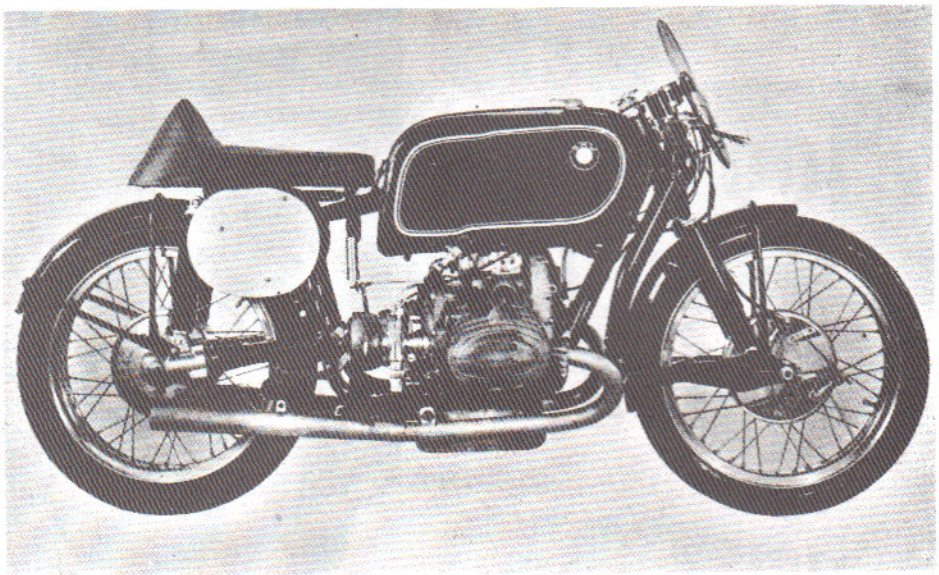


1953 BMW racing model has shorter, streamlined engine to reach speeds above 120 mph. For the first time torque shaft is covered for better aerodynamic design, has larger oil pan, and new brake system with dual action in the front

GERMANY'S SUPER THREAT

by F. H. Baer

TO BE TRIED out first at the Hockenheim race of 1953, the new BMW 500 cc racer is a successful combination of three main desires: it has boosted engine output, bettered driving characteristics, and lowered weight. Since it is not possible to develop one of the characteristics alone—this would mean lowering of efficiency of the other two desired features—the BMW people have compromised to produce a cycle which drives faster than a commercial airplane of the years before World War II, has more power output than a standard US automobile (at least the smaller 6-cylinder jobs).

To reach these records, BMW's engineers have stuck to the use of serial parts, or have designed parts which later may be used in the serial cycles. For that reason, BMW remained with the traditional 2-cylinder pancake system, with torque shaft instead of a secondary chain. The engine is shorter, more compact, and better streamlined than the serial R68; it also turns higher than the R68: about 8,000 rpm. The actual power output, though secret, is estimated 85 to 115 hp.

To arrive at this output, BMW engineers have ported and relieved the intake manifold and the valve arrangements. A tower shaft transmits the power for the two overhead camshafts from the crankshaft. Weight reduction is achieved by use of light alloys, which are, however, for rigidity's sake armed with steel inserts.

Use of dural sprockets for the drive of the magneto, etc. is to balance and eliminate changes in clearances caused by heat. The electron casting expands under heat, mind you, in a different ratio than the steel or aluminum engine parts. Dural is best to counterbalance the expansion variation during warm-up and racing.

A special feature is the both-sides foot shift, permitting the driver to shift either with the right or the left foot, a feature necessary on tight curves. Also for longer races is an enlarged oil pan which, armed with deep aluminum fins for better cooling, holds more oil to keep the temperature down.

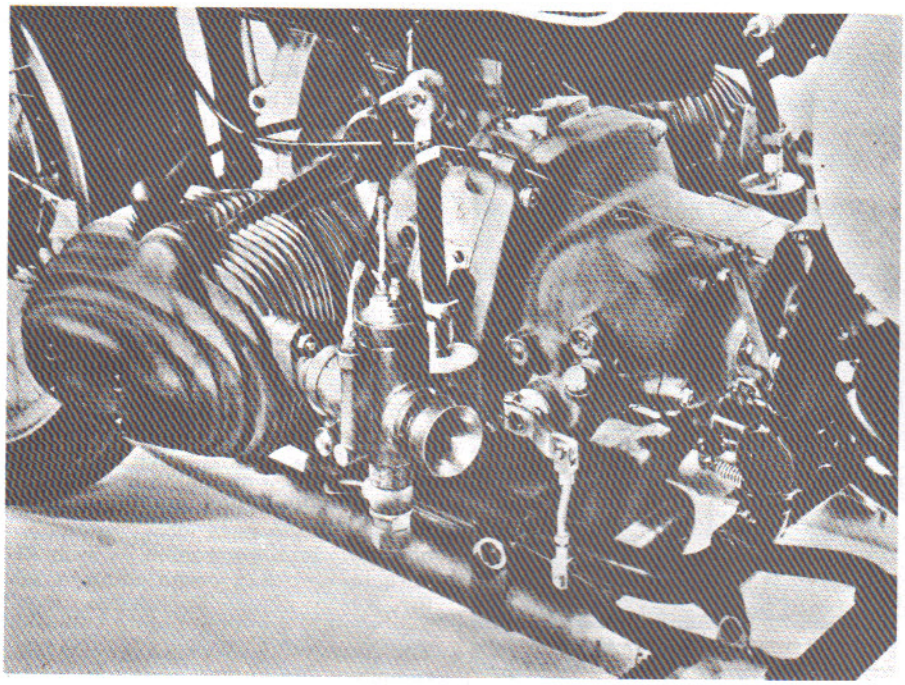
The rear drive, built into the brake drum of the highly polished full-width brake, was streamlined, and the torque shaft covered with tubing to permit aerodynamically better shaping. A nylon disk replaces the former mechanical universal joint, for smoother absorption of shocks and more flexible operation.

The front and rear suspension has been changed to the now stylish swing-arm suspension, temporarily replacing the telescoping suspension system. BMW engineers, however, pointed out that the reason for adoption of the swing-arm suspension is the drive to reduce the "nodding" of the cycle while changes in the speed occur, and to prevent the cycle from "dipping" while operating the front brake. The riding characteristics are thus considerably bettered.

The telescopic suspension is not out of production and will probably remain. BMW engineers' intention was to find—for racing's sake—a new concept to halt the undesired motions of the cycle. Tests and calculations with the cycle's wheelbase and its center of gravity led to the correct angle and the stiffness and the detail construction of the swing-arms.

The front and rear suspension may have their stiffness altered by conical roller bearings which, on the one hand, guarantee a clearance-free fitting of all suspension parts and, on the other hand, permit the quickest change according to the driver's weight and course characteristics.

The BMW 500 cc racing models come in three different frames of the "cradle"



Close-up shows new cylinder head, foot-gearshift and crankhousing breathing vent on top of bell housing. Output of engine per cubic inch displacement is in upper international quality class

type. The frames differ in the wheelbase only, because of the different lengths (height) of the drivers. Divided into "A," "B," and "C" type frame, the tallest and the shortest of the 6-man BMW factory team finds "his" made-to-order machine. This was done to permit a driving position (crouching, or sitting) best for the course's and race's necessary driving technique. Imagine such detail!

I don't know whether it may be said in public, but tests are on the way at BMW's to find out the characteristics of fuel injection in the 2-cylinder pancake type. I hope that Mr. Hoepner of BMW isn't too annoyed, but this fuel injection test is the first conducted in Germany, and for that reason alone, would create attention. Maybe he won't be too mad, and will let me look at the testing cycle for a good report to CYCLE.

The third feature of the BMW 500 cc racing cycle is that it is lighter in weight than the 340 lbs. serial R25-2 model. This, in conjunction with the enormous engine output, makes it a bomb on two wheels, and combined with its good riding abilities, one of the foremost predestined winners of Germany's 1953 racing season.

Front brake system features two levers to operate on one cable; each lever is progressively agitating one of the two brake shoes. Design might enter production. Note that short fender is so mounted that even distance from tire—regardless of suspension action—is insured