

Bigger Isn't Always Better, and Mondello's 307 Olds Proves the Point

BY CHRIS HEMER Photos by the Author

GIANT KILLER



Here's an old adage that says, "The engine doesn't

know what brand it is," meaning that with the proper modifications, one engine can perform as well as another.

To a certain extent this is true, but if you try to treat a 307 Oldsmobile like a small-block Chevy for very long, it will most likely tell you what brand it is by scattering the crank, rods and about five quarts of oil all over the road. Happily, Joe Mondello, the master of all that is Oldsmobile, has a cure for for the 307 blues. His patented methods for Oldsmobile performance and reliability have enabled the lowly 307 to produce as much as 75 extra horsepower while still attached to the computer—and over 307 horsepower off of it.

Now, while Joe is undoubtedly the biggest supporter of Oldsmobile products, he will readily point out the little Old's shortcomings. Among other things, the crankshaft and main webs are weak, and the cylinder heads

CAMSHAFT GUIDE On the Computer					
CAMSHAFT NUMBER	INTAKE LIFT	EXHAUST LIFT	ADVERTISED DURATION, INT.	ADVERTISED DURATION, EXH.	LOBE CENTERS
JM-14-100	.432	.445	248	260	112
JM-16-18	.472	.488	256	260	112
RH-6-14	.517	.517	250	256	110

The RH-6-14 roller hydraulic cam can be used in the early 307 engine by installing Mondello RT 685 roller hydraulic lifters, SK-245-DSS spring kit, #CS120-7 cam spacer, #GS125 cam gear spacer and a TB-740-7 cam thrust bumper. Conventional hydraulic cams (JM-14-100 and JM-16-18) can use the stock valve springs.

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CAMSHAFT NUMBER	INTAKE LIFT	EXHAUST LIFT	ADVERTISED DURATION, INT.	ADVERTISED DURATION, EXH.	LOBE CENTERS
JM-16-18	See above for specifications		260	266	112
JM-18-20	.488	.496			
RH-6-14	See above for specifications		258	266	112
RH-14-22	.533	.535	262	262	108
RH-22	.517	.517			

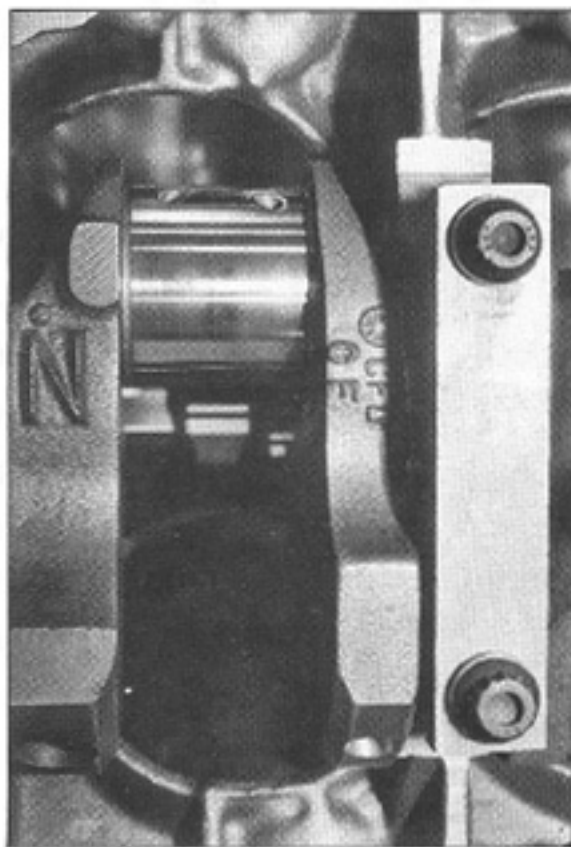
RECOMMENDATIONS

Any of these camshafts can benefit from the use of either an all-steel half-inch pitch timing chain set (TS 455) or a Cloyes true roller TR252 timing chain set. Use either SAR 485 adjustable steel roller rocker kit, or #7200 adjustable aluminum roller rockers. If using an '86 or later roller cam engine, it is recommended that you use the better flowing '80-'85 3317-5A heads, along with an Edelbrock Performer intake manifold. Mondello recommends that the factory Quadrajet carburetor and HEI distributor be modified by Brad Urban's Carburetor Shop. These last two changes can be good for up to 40 extra horsepower, but be sure to include your camshaft specifications.

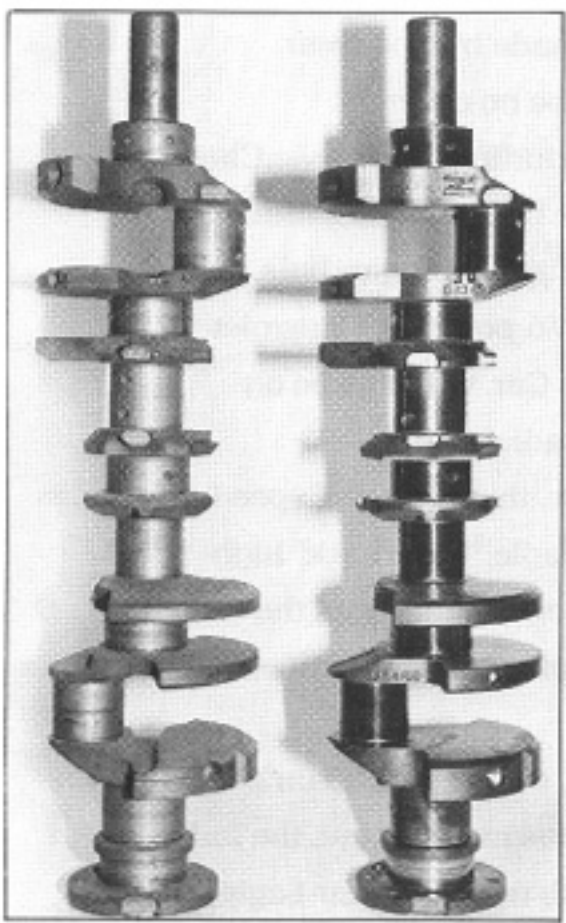


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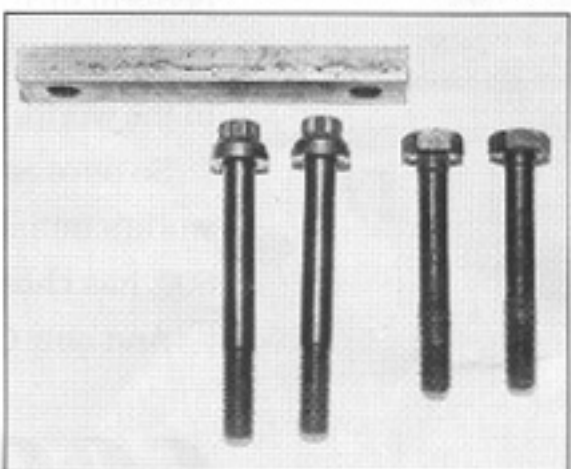
could definitely use some help. So why would you want to use the 307 in the first place? Because if you are running your car on the computer, the 350, or other engines, won't work with it—and disconnecting the computer is illegal for street use. Those of you who are going racing with a 307 will find that, once properly prepared, it is a very reliable, economical engine. So without further delay, let's find out what makes the 307 tick—and what can stop it from ticking. **FR**



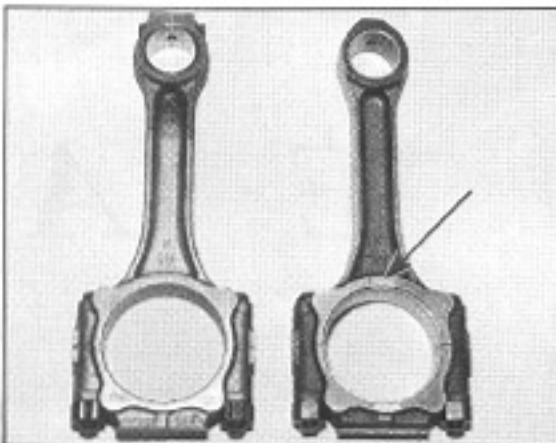
The nodular iron 350 Olds crankshaft is easily identified by the large "N" at the front. Notice the ST950 main cap strap and bolts in place.



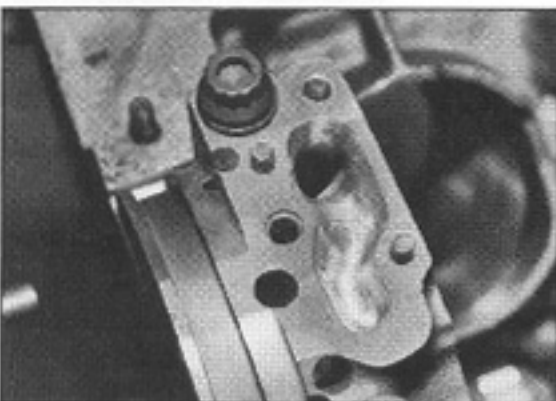
One of the weakest links of the 307 engine is the lightweight cast crankshaft (left). Mondello cures this problem by installing a heavy-duty nodular iron 350 Olds crankshaft, which will drop right in with no modifications. This crank is fine for high-performance street duty on the computer, but for racing, the crank should be cross-drilled, chamfered, heat treated and micro polished, like the crank on the right, number 6120. For bearings, Joe recommends Speed-Pro Vanderell bearings, #4005 (rod) and #4025 (main). **50/JUNE '90**



Here you can see the R307 oil restrictors ready for installation in the 307 engine, and the scalloped (windowed) main webs that allow too much crankshaft flex. While the webs can't be replaced, the problem can be remedied by installing main cap straps, (ST950) which will provide 50 percent more strength.



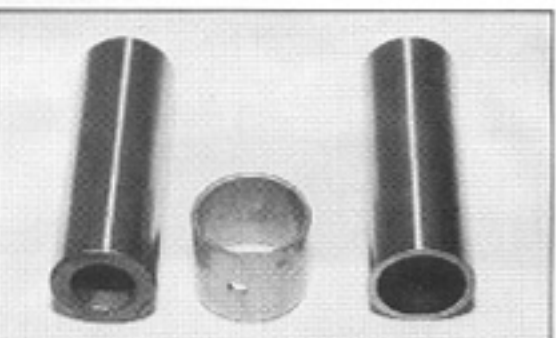
With the addition of high-strength bolts and nuts (RB200) the forged, full-floating factory rods are more than strong enough for street use (left), but for racing, the rods should be beam-polished, shotpeened, side ground and side notched to ensure better oiling. New wrist pin bushings can be obtained from Mondello under #PB307.



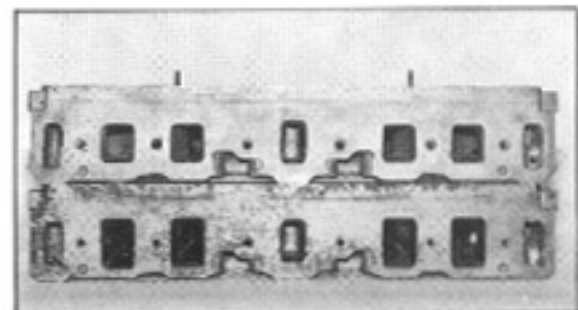
The stock oiling system can benefit by rear main cap grinding and polishing for maximum oil flow. Stock engines use a blueprinted, high-volume oil pump with the stock pan, while race applications use the high-volume, high-pressure pump with 3/4-inch bolt-on pick up, and OP805 seven-quart pan.



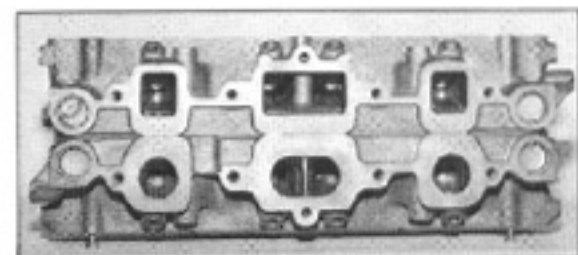
Compare the stock 8.5:1 ratio piston to the #2280 Mondello silicon forged 9.5:1 piston that is over 100 grams (782 gr. vs. 678 gr.) lighter than stock. For an even lighter-weight piston, use a #2270 tool steel pin, which will shave the weight down to 597 grams. This piston is available in .010 and 0.030-inch oversizes, and should be used with Speed-Pro plasma moly rings, #9985 (file fit) or #3010 (pre-fit, for stock rebuilds).



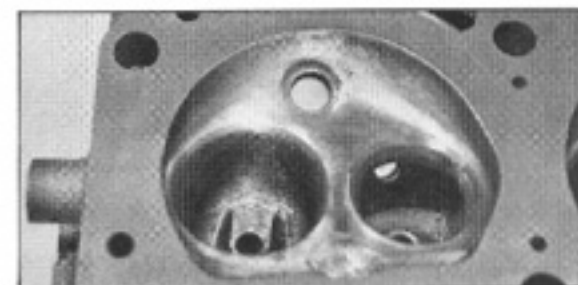
Stock, thick wall wrist pin on left, OEM replacement wrist pin bushing (center) and Mondello super light wrist pin on right.



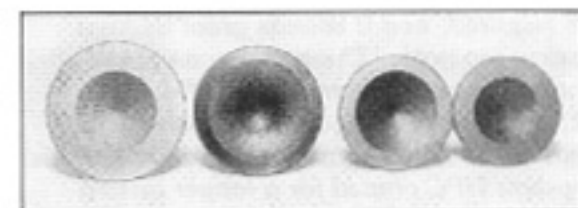
The top cylinder head is a 1986 swirl-port casting, #0142-7A. Due to the swirl configuration, flow decreases dramatically above 4300rpm. Compare its small intake ports to the '80-'85 3317-5A cylinder head (below) that has larger intake ports, and will readily accept aftermarket manifolds. Don't try putting 350 heads on the 307, because the chambers are much bigger and will overlap the bore.



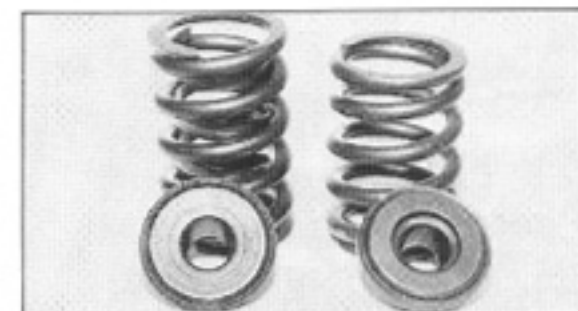
Here, the difference in exhaust ports is immediately evident. The top 1980-'85 3317-5A has a better flowing square exhaust port, while the '86-and-up 0142-7A has a round exhaust port.



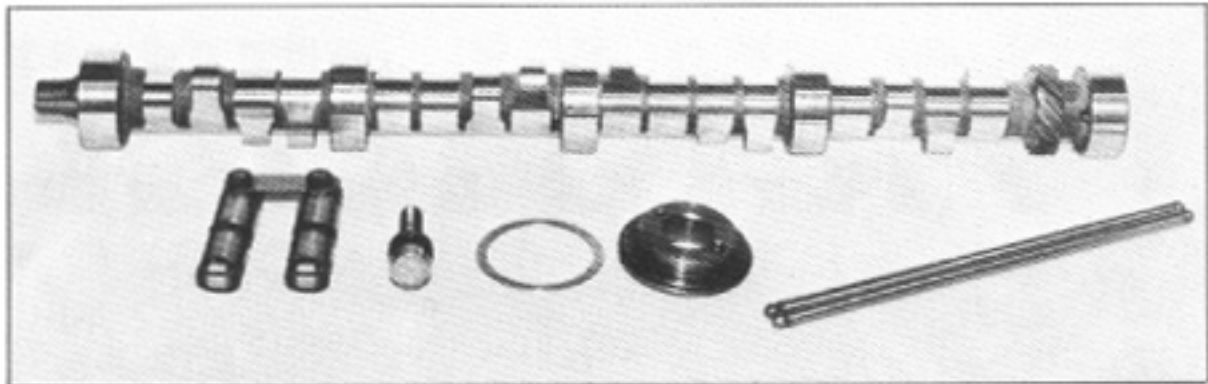
Mondello-prepared 3317-5A cylinder head for off-computer applications. Notice the larger valves, ported intake and exhaust valve pockets, guide work, EGR bump removal and polished chambers.



If you're racing your 307 off the computer, then oversize valves are highly recommended. Left to right are the oversize 1.875 intake valve; 1.750 OEM intake valve; oversize 1.562 exhaust valve, 1.500 OEM exhaust valve.



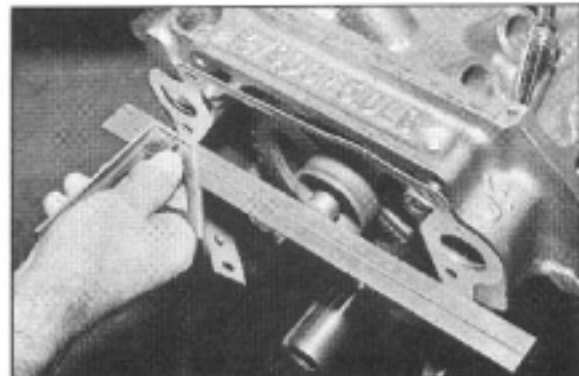
Mondello has two different valve spring/retainer combinations to choose from. Left is part #SK245-D with chrome-moly retainer, and right is #593—offered as a spring only, to be used with stock rotater retainer.



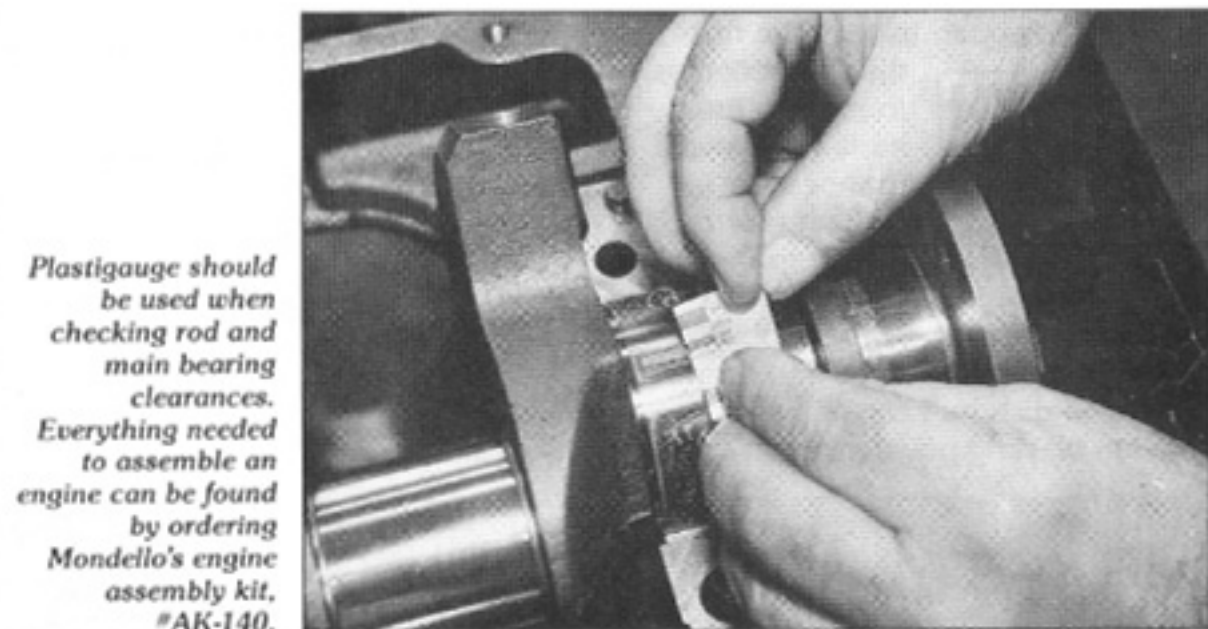
This is a complete RH-series roller hydraulic camshaft conversion for the early '80-'85 non-roller engines. These engines have a regular hydraulic cam with a lifter bore diameter of .842, and have casting #3161-5A. The pushrods are $\frac{3}{16}$ -inch diameter with a $\frac{1}{8}$ -inch ball end. Installation of 350 Olds pushrods and rockers can be made, but only if made together, because the 350 has a $\frac{1}{8}$ -inch ball end and is not compatible. Engines that are '86-and-up are casting #4790-5.0-LG and have a .921 diameter lifter bore. You may install a late-model roller cam in an earlier 307, but the lifters will not fit, so Mondello roller hydraulic tappets #RT685 must be used with a pushrod that is .500-inch shorter than stock. When using the OEM roller cam, the stock pistons must also be used, because the duration of a stock cam is so short that the added compression of the forged piston will give the engine too much compression to run on pump gas.



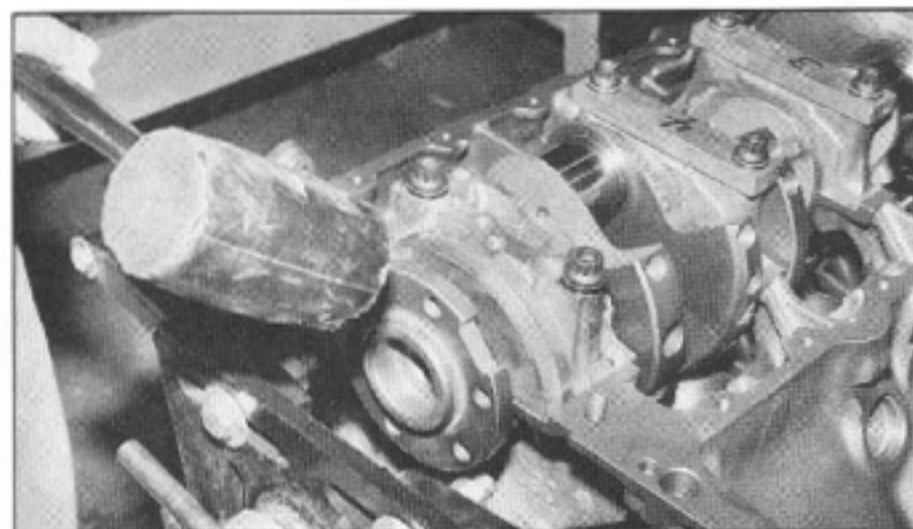
When performing a valve job on any Olds engine, a Mondello valve stem height gauge (#HG-455) is very important for correct rocker arm geometry and hydraulic lifter preload.



Checking camshaft end thrust clearance using the Mondello CS-120-7 cam spacer, GS-125 cam gear spacer and the TB-740-7 camshaft thrust bumper in place. These pieces will eliminate any camshaft walking.



Plastigauge should be used when checking rod and main bearing clearances. Everything needed to assemble an engine can be found by ordering Mondello's engine assembly kit, #AK-140.



Always tap the crankshaft front and rear with a large rubber hammer to center the thrust bearing. First, tighten the mains to 40 pounds, and tap them. Then 60; tap again, then 80; another tap; then tighten the rear main to 100 pounds.