



SCREAM IF YOU WANT TO GO FASTER


The KR-1S and ZXR400 were the sharp end of Kawasaki's supersport and production racing efforts. Road riders reaped the benefits in the 1990s... and still do.

Words: Ben Wilkins
Photos: Paul Bryant

The late 1980s and early 90s were pure heaven for any rider with affordable performance on their mind. The early years of the decade had seen the passing of the 250cc learner law and with it the decline of the performance 250. In 1986 Yamaha threw down a new gauntlet in the shape of its TZR250 parallel twin that gave 125mph performance all wrapped up in a box-section alloy frame set a new bar and revived the class. Kawasaki responded with the KR-1/KR-1S and the ZXR400.

These two bikes represented the best of Kawasaki's intent to conquer its domestic 400 series and the UK's

Supersport 400 class in the UK, not to mention reintroducing the concept of small capacity performance machines. Although these were seen by some as first bikes for new riders they also showed riders of litre-class machines that capacity could be countered with razor-sharp handling.

Both of these bikes were state-of-the-art and that art had changed rapidly in the late 1980s. High-revving screamers, both making around 60bhp, that were neck and neck on the race track and in the showroom sales chart but they go about their business in completely different ways. Together they are Team Green. 

KR-1S

Kawasaki built its reputation on crazy two-strokes, but for most of the 1980s Kawasaki UK was focused on the four-strokes and didn't import anything bigger than the KMX200. So while the others were bringing in RG250s and 500s, RD350s and 500s and NS400Rs, Kawasaki fans could only drool over pictures of the 'not-coming-to-Britain' KR250.

Thankfully, Kawasaki UK relented in late 1988 and announced it was bringing in the all-new KR-1: a parallel twin 250 with an aluminium box-section frame that raised the game. In its debut year the KR-1 dominated both Supersport and Proddie racing.

Just 12 months later Kawasaki upped the game again with the KR-1S. Driven by the need to stay ahead of the pack in the Japanese Sport Production series (the Japanese equivalent of 400 Supersport), the bike evolved and the spec change between the KR and the 'S' was significant. Among the many mods, Kawasaki did away with the cylinder liners in favour of Nikasil plated

aluminium barrels to save weight and improve thermal efficiency, and thus tolerances. Bigger wheel rims allowed the use of the latest sticky radial tyres. Exhaust ports raised, KIPS power-valves modified, new pistons on the inside and new exhausts tuned for more top-end power that weigh in 3kg lighter mainly due to aluminium silencers.

However, that's all history and the two-stroke 250 class has slipped into annals of history. Today the KR-1S is an appreciating classic that has a hard core and dedicated following of two-stroke enthusiasts. It's easy to see why the KR is a popular machine among both those who want to ride and those who want to restore. Before I go any further I must divulge that I owned one of these in the late 1990s in the white, green and blue colour scheme. However, the black and green colour scheme of this unrestored example is stunning, and the one I really always wanted to own. That out of the way, the fact that the bike could scream its way to 139mph, making it the fastest production 250 ever built, only adds to the bike's kudos.

The most spacious of the quarter-litre strokers



Centred rev-counter shows race design



These are still awesome today




140-section rear limits tyre options

As a six-footer, the KR is the only post-1985 250 that I can comfortably ride. The rest are just that bit too small. Of course, they're all small but this is the least small. On to the riding experience. A bit of choke and a prod on the short kick-start fires the KR into life. The engine feels docile yet quite torquey at low revs and sweeps up to 6000rpm where it stutters slightly before taking off like a scalded cat from 7000rpm. Coinciding with the 7000rpm rush is a change in exhaust note from docile to crisp and raucous. To my ears this is one of the sweetest and most purposeful sounding two-stroke parallel twins that has ever graced our shores. Chasing the revs on this bike is a pure GP experience. The revs build strongly all the way from 7000rpm to the 11,500rpm redline and keeping the engine singing between these points is incredibly addictive.

While the chassis doesn't have upside-down forks or banana swingarm bling

of the RGV250 competition, the KR's chassis is compact and stiff. The KR was the mainstay of 400 Supersport racing in the UK for years. CMM contributor Stan Stephens tuned the team Kawasaki bikes that so narrowly missed taking the title with John Reynolds aboard due to a broken collarbone.

The braking package was lauded back in the day and I have to say the brakes are as good as some fitted to sports bikes now. They're powerful and progressive. Unfortunately they're just a little too much for the standard fork setup. The forks are soft on the compression damping with a tad too much rebound, meaning they dive under braking and then stay down to give chatter over bumps. With only preload adjustment on the forks it takes a mix of springs and oil weights/level to tune it out for track days or racing, but for road riders they're more than capable. 



That's supposedly a pillion seat...



No frills but these work oh so well

Carbon silencers are non-standard



SPECIFICATION

1989 KAWASAKI KR-1S

Engine	249cc, water-cooled, two-stroke, parallel twin
Bore x stroke	56 x 50.6mm
Fuelling	2x Keihin PWK 28mm
Compression ratio	7.4:1
Power	59bhp @ 10,500rpm
Torque	27lb-ft @ 8500rpm
Ignition	Electronic
Wheelbase	1365mm
Brakes	Twin 300mm disc (f), single 197mm disc (r)
Tyres	110/70 x 17 (f), 140/60 x 18 (r)
Weight claimed	131kg
Performance	139mph

Use of pink was all the rage at the time



ZXR400

The first of the ZXR400s was launched in Japan in 1989. The 400H1 was a miniaturised facsimile of the 750H1 we saw on British shores in the same year. The H-models were never officially imported into the UK but the later models were sold in showrooms alongside the KR-1S. The ZXR had a huge price advantage over the Honda NC30 and Yamaha FZR400RRSP that were also officially imported. Listed at a huge £1800 cheaper than the NC30 the ZXR sold well. To put the Honda's price into perspective, the NC30 was £700 more than the GSX-R750 of the day.

Despite being a popular machine throughout the 1990s, the ZXR seems to have fallen off most motorcyclists' radar. That's a crying shame because the ZXR has many strong points that make it a better prospective buy than many so called 'grey' import 400s of the same era. First and foremost is the fact that

you can walk into any Kawasaki dealer and order parts for the bike. That's something that makes ownership just that little bit easier.

The ZXR is a far larger and more substantial package than the KR-1S. Where the KR feels tiny and weightless, the ZXR just feels small and easy to control. The upside-down front forks and brakes on this bike are among the best I've used. It's at this point I should admit to also having owned one of these; a supersport 400 racer. It was tuned to just over 70bhp but still completely reliable. No other mid-capacity machine of the era has a front end with such great control and feedback despite only being adjustable for spring preload and rebound damping.

The ZXR might not have a V-four engine or the single-sided swingarm of Honda's NC30/35 but it does have Hoover tubes from the fairing to the tank and that in itself makes the bike feel like a pure racer. Despite the lack of fripperies



Headlight offers reasonable performance



14,750rpm redline encourages revving



Underslung Tokico rear caliper

Mid-corner speed is what this is good at



Wing-shaped pillion grab rail



Standard silencer is quiet but sounds great



Great on the brakes, the ZXR's front end is the business


“WHERE THE KR FEELS TINY AND WEIGHTLESS, THE ZXR JUST FEELS SMALL AND EASY TO CONTROL”

the ZXR is the fastest of the 400s with a 140mph top speed. Don't forget that this was the basis for Kawasaki's production racing efforts.

As a road bike the ZXR was never quite as sexy as the V4 Honda but it is more suited to bigger-framed riders and, importantly for racing, eminently more tuneable at a reasonable cost.

This particular machine has only done 770 miles having been stored after a low speed tumble by the restricted licence owner. How do I know? The bike when we picked it up only ran on three cylinders and a splash of fresh fuel didn't fix the

problem so the carbs were stripped and cleaned. A coating of old fuel varnish showed they'd not been drained when the bike was put away – and the restrictor plates between the carbs highlighted the owner's licence status.

Carbs cleaned the bike ran on all four. With the redline on the clocks set at a heady 14,500rpm there are a whole lot of revs to play with. Below 6000rpm the engine has a good degree of tractability courtesy of its capacity advantage over the KR-1S. Open the throttle wide in the lower part of the rev range though and you'll either have to wait a while for the revs to build to six grand or knock it down a gear or two if you want make rapid progress. From 6000rpm to 10,000rpm the engine pulls well but it's from 10,000rpm to the 14,500rpm redline that the ZXR really flies. Keeping the revs high and taking advantage of the bike's beautifully balanced handling rewards with a back-of-the-neck tingle – and all without the ridiculous speeds of larger capacity machines. The beauty of a 400 is that you can use all that the engine has in the lower gears and you don't have to be worrying too much about it biting you. 



Forks are adjustable for rebound and preload

SPECIFICATION

2002 KAWASAKI ZXR400

Engine	398cc, water-cooled four, four-stroke
Bore x stroke	57 x 39mm
Fuelling	4x Keihin 32mm CVK
Compression ratio	12:1
Power	60bhp @ 13,000rpm
Torque	27lb-ft @ 12,000rpm
Ignition	Electronic
Wheelbase	1385mm
Brakes	Twin 310mm discs (f) single 240mm disc (r)
Tyres	120/60 x 17 (f), 160/60 x 17 (r)
Weight claimed	159kg
Performance	139mph



Hoover tubes ape ZXR endurance racers



BUYING

Both of these models were a mainstay in Supersport racing at both club and national level. Buying either means you really do need to look carefully to ensure you aren't buying an ex-racebike that's wearing fresh bodywork. The normal clues are bodywork that looks far cleaner and newer than the rest of the chassis parts. Are there marks on the wheels from lots of tyre changing? Damage to the frame or forks that's inconsistent with the surrounding parts like indicators etc. Basically, ask lots of questions if there are scratches on the cycle parts that don't match the bodywork or if the mileage looks extremely low compared to the condition of the rest of the bike. The chances are it's done a lot of miles around a racetrack without the clocks fitted. The often cited clues of drilled sump plugs and caliper bolts are easy to change so don't just assume the bike isn't an ex-racer because none of them are drilled.

The KR-1S has its own specific issues that have been rectified over the years. The pistons on early models had ring locating pegs that fell out and made a mess of the cylinder and piston. New

pistons were issued by Kawasaki. Rather than repeat the information here, turn to page 74 for Stan Stephens' critique of the KR-1S engine.

Where there was once an abundance of worn KR's in the classified pages of the magazines for less than £800, there are now few to be seen at all. The ones that do come up for sale are often snapped up quickly. Expect to pay £1000 for a bike that'll need plenty of cosmetic work, possibly more, up to £2500 for a very tidy example.

The ZXR400. In road as opposed to race trim, has a robust engine with a reputation for reliability. That said, at around 20,000 miles the camchains can need replacing and it's also at around this mileage that head gaskets have been known to let go. Once replaced they'll go on for many thousands of miles of screaming without further issue. In terms of price a tatty but sound example can be had for £1000 and a tidy machine for £1800. This machine, with only 770 miles on the clock that's as new (barring a couple of marks on the alternator cover where it fell over at a standstill), is up for £3995 from Rescoogs. Expensive, yes, but really only just run in.

CONCLUSION

Both of these bike models were once the frontline of Kawasaki's racing effort. They both took wins at the weekends and racing fans rode them to work during the week. There are few bikes that offer such a close experience to a racing machine that these two deliver. Both need their engine working hard to really get the best out of them. The ZXR is more flexible and better suited to larger riders and will go for tens of thousands of miles without needing new rings while the KR offers a pure GP experience in terms of sound, weight and smell but at the expense of more regular engine maintenance. Two-stroke or four? You decide. ☺

CONTACTS

www.zxrworld.co.uk
www.kr-1s.co.uk
www.stanstephens.com

THANKS

Andy Bolas for his lovely KR-1S. Rescoogs for the ZXR400 (07955 548449).



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KAWASAKI KR-1 & KR-1S

Kawasaki's diminutive KR two-strokes have potential for over 130mph. Stan Stephens explains how to keep them in fine fettle.

When the KR-1 came out in 1988 everyone was Proddy racing the TZR250; everything literally changed overnight. For the next three years the KR-1, and subsequently the KR-1S, ruled the roost. Unlike today – where there are only the Supersport 600 and Superbike classes at British Championship level – in the 1980s there was also the Supersport 400 British Championship, which was incredibly important to the manufacturers' small bike sales.

Noticing the success we were having at club-racing with the KR1 we were contacted by Kawasaki to tune and prepare engines for the works team. On the 'Stan Stephens/Team Green' KR-1 John Reynolds so very nearly won the British SS400 Championship. Those were heady days and it was a lovely little bike.

The KR1/S engine unit is tiny; the complete unit weighs less than 30 kilos. If only Kawasaki had updated it or made a 350/400 it would have sold all it could make. Many parts for the KR1/S are no longer available and a lot of my work consists of making or obtaining alternative parts to keep them in top condition.



The KR-1S engine is compact and looks great after a refresh

CRANKSHAFT

Kawasaki only ever sold the crankshaft complete, there were no parts available to overhaul them. Over the years I have managed to source nearly all the parts to rebuild them, including the crank

seals. For the left-hand and centre main-bearings I use TZR bearings and for the right-hand an LC350 item. I use Kawasaki KX125 motocross con rods and big ends. To build the cranks I have made a special jig which also times up the centre balance-shaft gear (photo 1).

On many of the KR-1/S cranks sent to me the centre main bearings are loose and have worn the centre shaft, so I have made some new centre shafts to solve the problem (photo 2). The right-hand primary gear is only a press fit, so I always tack-weld them on assembly (photo 3).

PISTONS

With standard Kawasaki pistons never attempt to smooth them or the cylinder head with emery cloth or wet and dry. The pistons and head are ceramic coated onto very soft alloy and you will inevitably remove the coating. The result will be detonation. The genuine pistons are no longer available from Kawasaki but the Mitaka pattern piston kits are okay.



Stan's special KR crank jig



Remanufactured centre shaft



Primary gear is tack-welded on



Bushes prevent the KIPS valves rattling

CYLINDER HEAD AND KIPS VALVES

The KIPS power valves and the linkages are right behind the front wheel and as such suffer from a diet of road dirt and salt. The KIPS valves wear in the head too and I make phosphor-bronze bushes to stop them rattling (photo 4).

Be very careful when removing the KIPS valves from the barrels and when removing the countersunk screws that locate the pulleys and arms. The KIPS valves are heat-treated cast alloy and are very brittle.

All four KIPS valves are the same and ensure you grease them before assembly. You must put the head-gasket on the head before you fit the KIPS valves to the head.

The Kawasaki workshop manual does not explain how to assemble and fit the KIPS linkage. It's simple to do but very difficult to explain, but here goes:

NEVER TRY TO SMOOTH THE STANDARD PISTONS WITH WET AND DRY



Gearbox bearing must be fitted when assembling the crank cases



This is how the KIPS linkage should look upon reassembly

1 When refitting the KIPS system notice all four alloy pulleys and arms are different and that two of the small connecting rods are the same but one is a different length.

2 Assemble the KIPS valves in the head with the flats on the KIPS spindles facing roughly forward. Fit the two pulleys on the centre KIPS valves. The pulley with 'open' and 'closed' on it goes to the side with the power valve timing pointer cast in the head. The two outer arms are different and are fitted with them facing inwards. The two connecting rods of the same length go between the pairs of valves and the shorter one goes diagonally between the two pairs of valves (photo 5). When fitting the countersunk screws, holding the pulleys and arms

to the valves, make sure the flats on the power valve spindles go towards the heads of the countersunk screws.

3 When the KIPS valves and linkages are assembled check it is all timed up correctly. Turn the pulley to the open position and look up the exhaust ports to make sure the valves have opened the exhaust boost ports. Turn the pulley to the closed position and check the boost ports are closed. Remove the KIPS side chambers and check the hole into the exhaust port is open.

ASSEMBLY TIPS

The engine unit features a cassette gearbox so the engine is assembled before fitting the gearbox but do not forget to fit the gearbox bearing when assembling the crankcases (photo 6). Do not forget to time-up the balance gear with the centre crank gear; just line-up the dots.

Always fit new O-rings and grease them on the steel water-pipe and be careful not to dislodge the O-ring when fitting the clutch cover.

Make sure the plastic sleeve in the middle of the kick-start spring is fully located or the clutch casing won't go on. When fitting the clutch casing turn the water-pump impeller to locate the gears.

Now this is very important – when fitting the barrels and head notice the barrels have only one dowel in each but the head has two dowels to each cylinder. Fit the barrels but do not tighten the base nuts. Fit the head gently, then move the barrels until the four head dowels line-up then lightly tighten the head bolts. Fully tighten the base nuts and then torque down the head bolts. ☺

Words & photos: Stan Stephens