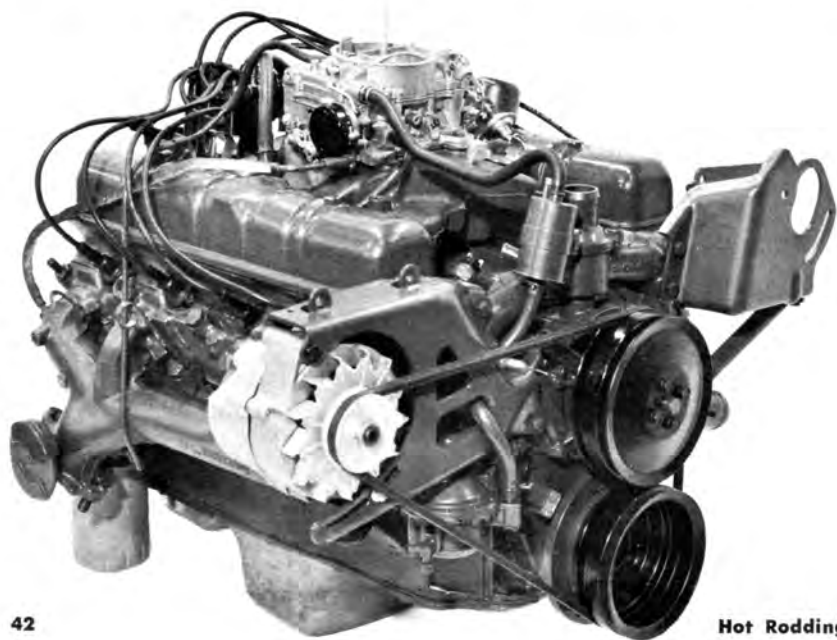


TWO BIG V8'S



Latest Buick engine packs 425 cu. in., close to NHRA, NASCAR limit of 427 cu. in. Did Buick have racing plans that went awry? Unit is optional in full-sized Buick models.





Typical of big Buicks powered by 401-cu. in. V8 is '63 Wildcat, which has 325-hp unit.

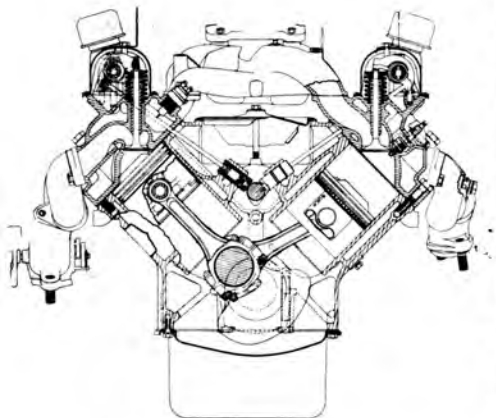
BUICK'S current "senior" engine, the 401-cubic-inch V8 which is standard on the LeSabre, Invicta, Wildcat, Electra and Riviera, is a direct descendant of the 1953 ohv mill which had a displacement of 322 cubic inches. It was raised to 364 cubic inches in 1957, and the current 401 was incorporated in 1959. Basically, however, the engine is the same with the exception of a block change in '57 which relates that engine more closely to the present V8.

Technically, Buick's 425-cubic-inch mill, which was brought out mid-way through the 1963 model year should be called the senior engine. But since it is offered only as an optional engine on the Invicta, Wildcat and Riviera, we'll refer to it as an option here. The basic difference is in the bore and a few other minor points, and the 425 probably will become the standard power plant for

1964, on some models at least.

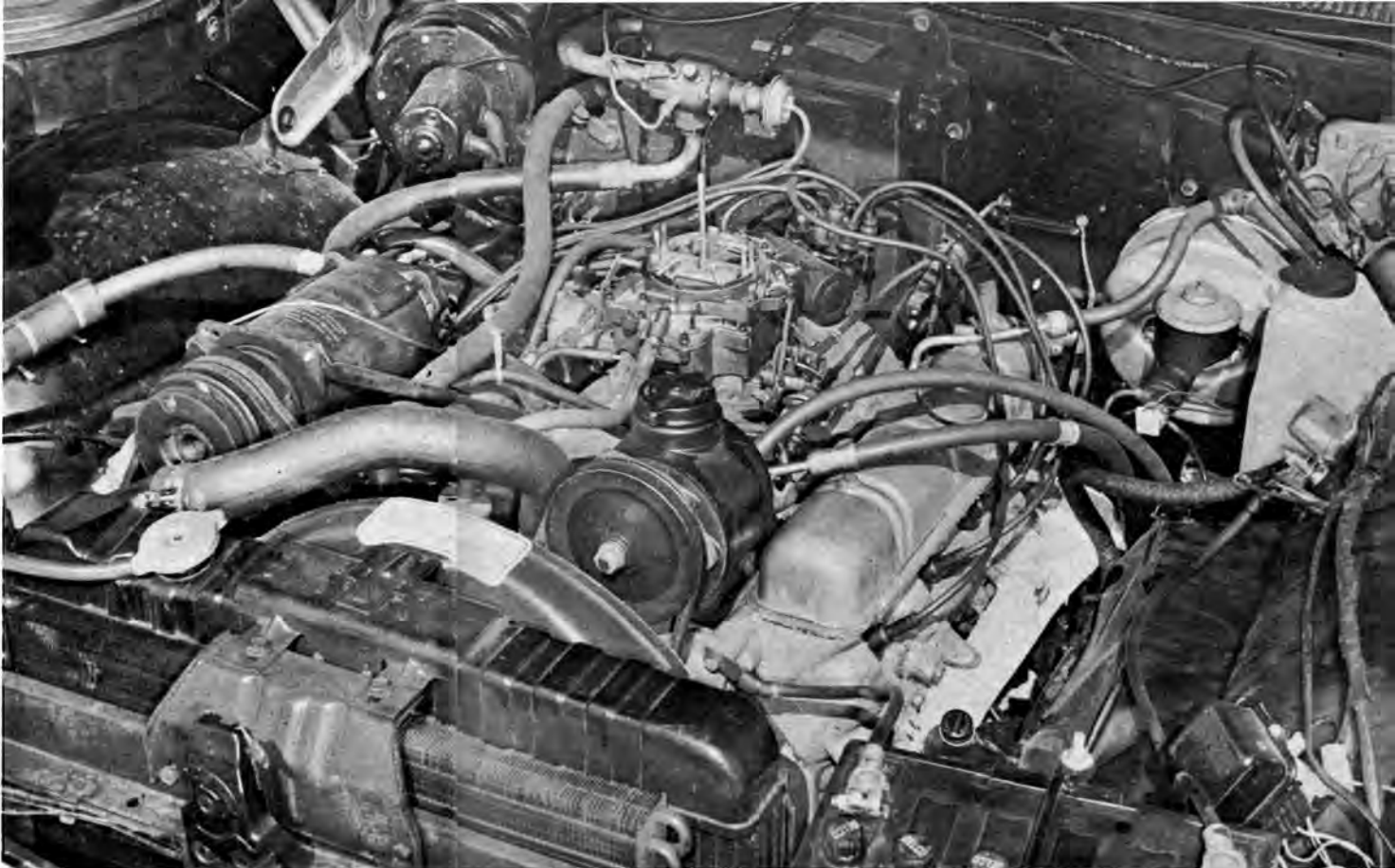
The 401 has a 4.1874 x 3.64 bore and stroke with 10.25-to-1 compression. It produces an advertised 325 hp at 4400 rpm using four-barrel carburetion, and has a torque rating of 445 lb/ft at 2800 rpm. The two-barrel version, standard for the LeSabre, is rated at 280 hp. Buick also offers an economy version which produces 265 hp with 9-to-1 compression and two-barrel carburetion.

The 425 has a 4.325-inch bore but retains the same 3.64-inch stroke as the 401, and is rated at 340 hp. Four-barrel carburetion and 10.25-to-1 compression are standard. Different casting methods were used on the 425 block, however, to give more density to the cylinder walls. Porosity with the bigger bore caused some problems with the rings which delayed production of the engine and made it a mid-year option.



Big 425 (above) is basically same as 401 but is bored out .138 to get more inches.

325-hp version of 401 (right) is standard in all big Buicks but low-priced LeSabre.



It was supposed to have been standard on the '63 Riviera. These problems have been solved, however, with the different casting and by going to a chrome top and bottom ring. Also, the number two compression ring now has an expander for more pressure.

Both engines employ the same SAE 1145 forged steel crankshaft with a rubber absorption vibration damper. It has .004-.008-inch end play and a 2.2495 pin diameter. There was no change in main bearing journal diameter with the bigger bore, however, and the 2.4985-inch diameter used for the 401 is incorporated on the 425. Main bearings have a recommended clearance of .0005-.0021-inch. End thrust is taken by

number three.

Connecting rods also are the same in both engines. They are forged SAE 1141 steel, weighing 24.384 ounces and have a length of 6.220 inches from center to center. Clearance limits for the steel-backed, M/400 aluminum bearings is .0002-.0023, with .005-.012-inch end play. Earlier rods are interchangeable and have the necessary meat for competition. The '57 rods for example can be used with the late pistons for a 3/4-inch stroke.

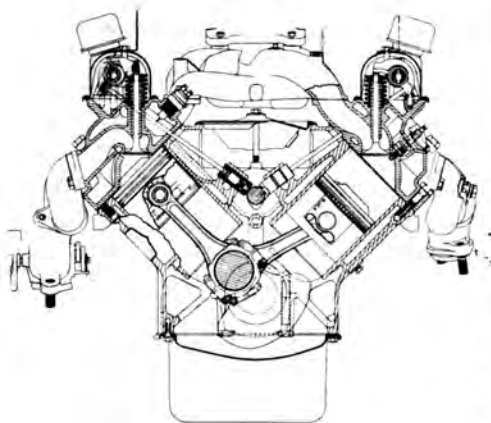
Pistons for both engines are made of the same cast aluminum alloy. They are

cam ground with divorced skirt, but here the similarity ends. The 425 slugs naturally are bigger and weigh more, 25.31 ounces as compared to 23.68 ounces for the 401. Also, the 425 has a 3/16-inch dome while the 401 uses a 3/8 dome.

Clearances also are different. Top land for the 401 slug is .029-.037 with .001-.0016 top skirt clearance and .002-.0036 bottom skirt clearance. Pistons for the 425 have a top land of .034-.042 with .0013-.0019 clearance for the top skirt and .0023-.0039 for the bottom. Pins are pressed into the rods with-

out bushings and are made from SAE 1118 steel. They have a .00075-.00125-inch clearance in the rod and are the same 3.520-inches in length for both engines. Diameter is .9994-.9997.

Cylinder heads which also are cast iron, have a relatively large combustion chamber—semi-hemispherical in shape—which has been incorporated into the aluminum V8. The valve train also is the same with the exception of the camshafts. Both cams are cast iron alloy with five main bearings and are driven by nylon coated aluminum gears. The difference in timing, however, can be



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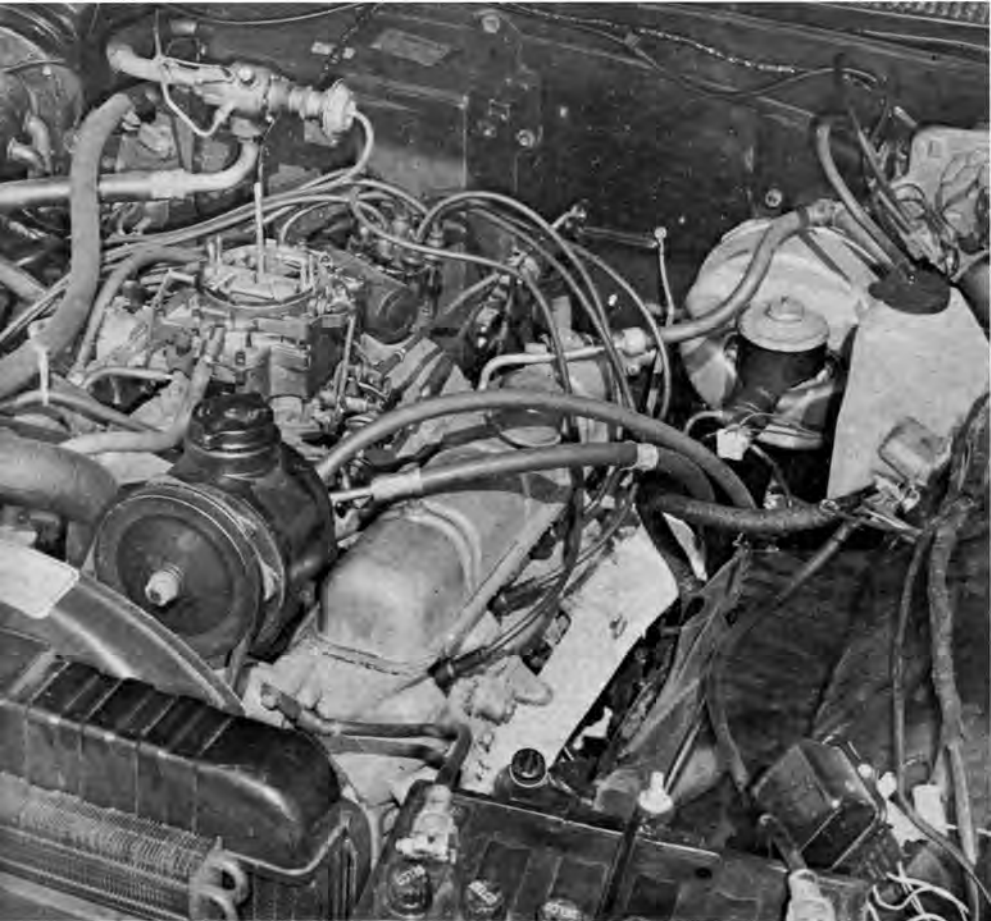
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seen in the following specifications:

	401	425
Intake		
opens BTC	28 degrees	29 degrees
closes ABC	87 degrees	81 degrees
duration	295 degrees	290 degrees
Exhaust		
opens BBC	76 degrees	71 degrees
closes ATC	46 degrees	48 degrees
duration	302 degrees	299 degrees
Overlap	74	77
Lift @ zero lash	431	431

Hydraulic lifters are standard throughout the Buick engine line, but the export kit which was produced in 1957 is still available for changeover to solid lifters. The same type of taper valves used in the aluminum V8 are used in the 401 and 425 engines, although the dimensions are bigger, of course.

Both the 401 and 425 intake valves are 1.875-inches in diameter and have an overall length of 4.785-inches. Stems taper from .3730 plus or minus .0005 to .3720, plus or minus .0005. Clearance in the guides is .001 to .003 at the top and .002 to .004 at the bottom. No

inserts are used in the 45-degree seats as they are with the aluminum engine.

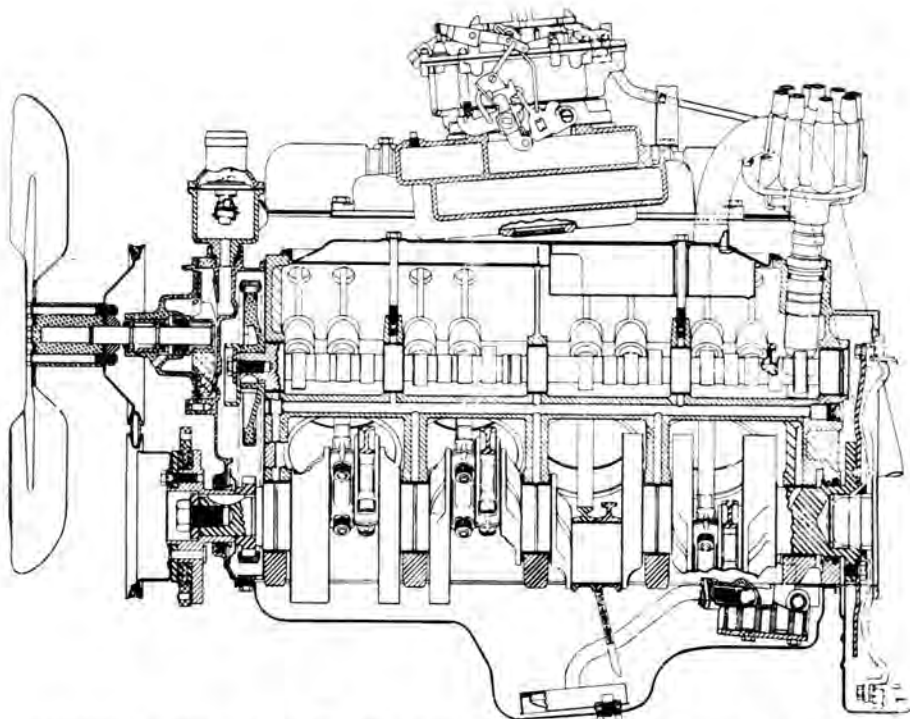
Exhaust valves have a head diameter of 1.500 inch and an overall length of 4.785 inches. Stems are tapered from .3725 to .3715, plus or minus .0005 at both ends. Top clearance in the guides is .0015 while bottom guide clearance is .0025.

Unlike the aluminum V8, the 401 and 425 valves use both an inner and outer valve spring, with the same pressure recommended for both the intakes and exhausts. Outer pressures are 46 pounds with the valve closed and 101 pounds with the valve open. Inner tension is 25.5 pounds closed and 76 pounds open.

Buick uses two makes of carburetors again this year. The two-barrel which is standard on the LeSabre is a 2GC Rochester while the four-barrel unit used on the Invicta, Wildcat and Riviera is an AFB Carter. The Electra uses a 4GC Rochester as its standard carburetor. All use the same secondary barrel size of 1.6874 and all of the four-barrel units have a 1.5625 primary barrel size of 1.6874 and all of the four-barrel units have a 1.5625 primary barrel size.

Aluminum alloy pistons for 425 are cam ground with divorced skirt, have 5/16" dome.





With nominal rating of 340 hp, 425 should have potential for greater development.

Polyurethane air cleaners are used on all Buick engines for 1963. The fuel pump has a pressure range of 5.25 to 6.50 pounds, and two fuel filters are used, one in the tank itself and the other—with replaceable pleated paper—is located on the engine.

Both the Wildcat and Riviera engines are equipped with dual exhaust systems as standard equipment, and employ a separate resonator. The LeSabre, Invicta and Electra have single exhaust with a crossover feeding into single reverse flow mufflers. Exhaust pipes are laminated tubing with a 2.25-inch o.d. The dual exhaust system is optional, of course, on all models except the Buick Estate Wagon.

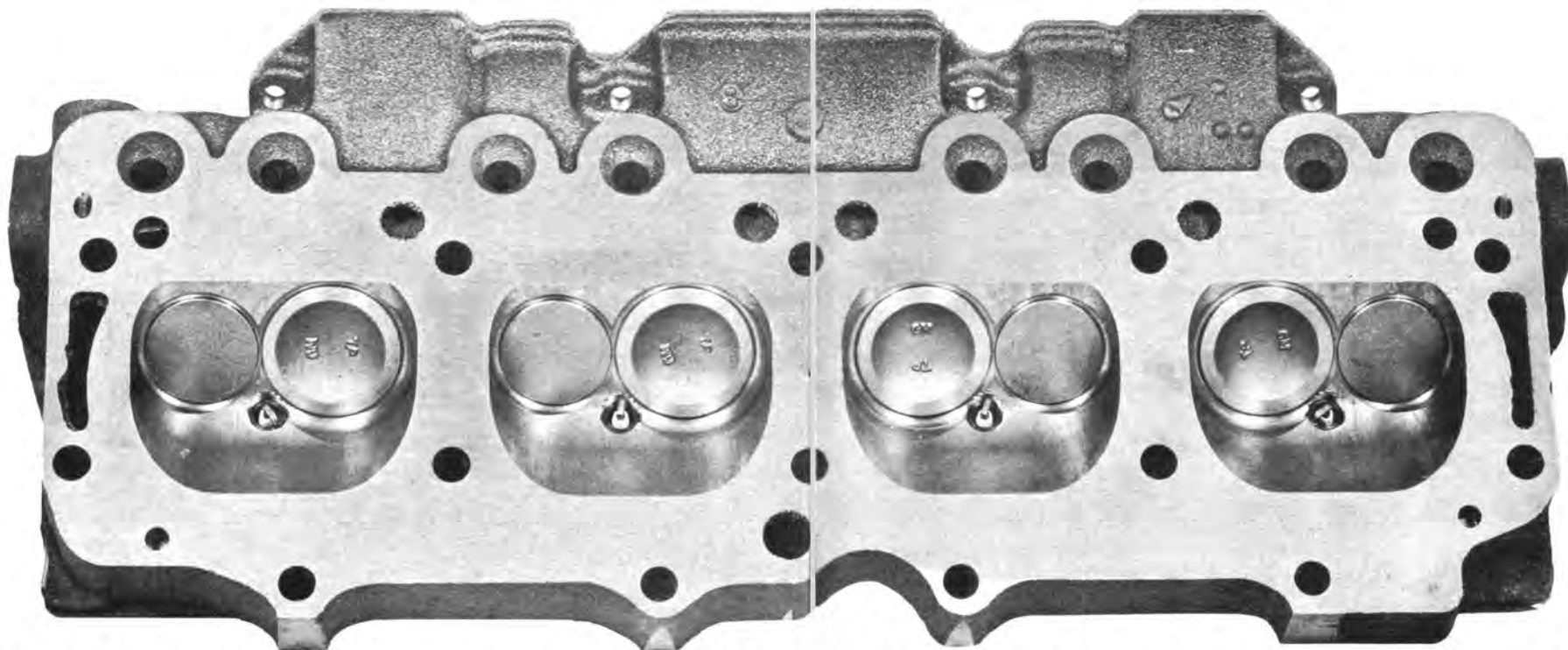
Heart of the 401 and 425 lubrication system is a gear driven oil pump of the non-aerating type. Normal oil pressure

for both engines is 40 pounds at 2400 rpm. Main bearings, connecting rods, camshaft bearing and tappets oil are pressure lubricated by this system. A full flow filter is also used.

Both engines are fired by Delco-Remy single coil ignition with a centrifugal and vacuum advance distributor. Centrifugal advance starts at 550 rpm, with intermediate points of zero to four degrees being reached at 900 rpm. Maximum is 22 degrees at 3800 rpm. Initial spark lead is 12 degrees BTC at 400 rpm.

Recommended setting for the breaker points is .013 to .019-inch and the breaker arm tension, which is important to good performance, should be 19 to 23 ounces.

AC spark plugs are standard, of course, on all Buicks, and the same



Characteristic Buick combustion chambers, shown in 425 head, are semi-hemispherical.

standard heat range (44S) is recommended for both the 401 and 425. Recommended gap is .030-.035 and the plugs should be torqued from 25 to 30 lb/ft.

While the big Buick V8 does not enjoy the performance image created by, say, the big Pontiac, its wide range of power makes it more than suitable for competition. The bottom end is exceptionally strong and has given amazingly little trouble in cases where the engine has been subjected to the severe strains of track racing. Main bearings and rod bearings seem to give exceptionally good wear and no trouble.

In track racing, one of the most successful operations with the big Buick has come with a series of sports cars known as "Ol' Yaller," built in Los Angeles by Max Balchowsky, one of

the foremost experts on the Buick engine. Max's cars have dusted off most of the top production sports cars from Europe in sports car events on the West Coast, and Max does it running basic stock components. We'll discuss some of his methods in another chapter.

As for drag racing, Lennie Kennedy, the 50-year-old enthusiast from Pomona, Calif., showed the younger set just what can be done with a stock big Buick by waltzing off with a roomful of drag trophies. He also earned second place in NHRA's world point championship for stockers two years ago, driving his Buick against the highly rated Chevrolets, Pontiacs, Fords, Dodges and Plymouths.

Then there is Tommy Ivo's all-out dragster, a tremendous piece of engineering that employs four big Buicks

Valve system (below) of 401 and 425 engines incorporates both inner/outer springs.

for power and covers the quarter-mile at better than 175 mph. Strictly an exhibition car (NHRA drag rules do not permit the use of more than one engine), Ivo's creation incorporates the full-house treatment to each of the engines, and we'll discuss these, too in

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Whether retained in its stock form or used for racing on the strip or track, the big V8 has plenty of form, and its reputation for dependability and durability has been proven time and again over the years. ■



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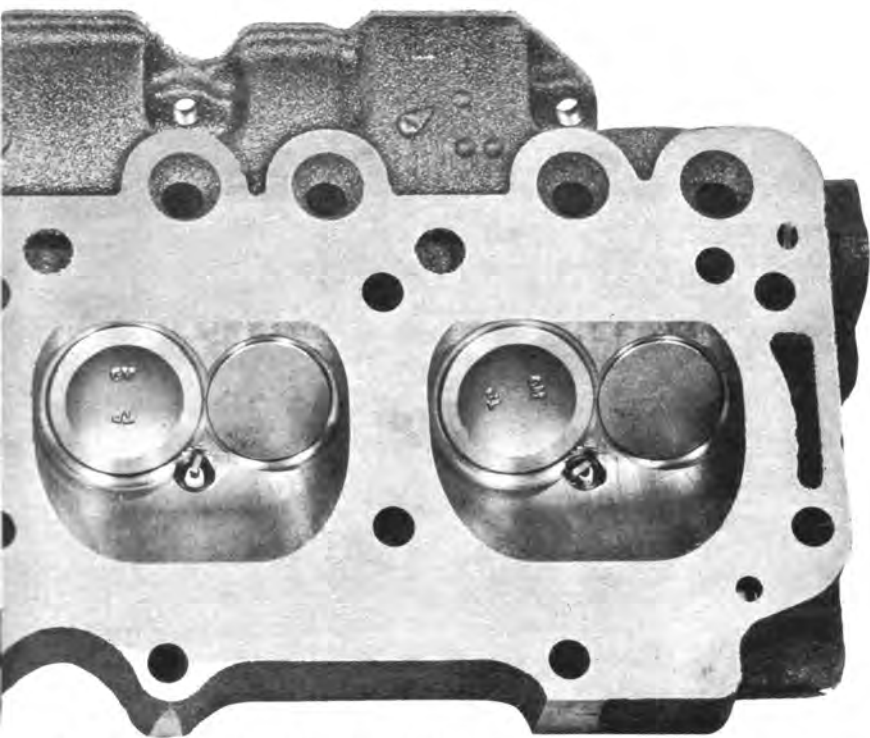
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