

THE HUB CAP

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THE HUB CAP

The Hub Cap is published quarterly by the Wisconsin Region of the Classic Car Club of America. It is not possible without the kind help of our members. Please send your articles, photos, car histories, ideas and/or just reminiscences about the club. You do not have to be a good writer, that is what your editors are for! You may contribute to the newsletter either by mail, 619 South Main Street, Lake Mills, WI 53551, email *edfors@charter.net* or call 920-648-3067.

The opinions expressed in this newsletter are those of the authors and may or may not be those of the club, either National or Regional, nor its managers or editors. The editors reserve the right to edit any material submitted for publication. Businesses and products mentioned in articles are for informational purposes and are not to be construed as endorsements.

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DIRECTIONS

by Regional Director

Bill Tess



Hello Wisconsin Region members. Congratulations to all, we did it together, we have reached a huge milestone in the Club, our Golden Jubilee! 50 years of continuous dedicated Classic car spirit, award winning publications, grand events and many wonderful and endearing friendships. Moving into this festive

year, it has been an honor to lead the Board of Manager's team. To share our achievement, a club anniversary decal has been produced (included in this *Hub Cap* - make sure you don't miss it in the envelope!) to proudly promote our special membership. For extra cheers, let me know if you would like a second, third or fourth decal (\$1.50 each) and I'll be sure you get them when I see you at a future event.

Thanks for making our first 50th Anniversary gathering, the Valentine's Brunch, at the beautiful Seven Seas Restaurant such a wonderful success, with an amazing attendance despite the challenging weather. After the incredible family style meal and a short club update, everyone was invited to move into the picturesque lounge overlooking Lake Nagawicka for more Classic car conversation. Then, Happy 50th, Seven Seas hosted nearly any beverage desired as their toast to our significant accomplishment. We all had fun – the last couples left smiling in the late afternoon.

I'm to the moon with anticipation! The Spring Driving Tour (Cannonball Run), crafted by Tom and Joyce Edfors, is set for Sunday, May 20th. The invitation with information is included inside this *Hub Cap*. Hope you can join us.

ON OUR FRONT COVER

Amazing rear detail of a Speedster from the Auburn Feature Class at the Amelia Island Concours d'Elegance

Photo by Carl Jensen

I'll ask every member (and associate member) to take a good look at the activities calendar in this issue and save the dates for as many events as possible. Note: it's possible some future activities may be confirmed and detailed only via email, to save treasury funds on ever increasing printing and postage costs. If you are without an email address we will still forward a printed copy by mail. The Fall Tour is now going to be on Sunday, September 23rd, and will be hosted by Andrew Bogusz. Andy likes everything with wheels and is sure to plan a fun day.

We want to make sure everyone understands the Milwaukee Concours d'Elegance schedule as it has changed from last year. It is still a weekend program (www.milwaukeeconcours.com), but this year both the formal judged Concours and the Show & Glow paddock (formerly known as Club Day) are both being held on Sunday, August 5th. On Saturday, August 4th, there is a planned car tour, seminar in the afternoon and gala social in the evening at the historical Milwaukee Club. Be sure to follow the Concours website for required registration and information.

The Club's Board of Managers generally rotate members (men and women) into the elected Board each year. If you have an interest in becoming a valued board member for 2019, please contact me or any board member in the near future so we can start the planning process. Every member, including associates, is welcome to apply for the board and you will be delighted with the experience.

Our official club nametag is again available to new members or to replace lost tags at a cost of \$9.00 each. Please contact me by email (or phone) with the exact name you wish on this exceptional magnet nametag. Delivery will be made at the Spring Driving Tour, if ordered by May 5th.

Sadly; recently we lost two members, Harry Krueger from Middleton, a good supporter of events and fond driver of his '38 Packard and also Jim Schneck from Manitowoc who had a showroom full of jaw-dropping Classics and recently hosted an open garage tour for our members and guests.

Enjoy the Spring weather even though the daffodils are hidden under snowflakes and the Robins are wearing overcoats. I am going out now to peak under the cover of my Alvis and find a good spot for the new decal – and also put one on my daily driver, too. Happy Motoring!



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2018 ACTIVITIES

MAY 20th... Sunday Spring Tour 'Cannonball Run' to Milton, WI *Tom & Joyce Edfors*

JUNE 1st - 3rd... Friday - Sunday CCCA Museum 2018 Experience, Hickory Corners, MI

JULY 1st... Sunday Ken Hollub Memorial Car Show, Waukesha, WI *Brandon Butler*

JULY 14th... Saturday Wisconsin Region club picnic, Franklin, WI *Paul & Jan Grant*

AUGUST 4th - 5th... Saturday - Sunday Milwaukee Concours d'Elegance, Milwaukee, WI *Carl & Carrol Jensen*

August 12th... Sunday Botham Vineyard Car Show, Barneveld, WI

August 18th... Saturday Baird Cars, Coffee & Cookout, Mequon, WI *Paul Westphal*

AUGUST 26th... Sunday Geneva Concours, Geneva, IL

SEPTEMBER 23rd... Sunday Fall Driving Tour (destination tba) *Andy Bogusz*

OCTOBER 27th... Saturday Halloween Party, South Milwaukee, WI *John & Bunni Boswell*

NOVEMBER 4th... Sunday Annual Banquet, Meeting & Silent Auction Location tba (*coordinator needed*)

The club welcomes other proposed activities/dates for board approval - please volunteer!

IN MEMORIAM

The club lost two valuable and long term members recently. We shall miss them.

Harry J. Krueger, 85, passed away on January 2nd, 2018 in Madison. Born and educated in Milwaukee, Harry became a well-known interior designer. He moved to Madison and later founded his design firm, H. Krueger & Associates in 1969. He had a decades long and very successful career. Harry had a passion for automobiles and loved his 1938 Packard Club Sedan.

James C. Schneck passed away at his home in Manitowoc, Wisconsin on January 18th, 2018. He was born on December 20th, 1942 in Waterloo, Iowa. His B.S. was in biology and M.S. was in biochemistry. He went to work as a research chemist at Red Arrow Products located in Manitowoc where he eventually went on to purchase the company with a partner. It is an internationally known food flavoring company. He had a great love of Classic cars, had a large collection and was especially fond of Auburns and Duesenbergs.

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in printing and mailing costs.

It is still the same issue as would be mailed
to you but photos in the electronic version
(*it is in a low res pdf format*),
unless they were originally black and white,
will be in color whereas not all photos in the
printed version can be, due to cost.

If you would prefer to get future issues
of *The Hub Cap* via email
please contact the editors
and let us know so we can put you
on the email list.

You can call 920-648-3067
or email to either

Joyce at edfors@charter.net
or Tom at brasscars@charter.net.

I ♥ THE VALENTINE'S BRUNCH

by Joyce Edfors

Our beloved bunch congregated for a bountiful brunch to celebrate Valentine's Day on Sunday, February 11th. Though the weather didn't exactly cooperate, the brave travelers adventured out on a blustery and snowy winter's morning that eventually transitioned into a bright, though decidedly not balmy, afternoon.

This, our first event of the 2018 season, was once again held at the ever popular Seven Seas Restaurant that graces the shores of Lake Nagawicka, one of Wisconsin's breathtakingly beautiful lakes. It was fun to see everyone again after weathering what already seemed like a long winter. Little did we know then that at the time I would be writing this article in April it would still be snowing with well over half a foot on the ground!! I can see the bright green tips of the daylilies poking through the snow drifts in the backyard!



View of Lake Nagawicka outside the window at Seven Seas

No one ever leaves hungry or disappointed at the Sea Seas. Starting the feast off was a Chef's Station where you could get a made-to-order omelet and waffles. Back at the table we enjoyed basketsful of scrumptious bakery delights, fresh fruit and a complimentary glass of champagne or Mimosa before the family-style main event of chicken, bacon, sausages, potatoes and more with add on choices of rime rib or Eggs Benedict.



John and Bunni Boswell enjoying the day

After the meal Bill Tess held a short meeting providing updates and information about the new season that *eventually* will happen. Several others spoke as well. Then we adjoined to the bar area where Bill had arranged for complimentary drink tickets for the club. This proved to be a wonderful way to keep the camaraderie going well into the afternoon. It was warm inside the restaurant and cold outside so no one was eager to leave. It was a welcome addition to the day's festivities.

Thanks very much to Gregg and Christine Hotson for hosting this club favorite kick-off event!



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CLASSIC (NC)

by Jim Nicholson

This article is about my recently purchased town car. I am not going to say what brand the car is in the body of the article but I am including a photo so you can have some fun guessing.

The Brewster family was involved in coach building beginning in 1810. The family traced its roots in America to Elder William Brewster who arrived at Plymouth Rock in 1620. James Brewster established his carriage business in New York City with a factory in New Haven, Connecticut. They were known for high quality four-wheeled carriages.

Brewster and Company began building bodies for automobiles as early as 1896 and by 1910 expanded by building a new factory in Long Island City, New York. The top two floors were used to house customers off-season bodies as many of their clients had both closed and open bodies made for their chassis. Often they were revarnished in the off-season.

Brewster had about ten teams of craftsman subcontracting on most jobs. They would bid against each other for each job. This was a long standing tradition in the carriage trade. In the teens they bodied cars by Mercedes, Panhard, Renault, Crane-Simplex and others.

Prominent repeat customers had their family crest and colors reserved exclusively for their cars. This also had been a tradition dating back to the carriage days.

Brewster became the exclusive New York importer of Delauney-Belleville and later Rolls-Royce motor-cars. This allowed them to sell complete automobiles. They later built Brewster-Knights and later Brewsters on Ford and other platforms.

Brewster was known for many unique qualities making their products recognizable. They developed an oil based paint that was more durable than the varnish of the day. Their cars usually had less ornamentation than others including even painted radiators. They developed the first roll up window with a unique cam that pushed the glass

against the frame. They developed disappearing jump seats and breathable, removable rear seat cushions. They also used the faux cane panel for decoration. Most of their bodies are conservative in appearance inside and out. They developed the four pane non-reflective windshield which was seen on many of their cars from the 1920s.

Brewster was in financial trouble by 1925 and was bought out by Rolls-Royce of America. They produced over 400 bodies while owned by RR. In an attempt to stay viable, Brewster produced a car jointly with Ford running gear from 1934 - 36. Approximately 140 were made. Additional history can be found on coachbuilt.com.

Now to discuss my town car. See photo below.



This is a 1920 model. Things that identify it as a probable, and likely, Brewster body include the roll up windows in the rear doors and divider window, the relatively simple elegance of the design, suicide rear doors and the color which was the Brewster color for the Aster family. While many of these features were not unique to Brewster, when taken together it is likely this car was bodied by them. There are no builders' plates on the body.

The history of the car as reported, but not documented, is that this car was commissioned by the Aster family and later given to their chauffeur on Long Island. It was bought by a collector in Maine where it remained for many years. I found the car at the Hershey Car Corral. It is not a Classic car but is built on a well known manufacturer's chassis. What is it? Any corrections or additional information is welcome.

MYSTERY CAR REVELED ON PAGE 11

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AMELIA ISLAND CONCOURS 2018

by Carl Jensen with additional content by Thomas Edfors

Escape the Midwest in March and look at cars with friends...I love Amelia! With good friends, and WIRCCCA members, Mike and Deb Korneli, along with another car 'nutty' couple, we woke up in our beach view house rental on Thursday morning, March 8th, to warm sunshine and cool cars. First it was off to the Gooding auction to say "hi" to our buddy, Garth Hammers, one of the top guys with Gooding, and do a little window shopping. While I am not really that interested in the car "market", I certainly do like to shop and see interesting and special cars that come to these premier auctions at Amelia and Pebble. One could go crazy trying to understand the market. Early Porsches selling for records, a very special front engine V12 Ferrari(nc) coming up over a million dollars short on the estimate, then a 1910 Peugeot V2Y2(nc) selling well above the estimate range. Again, it's crazy! Over at the RM action at the Ritz, things were just as unpredictable, although there were a few super bargains that made me wish I had registered to bid...but one just never knows.

The other big news, already spreading like wildfire on Thursday, was that the concours was again moving from Sunday to Saturday due to threatening storms. Last year, this worked flawlessly as Saturday was picture perfect. We had shown our Marmon then and it could not have been a better day, but on Sunday we woke up to severe storms. This year was a bit different. Saturday was again a beautiful day but this year Sunday was too. It was like a bonus day! So, we spent Sunday strolling around the island and town area. It is interesting to note that with 300 cars on display at the concours,

we saw only six driving around town, and all six were Rolls-Royce Silver Ghosts! It always appears the folks with the oldest cars, drive them the most.

Back to the Saturday concours, it was another amazing selection of cars that appeared to have appeared out of thin air. There were historic concept cars that had never been in the public, a complete display of Martini Racing cars, antiques and Classics that came from all over the world and a few rather unusual classes.

One of the cars that really grabbed us was a fresh restoration by Brian Joseph of a Duesenberg formal sedan. It was exquisite. The owner shipped the car to Brian's business in Troy, Michigan from his home in Russia and has yet to see the final product. He is in for a great surprise!



WIRCCCA member Tom Griffith displayed his 1936 Lagonda LG 45 with original coachwork by Frank Feeley (pictured above). This car has historical significance as it was the first Lagonda built under technical supervision by W.O. Bentley himself after he left Rolls-Royce in 1935. Tom's car won the Amelia Award - European Custom Coachwork.

Continued on page 10

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Amelia Island Concours continued from page 9



Another of the unusual classes was made up of hunting cars including Rolls-Royce and Bentley shooting brakes. {Assistant Editor's note: The term

'brake' came from an early heavy wagon or cart used to 'break' horses 'with spirit'. This evolved into the 'shooting brake' wagon or carriage with seating, doors to rear and/or side and storage for guns, ammunition and for game. Later shooting brake bodies, typically of wood, were attached to the chassis of automobiles, usually cars of high-quality and distinction and still used for hunting}. One, of course, needs such a Rolls or Bentley to take the dogs and friends to the field to bird hunt. These are quite practical for that use, as well as other sporting activities one has at their country estate. But then there was also the incredible custom-bodied 1950 Buick(nc) from the legendary King Ranch of Texas, complete with three rifle scabbards on each front fender, and early Rolls-Royces that maharajas had converted for tiger hunting. It made a very entertaining class. A real favorite was a Rolls-Royce shooting brake with the owner's very gentle Labrador Retriever in the back seat!

All in all, it was another excellent concours leaving us looking forward to next year's events!

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This Labrador Retriever was a popular addition to his owner's Rolls-Royce shooting brake

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MYSTERY CAR REVELED FROM PAGE 7

**Jim Nicholson's car is a 1920 Maxwell(nc)
with probable Brewster body.
Is it therefore partially a Classic?**

EDITOR'S NOTE

The following is from a chapter from the book by Ed Miller "*Road Testing Cars of Distinction*".

This appears by the author's permission as written
and will be featured in installments over the next several issues of "*The Hub Cap*".



Chapter Two: *Second Installment* 1935 Bentley 3½ Litre Aerodynamic Sport Saloon, body by Rippon Brothers

Two years later a completely different automobile was introduced to the world. It was a sports car unlike the Cricklewood Bentley. The new Bentley, manufactured at Derby, was much more refined and intended to be a sporty touring motor car for the upper crust. This is the story of a uniquely bodied Derby Bentley, a 3½ Litre Aerodynamic Sport Saloon, body by Rippon Brothers.

A six cylinder in-line engine with a bore and stroke of 3¼" X 4½" forming a displacement of 3,669 cubic centimeters or 223.9 cubic inches comprised the new 3½ Litre Bentley. The engine wasn't new. Rather, it evolved from the Rolls-Royce 20/25 power plant. Typical of Rolls-Royce, every part was meticulously manufactured. The fully machined crankshaft is composed of nitralloy steel, which increases the life of the metal and reduces wear. This process also increases its durability. To further improve the crank, the shaft was case

hardened to strengthen the metal. This process diffuses carbon into the surface of low carbon steel thereby increasing the crankshaft's hardness, wear resistance and fatigue strength. However, distortion can be of critical concern. This well made crankshaft is held in place by no less than seven main bearings. The crankshaft is fitted with weights combined with a friction damped spring drive and a friction driven flywheel to reduce crankshaft vibration. The crank is enveloped by a cast aluminum crankcase that was manufactured in two sections. Nonetheless, during the entire run of the Bentley 3½ Litre and its successor, the Bentley 4¼ Litre models, the threat of crankshaft problems loomed large. Therefore, if you desire one of these Full Classic® motor cars never exceed the indicated engine speed limit of 4,500 RPM.

The crankshaft actuates overhead valves via rockers and pushrods from a camshaft running at half

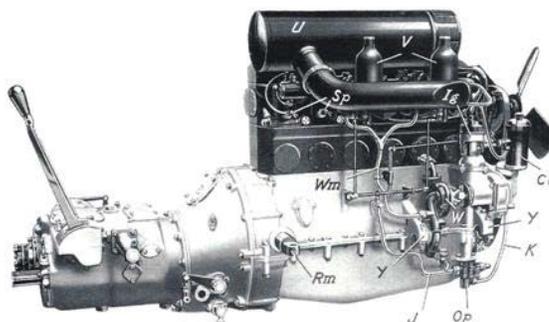
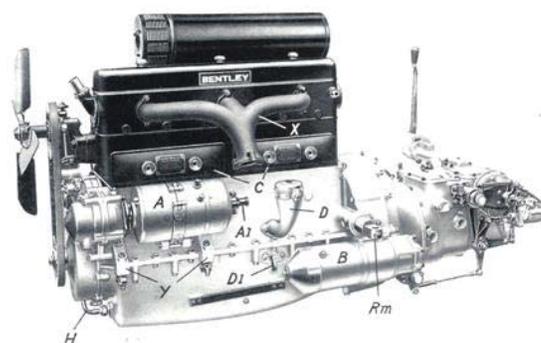
the speed of the engine. The camshaft is driven by a set of bronze helical gears and held in place by seven plain bearings high in the crankcase. Near the front of the camshaft is an additional cam which, together with a series of spring plungers balances out unevenness in torque which maintains silent operation of the timing gears.

Both head and block are of cast iron. They are individual units, though the cylinders extend two inches into the block. A conventional one intake and one exhaust valve serves each cylinder. The head is of cross-flow design. This means the fuel enters from one side and the exhaust out the other. This promotes uniformity of fuel mixture and more complete scavenging of the exhaust gases.

An unusual lozenge shaped combustion chamber provides better combustion. Although the first few Bentley 3½ Litre cars had pistons wearing four rings, the lowest of which was a scraper ring, the remainder of the run did just as well with three rings, the lowest continuing duty as a scraper ring; the remainder as compression rings. The aluminum alloy pistons wear skirts that are split in order to deal with expansion and contraction.

The connecting rods are both drilled and have external piping in order to allow pressurized oil to flow from the big ends to the gudgeon pins (wrist pins). The rods are nickel-steel forgings in the shape of an "I." The connecting rods use shimmed steel backed metal shell bearings. Shimmed connecting rod bearings had not gone out of style. When a connecting rod bearing starts to wear, a mechanic replaces the shim with a new shim of appropriate thickness rather than scrape the bearing. Incidentally, maximum oil pressure is 32 P.S.I. Typical oil pressure, when the engine is warmed up, is 20 p.s.i. at 2,000 RPM. At idle, expect 5 to 7 p.s.i. of oil pressure. If it falls lower, turn the ignition off and tow the car to your nearest Bentley mechanic.

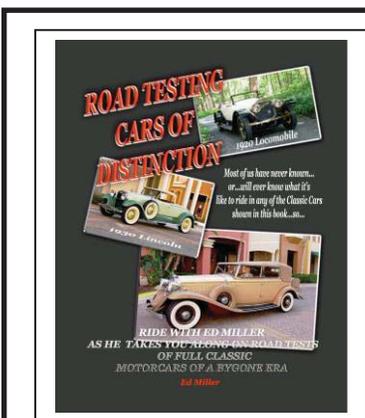
Continued in the next issue of The Hub Cap



For those who want to know more than they should regarding the Bentley engine, these diagrams hopefully will satisfy your desire.

A-Dynamo(Generator), A1-Tachometer connection, B-Starter, C-Tappet covers, D-Oil filler, D1-Oil level indicator, H-Oil pump line, Rm-Rear bearer arms, Y-Front bearer arms.

Cl-Coil, Ig-Ignition contact, breaker and distributor, K-Rocker, etc. oil line, Op-Oil pump, Sp-Spark plugs, U-Air silencer, V-SU carburetors, W-Water pump, Wm-return water pipes from induction manifold.



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Road Testing Cars of Distinction captures the very essence of pre-WWII luxury automobiles. Unlike other books, *Road Testing Cars of Distinction*, takes a very deep dive into the engineering, driving and performance that make our Classic cars extraordinary. *David W. Johnson*
President, CCCA Education Foundation
Former President, CCCA

PHOTO 'OPS' RATHER THAN PHOTO 'OOPS'

Photographic Observations by Thomas Edfors

I am not a professional photographer by any means but in my past life as a real estate appraiser I have taken literally tens of thousands of property photos and, of course, in my hobbies hundreds if not thousands of car, plane, bike, battlefield and aircraft photos. So, I thought it would be good to give some observations on taking automobile photos for publishing in *The Hub Cap*. Some readers may be professional or hobby photographers and if I write anything wrong, please correct me or, if you have better advice, please let me know as I need to improve the quality of my photographs too!

We are all, or for this purpose should be, using digital photography of some sort. What is of utmost importance for inclusion in *The Hub Cap* is to use the highest pixel (or in other words the highest resolution) possible. There is loss in clarity when a

photo has to be scanned from an actual printed photograph and the quality suffers so try to use your digital camera or Smartphone. Also, please use the jpg format.

Of course, the first step is to pick out the car or cars you wish to photograph. But don't just focus on the car. *Look also at the surroundings.* We often have photos sent to us that have those blue port-a-potties prominent in the background. These *really* ruin a photo. Other things to avoid are trash cans, fences and the like. Many things may not be noticed in the background as one puts their utmost attention to the car. Look *way* into the background too. I took a wonderful photo, I thought, of a brass-era car only later to discover that a construction crane far away appeared to grow out of the tonneau of the car. Telephone, utility and flag poles tend to do this sort of thing to you too. Try to be careful of all the surroundings.

Next, we have the never-ending problem with ...people! Yes, it is almost impossible to photograph a car at a concours, show or other event without people in the way. Think only of Hershey, it is almost impossible to see the car behind the wall of people. But, I have discovered that when you have a car with people around it if you have patience a hole will 'open up'. Just be ready for that moment. Most people who see you with the camera will be kind and give way (i.e. move), but not all do. I often simply ask if they would step out of the way for a moment. Usually the result is positive but sometimes not! What I used to do then is have my cards ready. If there is an issue I present them my card and ask if they will email me I'll email them a photo of the car if they would just let me take a photo sans them in it. This usually works, and most don't ask for a photo...interestingly. To avoid the above, get to the concours or show *early* and do your photographing then.

Another thing about people. I never understood it, but I have seen people between or behind cars do things they would never do if they knew they were in full public view. The trick is to not catch them on camera. We often have photos sent to us where in the background is the proverbial bent over (away from you) woman or man. There are other things I

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could mention but I think you get the point. Before you click, watch what is going on with the people in and around your field of view.

Then we have the car itself. There must be something special about the car for one to want to photograph it and send it to any editors to be hopefully published, whoever they are. So, once you take some three-quarter views of the car, identify some special features and photograph them, too. Close-ups of mascots, body lines, brightwork treatment and even dashboards can make interesting subjects. A rear view of the car can also provide an interesting look. Don't be afraid to experiment using the flash at times even in bright sunlight. A flash can reveal details on the car that may otherwise be lost in shadows. This can be a bit tricky as while you want to bring out details in shadow you don't want to have the flash reflected at you in all the chrome (or nickel or brass). Speaking of brightwork, and highly polished paint, make sure, as best as possible, not to get yourself reflected in it, nor other people or things. We have had to reject many photos due to the clear reflection of the photographer or others. We

have also seen dogs, children, folding chairs, picnic baskets, trees and so on being reflected.

This is *very* important; if you plan on emailing the photos for possible publication in *The Hub Cap* to make sure you take a photo of the sign in front of the car so that, without the editor or editors having to contact you, one will know what the car is and who owns it. This will save time and make sure the right information is published. It is even more helpful to describe what the year, make and model are and, if known, the owner in the caption when you send your photo. Photo identification is crucial.

One more word of note, it is best to avoid sending photos you found on the internet. One can never be sure if the photo is copyrighted or not unless you verify it is okay to use. Do not submit photos with writing over them or from websites that prohibit their use.

By following these guidelines for submitting the best possible photos to *The Hub Cap* or other publications you send them to will make the editor(s), whoever they may be, quite happy.

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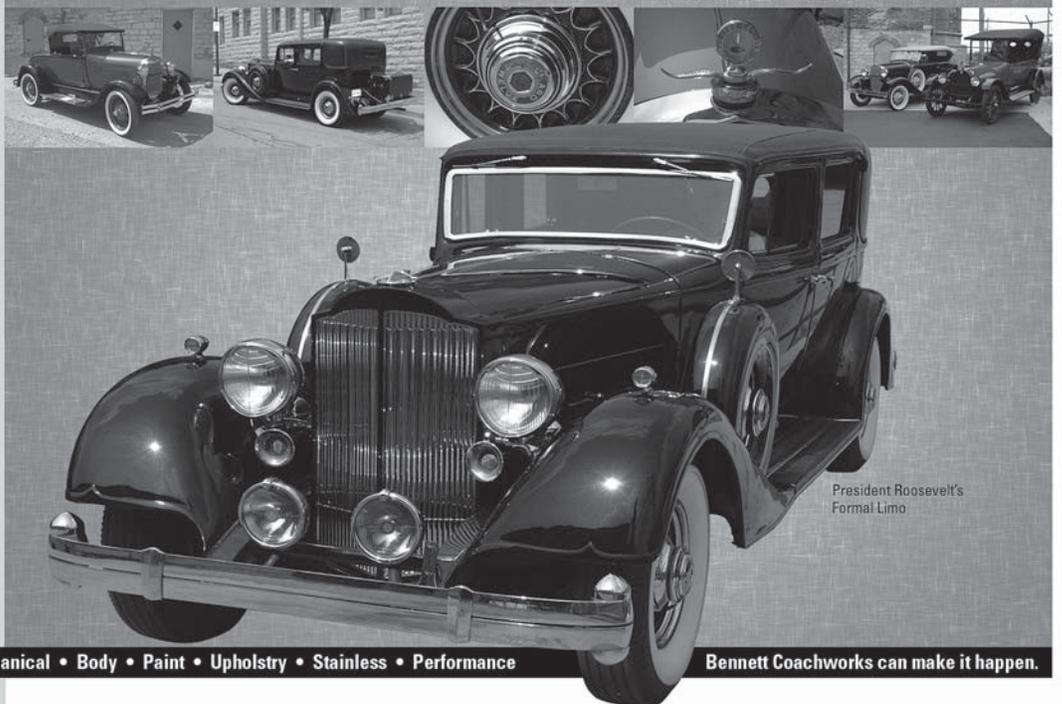
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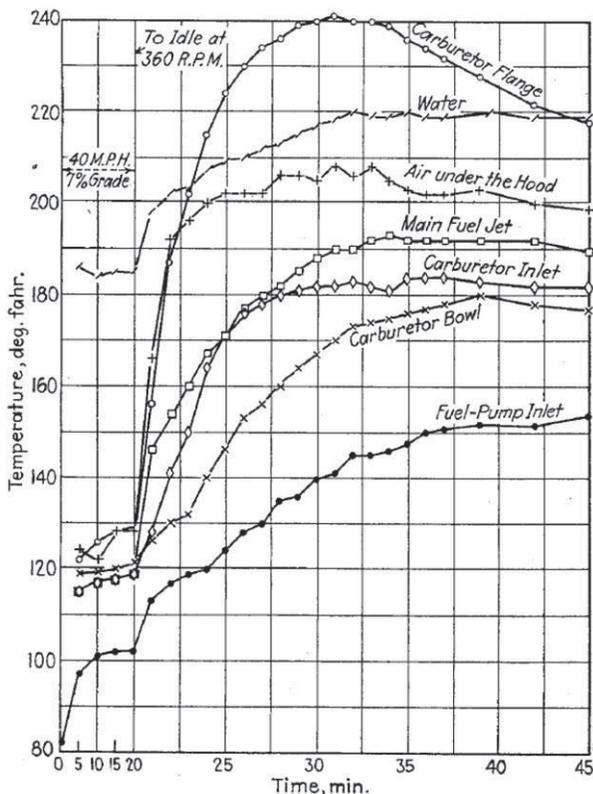
VAPOR LOCK PROBLEMS WITH ETHANOL AND POSSIBLE MITIGATIONS

by Jim Chase, Copyright November 2017

Assistant Editor's Note:

The following article is reproduced as written. Various cars mentioned are non-classics but "nc" has not been inserted. The article is lengthy and will be printed in installments with the author's permission.

How the volatility of the gasoline can be related to the temperatures in the fuel system of a car can be seen in the following chart where the temperatures were measured on a (unidentified) 1935 car at various points in the fuel system. The first 20 minutes the car was driven at 40 mph on an 80°F day up a 7% grade. Then the car was brought to a stop and idled for 45 minutes to plot the rise in temperature.



The fuel temperatures stay below 130 F while pulling the grade, but as soon as the car is stopped and the engine brought down to idle the temperatures rise rapidly. In five minutes the main jet of the carburetor reaches 180 °F. If the engine were shut down instead of idling, the air from the radiator fan as well as the air and fuel flow through the carburetor and manifolds would stop and the temperature rise would be greater. Note the temperature peaks are about the time it takes for a stop to have lunch.

The fuel gains temperature all the way from tank to carburetor jet. It is heated in the tank and in the line before reaching the fuel pump by air passing through the radiator and under the car at speed, and by proximity to mufflers and exhaust pipes. The biggest jump occurs in the fuel pump, noted by the increase in temperature between the fuel pump inlet and carburetor inlet. The fuel pump is a major player in both driving and idle vapor lock. It is bolted to the hot crankcase, in some cars it is in proximity to the exhaust system, and has a very large surface area able to transfer a lot of heat into the small volume of fuel trapped between the diaphragm and top of the pump. More discussion on fuel pumps is in Part II. (Next issue per Editor.)

The fuel in the carburetor bowl is at atmospheric pressure, not the higher fuel line pressure. At sea level pressure (14.7 psi or 29.92 inches mercury), pure ethanol boils at 172°F, so it is going to boil and vent. At higher elevations such as Denver (atmospheric pressure = 12.23 psi) ethanol will boil at 164°F, 12° lower, which helps explain why cars with no problem at low altitudes may suddenly give fits in the mountains. This is a bit of a simplification for illustration, when mixed with gasoline ethanol's boiling temperature actually drops for a given pressure lower than when pure. The most common hot restart vapor lock problem comes from the hot carburetor boiling off the fuel in the volatility range needed to fire and the dropping the fuel level in the carburetor bowl.

The 1935 report noted that problems could also come from flooding the carburetor rather than leaning out. The temperature of the fuel trapped in the line to the carburetor rises to 182°F as indicated by the carburetor inlet temperature in the chart above. This fuel is trapped between the fuel pump inlet check valve and the carburetor float valve. The vapor pressure of pure ethanol at 182 degrees is 18.3 psi, 3.6 psi above sea level pressure. At 5000 ft altitude, the differential pressure is over 6 psi. This means that a typical carburetor float valve designed to only resist 3.5 to 4.5 psi pressure will open and allow the carburetor to flood at 6 psi. Another problem is that as fuel boils in the carburetor bowl, its density is reduced and the float no longer exerts the same pressure on the float valve. The fuel line pressure it can resist drops. An electric pump running continuously with a stalled hot engine can flood and overflow the carburetor and is a potential fire hazard.

The carburetor is being heated by conduction and convection by the block and intake manifold, but more importantly the much hotter cast iron exhaust manifold. The intake manifold sits on top of the exhaust manifold intentionally to pick up heat for rapid warmup when cold and help the vaporization of the fuel, but when idling or stopped this heat becomes a primary vapor lock problem. The extra heat comes from air convection around the manifolds as well as direct conduction and radiation.

As indicated in the 1935 report, fuel systems were designed and able to operate with lots of vapor – 20 to 40x the liquid. It was not a matter of a big

bubble of vapor forming in the fuel line between the tank and fuel pump blocking all liquid fuel from reaching the pump.

While ethanol added to gasoline certainly has added significantly to vapor lock problems, it is a mistake to believe that our old cars were immune from vapor lock problems when new and that all faults can be blamed on modern fuel.

In SAE report 310018 “Fuel Line Temperatures in 1931 Cars” begins:

Road tests were made on a large number of 1931 cars operated under various specified conditions, and fuel temperatures were measured in each case at several points in the fuel-feed system. On the average, no material improvement over the 1930 models was found. Individual models had been improved considerably, while others had become worse. This unchanged situation may be due, in part, to the fact that the results of the 1930 survey were not available in time so that full advantage could be taken of the conclusions in designing the 1931 models. Reasonable protection for most of the 1931 cars as regards fuel cannot be obtained in hot weather if they are run on gasolines having a Reid vapor pressure higher than 7 lb. per sq. in. The production of such a product not only makes difficult the meeting of the requirements necessary for easy engine starting during some seasons of the year but, in addition, materially curtails the available supply of suitable

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gasoline. The problem of eliminating vapor lock would be greatly simplified in the case of forthcoming models if these cars were equipped with well designed fuel-feed systems; in fact, such a change in design is the only way of eliminating a large percentage of the vapor-lock troubles. The problem is not very difficult from the design standpoint, and some of the 1931 cars have satisfactory fuel systems. Effective installation of the line leading from the gasoline tank to the fuel-pump, and changes in the position and in the method of lubrication of the fuel pump, appear to be the two major points involved in solution of the problem.

Average RVP for summer premium in 1935 was 7.1 psi, and had risen to 7.9 by 1947. It is now generally controlled to 7 psi.

Fuel lines should be run outside the frame rails and preferably on the non-exhaust side. As seen on the temperature of the carburetor flange, the thick insulating gasket between intake manifold

and carburetor as well as between the fuel pump and crankcase is a critical component. Not all cars came equipped with these gaskets originally and installing one under the carburetor should help. Installing a thick insulating gasket between the fuel pump and crankcase may be more challenging since it likely will push the fuel pump actuation lever away from the cam eccentric that drives the pump and reduce its stroke.

Prior to WWII car manufacturers were concerned that the demand for the more volatile fractions of gasoline would outstrip supply and cars would need to be able to start and run with less volatile fuels. What happened was the opposite where fuel volatility actually rose through the 1960's until more stringent controls were put in place to reduce hydrocarbon air pollution. The result is that prewar car designs may supply more heat from the exhaust manifold to the bottom of the intake manifold than necessary for good cold drivability and this aggravates the vapor lock problem when hot. Some have fixed stainless steel plates of lower conductivity in the bottom of the intake



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manifold to reduce heat conducted to the carburetor from this source. Providing a slight air gap between plate and manifold would increase the insulating effect. This may call for some experimentation as the intake manifold still needs some heat to provide the right mixture and it would be possible to provide too much of a good thing.

Insulating the fuel line is a bit problematic. On the one hand it obviously slows down how much heat can be added to the fuel while it is running, but once the engine is shut down there is time for higher temperatures to make their way through the insulation and still heat up the line. Once the engine is restarted it will reduce the cooling effect of the fan to bring the fuel line temperature back down and could extend the time it takes before the engine stops missing and bucking. Polishing the fuel line or placing a polished heat shield with air gap along the line facing the exhaust manifold to reflect radiant heat may help. Basically, insulating the fuel line may help driving vapor lock but exacerbate restarting and initial running of a hot engine.

What else can be done? Of course using fuel with no ethanol is the obvious first choice, but in many areas that is simply not an option. It is probably best to avoid premium fuel if knock isn't a problem. Premium fuels are likely to have more ethanol than regular to increase the octane rating. Fortunately knock becomes less of a problem at higher altitudes where vapor lock becomes more likely.

Keeping the fuel temperature in the carb from rising is the primary consideration. Make sure the exhaust manifold heat riser butterfly isn't stuck in the cold position. That valve directs hot exhaust to the intake manifold to aid in warmup when cold and will force more heat into the carburetor.

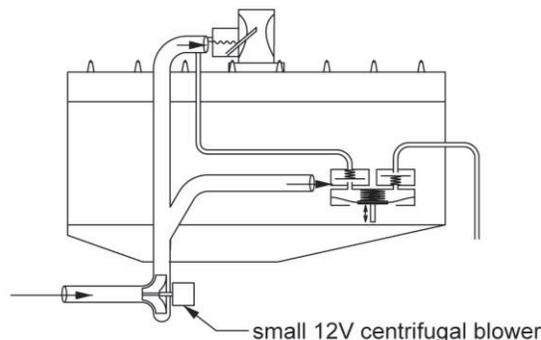
Many cars originally were fitted with metal heat shields with a small airgap around the carburetor bowls to reduce radiant heat from the exhaust manifold. If you don't have one, find a replacement, or make one out of sheet metal. Polishing it on the side facing the exhaust manifold will help. Shield the fuel pump from the exhaust system and provide a path for cool air to rise from below the car to the fuel pump without passing over an exhaust pipe or muffler first. Wrap exhaust pipes or mufflers near the fuel pump with muffler insulation.

On a car able to start but misses and bucks trying to drive, run the engine at high rpm briefly to

increase fan flow and bring fresh fuel in that cools the fuel system and carburetor.

This article is focused primarily on the more common restart and idle vapor lock problem after a warm drive. Driving vapor lock and fuel pump issues are covered in Part II. (*Editor's note: in the next issue of The Hub Cap.*)

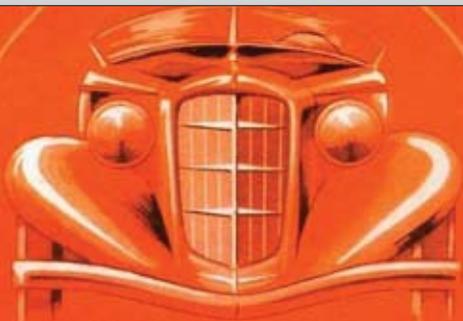
Once a hot engine is shut down and the fuel and airflow stops, there is no arrangement of pumps or fuel lines that is going to keep the carburetor from boiling off the critical 30% of the volatile fuel needed for restart and initial running. I submit that the most direct way to solve this problem would be to install a small electric fan below the engine and duct that transports cool air from beneath the car blowing directly on the carburetor bowl during hot idle and for a period of time after shutdown. It would require a thermostatic or time delay switch to keep from draining the battery. Since the fuel pump is a major contributor to vapor lock once the engine is running again, a branch to cool the top of the fuel pump would also help. Having the duct inlet facing forward under the radiator provides a source of ram air not heated by the radiator and cooling both pump and carburetor when the car is at speed and the blower is turned off – help for driving vapor lock. A schematic illustrates this in the following figure:



Note that a typical 12 volt blower will run on 6 volts at 1/2 speed. The electric fan should be mounted below the engine to prevent any chance of fuel vapors in the top of the engine compartment finding an electric spark.

Not an authentic solution, but when you are sitting stalled at a traffic light trying to restart with non-authentic fuel on a hot summer day with irate commuters on your tail, the pride of pure authenticity might wane somewhat.

To be continued in the next Hub Cap



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