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THE 2010 AMSOIL/MOPAR MUSCLE ENGINE CHALLENGE

INSIDE THE TOP TWO SMALL-BLOCKS

OF THE 2010 DYNO CONTEST

TEXT: DAVE YOUNG PHOTOS: DAVE YOUNG AND RANDY BOLIG

It's no secret that it takes a well thought out combination to win the AMSOIL/Mopar Muscle Engine Challenge, especially since each year we change the rules a bit, featuring a different popular Mopar powerplant. Each year our dyno competition is held at Comp Cams' Memphis, Tennessee, facility, and this year's contest featured the Chrysler small-block, featuring the new "X" casting cast-iron cylinder heads from Racing Head Service (RHS). We allowed the engines to rev high this year, eliminating the upper rpm limit, and all of the engines were judged by the same basic standard, horsepower per cubic inch.

For the second year in a row, Schurbon Engine and Machine won our annual contest, this year with a somewhat unconventional 340 cubic inch de-stroked small-block Mopar. Engine builder Scott Schurbon used some sharp rules interpretation this year, finding advantages that allowed his team to win the close contest. Each year our competitors find areas in the rules where they can gain an advantage, and this year Scott Schurbon will be the cause of more than one rule revision for next year's contest. We congratulate Scott for his win, making a dominant 1.504 hp per cubic inch, and we look forward to seeing him in next year's contest.

Promax Performance brought a bullet this year, earning second place in the dyno contest by making impressive power with their .030 over 340. Engine builder Ben Gorman has always brought strong reliable engines to our competition, but this year they pushed the limit with a big Comp solid roller camshaft and nearly 12.5:1 compression. The Promax entry performed well on Comp's dyno, making over 500 hp for a 1.452hp per-cubic-inch factor, nearly as much as the first place entry of Schurbon. This month we'll go inside both these powerful small-blocks, showing you what's inside the top two finishers in the 2010 AMSOIL/Mopar Muscle Engine Challenge.



◀ As the returning champion, and drawing the first dyno session of the contest, the pressure was on Schurbon Engine and Machine. Adding to the drama was Scott Schurbon's decision to attempt a cam swap during the timed period of the contest before the judged pulls.



Once your eyes adjust to the bright color, check out the water pump. The rules said engine driven water pump, but Scott contended it didn't say the pump had to be driven by the engine. (Editor's note—we fixed that glitch, Scott.) And the fuel pump? If you look closely you'll see it's routed to the crankcase, drawing a vacuum and allowing lighter tension rings.



We're not sure if Scott Schurbon wasn't satisfied with his cam choice, or if the team did it just to prove they could, but Schurbon Engine and Machine pulled off a cam swap with their engine on the dyno in under an hour, a first in AMSOIL/Mopar Muscle Engine Challenge history.



Bob Siegwarth and Larry Griffith worked with Scott Schurbon to complete a cam swap with enough time for their three judged pulls afterward. Though power was initially down, the team swapped intakes and added ignition timing for a best judged pull of 511.3 horsepower.

SCHURBON ENGINE AND MACHINE MAQUOKETA, IOWA

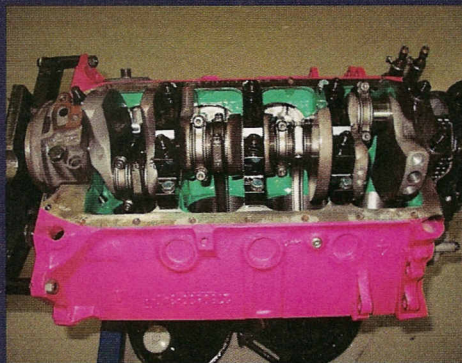
◀ We enjoy all of the competitors who've entered our annual dyno contest and have learned from all of them, but one engine builder who pushes rules scrutiny to the limits is Scott Schurbon of Schurbon Engine and Machine in Maquoketa, Iowa. This year Scott read the rules carefully, deciding that with the cast-iron RHS cylinder head and horsepower per cubic inch determining the winner, that a 340 cubic inch displacement engine would be the best choice. Additionally, in order to fit larger valves in the heads without cylinder wall interference or valve shrouding, he de-stroked the small-block to 3.250 inches and over-bored the cylinders to 4.080 inches. The result was a small-displacement

engine with enough bore size to really let the RHS cylinder heads flow properly, as demonstrated by the nearly 525 hp this 340 made during a qualifying pull.

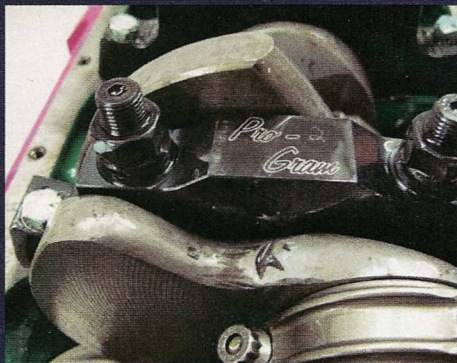
As the first contestant Monday morning, all eyes were watching Schurbon Engine and Machine as the team bolted their engine on Comp's dyno. Causing controversy right off the bat, Scott Schurbon mounted an electric motor to drive his water pump, though the rules read "crankshaft driven water pump." Scott's claim that his was a "crankshaft-driven" water pump held up since technically it meets the criteria of the way the rule was written, and since the rules didn't say it has to be driven by the engine (look for a revision next year). Next, Scott and his team began bolting on an engine-driven mechanical fuel pump, initiating a

barrage of "you know the dyno has a fuel pump" comments. As the team continued it became apparent that this was going to be used as a vacuum pump, drawing negative pressure on the crankcase to help seal lighter tension piston rings.

During the inspection of the Schurbon entry, we noticed that while this engine wasn't exotic by any means, it did utilize some really cool tricks to make power. To achieve a stroke of 3.250 inches, Scott trusted the crank grinding to Denny at Abraham's Machine. Rodger Friedman of Dyers Rods provided the remanufactured connecting rods, and Steve Christof assisted with the RHS heads, offering the use of his Superflow 600 flow bench. Rick at CP provided their Bullit series forged pistons for a compression ratio of more than 12:1.



Starting with a factory Chrysler 340 block, Schurbon bored the cylinders to 4.080 inches and offset-ground the factory crankshaft to 3.250 inches for a displacement of exactly 340 cubic inches.



Pro-Gram Engineering billet steel main caps and studs were utilized to beef up the bottom end, adding strength to the already sturdy small-block Mopar.



CP's Bullit line of forged pistons was utilized, as well as remanufactured Dyers forged H-beam connecting rods, resulting in a light-weight, strong rotating assembly.

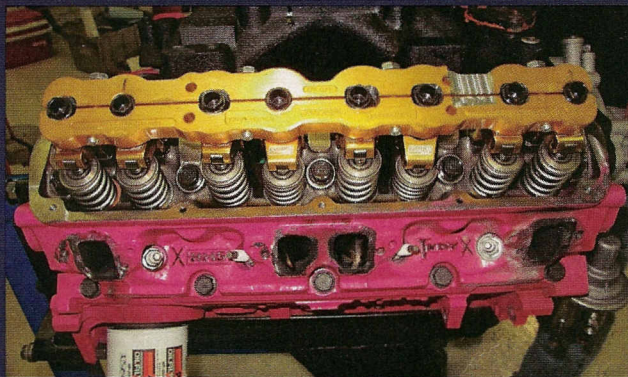


The real tricks employed by Schurbon Engine and Machine were in the RHS/Indy X cylinder heads. After completely porting



the cylinder heads, they were treated to some trick components. By resizing a set of second-hand, tita-

anium valves that had been used in a Winston Cup engine, Scott took considerable weight from the valvetrain. The small, 7mm titanium retainers, springs, and locks were utilized as well, keeping weight to a minimum for high-rpm stability. The small diameter of the seven millimeter valve stem and smaller valveguide means there's less space in the port taken up by the stem and guide, leaving more area for air and fuel to travel.



Comp Cams 1.6 ratio aluminum roller rocker arms were utilized, along with a stud girdle for extra support. This top end provided the necessary flow for the Schurbon 340 to make well over 500 hp on every pull, at a somewhat leisurely 7,200 rpm. We wonder what kind of power this engine could make if designed to really rev . . .

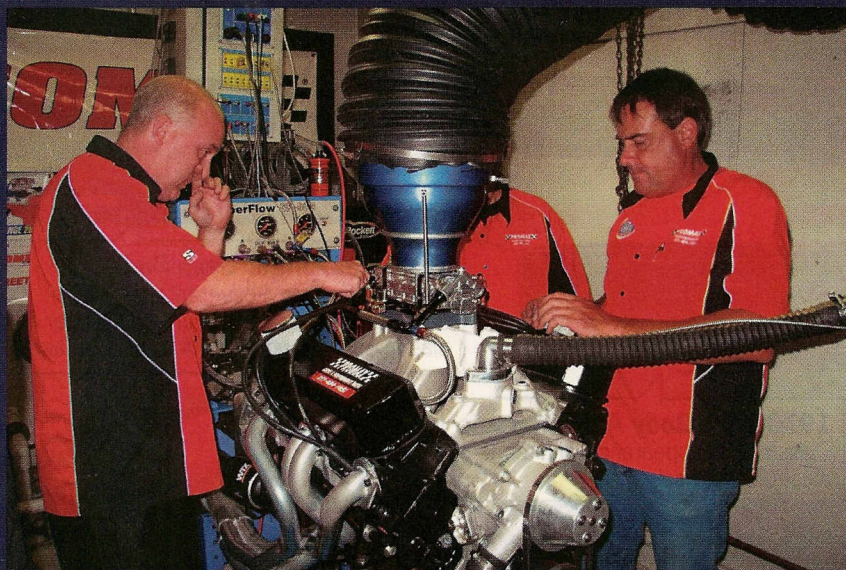


We congratulate Schurbon Engine and Machine for earning the top spot in the AMSOIL/Mopar Muscle Engine Challenge two years in a row. Be sure to watch a future issue for a complete list of parts and dyno chart for each of the engines in our competition.

Scott says winning a competition like this requires a good team, and he couldn't have built this engine without the help of Gary Myer, Conner, Dusty Nielson, and all of the Schurbon Engine and Machine employees. He thanks them for their

help acquiring parts and performing the necessary labor. Comp engineer Chris Padgett worked with Schurbon on both solid roller cam choices, coming up with cam grinds to complement Scott's use of lightweight, 7mm, used Winston Cup

titanium valves, springs, and retainers. Using a Holley 1,000-cfm carb, Indy single-plane intake, and MSD ignition, this engine's best pull of over 511 hp netted Schurbon Engine and Machine the winning score of 1.504 hp per cubic inch.



◀ Promax Performance brought a stout small-block to this year's contest, scoring a second place finish as the last engine to run in an exciting 2010 challenge.



Known for their professionalism and customer service, Promax Performance drew the last dyno slot during the 2010 contest. All eyes were on this engine as it made nearly 500 hp on its first dyno pull, hoping for the upset win.



The Promax Performance small-block was ready to run, having been dyno-tuned in house, and only needed minor tweaks for optimum performance in Comp's dyno cell. All eyes were on Promax as they tried to close the gap and win the contest. Making more power with each pull, their best pull netted 500.4 hp for a factor of 1.452 hp per cubic inch.



Inspecting the Promax Performance 340, the quality of this engine was apparent. Starting with a factory 340 block and crank, engine builder Ben Gorman paid attention to every detail, using high-quality parts throughout.

PROMAX PERFORMANCE INDIANAPOLIS, INDIANA

Located in Indianapolis, Indiana, the racing capitol of the world, Promax Performance started as a carburetor shop, but has evolved into a full-service engine shop as well. No newcomer to our contest, engine builder Ben Gorman didn't hold back for this year's competition, calculating that the best combination would be the 340 small-block, and pushing the limits of Rockett Brand's 93 octane fuel with 12.4:1 compression. On the dyno at Comp, this little 340 sounded stout, and as the last engine to run, it was the only one left that could upset Schurbon.

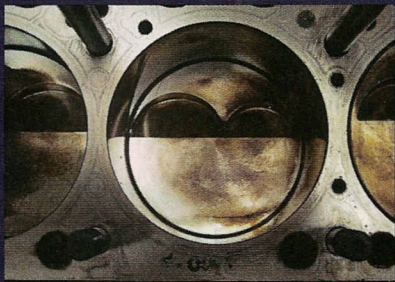
On the dyno at Comp, the Promax 344.6 cubic inch 340 sounded crisp when it fired up, making everyone wonder if

this small-block could contend for the win. While warming up the engine for its first pull, speculation was running rampant, and once dyno operator Rich Smith threw the handle, the little engine delivered, making nearly 500 hp. By making ignition timing and carburetor jet changes, Ben and his team attempted to achieve enough power for the win, finding more than 500 hp to earn a second place finish with 1.452 hp per cubic inch.

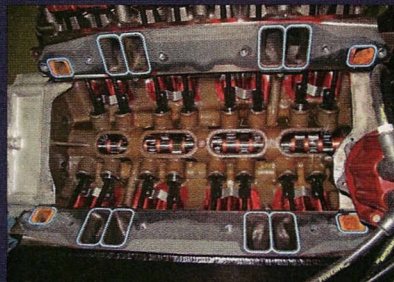
Once the Promax engine had cooled and been pulled off the dyno, we tore it down, making sure it complied with the rules and checking out what was inside. As a foundation, Promax used a factory Chrysler 340 block and forged crankshaft, combined with forged H-beam connecting rods and forged flat-top pistons, for a

final compression ratio of 12.4:1. No real oiling system tricks were utilized, just a solid system consisting of a Milodon pan and windage tray, combined with a Melling high-volume oil pump.

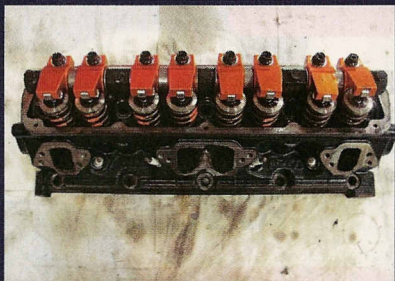
Topping the solid bottom end, Promax ported their RHS cylinder heads, installing stainless steel valves with Comp springs and hardware. Harland Sharp shaft mounted aluminum roller rocker arms were utilized for their proven reliability, keeping the valves stable at high rpm. For induction, a Promax prepped Holley 4150 series carb was installed atop an Edelbrock Super Victor single-plane intake manifold. This engine is a nice piece and well-deserving of a second place finish for Promax Performance in the 2010 AMSOIL/Mopar Muscle Engine Challenge.



Using forged internals where applicable, flat-top pistons were chosen to give a compression ratio of 12.4:1, testing the limits of the 93 octane Rockett Brand unleaded gasoline.



For maximum power, Promax chose a Comp solid roller camshaft with Comp roller lifters. Though more expensive, roller camshafts are proven to make more power than flat-tappet cams.



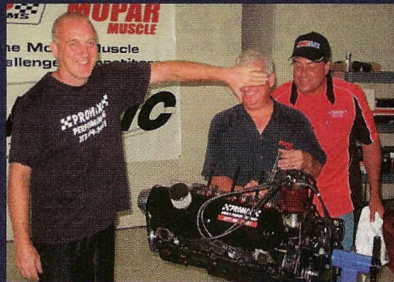
Promax ported the RHS heads for maximum flow and fitted them with stainless steel valves. Comp valvesprings and Harland Sharp shaft mounted rocker arms were utilized as well.



For maximum combustion chamber seal, Promax chose Cometic multi-layer steel (MLS) coated gaskets with a compressed thickness of .025 inch. Even in boosted or nitrous applications, we've found the Cometic gaskets to seal well and last indefinitely.



Our rules called for a 4150 style carburetor, so Promax prepped one in-house for their contest engine. An Edelbrock Super Victor intake manifold was the choice of most competitors.



Despite the kidding around, there was nothing illegal in the Promax Performance entry, and nothing to be ashamed of either. This is a strong 340, built with quality parts, and would be a fun engine in any street car or bracket racer.



◀ We congratulate Promax Performance for their strong second place finish in the 2010 AMSOIL/Mopar Muscle Engine Challenge. Be sure to watch future issues to see a complete parts list for each of these engines. **MMI**



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