

COSWORTH VEGA

OWNERS ASSOCIATION

CVOA INC., P.O. BOX 5864, PITTSBURGH, PA 15209

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June 2024

2ND QUARTER 2024 ISSUE 153

John Hinckley, Excerpts From The Automotive Business



CV #3387, Owned by CVOA Hall of
Fame Member Mark Rock

**Swing out Quarter Glass
Linkage Repair**

**CV Under-Hood Lighting
Fixture Alternative**

**Dark Green Metallic CVs by the
Numbers**

**CVOA National Roundup
45 Cookeville, TN Intro-
duction**

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Deadline for Submissions for 2024 Q3 Magazine is 8/24/2024. The Q3 Magazine is tentatively due out about 9/28/2024. Please submit all articles, ads, etc. to

cvoapresident@hotmail.com

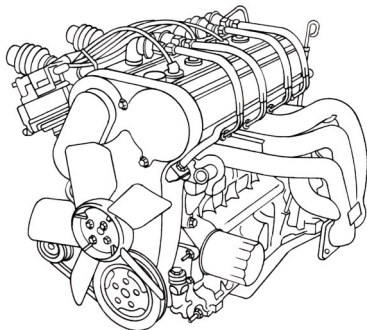
Thank You,

John J. Cowall

CVOA National Magazine Editor (and President)

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CVOA President's Notes

2024 Q2 President's Notes

Hello All in Cosworthland,

2024 is in full swing. Hopefully everyone has been able to get their cars out and about across the Country. JC (John F. Cowall) and I have already attended one show together, and have plans to attend a few more locally here in the Detroit area. The CVOA National Roundup in Cookeville, TN hosted by Bill Lynch will be upon us before you know it. I do hope to see many of you there.

The CVOA Annual Directors Meeting is Live on the CVOA website. Feel free to check in and comment on the topics being presented. We do have large issue waying on the Club these days. The Big Issue is participation in the Leadership positions of the Club. As some of you are aware, I would like to step down as CVOA President after the 2025 National Roundup. I am willing to stay on as long as need be if no one steps up, but I do hope someone will be willing to come in with some new energy and Lead the Club for a few years. It is a great honor to have served (and continue to serve) this Club, and hopefully someone will see an opportunity to offer a fresh perspective for the Club. There are other positions in this Club, Like Editor of this Magazine, the V.P. of the website, even being a Regional Director, that you can contribute to the Club as a Leader. Almost all of the Leadership positions in the Club have been filled by the same remarkable Members for 5, 10, and even 20 + years. Even if you are not interested in holding one of the positions on an "official" basis, but would like to try and help out any of us, please reach out to that individual and ask if there is something you can contribute to the Club for that Club official.

The Elections cycle is under way as well. Go to the CVOA Website, go to the Forums section, and click on the SurveyMonkey link to cast your vote. You can also vote by going the CVOA Facebook Official Page, the Link is there as well. Just scroll through some of the posts to find the link and cast your vote. Participation starts with you!

Get out this year, share your car at shows or on the

track, or even at a local car cruise. Our cars are very well received in the car world, and you deserve the credit for keeping them alive!

In this magazine, we have excerpts from John Hinckley. He wore many hats inside GM for over 21 years. He wrote a 41 page Memoir/ Stories/ Article. The full read can be seen on the CVOA website, under the CVOA Tab, under the Publications headings. I tried to shorten as much as I could, and keep it as related to the Vega and Cosworth, while still showing the flavor of the whole article. Also, there is a slide show that John Hinckley put together that showed many aspects of the Lordstown Plant with the Vega Production. There are also some really good Tech Tips/ Designs put together by Jim McIntosh and Chris Fenstermaker. (Feel free to contact hem for more details on these two articles if you need more information!) I also continued the "By The Numbers" segment that started in the last Magazine. This time around, I focused on the Dark Green Metallic car count that we have in our CVOA Registry. I hope you all enjoy this Magazine!

Thank You,

John J. Cowall

Proud Custodian for CV #1000 and CV #3136



CVOA Volunteers Notice

Hello Fellow CVOA Members

We have had quite a few new faces join the CVOA In the past few years. I wanted to touch on a subject that most of the new Members, and maybe some of the longer term Members, may not realize. The CVOA is run by Volunteers. The Executive Council, the Regional Directors, Tech Advisors, and other support staff for the CVOA all are dues paying Members, just like you. We do these roles for the Club because we believe in what the Club stands for, and want to see the Cosworth Vega Community continue. We do not draw a salary from the Club, nor do we get paid by the Club in any way for participation in these roles. We all have careers, family, and other obligations that at times may take up our time and be more pressing at that moment than the needs of the CVOA. So we have to prioritize when and how we can serve the Club. Some of have worked out systems to balance these work loads. Believe me, we enjoy the interaction, meeting new and re-connecting with existing Members through our roles. We have fostered relationships that expand through the Club. That is why we do what we do.

However, that may mean at times, you may not get the complete attention you feel you deserve. You may not get your part you ordered from the Club as quickly as you would like. You may not get an immediate response when you re-new your Membership. The CVOA Quarterly Magazine may be later than you would like. We ask that you Please be patient with us. We are doing the best we can with the resources we have at our disposal to help you.

I know the frustration of not getting a part on time. I know the irritation of not being able to log in to a website. I know the angst of getting a part and it doesn't work new out of the box. But be patient with the Leaders of the Club. We are people too, and have our lives that we need attend to as well as you do.

If you encounter an issue, we ask that you contact us directly (the Executive Council, the Support Staff, the Regional Directors). And, we will respond and help you out as best we can. Please be patient, we will respond. It may take us a day or three before we respond, but we will get back to you! We have plenty of avenues to reach us, Facebook Messenger Messages, text Messages, phone calls, emails. You may even find the text or message you send is "Read". Please do not be frustrated when we do not respond right away. We will address your needs, it just may take a few days or a couple weeks.

We are volunteers. One of the hardest things to encounter is a negative response to our actions. It can lead to a desire to not want to be engaged or fill a role for the Club. Please, be kind and patient. We will help out as best we can.

(I have definitely been guilty of this myself. Being impatient, feeling like I was being ignored. I may not have responded in the right way. Now, being on the other side of the conversation, I realize my mistake. I hope that all of you can have patience with your CVOA Support Staff. They are here to make sure you can enjoy your CV for years to come.)

Thank You,

John J. Cowall

CVOA President

CVOA Call For Help

Do You want to share your Cosworth Vega Story?

Do You have parts you want sell?

Do You need parts and need a place to find them?

Do You want to assist in any projects that the CVOA or Regional Directors are planning?

Do You want to help input data, pictures, and or help in continuing to modify and keep up to date the CVOA Website?

Do You want to be Regional Director or on the Executive Council for the CVOA, to meet, interact, and Lead the CVOA for in the upcoming years?

Are you Interested in being the story teller for the CVOA (Editor for the CVOA Magazine)?

Please send your story to me, John J. Cowall, at cvoapresident@hotmail.com

Please send all requests to assist with the CVOA to me, John J. Cowall, at cvoapresident@hotmail.com

You will be surprised at the enjoyment and the people you meet in the CVOA as you help with this great Organization!

Dark Green Metallic CVs By the Numbers

Dark Green Metallic CVs “By the Numbers” (Body Paint Code 49)

Green CVs are believed to be the 4th rarest color in the CV world. According to the CVOA Registry, we have been able to track 32 CVs in the Dark Green Metallic exterior color. It is believed that approximately 600-650 Cosworth Vegas were produced in a color other than Black, in the 1976 year. According to the CVOA Registry, we have tracked 440 total colored CVs. We have tracked a total of 2532 CVs, which is 72.2% of all CVs produced. (yes, there may be a couple discrepancies in all of the Registry, but, by and large, the Registry is pretty accurate). By these numbers, approx. 40-45 CVs are believed to have been produced in this Green Color.

Here is a break down of Green CVs by Interior colors.

Black Vinyl -2

Black Cloth - 0

White Vinyl - 6

Buckskin Vinyl - 21

Buckskin Cloth - 2

Unidentified - 1

Through the years, very few Green CVs have found their way to the National Roundups. Most notably, CVOA Hall of Fame Member, Mark Rock, has brought his CV #3387 to many Roundups, so many Members have been able to at least see one in person! (Add to this, Mark’s CV has the Ultra Rare SkyTrends Sunroof option!)

However, over the past few months, a couple Green CVs have popped up for sale!

CV #3173, Green Exterior/ Saddle Vinyl Interior. This car listed for sale on Ebay at a price of \$13,950.00, or Best Offer. This car used to be owned by Former CVOA Member (and former CVOA Magazine Editor!) Todd Erickson. Todd spent a few years restoring this car, and it was brought to the CVOA Roundup in 2011. It was actually one of the Featured CVs at that National Roundup, during the Carlisle, PA GM Nationals Car Show. Todd featured a bit of his restoration tips of the car in the CVOA Magazines he produced. The car is now in Fresno, CA. If you are interested, check it out on ebay!



Dark Green Metallic CVs By the Numbers Cont.

CV #3330, Green Exterior/ Saddle Vinyl Interior. This car is listed on Facebook Marketplace. The car is listed by a Larry Alvery in Maryland. The car about 12,000 miles on it. This car first popped up on my radar back in 2011, a rumor of this car and 2 other CVs were for sale in New Jersey. I did not follow up on the lead, based on asking price and condition (and I was not in the market for a few more CVs! LOL) This car has popped up for a sale a few times, mostly on Craigslist and Facebook. Larry is most likely the third or fourth owner of this car. The car has some rust on the exterior, but most photos show a pretty solid car. I have never seen a battery tray area picture, but was told back in 2011 that the tray area was rotted out. So, this car is a project, but supposedly runs. With its rare exterior color, this is most definitely a car worth saving! If you are interested, asking price is \$4500.00. Go check it out on Facebook Marketplace!



Dark Green Metallic CVs By the Numbers

A couple other Green CVs of note

CV #3147 Green Exterior/ Saddle Vinyl Interior. This car is not for sale! But, I had to include it since we are talking Green CVs. This car is owned by CVOA Member Tori Snaper. Tori inherited this car from her Grandfather, who bought the car from CVOA Hall of Fame Member and Co-Founder of the CVOA, Bob Maloy! Bob had this car restored in the 80's, and Tori's father kept in good condition. Tori has gotten the car up and running and back on the road. And, a Huge Shout Out to Tori, she is a Mother for the First Time! She just had a baby girl. Maybe one day little baby Finley will find herself behind Great Grandpa's Green CV!



Dark Green Metallic CVs By the Numbers Cont.

CV #3387 Green Exterior/ Saddle Vinyl Interior. This is Mark Rock's CV. He has driven this car to quite a few National (and Regional!) Roundups. Mark has written many an article for the CVOA Magazine based off of work he has done on this car. Mark has done some amazing restoration work on the car, showing off his techniques in the articles to help other CVOA Members get motivated to try these on their own cars. Oh, and did I mention it has a Skytrends Sunroof?! One of approximately 50 CVs to grace this option.



CV Under-Hood Light Fixture Alternative

CV Under-Hood Light Fixture Renovation Alternative

Submitted by Jim McIntosh & Chris Fenstermaker

Got a light? Always in need of a light source for service and display purposes. After coming across what appears as the CV original under-hood light fixture and curious to an un-connected wire lead, designed and 3D Printed a comparable moderately cost lighting system (3D Printed Housing around standard lighting components). Note, after several mock up trials, space allowance & interferences resulted in an acceptable fit arrangement, clearing the windshield washer reservoir and fit the original mounting location. Details as follows;



Original @ Lwr. Lt. Side



Wire Lead @ Driver Side Fire-Wall



Starting Point w/ Lt. Fix Rem'l
Inner Hood Pnl. @ Washer Bot



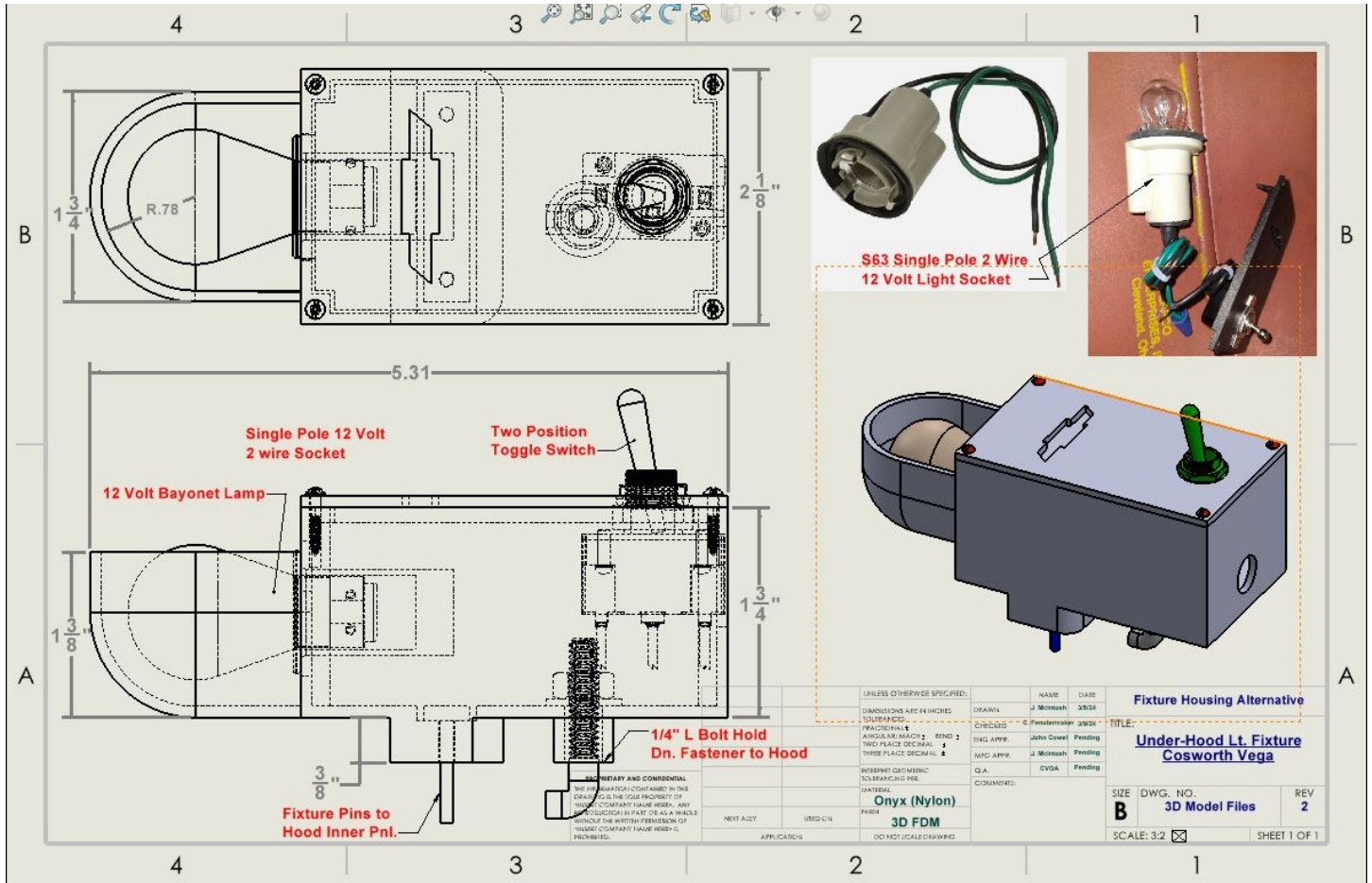
Redesigned Lt. Fix. Mount'g
Utiliz'g Hd. Pad Push Pin Loc.
(Held-in-Place 1/4" `L' Bolt)



Finish Product
Mtd. & Wired w/ On-Off Sw.
(Dorman #85982 Switch)

CV Under-Hood Light Fixture Alternative Cont.

CV Under-Hood Light Fixture Renovation Alternative



'And Let There be Light'
CV #1057



Lt. Fixture / Windshield Relationship
Hood In the Closed Position

CV Under-Hood Light Fixture Alternative Cont.

CV Under-Hood Light Fixture Renovation Alternative

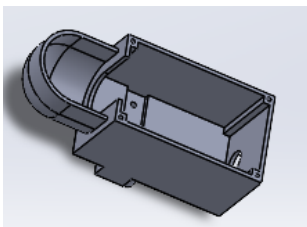
Presenting this alternative approach to the CVOA membership, pending approval by the editing staff, for possible feedback (Like or Dislike / Improvements and/or personalizing). E-mail; Leapertech@gmail.com
 Just a few additional aspects for what's it worth;

Metal reflector (cut from your favorite beverage can) wrapped behind the lamp and held in-place with spring edge clips.

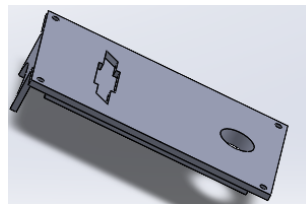
Wire Lead Connector from main harness, obtained from a salvage yard (Ford Pick Up).



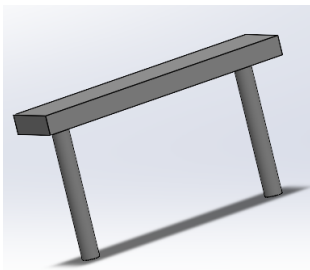
Debossed Chevy Bow-Tie into the cover (offering appearance appeal)!
 3D Models (available to CVOA Members @ NC having 3D Printing Capability or available sources otherwise, i.e. Public Libraries...). E-mail for STL Files; Leapertech@gmail.com



Housing:



Housing Face Plate:



Positioning Pin Fixture:
 (Sheet Metal Screws as an alternative in lieu of fixed pins)

Total **Material** Investment: **\$42.16**
 \$21.83 (3D Print Mat'l) + \$20.39 (Electrical Hardware)

CV Swing Out Quarter Glass Linkage Repair

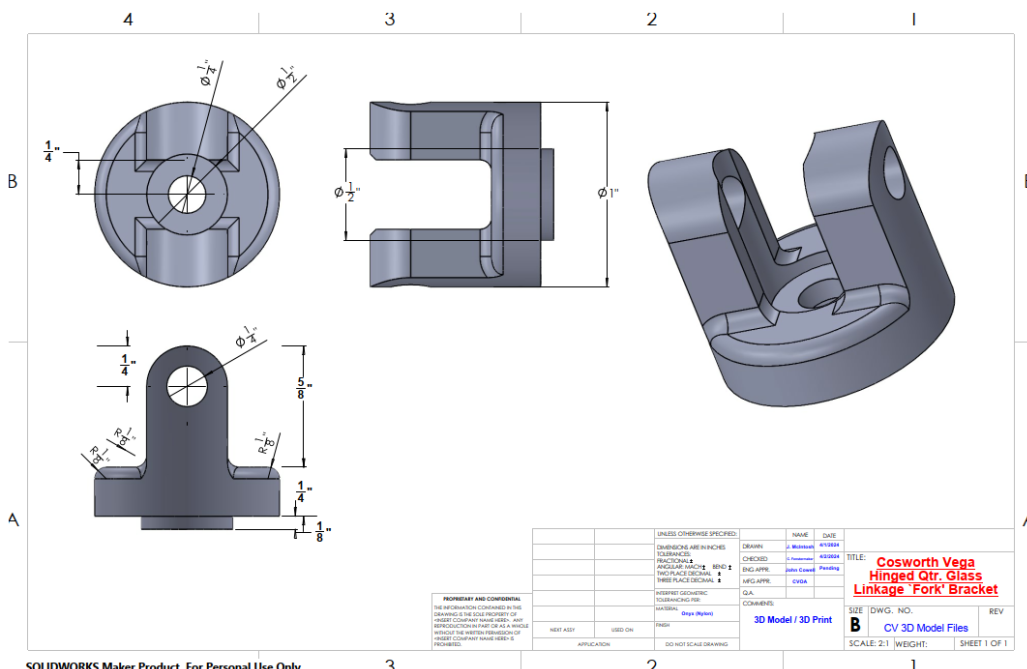
CV Swing Out Qtr. Glass Linkage Repair

Submitted by Jim McIntosh & Chris Fenstermaker

Passing along what appears as a common occurrence of the Vega Rear Quarter Glass Swing-Out Hardware, the 'Fork' configured window attachment bracket fatigue. CV 1057 when purchased, discovered both sides of the vehicle had failed side tabs to the said bracket attached to the glass (photo below) and thus experienced detachment of the swing out hardware to the glass. Note, potentially allowing the glass to swing beyond the hinge pivot retaining capability and allow the glass to disengage unexpectedly!



Submitting for discussion and consideration, 3D Printed hardware replacement as follows;



CV Swing Out Quarter Glass Linkage Repair Cont.

[CV Swing Out Qtr. Glass Linkage Repair](#)

Evaluating the space limitations, the overall bracket design dimensional sizing had been enlarged developing comparable or even added strength characteristics (rounded corner fillets for added strength). The roll pin 3/16" diameter size attachment hardware is duplicated although increased in length to 1". All other linkage and attachment hardware being re-useable with this restoration strategy. Extending assistance to the CVOA membership, pending approval by the editing staff, for possible feedback (Like or Dislike / Improvements). As a side note, restoration included Weather Stripping replacement sourced from Steele Rubber. E-mail contact; Leapertech@gmail.com



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Thank You, David Dempsey



John Hinckley, The Automotive Business, Exerpts

John Hickley
February 27th, 1941 – June 21st, 2021



He was the Senior Process Engineer at Chevrolet Pilot Operations responsible for Manufacturing Liaison with Engineering during the 2-year development of the original Vega, and was responsible for all Chevrolet assembly process development, pre-production activities, and the layout and conversion of the Chevrolet-Lordstown assembly plant for Vega production, including management of the production launch in June, 1970. John then was assigned as Vega Chassis and Final General Foreman for three years, and then became the GMAD-Lordstown Launch Coordinator, responsible for all new model launch activities, including planning and execution of the Cosworth-Vega launch. John was transferred from Lordstown back to GMAD Production Engineering at the Tech Center in July, 1975, and was recruited out of GM by Chrysler in 1985.

In regards to John Hinckley, We first made contact through the NCRS TDB circa 2000 and got together for a pleasant dinner at the 2002 NCRS national convention in Monterey, CA. My first job out of college was production engineer for Pontiac, and I spent a couple of weeks at the Van Nuys plant as engineering liaison in August 1968 for the '69 Firebird pilot build, so we had a lot in common and swapped war stories. The Chevrolet-Fisher relationship was just plain ridiculous, and I was glad that Fisher had absolutely nothing to do with Corvette production.

Also, since I'm the original owner of a Cosworth Vega John happily wrote more than one article about his roll as launch manager for the CV Magazine including the wheel eating tire mounting machine and explosive backfire with job 1. He really loved sharing his knowledge, and his war stories could have you laughing all evening.

He was the guest speaker at at least one CVOA Roundup and talked about his experience as launch manager for the Cosworth Vega. He also wrote articles for CVOA Magazine.

John Hinckley spent 1964-1985 with Chevrolet and GMAD, and 1985-2001 with Chrysler, retiring as Plant Manager of the Viper and Prowler assembly plant in Detroit.

I'd like to see this memoir posted with the CVOA

CVOA Hall Of Fame Member, Duke Williams

EXERPTS FROM

THE AUTOMOBILE BUSINESS – FROM THE BOTTOM UP
By John Hinckley

Lots of high-profile books have been written about the automobile business by authors such as John DeLorean, Lee Iacocca, and Bob Lutz, but they're all from the top down, with a strategic or marketing focus. To my knowledge, no one has written anything about the business from the bottom up – from the factory floor and the Engineering offices, from a first-person insider perspective. I spent 37 years (21 with GM, 16 with Chrysler) working my way up from the factory floor, “where the action is every day”, through many plant-related Manufacturing and Engineering assignments, and retired in 2001 after five years as an assembly plant manager. I kept notes during those years of what were, to me at the time, significant events along the way, and decided to put them all together as a chronology through the first twenty-one years. These are the stories and remembrances that outsiders never hear, the stories that don't make the papers, but they're the stories and events and people that shaped the business from the inside for the guys that kept the machine humming every day down in the trenches. It all started for me at age 23, in late 1964.

WILLOW RUN, 1964-66:

I hired into Chevrolet on Ford's travel and interview money. Ford sent me an interview invitation when I was about a month away from getting out of the Army in Texas, along with round-trip plane tickets. I took the trip, picked up a Ford company car at the Detroit airport, and spent two days at the Ford Livonia Transmission & Chassis Division Plant, shadowing the Production Manager. There was a constant stream of people in and out of his office all day long, both days, asking for decisions and approvals to do all manner of what appeared to me to be pretty routine things. During my exit interview at the end of the second day, he asked me what I thought about working for Ford. I told him I'd think about it, but that it seemed to me he had made every single decision in the whole plant all day long. He motioned me outside the front door of the Plant, pointed up at the big blue oval “Ford” sign on the wall, and said, “I guess you're right, John – but see the name up there? That's the way he likes it”.

I left (in the Ford company car), and had a couple of hours before my flight back to Texas, so I decided to drop in at the nearby Chevrolet assembly plant at Willow Run as long as I was in the area. I asked to see the Personnel Manager (Chuck _____), and we had about a 15-minute conversation. He made no commitments, but

The Automotive Business, Excerpts Continued

said he'd get back to me, and thanked me for dropping in. I headed for the airport, dropped off the car, and hopped my flight back to Texas.

About a week later, on the same day, I got two letters - a formal job offer from Ford to join them as a trainee at the Livonia Transmission Plant, and an offer from Chevrolet to join them as a trainee at the Willow Run Assembly Plant. Based on what I had observed during my two days with Ford and the fact that I had always been a GM guy, I graciously declined the Ford offer, accepted the Chevrolet offer, and started work at Willow Run as a College Graduate In Training a week after I left the service. I was still driving the 1962 Corvair Monza I had bought just before graduating from college, and a week later traded it in on a new 1965 Pontiac GTO - got some strange looks at the plant when I showed up in a Pontiac!

The idea of the CGIT (College Graduate In Training) program was to spend two or three weeks in each department of the plant and rotate from one assignment to the next in order to get an understanding of how the whole system worked, and to allow the Management to evaluate a trainee's performance and aptitude for different work situations before making a permanent regular work assignment.

My first CGIT assignment was in the Purchasing Department. The Purchasing Agent was not a rocket scientist, and apparently did his best while going to lunch with vendors. His secretary (Dorothy _____), really ran the 2-person department, did all the work, negotiated with the vendors, and taught me the administrative ropes in about a week. She then went on vacation for a week while I filled in for her, and it went pretty well. Hardly heard a word from the Purchasing Agent during the whole week. So much for Purchasing.

My next assignment was in the Material and Production Control Department, which was located next to the Traffic Department. The Traffic Manager (Charlie Trabandt) was nicknamed "Garbagemouth Charlie", as he swore, screamed, and yelled into his bullpen area full of clerks constantly. The Management wouldn't let Charlie out on the plant floor because the hourly people would revolt if they were humiliated that way. Willow Run was the only assembly plant in the system that had two Traffic Managers -- one for the office, and one for the plant floor.

The Comptroller was an alcoholic, and enforced a very strict dress code for his Finance employees. The women couldn't wear a sweater draped over their shoulders (it had to be properly worn and buttoned), and he wouldn't allow any of his people to eat with or talk to Production supervision - we were looked down upon as "those animals in the dirty short-sleeved shirts". He wrecked his assigned company cars one after another while driving drunk, and the Plant Manager finally took his company car away and made him drive his own personal car to work. He later got his company car back

anyway through friends in the Financial power structure at Central Office (Plant Controllers didn't report to the Plant Manager - they reported to the Finance Group at Central Office). At the plant Christmas Party for the salaried employees shortly after I came to work as a CGIT, he damn near drowned in a toilet when he passed out while on his knees while vomiting in a stall in the Men's Room at the Banquet Hall. A friend of mine from Plant Engineering happened to notice his shoes under a stall door (toes 2 down), heard gurgling sounds, and dragged him out under the stall door. He sure knew how to set the example.....

My final assignment in the CGIT program was to do hourly assemblers' work on the production floor for three months, working wherever I was needed on the line to cover absentees and vacations. During that time we were building Corvairs and Chevy II's together on the same line at 65 per hour. I really enjoyed it, as I had been a hot-rodder while growing up, built and drove my own race cars, and was good with my hands and tools. I quickly became "the Production foreman's friend", as I could do any line job that needed to be covered with only a few minutes' training, and I was "free" - I didn't count against their manpower budget or daily efficiency, as I was carried on the plant's G&A budget as a Trainee. I spent most of the assignment as a line repairman, a reliefman (doing people's jobs while they took their 8-minute break), and as a utilityman, doing just about anything that needed to be done on any line.

...

After two years in Production at Willow Run, I made it quite clear to the Personnel Director that I wanted a transfer to another plant where I could either get promoted or be in line for promotion, as I knew that Harry would be a General Foreman until the day he died, and I didn't intend to spend the rest of my GM career under him as a Foreman. Nothing happened, so I went out and found another (better) job on the sly, came in the next day and gave him 2 weeks' notice - promote me or I quit. The next day I was called off the floor into the Plant Manager's office and was interviewed by the Director of the Chevrolet Pilot Line (Assembly Research Center) in Flint, and an hour later I was both promoted and transferred to Chevrolet Pilot Operations as a Senior Process Engineer. Harry went nuts - I was now at the same pay grade as he was, and he was called in by Personnel and had to change my evaluation to qualify me for the promotion - he never got over it.

CHEVROLET PILOT LINE (1966-69):

Chevrolet Pilot Operations was located at the GM Assembly Research Center on Van Slyke Road in Flint, right next door to the Chevrolet-Flint Assembly Plant. Our job was to work closely with Chevrolet Production Engineering at the Chevrolet Engineering Center in Warren (60 miles away) on the design and assembly processes for each year's new models. Chevrolet Pilot Operations had

The Automotive Business, Excerpts Continued

to ensure that the released designs were buildable and compatible with plant facilities and processes, conduct pre production training programs at the Pilot Line a year ahead of production for plant personnel using hand-made prototype vehicles, develop the assembly processes and tooling, accompany the Manufacturing prototype vehicle for each model to the plants and conduct teardown-and-reassembly training programs on-site for plant employees. We also had to build all of Chevrolet's Pilot vehicles each year 20 weeks ahead of volume production in our mini-assembly plant at Pilot Operations, to be on-site at each model's "lead plant" (the first plant to launch each new model) to provide Engineering liaison and technical help, and to assist in resolving any start-up problems related to product design, process, facilities, or assembly tooling. My assignment was responsibility for the Chevy II, full-size Chevrolet (Impala and Caprice), and the Corvette through the 1967-68-69 model years, and then I was selected to take on total process and plant re-tooling responsibility for the Chevrolet Vega development program during 1969, to be launched in late 1970, with the understanding that I would transfer with it to the Lordstown assembly plant, manage the plant conversion and launch, and become part of the Production organization.

Each of us spent most of our time at Chevrolet Engineering at the GM Tech Center in Warren, following the detail design of each product we were assigned and providing input for improved buildability and assembly efficiency. We also visited Fisher Body Engineering occasionally, which was right next door to Chevrolet Engineering.

My first visit to a Fisher Body drafting room was a real eye-opener, especially for a guy fresh out of the hectic no-excuses environment of an assembly plant that built a car every fifty-five seconds. I was reviewing design proposals for a new type of window regulator, and spent an hour or so with a window regulator draftsman at his board in a Fisher Body drafting room that was about half the size of a football field. While reviewing the proposals, I asked him what other design areas he had worked in, and he responded that he had been designing window regulators for 32 years. I noticed that the designer at the next board over hadn't moved in about ten minutes, but his eyes were open, and his pencil was on his drawing. I nudged my guy and gave him a questioning look, and he said, "No problem, Hank's asleep – we can all sleep with our eyes open". Suddenly there was a flurry of action all around us, covers were rolled over all the boards in the room, pillows came out of drawers, and we were surrounded by men lying on top of their drafting boards and complete quiet – it looked to me like a temporary morgue after a plane crash. I asked my friend what was going on, and he just smiled and said "lunch hour – time to grab some z's".

I thanked him for his time, and said I'd leave so he could get his rest with the others, and he said, "That's OK, I work through lunch anyway, I'm on overtime". I recalled that he had mentioned earlier

that his window regulator design for the next program was all done, and I said, "I thought your design was done". He responded, "Yes, it is, but the whole program is late and on overtime, so I'm on overtime too." I shook his hand and left, wondering how you could keep a project on budget when you paid people overtime whose work was already done. I never forgot that day, and it was fifty years ago.

(Tom _____), the Plant Manager of the adjacent Chevrolet-Flint assembly plant, was forever sending his personal cars and trucks over to Pilot for special work. We were a mini-assembly plant, and had particular expertise in show-quality painting and fabrication (we also did some of the "cutaway" displays for Chevrolet Show & Display to keep our people busy on the floor in between Prototype and Pilot Programs). Tom sent his new pickup over one week with a new camper on the back and we had to completely re-wire the camper for dual power, install a gasoline generator, insulate it, and reinforce the roof so he and his friends could sit up there and watch the races – we also fabricated folding ladders and railings for it and installed an air-conditioning unit for the camper, plus a refrigerator and stove. It was a class job, and made a great way for him to go to the races.

One top executive kept having us pick up his kid's Corvette and bring it in to fix one thing after another (the kid heavily abused the car drag-racing it). We did everything from synchronize the carburetors to replace the engine and transmission, major body repair, and a complete re-paint.

Occasionally we'd get a special request for oddball modifications from Styling. At one point late in 1967 they were looking at the feasibility of using sheet film coatings instead of paint for the outer body surfaces, and they asked us to completely cover a Corvette with un-grained smooth vinyl top material for evaluation (they obviously didn't want to tie up their own manpower doing it, but they had the budget to pay us to do it without anyone asking any questions). They sent us a 1968 Corvette from their fleet and a big roll of smooth vinyl material, and it took four of our assemblers about two weeks to develop the techniques and completely "skin" the Corvette with red vinyl. Ugliest Corvette you ever saw – we shipped it back to styling, they paid our work order, and we never saw the car again.

We also did some of the show paint work for "show jobs" for new models for auto show displays - if every car we show-painted was gathered in one place, they'd have had to rent Selfridge Air Force Base to park them all. We also supported on-site vehicle preparation for the Chevrolet displays at the Detroit Auto Show, which was usually a last-minute frenzy, especially for new model introductions. When the new 1967 Camaro was to be introduced to the public for the first time, Chevrolet scheduled a Management review of their displays the day before the show opened for Pete Estes

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(then the Chevrolet General Manager and a GM Vice President) and his key executive staff. When they gathered at the Camaro display, with a new Camaro SS on a turntable, Estes remarked that the tires looked awfully small for a performance car, and said “let’s get some bigger tires on that thing”.

I was detailed along with another engineer to “take care of that”, so we unhooked the tie-down straps (in those days, all cars at shows were tied down an inch or two below normal ride height to make them look sleeker), jacked it up, removed the wheels, grabbed a cab, and took them down Jefferson Avenue to the first Firestone store we could find. The tires on the car originally were D70-14’s as I recall, and we bought a set of E70-14’s or F70-14’s, had them mounted, got them back to Cobo Hall, installed them on the car, snugged the car back down again, and the entourage was still in the building when we finished. The group came back by the display on their way out, Estes looked at the car, said “that’s better, I want those tires on the car at launch”, and they left. Those tires were on the car at launch, after a scramble with Stop Orders, new engineering releases, and purchasing negotiations with Firestone over who would pay for all the D70-14’s they had already made. The tires we bought for the show car went on my expense account.

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Shortly after John DeLorean became the Chevrolet General Manager, he attended his first monthly General Managers’ Meeting as the head of Chevrolet, at the GM Building. He arranged to be driven to the meeting from Chevrolet’s headquarters at the GM Tech Center in a black Cadillac limousine. Shortly after the limousine drove into the executive garage at the GM building, the manager of the garage called upstairs to the 14th floor to inform the Chairman that DeLorean had arrived in a Cadillac. This didn’t go over well at all with (Chairman) James Roche and (Vice Chairman) Richard Gerstenberg, and they upbraided him when he arrived in the conference room, reminding him that only the top two officers were entitled to chauffeured Cadillac limousines, and as head of Chevrolet, he was expected to arrive in his Division’s product, not in a Cadillac.

Later that day, after DeLorean arrived back at Chevrolet, he told Alex Mair, the Chevrolet Chief Engineer, that he wanted a Chevrolet limousine built in time for the next month’s General Managers’ Meeting. The project started that night in the Engineering Metal Shop. A Caprice station wagon was pulled out of the fleet for the front third of the car, and a Caprice hardtop coupe with the stylish concave back window was pulled out of the fleet for the back third of the car. The two cars were cut in half and set up on a surface plate, and work proceeded (on a three-shift schedule) to fabricate the center third of the car to join the two partial cars together as an extended wheelbase Caprice limousine.

Fisher Body Plant #21 (where the Cadillac limousine bodies were

built) was approached to provide the interior trim and glass divider partition, but they refused, so the interior was stripped out of the limousine used earlier, modified, and installed in the now-stretched Caprice, including the rear air-conditioning unit and overhead ductwork in the headliner. The completed car was sent to the Proving Grounds, checked out for function and safety, and returned to Chevrolet Engineering two days ahead of the deadline.

DeLorean used the freshly-created Caprice limousine to go to the next General Managers’ Meeting, the same call was made to the 14th floor from the garage office when he arrived, and he was again berated when he entered the conference room. He then pointed out that he had done exactly as he had been instructed and arrived in a Chevrolet. The 14th floor gang was not amused, but he enjoyed it. Upon return to Chevrolet Engineering, the limousine was parked in the fleet lot, sat there for several months, and was later wholesaled to a dealer or National Car Rental. Where it went from there is unknown, but it was the only factory-built Chevrolet limousine ever made.

At about this same time, the future mid-engine Corvette development program was getting under way, and a number of mid-engine reference vehicles from other manufacturers were purchased for Engineering evaluation as the Corvette preliminary design concepts were being worked out.

The first one to arrive was a Lamborghini Miura SV, with a transverse V-12. Zora Duntov took it home the first night for evaluation and on the way in to work the next morning, he really let it out and got “the speeding ticket of the century” from the Warren police. He was arrested on the spot, and wound up in the Warren City Hall lockup, right across Van Dyke from Chevrolet Engineering. He called Alex Mair, Chevrolet Director of Engineering (Chief Engineer), and Alex had to go over and bail Zora out of jail. Unfortunately, there is no record of their conversation that morning, but you can be assured it was “spirited”.

DeLorean also added a DeTomaso Mangusta to the list of mid-engine reference vehicles, with instructions that he was to drive it first when it was ready. He arrived in the garage to drive it home, and found it extremely uncomfortable. He was very tall and long-legged, and couldn’t fit his legs and knees in and still manage the controls. He got out of the Mangusta and said “rework it so I can drive it, and let me know when it’s ready.” The car went into the Metal Shop the next day, and it took two weeks to fabricate an entire new rear bulkhead and driver’s side floor pan and re-trim it so the seat could be moved rearward. DeLorean drove it over a weekend once it was completed and never asked for it again.

The Vega engine and its low-pressure die-cast aluminum block technology were developed at GM Engineering Staff, long before the program was handed-off to 18 Chevrolet to finish it and bring it to production. Then-GM President Ed Cole, who had been very

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personally involved with the design of the 1955 Chevrolet V-8 when he was Chief Engineer at Chevrolet, was equally involved on a personal level with the Vega engine. He was a frequent shirt-sleeve visitor on Saturdays to the Engineering Staff Engine Drafting Room, reviewing the design and giving direction for changes. He was a very cost-conscious engineer, and gave clear direction to Engineering Staff that there was no need for insert bearings in the iron cylinder head for the camshaft, as he felt "iron-on-iron" for the cam journals would work fine as long as "chevrons" were machined into the cam journal bores in the cylinder head to retain a good supply of oil. Every imaginable kind of "chevron" arrangement was tested, and all of them resulted in cam journal-to-bore lubrication failures and camshaft seizures. Finally, after the program was transferred to Chevrolet, he relented and allowed the design change to add insert bearings for the cam journals, less than six months prior to production launch. He most likely relented on this issue after listening to Chevrolet engineers he trusted from his experience working with them on the original Chevrolet V-8. As the final production engine development progressed at Chevrolet, it became known (in closed offices) as "The World's Tallest, Smallest Engine" due to the very tall cylinder head.

The Vega engine cooling problems started at the very beginning of the experimental engine program at Engineering Staff. During the development of the Vega, while it was still a Corporate Engineering Staff program not yet handed-off to Chevrolet, Ed Cole insisted that the engine probably had no need for a traditional radiator, due to the excellent heat rejection to the air from the aluminum block. He felt that coolant could simply be passed through the heater core, with outside air fed in through the cowl plenum, ducted through the heater core, and exhausted through a duct under the car, to provide auxiliary cooling. Several pre-prototype cars were built this way at his insistence, and (as you might imagine) all of them were dismal failures from a cooling perspective. After having one seize up while he was driving it at the Milford Proving Grounds one Saturday, he backed away from his theory and allowed the design to continue with a conventional cooling system (although with the world's smallest and least expensive 12"x 12" radiator, which caused many problems later in the field on production cars).

The radiator was sized to the absolute minimum cooling test boogys to keep costs down - this was standard practice at Chevrolet in those days on all car lines, assuming people who needed more cooling would pay extra for a heavy-duty radiator. It didn't work on the Vega, as it was so sensitive to overheating - a conventional iron-block engine could survive overheating occasionally, but one time was death for the Vega due to the differential expansion rates of its iron head and aluminum open-deck block. The head gasket seal would be broken when the block distorted, and the next overheating cycle would come much sooner and at lower load until the engine finally just seized-up tight. GM's first usage of the now-

common "coolant recovery system" was initiated on the Vega for 1973 as a result, but it just captured the coolant that would otherwise be puked out on the ground through the overflow hose. The cars still overheated (although they didn't lose the coolant) until the previously optional heavy duty radiator was made standard equipment as a last resort later in 1973. GM was then sued by the outside inventor of the coolant recovery system for using the design in violation of his patent, and the issue was ultimately resolved with an out-of-court settlement.

The optional L11 engine with a 2-barrel carburetor became a mainstream part of the Vega production engine development program in December, 1968 (and ran at a 75% level as an option two years later in production). But the Chevrolet Engine Group had an intense dislike for the tall iron cylinder head with its unusual tappet arrangement and side-flow "Heron" combustion chamber design that had been thrust on them from Engineering Staff, and set out quickly to design their own. Their new L10 design evolved rapidly as a "crossflow" aluminum head with a single centrally-mounted overhead camshaft and roller rocker arms operating intake valves on one side and exhaust valves on the other, remarkably similar to the Ferrari V-12 cylinder head design of that period. It was almost 3" lower than the production head, was a lot lighter, had true "hemi" chambers with big valves, and made excellent power. Numerous prototypes were built, manufacturing tooling was started, and it even got to the point where Assembly Instruction Manual Sheets were issued to Lordstown in anticipation of approval for production. The REAL story never came out, but some combination of Corporate politics ("You don't need another cylinder head - mine will work just fine") and additional program investment costs killed the in-house Chevrolet-developed L10 cylinder head program. Had it gone to production, it would not have had the differential expansion head gasket problems that plagued the iron-head engine and which resulted in millions of dollars in engine replacement warranty expense, and it would have provided significantly higher performance than the optional L11 2-barrel iron-head engine that went to production.

The accountants ran the Vega program from start to finish, with the objective being a 2,000-pound car that would sell for \$2,000.00. They said "no glove box", so there was none (for the first year - then we crashed a redesign to put one in for 1972). They said "build the base car with no headliner - just perforate the roof inner panel and paint it trim color". We built the pre-prototypes that way, and it was like being in a tin outhouse in a hailstorm, so the Beanies lost that one and the car got a molded acoustic headliner. They said "no plastic front fender liners - they'll cost \$2.28". The liners were added in a crash program in late 1973 after spending millions to replace thousands of sets of rusted-out fenders under warranty in the field.

There was another cause of the rusted-out fenders and bodies. It

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was a simple Fisher Body Engineering screwup and was corrected for 1974 start of production. The ELPO body dip-prime process from '71-'73 was "anodic" (body was the anode, paint was the cathode). Fisher Body designed it with the polarity backwards, so it didn't get the "throw" it was supposed to have to get into all the nooks, crannies, and crevices. It was corrected for '74 to "cathodic" (body was the cathode, paint was the anode). This gave much much better film build and "throw" into the recessed and enclosed cavities of the body shell.

The Vega transmission development program also fell victim to the Finance types. Following an early executive drive review of pre-prototypes, it became obvious that the MB1 Torque-Drive manually-shifted clutchless 2-speed automatic, which was to be the base transmission, was hopelessly inadequate, and the base transmission must be a manual. Opel had a 4-speed available that was in high-volume production, but the Finance types insisted that the base transmission must be a traditional low-cost 3 speed, with the traditional profit-generating 4-speed as an extra-cost option. The existing Saginaw 3-speed ratios were unsuitable, so Opel was commissioned to tool up a new 3-speed derivative of their production 4-speed (there was no such thing as an Opel 3-speed, as the Europeans had given up on 3-speeds as being archaic many years earlier). Opel did just that, and tooled up a new 3-speed from scratch, just for the Vega application, whose actual cost was higher than the (optional) Opel 4-speed due to the tooling investment and low production volume.

Tradition prevailed however, the Finance types got their way, and the (new) Opel 3 speed became the base Vega transmission, even though it cost more than the optional 4-speed. Both transmissions came by ship from Germany in HUGE wooden crates, 100 transmissions to a crate, and arrived in shipments of thousands of transmissions at a time. When the initial crates were opened, most of the transmissions were rusty from the salt air, and subsequent shipments had the transmissions sprayed with an oil and wax coating to prevent corrosion during shipment. Saginaw probably could have whipped up the desired ratios for both 3- and 4-speeds in less time and for a lot less investment, without the ocean shipping, inventory, and service parts problems that came along with the Opel transmissions, but they never got the chance until 1974.

Nothing escaped the bean-counters, except they ignored assembly labor and facilities costs entirely in their decisions. All they considered was piece cost of the parts. All Vegas had metal moldings around the rear quarter windows that were installed off-line in a subassembly where the rubber channel was put on the quarter window glass. The standard models used body-color painted moldings to cover the rubber seals, and the up-level option jobs used bright stainless moldings. Consider this logic - the moldings for the base models had to be taken upstairs to the Paint Shop, removed from their cartons, placed on specially-made magnetic racks, run through

a special paint system, painted in ten different colors, removed from the magnetic racks, placed on specially-made "trees" on wheels, sent down an elevator from the second floor Paint Shop, manually pushed to the subassembly operation, where the operators selected the right size, shape, and color for a right and left set, and applied the painted moldings to the window before it went on the car - in ten colors, there were 180 different parts to create in the Paint Shop, rack, transport, and select from in the subassembly operation. For the up-level option jobs, the operators simply took the bright stainless moldings out of the box and put them on the windows, with only 18 total parts to pick from. When the "cheapo" painted moldings finally disappeared from production, we removed at least 14 people per shift from Material, Paint, and Production.

The Finance types were always fixated on the "base car" (which we hardly ever built any of, but had lots of odd parts for), and "option profit" was king, which generated an incredible proliferation of option combinations and an ever-escalating level of parts to handle and decisions for people to make between cars at 100 jobs per hour.

Someone decided during the development program that the AC mechanical fuel pump was an ugly appendage sticking out of the side of the cylinder head, and the first in tank electric fuel pump in the domestic automobile industry was designed and released to replace it. The fuel pump power feed circuit ran through a fuse in the junction block, and then through an oil pressure switch in the engine's main oil gallery so the pump couldn't operate with the ignition in the "On" position with no oil pressure. The "Start" position bypassed the oil pressure switch to provide fuel pressure with low oil pressure at start-up. The oil pressure switch was a constant source of trouble, stranding many customers on the side of the road when it malfunctioned and killed the fuel pump. Our Lordstown assigned company cars and "overnight" test cars all carried a "fuel pump kit" in a little Anacin tin in the glove box, consisting of a spare fuse and a cotter pin. If the oil pressure switch failed and killed the fuel pump, you'd pull the harness connector off the switch on the side of the engine block and insert the ends of the cotter pin into two of the three female terminals in the connector as a jumper, and the fuel pump would then work with the ignition in the "On" position, oil pressure or not, so you could drive on to your destination.

The Vega 4-cylinder engine generated a very high second-order vertical shaking force due to its relatively large displacement, making it a major challenge to isolate the engine vibrations from the body structure. Ultimately, the only way to "calm down" the drivetrain vibration transmitted to the body (which amplified it even more) was to cantilever a "tuned absorber" pack of steel plates riveted together on spring-steel arms from the back of the transmissions (nothing was known about rotating engine balance shafts in those days, which is the "cure" these days for cancelling second-order vertical shaking forces). This development also came

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very late in the program, requiring significant casting and machining changes for the tailhousing of all five transmissions to provide the attaching provisions. Each engine/transmission combination required its own part number of “tuned absorber” (vibration damper). The early 1960’s 4-cylinder version of the Chevy II, with the “Iron Duke” 153 cubic-inch four, had the same problems, but nobody knew how to cure it in those days - they just used huge, soft rubber engine mounts, a 5”-diameter driveshaft with a heavy oiled cardboard liner, and they just “let it shake”.

The front seat backs on the base-model first-year 1971 Vega were designed to have an ultrasonically-welded feature to create an 8”-wide horizontal “tie-down” appearance about 10” down from the top of the front seat back, like the actual tie-downs used in the Custom Trim option by means of tie wires, sewn-in wire pockets on the seat cover, and hog-rings tying the wire down through the foam pad to the seat frame, but without the extra parts, cost, and assembly operations.

This was a Fisher Body “first”, and was to be accomplished by gluing a special piece of fabric coated with a heat-curing adhesive to a recess in the foam pad. After the vinyl seat trim cover was skinned over the foam and frame and hog-ringed at the bottom, the seat back assembly was fed into a huge 4-station indexing dial machine in the middle of the Cushion Room. This machine was then to precisely position the seat back, and a copper electrode would then come down from above on a cylinder, press the cover material into the foam at the location of the heat-activated adhesive strip glued to the foam, give it a blast of high-current RF energy through the dielectric electrode, and the result was supposed to be the contoured “tie-down” look without the expense of the Custom Trim, as the heat from the RF energy (microwave energy, if you will) was supposed to cause the inner backing of the cover material to adhere to the activated heat-sensitive adhesive strip that was glued to the foam pad.

It was a disaster – the results were thousands of seat back assemblies with the vinyl cover either fried, burned, melted, or that didn’t stick at all, and even the F.A.A. got involved, as every time the machine cycled and cut loose its blast of RF energy, it affected the instrument navigation systems of commercial airliners flying over the plant on final approach to Youngstown Municipal Airport. After about six weeks of “All the King’s Horses and All the King’s Men” from Fisher Body Trim Engineering and GM Research and Engineering Staff trying to make the thing work, they gave up and tore out the machine and scrapped it. That’s why you see some very early cars with base trim that have a “tie-down” feature near the top of the front seat back, and then it disappeared forever.

Then-GM Vice President and Chevrolet General Manager John DeLorean would occasionally bring high-volume dealers into the Chevrolet Styling Studio to show them what next year’s cars looked

like. The original approved Vega clay model had small rectangular front parking lights below the bumper. One morning DeLorean brought Zollie Frank, the owner of the world’s largest Chevrolet dealership (Z. Frank Chevrolet, in Chicago, which occupied almost an entire city block), into the Styling Studio to show him the Vega clay model and get his thoughts on the design. Zollie was a really big guy, with an even bigger cigar. He looked at the painted clay model, walked around it, and stood in front of it for a minute or so, and said “Get rid of those wimpy-looking little parking lights – they should be big, round things that look like European driving lights”. DeLorean turned to the Studio Chief, told him to make the change Zollie wanted, and said they’d be back to look at it later that afternoon. After the two of them left, the Studio Chief blew a gasket and began to rant about “Who does he think he is – what does that big slob know about design?” He finally calmed down and put the modelers to work on large, round lamps, and DeLorean and Zollie came back later that day and approved the change. DeLorean mentioned to the Studio Chief as they were leaving that “Zollie sells more Chevrolets than anyone else on earth – he knows what the customers like.” The car went to production exactly as it was revised that afternoon, with big, round parking lights that looked like European driving lights.

The Vega rear suspension design was another very late program change. The original rear suspension design had the axle located by four angled trailing arms. The uppers were angled outboard from the axle center section to brackets welded to the rear of the floor pan behind the rear seat bulkhead, and the lowers were angled inboard from the ends of the axle to brackets welded to the bottom of the rear seat bulkhead. The prototypes fractured the seat bulkhead and the rear of the floor pan due to braking and acceleration loads fatiguing the body panels during durability testing at the Proving Grounds, and a fix was developed there in order to keep the cars running on the test schedule.

The fix was to alter the lower control arm arrangement so they ran straight fore-aft and tied directly into the much stiffer structure at the rear of the rocker inner panel, and a large reinforcement was added to the rear seat bulkhead panel to spread the loads imparted by the angled upper control arms over a larger area to stop the “oil-canning” of that panel. This “fix” was adopted very late in the program and became the production design. The ultimate solution for rear axle control, adopted years later in production, was the “torque arm” design, also used in later years for the Camaro.

The process of finding a name for the program (which still carried the Engineering Staff “XP-887” designation when it was handed off to Chevrolet) also had its entertaining moments. The usual research was done, many names were considered, and one of the names that hung on and made the final “short list” was “G-Mini” (really!). The “Vega” name was finally chosen, as it stood for “bright star”.

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LORDSTOWN ASSEMBLY PLANT (1969-1975): Chevrolet –

Lordstown built Chevrolet Impalas and Caprices and Pontiac Firebirds, the last models before the massive changeover to the Vega. The Firebird moved to Norwood in mid-April, 1969. The last "B"-body Chevy was produced at Lordstown at the end of March 1970, and the first Vega was produced 12 weeks later, on June 26th, 1970, following a complete retooling of the plant - in only 12 weeks.

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Repair jobs sat in the yard for so long that they froze in place out in the mud as winter weather approached (the paved part of the yard only held 2,000 cars). When we finally had to clear every last job out of the yard and get them ready for shipment before we shut the plant down and gutted it for the major model changeover to the Vega, we had to hire tow trucks to bring them inside the plant. Several Firebirds that the wreckers pulled out of the frozen mud left their rear axles behind, with the rear springs ripped right out of the body, when the trucks tried to yank them free – these units had to be stripped of usable parts and scrapped.

The plant had always had problems at "Body Drop", where the body was lowered on the frame. They continuously had trouble lining-up the body on the frame to get the critical body mounting bolts driven, and many went down the final line with several body bolts missing and the bolts had to be put in by repairmen in the Final Line Pit. Shortly after arriving at the plant in 1969, I spent a few hours one day in the pit with the operators and repairmen and noticed it was always the same bolts that were missing, and the body was always out of alignment with the frame the same way. Maintenance checked out the alignment of the overhead Body Drop carrier rails to the floor-mounted frame conveyor that night on third shift with plumb lines, and they discovered it was an inch off at the front and two inches off at the rear. After about an hour's work, the overhead conveyor steel rail for the body drop tackle that held the body was properly centered to the floor conveyor, and all the body bolt problems disappeared the next morning. As a result, we pulled two of the four repairmen out of the Final Line Pit that day and eliminated two more Pit Repairmen in Final Process.

I had a hot-blooded Foreman in Chassis named Bill, who had been a pro football player with the New England Patriots. He reacted instantly to everything, frequently thinking with his fists or not thinking at all. When Firebirds entered his area to have the carpet installed, the center console was supposed to be laid in the back seat, out of the way, so his people could lay the carpet. The next foreman's area beyond his installed the console. One day, a long string of Firebirds hit the end of the Final Line with no consoles, and some at the head of the string had the carpet installation incomplete. I hopped on my scooter to go see what was going on, and found one of Bill's repairmen installing carpets halfway down the

Final Line from his area, and guys running down the aisle carrying consoles. I finally found Bill and he had been throwing all the consoles in a trash gondola. A new operator upstream of his area had been stocking the consoles in the front floor instead of the back seat. Bill's carpet people just let them go instead of moving the consoles out of their way to put the carpets in. He reacted as usual, and stood upstream of his carpet job and threw all the misplaced consoles in a trash gondola. When I confronted him, he just stammered "Gotta get the pahts in the cahs..." – it never occurred to him to solve the real problem.

After we converted to the Vega at 100 cars per hour, Bill's Wheel Room (where the tires and wheels were automatically mounted, inflated, and balanced at 550 per hour) had a lot of downtime and maintenance problems that usually resulted in people hand-carrying tires when the overhead delivery roller conveyor chutes went empty due to machine downtime. This was always a wild scene, as the car was set down on its wheels on a flat-top conveyor about 20 jobs past the end of his line, and HAD to have tires on it or we'd have to shut the main line down. One day Bill's Utilityman called me on the radio when I was at the end of the Final Line and said I'd better get to the Wheel Room (the "Captain Crunch Machine", as Bill called it) right away before Bill killed somebody. I got there as fast as my scooter could run, and found Bill holding a Maintenance foreman about a foot off the floor against a column with his left hand, punching him repeatedly in the face with his right and screaming at him for f__ing up his line again, while a group of hourly machine repairmen watched in amazement - two Management people in a fight. I had to suspend Bill and have Security escort him out of the plant.

Big Al, the Production Manager (yes, the same one I had at Willow Run years earlier), was tearing down the aisle on his scooter one afternoon with the Material Superintendent next to him on his scooter, and was screaming at him about a material shortage on the Final Line. They came to a 90-degree turn next to Body Drop, and Al never saw it - he kept on going straight, right through an operator's workstation, and rode the scooter right into the Final Line Pit, where it flipped and pinned him to the Pit floor. We had to stop the line and it took six people to lift the scooter off him and get him out of the Pit.

After we converted to the Vega and were in the middle of the "War" with the Union, Al ran up the stairs to his Mezzanine office one afternoon puffing on his usual big cigar, opened the door to the Production Office, and got a 5-gallon bucket of water dumped on him someone had set up for the occasion. I'll never forget the look on his face as he stood there soaking wet screaming for the Personnel Director to "fire ALL those bastards". The Plant Manager told him to go home and everyone in the plant knew about his bath in about two minutes. "Big Al" had a heart attack in the plant one afternoon, went out on a stretcher, and within an hour there was a

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pool under way in Final Process selling squares predicting when it would be announced that he had died. Al survived and recovered, but never came back to work; he retired on a medical disability.

The "War" was triggered by consolidation of the Chevrolet and Fisher Body organizations into GMAD (GM Assembly Division) as a single Management organization for the combined plants. GMAD began in the 50's as the B-O-P Assembly Division, as a four-plant operation with plants that built Buick, Olds, and Pontiacs together, and was very efficient compared to the single-division product Chevrolet/Fisher Body operations. The Lordstown Local Union was determined that GMAD wouldn't come in and get Lordstown efficient by reducing manpower like they did everywhere else, and they had signs up all over the plant weeks in advance of the consolidation saying "Fight GMAD", "We Won't Knuckle Under", etc. When the consolidation occurred, GMAD only sent in about three people, but the "War" was on in earnest the day they arrived.

The "War" consisted primarily of intentionally missed work, missing parts, incomplete operations, alleged tool failures, and thousands of incidents of intentional sabotage to slow or stop the line and fill the repair yard, plus an incredible political battle for control of the Local Union that included fistfights in union meetings and the warring factions finally burning down the Union Hall.

The most popular daily technique for shutting the line down usually took either of four forms: 1) the people at the Chassis-to-Body Marriage line (the "Towveyor" area) "forgetting how to do their job", which instantly shut the line down, 2) the people in the Cushion Room where seats were built "forgetting how to do their jobs" or alleging that their hog-ring guns were jammed, resulting in all the seats having to be repaired instead of going on the delivery conveyor to the Final Line, which meant cars went down the line with no seats, or 3) missed operations which resulted in cars that wouldn't start or couldn't be driven at the end of the Final Line, jamming cars up bumper-to-bumper back up the line until it was stopped, or 4) failure to disengage the pins that held the body in the clamshell carrier when the car was set down on the Final Line on its wheels. When the carrier spread apart, it would pull the car sideways and dump it on its side into the center Pit, stopping the line. We'd have to use a forklift truck through the windows or roof to pull the car out of the Pit before we could start the line again. This went on all day and all night, punctuated by outright sabotage such as punctured fuel tanks, slashed instrument panel pads and seats, damaged brake and fuel lines, 30 or 40 cars in a row with the coil-to-distributor wire cut off, brake fluid intentionally dripped on the paint (just like pouring acid on it), or a hundred other little tricks to cause repairs, shut the line down, or fill the repair yard to overflowing to guarantee weekend overtime. This went on for over eighteen months, with the Union denying any sabotage was taking place, in spite of us holding weekly news conferences in conference rooms

filled to the ceiling with intentionally-damaged parts by the thousands. People were fired and new people hired by the hundreds on a daily basis, and most days we were lucky to be able to run two or three hours of an 8-hour shift before shutting the plant down and sending everyone home. We went for a month or so where the longest shift we ran was nine-tenths of an hour.

The Union would call wildcat walkouts every now and then and prevent any of the salaried employees from leaving the plant, locking us in all night on several occasions, terrorizing female employees who tried to leave, turning company cars over at the plant exit gates, pounding and key-scratching people's cars at the picket line, and wearing hoods so they couldn't be identified. We had no help from the police - the Ohio State Highway Patrol wasn't allowed to become involved, there were no local police in the village of Lordstown, and the County Sheriff was elected by Democrats (read the Local Union and other Unions) and wasn't about to jeopardize his career. The only help he ever sent was a 70-year-old School Patrol man in a rusty old Ford Maverick who would watch for a few minutes, laugh with the pickets, and leave.

It ultimately got to the level where supervisor's homes were shot at, their families were terrorized while the husband was at work, and supervisors were run off the road and shot at on the way home from the plant by hooded Union members. One black supervisor was assaulted by three pickets as he attempted to leave the property during a "lock-in" by going over the fence, and he beat hell out of all three of them. They filed assault charges against him, and the supervisor got a lawyer and filed suit against the Local and International UAW in Federal Court for unlawful detention in violation of his Civil Rights. The assault charges were dropped, the International Union settled out of Court with the supervisor for close to \$500,000.00 to drop the federal suit, and the International finally took an interest in the situation and took over the Local Union. This, and the replacement of the Plant Manager by GM, started the "turnaround" at Lordstown. An audit of the Local Union showed financial irregularities and outright embezzlement by a number of the Local Union Officers, and they were all replaced by a new slate that was at least willing to discuss the issues. The turnaround continued slowly and took about two years, but nobody outside the industry ever wrote about it - the story wouldn't sell magazines, books, "60 Minutes" broadcasts, or newspapers like the "War at Lordstown" or "Blue-Collar Blues" did two years earlier. Lordstown soon became one of the best plants in the Assembly Division, and was near the top until it was closed. You had to be there and live through it to believe it. Many Management people's careers were literally destroyed by the "War at Lordstown", many had heart attacks or acquired serious nervous and mental disorders and simply couldn't face coming to work any more. Many took medical disability retirement because they simply couldn't function any more in that kind of daily combat environment.

The Automotive Business, Excerpts Continued

Some of the Hourly people were scarred as well - I had a man they called "Crazy John" (who was a few cards short of a full deck to begin with) who put the owner's manual and other paperwork in a plastic bag and put it in the glove box on the Final Line. He was always complaining about his health, and his co-workers had him convinced one day he had all the classic cancer symptoms and better see a doctor right away. He demanded to be let off for the rest of the day to go get a cancer checkup, and when he was told he couldn't leave, he waited until a plant tour train was going down the aisle past his operation, dropped his pants, and urinated in one of his plastic warranty book folders in full view of the visitors, yelling "Cancer, Cancer" at the top of his lungs. He was suspended immediately for the balance of the shift and three days, but refused to leave the plant, claiming his wife would kill him if she knew he was off the job. So he sat outside the plant exit lobby for three hours waiting for his wife to pick him up at the end of the shift. And then spent the next three "work" days sitting in the parking lot rather than let his wife know he wasn't working.

As initial production of the Vega ramped up toward the goal of 100 per hour, a major problem developed in the Paint Shop. At 85 per hour, the incidence of runs, pops, and sags in the paint became a major issue, with nearly 100% of the units requiring repair, and we had to plateau the rate through the spray booth at 85 per hour to stop it. We simply couldn't lay the paint on fast enough with conventional pressures and tips, and when we increased pressures and opened up tips, we got runs and sags everywhere. Fisher Body Paint Engineering sent in their troops, and they also called in DuPont, the corporate paint supplier, and DuPont sent in a small army of experts and chemists with two mobile paint laboratories. This bunch literally developed a whole new paint chemistry and application specifics over a weekend (NAD - Non-Aqueous Dispersion Lacquer), and we had production paint colors to that new formulation within a week, which enabled us to continue the production ramp-up successfully to 106 per hour in the Paint Shop (the Body Shop Main Line ran at 109, Paint at 106, Hard Trim at 104, and Chassis & Final Assembly at 102) in order to maintain 100 average off the Final Line with the inevitable occasional short stops for minor breakdowns. Masking, painting, and demasking the GT option's "skunk stripes" was something to see at 106 per hour!

Nobody had ever built a production Body Shop before that had to run continuously at 109 jobs per hour on a single line. The constant pounding of the power-and-free conveyors running at never-before-tried chain speeds and the tremendous shock loads imposed on the steel supporting the conveyors by the stopping and starting of heavy side frame gates and body carriers finally began to loosen up the building steel and trusses. We spent an entire Christmas holiday period with welders crawling all through the trusses and conveyor supporting structure in the Body Shop welding the overhead steel solid that is normally bolted and riveted in any other assembly

plant.

In 1975, after two years of delays and false starts in the development program, we launched the Cosworth-Vega, a technically-advanced variant of the Vega with 4 valves per cylinder, dual overhead cams, Bendix port fuel injection, aluminum wheels, and many other race-car features. The dressed engine wouldn't fit in from the bottom like the regular Vega engine, so the engine went in with no intake manifold, fuel injection, or exhaust manifold. Each Cosworth that came down the Final Line was manually pushed off the line into a stall across the aisle, and all the engine dress work was done by hand. The roll-testers loved them as they wound them to 6,500 rpm through the gears on the roll-test machines.

Just before production started, an engineer from the Tech Center brought the first set of hand-machined aluminum wheels down to the plant for trial runs through the high-speed automated wheel and tire mounting equipment. The wheels were made in England by GKN, and the set he brought cost about \$5000 per wheel as hand-finished Engineering samples. He watched intently as we scheduled two tryout wheels and tires into the production flow in the automated wheel and tire mounting system. When the wheel reached the mounting machine that stretched the tire over the wheel rim, the guide shoes on the mounter very neatly sliced the rim right off the hand-made Cosworth alloy wheel like it was made of butter, and he started screaming like a maniac to shut down the system. By the time we could get to the nearest stop button, the rim had been neatly sliced off the second wheel. He was so panicked he could hardly speak. We modified another set of guide shoes that night in Maintenance and installed them the next morning, and they worked fine. He went back to the Tech Center that afternoon with two good wheels and \$10,000 worth of scrap from the other two.

Every Cosworth-Vega engine was hand-built at Tonawanda in a special off-line "clean room", and the man who built it signed his name on a plate on the cam cover. The initial engines were all supposed to be hot-tested and certified before they left Tonawanda, and each one had a tag wired to it certifying that it had been hot-tested and met specifications for power, timing, etc. The tags on the first 25 production engines were also signed-off by the Chief Inspector of the Tonawanda Engine Plant, attesting to their absolute perfection. On the day the first production, Cosworth-Vega to be shown to the public came down the line in April, 1975, the plant was full of local and national press and enthusiast magazine people, participating in our media event to mark the occasion. We pushed it off the end of the Final Line, put it in the off-line Cosworth Final Assembly Crib, and three Cosworth-uniformed assemblers spent about 45 minutes installing the manifolds, fuel injection, air cleaner, and all the loose parts that couldn't be done on the main line.

When the assembly was done, the lead assembler turned the key on cue with all the cameras and microphones and with the hood open.

John Hinkley Memoir

The engine cranked for a few seconds to build fuel pressure, then there was a resounding blast, a sheet of flame, the air cleaner duct-work was blown off the car into the assembled press crowd, and the engine quit dead. The distributor turned out to be over 90 degrees out of time from the engine plant and the engine was firing with the intake valves open. There was no way that engine was ever hot-tested at Tonawanda. After about twenty minutes' work (during which we sent the press on a hastily-organized plant tour in the "Tour Train"), the intake manifold was replaced, the distributor was re-installed, timing re-set, the air cleaner was reassembled, and the engine lit off perfectly and ran like a top. The media returned from the tour and we did the event all over again for the cameras without a hitch. None of the TV or print coverage the following day mentioned the screw-up at all - only those that were actually there ever knew about it. I was particularly relieved, as I saw my career vanishing before my eyes when the sheet of flame followed the flying air cleaner ducts over the fender in front of all the cameras during the first fire-up. An animated phone conversation followed with the Chief Inspector at Tonawanda after the press left the plant. Several other Cosworth engines in the initial shipment, still in the racks, were inspected and found to have exactly the same problem.

When we started to build the first Vega station wagons with the wood-grain side trim (a vinyl material like contact paper that's installed wetted with Joy soap and water, then squeegeed down, formed around all the body contours, and finished around the door edges and fuel filler opening with a hot hair dryer), it was a disaster. At 100+ jobs per hour, few of the operators could form the wood-grain vinyl to the body contours without leaving wrinkles, air bubbles, and tears. We called in the specialist from Schlegel, the vinyl supplier in New York that night, and he put on a training session in the company car garage the next morning you had to see to believe. I think he could have wood-grained a basketball without a wrinkle. Whether it was out of training or embarrassment I don't know, but the guys apparently picked up the right tips and by the end of the day they could do the wood-grain operation just fine.

Fisher Body spent a fortune installing an automated windshield installation machine on the Trim Line, and two of their engineers lived with it for weeks to get the bugs out of it. It got to working pretty well until we got up to 85 jobs per hour. That cycle time was apparently all it could stand, and it literally shook itself to pieces one day. They finally gave up, and we went back to installing windshields manually with two rotating teams of people doing every other car.

When we did the 1973 model change, on the fly at 100 jobs per hour, a new rear hatch lid was introduced with a gas prop rod on each side instead of the previous model's torsion springs. Everything went fine until the first 1973 job hit the Trim Shop and they put the gas prop rods on. When they went to close the hatch, the

hatch bent almost in half across the bottom of the glass opening in a straight line between the two anchor points for the gas prop rods, and you could stick your arm in the big gap between the deformed hatch lid and the quarter panel with the lid closed. Somebody had made some die changes in the hatch tools and used a lighter gauge steel than had been tested as a last-minute weight reduction, and it weakened the hatch so much that it wasn't strong enough to overcome the closing force of the gas prop rods. We shut the plant down and sent everyone home (fortunately, it was a Friday). We then spent the whole weekend working 24 hours a day with the Fisher stamping plant next door and an army of Fisher Body engineers under Geoff Waterworth, the Fisher Chief Engineer on the Vega, trying different metal thicknesses, reinforcements, and die changes to come up with a lid you could close. We finally found a combination that worked Sunday afternoon, started stamping and assembling the new lids Sunday night in the stamping plant. We ran the new hatch lids through the small-parts paint system to replace the weak ones past the Paint Shop and scrapped all the first-design lids as we took them off cars Monday morning.

By 1975 the original Vega engine was in its death throes as far as the buying public was concerned. Its propensity for overheating and seizures was well-known by then, and painting the aluminum engine Chevy orange (a brilliant fix from the Marketing people) didn't help at all. The decision was finally made to cancel it, and the real problem was to find a replacement that would fit in the Vega's engine compartment. The Vega body and engine were literally designed around each other to allow the engine to be installed from below at a high production rate with less than 3/4" clearance, and no other GM engine had the right size and shape to go in from the bottom. The only 4-cylinder available was the old pushrod "Iron Duke" 4-cylinder originally designed in 1960 for the old Chevy II, so we devised a "dive-bomb" method to put it in from the top. As the car came down the line at floor level suspended in an overhead clamshell carrier, we took the hood off, took the complete front end panel off, swung the engine in from the front and "dive-bombed" it into place, hanging it on a chain from the carrier, then put the front end panel back on again. When the car got to the point where it was six feet off the floor and we raised the rear axle into place from below, a lift device grabbed the engine from below, lifted it up high enough to disengage the chain it was hanging from, and set it down on the engine mounts on the body. We put the hood back on when the body came back down to floor level.

We developed this weird process in an afternoon in the company car garage. It later opened the door for use of the V-6 and V-8 engines in the Monza, Skyhawk, Firenza, and Sunbird, which could only be installed from the top. We had developed a similar process about a year earlier for the much-ballyhooed GM Rotary Engine which was to power the Monza, but the Rotary went belly-up before we ever built a Pilot model. The Rotary was also supposed to

John Hinkley Cont.

power the AMC Pacer, whose engine compartment was designed around it - when the Pacer appeared, it had an AMC straight six it was never designed for, with an enormously deep depression in the firewall, added at the last minute, to make room for it.

When the bumper laws came into being in 1974, the Vega had new aluminum bumpers with a horrendously complex system of curved, laminated springs behind it to absorb impact energy, instead of the hydraulic absorbers used on all other GM cars. When we started production, we had every warm body we could find manning the bumper subassembly line trying desperately to get all the springs, holes, and bolts to line up while the whole bumper system was in a compression fixture - we were even building them on the floor and in the aisles. None of the springs were even close to print specs and Chevrolet had to go in and take over the supplier's plant for two months to get their processes under control for them so we could keep building cars.

THE “FISHER BODY PROBLEM” AND G.M.A.D. (GM Assembly Division)

Since the beginnings of the Corporation, the GM assembly system relied on Fisher Body Division to engineer the body from the firewall rearward, manufacture all the body parts, weld the body shell together, paint it, completely trim it inside and out, and supply the finished body to each of the car divisions (Chevrolet, Pontiac, Buick, Oldsmobile, and Cadillac). The car divisions paid Fisher Body Division for each body based on Fisher's transfer price schedule, and added the instrument panel, front end sheet metal (hoods, fenders, grilles, etc.), bumpers, and the complete frame, chassis, powertrain, and running gear at their final assembly plants to create the finished cars.

The “Home Plants” for Pontiac, Buick, Oldsmobile and Cadillac were located at their Division headquarters (in Pontiac, Flint, Lansing, and Detroit, respectively), but were physically remote from their supplying Fisher Body plants. One Fisher Body assembly plant in Euclid, Ohio, was hundreds of miles away from the Buick, Oldsmobile, and Cadillac plants it supplied with Riviera, Toronado, and Eldorado bodies. In all cases, bodies destined for the “home plants” were transported (on their wheeled Fisher Body conveyor pallets) to the Car Division assembly plants via huge enclosed two-level Fisher Body semi-trucks. Fisher had hundreds of these tractor-trailer rigs as a captive fleet that delivered about 5,000 bodies per day to the “home” assembly plants. When the trucks arrived at the final assembly plants, the bodies were unloaded and placed on the plant's conveyor pallets, and the empty Fisher body pallets were then returned to the supplying Fisher Body assembly plant on the same trucks that had brought them.

The Chevrolet arrangement was a little different. At Chevrolet assembly plants, the Fisher Body assembly plant was adjacent to the Chevrolet facility, on the same piece of property, and finished bod-

ies were conveyed directly from Fisher Body into the Chevrolet plant for final assembly. However, even at these adjacent locations, which were generally only separated by a wall, they had totally separate managements, offices, staffs and support systems, operated as separate companies, and could only deal with each other between the two Divisions at the highest level of local management. In most cases, they even had separate union locals. Even the horrendously costly Paint Shops were separate. Fisher Body had one to clean, prime, and paint the body, and Chevrolet had another one to clean, prime, and paint the front end sheet metal. In all cases (home plants and Chevrolet plants), paint color and gloss match between the firewall-back Fisher-painted body and the firewall-forward Car Division-painted hood and fenders was a never-ending problem, with DuPont (the corporate paint supplier to both sides) caught in the middle.

Why such a costly, burdensome, illogical, redundant, and inefficient way to build cars? Call it tradition, corporate politics, history, “turf” protection, and inward-focused Divisional profit goal competition, with no thought to the redundant costs and inefficiencies of production, administration and investment. This was borne out of huge corporate size, 54% market share and decades of zero domestic competition, which allowed GM to operate inefficiently and just pass the on the increasing operational costs to its customers through annual price increases.

...

It's difficult these days to comprehend the old “traditional” Fisher Body/Car Division way of doing business, which was extremely inefficient, but that's the way GM operated for nearly fifty years. Nobody else in the entire worldwide automotive industry had design, engineering, manufacturing, and car assembly set up as independent competing companies, and it took GM until 1984 to figure it out. That was the year Fisher Body Division disappeared entirely as a result of the infamous Roger Smith re-organization, and it was also the beginning of the phase-out of individual Divisional design, engineering, development, manufacturing, and assembly at Chevrolet, Pontiac, Buick, Oldsmobile, and Cadillac, which are now small Marketing operations (except Cadillac, which was allowed to continue on a semi-independent basis, although their current plants were built and are operated on the GM Assembly Division model).

Chevrolet and GMC truck plants and the Corvette plant weren't operated like the Fisher / Car Division plants. Fisher had no part whatsoever in trucks or Corvettes, which were designed, developed, manufactured, and assembled entirely within Chevrolet, and those products were built in integrated Chevrolet-only plants (which is why you never saw “Body by Fisher” on their door sill plates).

The “traditional Fisher Body/Car Division” operating model was one of the many reasons that GM North American Operations

The Automotive Business, Excerpts Continued

(design, development, manufacturing, and sales of cars and trucks) didn't make a dime from 1980-1994. Virtually all of GM's profits during that period came from GMAC, Hughes Electronics, EDS, MIC, and numerous other non-automotive subsidiaries, not from their core car and truck business, and a similar earnings pattern continued for many years.

GMAD CENTRAL OFFICE - GM TECHNICAL CENTER, 1975-1985

In mid-1975, I was promoted and transferred from Lordstown to GMAD Central Office Product Planning and Tooling at the GM Technical Center in Warren as the Manufacturing Project Manager for the 1980 "X" Car program.

The mid-70's saw the emergence of "Project Centers" at the GM Tech Center, to consolidate the design and development of new car programs that involved more than one Car Division at one common location, under one Chief Engineer, who reported to and took his direction from the group of corporate Chief Engineers. The intent was to share design expertise, assign specific systems of the car to each Division as the "Lead Division" for that system, to increase parts commonality across nameplates and reduce tooling investment, consolidate all the design groups for a car program in one place for improved communications through co-location of all involved disciplines, and manage the overall project under one leader. It made sense and worked relatively well, although the Divisional loyalties and politics continued to bubble under the surface, as all the personnel assigned by the Divisions to the Project Centers still worked for (and were paid by) their home Division engineering groups, not by the Project Center.

...

I had given some thought to leaving GM several years earlier for similar lucrative offers from Rockwell Automotive and Mitsubishi Aircraft, so I had been through the mental process and negotiating positions before, although I had elected not to make those moves. I had a series of off-site meetings in hotels over the next couple of weeks with various Chrysler executives to discuss the specifics of the position and my long-term career objectives, submitted my list of requirements to be met in order for me to leave GM after twenty-one years, and we came to an agreement in late January, 1985. I would report for work at Chrysler on February 18th.

The next morning, I sat down with my Director and submitted my letter of resignation. We had always enjoyed an excellent personal and professional relationship, and I had told him several weeks earlier that I had been approached, but hadn't made any decisions yet. I left several days later after cleaning up loose ends and leaving a status report to provide a logical starting point for my successor.

CHRYSLER CORPORATION, 1985-2001

Many of my long-time fellow GM colleagues questioned my sanity

when word got around that I was leaving for Chrysler, as those were the days when Chrysler was coming out of the Federal Loan Guarantees and didn't have the same comfort level as working for good old GM, which could (at least so far) survive anything and still make money, even if only from car and truck financing and home mortgages.

I had given it a great deal of thought myself, having no interest in going backwards personally or financially after twenty-one years with GM. In those days, people spent their entire career with GM, and were handsomely rewarded at their retirement for their 40 efforts, especially as a Senior bonus-level executive.

However, beyond being flattered by having them seek me out, I had seen something new and different in the Chrysler executives with whom I had interviewed during the recruiting process. These people were energized and motivated, most of them were real "car guys", they came across as risk-takers who had survived Chrysler's brush with bankruptcy, and they had a plan to bounce back and succeed. They were "scrappers" who did whatever needed to be done without forming committees or fighting multiple layers of bureaucracy to plead their case. I saw an opportunity to be part of something exciting and really contribute, so I decided to take the risk anyway and make the move. It certainly had more promise for personal and professional growth than the fumbling chaos I was leaving behind me.

I reported for work at Chrysler on February 18, 1985, and spent the next sixteen years in a series of challenging and rewarding assignments as Manufacturing Engineering Manager for Project Liberty and the "LH" cab-forward program (which defined the model for "Platform Engineering" for all future Chrysler car and truck programs), Chief Engineer – Advance Process Development, Director – Large Car Platform Advance Manufacturing Engineering (the "LH" cars), the same position for the Small Car Platform (Neon), and my last five years as Plant Manager of the Viper/Prowler assembly plant. The last sixteen years had nowhere near the "stories" as the first twenty-one, but had a LOT more successes and pride in accomplishment as part of a great team effort. That story will have to wait a few more years. (John did not end up writing the Chrysler part of his story, our loss.) Ó2021,

John Hinckley

Edited by Kurt Sonen

Excerpt Edited by John J. Cowall

The Full Story is Located on the CVOA Website , under the CVOA Tab, Under the Heading Publications

Vega Production at the Lordstown Plant

Vega Production at the Lordstown Assembly Plant

with captions by John Hinckley, GMAD-Lordstown Vega Launch Coordinator



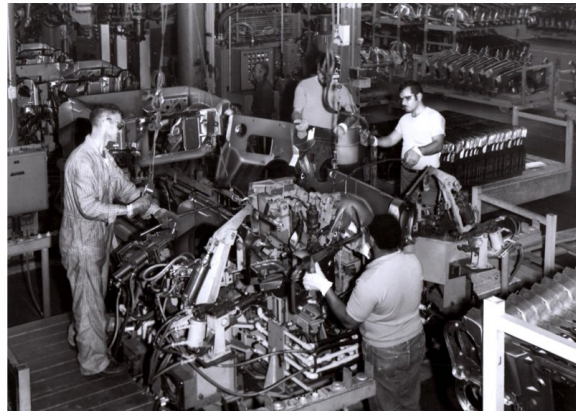
Compiled and edited by Kurt Sonen



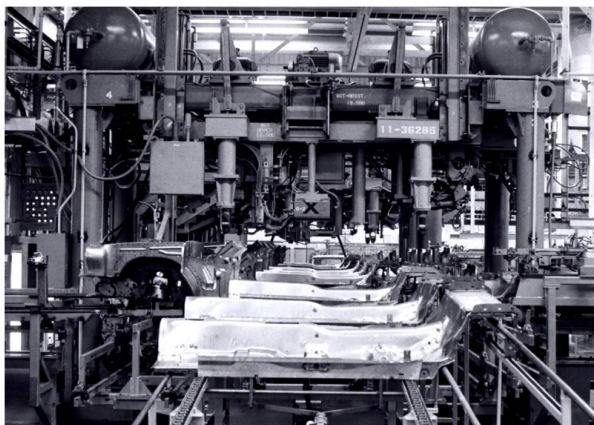
P.R. shot showing the front of the Chevrolet side of the Lordstown plant.



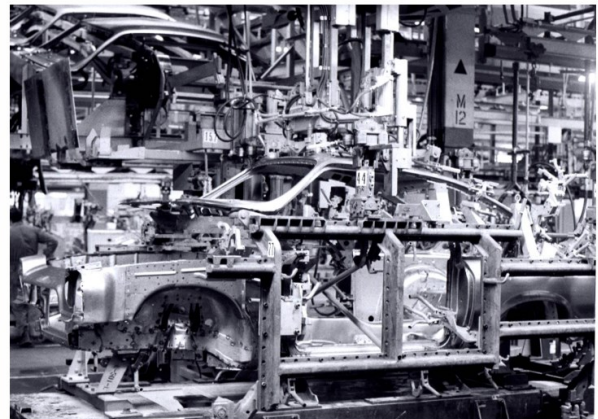
Aerial shot of the Lordstown complex; Fisher Body Fabricating (Stamping) plant at the upper left, Fisher Body/Chevrolet assembly plant in the foreground, and the Chevrolet Van assembly plant at the upper right. About 11,000 people were employed on the 1000 acre site.



Start of the body assembly process – the dash panel, radiator support, and engine compartment side panels are loaded into the automatic welding fixture that creates the engine compartment.



The underbody press-welders – this 5-stage system automatically welded the engine compartment, floor pan, and rear compartment pan together to form the completed underbody assembly; it ran at 140 units per hour.



The body framing line – the body side assemblies, built up in the side frame fixtures, join the underbody assembly and the roof in these moving fixtures to form the body shell. After tack-welding the four major components together, the side frame fixtures are removed and the body shell proceeds into the robotic welding line.

Vega Production at the Lordstown Plant Cont.



The "Unimate Line", the first fully-robotic automated body welding line in the industry; 26 Unimate hydraulic robots in 11 stations completed all body structural welding following body framing. Each body build truck weighed 14,000 pounds, and the conveyor drive system shuttled the entire line in unison from station to station every 30 seconds (120 units per hour).



Unimate robot in action – the large device at the lower right is a hydraulically-operated toggle that locks the body build truck in position before the robot begins its welding cycle. The robots are mounted on tracks so they can be easily pulled back from the line for access for preventive maintenance from the aisle.



Vega entering the 65,000-gallon "ELPO" dip prime tank after numerous cleaning and phosphating stages; the body is charged negatively at high voltage, and the primer tank is positively charged to ensure full and evenly-distributed film build throughout the body structure. Clamps were added to the conveyor hangers later to avoid bodies "floating" off the hangers and sinking in the tank.



Main downdraft exterior color spray booth; the interior has already been painted trim color and has been masked off (note masking paper on the dash of the dark car in the center of the photo). Note quick-color-change hoses and manifolds on the wall behind the sprayers. Ideally, colors were "batched" for two or three units in a row of the same color, as each color change sent about \$2.00 worth of lacquer and solvent down the drain to flush the lines to the spray guns.

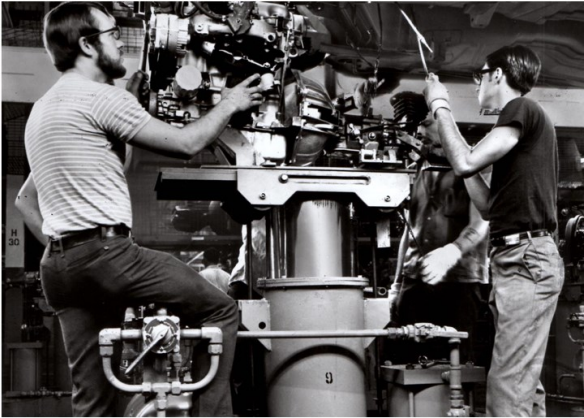


Four-minute deluge full-body water-test in the Trim Shop; the water contained a special dye that showed up under ultraviolet light in order to trace the source of any leaks.



View of the main portion of the Towveyor Line; the unit in the foreground shows the rear axle nearly in position (note rear coil spring in position on the base of the Towveyor for the assembler). Fuel tank was installed earlier, exhaust system was installed further down the overhead line.

Vega Production at the Lordstown Plant Cont.



The "Towveyor" air-over-hydraulic lift that raised the engine (and, separately, the rear axle) into position; they were pulled by an under-floor conveyor chain that was synchronized with the drive for the overhead conveyor carrying the body. There was less than an inch of clearance between the engine and the engine compartment structure during this installation; guide pins were used during the lift to maintain clearance.



Tire and wheel installation, using a multiple nutrunner. Tires were mounted and balanced in an automated system across the aisle at 550 assemblies per hour and delivered by overhead roller conveyors to the assembler in the roller chute at lower right; the fifth (spare) tire was diverted to another conveyor chute much further down the line for installation with the car at floor level. Note the machine-readable traveling inspection ticket under the windshield wiper, and the undercoating in the wheel well (sprayed in a booth in the background).



Grille installation - note plastic spacers to center it; the plastic nuts that accepted the grille screws were white so the assembler could see them clearly through the screw holes in the grille. Note the half-size broadcast sheet taped to the hood; teletype printers of the time couldn't print full 8.5"x11" sheets at 102 units per hour, so two separate half-length sheets were created. The one on the hood is the "Body" broadcast, and the one below the grille is the "Chassis" broadcast; each carried unique and separate information for those assembly areas.



Nearly-completed Vega preparing to transfer from the overhead conveyor to the moving "Flat-Top" floor conveyor plates on the Final Assembly Line; the rollers under the car center it for proper positioning on the conveyor.



Nearing the end of the Final Line - in a major departure from traditional practice, Vega seats were assembled across the aisle and were installed last to provide better assembly access to the interior of the car all the way through the assembly process. Front seat installation was simplified by having studs on the tracks that went through holes in the floor, and the nuts were secured from the center pit area between the conveyor tracks.



The first Vega built after the three-month national GM strike comes off the line in November, 1970; the two executives at right are the Chevrolet and Fisher Body Plant Managers.

Vega Production at the Lordstown Plant Cont.



One lane (of four lanes) of the final functional test section as the Vega came off the line. The first test was a road simulator with four independent hydraulic cylinders that shook the car with the engine off to spot any squeaks or rattles, the second was a brake tester that measured braking force at each wheel as the driver drove in and stomped on the brakes, and the third was a dynamic roll-test where the car was driven on rollers at road speed and then had toe-in set with the front wheels turning. Massive ductwork draws exhaust fumes out of the area.



Finished Vegas roll out of the Shipping Building, where they received another complete final inspection before being released to the shipper.



The Shipping Yard, with cars lined up by geographic zones, awaiting either truck loading for local delivery or rail loading for remote destinations.



The Vert-A-Pac rail loading area, where Vegas were shipped, 30 to each special rail car, nose-down and fully protected from the elements and vandalism. Four cast iron sockets were inserted in reinforced holes in the underbody, then the cars were driven onto the lowered rail car door; when the rail car door was raised, the cars rolled a few inches forward and the sockets engaged four steel hooks on the rail car door.



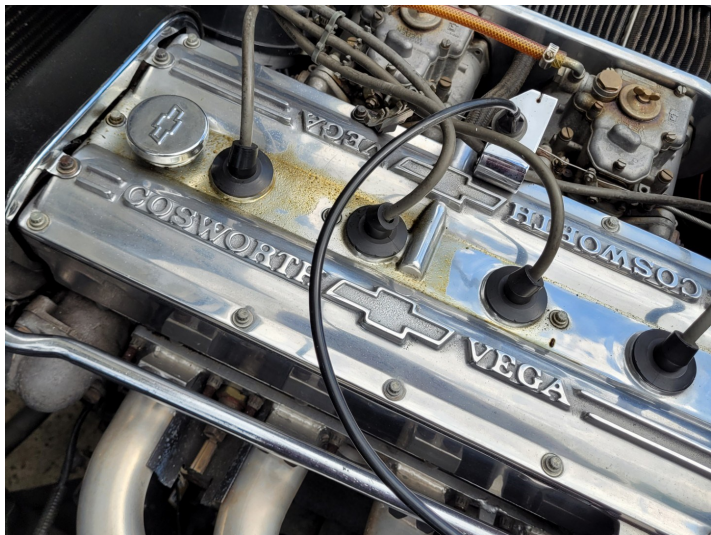
All Vega fluid containers (fuel tank, carburetor, battery, washer fluid, engine crankcase, etc.) were designed so the vent locations were above their fluid levels whether the car was level or standing vertically on its nose. Note the traditional tri-level Stac-Pac rail cars on the right which could only hold up to 15 cars vs 30 cars with Vert-A-Pac.



Vert-A-Pac was only used for Westbound shipments, as most railroad underpasses on the East Coast were too low to clear the very tall Vert-A-Pac rail cars; Eastbound rail shipments used conventional tri-level rail cars. Vert-A-Pac was a joint venture between GM and the Southern Pacific Railroad; the railroad supplied the basic "chassis" of the rail car, and GM paid for all the structure and mechanisms from there up.

CV #1000 A Daily Driver Again? (at least for a week...)

CV #1000 A Daily Driver Again?



This could be a lengthy story... I'll try and keep it short, LOL. In 2020 CV #1000 paint job was definitely showing its age. Chips, the stripes were mismatched colors, and definitely wearing thin in some places. I was able to work out a deal with a local CV Member (Aaron Kalinecki) who had restored another CV a few years back. He did a great job painting that car, so we worked out a deal and he agreed to prep, paint, and strip CV #1000.

Aaron did a phenomenal job, showing me his progress along the way getting #1000 ready for the paint. I figured the process would take a year or two, Aaron has a full time job after all. He did most of the prep work out of his garage, rented a paint booth, and got #1000 sprayed with a base coat clear coat black paint. In the fall of 2022, CV #1000 was ready for pickup.

I got her back into my garage, and in the winter of 2022 and spring of 2023. I started putting her back together. Putting bumpers on, windows back in, new rubber moldings on the doors, hatch, window trim, etc. (One thing that had bothered me on the car for a long time was that the Windshield leaked around the seal, and was clear glass, where the rest of the car was the soft-ray tinted glass. Back in the early 90's/ late 80's, the former owner, Lou Marr, had restored the car, and they had put soft-ray windows in all of the car except the windshield! I was able to work out a deal with David Dempsey, who

happened to have a soft-ray tinted windshield. So, that got installed onto #1000 as well, and the leak is definitely gone!



I used #1000 sparingly in the summer of 2023. I ended up bringing CV #3136 to the CVOA National Roundup, instead of #1000. I did not think #1000 was ready for her debut just yet. But, I got her to the Woodward Dream Cruise in August of 2023, and she showed out terrific! To say I am happy with the car is an understatement. I am proud to have this car shining in all its glory, in honor of Lou and Harriet Marr. Lou entrusted my



CV #1000 A Daily Driver Again? (At least for a week...) Cont.

family with the car, with his only caveat was to “Drive



the Son of a Bitch!” (If you knew Lou, you understand that sentiment!)

Well, I knew I had to my daily driver (my truck) into the shop for some suspension work. I knew it would take a week or so to get it fixed, and put that off as long as I could. But, I knew that would mean I needed to bring #1000 out of the garage as a daily driver during that time. I had a few lingering issues that needed to be addressed on #1000, so, this spring, I took care of those issues. 1) the clutch cable would stiffen up as the car warmed up. This is usually caused by the inside lining of the clutch cable to have worn down. So, I bought a replacement cable through Rock Auto. (I had to use the 45” cable, the Cosworth Cable is 60” long to allow for more room to go around the header, but no one makes the long cable anymore. I found a good route to keep the shorter cable away from the header, it can be done.) 2) Another issue was the Alternator, on start up, would whistle pretty loudly. It would stop, but I knew there was issue there. So, I bought a replacement alternator on Rock Auto, installed that, and the whistle is gone. (I have not take apart the old alternator to see what the issue was.) 3) There was clunking in the exhaust system. I ended up jacking the car up, and added the bracket that goes from the transmission to where the catalytic converter usually sits. (I have a cheater pipe in place of where the catalytic converter would usually go.) I am not sure why that bracket was off the car. But, I in-

stalled it, and the exhaust system is now rock solid with very minimal movement. I took #1000 for a test drive, and she did well.

So, on a Friday I took my truck in to the shop, and put #1000 into the driveway. I checked the oil, it was full, and #1000 started her week as a daily driver. For fun, I decided I would use #1000 like a real car. I would not open the hood for the entire week, driver her like I drive my truck, park where I normally park in the driveway, at work, not wash her for a week, the whole thing. This was the first week of May.

Monday came, she started right up, went to work with no issues. For the majority of the week, there were no issues. No whistling from the alternator, no clunking from the exhaust, and the clutch cable worked as it should with no binding. Frequently, driving home from work, I encounter at least one traffic jam on I-75 through Detroit. #1000 handled that, sitting in traffic, no



overheating, barely ever getting close to the 185 degree mark on the temperature gauge. Also, taking Chloe to her volleyball practices. As well as going to my golf league on Thursday night. There was plenty of rain

CV #1000 A Daily Driver Again? (At least for a week...) Cont.



through the week as well. The windshield did not leak, which was nice to see, and all of the new rubber seals helped keep water out of the inside of the car! (Seems like a simple thing, but with some of the CVs I have had over the years, this hasn't always been the case. As Wednesday came and went, I started to see the car get dirtier, and dirtier. The streaks on the roof and hood from the dirt, the brake dust and dirt making the rims look not so nice, but, I told myself, resist the urge to wash her! Go the whole week as a regular driver!

Friday Evening came, I got home, and the truck was ready for pickup from the shop. (New shocks and struts all the way around, there was a leak around the rear window seal that needed to be fixed, an alignment, etc.) I got the truck, brought that home, and it was time to garage #1000 again. I took some pictures of #1000 after her week of daily driver use. I put about 450 miles on #1000 for the week. One nice upgrade we did to #1000

quite a few years back, shortly after getting her from Lou Marr, was to install a Roy Linenberger rebuilt T50. This made cruising on the freeway (when not in a traffic jam!) pretty nice, cruising at 75-80 mph at the 3200 to 3600 rpm range. I did finally open the hood on Friday night. The engine bay was still nice and pretty as expected. With only a slight puddle of oil on the cm carrier cover top. I guess I need a new oil cap. Not Bad for a 49 year old car!



Fast Forward a few weeks later, JC came over to clean up #0803 and get her ready for the car show season here in Detroit. So, I gave #1000 a bath, and all that grime and road dirt came off, and the car gleams again with her new paint job. You wouldn't even know the car was used for an entire week!

Thank You,

John J. Cowall

Proud Custodian, CV #1000 and CV #3136

CVOA National Roundup 2024 Cookeville, TN

Roundup 45 Cookeville TN Itinerary (tentative)

Are you guys ready for some of the things I have planned for the roundup?

Thursday we can judge cars at my place if anyone wants to. I have 2 lifts if last minute repairs are needed.

Friday we will visit the Lanes Motor Museum its full of 1 off cars. we will have lunch there. I'm still working on a second location for this day.

Saturday we will try to hit a cars and coffee then off to the REDNECK Rumble Car Show for some of the craziest cars and trucks. It's the mecca for Rat Rods ! The Dinner will be out with friends but don't take too long because we will then head out to The Sparta Drive in Theater for a very special movie that ALOT of us have seen but not on the big screen.

Sunday we will sleep in a little or go to Church. Then we are off for a ride in the amazing Tennessee backroads ending back at my place for a catered BBQ and awards.

D



CVOA National Roundup 2024 Cookeville, TN

Welcome everyone to the 2024 CVOA/ H Body National Roundup. (Yes, I said H-Body. I have 4 H-Bodies, and no Cosworths! But, I am hosting the CVOA National Roundup for All!) I have a bunch of Fun things planned for this Event . We will start off on Thursday with a BBQ evening at my place. Some of the other events need to just be Finalized but it should be a Great Weekend with the CVOA and other H-Body Folks. ALL H bodyds are welcome. If you have Any Questions feel Free to call me at 570 972 3410 after 4pm central. I have booked us a bank of rooms in a Really nice hotel at a great room rate of \$109 per night. Book Your rooms now, and plan on seeing you in September of 2024!

TownePlace Suites Cookeville

1250 Sams Street Cookeville, Tennessee 38506
931-548-0950

Call to Make Reservations Mention the Code below.

Code – CVOA -2024 Roundup

More Details will follow as we get closer to the Actual Roundup Dates of Sept. 19- Sept. 22nd.

Actual CVOA Registration Form should be ready and in the CVOA Magazine for the Q1 2024 (due in Late Feb. 2024). And will be available on the CVOA Website for Print Out as well.

Your Roundup Host

Bill Lynch

570-972-3410

monzabill@gmail.com

CVOA Cookeville Registration

Cosworth Vega Owners Association National Roundup 45

Cookeville, TN

September 19th – 22nd

Name _____
 Address _____
 City _____ State _____ Zip Code _____
 Phone _____
 E-Mail _____

ROUNDUP ATTENDEES

Adults (18 +) _____ @ \$110 Each = \$ _____

Children (6-17) _____ @ \$50 Each = \$ _____

*Includes T-Shirt Total = \$ _____

*Add \$5.00 for larger than XXL

Will you be bringing your Cosworth? Yes No Dash Number _____

Will you be bringing your H-Body? Yes No Model _____

Class for Concours:

CV Stock CV Modified CV Custom H-Body Stock H-Body Modified

ROUNDUP 45 SHIRTS

T-Shirts

Size: M _____ L _____ XL _____ XXL _____ XXXL (+5.00) _____

Hotel Information

Town Place Suites, Cookeville, TN. 1250 Sams Streets Cookeville, TN 38506 Phone - (931) 548-0950. Rate: Approx \$109 Per Night Plus Tax

You must reserve your hotel room. Mention Code "CVOA 2024 Roundup" when you make your reservation.

PAYMENT

Please make Check or Money Order Payable To:

Bill Lynch

153 Ludwig Dr.

Bloomington Springs, TN 38545

Phone - 570-972-3410

Email- monzabill@gmail.com

CV #3241 For Sale

For Sale \$17,000
JD Smith's CV #3241 1976
Orange and white.
With manufacturers sun roof.
Very Rare con figuration.
It's been garaged since his death and started once in a while.
Barbara Smith
407-800-8103
Please Call If Interested



CV #3365 For Sale Jerry Tomlinson, TN UPDATED!

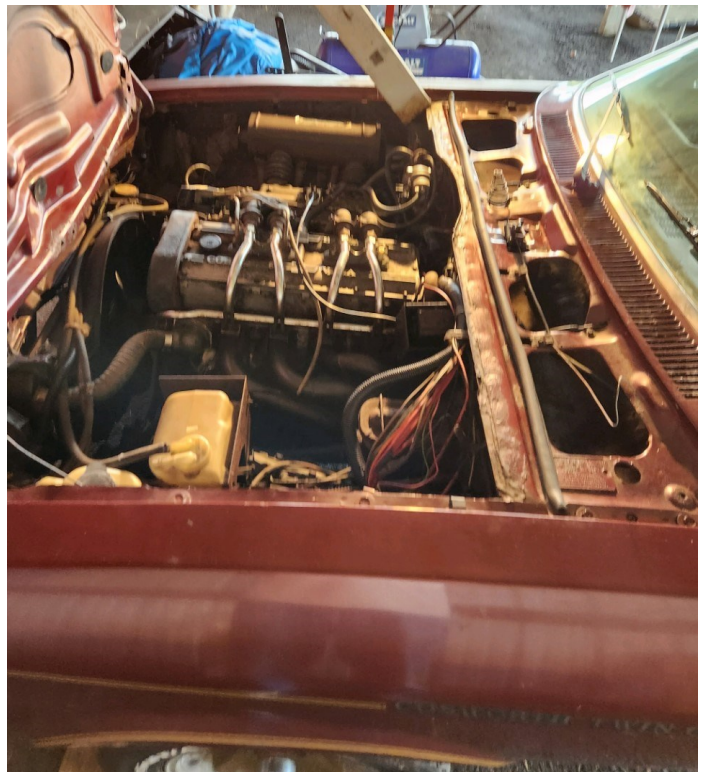
CV # 3365 For Sale. Asking \$4500.00/ OBO (or Make Offer)

Car is in Bethpage, TN. Ask for Jerry Tomlinson, Phone #419-707-0048 (or text)

Mahogany Exterior/ Tan vinyl Interior, 5 speed transmission

Car has 124,000 miles. Has not run in 30 years. Some rust around front fenders, doors. See pics for details. Good Restoration Candidate!

Car may be at Cookeville, TN Roundup for Pickup! May be at Roundup for Viewing!



CVOA Official Merchandise

(Price subject to change without notice, see CVOA Website for real time pricing)

<p>CVOA-PT-19 Neoprene Rear Main Seal \$30.00</p>	<p>CVOA-PT-05 \$28.00 Camshaft/Distributor drive seals. Set of three.</p>
<p>CVOA-PT-20 \$45.00 Gates reproduction lower radiator hose</p>	<p>CVOA-PT-06 \$5.00 Distributor O-Ring Set - 3 Rings</p>
<p>CVOA-PT-21 \$8.00 Front brake hardware set. One set required per front caliper.</p>	<p>CVOA-PT-07 \$25.00 Distributor drive belt.</p>
<p>CVOA-ACC-2 \$ 4.00 Kan Coolers - Foam sleeve to keep a can cool. Yellow with 20th anniversary logo.</p>	<p>CVOA-PT-08 \$135.00 Cam drive belt Fel-Pro Water Pump Gasket - No Charge with Belt Set Only</p>
<p>CVOA-ACC-3 \$ 3.00 Window decal - New design, static cling type. Affixes to inside of window. White background.</p>	<p>CVOA-PT-09 \$225.00 Water Pump with updated bearing set. Water pump purchase requires core to be returned. Gasket included. CORE CHARGE is \$100.00 *will be refunded when core is received</p>
<p>CVOA-ACC-4 \$ 4.00 CVOA Jacket Patch . Older design 3" round, WHITE background.</p>	<p>CVOA-PT-10 \$22.00 Heater box rebuild kit. Reproduction kit with seals. You will also need to get a small tube of 3M Super Weatherstrip Adhesive and some 3M Strip Caulk from your local parts store.</p>
<p>CVOA-PT-01 \$50.00 Upper End gasket set. Includes cam cover, cam carrier, intake and exhaust.</p>	<p>CVOA-PT-12 \$ 11.00 3M "27" Tape - The special white insulating tape used on the left engine wiring harness. 7ft. roll (enough to do one car) '75 or '76. LIMITED SUPPLY.</p>
<p>CVOA-PT-02M Molina Cosworth Vega Head Gasket \$235.00</p>	<p>CVOA-PT-13 \$ 11.00 Fuel Injector "O" Ring Kit - Includes (4) fuel rail grommets, (4) injector manifold seals, (8) injector to rail seals, and instructions.</p>
<p>CVOA-PT-02C \$75.00 Head Gasket Core-Tec with instructions for making the oil restrictor.</p>	<p>HME-1-2 2 Piece Dash Bezel \$125.00 (Machined Turned, Gold Tinted)</p>
<p>CVOA-PT-03 \$75.00 Lower end gasket set. Includes oil pan set, oil pump set, rear main set (rope seal), and water pump gasket.</p>	

CVOA REGIONAL DIRECTORS

WESTERN REGION

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925-642-0368
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Dave Bloch– Midwest Region Director
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Jack Hovick
H-Body Region
402-416-0153
Jack.big24fan@gmail.com



CVOA VENDORS

Carpets - Molded Floor, Rear Cargo and Material

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(800) 352-8216

***Note:** 1976 carpet is longer than the 1975. CVOA discount.

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101 Ridgecrest Drive, Lawrenceville, GA 30046
(770) 962-7556

Computer Repair

Bob Stallwitz, Pekin, IL
(309) 824-5940 Email: rstallwitz22@gmail.com

SMS Auto Fabrics

(<http://www.smsautofabrics.com>)
350 South Redwood Street, Canby, OR 97013
(503) 263-3535

Seat Belts- Repair and Restoration

Ssnake-Oyl Products (<http://www.ssnake-oyl.com>)
114 N Glenwood Blvd., Tyler, TX 75702
(800) 284-7777

Remanufactured Vega Steering Boxes

Lares Corp. (<http://www.larescorp.com>)
855 South Cleveland, Cambridge, MN 55008
(800) 555-0767

Weatherstrip for your Cosworth

Metro Molded Parts (<http://www.metrommp.com>)
11610 Jay Street NW, Minneapolis, MN 55448
(800) 878-2237

Cosworth Vega Professional Wheel Refinishing

Wheel Medic
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Columbus, OH 43224
(614) 299-9866

CVOA TECH ADVISORS

***Restoration and Mechanical**

Bob Chin, Bloomington, IN

812- 318-4604

4pm-9pm EST

BobC997615@yahoo.com

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Products that are currently available

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Reproduction Sill plates 71-73 OR 74-80	\$255* for two sets
Reproduction Sill plates 71-73 OR 74-80	\$370* for three sets



3D printed Vega visor mounts (pair)	\$45*
3D printed Vega visor mount (single)	\$27*
3D printed Vega Door Pulls all black (pair)	\$82*
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3D printed clutch cable bushing	\$25*
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Weber throttle cable bracket polished (Cosworth)**	\$90



*Includes shipping to the lower 48 States, surcharges do apply for other. Prices and availability are subject to change.

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Sending Unit Rebuilds

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\$165 flat rate, plus actual parts cost (see parts costs below) and return shipping.

I will de-rust your unit, coat all the internal pieces with POR15 tank liner, install LP or Fiero pump, recondition connector pins and replace resistor can if needed.

Current prices on parts (4-21-2024)

- Fiero HP in-tank pump (Cosworth Vega): \$60
- LP pump: \$27
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- New electrical straps: \$5 each
- Sock: \$10
- New O-ring: \$10

Option #2: Repair Level Sensor Only

\$190 flat rate, plus return shipping.

If you are satisfied with the overall condition of your sender and just want the level resistor repaired. This repair includes a new resistor can, recondition of connector pins and electrical straps/wires.



Website: jayshshackllc.com

Facebook: Jay's H-Shack LLC

Cosworth Vega: Sun-Visor Replacement Brackets

Replaces Molded Visor Retainer



Finished Side Contour



Back Side Contour

Contact Email: leapertech@gmail.com

Attn. Jim McIntosh

Order: \$37.50 per Pair or quantity of 2 (less shipping); Personal or Bank Check to Jim McIntosh

Part Specification: 3D Printed with Nylon (Black) infused Carbon Fiber Material ([Markforged Pro](#))

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Fuel Injection Corporation began as a one-man business that started in Bob White's home in 1987. FIC is still family ran and is located in Tracy California. For more than 30 years FIC has offered access to the finest rebuilt fuel injection components in the industry. FIC offers several product lines that are exclusive to Fuel Injection Corporation.

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Does your CV race to 3000 or 3500 rpm on cold starts? Your Fast Idle Valve O-rings, brittle from heat and age, have undoubtedly broken.

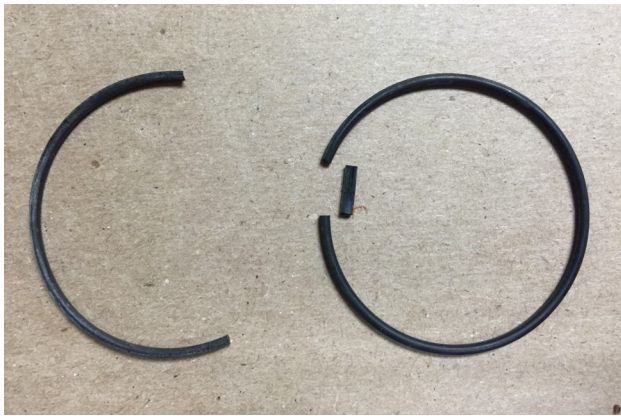
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markarock@gmail.com 216-789-3480 cell

*Refundable \$100 core charge



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1975-76 COSWORTH VEGA

Kit Contents:
• 2 "Cosworth Vega" fender emblems

Part #7576CV (plus color code)



CV #3244 With Tab McGee's Daughter. They are getting this car back on the road. Down in Texas. (Originally a Medium Saddle Metallic CV!)