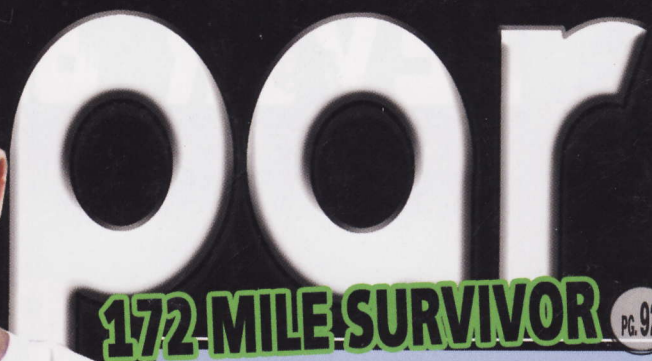


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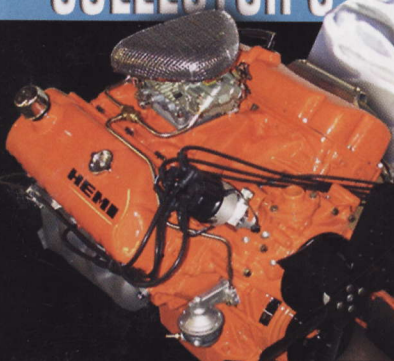


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A279

ARRUZZA BRINGS THE

EXPERIMENTAL

Those of us old enough to remember the late 1970s (we'd dare say the majority of our readers) can well remember what a dark period that was for Chrysler. In the midst of higher gas prices, high interest rates, and a terrible recession, Chrysler found itself in dire trouble making cars that hardly anyone wanted. Compounding the problem was a terrible lack of quality control, which sent Chrysler spiraling toward bankruptcy as the decade wore on. By late 1978, Chrysler's financial woes were national headline news. In a desperate frenzy to raise capital, Chrysler sold everything that was deemed surplus and could be sold. At that pivotal point in the company's history, there were three complete A279 experimental Hemi engines sitting in one of Chrysler's warehouses in Detroit. There were no buyers for what we



ABOVE: WHEN THE MOTOR ARRIVED FROM LANDY'S IT LOOKED GREAT, BUT WAS FAR FROM RUNNING CONDITION. HERE YOU SEE THE RESULT AFTER COUNTLESS HOURS AND DOLLARS.

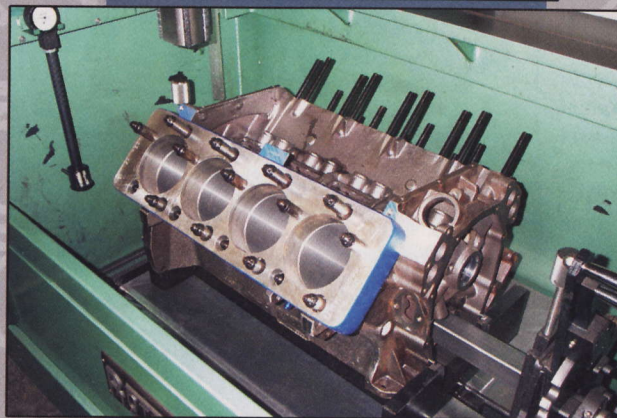
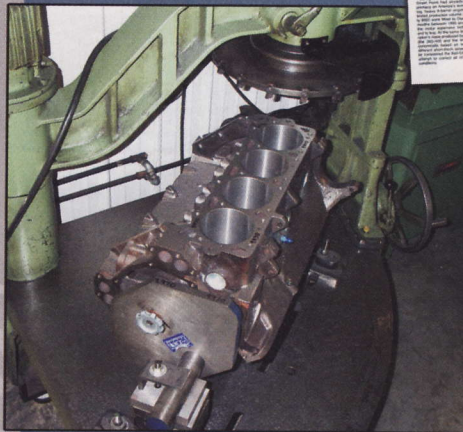
BALL STUD HEMI TO LIFE

HEMI

now refer to as the Ball Stud Hemi, so the result was that these historic engines were sold as scrap for around five cents per pound. Wouldn't you like a time machine? Had it not been for the intervention of Chrysler exec Dick Maxwell, there might not have been any surviving examples of the company's efforts to improve the 426 Hemi. Literally in the eleventh hour, once he found out what was happening, Maxwell requested that one of the engines be placed aside for himself. That one engine was the only A279 Hemi to survive.

Dick Maxwell's initial plans for this lone surviving A279 Hemi called for its installation in a T-bucket street rod. That never occurred. Instead, Maxwell gave the engine to Dick Landy in California for further development and possible use in one of Landy's drag cars. That never happened either. As a matter of fact, nothing at all happened with the twisted chamber Hemi for many years. It sat, a very heavy curiosity, in Landy's shop until it was requested for display at the Walter P. Chrysler Museum in Detroit. Landy obliged, loaning the engine to the W.P.C. Museum, where it remained on display for several years. Only the truly hardcore Mopar fanatics ever appreciated what they were looking at, however.

Through the years, noted Hemi expert and engine builder John Arruzza had kept a sharp eye on the A279 motor and had been bothering Landy to sell him the engine for the better part of a decade. Finally, in 2004, Landy agreed and called up the W.P.C. Museum to get his engine back; they didn't want to let it go. It took three months of sometimes heated conversations to get the engine out of the museum and back to Landy's shop. Once back in California, the engine was crated up carefully and shipped to Arruzza's shop in North Carolina. John finally had what he has always considered the Holy Grail of



THE ORIGINAL PISTONS FOR THE BALL STUD HEMI ARE REMARKABLY CLOSE TO BOSS 429 PIECES. THE ORIGINAL CAST CRANK WAS FOUND TO BE DAMAGED SO RUSS FLAGEL PULLED SOME STRINGS AND HAD CALLIES MAKE THIS CUSTOM FORGED UNIT FOR JOHN.



Hemi engines.

It may come as a bit of a surprise to many readers, but this historic A279 canted chamber Hemi had never left the launching pad, so to speak. Tom Hoover and his crew did extensive work on the A279 project with sights set on this being the next generation Hemi, but that work came to an abrupt halt when the factory pulled the plug on most all of its racing activities in 1971 and decided to withdraw from the performance business. As such, this sole surviving example had only run briefly on a dyno, and probably only turned a crank for a matter of minutes in its whole life.

Arruzza, having built over four hundred street and strip Hemis in recent years, knew he wouldn't be satisfied with merely having the historic piece as a paperweight.

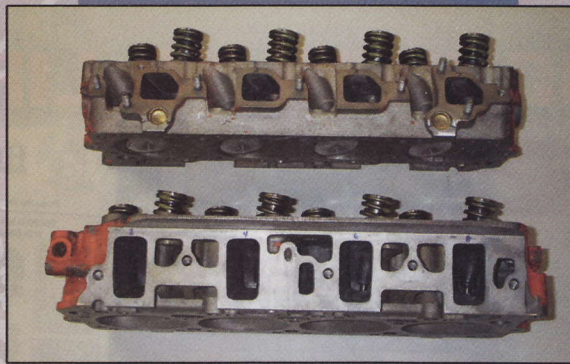
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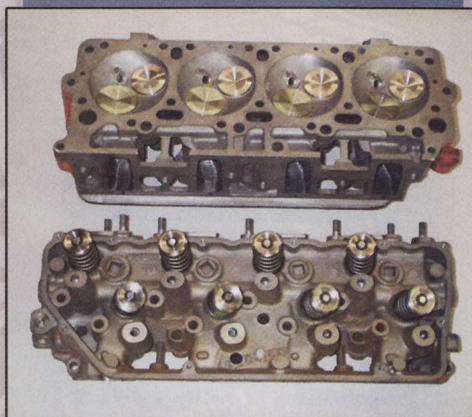
The twisted chamber concept deserved to be brought to its conclusion and Arruzza was just the guy to do it. Of course, his close relationship with Hemi godfather Tom Hoover didn't hurt either, nor did the first-hand accounts of the development work Hoover and company had done on the engine. Within twenty-four hours of getting the A279 in house, John was convinced he could get this long-dead monster breathing fire. John tore into the museum piece, boldly going where most engine builders would've never dared to tread. And anyone who knows John Arruzza knows he's not the kinda' guy who's going to tackle something like this without the goal of making a boat load of horsepower.

The initial problem for John was one which shall be an on-going problem for the rest of his life - there are no parts for this motor. Since it is the only surviving example of an experimental engine, this isn't something you can sit down and order up components for. John had to plan on making everything himself in order to accomplish his goal. Head gaskets, intake gaskets, exhaust gaskets, everything would have to be made from scratch. The original crankshaft was found to be a stock steel 440 3.75 inch stroke unit, but it was damaged, so John bid the crank goodbye. Russ Flagel of Indy Cylinder Heads pulled some strings and had Callies make a custom one-off forged steel crank with a 4" stroke and a 2.2" Chevrolet rod pin size and a Hemi eight-bolt flange. John decided to go with only an extra 1/4" stroke because he didn't want to notch anything. Since this is the only surviving block of this type, John didn't want to make any mistakes or ruin history forever.

Some changes were unavoidable. Thanks to decades of sitting around, one cylinder had a significant amount of rust on its walls. A .030 overbore was required to clean up the cylinder, which resulted in an engine with a final dis-



**MANLEY CUSTOM MADE NEW
STAINLESS 2.250 INTAKE AND 1.940
EXHAUST VALVES FOR THE PROJECT**



placement of 481 cubic inches. John kept the compression ratio to a very streetable 9.6:1 in order to run on pump gas. Ross made custom Boss 429 pistons for the A279 engine; yes, Ford Boss 429-type pistons are remarkably close to the original pistons used in the engine. The rods are Manley 6.60 length steel H-beam units rated at over 850 horses. The original intake was retained but completely reworked for plenum volume and a Holley double pumper. The intake originally held a Carter Thermoquad, but there was no way John was going back with the junky plastic spread bore carb. An 800 cfm blueprinted Holley from AED of Richmond, Virginia, was deemed the ideal replacement.

John reworked the intake ports on the heads and a lot of work went into improving the exhaust ports, as this was an area where not much progress had been made before the plug was pulled on the A279 project. Having done this, the exhaust manifolds needed extensive reworking inside to mate up to the new exhaust ports. John punched out the exhaust manifolds to the max with a careful eye on not altering their appearance or structural integrity.

One of the problems with the A279 engine was that the intake ports were actually much better than those found on the 426 Hemi, but the exhaust ports were notably lacking in flow. John put a lot of work into remedying this troubling problem. Cam Motion custom ground a new cam for this engine with extra duration on the exhaust side to help



**THESE
BALL ROCKER
STUDS ARE WHAT
THIS HEMI GETS
ITS NICKNAME
FROM!**



**THE ROCKERS, STUDS, AND GUIDE
PLATES ARE TOTALLY UNQIUE TO THIS MOTOR.**

in moving the spent gasses out. Manley set to work custom making valves for the engine to John's specs. The new stainless valves are 2.250 intake and 1.940 exhaust, which is the same size as those found in a stock Street Hemi. Titanium retainers were used to help guard against valve float. Since the rockers on the unique heads are not adjustable, John went with a hydraulic cam.

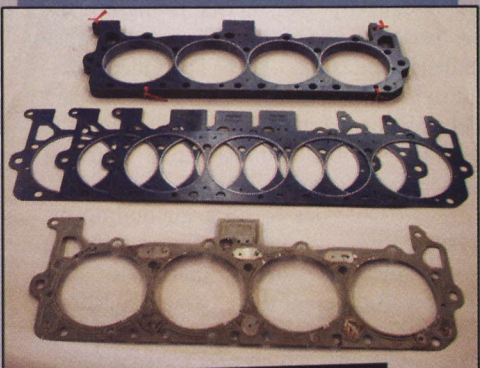
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JOHN PORTED THE UNIQUE EXHAUST MANIFOLDS FOR OPTIMUM PERFORMANCE



DESPITE BEING ORIGINALLY DESIGNED FOR A SPREAD BOARD THERMOQUAD, JOHN USED AN ADAPTER TO RUN AN 800 CFM HOLLEY FOR MORE HORSE POWER.



NOTHING WAS EASY ON THIS MOTOR BUILD. EVEN THE GASKETS HAD TO BE CUSTOM MADE.

**NEXT MONTH IN MCG THE BALL
STUD HEMI HITS THE ROAD.
ARRUZZA BOLTS THIS POWER PLANT
INTO TOM HOOVERS '69 'CUDA**

The rockers and gear atop the heads are unique in the world of big block Mopars. In fact, take the valve cover off and you'll see something you'd expect to see with a Ford or Chevy. The stud has the ball attached, thus making raising or lowering the rocker arm not possible. This has led to the popular nickname these engines took on, being referred to as the "Ball Stud Hemis." This also means you can't change push rod length on the engine. The set of rockers, the studs, and the guide plates are the only ones like this on the planet. Therefore, John took a lot of extra care in prepping these components so nothing would be harmed when the engine came to life. All of the parts were micropolished and radius corrected by Ed Miller at Extreme Microfinishing, and then coated with Casidium by Anatech manager Rex Griffin, which is a space-age procedure that produces a miracle film that literally cannot wear off or come off and eliminates metal-to-metal wear.

The valve covers themselves became a labor of love. The original covers had been battered quite a bit through the years as the motor was bumped around from one place to another. John stripped the steel covers to find a mess under the layers of paint. They needed days of welding and "bodywork" to get them straight again. These valve covers were hand-made prototypes and had a lot of crudely welded up holes to begin with and the engineering team had used a lot of brass to form their corners. After having spent so much time getting them much straighter than they'd ever been to begin with, John couldn't bring himself to paint them crinkle black as one would expect, so he painted them orange along with the rest of the engine, which is 1970 Plymouth Vitamin C Orange.

The original dyno work with the A279 project was done back in 1968 and 1969. John was delighted that most all dated parts on this engine are dated from 1968 and 1969, so it obviously hadn't been meddled with since its last dyno run in 1969. The block itself is very similar to a low-deck 400 block, except that it uses the 440/Hemi main journal sizing. This is the only low deck block John's ever seen that was set up that way. Stamped on the side

of the block is "EX 7", which John was informed meant this was experimental block #7. At the back of the block you'll find, "stress relieve", so John assumes this means the block was stress relieved.

On examining the engine, one of the main problems the program ran into was readily apparent. Since this one had been dyno run by Tom Hoover and the Hemi boys, some wear and tear was expected, but not as much as John discovered. The wear on the relatively low runtime A279 engine was much greater than one would expect, which had a lot to do with the metal-to-metal stress and friction on the valve train. The rocker gear, the push rods, and guide plates showed a notable amount of wear, which would've made these engines extremely short-lived had they made it into production. Likewise, the engine would've been of limited use as a race motor either due to this same problem. Friction and rapid wear are not friends to a high performance engine, so the design team in 1969 knew they were looking at an engine which would suffer failures in a relatively short time. Technology being what it is today, those problems with the A279 have been resolved with the micropolishing and Casidium plating - two things Hoover and his boys didn't have at their disposal in 1969.

In conversation with Tom Hoover, Hoover related to John that the A279 would've been a great high performance street engine had they been allowed to continue working out the bugs. It would've been a lightweight engine compared to the standard 426 Hemi, it had excellent breathing characteristics, it had an excellent combustion chamber design, and swirl fill ports on all eight cylinders filled the cylinders nicely by the nature of their design. The big block Chevy engine has only four swirl port cylinders and four back fill cylinders, thus not giving the engine an equality from cylinder to cylinder. This same problem is common to most wedge-style engines, even Chrysler's own 440 and 426 Max Wedge motors. The twisted chamber Hemi was ahead of its time and more evolution of the program would likely have created a formidable engine design. As it was, Chrysler didn't have the money or interest to continue the research and fell back on the traditional wedge design with existing technology. Once the A279 was pushed aside, nobody ever picked up the enthusiasm for the project again; that is, until John Arruzza became involved.

Three-and-a-half decades after the lone surviving A279 twisted chamber "Ball Stud Hemi" engine last ran on a dyno at Chrysler, the beast is alive once more. In 2006, the legendary engine rumbled to life at John Arruzza's shop, more raucous now than ever and better engineered now than it was when new. Better still, rather than being a stuffed museum piece for the rest of eternity, the historic engine has been placed in a rather historic car, and this one is actually turning tires for the first time in its life. Watch for this one at some of the major Mopar events this summer, and take the time to realize just what you're looking at. As far as we're aware, John Arruzza may be the only human being out there who has a one-off experimental factory built high performance engine in a privately owned car, and furthermore, it's a car that's being driven quite regularly. This is true living history, so pause a moment or two to savor those exhaust fumes; you'll not have the opportunity to see another one of these, and depending on John's busy work schedule, outings for the famous Hemi may be scarce in the coming years.

Congrats to John for pulling off what many enthusiasts thought would be impossible, and double thanks to Tom Hoover for being there when questions arose. Thanks to these guys, an invaluable part of Chrysler's high performance history will be around for the next generation to marvel at. ✖

Ball Stud Thanks List:

- Tom Hoover, the father of the Hemi for his technical assistance.
- Dale Nichols at Nichols Engineering for technical assistance.
- Anatech LTD. for Casidium coating all rocker gear components, push rods, and guide plates.
- Ed Miller at Extreme Microfinishing for micropolishing all rocker gear parts and lifters.
- Russ Flagle at Indy Cylinder Head for the custom special forged crankshaft.
- Ross pistons for the custom forged pistons.
- Manley Performance Products for the custom stainless valves and connecting rods.
- Armin Brown at Best Gasket for the custom exhaust gaskets and intake gaskets.
- Smith Brothers for custom push rods.
- Felpro for the custom head gaskets.
- Chris Leeder for the air cleaner assembly.
- Dick Landy Industries for saving this engine for me for three decades!
- Special thanks to my wife of twenty years, Lois, for not telling me I was crazy to spend more on an engine than it would've cost to have a Superbird.
- Cam Motion for Custom Cam.