

# BIG IRONS

Sure there are several substitutes for cubic inches, but few that can add the wallop of "a poke and a stroke"

By RAY BROCK

There are three ways to increase the displacement of an engine; bore the cylinders bigger, make the stroke longer or add cylinders. Obviously the last method mentioned is impractical since you just don't casually tack a couple of more holes someplace on the block, so that leaves us with the first two methods. The reason behind the thirst for cubic inches that this nation's hot rodders are trying to satisfy is that the more space within the cylinders of an engine, the more air-fuel mixture the engine can inhale. When this larger volume is ignited, the extra BTU's do a more forceful job of pushing the piston and connecting rod down to the bottom of the cylinder and this creates more foot-pounds of torque in the rotating crankshaft. More torque at a given rpm means more horsepower—and that is why "poking and stroking" are so popular.

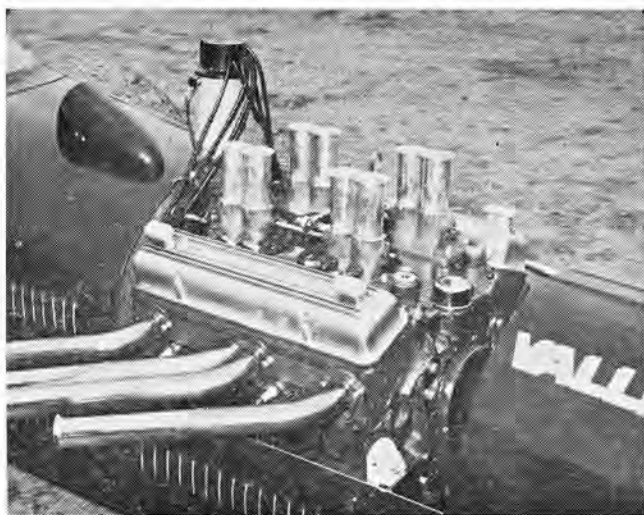
There are limits to how far you can go but just about the time somebody lays down a set of rules, somebody else comes along and belies the theories. Generally speaking, the rule of thumb is that an eighth-inch over stock bore and a half-inch over stock stroke are the limits. Even with these conservative estimates, however, some of the V8's don't conform. As an example, late 392-inch hemispherical Chrysler engines will bore

an eighth but more often than not, the cylinder walls are so thin that they flex, crack or even break completely through in time. After numerous hot rodders experienced cylinder wall failures, the word finally went out to leave the bore stock and concentrate on stroke. These engines can be stroked an extra  $\frac{1}{2}$  or even  $\frac{3}{8}$ -inch to give as much as 454 cubic inches with the stock bore.

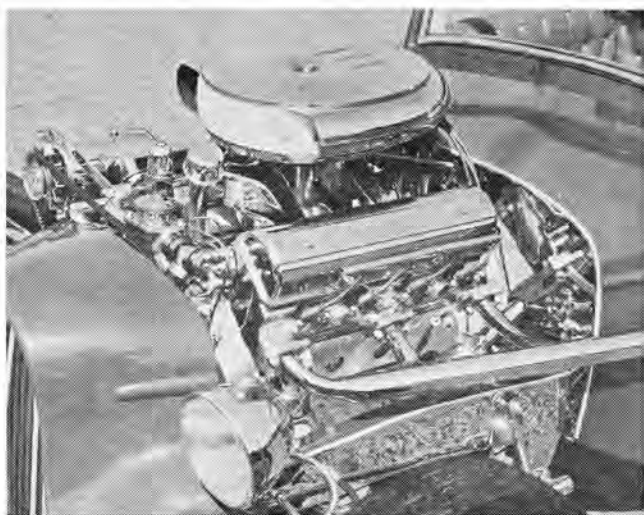
Another critical engine in the bore department is the late Cadillac. An eighth-inch overbore will sometimes work, sometimes end up in the main oil galleries. On the other side of the ledger, Oldsmobile and Pontiac V8's will usually go  $\frac{3}{16}$ -inch oversize without problems while the '55-'56 Packards can be bored  $\frac{1}{4}$ -inch oversize.

Although the  $\frac{1}{2}$ -inch longer stroke is usually acceptable for most of the late V8's, even here there are often little items to be checked out before bolting everything together. Some of the early Lincoln overheads had oil holes in the crankshaft so close to the surface that they would suddenly appear in the fillet area of the crankpin when the stroke was lengthened by grinding.

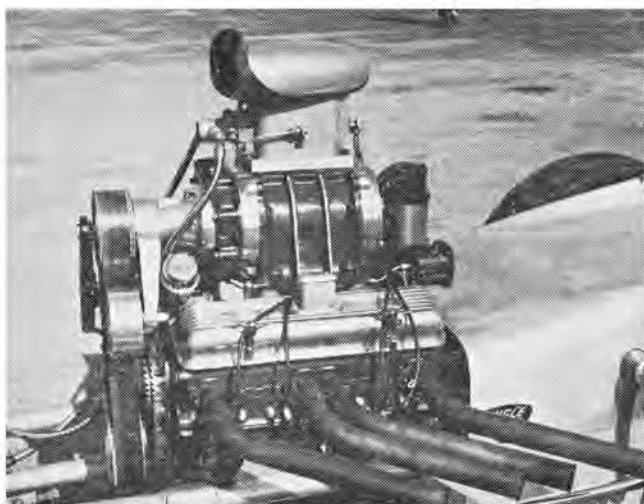
Other problems that might be encountered when increasing  
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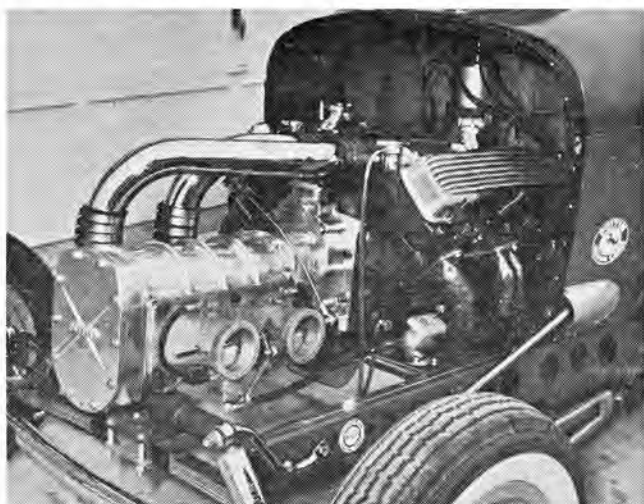
The 283 Chevy is a popular choice for competition with its light weight and high rpm capabilities. Staying on the "safe" side with a half-inch longer stroke and an eighth-inch larger bore, 352 inches result. Billet cranks, inch strokers give 403 inches.



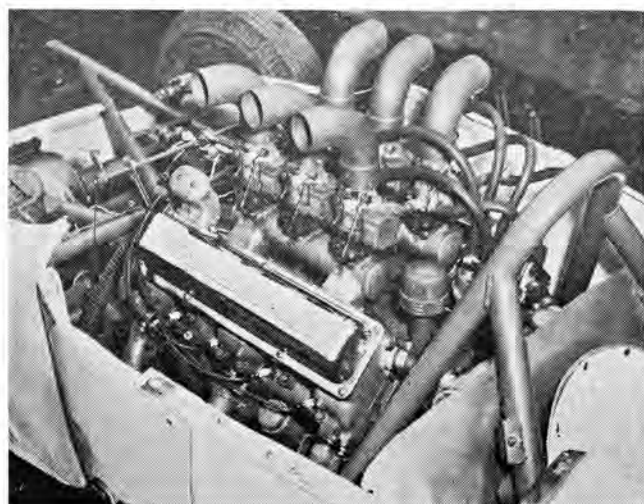
Once popular Cadillac engine hasn't kept favor with the crowd in the search for inches since it has certain bore and stroke limitations. This early 331-inch version has been bored  $\frac{3}{16}$ -inch and stroke increased  $\frac{3}{8}$ -inch to give displacement total of 403.



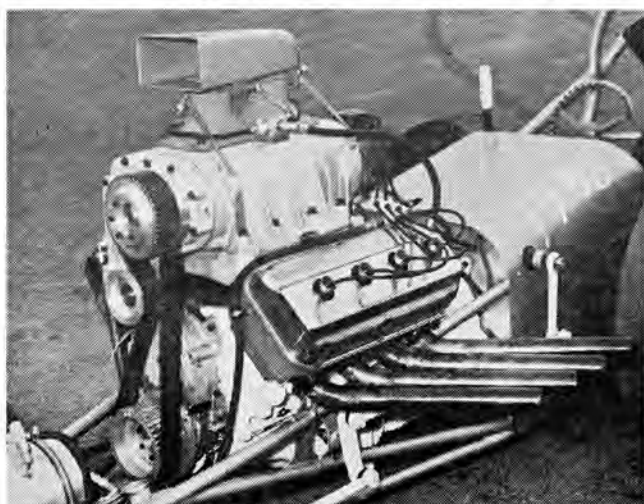
Another 283 Chevy with  $\frac{1}{2}$ -inch stroked crankshaft but in this case the owners anticipated the extra pressure from the blower could create quite a bit of strain so left the bore stock. Despite having only 330 inches, it pushes this dragster to 155 mph.



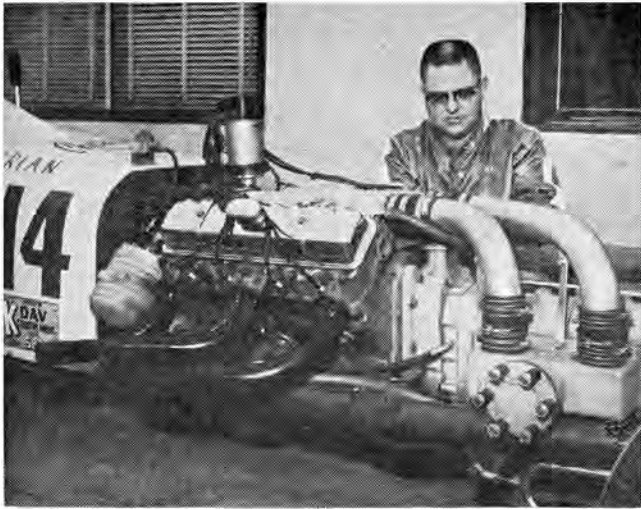
Latest Olds engines have two displacements, 371 and 394 cubic inches, with only a difference in bore size. For this competition coupe, 394 engine bore was left stock and crankshaft stroked  $\frac{1}{2}$ -inch to  $4\frac{1}{16}$  for a total displacement of 470 inches.



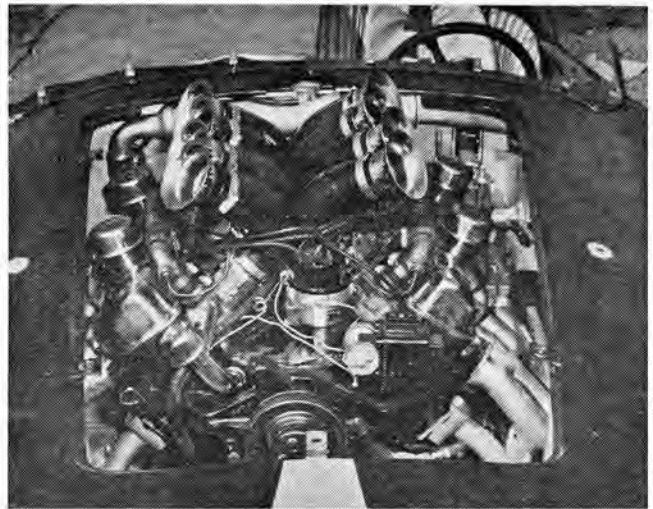
One of few engines that can be bored  $\frac{1}{4}$ -inch, this '56 Packard now has a  $4\frac{3}{8}$ -inch bore, stock  $3\frac{1}{2}$ -inch stroke for 422 cubic inches. Packard cranks can also be stroked  $\frac{1}{2}$ -inch to give a total of 468 cubic inches. This roadster turns 137 in 10.9 secs.



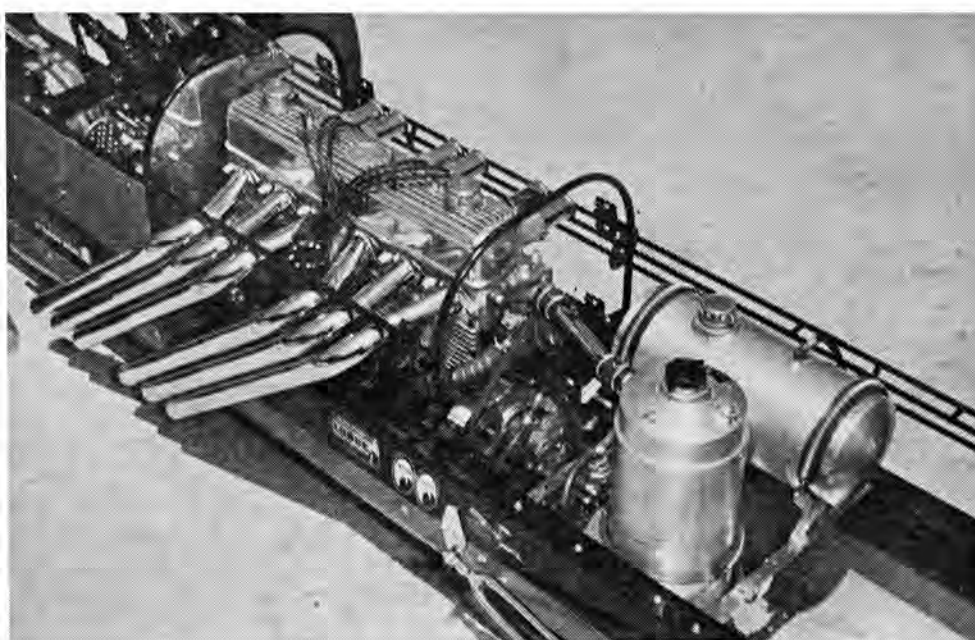
Early 331-inch Chryslers are not as touchy on cylinder wall thickness as the later 392 versions but when using a blower, it is a good idea not to bore at all. This engine retains the stock  $3\frac{13}{16}$  bore but has a  $\frac{3}{8}$ -inch stroker for 391 inches.



Lee Christian's gas dragster is powered by a '57 Olds engine with  $\frac{1}{8}$ -inch overbore,  $\frac{3}{16}$ -inch stroker crank for 454 cubic inches. The 6-71 GMC blower also helps produce 160-plus speeds.



Here's an engine you can really turn into a big inch special. The 430-inch Lincoln shown has been bored .100 to 4.400 and stroked  $\frac{1}{2}$ -inch to 4.200. Total displacement is only 510 inches.



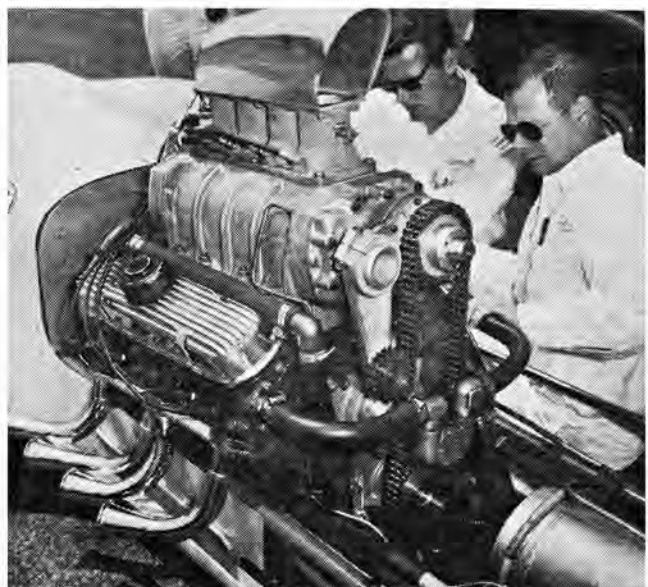
Not many sixes can qualify in the large displacement class but this '52 GMC has a  $4\frac{1}{8}$ -inch bore and a 4-inch stroke for 320 inches. Topped off with a Wayne 12-port head, the engine is a torrid performer with a 130 mph speed in 10.7 seconds.

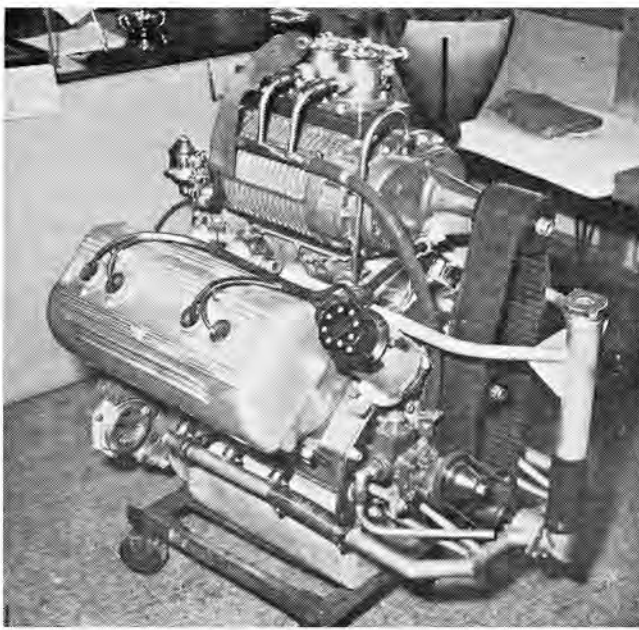
BELOW—Pontiac engines which powered Mickey Thompson's dragster to new World acceleration marks had two different displacements. The one pictured started out as a 389-inch stocker but by the time the block had been bored  $\frac{1}{8}$ -inch to  $\frac{1}{4}$  and the crankshaft stroked a lengthy  $\frac{7}{8}$ -inch, the displacement was jacked up to 508 cubic inches; horsepower rated 800 plus.

## BIG IRONS continued

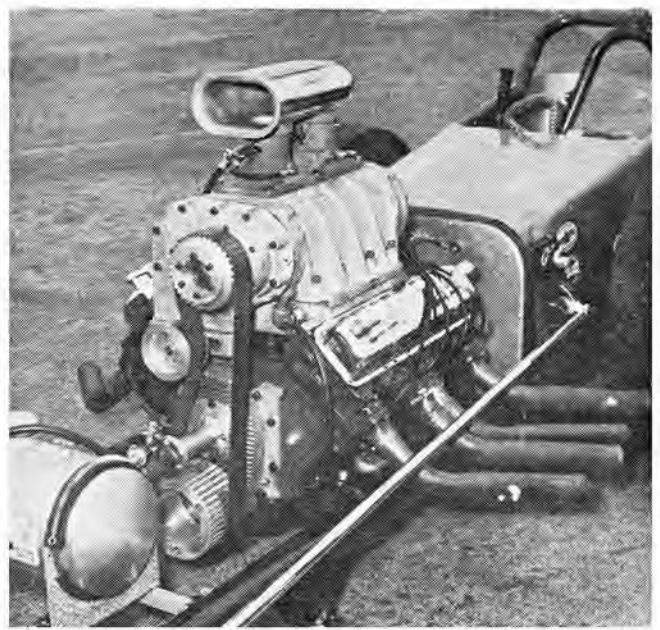
the stroke are: top of rod hitting underside of piston head when the pin is moved up in the piston to offset stroke increase; lack of piston material between piston pin and crankshaft counterbalance; decreased overlap between crankshaft main journals and rod journals on extra long stroke; short piston skirt so lack of stability and accelerated wear; difficulty in adding enough weight to balance assembly; and, often many more.

The best procedure to follow when you wish to bore and stroke is to contact a reputable supplier and tell him what you want. He will know how much your particular model engine can be safely bored, how much stroke can be increased, how much compression you can use and advise you on any other problems. There are many points to be considered before making the jump because a complete stroker kit doesn't sell for peanuts. After you have made your choice and finally get all the parts carefully assembled under the hood, though, we know you will agree that whether for the street or for weekends at the drags, there just ain't nothin' that will take the place of cubic inches.

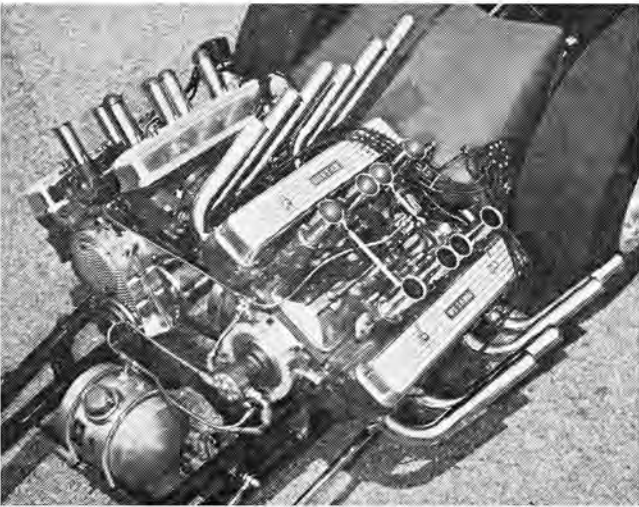




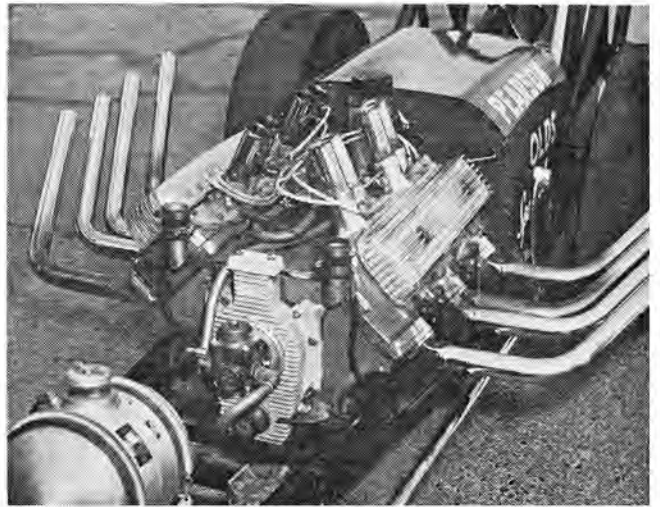
A '53 Ford block, last of the flathead variety would produce 296 cubic inches with a  $\frac{3}{16}$ -inch bore and  $\frac{3}{8}$ -inch stroker crank. Ardun heads and SCOT blower made it a potent package.



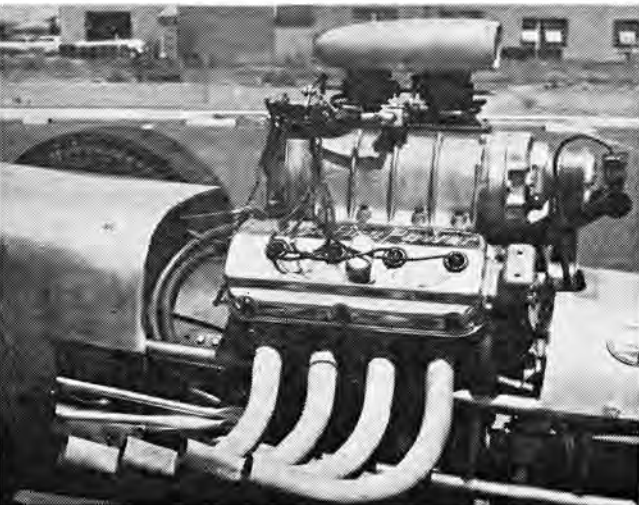
371-inch '58 Olds block was bored  $\frac{1}{8}$ -inch, the crankshaft stroke increased  $\frac{1}{2}$ -inch to  $4\frac{1}{16}$  for 445 cubic inches. When blowing an engine, be sure not to bore the cylinders too thin.



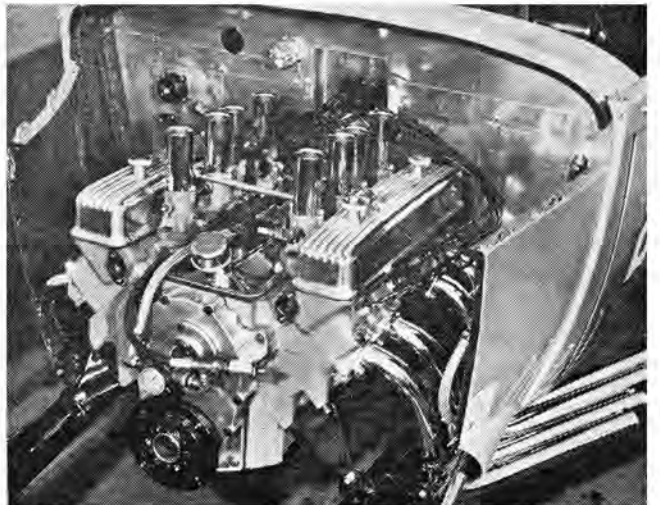
Tommy Ivo, the nation's tops in the gas dragster division has equipped his new dragster with two half-stroker '57 Buicks that displace 467 inches each for a grand total of 934 cubic inches. Top speed to date, 173.7 mph in 8.69 seconds.



Oldsmobile engines have proven quite effective in competition machines and the later models can be opened out to better than 500 cubic inches. This '57-'58 371-inch version with a  $\frac{3}{16}$  bore and  $\frac{1}{2}$ -inch extra stroke has a displacement of 461.



Another late Chrysler with the cylinder bore left stock to "play safe." The stroke has been stretched out an additional  $\frac{1}{2}$ -inch however so that the 454 cubic inches under pressure from the 6-71 GMC blower push the dragster chassis 160-plus.



Originally a 364-inch '57 Buick, this drag champion has been bored  $\frac{1}{8}$ -inch to  $4\frac{1}{4}$  and stroked .6 of an inch for a 4-inch stroke. The total displacement is now 450 inches and the '29 roadster it powers runs consistently in the 135 mph bracket.