Avoiding Grob 103 Twin II PIOs

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Some statistics

- 51 Grob 103 Twin II and Twin II Acros registered in the US
- More than 20 of these have been involved in accidents that resulted in a broken tail boom
- The primary cause of more than half of these accidents has been loss of control during landing in a PIO-type event
- PIO accidents in 103s are rare in Europe

What is different about the Twin II?

What it is:

- Aft position of main wheel – makes the glider a joy for ground handling
- Pneumatic (bouncy) nose wheel contacts the ground at a shallow angle with a long moment arm

What it isn't:

- The glider is not particularly pitch sensitive
- It doesn't react unusually to speed brake changes

Sequence of a 103 “PIO”

- Initial contact occurs in a level or nose-low attitude substantially above stall speed, with less than perfect control of vertical speed
- Aft position of main wheel (behind CG) causes A/C to rotate forward; nose wheel strikes and bounces
- With rapidly increasing angle of attack, A/C flies again; tailwheel strikes and bounces
- With sudden pitch down, the second contact is often directly on the nose wheel, resulting in another, more energetic pitch up
- Pilot often exacerbates the situation with out-of-phase control inputs

The Solution

Proper touchdown attitude

- Initial contact should be made with the nose *above the horizon*
- Ideally, both main and wheel should contact together, or even slightly tail-first

Why this works:

- If the glider does not have enough energy to fly in a nose-high attitude *before* the initial contact, it can't fly in response to a nose wheel bounce *after* the initial contact
- If touchdown attitude is nose-high, no other mistake will result in a divergent pitch oscillation

What does Holtz Say?

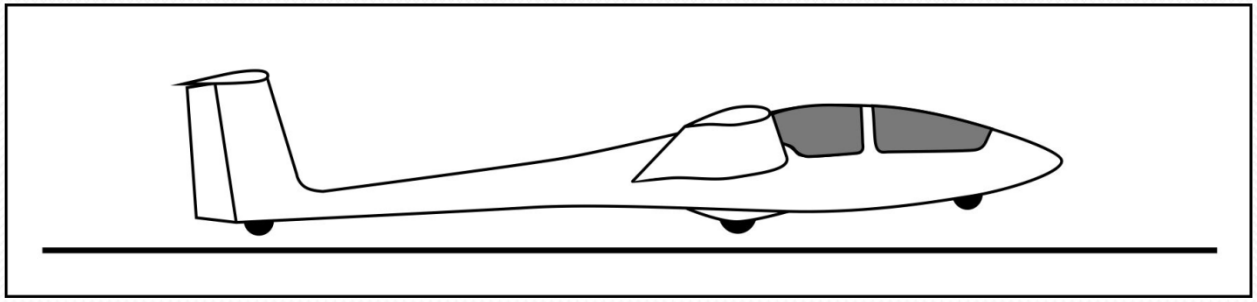

Figure 6.2 – Landing attitude, with the tail wheel level with the main wheel. The tail wheel should touch down at the same time, or slightly before the main wheel.

"Ideally, you will perform a "two-point" landing, with the main wheel and the tail wheel touching down simultaneously, or a tail wheel-first landing, with the tail wheel touching down slightly before the main wheel."

Note: Students in Europe and the UK are required to demonstrate this landing technique as part of basic competency.

Instructing Ramifications

- Don't allow students to routinely land in a level attitude on the main wheel – the way many of our students do
- Dealing with overshoots:
  - Mostly not necessary – just roll out long with a red face
  - Don't force the nose down in an attempt to make the glider land
  - May be necessary to *gently and smoothly* increase airbrakes in ground effect; this should not be routine, but students should know how
- "Fixing" a PIO may not be possible., especially with student skill level. Try to hold still with the stick slightly aft