



# Mopar

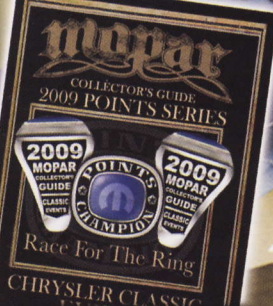
## MOPAR COLLECTOR'S GUIDE

### THE '71 DEMON S/S CAR THAT DODGE ALMOST BUILT!

PG.84



### BONUS!

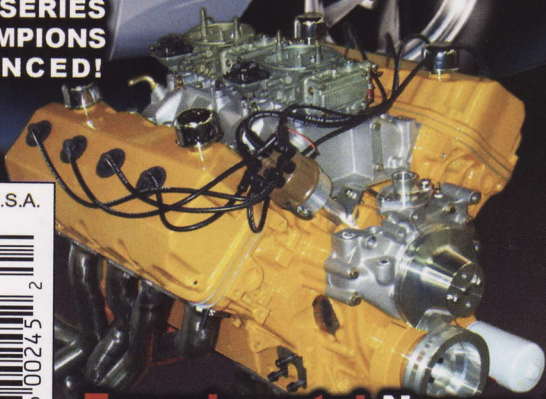


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# FORD

**STORY:** Randy Holden

**PHOTOS:** John Arruza



# J


ohn Arruza has been known, for the last two decades, as one of the premier Hemi engine builders in the world. If you're a longtime reader of MCG, you'll remember the feature we did several years back on John's notchback Barracuda, which is powered by the world's only running Ball Stud Hemi. His '69 Barracuda is seriously historic

for multiple reasons; it formerly served as Hemi Godfather Tom Hoover's personal hot rod, and the engine in the machine is the only surviving complete experimental Ball Stud Hemi, as developed by Hoover and company for possible NASCAR use. The engine had been in the hands of Dick Landy for ages after Chrysler shut down the test program. It spent some time in the WPC Museum on display,

but it hadn't fired a plug since testing ended back in 1969, and it had never been installed in a car until Arruza opted to build and mate it, quite appropriately, to Hoover's former personal Barracuda. Most Hemi maniacs would consider this the pinnacle of rare Hemi success, but John Arruza's nowhere close to being a

# FOILER

## Experimental Nascar Hemi Finds It Way To The Street!



typical Hemi fanatic. This guy's into stuff that most museums have never heard of, in addition to simply building extreme performance motors. Like the knights in days of old, John's on a never-ending quest for bizarre and rare Hemi history, and thanks to his relentless search ethic, he keeps finding stuff that's long been thought to be extinct, or was nonexistent in the first place. Evidence, this month, is offered with his latest achievement, the world's only complete and running A148 NASCAR "big valve" Hemi, and better still, it's in a factory '66 Plymouth HP2 Hemi Belvedere!

The A148 program at Chrysler apparently began with a corporate memo that's dated back to December 1965.

The memo calls for a Hemi engine with a bigger intake and exhaust valves, apparently designed to make for a better flowing and higher rpm Hemi for NASCAR racing. Thanks to the infamous Hemi ban imposed on Chrysler by NASCAR's Bill France, the company had its engineers working overtime on Hemi development to meet any and all eventualities. When the Hemi ban was lifted, Chryslers returned to NASCAR in July 1965 with the potent A117 Hemi, which actually displaced 404" instead of the expected 426". The A117 had a

shorter stroke than the 426, used a different crank, and made up for its lack of cubic inches with a trick intake manifold and modified cam timing. Petty won four events in 1965 with the A117, even though it was much smaller than the 427 Ford engines running alongside. When the '66 season began, they were back to using the 426" motors, but behind the scenes, an offshoot of the A117 project was underway - the A148 Hemi.

The logic behind the A148 was simple - win races regardless of practicality or cost. Chrysler knew Ford was developing the Boss 429 engine, and if that monster were to be approved for NASCAR use, the conventional Hemi would be in trouble. The answer was the A148 program. With Tom Hoover again at the helm, along with Dean Engle, the skunk works boys developed a Hemi with rocker gear capable of sustained 9,500 to 10,000 rpm laps with incredible torque and high-end horsepower numbers. The program rose from the ashes of the A117 project. The documentation that remains tells us the mythical engines used 2.44" intake valves and 2.08" exhaust valves, longer valve springs, a gear-driven cam, a custom intake, a custom crank, and a bored block to make it a 464" motor. The program experimented with both aluminum heads and iron heads, but in the dyno room, trouble developed.

The concept and the parameters seemed okay, but in 1966, the 426 Hemi block didn't have enough cylinder wall thickness to withstand high horsepower with a .110 overbore. The team sonic tested a batch of blocks and selected the best four examples they could find for the A148 builds. During dyno tests, three of the four blocks split cylinder walls and the whole program came to a halt - the lower end just couldn't handle the higher rpms and higher horsepower figures mandated by the execs. The A148 Hemi never

really got off the launching pad, but its basic concept remained sound.

Since Arruzza's been a long-time friend and ally of the legendary Tom Hoover, he's had many conversations with him about the experimental Hemi days. Through Tom and other engineering guys, John knew that after the program was stopped, the engines in development were in pieces anyway, so those pieces found their way out of the shop and into the hands of various factory-backed racers and engine builders - none of whom did anything with them. Herb McCandless ended up with some parts, and Dave Koffel eventually ended up with almost all of the A148 parts years later, and then sold them off once again to a variety of customers. Thus, the A148 pieces and parts were scattered coast-to-coast. John made it a holy cause some twenty years ago to round up all the parts to reassemble one of these historic motors, and furthermore, his quest called for him to succeed where the factory engineers had given the project up as a failure. One piece at a time, literally, John acquired parts from California, Michigan, New York, North Carolina, and all points in between. It took him the better part of those twenty years to get all the pieces needed, and a few extra parts as well, but by 2007, Arruzza had enough to start building the beast that Hoover and Engle became too frustrated with forty years ago. In fact, aside from one aluminum head, John Arruzza now owns every single surviving A148 part known to exist!

When John told Tom Hoover he was going to build an A148, then put it on the street, Hoover laughed and told him it would never work! Knowing his ability, however, Hoover restated his position by adding that, even if he could make it run, with the huge valves and ports it would be like a marshmallow on the street because the torque curve

and low-end power would be horrible. This only served to encourage John all the more.

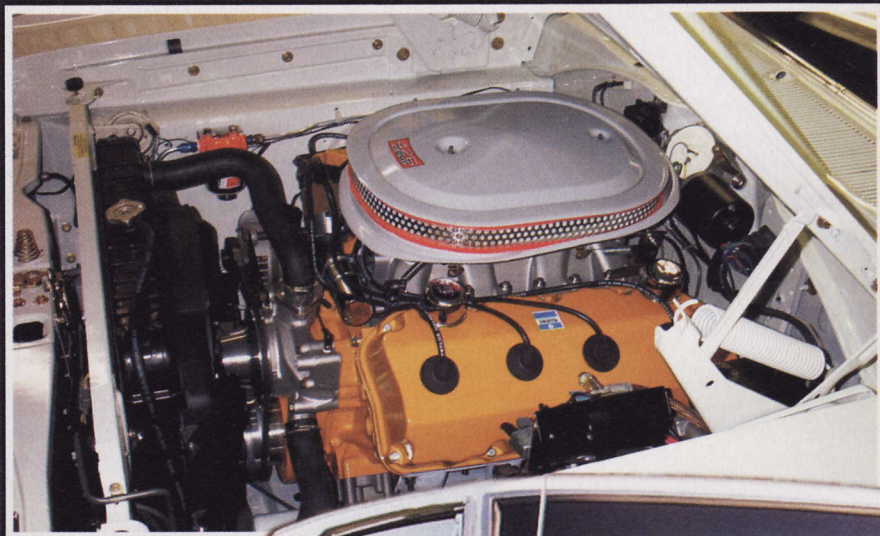
Building the A148, John Arruzza became the keeper of knowledge that had been long lost, except to those who worked on it to begin with. Here's some really interesting info on this genuine monster. The intake ports on the heads are 4.28" square inches as opposed to a stock Hemi's 3.51" square inches. Exhaust ports are a massive 3.825" as opposed to the stock 2.68". The port design is also better shaped and turns are smoother and farther away from the valve seats. The intake valve is more upright by three degrees, and the exhaust valve is more upright by a full five degrees. And, of course, the valves themselves are 2.440 big on the intake side and 2.060

on the exhaust side, with huge 3/8" heavy-duty stems and enormous "battle ship" tough return springs unique to these heads. The rocker stands are multiple piece units with hardened steel bases and cast-iron shaft enclosures. To hold it all in place, there are twenty-one extra bolts per head keeping the valve gear together! The camshaft, originally made by Racer Brown, is huge as well, and a full four pounds heavier than a conventional 426 Hemi cam. The lift is .597 with 267 duration and the journal diameter and overall core are much like today's Super Stock cams. The intake manifold externally, looks a lot like a NASCAR bathtub piece, but it has much bigger intake runners, which had to be reworked to run down into the lifter valley and turn back upwards to mate properly with the

heads. The intake itself is also wider than a NASCAR bathtub, so it has to be removed to get the valve covers off. The Kellogg crank is a legit part and is a 3.750 stroker part used in the program. NASCAR rods that are 6.960 in length swing the gorgeous domed forged aluminum pistons, custom-made by Ross for the project. Arruzza decided to go with a livable 10.4:1 compression ratio since this was to be a street motor, whereas the test motors were understandably higher compression mills. He also opted for a modified Stage V dual four-barrel intake instead of the original NASCAR intake because, after all, this was intended for street duty. When all was said and done, the reborn A148 displaced a grand total of 517" and, with only preliminary dyno testing, John saw over seven hundred horsepower with 670 ft. lbs of torque! And we caution you, those are conservative numbers because Arruzza didn't want to strain the freshly built engine prior to it being broken in.

Of course, the other half of this equation was what car to put such a motor in? Since this was designed as a NASCAR motor, Arruzza decided it should go in what it would've likely raced in back in 1966 or 1967. As the engine build progressed, John began looking for an original 1966 Hemi Dodge or Plymouth in need of an engine and restoration. Before long, he found just what he was looking for practically in his back yard.

Since Richard Petty owned NASCAR back in 1966, a disproportionately large number of '66 H e m i



Plymouths were sold new in North Carolina. John found one of these Hemi Belvederes not far from home, and since it had a build date of September 23, 1965, it seemed to coincide perfectly with the A148 project's timing.

The Plymouth is a factory WW1 white hardtop built new at the St. Louis plant. It was reportedly ordered new in Western North Carolina to run booze through several "dry" counties, and its options would seem to indicate somebody wanted a "sleeper." It was plain white with a black bench seat interior, plain old hub-caps, a column shifted TorqueFlite hooked to a 3.23 rear, and nothing flashy or over-the-top that would grab attention. When found, the old Plymouth was solid and had a lot of NOS parts already gathered for the restoration, so John had it hauled over to his friend, Lennie Melton, at Melton's Hot Rod Shop in Salisbury, North Carolina for a full resto. It arrived as a rather war weary rolling hull, and when it emerged from the shop, it was just what you see here - better than new.

As the engine was mated to the Hemi Plymouth, several other mechanical factors were considered to make everything work to perfection. There's now a manual valve body TorqueFlite by Frank Lupo behind the Hemi with a Herb McCandless built 3.55 Sure Grip chunk out back. Stock Hemi springs and torsion bars were used front and back, but tubular A-arms reside up front to provide a bit of extra positive caster for the Mickey Thompson Indy Profile radials.

During the summer of 2008, the A148 and the Plymouth were finished up, so that just left the challenge of actually driving the thing and seeing if it would indeed work. Despite Tom Hoover's warning (and he's admittedly delighted to have been proven wrong), the engine works! As of this writing, John's already put over 1,000 miles on the Belvedere with the



## What's Next?

**W**e'll tease you by telling you that John is on the track of another very rare and very exotic early Hemi, and we'll have details on that as soon as we can. However, since he's built the only running Ball Stud Hemi in the world, we have an interesting follow-up story regarding the Ball Stud Hemi project that came to John after we ran the article on his Barracuda. Without knowing who he was, another longtime Hemi devotee told Arruzza about a bizarre occurrence that happened to him back in the mid-1970s.

While traveling in Florida in his motor home, this very reputable guy stopped at a place that repaired those early Winnebago's and such. A Dodge motor home was there having its engine swapped, and sitting on the ground next to the RV was what looked like a cross between a Hemi and a big block Chevy. Being a Hemi guy, the man took an interest in the curious motor because he'd never seen one before. The owner of the repair shop proudly informed him the motor was a former experimental Ball Stud Hemi and the motor home belonged to a Chrysler executive who was having them swap a 440 into the camper because he was tired of fighting problems with the Hemi. He offered to sell the motor to this guy for \$1,500, and it supposedly ran, but why would anyone want to pay that much money for an engine that, admittedly, had problems and would be impossible to get parts for? He passed on the deal but, of course, years later, seriously regretted that decision!

Speaking with Tom Hoover about this, Arruzza was informed that it was entirely possible a few of the test motors could've made it over to the Dodge Truck Division, and it wouldn't have been out of the question for one to have ended up in an exec's motor home. Customized motor homes for the corporate office guys were something of a new fad in the early 1970s, so anything was possible. This guy had no incentive to make up the story, and when he told it to Arruzza, he didn't know John had the only running Ball Stud motor on the planet, so why bother if it wasn't true? Was a running Ball Stud Hemi installed in, of all things, a Dodge motor home? At least one source says "yes," so where is that motor today? If you're down in Florida, you might want to start checking around with any RV repair shops that've been in business for more than thirty years!

A148 Hemi, and he tells us, by far, it's the most powerful Hemi he's ever driven on the street. "This thing is like having a nuclear device under the hood, it's incredible." We're told the Belvedere goes from zero to one hundred in the blink of an eye, and to his own astonishment, the engine's proven to be extremely reliable. John's frequently using this one to get back and forth to his shop, he's taken it on several road trips, and it gets along equally fine in traffic or on the open road.

It takes a lot to get somebody like John Arruzza giddy, but trust us, he's giddy about this one. When we were asking him about comparisons, he started chuckling. "There's no comparison to other Hemis and this thing - none. Compared to what the Ball Stud Hemi does in the Barracuda, it's like having a stock 340 go up against a '68 Race Hemi." And, we're told, once he's through "breaking the engine in," we can look for a lot more antics with the white Plymouth. As for now, "Mr. Belvedere likes to get sideways in a hurry, and I'm happy with that for now." All we can say is, what is this boy going to do for a follow up? Knowing John, it'll be something even wilder than this. ✖