Check wheels, down

By John Morris

How are your wheels-aka tires? Inflated properly? When are we required or recommended to replace your tires?

According to the FAA and aircraft tire manufacturers the tires can remain in service as long as approximately 1/8" groove is present in tread, for the tires recommended for the PC12. Even flat spots, if no chord or reinforcing ply is showing, are allowable as long as no vibrations occur.

If you have to replace a tire you probably know the type: Main/Nose tyres (Europe-speak) tires used – Main: Type III 8.5 – 10 and Nose: Type VII 17.5x6.25-6, both bias ply-160mph maximum. Did you know that the Main "8.5" means the footprint, or average width of the tire and the "10" is the rim diameter? Guess what the width/total diameter of the nose wheel tire is? [Hint: reverse first two numbers]. Main tire is 10 ply while Nose tire is 8 ply. Ply denotes maximum load carrying. More Ply more load.

Inflation is very important. Pilatus recommends 60 +3 psi for all tires. It is highly recommended to only check tire pressure when "cool", at least 3 hours after landing. Use calibrated or digital pressure gages when checking. Ambient temperature changes can have a dramatic effect on tire inflation. A 5 degree change in ambient temperature will cause a 1% change in tire pressure. Landing with underinflated tires can cause internal damage to the tire due to excess flexing of the tire which can cause over-heating. An example given in the FAA maintenance handbook illustrates a real experience: flying from Phoenix, Arizona (100^{o} F) to Vail, Colorado (50^{o} F) would cause a tire pressure drop of 10%! That's 6 psi for the PC12. Could be bad! It is allowed to over-inflate (Pilatus recommended-not tire manufacturer +3 psi) for this example to help mitigate the resultant landing.

Speaking of tires over-heating. There are three fusible plugs [and one over-inflation safety plug] installed in the main wheel hubs. With the fleet now using steel brakes excess heat can also be generated by prolonged application of braking after landing/taxing. The fusible plugs have a soft metal core that will melt from excess heat allowing air to escape instead of a blowout. 1st is better than 2nd but it still is not fun to have a flat from just taxing!

So much for the wheel care. How about wheels down?

If you have ever have listened to or landed at a military or dual use military/civilian airfield you will always hear the phrase, ”check wheels down”, prior to a landing clearance. The military trains its control tower operators to state that phase, without exception, to all aircraft landing regardless of the possibility the landing aircraft/helicopter may not having retractable landing gear. Reasons include costly damage and closure of a runway, which during times of conflict could cost a great deal more than just dollars!

But for the civilian (our) world, it is up to the pilot(s) to lower the landing gear without the friendly pre-landing advice. Vary rarely do pilot’s fail to lower their landing gear now, hopefully due to normal procedures, but sometimes helped by warning systems installed by the manufacturer. These systems are designed to alert the pilot, in a timely manner, to lower the landing gear prior to the actual landing. Most installed warning systems came from manufacturing rules set by the FAA and other regulatory authorities.

The main requirement from the regulatory authorities is for a landing gear not down warning if the throttle(s) are reduced below what is considered to be minimum landing power settings. The warning usually consists of landing gear unsafe indications and an aural warning. In just about all aircraft the best way for the manufacturer to accomplish this is by positioning microswitches close to the idle position of the throttle(s). During the earlier days of high performance/retractable landing gear aircraft this worked satisfactorily except when reducing power, for extended altitude descent purposes, which would cause the activation of the landing gear warning indications and aural warning when actually not in a position for landing. Proper recourse was to move the

power levers forward enough to silence the warning. But this would then cause a longer time to descend due to reduced angle of descent because of power still in use. Of course there were some “clever” pilot’s that would silence the warning by finding/pulling the circuit breaker associated with the gear warning system which would usually disable the landing gear annunciators as well as the aural warning. Not good, especially if then distracted by…flying the aircraft let’s say, until landing without the landing gear extended. Oops! After several near and actual occurrences of this type manufacturers, like Pilatus, installed an extra solution to this particular problem – an airspeed switch. Pilatus uses 130 KIAS as the target speed for activating the gear warning. However, in order for the landing gear warning system to activate the power level must also be very near/ at idle detent. 130 KIAS should be familiar to all since that is also the maximum operating speed for flaps 30. And if using flaps 30 it is reasonable to believe an intention to land is imminent therefore requiring that the landing gear should be included in this situation!

But if using zero flaps or flaps 15 for landing or flight maneuvering the warning system may not activate due to the higher the 130 KIAS for flight with low/near idle power. If we do slow to 130 KIAS or less we have the means to “silence” the aural warning tone only but the landing gear annunciations remain, via pressing the silence button –Legacy PC 12’s only. It is interesting to note that Pilatus decided to remove the silence button in the 47E (NG). [FAR 23.729 require that there be no manual means to disable flap associated warnings, but is allowed regarding the landing gear system as long as a cancelation, in the case of the PC12, by PCL advancement, will then reactivate the warning when power is then reduced again.]

Here is a possible “gotcha” problem, for the legacy PC12’s. A landing with either zero flaps or 15 flaps the approach angle for landing, along with other possible distracters associated with landing using minimal flaps, will cause your airspeed to possibly be greater than 130 KIAS while having the PCL at/near the idle detent position. You then will not receive the landing gear not down annunciators/aural warnings until in the landing flair! Pilatus added an extra layer of warning to the

NG regarding this “gotcha” – at 200 feet Radar Altimeter and <10 PSI Torque, pilot will receive a voice aural and visual warning.

Another possible “gotcha” problem that could happen, again Legacy PC12’s only, is a possible flap asymmetry if the fault occurs when the flaps are greater than 15 degrees. One of the conditions of “Pusher Safe Mode” [Emergency Procedures 3.11 C.] is the pusher computer possibly resetting to the zero flap position*. Shouldn’t be a big deal right? Same condition as the previous paragraph could happen except as it happened to yours truly, flaps had faulted at 27 degrees [flap 30 takeoff] which with the landing gear handle in the up position, should have made the landing gear warning system “insist” on lowering the landing gear. It did not! So with the additional power used for return for landing the now “zero flaps” landing scenario required the PCL to idle detent (airspeed was already <130KIAS) in order to activate the warning system. No worries since no distractions, right?!

*The Legacy/NG Emergency Procedures state that Pusher Safe Mode will be a setting approximately 5 knots faster for pusher activation. The NG manual, section 7, currently describes what I am relating to regarding the zero flap position setting.

With all of the normal procedures and warning systems installed you would think we would never forget to lower the landing gear. And 99.8% of the time that is correct but looking over incident reports it appears that for turbine general aviation at least one booboo per year. Remember the “GUMPS” check? Doesn’t quite work for the PC12 but how about the TAWS “500” as a final reminder! Never hurts to have a backup, especially if you are by yourself.

A safe pilot is always learning

John Morris

ACFT Services, LLC

407-721-7442

www.acftservices.com