VELOCITY VIEWS
Volume 14

Factory Unveils Fast Build Option

IMAGINE BUILDING your own retractable gear 4-place single engine airplane...in only about 800 hours! Velocity has just received FAA approval for its new "Fast Build" kit option. *"The 'fast build' kit is proving to be our most popular,"* notes Velocity president Scott Swing. *"It makes the experimental amateur-build aircraft a viable choice for those who would otherwise not even consider building their own plane."*

The "Fast Build" kit for the Velocity XL Retract Gear plane – the newest, largest model – provides:

- pre-built wings, canard, winglets, ailerons, and elevators, up through primer
- fuselage with factory installed bulkheads, firewall, conduit ducts, nose gear, main gear, axles, tires and tubes, windshield, and side windows
- top and bottom halves of the fuselage are joined, and gull wing doors are installed
- nose access hole completed; nose gear recess and nose gear doors completed and primed; cowlings trimmed and pre-fanged.

Other Velocity factory options which further reduce build time are the pre-wire kit for the electro/hydraulic gear system, and a pre-wire package for the switches and circuit breakers to greatly reduce the time to wire the instrument panel. The Velocity factory also helps builders by offering one-source procurement for radios, flight instruments, engine instruments, interior packages, engines, propellers, and other items necessary to complete and fly the Velocity.

In this issue

by Duane & Scott Swing

Open House

May 2, 1998, Saturday - Features a Factory OpenHouse & Workshop in Sebastian Florida (X26). The day starts off with coffee and donuts at 9:00am, followed by the first workshop starting at 10:00am. A cookout (burgers & dogs) is served up around noontime, with the final workshop ending at 3:00pm. Workshops cover topics of interest for a Velocity builder including: avionics & electrical, interiors, painting tips, composite basics, composite molding techniques, 100 hour inspections, maintenance tips, engine installation, etc. If you plan on attending, be sure to call the factory to RSVP and check for an update on the day's workshop topics and schedule!

Fast Built Gets FAA OK!

We have just received news from the FAA that all our fast build options, including wings, canard, elevator, ailerons, fuselage with installed bulkheads windshield, windows, landing gear, etc. etc., have passed the major portion criteria for an amateur build experimental airplane. This is the so-called 51% rule. The official listing by the FAA will be Velocity XL RG Fast Build. Other fast build models will be an add on to this listing.

"Entry Level" New Project

We will soon be starting on our "entry level" Velocity. Our intention is to use the standard fuselage molds that, because of the XL, have not seen much use, and build a fixed gear, single gull wing door, no center keel, flat instrument panel, 160 to 180 HP, light weight, 3 to 4 place, no frills, Velocity. We will be looking at such things as a dual yoke set-up instead of the single side stick, along with other changes to provide a Velocity that would compete with the Cozy and Aero-Canard in total cost with a much reduced build time. We would like to make this kit available at under $20,000. Those of you who will be attending the quarterly 1st Saturday open house will be able to see this airplane come together. I have told many of you that I would rather be challenged by a project like this than by the joy of flying the finished product. I know many of you just don't understand why anyone would prefer building to flying, but it is true for me.

New Toy

We have a new toy to play with here at Velocity. How about a 1947 Ercoupe! Total time engine and airframe is 1350 hours. As some of you remember, the Ercoupe had no rudder peddles. All control was with the yokes as they were connected to the nose wheel along with ailerons and elevator with an interconnect to the twin rudders. The unusual thing about the Ercoupe is the way the ailerons work. In a full right turn, for instance, the full span right aileron is up at about 45 degrees, the left aileron is almost natural. The reason is simple, maximum drag on the down wing to minimize or eliminate adverse yaw in a turn. It sure works great in an Ercoupe so why not in a Velocity. One of the characteristics of the Velocity is the need to lead with the rudder to counter the adverse yaw at approach speeds. If we could incorporate the Ercoupe engineering design into the Velocity we should be able to minimize or eliminate this adverse yaw. We have already made a prototype of how this can be done and will soon be trying it in our XL. Let you know later if it works.

Friendly Reminder

Let me use this space as a friendly reminder of something that has come to my attention that you should know. Rick Lavoie has been flooded with calls from some of you regarding any number of things but especially Franklin engine related matters. Rick is not an employee of Velocity and some of you who are used to calling us at all times of the day and night, including weekends and holidays, should not assume this same procedure for Rick. Rick has a full time job and just can't take the time to talk to you whenever it is convenient for you. I know it is very frustrating to get a call at 9:00 PM from one of our California builders asking about some problem this person may be having. Please use some common sense in this matter and refer to his web page if you have the equipment to do so. Rick maintains a file of information (faxes from PZL Franklin) on his web site for you to download at your convenience. His web page is lavoiegraphics.com and you can go to the "Velocity Views" page and click on download section to find this file. Rick's wife Judy will appreciate your consideration.

Sound Deadening Material

I received a call from one of our builders telling about the extreme price increase from EAR on the sound deadening material. It seems that once EAR found out this material was going into an airplane the price went from around $400.00 for a kit to $800.00. Interestingly enough, I have been testing a sound deadening product that was highly touted and was used in the AOPA ultimate Arrow. It is called "The Insulator". It is an aluminum surfaced material with a fabric like core that provides sound and thermal protection. We used the 3100 product (3/8" foil both sides and weighs 3.44 oz./ sq. foot) for the headliner and sides, and the 3200 product (5/8" foil both sides and weighs 7 oz./sq.foot) for the firewall and false bulkhead just behind the rear seats. I estimate that it will take approx. 20 linear feet of

the 3100 ad 8 linear feet of the 3200. It can be attached using a spray adhesive sold with "The Insulator" or you can use the standard 3M General Contact Cement sold by Discount Auto. It will also take one roll of aluminum tape that can be purchased with "The Insulator". Current prices can be obtained by calling Unlimited Quality Products at 1-800-528-8219, ask for Shari.

Duane

Oil Temperatures

Lately there has been some discussion among some builders concerning the oil line installation and how the current installation technique may effect the overall performance of the oil cooler circuit. It has been suggested that running both lines in the duct may cause enough of a heat transfer from the hot oil line back into the cooled oil return line to actually raise the temperature of the oil in the return oil line. This has generated several thoughts and discussions, both between builders and us here at the factory. We decided we had an ideal opportunity to make some actual aircraft tests. This article will review the aircraft oil line installation between the engine and the oil cooler in N81VA, the results of those tests, and a brief analysis of those results.

N81VA, built by Dave Lee, is the fourth aircraft kit (DMO 043) to be produced by Velocity. It has always been in service to Velocity. Some of you know this plane as "Big Orange", the "Pink Panther", possibly as the aircraft that crashed in the water many years ago, and some of you know it as the "multi-color" that is currently being used for check outs and training. The data plate shows 1988 as the year of certification and the airframe has approximately 2,000 hours on it.

The oil lines in the plane are bare 1/2" aluminum lines. "Bare", meaning they do not have heat shrink tubing on them. Encasing the oil lines with heat shrink is a relatively new step in preparing these lines for installation. We have been sending out heat shrink for this purpose for almost 2 years now with the optional engine install kit(s). In the appendix of the new "Velocity Builders Manual" this step is mentioned in the "Engine Install Kit Instructions". It has always been a part of the new XL installation "Engine / Prop" section of that manual and is in the process of being incorporated into all of the manuals in that specific section. Both the lines in N81VA are in the right hand duct. While there is a 3/4" line run from the fresh air inlet to the opening of this duct at the canard bulkhead, the firewall end of this duct, as well as all points in between, have been sealed off with silicone. There is effectively little of no flow of air through this duct.

For testing purposes, we were satisfied to use 'relative' temperatures. In other words, we decided we would not take direct oil temperatures as this would require invasive techniques and would raise the cost of the testing procedures. We used a JP Instruments 'SLIMLINE' oil temperature gauge and six oil temp sender leads (K-wire) also supplied by JPI. With JPI's blessings we stripped back 1" of both the red and yellow wire insulation's, twisted the 1" bare wires together and crimped them at the ends. These "probes" were then placed directly against the aluminum line, wrapped with two layers of gray duct tape, tywraped to make sure there was positive contact between the "probes" and the tubing, then covered with an insulating material.

Two "probes" were placed abutting the flare nuts on both oil lines at the inlet and outlet fittings of the oil cooler. Two were placed abutting the flare nuts on the oil lines aft of the firewall where the unions for the flex lines are mounted on the bracket. One was placed to measure ambient air temperature in the nose compartment near the oil lines. And the sixth one installed to measure the ambient air temp aft of the firewall near the oil line unions. The ambient temperature "probes" were installed just to evaluate if these temps might have an effect on the oil lines in their respective areas. An accurate HVAC probe type thermometer was used in two locations in the duct to measure the air temperatures in the duct.

We made two different flights, one at 8 A.M. when the OAT was around 48 degrees, the other at 2:30 P.M. when the OAT was around 60 degrees. The only significant differences in the reading were the ambient temperature reading in the nose, behind the firewall, and in the duct. The forward duct temp was around OAT while the rear duct temp was about OAT plus 20 degrees. The nose temp was about 10 degrees above OAT and the firewall temp, a surprise to all of us at Velocity, was a cool 75 degrees.
(We are using a plenum downdraft cooling system on 81VA.)

The following numbers were good for both flights. The aluminum line taking hot oil from the engine towards the oil cooler indicated 180 degrees while the engine oil temp gauge on the instrument panel indicated 195 degrees. The other end of this line going into the oil cooler

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Factory wants Photos!

Please send us photos of your Velocity, once you have completed your first flight. We need them for our Builder's Velocity show and tell board!

Also, while you are at it, send some photos to Rick Lavoie for the Newsletter. Builders love to see photos of completed projects. It is inspiration to us all!

indicated 155 degrees. The other side of the cooler indicated 130 degrees. The interesting reading was the return oil line aft of the firewall. It was 150 degrees.

I can understand losing 25 degrees in the 'hot' oil line. Especially when the duct temps ranged from 50 degrees (front) to 70 degrees (rear) in the AM and 60 degrees (front) to 80 degrees (rear) in the PM flight. What I don't understand is how, after losing 25 degrees in those duct temps, still have it hot enough in those ducts to increase the return oil line temp 20 degrees. The only plausible explanation I would accept is that the two lines must have a lot of contact surface between them and the heat is being transferred through the aluminum tubes. It certainly is not hot enough in the ducts to raise 130-degree (relative temp) oil UP 20 degrees.

Our analysis of the data gathered is this. Even if shrink tubing on the oil lines acted as an insulator, it would seem reasonable to assume that the temperature readings would change proportionally. In other words, the net loss plus the net gain would still give us approximately a 30-degree difference in the oil being returned back to the engine. However, the real reason for the shrink tubing is consideration of possible chaffing of the oil lines against themselves, wires, or control cables also in the duct.

If high oil temp is a problem in your aircraft, routing these lines to and from the oil cooler in separate ducts may be the answer to your problem.

With a majority of the Velocity's out there that are flying and do not suffer from high oil temperatures, it is the current decision of the factory not to arbitrarily change our installation instructions with regards to both oil lines being installed in the same duct. However, we do feel this 'separate duct' technique may be a suitable answer for those that have not been able to cure high oil temperature woes.

Martin

New Velocity Poster

Hot off the press, be the first to order your new Velocity poster. This full color poster measures 18" x 24", and is the same photo featured on page 17 of this newsletter (but in full color!). To order yours, call the Factory or Velocity West today! The cost is $7.00 per poster (includes shipping).

New Velocity Web Site

Check out Velocity's new web site at:

velocityaircraft.com

"Our new web site's main focus is to present our aircraft to prospective Velocity wanabees," said Duane Swing.

There are lots of great photos of your favorite planes in flight. Go ahead and download your favorite photo to save as a screen saver for your desktop computer! You will also find an up-to-date calendar of events.

Note our new E-mail addresses:

Velocity Factory:
velocity@metrolink.net

Velocity West:
vwest@psyber.com

Sun N Fun Banquet Last Call for Sign Up!

Be sure to sign up ASAP if you plan on attending the Velocity Sun N Fun Banquet! All the details were included in the last newsletter on page 2. The banquet is held on Monday April 20th, starting at 6:00pm at the Imperial Golf & Racquet Club's Ball Room. The cost is $20 per person.

Sign up for the 1998 Velocity Oshkosh Banquet

Saturday, July 31, 1998 - The 1998 Velocity Oshkosh Banquet is all lined up for July 31st to be held at the Hilton Convention Center's LaSalle Ballroom. Social time starts at 6:30pm, with dinner served at 7:00pm. Cost per adult is $18.00, three entrees to choose, cost per child (age 4-10) is $9.00.

Call the Velocity office to be put on a sign up list, or stop by the Velocity booth prior to noon on July 31st (Friday). Thanks.

Bonnie

Views from the West

By Mark & Nancy Machado

Greetings everyone from all of us here at Velocity West, Velocity Inc's representative for sales, service and builders support on the West Coast. Much has happened here lately so we'll get right into it!

ALTERNATIVE ENGINES: As we reported in the last edition of the "Views", two alternative powerplants are under development here at Velocity West. The first project is a Chevy V-6 that will be powering a 173 RG, currently under construction here at our facility. This particular project, I can take very little credit for. It is owned and being built by Mr. John Kiss, a former employee of ours, who is now working full-time on his project inside our hangar. Needless to say, John still feels like an employee. He still drinks our coffee, has his lunch out of Nancy's jar of candy in the lobby and strolls though the door each day like clockwork. The big difference is he used to be here 8 hours daily, but now 12-16 hour days are not uncommon. For those of you who have been at the "finish-up" stage of your project, I'm sure you can relate!

John's engine and prop reducer is being built-up by Northwest Aero of Auburn, Washington. Last week John flew up to Washington to witness the engine/reducer combo perform on a dyno. John reported that all looked good, with a horsepower output showing something in excess of 230 hp! He's expecting the engine in our shop any day. At the rate he is working lately (just finished painting his airplane with a real jazzy look), the engine will get mounted and hopefully be in the air before long. We are all quite anxious to see how this engine will perform in a 173 under actual flying conditions. John is making a real attempt to mount the engine so that the original lines of the airplane are not significantly disturbed. The goal is "They'll never know until we start it up"!

The other project is the Chevy V-8. This engine is being configured for the XLs only. We currently have about 10 hours of test stand operation under our belts. Needless to say, it's exciting! This particular project is being headed up by myself, with some very serious assistance from Mr. Phil Keys, one of our somewhat more recent hires here at Velocity West. It really helps that Phil knows engines front to back! Without Phil's background and knowledge, we certainly wouldn't have been able to make the progress we've made. The engine simply runs great! Presently, we have completed our analysis of the ground performance of the engine with a Holley carburetor and are awaiting a fuel injection system from AirFlow Performance of Spartanburg, SC. Assuming the fuel injection system works out, that will probably be the configuration we fly the engine with. As the airframe for this engine gets completed and the engine gets transferred from the test stand to it, we'll report more details. We have essentially built the test stand to simulate the cowl area of an XL, so we anticipate the transition of engine from test stand to airframe to go smoothly.

Our long-range goal, assuming all goes well (and only if!) is to be able to offer a "firewall backward" package for XL owners and builders who wish an alternative. At best that would be sometime this Fall. In the meantime, we'll keep you informed of our progress (on both projects) through the Velocity Views. Again, if you have questions, just hold off a bit. Until these engines are flying in the air, it's just theory! Those theory questions tend to slow us down quite a lot. I'm sure you all understand.

FIRST ANNUAL VELOCITY WEST FLY-IN: Nancy's idea of a little party has grown! As we mentioned to you last time, the big event is May 16, 1998. Although we are putting out a mass mailing regarding the event, for those of you who for some reason are not on our mailing list, this comment and the notice on the event is your invitation to attend. The goal of this fly-in is essentially FUN and FELLOWSHIP. On the serious/technical side, much will be on display in our shop! Check out the notice for additional details. Hope to see as many of you as possible there!

WRAP-UP: Before I finish here today, a few comments. The first is about the Reflector. For those of you who don't know, the reflector is a group of Velocity owners and builders who communicate via computers/internet on a variety of topics about the construction of Velocitys. I like to think of it as kind of a "self-help" group of people. The main requirement for joining this group (at least the last time I checked) is you must be either a builder or flyer of a Velocity airplane. Tends to keep the dialogue more focused, I think!

As a "builder" of several Velocitys now, I have allowed myself to be a part of this group, admittedly in the background. That background position is primarily because sometimes weeks will go by before I have the time to download the current stack of Reflector e-mail messages and read them. By then it's skim reading, editing, deleting and needless to say, often not total concentration. But what I have found is a serious amount of "maturity" has developed with regard to the dialogue since the Reflector's inception several years ago. I personally have got some good-solid ideas from the Reflector and use them! Some of the initial concepts and ideas I have seen on the Reflector, at first glance I didn't think much of, but in most cases, a voice of reason (usually it's a former builder who's flying now) will eventually "log-on" and put everyone straight. This is good! I truly believe that many of the ideas and thoughts that have come from such individuals as Tom Cacek, Chuck Caldarale, Al Gietzen, Dave Black and certainly many others have improved the safety of our airplanes and hopefully help builders from making serious mistakes when they attempt to go in a direction that may not be in their best interests. Hey, who's kidding

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Views from the West

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who here! It cuts down on the number of phone calls I have to deal with daily! Keep up the good work guys (and gals)!

I think the current manager of the Reflector is Brian Michalk. He can be e-mailed at michalk@awpi.com. If you qualify and have a computer with Internet access, I'd recommend giving it a try.

The last item on my mind is a Calender of Events. Nancy and I will be representing Velocity at several fly-ins this year and I wanted to publish the list. This list is not all-inclusive, but represents those events that we are essentially "guaranteed" to be at. We'll probably be flying the 173 FG, unless we get the muscle Chevy XL flying!

That's it! Remember, when you're building your Velocity, you don't have to be perfect, just PRECISE!

Velocity West's Calendar & Events

- Calaveras Airshow, Calaveras, CA. March 28th

- Velocity West Fly-in, Lincoln, CA. May 16th

- Watsonville Fly-in, Watsonville, CA. May 30th

- Rocky Mountain Regional EAA Fly-in, Longmont, CO. June 27-28

- Northwest Regional EAA Fly-in, Arlington, Washington. July 8-12

- OSHKOSH (Naturally with the Swings)

- Golden West Regional EAA fly-in, Merced, CA. Sept 25-27

- Copperstate Regional EAA fly-in, Mesa, Arizona. Oct 8-11

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.

First Annual Velocity West Fly-In

- **May 16, 1998, Saturday**- First Annual Velocity West Fly-in at Lincoln Airport.
- Catered All-You-Can-Eat Texas BBQ dinner, prizes, speakers, etc.
- Several projects under construction will be on display!
- Dinner starts at 6:00pm sharp!
- Advance registration cost (prior to May 1, 1998) is $15 per person, children (3 to 9 years old) $10 per child, Cost for those that register after May 1st is $20 adult and $15 child.
- Please RSVP with Mark or Nancy Machado at Velocity West.
- Motels offering a group rate discount (be sure to mention that you are with Velocity West to get a corporate rate):
  - Best Western Roseville Inn, 220 Harding Blvd., Roseville CA 95678 phone 800-255-4747
  - First Choice Inns, 4420 Rocklin Rd., Rocklin CA 95677 Phone 800-462-2400.
  - Also, you can rent a car from Enterprise 800-325-8007

Please RSVP by May 1st! We need the following information by either phone, fax or E-mail:

Name_____ Phone #_____

Address_____ City, State, Zip_____

Type of aircraft_____ N number (if flying in)_____

Number of adults attending dinner _____ Number of Children (age 3-9)_____

Visa or Master Card #_____ Expiration date_____

If you mail in a check, make it payable to Velocity West.

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 077
Affects: All XL's
Manual Section: 11.4 Carbon Beams
Date of Change: 20 December, 1997

We neglected to include instructions for the carbon crossover support. Change your manual as follows:

Change the first two paragraphs of 11.4.1 to read as follows:

"Find the carbon crossover support, p/n VCCS-01, and the left and right carbon beams, p/n VCBLR-01. These will form a roll bar just behind the doors.

Fit the left and right beams approximately 5/8"-3/4" aft of the door lip, or about even with the outer edge of the door opening. They rest on the wiring duct. Notch them for the rear latch pin tube. Trim the crossover beam as necessary to fit flush between the left and right beams. Now remove the assembly."

Change the last paragraph of 11.4.1 to read the following:

"Pack the back side of the wood blocks with EZ-Poxy/microglass and clamp them in position. Let cure. Hot glue the crossover support in place. We will tape-glass them later."

Change the first paragraph of 11.4.3 to read as follows:

"Apply a small radius of EZ-Poxy/microglass to the junction area of the beams, crossover support, and fuselage and apply two layers of coarse BID, 3" wide. This should extend 1-1/2" onto the fuselage and beam. See Figure 11-23. Also apply two BID over the junction of the crossover and beams."

KPC 078
Affects: All Fixed Gear Velocitys
Manual Section: 14.3.3
Date of Change: 05 February, 1998

Towards the end of this section bulkheads "D" and "B" are mentioned. These are used in RG's only, so disregard this reference.

KPC 079
Affects: All Velocitys
Manual Section: 20.2.3
Date of Change: 01 February, 1998

The proper hardware used to attach the wings to the aircraft is as follows:

(6) AN 8-30A bolt
(12) 1/2" grade 8 wing washers
(6) AN 363-820

The plans erroneously show AN960 washers instead of the 1/2" thick washers.

KPC 080
Affects: All XL RG's
Manual Section: Pages 9-4, 9-21, 16-3,4
Date of Change: 20 February, 1998

The axle position should be changed to: 1/4" AFT of the center of the gear leg.

Our prototype has the axles 1/4" forward of center, which causes the nose to be lighter than we would like when sitting on the ground. If you have already put your axles in the forward position, you can leave them there. This KPC is not considered a critical safety issue, just an improvement.

KPC 081
Affects: All XL's
Manual Section: Chapter 18
Date of Change: 25 February, 1998

Instructions for the upper cowl attachment to the fuselage have been added.

The upper cowl screws across the fuselage are installed the same way as the lower cowl screws using the locations diagrammed below.

KPC 082
Affects: All Velocitys
Manual Section: 1.1.5
Date of Change: 01 March, 1998

Change the second paragraph to read:

" Review the entire manual. The appendix is packed with helpful information not found in the rest of the manual."

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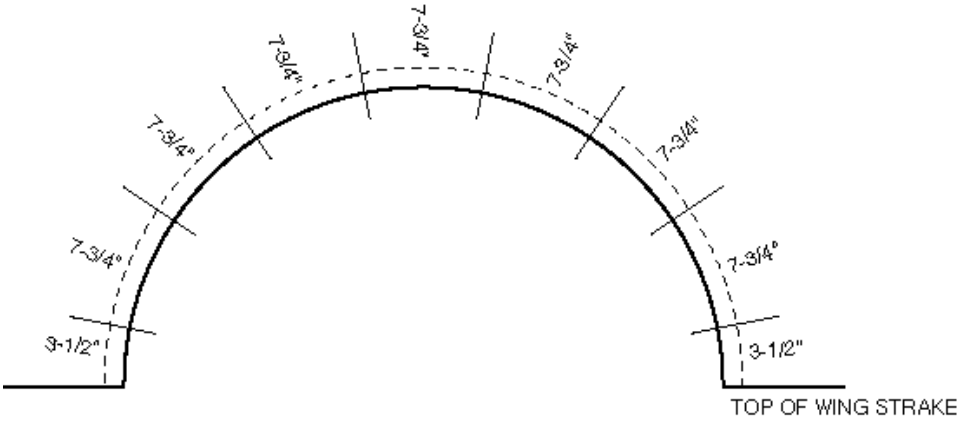
KPC 081 Diagram



Safety Corner

Accident & Incident Reports, Maintenance & Service Difficulties

Update on the Mark Ewart Accident

I just got off the phone with Preston Hicks of the NTSB who is the chief investigator regarding this accident. He would not give me any more information than we had at the beginning. He said that the investigation was not complete and nothing would be coming from his office until it is. I ask him if there was anything I could tell our customers. He said to wait another 4 to 5 months and he should be able to give us their official answer.

Although as most of you know, I really don't want to point fingers of blame on IVO or Mark Ewart, I feel compelled to tell you that those who are flying with the IVO on Lycomings and Franklins who are maintaining the torque values as specified by IVO are not having any problems. I just spoke to an IVO user yesterday and he said he checks his torque before every flight and has put over 50 hours on the prop with no movement of the bolts during this time. He said that after about the 10 hour mark no additional torque was necessary. Does this mean that Velocity is ready to give you the OK to use the IVO prop? No, this is not what I mean. I am simply giving you something to think about. How does this relate to Mark? Just this. If the NTSB would have checked the torque on the two remaining propeller blades before they removed them from the hub, we would have known from the beginning if Mark had torqued them properly. It seems that in the haste of the hour (the day before Thanksgiving) that the NTSB was in too big of a hurry. They could have removed the prop by unbolting the prop extension from the engine and thus preserving the torque values of the blades for later verification. Since this was not done, we will never know if Mark mis-torqued the blades. (perhaps used the wood prop torque values of 45 foot lbs. instead of the IVO recommended values of 65 foot lbs.) We do know that Mark did not follow the recommended IVO procedures when installing a propeller that we know had been removed for service. We also do not know if he re-installed the blades in the same index position as they were removed. This, too, is a critical area that, if done wrong, could have catastrophic results. So, what does this all mean to you? I really don't know. I cannot tell you that the IVO prop is OK to use. I cannot tell you not to use it either. At this time, you have to make that decision on your own.

KPCs

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KPC 083
Affects: All Velocitys
Manual Section: Chapter 17 - Engine/Prop
Date of Change: 01 March, 1998

Please note that detailed engine installation instructions are included in the appendix of your manual. Even if you do not purchase the optional engine installation package, refer to these instructions for guidance. Those of you with XL's who need XL instructions can call Velocity and we will send a copy to you.

All manuals shipped after March 1st will have these instructions in chapter 17.

Service Caution
Gear Related Incidents

We just received word of a main gear collapse after an aborted take-off. The airplane is several years old and still had the old gas strut installed instead of the modified over- center linkage. The gas strut had lost all its pressure and the resulting flexing of the main gear on touchdown caused the collapse. If you are still flying with the old gas strut, be warned that your overcenter linkage should be sent to us for modification.

We also heard from one of our customers that the nose axle set screw had backed out and the axle unscrewed itself out until the wheel departed the fork on landing. It might be a good time to check yours and add some locktite or add a second set screw on top of the first one to insure that the set screw does not back out.

Another of our pilots called to report a gear up landing. He said the repairs to the fuselage can be completed in a couple of days and with a new prop he will be flying soon. As it turns out, he did not have a gear horn when he put the speed brake down, he thought he had put the gear switch down. The resulting crunch taught him a valuable lesson. Can any of us justify not having a gear horn in our Velocities, or not checking the horn on every landing. My check is very simple. On downwind I reduce the throttle until the horn blows. I then advance the throttle to shut the horn off and proceed to lower the landing gear when speed permits. It is simple and it works all the time.

I had a new Velocity owner call me the other day saying that his airplane was pulling to the right all the time. He said that when he is looking at the landing gear the wheels are bowed the wrong way. That is he has a negative camber with the bottom of the tires being further apart than the tops. This owner had purchased a fixed gear airplane from the original builder and knew nothing about the airplane or maintenance. How the gear got this way was not known. When I mentioned the heat build-up while making fast taxi runs and riding the brakes when taxiing, he didn't seem to know just exactly what I was talking about. The new owner

Safety Corner

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wants to know how to fix his gear problem and wants us to send him some detailed instructions of just what to do. He also doesn't know if the gear is repairable or not and wants our opinion as to the safety of this repair. In any case, this points out what we have been saying for a long time. If you are going to purchase a pre-owned Velocity, it is best you know what your looking at. If you are going to sell your Velocity, please, please pay the new owner transfer fee that we charge of $275.00. In this case the new owner doesn't think he should have to pay anything for our service. What do you think? Should we have to spend our time going through the process of repairing this airplane? We didn't sell the airplane to the first owner, this was prior to our involvement. What would you do if you were in our shoes?

Service Caution
Other Maintenance Items:

We see airplanes that come in, especially those not built by the owners, that are not well maintained. In one case, the prop bolts on a wood prop had not been checked since the new owner took delivery nine months prior. He was not aware that this should be checked on a periodic basis. He said that he has the engine oil changed by his local FBO and they never mentioned it. Let me just say that most mechanics have never seen a wood prop until you show up with your Velocity. Don't blame them if they don't know anything about this. This is up to you to know. It blows my mind that some of you will sell your airplanes to an unsuspecting owner and not go over everything necessary for proper flight safety.

We also see about half the airplanes that show up here that have improper documentation for the airplane. As an example, on owner came in the other day and ask about what was needed for an annual inspection. After check his paperwork, I found the following:
- The airplane was a year and a half out of current annual.
- No entry had been made after the 40 hour restriction had been flown off.
- No weight and balance record was on board.
- No flight limitations were on board, and, in fact, had been lost soon after the FAA inspection.
- No special airworthiness certificate on board.

Any one of the above violations would have probably resulted in some sort of FAA trouble. In this case, the owner had been flying all over the country and had not had a reason for the FAA to look at what he had. If he had had an accident, not only would he probably lost his license for a time, but his insurance would have be voided by his lack of proper paperwork. Let's again review what you need:
Remember ARROW? This stands for:
A) Airworthiness certificate (for an experimental it is called a Special airworthiness)
R) Registration. This will show who is the owner of the airplane.

Continued on next page

Received From: *IVOPROP Corporation, Bellflower CA, 562-602-1451*

Ivoprop Installation Instructions (Excerpts):

• Very important not forget to insert plastic washer on each side of the spool. Failure to do so will immediately lead to the destruction of the gears in the planetary drive.

• The knurled pattern is 60 degrees symmetrical so if you re-install the blades between crush plates later in a different position the imprint on the blades should match the knurled pattern. However (because the manufacturing tolerances) to get the best match number the blades and plates and always put the blades back in the same place.

• Install the service bulletin stainless steel tape and follow the inspection schedule from service bulletin. Any time you inspect the tape check the torque on the bolts during the first four hours. After that check torque every ten hours.

Ivoprop Installation on Mark Ewart's Velocity

• No plastic washer was found on engine side of the spool.

• There are imprints from cams on a crush plate. The cams would not contact the crush plate if the plastic washer was used.

• The blades and the plates were not numbered and consequently were not put back in the same place.

• The marks from the blades on the crush plate show that blades were re-indexed 60 degrees from original position.

• No service bulletin tape was found on the blades roots to detect blade movement.

• Torque checking schedule was not followed.

• The grinding marks from the blades on the plate show that blades were moving inside the hub.

PURPOSE OF THE STAINLESS STEEL TAPE: TO DETECT BLADE MOVEMENT INSIDE THE HUB DUE TO IMPROPER INSTALLATION AND, OR HARMONIC RESONANCE BETWEEN PROP AND POWER PLANT. TO PREVENT FURTHER FLIGHT IF THIS SITUATION IS DETECTED AND DEVELOPS IN UNSAFE CONDITION (ALUMINUM BUSHINGS INSIDE BLADES BECOMING LOOSE BREAKING BOLTS, BLADES, ETC.)

Short Circuit

by Martin Hadley

Hello from wet and wild Central Florida! Neither wind nor rain or whatever (tornadoes?) can do us in down here. A few weeks back, the folks at Opa Locka airport lost over 150 airplanes due to high winds. That is down near Homestead airport that was hit so hard during Hurricane Andrew. Last week we had a couple of tornadoes rip through the center of the state and several lives were lost along with a yet undetermined amount of property damage. And I moved from Kansas for this!?

We are proud to announce that we have a 'new' gear retract electrical system available. Over the 3 years that I have been here, there have been several modifications to the wiring of the retractable gear system. We have finally developed a "plug-in and go" system that incorporates all of these modifications, plus adds a few other advantages.

The new control box mounts on a plate approximately 10 inches wide by 8 inches tall. Included on this plate are the main gear control box, the starter solenoid, and the battery master solenoid. It is intended to be mounted just forward of the battery on the right hand side of the fuselage. We are revising the construction manual to locate the fresh air NACA, which has been located in this spot in the past, to just aft of the canard bulkhead, on the co-pilots side. This will eliminate the need to run fresh air ducting through or over the canard bulkhead.

This new gear electrical system is considered a retrofit option at the moment. For $535.00 and the return of a few of your gear system parts (listed below) you will receive a pre-wired harness for both the nose and main gear position switches (up and down) and the throttle position switch. This harness has a connector on it that plugs directly into the main control box and terminal connectors that plug onto the switches. The gear control switch panel is already pre-wired with a disconnect plug on its cable so that all you have to do is route the wire and plug it into the control box. An umbilical comes out of the control box for the gear pump that is simply plugged into a connector on the pump. The pump will come pre-wired with the pressure switches already plumbed and wired. Connect three quick disconnect plugs, 12 colored coded wires onto the respective switches, and power and ground, and you have a fully functional gear electrical system!

You will also receive a 30 amp and a 5 amp circuit breaker (unless you get the new XL Upper Switch Panel w/ Circuit Breaker panel), 5 micro switches, a mounting bracket for the main gear up position switch, and a complete 25 page installation

Safety Corner

Continued from previous page

R) Radio station license. Now only needed if you fly outside the USA
O) Operating Limitations. This is what the FAA issued to you when the airplane was ready for the first flight. It is broken down into Phase I and Phase II
W) Weight and Balance. You all know what this is. We normally record this information in the flight manual. Log books are not required to be carried in the airplane.

Winter Operations

I got a call from one of our northern Velocity pilots who said he was freezing when flying and what can he do about it. First of all, I should have addressed this in the last newsletter as some of you will already have passed the cold weather by the time you read this. For the rest of you and for the future here is what I done when living in Ohio.

If you have more than one oil cooler, stop the air from going to your engine compartment oil cooler. Use some duct tape if necessary. Also use duct tape to shut off some of the air going through your front cooler. In my case, I put a 2" strip of duct tape right over the center of the front oil cooler. Make sure that your shut off valve that causes the air to go to the cabin does not allow any air to by-pass to the outside. This will probably necessitate a small aluminum "winter" plate to be installed in the outlet of the oil cooler air flow so the shut off valve contacts this plate when the cabin heat valve is in the full on position. Make sure that the elevator torque tube hole in the fuselage has some sealing material around it to prevent air flow into the cabin. This can best be done by the installation of some M-D (Macklandburg-Duncan) air conditioner foam sealer around the torque tube in this area. The seal material is about 1 1/2 " X 1 1/2" and is available in most hardware stores. It will crush down to allow full elevator movement and still fill the gap when the elevator is in the cruise position. The next step would be to seal the area where the oil lines pass through the firewall through the ducts. Air will normally be forced from the engine compartment forward through the duct and pre-cool the oil in the lines before it reaches the oil cooler. In the winter we want to keep as much heat in the lines as possible until after it goes through the cooler.

I have flown the Velocity with the ground temperature at 0 degrees F with no problem using the above steps. Good luck and if you have your own tricks, let everyone know about them.

Duane

manual for this system.

This new system has a built in press to test feature that will test all of the gear lights and the gear warning horn. A terminal is provided for any external lamp test boards that require a momentary ground to "test" warning lamps. (Velocity also has a lamp test board for those who are interested! It is set for up to 10 lamps with selectable +12 V or ground sender inputs-$80.00). The new gear system incorporates the airspeed switch mod which defeats errant gear retractions while the airplane is still on the ground. It also has the gear "reset" button used in the event that both pressure switches are 'open'. This button is wired so that it can be used as a backup to the gear selector switch for gear down extension.

The gear selector panel (11/2" x 3") contains the gear position selector switch, a single red light indicating the gear is not down and locked or up and secure (in transit light), two green lights, one each for the main gear and the nose gear, indicating that the respective gear is down and locked, and a single amber light, indicating the hydraulic pump has power applied to it (gear pump run light). There is also two soft touch buttons. One is for the gear system press to test feature. The other is the gear reset button. On the back of this panel is connections for the gear warning horn (not included) and an external lamp test board.

If you are interested in retrofitting your gear system, send us the following items:

a) Your hydraulic gear pump (please drain the fluid if you have already installed and used the pump!)
b) The high pressure switch (p/n 490A26.1)
c) The low pressure switch (p/n 490A26A.1)
d) 2 ea. AN 834-4D Tee fittings
e) 2 ea. AN924-4D Nuts
f) 2 ea. MS 28775-012 "O" rings
g) 1 ea. S6AL gear switch (or optional p/n GEAR switch panel)*
h) 2 ea. ST81SB gear solenoids

* A $50 dollar credit will be given for the return of this item. These units are being discontinued as an available option and while we have no need of them, we don't feel it is fair for you to take the entire 'hit'.

If you have already used your pump for your initial gear retract checks, we will pre-wire your pump and send it back to you generally within 3 - 5 working days. For those that have not been used, we will we will exchange them for pre-wired units sitting on the shelf.

This system will greatly simplify the electrical hookup of your gear system, and gives detailed information on how and where to install the gear position switches and the throttle switch. There are 14 computer-aided drawings detailing all aspects of this installation.

As always, Safe and Speedy Construction!

Martin

Caution...B one R D at your 12 o'clock!

On Tuesday, March 3rd, Joe Lovelace taxied up in his Standard RG Velocity to the east hangar door at Velocity here in Sebastian. After shutting down, Joe jumped out and asked, "What do ya think?" You've got to be kidding, I thought to myself. "No way!", I said.

Two days before, Joe and his girlfriend were in the friendly skies of Orlando, FL, flying in his Velocity. While entering a right downwind for runway 25 at Orlando Executive airport (where the plane is based) Joe's airplane and a bird failed the 'near miss' test. The bird impacted the upper left corner of the windshield.

While entering the downwind, Joe said he was indicating 140 knots and 1000 feet MSL. The gear was up and he was in the process of slowing the plane down so he could lower the gear. As it is with a lot of airports here in Florida, a flock of birds were thermaling in the area. Joe turned to his girlfriend and said "Those dirty birds! I wish they would go away!" Well, one of those "dirty birds" must of heard him and decided to make his presence known.

Here is where the amazing part of this story starts. Standing 30 feet from Joe's airplane when he taxied up, it was almost impossible for me to see where the bird had hit. It was not until I was about 15 feet away, with the sun hitting the windshield just right, that I confirmed a couple of cracks in the upper pilot's side corner of the windshield.

When the bird made contact with the windshield, it deflected it (the windshield) and the upper outboard portion of the fuselage down, separating and opening the seam between the fuselage and the clam shell door. That is where the flight of the bird stopped. Yep. "Half in and half out" of Joe's cockpit. "I was momentarily confused with all the blood and guts in my face. I'm trying to fly the airplane with no abrupt movements of the grip while my girlfriend is wiping all of this from my eyes."

After he could open his eyes again, and despite having to stare into the remains of the bird that just ruined his day, Joe was able to land the airplane safely.

Upon close inspection of the aircraft, this is what was observed:

1) Starting at the upper left hand side of the windshield, a crack 7 inches long, parallel to the left side of windshield, approximately 2 inches from the outboard side of the windshield.
2) Starting at the top of the windshield from a point approximately 3 inches inboard of the upper left corner of the windshield, a 8 inch crack going down towards the lower center of the windshield.
3) Starting at the top of the windshield, between the first two cracks, a 2" hairline crack going straight down the windshield.
4) A spot, about the size of a dime, of paint and contour filler, was knocked off. This spot was approximately 2 inches aft of the top of the windshield and 6 inches in from the outboard edge of the fuselage.
5) There were two, hard to see, hairline cracks in the paint.
6) Some serious delamination between the glass and foam in the fuselage behind the upper left hand corner of the windshield, about 6

Continued on next page

Bird Strike

Continued from previous page

inches in from the outboard edge to a point 2 inches down from the outboard edge.

Have you ever seen any airplane after losing in a game of "chicken" with a bird? They usually look like they came out of a war zone. Holes in them with bent and broke parts. everywhere! Bad!

Joe removed the bird once he was on the ground and has spent "several" hours trying to clean up the inside of his plane. There was blood and bird parts from the windshield to the aft cabin bulkhead. Joe is one of those guys who is almost approaching obsessive compulsive when it comes to keeping his plane clean. His efforts have paid off very well, although he is saying there are some interior pieces that he may replace.

The day before he flew the plane to Velocity, he called up and told us what had happened. He asked Scott if he could bring the plane to Velocity for evaluation and repair if possible. Scott looked at the plane and we will be replacing the windshield for Joe and rebuilding the upper left corner of the fuselage where it was delaminated.

Again, to look at this plane in front of the hangar door on Tuesday, you'da never guessed.

Kudos' go to both Joe and his girlfriend. Joe remembered the prime directive. Fly the airplane first! His girlfriend, instead of panicking, recognized Joes' needs and wiped his eyes clean so that he could see again.

After all, this story could have ended shortly after "There I was...flat on my back!"

All of us at Velocity, Inc., and I'm sure all of the Velocity family members worldwide, are glad you, your girlfriend, and your airplane survived with no permanent damage.

P.S. I asked Joe if he knew what kind of bird it was. His reply? "Big" and "Dead!"

Martin Hadley

Fellow Velocity Builder Starts Franklin Engine Business

Fellow Velocity builder Brian Michalk has recently started "New Aviation, Inc.", and will be importing PZL Franklin engines from Poland. Brian has enlisted the services of a local Franklin mechanic. He is an A&P with most of his Franklin experience in the Franklin powered helicopter engines as well as Franklin powered Stinsons. His name is Joe Sills. He has been in the business for over twenty years, owns his own repair shop and has been very successful.

Brian's business partner is Juanita Londenberg. She will be answering the phones and making sure things run smoothly. It looks like it is another family owned business, because Juanita is also Brian's mother. You can see pictures of Brian, Juanita and "The Goose" (Velocity Elite) at www.awpi.com/michalk/velocity/velocity.html.

New Aviation is taking orders now. They plan on placing their first order with the PZL factory next week (as of this writing).

They are still negotiating a few details with the factory. They don't yet have a stock of spare parts, or a complete parts list.

Please let Brian know if he can be of service.

Brian Michalk
New Aviation, Inc.
11901 Swearingen, Suite 54
Austin, TX 78758

512-496-1527 (cell phone)
512-928-1112 (voice at home)
512-837-7753 (fax)
512-837-0593 (business voice)

michalk@awpi.com
http://www.awpi.com/michalk

Editor's note: Brian has set up a **reflector E-mail list** for Velocitites with Franklin engines: **franklin@awpi.com** If you want in on this list, then send Brian an e-mail at michalk@awpi.com. You need to be either building or flying a Velocity to get on, so give Brian your factory serial number.

Editor's note: If I were to buy a Franklin engine today, I would not buy it from Pat Goodman (Atlas Motors Inc.). I found Pat to be unprofessional to do business with (rarely returns phone calls, fax memos, etc.). I had to stay on top of him to get him to keep his commitment about delivery dates, shipping of parts, etc.

Also, a difference between Brian and Pat, is that Brian will have PZL accessorize the engine. This increases the cost of the engine a bit, but, in my opinion, is well worth the extra dollars. If I were buying a Franklin today, I'd give Brian a call. After all, he is a fellow Velocitite!

Rick

Ray Watkins Velocity is based at Jacksonville, Florida's Craig Field. "I have been flying it since March of 1992. I can't say enough great things about the airplane, or the factory and their continued support," said Watkins.

Dave Black is getting real close to that exciting first flight!

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.

Brake Cylinders

From Paul Amberg, Clearwater, Florida

I damaged the threads on the shaft of one of my brake cylinders and needed a replacement. Scott thought that there might be an old one in the shop but no luck. I checked with NAPA and they get $55.00 a piece and all I needed was the shaft. So I checked in with my local auto salvage yard (one that lets you go in and pull your own parts) and they thought that they had an old Datsun B-210. Unfortunately after walking through the yard, I found out that they had crushed it the day before. Well I wasn't going to leave empty handed, so I took a close look at a couple of newer Nissans and found that the same cylinder is used on the 280 and 300ZX's. There was only one difference, and that was in the length of the shaft, with the newer cars having a shaft about 1/2 inch longer. I was able to cut it down and cut some threads with a metric die. My reason to mention this is to point out that the age and availability of parts for us down the road could be a problem. If we are still flying these planes in 10-20 years you will have a heck of a time getting a rebuild kit or replacement cylinder from a 1970's car. A master clutch rebuild kit for a 1980-1990 Nissan 280 or 300 should do the trick. If the factory can no longer get the old Datsun cylinder they may have to switch to a later model and retool the shaft to make it work in the current design. I would like to add one more note while I'm on this subject, the left cylinder is very close to the fuselage wall, and we are supposed to put in a 90 degree brass fitting and then hook the other end to the nyloflow tubing. The instructions tell us to use Teflon tape, this is a bad idea as Teflon tape shreds and a piece may enter the hydraulic system plus I have heard that a few builders are experiencing some leakage. The problem is the use of the 90 degree elbow, this cylinder was designed to have a flared metal tube and compression nut, not a tapered pipe fitting. When I removed the cylinder from the junk car I took out a piece of the steel line to see if I could get a tight enough radius without a kink. I tried it and you can, now all I need to do is to put in a union to connect the metal line and the plastic one.

If anyone is interested in picking up a fuselage cradle, it has caster wheels and screwjacks on each corner to level it. Because of its size it would be impractical to ship. So if anyone in the area is willing to drive to Clearwater with a pickup truck they can have it.

Also I was wondering if any other builders have considered, or have any experience with molded plastic bottles or containers. How difficult/costly would it be to have our fuel tanks made this way. So that we could just "drop them in" use some pour foam to hold them in place and not worry about leaks in the fuel system.

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Franklin Engine Information and Ivo Prop Notes

From Rick Lavoie,
St. Augustine, Florida

First, a couple of notes on the Ivo Prop...

- Wire:

If you are going to replace the lamp cord, you need to use #16 AWG aviation wire (not 18 AWG).

- Bolts Bottomed-out:

After about 75 hours on my original set of blades (I have a second set as back up), I noticed that the bolts were starting to bottom out. Ivo told me to add a second washer at the bolt head (or I guess you could go down one size with 6 new AN bolts).

- Electric Motor:

Since Ivo replaced the plastic gears with stainless steel and the carrier (aluminum to stainless steel), my motor has been running soundly.

If you have any doubt about your motor or blades, send then to Ivo for inspection. I have done this twice, to be on the safe side...

Since Mark's death, I'm extra extra extra cautious about everything (including the Ivo Prop). After each flight, I always clean the prop blades and inspect, check the torque at 65 ft lbs., and check the metal tapes. So far, all is ok.

For those of you with a Franklin engine, you may want to get your hands on the fax correspondence from PZL - Rzeszow (Franklin engine manufacturer in Poland). I have taken the time to scan and convert these faxes into one large "PDF" file, which is universal to all platforms (Windows, Macintosh, etc.). To download the file, go to my own web site which is lavoiegraphics.com and click on the "Velocity Views" link, then click on the "Download" section. Be sure to read the instructions about using and downloading "PDF" files.

This file is in chronological order and covers topics such as:

- oil cooling problem and the oil bypass group
- correct placement of the oil pressure and temp probes
- PZL Franklin manuals part numbers (is yours current?)
- placement of an oil filter
- oil leak at crankshaft hub (correct plug needed)
- propeller governor pad cover (if Pat Goodman left the wrong plate on, then you will have low oil pressure)
- Slick magneto service bulletin PZL-

F/50/96
- Service Bulletin PZL-F/58/97 (increases TBO to 1500)
- engine starter dilemma
- how to order parts direct from PZL's Sales Dept. in Poland
- other related information

I recently did a complete 100 hour/annual inspection on my Velocity. I followed the check list in both the PZL Franklin engine manual and the new Velocity Owners Flight manual. My Franklin's compression was 80/80 on all six cylinders! It still runs just great.

Please, if you want to contact me about the Franklin engine, be sure that you have obtained the "PDF file" from my web site and have read this information first! I have been flooded with phone calls from builders asking me questions, the answers to which are almost always contained in these files. I am not an employee of Velocity Inc., nor do I sell engines or parts. I am just a builder, like you, except that I am also the newsletter editor. Thus, as a volunteer sharing information, I ask that you first check these documents to see if your answer is there, then please be considerate of the hour if you feel you need to call me. Judy and I usually go to bed early. I am getting calls at all hours of the night, even at midnight! I much prefer to get an E-mail, so I can answer as my schedule allows, but for those instances when you must call, please do so during the day hours (9:00 am to 5:00 pm Eastern Standard Time). Lavoie Graphics is just me and Judy, working out of a room in our home, so when you call me, the phone rings in my home. I thank you in advance for your consideration.

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Starving!

From Simon Aegerter, Winterthur, Switzerland

The "90% done" mark is getting closer. The inspector says it is ready to fly, Jim Agnew says it is ready to fly and Sam Dasilva, my test pilot says so too. Who am I to think otherwise?

So, one nice morning with everything in place Sam donns his cap and we taxi out to runway 22. Run up. 1500 RPM. Mag check ok. 2200 RPM. "What the..." the engine stutters, coughs and quits. Restart with no problems. Run up to 1500 - no problem. Accelerate to 2200 - quits. It sounds like fuel starvation. At high rpm the engine seems to run too lean. Why? Too lean means too little fuel or too much air. Do I have a leak in the manifold? Looks like it: the manifold pressure never gets below about 23.5". Fixing some minor leaks doesn't change anything. I call Rick about the manifold pressure. He sees the same thing - and he flies!! I call Duane and he tells me that this pressure is perfectly normal, because, he says: " In the Franklin, the tupsulator does the justapoining in a crossgatoring fashion and that leads to a supligatating of the kreaptopolation." - or something to that effect. It was very clear and kind of obvious, if you knew what he was talking about. I didn't. You see, I'm not an engine man. I am your archetypical physicist. I know my thermodynamics and I know why an engine works. But I'll be darned if I knew HOW it works - and couldn't care less. That is why I had decided to buy a brand new engine with all the peripherals installed by a professional, so that everything would be right from the beginning.
Yeah, right!

I really don't care, but what happens in that manifold? I really don't want to think about it, but if I were, it seemed to me that a leak would lead to starvation at LOW rpms, not high. So, is it too little fuel rather than too much air? Looks like it, because when I try again, it starves and pushing the primer saves it. So does pulling the carb heat. Yes: pulling the carb heat INCREASES the rpm. The fuel comes from the carburetor, doesn't it? I decide to ask the Reflector folks. Marlin Howe also thinks the carburetor is bad, and he says he isn't an engine man either. Got to be right. Need to look at that carb. I have taken other things apart. Sure enough: that needle valve sticks. Well - a little. That burr here on the float hinge, does it bind? File it off!

To make a long story short: three people looked at the carb: Myself, A&P Bruce next door and the carb specialist at South East Fuel Systems. Now, the reaction to the carb heat is normal. But the engine still stalls at high RPM.

Forget it. Let the pros take over. I taxi the Velocity to the FBO on the field and demonstrate the starvation to the chief mechanic: Run the engine at 2200 rpm. Run. And run. It just won't quit. Just like toothache at the dentist's. I taxi around the parking lot and try again. There it goes: plop!

After a day, the pro decides that the p-leads must be shorting intermittently. He disconnects the grounds and it seems to work well. I rebuild the p-leads. Run up at 2200. Stalls.- Now, what? I try everything. I follow every suggestion: Tank venting? Clogged fuel lines? Fuel pump? It couldn't be the fuel pump, because the situation is the same whether the booster pump is on or off. If the engine driven fuel pump would fail, the electric pump would force the fuel through it, right? I try it: 22gal/hr flow through the idle pump. But I am desperate. I bypass the fuel pump. Run up to 2200 with the electric pump running. Runs. 2400 rpm. Runs. The engine can not be made to quit. Not with either mag off, not by jerking the throttle. I have to kill it when the oil gets too hot. After it cools off, I try again. It just simply runs and runs.

I have found it. It IS the fuel pump. And today is my sixtieth birthday. Where do I get a new fuel pump? Again, the Reflector helps: Bob Noble knows that it is essentially a 60s Chevy pump and Pep Boys have it. They do and it takes just a day to get it. It looks exactly like the old one except that the spring is stiffer and the push rod is 1mm longer (and it costs $29 - while I had payed $150 - for the old one). I install it and now the engine runs just fine. However, I have learned a lesson: the electric pump is not able to overcome a failing mechanical pump. So, it has to work on its own,

that means it has to run parallel to the mechanical pump, not in series. I have to rebuild the fuel line system. Oh, well! I guess I have learned a few things about how an engine works. Maybe that's not so bad after all.

I learn even more: Before my first solo flight, the run up sounds just like it did with the bad pump. One mag off kills the engine. But the sequence of events is slightly different: Pumping the throttle or pushing the primer doesn't save it. It is not fuel starvation. Now it is the opposite: plug fouling from running too rich! That's right - the engine has to be leaned for taxi and for good measure I have made it a habit to burn off any fouling at high RPM and very lean before the mag check.

So, I may have been the victim of multitude of problems: Bad carb, possibly grounding p-leads, bad fuel pump and plug fouling. No wonder I was unable to find a quick fix.

•••••

Keep it Cool!

From Simon Aegerter, Winterthur, Switzerland

Good decisions are based on experience, they say. Yeah - and experience comes from bad decisions. Wouldn't it be wonderful if you could let somebody else gather all the experience and you could then go ahead and take the good decisions? Well - it IS wonderful!

Rick Lavoie has volunteered to take all the decisions that, with hindsight, turned out to be the wrong ones, and he volunteered to share the experience that finally enabled him to take the right decision. The topic is oil temperature in the Franklin engine and you have read about Rick's predicament in the last issue of VV.

When I was finally ready to fly my Velocity (see my prior article on MY bad decisions), I kind of expected what would happen. Knowing about Rick's experience, I had not installed a second oil cooler nor an oil filter, but had used steel braided Teflon lines ("Air quip") to the cooler in the nose. That means fewer fittings and, I hoped, smoother oil flow due to the Teflon lining. From my static tests, I knew that the NACA scoop worked. After a static run of a few minutes, the oil cooler was so hot, I could not touch it. With the aircraft pointing into a 18 Kt wind, it took less than a minute to cool to hand warm. Looked hopeful. But then, so it had for him, Rick said. When Sam, my test pilot, was finally satisfied that the engine might run long enough to get us to a safe altitude, we went out there, with me in the right seat (as the manufacturer of the aircraft I have determined that the required crew for the first 5 hrs of flight is one pilot and one flight engineer).

First, Sam wanted to do a high speed taxi to see if he could lift the nose at a speed that made sense. He could. At 60 Kt. Looks good! Problem was, this test lasted about 40 minutes with all the taxi and holds that ATC wanted us to do (gee, they can't get enough looking at this beauty!). So, when we were finally ready to do the run up for the real thing the oil temperature had crept into the 230s. Time to call it off. Ground allowed us to sit at the edge of the apron with the engine shut down for the next 25 minutes.
With the oil down in the 160s, we went for another try. This time it was "cleared for takeoff" immediately. Sam firewalled (sorry, instrument paneled) it and he had only one thought: get it to a safe altitude fast. I had only one thought: watch that oil temperature. 210°F at lift-off - 220 - where are we? For a moment I take my eyes off the Monitor and look outside. Holy cow! we are at pattern altitude and not even beyond the airport perimeter! Back to the gauge: 230! Sam levels off at 1500 ft agl and the oil temp levels off just at the red line temperature of 232°F or maybe a hair above. One orbit around the airport. Oil temperature stays put. Second orbit. Plane flies great. Oil temp doesn't budge. "Sam, we gotta get down". He throttles back and asks to land. "Cleared to land, runway niner". On the ground, the temperature has backed off the red line just about 10 degrees. Not good. Not good at all. It takes a while till I realize that I have just witnessed the first flight of my Velocity from close up.

Just like Rick's first flight, I thought. Except, I knew exactly what to do. Pull the cowls and pull that plug in the bypass valve assembly. There is that spring. And there's the steel ball which the spring presses against the bypass orifice. Too weakly! I insert enough washers to pre compress the spring by 1/4 inch, just like PZL, the engine manufacturer, had told Rick.

Second flight next day. Again, climb to 1500 ft. Again oil temp climbs to 230°F. Looks conspicuously like yesterday. Except Sam hurries out towards the beaches at high power. "Can you throttle back a little?" He does and for the first time in flight, I see the oil temperature creep back from the red line. By the time we have reached the test area, it is down in the 210s and I take a deep sigh; we are finally flying for real. We remain careful and climb in steps of 1500 ft and let it cool off. I finally have time to look at all the other numbers; the cylinders are almost too cold - 220° to 240°F!

So, the recipe works: put in the stiffer PZL spring in the oil cooler by-pass group and bingo! There is so much heat going to the nose of the airplane that hot air is not only coming through the heater ducts but through all the open space behind the panel. There seems to be enough leakage through the closed nose gear door and I have not yet closed the open area above the canard. Sam asks me to relieve him from the heat treatment for the third flight.
I do. I close the doghouse opening with a piece of foam. I make sure that the flapper which routes the hot air to the cabin is pulled shut and for good measure I plug the heater ducts with a paper towel.
On climb out Sam relishes the cool cabin - and I watch the oil temperature with horror. It climbs just like in the first flight. I am about to call it off, when Sam's plug in the heat duct pops and hot air gushes into the cabin. "Why the hell did you push the flapper open?" I pull it shut and when I release it - bang - it is blown

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open. In other words: it closes the hot air duct to the outside. To keep Sam cool, I have essentially rendered the oil cooler inoperative! He uses the plug to fix the flapper in the "open to the outside" position and from now on, the oil temperature never is a problem again.
Next day I get the original "fix-it-spring" from Rick and I replace the washers and the old spring with the new one. Same results. I do a full power climb from 5000 ft to 11,500 ft with the oil temperature never even near the red line.

So, here is the bottom line, literally: You don't need a second oil cooler and you don't need 5/8" oil lines. All you need is the stiffer spring from PZL.

Thank you, Rick!
PS: when I'm back in April, I plan to do these tests again, in a slightly more scientific fashion and maybe the Florida heat will shift the baseline somewhat.

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First Flight Report: Velocity RG Elite with Franklin & IVO prop

From Michael Watson, New York

After exactly two years of frustration, setbacks, twice going to Sears to purchase a chainsaw to you know what that @#!!% Plane, trying to build a Standard Elite with a 173 manual, my Velocity RG-E is finally completed.

Being rusty flying wise, I decided it would be prudent for me to visit the factory and do some time in their trainer. BEST DECISION I HAVE MADE SINCE LEARNING TO FLY.

A friend of mine had to do his recurrence training in his Piper Malibu in Vera Beach Florida, so we decided to split the cost and make a week of it in Florida. Although the Malibu has a very sophisticated Auto Pilot, I decided to hand fly it from Westchester Airport in New York to Melbourne Florida.

My thinking was that this is a hot clean airplane with similar `V' numbers to the Velocity, so if I had four hours flying time plus a couple of take off and landings in it, the Velocity would be noooo problem, big big big mistake.

On Monday morning we flew from our base in Melbourne down to the Factory in Sabastian (10minute flight). There I met with Mr. Tom Jetters my flight instructor for the next three days. After all the niceties and finally meeting all the people I dealt with over the building period, it was time to get serious and mount that bronco.

- SURPRISE #1: I cant steer the dam thing, I'm all over the taxi way.
- SURPRISE #2: I'm not use to going vertical on takeoff, is this the space shuttle. I'm close enough to Titusville.
- SURPRISE #3: The VSI says "0" why are we in a 4 degree dive towards the ground.
- SURPRISE #4: Why is landing this thing feel the same as riding a ground hugging cruse missile to a Sadam target on the first third of the runway.

The differential braking took a while to get use to, but with Tom's patience and guidance I had it down pat after around my tenth taxi session.

The view from the cockpit places the artificial horizon in an unaccustomed position, this gives the elusion of descending when your flying perfectly straight and level. On takeoff you get the feeling of over rotating, but looking out the side window you can see that the canard is roughly 4 to 6 inches below the horizon.

The view in the landing phase was the hardest to become used to. We seemed low, level, and too fast yet Tom had the vasi nailed perfectly. Then came the touch down, wooooooooohhhhhhhooooo I don't think I like this flying into the runway crap at all. Anyone want to buy a Velocity cheeeep.

OK all fun aside I found Tom to be a Very competent Velocity pilot. His attitude, patience and dedication to the task at hand is commendable. If I had Tom as my instructor when I was learning to fly, I would have had my ticket in half the time. (And half the cost.)

The Swings were great hosts and Darin, Jeff and Martin are a riot to be around.

I strongly recommend to anyone building a Velocity to make arrangements to go through their training program. It's worth it (Less than your life or your wrecked aircraft). The Velocity flies very different than a standard configuration aircraft, even a high time Long EZ pilot (Rick Lavoie) confessed that he was thankful that he had the sense to become trained at the factory before flying his Velocity.

I also recommend that you hire Tom to do your initial low and high envelope testing. He is thorough

DMO339 Flies.

Well, it finally happened, after two and a half years of hard labor, frustrations and joy. On Sunday February 15, N104MW Standard RG-E "DMO339" lifted it's nose off Runway 16 at White Plains NY (HPN), and piloted by Tom Jeter, climbed like a Banshee before twenty plus gasping spectators, disappeared from view within two minutes.

Within ten minutes Tom was forced to returned to the field due to very high oil pressure.

On examination, we found that the oil pressure sending unit was cooked from pre-heating the engine earlier that morning. The next morning we replaced the oil pressure sending unit and Tom took off to do the high envelope test.

Unfortunately we were bitten by the dreaded "FRANKLIN HIGH OIL TEMPERATURE" problem, and again Tom had to land before completing the test.

Tom had to return home on the 18th, so I will have to continue the test, that's after replacing the oil lines with 5/8" tubing and adding the washers to increase the pressure in the lines.

Editor's Note: Upon reading Mike's article, I sent him an E-mail suggesting that he read Simon's report prior to changing his 1/2" lines to 5/8"

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Order your New Velocity full color poster by calling the factory or Velocity West. It cost $7 (includes shipping). Above is a grayscale version of the full color poster, which measures 18" X 24".

Vacuum System Installation Tips

by Martin Hadley

One area that builders occasionally have difficulties with is the vacumn system. Installations can vary widely with mixed results. While this is not the only way to install your vacumn system, it is one that has been proven to work well in the Velocity.

Materials needed for this installation can be obtained from any good hardware store. You will need to use thick walled flexible tubing. We use clear vinyl tubing for most all of the installtion except in the engine compartment where we use rubber hose. The heat factor is why we do not use the vinyl hose here. Nylon fittings may be used forward of the instrument panel while metal fitting should be used in the engine compartment.

Below is a list o materials:

- 12 ft.- 1/2" OD aluminum tubing (same as the oil lines)
- 5 ft.- 1/2" ID rubber hose (thick wall)
- 5 ft.- 1/2" ID vinyl tubing (thick wall)
- 7 ft.- 3/8" ID vinyl tubing (thick wall)
- 2 ft. - 1/4" ID vinyl tubing (thick wall)
- 3 ea. - 1/2" X 3/8" NPT barbed hose fitting (nylon or metal) (2 of these are for the regulator - your regulator may not need these.)
- 4 ea. - 3/8" X 1/4" NPT barbed hose fitting (nylon or metal)
- 2 ea. - 1/4" X 1/8" NPT barbed hose fitting (nylon or metal)
- 1 ea. - 3/8" NPT "TEE" (nylon or metal)
- 2 ea. - 3/8" x 1/4" Bushing (reducer) (nylon or metal)
- 1 ea. - short 1/4" NPT nipple (nylon or metal)
- 1 ea. - 1/2" X 3/8" NPT 90 degree barbed hose fitting (metal)

It is reccomended the 1/2" soft aluminum tube be routed from the engine side of the firewall to the front of the canard bulkhead. The suction regulator should be mounted for easy access through either the nose wheel well or the to nose cover hatch. Placing the regulator in the cockpit makes for difficult adjustment, especially if it is located behind the pilots side of the panel.

Using the 1/2" rubber tubing, connect the vacumn pump to the aluminum line. With the 1/2" vinyl tubing, connect the forward end of the aluminum line to the regulator.

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Vacuum System Installation

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From the other side of the regulator, use the 1/2" vinyl tubing to connect to the "TEE" which will be attached to either gyro with the nipple on the port marked eithr "VAC" or "AIR OUTLET".

Using the 3/8" vinyl tubing, connect the open end of the "TEE" to the other gyro port marked either "VAC" or "AIR OUTLET". Connect both gyros to an air filter with the remaining 3/8" fittings and tubing. The 1/4" fitting and tubing is used to connect a suction gauge to either gyro using the port marked "Gage". Most of the 1" suction gauges there is a "P" and a "V" port. The "P" stands for pressure, the "V" stands for vent. Hook the 1/4" line to the "P" as we are reading negative 'pressure'. The "V" may be left open.

Once your system is hooked up, make sure all lines are secure to the fittings and tubing. It would not hurt to place two tywraps approximately 1" apart on the rubber and vinyl tubing where it slips over the aluminum line. Once this is done, you are ready to adjust your regulator.

Your regulator should be adjusted around 1700 RPM. The reason we do this is because this is the general area where your throttle will be set during approaches and we want optimum vacumn at this setting. If your vacumn pump is new and has sat on the shelf for a while, or is used and starting to show signs of being worn, you will notice that your vacumn setting follows your throttle. This is not something to lose sleep over as long as you get your adjusted vacumn setting at and above 1700 RPM. A great and wonderful system will give you your vacumn setting above 1000 RPM.

And just what should your vacumn setting be? 4.8 to 5.0! The green arch on suction gauges goes from 4.8 to 5.2.
"Lazy" gyros are usually the result of a restriction or a bad gyro. If you have good vacumn, check for kinked hoses first, then for a dirty filter.

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VELOCITY VIEWS

"So, how is the newsletter doing?"

My answer depends on when you ask. Scott asked me that question last December, and I responded "Great"! You see, my goal for breakeven has always been to get us up to 500 subscribers. Last December, we were almost there with 465 subscribers. Looks great, right? Well, then there's renewals...

As of this writing, we have 397 subscribers. It was even more dismal when I mailed out Volume 13, when we had only 297 subscribers. A good part of the non-renewals is just human nature... to put off things like renewing a subscription. I imagine that by year's end, most of the non-renewals, will in fact renew again at some point during 1998.

There are a total of 537 names in my data base, of which 397 have renewed, leaving 140 that have not. Out of the 140 that have not renewed, the disturbing fact is that 89 are people with a factory serial number. This means that they are either building or flying a finished Velocity. I just don't understand how anyone could be building or flying a Velocity, and not want to keep up to date? Maybe some of them have put their project in moth balls for a while? Well, anyway, I'm preaching to the choir, since you obviously have renewed!

In any event, I expect that this will be the year that we may finally hit the 500 mark! But I also predict that, come January of 1999, we will go back down to about 320 subscribers. This is a trend that I'd like to change very much. Let me explain why...

Please renew on time...

When you renew your annual subscription after December 31, it creates a whole lot of extra labor on my part. Here's what happens. This past January, I mail out Volume 13 to the 297 subscribers that renewed on time. Those labels were computer generated, and all labeled and stamped at once. Since then, 100 of you renewed a bit late. This means that I must individually (by hand) send out each of those subscriptions as they dribble in. This process is very time consuming! Please, those of you who renewed late, please try hard to renew prior to year end this year. Thanking you in advance!

Rick

Velocity Views Web Site is Up!

Check out the new *Velocity Views* web site. Besides subscription and general info, there is a download section that has some files of interest. The index of all past articles file (volumes 1-13), and the PZL Franklin engine fax file are there for subscribers to download. The files are saved in "PDF" file format, which is a universal platform (Windows, Macintosh, etc.) that uses Adobe Acrobat Reader (available for free). Be sure to read the directions on the download page, if you are unfamiliar with downloading or PDF format. As I have more time, I'll place other files of interest here for subscribers to download.
Go to:
lavoiegraphics.com

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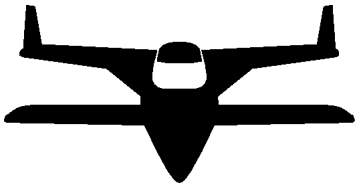
to all *Velocity Views* Subscribers.



For Sale
Velocity Elite 173 FG

Partial assembly includes: Professionally built canard, and wings with tips attached. Bulkheads, Center Spar, Main Gear, Keel with control systems in place, Seat hard points, Tabs to hold instrument panel, Brake master cylinders with brake lines run, Brake and rudder pedals, Landing light

Includes new manual with current newsletters and epoxy pump
Price: $36,000
Contact: Mark Fay in Tuscon AZ at 520-529-3699

Sign up for the
FIRST ANNUAL WEST COAST FLY-IN

See page 6 for details!

For Sale
Flying Standard Velocity

Built in 1989 by Dan Maher, 485 hours total time on airframe, original wings with LE cuffs, IO-360-A engine, 360 hours SMOH, IFR certified, King 155 Nav/Com, localizer, glideslope, King KT76A Transponder, Navaid AP-1 AutoPilot, marker beacon, PS PM1000 Intercom, JPI EGT/CHT engine scanner, new upholstery, 3 blade performance prop, (plus an extra 2 blade spare prop)

Location: St. Augustine FL
$65,000 - call for info sheet and photos if interested.
Contact: Dr. Dale Ingram at 904-824-4303 (office #), or 904-461-3132(home #)

Engine Tools For Sale

I recently purchased $1,000 worth of new tools from **PZL** for my **Franklin engine**. When I received the tools, I found that I ordered some tools that I would not be using. I got confused in the language translation. PZL is willing to take the tools, back, but by the time I pay for the shipping and customs, it would not be worth it. I do not ever plan on doing a major overhaul myself, so I thought I'd offer the following tools for sale. Call me if you are interested, or if you know a mechanic that might want them:

- Dynamometer Wrench, part # 26.08.0630, paid $435.00
- Wrench Assembly, part # 26.08.0190, paid $60.22
- Wrench Arm, part # 26.08.0140, paid $28.62

Call Rick Lavoie, St. Augustine FL 904-461-6912 or lavoie@aug.com

Free
Fuselage Cradle

If anyone is interested in picking up a fuselage cradle, it has caster wheels and screwjacks on each corner to level it. Because of it's size it would be impractical to ship. So if anyone in the area is willing to drive to Clearwater with a pickup truck they can have it.
Paul Amberg, Clearwater, Florida
pamberg@ibm.net

OPTIONS CATALOG
New Kit Options Catalog is Free for Builders

Velocity's new kit options catalog is hot off the press. Be sure to call the factory to get yours mailed to you (free to builders). This options catalog has doubled in size, and has just about everything you will need during construction of your Velocity!

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Delivery Dates	
Quarter:	**Mailed by:**
1st	January 15th
2nd	April 15th
3rd	July 15th
4th	October 15th

Submission Deadlines	
Quarter:	**Mail Date:**
1st	December 1st
2nd	March 1st
3rd	June 1st
4th	September 1st

Listed below are **4 options** for submitting your text. Please send us **photos** and drawings too!

1) Send it on a **3-1/2" computer disk** (Mac or DOS). This saves us from retyping all that text. Don't format your text, just give us raw text, with no underlining, bold, or any other type of formats. We also can take Zip100.

2) **E-Mail** your text file to me: lavoie@aug.com

3) If you don't have access to a computer, then we can scan in your **typed** page.

4) If you **print neatly** so we can read it clearly, we'll intype it on our computer for you!

Note: If you need your photos & materials returned, please include a self addressed envelop.

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VELOCITY VIEWS

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