

Oldsmobile Engine Build - Millennium 403

Dick Miller Builds A Challenge-Worthy Olds

By Scott Parkhurst

We've written on these very pages about the untapped potential within the 403 Olds. We've also made a point to state how the one major weakness of this otherwise decent performance block has been their windowed main bearing webs, which don't have much strength to support big power. But big power is a relative term, and the lesser Olds may not be down for the count as badly as many people think. Certainly, there are new technologies that have changed the way we think about the 403 and we'd like to tell you about them.

Is 599 horsepower on pump gas enough power for you? We think so, and we feel this particular engine was worthy of documenting. Yes, the Jeg's Engine Masters Challenge is over, and yes, this engine did participate and it did not win. It was not even the highest-finishing Oldsmobile entry. However, it was, by far, the smoothest-running engine in the entire competition. It wanted to idle far below 1,000 rpm, and it was difficult to even tell it was running just by watching it during the Challenge dyno tests.

For these reasons, we wanted to show you this engine. We felt no other entry could have shown itself as a better, more honest street engine, and the fact it was based on the common 403 Olds was all the convincing we required. Dick Miller built one hell of a good street engine, and it's one we'd love to have under the hood of our daily drivers. Check out the build, and know that plenty of smooth power in a truly usable rpm range is the result of these efforts. It's a cool build, and we're proud to share it.

In case you're wondering, the engine you see here--which is built to race strength standards despite being a pump gas bullet--will set you back about \$13,000, depending on options. That price includes the forged steel crank and billet Oliver rods, but you can have the very same thing for the street (with identical horsepower output) for around \$9,000. The street version of Dick Miller's 403 Olds uses a 350/403 cast-iron crank and forged Oliver rods. If that's too rich for your blood, Dick sells the parts separately, so you can build a 403 yourself as time and finances permit. If you're a true died-in-the-wool Olds fan, that's a bargain. We can't wait to see what Dick cooks up for next year's EMC!



The rotating assembly in this engine looks as good as it works. The pistons, Oliver 6-inch rods, and crank were all coated by Polymer Dynamics (PolyDyn). The crank was treated to lightening, knife edging, and was machined for 2-inch diameter rod bearings. Then, it was chromed (for increased smoothness and less overall drag on the bearings) by Crankshaft Specialist. The crank and rods received PolyDyn's oil shedding coating for less drag and weight while



The cam is a custom solid roller ground by Comp Cams (.730/.704-inch lift, 253/256 degrees duration @ .050 on a 107 degree LCA). Dick felt the engine could have used a larger cam. This one ran best with valve lash at .010-inch on the intake side, and .012-inch on the exhaust. With 107-degree lobe separation, the cam was installed with 3 degrees of advance. Dick asked us not to print all the cam specs, since such things are proprietary



The crankshaft began life in a 330-inch Olds, but went through some changes before ending up at the Jeg's Engine Master Challenge. What a life it's led! The chromed-and-coated piece was machined to a stroke of 3.385-inches. Many feel the 330 steel cranks are too rare, but Dick always seems to have a few on hand. He's also got SFI-certified flywheels drilled in 330 and 425 Olds bolt patterns.

spinning. The piston pins, piston skirts, and all bearings were coated with PolyDyn's dry film lubricant to minimize friction. The piston tops received a thermal barrier coating to improve heat retention in the aluminum-headed cylinders.



The cylinder heads atop the DMR 403 are the new Olds offerings by Bulldog Performance. We saw Bulldog's Cadillac big-block heads do well in last year's Challenge and were happy to see their Olds units here this time...



There's so many great new parts to see here. Small-block Olds fans should rejoice at the introduction of the Edelbrock Victor single-plane intake manifold for the small-block Olds (PN 2812), seen here teamed with the new Bulldog heads. A combo like this had never been available before, but now these great new parts can be had by anyone with the desire and the dough. Also of note in this picture are the roller rockers (by Comp Cams) in 1.6:1 ratio. Sharp eyes will also note the valve springs got a dose of PolyDyn anti-friction coatings too! Have you ever seen a 403 so cool?

among Olds enthusiasts. As with all the components shown, these parts can be purchased at Dick Miller Racing. This particular camshaft design is part of a new crate engine program from DMR.



...If the performance of the 403 is any indicator, Olds fans will be happy to see these new heads! We like the line-of-sight intake port design, the efficient D-port exhaust port, and the efficiently-designed combustion chamber...



...Again, the coatings are by PolyDyn and these aren't the way the heads ship! This set was worked over by Mike Stark before the chambers and exhaust ports got the thermal barrier treatment.



Degreeing in the Comp Cams bumpstick was made easier by using Dick Miller's own DMR-5002 drilled cam degree tool. This is only one of several custom tools Dick has crafted up to make assembling an Olds easier and more effective. We wanted to show you this one in particular, and if you build Olds engines, it oughta be in your toolbox.

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GETTING DYNO READY

aPrior to the Jeg's Engine Masters Challenge competition, Dick only had two days to dyno-tune this engine (seen here at Southern Performance prior to the Challenge). Without testing a wide variety of parts, we must commend Dick on the performance of this particular engine. As we stated

previously, it was by far the smoothest running mill we tested. We can't wait to see how it does once it finds a home on the street.

As far as the rest of the combo goes, the carb was by The Carb Shop and was developed to produce a very linear fuel curve. The distributor was also by the Carb Shop, and was a DUI HEI unit with their unique adjustable knob. This locking knob (not seen in the photo) allowed for easy timing changes and is calibrated so a complete 360-degree turn is worth a total of 2-degrees of adjustment. It allowed Miller to fine-tune on the fly, compared to other competitors who had to go through much more labor to fine-tune their timing and waste precious time. He also ran a Mezeire electric water pump, Melling oil pump, and Total Seal Gapless rings. You can clearly see the BHI neutral-balanced damper for less rotating weight.

DICK miller 403 oldsmobile dts dyno results		
RPM	TQ	HP
2500	419.6	199.7
2600	425.3	210.5
2700	429.2	220.6
2800	432.2	230.4
2900	432.1	238.6
3000	428.9	245.0
3100	425.3	251.0
3200	419.4	255.5
3300	410.9	258.2
3400	406.4	263.9
3500	409.9	273.2
3600	417.5	286.2
3700	429.1	302.3
3800	443.6	321.0
3900	459.0	340.9
4000	475.8	362.4
4100	489.1	381.8
4200	499.3	399.3
4300	508.0	416.1
4400	515.0	431.1
4500	518.0	444.1
4600	521.0	456.7
4700	524.0	469.1
4800	527.0	481.9
4900	529.0	493.7
5000	530.0	505.0
5100	531.0	516.0
5200	530.0	525.0
5300	528.0	533.0
5400	527.0	542.0
5500	526.0	550.0
5600	523.0	558.0
5700	521.0	565.0
5800	518.0	572.0
5900	514.0	577.0
6000	510.0	582.0
6100	505.0	587.0

6200	500.0	590.0
6300	495.0	594.0
6400	489.9	597.0
6500	484.0	599.0
