



SCCC News

OCTOBER, 2011

~ The C5 – Breach Born? ~

In a nice, maybe not so-perfect world, but one where things happen pretty much as they should and one where people work together for some common good, we could understand a car like the C5. GM would put the right people in the right place to do the right thing and a brilliant new Corvette would be the obvious result. I'd like to know if, say, Ferrari has as much difficulty creating new models and if the result has people standing behind their beautiful technological wonder with a phony smile, absolutely hating the people next to them and what has been brought forth? I guess on occasion that happens even in a privately-held company. Witness one Senior Lamborghini who stormed out of Il Commadore Ferrari's office and went down the street to a friend who had a tractor company to build what he knew would be a wonderful car. But somehow, I do believe that the top floors of GM in August of 1988 were staffed with so many accountants (yes, I do mean bean-counters) instead of car guys and engineers that it was probably a very difficult thing for three of them to agree on where to go for lunch – resulting in each of them going to their own favorite place alone.

But, to our great delight, there were three guys with a lot of clout who got together for lunch that August. Executive VP Lloyd Reuss leaned across the table to Corvette Chief Engineer Dave McLellan and Chevrolet Design Studio Chief Jerry Palmer and shared his goal of making a new car which would not only meet the new challenges from Europe and Japan, but *beat* them in the showrooms and on the track. That car could only be a Corvette, and four years from then would be 1993, Corvette's 40th anniversary. In '88, Porsche had introduced its 924, a front-engine, air-cooled, rear wheel drive two passenger sports car which looked rather like a rounded-off C4. As mentioned in last month's article on C4s, that car was designed by an ex-Corvette engineer, and was aimed directly at Corvette in their home turf. While Porsche touted this car as affordable and promising that it would be "every man's" Porsche, they just couldn't do it, as it hit the showrooms at \$45,000. But Japan was hitting Chevy between the eyes with Mazda's RX-7, Mitsubishi's 3000/Dodge Stealth, Toyota's new Supra and Acura's NSX. Those cars were serious contenders and sold for around \$10,000 less than the C4 ZR-1. All three guys were aware that in '88 it would be difficult to beat that field in both arenas and knew full well that by the '93 rolled around, they would all be better. It was, to say the least, a daunting challenge!

These three had a great ally in Chevrolet's General Manager and GM VP, Jim Perkins whose love of the Corvette rivaled Ed Cole's 35 years while sitting at the same desk. So, these four began in earnest picking up their lances and charging the windmills on the top floors. At that time GM's Chairman was Roger Smith, who had been supportive of Corvette on his way to the top floor, made an offhand remark about wanting Corvette to be a mid-engine transaxle car with a more fuel-efficient engine. That comment was made while he was facing an eminent cash and balance-sheet crisis and the possibility of GM being bankrupt was forecast by internal auditors within the next 5 years. He apparently saw Corvette, which made a handsome profit, as a platform for greater sales and even greater profit. If only they could sell Corvettes – a lot of Corvettes – to a broader and younger market. (Now, if any of this sounds familiar, don't stop reading just yet...) That comment by Smith put the design and engineering teams chasing dreams and cost a year – pushing the intro year to '94. About a half-year later the bean-counters took control with their cost projections and Corvette was again destined to be front-engine, RWD and powered by a conventional V-8 which they already had. On the heels of that, worsening financial conditions meant less money going to development, and the C5 became a '95 model. The three guys were agonizing – six years for development meant the competition would just be that much better! Even Porsche was close to bringing out their 928 – a V-8 powered 924 with meaningful handling and comfort improvements. And that in 3 years. It took the Japanese 3 years to bring an all-new car to the showrooms. How frustrating it must have been.

Then something curious happened in the land. Congress, looking for new revenues to keep government alive and well, oh yes, and their perks, ended the tax credit for car loan interest in '89. Every car built in America lost sales. With one exception. Yep – Corvette.

So, you'd think the bean counters would look with fresh eyes at the only car which was bringing some \$4,000 profit per unit and still selling, wouldn't you? Remember that make-believe near-perfect world I dreamed of at the beginning? Corvette was part of the Chevrolet-Pontiac-Canada (CPC) group, and forecasts for '90 showed a whopping \$2.6 billion dollar loss. The C5 wasn't delayed again, though. It was dropped. They couldn't afford to build it.

But – and this is the largest “but” in this article – it isn't like McLellan and Palmer were sitting on their thumbs watching this side-show. They had been given \$250 million to begin development and had looked critically at McLellan's C4. It was a unibody design, with a backbone frame and side rails which enabled McLellan to put the seats between them lowering the car considerably. Unfortunately, as anyone of us who have ever sat in a C4 can attest to, the sill was a formidable high and wide thing to step over to drop down into the seats. Good luck on getting a hot date in a short skirt to get in and out! The body was attached by a series of struts and braces known as the “birdcage” (after the famous Maserati Birdcages of '60 – '62). Any misalignment of the frame or any welding issues were substantial problems for body fit, and even the \$60,000 ZR-01 rattled and creaked. It was just in their nature. Having design (Palmer) and engineering (McLellan) sitting side-by-side to solve issues was the greatest thing to happen in GM since, well, maybe it was *the* greatest thing! With the stroke of engineering genius which created the hydroformed frames which were bent into shape by being injected with water at 7,000 psi in a hydraulic press, the new frames were much lighter and had five times as much resistance to twisting and



bending as previous fabrication techniques. Plus, they were cheaper to build. What a development! The frames were so strong that the convertible didn't need any extra supports. They then went about simplifying the C5 as much as possible. What was possible was amazing! They eliminated over 1,400 separate parts from the C4! They bolted the body directly to the frame, saying goodbye to the annoying rattles and squeaks. And always they attacked weight. Every pound of weight increased fuel consumption, tire and shock wear, created the need for more frame and driveline strength (read – “cost”) and hurt performance. They even sent a memo to accounting equating Corvette sales with acceleration time. All in all, they got the car to less than 3,500 pounds with full fuel, oil, two passengers and luggage. Not even mighty Ferrari who relied on the weight of their brick buildings to keep their cars from blowing around could do that! Hellofajob!

The design of the C5's body was placed in the capable hands of John Cafaro, who drove the design work for the C4 and loved to design in down-force instead of tacking on wings and things. The design limitations for the C4 back in '83 were gone. Sitting before a clean sheet of paper he visualized all the beauty of the exotic cars which Corvette seemed to have lost over the years. I like to think that visions of the ads for wine with their bottles lying horizontally below a Ferrari's profile with the sensual curves of a woman's back-lit shape behind that, danced through his head. All I can say is, “Hubba hubba Cafaro”. After five years of owning C5s, I still can't just get out of my Vette and walk away without looking back over my shoulder at it.

And then, there was the engine team. McLellan loved the Cadillac Northstar engine with its dual-overhead cams and four valves per cylinder, but also knew that if he was going to honor



Cafaro's stunning work he needed a low hood. His engineering mind also told him that a low hood greatly enables forward vision in addition to cutting fuel consumption by reducing drag. So he made the bean-counters happy by relying on the vast experience Chevy had with small-block V-8s. But the new engine, designated GEN-III, was new from the oil pan to the intake plenum. And with their hatred of weight, they found ways to cast it in all aluminum. Lighter, more powerful, more fuel efficient and smaller than the C4's LT4. And man are they reliable!

This engineering team not only worked hard under the financial constraints they were given in development and build costs, they also considered the buyer's costs of ownership. Miss the clamshell hood of the C4? They really are cool, especially when up. But insurance companies were placing a premium on the C4 because of the high cost of replacing those massive hoods. So the C5 had a conventional hood. All the individual parts stripped from the C4 and the strength built into the Vette is more than they needed to build and sell the cars, but they wanted the new Vette to be reliable and never be known as “garage queens”. They were designed to be driven – a lot.

With an eye on the track performance, the suspension was also improved to be more stable, hold the tires more vertically during hard cornering and keep the tires pointed straight in every condition and load. Oh yes, and also be more reliable and simpler to manufacture.

But, back to the melodrama - in '90 CPC didn't lose \$2.6 billion. They lost \$3.3 BB. Even worse, financial projections forecast that GM could be bankrupt in '91, just over the hill. Whadyaknow? The bean-counters cut Corvette's budget and the C5 became a '97 car. Massive changes in the top floors from the Board brought new leadership. Lloyd Reuss was shown the door, as was the CEO and most of the upper management. John Smith was the new president. He lasted a year. In the corporate vacuum of the reorganization many egos battled and Corvette was challenged as too much of niche car and its very existence was challenged. Some sought to move it from Chevy to a number of different flags, including its own division. All this kept moving the C5 back and it became a '98 car. Jeez, a 10 year development period. Really?

Dave McLellan got his belly full and joined the legions of good engineers and designers to retire or move to Ford and Chrysler for more stable jobs and better conditions – including pay. McLellan was replaced by a protégé, Dave Hill who was Cadillac's chief engineer at that time. Hill was also a brilliant engineer but had better management skills and brought a strong resume of performance. He and Jerry Palmer hit it off immediately and their teams continued their close cooperation in the development of the C5. Hill worked well with Jim Perkins, who had survived as Chevy's chief, and Perkins "discreetly directed" funds for the C5 project to continue in the face of the bean-counters' diminishing budgets.



Hill also brought with him a fresh look at what the bodies of the C5s should be made of. If you think C5s and C6s are made of fiberglass, I hate to tell you, but... John Cafaro's sleek body had been finalized with the location of mechanical parts and now had the lowest coefficient of drag of any production car ever built in America. With their eye on saving weight and reducing production costs, they decided to form it in plastic. The C5 uses sheet-molded compound-plastic

(SMC) and reaction injection-molded plastic (RIM). This change created body panels which were lighter, stronger and more rigid with better production tolerances. It was also under Hill's watch that the final decision was made to move the transmission to the rear end, freeing up a substantial amount of foot well space for driver and passenger and coming dangerously close to that perfect 50-50 weight split, front to rear. It also provided the ability to push the engine compartment *forward* a bit, enabling them to create a larger luggage compartment for both the coupe and later convertible, making the car even more user-friendly.

Just in case you think the new Corvette was now on fairly smooth waters and headed to a showroom near you in '98 – in steps Congress again. With the C5 designated as a '98 model, the Board ordered a thorough reskin for the C4 to keep sales up. Again, a huge distraction for the engineering and design teams, threatening even the '98 introduction date. However, congress passed a new auto safety law requiring all cars sold in the US to have side-impact protection by '97. Engineering could not feasibly retro-fit that feature into the C4. So the C5 was ordered to be released as a '96 vehicle.

Can you imagine the upheaval in Palmer and Hill's teams? Yet another internal "reorganization" (and I use the root word "organization" loosely) finally pushed the introduction to '97.



After all that, I feel like I've been reviewing a Shakespearian story. It's amazing we even got a new Corvette. It almost seems like when they finally rolled it out there were tracks of blood behind its tires. But look at what we got!

Obviously, the press fell in love with the car. Buyers went missing. Already a decade into the policy of not building a car without a purchase order for it, Chevy only built 9,752 coupes at a base price of \$37,495. However, when the convertibles hit the showrooms in '98, Chevy built more of them than the entire '97 run, 11,849 total. It's like the convertible was a great awakening, as 19,235 coupes also rolled off the line into happy owners' garages. Options included the first active handling system ever offered on a production car anywhere in the world, for an additional \$500. The Indy 500 just had to have one of the Motor Trend's North American Car of the Year for a pace car, so an additional \$5,408 could get you a 500 Pace Car replica in the purple paint with the wild yellow graphics and yellow wheels we've admired on Richard Campbell's car.



As a last note on the C5, on a cold morning in early November of 1998, Chevy's general manager made a fateful announcement – for the first time in Chevy's history, Corvette was going racing. Not in support of private teams, and no clandestine vacations for engineers on race weekends like Duntov's crew used to do, but a very official and public function of Chevrolet with a full-on factory team. It was fateful for lots of Ferrari, BMW, Porsche and Viper racers. A new kid on the block full of muscles and carrying a long, successful history of dueling it out on the tracks of North America. Doug Fehan, Chevy's racing program manager, pulled together a team including veterans of their NASCAR sponsored teams along with the best of the Corvette design and engineering stars, stepped back from other responsibilities and took on a mission conceived at a lunch in Detroit just over 10 years ago. Something about "...in the showrooms and on the track." as I remember. And not just racing – but the pinnacle of sports car racing, the series where the best of the best battled. The American FIA Le Mans Series. The team would turn their first laps in anger just three months later at the 24 Hours of Daytona, then on to the Sebring 12 Hours three months after that and then would be in it to win it. The race car dropped from 3,245 pounds to 2,510 and could have been less but that was the minimum weight in class. There was not a lot of tweaking to the body shape, save pressure-relieving vents on the hood and fenders, front underbody ducting to help with cooling and a rear diffuser to help the rear wing create down force and reduce drag. The engine needed to be redesigned to meet class specs, growing in displacement from the stock 346 cubic inches to 365 c.i. and put out 600 hp at 7,500 rpm. The race car was designated C5R, and the silver with black cars emblazoned with Mr. Goodwrench. At the end of the Daytona 24 hours, the lead car finished 3rd in class and 18th overall. That car ran as high as 5th overall, ahead of many of the pure sports-racing machines, before encountering a time-consuming repair for an oil leak. The second car suffered a suspension break and finished in obscurity, but both cars were running hard at the end of a punishing 24 hours and the lead car served notice that

something nasty was on the track. Fehan's team kept learning and finding ways to go faster longer throughout '99. The new millennium brought Corvette Racing's first full season.

Now, I'm sure that all of you who know me know I'm now in a passion of my life and I could wax on and on about all sorts of Corvette Racing stuff. In the bank, marketing thought it would cool to have baseball player-like cards. On them, we had to tell who our favorite sports team was. Yep – mine said "Corvette Racing". Given Corvette Racing's performances in '99, they were invited to compete at Le Mans in their first *real*



year of racing – a rarely bestowed honor. In 2000, prior to the race the European press said they considered the Corvette a touring car, rather than a real sports car, and expected Corvettes to be a novelty. The cars did have a rough go of it. The #63 car had to have its transmission replaced and the #64 car lost its starter motor in the pits near the end of the race. The transmission took 16 minutes, the starter cost 12 minutes. The #63 car set the fastest laps in the GT class ahead of the favored Porsches and Vipers. They finished 3rd and 4th in class and Chevy management said they were "very glad they came." Against this backdrop, Corvette introduced the C5 Z06. The stock coupe ran 0-60 in 4.7 seconds. The Z06 cut it in 4.0. The car weighed 3,115 pounds and while it was initially designed to be a track car with few options, when the bean-counters saw how many Corvettes were rolling off the line, they just couldn't pass on all the profit from the options so the Z06 hit the streets with all the bells and whistles available and became a best-seller. More than half all articles involving GM were written about Corvettes. How cool is that? But, like a line from the old TV show *Soap* – You think I finished? In the first race of '01, the Daytona 24 Hours, the lead Corvette finished first. I mean really finished first. First OVERALL! It beat all the pure racers! And the second car finished fourth overall and second in class by several laps. Four and a half months later, the two Corvettes finished first and second at Le Mans. In fact, Corvettes now have more 1 – 2 finishes at Le Mans than any other make. The C5Rs have won more ALMS championships than any other make. Corvette Racing has more team championships and their drivers hold more championships than any others.

All this drifts through my head as I look back over my shoulder at my car. What a difficult birth. It's a wonder the car ever saw production. Given all the in-fighting, three corporate restructures just during the development of the C5, the near insolvency of GM, the distractions of mid-engine V-6 mandates, even four wheel drive desires, Dave McLellan, Dave Hill and Jim Palmer made Lloyd Reuss' dream of beatin' 'em in the showrooms and on the track a pure pleasure in my garage. Yep, there truly were rafts of others rising above just doing their jobs to create the best Corvette ever made.

But time doesn't stop to feel good for a while. Nope, on it marches. How in the world would Corvette ever top this car?



Next month let's talk C6.

Members' Tales of C5s

The Social Corvette Club had just started and Bill Smith contacted me about doing events together with SCCC. It happened that Marty Valdez of the Pantry Restaurant was having a picnic at Pueblo Mountain Park in Beulah. Marty, who was a member of SCCC at that time said to invite any Corvette people.

We met at the Dog track and several members of the Social Club showed up. Bill Smith asked me if we were going to "speed" going to Beulah and I said no we would just take it easy and he said good "As I never speed".

As we were traveling toward Beulah, the speed limit was 65 mph, everything was fine until other members of the clubs began to "push" me along and I keep picking up speed as people would pass me and then wait along the road and get back into line.

I was going 85 mph and looked in my rear view mirror and here comes Bill in his C5 coupe, the C5 had been out only a couple of years, he passed me as if I was standing still. When we arrived at the Park I asked Bill how fast he was going when he went about me and he said, "135 mph and I still had a lot more power left".

I said, "For a person who never speeds your doubled the speed limit".

The picnic turned out to be the best one I have ever attended as the food and company was first rate.

Richard Campbell

We were returning from a visit with my sister & family in Prescott, AZ. Our '98 silver C5 was just a couple weeks old to us and we had discovered something completely unexpected about Corvettes. When we bought the car, it was for fun. Our first happy surprise was the cost of insurance – because it was rated as a "safe car" with the active handling and 3rd gen air bags, coupled with a very low rate of collisions and losses, the insurance was the same as our '03 Altima! So we smiled a little more and opened the hatch to try to get our luggage in there, remembering how we had to pack our Triumph Spitfire years earlier. I threw all we had in and smiled – there was room for so much more! So, we hit the road. That's when we found how comfortable and quiet the car was on a long road trip – plus how "boss" the stereo was. And we smiled a little more. Then, we had to buy gas but realized that we had gone all the way to Prescott on one tank. I tried to remember how big the tank was, but the pump didn't lie – we got 32 mpg on that trip! And we smiled a lot more. Sure, it was exactly what we wanted – fun. We just didn't have a clue about how practical it was as well!

So there we were, enjoying the stereo and a quiet talk as we rolled north through the fading light of an early spring day past Raton. The nose of the silver bullet came up as we hit Raton

Pass, not a cloud in the fading light. Over a ridge and there were some clouds – low and dark. But we were on a roll and had great tunes on the CD player. Over another rise and we were in weather. The temp dropped like a stone and there were white wiffs on the sides of the roads. The stereo got turned off as snowflakes brushed the windshield. I popped on the lights and the white flakes looked more serious. Soon the road was slushy and I tried to remember anything about what kind of tires we had – all I could remember was that they were summer tires. My fingers tightened on the wheel as my stress level rose. The slush turned to snowpack and ruts kept pulling at the tires. I took a deep breath and relaxed my grip, and realized that we were passing things like Subarus. We made it over the pass without a slip and headed down the back side towards Trinidad. Downhill is always worse in the slick with gravity working against you, and the car started sliding a bit here and there. And then I smiled. I could feel the active handling keeping the car straight and true. This car was a great snow car! True, we were plowing snow with the front air dam, but the snow wasn't deep enough to high-center us. By the time we hit Trinidad we were in rain on wet pavement again. And we looked at each other. And smiled. Great trip. What a car!



Oct 9th, Sun. – 3:00 PM – **Street Clean-up**, meet at Furr's lot @ Northern & Pbo. Blvd.

Oct 14th, Fri. – 6:00 PM – **Sonic Nite**, meet at N. Eliz. & we'll decide where to eat.

Oct 22nd, Sat. – 9:00 AM – **Street Clean-up**, meet at Furr's lot @ Northern & Pbo. Blvd.

Oct 23rd, Sun. – 2:30 PM – **The 2nd Wine & Cheese Tasting Party** at Schnebergers. Bring a bottle of the good stuff to share. 1000 Willowcrest Drive, Pueblo. RSVP to 719-561-2045 by Wed, Oct. 19th. Maybe a club car photo???

Oct. 25th, Tue – 7:00 PM – **Oct. Club Meeting**, Rawlings Library, food, drinks & fun afterwards.

Oct 27th, Thu. – 4:00 PM – **Wounded Warriors Trunk or Treat**, their annual Halloween event.

If you raised your hand in the meeting we're counting on you bringing your car, but if you weren't there or are still thinking about it – this is a chance to support our Wounded Warriors in a whole new way. They would be delighted to have us as their guests. We do need to know how many cars because we'll be in the middle of things. Call Bob Adams at 560-1814 to RSVP. Might be the best thing we do all year!

Nov. 5th, Sat. – **Veteran's Day Parade**, Union Street. Lucky is working with the city – more info to come at our next meeting.

Nov 22nd, Tue – 7:00 PM – **Nov Club Meeting**, Rawlings Library.

Dec. 3rd, Sat. – 5:30 PM – **Christmas Party** at Dog Track. We'll be catered by ex-manager of Gaetano's and we'll have live entertainment and dancing. Cost will be \$24.50 per person. Call Bill Kenney at 561-8508 to RSVP and more info.

Dec. 11th., Sun. – **Broncos/Bears Party** at Dennis & Patty Clarks. Whether you like pro football or not, you're gonna like the company and fun! More info to follow.

Now, for the end of the year, isn't that a fine list of club activities? Find what you can do and come join us. Seems kinda like whatever the event is, it ends up being a party!

Of note, Joe & Mary's son-in-law, James Romines, has opened a motorcycle shop known as *Motorcycle Salvage*. If you've got a bike, he's got whatever you need, both new & used. Contact James at 719-994-1737 or online at jsmotorcyclesalvage.com.

Most Powerful Crate Engine Ever Offered by GM



The LX454R (Part #19257880), at 720 hp is the most powerful crate engine ever released by GM. Intended for drag racing, on top sits a 4500 series Holley 1150 CFM Dominator carb. That's right, nothing fancy, but with NHRA regs and all... Torque matches the hp at 720 pound-feet, all of it near peak RPM of some 7,500 revs. It drinks minimum 110 octane racing fuel and apparently won't get great mileage. Even though this is an LS engine derived from the C5 Corvette, its cast in iron for sheer strength, so it's no lightweight like what's under the hoods of C5 and C6 Vettes. Oh, and in case 720 hp isn't enough, it's designed to take the additional stresses of nitrous oxide &/or forced induction. Expect to see Corvette tire tracks behind some of the top fuel dragsters and funny cars next year – lots of them since the cost will be almost cheap at somewhere around \$12,000. *Chevy – flaming on!*

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