



# Nuts And Bolts

## Welcome To The SW Region's FAASTeam Airworthiness Newsletter

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- If you are interested in safety and would like to help the FAASTeam spread the word in your local aviation culture, we need to talk to you. Contact your local FAASTeam Program Manager. See page 5.

The Southwest Region's Airworthiness FAASTeam would like to thank you for taking a moment of your time to read this newsletter. The purpose of this newsletter is to provide a means of sharing critical safety information and items of interest between the FAA Airworthiness Safety Team and the aviation industry's Maintenance Technicians. Our goal is to provide you with short articles that will help you keep up with the rapidly changing world of aviation maintenance, as well as guidance on where to find additional information when applicable.

The newsletter will contain at least one accident case study in each edition that we hope will make you think twice before you close that panel during your next inspection.

We hope to provide you with articles that will be informative as well

as interesting.

In our "Ask The Feds" column, you will be invited to ask questions about any issue or subject that might be bothering you or that you really just don't quite understand. We will do the necessary research and share the results with everyone in our column.

Our column titled "Lucky's Corner" will contain an article written by the one and only Lucky Lougue from Air Salvage of Dallas. (ASOD) If you haven't had the pleasure of working with Lucky on an accident investigation, parts location problem, or technical problem, then you're in for a treat. Lucky also conducts IA renewal seminars and is the "GO TO GUY" for the FAA and the NTSB.

The "Tech Forum" column will contain little known interesting technical tips and explanations or advice concerning legal matters that we feel you should know.

We hope to provide you with an interesting read that might answer some of those gray areas, or provide a tune up on issues you haven't dealt with for a while and occasionally, a 'heads up' for what might be coming down from the hill.

Remember, this is a newsletter written by Mechanics for Mechanics.



## Who Is The FAASTeam?

On October 1, 2006 the old FAA Safety Program died and the FAA Safety Team was born. The FAASTeam is a smaller group of hand picked Safety Inspectors that have been given the job of reducing accidents by teaming up with

an elite group of FAASTeam Representatives from the industry. This is where you come in! We hope to accomplish the mission by using a comprehensive data analysis system to identify problem areas geographically and then use our

resources to correct those problems. Isn't that a refreshing idea compared to the old shotgun approach? If you would like to get involved, contact your local FAASTeam Program Manager. They are listed on page 5.

## Aviation Maintenance Organizations In The Southwest Region Take AMT Training Seriously

The Aviation Maintenance Technician Awards Program for calendar year 2006 (AC65-25C) offers a Diamond Award Certificate of Excellence to those aviation companies who lead the industry in a measurable commitment to training. To qualify, a minimum of 50% of eligible employees must be recipients of individual FAA training awards in any given year.

Additionally, a company that has received an AMT award for 100% of its eligible employees will receive a Diamond Award Special Recognition Plaque

from FAA headquarters. For information on the 2007 awards program, see AC 65-25D since the qualifications have changed.

The following is a list of those elite companies that realize that a well trained technician is an asset that will return the cost of training many times over. For the award year 2006:

### Diamond Award Special Recognition Plaque:

Raytheon Aircraft Svcs.-SAT  
Air Logistics LLC - ARA

### Diamond Award Certificate of Excellence:

San Antonio Aerospace-SAT  
Chromalloy – SAT  
Marathon Oil Co.-HOU  
Texas Aviation Services-FTW  
Aramco Associated Co. – IAH  
Petroleum Helicopters - LFT  
Aeroframe Svcs. - CWF  
Tarrant Co. College - FTW  
Bombardier Bus. Jet Solutions - DAL

AAR - Oklahoma City  
GE On Wing Support - DAL  
Gulfstream Aerospace - DAL  
CBP/L-3 Comm./Vertex - HDC  
Citation Svc. Center - SAT  
Helicomb - TUL  
Nordam Repair Div. - TUL  
Aircraft And Turbine Support - TUL

## Ask The Feds

This question was submitted by an A&P / IA from the DFW Metroplex area that occasionally does condition inspections on Experimental aircraft. He asks, "Do Airworthiness directives apply to engines or propellers installed on experimental amateur built aircraft?"

ANSWER: Yes.

This has been a controversial subject for years. People assume that because part 43 does not apply to experimental aircraft that AD's are not applicable. Wrong, it starts in 14 CFR part 91.403(a) which says in part, the owner or operator must maintain the aircraft in an airworthy condition including compliance with part 39. Then we go to , 14 CFR Part 39 where the whole subject of AD's is covered, and there is no relief given in the rule for experimentally certificated aircraft. This is also covered in

AC 39-7C in paragraph 8. If they had intended to give relief to type certificated products installed on experimental aircraft it would have stated that in the regulation. The 14 CFR part 39 rule says in part, that when an unsafe condition exists in a product and is likely to exist in other similar products, an AD is issued. It's all about safety to the flying public. If the FAA knows there is a safety issue with a product, it is their job by law to require people that use that product to do something to correct or mitigate the unsafe condition. Big brother has no control over where that product gets used. That's why if that unsafe product has an applicable AD note, and it ends up on an experimental aircraft, in the interest of safety to the public the AD must be complied with.

If you read FAR part 39 again,

with an open mind this time, you will notice that there are no words like "except for products installed on aircraft that have been issued an experimental airworthiness certificate", or any other language that gives relief from an applicable airworthiness directive. This is not an area that has received much attention from the FAA Inspector staff, but we expect it may make it to the front lines with the influx of light sport aircraft many of which have type certificated products installed.

I always say "nothing happens until something happens". Just think what might happen if an experimental aircraft augers in with your name in the logs for the last condition inspection, and the investigation reveals the engine quit due to non compliance with an applicable AD.

That's food for thought.



**Do Airworthiness Directives apply to engines and propellers installed on experimental amateur built aircraft?**



**EAA Southwest Fly In Hondo, Texas June 1, 2007**



# Lucky's Corner

## IA Renewal

### It's Your Choice On How To Renew, So Make The Best Of It

The purpose of this article is to help clarify the renewal process for Inspection Authorizations. As with anything there are pros and cons. Last March the FAA passed a change in the renewal process, we are no longer required to renew our Inspection Authorizations every year. To save time and money as far as the FAA budget goes, IA's will renew their Inspection Authorizations every two years, on odd numbered years. This change blind sided most of us, including me. Once announced, I got busy to find out what this really meant to me as an Inspection Authorization holder. When I got through with the research, I was blown away by the fact that the only change would be that my Authorization would be renewed every two years instead of every year. This part sounds good, but don't get too excited yet. There is more to the story! As far as the requirements for renewal each year, nothing has changed. Under section 65.93 (c) (1) (5), you still have to "Qualify" for "**EACH**" preceding 12 calendar month period to be eligible to renew your Authorization at the two year interval. To "Qualify" everyone knows that you can renew strictly on activity, having signed off on at least 4 Annuals each year, having signed off on 8 Major Repairs and/or Alterations, 1 Progressive Inspection, attend an approved Renewal Course or everyone's favorite, "The Delightful Oral with the FAA". If you didn't "Qualify" by March 31 of that calendar year, you would not be able to exercise the privilege of using your Inspection Authorization after that date and would be in Violation of Far 65.93 if you did.

Remember what's important here — to renew!!!! You must meet renewal requirements by the end of the Calendar year "**EACH YEAR**" (March 31) or you blew it. So, when you take a good look at this "2 Year Renewal Thing" nothing has changed as far as renewal requirements for us, other than submitting the paperwork and getting renewed every Odd Numbered year. So, my suggestion to you is to act as if nothing has changed and continue to fill out your Renewal paperwork (FAA form 8610-1, not required but I recommend it) with your activity documented and/or continue to attend the approved courses and stash your paperwork in a safe place so you can have it readily available at renewal time. Remember, if you can't find it or produce it at renewal time, you've got a Big Problem! For further information on this refer to AMT Magazines April 2007 article by Bill O'Brien on page 24.

Now that we've gotten all that out of the way, let's talk about the advantages and disadvantages of how you renew. By renewing your Inspection Authorization by activity alone, I believe you will miss out on one very important thing! Continuing Education. This shows us what is happening in the field and industry!!!! That is where the Approved Renewal Seminars come into play! Most ask themselves, why should I pay money and spend a full 8 hour day sitting in a classroom listening to people talk and lecture when I already qualify to renew by activity??? To that I answer- For the knowledge and updating of what we have learned in the past year from our own mistakes and successes and that of others, that's why. The FAA Approved Seminars strive to keep you updated on upcoming changes. Changes that have already taken place and are in effect, whether it is regulations, processes, Airworthiness Directives, Improper Maintenance techniques, log book sign-offs, paperwork changes and what caused the most accidents last year. Renewal through Seminars shares with you All of the combined errors, misjudgments, proper uses that are shared by your fellow IA's. Instead of just acquiring the knowledge you gained last year through qualified activity, you now can acquire so much more from your fellow IA's as discovered by them, Industry and the FAA. Let's face it; "SAFETY" is the key word and focus behind the Seminars. It is your decision on how to renew. Think about being in a seminar with 150 to 200 IA's with individual experience levels ranging from being an IA for 1 year to 40 years. Just think of how much combined experience that is in one room that you now have access to just by being there!!!! It's your choice on how to renew, so make the best of it.

## Accident Case Study — Failure To Follow Procedures

For the purpose of this column we change the names of any person involved and do not release aircraft registration information.

You know this scenario— New student pilot buys a Beech Skipper without a pre-purchase inspection, (gets a heck of a deal), and hires a flight instructor to teach him to fly it. After a couple of flights, the flight instructor tells the new student/owner that he believes there is something wrong with the power output of this aircraft. They take the aircraft to ... let's use Joe. Joe is a good A&P/IA that the instructor has used before. Joe inspects the engine in his one man shop and determines that the camshaft in the little O-235-L2C has worn down lobes and needs replacement for the engine to develop rated power. The new owner agrees and work begins. During the repair process, Joe discovers that the oil pump AD was applicable and had not been complied with and that one magneto was totally trashed and needed to be replaced as well as a timing gear and all lifters. The owner agreed to the additional work and the parts were ordered.

During the reassembly process and while waiting on parts, Joe stuffed the crankcase and other openings with industrial paper towels (shop towels) to keep dirt and bugs out of the engine and he goes on working on other aircraft. Sounds pretty normal so far.

The parts are received, most of the paper towels (all but one) are removed, and the engine is reassembled. The engine is

serviced with the proper quantity and grade of oil, test ran, and checked for leaks. Nothing abnormal noted and the maintenance records receive an approval for return to service. The owner is called and told the aircraft is ready for delivery.

The flight instructor and a friend, who was also a pilot, show up and take delivery of the aircraft for the owner. A normal run up is accomplished, followed by an uneventful take-off. During level flight, the pilot reported a loud metallic sound and the propeller stopped turning. The pilot initiated a forced landing on a golf course. During the roll out the aircraft impacted trees and came to rest upright. The two occupants suffered only minor injuries. The aircraft was determined by the insurance company to be totaled.

The post accident investigation and engine teardown revealed the following:

The #3 piston was not moving. They were unable to remove the #3 cylinder. After removing the #4 cylinder you could see that the #3 connecting rod cap was destroyed by heat and the #3 crank journal was destroyed by heat due to oil starvation.

Portions of an industrial paper shop towel were discovered throughout the crankcase. Removal of the oil sump screen showed it was completely clogged with the same material.

The investigation led back to Joe's shop where matching paper shop towels were discovered. During the interview with Joe, he admitted putting the

towels in the engine to keep out dirt but thought he had gotten them all out. Additionally, there was no one available to do a second inspection prior to installing the cylinders.

This is clearly a case of 'Failure To Follow Procedures'. The Lycoming direct drive overhaul manual states in part "prior to assembly all parts should be cleaned to remove all traces of preservative oil and any accumulated foreign matter." I think a shop towel qualifies as foreign matter. You could also call this a case of another FAA favorite, 'Failure to Properly Inspect'. In either case, Joe really messed up when he was in fact trying to do a quality job for his customer and be a responsible and professional mechanic. As a result of his inadvertent oversight, he destroyed an aircraft, endangered the lives of two airmen, and put a major blemish on his record after dealing with the FAA Inspector, and the aircraft owner is still trying to get back the money he paid for the work.

This case also smells like a dose of "Human Factors", another FAA identified casual factor in accidents. Perhaps Joe was tired when he installed the cylinders, maybe he was thinking about something else, maybe there was poor lighting in his shop, maybe the phone was ringing off the wall and distracting him, who knows.

We can all learn at Joe's expense. If you work by yourself, you might want to check your work two or even three times before closing.



**Post Accident Engine Tear-down Reveals Paper Shop Towel in The Crankcase**



**The oil sump screen was clogged with a shop towel.**



**Experimental Special Light Sport Aircraft**



## Meet The Team

The Southwest Region's airworthiness FAASTeam is composed of four Program Managers. We are located in Dallas, Oklahoma City, Baton Rouge, and San Antonio. Each Program Manager is an A&P Mechanic with IA, some are Parachute Riggers, Pilots and were DME's, and we are all bi-lingual. We speak FAA and Mechanic fluently. Except for Mr. Capone in Baton Rouge, LA, he's trilingual, he speaks FAA, Mechanic, and a little Cajun. Please do not hesitate to contact us if you have a question or an issue that you would like to discuss, or if you would like to join the FAASTeam as a Representative. Below is our contact information:

Brian Capone - Assistant Regional Manager -Baton Rouge FSDO

Phone 225-932-5926 E-Mail - brian.t.capone@faa.gov

Mike Jordan - San Antonio FSDO

Phone 210-308-3312 E-Mail - michael.r.jordan@faa.gov

Barry Proctor - Dallas FSDO

Phone 214-902-1834 E-Mail - barry.g.proctor@faa.gov

Steve Keesey - Oklahoma City FSDO

Phone 405-951-4236 E-Mail - carl.s.keesey@faa.gov

## Tech Forum

**This article was contributed by Jim Sparks, (I'm not Kidding) an avionics technician, a FAASTeam Representative, and a writer for AMT magazine. Thank you Jim for the informative article.**

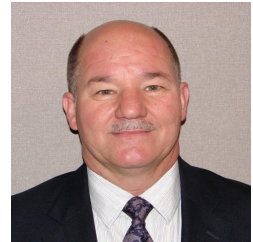
### All Aircraft Must Be Grounded!

No, the title is not a catch phrase from a Railroad Executive's conference. In fact, it has to do with **grounding** as used in an electrical sense. Although in some cases an aircraft is grounded when it is on the ground but there are grounds when this assumption is not grounded. Perhaps Merriam Webster can shed some light on this dilemma:

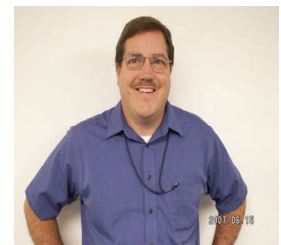
*Ground is obtained when an object makes an electrical connection with the earth: Ground is also referred to when a large conducting body such as the metal structure of an aircraft is used as a common return for an electric circuit and has a zero (or near zero) electrical potential.*

There are of course positives and negatives (please excuse the pun) when using aircraft structure as part of electrical circuits. On the plus side, elimination of significant amounts of wire can be realized as only one wire is needed to feed power to specific components and the return path can be through the airframe.

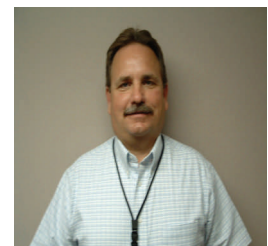
The down side is that many airframes are manufactured using aluminum which



**Brian Capone-  
FAASTeam Asst.  
Regional Manager**



**Steve Keesey -  
FAASTeam Program  
Manager**



**Berry Proctor -  
FAASTeam Program  
Manager**



**Mike Jordan -  
FAASTeam Program  
Manager**

is a good conductor of electrical current. Copper wires equipped with cadmium plated terminal ends are often attached to this aluminum structure using steel hardware. Just add water! Galvanic action occurs resulting in corrosion.

Not only does corrosion pose a structural threat but it can impact the proper operation of electrical circuits. In the world of glass cockpits where milliamp current flows are normal, milliohms of resistance can cause some of the strangest electrical and avionic problems. Corroded grounds can also hamper operations in high current draw systems as well. One of the leading causes of generator parallel problems is related to deteriorating electrical connections resulting from exposure. In fact in some situations this can become a serious safety concern as high resistance in an electrical circuit utilizing high current draw will result in heat being produced at the corroded junction. In severe situations electrical arcing can result which produces a fire hazard.

Electrical bonding is another topic associated with grounds and requires as much awareness as the corrosion issue. As the aircraft moves through the air there is constant contact with air molecules. This contact results in an electron transfer from the air to the aircraft. In the event the aircraft does not have the ability to discharge the excess electrons all or part of the aircraft will begin to build a significant electrical potential.

Once the charge is strong enough, an uncontrolled discharge will result and can cause radio interference as well as cause physical damage to aircraft components.

Most airframe manufacturers will map the aircraft surfaces and design a route where static discharge can be safely managed. This involves the use of bonding surfaces using a variety of methods including straps, wires, enhanced electrical contact points and static dischargers. In addition, manufacturers generally build into their maintenance programs a means of testing airframe electrical continuity as well as static discharge capabilities.

Care should always be taken when applying any product to an aircraft exterior. Certain commercial polishes may not be electrostatic friendly and when applied to an otherwise well bonded aircraft will cause electrostatic buildup and subsequent radio problems.

In addition to manufacturer's recommended bonding checks, planning to have a periodic "Corona Discharge" test accomplished will often pinpoint hard to find problem areas.

This process involves electrically grounding the aircraft and then bringing a wand that is charged to a very high voltage within a close proximity of all exposed external surfaces. By monitoring the inductive discharge rate a very accurate determination can be made as to what panels are conducting and which are not. Corona discharge equipment cost upwards of \$15,000 and is frequently owned by Maintenance and Repair Organizations (MRO). Testing on most general aviation aircraft can be accomplished within a short time and for a nominal cost.

Who knows, perhaps the MRO will even have ground coffee without grounds that is provided by a well grounded ground crew who have the grounds to get your aircraft off the ground.

Do you need to find or get information about any FAA office?

(click on the link below)

[http://www.faa.gov/about/office\\_org](http://www.faa.gov/about/office_org)



**EAA Southwest Fly In  
Hondo, Texas June 1,  
2007**