

PROJECT

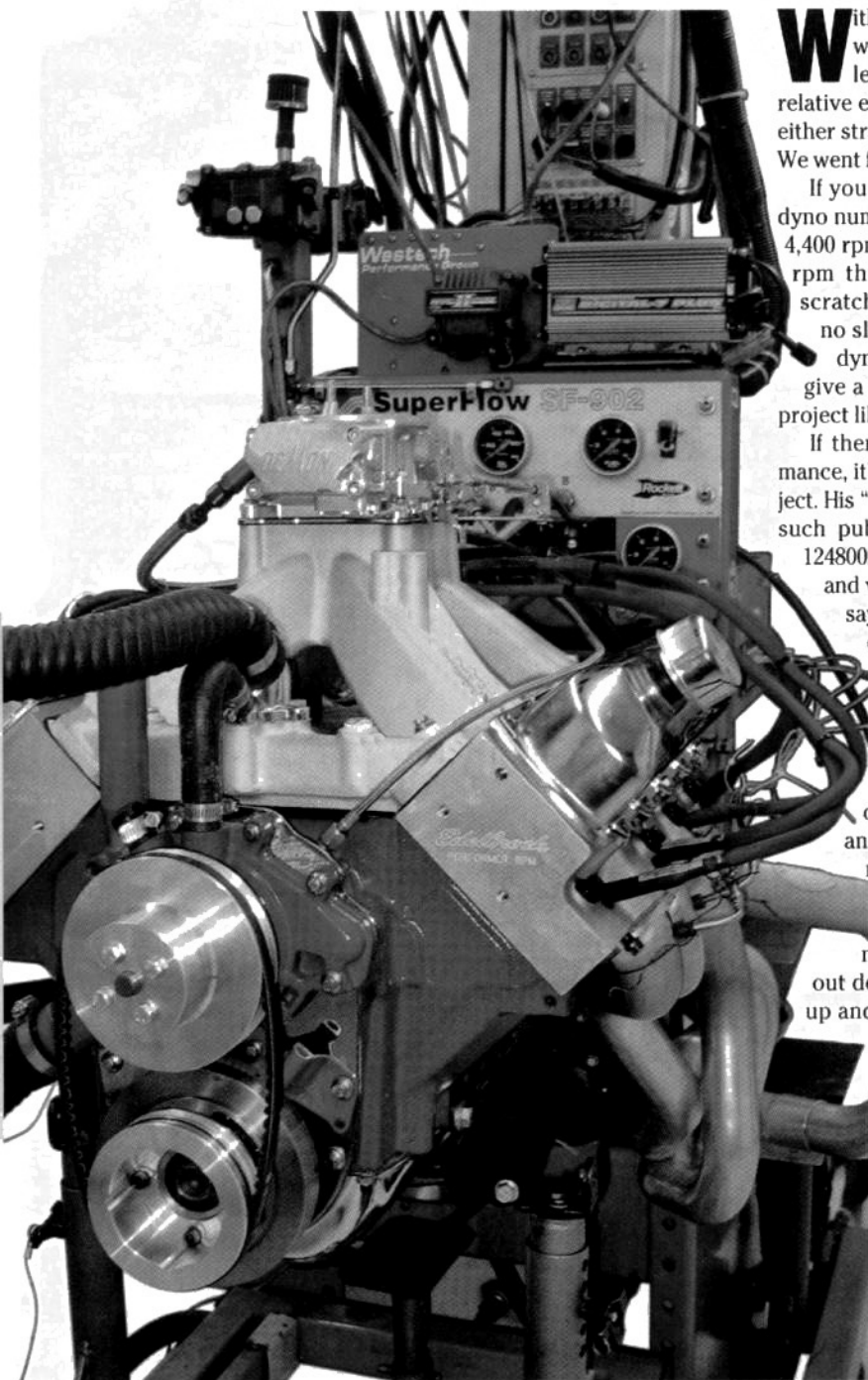
THE MONDELLO MONSTER

by Christian Hazel

photography: Courtesy of Mondello Performance Products and Christian Hazel

Murderous Overkill

Part VI



With a name like Project Murderous Overkill, did you think we were gonna puss out on the engine? The Olds 455 is legendary for its huge grunt, oozing character, and its relative ease to find in the junkyard. It makes a great performer either straight out of the four-door luxo barge or totally built-up. We went for the latter.

If you tuned in last issue, you saw our naturally aspirated dyno numbers of 544 hp at 5,700 rpm and 568 lb-ft of torque at 4,400 rpm with more than 500 lb-ft of torque on tap from 3,400 rpm through 5,700 rpm. With a Zex nitrous system, we scratched at 700 hp and 770 lb-ft of torque, so our combo is no slouch. (Editor's note: check www.jpmmagazine.com for dyno videos.) It may seem sycophantic, but we've got to give a big shout out to a few companies that really make a project like this come together successfully.

If there's one name synonymous with Oldsmobile Performance, it's Joe Mondello. He literally wrote the book on the subject. His "Oldsmobile V-8 Technical Reference Manual" is the only such publication to actually carry a GM part number (PN 1248002027), and 40 years ago, he blueprinted the oiling system and valvetrain for the Oldsmobile Motor Division. It's safe to say there's no better place to go for competent Olds knowledge and experience. Nowadays, Joe is semiretired, so we hooked up with the general manager of Mondello Performance Products, Lynn Welfringer, for an Olds big-block combo that would rattle the world when we line up at the bottom of a dune or the quarter-mile.

Competition Cams is constantly at the forefront of technology, testing and analyzing profiles, grinds, and combos. The company and its subsidiaries strive to maintain the highest-quality standards and are always looking for new and unusual ways to eke out more power with little to no trade-offs (the Zex perimeter nitrous plate is a good example). Yet they do this without degrading customer service. Curly Schmo can still call up and order a custom-grind camshaft and have it no later than a big-name engine builder.

Finally, Edelbrock is a huge supporter of American hot rodding, not only in its broad range of applications (the company has everything from Cadillac to Chevy to Buick covered), but most impressively, Edelbrock still maintains its manufacturing right here in the USA. A privately held company, the Edelbrock family invests in its employees, its product, and its country, dammit!

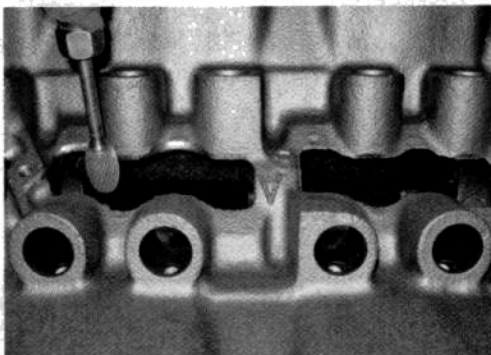
Read on for our Olds Pro Street combo that will serve our '48 Willys pickup dutifully, scare small children with open exhaust, and strike fear into the hearts of the import nation.

Project Murderous Overkill, Part VI

BLOCK PREP AND MACHINING

When choosing an Olds core, the 455 will have "396021 F" or "396021 Fa" cast in the front of the block between the manifold and the water pump. Sonic checking is required to overbore out to 0.120-inch, but Mondello simply cleaned up our block with a 0.060 cut before expertly honing the bores.

Mondello performed its Block Blueprinting process, which opens up the oil holes and returns, smooths any rough edges that hamper oil flow, and installs its oil restrictors.

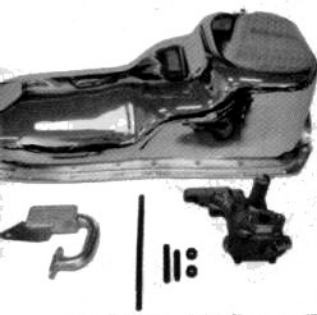


OILING SYSTEM

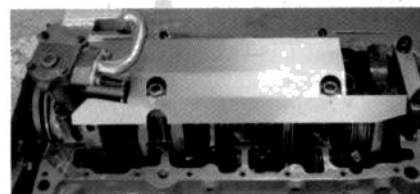
Like most luxury-car-sourced V-8s, the Olds oils the valvetrain first, then the bottom end. It's good for the doctor who didn't want to hear valvetrain clatter in the morning on the way to the hospital, but bad for high-rpm and performance use. Mondello knows all the tricks to keep an adequate supply of oil downstairs for the main and rod bearing.



Part of its Block Blueprinting process, Mondello installed its oil restrictors (PN R104) in the center hole of the No. 1, 2, 3, and 4 main bearings. These are the oil holes leading to the cam bearings, and restrictors here keep oil downstairs.



We picked out the Trans Dapt stock replacement chrome pan, but we'll need to swap it out because its 5-quart capacity was sucked dry on the dyno by Mondello's monster high-pressure/high-output oil pump (PN SP765) with 1/2-inch pickup. The pump delivers more gallons per minute than any other pump out there and needs a pan with at least 6 quarts. We'll either be swapping to a 10-quart marine pan or will run a 3-quart Moroso oil accumulator with the Trans-Dapt pan.



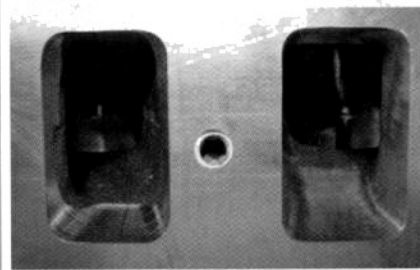
Windage robs power and can interrupt oil flow, so Mondello installed its hand-fitted, full-length alloy steel windage tray (PN CT850). The tray must be fitted and filed to maintain a 0.060-inch gap from the rotating components and fits all but Tornado oil pans.

CYLINDER HEADS

Edelbrock came on the scene with a vengeance a decade ago with its line of Performer, Performer RPM, and Victor series aluminum cylinder heads for nearly every brand of modern American V-8. The Performer RPM Olds heads are a much-improved design compared with even the best factory castings. The Edelbrock heads feature 2.07-inch intake and 1.68-inch exhaust valves, springs good for cams up to 0.575 lift, 77cc combustion chambers, relocated plug locations, and out of the box they flow a minimum 258-cfm intake/183-cfm exhaust at 0.600 valve lift. Mondello takes a great head and makes it better.



Mondello installed its PN SK700-700 valve springs for use with our solid roller cam. The springs were set to 250 pounds on the seat at 1.750-inch height. Also, Mondello's Posiflow 2.075-inch intake and 1.685-inch exhaust valves went in as part of its CNC valve job. The Mondello valves are swirl-polished, back-cut, and feature other proprietary tricks for improved flow. The combustion chambers were polished and slightly reshaped and smoothed (left).



The intake and exhaust ports are also treated to some CNC cutting as part of Mondello's valve job (right) to improve the flow numbers by 35 cfm as compared with out-of-the-box heads. The new port window matches the wide mouth of Mondello's Posi Flow intake gaskets.

ROTATING ASSEMBLY

Mondello upgrades components few builders even think of, from the use of its neoprene rear main seal (PN MS160) in lieu of the factory rope type or inferior aftermarket rubber seal to cryogenically treating the rotating assembly. The result is a bottom end well equipped to handle more than 750 hp.



Mondello's main stud and strap kit (PN MS ST942) has provisions for the company's windage tray. The chromoly straps and ARP studs increase bottom-end rigidity and strength for big power levels.



Mondello's cryogenically treated crankshaft (PN 6130) is made of 5340 nodular iron and is good for a conservative 750 hp. The cryogenic treatment triples the parts' longevity.

Like the crankshaft, Mondello's gorgeous H-beam rods (PN JM-HB455) are cryo-frozen and are good up to 950 hp. Naturally, they feature ARP studs. The rods are 4130 chromoly and are a floating pin design for use with our custom 0.060-over Ross pistons. The flat-top Ross pistons, along with block decking, bring our compression ratio right to 10.75:1. The Akerly & Childs Xtreme Moly piston rings are a double-twist design and will easily handle nitrous use.



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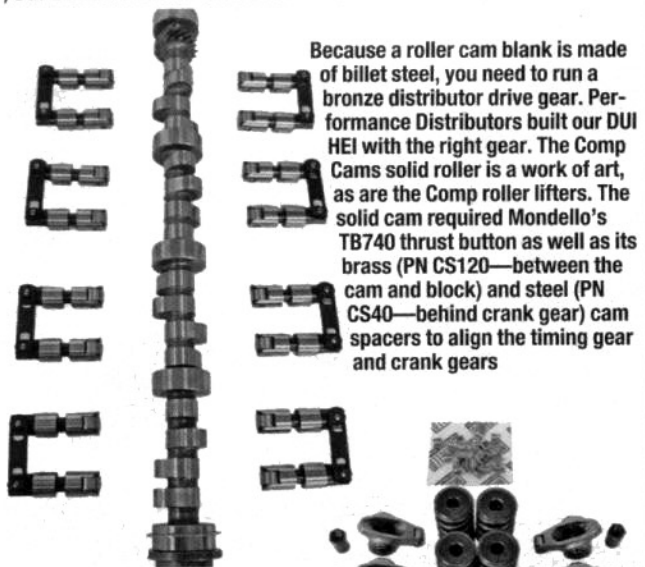


Mondello suggested its BHJ billet dampener (PN 8088) and SFI-approved Inertia flywheel (PN OL1210-FW). Olds engines are neutrally balanced, so the whole rotating assembly was balanced to NASA tolerances.

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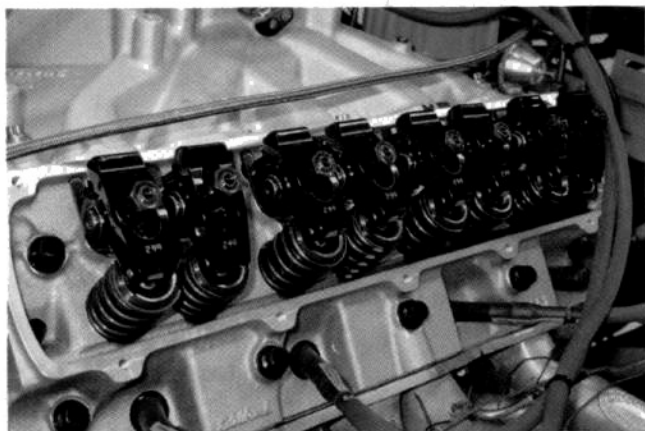
VALVETRAIN

One area in which an experienced outfit like Mondello's paid big dividends is in the camshaft selection. Thankfully, companies like Comp Cams and Mondello aren't married to the convention that off-road guys simply need to stab in a little RV cam and enjoy off-idle torque. We're about power too. The Comp Cams billet solid roller was ground to Mondello's specs quickly and sent out the door in plenty of time for assembly and dyno schedules. Ground on a 110-degree lobe separation, the 268/276 at 0.050-lift cam features 0.640/0.649 lift and really brings out the upper-end power with hardly any bottom-end penalty. Believe in your builder. That's the bottom line.



Because a roller cam blank is made of billet steel, you need to run a bronze distributor drive gear. Performance Distributors built our DUI HEI with the right gear. The Comp Cams solid roller is a work of art, as are the Comp roller lifters. The solid cam required Mondello's TB740 thrust button as well as its brass (PN CS120—between the cam and block) and steel (PN CS40—behind crank gear) cam spacers to align the timing gear and crank gears.

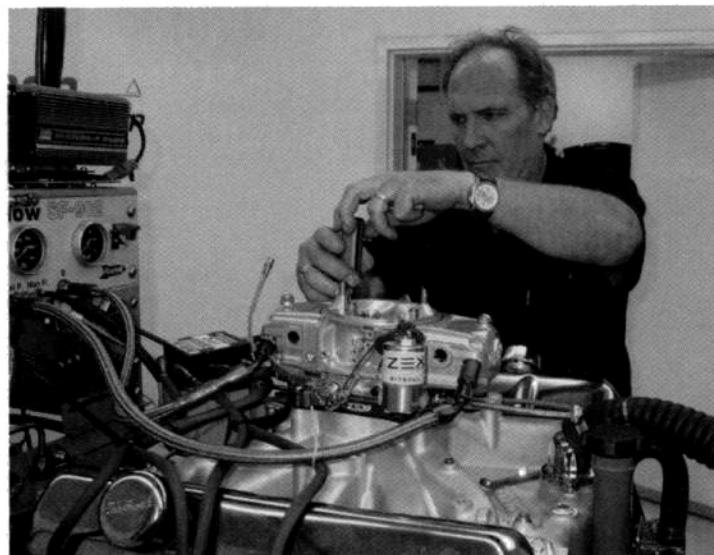
Mondello's 1.6:1 ratio adjustable roller rockers (PN JM455) are chromoly and are built to withstand incredible abuse. The springs and keepers were necessary due to the cam's monster lift (see heads section).



Once the engine was assembled, Mondello measured for pushrod length, then sent its measurements to Comp Cams, which quickly built and shipped a set of high-quality 4130 pushrods out the door. With lift numbers this high, valvetrain-component quality becomes critical. High spring pressures can bend inferior components, wear down poor-quality cam lobes, and just plain blow stuff up. We're more than confident in the quality of our Comp Cams pieces.

INDUCTION AND SPARK

Although we pushed Welfringer for specifics, we were unable to learn much more than the Edelbrock Torker manifold (PN 2730) underwent Mondello's proprietary blueprinting process. In a nutshell, the intake was port-matched to the cylinder heads using Mondello's gaskets and the plenum and ports were reworked to increase flow—a lot. Mondello also port-matched the Edelbrock Victor manifold (PN 2810) that we tested on Westech's dyno. The Victor was too macho for our engine, proving it needed even more compression, camshaft, and rpm to be happy. The Mondello-modded Torker proved to be an absolutely perfect match for the rest of the combo.



We caught Westech's Steve Brule wrenching on our Zex nitrous system. Note the Performance Distributors DUI HEI for reliable use up to 8,500 rpm. The distributor was delivered with the correct bronze gear for use with our billet cam, and the advance curve was dead on based on our cam and compression specs.

Mondello Pro Street 455 Build Sheet

Displacement: 468ci
Bore x stroke: 4.185 x 4.250 inches
Compression ratio: 10.75:1
Rod length, center to center: 6.735 inches
Piston deck height: 0.002-inch
Chamber volume: 77cc
Rod bearing clearance: 0.025-inch
Crank endplay: 0.004-inch
Piston-ring end gap: 0.014-inch (top), 0.018-inch (middle), 0.025-inch (bottom)
Piston-to-wall clearance: 0.005-inch
Camshaft type: Comp Cams solid roller
Valve lift: 0.640-inch (int.), 0.649-inch (exh.)
Duration at 0.050: 268/276 degrees
Lash (hot): 0.020-inch
Lobe separation: 110 degrees
Valve spring (seat): 250 pounds at 1.750-inch