1953 R25/3

In the years immediately following World War II, Germans (and other Europeans) were clamoring for affordable transportation. Prior to the war, BMW had built considerable market share with its lineup of single-cylinder bikes. Inexpensive motorcycles were a staple of the European transportation system, and BMW's singles had established themselves as durable and well-engineered products. But the manufacture of civilian cars, trucks, and motorcycles had been curtailed during the war, and BMW hadn't built a civilian version of a motorcycle since the last batch of R71s left the factory in 1941. Shortly after the war's end in 1945, the Allied occupying forces allowed German manufacturers to resume production of motorcycles and other vehicles. However, since the rules dictated that the motorcycles displace no more than 250-cc, BMW wisely resurrected its lineup of affordable single-cylinder bikes.

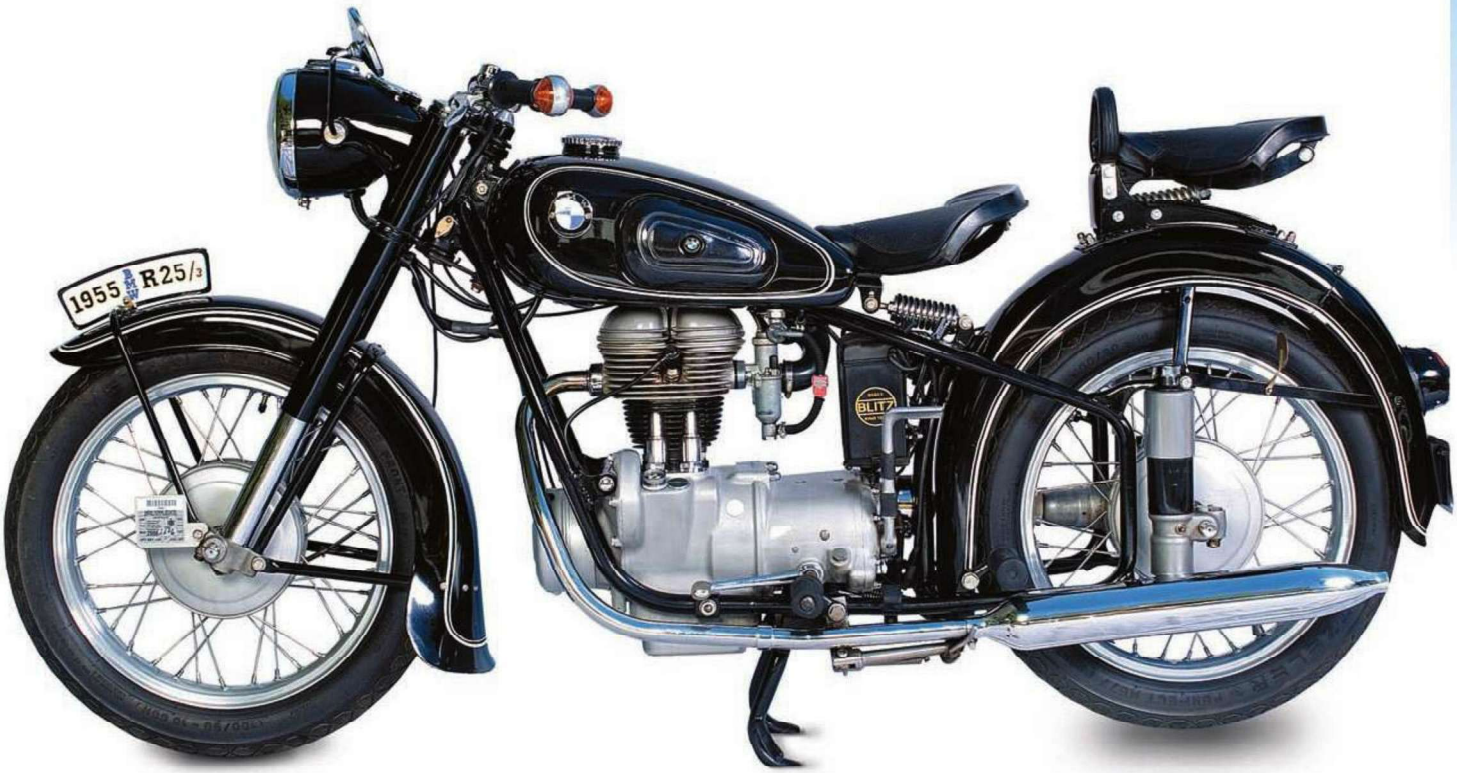
BMW's first postwar single was the R24. Like the R51/2, the R24 was derived from teardowns of the prewar R23, but it incorporated some significant improvements. Its new 247-cc single-cylinder engine, dubbed the 224/1, featured an all-new cylinder head closely based on the wartime R75's. This cylinder head sported revised valve angles, new rocker arm pillars, and a two-piece valve cover. Running a modest 6.75:1 compression ratio, the engine produced 12 horsepower at 5,600 rpm and could push the R24 to a top speed of 60 miles per hour.

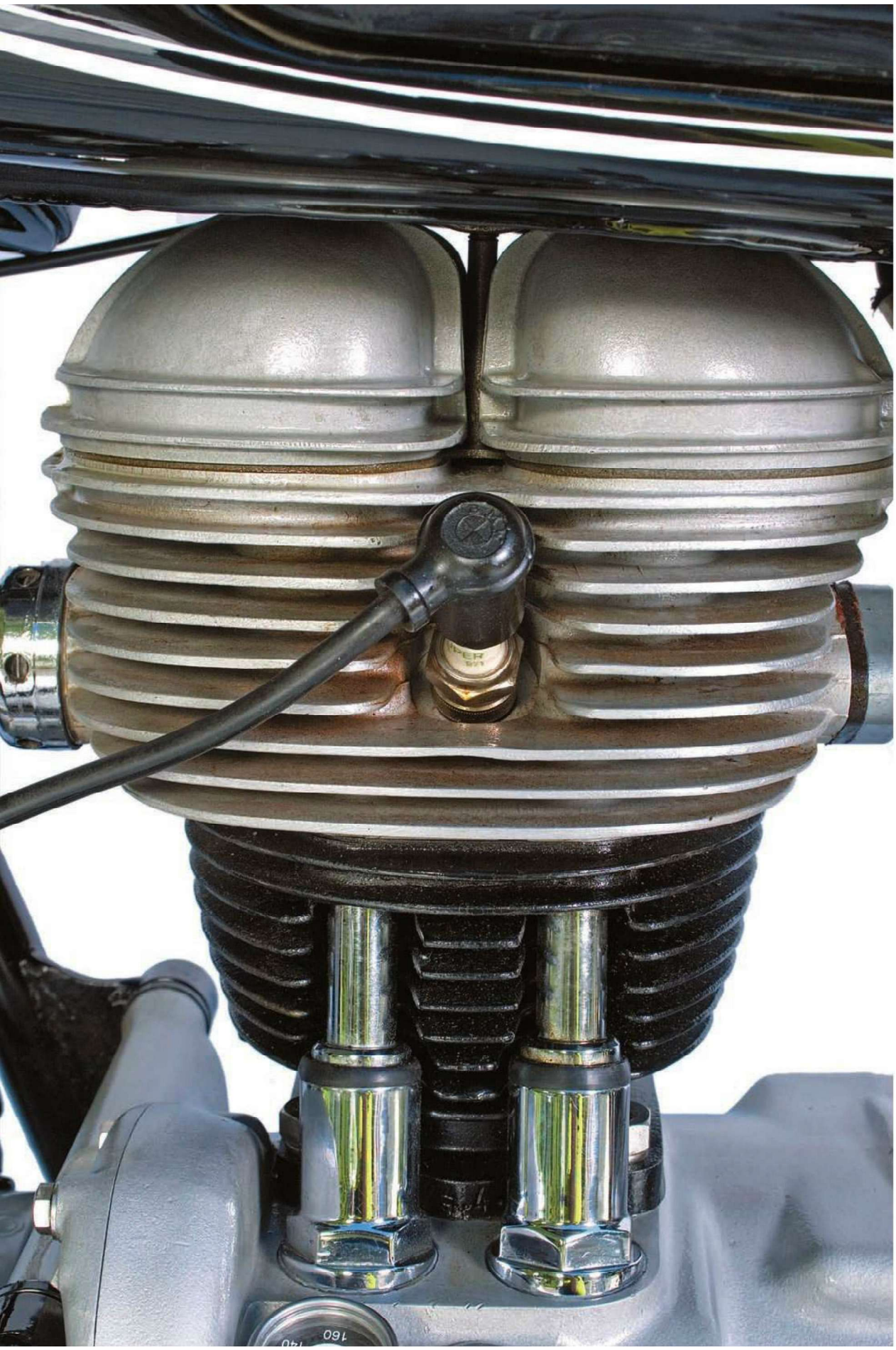
This engine was mounted in a familiar chassis, also called the 224/1. This tubular steel chassis featured a familiar twin-cradle design, with telescoping front fork and a rigid rear suspension. Adorning the R24 was the ubiquitous fishtail exhaust silencer, painted in a black finish due to the scarcity of chrome in postwar Germany. The 160-millimeter drums handled the braking chores at the front and rear, providing adequate stopping power for the 268-pound bike.

The R24 was launched into a receptive marketplace; BMW received 2,500 orders for the bike in early 1948, and the factory struggled to meet the demand through that year. However, as materials shortages eased during the next two years, BMW was able to produce over 12,000 copies of this bike before it was supplanted by the R25 in 1950.

The R25 was a mildly updated version of the R24. Its engine featured a revised camshaft and a larger intake valve, but these changes did not yield significant horsepower gains. The real news about the R25 was a new frame that featured a plunger-type rear suspension, making the R25 the first BMW single to ride on a fully sprung chassis. The R25/2, appearing in 1951, was nominally different from the R25, keeping the new chassis but reverting back to the R24 engine spec. The 1953 R25/3 had some significant powertrain and chassis developments, however. A 7.0:1 compression piston, revised intake system, and larger Bing carburetor boosted output to 13 horsepower.

The singles sold very well in postwar Europe through the mid-1950s. During this period, BMW produced 23,400 R25s, 38,500 R25/2 models, and 47,700 R25/3 bikes. The success of the BMW singles brought much-needed money into the company coffers, funding the R&D and manufacture of the company's next generation of boxers and singles.


1955 R25/3
BLITZ

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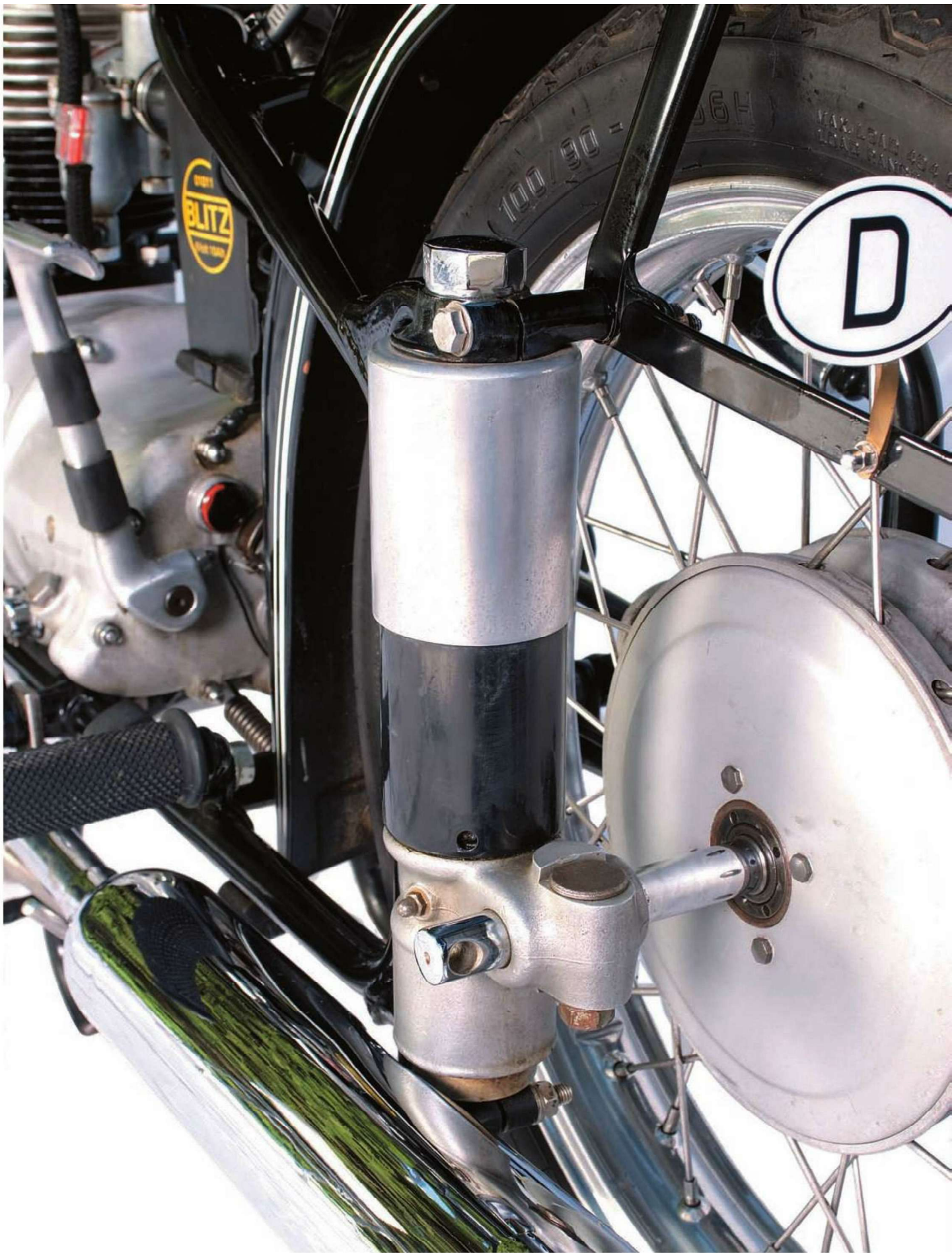
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1965 R69S

BMW had built a fine sporting motorcycle in the R68, a bike that helped re-establish its reputation as a manufacturer of powerful and refined machinery. With its dramatic styling and excellent performance, it served as a flagship for the entire lineup and was a source of pride for the war-ravaged company. But the powerful engine was pushing the edge of the chassis's performance envelope, and BMW engineers knew they needed to make some major changes.

BMW's racing experience in the 1950s helped to test some major engine and chassis technology improvements. Foremost among these developments were new swingarm suspension geometries. For years, BMW's factory teams had successfully campaigned motorcycles that used an Earles fork front suspension. The Earles fork was a robust setup, a design that BMW licensed from Englishman Ernie Earles. The design suspended the front axle via a swingarm and two shock absorbers that were attached to a pair of pivoting tubes descending from the steering head. The design was strong, had an innate resistance to dive under braking, and offered a well-controlled ride. An added bonus of the robust Earles fork was that it was especially well suited to sidecar duties. Racing teams had had success with this new suspension design, and it would soon prove to be a defining trait of BMW's production motorcycles as well.

The new suspension was to be offered in BMW's R50 and R69 of 1955. These bikes were based on a similar production chassis, which featured the Earles fork at the front and a standard swingarm at the rear. The new chassis retained familiar styling cues, with long loops that made them easily identifiable as BMWs, but the suspension design changes dramatically improved the bikes' ride and handling. In 1956, the Earles fork was also offered on the popular single-cylinder R26, and it would prove to be a defining trait of BMW bikes through the next decade.

BMW first showed the R50 and R69 to the public in January 1955 and put them on sale later that year. Company sales were weak through the end of that decade, but prospects revived in 1960 when banker Herbert Quandt invested heavily in the company. Quandt's financing helped BMW launch a quartet of bikes in 1960: the R50/2, the R60/2, the R50S, and the R69S.

The R69S was considered only an updated version of the existing R69 model, but it featured a few key upgrades. Its engine displaced the same 594 cc as the R69, but the pistons now ran a higher compression ratio of 9.5:1. Stronger internals, new carbs, and a harmonic balancer on the crank helped the engine produce a respectable 42 horsepower at 7,000 rpm. A hydraulic steering damper, mounted under the lower triple clamp, tamed headshake (a noted problem exacerbated by the Earles fork's unsprung weight). While not potent enough to dethrone the racy British motorcycles of the day, the R69S would develop a following as a powerful touring bike—a forerunner to the modern Sport Tourer.

BMW offered the R69S throughout the 1960s. The motorcycle division also created an R69 version without the Earles fork, the R69US. Built exclusively for export to the United States, the R69US was mechanically identical to the R69S, but its front suspension used a telescopic fork and all of the sidecar attachment points were removed from its frame. Despite these changes, the R69 was considered a very conservative motorcycle during the 1960s, and U.S. buyers were gravitating toward domestic V-twin bikes instead.


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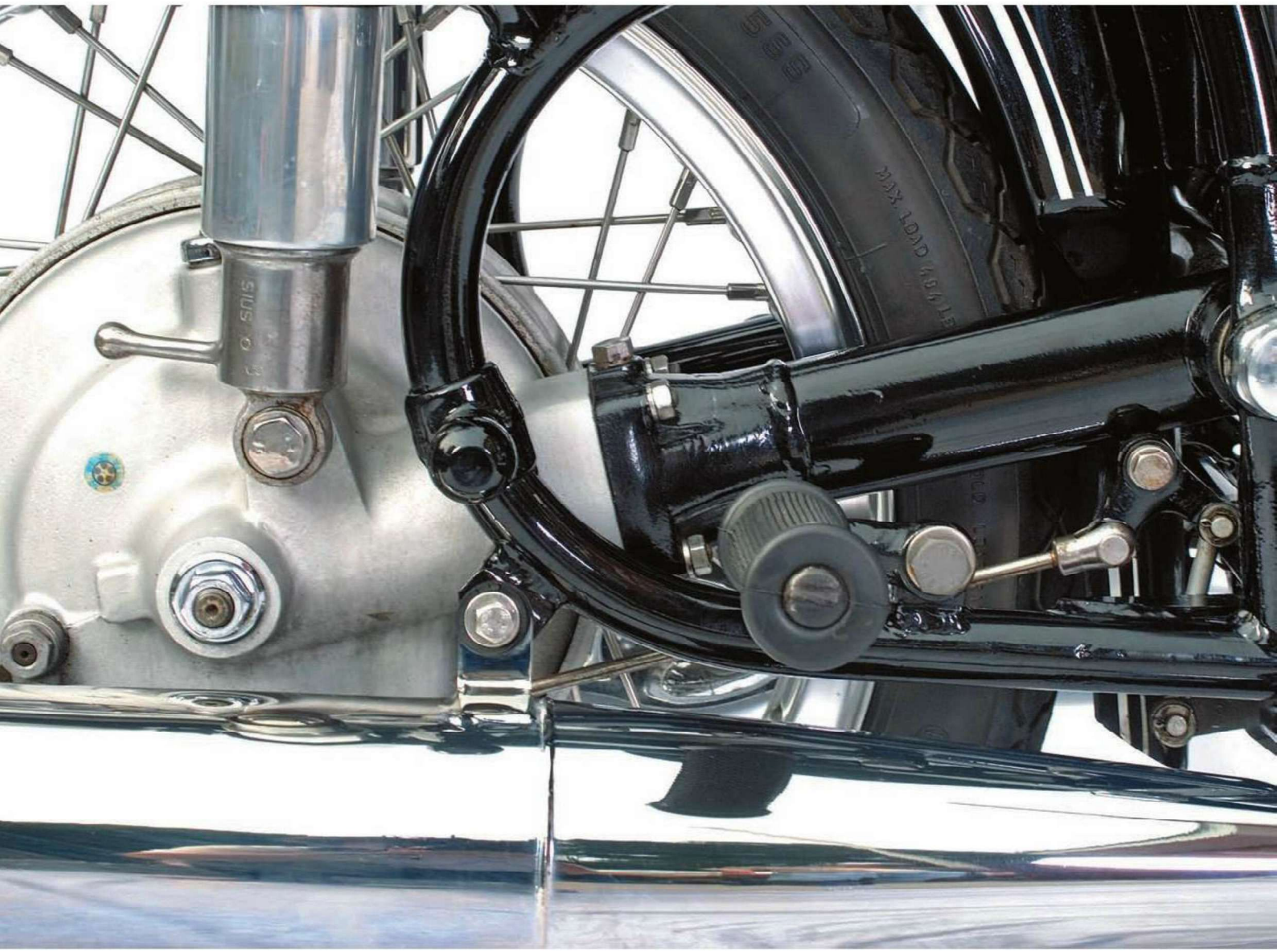
THE EMPIRE STATE



1967 R60/2

1969 R60/2 Polizei

BMW introduced three new models in 1955, all using the same chassis. Dubbed the 245/1, this chassis was shared by the R50, R60, and R69 and featured a true swingarm at the rear and the Earles fork setup on the front. This suspension layout was used on racing bikes and was considered state of the art in 1955. Of course, the rear swingarm is ubiquitous on today's motorcycles, but this suspension layout was an innovation in the 1950s. BMW would wisely incorporate this design into its lineup of boxer-powered bikes.

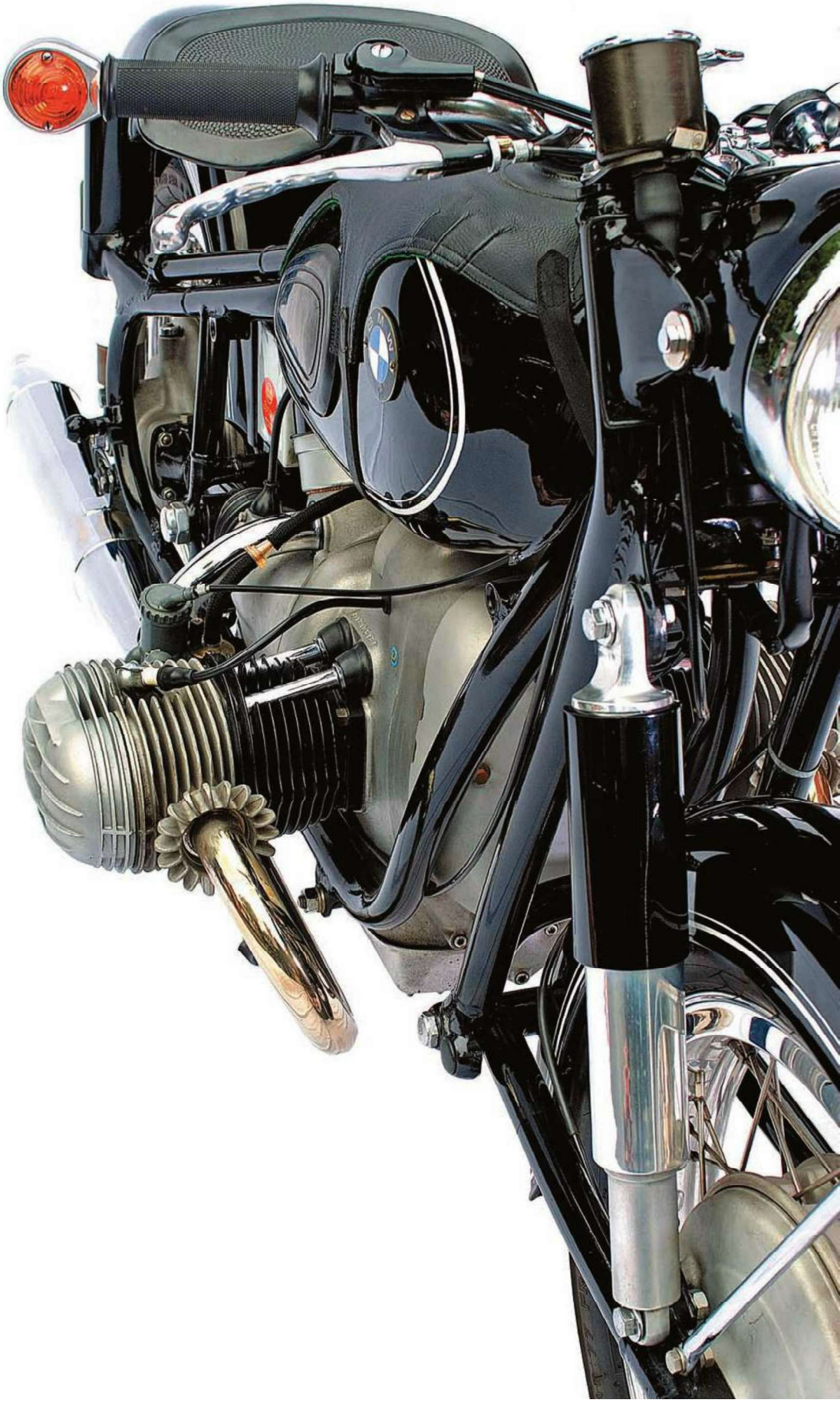
The R50 was powered by a modestly improved 494-cc engine, previously used in the R51/3. Boasting new pistons and a slightly higher compression ratio, the R50 had 26 horsepower on tap at 5,800 rpm. Mated to a four-speed transmission that no longer had a hand-shift lever, the R50 was not a thrilling performer, but it served well as a practical sidecar motorcycle. The R50's sister bike, the R69, was also powered by a previous-generation engine. Propulsion for the R69 came from the same 594-cc engine that was offered in the R68, a 35-horsepower boxer twin. Built with a reinforced crankshaft and mated to a new four-speed transmission, the R69 was the most sporting bike of the group. BMW targeted the new R60 directly for sidecar use. A utility-oriented replacement for the R67/3, the R60 was powered by the same torquey 26-horsepower engine. With the launch of these three bikes, BMW had nicely improved its boxer lineup, but the engineering progress didn't stop there.

The R50 and R69 were first shown to the public in January 1955, and they went on sale later that year. BMW struggled through the end of that decade, and Daimler-Benz made a takeover offer in 1959, but this offer was never accepted. Instead, BMW's fortunes were revived in 1960 by Herbert Quandt, who invested heavily in the company. His backing allowed BMW to weather the takeover offer and the downturn in sales. Quandt's financing also made it possible for BMW to launch a quartet of bikes in 1960: the R50/2, the R60/2, the R50S, and the R69S.

Fresh capital allowed BMW to make some significant improvements to its lineup. The R50 and R60 both received updates and were rebadged the R50/2 and R60/2. The focus of the improvements centered on the engines; both bikes received stronger crankshafts and bearings, and the R60/2 got new high-compression pistons. The 7.5:1 compression ratio (up from 6.5:1) raised the R60/2's peak output to 30 horsepower at 5,800 rpm. These updates helped make the R60/2 a success, and BMW manufactured this model from 1960 to 1969.

With modest horsepower ratings and heavy chassis, the R50/2 and R60/2 were

certainly not high-performance bikes. But it's important to put this in perspective. Throughout the 1950s, most of Europe (and especially Germany) was still in recovery mode after World War II. Buyers needed inexpensive, reliable transportation, and motorcycles were a very good solution. It's also no surprise that these motorcycles were widely used in commercial and police fleets. The R50/2 and R60/2 were important products for BMW, and they served their buyers very well.

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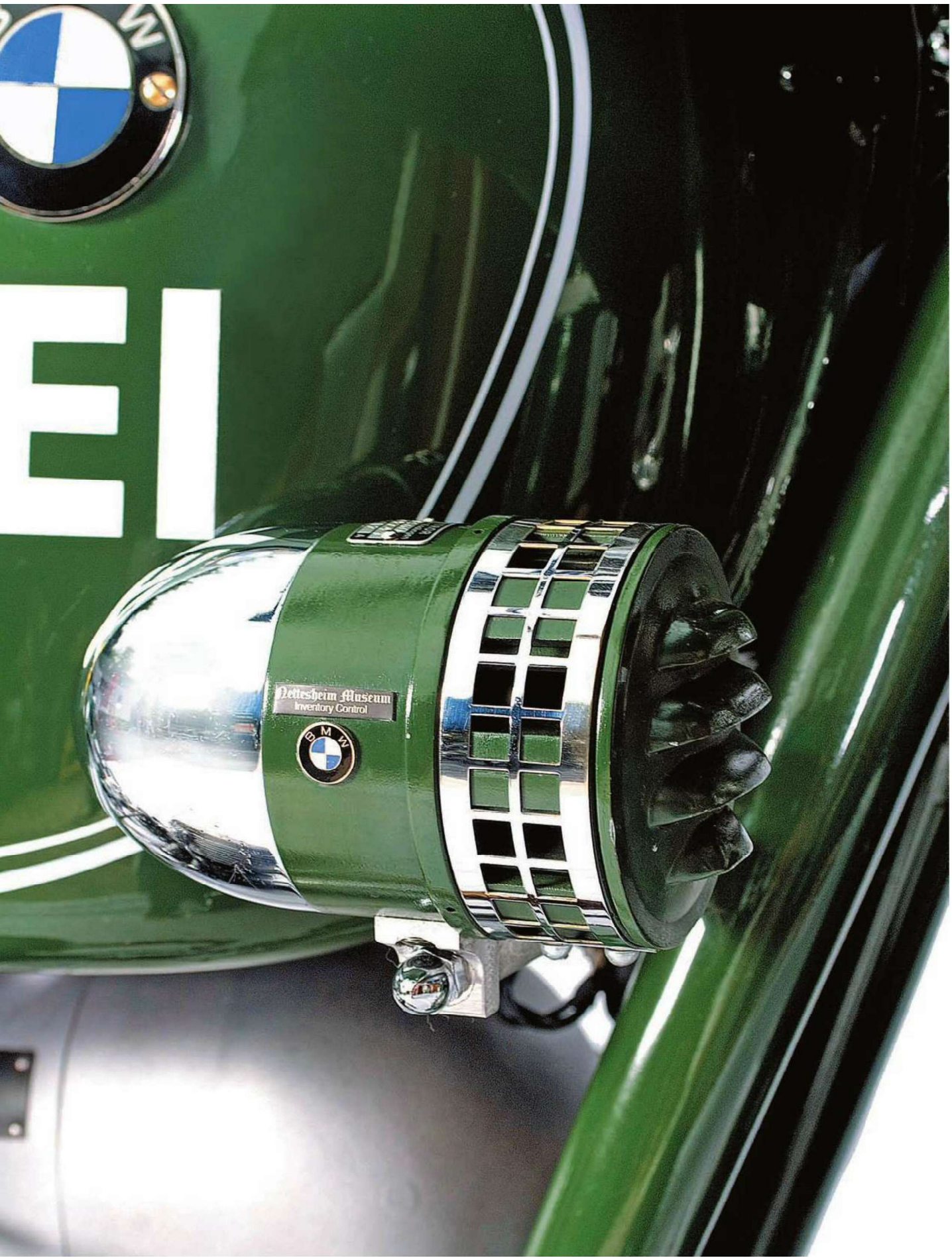
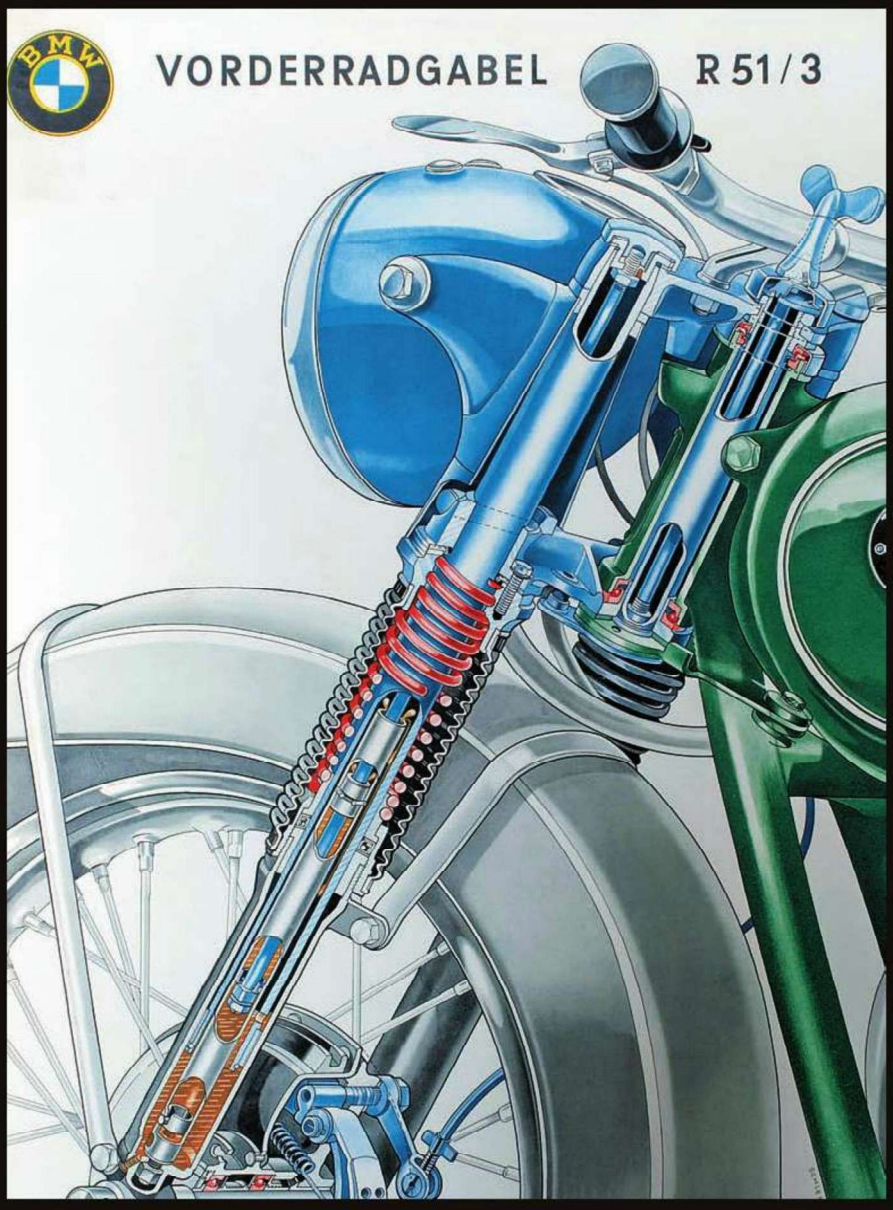

Nettesheim Museum
Inventory Control

1967 **R60/2** 1969 **R60/2 Polizei**


VORDERRADGABEL
R 51/3

1969–1984

As the 1960s drew to a close, BMW reevaluated its commitment to the motorcycle market. The company had increased automotive production rapidly over the course of the decade, and motorcycles were becoming much less important to its overall health. European motorcycle sales fell off dramatically during the '60s, and to make matters worse, Japanese manufacturers offered strong competition. Motorcyclists were discovering that the Japanese bikes were high-quality, technologically advanced machines, while BMW's line were based on 1950s designs with styling cues predating the war. The Beemers were not selling well in the face of this competition, and the motorcycle division's future was in jeopardy.

But BMW was not ready to give up on its motorcycles. In 1967, a photographer for a German magazine, *Das Motorrad*, snapped some spy photos of a new motorcycle running at the Nürburgring racetrack. This motorcycle was a BMW test mule and a signal to the two-wheeled world that the German manufacturer was preparing a new generation of motorcycles. Not only was BMW developing new bikes, but it was also moving motorcycle production from Munich to Berlin to afford automobile manufacture full use of the Munich plant. Bike production relocated to a former Siemens aircraft engine factory in Spandau, a Berlin suburb. BMW ceased motorcycle production at the Munich factory in May 1969, marking the end of one era and the beginning of a fresh one for Beemer bikes.

The /5 series was officially unveiled in the fall of 1969, under the watchful eye of new motorcycle operations chief, Wilfried Kramm. The bike was powered by an all-new boxer engine, and its chassis was a true clean-sheet design that addressed many of the shortcomings of the previous generations. It also represented a major style shift for BMW motorcycles.

Until this point, BMW dealers had a difficult time pitching BMWs as technologically advanced when they resembled the hardtail, side-valve bikes of the 1940s. Even if the bikes incorporated modern features, why did they look old? The /5 series challenged these preconceptions, however, and for the first time in more than 20 years, BMW had a motorcycle with a unique, modern look.

An all-new engine powered BMW's new /5 series. The engine case enclosed the crank, air filter, and starter, and the camshaft was now under the crank, moving the pushrods below the cylinders. The new design also lifted several key technical elements from BMW's automotive engines, notably an automatic tensioning cam chain and stronger crankshaft main bearings. The engine's high-pressure lubrication system didn't require the use of expensive roller bearings, and a battery and coil ignition replaced the magnetos. The cylinder heads were cast with larger valve openings, and an aggressive camshaft made this a heavy-breathing engine. Though it retained its predecessors' boxer layout, the engine was improved in almost every way. In late 1969, BMW released the R50/5, R60/5, and R75/5. Engineers employed the same stroke in all three engines, while varying cylinder bore to yield displacements of 498 cc, 599 cc, and 745 cc, respectively.

The moto world took notice of BMW's new bikes. The motorcycling press raved about the /5 series, praising its modern styling and refined manners. The bikes handled well, looked good, and were capable sporting machines. Once again BMW commanded the attention of the motorcycling world.

During the next several years, engineers and designers continued to update and improve the /5 series bikes. The early /5 bikes were known to have issues with "head shake" (front-end wobble) at high speeds. BMW engineers experimented with new forks and steering geometries, but were not able to solve the problem quickly. In 1973, they resolved the issue by extending the swingarm and stretching the bikes' wheelbase. This change altered fore and aft weight distribution and eliminated the nervous high-speed behavior. The stretched wheelbase had some added benefits, including additional space to locate a larger battery under the seat. The new layout also allowed for relocation of the footpegs, which created more legroom behind the engine.

In 1973, BMW upgraded the bikes and gave them a new model designation: the /6 series. The slow-selling R50 disappeared from the lineup, but the R60 and R75 remained and received substantial upgrades. Now designated the R60/6 and R75/6, the bikes got new five-speed transmissions and 280-watt alternators, and the R75/5 was equipped with a much-needed front disc brake. BMW also added a new model, the R90/6, which was powered by an 898-cc version of the boxer twin. The bigger engine was simply a bored-out version of the R75 mill.

More surprises were on the way. In 1973 BMW unveiled the R90S, its most potent motorcycle yet and a true superbike. The hot R90S used a performance-tuned version of the R90/6 engine, featuring larger 38-millimeter Dell'Orto carburetors, high-compression (9.5:1) pistons, and a hotter camshaft. The bike handled very well, and its performance numbers were competitive with the excellent Japanese bikes of the day, including the Honda CB750. But what really set the R90S apart was its styling. Featuring a rounded café-racer fairing and a stellar paint job, the R90S looked unlike any other motorcycle in the world. It commanded a hefty price, too, retailing for $3,800 in the United States in 1974.

The /6 models were updated in 1977 and renamed the /7 series. Bored-out cylinders boosted the displacement of the R75 and

R90, so they became the R80/7 (798 cc) and R100/7 (980 cc). At the top of the model range was the stunning R100RS—the Hans Muth design that shocked the motorcycling world with its radical fully faired body. The R100RS defied categorization when it was introduced; it was truly the only bike of its kind ever offered to the public. Was it a sportbike? A touring bike? It was actually both, and the R100RS single-handedly created the sport-touring motorcycle category. It was later joined by the R100RT, a bike that was fully faired like the RS, but had much less sporting character. At an MSRP of $6,345 in 1979, the R100RT was the most expensive touring bike that BMW had ever offered, but the softly sprung, fully dressed tourer did not live up to its expectations, and buyers ignored the bike in droves.

The late 1970s motorcycle market was growing increasingly competitive. BMW had introduced its most technologically advanced bikes ever, yet they quickly became outdated in the face of intense competition from the land of the Rising Sun. The Japanese manufacturers were accelerating their product development efforts and were extremely active (and successful) in worldwide motorcycle racing. The Japanese bikes had sophisticated overhead-cam engines that spun to sky-high redlines. Not only were the Japanese bikes performing well, but their engineering and reliability also matched or surpassed what BMW was offering. The competition was challenging BMW motorcycle division on every front, and by the end of the '70s its future was again in doubt.

THE K-BIKES ARRIVE

At the close of the 1970s, BMW faced a major test of its commitment to making motorcycles. By 1980, BMW's U.S. sales had utterly collapsed, and the Japanese manufacturers were dominating the worldwide market. Beemers were priced far above the Japanese competition, yet they offered precious little in features or quality to justify such a comparatively high price. Rivals Triumph and Harley-Davidson faced similar endgame scenarios.

BMW had survived two world wars, so this was not a company that gave up easily. Forced either to innovate or die, BMW took the only path it knew. Borrowing engineers and designers from its automotive division, the company quietly undertook development of an entirely new range of motorcycles. At the same time, it devoted considerable resources to restoring public enthusiasm for its boxer-powered bikes.

Of course, the new model range was the inline-powered K-series. For the first time since the days of Max Friz, BMW was preparing to offer a completely new engine design. This engine was a liquid-cooled, dual overhead-cam (DOHC) four-cylinder that displaced 987 cc. The engine used Bosch electronic fuel injection and generated 90 peak horsepower. The new inline engine was mounted longitudinally in the bike's frame. Yet unlike the competition's approach, the BMW engine was turned 90 degrees from vertical, placing the cylinder head in front of the rider's left foot with the pistons traveling horizontally. This layout had several advantages over a vertical orientation—most significantly, it kept the bike's center of gravity much lower.

The first bikes to use the new engine were the K100, K100RS, and K100RT, and they were officially unveiled in the fall of 1983. The bikes shared a common powerplant and similar chassis, but were differentiated by their features. The K100 was the roadster, sporting only a small fairing to protect the rider from the wind. The RS was a sport-tourer, fully clad with fairings and including stylish hard luggage for extended road trips. The RT was the classic touring bike, targeted to riders who wanted to put as many miles under their feet as possible.

GELÄNDSTRASSE

The K-bikes were certainly distinctive; BMW had pulled itself into the modern motorcycle design era. But the K-series bikes were not the only new products in BMW's lineup. In the early 1980s, the company created yet another new motorcycle classification: the adventure-tourer.

BMW had been formally involved in off-road racing for years, and in 1979, a BMW won the prestigious International Six Day Trials (ISDT). The bike was a purpose-built, 872–cc, boxer-twin-powered behemoth, with a special chassis featuring a mono-shock rear suspension. The bike was physically huge by off-road standards, heavy, too powerful for serious off-road work, and quite unlike any other bike in BMW's stable. BMW had a production R80G/S in showrooms the following year.

The G/S (shorthand for Geländstrasse) openly defied convention. Not only was it a large dual-sport bike with a very big engine, it actually had a sophisticated chassis and an all-new rear suspension design. The Monolever rear swingarm was a single-sided, monoshock setup with an integrated driveshaft.

Nothing like it had ever been offered by a major manufacturer. Yet buyers lapped it up like a fine Bavarian Pilsner. Sure, it was too heavy for serious off-road riding, but this was mitigated by the bike's excellent on-road behavior, where it came across as light and nimble. The bike was an unqualified success, and it quickly became the best-selling bike in the BMW lineup; the GS models still continue to be extremely popular.

1974 R90S

The R90S was BMW's answer to the superbikes of the early '70s, and it was a shock to the motorcycling world.

BMW had introduced the /5 series in 1969, and the bikes had revolutionized BMW's motorcycling image. Gone were the chassis of the '50s and '60s that were reminiscent of BMW's rigid-framed early bikes. A completely new boxer engine had redefined BMW's motorcycles, and the new bikes had made BMW competitive in a market that was heavily influenced by the Japanese manufacturers. Accelerating its development schedule, in 1973 BMW brought out the /6 series: the R60/6, R75/6, and the long-anticipated sport-bike R90/6.

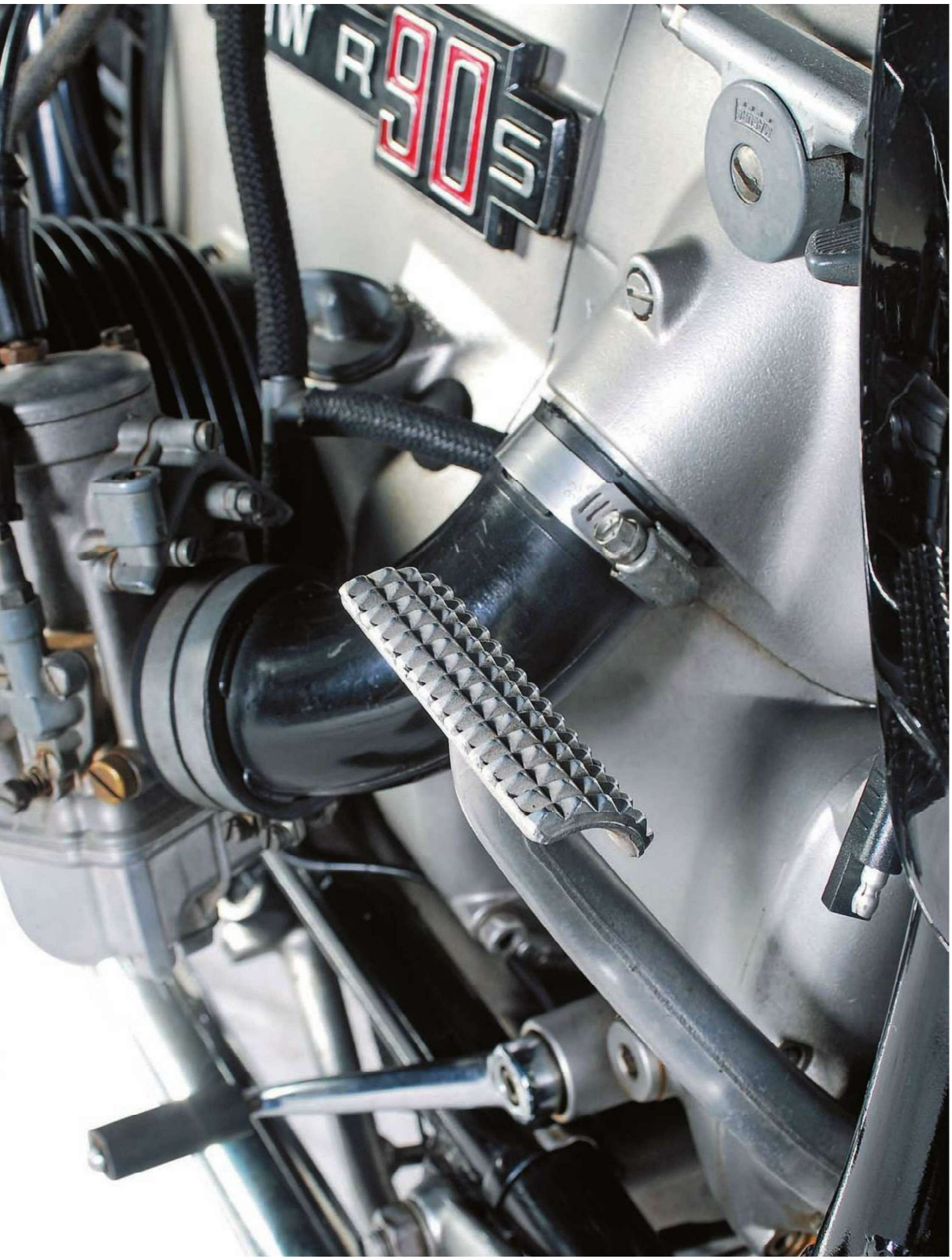
For about a year, there had been rumors of a 900-cc bike from BMW, and the 1973 R90/6 put those rumors to rest. Its powerplant was a bored-out version of the /6 series mill, producing 60 horsepower at 6500 rpm. Mated to a five-speed transmission, the 898-cc engine could push the R90/6 through the quarter-mile in 13.5 seconds and achieve a top speed of over 115 miles per hour.

The R90S, BMW's high-performance flagship, appeared in 1974, and it caught the entire motorcycling community by surprise. Based on the R90/6, the new bike offered even more performance with a radical styling twist. The R90S received a strengthened version of the R90/6 engine, featuring a stronger crankcase, higher compression (9.5:1) pistons, and larger 38-millimeter carburetors. The result was a boost in output to an impressive 67 horsepower. BMW's engineers gave the R90S chassis equal attention. Out front, twin vented front-disc brakes handled stopping chores, and an adjustable hydraulic steering damper mounted under the tank aided with cornering stability. The bike's long-travel suspension did a marvelous job of taming uneven pavement, offering sporty handling without compromising all-day riding comfort.

But the R90S's most striking feature wasn't its performance. With its remarkable new fairing and beautiful paint finish, the R90S set new styling standards—not just for BMW, but for the entire motorcycle industry. Created by BMW designer Hans Muth, the prominent café-racer headlight fairing was the first of its kind ever offered on a production motorcycle. The very functional fairing surrounded the round headlight and swept back toward the rider, offering wind protection and creating a perfect location for the cockpit instrumentation. On the outside, a Smoke Black finish was hand-painted on the fairing, tank, and side panels, further enhancing the bike's striking appearance.

It's difficult to overstate the R90S's impact on BMW's image. Long known for bikes that were well-built and durable, BMW made an extra leap with the R90S into the sporting motorcycle limelight. While there were certainly powerful competitors in the market, including the Honda CB750 and the 82-horsepower Kawasaki triple, none of them could match the R90S' combination of sporting capability, style, and quality. A manufacturer's suggested retail price (MSRP) of $3,800 in the United States meant that the BMW superbike was not for everyone; nevertheless, BMW's U.S. importer easily sold every copy that it was able to bring to the United States. The bike proved that buyers were willing to pay a premium for an outstanding motorcycle. The R90S's combination of power, handling, comfort, and style was unmatched in its day, and it would set the stage for more success through the 1970s.


BMW R90S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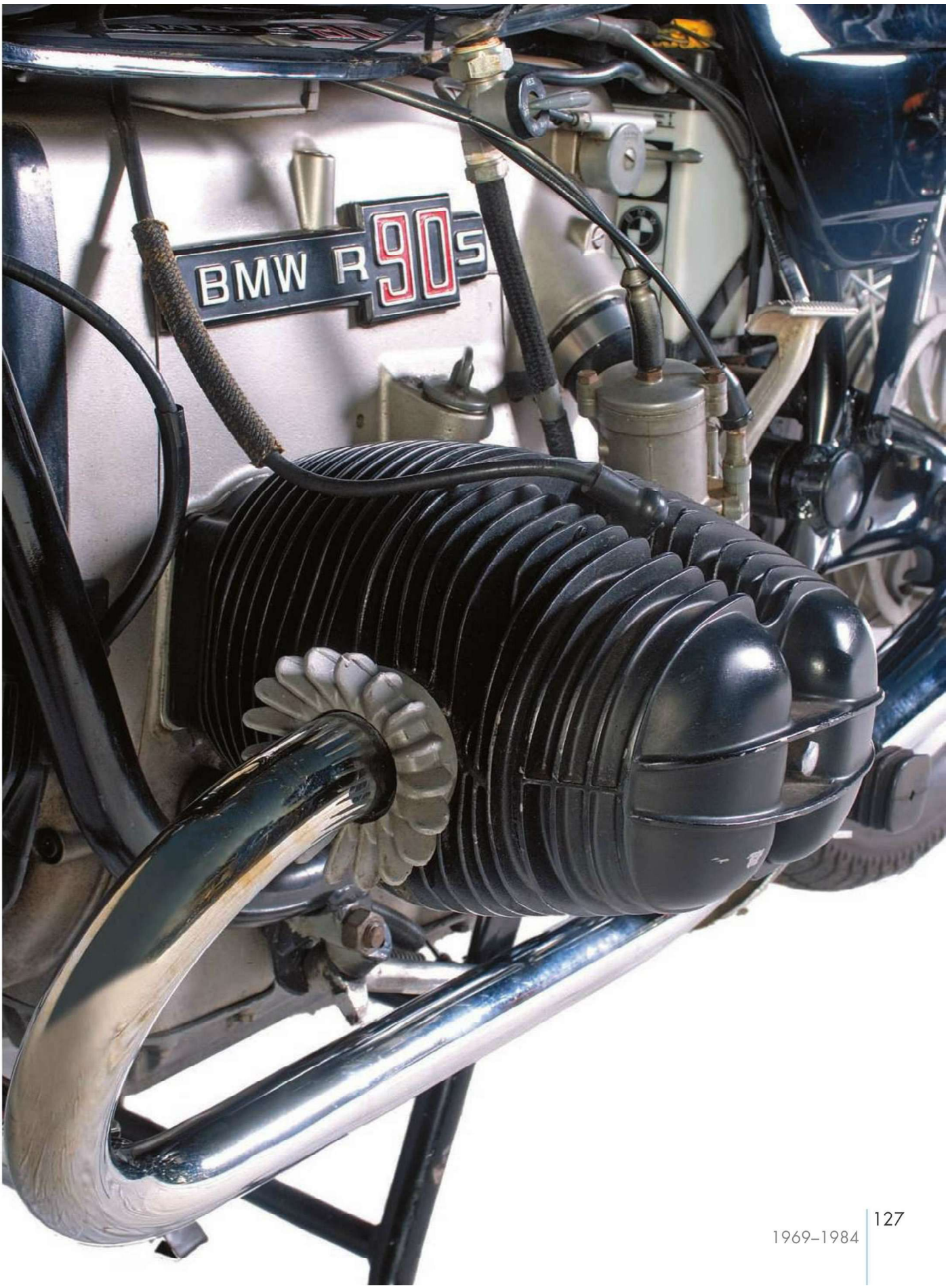

BMW R 90 S

1979 R100RS

The /6 series motorcycles were a big success, yet in typical BMW fashion, they received a steady flow of improvements. The new five-speed transmission that was introduced in the /6 series was plagued by difficult, clunky shifting. New shift forks solved this problem in the 1975 models, and this upgrade kit was offered to owners of previous years' models. The R60/6 and R75/6 models received braking system upgrades in the form of single-disc front brakes. The rotors were drilled to aid water dispersion, and the disc brakes were lighter and offered more braking power than the drums that they replaced. The R90S also received mild updates and a new Daytona Orange color option.

The R90S was a harbinger of major changes at BMW. The company had created a unique and powerful motorcycle, a true superbike that carried an image of engineering prowess and modern, powerful performance. BMW bikes were no longer regarded as conservative, sidecar-pulling motorcycles. The R90S was evidence that the company was capable of producing some of the finest sporting motorcycles in the world. Yet in the late 1970s, demand for motorcycles was declining. Slowing economies and higher oil prices caused worldwide motorcycle sales to falter in 1977, and the slide continued through 1979. In the face of these challenges, BMW was once again pushed to change and innovate or suffer significant consequences in the marketplace.

Following on the heels of the R90S's success, BMW again turned the motorcycling world on its ear with the radical R100RS. BMW designer Hans Muth created a sporting motorcycle that was unlike any other in the world. Its futuristic appearance and cutting-edge performance features would help BMW establish an entirely new motorcycle class.

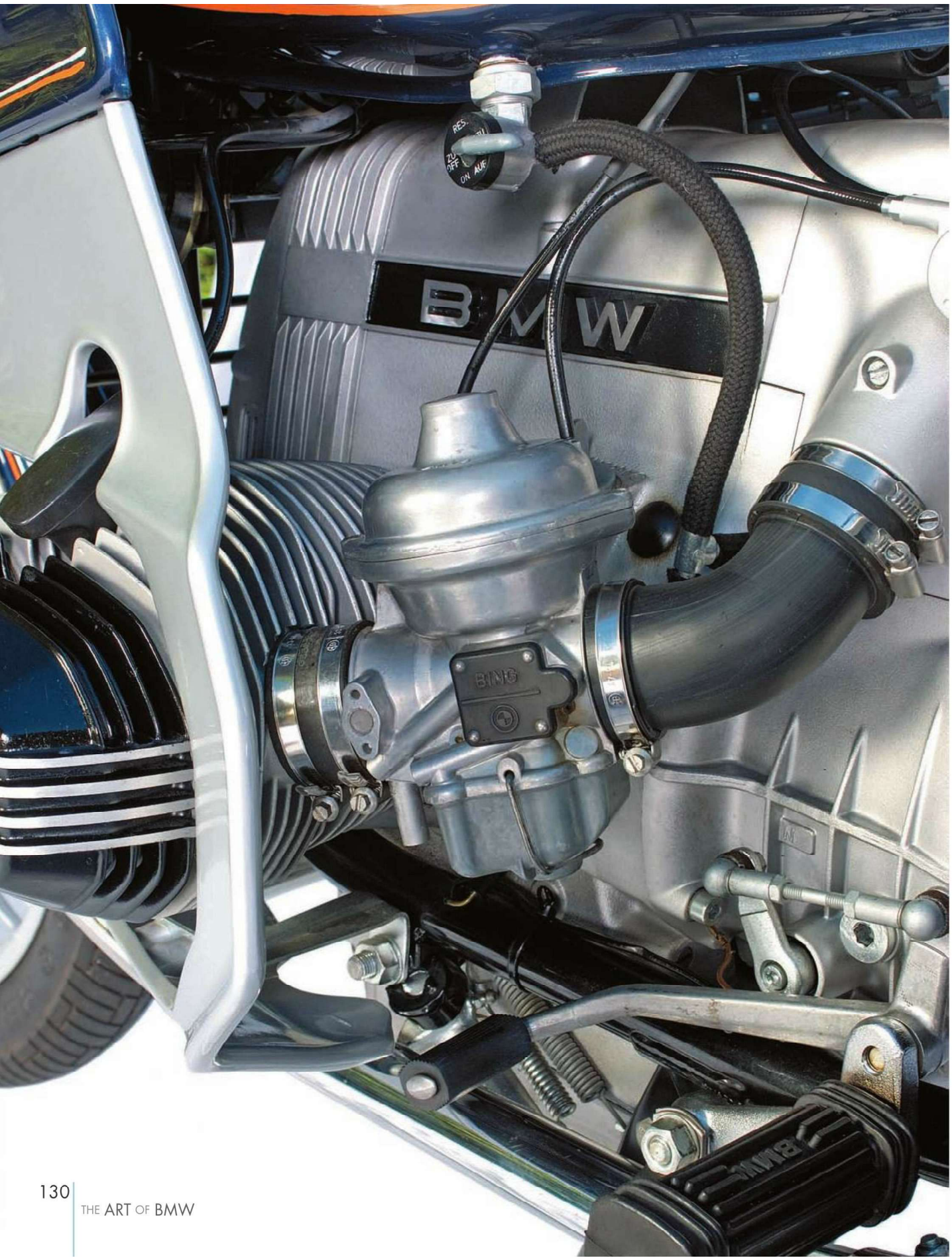
The bike's most striking feature was its modern, aerodynamic bodywork. BMW engineers used wind-tunnel testing extensively to shape the fairing's angular nose and swept windshield. The nine-piece bodywork kit included side panels that provided the rider with outstanding protection from the elements. Also integral to the bodywork design was a front spoiler that significantly reduced front-end lift and aided in stability at higher speeds. Behind the windshield, a full set of analog instruments that included an ammeter and large clock were integrated into a clean dashboard layout. A sporting saddle and low handlebars allowed the rider to "tuck in" behind the fairings, further aiding the bike's aerodynamic profile.

Motivation for the R100RS came from a punched-out version of the R90S mill. The new muscle was a direct result of a larger bore and new 94-millimeter pistons that pushed the boxer's displacement to 980 cc. The newfound power required a reinforced crankshaft, which was supported by only two main bearings and housed in the strong, compact crankcase. Atop the cylinders, the valvetrain layout was virtually identical to the R90S's, using a common camshaft to actuate pushrods that traveled beneath the cylinders. The new 980-cc engine generated 70 horsepower at 7,250 rpm and had a broad, flat torque curve. Putting this power to the ground was a five-speed transmission that was shared with all the other contemporary BMW boxers.

The R100RS excelled in its mission as BMW's (and the industry's) first modern sport-touring motorcycle. The strengthened frame and smooth-riding suspension made the bike a very satisfying mount, both in the twisties and on the long highway drones. The liter-sized boxer twin could propel the bike out of corners with authority, even when burdened with passengers and gear.

It had enough power to push the R100RS to a top speed of 125 miles per hour. The large, 6.3-gallon fuel tank allowed a very impressive fuel range of 240 miles, and the spacious hard luggage could easily accommodate the necessities for a long weekend's riding trip.

The R100RS was very desirable but expensive, with an MSRP of $4,595 in the United States. But the bike struck a perfect balance between a sporting motorcycle and a long-distance tourer, truly putting it in a class by itself. There was no shortage of buyers.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BMW

1983 R65LS

BMW's lineup in the late 1970s was dominated by the big boxer twins, but demand remained for smaller-displacement bikes as well. BMW responded with the R45 and R65. These small, lightweight bikes were aimed to compete against the influx of Japanese motorcycles that dominated the light- and middleweight street categories.

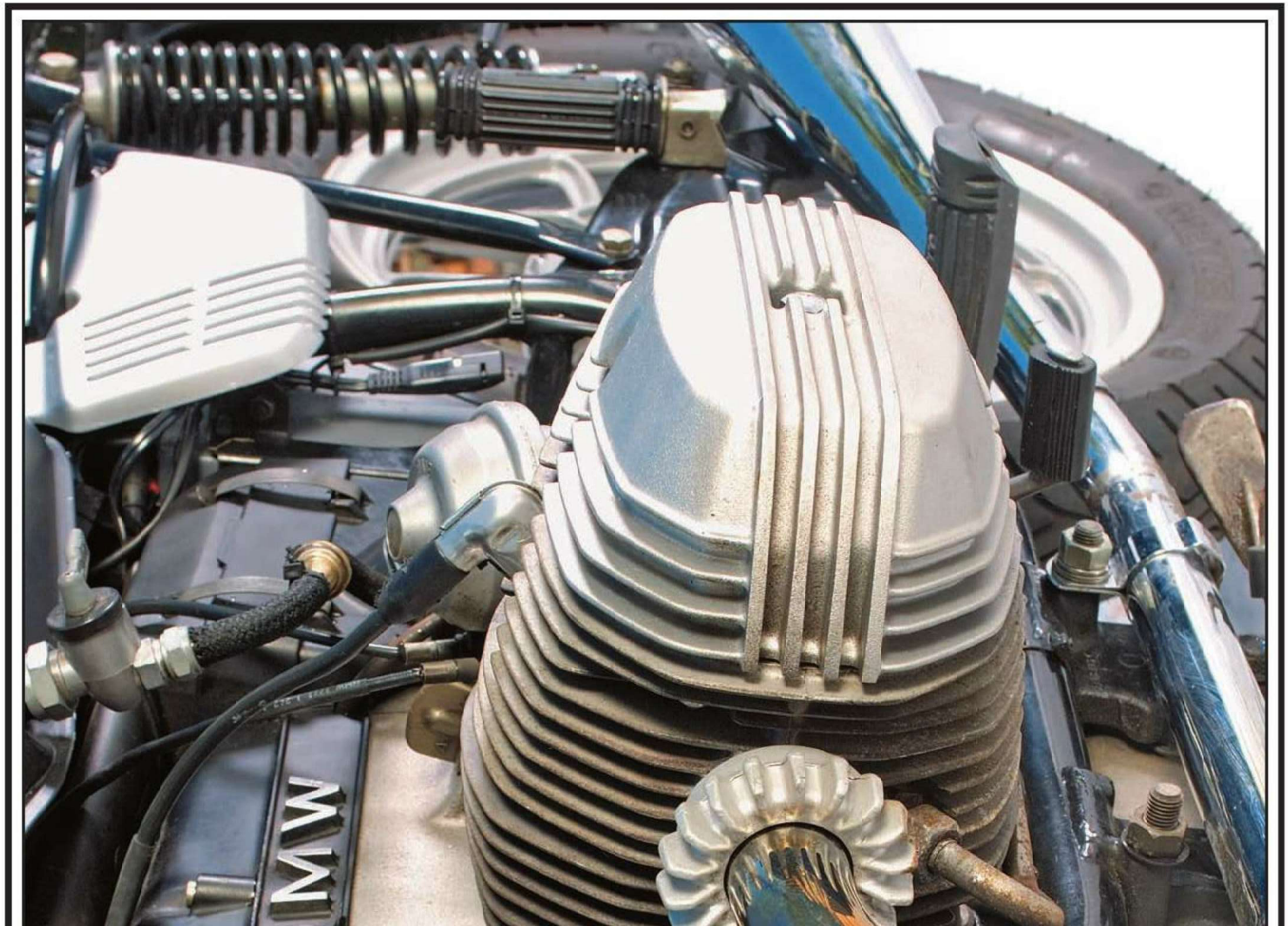
The R45 and R65 were introduced in 1978 to replace the outgoing R60/7. BMW had dropped its 500-cc bike from the lineup in 1974, and the R60/7 soldiered on as the smallest-displacement bike in the BMW range. It traced its roots back to 1969 and the start of /5 series production at the Spandau facility. Much had changed during the decade, and the 600-cc bikes had not been able to resist the tide of Japanese competition. BMW's answer was an all-new chassis, built shorter and smaller than its BMW siblings and designed to accommodate a new generation of smaller-displacement engines.

Inside this new R45/R65 chassis, BMW installed 474-cc and 650-cc boxer twins, respectively. The smaller-displacement R45 was intended primarily for the European market, where insurance categories favored small-displacement bikes. The R45's engine was offered in various states of tune, generating either 35 or 27 horsepower (the latter intended to qualify for reduced insurance costs). The R65's 650-cc mill produced 45 horsepower when released in 1978, rising ultimately to 50 horsepower in 1981. These small boxer engines were all mated to close-ratio five-speed transmissions.

In 1982, BMW offered the R65LS. The suffix "LS" was an abbreviation for "Luxus Sport," signifying a bit more refinement over the standard R65. The most striking feature of the R65LS was its wedge-shaped front fairing shrouding the headlight and black instrument nacelle. Designed by Hans Muth, it was more a styling feature than a true, functional fairing. Its small size added little, if any, additional wind protection, but it lent a much more sporting appearance than the pedestrian R65 projected. The R65LS also received a revised tail-section treatment with integrated passenger grab handles. Cast-alloy wheels and black-coated exhaust furthered the performance image.

But not all changes were cosmetic. To further improve the bike's sporting character, BMW gave the R65LS some performance upgrades. Dual Brembo disc brakes up front enhanced the bike's stopping power, while a firmed up-front suspension improved handling. The R65 would never be confused with a high-speed GT bike, but the LS improvements transformed it into a respectable canyon-carving mount. The R65LS's low center of gravity and forgiving engine made it an excellent bike for the twisty roads.

The R65 and R65LS were considered BMW's entry-level bikes and priced accordingly—at least by BMW standards. The market told a different story. Throughout the 1970s, Japanese manufacturers had increased their motorcycle production capacities at a rapid rate. By the late '70s, Japanese motorcycles were exported worldwide, flooding the U.S. and European markets. These inexpensive, well-built bikes sold at value prices redefined what an entry-level motorcycle was. Against this backdrop, BMW listed its R65LS at a premium MSRP of $4,000 in the United States, $400 more than the standard R65. Many other bikes offered more horsepower and sold at lower prices, limiting BMW's sales.


MW


BMW


BMW
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1984–PRESENT

Much to the purists' surprise, the K-bikes did not bring about a funeral for the boxer-twins. For awhile in the mid-1980s, this was certainly a possibility—BMW discontinued the 980-cc boxer in 1984. But a segment of the market remained devoted to the traditional boxer layout. The G/S bikes' success only enhanced this segment's enthusiasm.

In 1986, BMW reintroduced the liter-sized boxer. This was not the same 980-cc engine that had been discontinued in 1984, however. Instead, BMW bored out the R80's smaller 797-cc boxer to the liter mark. This engine was then offered in the resurrected R100RS and RT models, which also incorporated a version of the Monolever rear suspension that had proven successful on the G/S.

Resuscitating the airhead boxer in the '80s proved to be a prescient move for BMW. The company easily could have abandoned its heritage and produced nothing but liquid-cooled fours, triples, and twins. The air-cooled boxer lineage traced back to Max Friz's R32, though, and dropping this engine family could have alienated a significant portion of BMW's traditional clientele. The better move was to breathe new life into the boxer, refining a breed that was distinctive and innovative. With its unique boxer legacy, BMW offered individuality in a market increasingly dominated by the "UJM," or "universal Japanese motorcycle."

BMW had again found its footing, and the company's motorcycle product-development efforts gained new momentum through the late '80s. Three-cylinder variants of the K-series were introduced in 1985: the 750-cc K75 bikes. The big GS bikes also featured new technology. The '87 R100GS, for example, was the first BMW to utilize the new Paralever rear suspension. One flagship motorcycle showcased all of BMW's advancements: the K1.

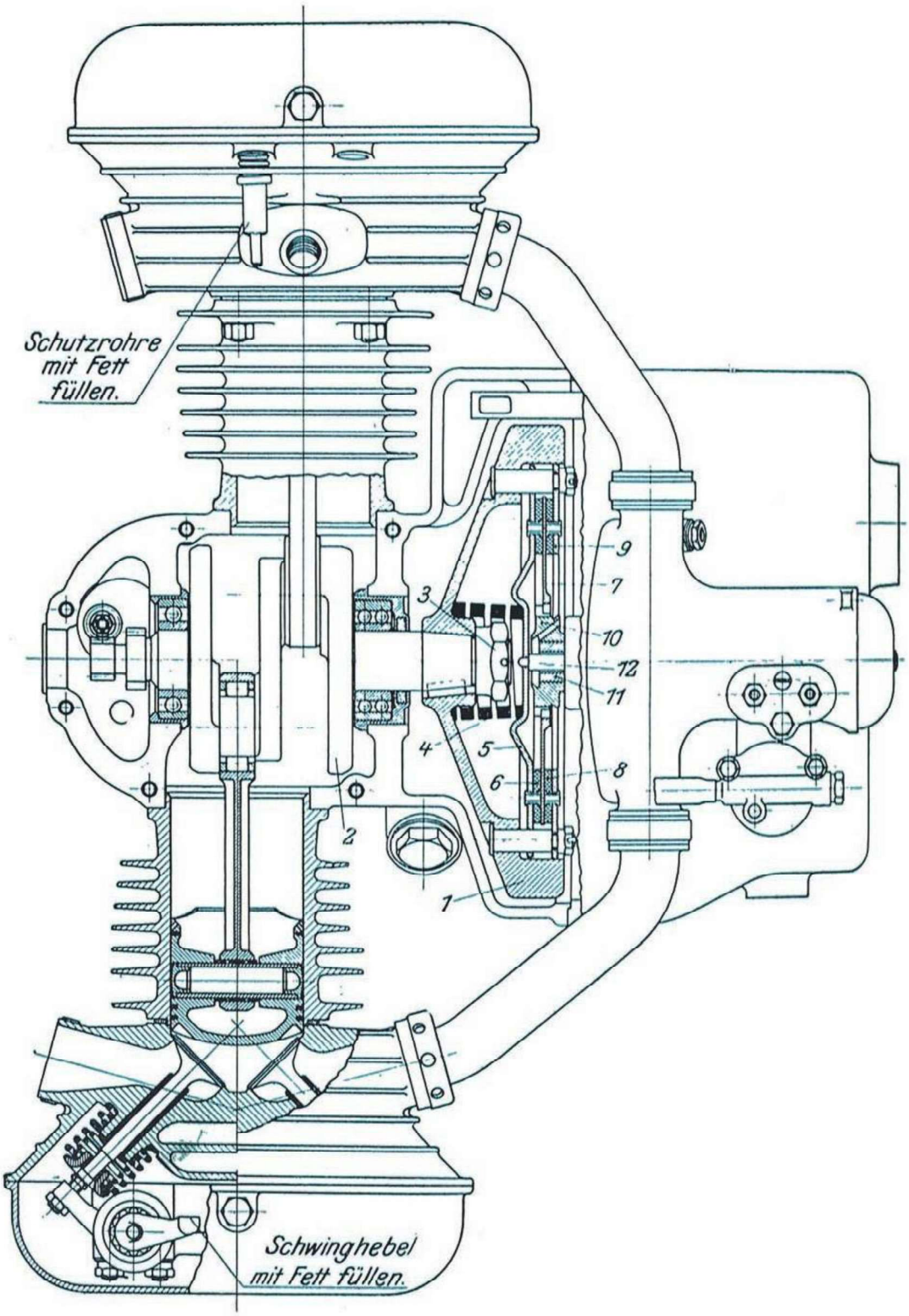
The K1 feasted at the technology buffet table, boasting anti-lock braking system (ABS), electronic fuel injection, four-valve heads, and Paralever suspension all wrapped in the most aerodynamic, unique bodywork that BMW had ever crafted. Intended to compete with the best of the Japanese superbikes, the K1 was BMW's shot at the title. Unfortunately, the K1 fell short of its mark. The big bike that tacked on all of the company's finest gadgetry was consequently *big*. Hampered by a very high curb weight and a gentlemen's agreement among German manufacturers to cap output at 100 horsepower, the K1 was not the bike that BMW had intended to offer. The company's rolling technology showcase reminded BMW that a good motorcycle is more than the sum of its parts.

While the K1 never met its sales objectives, the bike served as an important test bed for technologies that would find their way into the rest of the BMW lineup. ABS would ultimately be offered across all of BMW's motorcycle lines—its safety benefits were just too valuable in real-world riding. The K1 engine's four-valve head design was also significant, ultimately spreading throughout the K-series.

BMW's planners recognized an opportunity to grow the worldwide motorcycle business by reaching out to new market segments. Management had paid much attention to the large-displacement K- and R-series motorcycles, but for years BMW had not offered affordable, entry-level bikes. To remedy this situation, the company dipped its toes into unfamiliar waters and explored a collaboration with another motorcycle manufacturer.

BMW began to develop a relationship with Austria's Rotax in 1994. In that year, BMW executives visited an Aprilia factory in Italy, where Aprilia was manufacturing its new Pegaso 650. Aprilia had enlisted Rotax to produce a liquid-cooled, five-valve, single-cylinder engine for the Pegaso, and the completed Rotax engines were shipped directly to the Aprilia factory. BMW executives were impressed with the collaborative arrangement, and they welcomed the opportunity to add a single-cylinder motorcycle to the product portfolio. They immediately began to discuss a deal, and the result was the BMW F650, also called the Funduro. This new model was powered by a four-valve 650-cc Rotax engine, and the motorcycle was assembled by Aprilia at the Italian factory. BMW had completely outsourced this motorcycle, so many purists do not consider it a "true" BMW. But the F650 provided the much-needed entry-level model for BMW, and the relationship with Rotax continues to this day. This relationship led to the development of the mid-sized F800 bikes introduced in 2006.

Development work continued on the boxer engine, too. In 1993, BMW unveiled the new Oilhead—a complete redesign and modernization of the venerable boxer twin. It shared the same layout that Max Friz had used in the original R32, but the redesigned engine combined air and oil circulation to cool its Nikasil coated cylinders. A new valvetrain made four-valve heads a reality, without pushing the cylinder heads out to the point where they affected cornering clearance. The Oilhead would again revitalize the boxer engine layout and set the stage for today's evolution of the Oilhead, dubbed the Hexhead.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1990 K1

In a radical departure from the air-cooled boxers, BMW built its K-bikes. Powered by the liquid-cooled three- and four-cylinder engines, the K-bikes represented new technological territory for BMW's motorcycle engineers and designers.

Japanese manufacturers had redefined supersport motorcycles in the late 1980s. With lightweight aluminum perimeter chassis, high-revving DOHC inline fours, and fully faired bodywork, Japanese superbikes like the Yamaha FZRs and Honda CBRs were setting increasingly higher performance benchmarks. These bikes were direct descendants of the race bikes of the period, and the pace of engine and chassis technology development was very rapid. The 1990 K1 was BMW's salvo into these superbike wars and was to be a tour de force of BMW's technological prowess. The company's goal was to incorporate its finest engine and chassis technology into a motorcycle that could compete against the current crop of supersports.

The K1 was based on the K100, which was introduced in 1983. Built as a styling and engineering exercise, the first scale prototype of the K1 was shown at the Time Motion exhibition in 1984. The final form was shown to BMW management in the summer of 1986, where management gave the greenlight to the production of BMW's superbike. The bike was shown to the public at the Cologne motor show in 1988.

The K1's styling is very striking and unlike that of any other BMW motorcycle built before or since. From its shrouded front wheel to its unique tail section, this BMW was designed with the pure intent to minimize wind resistance. To achieve this goal, engineers conducted extensive wind-tunnel testing to reduce the bike's drag coefficient as much as possible. The engineers were certainly successful; the K1 achieved a drag coefficient of 0.34 with the rider tucked behind the fairings. But the overall effect of the K1's styling was polarizing, and the unique bodywork was further emphasized by the red and yellow color scheme that was standard in the bike's first production years. The bright red fairings, accented by a yellow swingarm, wheels, and body appliqués, were very unusual by BMW's conservative standards, and the coloring scheme was derogatively nicknamed "ketchup 'n' mustard."

Powering the K1 was a new four-valve version of the K-series engine. BMW had finally created a DOHC version of its inline four, which signaled that the company would continue to develop DOHC engines. Rated at an even 100 horsepower, this engine adhered to the manufacturers' "gentlemen's agreement" that forbade the sale of bikes in Germany with more than 100 horsepower.

Other technological features abounded on the K1. Bosch electronic fuel injection controlled the fuel flow and provided a host of advantages over traditional carburetors. Powerful Brembo discs handled the stopping chores, with dual discs and a single disc at the rear wheel. An antilock braking system (ABS) was optional (standard on U.S.-market bikes). The rear suspension incorporated BMW's patented Paralever suspension, marking the first use of this system on a K-series motorcycle. The Paralever integrated the shaft drive with a monoshock rear suspension and was originally introduced on the boxer-powered GS models. BMW engineers equipped the driveshaft with an extra universal joint between the engine and final drive housing, giving the shaft housing an extra pivot point. A horizontal link connected the housing and the frame, creating parallelogram suspension geometry that fed the gyrations of the driveshaft back into the frame in a back-and-forth motion, rather than an up-and-down one. Overall suspension damping

was excellent, featuring a Bilstein shock at the rear wheel, and Marzocchi fork at the front.

As a flagship sporting motorcycle, the K1 was only moderately successful. A bulky drivetrain plus an abundance of accessories and features burdened the K1 with a curb weight over 600 pounds. With only 100 horsepower on tap, the smooth four-valve engine wasn't able to accelerate the K1 at a rate comparable with the best bikes from the land of the Rising Sun. But despite the horsepower handicap, the aerodynamic bodywork enabled the bike to reach a respectable top speed of almost 150 miles per hour, and the bodywork also did a very good job of protecting the rider from the elements. However, this same bodywork inhibited inside leg movement during cornering, thus making it difficult to hustle the big K1 on the track or through twisty roads. The K1 was in its element on high-speed open roads with sweeping turns.

BMW expected to build about 4,000 K1s per year, which it accomplished in 1989. Sales began to taper off rapidly, however, and in successive years, the bike was offered in much more subdued color schemes. Despite these efforts, a total of only 6,921 K1s were produced, and the bike is now on its way to becoming a very collectible modern BMW.


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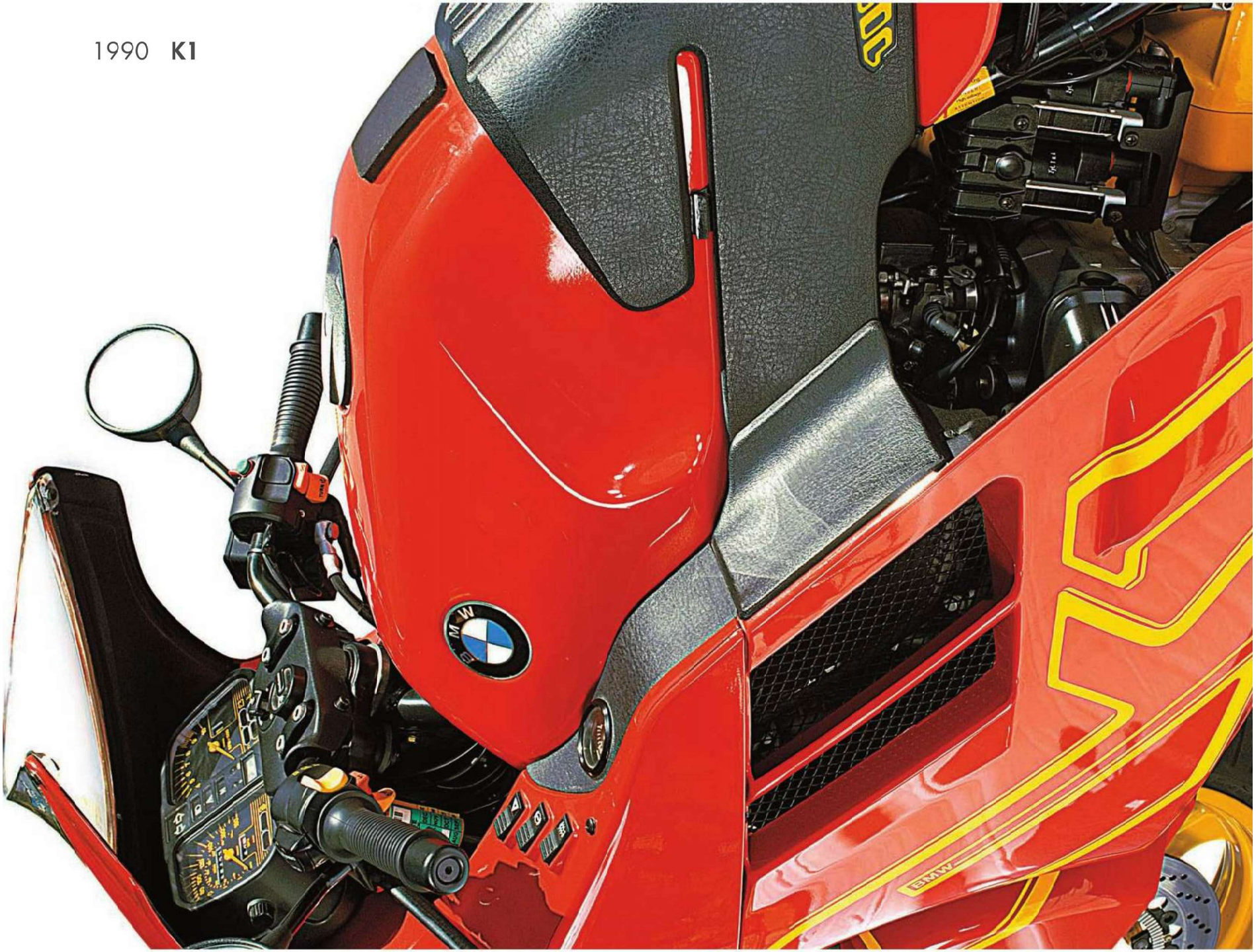
1990 **K1**



1995 R100GS

In an effort to improve the company's visibility in the late 1970s, BMW participated in various racing events. The racing efforts were not restricted to paved tracks, as BMW also participated in off-road events, sometimes with great success. In 1979, a factory-sponsored BMW won its class at the prestigious International Six Days Trials (ISDT) event, held that year in Poland. The rider, Fritz Witzel, won the event on an 872-cc boxer-powered prototype. BMW had developed this winning machine over the course of several years and would soon release it to the public as the new R80G/S.

Introduced in 1980, the R80G/S was unlike any other motorcycle that BMW had produced. It was a dual-sport, capable of on- and off-road use, and it was powered by BMW's 798-cc boxer twin. This engine was a retuned version of the R80/7 mill, and it produced 50 horsepower. The rear suspension was BMW's innovative Monolever, a swingarm that also housed the driveshaft and was damped by a single shock absorber. A large fuel tank offered a range of over 175 miles, and the bike handled surprisingly well on pavement.

Inadvertently, BMW had created yet another entirely new class of motorcycle: the adventure-tourer. When it was first introduced, the R80G/S was viewed as a bit of a novelty by the company and by the motorcycling community at large. Here was a bike that could easily tackle trails and fire roads, then romp down the pavement easily at supra-legal speeds. With some luggage attached, the bike was a perfect mount for trips to faraway lands (Argentina, anyone?), where road conditions varied widely and the terrain could be rugged. With its strong engine and clever features, the R80G/S was capable of conquering a trip to almost any destination.

Sales figures for the R80G/S surprised BMW. During the notoriously difficult market of the early '80s, BMW sold almost 22,000 of the bikes. After successful campaigns in the Paris-Dakar rally, 1984 brought the "Dakar" edition, featuring a larger fuel tank (8.5 gallons!), a luggage rack, and a revised seat. The R80G/S had created a buzz about BMW again, illustrating how innovative the company could be and reviving customers' interest. The R80G/S received nominal improvements until a major update in 1987. At that time, it would be rebadged the R80GS (without the "slash") and continue in production until 1996.

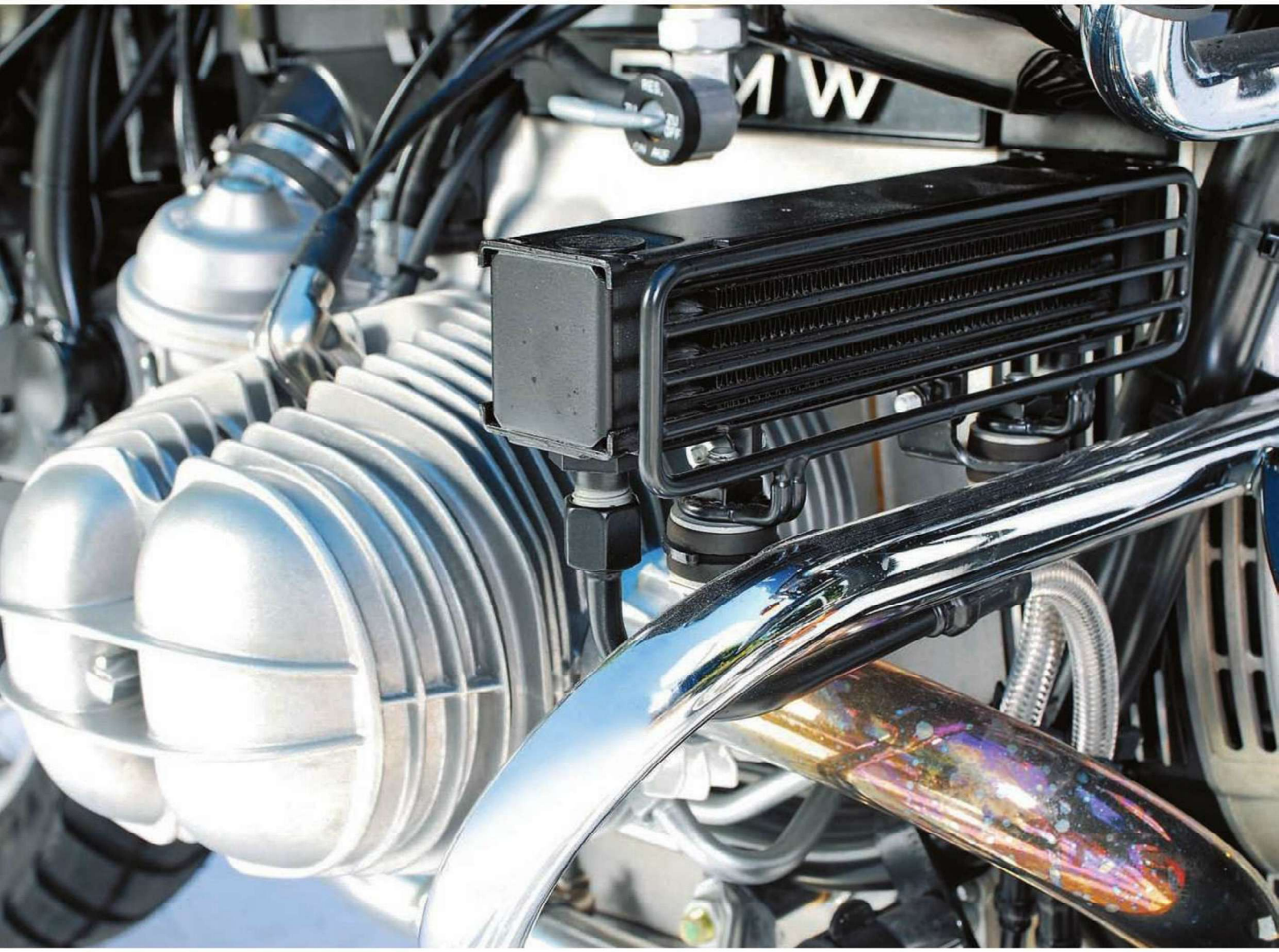
Joining the lineup in 1987 was the R100GS. This bike shared both its 980-cc engine and its chassis with the R100RS, though the difference between the two bikes was amazing. The 1988 R100RS was an unremarkable performer; its acceleration and handling did not even compare favorably to the R100RSs that were built in the early 1980s. But this chassis was absolutely transformed when BMW built the R100GS, due to one of BMW's finest chassis innovations—the Paralever rear suspension.

The Paralever solved one of BMW's most vexing problems: movement of the driveshaft under acceleration. As BMW's engines became more powerful, the torquing forces through the driveshaft tended to raise the rear wheel—a situation that can unsettle a bike during cornering and reduce available suspension travel when riding off-road. To solve the problem, engineers devised a double-jointed final drive layout. Inside the swingarm was a driveshaft with two universal joints. Beneath the swingarm was a strut that served as a connection point for the stay arm, and above the swingarm was a conventional single shock absorber mounted at a steep forward angle. This parallelogram layout, and the resulting suspension travel path, canceled out the effects of the driveshaft torque

when accelerating. The effect on handling was dramatic, and the Paralever would eventually be adopted across the entire lineup of shaft-driven bikes.

The GS models came into being almost by accident in the early '80s, but they would prove to be pivotal products for BMW. The bikes' combination of power, technology, and adventure-touring capability found a welcoming market, and worldwide sales of the GS models would remain robust for the next 25 years.


R100 GS
BMW



1995 R1100RS

When the K-series was introduced in 1983, many BMW loyalists feared that the beloved boxer engines were going to be eliminated from the lineup. From an outsider's perspective, the K-series' powerful, liquid-cooled inline engines made BMW's bikes competitive with the increasingly powerful bikes from Japan. But the K-series never eliminated the boxers. Public demand for the boxer-powered bikes kept BMW's sales mix in the 1980s at about a 50/50 split between the traditional engine and the inline K-bikes. Indeed, the boxer-powered GS models were showroom stars that also received critical acclaim from the motorcycling press. Equally important was the fact that the boxer engine was nearly synonymous with BMW motorcycle heritage. In 1984, BMW began a major redesign of its boxer engine.

Over the next several years, BMW experimented with many boxer engine prototypes. Variations included valvetrain layouts, camshaft locations, and cylinder displacements. At the same time, BMW's engineers were developing a remarkable new chassis and suspension system. The new boxer engine would join the new chassis in the 1992 R1100RS.

The new boxer engine, dubbed the R259, was radically different from its predecessor. Displacing 1085 cc, the new engine was the largest-displacement boxer BMW ever offered. New cylinder heads featured a clever four-valve design, with a single, chain-driven camshaft in each cylinder head that actuated the valves via pushrods and rocker arms. Engine-management chores were handled by the sophisticated Bosch Motronic fuel injection system. New 10.7:1 pistons were 30 percent lighter than their predecessors, and they were attached to a single-piece crankshaft. The boxer's oiling system was also a very clever setup. Two separate Eaton oil pumps circulated engine oil through the cylinder heads, around the exhaust valves, through the oil cooler, and back to the engine sump. This circuit kept the operating temps in check and earned the engine the nickname "Oilhead."

For its all-new flagship sport-touring bike, BMW developed a new chassis concurrently with the new boxer engine. The engineers had specifically designed the engine to be a stressed member of the bike's chassis, supporting the front and rear subframes. To make the design even more unique, the R1100RS integrated the now-familiar Paralever rear suspension with a completely new front suspension layout called the Telelever. This suspension consisted of a large A-arm, to which the steering head and the front fork were attached. The front suspension's motions were damped by a centrally located Showa shock, and the layout provided a generous 120 millimeters of travel. Overall, the Telelever provided excellent front-wheel control at the sacrifice of a bit of front-end feel through the bars.

The new R1100RS engine and chassis were wrapped in completely new bodywork. The Telelever front suspension required a new front-fairing shape to accommodate the A-arm. This had the effect of "raising" the upper fairing and giving the R1100RS a unique silhouette. BMW's fully faired bikes spent considerable time in the wind tunnel, and the R1100RS was no exception. Its side panels swept above and below the protruding cylinder heads, and flowed back into a tapered tail section. The result was a sporting body that was aerodynamic, stylish, and provided excellent protection from the elements.

Weighing in at 526 pounds (wet), the R1100RS was not a lightweight, but the new boxer engine, producing 90 horsepower, was ideally suited to

this motorcycle. The engine had plenty of power for high-speed transit, yet its excellent fuel economy endowed the bike with a range of over 300 miles on a single (6.1 gallon) tank of fuel.

Later versions of the R1100RS received incremental improvements, like an adjustable windscreen, adjustable handlebars, and a new Showa shock for the front end.

The R1100RS sold well, and it soon overtook the excellent K100RS as BMW's premier sport-touring bike. However, sales of the R1100RS were eclipsed by both the R1100RT and R1100GS bikes.


BMW
R1100RS
ELECTRONIC ENGINE MANAGEMENT
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brembo


SCHLAUCHLOS
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160/60 ZR 18
MTH2 4.50x18 E
Brembo
ABS
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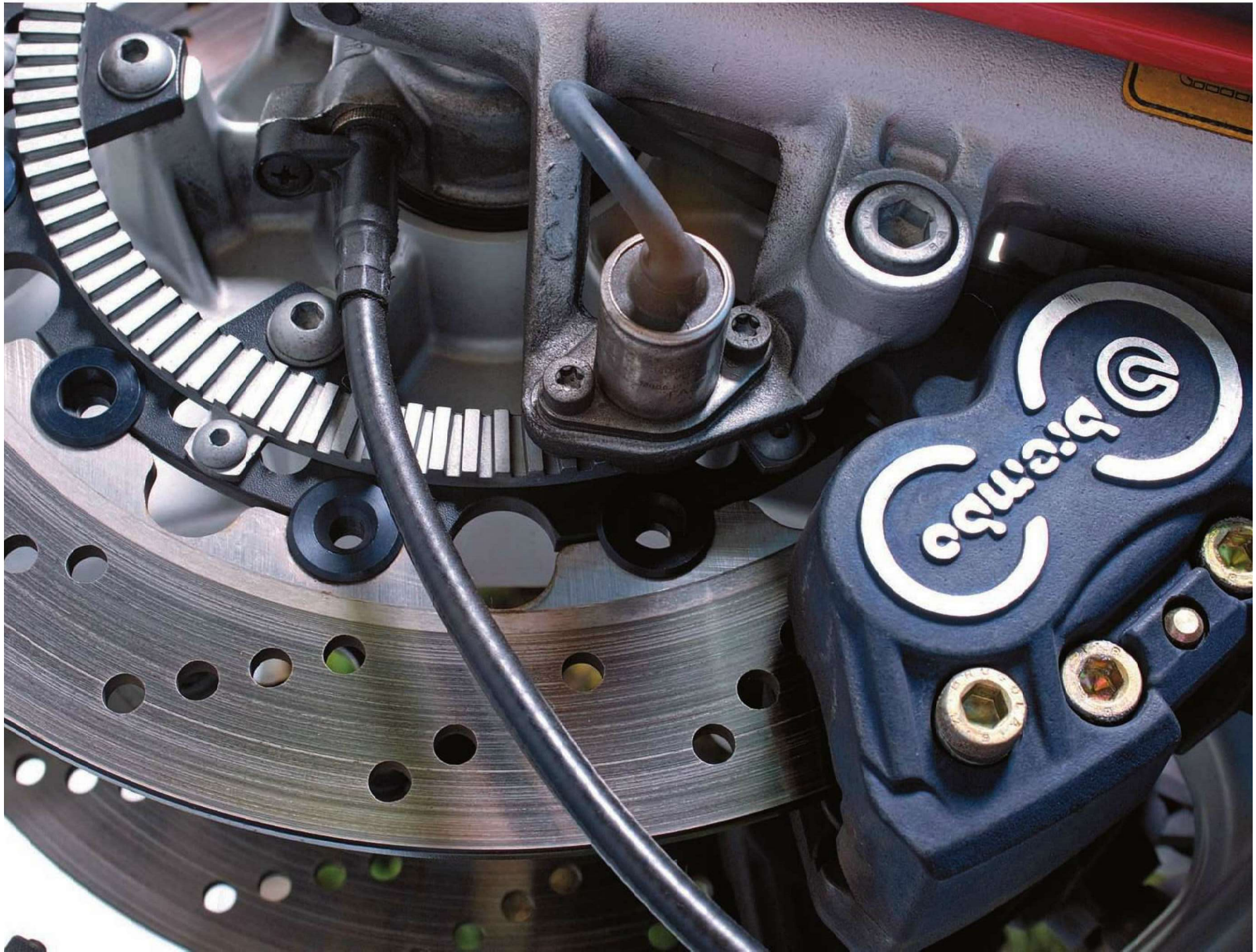

brembo

2007 F800S & F800ST

In the spring of 2006, BMW unveiled a completely new lineup of middleweight motorcycles. Based on a new parallel twin engine, the bikes were labeled the F800 series. This series bridged the gap between the F650 singles and the large-displacement boxers and K-bikes. This new mid-range motorcycle rolled off the assembly line of BMW's Berlin factory powered by a Rotax engine from Austria and jointly designed by BMW and BRP-Rotax. The engines were completely ready for installation when shipped to BMW's Berlin facility. During development, BMW experimented with various engine configurations including V-twins, but the parallel twin was selected by virtue of its compact dimensions and excellent power potential.

The heart of the F800 series, which includes the F800S sportbike, the F800ST sport-tourer, and the F800GS adventure-tourer, is its all-new liquid-cooled powerplant. Displacing 798 cc, the parallel twin features a four-valve cylinder head with DOHCs. The oversquare (82-millimeter) pistons have a 12:1 compression ratio, requiring premium fuel to keep detonation at bay. The pistons have a 360-degree firing sequence, meaning that they travel in tandem, with one on the "power" stroke while the other is on the "exhaust" stroke. To counter the vibrations inherent in a parallel-twin layout, BMW and Rotax engineered a unique counterbalancing system. Attached to the crank is a "dummy" connecting rod, offset 180 degrees to the pistons' rods. The effect of the third connecting rod cancels out vibrations, which produces the same effect as a separate counterbalancer, but BMW's solution doesn't penalize with the clatter that is present with conventional balance shafts. Clever.

The F800 series utilizes an all-new aluminum chassis. The design supports the engine from above and has a subframe that incorporates the seat and footpegs. The chassis layout locates the fuel tank beneath the seat, making way for a tall air box above the engine. The front suspension is a conventional telescopic fork setup, and at the rear is BMW's single-sided Monolever swingarm, which accommodates the toothed-belt final drive and positions the rear shock at a steep angle. This rear suspension setup offers easy access to the rear wheel and gives the F800 a clean profile.

In keeping with the bike's mission, the control layout of the F800S is aggressive. The seating position and handlebars are low, positioning the rider down in the saddle and helping to keep the overall center of gravity as low as possible.

The F800ST, the sport-touring version, has some additional standard features that are not found on the F800S. A higher windscreen and more extensive lower fairings provide protection from the elements and improve aerodynamics. The raised handlebar creates a

more relaxed riding position that belies the bike's mission as a touring mount. Luggage racks are standard, and F800ST buyers can purchase BMW's expandable hard luggage to carry enough gear for a long weekend's road trip. This luggage appears compact, but when fully expanded can easily accommodate a full-face helmet.


BMW
F800ST


brembo

2007 G650X

In another radical move, BMW dramatically altered its product portfolio with the G650 series. To produce these bikes, BMW enlisted the help of Aprilia (bike design) and BRP-Rotax (engine manufacturing), and final assembly takes place at Aprilia's manufacturing facility in Noale, Italy. The series comprises three unique interpretations of a modern off-road bike: the Xcountry, the Xchallenge, and the Xmoto (the "X" is spoken as "cross"). The Xcountry has a "scrambler" style and is the most conventional dual-sport bike of the trio. The Xchallenge is characterized as a "hard enduro" bike, set up for aggressive off-road riding. Finally, the Xmoto is a supermoto-style bike, featuring a similar suspension to that on the Xchallenge, but with cast wheels shod with sportbike rubber. The G650 series is very different from BMW's traditional street lineup, and it gives the company an entry into the large worldwide market for off-road and dual-sport motorcycles.

The G650 is based on a chassis similar to the F650's. A steel main frame supports the steering head and attaches the swingarm at the rear. Smaller aluminum subframes support the seat and also connect down to the front of the engine. The G650 shares the same underseat fuel tank location as the F650, which lowers the bike's center of gravity and makes room for a tall air box above the engine. The engine itself is a fully stressed frame member, and it attaches via a reinforced point on the cylinder head. The result is a very compact, rigid chassis layout. The G650 bikes weigh in at about 60 pounds less than an F650GS.

Powering the G650 series is a 652-cc liquid-cooled single derived from the F650 models. It shares key features (like its balance shaft) with the latter, but uses lighter-weight components where possible. Featuring a DOHC four-valve head, an 11.5:1 compression ratio, and BMW's BMS-C II electronic fuel injection, the engine produces a peak of 53 horsepower at 7,000 rpm. The fuel injection system, in conjunction with a catalytic converter, helps the G650 bikes meet stringent exhaust emissions standards. An added benefit of the BMW engine-management system is its tuning flexibility. BMW is able to create custom maps for the air/fuel mixture that can tailor the engine's power curve to match the needs of the individual bikes. The engine is also efficient; its 53-mile-per-gallon fuel rating gives the bike a range of 155 miles per tankful of premium fuel.

In keeping with the bikes' missions, the suspension is heavily oriented to off-road work. The Marzocchi front fork provides 9.4 inches of travel on the Xcountry and 10.6 inches of travel on the Xmoto and Xchallenge. At the rear, a conventional gas-charged shock controls the Xcountry and Xmoto suspensions, while the Xchallenge uses an air-suspension rear shock. The air shock has an inherent progressive spring rate and does not need a conventional steel spring. The air system actually becomes more effective when heat builds up—the opposite of what happens to an oil-filled shock when it gets hot—and BMW provides a compact manual air pump with the bike to facilitate trail-side suspension adjustments.

While closely related in overall design, each of bikes has a very different character. The Xcountry is the most forgiving of the three. It's a fairly conventional dual-sport bike that has a plush suspension and good on-road handling. Shod with street-oriented dual-sport tires, it can tackle some light trail-riding and still be very road-worthy for the ride home. The Xchallenge makes no pretense about its intent—it is a hardcore enduro bike that just happens to be road legal. Its unique air suspension handles rough trails with aplomb,

and the aggressive tires on stout spoke wheels are intended for serious dirty work. The last of the trio, the Xmoto, is a modern interpretation of the street-legal supermoto bike. Its Metzeler high-performance tires mounted on Marchesini alloy wheels belie its mission as a supermoto/hooligan bike. The Xmoto can achieve ridiculous lean angles.

2007 **G650X**

2007 K1200S

BMW's K-series flagship was unveiled to the motorcycling press in the fall of 2004, but the event was a major disappointment. The new bike was plagued with problems; most notable was a fuel injection system that needed major re-mapping to smooth out engine response. This launch was certainly an embarrassment for BMW, and it delayed the public launch by almost a year.

But the wait was worth it. The fuel injection was completely retuned, giving the bike excellent throttle response and making the most of the impressive output available from the 1,200-cc inline four. It also allowed the press to focus on the bike's amazing technology.

The heart of the K1200S is its powerplant; the liquid-cooled transverse four-cylinder is among the most tractable inline engines available. Displacing 1,157 cc, the DOHC four-valve engine features twin counter-rotating balance shafts that isolate vibration. BMW's electronic fuel injection is programmed for smoothness, compensating for abrupt throttle closure inputs by intervening and smoothing out the engine's actual throttle closure. The engine is rated at 167 horsepower, and it has a broad power band pulling smoothly from 2,000 rpm all the way to its 10,750-rpm redline. The six-speed transmission takes full advantage of this broad power band, and its tall gearing allows relaxed cruising in top gear. At 80 miles per hour, the engine is spinning a leisurely 4,800 rpm. This is the most potent engine BMW has ever offered, and when wound out, it can propel the K1200S to a top speed of over 170 miles per hour.

In keeping with its role as the K-series' sporting flagship, the chassis features BMW's newest suspension technology. At the rear of the bike is the familiar Paralever monoshock swingarm, while at the front is the Duolever suspension. The Duolever is nothing like a traditional telescopic front fork; instead, it uses hollow, rigid cast-aluminum tubes. The fork pivots on a pair of A-arms that behave like a double-wishbone suspension on an automobile. The arms are connected to a single shock, and the steering is stabilized with the help of an oil-filled steering damper.

The effect of the Duolever setup is profound, and the suspension behaves very differently from a conventional setup. Under cornering, the suspension compresses, yet this compression is isolated from affecting the bike's steering. Under braking, the suspension does not dive since it has an inherent anti-dive characteristic that is not affected by a shift in weight distribution. The bike can be trail-braked into a corner (much like an automobile), since the suspension will not be unsettled by mid-corner braking or steering inputs. The overall effect is difficult to describe, but the K1200S's handling capabilities are unlike any conventionally suspended motorcycle on the market.

To further enhance performance, the K1200S can be fitted with BMW's optional Electronic Suspension Adjustment (ESA) system, which allows the rider to adjust the suspension. Using a button on the left handlebar, the rider can select between three spring preload settings: solo, solo plus luggage, and two-up. Once the bike is underway, the computer calibrates the suspension damping to meet the rider's needs. The system maximizes ride quality and takes virtually all the guesswork out of suspension tuning. It also allows the rider to select between "Sport," "Normal," and "Comfort" damping modes while on the fly. Some critics believe that a rider can do a better job of calibrating a bike's suspension via manual adjustments, but it's difficult to imagine that an average rider would be able to replicate the ESA system's capabilities

through its nine possible preload/damping combinations.

All of the technology is wrapped in a very stylish package. From its angular nose and creased flanks to its upswept tail section, the K1200S looks the part of a rapid transit tool. The aerodynamic bodywork does an excellent job of protecting the rider from the wind blast and shielding the rider's torso and legs, while nicely controlling the wind that flows around the rider's head and shoulders. The styling would also set a precedent for other BMW bikes to follow, including the F800ST.

BMW may have stumbled a bit at the introduction of the K1200S, but the end result is a stunning machine that set the stage for a new family of high-performance K-bikes.


K1200
BMW

2007 K1200R

Muscular. Edgy. Potent. Unusual. Striking. Aggressive. All of these are words that can describe the K1200R. This is a bike that revels in being different—clearly not the bike for someone who wants to blend in. The K1200R is a naked version of the K1200S. Its powertrain, chassis, suspension, and electronics are all derived directly from the fully faired S model, but as the term "naked" implies there is no bodywork to hide the mechanical bits. Everything is on display, and the K1200R is resplendent in its dramatic styling and evident technology. It can be argued that the naked K1200R is the true showpiece of BMW's performance technology.

Motivation for the K1200R is the same 1,157-cc inline four that powers the K1200S. As in the S model, this engine is mounted transversely in the chassis with its cylinders angled forward at 55 degrees. The engine is integrated nicely with a cassette-type six-speed transmission, and its forward angle also helps to keep the bike's overall center of gravity low. The DOHC four-valve cylinder head allows the engine to breathe through steeply angled intake and exhaust valves—a technology that BMW has refined during its years of Formula One racing. The 13:1 compression ratio is very high and requires premium fuel to keep detonation under control. When necessary, however, the BMW engine-management system can retard ignition timing to accommodate lower octane fuel. Twin balance shafts keep the vibrations at bay, rotating at twice the rate of the crankshaft.

The new R's engine produces 163 horsepower, only a few ponies shy of what the K1200S has on tap. The output difference is a result of a different intake system on the K1200R that features only a single Ram-Air intake snorkel, whereas the K1200S has a pair. Nonetheless, the K1200R's engine is a brute, producing a broad torque curve that peaks at 77 lb-ft and propels the bike forward as though shot from a cannon.

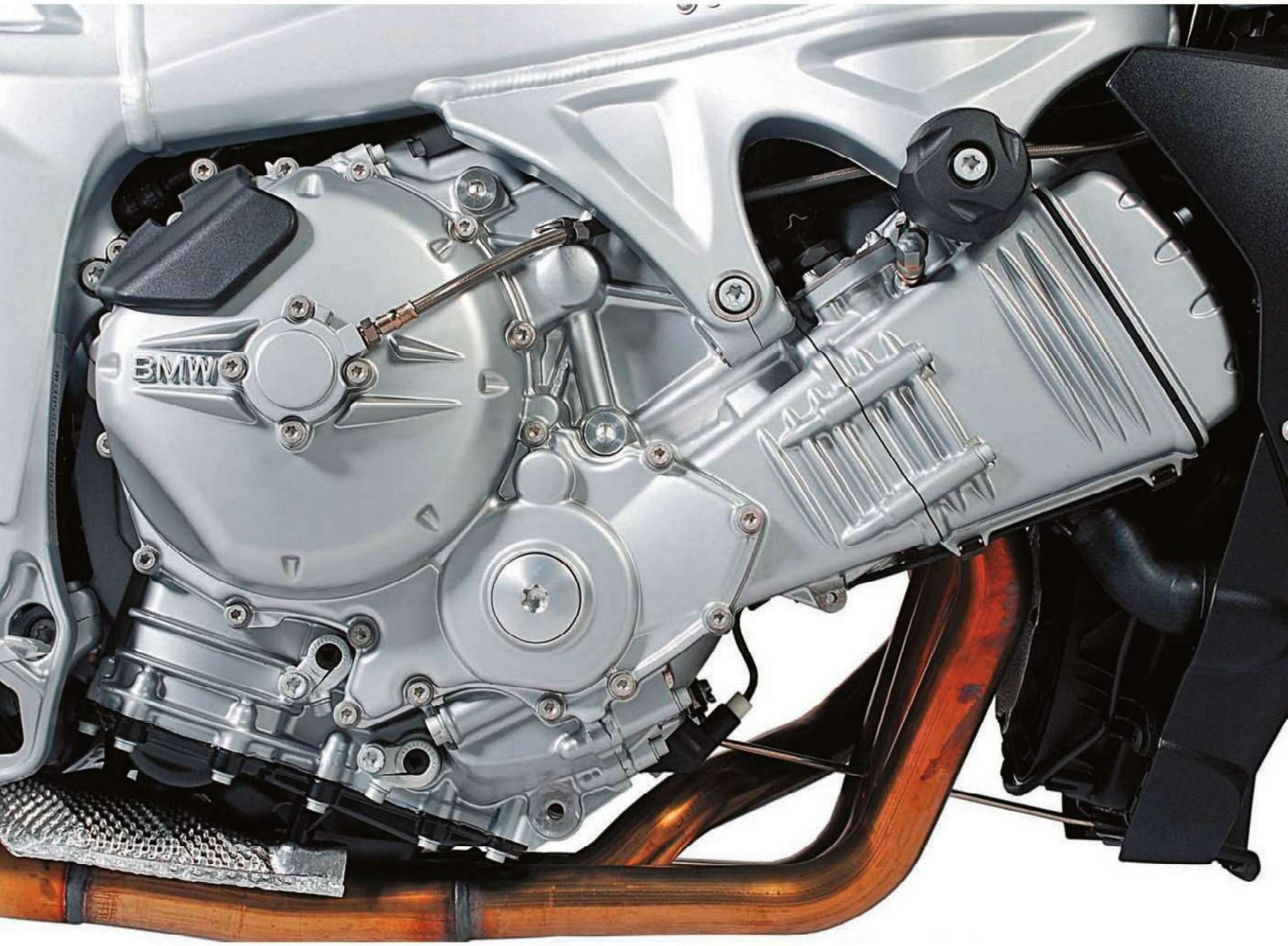
The K1200R chassis shares key features with the K1200S. Up front is the Duolever suspension, with a single damper attached to the A-arms. At the rear is the familiar Paralever, though it has been incrementally improved over the years to reduce its tendency to raise or lower the rear of the bike when the throttle is opened or closed. ESA control is an option, making it easy for the rider to configure the bike's suspension preload and damping via the handlebar controls. Also, the K1200R is available with BMW's Integral ABS, an electric power-assisted braking system. This is a linked-braking system, so when the rider squeezes the lever at the handlebar, both the front and rear brakes are actuated. The foot pedal only actuates the rear brake. These controls clamp onto big 320-millimeter discs at the front wheel and a 265-millimeter rotor at the rear, and they can bring the bike to a halt from 60 miles per hour in only 120 feet.

Technology and styling aside, the K1200R is about performance, and it has that in spades. In 2006, *Motorcycle Consumer News* tested the K1200R and recorded 0–60 times of 2.85 seconds and a quarter-mile time of 10.30 seconds at 133 miles per hour. These are stellar numbers, and they put the K1200R at the top of the naked sportbike class.

Despite its high-performance intent, the K1200R is also a very comfortable bike to ride. True to the spirit of a modern naked bike, the seating position puts the rider in a rather upright position, keeping weight off the wrists and reducing fatigue. The wide handlebars offer plenty of leverage on the steering, making the bike easier to handle in slow-speed traffic. The saddle has a broad cushion that makes all-day riding

a realistic proposition, and the footpegs' locations create ample legroom for even the tallest riders. To further rider comfort, the K1200R has a standard power outlet for heated clothing, and it can be ordered with optional heated handgrips to help extend the riding season into the cold months. Optional touring luggage makes the bike an ideal companion for a weekend's romp through the twisties.

Where the K1200S is BMW's refined luxury-sport bike, the K1200R is its frat-boy twin brother. While the S model wants to carve through the mountains on the way through the vineyards, the R model is likely to be found tearing through urban confines on a mission to find the nightlife.


BMW

2007 R1200GS

The big R1200GS is the latest in the evolution of the GS series. After single-handedly creating the adventure-touring bike category more than 25 years ago, BMW has set the standard to which others aspire. The newest GS is no exception.

For those who are unfamiliar with the GS, it's difficult to understand just how capable this bike is. Can it ford a stream? Check. Carve through the esses on a mountain pass? Check. Soak up ridiculously bad urban streets? Check. Devour 500 high-speed miles before lunch? Check. It's difficult to create scenarios where the big GS doesn't excel. It is unlikely that many of the world's GS owners will use the bike for a ride through Sub-Saharan Africa, yet that image of all-condition capability is a powerful one. Some owners have even been known to do an occasional track day on the adventure bikes. There's really not much that this bike can't do, and therein lies the appeal of the R1200GS and its off-road-oriented adventure sibling. Since the inception of the adventure-touring category with the original R80G/S in 1980, BMW has continually refined its big dual-sport bikes to accommodate almost any contingency, any road, and any terrain.

Buyers have responded in droves. From the spring of 2004 through August 2007, BMW produced 100,000 copies of the R1200GS and R1200GS Adventure, setting a BMW production record for such a short period of time. The bike's success has also required BMW to add additional work shifts at the Berlin factory to meet worldwide demand. The latest R1200GS continues to be the best-selling motorcycle in BMW's lineup.

A quick look at the GS tells you that it is a unique bike. Its duck-beak front fender, extra suspension clearance, and utilitarian styling give it a formidable presence. In person, the bike is big and can appear a bit daunting, but it has an undeniably strong presence. Even when the tank and fenders are covered in a subtle silver color, the bike still commands attention—standing head and shoulders above most other bikes (and cars) on the road. When fitted with panniers, the bike exudes an even stronger aura of function over form.

Its engine is the largest-displacement engine available in an enduro motorcycle: the latest generation of the 1,170-cc boxer twin, generating 105 horsepower and 85 lb-ft of torque. With an overhead-cam, four-valve cylinder head, and 12:1 compression, the engine is strong yet flexible. Its BMW engine-management system has been tuned to provide a very smooth power band, pulling strongly from just above idle speed all the way through its rpm range. With a broad power band, the rider doesn't need to shift often to get a strong response—an attribute that is as important on the dirt as it is on the highway.

The GS chassis shares some common layouts with other BMW bikes. A Telelever suspension controls the front wheel, and it provides a generous 7.5 inches of travel on the standard GS. At the rear, a Paralever setup provides 7.9 inches of travel and pivots in the frame, rather than in the transmission. This layout change helps strengthen the suspension and also saves weight. Braking is handled by a pair of 12-inch rotors at the front and a 10.4-inch rotor at the rear. The partial-integral power brakes can be had with optional ABS control. Since ABS may not be advantageous in off-road situations, the system can be easily switched off. Dual-sport tires on the alloy wheels (tubeless spoke wheels are an option) handle well on pavement and still provide ample traction in the dirt.

The net result is a motorcycle that can go anywhere and do everything. Sure it's a bit heavy for serious off-roading, but there are not many off-road bikes that can cruise comfortably at 100-plus miles per hour. Add in a wealth of features like a trip computer, heated grips, and a very versatile luggage rack system, and you have a bike that can do anything its owner asks.


R1200

2007 R1200R

BMW introduced its Roadster models in 1991. Built around the 60-horsepower boxer, the R100R was stripped down to its essentials—a stout engine, a performance chassis, and a nicely tuned suspension. It was the naked boxer, built for back roads and urban cruising. The Roadster has evolved over the years, getting the fuel-injected four-valve boxer engine in various iterations and receiving chassis updates as well. The latest in the line of BMW Roadsters is the R1200R. True to its heritage, it has a potent boxer engine and BMW's refined suspension.

The Roadster is powered by the new Hexhead boxer engine. This engine is both lighter and more powerful than its predecessor, producing 109 horsepower at 7,500 rpm and a stout 85 lb-ft of torque. Previous Roadster versions used the boxer in GS tune, which provided higher torque output and sacrificed horsepower. But the R1200R shares its engine tuning setup with the R1200RT and R1200ST, giving spirited power better suited to its sporting mission.

The R1200R's chassis leaves nothing to the imagination. Clearly visible at the front is the BMW Telelever fork. Its prominent A-arm spans from the front fork to the mounting points at the top of the engine. The main frame is a two-piece affair. The front half of the frame is shared with the R1200GS, with some minor changes to alter the steering geometry for the Roadster. The rear frame section supports the seat and the footpeg mounts. Beneath the two frame sections is the boxer engine, acting as a fully stressed frame member. At the rear, of course, is the Paralever suspension and final drive. Braking chores are handled by a strong dual-disc setup at the front and a single disc at the rear wheel. The brakes are "partially integrated" (the brake lever on the handlebar activates both the front and rear brake, while the brake pedal only actuates the rear brake), and BMW's ABS system is an extra-cost option.

Riders looking for a comfortable all-day mount will not be disappointed with the ergonomics of the R1200R. Its sit-up-and-beg seating position has a moderate forward lean and places the rider's hands in a comfortable position on the wide bars. The footpegs place the rider's feet almost directly below the hips, and the saddle's narrow front portion allows the rider to tuck his or her legs into the fuel tank's recesses. This gives the rider a good purchase on the tank during spirited riding and has the fringe benefit of providing significant wind protection at freeway speeds. To further tailor the ergonomics to a rider's taste, BMW offers a choice of three different seats (and seat heights) at the time of purchase. The R1200R can also be had with heated handgrips.

The R1200R's styling is very different from much of the lineup's angular, edgy look. It is also quite different from the in-your-face modern style of the K1200R naked. Instead, the R1200R uses an abundance of organic shapes that clearly set it apart. The large round headlight, the bulbous fuel tank, the rounded saddle, and the smoothly shaped fenders are much less dramatic than sharp creases. The R1200R is a mixture of old and new—an abundance of modern technology in a rather traditional, subtle package.

On the road, the bike is a delight. The 109-horsepower boxer revs smoothly to its redline at 7,900 rpm, but with abundant torque at low revs and a smooth power band, the engine does not need to be pushed hard. The excellent power-to-weight ratio and well-spaced ratios in the six-speed transmission give the bike tremendous flexibility, whether tearing up the back roads or lunging through gridlocked traffic.


R1200R
BMW


BMW

2007 R1200S

During the summer of 2006, BMW introduced a new model series, plus some major updates to key models. Of course, the new model series was the F800 bikes, powered by the new parallel-twin engines. But the boxers were not ignored. Among the most exciting new models for 2007 was the R1200S.

The R1200S is a new, improved version of the sporting R1100S, which was introduced in the 1999 model year and positioned as BMW's highest-performance boxer-powered bike. With its underseat exhaust and some intake and fuel-injection improvements, the R1100S boasted a five-horsepower advantage over the standard boxers. Add a stout chassis and sleek, minimalist bodywork, and the R1100S looked the part of a showpiece. The bike even spawned the Boxer Cup, a spec racing series built around the semi-clad R1100s. But in the real world, BMW had launched an aggressive sport-touring bike, one that certainly had performance capabilities, but was penalized by a portly curb weight of 504 pounds.

While it is built on an all-new chassis, the 2007 R1200S has much in common with its boxer-powered forebear. The six-speed transmission is a refined version of the Getrag six-speed that was offered in the R1100S. Featuring ball-bearing-mounted gear shafts and new internals that reduce shifting effort, the transmission handles the boxer's torque output and shifts flawlessly. The final drive is the familiar Paralever, which is virtually maintenance-free, and out in front is the Telelever front suspension. Damping, both front and rear, is provided by Showa components, but BMW offers an optional, extra-cost upgrade to higher-spec Ohlins bits. The Ohlins components offer additional adjustability, allowing riders to tailor the suspension to their particular riding style. Rounding out the chassis improvements, BMW has fitted powerful Brembo discs at both front and rear, with ABS control an option.

The engine is a showpiece of BMW's boxer engine development efforts. New exhaust porting allows for fat 50-millimeter exhaust pipes to flow back to the underseat silencers. New cylinder heads have the highest compression ratio ever offered in a BMW boxer—12.5:1—and have larger valves to improve flow characteristics. The pistons are forged aluminum, attached via strengthened connecting rods. The result of the engine work is the most powerful boxer that BMW has ever offered. Generating 122 horsepower and 83 lb-ft of torque, the uprated engine can spin to a redline of 8,800 rpm. The high compression ratio requires premium fuel to keep knock at bay.

BMW has also integrated a very unique and sophisticated throttle control system into the R1200S. The throttle cable is attached to a clever set of overlapping throttle spools that operate in a cam-like fashion. As the rider twists the throttle grip, the spools open the engine throttle to only a fraction of their potential. This gives the bike nice low-speed throttle response and eliminates jumpy low-speed behavior. As the rider twists the grip through the final 75 percent of its travel, the cam-like throttle spools open the throttle at a linear rising rate. The overall effect is that the engine is "tamed" when in low-speed riding situations, but still offers excellent throttle response when ridden at spirited levels.

BMW describes the R1200S as a "character sports" bike. This definition suits it since it is not a true superbike, as defined by the powerful inline-four bikes from Japan. Rather, the R1200S is a machine that is a delight for the riders' senses, matching a powerful motor to a very capable chassis. The R1200S weighs a full 100 pounds less

than the R1100S, giving it the agility that was lacking in the previous model. The bike also serves as a standard-bearer for BMW boxer technology. In 2008, the company offered an even higher-performance R1200S. Dubbed the HP2, the bike has 128 horsepower on tap and receives Ohlins suspension, front and rear. The R1200S and HP2 are not going to de-throne the Japanese superbikes anytime soon, but they will likely satisfy the well-heeled rider who is seeking a unique high-performance bike. They have plenty of character.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INDEX