

Stroker kits

for corvair[★]

by RAY BROCK

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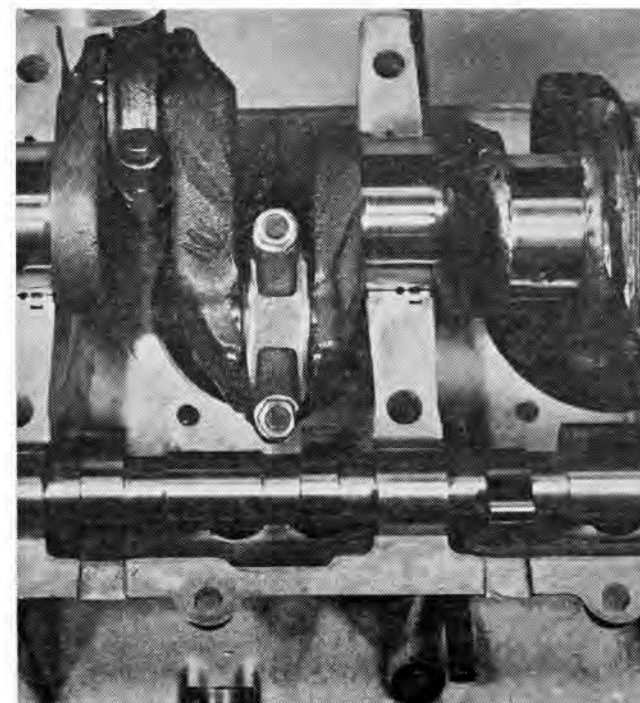
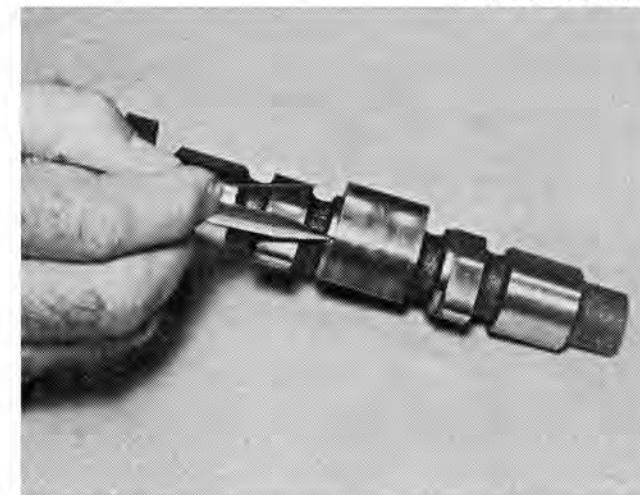
Weber Tool Company, formerly of Los Angeles but now located in Santa Ana, California, makes this kit with two stroke lengths. Corvair's stock stroke is 2.6 inches and combined with a bore size of 3.375 inches, gives a total displacement of 140 cubic inches. Weber's kits use either a 1/4-inch stroke (2.850 inches) or .400-inch stroke (3.00 inches) with an eighth-inch extra bore (3.50 inches) to increase the displacement to 164.5 and 173 cubic inches respectively. The displacement increase also gives the compression ratio of the Corvair engine a healthy boost, raising it from the stock 8:1 ratio to 9.25:1 for the 1/4-stroke kit and 9.65:1 for the .400-stroke kit.

These kits sell for \$335 (exchange on crankshaft and rods) and are complete so that the Corvair owner only needs to disassemble his engine, bore the cast iron barrels an eighth-inch, make a few other minor modifications, then reassemble the engine. Kit pieces include the welded stroker crankshaft (either length) reworked rods with eighth-inch oversize pistons fitted and aligned, rings, inserts and a guaranteed Weber balance job on the assembly. Camshaft pieces that also go with the kit include a cast steel billet cam, solid lifters and valve spring shims to permit higher rpm's.

Normally, stroker kits do not include a hot cam, but there is a special reason for including one with the Corvair kit. Clearance around rotating parts within the flat-opposed six is just barely ample with the stock crankshaft but with the increased length of the Weber crank, modifications are needed. First of all, with extra stroke, the big ends of the rods will strike the lobes of the stock camshaft. To solve this problem, Weber uses a special billet cam with the lobes slightly narrower and offset 3/32-inch to the rear of the engine. Coupled with this move, the Corvair connecting rods and caps must also be shaved slightly alongside the rod bolt to clear the toe of the cam lobes. Another trimming operation is performed to the bottom of the rod cap for increased clearance with the opposite piston skirt, barrel and crankcase. The cap is ground off .090 inch but plenty of meat is left so that the rods are not weakened. The bottom edge of the stock barrels project inside the aluminum crankcase halves about 1/8 inch. All six cast iron cylinders must be trimmed 1/8 inch on the bottom by the Corvair owner, a simple operation to perform while the barrels are being bored for the stroker pistons. Crankcases must also be relieved slightly to clear rod

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PHOTOS BY ERIC RICKMAN



TOP—Weber's original experiments with the Corvair engine disclosed that the extra stroke on the crankshaft would cause some rods to hit the cam. By grinding the stock lobes at the point of interference as shown, the rods would no longer hit. BOTTOM—Billet cam included in the stroker kit has lobes offset 3/32-inch but the side of rods number 1, 3 and 5 must be reworked slightly for additional clearance. The picture shows the rod and intake lobe of Weber's cam at their closest point.

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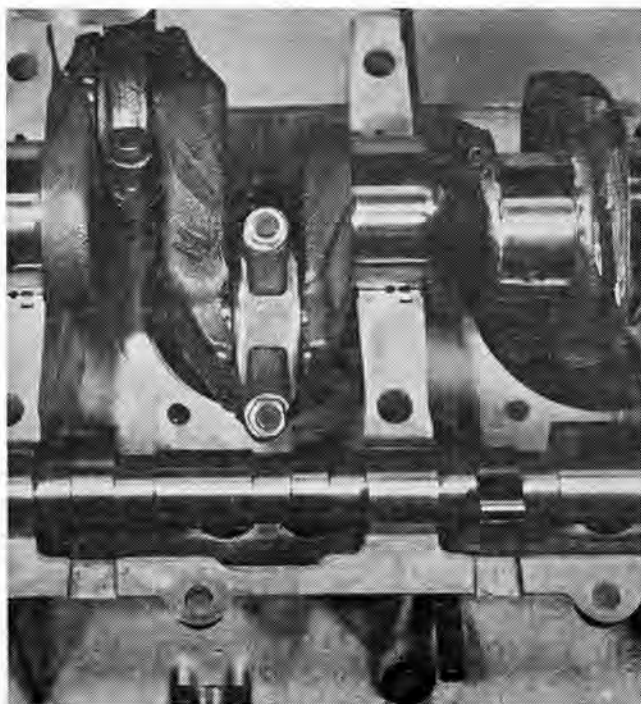
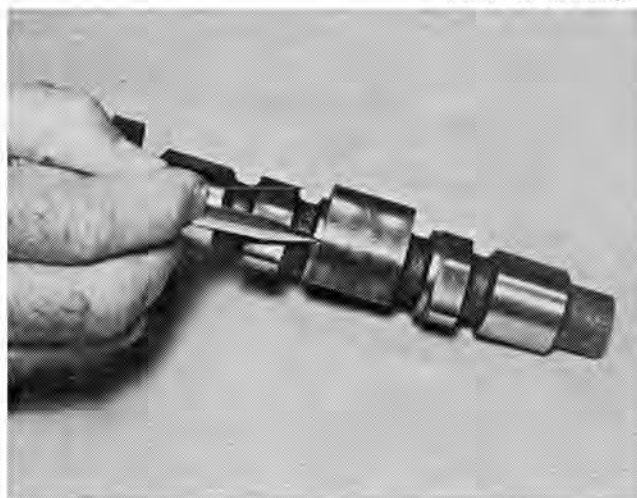
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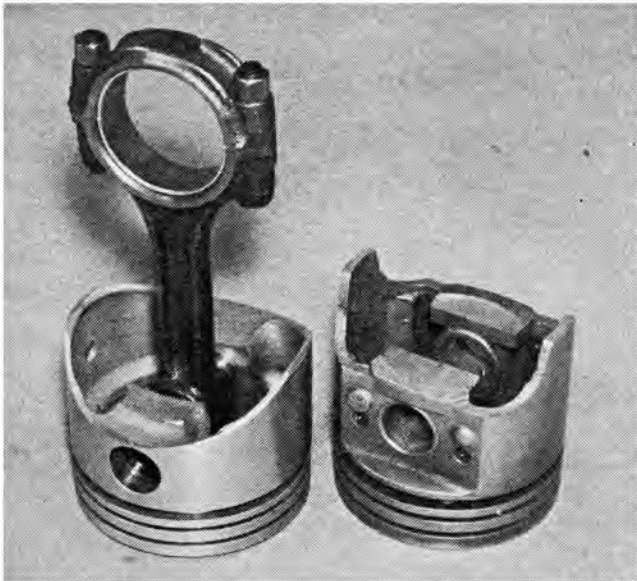


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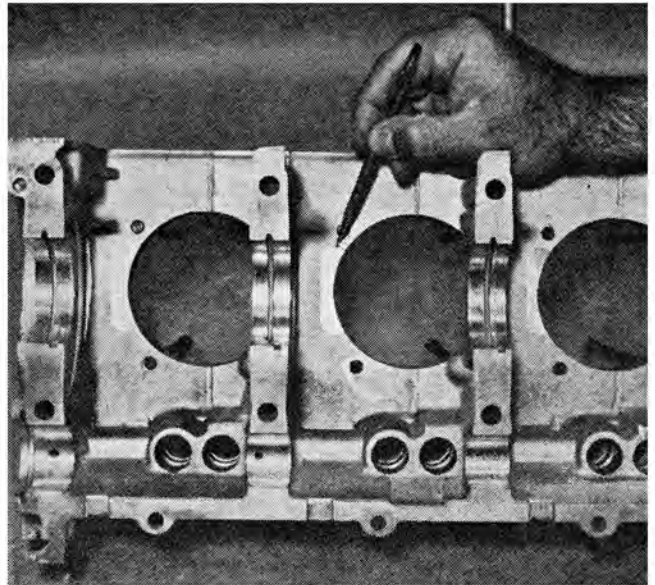


STROKER KITS FOR CORVAIR *continued*

The point on the rods which pass closest to the cam lobes is at the part line between the rod and cap. Slight relief by grinding will be made on all rods used in Weber kits. Bottom of rod caps are also trimmed off.

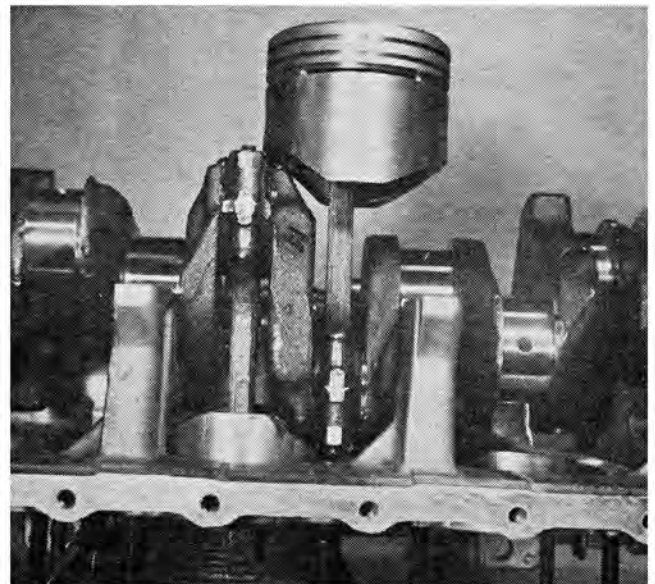


ABOVE—The pistons used with the stroker kit are made by Jahns. They are of flat top design but thanks to extra displacement, compression is boosted greatly.



UPPER RIGHT—The longer .400-inch stroker crankshaft also requires a relief in the crankcase to clear the bottom of the opposite rod. Barrels must be trimmed too.

RIGHT—In case you think more than .400 extra stroke can be used in Corvaire six, here's how tight everything fits. Room around moving parts is just ample.

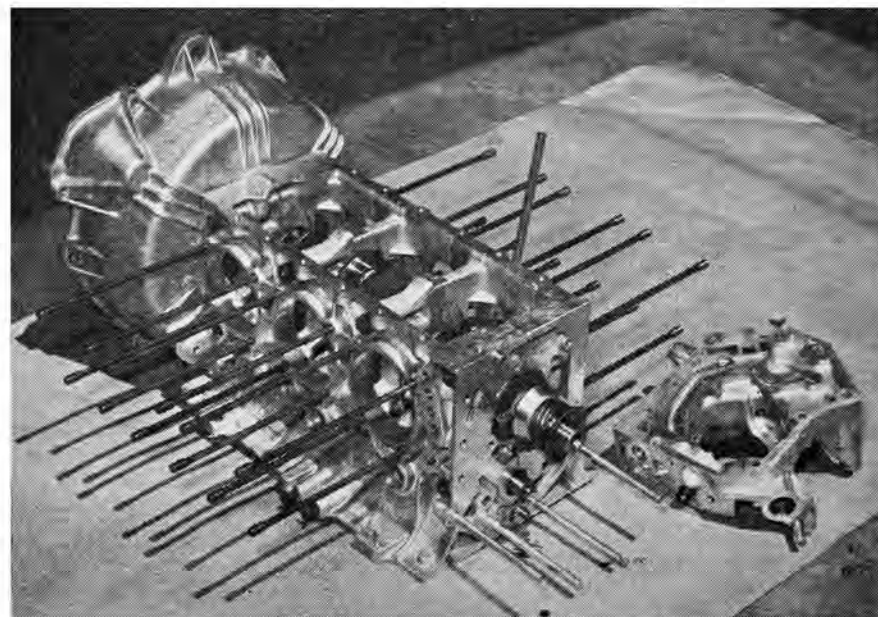
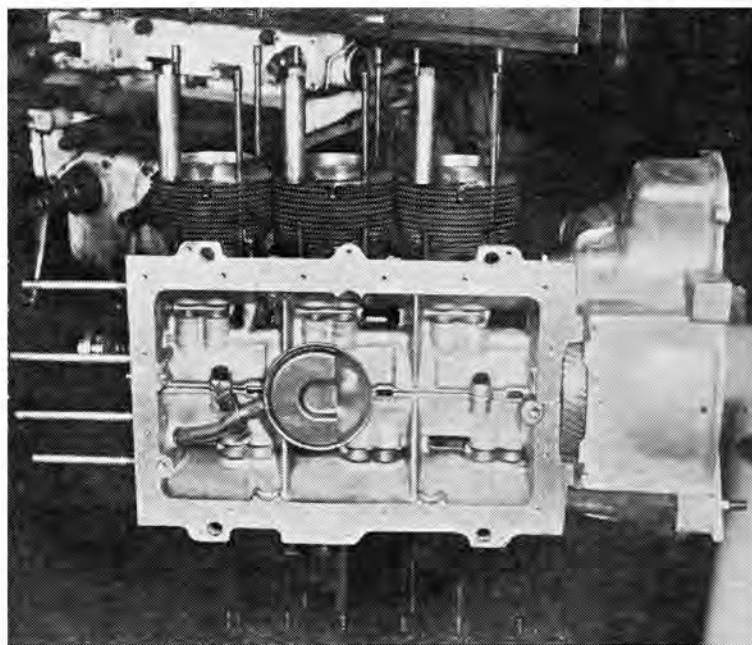
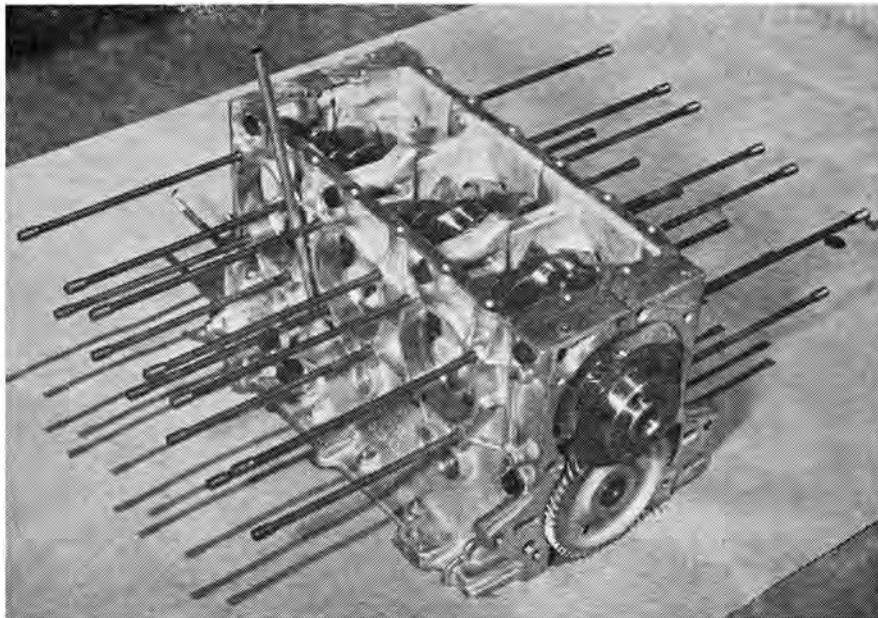


cap of opposite cylinder (see photo left).

Actually, most of the clearance problems are critical only with the longer .400-inch stroker crankshaft but even when using the 1/4-inch stroker crank, the barrels must be trimmed slightly and the offset camshaft installed to clear the rods. With the longer stroke, the owner needs to trim the barrels, bore them to the larger piston size, relieve the crankcase slightly and assemble the pieces. Boring the individual barrels might be a problem in some parts of the country where garages aren't equipped with the proper boring equipment but any motorcycle shop should be able to do the job. If they can't, any machinist can chuck the barrels in a lathe and cut them out to the correct diameter.

The pistons included in the Weber kit are made by Jahns and rings are Hastings. Since the crankshaft stroke is increased by welding additional material to the throw and then regrinding, the accepted procedure for ensuring exact main bearing alignment is to grind the main journals on the crank to .010-inch undersize. To prevent possible problems obtaining these undersize inserts in remote sections of the country, a complete new set of genuine Corvair .010-under main bearing inserts are included in the kit. Rod inserts are also included but these are standard size.

Stock 80 horsepower Corvairs use hydraulic lifters and even the optional 95
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TOP—Aluminum crankcase halves split in a vertical line through the crank and cam bearings. Steel backed inserts are used for crank but cam runs in aluminum case.

CENTER—Rods cannot be reached through the bottom of the engine. Sleeves are needed to hold the cylinder barrels in place while assembling piston-rod to crank.

BOTTOM—Bell housing and clutch fit on the front of the Corvair engine with an accessory drive case on the rear. Copper gaskets seal barrels to case and heads.



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STROKER KITS FOR CORVAIR

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horsepower engine is equipped with them to maintain constant valve clearance as the air-cooled six expands. The only problem here is that with a hot cam such as that used in the 95 hp engine, the hydraulic lifters keep valve lash at a zero clearance and this only exaggerates the cam timing and overlap to give poor idling characteristics. Weber furnishes solid lifters with their kit (the same lifters used with 283-inch Chevys) which, combined with .060-inch shims furnished to fit beneath the stock valve springs, will permit engine rpm's of 5700-5800.

Valve clearance must be set at .004 and .006 cold to allow for engine expansion. When the engine is hot, clearance is about .023 on all valves. The close setting when cold accentuates the cam timing so that idle is rough, in fact the cold idle is similar to Corvair's 95 hp engine idle. When the engine warms up, however, the extra clearance cuts down overlap and timing to give a smooth idle, much better than the 95 hp Corvair. Further tests are currently being made by Weber to see if aluminum pushrods with expansion qualities similar to that of the engine can be used so that valve clearances will not vary as much between cold and hot operation.

We drove Harry Weber's personal Corvair sedan equipped with the .400-inch stroker crankshaft plus eighth-inch overbore for 173 cubic inches and the extra 33 cubic inches are really noticeable. Low rpm torque is greatly improved even with the longer duration camshaft. The engine will "lug" much better in any gear than does a standard Corvair and acceleration feels on a par with many of the full-sized cars with small V8's. Although idle was rough when cold, the engine warms up after only a couple of blocks. Even with the .023-inch valve clearance when hot, the noise level is not objectionable. The engine will turn much higher rpm's than when stock and certainly reach these rpm's much faster. Weber made mileage checks and reported his 23 miles per gallon highway figure was lowered to just over twenty by the extra inches and cam timing.

The only improvement we could see a need for was in the carburetion department. Weber's Corvair uses the stock carburetion arrangement and especially with the extra inches to feed, carburetion is not adequate at higher rpms. Weber has no plans for modified carburetion kits to fit the Corvair engine but we know of a couple of other companies toying with the idea so perhaps it won't be too long before we can bring a report on them. Extra inches plus more breathing ability through camshaft design and carburetion should make Chevy's economy model an acceptable performance model too.