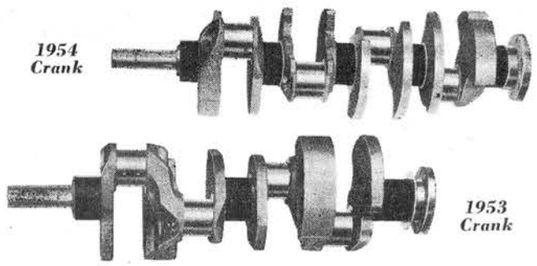
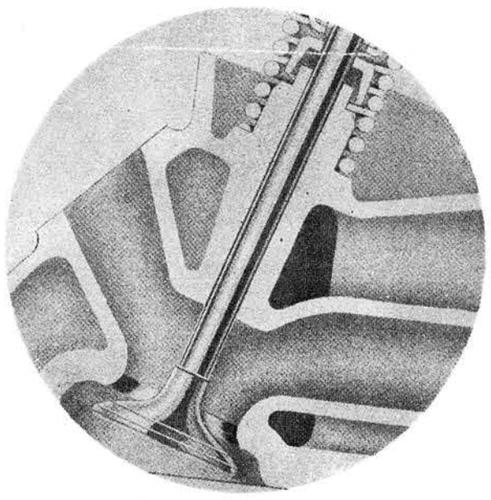
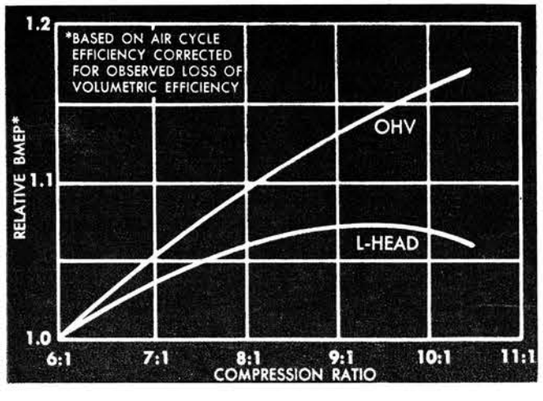


Five main bearings are a must for modern, high-compression V-8 engines, but the crankshaft for the new Ford ohv unit claims two additional advantages: the unit is cast, rather than forged; and the number of counterweights has been brought up to eight, which gives the engine the most precise balance and smoothest operation possible. Both Fords and Mercurys now have identical crankshafts in their engines



Integral valve guides reduce the critical valve temperatures by more than 100 degrees. This is because there is only a clearance and one wall between valve stem and the cooling water in the jacket. With separate guides, heat must penetrate twice as many insulating barriers. Integral guides provide the valve with a full-length bearing surface of oil-holding cast iron. Being integral, they cannot become bell-mouthed through faulty installation, nor can they extend into manifold passages to interfere with breathing, reduce power output

Overhead valve design gives better high-compression breathing and eliminates throttling effect obtained on L-head plants



FORD'S OHV V-8— NEW HOP UP HOPE?

BY BARNEY NAVARRO

FORD AND MERCURY engines have always been the most popular engines to hop up in the past. Among the many reasons for the wide favor they have won in this respect has been their outstanding ability to retain a long life expectancy after modification. Engines that were boosted up to ratings that exceeded factory specifications by 70 per cent, could be counted upon for 50,000 miles. This fact alone refuted one of the strongest criticisms of reworked engines.

Most of the ohv V-8 engines that have been introduced from 1949 through 1953 have not had the wonderful lasting qualities that the sidevalve Ford and Mercury engines possessed. When speed enthusiasts heard rumors that Ford was working on a new ohv engine, they crossed their fingers and hoped: "Would Ford do it right?"

We just had a good look at the new Ford engine for '54. The design and construction obviously will keep the famed name high on the list of hopping up popularity.

Balance in a high speed engine is important. This fact is no secret. But despite the desirability of this basic principle, a compromise short cut has been taken in the majority of the ohv V-8 engines now being produced. Because of the limitations imposed by mass production techniques, all drop forged crankshafts lack counterweights at the center main bearing. And while all of the Detroit-built ohv V-8 engines use five main bearing crankshafts—such as the new V-8—only Ford's has these extra counterweights. This is made possible by casting the cranks instead of forging them, as is the common practice.

The best place to balance an out-of-balance condition is at the point of imbalance. Correcting the condition at a place other than the point of imbalance will produce stresses within the unit that are conducive to fatigue. Thus, the advantage of the extra weights is obvious.

Added to the fine balance characteristics of these cranks is strength of design that is second to none. Due to the short stroke of only 3.1 inches, all crank throws overlap the mains more than three-fourths of an inch. High rpm operation of the hopped up new Fords and Mercurys should cause very little concern for crankshaft safety.

To date, the sidevalve Fords and Mercurys have been unsurpassed for a valve mechanism that would stand up after being reworked. Regrinding the cams of pre 1954 overhead valve V-8 engines has meant that rapid replacement was imperative and very few would last more than 10,000 miles because of extremely high unit loadings. In fact, many all-out racing conversions would lose power due to camshaft wear after very few competitions. And although tests on reground cams for the '54 Ford have not been made at this early stage, indications are that there will be a minimum of difficulty.

This opinion on the dependability of the '54 cams is not wishful thinking. Instead, it results from a careful appraisal of the factors involved. Examination of the valve train shows strong evidence that intensive consideration was given to each detail that involves wear. Cam lobes, for instance, are of maximum width. In fact, they are as wide as space will allow, which makes the unit loading lower than other ohv V-8 engines. And again, in line with Ford practice in the past, the new cams are cast instead of forged. The porous nature of a casting allows oil absorption into the pores of the metal, eliminating the tendency to "wipe dry" as happens with forged cam types.

The best feature is that the valve lifters, of the mushroom type with large diameter bases, are not hydraulic. It won't be necessary to spend countless hours and substantial sums of money making special lifters to replace heavy, troublesome hydraulics. After installation of a reground cam, valve adjustment will be no problem. It will be unnecessary to purchase special adjustable lifters or pushrods since the rocker arms are fitted with adjustment screws. The rockers are very short and light in weight, in keeping with the low reciprocating weight policy that is applied to all of the parts in the valve train.

Dual benefits are obtained from lightweight valve operating mechanisms. The smaller the weight, the less pressure is exerted on the cam lobes so wearing is reduced. At high rpm, where the momentum of moving parts is greater, less weight means that excessively high spring tensions will be unnecessary to prevent valve float. Undoubtedly, the '54 Fords—and Mercurys—should have less valve gear trouble from high rpm operation than with other engines.

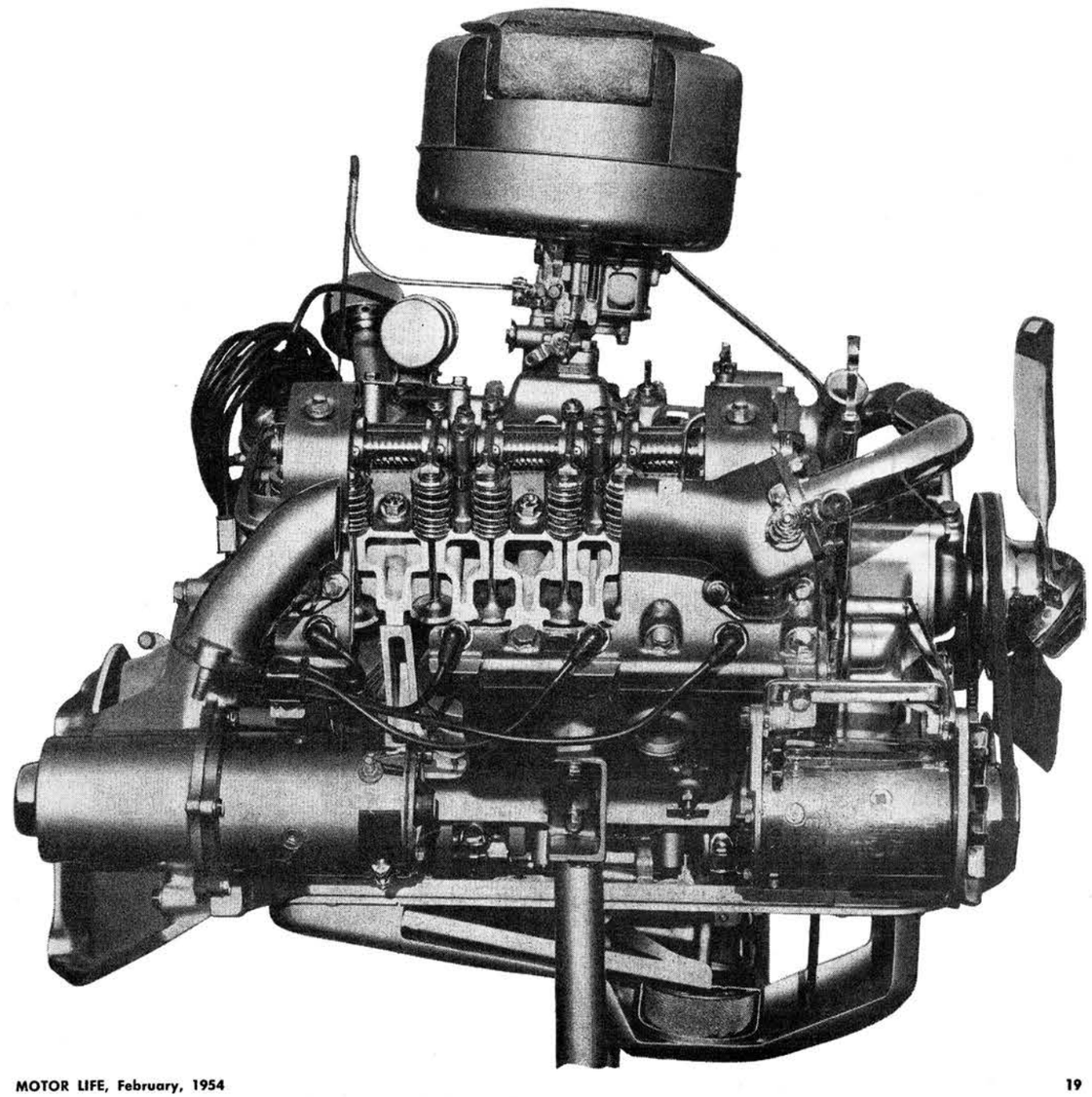
THE UNCONVENTIONAL intake port design is very good. Instead of the time honored practice of placing the ports side by side in a row, they are grouped in pairs—one above the other at each end of the heads. Number one port is uppermost on the head and number two port is directly underneath. Ports three and four are similarly located. This over-and-under arrangement appears pointless at first glance, but upon closer examination the wise choice of the design becomes apparent.

Part of the manifold passage crossover problem is solved and one of the most direct and evenly balanced manifold passage layouts ever created for a V-8 is made possible. The over-and-under arrangement has not caused any restriction in port size; instead, their area is greater than that obtained after the old style L-head Fords are ported. The ports are rectangular in shape and measure 1 1/16 by 1½ inches. Naturally, they can be enlarged with the usual porting processes.

There was no skimping in design of the exhaust ports for each head is equipped with four. The old problem of center

(*Continued on page 55*)

Overall view of the new Ford ohv V-8 engine points up some of major improvements by cutaway treatment. In general, the plant is much more rugged, efficient and dependable



tributor with a vacuum-operated load compensating device.

In practice, the installation of dual intake manifolds on Fords and Mercurys of the '49 through '54 series should be accompanied by a change in distributors such as prescribed in the preceding paragraph. The addition of two carburetors divides the air flow so only half as much air flows through one carburetor as previously at normal operating speeds. Venturi vacuum is dependent upon the air velocity through the venturi so any reduction in velocity will result in less spark advance. And connecting a line to each venturi vacuum takeoff of a dual set up will not increase the vacuum—such a practice is just a waste of copper tubing.

The best advice to keep in mind when purchasing a distributor is not to pinch pennies. An inexpensive unit, if it doesn't do the job correctly, can prove to be the most costly. The best way to avoid mistakes is to study the problems involved and learn enough about them so that you can select a distributor that matches your engine requirements.

'54 FORD ENGINE

(*Continued from page 19*)

port interference, found in the L-head Fords and Mercs and some overheads, has been avoided in the '54 engine. This interference is not a matter of back pressure, but is one of conflict between the intake and exhaust strokes of the center cylinders of each bank. There is a point where both exhaust valves and one intake valve of the center cylinders are open simultaneously. The practice of Siamesing the two center exhaust valves to one port causes exhaust of one cylinder to interfere with the scavenge of the one that has its intake valve open. The separate ports of the '54 Ford will allow regrinding the cams to timing specifications with more overlap, because interference is impossible.

Head milling to increase the compression ratio and boring to raise displacement will be standard possibilities with the new engine, as in the past, so it is unnecessary to dwell on these operations. However, the wonderful coincidence of crankshaft interchangeability that Ford enthusiasts enjoyed in the past has reached a disappointing finish. Previously, it was possible to increase the stroke of an L-head Ford one-eighth of an inch by the inexpensive installation of a Mercury crankshaft. If three-eighths of an inch increase is desired, the Mercury crank can be stroked one-eighth of an inch and early Ford rods installed to take up the difference in bearing size.

Now, however, both the '54 Fords and Mercurys have the same size cranks and have the same length strokes, so nothing can be gained by an interchange or substitution. Stroking will necessarily be limited to the process which employs metal spraying, an inferior method which weakens the crank considerably.