

# EXPERIMENTAL AIRCRAFT ASSOCIATION

## CHAPTER 1098

### SHAWNEE, OKLAHOMA



The Shawnee, OK, EAA Chapter 1098 is an official chapter of the EAA, Wittman Airfield, Oshkosh, Wisconsin 54903. Phone 414-426-4800. Chapter 1098 was organized to promote aviation in the community, provide camaraderie, sharing of aeronautical knowledge and skills among those with interest in grassroots aviation and who share the objectives of the EAA. Chapter dues are \$20.00 per year, payable on 01 January. Normally our meetings are held on the fourth Saturday of the month at 2:30pm at Gordon Cooper Tech Aviation Campus, 2600N Airport Dr, Shawnee, OK 74804, Shawnee Airport (KSNL). Please check newsletter for latest meeting information.

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Welcome to the May issue of EAA Chapter 1098 newsletter. I hope everyone has been staying safe and dodging the storms. In this month's newsletter, we will give you the latest on the tornado damage that hit Shawnee airport. I will take you through my airplane's annual inspection and some things I learnt.

Our Young Eagles Day originally scheduled for 15Apr23 got cancelled and we have re-scheduled it for 24Jun23. Please don't forget to sign up to help at our Young Eagles event (registration website below) at the Gordon Cooper Aviation Technology Center, Shawnee Airport. It's from 09:00 to 12:00. If you know any children interested in experiencing flight (8-17) please let them know so they can sign up (website below), come and fly in our general aviation aircraft and enjoy the fun of flying. We will need folks to help with admission, ground crew, escorting people to the planes, pilots, etc. There's plenty to do !

[www.young eagles day.org](http://www.young eagles day.org)

We also have our Eagle Learn to fly day on Saturday 20May23. This is for folks interested in learning to fly that are 18 or over. The format is similar to the Young Eagle event but also has an introduction section at the start of the day to give some good background information on local flight schools, cost of learning, available sponsorships etc. Folks must show up to the presentation even if weather is not flyable. We'll reschedule with attendees to fly them if weather is not favorable. CFII Scott Dorsey has kindly agreed to give the introduction. Please sign up using the following website:

[www.flyingstart.org](http://www.flyingstart.org)

This month's meeting will be on Saturday 27May23 at 2:30pm, Gordon Cooper Aviation Campus, Shawnee Airport, Oklahoma. This month, Joel Howard will be presenting all things cam related, including CamGuard and other Aircraft Speciality Products. We will also have some food to celebrate our Gold award achievement. I want to thank everyone for their help and support in making this chapter such a welcoming and successful team, reflected in this Gold Award achievement.



<https://www.faa.gov/air-traffic-safety/flight-safety/air-traffic-safety-boards/ntsb/press-releases/2023/05/086>

**SAFETY ALERT** 086

**NTSB** National Transportation Safety Board

April 2023

AVIATION  
HIGHWAY  
MARINE  
RAILROAD  
PIPELINE

# Mechanics: Ensure B-nuts Are Properly Secured!

B-nuts are a small piece of hardware that can cause a big problem if they are not properly secured.

## The problem

- A B-nut is a common term for a nut that provides the clamping force to create a reliable seal in lines (such as fuel, oil, or air lines on a reciprocating or turbine engine) installed on an aircraft. If a B-nut is improperly secured (either torqued too much or not enough), a loss of engine power or an engine fire could result.
- Under- and over-torqued B-nuts could cause fuel, oil, or air leaks depending on where the B-nuts are installed; over torqued B-nuts could also result in deformation and damage to a line. Fuel or oil leaked onto a hot engine could result in a fire.
- B-nuts are exposed to vibration and thermal expansion and contraction during aircraft operations; therefore, it is critical that maintenance personnel ensure that the B-nuts are properly secured.
- The figure at the right shows a loose B-nut that was examined as part of National Transportation Safety Board (NTSB) investigation [ERA21LA023](#) (which is discussed in this safety alert). The threads from the line are visible in the figure.



**Figure.** Loose B-nut at the fuel control unit of the accident engine (SOURCE: ROLLS-ROYCE ENGINES).

## What can mechanics do?

- **Ensure that the proper type of B-nut is used for the maintenance task and that the B-nut does not have any pre-existing damage, especially to the threads or the sealing surfaces. If a B-nut (or any hardware) appears questionable, remove it from service—when it doubt, throw it out!**
- **Follow procedures from the maintenance manual and the manufacturer's guidance (including service bulletins and letters) to ensure that all steps are taken to complete a task or an inspection. Remember that some B-nuts may be in hard-to-access locations; as a result, additional time and effort might be needed for the task.**
- **Ensure that the proper tools are used for tightening B-nuts and that torque wrenches are calibrated; check to confirm that the calibration is current.**
- **Develop a process to ensure that B-nuts that have been tightened during maintenance are also torqued as part of the task. Ensure that proper torquing practices are followed. Use appropriate checklists.**
- **During maintenance work and inspection intervals, inspect B-nuts for indications of slippage, cracking, misalignment, looseness, and leakage and ensure that the B-nuts are intact and safety wired (if required).**
- **Make every effort to avoid distractions while performing maintenance. Set a reminder about the remaining checklist items if you need to step away from a task before completing it.**
- **Perform the required leak checks after the task is completed.**
- **Properly apply torque stripe paint to the B-nuts, after they have been tightened and torqued, to provide a visual aid for identifying a B-nut that has become loose or is otherwise not properly secured. Remove any previous torque stripe paint before applying the new torque stripe paint.**
- **Upon completion of a maintenance task, inspect the work. If another mechanic is available, ask them to inspect the work as well.**
- **Seek out industry best practices for tightening and torquing B-nuts.**
- **For maintenance management personnel, incorporate procedures for properly securing B-nuts into maintenance training programs and safety management systems.**

We included a hyperlink to the original NTSB document at the start of this section. Definitely worth a read. Simply double click on it and you will be taken directly to the source document.

If you have any concerns or questions, please don't hesitate to reach out to one of our Tech Councilors and they will be happy to help you. Their contact information is on the front page. A simple text message is a great way to reach out and start a conversation.

## Shawnee Tornado

19Apr23. An EF2 Tornado ripped through Shawnee airport causing damage to 11 of the 12 structures on the airport. This resulted in the runway being closed by NOTAM and minor damage to the Gordon Cooper Aviation Tech Campus where we host our EAA Chapter meetings. Critical airport equipment including navigational aids, UNICOM, AWOS, navigation lights and other communication systems were also damaged.



Our thoughts and prayers are with those that were impacted by this tornado.

## Annual Inspection

The Annual Condition Inspection is due this month for my Vans RV-9A airplane. I thought it would be good to share how I went about completing this project and hopefully others will share some of their experiences and checklists etc. I'd like to suggest we create a section on our Chapter 1098 website to share our best practice as a guide for less experienced members.

I have owned my plane for less than 2 years so am still relatively new to airplane ownership. I also did not build my plane so do not have a Repairman's Certificate. I am also not an A&P certified mechanic. To this end, I reached out to our Tech Counselors for help.

I find the first step in any project is to write down a list of what you want to achieve along with a plan to show the sequence of events. I searched the web and reached out to several friends for a good work scope. I was given a good checklist that I have tailored and added to. The builder of my aircraft did give me the Operating Limitations document which included a list of inspections along with the Weight and Balance. Vans aircraft do offer a list of Service Bulletins for each aircraft model on their website which is constantly updated. I add these required Service Bulletins to my checklist. Key features I'm trying to add to my checklist are those that I forget from year to year and can help me be more efficient with my time. They include torque wrench settings, the size of wrench / socket required, the key features of the

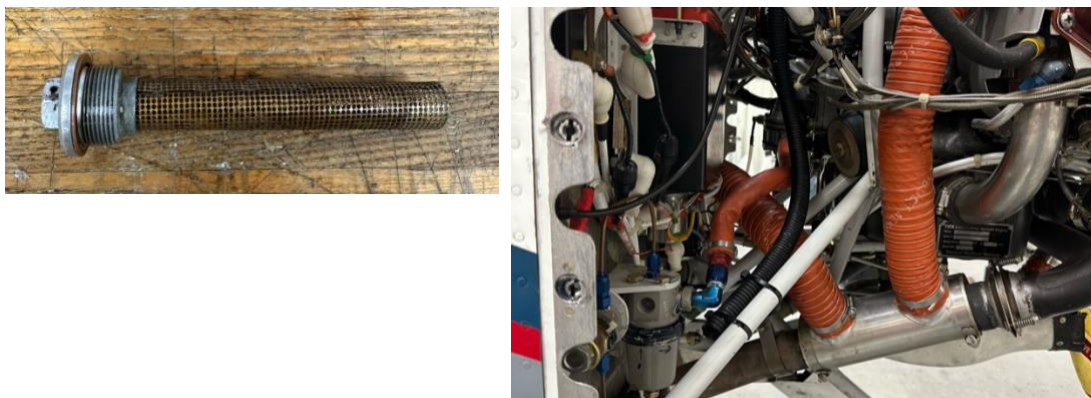
inspection. For example, how to remove the cup on the coalescing filter so it can be inspected and cleaned. (Sounds easy but is quite tricky, you need to unscrew the nut and not the bowl).

I've found writing the location of each inspection port on the rear of each panel and bag the screws accordingly helps tremendously. It takes a little longer when you are removing the panels but saves a significant amount of time with re-assembly.



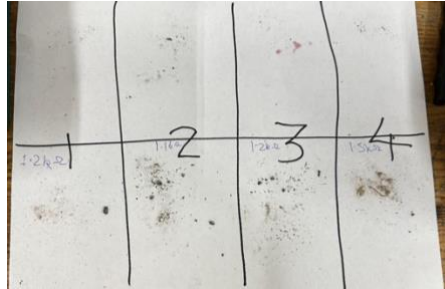
Keeping all the screws and bolts identified takes a little longer during dismantle but saves a bunch of time on re-assembly.

The oil and filter were changed with a mid-stream oil sample taken for chemical examination. I send my samples to Blackstone laboratories. Don't forget to remove and clean the oil screen. This is located on the rear of the Lycoming O-320 engine and takes a little care to wire lock once it has been replaced as there are fuel and cabin heat lines restricting access.



Oil Screen located on the rear of the engine.

Removal of the spark plugs and wires gives the opportunity to clean the lead from the plugs. The lower plugs tend to be more contaminated than the upper ones. The color of the electrode gives a good indication of whether the cylinder has been running rich or lean.



**Contaminants from the spark plugs.**



**Engine Timing and Cylinder Compression Require special tools and a second pair of hands.**

For my O-320 Lycoming engine and magnetos combination, we want to set the timing to 25 degrees prior to top dead center on both mags. This is a fiddly job and requires loosening the magneto clamp nuts and twisting the mag until the required timing is achieved. Care is needed on tightening the clamps such that the timing doesn't change. It's definitely worth a final check when the nuts have been torqued to ensure the nut torquing didn't adjust the timing. The timing is measured on the flywheel by adding a pin to the marker hole. The igniter box lights indicate when each magneto fires.

Compression testing is particularly dangerous if not completed per process as the cylinder will be on top dead center and 80psi air pressure applied through the spark plug hole in the cylinder on the piston. The propeller is held at this top dead center location by an assistant. Deviation from top dead center results in a significant force applied to the propeller which can cause it to spin. This test measures the blow by and hence wear of the cylinders and rings.



**Special tools such as spark plug removal socket, wobble sockets and torque wrench.**

Given the restricted access with working on an aircraft, it is important to have the right tools to complete the work. For example, it's almost impossible to check the torque of the inlet and exhaust manifold nuts without wobble sockets. Chapter 1612 has a significant tool crib and can help if you need to borrow a special tool. Given the large number of screws to remove, it's really handy to have an electric 3-4V style screwdriver. The bigger 18V style drivers can be too heavy and too aggressive. Be sure to complete the final tightening with a manual screwdriver so threads don't get stripped.

It's important to have a general inspection of the airframe and engine over and above the items specifically called out in the Service Bulletins. Removal of all available inspection panels is required to achieve this:



**View of main spar from cockpit.**



**Looking rearward from cockpit to inspect the elevator pushrod assembly.**





Removing the empennage cover shows the horizontal and vertical fin structure along with the elevator pushrod.

I want to thank both Gary Manning and John Myers for their help, guidance and support as Tech Counselors in completing this annual inspection.

VMC IMC

### **VMC**

**Question:** What are the requirements for pilots' use of supplemental oxygen under Part 91?

### **IMC**

**Question:** What systems or equipment malfunctions must a pilot report when flying under IFR?

## VMC IMC Answers

### VMC

**Answer:** FAR 91.211 requires pilots to use supplemental oxygen when flying at cabin pressure altitudes of **14,000 feet** and higher, and for any portion of a flight at 12,500 to 14,000 feet that exceeds 30 minutes. Above 15,000 feet, all occupants must use oxygen.

### IMC

**Answer:** § 91.187 Operation under IFR in controlled airspace: Malfunction reports.

- (a) The pilot in command of each aircraft operated in controlled airspace under IFR shall report as soon as practical to ATC any malfunctions of **navigational, approach, or communication** equipment occurring in flight.
- (b) In each report required by [paragraph \(a\)](#) of this section, the pilot in command shall include the -
- (1) Aircraft identification;
  - (2) Equipment affected;
  - (3) Degree to which the capability of the pilot to operate under IFR in the ATC system is impaired; and
  - (4) Nature and extent of assistance desired from ATC.

Therefore, we can surmise that a pilot must report the malfunction or failure of any system or equipment as follows:

- Navigation = DG, turn coordinator, radios (vacuum, electrical), WAAS GPS.
- Approach = aircraft flight controls, autopilot, navigation (see above).
- Communication = radio (electrical).