer will take this opportunity to make their dreams come true one more time, as these "farewell models" could well be particular collector's items in future.

On the avus black R 100 R the seat, frame, headlight support, instrument console and pillion grab handle are also finished in black, the fuel tank being embellished by white double lines and the model designation "R 100 R Classic".

The R 100 R Mystic is finished in mystic red metallic and differs from the R 100 R Classic in particular through its chrome-plated instrument console with separate telltales, a more sporting seat, and a modified tail at the rear.

The R 100 GS PD is again finished in avus black and bears the model designation "PD Classic", the case rack, fairing protection bar, cylinder protection bar, handlebar, and pillion grab handle all being chrome-plated. This machine also comes with the "round" valve covers of the R 100 R as well as heated handles.

The R 100 RT is finished in twin-tone paintwork: arctic grey metallic and graphite metallic, the upper half of the fairing and fuel tank being accentuated by double lining in silver. The tank again proudly bears the model designation, in this case "R 100 RT Classic". Further model features in this case include a case rack with BMW topcase and panniers.

Special models in the K 1100 LT and K 1100 RS series

The K 1100 LT Special Edition remains in the line-up for 1995, although it is now finished in navarra violet metallic. And it is joined by a special version of the K 1100 RS in marrakech red.

BMW well prepared for the 1995 model year

With all these new models and innovations, plus the proven range already successful in the past, such as the best-selling F 650, R 1100 GS, and R 1100 RS, BMW is entering the 1995 model year with flying colours. In other words, the white-and-blue marque has everything it takes to follow in the footsteps of record-breaking sales in 1994 with more than 40,000 motorcycles sold worldwide ...

THE NEW R 1100 R AND R 850 R:

Roadster models with all-round talents

As the third model in the new Boxer generation, BMW is introducing the R 1100 R for the 1995 model year, 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 is also entering the market at the same time as the first model of a new Boxer generation with a downsized engine.

Same high torque as the R 1100 GS

In principle, the drive system and running gear of the new 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 Metronic 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 contrast to the R 1100 RS 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 is planned for 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, weights, standard fitments, the range of colours, and the various options and accessories 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.

Again a totally unique and independent look

The new R 1100 R roadster not only offers superior power and performance, but also looks great: Like the R 1100 RS sports tourer and the R 1100 GS enduro, the R 1100 R excels through its quite unique, unmistakable appearance. Among other things, it comes with a new, 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")

A newly designed, two-piece stick-on seat offers ample space plus excellent riding comfort for both the rider and passenger. And as with the other two 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"). Clearly, the roadster models with a minimum seat height of 760 mm are particularly well suited for short riders, even more so than the R 1100 RS with its minimum seat height of 780 mm and the R 1100 GS with a minimum seat height of 840 mm or 33.1".

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 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. The front and rear spring struts come from the R 1100 RS, but have been tuned for this new machine in their spring and damper action. Spring travel is the same as on the R 1100 RS, that is 120 mm/ 4.72" at the front and 135 mm/5.31" at the rear.

With front wheel load being smaller in this case, as the R 1100 R is not fitted with a fairing or oil cooler, etc, a handlebar damper is fitted 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.

Another feature of the R 1100 R is an integrated ignition and handlebar lock, the ignition key fitting on both sides locking and unlocking also the fuel tank filler cap, seat and helmet lock. Further standard features are hazard warning flashers, a main support, the side support automatically interrupting the motorcycle's starter function, a storage box in the tail of the machine complete with toolkit and tyre service kit, and, as on all BMW motorcycles, an electric socket.

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 BMW's second-generation ABS as well a fully controlled catalytic converter.

The colours available are arctic grey metallic (with classic red seat) and mystic red metallic (with black seat) on both the R 1100 R and R 850 R.

Options and accessories

Options available from the factory are heated handles, cross-spoke wheels, a case rack, rev counter and a clock. And a windshield is currently being prepared for the R 1100 R. 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 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.

The bottom line: BMW's roadsters are absolutely unique

The new R 1100 R and R 850 R roadsters are genuine all-rounders with high-torque power units. Long service intervals of 10,000 km and a concept ensuring superior ease of maintenance keep the cost of ownership to a minimum. And these are the only "naked" bikes in the market available as an option with both ABS and a fully controlled catalytic converter.

They are also the only "naked" bikes with a height-adjustable seat where minimum height may be reduced to the particularly low level of just 760 mm or 29.9". Weighing 235 kg or 518 lb with full tank, these roadster machines are furthermore among the lightest motorcycles in their segment, their touring qualities being underlined above all by a maximum load capacity of 215 kg or 474 lb. Highly progressive suspension technology featuring the BMW Telelever and Paralever ensures maximum riding stability and excellent comfort on the road. And thanks to their magnificent handling, these new roadster models feel particularly at home on winding country roads simply ideal for enjoying sheer riding pleasure ...

THE R 1100 GS:

The enduro continues the successful history of the BMW GS

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, already leading the plus-750 cc segment in Germany as the No 1 machine in terms of sales figures. By the end of the model year, total production amounted to no less than 7,400 units.

The only modification for the 1995 model year is the new lower cover on the front wheel extended to the front by 192 mm or 7.6" versus the old cover to provide a better mudguard function.

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.

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.

This modification of the model'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 on the GS model

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.

Separately mounted handlebar

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 sping strut

Like its RS counterpart, the GS comes with its rear wheel running in a Paralever 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 opration. 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) plastic 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. Again, seat height can be varied very easily simply by fitting the seat into fixed supports at various levels.

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, 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 and a handlebar impact protector.

The R 1100 GS: Setting new standards in the big enduro class

Just like the R 80 G/S in 1980 and the R 100 GS in 1987, the R 1100 GS launched for the 1994 model year sets new standards in the big enduro class. It features not only the largest engine, but also more torque than any of its competitors. With the unique Telelever, the suspension ensures optimum riding stability, comfort, and excellent handling. And the R 1100 GS is the world's only off-road machine available with both ABS and fully controlled catalytic converter, meaning that it fulfills even the most stringent demands in safety and environmental compatibility.

THE R 1100 RS:

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 the end of the 1994 model year, sales of the R 1100 RS amounted to no less than 12,400 units.

Entering the 1995 model year with no need for a change

The R 1100 RS is entering the 1995 model year with no need for a change. The only difference is that the ergonomics package and rider information display already fitted as standard in Germany and a few other countries in the 1994 model year, has now become a standard feature worldwide.

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 1100 cc

The new, 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: 1100 cc capacity, 90 bhp (66 kW) at 7250 rpm, maximum torque 95 Nm (70 ft-lb) at 5500 rpm.

Four valves per cylinder it had to be!

With the engine being required to fulfill demanding standards, 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 in this case. 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.

Longer adjustment intervals

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 (this also applies to all K models). 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:

One auxiliary shaft and a separate camshaft on either side

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.

The decision to use chains for this purpose was based on their strength and endurance, the precision a chain is able to offer and, in particular, the slim, compact design of such a drive chain taking up very little space.

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: a steel structure with sintered cams

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.

The engine even looks dynamic

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 cylinder cooling fins - unconventional in every respect

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.

Friction reduced to a minimum inside the cylinders

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.

Compared with the old Boxer fitted with two Bing carburettors, 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

In spring 1991 BMW became the first motorcycle manufacturer in the world to offer a fully controlled closed-loop catalytic converter, fitted at the time on the K 100 Series. This active policy of protecting the environment is being continued by Bayerische Motoren Werke with the new Boxer, the three-way catalytic converter fitted as an option being 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 betwen 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 in front of the catalytic converter

On the engine of the new Boxer the oxygen sensor is fitted upstream of the catalytic converter (while on the K 100 models it is downstream of the 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.

Through its configuration the tail silencer allows the motorcycle to outperform current noise emission limits and comply with future standards, without forfeiting any power in the process. Measured according to the ECE standard, the new engine develops a noise level of 79 dB(A), the current limit being 82 dB(A). The new standard applicable in the EC is 80 dB(A). (An increase by 3 dB(A) means that the noise pressure level is doubled - and vice versa.)

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.

Electrical System:

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.

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 chanage 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 now mounted in a central position. It comes complete with coil pressure spring and a single-sleeve gas-pressure shock absorber. Outward damping is infinite and the pre-tension of the spring can be set to 7 different positions. Supplied by Showa, the Japanese manufacturer from which BMW also obtains the front spring strut, the rear spring strut allows overall spring travel of 135 mm (5.31").

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 hiousing, 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 allows inexpensive production. Another advantage is its superior ease of repair.

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. Operation of the front-wheel brake is by a handbrake lever adjustable to four different positions.

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's second-generation ABS is available as an option to significantly increase safety when applying the brakes.

Side stand with automatic starter interruption

The side support pivoting on the bearing block of the main stand is easy to operate even when sitting on the machine. A switch on the support bearing interrupts the power supply to the fuel pump whenever the side stand has been swivelled down, in this way automatically interrupting the starter. As a result, it is impossible for the rider to inadvertently set off with the side stand extended, with the risk of the stand hitting the ground and thus causing an accident when cornering.

Excellent riding characteristics

The ideal centre of gravity of the Boxer engine, the relatively low weight for a sports tourer of just 216 kg/476 lb (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 the painted components are made of high-quality thermoplatics: a combination of PBT and PC natural rubber. The big advantage of this material is that it is very tough, stable and light all in one.

Like all the other plastic components, the fairing is made without any CFCs (chlorofluorohydrocarbons). Each component is marked to indicate the specific type of synthetic material used, and can be fully recycled.

To facilitate maintenance, the large side panels of the fairing can be removed easily and quickly with the help of rapid-action catches and velcro fastenings.

Full fairing available as an option

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.

23-litre fuel tank made of plastic

The fuel tank is made of polyamide 6 G in a special rotational casting procedure. The fuel pump is fitted into the tank itself, complete with the fuel level sensor and fuel filter. Designed and built as a light-weight component, the tank cap opens with the same standard key used on all the locks. Tank capacity is 23 litres or 5.1 Imp gals.

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.

Another special option: the ergonomics package

One of the most outstanding innovations on the R 1100 RS is the ergonomics package now fitted as standard (and formerly available as an option). 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. **The 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. **The adjustable handlebar**
   The adjustable handlebar is made of forged aluminium segments and is connected to an aluminium tube to which the controls and instruments are fastened. The adjustable handlebar rests on special anti-vibration mounts in the interest of smooth riding.

   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. **The 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"). Such variation of seat height is achieved very easily indeed, without requiring any tools, simply by inserting the elastic seat frame into rigid suppports resting on the motorcycle frame itself.

Easy-to-read instruments and warning lights

Clearly standing out as the two most important instruments, the speedometer and rev counter are fitted directly on the frame of the R 1100 RS, exactly in the rider's line of vision. The speedometer is driven by a flexible shaft leading up from the front wheel, while the rev counter converts the control pulse from the coil electronically into an easy-to-read speed signal.

An instrument cluster with numerous functions comes just below these two dials, providing a clear indication of the following items:

- Direction indicator right/left

- Idling speed
- High-beam headlight
- Fuel reserve (as soon as the fuel level has dropped to approximately 5 ltr/1.1 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 now also comes as standard with the rider information display formerly only available as an option: 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.

Three additional switches come in the interior fairing cover on the left-hand side, serving for the hazard warning flashers, heated handles, and ABS control/cancellation function all standard as of the 1994 model year.

On-board toolkit and tyre service set

The on-board toolkit and tyre service set are both housed in the rear storage compartment. Like all BMW motorcycles, the R 1100 RS also features an electric socket (power take-off) as another standard feature.

Wide range of options and accessories

Following BMW's usual philosophy, the new R 1100 RS is available with a wide range of options and accessories straight from the factory. The range starts with the full fairing with slide tube panel and extends all the way through heated handles, cylinder protection hoops and case supports to a luggage rack. The catalytic converter and ABS brakes, in turn, help to protect the environment and offer extra safety.

Apart from these many options available from the factory, the customer also has the choice of a wide range of accessories. Examples are BMW's touring cases, inner bags to be put into the cases, a suitable tank bag, and an anti-theft warning system.

THE TWO-CYLINDER R SERIES BOXER MODELS WITH TWO-VALVE ENGINES:

Four "farewell models" bidding goodbye to the Boxer

Reflecting the gradual enlargement of the new Boxer line-up, the day and age of BMW's conventional Boxer motorcycles with two-valve power units is coming to an end.
After production of all two-valve 800 and 1000-cc Boxers already expired as of late July, marking the end of the 1994 model year, four 1000-cc models will be giving their "farewell party" at the International Bicycle and Motorcycle Show in Cologne in early October 1994: the three R 100 R, R 100 GS PD, and R 100 RT Classic models and the R 100 R Mystic launched in spring 1994.

Not only fans of the old Boxer will take this opportunity to buy their dream machine once again, since it is quite likely that these four "farewell models" will become particularly valuable collector's items in future.

R 100 R Classic

In technical terms the R 100 R Classic corresponds to the very successful R 100 R launched for the 1992 model year.
This new machine comes in avus black with double white lines on the tank and the model designation "R 100 R Classic" beneath the BMW roundals on the tank left and right. The seat with its new upholstery, frame, headlight support, instrument console and pillion grab handle are also finished in black, the handbrake and clutch levers coming in silver eloxy plating.

Standard features include cylinder protection hoops with a side support, double disc brakes, BMW's SAS (secondary air system for afterburning exhaust gas), hazard warning flashers and a luggage rack. And while no options are available ex works, the R 100 R Classic may be fitted with the usual accessories available from BMW dealers.

R 100 R Mystic

The R 100 R Mystic was introduced in spring 1994, supplementing the R 100 R and offering the following signs of distinction:

- Mystic red metallic paintwork
- Modified, chrome-plated headlight supports
- New instrument console cover plate, made of chrome-plated metal and with new telltales
- New chrome-plated direction indicator supports
- New handlebar
- New, more sporting and narrowly contoured seat plus a new tail section
- New rear frame section in black
- Tail silencer turned approx 3 cm to the inside along the longitudinal axis of the motorcycle

R 100 GS PD Classic

In technical terms the R 100 GS PD Classic has the same features as the R 100 GS Paris-Dakar launched in 1989.

It comes in avus black with a black double seat and bears tapes marked "R 100 GS" on the left and right of the tank, another tape on the tank storage box cover bearing the words "PD Classic". Both the handbrake and clutch lever are finished in silver eloxy plating.
The case holders, fairing support, cylinder protection hoops, handlebar and pillion grab handle are all chrome-plated.

Standard features include "round" valve covers as on the R 100 R, a high-rising, extra-wide front wheel mud-guard, heated handles, and BMW's SAS secondary air system. And while there are likewise no options for the R 100 GS PD Classic, it can of course be fitted with the usual accessories.

R 100 RT Classic

Technically, the R 100 RT Classic comes with the same features as the R 100 RT. It is finished in twin-tone arctic grey metallic and graphite metallic paintwork, the upper half of the fairing and the tank being embellished by double silver lines. The tank is marked "R 100 RT Classic" and both the handbrake and clutch lever are finished in silver eloxy plating.

Standard features include a black comfort seat, heated handles, cylinder protection hoops, a luggage rack with BMW topcase, case supports with cases, hazard warning flashers and the SAS secondary air system.

Again, the R 100 RT is not available with any options, but can be upgraded by adding the usual accessories.

THE SINGLE-CYLINDER F 650:

A best-seller from the start

Shortly after being launched in November 1993, the BMW F 650 proved that it was poised for outstanding success in the market: Nearly all test reports lauded in particular the powerful engine, excellent riding qualities, above-average comfort for a motorcycle of this kind and, not least, the outstanding finish quality of the F 650. And after the motorcycle journalists had expressed their view, the customers came next, providing an overwhelming opinion on the new machine.

In many countries the F 650, despite being a newcomer, rocketed up into the best-seller lists almost overnight. In Germany, for example, it quickly became the second best-selling machine in the market. And within just 10 months after the start of production, the 10,000th F 650 came off the assembly line in July 1994.

Having exceeded even the highest hopes in this way, the F 650 is entering the 1995 model year without a change.

From BMW's heritage in the single-cylinder market to the "Euro bike" for newcomers to the world of BMW

From 1925 to 1966, the total output of single-cylinder BMW machines ranging in size from 200 to 400 cc amounted to approximately 230,000 units. These were the days when motorcycles in general and single-cylinder models in particular were still primarily an inexpensive means of transport. It was only in later years that the motorcycle took on its new role as a pastime and leisure occupation.

Adjusting to demand in recent years, BMW constantly enlarged its model range in the course of the '80s: The traditional flat-twin Boxers were first joined by BMW's entirely new three- and four-cylinder K-models. And it was obvious to specialists at the Company what kind of machine would one day round off the model range at the bottom end: A single-cylinder motorcycle as the entry-level model into the BMW world.

Reaching this objective with an entirely new approach

To introduce this entry-level machine as quickly and efficiently as possible, BMW took a new, previously almost unthinkable approach, applying entirely unconventioanal strategies and proceeding along completely new lines.

Following initial talks with potential system suppliers in the late '80s, an initially vague idea slowly but surely materialised into a fully-fledged project agreed by contract in Munich on 5 June 1992 and announced to the public in the following press release:

BMW Plans Entry-Level Motorcycle
European Cooperation with Aprilia and Bombardier-Rotax

All the details have now been finalised for a German/ Italian/Austrian joint venture in the motorcycle market: BMW Motorrad GmbH in Munich, Aprilia S.p.A., a motorcycle manufacturer in Noale, Italy, and Bombardier-Rotax GmbH, a manufacturer of engines in the Austrian town of Gunskirchen, have now signed the contracts for a new initiative in the motorcycle industry.

The target of this joint venture is to implement BMW's long-pursued and quite unconventional concept for the development and production of an entry-level motorcycle. Also suited for off-road riding under moderate conditions, this new model will be an entirely unique but typical BMW. This is why BMW is responsible not only for its styling, but also for the technical concept.

The new motorcycle is to be developed by Aprilia in cooperation with BMW and produced in Aprilia's modern plant in Noale. Power will be provided by a Rotax 650-cc single-cylinder engine modified according to BMW's design criteria. Obviously, the contracts specify that all BMW test standards and quality requirements must be fulfilled in every respect. Sales of this new BMW motorcycle will presumably start in the 1994 season through BMW's network of motorcycle dealers.

Introducing this single-cylinder machine highly attractive in terms of both product features and prices, BMW are rounding off their existing range of two-, three- and four-cylinder models, moving down to a lower level in the market and gaining access once again to the important midsized engine segment. BMW's last single-cylinder motorcycle, the R 27, was produced from 1960 to 1966.

The cooperation of BMW and Aprilia involves two very successful motorcycle manufacturers: In 1991 BMW built approximately 34,000 motorcycles in the 650 - 1100 cc range, while Aprilia's total production last year was 50,000 machines with an engine capacity between 50 and 650 cc. Together with BMW's increasing cooperation with systems suppliers, this first genuine European joint venture in the motorcycle market represents a further step in the new strategy of BMW Motorrad GmbH to expand its market and hold its own against the competition.

Developed in only 2 1/2 years

Somewhat more than a year after signing of the contract, the F 650 made its world debut at the Frankfurt Motor Show in September 1993. The first road-going prototype nevertheless saw the light of day in June 1992, development of the F 650 taking no less than 2 ½ years in all and therefore showing what kind of potential such a joint venture is able to offer also in terms of all-round efficiency.

Launching the F 650 27 years after the legendary R 27, BMW once again returned to the Company's long tradition of single-cylinder machines. And reflecting the new status of Europe in 1993, this motorcycle definitely combines the best ingredients of European motorcycle design to provide the very first "Euro bike" under the BMW stamp of quality and high technology. You might indeed call the F 650 the "first European on two wheels" ...

A new concept - the "funduro"

The F 650 clearly stands out from other motorcycles not only through its heritage and unmistakable looks, but also through its unique concept. And being both fully compatible with the environment (available as an option with standard, non-controlled catalytic converter) and ideally suited for touring, it is a genuine BMW in many other respects, too. The engine and running gear provide an ideal blend of a funbike and an enduro, which is why BMW refers to the new F 650 as the "funduro".

A chain replacing the drive shaft

Looking at the drive concept of the F 650 the knowledgeable observer will see right away that BMW has been most consistent with this new machine in crossing old borders: For the first time in BMW motorcycle history, the rear wheel is driven not by the "obligatory" drive shaft, but rather by an O-ring chain - a logical decision for this kind of engine with its crankshaft arranged crosswise to the direction of travel.

Targeted above all at young people and beginners

Highly attractive also in terms of its low price, this entry-level BMW is aimed primarily at young people and beginners of any age, and therefore comes with an output of either 48 bhp (35 kW) or 34 bhp (25 kW). A further benefit making the F 650 particularly attractive to the growing number of lady riders and re-entrants is that this new BMW weighs only 189 kg (417 lb) in road trim, while the seat is very low for a machine of this type at just 810 mm (31.89").

Last but not least, the F 650 is also the ideal country and city bike, that is a motorcycle providing a perfect blend of riding pleasure and practical value.

The Engine:

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 again features 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 is 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.

Coated cylinders

Like all BMW motorcycle engines, the cylinder liners on the F 650 are finished in a highly stable, low-friction and low-wear nickel-silicon coating.

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.

Crankshaft and connecting rod running in anti-friction bearings

Vibrations of the weight-optimised crankshaft made of heat-treated nitrided steel are minimised in advance by careful balancing. The crankshaft runs in two high-efficiency anti-friction bearings, as does the forged connecting rod.

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 intake leading into the intake air silencer (which also serves to bleed 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 available as an option

As an option the F 650 is available with a standard, non-controlled catalytic converter 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. And like all catalysts on BMW motorcycles, the catalytic converter on the F 650 can be recycled at the end of its running life through BMW dealers, ensuring in this way that precious materials are preserved and used again.

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

Like the new Boxer generation and all car 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 supplied by Showa (just like the telescopic fork) 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 gaurantees 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 two-piston floating calliper at the front and a single-disc brake (diameter 240 mm/ 9.45") with single-piston floating calliper at the rear. The entire brake system was designed for the F 650 by Brembo from a clean sheet of paper.

With full tank and in road trim, the F 650 weighs a mere 189 kg (417 lb). And with its maximum permissible weight of 371 kg (818 lb), it offers a service load of 182 kg or 401 lb. Particular strengths of the F 650 are its excellent handling and superior riding stability also at high speeds (160 km/h or 100 mph plus) as well as its outstanding qualities in carrying a rider and passenger even on long tours. And this new machine is really at home on winding country roads as well as dirt tracks and in dense city traffic.

Model Fitments:

Same headlight as on the R 100 GS

The F 650 features a stable cockpit fairing fitted directly to the frame and incorporating both the windshield and headlight (which is the same as on the R 100 GS). The cockpit houses the speedometer and rev counter, a coolant temperature gauge and telltales for oil pressure, the idle indicator, direction indicators and high beam. The steel tube handlebar measures 880 mm (34.65") in width and is specially reinforced by a transverse bar for riding off-road.
The plastic fuel tank has a capacity of 17.5 litres or 3.85 Imp gals, including two litres reserve.

Measuring 710 mm or 27.95" in length, the stick-on seat offers ample space for both rider and passenger. Despite very generous spring travel, seat height is only 810 mm or 31.9" - very low indeed for a machine of this type. The F 650 comes with a central ignition and steering lock.

The front wheel is covered by a low mudguard with an integral sliding tube cover. The rear-wheel cover directly fastened to the swinging arm serves both as a mudguard and a built-in chain protector. Further standard features on the F 650 are the luggage rack with grab handle function, a side-stand, the engine protection cover made of flexible plastic, and the on-board toolkit.

Wide range of special equipment

The F 650 - as you would expect of a BMW - comes with a wide range of special equipment: The items available range from a main, central stand through case supports, city and integral cases, a separate socket, cylinder protection hoops, hand protectors, heated handles, a handlebar impact protector, all the way to the 22-ltr (0.77 cu ft) topcase and an anti-theft warning system.

THE THREE-CYLINDER K 75 MODELS:

Entering the 10th year without the need for a change

The K 75 models are entering the 1995 model year, their tenth year of production, without any changes.

Production exceeding 60,000 units

Introduced in autumn 1985, the three-cylinder K 75 Series now looks at a total production volume of more than 60,000 units by the end of the 1994 model year. All three models in the series are available with electronic/hydraulic anti-lock brakes (ABS) and a catalytic converter fitted as an option. As of the 1993 model year, the K 75 models have furthermore been fitted with a Showa telescopic fork providing an even better and smoother response. Standard features include hazard warning flashers and an automatic side-stand returned to its resting position via the clutch lever.

K 75: An attractive model for achievers with an extra-low seat

In terms of both price and styling, the "basic" K 75 without fairing is a very attractive model for achievers moving into the BMW K Series. With its seat height of 760 mm (29.9") it is just right for the somewhat smaller rider.

K 75 S: Sports suspension and dynamic looks

The sports version of the K 75 features a sports fairing with integral direction indicators styled in BMW's wind tunnel. The relatively slender but nevertheless efficient fairing offers good protection from wind and weather.

K 75 RT: Now available with adjustable windshield

Starting with the 1991 model year the K 75 Series has also had a superior touring model with the same large tourer fairing as the K 1100 LT. The silky-smooth refinement of the three-cylinder power unit combined with the superior handling of the K 75 make the new K 75 RT already sold successfully in the USA and Spain since the beginning of the 1990 model year an interesting alternative for the touring enthusiast. As of the 1993 model year, the K 75 RT has also been available as an option with the electrically adjustable windshield featured on the K 1100 LT.

THE FOUR-CYLINDER K 1100 SERIES:

The K 1100 LT Special Edition and the special K 1100 RS model

Entering the 1995 model year, the K 1100 RS now comes as standard in all countries with temperature and fuel gauge. Otherwise unchanged, the K 1100 RS is also available in a special version in the 1995 model year, the colour in this case being marrakech red and the black lettering on the side fairings being somewhat larger than on the standard model. Everything else remains unchanged.

The K 100 LT is entering the 1995 model year without any changes, and the K 1100 LT Special Edition remains in BMW's line-up, albeit in a new colour (see the following description for details).

The K 100 success story

Launching the all-new K 100 Series in autumn 1983, BMW started a dual product strategy, four-cylinder liquid-cooled models supplementing the proven two-cylinder Boxers and being joined in 1985 by the K 75 Series featuring three-cylinder power units derived from the K 100. The K models were also the first motorcycles to be produced in large numbers featuring both electronic ignition and fuel injection.

In spring 1984 the K 100 and K 100 RS were supplemented by the K 100 RT re-named the K 100 LT in 1986.

In 1989 these three models with their 90 bhp two-valve power units were joined by the K 1 supersports machine powered by a 100 bhp four-valve engine. The K 1 fulfilled its role in full as BMW's spearhead in image and technology, production totalling more than 7,000 units before coming to an end in late 1993. Early in 1990 the K 100 RS also received the technical innovations introduced with the K 1, such as the four-valve power unit, Paralever swinging arm, and upgraded brake system.

In 1988 BMW became the world's first motorcycle manufacturer to introduce ABS (on the K 100 models), followed in 1991 by the fully controlled catalytic converter. Setting new standards in motorcycle technology in terms of both riding safety and environmental compatibility, both of these innovations received a very positive response from customers.

Launching the K 1100 LT in February 1992 and the K 1100 RS in December of the same year, BMW very successfully updated the K 100 Series to an even higher standard. Numerous test reports all over the world show clearly that the K 1100 LT and K 1100 RS can live up to virtually any comparison.

The success story of the K 100 Series is also expressed by a proud figure, total production of K 100 models up to the end of the 1994 model year amounting to approximately 125,000 units.

The K 1100 RS:

BMW's successful sports tourer with production exceeding 53,000 units

The K 100 RS sports tourer may be regarded as one of the most successful motorcycles of the '80s. The readers of MOTORRAD, Europe's largest motorcycle journal, have voted the K 100 RS Motorcycle of the Year no less than five times running, a truly unique achievement in the history of this popularity vote. In other European countries, in America, Australia and even in Japan, the K 100 RS has also received many coveted awards. Following the model update in early 1990, the K 100 RS was thoroughly revised once again for the 1993 model year, taking on a new designation - the K 1100 RS - and featuring a totally revised fairing, engine and running gear. And with sales now amounting to more than 53,000 units, this sports tourer is also BMW's best-selling four-cylinder motorcycle.

Now the K 1100 RS also features the high-torque power unit of the K 1100 LT

Almost exactly one year after the launch of the K 1100 LT, the successor to the K 100 RS also received a new power unit: the 1000-cc four-valve engine of the K 1 was replaced by the ultra-powerful 1100-cc engine of BMW's luxury tourer, the new model designation being K 1100 RS. While the engine of K 1100 RS has the same output as that of the K 100 RS of 100 bhp (74 kW), the speed at which this output is generated is 7500 rpm and no longer 8000 rpm. The increase in engine size helps to boost torque from 100 Nm or 74 ft/lb at 6750 rpm to 107 Nm or 79 ft/lb at 5500 rpm. Unlike the K 1 (2.75) and K 1100 LT (2.91), the final drive ratio of the otherwise identical five-speed gearbox is 2.81.

Even at first sight, the K 1100 RS clearly bears testimony to its thorough modification: The almost classic upper part of the fairing has been combined with new side panels and an engine spoiler, providing a very attractive and stylish combination of individual features. Together with the new battery panels, this creates an - almost - brand-new, highly appealing look.

The suspension has also been modified to suit the new fairing and engine features, the Marzocchi telescopic fork and Showa spring strut on the rear wheel being retuned accordingly. In the interest of even greater riding stability, the frame has been reinforced by adding v-shaped tiebars connected to the handlebar centre-point and the rear support bar.

Some other new features are the redesigned gearshift lever and an innovative brake lever adjustable to four different positions depending on the size of the rider's hand. A further feature is the footrest support plate separated from the motorcycle itself to reduce vibrations (also on the K 1100 LT).

Optionally available with ABS and catalytic converter

The K 1100 RS is available as an option with BMW's ABS II and fully controlled catalytic converter.

K 1100 LT Special Edition also in the 1995 model year

Commemorating the tenth anniversary of the K 100 Series, BMW launched the K 1100 LT Special Edition in 1994. Proving very popular, this special model remains available in the 1995 model year, standing out from the "regular" K 1100 LT through the following features:

- Special paintwork now in navarra violet metallic
- Even more comfortable seat now in muscat
- Radio with cassette player and remote control on the handlebar, plus two loudspeakers in the fairing
- Backrest on topcase with two additional, fully integrated loudspeakers
- New instrument dials, placard marked "K 1100 LT Special Edition" in the middle of the rev counter
- ABS II

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 so far 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.

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 as of the 1994 model year.

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 from Showa in Japan 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".

Apart from the foot lever, front-wheel mudguard, side covers and battery panels, the handlebar (measuring 765 mm/30.11" in width) and handlebar cover are also new. A further feature is that the handbrake lever is adjustable to four different positions.

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"). The electric adjustment system is comparable to an electric sunroof in a car and is controlled by a push button automatically cutting off the power supply when the windshield has reached its final position.
As a result, windshield height can be chosen individually as a function of rider size and road speed, weather and temperature. And on the road this means not only better protection from wind and weather, but also a significant reduction of wind noise.

The instruments of the K 1100 LT are no longer fitted on the handlebar unit as with the K 100 LT, but now directly on the frame of the motorcycle, in this way being protected even more efficiently from vibrations of any kind. A feature the rider will appreciate in particular is that the fairing has been moved 30 mm (1.2") to the front in order to provide extra kneeroom. And all riders will benefit from the extra seating comfort provided by new seat upholstery and the extension of the rider's seat by 20 mm (0.79") in length.

Topcase and touring cases even larger and more functional

The new topcase offers extra capacity, being increased in size from 22 ltr (0.77 cu ft) to 35 ltr (1.23 cu ft). A special feature is that the carrier handle for the topcase now also serves for fastening the case to the motorcycle itself.

Increased in size to 33 ltr (1.16 cu ft) from 31 ltr (1.09 cu ft) and significantly improved in terms of watertightness, stability and convenience, the touring cases fitted as standard just like the topcase offer even greater practical value. As an example, a newly developed labyrinth system efficiently seals the lower part of the case and the lid.

The lower part of the touring cases features an integral, folding handle, but otherwise remains unchanged and is fastened to the motorcycle - as in the past - by a profile carrier. The lid, on the other hand, has been completely redesigned and is made of ABS (acrylnitrile butadiene styrene) plastic suitable for painting. The lid also comprises locks turned 180° to the outside and with improved function.

Applying a standard BMW principle, all the locks on the K 1100 LT (ignition, handlebar, tank cap, seat, touring cases and topcase) can be opened and closed with one single key.

Weighing in at 290 kg (639 lb) with full tank, touring cases and topcase, the K 1100 LT is certainly not a lightweight, but is still the lightest machine in the luxury tourer market. It also offers a standard of superior handling one might not expect at first sight. And it does not present any weight problems, either, when it comes to service load: With the maximum permissible weight being increased from 480 to 500 kg (1058 - 1103 lb), the K 1100 LT's service load is now a very adequate 210 kg (463 lb).

The world's only luxury tourer available with ABS and catalytic converter as an option

There can be no doubt about it: When it comes to the engine, running gear, brakes, fairing, riding comfort or luggage space, the K 1100 LT is a significant improvement in nearly every respect. And not least, it is the world's only luxury tourer avilable as an option with BMW's ABS II and fully controlled closed-loop catalytic converter.

THE 1995 COLOUR RANGE

R models

R 1100 R		
and		
R 850 R:	mystic red metallic	
	arctic grey metallic	(seat in classic red or black)
R 1100 GS:	avus black	(seat in yellow or black)
	marrakech red	(seat in yellow or black)
	alpine white	(seat in yellow or black)
R 1100 RS:	avus black	(seat in red)
	marrakech red	(seat in black or red)
	cobalt blue	(seat in black or red)
R 100 R		
Classic:	avus black	
R 100 R		
Mystic:	mystic red metallic	
R 100 GS PD		
Classic:	avus black	
R 100 RT		
Classic:	twin-tone graphite and artic grey metallic	

K models

K 75 and K 75 S:	graphite metallic, mystic red metallic, arctic silver metallic
K 75 RT:	graphite metallic, mystic red metallic, morea green metallic
K 100 RS:	graphite metallic, mystic red metallic, palmetto green metallic
K 1100 RS Special Model:	marrakech red
K 1100 LT:	graphite metallic, morea green metallic
K 1100 LT Special Edition:	navarra violet metallic (seat in muscat)

F 650

F 650:	flame red aura white (seat in blue or black) lime green (seat in blue 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		
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 (also unleaded)		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			
	Wheel castor	mm	110			
	Wheelbase	mm	1480			
	Brakes	Front	single disc brake, dia 300 mm			
		Rear	single disc brake, dia 240 mm			
	Wheels		wire spoke wheels			
		front	2.15 x 19			
		rear	3.00 x 17			
	Tyres	front	100/90-19 57 S			
		rear	130/80-17 65 S			
			pneumatic tyre			
Dimensions and weights	Length, overall	mm	2180			
	Width with mirrors	mm	880			
	Handlebar width	mm	880			
	Seat height	mm	810			
	Weight, unladen with full tank	kg	189			
	Max permissible weight	kg	371			
	Fuel tank (reserve)	ltr	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		

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	SPECIFICATIONS BMW MOTORCYCLES		R 100 GS PD	R 100 R	R 100 RT	
Engine	Cubic capacity	cc	980	980	980	
	Bore/stroke	mm	94/70.6	94/70.6	94/70.6	
	Max output	kW/bhp	44/60	44/60	44/60	
	at	rpm	6500	6500	6500	
	Max torque	Nm	76	76	74	
	at	rpm	3750	3750	3500	
	Design		flat-twin	flat-twin	flat-twin	
	No of cylinders		2	2	2	
	Compression ratio/fuel grade		8.5/N	8.5/N	8.45/N	
	Valve control		OHV	OHV	OHV	
	Valves per cylinder		2	2	2	
	Intake/outlet dia	mm	42/40	42/40	42/40	
	Fuel supply		Bing carburettors	Bing carburettors	Bing carburettors	
	No of carburettors/dia		2/40	2/40	2/32	
Electrical system	Ignition		contactless transistorized coli ignition			
	Alternator	W	240	240	240	
	Battery	V/Ah	12/25	12/30	12/30	
	Headlight	W	H 4 55/60	H 4 55/60 dia 180 mm	H 4 55/60 dia 180 mm	
	Starter	kW	0.7	0.7	0.7	
Power transmission, Gearbox	Gearbox		5-speed gearbox with dog-type shift			
	Gear ratios	I	4.40/3.09	4.40/3.09	4.40/3.0	
		II	2.86/3.09	2.86/3.09	2.86/3.0	
		III	2.07/3.09	2.07/3.09	2.07/3.0	
		IV	1.67/3.09	1.67/3.09	1.67/3.0	
		V	1.50/3.09	1.50/3.09	1.50/3.0	
Suspension	Rear-wheel drive		BMW Paralever	BMW Paralever	BMW Monolever	
	Clutch		Single-plate dry clutch with diaphragm springs			
	Type of frame		Double-loop tubular steel frame with bolted-on tail section			
	Spring travel front/rear	mm	225/180	135/140	175/121	
	Wheel castor	mm	101	101	120	
	Wheelbase	mm	1513	1513	1447	
	Brakes	Front	single-disc brake; dia 285 mm	dual-disc brake; dia 285 mm	dual-disc brake; dia 285 mm	
		Rear	drum brake, dia 200 mm	drum brake, dia 200 mm	drum brake, dia 200 mm	
	Wheels		Cross-spokes	Cross-spokes	Cast light-alloy	
		front	1.85 – 21 MT	2.50 x 18 MTH 2	MTH 2.50 x 18 E	
		rear	2.50 – 17 MT	2.50 x 17 HTH 2	MTH 2.50 x 18 E	
	Tyres	front	90/90 – 21 T	110/80 V 18	90/90 – 18 H	
		rear	130/80 – 17 T	140/80 V 17	120/90 – 18 H	
			low-profile	low-profile	low-profile	
Dimensions and weights	Length, overall	mm	2290	2210	2175	
	Width with mirrors	mm	1000	1000	960	
	Handlebar width	mm	830	720	714	
	Seat height	mm	850	800	807	
	Weight, unladen with full tank	kg	236	218	234	
	Max permissible weight	kg	420	420	440	
	Fuel tank / reserve	ltr	35/5	24/4.7	22/2	
Performance	Fuel consumption					
	90 km/h (56 mph)	ltr	4.9	4.9	4.4	
	120 km/h (75 mph)	ltr	6.9	6.1	6.6	
	Acceleration					
	0–100 km/h (62 mph)	sec	4.8	4.8	5.0	
	standing-start km	sec	26.5	26.5	26.0	
	Top speed	km/h	180	180	185	

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	SPECIFICATIONS BMW MOTORCYCLES		R 1100 RS	R 1100 GS	R 1100 R	R 850 R
Engine	Cubic capacity	cc	1085	1085	1085	848
	Bore/stroke	mm	99/70.5	99/70.5	99/70,5	87,8/70,5
	Max output	kW/bhp	66/90	59/80	59/80	52/70
	at	rpm	7250	6750	6750	7000
	Max torque	Nm	95	97	97	77
	at	rpm	5500	5250	5250	5500
	Design		flat-twin	flat-twin	flat-twin	flat-twin
	No of cylinders		2	2	2	2
	Compression ratio/fuel grade (also unleaded)		10.7/S	10.3/S	10,3/S	10,3/S
	Valve control		HC	HC	HC	HC
	Valves per cylinder		4	4	4	4
	Intake/outlet dia	mm	36/31	36/31	36/31	32/27
	Fuel supply		Motronic MA 2.2.	Motronic MA 2.2.	Motronic MA 2.2.	Motronic MA 2.2.
Electrical system	Ignition		Motronic MA 2.2.	Motronic MA 2.2.	Motronic MA 2.2.	Motronic MA 2.2.
	Alternator	W	700	700	700	700
	Battery	V/Ah	12/19	12/19	12/19	12/19
	Headlight	W	H 4 55/60	H 4 55/60	H 4 55/60	H 4 55/60
	Starter	kW	1.1	1.1	1,1	1,1
Power transmission, Gearbox	Gearbox		5-speed gearbox with dog-type shift			
	Gear ratios	I	4.16/2.81	4.16/3.00	4,16/3,00	4,16/3,36
		II	2.91/2.81	2.91/3.00	2,91/3,00	2,91/3,36
		III	2.13/2.81	2.13/3.00	2,13/3,00	2,13/3,36
		IV	1.74/2.81	1.74/3.00	1,74/3,00	1,74/3,36
		V	1.45/2.81	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	120/135	190/200	120/135	120/135
	Wheel castor	mm	111	115	127	127
	Wheelbase	mm	1473	1509	1487	1487
	Brakes	Front	dual-disc brake, dia 305 mm	dual-disc brake, dia 305 mm	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	single-disc brake, dia 276 mm	single-disc brake, dia 276 mm
	Wheels		Light-alloy wheels	Cross-spoke wheels	Light-alloy wheels	Light-alloy wheels
		front	3.50 – 17	2.5 x 19	3,50 – 17	3,50 – 17
		rear	4.50 – 18	4.0 x 17	4,50 – 18	4,50 – 18
	Tyres	front	120/70 – ZR 17	110/80 H 19 TL	120/70 – ZR 17	120/70 – ZR 17
		rear	160/60 – ZR 18	150/70 H 17 TL	160/60 – ZR 18	160/60 – ZR 18
			tubeless	tubeless		
Dimensions and weights	Length, overall	mm	2175	2196	2197	2197
	Width with mirrors	mm	920	920	898	898
	Handlebar width	mm	738	820	729	729
	Seat height	mm	780/800/820	840/860	760/780/800	760/780/800
	Weight, unladen with full tank	kg	239	243	235	235
	Max permissible weight	kg	450	450	450	450
	Fuel tank	ltr	23	25	21	21
Performance	Fuel consumption					
	90 km/h (56 mph)	ltr	4.3	4.6	4,6	4,6
	120 km/h (75 mph)	ltr	5.2	5.9	5,9	5,7
	Acceleration					
	0–100 km/h (62 mph)	sec	4.1	4.3	4,3	5,0
	standing-start km	sec	23.7	24.7	24,6	26,0
	Top speed	km/h	215	195	197	187

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	SPECIFICATIONS BMW MOTORCYCLES		K 75	K 75 S	K 75 RT	
Engine	Cubic capacity	cc	740	740	740	
	Bore/stroke	mm	67/70	67/70	67/70	
	Max output	kW/bhp	55/75	55/75	55/75	
	at	rpm	8500	8500	8500	
	Max torque	Nm	68	68	68	
	at	rpm	6750	6750	6750	
	Design		inline	inline	inline	
	No of cylinders		3	3	3	
	Compression ratio/fuel grade (also unleaded)		11.0/S	11.0/S	11.0/S	
	Valve control		DOHC	DOHC	DOHC	
	Valves per cylinder		2	2	2	
	Intake/outlet dia	mm	34/30	34/30	34/30	
	Fuel supply		LE-Jetronic with coasting cut-off			
Electrical system	Ignition		VZ-51 L digital ignition			
	Alternator	W	700	700	700	
	Battery	V/Ah	12/19	12/19	12/19	
	Headlight	W	H 4 55/60 dia 180 mm	H 4 55/60	H 4 55/60	
	Starter	kW	0.7	0.7	0.7	
Power transmission, Gearbox	Gearbox		5-speed gearbox with dog-type shift			
	Gear ratios	I	4.50/3.20	4.50/3.20	4.50/3.20	
		II	2.96/3.20	2.96/3.20	2.96/3.20	
		III	2.30/3.20	2.30/3.20	2.30/3.20	
		IV	1.88/3.20	1.88/3.20	1.88/3.20	
		V	1.67/3.20	1.67/3.20	1.67/3.20	
Suspension	Rear-wheel drive		Encapsulated drive shaft with universal joint and integrated torsion damper			
	Clutch		Single-plate dry clutch rotating in opposite direction			
	Type of frame		Tubular space , engine serving as loadbearing component			
	Spring travel front/rear	mm	135/110	135/110	135/110	
	Wheel castor	mm	101	101	101	
	Wheelbase	mm	1516	1516	1516	
	Brakes	Front	dual-disc brake, dia 285 mm	dual-disc brake, dia 285 mm	dual-disc brake, dia 285 mm	
		Rear	single-disc brake, dia 285 mm	single-disc brake, dia 285 mm	single-disc brake, dia 285 mm	
	Wheels		Light-alloy wheels	Light-alloy wheels	Light-alloy wheels	
		front	2.50 – 18 MTH 2	2.50 – 18 MTH 2	2.50 – 18 MTH 2	
		rear	2.75 – 17 MTH 2	2.75 – 17 MTH 2	2.75 – 17 MTH 2	
	Tyres	front	100/90/H 18 tubeless	100/90/V 18 tubeless	100/90/V 18 tubeless	
		rear	130/90/H 18 tubeless	130/90/V 17 tubeless	130/90/V 17 tubeless	
Dimensions and weights	Length, overall	mm	2220	2220	2220	
	Width with mirrors	mm	900	810	916	
	Handlebar width	mm	710	650	770	
	Seat height	mm	760*	810	810	
	Weight, unladen with full tank	kg	228	235	258	
	Max permissible weight	kg	450	450	480	
	Fuel tank	ltr	21	21	22	
Performance	Fuel consumption					
	90 km/h (56 mph)	ltr	4.5	4.3	4.5	
	120 km/h (75 mph)	ltr	5.2	5.0	5.2	
	Acceleration					
	0–100 km/h (62 mph)	sec	4.6	4.6	4.6	
	standing-start km	sec	25.6	25.2	25.2	
	Top speed	km/h	200	210	210	

* *alternatively 800 mm*

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	SPECIFICATIONS BMW MOTORCYCLES		K 1100 RS	K 1100 LT		
Engine	Cubic capacity	cc	1092	1092		
	Bore/stroke	mm	70.5/70	70.5/70		
	Max output	kW/bhp	74/100	74/100		
	at	rpm	7500	7500		
	Max torque	Nm	107	107		
	at	rpm	5500	5500		
	Design		inline	inline		
	No of cylinders		4	4		
	Compression ratio/fuel grade (also unleaded)		11.0/S	11.0/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	Ignition		Motronic MA 2.2.	Motronic MA 2.2.		
	Alternator	W	700	700		
	Battery	V/Ah	12/19	12/19		
	Headlight	W	H 4 55/60	H 4 55/60		
	Starter	kW	0.7	0.7		
Power transmission, Gearbox	Gearbox		5-speed gearbox with dog-type shift			
	Gear ratios	I	4.50/2.81	4.50/2.81		
		II	2.96/2.81	2.96/2.81		
		III	2.30/2.81	2.30/2.81		
		IV	1.88/2.81	1.88/2.81		
		V	1.61/2.81	1.61/2.81		
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	135/120	135/120		
	Wheel castor	mm	90	101		
	Wheelbase	mm	1565	1565		
	Brakes	Front	dual-disc brake, dia 305 mm	dual-disc brake, dia 305 mm		
		Rear	disk brake, dia 285 mm	disk brake, dia 285 mm		
	Wheels		Light-alloy wheels	Light-alloy wheels		
		ront	3.50 – 17 MTH 2	2.50 x 18 MTH 2		
		rear	4.50 – 18 MTH 2	3.00 x 17 MTH 2		
	Tyres	front	120/70 VR 17	110/80-VR 18		
		rear	160/60 VR 18	140/80-VR 17		
			tubeless	tubeless		
Dimensions and weights	Length, overall	mm	2230	2250		
	Width with mirrors	mm	800	915		
	Handlebar width	mm	610	765		
	Seat height	mm	800	810		
	Weight, unladen with full tank	kg	268	290		
	Max permissible weight	kg	485	500		
	Fuel tank	ltr	22	22		
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	3.8	4.3		
	standing-start km	sec	22.7	24.3		
	Top speed	km/h	more than 220	more than 210		

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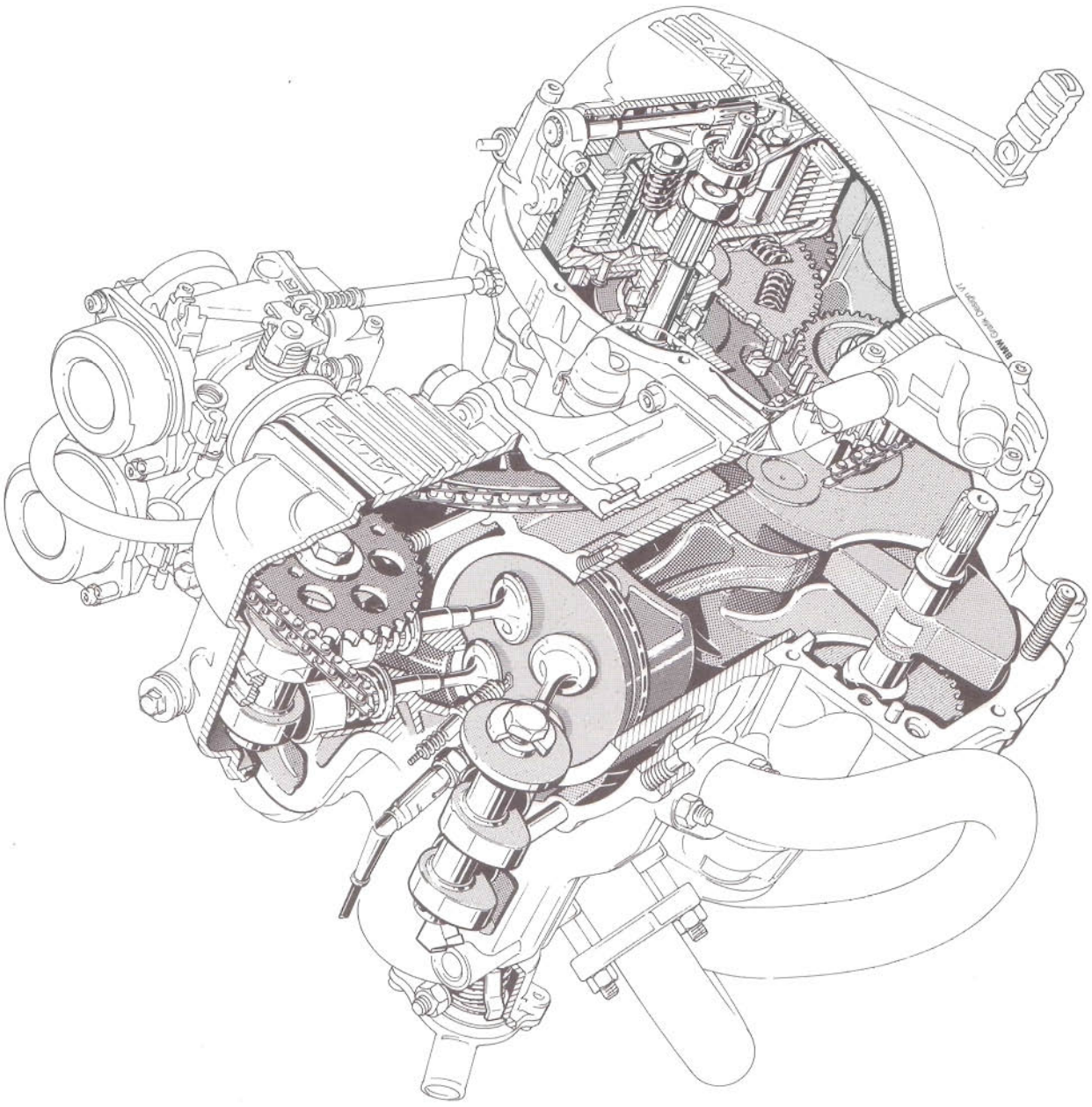
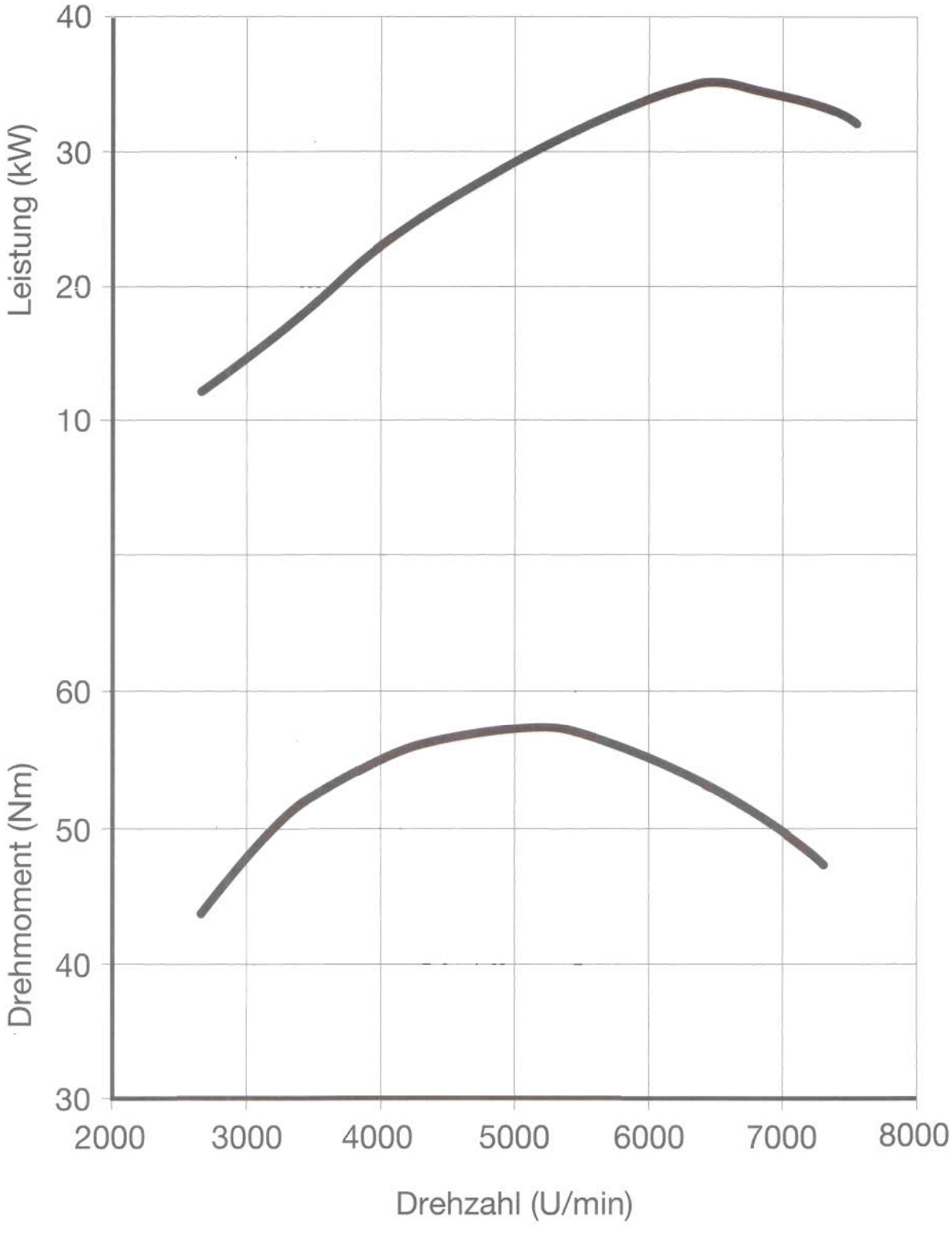
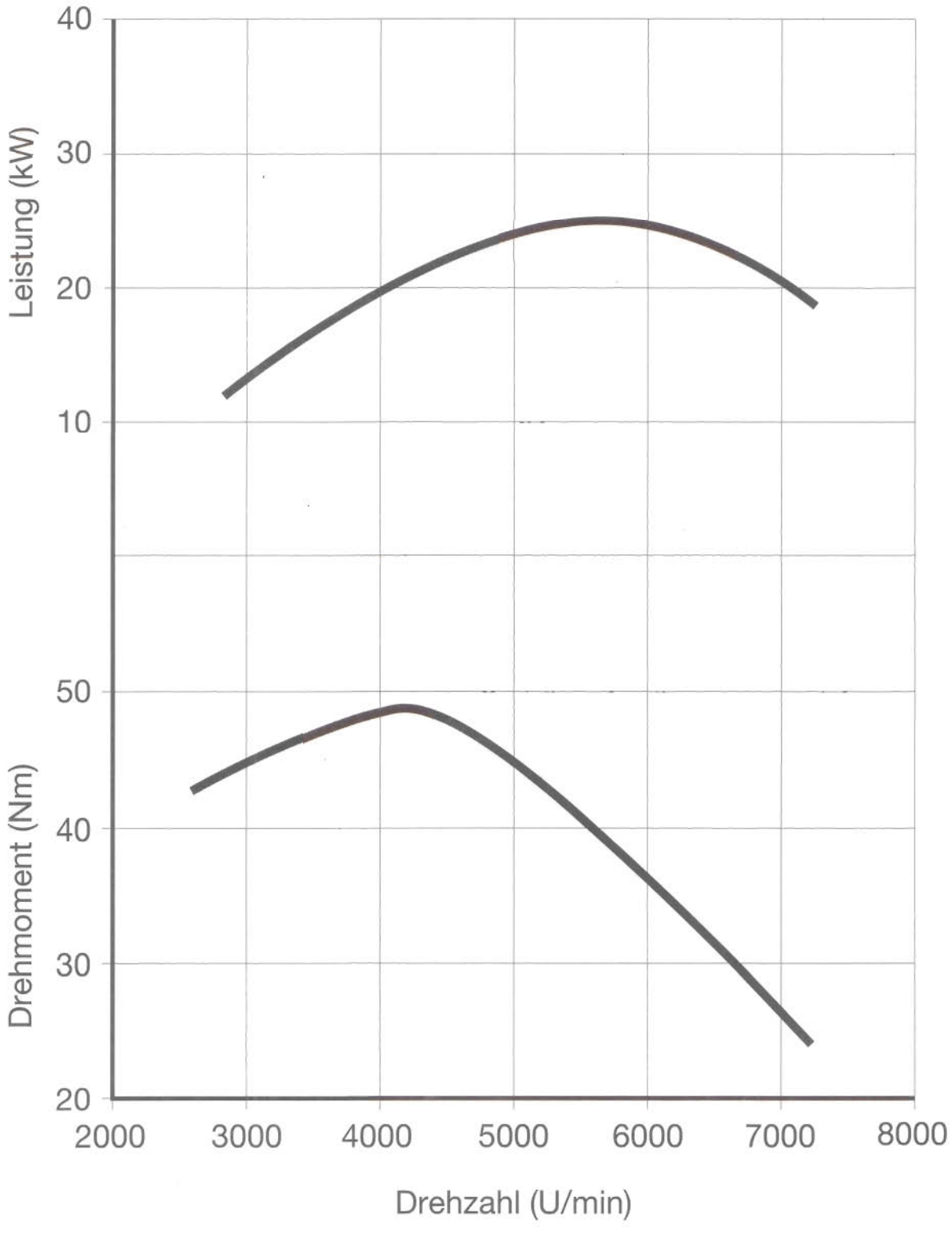
BMW F 650	M 95/1



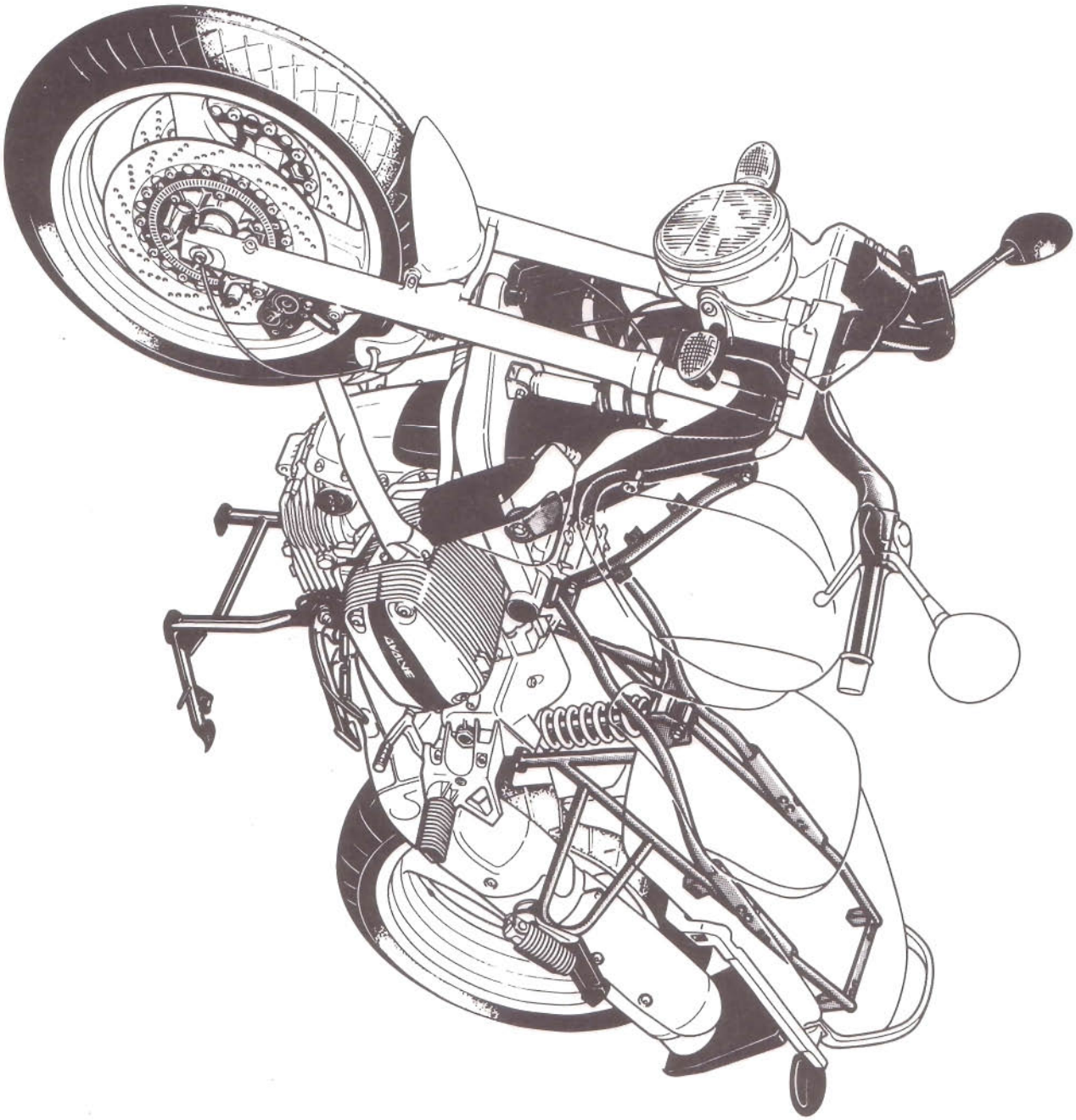
BMW F 650	35 kW/48 PS	M 95/2



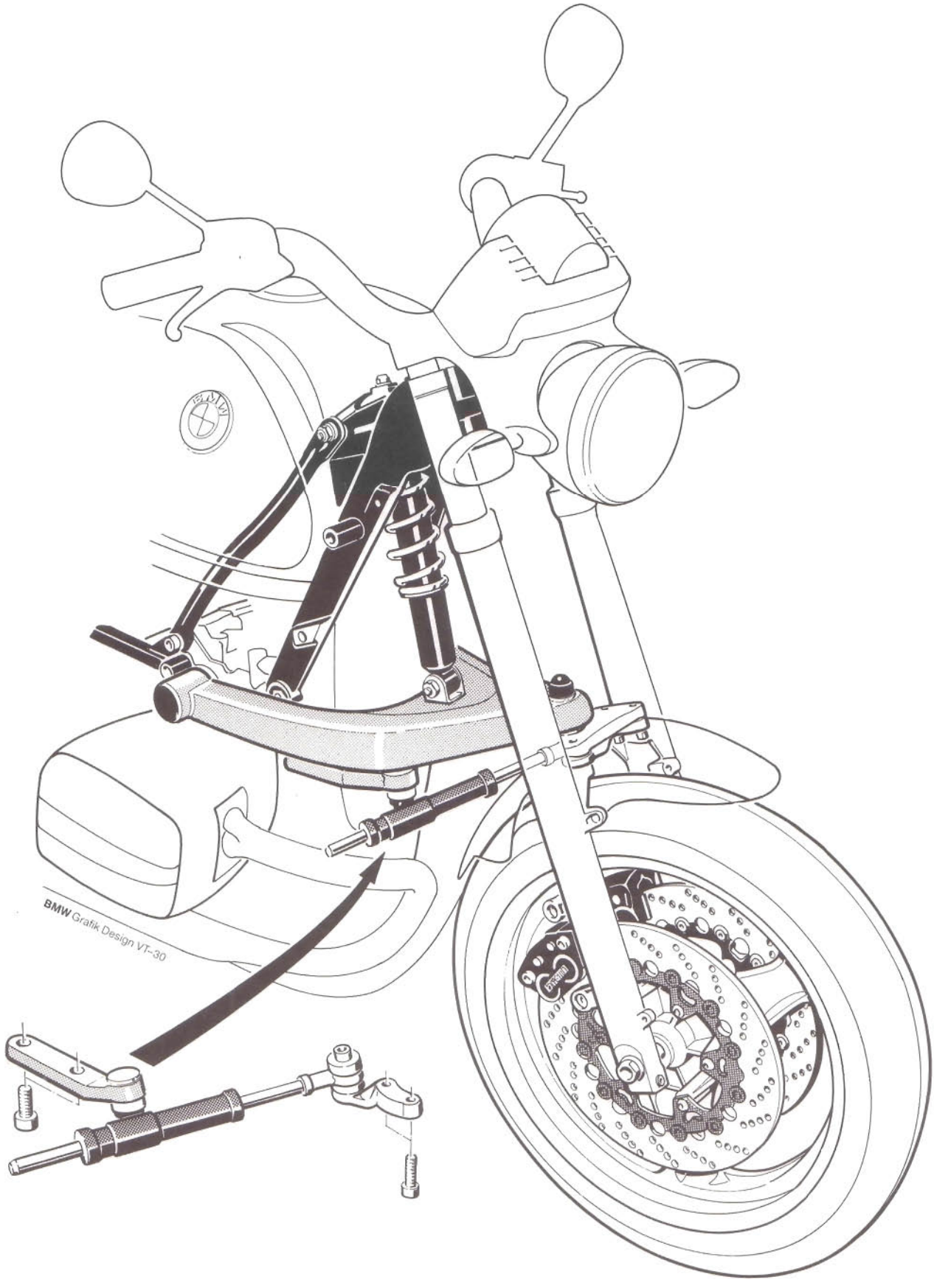
BMW F 650	25 kW/34 PS	M 95/3



BMW R 1100 R und R 850 R	M 95/4

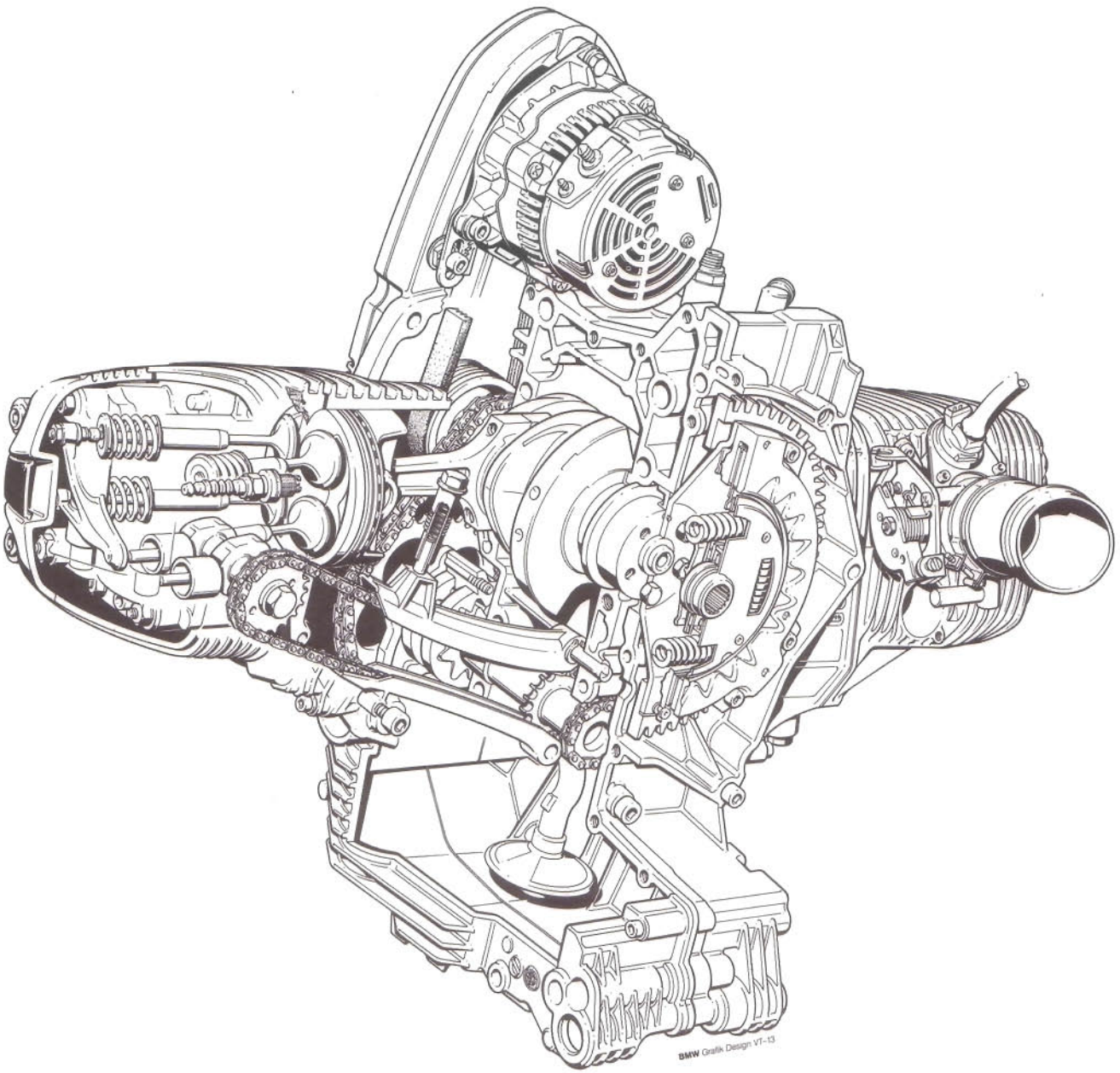


BMW R 1100 R und R 850 R	M 95/5

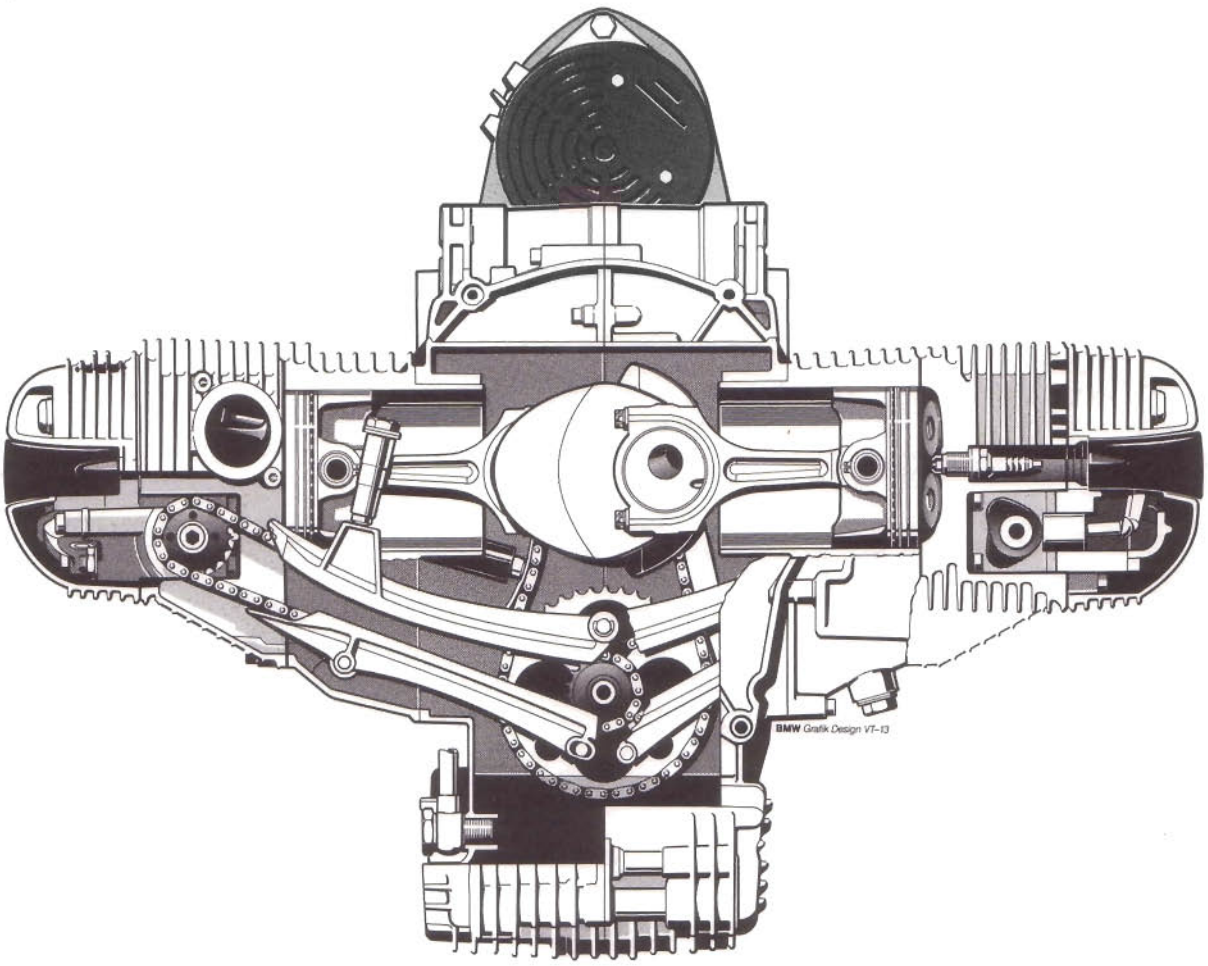


BMW R 1100

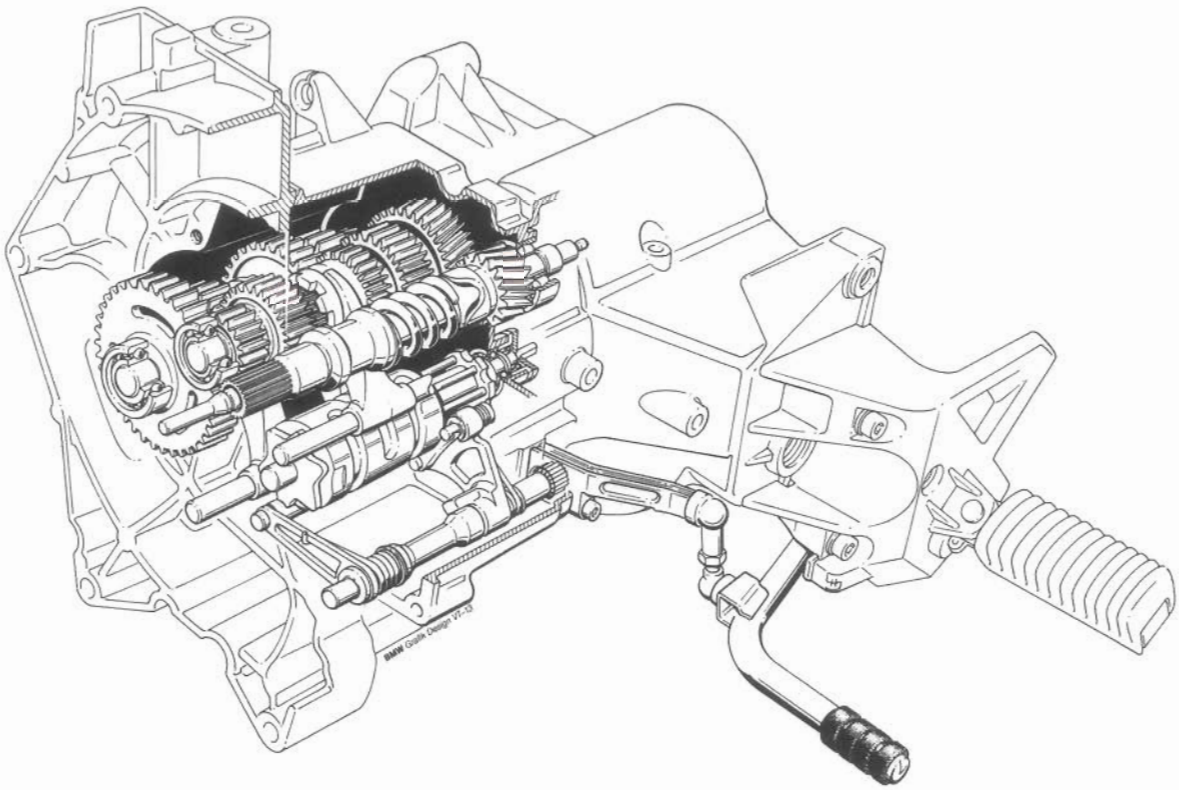
M 95/6



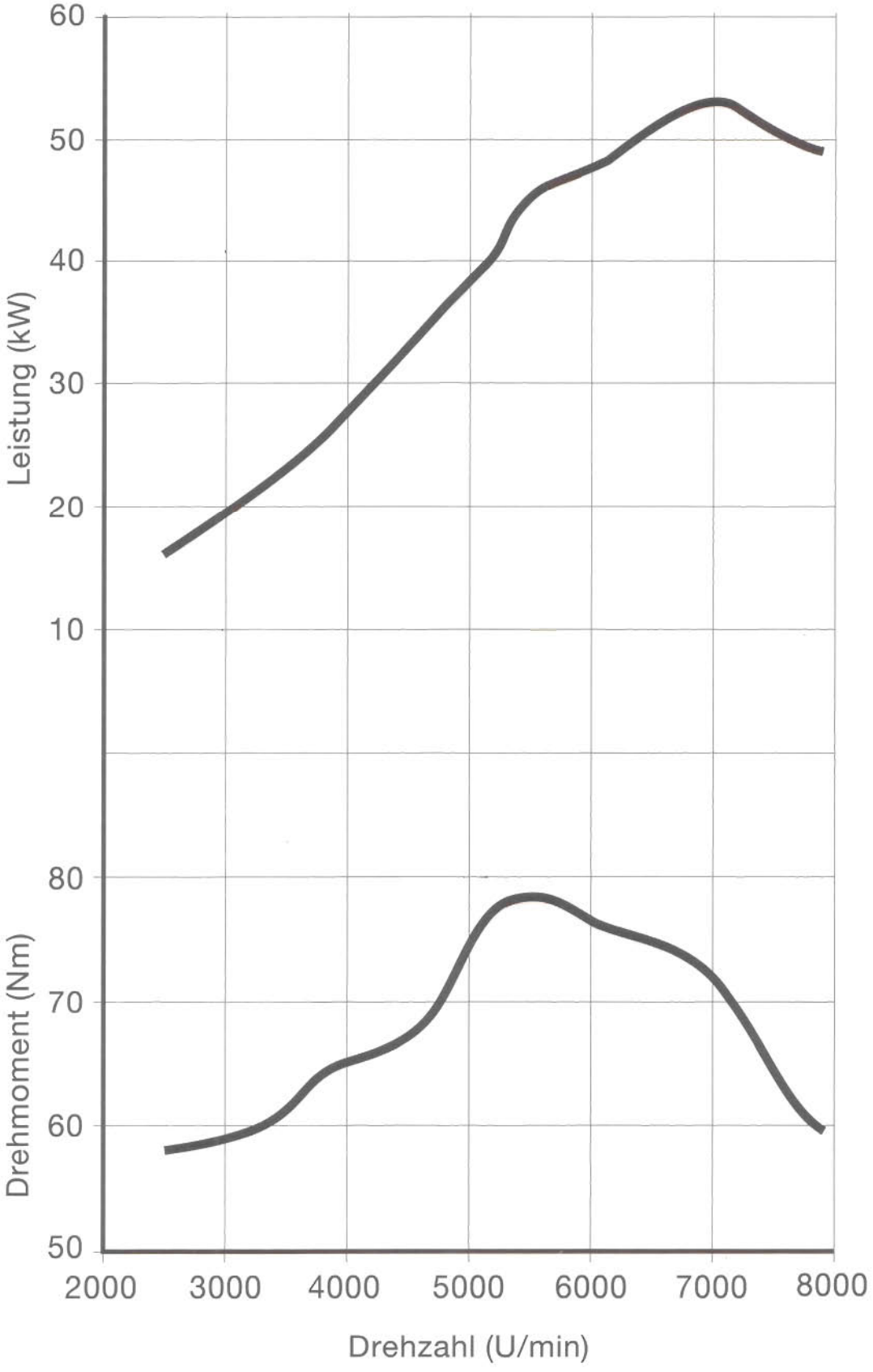
BMW R 1100	M 95/7



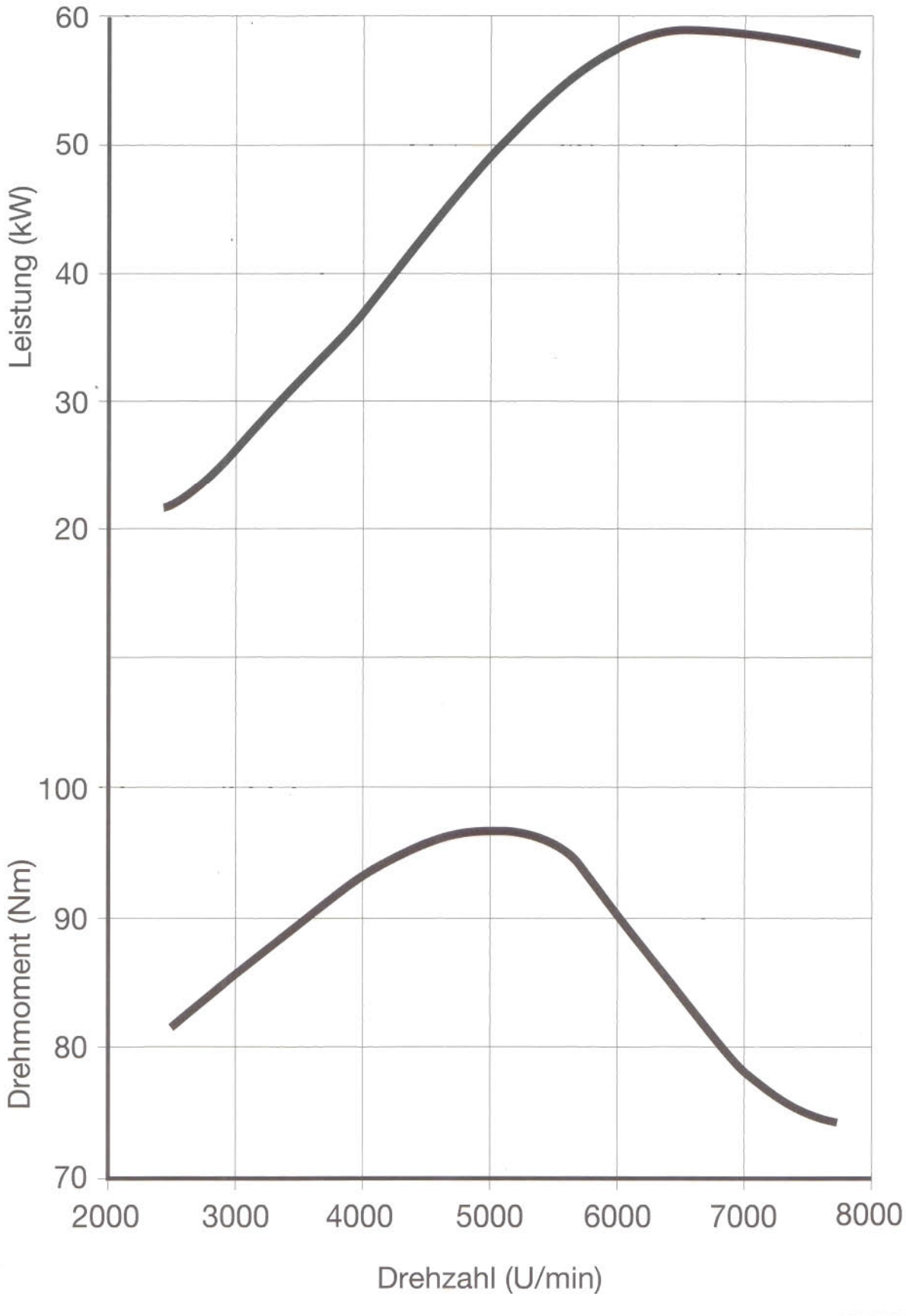
BMW R 1100	M 95/8



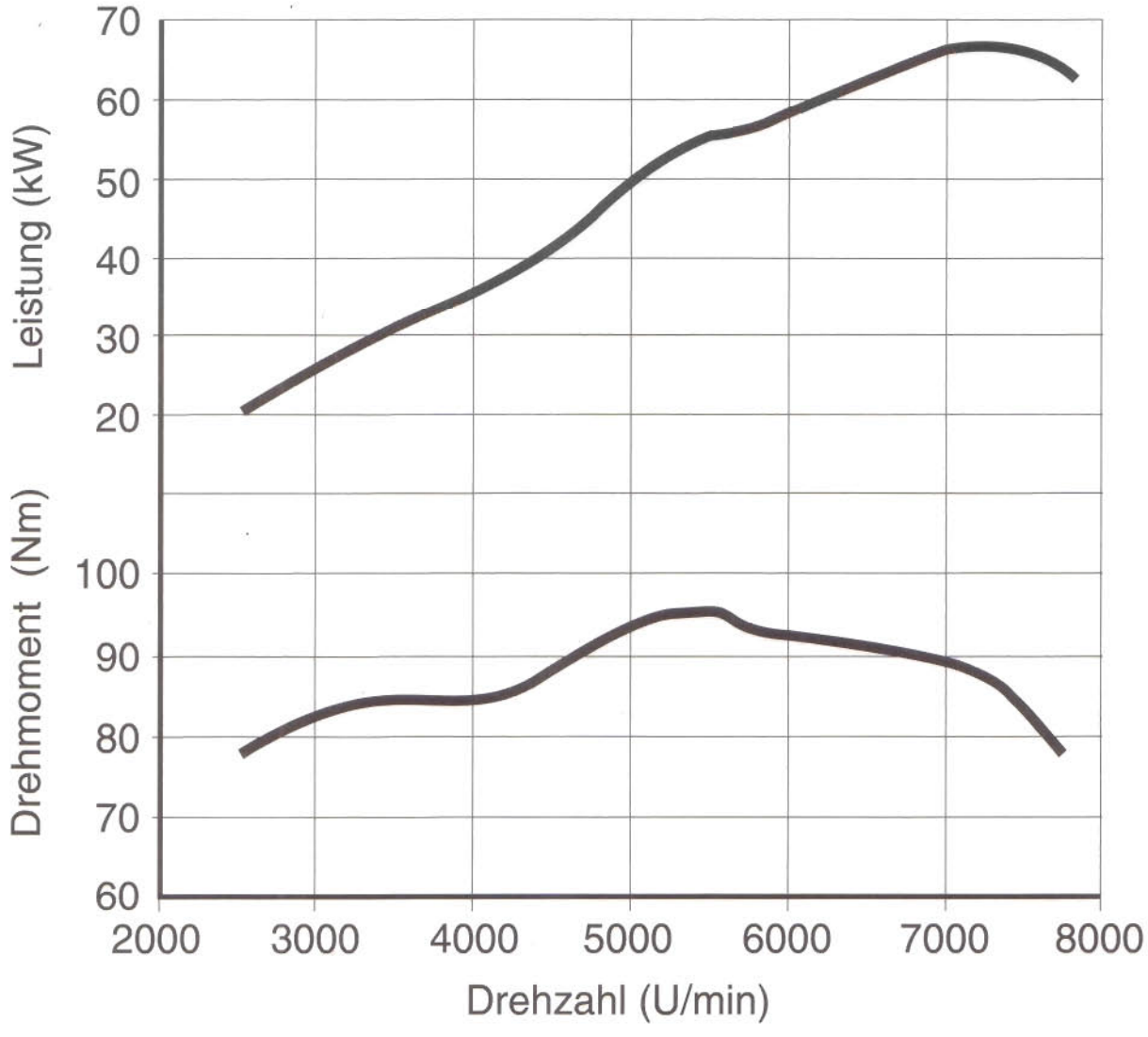
BMW R 850 R | M 95/9



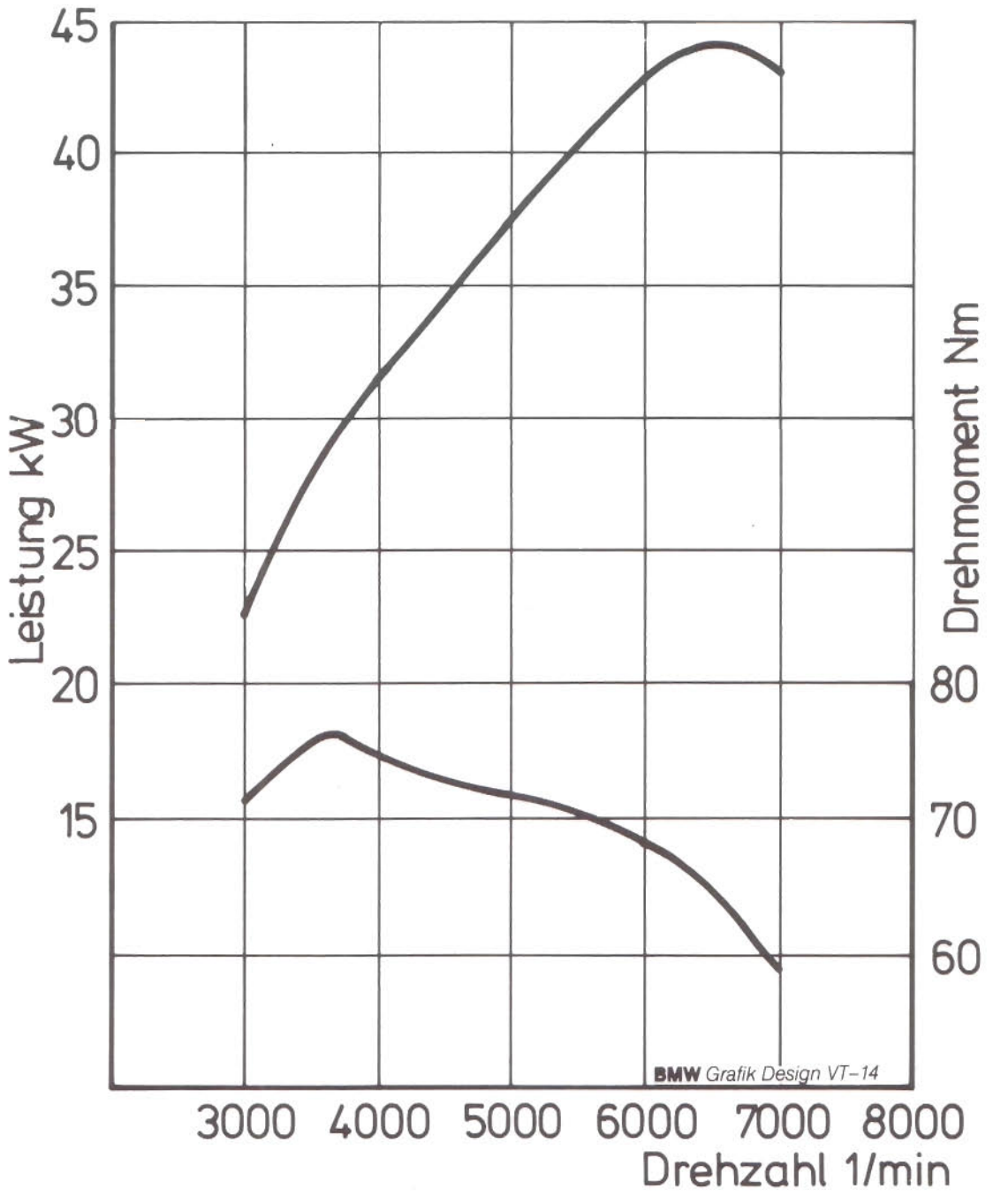
BMW R 1100 GS und R 1100 R | M 95/10



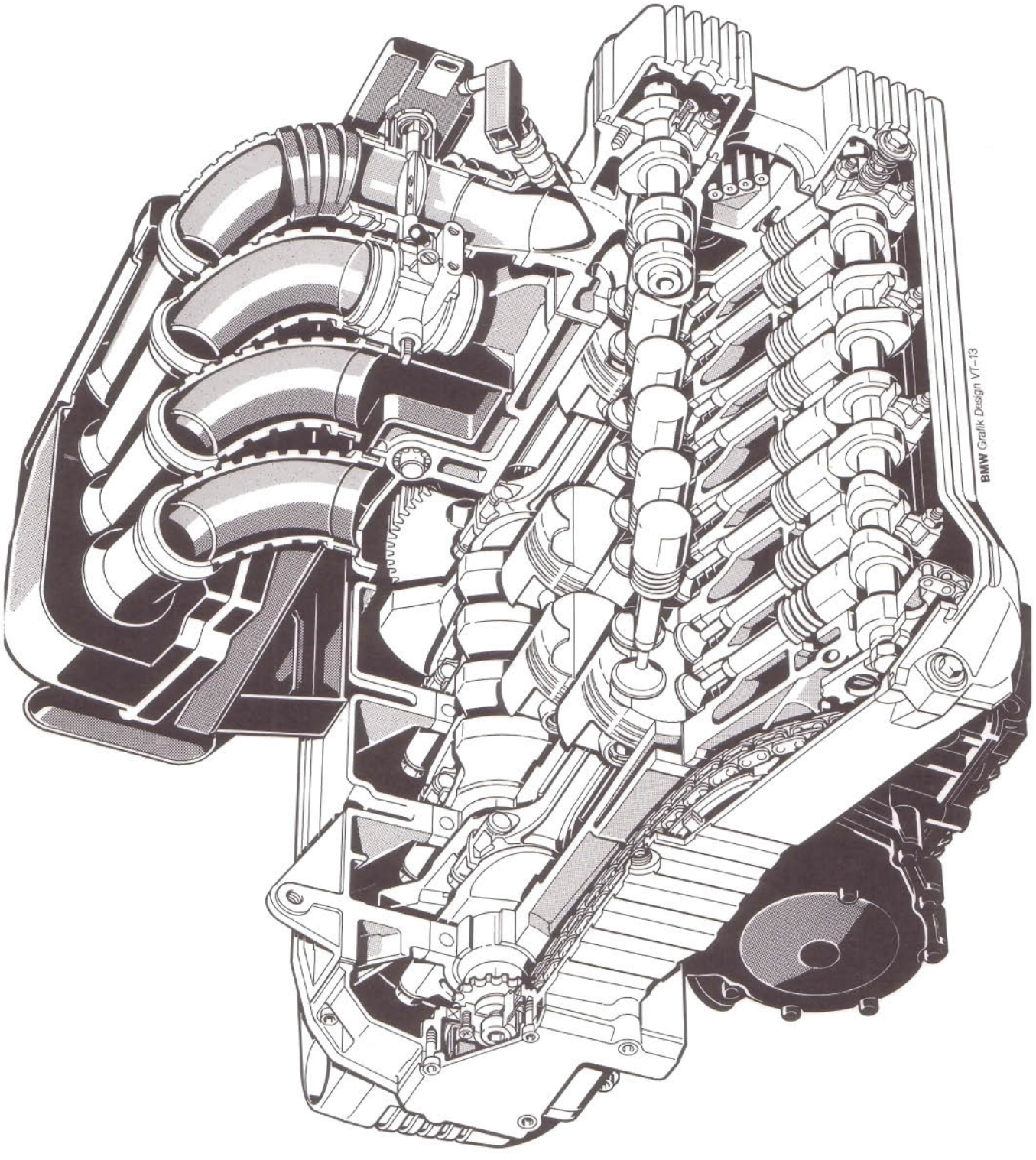
BMW R 1100 RS | M 95/11



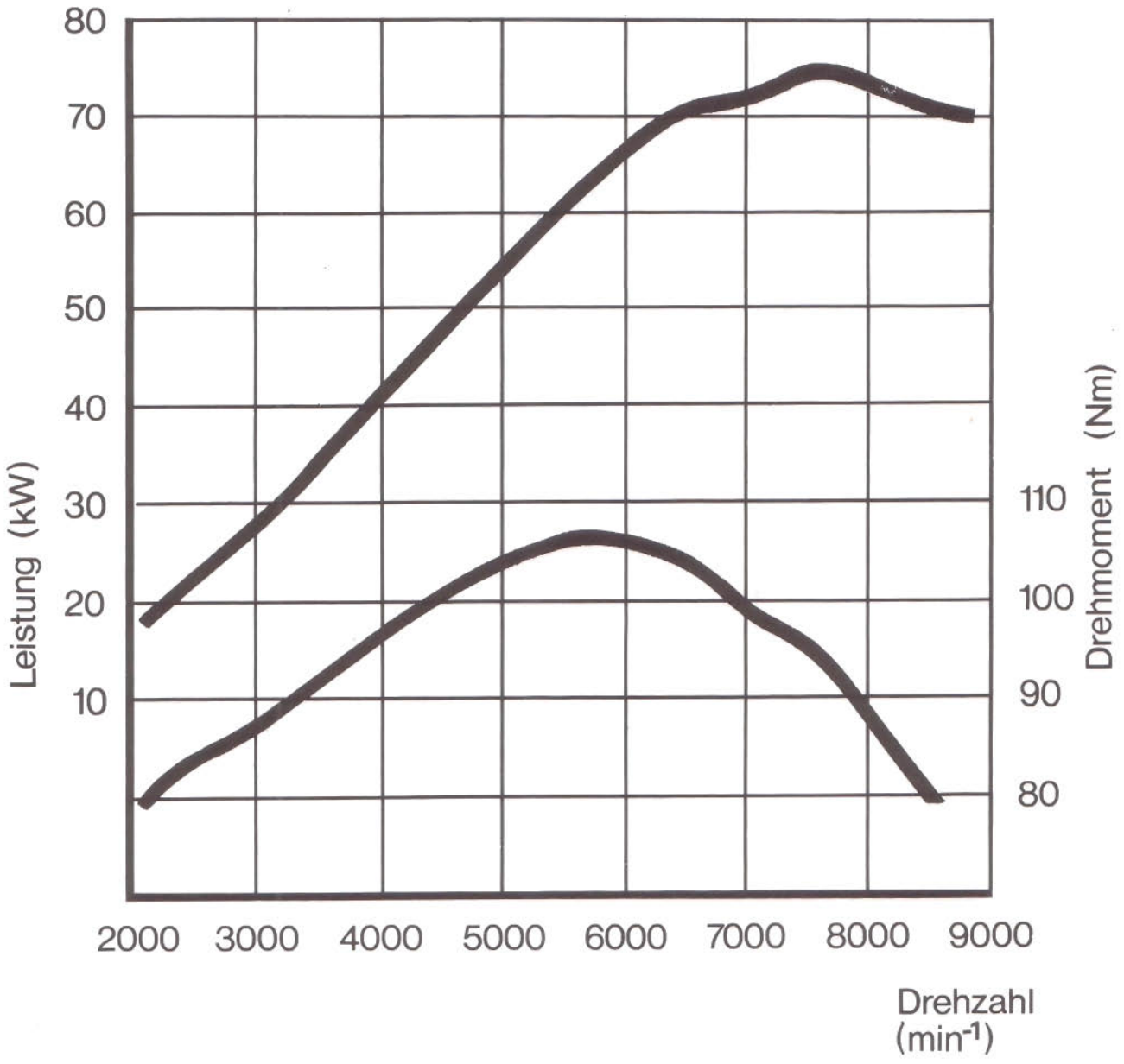
BMW R 100 R, R 100 GS und R 100 RT | M 95/12



BMW K 1100 RS und K 1100 LT | M 95/13



BMW K 1100 LT und K 1100 RS | M 95/14



BMW K 75	M 95/15