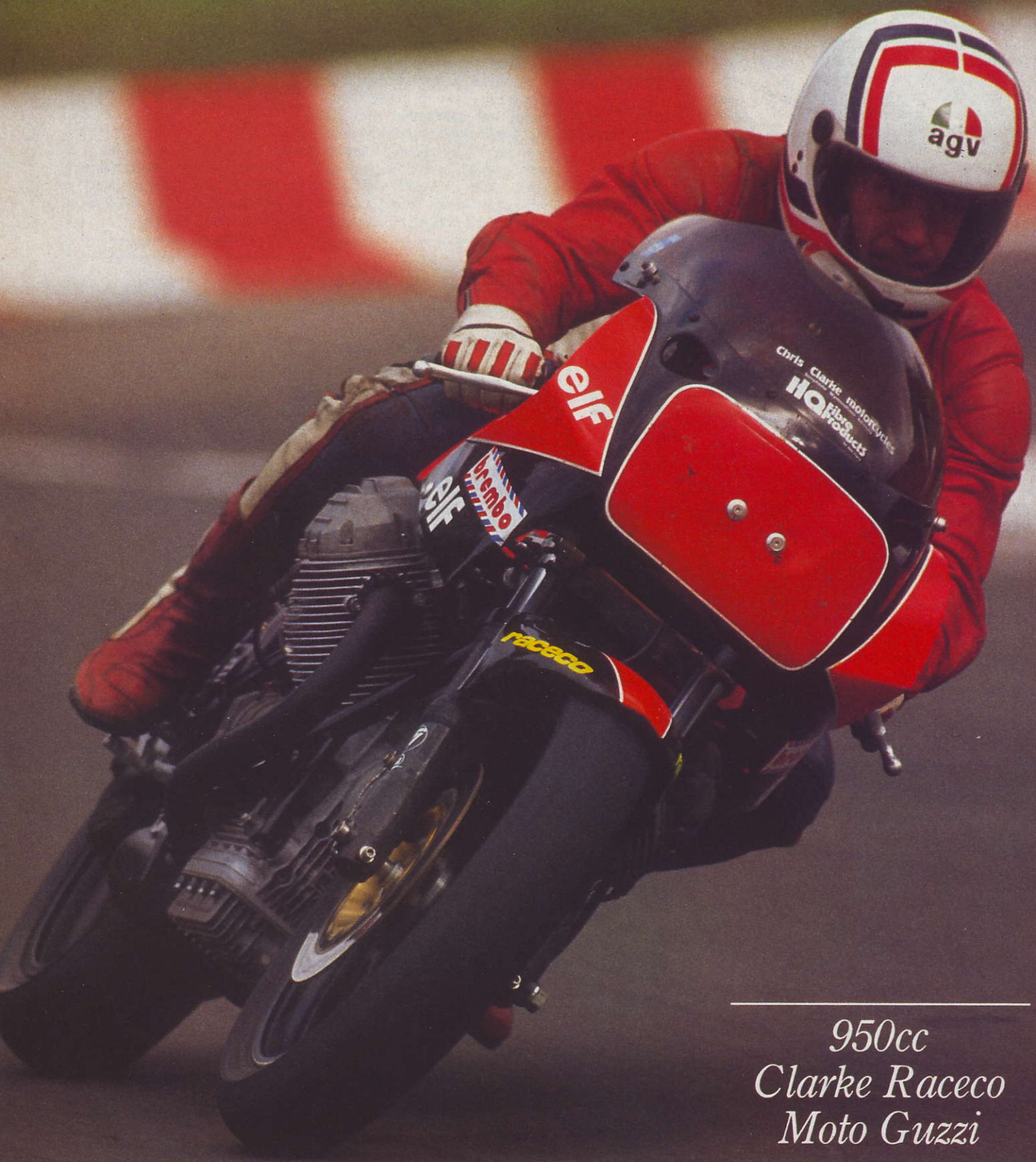
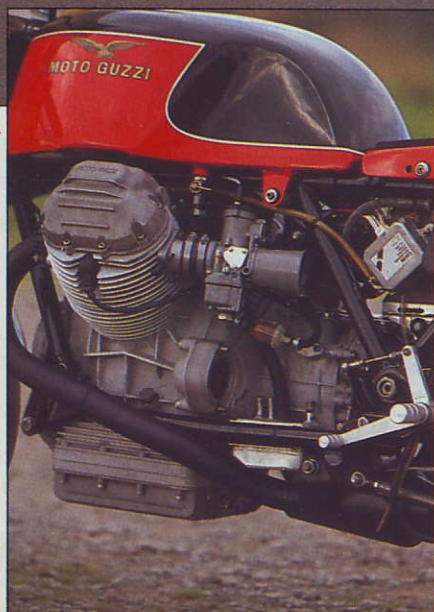


Gutsy Guzzi!



950cc
Clarke Raceco
Moto Guzzi

Gutsy Guzzi!



Above: torquey power is matched by superb brakes

Left: heads have twin plugs, carburetors are Dell'Orto PHMs

Right: slick tyres are used on 18in Astralite wheels



Track test Tony Osborne

Machines with shaft drive and pushrod engines don't often set the racing world alight, but the Moto Guzzi prepared by Chris Clarke and Amadeo Castellani has made an extraordinary impact on British circuits in recent seasons.

Ian Cobby's victory on the V-twin in the hard-fought 1989 *Classic Bike*/Norman Hyde championship proved the 950cc Guzzi's supremacy over the popular Thunderbike class. Ian would probably be on top of the Battle of the Twins tree, too, if it weren't for the four-valve, water-cooled, alloy-framed 888cc Ducatis now available to a few riders.

In the year before, Peter Warden headed both series until his tragic death in a production class accident on a Suzuki. And yet nobody had heard of the Clarke Raceco bike a year before that: it seemed to be a winner from the word go.

Having raced a shaft-drive Guzzi myself – the 750cc machine I shared with Jim Wells in European endurance events in the late seventies – I was quite surprised at this one's success. My memories are of diabolical handling: in the Bol d'Or at Paul Ricard I would be standing on the footrests wrestling to keep control – and that was on the long straight!

But by the end of our Mallory Park session I realised that the Clarke Guzzi is a different matter entirely. It does look big and bulky at first sight, but when you actually sit on it, it's small and light to manoeuvre. It's roomy, too, placing no restrictions on the rider's posture.

Starting is easy for Clarke Raceco riders: the team have a paddock trolley equipped with a large battery and a portable starter motor which can be temporarily attached for as long as it takes to fire up. *CB*/Hyde and *BoTT* events have clutch starts.

Once you've left the paddock, the first thing you notice is how much torque is available. The Guzzi doesn't need to be revved

to get it to take off, as it pulls beautifully even at the lowest engine speeds. There isn't any need for a super-close-ratio gearbox here, as the engine seems to deliver useful power regardless of which gear you are in. This makes life easy for the rider, as you can go into a corner without worrying about being in precisely the right gear, knowing that when you open the tap you'll have power to drive out.

Shaft-drive machines with fore-and-aft crankshafts do suffer from torque reaction, which can take some getting used to. As the power is turned on and off, there's a tendency to rock from side to side. If you ease the throttle part way round a long bend, the machine will try and pick itself up, so you generally try to get your line in good time and keep the power on as you corner.

I found that the Guzzi was easy enough to pick up and lay down in traffic – but if you want to change your line you really have to look out for bumps. I knew this might be a problem on this machine, as Ian Cobby was drastically slowed by the uneven surface at a Castle Combe meeting last season.

Because of the crown wheel and pinion final drive, the rear suspension is affected by the power that is transmitted, especially under acceleration. Reactions from the gears and the swinging-arm can have strange effects, one being that the rear dampers extend fully when the power is turned on, preventing them from doing their job properly.

Mallory is pretty smooth compared with Castle Combe, but even so, this effect was noticeable. At the Esses, where it's usual to turn the power on as you flip from right to left over a rise, the Guzzi's back wheel would launch right off the tarmac. And I soon gave up trying to make a clean gear-

change on bumps exiting Devils Elbow. Early on in the test session, I found that engaging top (fifth) while crossing the notorious patched surface marking the end of Gerards' long right-hand sweep caused a severe wobble at the front end.

In fact, I decided after a few laps that the steering was quicker and more lively than it should have been. Chris Clarke was sceptical when I suggested that the head's taper-roller bearings might need adjustment, but they had probably bedded-in over a season's racing, for slight tightening of the races made a drastic improvement.

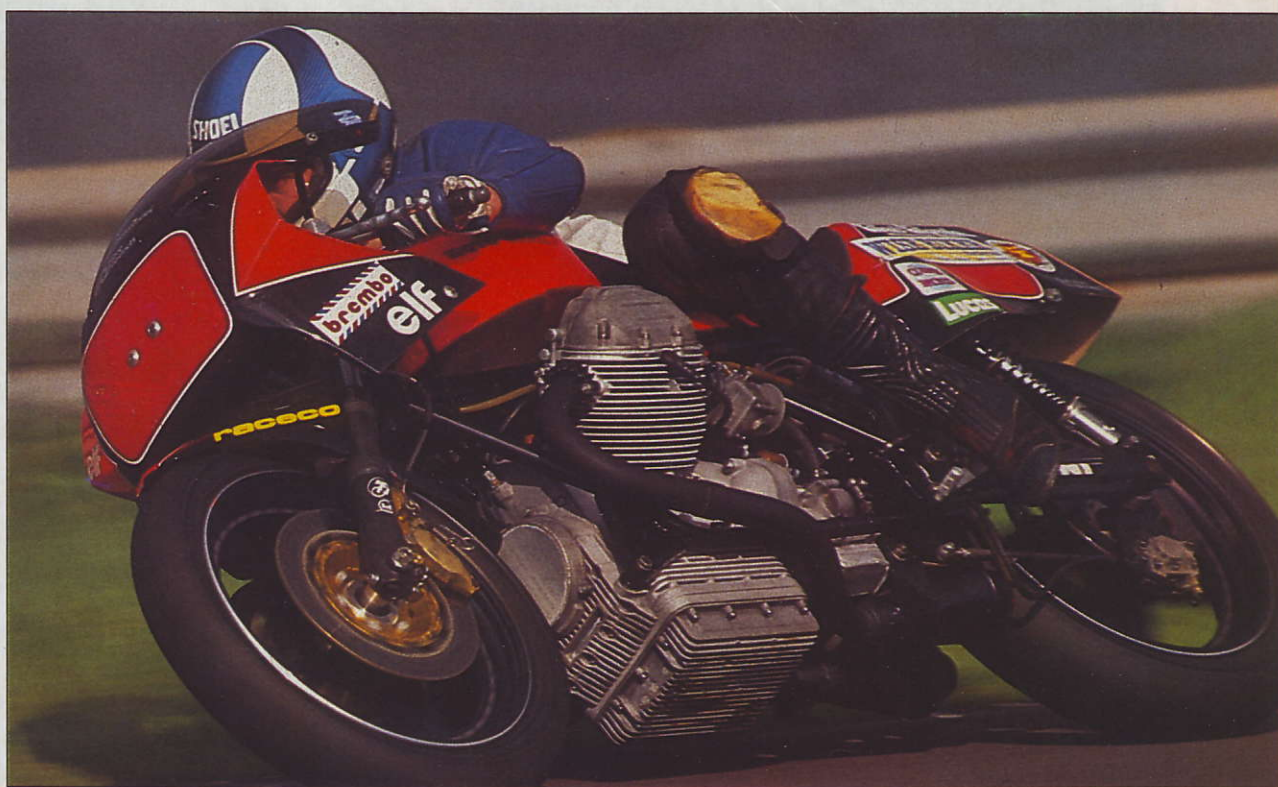
When I got back on the circuit the front end was fine. This machine caused some controversy in 1988, when Chris Clarke had the machine equipped with Suzuki forks, unaware that they contravened the *CB*/Hyde eligibility rules. Now the Guzzi has legal Italian Forcella forks with 42mm stanchions clamped in Harris yokes offering adjustable trail.

I believe the team has left trail adjustment at the minimum setting, which feels dead right. Once the bearings were adjusted, the Guzzi would flick through the chicane with ease. I was able to sweep nicely round Gerards, too, going outside of an up-to-the-minute Yamaha FZR-powered machine here on one lap.

The approach to Mallory's Hairpin is a good test of brakes, and I would describe the Guzzi's anchors as superb. Brembo equipment is fitted, with four-piston calipers acting on two floating discs at the front, and a single PS12 unit at the rear. Very little dive was noticed when the front brakes were used, and I liked the way the rear brake is set up not to be too harsh.

You do need decent brakes on this bike, because it travels deceptively quickly. The leisurely noise you hear from the engine gives an impression that you're going fairly slowly – until you have to lose speed, when you find out how fast you're actually going. ▶

Left: tester Tony Osborne aboard the roadster-based 150mph Guzzi



Right: Clarke Raceco team prospect Clive Ling tries the Guzzi at Mallory

Even though the engine doesn't need to scream, the power is impressive and instant. The strong acceleration seems to build from zero revs, but real surge comes in from about 5500rpm, with no apparent need to exceed 8000rpm. This engine is certainly different from its four-cylinder Japanese contemporaries, which have critical power-bands: it feels like a diesel in comparison.

The twin has got so much grunt I think it probably needs slick tyres to be ridden to its full potential. I can imagine that on intermediate treads, which are okay on a Triumph triple, the Guzzi's rear wheel could well break away too easily when the throttle is opened. For our perfectly dry test session, the machine was shod with its usual slicks – a Dunlop KR108 up front and Michelin rear.

There were a few minor things I didn't like, but most of them would be easy to put right if I were a Clarke Raceco rider. The gearchange lever felt particularly heavy to operate: to make upward changes I had to use the upper part of my left foot, rather than the toe, and this was a hindrance.

On the other side, my foot tended to snag on the stop-peg provided for the brake pedal and the back of my boot sometimes caught against the front edge of the rear fairing. But things like this are really for individual riders to sort out, as they affect everyone differently. I would have liked more foam on the seat, but this could be because I'm getting older!

On the whole, this is a superb machine for Thunderbike racing. It is obviously more powerful than the Triumph triple I ride in CB/Hyde events, it has more pick-up from low revs, and the rider is much less cramped.

In the long run, however, the triple is an easier ride because it copes with bumps better, so you don't have to think about picking your way around them. I think the Clarke Raceco team will have a real job eliminating the rear-end peculiarities of the Guzzi with its present chassis. But it has been proved that a skilled rider can win on it anyway. If Jim Wells and I had been able to use this machine back in the seventies, our results would have been different.

Development history

Mick Duckworth

'WE didn't expect anything really, so it's been an exciting time for us,' Chris Clarke says of his Guzzi racing project.

The shop proprietor from Wymondham, Norfolk, has been selling Mandello-built machines since 1980. The phenomenally successful 950 was assembled from what Clarke calls 'odd bits', after he had threatened to build a racing machine for years. The intention was mainly to attack the Battle of the Twins series that was successfully revived in 1987.

The frame once held together a 1000cc Spada tourer dating from the late seventies, while the engine has been built around a set

The power is impressive and instant

of main cases from an 850cc Le Mans MkI, as made up to 1978. A large number of major components are readily interchangeable between the various Guzzi V-twins, right back to the seminal 750cc V7 Sport of 1972.

As originally raced, the Clarke machine didn't even pretend to be fully competitive, having standard-issue pistons and cams, but, ridden to the limit by Peter Warden it produced promising results, including third place in the BoTT pilot event at Snetterton in September 1987.

'If we hadn't had such good riders, we'd have got nowhere,' Clarke says, probably belittling the part played by him and Amadeo Castellani in constant machine development.

Thanks to Mistral Engineering in north London, power output has been carefully assessed by dynamometer testing. Tests conducted in the winter of 1988-89 gave a best reading of 94.5bhp with the engine

driving the dyno via a differential box, but without the Guzzi five-speed gearbox. Clarke believes this approximates to 100bhp from the crankshaft.

Exhaust muffling added to comply with current noise limits has lost some horsepower, but in 1989 trim the engine was producing an estimated 95bhp.

The camshaft and valve springs are American 'Dr John' goodies, from John Wittner, who has inspired Guzzi tuners everywhere – including the factory itself – with his superbly engineered BoTT V-twins. Castellani's Raceco company imports Dr John parts and a 1000cc short-stroke 95 x 70mm engine based on Wittner experience is presently under development.

The 950's crank has been balanced, but otherwise left standard. Carillo steel con-rods run on the plain big-ends and Cosworth pistons have boosted the compression ratio to 11:1. Pump petrol is used with a dash of octane-booster. Guzzi's usual plated cylinder bores are not kept: instead, 83mm-bore 850cc barrels have been opened out and lined to 88mm.

Valves of normal early Le Mans size, rather than bigger types used by Wittner in his two-valve engines, are made from Tuft-rid stainless steel by G and S in the UK. Their top collars are made in titanium, as standard alloy items have threatened to let go.

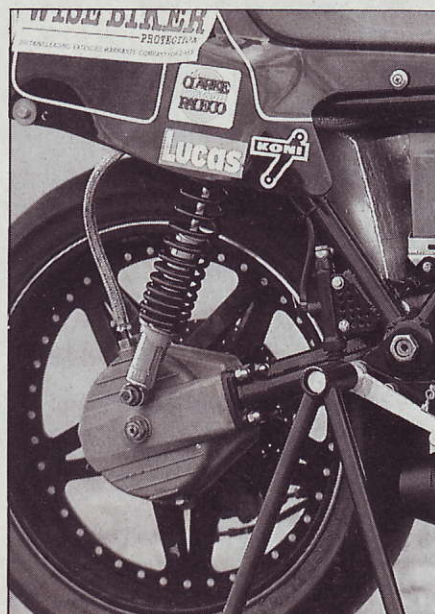
Each cylinder head has been drilled and tapped on its upper side to take an extra spark plug. Castellani says the resulting better combustion was borne out by reduced fuel consumption. Some flow work has been done, with more due for next season.

A Lucas electronic ignition trigger unit mounts at the front of the crankshaft instead of the roadster's alternator. It provides sparks via amplifier boxes and two double-ended coils from current stored in a battery under the seat.

Carburation is by two Dell 'Orto instruments which started life with 40mm bores, as used on the standard 1000cc Le Mans. Their tracts have been eased out by another 1.5mm, and the accelerator pumps have been removed as they have been



Left: Brembo discs are used with 42mm Forcella forks



Right: shaft drive causes handling quirks, suspension is by Koni

Gutsy Guzzi!

found to give no benefit in racing.

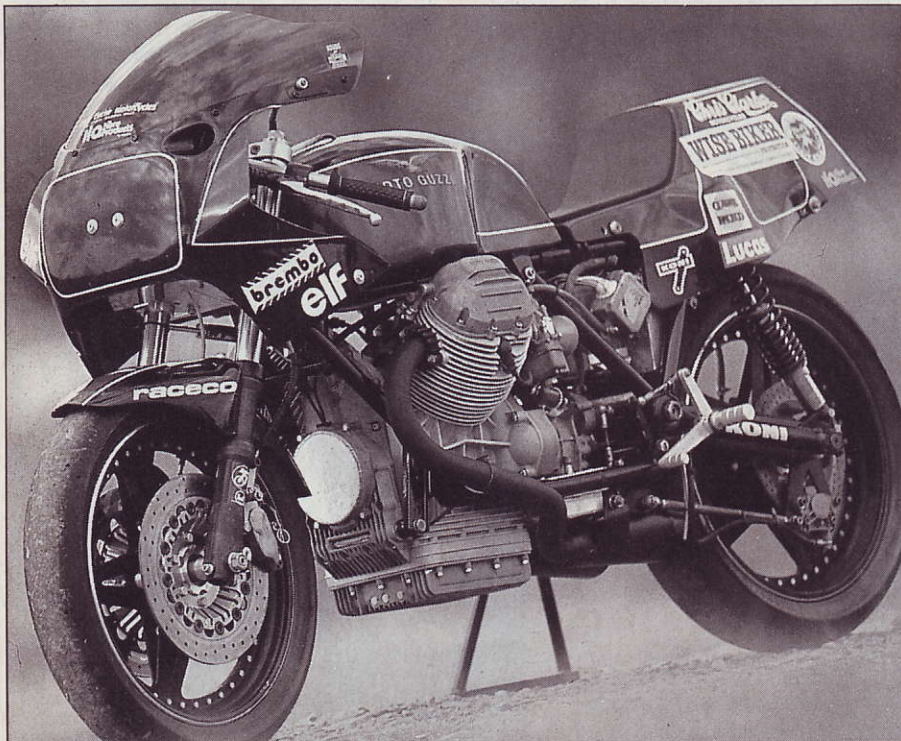
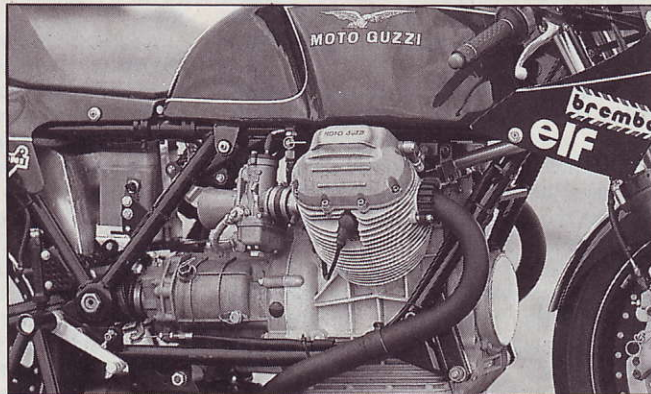
The lubrication system with its gear pump is left standard, but an extra-deep sump casting is fitted. It is not used to increase oil capacity, but it reduces crankcase pressure and avoids power losses caused by the crankshaft dipping in oil. There's a simple breather outlet on top of the crankcase, running to a catch-tank via a ball-valve.

Like Dr John machines, the Clarke Raceco Guzzi uses a Swiss-made Transkontinental single-plate clutch which offers a halving in weight over the original two-plate type, as well as improved function. The standard Le Mans' 7:33 gear ratio in the rear hub's drive-box is an acceptable compromise. Guzzi variants can be used, but they are either too high or low geared.

The overall gearing equates to 152mph at 9500rpm – a rev figure that Ian Cobby has seen in fifth. When *Performance Bikes* magazine held a shoot-out for hot twin-cylinder machines at an airfield in 1988 this machine came out fastest at 147mph. Although 9500rpm is a rough ceiling figure, Clarke says the engine will rev beyond it

Right: Lucas ignition replaces alternator at forward end of crankshaft

Below: deeper-than-original sump prevents crankshaft oil drag



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Raceco UK is at Unit 7R, Worton Hall, Worton Road, Isleworth, Middlesex TW7 6ER (01-569 7969)

Their racing activities are sponsored by Koni Holland, Motomecca, Mistral Engineering and Wise Biker Breakdown Insurance

but with no power benefit. He says peak power is being approached at 7750rpm.

Experiments with the exhaust system – made, like the fuel tank, by Norfolk constructor Nick Parravani – have shown that shorter pipes with bigger megaphones boost top-end power. Mid-range grunt is lost, however, so a compromise has been found to keep the most useful characteristics.

The roadster frame's twin-shock swinging arm rear suspension uses Koni dampers supplied by the manufacturers. Since our test was conducted, Chris Clarke has heard

it suggested that Koni's earlier units, without external damping adjustment, may prove better in dealing with the problematic shaft-drive rear end. A floating rear drive box is planned for the 1990 season.

Clarke's monoshock-framed machine undergoing development was at our Mallory session: though not eligible for the CB/Hyde series, it could become the team's entrant in BoTT events.

The widest rear tyre that can be fitted in the twin-shock chassis is the 14/68 size slick used on present-day 250 and 350cc two-strokes. The twin-shocker has run in club events shod with Avon, Michelin and Pirelli road tyres without major problems.

The 18in wheels are by Astralite with a 2.50in rim size at the front and 3.50 for the rear. Brembo brakes are a natural choice for free-formula racing and the rear caliper mounts below the wheel spindle in a way that offers the most rapid wheel changes.

The Guzzi has proved solidly reliable. Its only failures were a gudgeon-pin circlip that inexplicably broke, and loosening of the starter ring-gear which dashed Cobby's hopes at Knockhill in 1989. The entire machine is well turned out and preparation is obviously in line with the Clarke Raceco team's general air of calm efficiency.

Possible future developments include fitting a close-ratio gearbox and exhaust resonance chambers (rather like Kawasaki's ATAC system) as well as weight-paring and the short-stroke engine. There's another Clarke Guzzi that should be mentioned too, campaigned by Bob Clarke, Chris's brother and proprietor of his own shop. It will be competing in CRMC events next season.

Defending the CB/Hyde title is an obvious challenge for 1990, but in open Twins racing Clarke has no illusions about the 120bhp, 11,000rpm four-valve Ducatis' superiority. Perhaps a visit to Dr John's clinic is called for □

At press time the Guzzi was for sale at £7000.

specification

ENGINE

Type: ohv V-twin. **Bore and stroke:** 88 x 78mm. **Capacity:** 949cc. **Compression ratio:** 9:1 **Carburation:** 2 x 41.5mm Dell'Orto PHM. **Output:** 95bhp @7750. **Electrical:** Lucas electronic ignition, two coils.

TRANSMISSION

Clutch: single-plate, dry **Gearbox:** 5-speed. **Final drive:** shaft and bevel gears.

CYCLE PARTS

Frame: tubular duplex cradle. **Suspension (front):** Forcella telescopic fork **(rear):** swinging arm, twin Koni units. **Tyres (front):** 3.25/4.50 x 18in Dunlop KR108 **(rear):** 14/68 x 18in Michelin. **Brakes (front):** 2 x 300mm Brembo floating disc **(rear):** 230mm Brembo disc. **Wheelbase:** 56.25in (1428mm). **Ground clearance:** 7.5in (190.5mm). **Seat height:** 29.5in (749mm). **Dry weight:** 365lb.

PERFORMANCE

Top speed: 152mph