INSTALLING A 750 HONDA CAM

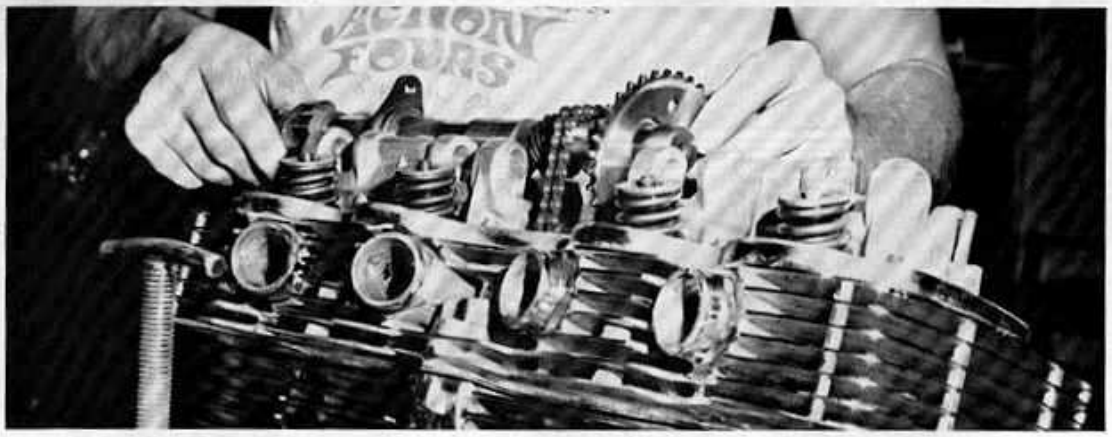
by Steve Stillwell

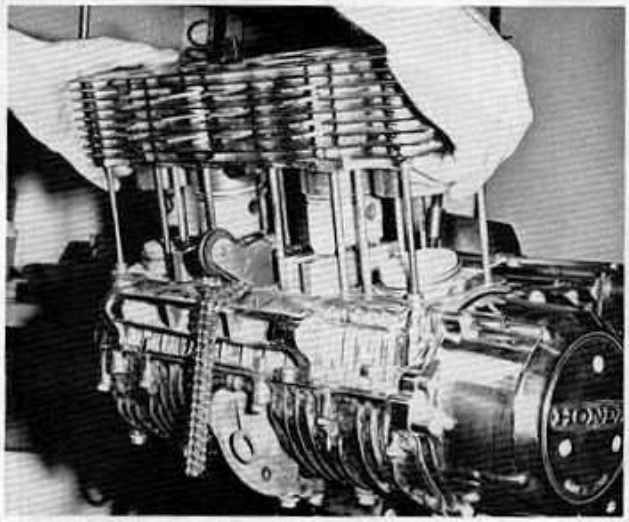
If you think there is a short cut to high performance for the Honda 750 Four, you're right. We've done some pretty extensive stories on the carburetors and such for the big Four, but have saved the cam story till now. Actually, we were very curious as to what effect a cam installation would have on the 750, and Action Fours in Santa Ana provided us with the answers.

I had no sooner sat down in front of Jim when I asked some simple questions. "How much performance can we get out of a cam installation on a Four and do you have to remove the engine from the frame?" Well, Jim reached out and handed me a copy of their catalog pointing out the paragraph on page 25. It says:

CAMS:

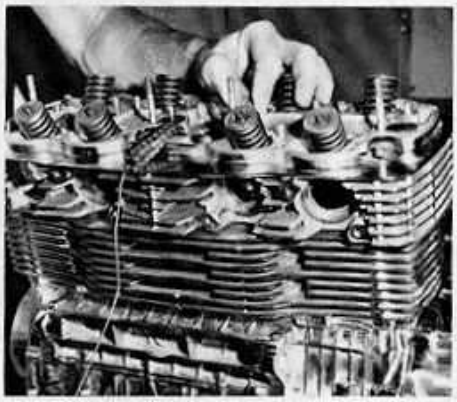
An obvious route to performance, but Honda has made it difficult. Valve to piston clearance, while sufficient with the mild stock cam, disappears completely with the installation of a "hot" cam. Stock pistons may be notched for clearance, but this is not an entirely satisfactory solution. The combination of low compression and hot cam makes for poor tractibility. A better solution is to install pistons with greater compression that also provide sufficient valve to piston clearance. Do not "over-cam" your motor; while a competition cam may produce more h.p. at higher r.p.m., the loss in low & mid-range may actual-





LEFT—Hot set-up for any cam installation is to match cam with a set of high performance pistons.

BELOW—After the head is torqued, install the four small O-rings and the six sealing rubbers; no sealer.



ly result in poorer overall performance in a street (heavy driven) machine. As a general rule, the greater the displacement of the engine, the "more" cam (greater timing and lift) can be successfully run.

What this all boils down to is a simple statement that Jim Dickinson makes to anyone asking about cams. He says "the most important thing about cams and pistons is not to mix them." The problem here is that the valves might decide to meet the pistons if you match sets from different manufacturers. Furthermore, Action Fours doesn't sell a cam designed to be used with stock pistons. They also won't sell you a regrind cam because they know that regrind cams will mean the motorcycle owner will have to experiment with ignition and cam timing to even get it close to performing. Playing with the cam timing can also cause some conflicts between the valves and pistons.

The engine we were doing the story on already had the 811cc piston kit installed, so we wouldn't have any of those problems. A hot cam could be used because the pistons are already notched for valve clearance and also have 10½ to 1 compression ratio.

Ed's note: In the piston kit, you receive new pistons, rings, wrist pins and retainers, so this installation will also serve as a nice top end rebuild for your Four while picking up some horses!

Installing a piston kit is another story though, and we wanted to show you just how simple the Honda cam is to install. Notice I said cam, not cams because unlike most bikes, the Fours only have one.

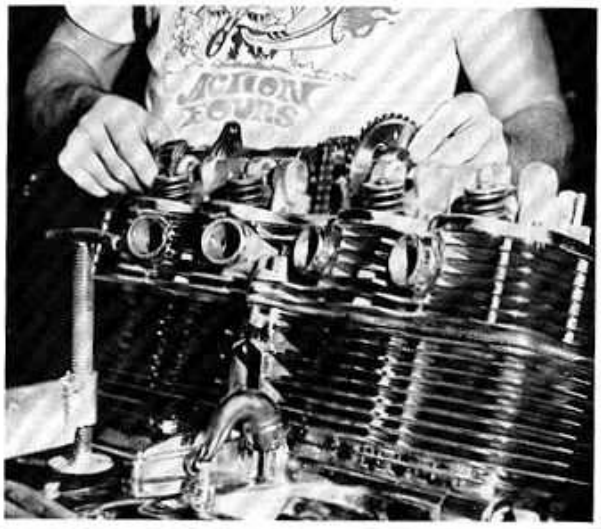
The first place you'll want to start is by removing the engine from the frame unless you have a custom frame with a lot of clearance on the top end. Then you'll disassemble the whole top end including removing the head and barrel. Incidentally, the complete piston kit (the 811cc) retails for just under one-hundred dollars complete and a bore job done in a professional shop will cost approximately forty bucks. If you are coming up on a rebuild you can expect to pay out that much just for a stock rebuild, if you need a clean-up bore and oversized pistons.

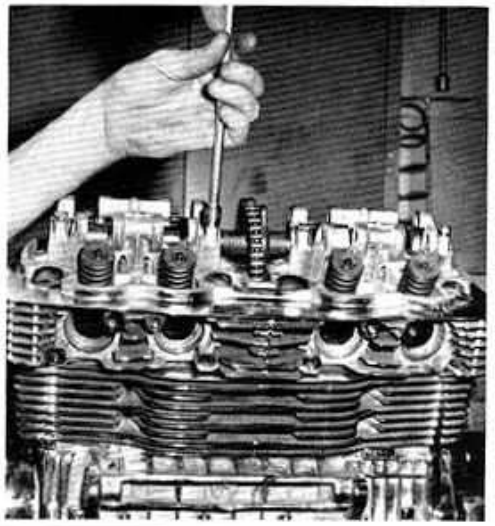
The camshaft installation. The first thing you'll want to do, before the barrel and head are reinstalled, is to clean all of the parts thoroughly. This is a must. After the head is torqued down to specs, install the four small o-rings (two under each stand) and the six sealing rubbers. DON'T use any sealer as it might clog the oil passages! After this is complete, install the cam stands. Be very sure that the four locating dowels are in position and blow out all of the oil passages to be

LEFT—Install the cam stands. Be sure that the four locating dowels are in position and blow the oil holes.

BELOW LEFT —Lift the cam chain being sure that the chain has engaged with the crankshaft sprocket.

BELOW—Install and tighten the cam shaft stand caps. They are coded to assure proper fit. 100 inch lbs. max.





sure that they are unobstructed. Also, make sure that the stands go back in the same place and position as before. This will assure you of proper alignment.

Lift the cam chain and feel to make sure that the chain is engaged with the crankshaft sprocket. Now you can slip the cam and cam sprocket through the chain. Install and tighten the cam stand caps. These caps are coded to assure each will be mounted in the proper position. Use a torque wrench and *do not exceed* 100 inch/lbs. of torque! These parts are alloy, not cast iron.

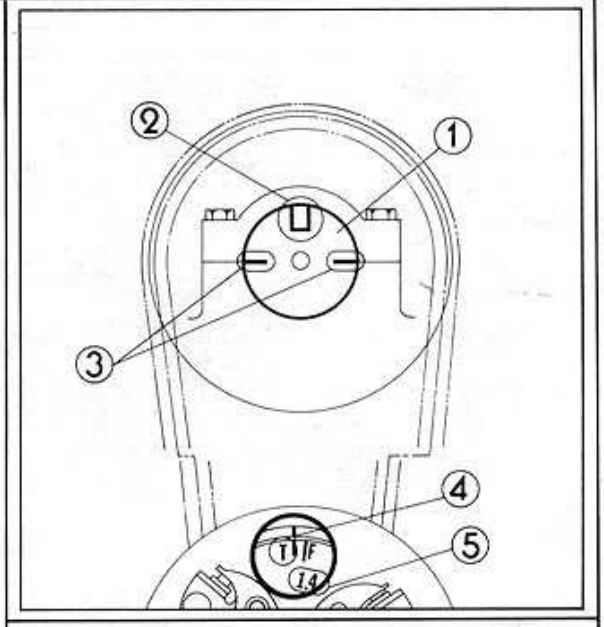
Now, down on the backside of the cylinders is the camshaft tensioner. Be sure that the pushbar is fully retracted at this point in the installation. It is now the time to "time" the cam. Refer to the illustration for details. Turn the engine till the "T" mark shows through the timing hole on the inside of the point cover. This will be for cylinders 1 and 4. Turn the cam so that alignment marks are parallel to the surface between cam holder and caps. Install and tighten cam sprocket. Be very sure that all of the slack in the cam chain is to the rear of the engine. Now, set the cam chain tension by releasing the tensioner bolt. This will allow the push bar to contact the chain. Retighten the bolt and lock nut.

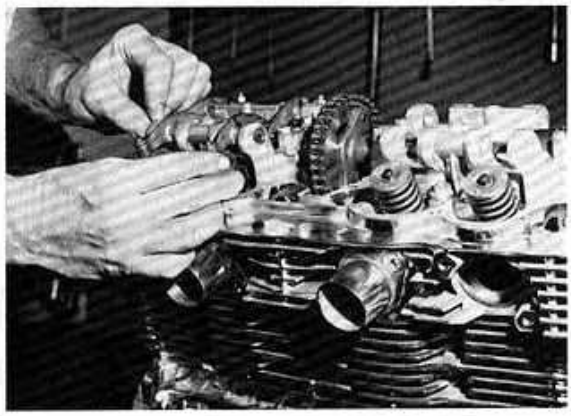
Now rotate the motor in stages so that each pair of lobes is pointing down in turn. (1 & 2 intake, 1 & 2 exhaust, 3 & 4 intake and 3 & 4 exhaust.) Install the rockers on the rocker shaft. Install the bolts for each shaft and *do not exceed* 100 inch/lbs. of torque. Now, install the thrust washer and bolt. This will keep the cam from traveling in the stands.

Next, rotate the crankshaft once again and set the valve clearances to the cam manufacturer's specs.

SPECIAL NOTE: If you are installing a high performance cam, be sure to use the special break-in lube provided. All the moving parts should be pre-lubed with engine assembly lube and/or motor oil at this point.

Now, you can install the valve cover gasket and valve cover. Now, wonder no more as to what's inside that Honda 750 valve cover marked with "OHC". It's not really that hard of a job to hop-up the 750 and Action Fours, 2621 S. Main St., Santa Ana, California have made it even more simple for you.



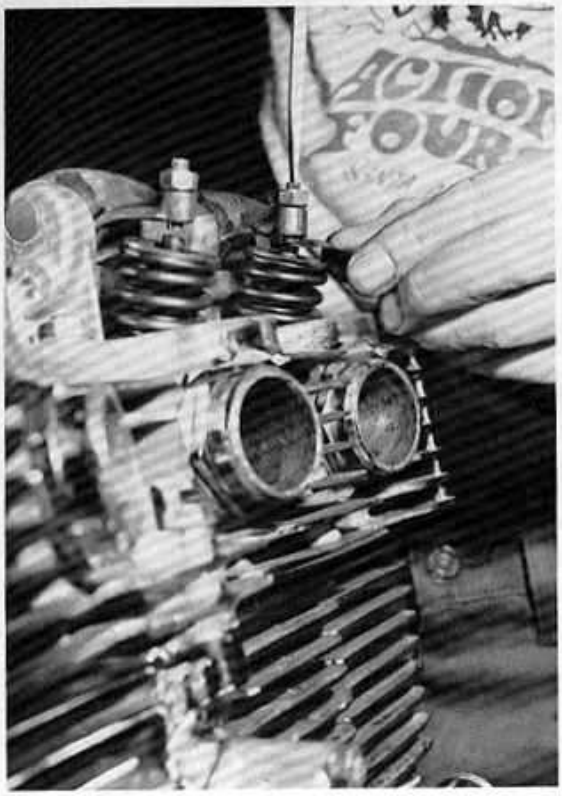


ABOVE—Now, on the back of the cylinder, locate the cam chain tensioner. Be sure the push bar is back.

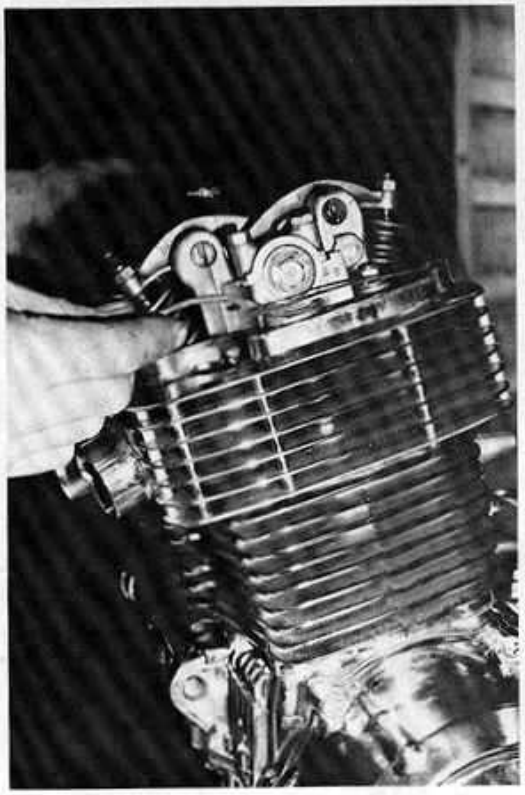
ABOVE RIGHT—1 is the cam, 2—groove, 3 are index lines, 4 is the "T" mark and 5 the 1.4 mark. These are the marks found inside the point cover for correct timing.

RIGHT—Install and tighten the cam sprocket bolts. See timing on chart. Now install the rockers on the rocker shaft. This is done by rotating the engine in stages.

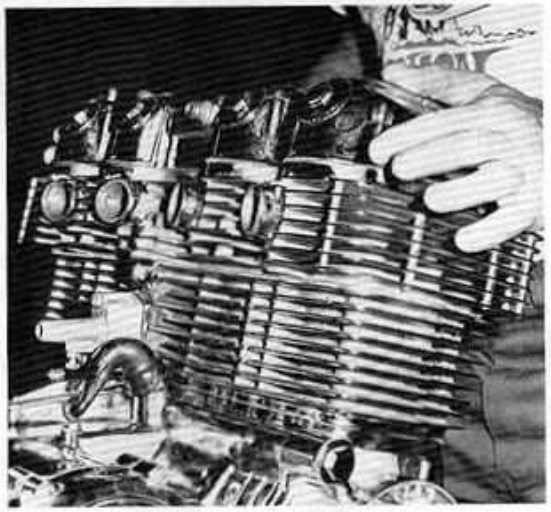
drawing: Gibert Luna



ABOVE—The next major step is to adjust the rockers. This is done on the low side of the cam as to factory specs.



ABOVE—Check the sealing surface around the top of the head and then install the cam cover gasket. Use light sealer.



ABOVE—With the gasket carefully located into place, lower the valve cover and gently position it. Check for leaks.

RIGHT—Last but not least, install all of the bolts which hold all of the engine covers on. Snug, not too tight.