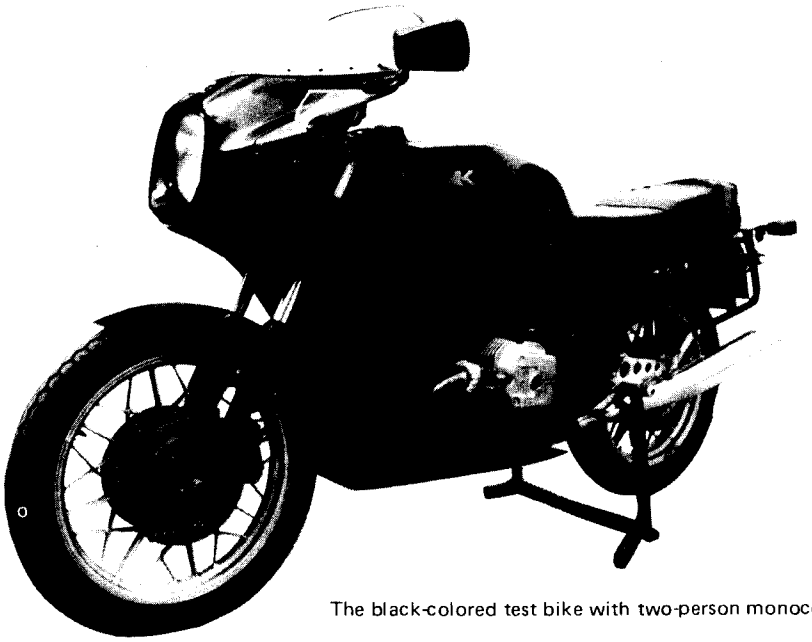

The black-colored test bike with two-person monocoque.

Test Ride and Impressions of the Krauser MKM-1000 4-valve

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The Netherlands

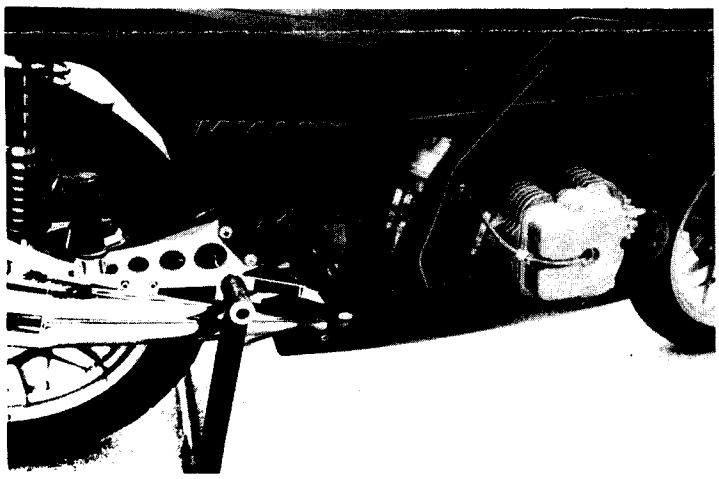
With this motorcycle, Mr. Krauser meets a demand that exists among BMW lovers for quite some time. Now you can buy a fast and good handling "BMW". This is a motorcycle the BMW factory should have produced years ago, but what they never wanted to do. The could have easily come up with a good design; see the production RS-solo-racer from 1954—a dohc 500 cc twin with 50 Bhp at that time. Now Mr Krauser tackles the challenge. All his hobby is about motorcycles. In Europe you can notice it because he sponsors several roadrace teams. And he is successful, with two of his teams being FIM-World Champions: the German team, Schwärzel/Huber, for the sidecars; and Swiss Stefan Dörflinger, for the 50cc.

When visiting the Krauser factory in Mering near Augsburg (southern Germany), where I could look at all of Mr. Krauser's activities, he enabled me to test a pre-series model of the MKM-1000 with special 4-valve cylinderheads. This cylinderhead is developed by a Mister Roth, who gained experience with designing 4-valve speedway engines (European speedway, 500cc single on methanol). This man's prefession is baker!! These cylinderheads fit on a standard 1000cc BMW engine of 70 hp. Mr. Krauser also intends to sell these cylinderheads as a kit, to be introduced in February of 1983, so that every 1000cc BMW-owner can transform his motorcycle. Costs of this kit in Germany at the moment, is $1,100.

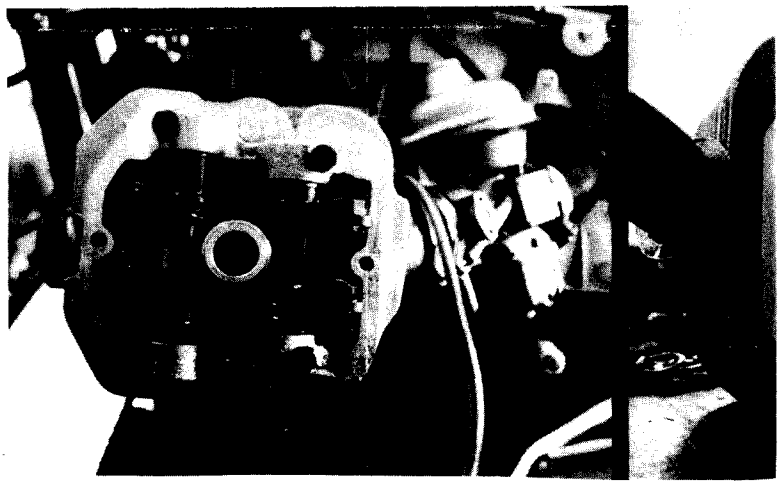
The design is simple, so that many BMW parts may be used. The 4-valve cylinderheads fit with the original BMW exhaust pipes, silencers and carburetors of 40mm. The two inlet valves work under an angle of 18 degrees; the outlet valves work under an angle of 21 degrees. The rockerarms serve two valves each in this way, are made of chromemolybdenumsteel, and incorporate needle bearings. Adjusting the valves is made easy by excenterrollers. In the cylinderhead, extra valve-lifters go up and down in special steel guides. These valve-lifters are operated by pushrods half as long as the originals in BMW.

The valve-lifters work on an angle on the pushrods. This was necessary because on the 4-valvehead-configuration, the application point for the rocker arms lies further away from the center of the cylinder. Because these valve-lifters and guides are made of special space-age steel which doesn't expand, the valve-clearance may be adjusted at zero when the engine is cold. Because of the 4-valvehead-configuration, there was only room enough for a 10 mm spark plug, which is placed in the center of the cylinderhead. The pistons do have four cut-aways in the piston top, to clear the valves. With this a compression ration of 10.2:1 is reached, leaded premium is required. All this results in a guaranteed power of 82 DIN-Bhp for the former BMW engine.

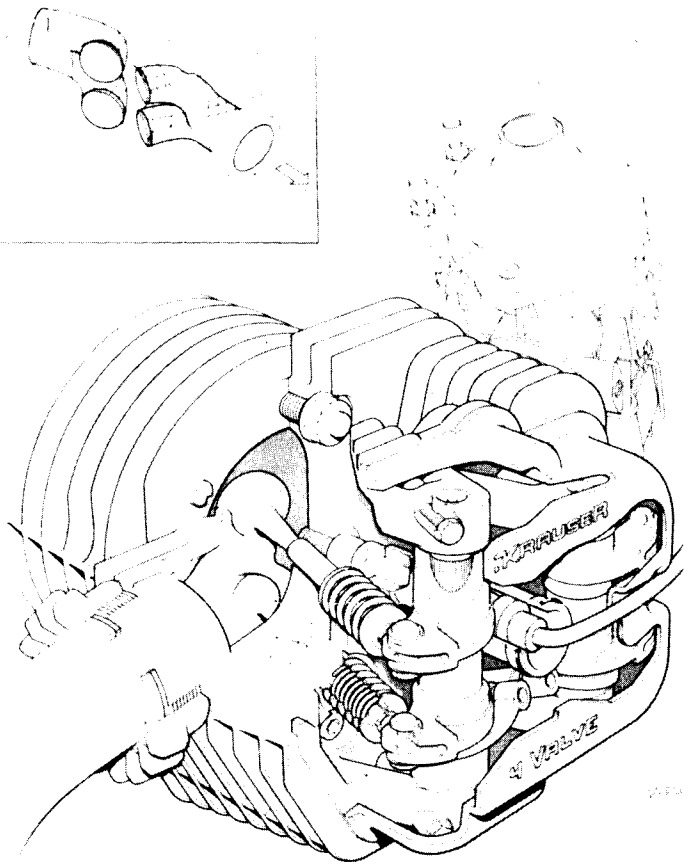
The other specialty on this motorcycle is the frame. The idea and design are from the endurance racers, Halbfeld and Zettlmayer, who rode for Krauser in 1976. The frame is designed with a computer as a degree project for Halbfeld, at the Technical University. The frame is a so called open-bridge-frame, made of triangles of special tube steel, welded together. It consists of 56 pieces of tube, and weighs only 11.5 kilo (25.35 lbs.)—6.5 kilo less than the original BMW frame. So the frame is open from un-



Close-up of the engine of the tested bike.



Arrangement of the rocker-arms.



derneath, but the engine is mounted in rubber onto two tubes and then bolted into the frame. These tubes 'close' the frame and reinforce it even more. At this frame, the steeringhead is 45 mm (1.8 inches) longer than the steeringhead of the BMW frame. Because of this, more tubes from the frame can be connected with this steering head, which adds more stability to the frame. In this frame the engine lies 25 mm (one inch) higher than the BMW frame. The Krauser cylinderheads make the engine another 35 mm (1.4 inch) narrower. This with the higher engine, adds to the groundclearance in curves. Using this frame, 45 mm is added to the wheelbase, and this gives a much better stability at high speeds. The maneuverability lost a bit due to this measure.

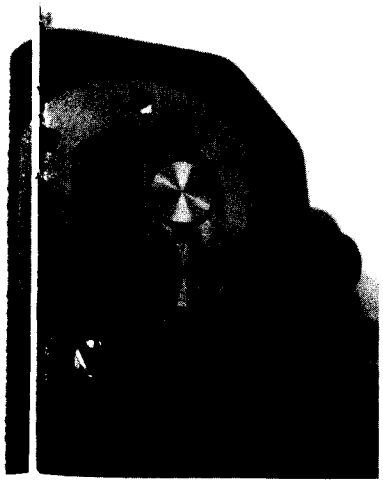
At the pivot of the rear swingarm, the frame is wider to take the 27 mm (1.1 inch) wider rear swingarm. This is done to adapt the wider, new Metzeler 130/80 V 18 ME 99 rear tire. This tire is quite a bit wider than the 4.00x18, and results in a much better roadholding. In order to clear the wider tire from the tube in which the drive shaft runs, the drive-coupling had to be moved to the right by placing a 10 mm (0.4 inch) shim under it on the wheelhub. Also for this, the rear axle then had to be lengthened by 25 mm.

The frame is made and inspected according to aircraft specifications for the Krauser Company, at the factory of the aircraft company Messerschmitt-Bolkow-Blohm in Munich. The frontfork is the BMW fork of the 1000cc BMW, with Brembo brakes. This frontfork is used with a reduced stroke of 160 mm (6.3 inches). For this, Mr. Krauser uses a shortened inner-damper with a special lower piece. Also, a reinforced lower forkyoke is used. Together, with the 45 mm longer steeringhead, this all adds up to much more stability in the frontfork. Placing a wider tire on the front rim is also possible now by another front fender without a reinforcement brace.

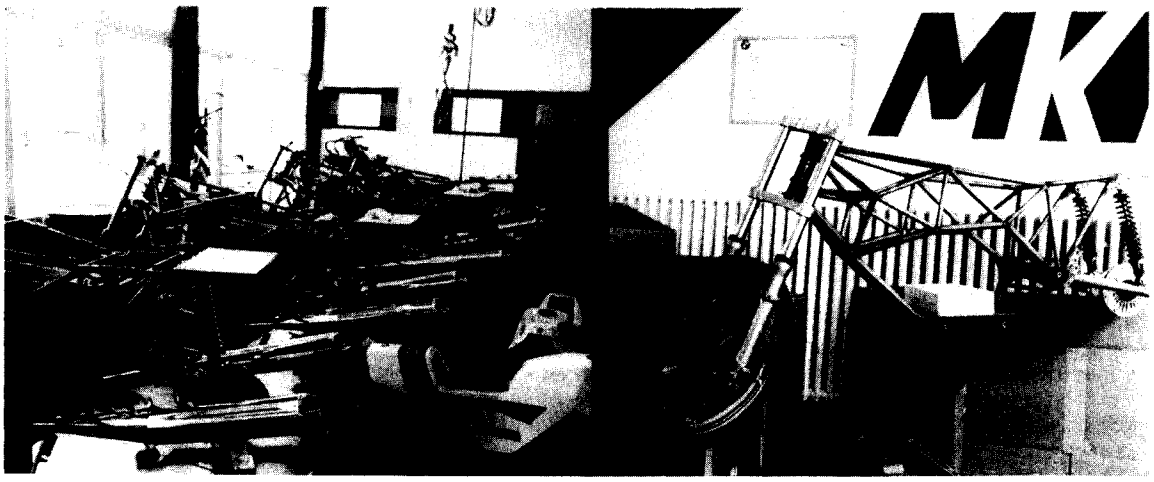
The rear wheel drive-unit is the original BMW unit with a ratio of 2.91. Through using this frame, the dry-weight of the complete bike is only 198 kg (436 lbs.), including the fairing. This is substantially less than comparable specials with Japanese engines and clearly less than a BMW R100RS. The fairing is made up from three separate parts mounted to a light subframe by quick-fasteners. The two lower parts can be taken off in a few seconds if there is any need to work on the engine. The aluminum fuel tank is fitted to the frame with silent-blocks and contains 21 liter (5.5 gal.) —enough for more than 200 miles. The original BMW fuelcocks are used. The monocoque unit for the tank and seat is made of fiberglass and fits neatly over the gastank and frame, and is also mounted with quick-fasteners. This monocoque is obtainable as a one- or two-person unit.

The rear light and numberplate are mounted on a small fender, directly to the tank-seat-monocoque. You can quickly disconnect the electrical wiring by plugs. The electrical components, complete from BMW, are mounted on one base-plate underneath the gas tank—everything clean and clearly arranged. The footrests and their base-plates are made of forged aluminum. The footrests are not adjustable, but well placed for short and tall people as well. The brake lever is not adjustable either, but is placed OK. The shift lever is adjustable by an adjustable rod, but only a little. The other parts are all from the 1000cc BMWs, so a lot of parts can be used when transforming your own bike.

When the entire bike is built in the new Krauser factory in Mering, a checklist is used to verify 139 functions and mounting steps. So these Krauser 'BMWs' are put together "gewissenhaft" and with German "Gründlichkeit". Every bike is delivered with a certificate of the frame manufacturer MBB and a power-test-curve of the bike. The Krauser company also hands out a manual as a supplement to the original BMW manual—plus a supplement to the original BMW parts list (Auxiliary Catalogue). Almost all MKMs are delivered with a white color and Krauser colors. The tested bike, however, had a black color combination, which looked quite distinguished. This bike was used at the test department and had just under 10,000 miles on the tachometer when the bike was



Cylinderhead with the four-valves.



Assembling the MKM's at Mr. Krauser's new factory.

The racing-version for the Battle of the Twins??

handed over for the test. For its exactness, a Kröber rev-counter was fitted. The test bike was fitted with a two-person tank-seat-monocoque. There was no wear to be seen or heard from the engine or elsewhere.

The test ride was made at a temperature of 10 degree C (50 F) with almost no wind, and a clear sky. The route led from Augsburg over country roads, through small villages towards Munich, and back over the Autobahn. In spite of the totally new frame, the roadholding characteristics stay clearly related to the BMW's, but also clearly better at high speeds. It is comparable with a R100RS, but more quiet and more stable. Because of the lower weight and quiet engine characteristics, it is not difficult to handle the MKM 4-valve at low speeds in town. It is a bit difficult to turn in a narrow street because of the increased turning radius. Outside of town on the wide country roads, the bike reaches the 110 mph quickly, and is effortless to ride in long curves. There is totally no instability even when on bad road surfaces. In this case, in fast-ridden short curves, the bike tends to bounce a little—but not frightening, and the bike stays on the aimed line. Although the bike really has to be directed into shorter curves, minor corrections are easy to perform.

The BMW-Boge shocks were at their stiffest setting, position 3. The new Metzeler rear tire allows a fast curve-style; it is a bit of a soft kind of rubber compound, fine for good grip on dry and wet roads. When running warm, because of the lean adjusted carburetors, you will need the choke for some time—with cold weather, up to 5 minutes. The choke is fine-adjustable, with good feedback.

Under 3000 rpm there isn't much torque, especially when needed for pulling away. You have to go up to almost 3000 rpm or the engine will die. The valves of these 4-valveheads make only a bit of noise; but when you drive slow the noise is intensified by the fairing. Especially in town where the sound-board action of the fairing is even more intensified by the buildings along the street. However, when riding out of town and over 35 mph, the noise totally disappears; you only hear the engine sigh. When driving 110 mph at the country roads, I had the same impression as at 90 mph on a R100RS: Quiet touring. At this speed there was absolutely no impression of racing. On the highway, driving up to top speed is no problem at all; the bike stays stable on course, and doesn't react on length-ridges in the road surface. Aslo, side winds and air circulation from cars driving in front of you, don't influence the stability.

In my Belstaff suit, I drove up to 140 mph (on the tachometer) and even with this anti-streamline-suit, there was no inconvenient air circulation. I could have pushed it even faster if it hadn't been for a BMW 735i car that didn't let me pass. The actual tops speed had to be a genuine 132 mph, according to the exact rev-counter at 7200 rpm. This motorcycle was timed with a 90 kg driver of 6'—4" at a precise topspeed of 137 mph. This is possible with these engines. The philosophy behind this is: Their engines must have at least 82 DIN-bhp, even in the 'worst' state when new. This is done for the German "TÜV", so that the official figure is normal, but most exceptions are faster. And to relate that weight with that speed, you certainly need more horsepower for almost 140 mph.

For tall people, the riding position is somewhat straining at first, but with my length of 6'—3", I had no difficulties after two hours of testing. I quickly got used to this position. With my motorcycle boots, I almost touched the carburetors because the engine lies higher in the frame. But because of the sportive position, my knees were wider apart and the boots slipped along the carbs. The seat is not hard and a long ride is still comfortable. Because the MKM-1000 is lower than a BMW and the seat is narrow in front, you can get to the ground more easily; convenient for small people. The new Brembo brakes work fine and there is good feeling feedback in applying. The brakes don't need much power due to the internal changes; and the frontfork doesn't collapse as much as with a BMW when using the brakes. This is easier and better for steering in front of a curve.

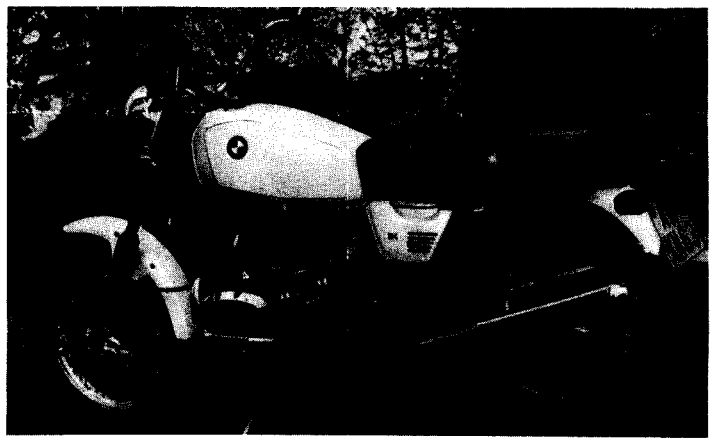
The gearbox is the new BMW 5-speed gearbox with improved sealing at the clutch-thrust-rod. It's gear change is good, especially when cold; but it sticks a little when warm, and I wanted to change the gears quick. This is because of the synchronising behavior of the cold oil. The gears correspond nicely, what is also a compliment to the flat torque-curve of the engine. On the tested bike, a new model plastic Krauser luggage rack was mounted. This also gives the bike a possibility for enough storage room. This type of rack is just brought into the market and made of unbreakable plastic. The platform for the topcase can be turned over backwards so you will be able to open the seat when the seat end runs under the platform.

Mr. Krauser really believes in his product: He gives 3 years warranty on this rack. To take a tankbag along on this motorcycle means a difficulty, if not impossible to realize. You cannot attach or make it fit on the back end of the gas tank. The total bike hasn't grown into a real and nervous racing motorcycle, but into a fast motorcycle for long rides. This is most enjoyable as a solo-rider, and you can still take along enough luggage for that.

Next year, Mr. Krauser intends to run a special MKM 1000 4-valve in the *Battle of the Twin* races in the U.S., and perhaps also in the *Formula World Champion Races* on the Isle of Man. This bike has an altered frame for better cornering, a Paoli telescopic front fork, Koni shocks, and racing slicks.

TECHNICAL SPECIFICATIONS

	BMW R100RS	Krauser MKM 1000 4-valve
Piston displacement	980 cc	980 cc
Bore and stroke	94.0 x 70.6 mm	94.0 x 70.6 mm
Brake-horsepower at rpm	70 DIN-bhp/7250	82 DIN-bhp/7300 rpm
Torque at rpm	76 Nm /6000 rpm	83 Nm /4000 rpm
Max. revs.	7400 rpm	7400 rpm
Compression ration	9.5 : 1	10.2 : 1
Inlet valve diameter	1 x 44 mm	2 x 37 mm
Outlet valve diameter	1 x 40 mm	2 x 31 mm
Diameter valve stem	8 mm	7 mm
Spark-plug thread	M 14 x 1.25	M 10 x 1.25
Sparkplug heatrange	225	210
Carburetors	Bing 40 mm CV	Bing 40 mm CV
Fuel capacity	24 ltr. (6.3 gal.)	21 ltr. (5.5 gal.)
Suspension, travel-front	200 mm (7-7/8")	160 mm (6-3/8")
Suspension, travel-rear	125 mm	125 mm (4-7/8")
Final drive ratio	3.00 (R100S=2.91)	2.91
Tire—front	3.25 H 19"	100/90 V 19"
Tire—rear	4.00 H 18"	130/80 V 18"
Wheelbase	1465 mm	1510 mm
Trail	95 mm	100 mm
Width (at engine)	746 mm	711 mm
Length	2180 mm	2220 mm
Seat height	820 mm	800 mm
Dry weight	215 kg	198 kg
Top speed	198 kmh	218 kmh



THE KRAUSER—TRAVELLER

Some of Mr Krauser's activities in the near future: A Kit for a BMW "Chopper" to be called the Krauser-Traveller (available in February '83, price not yet known); He is setting up production for two fairings (the first is intended as an improvement of the BMW R100RT fairing, the second as an improvement to the R100RS).