

The official newsletter of

The Revs Institute Volunteers

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- Chip Halverson
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- Brian Lanoway
- Roc Linkov
- Steve Smith

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TAPPET CLATTER

Volume 26.6

February 2021



Chairman's Notes

Well, it has finally happened.....

It was recently announced that the Revs Institute will officially re-open after being closed since March 2020 on February 25, 2021

Wow, it seems like it's been years since we all have been there.

A special thanks to Joe Ryan and Carmine Ermi for starting a Tuesday morning group that has met in the volunteer parking lot since we closed... it has been a source of camaraderie and support for me personally and I suspect most of the regular attendees as well.

Another "Thank You" to John Fritz and Michael Bensing for helping organize Revs Institute Volunteers first Annual Gimmick Rally!

Twenty-one teams and 54 volunteers and Revs Institute staff started at the Miromar Outlet Mall and drove 30 minutes and looked for 42 clues along the way, to Buckingham Farms where we had a fantastic lunch and were treated to a discussion from Scott George on a little Revs Institute history and personal stories. A great time was had by all.

I look forward to seeing you back at Revs Institute on February 25th!

Mark Koestner

Volunteer Gimmick Road Rally

January 20, 2021

What to do with a group of volunteers for an automotive history museum sidelined because of a global pandemic? How about a road rally? Let's see if we can check all the boxes. Group activity; Check! Socially distanced; Check! Automotive themed; Check! Great location for lunch; Check! We are good to go!

This event was brain child of the combined minds and talents of, Mark Koestner, Michael Bensing and John Fritz. Their thoughts came to fruition in the form of a gimmick road rally ending with lunch at Buckingham Farms. Fifty four volunteers and guests attended with 21 cars participating in the rally.

What is a "gimmick rally" you ask? Each team of at least people two per car meet at the starting point. For this rally, it was behind the Wells Fargo beside Miromar Outlets. One car per time interval (about a minute) is released with route instructions and a series of questions that are to be answered between each route instruction. This is not a timed event, so speed does not matter. You can't get lost, the instructions are clear. The questions, however, are purposely vague. They may require trivial knowledge of Florida, advertising, sports or observation of things you will see along the route. You answer the questions or, for example, count the number of green roofs you will see before the next instruction. The last was an actual question used in the rally. If you couldn't answer a question, no matter, make one up! An award was given for the most creative answer.



A couple of final tie-breaker questions were added at the very end of the instructions. To the experienced rally competitor, reading through to the end would eliminate the surprise in seeing a question about the total number of light posts we passed. Just for the record, this author did *not* read ahead.

Once we all finally arrived at Buckingham Farms, a buffet lunch was served at this restaurant, grocery and working farm. Susan Kuehne took time from her busy retirement to lunch with us. Scott George told us stories from his past and path to the Revs Institute.



Volunteer Gimmick Road Rally ...continued

(Continued from page 2)

Scott is a man of many skills (and many stories) honed repairing race cars in hotel rooms between race and rally days. The Revs Institute and all the volunteers are lucky to have someone of his caliber as the curator.

John Fritz then announced the second and third place teams. These were the teams of Bill and Marion Cantrell and Dale and Carole Liebenthal. The most creative answers were the team of Jim Wood and Hal Hayden. John announced the winning team of Gary & Priscilla Goeckel. They were awarded a travelling trophy. They can display and keep the trophy safe until the next Volunteer Rally where it will travel to the next winning team.



Above: The winning team of Gary & Priscilla Goeckel

Below: Lined up and ready to go



Above: The outdoor dining area of Buckingham Farms

Below: Scott George sharing his experiences



Cars and Coffee at Mercato

By Eric Jensen

While the Revs Institute's car show schedule has been greatly reduced due to the cancellation or postponement of events, local shows become the beneficiary. As with the rookery Bay car show reported in December Tappet Clatter, the Miles Collier Collections intrepid Volkswagen Beetle made another guest appearance.



On the third Sunday of each month, the Mercato shopping center in Naples, Florida becomes the site of a growing Cars and Coffee gathering. The official time is 9am to 11am but many cars are already in place before the start. One of the event organizers is the Revs Institute's very own Max Trullenque. Like many of our volunteers, Max combines his vocation with his avocation. When not video recording training sessions, photographing events or posting on social media in his day job, Max is organizing the [Cars and Coffee 239 at Mercato](#).

Tim Bair and Pedro Vela hosted the little grey hot rod VW in amongst some serious high horsepower Porsches, McLarens, Lamborghinis and more. Little do they know of the 207 horsepower heart that beats in the engine bay of that Volkswagen.



The show attracts over 300 cars in styles from Rat Rods to modern supercars. There is something for every automotive taste. This is a cars and coffee in its truest form. Just cars, people and maybe a little coffee. I highly recommend a visit.



Eric Jensen Photos



(Continued on page 5)

Cars and Coffee at Mercato ...continued

(Continued from page 4)



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 obscure or tricky. Test your collection knowledge and *have fun!*

1. What is the purpose of the scoop, located in the center of the rear deck on the 1963 Corvette Grand Sport?
2. What two Porsches in the museum carry the 917 model designation?
3. Who owned the Miles Collier Collections 1914 Simplex before Briggs Cunningham?

Candidates for our Volunteer Board of Directors

It is time to elect three new members to our nine-member Revs Volunteers Board. We elect three new board members each year, with board members serving three-year terms. We would like to thank and show our appreciation to our members whose terms are expiring: Michael Bensing, Chip Halverson and Lodge McKee.

At the time of this publication, we have four candidates and three openings on the board. Our candidates include the 3 whose terms are up, Michael Bensing, Chip Halverson and Lodge McKee as well as new candidate, Mark Kregg. Bios for Mark Kregg, Lodge McKee and Michael Bensing are included in this issue of Tappet Clatter. An election will be held by electronic voting in March. Additional volunteers wishing to be considered may contact me or Steve Smith by mid February and we will be happy to explain the requirements and add each to the slate of candidates.

The final voting results will occur at the March Volunteer Monthly Meeting which will be announced.

Roc Linkov and Steve Smith

Nominating Committee

C. Lodge McKee II:



Nearly three decades ago a fortuitous event befell automotive enthusiasts in Naples Fla. with Miles Collier's decision to acquire The Briggs Cunningham collection of sports and sports racing cars and merge it with his own collection of Porsches to be housed and shared here in S.W. Fla. Mr. Collier's plan envisioned a purpose-built museum, an Advisory Board, and a support group of guides to interpret the collection. This was not to be merely a "man-cave" housing one man's collection for show-and-tell with friends. It was to be a repository of historical artifacts with a distinct social relevance and educational importance. I was fortunate enough to be here and to be asked to participate, and my life in Naples has been enhanced immeasurably ever since. The mission has been refined and expanded; the name has been changed: and the cumulative works of study, conservation, research, presentation, and education have reached an extraordinary level today.

I believe that the tenets with which this endeavor was started are an important measure of it's strength and success in 2021. We have achieved something exemplary and we have managed it with an unswerving spirit of volunteerism. It is my hope to see the Revs Institute Volunteers continue in that pursuit guided with a steady hand and an enthusiastic board of directors. I look forward to the opportunity to continue to serve.

Candidates for our Volunteer Board of Directors ... *continued*

Michael Bensing:

(Continued from page 6)



I am submitting my wish to remain a member/participant on the REVS Board of Directors. I would be happy to continue to serve as Secretary. If this is not possible, I will serve in any role where I can effectively contribute to fulfilling REVS mission.

My qualifications: I have served as Board Secretary for nearly one year. I enjoy serving the volunteers in this position. I believe that I have served both the volunteers Board as well as the Volunteer Coordinator well during my year of service.

My administrative/management background, education and experience over more than 34 years of employment give me a strong grounding in assisting Revs Institute in achieving excellence. Education is BBA, MBA, and AMA Leadership School graduate, along with a variety of increasingly more responsible work assignments over my long career in government. I ended my career as an Operations Executive and responsibility for nearly 4000 employees. In addition to being a REVS volunteer since early 2014, I also have volunteered with SCORE, several veteran's organizations including serving as a veteran mentor for the Collier County Veteran's Treatment Court for over 4 years.

Rather than more horn blowing, I will provide a bit about my desire to contribute to Revs Institute's newly revived branding, style, tone and behavior emphasis. I believe the volunteer cadre should match and rise to the level of the caliber of the collection we represent when we step into the galleries and interact with the wide variety of guests, we have the opportunity to interact with – many from all over the world. I believe that every volunteer is a leader in offering an unparalleled guest experience whether on a tour as a docent or in any other capacity we are asked to perform at the Museum.

Mark Kregg:



The reason I want to serve on the Revs Institute Volunteer Board is to utilize my work at the Institute and personal experience.

I have been a Volunteer at the Institute since October 2017 and have amassed approximately 900 hours of service time. I also became a Senior Station Guide in the fall of 2019.

I also bring with me 35+ years of road racing experience, sharing my love and intimate knowledge of automobiles, especially the racing breed. I volunteered with the Chicago Region SCCA Emergency Service group, and twice I was the Regional Administrator for Emergency Services. I served with SCCA, IMSA, CART, USAC (FI at Indy) at most major road racing track across the United States and saw many of the Institutes vehicles on track in period. The collection of Briggs Cunningham's cars that raced at Le Mans were my first introduction to long distance racing... love at first sight. I have a good working knowledge of automotive construction and have studied vehicle dynamics and aero design evolution.

I would also bring real life experience from years in the business world at management and leadership levels, and I would work with my fellow board members to help volunteerism at the Institute grow and flourish.

Candidates for our Volunteer Board of Directors

Correction and Addition:

Chip Halverson's statement for his re-election was unfortunately omitted from the February edition of the *Tappet Clatter* from the list of candidates. That was your editor's error for which I apologize. This addendum is to correct that error so that the membership has a complete list of all candidates and their reasons for election.

We elect three new board members each year, with board members serving three-year terms. We would like to thank and show our appreciation to our members whose terms are expiring: Michael Bensing, Chip Halverson and Lodge McKee.

As previously stated in the February 2021 *Tappet Clatter*, the final voting results will occur at the March Volunteer Monthly Meeting which will be announced.

Eric Jensen

Tappet Clatter editor



I started at the Revs Institute at the end of 2015 and have served as a Station Guide and more recently as a Docent. In that time, I have put in over 1,000 hours, including a number of Tappet Clatter articles and organizing the program for a members meeting. I am completing my first three year term on the Board having served as Adopt-a-Car chair and currently as Vice-Chairman of the Board. The Collection, the training, the guests, the staff and my fellow volunteers have all contributed to a very rewarding experience.

I was attracted to Revs like most volunteers by my passion for all things automotive. It began with my father taking me to the 1964 Indy 500 (I have only missed three since). Since then, I have followed

Indy car racing, sports car racing and even some drag racing. I have attended races at Road America through the Can-Am, Trans-Am, Formula 5000, through to the present. Fifteen years ago, I started vintage racing and continue to be active.

After earning a BA and MBA from Northwestern University, my career was focused on healthcare services. I was President of the Healthcare division of a Fortune 500 company and spent the last fifteen years involved in venture-backed healthcare companies. I have served on numerous boards; currently with a public company, a private company and a not-for-profit. If I were fortunate enough to be on the board for another term, I feel I could contribute in several areas. In particular, I offer broad marketing experience and a current perspective on vintage racing.

Making the volunteer experience rewarding is imperative to recruit and retain the best possible people. With that goal in mind, I would encourage the board to look at current and new initiatives with a view towards a triple win, for REVS, for our guests and for the volunteers.

Pikes Peak International Hill Climb

The Second Oldest Race

By Morris Cooper

June of this year will be the 99th time a most unusual race will take place outside Colorado Springs, the second oldest race held in the Western Hemisphere, started in 1916.

The race is officially called the Pikes Peak International Hill Climb. The course up the mountain is 12.42 miles long and has 156 corners. The finish line is at an elevation of 14,115 feet. This explains why it is also called "The Race to the Clouds."

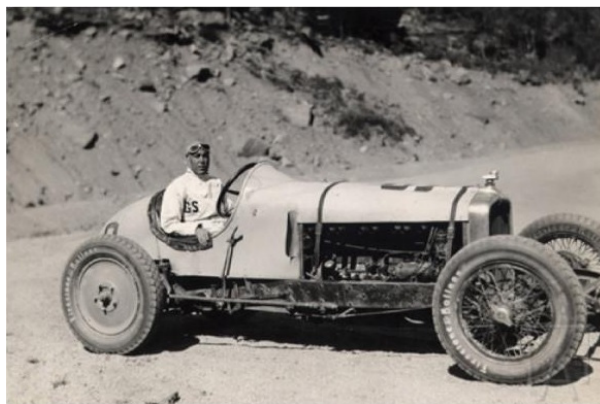
A number of famous cars have challenged the mountain, notably the Lucie O'Reilly Schell blue Maserati in the Revs gallery exhibit upstairs. So, here is a bit of the history and importance of this hill climb race.

The first Pikes Peak Hill Climb had been promoted by Spencer Penrose in 1916 after he converted the narrow carriage road into the Pikes Peak Highway. The Peak is the highest in the southern front range of the Rockies, named after the explorer Zebulon Pike, about 12 miles west of Colorado Springs. Pikes Peak is higher than any mountain in the U.S east of its location.

In 1948, Colorado Springs became responsible for maintaining the highway through a special use permit from the U.S. National Forest Service. Back then



Spencer Penrose, left, and the Penrose Trophy



1928 Stutz Special with winning driver Glenn Shultz

it was an entirely dirt road, and during the 50s the first six miles were paved, but that was still a mile below the Start line of the PPIHC.

It is fun to compare the five hours and 28 minutes it took on July 17, 1913 for W.W. Brown to drive his car 20 miles to the summit, and the incredible speeds of the race cars today. A little-known fact is that Katherine Lee Bates wrote "America the Beautiful" in July 1893 after admiring the view from the top of the Peak.

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Pikes Peak International Hill Climb

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As a marque, Porsche cars have been heavily involved in this race with the first appearance in 1958 and a later Porsche victory in a 356A Speedster, on to the remarkable string of victories by eight-time winner since 1994, race driver Jeff Zwart.

In 1998, the Pikes Peak Chapter of the Sierra Club filed suit against Colorado Springs for the 1.5 million tons of gravel deposited on the highway and the pollution caused by its 13 unpaved miles. The gravel was migrating down from the highway, polluting streams, wetlands and reservoirs as a result of gravity and weather.

As a result of a settlement, sections of paving began in 2002 and during the 10 subsequent years the race consisted of both paved and dirt sections, making it very dangerous.



Jeff Zwart at Pikes Peak in 2015

Its worth noting that the PPIHC race only rents the road from the City to organize the race each year and had no involvement with the ultimate settlement and decision to pave the top 13 miles of the highway. They were not in favor of paving the historical dirt racing surface.

It is one of the proofs of the Law of Unintended Consequences that the paving of the road completed in 2012 led to a significant improvement in the popularity of the Hill Climb and the increased involvement of the car manufacturers. Hill Climb champion Rod Millen had warned that paving of the road would put an end to the race. As good as the Porsches were on the dirt, now they became the perfect Pikes Peak car.

Electric cars have now figured prominently in the race. Their limited range is irrelevant to the short sprints and twists of the hill climb. The instant massive torque delivery of electric motors is a great advantage, coupled with the fact that the reduced air density at higher altitudes has no power reduction effect on an electric motor. In 2018, an all-electric Volkswagen ID-R broke the 8 minute barrier for the first time.

Hill climb races have a certain special appeal. Like rallying, it is a race against time. Unlike rallying, it is not an endurance challenge but more akin to a steeplechase race --- combining raw power with finesse and masterful handling on the edge of disaster. Many of the early automobiles, particularly the British cars on display in the Vitesse gallery were successful hill climb racers and daily drivers. The lobby car Abarth Simca had a very successful hill climb career, perhaps aided by its engine hung aft of the rear axle.

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Pikes Peak International Hill Climb

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The global pandemic created serious challenges for the 2020 race, which was postponed for two months. No spectators were permitted on the mountain and many prospective entrants were prevented by travel restrictions. Twelve of the historically small total number of 44 entries were Porsches. Motorcycles had now been eliminated from the race after the tragic death in 2019 of four-time champion Carlin Dunne only 20 yards from the finish line -- the race's seventh fatality.

The 2020 race had a storybook ending. Local hero and racer Cliff Vahsholtz ran a homebuilt car (right). The subsequent *Autoweek* headline read: "Homebuilt Contraptions Beat the Fancypants Porsches at Pikes Peak." His car was described as a bathtub with a snow shovel on the front end and a large package shelf poking out the rear.



Events Calendar

Event	Date	Info or contact
Cars on 5th	Feb 6, 2021	Multipla on display 10 am to 4 pm
Euro Tripper Show	Feb 13, 2021	Fenway Park in Ft. Myers—tentative
Revs Institute Soft Re-opening	Feb 16, 2021	Whitney Herod
Revs Institute Re-Opens	Feb 25, 2021	Whitney Herod

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

What does Henry Ford have to do with Barbeque?

Or Just another Briquette in the Wall

By Eric Jensen



We all know Henry Ford created the most significant "people's car" the world has ever seen, the Model T. Henry Ford succeeded by producing a low cost car that nearly everyone could own. By using a moving assembly line to lower labor costs, the price of the car was reduced to allow middle class workers to afford one. Ford continued to drive costs down each year of production while paying his workers higher wages than his competitors. The cost-cutting was relentless.

Henry Ford wanted to make as much of the car as possible within the company as possible. The goal was to buy raw materials to make each and every part that went into every Ford car. This is a concept known as vertical integration. If we take a look at the 1909 Model T on display in the museum, we see quite a lot of the car is made from wood; steering wheel, dashboard, floorboards, wheels and the unseen structure under the metal body. Wood requires a forest. A forest requires the purchase of timberland.

In 1919, Henry Ford enlisted his cousin's husband, Edward G. Kingsford, a Michigan real estate agent, to find some timberland Ford could purchase to use in his car production. Kingsford found land in the far northwestern portion of Michigan's Upper Peninsula adjacent to the Wisconsin border in the town of Iron Mountain. Adjacent to the timberland, Ford built a sawmill and a parts plant in a nearby area, later called Kingsford, to process the wood and produce parts for his cars. Sawmills and production wood shops create quite a bit of wood waste while making the end product.

Henry Ford recognized that waste as opportunity, not as trash. He enlisted the technology created by a University of Oregon chemist, Orin Stafford, to make pillow-shaped lumps from sawdust and mill waste. The lumps were bound together with tar and cornstarch and called "charcoal briquettes."

Ford then had the bright idea to hire Thomas Edison to design the charcoal factory and the nepotism to have Edward Kingston run it. The plant was quite efficient producing some 600 pounds of charcoal briquettes from every 2000 pounds of scrap wood. Henry called the new business *Ford Charcoal*. Initially sold to meat and fish smokehouses, soon the supply overwhelmed the demand. So how do you solve the problem of oversupply? You increase demand. By the 1930's Ford dealers were marketing "picnic" kits containing charcoal and portable grills.



What does Henry Ford have to do with Barbeque?

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Ford was trying to capitalize on outdoor adventures of his own "Vagabonds." The Vagabonds, as they called themselves, were Henry Ford, Thomas Edison, Harvey Firestone and American writer and naturalist, John Burroughs. The Vagabonds took summer trips, by car, to various locations about the country. The idea was initiated in 1914 while Ford and Burroughs were visiting Edison in what is now Fort Myers.



Left to right: Firestone, Ford, Edison, Burroughs

The charcoal briquette business really caught fire when backyard barbecues took off with the migration to suburbia and the invention of the Weber grille after WWII.



An investment group bought Ford Charcoal in 1951 and renamed it Kingsford Charcoal in honor of Edward. So the next time you toss a few shrimp and steaks on the charcoal grill, thank Henry Ford for his contribution to dinner.

Car Events of Interest

What: West Coast Muscle Car Club Car Show

Benefitting: Shriners Hospital for Children

Where: North Collier Regional Park

1500 Livingston Road, Naples Florida 34109

When: March 21st, 2021, 9 am to 4 pm

Admission: \$10

The 17th annual with 300 Cars on display to benefit Shriners Hospital for Children. Registration for participating cars at westcoastmusclecarclub.com

The 1960 Fiat D Multipla

By Brian Lanoway

1960 Fiat D Multipla

Chassis no. 100.108064817

Four-cylinder, in-line, water-cooled engine mounted in the rear

Original engine: 767 cc, 29 bhp at 4800 rpm, 36.1 ft. lbs at 3000 rpm

Current engine: Fiat Abarth A112 engine: 1050 cc, 75 to 80 bhp estimated

Wheelbase: 78.75 inches. Weight: 1332 lbs.

Anyme you can confuse the front of a car with the rear, you know you are looking at a unique and unconventional automobile. Born in the rush to accommodate growing Italian families after World War II, and based on their new Fiat 600 sedan, Fiat design head Dante Giacosa created a radical new multipurpose vehicle that could fit six passengers into a 78 ¾ inch wheelbase.



To create this inside space, Giacosa pushed the driver as far forward as possible over the front suspension, with his knees only a few inches behind the front headlamps. This allowed the Multipla to offer three configurations: a 4 to 5 passenger version, where the two bench seats could be folded flat into a bed; a six passenger model, like the Miles Collier Collections'



Three Row Seating Revs Institute Photos

vehicle, where the rear passengers were seated in two rows of individual seats; and a taxi, where the front passenger seat was readily converted to a luggage shelf and four passengers and their luggage could be accommodated in the rear jump seats that could be folded flat on the floor.

The original version of the car only had a 25 bhp engine and despite its 1332 pound weight, it took over 40 seconds to reach 50 mph. The little mini-van, however, could cruise comfortably all day at 55 to 60 mph and get 40 miles per gallon. To suit modern traffic, the black over red Multipla has been repowered

with a Fiat Abarth 1050 cc engine, which makes triple the power of the original. The Miles Collier Collections Multipla also been updated with modern dual-circuit brakes.

In 1957, *Sports Cars Illustrated* called driving the original Multipla "a real kick." Both its handling and braking were rated as very good, especially when passengers brought the car to an ideal 50/50 weight distribution.

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The 1960 Fiat D Multipla

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(Continued from page 14)

The car was noted for its quick steering and the out-in-front driver's position enabled real agility in traffic, allowing access to opportunities and narrow lanes not possible in any other car.

The Multipla proved to be immensely popular. Almost 130,000 versions spread like wildfire across the narrow and competitive roads of Italy. Families quickly adopted it as the Italian station wagon and the cute little car often came in two-tone pastel colors.

As a taxi, often in black over green livery, the Multipla provided a luxurious ride for its rear passengers, who experienced none of the typical chop found in other short-wheelbase cars. The wide doors on each side and the four-foot-square cargo space made the car a desirable delivery vehicle. Custom coachbuilders even converted the Multipla into platform trucks.

Production of the original Multipla lasted until 1966. Taxi versions of the car remained on Italian roads well into the 1970s. The Multipla is now a rare collector car on these shores and Fiat considers it to be an important classic in their brand history. The little car is more important than it seems. The Fiat Multipla is really the world's first six-passenger mini-van, introduced 28 years before Chrysler "invented" theirs.



TAPPET RIVIA

*And now,
the answers...*

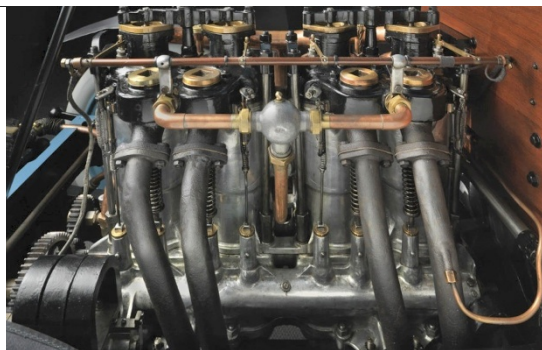
1. What is the purpose of the scoop, located in the center of the rear deck on the 1963 Corvette Grand Sport? **Answer:** To cool the differential
2. What two Porsches carry the 917 model designation? **Answer:** The Porsche 917K and the Porsche 917 PA
3. Who owned the Miles Collier Collections 1914 Simplex before Briggs Cunningham? **Answer:** Barron G. Collier, our collector's grandfather.

TAPPET TECH

How Racing Improves the Breed

By Chip Halverson

We all love the Revs gallery. What auto enthusiast would not love a display of machines designed specifically to go fast and win races? Beyond just the cars on display, the gallery also vividly shows the growth of engine efficiency over the course of more than 80 years of racing technology from 1902 to 1988.

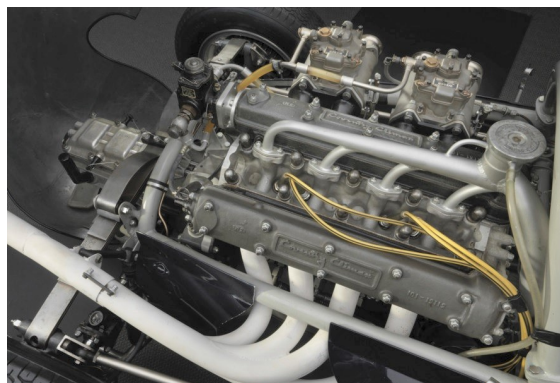


The first car in the Revs gallery is the 1902 Mors with a 9.2-liter 4-cylinder engine (at left). Each piston in this engine sucks in a 2-liter soda bottle-equivalent of air and fuel every time the intake valve opens and the piston plunges to the bottom of its stroke. The engine in the 1902 Mors is three times the size of the average engine in a modern car, but it only makes 60 horsepower at a lowly 1,400 revolutions per minute, not much above the idle speed in most cars.

If we want to compare one engine to another, it is helpful to calculate the horsepower per liter of engine displacement. This is a measure of efficiency. The Mors makes only 6.5 HP per liter so it needs a very large engine to power the racing car. Its neighbor, the 1908 Mors, makes 100 HP from 12.5 liters, or 8 HP per liter. That is a 20% improvement in only 6 years.

Now jump forward to the 1913 Peugeot. Ernest Henry's brilliant design made an astounding 90 HP from only 3.0 liters but it could run at 2,900 RPM. Henry's double-overhead cams and four valves per cylinder allowed for better flow of air and fuel in and exhaust out, which took this 4-cylinder engine to a lofty 30 HP per liter; almost four times that of the 1908 Mors in only five years.

If we leap ahead to the post-war Grand Prix racecars in the Revs gallery, the 2.0-liter, 4 - cylinder engine in the 1957 Cooper T 43 (at right) now produces 180 HP at more than double the RPM of the Peugeot. This gives us 90 HP per liter at 6,500 RPM. In 55 years we've made 14 times more power per liter than in 1902.



Now let us add some pressure to the game.

Pressure supplied by forced induction. This can be done by either adding a compressor driven directly by the engine (supercharging) or one driven indirectly using the pressure of the exhaust gas (turbocharging). Forced induction means more air and fuel can be pushed into the engine than it can draw in on its own.

TAPPET TECH

How Racing Improves the Breed

... continued

(Continued from page 16)

More fuel and air means more horsepower from the same engine size.

Which brings us to the 1974 AAR Eagle, towards the end of the Revs gallery, which won the 1975 Indy 500. The Eagle was equipped with an Offenhauser 2.65-liter 4-cylinder engine largely based on Ernest Henry's design from 1913. It is also equipped with a large, exhaust gas-driven turbocharger that forces huge amounts of air, at about four times normal atmospheric pressure, into the engine to produce 1,000 HP at an astounding 10,000 RPM. This results in a stratospheric 377 HP per liter. Racing teams used to add a little nitro-methane (an exotic power boosting liquid) to the fuel for short qualifying runs that brought power up to an estimated 1,200 HP. No one knew for sure and the teams weren't talking. With the nitro on-board, they hoped the engine would hold together for the ten mile qualifying run at Indy. Many didn't.

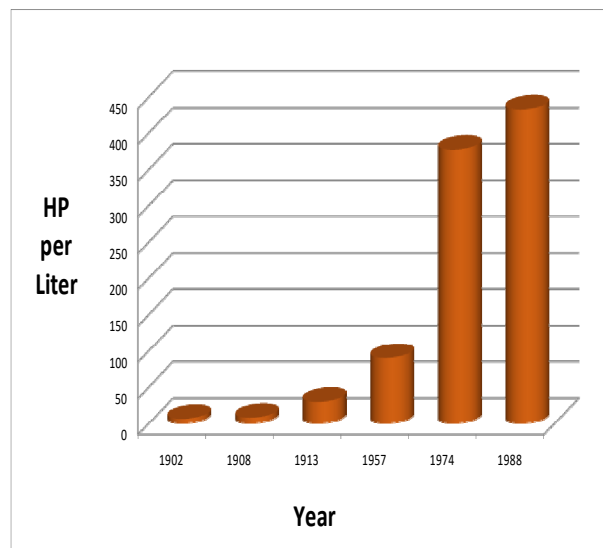
One last example in the Revs gallery is the 1988 Arrows F1 car. The car is equipped with a 1.5-liter 4-cylinder, turbocharged engine making 650 HP. The maximum boost available from the turbocharger was constrained by the rules to limit horsepower, but the engine still produced 433 hp per liter of displacement. Before the pressure was limited, these engines could produce an estimated 1300 HP for race qualifying. Again, no one knew for sure as there were no dynamometers strong enough to test the engine. The 4-cylinder engine in the Arrows F1 car could produce 866 HP per liter... for a very short time.

We have used these examples from the Revs gallery to show how racing technology increased engine efficiency from single to triple digit horsepower per liter. Technology always flows to passenger cars from things learned on the race track. We can see the same growth in the single digit horsepower produced by the Panhard et Levassor to the 650 HP in the Miles Collier Collections' McLaren F1.

In the case of US built street vehicles, in the not-too distant past, sedans like the Cadillac normally had 5-liter, if not greater, sized engines. Now they are in the two to three liter range. The Ford F150 truck has gone from a 5-liter V8 to a 3.3-liter V6. Due to increased efficiency, these new engines are lighter, use less fuel and run cleaner with similar if not greater performance than their predecessors.

The motoring public has benefitted much from the staggering growth in technology during the 20th century. Much of this was made possible by the advances first pioneered in race cars.

Imagine what we can expect in the 21st century.



Adopt-A-Car Program

Available Adopt-A-Car Automobiles and Engines



Peter Harholdt

ALFA 1300 Giuliett Sprint Veloce	LOTUS Type 14 Elite	ENGINE: Cadillac OHV V-8
Alfa 8C 2900B	MASERATI Birdcage	ENGINE: 1965 Ford Indy Car
ALFA GTZ	MERCEDES SSK	ENGINE: Abarth 1000-TC-R
ARROWS Formula 1	OSCA MT4	ENGINE: Alfa Romeo GTZ
BENTLEY 6 1/2 LITRE SPEED SIX	PANHARD LEVASSOR Wagonette	ENGINE: Chrysler Hemi (Cunningham C-3)
BENTLEY Corsica 8 litre	PORSCHE 550A Spyder	ENGINE: Duesenberg Sprint Car
BRM P578 GP	PORSCHE 718 RSK Spyder	ENGINE: Ford 1965 Indy Car
BUGATTI Type 55	PORSCHE 904 Carrera GTS (red)	ENGINE: Ford GT-40 Transaxle
CISITALIA 202	PORSCHE 904 Carrera GTS (silver)	ENGINE: Ford Turbocharged Indy Car
COLUMBIA Three-Track Tricycle	PORSCHE 907	ENGINE: Jaguar XK Series
CUNNINGHAM C-1	PORSCHE 908/3	ENGINE: Jaguar XK100 Prototype
CUNNINGHAM C-4R	PORSCHE 910/6	ENGINE: Porsche Type 771
CUNNINGHAM C-5R	PORSCHE 911	ENGINE: Porsche Type 901/20
CUNNINGHAM C-6R	PORSCHE 911R	ENGINE: Porsche Type 901/22
FIAT ABARTH 1000	PORSCHE 917K	ENGINE: Porsche Type 908
FORD MODEL A	PORSCHE Abarth Carrera GTL	ENGINE: Porsche Type 916
GURNEY EAGLE G.P.	PORSCHE BEHRA F2	
HISPANO SUIZA H6C CHASSIS	PORSCHE GT CARRERA SPEEDSTER	
HUMBER 58" Ordinary Bicycle	PORSCHE RS 61L	
JAGUAR D-TYPE	ROLLS ROYCE SILVER GHOST	
JORGENSEN EAGLE	STUTZ BLACKHAWK	
LAMBORGHINI 350 GT	VANWALL F1	
LANCIA LAMBDA 7TH SERIES TORPEDO	VAUXHALL, 1927 "Quicksilver"	
LOTUS 23	VELOCIPEDE Bicycle	

To adopt a car or engine, contact:
Brian Lanoway
 Adopt-A-Car Chair

The **Tappet Clatter** is the official newsletter of **The Revs Institute Volunteers** of Naples, Florida. Its intended purpose is to inform, entertain and promote camaraderie for our members.

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