

MIRA  
FILES

# Little BELTER

Kawasaki's GPz305 twin, launched in 1983, was a brave move: a bike that matched the head-banging Yamaha 250LC for speed but with refined performance and low fuel consumption. Was that enough? asks John Nutting, who tested the bike at MIRA.

There are those who, back in the dark days of the early 80s when the powers that be first introduced more complicated ways of getting your bike licence, mourned the end of the UK's regulations that limited novices to bikes of less than 250cc before they passed their test. After all, it had produced machines like the RD250LC – a ton-plus bike on a good day –

and a lively market for a wide range of less dramatic yet very practical alternatives. Of course it was the Elsie's red rag being waved in the face of the face of the legislative bull that killed off the 250cc class in the UK. Too many young guns were being wiped out, so in 1982 basic training on 12bhp 125cc bikes was introduced, even though the industry had

lobbied for a more logical power limit on bigger bikes, as was successfully being used in Germany. Scrapping the old 250cc limit did however have a silver lining. It enabled manufacturers of four strokes to consider the idea of upping the capacity of their quarter-litre bikes in the quest for more performance that would match the two-strokes, producing little

gems'like Kawasaki's GPz305, a four-stroke six-speed twin. Taken on face value, this was a remarkable package that, unusually, matched performance, economy and wieldy handling. It could top 100mph, cruise smoothly at 80, return a fuel consumption of up to 70mpg and

also provide an exciting element of flickability. And not for a silly price. Trouble was, would aspiring riders think logically once they'd gained their full licence after riding a 125 and consider the rather novel 305 appellation in preference to a more ballsy 550 sports bike? After all, the

PERFORMANCE COMPARISONS						
	ENGINE TYPE	MAX	TEST	TOP	QUARTER	FUEL
		POWER	WEIGHT	SPEED	MILE	MPG
		BHP/REVS	LB	MPH	S/MPH	
Kawasaki GPz305	ohc twin	36/10,000	385	100.7	15.1/84.6	63.7
Yamaha RD250LC	ts twin	35/8,500	371	98.8	15.4/83.9	41.6
Honda CB250RS	ohc single	26/8,500	313	89.7	16.7/75.8	65.0
Suzuki GSX250E	dohc twin	27/9,500	335	89.7	16.8/75.9	69.4





## KAWASAKI'S GPZ305 ON THE INTERNET

Lothar Conrad runs a German-based website about the Kawasaki GPZ305 after he bought a sixth-hand machine with 63,000km on the clock four years ago.

There was very little information about the bike and, worse, no service manual that he could find.

Lothar, who describes himself as network specialist for IP routers and high speed internet connections, decided to construct a German-language website to gather information and publish it for other owners.

The base of this is a forum which now includes hints and tips on how to keep the bikes running.

"I have only networking knowledge and a little basic html knowledge," he says, "but I succeeded in programming the website and, with luck, I was able to bring up the forum with PHP and SQL. Fortunately I have some web space for that."

"So the lack of a good service manual has led to a useful website, which has some hardcore-users in the forum. I don't ride the bike very often, but I like it very much, even if it looks so ugly and has reached now more than 80,000km, following the fitting of a spare engine."

"My engineering expertise is not professional. I can grab a screwdriver at the right end, but I am not a mechanic nor do I work in this area."

Fuel consumption, says Lothi, is usually between 3.2 and 3.5 litres per 100km, which is a remarkable 88mpg or more. If the consumption drops to about 65mpg, he says, then you should synchronise the carburettors. There should be more measurable oil consumption between changes, which should be around 2000 miles or 3500km, or less if possible.

The engine will last for more than 100,000km (62,000



miles) despite its high-revving nature. Long life depends on regular and frequent oil changes. Avoid revving the engine when it is cold: the cylinder-head bearings are being lubricated with old oil from the last time it was used.

The final drive belt used on the later versions of the GPZ305 will last more than 25,000 miles (40,000km) and is said to benefit from the application of a little vegetable oil. While it's possible to retrofit a chain on the belt-drive model, you can't change it the other way for some indeterminate reason.

Conrad's website is at [www.gpz-305.de](http://www.gpz-305.de) while the forum is at [http://www.lothi.org/forum/gpz-305/album\\_personal\\_index.php](http://www.lothi.org/forum/gpz-305/album_personal_index.php)

There is also an English Yahoo-group for the GPZ305: <http://autos.groups.yahoo.com/group/GPZ305Owners/>

305 was small and compact, even compared with other 250cc twins. It just lacked the presence of the bigger bikes.

If not they'd be missing a trick. It was the very fact that the 305 had been derived from what was already an excellent 250, the Z250 Scorpion, that made it so potent.

Kawasaki's range of 250cc four-strokes had been launched in 1979 to compete with the likes of Honda's CB250 Super Dream, Yamaha's XS250 and Suzuki's GSX250, all of which were also offered as 400cc versions. That made them big. But the Kawasaki was designed purely as a 250 from the start, enabling it to be smaller overall.

First model was the Z250A1, powered by a newly-designed overhead-camshaft twin with a 180-degree crankshaft giving that same appealing warbly exhaust note of early Hondas. Difference was that the Kawasaki came in a nimble chassis and the engine was rubber mounted, so the rider could use the full 27bhp up to its 90mph top speed without suffering from tingling toes.

A year after its launch, the Z250's image was boosted by the adoption of cast-alloy spoked wheels and disc brakes from and rear, with the option of a works green livery version celebrating the brace of world 250cc road racing titles won from 1979 by Kork Ballington. The was followed in 1982 by the more highly tuned Z250A3 Scorpion, featuring a single-shock Unitrack rear end and the same swoopy styling as on the GPZ550 complete with a rectangular headlamp and, for the first time on a mass-produced motorcycle from Japan, a toothed-belt final drive instead of a chain. With 33bhp on tap, most ever offered from a mass-produced 250cc four-stroke parallel twin, the Scorpion was said to be good for 93mph.

But the early models were blighted by problems with the valve gear. Wear in the rocker spindles and their supports were repaired under warranty. Redesigned spindles were introduced. Then in 1980 crankshaft failures were reported, and cranks with larger oilways were introduced. High oil consumption forced the redesign of pistons and rings. And so it continued. Camshaft side play would result in wear enough to need a replacement cylinder head. Carburettor vacuum diaphragms would split and valve stems break, though this latter problem may have been related to the earlier rocker and camshaft wear.

In short, the early 250cc twins gained an understandably poor reputation. And not surprisingly,



buyers' guides, even in the early days, recommended that riders avoid machines with engine numbers below AE032534 or BE0001690 made before 1982.

Kawasaki got the message, and though the GPz305 when launched at the end of 1982 looked like a cosmetic update of the Z250A3 because it used the same swoopy bodywork, it was in fact a much more comprehensive redesign with significant changes to the engine and chassis encapsulating the GPz philosophy found on the bigger models in an entry-level package that, at £1249 was priced at just £100 more than Suzuki's GSX250E. A measure of the Z250A3's dwindling appeal was that Kawasaki listed it at no more than £829.

Lucky for Kawasaki, once the press had overcome their reticence in trying out the GPz305 they raved about its revitalised performance and handling. Okay, it still looked like a 250 on steroids but this was a lightweight that punched way above its weight.

Bringing the styling in line with the bigger GPz models, the bodywork in which the fuel tank and side panels were linked were finished in red along with a matched neat bikini handlebar fairing. Under the skin the frame was a more substantial tubular-steel with a duplex cradle matched to a triangulated upper spine in which the steering head angle had been changed from the A3's 63 degrees to a steeper 63.5 degrees, imparting light and neutral steering.

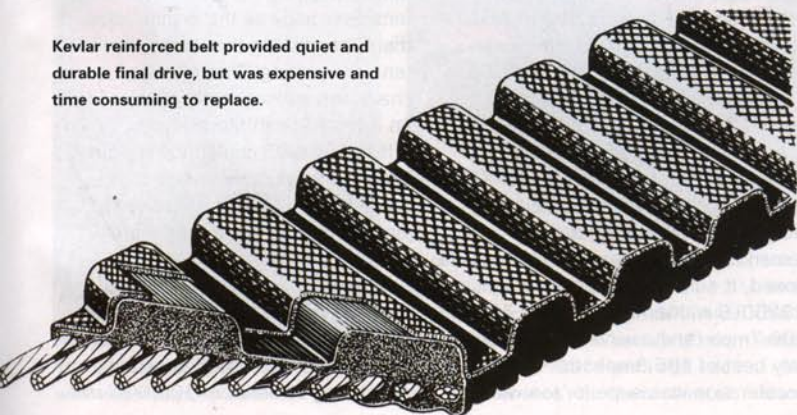
Rear suspension was up-to-date with a vertically-mounted single spring-damper unit – dubbed Unitrak – mounted behind the engine and compressed by the movement of the rectangular-section swing arm by a frame-mounted lever and two links.

This was in the early days of single rear shocks so the specification wasn't comprehensive: just a preload adjuster. And neither were the bushes in the linkage provided with lubrication points. So, the only way to ensure that the suspension operated smoothly was dismantle the linkage



“IN TOP SPEED, THE GPZ305 SURPASSED YAMAHAS RD250LC WITH A FLAT-OUT MEAN OF 100.7MPH”

Kevlar reinforced belt provided quiet and durable final drive, but was expensive and time consuming to replace.



#### PERFORMANCE DATA

All figures compiled at Motor Industry Research Association's proving ground, Nuneaton, Warwickshire.

MODEL	Kawasaki GPz305
DATE OF TEST	April 1983
REG NO	na
MEAN TOP SPEED	100.70mph
BEST ONE-WAY SPEED	105.45mph
NORMALLY SEATED (MEAN)	90.50mph
STANDING QUARTER-MILE (MEAN)	15.07sec/84.65mph
BRAKING DISTANCE FROM 30MPH	na
SPEEDO ACCURACY, ACTUAL MPH AT INDICATED	
30	26.9
50	44.3
70	63.6
OVERALL FUEL CONSUMPTION (MPG)	56.9mpg



occasionally for cleaning and regreasing the bushes.

Up front the telescopic fork came with pressurised air to complement the springs, enabling the rider to tune its behaviour to taste. While the bike felt reasonably nimble in most circumstances, in more excitable moments on demanding road surfaces it would lose the plot, especially under braking.

To complement the 150mm of travel, the fork was set with a 10psi air pressure in each leg in a recommended range from 8.5 to 11psi. It was clearly too soft so I used a small syringe type pump (none was supplied in the tool kit) to crank it up to 15psi. Tightening up the rear end called for careful application of a drift and a hammer to increase the preload on the shock.

It did the trick, stabilising the machine when being used in a more fiesty manner and enabling the potent front brake to be used to its potential without any pogoing. For the GPz305, Kawasaki had employed a more refined set up than the inappropriate but fashionable large-diameter single discs front and rear used on the Z250A3. This was a pair of potent 240mm discs up front matched with the same 160mm drum used on the Z250 Scorpion.

In concert with the excellent Dunlop tyres, you could haul up the bike in howling stops in complete control, and though some thought it



Kawasaki offered a range of stylish clothing to match the GPz livery.

overbraked they also appreciated their progressive behaviour in rain. The only flaw in the design, as it turned out later, was that wear rates were very high.

Slotted into this chassis was one of the most free-revving parallel twins ever offered by Kawasaki. Like the 250s, the GPz305 used horizontally-split crankcases with the 180-degree crank supported in ball bearings, the rods spinning on needle bearings. Capacity was upped to 306cc by using bigger 61mm pistons with an oxide coating to minimise wear. The cylinder head used bigger fins than on the 250 and larger combustion chambers with the compression ratio upped to 9.7 to 1. Raising the power peak to 36bhp at 10,000rpm (and an 11,000rpm red line), the valve opening duration and lift were both increased to 280 degrees (from 270deg) and 8.35mm (from 7.85mm) respectively. Ignition was also changed to a capacitor discharge set up, triggered from the end of the generator rather than from the end of the camshaft as on the smaller engines.

But it wasn't all top end power. There was enough poke at 3000 in third or fourth for feisty town wriggling while out on the open road the use of the peak power brought up 74mph in fourth and 86mph in fifth. Cruising at 80mph with 8000 on the clock (and about 10mph in hand) was a breeze, particularly because the rubber mounts on the front of the engine absorbed any of the modest vibration the crank might have been generating. In practice, the engine's only annoyance was that it would take so long to warm up.

At MIRA's timing straight, the engine's ease of use and the bike's modest (for the period) tanked up weight of 385lb contributed to remarkable performance. In top speed, it surpassed Yamaha's RD250LC with a flat out mean of 100.7mph (and a wind assisted one-way best of 105.5mph. Its acceleration was superior too with a

standing quarter-mile time of 15.07 seconds with a mean terminal speed of 84.65mph.

What really made the performance impressive was that it didn't have to be paid for with heavy fuel consumption. Throughout the test the GPz305 just sipped the fuel through its CV Tekei carbs, giving a useful range of well over 220miles and an average of 64 miles to the gallon. Those were the days.

In its original form, the GPz305 came with a chain final drive, the gearing have been raised compared with the 250 versions. But for its second year of manufacture, 1984, Kawasaki changed to a toothed belt. This was a brave move because it goes against the grain of motorcycling lore. Riders are also suspicious because it's also a chore to change the endless belt because the whole swing arm has to be removed.

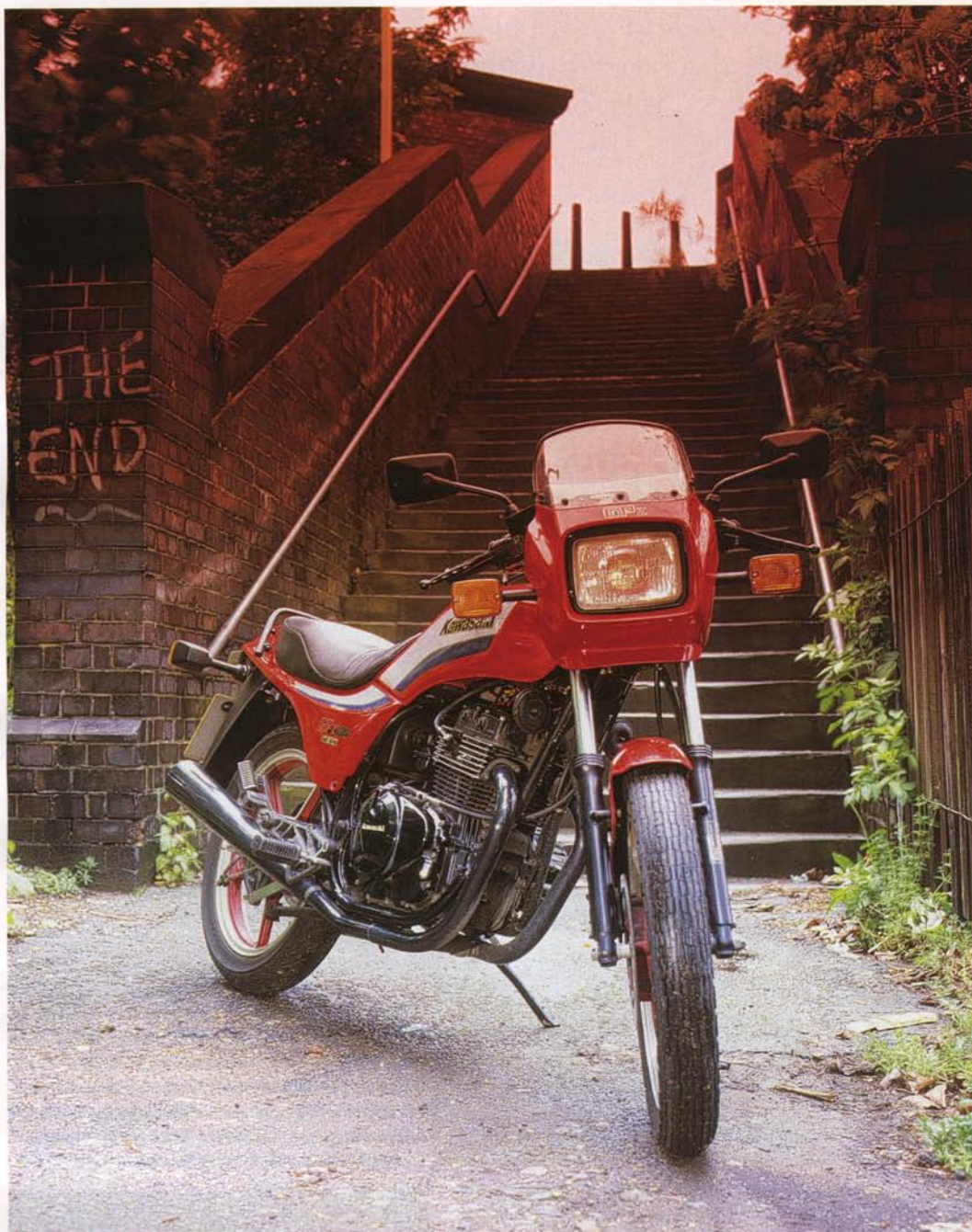
But Kawasaki had proved that the belt even worked in competition use, having raced a 250cc in-line two-stroke twin to a US championship a year earlier. And on the GPz305, as it had with the 250 Scorpion, it worked a treat: it was smoother than a chain, and quieter too, providing an almost uncanny sensation of floating on air. The belt was also longer-lived than a chain, provided you looked after it by tensioning correctly and dousing it occasionally with a mist of vegetable oil. Trouble was that for belts to be reliable, the shafts they run on must be parallel, otherwise they rub against the sides and wear prematurely. Wheel alignment was therefore critical. And when a stone gets caught in the teeth, the break is catastrophic. So some owners switched back to the chain. And although Kawasaki eventually phased out its use of belts, Harley-Davidson continues to use them in their cruiser applications.

As experience was to show, Kawasaki hadn't completely ironed out the reliability problems of the 250 when the GPz305 was introduced. Can chain tensioners would still occasionally jam as the spring weakened. You can identify this by wiggling the loosened tensioner body as the engine idles. If there's a clicking that stops, it's the tensioner spring. The roller-type cam chain was subsequently changed to an inverted-tooth Morse type.

If the GPz305 couldn't really cut it against the fours when the choice came for a newly-qualified rider to jump up the ladder, it was more widely accepted in markets like Germany where a 27bhp version could be ridden by novice riders. There even now the bikes are still widely ridden with their speedos registering upwards of 100,000km.







## SPECIFICATION KAWASAKI GPZ305

### POWER

ENGINE	Air-cooled 180-degree parallel twin
CAPACITY	306cc (61 x 52.4mm)
VALVE OPERATION	Overhead camshaft
COMPRESSION RATIO	9.7 to 1
LUBRICATION	Wet sump
IGNITION	Capacitor discharge
CARBURATION	Two 32mm Keihin CV
PEAK POWER	36bhp @ 10,000rpm
PEAK TORQUE	19lb-ft @ 8500rpm
PRIMARY DRIVE	Gears
PRIMARY RATIO	3.736 to 1 (71/19)
CLUTCH	Wet multiplate
GEARBOX	Six speed
INTERNAL RATIOS	2.60 (39/15), 1.79 (34/19), 1.41 (31/22), 1.16 (29/25), 1.00 (27/27) and 0.89 (25/28) to 1
FINAL DRIVE	530 chain
FINAL DRIVE RATIO	2.18 to 1 (35/16) [2.17 to 1 (50/23) belt]
OVERALL RATIOS	21.4, 14.7, 11.6, 9.54, 8.22 and 7.33 to 1
ELECTRICAL SYSTEM	150w alternator, 60-55-watt H4 headlamp, starter motor
BATTERY	12v 9Ah

### CHASSIS

FRAME	Tubular welded semi-duplex steel
FRONT SUSPENSION	Telescopic fork, air-pressure assisted
REAR SUSPENSION	Swing arm with single shock with adjustable preload
FRONT WHEEL	Cast-alloy 18in
REAR WHEEL	Cast-alloy 18in
FRONT TYRE	Dunlop 90/90-18 51S
REAR TYRE	Dunlop110/80-18 58S
FRONT BRAKE	Dual 240mm diameter discs
REAR BRAKE	Drum 160mm diameter

### DIMENSIONS

FUEL TANK	17 litres (3.74 gallons)
WHEELBASE	53.3in (1355mm)
SEAT HEIGHT	30.7in (780mm)
CASTOR ANGLE	63.5deg
TRAIL	3.74in (95mm)
WEIGHT (CLAIMED)	323lb (147kg)



## THE SPECIALIST

In The Netherlands, Frans Stroetmann, has worked on a number of Kawasaki GPz305 twins, and also runs a website that charts his



This is me in the kitchen, just finished with a crankshaft replacement.



experiences with the machine, and other things as well.

"I've bought myself a GPz500, but two of my friends still use daily two of my earlier GPz305s and I still I do the maintenance on them. One of

the bikes just passed 100,000km. Normal for motorcycles nowadays, but a miracle for a GPz305," he said.

More information from [www.home.zonnet.nl/Stroetmann44](http://www.home.zonnet.nl/Stroetmann44)