

# STROKER SMALL BLOCKS

*The Strong Arm  
Solution for Weak-  
Kneed 350s*

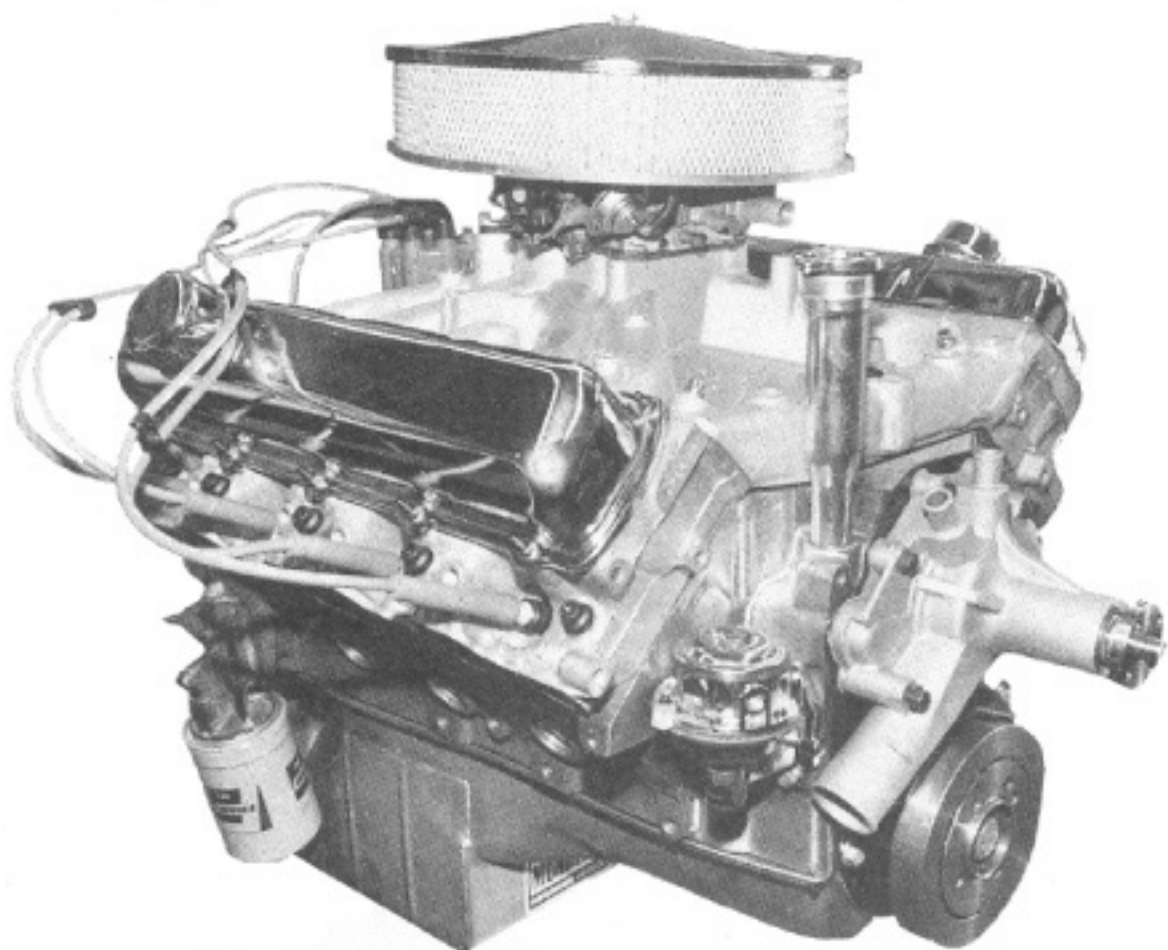
**O**f all the stroker combinations featured in this issue, none can compare with the additional inches Mondello's stroker 350 Olds produced. While most of the common stroker combos produce anywhere from 30 to 60 cubic inches, Mondello's 350, based on a production Diesel block, can yield up to 90 extra inches! It sounded incredible, so we visited "The Doctor" himself to find out what it takes to make a 440-inch small-block Olds.

## BLOCK

Since there's a lot of modification involved, we'll start with the block and bottom end of the engine and work our way up. First of all, Joe wants to clear up any rumors you may have heard that the diesel block has four-bolt mains. It does not, but Joe has found that the factory two-bolt mains are more than adequate when used with his main studs and straps (part# ST940). Before beginning any machine work, Joe strongly recommends that the block be cleaned, Magnafluxed and pressure checked. Many diesel blocks crack between the #2, #3, and #4 main web housing leading up to the cam bearings. Because of the excessive detonation and crankshaft flex in the diesel engine, align honing the mains is also highly recommended.

In addition to magging and pressure testing, the prospective 440 block must also be sonic tested—a process that will tell you how thick and stable the cylinder walls are before you attempt to bore the engine out to 4.185. It's an expensive process, but not as expensive as having a block machined and then finding out you have to throw it away. If the sonic test checks out okay, and you still have at least .100 wall thickness to play with after boring, then you've got a good basis for the build. Joe notes that up to 454 cubes can

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Photos by Chris Hemer

be squeezed out of this combination by boring the block to 4.250, but the water jackets must be filled with epoxy resin, and this restricts the engine's use to drag racing only.

With the boring, honing and align honing completed, it's time for trial assembly to see if everything fits. All blocks will have to be notched approximately 1/8-inch when using the kit crank and rod assembly, although the connecting rod to camshaft clearance will not become a problem unless your cam exceeds .650 lift.

Notice that we didn't mention decking the block. That's because it shouldn't be done until you find out where everything is inside the block. You see, all Mondello compression ratios are based on a piston that resides .020 in the deck, using a .041 thick compressed Fel Pro gasket. You may find that your piston may be .030 or .040 in the deck, and the material must be removed accordingly to maintain an accurate compression ratio. Joe has noticed that these

blocks can vary between .005-inch and .030-inch of specified factory block height, so do yourself a favor and check it before you deck it.

With all the machine work completed, you may now move on to the other necessary modifications. All Olds 5.7-liter engines should be restricted on the bottom end. Mains #2, #3 and #4 oil galleries leading up to the cam bearings can be restricted using kit #R100S, and this kit will work with both hydraulic and mechanical cams. These same mains must have their main bearings modified for proper oiling. The #3 main bearing oiling hole needs to be enlarged to 5/16-inch, and main bearings #2 and #4 must be enlarged to 5/16-inch and elongated with a rattail file to the center of the oil restrictor hole. All bearings should then be deburred and lightly rubbed with Scotchbrite to remove surface blemishes in the bearing before installation. When preparing the diesel block for gasoline use, you should install 350 gas engine cam bearings

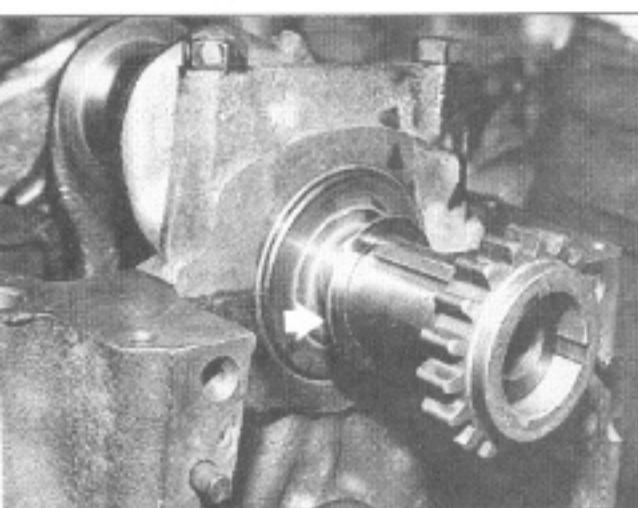
to block off the open oil passage leading up to the injector driveshaft hole. If you are leaving the diesel cam bearings in the engine, then the oil gallery must be plugged using the #1080 aluminum plug. In the rear of the block, there's an injector oil drain hole in the lifter valley area that must be plugged using an 11/16 cup plug.

## CRANK

Now that your block is ready, the 425 crank is next. Its factory part number is 384722, a forged crankshaft that is no longer available new from the factory. Also, the 425 crank will not just "bolt" into place like a 400 Chevy crank into a



*Number 1080 aluminum plug is used to block off the injector drive oil hole when using the diesel cam bearings. The center is threaded for easy installation using a common head bolt.*

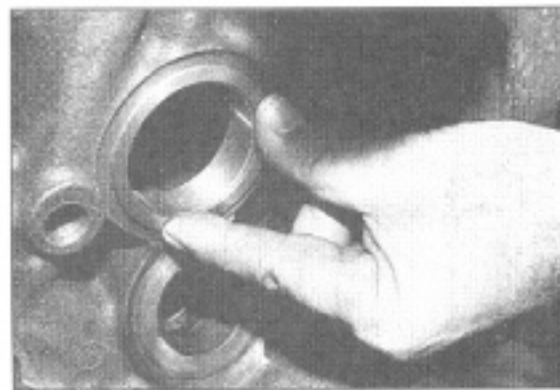


*Number 1100 crank gear spacer is used to space out the bottom crank gear for proper timing chain alignment.*

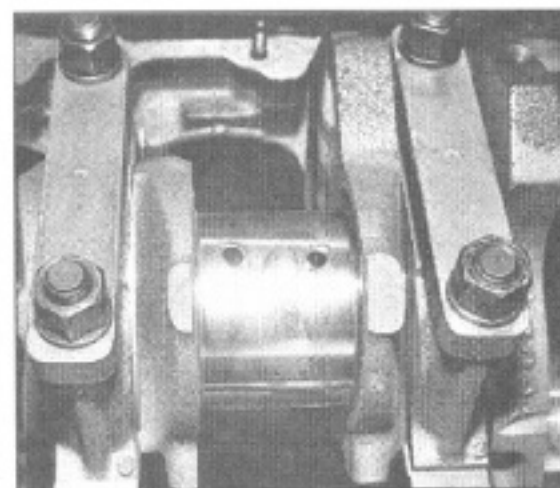


350—it requires extensive modifications, first. The counterweights must be reduced in diameter by approximately 3/8-inch just so it will fit inside the block. It is then offset ground to 4.00 from the factory 3.975, and the rod journals are turned down from 2.500 to 2.199. Finally, it is cross-drilled, reheat treated, shotpeened, chamfered and micro polished. It

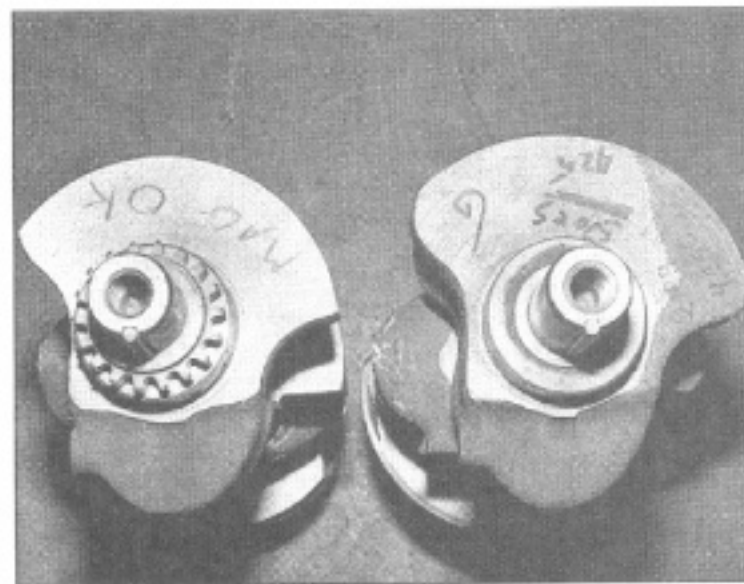
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*Number CS-120-85 bronze cam spacer is also used for proper timing chain alignment.*



*Here you can see the crank's chamfered oil holes and Mondello's main stud and strap kit, part #ST945. This crank is a tight fit inside the 350 block, so make sure there are no crank or rod-to-block interference problems.*



*The crank on the left is a finished 425 steel crank with reduced counterweights. Compare this to the stock 425 crank on the right—you can see how much material is removed.*

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should also be noted that this crank will only accept an early flywheel or flex plate bolt pattern from the 330, 400, and 425 Oldsmobile engines from '64 to '67. These would be hard to find at a junkyard, so it's probably a good idea to buy one new from Joe—available in steel-billet or aluminum. One other thing to remember is that if you are using the diesel harmonic balancer, you'll need to use Mondello's .680-inch-thick spacer, part #1110. For a 350 gas or 455 balancer, no spacer will be required.

## RODS AND PISTONS

The next hybrid part of this unique engine is its connecting rods. They're not even Oldsmobile! They are steel 454 rod cores, cleaned, magged, beam polished, shotpeened, resized and fitted with high strength rod bolts and nuts. Due to the space limitations inside the diesel block, the big end of the rod is narrowed on one side to remove the offset, and the other side is narrowed slightly for proper side clearance—approximately 1/16th total material is removed. The rod is then side ground and side notched with a .500-inch wide, .010-.012-inch deep notch for better oiling. Since the rods have been narrowed, they also require a rod bearing that is also narrowed according to rod width. The small end of the rod is bored and bushed and the centers are corrected to accept a .927 small-block Chevy wrist pin.

The main reason a small-block Chevy pin is used is because of the short-block height. Because of this, the piston is a custom piece designed by Mondello and built by Arias in any compression ratio you want. The piston is so compact that this smaller pin had to be used because of space constraints, along with the small 1/16-1/16-3/16 ring grooves.

Balancing this short-block assembly is very costly because it takes six to eight inches of mallery metal to balance the reciprocating mass. However, the Mondello kit is very reasonable at \$2600. The kit includes forged steel 425 stroker crank, special 454 steel rods, Arias/Mondello pistons, heavy-duty small-block Chevy wrist pins, Speed Pro plasma-moly ductile rings, degreed damper, new billet-steel Mondello flex plate, Childs & Albert rod and main bearings,



complete balancing, complete gasket set, engine cleaning brush set and engine assembly kit.

### OILING SYSTEM

Now that your short block is finished, you're going to want to protect it with a good oiling system. For street use, Joe recommends the use of a Tornado oil pan from the years '67 to '76, factory part #PN398438—available at your junkyard, but not available new anymore. Use this pan with a Mondello rear sump windage tray, (part #WT190) high-volume oil pump (part #SP755) and bolt on 3/4-inch pickup tube, part #PU1. The "Toro" pan as Joe calls it, is approximately 3/4-inch lower than a 350 or 455 oil pan, holds six quarts including the fil-

ter, and is good for engine speeds up to 6000 rpm.

The next step up is an eight-quart pan, two inches lower than stock, constructed of gold-irridited steel, part #OP800. It too uses the SP755 oil pump, but it uses a bolt-on 3/4-inch drop pickup tube—part #PU2. This system can utilize Mondello's full length windage tray, (part #CT850) and necessary mounting hardware (part #WS870). The CT850 will not fit the Toro pan. Another item highly recommended by Joe is the chrome-moly oil pump driveshaft, (part #OD260) especially when using the high-volume pump. Joe says that the capacity of a diesel oil pan is five quarts including the filter, but with the

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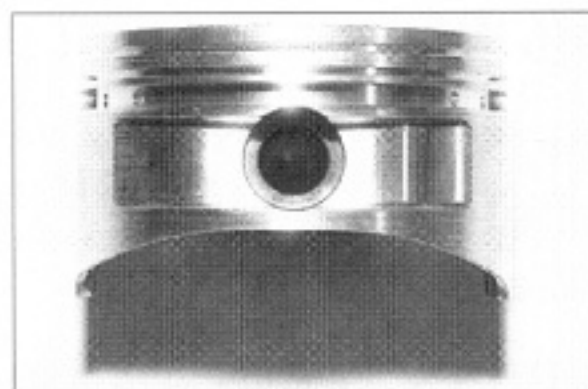
factory oil cooler, the actual capacity is eight quarts. It is for this reason that some people have been lead into thinking that the diesel pan holds eight quarts, and this is not the case.

### CYLINDER HEADS

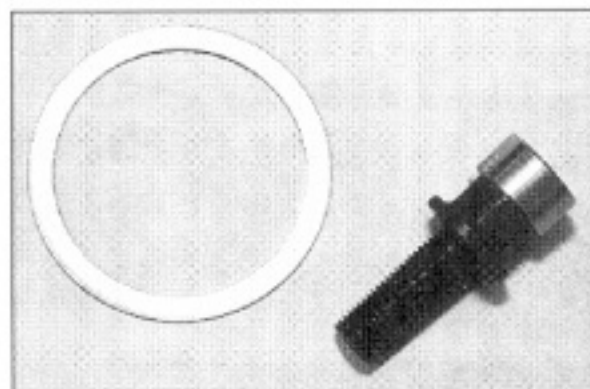
Joe recommends using the 455 head because of its larger ports and valves, but with these heads the intake manifold must be welded, resurfaced and then ported to size. If you already have a set of cherry 330, 350, 400, 403, or 425 heads laying around that you were hoping to use, have no fear, for these heads too will accept oversize valves up to 2.07 on the intake side, and 1.71 on the exhaust. However, oversize valves in small-block, big-block, or big-block heads on a small block will require the use of adjustable pushrods or an adjustable rocker system to maintain proper lifter preload. If the heads you plan to use are '76 or earlier, the cylinder-head bolt holes must be enlarged to .532 or 17/32 in order to accommodate the larger 1/2-inch diesel head bolts. Last but not least, make sure your heads are fully prepared and you have a correct cc rating in hand when ordering the pistons.

### CAM, IGNITION AND CARB RECOMMENDATIONS

Joe has been working with these and other Olds engines for so long that he has pretty much developed a formula for what parts to use on an engine with a specific application. For street, Joe recommends one of two cams—the JM2022 hydraulic (.496/.512/266/274 gross) or the JM2225 (.512/.523/274/280 gross). These cams must be used with the following pieces: Cam spacer (CS-120-85 Fuel pump eccentric (#1140), camshaft bolt and thrust bumper (TB740), and crank spacer (#1100). The carburetor choice with either of these cams should be either a Holley 750 or 800-cfm double-pumper square bore, or a Mondello Stage II Q-Jet 750 or 800-cfm, using either an Accel blueprinted HEI with Accel Super Coil or a Delco "trap-door" distributor containing a Mondello curve kit, part #DK210 with MSD 6A and MSD 8203 coil. Joe has found that using any one of these cam, carb and ignition combinations on his diesel-block stroker motors has produced approximately one horse per cubic inch in street trim on pump gas—and that's mighty respectable in anyone's book. 🏆

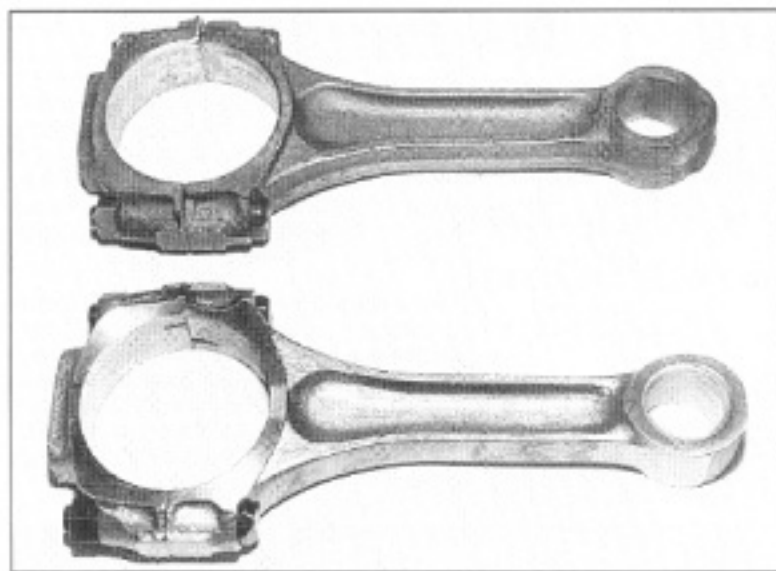


Here you can see how compact the Arias/Mondello piston really is—necessitating the use of a small-block Chevy wrist pin and 1/16-1/16-3/16 ring lands.



Number CS-120-85 cam spacer and Number TB740 cam bolt and thrust bumper must be used when running a gasoline cam in a diesel block.

Stock rod top, Mondello rod bottom. Note the polished beams, high-strength rod bolts and nuts, bronze bushing, side clearancing and small notches at the top and bottom of the big end for better oiling. You can also see how much was trimmed from the top of the Mondello rod for better rod-to-piston clearance.



This is where the factory injector oil drain hole is located. It can be blocked with an 11/16th cup plug, as shown here.