



**Tribal Knowledge (TK)** is a term often used in aviation. What does it mean? What use is it? Where can I get some? According to Wikipedia TK is “any unwritten information that is commonly known by those within a company, but not by others.” This term is used most when referencing information that may need to be known by those who produce quality products or services Safely in

companies. Some say that it is just plain ole common sense and with some that may seem so, but it goes much deeper than that. Many companies will have a Safety net developed in order to avoid a repeat of a preventable incident the organization may have experienced. The biggest problem with TK is the tribes are very small and usually that knowledge will be learned the hard way. Let’s look at some and you can determine if it is applied in your tribe or perhaps it should be. If you think it is a good idea then implement it before you learn the hard way as many of these examples will illustrate.

**1. RTGDM** This is written at the top left side of my toolbox and stands for **Read The G.. D.. Manual**. Taught to me by a very experienced A&P who learned the importance of this advice in WW2. He told stories of planes that crashed and pilots killed, not by enemy action, but by incorrect maintenance done in a rush without referencing the manual. He was very passionate about this and I’ve never forgotten that knowledge that our tribe of students received.

**2. Always insure that all the air is out of a tire before removing it.** If you look at the cartoon you see it combines #1&2, I remember before loosening the axle nut of all large aircraft tires we would always remove the air. I suspect it was in case some of the wheel half bolts were broken and the axle nut was all that was holding it together.

A very near fatal accident occurred when the worn tire on a 727 nose wheel needed to be replaced. Afternoon shift removed the tire and noticed a little corrosion on the inside of one of the wheel halves. They dressed it out, painted the inside of the wheel and left it to dry. Near the end of midnight shift (about 5 am) an experienced AME reassembled the wheel and new tire as per the manual and added air to it. The pressure gauge showed zero pressure so he added more air. Still zero. He went and got another gauge, added more air but still zero pressure. He

removed the valve core and proceeded to disassemble the wheel halves. His life was about to change forever.

**3. If something doesn't feel or seem right, stop and check.** Something was not right! Where had all that air gone? Let's just think about this for a sec. The explosion of the wheel half breaking could be heard throughout the hangar. The piece of broken wheel half took his arm off below the elbow stuck his rib cage a glancing blow then smashed the side of his face before going on and hitting a wooden hangar ceiling beam, leaving a visible gouge in it before coming back down. He survived but would never be the same. What happened? The painter of the wheel half had put a small piece of masking tape over the black rubber valve stem inside the tire and then painted over it. Remember the time – 5am. If you go back to articles 18 & 19 DOM Oct/Nov 2016 and Dec/Jan 2017, you will understand how this could happen to even you as the “don't care” fatigue attitude becomes ever stronger. **Take that minute for Safety.** If things don't seem quite right, **stop** and determine why. Your life and the lives of others could depend on it.

**4. All the way on or all the way off.** As an accident investigator, I could almost always count on at least one accident per year that was the result of a loose B nut. Sadly, I was very seldom disappointed. One loose fuel line almost made me quit aviation. Go to our website at [www.system-safety.com](http://www.system-safety.com) Click on “Safety Videos” and read the case study of #6 “The Price of a Mistake.” That accident saw seven lives snuffed out in an instant due to a loose fuel line on a Piper Aztec. Only about a month before we had a similar incident with a Cessna 206. It took off toward the ocean for a short test flight after a routine 100 hourly with a pilot and an AME on board. No one paid much attention until we suddenly heard backfiring and looked up to see the 206 disappear off the end of the airstrip facing the ocean. Soon we could see the aircraft flying inches off the water headed out to sea trailing black smoke. Slowly it turned until it was headed back to the airport. We now knew where the crash site would be and started to run towards the end of the airstrip with fire extinguishers. I'll never forget the sight of the aircraft that suddenly appeared in front of us with its nose pointed toward the sky before coming back down and stopping right in front of us. There was no fire, as the pilot had shut the fuel off at the last second. The belly skin was blackened and the paint was blistered so the skin was removed, a new one fabricated primed and installed. Oh yes, the fuel line was tightened as well. The shaken AME said that he was never so scared in his

life as the stall warning was going the whole time and on looking out, the water was “right there” waiting for him and he couldn’t swim. The pilot had actually touched the main wheels on the beach then had pulled full up elevator to bounce over the road and stall, nose high, on the 45 degree upslope to the runway. With limited power still on they had rolled up the slope to meet us on top. Our Tribal Knowledge after that called for a dual inspection of any fluid line that was loosened. Make it a tribal rule that if you start tightening anything from a sparkplug to an oil filter, you either complete the job **or** unfasten it. That way, if a visual inspection only is made there is little doubt that it is either tightened or very loose (unfastened)

**5. Never trust your eyes alone.** A visual inspection is what we do all of the time when performing a 100 hour inspection but any time you are doing a duplicate inspection, don’t trust your eyes for anything that could be loose yet look tight. There is no way for the eyes to tell if a fitting is hand tightened only and waiting to vibrate loose or it is torqued and airworthy. Always use a wrench or, at the very least, your hands to check if the part is, in fact, actually tight. Much better yet, do the following

**6. Torque-seal is NOT there to hold a fitting from loosening** Torque-seal was not known at the time that the Aztec crashed in New Guinea. After that accident our tribal knowledge decreed that every line had to have a paint line on it prior to the independent inspection of all lines. This resulted in dried up paint bottles and brushes everywhere so we switched to a simple gob of silicone rubber on each connection. I believe that Torque-seal or its predecessor was developed in WW2 as an “anti-sabotage inspector’s lacquer.” This used to be printed on the side of the tube. It seems that they are no longer in business. I wonder if the lawyers found a way to sue them for the use of this Safety device and they were forced out of business? That also may help explain how an equivalent tube of Viz-Torque cost \$7 to 8 US plus shipping. Some reviews called it “like a bag of chips” – half empty.

Let me give you a valuable tip that will do the same thing for a fraction of the cost. It is called “fabric paint”. I’ve tested it on lines and left it out in the rain for months and it hangs in there. If it can survive machine washings on fabric as they say it will, it should work as a Safety marker without the lawyer liability. You can find a tube of it for under a dollar (**16** assorted colours for \$13.41). You can even get a “glow in the dark” version. I can vouch that it doesn’t dry out in the tube like Torque-seal.



When installing always practice **T.T.T.** That stands for hand **T**ighten, **T**orque it and immediately mark it with **T**orque-seal or equivalent, so that an independent visual inspection any time after will notice the Safety net.

Also, no matter what you use, wipe the old stuff off with lacquer thinner prior to loosening the B nut. That way nothing can get in the line.

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