

BOXING

CHAMPIONS

If you like BMWs, then you'll be delighted at the improvements made to the 1981 Berlin 'Boxer' twins. If you like across-the-frame multis, you'll be surprised that the latest R100CS and R100RT machines really are worth everything you have to pay for them. Tests by *John Nutting*.
Photography by *Ian Dobbie* and *John Perkins*.

BMW R100CS & R100RT

BMWs are gentlemen's motorcycles, right? Okay for that comfortable cruise to the Mediterranean and back but definitely not the sort of bike that can out the mustard in the High Street drag races.

Wrong. That may be an image understandably built up over the years by machines of solid reliable stock and limited horsepower. But as of the model year, BMW is serving notice on its competitors that it will

Only last October we justifiably compared the new shaft-driven GS1000G Suzuki to the BMW R100T and found little to choose between the two bikes in overall touring ability.

A couple of years ago, however, a completely new management team was installed at BMW, whose priority, despite talk of a redesigned machine to appear about 1984, was to breathe new life into their traditional horizontally-opposed flat-twin design.

Now, like many others, I'd thought last year that the boxer had reached the end of the line. Stretched to the limit of its possible capacity, it was becoming delicate and intractable. Worse, it was proving in many cases to be less reliable than its oriental counterparts, despite the appeal of its simple engine.

I'm pleased to say that with the 1981 models, the factory's new staff have not only reversed that trend, but restored the BMW to its rightful position as one of the world's most desirable motorcycles.

take on all comers — in luxury, quality and performance.

Hang on, you might say. This isn't news. That's what BMW has been saying for years. Maybe, but the fact is that, over the last five years, the Berlin factory has gradually been losing ground to the Japanese, not only in overall quality and ride comfort, but in reliability, too.



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Furthermore, what is virtually a revision of the complete machine has transformed it into a truly versatile bike that can be a surprisingly quick sportster on one hand and a supremely comfortable tourer on the other.

Those extremes are represented by the lithe and purposeful R100CS with a small, handlebar-mounted fairing and the fully-faired R100RT. Both share the same basic running gear of a 70bhp pushrod flat-twin driving through a five-speed gearbox and shaft final drive and supported in a duplex-loop frame with a leading-axle front fork. Basic appeal of the layout is that the engine's low centre-of-gravity, the slim frame and the inherently smooth engine make the steering light at low speeds; rider control is easy and fatigue-free, whether you're filtering through city traffic or cruising at 100mph on the open road.

What's striking about the new models is that those same basic virtues have been combined with stunning road performance. In absolute terms, the top speed and quarter-mile times for BMWs have never been as impressive as those of the comparable multi-cylinder sports bikes — not that it made much difference to the typical

high-mileage Bee-Emm rider. You'll find that the '81 bikes are no different in this respect, the R100CS being capable of a true 120mph, while the bulkier and lower-geared R100RT is good for about 115mph. Flat-out acceleration is average with quarter-mile times in the mid 13-second bracket.

But seat of the pants assessments tell another story. Because BMW engines have been tuned for mid-range power rather than top-end, they've always been tractable and easy to ride, with ample punch from low revs. The '81 models are another story altogether. Throttle response on the R100CS is now so frighteningly quick that you can pull wheelies in bottom and second gears and happily haul away from other heavyweights in top gear just by throttle action alone. The heavier RT is almost just as lively, lifting its front wheel when you attempt really brisk getaways from the lights.

If that suggests a bike almost touchy in character, then you can relax. If you want to carve up the tarmac on the new Bee-Emms, then you can do so. Yet they are just as easily switched to luxury mode and can glide along in serene quiet with the ignition keys drowning the

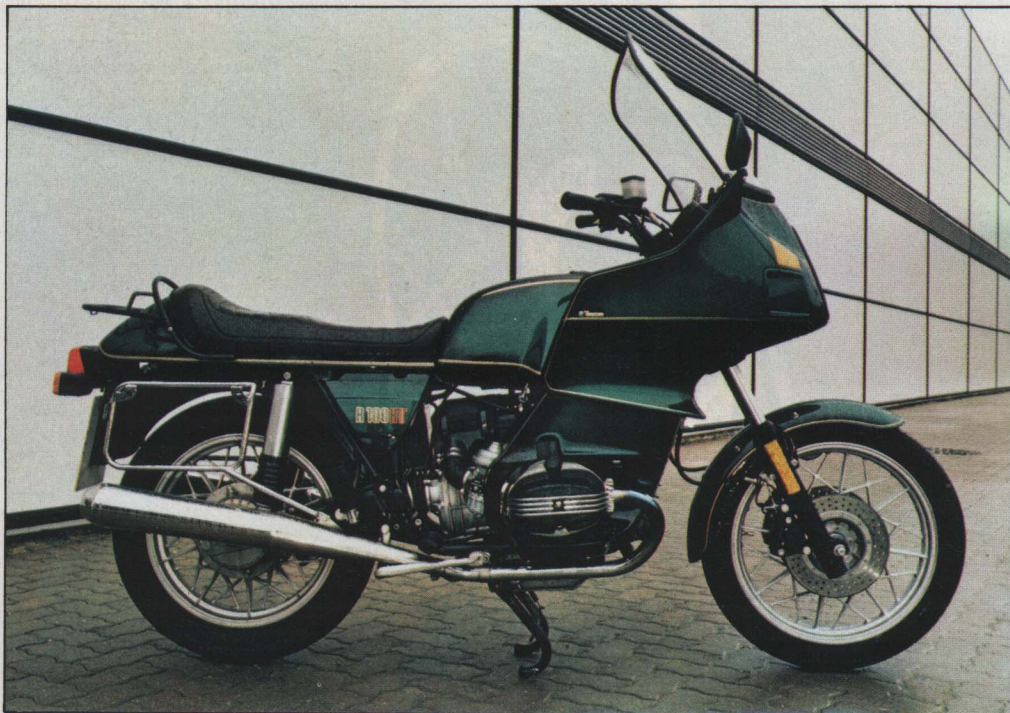
chattering of the valve gear and the muted exhaust note.

Secrets behind this new Jekyll & Hyde character are twofold. There's been an overall design update that has shed bulk from the frame and engine, cutting the CS to 441lb dry and the RT to 478lb dry — weights that are comparable with heavier Japanese 500s, providing benefits in both acceleration and handling.

The cylinder barrels are now all alloy with a special hard Galnickel bore coating, similar to that used in Grand Prix racing two-strokes, which allows tighter piston clearances and a weight saving of 6.6lb.

The large diameter fly-wheel which houses the dry, single plate car-type clutch has also been lightened by 40 percent, improving rev pick up. Clutch disengagement weight has been cut by 30 percent, too, reducing the effort to a single finger job. More importantly, the friction point has been widened so those jerky take-offs are now a thing of the past.

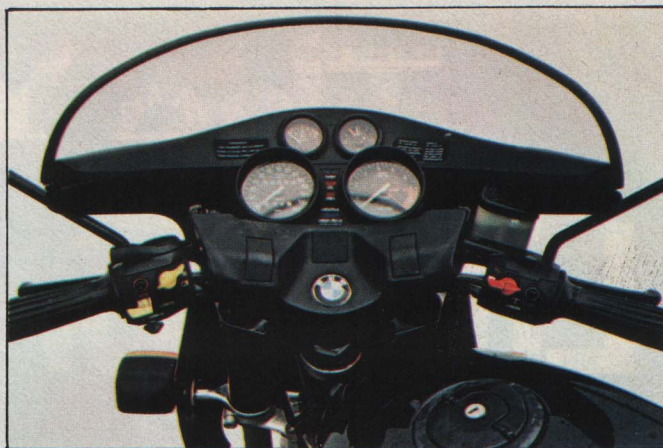
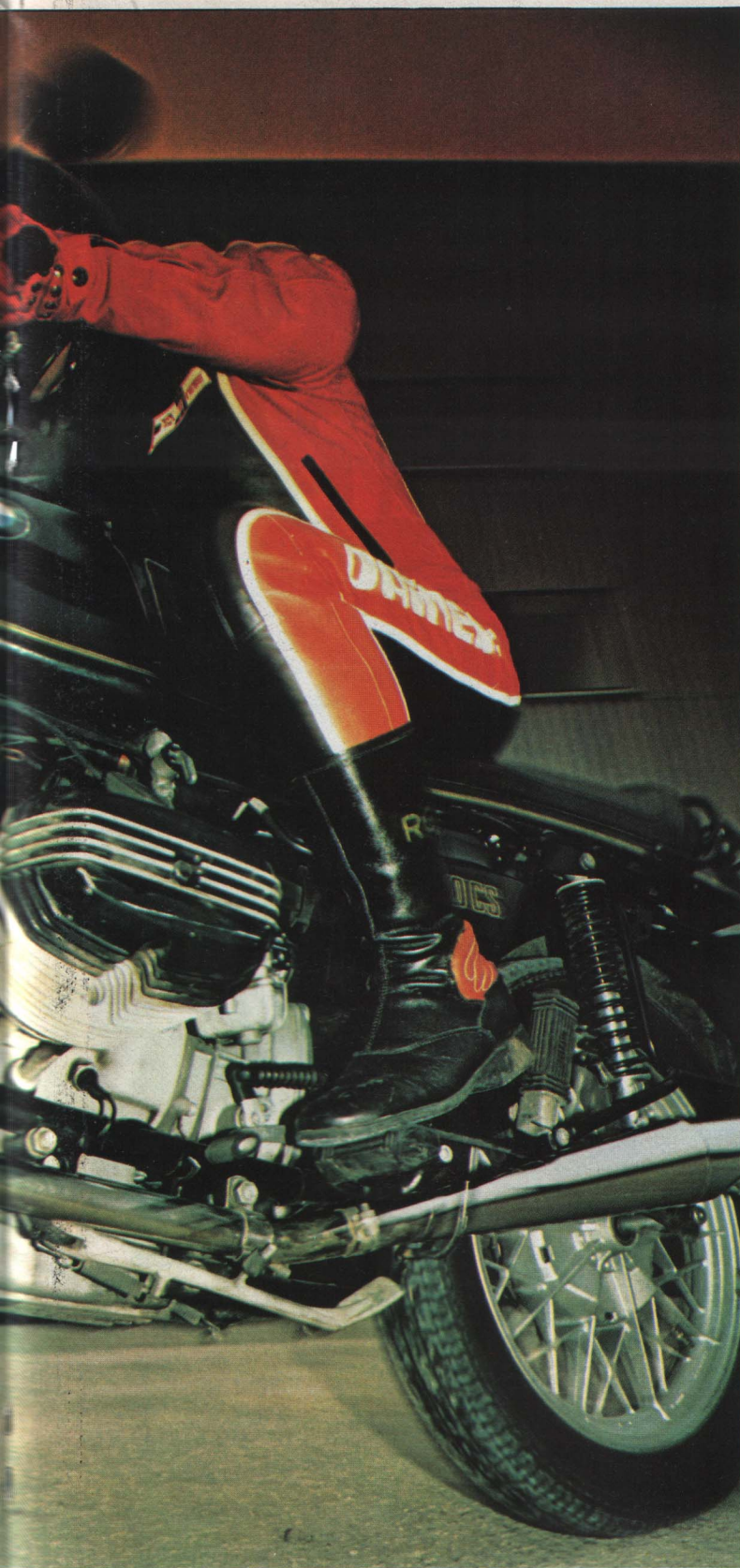
So although the specification of the 980cc motor has been left unchanged, with the same 9.5 to 1 compression ratio and valve-timing, mid-range torque has all the indications of being much better. Some of this is



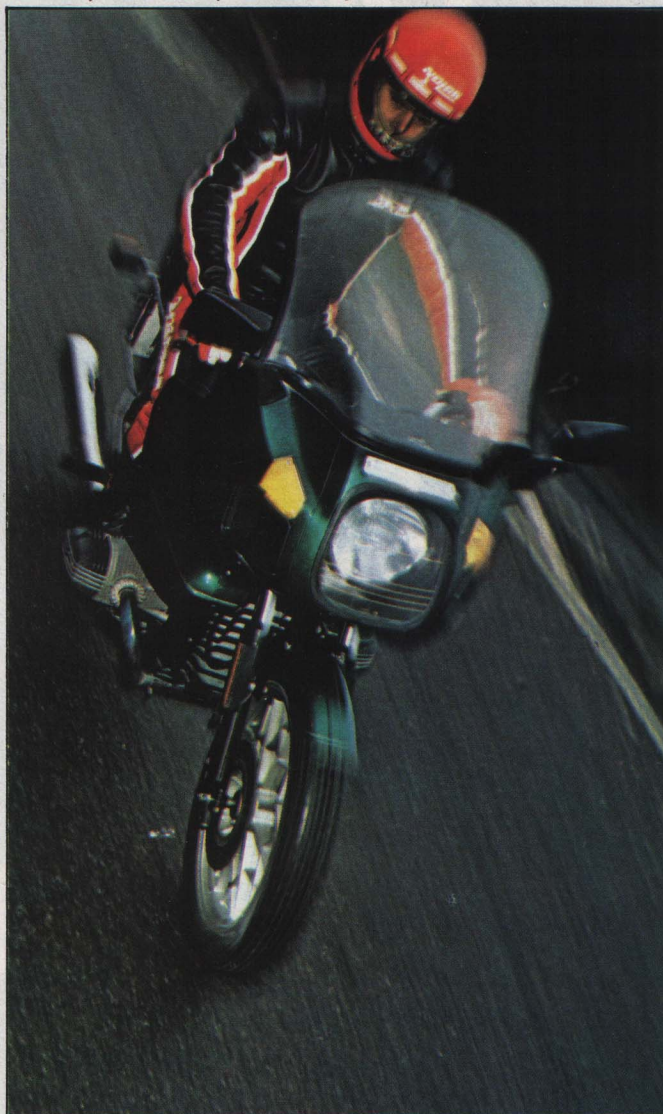
For travelling far and fast with minimal effort there's nothing to touch the R100RT. It's both luxurious and lively, being equally at home in town traffic, twisty lanes or the open autobahn.



also due to detail modifications to the 40mm-choke Bing constant velocity carburetors. These have revised metering circuits, plus the use of a throttle cable with a junction under the tank. The smoothness of a BMW relies on the balancing of the carbs: as soon as they go out, the bike loses its sweet edge. The new set-up, with the single cable running into the twist-grip housing parallel to the



Rider's eye view of the R100CS's cockpit. Ignition switch is mounted on the left hand side of the headlamp.



Left: Instant power is the calling card of the R100CS sports twin. Above: Travelling light. BMW have made the RT much less of a handful than some tourers.

handlebar, should improve this considerably.

On the other handlebar console there's a choke lever, a newcomer that'll please anyone who's had to juggle with the old type choke lever mounted on the air-filter box. The new choke lever (it's not really a choke lever, more a mixture enricher) has three positions: full, three-quarters and off, the first being for starting

from cold and the second for warming up on the road, which is now much quicker because of the revised barrels.

We weren't too happy with the way the electric starter spun the engine over. From cold it felt as if it was labouring and a slightly run-down battery (even though it has 28Ah capacity) would probably balk at the task at the slightest provocation, a characteristic that was

common to both the CS and the RT. Overall fuel consumption was between 46 and 49mpg.

Other welcome changes on the flat twins are to the air filter and the lubrication system. The new air filter can be unclipped and pulled out from the right-hand side, a much easier arrangement than having to dismantle the whole rear of the engine.

Lubricating oil is now fed

from the full pressure filter direct to the crankshaft, instead of via the camshaft bearings below the crank, and the case breathing arrangements are altered so that there's none of the twittering from the breather as before. One thing hasn't been changed: the oil filler hole and its combined cap and dipstick are still difficult to get at and refill. There's now a deeper sump with

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greater oil capacity that on the aerodynamically-faired R100RS is augmented by an oil cooler.

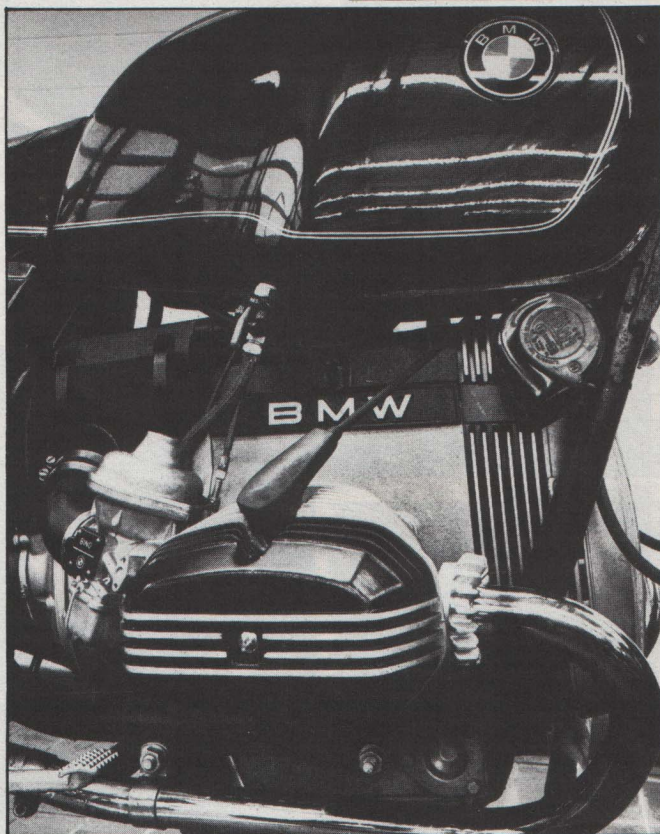
The BMW gearchange has long been criticised, but after the latest batch of alterations it's now as good as you'll find anywhere. Upward changes can be made without the clutch and completely noiselessly. Furthermore, the feel is superb: a faint click is all that's transmitted through your toes. A rare feature is that although the gearlever height is adjustable by means of shortening the linkage, the footrest height is variable, too. The footrests, with vibration absorbing rubber covers, are mounted on supports reversed from the old arrangement, that can be raised or lowered to suit the rider's taste.

Not that you'd want to muck about with the BMW's riding position all that much. The bike is slim and lends itself to a variety of rider heights and sizes, a feature that BMW exploits with the differences between the various models. The CS is the sports machine with a semi-low handlebar, while the RT has a full touring stance, the rider sitting bolt upright behind the screen.

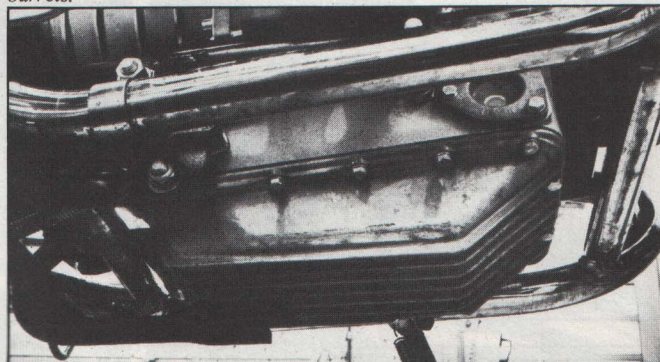
In terms of overall comfort we have to say that we liked the RT best for comfort. The high handlebar has just the right angle and suits the broad seat well. Good news this year is that BMW has at last dispensed with the first-aid locker in the front of the seat, banishing it to the compartment in the tail fairing. That means there's more padding for extra comfort. And the bike is comfortable — we spent an afternoon touring in East Anglia for three hours without getting off the bike and felt fresh as when we started.

The CS set-up isn't quite so good because the lower riding position causes the seat edges to dig into the rider's thighs. The even lower stance of the RS will probably be worse still.

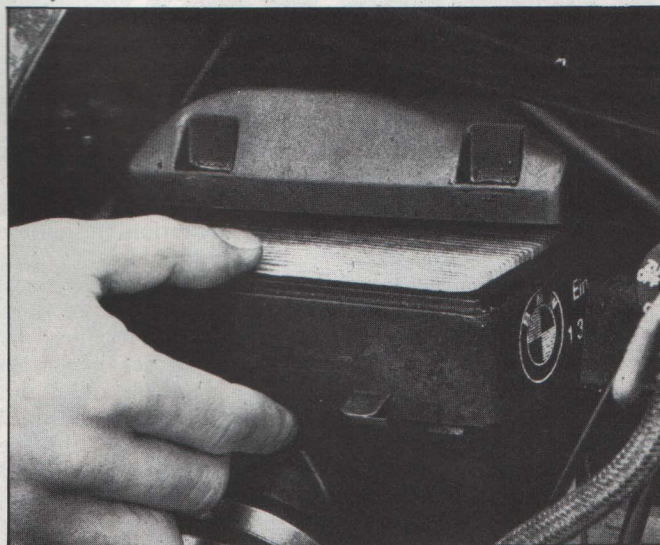
The comfort of the bike is no less a result of the long and soft suspension travel. BMW has introduced a new leading axle front fork for the '81 models that gives a better ride than before, and the rear



Engine changes to the BMW flat twin include a new easily accessible air filter, deeper oil sump, rejetted carbs and lighter Nikasil-coated barrels.



Two balance pipes are used in the exhaust system at either end of the larger capacity sump. Main stand is located at the balance point of the bike for easier wheel removal.

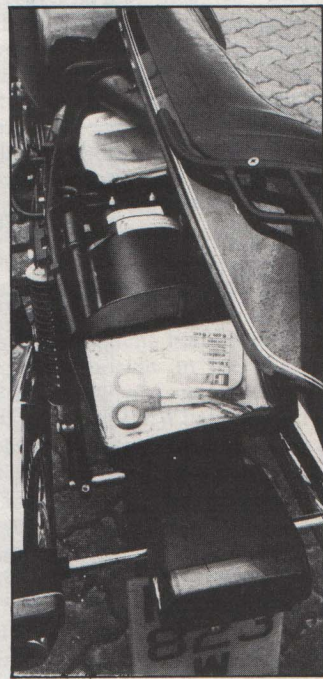


No more tricky antics removing the air filter on the latest BMWs. This cartridge-type filter element is a snap to change.

end of the RT uses the self-levelling air-sprung Nivomat units we first tried on the R100T last year. These, too, give a better ride as well as giving the same ride height, regardless of load and automatic stiffening of the action on rough roads. The CS uses the conventional coil spring units with a manual preload adjuster either side.

While the comfort of the suspension is good, in either case its long travel does require getting used to. The responsiveness of the engine and the antics of the shaft-driven rear end mean that there are gross attitude changes when using the throttle, especially when you're cranked over. But once you've learned that, the bike can be a real joy. The steering is ultra-light, even with the extra weight of the RT's fairing before you, and low speed control is as good as you'll find on any machine. Most of the staff rated the RT one of the best bikes in town traffic, despite its weight and the width of its engine, merely because it was so easy to ride at low speed. No wonder the coppers like their R80 twins for city use.

Jumping from the CS to the RT you notice that there are important differences in the handling. At lower speeds the CS feels like a nimble sports bike, where the RT



First aid kit is transferred to the rear compartment to restore deeper seat padding.

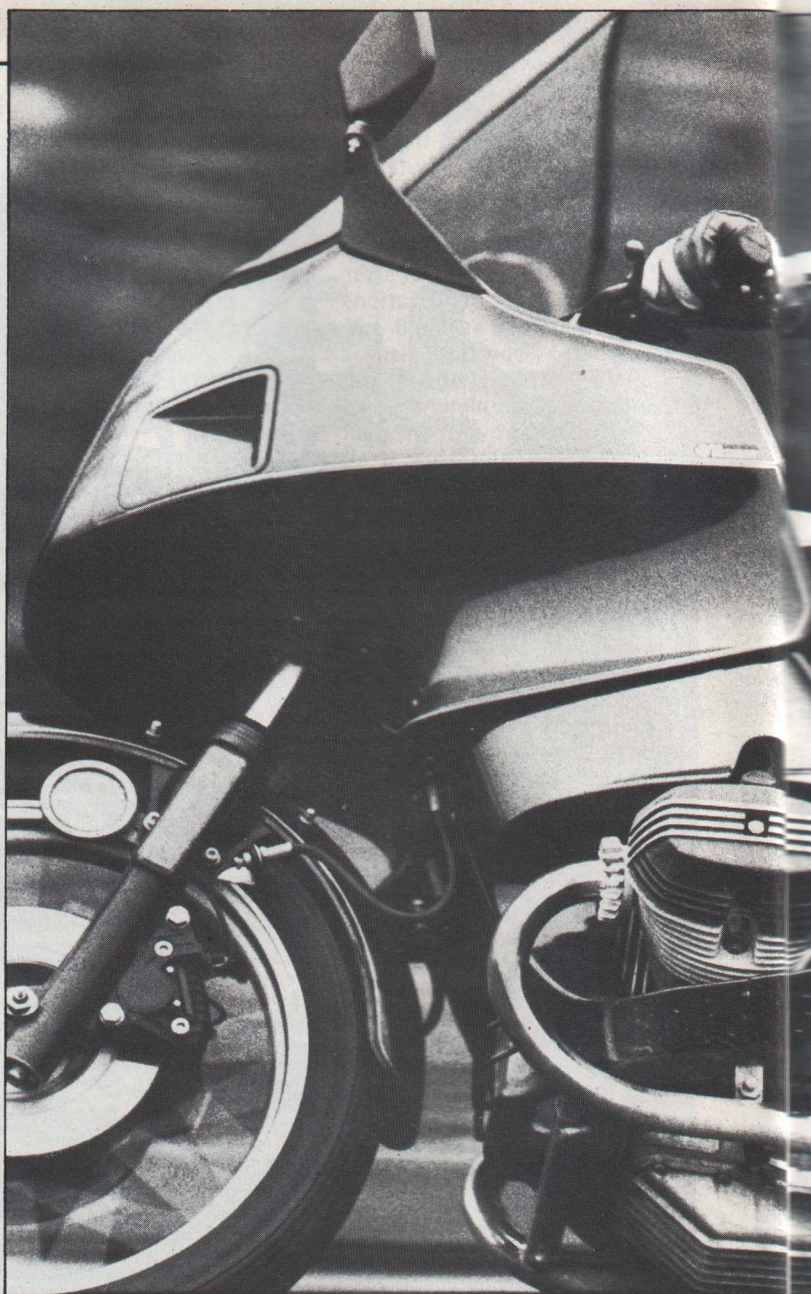
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lumpers more. At high speeds, and we mean in the 95 mph to well-over-the-ton bracket, the advantage swings the other way. The CS's small fairing, being fork-mounted, unloads the front suspension and lightens the steering enough to reduce the weave stability and allow a slight wobble to set in, whereas the RT can hold 90 plus speeds steady as a rock, only bothered by heavy cross winds and

lorry wakes.

The aerodynamics of the RT are therefore impeccable for fast riding. There's only the slightest amount of turbulence around the rider's helmet at speed and this can be modified by altering the position of the screen. The screen, which this year has a smoother contour for better optical clarity, hinges at the base and has lock buttons at the outer edges



that are far better than the old ratchet mechanisms on the original RT. Storage compartments with lockable lids are provided in the fairing base, but they'll only hold small items like miniature cameras and maps. For luggage carrying, Krauser-style pannier cases can be fitted to the frames.

Another characteristic highlighted by the RT was its greater sensitivity to the rattling vibration the engine develops at low engine speeds. This is not mechanical vibration but a softer, low-frequency buzz produced by the torque pulses, which are impossible to smooth out unless a far bigger flywheel is used. Using heavy throttle openings at low speeds in top gear would rattle the bodywork until the speed picked up, but this rarely occurred and depended on rider technique.

That's the only blot that intrudes on the BMW rider's perception of the bike. It's less bothersome on the CS, even though it pulls the highest gearing you can get on a Bee-Emm: a 2.91 final drive ratio that gives a loping 4,000rpm in top gear at 70mph, compared to the lower 3.00 ratio on the RT and RS.

Otherwise, the bike feels smooth, refined and utterly docile, able to amble along at a walking pace in bottom gear. The controls are pleasant and the switchgear easy to find, though we can't understand why the ignition switch is still tucked out of the way on the left-hand side of the headlamp on the CS. Instruments are still the small-style speedo and electronic rev meter, augmented by a voltmeter and a very handy electric clock with a sweep second hand.

	BMW R100CS	BMW R100RT
Price inc VAT:	£2795	£3497
Warranty:	12mth/unlimited	12mth/unlimited
ENGINE		
Type:	Ohv flat twin	Ohv flat twin
Capacity:	980cc (94x70.6mm)	980cc (94x70.6mm)
Lubrication:	Wet sump	Wet sump
Comp ratio:	9.5 to 1	9.5 to 1
Carburation:	Two 40mm Bing CV	Two 40mm Bing CV
Ignition:	Breakerless inductive	Breakerless inductive
Max. power:	70bhp @ 7,000rpm	70bhp @ 7,000rpm
Max. torque:	56lb-ft @ 6,000rpm	56lb-ft @ 6,000rpm
TRANSMISSION		
Primary drive:	Helical gears	Helical gears
Clutch:	Dry single plate	Dry single plate
Gearbox:	Five-speed	Five-speed
Final drive:	Shaft and bevels	Shaft and bevels
Overall ratios:	12.8, 8.32, 6.02, 4.86 and 4.37:1	13.2, 8.58, 6.21, 5.01 and 4.5:1
ELECTRICS:		
Power source:	280W 3-ph alternator	280W 3-ph alternator
Battery:	12V 28Ah	12V 28Ah
Headlamp:	60/55W quartz-halogen	60/55W quartz-halogen
CHASSIS		
Frame:	Duplex cradle	Duplex cradle
Suspension front:	Leading-axle telescopic fork	Leading-axle telescopic fork
Suspension rear:	Swing arm with five-pos, spring pre-adjustment.	Swing arm with Nivomat self-leveling air dampers
Brakes:	Dual 10.25in disc (f) 7.1 in drum (r)	Dual 10.25in discs (f) 10.25in disc (r)
Tyres:	Metzeler 3.25 x 19 (f) 4.00 x 18 (r)	Metzeler 3.25 x 19 (f) 4.00 x 18 (r)
CAPACITIES		
Fuel tank:	5.3 gal	5.3 gal
Oil:	na	na
DIMENSIONS		
Wheelbase:	57.7in	57.7in
Seat height:	32.2in	32.2in
H'bar width:	25in	27.6in
Ground clearance:	na	na
Rake/trail:	61.5deg/3.7in	61.5deg/3.7in
Dry weight:	441lb	478lb
EQUIPMENT		
	Electric starter, carrier, mirrors, cockpit fairing, voltmeter, first-aid kit, clock, speedo, rev meter, side stand, hand pump, turn signals, toolkit.	Electric starter, mirrors, touring fairing, carrier, hand pump, voltmeter, clock, first-aid kit, speedo, rev meter, side stand, turn signals, toolkit, hazard lamps, saddlebag frames, accessory socket.
PERFORMANCE		
Top Speed:	120mph	115mph
Speeds in gears at max power revs:	42mph, 64mph, 89mph, 110mph and 122mph	40mph, 62mph, 86mph, 107mph and 119mph
0-60mph:	4.5s	4.9s
St 1/4-mile:	13.4s	13.9s
Av fuel consumption:	48mpg	45.7mpg
Tank range:	250 miles	240 miles
Importer/Manufacturer:	BMW (GB) Ltd, Ellesfield Avenue, Bracknell, Berks	

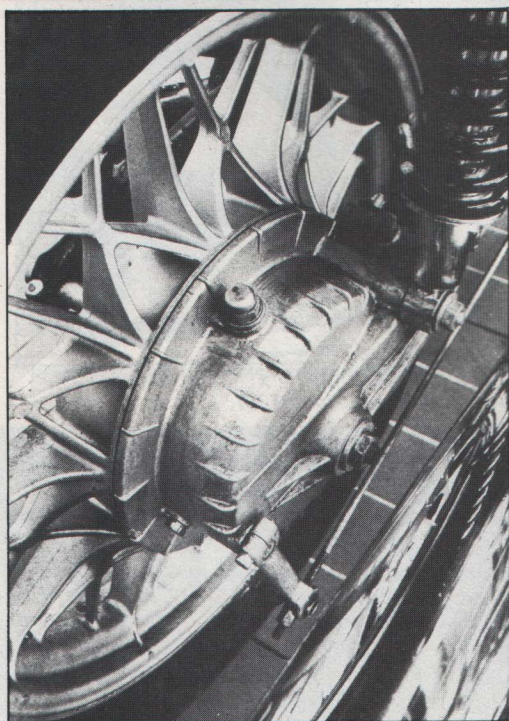


The new Brembo brakes raise the BMW's stopping performance to a new high standard, not only in power but in feel, too. Italian-made to BMW's specifications, they employ dual piston calipers like those fitted to Ducatis and Moto Guzzis. The essential difference on the BMW is that metallic pads are used which, in combination with the stainless-steel perforated discs, provide good wet or dry action. A handlebar-mounted master cylinder, like the less flex-prone calipers, improves the brake's sensitivity and removes the sponginess associated with the complex cable-and-hydraulic system on the pre-1981 models. The RT uses a similar disc on the rear but for lightness and simplicity the CS has a drum brake with just as much power and feel.

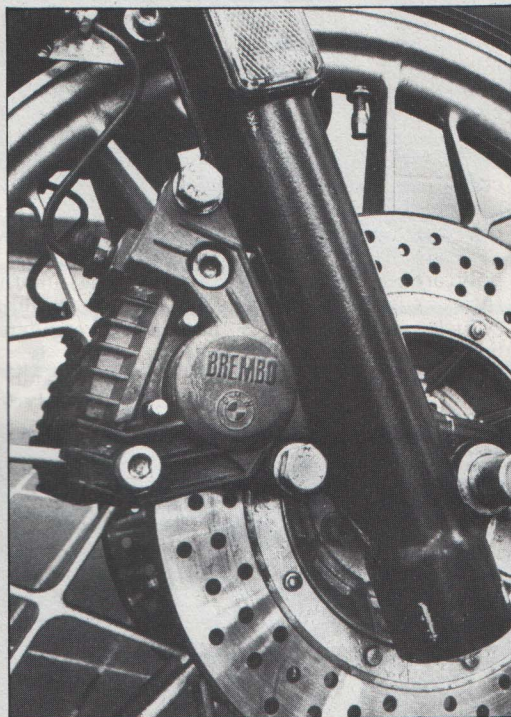
BMW purists might think that quality has been sacrificed in recent years with the use of die castings for the rear drive casing and certain engine parts, along with a powder-coated frame instead of the deep coatings of yore. Time will tell whether these revisions will blunt the machine's appeal. Basically, the bike's merit results from its simplicity and the factory's concentration on the practical aspects of riding. For example, the centre stand balances the bike so that either wheel can be removed without jacking up the engine. For this year, the side stand locks down to prevent the bike rolling over on a slope. There's a hand pump for the tyres and the RT has an accessory socket. The tool-kit is as extensive as ever and now sits in a tray under the seat that has a rubber lid to keep out dirt. Horns are a pair of strident Fiamm units.

After a ride on the latest Bee-Emms, anyone but the most biased BMW hater would be bound to agree that the '81 models are the best the factory has ever made. In every respect, short of the rather nebulous subject of drag-strip performance, the flat-twins have become yardsticks that Italian and Japanese manufacturers will have to work hard at to match, even at around £3,000 a hit.

WB7



Final-drive bevel housing is a new die-casting on all the 1981 BMW flat-twins.



Brake calipers are dual-piston units with asbestos-free pads made for BMW by Brembo in Italy.