THE OZAUKEE CORVETTE CLUB

OZAUKEE GLASS

Official Newsletter of the Ozaukee Corvette Club

December 2016 Issue

"Cruisin' Since 1979"
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The Ozaukee Corvette Club meets the 3rd Sunday of the month!

Time for the Annual Christmas Party!!!

This year's Christmas Party will be on Saturday January 14th at MJ Stevens Restaurant – 5260 Aurora Road Hartford, WI 53027 (See website calendar for map link). We will be meeting at 5:30pm for cocktails, followed by dinner at 6:30pm. Ron would like to remind you to wear OCC apparel and your name tags if possible.

Ozaukee Corvette Club Meeting Minutes – December 18th, 2016 – Meeting Cancelled!

Meeting will resume as scheduled at 1PM on Jan 15th, 2017 at the Firehouse Restaurant in Saukville. We will have a special guest speaker at our March 2017 meeting; Ed Saari from Corvette Adventures will be coming by to talk about this year's Dells Adventures!

Note to Club Members and Advertisers:

Dues and advertising fees were due on 12/31/16. There will be a grace period for the advertisers until 1/31/17 to get their renewals in. On 2/1/17 any unpaid advertisement will be removed from the website and monthly newsletter.

Thank you, and Happy New Year from the OCC Board and Staff!!!

Classifieds:

For Sale- 2007 Corvette Convertible, 22,350 miles, 3LT with Select Ride, chrome wheels, heads-up display, 6 disc CD, am/FM Bose Stereo, power convertible top, 6 speed automatic transmission. This is also a very rare Corvette with Lemans Blue Paint and a Cobalt Red Interior- 1 of 4 built with a black Haartz convertible top. Lemans Blue was a $395 option and has not been offered since 2007 on any Corvette. The original sticker price on this Corvette was over $65,000. The Current NADA price guide states this Corvette is worth $32,562. This does not take into account the chrome wheels ($1995), Genuine Corvette Accessory Silver and red center stripe ($395 + $600 installation labor), Red Brake Calipers ($500), Chrome gauge accents ($100), Comp Cams Roller Rocker arm bearing conversion ($130), MSD 8.5mm Super conductor Spark Plug wires($75). This Corvette will be sold with the stock factory exhaust, but the SLP aftermarket exhaust is available for $800. This very low mileage, immaculately maintained, Corvette is available for $31,000. Jeff or Sue Myers 262-421-8049

C-5: ● Soundboard for trunk ● Taillights & license plate louvers (Painted mell. yellow) ● Relay for low & high beam lights (turns on both high and low headlights beams on the highway) easy to wire in ● Dr. Color chip kit Mell. Yellow (never opened) ●Leather steering wheel cover (yellow & black) ● Emergency hood release ● Touch up bottles (3) ● Can of NAPA spray paint (Millennium yellow) ● 2-yellow key fob rubber covers ● Yellow grab handle -5. Contact Ron at: ronhgiese@gmail.com

CORVETTE Storage in Cedarburg area. Very clean, dry, bird proof and secure. Reasonable annual rates. Thom Brown 262-377-6857.

Storage in Germantown. Very clean, dry and secure. Reasonable seasonal and annual rates. Electricity available for battery tender at additional charge.
Wally Baatz 262-751-5011

December 2016 Tech Tip –Compression Ratio.

You may have heard the expression, “my 327/ 350 hp L-79 has 11 to 1 compression”. You may wonder what they are talking about, and what is the big deal?

Before World War II cars had to be able to burn the fuel that was available. There were very few standards for high quality fuel, and the business of selling gasoline was at times very shady. The major oil companies were your best source for consistent fuel quality in the 1920's and 1930's. Cars built back then were primarily in-line 4 or 6 cylinder engines. Henry Ford developed his flathead V-8, and the luxury cars of the day offered V-12 and V-16 engines. These engines produced very low levels of horsepower due to the variance in fuel quality. This is where compression comes in.

As a very crude example, let us say that we have 7 inches of piston travel, and when the piston reaches the top of its travel, there is still 1 inch of space in the cylinder head's combustion chamber. The air and fuel mixture has been compressed into this 1 inch area in the cylinder head on top of the piston. (Continued next page)

That particular engine would have a 7 to 1 compression ratio. Very common in the 1920's and 30's. This was considered normal compression, and was adequate to fire a good quality fuel of 85 octane. There was only one grade of fuel back then. If the compression ratio was greater than 7 to 1, the fuel would be compressed too much and fire off whenever it wanted to. It was uncontrollable, unstable, and would fire off at very erratic times;. Sometimes, it would not fire at all- especially if some unethical gasoline station had been cutting their fuel loads with kerosene or mineral spirits. Driving back then was a real adventure. It was also the basis for people to become loyal to one brand of fuel and a particular gas station owner.

While all this is going on in the marketplace, the combustion engineers have discovered if they raise the compression ratio to 9 to 1, there is a huge increase in horsepower and throttle response. Some brave souls at GM were fooling around with 11 to 1 and 13 to 1 compression, but not having much success because there was a need for better fuel with higher octane. Higher octane fuel was found to not ignite until the actual spark was created by the ignition system, and lit off the fuel at the exact moment it was supposed to. When that high compression engine ran, the pistons traveled at much greater speed creating far more horsepower. It was frustrating for the engineers, because they knew how to really build power, but available fuel of the day wouldn't allow it. GM found itself being denied the opportunity to build higher horsepower engines, because the oil companies chose not to increase the octane levels in their fuels.

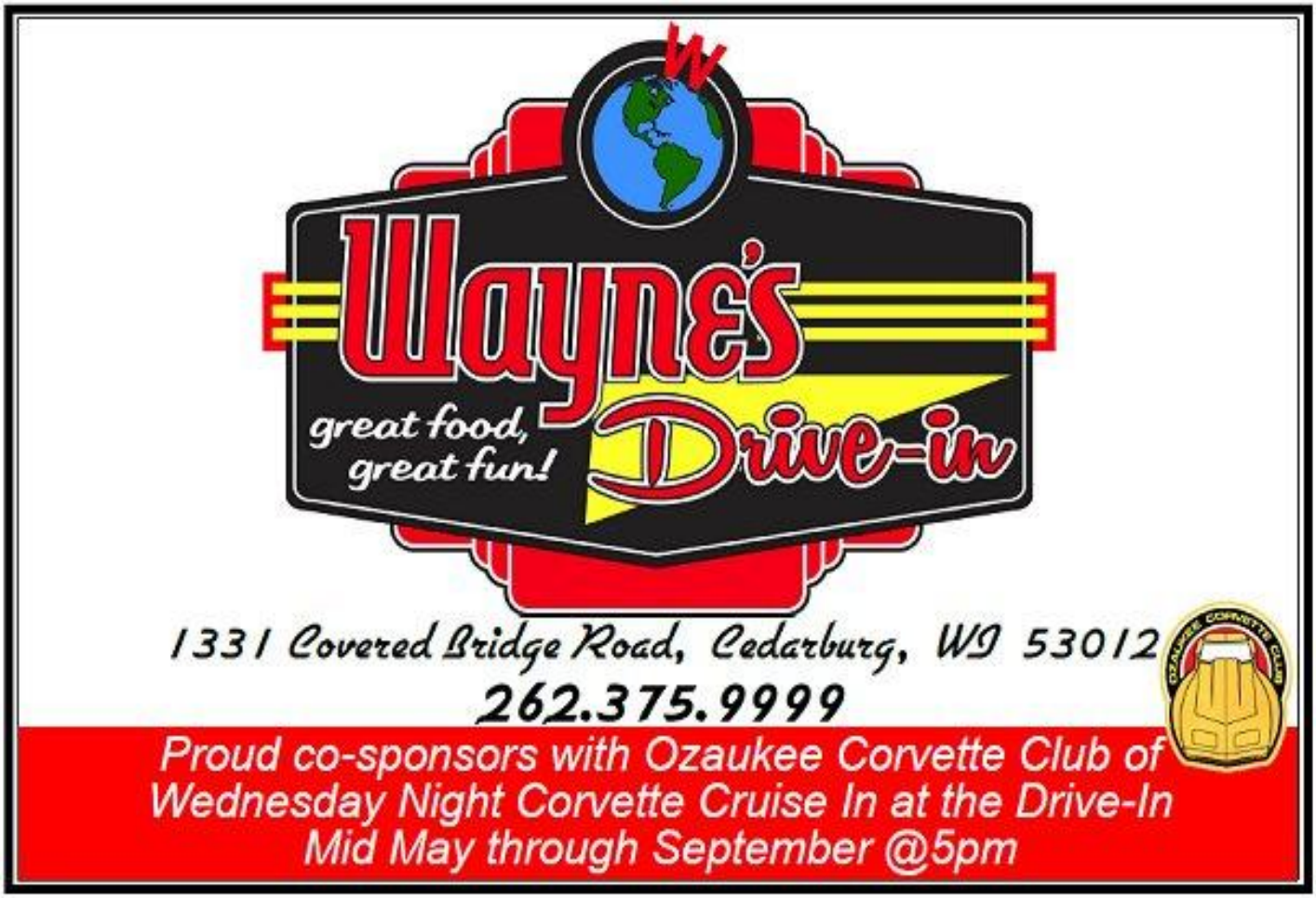
The engineers at GM and DuPont Chemical worked on a fuel additive to increase octane in existing fuel. They discovered, and invented Tetra Ethylene. You may know this product as Ethyl. GM and DuPont went so far as to create the Ethyl Corporation for the sole purpose of offering a product that would allow cars with higher compression to operate trouble free. However, there was one huge problem, World War II started in Europe in 1939, and aviation fuel was needed by our allies, even though we were not yet in the war. Special processes had to be developed for oil companies to make 100 octane aviation fuel. Unlike fuel used in cars, aircraft fuel has special requirements that allow combustion at high altitude. As luck would have it, the Ethyl Corporation had a massive demand for their product for the fuel manufactured for aircraft and marine engines. (PT boats) GM also knew that after the war, the oil companies were all set to make high octane motor fuel for all their new high compression engines.

Cadillac used their old pre-war flathead V-8 until 1949. In 1949, the first overhead valve Cadillac V-8 had 10 to 1 compression, and produced the unheard of horsepower of 125 to 150. Cadillacs were in high demand, and did they perform! Chevy still used low compression in-line 6 engines, Pontiac and Buick still used their pre-war in-line 8 cylinder engines, but Oldsmobile had developed the “Olds Rocket V-8” near the end of the war. This engine was an overhead valve engine with a four barrel carburetor and 10 to 1 compression. The Olds was lighter, and the 165 horsepower it produced was due in great part to the raised compression ratio using Ethyl Corporation enhanced fuel. All the way through the 50's, 60's right up until 1970, the Oldsmobile V-8 ran some of the highest compression ratio motors in the auto industry. Soon the competition realized just what Olds was doing; getting a lot of free horsepower by running high compression, and requiring customers to use “premium only” in their Rocket 88's. Chrysler bumped the 392 Hemi to 10 to 1, as did Ford. Eventually all the GM divisions had overhead valve high compression V-8 motors either as standard or optional equipment. All these cars needed to use Ethyl or premium grade fuel that had a octane of 98 to102; and at 29.9 cents a gallon versus 27.9 cents for regular, filling your new car with Ethyl was affordable.

One obscure fact was the development of our iconic small block V-8 Chevy. Very few people realize it was developed in 1935 and running in 1937. The war delayed the introduction, but waiting until 1955 to make it's debut seems a bit odd. For years we were told the Small Block Chevy would not fit in the 1947 to 1954 Chevy body. Well, don't tell all those hot rodders that did it. Also, the 1948 to 1952 Chevy, Pontiac, and Olds all used the same Fisher body, and that Olds V-8 was a lot bigger than the Small Block. The desire to remain the low priced leader was more important to GM. When the first Small Block was offered it was in the form of an optional 265 cu.in. V-8, and made 125 horsepower with its 8 to 1 compression. Very soon “power pack” and fuel injection packages were available, size increased to 283, and the compression was increased to 11 to 1 yielding a lot of free horsepower. For the first time, in 1957, a 283 fuel injected V-8 produced 283 horsepower! As the years progressed, displacement grew to 327cu. in. and horsepower to 375 with 11 to 1 compression and fuel injection. Some engine guys even said the 1965 Corvette with 375 horse fuel injection produced between 425 and 450 horsepower when tuned properly. Most consider 1970 as the high water mark in horsepower development because of high compression. The 454 LS-6 in Chevelles had 11.5 to 1 compression and produced a very conservative 450 horsepower dyno tests show that 500 to 525 horsepower in more realistic. (Continued next page)

In 1971, 2 years after the creation of the Environmental Protection Agency, new clean air regulations were in effect. The public soon realized that "Ethyl" in fuel was actually Tetra Ethylene Lead, and this form of a leaded substance was causing health issues in Americans living in large cities. In 1971 GM ordered all of it's divisions to lower compression ratios in preparation for unleaded fuel coming in 1975. Most GM engine compression ratios dropped to 8 to 1. The Chevy small and big blocks fared well, but the Oldsmobile Rocket V-8 was no longer a Rocket. The Olds was very dependent on high compression to make power. Cadillac's 500 cu.in. Engine produced only 195 horsepower with 8.5 to 1 compression. Add to these problems, a far more costly process to refine fuel without using lead to maintain octane levels, and fuel started to cost more. People were parked in long lines to buy fuel that was suddenly in short supply and was now 55 cents a gallon! Many of you remembered that less than a year earlier there were still gas wars when the prices went down to 19.9 cents a gallon in some areas of the country. Some folks were losing their minds over the fuel prices and the EPA requirements for lead free fuel. Many of you remember this first hand, and the anguish it caused. Corvette engines were nothing special- the same motors put in station wagons and Impalas. In 1975 the base 350 Corvette motor was 165 horsepower with 8.5 to 1 compression. Think about this, from 1955 we went from 165 horsepower to 450 horsepower in 1970 and back to 165 horsepower over a 20 year span. Things looked very bleak for the Corvette except for one thing, for some unknown reason people were buying Corvettes in record numbers. 53,807 anemic Corvette coupes were sold in 1979! (Continued next page)

Basic Hot Rodding teaches us that the more we can compress the air/ fuel mixture, the greater is the increase in horsepower. Fast forward to the development of the 1992 LT-1. Compression is back to 10 to 1 and horsepower is a very respectable 300. Aluminum heads that breathe well dramatically lowered combustion temperatures prevented detonation and allowed more horsepower to be possible. GM's engineer had developed an all new motor to finally replace the 1935 designed small block that served GM so well over the years. The LS-1 motor introduced in the 1997 Corvette. 346 cu. Inches and 350 net rear wheel horsepower. The rear wheel horsepower is a new way of rating motors based on how they are installed in the vehicle, and the actual power getting to the pavement as installed. Measuring the power like they did in the 1960's, the 346 cubic inch LS-1 was probably producing 435 horsepower- truly remarkable! All this on 91 to 93 octane lead free premium fuel. GM engineers are getting these incredible horsepower results using aluminum heads, and "heart shaped" combustion chambers using 11 to 1 compression. The new LT-1 used in the C-7 Corvette delivers 455 rear wheel horsepower using free breathing aluminum heads and 11.5 to 1 compression. The real miracle is, how does GM keep these LS and LT engines from destroying themselves with high compression, lean fuel mixtures, and low octane fuel? The answer is the aluminum heads developed and used on these engines. Unlike cast iron heads that keep heat in the engine, the aluminum head absorbs the heat and removes it from the combustion process. GM's foreign competitors like to ridicule the LS and LT series engines because they still use old school pushrods compared to their exotic overhead cam engines. Even Ford and Chrysler like to point out this to potential buyers. Someone forgot to tell those guys that by using 4 cams on the top of their exotic engines to open 4 valves per cylinder, they have added approximately 40 pounds to the top of their engines, and raised the center of gravity so high that handling is affected. Not too well known is the LS series engines in the Pratt & Miller prepared Corvettes, and now the C-7R Corvettes had to reduce the cubic inch displacement from 6.2 liter down to 5.5 liter because the Porsche, BMW, Ferrari, and Jaguar race teams threatened to leave the race series because the front engine Corvette was winning all the races. They don't want the public to know that the old school pushrod V-8 LS and LT motors are faster anywhere on the track- the Corvettes are just too dominant than the "ultimate driving machines" and anything else. These same competitors shake their heads in disbelief and have all purchased and taken apart LS-3 and LT-1 engines trying to find out just what GM is doing to beat them consistently. When they couldn't come up with a solution, they threatened to take the ball and go home if the sanctioning body didn't handicap the Corvette. So, smaller engines and adding ballast weight to slow down the Corvette was ordered. Ironically, those of you with an LS-3 or new LT-1 actually make about the same horsepower as the racing 5.5 liter LS motor. Why am I going into all this, when the subject here is compression and the free horsepower and efficiencies gained from higher compression? (Continued next page)



Pratt & Miller are thoroughly handicapped with the tiny 5.5 liter motors, but they run a very high compression ratio that is confidential. The racing fuel used by everyone in the race series, has very high octane numbers compared to what you and I can purchase. The aluminum LT-1 heads with direct fuel injection dissipate any excessive heat that would cause misfiring or detonation. Add a compression ratio somewhere north of 13 to 1, and they manage to get over 500 horsepower from their race engines. No wonder none of those foreign car snobs never say anything to your faces about your crude American iron. (Oops, fiberglass), because they know they can't really compete one on one.

A recent development has been the request by all 3 domestic auto companies for higher octane like they have in Europe. Shell or BP unleaded premium fuel in Europe is 95 to 96 octane without any ethanol or additives. The US car makers are asking for this fuel so they can raise the compression ratios, and get even more mileage out of their engines. The car companies are facing a mandatory major increase in corporate average fuel economy and they know high compression engines deliver higher mileage numbers and cleaner tailpipe emissions. It is speculated that a current LT-1 engine, with 11.5 to 1 compression, in a C-7 running 96 octane non-alcohol premium can get a combined 32 to 33 average mpg, up from the current 29 mpg. Add the politically mandated ethanol and octane levels could approach 97 or 98. The engine's ECM computer adjusts itself to this higher octane fuel. Then, it is rumored, the engineers want to increase the compression ratio to 13 or 14 to 1 for even more efficient combustion and even greater mileage. With these changes, we may be looking at somewhere around 500 conservative horsepower from a base LT-1 and a guess at mileage would be 37 to 40 mpg city and highway combined. Of course this is merely an educated guess, but all very possible. And to think that 42 years ago the '75 Corvette was a weak 165 horsepower getting 12 to 14 mpg. Who would have ever thought that we would even have Corvettes as technologically advanced as the C-5, C-6 and C-7? Just imagine if you can, what the future will bring. Whatever it is, it will be exciting and probably exceed our expectations.

Save the Wave,

Jeff Myers

For those of you that have not seen it yet, below is a photo of our brick that we purchased for the OCC at the Grafton Plaza.

Ozaukee Corvette Club
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(262) 284-8886
Owner – Jim Keller

Upcoming Calendar Events

(See web site calendar for latest information)

Jan 14th - OCC Annual Christmas Party MJ Stevens Restaurant- 5260 Aurora Road Hartford, WI. Cocktails at 5:30pm followed by dinner at 6:30pm See website calendar for map and more information.

Jan 15th – OCC Meeting at Firehouse Restaurant, Lunch at 12PM, Meeting at 1PM.