YAMAHA'S FINEST

After close inspection you begin to realize that a works bike is just that. Mike Bell's 250 stadium bike represents the finest the Yamaha factory can produce. By Dave Hawkins

• HOW ABOUT A NICE CLOSE LOOK AT A current factory motocross machine? As near as most people get is a crowd-control arrow fence; viewed from there, the bikes fly by so fast that your eyes and neck are out of synch for weeks. Or try a stadium seat. Far from the dust and noise, you may be hard-pressed to make out such intricate details as tank and fender colors.

On the showroom floor, you may be bombarded with all the go-fast catch-phrases. "It has the same porting that blasted The Factory Rider to seven holeshots in last year's world championship chase." "The biggest difference between a works bike and a stock bike is the fenders." "Our guys won on works bikes that are closer than ever to our stock bikes." "It's super light and super fast. It's a works replica with the works."

Sometimes during a racing season factory riders will make token appearances on stock-looking machines. But when the racing is serious or titles are on the line you can bet they are aboard the finest equipment their factory can produce. Because in the real world, champions set motorcycles.

While the works bikes of today might not exactly be the stock bikes of tomorrow, there is a huge amount of yearly technological trickle-down. After all, Bob Hannah could win on most any stock bike available, and that's a tribute to how good things are today on the showroom floor.

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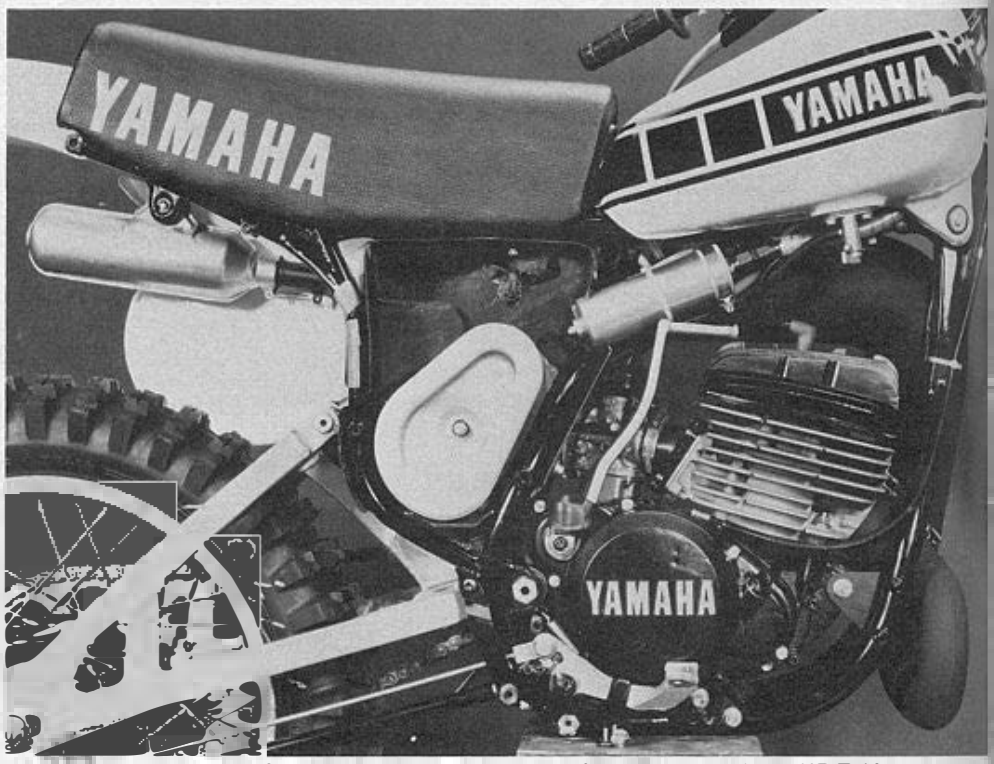


At 202.5 lbs. the works bike is almost 30 pounds lighter than the stock YZ-F. Heavy rims and steel shift lever and screws could be replaced to further lighten the bike

But what makes the factory bikes of today so interesting is that they can be harbingers of tomorrow's stock bikes.

Back in December 1978, we tested the current Yamaha YZ250F. And we said that "... only one rider in a million could reasonably ask for a better machine." But what does the factory do for that one rider? You see, Mike Bell is one rider in a million. Last year in his first full year under contract, Bell finished the Supercross series in sixth place. At the Superbowl of Motocross in Los Angeles, Mike rode a stock YZ-F to a close victory over teammate Bob Hannah, who was on a works bike. During the off-season Bell inherited one of the older works 250s and campaigned the old bike in the first two rounds of the 1979 Supercross season. Then just before Dave Osterman, his mechanic, left for the Atlanta stadium race, a new OW-40 works bike arrived for Bell.

"I rode last year's bike and didn't think they could build anything better. Then I get my new bike and they have done just that," Bell confessed in amazement. So Cycle arranged to photograph the OW-40; that took a few telephone calls to Kenny Clark, Yamaha's racing manager. We promised not to divulge any secrets we didn't know, couldn't look for and certainly were not told.

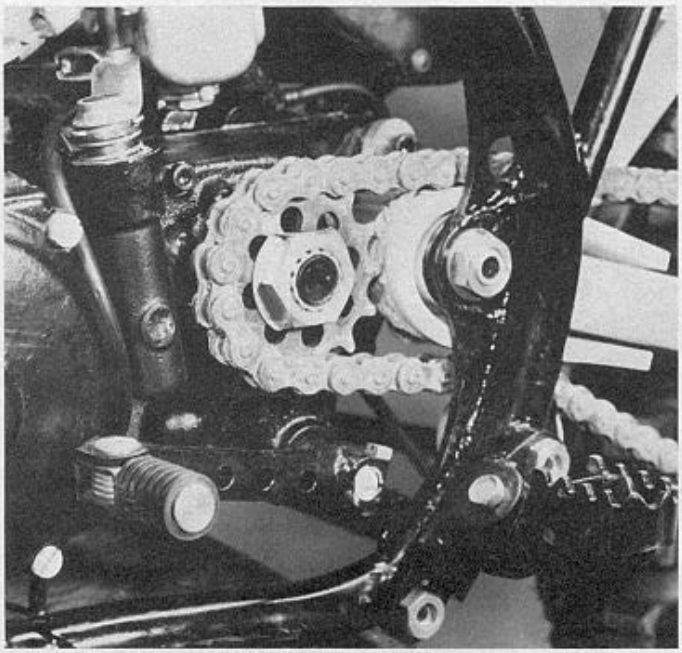
After propping the Yamaha on our background paper, Dave launched into an extensive monologue describing the sparkling new Yamaha. "All I can tell you is that it has 12 inches of travel at both ends." His long winded lecture completed, he retired into the studio darkness, only to reappear to turn the bike around and take off one number panel.

The secret to stadium racing, if there is one, is building a responsive bike that has good suspension. The suspension allows the rider to negotiate man-made obstacles faster, and the quick-response handling enables the rider to pick his way through stadium racing's inevitable wrecks and heavy traffic.

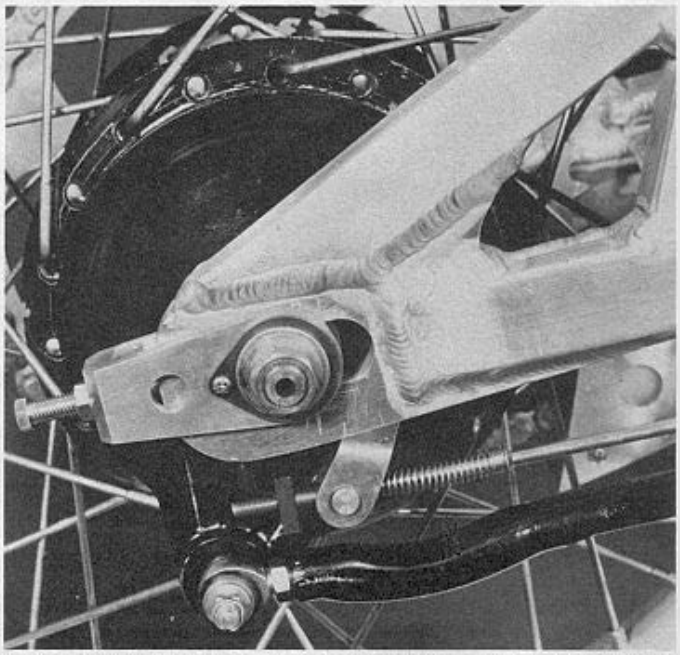
Although Yamaha mounted Bob Hannah wrapped up the Supercross title long before the last race in 1978, the works bike's engine has been improved for this year. Of course we saw no evidence of this in the engine's internal parts because we didn't see any internal parts. Bell's riding observations made the point. "I think that the new OW has a much better powerband, especially in the low rpm range. With the older bikes we had to use the clutch a lot to get a strong drive out of a turn. That is not true with the new bikes. They come off slow turns much cleaner and faster."

There are no visible changes to the OW-40 engine, but the bike does have a new pipe with a smallish silencer that closely resembles a 125 unit.

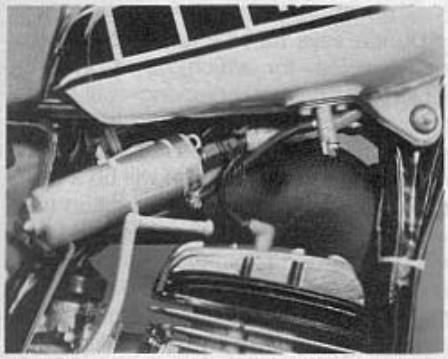
Yamaha ships their bikes to America



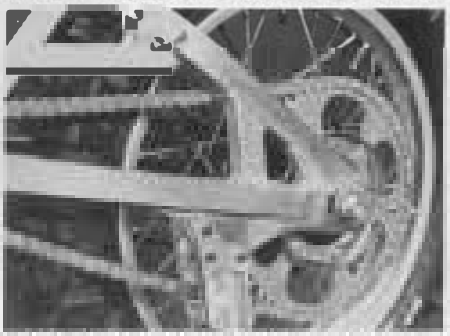
Countershaft sprocket and swing-arm pivot could not be any closer. The sprocket actually saws a grove in the teflon pad.



For quick tire and wheel changes between motos, a retainer secures the washers and the chain tensioner to the swing-arm.



Yamaha's works head closely resembles the 125 Honda's quasi-radial head.



A dished rear sprocket ring prevents a derailed chain from becoming lodged between the sprocket and the swing arm.

The diminutive conical front brake belies its stopping strength instead of the traditional leading/trailing configuration, powerful double leading shoes are used.

following the so-called "pizza principle." Once it lands in California, the basic works machine gets add-ons to suit the machine to a rider's preferences. Various bars, seats and footpeg designs are available. Bell is the tallest Yamaha team rider; he uses footpegs 10mm lower to the ground than does Hannah. Bell also uses a relatively low handlebar and the highest, thickest seat. In contrast, Rick Burgett, who is much shorter than Bell, uses the same footpegs as Mike, but Rick's handlebars are 20mm lower than Bell's.

A close comparison of the stock frame and the OW tubework demonstrates a similarity only in color (black) and tube pattern (round). Our scale sensed a difference between the factory effort and the production bike. With oil in the gearbox, fork tubes and monoshock—and with what Osterman condemned as "heavy rims" — the OW was rolled on our scale (certified by the State of California). The verdict was 202.5 pounds—almost 30 pounds lighter than the stock YZ-F and only six pounds heavier than the lightest motocross bike we have tested, the Kawasaki KX125-A4. A lot of weight was saved, compared to the stock YZ, in the engine. Both cases and the clutch and ignition cover are sand-cast magnesium. We went over the bike with a small magnet to see what parts were some kind of steel. Surprisingly there were plenty. It seems that Yamaha has replaced all titanium bolts with steel and aluminum items. All the larger steel pieces like the swing-arm bolt, front and rear axles, rear brake torque-arm bolts and footpeg bolts are all drilled for lightness. To be sure there's lightmetal everywhere in the engine and suspension. The magnet showed no interest in the engine mounts. Aluminum, right? Osterman was tight as a clam. So we tapped the mounts for that good metallic sound. They didn't tink; they thudded. Our conclusion: the mounts are more closely related to a petrochemical family than a metal one.

Knurled sections on the tubes give the aluminum triple clamps an improved grip.

The rear brake pedal and the swing arm are made of aluminum and appear very sturdy. The stout-looking brake lever is safety-cabled to the frame; in case anything would snag and bend the lever, the cable would prevent it from wrapping around the footpeg. The swing arm is heavily braced. The top member of the arm is straight, quite unlike the curved member on the stock Yamaha.

The factory monoshock unit is the heart of the OW-40. The body appears to be machined from solid aluminum stock. Shorter than a YZ shock, the OW mono-unit has external adjusters to vary damping and spring preload. The damping adjustment rings are accessible by simply reaching under the rear fender to the bottom of the monoshock. The top of the shock attaches to the backbone tube under the gas tank and about at its midway point. An oil line connects the top of the shock and a remote reservoir strapped to a vertical frame tube just in front of the airbox.

Last year the works bike had dual air filters; separate units were on each side of the machine. This year the OW has a single large airbox mounted on the right side of the bike. Two small breather tubes for the carburetor lit through the backwall and draw air from the airbox.

The front fork provided a few surprises

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for us. The fork tubes themselves between the triple clamps are only 37mm OD, slightly smaller than most stock tubes. But the OW's tubes increase in diameter at the triple-clamp joints where they are knurled for a better clamp/tube grip. The tubes are secured in the clamps by aircraft-type lock nuts.

The fork sliders are cast, but it's difficult to tell what has been machined, filled in or drilled out merely by looking. What amazed everyone was the OW-40's double-leading shoe brake.

Unlike an ordinary drum brake with one leading and one trailing shoe, the leading shoe generates most of the stopping power; the trailing shoe is primarily along just for the ride. Since such a brake has one cam, only the leading shoe benefits from a servo effect in which the shoe is drawn into the drum by the wheel's rotation. When two brake cams are employed, both shoes are leading shoes. Consequently, the double-leading-shoe design requires less pressure at the brake lever

and produces more consistent shoe wear. A double-leading shoe brake is more fade resistant than a single cam brake of equal swept area because the second cam makes the second shoe far more effective, and thus more evenly spreads a greater braking force across the same nominal shoe area.

Yamaha did not exhaust its racing technology on the front brake alone. A lot of thought and racing knowledge went into the rest of the machine, especially the rear wheel and chain drive. If a chain derails during a race and lodges between the swing arm and the rear hub, a rider can lose dozens of places before getting the chain unstuck and back onto its sprockets. On the OW a dish-shaped ring is bolted onto the rear sprocket and does not give the chain room to slip between the hub and the swing arm.

Everywhere you look, the OW impresses you. But for now a close look is all you get—because it's all we got. But that is better than a slit-eyed squint from the 133rd row at a stadium race.