

CONVERTING A HOMELITE 55 FOR AUTOMOBILE USE

Last year I acquired a Homelite 55 outboard motor that allegedly didn't run. If you've never seen a Homelite 55 outboard motor I have to tell you that it is really big and HEAVY. It took three guys to unload it from the car. Not wanting this monster cluttering my shop I decided to remove the power head and convert it for use in my CD.

Removing the power head from the rest of the marine contraption was straightforward. In the marine application the power head is in a vertical position with what would be the front of the engine in a car on the bottom. Just the reverse of what a Fageol VIP would be. The engine was then placed on an engine stand in a horizontal position for study.

The major differences between the Homelite 55 and a standard Crosley engine were noted. The Homelite's ignition distributor is located on the back of the cylinder block and is driven off of the rear of the camshaft. The fuel pump is located on the top of the cam cover and driven off of an eccentric on the center of the camshaft. The Homelite has a water cooled combination intake/exhaust manifold. The side covers for the cylinder block are different than those on a Crosley. The water outlet on the spark plug side of the block is considerably smaller. The rear of the crankcase is not machined for a bell housing. The left side is not machined for an oil dipstick, breather tube or distributor, though the bosses are present on the casting. The right side of the crankcase has no provisions for a water pump or generator. The oil pressure relief valve is in the oil filter adapter on the right rear of the crankcase. The crankshaft has no flange for mounting a flywheel. The oil sump is a cast aluminum piece that is set up for use in the vertical position. The oil pickup tube goes out the front (bottom in the marine application) of the oil sump.

The conversion process was started with the cam cover. The distributor was removed and discarded. Upon removal it was noted that the nylon coupling between the distributor shaft and the camshaft had sheared and that's why this engine wouldn't run. (The engine turned out to be very low time and in good shape.) Welding in an aluminum plug closed the hole in the rear of the cam cover. RE: Photos #11, 12, 13 & 38

The cylinder block was next. The rear of the block was milled down on the outside of the oil drain back passage to allow clearance for the forward bell housing. The boss on the left rear was drilled and tapped for the water temperature probe. The water outlet boss was bored out to accept the thermostat and drilled and tapped for the studs. A 1/4" thick aluminum spacer was made to go between the block and a standard water outlet elbow to allow room for the thermostat. The water outlet holes that were under the manifold were drilled and tapped for pipe plugs to block them off. Additional holes were drilled and tapped for manifold studs to allow mounting Crosley intake and exhaust manifolds. The left lower engine mount flange on the front of the block was cut off to make room for a front mounted distributor. The other three mounting flanges were left intact to provide a

place to mount a $\frac{3}{4}$ " aluminum plate for attaching a generator. These flanges are set back $\frac{3}{4}$ " further than the two on a Crosley block, so the $\frac{3}{4}$ " aluminum plate is perfect for positioning the fan bracket/pulley to line up with the crankshaft pulley. Standard Crosley side covers were then installed on the sides of the cylinder block. RE: Photos #12, 14, 23, 24, 28 & 31.

The crankcase was next on our list for machining. A length of precision ground 1.5" steel bar was purchased for use as a mandrel. The crankcase was mounted to it by using the bare #1-4 main bearing caps. The #5 bearing had its inserts installed with a couple of strips of paper between the bearing inserts and the mandrel. Standard torques on the bolts clamped the case rigidly to the mandrel. The rear face of the crankcase was then turned flat in a lathe. The left side of the case flange had already been machined to the correct dimension so all that is required is to make the rest of the rear face even with that face. The #5 bearing cap was profiled to match a Fageol cap while the assembly was still clamped to the mandrel. The difficult, or should I say time consuming, operation was boring the hole for the distributor. Fortunately I have a Fageol crankcase so we clamped it up to an adjustable angle table on the P&W Jig Borer after machining up a spud for the lower tower shaft bushing. A tooling ball was inserted into the spud and all measurements were taken off of the tooling ball to determine the hole location and angle. Then the Homelite crankcase was clamped up in the Jig Borer and we used the acquired measurements to bore the distributor hole to 1.75", which is the same diameter as the hole in a Fageol case, and then faced it off with an end mill. The hole must be bored to 1.75" due to the casting configuration. Unfortunately the casting does not have two bosses for the distributor retaining bolts, only one. Consequently the distributor bushing cannot be stepped on the O.D. like the one in a Fageol, but must be its full diameter for its entire length in order to keep the distributor rigid in the crankcase. The single retaining bolt allows the distributor to tip in the crankcase if a stepped bushing is used. This means that the distributor must have its drive gear removed for installation and removal. The dipstick hole and breather hole are at the same angle as the distributor so they were then bored in the appropriate locations. The crankcase was then clamped up vertically and the dowel pin holes and bell housing bolt holes were drilled and tapped using the Jig Borer. RE: Photos # 12, 14, 21, 22, 26 & 34.

The crankshaft was next. The Homelite shaft does not have a flywheel flange, nor is it drilled and tapped at the front for a pulley-retaining bolt. I took a six bolt flange from a junk military crank and bored and threaded it to 1 $\frac{1}{4}$ -12. It was then cut to length so that the juncture would be just aft of the radius on the crankshaft slinger ring. The crankshaft taper was then cut off and the remainder of the shaft turned down to 1 $\frac{1}{4}$ " diameter aft of the slinger ring radius. It was then threaded to 1 $\frac{1}{4}$ -12 with a nice snug fit to the internal threads on the flange section. The front of the crankshaft was then bored and tapped to 3/8-24 to accept the pulley-retaining bolt. We made up an 8' wrench, which was bolted to a flywheel so that we had two 4' handles. The flange and crankshaft threads were lubed with red Loctite and the flange was threaded onto the shaft, which had been clamped in a large vise. The flywheel was bolted to the flange and the flange torqued to approximately 700 ft/lbs. The flywheel was removed and the threaded juncture was bored and tapped to take two hardened 10-32 set screws. The splines on the Homelite

shaft are finer than on a Crosley shaft. The Homelite drive coupling was turned down, bored to 3/8" and cut to length. A Crosley crank pulley was bored for a press fit on the modified drive coupling and pressed onto the coupling. A weld bead around the front secured the pulley to the coupling. A Parker Clipper 9628 H1L5 KC oil seal was used at the rear of the crankshaft (This seal fits a Fageol crankcase also). The standard Homelite seal arrangement is retained at the front. RE: Photos # 10 & 11

The Homelite oil sump was cut and modified to the profile of a Crosley oil pan. A drain plug bung was welded on and a windage tray welded into the interior. The Homelite oil pump oil pickup was cut and shortened between the pump cover and the elbow. An aluminum oil pickup tube with a suction screen was pressed into the elbow. RE: Photos # 17, 18, 23, 24, 28 & 31

The Homelite oil filter adapter was removed and a new adapter made from a 3 1/4 X 3 1/4 X 2 1/2" block of 6061T6 aluminum. This adapter allows the oil filter to be hung vertically below the adapter. The adapter also contains the oil pressure relief valve. A 3/16" plate is sandwiched between the filter adapter and the crankcase to make a water pump mount.

A piece of 3/4" 6061 plate was cut to size and bolted to the three remaining motor mount lugs on the front of the cylinder block. Three 5/16" boltholes were drilled and tapped into the right side of this plate to mount the generator mounting plate to. RE: Photos # 41 & 42

The engine was assembled using the Homelite 55 manual and everything fit as planned. An Autolite 4181C Distributor with a Pertronix module, and Braje intake and exhaust manifolds were used. RE: Photo #36