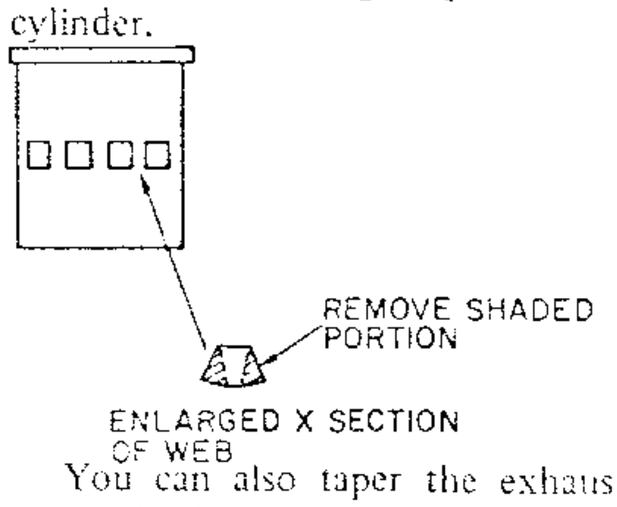
should still rock to the bottom. Any binds must be removed. Also remember that once you have the lower end dead free, the engine must be bolted to a true mounting surface. The slightest twist in the mounting lugs can bind everything up again. If you use wooden beams, be sure they are true. If you use a Tatone mount be sure and check this out as well. Quite often these will need surfacing on a piece of 320 wet or dry.

Next, we have the piston and sleeve. Not much can be done to the piston, other than to remove any sharp edges or burrs from the baffle or wherever you may find them. Do not remove the ring from the piston unless you intend to replace it. If you remove it, it cannot be used again. If the engine has had any amount of running, look at the ring gap with a magnifying glass. If the edges appear to be beveled slightly and the top edge rounded off, the gap is not sufficient and the ring needs replacing. Insufficient gap causes the edges to butt together. If this occurs when they are lined up with one of the port windows, they will have a tendency to push out and catch on the edges of the ports. This results in the beveled edges. Don't mistake shiny edges for beveled. For this reason, be sure and use a magnifying glass. If you find it necessary to replace the ring, slip it into the sleeve first and square it using the bottom of the piston. Check the gap with a feeler gauge. You want no less than .006" nor more than .008". Anything less will cause the ring edges to butt together if you should get a lean run with hot fuel. Anything more will make for soft compression when starting. If the gap is less than .006" you are going to have to open it up by filing. Get a contact point file that is used for automobile voltage regulators, from your friendly auto parts dealer. An ordinary ignition point file is too thick. Carefully file the edges, being sure to keep them square and not distort the ring. This is not easy to do, so if you have ever been accused of being a hacker, this job is not for you. The easiest way to go about this is to cut yourself two 1/8" plywood washers about 1½" in diameter. Cut a slot in each piece about 1/4" long by 3/32" wide. Drill a hole in the middle for a nut and bolt and use these to hold the ring when filing. Don't try to hold the ring by hand or you will end up bending it. Also be very careful when installing the ring on the piston to not distort or bend it. These rings are made of ductile iron and will bend very easily. Most of you are used to the conventional expansion type of ring that is much harder and springy.

The webs in the bypass port-windows can be narrowed slightly. The webs are actually wedge shaped. They are wider on the outside of the sleeve than on the inside. Do not change the inside width, but you can narrow the outside down so that the wedge shape is reversed. Also bevel the lower edge of the windows. This makes it easier for the incoming charge to get into the cylinder.



You can also taper the exhaust port webs, but there seems to be little advantage in doing this. The exhaust gas is coming from the inside out rather than from the outside in, as in the case of the bypass ports. Some of the fliers are going as far as to remove every other web to increase the size of the window. The ring must then, in turn, be pinned so that the ring gap cannot line up with one of the port windows. I do not recommend doing this as the remaining web will wear extremely fast and the engine will be very short lived. To compensate for the increased wear, you can hard chrome the sleeve, but this is getting into work that should be left to a professional and is really not of that much benefit.

Quite a few fellows have wanted to know if chroming the sleeve will increase the power of the engine. Chroming only increases the life of the engine. It does not increase the power. In fact, an engine with a chrome sleeve will run hotter than one with the regular iron sleeve.

The last thing we are going to check is the head. No gasket is used, depending entirely upon the machined surfaces for the seal. Occasionally there will be a slight irregularity and the head will leak. Especially after some of you have replaced the regular screws with Allen screws and over tightened them, warping the head. With the head in place, hold the engine up to a bright light. You should see light between the bottom of the head and the top of the case. If you do not, it is time to get a new head. The head should be lapped to the top of the sleeve. Get yourself some ordinary BonAmi at the grocery store. With the sleeve out of the engine, put a few drops of light oil on the top or flange. Sprinkle some BonAmi on a piece of paper and touch the top of the sleeve to this. Set the head on the sleeve and rotate it back and forth with a light pressure. Every five or six motions, rotate the head a quarter turn, and keep up the lapping motion. Replenish the oil and BonAmi occasionally. Keep this up until there is an even grey ring around the seating surface of the head. Check the top of the sleeve for any low spots. If any are present, the sleeve should be surfaced on a piece of 360 wet-or-dry rather than trying to lap them out. The aluminum head wears considerably faster than the iron sleeve and you would wear away too much of the head. If it is necessary to surface the top of the sleeve, it will have to be lapped to the head again. You should get into the habit of checking the head occasionally to see if it has been leaking. You can easily tell, because there will be a dark spot where the leakage has occurred. Over tightening or running too lean can warp the head and cause it to leak. It is a good idea to carry an extra head along in your tool box just for this reason.

Some RC'ers have wanted to know about polishing out the bypass. Don't waste your time. The only advantage to polishing is through the metal removed. If the area is adequate to begin with, as it is in the K & B .40, then there is no advantage and actually a disadvantage. Most of you have seen the water bead on your car after a wax job. The same thing will occur on a polished surface in your engine. This beading of fuel can actually work as an obstruction and slow down fuel flow. As these blobs of fuel break loose they will affect the mixture, resulting in surging, difficulty in setting the needle, etc. A smooth surface is fine, but a high polish, NO!

That about covers the refinements to the .40. I am sure I will think of other points the day after this is turned in to Don. If so, we'll cover them in a future column.