



Steve Bell

Special Safety Ramblings

Imagine this if you can: you have decided you are going to fly over the weekend with an overnight stay at an old friend's house. You have your weather reports for areas you will be flying in and it all looks absolutely perfect for the entire weekend and you are looking forward to the trip. The afternoon before you are due to leave you fly a couple of circuits just to get the bugs out before you go. After landing everything is fine so you go home for a good night's rest before you leave early in the morning.

It is the next morning where things begin to go wrong. When you arrive there is a little bit of un-forecasted fog, but you know from experience that it won't last long however, because of the fog your plans are little delayed. Unfortunately things start to go downhill from here and you notice that your aircraft is leaning to one side. When you have a look, you have a flat tyre. You initially pump the tyre up and you seem satisfied that it is holding its pressure. You then start your preflight daily walk-around or daily inspection but when you get to the tyre which you pumped up, it's flat. So now you have to fix it, which you do, sadly this takes about an hour because you haven't got the required tools with you so you had to drive home to get them and the spare tube.

You have now had two delays which means that you will be getting close to last light when you arrive at your friend's house. You then decide to discontinue the pre-flight and leave, after all "it flew in yesterday and should be right to fly out" right! What you missed was that the engine oil level was low and there is a loose bolt in the end of the elevator control cable, because the nut has fallen off. I won't labor the point further, but in this case this particular aircraft is now suspect, there is a chance of an engine failure and in the worst instance inoperative elevators and a possible disaster. The problem I have with this scenario is that it is just all too common and people place a total trust in what happened yesterday or last week and this could have been avoided.

I have written just recently about the advantages of preventative maintenance. We all get into difficulties from time to time because of the sheer number of scheduled inspections which are required for most aircraft during their life. There are inspections at 25 hours, 50 hours, 100 hours etc., and on top of that you are asked to inspect the aircraft each morning before the day's flying and a minor inspection before each flight.

Even with all of these inspections, the two most important inspections are the Daily Preflight Inspection and the Preflight Walk-around, which in most cases can be done by the owner or pilot.

Why are these two inspections so important? When a periodic inspection is carried out, the wear and tear on the aircraft is assessed

and a determination made that any worn parts are within the manufacturers wear limitations, so the aircraft is serviceable. That sounds good, but this determination is only applicable at the time the aircraft was inspected, and the expectation is that the operator of the aircraft will constantly check that the wear hasn't increased. To give an example: all hinges on controls will wear over time, and the manufacturer states that when the control can be moved at the hinge say 0.030" or 1 millimeter, up and down, it should be replaced. So this is checked during the last 100hr inspection and the wear is determined to be 0.029", which means this hinge is considered serviceable. A further 0.001" of wear means that the hinge should be replaced, so you (or any person who flies the aircraft) are now the person who is responsible to determine before the aircraft is flown if the control hinge isn't worn beyond limits.

The next aspect to consider is that the Daily and/or Preflight inspection is the last chance anyone has to make sure that the aircraft will be as safe as possible for the intended flight. It is always far better to know that something is broken or worn or doesn't work properly **before the aircraft is flying** than to find out in the air when you are relying on that piece of gear to keep you flying or get you out of trouble. ***A person can be the best pilot in the world who has taken all of the necessary precautions in preparation for a flight if the aircraft is not fit to fly. EH??***

Second chances happen in the air but they are rare, and there are no second chances when something you need is broken. After all, anything that is moving on an aircraft is wearing all the time you are flying, additionally everything fitted to an aircraft is under stress once it is in the air. Some components are more inclined to wear quicker because of the stress they are put under, for example the engine. Aircraft engines are subject to enormous stresses while they are operating, they are hot, they have a large number of moving parts some of which are not only hot but they are under enormous pressure as well, so having the right lubricant in the right quantity is extremely important. So the wrong oil will not act in a predictable manner nor can the oil work properly if there isn't enough in the system.

Preflight or Daily Inspection

A daily inspection is required before the first flight of any day the aircraft is flown.

An aircraft with a Flight Manual (or Operator's Handbook) or which has the aircraft, engine, and propeller maintenance manuals will have a list of those things that must be inspected before the aircraft is flown on the first flight of the day. In some cases these manuals will make reference to the standards the aircraft must meet. If the aircraft manufacturer has not included this schedule in their documentation then the check list printed in the RA-Aus Technical Manual (Section 4.2.1) MUST be used. The use of these checklists or schedules is mandatory, even if the aircraft is an amateur built. In addition check lists or schedules are the minimum requirement, not the maximum. So when performing an inspection prior to operation of the aircraft, it is important to determine the condition of every component where easy access can be gained. For instance, very few daily inspection schedules require that the engine cowl be removed for a daily inspection, but in most cases the top cowl may be removed quickly and easily giving full access to the engine, so it should be removed.

Doing the Inspection

Using your checklist you should have some idea of what to look at. Two things to remember here:

1. The checklist you are using is the MINIMUM that needs to be inspected.
2. You will be using all of your senses to perform this inspection.
 - a. You will be looking so a strong torch is needed;
 - b. you will be using your sense of touch, so you will be pushing and pulling and shaking parts of the aircraft (all parts of an aircraft are designed to take a certain amount of load which is generally greater than you can supply with just your hands and fingers);
 - c. you will be listening for groans and clicks and crunching noises;
 - d. finally you will be alert to odd smells.

For example when you are checking the wings, you will first have a look along both sides at the entire surface for obvious flaws. You can then give the wing a vigorous shake, while at the same time you will be observing for flaws and listening for clicks and groans (groaning noises are usually fine, while clicks may indicate a crack or loose fittings etc. Lastly if you can smell fuel near or in the aircraft, then you will need to investigate where it is coming from. Remember that there is little chance of you breaking a serviceable wing; after all it is designed to carry the weight of the aircraft and passengers. The same could be said about the undercarriage and the other major components, the smaller the thing you are checking the lower the force you use. If you can run your hands over every surface in most instances you will feel a flaw before you can see it. Take panels off if you feel it is necessary and have a look inside, but don't move on until they are re-fitted.

3. Check all fluid levels and fill up to the required level.
4. Always ensure your inspection is thorough and systematic – remember everything you can see or reach needs to be inspected.
5. Always start at a particular point on the aircraft and finish at the same point.
6. Your safety and the safety of others must be the first thing you consider at all times. Always make sure the ignition switches and power are off. Be careful of confined spaces, sharp edges and black holes. Never put any part of your body in an area where something can move and injure yourself. Unpleasant things like to take up residence in dark spaces: spiders, insects and snakes for instance.
7. Never rush this inspection or skip over things, you can almost guarantee that the thing you miss will be the thing that brings you the most grief.
8. Finally be proud of what you have achieved and sign for the inspection in the logbook.

Until next time, happy, safe flying and fixing. ■

Steve Bell
Technical Manager