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Yamaha Fazer

**Outrageously Radical,
And Quick To Flaunt It**

**Kawasaki Double
250 Ninja
And ZG1000
Concours**

**Bimota db1
Chariot Of A
Richer God**



271

YAMAHA FZX700S FAZER

The Fazer stretches styling till it squeaks, a new-wave treatment of a very traditional idea.

Product-planning manager Keisuke Yoshida was all ears. In the last 10 days he had chaperoned his tour of journalists through the Mysterious Corporate East; the Americans had swooped at Yamaha's private race-track, cavorted on a midnight cruise aboard the company yacht, been soundly thrashed by a team of baseball-savvy engineers and initiated into the mysteries of computer and grand-piano construction. Gracious behavior had prevailed.

A small man, Yoshida displayed power enough against closed doors. Now he

rocked silently on his heels as we were ushered into the innermost of Hamamatsu's sanctums, a place, we were assured, where foreigners had never set foot. The curtains were drawn, a shadowy object was hustled onstage. Unseen, a switch was thrown and a preproduction FZX700 Fazer, its armor-plating bodywork aglow under the tracklights, hot pink plug wires coiling from its gilded valve cover, was greeted with a thunderous . . . silence.

It can't be helped. Now the production model has made its stateside appearance, with at least one graphic

change: Due to difficulties in matching colors between the wires, caps and boots, the pink plug wires are gone, and the engine, energized now with flat black wires, is much less a poke in the eye. But first looks at the Fazer remain a shock. The FZX700S denies the cozy identities of marketing by the niche, defies the handy handle. Think: The FZs have power and handling, the 600cc SRX single light weight, the Radian a low price. So what's the Fazer's hook? Perhaps all three.

Consider the first: Mounted inside the FZX's perimeter steel frame is Yamaha's liquid-cooled five-valve





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Genesis engine, a marriage of Maxim 700X and FZ750 parts united by pieces of its own. From the Maxim X microfiche the Fazer draws its cross-flow radiator, mounted behind is an electronic fan from the FZ. Maxim pistons renew their lease in XJ cylinders configured at 68 x 48mm, but the Fazer's pots are inclined at 45 degrees, Genesis-style, and mated to FZ engine cases. The Fazer shares the FZ's 11,000-rpm redline.

To displace a tariff-exempt 698cc, a modified FZ crankshaft spins in the Fazer cases, its pins moved inboard 1.8mm, its flywheel shaved four percent to accommodate the reduced reciprocating mass of 1.5mm shorter connecting rods. Though valve timing is the same in the FZ and FZX, the camshafts are not: the Fazer has a touch less intake lift. Interestingly, it's the FZ and Maxim cams that share identical part numbers. The Fazer's gear train—straight-cut primary, chain and six-speed transmission—comes straight off the FZ production line.

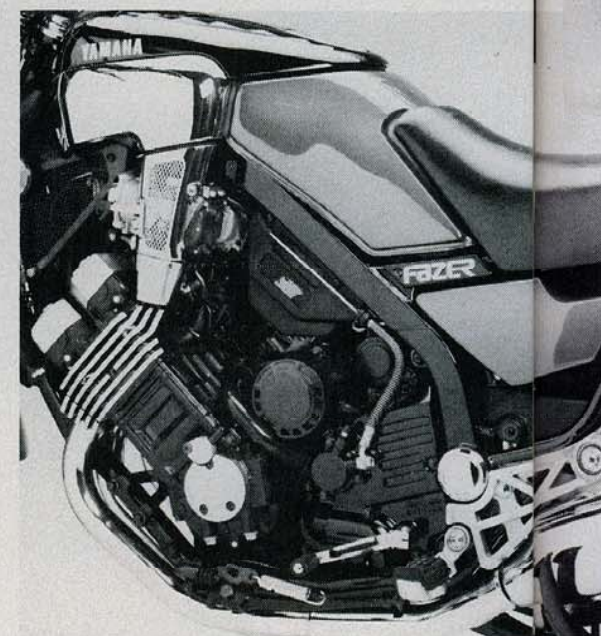
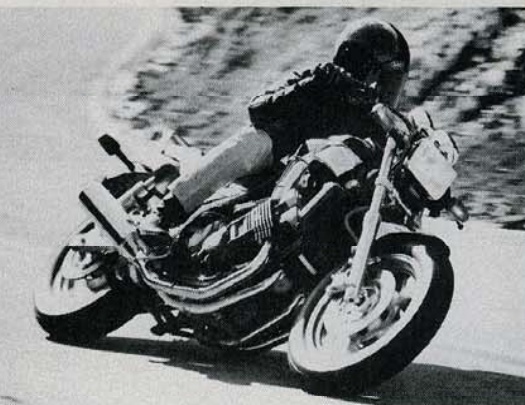
All the Yamaha five-valvers—Fazer, FZ and Maxim—run common piston rings, all have identical combustion chambers with 11.2:1 compression, but the Maxim's ports run horizontal to a bank of sidedraft 33mm Mikunis. With the exception of the FZX's six polished accent stripes, Fazer and FZ cylinder heads are identical.

The FZ's 34mm, downdraft carburetors feed the Fazer, though a side-mounted choke lever replaces the cable-and-knob arrangement mounted in

the sport bike's fairing panel. Sharp eyes will note a curious appendage to the FZX's carbs. Two polished tubes run parallel to the frame rails along the Fazer's right side: the upper ventilates the crankcase through the airbox; the lower tube taps into the carb float bowls on top, emptying straight into the atmosphere down below. It's an unusual setup; most float vents march their vapors straight back to the airbox. Yamaha assures us the atmospheric vent is EPA-endorsed for 49-state models. A California-legal model is yet to make its appearance, but regulations here will doubtless require fitting of a hose directing evaporative emissions through a charcoal canister to be mounted in a space above the Fazer's centerstand.

As with the FZ, the layout of the Fazer's central bodywork involves a bit of visual trickery. The front of the "fuel tank" is an airbox cover, carrying a panel of indicator lights and a water-temperature gauge. Over four gallons of fuel is contained in a cell directly beneath the aircraft-style filler cap, extending down low enough to almost contact the gearcase. An electronic pump carries fuel uphill to the carbs. Like the V-Max, the FZX's chromium side scoops perform a primarily styling function, serving to obscure the sides of the bulging airbox.

The Fazer is equipped with an excellent fuel reserve. In place of a gauge, FZX fuel level is monitored by a sensor which causes a "tank-mounted" warning light to glow red when fuel level drops to within a slosh or two of one gallon. When 0.8 gallon remains—good for about 40 miles of highway riding—



the fuel pump shuts off. A sliding switch on the right handlebar restores power to the pump again. Though not a "reserve" system in the strictest sense, the Fazer's method of fuel delivery rates top marks for security and ease of use.

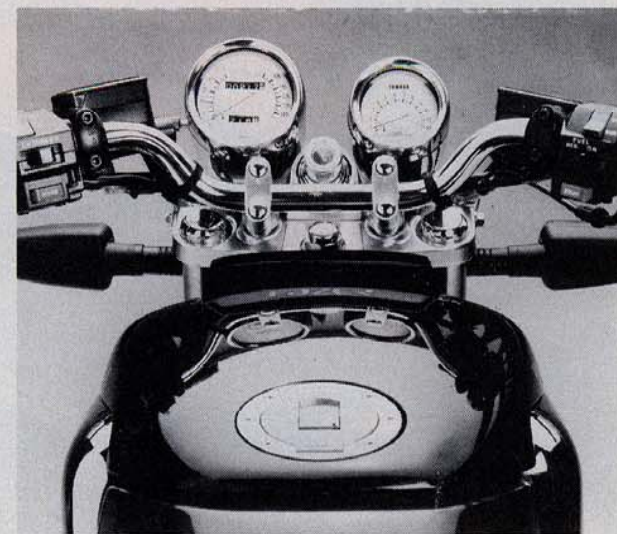
The Fazer may seem merely the beneficiary of existing pieces, with little new development of its own. That's not entirely the case: An additional bearing between the pushrod and pressure plate smoothes the clutch engagement, springs rather than rubber bushings absorb shock loadings, the FZX's water pump has steel rather than plastic blades—all technologies that have trickled inexorably up to the FZ.

Similarly, both the Fazer and '86 FZ750 have had some dental work. The primary teeth have been polished mainly for strength; one happy product of the buffing is that the straight-cut gears now mesh with less whine than before, and the quality of sound from the Fazer's engine—an intriguing blend of exhaust pipe rumble with a primary-gear descant—is pleasing rather than obtrusive.

Close encounters with the five-valve engine produce consistent impressions from our testers. The responsiveness and power from these engines dominate every impression of the motorcycle they are powering, be it FZ750,



The Fazer's eclectic components are calculated to jumble the categories in your head. The low-slung chassis and shrouded shocks say cruiser bike, chain final drive and the five-valve Genesis engine sing performance. So sit down already: The Fazer makes most sense from the saddle.



Maxim X or Fazer. There are credits and debits to this kind of response: Crack the right grip, and the forward rush is instantaneous, intoxicating. But ease the throttle off, and, just as quickly, the lunge becomes a nose dive.

We've experienced this "hair-trigger" throttle response to some degree in all the five-valvers we've tested, perhaps a little more so in the Fazer. The FZX drivetrain exhibits little lash, but the combination of big carburetors and a light flywheel modulated by a throttle with a relatively short throw assures that smooth power transitions require a delicate hand, especially in the stop-and-go, low-speed traffic zone where the crankshaft cannot generate high-rpm momentum.

In getting power to the ground, the FZX700 creates a phenomenon all its own. Two staffers hopped on the Fazer, slung it through some turns, and returned with the same illusion: "Not bad handling," they said, "for a shaftie." Both were shocked to discover the FZX gets its final drive through a #530 chain. Why this shaft impression from the Fazer's rear end?

Quite aside from its rise-and-fall effect, the weight of a shaft drive's gears and cases influences handling in a characteristic way. Regard the Fazer's

rear end and what do you see? A large tire held on an almost solid wheel: plenty of unsprung mass poised at the end of a relatively lengthy swing arm, supported by shocks with little compression or rebound damping. The result is a sensation of mass in the Fazer's rear end, mass that reacts to road surfaces and changes in chassis attitude under power, much like that of a shaft-drive bike.

And what is the level of Fazer power? On the Kerker dyno, our FZX turned in a puzzling performance. At 5500 rpm it ran dead even with the FZ750, but at 9500 rpm it could not rise above a peak of 72.29 horsepower. To understand how curious these numbers are, consider that our first FZ750 posted a peak output of 85.33 horsepower, more than 13 horses up on the Fazer. Consider, too, that the Maxim X, despite passing its power through a jackshaft and two 90-degree shaft-drive bevel gears on its way to the dyno brake, produced a power peak nearly three horsepower higher than our Fazer test unit. Concerned, we requested a second Fazer from the Yamaha test pool and dispatched it to Kerker. Numbers from the second Fazer confirmed the output of the first: With a peak of 74.13 horsepower, also at 9500—a variation of 2.5



percent—we must consider our original Fazer's dyno performance as representative of the breed.

Does that qualify the FZX for the drag-strip dog house? Hardly. Our FZX did well at the strip, posting a best run of 11.58 seconds with a terminal speed of 114.11 miles per hour. Even on a cold, damp launching pad which compromised traction, our Fazer ran a zero-to-60 mph time of 3.02 seconds. If Yamaha's claimed output figures are to be believed, that's just where you'd expect the Fazer to fit—smack in between the best quarter-mile runs of the FZ750 and the Maxim X—and that makes our Fazer the fastest production 700 we have tested, despite its modest peak horsepower output. How can this be?

Acceleration is a function of thrust, and thrust, as every schoolboy knows, is power and velocity divided by weight. Denominators wield enormous force in calculations of this type, and, when figuring for acceleration, low weight can undo power disadvantages in dramatic ways. The formula worked for Suzuki's GSX-R750, and it's the Fazer's saving grace as well.

Through careful trimming, the FZX700 becomes a militant in the low-mass revolution Suzuki's sporting GSX-R began. At 486.5 pounds fully gassed, the Fazer undercuts the FZ750 by 40 pounds, the Maxim X by 30. It is even lighter than the air-cooled, four-valve Maxim. Where does the weight come off? Compared to its fraternal twin, the FZ750, the Fazer's frame is lighter by 6.5 pounds; its suspension, minus Monocross linkage, sheds 4.5 pounds. A fairing costs the FZ nearly nine pounds, its larger-capacity tank 15 pounds in hardware and fuel. The result, despite its disappointing showing on the Kerker dyno, gives our Fazer power-to-weight figures of 6.72 pounds per horsepower, an excellent ratio for high performance. It takes the FZ750's broad back of 85 horsepower to spread its weight load out to a ratio only half a pound per horsepower better than the Fazer's.

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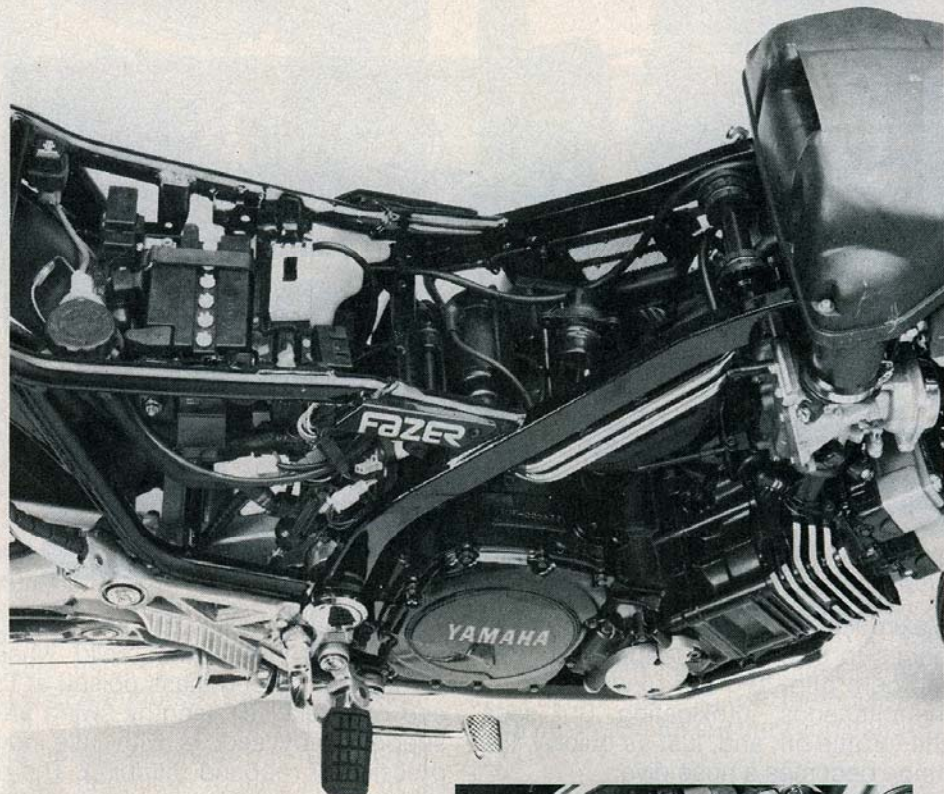
But the Fazer's low mass cannot save it in roll-on acceleration contests from 45 to 70 mph. Our Fazer got smoked in roll-ons by the FZ, Maxim X, and the air-cooled Maxim. Why? We think the answer lies in the FZX's big carburetors. Crisp carburetion is essential to good roll-on performance; a moment of hesitation when the throttle is yanked full open and the Fazer's advantages—mid-range power, lower gearing from its 15-inch rear wheel, and light weight—all evaporate in the first gagging gulp of unatomized fuel.

No, roll-on contests are not the Fazer's forte; cruising at middling speeds, the FZX rider must gear down to keep up with other bikes of like displacement when executing a full-throttle pass. Even so, time spent with the Fazer's Genesis engine enhances its appeal. Cruising at a constant speed, the engine does surge slightly, "hunting" within a band of 100 rpm or so, but it is still a jewel—responsive and spritely, and remarkably free from vibration, despite the absence of an internal counterbalancer.

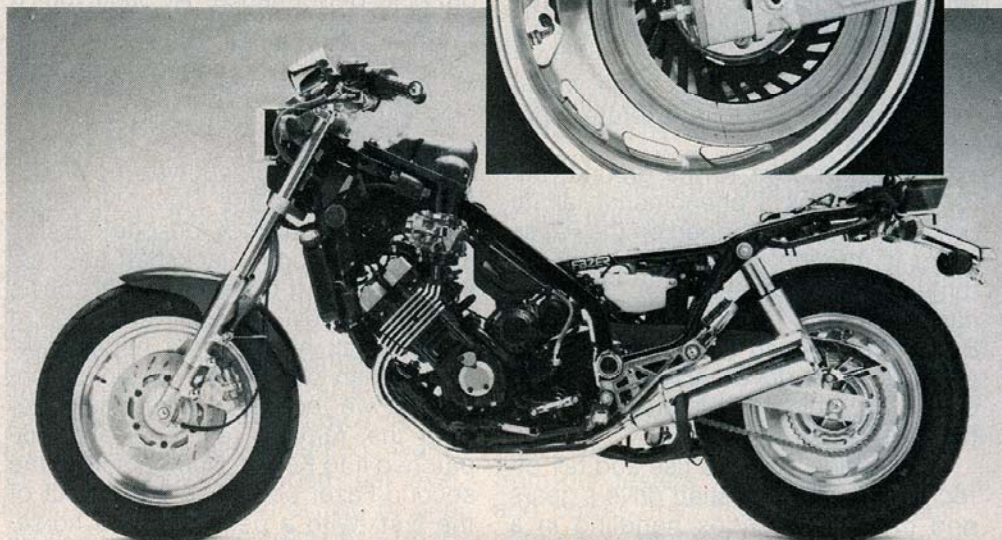
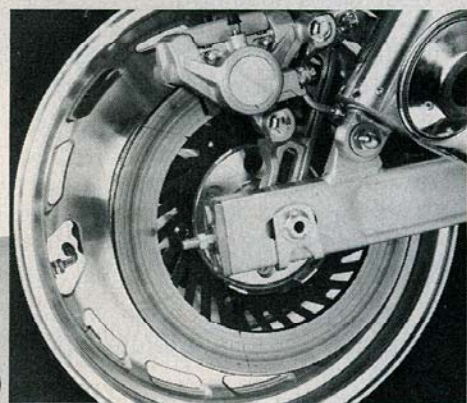
Much of this smoothness comes from the Fazer's mating of engine and frame. The FZX's box-section frame is of perimeter design, but not in the normal sense because the upper frame rails do not run entirely outside the engine bay, snaking instead between the carburetor intakes on their way to the steering head. To conserve space and weight, coolant flows through the frame's left front downtube.

Mounting the Genesis engine in the Fazer's "partial perimeter" frame involved use of both rigid and rubber mounts—two elastic mounts in the rear, a solid mount tying the engine in place on top. The FZ uses some rubber mounts as well, but, with handling (i.e. rigidity) at a premium, the 750's mounts are as hard as possible. The Fazer's mounts use a softer compound, and the FZ's lower front mount has been eliminated entirely in the Fazer. Yamaha claims the changes have reduced Fazer vibration by 50 percent from the FZ, and we won't disagree. Despite turning 300 more rpm at 60 mph in sixth gear, the FZX is significantly smoother than the FZ750 on the highway.

Much of the Fazer's pleasing road presence comes courtesy of ergonomics compromised little by the tyrannical stylist. The footpegs are a tad more forward than we like, but all controls are well positioned. The handlebar, with a down-turned bend that feels awkward to the wrists at first but entirely natural a few minutes later—much better than the other way around—sets the rider in a position for optimum comfort and



The Fazer's steel frame is of "partial perimeter" design, with box-section rails passing between the carb intakes. Disc-type wheels are aluminum, machined and polished.

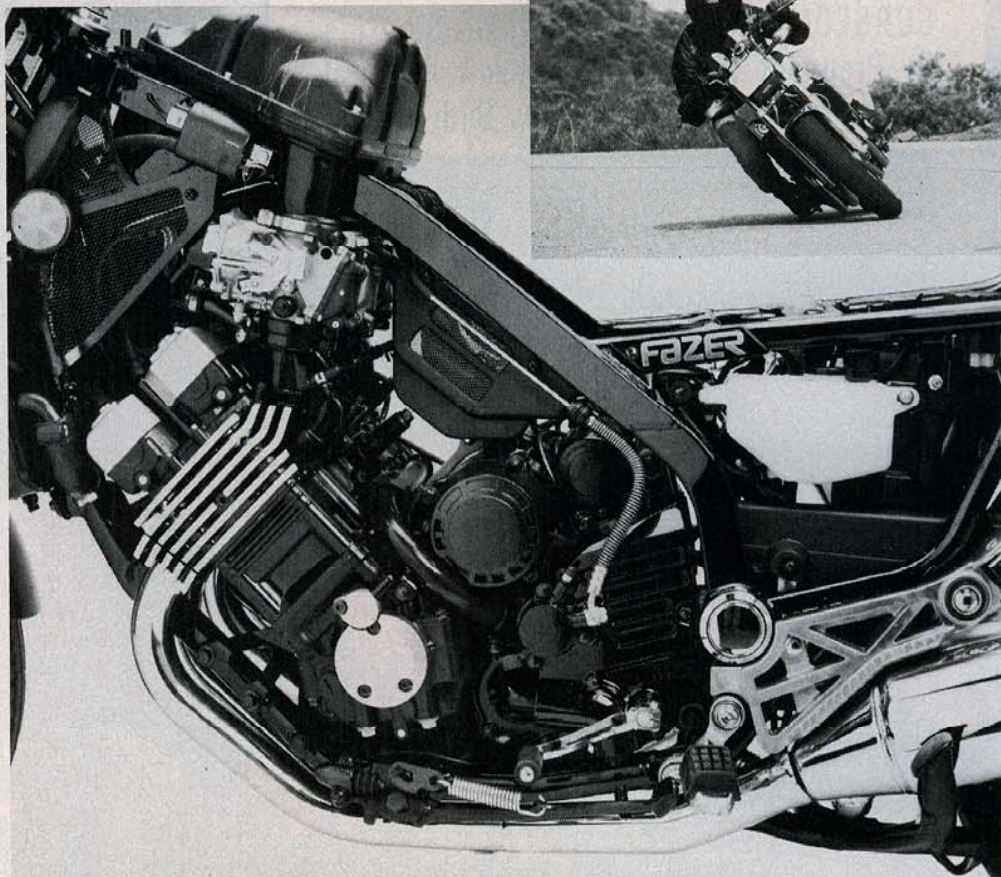


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control. Less user friendly is the seat. Though low and nicely dished for support and room to move, the rider's saddle is backed by foam with a halflife of about 20 minutes before it sags into the plastic base. Passengers report excruciating rump experiences from the Fazer pillion.

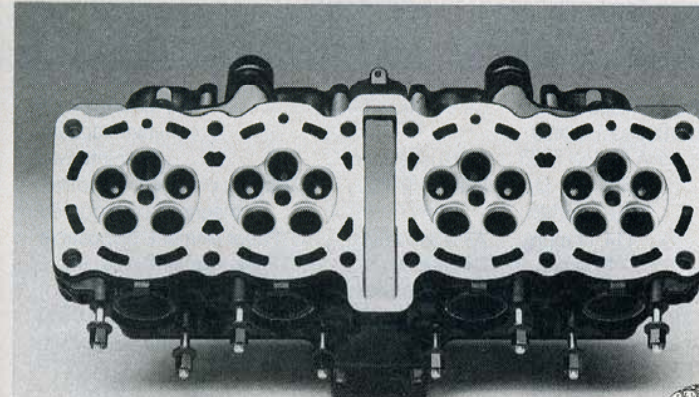
As with several of Yamaha's new-generation motorcycles, the Fazer's almost "generic" seating position and chassis work well off the Superslab. Pressed through turns, the Fazer does not deliver the raked-out cruiser feel. With a rake of 29 degrees ending in a 16-inch front wheel, the FZ's steering geometry, like the V-Max's, is more sport-bike sharp than cruiser slow, and excellent ground clearance, good brakes and crisp shifting serve it well when the road turns curly.

Hard riding, however, exposes suspension shortcomings. The Fazer's box-section swing arm and stubby 38mm fork exhibit admirable lateral rigidity—it's the up-and-down stuff that sells the chassis short. Since the Fazer's softly sprung front end gets its compliance from pneumatic preload, pressure settings are crucial to handling: With the minimum six pounds ap-



plied, the front end can jackhammer, bottoming out over sharp bumps or under hard braking, then bouncing back up. Even 10 psi overwhelms the damp-

ers; the fork tops out over dips, and the front end gets alarmingly light under hard acceleration. We found eight pounds to be the best compromise for

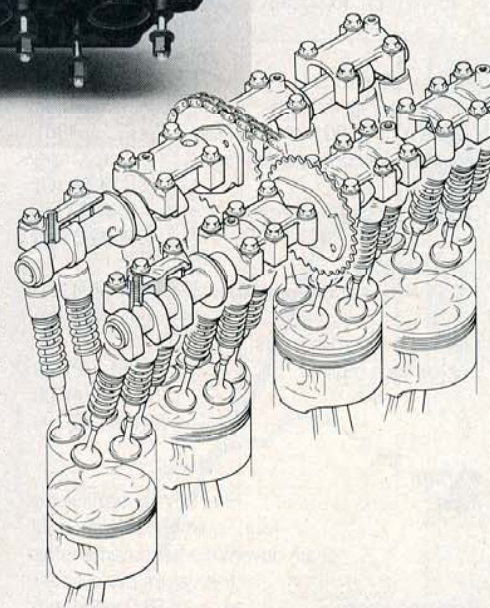


The Fazer's five-valve train uses shim-under-bucket actuation; lash-adjustment interval 26,000 miles. Intake cam has slightly less lift than the FZ; heads are functionally identical.

canyon work, though the Fazer's fork still needs more damping in both directions, and a more progressive spring.

The dual DeCarbon-type shocks also suffer from inadequate damping and springs that sack. The Fazer's rear wheel has a short travel, under four inches, and the straight-rate linkage further limits the rear suspension's versatility. It's the fork Catch-22 all over again; keeping the soft springs from bottoming over bumps means resorting to preload, which in turn overrides the damping, making the Fazer's ride harsh over just the sort of minor pavement irregularities riders encounter most.

Still, the greatest limitation to the Fazer's handling is its tires. In the past, we've faulted the profiles of the



FZ750's Bridgestone Exedras for compromising its otherwise excellent handling. The shape of the Fazer's Dunlop K355s are fine, broad and nicely

matched front and rear; rather, the FZ's tire problem concerns tread pattern and compound.

The first applies to the front end. The Dunlop is carved with three circumferential sipes, all within an inch of each other along the tire's centerline; the next longitudinal tread falls almost to the sidewall, an inch and a half away. This tread pattern produces an almost slicklike footprint when the Fazer is leaned into a turn. With only transverse sipes to break up the rubber, we suspect the Fazer's excellent cornering traction in the dry will be matched by slipperiness in the wet. With no rain during our test period, we can't be sure.

This much we *do* know: The parallel centerline sipes eat up so much rubber that the Dunlop's footprint is seriously reduced when running straight up and down. Brake testing the FZ was scary business, the tire locked frequently under load from the Fazer's dual discs. The shortest stopping distance from 60 mph was 133 feet, almost 20 feet farther than it took to haul the heavier FZ750 down to zero.

At the rear, a too-hard compound limits the Fazer's speed out of corners. At racetrack velocities the Dunlops heat to operating temperature and stick well. On the street they remain cold and hard, kicking out consistently but unmanageably under even moderate

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throttle. "These tires," read one tester's notes, "are rotten to the cord."

Summing up the Fazer is a complex process. There are the usual small nits: the rimless headlight throws a light beam into the rider's eyes at night, the tank-mounted indicators are obscured by the chinbar of a full-face helmet, the horn makes barely a beep, hardly a forceful honk. But essentially the Fazer is an excellent basic motorcycle compromised by a number of marginal, yet crucial, components. A strong, rigid chassis is weakened by improperly calibrated front and rear suspension units, functional ergonomics are marred by an afunctional seat, good ground clearance and powerful brakes can't be put to use on tractionless tires.

Still in all, the Fazer has powerful appeal. Despite some questionable pieces, what you get with the FZ is the lightest, fastest and, at \$3499, one of the least expensive high-tech 700s available. And you get to keep company with that wonderful Genesis engine that will make your days glow with high-intensity.

To understand the FZ, it's best to look past the bodywork and see the motorcycle underneath. Yamaha has

TEST SPECIFICATIONS

Make and model Yamaha FZX700S Fazer
Price, suggested retail (as of 2/19/86) \$3499

Performance

Standing start 1/4 mile 11.58 sec. @ 114.11 mph
Acceleration, 0-60 mph 3.04 sec.
45-70 mph, top gears (4) 4.64 sec., 356 ft.
(5) 6.08 sec., 469 ft.
(6) 7.20 sec., 551 ft.

Braking, 60-0 mph 133 ft.
Horsepower @ 60 mph 10.48
Engine rpm @ 60 mph, top gear 4961
Average fuel consumption rate 46.3 mpg (19.7 km/l)
Cruising range (main/reserve) 157/37 mi. (252/60 km)

Load capacity (GVWR less curb weight) 494 lbs. (224 kg)

Maximum speed in gears @ engine redline (1) 53 (2) 69 (3) 84 (4) 100 (5) 118 (6) 139

Engine

Type Four-stroke, transverse four; liquid-cooled with dual chain-driven overhead camshafts; five valves per cylinder
Bore and stroke 68.0 x 48.0mm (2.68 x 1.89 in.)
Piston displacement 698cc (42.6 cu. in.)
Compression ratio 11.2:1

Carburetion (4) Mikuni 34mm constant-vacuum
Exhaust system Four-into-two
Ignition Battery-powered, inductive, magnetically triggered
Air filtration Paper element, disposable
Oil filtration Paper element, disposable
Oil capacity 3.7 qts. (3.5 l)
Bhp @ rpm 72.29 @ 9500
Torque @ rpm 42.46 @ 8500

Transmission

Type Six-speed, constant-mesh, wet-clutch
Primary drive Straight-cut gear; 91/48, 1.90
Final drive #530 chain; 44/16, 2.75
Gear ratios (transmission) (1) 37/13, 2.85 (2) 35/16, 2.19 (3) 32/18, 1.78 (4) 30/20, 1.50 (5) 28/22, 1.27 (6) 26/24, 1.08
Gear ratios (overall) (1) 14.91 (2) 11.45 (3) 9.31 (4) 7.85 (5) 6.64 (6) 5.65

Chassis

Type Double-downtube, full-cradle perimeter frame; box-section steel swing arm
Suspension, front Center-axe, air-adjustable fork with 38mm tubes and 5.5 in. (140mm) of travel
rear (2) enclosed spring shock absorbers, adjustable for spring preload, producing 3.82 in. (97mm) rear-wheel travel

Wheelbase 59.8 in. (1520mm)
Rake/trail 29.0°/4.61 in. (117mm)
Brake, front Hydraulic, dual-disc with dual-piston calipers
rear Hydraulic, single-disc with dual-piston caliper
Wheel, front Cast, 2.50 x 16
rear Cast, 3.00 x 15
Tire, front 110/90 V16 Dunlop K355F
rear 140/90 V15 Dunlop K355
Seat height 29.5 in. (749mm)
Ground clearance 5.7 in. (145mm)
Fuel capacity (main/reserve) 3.4/0.8 gals. (13.0/3.0 l)
Curb weight (full tank) 486.5 lbs. (220.7 kg)
Test weight 636.5 lbs. (288.7 kg)

Electrical

Power source AC generator
Charge control Solid-state voltage regulator
Headlight beams (high/low) 60/55 watts
Tail/stoplights 8/17 watts
Battery 12V 14AH

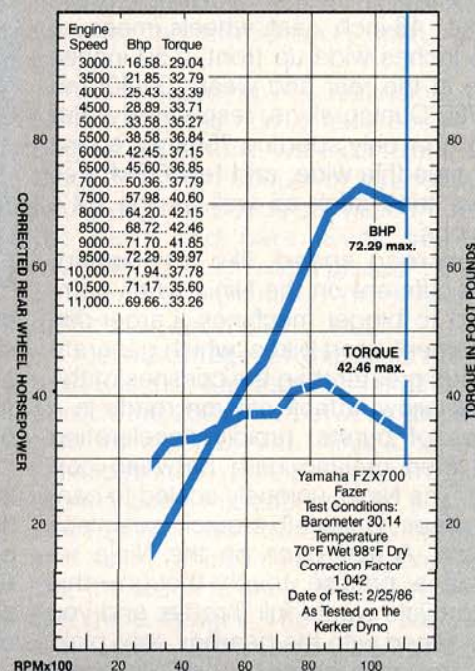
Instruments

Includes Speedometer, odometer, tripmeter; tachometer with 11,000-rpm redline; coolant temperature gauge; indicators for high beam, turn signal, neutral; warning light for low fuel

Speedometer error, 30 mph indicated, actual 29.46
60 mph indicated, actual 58.36

Customer Service Contact

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come full circle to embrace the standard motorcycle in a new-wave form—intelligent, high-tech, functional. Even the Fazer's styling gets stronger, seems to become more sensible over time.

Shock is always the first reaction to something as new and striking as the Fazer. More secrets were hidden in the backrooms of Hamamatsu, we knew, new forms that will press our definitions of motorcycle styling to their very limits, then beyond. Product-planning manager Keisuke Yoshida smiled, rocked on his heels again, looking suitably inscrutable. After the Fazer rolled out, the door to Yamaha's future fell quietly, firmly closed.