

CYCLE GUIDE ROAD TEST

BMW R90/6

BMW climbs on the big-bike bandwagon.

Bavarian Motor Works has been around for a long time making motorcycles, cars, and airplanes (The BMW logo is based on an airplane propeller.), among other things. For years their motorcycles have been considered the epitome of reliability, comfort, and elegance. But more recently, without sacrificing its reputation for civility, the West German marque has been cultivating a sporting image for its motorcycles.

One of the results of BMW's change in attitude is an increasing use of their machines as sporting motorcycles. More BMW cafe racers and production road racers are appearing on the scene all the time.

For the past few years BMW has been active in local and national championship road racing. Their record on the national circuit hasn't been spectacular, but their West Coast rider, Reg Pridmore, has dominated California open class production road racing to the point that when he's present with his 750 BMW, the only question is who will finish second. At the two production races at AMA nationals last year (Laguna Seca and Pocono), Pridmore brought the BMW home third behind factory Kawasaki riders.

Another result of BMW's sports orientation was the addition of two new 900cc models to the top of their line: the R90S, a cafe racer, and the subject of this test, the R90/6.

THE BIKE: The basic BMW layout—that is, the horizontally-opposed flat twin engine, utilizing a driveshaft—is currently unique to BMW in this country despite its use in the past by Marusho, Zundapp, and Ural, among others (although Honda has been experimenting with a shaft-drive flat four).

The engine-transmission unit looks huge and heavy, but its appearance is deceiving. Much of the room inside the cases is taken up by a large airbox, and the illusion of bulk is added to by the horizontal cylinders which protrude out into the airstream, thus keeping cool. The engine is only about 29 inches wide, but 11 inches on each side are taken up by the cylinder and head. Because the crankshaft is set parallel to the direction of travel and the crank throws are offset, the cylinders are offset—the left one is slightly ahead of the right.

The engine is basically a bored-out 600cc BMW. The 70.6mm stroke is common to the entire BMW line, and the R90/6 has a bore of 90mm. Pushrods operate overhead valves, and the 180-degree crankshaft keeps the pistons op-

posed, thereby counterbalancing each other.

Various accessories are located inside the engine cases. The alternator and points are mounted under the large cover at the front of the engine; the electric starter is inside the case above the engine; and the back-up non-primary kick starter is located on the left side. The starter lever swings outward and is difficult to use, but fortunately you don't need it very often.

Constant-velocity 32mm Bing carburetors are mounted at the rear of each cylinder. Two plastic hoses connect the carbs to the airbox. Two petcocks, one on each side of the tank, feed the carbs. The markings on the petcocks are "A" for on, "ZU" for off, and "R" for reserve. The



PHOTOGRAPHY BY MARC MADOW AND ART FRIEDMAN

choke lever is mounted on the left side of the engine case just under the gas tank.

The engine layout is in the BMW tradition, but major changes have been made elsewhere on the bike. A standard single-leading-shoe drum brake stops the rear wheel, but the single thin disc brake mounted on the left side of the front wheel is obviously different. This disc brake system differs from most others in two ways: (1) The master cylinder is located under the gas tank and connected to the lever by a cable. Its location protects it in the event of a crash, but more importantly, conceals it from vandals, who lately have been ripping off master-cylinder caps like they break automobile radio antennas. (A warning light in the instrument panel also warns you if the fluid level gets low.) (2) The caliper is mounted behind the fork leg. In theory, this minimizes distortion of the fork leg during braking and the consequent tendency to pull to

one side. It also puts the weight of the caliper closer to the steering axis where it has less effect on steering action.

Another major change for BMW this year is the five-speed gearbox. Although few people ever complained about gaps in the ratios of BMW's four-speed, a five-speed better fits the new BMW image.

Quite a few styling changes have also been made. The chrome panels on the gas tanks of last year's bike are gone, replaced by paint and pinstripes (in seven available colors) to match the fiberglass fenders and side panels. The tank itself is tall, fairly narrow, and holds 4.8 gallons. (A 5.8 gallon tank is available as original equipment for an additional \$40.) The tank is easily removed to service the front brake master cylinder.

Another stand-out styling change is the instrument panel, which is in its own case and uses printed circuitry in place of the internal wiring of the speedometer and tachometer. The printed circuits are more resistant to water and vibration. Between the speedometer and tach are five idiot lights: neutral, turn indicator, oil pressure, generator, and brake failure. Also new is a real honest-to-God ignition key which also fits the fork and seat locks. The ignition lock is incorporated into the left headlight mounting bolt.

There are two handlebar switches, each with a button. The left one is the horn (which should be louder) button and a three-position headlight beam switch (high, low, and flash). The right switch is the electric start button and the turn signal switch.

The headlight is turned on by the ignition switch, which has five positions: everything off; ignition off with rear parking light on; ignition on with no lights; ignition on with taillight; and ignition on with both lights.

Under the seat lies the 25-piece tool kit that includes tire irons, a tube patching kit, and a tire pump. The quality of the tools is very good, considering they are in a kit supplied with a motorcycle.

Another new feature is an unusual steering damper composed of a hydraulic cylinder between the bottom triple clamp and the frame and a large plastic knob atop the forks. The mount that attaches the damper to the triple clamp can slide from right to left, and turning the knob varies the mount's distance from the steering shaft. The knob has three positions: 0, 1, and 2. The "0" position places the mount closest to the steering shaft and provides the easiest steering; the "2" position places the mount furthest from the



steering axis and provides the stiffest steering.

The telescopic front forks have internal springs and allow 6.25 inches of travel. Black rubber gaiters keep road crud away from the seals.

The rear shocks are manufactured by Boge and allow four inches of wheel travel. A built-in handle on the spring base allows three preload adjustments without any special spanner.

The engine is surrounded by a double-loop cradle frame. The seat, rear suspension, and rear accessories are supported by a bolt-on rear subframe. The housing for the driveshaft forms the right fork of the swingarm, and the driveshaft itself is connected to the transmission with a universal joint.

Center-pull spokes are laced to alloy wheels front and rear. A 3.25 x 19 Metzeler rib is mounted at the front, and a 4.00 x 18 universal Metzeler at the rear.

ENGINE AND GEARBOX: If the engine is cold you need the chokes to start the bike. The engine will fire off and idle immediately, but needs a few minutes warm-up before it will pull away strongly. The electric starter button requires a fairly hard push before it makes contact, but the starter won't operate if the clutch is engaged with the bike in gear.

The bike has a broad powerband with no sudden power surges through the rpm range. It accelerates smoothly from 1500 rpm in fifth gear, even with passenger aboard. At 60 mph the engine is turning about 3500 rpm, only halfway to the 7000-rpm redline.

Performance isn't generally considered to be the BMW forte, and compared to some other bikes of similar displacement, the R90/6 isn't a rocketship. BMW claims only a 14.0-second quarter-mile time for the R90/6, but our test bike logged 13.49 seconds at 96.8 mph, not bad for a tourer. We had a 1000cc Harley-Davidson Sportsster along at the drag strip (for a test next month) and raced it against the BMW. The BMW won, hands down.

Unless you get your weight well forward on the BMW, wheelies may be a problem if you are trying to get a quick hole shot—a fact that firmly impressed us during our first run at the dragstrip. Our tester wasn't far enough forward, and the tire spun for a few yards; when it got traction it almost looped the bike. The reason the BMW is prone to wheelie is that, in addition to normal rearward weight transfer during acceleration, the pinion on the driveshaft tries to rotate around the ring gear in the rear end and raises the whole bike when power is applied.

At 50 mph on level ground, you can accelerate and pass in fifth gear. If you are riding double or are on an upgrade, you must downshift into fourth for passing at 50, and if you're in a hurry, a quick jab down to third will give even more punch.

There is a large flywheel on the crank-

shaft to smooth out engine vibrations, and its inertia also helps low-speed torque. However, the additional inertia makes the engine less responsive to changes in throttle and load; because of the flywheel weight, the engine doesn't rev as quickly as, say, a four-cylinder bike. Nor does it return to idle immediately when the clutch is disengaged and the throttle closed. Because of this gradual response, it takes some time to learn how to shift without lurching. The faster the shift, the bigger the lurch when the clutch is released. The trick is to let the engine speed synchronize with the transmission speed before engaging the clutch after shifting.

In past years, one complaint about BMWs has been that the gearboxes clunk during shifting. Although the gearbox has been revamped this year, ours usually still clunked when it was shifted. By downshifting without the clutch—just blipping the throttle as we shifted—we could usually keep it from clunking. Normally, though,



we just used the clutch and let it clunk. The only shift that was usually silent was the upshift from fourth to fifth.

With a powerband as broad as the BMW's, a five-speed transmission hardly seems necessary, but it does bring the ratios closer together. They are evenly spaced and offer flexibility with however much power you want for any particular move. For example, you can come out of a 70-mph corner in any of three gears, depending on how much power you want. You can change the overall gearing on a BMW, but it's not cheap or terribly easy. You have to replace the ring and pinion set, which is a complicated job. Unless the bike is going to be used for something unusual, there is no reason to change the gearing.

The clutch lever required a fairly hefty pull, but otherwise the clutch was flawless. It never slipped or dragged, and the engagement was smooth and predictable.

HANDLING: The R90/6 is most at home with straight line cruising and casual cornering. It won't wobble at all on the freeway rain grooves, and if you are cruis-

ing in a straight line, you can take both hands off the bars and the bike will remain straight and steady. The only time it wiggles while going straight is if you make a hard shift with the power on; then it gives a slight twitch due to the offsetting torque of the engine and drive shaft.

Because the R90/6 is designed with long-distance touring comfort as the foremost consideration, some concessions are made in the area of high-speed handling. The soft suspension allows the bike to wallow slightly during fast cornering. We experimented extensively in one turn where it wallowed at 55-60 mph when pushed very hard. We were unable to make it wallow less with any combination of rear shock preload or steering damper position. The wallowing never turned into a tank-banging speed wobble or threatened to wrest control from the rider, but it made it difficult to take a precise line through those corners. But as long as you're not stuffing it through a turn at the absolute limit, the BMW corners precisely and predictably. You can pick a line with confidence in any corner, bumpy or smooth. It will also change lines willingly in the middle of a turn.

For comfort's sake, the suspension, especially the front forks, offers more wheel travel than most street bikes. However, overcoming centrifugal force while cornering causes much of the suspension travel to be used up, which reduces ground clearance. When cornering hard the side stand drags on the left and the brake pedal grounds on the right. If you lean still farther to the right, you can nick the valve cover, but that's leaning *very* far.

Part of the reason that the ground clearance is reduced during cornering is the torque reaction of the bike when the power is rolled off. The driveshaft tries to rotate around the ring gear and push the motorcycle down during deceleration; and applying throttle will cause the driveshaft to raise the motorcycle. The result is that acceleration means more ground clearance, and backing off the throttle means a reduction in ground clearance. Most riders will never be concerned by the resulting dragging of the sidestand and brake pedal, but riders who corner fast will have to deal with it.

Because of the low center of gravity offered by the horizontal engine, it's a breeze to flick the bike from side to side in an S bend. The lower center of gravity also makes the bike seem lighter when you are supporting it at a stop light. And you don't have to be built like King Kong to back it into a parking place.

The Metzeler tires are designed for long life at high speed. The rubber compound is fairly hard, but the tires hold well within the limits imposed by the bike's power and ground clearance.

COMFORT AND RIDE: One of the things that BMWs are most famous for is comfort. They may give away something in handling, but they give away almost

nothing in comfort.

The seat is long, wide and comfortable. Long hours in the saddle won't make your posterior sore. The bars are rather narrow (27.7 inches) but are wide enough for easy maneuvering at low speed. The narrowness is good for high-speed comfort and touring because it keeps you from being spread out in the wind. The Magura grips are large and soft enough that your hands won't get cramped.

A friction damper on the twistgrip allows you to ride long distances without constantly having to twist the throttle. Turning a thumb screw pushes a friction shoe against the drum of the twistgrip, but you can still close the throttle by forcibly turning it back.

The only part of you that will ever get sore while riding the R90/6 will be your left hand, due to the heavy-pulling clutch. But that will only occur on roads where you must shift frequently.

Because the right cylinder is offset to the rear in relation to the left cylinder, the right footpeg is equally offset behind the left footpeg. Nobody noticed this unless it was pointed out to them. Two of our testers were bothered by the right intake tube, which occasionally hit their ankles.

The seat-bar-footpeg arrangement fits most riders. You lean forward on the bars only a little bit, which works out fine once you're moving and there is wind pressure on your chest.

The front suspension, with its long travel, absorbs big jolting bumps and tiny road cracks equally well. The rear suspension never pounds a solo rider, even with the shocks on their stiffest setting; thus your back doesn't get sore after a day of riding. For the average rider, the best ride is with the shocks on the softest position; the best position for hard cornering is the stiffest position.

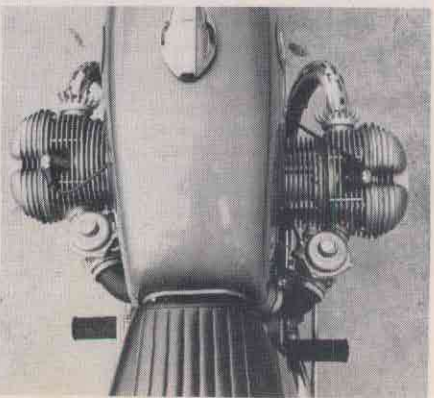
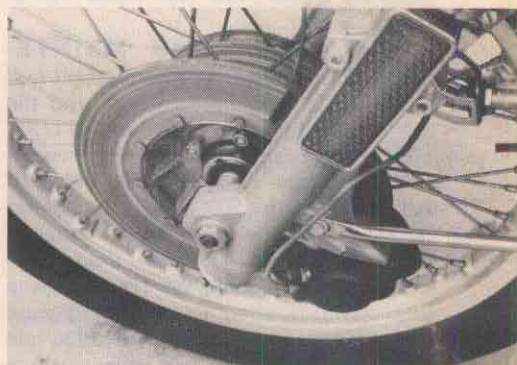
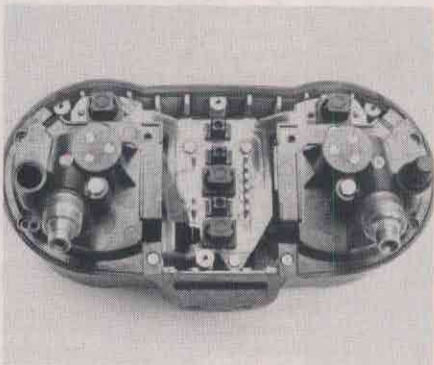
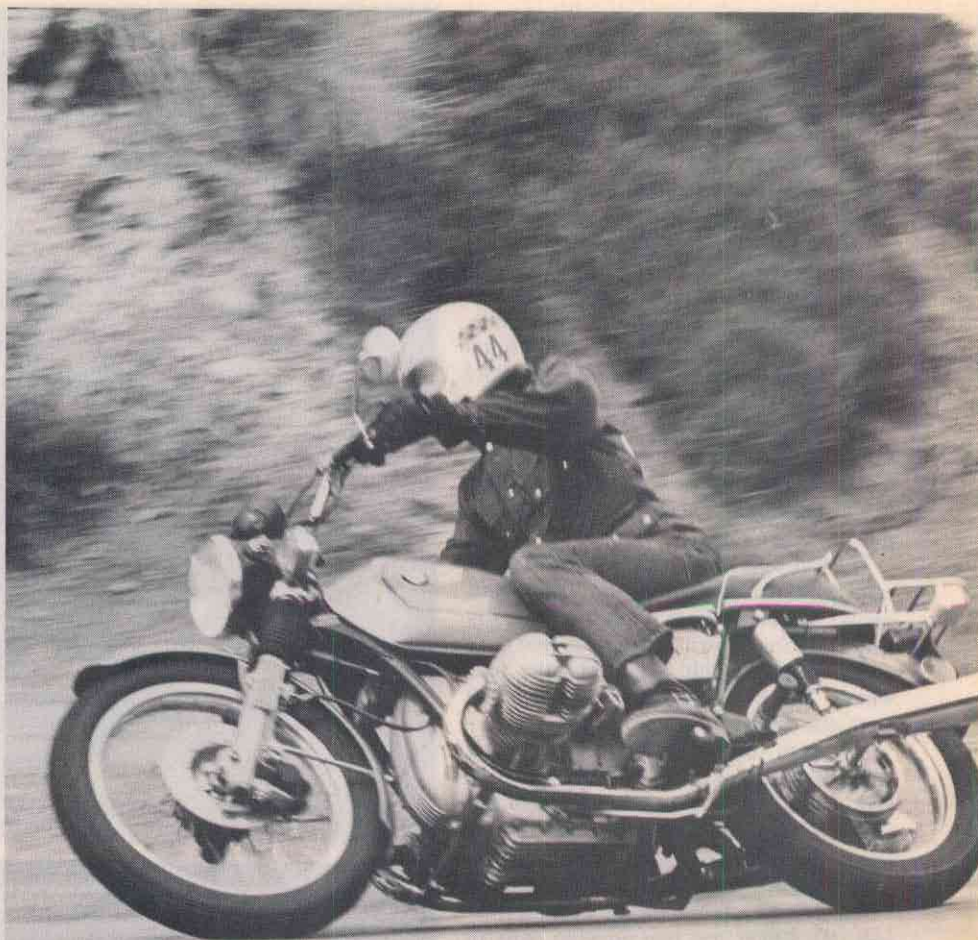
The R90/6 vibrates far less than most bikes. Our test bike was smooth at highway speeds, but during hard acceleration and when the engine was under load, it had an annoying low-frequency vibration.

BMW has eliminated bird nests in the instrument wiring by using printed circuitry.

The BMW front disc is very thin, and there are various advantages to mounting the caliper behind the fork leg. Notice the center-pull spokes.

Because the cylinders are offset, the footpegs are offset, but it's not easily noticeable. The Bing carburetors get air from an airbox at the top of the engine cases.

The master cylinder for the front brake system is under the tank and is protected from damage in a crash. A warning light tells when fluid is low.



And it was noticeable at any rpm, although not enough to cause fatigue.

Noise can also be fatiguing, but the very low level of exhaust and mechanical noise from the R90/6 makes a ride to work or a tour through the country a really pleasant experience for both you and those around you. BMW has set an enviable standard of excellence in this area.

The passenger is well taken care of; he has plenty of room on his part of the seat and the passenger pegs are adjustable. Instead of a grab strap, BMW uses a hand rail around the back of the seat for those not inclined to hold onto the rider.

THE BRAKES: Feedback and feel from the front brake were excellent, and the brake required a great deal of force to lock the wheel. There was no noticeable pull to either side.

The rod-operated rear brake is too powerful and insensitive. It can be locked easily, especially if the rider downshifts while braking. Downshifting into first gear while braking would often lock the rear wheel. The best stopping distance at 60 mph was 137 ft. 6 in.

Although the brakes were quiet when cold, they squeaked when they got hot. The front brake emitted a soft, high-pitched squeal, and the rear shoes squeaked louder but with a lower pitch.

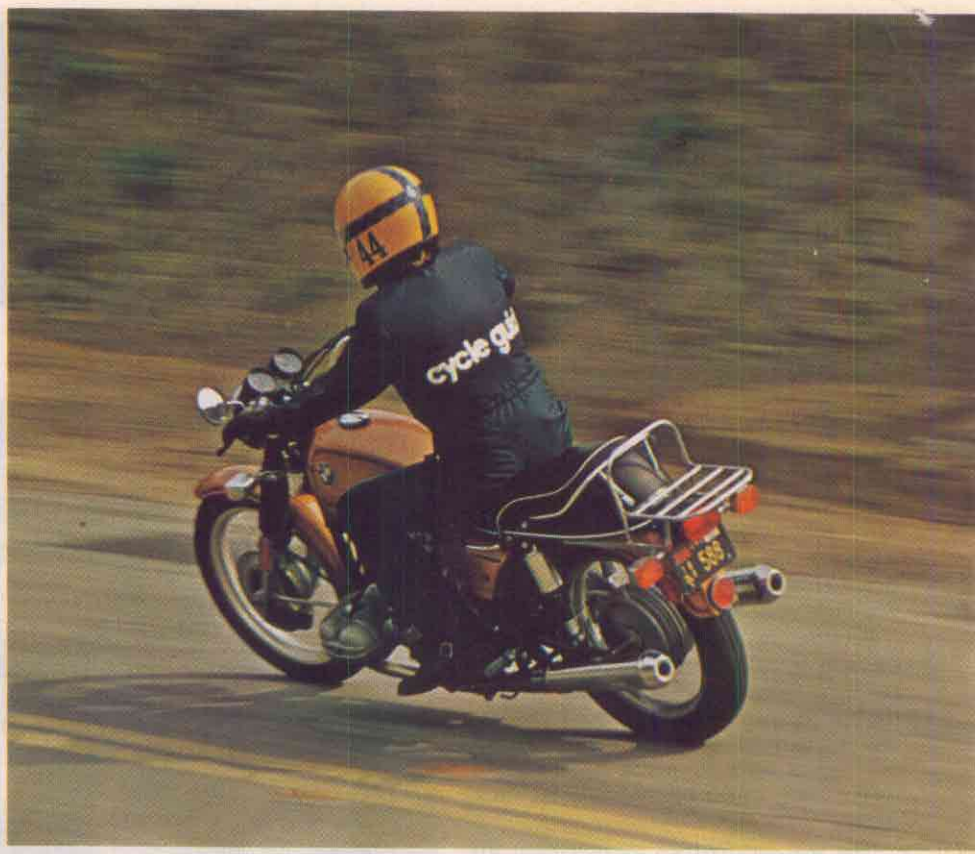
Instead of an external pointer to meet Federal demands for brake wear indicators, the BMW has two viewing slots in the rear hub. You look through these slots to check the condition of the brake shoes. We thought the slots might allow water to enter the drum and make the brake ineffective, so we thoroughly doused the rear brake with a hose and immediately went for a ride. The rear brake was as strong as ever.

RELIABILITY AND MAINTENANCE: One of the most important factors in deciding a bike's worth, and the hardest to measure in a road test, is reliability. A bike can be a rock-steady rocketship that stops in an instant, but if it self-destructs after 5000 miles it had better have a pretty low price tag to make it worth considering. Owners of any particular motorcycle always tend to be a little optimistic about its qualities because their egos are involved, but we called one mechanic friend who has been working on BMWs for a few years and asked him how often he had to do top-end jobs and replace crankshafts.

There was a pause. "I've never done a top-end job on one," he said. "And I don't even know what a BMW crankshaft looks like."

Was there any problem that they commonly had? "Yeah," he said, "they turn pipes blue."

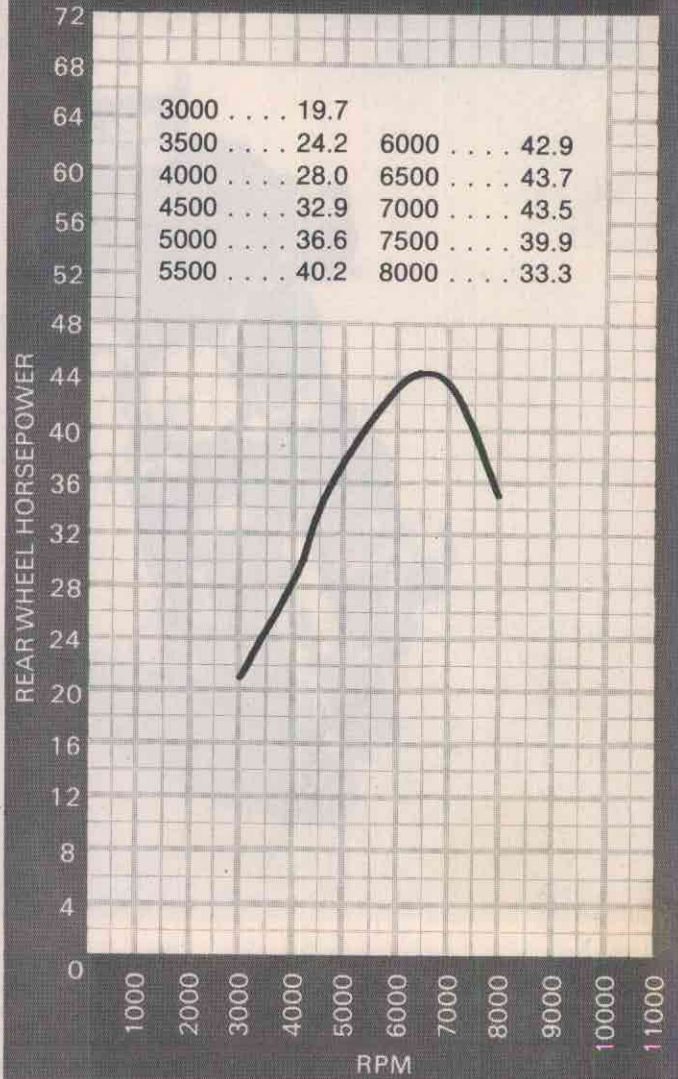
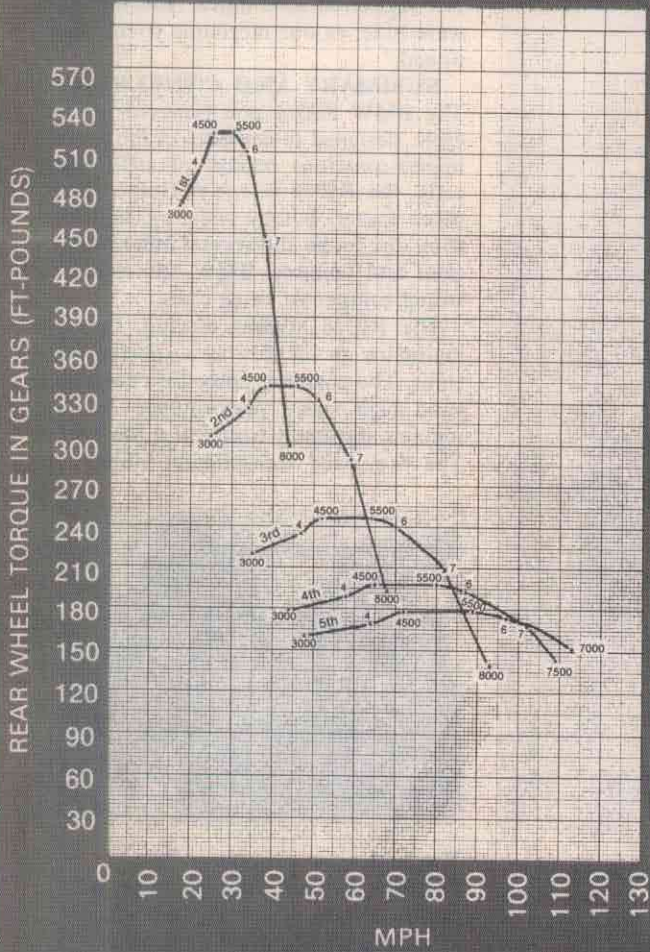
That was only one mechanic, but we've never heard anyone say anything different; the legendary BMW reliability comes from more than the overconfidence of a few happy owners. The new engine size introduces a variable to that legendary



SPECIFICATIONS

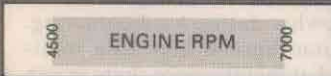
Engine type.....	four-stroke
Cylinder arrangement	horizontally-opposed twin
Valve arrangement.....	overhead valve, pushrod-operated
Bore and stroke	90mm x 70.6mm
Displacement	898.2cc
Compression ratio	9.0:1
Ignition	battery/dual coil/single point
Charging system	12-volt AC generator, voltage regulator, diode
Carburetion.....	two 32mm Bing constant-velocity
Air filter.....	disposable paper element
Lubrication	wet-sump, 2.4 qt. sump capacity
Primary drive	gear, 1.5:1
Clutch	dry, 1 drive plate, 1 driven plate
Starting system	electric and kick; in neutral only
Transmission	5-speed, left foot shift
Overall drive ratios	(1) 13.6; (2) 8.83; (3) 6.4; (4) 5.16; (5) 4.63
Pinion gear	11-tooth
Ring gear	34-tooth
Front forks	telescopic, 6.25 in. travel
Rear shocks	Boge, 3-way adjustable, 4 in. travel
Front brake	single-action hydraulic caliper, 10.2 in. disc
Rear brake	drum, single-leading shoe, rod-operated
Front tire	3.25 x 19 Metzeler rib
Rear tire	4.00 x 18 Metzeler touring
Frame	tubular steel, double cradle, bolt-on rear subframe
Wheelbase	59 in.
Length	86.6 in.
Weight	468 lbs.
Weight distribution	45.5% front, 54.5 % rear
Ground clearance	6.1 in., at sidestand
Seat height	32.5 in., unladen
Handlebar width	27.7 in.
Handlebar grip height	41.4 in.
Footpeg height	11.5 in. right, 11.1 in. left
Instrumentation	tachometer, speedometer, odometer, tripmeter resettable to zero.
Gas tank	steel, 4.8 gal.
Gas mileage	46.8 mpg average
Best 1/4-mile acceleration.....	13.49 sec., 96.8 mph
Stopping distance from 30 mph	35 ft. 1 in.
Stopping distance from 60 mph	137 ft. 6 in.
Suggested price	\$2930 East Coast, \$2950 West Coast.

BMW R90/6



3000	19.7	6000	42.9
3500	24.2	6500	43.7
4000	28.0	7000	43.5
4500	32.9	7500	39.9
5000	36.6	8000	33.3
5500	40.2		

MINIMUM TO MAXIMUM SPEED
IN MPH WITHOUT STALLING OR
OVERREVVING THE ENGINE

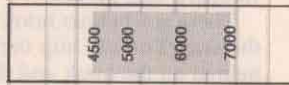


POWERBAND IN MPH

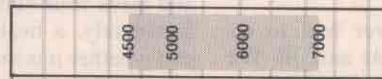
1ST
GEAR



2ND
GEAR



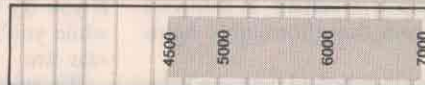
3RD
GEAR



4TH
GEAR



5TH
GEAR



MILES PER HOUR

0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100 105 110 115 120 125 130



reliability, but we don't feel that the bore-job will affect engine life. BMW engineers have proven themselves more careful than that.

Commonly maintained parts are easy to reach: The valves, carburetors, points, air cleaner and large 12-volt battery are all at hand.

Two maintenance benefits of the drive-shaft are: (1) It only requires an occasional change of lubricant; (2) you never have to align the rear wheel.

The spokes are of the center-pull variety and require less attention than conventional angled ones which are found on most bikes.

During the test we never had to do anything more than add gas and oil. We didn't even have to adjust the clutch or brakes after acceleration and brake testing.

MISCELLANEOUS: The Bosch quartz iodine headlamp is excellent. It throws a bright, wide beam that thoroughly lights a large area.

Two mirrors are supplied with the bike. The right one on our bike badly distorted the images over much of its area.

The speedometer includes a resettable tripmeter, something that is useful for telling how long it's been since you last filled the gas tank. It was about four mph optimistic at 60 mph.

The BMW sidestand snaps back automatically when the bike isn't leaning on it. This might be overlooked by someone unfamiliar with the bike; he may lean the bike upright and then try to lean it back over onto nothing. A centerstand is also standard equipment.

There is a helmet hook located beneath the seat. You can slip the D rings of your helmet on the hook and then lock the seat and leave your helmet with the bike. Unfortunately, a healthy tug will open the seat whether it is locked or not. And while someone is stealing your helmet, he'll probably take your tool kit and tire pump too. The lock needs redesigning, along with a repositioning of the helmet hook. If you try to carry a helmet on the hook while you're moving, the helmet hits the rear tire.

We averaged 46.8 miles per gallon during the test, or almost 225 miles per tank. We got one bad batch of "premium" gas

that made the engine ping when the throttle was open wide at low rpm. If the quality of gas seems to be low in your area, or you plan on touring in areas where high octane fuel isn't available, your local BMW dealer can show you how to retard your timing to suit the fuel.

The only problems we had during the test were improperly adjusted carburetors (which we adjusted and had no further problem with) and very slight oil seepage around the case joints when the speedometer registered 5200 miles. And the pipes were blue, as our mechanic friend mentioned.

SUMMARY AND CONCLUSION:

The BMW R90/6 is a powerful motorcycle, designed to compete in the performance-conscious market of 1974. Basically, the R90/6 is a bored-out, snappy 600cc tourer, but by restyling, adding a front disc brake and several other innovations and features, BMW has created a strong competitor in its class.

The R90/6 accents touring, but still maintains an identity as a sporting machine. The engine is powerful enough for good high speed performance and yet remains absolutely tractable at low speed. The five-speed transmission clunks but



The tool kit is excellent. The 25-piece kit includes tire irons, a pump, a tube patch kit, and a monogrammed polishing cloth.

has well-spaced ratios; the clutch is smooth, but heavy-pulling.

The R90/6 is very much at home on the highways and interstates. It is smooth, stable, and quiet at touring speeds but some of the concessions to comfort and ride, so valuable in a touring situation, limit it somewhat during hard cornering. Routine maintenance is kept to a minimum, and what maintenance there is can be done quickly.

As a tourer, the R90/6 is not outdone by any motorcycle, but some of the Japanese multis have closed the gap on BMW in many areas where BMW used to stand alone. And although the prices of Japanese bikes are rising, they are still cheaper than the \$2950 price of the R90/6.

So, in the end, the R90/6 will have to sell itself by reputation, reliability, charisma, and unique features that have appeal to some buyers and are unavailable elsewhere. **CG**