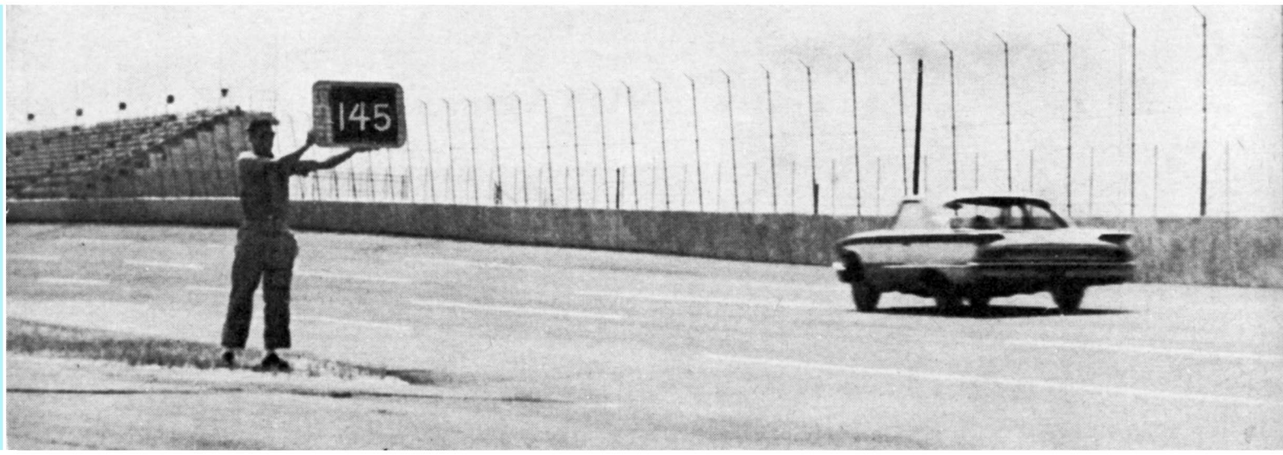
FORD'S OPTIONAL SUPER-STOCK



Heading down the main straightaway of the 2½-mile Daytona Beach tri-oval track, Cotton Owens gets a message from pit crewman telling him that his average speed for the previous lap was 145 miles per hour. Ford Starliner had Interceptor suspension.

By RAY BROCK

Here's the performer you've been waiting for—a 360 hp V8 capable of pushing a stock-bodied coupe over the 150 mph mark.

Hang onto your hats fellows because this is going to be an exciting year in the automotive industry and in a couple of ways that you would have never suspected. Only about ten years ago the name Ford and performance were synonymous and 90% of America's youth drove Fords. Then an increasing number of the competition started switching over to overhead valve V8 engines and Ford's flathead V8 couldn't keep up with the pace. Ford produced its first overhead valve V8 in 1954 but it wasn't noted for power, and by that time the Cadillac, Oldsmobile and Chrysler ohv's were so far ahead in cubic inches and power that it was a lot simpler to install one of them in a Ford chassis than it was to try to rework the Ford V8 to match. Then in 1955 Chevrolet hit the market with their hot little V8 and it wasn't long before the boys who were really serious about going places decided that Chevy was the answer.

In 1958 Ford offered an entirely new engine to the public with 352 cubic inches of displacement and some pretty decent performance but, although the early '58 models used a solid lifter camshaft, production changes shortly after introduction replaced this cam with a milder version and hydraulic lifters. It was obvious that whoever was pulling the strings in the front office was not particularly interested in seeing how fast a Ford could go from a standing start to the end of the quarter mile. Chevy also introduced a new V8 in 1958, a 348-inch model that was available not only in a mild form with hydraulic lifters and four-barrel carburetion but also in a couple of optional versions featuring hot cams with solid lifters, increased compression and multiple carburetion. Result: Chevy forged even farther forward in the optional performance field while Ford coasted along. 1959 was more of the same story; Ford detuned slightly to get improved mileage while Chevy added a couple of more optional engines to their already impressive list.

By the middle of 1959, Ford policy makers decided that maybe there was a place for a performance model in the line. Although not all of the younger set could afford to buy a new car, junior did influence his parents when they decided to buy. Junior was, in most cases, quite an automotive enthusiast and after watching Ford's competition take home the trophies at the drag strip or finish in front in stock car track racing, it didn't take him long to convince the old man which car he should look at first when getting ready to make a trade. Ford told their engine division to start experimenting.

So that brings us up to the 1960 models

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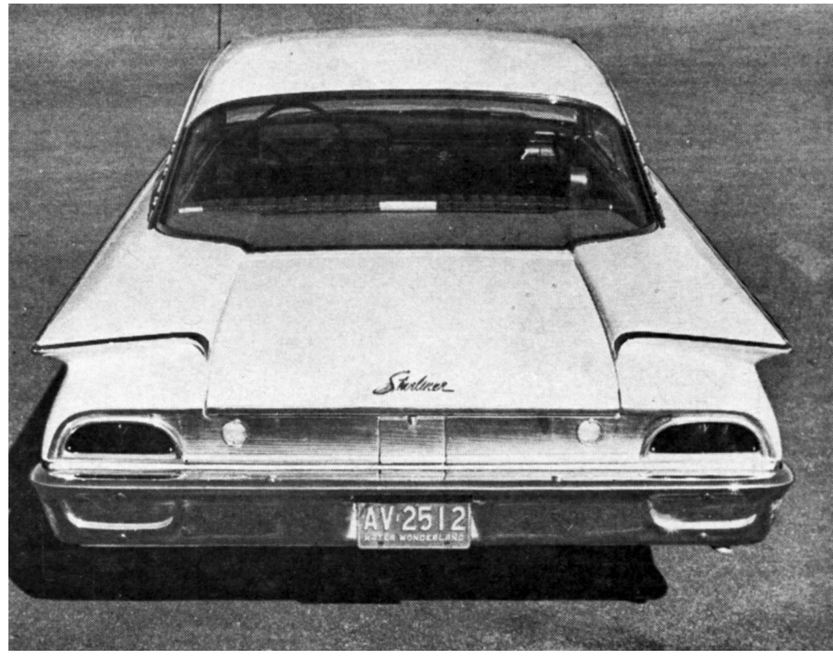


Maximum width across Ford's swept-back fins is 81.5 inches while the rear window on the hardtop Starliner has nearly 30% more area than the front wrap-around windshield.

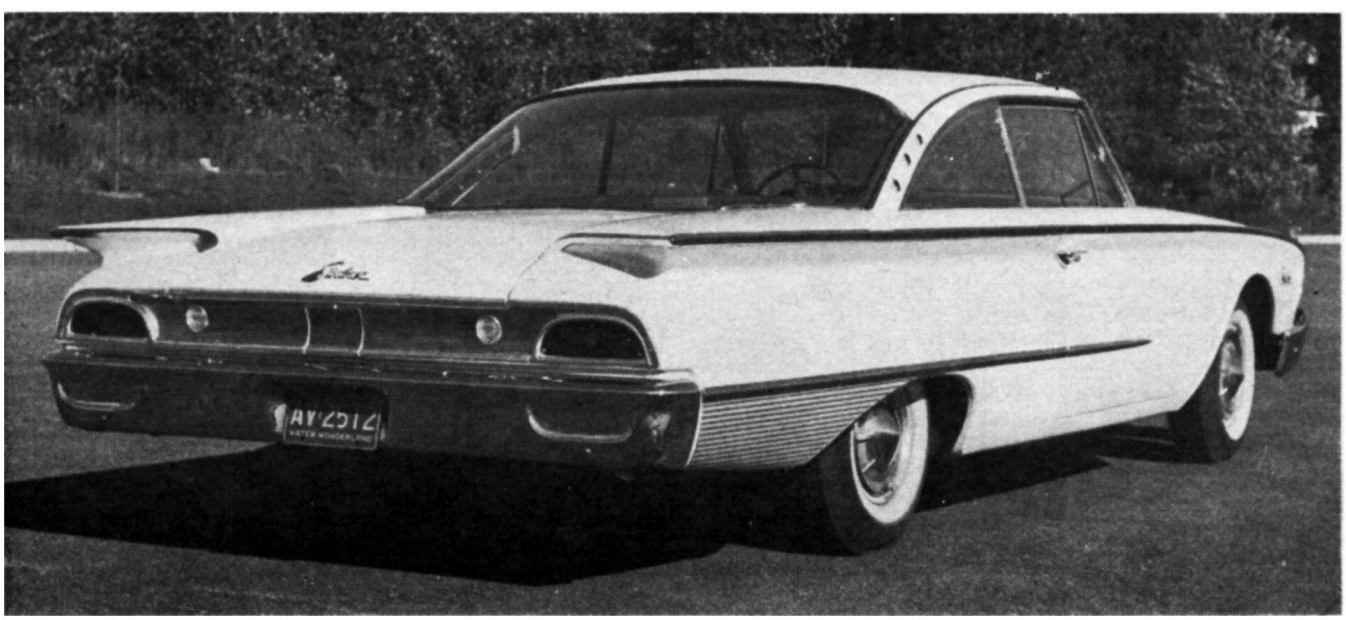
Only one two-door hardtop is available in the '60 Ford line, the Starliner. Past practice of offering hardtop coupes in Custom and Fairlane models has been discontinued. 14-inch wheels are standard but 15-inch are suggested with heavy-duty brakes.

FORD'S SUPER-STOCK continued

and the question of just what does Ford intend to do this year? Their cars are already on the road and it is obvious that they don't have to take a back seat to anybody in the style department but what are they going to do in the power department? Well, we have an *exclusive report* on an engine which will be available to the public about December 1, 1959; one which should bring joy to the hearts of a lot of old time Ford lovers.

We just got back from Detroit where three days were spent behind the wheel of a 1960 Ford two-door hardtop Starliner that toured Ford's five-mile high-speed track at Romeo, Michigan, at an average speed of 152.6 miles per hour. This car was also taken to Daytona Beach, Florida, where the Firestone Tire and Rubber Company used it to test tires on Bill France's 2½-mile high-banked race track. Equipped with Police Interceptor suspension, the '60 Ford was driven at an average speed of 142 mph for 40 laps by Cotton Owens to check out new Firestone racing tires, and then let out for five laps at an average speed of 145.5 mph. The Interceptor suspension is only slightly stiffer than standard suspension and observers at Daytona insist that heavy-duty racing suspension should deliver speeds of 150 mph on the Daytona tri-oval. Anybody interested? OK, we'll continue!

The big surprise is that the engine that produces all of this speed is the same 352-inch V8 that Ford introduced in 1958,



The '60 line of Fords is 213.7 inches in overall length, 5.7 inches longer than 1959. The 1960 wheelbase is 119 inches and both front and rear treads have been widened to give better stability. With design load, Starliner is 54.5 inches high.

used in 1959 and also offers again in 1960. Of course a few important changes have been made for the hot optional V8 but displacement has not been increased. The bore is still 4 inches; stroke is 3½ inches. Valve sizes are unchanged with intakes 2.030 inches in diameter; exhausts 1.560 inches in diameter. Ports in the heads remain the same as '58-'59 but the combustion chamber has been reshaped to give 10.6:1 compression instead of the 9.6 offered with the standard 352 engine. Adjustable rocker arms identical to those used on the early '58 engines are used together with tubular pushrods and solid lifters borrowed from the Falcon six.

The camshaft is, of course, a much hotter version than that used the past couple of years. Valve spring tension has been increased only slightly over the standard 352 engine and a flat wound steel damper has been added to the single spring to cut down spring harmonics that produce early valve float. Valve clearances for the special camshaft are .025-inch hot or .028-.030 cold. Obviously, this engine will not win any prizes for quiet operation but it isn't much noisier than some of the pre-'58 Ford engines with mechanical lifters.

Ford's 352 V8 uses the intake manifold as the top engine cover and on standard engines this cast iron manifold weighs about 80 pounds. For the optional engine, an aluminum casting is used weighing about half as much and designed with larger, more direct passages than those in the cast iron version. This manifold uses a single four-barrel Holley carburetor. Cars equipped with the special engine will be fitted with a ⅜-inch gas line instead of the 5/16-inch line used on standard models. Exhaust manifolds are cast iron but are shaped like tubing headers. This is no accident since tubing headers were used in the development of this engine and then closely copied in cast iron for production. Manifold outlets are 2½-inch diameter but exhausts are swaged down to 2-inch pipe. For competition, 2½-inch pipes could be fitted.

As they come down the assembly line, engine blocks for the special 352's are

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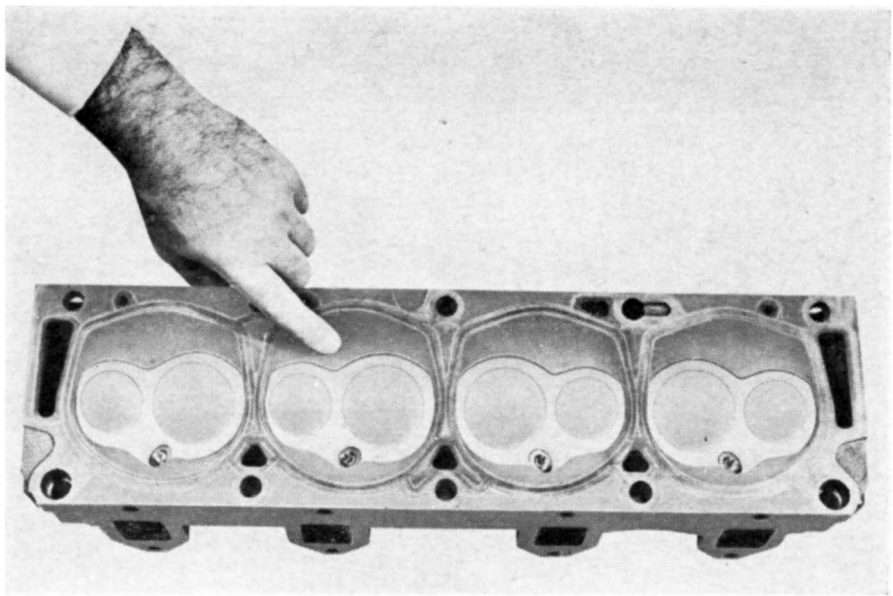
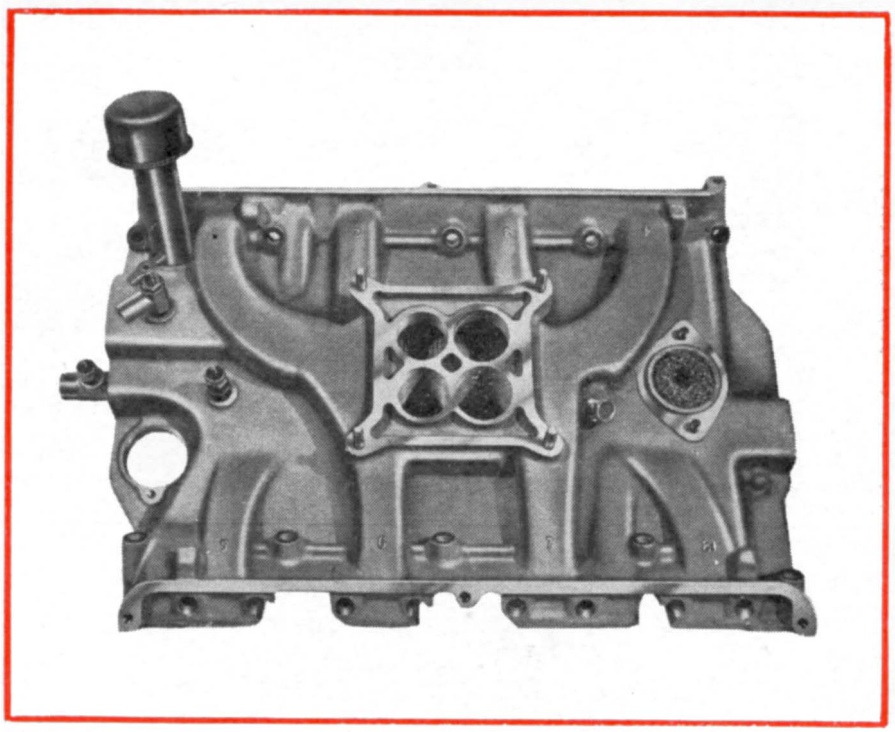
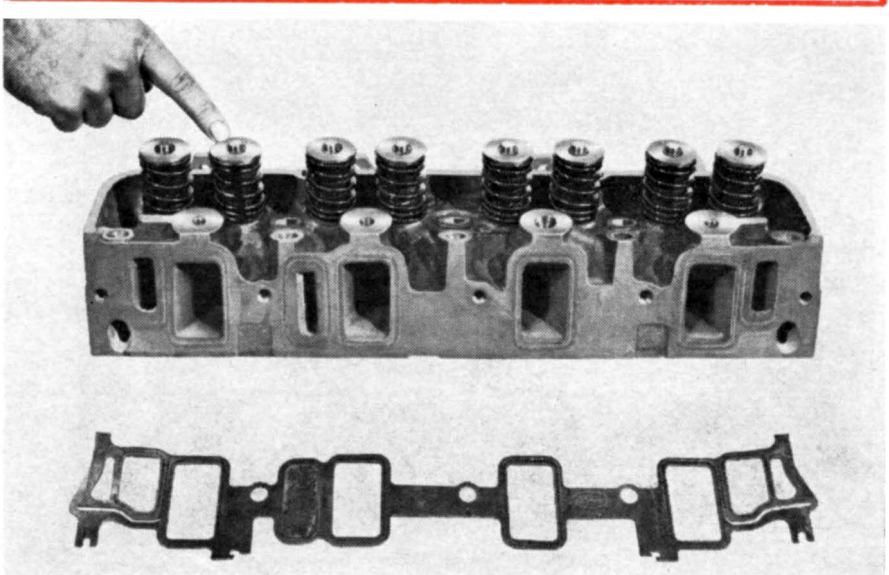


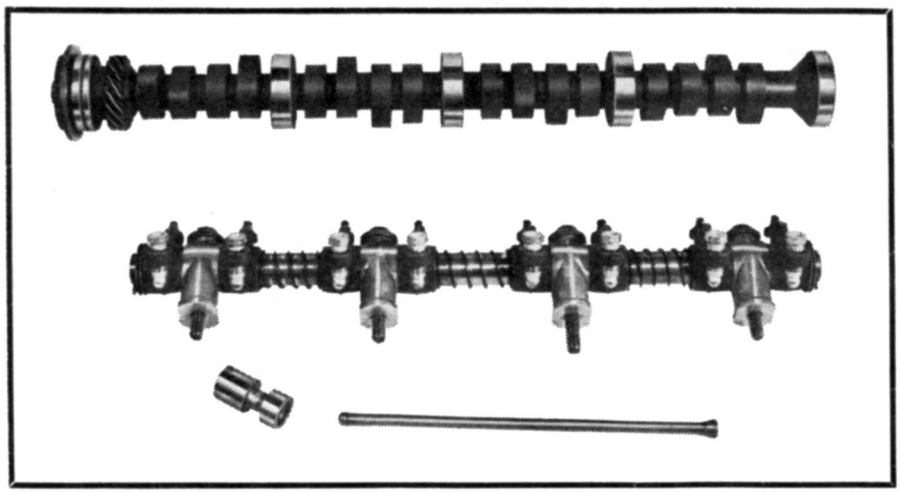


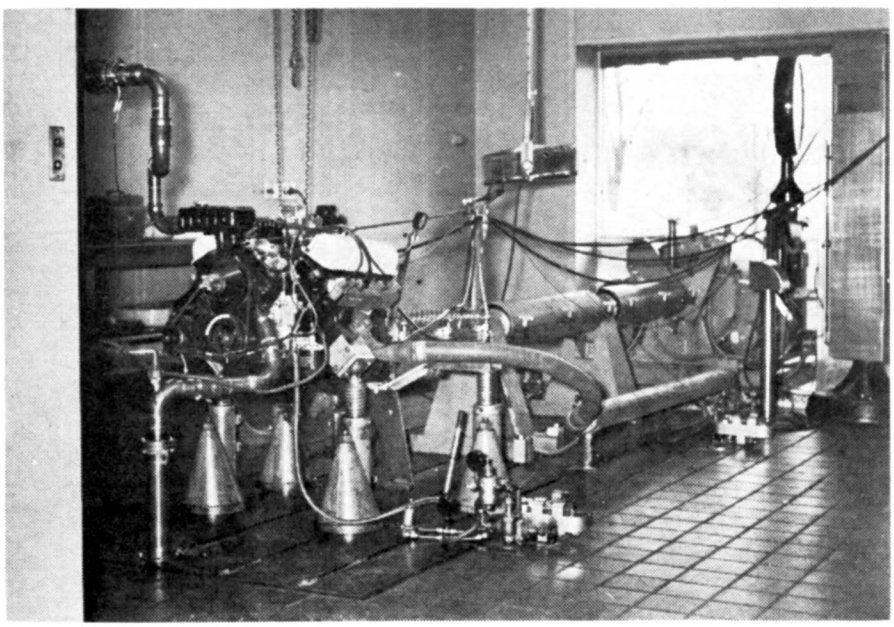


TOP—Heads used on the 360 hp V8 have modified combustion chamber, indicated, which reduces volume and increases the compression ratio from 9.6 to 10.6 to 1.

CENTER—Aluminum intake manifold cuts engine weight by 40 pounds, is better designed for high speed. Breather outlet on top has woven mesh, traps oil vapor.

BOTTOM—Valve springs used with the hot cam are designed for 6000 rpm, consist of single spring with steel damper. Intake gasket blanks heat riser to manifold.





made the same as those for the standard 352 V8's. Different clearance tolerances are used when assembling them, however, so that they will have improved oil flow and better bearing life. Connecting rod end play for two rods has been increased from .006-.016 to .014-.024 inch. Standard rod tolerances are .0006-.0024; the special 352 tolerances are .0009-.0032. Main bearing tolerances for the standard engine are .0007-.0029; special 352 main tolerances are .001-.0034. Both rod and main bearings use steel-backed copper-lead heavy-duty inserts. Ford still uses the cast nodular iron crankshaft with 2.750-inch main bearings and 2.440-inch rod journals. The pistons used are the same for standard and special 352's, aluminum alloy skirt and a flat top, but slightly more skirt clearance is used for the special 352. Oil pump pressure has been increased for the special 352 by a different pressure relief spring that gives 55-65 pounds pressure at 1000 rpm, 10 pounds better than the standard 352. A heavier crankshaft front balancer is used to give smooth high-speed operation and a larger generator pulley is used so that high engine rpm's will not overspeed the generator.

The distributor for the special engine is equipped with dual points for increased coil saturation at high rpm's and uses centrifugal advance only, no vacuum unit is provided. The engine should be timed at 700 rpm, 12° before top dead center and the centrifugal advance plus the initial 12° gives a total of 40° crankshaft at high speeds. A colder range plug is used for the special engine, Champion F 83Y's.

The horsepower tag Ford has put on this powerhouse is 360 at 6000 rpm with torque rated 380 foot/pounds at 3400 rpm. Ratings are corrected to sea level atmospheric pressure and 60° F. temperature. The engine used at Ford's Romeo proving ground and Daytona Beach had 450 hours of running time on the dynamometer at 5800 rpm with a full load before it was dropped into the chassis. Needless to say, the life expectancy of this engine

TOP—Special camshaft pattern is ground on hardened cast iron billet. Adjustable rocker arms are 1.74:1 ratio, like early '58s. Pushrods are tubular; lifters Falcon.

CENTER—Extensive high speed testing on Ford's dynamometers have proven the 360 hp engine to be capable of full-load running for hundreds of hours non-stop.

BOTTOM—Holley four-barrel carburetor is comparable to 383 Mercs in bore size. Ignition has dual points and no vacuum advance. Air cleaner is dry paper type.

Sleek lines for 1960 Ford Starliner also contribute toward top speed. Notice that Ford now uses swept back windshield post so that passengers can enter and exit without bumping the troublesome "dogleg" corner as used on windshields in the past.

is very high. For those anticipating severe usage and lots of heat, an oil cooler is available which will bolt to the block in place of the full flow oil filter. This cooler is cast aluminum with water forced through it by the water pump to cool the oil as it is on its way from pump to oil gallery.

This engine will be available only with a standard transmission or standard transmission with overdrive. Both units are heavy-duty but have different gear ratios. As we go to press, Ford is still conducting evaluation tests on the transmissions but the standard transmission will probably have a 2.37 low gear ratio and 1.51 second gear ratio. A 3.56 differential ratio will probably be standard with a 3.89 ratio optional. The overdrive transmission appears to us to have the most ideal spread of gear ratios especially when used with an axle ratio of 4.86 to 1. Low gear ratio in the OD transmission will probably be 2.18 with a second gear ratio of 1.39 and an overdrive ratio of .72. This combination, which is also still being tested, gives ideal gearing for ¼-mile drags while also permitting a 3.50 final OD ratio for highway cruising. Ford's main competitor does not offer an overdrive transmission with their hot engines, so if you use 4.56 or lower gears for drag racing with their cars, you are stuck with the same low final drive on the highway. This, of course, is undesirable, promoting not only excessive noise and poor economy but also shortened engine life.

The clutch used with the special engine is 11-inch with 1710 pounds of spring pressure and 113 square inches of lining area. The standard 352 uses the same disc but with only 1575 pounds of spring pressure. For those who anticipate extra severe clutch usage, a 10½-inch clutch with 2495 pounds of spring pressure will be available through Ford parts departments. It cannot be ordered with the car. The special 1710 pound clutch seemed quite adequate in our test car and did not require excessive pedal pressure. The 2495-pound clutch, according to Ford engineers, requires plenty of pedal pressure.

Beside the differential gear ratios mentioned when discussing the transmissions, Ford will have a whole flock of ratios that will be available through dealer parts departments. Ratios from 3.40 to as low as 5.83 can be ordered. A limited-slip differential will also be available for all 1960 Fords and can be ordered with the car by those anticipating traction problems.

When ordering a 1960 Ford from a dealer, there are a few more items which

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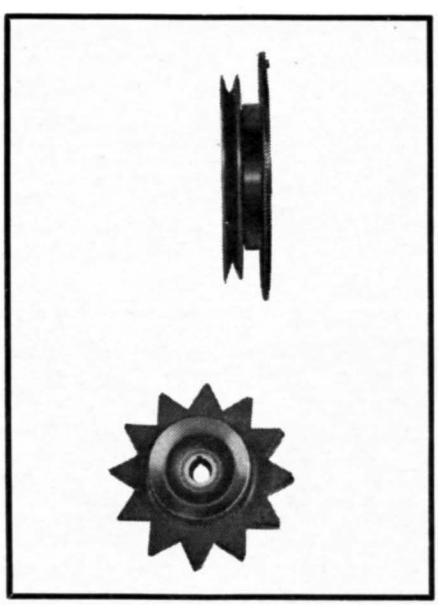
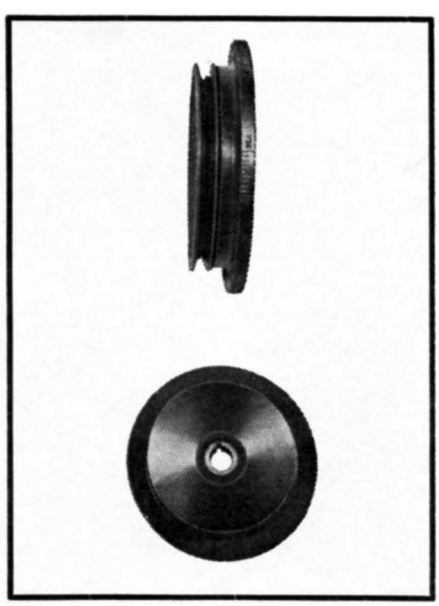


The standard 352-inch front crankshaft balancer and generator pulley. Notice that balancer is lighter and generator pulley smaller than those in the picture at right.



360 hp V8 has heavier balancer for smoother high speed operation and generator pulley is larger so that it will turn slower to avoid throwing armature apart.

FORD'S SUPER-STOCK
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are regular production options that we think should interest the type of driver who wants a hot stocker. We recommend that the heavy-duty suspension be ordered, consisting of the same springs, shock absorbers and front stabilizer bar that Police Interceptors use. This suspension is firmer than that used on the regular stockers but is not the least bit objectionable in average travel. For cornering it is of course highly desirable. Heavy-duty brakes can also be ordered as an option. The standard '60 Ford brakes have 11-inch cast iron drums with 2.5-inch wide drums front and rear and 190 square inches of effective lining area. Optional brakes have 3-inch wide front drums and 211 inches of lining area. A different lining material is also used. 15-inch wheels with 7.10 x 15 tires are also recommended options with the heavy-duty brakes for increased cooling. Standard tire size for '60 Ford with the special engine is 8.00 x 14. Our test car had the standard brakes and they were very good, giving fast straight-line stops from all speeds.

Some of the options made by Ford which are not available on cars with the special 352 V8 are power steering, automatic transmission and air conditioning. The reason that all three of these items are restricted is either because of the rpm potential of the engine, idle characteristics, or both. If used with an automatic transmission, the engine speed would have to be set so high for a smooth idle that the car would creep badly at stop lights unless the brake was firmly held. Also, an over-eager driver trying to see how fast the car would go in low range would probably succeed in blowing the torous cover seal or possibly exploding the whole unit. Power steering is not offered because the potential engine speed would be too great for the pump design. The same applies to the air conditioning compressor. Although it would be possible to change pulley ratios on the power steering pump and air conditioning compressor to slow them down, Ford does not believe that the potential prospect for this type engine will be interested in weight-adding options.

A couple of other new features which are of interest include the cross-flow radiator and rear mounted mufflers. During recent years, the automobile radiator has been transformed from a high, narrow shape to the more recent low, wide shape. When the radiator was narrow, the fan could easily span the width of the radiator and pull cooling air through the whole width of the core. More recently, radiators have been getting wider and it was not practical to make a fan large enough to span the radiator. The result was that an expensive, complicated shroud was needed or water could flow from the upper tank to the lower tank on either side of the

radiator where the fan could not pull cool air through that part of the core. Result: Overheating in traffic. Ford's 1960 cars use a cross-flow radiator of wide, low design with the tanks on either end and a horizontal core. It can be easily spanned from top to bottom by a normal sized fan that will pull air through the entire height of the core. A two-quart expansion tank mounted on the front of the engine keeps the proper radiator level. The cross-flow radiator's low height also permitted Ford to slope the hood for greater road vision in 1960.

Exhaust systems have always been a source of trouble for the manufacturer especially since the cars have become so low. Just where to put the mufflers was the problem. With step-down floor design and frame rails in the way, there wasn't always a logical spot near the engine. We mention "near the engine" because engineers have always insisted that the mufflers had to be close enough to the engine so that exhaust gases would not cool too much before reaching the muffler. Espe-

"She won't neck and I've seen the picture!"

cially in the colder areas of the country, the muffler had to be kept hot so that the inner networks would stay dry and not rust. Ford uses "aluminized" exhaust pipes and mufflers for 1960. This aluminum coating process resists rust and permitted Ford to place the mufflers at the rear of the car where there is more room. The muffler is located beneath the right rear fender, or one on each side for dual systems, with a short outlet beneath the rear bumper.

The test car we used had the special 360 horsepower V8 with standard transmission, 3.56 axle ratio, power brakes, radio and heater in a two-door hardtop Starliner chassis. This body style is the sleekest of Ford's 1960 models with a fastback type roof line that is undoubtedly partially responsible for the ease with which the car recorded such fast lap speeds at Romeo at Daytona. Although the basic frame and suspension system appears quite similar to that used in 1959, there have been a number of dimensional changes made for 1960. The wheelbase has been increased one inch to 119 inches. The car at 213.7 inches is 5.7 inches longer than it was in '59 and 5 inches wider at 81.5

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inches, so the tread has also been increased both front and rear for increased stability. Front tread is 2 inches wider at 61 inches while the rear has been widened 3.6 inches to 60 inches. Car height is practically the same as 1959 with the hardtop models 54.5 inches high with four passengers.

Ford automobiles have always had a reputation for good cornering ability but the changes made to the car for 1960 have in our opinion helped make it a great deal better. Our test car was equipped with the optional heavy-duty suspension, so naturally was outstanding when pushed around the Ride and Handling section of the proving grounds. We also borrowed a '60 hardtop model with standard suspension for a few laps and found it to be almost as good.

The final steering ratio without power is 27:1 and although it is not too quick, it is not the worst we have tried by any means. The steering is smooth and easy with almost five turns of the wheel needed to go from lock to lock. The linkage boost power steering unit which is available on Ford cars without the 360 hp engine has a final ratio of 25:1, only slightly quicker than the standard steering. Heavy-duty front spindles which are available through Ford Parts have shorter steering arms which will speed up the ratio to approximately 18:1. Heavy-duty linkage can also be ordered through Ford Parts.

We took a trip of several hundred miles from Detroit to eastern Ohio while testing and can report that the trip was very enjoyable. Riding in the '60 Ford is not tiring; seat position and height is quite acceptable despite the low car height. We cruised effortlessly over all types of roads and the Ford can certainly hold its own with higher priced models in the ride department. Don't forget we had the Interceptor suspension, too. Conventional suspension is a little softer so should provide an easier ride at moderate speeds. At highway speeds with the 3.56 axle ratio, there was absolutely no indication that an engine with increased clearances and mechanical lifters was beneath the hood. Insulation effectively cancels out the engine noise.

Driving through Akron, Ohio, we happened to find ourselves in the middle of afternoon rush hour traffic. Things couldn't have been better planned as it gave us an excellent opportunity to check the engine for heating and stalling. We found that the engine would idle very well under all conditions at an estimated 600 rpm and although it was an uneven idle associated with a hot cam, throttle response was good when engaging the clutch. Hot cam and all, this engine is easily capable of being driven in heavy traffic; not once did the engine stall nor did the temperature

gauge rise above normal. Mileage on our round trip of nearly 450 miles was a flat 13 miles per gallon, not bad considering the nature of the engine. Some of this was heavy city traffic and while on the Ohio Turnpike the speed was usually well above what experts would recommend for maximum mileage.

By the way, we might mention for the benefit of those who would like a hot engine but also desire an automatic transmission and maybe power steering or air conditioning, we heard rumors while in Detroit that shortly after the first of the year, Ford will make available another optional 352 cubic inch engine that can be purchased with these extras. No horsepower figures were mentioned but it should be near the one we tested and will feature an aluminum intake manifold with progressive triple carburetion, increased compression, cast iron headers and a hot cam. The cam will probably be designed for torque instead of rpm's so that the power options can be used.

Our test car weighed 4040 pounds full of fuel but minus driver. This doesn't qualify the car as a lightweight but acceleration was very good. The 3.56 axle

"Let's not waste time necking tonight, Casper. Let's work the fuel-injection system over instead!"

ratio was not the best selection for fast starts and we didn't have a ¼-mile strip handy, so we made no timed acceleration runs. Low and second gear pickup, especially after the engine got by the 3000 rpm mark, were quite impressive. While cruising around the Ford test track at 80 mph, a punch of the throttle caused the car to jump forward and quickly run the needle past the 100 mph mark. If equipped with the overdrive transmission we mentioned earlier, 4.86 axle ratio and limited slip differential, this car should break the 100 mph mark at any drag strip with a sharp driver at the wheel.

If you sort of get the impression while reading this that we like the 1960 Ford, you are *so right!* We like the way it looks, rides, corners, stops and especially how it goes when equipped with the 360 horsepower engine. If Ford has made any big mistakes for 1960, we haven't found them yet. We predict a highly successful year for Ford and we also expect to see it give fits to the competition in the field of performance. It took several years but we think Ford has the right answer for 1960.