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S&M PERFORMANCE SERIES

HEMI POWER 'SHAFTS

Putting COMP's Hemi Grinds to the Test

By Steve Dulcich

Chrysler's latest line of Hemi engines is a worthy successor to the legendary status of the Hemi of yore. Not convinced? If the performance of the new powerplant isn't enough to get your attention, get the wrenches out and you'll find the mother lode of easy power. We did, and judging by the numbers, the Hemi is in a league of its own in terms of small-block power. We've been on the dyno plenty with traditional small-block engine packages, and if the criterion is making power from production-based engines, the

Hemi is a force to be reckoned with. The stock power output just hints at the potential within.

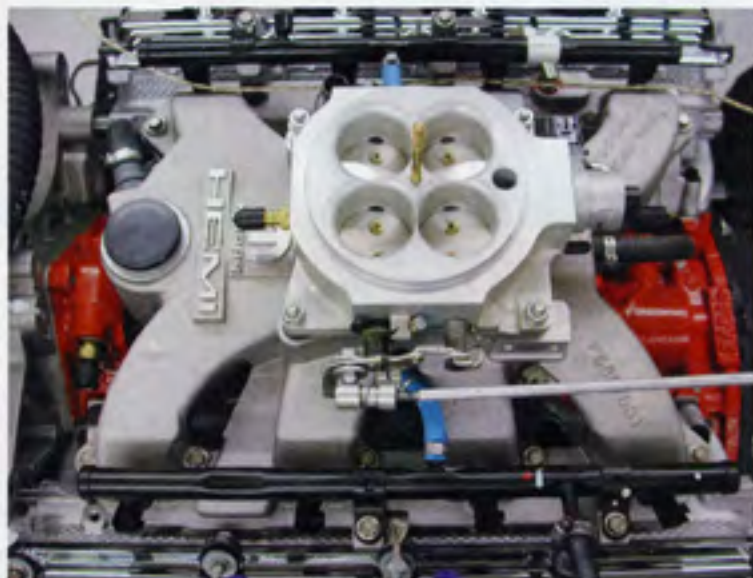
We had the opportunity to tap into some of that hidden potential, thanks to the excellent line of XFI cams being ground at COMP Cams. These are not radical Pro Street race grinds, mind you, rather hotter grinds aimed squarely at street performance, with duration numbers ranging from a conservative 208 degrees, to a moderate 224 degrees; hardly the type of wicked 'shafts that will rattle your teeth. It didn't take a crystal



COMP Cams has a line of hydraulic roller cams from their XFI lobe profiles for the new generation of Hemi. As luck would have it, we had a Mopar Performance 5.7 crate on the pump to see for ourselves what they were worth.



Our test engine is a Mopar Performance crate engine, based upon the truck 5.7 Hemi, with some changes to make it suitable for retrofit application. The engine is available in either an MPI fuel-injected version, such as our test engine, or equipped for a four-barrel carburetor. Mechanically, the engine assembly is straight production, with the exception of a unique cast-aluminum intake manifold. The engines are shipped with production truck exhaust manifolds and cams.



A closer look at the intake manifold reveals a single plane layout, with a centrally mounted throttle body. The induction is aimed at making the engine more adaptable in retrofit applications. The four-barrel carbureted intake shares the same basic layout.

...all to predict that the Hemi would be hungry for the extra
...ft and duration, with its stingy factory cam spec'ing out at
...a meager 196 degrees duration at .050. What was shock-
...ing was just how much power and rpm was waiting to let
...go. We closed dangerously near the 500 hp and 7,000 rpm
...mark with the largest of these sticks—astounding really,
...considering the modest 9.6:1 compression ratio and 346
...cubes. There's power to be had with this Hemi engine,
...maybe more than you bargained for.



Baseline testing the crate engine in totally stock form netted peak power numbers of 376 hp at 5,700 rpm, and 372 lb-ft of torque at 4,600 rpm, at STP correction factor. Not bad! We figured since we were going to run some hot cams through the engine, we'd first address the exhaust situation by ditching the factory log manifolds.



TTI makes these beautiful 1 $\frac{1}{4}$ -inch full-length headers, designed to fit a new Hemi into a conventional A-, B-, or E-Body chassis. The headers were worth big dividends in power and torque, raising the bar to 393 hp at 5,700 rpm, and 390 lb-ft at 4,700 rpm. With this baseline of nearly 400 hp with the production cam still in place, we were ready to look for even more with the COMP cams.

CAM SPECIFICATIONS:

	Stock/Crate	XFI 260	XFI 268	XFI 273
Duration at .050 inch	196/196	208/212	216/220	224/228
LSA	113	113	113	114
Design Intake Centerline	124	113	113	117
Lift Intake/Exhaust	0.477/0.462"	0.522/0.525"	0.528/0.531"	.547/.550"



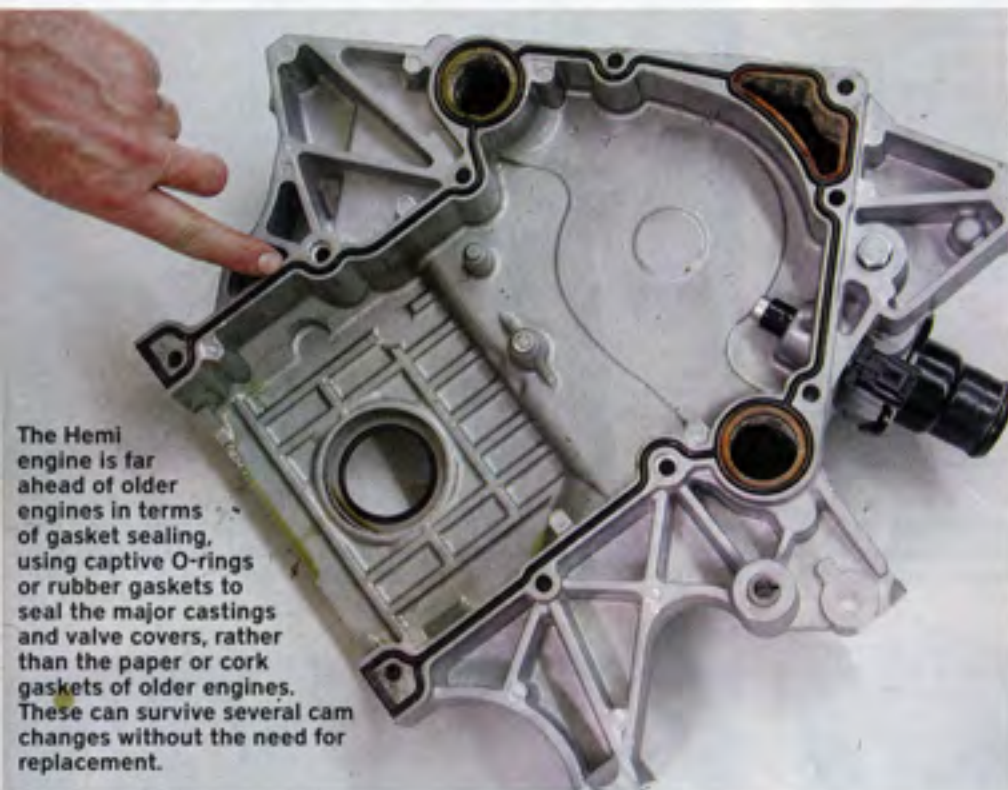
One additional change was required before we could run the cams, and that had to do with the engine management system. The Mopar Performance controller is tuned perfectly for the Crate as-delivered, and the supplied harness plugged in and wired up with minimal effort, allowing the engine to be hooked up and fired with ease. It is not readily programmable, however, for the serious modifications we had in mind. We needed full control over the fuel and spark curves, as well as a much higher rev limit to really get the most of our new cams.



With the help of fuel injection guru Tom Habrzyk, we swapped to a FAST XFI system, which is fully programmable and tunable. FAST has a dedicated Hemi controller and harness system available.



How do you change cams in the new Hemi? Actually, it is one of the simpler engine designs to work with. Begin by removing the crank damper and timing case casting up front, and the valve covers up top.

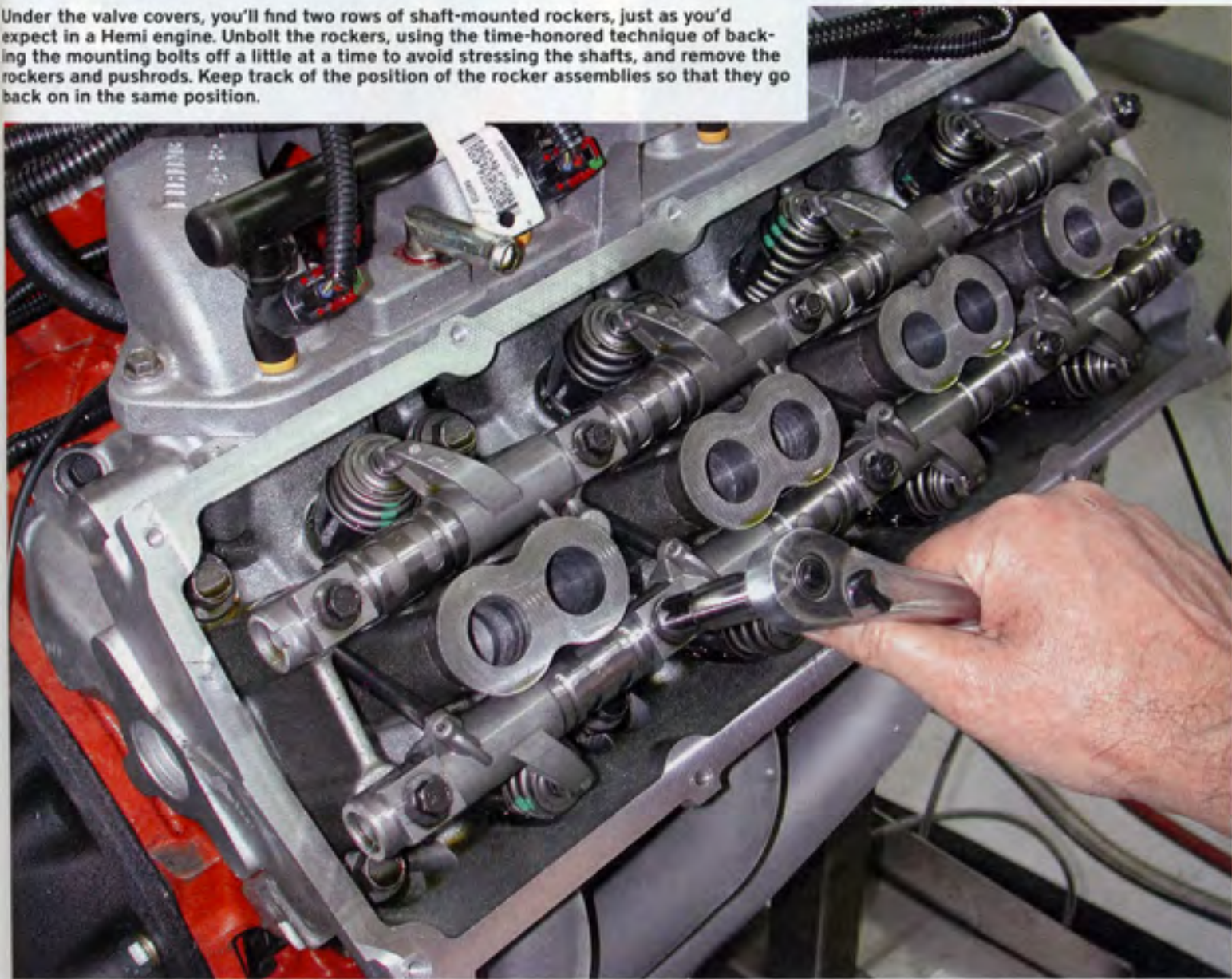


The Hemi engine is far ahead of older engines in terms of gasket sealing, using captive O-rings or rubber gaskets to seal the major castings and valve covers, rather than the paper or cork gaskets of older engines. These can survive several cam changes without the need for replacement.



Rotate the engine over to line up the timing marks of the cam and crank gears, and then remove the cam drive gear. The sheetmetal wheel attached to the cam gear signals the cam position for the ECU.

Under the valve covers, you'll find two rows of shaft-mounted rockers, just as you'd expect in a Hemi engine. Unbolt the rockers, using the time-honored technique of backing the mounting bolts off a little at a time to avoid stressing the shafts, and remove the rockers and pushrods. Keep track of the position of the rocker assemblies so that they go back on in the same position.





Behind the cam gear is the tensioner assembly, which also serves as the thrust plate for the camshaft. It can be unbolted and removed to gain access to the cam. The timing chain is captive due to the front crankshaft-mounted oil pump, and can be just draped over to the side, out of the way.



At this point, the factory cam could be slipped out, and the replacement cam carefully slid into position. We started with the smallest of COMP's offerings for the Hemi, the XFI 260 (see spec chart).



There is no need to pull the intake manifold or lifters with the Hemi engine. Just rotate the cam in the bore through several turns, and the lifters will be retained in the up position away from the lobes by the guide/retainers.



Reassemble the cam drive by realigning the timing marks and bolting on the cam gear. The timing chain tensioner has a provision to be pinned back, relieving the chain tension to ease the installation. From here, it's just nuts and bolts to reassemble the engine, and it's ready to run.



We were rewarded for our efforts with substantial power gains, even with the smallest of the cams tested. We scored 424 lb-ft at 4,800, and 443 hp at 62-6,500 rpm. That's a gain of 50 hp and 34 lb-ft with the smallest of the COMP Cams.

SOURCES

COMP CAMS
800-999-0853
www.compcams.com

FAST
877-334-8355
www.fuelairspark.com

MOPAR PERFORMANCE
www.mopar.com

TTI EXHAUST
951-371-4878
www.ttiexhaust.com



Back in for round two, we opened the Hemi again to install the midrange cam, the COMP XFI 268. This cam proved to be a real sweet runner, making for a very nice balance of idle quality and all-out power. Power was up another 20 hp to rate at 463 hp, while torque output was little changed recording 423, but peaking at a higher 5,000 rpm.

Our Martini shot of the day came with the installation of the biggest of our trio of cams, the XFI 273. While it's the largest cam tested, it is relatively mild in specs by the standards of brawny street cams, measuring a comfortable 224/228 degrees duration at .050. Power proved the potential lurking in the Hemi, recording a blistering 491 hp peak at a jaw-dropping 6,900 rpm, while torque checked in at 417 lb-ft at 5,000 rpm. Does Mopar's little Hemi have muscle? With nearly 500 hp on tap from a stock engine with a street cam and headers—oh yeah! **EM**

DYNO RESULTS

ENGINE MASTERS CAM TEST SUPERFLOW 901 ENGINE DYNO STP CORRECTION FACTOR

TORQUE

RPM	STOCK	XFI 260	XFI 268	XFI 273
2,500	368	374	363	345
3,000	360	394	387	363
3,500	364	399	395	377
4,000	375	410	410	397
4,500	385	418	418	411
5,000	387	422	423	417
5,500	370	411	417	415
6,000	338	387	398	409
6,500		360	374	391
6,800		340	360	379

HORSEPOWER

RPM	STOCK	XFI 260	XFI 268	XFI 273
2,500	175	178	173	164
3,000	206	225	221	208
3,500	243	266	263	251
4,000	286	312	312	302
4,500	330	356	358	352
5,000	368	401	403	397
5,500	387	431	437	434
6,000	385	442	454	467
6,500		446	462	484
6,800		440	466	491

