YAMAHA XJ750 & KAWASAKI GT750

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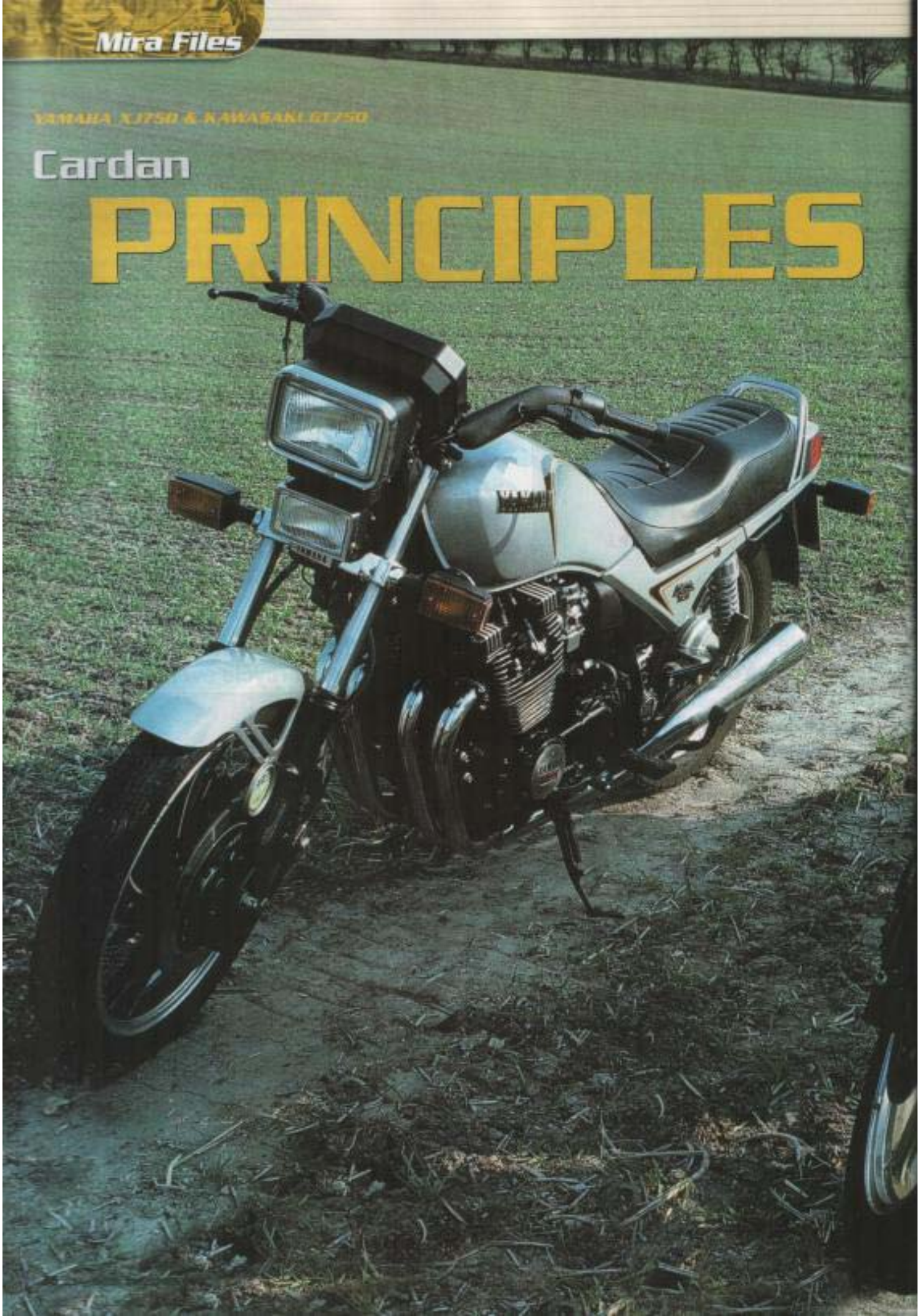

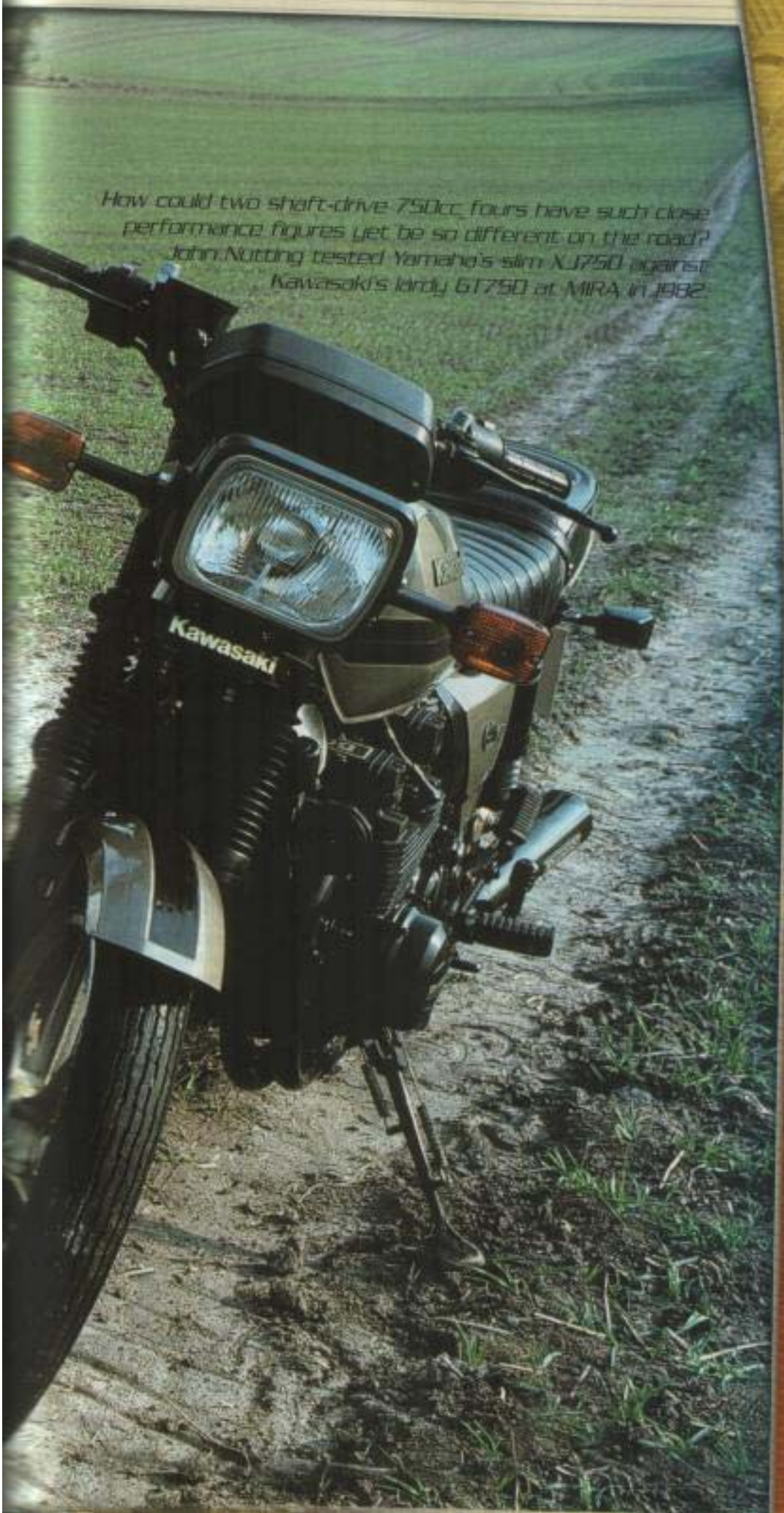

How could two shaft-drive 750cc fours have such close performance figures yet be so different on the road? John Nutting tested Yamaha's slim XJ750 against Kawasaki's lardy GT750 at MIRA in 1982.

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1982
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1984
1985

John tested the Seca when editor of 'Which Bike?'

YAMAHA XJ750

ENGINE

- Air-cooled in-line four
- Capacity, 749cc (65x56.4mm)
- Valve operation, double overhead camshafts
- Compression ratio, 9.2 to 1
- Lubrication, wet sump, oil cooler
- Ignition, electronic inductive
- Carburation, four 32mm Hitachi CV
- Peak power, 81 bhp at 9,000 rpm
- Peak torque, 48.4 lb-ft at 7,500 rpm

TRANSMISSION

- Primary drive, spur gears
- Clutch, wet multiplate
- Gearbox, five speed
- Final drive, shaft and bevel gears
- Overall ratios, 15.3, 10.5, 8.1, 6.52, & 5.68:1

CHASSIS

- Frame, Duplex tubular steel cradle
- Front suspension, telescopic leading-axle fork
- Rear suspension, pivoted fork, twin shocks 4-pos damping, 5-pos preload adjustment

WHEELS

- Front wheel, cast light alloy
- Rear wheel, cast light alloy

TYRES

- Front tyre, Bridgestone 325-H19
- Rear tyre, Bridgestone 120/90-H18

BRAKES

- Front brake, dual 295mm (11.6in) discs
- Rear brake, 200mm (7.9) drum

ELECTRICS

- Alternator 260w, fault diagnosis 60/55W headlamp, starter motor

WEIGHTS AND MEASURES

- Battery, 12V-14Ah
- Fuel tank, 19 litres (4.2 gal)
- Wheelbase, 1,445mm (56.9in)
- Seat height, 775mm (30.5in)
- Castor angle, 61.5 deg
- Trail, 117mm (4.6in)
- Weight, dry 219kg (482lb) claimed.

THE concept of the modern sport-tourer - a high-performance motorcycle that combines a measure of high-speed agility and speed with stamina and a useful cruising range - is much older than many might imagine.

While many of us like the idea of a full-on racing replica, the realities of day-to-day use - comfort and practicality - force us to compromise with less daunting machines.

But the earliest example of a manufacturer offering a contemporary bike that combined exciting performance, with a common-sense feature such as shaft drive, devised it for a wholly different reason.

In 1980 Yamaha had already built up a strong following in the US for its custom cruisers like the huge XS1100G and XS750G. But what riders Stateside really wanted were 'proper' cruisers that had feet-forward footrests and laid back seating. Engine designs dating from the Seventies, with their alternators and ignition systems hanging off either end of the crankshaft, cramped the style.

So for its first mid-range 650cc cruiser Yamaha's engineers designed a new and more compact engine. The XJ650G Maxim was powered by a twin-cam four that was all of two inches narrower than its counterparts from Honda, Suzuki and Kawasaki, and just as significantly, was shorter too, which was important because it drove the rear wheel with a shaft and bevels.

Most riders' interpretation of a bike with shaft drive was that it was equated with excessive weight, compromised handling and an 'old-bloke' image.

Not so with the Maxim 650. It was quick and feisty yet had the righteous laid-back look that was even enhanced by the 'superior' engineering of shaft drive.

In Europe, the XJ650 was launched with conventional styling. But the design features of the engine originally intended to help make a better cruiser and provided sporting credentials that set it apart from the competition.

To reduce the XJ650's width, the heavy alternator was mounted above the gearbox, driven by an inverted-tooth chain from the centre of the crank. This had first been tried on Honda's six-cylinder CBX for obvious reasons. To reduce the engine's length front to rear, the gearbox mainshaft was mounted above the lay shaft, enabling the countershaft and output bevel gears to be tucked in more closely.

The upshot of this was that despite a tanked up weight of 504 pounds, the XJ650 presented a clue to a future of machines that could be slimmer, more potent and more agile than their forebears. The short engine enabled the rear wheel's swingarm to be longer without suffering from an overly long wheelbase.

Handling and steering were precise, demonstrating that Yamaha hadn't forgotten how to make big bikes handle, even though it had produced the huge XS1100. And the XJ650 styling, which harked of the RD350LC launched the same year, was set off a by a huge eight-inch headlamp.

Excitement continued with the power delivery. But while the engine was rev happy with a power peak of 68 bhp at 9000 rpm and 9500 red line, offering a 120 mph top speed, a chasm in the torque curve demanded that it be ridden like a two stroke. Fuel consumption was poor too. That didn't go down well with riders and sales suffered.

Yamaha got the message though and for the 1981 model year in the US it introduced a sporty alternative to the Maxim in the form of the XJ750RH Seca, while Europe had to suffer another year of the XJ650. The 650's problems had been overcome by more cubes, bore and stroke being opened up from 63 x 52.4mm to 65 x 56.4mm.

Despite curious swoopy styling with twin rectangular headlamps and the use of a novel instrument panel featuring a liquid-crystal display and a diagnostic programme that the rider could enjoy every time the bike was fired up, the bike was a hit with magazine testers.

So much so that a west country dealer in the UK imported one that I was able to ride briefly in Somerset.

A swept-back handlebar enclosed in mouldings perfectly complemented the low seat and tucked in footrests, offering a riding position that was ideal for flinging the bike down twisty country lanes. I was hooked on the smooth and lusty

The Seca was a hit with magazine testers when it was launched in Britain in 1982.

engine, and said so.

While many fours still gnawed into your fingers at high revs, the XJ750's rubber-mounted unit felt silky and distant. Until you opened up, when from anywhere between 2000 and 6000 there was ample response from the quartet of Mikuni CV carbs.

US DICTATION

NO doubt the US market had dictated Yamaha's priorities, so it wasn't until 1982 that the XJ750 found its way into the UK model range. By this time it had been refined both in chassis and engine to cater for European riding tastes with alterations to the steering geometry and suspension.

But it was still much the same with its low-slung engine aiding manoeuvrability and road holding. Suspension was state of the art for the day, with a leading axle telescopic front fork that allowed more overlap between the stanchion bearings, air-pressure adjustability (though not connected leg-to-leg) and an anti-dive mechanism.

This used front brake fluid pressure to change the compression damping valves during braking which, thanks to the huge 11.6in discs, could be eye-popping. It wasn't entirely successful because it stiffened the fork when you often best needed more compliance, but at least it allowed softer springing for a smooth ride.

General behaviour was unaffected because handling was impeccable.

Another feature, also used by BMW, was the positioning of the front brake master cylinder behind the headlamp and operated by a cable from the handlebar lever. What with the additional plumbing used by the anti-dive, this didn't help the precision of brake application.

Ah, but with steering that was as neutral as it gets, and remarkable cornering clearance even though you were seated as near the ground as is possible without rising a chopped hardtail, the XJ750 made up for that in all other ways.

BACK TO BACK TEST

AND this wasn't just subjective. In 1982 while at *Which Bike?* I tested the XJ750 back to back with Kawasaki's GT750 four, and there couldn't have been a better opportunity to match what appeared to be - on paper at least - two identical machines.

I thought the Yamaha was fast. At MIRA's timing straight it clocked a mean two-way top speed of 126.3 mph, some eight mph faster than the XJ650. One-way with a slight tail wind it clocked almost 129 mph.

Gearing, giving almost 120 mph at the 9000 rpm power peak when 81 bhp was on tap, was about right. Sitting normally I could get 112 mph.

But the GT750, an altogether more sober proposition than the Yamaha, was to my surprise faster. Kawasaki had been evolving its middleweight 750cc four for the two years since it had been bored out from the Z650 engine.

In 1982, the GPz750 sports version had been modified with revised cam timing, a higher compression ratio and deeper-breathing 34mm Mikuni CV carbs to give 80 bhp at 9500 rpm. The GT750 with its shaft drive - in effect a smaller version of the Z1100A shaft-drive - was the sensible option, its black and bronze finish contrasting with the GPz's fiery red.

Suspension was state-of-the-art for the day.

LEFT: liquid crystal display provided information for the rider every time it was fired up.

Like the Yamaha, the Kawasaki had a smooth twin-overhead camshaft aircooled four cylinder engine rubber mounted in a duplex tubular frame. It had five speeds, a snazzy rectangular instrument cluster, a leading axle front fork, twin rear shocks with air pressure adjustable for load.

Yet with 78 bhp at 9500 rpm on tap it was almost as potent as its GPz sibling. And at the test strip it showed, pulling a mean top speed of 127.2 mph with a best of just over 130 mph.

It was also quicker through the standing quarter mile, clocking a mean of 12.76 seconds with a terminal speed of 104.75 mph as against the Yamaha's 12.88 seconds at 104.45 mph. The split is hardly worth mentioning, except that at first sight, the Yamaha is a hot rod while the Kawasaki is the tourer.

On performance alone there was nothing in it. On the weighbridge there was little to choose either, the Kawasaki tipping the scales with a full tank at 539 pounds while the Yamaha was just seven pounds lighter. A big breakfast could make the difference.

In day to day use the Kawasaki scored because its 5.3 gallon fuel tank was much bigger than the Yamaha's 4.2 gallon unit. Combined with an overall consumption of 46.6 mpg, the Kawasaki offered a range of nearly 200 miles until reserve was needed, about 50 miles more than the

PERFORMANCE DATA

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

MODEL	Yamaha XJ750	Kawasaki GT750
DATE OF TEST	1 April 1982	1 April 1982
MEAN TOP SPEED (MPH)	126.30	127.20
BEST ONE-WAY (MPH)	128.90	130.09
MEAN NORMALLY SEATED (MPH)	112.30	116.60
STANDING QUARTER-MILE (MEAN, SECS/MPH)	12.88/104.45	12.76/104.75
SPEEDO ACCURACY, ACTUAL MPH AT INDICATED		
30	29.43	26.24
50	46.94	45.60
70	68.70	66.30
TEST WEIGHT (1 GAL FUEL)	532 lb	539 lb
OVERALL FUEL CONSUMPTION	45.3 mpg	46.4 mpg
SPEEDS IN GEARS AT PEAK POWER REVS	44, 65, 84, 104, 119 @9000 rpm	49, 70, 90, 110, 130 @9500 rpm

COMPARISONS		
Model	Top Speed (mean, mph)	Acceleration St 1/4 mile, (secs/mph)
Yamaha XJ650	118.87	13.37/100.52
Yamaha XJ650 Turbo	123.27	12.98/102.50
Kawasaki GPz750	128.51	12.38/107.57
Honda VF750F	132.64	12.09/109.95
Suzuki GSX750	127.46	12.18/107.66

In the back-to-back test the Kawasaki was faster.

KAWASAKI GT750

ENGINE

- Air-cooled in-line four
- Capacity, 738cc (66x54mm)
- Valve operation, double overhead camshafts
- Compression ratio, 9.5 to 1
- Lubrication, wet sump, oil cooler
- Ignition, electronic inductive
- Carburation, four 34mm Mikuni CV
- Peak power, 78 bhp at 9,500 rpm
- Peak torque, 46.2 lb-ft at 7,500 rpm

TRANSMISSION

- Primary drive, Hy-vo chain and gears
- Clutch, wet multiplate
- Gearbox, five speed
- Final drive, shaft and bevel gears
- Overall ratios, 15.0, 10.5, 8.19, 6.69, & 5.63:1

CHASSIS

- Frame, Duplex tubular steel cradle
- Front suspension, telescopic leading-axle fork
- Rear suspension, pivoted fork, twin shocks 4-pos preload and air pressure adjustment

WHEELS

- Front wheel, cast light alloy
- Rear wheel, cast light alloy

TYRES

- Front tyre, Dunlop 100/90-H19
- Rear tyre, Dunlop 120/90-H18

BRAKES

- Front brake, dual 260mm (10.25in) discs
- Rear brake, 260mm (10.25in) drum

ELECTRICS

- Alternator 240w, starter motor 60/55W headlamp, starter motor 12V-14Ah

WEIGHTS AND MEASURES

- Battery, 12V-14Ah
- Fuel tank, 24 litres (5.3 gal)
- Wheelbase, 1,480mm (58.3in)
- Seat height, 810mm (31.75in)
- Castor angle, 62.5 deg.
- Trail, 104mm (4.1in)
- Weight, dry 220kg (484lb)

Yamaha, which recorded 45.3 mpg.

But there was a price to pay on the Kawasaki. The wide fuel tank forced your legs apart which were already splayed by the width of the engine, just where the footrests were placed. Rather than design the engine from the ground up as Yamaha's engineers had done, Kawasaki had taken the conventional engine, which was already wide with its alternator and ignition units mounted on the crank, and added a bevel gear unit where the drive sprocket was normally located. This forced the swingarm pivot to be wider, pushing out the footrests.

The five internal gear ratios are the same as on the GP2750, while the overall ratios are almost identical. "Surprisingly, the gearchange is extremely slick, humbling the Yamaha's clunk-click sufficiently to con the rider he's on a chain drive machine," I said at the time.

The GT's handling was described as 'deliberate'. "Compared to the shorter XJ750, the GT's long 58.3in wheelbase imparts a level of stability that's fine for straight line cruising but results in more effort in cornering," I said.

Not that there was anything much wrong with the Kawasaki's handling or steering. Just that taking advantage of the performance - you could easily cruise at more than 100mph - was too much of a struggle battling with the wind blast. The lower and leaner Yamaha was easier to live with at speed.

Despite this the Kawasaki's dependability and reliability made it a favourite - along with its GT550 sibling - for despatch riders for many years. "Most of those who liked the GT, appreciated that Kawasaki is making a genuine effort to offer a practical machine. But the GT illustrates that an assemblage of various components doesn't always provide the desired results," I said.

"Compared to the Yamaha the GT750 has some sensible features," I added. "But they're tempered by glaring flaws. There's plenty of room for pannier cases but rear wheel removal requires either dismantling of one of the silencers or the rear suspension to remove the wheel spindle.

"The carrier has handy bungee hooks but it's too narrow to be of much use. The seat lock has a mount that you can bend by hand."

Furthermore, adjustment of the rear shock pressure, necessary if you wanted either comfort or cornering clearance, meant you had to remove the seat to gain access to the valve. These things mattered to riders of 20 or more years ago.

But what of the fancy electronics? Kawasaki took a more measured approach with its instrument display than Yamaha and that was appreciated by Colin Schiller, who shared the *Which Bike?* office, in his assessment of the Yamaha's Blackpool illuminations.

"I can do without a bike that lights up like a Christmas tree every 100 yards, tells you when to put your feet down and is anyhow, eternally paranoid - it flashes eccentrically at least an hour before any disaster is likely to impend. Ugh, leave software out of the hardware."

By 1983, Yamaha had offered updated versions of the XJ650 and retained the XJ750, while in Japan offered a version that combined the XJ650 chassis with the bigger engine, but then opened up engine further with the XJ900 that lasted in some markets until 1993.

All versions of the XJ models were updated with the induction control system (YICS) which proved to be of limited value. Engines with two valves per cylinder such as these had a limited future that was bourne out by the introduction of the 20-valve watercooled FZ750 at the end of 1984.

But the FZ was a pure sports bike with chain drive. What the XJ series showed was that you could have a clean-living shaft-drive bike with performance and handling by intelligently designing the engine.

The despatch rider's favourite, the GT750's handling was described as 'deliberate'.