The official newsletter of

Revs Institute Volunteers

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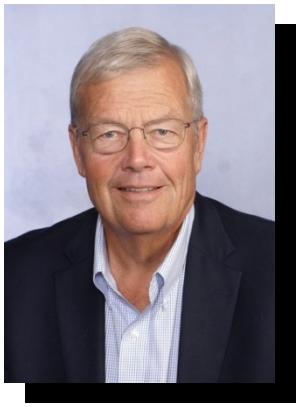
TAPPET CLATTER

Volume 27.5 **January 2022**



Chairman's Notes

Chip Halverson

As we turn the page in the calendar there is much to look forward to at Revs Institute. Foremost in the near term is our annual banquet scheduled for Saturday, January 22nd. Whitney has a great evening planned.

For this letter I want to take the opportunity to talk about volunteer driven research. While Revs Institute as a whole is very much about research, our volunteer organization also has a long tradition of producing high quality research related to the collection and other automotive topics. The research has been presented in various forms including the *Tappet Clatter*, Adopt-a-Car reports and presentations to the volunteer meetings.

What's in it for the volunteer? The opportunity to explore a topic of interest and possibly have it published on the Revs Institute website. It's also a way to earn volunteer hours. It especially gives our seasonal volunteers a chance to stay engaged and earn hours when you are not in the building.

You can start with a small project. That was my intention when I recently attended an event honoring our fellow volunteer, Bill Wuesthoff. I was originally going to write a few paragraphs and include a picture. After I read the book about Bill that was released at the event, my project turned into a full-length article in the *Tappet Clatter*.

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Chairman's Notes....*continued*

(Continued from page 1)

I am not a writer by background, but for this article and several others I have done, I put the content together and Eric Jensen and others have done a great job of editing and formatting. The article was much improved and more polished after they were done.

If you have an interest talk to ether Brian Lanoway or Eric Jensen. They can help you define your project, point you towards research resources and make sure the topic has not been covered already. We will talk more about this at our next meeting.

All the best! *Chip Halaerson*

2022 Volunteer Board of Director Elections

All members who have served for two years or more and have contributed 60 service hours/year are eligible for the Board. Board members serve a three-year term. You don't have to live in Naples full time to serve on our Board. We use email a great deal and don't meet during the summer. During "the season" we meet once a month.

The election will be held at the monthly meeting in April. Once we have the new Board members in place, the new Board will elect the President, Vice-President, Treasurer and Secretary.

We hope everyone will seriously consider serving as a Board member. If you wish to stand for election, **please submit your bio and a picture** (100 words or less) to **Roc Linkov**

Submissions later than **January 21**. Biographies of the candidates will be published in the February *Tappet Clatter.*

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. Did Ferdinand Porsche build the first hybrid automobile?
2. What superstar rock band elevated the Trabant to western fame?
3. When Did Louis Delaunay change his name to *Louis Delaunay - Belleville*?

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Autonomous Autos, Not Ready for Prime Time?

By Morris Cooper

In 2015, Tesla's boss, Elon Musk, said fully functional self-driving cars were two years away. Chris Urmson was an early engineer on the Google self-driving project that became Waymo. He is now the Chief Executive of Aurora, the company that Uber essentially paid to take over when Uber tapped out a year ago. He says that driverless cars are 30 years away, and possibly longer.

Christopher Hart is a former chair of the National Transportation Safety Board and knows something about automobile safety. Recently, in September 2021, he authored an article for The National Academies of Sciences, Engineering and Medicine entitled "Driverless Motor Vehicles: Not Ready for Prime Time."

The Waymo Firefly autonomous auto
Photo Courtesy of Revs Institute

In his article, Hart acknowledges the potential benefits of driverless motor vehicles but highlights the key automation challenges to be met before these vehicles are ready and acceptable by the public for widespread use.

The case for automation is based on the statistic that more than 90% of motor vehicle crashes involve driver error, and nearly 40,000 lives are lost each year on U.S. roads.

Hart argues that the aviation industry has been developing innovative automation for decades, but airliners will continue to have pilots for the foreseeable future. The reason is because automation designers are unable to provide satisfactory answers to two crucial questions:

1. What if the automation fails?

And much more likely,

2. What if the automation encounters circumstances not anticipated by the designers?

Hart writes that "The same questions apply for automation in road vehicles" and continues "Hence, despite the substantial potential life-saving improvements of removing drivers from cars, driverless cars probably will not achieve public acceptance for widespread use until car automation designers can answer those two questions."

Underlying his conclusion is that developing autonomous vehicles is much more challenging compared to automation in commercial aviation. The concerns of the aviation industry are that inadequate consideration has been given to human factors in designing automation in dealing with automation failure, and automation in situations not anticipated by the designer. The object is to learn from the mistakes made in aviation automation.

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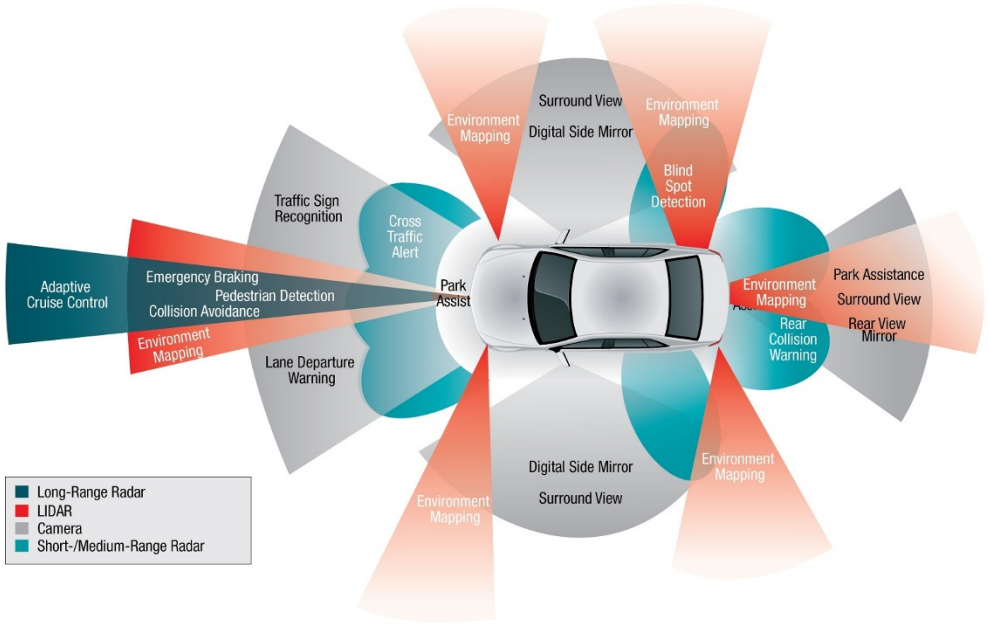
Autonomous Autos... *continued*

(Continued from page 3)

Hart notes that any system designed, built and maintained by humans will fail sooner or later. The challenge is to ensure that failures in automation do not endanger the lives of passengers and those outside the vehicle such as other drivers, cyclists, and pedestrians.

The current industry concept for autonomous vehicle failure is to have the vehicle pull off to the side of the road or stop in the lane of travel, but these might not always be the safest options. Hart writes. "A human driver may assess options in the moment to come up with a safer course of action."

Reviewing past aviation experience, Hart says that automation accidents are more likely a result of circumstances that automation designers did not anticipate rather than outright failures and gives a number of recent examples.



Multiple sensors are required for autonomous cars to cover every angle and every distance, near and far. Different kinds of sensors are needed for different conditions. All must work together to guide the car and avoid obstacles.

Recovery from unanticipated situations in an autonomous vehicle is an even greater challenge since it might only be possible with human intervention."In a driverless car, equipped with only a screen for passenger input about destination – but no controls for acceleration, braking or steering – there will be no opportunity for human intervention."

The ground environment is also much more complex and variable than the air. There are 4 million miles of roads in the U.S. with unique features that constantly change. Hart argues that programming for this is effectively impossible.

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Autonomous Autos... *continued*

(Continued from page 4)

In aviation, simulators are capable of extensive automation testing, but for cars, automation cannot substitute for real-world testing. Unfortunately, street testing of driverless vehicles will eventually lead to crashes and deaths. Recall the 2018 automated Uber fatality in Tempe, Arizona where an inattentive monitor/driver killed a woman walking her bicycle across the street. Also, recall that this was a street test of an Uber vehicle designed to be driverless.

The author cites the real-life ethical issues in automation. What does a car do when encountering a vehicle coming in the opposite direction in the same lane where there are pedestrians on the sidewalk? The programmers will have to determine if the vehicle should go onto the sidewalk to save its occupants while harming the pedestrians, or crash into the oncoming vehicle to save the pedestrians.

And finally, if that were not enough, we are reminded that autonomous vehicles will always need software updates from manufacturers, exposing them to ever-increasing cyber invasion. Hence, the reason for the very appropriate title of Hart's article.

A recent book that explored this issue in depth is Michael Crawford's "Why We Drive: Toward a Philosophy of The Open Road." Crawford is the author of the earlier well-known book "Shop Class as Soulcraft" and is a Ph.D. motorcycle mechanic. A few title chapters in his new book explain the author's viewpoint: "The Diminishing Returns of Idiot-Proofing as a Design Principle" and "Automation as Moral Re-education."

For Crawford, the creeping culture of "safetyism" is abetted by tech companies disguising venal self-interest. Visitors can be reminded of this when they see that the Waymo car has no controls so that you can watch ads and social media instead of doing what the rest of the museum is all about -- wasting your time driving a car. It is a fitting and thought-provoking endpoint of our Docent tours.

The Society of Automotive Engineers Five levels of Autonomous Cars - Simplified

Zero - None, no assist.

One - Driver Assist. At least one driver assist feature. Example, Smart cruise control.

Two - Partial Autonomous Driving. Combines at least two automatic features like smart cruise control and a lane-keeping steering system.

Three - Conditional Automation. Autonomous under certain specific conditions such as a divided highway with physical barriers.

Four - High Automation. Full automation without driver or driver intervention but confined to well-defined areas with restrictions.

Five - Full Autonomous Driving. No driver required, no location restrictions, no controls inside the car are required.

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General Admissions

Thoughts on my first Formula 1 Grand Prix

By Lauren Goodman

Downtown Austin hotel room, Texas, 6:30 am: My alarm goes off but I'm already awake. We've got general admission tickets and I know we need to get there early to get a good spot on the hill near Turn 1. Per the email from Circuit Of The Americas, shuttles start at 8 am and gates open at 8:30 am on race day.

I'd held off buying a Grandstand seat since the vaccine had only just started rolling out for the elderly and high-risk populations. (FYI, Walgreens does *not* consider F1 fans to be a high-risk population). By the time I got my jab, I had to pin my hopes on the last round of Sunday-only general admission tickets. At least the hours-long digital ticket queue on the COTA site gave me time to convince my sister Amanda to come with me.

Lauren and Amanda at COTA
All Photos Courtesy of Lauren Goodman

7:00 am: Equipment review: McLaren/Ricciardo shirt, check; camp chair, check; phone charged, check; unopened bottles of water, which are permitted inside COTA, check; breakfast (leftover pizza and Diet Coke), check. I begin to feel nervous.

I open the COTA app on my phone to have our tickets at the ready. The venue was ***very*** clear that tickets would be delivered via the app, ***not*** via email attachment. A small pop up screen advises me to download the tickets from the COTA app to my phone, as the demand on the cellular data network out at the venue might make the app slow to bring up our tickets. This would foreshadow things to come.

Pickup truck traveling 8:30 am: Ok, so we've had a small setback re: shuttle transportation. Amanda booked our hotel thinking it was near the COTA shuttle stop in Downtown Austin, and it was -- just not the shuttle included in our ticket. Allegedly, I should have known there were two different shuttles, and that the shuttle near our hotel required a separate ticket. *Allegedly.* No matter, I simply ordered a private Lyft and now we're en route in Brayan's massive Chevy Silverado. Giddyap.

I look over at Amanda: Even though she's a lawyer, I'm still glad she's with me. First, it is very key to have at least one morning person in any travel group and she is. Second, she's also a fan of F1 but it took me a long time to wear her down. For nearly a year, while we hunkered down together during quarantine, she rolled her eyes when I watched Formula 1 Free Practices (*"So this, like, doesn't even count?"*), when I re-watched historic races (*"You already know who wins!"*), and when I paid entirely too much for my new Ricciardo (driver Daniel Ricciardo) t-shirt (*"I thought you already had his shirt, a black and yellow one?"*).

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General Admissions...*continued*

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But I had an ace up my sleeve: *Drive to Survive*, the Netflix docuseries. I recommended it when she needed something to put on in the background during tax season. A few weeks later came one of the greatest moments of my life, when Amanda sheepishly wandered into the living room while I was watching Qualy: *"I think… I'm ready to admit… that I am developing a crush on (driver) George Russell."*

COTA main gates 9:30 am: The 'Netflix Effect', by the way, is very real. 400,000 admissions over the weekend at COTA, with 140,000 attendees on Race Day. Whoever at Liberty Media put together the deal with Netflix should be given a MacArthur Grant.

But whoever runs operations at COTA should be given a pink slip. The gates still aren't open. It's not clear from the map in the app if general admission tickets can enter at the other gates, nor is there signage from the drop zone directing foot traffic to other gates. I have some kind of flashback to when I produced TV commercials: I reach for a non-existent walkie to call for the assistant director to send a couple of production assistants down here with megaphones. Or at least with some coffee.

9:40 am: Finally, the gates part. But, for all the lines with ticket scanners, there aren't very many metal detectors. A huge crowd is funneled into a very tight security checkpoint like a venturi for humans. The pressure is on, and the security people have clearly just given up just to get people through quickly. When I put my backpack on the table next to the metal detector, the kid they hired to check bags doesn't even look inside. *Not comforting*.

***COTA grounds 10:00 am*:** We're winding our way around the inside of the track, because I'm pretty sure the footbridge is here… no, wait… there? I can't make out the map on my phone's app. Fortunately, my sister grabs a paper map from an attendant.

10:01 am: We are not quite where I thought we were. Allegedly. Where can a lady get some 'darn' (*editor's note; caffeine deprived adjective adjustment...*) coffee in this place?

Checo Perez Fans

10:05 am: We're crossing a pedestrian footbridge when the Formula 4 second race comes zooming beneath us. We can't see anything -- obviously those footbridges are covered with Aramco and Pirelli signs -- but we can feel it. As each car punctures the air, my hair stands on end. I feel like I've plunged into a screaming sound bath, with air waves as solid as ocean surf. Gone just as suddenly, the receding buzz of the engines seems to take the air with it. Is the world quieter now, or does it just seem quieter? I feel elated.

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General Admissions...*continued*

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The View to Turn 1

10:10 am: I now experience the porta-potties. I am less elated.

10:20 am: Wait, did we take the wrong bridge?

10:30 am: Yeah, we absolutely took the wrong long way around the track.

10:40 am: Turn One… **huff* doesn't look… *huff* this steep…. *huff* on TV….*

Hillside - between the Grid and T1 10:50 am: Finally, we're coming around the Red Bull hospitality tent and… holy cow. How did everyone else get here first?

11:00 am: Where we've squeezed in, we can just see the starting grid. Can't see a screen, though, and later we'll find out there's no PA speaker here, either. The cellular network is so overloaded, no way will anyone be able to stream commentary online. Still, the COTA app manages to send a push notification on my phone: "Commentary will also be broadcast on an AM station."

A push notification. On an iPhone. Which does not (last I checked) have an AM/FM receiver. Because it is not 1987.

11:05 am: We watch the W Series start. After a few laps, I decide to go on a hunt for coffee while Amanda holds our spot.

Main Grandstands entrance 11:10 am: I can't believe how many people are here. I thought coffee would be around here, according to the map? I can barely get through the crowd. Well, if there's no caffeine, might as well move on to alcohol.

11:11 am: A beer is $12. I try to reach a reporting hotline for the UN High Commissioner for Human Rights, but the network is still overloaded. Instead, I convince myself that buying a beer *and* a lemonade to make a shandy will provide necessary electrolytes on a hot day.

Back on the hillside 11:30 am: I make chit chat with our neighbors while Amanda goes on a quest for merchandise and vegetarian fare. They've got 3-day general admission passes and they give me the weekend report: COTA ran out of water on Friday and there's no soap at the porta-potties. I offer them my baby wipes but guard my unopened water more carefully. One of their group decides to worm his way down the hill for a better view. I can't imagine how he'll squeeze through.

12:30 pm: Drivers Parade! But what are those truckloads of other people, out in front of the drivers? Our neighbors' friend, who did indeed make it to the bottom of the hill, returns now with a report.

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General Admissions...*continued*

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They were the people who shilled out big bucks for tickets that included being driven in the Parade. For no other purpose, I suppose, than to wave benevolently down upon us, the hoi polloi of general admission. Their friend further reports the people of the hill booed them soundly. This, and a second shandy, make the wait easier.

1:45 pm: We're pretty sure they're playing the National Anthem. Everyone in our section stands, just in case. The helicopters overhead and the parachuters with a giant American flag are also fairly good evidence.

1:50 pm: The sea of people is truly incredible. If the person at Liberty who made the Netflix deal is a genius, then the person who got rid of Grid Girls should get a Nobel Prize. Looking around me, the gender split seems to be 50/50 -- and I don't mean because husbands brought their wives. For every pack of roaming men in matching merch, I saw another group of women sporting team and driver apparel. As a 35-year-old woman, a Grid Girl wouldn't put me off the sport, but at the tender age of 15, the equivalent marketing techniques did put me off a lot of things: X Games, cars, comic books, cars, video games, cars… and did I mention cars? Granted, I don't think the F1 marketing department was looking for progress, I think it was just looking to expand their market to the other half of humanity. I know some folks say they miss the 'glamour' of having Grid Girls milling about in branded apparel. (I wonder if those same folks would call Hooters a charming little bistro.)

The Race Grid

But it's more than a matter of taste (or lack thereof). Watching the crews on the Grid, seeing the drivers climb in… I don't want to be in a low-cut t-shirt next to the driver. I want to *be* him. F1 and the FIA are doing a big push to put more women in visible positions. I love to see them on the pit wall and in the paddock. I love the inclusion of the W Series in the support races. Just I ponder the future of women in the sport...

...here come the Dallas Cowboy Cheerleaders, representing America on a worldwide broadcast. Amanda has seen their reality show. Did you know the cheerleaders barely make minimum wage and foot the bill for their own hair and makeup? "So I'm guessing they don't have a union," I grumble. We both wince as the Cheerleaders execute perfect splits on the sizzling track surface. "Or health insurance."

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General Admissions...*continued*

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2:01 pm: Finally. Verstappen and Hamilton pull up to the starting line after the Formation lap, and it seems to take the rest of the grid ages to finish. There's no speaker, but I can almost hear Crofty (the British TV Broadcaster...) in my head: "... the 2021 United States Grand Prix… here in Austin… it's lights out and away we go!" The crowd roars. The Checo (Mexican Red Bull racer Sergio Pérez) fans in particular are out in force, and their cheers are infectious. (The Red Bull merch is already sold out say signs at their booths throughout COTA.) Amanda and I watch a few laps from our vantage point on the hill. We decide to descend and walk around the track, to get closer and take pictures from different vantage points.

COTA grounds - walking 2:43 pm: So...Many...People...But we do get some good pictures through the chain link fence in the final corner.

3:00 pm: We realize we have no idea how the race is going. We sit for a while in the amphitheatre inside the track, where giant screens are broadcasting the action.

3:38 pm: We queue up at a gate near one of the hospitality suites. This is apparently a 'fan incursion point'. Max Verstappen crosses the finish line under the waving checkered flag and fireworks go off over our heads. We're surrounded by Perez fans, who chant, "Che-co! Che-co!" until he crosses in the line in third. Minutes later, the gate opens and we rush out onto the track.

3:41 pm: We are all cheering and running toward the podium!

3:42 pm: I am very out of shape!

Starting Grid/Podium 3:53 pm: "Che-co! Che-co!" We're all Perez fans today.

4:08 pm: Ceremony over. Amanda and I set off for a walk along the track.

Turn One Again 4:15 pm: How… *huff* had I forgotten… *huff* how *steep* this is?!

Further along the track 4:23 pm: Some kid picks up a DRS (Drag Reduction System) sign, which is about the size of a door, and walks off with it.

4:24 pm: Nope, it's not going to fit in my checked bag.

COTA Main Gates 5:00 pm: We decide to make our way back to the hotel. The signs aren't clear which downtown shuttle is which. Two women advise us that the one we're looking for is a ten minute walk away. As one of the pair is also wearing a Danny Ric shirt, I decide she must be trustworthy.

A field 5:15 pm: We find the correct line, but it looks like COTA forgot to rent enough school buses. And the rideshare apps are completely overloaded. Our line is in the middle of a soccer field: no shade, no water, and no information. There are some porta-potties at the far end.

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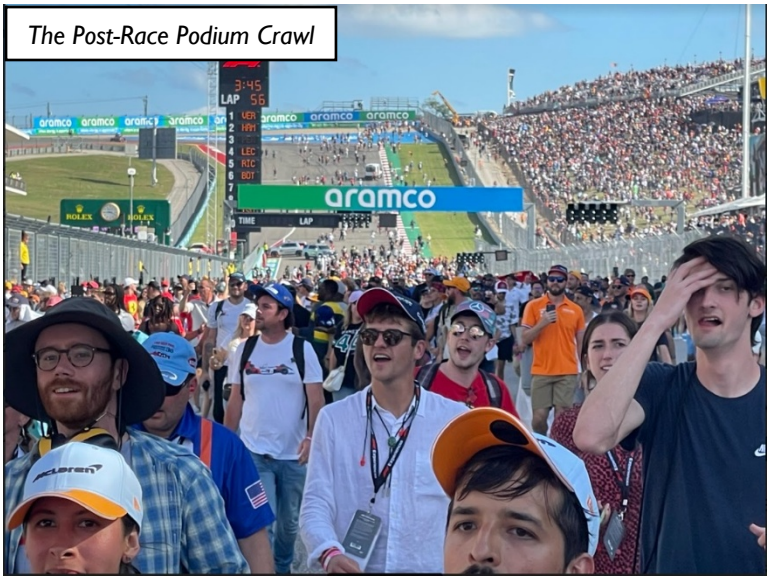
General Admissions...*continued*

(*Continued from page 10)*

A God-forsaken field 7 pm: Only a few school buses have stopped for us in the past two hours, and the line is hundreds (perhaps over a thousand) deep behind us. Mercifully, my sister has bottled water remaining and the sun is now setting. A COTA worker comes to turn on the generator for the outdoor lights but there is no information about our buses.

This stupid horrible God-forsaken field 7:15 pm: The network is starting to function again. I send several STRONGLY WORDED tweets. After waiting hours for a shuttle, some people are just trying to walk back to Austin.

The Post-Race Podium Crawl



7:30 pm: I wish I had that DRS sign, so I could write UNION on it like Norma Rae. Other buses are coming and going for the other shuttle stops. If we block the road, they'll HAVE to take us, right? On the advice of counsel/sister, I do not stage a coup in the shuttle line.

8:00 pm: The air-conditioned coaches, having finished their runs for the *separate* downtown shuttle service that cost *extra,* have finished their runs and are now coming to rescue us. I choose to believe my tweets, seen by literally *tens* of people, played a part.

8:15 pm: The workers don't even bother scanning our shuttle tickets on our phones. "I'm sorry about that wait," says one of them, a gentleman in his fifties.

Truly, here among the General Admission crowd, I have become one of the real fans, those who would brave heat and exhaustion for a glimpse of our favorite drivers. It's Kimi's (driver Kimi Räikkönen) last year and there's a real fight for the title. I'm glad I got to experience a Grand Prix this season, but if this is how COTA treats its general admission attendees, I vow never to return to this freaking track.

Motorcoach 8:30 pm: We're stopped in traffic. It's Sunday night, so the race is the only reason for the jam. At least we're in an air-conditioned coach and not a school bus. Amanda is using her phone to search for pizza delivery near our hotel. We'd hoped to go out for dinner, but I see now that was hubris, a pipe dream. I should have known a venue that ran out of Heineken at a Heineken-sponsored event would not be able to organize mass transportation.

Ding. The COTA app sends me another push notification: Put down a deposit now for a grandstand seat for next year's race!

Which of course I'm going to do.

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Early Electric Automobiles

By Eric Jensen

For many, throughout most of our lives, electric cars have been an oddity of a bygone era or a prototype in the pages of *Popular Science* magazine. The first practical prototypes of electric automobiles pre-date Karl Benz's 1885 Patent Motorwagen internal combustion engine car by four years.

To create an electric auto, three things are needed; The battery (fuel), the motor and a way to control it (the throttle). Batteries, a chemical conversion device to make electricity, were invented in 1800. British scientist William Sturgeon invented the electric motor in 1832. It only took Thomas Davenport from Vermont, U.S.A. 2 years to invent a type of electric motor he applied to a small car in 1834. This "car" received a U.S. patent in 1837. This invention was a bit ahead of its time as the first rechargeable battery was not developed until 1859 by French physicist, Gaston Planté.

1908 Columbia Electric Victoria Phaeton
Click on the Photo for the Link

In France, the first practical electric vehicle was demonstrated in April 1881 by French inventor Gustave Trouvé. The first commercially viable electric car was developed by Englishman Thomas Parker in 1884. Parker was called the "Edison of Europe." While in Germany, engineer Andreas Flocken built a significant electric car in 1888. William Morrison of Des Moines, Iowa built his six passenger auto in 1890.

By 1897, fleets of electric taxis were introduced in London, Paris and New York. By 1898, Ferdinand Porsche created his first electric car, the Lohner Model C2 Phaeton. In 1899, the first speeding violation was given to a the driver of one of New York's electric taxis. Also in 1899, Camille Jenatzy was the first to drive over 100 kilometers per hour in any car and that car was electric powered.

By 1900, 38% of the cars registered in the U.S. were electrics, 40% were steam powered and only 22% were gasoline powered autos.

In these early days, batteries were either the lead-acid type, much as we use as starter batteries in cars today, or iron-nickel alkaline batteries invented by Thomas Edison in 1900. Twelve to as many as 36 batteries weighing 600 to more than 1500 pounds powered the cars. The batteries carried the energy equivalent of one pint to one half gallon of gasoline in total. The electric motors, however, were as much as five times more efficient than gasoline engines of the day. The throttle controls to regulate speed were very inefficient wasting energy in large heating coils to regulate speed.

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Early Electric Automobiles...*continued*

(Continued from page 12)

Electric autos were manufactured in the U.S. by many companies such as Columbia, Pope-Waverly, Studebaker, Babcock, Woods Motor Vehicle, Stanhope, or Rauch and Lang. The Anderson Carriage Company produced the Detroit Electric autos and many more smaller companies existed during that period. The largest manufacturer was a Cleveland, Ohio company called the Baker Electric Motor-Vehicle Company.

Sales of electric cars peaked in the U.S. in 1912 with 30,000 registered autos. The date is significant in automotive history as it is the year Cadillac first offered Charles F. Kettering's electric starter. Other manufacturers rushed to offer electric starters soon after.

Baker Electric was out of business by 1914. By 1917, electrics were less than 2% of autos registered and the gasoline power auto was the clear sales winner.

1914 Detroit Edison
Click on the Photo for the Link

So who killed the electric car? Conspiracy theorists of all types have their favored villains. Was the electric car killed, or did it naturally fall to near extinction only to rise again in the 1990s? Let us compare the state of two fine examples of electric and the internal combustion autos from 1914; a Detroit Electric Model 47 and a Buick B55. Both models were considered to be in the upper range of autos worthy of purchase by affluent professionals.

	Detroit Electric Model 47	**Buick B55 48 hp 6**
Price:	**$3,730**	**$1,985**
Range:	80+ mi/charge	120+ mi/tank of fuel
Speed:	25+ mph	40+ mph
Availability City:	50% of cities	440 stations in cities
Availability Rural:	3% of rural	most general/drug stores

We can see from the comparison that the electric was more expensive than even Buick's top of the range 6 cylinder car. The top speed of the electric is quite acceptable for the time as city speeds were 8 to 12 mph. The average speed on improved roads was 20 mph. Unimproved roads in the country rarely allowed those speeds.

The range allowed by the gasoline carried in a tank was greater than electrics of the day. There were gasoline stations in cities but few in the rural areas. Gasoline was, however, readily available at general stores or drug stores.

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Early Electric Automobiles...*continued*

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Gasoline cost about 19.8 cents a gallon in 1914 ($5.53 in 2021 dollars) and rose to as much as 27 cents a gallon by the end of the decade due to war shortages.

The Edison Electric, being equipped with optional iron-nickel alkaline batteries instead of the more common lead-acid types, gave the auto greater range. Within the city, electricity was generally available to recharge as about 50% of areas within cities were electrified at that time. The cost of electricity was coming down very quickly in the 1910s dropping to $2.07/kW-hr in 2021 dollars. That is about 18 times higher than today's average cost.

An early home charging station
Click on the Photo for the Link

If one wished to visit the country cousins driving the electric auto, they must live within about 30 miles of the city to be certain the electric could make the round trip journey as less than 3% of rural America had electric power at that time. Your cousins would need to own a charging station, too, as you could not just plug the auto into a wall outlet to recharge.

While the Delco Light Company was created to build and sell gasoline powered electric generators for farm use in 1916 to fill that void, it was still too late for the electric auto. There was little opportunity to charge your electric car outside a major city until the Rural Electrification Act was passed in 1936, long after the electric autos ceased to be a major seller.

In 1914, as today, maintenance required of electric cars was less than internal combustion autos. An article on maintaining 1914 Buicks in the December 2021 *Tappet Clatter* clearly shows just how much maintenance was required of the typical gasoline auto of the day. All of the engine, clutch and gearbox service would be eliminated with an electric auto to be replaced with watering of the batteries (readers may remember adding water to lead-acid car batteries) after recharging. Ease of maintenance was a clear benefit of the electric auto.

Operating the electric auto was much easier than an internal combustion auto before electric starters. After the electric starter, one significant benefit of the electric auto was lost.

So by 1914, the primary benefits of the electric auto had diminished with the invention of the electric starter but the drawbacks of a higher price, limited range and scarce recharging points remained. The freedom of travel promised by the automobile was limited by the lack of electrification across the countryside. Cities were too widely spaced for electric vehicles to reach with limited range. This was true across Europe as it was in the U.S.

So was the electric car "killed" or was the car surpassed by superior technology in the 1920s? The consumer ultimately decides the fate of any product in the absence of outside interference. In this era, the consumer chose to spend their earnings on internal combustion autos over steam and electrics.

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Welcoming our Newest Volunteers

Ed Kralik

Joined Dec 2021

Full Time Resident

Engineering manager for Arthrex. Originally from Niagara Falls, New York. Interested in being around these special cars and passing along the stories to our guests. His interests include cars, playing sports with his kids, running and biking.

As a kid, he worked at the Crawford auto museum in Cleveland Ohio and remembers great summers visiting the museum and seeing the Duesenbergs, Cords, Pierce Arrows and Stutzs.

Paul Konikoff

Joined Dec 2021

Full Time Resident

Paul is interested particularly in Porsches since he is an owner of a 1987 Twin Turbo 911. He is owns several other models. He is an anesthesiologist and commutes to work in California for one week per month. He enjoys scuba diving, traveling and had a part interest in a repair shop in the past.

Abe Herskovitz

Joined Dec 2021

Full Time Resident

Abe is retired and relocated from Cleveland three years ago. He was a union representative for the bakery workers union and also is involved with real estate. His interests include motorcycles as well as his dogs. At 14, he worked in a gas station and learned the mechanical basics of engines. He owns an Indian motorcycle a Dodge Charger and has on some Impalas as well.

Rick Soloway

Joined Dec 2021

Full Time Resident

He is originally from Rochester New York. He worked for Lockheed in Burbank, California and was involved with pricing the F-18 fighter jet proposal. He managed radar installations in Egypt. He has an extensive background in motorcycles. He has also been involved with tutoring disadvantaged children in downtown Baltimore.

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TAPPET TECH

Engines Configurations

Variation is the Spice of Automotive Life...

By Eric Jensen

*I*n an earlier article we explored why more cylinders made an engine smoother. Those extra cylinders take up quite a bit of space so they tend to define the styling of the car in which they are installed. The long majestic hood of the Stutz Black Hawk Speedster or the Packard Prototype Speedster are perfect homes to each car's long inline 8 cylinder engine. The same can be said of the inline 6 engines in the Hispano Suiza H6 and the Mercedes Benz SSK.

Early autos had their hood length and height defined to fit their inline 4 cylinder engines. As more power was desired, displacement grew making the 4 cylinder engines longer but also taller. Increasing the number of cylinders, increased engine displacement and increased power. As engines grew from inline 4 to 6 to 8 cylinders, the length of the hood grew to accommodate the long engines but the height was kept low enough for the driver to see over.

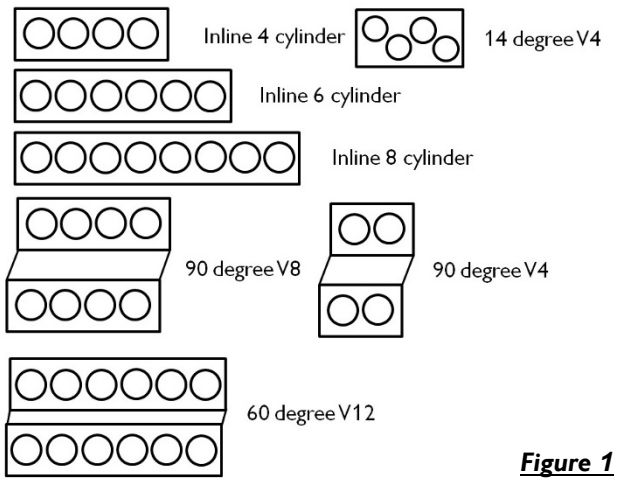
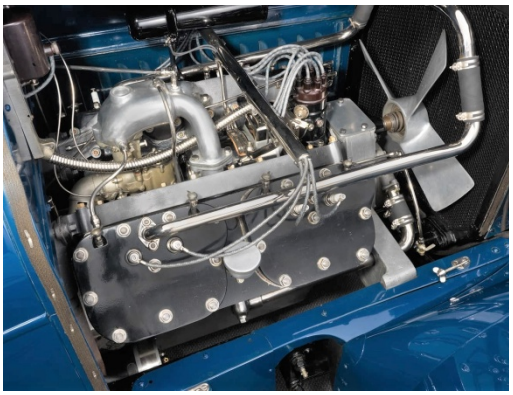


Figure 1

What could be done if the coachbuilders wanted a shorter hood but still wanted a smooth powerful engine? Look no further than the 1920 Cunningham V3 Boattail Speedster with its V8 engine. In Figure 1, there are a number of engine layouts represented from the inline engines to the Vee configurations. The V8 is effectively two inline 4 cylinder engines joined to a common crankshaft. Since the 8 cylinder engine fires every 90 degrees of rotation, the angle between the two banks of cylinders is 90 degrees. That allows the opposite cylinders to share an attachment on the crankshaft. As you can see, the engine is much shorter than an inline 8 but wider. It provides a smooth engine that fits into wider modern cars a bit better than narrow early 20th century autos.



The 1920 Cunningham V8 fills the engine bay
Peter Harholdt Photo Courtesy of Revs Institute

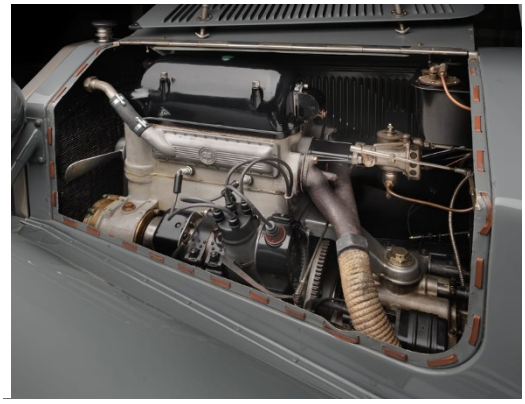
This concept can be used for a variety of configurations. Two inline 6 engines create a V12 with a 60 degree vee angle. The 12 cylinders fire every 60 degrees, so again, the angles are complementary.

(Continued on page 17)

TAPPET TECH

Engines Configurations ….continued

(Continued from page 16)



The 1927 Lancia compact V4
Peter Harholdt Photo Courtesy of Revs Institute

A 60 degree V6 can be created from one-half a V12 to create a very short, narrow engine as used in the 1952 Lancia Aurelia B20 GT. This is a common engine configuration used today. A 90 degree V4 can be created from a V8 but this is fairly uncommon.

The 1927 Lancia Lambda has a very compact and unique 14 degree V4 engine. The opposing cylinders in this engine do not share a crankshaft attachment since the angle is not divisible by the firing angles. The display engine in the Vitesse Gallery shows just how compact the engine is. While most Vee engines would have two cylinder heads, the Lancia engine has but a single head. This design surfaced decades later when Volkswagen created the VR6 engine; A narrow engine V6 with a single cylinder head to fit a six into the space of an inline 4.

Now we come to the opposed cylinder configuration also called the "flat" engines. Flat 4s, flat 6s, 8s,and 12s. Porsche embraced the opposed cylinder configuration starting with the four cylinder (see Figure 2). The engine is very compact and, as we know, fits well in a rear or mid -engine car. The cylinders are arranged to move in a "boxer" motion. Click on Figure 2 for the animation. The opposing pistons extend and retract at the same times to balance the vibration on the engine. It makes the crankshaft a bit longer to do this but the engine is very short to start, so it is of little consequence. The flat 4 design can grow to a flat 6, a flat 8 or even a flat 12 as we can see in the progression of Porsche's racing program.

Figure 2: *The flat "boxer" 4 cylinder. Click on the photo for an animation*

The list of engine configurations is much larger than presented here. Engines have been designed to fit the space available in whatever they are designed to power. Some designs lend themselves to air cooling, others are better water cooled. Some are best left to motorcycles, some will only fit in airplanes. Some engines have only seen the racetrack. Some have never been outside of a laboratory. Hopefully this article has shed some light on the different configurations displayed in the museum.

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TAPPET TRIVIA

And now, the answers…

1. **Q:** Did Ferdinand Porsche build the first Hybrid? **Answer:** No! The first Hybrid was developed by Garry E. Dey and built by the Armstrong Company for the Roger Mechanical Carriage Company in Connecticut. The car featured both a gasoline powered 6.5 liter two cylinder engine and a dynamo flywheel connected to an onboard battery. The dynamo and the regenerative braking is used to charge the battery, in addition to starting the motor. The flywheel can also propel the car and assist the gasoline engine.
2. **Q:** What superstar rock band elevated the Trabant to western fame? **Answer:** In 1992, while recording their album **"*Achtung Baby*"** in Berlin Germany, the rock band U2 included a photo of a Trabant in the cover art after seeing and driving the cars during the Berlin recording sessions. Gutted and provocatively painted, Trabant's were used as spotlight fixtures for the group's 1992 "Zoo TV" stadium concert tour. "West, meet East." In Europe, cast-off Trabants found new homes among artists, custom car builders and sightseeing tour companies. Trabants began emigrating to the U.S. as oddly compelling playthings for the "car nerds."
3. **Q:** When Did Louis Delaunay change his name to *Louis Delaunay- Belleville*? **Answer:** Some years after his marriage, to Anne Elizabeth Belleville. Her family business was the manufacture of the well known Belleville Boilers. Manufactured for industrial and marine applications. Louis became a partner and later head of the company. Good reason to change his name!

Are you interested in vetting completed Adopt-A-Car reports?

We are looking for a few volunteers who love to make sure things are absolutely correct.

The Adopt-A-Car program has a handful of completed AAC reports that need vetting. The purpose of vetting is to ensure the statements of fact in each report are correct and clear. This can be done by double-checking the references used in the report and checking the facts stated against other, usually web-based, references or information in the CarPad files. Of course, if you could bring your own personal expertise to the vetting process, that would be valuable as well.

We would expect that vetting a report should take around half-a-day to a full day's effort. You do not have to be physically at Revs Institute to do this vetting work. It can readily be done from the comfort of your home. Your vetting hours will contribute toward your annual volunteer hour requirement.

If you are interested in vetting, please contact Brian Lanoway, the Adopt-A-Car Committee Chair.

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Events Calendar

Event	Date	Info or contact
Memorial Dinner	Jan 11, @ 5:30 pm	Sign up on VicNet
Minneapolis Heart Institute	Jan 18, @ 5:00 pm	Sign up on VicNet
Naples Ultimate Garage Tour	Jan 19, @ 1:30 pm	Sign up on VicNet
Naples Lifestyle Group	Jan 21, @10:30 am	Sign up on VicNet
Volunteer Banquet	Jan 22, @ 5:30 pm	wherod@revsinstitute.org
SAE Fraternity	Jan 28, @10:30 am	Sign up on VicNet
Peace River Corvette Club	Feb 4, @10:30 am	Sign up on VicNet
Busey Bank	Feb 17, @6:00 pm	Sign up on VicNet
For a full list of daily tour groups and events, go to the 'Calendar of Events' on VicNet.		

1958	Alfa Romeo Guilietta Sprint Veloce
1964	Alfa Romeo GTZ
1934	Alfa Romeo 8C 2300
1934	Alfa Romeo 8C 2900B Berlinetta Touring
1967	Alfa Romeo AutoDelta 1600 GTA
1967	Anglo American Racers Gurney Eagle
1949	Ardent Alligator
1988	Arrows A10B Formula 1 Car
1919	Ballot
1926	Bentley Super Sport
1901	Benz Dos-a-Dos
1930	Bugatti Type 35
1933	Bugatti Type 55 Super Sport
1950	Cadillac Series 61 LeMans LeMonstre
1950	Cisitalia SC
1961	Citroen 2CV Sahara
1950	Cunningham C-1 Prototype
1952	Cunningham C-3
1952	Cunningham C-4R
1953	Cunningham C-5R
1955	Cunningham C-6R
1937	Delahaye 135 Comp. Special Roadster
1917	Detroit Electric
1963	Elva Porsche
1970	Fiat Abarth TCR
1955	Jaguar D-Type
1974	Jorgensen Eagle
1927	Lancia Lambda
1962	Lotus Elite Series II SE
1938	Maserati 8CTF
1961	Maserati Tipo 60 Birdcage
1995	McLaren F1
1929	Mercedes Benz SSK
1939	Mercedes Benz W-154
1912	Mercer Raceabout
1935	MG PA PB Leonidis
1922	Miller
1927	Packard Speedster
1896	Panhard & Levassor
1951	Porsche 356SL Gmund Coupe
1956	Porsche 550A Spyder
1959	Porsche 718 RSK Spyder
1964	Porsche 904 Carrera GTS Red
1964	Porsche 904 Carrera GTS Silver
1966	Porsche 906 Carrera 6
1968	Porsche 907
1969	Porsche 908-02 Spyder
1967	Porsche 910-6
1964	Porsche 911
1967	Porsche 911R
1969	Porsche 917 PA
1958	Porsche Carrera Speedster
1963	Porsche Elva
1961	Porsche RS-61L Spyder
1958	Scarab Sports-Racer
1914	Simplex
1928	Stutz Black Hawk
1920	Vauxhall 30-98 Type E
1927	Vauxhall 30-98 Type OE
1869	Velocipede Bicycle
1884	Columbia Three-Track Tricycle
1885	Humber 58" Ordinary Bicycle
	Abarth 1000-TC-R engine
	Alfa Romeo GTZ engine
	C-6R Offenhauser Racing engine
	Cadillac OHV V-8 engine
	Chrysler Hemi engine (C-3R)
	Duesenberg Sprint Car engine
	Ford GT-40 transaxle and engine
	Ford Turbocharged Indy engine
	Jaguar XK Series engine
	Porsche Type 771 engine
	Porsche Type 901/20 engine
	Porsche Type 901/22 engine
	Porsche Type 908 engine

New Adopt-A-Car Format

Now that the seasonal volunteers are starting to get work their way down to Florida, perhaps it's time to consider adopting a Collection car. None of the cars listed here have ever been researched by a volunteer.

Although a full Adopt-A-Car report is still our ultimate goal, we have made the research possibilities easier by offering shorter sub-topics that you can investigate, such as:

- the car's pedigree
- the history of the car's manufacturer
- its racing history
- how to drive the car
- the innovations in the car's design
- the processes and materials used to produce the car
- the styling features and colors used
- the car's restoration or re-restoration
- anecdotes about the car's history
- identifying additions to the car's research bibliography

The sub-topic research efforts don't have to be long. A one to three-page effort would do.

Any time spent on your research can be applied to your annual volunteer hours, even if your work is remote.

Even better, for those of you who are willing to take on a full Adopt-A-Car research report, we will do our best to get you a ride in your selected car when it's being exercised.

For further information, click on the link here to look at our Adopt-A-Car guidelines.

If you are interested please contact:

Brian Lanoway at blanoway@shaw.ca.

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Adopt-A-Car Program

Available Adopt-A-Car Automobiles and Engines

Alfa Romeo Guilietta
Alfa Romeo GTZ
Alfa Romeo 8C 2300
Alfa Romeo 8C 2900B
Alfa Romeo AutoDelta 1600
Gurney Eagle F-1
Ardent Alligator
Arrows A10B Formula 1
Ballot
Bentley Super Sport
Benz Dos-a-Dos
Bugatti Type 35
Bugatti Type 55 Super Sport
Cadillac Series 61 LeMonstre
Cisitalia SC
Citroen 2CV Sahara
Cunningham C-1 Prototype
Cunningham C-3
Cunningham C-4R
Cunningham C-5R
Cunningham C-6R
Delahaye 135 Roadster
Detroit Electric
Elva Porsche
Fiat Abarth TCR
Jaguar D-Type
Jorgensen Eagle
Lancia Lambda
Lotus Elite Series II S.E
Maserati 8CT
Maserati Tipo 60 Birdcage
McLaren F1
Mercedes Benz SSK
Mercedes Benz W-154
Mercer Raceabout
MG PA PB Leonidis
Miller
Packard Speedster
Panhard & Levassor
Porsche 356SL Gmund Coupe
Porsche 550A Spyder
Porsche 718 RSK Spyder
Porsche 904 Carrera GTS Red
Porsche 904 Carrera GTS Silver
Porsche 906 Carrera 6
Porsche 907
Porsche 908-02 Spyder
Porsche 910-6
Porsche 911
Porsche 911R
Porsche 917 PA
Porsche Carrera Speedster
Porsche Elva
Porsche RS-60 Spyder
Porsche RS-60 Spyder
Scarab Sports-Racer
Simplex
Stutz Black Hawk
Vauxhall 30-98 Type E
Vauxhall 30-98 Type OE
Columbia Three-Track
Humber 58" Ordinary
Velocipede Bicycle
Abarth 1000-TC-R engine
Alfa Romeo GTZ engine
C-6R Offenhauser engine
Cadillac OHV V-8 engine
Chrysler Hemi engine
Duesenberg Sprint Car
Ford GT-40 transaxle and
Ford Turbocharged Indy
Gurney Eagle GP engine
Jaguar XK Series 6 cyl
Meyer-Drake Turbo Proto
Porsche Type 771 engine
Porsche Type 901/20
Porsche Type 908 engine

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

The editor is Eric Jensen, eric60@gmail.com. Although email is preferred, correspondence can be mailed to:
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