

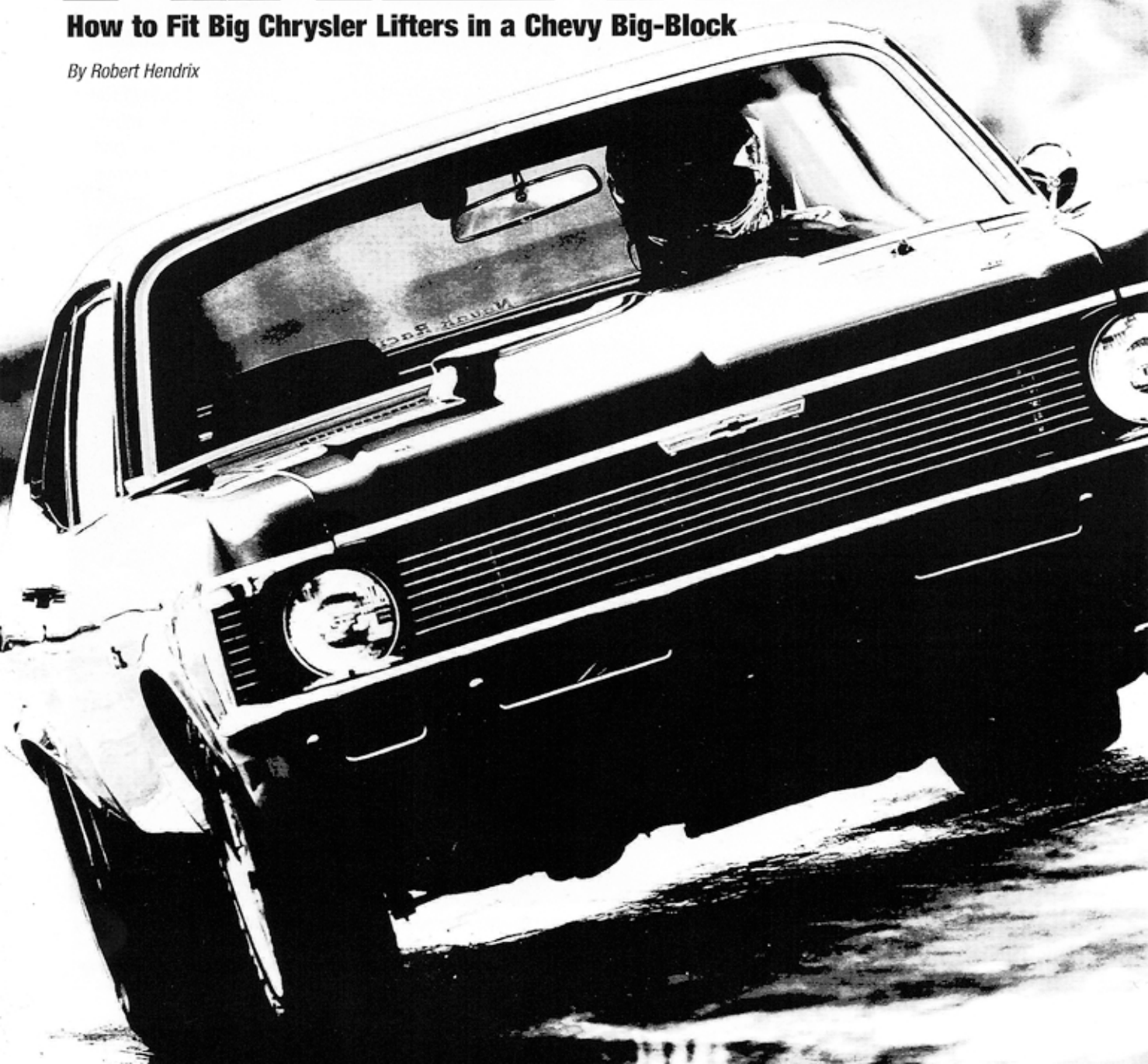
SURFACE AREA

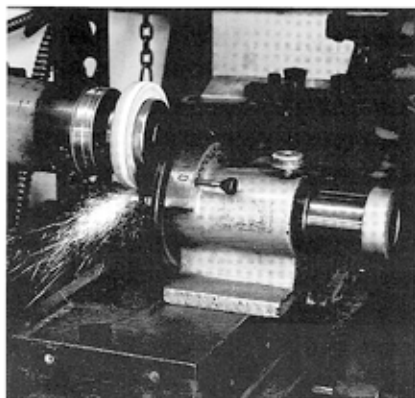
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CHEVY
HIGH PERFORMANCE

How to Fit Big Chrysler Lifters in a Chevy Big-Block

By Robert Hendrix





As gearheads, we're always looking for ways to glom a few extra horsepower. If we can do it on the cheap, it just makes it that much better. There's also the cool factor: the machining process performed on your engine that none of your friends has had done.

For years, racers have been enlarging the lifter bore size in big-block Chevys in order to take advantage of the faster ramp rates that can be achieved. Both Ford (0.875-inch) and Chrysler (0.904-inch) bore sizes have been used with great success, as well as longevity. Since the factory Chevy lifter bore measures 0.842-inch, the advantages of the larger lifter and the effect it can have on ramp rates, overall duration, and maximum lift numbers can be significant. The larger-diameter lifter also tends to handle the increased loads of high-performance camshafts and springs better, too.

We enlisted JMS Racing Engines to help demonstrate that this machining process isn't just for racers and show that the everyday street guy can benefit, too. To accomplish this procedure, the crew there used a BHI Products Lifter-Tru fixture. Misalignment of the lifter bores can cause premature camshaft wear and a loss of horsepower, and since the BB Chevy is notorious for having less-than-perfect lifter bore alignment, blueprinting the block using the Lifter-Tru fixture is an added benefit of this modification.

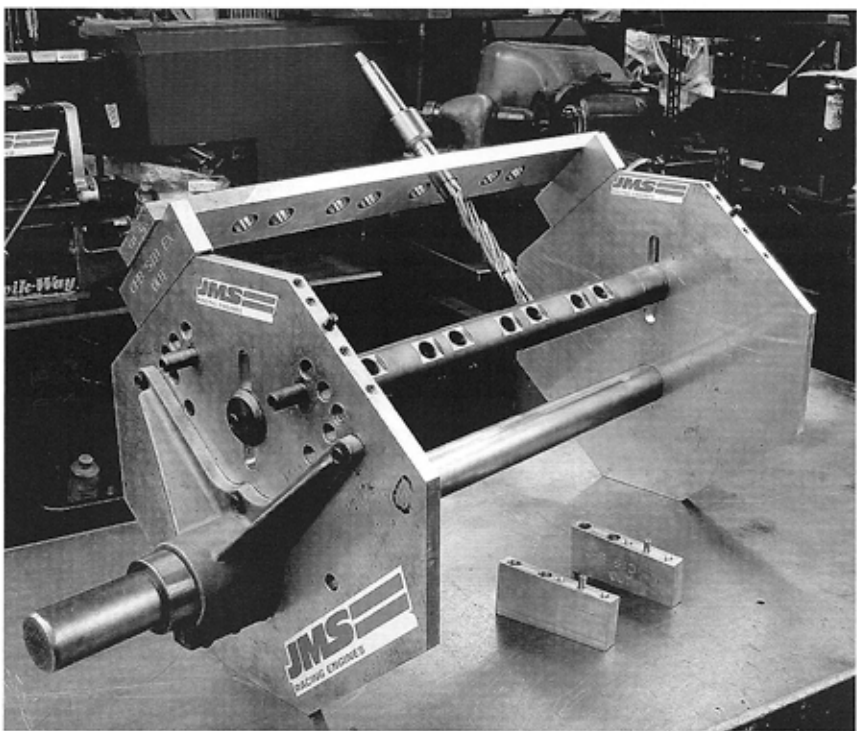
The camshaft manufacturers will tell you that during the ramp-up phase of the timing event, the lobe contact point should never get closer than 0.015-inch from the edge of the lifter. So it figures, the larger the lifter diameter, the faster and more aggressive the rate of acceleration can be. To take advantage of the larger lifter size, the cam lobe must be designed with this in mind.

Ultradyne has long been known in the camshaft industry for designing cam lobes specifically to take advantage of the Chrysler 0.904-inch lifter.

Recently, Lunati acquired access to the Ultradyne designs so we'll use two of its lobes to demonstrate the differences between a Chevy-based lobe design and a Chrysler-based design. With an overall duration at 0.020-inch number of 274 degrees as the basis for the comparison, the Chevy design yields a duration (at 0.050-inch) of 244 degrees, while the Chrysler is 247 degrees, a significant increase. The maximum lift achieved

using a 1.7:1 rocker ratio is 0.590-inch for the Chevy and 0.634-inch for the Chrysler. The change to the Chrysler lifter size increases the available lift more than changing to a 1.8:1 rocker ratio! Just think, more lift and subsequent flow without affecting idle quality or street manners too much because the overlap stays pretty much the same—and all for about \$225. What a bargain!

This procedure isn't without problems, however. The Chevrolet and Chrysler blocks have different oiling systems. The Chrysler oil galley runs along side the lifters providing oil through holes in the sides of lifter bores. The Chevrolet oil galleries run straight through the lifter locations, so by using a relief in the lifter body, oil can pass by one lifter and move on to the next. There is no such provision in the Chrysler lifter, so oil flow in the galley would not be possible without the modification. The solution is to grind a relief into



The BHI Lifter-Tru fixture is held in place by both the main caps and a special reamer-receiving bar located by the cam bore. The front plate locates from the front of the block and the reamer bar is aligned with a machined slot in both front and rear plates. Once everything is tight, accurate lifter bore alignment is virtually assured and repeatable in any block.

the lifter body to match the Chevy lifter (see image). Another inherent difference is that the Chevy oils the valvetrain through the pushrod while the Chrysler oils up through the block and cylinder head, and then into the rocker shaft. Luckily for us, the late-model Magnum engines offered by

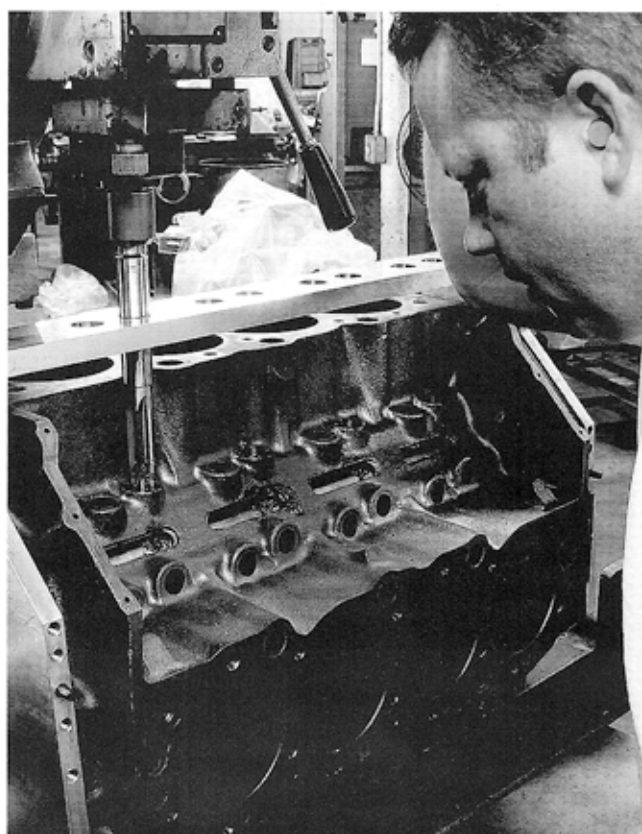
Chrysler (5.2L and 5.9L) took a cue from GM and oil through the pushrods. That means that both hydraulic and mechanical versions of the 0.904-inch Chrysler lifter are available with this type of oiling configuration.

Sure, some of you are saying, why

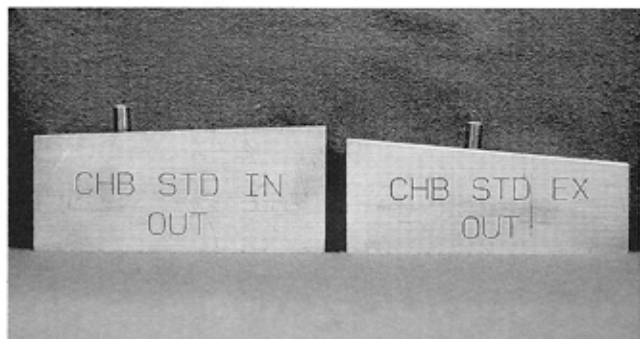
not just go to a roller cam and forget all the fuss? Unfortunately, the cost of upgrading to a roller can be upwards of \$1,000—even for a Chevy. So for less than half the price, a much-improved valvetrain is easily available, and you'll be the only person on your block to have it.



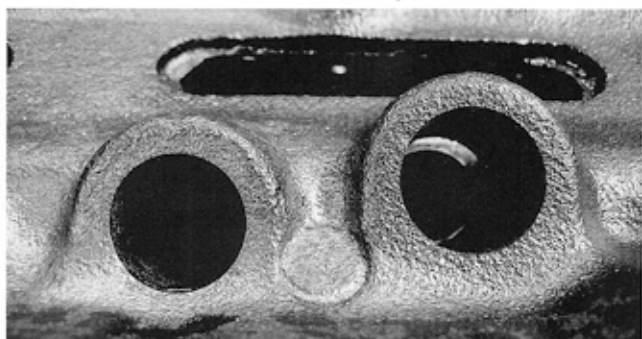
The author begins the plate-mounting procedure. BHJ provides everything you need to set-up this tool, including reamers, spacers and special adjustment hardware for locating the fixture. You will need to install cam bearings in each end of the block in order to center the reamer-receiving bar.



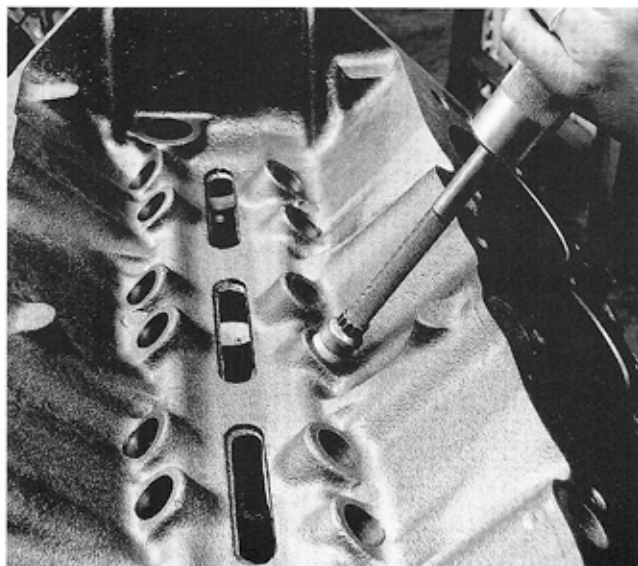
Notice the slot in the end of the motor plate that keeps the reamer-receiving bar in position. The bar is bolted to the front plate, which keeps fore and aft movement in check. The reamers are custom made by BHJ specifically for their fixture and they cut through cast iron with ease. The end of the reamer has been reduced so it fits into the receiving bar throughout the entire plunge distance of the cut, thus ensuring accuracy.



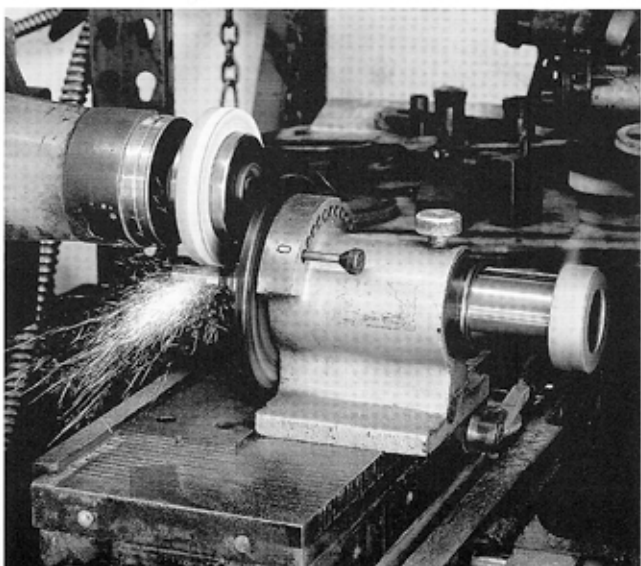
The canted valve layout of the BB Chevy cylinder head requires that the lifter bores be located at slightly different angles to each other. These extensions to the end plates position the top reamer-locating bar in the correct position for their respective bore angles.



At this point in the procedure, the intake lifter bore size has been increased, while the exhaust has not. This image shows the difference between the two bores and that even after being enlarged, there's plenty of cast iron left in the block to support the bigger lifter.



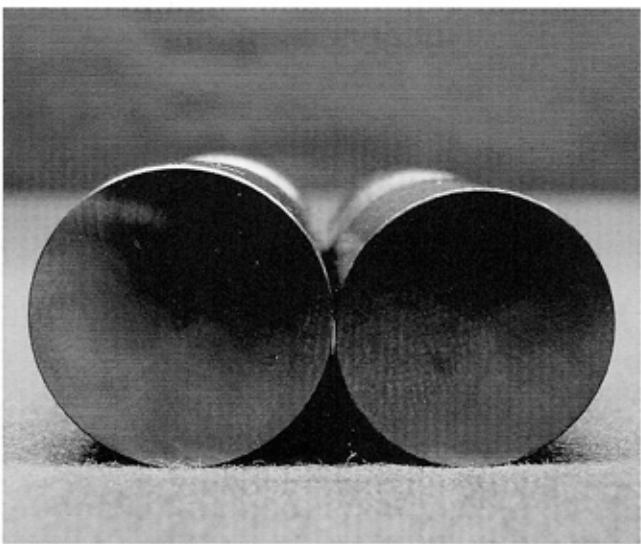
To take care of any irregularities after boring, a hardened ball (bore broach) is passed through the lifter bore.



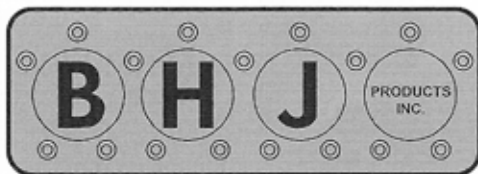
Because the oiling system of the BB Chevy differs from that of the Chrysler, modifications to the Chrysler lifter must be made to allow use in the Chevy block. A fixture known as a "spindex" is used with a surface grinder to create an oil passage band mimicking the Chevy lifter. This relief allows oil to flow past one lifter and provide oil to the next and so on. The band depth should be a minimum of 0.025-0.030 inches.



A side-by-side comparison of the two lifters illustrates the difference in diameter, as well as height. Because the overall lift of the camshaft ensures that the lifter uses the entire lifter bore, this doesn't create a problem. Since the distance below the band is the area that sees the most stress when you grind, you'll want to leave at least the same amount intact as the Chevy lifter provides. The increased diameter of the Chrysler lifter also provides a larger surface area, which helps to transfer load and reduce wear.



Visually, the size difference between the two lifters is obvious. Although 0.062 inches doesn't sound like much, the effect it can have on ramp rates, overall duration and maximum lift numbers is significant.



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