

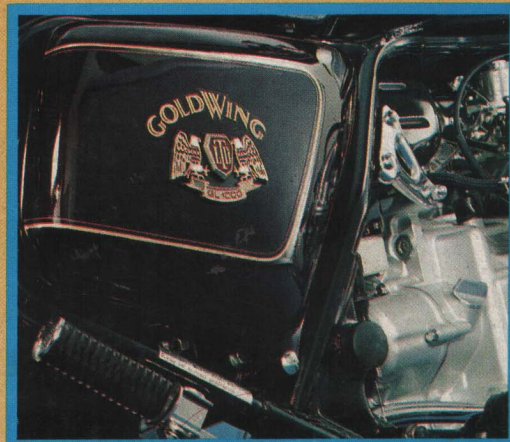
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FIRST TEST! Yamaha XS360 4-Stroke
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"The SOMEDAY" Machine

If You Knew What I Know, Someday
You Really Will Own This Yamaha...
Like Maybe Tomorrow! 600 Miles
Down The Road With Bob Greene
Photography: Pat Brollier

Someday you'll own a Yamaha," they extolled. They ground me with the inevitability of it at every turn of the page, every punch of the boob tube button, every flick of the radio dial. Not that I hadn't owned one already; they were pushing for seconds, and I was playing hard to get.

But Yamaha plays harder. Coming from behind, they were going for the four-stroke market they had neglected too long. They were going for Honda's throat. Yamaha's 500 off-road thumper had hit the mark and now they were grubbing for real pay dirt, the 350-400cc street roadster bracket, with still another all new model, a single overhead cam 360 twin virtually identical to Honda's breadwinning CB360 middleweight. Of all the tough acts to follow!

Had you been the Yamaha engineer hung with this assignment, how would you have played it? Gone off on a tangent, or snuggled right up



Only muffler bolts keep Bridgestones from running on sidewalls, a dazzler in corners. Low saddle makes it ideal for all sizes, shorties and girlies.

Handling tubes are good old bend of a '69 Triumph, with clutch bracket separate from electrical switch box so's a tumble doesn't short-out electrics.

beside them with only delicate improvisations on a similar theme? Yamaha opted for the latter, a proven safe approach, likewise using the 180-degree crankshaft layout and no out-of-phase balancer, thank you. Both twins employ chain-driven overhead cam, dual vacuum carbs, electric starter, six-speed box, disc front brake and 2.9-gallon gas tank.

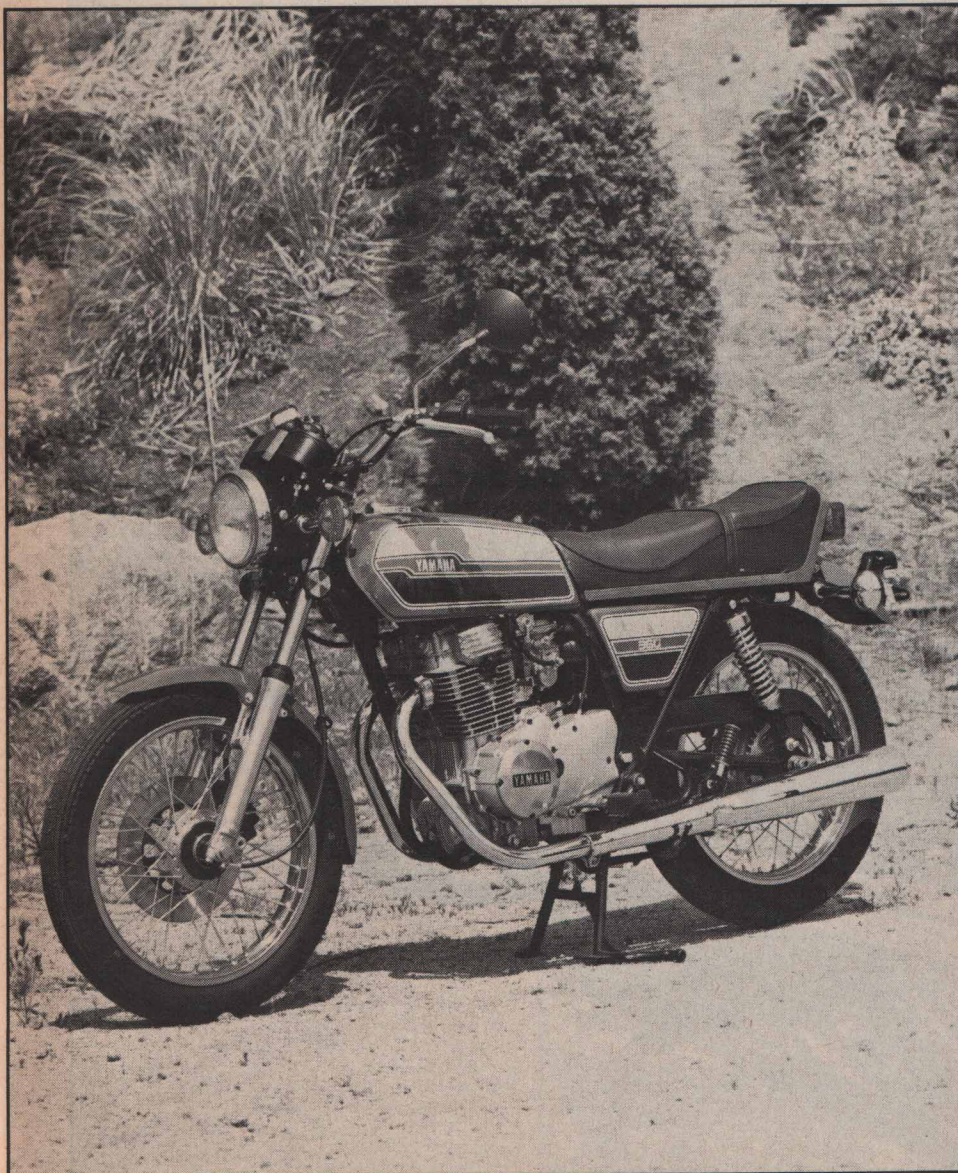
Now for the improvisations. Yamaha jumps right on Honda's pet corn in the opening act, being eight pounds lighter and \$40 under their suggested retail. And as similar as they may appear on the outside, many subtle differences are hidden within. Rather than a single-phase permanent magnet charging system, Yamaha's XS360 alternator has the more sophisticated three-phase system consisting of an electromagnet field coil with voltage regulator that is most sensitive to battery needs, being capable of more wattage at low speeds. The Yamaha brushless setup

is automotive type, considerably more expensive to manufacture and less apt to give trouble under demanding or adverse conditions.

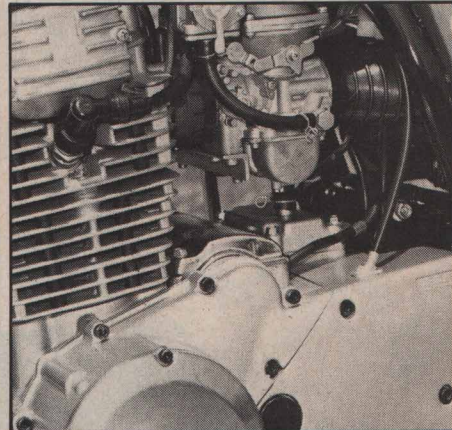
Another electrical bonus, again more sophisticated and costly, is the Yamaha double backing plate setup supporting the ignition points. Having both a main backing plate and a sub backing plate allows each cylinder's individual timing to be set without disturbing point gap. Honda uses a single backing plate whereby timing must be set by moving this single plate for one side but varying point gap for the other, compromising ignition dwell. Again, Yamaha's determination to offer more is seen in their vacuum-operated fuel petcock that automatically closes the tank valve and shuts off fuel flow when the engine is stopped and vacuum is interrupted, eliminating wasted time fumbling for the valve upon each start and stop. And a secondary advantage of the vacuum-controlled fuel

valve occurs when it comes time to sync the carbs. Just remove the vacuum line from each intake manifold and plug in the vacuum gauges at these outlets, meanwhile turning the gas tank petcock lever to Prime position (manual bypass) to permit fuel to flow around the disconnected vacuum segment of the valve. Further simplifying carb butterfly synchronization is a single adjustment screw that simultaneously opens one butterfly plate while closing the other, or vice versa when turned in the opposite direction—ingenious.

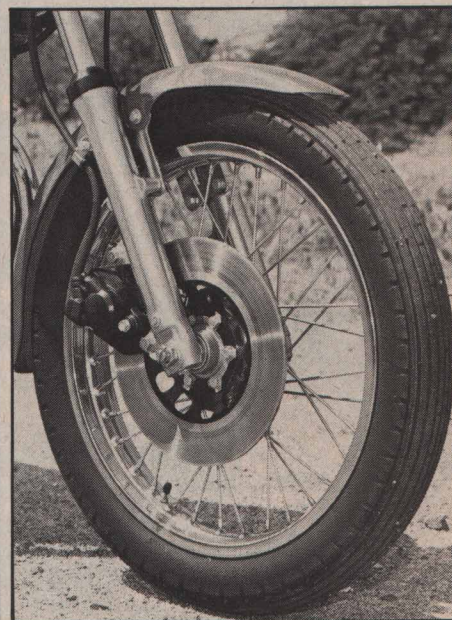
And when the Yamaha lower end eventually goes south, unlike the Honda with its practically integral needle roller big end that must be replaced in toto, including the rods, Yamaha's insert bearing crank and rods can be reshod merely by pulling the crankcase. Also as a matter of convenience, Yamaha has exiled forever the manual cam chain adjuster. There isn't even an outside fitting;



Get used to those square lines, they are Yamaha trademark. Raked duals clear low curbs, have a mellow whack. 62 mpg mileage makes car unpatiotic.



Engine case screws show class—Allen heads all! Above them are 63 silencer plugs to deaden mechanical noise. Carburetors and petcocks are vacuumatic.



Brakes? Fantastic! And that poly-pro fender might as well be made of rubber it's so flexible. Even a lightweight can heist it onto centerstand.

“In Practice The XS360 Is More Impressive Than On Paper”

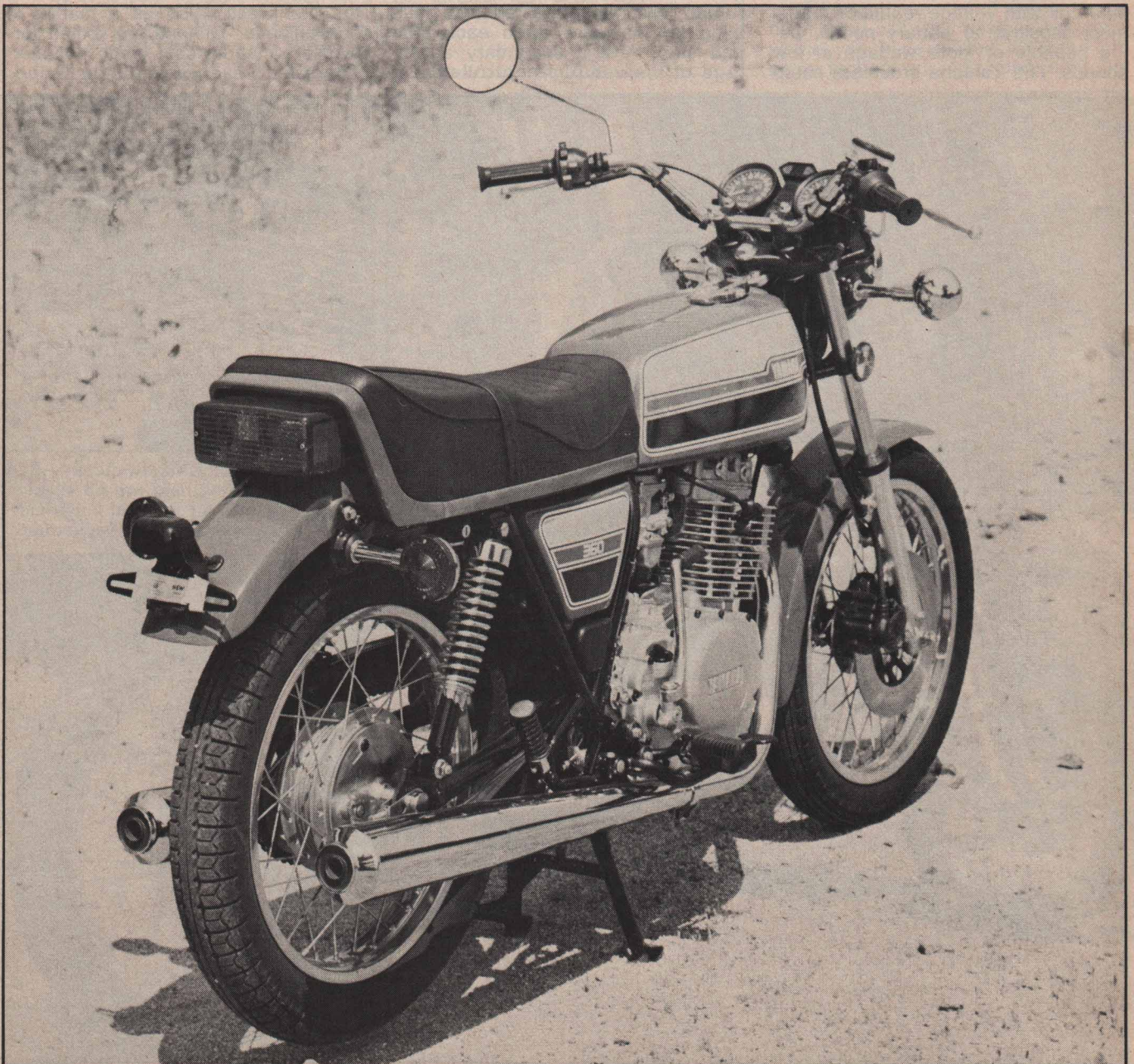
tension is now automatically handled by a spring-loaded ratchet tensioner that maintains free play within a predetermined limit without lifting a wrench. One more nagging chore eliminated, one less chance of rider neglect or maladjustment.

Other similar dissimilarities are of less magnitude; Yamaha's 34mm Mi-

kuni constant velocity carbs opposed to Honda's 30mm Keihin constant velocity suckers. Both mills allow head and barrel removal while still in the frame, the Yamaha frame being triple tube construction under the tank while the Honda is stamped steel in that area. In Honda's favor, however, is the minimal 3½-inch spread be-

tween countershaft sprocket center and swing arm pivot center; comparable Yamaha measurement being a less efficient 4-15/16 inches, permitting slightly more rear chain tension fluctuation due to greater disparity between chain and swing arm arcs during wheel travel. Both engines are over-square, the Yamaha being less so with slightly smaller bore and longer stroke.

The Yammy engine, which I figure to be about 32 horse, gear-drives its clutch and trochoid pump off the right end of its three-bearing crank, mounts electric starter and 188.5-watt alternator directly off the left. Centrally disposed on the shaft is an integral sprocket with roller chain to the attic cam. Up in that loft the four cam lobes wallow in bathtubs of oil that never run dry, ensuring constant



Suspension proved adequate even when riding double, never bottomed, didn't pogo. Check tiny license lamp. Not even a chain adjustment was needed.

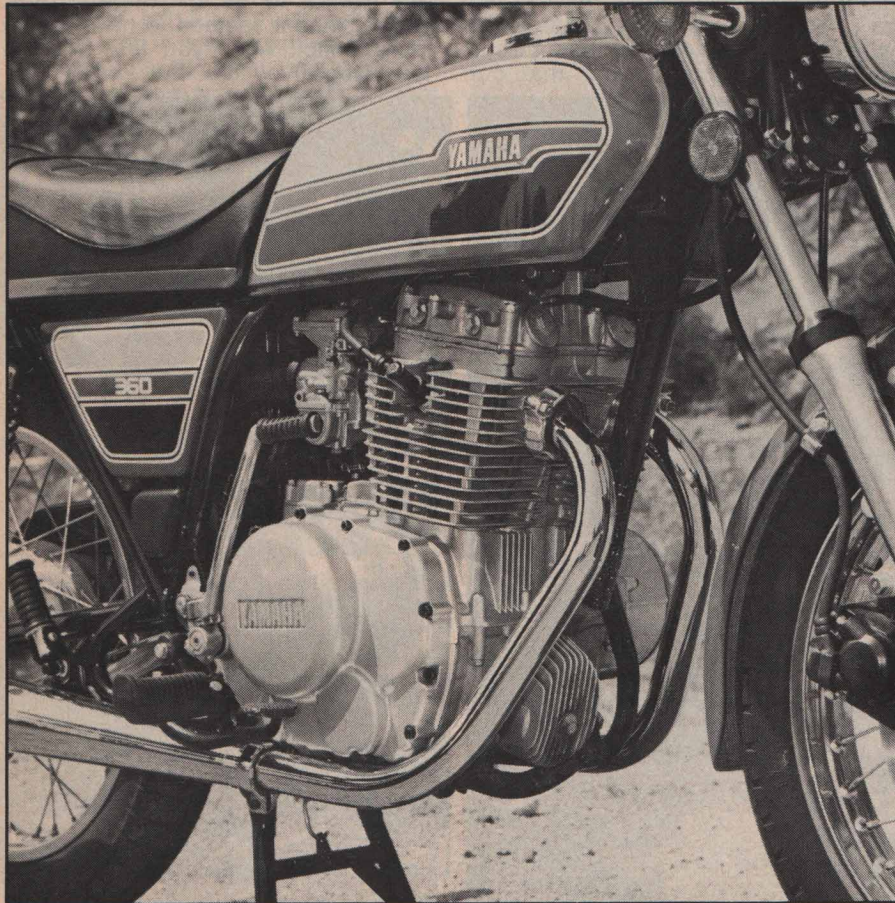
lubrication even from cold fire-up, eliminating any possibility of scuffing. Oil picked up by the pump from the crankcase sump is directed first to the replaceable front-mount filter (with bypass), then to crankshaft and on up to camshaft, cam bath and screw-type adjustable rockers, subsequently gravitating through the cam chain tunnel down to the sump. A second line from the filter accommodates the gearbox mainshaft, spilling over onto the gears. Ala Oriental custom, one oil source serves engine, primary drive and gearbox, a wet sump system without separate oil tank. Included photos describe better than words the basic layout.

In practice the XS360 is even more impressive than on paper. It is remarkably quiet and smooth. Feel of the engine through bars, saddle and

pegs is surprisingly pleasant, obviously the effect of very careful attention to balance factor, engine mounting points, and other considerations such as resilient shock snubbers in clutch hub and rear wheel, plus rubber mounting of handlebars, footpegs and saddle. Even the front turn signals, and the headlight mount to which they attach, are cushioned in rubber; all turn signals stems, by the way, being attached in break-away rubber grommets that pop out on impact, rendering them dangling and harmless in an accident. The low mechanical noise level sounds to be considerably less than Honda or Kawasaki, probably because of the extensive use of no less than 63 neoprene resonance suppressor buttons wedged between cylinder and head fins. Additional hush stems

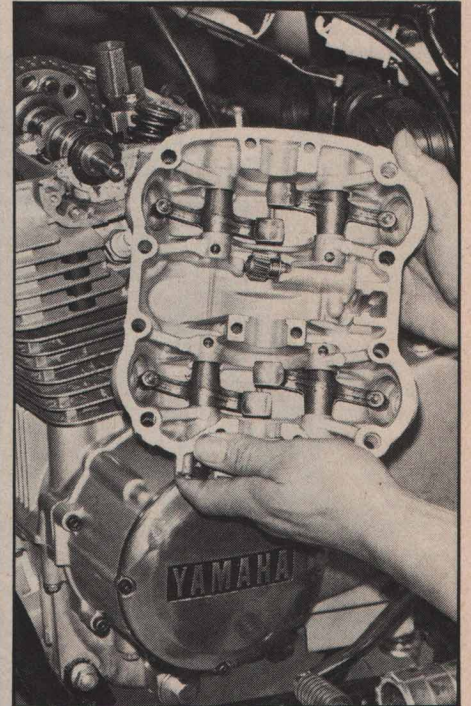
from double-walled exhaust header pipes that also resist blueing. Vibes are at a new Japanese low, in class, to the extent that, to me at least, they were not a point of contention at any speed, proving that counter-rotating internal compensators are not necessary when an engine has inherently good balance.

One other very important component plays a leading role in isolating firing impulse reactions from the rider; this saddle. It may be the first big-bike saddle to grace a small-to-mid-size machine. Broad, a little on the firm side, it floats you comfortably over the motorcycle rather than trying to get fresh with your fanny. Yamaha has been experimenting with many compositions and contours of foam rubber saddle cushions on each model and they now have it

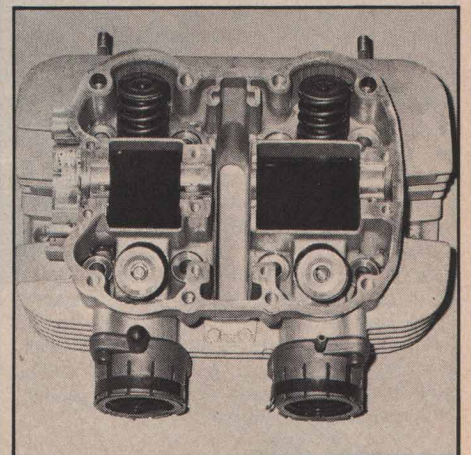


All-tube frame spreads to permit full access to throw-away paper oil filter. Yamaha has at least seven unique features, maybe more. Recall them?

As large as many a car, the dual-bulb taillight could make a life and death difference some night. Beneath saddle are neatly bundled and sheathed wires.



Rocker box, head and barrel come off with engine in frame. Double ignition point plates mount on camshaft tip. Adjustable rockers have access caps.



Attic apartment is furnished with oil bath for cam lobes. Supply never diminishes, always ensures lobe lube even after sitting for prolonged periods.

“Spell It XS Or Excess, This Motor Is A Real Swinger...”

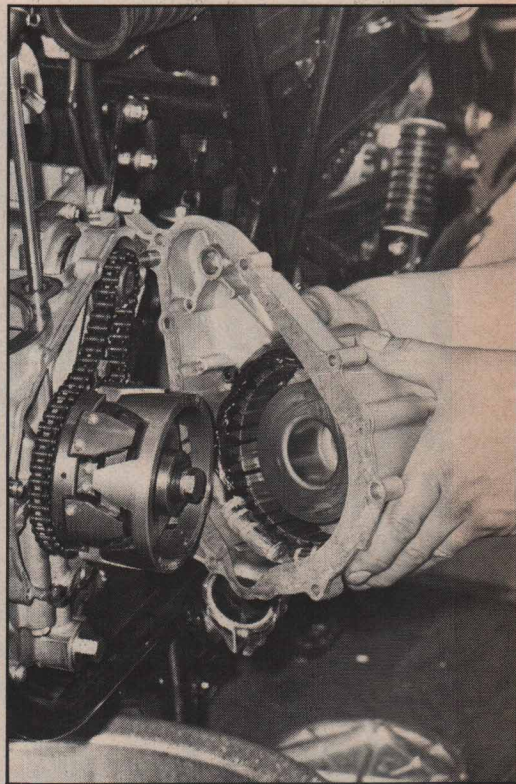
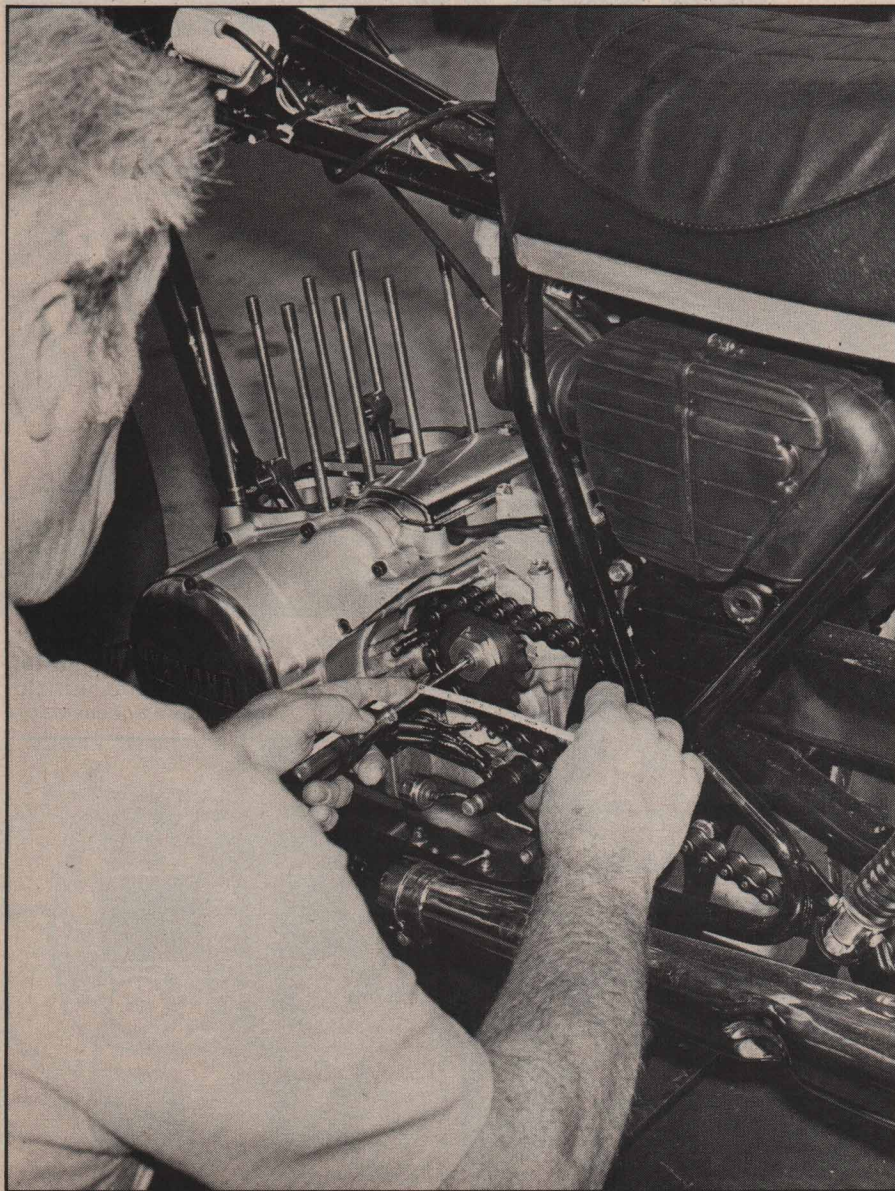
dialed in to near perfection. Here's the kind of a bike on which you can spend a full day without being a candidate for a wheelchair.

A revealing insight on Yamaha's penetration into the four-stroke field, especially their prime target, the '360 Honda, surfaced when fellow editor Rich Cox and I spent an afternoon boogieing through the Malibu Hills with the XS360 and the CJ360 Honda just tested in the May issue of *Motorcyclist*. Unfortunately we didn't have

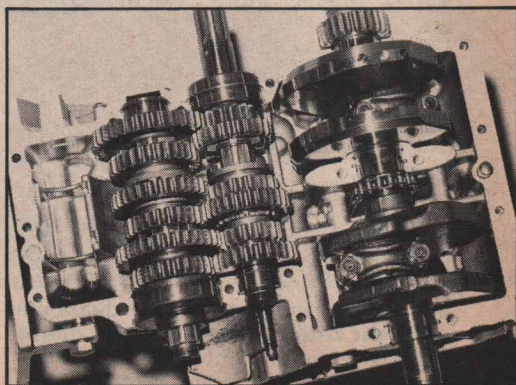
a direct counterpart CB360 Honda six-speed with front disc and electric starter, but the CJ would provide most of what we wanted to know. On the freeway approach to the hills, switching mounts occasionally, we were dramatically impressed with the Yamaha's undeniably superior engine smoothness, roomier leg position and more comfortable saddle. As dazzled as I had been only a month previous with the Honda on our Las Vegas test shot, it became clear that our

industry is now working at an accelerated pace, moving forward on a monthly rather than annual basis, and that Yamaha had done a number on the leader.

Eventually cutting off into the corkscrew hills, the Honda tightened its belt and stuck out its chest, giving the Yamaha a fit, no matter who was at the tiller. Here, where we were unable to muse on pleasantries of engine balance and saddle comfort, the Honda, even though one gear short, crowded the Yamaha hard, both shrieking tires and chassis hardware in the knottier chicanes. Deceptively, the Honda felt to handle quicker in the tight stuff, giving the impression of shorter wheelbase that was soon dispelled when the Yamaha measured slightly shorter axle to axle. Similarly, we would have assumed the Honda to be of longer crank stroke since it seemed to have a little more whack when you first twist its tail. Negative; it's the other way



Alternator windings come off with ease to expose ball and ramp starter clutch behind brushless rotor. It's a high class, three-phase electrical system.

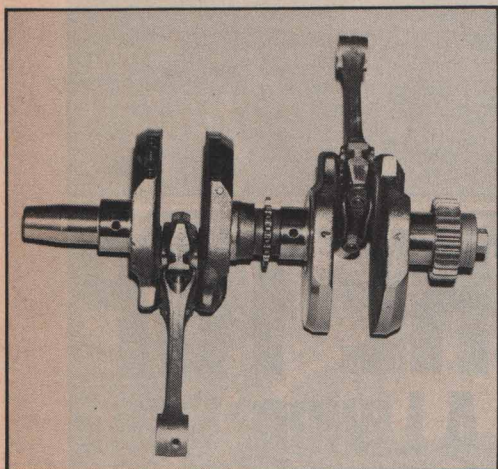


Distance between the countershaft and swing arm pivot is 4-15/16 inches, a little shorter than most, helpful in keeping chain tension fluctuation low.

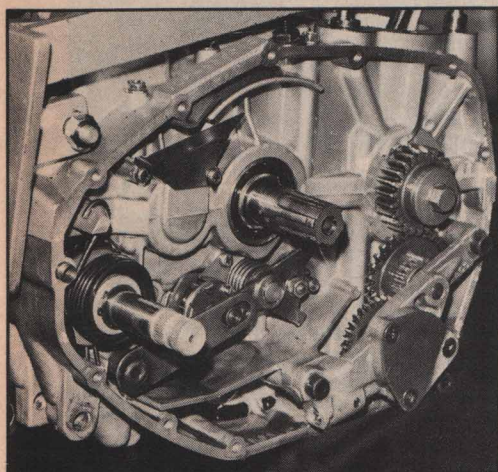
around, Yamaha having the longer stroke. But both love to scratch in the hills.

And the Yamaha is one of those rare scooters that does it all well. Scratch, tour, commute; it shines in every direction. A touring range of 241 miles gets it well up in the cross-country league. Cruising revs of 5100, 5500, 6100 and 6500 rpm at 55,60,65 and 70 mph are only a little over half to two-thirds the engine's 9300 red line. Get a haircut and suck in your gut and you might see 90 on the clock.

As a matter of fact, I saw 96 one day on this abandoned downhill section of desert road, the engine *redlining* in top gear! Spell it XS or excess, this motor is a real swinger, cranking 8500 R's at 90 mph and a shade over 9000 at 96. The two of us had just completed a 33-mile mountain section at full tilt in just under 33 minutes and I was delighted with its handling finesse, being unable to re-

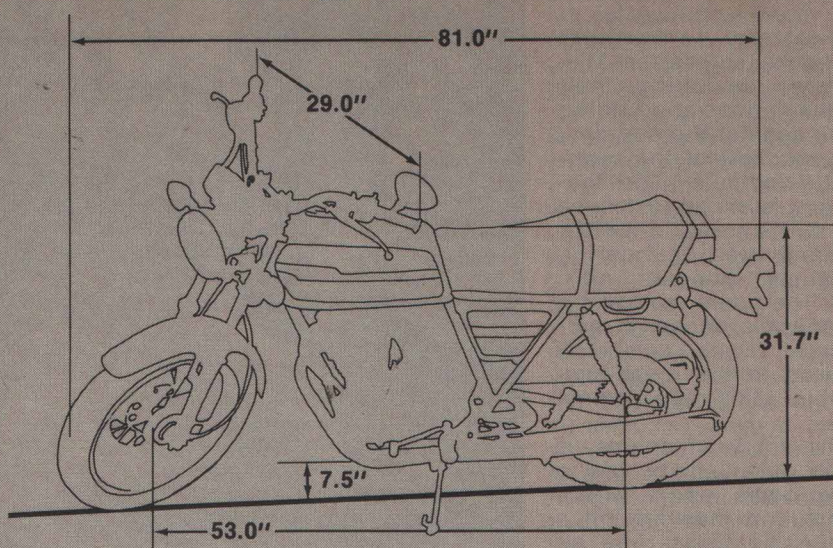


Crankshaft has 180° crank throws and central cam chain sprocket. The shell bearing lower end makes for a durable assembly that's overhauled at home.



Clutch removed, oil pump gears show. Discard kickstarter and shaft, left, and save three pounds. With electric starter, who needs it? Pushes easy.

How simple can it get? Engine upside-down, lower case removed, shows compact arrangement. Gear-ringed clutch basket fits atop gearbox's mainshaft.



Yamaha XS360

TEST BIKE: YAMAHA XS360-C

Base Price.....\$1184
Engine Serial.....1L9-001902
Warranty.....6 months or
4000 miles

ENGINE

Type.....SOHC parallel twin,
180° crank
Bore x stroke.....66x52.4mm
(2.598x2.063 inches)
Displacement.....358cc
(21.85 cubic inches)
Compression ratio.....8.7:1
Carburetion.....Dual 34mm Mikuni
constant velocity
Air filter.....Dual pleated paper
Ignition.....Battery, 12V, 12AH
Electrical system.....3-phase
alternator, 188.5 watt
Lubrication.....Full pressure,
trochoid pump
Starting.....Electric & kick

DRIVETRAIN

Primary drive.....Gear, straight cut,
3.250 ratio
Clutch.....Multi-plate, wet
Final drive.....Chain, DID 530DS,
2.500 ratio
Overall ratios.....1st 2.5;
2nd 1.777; 3rd 1.380;
4th 1.125; 5th 0.961; 6th 0.866

CHASSIS & SUSPENSION

Suspension,
front.....Telescopic, 5.5-inch travel
rear.....Spring/oil shock, 3.6-inch
Frame type.....All tube,
single front downtube
Wheelbase.....53.0 inches
Rake/trail.....26°30'—3.19 inches
Brakes,
front.....Hydraulic disc, 5.58 sq. in.
swept area
rear.....Drum, single leading shoe,
13.95 sq. in. swept area
Tires,
front.....Bridgestone 3.00x18
rib 4PR
rear.....Bridgestone 3.50x18
rib/block 4PR
Instruments.....120 mph
speedo w/odo & reset trip,
12000 rpm tach

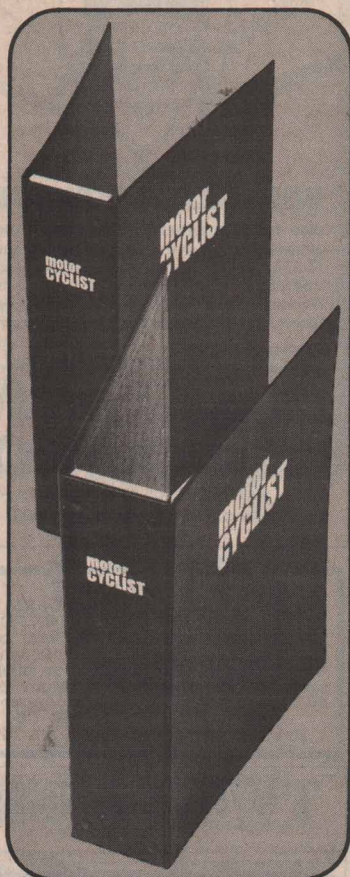
WEIGHTS & CAPACITIES

Curb weight.....380 full of gas
Fuel capacity.....2.9 gallons
(15-mile Reserve),
low lead or no lead
Engine oil.....2.4 quarts
Transmission oil.....Included in
engine oil
Fuel consumption.....53 mpg
commuting, 62 mpg highway

sist one final big roll-on, rider in a semi-crouch. Equally creditable was fuel mileage at the end of this long, hard charge: 35.90 mpg after cranking in the 2% odometer error. A subsequent 55-mile run on fairly level freeway at a steady 55 mph netted an excellent 62 miles per gallon corrected, indicative of a 241-mile cruising range with its 2.9-gallon tank. Commuting back and forth to work, half freeway, half surface streets, you can expect around 53 mpg. Oil con-

sumption, too, was exceptional; topping off at 587 miles, the day prior to turning the XS back over to Yamaha International, required 10 ounces, or the equivalent of 1878 miles per quart! To obtain full performance over the 5,000-foot mountain it was necessary to occasionally call up fifth gear. Similarly, on the freeway section beyond moderate uphill sections also required a drop to fifth cog when bucking a headwind. But this

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THE SOMEDAY MACHINE

continued from page 21

had been a day of days, the Yamaha exceeding my every expectation of handling, performance and comfort.

No, the Yamaha XS360 isn't your average annual obligatory offering. Not only do I find it virtually impossible to fault, it represents a growing up of the 360 class. Aside from the many virtues already mentioned, it sports a space-age self-cancelling turn signal device that automatically snuffs the blinkers after 10 seconds or 490 feet, whichever is greater. Should you desire to cancel the signal prior to either of these limitations, the automatic control can be manually overridden merely by punching the handlebar button straight in. An outstanding safety feature is the dual bulb taillight fixture; should one bulb blow, you still have a chance to survive by recognizing it when you get home that night, instead of having a Coupe de Ville disappear in your bloomers. This is the only new motorcycle so endowed, and this alone could make you and your loved ones grateful you went the Yamaha route. In fact, the entire lighting system is brilliant, the taillight being more automotive-like than motorcyclish in proportions and illumination, and instrument numerals almost appearing to stand out in relief.



Up front, the centrally disposed instrument cluster includes a topside ignition switch with double-edged key, and both right and left turn signal indicator lights. And Harry James can't finger his magic horn any quicker than you can play these hand switches; they're right. The grips, while about a half inch too short, are the good competition type, soft and comfortable. Clutch and brake levers have a light pull. And those brakes—oh, baby—I call 'em retroactive; they'll stop you yesterday. Disc front and drum rear, their government-rated stopping distance is 37 feet shorter than the CB360 Honda from 60 mph. And the Yamaha single-piston front brake caliper is down behind the fork leg rather than up front of it.

The six-speed gearbox provides equal facility, having a short throw, positive engagement and smooth action. It seems to be the nature of the vacuum-type carburetor to accentuate throttle action, sometimes inducing drive lurch if not handled with care. There is some manifestation of this characteristic in the XS360 but it is not offensive when the operator becomes accustomed to the feel. To smoothen throttle action in those occasional circumstances requiring maximum throttle control, usually in slow, tight situations, I lay an index finger over the stationary throttle reel housing to act as a drag and steady-ing influence. Personally, I dig fairly fast throttle action and find the Yamaha component most controllable during normal gear changes. For the engine is not the least "cammy" and pulls strong under heavy load, enough so I figure it could qualify for a dirt bike with suitable off-road appointments. This should give a clue to its lusty torque characteristics.

It's been awhile since the motor moguls have offered up a machine as versatile as the XS360, particularly in this displacement capacity. If the most adamant critics of vertical twin engine vibration don't have to eat the whole crow, they're at least going to have to swallow some feathers, for Yamaha has finally got this thing in the ballpark. And the others who rightfully complain about small bikes' crackerass saddles had better fall back and regroup until they've luxuriated atop this sultan's cushion. What Yamaha's done here is close much of the credibility gap betwixt little bike and big bike, evidenced by their expensive electrics and point adjustment systems, electric starter, trick flashers, and on and on. Small only in displacement and wheelbase, Yamaha's new generation four-stroke twin is a wire to wire winner that's going to make their contemporaries hump like they never humped before.