



# THE R90S (1976)



While the 1976 R90S looked visually similar to the 1975 model, there were many unseen updates, particularly to the motor. With the development of the 980cc /7 already well under way, most of these engine modifications were a precursor to this updated design, and shared with other /6s for 1976. As was usual with BMW production, some of these updates were introduced gradually as the parts supply for earlier versions was exhausted. The numbers for the 1976 Model Year began at 4090001 for ROW, and 4990001 for the U.S. The updates were officially notified from February 1976, with the proviso that these “modifications were subject to alteration without notice.”

## **1976 Engine and Transmission Updates**

Although the power and specifications were unchanged, many engine components were new for 1976. This included the crankcases, cylinders and pistons, and cylinder heads. The engine type was now known as the 247/76, with reinforced crankcases, to accept larger cylinder spigots, and strengthening around the front main bearing. There was also a 10mm deeper oil sump pan, although the engine oil capacity of 2.25 liters was unchanged. The new sump pan moved the oil further from the crankshaft and camshaft to reduce internal friction, stabilize oil consumption, and lower oil temperature. A longer oil dipstick was required for the deeper sump. During October 1975, after 4090352, and U.S. 4990308, a 59 x 3mm O-ring was inserted between the crankshaft and flywheel. Also new for 1976 was the timing chain case, inner and outer cover, with larger bushes and oil seals for the timing advance mechanism.

The cylinder heads were also new, with modified valve guide positions to provide a greater clearance between the rocker and valve spring plate. The inlet valve guides were longer, at 54mm, while the 48mm exhaust valve guides were as before. There were wider rocker arm support blocks, and a spacer included in the cylinder head pushrod supports. These updates were aimed at reducing valve clatter. The shorter rocker arms were re-angled to increase stiffness and striking angle efficiency, and were centered in the cylinder head with special fitted rings instead of sleeves. The rocker arm ratio was unchanged, but incorporated self-aligning needle bearings. This had a practical benefit in that the valves didn't require re-adjustment every time the cylinder head was re-torqued. The 275mm

*OPPOSITE:*

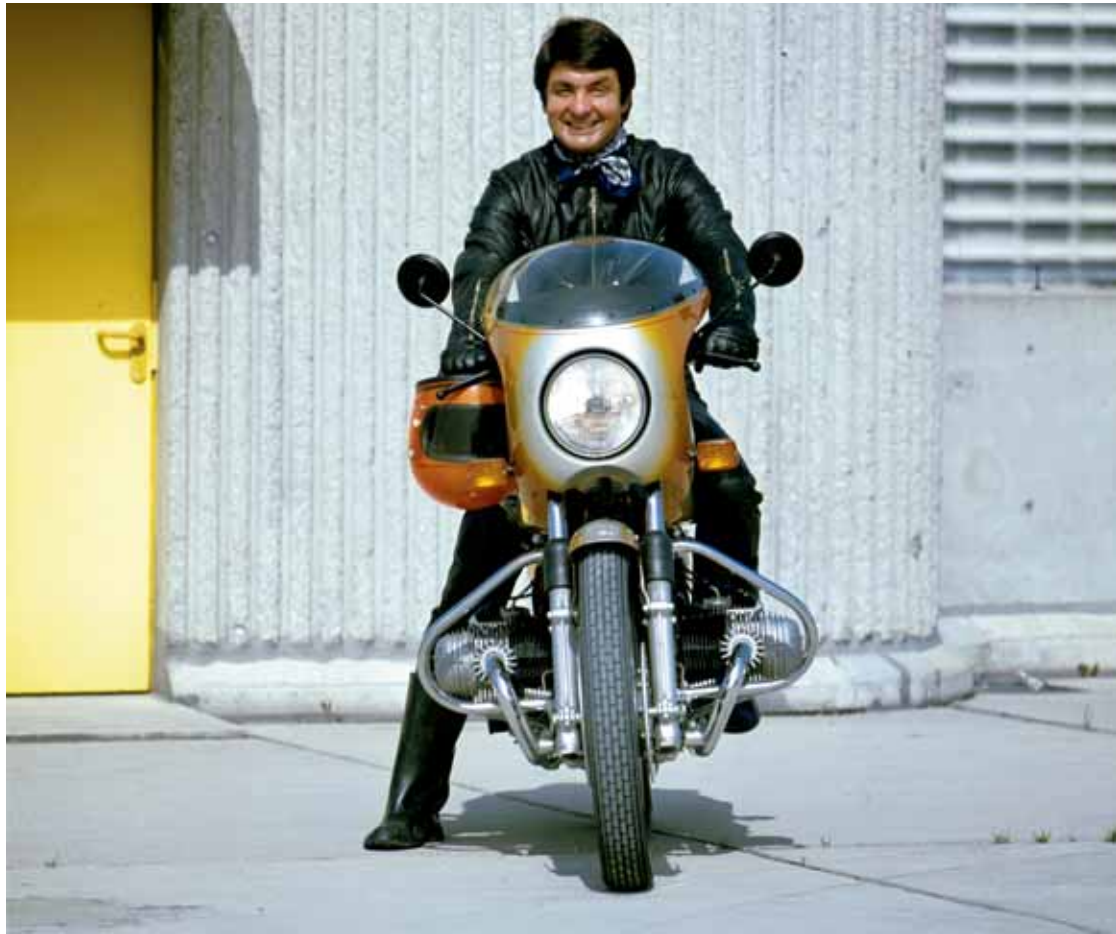
*Although the 1976 R90S looked similar to the previous model, there were numerous internal engine updates. Externally the most obvious was the deeper sump.*

pushrods were 20 percent lighter, hollow, three-part aluminum/steel/aluminum similar to those used on the V8 automobile engines, with new lower rubber grommets. These pushrods expanded more consistently with the aluminum cylinders, and provided quieter running from cold to full operating temperature. Instead of an aluminum base gasket to seal the new cylinders, “Hylomar” sealing compound was used, along with cord O-ring seals on the cylinder studs. The Hylomar compound needed to be applied sparingly so as not to block the small O-rings. The new cylinders also included new pushrod tubes.

Although the camshaft valve lift and timing were as before, the camshaft spindle diameter was increased from 12 to 20mm. The larger diameter spindle was intended to reduce camshaft flex, with a reduction in oil seal wear and improved valve operation. The front cam-bearing flange was also cast-iron, instead of aluminum, with a bronze bush, resulting in closer tolerances and cam timing accuracy. The reduced bearing play was also claimed to reduce load on the sealing ring, which was now larger. Inside the oil pump was a new inner rotor, and the clearances between the oil pump rotor and pump housing, and the gap between the inner and outer rotor, were tightened. The woodruff key locating the oil pump rotor on the camshaft was increased to 5.0 x 6.5mm, although the sprocket key was as before. During 1976 a new engine breather cover was introduced.

*Silver Smoke was also popular in 1976. This is Mac Kirkpatrick's low-mileage original bike.  
Jeff Whitlock/Mac Kirkpatrick*





Changes to the gearbox included strengthened transmission cases, and to improve shifting there was a new gearshift cam plate and detent spring. The obsolete neutral locator that always made it difficult to select neutral was also revised, with the spring-loaded, neutral indicator switch detent plunger in the gearbox redesigned. The recess in the shift cam was replaced by a raised projection. Although an improvement, and BMW claimed it provided a more positive selection, this modification was only moderately successful as on many 1976 bikes neutral was still hard to find. The other gearbox update was a new torsion spring for the switch pawl, with five turns instead of three. The clutch lever featured a repositioned pivot point, and when combined with the reduction in clutch spring pressure, made for a lighter clutch pull. Also improved was the clutch engagement, now smoother and more controllable.

The electrical and ignition system was largely unchanged, except for a new Bosch diode carrier and slightly higher rated Bosch alternator. The maximum output was 250 watts with 18 Amps of current. The starter included a wider chamfer on the starter gear ring, and a modified starter pinion for easier starting and pinion engagement. Updates to the Dell'Orto carburetors saw the carburetor slides activating the accelerator pumps

*Even BMW's board members rode the R90S. This is Dr. Eberhard C. Sarfert, who was responsible for Human Resources, and BMW board member from 1977 until 1983.*

*BMW Mobile Tradition*

earlier to improve low speed engine pickup. The result of these updates made the R90S stronger and easier to ride, but most of the engine modifications couldn't be retrospectively fitted to earlier models.

*OPPOSITE (above, left):  
Some of the final R90Ss  
had gas tanks like this,  
with /7 flush gas caps.*

*Peter Herbert*

*OPPOSITE (above, right):  
Many painted components  
also left the factory with  
the painter's initial.*

*Peter Herbert*

*OPPOSITE (below):  
A much-modified R90S was  
used as a mule to test ABS  
as late as 1983.*

*BMW Mobile Tradition*

## Chassis

There were also a number of chassis updates for 1976. The swingarm was more conventional than before, and instead of the single transverse bracing tube welded across the extreme closed end of the arm, BMW now adopted a pressed-out box section, welded in place, and reinforced the swingarm so the bearing pivot couldn't twist torsionally as before. The cross strut on the center stand was repositioned to provide clearance for the deeper sump.

There were also updates to the braking system, with larger piston (40mm) ATE black anodized front brake calipers and new brake pads. The calipers were marked "40" to indicate their piston size. Accompanying the larger calipers was a new master cylinder with a larger (17.46mm) piston, considerably reducing hand lever effort. A coil clip replaced the hose clamp retaining the master cylinder to the frame, and a new Bowden brake cable connected the handlebar lever to the master cylinder, with a stronger cable nipple.

To improve the handling there was less clearance between the fork tube and fork leg (0.1mm instead of 0.24mm). The brake caliper mounts were wider, 72.5mm (up from 72.2mm) mounts for the larger brake calipers, and the rear shock absorbers had dual rate springs. Not all 1976



*By 1976 the shock absorber  
nuts were no longer a  
chromed acorn type.*

*Jeff Whitlock/Mac Kirkpatrick*



*The gas cap was also  
chrome-plated steel for  
1975 and 1976.*

*Jeff Whitlock/Mac Kirkpatrick*



*Chrome plated nuts no longer  
appeared for the footpegs  
and rear subframe by 1976.*

*Jeff Whitlock/Mac Kirkpatrick*



BMW R90S Production 1976 Model Year				
Date	Start	End	Start (U.S.)	End (U.S.)
08/75	4090001	4090075	4990001	4990041
09/75	4090076	4090351	4990042	4990282
10/75	4090352	4090412	4990283	4990542
11/75	4090413	4090613	4990543	4990575
12/75	4090614	4090912	4990576	4990584
01/76	4090913	4091258	4990585	4990706
02/76	4091259	4091781	4990707	4990713
03/76	4091782	4092298	4990714	4990976
04/76	4092299	4092935	4990977	4990980
05/76	4092936	4093407	4990981	4991235
06/76	4093408	4093724	4991236	4991260

R90S Production 1976 Model Year (Supplied by BMW Mobile Tradition)				
Model	Production Dates	1975	1976	Total
R90S 1976	09/1975–07/1976	912	2,812	3,724
R90S U.S. 1976	09/1975–07/1976	584	676	1,260
		1,496	3,488	4,984

R90Ss were identical. Many 1976 examples had a cutaway for the rear subframe bolt in the right side cover.

By June 1976 production of the R90S and /6 was scaled down as BMW prepared for the /7, R100S, and R100RS, and some R90Ss appeared with /7 features. John Yee, treasurer of the National R90S Sports Owners Club bought number 4990496 new, in November 1976. This Silver Smoke example incorporated a /7-style flush gas cap, black rear grab rail, and black left lift handle instead of chrome, matte black finish on the rear fender and side covers, and a matte black tire pump. The valve covers were also black and the cylinder fins unpainted. It isn't known if the bike left the factory like this but it is possible some unsold R90Ss were updated to /7 spec later in 1976. Other 1976 R90S featured similar anomalies; Silver Smoke 4990894 also had a flush gas cap. Peter Herbert in Australia bought one of the last European Daytona Orange models, 4093675. Sold new from Gus Kuhn in London in February 1977, this too had a flush gas cap, with the painter's initials under the tank.

In the author's opinion the improvements for 1976 resulted in the quintessential version of the R90S series. Although only marginally improved over the 1975 model, the 1976 examples embodied the inherent excellence of the series, with slightly improved braking, handling, and reliability. As BMW pursued a path of increased production and lower production costs, the quality also declined slightly. There is no doubt the finish on the R90S and /6 was superior to the later /7. In the words of *Motorcyclist* magazine in their "Great Bikes of the 70s" publication, "The last year for really good overall finish was '76. The '77s looked bad."

## What the Press Said About the 1976 R90S

As had happened in 1974 and 1975, the R90S continued to impress. The Daytona Orange R90S graced the cover of **Cycle** magazine and **Motorcyclist** early in 1976. Despite a price rise to \$3,965, both tests were extremely complimentary about the updated model. Of the **Motorcyclist** test bike, an early 1976 model number 4990023, venerable tester Bob Greene had this to say: "Embarrassingly little constructive criticism can be levelled at the BMW Sport in 1976; they've been fine combing every test report and have done their homework." Greene went on to ask, "Is the Sport really superior to the standard 900 and is it worth four Gees? Affirmative on both counts. I prefer the Sport's less plodding gait, more fleet acceleration, taller cruising gear, and lower seating position. And that café fairing does work." To justify the still considerable price BMW extended the warranty to 12 months or 6,000 miles. In the U.K. the 12 month warranty was even more generous, including an unlimited mileage guarantee. **Cycle** magazine had this to say about the 1976 R90S. "The latest BMW R90S is improved over the first version, which we also liked a lot. Roads stream by under the flashing spokes, the exhaust is a civilized, subdued basso rumble. There's power to spare, and reliability unquestioned."

LJK Setright in the English **Bike** magazine described the R90S as "possibly the best production motorcycle in the world" after the initial press launch, and two years later, in December 1975, Bill Haylock still believed the

R90S was the best. Searching for the ultimate motorcycle, Haylock stated, "The R90S handles and stops almost as well as the best Italian sportster; is almost as fast as the fastest Japanese roadburner; it is almost as uncomplicated as the good ole British twin; it is almost as smooth as the best multi; and when it comes to comfort and capability for traveling at maximum speed with minimum fatigue, the R90S is second to none. Many bikes do one thing superbly, but the BMW is the only bike I know that does **everything** very well." ■



*Although now two years old, the R90S continued to appear on the cover of many motorcycle magazines in 1976.*