VELOCITY VIEWS

Volume 12

First Flight for Lavoie's Franklin Powered Velocity RG

Rick Lavoie flying his standard RG Velocity, N570, over the St. Augustine, Florida, coastline. Notice the sunroof. Photo by Bill Ruch

"Show me the baby!" After building my Velocity RG, I can sort of empathize with a woman after giving birth. Nobody (except for other expecting mothers) cares about the labor pains, they just want to see the newborn. Well, it is pretty much the same thing building an experimental airplane. My labor pains are now over and I love my new Velocity. The only people interested in my labor pains are the builders that have yet to conduct their first flights. Understandable, they want to learn from my mistakes (and things I did right) to minimize their own labor pains. This newsletter is dedicated to those of you still laboring.

Persistence is the key word. Both Mark Machado and Moses Eziekel told me the same thing two years ago. Do not focus on the big picture. Just focus on the step that is in front of you. Also, do something every day. Before you know it, you will be done! I started my project in April 1995, and just flew my maiden voyage on June 25th. That is two years and three months building time. I did just about everything myself, including my wings. I had some help from my wife, my dad, and my best friends. My friends became scared to visit, as I always seemed to find something for them to sand. My Dad persisted and just kept coming back

Continued on next page

In this issue

Lavoie First Flight

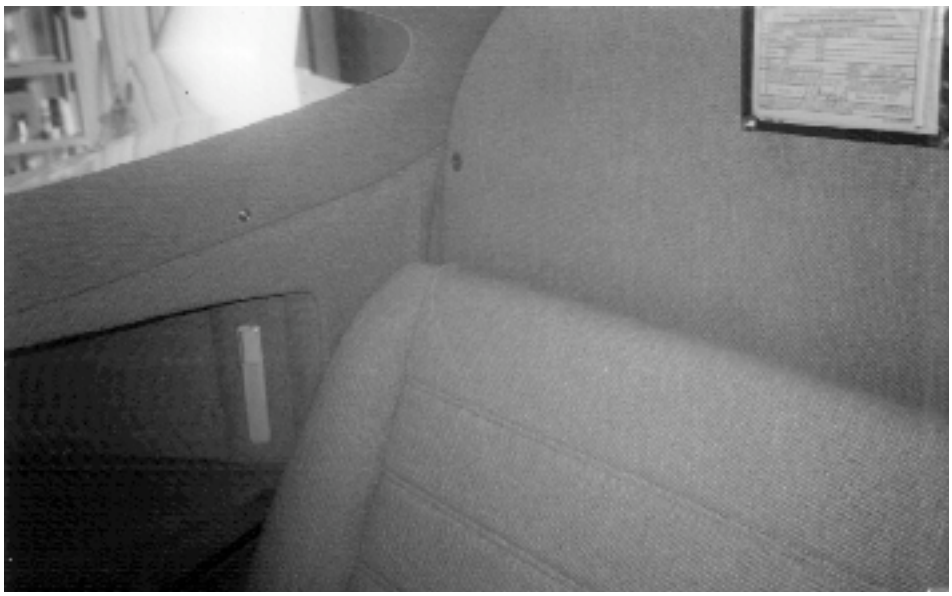
Continued from page 1

for more. Besides helping me move little parts around (like the wings!), my wife Judy did all of my interior herself. If you don't believe me, just try getting in my plane with dirty shoes on! The only thing I had professional help with was my instrument panel. A very smart decision, and when you see my Velocity, you will know why I'm so happy with that Martin Hadley panel. It looks and works great!

Construction time (my time only) up to my first flight was 2,643 hours. Since then, I have logged an additional 400 hours "tweaking", bringing my total construction time to 3,000 hours. Besides my 3000 hours, Judy spent about 250 hours on the interior. Why so many hours you ask? Well it seems that being "one of the first" to do something adds substantial construction time to any project. Prior to picking up my engine, I had about 1900 hours of time logged, with only the engine, engine electrical, finish paint and interior to go. I figured another 300 hours, and I'd be flying. Wrong! Being one of the first Velocity builders to mount a Franklin engine added about 400 extra hours to my project. Fortunate for the future Franklin Velocity builders, you should not have to follow my foot steps and re-create the wheel. I have worked closely with the Swings. They are aware of all the problems and are working to update the engine install kit and instructions. Also, the people at PZL Franklin (in Poland) were extremely helpful and eager to help solve my oil temperature problems. An article on my Franklin engine installation is contained in the "Builders Forum" section of this newsletter. One final word on construction hours is that the "learning curve" is high. If I were to build a second Velocity RG with a Franklin engine, I'm sure I could do it in about 1500 hours.

Being the publisher of the newsletter, I get many e-mails and phone calls. One "wanabee" wanted to know about the service from the factory. I told him that just yesterday

Judy hand-cut a stencil from acetate, tracing over letters she printed off the computer. She sprayed light stencil adhesive on the back, positioned the acetate on the door panel fabric, and used white cream-type fabric stencil paint to create the word "Experimental".



Rear bench seat interior with trim pieces that bring the material right to the windows. Notice the EZ style fuel gauge. Refer back to Vol. 8, page 19 to see the unfinished trim piece and fuel sight gauge. It sure looks better now!

(Sunday), I had called the Swings six times. As a matter of fact, Duane started answering the phone "Hello Rick". This was a Sunday a few weeks prior to getting the XL ready for Sun-n-Fun, too. No matter what, Scott, Duane, Martin, and Jeff are always very willing to help clarify something in the manual, or help solve a construction problem. This kind of friendly service is Velocity's strength. Thank you all very much! You are true friends.

I want to share with you the story of my first flight. As I pushed the throttle in, my plan was to hover a few feet above the runway to check out my flight control response, thus giving me the option to put her back down if there was a problem. But instead, the nose literally leaped off the ground, and I was climbing at 1000 feet per minute! I applied full nose down trim, reduced power, and used plenty of muscle to hold down the nose, to level off at 1,500 feet AGL. The trailing edge of my elevator was up over 1". I also noticed that I was porpoising slightly. To make matters worst, my alarms for oil temperature and CHTs were flashing on my JPI engine monitor. Naturally I made gentle turns and headed back to the runway. My only thought was

to get back on the ground safely. To my surprise, I made a very nice landing. There was a crowd of about 30 of my friends, including my parents, waiting on the ground. When I exited the aircraft, they had rolled out a red carpet, poured champagne and were all ready to celebrate. My thoughts were quite different, I was still shaking, with sweaty palms, just happy to be alive! Would I fly my own first flight if I had to do it over again? Yes! Well then, what's the point of this story? Am I trying to put some fear into those of you who have not yet flown your first flight? Yes, I am!

For those builders that are still building and thinking about piloting your own first flight, I have some strong advice. You need to have a "factory sign off" and plenty of Velocity left-seat time. Otherwise, get somebody with good Velocity experience to do it for you. I considered myself just marginally qualified to do my own test flight. At the time, I had a two year old factory sign off with Scott Swing, had flown N81VA (factory demo) to the Bahamas twice (a year apart), and about 25 hours of Velocity time total, and about 300 hours of Long EZ time to boot. Also, I had just recently completed my bi-annual flight review with Tom Jeter in N81VA. Did I have enough experience to get into a Velocity and go fly it? Yes. Did I have enough experience to get in a Velocity and test fly it for its maiden voyage? Just barely! The problem is quite simple. On any maiden voyage, you can expect the unexpected to happen. As in my case, if I did not act quickly, I may have become another statistic. Much of the "experimental aircraft" risk occurs during that first flight. The typical scenario is that the builder has been busy building, and has logged very little recent flight time. Also, the builder may fail to understand that the Velocity requires special flight skills, quite different from flying a Cessna 182! That builder very much wants to conduct the first flight (ego), and thus puts himself in a high risk situation. Don't do it! Get that factory check ride and log some time in a Velocity. Tom Jeter (factory CFI) is available full time for factory training, sign offs, and bi-annual flight reviews in N81VA. If you do not want to go to the factory in Sebastian or the West Coast Service Center, you can do like Richard Dargis did. He hired Tom Jeter to fly to Canada. In any case, please do not do your own first flight unless you are experienced.

Instrument panel by Martin Hadley. I just love to sit it in and look!

So back to my first flight, why the nose up attitude, porpoising, and high engine temps? The nose up attitude was caused by two things. My canard was generating extra lift, due to my building up the area over the spar. Plus my wing incidence jig was defective by about 3/32". After consulting with Scott, I lowered the incidence of my canard by 1/8". Regarding the porpoising, most of it was probably just me over controlling the stick, but also I eliminated some slop that I had around the bearings within my elevator concentric torque tubes. On my next flight, the aircraft flew just perfect, except for the high oil temps. Scott said that the ideal position for the elevator is for the trailing edge (TE) to be slightly up (not more than 1/4" up). My plane also weighed in on the heavy side at 1428 lbs. When I am alone in the plane with low fuel, I need to add ballast to the nose to move my CG forward. I made removable ballast out of lead that fits in the nose area. The aircraft now flies and lands just great!

'How about that Franklin engine with the IVO prop? The 6 cylinder Franklin engine runs very smooth, and, combined with the IVO prop, gives tremendous take off and landing advantages. I have climbed out at 28 squared and the VSI is pegged at 2000 ft per minute. I have recently been landing on the small runway (2600 ft), using only about 2300 ft total to stop. My engine temp problems have been resolved and I thank Mr. Wieslaw Bomba and Boguslaw Reichel of PZL Franklin in Poland for all their help and support. They went to the trouble of setting up a Franklin on a stand to duplicate my problem (refer to my article on the Franklin engine in the Builders Forum section of this newsletter). We corresponded by fax for over two months to get my oil temp problem resolved. The people at PZL demonstrated that they want to make the Franklin 6 cylinder the engine of choice for the Velocity by providing great service.

I can't tell you how happy I am with my new Velocity! Just sitting in it or polishing it gives me great joy. Flying is pure ecstasy. My calender is just filled with flying trips, the first of which is the Central States Association's canard pusher fly-in to Rough River State Park in Kentucky. Just mention a fly-in and Judy and I will be packing! See you soon...

Rick Lavoie

Prudhomme's Dream Machine Velocity XL RG

Jean Prudhomme and his good friend Gus stopped in at St. Augustine for a quick visit. They were returning from a number of shows in North America, including Oshkosh. I marveled at Jean's creation.

I first met Jean and Gus back in May of 1995 at our first Bahamas fly-in. Jean and Gus were the life of the party. They both kept us laughing the entire weekend.

Way back then Jean told me of his concept for a bigger Velocity. I thought he must be crazy, how can he do this? Little did I know that the Swings were thinking the same thing. Jean worked closely with the Swings, and now we have two flying XLs.

Jean started his project in December of 1995 and logged 4000 hours. His first flight was July 15, 1997. This is Jean's 7th homebuilt (2nd Velocity). Jean told me that he will be offering professional building services for individuals wanting to build a Velocity. He especially likes building the bigger XL! Jean's phone number in Hollywood, Florida, is 954-920-5419 or 954-983-1094.

Gus and Jean stand proudly in front of N140JP

The beautiful Velocity XL RG rolls down Runway 06 at St. Augustine

Jean's interior and panel are really unique! Jean thought of just about every creature feature you might imagine. Want to watch TV or play a video? No problem. How about a 16 changer CD player? Jean's panel is also loaded, as the photo to the left shows. This is one plane you just have to see for yourself. I hope that Jean comes to the Sebastian fly-in this November so we can all marvel at his creation! How about it Jean?

Why not send me some photos of your flying Velocity? We want to see it in the next volume!

Rick

by Duane & Scott Swing

New Family Additions

Jeff and Cindy Baker are the proud parents of a new baby boy. His name is Daniel. They now have a pair, David and Daniel. Good job Jeff and Cindy.

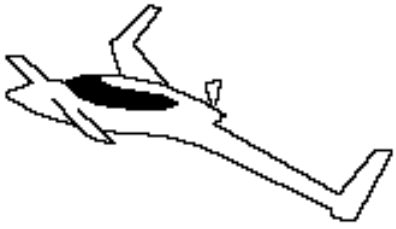
Flash!! Scott and Amy also became parents to Wesley, a 10.5 lb. monster boy born 9-19-97. It looks like we will have plenty of help in years to come.

<Editor's note: In hearing the size of Scott and Amy's new son Wesley, I just have to wonder what Scott and Amy might have been thinking about during conception? Remember that at this same time, they were building the new XL, which Scott affectionally nicknamed "Fat Boy" or "Bubba">

XL Fastbuild Option

We are hard at work to get the fast build fuselage for the XL completed. Our goal is to provide the fuselage with all bulkheads installed including the firewall, the retract gear installed with the major heavy lay-ups between the main gear bulkhead and the firewall completed, the ducts installed, the upper fuselage access door completed, windshield and side windows installed, the two fuselage halves joined together and the gull wing doors installed with the seal flange in place. The carry through spar will be indexed for proper alignment but not installed for shipping reasons. This should reduce building time by about 300 hours, at an added cost of about $5,000.00. If you are waiting for an XL with the fast build fuselage, please be patient. We are doing the best we can to get up to speed.

Our XL has over 125 hours of flight time to date with only minor problems. We have completed all the mold work for the plenum system and it should be ready to ship soon. We also finalized on an engine mount that will hang either the 260 or the 300 Lycoming. The 300 Lycoming will present some builder problems because we do not have a 300 horsepower plane to work with. We have completed the 300 plenum but have no idea if the cooling ability will be the same as with the 260. What I am saying is that those of you who will be using the IO540, 300 HP engine will be doing some trial and error work in the installation and flight testing. Those who get there first will be the most help to those who follow.



Looking for First Flights and Flying Velocity Stories

When you get your project airborne, send photos and information about you and your Velocity to Rick Lavoie at *Velocity Views* Newsletter.

OSHKOSH '97

Almost 100 Velocity builders showed up at our display this year with pictures and comments about how their work was progressing. Over 125 were in attendance at our dinner, followed by a good exchange of information from one builder to another. We also had several of you fly into Oshkosh. Wm. Huisman flew his Elite in from VA, Hugh Dunn flew his RG in from Ohio, Mark Ewart flew in from Delray Beach Florida, Timothy England flew his V6 powered RG in from Ontario, Jean Prudhomme flew in from Hollywood Florida in his brand new 300 HP XL. Mark and Nancy brought our 260 HP XL in from Lincoln California, Chris Conklin flew his FG in from Tulsa, Kirk Lindberg came in his FG from Inver Grove Heights, MN, Tom Cacek flew his RG in from Lakewood California, Arthur Hernandez flew in from Golden Colorado, Sam Muncie flew his Franklin powered RG in from Columbus Ohio and Joe Mistretta from Albuquerque NM. Bonnie and I flew the prototype Elite up from Florida on the Saturday before the show and liked to die in the high heat and humidity present during the week proceeding the show. We are not used to this, living in Florida. (Sure). This makes a total of 13 Velocitys present. Next year we will be looking for YOU.

The new location, along with the new airplane (XL) and the excellent weather, resulted in several new orders. One of note is Jay Hoogstra who is modifying a FG XL as a camera ship. Jay is now using an Aztec for this work and will be able to

Continued on next page

Owners Flight Manual

We have published a new owners flight manual, with 2 different versions, covering all our airplanes that is 8 1/2" high and 5 1/2" wide. It has room for all your weight and balance information along with the normal 100 hour/annual inspection procedures, emergency procedures, engine starting procedures etc. etc. This new manual will be shipped to all our new customers as part of the construction manual. If you want one for your airplane, it is available for our cost of $8.00.

Factory News

Continued from previous page

match the room and speed of his Aztec at less than half the cost. We look forward to working and getting to know these new customers.

I would like to thank all of you who were there and who gave us a word of encouragement. You are all special to us and we want you to know that. One word of advice, if I can jump on my soapbox for just a minute, Sun-N-Fun and Oshkosh are not a good place for us to spend a lot of time answering builders questions. We are there to introduce our airplane to those who are looking for a building project. I have had two phone calls since returning from Oshkosh, perhaps this represents only a small number of potential calls, from prospective customers who complained that they stood around for as much as an hour waiting for us to finish a conversation with one of our builders who dominated our time with builders questions. Don't get me wrong, if you have questions, please ask, just don't hold us hostage with questions while prospective customers are forced to head over to a competitor.

Duane

Sloppy workmanship...

Over the past year we have seen several customer airplanes come into the shop for one thing or another. Of these, I have seen some disturbing things that I want to relay to you all. The problems that I have seen do not relate so much to what was done, but how it was done. Things are not finished, glass work is sloppy at best, and sometimes unsafe, overall poor attention to detail. Because of this I want to go over some things that may improve our odds.

I know sanding is a pain but sand until it is sanded. I don't want you to overdo it since some of the glass is real porous and if you sanded until it was all dull the glass would be gone, but at least get all the tops sanded. Vacuum your work and check it to see if you should sand some more. Clean the area properly before you glass over it. Use of peel ply is nice and really looks good when you are done. When wetting out the cloth, use your brush to apply pressure to the lay-up and this will get excess epoxy back into the brush where you can wipe it back into the cup or further on the lay-up. This procedure doesn't need to be done until the last layer of cloth has been applied, but in order to keep epoxy from running down the side of your fuselage it would be nice. When using triax, make sure you pre-wet the lay-up on plastic if you can and let sit for a while until it starts to get a little tacky. This is done to keep the epoxy from draining out of the lay-up which is undesirable and looks bad. When the lay-up is ready to install, pre-wet the area where the lay-up is going, apply the lay-up, use your brush and squeegee to insure that the lay-up has good bonding with the surface. You can then add some peel ply to the edges if you like to complete the lay-up. The key here is to make the lay-up look good. I cannot emphasize the look good comment enough. Some of you may say that you do not know what looks good. What I say to that is you should. Obviously the white look means that you are not wet out enough and if you look real wet and drippy then it's too wet. Other things like wavy glass edges and unraveled glass will make for ugly lay-ups. It is not that hard to distinguish between good looking and bad looking lay-ups.

Another area of concern is with the RG systems that I have looked at. They have all been installed properly but seldom are they adjusted properly. The spacers are an important part of the system because if you do not have them adjusted properly, you will put much more load on the system and structure than is needed and was designed for. So, on the main gear system, the cables and rod ends are adjusted to give you slight tension on the cables when the gear is down and locked. The spacer is adjusted to give you the proper gear up position. When I say gear up, I don't mean jammed up. The gear should be up where it is supposed to be and no further. What I mean here is that you can get the spacer too short and everything will look just fine but you are straining the system more than it is supposed to be. Nose gear door adjustment is also a concern. I have seen some situations where the nose gear doors have too much travel. The up position is okay but when the gear doors are open the swing arms are jamming the fuselage or the slide guides are restricting movement which causes the cylinder to warp the bulkhead. In this case, a spacer needed to be made to lessen the movement of the cylinder. The key here is get it right, do not settle for the idea that it works even though it is not working as it should. The gear going up and down is not enough, it needs to go up and down *properly*. If there is something that you cannot figure out, let us know and we will help you to straighten it out.

Although this area is not my expertise, Martin would agree with what I am about to say. The wiring is sometimes a mess – to say it mildly. I can't emphasize enough that you need to use aircraft wiring and do it as simply and with as few wires as you can. Think about what may have to be done as far as future maintenance so that when you go to work on something, you won't be so upset. If you can't get to a maintenance item then make sure you are able to remove what is in the way. We find that we tend to ignore things more when we can't get to them.

Those of you who are building the XL need to be more in touch with us if you encounter any problem or even if you suspect there to be. The kit is fairly new so we will have a few bugs to iron out with the plans as well as the parts so please let us know. Some of the things that have already come up are:

If the foam at the rear of the bottom fuselage does not end early enough you may have to remove the inner skin and foam in order to fit the gear bulkhead in. This is fine but you should glass it over with 2 bid

Factory News

Continued from previous page

before you install the bulkhead. Overlap the inside skin by an inch or so. You can do this as you install the bulkhead so there is no more sanding to do. If this foam is too far back in the fuselage, you may also need to cut the flange of the duct away in this area in order to slide the duct forward enough to reach the canard bulkhead.

There has been one customer that had a problem with the placement of the hinges and hinge arms on the canard. The new dimensions are from the CANARD CENTERLINE and are 23", 43-1/4", 64-1/2", 85". The old dimensions should work but you would want to check them to insure that they would clear the fuselage side.

The nose gear door length was extended on the front side a little making the total length about 32-1/4". The tire was just clearing the hole before. This should be about 1/2" longer than original.

The shimmy dampener arrangement on the XL is different than the other models. The Belleville washer assembly (including the two flat washers) goes on first, then the fork, then a flat washer and the nut. Of the two flat washers that sandwich the Bellevilles, the top one can be left off if there is a clearance problem.

I thought I mentioned this before but there was a mistake made on the fuselage video tape. We are talking about the triax lay-ups that go from the firewall down over the top of the spar on down to the front side of the gear bulkhead to the floor. The orientation of the triax is long ways and it should stay that way. Do not put the triax on there with the orientation of the Uni on the short dimension. The plans show proper orientation.

Scott

First Flight Test Pilot

As many of you know, Tom Jeter, our CFI check out pilot, has agreed to test fly customer built airplanes. It's important that you understand just what is required of you in preparation for his arrival. There is no reason Tom should spend one or two days sitting around your airport waiting for those last minute things to be done prior to his flying your airplane. It is your responsibility to provide a ready-to-fly airplane. You should have already completed low- and mid-speed taxi tests. You should know that your airplane tracks straight with the proper toe-in. You should know that your engine will take full power and have the static RPM needed for safe flight. Your door(s) should fit properly, the elevator should have the required 23 degrees up and 26 degrees down, your ailerons should have the minimum up and down as specified in the builder's manual, your rudders should have the proper deflection with properly operating brakes, your paperwork should be in order, etc. etc. etc. In other words, your airplane should be ready for first flight. With this done we can proceed to the cost of the first flight.

Tom has broken down his fees into two basic categories; Low Envelope Tests and High Envelope Tests. The Low Envelope Tests are the general flight airworthiness assessment and include stability within the 120/150 knot range, oil temps, cylinder temps, general engine smoothness, elevator position, aileron position, rudder position, pitch sensitivity etc. etc. and recommendations as to what is necessary to correct any problems found on the first flight. There may be minor corrections necessary to continue the first flight phase such as shimming the rudder for correct yaw, shimming of a wing or wings to correct a wing heaviness, cowling removal to correct an idle problem etc. etc. Most of these things can be done and another flight completed all within the "first flight" phase of testing. The price for this is $450.00.

The High Envelope Tests can only be accomplished after the first phase has been completed and any corrections made and tested. The High Envelope Tests will require that Tom wear his parachute and flight test your airplane up to VNE. (200 knots) This will include checking for flutter in stages of 5 knots up to VNE, checking for any engine problems at the higher power settings, and any control problems in the upper speed ranges. The price for this is $450.00

If both tests can be combined within the time frame allowed, then the total for both would be $700.00

Additional pilot charges would include:

A) Additional flying required to determine or correct problems. @ $30.00 an hour.

B) Flight training (dual) @ $30.00 an hour

C) Ground time while working with customer or his airplane @ $30.00 an hour.

D) Overnight retention of pilot for a variety of reasons. @ $75.00 per night

E) All expenses for travel, food, and lodging.

Kit Plans Changes "KPCs"

Note: Check the date at the bottom of your page. If it matches the "Date of Change" shown in the KPC, your manual has already been corrected.

KPC 057

Affects: All XL's

Manual Section: 4.1.1 and 4.4.4

Date of Change: 20 September, 1997

In order to give more clearance between the inboard elevator hinge and the concentric torque tube, the locations of the hinge arms and hinges has been changed. Note that the new dimensions are referenced from the canard centerline. The new locations, starting from the centerline are:

23", 43-1/4", 64-1/2", 85"

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KPCs

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KPC 058
Affects: All models with Elite doors
Manual Section: 11.2.4
Date of Change: 20 September, 1997

Change the width of the hinge recesses from 1-3/4" to 2-3/4", thus making the recesses 2-3/4" square. This is desirable since the hinges themselves are 1-7/8" wide!

KPC 059
Affects: All XL's
Manuals Section: 15.2.1
Date of Change: 20 September, 1997

The wording in the first paragraph does not match the figures. Change the phrase, "two 6" x 8" pieces of Triax" to "four 6" x 8" pieces of Triax"

KPC 060
Affects: All RG XL's
Manual Section: 16.2
Date of Change: 20 September, 1997

On the XL's the Belleville washer assembly should go on top of the fork, not under the fork. Also, the phenolic washer shown in the figure is not used.

Here is the order of components from the strut flange down:
Large washer
4 Belleville washers
Large washer
(steel sleeve within this assembly)
Fork
Large washer
Nylock nut
(see drawing to the right)

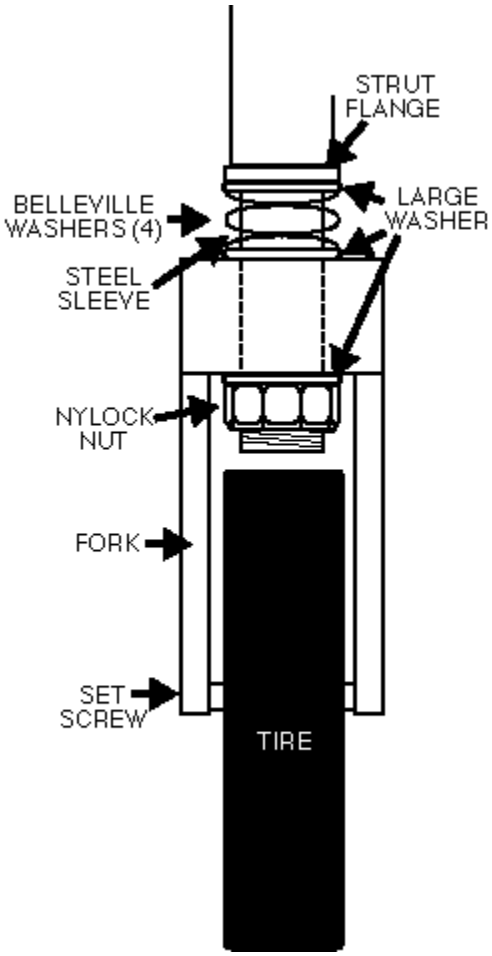
KPC 061
Affects: All XL's
Manual Section: 9.1.2
Date of Change: 20 September, 1997

Since the gear legs are made of stronger S-glass, the carbon fiber reinforcing wrap is not needed in the area of the modification. Change the wording of this section to:

"The gear legs may need to be modified slightly in order to clear the spar in the retracted position. This must be done before the torsional wraps are layed-up on the gear legs.

In order to determine how much of the leg must be shaved, you must first fit them in the fuselage and rotate them to the up position. This will show where the gear contacts the spar and allow you to remove the correct amount. You should have about 1/8" of clearance since you must still put on the torsional wraps.

After this has been checked and any modifications done, remove the gear and remove the bushings."



Short Circuit

by Martin Hadley

ZAP! ..... Ouch!
Snap! ..... Dang!

First, electricians' tape is for securing wiring nuts when you install a ceiling fan in the family room. OK?! Enough said about that! (May he who uses electrical tape for ANYTHING in his airplane get gooey, sticky, hot, flimsy electrical tape on his clean interior!)

Next, if you are the person who feels the need to tyrap your wiring going through your wing foam cores or through the bulkheads between the main spar and the gas tank baffles, please don't ask me to fix a problem with your nav lights. (It'll never happen, right?!)

As a side note, last week a customer flew in with a main landing gear light problem. It turned out to be a loose screw on his ground terminal block installed on the cabin side of the firewall. If you are going to use a screw type terminal block, once you have tested all of your circuits, use either some thick nail polish or a small spot of silicone sealer to "lock" the screws in place.

And last, when you are wiring up things in your airplane please do one of two things: start wiring at the panel and leaving all of your 'ends' disconnected and un-terminated until you have cleanly 'bunched up' the wires so that you have a clean-appearing installation. Once all of the wires have been neatly bundled behind the panel, then cut your 'ends' to the proper length and put

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Views from the West

By Mark & Nancy Machado

Well, it's Labor Day (September 1st) and here I'm "laboring" in the office. Seems appropriate! Nancy and I sincerely hope everyone had a productive summer and are getting ready for the long winter when lots of progress on your projects can be accomplished because it's too cold to do anything else! For those of you who think that winter is a time to stop working on the airplane.....we who do this full time call that a "bad attitude". It's amazing what ingenious methods we have seen in the field that create those little "microclimates" that make the epoxy think it's summer again! Aside from the obvious (i.e. paint stripping guns, infra-red heaters, electric blankets, etc.), I personally have built small plastic tents over my work area, heated the space with a small electric heater and elevated the temperature in my little work environment 30 degrees above the temperature of the garage. Down right tropic! Once I got real industrious and built a "double walled" plastic room. Ended up using the space to paint most of my first Velocity (made a paint booth out of it with a few air conditioning filters and an explosion-proof house fan arrangement). True story..... I was painting a wing late one night in this little space, cleaned up around midnight, walked outside the hangar door and it was snowing! For those of you who remember our turquoise and white Velocity.....that's the one! The moral here is if you need a good excuse to stop working on your Velocity this winter, let it be religious in nature, or the fact that your spouse is pregnant with triplets or whatever.....not because it's too cold!

Last quarter I wrote a column that primarily focused on "neatness" I warned everybody who was reading the column not to assume I was talking about them in particular. For the half dozen people who called me and said "You were talking about me weren't you?", I can honestly say no I wasn't.....it was somebody else!! The point here (and I'm really glad most of you got it) is that with neatness comes precision and with precision comes strength. Strength is what you need when flying over the Rockies on a regular basis like Nancy and I do often. If you're a Florida flyer, let's call it insurance!! Regardless, Nancy and I are really glad that many builders are taking a bit more time to make sure that when they finish a lay-up and are about to walk away, they look back and make sure it has that professional look to it. Guaranteed, it will make a big difference later on!

This summer was quite busy around here. We had the XL prototype here locally for most of August and managed to put about 40 hours on it personally. This is one great airplane and Nancy and I will be building one for ourselves starting

Continued on next page

Short Circuit

Continued from previous page

whatever terminals may be needed on them.
OR...
Hook up all of your remote lights, switches, pumps, etc. and bring all of the wires to the back of the panel. Before you hook them up to their respective switches, make a nice neat bundle coming up the side of the fuselage, along the bottom of the panel, and forward to the canard bulkhead, where ever you have decided to route your main bundles. Then break out the wires individually from the bundle at the closest point to where they are going to get hooked up at. If you remove your canard and all you can see is a mess of wires going every where with a few vacuum hoses intertwined.....

OK already, I know you all haven't experienced all of the thrills of troubleshooting your own work, as most of you haven't had any problems yet. But, trust me, some day there is a really good chance that you are going to hate yourself for the way that you assembled something. The moral to all of this, make your airplane serviceable. If your are having to stand on your head, or twist your arm and backhand a wrench while assembling something during the construction process, it'll be 2 or 3 times as hard to service or repair it once your airplane is finished.

Dave Black will be happy to tell your about the reason why he came up with his RBH (really big hatch). For those unfamiliar with the RBH, check out Volume 11 of the *Velocity Views*. It is in the Builders Forum, page 14.

A production version of the XL overhead switch panel is in the works, along with a pre-labeled, pre-assembled circuit breaker panel. There is also a gear retract electrical system that includes all of the latest modifications and a self contained lamp and gear horn test circuit being developed as an option.

Just a couple of quick suggestions:
1) Do not mount your fuel pump or run fuel lines 'over' an electrical bundle. Try to always have the fuel line and / or pump 'under' your wiring bundles.
2) Do not secure wiring bundles with tyraps, string, tape, or anything when that bundle is running through a confined area. (Hint: If your can't reach it with your own hand and /or arm, it is confined enough.)
3) If during the construction process you are thinking "I sure pity the quy who has to take this apart.", then you best go look in the mirror, because more often than not you are going to be the guy to take it apart.

As always,
Safe and Speedy Construction!
Martin

P.S. Thank you all that have been more than patient with my shipping schedule of all the parts who all have ordered.

Views from the West

Continued from previous page

about mid-September. Our goal is to have it completed by late Spring of '98. Hold me to it, I need the motivation!

The "Service Center" aspect of the Velocity West location continues to grow. Currently we have four projects under construction here in Lincoln, with Velocity builders working here everyday under the watchful eyes of the Velocity West staff. One thing that has become very popular is our "Custom Fast-Build Fuselage" program. By now I'm sure most of you are aware that Velocity is offering for sale a Fast-Build fuselage, to compliment the Fast-Build wing program. What we do here is take that Fast-Build fuselage from Velocity and go further. To make it legal and above all else, safe, the no-exception policy is OWNER INVOLVEMENT! We even have lodging available 10 feet from our hangar door, where Velocity builders can live while we work together on customizing the continuing work on their fuselage. We have developed a technique where essentially the fuselage can be completed prior to the main spar being installed, allowing the builder/owner to trailer the fuselage down the highway without a wide load permit, pilot car and everything else our states and government require. Once the fuselage is "home", the first task will be to install the spar.

This program is not for everybody. You must be willing to be involved. Our main goal here is education. This is not a professional building program. That simply would dilute the purpose of the Experimental classification, something Nancy and I have no intention of doing. On the other hand, if you want to learn, have no problem with "getting down and dirty" with epoxy and are willing to be a true partner in the construction of your Custom Fast-Build Fuselage, give us a call.

We are continuing to have success with the IVO prop on our 4 cylinder Lycoming. One bit of technology we have added recently is a harmonic dampener on the aft side of the starter ring gear assembly. With the dampener operational, cruise power settings tend to be smoother, which is having a beneficial effect on the prop. For those of you who would like to try an IVO prop on your Lycoming powered Velocity, give us a call and we'll see what we can do. At this point, Ivo himself is still reluctant to sell direct to any Velocity builder, until much more time is obtained on the props, but exceptions have been made. As an example, if you're operating out of a desert or Rocky Mountain airfield, where take-off roll is calculated every time you fly, you may be safer with an IVO than not! Again, this is still very much in the testing stages and all who are involved must understand that.

Nancy and I would also like to thank everyone again who came up to us at one of the many fly-ins we attended this summer and simply said "nice things". We really love what we do and the people are what make it so! Building a Velocity is without a doubt a very emotional event. Not necessarily hard.....just emotional! We want to be there to help you through all of it, thick and thin. Please understand, we can't be "perky" all the time (we still build Velocitys and still get emotional about it occasionally too), but if you promise to "bear with us" on occasion, we'll do the same for you!

Keep at it. Remember, you're not allowed to say your 90% done until you've had your FIRST FLIGHT!

One of our Western builders has reminded me of something that in my opinion is in the "Very Important" category. This involves ELEVATOR BALANCING! This has been addressed in the past *Velocity Views*, but in my opinion needs a second reminder. The effects of not properly balancing your elevators has become very apparent lately, especially with the longer 173 canards. Gary Unander in Utah, myself and several others have experienced a significant canard "shake", when plowing through our local mountain turbulence. In all cases that I'm aware of, when the elevators were checked for proper balance, they were NOT! It is an easy thing to miss. The stock balance weights that are provided in the kit, depending on how much paint and filler you use, whether you have a sparrow strainer attached, etc., may not be sufficient for every situation, especially for the 173's. In most cases the balance weights are OK, but everybody builds things differently and as a result you cannot assume the balance is going to be acceptable by merely attaching the stock weights and walking away. IT IS YOUR RESPONSIBILITY TO CHECK THE BALANCE AS OUTLINED IN THE MANUAL AND MAKE THE NECESSARY ADJUSTMENTS FOR YOUR PARTICULAR AIRPLANE.

A few pointers:

1. When you suspend the elevators upside down with a wire, they act in a similar manner as when they are attached to the canard in the "flying mode" (i.e. properly balanced, the nose is down and the trailing edge is up).

2. In my opinion, trailing edge up (± 1/2"), after everything is installed and painted is better than level.

3. The "sparrow strainer" side is going to require more balance weights than the "non-sparrow strainer" side.

4. Attaching small auto wheel balancing weights to the underside of the stock balancing weights worked for me. I used an epoxy adhesive. For the local 173, it was only required on the sparrow strainer side. Everybody's will be different.

Although I don't profess to being an aeronautical engineer, my simple understanding of what proper control surface balancing does is to negate the upward or downward deflection of a flying surface, like a wing or canard, by damping the

Continued on next page

Weekend Fly-in to Sebastian / November 1st, then Monthly Open House Starting December 6th

Monthly Open House

Starting on December 6th (the first Saturday of December) and every 1st Saturday thereafter, we will have an open house starting at 10:00 in the morning and continuing until 3:00 in the afternoon. Coffee, donuts, lunch sandwiches, soft drinks etc. will be provided free of charge. We will have special workshops and question/answer periods to make your visit more enjoyable. If desired, special speakers may be available from time to time. If you have a friend who is interested in building an airplane, bring him/her along. Bring your wife or girl friend and we will try to arrange some special events just for them. (Bonnie will be working with me on this) We will also be taking rides in the XL if this is of interest. Fly-in or drive-in, we don't care, just show up. Call me if you have any questions.

Duane

Views from the West

Continued from previous page

action with a control surface. As an example, let's look at a canard that has been abruptly pushed UP by turbulence. If the elevator is properly balanced nose down (trailing edge up), as the canard goes up, the balance weight will slightly lag, causing the elevator trailing edge to rise (relative to the rising canard surface), thus dampening the movement of the rising canard. Can you imagine what would happen if the elevator was not balanced properly or balanced the opposite direction? Rather than dampening the action of the moving canard, the action would be reinforced. Nuff said. You can figure the rest!

Bottom line.....do it! If you have any questions whatsoever, don't hesitate to give us or the factory a call. That's why we're here!

Factory Weekend Fly-in to Sebastian Florida (X26) Weekend of November 1st

To get this open house concept kicked off, for November, we will sponsor a weekend fly-in to Sebastian. Here is the info:

Arrival: Friday afternoon/evening (notify Velocity if arrival will be after 6:00PM). Transportation provided to and from the Vero Beach Inn courtesy of Velocity Inc. Saturday morning arrivals go direct to the Velocity factory. We don't care if you drive, fly a Velocity, fly a spam can, or walk...just get here.

Saturday Activities:

- 8:30 am Pick-up at Vero Beach Inn by Velocity vans
- 8:30 am Coffee and Donuts at the Velocity factory
- 9:00 am Workshop on Electrical Basics by Martin Hadley
- 10:30 am Annual InspectionWorkshop by Duane Swing This workshop is aimed at the person that bought a flying Velocity and or someone that has never completed an annual inspection
- Noon Cook out - Burgers, hot dogs, salads, cold drinks, etc.
- 1:30 pm Workshop on Composite glass lay-ups by Scott Swing
- 1:30 pm Vero Beach Shopping Excursion with Bonnie Swing for those not interested in the workshops; a trip to Vero Beach offers lots of nice and unique shops.
- 3:00 pm Informal Builder's Q&A with the Swings
- 5:30 pm Vans leave for the Vero Beach Inn
- 6:00 pm Social Hour at the Vero Beach Inn banquet room
- 7:00 pm Dinner at the Vero Beach Inn banquet room
- 8:00 pm After Dinner Speaker (to be announced)

Sunday

- 9:00 am Check-out at the Vero Beach Inn
- 9:30 am Vans leave for Velocity factory
- 10:00 am Free to depart for home or stick around for some socializing and "hangar talk"

We will be offering demo flights on Friday afternoon and Saturday for a cost of $25.00 per person (minimum of two people) in the XL. No particular schedule, just show up and grab an open slot when the urge strikes you.

You need to make two phone calls!

To sign up, please call Bonnie, Pat, or Gail at 561-589-1860 or fax us at 561-589-1893. We need a count for ordering food for Saturday's lunch and to get your choice of food for the banquet. You will also need to make your motel reservations with the Vero Beach Inn (on highway A1A) by calling 800-227-8615. Cost per night for the room is $71.50 and $17.50 per person for the banquet, including taxes. Tell the Vero Beach Inn that you are with Velocity group to get this rate.

Duane

Safety Corner

Accident & Incident Reports, Maintenance & Service Difficulties

Accident Report

I just received word of a Velocity FG that had two emergency landings in its last two flights. The second landing was in a wooded area that destroyed the airplane. The pilot was not hurt (except a bump on the head) The unofficial reason was fuel starvation. And now the rest of the story. I received a call from a Velocity pilot (not the owner of the airplane) who said he was flying this airplane when apparently a vent line restriction caused the engine to slow down until idle was all he could get. He found an airport within a few miles of his present position and made an uneventful landing. He indicated that he left the airplane for the owner to pick-up and had blown air through the vent line and thought all was now OK. The owner of the airplane picked it up a few days later and indicated to me that he spent almost an hour flying over the departing airport to make sure the engine would not stop again. He then continued on to his home airport and the same engine stoppage took place, this time without an airport to land on.

What can we learn from this accident? The first thing would be to be sure you know how your vent system works. In this case, the header tank is vented to only one of the strake tanks. Both strake tanks, however, have their own vent system and are totally independent from each other. If the vent on either one of the tanks happened to be plugged, then the problem was not corrected. As fuel is being drawn from the sump tank, the vent plugged side strake tank will not supply fuel to the sump. Fuel will continue to flow from the un-plugged side until that tank is empty. The engine will stop soon thereafter. This will be true even if the airplane has 30 gal. of fuel in the strake side that is plugged. Fuel will not flow without a vent in the respective tank. It is also possible that a plugged vent line on one side will force fuel from a good vent side into the plugged side and thus drastically reduce the time remaining until engine stoppage. I have seen this happen. Fuel will actually transfer from one tank to the other while flying at higher power settings until one side is full while the other is pushing empty. This may have been what happened in this case.

What can be done to prevent this situation. First of all is to insure your vent system is open. Blow on the vent tube and have someone listen for air hiss coming from within the tank. Second, monitor your fuel situation at all times. Make sure your fuel level is consistent from one side to the other. If one tank is almost empty while the other tank is almost full, chances are you have a plugged vent system someplace. Most imbalance in the fuel system will equalize while setting on the ground; this is normal and cannot be used as a gauge of proper venting.

Those of you who have the newer single point vent system should not have this problem. It is, however, a good idea to add a check valve to this system (Spruce #10630 $19.90). This would allow cabin air to supply vent air to the tanks in the event of a plugged line.

Service Warning
Elite Door Incident

We have had a case of an Elite pilot door coming open in flight. The door ultimately departed the airplane with minor damage to the airplane. The door, however, could not be found and a new one had to be fitted. We are working on a latch/lock modification that will require a separate pull by the pilot before the handle can be moved. This is similar to the co-pilot door except the pilot door will have this lock accessible from the outside as well as inside. In the meantime, if you're flying an Elite, provide a temporary lock to prevent this from happening. On our two airplanes with the Elite doors, we just don't find this to be a problem. Perhaps this is because we have adjusted the taper pins to engage the frame receptacles as far in as possible. This prevents any vibration from forcing the taper part of the pin from working its way out. We have also replaced the springs that snap the handle into the closed position with heavier springs. If you would like these heavier springs, just ask.

Aerobatic Warning

Many, many times we are asked about the aerobatic capability of the Velocity. Usually this question comes from a potential customer who has never had any aerobatic training, but, equates the +12 G rating as being an aerobatic qualifier. Let me say first off that the Velocity does not make a very good aerobatic airplane. Not only is it too stable, it is very slippery, and can get a pilot into trouble fast. Secondly, the canard has a +4 degree incident angle higher than the main wing and when inverted this becomes a -4 degree. This creates an airplane that demands a lot of down elevator when inverted to keep from making a split S out of a normal roll. To put this into some kind of real life adventure, let's look at a true story of one of our builders. This was related to us at Oshkosh at our dinner party. I must share some of the blame for what took place as I showed the owner how easy the airplane was to roll during one of his visits to the factory. I also warned this pilot not to try this unless he has had training in aerobatics. His airplane was the first Elite to fly and is the 173 fixed gear version. A few days later he decided to try a roll on his own. Once inverted he lost prospective with the ground and instead of completing the roll, the airplane began to pitch down and he completed what is commonly called a split S. That is,

he reversed direction of flight by rolling inverted and then pulling back on the stick until the plane is pointed in the opposite direction. He said his speed continued to build until he was up to 273 knots before he was back into control. He couldn't remember pulling the throttle back and I would assume that he did not. He promised to get some aerobatic training before trying this again.

Even with proper aerobatic training, the Velocity is different than a Pitts and must be treated differently. There are several things that must NOT be tried in a Velocity (any canard pusher) The first would be any maneuver that would result in airspeeds dropping below the normal stall speed of the airplane. That is, a high nose up attitude starting from a high cruise speed that would result in a decay of speed much less than normal stall. This could be as a result of an attempted hammerhead stall, or a loop where air speed could get dangerously low. Another would be any attempt at holding an inverted position by pushing excessive nose down with the elevator. Let me relate to you a true story as was told to me last week. An aerobatic trained CFI purchased a share in a Velocity that had the wings re-skinned by the owner to give it a higher G rating. (I doubt this is true but this is what the CFI was led to believe) He was not briefed as to the aerobatic capabilities of this design and, as a 170 lb. pilot, was not aware that he may be flying aft of the CG limit. I ask him if a new weight and balance had been done if, in fact, the wings had been re-skinned, and he didn't know. He also didn't know that he was probably pushing the aft limits even if the wings had not been re-skinned. In any case here is the story he told me. " While executing a loop, I was way too slow in my entry speed and the airplane stalled while still pointing nose up. The airplane immediately began to fall and the airspeed went to "0" (inverted deep stall). I applied full power and pulled the stick full aft while working the rudder peddles until the plane pitched nose down and I regained flying speed and recovered back to a wings level attitude." His question to me was, "what did I do wrong?" After due consideration I told him he should go to church next Sunday and thank almighty God he is still alive to tell me this story.

What I am trying to tell you that even a good aerobatic pilot should not do aerobatics in a canard pusher unless he knows the characters of the design. I also believe that learning aerobatics could some day save your life. Don't learn, however, in a Velocity. Learn in an airplane that is made for aerobatics and practice, practice, practice.

My first introduction to aerobatics was in a Skybolt I built many years ago and the training and practice I received will be a valuable asset forever.

Duane

Velocity Fly-in to Sebastian

- **Weekend of November 1st**
- **At Sebastian Florida**
- **Builder Workshops**
- **Spouse Shopping Trip to Vero Beach**
- **Vero Beach Inn is a nice motel right on the ocean!**
- **Banquet Saturday Night with Speaker**
- **See page 11 for details**

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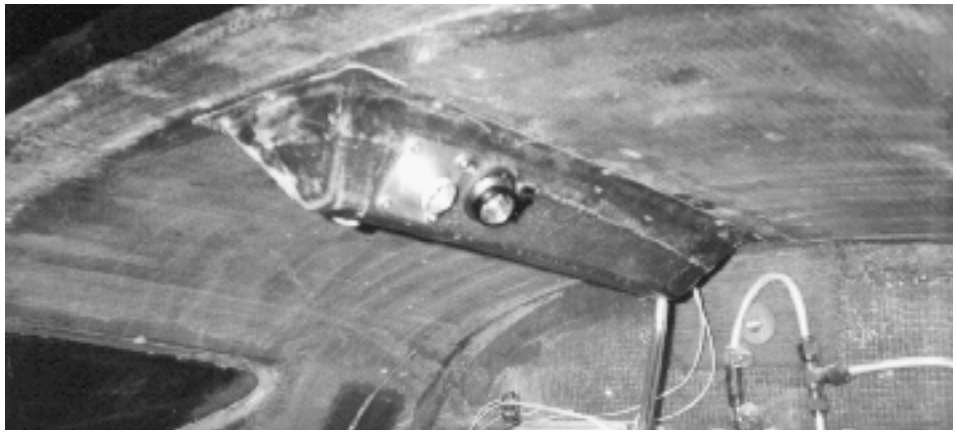
Rick L.

Builders Forum

Builders Forum is full of tips, information and letters ("material") supplied to *Velocity Views* Newsletter from individuals that are Velocity builders (or want to be builders). It is provided as "**USE AT YOUR OWN RISK**" material. Neither Velocity Inc. (The Velocity Factory) nor *Velocity Views* Newsletter (Lavoie Graphics & Rick Lavoie) have endorsed this material, and disclaim any liability for the use of this material. Individuals who use this material for the operation, maintenance, or construction of their homebuilt aircraft do so at their own discretion and at their own risk. Any variance from the builders manual is high risk.

Super Efficient Cooling System (SECSY)

From Hugh L Hyde, Houston Texas and Travis Holland, Sebastian Florida



Hyde's XL style rear seat cooling and lighting for a standard Velocity

In addition to the cooling system, I have two other items that may be of interest to Velocity builders:

I had my engine mount blasted with glass beads to clean up and then powder coated with a clear poly-something paint that worked much better than colored paint (even white) because you can see the details of the welds and it should be easier to spot cracking. Also looks great.

The photo shows the rear seat cooling and lighting copy of the one done in the XL as installed in a unidoor model. I assume that the air flow will be similar to the XL, which I understand works very well. The NACA scoop and the roof piece, which will require modification for a unidoor model, are available from Velocity

Following is a somewhat detailed chronicle of the construction of SECSY, a plenum based cooling system initially installed by Travis Holland in his Velocity and duplicated in Hugh Hyde's Velocity. The system can be adapted to a Franklin or used in any Velocity project that uses the plenum baffle system. The concept is similar to several other applications but has a few features not seen in other installations. It is literally as efficient a cooling system as can be found on any pusher airplane to date. Several numbered photos are attached to develop a pictorial of the development of the system. The following steps assume that you have completed your lower cowling, including the installation of the armpit scoops to the cowling.

1) Obtain plenum baffles from Velocity and also order a second set of armpit scoops to bolt to the fuselage. Trim and fit the plenum baffles to the engine as normal.

2) Obtain a 4" spiral bound aluminum dryer vent hose (approximately 10 feet).

3) Remove the vertical brace left in front of the scoop included in your lower cowling.

4) Trim the second set of scoops to fit snugly inside the scoops attached to the lower cowling (use clamps to hold in place). PHOTO 1

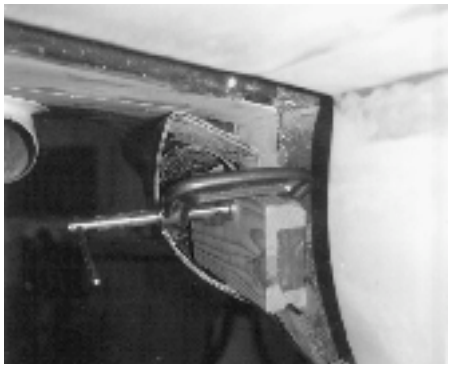


Photo 1

5) Put duct tape on fuselage and use two layers of triax (or equivalent) to glass from the inside top of the second scoop, across the fuselage and back across the inside bottom of the second scoop. PHOTO 2

6) Shape an approximately 5 foot length of the vent hose to go from the inside of the second scoop to the back of the plenum baffle, keeping the curves as slight as possible. Shape the ends of the vent hose to approximate the shape of the inside of the second scoop and the area of the baffle that will be removed for the hose. Do not allow the shaping on either end to reduce the frontal area of the vent hose. PHOTO 3

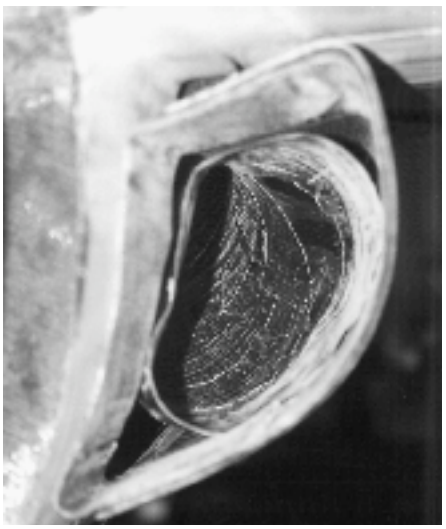


Photo 2

7) Wrap vent hose with duct tape and glass with two or three layers of whatever scraps of glass you have laying around (avoid triax-it's too thick). PHOTO 4

Photo 3

Photo 4

8) After cure, remove spiral vent hose (it spirals out of the glass) and remove the duct tape. Sand inside and out to smooth up as much as possible.
9) Number your two glass hose tubes and mark a straight line where you are going to cut in half to create a flange, so that you can put the halves together in the same manner. Cut in two pieces in the approximate middle but avoid cutting in curved area. PHOTO 6

Photo 6

10) Use sticks and hot glue (or other method) to hold the halves together, duct tape end that attaches to the second scoop and glass to create a flange. Use two or three wraps of tape so that the glass hose can accept vibration from the engine. PHOTOS 7 & 8
11) Put glass hose into scoop and glass whatever sides will lay against the inside walls of the scoop. PHOTO 9
12) After cure, cut the remaining inside walls of the glass hose inside the scoop to spread out the glass hose to glass to the inside walls of the

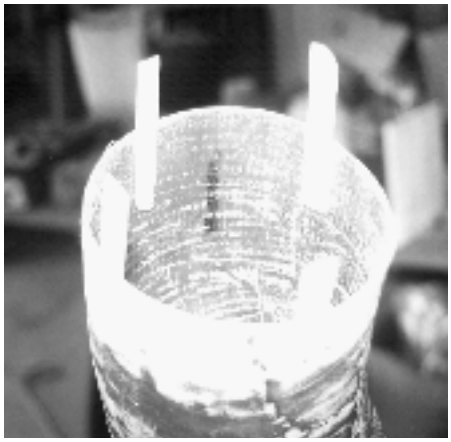


Photo 7

Photo 8

Photo 9

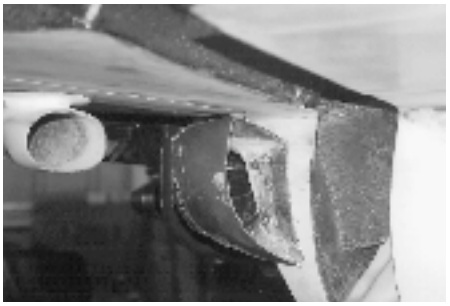


Photo 10

scoop. Again, do not reduce frontal area. Use all of your acquired glassing skills, hot glue, temporary pop rivets, tape, clamps, etc, to completely close up this area so that all air entering the scoop is directed into the glass hose. PHOTO 10
13) Trim back of scoop of excess length behind the glass hose entry point. Seal scoop from back with micro-something and glass. PHOTO 11

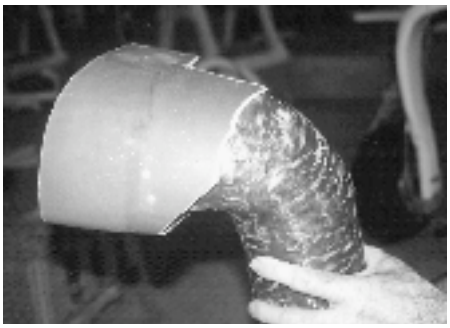


Photo 11

14) Drill out pop rivets and perform other procedures to clean up inside of scoop where the air enters and be sure you have sealed the air flow without reducing frontal area.
15) Attach second scoop with attached one/half glass hose to fuselage with 10/32 bolts, behind the firewall on the cowling lip. To do this, reattach lower cowling, place second scoop into place, mark carefully on side of fuselage, remove cowling, then drill and attach the second scoop to the fuselage. PHOTO 10
16) Add microballoon to end of glass hose that will attach to the plenum and sand to shape. You will construct a female flange on the plenum. PHOTO 11
17) Cut out the plenum with as large a hole as you can on the flat area where the hose attaches. It is especially important that you maintain the large initial frontal area at the plenum. PHOTO 13
18) Use blue foam pieces on end of glass hose that attaches to the plenum. Sand to match the size hole in the plenum. Apply duct tape to foam and end of glass hose and lay up female flange directly on the glass hose. Let cure and remove from glass hose. This should form the flange that you will now glass to the plenum. When you glass the flange to the plenum, pack the lower side with microglass to add support. We

Photo 12

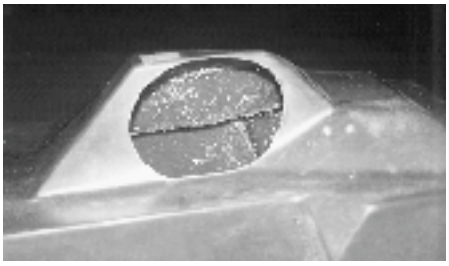


Photo 13

Photo 14

Photo 15

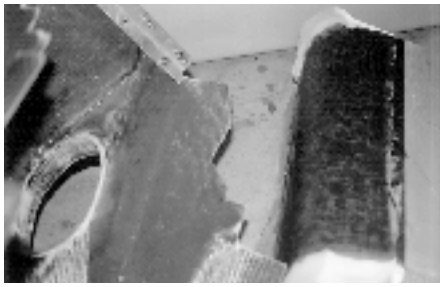


Photo 16

used two layers of triax for the flange, and used plastic wrap and duct tape to force the lay-up to hold its shape during cure. PHOTO 14

19) Trim the inside of the female flange inside the plenum and glass over to be sure that all air enters the plenum. PHOTO 15

20) The standard plenum forces air between the cylinders to create down

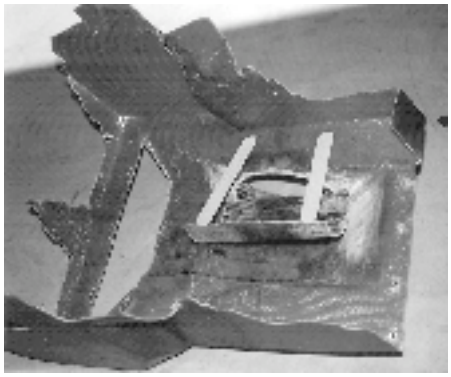


Photo 17

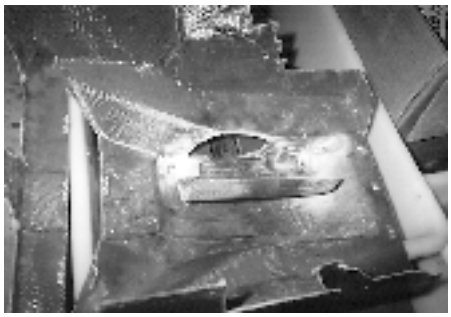


Photo 18

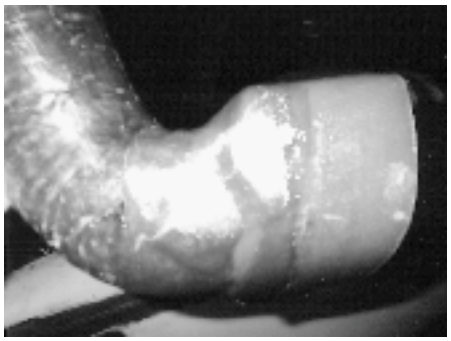


Photo 19

Photo 20

draft cooling, but it does not do it uniformly. Therefore, even cooling is improved by making an "air flow diverter". Shape a piece of foam as shown in the photos and lay up two layers of triax over duct tape applied to the foam. Trim to fit and place over the center of the air intake to the plenum to separate the air flow immediately to the rear and front cylinders on each side. PHOTOS 16,17 & 18

21) Additional "finish glassing" was done to intake scoop and the system was spray painted, as done on the XL, with Bar B Q grill paint prior to final installation. PHOTOS 19 & 20

See—Nothing to building a SECSY cooling system, except several days of unique glassing applications. Note the use of aluminum angle where the two halves of the baffle join and the spark plug access doors. We believe these are considered standard application.

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PZL Franklin Engine Installation Tips

From Rick Lavoie, St. Augustine Florida

First off, let me say that I have solved all my problems with the Franklin engine installation and my high oil temps. The engine runs very smoothly. If someone tells you that the Franklin leaks oil, come look at mine right after I land. You will find it quite dry and clean. Get a copy of the Type Certification Data Sheet E9EA to see the changes that PZL has made to the older USA Franklin.

Prior to getting into the high oil temp problem, let me give you a brief summary of the problems I faced with the factory installation kit. I'm sure that most of this has already been addressed by the Swings:

• Engine mount - I had clearance problems with the mount and the oil pan (nearest the prop). Also, if you drilled your lower mounting holes through the firewall, you would not clear the sump tank. Thus if you have the old style mount, you need to modify your sump tank (see Corey Howe's article in Volume 8)

• Plenium and upper cowl clearance. I had to modify my upper cowling and plenum for clearance with each other and the # 1 and # 6 plug harness.(see photos to the right)
• Push pull control cables (to carb) - The biggest problem is with the mixture cable. If you followed the kit directions (with a small Elite sump tank), you would end up drilling a hole into the sump tank. We tried several things here, but I ended up having a custom carburetor mixture arm made at a local machine shop that allowed me to bring my mixture cable through the firewall just above the pilot side duct. And the cable was also 6" too long, thus the need for the loop (see photo below right). Duane has looked this all over and says he has an easier, less costly fix.

The engineers at PZL Franklin went out of their way to help solve my high oil temp problem! They set up an engine on the test stand to duplicate the unique problem that their engine has with a Velocity installation. The problem is with the oil cooler in the nose, there is much greater flow resistance in the lines due to the long length of the lines. Flow resistance greater than 1 bar (14.7 psi) of pressure between the engine oil inlet and outlet causes the differential valve (also called the oil cooler relief valve) to divert oil "the easy way", and not to the oil cooler.

PZL has just issued a service bulletin (no. PZL-F/58/97) that covers the installation of a stiffer spring and the correct location for the oil temp sender and oil pressure sender. The new spring will set the differential at about 24 psi (vs. 14psi). I did not yet have this bulletin as of printing time, so I will be sure to publish it in the next volume. Velocity Inc. and Atlas Motors will also get a copy. If you are near the point of engine installation, be sure to get this PZL bulletin!

There were a total of 14 faxes over a two month period, between PZL Poland and myself regarding oil cooling. Dave Black has posted these files on the Velocity Reflector (internet mail list), in case you want all the details. But I'm sure that the bulletin will contain what you need. I will

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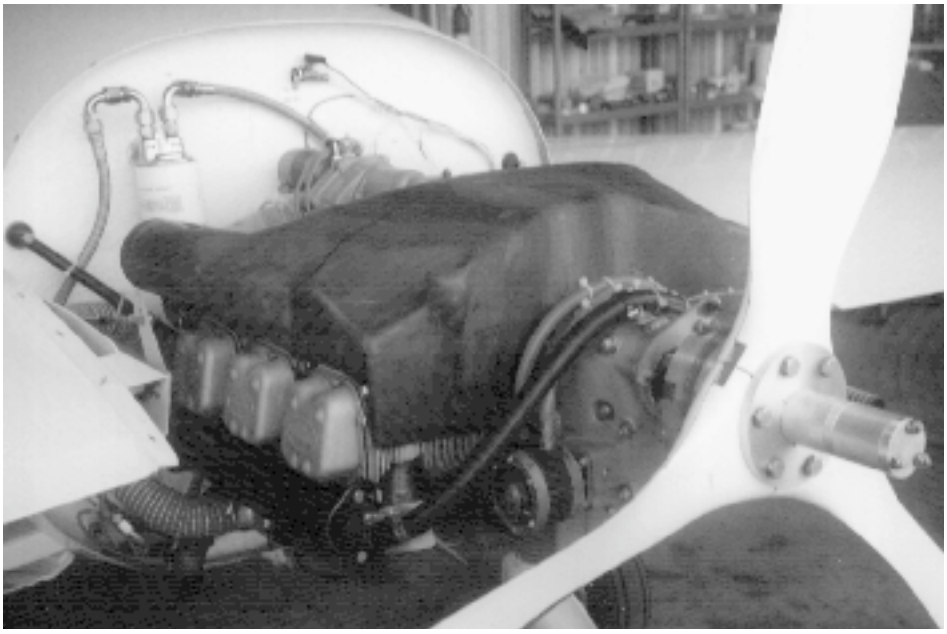

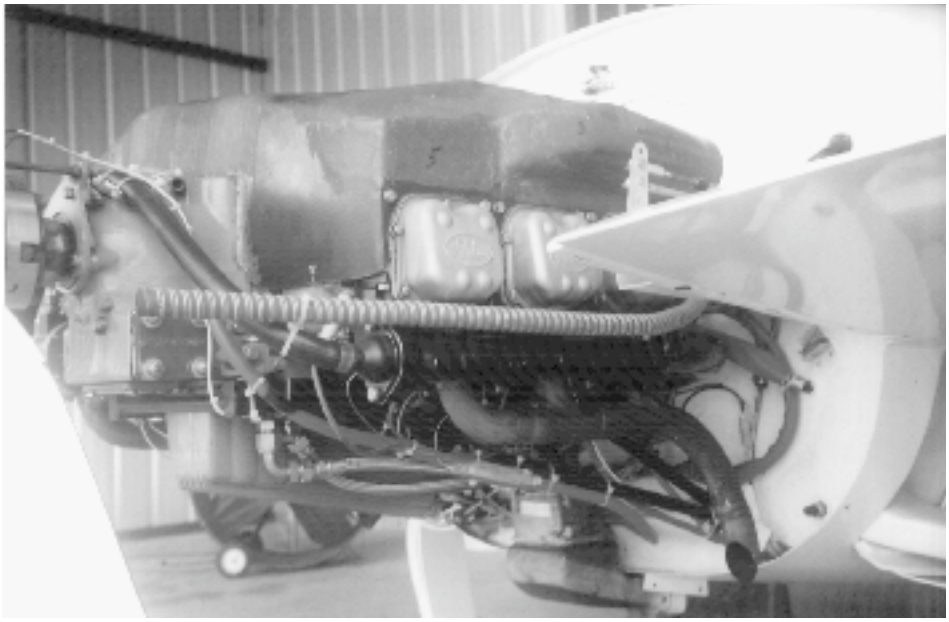

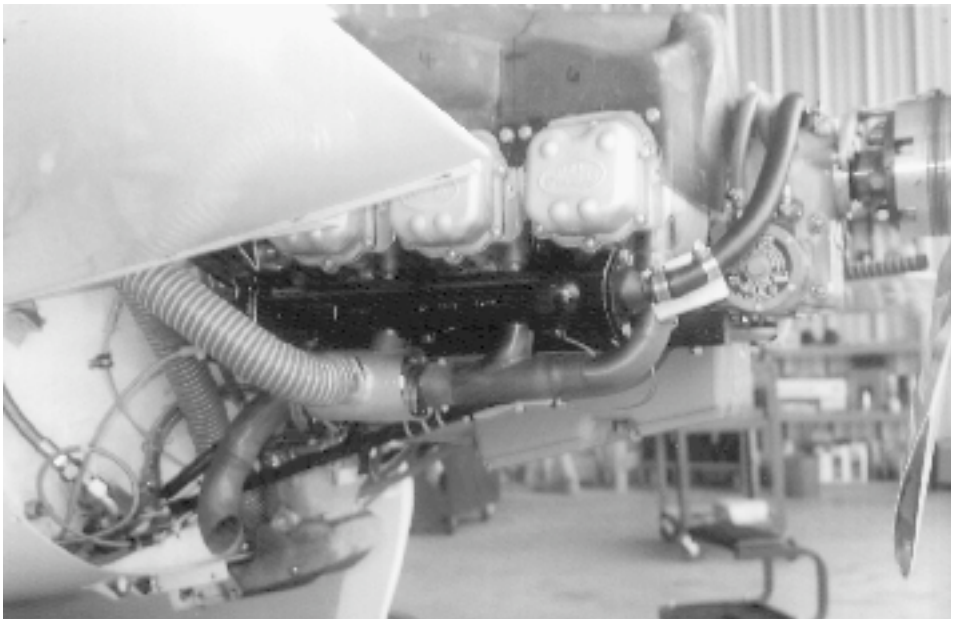

Builders Forum

Continued from previous page

elaborate on any details that are missing from the bulletin in the next newsletter volume. Also note that the new spring has not been tested in an actual Velocity installation. PZL has shipped me one to try.

There appears to be more than one way (or a combination of) to fix the high oil temp problem:
- Increase the differential pressure per PZL's instructions
- Increase the size of your oil lines from 1/2" to 5/8" (per Dave Lincoln's calculations)
- Install your oil cooler under your engine (or near it) as Corey Howe has done.

As my plane sits now, my oil temps are within limits, even at full throttle. I have done the following that I feel has helped bring my oil temps down:
- increased the spring tension (per PZL fax instruction using washers) from 14 psi to 19psi. I will remove the washers and install the new stiffer spring when it arrives from Poland.
- Changed my oil lines to 5/8"
- Installed a larger oil cooler (Duane gave me one from a Seneca)
- Aligned my oil cooler from the 45° position to more of a 90° angle to the NACA scoop (be sure your nose gear clears for rg systems).

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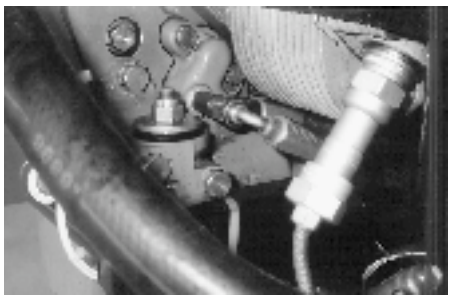

This photo shows the oil bypass group. The "7.3" (refer to PZL manuals) location is where PZL wants you to measure both oil temp and pressure. This line also feeds oil to the fuel pump drive. At the tee, I ran another line back to the firewall to a tee for my two oil pressure senders. For the temp, I installed a tee between the line that feeds oil to the fuel pump drive. Future PZL engines will have a separate 1/8" pipe thread in the by-pass housing for oil temp.

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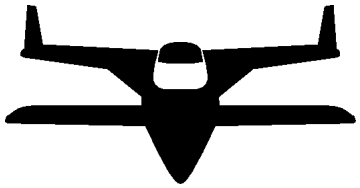

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Velocity 173 FG Kit

Work completed: Canard, elevators, wings and winglets skinned, winglets attached. Engine mount powder coated.
Includes: All parts, new manual & construction video tapes, epoxy pump, some supplies.
Options included: 4 into 1 stainless steel exhaust for Lycoming IO-360, headlight kit, molded instrument panel, Whelen strobes / nav lights.
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- True Airspeed indicator (United) (pre-marked to Velocity specs) $195.00
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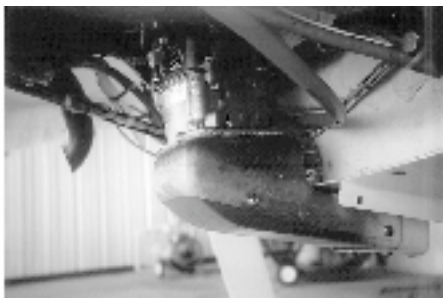
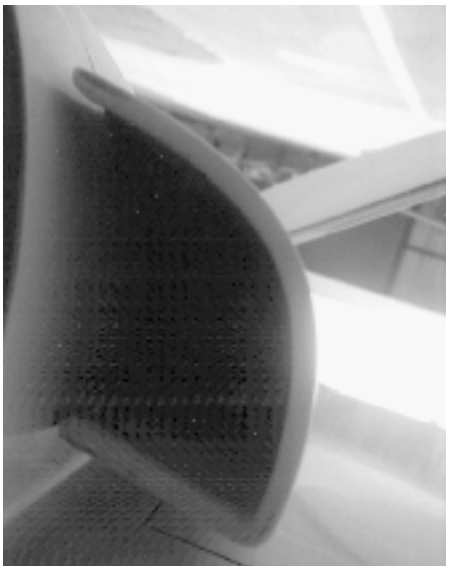
Call Martin @ Velocity Inc.



The above two photos show that the carb air scoop needs to be cut at the cowl line with a flange installed. Otherwise there is no easy way to remove the lower cowl!



Scott had me install an "airfoil" inside all of my air scoops, including the NACA scoop. I used a piece of foam about 2" wide (same stuff used for the bulkheads) and shaped it to fit, then glassed with 1 layer of BID.

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