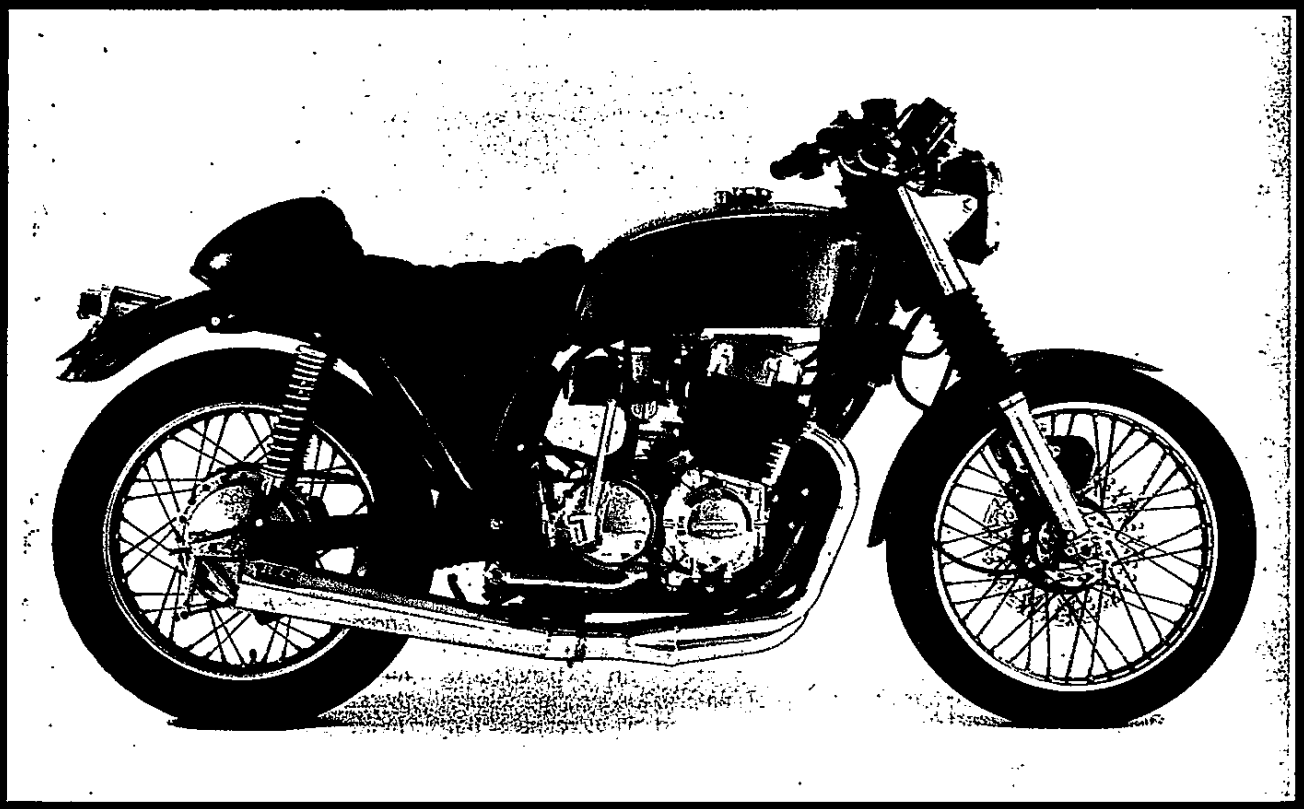


HONDA 750 FOUR

Taking it Into the Eighties

By Joe Minton

In late 1969, Honda announced Japan's full arrival into the world's motorcycle manufacturing brotherhood. England could no longer discount the Japanese as makers of entry-level motorcycles and the American rallying cry of "Jap-Junk" began to take on a hollow ring. Honda's CB750 delivered a cold shock to complacent management on both sides of the Atlantic. Here was the first modern four-cylinder motorcycle. Harley-Davidson had developed a one-liter DOHC four-cylinder motorcycle which could have been introduced the same year, but they were convinced that no one would buy it! The English were bogged down in an incredible management morass that effectively stopped design progress and eventually destroyed the industry. BMW was seriously considering abandoning motorcycles altogether.

Honda's CB750 resembled nothing so much as one of their Grand Prix roadracers with which they had won *all five* world titles in 1966. It had four carburetors, a single overhead camshaft, four exhaust pipes and something even the racers lacked—an effective disc brake. Perhaps the most remarkable aspect of Honda's stunning first "big bike" was that it went from design concept to showroom floor within the space of one year. A seemingly impossible feat accomplished by design expertise, teamwork and the will to succeed.

After a few initial difficulties (chain breakages and carb sticking) the

CB750 Honda settled into a long, nine-year production run. There were yearly design updates: new models that reflected buyers' changing tastes and the various government agencies' noise and visibility requirements. Power increased from 54 horsepower at first to 64 with the last sport model. Honda fitted an "automatic" transmission and even experimented with the 750's use in snowmobiles. Inevitably, the design was replaced in 1978 by the 16-valve DOHC 750. Make no mistake: the original CB750 engine is not out of date, it is simply out of fashion.

Honda's 750 engine has acquired a deserved reputation for long life and reliability. When left stock, and reasonably well cared for, it will last 80 to 100,000 miles with no major surgery. It will stand overheating, dragracing and almost any abuse but over-revving and too-infrequent oil changes. What we offer you here is *more* of the same durability. Our goal is to increase the peak power some, the mid-range power a lot and to do so with the least money and with *no* loss of reliability. The modifications we made do exactly that. They are proven, cheap and will bring your Honda 750 up to date while retaining its original reliability.

Engine technology has crept ahead slowly in the 1970s, but there have been major advances in chassis technology. Modern tires with their greater traction have led to stiffer frame designs. Cast wheels and motocross development have brought us the remarkably soft and well controlled suspensions of current designs. Finally, frame geometry has been refined to the point that wobbles are rare and no longer excused, no matter what the bike will do in the quarter-mile.

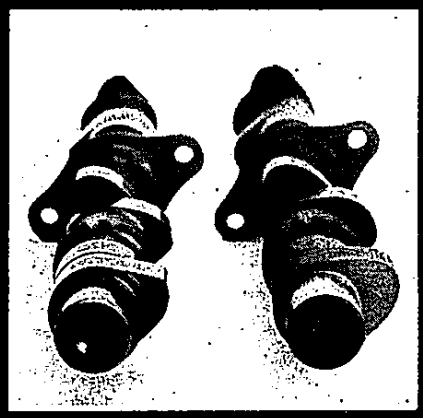
How does the SOHC Honda CB750 stack up against the chassis-suspension wonders of today? Not bad, not bad at all. Its frame is stiff enough for the best street tires available and, until one gets on the race track and really goes fast, the swingarm is just fine, thank you. Better bearings in the headset and swingarm pivots, more useful spring rates at the front and rear, and less stiction in the stock fork will bring the CB750 right up to date and extend its useful life far into the Eighties.

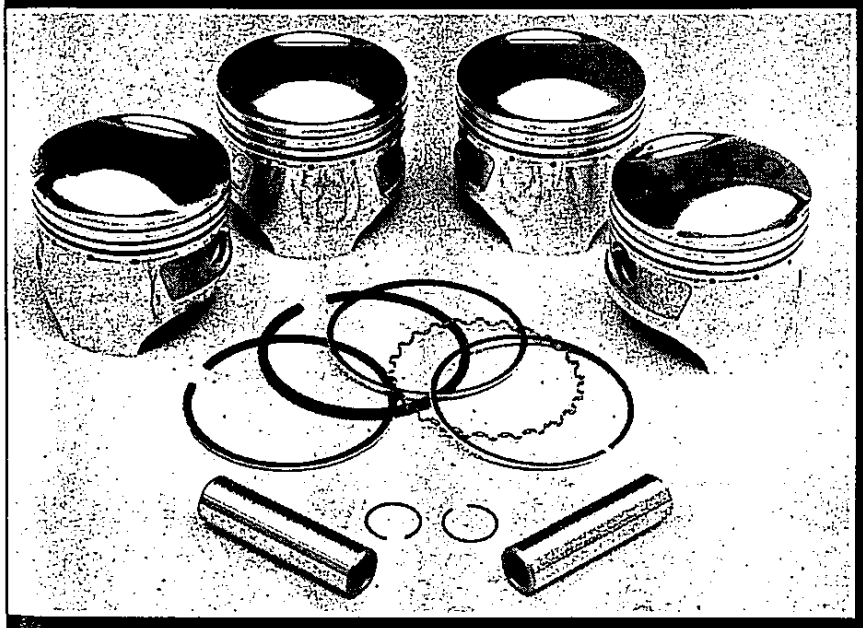
If you have been put off by the price or increased complexity of the new fours, if you really *like* your CB750 or you just want something different, like maybe a sleeper, grab your shop manual and tools and let's get started.

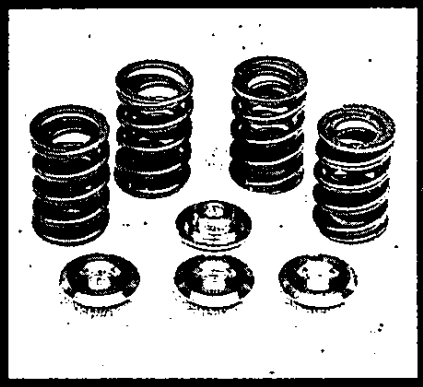
The most effective (easiest and cheapest) way to raise the 750's performance is to increase its displacement and to improve breathing. The maximum displacement one can get with a simple bore job is 836cc. This is 110cc more than stock and, if the breathing is improved, will just about deliver the maximum reliable horsepower (about 75) of the otherwise unmodified engine. We used one of the Action Fours 836cc cast piston kits in our Honda. This kit has been on the market for almost eight years and many thousands are on the road with an excellent reliability record. The pistons are manufactured in Japan by the maker of the original Honda pistons. The rings are from the Honda 350cc twin and are, if anything, better than the 750 rings. This kit's piston pins are also borrowed from the 350 twin for the same reasons: reliability, strength and low price. The 836cc (or 811cc) kit retails for $179.95 and is available from Action Fours or R.C. Engineering. The Honda's weakest link is its connecting rods. If the redline is observed and the peak power is kept to 75 horsepower or less, the stock rods are fine. More power will mean splitting the cases and installing heat-treated or aftermarket rods, either of which is expensive.

Adding a high-lift, short-duration (torque) camshaft will improve the engine's power potential enough to take advantage of the extra displacement while lowering cranking pressure so that the engine will be able to digest today's gasolines. The cam is not necessary, but it is nice. Again we turned to the *proven* performer, an R.C. No. 295 cam. This cam enhances the broad powerband of the 836 kit, is easy on valve gear and is not costly ($141). R.C. valve springs ($49, No. 1050) and stock retainers were used to keep things under control.

A cam won't do any good if the engine can't get air. The Honda's airbox and carbs are fine; the 28mm Keihin carburetors will pass more air than the excellent Mikuni 29mm smoothbores. The stock paper air filter, however, is too restrictive. A K&N cloth filter will







Action Fours' 836cc piston kit is the best way to improve the performance of any SOHC Honda 750. It is reliable and of top quality (left). R.C. Engineering's 295 cam (top right) has more lift and duration than the stocker. It is quiet, easy on valve gear and makes more power. Aftermarket valve springs (Action Fours are shown) are a necessity if you expect to use lots of revs, as in dragracing.

PHOTOGRAPHY: JOE MINTON, JOHN GATES

take care of the intake's needs.

Stock Honda exhausts for the 750 four changed almost continuously over the life of the bike. The first were rather loud and not very restrictive; excellent for making power. They became quieter, more restrictive and heavier. There are few of the original, high-performance exhausts left. Either they have rusted out or have been replaced by four-into-ones. The late Honda four-into-one pipe was rather stuffy and very heavy as well—and it robbed ground clearance from the right side of the motorcycle. Aftermarket four-into-one pipes are lighter, longer-lived and usually make more power than the stock item they are designed to replace. One of the most successful of these collector systems was also the first: the R.C. Engineering four-into-one ($219, chromed). Although it will not give as much ground clearance as the Kerker (also $219 in chrome), it is better than the Honda four-into-one pipe. Both pipes will make a lot of power and remove about 20 pounds from your bike.

Jetting for either of these pipes is rather easy. Simply install the K&N stock replacement filter, change the pilot (idle) jets to No. 35s, go up two sizes on the main jets and adjust the pilot-air screws out one to one and one-eighth turns. Be sure to synchronize the carbs. (See the Feb. 1981 issue of *Motorcyclist.)*

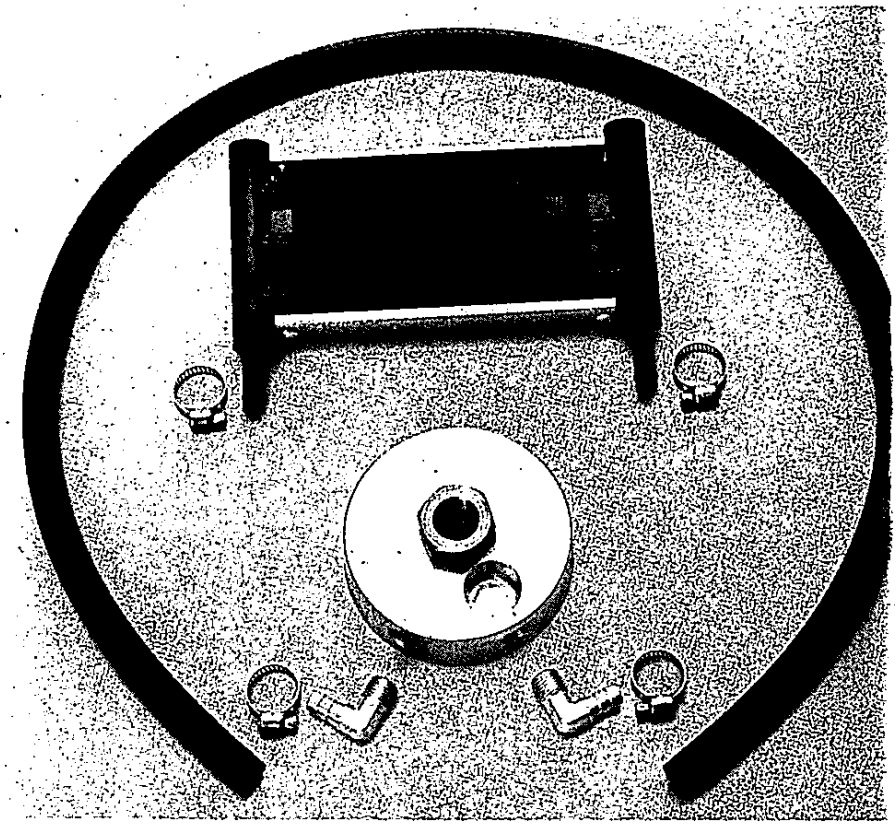
Honda's four will overheat if it is stressed highly. Large-displacement, high-power versions will, when ridden hard, raise oil temperatures to over 275 degrees Fahrenheit. Worse yet are the touring bikes that are heavily loaded, then ridden across Western deserts and high mountain passes during the summer. The simple answer to the oil temperature problem is to install an oil cooler. We recommend that you do so whether or not you increase the power output of your Honda 750.

Riders who indulge in dragracing must install a stronger clutch. An 836cc Honda will not burn out the stock clutch *unless* the bike is ridden very hard. However, one set of plates so improves the feel of the Honda's clutch that we recommend installing one even if you are the most gentle of riders. Metal Frictions Co. makes these plates (also for most other bikes) for the Honda. They are available as clutch kits from Action Fours (new friction plates and one steel plate, with springs) for $66.95. R.C. also sells the same plates but in a more inclusive kit (friction plates, springs and copper-plated steel plates) for $91.

Honda valves and valve guides are of the very finest quality and have outstanding wear characteristics. There is no need to change them for street use.

ENGINE

STEP 1: DISASSEMBLY AND INSPECTION. Prepare for the engine work by thoroughly cleaning your work area and the bike itself. Dirt will collect at the base of the studs running from the upper case through the cylinder and head. If not washed out, it can fall into the engine when the cylinder is lifted from the case. You cannot remove all the dirt, but most of it will come out.



Touring riders and back-road buffs can put more heat into the Honda's oil than can be drawn away by the air stream. This can lead to excessive wear or outright failure. Derale's thermostatically controlled oil cooler keeps a 750's oil temperature within the 180-210 degrees Fahrenheit range recommended by the American Petroleum Institute.

Since the engine won't be back together for a week or so, put the parts of each sub-assembly (for instance the rocker arms and pivot pins) into separate small paper bags. Mark each bag with a short description of its contents. The bags will keep all the proper nuts and bolts together and ensure that they stay clean.

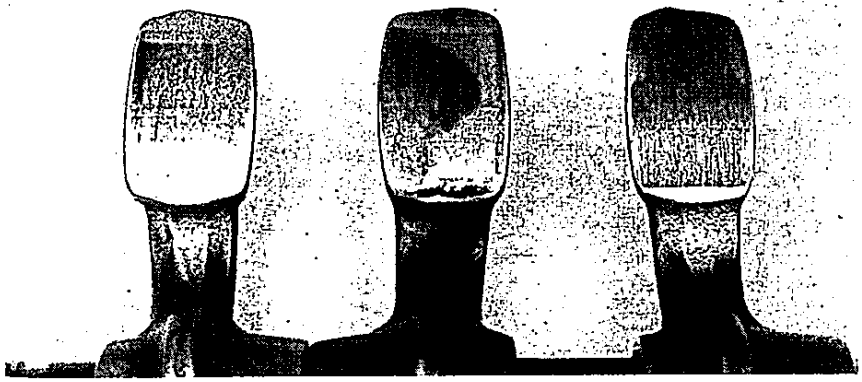
Referring to your shop manual, remove the engine and set it on your bench. A couple of two-by-fours about a foot long are very handy for propping the engine and steadying it.

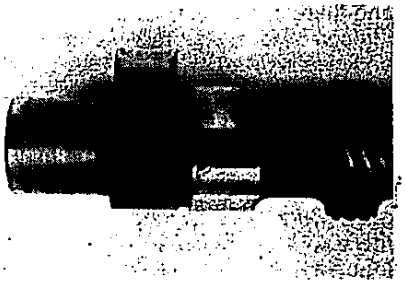
Remove the cam cover, cam chain tensioner and the rocker arms. Inspect the rockers for excessive wear on the chromed face that contacts the cam lobes. If the chrome plating is worn through or has flaked off, the rocker must be replaced. The wear-surface must also be smooth; if there's a wear-groove in the middle of the contact patch of the rocker arm, the rocker must be replaced. A slightly mottled appearance is normal.

Remove the camshaft. Inspect it for pitting and scoring. If there are score marks on the cam or the rocker arms, the engine has had an oil-film failure. This is usually caused by excessively high oil temperatures. However, if the oil is not changed for a long period of time it will lose its lubricating properties, which can also cause scoring and pitting. A pitted camshaft is usable if the pits are small and there is no scoring of the lobe on which they are found. Large pits indicate extensive disintegration of the cam material. Scoring of the cam is also reason for replacement. If you determine that the cam should be replaced, also replace the rocker arms that contacted the damaged lobes.

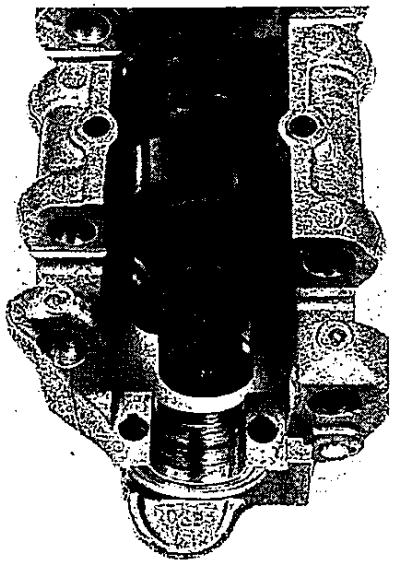
Inspect the camshaft-bearing surfaces and the cam bearings themselves. If there is heavy grooving of these surfaces, both the cam and the cam bearings will have to be replaced. None of these expensive-sounding maladies will occur if there is an adequate supply of properly fresh and sufficiently cooled oil.

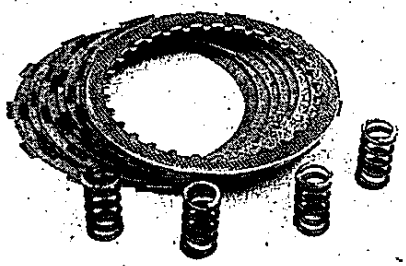
NOTE: The bolts that fasten the cam holders to the head can easily strip the threads in the head casting if they are over-torqued. Be *very* careful not to exceed the factory recommended torque for these bolts; it won't seem like enough, but trusting the factory is better than removing the head so your local mechanic can install a heli-coil.





Oil-film failure caused this cam (above) to spall, forming the dark pits in the middle of the right lobe; it will have to be replaced. The oil was too hot.





The left rocker arm (top) shows normal wear and is OK; the middle rocker has had its chrome plate worn through; the last galled because of oil failure. The two on the right must be replaced. This cam bearing (left) has galled and must be replaced—oil failure again. Action Fours' clutch (above) will improve shifting and operate smoother.

Remove the cylinderhead. If the head gasket is sticking the head to the cylinder, place the edge of a putty knife in the gap between the head and cylinder and tap it into the gap with a light hammer to separate the gasket.

NOTE: There are two bolts (one at each end of the heads) that are rather difficult to remove with an ordinary socket or screwdriver. A deep, thin-walled 10mm socket or a Snap-On No. 3 Phillips screwdriver will remove them easily. The Snap-On screwdriver has a hex shape just below its handle that will accept a wrench and increase the leverage enough to remove these head bolts.

STEP 2: VALVES AND SEALS. If your bike has less than 40,000 miles on the odometer, it probably will not need a

valve job. You should, however, replace the valve guide oil seals. Remove the valves and inspect them for contact width. If the valves have a uniform contact width around their circumference and that width is within the range specified in the shop manual; simply clean the valves with a wire brush, lap them (use Perma-Tex valve-grinding compound; it's the best) and return them to the same hole. Be certain that you get all the grinding paste off the valves and seats before reassembly. Lightly grease the valve stems with Bel-Ray assembly lube as you insert the valves into the head. Rarely will the valve guides need replacing.

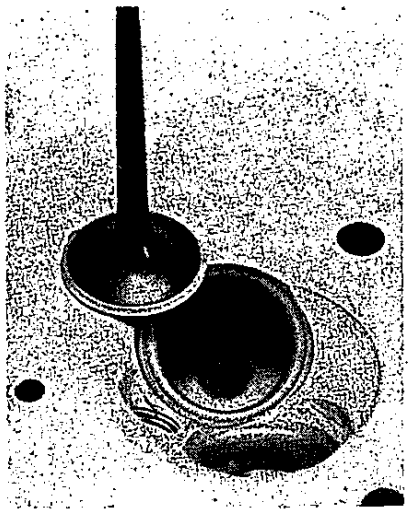
One of the greatest problems you can have is finding a mechanic who can do a proper valve job. Very few can. The valve seats of most Honda 750s are hardened and must be ground rather than cut. Most of the valve-seat grinders available were designed for automotive use (large and heavy) and only the most skilled can control them well enough to provide the delicate one-to-two millimeter wide valve seats that are so critical for performance and long life in a motorcycle engine. Find someone you can trust and be sure that he understands what you want (factory specs) and that you are going to inspect the work. A good mechanic may be irritated, but you will probably get the best he can do.

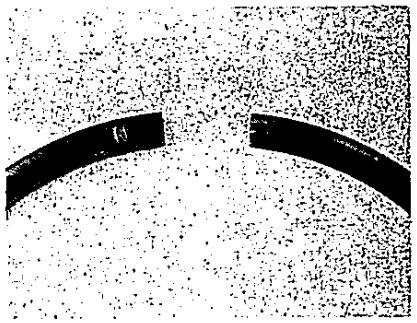
If the engine has been burning oil and there is a thick coat of carbon on the combustion chamber, scrape it off and clean it. A normal thin coat of carbon is permissible and there is really no need to remove it, since it will return within a couple of thousand miles anyway.

Most accessory camshafts will require stiffer valve springs. Be sure that these springs are installed to the maximum height recommended by the spring manufacturer. Most cam and spring manufacturers are conservative and will specify a tighter spring pack than is needed. They are looking out for the guy who shifts by valve float and thinks the redline is where the power starts. If you aren't that type, your engine does not need the added stress of tightly packed valve springs.

For engines destined for the street with an occasional dragrace thrown in, stock valve spring retainers are best. They last indefinitely and cost less, since you already have a set.

STEP 3: CYLINDER. Squirt a *small* amount of chain lube into the cylinder stud holes at the base of the cylinder. This will make the dirt particles at the bottom of the holes stick together and prevent them from falling into the crankcase when you remove the cylinder. Remove the cylinder. Don't worry about the cam chain falling into the case; it can easily be fished out later. Use the putty knife to loosen the base gasket if it is stuck. Stuff shop towels (or paper towels) into the case and remove all the dirt and old gasket from the top of the case where the cylinder seats. The putty knife, with a sharpened edge, and a pocket knife will make this relatively easy. Be careful: if the edges are too sharp, you will remove aluminum as well as gasket, causing a leak.





Big engines and high compression mean nothing if the valves don't seal well; the best valve job (left) looks just like the examples given in your shop manual. Japanese rings (above) have a top and bottom side; the top is always identified by a letter and/or number near the ring ends. These letters must face up.

Clean the cylinder of all gasket material, making sure there is an oil film in the bores (use some chain lube) and send it out for boring. Whether you use cast pistons or forged, specify a piston-skirt clearance of .001 inches. The measurement should be made just above the bottom of the piston skirt and at right angles to the piston pin. Many will argue with this tight clearance; let them, they're wrong.

When the cylinder is returned, clean the bores thoroughly with a soapy SOS pad and hot water. Carefully dry the cylinder and lightly oil the bores so they won't rust. Wrap the cylinder in a shopping bag and set it aside until you are ready for it.

STEP 4: PISTON INSTALLATION. Remove the old pistons.

NOTE: Be very careful not to drop one of the piston pin clips into the crankcase; a shop rag placed around the mouth of the case will help. Check the fit of the new piston pins in the rod eye. Also examine the rod for signs of seizing.

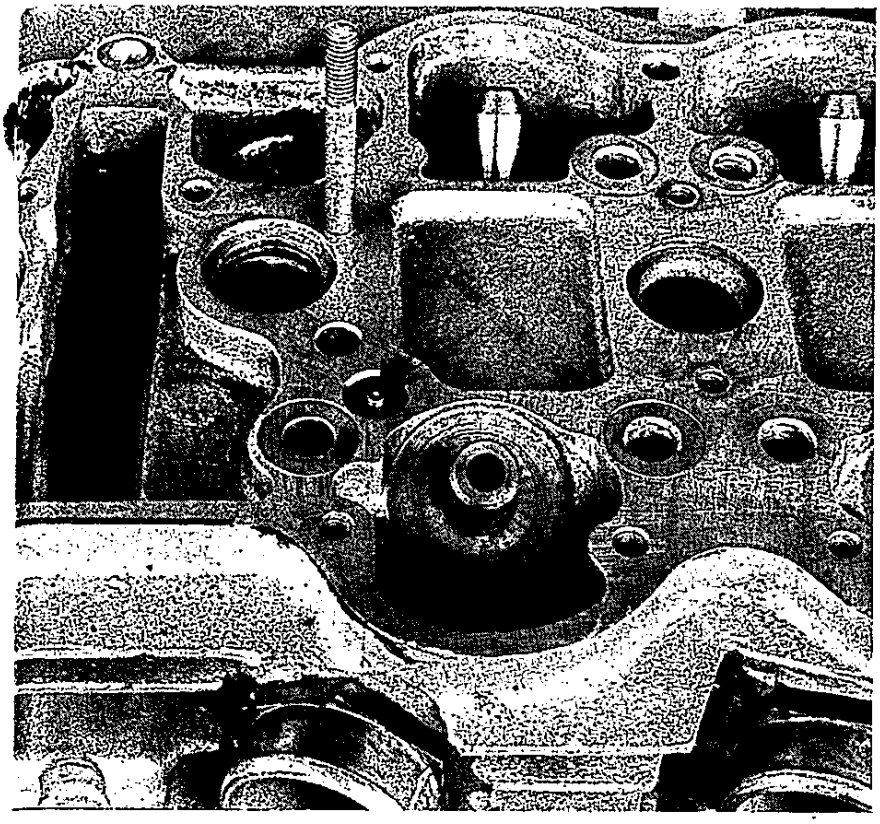
Lightly oil the piston ring grooves and install the rings. Piston rings normally rotate, so it is not that important that they be evenly staggered around the piston circumference. The most crucial consideration for the mechanic about to install the cylinder of a Honda four is to get all the rings in without breaking any of them. If the oil control ring is a three-piece ring, place the two end-gaps at 120- to 180-degree intervals (more or less opposite one another on the pistons). The second compression ring will be the dark one (unplated) and its top is indicated by stamped manufacturer's trademarks near one of the ring ends. It doesn't matter what the mark is; it will be on the top side of the ring. Of course, this mark should be installed facing the top of the piston. Finally, slip on the top compression ring (chrome plated), also with the mark up.

Lubricate the piston pin and connecting rod with heavy oil or Bel-Ray assembly lube and install the pistons on the rods. Be certain that they are correctly oriented; the large valve cutaway goes on the intake side of the engine. Carefully install the piston pin clips and be sure that they are all seated fully. Feed one end of the clip into the piston pin hole in the piston and then carefully work the rest of the clip into place with the aid of a small screwdriver. *Never* grab the clip with a pair of pliers and distort it while you force it into position; the clip should be compressed just enough to slide into the pin hole. The stock pin clips are just fine and there is no need to go to exotic pin retainers with the R.C. or Action Fours 811 or 836cc piston kits. Most wrist-pin clip failures have resulted from damage upon installation or an improperly shaped bevel on the piston pin itself. These kits use the excellent Honda 350 twin piston pins, so buttons are not needed.

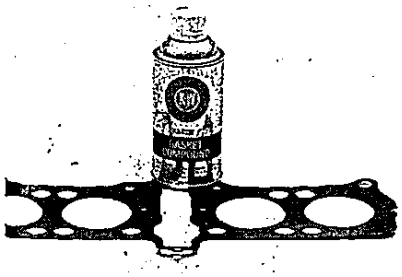
After the pistons are in place, orient all the piston rings so that the gaps fall between the two front studs on either side of the individual pistons. All the end gaps should point toward the front of the engine. Place the number two and three pistons at TDC. If your set of oil rings are the three-piece type, don't worry about their end-gap positions.

Apply a light coating of Gaska-Cinch or Copper-Coat to the cylinder base gasket and let it dry for about ten minutes. Be sure there is no oil on the surfaces that will be in contact with the gasket. Install the gasket.

NOTE: Be sure it is oriented correctly and that all the locating dowels are in place.



These two little orifices (above) control all the oil to the top end. If they're clogged, the cam and bearing will be destroyed! Careful cleaning and assembly will avoid a potential disaster. Honda head gaskets need help if they are not to leak. Copper-Coat or Gaska-Cinch and slight over-torquing can guarantee no leaks (below).



Place the cylinder over the pistons and begin to feed the rings into the cylinder. Cock the pistons so that the ring gaps enter the cylinder bore first. As the gaps feed into the bore, compress the rest of the ring with a small screwdriver and lightly tap the top of the cylinder with the heel of your hand. Watch the rings carefully and keep pushing them in with the screwdriver until the pistons are straight in the bore and all the rings are in place. This task is not very difficult, even though it may sound it. After you have the pistons for cylinders two and three in place, carefully rotate the crankshaft and do the same for one and four.

STEP 5: HEAD INSTALLATION. Inspect the assembled head for dirt and any remaining gasket material that might have been overlooked. Clean the surface that will come in contact with the head gasket. Similarly, inspect and clean the cylinder itself. Be sure that all locating dowels are in place as well as the rubber seals around the appropriate studs. Smear a *thin* coating of Yamabond, Kawasakibond, Gaska-Cinch or Copper-Coat onto the head gasket top and bottom surfaces. Place the gasket on the cylinder (watch the orientation) and the head on the gasket. Immediately place the lightly oiled copper washers and nuts on the cylinder studs and torque the head to 19 foot/pounds. It is important that the head be torqued before the gasket cement has set up, and it is important that the washers and nuts be oiled. The specified 19 pounds of torque is higher than the factory recommended value, but their head gaskets leak and yours won't. Let the engine set for about ten hours and torque the head nuts again.

CAUTION: Two tiny orifices control the amount of oil reaching the cam bearings. These orifices are located next to the cam chain opening and to the rear of the head. They *must* be kept clear or the cam and cam bearings, as well as the rocker arms, will be destroyed from lack of oil. We strongly recommend that you *do not use* silicone rubber sealants, since they can very easily plug these holes and ruin your engine. Use Gaska-Cinch, Copper-Coat or a similar sealant to seal the cylinder base and head gaskets. Just be sure, whatever you use, that none of it gets into the passageways formed by the cylinder and head around the two rear studs next to the cam chain tower.

STEP 6: CAM AND VALVE GEAR ASSEMBLY. The most common reason for differing performance between otherwise identical bikes is cam timing. The Honda single-overhead-cam fours are particularly affected by incorrect cam timing. Unfortunately, the Honda 750's cams are also often retarded enough to make timing them worth the effort. Rather than going over the cam timing procedure, we will simply refer you to the October 1980 issue of *Motorcyclist*.

Whether you choose to use the stock cam or the R.C. Engineering #295 cam as we did, the timing should be set so that the intake valve opens as many degrees before top dead center as the exhaust closes after top dead center; the timing should be split between the intake and exhaust during overlap. R.C. furnishes a slotted cam sprocket (No. 1045; $25.50) in case you do not wish to do it yourself.

If you plan to install the R.C. cam, it will be necessary to grind some aluminum from the head and cam holders to clear the larger lobes. A Dremel tool or rotary file will do this easily. You should trim the head and cam holders before assembling the head to the engine to keep metal particles out of the crankcase.

There are six rubber sealing discs that go under the cam holders. These must be sealed with Yamabond, silicone rubber or other sealant or the head will leak oil. *Always* replace these seals with new ones. Before placing the cam holders (bearings) over the seal rings, be sure that the threaded holes for the cam-holder fixing bolts are clean and clear. If the holes are partially filled with oil, there is a very good chance that you will strip the rather weak threads in the head due to the buildup of intense hydraulic pressure as you screw the bolts into the blind holes. Clear the holes with a squirt from a can of contact cleaner, let it dry and lightly oil the threads of the bolts.

After you have timed the cam and installed all of the rocker arms and pivot pins, brush a coating of Bel-Ray assembly lube onto the surfaces of the cam lobes and rocker arms (just as you did the rocker arm pivot pins before you installed them). Adjust the valves on the tight side of the manufacturer's tolerance range; this will minimize loads on the new cam. Adjust the cam chain and pour oil over the valve gear. Install the cam cover and install the engine in the chassis.

NOTE: Before starting the engine for the first time, fill the oil filter cavity with oil and turn the engine over, with the

spark plugs removed, for about 20 seconds to be sure that oil has reached the rod bearings. Do not oil the cylinder walls of a new engine; merely place a drop on the skirt of each piston. Upon starting the engine for the first time, run it up to half the redline rpm and hold that rpm for at least 30 seconds. Shut off the engine, check for leaks, etc., and then ride the bike while keeping the rpm low but with a load on the engine—lug it a little. This will place pressure on the piston rings and help them seat.

FRAME

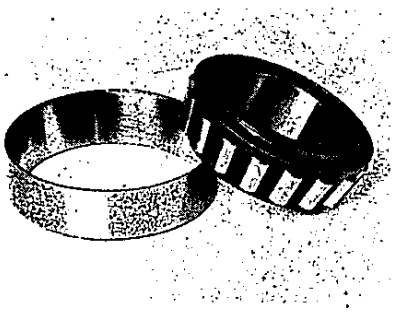
STEERING-HEAD BEARINGS: All SOHC Honda 750s were equipped by the factory with loose ball-type steering bearings. These are cheap and inadequate for the weight of the bike. Any Honda 750 will wear out the loose ball bearings in under 10,000 miles unless the rider only travels on glass-smooth roads and never uses the brakes hard. Ball-type bearings dent the races, cause the steering to be jerky and can contribute to high-speed instability. Since this race-denting takes place over a few thousand miles of use, the rider is often unaware of the deterioration of his bike's handling. Whether you are a canyon racer or a touring rider, installing good steering-head bearings will give you the most improvement for your money.

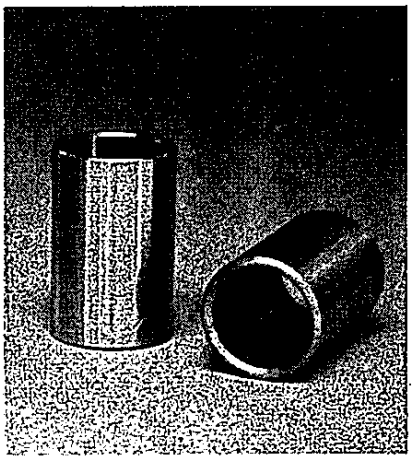
We published a detailed how-to article on steering-head bearings in the February 1980 issue of *Motorcyclist*. (See, you should keep them.) If you can't find that issue, simply follow the directions of your shop manual and substitute tapered bearings for the OEM loose balls and races. We bought ours from Racer's Supply; they stock either the Japanese or the English (Dresda) tapered roller replacement bearing sets. The Dresda bearings are about five bucks more but seem to be easier to install, and their bearing area and rollers are larger, which should translate into greater load capacity and longer life.

Be sure that you readjust the steering bearings after a couple of hundred miles, as they usually loosen a little. Adjust the bearings so that the forks rotate freely but have no detectable play. Tight bearings can damage the races and contribute to high-speed instability; loose bearings will do the same things, so spend enough time to get them adjusted correctly. Use a light grease (Moly filled) and pack the space between the lower bearing race and the triple clamp to act as a dirt barrier for the lower race.

It is difficult to overemphasize the improvement this simple change will make, but when you turn out of your driveway with the new bearings installed, it will be obvious.

SWINGARM: Honda did a good thing when they designed the 750's swingarm. It is very stiff and was even suited to the rigors of roadracing until the advent of slicks obsoleted the entire chassis (for roadracing, that is). Putting plastic bushings in this very fine swingarm was strictly a bean-counter's exercise. Plastic bushings wear out quickly, no matter what you do. Install a set of the silicone-bronze bushings available from Racer's Supply or Pro-Tec. With proper installation and care, they will last as long as the rest of the bike.





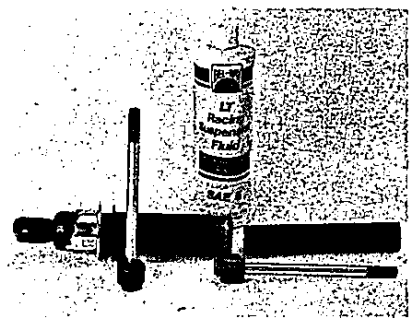
Every motorcycle made should have these tapered roller bearings (above) in the steering head; your Honda will steer better and feel more solid with them. These bronze swingarm bushings (right) work and last as long as you keep them greased.

Remove the swingarm. Remove the ground steel sleeve that the plastic bushings run on. Inspect the sleeve for wear; often it will be scored and worn and will need replacing. Polish the bearing sleeve with 320 or 400 grit wet-or-dry sandpaper where it is to contact the bronze bushings. Clean the polished sleeve with soap and water, oil it, and set it aside.

Use a fine-toothed hacksaw blade to saw through the plastic bushings so that they are split along their length; this will make removal relatively easy. Use a long, sharp-cornered punch to drive the old bushings out from the other side of the swingarm. If you really have trouble getting the old bushings to move, use the sawblade again and cut them into two pieces. Clean the swingarm-bearing area.

Grease the outside of the bronze bushings and start one of them into the swingarm. Tap the bushing in until it is flush with the end of the swingarm pivot tube. The head of a socket makes a good driver. Be sure that you use a large, heavy hammer and tap the bushing driver (socket) very gently; a slow-moving heavy hammer is *much* less likely to distort the bushing than a faster-moving light hammer. After you have installed both of the bushings, clean any metal chips from the bushings and install the bearing sleeve with a generous portion of grease.

Install the swingarm in the bike. Grease the end washers that take the side-to-side loads. Tighten the swingarm pivot bolt until all of the side play is removed from between the swingarm and frame. Check this again after a couple of hundred miles. The swingarm should be free to pivot without binding, but there should be no play in the pivot area. Grease the pivot each time you change oil. Be sure the zerk fittings aren't clogged and pump grease into them until it flows out of the seals at the ends of the swingarm pivot tube.

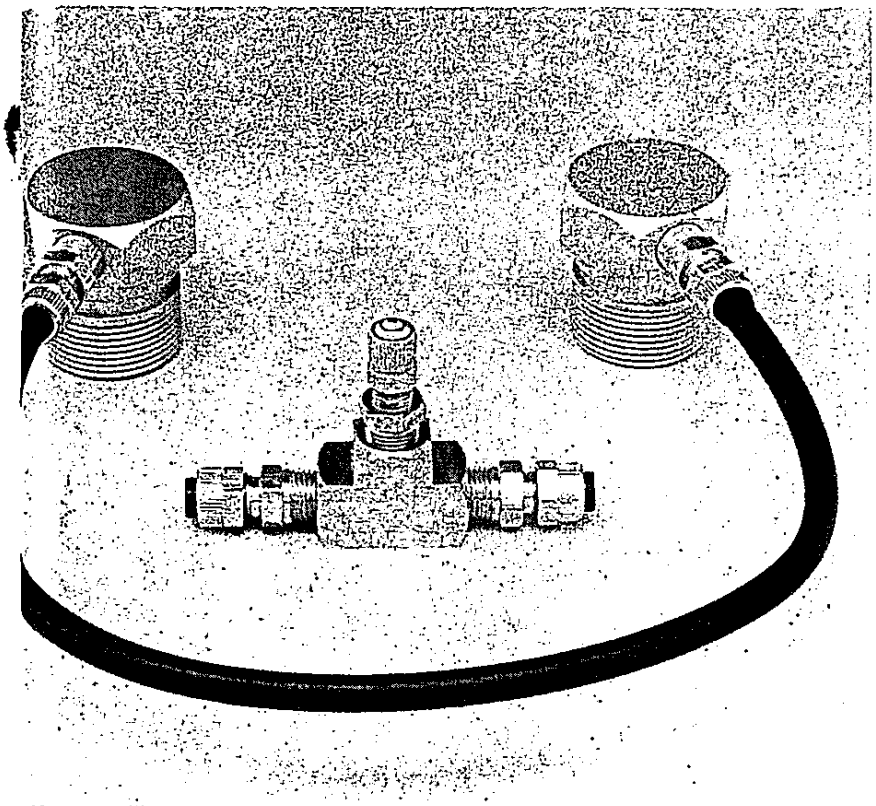


Rebuildable Interpart dampers are fine performers but should have the "soft" pistons installed for best ride qualities. Bel-Ray synthetic shock oil is the best for them.

Like the steering-head bearings, good-fitting swingarm bushings will give your bike a greater feeling of stability. It will not only feel more solid and secure—it will be.

REAR DAMPERS: Almost anybody's dampers will be better than the originals. If you plan to vary the load placed on your Honda (as in touring), perhaps you would prefer the adjustability of air or air-assisted dampers. S&Ws or the new Interpart Force Ones have the extreme load-carrying adjustability so desirable to the touring rider. If you ride your bike for sport with an infrequent light touring trip or occasional double riding, you'll get better handling for less money with conventional dampers and springs.

There are several very satisfactory damper assemblies available for the Honda's odd lower shock mount: S&W, Interpart (Boge) and Fox are three companies whose dampers we have had experience with on the Honda 750. We chose the Interpart No. SS-13310 dampers for our project



Air caps will give the rider considerable control over the ride qualities of his Honda 750. However, adding air caps to an otherwise stock fork assembly is less than satisfactory. Air-assisted forks need lighter springs, appropriate seals and different oil volumes to take advantage of the special properties of the spring/air-spring fork system. Do it right.

bike. The medium damper rod assemblies of this shock need to be exchanged for the optional soft rod. The procedure is not difficult and instructions are furnished with the damper rod assembly. Just be careful that you do not spill any of the fluid and that you keep everything very clean. Bel-Ray 5W shock oil is the proper replacement for Interpart's original oil. These shocks can be overhauled, and they last and work very well. Should you wish to avoid the damper-rod exchange, purchase a pair of Fox dampers with medium damping (38-1339, $119). They are rebuildable and there is, currently, nothing better available.

If your bike is very light (less than 500 pounds) and you do not plan to use it to carry heavy loads, install the 80-100-pound springs on the Interpart dampers and 85-115s on the Fox. Five-hundred-pound-plus bikes and two-up touring will work better with 90-120- or 95-125-pound springs for the respective brands.

After you have added a set of these excellent damper-spring assemblies to your newly bushed swingarm, you will have a more stable, comfortable and better handling Honda. One negative effect of fixing the rear suspension is that it brings into sharp focus the inadequacies of the front forks.

FORK: Honda did a pretty good job of selecting damping values for the Honda 750's fork, and there is little reason to alter it. The primary limits of the various versions of this fork are: the engagement length between the slider and fork tube, and the stiction. There is little we can do about the engagement length, short of changing the fork assemblies. But the stiction of these forks can be reduced so much that only the newest designs will perform more smoothly.

The earliest examples of the Honda 750 (from frame No. 1000001 to 2093730) were furnished with forks that cannot easily be modified. They work fine but require 35 by 47mm fork seals and cannot be converted to air-assist forks. They perform quite well and can be improved, so, if you have a set of these, don't be discouraged. Install a set of the "Leak-Proof" seals available through your dealer. Replace the fork oil with a normal amount of Kal-Gard's 5W "Smooth Stroke" fork oil and align the fork.

Air-assisted forks will give the best performance whether you are building a bike like the one in the lead photo or are planning on loading your Honda for touring. They will give the best ride, most secure braking and handling, and they offer adjustability that will allow you to choose the ride qualities most suitable for the road you are on and the mood you're in.

AIR FORK: If your Honda is going to weigh less than 500 pounds, install a set of S&W's No. SP1530-19 springs. For a normal-weight 750, use the same company's No. SP2838H spring set. The spring preload is critical for proper operation of any fork and especially so with air-assisted forks. After you have chosen the fork-cap assembly you are going to use, you must shorten the fork springs so that they will be compressed one-half inch when the fork cap is screwed completely into the fork tube. The easiest way to do this is to place the spring in the fork tube (with the front wheel off the ground), set the air cap on top of the spring and measure how far the cap will have to travel to seat fully on the fork tube. If it will have to compress the spring 1.5 inches, you will need to cut one inch from the length of the spring; if it must go two inches, remove 1.5 inches from the spring, etc. Trim the spring's length by filing a notch where you want to cut it and bend it back and forth a couple of times until it fractures. You can get the nice flat end by cutting the spring with an extra three-quarters turn and then grinding it on a bench-grinder until the end is flat and the overall length of the spring is correct.

Buy a set of 1976 YZ250 (No. 509-23145-L0-00) fork seals from your Yamaha dealer and install them in the fork legs. These seals are designed for 36mm fork tubes (the Honda's are 35mm), but they work very well in the Honda, having less friction than anything else available. Also, since they were designed for air fork use, their grip on the fork tube is not increased much with increased air pressure, as with standard seals. Put them in carefully by tapping around their edges with a soft punch, or use a large socket. If these seals are distorted, they will leak, but they will last the life of the bike if straight.

Air forks work best when there is a higher than normal compression ratio in the fork assembly; the oil volume of the Honda's forks should be increased so that there will be a useful rise in air pressure as the forks compress during braking or when negotiating a large bump. Raising the forks' compression ratio is accomplished by adding more oil which lowers the total volume of air.

With the fork caps off and the springs removed, compress the forks completely. Pour about 200cc of Kal-Gard 5W fork oil in each leg and pump the forks until all the air is out of the lower portion of the fork assembly. This should take only a few strokes of the forks. You can hear the air bubbling through the damper orifices; when all the air is purged, the forks will move smoothly. Bottom the forks again and fill each leg until the oil is six inches below the top of the fork leg. Install the springs and fork caps.

NON-AIR FORK: If you choose to forego the air-assisted fork modification and stay with conventional springing, you will not have the adjustability of air, but you won't have to carry around a special air gauge and pump either.

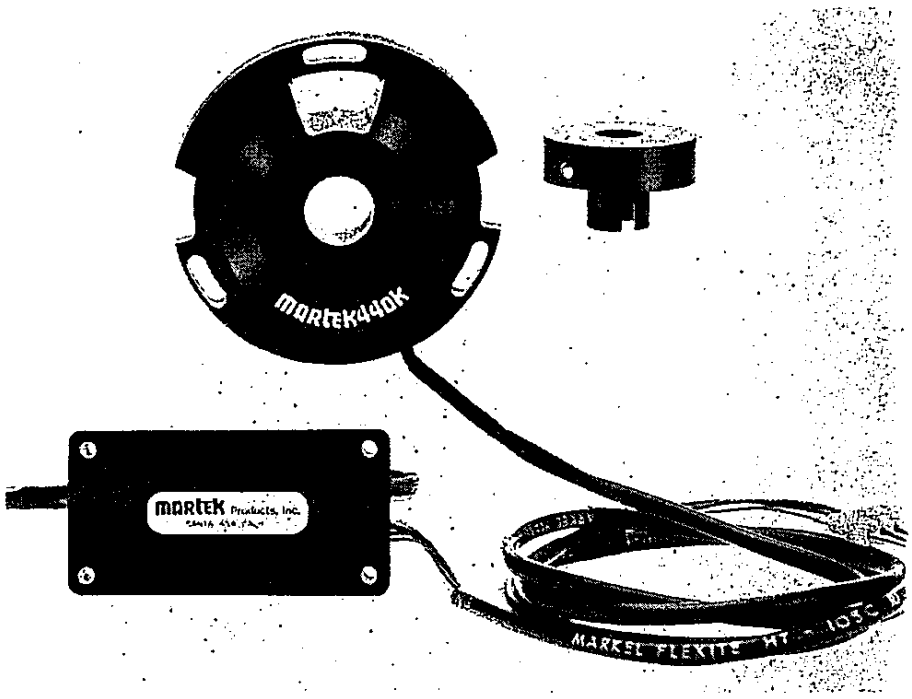
Install S&W No. SP3560-20S fork springs and Yamaha fork seals from the 1976 IT400 (part No. 1K7-23145-00-00). If your 750 has the late dirt-scrapers instead of the original bike's fork boots, they should be modified. Buy a half-inch (or more) diameter grinding stone from Sears or a hardware store. Remove the dirt scraper from the fork leg. Grind the inside of the sealing-lip until the scraper slides freely over the fork tube but still contacts it fully. Of course, this modification should be done with the air-fork modifications too.

FORK ALIGNMENT: Slick seals and trick fork oil will get you nothing if the forks are not aligned to prevent binding. The front fender must fit its mounting lugs on the fork leg. Use an adjustable wrench to bend the fender bracket around so that it is a slip fit between the fork legs; the mounting bolts must not have to force the fender out into contact with the threaded lugs cast into the fork legs. Similarly, the fender must slip between the fork legs without having to force it inward. Bend the fender stays so that, like the fender, they neither force outward nor inward on the fork legs.

Completely assemble the forks, wheel and fender. Tighten only the bolts in the lower triple clamp and pump the forks vigorously 10 or 12 times. Tighten the top triple clamp bolts. Pump the forks again and torque the axle nuts and fender bolts. This procedure will ensure that the forks are in alignment and will operate as smoothly as possible. It should be performed anytime the fork is disassembled.

IGNITION: Honda's 750 shares a weakness with many other motorcycles: ignition. Slow warm-up, short spark-plug life and extreme sensitivity to carburetion changes are signs of a poor spark. Sheer voltage is no guarantee of good spark; a four-stroke engine needs only about 12,000 volts to strike a spark across the gap of a spark plug. What really counts is the total amount of energy that is delivered across that gap. Several aftermarket electronic ignitions will increase the energy of the Honda's spark without the necessity of installing new coils. They do this by delivering current to the stock coils for a longer period of time; the coils will store more energy (especially at high rpm) and deliver it to the combustion chamber.

We have extensive experience with the Martek 440 ignition and recommend it for the CB750 without reservation. Installation is simple, and it has proven to be more reliable than the stock ignition system. Once in place, you will have no need to concern yourself with the ignition again, with the exception of occasionally changing the spark plugs. Your bike will warm up quickly and be more responsive.



Honda's stock ignition is weak; high compression and good breathing make it completely inadequate. The Martek 440 is easy to install and will double spark energy at high rpm.

TIRES: Rain grooves, dragging the footpegs and hooking-up all figure in magazine road-test statements about tires. Most of us never drag anything after our morning cup of coffee and most of the country does not have to suffer the indignities of California's rain grooves. But we are all concerned about good traction, smooth ride and long tire life. Long, intelligent development by tire companies has brought us a magnificent selection of treads for our bikes. Whether it's all-out traction or the longest possible life, there's a Continental, Dunlop, Pirelli, Michelin or Avon that delivers what you want.

Perhaps the greatest compromise tires available today are the Continental front and rear set. They give the best ride, longest life and seem to be compatible with any bike and road surface. While there are tires that will stick better in the rain, Contis will allow you to drag the undercarriage of any street bike. If you're concerned about wet-weather performance, there is just one tire—the Dunlop K81 series. These tires are available in a variety of sizes and in two compounds (one for road-racing traction). They won't last as long as a couple of other tires (Avon or Continental) but you'll never need more traction. Avon MKII Roadrunners work well in the rain and seem to last indefinitely. A very stiff tire with rather hard rubber, the Avon doesn't give the impression that it will give good traction, but it does. Pirelli, Michelin and Metzeler all make tires that have or are getting a reputation for supplying exceptional traction and feel. Some club-level roadracers are turning to the MT29 Pirelli and ME99 Metzelers for their great traction and splendid feel; these tires won't last forever but, if ultimate traction and feel-of-the-road are what you want, they are the current state-of-the-art in motorcycle tires.

OIL COOLER: Honda says that the SOHC 750 does not need an oil cooler—which is what you would expect them to say. Indeed, most 750s do not. Some do, and what is most surprising is that it is the touring rider whose bike could most use the cooling assistance. A fully loaded 750 climbing a high mountain pass on a hot, dry day will generate oil temperatures exceeding 275 degrees Fahrenheit (too high). If the oil is changed every 1000 miles, this is not too high; it will still fulfill its role as a lubricant. The *metal* parts will be kept from grinding themselves into powder—but not all the pieces that make up an engine are metal. Extreme heat (275 degrees) will cause the gaskets, especially the head gasket, to become brittle and leak. Rubber cam-chain rollers will begin to harden and crumble, which can lead to a premature engine teardown or even engine destruction by a broken cam chain.

If you expect to *ever* ride your bike fast in hot weather, you *should have* an oil cooler.

Derale's H-1T oil cooler kit for the

SOHC Honda 750 (also 550) has to be the biggest bargain around ($85.95). It has a very desirable thermostatic control and will shed a lot of heat. The kit is complete with instructions and is easy to install. The $86 investment will get you safe 2000-mile oil changes and greatly extend the life of your bike's engine.

CONCLUSION

There are many other modifications you can make to your Honda that will improve its performance, reliability and appearance. We have described, in some detail, those that are *most* important and that demand the most knowledge or experience to complete. If we were to describe and justify *all* the good things you could do, this would be a book instead of an article. There are a few, proven changes you can make that we can list though.

Install a 17-tooth countershaft sprocket on those 750s that were equipped with 18-tooth sprockets for a noticeable improvement in acceleration. Use the excellent NEP nylon rear sprocket for quiet running and long chain life. The mess-free Tsubaki "Lube-Free" chains last a long time and are cheap to run as a result. A quartz-halogen headlight will improve your chances of living long enough to wear your Honda out. A set of Fiamm horns (available from Pep Boys) will help get those right-of-way violators back where they belong.

The *specific* modifications we've recommended have been made to thousands of Honda 750s, either in part or in totality. They work. They are proven and they are reliable. The Honda that results from these modifications is a much better bike than it ever was in its stock form. The engine will give more power, especially in the mid-rpm range, better response and will be more reliable than stock. Even more impressive will be the suspension changes. Honda gave the 750 some of the best suspension parts available at the time and finally updated them near the end of the design's production life. (They never did make quality rear-dampers available, however.) The addition of recently developed air-fork technology will dramatically improve the ride and handling qualities, as will the high-quality dampers. When coupled with the steering and swingarm bearing improvements, the Honda's chassis will equal those of most bikes made today and only the latest fork designs will give a smoother ride.

With economic pressures what they are today and the increasing desire we all have to hang onto something that is good, updating the Honda 750 makes a great deal of sense. It is one of the best motorcycles *ever*, and if we have helped keep these fine machines on the road where they belong, our goal has been accomplished. *M*