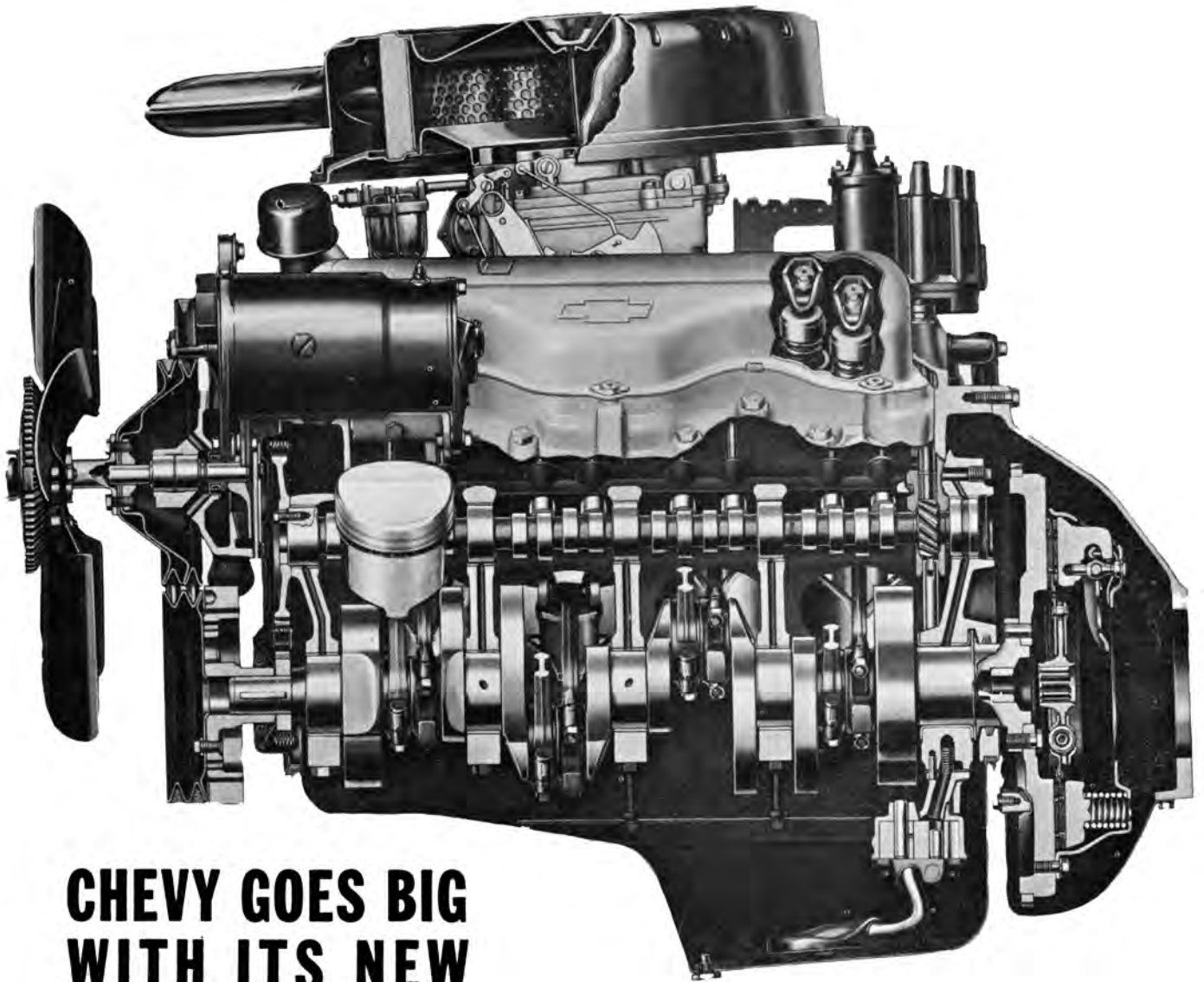


THE HOT SUPER-STOCKERS



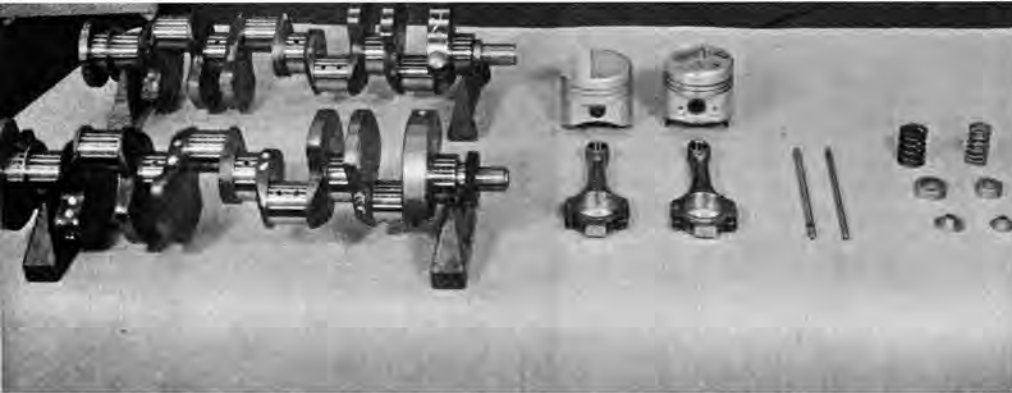
CHEVY GOES BIG WITH ITS NEW 409 V8

Having been stung by those big Pontiacs during the last couple of years, Chevy has come out with something to blow competition off the strip.

CCHEVROLET has long been a by-word for hot engines that sizzle across the finish line. However, stung by some of the larger displacement engines from competing divisions, Chevrolet turned on the steam and carved extra inches from the 348 engines. For '62, the 348 has been dropped, since the new 327 cubic inch mill more than equals it in performance. However, the 409 remains and has blown off competition at more than one strip.

With a bore and stroke of 4.3125 by 3.50 inches for its 409 cubic inch displacement, an 11-to-1 compression ratio, and every chance that the engine will run in Super-Stock, there is little wonder that the 409 is available only with a manual shift. Automatics apparently would not keep pace with it. The 409 is available with one or with two four-barrels. The first produces 380 hp at 5,800 rpm and the second 409 hp at 6,600 rpm. Torque values are the same for both engines, 420 lb/ft, but the single four-barrel peaks at 3,200 rpm while the dual four-barrel puts out its maximum torque at 4,000 rpm.

The inside of the engine quickly documents this premise of vastly increased power, for the main bearing webs have been



Layout of major moving parts involved in converting from 348 to 409 inches includes considerably more beefy, tubular pushrods with separate tips drilled to allow oil passage from the mechanical valve lifters.

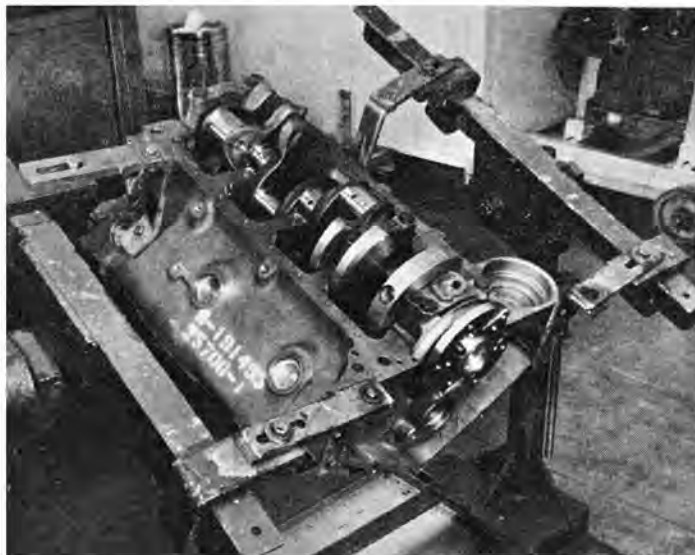


Larger valve springs with 130-pound pressure and a flat-wound spring damper are used in combination with different retainers, oil shields.



409's cylinder head has same number of valves as 348's, certainly ample. Larger bores, redesigned pistons, have unpocketed valves.

Main bearing webs were reinforced quite extensively and more room was made for the larger crankshaft throws.



NEW 409 V8

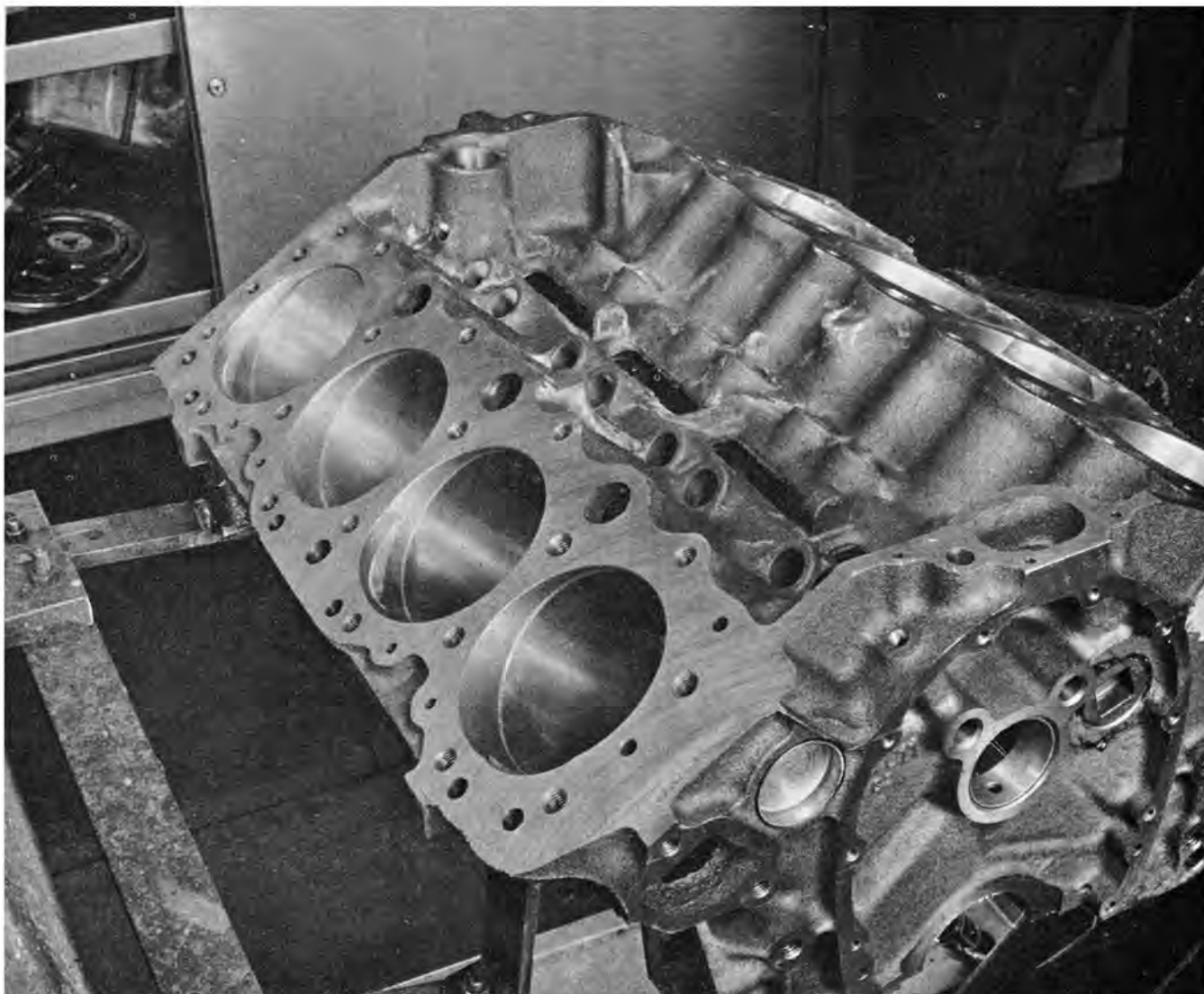
visibly beefed up. All radii are larger and more generous. Room was made for the larger counterweights of the crank where they pass the bulkheads and the base of the cylinder bores. The block is parted at the centerline of the mains. Cut-outs used at the top of the cylinder in the 348 to make room for the exhaust valves are not needed on the 409, thanks to the increase in bore size.

The forged crank is essentially a stroked version of the 348's, with correspondingly heavier counterweights. One fairly unusual step was the contouring of the greatly enlarged flywheel flange of the crank, forming it into an extra counterweight. The rubber-mounted vibration damper was also beefed up. Premium aluminum bearings, Morraine 400's, are used at the rods and mains. Larger clearances all around increase the oil supply and reduce drag. Crankshaft end thrust ranges between .006 and .010 inches. Bearing clearances at the mains have been just about doubled to a .003-inch maximum. Even end play at the rods ranges between .014 and .021 inches, also a healthy increase over stock specs.

When a close-coupled engine like the 348 is stroked, a good bit of "stealing" must be done in order to gain the needed room. In the process, the rods were shortened from 6.134 to 6.009 inches, for there certainly was no room in the piston to absorb the entire 1/4-inch change. However, a glance at the connecting rod weights is an eye-opener; they have grown from 19.20 to 26.20 ounces, with the extra weight put to good use in bringing them to maximum strength. Only those connecting rods that return from heat treat at the high end of the hardness scale are used. Keep in mind that the 409 cubic inch brings Chevy right up there with the largest displacement engines, something to enliven big bore competition this year.

We really saved the best for last, for the pistons are forged, in line with the best hot rod practice. Two hefty towers for the wrist pin bosses extend from the skirt up to the crown. While the thrust faces are still of the slipper type, the cutout has been drastically reduced. The center of the thrust faces is reinforced by a thickened section in the skirt. To simplify die withdrawal, these stiffening ribs must also be in the form of vertical towers.

Inserts are not used for expansion control, and the wrist pin bores are on dead center instead of being offset for piston slap control. Obviously,



The upper part of the cylinder forms the wedge-shaped combustion chamber's envelope. Note the exhaust valve cutouts.

strength and simplicity rather than sound effects governed piston design. Slightly more fall-away is used in the elliptically-ground 409 pistons to offset the lack of inserts. Clearances are up all along the line, including those at the wrist pins.

To make the pistons interchangeable into any of the eight holes, top contour was changed and the "eyebrows" for valve clearance were replaced by straight cuts across the tops of the pistons. Another cut on each piston at a slightly different angle forms the squish area. A pair of drillings supply oil to the wrist pin bores. The pin, as on all 348 engines, is pressed into the rod. Heavy grooving formed by flat, rough turning produces a series of oil pockets along the skirt surface and prevents scuffing. An additional advan-

tage in this type of grooving is that it will shortstop a scuff mark even if one should begin.

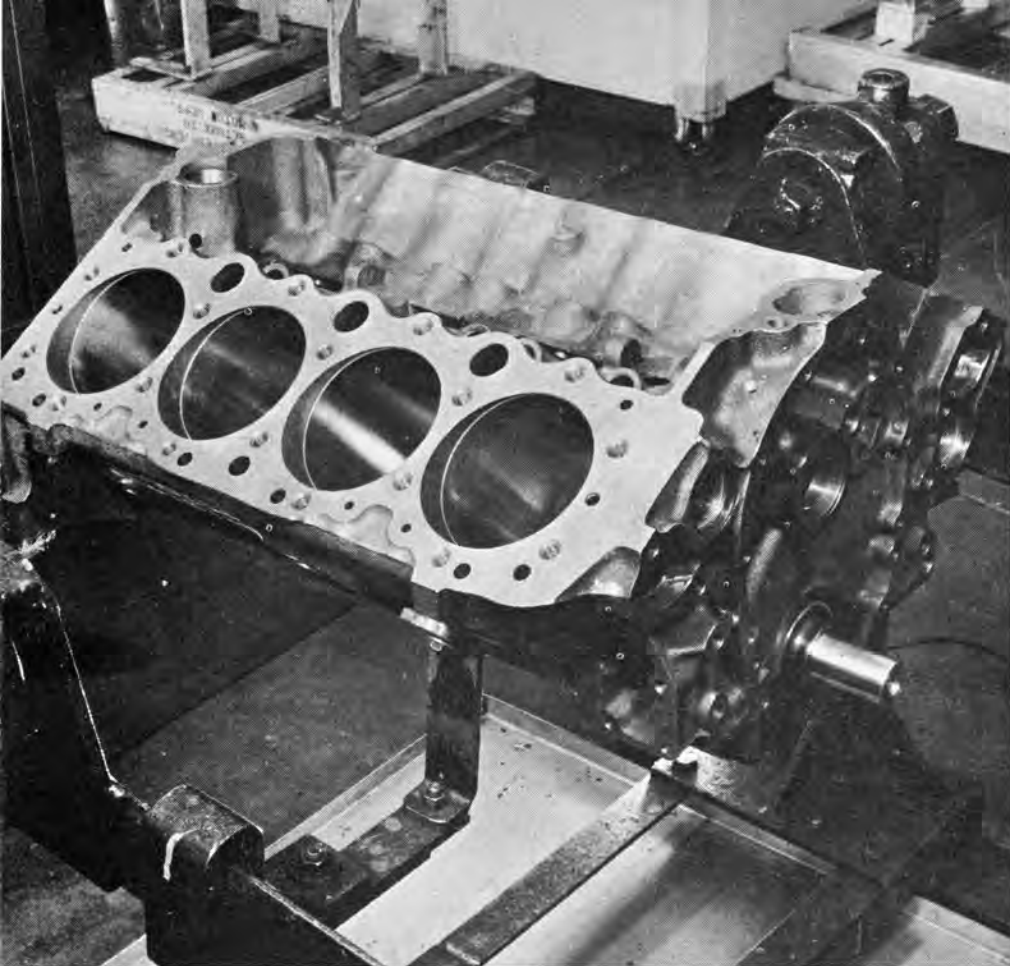
Oil capacity has been increased from four quarts on the High Performance 348 (RPO590) to six quarts on the 409. Considerable pains were taken to reduce oil foaming, since it doesn't take long for an engine to go when the oil pump begins delivering air bubbles to the mains. The deep section of the pan is baffled, and another flat baffle extends under the last three mains and is bolted to them. These baffles trap the oil and give air bubbles extra time in which to flow out.

Valve sizes were considered ample and remain unaltered, but the valve train was completely reworked from the cam up. Spring pressures, which normally range between 76 and 84

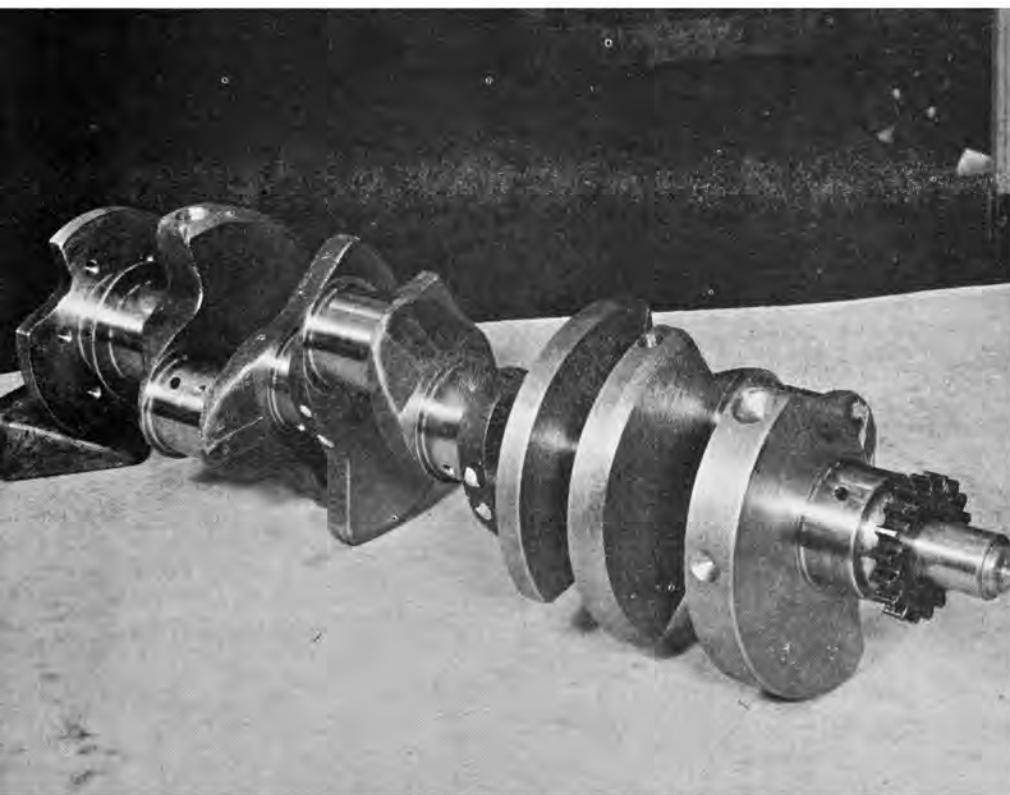
pounds with the valve closed, have been raised from 130 to 138 pounds. The springs are now fitted with vibration dampers in the form of flat, wound coils. Corresponding changes were made in the oil shield and valve spring retainer.

Separate inserts were used at both ends of the beefed-up tubular pushrods. These inserts are drilled to allow rocker arm lubrication. Solid valve lifters of the dumbbell type relay oil to the pushrods through drillings.

A first glance at camshaft timing provides a completely unrealistic picture of 345 degrees of intake duration and 294 degrees of exhaust duration. Actually, much of it is due to extra long ramps that lessen the loads. The cam is, nonetheless, quite wild.



The larger bore of the 409 does away with the cutouts. Despite this larger bore, there is ample coolant space between the engine's cylinders.



The 3.6-inch stroker crank (up $\frac{1}{4}$ -inch from the 348's) has larger counterweights and even a flywheel flange formed into a separate counterweight.

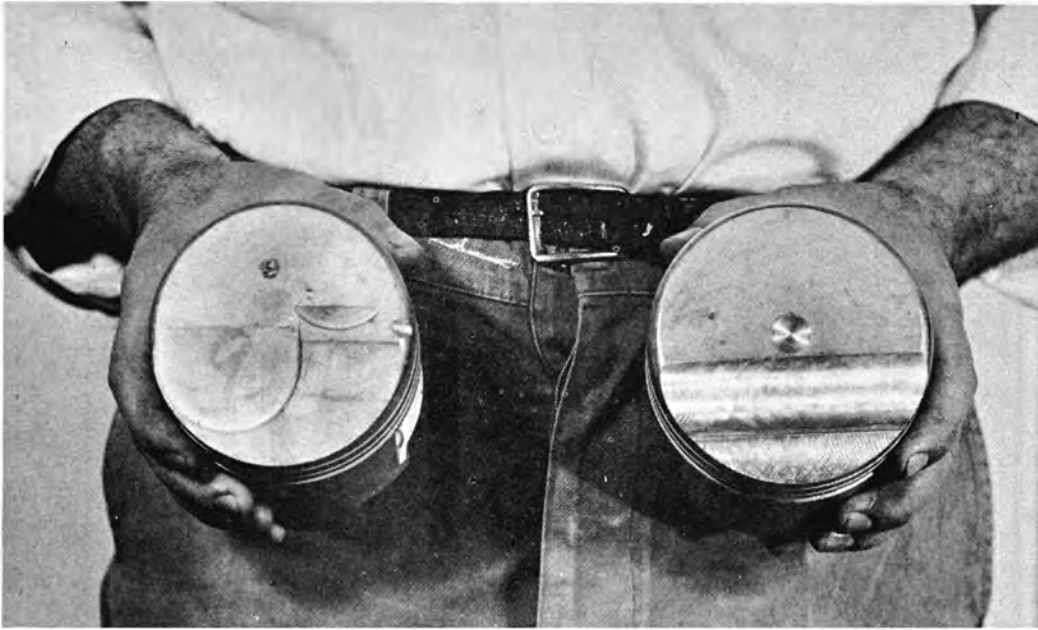
NEW 409 V8

Fuel pump pressure has been upped to the 9.25-to-10.75 pound range, same as on the High Performance 348 but almost double that of the normal 348. This was done primarily to reduce fuel boiling in either the pump or the line to the carburetor. The carburetor is a Carter AFB 7020029 four-barrel that shows some appreciable size increases at strategic locations: $\frac{3}{32}$ inches more at the primaries, $\frac{1}{16}$ -inch more at the secondary and an air horn that now measures five inches instead of $4\frac{1}{2}$ inches. The carburetor is, of course, set up for the higher fuel pump pressure.

A dual breaker point distributor is used, as on the High Performance 348, and vacuum advance is discarded. At full throttle, manifold vacuum is very low and undesirable fluctuations in maximum advance may occur under those conditions when a vacuum advance is used. Gas economy is not of much concern when you are trying for a trophy at the strip or the local stock car event. Initial advance is 12 degrees before top dead center (4-10 degrees on the 380 hp version) and maximum centrifugal advance is 24 degrees. The official spark plug recommendation for the 409 is an AC 43N.

Several other touches were added to the engine, such as a larger generator pulley to prevent the generator from blowing up when the engine is wound out, and a beefier clutch. Clutch plate pressure is now 2,275 pounds, which calls for a very strong left foot.

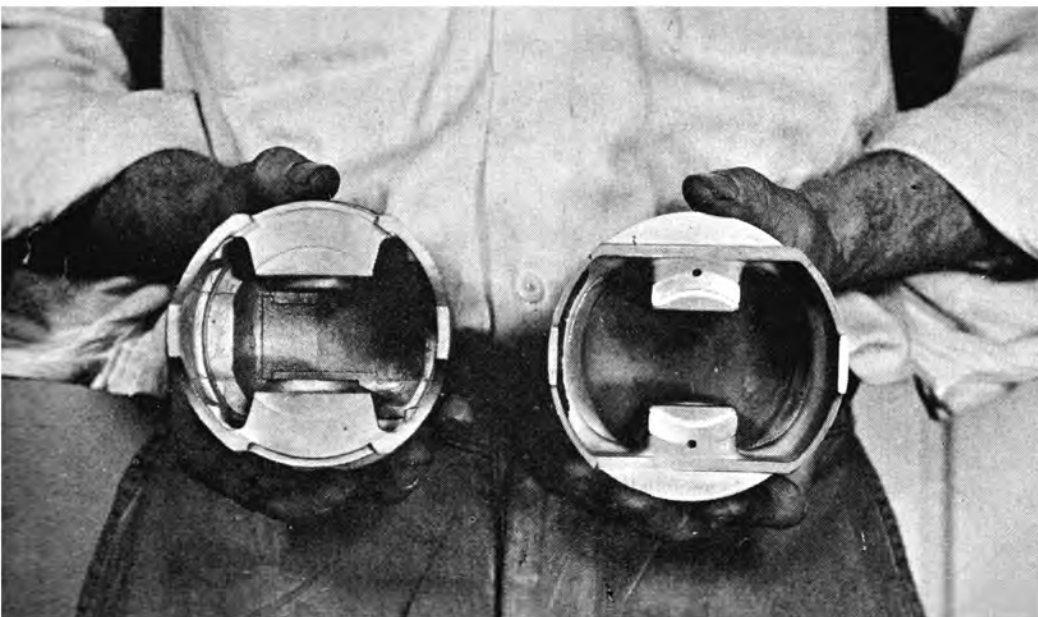
Much of the equipment which was considered optional on other engines, such as forged crank and pistons, a beefed-up valve train, etc., is stock on the Chevy 409. This makes an appreciable difference in the cost of a season's running. What's more, we would like to have a dollar for every car that will be running downwind of a 409's exhaust pipe this year.



Eyebrows for the valves on the 348 piston at left were eliminated on the 409 piston. Thus all pistons are interchangeable from hole-to-hole. One straight cut provides valve clearance and another provides the needed squish area.



The 409 skirt, right, is quite a bit shorter than the 348 skirt. A flat, heavy grooving on the skirt side acts as an oil retainer and serves to stop any scuffing.



409 piston, right, is forged in best hot rodding tradition, with two beefy towers for wrist pin bores. Thrust sides of skirt have thickened section. Forged piston has more strength than a cast unit.