

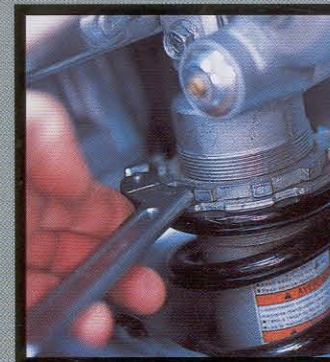
Contacts

<i>Who are they?</i>	<i>Number?</i>	<i>What do they do?</i>
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Valmoto	0161 6435511	Penske shocks
WP UK	01507 327509	WP kit/set-up service

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PERFORMANCE BIKES

SET-UP MANUAL



All major models covered including

Aprilia RS250
Aprilia RSV1000 Mille
Ducati 748SP
Ducati 996/996S
Honda CBR600F
Honda Fireblade
Honda VFR800
Honda VTR1000 Firestorm
Honda VTR1000 SP-1

Kawasaki ZX-6R
Kawasaki ZX-7R
Kawasaki ZX-9R
Suzuki GSX-R600
Suzuki GSX-R750
Suzuki TL1000S
Suzuki TL1000R
Suzuki GSX-R1000
Suzuki GSX1300R Hayabusa

Triumph TT600
Triumph T595 Daytona
Triumph T955i Daytona
Yamaha Fazer 600
Yamaha YZF600R Thundercat
Yamaha R6
Yamaha YZF750
Yamaha YZF1000R Thunderace
Yamaha YZF-R1

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Welcome

We published our first Performance Bikes set-up guide nearly four years ago, and since then we've twanged the suspenders of all the significant sports-bikes from the last decade - 42 in all. So chances are we've done yours. But don't panic if we haven't. This collection of all the set-ups to date is also a guide to how suspension works, and tells you what you need to know to make yours work better. So don't fear the preload adjuster, make friends with the C-spanner and get more from your riding on road and track with a Performance Bikes set-up

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CULPABILITY

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■ Bike and rider in harmony - if you want to do this, better make sure your suspenders are on the right way round

Know lots about suspension

A normal pushbike has no suspension and if you ride it over a pothole it hurts your wrists and your tackle. If you cut the forks in half, slot one half inside the other and fit springs between them, you have front suspension. If you do the same to the top pair of rear wheel support struts and put a pivot between the frame and the lower arms, you have rear suspension. Now if you ride over a pothole it doesn't hurt any more. That's suspension.

What's it for?

1) It tries to make sure the wheels go up and down over the bumps and you don't.

2) It controls the bike's behaviour into, through and out of corners – what we call the 'feel' of the bike.

Why bother adjusting it?

1) To make it more comfortable.

2) To make it 'feel' better.

Will I notice the difference?

Yes. Small changes can make a big difference to the feel of the bike.

Why aren't the stock settings good enough?

They are for most people, most of the time, but they're a compromise because they have to be stable in all conditions and they have to be able to cope with everything from an anorexic dwarf through to a lard-

arse and his fat wife on the same settings. Fast bastards like you can fine-tune your settings for your own weight and riding style.

What is damping?

If suspension only had springs you'd bounce all over the road like a pram. Damping puts a drag on the springs to stop them compressing or extending as fast as they want to.

What is compression?

It's the movement caused when a wheel first hits a bump, or when the front dives under braking or when the rear squats under power.

What is rebound?

Extension after the suspension has been compressed. It's the movement when the spring is unloaded: coming off the peak of a bump, or when weight is transferred away from the front under power or away from the rear under braking.

What is preload?

It's the amount by which a spring must be loaded before it begins to compress. It's adjustable so as to keep both ends of the bike the ideal height from the ground to compensate for the varying weight of rider, luggage, or passenger. Also, being able to tip one end of the bike more than the other lets you alter the bike's steering geometry: how fast or slowly the bike steers or how stable it is. Which is nice.



The rear shocks fitted to most road bikes are pretty crap really, but there are plenty of far better options available. £500 spent on buying and setting up a good rear shock like this Öhlins is a better investment than the same money spent on engine tuning

Most sportsbikes' forks can be modified to work extremely well. Still, no reason why we can't dream of WSB-spec upside-downies like these Bitubos, is there..?



MAXTON SAY...

Throughout the set-up guides you'll see boxes like this telling you what Maxton engineering think of the bike's suspension.

Maxton have decades of experience at setting up and modifying suspension for road riders, racers and trackday fiends. They can transform your existing forks and either revalve your rear shock or supply a far more effective fully adjustable replacement.



If you get your suspension set up right, your tyres should wear evenly, without tearing up or chunking

Sort the basics

Before you start furling with your suspenders, make sure the problem doesn't have a more obvious cause. Most handling

problems are caused by:

- a) worn, mismatched, misaligned or under/over inflated tyres
- b) knackered or poorly adjusted head or swingarm bearings
- c) blown fork or shock oil seals
- d) bent frame, swingarm, forks, wheels or wheel spindles.

So check that lot out first, then set all your suspension adjusters to the standard settings.

If you don't have a baseline setting – if the bike's a special, or if it's got a non-standard rear shock for example – you'll need to establish some settings to work from. So...

1) Set up the preload.

Get a friend, a ruler, a long stick and some cable ties. Put a tie around the fork slider and push it tight against the fork seal with the wheel off the ground. Then sit on the bike, letting it take your weight as if you're riding it. Pick your feet up and get the friend to balance the bike if you don't want to fall over. Then get off the bike. Measure the gap between the tie and outer tube.

At the rear, mark a point on the subframe or rear seat unit directly above the rear wheel spindle and run a rule from there to the wheel spindle with the wheel off the floor. Sit on the bike again and measure again. This is the sag.

You now have two numbers: front sag and rear sag. They should be approx. 30% of wheel travel. Most modern sports bikes have 125-150mm of wheel travel, so you'll want around 35-45mm of sag.

2) Set the compression damping adjusters to minimum.

3) Set the rebound damping adjusters to halfway.

4) Ride the bike.

Easy really...

Rear compression



Screw adjuster on the top of the shock body or on the remote reservoir. Usually adjusted with a screwdriver – sometimes it's a thumb-wheel

Fork preload



Threaded fork top nuts, usually with lines machined into the body for easy reference. Adjust with a spanner

Fork rebound

Screw adjusters on the tops of the forks (see pic, left). Adjusted with screwdriver



Rear preload



Threaded collar and locknut adjuster on the shock body or multi-position cam ring. Adjust with C-spanner. Can be hard to shift – skinned knuckles inevitable

Rear rebound



Either a thumb wheel or a screw adjuster on the bottom of the shock body. Sometimes hard to get at

Fork compression



Screw adjusters on the bottom of the forks. Some are hidden and accessed from below through wheel spindle

How do they do that then...?

All our set-up guides are produced by taking a trip to a track to get some serious laps in, and then fiddling with the adjusters until the bike works the way we want.

Because to most of us suspension is as big a mystery as why toast always lands butter side down and why babies always look like Chairman Mao, Queen Victoria or Winston Churchill, we let a set-up expert do the actual setting up, while we take notes and pretend to understand what he tells us. For most of the guides, that expert is Bruce Dunn. National 250 racer, massively experienced road tester and faster than a speeding ferret, Bruce has an instinctive feel for what a bike's suspension is doing, and knows which knobs to turn to make it better. But we'll let him explain what it's all about. Over to you, Fen Weasel...

Faster than a speeding ferret - Bruce has an instinctive feel for what a bike's doing, and he knows which knobs to turn to make it better

Bruce: When we set up a bike the first thing is to return the suspension to standard settings and fit some decent tyres. All tyre manufacturers will give you a recommended pressure for track use – usually a fair bit lower than for the road.

After warming up the tyres we put in a few laps to get a feel for how the bike behaves – and that feel only comes with experience. We're looking for how the bike behaves at every point: does it wobble or wallow mid-corner? How does it feel when you turn in hard off the brakes? Would a bit less front ride height make it quicker-steering? Maybe, but if it's already decking out you'd have to raise the rear rather than dropping the front. Every

aspect of the bike's behaviour is analysed, and we get into the classic set-up spiral – changing one thing affects another thing, and every time you solve one problem and go faster you run into the limitations of something else.

Even before you ride, it can be useful to get a feel for what the damping adjusters do by pushing on the bars or seat, and playing with the various adjusters – feeling the difference between the damping full on or off. Remember you can always go back to the standard settings if you get lost.

So do we turn adjusters a little bit at a time? Not necessarily. Partly because it's easier to feel bigger changes than small ones, and partly because most road bikes have a limited range of adjustment anyway – even if it's got 40 clicks of rebound adjustment the chances are it'll only be the last five that make any difference. So don't be shy in turning things in or out in big amounts – it will help you feel what's happening. Once you know you're going in the right direction smaller

increments can fine tune things. Ride height adjustment is the exception to that rule – small changes in ride height front and rear really do make a lot of difference, dropping the forks only 5mm from standard will transform the way the bike feels (not always for the better!). Be careful when venturing out on fresh settings, build your speed up slowly, and be prepared for more instability, or a bigger rate of turn in.

Racers speak of a bike being 'balanced' and that's what you're after – a standard road bike set up to get the best balance will handle better than the trickiest special that's got mismatched components and a poor set-up.

And it needn't cost you a penny.

■ This is Ron Williams from Maxton. He knows more about things that go boing than any other man of his size and weight in the kingdom



■ The humble cable tie has a vital function - it helps you keep track of suspension movement



■ Some damping adjusters are easy to get at, and some are hidden away, especially on the rear shock



■ Front preload adjustment - often the first step in getting a bike set up properly



■ Rear ride height adjusters are often hidden away, but well worth finding - if your bike has one

Diagnosis

Understanding how suspension works is one thing – applying the theory to what you feel through your wrists, bum and feet when the bike is moving is another. And as if that wasn't hard enough, each part of the suspension interacts with the others and so problems you feel through the bars may be caused by the rear shock and vice versa.

Most adjustments to suspension are quick and easy, so don't worry if you make the handling worse; you can easily make it better again and you then know what adjustment is having which effect. There's no substitute for experience and only one way to get it, but here are a few common problems and likely solutions to get you started.

STEERING

If the steering is heavy, slow, or the bike sits up under braking/runs wide into corners you need to raise the back and/or lower the front by:

- a)** increasing the rear ride height adjuster (ideal solution but most bikes don't have one).
- b)** increasing the rear preload (all bikes have adjustment but it's not always easy physically).
- Other things to try:
- c)** increasing fork rebound damping.
- d)** increasing rear bump damping (neither of these is ideal because the damping might then be wrong in other conditions).

- e)** drop the yokes down the forks (reduces ground clearance).
- f)** fit a longer spring, a different rate spring, or a different ratio linkage to the rear shock (expensive/a pain).

All these will make the steering lighter, faster, and more twitchy. If the steering is too light, fast or twitchy, or the bike tankslaps or follows a tighter line than you want it to you need to raise the front/lower the back by doing the opposite of the above.



■ Forks dive under braking? You'll be after a bit more compression damping then...

MID-CORNER WOBBLES

Almost all mid-corner wobbles and weaves are caused by poor maintenance but if your bike's in A1 nick and it still corners like a Tellytubby:

- a)** increase rebound damping front and rear.
- b)** check for a big mismatch between front and rear settings.

TANKSLAPPERS

More common than ever due to big power, little weight and steep head angles/short trail for quick steering.

- a)** raise the front or lower the rear.
- b)** up front compression damping.
- c)** reduce front rebound damping.
- d)** change your riding style. Under power, sit up against the tank and put all your weight over the front. Keep a light touch on the bars – don't lean on them – and take your weight through the pegs.

BRAKING

- a)** if the front dives too much on the brakes, increase the front compression damping.
- b)** if the front bounces back after braking, increase front rebound.
- c)** if the rear end chatters or leaves the ground under braking, decrease rear rebound or sit further back.

UNDER POWER

Even bikes that handle badly handle less badly under power: the bike is driving from the rear, the rear tyre works harder than the front, and the bike naturally holds a tight line.

- a)** if the rear squats too much, increase rear compression damping.

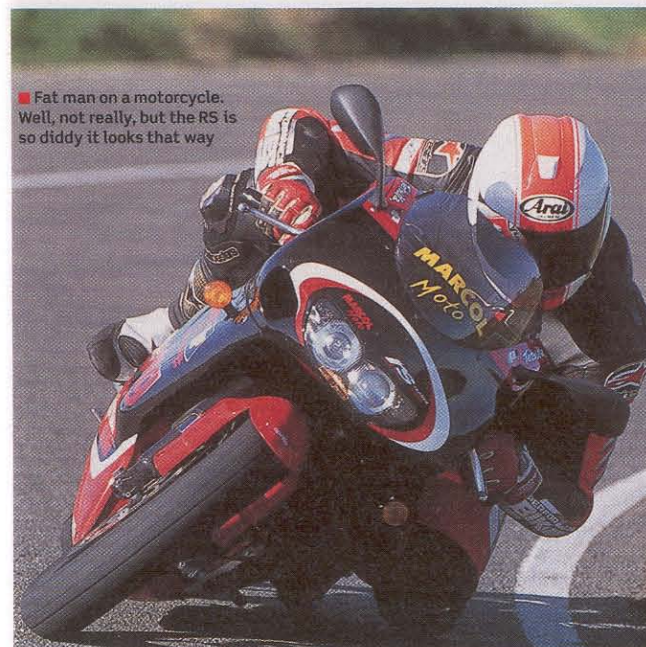
IN GENERAL

Compression damping affects how much the bike moves around when it first does something (like brake, accelerate or turn), and rebound damping helps holds the bike steady afterwards.

Quite often adjustments have effects which are completely different to what you expected. This is because adjustments (and problems) sometimes overlap and something changed at the back end manifests itself at the handlebars. If you then alter the front suspension to compensate it may not have the desired effect. Therefore only change one thing at a time and keep a note of the changes you make.

To start with you'll tie yourself in knots trying to get your head round what's going on, but stick with it and you'll be rewarded with better handling, better tyre wear and the adulation of the masses. Sorted.

RS250



■ Fat man on a motorcycle. Well, not really, but the RS is so diddy it looks that way

You bought the RS250 to learn how to corner better – and to hand out riding lessons to bigger bikes on track days. To say it's a featherweight is an understatement – full of fluids it tips the scales at only 140kgs. And it has, on average, 52bhp at the rear wheel. But even the ultra-lightweight Aprilia needs setting up. So we went off to Darley Moor circuit to sort it out. The track's as bumpy as your local farm road and you must have your suspension set-up so it moves. No use having stiff-

as-a-board settings.

For the first session we went out with the standard setup, only to scamper back in to the pits a few laps later. We thought the little twin-cylinder Aprilia would put a smile on our mugs for sure. But we had worried frowns instead – entering the 70mph chicane on a quick lap, the front let go and bounced all the way out of the corner. The rear end of the bike was squatting way too much when the power was added exiting the corners, and there was way too much weight on the back.

The bike's a lightweight, but it's set-up for spindly little people too. We tightened the rear preload until we only had 30mm of sag (originally 55mm), then added two clicks of compression damping. The front had 40mm of sag so we screwed down the preload adjusters to get 32mm. Out went our Guinea pigs again.

We were much happier and the bike was holding a line much better.

If you only do one thing
Raise the rear - as standard it squats far too much, slowing the steering and reducing valuable ground clearance

SPECIFICATIONS

PB TRACK SETTINGS

REAR SHOCK

Static sag	27mm
Compression	7 clicks off maximum
Rebound	8 clicks off maximum
Tyre Pressure	31psi (track)

FRONT FORKS

Static sag	32mm
Compression	½ turn off maximum
Rebound	½ turn off maximum
Tyre pressure	30psi (track)

MAXTON SAY...

Post-'98 bikes have Showa forks that have all the adjustments plus springing and damping in both legs. But they still have their limitations. The spring is a bit soft so they dive a lot under braking. And the damping has too much compression damping and not enough high-speed rebound damping. This gives the rider a vague feeling up front and sometimes bad chatter. The rear shock suffers from heat and fades a lot, it's no rebuildable, so apart from changing the spring a new shock's the only answer.

It also steered more precisely, but it was overheating the forks and shock after four or five laps.

Three more clicks of rebound damping on the rear and a further three clicks of compression went on, and the spring was tightened 3mm more so the rear sag was cut down to 27mm. The front spring was left alone but we added a quarter of a turn of compression damping and a half-turn of rebound. Out we go again, and this time we didn't want to come back in... sorted.

RSV Mille

The RSV was Aprilia's first attempt at building a large-capacity sportsbike and they did a bloody good job. But not perfect: after a few laps scrubbing in fresh Pirelli Dragon Corsas (32psi front/35psi rear) at Cadwell, it's reluctant to turn into corners and stands up and runs wide when you get on the gas.

The bike's attitude is wrong, it needs to be tipped more forward on its nose. If this were an inline-four we would jack up the back, but it's a V-twin and as they tend to be a bit top heavy, increasing rear ride height won't help when it comes to holding a tight line around corners.

First we raised the fork legs through the yokes an extra 6mm (any more and it gets nervous), and even a warm-up lap makes the RSV feel like a different bike - it turns in much better, but going into corners the forks dived a lot. Increasing the preload on the forks by two incre-

■ Yes, we know, it's a pic of a Mille R with Öhlins front forks. But it's a nice pic anyway...

If you only do one thing
Get some weight over the front wheel. Raising the forks in the yokes helps, but modify your riding style to keep your weight forward too

ments, using a 22mm spanner, didn't seem to make much difference. We continued turning it in until there was only one line showing. We also increased the compression by half-a-turn. This helped reduce the dive.

Flicking from left to right at the end of the start-finish straight, the front would unload, springing the forks back too quickly when changing direction, meaning the rebound rate needed increasing. We tried it in several positions and ended up half-a-turn from full in.

The rear shock's standard preload setting is a little on the soft side. The Mille was really squatting around Chris Curve and needed



firming up. We increased the amount of thread showing by 5mm and locked it off. Initially it felt better, but after a few fast laps it became loose and bouncy, highlighting the fact the rebound needed increasing.

We turned it all the way in (by hand) and it felt better. The rebound adjuster has about 40 clicks of adjustment. Both the adjusters on the rear shock have a wide range, but when the shock gets hot, the oil

heats up and thins, reducing the damping effect - that's why we ended up with both adjusters wound full in. When the shock cools the damping effect is stronger.

We ended up with the RSV braking and turning properly and firing out of corners holding tight lines. Mission accomplished, and great for the road, but for the committed trackday rider a replacement shock is strongly recommended.

SPECIFICATIONS

STANDARD SETTINGS

REAR SHOCK	
Preload	26mm of thread showing above top locking ring.
Rebound	16 clicks from full in
Compression	14 clicks from full in
FRONT FORKS	
Preload	four lines showing
Rebound	1½ turns from full in
Compression	1 turn from full in
Ride height:	8mm of fork leg protruding through top yoke

PB TRACK SETTINGS

REAR SHOCK	
Preload	31mm of thread showing above top locking ring
Rebound	turned all the way in
Compression	turned all the way in
FRONT FORKS	
Preload	one line showing
Rebound	½ turn out from full in
Compression	½ turn out from full in
Ride height:	14mm of fork leg protruding through top yoke

MAXTON SAY...

The standard Sachs rear shock has the right spring for average rider weights, and a good range of adjustments. But it only has about 75mm of wheel travel, so on a bumpy road it can bottom out. Because the shock is behind one cylinder and next to the exhaust, it overheats quickly and loses damping.

The forks feel notchy and harsh on the road - too much compression damping - but they are OK on the track. The lack of rebound damping makes the bike spring back too quickly when going into turns, and can cause it to run wide. The forks can be revalved and resprung to suit the rider's weight and what the bike is used for.

We got the RSV to brake, turn and hold tight lines - mission accomplished

748SP

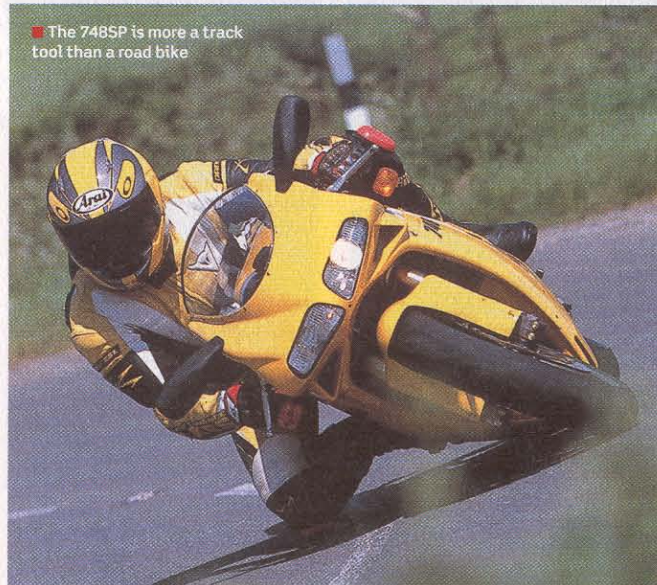
The 748SP is a quick steering beast. Sticky tyres and a stiff chassis make light work of tight corners and chicanes. Carrying corner speed is what it's all about.

On the brakes the forks dip, but a little more preload was better.

The fork compression adjusters are found at the bottom, hidden inside the fork legs and a long flat-bladed screwdriver is needed to pass through the wheel spindle. Clockwise for firmer, go all the way in until the screwdriver can't turn any more and then go anti-clockwise for eleven more steps.

If you only do one thing
Add a bit of rebound damping at the front to stop it bouncing back off the brakes, and add a bit of rear preload

■ The 748SP is more a track tool than a road bike



Rebound had to be upped to slow the rate of fork extension after letting off the brakes.

The rear wallowed through the chicane and would squat with the throttle wound on - the shock was close to bottoming. Adding another 5mm of preload cured the wallow and left only slight squat on the gas.

More preload, but did this mean more rebound and compression damping was needed? No, as it turned out. We actually softened the rebound off because the rear still felt firm over the odd bump and the tyre was getting chewed up to buggery.

Compression was also tickled - the knob is so positioned that a hand reaching back can make changes pretty easily.

The end result was a 748SP that was tauter and more flickable through the twisties. But off the track the bike was deemed "too bloody hard". Eating more pies is one way around this. The other is to put it all back to standard and leave well alone.

SPECIFICATIONS

STANDARD SETTINGS

➔ REAR SHOCK

Preload 20mm of thread above top lock ring

Rebound 14 clicks out from full in

Compression 14 clicks out from full in

➔ FRONT FORKS

Preload five lines showing

Rebound 10 clicks out from full in

Compression 12 clicks out from full in

PB TRACK SETTINGS

➔ REAR SHOCK

Preload 25mm of thread above top lock ring

Rebound 16 clicks out from full in

Compression 17 clicks out from full in

➔ FRONT FORKS

MAXTON SAY...

The hard suspension is fine on a smooth circuit, but on the road it can be a bit naughty. The main problems with the forks are: 1) not enough rebound damping so the bike sits up off the brakes, 2) too much high speed compression damping, and 3) very stiff springs as standard - which amplifies the first problem.

A revolve and slightly softer springs (to suit the rider) gives more suspension control, which in turn makes the bike hold a better line.

The Öhlins shock also has too much high-speed compression damping - rear tyres get really chewed up on 748s - and works better on the track than on the road.

996

■ A 996 yesterday



SPECIFICATIONS

PB SETTINGS

➔ REAR SHOCK

Static sag 10mm (measured vertical from wheel spindle)

Loaded sag 30mm

Compression three turns

Rebound 1½ turns

Ride height Standard

Tyre pressure 29psi track, 39psi road

➔ FRONT FORKS

Static sag 22mm

Compression 10 clicks

Rebound 8 clicks

Fork height 19mm

Tyre pressure 31psi track, 35psi road

Preload six rings showing

Steering head angle Steep position (1° less than standard)

We tested the 996 at Oulton Park with a 190 and a 180 rear tyre and found the 180 allowed higher mid corner speed and increased stability when driving hard out of turns. We put this down to the rounder profile of the 180 giving a bigger contact patch while turning and less tyre flex.

On standard settings and with the 190 there was very little feedback from front or rear ends and the bike was very twitchy over bumps. As we went softer on compression and rebound the feedback got better and the bike became more sta-

ble. When we went too soft the rear wheel chattered under hard braking so we increased the front compression and rear rebound.

Once we were happy with the setup it was time to make it turn, so we reduced the steering head angle. On most bikes changing head angles is not an option, but Ducati give you choice of 23.5° or 24.5°.

The change to 23.5° will make the bike steer into corners faster and hold a tighter line through turns, the downsides are less straight line stability and a steering lock that doesn't work, because the position of the top yoke has changed. It's worth it though - it transforms the bike, making it possible to brake late into turns and still hold a tight line. To start with the extra load on the front end caused the forks to bottom and the front wheel to chatter under hard braking. More front spring preload and compression damping had the problem sorted.

The final problem we had was the rear end squirming exiting turns especially coming onto the start/fin-

ish straight. After no improvement was gained from stiffer rear settings the 180 rear tyre was fitted. The increased grip and reduced tyre flex making accelerating out of turns hard much less scary.

Because of the 996's power characteristics it's essential to carry loads of corner speed to achieve quick lap times, but unfortunately the standard Ducati suspension settings don't really encourage this kind of behaviour.

The stiff standard setup makes the Duke twitchy and unwilling to hold a tight line. Our setup makes the bike more supple so it soaks up the bumps and this in turn allows you to run less steering head angle so the bike will turn.

The narrow rear tyre also helps to increase corner speed and stability. The original fitment springs on the 996 are slightly too hard, this means they will work better with a heavier rider (Maxton recommend softer springs front and rear). But with our final setup they coped well on track and road, solo and two up.

If you only do one thing
Soften it all up a little with the damping setting - if you really want it to turn fast, go to the more extreme head angle

996S

The 996S is a top sportsbike and capable of being pushed hard on the road, remaining very stable while tracking the chosen line perfectly. But it could be even better. The ride is sometimes very harsh, particularly on uneven surfaces, and this hard set-up works against it on the track too.

We fitted Michelin Pilot Race 2s with the pressures set to 31psi front and 29psi rear. After a couple of warm-up laps to get the tyres up to temp, we started to up the pace. At which point the ride starts to get choppy. Mid-corner, when the bike is leaned over and the suspension is fully loaded, any small bumps rock the bike. You tend to ride round this problem by getting your body weight off the bike more in corners.

Another problem with the 996 is the amount of effort needed to get the bike into corners. It's a problem that's highlighted most at Gerards

■ Bull Moose Franklin in full cry, forcing an innocent Ducati to do things its mother told it not to



If you only do one thing
Change the ride height or the front rake setting to get it steering a bit quicker, and ideally change the rear spring for a softer one

and the Esses, where you have to start to make the turn very early simply because of the lazy way it steers.

The steering can be quickened in two ways. The headstock can be adjusted, an approach which works well, but you can't use the steering lock any more. The alternative is to increase the rear ride height.

The ride height adjuster is located to the left of the shock absorber. You need to slacken the two lock-nuts either end of the adjuster rod, using an open-ended spanner (normally 19mm but sometimes 17mm, and watch out – the one on the bottom is left-hand thread). Turning the adjuster rod two turns clockwise will

increase the ride height sufficiently. Remember to tighten up the lock-nuts, though.

The tyres were seriously worn after just a few laps, the tear marks on the rear tyre and the fact that it wasn't wearing out to the edge confirming that the rear spring is too strong. This is why it bumps and chops around corners when the pace picks up. It also restricts lean angles and, of course, corner speed.

The solution is to reduce the preload setting. We reduced it by 6mm so there was now 13mm showing.

The compression damping felt too much when we were pushing the seat unit down, so we reduced this by turning the knob on the top of the shock four clicks anticlockwise. The rebound was very quick, so we slowed it by turning the adjuster six clicks clockwise (viewed from underneath).

On the next session the bike was transformed. The change in ride height had made the most difference, as you could now turn the bike in much more quickly and with less effort – but this started to high-

light problems with the front end. Going into the faster corners trailing the brakes, the front end was running wide, as if there was too much preload and compression damping.

Back in the paddock we reduced the preload by one ring so there were now seven rings showing. We increased the rebound by three clicks, and reduced the compression damping. We turned it anti-

clockwise three clicks.

A few more laps on the track showed that the Ducati was now a lot easier to live with. The biggest difference was the way it steered into corners. It was still on the firm side because the 996S is a bit oversprung, especially at the rear – it's a Biposto version and it needs the extra spring rate to cope with carrying a pillion on the road.

SPECIFICATIONS

STANDARD SETTINGS

➡ REAR SHOCK	
Preload	19mm of thread above locking rings
Rebound	14 clicks from full in
Compression	14 clicks from full in
➡ FRONT FORKS	
Preload	6 rings showing
Rebound	11 clicks from full in
Compression	12 clicks from full in

PB TRACK SETTINGS

➡ REAR SHOCK	
Preload	13mm of thread above locking ring
Rebound	8 clicks from full in
Compression	18 clicks from full in
Ride height	adjuster rod 2 turns clockwise
➡ FRONT FORKS	
Preload	7 rings showing
Rebound	8 clicks from full in
Compression	15 clicks from full in

MAXTON SAY...

The forks have a lot of compression damping, which gives a hard, twitchy ride. The springs are soft and bottom out under braking, then lack of rebound damping lets the forks spring back when you let go of the brake.

We revalve and respring the forks, reduce the compression damping and increase the rebound damping so the bike is more compliant and holds its line better out of corners.

The rear Öhlins unit is a good design, but there's too much compression damping, so the rear kicks off bumps in the road, and not enough rebound damping, which can throw you from your seat on bigger bumps. We can revalve and respring the shock to suit the rider's weight and what the bike's used for.

The tyres were seriously worn after a few laps – the rear spring's too strong

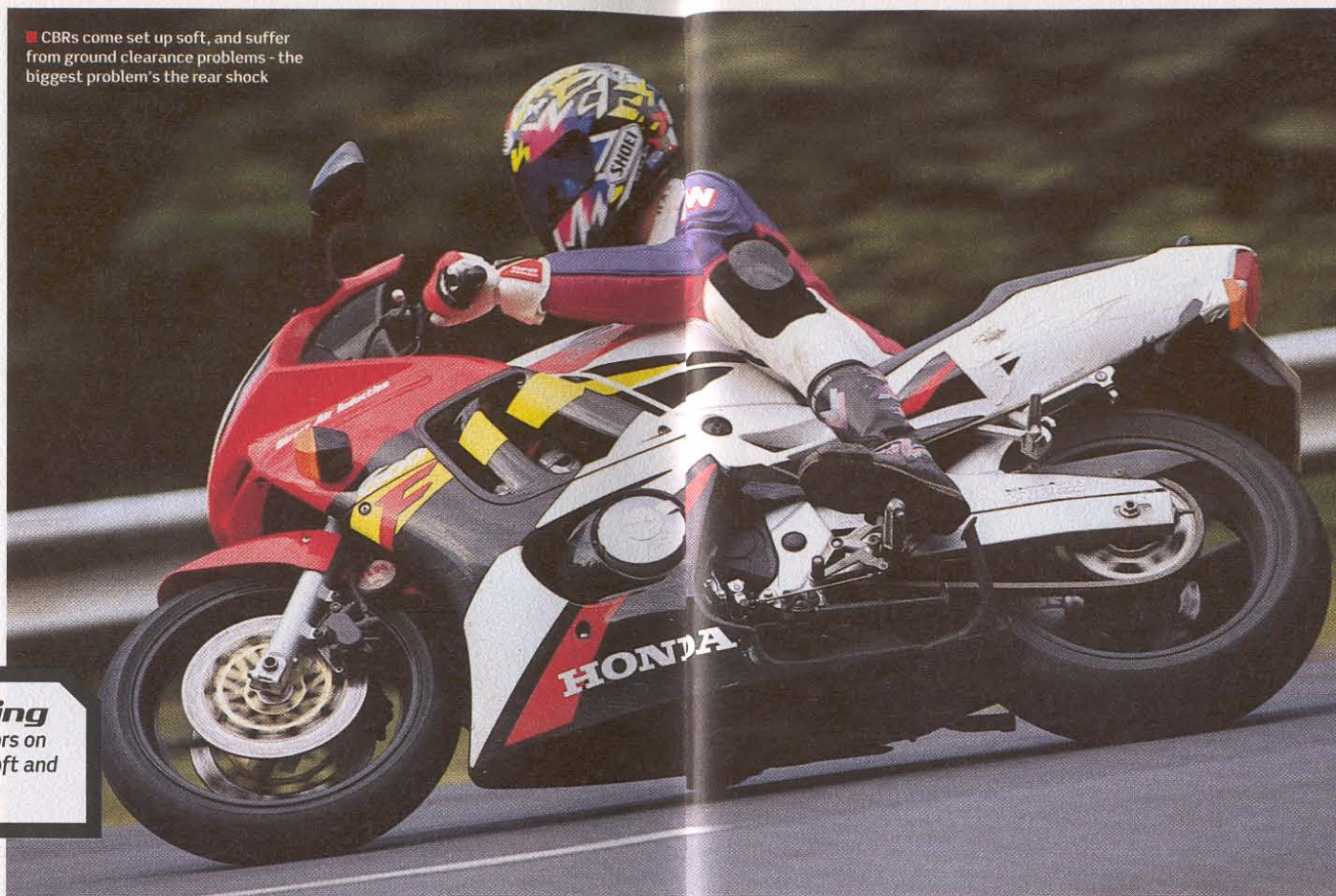
CBR600F-S/T

By 1994 the CBR's suspension was starting to look dated. While it all hangs together okay on the road at moderate speeds, it all changes if you up the pace and get out of commuter mode.

At Mallory, the first thing we did was fit some more suitable tyres. Once they were warmed up the CBR was slow to steer and to turn into the ultra-fast right-hander of Gerards and this was made even worse because as you let go of the brakes the bike would then very quickly spring back off the brakes and unsettle the already unhappy front end. The angle of lean was also hampered because the bike would squat on its suspension travel and deck out too early – which also reduced corner speed.

Before the next session we increased preload on both front and rear and at the same time turned the

■ CBRs come set up soft, and suffer from ground clearance problems - the biggest problem's the rear shock



If you only do one thing
Stiffen it all up. Like most CBRs it majors on adaptability, but that means it's too soft and squidgy for fast road and track use

damping adjustment right up - the CBR behaved better the more the adjusters were turned up.

With the suspension almost there we now needed to improve the way the CBR turned. This is easily done by adjusting the ride height at the front end. We tried a variety of heights but settled with 6mm of fork protruding through the yokes.

We ended up with the front preload wound fully in. This made it resist diving too quickly into corners and also gave more feel while hanging onto the brakes deep into turns.

The rebound damping had also been wound fully in to prevent it pinging back up off the brakes.

■ The S/T model CBR was the first of the ram air versions



The rear shock also needed plenty more preload - position 7 out of 7 for the track. The damping adjusters have little effect until you screw them all way in.

These settings also worked much better for faster riding on the road. The combination of sportier tyres and a firmer suspension set-up gave a more sure-footed feel and more accurate steering response.

One thing worth mentioning is that our test rider is only 10-and-a-half stone and yet still ended up with the preload and damping wound right up at both front and back - if you're a fat bastard or regularly take a passenger you might need to consider either getting their bike's suspension units modified or replacing the originals altogether - there are plenty of options out there.

SPECIFICATIONS

STANDARD SETTINGS

REAR SHOCK	
Preload	Position 4 out of 7
Rebound	1 turn out from fully in
Compression	1½ turns out from fully in
FRONT FORKS	
Preload	4 lines showing
Rebound	1½ turns out from fully in
Compression	N/A

PB TRACK SETTINGS

REAR SHOCK	
Preload	Position 7 out of 7
Rebound	Fully in clockwise
Compression	Fully in clockwise
FRONT FORKS	
Preload	Fully in clockwise
Rebound	Fully in clockwise
Compression	N/A
Fork ride height	8mm of leg protruding
Tyre pressures	30psi front and rear

PB ROAD SETTINGS

As above but with 2mm less fork ride height	
Tyre pressures	34psi front, 39psi rear

MAXTON SAY...

The forks work well on the road, but for the track should be uprated. We revalve and respring to suit rider weight and also fit bump springs to stop bottoming out and patter when braking deep.

The standard spring is on the hard side and hasn't enough damping so if you ride hard or are above average weight it can get out of shape. The shock hasn't enough travel either - only 90mm when you need 120mm - and cannot be resprung or revalved. Our high pressure gas shock is fully rebuildable and adjustable. Each is tailor-made either with a piggy back remote reservoir and a second compression adjuster or without either, which is a bit cheaper.

If you're a fat bastard you might want to change the suspension units

CBR600F-V/W

On stock settings these bikes handle well for everyday road use. But if you're on a mission to be first everywhere, last-yard braking causes the forks to dive. They don't go solid from bottoming out, or from hydraulic lock – but enough to use up all of the available travel.

At Donington, it took the time to warm up the Bridgestone BT010 tyres (one and a bit laps) to realise track abuse was too much for the suspension, and ground clearance was limited. The bike would wallow exiting turns, miss apexes by a mile and generally feel loose and squishy.

First mod was to remove the hero blobs, then to screw in fork preload to give two lines showing and reduce unwanted sag. Rebound was screwed all the way in (clockwise) and backed out half a turn.

The shock had around 25mm of sag which is about right for the road but we needed more ground clear-

■ Another day, another CBR – last of the steel framed line and still a belter on the road

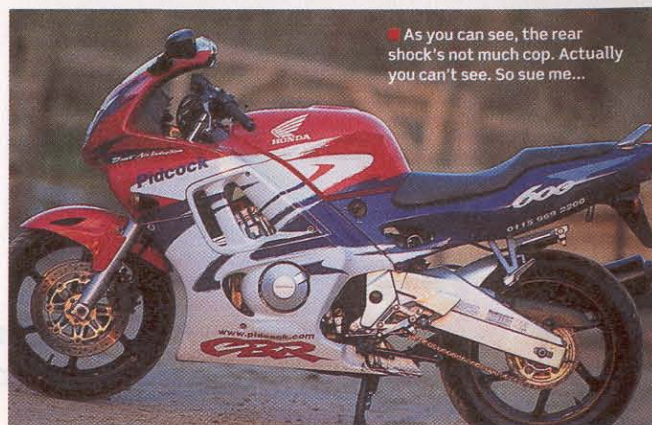


If you only do one thing
Fit a decent rear shock to raise the rear for better ground clearance, better damping and quicker steering - the stock one's pants

ance for the track

One extra notch of preload took out the sag altogether and, because of the tighter spring, more rebound was needed (one quarter of a turn back from all the way in) to control (slow) the faster rate at which the shock would return to full length after being hit by bumps and lumps. Compression had to be upped too, to half a turn back from fully in.

What a difference. Tauter, more feedback, and a few more degrees of lean and quicker corner speed from added confidence. The forks still dived on the brakes, pitching weight onto the front tyre making the front end squirm. Preload was



■ As you can see, the rear shock's not much cop. Actually you can't see. So sue me...

wound up to one line/groove showing, and a quarter of a turn of rebound added to compensate.

Considerably more stable on the brakes, through the turns and on the gas, Donington's flowing corners could be taken with confidence and aggression, to make up for the lack of power compared to the swarms of R6s and GSX-R600s. How much better? Put it like this, the mainstand

and exhaust are the limiting factors for a fast lap.

Back on the road, the rear shock was left on the track settings. The front end was too harsh, banging off ripples, holes and cat's-eyes with wrist-jarring effect. Reducing preload by one line/groove (two showing) and reducing rebound by quarter of a turn anti-clockwise does the job nicely.

What a difference - tauter, more feedback and quicker corner speeds

SPECIFICATIONS

STANDARD SETTINGS

REAR SHOCK	
Preload	step 2
Rebound	1 turn out from full in
Compression	1 turn out from full in
FRONT FORKS	
Preload	3 lines showing
Rebound	1 turn out from full in

PB TRACK SETTINGS

REAR SHOCK	
Preload	step 3
Rebound	½ turn out from full in
Compression	½ turn out from full in
FRONT FORKS	
Preload	1 line showing
Rebound	½ turn out from full in

PB ROAD SETTINGS

FRONT FORKS	
Preload	2 lines showing
Rebound	½ turn out from full in
REAR SHOCK	
Preload	step 3
Rebound	½ turn out from full in
Compression	½ turn out from full in

MAXTON SAY...

The rear spring rate is about right but compression and rebound damping is minimal.

The shock body is a sealed unit and can't be modded. In time, the piston seals wear and lose pressure. A quality replacement is the answer.

An added bonus will be sharper steering as most of them are longer and jack the back end up.

Considering there's no compression damping, the forks are fairly well suited for road use. The springs are too soft. Put in stiffer units, though, and they'll overcome the stock damping. What they need is stiffer springs, a revalve for finer damping adjustment and 5W oil.

CBR600 F-X/Y

The 1999 CBR600 was a drastic improvement over the previous model. With a lighter, stiffer chassis and improved suspension

components, it can be made better still by twiddling its adjusters in the right directions, so we went to Mallory to do just that.

At Mallory we used the first session to get baseline settings as a warm-up, with every adjuster set to its standard position as detailed in the Honda owners manual.

After ten warm-up laps rider Peter started to give the CBR some stick. At the end of the session he came in saying that so far the most limiting factor was the soft front end and the lack of compression damping. He only had to breathe on the brake lever and the front wanted to slam down. Peter wanted more compression damping to slow the movement of the fork and one line more of spring preload to assist the

■ First of the alloy-framed CBRs, the X/Y saw Honda change everything except the rear shock, which was the bit that needed changing most...



If you only do one thing

Chuck the rear shock in a skip. Oh, and buy another one to replace it, or you'll probably have ground clearance problems...

new damping forces. Out on the circuit the changes paid off, his lap times dropped a full second and a half. He claimed the bike was much more controlled on the brakes. It didn't take long for him to get to grips with the track and he was soon passing riders on dedicated race bikes.

With more corner entry speed, ground clearance was becoming a problem, especially around the fast fourth-gear corner of Gerards. The Akrapovic titanium exhaust system was grinding itself to bits in a shower of blue-white sparks.

Back to the pits again and the shock was put on preload position

■ Note the chamfered exhaust can - ground clearance is a big issue on most CBRs



number four, and a quarter-turn of compression damping was added. Now the rear end was really firm and unforgiving. In the tight bumpy chicane the rear end started stuttering. Instead of the suspension moving, the tyre was being overworked. This is the quickest way to a major high-side. Back to the pits again and Peter had us put the rear shock back to position three. This time we

lifted the tank and added a washer under the top of the shock mount. The washer was only 3mm but it raised the rear of the bike by some 15mm. This gave us a bit more lean angle before the bike started to drag its guts on the tarmac. But really we wanted more.

With all the lifting of the back end the front was starting to become a bit lively in a straight line. Peter really

SPECIFICATIONS

PB settings

REAR SHOCK

Compression half turn out from maximum

Rebound 1 turn out from maximum

Static sag 54mm

Tyre pressure 32psi track, 36psi road

Preload position 3

FRONT FORKS

Static sag 35mm

Compression 1 turn out from maximum

Rebound 1/2 turn out from maximum

Preload two lines showing

Tyre pressure 32psi track, 34psi road

MAXTON SAY...

The CBR's wheels can be as much as 20mm out of line with each other. Set the wheels up using alignment rails or a piece of string. If you're not sure how then take it to someone that knows.

We revalve and respring the front end to give you more control and feel - it makes a world of difference.

The shock is cheap, oversprung, too short and on hard hits it bottoms too easily. On bumpy roads the shock loses its damping. The shock can't be reworked because it's a sealed unit, so the only answer is to replace it.

The Akrapovic exhaust was grinding itself to bits in a shower of sparks

CBR600FS/Sport

Comfort and practicality cannot be argued with, and the CBR's always delivered, and even the 2001 Sport is still almost as user-friendly as the cooking model. In fact so close are they that owners of the 2001/2 CBR600F can use this setup guide too. The only difference is that the Sport has aluminium cartridge dampers in the front forks which make it slightly stiffer than the standard bike.

Out on the track, tester Bruce was immediately hampered by the softness of the standard settings. Taking the long right-hander, Redgate in third saw the CBR's pegs decking out all the way round. Powering out and down into Craner Curves the bike gained good speed. But Bruce had to back off early when changing direction through that part of the circuit, otherwise the bike would load up, sag and then spring back.

If you only do one thing
Get yourself some more ground clearance with extra preload front and rear, and some firmer damping. Jack-up plates can help, too

Through the Old Hairpin the CBR scraped predictably. Just after Starkey's Bridge there's a bump that's too big for the standard preload settings to handle and the pegs touched again.

The bumps at McLeans unsettle anything with a firm setup, but the CBR soaked them up no problem.

Coppice is important for a fast lap, and good entry speed is vital. The CBR struggled because the entry to Coppice is uphill and loaded the soft suspension up to its max. And when Bruce started to lean the bike over the footrests were already on the floor. Then, back on the gas, it sprang back because of

the lack of rebound damping front and rear. All this added up to very reduced corner speed.

Even when the bike had settled and Bruce introduced the power the rear squatted and the right peg got hit again. Braking hard at the end of the straight for the Melbourne Loop, the front end dived and sprang back quickly. What the CBR needed was more damping and preload front and rear. Owner Alan's road settings had already suggested a much firmer setup would be the order of the day, so Bruce elected to go beyond even those for the track.

First he got the C-spanner out and increased the rear preload to the sixth hardest notch out of seven.

Next up was rear rebound and compression - half-turn out from maximum on each.

Turning his attentions to the front, Bruce maxed the preload, and went for a half-turn from full in on the rebound and three-quarters out on the compression adjusters.

The tyres we were using were Michelin Pilot Sport Cup, with 31psi front and 29psi rear.

Even exiting the pitlane the differences made by the new settings

were apparent. The CBR was much firmer and tauter. Under hard braking the front dived, but not as viciously as before. The back end was stable and squatted less, especially exiting turns. Corner speed was increased.

Despite less sag the footrests were still decking, mainly because the bike was able to go faster - the CBR's footrests are too low anyway. Time for rearsets or jack-up plates -

NWS(01992 509900) make some good ones to fit.

Back in pitlane, Bruce had another think. He decided the front felt a little wooden, so backed the preload off to one line showing. This small adjustment made a huge difference - the front end was giving good feedback through the bars allowing late and deep braking. The CBR ended up much better on the track, but we had to use nearly all the pre-

SPECIFICATIONS

STANDARD SETTINGS

REAR SHOCK	
Preload	3 of 7
Rebound	1½ turns out from full in
Compression	1½ turns out from full in
FRONT FORKS	
Preload	4 lines showing
Rebound	1½ turns out from full in
Compression	1½ turns out from full in

PB SETTINGS

REAR SHOCK	
Preload	position 6 of 7
Rebound	¾ turn out from full in
Compression	¾ turn out from full in
FRONT FORKS	
Preload	1 line showing
Rebound	¾ turn out from full in
Compression	¾ turn out from full in

MAXTON SAY...

The forks are underdamped and undersprung, so we revalve them and fit harder springs. We also fit bump springs which stop the forks from bottoming out and take the place of the hydraulic bump stop, which gets rid of severe patter braking into tight corners.

The shock's set-up quite well for general road use. The spring's about the right rate for the average rider. Ride it hard and it lacks travel though - the only way to sort that is a different shock.

load and damping adjustment.

Heavier riders might find that there just isn't enough preload available front and rear. And if you're serious about trackdays you'll want harder front springs and a replacement rear shock.

Back on the road the stiffer settings work well everywhere, apart from the very bumpiest of surfaces, where a little less preload would help soak up the jolts.

Even exiting the pitlane the difference with the new settings was apparent



Considering it's the Sport version, the CBR F-S comes with pretty soggy suspension

CBR900RR-T/V

First thoughts at Cadwell are that, even at a steady pace, the rear-end is soft and underdamped, so it runs wide under power.

The front-end is also giving an overly soft ride – it's diving harshly, most noticeably into the downhill lefthander at Mansfield. And the Blade is reluctant to turn-in at this point because of all the weight being transferred onto the front tyre. More preload and a different fork ride height are called for.

First the rear shock goes up to the sixth hardest notch and the rebound goes almost all the way up.

If you only do one thing
Dial in a load more front rebound, and wind the rear shock preload up a couple of notches to sharpen up the steering



■ Tyre choice is crucial on a 16in front wheel Blade – we like Metzlers for stability

The fork preload is also increased – wind the adjusters in clockwise until there's one line showing. Front rebound and compression damping go up half a turn each to start with but we end up with the rebound one turn from fully in. To help the bike turn-in more quickly we raise the fork tubes so that 5mm of tube is clear above the top yoke.

The difference is astounding. The Blade now goes round corners. With the back firmed-up enough to stop it sagging, and the front tipped more on its nose, it turns and holds a tight line like a good 'un. It'll barrel through the long right-hander of Chris Curve with the throttle pinned to the stop and the motor revving its knackers off. And it flicks through the right/left of the Gooseneck with little fuss and less effort than before.

On those settings on the road the Blade feels choppy at first – the front-end is too firm and it's a tad flighty on the bars. We re-adjust the forks so only 2mm is protruding which gives it a more settled feel.

SPECIFICATIONS

STANDARD SETTINGS

➔ REAR SHOCK

Preload 4th hardest notch out of 7 stepped notches

Rebound 1 turn out from full in

Compression 1 turn out from full in

➔ FRONT FORKS

Preload 4 lines showing

Rebound 1½ turns out from full in

Compression 1 turn out from full in

PB TRACK SETTINGS

➔ REAR SHOCK

Preload 6th hardest notch out of 7 stepped notches

Rebound ½ turn out from full in

Compression ½ turn out from full in

➔ FRONT FORKS

Preload 1 line showing

Rebound 1 turn out from full in

Compression ½ turn out from full in

Fork ride height 5mm through top yoke excl. fork cap

Tyre pressures front 30psi, rear 32psi

PB ROAD SETTINGS

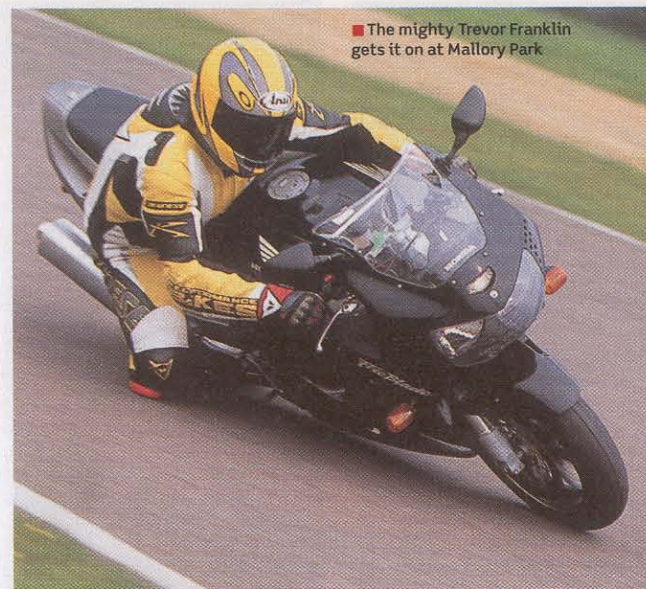
All as track settings, but reduce fork protruding through top yoke to 2mm

Tyre pressures front 34psi, rear 39psi

MAXTON SAY...

The forks have two problems. Compression is too severe which gives a hard and twitchy ride. There is also not enough rebound damping. We reduce compression, increase rebound and fit springs to suit the rider. The stock shock isn't bad. The spring rate is fine but if ridden hard, or the rider is above 13-stone, you may find it too soft. If the bike is used for racing or trackdays we recommend a fully adjustable, alloy-bodied replacement shock - there are plenty to choose from.

CBR900RR-W/X



■ The mighty Trevor Franklin gets it on at Mallory Park

SPECIFICATIONS

PB settings

➔ REAR SHOCK

Compression ¼ turn from max

Rebound ½ turn from max

Preload fourth notch back from max, third notch if two-up or more than 14 stones in weight

Tyre pressure 32psi (38 road)

➔ FRONT FORKS

Static sag 31mm loaded (with rider)

Compression 1½ turns back from max

Rebound 1 turn back from max

Preload 3 lines showing (12mm of adjuster showing)

Tyre pressure 32psi (34 road)

MAXTON SAY...

The front forks are way too soft, and the low-speed damping is too firm. We fit harder springs to suit individuals, re-valve the damping system for more refined/greater range of adjustment and swap the hydraulic bump stop for dual-spring affair.

The rear shock is a nasty, mass-produced piece of work. Honda fitted a soft spring and the range of damping adjustment is minimal so it all happens on the last turn of the screwdriver. They also over-heat with a lot of track use.

Saying that, the steering was as sharp as you'd want on the road. It could do with some rear ride height for faster turn-in on the track, though. Proof of this was the rear tyre being scuffed right to the edges, and the front not marked on the outer half-inch.

As a final adjustment, front compression was turned back half a turn. Such a small amount made a lot of difference. Job done.

We started out with standard settings at Mallory, but it was wallowy, especially hitting bumps mid-corner. So we messed with the static sag, winding in the front preload adjusters to give about 30mm of sag, and changing the rear shock preload to give about 13mm of sag. Next we started playing about with the damping: front compression and rebound 1½ turns out was a good starting point, but the rear adjusters don't seem to do anything until you get them almost all the way in – we ended up with just a quarter turn out

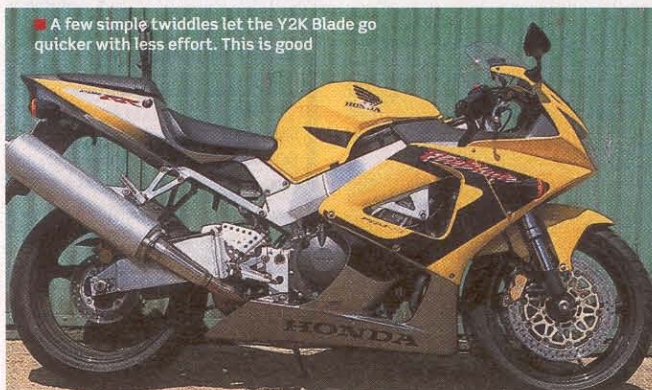
for compression and half a turn for rebound.

Mallory is fairly smooth on what straight bits there are. Once we'd got close to our final settings, even nailed to the stop the Blade was rock solid. Pitching into turns and getting on the gas, everything was hunky dory, but there's the mother of all bumps going into Gerards, after Kirkby Straight, and the forks couldn't soak it up. The front would kick off and make the bike run wide while the rear end took the bump in its stride. But the Blade was perfectly poised on the brakes and we didn't want to back off the front compression just for one big bump, so apart from an extra quarter turn of the rebound screw we called it a day at the track.

The ride home soon showed the pitfalls of a track set-up – forks way too firm at speeds anything less than a ton. Ripples, tarmac joins, rough tarmac, all would get the front forks banging about like a bog seat in a salmonella-hit Spanish resort.

If you only do one thing
Sling the shock and get the forks revalved. That's two things. Blades are tyre sensitive so try different types. That's three

CBR900RR- 4/1/2 FireBlade



■ A few simple twiddles let the Y2K Blade go quicker with less effort. This is good

This FireBlade was the most track-orientated in the model's history. It got a fuel injected engine in a revised chassis and at last the Blade got a 17-inch front wheel, allowing a much wider choice of tyre.

On the track the Blade feels much more at home than previous

was back into the pits for more adjustments: half a turn more on both rear compression and rebound and on front rebound, and $\frac{3}{4}$ of a turn more front compression.

Out on the track the front end felt very positive – perfect feel for how much grip the front tyre was giving. The rear shock worked well with more damping, but it still tended to squat on the gas exiting corners. Winding up the preload any more wasn't an option because the rear was starting to get a bit choppy around Gerards.

If you only do one thing
Change the rear shock for something a bit posher. You'll probably save the cost in reduced tyre wear over a couple of years

models but at Mallory tended to squat at Gerards. The forks were soft and underdamped, making the bike feel vague. So we wound the rear preload up three notches, and increased the front preload too

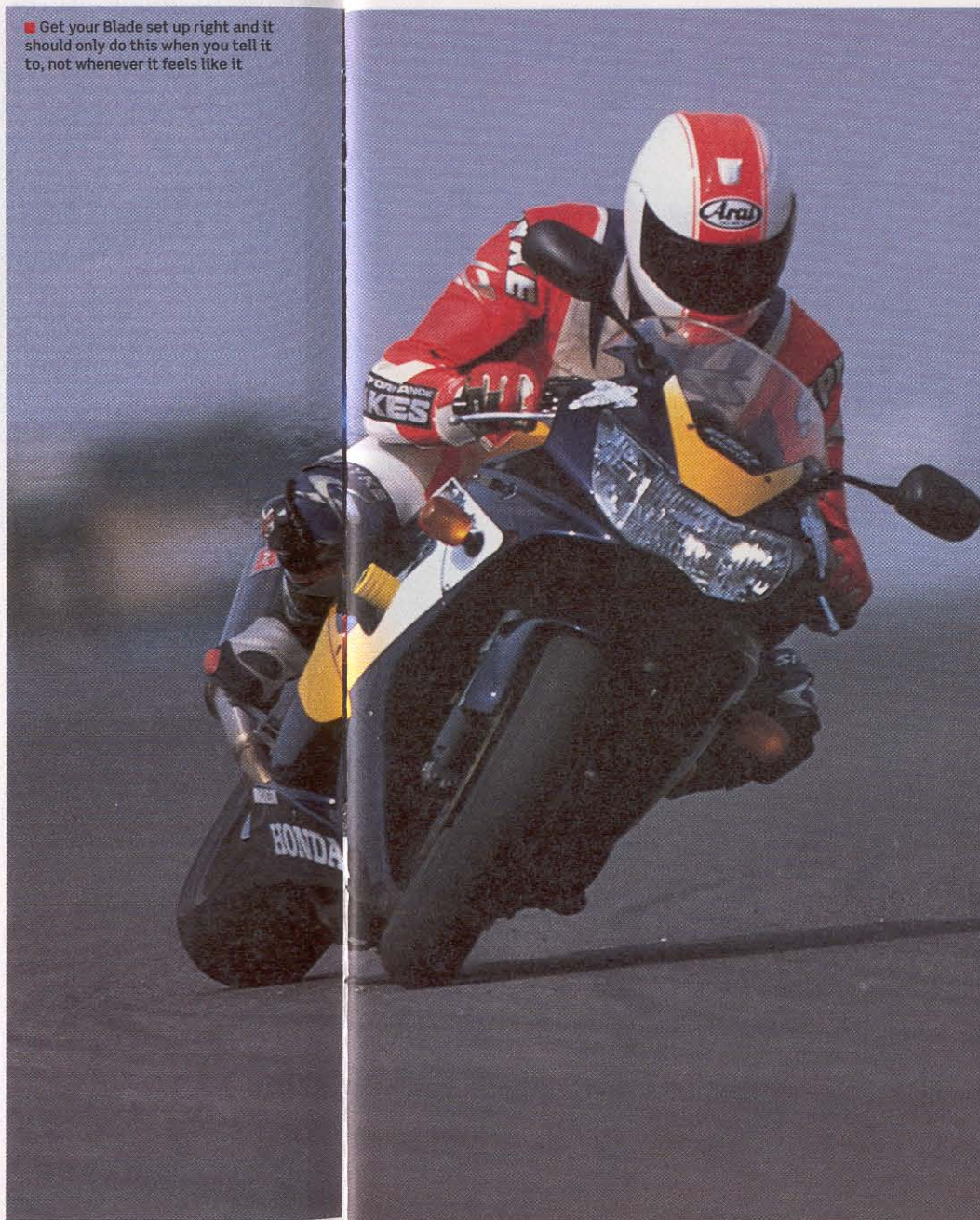
Going out for the second session the bike felt stronger mid corner, resisting the tendency to squat. But now it felt underdamped at the rear. The front forks were much better into Gerards – feedback was clearer thanks to the increased preload. But everything was underdamped so it

On the drive out of Devil's Elbow it felt better, but the rear Bridgestone was squirming, and it looked like it'd just done an endurance race. We suspected the pressures were too low, so we tried 35psi in the rear and 33psi up front. These seemed to work, and the tyres looked freshly scrubbed rather than freshly shagged.

Our settings shaved over a second off the lap times, but more importantly it felt easier and safer to ride, as well as faster.

The rear Bridgestone was squirming on the drive out of Devil's Elbow

■ Get your Blade set up right and it should only do this when you tell it to, not whenever it feels like it



SPECIFICATIONS

STANDARD SETTINGS

➔ REAR SHOCK	
Preload	position 4 of 9
Rebound	1½ turns out from full in
Compression	1 turn out from full in
➔ FRONT FORKS	
Preload	4 lines showing (8mm showing, measured from bottom of preload nut to top of fork cap)
Rebound	1 turn out from full in
Compression	1½ turns out from full in

PB TRACK SETTINGS

➔ REAR SHOCK	
Preload	position 7 of 9
Rebound	¾ turn out from full in
Compression	screw full in clockwise
➔ FRONT FORKS	
Preload	2 lines showing (4mm showing, measured from bottom of preload nut to top of fork cap)
Rebound	¾ turn out from full in
Compression	¾ turn out from full in

MAXTON SAY...

The fork springs are too soft – sort this with harder springs to suit the rider's weight. There's too much front compression damping and not enough rebound, which loses feel and makes it difficult to get a really good set-up. The cartridges can be reworked to correct this. The biggest problem is that each seal grips the fork leg too hard causing stiction, which makes the front wheel kick off small bumps. This can be modified.

The rear shock is fairly harsh – the spring is more suited for two-up riding, and when ridden hard for a few laps the damping tends to go off. The linkage ratio is extreme, and works the unit too hard. There is little point in modifying the standard shock because you will still have the same problems.

CBR900RR-2 FireBlade

First time out on the track and the Blade behaves well. But when you start to push harder the problems set in. Along Cadwell's start/finish straight the front end dances in your hands. Not a full-on tankslapping boogie, more of a gentle shuffle.

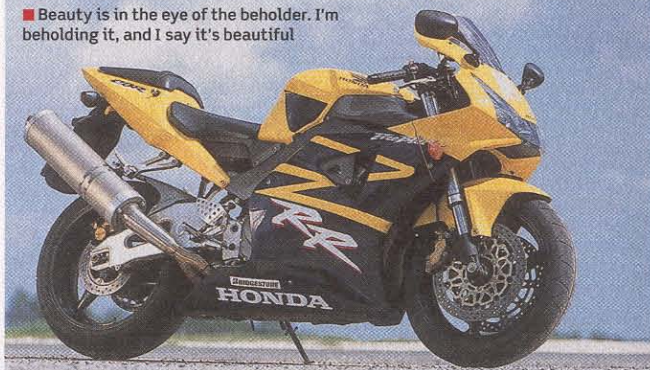
Driving hard out of corners the Blade tends to run wide, which stops you getting on the gas early. And hard braking for Park Corner, at the end of the back straight, has the front end diving.

To stop the bike running wide when you get on the gas you have to increase the rear preload and compression damping. What's happening is the back end of the bike is sitting down or squatting too much under power, which in turn tends to make the front end sit up and run wide – it's a geometry thing. More preload lifts the back of the bike and increases the rear ride height, and more compression damping stops

■ The late great Ronnie Smith gets it on with a Y2K Blade. One of the best of the breed. And so's the Blade



■ Beauty is in the eye of the beholder. I'm beholding it, and I say it's beautiful



If you only do one thing
Increase the rear preload and compression damping to stop the bike squatting under power and to quicken up the steering

the back of the bike squatting.

Next up, the front. On standard settings you don't get much feel for what the forks are doing, which is vital for confidence – you can get away with a vague rear end, but a vague front end just feels horrible.

To help the forks talk to you, you need to stiffen them up a bit, so preventing excessive dive when the staggeringly sharp brakes are used in anger. To do this, turn each fork leg two complete turns clockwise from stock. Then turn the compression adjuster – the red screw on the bottom of the fork leg – one full turn clockwise. It might not sound much,

but it'll improve feedback and let you brake right up to the apex of the corner. For the committed trackday rider, we'd also recommend dropping the yokes down the forks by 5mm. This will sharpen the steering and speed up turn in. You might want to fit a steering damper, too.

Generally speaking, the settings that work well on the track are a bit on the firm side for road riding. The rear shock is okay on track settings,

but the front end tends to skip over bumps instead of tracking them, which is unnerving and can add to a feeling of front-end instability.

Returning the fork preload to the standard settings and turning the compression back two full turns helps keep the front wheel in touch with the road, while upping the rebound damping a turn will help give a less bumpy, and more confidence-inspiring ride.

The front skips over bumps - unnerving

SPECIFICATIONS

STANDARD SETTINGS

➔ REAR SHOCK	
Preload	position 4 from minimum
Rebound	2 turns out on punch dots (from full in)
Compression	2 turns out on punch dots (from full in)
➔ FRONT FORKS	
Preload	11 full turns out (from full in)
Rebound	2 turns out on punch dots (from full in)
Compression	2 turns out on punch dots (from full in)

PB TRACK SETTINGS

➔ REAR SHOCK	
Preload	position 6 from minimum
Rebound	as standard
Compression	1 turn out on punch dots
➔ FRONT FORKS	
Preload	9 full turns out (from full in)
Rebound	as standard
Compression	1 turn out on punch dots (from full in)
Tyre pressures	32psi front, 36psi rear

PB ROAD SETTINGS

(Same as track except)

➔ FRONT FORKS	
Rebound	as standard
Compression	3 turns out on punch dots (from full in)
Preload	as standard
Tyre pressures	36psi front, 42psi rear

MAXTON SAY...

The forks have too much compression and not enough rebound damping. We revalve the forks to reduce the compression and increase the rebound to make the bike turn into corners better and hold the line out. We also respring the forks to suit the rider's weight, increase the range of adjustment in the damping screws and fit bump springs to replace the hydraulic bumpstops. The rear shock's ok, but we can fit a new spring, to suit the rider.

VFR800

A track's not the VFR's normal habitat but it's well up to the odd trackday if you set it up right. As standard it decks out everywhere and dives too much on the brakes.

Because of the increased braking and cornering forces the bike is sagging too much into and mid corner, and reducing ground clearance and therefore corner speed. We started with the rear preload - turn it all the way until it seats then back it off 10 clicks. We give it half a turn more rebound while we're at it, and

from the tyre too, particularly powering out of turns.

With the forks a bit firmer they resist diving under braking into turns - this helps the VFR turn in and hold the chosen line better.

We also experiment with different ride height settings on the front. Lowering the yokes down the forks a few mill helps the bike steer quicker, but it compromises stability and reduces feel from the front end. Another thing that's affected is the VFR's neutral steering - it loses its ability to roll into corners with positive input through the handlebars.

We give the VFR a blast on the road with the track settings, but it's a bit choppy so we decide to soften the rear end a bit (back off preload five clicks).

So that's it for the

VFR800 on standard suspension.

There's still room for improvement - a replacement shock with compression and rebound adjusters would be nice. The forks feel soft, so a respring and revalve would make a big difference.

wind the fork preload adjuster all the way in.

Back on the track the biggest difference is felt at the back end - it resists sagging into corners much better and there's more ground clearance. Loads more feedback

■ The road's its natural habitat, but it'll get down on the track too, if you set it up right



HONDA

SPECIFICATIONS

STANDARD SETTINGS

➔ REAR SHOCK	
Preload	25 clicks out from full in
Rebound	1½ turns out from full in, punchmarks aligned
Compression	none
➔ FRONT FORKS	
Preload	2 lines showing
Rebound	none
Compression	none

PB TRACK SETTINGS

➔ REAR SHOCK	
Preload	10 clicks out from full in
Rebound	¾ turn out from full in
Compression	none
➔ FRONT FORKS	
Preload	turned fully in
Rebound	none
Compression	none
Tyre pressures	front 32psi; rear 30psi

PB ROAD SETTINGS

(Same as track except)

➔ REAR SHOCK	
Preload	15 clicks out from full in
Tyre pressures	front 36psi; rear 40psi

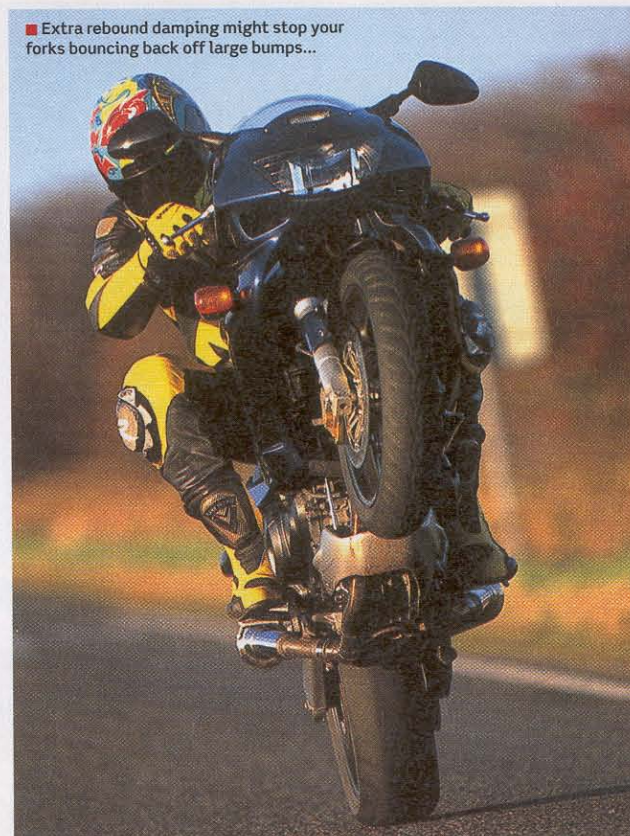
MAXTON SAY...

The forks are underdamped and undersprung. We revalve and respring them fitting harder springs to suit the rider. This gives the bike a lot more feel in the corners and also a lot more stability under heavy braking.

The rear shock hasn't got enough travel - three inches where most bikes have five. This means it bottoms out and can pitch you out of your seat over serious bumps. Unfortunately there is nothing we can do to change the design of the unit as parts aren't available - a new shock is the only answer.

VTR Firestorm

■ Extra rebound damping might stop your forks bouncing back off large bumps...



SPECIFICATIONS

STANDARD SETTINGS

➔ REAR SHOCK	
Preload	position 2 of 7
Rebound	one turn out (anti-clockwise) from full in
➔ FRONT FORKS	
Preload	fourth groove from the top, level with fork top
Rebound	one turn out (anti-clockwise) from full in

PB ROAD/TRACK SETTINGS

➔ REAR SHOCK	
Preload	position 2 (track - 3)
Rebound	¾ turn out from full in
➔ FRONT FORKS	
Preload	groove 2 (track - max)
Rebound	¾ turn out from full in

MAXTON SAY...

We alter the forks' compression damping so there's more than stock. Next we sort the rebound damping to give a greater range. The hydraulic bumpstops are replaced with a spring set-up to give movement even when the forks are fully compressed. The stock fork springs are then replaced with stronger items. Quality fork oil finishes the job.

The rear shock isn't rebuildable but we can supply lighter springs. Finally, a 5mm-thick spacer on the shock's upper mount jacks up the rear, reducing understeer and making life better in the twisties.

As standard, the forks give a comfortable ride on the road. But because of this supple feeling there isn't a great deal of feedback through the turns. On the track there's a chance of front end tuck going in to bends. Turn up the gas and the rear shock overheats.

Adding more rear preload on the cam-type adjuster sharpened the steering and quickened turn-in but made it a bit too firm for the road - standard setting is better.

We did what we could with the forks (preload all the way in, rebound a quarter turn from max), but no matter what we did with the

given adjustment, nothing cured the way in which the forks go solid when braking hard for every corner. Hydraulic lock is the reason. It's when the hydraulic fluid (fork oil) in the fork cartridges (two legs, remember) can't get past the hydraulic bump-stops quickly.

The result of this is front-end chatter - there's only one cure and that's to have the forks modified by

If you only do one thing
Get the forks modified.
They're crap as standard

Maxton or another specialist. The rear shock's not so bad - it's oversprung unless you're seriously lardy, but with rebound a quarter turn out from max it's ok until it overheats. If you're on a budget get the forks sorted first, and worry about replacing the rear shock later.

HONDA

VTR1000 SP-1

The SP-1 was never meant as a road bike - it's a homologation special for World Superbikes, and it's got racetrack-firm

suspension. On everyday roads, where raised and sunken sections of black stuff lurk, the SP-1 tries to snap wrists. Even when on its side, the smallest of road imperfections has the front wheel jumping and skipping.

A really bumpy road gets the back end properly airborne as if too much rebound is keeping the shock compressed. But just as bad is its reluctance to lay over in to a turn - the Honda needs force through the bars to change direction at high speed or to get it on its side.

Although the forks are stiff over bumps, they do use up all their travel when the brakes are used hard. Bit by bit we added more preload to take out fork sag and dive. But not so much the forks would top out on

the standard setting of position four.

To achieve a supple ride, rear compression was backed off (anti-clockwise) one click at a time. Four clicks less seemed about right for my weight (15.5 stone in leathers), although Gus (11 stone) felt it could be slightly better. Rebound ended up two full turns out from maximum - one more than standard.

So far so good. A far more supple ride but not so supple we lost feedback through squishy suspension. But we still needed to sharpen the steering and get the bike to hold a tight line. With no rear ride height adjustment as standard, the next best (easiest) thing to do was to push the forks though the yokes.

An extra 8mm of fork showing above the top yoke was our limit: any more and the rebound screws would clobber the upper fairing brace (be sure to remove the wire circlips from the fork legs). On the road, the adjustments meant no headshakes, wobbles,

weaves, or anal prolapse. But we felt the bike could turn quicker still without sacrificing stability, which would up the bike's corner speed.

By taking off the shock's upper mounting locknut and removing the rocker linkages, it was possible to fit a 4mm-thick alloy washer under the shock-to-frame mounting bracket.

The combination of suspension that now deals with all but the roughest of tarmac and sharper steering with stability, upped corner speed on the road no end. This setup would do for track use, but different weights and riding styles will mean slight tweaks of the stock suspension may still be required.

extension. Despite the fork springs being more compressed and, therefore, more likely to spring back even quicker off the brakes, only two extra clicks (clockwise) of rebound damping kept the fork return action nice and smooth. With the compression damping backed off (anti-clockwise) three clicks, mountains now felt like molehills.

To sharpen the steering, we added more rear preload. All we got from this was a harder, harsher ride, so we went back to

On a really bumpy road the SP-1's back end gets properly airborne



It may not handle very well on the road, but it looks a treat and it pulls fantastic wheelies, so that's ok then...

SPECIFICATIONS

Standard settings

REAR SHOCK	
Preload	position four of nine
Rebound	one full turn (360°) out from full in
Compression	ten clicks out from full in
FRONT FORKS	
Preload	fourth groove from top aligns with fork-top nut
Rebound	7 clicks out from full in
Compression	12 clicks out from full in

PB TRACK SETTINGS

REAR SHOCK	
Preload	position four
Rebound	two full turns (720°) out
Compression	14 clicks out (15 if lighter than 14.5 stone)
Ride height	4mm spacer
FRONT FORKS	
Preload	one line showing
Rebound	five clicks out
Compression	15 clicks out
Ride height	forks pushed up through yokes an extra 8mm

MAXTON SAY...

The forks have far too much compression damping. The smallest of bumps causes the front end to kick off, and then it wanders badly coming out of corners. There's a lack of rebound damping, too. And with the stiff springs, the front end has a tendency to spring back when the brakes are let off. Under severe braking, the hydraulic bump stops can lock solid and the forks start to patter.

The shock is a cheap unit. The spring is over-firm, but there's a lot of compression and rebound damping. And there isn't enough travel - 120mm is ideal but there's only 95mm. It is not re-buildable and changing the spring is pointless because of the damping problem. The cheapest way to sort it is to buy a new shock.

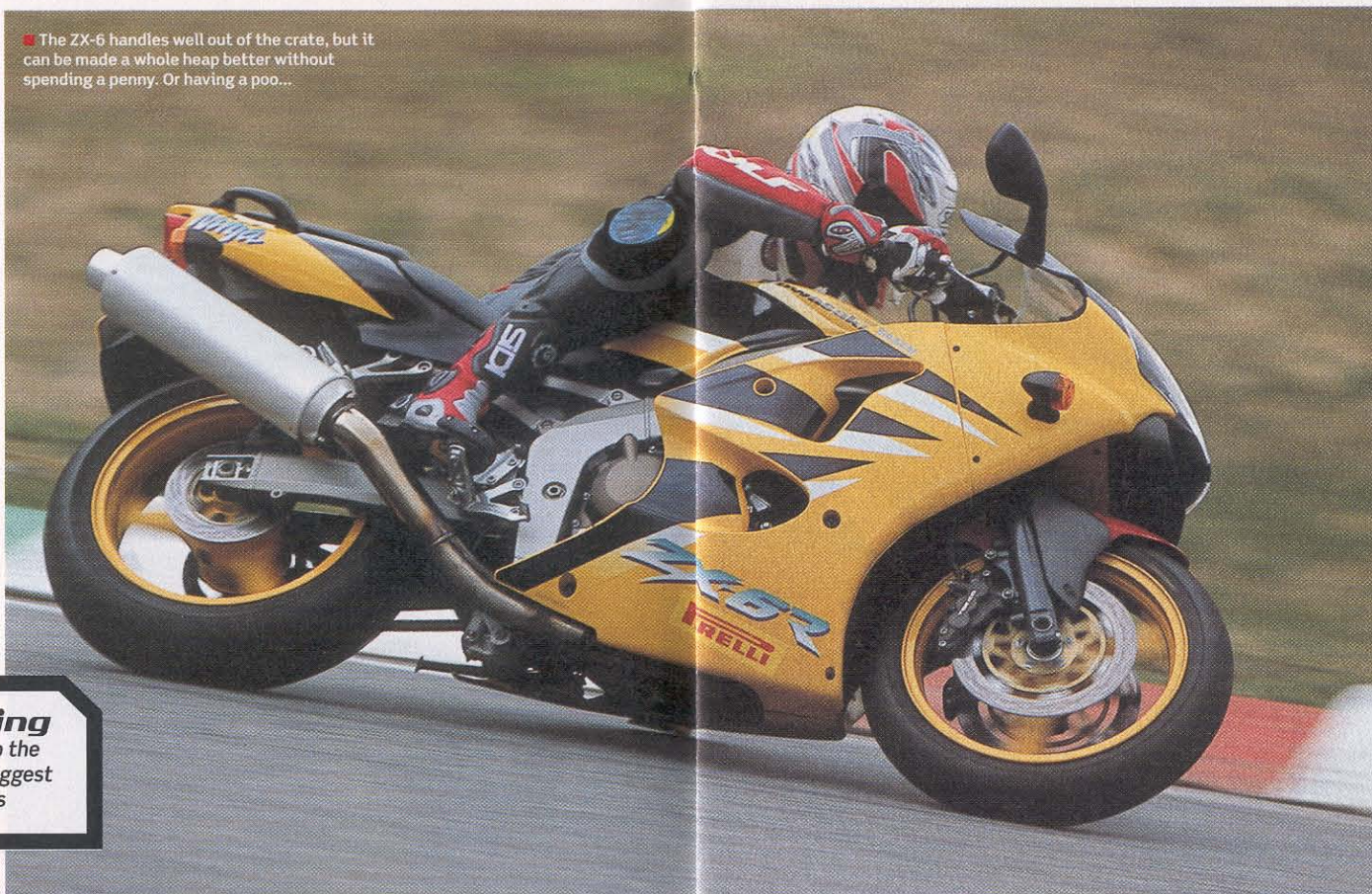
ZX-6R J1/J2

Circuit Pau Arnos in southern France is a mix of slow, fast, uphill and down dale turns. On the ZX-6 there was plenty of see-sawing effect as the front end dived under braking and sprang back with the brakes off.

It was the same story at the rear, squatting with a fistful, and a slight lurch/wallow sensation over harsh bumps. At the same time, the front end felt vague mid-turn and on a steady throttle. Understeer reared its head, too. Powering out of turns, the bike ended up closer to the outside edge of the track than was healthy.

Raising the easily accessible rear ride height adjuster by 8mm sharpened the steering by 100%. Where wrestling with the clip-ons and getting off the seat was necessary to get it on its side, shifting body-weight would now pitch it over. This simple adjustment also put more weight over the front end to give slightly more feel from the front.

■ The ZX-6 handles well out of the crate, but it can be made a whole heap better without spending a penny. Or having a poo...



If you only do one thing
Raise the rear ride height to quicken up the steering - it's easy and it'll make the biggest single difference to how your ZX-6 feels

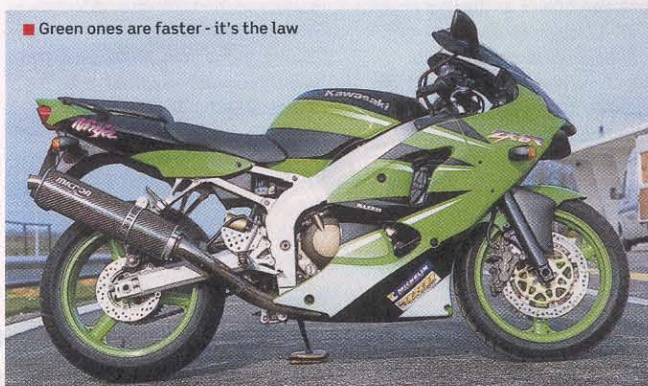
More feedback came by adding more front preload to take out unwanted sag. Our final setting was four lines showing, the fourth line level with the top of the fork-top nut.

It was next a case of slowing fork dive (compression) and the return to full length (rebound/extension).

Rebound ended up as four clicks out from fully in. Screw clockwise all the way in till the adjuster can't turn, then go back until a click is felt. This is position one. Then turn the adjuster for another three clicks.

Final setting for compression was all the way in clockwise, then back out six clicks. The front end was transformed. Smooth and progres-

■ Green ones are faster - it's the law



sive on or off the brakes, a tauter, tell-all ride, but still compliant on the rough and bumpy stuff.

At the back end, it was a similar tale. Rebound set at seven clicks out from full in, compression eight out from full in. There was a slight argument on the subject of rear spring preload. Like where it should be set...

Trev thought the bike felt better

on the stock setting (180mm spring length). Gus, our other tester, being three stone lighter (a conservative figure...), favoured less preload. One full revolution back of the locking rings to give (approx) 186mm spring length. It seems the ZX-6R has a pretty hard spring as standard. And anyone over 14-stone butt-nekked would be advised to stick with the standard preload setting.

SPECIFICATIONS

STANDARD SETTINGS

REAR SHOCK	
Preload	spring length set at 180mm
Rebound	10 clicks out from full in
Compression	10 clicks out from full in
Ride height	zero
FRONT FORKS	
Preload	Kawasaki quote 14mm showing
Rebound	7 clicks out from full in
Compression	9 clicks out from full in

PB SETTINGS

REAR SHOCK	
Preload	one full turn back if weighing less than 14 stone
Rebound	7 clicks out from full in
Compression	8 clicks out from full in
Ride height	+8mm
FRONT FORKS	
Preload	4 lines showing

MAXTON SAY...

Just for a change, the rear shock is one that we can revalve. And it needs it. It's underdamped, and the rear spring is hard. Because of that, and despite the firm spring, the bike tends to ride on the spring. We change the rear spring for a softer one and revalve to give a damping curve similar to our Maxton shock. But we can't widen the range of adjustment.

The forks carry too much compression damping - kicking hard off bumps with not enough rebound. The springs are on the softish side, but not as bad as, say, a CBR600. We revalve and reshim which will reduce compression and give a greater range of adjustment.

Raising the rear ride height adjuster sharpened the steering by 100%

ZX-6R G1/G2

The starting point when setting up a bike is to adjust the preload on the front and rear springs.

Static sag is measured with the bike's weight only and loaded sag is with the rider on the bike.

Put a cable-tie around one fork stanchion, push down on the forks a couple of times to settle them, then slide the cable-tie down against the dust seal. The next step is to lift the bike by the bars until the front wheel is off the ground, then measure the amount the forks travel down. This is the sag and it is changed by adjusting the spring preload (more preload, less sag).

Mark a point at the rear axle and another on the tailpiece directly above it. Hold the bike upright and measure between the two points. This is the ride height. Lift the rear of the bike and measure how much it comes up. This is static sag and it's adjusted as for front sag.

■ Set it up right and the ZX-6R is a top trackday bike



■ Still a pretty beast, although it's been eclipsed in performance terms by the latest 600s



If you only do one thing
Whack up the front and rear preload to stop it wallowing and bottoming out when you push it hard - and to give more ground clearance

Sit the rider on the bike with his feet on the foot pegs and measure the amount the rear moves down. Use the marks you made on the tailpiece and swingarm as the reference points.

Add this figure to the static sag and you have your loaded sag. This is changed by adjusting the spring preload. Again more preload equals less sag. You also need to check travel, so put cable-ties around one front fork stanchion and the rear shock shaft, then slide them against the dust seals.

After riding the bike, check the amount of travel used. As a general rule 5mm of unused travel on the

forks and 10mm on the rear shock at full compression is about right.

If there is more than 10mm, reduce compression damping followed by spring preload. Less than 5mm and the reverse applies.

Initially the bike felt very soft and was running wide in turns. The suspension was chattering badly as both ends bottomed out when the Kwak was pushed hard. The reason for this became clear when we

measured the settings and found 45mm of loaded sag on the rear and 35mm on the front. With this in mind we increased the preload at both ends, reducing the sag.

Rebound needed to be increased front and back to cope with the extra spring pressure. This made the bike feel much firmer and reduced the front end chatter. As lap times got quicker the front end started to bottom out again. The bike was skit-

SPECIFICATIONS

PB SETTINGS

REAR SHOCK	
Static sag	11mm (6mm two-up)
Loaded sag	29mm (25mm two-up)
Compression	7 clicks
Rebound	three clicks (2 two-up)
Ride height	10mm up on standard
Tyre pressure	29psi track, 38psi solo (42psi two-up)
FRONT FORKS	
Static sag	23mm
Compression	five clicks
Rebound	one click
Fork height	3mm
Tyre pressure	30psi track, 36psi road
Preload	three rings

tish while braking, and it was still running wide in tight turns. More preload on the front fixed the problem and raising the rear ride height improved the turn speed.

The final track setup had the ZX-6 holding tight lines even round Croft's awkward hairpin, but still stable enough to take the fast back sections flat out.

For the road test a 20-mile loop consisting of fast sweepers, jumps and slow bumpy right angle turns was used. The track settings were fine for solo riding once the tyre pressures were increased to allow for lower temperatures. With a pillion on board the rear suspension needed slightly more damping to cope with the extra weight.

Before that the rear suspension would bottom out on fast bumps and kick both of us into the air. We pumped the back tyre up a bit too.

The only thing that lets down the standard suspension on the ZX-6R is the front end's lack of rebound damping. This could be improved by changing the standard 5 weight fork oil to a heavier 7.5 or 10 weight. However this isn't essential. On the final setups the Kawasaki ZX-6R is an excellent road and trackday bike and is easy to ride - fun and fast.

The ZX-6R was skittish on the brakes - more preload on the front fixed it

Ninja ZX-7R

Step on up, Kawasaki's ZX-7R, your set-up time has come. Introduced in 1996, the ZX-7R lives at the strong and dependable end of the race rep market. It's a bit down on power and it's substantially heavier than the GSX-R750 (its natural competitor) so, standard, it's slower. But it can go faster, a lot faster. As fast as an untweaked Gixer, in fact, and the race bikes have always punched above their weight.

We can't promise you a ride in WSB, but we can give you a considerably sharper and faster tool for no outlay whatsoever. Or a seriously cunning device if you're prepared to make a modest investment.

The ZX-7R is heavy but very stable. Everyone describes it as feeling planted, especially the front end. It has a strong, well-developed engine with no quirks or flatspots. The weight damps down the perform-

except preload – at minimum. The result: slow lap times that left JB surprisingly upbeat: "Great bike, taut, lots of feedback, working well. Great track too," he babbled. It took some Gestapo-style cross-examination to reveal the truth – dive under braking, a tendency to run wide and rear end squat exiting Devil's Elbow.

JR then wound ride height to 8mm of rear shock ride height (exposing about four threads on the adjuster), upped the rebound damping in the forks, plus the compression and rebound damping in the rear shock. The idea was to make the bike steer faster and to tighten the suspension. JB came back gushing. The bike now hit apexes, held a line, and he could get it turned through the bus-stop by weighting the footpegs alone. It was a whole new bike, racer-like and two seconds per lap quicker too.

Next session saw the esteemed Robinson going extreme with the ride height and adding even more damping. But it caused loss of stability, the front beginning to wag while the rear gave a squatting sensation

under acceleration.

A compromise ride height setting was found and JR quietly turned up the idle speed to 1,600rpm to aid stability under braking. JB was again a happy bunny.

The way to go is to get the best tyres for your purpose and tweak the steering geometry to suit them, using Kawasaki's thoughtfully-provided rear ride height adjuster. It is the single most important adjustment on the bike. The rest is very fine tuning.

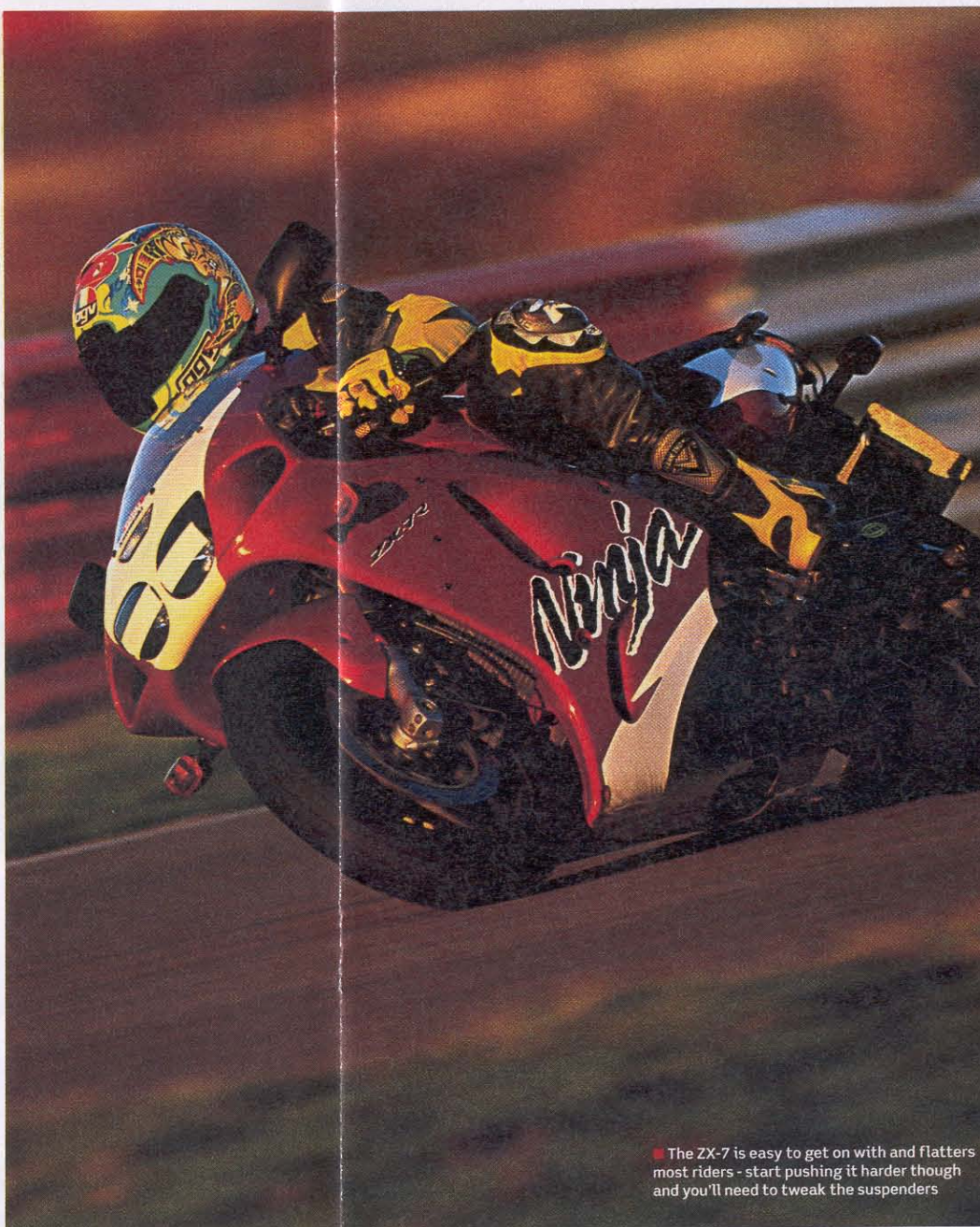
If you only do one thing
Get busy with the spanners on the rear ride height adjuster - you'll reap the benefits of quicker steering and a more satisfying sex life

ance and also makes it easy for the suspension to work, which means Kawasaki can get away with relatively cheap dampers.

The good news is that it is not sensitive to damper settings. The bad news is that the dampers provided don't give enough range to make much difference anyway.

We tested the ZX-7R at Mallory Park, where test rider, Jon Bentman, went out for a few laps to assess the bike. Tech supremo, John Robinson had set all adjustments –

It was a whole new bike - racer-like and two seconds a lap faster



■ The ZX-7 is easy to get on with and flatters most riders - start pushing it harder though and you'll need to tweak the suspenders

SPECIFICATIONS

PB SETTINGS

REAR SHOCK	
Static sag	5mm
Preload	18 - 23mm of thread
Compression	12 clicks out
Rebound	position 3 or 4
Ride height	+10mm from fully off
Tyre pressure	31psi track, 42psi road
FRONT FORKS	
Static sag	45 - 50 mm
Compression	4 clicks out
Rebound	4 clicks out
Fork height	5mm above top yoke
Tyre pressure	28psi track, 36psi road
Preload	6 rings

MAXTON SAY...

The ZX-7R has good basic suspension components. Most of our referrals relate to race bikes and trackday bikes.

Essentially the bike comes with too-firm springs. This gives it a slightly choppy ride but also gives the fantastic sense of feedback (particularly from the front) that most riders rave about. But the forks do kick off small bumps and ripples because of too much low-speed compression damping. And racers may find there's not enough rebound damping, meaning the forks spring back too quickly when they let off the brakes.

We fit a softer spring and revalve the damping to accommodate the rider's weight and riding usage. This also gives the forks a greater range of damping adjustment.

The rear shock suffers from a hard spring, too little compression and too much rebound damping. This means that under acceleration the shock squats despite the firm spring. Again the limited adjustment provided as standard means this can't be fully eliminated. It can be revalved and resprung quite cheaply though.

1998 - 1999

Ninja ZX-9R C1/C2

OK now let's get to work. Well, if you can call a test session at Mallory Park work. Can we tame the mighty Ninja or will we end up in a heap at Gerards bend?

The big 900 was slow entering corners and wallowed badly in the middle, but as soon as the bike got anywhere near upright it was gone. The engine is a stormer – down the front straight it was blasting past supersport race-prepped 600s with the authority of an F-18 jet on full afterburners. Just watching the big brute howl past the others was scary enough and, after complaints of high-speed passes, we were bumped up to the fast group. That first session led to another discovery – no brakes. First time into the Armco-lined hairpin, it was almost brown trousers time. Someone was heard to mutter: "I hit the binders, man, and the thing accelerated."

We knew we had to get the bike

If you only do one thing
Learn to love your fellow man. Life's too short for petty recriminations and mean-spirited conflict. Oh, and raise the rear ride height too

turning better, so we took 5mm out of the sag at the back, trying to shift the weight forward. Mid-corner, the bike wandered on and off line like a drunken idiot. You just aimed the thing in the general direction you wanted to go and then held on tight.

The shock was one culprit – it was under-damped in standard trim, bouncing up and down and loading and unloading the front end, putting it off line every time you hit the gas or a bump. We added three clicks of compression damping so it would not squat so quickly.

The front end had developed a nasty patter exiting Gerards at 110mph. When you're on the gas,

■ ZX-9s have always had 'issues' with suspension set-up, but there are plenty of things you can do to improve yours for road or track



■ Looks fast standing still, but the handling's not up to the looks, or the engine...

the front starts buzzing like the wheel is out of balance.

Even though the ZX was weak on the brakes, it was using up all the suspension travel. We had no choice but to increase the spring preload up front. We wound down the adjuster two lines and added a click of compression damping to try and slow the dive.

Back out for another session and things were looking better. It was

possible to move around on the bike – a good sign that things were coming together. But it was still slow turning-in and there was a lack of feel from the front end. Mid-corner, the bike was better but still wouldn't hold its line. Back in the pit we removed 5mm of rear sag and added two clicks of compression.

A couple of us started to complain about the excessive dive on the front end, where the bike had

SPECIFICATIONS

PB SETTINGS

➔ REAR SHOCK	
Static sag	5mm
Compression	2 clicks out from max
Rebound	4 clicks out from max
Tyre pressure	34psi track, 36psi road
➔ FRONT FORKS	
Static sag	30mm
Compression	3 clicks out from max
Rebound	4 clicks out from max
Preload	2 lines on adjuster
Tyre pressure	32psi track, 34psi road

MAXTON SAY...

The fork is really good internally, it just needs to be set up properly. We re-valve and re-spring the fork to suit the rider's weight and ability, and replace the hydraulic bump stops with springs.

The rear shock fades out badly and is over sprung. The C1 model has a 520lb spring while the C2 has a 550lb spring. But Kawasaki did not change the damping to cope with the stiffer spring. So, the extra bounce of the spring over-works the oil in the shock and you get a fading back end. We re-valve it and install a softer spring, but a new shock is a better solution. You can also buy longer rear tie rods which helps to raise the rear end by about an inch, which helps steering.

started to bounce under heavy braking. We tightened the preload adjuster another two lines and added another click of compression damping to slow the dive.

Next time out on the track, the bike was the best it had been. It still needed loads of muscle to get it on its side, but now at least it happens more quickly. The patter at the front end was still there through Gerrards but we could live with that.

The engine's a real stormer - it was blasting past race-prepped 600s

Ninja ZX-9R E1/E2

At Mallory Park, our 2000 ZX-9R E1 struggled to turn quickly and hold a tight line. The forks were overworked and gave poor feedback. What's to be done?

We fitted Pirelli Evo Supercorsas with the pressure set to 31psi front and 28 rear. The ZX-9R felt better straight away: impressive grip, really good feedback, and they hold a line better than the standard tyres.

Sorting the tyres highlighted how slow the standard bike is to turn in. With the power coming on between mid-corner and exit, it wants to run wide. This is caused by the conservative setting of the rear ride height adjuster. It is too low as standard.

We raised the rear ride height by 10mm (measured at the adjuster).

This transformed our bike, with sharper, quicker steering, and less inclination to run wide coming out of the turns. Through the Esses, where a rapid change of direction is need-

■ Call that a lean angle? I've seen 2CVs lean further over in the bends. Go on, get it over, ya mincing queen



If you only do one thing
Like most road bikes, the ZX-9 needs tipping on its nose a bit to help rapid direction changes and stop it running wide

ed, the ZX-9R felt like a different bike. Result.

The quicker and more accurate steering highlighted another problem: the forks were struggling to keep the bike on-line into corners. Under hard braking the forks would come close to bottoming out.

Because the forks dived for Argentina we turned the preload adjuster all the way in. Increasing the preload meant we also had to increase the compression damping, but not by much - we turned it clockwise four clicks, did some laps then backed it off by two clicks, so it was then six clicks out from full in. The rebound needed turning up too



■ One day Kawasaki will employ someone who understands suspension. Until then stick with us, we'll see you right

- we turned it up until it made a noticeable difference. The front end felt firmer and more controlled after these changes, particularly in slower corners. But in quicker corners, it still felt a bit overworked.

With the front end set-up better, the rear shock now needed looking at. As standard, the back end feels firm on the road, on the track it's better unless it's very bumpy.

At Mallory it tended to wallow through the Devil's Elbow, suggest-

ing that compression and rebound damping needed turning up. This got worse as the shock heated up.

We turned up the rear compression damping to two out from full in. We tried the rebound adjuster fully in, but on the track it felt overdamped and a bit wooden, so we turned it back three clicks.

With these settings the ZX-9R could run at the front of the red group at trackdays. Now you can't use the bike as your excuse.

SPECIFICATIONS

STANDARD SETTINGS

➡ REAR SHOCK	
Preload	178.5mm spring length
Rebound	8 clicks out from full in
Compression	8 clicks out from full in
➡ FRONT FORKS	
Preload	4 lines showing
Rebound	10 clicks out from full in
Compression	8 clicks out from full in

PB SETTINGS

➡ REAR SHOCK	
Preload	178.5mm spring length (standard setting)
Rebound	3 clicks out from full in
Compression	2 clicks out from full in
Ride height	increased by 10mm
➡ FRONT FORKS	
Preload	turned fully in
Rebound	turned fully in
Compression	6 clicks out from full in

MAXTON SAY...

The forks feel very notchy and harsh, because they have too much compression damping. And when you brake hard you can feel the forks bottom out, because the springs are too soft. The forks don't have enough rebound damping either, so the bike springs back when you come off the brakes, making it hard to turn and hold a tight line when cornering. We fit harder springs and revalve the cartridges, reducing the compression damping to make the bike more compliant over small bumps and increasing the rebound to stop them returning too quickly.

The rear shock has a stiff spring and inadequate damping. Accelerate hard and the bike will squat down and then recover too quickly. We revalve and respring the unit to suit you.

➡ Through the Esses, the ZX-9R felt like a completely different bike. Result

GSX-R600 V/W/X/Y

On stock settings, a track virgin would find this GSX-R well suited for the job of learning how to brake later and later, corner faster and... er, faster with every session. The more experienced will find the suspension needs tweaking.

A lot of fork travel is used up on the brakes, enough to leave only 5mm of slider not wiped clean by the fork seals (a cable tie on the slider confirms this). Last-gasp braking also had the forks pattering when fully compressed at the end of Park Straight and in to the first gear hairpin. There was also a slight tendency for the bike to sit up if the front brake was dabbed mid-corner.

To start with, the back end felt firm but OK. But with every faster lap, the back end would take off over the odd bump, and break loose when the throttle was whacked open with the bike off upright.

Lifting the back of the seat unit to

■ The '97-00 GSX-R Six is a screaming little beastly that responds well to a bit of fettling



If you only do one thing
Increase the front preload to reduce fork dive under braking. It's worth increasing the front rebound and compression damping as well

get the shock to full extension (no sag) showed there was no sag. In fact, with the rider seated, the back end was as good as solid. At some point in time the rear preload had been wound right up.

Fortunately for us, Suzuki's yellow paint mark to show the original position of the preload locking rings was still visible. Two C-spanners later and the rings were close to where they should be. When measured, the distance between the top of the upper lock ring and the lip of the shock's body casting was 24/25mm. Some sag (15mm approx) could now be felt. As a starting point, compression damping



■ Aerial view of GSX-R 600 that's fallen off its stand in the car park...

was set at three-quarters of a turn (stepless-type) out from full in; rebound too was three-quarters of a turn out. We added more front preload – three lines showing – and altered compression and rebound to three-quarters of a turn out from full.

No complaints about the back end this time. Seemingly, in one attempt, we'd got it right. Two, hard, 20-minute track sorties later and the rear Bridgestone was in better nick

than after the very first half-hearted session – no curling up on the edges of the tread grooves.

There was still a lot of fork dive on the brakes, and it was quick to spring back off the brakes. Preload was altered to two lines showing.

A vast improvement all round, but still plenty of fork dive, so fork preload went to two lines showing and a quarter of a turn more compression and rebound.

With the extra preload the forks picked up every ripple at any speed

SPECIFICATIONS

STANDARD SETTINGS

➤ REAR SHOCK	
Preload	overall spring length 195.4mm
Rebound	1 turn out from full in
Compression	1½ turns out
➤ FRONT FORKS	
Preload	4 lines showing
Rebound	1½ turns out from full in
Compression	1 turn out

PB ROAD/TRACK SETTINGS

➤ REAR SHOCK	
Preload	24-25mm from shock body to upper ring
Rebound	1 turn out from full in
Compression	¾ of a turn out
➤ FRONT FORKS	
Preload	3 lines showing
Rebound	½ turn out from full in
Compression	½ turn out

MAXTON SAY...

The forks have soft springs, and not much rebound damping. We fit stronger springs and modify the damping system (more rebound, suitable low-speed damping). Also, we replace the hydraulic bump stop with a spring system to reduce fork patter.

The shock is oversprung and the damping's not good – we fit a different spring and modify the damping but it's better to get a new shock.

With the extra preload the forks would pick up every ripple at any given speed when upright. On and off the brakes the fork action was more controlled. What was worse was the way the bike would sit up in the turns. Preload went back to three lines showing while damping adjustment was left alone. We tried further tweaking at both ends but always ended up with the same settings – they worked on the road too.

GSX-R600 K1/K2/K3

The latest GSX-R600s produce more power, spread more evenly through the rev range. Fuelling is precise, allowing perfect control. And the 2001-on chassis is more agile.

We took the 600 (fitted with new Pirelli SuperCorsas, set to 31psi front, 28 rear) to Mallory Park.

After a few laps it became obvious that the stock bike is good on standard settings. Bruce had to push hard to find its limitations.

The forks almost bottomed out going into the fast, sweeping right-hander at Gerards. Into the Esses the forks felt soft and they pinged back quickly when flicking left for the run to the hairpin.

Braking up to the hairpin had the back end chattering about a bit, but through the Bus Stop the Gixer felt good. The bike had a nice, neutral feel and would easily flick through the tightest bends quickly enough.

If you only do one thing
Get out and ride it. For most people the GSX-R is pretty good as standard. A bit more front preload and rebound makes it better though

Going down the Devil's Elbow the bike took a good amount of throttle in the first two gears, but when we started to rev it out in third the back end wallowed and felt loose. This in turn started to make the front end nervous.

Back in the paddock we turned up the fork preload until there was only 3mm of the adjuster body showing. We also turned up the rebound damping $\frac{1}{2}$ of a turn, and the compression half a turn to match the increase in preload.

Happy with the preload setting at the back end, we just needed to sort out the wallowing out of the Devil's Elbow.

■ You have to be pushing pretty hard to run up against the GSX-R's limitations, but tweak it a bit and you can push even harder



■ Yellow, but not mellow. A few years ago you'd have needed a 750 to get the GSX-R's performance



We adjusted rear rebound $\frac{1}{2}$ a turn at a time, and then checked by pushing the back end down. It wasn't until it was a $\frac{1}{4}$ turn from fully in that it had any useful damping (when it got hot later we had to screw it all the way in).

Like this the front end felt a bit choppy, as if it was too hard. So we turned the preload back until there was only one ring showing, then went out for another session.

This time it felt better. The Gixer performed well – particularly into Gerards where it was running wide before. The rear shock handled the run down the Devil's Elbow much better with a lot more rebound.

At the end of the day one thing was clear. On the stock settings and with a good set of tyres like the SuperCorsas the GSX-R600 K1 is a very good track tool. But there's plenty to be gained in terms of lap

SPECIFICATIONS

STANDARD SETTINGS

➤ REAR SHOCK	
Preload	10mm thread showing
Rebound	$\frac{1}{2}$ turns out from full in
Compression	$\frac{1}{2}$ turns out from full in
➤ FRONT FORKS	
Preload	3 rings showing
Rebound	$\frac{1}{2}$ turns out from full in
Compression	1 turn out from full in

PB SETTINGS

➤ REAR SHOCK	
Preload	standard
Rebound	$\frac{1}{2}$ turn out from full in when cold, if shock gets too hot turn fully in
Compression	standard
➤ FRONT FORKS	
Preload	1 ring showing
Rebound	$\frac{1}{2}$ a turn out from full in
Compression	$\frac{1}{2}$ a turn out from full in

MAXTON SAY...

The forks have too much compression and not enough rebound damping.

We fit harder springs, and revalve the fork cartridges for more rebound damping.

The rear spring is slightly too hard for the average rider's weight, and there's too much compression and not enough rebound damping. It has a very poor range of adjustment. It's a sealed unit and cannot be revalved, so we supply a new shock.

times by adjusting the standard settings. The bike as Suzuki supply it was lapping in the high 54 secs. When we finished fine-tuning we got our lap times down into the low 54s with a couple of 53.9s.

Before you tweak your own GSX-R600's suspension to Bruce's carefully adjusted settings, check your poundage. He only weighs in at 10% stone, 147lb or 66.7 of those Euro-kilo-thingsies.

Even on the standard settings the GSX-R600 is a very good track tool

GSX-R750 W/X

Introduced in 1996, after years of increasingly porky GSX-Rs, the T-model was a return to original GSX-R values – a super-light, super-fast, dyed-in-the-wool racer – with lights.

The carburetted T and V-models gained a reputation for being a trifle flighty due to their extreme steering geometry. They turn fast. The W-model addressed this with a robust, non-adjustable steering damper, but any improvement in rideability has been more than countered by the light-switch throttle response of the fuel injection system. It's a bike that doesn't suffer fools but responds well to a bit of tweaking.

When it came out, the GSX-R left our road test editor positively frothing: "Steering is light, impeccable... the standard suspension setup is firm, but supple, and combined with the neutral feel of the whole bike I feel I can place it anywhere, to within an inch, on any piece of tarmac."

■ The fuel injection cured the huge midrange flat spot of the old model, but the suspension's a bit flighty



If you only do one thing
Raise the spring preload front and rear - otherwise you'll be dragging the undercarriage everywhere once you start pushing it

Which could make you think we'd be looking at an abbreviated suspension set-up column. Not so. While the Suzuki GSX-R is more than capable on standard settings, pushing hard, particularly on the track, reveals several flaws in the standard setup.

Tested at Mallory Park on a dry but cold day, the standard settings on the GSX-R were found to be a bit on the soft side – pushed hard it became slightly unstable. The rear suspension tended to chatter badly braking hard into Mallory's hairpin and on the long, fast corners it only took a small bump to make it twitch and become unsettled.

After measuring the suspension travel the cause of the instability and chattering problems was found. Both the forks and rear shock had been bottoming out. Increasing the spring preload was the fix. This improved the bike making it stable even on bumpy high speed turns. Rebound damping on both ends was increased slightly to compensate for the reduced travel - the settings table gives the precise settings we ended up with.

The road and pillion part of the test found our track settings to be just as good on the highways, the

only changes were to the tyre pressures.

It's worth remembering that these settings suited our tester for his weight and riding style. While the settings are a good starting point, feel free to improvise...

Ed's note: Now, because this is one of the first set-up guides we did, you don't get any more info on suspension, you get a load of drivel about end cans. Sorry.

It's debatable whether the GSX-R needs tuning. In standard trim it makes more power than most can handle – and in fuel-injected

mode it can be a bastard to contain – but, as the wise man sayeth: "Too much is never enough."

For instant gratification the combination of a Dynojet kit, a K&N filter and a slip-on end-can make a worthwhile performance gain on the carb bikes. This alone will usually see a 10bhp gain in top end power with 5-6 bhp through the midrange.

Porting and gas flowing is the next option. When it comes to these

mods, though, it's best to give your tuner as much detail as possible on carb and exhaust mods (for matching) and intended use.

The GSX-R has Nikasil-plated barrels so a big-bore upgrade – typically to about 790cc – will cost that little bit more than usual. The advantage of boring is the increase in torque as well as power. Don't be inclined to go too far, we know of quite a few GSX-R's that have been

SPECIFICATIONS

PB SETTINGS

➔ REAR SHOCK	
Static sag	6mm (4mm two up)
Preload	set to give 10mm of unused piston stroke
Compression	2 1/4 turns
Rebound	1-1 1/2 turns
Ride height	standard
Tyre pressure	29psi track, 36psi road
➔ FRONT FORKS	
Static sag	25mm
Compression	1 1/2 turns
Rebound	1 1/4 turns
Fork height	3mm above top yoke
Tyre pressure	30psi track 36psi road
Preload	2 rings

MAXTON SAY...

The forks are too hard AND too soft. Specifically it's the low speed damping that is too harsh and the high speed damping too soft. While slower riders find the GSX-R forks kick off bumps, faster dudes are finding they're reaching maximum compression way too early. We cure it with new springs and revalve.

The rear spring's too stiff, with a lack of low speed rebound damping preventing squat (useful for finding grip under acceleration). It's a simple fix again - we revalve the standard shock and fitting a suitable spring.

bored-out as far as 820 and 840cc and they usually go bang in quite short order.

Fuel injection was once a potential impediment to performance modifications. However, devices such as the Dynojet Power Commander can, at a keystroke, produce significant alterations to an engine's fuelling characteristics.

Have you finished? About bloody time too. Some people...

I feel I can place it anywhere, within an inch, on any piece of tarmac

GSX-R750 4/K

Suzuki's GSX-R750 got a major revamp for 2000, and they got it right. Handling in stock trim is outstanding but for the track it can be even better. We fitted our GSX-R with a fresh set of Dunlop D207RRs, with pressures set at 30psi (front) and 32psi (rear) and headed for Snetterton. Sure enough, after a couple of warm-up laps the GSX-R with its stock settings was on the limit. The sticky D207s gave a big increase in grip and the ability to turn-in quicker. But doing this on the brakes had the front end diving too much, too quickly. The back end was squatting excessively under power exiting turns, making the bike stand up and run just a bit too wide.

To help the bike turn-in sharper and stop it diving too much we added more front preload so there were now two lines showing.

The extra preload gave a firmer

something for nothing) was that exiting the Bomb Hole in third gear with the throttle pinned made the front end very light and tricky to line up for the turn.

The tendency to squat and run a little bit wide when exiting turns, particularly Coram and Riches, was down to a need for more rear preload. Exposing another 5mm of thread on the shock body meant the rear spring offered enough resistance to stop the bike squatting when the power is fed on.

We tried increasing the rear compression by a half-turn, but it wasn't a success. We thought it would give more feel from the back end, but instead it gave a very choppy ride. This was confirmed by the state of the rear tyre – it was torn and shredded. Setting the compression back another quarter didn't make much difference, so we went back to the standard setting.

Because of the higher preload the rebound damping needed to be turned up by an extra quarter turn. This gave the bike a tauter feel, allowing higher corner speeds without any of

feel but the Suzuki was still diving too quickly. A half-turn more compression damping at the front was too much, so we backed it off a quarter-turn and it felt spot on. The bike braked, turned and tipped into Snetterton's first corner without fuss. But mid-corner the forks juddered uncomfortably, so back in the pits we reduced the rebound damping by a quarter-turn so it rode the bumps without losing corner speed.

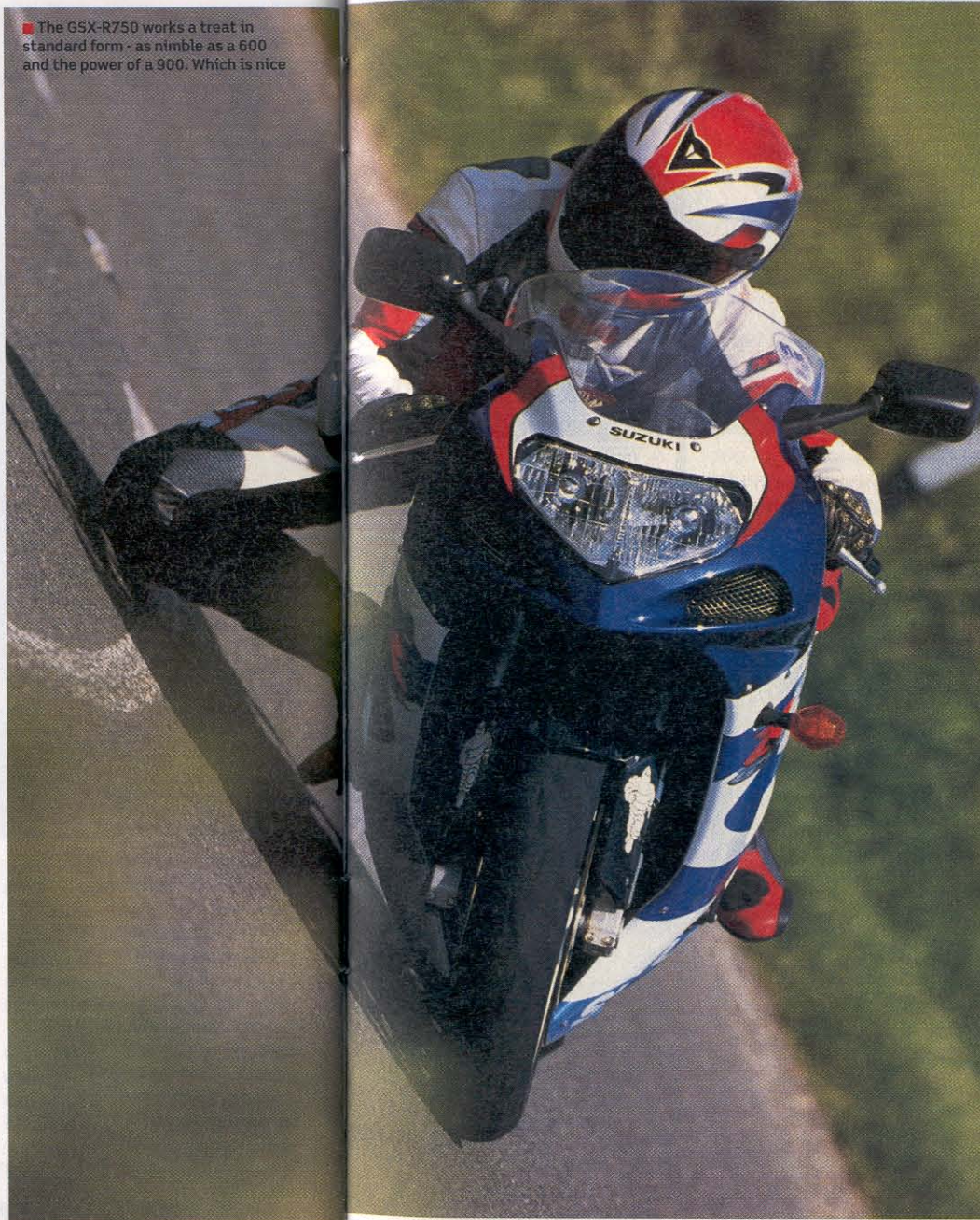
The negative effect of reducing the rebound damping (you never get

the old wallowing or running wide on the gas.

Hard on the brakes into Russells, the now well set-up GSX-R gave enough confidence to let you start the turn while the back wheel was still being braked hard by the engine, with no chatter or skipping.

On the road the setup we arrived at on the track felt a bit harsh at the front end – less front preload helped – but stability and roadholding were unaffected overall so it's still a good compromise for fast road use.

■ The GSX-R750 works a treat in standard form - as nimble as a 600 and the power of a 900. Which is nice



SPECIFICATIONS

STANDARD SETTINGS

REAR SHOCK

Preload	10mm of thread above top locking ring
Rebound	1½ turns out from full in
Compression	one turn out from full in

FRONT FORKS

Preload	four lines showing (8mm showing, measured from bottom of preload nut to top of fork cap)
Rebound	1½ turns out from full in
Compression	one turn out from full in

PB SETTINGS

REAR SHOCK

Preload	15mm of thread above top locking ring
Rebound	¾ turn out from full in
Compression	1½ turns out from full in

FRONT FORKS

Preload	two lines showing (5mm showing, measured from bottom of preload nut to top of fork cap)
Rebound	1½ turns out from full in
Compression	¾ turn out from full in

MAXTON SAY...

Fast trackday riders should be able to find a good setup using the standard units.

However on the road there are limitations. The front fork springs are a bit on the soft side and tend to dive too much. Plus there's too much compression damping and the forks kick back through the bars creating a choppy ride. Fitting stronger springs and revalving the forks is the only real answer.

The rear shock tends to feel very harsh on the road. It's not the spring - the problem is that there is too much compression and rebound damping, even on the minimum settings. Unfortunately it's a sealed unit and you can't get in there to change things around. One of our own shocks is a better option.

If you only do one thing
Get out and ride it! It's superb anyway on stock settings, and if you never hit the track you might be better leaving well alone

Rure A tauter feel,
allowing higher corner speeds without any

TL1000 S

The TL has well-publicised handling woes that led to a recall for a steering damper to be fitted soon after the first models appeared - basically it was too inclined to shake its head coming out of bends and on bumpy roads.

Suspicion fell on the radical rotary rear damper, but the TL's legendary grunt was probably at least as much to blame in most cases - it offered wheelies not just on demand, but also when you didn't even know you'd asked for them. Basically it did what it was told, even when it was told the wrong things - more experienced riders had fewer problems. Being fat was good, too - it brought the rear suspension into the area

where it worked more efficiently.

We headed for Mallory Park armed with a '96 TL and a pair of Metzeler Sportec M1s - a performance road tyre with good grip and neutral handling characteristics. After the track session we headed for local roads to get the measure of the big Suzuki.

The settings speak for themselves but if we'd had more time we'd have played more with the rear preload - unfortunately it's so bastard hard to get at we left it as it was.

There are two absolutely crucial points. First is chain tension. If it's too tight it will restrict suspension movement. Keep checking it until you're absolutely sure it's not too tight. Second is the rear tyre. It

comes with a 190/50, but fit a 180/55 instead - it will steer better, grip better, do everything better and you won't regret it for a second.

If you only do one thing
Adjust your chain! Too tight and it won't allow the rear suspension to move properly, making the TL's legendary instability even worse



TLs can be made to handle, but it takes work, and usually money too

SPECIFICATIONS

STANDARD SETTINGS

➔ REAR SHOCK	
Preload	5mm of thread showing above locking ring
Rebound	2½ turns out from full in
Compression	2½ turns out from full in
➔ FRONT FORKS	
Preload	4 lines showing
Rebound	1½ turns out from full in
Compression	1½ turns out from full in

PB TRACK SETTINGS

➔ REAR SHOCK	
Preload	5mm of thread showing above locking ring
Rebound	¾ turn out from full in
Compression	¾ turn out from full in
➔ FRONT FORKS	
Preload	2 lines showing
Rebound	1 turn out from full in
Compression	¾ turn out from full in
Tyre pressures	32 psi rear, 30psi front
Fork ride height	3mm of fork leg protruding through top yoke (excluding fork cap)

PB ROAD SETTINGS

As above but rear shock compression and rebound damping 1 turn out from full in	
Tyre pressures	34psi front, 39psi rear

MAXTON SAY...

The rotary damper makes the same damping on rebound and compression, like a steering damper - not what you want at the rear of a bike. Swap it for a normal damper.

For trackdays and heavier riders, fit a different spring.

The forks aren't too bad, but give a firm ride and dive a lot. It's worth modifying the forks to make the compression damping more progressive. We revalve the forks and fit a harder spring, giving a much more comfortable ride.

TL1000 R



Ugly, lardy and never really fulfilled its promise. That's why Trev works for MCN now

After only a few laps of Mallory it was clear the TL was struggling when pushed. The front end felt crude entering Gerards, bouncing up and down and giving poor feedback. Exiting hard under power would have the bike standing up and running wide, but the really nasty bit was powering out of the left-handed Devil's Elbow onto the start/finish straight.

To sort out the front end's bumpy feel, we backed off the compression damping by three clicks and upped rebound by three clicks to stop it springing back so quickly off the brakes. We then wound the preload out until eight lines were showing.

It felt much better. The front didn't move around going into corners, and soaked up ripples rather than skip-

ping across them. However, it was still very slow to turn. We pushed the fork legs through the yokes by an extra 5mm to quicken things up.

Back out on the track we found the TL turned-in very well and held a good line, but was let down badly by the back end. The bike would lean over so far, then the rear would jump around all over the place and it wasn't possible to use any power until very late on the exit.

Backing everything off seemed like a good idea. We reduced rear preload until there was almost no thread showing, which gave a 5mm gap from the bottom of the locking ring to the shoulder of the shock.

Our other option was to reduce compression and rebound damping at the rear. We wound out both adjusters by the same amount - 21 clicks out from full in, using a flat-bladed screwdriver. Even then the bike still felt over-damped when pushing down on the back end.

We took it out again and the rear still felt very hard and non-compliant, especially out of the Devil's Elbow. We tried further adjustments with the rear shock's damping, but it made no real difference. So we gave up and went home.

If you only do one thing
Lob that rotary shock in the bin and shell out for a Maxton replacement - it's well worth the dosh for the improvement

SPECIFICATIONS

STANDARD SETTINGS

➔ REAR SHOCK	
Preload	10mm from bottom of locking ring to shoulder of shock
Rebound	14 clicks out from full in
Compression	14 clicks out from full in
➔ FRONT FORKS	
Preload	6 lines showing
Rebound	5 clicks out from full in
Compression	5 clicks out from full in

PB SETTINGS

➔ REAR SHOCK	
Preload	5mm from bottom of locking ring to shoulder of shock
Rebound	21 clicks out from full in
Compression	21 clicks out from full in
➔ FRONT FORKS	
Preload	8 lines showing
Rebound	2 clicks out from full in
Compression	8 clicks out from full in
Ride height	11mm of fork showing above top yoke

MAXTON SAY...

The forks are oversprung, with too much compression and too little rebound.

We revalve the cartridges to reduce the compression and increase rebound, and fit softer springs.

The rotary rear damper has a lot of high speed damping, which means the faster you compress it the more it locks up. It also has too much damping on rebound and compression. The spring's too hard and never gives the back of the bike a chance to sit and grip. The unit overheats quickly too. Revalving will not make much difference - replace the whole lot with a conventional shock.

GSX-R1000 K1/K2

Suzuki's GSX-R1000 is superb - masses of power and very good handling. But it can be even better.

At Donington Park, riding at the limit on the standard set-up (with tyres at 31psi fr, 28psi rr for the track), the forks dive too much, too quickly, especially hard on the brakes into slow corners. The rear end feels good for a few laps but seems to fade and loses some damping effect when it gets hot, which can make for a scary moment or two.

First job was to firm the forks up. Tester Bruce turned up the preload so there was only one ring showing.

To match the extra preload, compression and rebound got an extra one and two turns respectively.

Apart from the lack of damping as it got hot, the rear shock suited Bruce and his 10.5 stone weight well enough. There was no squat or

At this point you should be very, very careful about opening the throttle - GSX-Rs have a habit of biting the throttle hand that feeds them



If you only do one thing
Drop the yokes over the forks by an extra 5mm (standard is 13mm) to put a little more weight on the front wheel and improve turn-in speed

bottoming, even pushing hard.

So he left the preload alone and concentrated on increasing the damping - compression fully in and rebound one turn out from standard.

Bruce went out for a few more laps. The firmer front end felt much better, resisting dive under braking and allowing faster entry into turns. And it didn't spring back when the brakes were released. But there was a downside. Despite feeling more settled and faster into corners, the GSX-R felt reluctant to turn.

So Bruce decided to reduce the front ride height. This is done by putting the bike on a front stand that supports the bike from the centre of

Yes, it's a 1000 - you can tell by gold finish forks and six-pot brake callipers



the bottom yoke. Do it one leg at a time. All you need is a 10mm spanner or small ratchet and socket.

Loosen the two pinchbolts on the bottom yoke first. There's another 10mm pinchbolt on the top yoke to loosen and one more on the clip-on.

Slide the fork tube up through the yokes by 5mm then tighten everything up and repeat the process for the other leg, carefully checking that both protrude equally above the top

yoke. The standard amount (excluding the fork cap) is 13mm, this should now be 18mm.

Once again our meddling helped, and the GSX-R felt even better on the track. The bike was turning in more precisely, holding a tighter line and changing direction with less input. This made life a lot easier.

But again the back end let the side down. The increased damping helped, but the shock still faded

SPECIFICATIONS

STANDARD SETTINGS

➔ REAR SHOCK	
Preload	21mm of thread showing
Rebound	1½ turns out from full in
Compression	1½ turns out from full in
➔ FRONT FORKS	
Preload	4 rings showing
Rebound	1½ turns out from full in
Compression	2½ turns out from full in

PB SETTINGS

➔ REAR SHOCK	
Preload	stock
Rebound	¾ a turn out from full in
Compression	fully turned in
➔ FRONT FORKS	
Preload	1 ring showing
Rebound	¾ turn out from full in
Compression	¾ turn out from full in

MAXTON SAY...

The front forks are pretty good for normal road use. You start to have problems when you ride the bike hard, do trackdays or race. We fit harder springs, and also revalve increasing the rebound damping to give more control over the extension of the fork, which helps it turn in better and hold a tighter line.

The rear shock's spring is a good rate for the average rider, but the adjusters do very little. You can't revalve the standard unit, so a new unit's the best way forward.

after a number of hard laps. If you're serious about your set-up and want to improve an already superb bike, an aftermarket shock is the only way to get the full range of adjustment the standard shock can't deliver.

At the end of the day we had the GSX-R1000 handling and turning better than it did on the standard setup. It also felt easier to ride fast, and that's the thing that makes all the difference.

➔ **On the standard set-up, the forks dive too much, too quickly on the brakes**

GSX1300R Hayabusa

The Busa is phenomenally fast but the trouble is there are only two or three circuits in the UK where you can use the Suzuki's straightline potential. Mallory Park is not one of these circuits, but riding it there does give a good indication of what's needed to help it get through the twisty bits.

On the track the front felt vague, especially going into Gerards, the very fast corner at the end of the

time the shock really moved was when the wheel hit a big bump. The tyre was coping a lot of deflection too. With all the weight and power of the Hayabusa to contend with, the poor old Bridgestone didn't really need anything more on its plate. There was only one solution – the Busa definitely needed the preload backing off.

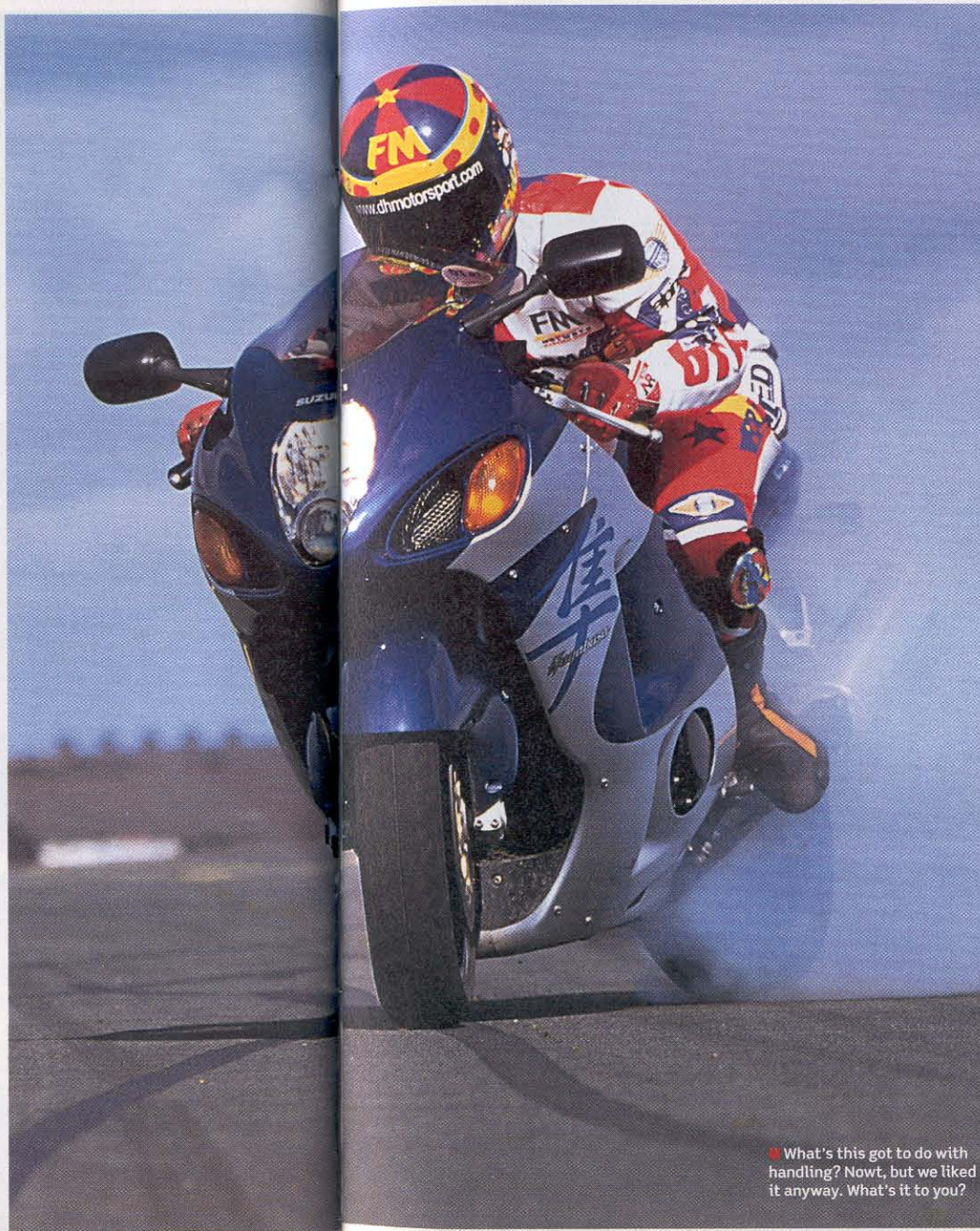
For easier access to the top of the shock we removed the three 6mm Allen bolts that fix the right-

side footrest assembly to the frame. With this out of the way it is easier to get a C-spanner onto the lockings and adjust them so there is only 6mm of thread showing above the top ring.

Then we turned the compression back eight clicks and the rebound back six.

Back on the circuit and the rear felt much more compliant, the wheel moving up and down more with the shock absorbing bumps better. With the front end harder, the forks dived less. Damping was also improved. But after several hard laps Bruce noticed the rear damping was starting to go off because of the heat generated inside the shock body.

Even after a day spent track testing and tweaking the Busa there was not a huge improvement in the bike's lap times. What we achieved is a more evenly sprung and damped set-up using the bike's standard suspension, which makes it easier to ride faster and feel more comfortable. The trouble is the standard units get overworked so easily. Get your forks and rear shock modified or revalved by a suspension specialist if you are going to do lots of trackdays.



What's this got to do with handling? Nowt, but we liked it anyway. What's it to you?

If you only do one thing
Don't go to the track! It's not really at home there. If you must, increase the preload at the front and reduce it at the rear

start-finish straight. When you start braking the weight of the bike really compresses the forks and the Busa gets all stropky and reluctant to change direction.

The first thing we wanted to do was drop the forks through the yokes a few mm, but this isn't possible on the Busa because of the casting over the top yoke that covers the fork tubes. Bugger. To get round this problem we would have to fit clip-ons and dump the casting for a new yoke. Instead we increased the preload to try and stop the forks diving so much when entering corners on the brakes. Turn the adjuster in so there are only two rings showing. Because of the extra preload we increased the compression damping by three clicks and the rebound by four clicks.

The rear end felt hard, kicking Bruce up the arse off bumps and not really letting the shock travel. As standard the rear spring has way too much preload, solo, and the only

SPECIFICATIONS

Standard settings

REAR SHOCK	
Preload	12mm of thread showing, from top of locking ring to end of thread
Rebound	9 clicks from full in
Compression	9 clicks from full in
FRONT FORKS	
Preload	6 rings showing
Rebound	6 clicks from full in
Compression	8 clicks from full in

PB SETTINGS

REAR SHOCK	
Preload	6mm of thread showing, from top of locking ring to end of thread
Rebound	15 clicks from full in
Compression	17 clicks from full in
FRONT FORKS	
Preload	2 rings showing
Rebound	2 clicks from full in
Compression	5 clicks from full in

MAXTON SAY...

The forks have a lot of compression damping, especially over small bumps, making the bike feel harsh. The springs are too soft and the forks dive too much under braking. The other problem is the forks spring back when you let the brakes off because there isn't enough rebound damping.

We revalve the forks so the bike is more compliant and holds a better line, and fit harder springs to suit.

The rear end feels harsh because the spring is too hard for the average rider, and the shock has a lot of rebound and compression, even on minimum. This makes the back 'kick' off bumps.

Another problem is high rear tyre consumption. This is partly because the engine is so powerful, but also because the rear suspension is so stiff, so the rear wheel spins and slides out of corners. A new shock's the only real cure.

Easier to ride fast and feels more comfy

TT600

We take the TT600 to Mallory Park. The first couple of sessions are a bit damp. The TT's standard set-up is ideal for these conditions, the preload front and rear are soft enough to allow you to feel exactly what the tyres up to. We set the pressures for the track to 31psi front and 33psi rear.

Once the track dries, it's time to start fiddling. The forks are diving under braking and making the TT run wide into Gerards and the Esses, plus the rear end is sagging and wallowing mid-corner, allowing the pegs to scratch.

First we look at the front end, and increase the spring preload. We try varying amounts of preload and in the end have it wound in leaving only one line showing. Heavier riders might need to wind it right in.

We also increase the damping, again gradually, until it starts to feel

■ Looks like a yellow version of one of the sand people from the original Star Wars, but handles bloomin' well on the road



If you only do one thing
If you're riding hard and braking heavily, you'll find the forks are a bit soft and dive a lot - upping the preload and the damping helps

like it is controlling the spring action. The rebound seems to have a poor range of adjustment and needs to be turned in all the way, then backed off a quarter of a turn.

We increase compression until it's half a turn out from full in.

The rear shock preload is increased by 7mm (44mm showing above top locking ring).

Rear compression is turned in one turn so it is only half a turn out from full in. Rebound is increased by three-quarters of a turn.

We also experiment with lowering the yokes down the fork tubes by up to 3mm. This does make the bike



■ Black is black... I want my baby back; oooh... grey is grey... since she went away



turn easier and change direction quicker, but it feels nervous through the handlebars and shaky when exiting turns.

On the road, we set the tyre pressures to 36psi front and 42psi rear. But that, combined with the track suspension settings, makes the set-up way too hard away from Mallory's smooth curves, giving a choppy ride, particularly at the front.

We wind back the preload so it's more comfortable (eventually arriving at three lines showing), both compression and rebound damping are reduced by a quarter of a turn each.

Then we turn our attentions to the rear, fiddling with the shock, trying less preload. But it feels too soft so we turn it back up to the track setting - the damping adjusters are the same as we had them for the track as well.

SPECIFICATIONS

Standard settings

➡ REAR SHOCK	
Preload	37mm of thread above top locking ring
Rebound	1½ turns out from full in
Compression	1½ turns out from full in
➡ FRONT FORKS	
Preload	5 lines showing
Rebound	1½ turns out from full in
Compression	1½ turns out from full in

PB TRACK SETTINGS

➡ REAR SHOCK	
Preload	44mm of thread showing above top locking ring
Rebound	¾ turn out from full in
Compression	¾ turn out from full in
➡ FRONT FORKS	
Preload	1 line showing
Rebound	¾ turn out from full in
Compression	¾ turn out from full in
Tyre pressures	31psi front, 33psi rear

PB ROAD SETTINGS

(Same as track except)

➡ FRONT FORKS	
Rebound	¾ turn out from full in
Compression	¾ turn out from full in
Preload	3 lines showing
Tyre pressures	front 36psi, rear 42psi

MAXTON SAY...

If the bike is being ridden hard the forks dive quite badly under braking and can bottom out. Also, they don't have enough rebound damping. We can fit harder springs and revalve to increase rebound damping. We also increase the range of damping adjustment and fit bump springs to replace the existing hydraulic bumpstops.

The rear shock is pretty good. The spring is the right rate for the average weight of rider, but it doesn't have a lot of travel. If that's a worry, a new shock is the answer.

➡ Turns easier and changes direction quicker, but feels nervous at the bars

T595 Daytona

We took a T595 to Donington to muscle the bike around on relatively smooth tarmac in an attempt to get the Trumpet handling sweetly.

We set all the adjusters at the recommended factory settings as a starting point, and it felt like an old barge. It just didn't want to turn, it would run wide, and would drag its guts on the tarmac everywhere.

The first thing we did was add spring preload to the rear shock. As standard the bike had 20mm of static sag. We halved this to 10mm to put more weight on the front and help lift the bike off the ground. A quarter-turn of compression damping was added to the rear shock to slow it when the bike hit bumps. We backed off the rebound damping by a quarter-turn. Up front we added a

line of spring preload. This reduced the static sag from 34mm to 32mm. Out on the track there was a slight improvement, but the bike would still drag in corners.

We ran out of threads on the rear shock so the spring was now at maximum preload. It was only showing about 5mm of static sag. We added the last of the compression damping so it was maxed out too, and hoped for the best.

The front fork got another line of spring preload so now it was showing two lines on the adjuster. Front static sag was now at 28mm.

Out for another session. The rear tyre was showing a bit of wear after the previous stint, and after being heat-cycled a few times it was taking a bit longer to warm up. The bike was turning better and giving a lot more feedback. After two quick laps

the Triumph started to lose rear compression damping. And after 20 minutes it was back to its old self, dragging bits and pieces on the track. The bike would do better with a rebuilt

If you only do one thing
Get the rear shock rebuilt with a softer spring and better damping - you'll really notice the difference. Raise the back end a bit too

shock, especially if it's going to do a lot of track days. An aftermarket rear shock with a ride height adjuster would be even better. The front forks felt OK, but didn't give much feedback. They just float around in no man's land, not letting the rider know what the tyre is thinking of doing.

On the road the bike's track settings made it a little harsh, but the payoff was a more predictable ride. It was extremely stable and never got into any head shakes when pushed to high road speeds.

SPECIFICATIONS

PB SETTINGS

➔ REAR SHOCK	
Static sag	5mm
Compression	max
Rebound	1½ turn out from max
Tyre pressure	32psi (track)
➔ FRONT FORKS	
Static sag	28mm
Compression	1 turn out from max
Rebound	1 turn out from max
Preload	2 lines showing
Tyre pressure	30psi (track)

MAXTON SAY...

The front forks have too soft springs that let them down under braking and too much damping at low speed. We revalve the forks and add our own spring.

The shock can be rebuilt. We find the spring a bit too hard, and the damping's not very consistent. It works well at first but as some standard shocks bounce they get hot and suffer from an internal bleed of oil that robs them of their damping abilities. We rebuild the shock and fit a spring better suited to the riders weight.

T95Si Daytona

➔ Pretty, grunty and effective, but the Daytona needs some serious suspension fettling for hard use



At Cadwell Park the 955 was struggling to hold a good line round all of the corners, especially exiting faster turns like Charlies and Chris Curve. And it was really lazy to turn in – and this felt worse going into the quicker corners.

The first thing we did to sort the bike was to fit some better tyres. We chose Pirelli Evo Supercorsas with pressures set to 31psi on the front and 28psi at the rear.

After scrubbing in the new tyres it was a lot better, but on the faster corners it still wasn't holding a tight enough line. It would run wide on exiting, and felt very unsettled if you were too fierce with the throttle.

We reduced the front compression and rebound by half a turn each. We increased the preload by two lines as well.

To help the bike turn into corners better we adjusted the ride height

up front by lowering the forks through the yokes. We tried lowering them by 5mm.

At the rear end we decided to reduce the preload on the spring because it felt way too firm. We reduced the preload by 6mm.

The compression damping was then turned down by half a turn. There's not much of a range of adjustment between full in to fully off. We left the rebound setting alone because it felt as good as we were going to get it.

Back on the circuit the 955 steered into corners much better. But the bike now had a tendency to drop into the corners and needed some opposite input on the bars to prevent it flopping into the turn.

It was particularly unsettled when turning into and out of the Gooseneck or at the top of the rise towards Park, where the Triumph would flap its bars when the front wheel went light.

This was all due to us dropping the forks through a bit too much, making the 955 feel a little flighty. We went back to the pits sharpish and reset the forks to 4mm, then 2mm and finally 3mm. At this ride height setting the Triumph still felt neutral on the bars but turned much

SPECIFICATIONS

STANDARD SETTINGS

➔ REAR SHOCK	
Preload	12mm of thread showing above locking ring
Rebound	1½ turns out from full in
Compression	1½ turns out from full in
➔ FRONT FORKS	
Preload	5 lines showing
Rebound	1 turn out from full in
Compression	1 turn out from full in

PB SETTINGS

➔ REAR SHOCK	
Preload	6mm of thread showing above top locking ring
Rebound	1½ out from full in
Compression	1½ turns out from full in
➔ FRONT FORKS	
Preload	3 lines showing
Rebound	1½ turns out from full in
Compression	1½ turns out from full in

MAXTON SAY...

The forks' compression is too severe. We alter the valving to increase the rebound damping range and fit harder springs.

The rear feels good on smooth roads but kicks you out of the seat on bumpy roads because the spring on the unit is too hard for the weight of your average rider. This is why the bike handles better when you carry a pillion. We can revalve and respring the existing unit or supply a much better one.

better than it did before and it held a tighter line.

These settings also worked well on the road. The bike steered a lot better and would track the chosen line more accurately, but it still gave a harsh ride when the going got bumpy – especially from the rear.



➔ It's no Blade-beater, but it'll boogie in the bends

If you only do one thing
Drop the yokes over the forks by 3mm and raise the spring preload by two lines. You won't regret it

T955i Daytona

We return to Mallory Park, to set up Triumph's 955i Daytona - this is the version with the double sided swingarm, not to be confused with the single sided model (previous pages). First off, we need to sort out the riding position, because the clutch and brake levers are set too high to be comfortable. In the standard position, your fingers tend to reach up to them, which strains your wrists. The levers can be lowered to a better position by slackening the two bolts that secure each assembly to the bar. Set them so that they are roughly in line with your arms.

The tyres are Bridgestone 010s. While not a dedicated sports tyre, they perform very well on the track. We give them an extra lap or two to warm up, just to be safe. The pressures are set to 31psi (front) and 33psi (rear).



If you only do one thing
Wind the front preload all the way in, as the springs are too soft for track and fast road use. Increase the damping to suit

The Daytona feels well balanced and smooth. It's not until we up the pace a bit that we start to run into problems - the front end dives much too hard on the brakes, and feels vague going into corners. The bike also springs back too quickly, making it run wide (most noticeably at Gerards). The rear end feels choppy and harsh, as if the rear tyre is doing a lot of the work that the shock should be doing.

The first thing to adjust is the fork preload. Initially, we turn it in so there are only two lines showing, but in the end it has to be wound all the way in to the stop. The range of adjustment is good, but

the spring rate really needs to be increased for track riding as it's too soft.

We also increase compression and rebound damping. The compression adjuster, located at the bottom of the forkleg under the brake caliper, is turned in half a turn using a flatbladed screwdriver, while the rebound is turned in three-quarters of a turn, again with a flatbladed screwdriver. The rebound adjuster is located on top of the fork cap.

The rear end feels very harsh. Normally, we would back off the preload a bit, but the standard rebound setting is a bit too heavy (assessed by pushing the back end down and feeling how quick it is to return). We turn the rebound adjuster - located at the bottom of the shock - out one turn using a flatbladed screwdriver to reduce damping, and leave the compression adjuster on standard.

Ultimately, the standard suspension can be made a bit better, but

the front end is still a little on the soft side for track work.

The rear shock's spring and preload aren't too bad, although a better range of adjustment from the damping controls is needed. If you're planning a lot of trackdays, it would be advisable to have the suspension reworked by a specialist.

On the road, the Triumph feels good on the track settings. But it's even better with the fork preload wound back to two lines showing.

The back end settings remain the same as for the track; if you're planning to take a passenger, increasing the rear preload by 5mm at a time until it's right makes sense.

SPECIFICATIONS

STANDARD SETTINGS

REAR SHOCK	
Preload	5mm of thread showing above top locking ring
Rebound	1½ turns out from full in
Compression	1½ turns out from full in
FRONT FORKS	
Preload	5 lines showing
Rebound	1 turn out from full in
Compression	1 turn out from full in

PB TRACK SETTINGS

REAR SHOCK	
Preload	5mm of thread showing above top locking ring
Rebound	2½ turns out from full in
Compression	1½ turns out from full in
FRONT FORKS	
Preload	0 lines showing (fully wound in)
Rebound	¾ turn out from full in
Compression	¾ turn out from full in
Tyre pressures	31psi front, 33psi rear

PB ROAD SETTINGS

MAXTON SAY...

The forks have too much compression, the springs are a bit soft, and they could do with more rebound damping. We can revalve the forks and increase rebound damping, reduce compression damping and fit harder springs to suit the rider's weight.

The standard shock tends to feel harsh and hard on bumpy roads. The problem is in the damping. The unit has slightly too much compression and rebound damping.

Unfortunately, the unit cannot be revalved due to its design, so we would fit one of our own Maxton units.

If you're planning a lot of trackdays, have the suspension reworked

FZS600 Fazer

Cadwell Park provides a good set-up test for any bike, but first we fitted new tyres (Metzeler Sportecs, which give loads of grip and stability and wear better than a dedicated sports tyre) and set the pressures to 29psi rear and 31psi front. Next up we dumped the centre stand for more ground clearance – even on the road it's easy to ground it out and at the track it could easily dig in and lever the rear wheel off the floor. It's only held in with a couple of bolts so it's easy enough to remove.

Out on the track it's only when you pick up the pace that the soft set-up starts to hamper progress. It tends to squat when cornered hard, and it's slow to turn in.

We went up four notches on the rear preload and wound the front in so there was only one line showing

If you only do one thing
Increase the preload front and rear to stiffen the bike up and stop it squatting when you're cornering hard

■ There's not much to adjust on a Fazer, but what there is makes a big difference



To help the bike steer and change direction we raised the forks in the yokes until there was 5mm extra sticking through the top yoke.

Just getting onboard the bike we could tell the difference, the increased preload making it feel firmer and tauter. On the circuit it resisted sagging and squatting into turns which meant it could be cornered harder and even though the footrests were still decking out it was smoother and more predictable.

The change in front ride height made the bike turn and hold a tighter line which really showed through the Gooseneck where it could now be flicked through with more accuracy and less of a pause when rolling off the throttle. Through Hall Bends and Barn the Fazer was quicker than you would have thought and was making yards up on other bikes. Adjusting the ride height did make the front end a little bit nervous, but it wasn't kicking the bars out of our hands, they just felt a bit on the loose side.

We tried the track settings on the road as well. The extra preload gave a firmer, more controlled feel but the change in ride height isn't a step in the right direction. It makes the bike feel twitchy, so we put the settings

back to standard.

Heavier riders would more than likely need to further increase the preload settings too. Tester Bruce is 11 stone and almost at the end of the preload adjustment front and rear, so a heavier rider would probably run out of adjustment.

SPECIFICATIONS

Standard settings

➔ REAR SHOCK

Preload 4th hardest out of 9 notches

Rebound N/A

Compression N/A

➔ FRONT FORKS

Preload 5 lines showing

Rebound N/A

Compression N/A

PB ROAD/TRACK SETTINGS

➔ REAR SHOCK

Preload 8th hardest notch

Rebound N/A

Compression N/A

➔ FRONT FORKS

Preload 1 line showing

Rebound N/A

Compression N/A

Ride height drop yokes by 5mm (track only)

MAXTON SAY...

The forks are a bit on the soft side and need re-springing. We also revalve them to increase the damping and we use the standard weight oil.

The rear shock is basic, but does work well. Although if ridden hard on a track the stock unit does overheat and loses damping. That said you get this on most shocks, so it's only a problem on the track. We could supply a fully adjustable replacement.

Thundercat



■ Never the hottest 600, the Cat needs fiddling for best results

Once again, we take to the road and track (at Mallory) to set up the Yamaha Thundercat. First job is to set the tyre pressures for the circuit: 32psi (front), 30psi (rear).

As standard it feels loose, the front forks diving too much on the brakes, and springing up too quickly when the brake is released. The rear end is okay, apart from a wallowing action when the throttle is wound on; it's like a see-saw action. Exiting the Devil's Elbow it feels severe.

We wind in the fork preload so there's only one line showing. The compression gets an extra turn and the rebound gets one and a quarter.

At the rear we turn the rebound up seven clicks and the compression by a quarter of a turn. The preload goes up one notch to the fourth notch out of seven.

If you only do one thing

Buy something else. No, not really, the Cat's ok, but a bit dull. A bit more fork preload helps stop the front end diving

The extra preload on the front really firms up the forks, and, back on the track, it feels much better into turns. The increase in rebound on the rear shock has eliminated the see-saw effect.

Next, we try raising the fork tubes through the yokes, and find that 3mm protruding through is the best compromise.

With the same settings on the road, the front feels a bit on the hard side and the bars feel a bit wild. So we reduce the fork preload so there are three lines showing, and set the fork tube protrusion back to the standard setting.

It feels much better. Where before it gave a choppy ride (with a bit of lightness thrown in for good measure), it is now almost completely stable as the forks are absorbing the bumps as opposed to hammering off them.

We end up with a slightly softer set-up on the rear, turning the preload back to the standard setting (third notch), and reducing the rebound damping by a couple of clicks. If you were to take a pillion you would need to increase the rear preload by at least two more notches and turn up both the compression and rebound damping.

SPECIFICATIONS

STANDARD SETTINGS

➔ REAR SHOCK

Preload 3rd notch out of 7

Rebound 10 clicks out from full

Compression 2 turns out from full in

➔ FRONT FORKS

Preload 5 lines showing

Rebound 1½ turns out from full in

Compression 1½ turns out from full in

PB TRACK SETTINGS

➔ REAR SHOCK

Preload 4th notch out of 7

Rebound 3 clicks out from full

Compression 1½ out from full in

➔ FRONT FORKS

Preload 1 line showing

Rebound ¼ turn out from full in

Compression 1 turn out from full in

Tyre pressures 32psi front, 30psi rear

Fork protrusion 3mm (excl fork cap)

PB ROAD SETTINGS

(Same as track except)

➔ REAR SHOCK

Preload 3rd notch out of 7

Rebound 5 clicks out from full

➔ FRONT FORKS

Preload 3 lines showing

Fork protrusion standard

Tyre pressures 34psi front, 38psi rear

MAXTON SAY...

The forks have too much compression damping and the springs are too soft. We increase the rebound damping, fitting harder springs to suit the rider's weight and style. We also modify the cartridges of the forks, increasing the range of adjustment in the damping.

For fast use a new rear shock's best - ours is designed to work with new tie bars which give a more constant shock ratio.

YZF-R6

There's only one way to ride an R6 fast – nail it like a two-stroke and plot smooth lines to carry crazy corner speeds. S'easy.

But the R6's twitchy manner can make this riding style tyre-wall hazardous. Time to tame the tempestuous middleweight.

The first session on the track proved the R6 had no major shortcomings in its set-up, but near enough is never good enough.

It had a weird tendency to shake its head while accelerating hard, especially over bumps. This is a known R6 trait, but it needn't be this bad. The bike also tended to chatter and run wide slightly when pushed hard – the much chronicled R6 understeer.

To make the bike turn quicker we need to raise the forks up through the yokes. This would make the bike even more twitchy, so we looked at stability first. A suspension travel



■ You can hang off all you like mate, but if you don't lean the bugger over, you won't get your knee down

If you only do one thing
Increase the rear spring preload and damping for better ground clearance - as standard the R6 drags its arse like a freshly-whipped puppy

check showed both ends were bottoming out. This is easy to check out and, as we found, very important for ironing out problems. Use a cable tie on the forks and put another around the rear shock shaft. Slide them against the moving parts of the units, ride the bike then check the travel. As a general rule, 5-10mm from full compression is about right. Increasing spring preload and compression damping will increase the amount of spare travel and vice versa. If you can't seem to get this right consult someone like Maxton – the spring weight or damping may be wrong for your situation. After our check we increased preload

front and back. This improved stability slightly but both ends were still bottoming, so we dialled in even more preload. By now the front end had 8mm of spare travel, but the rear was still bottoming.

This was when a pattern emerged: as we increased rear spring preload the front end became

more stable. This is a good example of a front end problem being down to the rear. Because the R6 power comes in with such a rush, the rear suspension was being fully compressed on hard acceleration. This left no spare travel, so when the bike hit a bump the suspension bottomed and set the front end shaking. Once

we stopped the rear end bottoming the bike became stable enough to quicken the turn-in. (Note: as we increased the spring preload we increased the rebound damping to

stop it returning too fast).

By increasing the amount the forks protrude through the top yoke the steering head angle can be reduced. This will make the bike

SPECIFICATIONS

PB settings

REAR SHOCK

Static sag	5mm
Loaded sag	23mm
Preload	2nd from maximum
Compression	1.5 turns out
Rebound	13 clicks out
Tyre pressure	28psi track, 40psi road

FRONT FORKS

Preload	4 rings
Sag	24mm
Compression	6 turns out
Rebound	3 clicks out
Tyre pressure	30psi track, 36psi road

steer quicker but reduce stability. When doing this always check for clearance between the fork lower and bottom yoke on full compression. This is very important because if they touch you will crash – we know from experience. Don't do it at all if you are having stability problems or if you aren't confident about holding onto a bike that shakes its head. On the R6 even small changes will make a huge difference to the bike's handling – we dropped the yokes by 10mm.

The bike now turned-in better and held tight lines, even on fast, flat turns, and remained stable and relatively predictable. After Gus and Trev gave the bike the thumbs up, it was off for the road session.

The bike felt as at home on the road as it had on the track so only tyre pressures were changed. It was fine with a light pillion too, but a larger pillion would require one more notch of rear preload – really heavy pillions or very hard riding might benefit from a harder rear spring.

Even with a careful set-up, the R6 will still be lively to ride and landing the front wheel from high-speed wheelies can be scary. So if you ride your R6 hard, fit a steering damper. The R6 is a hardcore bike and any help to tame violent outbursts will increase your pleasure and reduce your pain.

It now turned in better and held tight lines even on fast, flat corners

YZF-R6

On our first session at Cadwell Park's full circuit, the R6 felt great. The Metzeler Rennsports we'd fitted (28psi rr, 31psi fr) are such an improvement over the standard Dunlops – they allow higher lean angles with a good reserve of grip if you go in too fast and have to tighten the line mid-turn.

At the end of the start-finish straight, the left-hander had the R6 running wide and progress through the Gooseneck was steady because of the same problem. When we turned into corners the front dived too quickly and sprang back when the power was fed on.

The rear shock was also too soft – it was squatting too much when the power was cracked on.

Back in the paddock we needed to spanner up the R6. We started by raising the forks in the yokes by 5mm. The preload setting is too soft

Like the front forks, the extra preload demands rebound and compression damping to be tweaked. The rebound adjuster is a sod to reach, but it's easier from the right. It's located at the bottom of the shock and is a knurled knob. Turn anticlockwise to reduce the damping effect – we turned it clockwise four clicks.

The compression adjuster is easy to reach on the end of the remote reservoir at the top of the shock. Adjust it with your flat-bladed screwdriver and turn clockwise to increase damping strength. Half a turn should do it.

Out on the track the R6 was much better through the turns and we could get it on its side quicker and hold a tighter line even with the power wound on exiting corners. Into the Gooseneck the front end gave more feedback and it was easier to flick through the left-hander.

Stability from the front end was still good, and even under hard acceleration the front end remained stable. We did try dropping the yokes by 3mm at the front to see if there was

an improvement. The bike steered even faster but needed more rider effort to prevent the now nervous front end from kicking the bars around. The extra rate of turn demands a committed riding style better suited to racing than track-days. We reset it to 5mm of fork leg protruding through the top yoke.

Our setup makes the R6 easier to ride faster on the track, but on the road it's a bit nervous – nothing a steering damper wouldn't sort, but be wary first time out.

■ This picture demonstrates perfectly why dark visors were invented



If you only do one thing
A bit more spring preload front and rear will help tighten the whole thing up, and stop the forks diving so much on the brakes

so this needs to be increased. We turned it so there were only two lines showing.

Because of the extra preload, both the rebound and compression damping need increasing – an extra half a turn on each. The rear shock preload needs increasing. Use the C-spanner in the standard toolkit which should be under the passenger seat. It's easiest to get the spanner on the shock from the left side of the bike. We turned up the preload three notches.

Now it holds a much tighter line even under really hard acceleration

SPECIFICATIONS

STANDARD SETTINGS

➔ REAR SHOCK	
Preload	position 4 of 9 (9 is firmest)
Rebound	12 clicks from full on
Compression	1 turn out from full in
➔ FRONT FORKS	
Preload	7 lines showing.
Rebound	1½ turns out from full in
Compression	1½ turns out from full in

PB SETTINGS

➔ REAR SHOCK	
Preload	position 7 of 9
Rebound	8 clicks from full on
Compression	¾ a turn out from full in
➔ FRONT FORKS	
Preload	2 lines showing
Rebound	1 turn out from full in
Compression	¾ turn out from full in
Ride height	5mm of fork tube protruding through top yoke (excl fork cap)

MAXTON SAY...

The forks are fine for road use, but on the track they dive badly under braking and may bottom out. And they don't have enough rebound damping. We modify them with harder springs.

We also revalve the cartridges, increase rebound damping range and fit bump springs to replace the existing hydraulic bumpstops. This removes the patter you get when the forks bottom out.

The hard rear spring tends to kick you out of the seat over bumpy roads. We replace it with a spring to suit rider weight and the type of riding you do. The damping in the unit is alright for road use but does lack a little compression damping. This cannot be increased, but if the bike has done a lot of miles a service may improve the quality of the damping. For track use a replacement shock is a better bet.

YZF750R

Quick-steering the YZF is not. It takes muscle to get it onto its side. When it's dragging the pegs it runs two miles wide of the chosen apex and exit line.

What the YZF needs is sharper, more accurate steering. But how? The settings (right) tell most of the story.

There's not enough rear preload adjustment to make a difference, and dropping the yokes down the forks reduced the ground clearance too much. Winding the fork preload all the way in helped but then there wasn't enough rebound damping. A happy medium was reached with

two-and-a-half lines of preload showing and two clicks of rebound.

Compression three clicks back from fully-in slowed the rate of fork dive and gave better front feel. The trade-off was a slightly harsher ride.

Fast direction changes got the rear wallowing. More rear compression (five clicks out from full in) at the back end helped, with rebound at seven clicks off maximum.

Ride height is the key to a sharper YZF. But it also helps if the suspension is in good order. Fork oil should be changed frequently - wheelies and track days cause the oil to heat up, aerate and 'thin'. The

rear shock as mentioned is prone to dying - so if it all goes horribly wobbly and floaty at the back, you'll have to shell out for a new one.

If you only do one thing
Bin the rear shock and linkages - they're poo

■ There's a limit to how good you can get a standard YZF handling - it really needs a new rear shock and linkage



SPECIFICATIONS

STANDARD SETTINGS

REAR SHOCK

Preload	11.5mm thread between top of locking ring and underside of shock top
Rebound	10 clicks out from full in
Compression	10 clicks out

FRONT FORKS

Preload	fourth groove from the top aligns with top of fork nut
Rebound	6 clicks out from full in
Compression	7 clicks out

PB SETTINGS

REAR SHOCK

Preload	16.5mm thread between top of locking ring and underside of shock top
Rebound	7 clicks out from full in
Compression	5 clicks out

FRONT FORKS

Preload	2½ lines showing (8mm from top of preload nut to top of fork cap)
Rebound	2 clicks out from full in
Compression	3 clicks out

MAXTON SAY...

Rear spring rate is quite hard and there's too much high speed compression damping. A softer spring will help here.

The shock can be revalved if it's in good nick but they're usually knackered. Then the only option is a replacement unit. For more ride height a revised rocker linkage to take a shorter shock is the answer.

The forks bottom out under heavy braking because of soft springs. We fit new springs, revalve and replace the mechanical bumpstops to stop the forks bottoming out too easily.

Thunderace

■ The Ace is a seriously underrated fast road tool, especially once you get the suspension sorted properly



Thunderaces are heavy old chaps by today's slimline standards, but they can still just about cut it with the best of the new kids on your block if you set them up properly.

It didn't take us long to find the standard set-up's limits at Donington. It was wallowing badly and dragging its hero blobs everywhere. It lacked feel at both ends and turned-in like a Harley Fat Boy.

We started the treatment by adding two steps of spring preload to the rear shock, and upped the compression four clicks while the rebound was upped three clicks.

The forks got similar treatment to the shock. We turned the spring preload adjusters in another ring, the compression was upped five clicks and the rebound damping got six clicks added. Now we managed to

pass a few people and got the tyres up to a respectable temperature without ripping the hell out of them. The YZF wasn't decking out quite as much now, but we noticed the aluminium end-can had touched down in a couple of places.

There were complaints the bike took a lot of time to settle after you turned it into a corner and someone mumbled: "Man, this thing doesn't let me know what it's doing. I'm not sure if the front is tucking or sticking as the bike turns. It sort of floats." Translated, this means it lacks feedback. So, we added more compression damping front and back to hopefully stop the floating feeling. We added a step on the rear spring and hoped that it would be enough as there was only one position left for us to use.

Now the bike was reborn. It was hooking up and going great.

On the road, the track settings were a bit harsh on the arse but the bike turned so much better that we found ourselves putting up with it. The Thunderace might not be the choice of steed for a race, but with careful tweaking you'll never be last to the Little Thief. Oh yeah, and it'll do all that two-up sports touring stuff as well if you really want it to.

If you only do one thing
Stiffen up the front end to reduce the fork dive - you'll be rewarded with far better feel on the brakes and better turn in

SPECIFICATIONS

PB BASELINE SETTINGS

REAR SHOCK

Static sag	5mm (free play)
Compression	2 clicks off of max
Rebound	3 clicks off of max
Tyre pressure	35psi track, 37psi road

FRONT FORKS

Static Sag	30mm
Compression	5 clicks off of max
Rebound	7 clicks off of max
Preload	2 lines showing
Tyre pressure	33psi track, 35psi road

MAXTON SAY...

We are really big fans of the Thunderace - it used to be a top bike for the TT. In fact, that was one of the first experiences we had with it. It's weight is a benefit on the road as it helps ride quality.

The main problem once you start pushing it is lack of damping front and back. The forks needs to be re-sprung and re-valved because it dives way too much under braking and then bounces off the bump stops. But get 'em revalved and resprung and they're some of the best standard forks out there - the internals are very similar to the R1's forks.

The shock has way too much spring preload and not nearly enough high-speed compression damping - which is why it squats so badly when you open the throttle.

Unfortunately, because Yamaha don't supply any spare parts for the shock, it's not rebuildable, so a high-quality replacement is the answer - it'll cost you for a decent one but it'll be worth every penny.

YZF-R1

Once considered the holy grail of sportsbiking, the R1 in standard form is formidable. With one of the strongest motors and arguably the best suspension of its time (for a road bike), it's a well rounded package that's surprisingly accommodating.

The R1 comes with excellent suspension. But it's lively, and sensitive to small shifts in weight distribution and steering geometry.

Whaddaya know, we're at Mallory. But that's good, as Mallory is not a track suited to the R1, highlighting a slowness in turn-in and a sogginess under power.

In time-honoured fashion John Robinson tests riders Jon and Bruce first by giving them the least appropriate setup. The front carries max preload while the rear is set on minimum. Predictably it handles like a pile of poo. The steering is lazy to the point of not turning at all and as

■ Bruce the Fen Weasel. Like Private Godfrey's sister Dolly, he's only little, but he's very determined...



If you only do one thing

Quicken the steering up by raising the rear preload and firming up the damping settings front and rear - a new rear spring's even better

the back squats dramatically under power, stability is compromised. So much that Jon's had enough after four laps, although Bruce, being a pro, gives it a fair shake.

Having also established that both testers are in fact awake, JR takes the preload off the forks and sends them out again. The difference is immediate - it's beginning to steer, it's still far from acceptable, but enough to take two seconds off the lap times. Jonathan impresses himself, and nobody else, by detecting a lack of rebound damping in the forks. Cornering is far from accurate, apexes but a distant dream.

JR dials more rebound damping

into the forks (four clicks) and sends Bruce out, who goes another one and a half seconds quicker. The bike is beginning to steer, gaining nearly all its time in the twisty Esses-to-Devil's Elbow section as evidenced by the split times.

So JR gives the rear shock some agg. Preload is set to its mid point (standard). It's another improvement of a second a lap for Jonathan, but he's still not impressed. The steering

is better so that the Esses can be approached with more confidence but powering out of the turns is still unpredictable as the rear squats far too much.

Maximum preload goes on the rear shock and Bruce is sent out. He goes only three tenths of a second faster, but that's all in the Gerards to Esses section, meaning he's now able to get the power down. Bruce identifies squat as still

a significant problem, compromising his lap times.

JR tunes this out as far as possible with some extra compression damping in the rear shock and with a little extra rebound damping to balance it and ensure the shock maintains an even stroke under both

compression and rebound.

Yet the steering is still far from razor. To sharpen it further we really need to drop the forks through the yokes - there being no ride height adjuster - but before doing that JR advises we would need to fit gripper rubber than standard. It's a matter

of keeping a balance, doing one without the other is a sure-fire crash opportunity in waiting.

For road use we back the shock preload off to position 10 (out of 12), to give a less choppy ride and stop it kicking the rider out of his seat over serious bumps.

SPECIFICATIONS

PB SETTINGS

REAR SHOCK

Preload max (2 steps less for road use)

Compression 1 click out

Rebound 3 clicks out

Ride height non-adjustable

Tyre pressure 31psi track, 39psi road

FRONT FORKS

Compression 6 clicks out (max 12)

Rebound 4 clicks out (max 12)

Fork height 2.6mm above yoke

top surface

Tyre pressure 33psi track, 35psi road

Preload 6-8 lines showing

MAXTON SAY...

As standard the springs are too soft and there is inadequate rebound damping. A Maxton re-spring and revalve addresses these problems and significantly extends the range of adjustment. Once converted they're as good as the Öhlins found on the R7 and Aprilia's RSV SP.

The rear suspension linkages are well designed, but the rear shock comes with a too soft spring rate, and a lack of compression damping - leading to packing-down and tankslapping problems.

Unfortunately as the rear shock is not of the rebuildable type, the fix is a new shock. Which means a custom Maxton unit or alternative - perhaps a custom-valved Öhlins, (not an off the shelf).

Now it'll power out of corners and shadow race 600s with ease

YZF-R1

After riding the 2000-model R1 on standard suspension settings for a couple of hard laps of Cadwell Park, one thing is clear: the Yamaha is hard to turn in and struggles to hold a tight line.

First thing was to drop the yokes over the forks to put some weight on the front. We initially tried a 5mm fork leg protrusion and found it made an enormous difference to the way the bike steered. Then we tried 10mm, but that was too much. We eventually settled for 6mm of fork leg showing above the top yoke. This simple change improved turn-in and allowed us to hold a tighter line.

Having dealt with the R1's turn-in and line-holding issues it was time to stop the bike's upside-downies bottoming out under hard braking. We adjusted the preload with a 14mm spanner. We tightened a cable-tie around the fork slider and started making adjustments of two

■ Standard R-1 suspension's a pretty good compromise for the road - set it up stiff for trackdays and it'll slap like a bastard in the real world

If you only do one thing

Drop the yokes over the forks by an extra 6mm or so. It might not sound much but it'll sharpen the steering up no end

lines at a time. It was obvious these increments made very little difference. Returning to the pits after each change, the position of the tie-wrap - down at the end of the stanchion - proved this. We eventually ended up with the adjusters screwed completely in.

Compression damping next. We wound it in three clicks, so it was just one click out from full, to help damp the increased spring loading.

Although the bike reacted well to the fork adjustments they still felt a bit on the soft side. The rebound damping adjustment was minimal and the adjuster at the very top of the forks ended up screwed right in

to the stop (rebound adjustment is also made with a flat-bladed screwdriver). Suspension wizards Maxton confirm the forks are a little soft for brain-out riding and recommend uprated springs.

Once we'd finished, the front end felt more compliant and planted when the brakes were feathered and as the R1 was flicked from left to right to negotiate Cadwell's Gooseneck. Tyre choice is crucial.

The R1 we tested was shod with Dunlop D207s. We reduced the pressures to 32psi in the front and 30psi in the rear.

With the front improved the rear shock's flaws were shoved into the spotlight. The R1's shocker needs more preload and more compression. The rear wallows and destabilises the front end when charging through Cadwell's long right-hander Chris Curve. It got so bad that we had to feather off the power to stabilise the bike.

Searching for a solution, first we increased the preload using a C-spanner to click the collar over the notched adjustment. There are a total of nine clicks; we turned it up to seven (just two clicks from the

hardest setting).

Then, holding the bike upright and pushing down on the tail to assess the compression damping, we deduced there was next to bugger-all. We cured this by screwing the adjuster fully in and then backing it off two clicks.

The rear shock's return rate was deemed to be a bit vicious so we increased rebound damping to three clicks from full in.

These adjustments made the Y2K R1 much more stable on the track. Through the 100mph Chris Curve the power could be kept on longer and harder. Turn-in was quicker and more accurate and the forks no longer bottomed out so readily under hard braking. When ridden vigorously on a track the R1's suspension shows it has been compromised for varying road conditions and rider builds, so it's relatively

Much more stable - the power could be kept on longer and harder

SPECIFICATIONS

STANDARD SETTINGS

REAR SHOCK

Preload	position 4 of 9
Rebound	8 clicks out from full in
Compression	9 clicks from full in

FRONT FORKS

Preload	6 rings showing (10mm)
Rebound	4 clicks out from full in
Compression	4 clicks out from full in

PB SETTINGS (track)

REAR SHOCK

Preload	position 7 of 9
Rebound	3 clicks out from full in
Compression	2 clicks out from full in

FRONT FORKS

Preload	turned all the way in
Rebound	turned all the way in
Compression	1 click out from full in
Ride height	6mm of fork leg protruding through top yoke
Tyre pressures	32psi front, 30psi rear

MAXTON SAY...

The fork springs are soft for track use and tend to bottom out under heavy braking. Also, they don't have enough rebound damping.

We fit harder springs, revalve and replace the existing hydraulic bump-stops with spring bump-stops.

The rear spring is a bit soft and there's not enough compression damping. There's a fault with the unit as well - over the first 5mm of travel there's no comp damping at all. We can't cure this problem by revalving - the best option is to replace it.

easy to sharpen up for the committed trackday addict. However, when these settings were tried on the road it felt very nervous and the handlebars were kicked around by bumps. Next stop Tankslappersville, so fit a good steering damper if you try these settings on the road.

YZF-R1

Anyone that's ridden an R1 in anger on the track will know that it is capable of biting back. A combination of light chassis and outright power can make it a right old handful. Some of the R1's bad manners come from an enthusiastic throttle and too many revs. The best way to ride the R1 is to not over rev it. Try shortshifting at 8,000rpm exiting turns, and the R1's motor will punch it out with more control and speed while being more stable.

Fitting suitable tyres for the track is essential. We've opted for Pirelli Diablo Corsas, set for the track to 31psi front and 30psi rear.

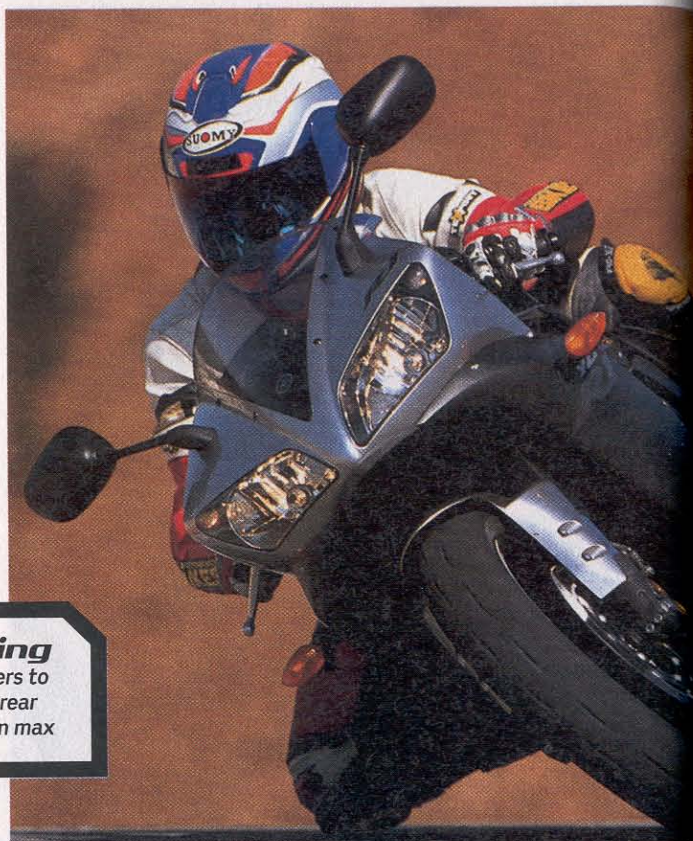
After settling in and warming up the tyres, it's soon apparent that we need to come in and make some changes. Both the front and rear are too soft – the front end dives too

If you only do one thing
Stiffen it all up on the damping adjusters to help control the over-soft springs. The rear compression adjuster will need to be on max

much under heavy braking and gives poor feedback when exiting corners, more so on the slower ones. Also it is reluctant to turn in at higher speeds when trailing in on the brakes. The preload is also too weak on the rear spring, this needs increasing to stop the bike squatting when cornering hard.

We increase the fork preload by four lines, then increase the rebound damping – ¾ of a turn out from full in is the best setting. Compression damping gets another half turn too.

The first thing to do with the rear shock is increase the preload by three more notches. On our R1 it takes an age for the back end to spring back if the rebound is fully in. We settle for ¾ of a turn out from full in. The compression adjuster is at



For a supersports bike the R1 is set up very soft – it needs properly reworking to get it racetrack fit



The current R1 is the best yet, but the suspension's still a compromise and can easily be made heaps better

the top of the shock. We turn this fully in but it makes hardly any difference. We leave it fully in on the assumption that it has a poor range of damping. To help the bike turn in we try dropping the fork yokes down the tubes by 3mm. This helps the R1 turn in better and hold a line more accurately, but the trade-off is less stability. On the track this isn't a problem – just hold on tighter. But when we venture out on the road it

makes the bike feel somewhat nervous and flighty at the bars, so for road riding we recommend restoring it to standard. On the road the track settings feel a bit firm, only working well on smooth and even roads. We soften the preload by two notches on the rear, and wind out fork preload by two lines to give the R1 a bit more compliance for road riding. Tyre pressures are increased to 34psi front and 39psi rear.

SPECIFICATIONS

STANDARD SETTINGS

REAR SHOCK	
Preload	4th notch out of 9
Rebound	2 turns out from full in
Compression	2 turns out from full in
FRONT FORKS	
Preload	6 lines showing
Rebound	1½ turns out from full in
Compression	1½ turns out from full in

PB TRACK SETTINGS

REAR SHOCK	
Preload	7th notch out of 9
Rebound	¾ turn out from full in
Compression	fully in
FRONT FORKS	
Preload	2 lines showing
Rebound	¾ turn out from full in
Compression	1 turn out from full in
Tyre pressures	31psi front, 30psi rear

PB ROAD SETTINGS

(Same as track except)

REAR SHOCK	
Preload	5th notch out of 9
FRONT FORKS	
Preload	4 lines showing
Tyre pressures	34psi front, 39psi rear

MAXTON SAY...

The front springs are a bit soft, and there's not enough rebound damping. We fit harder springs, revalve the cartridges to increasing rebound damping and replace the hydraulic bumpstops with springs to reduce patter. The rear spring's a little weak for fatties. Compression is a bit weak as well – it tends to sit down a little when exiting corners, making the front feel light and twitchy or nervous on bumpy roads. You cannot cure this problem by revalving the unit and therefore all we can do is supply you with a replacement Maxton unit.

Try shortshifting at 8k – the R1 will punch out of turns with more control

