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Chairman

**Bob Zimmerman, Newsletter**

Editor

**BUSINESS MEETINGS &  
TECH SESSIONS**

Hightstown Elks Club  
110 Hickory Tavern Road  
Hightstown, N.J.

3rd Monday of the month at  
8:00 p.m.

## CHAPTER'S ROAD TOUR COMING NEXT MONTH!

**Chairman's Column**

By: Ed DiNapoli

The summer is upon us, which gets the blood rushing of any Corvette enthusiast. The Corvette is one of our obsessions and has been and will be for me for the foreseeable future. But what good is an obsession if you don't have a method to communicate and a community to share that obsession. For me that is why I belong to the NCRS. The NCRS at the local level is a great way to get started with the hobby and satisfy your desire to know more about your car, understand the history of Corvette and meet wonderful people. As this newsletter not only goes to chapter members but to Corvette people outside our chapter, I am writing this month's message to encourage new membership as well as current members to get more involved in the chapters workings.

It was great to see such a good membership turnout at our May business meeting. The reason that the turnout was as good, may have been the anticipation of the details for the exciting event we have in July. As you probably know on July 15, we will be conducting a road tour, tech session and picnic. The road tour will form at two different points; one from the South and one from the North (see chapter web site for details). Mark Rudnick will direct the Southern tour and the Northern tour will be directed by Rich Vaughan. The tour will terminate at Jim and Dottie Loughlin's who have generously offered their home to our chapter for a picnic and technical session. This beautiful home offers a setting in the heart of horse country and offers a terrific backdrop for our technical events directed by our chapter top judges. In addition to the tech session, the Loughlins have offered to indulge the chapter

members to some great food, and if the past is any indicator of what Dottie is going to prepare, I guarantee you will not be disappointed.

Our next month's technical meeting topic (June 18) will be related to painting a Corvette, and will be presented by John Kuhn and Dennis Sheridan. Dennis has been in the paint business for more than 30 years and will share his knowledge and experience with the chapter. They will point out what options are available to the Corvette hobbyist, from a very inexpensive, economical, low cost restoration to an NCRS, concours high-end restoration. I would like to thank Erich Meyer for his well-prepared, April's technical presentation on the TCS systems used in early 70's Corvettes. I know that it was enjoyed by all who attended.

On September 15 the chapter is on schedule to host a  
(Continued on page 2)

## CORVETTE PILGRIMAGE

**CORVETTE PILGRIMAGE:  
C4/ZR-1/Grand Sport  
GATHERING @ BOWLING  
GREEN  
17-19 May 2012**

By: Jack Brown

With the same level of enthusiasm that inspired the Blues Brothers to take their infamous ROAD TRIP, with spring in the air and a deep dip in gasoline prices, the author started his pilgrimage to the Holy Land, Bowling Green, for the Annual C4/ZR-1/GS Gath-

ering held at the Museum. While the decision to make the trip preceded the departure time by only about 10 hours, his trusty steed was **always** gassed and ready to go on last minute junkets. What better

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### Chairman's Column

(Continued from Page 1)

chapter judged show at Superior Chevrolet in Lawrenceville NJ. This will be our first show since our Regional in Wildwood. We have designed this event to be a very laid back affair, as we will only be judging 12 cars. This will allow all judges time to enjoy their fiends, chapter members and learn about the corvettes that are being presented at the show.

In addition to the above events we are trying to schedule a light-house tour at the end of October and Howard Welch has worked out the details for the annual Holiday Brunch. Keep an eye on our web site for details of all events.

I am pleased to report that most members' cars that have been presented to Bob Zimmerman have been posted on our web site. Bob and our webmaster have done a terrific job in organizing and uploading all of your pictures. If you have not seen them, just go to <http://www.centralnewjerseyncrs.org/> and see the fine cars our members have on display. If you get the "Corvette Magazine", or get a chance to pick one up, you will find a terrific article on Bob Zimmerman and his, McLellan Award winning, yellow, 1990 corvette convertible. This is a well written, informative article on Bob's car and how Bob progressed to develop it into a NCRS top award. Congratulations Bob.

The web site is also looking of anyone interested in advertising their business. We have had over 4000 hits to the site since March and I think this would offer a great place to get exposure to corvette community. The cost is \$100 for a year's subscription. As of today Mark Rudnick at, "Buyers and Sellers Connection", is our first advertiser and want to thank Mark for his continued support of the chapter.

The board will be in preparation for our nomination of officers in October. In July the succession committee (Mark Rudnick and Ed DiNapoli) will meet with the board and gather the intentions of each board member, as to their desire to again run for office. Even if all board members desire to run, the chapter would be healthier if we had some additional members contesting their positions. By getting involved with the workings of the chapter you will learn more about the NCRS, it policies, procedures and awards than you could by just being a bystander.

To conclude this quarters message, I would like to encourage you to get out and enjoy the events and programs that the chapter members have developed, as I think you will have fun doing so and probably learn something about Corvettes in the process. I hope our activities offer incentives for more members to come and join us and see what we are all about. I wish everyone a great summer, and hope to see you with your Corvettes.

Ed

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### Corvette Pilgrimage, Bowling Green, KY

(Continued from Page 1)

vehicle to make this happy journey in than the old "Lady in Red".

No, she's not a lady of the evening, nor is she an undiscovered 19<sup>th</sup> century work of van Gogh, but his red '91 long-in-the-tooth L98 convertible. Preferring to enjoy the scenery, he broke the 1000 mile trip into 1 ½ days of casual driving. Arriving in the afternoon of the second day before registration was set up, he opted for a tour of the Corvette plant. Having done this before, he knew what to expect but for \$ 7.00, what better way to spend an afternoon. Sure beats drinking beer in your motel room (Kentucky is better known for producing other libations and not beer). To avoid the slings and arrows of caustic censorship and accusations of being a curmudgeon by our patient and benevolent Newsletter Editor, the author will now try to relate the events of the 3 day gathering from a more serious journalistic perspective.

The plant tour was initially surprising; because of the poor economy, demand, and therefore production was way off. Chevrolet apparently said, "Why should we continue producing 2012 models when there is little demand? Let's start the 2013 production" and they have in fact done that. A Corvette spokesperson said the 2013 model year had started earlier than historically but would probably run longer (until late spring 2013), retool and begin MY 2014 in late summer next year as it has historically done. The plant is currently running production with only one shift, Monday through Thursday. The featured car on the line seemed to be 427 convertible. Wow, the most powerful Corvette convertible ever produced!

Registration for the Gathering seemed larger than the author expected but not at the level as in some previous years. Most entrants were ZR-1 guys and their wives with a good turnout of the Grand Sport people. The regular C4 community was in the definite minority. Activities were organized by the gung-ho ZR-1 community in coordination with and strong support from the Corvette Museum, which is where the program was centered. The agenda was quite diversified to offer something for all in the C4 community and started with a reception at the (not your usual) Holiday Inn on Wednesday evening, 16 May. Part animalism was the behavior code for those in attendance but the Holiday Inn has been hosting the ZR-1 crowd for over 15 years and was used to it. The major program began the next day with a very informative seminar on the Challenge Car Series (CCS) by retired GM executive, Frank Ellis. He was a marketing manager back then and was responsible for pulling all the engineers, racers, team owners, sponsors, and dealers together. Ellis played a major role in the CCS and his presentation was outstanding. Dave McLellan was to join him but had to drop out at the last moment. The CCS theme was continued into the afternoon by retired GM executive, Ralph Kramer and Doug Rippie, famous CCS team manager/owner and engine builder. Rippie's race team won the '89 CCS title. Other seminars in the afternoon were also led by Rippie and Kramer but were more focused on the race execution side. Rippie went into detail on-car preparation, race official inspections, driving strategy, etc. He provided many very entertaining anecdotes from his personal experience and about some of the drivers. Gordon Killebrew was in attendance at all sessions and was consulted frequently as the C4 "expert witness" on many technical questions. His knowledge base is un-believable! An autograph session was followed by a very informal, open dinner at Jim Van Dorn's speed shop next to the Corvette plant. Van Horn is one of the most significant personages in the ZR-1 community and has been heavily involved in Corvette racing most of his life. Very nice and generous guy. The second day seminar program began with a detailed discussion of Corvette racing from the Challenge Car Series to Le Mans. Doug Rippie, who campaigned successful teams in CSS as well as LeMans was joined by Graham Behan,

Chief Engineer for Lotus in its development of the LT5 engine. After-noon sessions included engine and suspension upgrades on the C4 by Doug Rippie followed by "C4 Do it Yourself Tuning" by Dominic Sorresso. This session was **very** technical and geared for those who want ultra high performance out of their engines and are very computer savvy. This seminar was a lead-in to "LT5: The Inside Story" conducted by Gary Cline, Chief Engineer at Mercury Marine on the ZR-1/LT5 project, Graham Behan, and 2 more Mercury Marine engineers plus 4 ladies from the production line who assembled all the engines. (Jim Loughlin, Bob Zimmerman and the author had the pleasure of flight judging Gary Cline's beautiful black '95 ZR-1 at the NCRS National Convention in Novi last summer.) All participants told stories of their experiences in the production of these engines, most of which had never been heard before and none of which were in print or probably ever would be. That concluded the "classroom" portion of the program and many in the audience adjourned to the Beech Bend Drag Strip to try to lower their ET times. The Saturday program began with a seminar on the wind down of the LT5 program, the reasons, and the influence on future engine development. Rumor has it that we haven't seen the last of the quad overhead cam, 32 valve engine. Hmmmmm. Later in the morning was a session on high performance builds for the LT5 followed by a very informative session on how and what to do to start a C4 that hasn't been started for a long period. The day closed with the banquet and auction that evening, also in the Museum. The banquet was very tastefully done (no rubber chicken).

Also featured during the weekend were local 2-3 hour tours of local historical sites and a shopping expedition. A 50 mile road tour was scheduled by the ZR-1 contingent and the author participated to the extent of his car's ability (last to finish). The C4/ZR-1/GS Gathering of 2012 was well attended and a lot of fun for those who love their cars and wanted to learn more about them.



Author's "Lady in Red"

## Replacing L98 Corvette Fuel Injectors

Part II of the C4 Operability Diagnosis article that appeared in the last quarterly CNJ NCRS Newsletter

By: Bob Zimmerman and Jim Loughlin  
a.k.a. "Two Old Guys and a Bag of Tools"

Photo Credits: Jim Loughlin

With both of us owning C4's a year apart in manufacture and both cars in need of new injectors, Jim and Bob decided that they would team up and tackle the operation together on both cars. We chose our respective sides from which to work and started into the project.

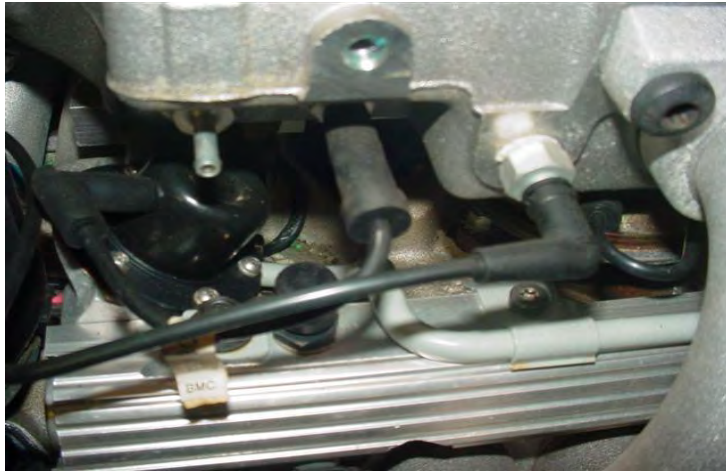
With the battery switch turned off and the radiator drained, remove the air cleaner filter housing air intake bellows and distributor cover.

Next, remove the coolant hoses, breather vent tube and throttle position sensor connector from the side of the throttle body housing. Remove the throttle cable brackets from the driver side of the plenum then remove the four 10 mm bolts that hold the throttle body to the intake plenum. Using care in removal of the throttle body will often allow the separation to occur without damage to the original gasket. Lift the cables and throttle body away from the

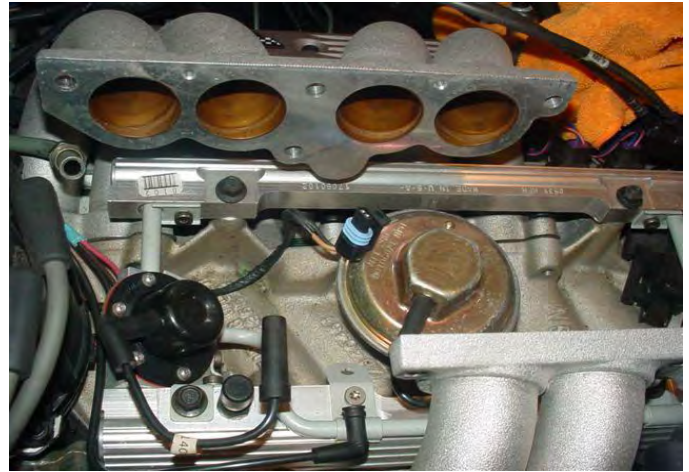


Disconnecting Throttle Body from Plenum

plenum and set them on the driver's side of the engine compartment. Next, remove the vacuum pipe from the rear of the intake that goes to the brake booster. Using a long reach T-40 torx wrench remove the external bolts that hold the intake plenum to the runners. There are two more torx bolts not readily visible that attach the runner tubes to the intake manifold in the front and rear of the intake. These must be removed in order to remove the intake plenum. Remove the MAP sensor from the right side of the intake plenum along with several other vacuum connections behind the sensor. Once all the bolts have been removed from the runners apply a little leverage to the runners at the top and carefully separate each set of runners from the plenum. Here again, care taken in this process will allow you to save the original gaskets.



MAP Sensor Removed Showing Remaining Vacuum Ports



Intake Plenum Removed With Fuel Rails Exposed

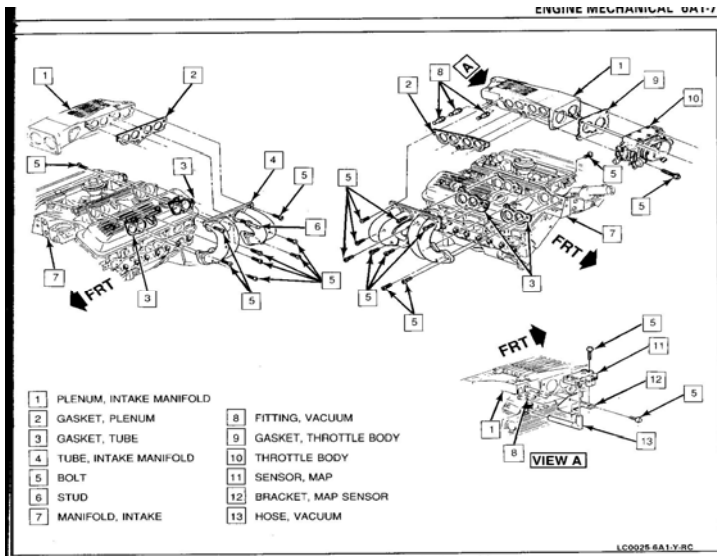


Figure 3 Intake Plenum and Tube Assembly

**1990 L98 Service Manual Excerpt Showing Intake Bolt Locations**

Once all the runners have been disengaged from the plenum, lift up on the plenum slightly to extend the wires and connector that attach the IAC sensor to the bottom of the plenum. (Note: that as with all plastic connectors that become brittle from engine heat, use caution when releasing the lock tabs so they don't break off.) Lift the intake plenum up and out of the way. Next, remove the intake runners from the intake manifold and set them aside.

One of the things that I like to do when dealing with engine parts and their attaching hardware is to mark a piece of cardboard, poke holes in it representing the location where each bolt goes. You can store the bolts in the proper orientation and know that if a bolt is slightly longer or shorter than others that it will be returned to its proper location during reassembly.

Next, remove the Schrader valve cover on the fuel rail and using the fuel pressure tester, bleed off the fuel pressure from the rail assemblies into an approved container. Then remove the fuel pressure and return lines where they couple to the fuel rails in the front of the motor and remove the bolt that secures the fuel rail bracket to the front of the intake manifold. Remove the four 10 mm bolts that secure the fuel rails to the intake manifold. Remove the eight fuel injector connectors from the injectors by depressing the wire bale and lifting up on the connector.



Disconnecting Fuel Pressure and Return Lines

Applying a little leverage under the injectors while pulling upward on the rails will disengage the O rings on the bottom of the injectors. Disengaging one side then the other works the best. Once both sides are free of the intake manifold simply lift the rails up with all eight injectors and old O rings attached and set them upside down on the bench.

With bottom side of the rails facing upward, turn each rail latch to the opposite end of its rotational spectrum which will release the top of the injector from the rail. Remove each injector and old O ring from the fuel rail. We chose to remove and install as we worked our way down each side of the fuel rails. It is highly recommended that as you install each new injector

into the fuel rail that you coat the O ring with a lubricant to keep it from scoring the new supplied O rings during installation. Motor oil or liquid dish detergent both work well as a lubricant. After installing all eight new injectors and O rings into the rails and retuning the latches to their closed position, we oriented each injector so that the electrical connectors were all facing outboard of the rails.



**Installing New Injectors into Fuel Rails**



**Applying Lubricant to Intake Manifold Injector ports**

**Also note the location of the lateral 40 mm torx Runner Bolt  
To the Left Center in Photo**

Then lift the rails with injectors attached being sure to apply lubricant to the base O rings and you are ready to install the injectors and rails back on the intake manifold. Again it was easier to start the bases of the four injectors on one side of the engine and then the other. Once all injectors are started into the intake manifold simply apply downward pressure to the rails pushing the injectors all the way down until the rails contact the mount bosses on the intake. Reinstall the four 10 mm bolts to the top of the manifold and the rail bracket to the front of the intake. Reconnect the fuel pressure and return lines and fasten the electrical connectors onto the injectors.

Next, loosely start the base bolts of the intake runner pipes and gaskets. Leaving them loose will allow better clearance to lower the intake plenum between them with the necessary clearance for the gaskets to slide in place. Reconnect the IAC connector to the bottom of the intake plenum as you lower it down. Install the bolts from the top of the runners into the plenum and torque all bolts to 25 ft. lbs. Reconnect the power brake booster pipe, reinstall the MAP sensor and vacuum lines to the right side of the plenum. Position the throttle body and throttle cables and reconnect the throttle body and gasket to the intake plenum. Reconnect the coolant lines, breather tube and TPS connector. Refill the radiator. Turn on the battery, set the ignition key to the run position and check for fuel leaks.



**Reconnect Power Brake Booster Vacuum Line**

Turn off the key, reinstall the air filter housing and bellows and reinstall the distributor cover. Start engine, recheck for fuel leaks and any coolant leaks and you are ready for the road test.

As with the case with our two C4's, the road test proved the benefits of replacing all the injectors with a flow tested set that were matched at the factory for optimum performance. Both cars have never run so well and so strong.



**Northwest Regional Seaside Oregon May 3-6, 2012**

By: Bob Zimmerman

For those of us from the Central New Jersey chapter who were able to attend the NW Regional at Seaside Oregon, we were rewarded with a great assortment of early Corvettes particularly those of the 53-55 vintage. The weather, on the other hand, wasn't so pleasant. Rain was the operative weather word for most of my stay with the exception of Saturday afternoon which brought sunshine, warmer temps and a chance to tour the Astoria, Oregon Maritime Museum. Located on the pacific ocean at the mouth of the Columbia river much of the museum's collection was devoted to the treacherous intersection of those two bodies of water. The U.S. Coast Guard maintains a station there along side the museum. The same pier is home to the U.S.C.G. Lightship "Columbia". The ship served as a floating lighthouse at the mouth of the Columbia river for many years.

The Oregon landscape is rugged and rich with timber but some of the most dramatic landscape can be seen along much of the pacific coast of Oregon and Washington state.



**Doing Ops Checks With Glorie McNay's Umbrella**



**Tom Barr and the National C4 Team Conducting A C4 Seminar**



Pacific Shore



Tom Barr & Jim Loughin



Coastline



U.S. Coast Guard Cutter



U.S.C.G. Lightship Columbia



**METRO LONG ISLAND CHAPTER MEET**

Some images from Metro L. I Chapter meet at Syosset, NY

**CORVETTE TRIVIA**

By: Jack Brown

1. Can you guess the myth about the C4 build sheet being slipped into left front shock tower?
2. What five bits of information can be gleaned from the front face of a '61-'62 differential housing.
3. Was there any difference between the L-88 and ZL-1 engines and if so, what were those differences?
4. Historically, GM hasn't always distinguished itself for accuracy in the delivery of timely announced product introductions. However, a notable exception to that statement is the introduction of the ZF 6 speed transmission in 1989, one year earlier than previously announced. What was the reason for this acceleration?
5. In 1955, the small block V8 replaced the Blue Flame 6 as the power plant for the Corvette. Other than horsepower and torque, what other advantage did it have?
6. What was the story behind the disparity in the reported horsepower rating of the 1966 Mark IV L72 engine; 425hp vs. 450hp?
7. In the 1965 MY, four wheel disc brakes were introduced as standard equipment along with conventional drum brakes. The selection of the sub-performing drum brakes resulted in a small credit to the buyer. What was the reason for offering a greatly improved performance brake option and still offering a now obsolete drum brake?
8. Can you de-cipher your 17 character Vehicle Identification Number or do you need an advanced degree in Cryptography?
9. What was the last year the brass radiator was used in production Corvettes?
10. In racing parlance, the term "Le Mans start" is one we have all heard before and one we have probably seen, maybe at Sebring. The drivers line up behind a line 50 yards across from their cars and on the sound of the starting gun, run to their cars, jump in and take off. Exciting, but whatever happened to it?





## TRIVIA QUESTION ANSWERS

1. On most C4's, the build sheet was slipped into a compartment in the left front upper shock tower while the car neared the end of the production line. With very careful but laborious effort, it can be removed intact. Most of us in the C4 judging community gave Chevrolet or the production build team credit for such a secret and ingenious way to preserve a little bit of the car's document history. Gordon Killebrew dispelled this myth at this year's C4 Gathering with a hearty laugh and the explanation that the production line worker slipped the build sheet into this little area because it was a lot easier for them to do that than to walk 25 feet over to the trash can and throw it away.
2. Two alpha character ratio code, casting number, casting date, assembly date, and a casting "P", or lack of one, indicating whether the unit is a positraction axle or not.
3. Yes. The ZL-1, introduced in 1969, had several differences beyond the misnomer of "an L-88 with an aluminum block". The differences were a higher lift, shorter duration cam, improved intake port shape, larger exhaust valves and ports and stronger connecting rods. Additionally, the assembly and machining processes were greatly refined, the engines were balanced and dyno tested and the overall handling and cleanliness were raised to a point never undertaken at GM before.
4. The ZF 6 speed transmission was originally scheduled to be a part of the ZR-1 introduction in 1989, however, delays with the LT-5 engine delayed the ZR-1 and therefore the ZF. However, the huge success of the Corvette Challenge Series in 1988 prompted GM to increase the performance of those race cars for the 1989 series, and since the ZF 6 speed was already developed, merely awaiting the ZR-1 package, it decided to install them in the '89 Challenge cars and not wait for the ZR-1 in 1990.
5. The other advantage of the small block V8 was that it weighed less than the Blue Flame 6.
6. The story goes back to 1965, with the introduction of the first Mark IV big block engine, the L78. This 396 c.i. engine was rated at 425 hp. In 1966, this identical engine was 5/32nds over-bored and introduced as the 427 ci. L72. You increase the displacement by 31 c.i. but don't get any horsepower increase? Hmmmmm. GM had a public anti-racing policy at that time that permeated its culture. No horsepower could be publicly reported above 425hp. So, the engine was dyno tested at 5,600 rpms, well below its power peak, which would have actually produced something in excess of 450 hp. At the beginning of 1966 MY introduction, someone at GM dropped the ball and listed the rating at 450 hp on the options list that went to the dealers. Quickly realizing its mistake, GM quietly corrected the mistake on the dealer options list. However,

several L72 optioned cars had already been ordered and shipped with window stickers showing the engine rated at 450hp.

7. The answer that we all probably know is in the economics of building cars. The performance of the disc brake over the drum was so great that GM saw no reason not to offer it as soon as it was available. However, GM had a large inventory of drums that it didn't want to have to write off so it offered them to buyers, with a rebate. Another reason might be that since disc brakes were new, some buyers didn't want to take any chance on new technology so they played it safe and selected drums.
8. The U S government mandated the introduction of the 17 character Vehicle Identification Number (VIN) for several reasons but primarily to develop a standardized format by which all of the users of the information contained in the VIN could more easily interpret the data for their specific uses. Users include the manufacturers themselves, law enforcement agencies, state motor vehicle bureaus, automotive parts manufacturers, NCRS judges, etc.
 

Typical VIN: **1G1YZ23J8L5800652**

  - 1: Nation of origin (1=US)
  - G: Manufacturer (G=GM)
  - 1: Division (1=Chevrolet)
  - Y: Carline (Y=Corvette)
  - Z: Series (Z=Corvette ZR-1)
  - 2: Code body types (2= Two door hatchback)
  - 3: Code restraint system (3=Manual seatbelts, driver air bag)
  - J: Engine Code (J=LT5, 5.7L V8)
  - 8: Check digit
  - L: Model year (L=1990)
  - 5: Assembly plant (5= Bowling Green)
  - 800652: Plant build sequence number
9. The last year for the brass radiator was 1961. Really 1960, because in 1961 the aluminum cross flow radiator was offered but not at initial introduction. All early base engine '61's got left over brass radiators and when the inventory was exhausted the aluminum radiator was used. However, '61 high performance engines all got the '60 aluminum high performance radiator until its supply was exhausted.
10. The last true LeMans start was in 1969. The reason for its demise is simple. Racing in the 50's and 60's was somewhat seat-of-the-pants where today it is much more complicated. This complexity increased to the point where it took 2 pit crew members several minutes to assist the driver to get into the car, secure his 6 point restraint system, help him get into his helmet, connect the electronics, communications, cool suit lines, driver hydration system, etc.

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**PARTS FOR SALE/WANTED**

No Listings This Quarter

