

Cycle-Test

With a big engine,
full bodywork,
a stiffer chassis
and a
controversial
paint job,
BMW's newest
makes a startling
departure from
the norm—
with only
mixed success.

BMW



R100RS

● IF YOU WERE WONDERING whether BMW's R90S constituted a stylistic final expression beyond which any tradition-festooned motorcycle manufacturer would hesitate to go, here's your answer: the R100RS, the most radical-looking motorcycle the modern market has ever seen. Wheels a-twinkle and silver-blue paint glowing in contented recollection of great German racing machinery, the RS doesn't make a statement so much as it asks a question: how far can a motorcycle go in two separate directions before it's unable to make either connection and, over-extended and over-compromised, snaps in the middle?

We wondered the same thing four years ago about the R90S: on the one hand it was plush, softly-sprung, resolutely comfortable. On the other it had a pretentious little quarter-fairing, a low handlebar, a snarling paint job and a hot engine. Well, we

demanding, what was it? A street racer or a *gran turismo*? Both, said BMW. And neither.

The R90S went on to become one of the great successes in BMW's history, completing the image-transformation of that company's products from dray horses to Thoroughbreds and teaching all of us two important lessons in the process. Lesson #1: there is no price ceiling if you've got the goods; and Lesson #2: what the buyer wants and what he thinks he wants are not always the same things, but if you manufacture the former in the guise of the latter you can make him happier than he ever imagined, and get rich doing it.

Lesson #2 is the R90S's great secret, and by giving it a little dash and a lot of detailing, BMW proclaimed a very warm and not the least bit cynical understanding of who its loyalists were. The R90S was a quasi-cafe racer, but not really. It was a quasi-hot rod, but not really. It made a commitment to wacka-wacka riders, but not an irretrievable one. If you bought an S you had a bike with plenty of power, a long-distance capability and the kind of ground clearance and high-speed stability consistent with its ultra-squish suspension components. BMW knew that ultra-squish was always comfortable and only occasionally wallowy, and they knew that a compromise biased towards comfort was the proper one for them to make. The R90S was a comfy-cruiser leaning towards sport, or a sport bike leaning towards comfort; because BMW was careful when they laid it out, the commitments in both directions did not carry far from the bike's dead center.

Too—and this is important—what filigrees there were in terms of style did not intrude in the slightest upon the bike's ability to get the job done. The little fairing improved the bike's appearance by giving it a mildly predatory look, but at the same time the rider was not called upon to hunch forward Roberts-style and pay the price for snappiness with the coin of discomfort. For the extra money an S buyer shelled out, he got more than the trappings of performance; the S was certifiably faster than a Slash-6, changes having been made in the areas of breathing and compression.

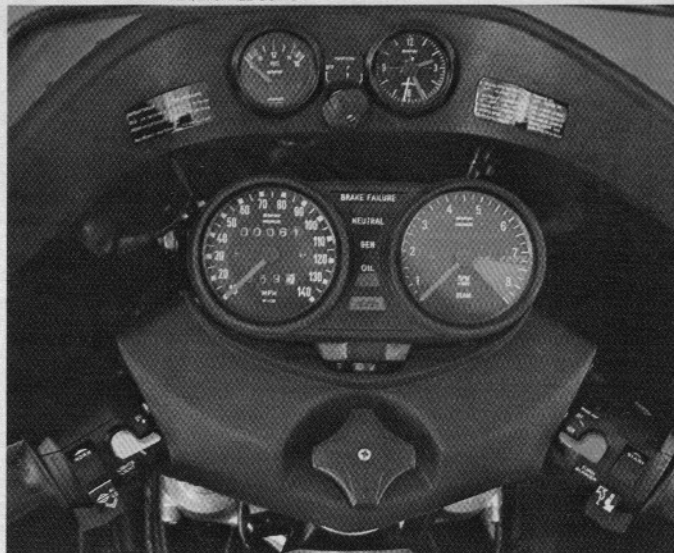
Now, three years after its debut, BMW has stacked on top of the S a motorcycle that travels much farther in the two directions that were so successfully reconciled in the R90S. The RS doesn't just fiddle around with an arresting visual presentation; it comes at you with a no-holds-barred super-swoop zoot suit, a 9.5:1, 980cc engine, a reinforced chassis and a beefed-up swing arm, modified front fork damping and your choice of seats. In that fine BMW tradition it'll mash your wallet flat as a flounder.

Those of us who remember when BMW made essentially one motorcycle painted in your choice of black tend to be shocked when faced with the R100RS. It's not black. It's not a friendly, familiar face. It's not slow. It's so far from being staid that it makes Harry Reems seem like Harry Reasoner in the comparison.

But after the introduction and success of the R90S and that bike's very impressive production racing efforts, there is not a reason in the world we should be taken by surprise by the RS. The times of getting by with minute improvements to a product, year after year, are all but gone. The Japanese thrash and hustle with panicky enthusiasm, and if you as a manufacturer don't get in there and thrash with them, you may as well make early arrangements with your friendly local liquidator and get in line to go broke. Many have, and recently. Progress is important; motion is important. Companies that recognize this venture increasingly beyond the bounds of their specific expertise. That's why Honda built a 250, Yamaha a 500cc banger and a shaft-drive three-cylinder. Stagnation in the modern marketplace is ruinous; to keep producing the same bike year after year, however splendid that product may be, is simply not acceptable.

Distasteful as this may be to BMW, they recognize and accept it. The question is, how to respond? There are apparently two power centers at BMW, each with its own vision of what the future should bring. One center argues for a four-cylinder; the other for continuing development of the opposed twin. The four-cylinder folks believe that the twin should be abandoned before the market abandons BMW. The twin people think the existing motor has life in 'er yet, and cling to it because it works and because nobody—least of all the Japanese—builds anything like it.

PHOTOGRAPHY: DALE BOLLER, MICHAEL GOING



Like the R90S, the R100RS comes with complete instrumentation: voltmeter, speedo and tach, clock, and warning lights galore. Wanna take your own lap times?



Flip up the locking seat and you'll find motorcycling's most complete tool roll—including a tire repair kit. Not shown: a tire pump. Tray is removable.



There's a compartment for odds and ends under the tail section. But a tourer needs more space.

BMW R100RS

Scratch the RS and you'll find a BMW underneath—that's what saves it.

BMW R100RS



Obviously the twin has won, at least for now. Which brings up the most important point: what can we do with it?

You see here one of the answers to that question. Bear in mind that the R90S continues (in R100S form), and the R90/6 continues (in R100/7 form), and the R75/6 continues (in R75/7 form). There is no reason to feel threatened by the R100RS, or confused by it; whether you think the RS package is "a terrible thing to do to a BMW," or makes it into the bike it should have been all along, it's only *one* BMW, and there are four other models (including the 600cc version), all absolutely conventional, right behind it. The RS is its own bike, and expression, emblematic of course of BMW's willingness to thrash with the Japanese but not necessarily a signpost pointing into the future. It is BMW's Corvette; whether it succeeds or fails, there will always be Biscaynes enough for all.

At \$4595 (not including the one-piece wheel accessory) the RS is \$400 more expensive than the R100S. For your \$400 you get the fairing (seven sections altogether), your choice of seats (one like the R100S seat, the other a *monoposto*-and-a-half), and a special handlebar necessitated by the fairing. Improvements and changes it shares with the new 1000cc Sport and /7 include a new breather system designed to deal with increased volumes of air in the crankcases brought on by the bigger bore size; 94mm pistons operating with a compression ratio of 9.5:1; new Bing V 94 constant vacuum 40mm carburetors (RS and S); 44mm inlet valves (RS and S); and a piercing double-tone horn (RS and S).

It would have been atypical for BMW to make changes in one area and neglect corresponding changes in another. While it is claimed that the weight of the new 94mm pistons is roughly the same as the older 90mm ones, there is no doubt that with a lot of compression and 4mm more bore size, power has gone up. The design of the crankshaft hasn't been changed—but the crankcases have. They were reinforced to accept extra-large cylinder spigots in 1976, and selected stiffening has gone on all along—most noticeably in the area of the front main bearing. The

transmission housing likewise was strengthened during the '76 model run, and continual development in the shift mechanism and neutral detenting has yielded the smoothest BMW gearbox we have yet experienced.

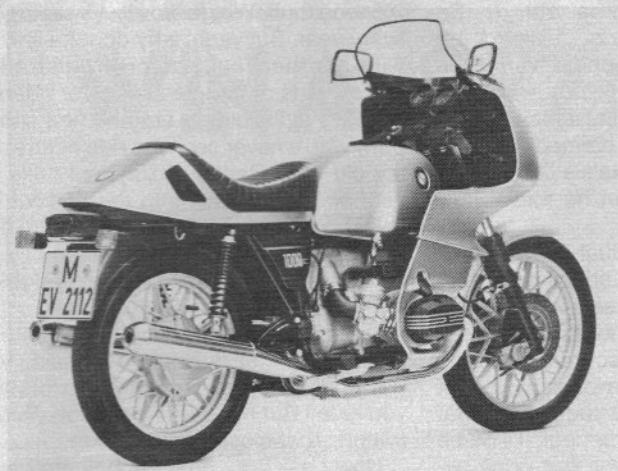
Alloy pushrods came during 1976 and are used by the new 750 and 1000s. The thinking holds that a pushrod alloy that expands at the same rate as the cylinder is the best alloy possible, since valve clearances can be set tighter and valve train noise better controlled. Valve lash used to be .006-in. on the intakes and .008-in. on the exhausts; the new specs are .004 and .006. New cam followers, different cylinders (the fins are shorter and thicker, primarily to reduce fin ringing), O-rings that replace the base gasket (another late '76 modification), a stiffer clutch disc, a more muscular starter ratio and a bigger battery round-out BMW's model-wide powerplant improvements.

A couple of important changes to the chassis: late-'76 BMWs arrived with heavier swing-arm gusseting directly in front of the rear tire, and for the '77s an additional horizontal brace was welded between the two frame front downtubes.

The R100RS shocks and springs don't differ from those on earlier R90Ss and R90/6s—they're the same 4.92-in. travel European Boges we've come to know and love, with the same multi-rate, three-way-adjustable springs that have been so kind to BMWists' fannies for these many years. In front, the 7.87-in. travel fork has been re-valved to provide an even softer ride in the middle ranges of movement, but is now progressively stiffer as the fork pipes sink into the sliders to better control the bike's front end under vigorous braking, and to improve cornering clearance at zealous lean angles.

As noted, most of the subcutaneous fiddling has benefited all the current BMWs; below its paint job and fairing the RS doesn't differ in any substantive way from the R100S. What makes the RS unique, obviously, is its styling. First the paint: silver, left unglossy (some feel unfinished) and shot with a top coat of clear lacquer.

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BMW R100RS

Price, suggested retail . . . \$4595 (optional wheels extra)

Tire, front 3.25H-19 Continental
 rear 4.00-18 Continental

Brake, front 1.375 x 10.24 in. x 4
 (35 x 260mm x 4)
 rear 1.18 x 7.87 in. (30 x 200mm)

Brake swept area 111.7 sq. in. (720.7 sq. cm.)

Specific brake loading 6.27 lbs./sq. in.

Engine type Opposed four-stroke twin, OHV

Bore and stroke 3.70 x 2.78 in. (94 x 70.6mm)

Piston displacement 59.8 cu. in. (980cc)

Compression ratio 9.5:1

Carburetion 2; 40mm; V94 Bing

Air filtration Micronic Paper

Ignition Battery and coil

Rake/Trail 28°/3.5 in. (90mm)

Mph/1000 rpm, top gear 16.7

Fuel capacity 6.3 gal. (24 liters)

Oil capacity 4.7 pts. (2.25 liters)

Transmission oil capacity 1.7 pts. (0.8 liters)

Electrical power 240 watt generator

Battery 12V, 2.5 AH

Primary transmission Helical gears

Secondary transmission Shaft, spiral gears, 3.00:1

Gear ratios, overall (1) 13.20 (2) 8.58 (3) 6.21
 (4) 5.01 (5) 4.50

Wheelbase 57.5 in. (1466mm)

Seat height 32.5 in. (826mm)

Ground clearance 6.5 in. (165mm)

Curb weight 535 lbs.

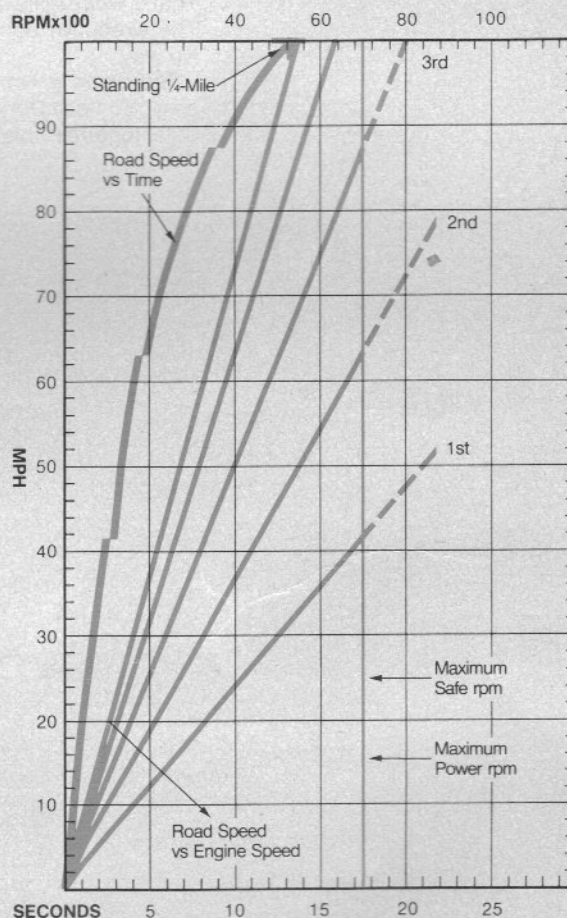
Test weight 700 lbs.

Instruments Tachometer, speedometer, tripmeter,
 ammeter, clock

Standing start 1/4-mile 13.33 sec. @ 99.11 mph

Average fuel consumption 44 mpg

Speedometer error 30 mph, actual 30.18
 60 mph, actual 58.97



The RS paint has a subtle blue undertone and in bright sun the effect is almost luminous. As on all BMWs the bike's surface is veined the pinstriping; around the raised reinforcing bead that stiffens the fiberglass front fender, around the top and middle of the fairing, on either side of the fuel tank and along the bottom of the seat/tail section. Other than a white line at the lowest portion of the tail section, all striping is done—only moderately well—in a deep blue that matches the BMW logo, the plaque on the sides of the engine and the "1000cc" on the bike's two vestigial side covers. Other than just the right number of chrome accents and unpolished alloy, the remainder of the bike is flat black: the mirror-backs, the inside of the fairing's top half, the control levers for clutch and front brake and both hand control housings, side covers, fork sliders, rear under-fender and all three rear light housings.

The care that was lavished on the fairing was painstaking almost to the point of fussiness. The key-switch, voltmeter and clock are all integrated, as are the turn signal lights, the parking light and the clear headlight cover (with four mysterious orange stripes, mysteriously spaced, running horizontally across it). The main fairing stay, which supports the headlight, is welded to the steering head; two curved tubes jog up from the stay's left and right ears to secure the fairing's top half, sharing mounting bolts with the mirror stands. The fork pipes plunge down to the front wheel through a pair of almost-oval rubber cups which encircle the stanchions and are fixed to the fairing; they are there to seal off the rider's compartment from wind and rain. The fairing's top half is additionally secured by a brace running between the top of the engine housing and the bottom of the fuel tank; the lower section, which separates from the upper just below the midsection dive planes, is supported by pressed steel braces which attach to the chassis with the motor mount nuts. Open-cell foam fills the space between the fairing and the frame's front down-tubes to reduce whatever resonance may occur.

However easy it may be to detach the upper part of the fairing (all electrics are quick-disconnect), it shouldn't be necessary. Any and all carburetor and valve adjustments are right out there on the ends of the cylinders, and the grille pops off after removing eight Phillips-head screws for unobstructed ignition or generator service. For more pleasant warm-weather riding, spin out more screws, remove the header pipes and drop off the lower fairing halves.

All the planes, angles and shapes in the fairing suggest one thing: down force. The fairing's front is terminated abruptly below the headlight cover housing and angles back toward the rider, giving the bike a drop-nosed effect reminiscent of

a Concorde coming in for a landing. The fairing is allowed to swell out into sharply-angled surfaces designed to protect the rider's hands; below that it is pulled in severely and maintains moderate proximity to the motorcycle all the way to its rearmost reinforcing ribs.

According to BMW, the fairing shape resulted from many hours in the wind tunnel. Compared to figures on the much smaller S fairing, the RS lowers wind resistance by 5.4%, front wheel lift by 17.4% and response to side winds by 60%. We'll take BMW's word for it—but there's one characteristic of the fairing that we *know* is correct: it's big. In wind tunnel testing done seven years ago by Harley-Davidson and Dean Wixom to develop fairings for the KR road racers, it was discovered that the more bits and ends there were behind the fairing, the better—and zippy shapes were of relatively little significance. The fairing that was produced from all this research continues to be thought of as road racing's finest streamlining effort.

The BMW engineers made one aerodynamic mistake, however. The top of the windscreen terminates in a small kick-up edged with a decorative plastic material. At any speed above 35 mph the kick-up generates turbulence right at the level of the rider's helmet, resulting in light helmet buffeting and a lot of racket. If the rider elevates his head six to eight inches by rising off the seat, the buffeting and noise diminish. We removed the trim and hacked off the uppermost inch of windscreen, and noticed an appreciable noise reduction.

Other than the turbulence problem, the fairing has no problems of its own. It seals well in front, keeps the hands warm and the feet warmer, weighs but 21 lbs. and is very carefully finished. There seems to be little wake activity—your back stays dry even in moderate rain, and if you're wearing a loose-fitting jacket the wind doesn't blow it up around your neck at 55 mph. Too, it's mounted so securely that even the BMW's low-pitched engine thumps and throbings don't get it rattling.

It's not a touring fairing in the Wixom/Vetter idiom, nor is it a tear-around item like those sold by Camber or Dick's Cycle West. The Wixom/Vetter frame-mounts, developed over the years to be adapted to existing high-bar touring bikes, offer the traditional seating position, complete head protection and a multitude of knick-knackery their clients call for—like storage space. The tearing-around guys have half- and bikini fairings designed to duplicate those of current road racing hero-bikes. BMW is betting that somewhere in between, perched atop fat bank accounts and fond of the way BMW does things, will be a substantial number of buyers who will be attracted to the R100RS by its looks, its concept and BMW's reputation.

The problems we had with the RS centered around its handlebar. Attached to

the upper triple clamp in the traditional place beneath what can only be described as a motorcycling version of a padded dash board, the RS bar is completely different from the S bar. The RS piece has no elevating curves—it's flat, and angles back to mount the hand controls and grips. It's also narrow—almost as narrow as a set of formal clip-ons. To reach the grips the rider has to either locate himself at the front edge of the seat, or lean forward. If he takes the former approach he finds his shins close to the carburetors and his knees close to the trailing edges of the fairing; if he opts for the latter he does away with the slight elbow bend that helps cushion the shock coming through his arms from the front suspension. In the lean-in pose the rider has no trouble with the rear brake pedal; he will if he elects to scoot forward.

BMW makes much of the "integral" design of the RS package; it may well be, for touring riders, a bit *too* integral. For the fairing to work properly the handlebar has to be where it is, and angled like it is. But such a disposition may not be the best of all possible worlds for a guy with Interstate 80 and the entire state of Kansas looking at him through the windscreen.

Despite the sheer size of the fairing, the sporting rider may get a better shake from the RS. He won't be overly put off by the seating position, nor will he complain about the clip-esque handlebar. If he rides like we do he'll find the swing arm, front suspension and down-tube modifications have produced a genuinely good high-speed handler. The last R90S we tested was fine up to a point, and then it would generate a faint floating sensation. If the RS gets queasy in fast corners taken at high speeds we didn't notice. We did notice that the same old things start to drag at the same old speeds: the brake arm on the right side and the side stand foot on the left. Tightening up the rear springs moved the contact points forward—to the header on the left and to the header and rocker-cover on the right. If you feel inclined to bounce undercarriage hardware along the tarmac and point out the battle wounds to your friends, the hardware will getcha long before the tires will. They're Continentals, they're H-rated and they stick as well as any non-racing tire we've experienced.

Changes made to the front brake hydraulics in 1976 have been carried forward to the '77 S and RS. When first presented, the S's dual disc front brake demanded an exceptionally firm pull. Different caliper cylinders and a different master cylinder reduced the number of white knuckles on the right hand, and the current dual disc front brake is as pleasant as any we've tried: strong, predictable, consistent. The punched holes in the discs do improve performance in the wet—but curiously enough the holes' diameters rusted immediately, as did the

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BMW R100RS Continued from page 61
peripheries of both discs. It is alleged that the discs are dipped in cadmium to prevent this sort of thing; at least two of them weren't.

If you're a proponent of the way BMW does engines you'll love the new 1000. Last year's 38mm DellOrto pumper carbs have been replaced on the S and the RS with 40mm constant vacuum Bings. The change was made because of emissions, fuel economy and easy supply (Bings are made by Hintermayr in Nuremberg; Dell-Ortos aren't). However unhappy your Japanese experience may have been with CV carbs, the Bings work extraordinarily well. They're responsive on and off, they can be modulated accurately and they do deliver good mileage (in one almost-peaceful stretch the RS returned 47.2 mpg and a staggering range of 290 miles). It's not just carburetion, obviously; the camshaft is the same mild 308-degree beauty used in the 750, last year's 900s and all three of 1977's 1000s.

The RS's red-line is set at 7300 rpm; the bike has so much urge that you'll seldom explore above 6500. It is the Roll-on King of the Universe, able to thud smartly away from any good 750 while spotting the enemy one gear and sometimes two.

On the open road the RS performs like all BMWs have always performed—splendidly. Its suspension responds to bumps that would be transmitted directly to the

rider's arms and seat by a lesser motorcycle (except the new Yamaha XS750D triple), the engine's enormous reserve of torque can be tapped without resorting to a downshift, and once into its cruising lick there is not enough vibration to do anything except fuzz up the mirrors. BMW continues to change some of the finger-operated controls. The up/down turn signal switch has been re-legended, and it still takes some getting used to.

The BMW has a highway texture that is extremely satisfying. It be-bops down the road with an assurance and contentment and arrogance uniquely its own. There is nothing frenzied about anything it does, nothing hasty, nothing is beyond its capabilities and nothing is permitted to intrude on its effortless, serene passage. It doesn't devour distance so much as it transcends it, and there is no sense of deterioration or loss of freshness as the miles stream by below.

This is true not exclusively of the RS—it is true of all BMWs, and it's one reason why BMW owners keep buying new BMWs despite the savagery done to savings accounts. BMWs endure. People know that. BMWs are very special. People know that too, and when they're called upon to plunk down for one, there is ample justification available to them. Despite the expense, BMW/buyers never feel ripped off, surprised in an unpleasant way, unfulfilled or even faintly disap-

pointed. They have a vision of what they're getting, and if there's a gap between vision and reality, it can be promptly and pleasantly negotiated.

However you respond to BMW's R100RS as a styling exercise or as an attempt to produce "something new" in the face of constant change by their Japanese competitors, the bike's eternal BMW-ness comes through the fancy fairing, and the trick paint job, and the curious "one-and-a-half" seat, and the blue-anodized front brake calipers. The fairing and seat, the most important items of the RS package, raise some questions about function. The fairing gets most of you through the breeze—but not your head. The seat is comfortable for the operator, but because of the handlebar (necessitated by the fairing) you don't get to sit on much of it. There are hand-holds for a passenger, but little room on the seat for one. The fairing protects your hands, body, legs and feet—but you can bang your knees against it. It's more of a touring fairing than a sport fairing—but we're curious to see whether American touring riders are going to go for the peculiar (and distinctly European) riding position.

The R100RS does gracefully those important things BMWs have always done gracefully, and it'll keep doing them well beyond the limits we have come to expect from lesser machines. But the suspicion here is that the RS reaches too far. ●



...for riders

BEE-EMM AGAIN

It takes a special bike and an even more special rider to win the 7,500-mile Paris-Dakar Rally, probably the toughest in the world and taking in deserts, rocky tracks and 21 moto-cross type stages.

BMW have a good record in the 20-day long event, having won three times in the last four years.

In the latest race, they excelled themselves by coming first, second and fifth, beating off the challenges of the Honda and Yamaha work entries in the process.

The winner was Gaston Rahier riding a rather special works-supported R100GS equipped with 10-gallon fuel tank (with 1¾ gallons under the seat). The bike has a dry weight of 385 lb (175kg) and an engine fitted with 40mm Bing carbs, a 9.5mm increase in bore and standard compression, pushes out a claimed 75bhp.



Twice previous winner and runner-up this year Hubert Auriol

MECHANICS APRIL 1984