



2004

ROAD TEST

★ DUCATI ST3 89%

Sports touring to the power of three

Ducati debuts its three-valve motor in a new base model for the ST range. More performance without more cost is the goal – and it succeeds

BY TREVOR FRANKLIN PICTURES HOWARD BOYLAN

THE launch of the ST3 is far more than just the arrival of a new Italian sports tourer – it marks the introduction of a new generation of multi-valve engines from Ducati.

The bike is a replacement for the ST2 and comes with a host of updates including a three-valve-per-cylinder 992cc V-twin to replace the ageing two-valve unit of its predecessor.

And our first ride suggests the motor is a worthy successor, offering the kind of solid low and midrange thump you'd associate with Ducati's legendary four-valve engines.

The change to a three-valve unit has been forced on Ducati by tightening emissions laws – the new motor, with two inlet valves and one exhaust valve, runs cleaner. But it's also a lot more fun.

Launch the bike from a standing start and it responds with a searing surge of acceleration – rather more than you might expect from a three-valve twin. A little lumpy initially, it smoothes out as the needle swings past 3000rpm. Slot through the gears and there's a surprising amount of top end punch. And like all Ducatis, the ST3 has perfect fuel-injection for clean,

stepless drive all the way through the revs.

Select top gear and gas the ST3 at around 70mph and again there's a decent response from the motor. It proves that Ducati has succeeded in making a cheaper, less complicated engine work very, very effectively.

But the engine is only the foundation of the ST3's make-up. The main elements of the design brief were to produce an ST machine with favourable engine performance, but which would also be economic and easy to live with. First impressions are a big thumbs-up for the performance. Fuel consumption looks good for around 40–45mpg, although a steady throttle will improve that – at 80mph the bike is as good as ticking over at 3100rpm and there's another 7000rpm to play with.

Rider comfort also figures highly on the ST3, thanks in part to a new fairing. It is arguably the best looking frontal area of any bike from the current crop of sports tourers (VFR800, Fazer 1000, Sprint ST). Aside from looking modern, angular and aggressive with faired-in indicators, it's pretty effective too.

Ten centimetres taller and wider than the old ST4S fairing, with a pronounced angular

shape and an aggressively-styled headlight that's so bright no driver could ever claim they "didn't see you, mate", it deflects air so only shoulders of taller riders cop the effects of 100mph-plus windblast. And this is only really noticeable with baggy one-piece waterproofs on.

Feet and legs don't fare quite so well

'Ducati has made a cheaper, less complex engine work very, very effectively'

because the lower half of the fairing is slim. Consequently, surface spray and cold air hits shins and booted feet.

The new fairing is a response to criticisms from ST owners, as are the new adjustable brake and clutch levers. Ducati's answer has been to dump the old master cylinders and their remote fluid reservoirs for items that have integral reservoirs and four-way span-adjustable levers.



The instruments are identical to the Multistrada unit. An analogue tacho sits next to an LCD display which shows speed, oil pressure, coolant temperature, a trip meter, average and current mpg, tank range remaining and even warns you when you've hit a service interval. All useful stuff.

The clip-on bars are now height-adjustable, but sadly not for reach. As standard the bars are set at the same height as the old ST4S, but by loosening their retaining bolts they can be moved up by 20mm. Guide marks at 5mm intervals on the forks ensure the bars can never be out of alignment.

Put this together with a sumptuously padded seat, shaped to cope with bigger butt cheeks than even mine, and you get a day's riding with no aches or pains.

Like the STs of old the ST3 has a tendency to understeer on stock settings and run wide of the chosen mark. It's made worse by the softly-sprung Sachs rear shock. With rider on board the shock squats low to upset the horizontal plane of the bike. Wind the throttle on and the forks extend, heightening the tail-down stance.

The shock is completely adjustable and dialling in more pre-load and a dash of

compression and rebound damping has two effects. One, the bike does the same job of soaking up the bumps but without the floaty, wobbly sensation. Secondly, there's a lot more feedback from the tyre, which boosts confidence ten-fold.

The forks are set on the soft side but can't be tweaked because there is no damping adjustment, only pre-load. Ducati claims it's all part of the affordability programme – adjustment means new fork internals.

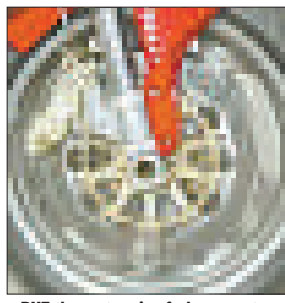
To be fair, though, the forks are only a problem when the bike is banked at high speed and you encounter a good-sized bump or section of broken Tarmac. The front end lurches, but then the bike as a whole wallows when the rear shock hits the same bump.

Over 70mph in a straight line the front end tends to move around. Not drastically – just an unnatural swaying movement. The tyre doesn't lose traction but the forks become unsettled, possibly due to wind lifting the front end.

However, taking into account the fact that Ducati has set about the making ST3 a bike capable of blowing the miles away and cobwebs from your head in comfort, the Italian company has succeeded.



SACHS rear shock is fully-adjustable



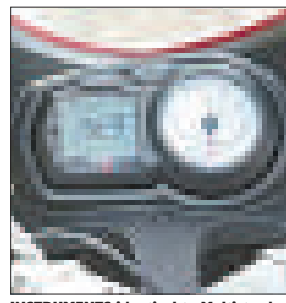
...BUT the cost-saving forks are not



IT'S Desmo, Jim, but not as we know it



LIGHT looks sharp and burns retinas



INSTRUMENTS identical to Multistrada



THE ST3's new three-valve Desmodromic motor offers plenty of low and midrange drive, and a surprising amount of top-end punch

★ **DUCATI ST4S 90%**

Higher-spec brother has the edge

DUCATI'S four-valve ST4S has always been a popular choice for riders who want a touring bike with sports capability. And for 2004 the bike has changed little in the way of performance and chassis components. Instead Ducati has majored on the bike's looks by treating it to the same styling exercise as the new ST3.

There are significant chassis and engine differences between the two bikes, which accounts for the ST4S's higher price.

It's a better bike for A-road charging because it has the same suspension ingredients as a pure sports bike. The Showa front forks are fully adjustable as is the Ohlins rear shock.

Soft to start with, the Ohlins unit reacts well to tweaks (and remote pre-load and compression adjusters are easy to get at). This encourages harder, faster riding. It's exactly the same for the forks. With the whole bike stiffened up it can be stopped later and turned and fired quicker out of corners than an ST3 on a back-road blast. The quality of the suspension is compounded by the ST4S's lighter aluminium swingarm (steel on the ST3) and titanium nitrided forks. The forks are much

more responsive to surface undulations, and the rear arm reduces unsprung weight.

Its 996cc four-valve Desmoquattro engine produces 15bhp more at the top end of the rev range than the ST3. But run the two together from a standing start and the ST3 has the early edge – thanks mostly to significantly lower gearing. The additional top end poke of the ST4S only begins to tell over the 100mph mark, when it starts to reel in the ST3. By 120mph the ST4S is back in front and pulling away. For high speed autobahn blasts the ST4S is the daddy.

Given the fact the two bikes are styled exactly the same, have the same level of comfort and are powered by twins, it'd be a tough choice which to part with your hard-earned for. Both are easily capable of dusting big distances without tiring the rider – or themselves come to that. But when it comes to carrying weight in the form of pillion and big luggage mass, or even hacking across roads that goats have been pooing on, then it has to be the ST4S. The top suspension makes it the better practical proposition.

A WORLD OF ACCESSORIES FOR THE ST RANGE

DUCATI offers more official accessories than any manufacturer.

Not only is there matching hard luggage, but also a whole book's worth of parts listings dedicated to customizing the ST range. This is just a selection of some of the best stuff that is available:

- | | | |
|----|-----------------------------------|-------|
| 1 | 30-litre panniers and fitting kit | £486 |
| 2 | 48-litre top box and fitting kit | £270 |
| 3 | Carbon or stainless exhausts | £639 |
| 4 | Aluminium sprocket cover | £46 |
| 5 | Billet clutch cover | £191 |
| 6 | Carbon numberplate hanger | £118 |
| 7 | Ducati GPS system | £1297 |
| 8 | Carbon fairing inserts | £97 |
| 9 | Slipper clutch | £591 |
| 10 | Carbon rear hugger | £122 |
| 11 | Carbon front mudguard | £121 |
| 12 | Race-style lever set | £106 |



▲ 5 & 9: Slipper clutch and billet cover



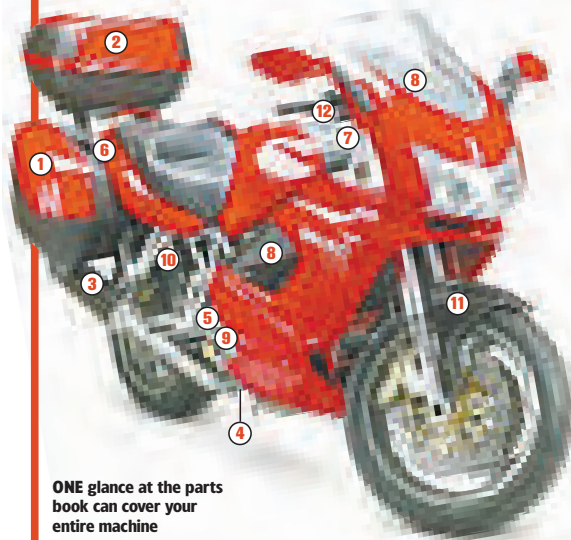
▲ 7: Ducati's own GPS system



▲ 12: Race-style adjustable lever set



▲ 10: Carbon-fibre rear hugger



ONE glance at the parts book can cover your entire machine



FOR more cash you get better suspension – and that makes all the difference

DUCATI ST4S
£8695 otr

Available: December 2003, with 2 years' manufacturer's warranty and roadside recovery
Colours: Red, yellow or grey
Insurance group: 15
Info: Ducati UK, 0845-122-2996
Power (claimed): 117bhp
Fuel capacity: 21 litres
Seat height: 820mm
Weight: 467lb (212kg)

Note: ABS version available for £9495

SPECIFICATION

Engine: Liquid-cooled 996cc (98 x 66mm) 8v Desmodromic V-twin. Fuel injection. Six gears
Chassis: Tubular steel trellis
Front suspension: Showa 43mm upside-down forks, fully adjustable
Rear suspension: Ohlins single shock, fully adjustable
Tyres: 120/70 x 17 front, 180/55 x 17 rear
Brakes: 2 x 320mm front discs with 4-piston callipers, 245mm rear disc with 2-piston calliper

PROS ● Better handling than new ST3 ● Most practical tourer in ST range
CONS ● Performance comes at a price ● Suspension set up soft as standard

90%

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ROAD TEST

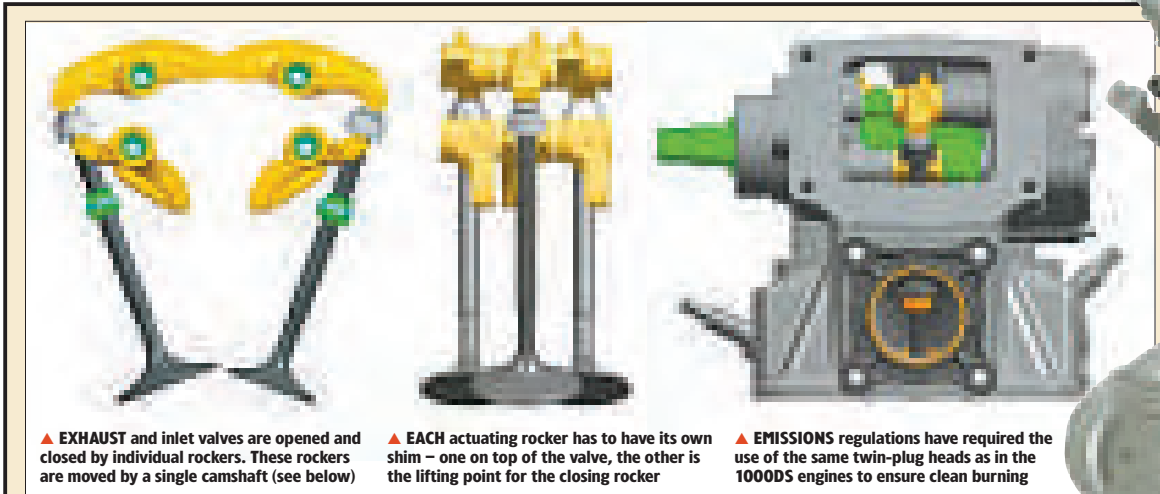
Inside the new three-valve 'Desmotre' engine

THE key technical highlight of the new ST3 is the new Desmotre (pronounced Desmo-tray) engine, designed to meet tightening emissions regulations. "Desmo" is short for Desmodromic, the name given to Ducati's method of both opening and closing the exhaust and inlet valves by camshaft-actuated

rocker arms, with no springs required. Tre is Italian for three – the number of valves in each cylinder head. The three-valve head design is intended to blend the high torque at low rpm of Ducati's two-valve (Desmodue) motors with the high rpm power of its four-valve (Desmoquattro)

engines. It is also Ducati's cleanest burning engine. And because it's based around previous designs, it slots straight in to an existing chassis, in this case the steel trellis frame of its ST4S stablemate (the running gear is identical save for cheaper three-spoke wheels, non-adjustable forks and a steel rather

than alloy swingarm). The Desmotre's bore and stroke (94mm x 71.5mm) is the same as the 2v air-cooled 1000DS engine, and claimed peak output figures are 102bhp and 68.6ftlb. Equivalent figures for the 996cc ST4S are 117bhp and 72.3ftlb.



▲ EXHAUST and inlet valves are opened and closed by individual rockers. These rockers are moved by a single camshaft (see below)

▲ EACH actuating rocker has to have its own shim – one on top of the valve, the other is the lifting point for the closing rocker

▲ EMISSIONS regulations have required the use of the same twin-plug heads as in the 1000DS engines to ensure clean burning

★ TOP END

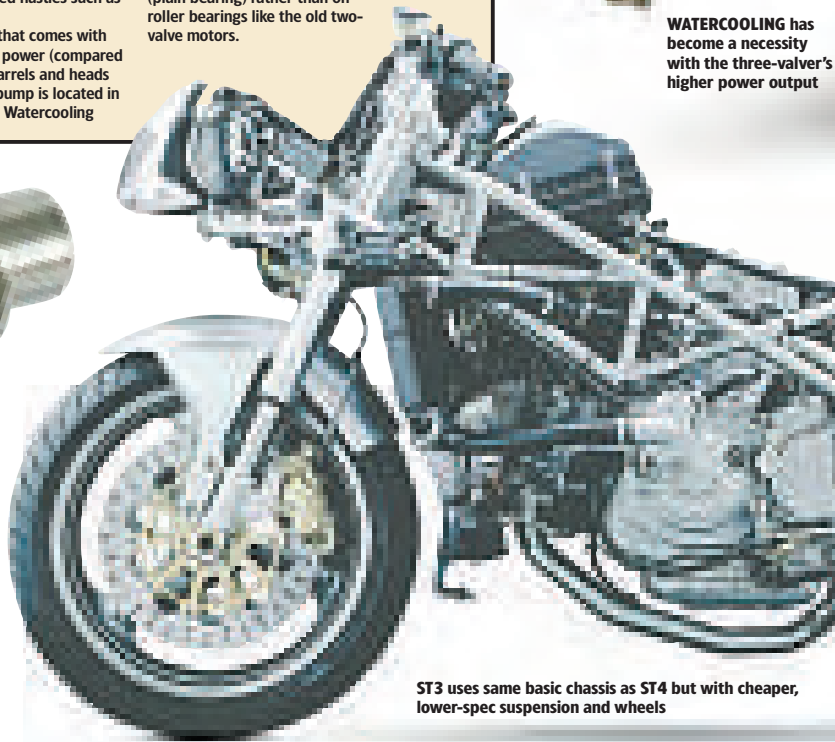
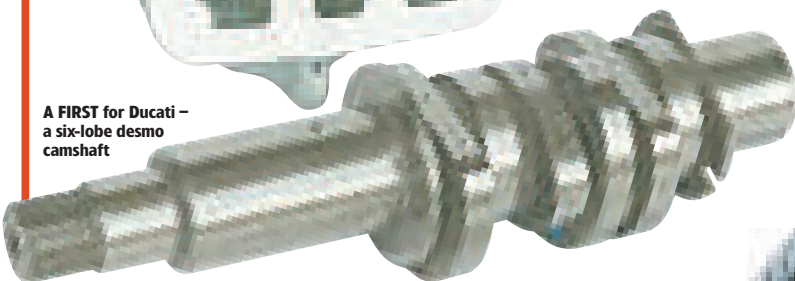
THERE are two inlet valves (34mm) and a single exhaust valve (40mm) set at 40°. The steep valve angle creates a compact combustion chamber but a large squish band to ensure a wide flame path and better fuel burning. Two spark plugs as per the 1000DS (Dual Spark) and a compression ratio of 11.3:1 also ensure the compressed fuel mix is burnt efficiently, making the engine clean-running. Catalytic converters in the exhaust system oxidise any remaining unburnt nasties such as hydrocarbons. To deal with the extra heat that comes with the three-valve motor's extra power (compared to the two-valve units), the barrels and heads are liquid-cooled. The water pump is located in the left-hand alternator case. Watercooling

also reduces engine noise, keeping it within the latest and future European noise limits. The head design uses one camshaft to both open and close the valves. Each cam has six miniscule lobes which act upon three pairs of opening and closing rockers. With only one cam per cylinder – as opposed to the twin-cam design of the Desmoquattro engine – the Desmotre's head is very compact. The ST3's camshaft runs directly in the head (plain bearing) rather than on roller bearings like the old two-valve motors.

WATERCOOLING has become a necessity with the three-valver's higher power output



A FIRST for Ducati – a six-lobe desmo camshaft



ST3 uses same basic chassis as ST4 but with cheaper, lower-spec suspension and wheels

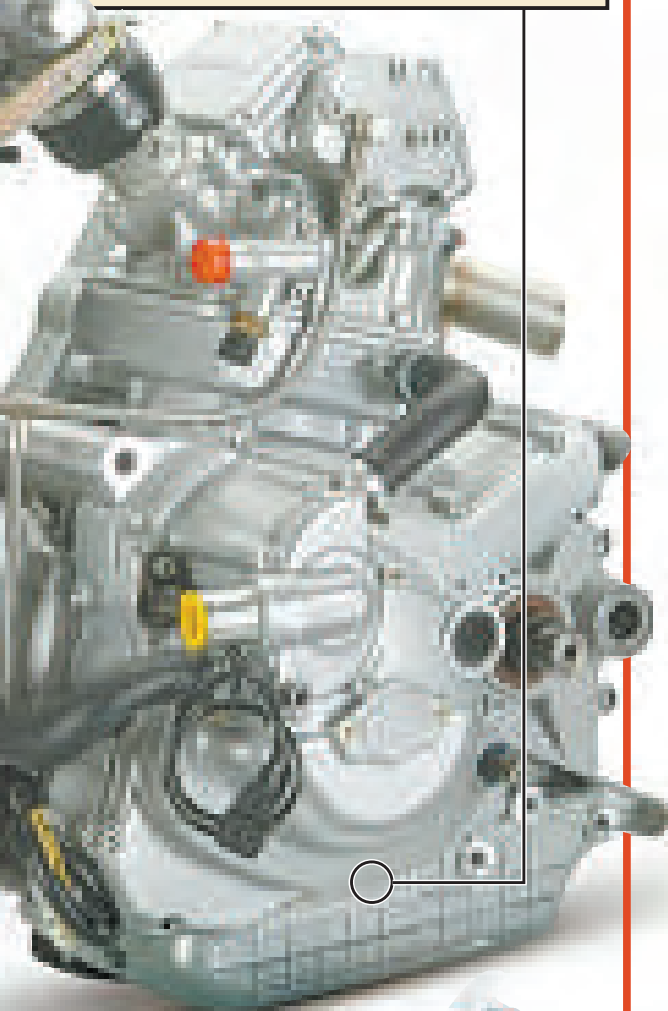
<p>DUCATI ST3 £7495 ovr</p> <p>Available: December. Two years' unlimited mileage warranty, and roadside recovery Colours: Red, silver or yellow New for 2004: New model Insurance group: TBC Info: Ducati UK: 0845-1222996</p>		<p>SPECIFICATION</p> <p>Engine: Liquid-cooled, 992cc (94 x 71.5mm), 6v Desmodromic 90° V-twin Six gears. Marelli electronic fuel injection Chassis: Tubular steel trellis Front suspension: Showa 43mm inverted forks, adjustable for preload only Rear suspension: Sachs single shock, fully adjustable Tyres: 120/70 x 17 front, 180/55 x 17 rear Brakes: 2 x 320mm front discs with 4-piston calipers, 245mm rear disc with 2-piston caliper</p>
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PROS ● Strong punch throughout the range ● Comfort over distance ● Best looking sports-tourer
CONS ● No fairing pockets ● Forks are pre-load adjustable only ● Lower body wind protection could be better

89%

✦ BOTTOM END/GEARBOX

THE bottom half of the engine is based around Ducati's 1000DS engine – cases, crankshaft and six-speed gearbox are exactly the same – but uses its own design of cylinders, conrods and pistons. Internal gear ratios are as the ST4S, but the final drive ratio is different. The ST3 has a 42-tooth rear sprocket, the ST4S 38. With the ST3's plentiful torque it is little wonder that the new engine is livelier in the first four gears.



✦ DUCATI 749S 91%

More power to take on the fours

THERE'S never been any doubt about the track prowess of Ducati's 749S, the updated version of the base 749 with improved suspension and chassis tweaks. But engine-wise, the 'S' had exactly the same performance as the standard model – until now.

For 2004 Ducati has tweaked the 749S's powerplant to raise peak horsepower and put it more on a par with the 600cc four-cylinder competition. To be exact it has risen by 6.7bhp to a claimed 110bhp. Torque is up too, although less dramatically – an increase of 0.74ftlb to 57.56 ftlb. The rev ceiling has moved up to 11,250rpm.

The power boost is noticeable immediately. The new motor revs more freely and more quickly than the old 'S' and pulls hard in the first five gears – sixth was only hooked very briefly on the start/finish straight of our test at the Catalunya GP circuit in Spain.

On the old 749S the motor would start to lose drive in fourth gear with 110mph showing.

To safely wring out those extra horses Ducati has revised the crankshaft, valves and rocker gear. The crank's flywheels have been trimmed to make them smaller across their width and breadth, but adding to their depth. The weight loss is enough to help the crank respond quicker with large throttle

openings.

Like the ST3, the new 749S has benefited from a polishing process on the crankshaft and conrods which is claimed to strengthen them.

Engine breathing is boosted by the use of narrower valve stems (6mm from 7mm) and the diameter of the inlet valves has grown 1mm to 38mm to speed up gas flow. And because of this, and the higher rev limit, the valves' closing shims are now retained by conical titanium collets. These are the same type as used in Neil Hodgson's WSB championship winning 999 F03 bike. They are much bigger than the old 'wire' type retainers and have a greater friction effect to effectively grip the valve stem and stay in place at high revs.

New camshaft profiles have led to longer valve lift and duration.

A possible weak link that could have manifested itself as major mechanical failure at high revs was the closing rockers. These were cast items, potentially weak where excess molten metal escaped between the two halves of the casting mould. But a new-shaped casting mould produces rockers with a stronger and lighter 'H' shape and minimal flash, which is then polished off.

So, more power, same sweet handling and in the words of one Ducati technician: "A little more from a V-twin is enough to beat Japanese four-cylinder bikes."

DUCATI 749S £9795 otr

Available: 2004, two year unlimited mileage warranty and roadside recovery
 Colours: Red or yellow
 Insurance group: 16
 Info: Ducati UK: 0845-1222996
 Power: 110bhp
 Fuel capacity: 15.5 litres
 Seat height: 780mm
 Weight: 439lb (199kg)

SPECIFICATION

Engine: Liquid-cooled 748cc (90mm x 58.8mm) 8v Desmodromic 90° V-twin, Marelli electronic fuel injection, Six gears
 Chassis: Tubular steel trellis
 Front suspension: Showa 43mm fully adjustable inverted forks
 Rear suspension: Showa single shock, fully adjustable
 Tyres: 120/70 x 17 front, 180/55 x 17 rear
 Brakes: 2 x 320mm front discs with four-piston calipers, 240mm rear disc with two-piston caliper

PROS ● Superb handling ● Adjustable seat and pegs ● It's a Ducati
CONS ● Too small fuel tank ● Bars hurt wrists after a while

91%

THE 749S was always a great choice for the track but the performance boost now makes it better still



NEW CRANK



▲ NEW 749S crank (bottom) is lighter and smoother than old version (top) to boost top end performance

749S RIVALS

THE competition the 749S is going to have to beat...

- ✦ **HONDA CBR600RR**
Definitive Japanese sports 600 – over 100bhp in a chassis inspired by its MotoGP winning bike.
- ✦ **KAWASAKI ZX-6R**
Wickedly styled and powerful. Not as polished as the Honda but always right up its chuff.
- ✦ **YAMAHA YZF-R6**
A favourite with track-dayers and right up with the CBR and ZX-6R on the road. Just lacks their looks.
- ✦ **SUZUKI GSX-R600**
Always a scratcher's tool and all-new for 2004. Could cause a major upset next year.