

SMOOTH SURVIVOR

1972 Yamaha TX750 Road Test

Story by Alan Cathcart
Photos by Kel Edge

Vibration is the enemy of just about everything that makes motorcycling fun.

It promotes discomfort, breaks parts, turns lubricating oil into a foam bath, and eats up power. Nowadays there are more bikes built with a balance shaft, or counterbalancer, than those without — certainly over 250cc, anyway. Yet it was only 50 years ago that the first ever motorcycle fitted with one reached the global marketplace, in the form of the Yamaha TX750 parallel-twin.

Only the most dogmatic fan of any of the other Big Four Japanese marques would dispute the notion that Yamaha has always been by some way the most innovative Japanese motorcycle manufacturer in terms of product design. Sometimes Yamaha's wilder R&D bets haven't paid off, but they failed because they didn't thrill customers enough to make them whip out their credit cards, whereas the Yamaha TX750 was that rare thing, an apparent category-topper that turned out to be an unreliable mechanical catastrophe Made in Japan.

The weird thing is, it only came about because Yamaha played the conservative card at a time when its three J-rivals were pushing the barriers of road bike technology. Honda of course had led the way in October 1968 by unveiling its 4-cylinder 4-stroke CB750 at the Tokyo Show — but there across the hall was Kawasaki's 3-cylinder 500cc H1 Mach III 2-stroke, the replacement for its 650cc W1 neo-British OHV parallel-twin. Two years later at the same venue Suzuki debuted its version of the 2-stroke triple theme, the liquid-cooled GT750 — followed a year later at Tokyo '71 by Kawasaki's ultimate drag-strip dominatrix, the 750cc H2

Mach IV 2-stroke triple, and then by the 903cc Z1, the most powerful Japanese 4-cylinder 4-stroke yet marketed, trumping Honda's smaller, slower 736cc rival.

Catching up

So this meant that, commercially speaking, against their rivals' high performance, high tech new models, Yamaha's engineers were fighting the war before last, when Japanese manufacturers tried to beat the British at their own game. Hence the 1969 debut of the XS650 Yamaha parallel-twin with its SOHC unit-construction engine and horizontally split crankcases, which underpinned the firm's attack on an American market then dominated by British bikes. Yamaha had obtained the design almost by accident when it purchased Showa (as in, suspension) in 1960, who had in turn acquired it by buying minor bike brand Hosk earlier that same year. Hosk was a former licensee of the German manufacturer Horex, whose 500cc SOHC Imperator parallel-twin had entered production in 1955, but was phased out two years later and the design then sold to Hosk when Horex went bankrupt in 1958. After acquiring Showa, Yamaha duly used the Hosk/Horex design as the basis for the XS650 (aka XS-1), its first 4-stroke twin, which sold sufficiently well in the U.S. for them to consider developing a follow-up version of the model which addressed its customers' No.1 complaint — the vibration endemic in such 360-degree two-up twins.

The result was the TX750 duly launched in 1972 as Yamaha's range-topping model, dead-heating with the Kawasaki Z1 — despite which sales initially boomed, with 15,511 examples shipped to dealers in the last five months of the year. While superficially similar to the XS650, the TX750 was an almost entirely new design, so although its all-aluminium, horizontally split, dry sump engine remained a





Brit-style air-cooled parallel twin with two valves per cylinder, a 360-degree crank and the same 74mm stroke as before, its pistons delivering 8.8:1 compression now ran in 5mm oversized 80mm cast iron bores for a capacity of 743cc, resulting in a claimed output at the four-bearing crank of 63 horsepower at 7,500rpm — up from the XS650's 53 horsepower. Much beefier peak torque of 50.7lb/ft (against the 650's 35.8lb/ft) was produced at 6,000rpm, transmitted via a 5-speed gearbox, straight-cut gear primary drive, and an oil-bath clutch. It retained its predecessor's chain-driven SOHC with four short, finger-type rocker arms operating the valves, while twin 38mm Mikuni Solex carbs fed the reworked cylinder head, with relatively shallow combustion chambers sculptured to produce a better bang. Other new features included a crankcase ventilation system where gases were fed via a reed valve into the airbox for recirculation, along with sintered alloy valve seats suitable for unleaded fuel, and a balance tube in a cast manifold which connected the two exhaust ports together at the front of the engine.

Apart from the 100cc greater capacity and increased power and torque, the major new feature on the tough-looking new TX750 engine was its so-called Omni-Phase Balancer positioned in a cavity beneath and slightly to the rear of the crankshaft — hence the dry sump engine's oil tank was positioned just

under the seat. These vibration-sapping balance shafts consisted of two counter-rotating weights driven by a single chain running directly off the crankshaft. One of these was designed to eliminate the primary imbalances created by the firing

strokes of the crankshaft against which it counter-rotated, and the other (smaller) one to counter the rocking couple created by the first balancer. It worked, providing this big-bore twin with a similar feel to a 4-cylinder bike. "The result is smoothness beyond belief," wrote *Cycle World* in its October 1972 issue. "Shut your eyes, and you are on a four. It couldn't be a twin."



1972 YAMAHA TX750

Engine: 743cc air-cooled dry sump 4-stroke parallel-twin, 8.8:1 compression ratio, 80mm x 74mm bore and stroke, 63hp @ 7,500rpm, 50.7lb/ft at 6,000rpm

Top speed: 114mph (183kmh)

Carburetion: Two 38mm Solex Mikuni Type B538

Transmission: 5-speed unit-construction gearbox

Electrics: 12v, coil ignition

Frame/wheelbase: Tubular steel duplex cradle frame/57in (1,455mm)

Suspension: 36mm telescopic fork front, swingarm with dual Hagon shocks rear

Weight/distribution: 518lb (235kg) wet, split 45/55 percent

Brakes: 11.8in (300mm) steel disc front, 7in (180mm) SLS drum rear

Tires: 3.5 x 19in front, 4 x 18in rear

Seat height: 32in (810mm)

Fuel capacity: 3.7gal U.S. (14ltr)

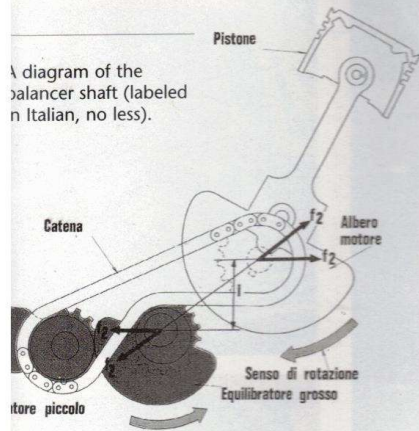
Owner: Joel Samick, Retro Tours, Kennett Square, Pennsylvania, retrotours.com

Looming problems

Unfortunately, all was not so rosy, and it took only a few months — especially after sales began in Europe early in 1973 — for word to get out of serious reliability problems with the new engine, with broken cranks aplenty seemingly caused by the Omni-Phase balancers heating up the engine lubricant at high revs and whipping it into a froth, so the aerated oil then starved the crank bearings and connecting rods of lubrication, while flooding the two ignition points housings. Additionally, the balance chain apparently tended to stretch, knocking the counterweights out of phase and making the engine run even rougher than a standard twin without the balancers — before eventually breaking, with imaginable results. It seemed that Yamaha had unforgivably not tested the bike under the more extreme riding conditions prevalent in Europe compared to Japan — or even America.

Still, the company responded quickly — as it had to, with sales of 7,770 such

A diagram of the balancer shaft (labeled in Italian, no less).



bikes in January to March 1973 tailing right off to 3,360 units in all the other nine months of that year — via what was the first technical recall of a current model in modern motorcycle history. This was for no less than 18 different component replacements or adjustments, up to and including new crankcases now incorporating external balancer chain adjusters, a deeper oil sump with anti-froth baffles, a factory-developed oil cooler, and doubled up gaskets for the points housings. But the damage had been done, with the model already synonymous with poor design and unreliability. The 1974-model TX750A had no such issues but sales still

flopped, with just 900 examples finding owners that year, and 400 more in 1975 as remaining stocks were sold off at massive discounts. In just two and a half years Yamaha had sold 33,441 examples of what some today regard as the best Classic-era parallel-twin ever made. It's just a shame that its engineers needed two tries to create it.

Owning one

Still, the TX750's well-earned reputation for unreliability made it a surprise to find an early example from September 1972, which today earns its keep in southern Pennsylvania as one of the fleet

of classics available for hire from Retro Tours (Retrotours.com). We'll let owner Joel Samick explain how he came to acquire the 1972 TX750.

"It was the dreariest part of the winter of 2003," Joel recalls, "and I was thinking about how I could add a big 4-stroke twin from the tuning fork folks to the Retro Tours fleet. But XS650 Yamahas were too commonplace, almost prosaic, so when I happened across an obscure, probably obsolete listing for a TX750, it sparked some real masochistic interest, because it was renowned as the worst bike that Yamaha ever built — they blew up like hand grenades! The problems were





The single-disc front brake's performance is lackluster at best. The fork has a boss for a second disc, but U.S. models only got one. Racer Jarno Saarinen and wife Soeli in a PR photo for the TX750, circa March 1973.

Time for a ride

I will admit that I'd never knowingly seen a TX750 before throwing a leg over Joel's bike's broad, well-padded 32-inch-high seat, so I wasn't quite sure what to expect. I pushed down on the choke lever to the left of the carbs, thumbed the starter and it fired up eagerly before settling to a 1,500rpm idle with a great-sounding thrum from the long, tapering megaphone exhausts that sounded 100% like a higher-revving version of a traditional British twin. But instead of the shake, rattle and roll of any such bike, the Yamaha was completely free of vibration, as in none, nada, zero, zilch. Not from that plush seat, nor the quite low footrests which didn't however scrape even with the decent grip from the Dunlop D404 tires. Nor was there any vibration in the quite high-set U.S.-market handlebar delivering an upright riding stance via its pulled-back grips — the Euro version had a lower, flatter bar — which made me feel I was perched quite high up on top of the bike, with the 3.7-gallon fuel tank seemingly rather far away from me.

That lack of vibration was almost uncanny. For a start, it sounded really great, and I'll admit to using the gearbox

just a little more enthusiastically than absolutely necessary while carving curves through the Delaware River Valley. Not only was there heaps more grunt on the TX750 compared to the XS650, but the torque curve is much flatter, too, so it's really forgiving in terms of which gear you throw at it. This is just as well, as the one-down four-up gearshift is quite notchy and not so pleasant to use — I didn't miss more than a couple of shifts in my total of 220-plus miles on the Yamaha, but it's by no means a smooth shift action, and you need to use the clutch for the bottom two upshifts. Plus the clutch is pretty heavy — you'll want to use the wide spread of torque for town work and cut down on changing gear, to stop your left hand cramping up unduly. Oh, and neutral is impossible to find at rest — you have to select it while still on the move coming up to a set of lights.

But that smooth operator of an engine will pull cleanly away from little more than idle speed. From 2,000rpm upwards, it pulls hard and strong wide open to the 7,000rpm mark where I shifted gear, 500 revs below the point at which peak power of 63 horsepower is delivered. Even at higher revs there's no undue

vibration, just that low down thrum from the exhaust becomes a higher-pitched howl. Like I say, it's a great-sounding bike, and long-legged, too — at 60mph it ran at 3,500rpm, rising to just 4,200 revs at 70mph, and 5,000rpm at 80mph. No wonder its previous owner Joel acquired the bike from liked to use it for touring, especially with zero vibes.

The TX750's duplex cradle chassis comes close to rivaling the Featherbed frame it's copied from in terms of rock-solid stability, but it does feel lighter than a Norton Manx in the way it steers, and those Dunlop tires Joel has fitted really suit the bike — especially on the DID-made Borrani-style ridged aluminium rims, which add to the sense of lightness. So you can use lots of lean angle to keep up turn speed, and even with no steering damper fitted the Yamaha didn't shake its head if I hit a bump cranked well over, with the fork doing its job of eating up the road rash. Furthermore, the ease and stability with which the TX750 flicked from side to side through a series of third-gear bends showed that Yamaha got the steering geometry right, with a 27-degree rake and 99mm of trail for the 36mm telescopic fork delivering



150mm of travel for the 19-inch front wheel (matched to an 18-inch rear). Joel had obviously been experimenting with fork oil because he had just enough dive dialed in to make you know you're stopping, without sacrificing the ability to eat up bumps — I presume it's a Showa fork since Yamaha owned them back then, and it works pretty well for such an elderly item. "The stock fork is actually pretty decent," agreed Joel, "but we've improved it with shimmed springs to stiffen things up a tad, and more viscous oil to keep dampening in control." He'd also fitted a pair of Hagon shocks at the rear, and despite the restricted 80mm of wheel travel, in terms of Classic-era rear suspension they don't come better than these.

Perhaps inevitably, the Japanese brakes fitted to the Yamaha I rode aren't in the same league as the fork, though the reason isn't hard to find, because

up front there was just a single 300mm stainless steel disc gripped by a wimpy single-piston caliper, with a 180mm single leading-shoe rear drum. With the TX750 clocking in at a porky 518 pounds split 45/55 percent, a single front disc is quite insufficient for spirited riding, and indeed the left-hand fork leg already has the mounting boss for a brake caliper. That's because for European markets the bike came with doubled-up front discs, with Japan and the U.S. only getting a single one — making Yamaha's decision not to test engine performance in Europe all the stranger, if they already knew they had to provide extra braking capacity for Euro-riding.

Stopping was the one thing the Retro Tours TX750 didn't do very well, either from high speed in the dry or the wet, when the disc/pad combo proved as inadequate in stopping the device as I

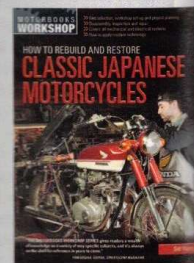
remember my year-old Suzuki GT750's had been in early-70s U.K. rain, after Heron Suzuki recalled it to substitute a single front disc for the drum brake it had been supplied with! Not ideal.

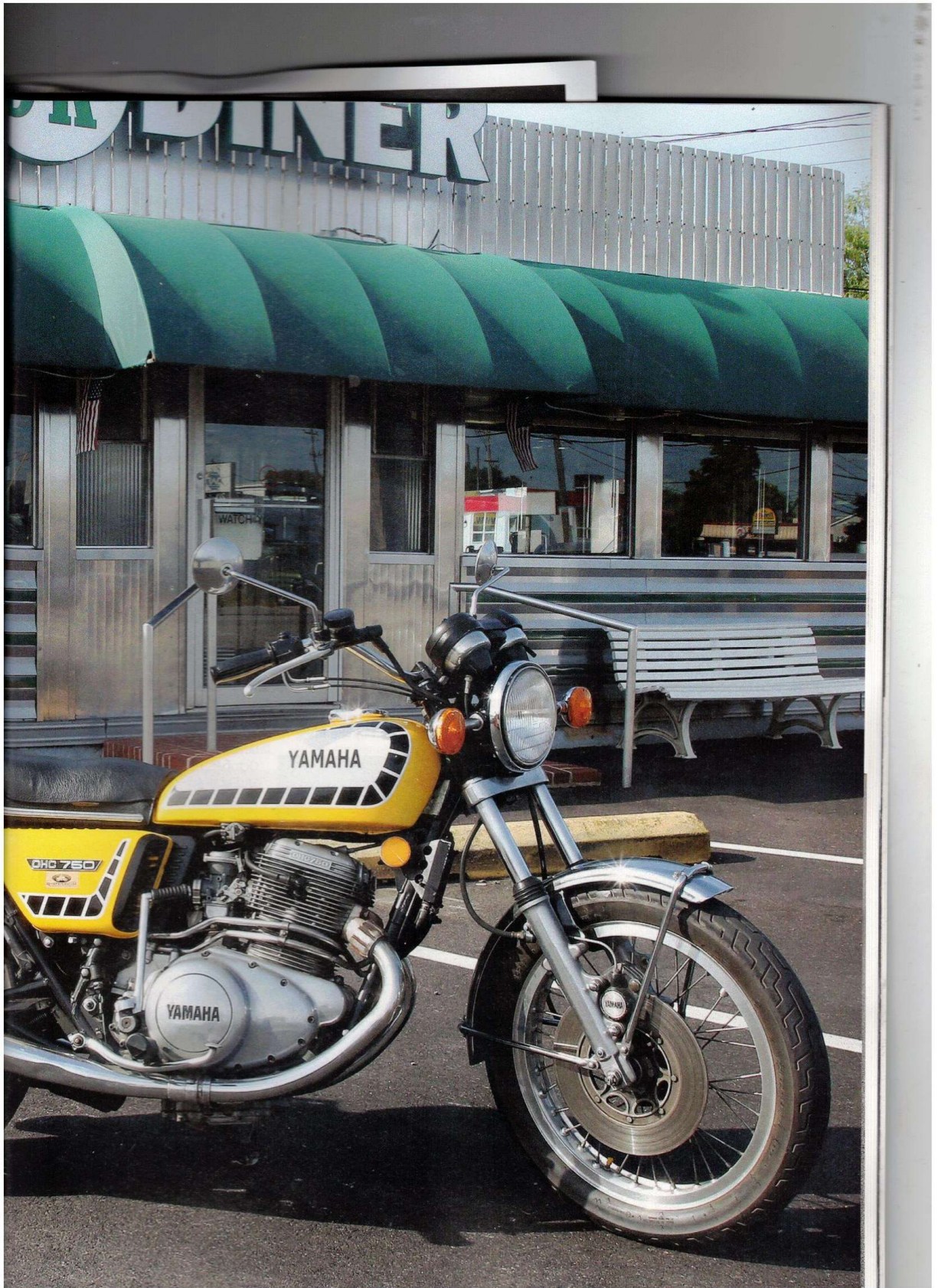
But correctly set up and well maintained, the TX750's Omni-Phase Balancer really works, and in so doing has civilized what's potentially the worst of two-wheeled shakers — a rigidly-mounted 750cc 4-stroke parallel-twin, with a two-up 360-degree crank. No wonder other manufacturers quickly began to develop balancer systems of their own — but Yamaha was first, with this nowadays little-known model, whose rarity probably derives from the likelihood that most of the 33,441 examples made blew up, and were then scrapped.

What an unexpectedly nice bike — but what a shame it took Yamaha two goes to get it right! *MIC*

How to Rebuild and Restore Classic Japanese Motorcycles

Whether you want to correctly restore a classic Japanese motorcycle or create a modified custom build, you need the correct information about performing the mechanical and cosmetic tasks required to get an old, frequently neglected, and often long-unridden machine back in working order. *How to Rebuild and Restore Classic Japanese Motorcycles* is your complete, hands-on manual, covering all the mechanical sub-systems that make up a motorcycle. From finding a bike to planning your project to dealing with each mechanical system, *How to Rebuild and Restore Classic Japanese Motorcycles* includes everything you need to know to get your classic back on the road. Japanese motorcycles have been the best-selling bikes globally since the mid-1960s, driven by the "Big Four" Honda, Yamaha, Suzuki, and Kawasaki. This is the perfect book for anyone interested in classic Japanese motorcycles and prepping a bike to build a café racer, street tracker, or other custom build. This title is available at store.MotorcycleClassics.com or by calling 800-880-7567. Mention promo code: MMCPANZ5. Item #10936.



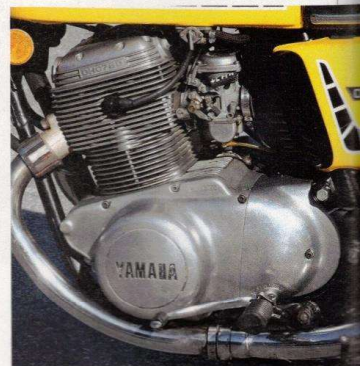




serious and numerous. Oil got into the points case, ending spark production. Balancer chains were non-adjustable, and broke — major internal shrapnel. If the balancer chain didn't break, then the balancers were likely to churn the oil into froth, much to the demise of rod and main bearings. If the oil didn't turn to foam, it would soon leak past the head gasket, making a real mess. I had never seen one that ran.

"So for a motorcycle related diversion from the cold winter, and to spend some quality time with the missus, we took the pickup truck and headed for New Jersey, not too far away — three hours or so. I'd called the guy and he said, yes, it's a very nice bike, it had been real reliable for him and his wife going touring, he had

been riding a newer bike, but he and his wife still preferred to tour on that one, for some reason. My wife happened to have a bunch of money in her purse from our dealership she ran — always risky. Can you see where this is going? We found it ran and in fact sounded healthy — somehow it had accumulated nearly 30,000 miles, a record for the model, for sure! I test rode it half a mile in the snow, paid the asking price which was really low, loaded it up and took it home. I just had a feeling, and I'm glad I did. I did some work on it and rode it for a year or two, but the paint was just so ugly that it almost detracted from the enjoyment of riding it. So I eventually got it painted, and the guy who did it was a real artist — I told him I wanted a strictly non-standard Kenny



The 743cc air-cooled twin makes 63 horsepower at 7,500rpm.

Roberts paint job, and in my opinion he did it brilliantly well.

"During my research, I came across a website in Newark, Delaware, detailing every bit of known information on the model: a fantastic find. I soon discovered that before bailing out, Yamaha had methodically updated and improved the TX750 to bring it up to their usual high standard. New crankcases with balancer chain adjusters, a deep oil sump with anti-froth baffles, factory installed oil cooler, doubled up oil seals for the points compartment — every flaw had a cure. These updates had all been performed on my new acquisition, including the new crankcases, plus all the usual work needed to rekindle the flames idled by time. So fine, now we have ourselves a TX750 that runs as designed, and blows up much more slowly than before — and we've had it for almost 20 years during which time it's done another 14,000 miles with practically no hiccups. It's just a very good bike that Yamaha should have got you guys in Britain to ride hard before they let it loose on the rest of the world. Then they'd have known what they still had to fix before shipping them to dealers."