WHAT MAKES THAT "BEEZER" GO?

"Short Rod" Treatment to BSA Twins Gives Added Punch

By Leland R. Roosa

THAT'S THE BIG QUESTION around the Bay area, out here in California!

Not that the stock BSA's are any slouches when it comes to "flashy" performance—far from it! It has been my observation, over a period of years in the business, that stock machine for stock machine, and, inch for inch in displacement, they can and do give any other motorcycle a very bad time—but lately, some of the Beezers have that extra punch that can raise eyebrows anywhere they run.

What have they got in 'em? How can it be duplicated? Well, here's the lowdown!

SHORT RODS!! That is the basic difference, which can make a star performer out of a run of the mill stock forty inch Beezer engine.

If you are interested in a "Do it yourself" project, I'll give you the details.

FIRST—it is necessary to have a drill press, a lathe, and an arc welder.

Now, let us get down to the serious business of SHORTENING, SHAVING, PORT, POLISH and TUNE.

Let us assume that you are interested in MAXIMUM performance. So, in the progress of this Hop-up, I will describe every means I know to get it out of your short rod job.

BIG CARBURETION: the advantages of this are well known. An engine that is restricted in breathing cannot go with the best of them. An inch and three sixteenths Amal, either Monobloc or TT carburetor seems to work best on this conversion. If you get the large throat size, it's only a matter of personal choice, or what is available—either one, properly tuned, will be ample.

PORTING and POLISHING — also obvious! A small port cannot handle the capacity of a large carburetor, so port out—clean through to the valves, being careful not to leave any small areas or bottle-necks to restrict the flow. Care must also be exercised to avoid sharp corners or short bends. Smooth even flow—that's important! Polish is secondary, and some tuner will maintain that a high polish is a detriment. However, it IS of prime importance to have an unrestricted smooth flowing contoured port, from carburetor to valves.

It is well to remember that it is nearly as important to have a free exit for the gases, as it is to get them into the cylinder. Give a little careful attention to your exhaust ports. It is worth your time.

OVERSIZE INTAKE VALVES: a very important item, but easily overdone. For this mill you are building, a one-sixteenth oversize valve works very well, without being large enough to connect with the piston, at high R.P.M. Oversize exhausts are some small advantage, but are NOT a MUST. High tensile racing valve springs, light alloy spring plates, and alloy push rods are a definite advantage, also, at the high R.P.M. you'll get out of this engine.

HIGH COMPRESSION PISTONS: eight and one-half are best for all around use—but if you'll go for Drags and Top Speed performance, the nine to one is best.

So much for the top end of your engine. Now we can get down to the crankcase, where the business end of the Short Rod hop-up is built.

As you may have judged from the foregoing, the better Mill you have to start with, the less work and expense is involved in the building of this two wheeled Hot Rod.

Easily, the best machine for this conversion is the BSA Spitfire. For this engine comes from the factory with slightly oversize ports and valves, nine to one pistons, a heavy base cylinder block, and a heavy journal Daytona style crank—also, a number '57 cam.

Next in line is the Super Rocket, with the slightly oversize ports, big valves, big base cylinder block and the big journal Daytona crank.

The stock Golden Flash engine, of course, requires the most work, but with a little more effort and expense, can be made to go with the best.

Just so we don't miss any of the operations, let's assume you have a stock Golden Flash for the basis of your conversion. First: tear down the mill completely; clean and inspect all parts thoroughly; install a bronze right side bearing for the crank main. Clearance should be not less than one and one-half thousandths, nor more than two thousandths. You'll need that bearing to be RIGHT, for these mills wind out to around 8000 R.P.M. Get a set of A-A-7 connecting rods, if for the Golden Flash or Super Flash. If you have the Rocket or Spitfire, get A-A7 Daytona rods with the large big end bearing. Drive out the wrist pin bushings, and install B-33-34 wrist pin bushings; file off the excess length and hone to fit the A-10 wrist pin. FIT THESE RODS CAREFULLY, FOR THEY ARE THE MOST IMPORTANT PART OF THE CONVERSION—IN THE SAME SENSE THAT A GOOD FOUNDATION IS THE MOST IMPORTANT PART OF A PROPERLY CONSTRUCTED BUILDING.

We'll leave it to the Engineers to make a long winded technical explanation of how these short rods add so much to the performance of this conversion. Let it suffice to say here that the increased angularity of the rod gives a greater piston speed at the upper half of the stroke, and decreases the piston speed over the lower half of the stroke, which results in greater mechanical advantage on the power stroke, and working in conjunction with the '57 cam design, makes an overall efficiency which can be obtained in no other way.

Install a number '57 cam shaft, if you do not already have one. (As previously noted, they are standard equipment in the Spitfire).

Measure the fly wheel diameter. Make a note of this, and assemble the cases. If you are beginning to wonder where all the "goodies" come from, don't worry — the commercials will come later.

Now examine the cylinder block. If it needs boring, be sure your piston selection is of the next oversize, and of the compression ratio best suited to the use you will make of the machine.

"Alky" burning set—ups with compressions of thirteen or fourteen to one, are not advisable unless you have the heavy base block such as the Super Rocket or Spitfire, as the high thrust developed may crack the lighter base cylinder block around the mounting flange.

Having made your piston selection, you are now ready to profile them. For this, you will need a fly cutter, which can be easily and simply made by welding a piece of tool steel at right angles

—90 degrees to the head of a half inch bolt. The length of the cutter bar must be equal to the radius of the fly wheel, plus one sixteenth of an inch. For the sake of balance in your fly cutter, weld a counter weight opposite the cutter bar of approximately the same weight.

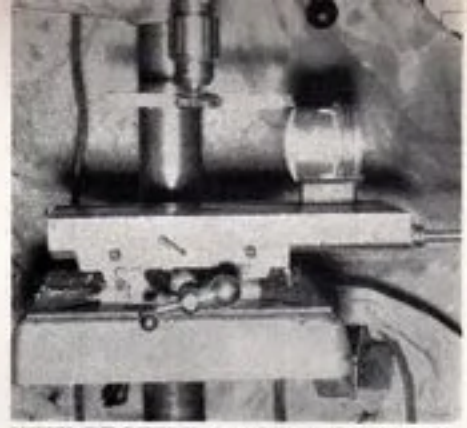
Now mount the fly cutter in your drill press, and bolt the piston on a raised block, to the drill press table, so that the wrist pin hole is perfectly in line with the vertical spindle of the drill press; and the base of the piston skirt is at right angle to the center of the spindle, as in the picture of the set-up. Spindle speed for this operation should be about 250 R.P.M. By lowering and raising the rotating fly cutter, and gradually feeding towards the spindle, you can now take light cuts across the bottom of the piston. Continue until the side of the piston is cut to exactly seven-sixteenths from the bottom of the wrist pin hole to the bottom of the piston skirt, at the closest point. You will find that this operation has cut very little from the front and rear slipper faces of the piston. Dress off the burs, and carefully install the pistons, rings, and wrist pin keepers.

Don't give up now! There is only one more major hurdle—the **CYLINDER BLOCK ALTERATION.** In this operation, a total of exactly seven sixteenths of an inch is to be removed from the top of the cylinder. Before you start cutting, make a template or pattern of the top face of the cylinder block. BE PRECISE!—especially as to the location of the rear center bolt hole, and the small lip or boss which projects forward from the rear rim of the push rod tube hole.

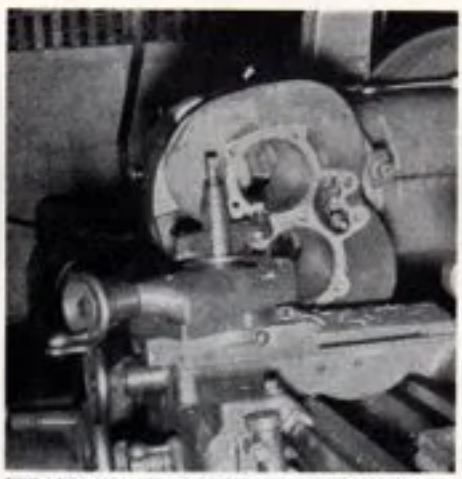
Take a light hammer and carefully break off the top cooling fin all around the block. This will make the machining much easier, as the chilled outer edges of the fin may only be cut with a carbaloy cutter, and then only with difficulty. Machine thirteen thirty-seconds of an inch off the top face of the cylinder block. Drill the rear center bolt hole out to five-eights of an inch diameter.

Now after preheating the cylinder to 400 degrees, reach down in the drilled hole with Eutectic Number 24 X cast iron arc welding rod, and, working from the bottom up, build up a solid core—filling the hole so that you have a solid body at least three fourths of an inch deep to tap for the cylinder head bolt hole. Then by using the template as a guide, build up a lip in the center of the rear wall of the valve push rod tube—at the top, of course.

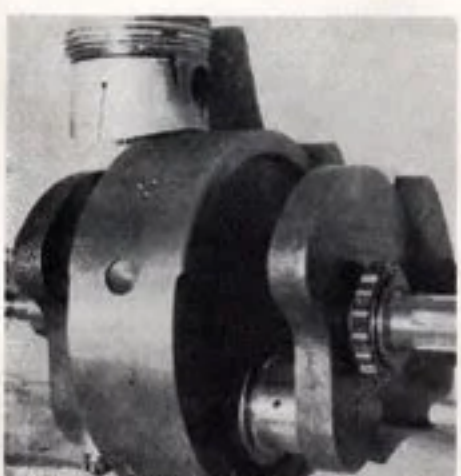
Machine off the remaining one thirty-second of an inch from the top of the cylinder block to a good smooth gasket surface. (You now have a cylinder block just seven-sixteenths shorter than stock). Again using the template, relocate the rear center bolt hole. Using a five-sixteenths drill, deepen all holes to seven-eighths inch, and tap with an English three-eighths twenty thread tap. Use a glaze breaker on the cylinder walls, or rebore as necessary for your pistons. Clean thoroughly and install the cylinder block. YOU'VE PRACTICALLY GOT IT MADE! The rest is routine hop-up, except for the valve push rods. These are to be shortened exactly seven-sixteenths of an inch.



NEW PROFILE to piston skirt is machined with this drill press set-up.



SHAVING the cylinder barrel is done here with a lathe.



DAYTONA type crank with short rod and newly machined piston fitted. Note clearance between piston and flywheel.

THE FINISHED cylinder barrel.

From here on out it is dealer's choice. PORT, POLISH, BIG VALVES, BIG CARBUTETOR, RACING VALVE SPRING SET-UP, all add to the PUNCH, and top performance you get. The standard head and carburetor set-up of a Golden Flash, will give you a very healthy engine, but the more you put in—the more you get out of it.

A word of reassurance here. These engines have proved to be just as durable, noticeably smoother, and a darn sight faster than their stock counterparts. You are definitely not on the thin edge, or out on a limb.

Having completed the engine and mounted it in the frame, there is just one thing more. STRAIGHT PIPES WILL GET THE MOST OUT OF WHAT YOU HAVE BUILT. Run the straight pipe out to the center of the rear axle, and finish it off with a very short two and one-half inch bell.

In tuning, you'll find that generally, you'll need about two sizes larger jet than previously, and that the main jet needle should be raised one or two positions. Ignition advance on pistons is eleven thirty-seconds. Precision tuning from there out is as you find it for the individual engine, but keep it on the rich side. And PLEASE, break it in carefully. If you do, you will be rewarded with an engine that is a real going concern.

PERFORMANCE FIGURES?? Well, Gary Bodkin of Vallejo, recently took his short rod Beezer to the Drags at Vacaville, and he made a clean sweep all the way. Fast time of the day; fastest in his class; and top eliminator of the day against all comers—motorcycles, cars, and rail jobs. It was just like turning a hungry wolf loose in a herd of sheep. Watch that boy in the future! And look out for the Short Rod Beezers!

Oh, yes! The commercials! Standard engine parts—such as carburetors, pistons, rods, cams, and cranks, you can get from Hap Alzina in Oakland, California, or from your local dealer; special taps from Flanders Manufacturing Company of Pasadena, California; bronze side bearings from Beck Distributing Corporation of New York City, Alzina's of Oakland, California, or the Roosa Motorcycle Centre, in Vallejo, California; special iron welding rod from your Eutectic dealer. And last, but not least, you will need a clutch to hold this rascal at it's peak. You can get the new 'Rosie' Gold Bond neoprene clutch at your dealer, if he has them; OR you can order direct from the factory, located at 3729 Sonoma Blvd., Vallejo, California.

That is all there is to it! HAPPY MOTORCYCLING TO YOU.

"ROSIE"