

The official newsletter
of: Revs Institute
Volunteers

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Thank You to this month's contributors:

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- Larry Gleeson
- Morris Cooper
- Joe Hauser
- Shawn Schroeder
- Whitney Herod
- Max Trullenque
- Joe Ryan
- Chip Halverson
- Anna McDowell

TAPPET CLATTER



Volume 28.2

October 2022



Chairman's Notes

By Chip Halverson

As I write this, hurricane Ian passed through two days ago. We know the status of all of our local volunteers at this point but Whitney will keep us up to date, and let us know of anyone who needs help.

In this letter I want to talk about leadership and committee opportunities in our volunteer organization. From an overall perspective, it's been my experience that all organizations, volunteer ones in particular, benefit greatly by having a mixture of new and longer tenured leaders in place. Having the experience, alongside the new energy and ideas that come with people newer to the roles, creates a powerful dynamic.

What is the path to getting newer members involved leadership? First, we have our committees listed on the next to last page of every *Tappet Clatter*. Each has a defined mission statement and is led by a Chairman. Members of these committees serve in both advisory and working capacities, with an emphasis on the working role. Their meetings are open to all members and I would encourage you to attend those that you find of interest. The Chairs are almost always looking for new committee members. They can also communicate the time commitment involved.

Another opportunity is Board membership. We have nine board members serving staggered three-year terms. Thus, there are three seats up for election each year at our annual meeting in the Spring. Any member in good standing can run for these seats.

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Chairman's Notes...continued

(Continued from page 1)

Hank Berglund is Chair of our nominating committee and can answer any questions you might have. He will be getting more information out prior to the elections.

Our Board members also serve dual advisory/working roles, again with the emphasis on the working role. While any member in good standing can run for these seats, I feel that serving on a committee first will give you exposure to the inner workings of the volunteer organization and our culture. That knowledge will serve to make the new Board members productive from day one.

In closing, I wish all of you the best in your recovery from Ian. At this point, the plan is to open Revs Institute to guests on November 17th. It will likely require all of us to be very flexible in the near term. Again, Whitney will be frequently communicating with us.

Please keep in touch and stay safe.

All The Best! *Chip Halverson*

TAPPET RIVIA

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!*

Cunningham cars provide the theme for this month's questions.

1. Question: In what year did the Cunningham C-4R Win the 12 Hours of Sebring?
2. Question: Who were the drivers of that winning Cunningham C-4R at the 12 Hours of Sebring?
3. Question: What car did Briggs Cunningham, with Bill Lloyd, drive in the 1953 12 hours of Sebring ?
4. Question: In what year did the Miles Collier Collections OSCA MT4 1500 win the 12 Hours of Sebring?

The answers appear later in this issue

C OORDINATOR'S C ORNER

By Whitney Herod



Since the devastation Hurricane Ian unleashed on Florida just a few short weeks ago, the most important news to report is all Revs Institute Employees and Volunteers weathered the storm without injury. While we're very fortunate Revs Institute and the collections escaped damage, the most important cause for celebration is all our PEOPLE are safe. Buildings and cars can be replaced, but our people cannot. We appreciate everyone for checking in after the storm. It was an incredible relief once all volunteers had confirmed they were safe. Our thoughts and support are with team members as they endeavor to recover from the havoc Ian brought.

Special thanks to Don Parmelee, Steve Smith, Bill Van Tiem, and Cliff Wheeler who, in midst of their own hurricane preparations, helped move cars to "safer ground". In just 16 hours, every car in the building was moved to a more hurricane ready position, where they will remain until later this month. This gives us time to clean and prepare for the joint WFFMM/NAAM Conference scheduled for November 8-12, with roughly 150 attendees expected. There will be a range of conference assignments to fill. I will reach out to volunteers for support this month.

While the museum remains closed to the public, it is wonderful to see the camaraderie our members share. Whether it's helping one another with post hurricane clean-up or enjoying early morning breakfast, volunteers continue to find ways to come together. So we're ready for our November 17th reopening, I encourage Volunteers to use this time to sharpen collection knowledge.

Finally, please join me in congratulating volunteer Lauren Goodman who will present her paper, *Lucy O'Reilly Schell: Innovator of French Motorsports* at the Argetsinger Symposium in Watkins Glenn. Lauren has also been invited to join a roundtable on women in racing.

On November 5th, Lauren will be the second speaker in the Saturday afternoon 1:30 pm session. If you'd like to view the symposium, bookmark the link [HERE](#) below. The video will go live when the symposium starts.

Way to represent Revs Institute, Lauren!



*Lauren presenting at a Volunteer Meeting
Photo courtesy of Revs Institute*

Membership Report

By Tom Dussault

During September, the Membership Committee welcomed two new Station Guides and one new Steward to our volunteer organization. When Revs Institute reopens in November, our new members will attend the Orientation Program to learn about the museum and research library as well as volunteer guidelines, responsibilities, and benefits.

We will introduce our newest members in the November issue of Tappet Clatter. They are anxious to begin formal training as well as meeting our members.

Our next event is "Get Involved Collier! Volunteer Expo" sponsored by the Greater Naples Chamber of Commerce. This is an opportunity for not-for-profit and government agencies within Collier County to reach out to members of the community who are interested in volunteering. We will have an exhibitor table with information about our museum and volunteer organization. It is a good opportunity to attract new enthusiastic volunteers as well as network with other organizations to spread the word about Revs institute.

If any members of our volunteer organization would be interested in joining us for this Volunteer Expo, please let Whitney or I know. We would be delighted to have you join us. The Collier Volunteer Expo will be held at Coastland Center, 1900 Tamiami Trail North on Thursday, November 3, 2022. It will run from 3 PM to 6 PM.

Please continue to stay safe. We look forward to seeing you when we reopen in November.

From the Editor *by Eric Jensen*

Keeping communications open to the Volunteers is a key part of the *Tappet Clatter's* mission. I want to express my gratitude to the contributors to this month's issue of the *Tappet Clatter*. Through all the problems created by hurricane Ian, power outages, water boils, flooding, poor cell phone services, and internet outages, we prevailed to produce this issue.

We all wish everyone a rapid recovery from this historic storm.

While we don't yet have pictures to share from the museum's hurricane preparations, I'll share a very crowded picture of the Revs Gallery from hurricane Irma from 2017 of the cars gathered together, high and dry.



1955 Jaguar D-Type

By Larry Gleeson

The Miles Collier Collections 1955 Jaguar D-Type, although fully prepared and supported by the Jaguar factory, is said to have been "loaned" to Briggs Cunningham. It was to be entered in races privately by Cunningham.

This car is one of 7 surviving "long nose" cars, and one of 5 made for Le Mans. They were 7 1/2" longer than a standard model, with a more aerodynamic nose, air ducts for the front brakes, better integration of the wraparound windscreen and headrest fairing, and a slightly extended tail fin. The retuned engine now produced 270hp, with a new ZF limited slip differential.

Unfortunately, this car competed in the ill fated 1955 Le Mans. A slower Healey swerved in front of a Mercedes traveling 150 mph and caused the horrific accident that killed more than 80 people. Phil Walters was driving this car at the time. When he came into the pits after the accident and saw what happened, he retired, not just from the race, but from the sport. Phil Walters would never drive another race car. Co-driver Bill Spear would take over but only race until 7:20 pm. A piece of aluminum broke off the air intake box and got sucked through the carburetors into the engine and broke a valve.

Jaguar was cutting ties with their US distributor, Max Hoffman, who also represented Mercedes Benz. Briggs Cunningham would become the new Jaguar distributor for New York and much of New England. He would campaign a team of ex-works D-Types all across the country. Alfred Momo was his master mechanic and team manager. This car was the first long nose D-Type in the US and Briggs' favorite. It ended up being a test bed for many of Briggs and Momo's ideas. Some of these were bigger openings for the front brake ducts, window shade-like radiator blinds to control water temperatures, and the installation of roll bars inside the headrest. Many of their changes were adopted by the factory. Most notable was Momo's suggestion to bore the 3.4 liter six to 3.8 liters, a change that was incorporated on the works race cars and eventually throughout Jaguars entire line of road cars. This car was one of the first with the bigger and more powerful 3.8 liter engine.

In all, 71 D-Types were built, including 11 works long nose cars, only 7 of which survive today. 16 XKSS models were also made. A fire in 1957 halted production. All the D-Types went back to the factory. Except this one. Since 1987, this historic car has been a valued part of the Miles Collier Collections, faithfully preserved just as it was raced.



*Courtesy of Revs Institute,
Perter Harholdt Photo*

Bill Sadler – Champion of the Home Built Racecars

By Morris Cooper

There was a time when a self-taught race car home builder could compete and win against the best and influence the designs of the cars that followed. That man was Bill Sadler, Canada's most successful engineer and racecar constructor, who passed away recently in April 2022 at the age of 90. He won with cars he designed and built himself, and is said to have combined the mechanical talents of Phil Remington and the design instincts of Colin Chapman with a large measure of his own driving talent.

Sadler's series of sports racing cars challenged and won against the greatest American and European road racers of the day during the late 1950s and early 1960s including the Ferraris, Cunningham's Jaguar-Listers, Maserati Birdcage, Shelby's Cobras, and Lance Reventlow's Scarabs.

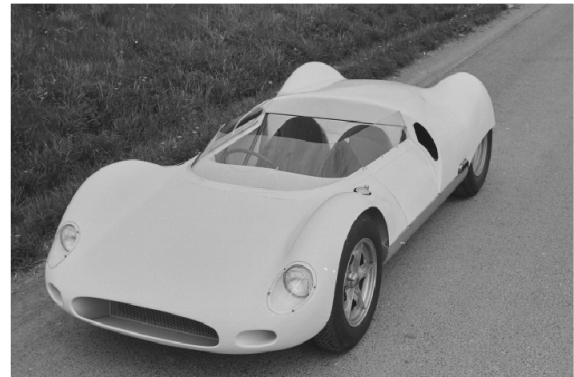
Drawing inspiration from the mid-engine Coopers, Sadler built the very first mid-engine sports racing car fitted with an American small-block Chevrolet V8.

He built an open-wheel racer to run in the Formula Libre, a category open to everything and everyone. With the first of its kind rear V8 engine, there was no room for a transmission, so the engine was connected directly to the differential. You started the engine and off you went, hopefully pointing in the right direction. There was a reason it was called "Formula Ferocious".

The Sadler Mk5 from 1960/61 with its rear-mounted V8 is now regarded as the prototype for the later CanAm Series race cars.



*Sadler Formula Junior
Albert R. Bochroch Photograph Collection,
Courtesy of Revs Institute*



*Sadler Mk.5
Karl Ludvigsen Photograph Collection,
Courtesy of Revs Institute*

Sadler's front-engine Formula Junior cars beat the best from Europe, using BMC parts from their Austin Healy Sprite and looked much like an Elva. It sold for a modest race car price of \$2995, including one owned by the legendary Brock Yates and raced by him in 1960. Amid this, Sadler also built go-karts, called the Sadler Sportkart.

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Bill Sadler ...continued

(Continued from page 6)

Bill Sadler was born and raised in St. Catharines, Ontario, in the Niagara region. It remains an important auto industry town with a major GM engine and transmission plant. His father started Sadler's Auto Electric and was the Canadian agent for Lucas of Britain. Lucas paid for his honeymoon in England in the early 1950s when Sadler saw his first sports car race. Soon after his return, he began racing cars in Canada.

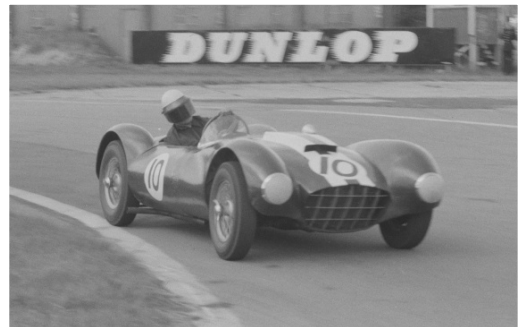
Sadler built a V8 conversion of a 1949 Hillman Minx, using a Ford flathead V8 engine. His first "special" was the Mk.1, built over the winter of 1953-54, incorporating a Jowett Javelin sedan, a final drive from a Studebaker, and steering from a Morris Minor. He raced it in 1954 at Watkins Glen and in 1955 began building a new fiberglass body for it. When the Triumph engine threw a rod he replaced it with a Canadian-built 1956 Chevy small block V8 with dual four-barrel carburetors.

His later Mk. 2 replaced its original motor with a 283 CID Canadian-built version of the 1957 Corvette engine fitted with a Duntov camshaft and three two-barrel carburetors. The Mk.2 won Watkins Glen in 1958. That year Sadler began building a new Sadler-Meyer Special for racer John van Meyer using a Pontiac V8 which Meyer then raced to several hill climbing championships in the U.S. Sadler's Mk.4 cars were competing against the Elva Porsche and the Lotus 23.

The Sadler Mk.5 was built in 1960 for the 1961 racing season with a Chevrolet rear-mounted small block V8. The Mk.5 had two forward speeds, the result of Sadler building a two-speed transaxle out of a Halibrand quick-change differential with its rear end extended to accommodate another set of gears and Ford synchronizers. Another benefit was the ability to use the quick-change differential to change gear ratios to suit the track.

Preparing the Mk.5 for that fall's race at Mosport, one of the Comstock team's drivers went off the track and did some suspension damage. Sadler stayed up all night to repair the damage. He concluded that the car was not ready for race day and was unsafe but Sadler was overruled by the team's race manager.

Sadler Mk.1



Sadler Mk.2

*Karl Ludvigsen Photograph Collection,
Courtesy of Revs Institute*

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Bill Sadler ...continued

(Continued from page 7)

The car soon went out of control coming out of a turn and did some end-over-end somersaults. Fortunately, the driver was shaken but not seriously hurt. Sadler decided then and there to close down his company after his engineering skills were questioned. He left auto racing at age 29.

Sadler then decided to go back to school and obtained an engineering degree in 2 ½ years at Tri-State College in Indiana and then his Master in Engineering on a full scholarship to MIT. He could not get into an engineering school in Canada because he had never completed his last year of high school.

After working for General Dynamics and at "Area 51," Sadler shifted his attention to ultralight aircraft. One of his designs won the Grand Champion Award at the 1982 EAA AirVenture Oshkosh show. In 1985 after searching for a small aircraft engine he designed a radial aircraft engine and obtained its patent. By 1987, his planes were converted to unmanned drones, badged as the "Predator" and he developed military aircraft.



Bill Sadler and his Sadler Vampire Aircraft

Many years later in 2014-15, and now in his eighties, Sadler raced one of his Juniors at the 2014 and 2015 Monterey Historics and built a replica Mk.3 in his garage for John van Meyer who raced it at the Historics in 2015.

Bill Sadler was a remarkably talented man in the historic age of sports car racing.

Video Treat

The 2022 AAR Eagle Reunion at Road America featuring the Miles Collier Collections 1967 Spa F1 Winner

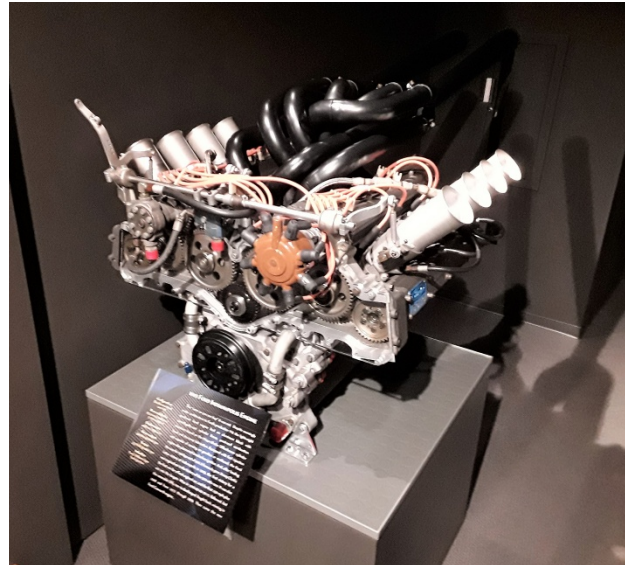
Click on picture for the video



1965 Ford Indy Engine

By Shawn Schroeder

Since 1947, the Indianapolis 500 race had been consistently won by Offenhauser engines that were built in California and placed in a simple, sturdy front engine racecar configuration. By 1963, the Offy had evolved into a meticulously built, 255 cubic inch, twin-cam, 16-valve, four-cylinder, alcohol fuel-injected, magneto-ignited engine that was capable of over 400 BHP. But 1963 was a year of significant change. The mid-engine race car evolution had reached the Indianapolis 500 and this new configuration was beginning to show that it was the way forward in terms of speed.



Eric Jensen Photo Courtesy of Revs Institute

Although it's strange to think of Ford, which was the second largest corporation in America at the time, as an underdog; it was exactly that. In 1963, the Offenhauser engine was the dominant Indy 500 power plant.

With the ultimate goal of competing in the Indy 500, Ford first used their 260 cubic inch small block V8 engine (commonly referred to as the "Fairlane engine") to compete in the USAC championship race series. Although modified with a new aluminum cylinder block and slightly de-stroked to 255 cubic inches, it was otherwise a conventional American V8 with a single camshaft - with pushrods and rockers, a wedge-shaped combustion chamber and a battery rather than magneto ignition. Running premium grade gas through four Weber carburetors, the engine built for the 1963 Indy 500 made 375 BHP.

Colin Chapman's Lotus 25 Climax-powered Formula One car, driven by Englishman Jimmy Clark, dominated the Grand Prix championship series in 1963. In an effort to bring this same success to the Indy 500, Ford and Lotus combined this new "Fairlane" 255 cubic engine with the Lotus 29 chassis; a modified version of the model 25 that Clark had used. The modified chassis was widened and incorporated the offset suspension commonly used at Indy. The Lotus-Ford chassis car finished second in 1963. It didn't win, but the writing was on the wall. A lightweight mid-engine race car with fully-independent suspension that ran on pump gas would make fewer fuel stops and still be very competitive at the Indy 500. While the '63 Ford-Lotus cars went on to win other USAC races, what it needed in order to win the Indy 500 was more speed.

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1965 Ford Indy Engine...continued

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Ford designed four prototype engines for the 1964 race; three of them continued on with the development of the pushrod engine, the fourth became the new 255 cubic inch, double overhead cam (DOHC) engine. Incremental power increases were achievable with the pushrod engines, but short of running alcohol fuel, which would negate the pit stop frequency advantage, something more radical was needed. Engine number 4 became the complete engine we now know as the 1964 Ford Indy engine. The new 255 cubic inch DOHC engine produced 425 BHP @ 8000 RPM. The specifications for the '64 and '65 Ford Indy engines are essentially the same.

The new Ford DOHC Indy engine made a dramatic entrance at the 1964 Indy 500. Driving his repowered Lotus-Ford, Jimmy Clark qualified first with nearly a 3 mph lap advantage. He led the actual race until a rear suspension control arm broke, finishing his race with a DNF.

A.J. Foyt won that race in an Offy-powered, front-engine car. The last of the front engine, conventional roadsters to win the Indy 500 and Foyt's 2nd win.

Sadly, the 1964 race is mostly remembered for the tragic, fiery accident that took the lives of drivers Eddie Sachs and Dave McDonald. As a result of that accident, gasoline was banned and future races would only use alcohol-based fuels (alcohol is safer than gasoline because it has a much lower flash point).

With the writing on the wall, only six of the 33 cars fielded at the following 1965 Indy 500 were Offy-powered front-engine cars. With just 11 cars finishing the race, Jim Clark's Lotus-Ford won with Parnelli Jones' Offy-powered, mid-engine car barely coming in 2nd after running out of fuel. Mario Andretti came in 3rd and won Rookie of the Year.

It also the only time in history where a driver would win both the Formula One championship and the Indy 500 in the same year. The Ford Indy V8 would go on to win five of the next six Indy 500 races

In 1972, the Ford Motor Company pulled out of Indy car racing. A.J. Foyt subsequently bought the rights to Ford's now turbocharged Indy engine and re-badged it as a Foyt. Ford/Foyt-based engines qualified at Indy from '72-'78. A.J. won the 1977 Indy 500 in his Coyote chassis.



*Jim Clark's Lotus/Ford,
1965 Indy 500 Winner
Courtesy Revs Institute,
Tom Burnside Photograph Collection*

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1965 Ford Indy Engine.....continued

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The 1965 Ford Indy engine on display at Revs Institute:

The engine has casting code C5FE-6015-A

- C5 is the year, C signifying the decade 1960. The 5 indicates 1965.
- FE is broken down by F for Foreign or Trans Am racing, and E for engine group.
- 6015 is an engine base assembly.
- A is the engineering version. A being the 1st version of the engine base assembly.

Based on this information, it may be possible that the Miles Collier Collections engine was earmarked for use in Ford's FIA European sanctioned GT40 racing program. (shown at right) It is known that Carroll Shelby discarded the use of these engines for the GT40, preferring the tried and true Shelby American race prepped 289 Ford passenger car engine for use in Europe, likely because of better low-end torque.



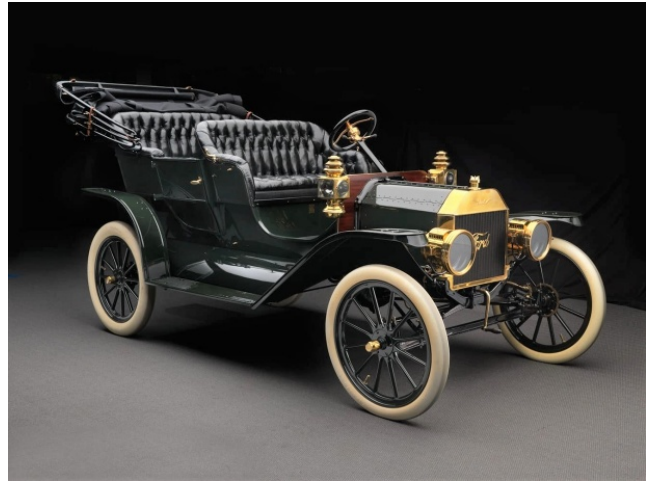
Ford Indy Racing Engine Specifications:

- Bore and stroke: 3.76 inch bore by 2.87 inch stroke for 255 cubic inch displacement. (4.2 liters).
- Aluminum engine block with pressed-in cast iron bore sleeves.
- Dry sump lubrication.
- Forged pistons with a pent-roof design, 12.5:1 compression ratio.
- Ford 289 V8 connection rods, shot-peened and polished.
- Cast aluminum 4 valve, twin cam cylinder heads with the exhaust ports exiting in the valley and intake ports between the camshafts.
- Gear driven camshafts using 14 gears total also driving the water pump, oil pump and alternator.
- Transistorized ignition system supported by a small battery.
- Hilborn mechanical fuel injection intake system

Why Are Tires Black?

By Joe Hauser

One of the most often-heard questions at the Revs Institute is: "Why are the tires on the Model T white and not black?" I'm sure every Revs Volunteer has heard this question and has answered it. The simple answer is: "Because white is the color of natural rubber and until the 1910's, tire manufacturers did not know that adding carbon black to the rubber would greatly increase the tread life of the tires." So, is it the fact that tire companies added carbon black to natural rubber that make our tires black?



*1909 Ford Model T with Natural Rubber Tires
Peter Harholdt Photo, Courtesy of Revs Institute*

This sounds like a reasonable answer, but I thought I would look into this a little deeper to find out how it was discovered that carbon black increased the strength and wear life of rubber - and when it was first used. In researching this topic, I found a really fascinating story involving CRAYOLA Crayons!

Binney & Smith

What do Crayola Crayons have to do with black car tires? Before my research, I would have said "absolutely nothing", but that turns out to be false. First, as a hint to this relationship, does anybody recognize the company name "Binney & Smith"? Well, you should, because you have probably seen that name a thousand times, especially when you were a kid growing up, since your coveted Crayola box of 64 crayons was made by Binney & Smith. Yes, it turns out that the same Binney & Smith that invented and still makes three, yes, THREE billion Crayola crayons per year, was also responsible for the blackness in rubber tires. It is a little known fact that Binney & Smith was responsible for both products. Although it took place over one hundred years ago, the founding partners of a little company in New York are responsible for the development of both innovations.

Carbon Black

Edwin Binney and C. Harold Smith were cousins that took over a family chemical business in the late 1800's. The primary output of their business was making pigments for paints.

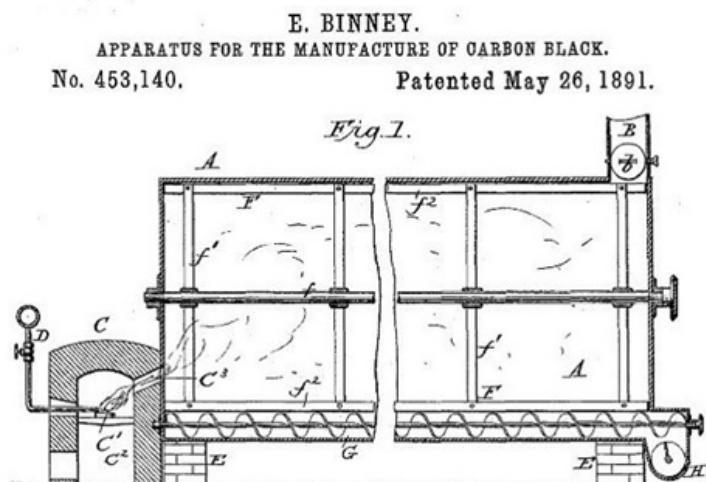
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Why Are Tires Black? ...continued

(Continued from page 12)

They used red oxide pigment to make red paint (used widely for the ubiquitous red barns found in the U.S. farm land) and they used lamp black to make black paint and printing ink. In the 1880's, Edwin Binney invented a new method to make a pigment called 'Carbon Black' which resulted in a much more intense black pigment than the previously used lamp black.

They obtained a patent in 1891 for an 'apparatus for the manufacture of carbon black'



on a large scale, and became the largest producer of carbon black. This carbon black refining process produced a fine, soot-like substance, which was extremely black, and a better pigment than any other in use at the time. It was more intensely black and stronger than any other black pigment. Binney & Smith's carbon black soon became the main ingredient in printing ink, stove and shoe polish, marking inks and black crayons.

Capitalizing on their patent, Binney & Smith not only played an active role in the development and production of carbon black, but in products using carbon black; to naturally help sell more carbon black. One of their early innovations was to mix carbon black with oilfield paraffin and other waxes to produce a paper-wrapped black crayon marker for crates and barrels. It was promoted as being able to "stay on all"; because it would write on wood, metal, tile and 'all surfaces'. It was accordingly named 'Staonal', which is still being sold to this day for permanent marking on industrial products.

Crayons

So, how did a patented means of producing a killer black pigment and a black paraffin marker lead Binney & Smith to crayons?

Well, it turns out that Edwin Binney's wife was a school teacher and she was an advocate for improving kids learning tools in the classroom. At Mrs. Binney's urging, Binney & Smith had earlier developed a dustless chalk, called 'An-Du-Septic' chalk which won a gold medal at the 1904 St. Louis World Exposition.

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Why Are Tires Black? ...continued

(Continued from page 13)

Teachers loved An-Du-Septic, because it reduced the messiness in their classrooms. To further their educational portfolio, Binney & Smith, with that encouragement from Mrs. Binney, decided to develop colored paraffin markers, similar to 'Staonal', for use in the schoolroom. The Binney & Smith chemists, aware that most of the pigments available at the time were highly toxic, developed synthetic, nontoxic pigments to use in their markers so they would be safe for children to use.

Mrs. Binney coined the name Crayola from 'craie' (the French word for chalk or stick of color) and 'ola' (from oleaginous, a word referring to the oily characteristic of liquid petroleum before it is distilled into the paraffin used for crayons). The first box of Crayola Crayons was produced in 1903 as an eight count box. It sold for a nickel and contained the colors red, orange, yellow, green, blue, violet, brown and of course, black.

Crayons were an immediate success with school children and their teachers! They were also an immediate sales success and to deal with the huge demand for their new product, Binney and Smith split their company into two divisions: Pigment (which made carbon black), and Crayolas. They relocated the Crayola division to Easton, Pennsylvania and became the largest maker of crayons for the next 100+ years. Hallmark Cards bought Binney & Smith in 1984 for \$200 million.

Tires and Carbon Black

Edwin Binney worked actively with his chemists and other companies to develop new products that would use their carbon black. One of the many companies he worked with was the 'India Rubber, Gutta Percha and Telegraph Works' in Silvertown, England. This company produced 'Silvertown' tires and were very active in researching improvements for tires. Mr. S.C. Mote, while working for the India Rubber company in 1904, discovered that using carbon black as a rubber reinforcement dramatically increased the wear capabilities of rubber. Meanwhile, in the U.S., B.F. Goodrich experimented with "Silvertown" tires and discovered that their tread rubber life was considerably longer than that of their older white tires. Goodrich experimented with varying amounts of carbon black mixed with the rubber and found that increasing the amount of carbon black to 25% by weight, bound the rubber particles together to a greater degree than ever known - which in turn prolonged the life of the tire.

As a result of these experiments, Goodrich decided to manufacture tires with a large amount of carbon black. Since Binney & Smith was the largest producer of carbon black, Goodrich turned to them to supply the amount needed: one million pounds per year! This remarkably large order was placed in 1912.

(Continued on page 15)

Why Are Tires Black? ...continued

(Continued from page 14)

Because of the size of this order, Binney & Smith formed a separate company, the Columbian Carbon Company, to fulfill this order. Columbian Carbon was the largest producer of commercial carbon black for many years. Another important innovation by Binney & Smith was their method to deal with the large amount of dust created in the rubber-carbon black mixing process.

Dispersing carbon black into rubber in its dry state created copious amounts of dust as opposed to the dust-free addition of carbon black to liquid bases, such as paints and inks. Transporting raw carbon black also generated large amounts of noxious dust. So, Binney & Smith technicians developed and patented a formula for transforming carbon black into pellets, which greatly reduced the dust created. Of course, other tire companies discovered that carbon black pigment greatly extended the life and durability of their tires, which led to all tires becoming black in color over the next several years.

To fully-close the circle, just look below to see what you can get.....

Colored tires for those colorful smoky burnouts!



235/40R18 Highway Max -
Blue Smoke
\$285



235/40R18 Highway Max -
HOT Pink Smoke
\$285



235/40R18 Highway Max -
Red Smoke
\$285



235/40R18 Highway Max -
Green Smoke
\$285



235/40R18 Highway Max -
DUAL SMOKE Purple &
Blue (Custom Tire)
\$315



235/40R18 Highway Max -
Yellow Smoke
\$285



235/40R18 Highway Max -
Orange Smoke
\$285



235/40R18 Highway Max -
DUAL SMOKE Purple &
Pink (Custom Tire)
COMING SOON



TAPPET TECH

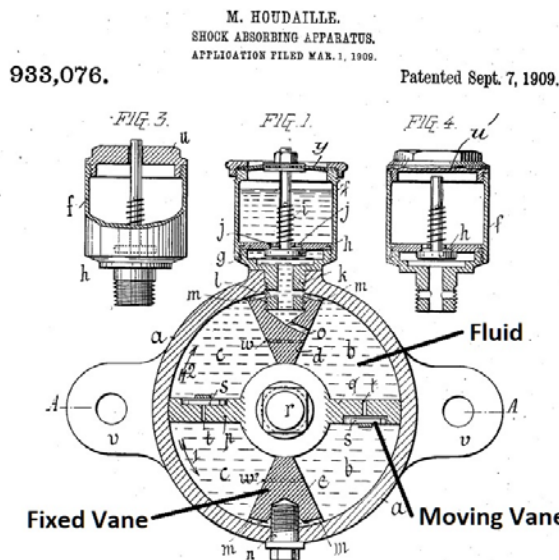
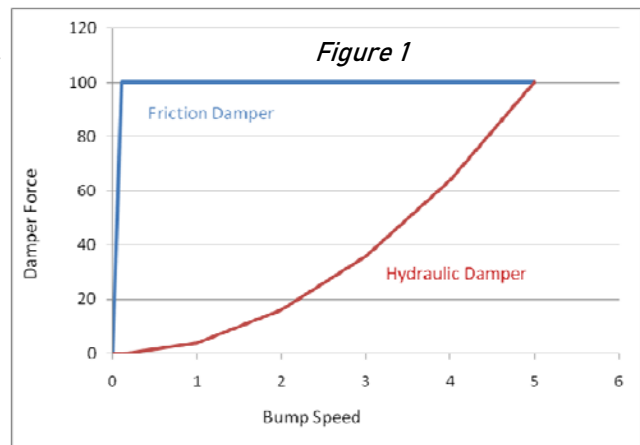
Fluid Filled Shock Absorbers

By Eric Jensen

It took few years from the birth of the automobile for engineers to recognize the need to dampen the bumps from the road. As vehicle speeds increased, so did the need for damping. This began the quest for both a good riding and a good handling auto.

In a previous article the operation of friction dampers was explored. A friction damper doesn't move until the force from the bump exceeds a set force. Big bumps or small bumps, that set force will be applied to the car. No matter whether upward or downward the force is the same. This is better suited to sporty cars which demand a firm ride and good control. It does not, however, provide much ride comfort demanded of more luxurious autos.

Fluid filled dampers work differently. They work by pushing fluid through a small hole or passage. The Houdaille rotary damper (below) shows two fixed vanes (triangular) and two moveable vanes (rectangular) in a fluid filled cavity. When the center shaft rotates, fluid is pushed from one chamber to another through small holes. The resistance to the oil flow creates the damping force. Small bumps, create small damping



forces, big bumps create bigger forces. The amount can be tailored by adding spring loaded valves to provide different forces for upwards motion (compression) or downward motion (rebound) of the wheel.

Patents for fluid filled, or hydraulic dampers were filed as early as 1901. Telescopic models as well as rotary designs were developed from 1901 to the present day. In 1906 Houdaille produced a vane-type fluid filled damper used on many autos.

Both friction and hydraulic designs were used on early autos depending on the need. The 1912 Hispano-Suiza autos illustrate this point. The 15T Alfonso XIII Torpedo Sport is

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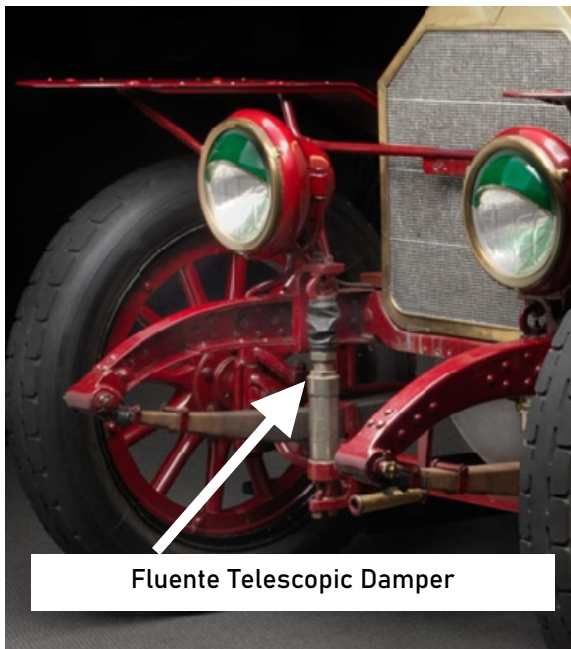
TAPPET TECH

Fluid Filled Shock Absorbers

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The 1912 Hispano-Suiza autos illustrate this point. The 15T Alfonso XIII Torpedo Sport is equipped with rotary-type fluid-filled dampers to provide a nice smooth ride for the family outings. Its more sporting neighbor, the 2 seat 15T Alfonso XIII, is equipped with friction dampers to complement the more expected energetic driving.

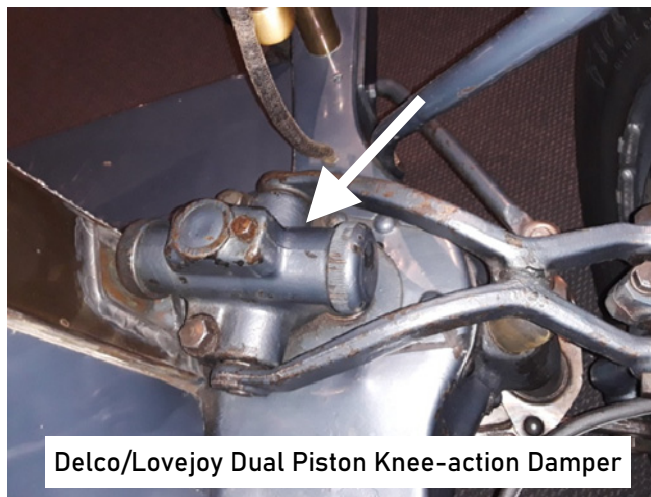


Fluyente Telescopic Damper

A very early telescoping hydraulic damper is also nearby. Around the corner from the Hispano-Suiza is the 1914 Simplex equipped with tube type telescopic dampers somewhat similar to those used by modern cars and trucks.

Several variations of hydraulic dampers can be seen as one strolls through the Vitesse or Revs galleries. Those autos of a more sporting nature are equipped with friction dampers. It isn't until we get into lower Vitesse that we see sporting autos with hydraulic dampers, notably, the Bu-Merc.

In 1919 a company called Lovejoy (later bought by General Motors's Delco Division) developed a lever-arm hydraulic damper first as a single piston and later a double piston design. One of the double piston designs (right) can easily be seen on the Bu-Merc with the lever doubling as the upper A-arm of the suspension.



Delco/Lovejoy Dual Piston Knee-action Damper

The lever-type designs were easily fitted to cars up through the 1930s and 1940s as they fit similarly to the friction dampers. The designs were continually refined in the quest for a smoother ride.

Photos Courtesy of Revs Institute, Peter Harholdt and Eric Jensen

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TAPPET TECH

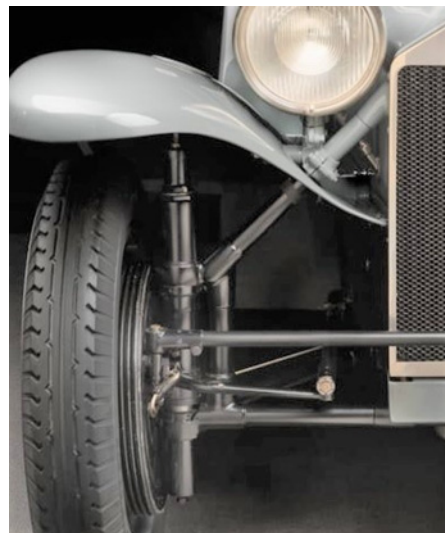
Fluid Filled Shock Absorbers

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The introduction of independent suspensions, as seen on the 1927 Lancia Lambda Torpedo Tourer (right), preceded the widespread adoption of the telescopic damper most common on modern automobiles. The Lancia is unique in that the front suspension spring is also contained inside the damper. Since the damper is also a support member of the suspension it acts much like a more modern MacPherson strut.

Tube-type hydraulic dampers gradually became the preferred damper design through the 1950s into the 1970s. There were notable holdovers (mostly British cars...) still using the lever-arm dampers through the 1960s.



**20% VOLUNTEER DISCOUNT
ON ALL
GIFT SHOP MERCHANDISE**

A photograph of the interior of the Revs Institute gift shop. The shop is filled with various automotive merchandise, including t-shirts, mugs, and books. A counter area is visible in the foreground, and a sign in the background reads "AUTOMOTIVE TREASURES SELECTIONS FROM THE JOEL E. FISH COLLECTION".

TAPPET RIVIA

By Joe Ryan

And Now The Answers.....

1. **Q:** In what year did the Cunningham C-4R Win the 12 Hours of Sebring?
Answer: The C-4R won the 1953 12 Hours of Sebring.
2. **Q:** Who were the drivers of that winning Cunningham C-4R at the 12 Hours of Sebring? **Answer:** Phil Walters and John Fitch.
3. **Q:** What car did Briggs Cunningham, with Bill Lloyd, drive in the 1953 12 hours of Sebring? **Answer:** They drove a 1953 OSCA MT4 1350 to a 5th place finish overall but 1st in the 1.5 liter class. OSCA was formed by the Maserati brothers. Their first car was offered in 1947.
4. **Q:** In what year did the Miles Collier Collections OSCA MT4 1500 win the 12 Hours of Sebring? **Answer:** It won the 1954 12 Hours of Sebring, with Sterling Moss and Bill Lloyd driving, beating the larger 4.5 liter Ferraris, a 5.5 liter Cunningham C-4R and the 265 hp Lancia D24s!

Events Calendar

Event	Date	Info or contact
Volunteer BOD Meeting on Zoom	Oct 14 @ 10:00 am	Contact Whitney at wherod@revsinstitute.org
"Get Involved Collier!" 2022 Volunteer Expo	Nov 3 @ 3-6pm	Contact Whitney at wherod@revsinstitute.org
Revs Institute <i>Tentative</i> Re-Open	Nov 17 @10:00 am	Sign up on VicNet
Save The Date: Volunteer's Banquet	Jan 21, 2022	wherod@revsinstitute.org

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

Adopt-A-Car Program

Available Adopt-A-Car Automobiles and Engines

Alfa Romeo Guilietta	Simplex	C-6R Offenhauser engine
Alfa Romeo AutoDelta	Stutz Black Hawk	Cadillac OHV V-8 engine
Ardent Alligator	Vauxhall 30-98 Type OE	Chrysler Hemi (C-3) engine
Bugatti Type 55 Super	Waymo Firefly	Duesy Sprint Car engine
Cadillac Series 61	Abarth 1000-TC-R engine	Ford GT-40 Transaxle engine
Cisitalia SC	Alfa Romeo GTZ engine	Ford Turbocharged Indy
Cunningham C-3		Gurney Eagle GP engine
Fiat Abarth TCR		Jaguar XK120 Series engine
Jorgensen Eagle		Meyer-Drake Turbo Prototype
Maserati Tipo 60		Porsche Type 901/20 engine
Mercer Raceabout		Porsche Type 901/22 engine
Miller board track racer		Porsche Type 908 engine
OSCA Sports Racer		Porsche Type 916 engine
Porsche Elva		Columbia Three-Track
Porsche RS-61L Spyder		Humber 58" Ordinary Bicycle
Scarab Sports-Racer		Velocipede Bicycle

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

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

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