Newsletter of the Lehigh Valley Corvair Club (LVCC)

the fifth wheel

AUGUST 2011 HTTP://WWW.CORVAIR.ORG/CHAPTERS/LVCC ESTABLISHED 1976

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LVCC News

Das Awkscht Fescht.

Thirty-two Corvair owners from the Lehigh Valley and Philadelphia Corvair clubs brought their cars to Club Day at Das Awkscht Fescht, and we had a good variety of them, too. Randy Kohler is writing a complete article about it for the September issue of the Fifth Wheel. Stay tuned!

Our Next Membership Meeting.

In September, we return to our normal schedule for monthly membership meetings. Our next meeting will be held on Wednesday, September 28th at 7:30 PM at the LANTA Community Center in Allentown. See the back panel of this newsletter for the address!

Two New Members!

LVCC welcomes Jonah Rodriguez from Allentown this month. Jonah is a Corvette owner who is also a Corvair enthusiast. Jonah, we hope to see you soon!

We also welcome Joe Lynch, who attended our membership meeting at Das Awkscht Fescht. Joe is currently shopping for a Corvair, so if you have one for sale, you can reach him at joelynch @dejazzd.com

Greetings from Australia.

A few months ago, we heard from Sten Backhans of Sweden. Sten wanted to purchase a Corvair engine for his home-built airplane. This month, Dick Weidner received a letter from the other side of the planet! Peter Hennessy of Australia wants to buy two or three Corvair engines. To reply to Peter, see our Classified Ads on page 5.

The Fifth Wheel is published monthly by the Lehigh Valley Corvair Club (LVCC), Inc. We accept articles of interest to Corvair owners for publication. Classified advertising of interest to Corvair owners is available free of charge to all persons. Commercial advertising is also available on a fee basis. Please contact our newsletter editors, Wesley Weiss and Allan Lacki, for details.

LVCC is one of the many regional chapters of the Corvair Society of America (CORSA), a non-profit organization that was incorporated to satisfy the common needs of individuals interested in the preservation, restoration, and operation of the Chevrolet Corvair. LVCC caters to Corvair people who live in and around the Lehigh Valley Region of eastern Pennsylvania. This is a very special car club! LVCC dues are $10 a year for CORSA members or $15 a year for non-CORSA members.

TAME THOSE CRAZY SWING AXLES!

Swing axles are fascinating. So many advantages! Simple. Cheap. Light weight. Smooth-riding. Jacking. Jacking? Yipes!

Sure, all the Corvair experts know about jacking. It's such an old beaten topic that we don't discuss it anymore. Ralph Nader, blah, blah, blah...

But strange though it may seem, swing axles remain a hot topic on the Porsche, Triumph, and Beetle discussion boards. A lot of these guys race their swing axle cars and they use every trick in the book to keep them glued to the track.

Swing Axle Refresher.

In May 2011, Triumph Spitfire enthusiast Paul Geithner of Maryland wrote,

"Although considered archaic today, some of the most celebrated high-performance cars of the past, such as the Mercedes-Benz 300SL of the 1950's and the Auto Union racecars of the 1930's, employed swing axle architecture.

Swing axles serve as both driveshafts and primary suspension links. This design has the advantages of independence, simplicity, low cost and low unsprung weight, but it has the disadvantage of poor camber control and potentially dangerous handling behavior.

The wheels are always normal (i.e., plane perpendicular) to the axles and the swing arms, being the axles themselves, are short, so the design has a high rate of camber change and a high roll center. This makes swing axle cars prone to "jacking," which is the progressive raising of the car due to forces generated during braking and turning.

Jacking occurs when the outboard axle (which is taking most of the load during the turn) angles upward toward the differential. The sideways force of the pavement against the tires reacts against the axle, and that raises the differential, which of course, is bolted to the body of the car. As the effect progresses, it gets worse and worse and camber gets more and more positive. Quickly, grip is reduced to the point that the rear tires break loose and the car goes into violent oversteer."

The Two-Step Cure Program.

To make your swing axle car handle better, you must accomplish two things. First, limit the droop of the axles to prevent jacking. The second is to decouple the rear suspension from body roll so that the tires remain flat on the ground even when the body leans.

With a typical swing axle suspension, the road spring is free to push down on the axle any time it is relieved of the weight of the car. The spring is always under compression to some extent throughout its travel, and therefore, is always exerting force to push the body of the car up in the air. In other words, the road spring contributes to the jacking effect. And as the body rises higher, the wheels tuck under.

Rebound Straps.

Of course, one of the easiest ways to keep the wheels from tucking under is to add rebound straps to the suspension to prevent the rear wheels from ever swinging down into a positive camber position. Straps were

Jacking & tuck-under illustrated. It's not just for Corvairs!

Suspension rebound straps, sold by EMPI for swing axle Volkswagen Beetles.

Camber compensator on a dune buggy. Spring pivot is bolted to the differential.

Z-bar on an older Formula V car. The bar pivots in the clamps bolted to the chassis.

part of the high performance suspension option that Chevy offered on Corvairs during 1962 and 1963. The downside to this technique is that it limits suspension travel instantly and abruptly. The is not what you need while negotiating a turn at high speed...

Transverse Leaf Springs.

In 1964, Chevy upgraded the Corvair's suspension system by including a front roll bar and a transverse leaf spring in the rear. The ends of the transverse rear spring were attached to the hubs and the center of the spring was hard-bolted to the differential. It served to limit tuck under and therefore controlled the jacking effect without the drama of the straps.

But it did more than that. It also used the travel of the heavily-loaded outside wheel and the road spring force of the lightly-loaded inside wheel to pull the differential downward. This keeps the body of the car from rising during a sharp turn.

Camber Compensators.

A slightly more sophisticated device for limiting jacking is the camber compensator. It differs from the 1964 Corvair transverse spring in one critical respect: The hard-bolted connection between the spring and the differential is replaced with a rocking pivot. All other things being equal, this reduces roll resistance in the rear suspension. And that's a good thing.

Z-Bars.

A Z-bar is the opposite of an anti-sway bar. The difference is that, instead of both arms projecting the same direction, one of them goes the opposite direction. Rather than being shaped like a "U", it's shaped like a "Z".

The ends of the Z-bar are attached to the wheel hubs and the middle of the bar is attached to the chassis by two bushings, much like the front anti-sway bar on a Corvair.

But unlike an anti-sway bar, which increases roll stiffness, a Z-bar actually decreases it.

Zero Roll Resistance Linkage.

The best way to reduce roll resistance is to eliminate it entirely. And that's what the zero roll resistance linkage does. Formula V race car builders have been using the zero roll resistance suspension linkage for years.

Formula V is an open wheel race class which requires the extensive use of Volkswagen Beetle components, including Beetle swing axles. But the rules do not prohibit modifications to improve handling. This racing class has been around since the early 1960s and about every conceivable trick has been tried.

With a zero roll resistance linkage, the wheels are suspended against each other instead of to the chassis. Arms extend up from the axles on each side and a spring and shock are placed between the arms so that when the axle pivots, it applies force to one end of the spring and thus compresses the spring and applies force to the other axle.

The beauty of this linkage is that the body roll is now decoupled from the suspension entirely. The body is free to lean about without affecting the contact patch of the tires.

Z Bar Versus Zero Roll.

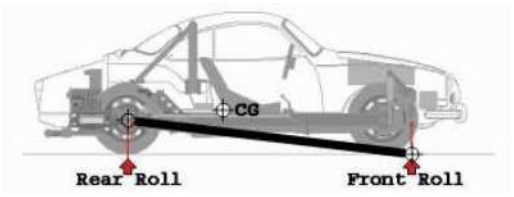
A Formula V racer who goes by the name "Racerdave" recently described the reason why the zero roll resistance linkage is better than a Z-bar out on the track:

"With the Z-bar working at it's greatest potential, the car can stick really well. However there is one attribute that can cause some apprehension.

Continued on Page 5.

Two photos of zero-roll resistance swing axle suspensions on Formula V cars. The wheels are suspended against each other instead of to the chassis.

Swing Axles & Roll Resistance



The preceding article advocates the elimination of roll resistance for swing axle suspension systems. How can that possibly improve that handling of a swing axle car?

Imagine a Perfect World.

A world where a car drives through the turns sideways without leaning at all, so that all four tires do an equal amount of work. Zero lean. What would we have? Most likely, a go-kart with no suspension and rubber bands for tires!

Unfortunately, a go-kart with no suspension does not yield a comfortable ride. Cars need to bounce up and down a little to provide comfort. And cars that bounce up and down tend to roll from side to side a bit too, like a boat on the water.

With primitive spring suspensions, the amount of rolling around can be quite disconcerting. Take a tin-lizzy Model T Ford for example.

But a modern suspension is, in effect, a linkage. And suspension engineers can design these linkages to minimize the amount of roll while maximizing suspension travel. The end result: a nice, comfortable controlled ride in a car that doesn't lean much in the turns. And that makes each of the four tires do its fair share of work while the car negotiates a turn.

Corvair Front Suspension.

It all has to do with roll centers - the axis around which the body of the car rolls, like that boat rolling from one side to the other out on the water.

Let's say you could design a suspension linkage where the roll center is at the center of the earth. Sure, your car would roll a little around that center, but the roll center would be so far beneath the pavement that the roll would be imperceptible.

Although this is an exaggerated example, we can look at the front suspension of your Corvair this way.

Swing Axle Rear Suspension.

Now, let's take a different example, where the roll center is, say, 15 inches above the pavement. The car would roll from side to side around this axis, 15 inches above the pavement.

This is a perfect description of a swing axle suspension. There's no way to drop the roll center much lower with a system like this because the rolling motion is hinged at the differential.

If the suspension lets the car roll around this axis without any resistance, the body of the car will lean quite a bit because the car's center of gravity is higher than the axis. One side of the car will rise and the other side of the car will fall, but the body will not rise overall. This is why we want to minimize, not maximize, roll resistance in our swing axle suspension.

On the other hand, if the suspension resists rolling around this axis, a natural lever will be created, with one end of the lever located at the roll axis (at the differential) and the other end located where the tire grips the pavement. And the body of the car will catapult itself upward on this lever because the center of gravity of the car is substantially higher than the roll center axis. Jacking occurs and the tires tuck under the car.

Adding roll stiffness in the back (with either stiff springs or a sway bar) aggravates the issue as it causes more camber change when we really want less.

Well Then...

How do we keep a swing axle car from rocking from side to side like a boat? The answer is quite simple: We move all the roll stiffness to the front of the car by adding a big sway bar to the front suspension. Viola!

LVCC Merchandise

LVCC license plates and hat pins: $3.00 each. LVCC T-Shirts: $6.00 each.
Call or email LVCC Secretary/Treasurer Richard Weidner at 610) 502-1414 rcwvair@rcn.com

Tame Those Crazy Swing Axles. Continued from Page 3.

As you drive thru a turn at 10/10ths, the car's rear tends to ratchet around the corner as the Z-bar loads and unloads from one tire to the other. Sometimes it's hard to distinguish between 10/10ths and 11/10ths when the car breaks loose and you're off mowing the grass.

With the zero roll resistance linkage, it is much smoother. The car is much more predictable in the corner, but it depends on a large sway bar in the front. If you jack the back end off the ground, you can ride the back tires like a see-saw.

On the zero roll resistance setup, there is a suspension travel limiter to keep the droop at neutral (0 camber). And on this limiter, there is some sort of snubber; either a die, spring, or some really soft shock snubber. This really makes for a smooth transition to the end of suspension travel under braking. Without this, even with the zero-roll, you would be mowing grass."

Cheap Trick: Adding Negative Camber.

With some negative camber dialed into the suspension, the rear of the car has to rise and roll more before the camber of the outside wheel becomes positive.

With swing axles, camber is reduced by adjusting the rear ride height. Lowering the rear to get the desired amount of negative camber, lowers the roll center a little and also lowers the car's center of gravity, too.

Editor: This article, prepared by LVCC member Al Lacki, borrows liberally from the writings of Larry Jowdy of Ontario, California, Paul Geithner of Maryland, and several other sources. We thank all the people who contributed to this writing.

NECC UPDATE

The members of the Northeast Corvair Council invite you to the 2012 CORSA International Convention in Sturbridge, Massachusetts. This is the very first CORSA Convention to be held in New England. And Sturbridge is New England at its best!

Where: Sturbridge Host Hotel & Conference Center. 366 Main Street (Route 20), Sturbridge, MA 01566.

When: The Convention begins with Autocross on Wednesday, July 25, 2012. Then, the very next day, Thursday, July 26, the Convention gets into full swing at our host hotel and continues through Saturday, July 28, 2012.

What: The 2012 Convention will include a full menu of meetings and events for every kind of Corvair enthusiast, including: Concours d' Elegance, Car Display, Road Rally, Autocross, Valve Cover Racing, Group Meetings, Board of Directors Meeting, Tech Sessions, Swap Meet, Parts Vendors, and more. And there will be activities for other members of the family, too, including a Bus Tours, Craft Exhibits, a New England Style Clam Bake, and a big Model Car Contest.

Next Step:
Reserve the dates on your calendar. Standby for information regarding special CORSA Convention room rates at the Sturbridge Host Hotel and Conference Center. And stay tuned for further details in upcoming issues of the CORSA Communiqué.

CLASSIFIED ADS:

FOR SALE: 1963 Corvair Monza M900 Coupe. 102 hp. Unrestored survivor. Runs perfectly. Never in a body shop or driven in snow. All service records since new. 50,000 miles. Needs nothing. Tinted glass. Day-night mirror. Pushbutton AM radio. Factory seat belts. Asking $7,000 or serious offers only. Dave Riddle. (610) 264-7155. dariddle@verizon.net

FOR SALES: 1963 Corvair Monza Convertible. White exterior with black top. Powerglide. $1,500. Contact Keith Koehler. (215) 703-0644. kpissant@verizon.net

WANTED: I am trying to source two or three 1965 110-95 HP engines with codes RD RF RH RX RK RA RE RG RJ for export to AUSTRALIA. They do not have to be in running order but need to turn over freely. Are you able to help? Yours Sincerely.
Peter Hennessy.
74 Wellington St. Mundingburra, Townsville, Queensland 4812, AUSTRALIA.
phe47727@hotmail.com
61 7 47753350

Membership Meeting: Wednesday, September 28, 2011

Time 7:30 PM. Place: LANTA Community Center, 2nd Floor Meeting Room, 1060 Lehigh Street, Allentown , PA 18103. All LVCC members are encouraged to attend. Feel free to bring a guest.

LVCC Calendar of Events

Sunday, August 21, 2011 :::: Coopersburg Car Show.
Corvair Class included. Coopersburg Collector Car Show. Hosted by the First Pennsylvania Mustang Club. Location: Southern Lehigh Living Memorial Park : Time: from 10am to 4pm with registration by noon. Entry fee is $15 on day of event or $10 before August 12. 50/50 drawings, music, food, door prizes and more! Phone: 215-892-6758 http://www.1st-pa-mustang.org/

Saturday, September 3, 2011 :::: Duryea Day.
Annual Duryea Day Antique & Classic Car & Truck Show and Flea Market. Saturday, September 4, 2010 9:00 AM to 4:00 PM. Location: Boyertown Community Park, Boyertown, PA. Registration by August 25, 2010: $10.00. Day of Show Registration: $12.00. http://www.boyertownmuseum.org/

Monday, September 5, 2011 :::: Ludwigs Corner Car & Horse Show.
The car show/horse show grounds are located just beyond the intersection of Routes 100 and 410, Ludwigs Corner, PA. Time: 9 a.m. - 3 p.m. (Rain or Shine). PRE-REGISTRATION (per vehicle) $13.00 (must be received by August 30, 2011). REGISTRATION AT GATE (per vehicle) $15.00. http://www.historicalcarclub.org/images/cms/calendar/ludwigs%202011-1.pdf

Friday to Sunday, September 9-11, 2011 :::: Annual Corvair Camping Weekend.
At the Pioneer Campground in LaPorte, PA. Ray and Kathy Coker, Pioneer Campground's new owners, are Corvair enthusiasts. This will be there fourth annual Corvair Camping Weekend. You can visit their website at www.pioneercampground.com. Or call Ray and Kathy by phone on (570) 946-9971.

Sunday, September 11, 2011 :::: Sugarloaf Region AACA Car Show with Corvair Classes.
The Mid-Maryland Corvair Club invites you to the Sugarloaf Region AACA Car Show which will be held at the Urban Fireman's Carnival grounds at 3602 Urbana Pke, Urbana, Maryland from 10 AM to 2 PM. Although their flyer doesn't mention it, this AACA meet will include Corvair classes for Early Open, Early 2-Door & 4-Door, Late Open, Late 2-Door & 4-Door, and FC/Truck/Van/Wagon. Flyer at http://local.aaca.org/chesapeake/ActivitiesMeet2011.pdf

Saturday and Sunday, September 17-18, 2011 :::: Corvair Days 2011 at Hershey.
Two days of Corvair-centric fun sponsored by the Central PA Corvair Club. Held at the AACA Museum, 161 Museum Drive, Hershey, PA. Saturday: People's choice car show, funkhana, scavenger hunt in the museum, vendors, and banquet. Sunday: People's choice car show, model car display, and road rally. Awards, door prizes, and food both days. Registration includes admission to the museum. Pre-registration not required. Schedule of events and other details at www.centralpacorvairclub.org.

Sunday, October 30, 2011 :::: Kempton Car Show.
The Free Spirit Chapter of the Buick Club of America will hold its 35th Annual Collector Car Show and Swap Meet at the Kempton Community Center, 803 Old Philly Pike, Kempton, PA. 19529. Located 5 miles north off I-78/ Rt.22 using either Rt.737 N. or Rt.143 N. Held rain or shine! Indoor/ Outdoor Flea Market and food on premises. Day of show registration is from 8 AM to 12 noon. Dash plaques to the first 250 vehicles. Day of show registration $10. www.buickfreespirit.org

Mail Dues to:

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