

# Pentastar Press

Volume 33, Issue 2

February, 2015



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# "2015" DMC Hole Shot

President's Corner: Tracy

It's a new year 2015. New Shows, New events. The club will be represented at Autorama this year. We will have 6 cars Representing Dallas Mopar Club.

The members voted to have Lee Elms to be club Secretary. Her board seat is up in March and we need nominations to replace her as a Board Member, so if anyone wants to be a board member or would like to nominate a person we will hold nominations and hopefully vote at our February club meeting Feb 8<sup>th</sup>.

Mark your Calendars March 28<sup>th</sup> is the Mopar Magic's Annual Car Chow in Shreveport, Louisiana. The board voted on paying for the entry fee to any active member in good standing attending the Louisiana Mopar Magic Show .You must attend with your car to get reimbursed. We need at least 16 cars to beat Mopar Magic this year.

**M** - Massively

**O** - Over

**P** - Powered

**A** - And

**R** - Respected

Tracy Barenz, Dallas Mopar Club President

Next Board Meeting Feb 6<sup>th</sup> next Club Meeting Feb 8<sup>th</sup>

# Minutes from the DMC Club Meeting

Dallas Mopar Club January 9<sup>th</sup>, 2015 Spring Creek Bar-B-Que

The meeting was called to order at 2:00 PM by President Tracy Barenz.

We still had the Secretary position open and Lee Elms was nominated for the Secretary position. Lee's board seat will be up in March 2015. At the next meeting we will need to nominate someone to fill that board seat. Frank Maxwell was nominated to fill Tracy's board seat.

Upcoming shows:

**AutoRama** February 13<sup>th</sup> - 15<sup>th</sup> **Louisiana Mopar Magic Show** March 28<sup>th</sup> **Oklahoma Show** June 6<sup>th</sup> **Wylie Car Show** June 27<sup>th</sup>

On Friday night at the board meeting, a motion was passed that the club will reimburse the entry fees of the paid, voting club members who enter their cars in AutoRama. The club will also pay for decorations for the clubs' display area in AutoRama. Set-up is on Thursday and take down is on Sunday evening after the awards are given out. The board wants to recognize our club member's longevity with the club. We will be getting a pin to show how many years we have been constant members. You will receive a pin after you have served 5 years.

Tracy has already gotten our first MiniNats sponsor for this year. They are Wooten Metal Works, and Tracy has commissioned them to build us an alternator tool. They will be sold to any member that wants one.

If any club member has anything to mail to the Dallas Mopar Club for another club member, it must be addressed to The Dallas Mopar Club and the P.O. Box number. To the side you can put, "Attention" and the club members' name. Then we will see that they get it.

We discussed getting new club jackets and asked for a show of hands of the club members who would want a new jacket. There is sufficient interest, so we are going to go ahead and order some from Gabby. We been discussing getting a new sound system for the club as well.

Because of AutoRama being on Sunday, our club meeting day in February, we will have the club meeting on February 8th. The board meeting will be on February 6th.

There is \$18.00 in the 50/50 pot, and Everett Lee had the winning number, so he got \$9.00. The other half of the 50/50 pot is for the best Mopar in the parking lot and our new club member Jack Hooper won \$9.00 for his 1963 Plymouth Sport Fury. It is a very pretty car. Welcome to the club Jack.

**The meeting was adjourned at 3:15pm.**

**Respectfully submitted, Lee Elms**

## **Feature Car / Truck:** The Kicks Fix By: Mark Patterson

It was one of those things where I said I was going to do it and finally got the time to do it, so I just did it. I mean Route 66 of course. Last Fall I was sitting around with my son and we were talking muscle cars. I mentioned that I thought it would be a blast to take our '70 Challenger R/T on the road and drive Route 66 – the whole thing – from Chicago to LA. I told him about some of the legendary stuff along the way, as well as some of the genuine Americana to be experienced. I remember as a kid hearing about all the giant roadside attractions and other oddities that could be found along the way, as well as the great old restaurants and motels.



The more I thought about, the better it sounded. Being out of school for the semester, it didn't take much to convince my son to ride shotgun. I was a little concerned about taking the '70, however. I could just see us having a mechanical problem in Tucumcari and sitting around for two weeks to get parts. In the end, we decided to take our 2013 Challenger, shown here. Hey, it's still Mopar muscle, and since the car is white it reminded me of that old film "Vanishing Point", although I hoped we'd have a happier ending.



Our plan was pretty simple. I had set aside about four weeks to drive Route 66 to Los Angeles and then extend the trip up to San Francisco so my son could experience Big Sur and the California Coast. Along the way, we'd go through St. Louis in time for the Rams vs. 49'ers on Monday Night Football, and then get to San Francisco for the 49'ers hosting the Rams on November 2<sup>nd</sup>. I figured that if we got to Chicago around the 8<sup>th</sup> of October we'd have plenty of time to get it all done. Being a second generation 49er fan, it felt right having our trip bookended by two games. So, we shipped the car to Chicago and left Dallas on October 8<sup>th</sup>. On November 3d we arrived back in Dallas, having driven 2830 miles, been through over 300 towns of all sizes (just to reach Santa Monica), stayed at 13 different motels and hotels, and seen some of the coolest – and most hilarious stuff you can imagine. We also caught both NFL games and Game 2 of the NLCS, Cards vs. Giants, as well as Game 5 of the World Series, Giants vs. Royals. Being from SF, seeing the Giants win the series and being there for part of it was a dream come true and the ultimate icing on the Route 66 cake.

Our approach to the trip was pretty simple. We would take off every day and map out our route and final objective for the day while driving. Along the way we would figure out the best place to stay each night and where to eat along the way. We had a few Route 66 guidebooks with us which turned out to be indispensable, especially the EZ Route 66 Guide by Jerry McClanahan. It lays out all of the different vintages of the Mother Road so you can decide which parts to traverse and which parts to skip. We did a pretty good job of sticking to the authentic route along the way.

We began in Chicago, as custom dictates, hitting David Burke's Primehouse for steaks and Buddy Guy's for some blues. Shortly after that we were on the road heading west. Our first real stop was in Cicero, IL for chow at Henry's, a 66 fixture for over 50 year. Then it was on to Joliet, where I was granted "early release" from the prison of Blues Brothers fame. We kept rolling, spotting tons of "giant" stuff, like the giant Paul Bunyan holding a hot dog in Atlanta, IL (shown above). It's just part of our history that we built giant roadside attractions along our highways as the country expanded west. Sure beats billboards! We eventually made overnight stops in St. Louis, Springfield MO, Tulsa, Elk City OK, (now there's a real garden spot), Tucumcari and Albuquerque NM, Williams AZ, Needles CA, then San Bernardino and finally Santa Monica CA, the official terminus of Route 66.

In addition to all of the cool places we stopped at (too numerous to mention here), we saw plenty of automotive attractions. My two favorites were the Route 66 Auto Museum in Santa Rosa NM, and the Justice Brothers Racing Museum in Duarte CA, both shown here. There was a Roadrunner for sale in Santa Rosa that had me drooling momentarily, but it quickly passed.



## The Route 66 Auto Museum in Santa Rosa, NM



## Justice Brothers Racing Museum in Duarte, CA

Of course, it's not a road trip if you can't air out the engine from time to time, and man did we enjoy the Challenger on the wide open desert stretches, as well as the tight corners in places such as Sitegreaves Pass in AZ, where the old highway was wide enough for about 1 ½ cars. We startled more than a few motorists coming the other way by taking the inside line on tight curves where oddly enough they felt *they* had a right to be. By the way, the pass emerges on the western side in Oatman, AZ, where burros abandoned by gold miners long ago have multiplied and now roam the streets in feral donkey gangs. As shown here, they're more than happy to hit you up for whatever you're carrying.



We eventually rolled into Santa Monica, just in time for a classic left coast sunset. After dinner there we wrapped up the Route 66 portion of our trip by walking to the end of the Santa Monica Pier and paying tribute to the millions of motorists who had made the trip before us.



Footnote: Any trip across the US is going to expose you to new places that have certain charms and attractions about them. In my case, I think I found a place in Missouri where I can retire and live happily ever after:



**Mark Patterson**

**Edited by: Ray Z 1/19/15**

2015 Membership Dues can be paid on-line  
though our website:  
<http://dallasmoparclub.com/membership.html>

Or due can be paid by check sent to the clubs  
address:

Dallas Mopar Club  
P.O. Box 472601  
Garland, TX 75047



**In Case You Missed It...**



**Up and Coming Mopar Events:** Membership Dues are Pro-rated at Mid-Year. See application for details on our club web site: [www.dallasmoparclub.com](http://www.dallasmoparclub.com)

**MONTHLY CRUISE UPDATE**

Looking forward to seeing you on the road: [Brad.buttermore@cadallas.com](mailto:Brad.buttermore@cadallas.com) 214-202-7480 Cell

**AUTORAMA:** FEBRUARY 11 — 15, DALLAS MARKET HALL, DALLAS, TX

CONTACT BOB OSTROWSKI BY DECEMBER 1ST.

**MOPAR MAGIC:** MARCH 28, 1ST BAPTIST CHURCH, SHREVEPORT, LA

CONTACT BRAD BUTTERMORE FOR CRUISE DETAILS.

**MOPARS AT THE MOTORPLEX:** MARCH 28, TEXAS MOTORPLEX, ENNIS, TX

CONTACT ROBERT VAUGHAN FOR DETAILS.

**THE HEIGHTS CAR SHOW:** TBD, THE HEIGHTS BAPTIST CHURCH, RICHARDSON, TX

SEE THE HEIGHTS CAR SHOW WEBSITE FOR MORE DETAILS.

**COWTOWN MOPARS:** APRIL 19, ALLEN SAMUELS CHRYSLER/DODGE, FORT WORTH, TX

CONTACT BRAD BUTTERMORE FOR DETAILS.

**CHRYSLER PARTS DEPOT CAR SHOW:** TBD

CONTACT DAN CLARK OR BRAD BUTTERMORE FOR DETAILS.

**CENTRAL OKLAHOMA MOPAR ASSOCIATION:** TBD, JOE BARNES PARK, MIDWEST CITY, OK

CONTACT TRACY BARENZ FOR DETAILS.

**BLUEGRASS ON BALLARD:** JUNE 27, WYLIE, TX

CONTACT BILL BONNEY FOR DETAILS.

**31ST ANNUAL SOUTHWEST MOPAR MINI-NATIONALS:** SEPTEMBER 5, GARLAND CENTRAL PARK, GARLAND, TX

VISIT THE CLUB'S MINI-NATS PAGE OR CONTACT CLINT CASH FOR MORE DETAILS.

**TEXAS STATE FAIR:** SEPTEMBER, FAIR PARK, DALLAS, TX

CONTACT JERRY REED FOR DETAILS.

**GRAND STREET FALL FESTIVAL:** TBD, WHITEWRIGHT, TX



CONTACT BRAD BUTTERMORE FOR CRUISE DETAILS.

**HERITAGE FESTIVAL AND CAR SHOW:** NOVEMBER 7, EDGEWOOD, TX

CONTACT BRAD BUTTERMORE FOR CRUISE DETAILS.

**CHRISTMAS PARTY:** DECEMBER 5, GARLAND SENIOR ACTIVITY CENTER

CONTACT LEE ELMS FOR DETAILS.

ANNOUNCING THE FIRST ANNUAL

# CAR SHOW

SATURDAY MAY 2, 2015

JOIN US for the Wheels of Hope Car Show in Garland, TX and enjoy antique and classic cars, music, raffles, a car giveaway, local celebrities and much more. Proceeds benefit the Hope Clinic.

10:00 am - 5:00 pm   Downtown Garland   FREE Admission   [WheelsOfHopeGarland.com](http://WheelsOfHopeGarland.com)

Special appearance from the Gas Monkey star Richard Rawlings. Also the Car Pro Jerry Reynolds. It is a benefit for the Hope Clinic. Go to: [wheelsofhopegarland.com](http://wheelsofhopegarland.com) and look around. Thanks.



### Spring Festival of LX's 10 will be March 21, 2015.

- **Registration:** Open to owners of modern Chrysler 300s, Dodge Challengers, Chargers & Magnums
- **Location:** Irvine, CA
- **Registration: FREE. Registration opens MIDNIGHT January 1, 2015. Sign up here: [www.socallx.com](http://www.socallx.com)**
- Book your hotel room thru the above website. Doubletree: Two night minimum stay. Other nearby hotels available.
- Info and responses on the LX Forum here: [http://www.lxforums.com/board/showthread.php/364778-\\*\\*\\*The-Date-For-Spring-Fest-10-has-been-set\\*\\*\\*?highlight=SPRING+FEST](http://www.lxforums.com/board/showthread.php/364778-***The-Date-For-Spring-Fest-10-has-been-set***?highlight=SPRING+FEST)
- [cali75chevy@gmail.com](mailto:cali75chevy@gmail.com) Interested talk to Tony here he goes seemingly every year.

**Sponsored By:**

**14th Annual New Orleans Mopar Show**

Rotary Club of the West Bank

**BERGERON** **The Finer Details** **RM RESTORATION**

**Date: Saturday March 14, 2015**

**Featuring:**

- Ken Mosier The Finer Details
- Rob Wolf Mopar Collectors Guide
- Tim Wellborn Muscle Car Museum
- Joe Suchy Mopar Cars & Parts
- Herb McCandless
- Roy Gobjczynski

**Date: Friday March 13, 2015**

**\$129.00 per Couple—Must register by January 14, 2015 Includes:**

- Registration for 1 car
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## New Stuff from Mopar



## Mopar maneuvers into SEMA with a multitude of modified models

As the aftermarket and performance arm of [Fiat Chrysler Automobiles](#), [Mopar](#) has a duty to extract everything from the company's models that it can, and there's no better place to show all of its work off than the annual [SEMA Show](#).



[Dodge](#) really gets in on the act this year with several customs to show off different parts of the brand's performance heritage. Perhaps the most interesting among them is the track-prepped [Viper ACR Concept](#) (pictured above). It wears a custom body kit to produce even more downforce, thanks in no small part to a monstrous wing at the back. To shed weight, most of the interior is stripped out, as well. Next up, the [Challenger T/A Concept](#) takes inspiration from '70s Trans-Am racing in a livery of Sublime Green and matte black paint. The center scoop in the hood keeps the 6.4-liter V8 fed with cool air, and the special's 20-by-9.5-inch matte black wheels keep it planted in the corners.

Also getting the once-over from Mopar is the [Charger R/T](#). It wears the division's body kit, and under the hood, a cold-air intake keeps the 5.7-liter V8 breathing. The suspension is retooled to hold the road better with a coil-over kit, upgraded sway bars and strut tower braces for the front and rear. The company is also showing off a snazzy blue Charger with a mean look. The final Dodge getting work from Mopar is the [Dart R/T Concept](#) with bright, O-So-Orange paint and a matte black hood with a scoop hooked directly to the air intake. The performance-oriented design is finished off with a coil-over suspension and big brake kit, as well.



The performance arm also works its magic in the [Chrysler 200S](#) at the show. Its wears Mopar's body kit in Phantom Black Tri-coat paint to really shine. A coil-over suspension and 19-inch, bronze-colored wheels complete the subtle design.



## ***Mopar Goes All-in With Fleet of Customized SEMA Show Rides***

(Press Release) October 24, 2014, Auburn Hills, Mich. - Mopar once again is gearing up to hit the Strip in full force at the 2014 Specialty Equipment Market Association (SEMA) Show in Las Vegas, Nov. 4–7, with a fleet of Mopar-modified vehicles and hundreds of existing and prototype Mopar products set to add sizzle at the world's premier automotive specialty products trade event.

The Mopar display is always a safe bet as a hot-spot stop for industry leaders at the mammoth gathering. Innovative Chrysler, Jeep®, Dodge, Ram and FIAT brand show vehicles, all reimagined with Mopar products, will fill the 15,345-square-foot exhibit space at the Las Vegas Convention Center and demonstrate how enthusiasts can sprinkle their own rides with a little Mopar magic by choosing from the brand's vast portfolio of parts.

"Each creation we dream up for SEMA represents an original, unique interpretation of how customers can personalize and transform their vehicles with an assist from Mopar products," said Pietro Gorlier, President and CEO-Mopar Service, Parts and Customer Care. "Our modified SEMA rides prove that whether owners are seeking more power, performance and style for the street, extra capabilities to get the job done or the freedom to go off-road and beyond, Mopar has the products to help get them there."

### **Dodge Challenger T/A Concept**

The Dodge Challenger T/A Concept is a Sublime Green example that the big gun in the Dodge brand's muscle-car arsenal hasn't forgotten its roots.

A modern interpretation of the legendary T/A package available in the 1970s for the Challenger, the Dodge Challenger T/A Concept draws on heritage-inspired cues but also calls on present-day performance modifications and new prototype products designed with an eye toward the future.

The Sublime Green paint is underscored by full-length matte black T/A graphics, flanking each side of the body, in keeping with the spirit of the original T/A. The matte black look carries over from the aggressive front fascia all the way to the rear deck-lid spoiler to provide an iconic, sinister appearance. The functional "Viper"-inspired center scoop hood with Mopar gloss black hood pins has been adapted to accommodate a Mopar induction system. Cooling air streams into the air box, chilling the incoming air to the 6.4-liter legendary 392 HEMI® engine via a hood scoop.

At the front of the Dodge Challenger T/A Concept, a Mopar matte black front splitter works in unison with the Mopar matte black gurney-lip deck-lid spoiler to provide additional downforce assist. Air Catcher headlamps on both the driver and passenger sides add a distinctive appearance with hidden LED lights creating a menacing glow, as well as working to provide a steady stream of cool air to the engine. Iconic heritage Challenger script T/A badges complement the front gloss black grille and rear deck-lid spoiler.

Underneath the extra wide 20-by-9.5-inch matte black lightweight forged aluminum wheels are Brembo six-piston calipers with two-piece slotted and vented rotors for ultimate handling and stopping performance. Rear and side exhaust tips are black ceramic-coated finish, and electronic cutouts offer the choice of a healthy rear exhaust stock sound or a louder, more robust side exhaust note.

The celebrated road-course racing reputation of the Challenger T/A package, best embodied by the legendary Sam Posey's success in his No. 77 Dodge Challenger T/A, distinctly influences the interior feel of the Dodge Challenger T/A Concept.

The race-inspired design elements offer weight reductions paired with increased chassis rigidity enhancements. The high-performance flat bottom steering wheel boasts perforated leather and gloss black bezels. Race-inspired carbon fiber seats with safety harness pass-through and T/A embroidered logos are enhanced with bolsters and high grip cloth design for improved lateral support.

Rear seat delete with brushed aluminum closeout panels achieve additional weight reduction. A pistol grip shifter is another heritage-influenced touch, and the 180 mile per hour (mph) speedometer stands out with white face gauges and platinum metallic trim ring. Accents include gloss black trim ring bezels and door release handles. The rear roll-bar is designed for enhanced chassis rigidity.

### **Dodge Charger R/T Mopar Concept**

the world's only four-door muscle car is transformed with a healthy selection of Mopar parts and accessories, creating the Dodge Charger R/T Mopar Concept vehicle.



The current Charger's update of old-school muscle is further fleshed out by plugging in unique new Mopar products, including a front splitter, as well as Mopar side sills and sill extensions that boost handling and aerodynamic characteristics. At the rear, a unique Mopar valance frames the exhaust tips. A unique Mopar one-piece rear spoiler rises high, resulting in more downforce and a more dynamic rear profile.

The gloss black bedecked roof plays off the TorRed exterior paint. Granite Chrystal low gloss colors the forged Mopar lightweight 20-by-9-inch wheels, a feature included on many 2014 Mopar SEMA vehicles, reinforcing the positioning of the lightweight rims as the company's go-to performance wheel.

A Mopar cold air intake adds a jolt of horsepower to the 5.7-liter HEMI V-8 engine of the Dodge Charger R/T Mopar Concept. Additional Mopar performance mods include a coil over kit, front and rear sway bars and front and rear strut tower braces.

### **Dodge Dart R/T Concept**

The Dodge Dart R/T Concept demonstrates that in addition to value and style, the 2015 Dodge Dart has loads of potential to deliver the goods for performance enthusiasts.

The Dodge Dart R/T Concept flexes its muscle with athletic and agile performance styling cues. A Mopar performance matte black aluminum hood provides a sinister, contrasting look to the "O-So-

Orange" painted concept Dart. The hood mounted duct feeds cool ambient air directly into the air box, while an air exhauster at the rear pulls hot air from the Dodge Dart R/T Concept's intercooled turbocharged engine.

An aggressive front fascia with an enlarged grille opening provides maximum airflow to the Dart's massive intercooler. New grille textures and LED fog lamp surround, along with select items from the Mopar Dart body kit (including a front chin splitter, side sill accents and rear fascia diffuser) amp up the car's attitude. In line with the more aggressive appearance, the back end boasts a unique three-piece spoiler, perched above prominent three-and-a-half inch exhaust tips.

Riding on 18-inch Mopar anodized black lightweight wheels, the power of the Dodge Dart R/T Concept is harnessed by a Mopar big brake kit, and handling is improved with an adjustable coil-over suspension. Like the hood, the roof and deck-lid have a matte black finish, creating a unique look that is poised to strike fear in the competition.

<http://www.autoblog.com/2014/11/05/mopar-dodge-chrysler-fiat-sema-2014/#image-10>



Edited by: Ray Z 12/06/14



Lindenhurst, NY 1982 AMC Hornet Wagon



## Technical Article: February 2015

# We Take A Hard Look at Dodge's Paradigm-Shifting 707hp Hellcat Hemi

Written by Johnny Hunkins

December 5, 2014 Inside Hellcat



The year 2014 is the one when we forever change the way we think about making horsepower. For decades, this author has written cover blurbs shouting the tips, tricks, and how-to's for building engines in the 400-, 500-, 600-, and 700-hp range. Like a carnival hawker, we lure readers into the inner sanctum of power on the promise of faster, cheaper, or easier performance. Even in the best how-to scenarios, it's up to you, the reader, to gather the right stuff, to know how to bolt it together, and to maintain your new power plant in good health. We don't plan on walking away from any of that at *Mopar Muscle*, however, with the news of a smog-legal, 707hp engine that gets 22 mpg on the highway and that comes with a 100,000-mile warranty that even covers racing—well, we don't have anything reserved in our *back pocket* for that.

If it is possible to achieve mechanical *nirvana* in the hot rodding world, the Hellcat Challenger is by far the best candidate out there. To put it into perspective, imagine you went to a world-class hot rod shop and asked them to build a '71 Challenger with a 700hp fuel-injected Hemi, 22 mpg, an eight-speed paddle-shifted transmission, IFS, IRS, ABS, stability control, a custom leather interior, 1g

handling, giant Brembo brakes, an earth-shaking infotainment center, and by the way, you want a five-year warranty and a guarantee that it runs 10's on slicks, and you've only got \$60k. *Yeah, right.* Or, you could go to your neighborhood Dodge dealer.

At the center of the cost/performance equation is the SRT Hellcat Hemi engine. Its 6.2 liters of displacement are fed by a 2.4L IHI-sourced supercharger that incorporates dual heat exchangers on an independent low-temperature cooling loop. Cool, dense air is forced into hemispherically shaped combustion chambers to the tune of 11.7 psi. The Hellcat's full-floating 9.5:1 forged pistons keep their cool with revised oil squirters, then transmit power through new powder-forged, steel connecting rods to a forged crankshaft with heat-treated, micro-polished journals. And here's where we are slapped into reality with yet another revelation: When operated with its dumbed-down black-key, Hellcat's power is limited to around 500 hp, or roughly the peak output of last year's Corvette Z06. Even the new Z06's celebrated LT4 with 650 hp can't make the Hellcat break into a sweat—and it costs \$19,000 more.



If you're wondering "how'd they do *that?!* " you aren't alone. We wondered the same thing, so we got in touch with Dodge and got permission to sit down with Chris Cowland, Chrysler's Director of Advanced and SRT Powertrain, and Gregg Black, Chief Engineer on the Hellcat engine, and ask every question we could think of. Our story took us to the Chrysler Technical Center in Auburn Hills, Michigan, where we got the opportunity of a lifetime to put our hands on all the Hellcat's parts, and even watch a Hellcat run a treacherous thermal load test on the dyno in the D wing of Chrysler's expansive powertrain center.

...in its dumbed-down black-key 'valet' mode, Hellcat's power is limited to around 500 hp, or roughly the peak output of last year's Corvette Z06.

## 91 Percent New

When Dodge announced that the Hellcat was 91 percent new, a lot of questions went through our head. The word new is a hot button that we in the media (and PR guys at manufacturers) like to use to elicit interest, but to a hot rodder who likes to mix and match parts Frankenstein style, it can spell frustration. In this regard, the Dodge boys were guarded in their answers, and you'll be left to speculate on your own. Can the Hellcat crank fit in a 392 Apache block? Can you put a Hellcat manifold and blower assembly on a 6.4L, 6.1L, or 5.7L long-lock? Should you use a Hellcat block for a bitchin naturally aspirated buildup? What kind of interchangeability is there between the Hellcat's parts and previous Hemi variants? All of these are great questions, and nobody will know the answers for certain until somebody tries. Nevertheless, we have some facts that give important hints about mixing and matching Hellcat parts, especially with the 392 Apache variant.

Our quest for Hellcat knowledge brought us to the Chrysler Technical Center in Auburn Hills, Michigan, where we examined this very elaborate cut-away model of the Hellcat. Windows have been cut out to reveal key features and colored lights call out specific systems: green for coolant, orange for crankcase oil, red for exhaust, amber for combustion, blue for intercooled charge.

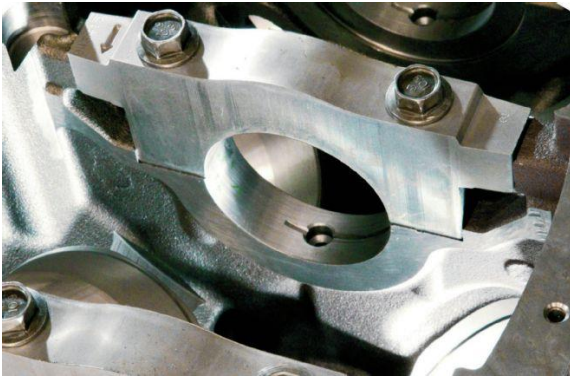


The Hellcat's cast-iron block is powder-coated Hemi Orange, and is nearly indistinguishable from the Apache 6.4L (392ci) block in all but a few key areas. Note the four plugs in the lifter galley—these are part of the lube circuit for MDS cylinder deactivation in the Apache and are not used in the Hellcat.



This cutaway of the Hellcat display shows in green the cooling jackets. Note how they extend from the top of the fire deck all the way down to piston bottom dead center. The thermal load on the 485hp Apache is not as high, so its water jackets do not extend this far down.





Here's where we see another major improvement to the Hellcat. The deep-skirted cross-bolted main caps are a design carry-over from previous Hemi's, but the main webbing between the cylinder bores and mains has been beefed up.



This close-up of the Hellcat block of the pan rail area shows what will already be familiar to many builders of 5.7L, 6.1L, and 6.4L Hemi's. The cylinder walls have been tied to the pan rails with plenty of material from day one of the Gen III Hemi (2003), and remain that way here in the Hellcat.

One of the questions we asked the engineering team was, "what do you mean by 91 percent new?" The answer is: Relative to the 392 Apache Hemi, the cumulative dollar value of the parts that got design changes or material upgrades is equal to 91 percent of the engine's value. Parts that got changed that were of higher value, such as the block and cylinder heads, carry more influence on the equation than small, simple stuff like fasteners. Moreover, and perhaps more importantly, it turns out "new" doesn't necessarily mean incompatible with parts on an earlier Hemi variant. And while Dodge understandably won't confirm, for instance, that a Hellcat piston will fit in an Apache's bore, the evidence is that it could. That kind of speculation is our job, and we'll do our best to paint an accurate picture here.

To sum it up: The Hellcat is pure Hemi architecture, and you will immediately recognize it as such. With the large 4.09-inch bore of the 392 Apache, and the short 3.58-inch stroke of the 5.7L and 6.1L Hemi, there is much in common with prior Gen III Hemi's. The engineering team added to the Hemi's already great design features like the hemispherical combustion chamber and the deep-skirted, cross-bolted block by leveraging them with evolutionary changes in materials and design. They did not change key dimensions like bore spacing, bore diameter, main and rod journal diameter, rod length, deck height, cylinder bolt holes, cam location, cam journal diameter, or other critical areas. And for good reason—the Hellcat needs to package into the same space as other Hemi variants and be easily serviced, so the more that can stay the same in meaningful ways means less cost for the car, and we're all for that!



## Short-Block

The engine block is the bedrock of the Hellcat. All 707 of the Hellcat's horsepower get transmitted through the block, which is made of cast gray iron. Outwardly, it looks very similar to the Apache block that underpins the 392, but there are two primary changes—three if you count the standard Hemi Orange powdercoat paint!

During development, it was discovered that a significant change in the coolant circuit was needed in order to manage the Hellcat's increased thermal output. Specifically, the water jackets now continue all the way down to a level equal with the piston crown's bottom dead center. Second, the amount of material in the webbing between the bores and the main caps has been increased. Lastly, the piston oil squirters have been retargeted to cool a slightly different region of the piston, which itself is significantly different than the cast piston in the 392 Apache. These revised squirters also have a pressure-sensitive lube valve to shut off flow to them at low pressure; this is done to prioritize volume and pressure to the rest of the lube circuit.

The difference in displacement between the 6.4L Apache and the 6.2L Hellcat is all in the stroke (3.72 inches versus 3.58 inches), so the rotating assembly is different dimensionally. The Hellcat's shorter-throw forged steel crank is actually machined from the same forging as the longer stroke Apache crank, but because of increased journal overlap, it's stronger. Moreover, the surface of the Hellcat crankshaft is induction hardened, and all journals are undercut, fillet rolled, and micro-polished to very tight tolerances. On the front counterweight you will see a laser-etched QR code; the manufacturing information for each crankshaft is unique, and the code is tied to a specific date, time, and place of manufacture. A line of alphanumeric code is also laser etched near the QR code and denotes a sequence of specific-sized select-fit bearings that are to be installed in each journal. The result is a bearing interface with extremely precise tolerances that can handle enormous amounts of surface loading.

On the end of that crank is a Hellcat-specific damper designed to withstand an impressive 13,000 rpm. That damper is fitted to the Hellcat's crank snout with a diamond-like carbon-coated washer and damper bolt that is 2mm larger than the one in the Apache. That snout likewise has a strengthened fillet radius for additional fatigue resistance. All that beefcake adds up to an assembly that can easily weather years of side-loading from the Hellcat's 10-ribbed drive belt.





The Hellcat's forged crank is carved from the same steel forging as the 392 Apache, with a few key differences. The stroke is ground to a shorter 3.58-inch throw (the same as the 5.7 and 6.1), and all bearing surfaces are induction hardened prior to being given a fillet roll. A micro-polish finish is then given to all journals.



Each Hellcat crank has a unique laser-etched QR code linked to pertinent manufacturing data. The sequence of letters above it correspond to select-fit bearings in sizes A, B, and C, which have an incremental difference between them of .00031 inch. (As a point of reference, aftermarket select-fit race bearings are typically offered in  $\pm .001$  over/under increments.) When the crank is manufactured, the measurements are taken and the corresponding bearing number is etched on the crank. When the engine is built, the numeric code tells the assembler which select bearing to use for each clamshell.



A bottom view of both the cast Apache 392 piston (left) and forged Hellcat piston reveals a significant difference in design. Note how the support ribs of the Hellcat piston intersect more centrally with the pin boss.



Up top, this side-by-side comparison shows how the Hellcat piston has significantly more meat above the ring land (right) than the naturally-aspirated Apache piston, a result of having .07-inch more compression height. This angle also shows the difference in the piston crown, with the Apache exhibiting a slight dome, and the Hellcat a slight concave shape.



The Hellcat rod is full floating with a bronze bushing, and is paired to a diamond-like carbon-coated steel wristpin. Note the Hellcat's unique rod; the small end is the same width as the big end in order to better support the combustion pressure, and the top is tapered for a marginal savings in mass. It's all race-quality stuff.

The Hellcat's rods—which are the same length as the Apache's—are of a forged powdered steel construction, and are upgraded relative to the Apache rod with proprietary metallurgy. The rod's small end receives a full floating pin in a bronze bushing; it has an interesting detail in that it is the full width of the rod's cheek on the compression side of the small end, but a machined taper was given to reduce its mass at the top of the small end. The Hellcat's steel piston pins have a diamond-like carbon coating, and are some of the tightest-fitting, precision-machined pins we've seen. And coming full circle, keeping those pin clearances tight at full rated power when the heat is on is the job of the piston oil squirters, which play a huge role in the thermal management on the top side of the short-block. Make no mistake, this is what we normally encounter when we examine top-shelf race hardware—there is no skimping here!

Moving up the rod to the piston, we see big changes relative to Apache. A forged piston was the only type considered by the Hellcat's engineering team. To wit: At full rated power each piston sees the force of 22,000 pounds on every combustion cycle at full-rated power. With strength a priority, the Advanced and SRT Powertrain team went to work with some very interesting tools, the first of which is a computer model called finite element analysis (FEA). This allows engineers to design a virtual piston and place virtual mechanical and thermal loads on it to identify weaker areas. It saves hundreds of man-hours prototyping and testing parts, and



moves a more proven product to market faster. The next powerful tool the team used for the piston design was thermal telemetry. Advanced and SRT Powertrain built a prototype engine with thermo-couples attached to the pistons; as the engine runs through its battery of tests, it's possible to see in real time the thermal stresses across the piston. This proved out the earlier FEA work, while allowing the team to further refine the piston design.

A cursory inspection of the Hellcat piston alongside a 392 Apache piston reveals much. Most obvious is the Hellcat's forged design versus the Apache's cast design. And while both have anti-scurf, oil-shedding coatings on their skirts, the shape of the skirts themselves are quite different. The Hellcat's is noticeably wider at its base and its support ribs intersect more critically with the pin boss nearer the center of the piston. Up top, a gradual reverse dome gives the Hellcat a 9.5:1 compression ratio, while the Apache's slight positive dome delivers a higher 10.9:1 compression ratio. On the profile, most noticeable is the .070-inch taller compression height of the Hellcat slug (Hellcat specs out 1.28 inches to the Apache's 1.21 inches). That places the extra .070 inch (a total of .09 inch crown height) right up top at the piston crown, which allows the Hellcat to better withstand the Hellcat's higher temperature and cylinder pressure. Along with the shorter-stroke crank, it's here that we see the genius of the displacement give-back relative to the Apache—those .2 liters of lost displacement have endowed the entire short-block with the strength needed to back a 100,000-mile powertrain warranty that even covers racing. Make no mistake, this is what we normally encounter when we examine top-shelf race hardware—there is no skimping here!

## Cylinder Heads

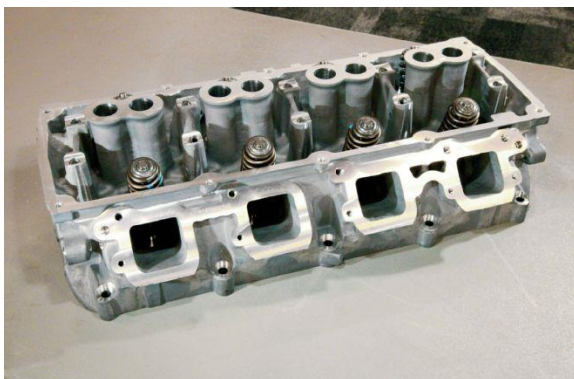
In the pressurized environment of the Hellcat's induction system, the priorities within the cylinder head and valve train shift somewhat from outright flow, to thermal management. While flow is still a priority, the swift, efficient movement of heat out of the system takes on a new magnitude of importance. As for the flow itself, the capacity engineered into the 392 Apache cylinder head is already significant; its nearly 350 cfm of intake port flow right off the assembly line would've been the stuff of dreams even in the aftermarket just a few years ago, and here the Hellcat largely echoes the Apache design. The Gen III Hemi's combustion chamber shape with its 34.5-degree included valve angles already give it a huge advantage, and what made the original Hemi such an overwhelming success in supercharged drag-racing circles all those decades ago still holds true today. A hemispherical-style roof means the flow around the valves—particularly the intake— isn't as shrouded against the cylinder wall, and it also means bigger valves can be used for any given bore diameter—a double dose of goodness. While the Gen III Hemi is light-years ahead of earlier Hemi's in terms of combustion dynamics, the basic advantage of a hemispherical chamber in supercharged situations still holds to this day.



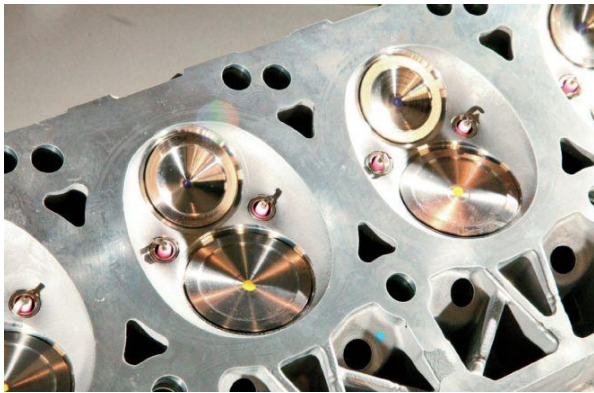
The Hellcat's powder-forged steel rod is by far the toughest in the Gen III Hemi family, and would make a good candidate for use in an all-out naturally aspirated 5.7L or 6.1L buildup.



Compared to the 392 Apache head, the Hellcat head (right) looks very similar. Nevertheless, the Hellcat heads are cast at a specialty low-volume foundry using Hellcat-specific tooling. The Apache is a 319 alloy while the Hellcat is a premium heat-treated 356-T6 alloy, giving it higher thermal conductivity and improved elongation (one of the measures of an alloy's strength). Of note are the differences in the valves. Hellcat's are the same size as Apache, but are materially different, with the intake being hollow-stemmed and the exhaust being sodium filled.



The Hellcat cylinder head flows essentially the same as the 392 Apache, with intake ports that tickle the 350 cfm range at .600-inch lift. Beehive springs keep valve train dynamics stable up to the Hellcat's electronically limited 6,200-rpm redline.



A tighter view of the Hellcat's combustion chamber and 34.5-degree included valve angle.

My comment: "This is a thing of beauty"!



The Hellcat's MLS gasket is well up to the task of retaining nearly 1,600 psi of cylinder pressure at full rated power. It has also proven it can repeatedly withstand the rigors of extreme thermal expansion and contraction without losing seal.

Like the 392 Apache cylinder head, the Hellcat cylinder head benefits from the extensive use of computational flow dynamics, or CFD. This gives a very accurate picture of the particle motion within the flow path, and produces amazingly granular models of velocity, pressure, density, and temperature. We combed over the Hellcat and Apache head castings loaned to us, and could find very little difference between the two, save for a different appearance in the casting texture and some changes in the mold fixture's parting lines. Port shape, contour, and location seems the same, as do the valve angles, valve train hardware, and bolt locations. Of course, there are features added to allow the supercharger to be screwed down to the engine, as well as some additional bosses for the unique supercharger drive system components that you won't find on Apache heads.

In the Hellcat's cylinder head design, the main focus appears to be the effective evacuation of heat. To that end, the Hellcat's cylinder heads use a heat-treated 356-T6 aluminum alloy, which conducts heat at a faster rate than the Apache's 319 alloy. The casting itself has strengthening gussets cast into the deck face behind the intake ports; these help carry heat away from combustion while providing a stable bulwark for the large manifold/blower assembly.

At the fire deck level, the Hellcat employs all-new multi-layer steel (MLS) head gaskets. These are designed to retain the 110 bar of cylinder pressure at rated power, while providing a comfortable margin of safety in all operating scenarios. They have also been subjected to extreme thermal shock testing on the dyno to simulate



extreme changes in thermal and mechanical loading. Through testing, it was deemed that a unique four-layer MLS gasket was best for coping with the differential rates of expansion between the iron block and aluminum heads, while also being able to provide the superior sealing needed for a high-powered supercharged engine. On the valve side of things, sizes stay the same as the mega-flowing Apache head, with 2.13-inch intakes and 1.65-inch exhausts. The difference is, once again, in what Dodge did to manage heat. The Hellcat's intake valves are hollow stemmed, giving them a nice mass reduction, and the steel alloy-headed exhausts are filled with sodium, which when brought to operating temperature turns to a highly heat-conductive liquid state. At this power level, heat becomes such an enemy that ignoring it will cost you more than power—it will cost you parts, so in this sense good thermal management not only equals more power, but an engine that can go the distance.

## **Induction**

On its face, a supercharger performs a very simple function—it uses mechanical energy from the engine's crankshaft to power a compressor that forces air into the manifold. In practice, however, there are many more nuanced functions a supercharger assembly has to do for it to function efficiently and last the long haul. Blowers on automotive engines are not new—but having one that produces this level of power reliably in a production car that gets 22 mpg is new, exciting territory.

For the Hellcat's supercharger, Dodge reached out to IHI, a Japanese technology giant that is not well known for its work with domestic auto manufacturers, but nevertheless has vast industrial experience going all the way back to the 1850s. IHI's expertise in compressor design has made it a go-to company for outfits like Boeing, GE Aviation, Mercedes' AMG division, Fuji Heavy Industries, Mitsubishi, and Kawasaki, and here Chrysler felt more than comfortable partnering with such a strong engineering force.

At full tilt, the IHI huffer can move 30,000 liters of air per minute running at 14,600 rpm, thanks to a 2.36:1 drive ratio. It does this with high-helix rotational-pull die-cast, PTFE-coated aluminum rotors that displace a tick shy of 2.4 liters every rotation, and for those keeping count, that's 41 percent more volume than the Eaton supercharger in the '15 Corvette Z06. Comparison with the Corvette's LT4 is inevitable, and here a couple of hard facts may prove informative. GM's 1.7L compressor sees a peak speed of 20,000 rpm on the same size engine. Relative to the Hellcat, there is little room on the LT4 for increasing boost via a smaller pulley—it's tapped out—and even if you could overdrive the LT4's Eaton compressor, it's probably a bad idea. That's because GM's air-to-liquid intercooler operates on a high-temp cooling loop with the engine, limiting boost to 9.5 psi, and limiting air density due to its less efficient heat exchanger.

Internally, the IHI compressor, manifold, and plenum benefit from a significant amount of CFD simulation at both Chrysler and IHI, whereby the distribution of flow has been carefully modeled to ensure it is even across

all cylinders. This flow path was modeled from the throttle-body inlet, through the screws and into the plenum, then across the heat exchangers in both banks, and finally into the cylinder head intake ports.

In this deep thermal shock test, the Hellcat has been fed a diet of minus 40-degree coolant (At that temp, Fahrenheit and Celsius are the same.) Those pipes are not white plastic, they're frosted-over metal, and the frost covers most of the engine too. For the test, the dyno operator fires up the engine and immediately runs it to peak torque. This is essentially a gasket sealing test.

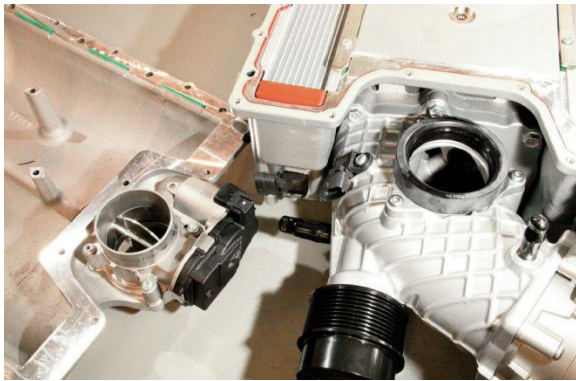


Behold the blower assembly as it looks divorced from the Hellcat engine. If you think it might look good bolted to the top of your hemi short-block, you're not alone. We can easily envision this thing coming to our door on a UPS truck—and with a little ingenuity, it can be made to bolt on.





With the lid removed, we see the high-pressure discharge side of the IHI supercharger and the two heat exchangers—one located in each cylinder bank. The 92mm throttle body feeds air to a cavity below the bypass valve, routing the flow into the screws.



The bypass valve inside the Hellcat's supercharger assembly is actually a repurposed throttle body from a four-cylinder engine. The natural state for the unit is open instead of closed—opposite of a throttle body. When your throttle foot goes down, the bypass shuts, instantly creating boost



Peering into the cutaway on the Hellcat's manifold, you can see how the high-helix rotors of the IHI supercharger trap air between the rotors and not against the housing—a feature that keeps charge temp down. This view also illustrates the dense packing of layers in the heat exchanger core.



## Low-Temp Cooling Loop

This brings us to the Hellcat's knock-out punch—the supercharger's low-temperature coolant loop. Here's a little known secret: In the boosted power plants of most manufacturers, the rated horsepower is only valid under normal highway use for a limited period of full-throttle time. For safety's sake, once the air charge temperature elevates to levels where detonation and knock begin (such as at a race track) the engine controller limits ignition and boost to save the engine. This is called de-rating. When you see guys at the dragstrip packing their manifolds with ice before a run, they're trying to avoid de-rating the power of their engine.

With the Hellcat, the air-to-liquid intercooler operates on a low-temperature cooling circuit that is independent of the engine's cooling system. Competing powertrains operate on the same high-temp cooling loop as the rest of the engine, limiting their intercooler efficiency. By running a low-temp loop, the Hellcat's two heat exchangers—one in each bank of cylinders—can produce a much greater temperature differential. This system is so effective that the Hellcat can be driven for 20 laps on a 3.1-mile road course in 100-degree ambient heat without the engine power de-rating. (Among one of the torture tests Dodge engineers conducted was a grueling 24-hour endurance test at Nelson Ledges road course in Ohio.)

There are two other notable airflow features of the Hellcat's induction system. The first is an Air Catcher inlet port in the driver-side inboard marker light. By taking fresh ambient air from outside the engine compartment, the density of the air charge entering the engine is increased. The second airflow bump comes from the Hellcat's 92mm throttle body, the largest ever used in a Chrysler production car. The large orifice means pumping losses past the throttle's choke point are minimized, and that shows up as power at the wheels. Unlike carbureted cars of yore, no venturi effect is needed to siphon fuel into the air stream, so bigger really is better when it comes to throttle body diameter.

From the standpoint of driveability and durability, Hellcat has two other interesting features. An electronically controlled internal bypass valve located between the inlet side and the discharge side of the compressor allows air to move directly into the intake ports without being compressed. Under low load and off-throttle conditions, it lowers parasitic drag on the engine and reduces wear on the compressor. The other feature is a decoupler—a one-way mechanical diode—inside the supercharger pulley, which only allows torque to be transmitted in one direction. The compressor's rotors are then allowed to freewheel when engine speed suddenly drops, during shifts for instance, thus saving unnecessary wear on the compressor's gear drive and preventing problematic drive belt dynamics.

## Camshaft

If you want to make the kind of power that the Hellcat makes, you will need to move some air. Typically, that involves a discussion about the valve train, and that certainly applies here. As mentioned before, a combustion

chamber with a hemispherical layout has several inherent advantages, one being the potential for fitting valves with larger diameters, the sum of which being greater than the cylinder bore's diameter. Along with the fact that the valves are unshrouded from the cylinder walls, the hemi chamber has an airflow rate not unlike a multi-valve engine—only without the added complexity and mass. What this means is that relative to an engine with a typical wedge-shaped chamber, the hemi can move a similar volume of air using less camshaft. Adding a blower—and its attendant airflow—to the hemi equation means we need an even less aggressive intake valve event, which spells better efficiency all around. With the cylinder being filled under pressure from the blower, getting the air mass into the cylinder is far less problematic than getting it out. That said, it should come as no surprise that the intake specs for the Hellcat's hydraulic roller camshaft are slightly milder than the 392ci Apache. (Intake valve lift is reduced from .577 inch on Apache to .561 inch on the Hellcat. Duration likewise goes from 286 degrees at .006-inch lift to 278 degrees on the Hellcat.)

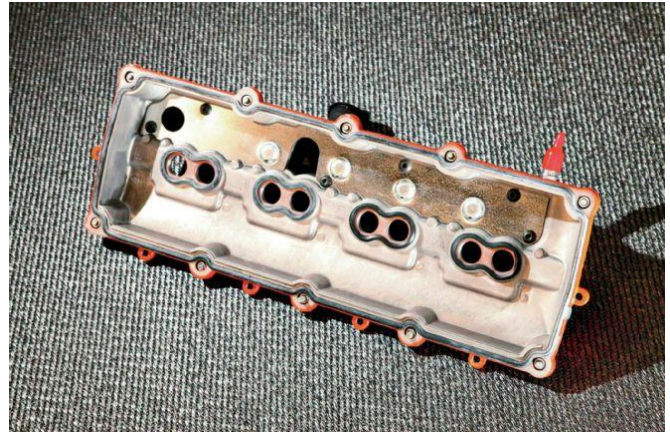
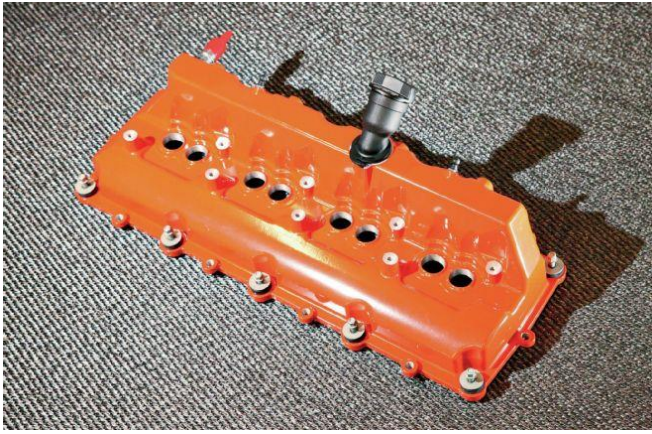


The Hellcat relies on traditional fuel injection rather than direct injection to feed the cylinders. That's good news for hot rodders. The Hellcat's 600cc/min fuel injectors can empty the SRT's 18.5-gallon fuel tank in about 13 minutes at full power.

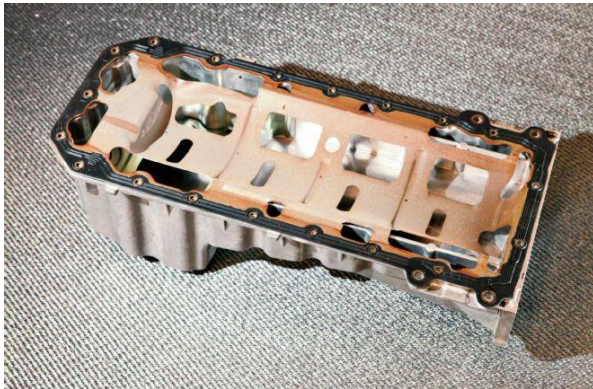


A close-up of the rotors in the IHI blower reveals the PTFE coating solid-film lubricant, which gives them a satin-black texture. This keeps friction and heat down.





The shape of the Hellcat's Hemi Orange valve cover has an unusual appearance due to an ingenious air/oil separator. The raised slab section of the valve cover is home to a labyrinth that draws crankcase pressure through it. Oil mist and air go in, but air and oil go out their separate ways.



Most production engines at the Hellcat's power level rely on complicated, expensive, dry-sump lube systems to get the job done, but Advanced and SRT Powertrain used a larger displacement pump in a wet sump system to feed the increased needs of the Hellcat's bearings, variable cam timing, and cooling jets. The openings were engineered to encourage the oil to be stripped from the rotating components, creating a highly effective crank scraper/windage tray.



This grouping of parts shows all the key pieces in the Hellcat's valve train. Hydraulic roller lifters are the same ones used in the 392 Apache (non-MDS), which act on hardened pushrods and a super-stable shaft rocker system. Hellcat's cam sports dramatically different lobe profiles than its Apache sibling, with reduced intake lift/duration but greater exhaust lift/duration.



On the exhaust side, the need to expel the spent gases is vastly increased over the Apache. To that end, the Hellcat's exhaust timing is expanded by an additional 16 degrees in length (304 degrees versus the Apache's 288 degrees at .006-inch lift) to improve blow-down. Exhaust valve lift also gets a bump, going from .537 inch on the Apache to .551 inch on Hellcat. With the Hemi's ability to vary cam phasing, the valve events can be altered to favor different load and emission regimes, such that the intake closing and exhaust opening events can be advanced at full throttle and higher rpm to increase power, and reduced at lower rpm and low load for better fuel economy. To accomplish the dual goals of optimized power and economy, the engine management system has 37 degrees of authority over the Hellcat's camshaft timing, and operates through an electronically controlled lube circuit and assembly on the cam timing gear. The range of camshaft authority is the same for both Hellcat and Apache, in fact, the timing chain and VCT assemblies are mostly the same. The mapping for the camshaft phasing, however, is different.

Rounding out the valve train overview, the Hellcat's valves are moved by hydraulic roller lifters that are otherwise the same ones used in the non-MDS cylinders of the Apache 392. They likewise act on a very stable shaft-style rocker system comprised of investment-cast stainless steel rocker arms mounted to a pair of steel shafts: one for all the intake valves of each head, and one for all exhaust valves on each head. Lube is fed to the rocker trunnions via hollow hardened pushrods and pressurized lifters, as is standard per all Gen III Hemi's.

### **Lube Circuit**

With engines of this power rating, we typically see exotic and expensive dry-sump lube systems, but the Hellcat's lube circuit is a model of simplicity and packaging relative to its competition. And while significant upgrades to the lube system in terms of capacity and electronic control have been made here, there is nothing about it that would be unrecognizable to most Gen III Hemi fans.

The Advanced and SRT Powertrain team recognized right away that the advantages of a wet sump system in terms of vehicle cost and packaging would be significant. The key was getting it to operate under extreme temperatures and g-loading without fail. Tight clearances and close tolerances in the bearings were critical, and we've already pointed out the lengths SRT has gone to in the implementation of select-fit bearings. At the pan, engineers used a sump with a close-fitting baffle that holds oil close to the pickup under extreme acceleration, cornering, and braking. An oil scraper/windage tray with an integrated over-molded perimeter seal is sandwiched between the pan and the block; this reduces friction on the rotating assembly from oil entrainment, and also mitigates foaming and aeration near the pickup. The oil is supplied to the engine with priority to the main journals via tight clearances, and also to the block's oil squirters, which have been targeted specifically for the crown and pin-boss area of the Hellcat's redesigned forged pistons. A residual pressure valve shuts off squirter flow under low load.

The Hellcat's mechanical oil pump also supplies lube to the VCT circuit to drive the phasing of the camshaft by means of an electronically controlled actuator, and like the Apache's pump, has been designed for the added flow and pressure demands on the engine. Oil capacity for the system is a relatively thrifty six quarts, and SRT requires full synthetic with a 0W40 weight. Lastly, the lube system has been given a very ingenious oil/air separator that changes the physical appearance of the Hellcat relative to other Hemi's. The tall coffers that are cast into the Hellcat's orange powder coated cast-aluminum valve covers are actually a maze of passages designed to separate the air oil droplets from the crankcase ventilation flow prior to being recirculated. The result of all this ingenuity is a lube circuit that can support an engine with the highest power output of any domestically produced car—and with simplicity and cost efficiency that beats all comers.

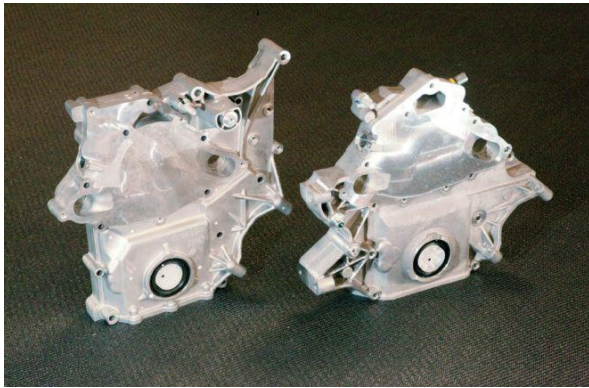


This timing chain "kit" is a great example of how subassemblies of parts arrive for engine final assembly. Parts are packed into the shipping container, pre-indexed, and are ready to be installed with all fasteners. This one contains the crank timing gear, timing chain, cam gear, and VCT actuator. Other than DLC-coated washers added to the crank sprocket, it is the same one used in the Apache

The Hellcat's exhaust manifold looks more like a shorty header—its double-walled construction acts like an insulator and is designed to keep heat in for faster catalyst light-off. It also lowers under hood heat for longer life of engine bay components.



Within the Hellcat's supercharger pulley is this decoupler, which allows torque to be transmitted through it only in one direction. The coil on the inner spool expands against the drum of the outer pulley shell and locks it, but only when moved in one direction.



The front cover of the Hellcat (right) is considerably different than the 392 Apache cover. The different design is needed to accommodate the supercharger assembly and more complex accessory belt drive system. Hellcat also has a slightly different water pump design. Any swap involving putting a Hellcat blower on a different hemi would certainly require this. There are differences in the fasteners as well, but figuring that out is what hot rodders do best.



The ring pack must seal the engine effectively while providing the least amount of parasitic drag, and it must last much longer than what a competition engine might be expected to. Here the Hellcat uses a 1.2mm steel top ring with a high-velocity oxygen fuel (HVOF) spray barrel face and a manganese phosphate coating. The 1.2mm second ring has a recognizable micro-Napier face with zinc phosphate coating, and the 2mm three-piece oil ring has nitrided stainless rails and a stainless steel expander.

## Final Thoughts

Clearly, Mopar fans have a lot to be proud of with the breakthrough Hellcat engine, but lovers of performance in every corner of the world can also enjoy the news. The Hellcat sets new performance and cost benchmarks that will have to be faced head on by all manufacturers who want to stay in the performance game. That's good for all gearheads—but for now it's best for the Pentastar proud. Getting a Hellcat engine, however, through any other means than buying an SRT Challenger or Charger could mean a wait. Typically, on a highly sought-after power plant like this the demand for production engines comes first. Once pent-up demand is satiated can any thought of offering a crate engine be entertained? That said, we wouldn't be surprised if the Hellcat Hemi crate engine was available as early 2016. Until then, you might want to keep your eyes peeled on the salvage yards. There will be a lot of test drives given in the months ahead, and skill might not keep pace with enthusiasm in all cases—if you know what we mean!



## Fast Facts 6.2L SRT Hellcat Hemi

### Engine

Type: 370ci V-8

Compression ratio: 9.5:1

Bore x stroke: 4.09 x 3.58 inches

Block: cast gray iron with revised cooling passages, reinforced webbing, revised and retargeted oil squirters

Oiling: wet sump, 6-quart capacity, 0w40 synthetic required

Rotating assembly: induction-hardened forged steel crankshaft with micro-polished journals, rolled fillets, and select-fit bearings; powder-forged steel connecting rods; forged full-floating pistons with DLC (diamond-like coating) forged steel pins

Cylinder heads: gravity-cast, semi-permanent mold, heat-treated 356-T6 aluminum; hemispherical chambers with hollow 2.13-inch intake valves and 1.65-inch sodium-filled exhaust valves

Camshaft: hydraulic roller, .561-inch intake lift, .551-inch exhaust lift, 278/304 degrees duration at .006-inch lift, variable camshaft timing (VCT) with 37 degrees of authority via electronically controlled lube circuit

Induction: IHI-sourced, liquid-intercooled, twin-screw supercharger with integral overrun decoupler, 11.6 psi of max boost, 14,600 rpm max blower input speed, 600cc/min fuel injectors, integrated electronically controlled bypass valve, 92mm fly-by-wire throttle body

Intercooling: independent low-temperature cooling circuit with computer-controlled coolant pump, dual parallel heat exchangers in the intake (one per bank) and front-mounted heat exchanger cores

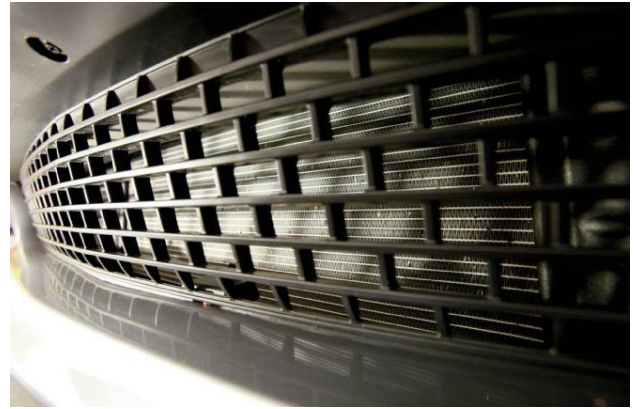
Ignition: dual coil-over-plug, electronically controlled

Exhaust: dual 2.75-inch exhaust with twin electronic exhaust valves

Fuel requirement: 91-octane minimum

Output: 707 hp at 6,000 rpm, 650 lb-ft at 4,000 rpm

The Hellcat derives much of its class-leading power from the use of a low-temp cooling loop, and here we see one of the heat exchangers responsible for that right behind the SRT's grille. This one is the first to face the oncoming air; the second low-temp cooling circuit heat exchanger is behind the A/C condenser in front of the engine radiator.



This close-up of the accessory belt routing should give you an appreciation for the engineering that goes into belt dynamics and packaging. Note that there are two drive belts—the inner one for the blower, and the outer one for everything else. Note how the power steering pump is mounted directly on the cylinder head—another area where the Hellcat cylinder head is different from the Apache.



### More Online

Go to [MoparMuscleMagazine.com](http://MoparMuscleMagazine.com) to watch our video interview of Gregg Black, Chief Engineer on the Hellcat engine, as we examine the Hellcat's parts, and tour the dyno as Hellcat gets tested in a treacherous thermal shock test!

<http://www.hotrod.com/features/1502-we-take-a-hard-look-at-dodges-paradigm-shifting-707hp-hellcat-hemi/>

[http://www.stockcarracing.com/car\\_racing\\_videos/01/hellcat\\_challenger\\_dyno\\_test/22057/#oid=d5am52cTroerryZkcIXUbu6QB3pGLGAY](http://www.stockcarracing.com/car_racing_videos/01/hellcat_challenger_dyno_test/22057/#oid=d5am52cTroerryZkcIXUbu6QB3pGLGAY)

Edited by Ray Z 1/2/15

## **Mopar's: For Sale - Cars Wanted – Stuff**

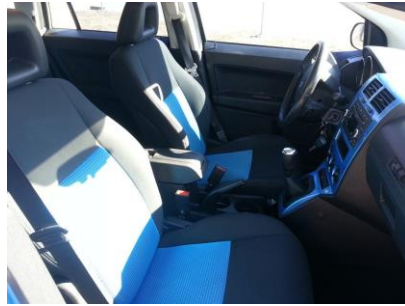
**Wanted: Transmission linkage / column shift for big block 727.** If anyone has this and is willing to part with it, please call Charles Barnett - 214-802-2291 [bebarnett1@msn.com](mailto:bebarnett1@msn.com)

**1991 Dodge Ram 1500** work truck 318 5.2 automatic single cab long bed \$1,000 214-709- 8181

**Omni / Horizon Parts:** 2.2 parts basically the entire powertrain some interior and trim pieces. Anthony Shelton [adshelton2004@hotmail.com](mailto:adshelton2004@hotmail.com) Cell 214-728-1162

**Misc. 1946-1952 Plymouth parts:** Extras from two restorations. Example: new pair of rear shocks for same \$20.00 for the pair, plus actual shipping. Call Mike Greer (Dallas) 214-341-8200 [mmgreer37@att.net](mailto:mmgreer37@att.net),

**2009 Dodge Caliber SXT.** The car is in excellent shape and has been well maintained. Here are the details, 1.8L Inline 4 Cylinder, 5-Speed Manual Transmission , 89000 miles Air Conditioning, Premium Sound System, flip down rear speakers, Power Windows and Locks, Remote Keyless Entry, 17" Alloy Factory Mags, Michelin tires (35000 miles on 70000 mile tires), Theft Deterrent System, New Front Brakes, \$7000.00 Robert Vaughan 972-998-7381 [rvaughan93@gmail.com](mailto:rvaughan93@gmail.com)



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## Meeting Information:

Monthly meeting 2<sup>nd</sup> Sunday of each month at 2:00 pm, Spring Creek BBQ,  
12835 Preston Rd. SW Corner of Preston and LBJ

### BOARD MEETING INFORMATION

(Based on current officer and board positions)

<i>January – Tracy Barenz, President</i>	<i>July – Bill Bonney, Director</i>
<i>February – Clint Cash, Vice President</i>	<i>August – Tracy Barenz, President</i>
<i>March – Lee Elm, Secretary</i>	<i>September – Clint Cash, Vice President</i>
<i>April – Mike Boyd, Treasurer</i>	<i>October – Lee Elm, Secretary</i>
<i>May – Open, Director</i>	<i>November – Mike Boyd, Treasurer</i>
<i>June – Lee Elms, Director</i>	<i>December – Open, Director</i>

Board meetings are open to all club members: Board meetings are usually held at an Officer's or Director's home starting at 7:30PM the Friday before the Sunday monthly Club meeting and all members are encouraged to attend. Check the DMC website for any last minute time or location changes.

**Our Sincere thanks go to Jim Proctor and the staff of [Chrysler Jeep Dodge City of McKinney](#) their support of the Dallas MOPAR Club**



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