Hangar Talk

FLASH - MATCO SERVICE BULLETIN JUST RELRASED

The "Lightning" Newsletter

July 2010 - Volume 3, Issue 7

Greg Crouchley's' Lightning of the Month

Please submit a photo of your Lightning for future "Lightning of the Month" consideration.

The newsletter goal is **to get the word out** on anything having to do with the Arion Lightning aircraft, and **to give a voice to Lightning builders, flyers, and anyone interested in this amazing airplane**. It is not only a way for the factory to provide Lightning news, but it is your newsletter as well. Its success will depend on you getting involved to spread the word and to help others that are considering a Lightning, plus building, flying, and maintenance tips. So think of this newsletter as an "exchange of information publication". Send your inputs directly to me at: **N1BZRICH@AOL.COM.**

Contents in this issue

And now, the rest of the news.

NEWS FLASH: SERVICE BULLETIN ON MATCO WHEELS
SEE ADDED PAGES 41 & 42

July 2010 – As I complete this issue of the Lightning Newsletter during the last few days of June, I realize that in about two weeks I will be on my way to Oshkosh. Hopefully many of our Lightning Newsletter readers will also be able to attend the annual EAA convention this year and we can enjoy the year's greatest sport aviation show together. I always enjoy meeting members of our group at the Lightning booth and finally getting a chance to put a face with a name. If you haven't flown your Lightning to Oshkosh yet, make this the year you put your pride and joy out there for everyone to see and enjoy. I am hoping that we have lots of Lightnings on display in the homebuilt parking or homebuilt camping areas and therefore many others get to see what a beautiful airplane it is. There is no doubt in my mind, many of you have built award winning airplanes, so be sure to have your jet judged. See you there.

This issue of our newsletter starts off with a write up by Greg Crouchley about his Lightning of the Month and Virginia Regional Fly-In award winning jet. Greg built his Lightning at Green Landings Flight Center in West Virginia and is now enjoying flying it all over the east coast from Rhode Island (his home state) to Florida for Sun-N-Fun.

Also featured in this issue is a write up by Dave Jalanti, the Lightning Northeast dealer, about his Lightning, N81DJ. Dave's Lightning is the very first Lightning certified as an ELSA and as such, will now allow future Lightning customers to have three choices as to how they want to buy their Lightning – SLSA, ELSA, or EAB. Just to make sure everyone understands the distinction between the three possibilities, here is a short explanation. Of course the first Lightnings sold were all Experimental Amateur Built (EAB) kits, meaning that they were sold to meet the existing FAA rules that allowed an individual to build and certify the aircraft if they, the builder, did 51% of the work to complete the airplane. The individual that completed the EAB kit airplane is listed on the data plate and in the FAA records as the builder of the airplane. These kits could be built to meet light sport rules (stall speed, max RPM cruising speed, and gross weight) so that a pilot flying with a light sport license could fly them. Next, the Special Light Sport Aircraft (SLSA) Lightning, LS-1, is a ready to fly aircraft. Some people refer to the SLSA as a turnkey or store bought airplane. It is built at the Arion Lightning factory in Tennessee and delivered to the customer as a completed airplane. Arion Aircraft is listed as the builder of SLSA Lightnings. Once a light sport aircraft manufacturer has produced at least one SLSA, that company can then also sell Experimental Light Sport Aircraft (ELSA) kits. ELSA kits are more than 51% complete, but less than 100% built. The customer and Arion, or one of their dealers, will decide just how complete the ELSA kit will be and that will determine the kit cost. The buyer then completes the airplane, but the builder of record for ELSA kits will also be Arion Aircraft and the ELSA Lightning must be built and equipped like the SLSA Lightning. So with the ELSA Lightning now approved and flying, you can have it your way – an EAB kit, an ELSA kit, or an SLSA completed airplane.

Greg Crouchley's N126NM, Lightning of the Month

Dear Buz,

Greetings! Well, we have passed the 50 hour mark with this fantastic bird! I have a collection of thoughts and observations to share.

First, I'll cover the Green Landings build center.

Being a customer of Ryan's at Green Landings when the first Lightning arrived, I have had 3 unusual opportunities. First, I could watch the Lightning being built over and over again as each of the customers who chose the Builder Assistance Program progressed. It is a very straightforward build, the manuals are very clear, easy to follow, and complete. The pictures are excellent guides throughout. Watching the builds in real life and studying the manual gave me a very complete and thorough understanding of every step of the process. I estimate that very few potential individual builders have been able to repeatedly watch every single part of the construction so closely and as often as I have. So, as the desire to have my own bird grew, I was being seduced by the "Hey, I know I can build this myself" siren song.

Next, thanks to great people like Buddy Carlisle, Ryan and Nick, Jim Langley, Gary Winkler, and several other owners, I was able to fly in just about all the different wing length and tip, bell cranks, elevator, wheel pants, trim, and prop set ups available, allowing me to decide exactly what I wanted and why. The same is true for the avionics, instruments and of course paint and interior options as well.

I am not aware of any customer not already affiliated with Arion that has had an opportunity to the extent I have. However, I HAVE seen every single builder modify their initial plans to some degree or other during their build based on what they learned at the Build Center.

While it was not part of my initial plan, being around the other builders at the Build Center, both while I was deciding to build and watching others, and especially DURING my build (things evolve steadily at Arion!), were keys to my total satisfaction with my Lightning.

The third key is the more obvious. Since I have to fit the build into my work and family obligations, the Builder Assist Program allows me to spend time building, not studying plans. The tips, know-how, special tools, little parts, and plenty of helping hands all around, really make the build not only quicker, but MUCH less frustrating. I almost never encountered a situation where I had to postpone or delay any project due to a missing part or useful tool. Further, the advice on what NOT to do to avoid a future conflict, what TO do that keeps clarity and perspective for the thousand little questions that arise ("run this in front or in back of that?" type thing). When I read, talk to, and listen to people building other planes, the realization of how valuable this assistance and guidance is to me and my mission continues to grow over time.

So, in the end, for a pilot with limited free time and who is a bit of a Type A, I decided to make use of the program, and I could not be happier that I did. Could I have built it myself? Absolutely. The kit, the manual, and the Arion support are just THAT good. Now that I have a plane that turned out even more perfect for me than I had expected, WOULD I use the Builder Assist Program if I were to do another one? Absolutely.

Greg looks like a happy customer to me.

Not once in the entire build did the thought cross my mind, “when will I ever finish?”, or “NOW, what little part or tool do I need to order from Spruce, Wicks, or Avery?” So many non-Lightning builders like to report that when they finally got their planes in the air, all the time, frustrations and struggles were worth it. Part of my mission was to avoid the situations that caused the “character building” in the first place!

Thanks to Ryan and his Builder Assist Program, and of course Nick and Pete for such a thorough and thoughtful kit, the build was nearly as enjoyable as flying the Lightning!

Ryan and Greg getting ready for a local flight while at the Virginia Regional Fly-In

Next, are my thoughts on designing my instrument panel.

I was interested for a while in MGL and when I had a chance to see their then latest and greatest in person, the 10" Odyssey in Jim Langley's Lightning, I was sold. I chose the 8" Voyager as it fits better with the newer panel. It is EFIS, EIS, and GPS all in one. It also is the control for my 2 Trio autopilot. Needless to say, tracking to waypoints and destinations, altitudes, automatic 180 degree reverse courses are all a click or two away.

I can customize each of 9 screens, leaving in what I like, changing to larger fonts and bigger arcs for my aging eyes, and leaving off things I don't need or use with the Jabiru. MAP, fuel pressure, and carb temp give way to local time, density altitude, and traffic. Lastly, it is connected to my audio system, so I hear voices in my head such as airspeed and altitude called off on final as they drop to levels I select. Critical warnings also speak to me as well as flash a light and warning on the screen. What is said as any parameter is reached, as well as whose voice the word files are recorded in, are all part of the experience. It's sort of like having a flight instructor along keeping watch and speaking an alert to you as it notices combinations of parameters approaching.

I then installed MGL's V10 radio, which connects to the Voyager. Any frequency at any airport in the GPS goes active at the push of a button. ATIS, tower, ground and more, are all driven by the EFIS. Easy to monitor airports we were crossing over during the last trip. The result is a lower workload approaching controlled airspace. Dual VOX intercom and of course a music jack make it easy to add some Top Gun soundtrack to the drama unfolding outside the plane. It fits a standard 3" hole, is less than 4" deep, and best of all, it weighs one half pound total! It is self contained, not a remote head type unit.

I have the Garmin GTX 327 transponder, and a Control Vision switch panel. We split each of my air vents into two, so I have 4 vents. One is in each traditional place on the low side panel, and two are top center of the panel. Each person has a low vent and then a high one to help combat the sun's heat. They

definitely added comfort over Florida. I added a parking brake, and my flaps and trim controls are on the sticks. Interestingly, I built the indicators into the screens on the Voyager, so there are no Ray Allen indicators on board. I use the iFly 700 GPS as a backup, and am adding a 2" steam ASI soon.

I see my Lightning and Jabiru as state of the art in an experimental homebuilt. The speed, efficiency, handling, styling, and the glass and carbon fiber made me feel I wanted to try to complement it with state of the art avionics. I am very pleased with the total package results and felt the little extra on the gadgets was well worth it, but completely appropriate for my interests and intentions.

Greg's panel in N126NM

And finally, here are my thoughts on flying my Lightning.

There is nothing I can add to what has already been written about this aircraft's fantastic flight characteristics in all flight regimes and by so many experienced and skilled pilots in our Lightning community. The glowing accolades showered upon this plane by people who both know of what they speak, AND have no incentive whatsoever to mislead, are surpassed only by the grins, the laughing, the happy chattering, and the amazement of people of all experience levels (including their first small plane rides) as they Fly Lightning!

But perhaps a word or two would be appropriate now for people, some low-time newer pilots properly weighing their flight intentions, their real skill level, and their long range mission, since I am that lower time pilot as well. I was concerned that a plane with such low drag that is so sleek, and handles so responsively, might result in a workload on final that would challenge me to the point of draining some of my enthusiasm. And my first few feeble attempts at landing Lightnings seem to hint that this plane was 'hot'. She picked up speed when I pointed her downhill faster than the planes I trained in and was used to. She loves to fly, even at low power and in ground effect can float uphill a bit if you have excess energy. But with short, but QUALIFIED instruction, it turns out my girl is very easy to control, to set up, and to land gently. This is borne out by so many of my fellow owners in past newsletters that it turns out it is not news!

Let me add here that I believe that no one should ever attempt to learn to fly any plane new to them on their own, especially these days when 20 hours is "enough", and is usually accumulated in one plane, or is likely gained in planes designed specifically for training. Light Sport aircraft are real airplanes, and the category is broad enough, thankfully, to accommodate a wide range of missions. That said, once again Arion demonstrates its well-deserved gold plated reputation in this industry, offering 5 hours of transition training in Shelbyville. There is no reason for anyone, regardless of what is in their log, to pass on the opportunity to fly this plane with QUALIFIED pilots and instructors. Not only adding a lot of safety, it really adds to the fun too.

So, why did things start out a bit shaky for me, yet become second nature so fast? I suspect it is because the planes I was used to required a lot of input, with a fair amount of muscle. In short, I was rowing the Lightning's stick instead of gently guiding it. And when we got that trained out, the realization that the approach speeds were the SAME as I was using in my slower, draggier plane made the concern over workload evaporate.

To repeat myself, a plane that can fly on the high end of what is allowed of a light sport all day long, handles like it's on rails, and lands so slowly yet with control is nothing short of amazing, and is state-of-the-art.

I have said that this aircraft reminds me of my Porsche Boxters like no other (sorry Nick, Buz...apologies to C6's!) in that in a few hours I developed the sense that I am not riding IN the plane, but the plane actually seems to fade away and the controls are wired directly to my brain. I think it...it does it. I don't think about “flying the plane”, rather what I want to do and it does it. Instantly, and with no drama.

I want to thank Nick and Pete for creating this plane and building a first-class support network, Ryan for his generous time and expertise in guiding my build and my transition time, and Buz for bringing such a high level of professionalism and enthusiasm to the Lightning community.

Needless to say, with 50 hours in the air, 'I'm just getting WARMED UP!'

Best regards,
Greg

Enjoy the photos below that Greg sent along with his write up for this article. This young lady is Greg’s youngest daughter, Michelle. She is the M in 126NM.



The above photos of Michelle and Greg’s Lightning were taken at Shreveport North.

Greg landing and taxiing in at Green Landings on 25 June 2010.

Greg also sent this photo to the left and mentioned that you sure do meet some fine people when you fly a Lightning.

But I think he may be dreaming.

Greg says the photo on the right is Ryan paying for the gas. Really, are you sure? Actually, I think Greg doesn't know his Lightning peers.

Dave Jalanti's N81DJ, the first ELSA Lightning

Hello Buz, N81DJ is finally flying!

The FAA Airworthiness Examiner found no issues during inspection and gave me a minimum of 10 hours to fly off during phase one ELSA flight testing. As of this writing, I have 13 hours on N81DJ.

N81DJ, the first ELSA Lightning. Ready for first flight on April 31, 2010.

For the first flight I had a couple of fellow pilot friends, Dave Burgess and Paul Orsini, on the ground with a handheld comm as ground support for the first flight. We had waited till fairly late in the evening, allowing the winds to die down so the remaining daylight was limited. I had my last BFR in the demo Lightning with Katie Bosman in Shelbyville so I was aware of the responsive pitch control and necessity for proper speed on short final. However, my home airport (Kline Kill – NY1) is a not so smooth turf strip. I knew I would need to pay extra attention to the light and responsive pitch and not over control the plane should I get bounced or launched into the air on take-off or landing. Overall, the first flight went very well.

N81DJ –First take off April 31, 2010, Runway 01, Kline Kill Airport, Ghent NY (NY1).

The take off went well but as the plane accelerated past the indicated speed of 65 knots I realized it had a left rolling tendency. It was moderate and controllable so I decided to continue the planned flight. After climbing to 1500 feet the engine was within limits and control was good, even with the left wing heaviness. I then climbed to 3000 feet and did large “figure 8” patterns over the area of the airport, checking the feel of the plane and monitoring the engine parameters on the EIS. I varied throttle and trim settings and bank angles in both directions assuring myself that the left rolling tendency would not be an issue for the rest of this flight. In addition to the left roll, I was suspecting the airspeed was reading low. Either that or this was a very slow Lightning and I knew that was unlikely. At cruise RPM it was indicating 103 to 105kts. Prior to landing I slowed the plane down. Slowing the plane to an IAS of 60kts, the control was still firm and positive. I noticed the left rolling tendency was much less at this speed which would make sense if the roll was an aerodynamic imbalance. Then I slowed the plane to an indicated speed of 50kts. Although the clean stall is supposed to be somewhere around 45kts, there was no indication it was getting close to stall. The controls were still quite firm and responsive, another reason to believe the airspeed indications were reading low. I repeated this with 10, 20 and 25 degrees of flaps. With 25 degrees of flaps I could slow down to 42kts, and still no indication of a stall. However with anything more than 10 degrees of flaps, full up trim was not enough to eliminate the forward pitching moment produced by the flaps. A fair amount of back pressure was needed to prevent the nose from dropping and the plane from accelerating.

With the low airspeed indication, using 60kts for approach and 55kts over the fence would give me plenty of cushion, particularly after I add 20 or so degrees of flap. It turned out that these speeds were too fast and I was also a little high. Knowing the absolute wrong thing to do with a Lightning is to let the nose down to attempt to shed the extra altitude, I opted for a go-around. On my 2nd approach, I lowered my speed by 5kts and came in a little lower across the fence. Still, I had more than ample speed and floated a ways while gradually bleeding off speed then settling on the mains with the nose wheel following a couple seconds later. The touchdown was a non event but the rough runway kept me focused on the controls and wondering if I was going to be launched back into the air. It all worked out, and the only issues I felt needed to be dealt with before flight #2 was to make some adjustments to the flaps to reduce the left rolling tendency and make the necessary changes to get a more accurate airspeed reading. I would deal with the trim issue later.

N81DJ – First Landing, April 31, 2010, Runway 19, Kline Kill Airport, Ghent, NY (NY1).

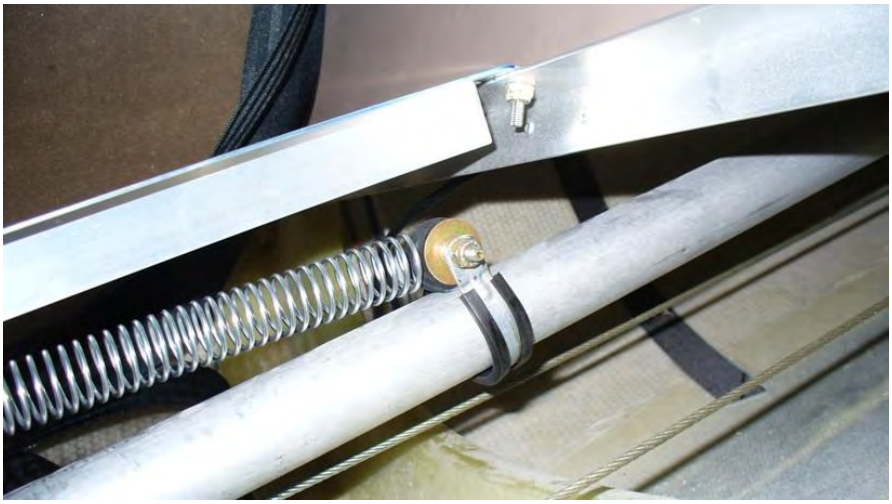
To correct the airspeed, first I needed to correct the angle of the pitot tube. It was angled up relative to the longitudinal axis of the aircraft. Since the pitot and static tubes are joined, they needed to be bent together. It was a simple matter to gently bend them while supporting them near where they enter the wing. I bent them till they were parallel to the longitudinal axis. Additionally, Nick suggested making a small collar to slide over the static tube up to but not covering the static port to block any air that may flow into the static port, creating an air dam of sorts. These two changes cured the airspeed problem and now my speed at 2850rpm is 118kts indicated. Stall clean is 43kts and with flaps at 25 degrees the stall is a ridiculous 35kts! The original airspeed in cruise was about 15kts low and about 10kts low on the low end.

To correct the left rolling tendency, adjustments in small increments were made to the flaps, gradually reducing the left roll tendency. With equal fuel in the tanks it now flies hands off for 5 to 10 seconds before there is a very slight roll to the left. I attribute that to my butt in the left seat. To help counter this, I burn fuel off on the left side first when flying solo.

The next thing to address was the inability to trim out the plane with flaps deployed. It was clear to me, and Nick agreed, that with flaps deployed the trim tab cannot apply enough aerodynamic lift to the elevator to overcome the weight of the elevator and the forward pitching moment of the aircraft. Nick didn't want to increase the area of the trim tab or add a trim tab to the other elevator for fear it would make the trim too sensitive in cruise flight. Adding a counterweight to the elevator would help but Nick didn't want to add any weight to the plane, particularly that far aft. Increasing the range of motion of the trim tab is not the answer either. If the angle is increased more than the current design allows for, at full deflection the tab itself could stall and become completely useless.

So, I decided to experiment. After all, one of the reasons I built my plane as an "Experimental Light Sport" is so I could tinker with stuff. The trim tab basically needs more muscle to overcome the weight of the elevator so it can neutralize the pitching moment of the aircraft when flaps are deployed. A way to do this is to add an assist spring to the elevator system to effectively make the elevator lighter, much in the way counterweights on an elevator work. If the elevator assist is able to give the elevator a neutral or near neutral balance, then the forces created by the trim tab don't need to counter the weight of the elevator and will be more effective at trimming out the pitching moment of the aircraft when flaps are deployed. I did have some concerns with this approach. I could lighten the elevator too much and create an undesirable pitch sensitivity, particularly during take offs and landings. Another issue could be the effect it could have on dynamic pitch stability. In stock form, the Lightning has very good pitch stability characteristics and I didn't want to ruin that. I was particularly concerned that the plane would not return to trimmed flight after pitching the nose up. The plane could continue to climb with no tendency to resume level flight and trimmed speed, or worse, the speed could continue to decay to the point of stall. I also did not want the forces of a spring assist to stack up or increase as the control stick was deflected. The forces needed to be as linear as possible to allow the pilot to feel the natural aerodynamic loads. I decided to try this approach but would not completely neutralize the weight of the elevator at first. I would increase the assist in steps and hopefully achieve acceptable results.

I'm sure similar forms of what I did have been done with other planes, so I know I'm not inventing anything new. The design is simple. I attached a rather long tension spring to the main elevator push-pull tube using an Adel clamp on the tube. I fashioned a mounting tab with 2 holes in it. One hole is used to attach the tab to the screw that fastens the baggage floor support at the seat back. The other hole is for the other end of the spring to attach to. There are a couple of grommets, bushings, wide area washers and other standard AN hardware used to do the fastening. The Adel clamp can be secured at different locations on the push-pull tube to achieve different spring tensions. It all installs in a few minutes and no additional holes need to be drilled in the existing elevator system or airframe. Photos below.



Elevator spring assist attached to the elevator push – pull tube.

Other end of elevator assist spring secured to the seat back.

Initially the spring tension was set such that the elevator will still drop from the neutral position to the full down position but slowly and not hit the stop with a “thud”. Flight testing with the assist went well. Not much difference was noted during takeoff; maybe a little less back pressure was needed to rotate. I could now trim the plane to 60kts with up to 20 degrees of flaps. At 25 degrees the assist was still not quite adequate. However, I was flying solo with ½ fuel so this would change when the plane was loaded with a more aft CG. Pitch stability was still very good with a tendency to return to the trimmed speed and attitude. When the plane was put into a descent the speed and attitude of the plane would return to the trimmed condition with just two oscillations. When pitched up, the plane just slowly returned to the

trimmed condition with no noticeable drop of the nose through the horizon. Pitch sensitivity in level flight and during the landing flare seemed close to what it was without the spring assist. I was ready to give Nick a call to discuss the preliminary results of this experiment. Nick was excited to learn of my findings and I gave him the specifications of the spring I had used and explained the rest of the hardware and sent him pictures. Nick wasted no time procuring the hardware and testing the spring assist. He was not able to find the exact spring I used, but something close. The spring he used was slightly shorter and maybe a little stiffer. He set his up such that the spring did hold the elevator in the neutral position, but just barely. His initial test results were similar to mine except that he was able to trim the plane even with full flaps. Hopefully Nick will have more news on this soon and be offering retrofit kits to current Lightning owners.

Here is another simple fix to something that can be more of a nuisance then a problem. My wife Kate could not reach the canopy to pull it closed once she was buckled into her seat. Kate is of average size for a woman so I have to believe this could be an inconvenience for many others as well. After a little fiddling and fussing, I came up with these easy to install pull straps. Now Kate can pull the canopy closed with no problem plus the strap can be used to control the opening of the canopy, particularly if there is a wind from behind that can catch the canopy and open it with more force than is healthy.

Canopy Pull Strap

To install these straps the retaining clip is removed from the end of the gas spring at the canopy. Then the gas spring is removed from the mounting ball. The pull strap is installed over the mounting ball and the gas spring is reinstalled and secured with the retaining clip. I plan to make these straps as a kit to sell to Arion Aircraft and Lightning owners who want them. I haven't figured out my fabrication cost yet, but they will be a reasonably priced addition that many will find nice to have.

Next month we will have part two of Dave's write up on N81DJ. It will provide some background on how Dave got involved with the Lightning, how he became a dealer, and some additional information about his building the first ELSA Lightning.

News from the Factory

Lightning Announcements

Mark Stauffer, Arion's Production Manager, reports that they have now decided on the official dates for this year's Lightning Homecoming and Fly-In. The main date for the fly-in will be Saturday, October 2nd. Of course most attendees will probably arrive at KSYI sometime on Friday, the 1st and therefore be able to enjoy that evening's activities of hangar talk, cold beer, brats on the grill, and the 2010 edition of the World Series of Creeper Racing. Will World Record Earl be back to defend his Senior's Division Championship? Will Dana again be the World's Fastest Creeper Racer and once again beat Nick? Maybe the Florida Squadron of the Lightning Flyers Wing will be there to challenge all other Squadrons. Are there any other Lightning Squadrons out there? Remember we will have creeper drag races, oval track races, and slaloms. So bring your racing creeper and your racing shoes.

Saturday morning of the Lightning homecoming will start off with a fly out to Winchester Airport for a breakfast put on by one of several EAA chapters in this area of Tennessee. Winchester is about a 20 minute flight away from Shelbyville. We may try to hold some type of speed event for the return flight to Shelbyville.

Saturday afternoon will be full of other activities, but rest assured that the normal informational briefings on various Lightning and flying topics will again be held. One thing you can do to help them prepare for the Fly-In is to provide suggestions for what you would like to see covered in these Saturday afternoon briefings. For example, Tex Mantell (A Tex from New York? How does that work?) has suggested that he would like to see Nick do an overview of the problems people have had building or flying their Lightning and a discussion of any Lightning parts that have failed or worn out. This briefing could also include changes that have been made to the Lightning over the years and why the changes were made. Send any suggestions you may have to Mark Stauffer at the Lightning offices in Shelbyville.

Oshkosh Forums

As long as we are talking about upcoming briefings, now is not too soon to mention that the Lightning Forum at Oshkosh has been scheduled for Wednesday, 28 July at 1000 in Pavilion #5. Also, the Jabiru engine and aircraft forum is also on Wednesday the 28th at 0830 in Pavilion #9.

Factory News

From Nick - Arion Aircraft's new LS-1 demonstrator has got the new style wheel pants fitted and ready for the paint shop. These were purpose built to complement the LS-1's already great looks and are sleeker looking wheel pants. They should add style without exceeding the 120 knot limit and weigh only 2 pounds per pant which is slightly less than the previous Jabiru type of pant. The new wheel pants are now standard on all LS-1 aircraft and are also available to homebuilders who want their experimental amateur built (EAB) Lightnings to meet the light sport rules.

New LS-1 wheel pants.

Buz,

I will be sending some photos of N326AL, our new demo aircraft. This is a photo from last week while we were finishing things up. The production acceptance inspection was performed on Thursday night the 17th. First flight was Friday the 18th. We managed to get about 6 hours on the plane over the weekend. Although we do put 15 total on a new SLSA, 5 is only required to complete the SLSA acceptance testing. I met Gary, our DAR, at the Lebanon airport about 38 nm north of SYI to do the final inspection on Sunday. This morning I gave a demo ride in the airplane at 8 AM. What a busy weekend. We do not have the wheel pants installed yet but they have been fitted and they are at paint. We should get them back this week. The interior is coming along nicely but not finished yet.

N326AL, the new factory LS-1 demo aircraft.

The airplane has been flying well except for a bad solder joint on a connection to the oil temp sender. Apparently when the joint is not properly soldered the unit will still read something. The sender in the Jabiru works off resistance, and if it is unplugged, the EIS will read 59 by default. Should you have good temp one minute and 315 the next, it is most likely the solder connection. That was my problem on Saturday. Other than that all is fine, we have got the new GDU375 up and running (a panel mount 696) and it is very nice indeed. All rivers and roads appear on the map as well as the names of tiny towns I did not even know were there. I was up flying with it on Sunday and all day I could hear a commercial in my ear, not voices in my head, but a sales pitch. It was an XM commercial coming from the unit talking about all the radio stations it could pick up. It took me 30 minutes to figure out how to mute it. The unit also has a Bitchin' Betty built in and gives altitude above touchdown and warns about traffic pattern altitude when getting close to it; kind of neat.

Panel of N326AL with Garmin GDU375 on the right side.

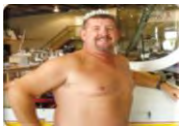
The second Photo is an overhead of the shop. The inverted LS-1 is Sid Mann's plane from TX. It will be off to paint this week. N326AL is in the background. The Jabiru crew has done a good job of learning the construction techniques for building the Lightning and feel almost as at home building LS-1s as they are building Jabiru's. We will get some photos of Ken Wilson's new jet finishing up this week. Ken and the guys are wiring today.

Nick

LS-1 final assembly is now accomplished in the Jabiru hangar.

The new N326AL demo. Does it look like the drawing that Nick showed us last month?

More From Mark - We're really busy this month. We're finishing Ken Wilson's plane and will be starting Bill Beasley's the last week of June. By the time the July issue comes out we should be done with Ken's Lightning and flying it. I have his inspection scheduled for the 24th (***my birthday by the way***) and should fly it shortly thereafter.



Birthday boy.

Hopefully we will have some photos of Ken's completed Lightning and Bill Beasley's Lightning under construction for next month's newsletter issue.

News Flash

Nick sent out an email late in the day on 25 June saying that Ken Wilson's Lightning, N127KL, flew for the first time this afternoon. The 30 minute flight went well with no problems. His panel is a Sport GRT EFIS for a primary PFD and a GDU375 for GPS. Tru trak auto pilot and a GRT EIS round out the instrumentation. After a few more hours on it, Ken will take over the flight testing.

Current Lightning Dealers

Arion Lightning, LLC, contact Nick Otterback, Shelbyville, TN, 931-680-1781, www.flylightning.net

Lightning Southwest, Greg Hobbs, Marana, AZ, 520-405-6868,

Green Landings Flight Center, Ryan Gross, WV, 304-754-6010, www.greenlandings.com

Lightning North Central, Tom Hoffman, Neenah, WI, 920-836-2318

Lightning Northeast - Jabiru Power Solutions, LLC, Dave Jalanti, NY, dave@jabirups.com

Lightning Australia, Dennis Borchardt, Kingston SE, South Australia, 08-8767-2145

Lightning Brazil – Cimaer Ltd, Claudio Nunes, Brazil 24 900-000, 21-2637-3605, 21-9451-9700

Russia and CIS – AVIA-NIANIA, Moscow, Russia, + 7495518-62-75, avianiania@mail.ru

Lightning Florida, Max Voronin, DeLand Airport, FL, 386-873-9995, ww.moonshineaviation.com

News from the Dealers

From Green Landings

Once again this year, I stopped off at Green Landings in my 1940 J3 Cub Sport on the way to Sentimental Journey, the annual Piper Cub fly-in at Lock Haven, PA. It is a great grass roots fly-in and is held at the old Piper factory. Doug Koenigsberg flew a Sky Ranger with us from Green Landings to the Cub fly-in. One of the neat things about Sentimental Journey is that whatever you fly to the fly-in, you are a show airplane and park with all the old Pipers.

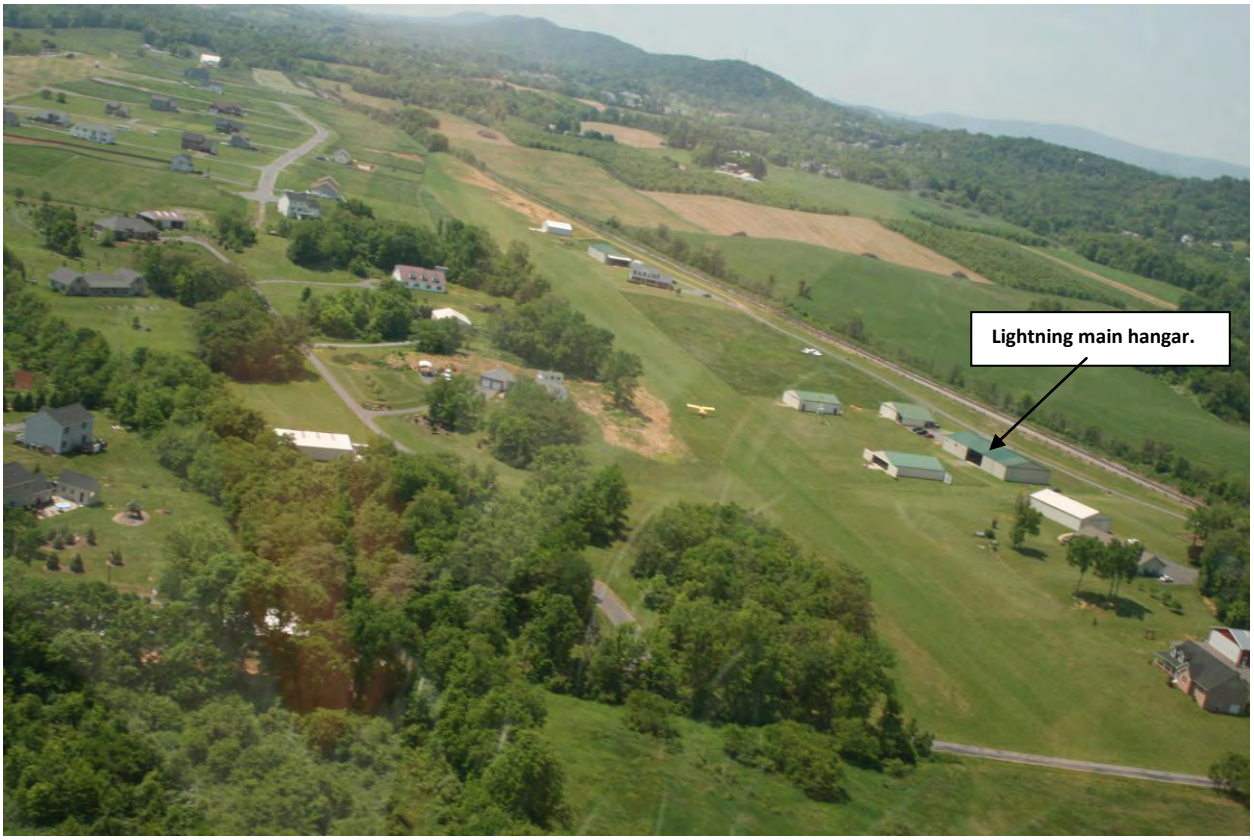
While at Green Landings I took a few photos of their current projects. As you can see from the photos below, the Green Landings team provides expert build assistance and the results are outstanding Lightnings. Greg Crouchley's jet is just one example of their great work.

Don Shaffer's Lightning, shown above, is almost ready for paint. Don is from New Garden, PA.

Above is Jon Meriwether's silver, bronze and gold Lightning, a striking paint combination. Striking seems to be a good adjective for a Lightning, don't you think? Jon is from Wellsburg, WV.

Photo on the left shows Stuart Reed's Lightning wing. His paint scheme will be similar to Greg Crouchley's Lightning, shown on the right. Stuart is from NJ.

This photo taken inside the Green Landings main hangar and shop area shows some of the other non-Lightning projects that are in progress.



Green Landings is a beautiful airpark (WV22) with many hangar homes lining the nice grass runway. The turf runway is oriented 03-21, with a field elevation of 510'. The nearest town is Hedgesville, WV. In the photo above, the Lightning dealership facilities are to the right center of the picture and to the right of the grass runway. They have turned out some absolutely beautiful award winning Lightnings over the past several years. If you live close enough for a cross country flight to this area, I highly suggest you attend the next open house and fly-in that Ryan schedules.

From Lightning Florida

Hi Buz,
Just a little update photo with the wheel pants on. Just got back from Chicago, didn't even have a chance to fly it like that.
All the best,
Max

For You Other Lightning Dealers

I can't print your news if you don't send me any news. Remember this is your newsletter too, so use it to get the word out on what is going on at your Lightning dealership. Lots of future and potential Lightning buyers read the newsletter and this is inexpensive advertising for you. So put down those golf clubs and tennis rackets, park your boat and water skis, grab a beer while you sit down at your computer and send me something to report – "Toot your own horn, so to speak". And I like lots of pictures of airplanes, especially Lightnings.

News from Builders and Flyers

The first entry is from Philip Beeson of Winter Haven, FL. He provides an excellent perspective on his decision process when he was deciding on which light sport aircraft to buy, and some great descriptions of some of his early Lightning flights.

Hello Buz,

Well the day finally came that N897PR was finished and I could pick her up, I thought it would never get here. Ever notice when you are anxiously awaiting something that time seems to just drag by.

I received my Sport Pilot License on Aug 20, 2009 and have had the opportunity to fly several different types of aircraft since then. I trained in an Aerostar Festival, much like a beer can with wings, and bought my first plane half way through my training, a 1946 Ercoupe 415C. The Ercoupe was a great plane and a whole lot of fun to fly, but the time had come to move up to something a little more advanced with just a touch more speed.

Not that low and slow isn't a hoot at 95 mph, but sometimes you just want to add a little more speed to keep up with the guys. Trying to decide which aircraft I wanted wasn't really that difficult of a decision. I attended the Sebring LSA show, AOPA Aviation Summit and of course Sun-n-Fun to look at everything offered. When it was all said and done I narrowed my decision to just two aircraft, the Piper Sport and the Lightning LS-1. I looked at everything out there and for what I wanted these two were the only ones that I felt would fit the bill. It had to be a low wing, have good visibility, run at the upper end of the speed allowed for the LSA category and be as sexy as possible. The sexy part is where the Lightning just blew everyone else away. The Piper Sport may have a wider cockpit and a BRS as standard equipment, but sit it side by side to the Lightning and see who gets all the attention.

The Piper Sport also won't run at the 120 knots like the Lightning will, with a tailwind and 2 geese pushing on the vertical stab it is lucky to hit 116 knots. So I have narrowed my search to two, which way to go. Do I choose fast and sexy or wider with a BRS? Unsure what to do I talk to a friend of mine named Jim Newman and ask his opinion. I tell him what I am looking at and my concerns with both, hoping he will give me the insight I need to make a decision.

Instead he does something even better, he called Lynn Nelson. If you have ever taken a ride in a Lightning with a competent pilot than you understand what I mean by HOLY S@#T that was fun. Lynn had me take the controls only to discover this was NO Ercoupe, and Lynn is an expert on those as well, and I was in for a hell of a ride. A LSA that climbs like a homesick angel, responds quickly to your touch, flies at 120 knots, uses 5 GPH, has a glide ratio of 17:1 and would give Angelina Jolie a run for her money in the sexy department, SIGN ME UP I WANT ONE! I called Mark the next day to find out what the options were and how long I would have to wait to get one. We talked for a while, configured some of the options I wanted and I inquired about the next opening slot. Mark, being the outstanding salesman he is, offered up the slot slated for the next demo. Well after a quick discussion with my wife and a follow up phone call from Mark, about 30 minutes later, I wrote the check to start the build. Well here we are today, N897PR is born and another Lighting LS-1 has joined the ranks. Everywhere I take her, and it has only been a few places so far, she draws attention and everyone wants to know "what is that"? Which I proudly respond, "That is my Lightning LS-1 by Arion Aircraft, sexy isn't she"? The best has to be just this last weekend when Jim Newman and I flew to KOBE.

We fly in, taxied over to the restaurant and grabbed a seat for breakfast. Now we get some lookers, and some pointers, but the best came when a Cirrus SR22 landed, taxied beside us, and the pilot immediately

got out and took pictures of MY plane. REALLY, a Cirrus owner is snapping shots of my LS-1, HELL YEA!!! It may not be a $650,000.00 aircraft but when I get more looks on the ramp than he does, and I can live with that. THANKS Mark and Nick, you guys did good.

I am flying her every chance I get and I look forward to getting the Lightnings in Florida together for a few fly-ins. Just in case you wanted to know what she is equipped with here is a list:

Dual GRT EFIS
Garmin SL40
Garmin GTX 330
TruTrak Digiflight II VSGV

If you have any questions please do not hesitate to contact me.

Sincerely,
Philip Beeson
PS. Even though my wife will not fly, even hates commercial flights, I had her in mind for my N number. My wife and I were married in August of 1997, hence the 897 and the PR stands for Philip and Robin.

Beautiful aircraft, Philip. You made a super decision!

Buz:

On Saturday, I was talking to my instructor, I have a new one, and a very good one - about short field take-offs. He said that with short field take-offs, you keep the plane on the runway until you approach Vx, and then rotate up to achieve best angle of climb. My Gleim Private Flight Maneuvers Book suggests Vx, +10/-5 Kts

If my Vx is 76 kts, I told him that I don't see how I can keep my Lightning on the ground that long. My instructor - Steve Fischer who now has about 10 hours in the plane concurred, and it is his impression that my actual VX is more like in the low 60's or high 50 kts.

My Lightning N335CE is now configured with standard wings but with the wing tips. And even with the new configuration, the plane wants to rotate before 50kts. I have a note in to Ryan over at Green Landings as well but the question I am asking is:

Is anyone reporting a Vx considerably slower than Vx @ 76kts (87 mph) and Vy @ 87 kts (100 mph)?

Note: I understand that as owner/builder of my plane, that it is my responsibility to determine this but frankly, as a student pilot, the testing that I did, did not encompass this.

Steve Hacker

Below is my answer back to Steve.

Steve,

Good to hear that the flying is going well. However, I think you must have *misunderstood* what your instructor said about short field take-offs. Think about it, if you want to get off short, why would you keep the plane on the runway *past the point that it will lift off*. Doesn't make sense. Since you want to get off short and as soon as possible, so as soon as it will fly - fly it off (and be sure you have at least 10 degrees of flaps - actually, if I want to get off really short, I use at least 15 and sometimes 20 depending on how heavy I am). Once it does lift off, *let it accelerate to Vx* and then climb out at Vx until clear of any obstacles. After clear of obstacles, I normally lower the nose to pick up Vy and climb out at Vy.

However, here is one more tidbit of Lightning knowledge. In all the Vx and Vy testing that I have done in the Prototype Lightning, and the certification test flying I did in the very first LS-1 Lightning, I actually found that there are basically two Vy numbers that gave pretty much the exact same rate of climb performance - and I am not sure why. When I mentioned this to Nick, he said that he had seen the same thing. So basically, I think the Lightning has two Vys, one at about 85 knots and another at about 100 knots. So what I do after a normal takeoff is use the 85 knot Vy initially after takeoff and through a climb to at least pattern altitude. Then, depending on how high I am going to be climbing to (especially if climbing fairly high for a cross country flight), I will then change to 100 knots for the rest of the climb - I call it a cruise climb, as you are climbing about as fast, but are certainly covering more distance across the ground. And the extra speed gives more airflow through the engine for cooling during the climb.

When you get the chance you should do all the Vx and Vy tests for your airplane. I wrote a complete article on the phase one testing in a previous newsletter that might be helpful to you. But if you have a steady hand and a stop watch, Vx and Vy testing is basically a lot of climbs at various speeds where you measure the altitude gained in a minute or the time it takes to climb 1000 feet. There are other ways to do this, but this way is pretty simple. Then when you have lots

of numbers you graph them out and it will be obvious what your Vx and Vy numbers are. Remember these should be done close to gross weight, but I don't mean for you to land after each run to top off the fuel. That would take a long time. All of this repetitive testing can get boring, but that is what test flying can be - hours and hours of boredom interspersed with moments of stark terror.
Blue Skies,
Buz

Next, Ken Wilson, another member of the Alabama Lightning gang, provides some insight on his build at Shelbyville.

Hey, Buz

Just back from the second week of the Builder Assist program on my Lightning N127KL. It has really been a great experience for me and for my CFI and good friend Bob Lock, both of us from Guntersville, Alabama. He has been there the whole time also and he knows his stuff. Roll Tide!!!!

Looks like Bob Lock, Mark "Canzer" Stauffer and Ken Wilson are all shorter than Ken's Lightning.

Bob Lock and "Moostang" Mike

Working with Mark and Mike is a blast---both are very knowledgeable and even more important, patient---very patient. And also Nick O's help has been most valuable. I told them that if they were the least bit grumpy, it would be a whole different experience and a lot less fun for us. They are just great and I recommend this approach to building as it is results in a top quality Lightning in a lot less time. My third week is June 21st and hopefully test fly June 25th.

Ken Wilson working on his push/pull tubes

Bob Lock, I, and my son flew up to Shelbyville early in the year and we really liked what we saw there; then I went to the Sebring show and flew with Nick and I was completely sold! So shortly after that I ordered mine and at the time I thought I would surely be the oldest guy to own and fly the Lightning. But, with me at 79, I learned later that Tom Herbert of Titusville is 82 and flies N325AL. So much for being the oldest! It has been 40 years since I have flown so it will be interesting. It is NOT like riding a bike again.

My friend Jim Johannes of Huntsville and Guntersville has his 40 hours on his Lightning and will be keeping it in Guntersville. We plan to share a hanger and thus the Alabama squadron of Lightnings has started up!

I really enjoy and appreciate your Newsletters for the information as well as the technical items. Thanks much and please keep them up.

Ken Wilson
N127KL

Next, Philip Beeson tells about his first solo in N897PR.

Hey Buz,
I thought I would forward you the e-mail I just sent to Mark. It has a little more information surrounding my first solo and a few pictures of a flight I did yesterday.
Sincerely,
Philip

Hey Mark,

I just thought I would let you know how things have been going down in Florida.

I SOLOED N897PR for the first time on June 5. I really took my time with this to ensure I was comfortable with everything. I did many flights with Jim Newman (accompanied me bringing my plane home from TN) and then took my instructor up on June 5 to show him what the plane was like and get his blessing on my abilities in my new jet. After doing some slow flight, a few steep turns, turns about a point and a couple of touch and goes I ask him if he felt I was ready? His reply was comforting, "You land this thing better than I could." So with that I kicked him out and soloed her for the first time doing 3 touch and goes. WOW, that was AWESOME!! The rest is history and I have been flying her every since. I currently have 40.9 hours on her, not bad for someone who works 12 hours a day 6 days a week, so you can tell I have been getting her in the air every chance I get. I just did a coastal flight yesterday and took my very first non-pilot passenger EVER. I took Justin up (who works for me) and it was a blast, a little nervous knowing I was the only pilot on board, but definitely a wonderful flight. I am enclosing a couple of pictures for you.

I hope all is well in TN with you and your significant other.
Sincerely,
Philip

Hey, you look really serious, Philip. It's supposed to be fun.

Congratulations on that first solo, Philip. Great photos.

OK, all you Florida Lightning flyers, it's time to get organized. Philip Beeson is taking the lead at putting together the first Lightning Wing (or Squadron, based on the numbers) in Florida. I think it is a super idea and suggest the same for other states. I know there are enough Lightnings in several other states to form Lightning Squadrons (or Wings). So Arizona, Alabama, and Virginia, (any others?) how about someone there taking the lead as Philip has done. Below are several messages about Philip's organizational ideas.

Good afternoon ladies and gentlemen,

Well I think the time has come for us to start our own Lightning Owners Group, Florida Division.
I have spoken to Mark and he thinks it is a great idea, with nearly 10 Lightning owners in the state we have a great start. There are still a few owners that I do not have contact information on and if anyone knows how to reach them please pass the information on to me or forward this e-mail on to them. Those members are:

Bob Hass
Dick Cudney
Tom Herbert

Mark has suggested the name "Lightning Air Force" Florida Wing, but I want to make sure we do not steal anyone's thunder (Van's Air Force), especially since the RV guys keep hanging out at my hanger telling me what a beautiful plane the Lightning is.

If the idea is one that everyone approves of I can create a website dedicated solely to the Florida chapter that will have its own domain, links, photos, personal pages, and about anything we choose to have.
I will design and host the site so input from the members will dictate what the site looks like and has to offer.

I would like to nominate Jim Goad as our first Wing Commander, being he was the first Lightning owner in the state I feel it is only fitting for him to take the lead role.

Please let me know what you think of the idea, we have too many opportunities to let this pass us by.

Sincerely,

Philip Beeson
N897PR, KGIF - Winter Haven

Thank you to Lynn Nelson, Paul "Bear" Bryant and Tom Herbert for getting me pictures of your jets.
I still need pictures for the remaining Florida Flyers.

The current list of name possibilities suggested so far:

Lightning Jet Set - Paul "Bear" Bryant
Lightning Air Force - Mark Stauffer
Arion Aviators - Philip Beeson

If you have an idea or suggestion please let me know so I can put them together and submit them to the group.

My thoughts for the site is to have pictures of members jets, local FBOs, flight blogs, stories, updates from the factory, Lightning get together, tips, etc... and would love to have any member input for ideas to add to its content. We will also have links and pictures to Moonshine Aviation as well as our monthly newsletter that Buz puts out. With the number of forum boards currently available (AOPA, EAA, Sport Pilot Talk, The Purple Boards, etc...) I don't feel we need a forum on our site but I am definitely open to the idea if the members feel it is necessary.

Please send me your thoughts, ideas and what you would like to see offered on the site. As soon as we nail down a name for our group I will purchase the domain.

Have a great day!
Philip

Hey Buz,

I have a few more pictures for you.

Lynn Nelson came over to my field on Sunday and we were showing off the jets to everyone. I took a few pictures of the two together and have a special shot of my jet with a Vette I know you will love.

Philip

Lynn and Philip's jets. Lightning flight, canopies down……..

Now!

A super airplane design and a classic car.

Vette's engine is a blown 383 putting out 575 HP.

Greetings flyers,

I hope everyone had a wonderful weekend and was able to spend a little time aloft. Since I work 12 hour days 6 days a week Sunday is the only hope for me, and it was a nice day until the typical afternoon downpour. I was very happy to have a visitor this past Sunday when Lynn Nelson flew his jet to my field and we spent the morning showing off our birds. Thanks Lynn, I love showing off the Lightnings and having more than one on the field sure makes a huge impression. We even had a guy come by in a beautiful rag top Vette that made for a great photo op.

I am currently working on the website design and wanted to post a link for everyone to see. I will not purchase a domain until we have decided on a name so the page is just attached to my business hosting for now. Once a domain is purchased the site will have its own original web address. The current list of possible names suggested by members is:

Lightning Jet Set - Paul "Bear" Bryant
Lightning Air Force - Mark Stauffer
Arion Aviators - Philip Beeson
Lightning Mustangs - Tom Herbert

I have designed the site around the name I suggested for now but can easily be changed once we have reached a decision. The site is just a basic webpage right now and none of the banners, links or pictures are currently active. This is just the first rough draft and wanted to get the members input on ideas and

suggestions before moving on. Since I designed all aspects of the site and this is not a basic template, we can change everything from banners, images, colors, layout, etc...
Once activated each banner, ribbon, link and picture will take you to sub-pages containing in depth information based on the link or banner selected. I am NO web design guru, but if we all put our heads together I am sure we can make something better than most you see out there.

www.waglespawn.com/lightning.html

Please take a look at the site and let me know what you think so far.

I hope all is well with everyone and I would like to work on a get together sometime next month. Before I can do that I need to know a few things.

1) Is anyone going to Oshkosh?
2) How many members can fly on Sundays?
3) What would you like to see for our first destination?

Have a great day and I look forward to talking to you soon.

Philip
N897PR

The last entry from builders and flyers is from J. Dupont of Canada. As far as I know, he has the very first Canadian registered Lightning.

I bought the 2009 experimental demo and after a long bureaucratic process it is now officially registered as a Canadian aircraft. The new mark is C-GCAA.

If anyone is ever interested in importing or building a Lightning over here, feel free to contact me, I believe I could save a few of hurdles to a new builder over here.

J Dupont

Reader Feedback or Q & A

Hi Buz.

I have recently become interested in your Lightning EAB. I think it may be a great fit for my mission and I have to admit, the idea of a sleek composite aircraft with a conservative fuel burn and quicker build time than some of my other considerations, could make the difference between me building or not. Though I am intending to visit Oshkosh to see and test fit the "short list" of build candidates, I was hoping to get a

jump start on that by getting in touch with one of your Colorado builders, Richard Cleavinger (N213RC). I am based at APA and I suspect he is on the other side of Denver at BJC, but that's a short distance to go to see one of your completed aircraft first-hand. I am hoping he would be amenable to showing off his aircraft at his convenience.

If there is any way you can put me in touch with Richard, or pass along my email, I would be very appreciative.

I look forward to visiting your tent at OSH and here at RMRFI in August.

Best regards,
Paul Catterson

Hi Paul,

Sorry to take so long to answer, but I have been spending lots of time with my sister who is in the hospital. She broke the T-12 bone in her back last Saturday when she took a fall at my local Williamsburg, VA, hangar.

Now to your message. First, I just want to make sure you understand that I am not associated with Arion Aircraft in any way other than they have become good friends since I bought one of the previous Esqual kits that they used to import. I have been lucky enough to fly many of the Lightnings they have, including the prototype, and was chosen to fly the ASTM certification flights for the LS-1s SLSA certification. I love the looks of the Lightning and certainly the way it flies.

I certainly agree with your assessment of the Lightning. It is a fantastic looking and performing aircraft that is truly a quick built kit and can be built in an amazingly short time frame. I think that has been proven numerous times based on the completion rate of well above 50% for all the kits sold to date.

I will look through my files and find Dick Clevenger's email address for you and will send it when I find it. Here it is: n213rc@gmail.com

I look forward to meeting you at Oshkosh. I work as a full time volunteer in the Vintage Aircraft area, but do spend a lot of time with the Lightning guys in their booth just to meet more of their customers. All good people.

Blue Skies,
Buz

Thanks Buz! Ya know, I realized after writing to you that you are not an 'official' member of the Arion team but 'merely' a very satisfied customer/partner of Arion and you provide a great service to all Lightning builders with your website. (Pardon the comparison, but sort of the 'Doug Reeves' of Lightning!) Of course, I learned this little tid-bit while reading a back issue of Kitplanes magazine profiling the Lightning EAB.

So, I am currently deeply immersed in the protracted processes of investigating the aircraft I want to build, own and, most importantly, FLY. I keep coming back to the EAB Lightning from the RV9A for a few reasons, but my limited familiarity leads to some questions too. Maybe you can help as a 'neutral 3rd party'?

1. The shorter build time is very attractive but I cannot assess whether the reduced build time estimate is a factor of taking part in the Build Assist program or whether I can legitimately figure this all out in my garage without spending the overhead and time away from home for the Build Assist program. Maybe you can advise me there? What is the tooling outlay requirement for constructing at home with or without build assist? I suspect one of the SportAir composites courses would be worthwhile?

2. The cost-per-mph seems quite aggressive, so that's exciting. I do, however, have some concerns for a foreign engine and availability of parts and qualified A&Ps. This could just be my unfamiliarity with Jabiru. Though I hear great things, I still have to voice that concern.

3. The sleek styling of the aircraft is beautiful, but I have been encouraged time after time by RV builders that building a composite plane is far more challenging than a match-drilled, aluminum RV. And I can see how it'd be hard to match the RV community support. I have some concerns about getting stranded mid-build. I am an engineer by trade, but what can you tell me about the quality of the build documentation?

4. Cabin size concerns me. I regularly fly C-172SPs and Diamond DA-20-C1 (Katana). The diamond seems most like the cabin of the Lightning but it seems the lightning has more cargo space due to the tanks being in the wings. I am 6'2" @220lbs and I'll be flying with my wife and our small Shih Tzu (in back) on cross-country flights (<500nm). What do you think about fit? Can you compare it to anything?

Alright. Enough questions! :-)
Thanks for Dick's email address. I truly appreciate your time. I hope your sister heals up well also!!
See you at OSH,
Paul

Hi Paul,

I don't know if I can realistically be called a neutral 3rd party, because I have never flown any airplane that I didn't enjoy, and the last time I tried to count all the different airplanes in my log book (several years ago), there were close to 200. Of course I like some more than others, but I do enjoy flying them all, and the Lightning is one of my favorites. As far as I am concerned, there is no better looking design out there, and the overall package of performance, build time, safety, and flight handling makes it a real winner.

You wanted to know if the Lightning kit is really as fast a build as the completion percentage numbers seem to indicate. Let me put it this way, as a long time EAA Technical Counselor (and Flight Advisor), I have looked at lots of projects, and overall, probably more RV projects than any other variety. I have never seen an RV kit completed in less than three years - usually much more. Of course, working full time, someone could easily beat that, but I have not seen that in my experience. I would guess that your RV friends have not really seen a Lightning kit as it comes to the builder. They are probably commenting about long build times for composite kits based on seeing some of the other composite kits that require lots of fabrication of small parts, then larger parts, then finally complete assemblies like a wing or fuselage. Have you really looked at how the Lightning kit comes to you? Realistic built time for a Lightning is of course much faster if you do use a builder's assist program at the factory or one of the dealers - that way it only takes about 3 weeks of your time and you will have a flying airplane. However, there are other Lightning builders who have completed their projects without help and most have them flying in a year or less of part time work. I am going to print your emails in the next newsletter and suggest some of those builders contact you and relate their experiences. As an example, most recently the new Florida Lightning dealer completed their first Lightning with no Tennessee help and they had it completed in just several months.

As to the build manual, I see no problems with it. However, rest assured that Nick updates it when some builder points out something that is not clear or something changes. But, unless he gets feedback from builders, he will not know if something needs changing, so builders must be

proactive to insure the build manual gets updated. Also, a simple phone call to Mark or Nick will quickly answer any build question that you might have.

I absolutely love my Jabiru engine. I now have some 660 hours on mine with only standard maintenance things done. It is truly an airplane engine that is easy to understand if you are used to Lycoming or Continentals. And you don't have the high cost of parts that you do with other aircraft engines. Many parts (oil filters and spark plugs, for example) are available at your local auto parts store.

As to cabin size, like you, I am also 6'2" and about 215 to 220. I can easily fly from either side with another 6'2" person with no problem at all. So unless you have a 6' torso and 2" legs - no problem at all. :-)

Hope this helps,

Buz

PS: I am sending a copy of this to Tex Mantell, who built his Lightning totally alone at home and in the cold winters of New York. He will probably jump in and give you his thoughts.

Buz,

Thanks again for the depth of knowledge and willingness to share it. Indeed, Tex called me on my cell last night and we chatted for quite some time about his experience being the first Lightning non-build assist customer (incidentally, we're both native New Yorkers!). It was certainly an enlightening and encouraging conversation.

I also spoke with Dick Cleavinger and we are making arrangements to meet in Boulder within the next few days so I can see his Lightning. In the meanwhile, I have been reading back-issues of the newsletter and browsing the build manuals on the Lightning site. So far nothing is really scaring me about the build or the support. And it is certainly encouraging to hear you say someone of my stature can probably fit comfortably in a Lightning, with a passenger. That was a big concern and I'll confirm it when I meet Dick.

The only other thing that changes the scenario here is the seemingly significant initial outlay of funds for a Lightning. Wherein with the RV I was planning tools and the empennage purchase first, then the wings, then the fuse, finish kit, engine, etc., over a number of years, it seems I may need to wait to begin the Lightning as the incremental investments are larger and come with more frequency. I also don't know that I can - or want to - finance the aircraft. Any thoughts there? Can the airframe be built in sub kits over time?

Well, the next few weeks leading up to Oshkosh will be exciting as I hone in on a decision.
Thanks again!
Paul Catterson

Paul,

Just one caution when you sit in Dick's Lightning in case you think you don't have enough head room. Each Lightning builder can adjust the pilot and co-pilot seat pan bottom supports while you are building (you glass the supports in and thus can determine how low or high the seat pan is - thus more or less head room) so that you can set up your Lightning for more or less sitting height. Of course, the amount of upholstery also determines sitting height. I had some extra cushions made for my Esqual to use when I fly shorter people or Young Eagles. Some people have also narrowed the center console somewhat to give more side to side room.

You can buy your Lightning in sub kits - meaning you don't have to buy the entire kit at one time. Pretty sure the Lightning website discusses the sub kits.

Blue Skies,

Buz

Upcoming Events

AirVenture, Oshkosh, Wisconsin, 26 July to 1 August, 2010

Lightning Forum, Wed. 28 July, 1000, Pavilion #5

Jabiru Engines & Aircraft, Wed. 28 July, 0830, Pavilion #9

4th Annual Lightning Homecoming and Fly-In, Shelbyville, 1-3 October 2010.

If you haven't been to one of the previous Lightning homecomings, start planning now to attend this one. You will have an absolutely great time. All of last year's creeper race winners will be back to defend their titles and we will once again plan to have several Lightning competitions that you will want to compete in.

Technical Tips

More on gear leg shimmy from Nick

This subject has been brought up several times here on the list. Yes I would agree that the Lightning main gear design will shimmy if the proper conditions occur, however this is not just the Lightning but pretty much any aircraft with a round rod gear leg. Yes we have had demonstrators do it. Our solutions that worked best were proper tire inflation and gear toe. This did minimize the shimmy if not completely eliminating it all together. Those that still had it found better tires worked, because of that we switched to a 6ply aero-classic tire with the name "LSA" on it. These are much improved over the 4ply supplied earlier. Recently we have replaced a couple of sets here on the standard gear and found much better results.

It is possible that the nose wheel will shimmy but unlikely. The pivot point for the swivel is swept forward not on a vertical axis. This is to put forward and downward pressure on the fork assembly and not allow it to be in free caster trail position. This is the case on aircraft like the Cirrus, RV, etc., those aircraft do have the swivel axis vertical to the direction of travel, and the fork can go back and forth easily hence the need for tension to keep it straight after takeoff and keep it there for landing. If you notice on the lightning if you move it left or right the nose will lower slightly this cannot happen with the aircraft moving forward during landing or takeoff. This will keep the fork from shimmying. True the block should be tensioned so no slop is evident, as the blocks can wear if there is movement causing other issues. This was the reason for the move to the Oilite bushing in the nylon blocks. You cannot put tension on the Oilite bushing but they will keep the pivot point true and free from wear.

Nick Otterback

Nick's mention above about the Oilite bushings resulted in the below question from Selwyn.

Um, which move to Oilite bushings was that? I noticed the bushes in Buz's photos and wondered where they came from. It's not in the build manual, no service bulletins, can't find it anywhere on the Arion site, can't remember

reading it in the newsletter. What's the status of the change? Is it part of ongoing development or a recommended retrofit?

Cheers, Selwyn
Kit 66

Above is the photo that Selwyn mentioned.

Nick's explanation follows.

About the beginning of the year I noticed a slight vibration in flight on one of our planes. It felt as if it was coming from the nose I could feel it in the pedals. After pushing down on the tail in the hanger, I noticed that the nose block had a small amount of slop in it and the fork assembly could be moved around a bit, this was not due to a suspicion of shimmy. I took the fork off and thought about trying a large bushing. Because the steel leg and the nylon are different materials I figured that the small trash or bur might wear the plastic quickly and I think that is what happened. So I found a large Oilite bushing (oil bronze bushing) to put in the block. This did take care of the slop and the vibration/buffeting in the nose wheel and pant in flight. We than put in the news letter that if anyone noticed this in their Lightning that this bushing could be retrofitted as a fix. True the blocks should be tight so not to develop slop in the system but beyond that the tension is not to combat a nose wheel shimmy the design itself is, the bushing to combat wear. We can release recommendations and things we have noticed in the design thru the newsletter or web site to help make things better. It would not be right for a kit manufacturer to issue an AD or SB as we are not the manufacturer of the Aircraft the builder is and we do not control their construction. So with that in mind we set it out in the newsletter as a way to bring it to everyone's attention type thing and have now added the bushing to the kits and machined the blocks to match.
As a side note it is important to recognize the difference in the Esqual nose leg and the lightning. The Esqual nose leg does have a vertical pivot point, it is not swept forward. So the nose leg on an Esqual without the blocks tightened can shimmy. Some later Esqual's had Lightning parts because we got none from them.
Nick Otterback

The next tech tip is from Bill Strahan.

I previously reported that wheel balancing didn't appear to affect my landing gear shimmy. Well, I wasn't doing an apples to apples comparison, because I decided to fly without the wheel pants and fairings to do a quick check.

The weight of the wheel pants would obviously affect the resonant frequency of the gear, and that never crossed my mind.

Today I finished some mods to my wheel pants and reinstalled them and went flying. I was surprised to find that on landing I had the slightest, barely noticeable shimmy just before turning off the runway. I was so surprised that I taxied back out and did another circuit. Same results.

There are other variables compared to last time (such as the 100 degree heat!) but I am optimistic that the wheel balancing did actually address the shimmy issue to my satisfaction. It used to be bad enough that if I was transmitting when it happened I sounded like I was in a helicopter. Now I think a passenger wouldn't even notice. Good stuff.

If anyone wants to drop by the Dallas, Texas area and balance their wheels they're more than welcome to the hanger.
Bill Strahan

Next is Bear's latest tech tips suggestion on Matco wheels and it certainly bears looking out for. It could be a potential disaster if you don't catch the problem early enough.

Hey Buz,
Hope you're enjoying the summer. It's been very hot and humid here in Clearwater. Been working through some problems with my Matco wheels. Been discussing the problem with Nick. He believes there's something going on at Matco, but they are not telling him much.

Basically all 3 of my rim bolts on the pilot side have been sheared off. When I called and told Nick about it a couple of weeks ago, he said I was the 3rd person in the last couple of months that called to report the same thing....

I'm thinking about going with a grade 8 bolt and fine thread compared to what Matco is providing.

I'm sure some of my shimmy had to do with all the bolts missing off one of the wheels; just so glad I found it before I had more than just a shimmy. Since the wheel pants cover up the wheel, it's almost impossible to see during a pre-flight. I've now added a process to inspect this at every oil change, to my 100 hr inspection, annual.

Hopefully, using the newer bolts will eliminate the problem.

Take care,
Bear

Finally, World Record Earl mentions a high failure rate of his ignition switch.

Buz,

I just replaced the ignition switch on N17EF again. I got the last one in September of 2008. Rough running on the mag check but normal operation on both. Pete diagnosed the problem both times. These switches are PMA parts and should last longer. And the price has jumped to $125 ($140 w/tax and shipping) from Spruce. I wonder if this has been a common problem?

I'll be in Shelbyville next week for some help on some maintenance items and a BFR. I'll never learn all the EFIS features without some help.

Earl

Hi Earl,

Although your ignition switch failure is the first I have heard of in the Lightning (or Esqual) community, the Zodiac 601XL that our chapter built did have one fail shortly after we started flying it. All has been fine since we replaced it about two years ago. I did also have one fail in my Pitts, but that was probably after some 20 plus years of hard flying, so my experience has not shown the ignition switch to be a high failure item. Glad you were able to get it diagnosed by Pete both times. When it was running rough on the mag check, did it sound like a fouled plug or what exactly were the symptoms?

Blue Skies,
Buz

Flight Safety Tips

A recent hangar discussion about various cross country techniques resulted in a question from a relatively new pilot about the best way to determine when to start down from your high cruising altitude. There are several book answers to this question, but I like the KISS principle – Keep it simple, stupid. I went on to explain that my normal technique and rule of thumb was to take the number of feet I wanted to lose (in thousands of feet) and multiply by two (when using a descent rate of 500 feet per minute) to give me the time it will take to descend. For example, if I am cruising from Shelbyville, TN to Williamsburg, VA, I will probably be (depending on the winds and weather) up pretty high. Lets say I am at 11,500 (VFR eastbound = odd plus 500'), and I want to get down to 1,000' (KJGG is pretty near sea level), so I need to lose 10,500'. With an average of 500'/min rate of descent, it will take me 21 minutes to lose 10,500' (10,500 divided by 500 = 21). Or my simple

rule of thumb stated above, take the number of feet I want to lose in thousands of feet (in this case that would by 10.5) and multiply by two (10.5 X 2) would again equal 21 minutes.

Now all you have to do is figure how far you will travel in 21 minutes to determine how far out you should start down. An airplane that cruises at 120 knots makes the calculation easy – 120 knots is 2 miles per minute. So if it will take you 21 minutes to descend, and you average 2 miles per minute, you should start down 42 miles out. But hold on a second, you don't want to arrive at your planned altitude right over the airport, so add 3 to 5 miles so you will be at pattern altitude as you enter the local traffic area. So in this case, I would start down at a nice round number of 45 miles out.

If you cruise faster, say 180, which equals 3 miles per minute, then multiple your descent time by three. Easy, right?

So now that we know how far out to start our descent, what about descent technique? Just nose it over and pick up some free airspeed in the descent, right? You might even be able to go from 2 miles a minute to three. Not so fast, Kimosabe. Even though it might be a common technique to simply trim the nose down, leave the power set and accept the increase in airspeed, that procedure might not be too smart and perhaps not even safe, especially now that it is summertime.

Lower air is often bumpier air and it's possible you'll encounter turbulence as you descend. This is very common on a hot day, with significant thermal activity, but it can also occur on cold sunny days that can result in localized thermals. It is also possible on cool nights if you descend through the boundary of a temperature inversion. And any time surface winds approach about 20 mph you can find moderate or stronger gusts within a few thousand feet of the ground.

So unless you're certain the air is smooth below, a better technique is to make a small power reduction and descend at no faster than your normal speed range (top of the green arc). This keeps you away from the caution range (yellow arc) and provides protection against structural problems if you hit some turbulence on the way down. If the turbulence becomes moderate or strong, you should immediately slow to the turbulent air penetration speed or Va. Actually, I try to slow to below Va, because all that bouncing around and possible gust encounters will cause momentary variation on your airspeed indicator, so go a little slower to be safe.

One last thought. Turbulent air penetration speed actually goes down with a reduction in airplane weight. The precise rate of speed reduction is not included in most Pilot Operating Handbooks (POHs), but for most light airplanes a good rule of thumb is two knots for every 100 pounds below the airplane's maximum weight.

Lightning Skunk Works

Do you know the difference between a regular squirrel and a flying squirrel? See the photo below.

Other Items

It is probably my military background, but *proper and efficient* radio calls have always been a pet peeve of mine. We were taught to only say what needs to be said and to do it as efficiently (quickly) as possible. I have lost friends because the radio frequency was so busy with extraneous transmissions that it was impossible to get a timely call out for them to "break" because of a tracking SAM or missile. Yes, I know, that is not going to happen in general aviation, but just go flying on a beautiful weekend weather day and you will hear so many extraneous, incorrect and unnecessary calls that potentially will prevent a needed call that just might prevent a traffic pattern collision. It is a flight safety situation.

Here are just a few examples of what I think are unnecessary radio calls, and I will add that I have heard all of them in the last month. If at your airport you can see both ends of the runway from both ends, why do you need to call clearing the runway after landing? Heck, I have even heard that call when no other airplane was in the pattern or waiting to take off. Or what about the call that you are passing overhead some airport, westbound at 4500 feet? You have no intention of landing there and the airport area only goes up to 2500 feet or less. Wasted call? I think so. And guess what, that call was probably heard by every airplane on that frequency in a radius of at least 100 miles. That is a lot of airspace with airplanes that may need to be hearing other important calls.

Another phrase added to a call in the pattern that I think is wasted is saying the words full stop. Most landings are full stop, so why not just say touch and go if you are not making a full stop. Makes more sense to me and makes the call more efficient.

Here is another common radio call that bugs me. These days, a lot of pilots, particularly charter or other commercial operations, wrap up their initial position announcements with the statement: "Traffic in the area, please advise." It almost sounds like they are saying "I am the most important person up here and all of you must do as I say".

The habit of using this call has become a big enough problem that the FAA felt the need to address it. Asking traffic already in the airport area to advise YOU of their positions is totally backwards. The system works when each pilot volunteers that information. Inbound pilots need to LISTEN on the traffic frequency well before they enter the area. If they do that, they won't need to be advised of anything. They'll already know it except for any NORDO aircraft....see and avoid is the final task for all.

So don't be one of them. The phrase is redundant (we're all supposed to be listening and self announcing anyway), and it contributes to frequency congestion. In fact, according to the AIM, section 4-1-9(g), it is "not a recognized self-announce position and/or intention phrase, and should not be used under any condition." That makes it pretty clear, but you still hear it almost every time you go flying on a busy day.

OK, enough said, for now. There are many more examples of what I think are extraneous, incorrect and unnecessary calls that potentially can prevent a needed call, but I'll save those for a future soap box session.

As always, your mileage may vary.

Final Thoughts

Over the years I have hosted lots of hangar parties at the various civilian airports I have flown out of and kept my airplanes at during my long military career. One of my favorite parties to host was a hangar pool party. Yes, I said pool party. For a number of years every 4th of July I would set up a fairly large portable pool, like you see in many back yards during the summer months, on the ramp in front of my hangar. I always had the airplane out before putting the pool in place, because giving rides to my guests before the beer started flowing was always part of the scheduled events. Along with the pool full of water, I always tried to have various play things to keep the guests in the "let's have fun" spirit. Examples are: inflatable floating animals in the pool like sharks or octopi, lots of water pistols for duels, some green carpet for miniature golf putting contests, and various balsa gliders for flying contests and to give to any kids that were attending. Those parties were always fun, well attended, and talked about for some time after the event. I don't host those any more since my daughters have moved away and I guess I am too lazy to try to do all the work setting it up by myself.

However, for the past several years I have hosted a new kind of event at my hangar here in Williamsburg. One of the local kindergarten teachers brings her class to the airport every year in early June, knowing that I have built several of the pedal airplanes that the kids like to play with. I actually bought the plans for the Pedal Pitts (painted up just like the real one I built) and the pedal P-51 when my oldest daughter was only 5 (she is now 30). However, as busy as I was flying in the Air Force during that time period, I didn't get them built until my kids were teenagers. Guess what, teenagers don't fit in pedal planes. But that didn't mean that the pedal planes didn't get

used. I actually use the pedal airplanes for airport open houses at two different airports, so they do get more use than just the kindergarten day at Buz's hangar.

This year's hangar party for kindergartners at Buz's hangar was June 9th, and I finally remembered to bring my camera to take some photos. Actually there was a very good looking professional photographer there taking photos for the parents, so I hope to get some better photos from her. But for now, below is a shot of this year's first group of kindergartners flying the pedal planes and the rocking biplane on floats. They had fun and I enjoyed watching them. Maybe there are some future pilots in that group. Hope so.

Not quite Young Eagles. Let's call them young fledglings.

Be sure to go flying on the 4th of July as part of your celebration of our National holiday. I can think of no better way to demonstrate the freedoms that we have in our country than a flight in your own aircraft.

Blue Skies,

Buz Rich

N1BZRICH@AOL.COM **(Contact me directly for newsletter inputs – I need your help to keep this newsletter both interesting and informative.)**

SEE MATCO SERVICE BULLETIN ON NEXT PAGE

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SERVICE BULLETIN

Mandatory Wheel Half Replacement on W50CC & W51CC Series Main Wheels

EFFECTED MODELS: All variations of the WHLW50CC & WHLW51CC wheel and brake models using Nordloc Washer and buttonhead cap screw attachment of the disc. The wheel half effected is the side where the disc attaches, the brake half of the wheel. The effected unit are those that have disc attach bolt holes that **ARE NOT** drilled all the way through the lug (those having a blind hole) Wheels with the hole drilled completely through the lug or that do not use the Nordloc washer are not effected by this service bulletin and do not require replacement. (See Figure 1)

REASON: Insure bolt head engages Nordloc washer without bolt bottoming in threaded hole.

REPLACEMENT HARDWARE: The required replacement wheel halves are available from MATCO mfg. For WHLW50CC series wheels, the replacement is accomplished by obtaining the brake half only. For the WHLW51CC series wheel, the entire wheel is replaced to ensure alignment of the valve hole between the wheel halves. Arrangements
for obtaining the replacement parts can be made by calling MATCO mfg.

COMPLIANCE: This replacement is urgent and must be accomplished at the earliest opportunity. Loosening of the disc bolt holding the disc can occur without this replacement.

Questions regarding this bulletin can be referred to the technical support department of MATCO mfg at 2361 S. 1560 West, Woods Cross, Utah 84092, by email to tech@matcomfg.com, or by telephoning (801) 335-0582.

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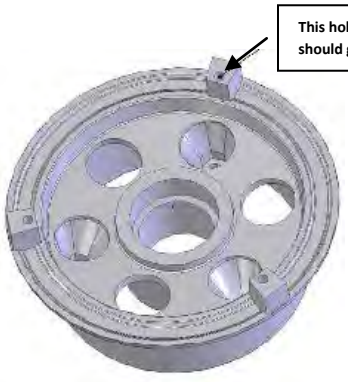
MATCO mf



Nord Lock washer.

See a SB clarification message from Mark on the next page.

28 June 2010
Hi Buz,

A bit of clarification for the SB. The SB is mandatory for any customer that has the Nord-Lock washer with button head screws. If a customer has Allen head cap screws that are safety wired to the disc AND they have not experienced any problems in the past then they DO NOT have to comply with this SB. If a customer with Allen head cap screws has had problems in the past (I know of a couple) then they can contact MATCO and take advantage of the SB.

Please note people need to contact MATCO directly. MATCO is talking about two options for the exchange. Option One - Remove your wheels and send them back to MATCO and they will replace them. Option Two - MATCO will send you the new wheels but will invoice you for the wheels. Once you return the old wheels to them they'll credit your account.

Like we spoke about on the phone this does not address the 3 bolts that hold the wheel halves together.

Thanks for your help getting the word out.

Mark