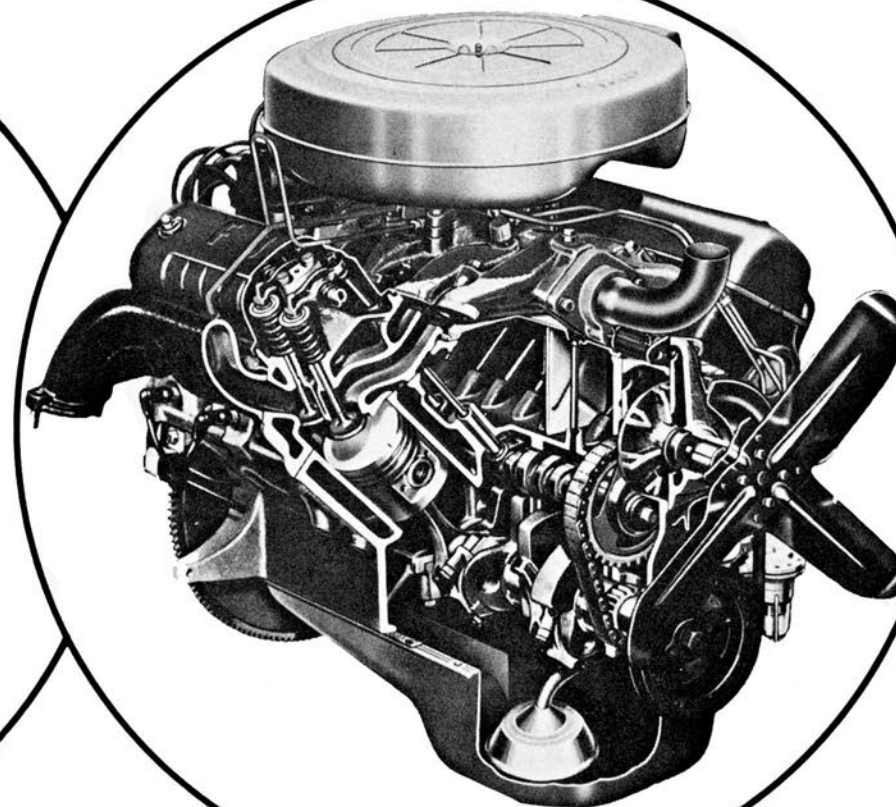


**HOT
RODDING
THE-**

292 FORD ENGINE

This is the engine that replaced Ford's famous old flathead. There are millions of them. Low priced. Easy to hot rod and waiting for reworking. Here's the basic procedure.

By Matt Zedke



Cutaway above of 1954 thru '62 Ford block that weighs close to 600 pounds. Various displacements are available from 239 to 312 cubic inches.

We started this series of articles on "shoestring" hop-up projects with the small Chevrolet V-8 engine because it is the most popular basic powerplant in the hot rod field — for reasons of performance potential, low cost, light weight, etc. In picking a second basic engine for the budget-minded rodder we inevitably arrived at the Ford Y-block V-8 of the 1954-'62 period, used mostly in 292-cubic-inch form.

Admittedly this engine lacks some of the virtues of the small Chevy. It's larger and heavier — around 600 lbs. without flywheel and clutch — and it doesn't have the breathing and high rev potential of the Chev. Also there is not quite such a wide variety of speed equipment available. But this engine had to be listed next in this series for one very good reason: You can probably do more hopping for less money with this engine than any other one. There are millions of these things in the junkyards at dirt cheap prices. Good ones are trading for well under \$100. There's a big supply of spare parts in the junkyards, and part interchangeability between different year models is excellent. New factory parts over the counter are not rough. There's a lively market in used speed equipment.

If you're hopping on a shoestring, this could be your engine.

This basic engine was introduced in 1954 at 239 cubic inches for Ford and 256 for Mercury. In 1955 the bore and stroke were increased to give displacements of 272 and 292 cubic inches for the various models. For '56 another bore and stroke increase gave 312 cubes. All three engine sizes — 272, 292 and 312 — were used in 1956 and '57. Then in 1958, after the the AMA anti-racing resolution and condemnation of the horsepower race in Washington, Ford standardized on just the 292 block — and carried it through 1962 (after which the new 260-289 engine took over as the standard V-8 option).

Opposite page, '57 Ford mill sports three-carb manifold and racing headers.

In other words there were millions more 292 engines built than any other kind. These are the ones that are by far the most plentiful in the junkyards. Of course the 312-cubic-inch blocks would be preferable; but you have to go back to '56 and '57 models to find them. Fortunately these years were right in the bloom of the horsepower race, and a lot of buyers were glad to pay the extra to get the big engine. Quite a few were produced in those years. So don't give up too easy. But also don't feel too badly if you have to settle for a 292 engine to keep within the budget. After all, the difference is only 20 cubes.

Unfortunately a 292 block cannot be readily expanded to 312 cubes using factory parts. The 312 crankshafts had 1/8-inch larger main bearings. These could be machined down; but it would be an expensive job. One good part about it, though: When Ford lengthened the stroke for the 312 engine they used shorter connecting rods, rather than compensating for the stroke increase by raising the block deck height or increasing the piston pin-to-crown height. This means that intake manifolds are interchangeable, and you can use 312 pistons in a 292 block by boring .050. (You would thus end up with 300 cubic inches). Incidentally, a 272 block can be raised to 292 by boring .125 and using 292 pistons. Also the cylinder walls are relatively thin on the 312 block, so maximum safe overbore (using specialty pistons) is about .060. The smaller blocks can be bored .125.

The "crank train" parts on the Ford Y-block engine — crankshaft, rods, pistons, bearings, etc. — seem to be plenty beefy for moderate hopping. There are no glaring weak points. The oil pump relief valve spring can be shimmed a little to raise the oil pressure. Also it might be mentioned that Ford used copper-lead bearings on many of their engines, so it is important that

you change the oil filter at regular intervals. (Copper-lead bearings are a little harder, and thus more critical on dirt in the oil).

You have an unusual situation on cylinder head valve and port sizes on this Y-block Ford engine. That is, intake valve head diameter started out at 1.65 inches in 1954 (1.51 exhausts). When they went to the 272 and 292 blocks in '55 they went up to 1.78-inch intakes. In 1957, with the emphasis on horsepower, Ford went up to 1.93-inch intakes and much larger ports for all three blocks. These heads were continued through '59. Then in 1960, with the emphasis back on fuel economy, Ford went back to the original 1.65-inch valve size and small ports for the 292 engines — which they retained through the end of the production in '62. (Also it must be remembered that Ford had their big. 352-390 engine for performance in this period.)

So it's obvious that if you're after maximum performance you absolutely *must* have these big-valve, big-port cylinder heads used between 1957 and '59. You can identify them by numbers and letters on the castings — the number 5752113, and generally either the letter code ECZ-E or ECZ-F. The letters identified the volume of the combustion chamber, which determines the compression ratio. The ECZ-F heads give 9.7-to-1 ratio on a 312 block; the ECZ-E heads give 8.8-to-1 on the 292 block. Or these ECZ-E heads would give 9.3-to-1 on a 312 block. All heads are interchangeable right through 1962, so there's no problem of adapting the parts you have. Just bolt them on.

You can also remember that the heads can be milled to raise compression ratio. On these Y-block Ford heads a mill cut of about .050 inch will raise compression one full ratio. In other words if, say, you found a 312 block with a cracked head, you could substitute ECZ-E heads from a 292 engine — which would give 9.3 compression when bolted on (instead of the 9.7 of the standard ECZ-F heads. Compression could then be raised to, say, 10-to-1 by milling the heads about .030. Maximum recommended mill cut is .060 or .070, as these heads didn't have much deck thickness. Also, when milling heads on *any* engine, be careful for interference between pistons and valves at top center. This can be a problem with late high-compression engines using high-lift cams.

And of course there's the usual head work that can improve breathing — porting out with a high-speed grinder, opening up the port under the valve with a 70-degree reamer to narrow the valve seat, etc. In fact there is one thing you can do in this area that will help this Y-block Ford engine more than most. This engine was always noted for excessive "shrouding" of combustion chamber walls around the edges of the valves. These engines lost a lot of breathing efficiency right here. A little grinding away of the chamber walls around the valves will do wonders for you. Of course this removal of metal from the combustion chamber lowers the compression ratio; but this can be restored by milling. A mill cut of .030 or .040 will compensate for fairly deep porting in the chamber. Keep it in mind.

Since Ford didn't raise the deck height of their Y cylinder block all through these years ('54-'62), all intake manifolds for this basic engine are interchangeable. However the passage sizes of the various manifolds were increased to match the ports in the heads. Thus, of course, your '57-'59 manifolds, used with the big port No. 5752113 heads, would be the ones you would be looking for. These were available for either single 2-throat carb, single 4-barrel, or in 1957 only they offered a dual 4-barrel Thunderbird power option on the 312 block.

The latter would be very scarce in the junkyards of course. You can still buy them from Ford Parts over the counter (part No. B7A 9424-D), but the price is \$92. Better haunt the used hot rod market. Incidentally, casting numbers are not available for the above manifolds — so be sure to measure the ports carefully before buying, to see that they match up with your head ports. It would be easy to get a late model '60-'62 manifold

with small ports. A '57-'59 single 4-barrel will do the job.

It might be mentioned right here that Ford offered an optional 300-hp supercharged 312 engine in 1957. It used the Paxton centrifugal blower kit with a bigger 4-barrel carb (on standard manifold with bigger throttle bores) and special heads with larger combustion chamber volume to give 8.3-to-1 compression. It was a real strong engine early in the season, and was blowing off a lot of new 283 fuel injection Chevys. But after the AMA resolution in June, 1957, Ford withdrew the car from the market. Only a few were actually built and sold. So your chances of finding one of these engines are small. (We just wanted to mention it to keep the story complete!) Of course you could always build up your own supercharged Y-block engine by using a later Paxton blower kit to bolt onto a standard engine. There are a lot of these kits on the used speed equipment market.

Ford was unique in using mechanical valve lifters for the small Y-block engine clear through the end of production in '62. This will give you a slight advantage on RPM potential, if you don't let your valve springs get too tired. You should be good for between 5000 and 5500 rpm before valve float.

Most camshafts are interchangeable, except as noted here: Early 1954 blocks had 1/8 in. larger cam bearings than later blocks, so late cams can't be used in those blocks. Late '54 and '55 camshafts had a hole in the center journal to feed oil to the rocker arm shafts. In 1956 this oil was metered by a groove around the journal with a different bearing. So if you use a later cam in a '55 block you would need to use the corresponding late bearing, to prevent excessive oil flow to the rockers. Otherwise all your '56 and later cams are interchangeable.

Actually you don't have much choice in factory cams. All your '58-'62 engines used a mild 246-degree-duration cam with .350 valve lift with the early 1.43-to-1 rocker arms. In 1956 they used this cam with new 1.54 rockers to get .386 lift. Then in 1957 they used the high-lift rockers and a more radical 256-degree cam that gave .400 lift, you will naturally want to use the '57 256-degree cam with the 1.54 rockers ('56-'57). Don't settle for a late 246-degree cam, even if you have to use the low 1.43 rockers — since a '57 cam can be bought over the counter for only \$24. It's not a bad cam at all for all-around driving. Good mid-range torque with a healthy top end. Ask for part No. B7A 6250-B.

Of course there's always the possibility of a special "California" reground cam for \$30 or \$40. This would be a good investment. You can use your stock mechanical lifters, pushrods and springs. Your maximum rev potential still may not be much above 5000; but the hotter cam will give you a lot between 3500 and 5000 rpm. If you want to wind up tighter you'll need stiffer valve springs. These can be bought with your hot cam from the hot rod supply house.

Incidentally, Ford also offered the Iskenderian E-2 cam as a factory high-performance service part in 1957 (No. B7A 6250-C). This had 290 degree duration, and was factory-installed in the '57 supercharged jobs. You might be able to locate one of these. With this E-2 cam and dual 4-barrels on the 312 Thunderbird engine, the drag strip boys used to run over 90 mph — and 95-100 mph with the blown jobs in Super/Stock. This was in '57.

Up through 1956 Ford used a unique spark advance system that used vacuum only to operate the mechanism. This vacuum was taken off at the carb venturi, instead of under the throttle plate, so it would be more or less proportional to the amount of air flowing into the engine. The spark was retarded at low vacuum readings at low speeds, then higher vacuums would advance it. The theory looked good on paper; but it had its flaws in practice. Mostly it was a matter of lag, so when you whopped the throttle open at low speeds there was insufficient advance to make the car jump.

Needless to say, we advise the 1957 and later vacuum-

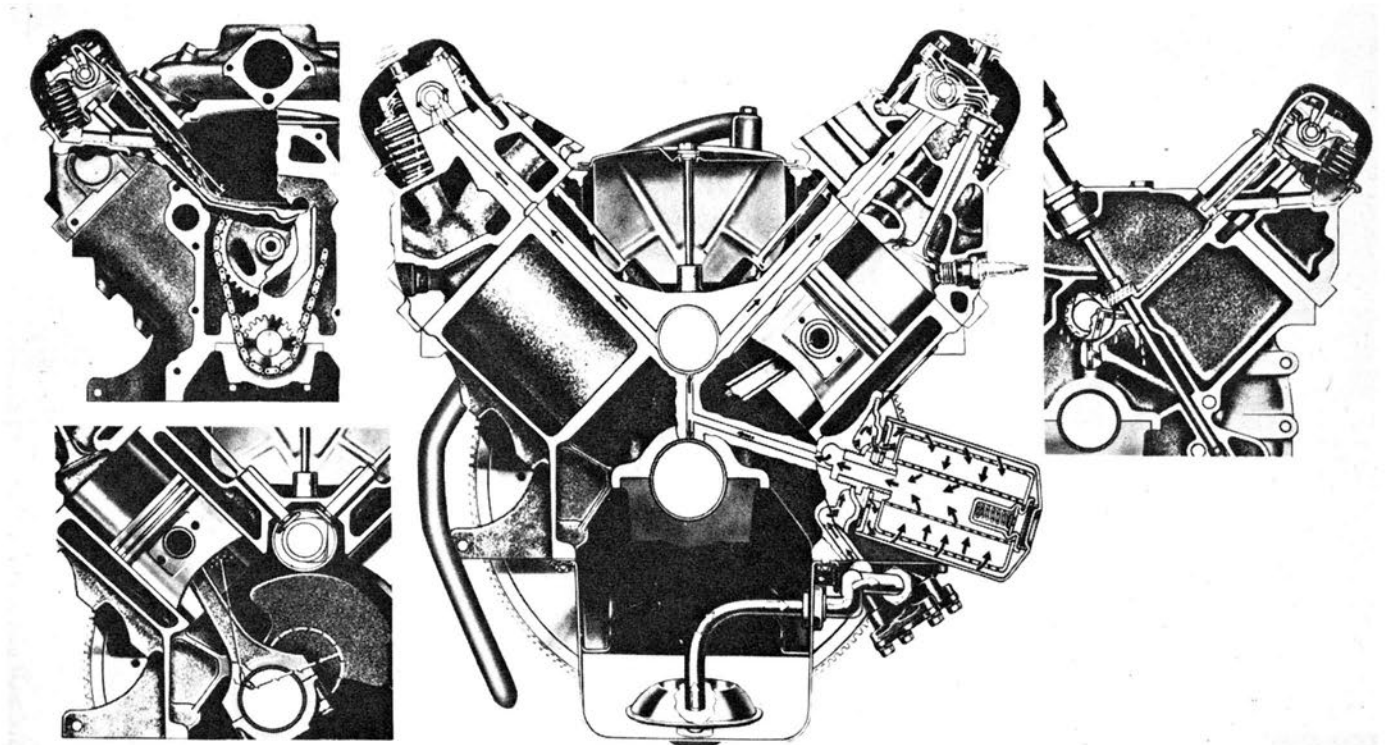
centrifugal distributors of a more conventional design. All of them are interchangeable. Of course there will be different spark advance curves for different engine models. But we expect you'll want to tailor your own curve by juggling advance weight springs and stops. We would suggest a total distributor advance of about 12 degrees (distributor degrees), at a distributor speed of 1000 rpm. Then set your initial spark timing at 12 or 14 degrees BTC at the crankshaft. You'll need access to a Sun machine to work this out. It's fun.

Then ignition strength can be further beefed up with a dual-breaker-plate conversion (around \$6), hotter coil, and maybe solid copper plug leads. You don't really have a critical ignition problem with the Y-block Ford engine, though, since its practical rev range is well below 6000. Just get the advanced curve right.

Ford designed new exhaust manifolds with larger passages to go with their new big-port 312 engines in 1957, and these manifolds were continued in production through '62. These would be your best bet for a factory exhaust system, preferably of course with dual mufflers and outlet lines. The next step would be your special fabricated headers from the hot rod shops. A number of companies make these for the small Y-block Ford — though we know of no company that has tooled up for the

new split-flow drag racing type, that have twin secondary pipes on each bank. (There hasn't been enough demand from this engine to warrant tooling up). Hedman has regular streamlined headers with single outlet pipes for each bank. These are a lot better than factory cast iron manifolds, and cost around \$60 a set. There's a lot you can do to help your exhaust breathing on this engine.

So these are some ideas on "shoestring-hopping" the Y-block Ford engine. It's a good basic engine, and will respond well to the tuner's touch. And the basic parts are widely available at low prices in the junkyards. This factor is almost as good as horsepower in many hop-up projects! Now of course if you want to get the maximum possible performance from all factory equipment, the combination would be the 312 block with '57-'59 big-port heads, Isky E-2 cam, '57 dual quad intake manifold, late exhaust manifolds and late vacuum-centrifugal ignition. The factory actually built and sold this engine combination in a crate to qualified racing people in 1957 (though it wasn't an assembly line option at that time). They rated it 285 hp at 5200 rpm — and NASCAR mechanics say it would come pretty close to this on the dynamometer right out of the crate! You could do a lot worse for your hot homebuilt car. And you can't beat the prices!



Cutaway shows lubrication system. Full flow oil filter and oil feed to rocker arms through drilled passages in block and heads are good feature of engine.

Ford used 292-cubic-inch engines from '58-'62. Problem of swapping mill is low oil pan requiring dropped tie-rod. These powerplants are plentiful in junk yards.

