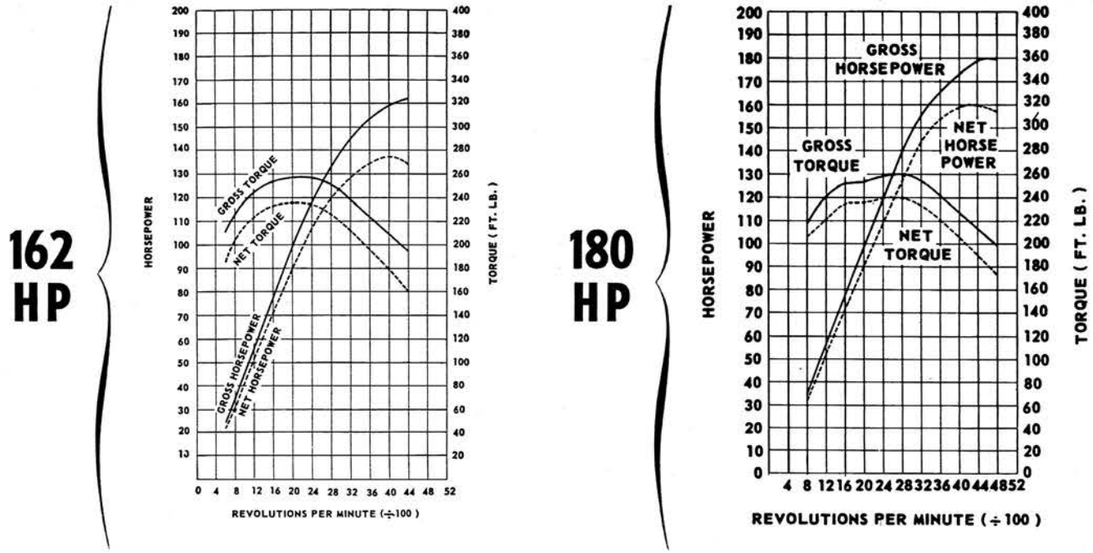


New Chevrolet engine turns out 162 hp in stock form and 180 hp with special manifold, dual exhausts and four throat carburetors. Power/weight ratio is 18:1. Comparison charts for the 162 hp and the 180 hp engines show development of torque and horsepower at various rpm.

CHEVROLET'S

THE V-8 must be here to stay . . . Chevrolet is using one at last!

I don't think it's exaggerating anything to say that overall production in the Chevrolet organization is more efficient, well planned, and economical than anywhere else in the industry. It just about *has* to be. Their physical size and "break-even" volume are greater than the others and, unlike Ford, they've got to crank out a hefty enough profit to keep a bunch of hungry stockholders happy. It's sink or swim in a big way at Chevy.

The point I want to make is this: We can study the design of the new Chevrolet V-8 engine and safely say, "Here is the last word in producing a complicated 8 cylinder engine at a price competitive with the most inexpensive powerplants in the industry." Furthermore, I think it only fair that we approach our design analysis *expecting* that some points on performance, durability, etc. might be compromised to hold down that *first cost*. We can't expect this to be any custom-built jewel for a utility family car; it is, instead, the very best mass-production compromise between cost and functional efficiency that modern bread-and-butter engineering can devise.

Let's judge it from this angle . . .

A MODERN V-8

At first glance a cross-section of the new 1955 Chevrolet V-8 looks quite a lot like the Olds Rocket and Cadillac engines. We see the familiar G.M. Research wedge-type combustion chamber with in-line overhead valves, oversquare stroke/bore ratio, slipper pistons, and the crankcase chopped at the main bearing center lines.

With a bore and stroke of 3¾" x 3" (265 cu. in.), the stroke/bore ratio of .8:1 is equal with Buick as the lowest in the industry. This not only permits an overall engine width of only 26½", but the wide bore makes room for large valves *in relation to the cylinder displacement*. (This last advantage of the oversquare layout is not generally appreciated by John Q., but it's actually a very important factor in the terrific performance we're getting out of our new ohv V-8s these days.) The large 1¾" intake valves in conjunction with huge ports give really deep breathing, even though we're pulling through a two throat carburetor. The peak output ratings of 162 hp at 4400 rpm and 257 lb.-ft. rated torque at 2200 rpm attest to this. (These figures were achieved running stripped on the dynamometer; maximum output as installed in the car runs about 137 hp, according to factory data.) At any rate, this is a lot of punch from an inexpensive utility passenger car engine of 265 cu. in.; we can attribute it mainly to the good porting, healthy compression ratio of 8.0:1, and the very short stroke, which reduces the power lost in friction. I'd say the mill should easily hold its own against the other low-priced V-8s on performance and fuel economy.

SQUEEZING THE NICKEL

The thing that impressed me most about the new Chevrolet design were the many brilliant features aimed solely at reducing the *cost of manufacturing* the thing. I was flabbergasted, in fact. The thing is a work of genius from this angle. I'd bet they can build it for little over *half* of what it costs Ford and Plymouth to build their new V-8s. Space won't permit a complete discussion of this interesting aspect, but here are just a few of the cost-saving features:

The cylinder heads for each bank are *interchangeable* and are made on the same machines. There are no separate valve guides; the valves run direct in the iron heads. (This idea was originated by Ford Motor Co.) The piston pin is pressed into the top end of the rod, eliminating need for a bushing here, as with a floating pin, and even eliminating the slot and screw clamp as on the Chevy 6.

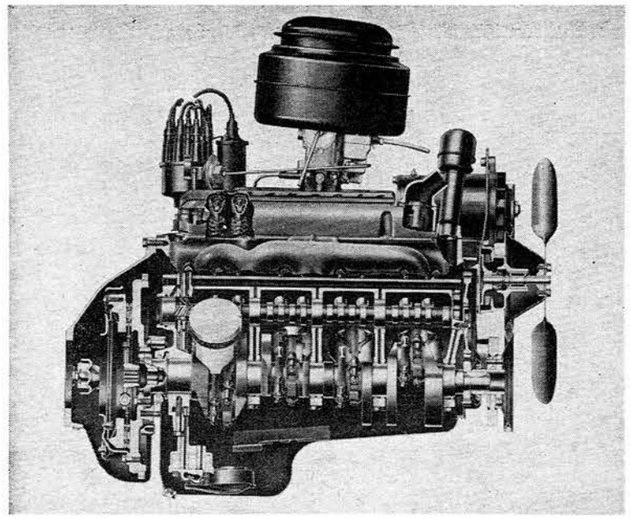
There are no rocker arm shafts on the new Chevrolet engine! That's right. The rockers are light one-piece steel stampings that oscillate on crude steel-on-steel ball joints supported by studs pressed in the heads. The fulcrum ball is held on the stud by a nut and lock-screw; valve lash adjustment with the solid lifters is merely a matter of turning the nut. Pushrods are steel tubing, crimped at the ends, operating in hollowed-out seats in the rocker stampings. The new Chevrolet intake manifold casting is unique in that it serves not only as the manifold, but also seals the tappet chamber, contains cast-in water outlet passages from the two heads, and directs these to a central point where the thermostat is located. All other V-8s use a separate tappet chamber cover plate.

The entire lubrication system is a matter of drilled holes and machined passages in the block and head castings; there are no external pipes. The main oil gallery runs above the camshaft. Oil is fed down to the five cam bearings through drilled holes; most of it, however, is routed *around* the cam bearing through an "annulus" passage to the main bearing below—from where it's also fed off to the rods. Slots at the split lines of the rods throw oil off on the cylinder walls once each revolution. Each row of valve lifters (hydraulic lifters are used with the Powerglide transmission) has its own special oil gallery, running at reduced pressure by routing the oil through a metering slot; oil is fed into the lifter, then up through the hollow pushrod where it squirts out to lubricate the valve mechanism in the head. The oil drains back

(*Continued on page 56*)

LATEST GM ENGINE FEATURES LOW PRODUCTION COST AND A DIFFERENT APPROACH TO THE OHV V-8

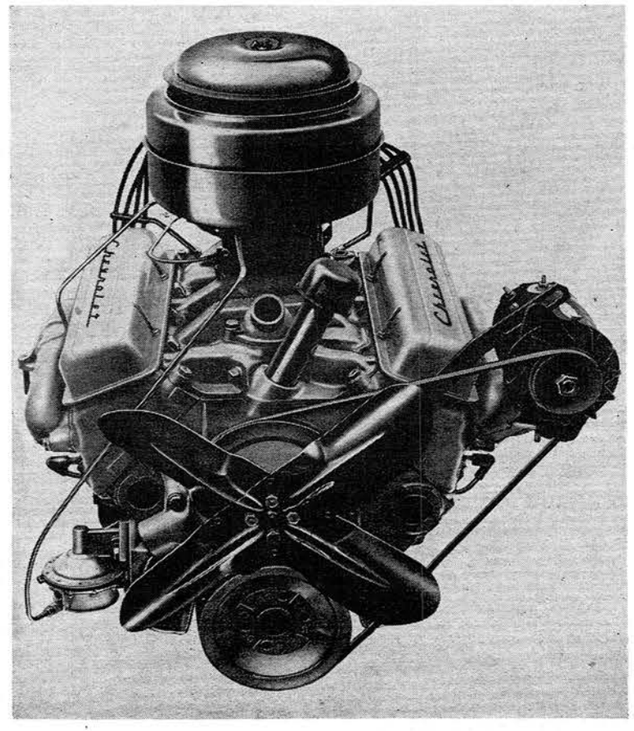
BY ROGER HUNTINGTON, SAE



Cutaway side view of new V-8 shows compactness of design. Moving parts are factory balanced after assembly. Engine features ease of repair.

NEW V-8

New V-8 runs a compression of 8:1, has a displacement of 265 cubic in. Manufacturing costs for new engine have been reduced to the minimum.



CHEVROLET'S NEW V-8

(*Continued from page 25*)

to the sump through passages drilled in the heads and block.

Now you tell me how you're going to put together a V-8 engine at less cost than Chevrolet has put this one together!

WILL IT STAND UP?

Chevrolet has never yet put out an engine that *didn't* stand up. But everything on the new design is so ridiculously simple and straightforward that you can't help but wonder if the thing will stay month after month, winter and summer, with the more elaborate V-8s. The whole thing is so simple that there's almost *got* to be a catch somewhere! If the new Chevy engine *does* hang in with the other V-8s, what use will there be anymore to cast or forge rocker arms, machine rocker shafts, spend time and money carefully machining pushrod ends and sockets, use floating piston pins, etc.?

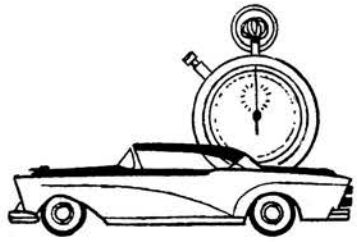
Actually, this is a tough one to answer on paper. These rocker ball joints are entirely new and untried; offhand, they look like they could get sloppy pretty quick . . . but who knows? Up to now pushrod ends and seats (sockets) have been a critical point. Can Chevy get away with simple crimping and stamped seats, even with their more ample lubrication? Their engineers, backed by thousands of miles of road tests, must figure the setup will take it in everyday operation or they wouldn't be putting it on the road. But then, the Ford engineers thought their '54 camshaft would take it, too . . . and the lab boys said that Buick's original V-8 combustion chamber wouldn't knock too badly at 8½:1 compression! Only time will tell the Chevy story.

On the other hand, the design shows many good features aimed specifically at long life. Precision insert bearings of G.M. Durex (copper-nickel matrix with thin babbitt overlay) are used for rods and mains. These babies are tough. Also, they don't groove and lower half of the main shells, which is said to increase their load-carrying capacity 40%. The oil control piston ring is of the very efficient steel rail type, chrome plated for durability. These will control oil consumption even with considerable bore wear, when old-style rings would be burning a quart of oil every 50 miles. A new aluminum dip process that has been found to reduce exhaust valve oxidation (burning) is featured. Couple all this with the very short stroke, low piston travel, compact, rigid block, good stud layout around the cylinders . . . and certainly the new Chevy V-8 is going to have a fighting chance to live as long as the more expensive mills in our industry.

HIGH PERFORMANCE PACKAGE

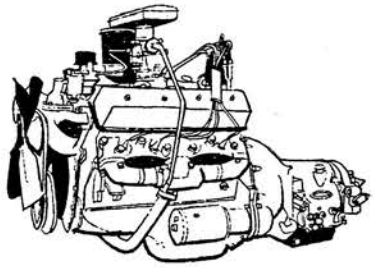
For the first time in their ultra-conservative history, Chevrolet is letting the hair down and offering you a little extra oomph for the family chariot right at your corner dealership. The 1955 "high performance package" for the V-8 includes a 4 barrel carburetor, matching large-port intake manifold, and dual exhaust system. Advertised rated output for the combo is 180 hp at 4600 rpm, and 260 lb.-ft. torque at 2800. (Output as installed in the car is stated to be 160 hp.) I'm thinking a little, light Chev ought to really jump with this stuff under the hood!

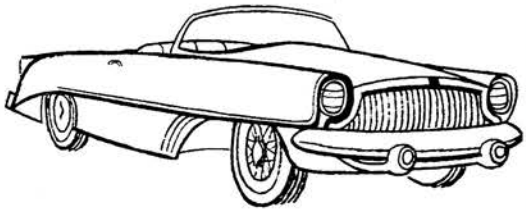
In conclusion on Chevy's new V-8: It's definitely a highly advanced and progressive design, but mostly from the standpoint of manufacturing economics rather than performance and general functional efficiency. You'll never build a modern V-8 engine at less cost than they're building this one. But at the same time, I think it has plenty of port and valve area, combustion control, and mechanical efficiency (low friction loss) to stay with the competition very nicely in the horsepower race. The engine is also very compact and light. The only doubts I would have are in regard to the durability of the valve gear. Since it's an entirely new layout, only time will tell. •



ROAD TEST INFORMATION

ENGINES AND NEW EQUIPMENT





TOMORROW'S CARS TODAY