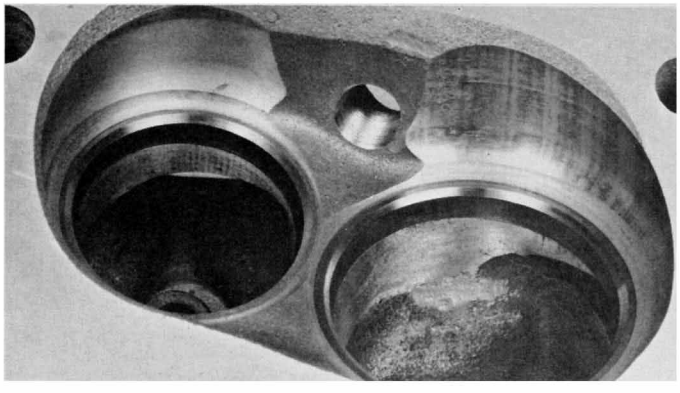
BUDGET HP

BY TERRY COOK

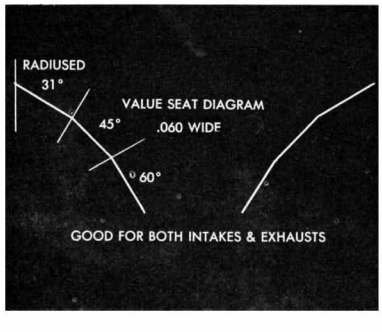
396/427 CHEVY HEAD PACKAGE

Here's the good deal for those "big motor" heads, with a few bonus tips on tuning thrown in for good measure.

So you have this Chevelle that you drive around town with a 375 horse 396 or high performance 427 engine, and it seems to be waning in the pep department? Here's the inexpensive plan to change all that and bring the engine back to life. The answer comes from Tony Feil of Competition Engines in Hanover, N.J. Specializing in just this sort of thing, Tony has come up with a head package that really talks. ● Normally, you will want to shoot for a head cc'ing job that produces a combustion chamber volume of 106.9 cc's, but since carbon deposits are going to build up in the chambers of a street machine, go to a volume of 107.5, compensating .6 cc's for that carbon buildup. ● Looking at the stock valves and valve seats, we see that the approach angle to the seat and the pockets under the seat are of fine design and workmanship from the factory, so we want to generally follow those factory angles. Lead off with a 45-degree stone to form the seat itself, then follow with a 31-degree stone until you approach a slight margin about .010 to .015 from the top of the 45-degree cut. In this way the valve will be slightly overhanging the top of the seat. Then, work the width of the seat out with a 60-degree stone. Tony doesn't like thin valve seats on street machines, as they have a tendency to hammer into the valve. With a wide seat, however, there is always a sealing point at high rpm's. On the 396-427 engines specified above for street, aim for a seat width of .060 of an inch on both intakes and exhausts. Incidentally, the 45-, 31-, and 60-degree procedure is correct for both intakes and exhausts. The valve itself should be cut to 44 degrees to offer a one-degree angle of interference. Remember to blue the seat and hand lap the valve to see how it shapes up. ● One general rule to follow is: the more clearance (wear) you have in the valve guide, the wider you should make the valve seat; however, do not exceed .0035 guide clearance. Using stock springs, special valve guide seals are not necessary, as the stock rubber umbrella seals will suffice. ● During assembly, remember that valve spring tension is critical, as the springs have been known to break for one of two reasons: first, too much valve lash (.020 on the intakes and .024 on the exhausts are the marks you should shoot for); second, not enough spring tension. The stock springs seat pressure is adequate, but Tony likes to set the springs for 106 pounds, using slightly used springs. Remember to use the factory shims because they are hard, which is desirable because the damper inside the springs has been known to chew up soft shims. For your information, factory shims come in three different thicknesses, .015, .030, and .060 of an inch. On all assembly Tony recommends you use STP as a pre-lube on the valve stems when putting them into the guides. ● Use the stock studs, as they are the screw-in type and will work fine. An additional word on the camshaft: the factory cam (375 horsepower in 396 engines, and 425 in 427's) is strong and will work well until you can afford a racing cam. If you do select a cam from any of the popular manufacturers, make sure to take steps to see that the valves don't hit the pistons because of higher lift. ● In the ignition department, use 38 degrees total advance, and don't overlook the GM distributor hop-up story on page 36 of the January '68 issue of CAR CRAFT. As for the carburetor, put a screw at the end of the travel of the slot on the secondary linkage, on the end farthest from the link; bring the float levels up to the sight hole, and make sure the needles and seats don't leak. Put the throttle pump on the #2 position and set the throttle pump spring so the attaching bolt is tight. ● So there's the low dollar plan on pepping up that 396-427 high performance Chevy of yours. You can either do it yourself or take it to a qualified local shop. To give you an idea on price, Tony charges about $80 if the heads are brought to him off the car, and will do the whole package, heads, distributor and carburetor for slightly under $100. The package will produce close to an honest 40 horsepower boost, one that you will really feel. After all, the big Chevy engine needs a touch now and then to keep it running in top shape, and if you know where and how to put that magic touch, you'll be rewarded with powerful "nepp-snacking" performance.



Normally a chamber volume of 109.6 cc's is correct, but to compensate for carbon buildup which occurs on the street, go to a corrected volume of 107.5 cc's.



When doing valve seats, follow this diagram. Shoot for .060 of an inch width on the intake and exhaust seats themselves, and use a radiused 31 degree stone for the top.