

The official newsletter
of: Revs Institute
Volunteers

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*Thank You to
this month's
contributors:*

- Bill Vincent
- Ralph Stoesser
- Mike Ellis
- Lauren Goodman
- Whitney Herod
- Joe Ryan
- Chip Halverson
- Mike Barboone

TAPPET CLATTER



Volume 29.3

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Chairman's Notes

By Chip Halverson

Walking through the museum last week you could feel the transition from the summer season of extensive travel for the collection cars to them returning to fill their spots in the galleries. The shop was very busy with the return process as well as their normal maintenance rotation.

The summer season travel saw Revs Institute represented at Monterey, Rennsport, Goodwood, numerous other special events and in Mexico where Porsche 550-01 is at Porsche event.

This time of year also brings the return of the seasonal volunteers. With all of that going on, it's exciting to begin the new season with renewed energy and excitement.

Speaking of volunteers, Joe Ryan passed the mark of 4,000 hours served, incredible!! John Wharton just passed the 2,000 hour mark, again, extraordinary. And Dr. Jim Wood became a Docent. Please join me in congratulating them all.

Also, don't forget the learning opportunities created by our Training Committee. Footprints Masters Class Part Deux is scheduled for November 8th. Morris Cooper presents people with significant connections to the cars in the museum. There are only a few spots left so sign up quickly.

I look forward to serving with all of you this season.

Chip Halverson

TAPPET TRIVIA

By Joe Ryan

This section is devoted to questions about the Miles Collier Collections cars or cars of the same period. Some of the questions might be a bit (very) obscure or (impossibly) tricky. Test your knowledge and *have fun!*

The Porsche 917 PA has gotten a lot of track time over the summer months so this issue of Tappet Triva is focused on the all-conquering Porsche 917.

1. **Question:** The Porsche 917 PA; What does the PA stand for?
2. **Question:** What year did Porsche first take the overall win at the 24 hours of Le Mans?
3. **Question:** Who were the winning drivers of that first overall winning car?
4. **Question:** What was the starting position of the Porsche that brought the company that first overall 24 Hours of Le Mans win?
5. **Question:** What is the difference between the Porsche 917 and the 917K?

The answers appear later in this issue

Events Calendar

Event	Date	Info or contact
Cars and Coffee	Nov. 4 @ 8:00 am	Sign up on VicNet
Footprints Masters Class Part 2	Nov. 10 @ 10:00 am	Sign up on VicNet
Horseless Carriage Club	Nov. 11 @ 10:30 am	Sign up on VicNet
MG Car Club	Nov. 16 @ 1:30 pm	Sign up on VicNet
Volunteers and Staff Banquet	Jan. 20 @ 5:30 pm	RSVP to Jan. Evite

For a full list of daily tour groups and events, go to the 'Calendar of Events' on VicNet.

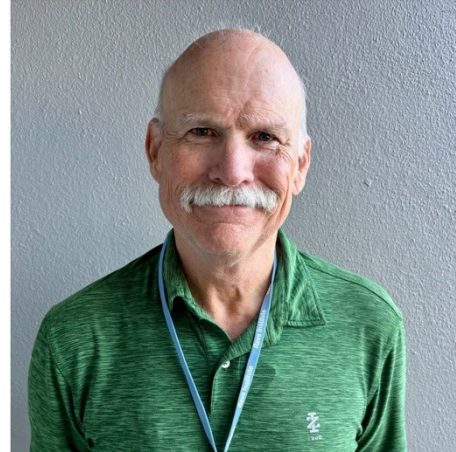
Membership Report

By Tom Dussault

The Membership Committee is pleased to introduce two new members to our Volunteer group. Please reach out and welcome Thomas Tingle and Dave Kelly when you meet them in the Museum.



Thomas Tingle is a new Steward. He recently moved with his family to Southwest Florida from Maui. While living in Hawaii, Thomas was an active member of the Rotary Interact Club doing cleanups as well as cooking meals at the local homeless resource center. Thomas is a trained classical pianist, participated in the Science Olympiad and was a member of his school's Outrigger Canoe Paddling Team. He has just begun learning the sport of fencing. Thomas hopes to study mechanical engineering and we anticipate he will receive some valuable advice from his mentor Eric Jensen. Thomas visited Revs Institute in July and looks forward to learning about and sharing the Miles Collier Collections with our guests.



Dave Kelly retired to Naples a dozen years ago following a thirty-year career in the Insurance and Risk Management industry. Originally from Philadelphia, Dave spent most of his extensive career in New York and New Jersey. An eight-time visitor to Revs, he has taken three RevsEd classes to date and has enjoyed them so much he plans to take a few more. He has always been a "car guy" and is a member of West Coast Muscle Car Club as well as Cool Cruisers of Naples. Dave looks forward to learning the collection with his mentor, John Wharton, and to sharing the Revs Institute experience with our guests.

The next meeting of the Membership Committee is Tuesday November 7th. Please note that any member who wishes to request "reduced hours" to be exempt from the 60-hour yearly service requirement but may also wish to continue to serve in some fashion should speak with Whitney Herod prior to our meeting. Please speak with Whitney for details about "reduced hours" and the nomination and selection process for "Tenured Volunteer" and 'Emeritus' honors.

November Members Meeting

By Eric Jensen

The member's meeting for November featured Mike Barbone speaking about the RevEd program. Many of you have noticed a classroom built off of the main shop area fitted with various displays, parts and tables.

This is the starting point of RevsEd, hands on classes to teach future collectors, interested teens, lifelong learners and any other interested parties how various systems work in automobiles.



The classes are defined as “edutainment”; Learning while having fun. Imagine, say, a 40 year old with an interest in old cars purchasing a 1967 Mustang or 1969 Camaro as their entry into the old car hobby. These cars are quite basic in design compared to today but don't operate like a modern car. Cranking the ignition and pumping the gas pedal to start an old car doesn't compare to simply pushing “Start.”

Old cars are equipped with carburetors and points-type ignition systems were both gone from the automotive world by the time the new 40 year old collector was born! (ed... this makes me feel old!) Where do you go to learn how these work and what to do when they don't? “It All Starts Under The Hood” so RevsEd is where.

Classes start with Engines 101, and proceed to Engines 102, Brakes 101, Steering and Suspension 101, Electrical 101 and Metal Fabrication 101. The classes are four 2 hour sessions with 8 people in each class. All are structured as; *Instructor does it, We do it, You do it together* and *You do it alone*. There are no tests, just fun. Over 400 students have taken classes to date. The students should be at least age 18. Classes are both day and evening. In the summer months, there are teen classes for ages 14 to 18.

Mike Barbone's presentation consisted of the introduction to Engines 101 to show how the classes proceed. Each class is very hands-on for the 8 students in class. The students handle parts, set point gaps, set timing, adjust carburetors and tune running engines. Even if the student has never held a screwdriver or wrench in their hand, they will learn how to use them.

The reviews are very positive so far. A great majority of students of Engines 101 have returned for 102 and more. RevsEd has grown since its inception adding instructors from the ranks of the retired. Revs Institute is the “flagship” location but the intent is to develop “satellite” locations in major cities.

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November Members Meeting...continued

(Continued from page 4)

At the recent Turtle Invitational concours in Bedford, New York, RevsEd went on the road. A trailer was loaded up with parts, tools, screens and tables to bring RevsEd to the students at the Hagerty Garage and Social (*right*). With brand new Volkswagen cylinder heads, spark plugs pistons and rods for the students to learn, instructors Mike Barbone, Scott George and Craig Lortie.



A link to the Hemmings article can be found [here](#).

As Station Guides and Docents, we are all encouraged to promote RevsEd to our guests. There are RevsEd brochures posted at the front desk explaining the program. Information about RevsEd has been added to the video shown to each Docent tour promoting this wonderful educational initiative.

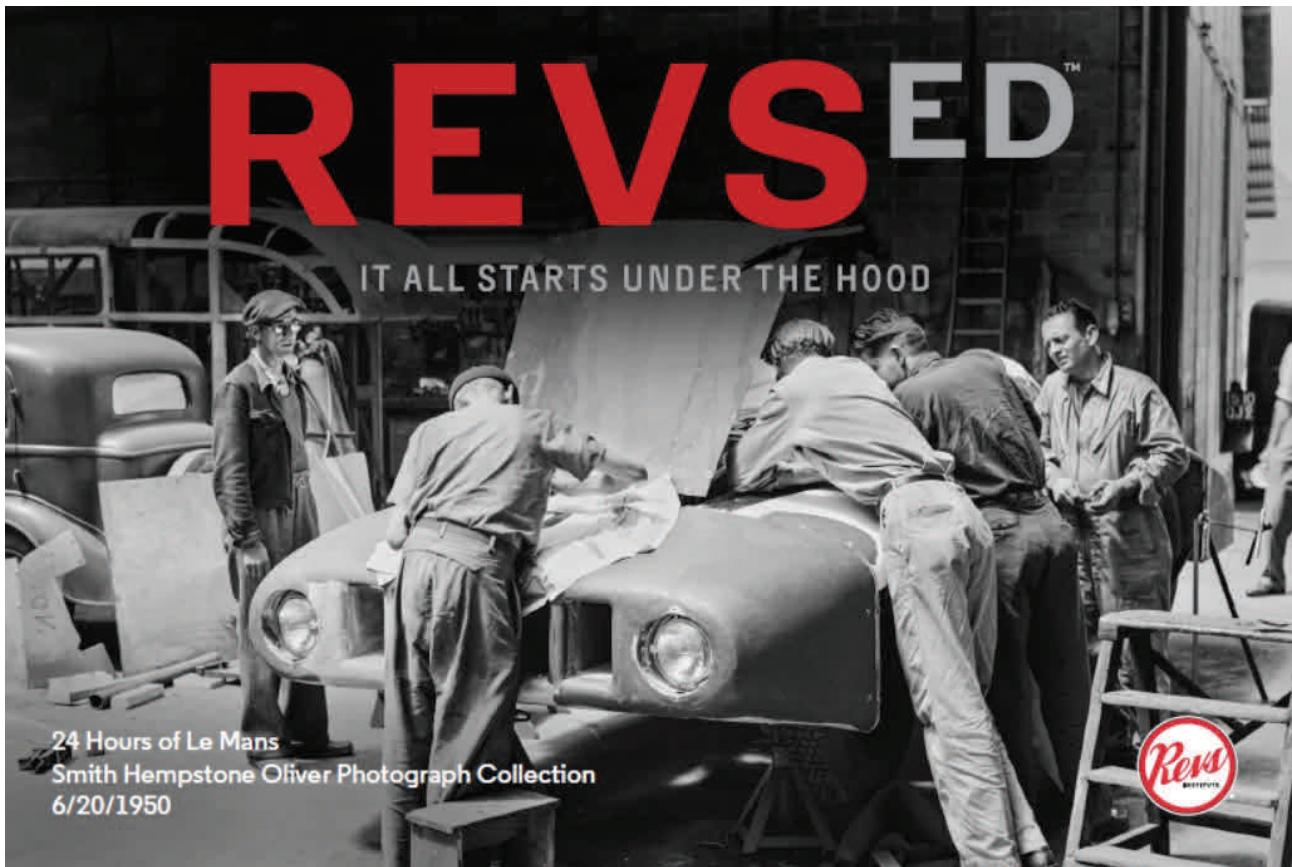
RevsEd Recognizes Joe Hauser

Volunteer Joe Hauser donated his Triumph TR3 parts car to be used as a teaching aid for various RevsEd classes.

On behalf of all of us at RevsEd, we sincerely appreciate Joe Hauser's gracious donation of his Triumph TR3. This car will be used as a teaching aid to enhance the hands on learning experience for many years to come. Thank you Joe!

Sincerely, The RevsEd Team





24 Hours of Le Mans
Smith Hempstone Oliver Photograph Collection
6/20/1950

REVSED™

IT ALL STARTS UNDER THE HOOD

WHO: -Adult and Teen classes

HOW: -Small class size
-Hands On with Live Equipment & Tools
-Revs Institute Instructors

WHY: -Gain knowledge and confidence
-Meet like minded car lovers
-Have fun!

WHERE: -Revs Institute in Naples, FL



LEARN MORE

revsinstitute.org/visit/register-for-classes/

Engines 101 Learn how engines work, how to use hand tools, and ultimately what makes an engine GO.

Engines 102 Perform diagnostic testing on all the major engine systems, including the starting, charging, ignition and fuel systems; then make the repair.

Brakes 101 Remove, inspect, and reinstall components, then flush and bleed the fluid in the hydraulic system.

Steering & Suspension 101 Remove, inspect, and reinstall all components. Learn how to evaluate tire wear and the importance of wheel alignment.

Electrical 101 Learn how all electrical components receive the proper voltage through specific wires at the push of a button.

Metal Fabrication 101 Learn how to design, cut, bend, and fasten sheet metal to construct a finished product.

Chattanooga Motorcar Festival

By Eric Jensen

The Chattanooga Motorcar Festival held their fourth annual event in Tennessee. This year's event included the Luftgekühlt's celebration of Brian Redman. This three day festival also included a Concours d'Elegance, Brian Redman's Targa 66 track events, Mecom Auctions and panel discussions.

The Luftgekühlt is a celebration of air-cooled Porsches. What better example of an air-cooled Porsche with a connection to Brian Redman than Miles Collier Collection's 1969 Spa 1000 km winning Porsche 908 LH driven by Redman and Jo Siffert in that event.



The 908LH with Brian Redman

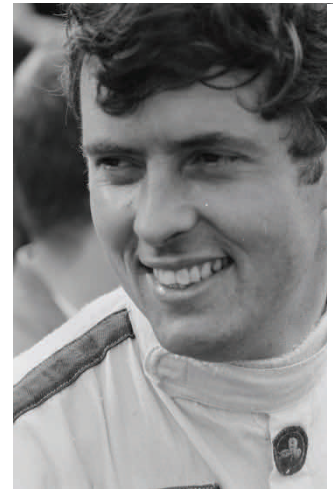


A young Brian Redman - right

Brian Redman and Bob Varsha at a panel Discussion - left

An overhead shot of the Luftgekühlt display - lower left

The 1969 Porsche 908 LH on display - lower right



Photos Courtesy of Revs Institute



Rennsport Reunion VII

To start this article off, just what is Rennsport Reunion?

Rennsport Reunion's own description....

...part motorsport, part car show, and part family reunion—and it all adds up to an unmissable weekend of celebration for fans of all ages.

Rennsport Reunion was conceived by racing great Brian Redman and Porsche Cars North America's longstanding press spokesperson, Bob Carlson, in 2001 to celebrate the racing heritage of Porsche.

They envisioned an event at which drivers, enthusiasts and historians could gather to celebrate racing and pay tribute to the men, women and cars that have helped build the Porsche legacy.

Rennsport Reunion celebrated the iconic cars, people, and moments at the heart of the Porsche experience.



The Porsche 550-01 on display



This is the seventh running of this event. While it is not an annual event, it is a regular event. Rennsport VI was held in 2018, V in 2015 and IV in 2011 so it is on an irregular schedule.

The 75th anniversary of Porsche automobiles has been celebrated throughout 2023. Rennsport VII is no exception. Revs Institute, of course, was a part of this great event at Laguna Seca. Having some of the most famous, iconic and celebrated Porsche automobiles in the world's finest collection, a fair few Miles Collier Collections Porsches were in attendance. The first Porsche 550, the 908/3, the 356 GT Speedster, the 904 GTS and the AP-18 tractor were in attendance.

Gunnar Jeanette in the 917PA on Laguna Seca's famous Corkscrew turn (right)

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Rennsport Reunion VII...continued

(Continued from page 8)

We ran two cars in the Werks Trophy race: Gunnar Jeannette brought the 917 PA to a second place finish, and we were pleased to have Tazio Ottis with us for his first drive behind the wheel of our 906!



*Tazio Ottis in
the 908/3
- right*

*And in the 906
-left*

*Thanks to
Rami Garcia
for the photos*



Tazio had a great run among the various prototypes and other 906s entered! Tazio also finished P3 in Sunday's tractor race, and we were thrilled that John Oates joined us for the Saturday's tractor race in the AP-18 tractor he drove at Rennsport VI in 2018.



Cunningham Porsche 904 GTS



We were pleased to share 550-01 as one of the poster cars, before it heads down to the Panamericana. We also had the 908/3, the 356 GT Speedster, and the 904 GTS on display and for Heritage / Icon Parade Laps. We are so grateful to Porsche, the entire WeatherTech Laguna Seca Team, and the 90,000 plus fans for making this all possible.

Photos Courtesy of Revs Institute unless otherwise noted

Staff Profiles: Mike Ellis

By Eric Jensen



This column is an introduction to the Volunteers of the talented staff members that are dedicated to the mission of the Revs Institute. These staff members are resources the Volunteers can use to help educate and entertain our guests. If you get an engine question, the place to ask is our first staff member interviewed for this column, Mike Ellis.

Mike's main function in the shop is to maintain the collection of cars as well as help with race prep of those competition cars that attend vintage track events. With some 115+ cars to maintain and the number of appearances for the Miles Collier Collections cars each year, clearly that is a big job. In 11 years at the facility, Mike has become very knowledgeable about the collection.

The shop would be hard-pressed to find an employee with more experience. After growing up in California, Mike started working for the famous racing engine builders Traco Engineering at only 18 years old. For those not familiar with Traco Engineering founded by Jim Travers and Frank Coons, they were the chief mechanics for Howard Kecks Indy winning cars that Bill Vukovich drove, were the engine builders for the Lance Reventlow's Scarabs, and all of Roger Penske's racing interests including, Trans am, Can-am and Mark Donahue's Indy 500 win.

During Mike's stay at Traco he participated in the IROC series, supplied engines for people like Alex Van Halen, Arnold Schwarzenegger, Nicolas Cage and many others. Traco was responsible for a modified Chevrolet engine that set a closed course speed record of 176.25 mile hour with a stock body Corvette driven by Stock car racer Ricky Rudd. That led to building engines for Dick Guldstrand and the revamped Corvette Grand Sport 80 package that could be added to Corvettes started in 1989.

A few years intermission from engine building had Mike working in Truk Lagoon in Micronesia diving World War II Japanese shipwrecks acting as the ships engineer/ diver safety officer and underwater photographer. To the right is one example of a Japanese Zero airplane in Truk Lagoon.

Next came some time at Shaver Specialty Racing Engines supplying engines for the World of Outlaws and CRA sprint cars where he was in charge of induction systems, cylinder heads, fuel injection and cylinder block machining.



All Photos Courtesy of Mike Ellis

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Staff Profiles: Mike Ellis

....continued

(Continued from page 10)

Then came Fischer Racing Engines, supplying the engines for Dale Earnhardt's NASCAR Truck series and driven by champion driver Ron Hornaday leading to that series first championship. And also supplied engines for Dale's Bush series and his Winston Cup series cars.

If you are building engines for NASCAR, it helps to be in North Carolina. Mike moved there in 1997 working for Robert Yates Racing building Ford lease engines in a shop later sold to Cal Wells building Chevy Cup engines for the only Pontiac team for driver Ricky Craven. The team won their second open race of the year at Darlington in the closest NASCAR finish ever in the last Pontiac and last single-car entry to win.

During that time, Mike was invited to dinner by the shop manager. Little did he know that it was just a ruse, as they were entered in the Clevite 77 Engine Building Challenge to compete... cold turkey, with no prep!

Each team of two is given a disassembled Ford V8 engine to assemble, start and run as fast as possible. Would you believe 26 minutes and 36 seconds? And that includes 3 minutes of the engine running! Look to the picture (*right*) as proof! Mike competed against the best engine builders in the country for 3 years.



Mike moved back to Robert Yates Racing working in the restrictor plate engines for Daytona and Talladega. Mike's engine won the pole with driver Dale Jarrett and then to a championship with Kurt Bush in 2004 (left). This includes a championship ring!

When the racing business took a downturn, it was back to diving for Mike. This time in the Bahamas working for five years as a safety diver, crew and deck hand for a charter boat. This involved taking

photograph and study wild dolphins and sharks. This allowed Mike to hone his underwater photography and to be published in print and online.

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Staff Profiles: Mike Ellis ***....continued***

(Continued from page 11)

Amongst all that, Mike found time to earn a black belt in Ed Parker's Kenpo Karate, compete in the International karate championships in Long Beach California and have his own karate school in North Carolina. He also worked as a tour director for Pro Beach Volleyball and help set the stage for the sport to be part of the Olympics.

As a favor for his friend who built the Corvette Grand Sport engine, Mike was asked to deliver the engine to Revs Institute. A resume, an interview, a job offer and Mike joined the staff.

Links:

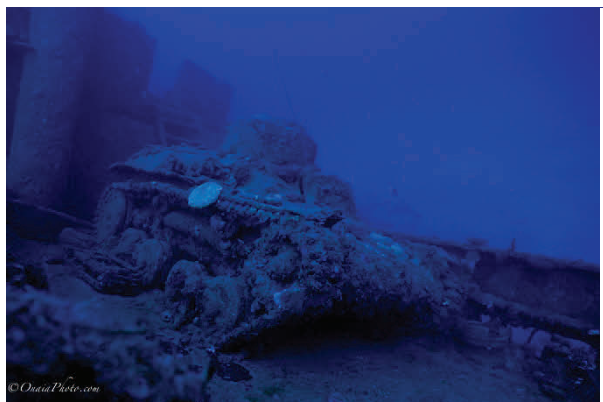
More of Mike's underwater photos [on Instagram](#).

Mike motorsports and engine photographs [on Instagram](#)

And a [MotorTrend article](#) about the Guldstrand GS80 Grand Sport Corvettes.

A [YouTube video of Ricky Craven's](#) record close finish in a Pontiac

A few more examples of Mike's photography below.



French Coach Building and the Three Olive Machine

By David Cooper

A feature presentation from the 2019 Revs Symposium

Reprinted from the November 2019 Tappet Clatter

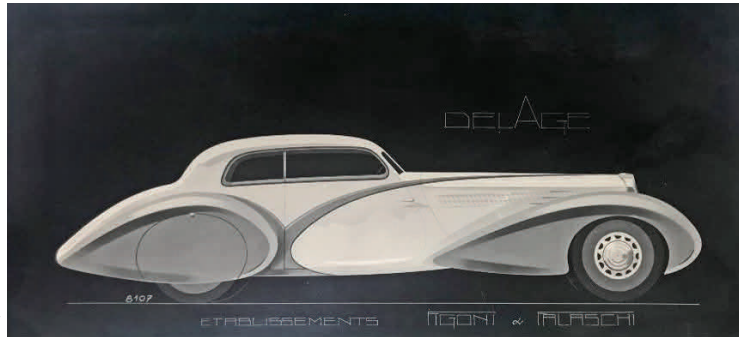
In pre-war Europe, the French created some of the world's greatest automobiles, by combining elegant streamlined design, inventive state-of-the-art engineering and superb, detailed craftsmanship. They dominated this elite market.

French coachbuilders developed unique and new techniques to manufacture limited production custom bodies with complex curves and shapes such as those exemplified by the Collection's 1937 Delahaye. While the quality of the finest coachbuilding in Germany, Italy and England was also superb, they did not use the French methods - and it affected their coachbuilding. It is curious that there are almost no photos taken inside a French coachbuilder's atelier. While craftsmen moved from one coachbuilder to another, they kept the unique French techniques and equipment secret.

In this article, which is based on his presentation at the 2019 Revs Symposium, restoration specialist David Cooper will reveal the special machinery and techniques that made French coachbuilding of the 1930s so exceptional.

When you look at the finest pre-war classic cars, you see the art of the coachbuilder. Everything visible and tactile, the custom handmade body and the interior is the work of the coachbuilder. The major manufacturers, like Bugatti, Delage or Delahaye for example, made the chassis, engine and drivetrain. Except for the radiator shape, most of their work was invisible. The coachbuilder's work expresses the style, elegance and beauty of a fine automobile, much like a couturier adorns and presents beautiful women.

The bodies of fine automobiles moved from the simpler, boxier designs of the 1920s into complex streamlined shapes, reaching their pinnacle in the late 1930s. The French designers led the world in creating some of the finest streamlined cars before World War II. These coachbuilt cars were custom or hand-built in small series. Their complex shapes could only be hand-formed, in contrast to production cars where simpler panels were formed by giant stamping machines.



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French Coach Building ...continued

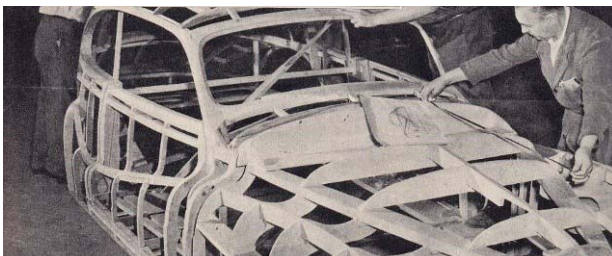
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To build these custom bodies efficiently, usually in just weeks, the French coachbuilders developed proprietary techniques, machinery and methods. Only the Swiss incorporated any of the French techniques; but, not surprisingly, they generally designed more conservative and less dramatic bodies. The British, Italian and German coachbuilders made superb bodies and there are examples of them building wonderfully streamlined shapes; but, they mostly avoided the complex curves of the French, partly because they did not have the machines and techniques to form these shapes quickly.

To maintain the secrecy of the French methods there were very few photographs taken inside any of the major French coachbuilding *ateliers*. While most of the great coachbuilders kept their top people for years, craftsmen sometimes moved from one French coachbuilder to another, still keeping the secrets. The biggest secret was the Three Olive machine.

To understand how the Three Olive machine was used, we will focus on two aspects of coachbuilding: fabricating the structural wood skeleton of the body and the art of forming the sheet metal. First, the designer at the coachbuilder's *atelier* prepared sketches and color renderings, often working closely with the client. There were mechanical constraints. Each body was made to fit over a specific chassis, with a fixed wheelbase and position along with the angle of the bulkhead/firewall determined by the car manufacturer. The designer specified the number of seats and doors.

Once the general look was decided, large-scale drawings would be made of the side and top views. From these finished drawings, a wire maquette, as a full-sized body form, would be made. The maquette would allow the designers to resolve the details of the design that they could not fully anticipate from the two-dimensional drawings. With the maquette, designers and craftsmen could see the three-dimensional shape in full 1:1 scale.



Next, the wood artisans fabricated a wood skeleton for the cabin area of the body. This skeleton was the structure of the body, and it was never removed; the sheet metal wrapping merely functioned as a protective cover.



A wire maquette of a fender

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French Coach Building ...continued

(Continued from page 14)

The design of the wood skeletons continually evolved as the new streamlined cars demanded a more complex wood body structure.

Typically, aged ash would be used, as it is resistant to moisture and insects. It also has a fine grain, making it both supple and resilient. Maple, also a fine-grained hard wood, was not typically used, because it could be easily damaged by water. Oak had long grain lines, which under stress or moisture could form cracks. The ash was typically aged for three to five years to remove excess moisture, so it would not distort or warp after assembly.

During WWII, techniques were developed to speed up the aging process, but coachbuilders did not use, or trust, the new processes. After the war, when there was no aged ash available, coachbuilders who still used the traditional methods were forced to use green ash wood. The green wood was unstable and attracted insects. The wood structure underneath the bodies of the cars built just after the war are usually in much poorer condition than the earlier pre-war cars.

The cabinetry differs considerably from one French coachbuilder to another. *Letourneur & Marchand*, for example, was known for the intricacy of their skeleton design and the quality of their joinery. *Gangloff's* skeletons, on the other hand, were surprisingly crude, although the skeleton is invisible when the sheet metal is installed over it.

While the wood artisans were fabricating the structural wood, wood bucks were formed following the pattern of the maquette to allow the sheet metal formers to simultaneously create the body panels. Today we use steel bucks, laser cut and welded together, but the effect is the same. The French did not typically use hammer or forming bucks like the Italians, where the sheet metal is formed directly on the bucks. Instead, they built fitting bucks. The sheet metal was formed off the buck and then test-fitted against the buck shape. If the maquettes were sufficiently detailed, sometimes they were used to create fitting bucks for the sheet metal panels.

The coachbuilder's art is to fit a complex, curved sheet metal skin snugly over the wood skeleton. The larger the sheet metal panels that make up the body, the less welding and joining will be needed, enabling faster production. To fabricate these large curved panels, all of the French coachbuilders used a crown-forming machine commonly known as a "Three Olive" machine.

The Three Olive machine differs dramatically from an English wheel, the primary machine used by most English and American coachbuilders. The English wheel is generally limited to smaller panels.

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French Coach Building ...continued

(Continued from page 15)

As a consequence of how the English wheel curves the sheet metal between small rollers in a small area, the material work hardens. The sheet metal then needs to be annealed or softened before more forming can be done.

The Three Olive machine, because it gently forms curves over a large surface, does not work-harden the sheet metal, and a panel can be run through the machine many times until the desired shape is achieved. On the Three Olive machine, sheet metal panels pass through the rollers controlled by two operators, one feeding and the other receiving the panel; whereas, the English wheel is operated by one person.



Three Olive Machine powered by an electric motor

The English wheel is manual, whereas the Three Olive machine is powered by a large electric motor. The Three Olive does not feed the part through, however. Instead, the powered, wide rollers function as a continuous form rolling or pressing the part into the curved shape while the operators manually pull it through the machine.



The English wheel used for smaller panels

It is not just this magnificent machine that makes French coachbuilding unique. To use the Three Olive machine effectively, it is necessary to conceptually rethink how panels are made. Imagine making the rear panel next to the trunk opening on a Delage Aerosport. This is a large panel, but with the Three Olive machine it can be made in one piece rather quickly. To do this, the artisans first need to determine the primary curve, the area that must be stretched the most. Then they select the area on one of the rollers of the Three Olive that matches this primary curve. Two artisans run the sheet metal through the Three Olive and then check the panel against the shape on the forming buck. The skilled artisan receiving the panel has the ability to twist or otherwise modify the shape or the panel as it comes through the rollers. For the Aerosport, it was necessary to twist the panel as it exited the Three Olive.

(Continued on page 17)

French Coach Building ...continued

(Continued from page 16)

When the primary shape is correct, the skilled artisan can see that the edges along the primary curve are stretched too much. He then needs to shrink the edges back using a hammering machine with shrinking dies like an Eckold machine. The two different machines work in tandem to form these large complex curved panels efficiently.

Sometimes, after all this is done, the panel is fed through the Three Olive machine for planishing, to remove the hammer and forming marks from the sheet metal surface. If one was to make this same part with an English wheel, one would be fabricating many smaller parts, requiring more welding.

When the panels are formed, they need to be joined together. In the 1930s, this was done by welding by hand with a small oxygen-acetylene torch. The panels were cut and fitted so that the seams were butted together. Then, using the swarf or rough edges from the saw cut as their welding rod, the panels were welded slowly at low heat. This prevented the metal from hardening or warping along the weld lines. The underside of the panel reveals how little the heat spread into the metal, and how precise and consistent the welds are. After welding, the part was test fitted on the forming buck or maquette and adjustments were made as necessary.

Modern welding, either TIG or MIG, produces too much heat, and hardens the panels along the weld seams. Right after the war, French coachbuilders started using electric spot welders to attach brackets and supports to the sheet metal. This made construction even faster. Once the panels were formed and welded, they were then tightly wrapped around the wood skeleton and nailed in place.

The French company that made the Three Olive machines offered a choice of six roller sets. For automotive work, the machines usually had size 1, 2 and 3 or 1, 2 and 4. The larger flatter rollers, 5 and 6, that formed more gradual curves, were not necessary for automotive work. Automobile roof panels, for example, which have very gentle gradual curves, could be formed quickly using a power hammer. The larger rollers were used by manufacturers of boats, airplanes, trains and other vehicles. The well-equipped French coachbuilder of the period would have one or two Three Olive machines, an Eckold shrinking machine, an English wheel, a power hammer and other sheet metal forming tools.

David Cooper [Cooper Technica, Inc.](#) Bristol, Wisconsin

David Cooper studied the French methods with a master French sheet metal former, now retired, who trained on a Three Olive machine when he was an apprentice. This is mostly a lost art today. David knows of only 12 Three Olive machines remaining. Cooper Technica, Inc. owns and restored two of them, which are both used today in the company's restoration work.

The Isle of Man TT

By Bill Vincent

The Isle of Man is located in the Irish Sea, between England and Ireland. It's known for its medieval castles, wind and wave swept coastline, and a rural landscape that sweeps up to mountains in its center. Although it's a dependent of the British Crown, it is self governed - which played a big role into the event the island is most famous for: The Isle of Man TT.

The Isle of Man TT is a time trial motorcycle race, run on closed public roads - and it's considered by many as one of the most dangerous competition racing events in the world. But before it became the iconic motorcycle event it is today, it was an automotive challenge.



Its origins trace back to 1904, when it was called the Gordon Bennett Eliminating Trial, and was restricted to "touring automobiles" of the day. The Motor Car Act of 1903 had placed a speed restriction of 20 miles per hour on automobiles in the United Kingdom. Something that didn't sit well with automotive enthusiasts or manufacturers!

So Julian Orde (*left*), the Secretary of the Automobile Car Club of Britain along with members of the Irish government, reached out to the authorities on the Isle of Man for the permission to race automobiles on the island's public roads... because, being self governed, the Motor Car Act of 1903 didn't technically apply! The island's Highways (Light Locomotive) Act of 1904 gave their permission and racing began!



30-H.P. NAPIER CAR-GORDON-BENNETT CUP

That first Gordon Bennett Eliminating Trail ran what was called the "Highroads Course" (*above right*), which had a length of just over 52 miles and featured over 420 turns! The 1904 winner was Clifford Earl in just under 7-1/2 hours driving a Napier (*left*). In May 1905 Earl won again in a Napier, bumping the race time down to just over 6 hours!

(Continued on page 19)

The Isle of Man TT...continued

(Continued from page 18)

By September 1905 the first Isle of Man Tourist Trophy Race for racing automobiles (known as the RAC Tourist Trophy) and was run with John Napier driving an Arrol-Johnston (*right*) winning in 6 hours and 9 minutes at an average speed of just under 34 mph. In second place was Percy Northey, driving a Rolls-Royce, and rounding out the podium was Norman Littlejohn, in a Vinot-Deguingand.



The cars competing in 1905 had to meet a number of specs:

- The chassis had to weigh between 1,300 and 1,600 pounds.
- The wheelbase had to be at least seven and a half feet long.
- The cars had to carry a load of 950 pounds, which included the driver, an optional passenger, and ballast.
- The cars also had to be able to carry four people, including the driver.

Even in 1905, homologation was in place, as the model of car had to be available for sale for at least a month after the race. Maybe environmental concerns were also in mind, as originally it was decided that each car was only allowed to use one imperial gallon of fuel per 25 miles of the race. But this was later changed to one imperial gallon per 22.5 miles.

Tire wars too were in their infancy, as manufacturers represented included Continental, Palmer, Dunlop, and Michelin. Many of the rules introduced were an attempt to make the cars more representative of the touring cars that the public could drive and, for the most part, in many ways they were successful in that goal. But politics were also already at play as it had originally been suggested that the number of foreign entries should be limited! A target of no more than two foreign cars for every five British entries was put forth, but that restriction was never enforced.

It was decided though, to give special prizes for cars that were entirely British-built. A bit of a snub to the entries from France, including a Vinot-Deguingand, a Peugeot and a pair of U.S. built White steam cars and a Cadillac. These were all cars akin to the style and technology of the 1908 Mors, the 1912 Mercer, and the 1913 Peugeot Type L3, as seen in the Miles Collier Collections.

Uncredited Photos linked to their source

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The Isle of Man TT...continued

(Continued from page 19)

The Tourist Trophy continued on the Isle of Man for another three years. The race remained four laps, but was run over a shorter course of about 40 miles. Charles Rolls won the 1906 event, Napier finished over an hour behind in an Arrol-Johnston.

These races were not without their "issues" though, as many incidents marred the events being run on the public roads. One car crashed into a pub in the town of Ballasalla with a number of others crashing through road side hedges. Sadly, not long after the start of the race, three children were hit by a car driven by one of the race officials on a side road, near the finish line. While none had serious injuries, it was a sobering moment for all!

Another, more serious, accident occurred on the Snaefell Mountain Railway. A tramcar had been transporting people to watch the racing and was descending the railway when it broke down, a second car had stopped close behind it. A third tram, rounding the bend above them, was unable to stop in time and slammed into the rearmost car, which was then pushed into the car in front of it. Injuries were sustained by some of the passengers, though thankfully none were too serious.

There were races on the Isle of Man in 1914 and 1922, but the event moved to Dundonald in Northern Ireland. "Tourist Trophy" became more closely associated with the Isle of Man TT motorcycle races which began in 1907 and have continued to run on the Isle of Man to this day!

These motorcycle races are a spectacle to behold! John Surtees, who is the only man to have won the Formula One World Championship *and* the Isle of Man TT on a motorcycle, was once asked:

"What was more difficult; racing at Monaco (in an F1 car), or the Isle of Man (on a motorcycle)?"

His reported response:

"Oh, the Isle of Man! - Because there you had to remember to duck for mailboxes!"

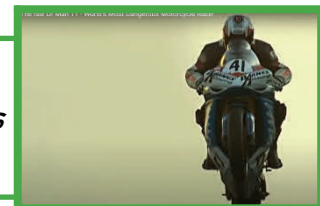
We can appreciate the connection to those first Isle of Man events through the cars of the era on display at Revs Institute.

For those that would like to know more of the Isle of Man events as they are now, here is a video link you may enjoy *(right)*.

*The Isle Of Man TT
World's Most Dangerous
Motorcycle Race*



*Peter Harholdt Photos
Courtesy of Revs Institute*



TAPPET TECH

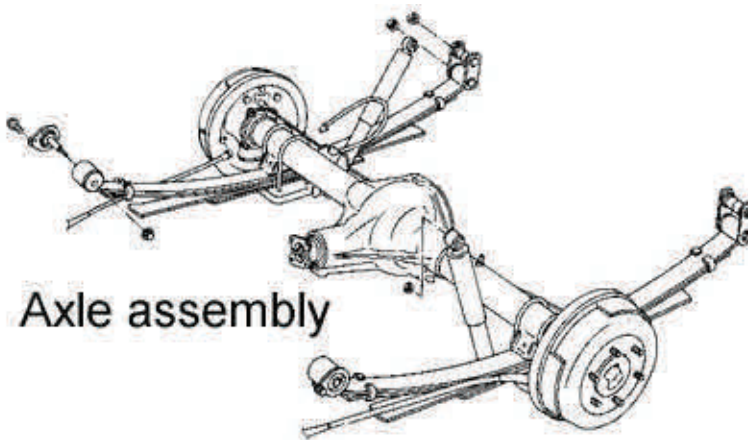
De Dion Suspensions... or Weight, There's More!

By Eric Jensen

For those automotively curious among us, you may have asked; "Just what IS this thing we call a de Dion suspension, anyway?" The design's name owes its origins to a French automobile and railcar manufacturer, De Dion-Bouton, and its founder Jules-Albert de Dion. The company was formed in 1883 and lasted until 1953. Early products included a 3 wheeled steam powered car that used the axle design as early as 1894. The de Dion suspension is used in the 1939 Mercedes Benz W154 and the 1958 Scarab to name but two Miles Collier Collections examples. The design was commonly used in Lancias from the 1950's, Aston Martin cars in the 1960's and Alfa Romeo cars from the early 70's. So what is it, exactly?

If we consider a modern pickup truck, the solid rear axle supports the wheels and carries the differential and gears that transmit power from the engine to the drive wheels. This is known in the industry as a Hotchkiss axle. Springs and shocks are also bolted to the axle which supports the weight of the rear of the truck and dampens the bumps in the road.

If we round corners and the truck rolls a bit, the tires stay straight up and down with respect to the road. That is a good thing. With the tires straight up and down, they provide good cornering and good traction for acceleration and braking, no matter what else is happening with the truck.



Axle assembly

The leaf-sprung Hotchkiss axle as used on millions of pickup trucks.

The down side of this is if one wheel hits a bump, the other wheel will "feel" that bump. That is a bit of a problem on rough roads at higher speeds. Additionally, that axle is very heavy. Bumps in the road try to bounce the tires completely off the ground. The springs and shocks work hard to keep the tires on the road. The weight of the axle makes that very difficult.

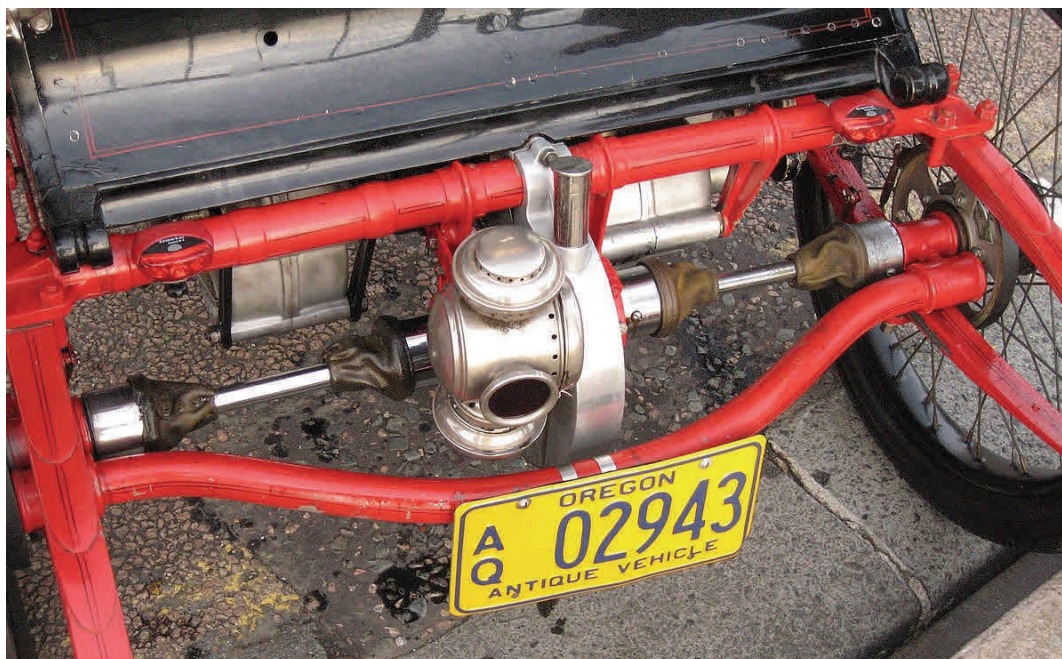
(Continued on page 22)

TAPPET TECH

De Dion Suspensions *...continued*

(Continued from page 21)

Now what if we could remove all those heavy gears, differential and case that holds them from the axle? We could make the axle much lighter and ease the burden of the springs and shocks to keep the tires on the ground. Enter the de Dion suspension. The gears and differential are firmly mounted to the car's chassis so the springs no longer have to control the weight. A bent tube is used to connect each wheel by running it behind the differential and driveshafts. This acts the same as the Hotchkiss axle housing. Flexible axle shafts with u-joints or CV joints are added between the differential and the wheels to carry the power. The end result is a suspension design that acts just like a solid axle without all the weight. The spring and shock absorbers' jobs gets much easier so the ride and handling are much improved.



In the picture above, the bent tube with the license plate attached to carries the load and is attached to the leaf springs. The shiny housing in the center is the differential and gears. The driveshafts that carry the power to the wheels can be seen on each side of the differential. Although this is not a proper independent suspension, it is an improvement over a heavier Hotchkiss (solid axle) suspension. (Click on the image for its source.)

TAPPET TRIVIA

By Joe Ryan

And Now The Answers....

- Q:** The Porsche 917PA; What does the PA stand for?
Answer: Porsche Audi. The new Porsche Audi Division of Volkswagen of America would sponsor the entry since Porsche cars that were sold in North America were sold through this division. The car was to compete in the Canadian-American, or Can-Am racing series in North America.
- Q:** What year did Porsche first take the overall win at the 24 hours of LeMans? **Answer:** 1970, in a 917K followed by a 917L in 2nd place.
- Q:** Who were the winning drivers of that first overall winning car?
Answer: Hans Hermann and Richard Attwood.
- Q:** What was the starting position of the Porsche that brought the company that first overall 24 Hours of Le Mans win? **Answer:** The winning Porsche 917K started in 1st, or pole position, with Richard Attwood at the wheel.
- Q:** What is the difference between the Porsche 917 and the 917K?
Answer: The 917K (for Kurzheck or short tail) had a less upswept tail and vertical fins to help with the aerodynamics and high-speed stability.

Contributions to the column are always welcome.



*Peter Harholdt Photo
Courtesy of Revs Institute*

Adopt-A-Car Program

Available Adopt-A-Car Automobiles and Engines

Alfa Romeo Guilietta	Fiat Abarth TCR	Vauxhall 30-98 Type OE
Alfa Romeo AutoDelta	Jorgensen Eagle	Waymo Firefly
Ardent Alligator	Lancia Aurelia B20	Abarth 1000-TC-R engine
Austin Cooper S	Lotus Elite	Alfa Romeo GTZ engine
Bugatti Type 55 Super	Maserati Tipo 60	C-6R Offenhauser engine
Cadillac Series 61	Mercedes Benz W-154	Cadillac OHV V-8 engine
Cisitalia SC	Mercer Raceabout	Chrysler Hemi (C-3) engine
Cooper Climax T-43	Miller board track racer	Duesy Sprint Car engine
Cooper T-51	OSCA Sports Racer	Ford GT-40 Transaxle engine
Cunningham C-1	Porsche Elva	Ford Turbocharged Indy
Cisitalia SC	Porsche RS-60 Spyder	Gurney Eagle GP engine
Cunningham C-3	Porsche RS-61L Spyder	Jaguar XK120 Series engine
Delage Grand Prix	Rolls Royce Silver Ghost	Meyer-Drake Turbo Prototype
Delahaye 135 CS	Scarab Sports-Racer	Columbia Three-Track
Duesenberg Model J	Simplex	Humber 58" Ordinary Bicycle
Elva Porsche	Stutz Black Hawk	Velocipede Bicycle
	Trabant	

To adopt a car or engine, contact: Brian Lanoway, Adopt-A-Car Chair
at blanoway@shaw.ca

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