THE YOSHIMURA 750

Dale Alexander, Fujio Yoshimura and Starr Thompson of Yoshimura Racing and Checkered Flag Customs enjoy thoughts of rider reactions to the mind-bending power of this Yoshimura-modified road machine.

A quick, easy way to a wallet full of pink slips

Story and Photos by BILL OWEN

Since the Honda 750 Four came along in 1969 and proceeded to rewrite the sales and record books, it has been the target for the slide rule and blueprint set in almost every motorcycle R & D department in the world. The men in white coats have been rewriting the book with trick touches in order to catch up. Lately, they've begun to be successful.

If you're a 750 fan who remembers the good old days when you blew everyone in your class into the weeds, and you want a way to get the ring-a-dings off your neck again without sacrificing either reliability or too much gold, you'll be interested in the possibilities offered by Yoshimura Racing.

For instance. How does a 50-percent increase in horsepower for under $225 grab you?

Unbelievable?

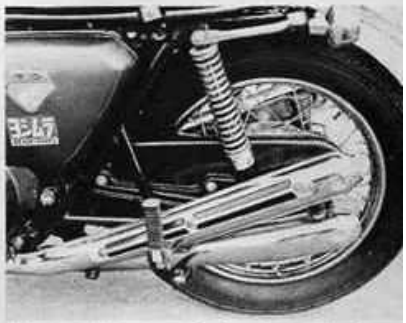
Yoshimura has a foolproof method of handling skeptics. It's called, "Park yours, try ours." "Ours" is a stock-appearing 812 street sleeper which has scared more magazine editors than Prohibition did.

When you light the 812 off, you discover mind-bending power, yet remarkable smoothness and stock-equivalent reliability. And for once, the handling and braking capabilities of a modified machine have been brought into balance with its vastly improved acceleration and top speed.

The techniques which go into the making of this bomb were developed by super tuner Pop Yoshimura, whose Japan-based R & D operation makes a habit of beating factories at their own game. With their own toys. Honda finally tired of that action, and decided to cooperate. The result is Yoshimura Racing, an independent company with factory connections.

While "Pop" runs the home factory back in Japan, son Fujio Yoshimura handles the family operations in the U.S. Roadability improvements are the work of Dale Alexander, a 17-year veteran of factory racing teams, twice Unlimited Grand Prix National Champion, and Flying Tiger Airlines jet captain. Alexander and fellow Tiger captain Starr Thompson have combined cycle expertise with aerospace technology in

Avon GP rubber up front provides adhesion for the extreme braking loads generated by the Checkered Flag Customs dual disc system.



The big footprint of the Continental K-111 transfers heavy power to the pavement. Note Koni adjustable springshocks and stone stock exhaust system.

the development of Checkered Flag Customs' improved chassis and braking systems for motorcycles. Together, the Yoshimura/Checkered Flag Hondas are hard to beat.

When Yoshimura and Checkered Flag synergize a scoot, the result is awesome. Some riders are frankly frightened by the kind of power these bikes can produce. A machine that lights rubber in the intermediate gears, and puts the tach right through the red on top just isn't for everybody.

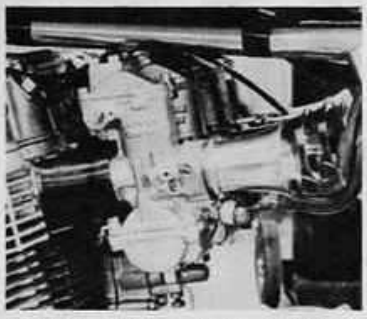
Recognizing this, Yoshimura has concocted several packages which give the rider a choice of just how far he wants to go. The baseline power package is the 15-percent over stock horsepower Road Special engine, with YR-1-2 Road and Track cam and a set of modified pistons, for $114.50 complete. This combination provides the 750 with a healthy but not too hairy broadband power increase at the stock displacement of 736cc.

Installation of this modest package is straight Honda manual stuff. If you have access to a set of metric tools (ISO Standard), including some gauges and a ring compressor, plus the 750 shop manual, you're set. A word of caution, though: If your cylinders are worn, you'll have to consider an overbore when ordering pistons.

For those needing mechanical help, Yoshimura will handle all or part of the installation. If you don't mind grunt work, but don't want to open the engine, they'll do the out-of-bike modification for $159 complete, including parts but not shipping. The R & R scooter operation adds $37.50 to the tag.

The Road and Track cam delivers its 15-percent boost at 9,000 rpm, which is also the redline for this and all other Honda mills with stock connecting rods — particularly if there's been a big power boost at the top end. The cam's smoothness only makes you wonder why the factory doesn't use it to start with.

Of course, the factory isn't necessarily interested in producing the stock 750 with any more power. The fact of the matter is, the original CB750 came with more stock power than the later K1 and K2 versions. This was due primarily to the use of less restrictive mufflers and air cleaners. However, the speculation is that the factory didn't mind taming the 750 a bit. Sales are the name of the game, and the big Fours were scaring a lot of people.



Oversize Keihin racing carburetors mounting tuned smoothing horns supply the appetites of the Yoshimura competition engine.

Of course, factory figures never indicated the loss. But performance did. No wonder most knowledgeable riders are skeptical of the numbers game.

For instance. Honda lists the power of the 750 as 67 hp at 8,000 rpm. Yet well-tuned 750s, measured on dynos all over town, will average a maximum power output through the transmission of about 52 hp. Of course, other manufacturers play the same numbers game.

This is not to say that the factory figures are wrong. Like a busted watch, they're right under certain conditions. But a running, stock motorcycle will never match those conditions.

In contrast, all figures from Yoshimura are in actual measured increase in power available at the rear wheel —where it counts. Disputes are settled on the road racing circuit, and the figure jugglers come in last.

If a 15-percent increase of power is too small for your brand of road racing, a 25-percent boost is available in the stock displacement Road Special with the YR-1-1 Daytona cam. This limited production model is available with modified pistons for $153. Even though this version is Yoshimura's flat-out racing grind, it still has very solid low-end power. Lift and overlap just aren't that radical.

Why not?

Because it works better that way.

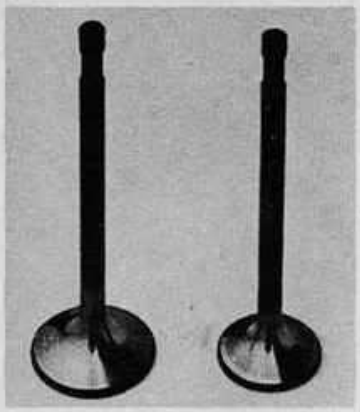
According to Alexander, cams that come on sharply at high rpm seldom provide a real power advantage over

The rear disc system of this modified chassis is useful at speeds produced by the fully developed Yoshimura engine.

The YR-1-13 Racing piston is the product of extensive development work to produce the maximum horsepower in the 812cc engine.

Yoshimura racing rods are light but super strong, for full reliability in racing engines producing more than double the horsepower of the stock engine.

This billet for the YR-1-1 Daytona camshaft is pre-profiled and specially hardened for extreme durability.

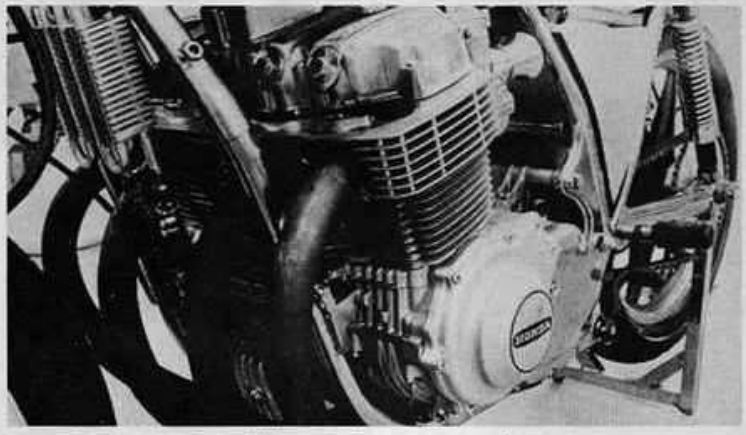


Special high-strength, heat-resistant valves for the Yoshimura racing head withstand the increased loadings and higher temperatures of competition.

Competition springs and lightweight collars and retainers of the Yoshimura racing head provide valve sealing for the Daytona cam at engine speeds in excess of 10,000 rpm.

profiles carefully developed to provide maximum output over a wide rpm band. It's just that the wilder grinds *feel* more powerful to the rider, when they make their power grab at high engine speeds. Same thing with exhaust systems. The rider almost always thinks that the loudest plumbing is the fastest, despite other factors to the contrary. If you want a foolproof opinion on the subject, consult a good stopwatch — they're deaf, and they keep on ticking while radical cams are leaking horses at low rpms.

The Daytona cam is faster, therefore it's a bit trickier to run with. Specifically, the rapidly climbing tach needle has no tendency to slow down as the redline comes up. Fast. That 25-percent power increase is measured at 9,000 rpm, but the cam peak is at 9,500. The rider MUST restrict himself to the 9,000 rpm limit, or break rods. Although there is some valve leakage above 9,000, no damage will usually result from the float. But stock connecting rods absolutely will not take the power of the Daytona cam at engine speeds much above the 9,000 rpm figure.



Super-light magneto cover reduces width of Yoshimura competition engine for extreme banking clearance. Oil cooler is necessary for long competitions.

Yoshimura urges you to take their word for it.

If you send your 750's mill to Yoshimura for modification, you can just keep your old cam and pistons at home. There is no way they can be used. The modified pistons used are stock-based, but they're jig relieved and buffed by a special process that would be hard to duplicate particularly at the price. For the sake of the reliability of components, cam and pistons are sold only as sets.

Both the YR-1-2 and the YR-1-1 (Daytona) cams are ground by Yoshimura from billets. The Daytona version is cut from a specially profiled stock that is toughened by subjecting it to extreme pressure during cooling. Since the shape of the billet is very close to that of the finished cam, very little of the toughened surface metal is removed during grinding.

After Yoshimura is finished with the trick stuff, the Honda factory cuts the tach drive gear, and drills the flange for the cam chain sprocket. Then the finished product is distributed by Yoshimura Racing. It's a nice relationship.

For the 750 owner who demands top road performance, the 812cc Road Master engines with 10-percent over stock displacement combine impressive low-end torque gains with top-end power increases of 40 percent and 50 percent, depending on the cam. The YR-1-13 pistons are responsible for a big hunk of the improvement.

These pistons are *not* modifications of the stock 750 piston, but are designed for this engine. They feature a crown shape—which has been developed to produce the maximum power in the 750 combustion chamber. It's that kind of long, exacting and expensive development work that makes Yoshimura Racing such a tough competitor.

The YR-1-13 pistons go for $91.20 per set of four, complete with rings, wrist pins and circlips. The Road and Track cam adds $94.50 for a 40-percent power gain, while the Daytona model provides a 50-percent power increase for $133. Installation is essentially the same as in the Road Special engines, except that the stock sleeves are bored out to 64mm for the 812 pistons.

Yoshimura will build your engine for you for an additional $85, if the engine comes to them out-of-bike. It costs $122.50 for the ride it in, ride it out conversion—if you're really lazy or short on time.

Competition engine mounts magneto in place of alternator, oversize Keihin racing carbs, scavenging exhaust system and high-volume oil cooler.

This Honda 750, converted for competition for ACA president Wes Cooley, (shown without racing fairing) mounts Yoshimura full competition engine, dual disc brakes in front, single disc rear, magnesium wheels, highly modified 750 forks, special lightweight oil and gas tanks. Magneto ignition replaces conventional electrics, including alternator, starter and battery.

Despite their parts list of over 39 items totaling thousands of dollars, that is ALL the money Yoshimura wants you to spend on the engine of a 750 for road use. But the engine isn't the whole story.

Most large and powerful motorcycles sold to the general public are designed to provide the owner with adequate power for general cycling conditions. He needs enough horsepower to accelerate to and at high cruising speeds, as well as to maintain those speeds for long periods without really overworking the engine. Then there's the weight problem. The owner may bolt on a touring fairing, and add a few hundred extraneous pounds of racks, luggage and maybe a packer, and then set out jammin' the territory. So the factory gives him enough power to do the job without melting the pistons or boiling the oil.

Almost incidentally, that amount of stock power will shove a clean bike to over 125 mph. The factory is aware of this, but they don't really expect the riders to run the machines flat-out, maintaining maximum possible speeds in spite of vehicle codes, high tides and lunched engines.

The rider who *does* want to be able to maintain those kinds of speeds will hie on down to someone like Yoshimura and request a little trickery. However, since the bike he's riding was built around the idea of going considerably slower than he wants to go, basic human decency requires that, when you give him his power boost, you also offer him some way of keeping it all under control.

Enter Checkered Flag Customs.

THE STOCK HONDA 750 disc brake is a pretty fair restraining device for "normal" applications, but problems develop under high-speed conditions. "Adequate stopping power" for the ultra-high-performance motorcycle does *not* mean simply the ability to lock the wheel(s) at the highest speed of which the machine is capable. It means—at least to the boys who should know, the road racers—the ability to deposit rubber at will *without* locking the wheel; from three digit velocities, all the way down to zero, if necessary. And it means the ability to do so repeatedly.

This kind of performance is beyond the capabilities of the stock system.

And that ain't all.

When the single disc caliper mounted on the left fork leg is engaged with vigor, the leg warps forward, turning the wheel to the right. This tends to produce a left bank and turn, which is not particularly enjoyable during a straight line panic stop attempt at 100 mph plus. Nor does this tendency inspire rider confidence while threading freeway traffic at 20 mph greater than standard auto speed. This standard was Alexander's minimum requirement.

The Checkered Flag Custom dual front disc system was fabricated to solve these problems.

It takes care of both. The second caliper mounted on the right fork balances the braking forces, eliminating the tendency to veer under heavy deceleration. Front braking capacity is doubled, and the additional piston area of the second caliper effectively increases the mechanical advantage of the brake lever, allowing the rider more precise control. The complete kit is available for $99.50, and is strongly recommended for use with the Yoshimura modifications.

THERE ARE A few other changes a rider with a Yoshimura kit should consider. Some riders find the front forks a little mushy for high-speed road work. A heavier fork oil should help things, with 20W-50 a good guess for strenuous work. Experimentation is the best way to determine the proper combination for road and rider.

At the other end, the factory shocks leave something to be desired for rapid motoring. Checkered Flag and Yoshimura are developing their own racing spring-shock to be available in early 1973. Meanwhile, the in-house machines at Yoshimura, including Fujio's, are running Konis. Enough said.

With an eye to maximum transfer of power to the pavement, Fujio mounts Continental K-111 rubber at the rear. A very sticky Avon GP is up front to absorb the fantastic braking loads of the dual disc system.

Fujio also runs non-standard gearing, with the stock final drive of 17/48 upped to 18/48. This is *higher* gearing, and says plenty about the tractability of the Yoshimura machines. Top speed at the imposed rev limit of 9,000 rpm is over 142 mph. And on the Road Master Daytona, it comes up in a big hurry.

With Yoshimura's extensive list of racing parts, there are other ways to power. But the Road engines provide the most go for the money. And the 50-percent over stock power Road Master Daytona is the maximum power recommended with stock connecting rods. It is also the maximum power that should be run in the 750 chassis, even with dual discs up front.

But if you want more power, it's available. Once you buy the racing rods, the sky's the limit.

The Yoshimura rods at $49.50 each are light alloy forging that can handle well over twice the output of the

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stock engine on the high side of 10,000 rpm. The lighter weight alone will provide some power gain.

In the fully modified Yoshimura engine, these rods will connect to a lightened, balanced and polished crankshaft, which is available in a special version for magneto, which replaces the alternator in the competition engine. Non-ignition electrics will be missing. The magneto is covered by a special light alloy housing that reduces engine width, a plus for the extreme bank angles of road racing.

The cylinder head gets a full treatment—porting, polishing, oversize intake ports, high strength intake and exhaust valves, racing valve springs, cups and retainers. For less critical work, a fully ported and polished head that gives up a little power to stay with stock springs and modified production valves is available for far less money.

With the racing head and rods, the Daytona cam will be able to develop its full power at 9,500 rpm, and will develop usable power up to 10,000 rpm and beyond. The cam will operate the valves through stone stock rocker arms, one of the few moving parts remaining from the unmodified engine.

Cam drive trouble is headed off by use of a heavy-duty cam chain, a special cam chain guide with a steel roller, and by shimming up the camshaft pedestals to reduce the lash of the chain. A set of oversize Keihin carburetors accommodate the greatly increased breathing capacity of this engine, with Yoshimura's 4 into 1 scavenger exhaust system on the other end. Further plumbing modifications include an oil cooler and racing oil pump relief spring.

The fully modified Yoshimura engine is available in 750cc or 812cc versions, developing 185 percent and 221 percent of stock power, at $2,600 per copy. Exchange.

Winning never comes cheap. But when you consider how much it costs just to get out there and *lose*, the Yoshimura competition engine looks like it might be quite a bargain. All of which is road racing stuff and academic to most of us bistro-bounders.

But there's one thing for sure. When the word gets out on the Yoshimura/Checkered Flag Road machines, the *Grand Prix de Cafe* will never be the same again.