Whether he be boy or man his motorcycle is his very own piece of property. It shall be loved and polished and defended to great lengths when muddied, abused, or degraded. His machine is as close to a living thing as a bunch of metal can be, complete with habits that are both good and bad.

Mention that his machine was one of thousands that took shape on an assembly line (with the same pair of hands nearly a thousand times each day) and you're just liable to get a punch in the nose. True as it may be, the truth hurts, and any word that may reduce his machine to the same level as all those others (even though they look the same, cost the same, and are the same) are immediate grounds for violence. A man's machine is his very own personal possession.

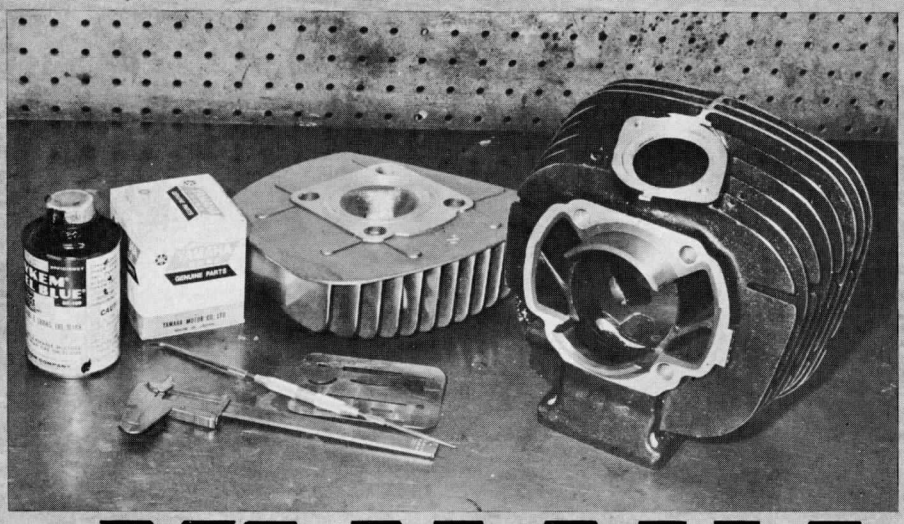
If man can do, or have done, a little something that truly will make his machine better than all those others that were born at that same factory then, by golly, it shall be done.

Of most interest to our readers, and we get all kinds of letters to support this, are the "go-fast gimmicks." Also of a high priority level is performance tricks for the Yamaha Enduro line. Several issues ago, *Modern Cycle* published a comprehensive article detailing the hop-up procedure for a Torque Induction 175 CT-2. Our reader response was most gratifying. We have now gone back to International M/C in Canoga Park, California, and stolen their secrets for the 250cc DT-2.

It is possible for a skilled person equipped with all the necessary tools to follow this story and accompanying drawings and duplicate the International M/C effort. The other alternative would be to send your pieces off to Canoga Park and have their personnel do the dastardly deed, for a fee of course.

Only the cylinder head and barrel are tampered with to any extent. The piston has but one millimeter removed from the bottom of the inlet side of its skirt and that's all. You need only to scribe a line .040 from the piston's edge and then remove material with a file until you reach the scribe mark. The piston is shaped.

At International M/C they raise the corrected compression ratio to 6.8:1 by laying the head flat on a disc sander and removing one millimeter. (1mm is equivalent to .040.) This operation des-



Dykem blue, calipers, a scribe, and the thin metal draftsman's erasing shield are necessary for getting the marks on the inside of the cylinder. Head, barrel and piston have not been tampered with yet.

YAMAHA DT-2 HOP-UP

HOW TO GET A 25% BOOST IN THE SEAT OF YOUR PANTS

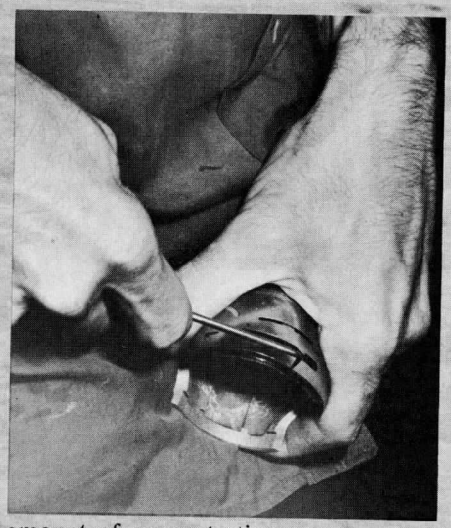
troys the little groove installed by the factory for the reason of a better head to cylinder seal, but International M/C says it doesn't seem to matter. Next, they have to re-cut the squish band so it will once again accept the protruding piston dome. This is very important because the optimum squish dimension,

At times, it would be nice to have small hands, especially when you have to shove them inside of cylinders. This is part of the scribing operation.

the distance measured between the piston dome and squish band, is .030. A .010 variation is acceptable but any more renders the squish area inoperative. Believe it or not, at International they re-shape the squish band by hand with the same porting tool used for cylinder work.

On a two-stroke the locations of the holes or ports in the cylinder relate directly to the valve timing of a four-stroke. To begin this most important part of the hop-up procedure, Dykem blue is painted on various areas of the bore. Exact measurements are made from the top of the cylinder to the appropriate area above or below the port and a thin line is scribed. The porting operation is simply a matter of grinding away material until you reach that line. The job is tedious and takes a fair

This is a very clear illustration of how the scribe mark is made on a piston skirt.

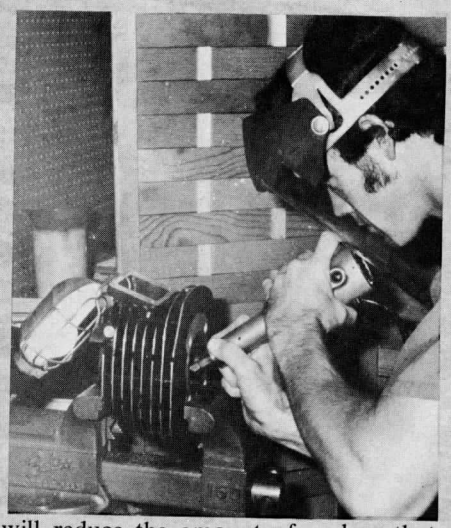


amount of concentration.

In order to keep the soft aluminum from plugging up grinding tools liberal amounts of WD-40 is sprayed in the working area. In the reed valve cavity upstream from the inlet port a fair amount of smoothing and de-ledging is performed. Using machinists terms the smoothness of this area is left at about 250 micro. That would relate to about the roughness of a matchbook striking pad. A smoother surface doesn't seem to help so the extra effort of mirror-finishing this area would only be aesthetic.

An extensive amount of meat is removed from the exhaust port and the hole is polished to a high lustre. This

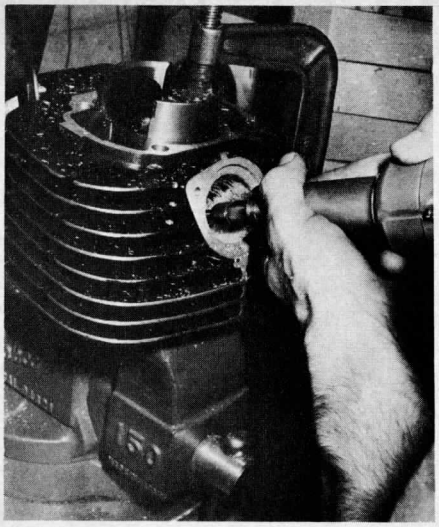
The grinding operation is long and tedious. A light shining through from one end of the cylinder aids the operator. Re-positioning the cylinder several times is absolutely necessary in doing a proper job and remaining comfortable.



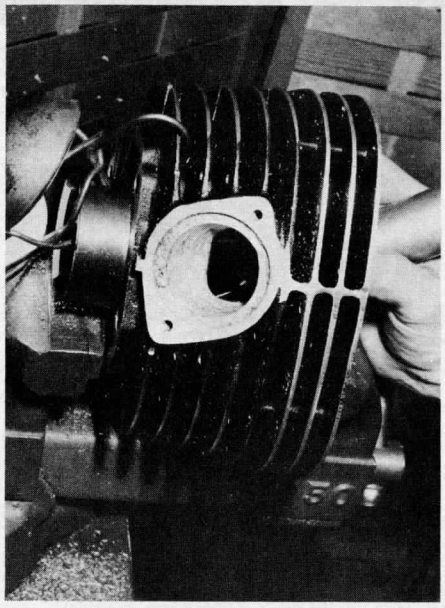
will reduce the amount of carbon that tends to form in this area and greatly aids in the flow transition from port to pipe.

Transfer ports, because of their location in the center of the cylinder, are very hard to get to without removing the cast iron cylinder liner. International M/C has come up with an effective short-cut where they just grind away the upper edge of the window at rough-

BY LAWRENCE ELDRIDGE



C-clamp to vise is a novel way to obtain good working positions. The exhaust hole is getting some extensive grinding.

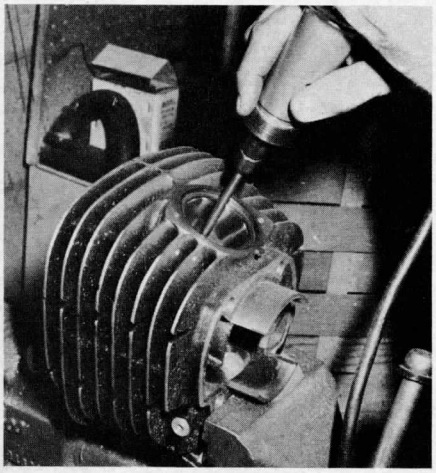


Looking through the exhaust hole you can see the grinder at work on a transfer port. Both lighting and positioning are important.

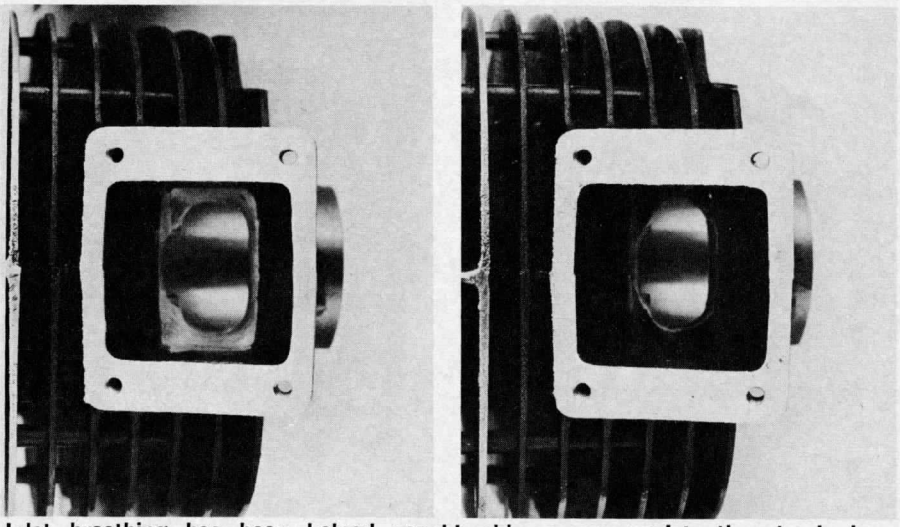
ly a 45-degree angle until the scribed line is met.

After the ports have been re-dimensioned the upper and lower edges of all the windows are broken, or chamfered slightly, to keep from snagging a piston ring. Then the cylinder is honed to complete the job. The engine was re-assembled with new gaskets and many standard pieces were unchanged. The oiler was left intact and ignition advance set at 2.6mm BTDC. They did mount the 32mm carburetor found as standard on the RT-1 Yamaha.

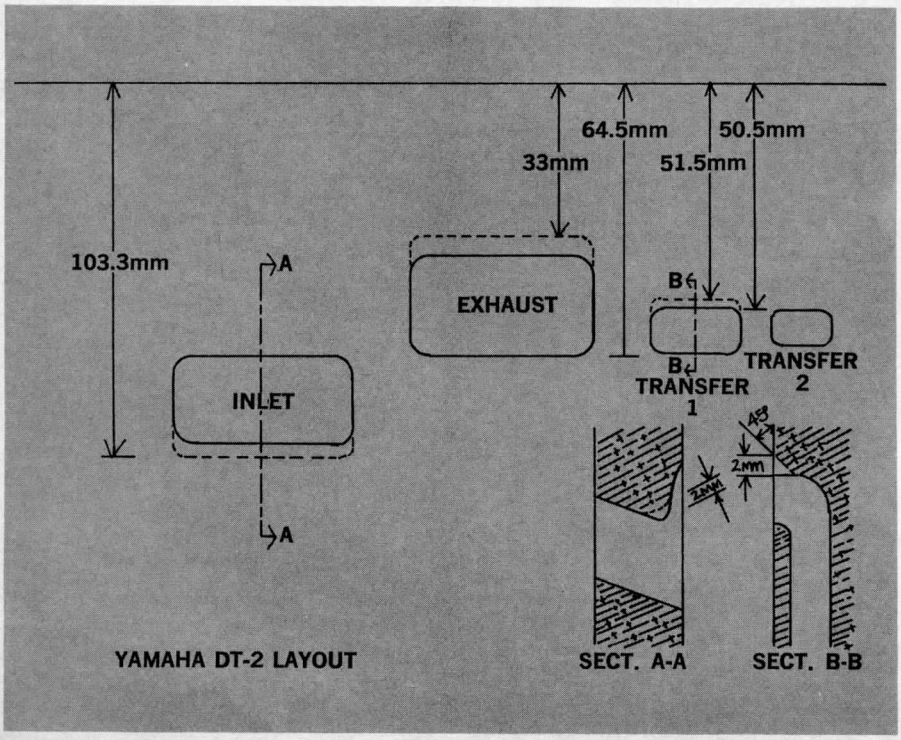
As with any engine modifications, *Modern Cycle's* words of wisdom are, you've got to feel the difference in the seat of your pants otherwise it's not worth the effort. With this one you know it's a runner.



The polishing tool is simply a strip of emery cloth placed in a slotted rod. The high speed grinding tool does the work and results are evident.

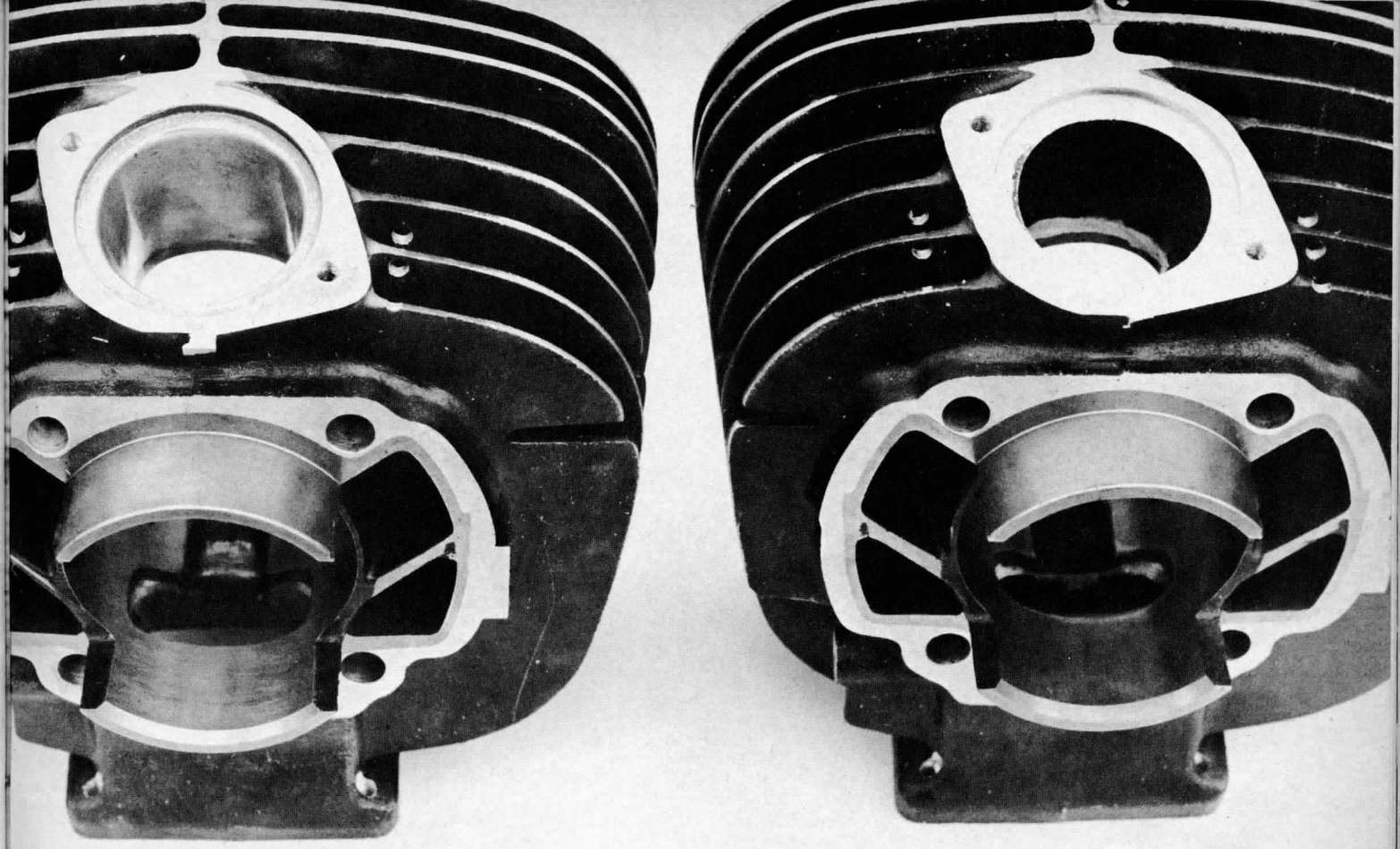


Inlet breathing has been helped considerably as compared to the standard untouched intake port.



At this point, using a muffled expansion chamber, RT-1 carburetor, and all the aforementioned porting, the engine was producing a little over 30 horsepower developing it over a very broad 8,500 to 9,500 rpm range. Before modifications the standard engine was kicking out 24 horsepower at 7,500 rpm and dropping off suddenly thereafter. Both engines pull like gangbusters from 2,000 on up, but you can definitely feel a stronger push coming from the modified engine.

Upon exchanging the expansion chamber for the stock muffler system we found the engine to produce about 1½ horse less in the upper ranges. Either way, the bike has ample power to get the job done. Whether you want to grind it yourself or send off via mail order to get this work done is your prerogative. If you've chosen the latter method you may write to: International Motorcycles, Inc., 7233 Canoga Avenue, Canoga Park, California 91303. ●



Exhaust hole in the left hand cylinder is not only polished but enlarged considerably.

Cylinder head on the left is untouched. The right hand head has been reworked according to the formula.