

Bounced Landings and Prop Strikes

I'd really hate to think that anyone in the Mooney community in the future would have to confess to a prop strike. Eliminating this issue would save us all a lot of money in insurance costs. Every time I see or hear of a prop strike I hope my insurance company isn't involved...but it usually is. And the sad part of all of this is that I don't know of one that wasn't preventable. So, although this has been talked about in the past, I'd like to go over a few things again. First off, I really recommend obtaining copies of the Aviation Safety Series "On Landings" put out by the FAA. The documents are FAA-P-8740-48, FAA-P-8740-49, FAA-P-8740-50. Bounced landings are discussed in detail in Part I, 48. I'm going to give a number of reasons for bounced landings and follow them with the way out. I do one or more of these in every recurrency or aircraft checkout I do, so I know how to bounce them pretty well.

The first easy way to bounce a landing is to come in too fast. If you're going too fast there is no way to achieve the proper landing attitude. You are guaranteed to have a "flat" attitude. The runway zooms by and you push the yoke down to get the plane down. The flexible nose wheel donuts oblige well on "pushdown" by compressing and shooting the plane back into the air nose high. The next usual pilot response is to push the nose back down. Unfortunately, due to brain to muscle delay, the pilot is out of sync, the nose was already going down, and he amplifies the problem and bounces the nose again, only this time harder. He either strikes the prop this time or the same process continues one more time, and the prop strike occurs on the third bounce.

Another good way to have a bounced landing is to have your airplane trimmed nose down on approach, thereby making it difficult to achieve the landing attitude in the flare. You would absolutely not believe how many pilots in the majority of my checkouts fall victim to this situation. On mid final all I have to say is hands off the yoke, and watch a majority of the planes severely pitch down and head for the ground at two or three times the proper approach angle

A third way you might increase your insurance bill is to actually come in too slow for the circumstances. In this situation you have gusty conditions, and just before touchdown a wind gust smashes you into the ground. You get a repeat of the coming in too fast procedure. I had this happen to me several years ago at Palo Alto on a very gusty day. I recovered properly, left my SO on the instructor's bench, and proceeded to go around the pattern about four more times to improve my technique in such circumstances. Not too many people were flying that day, but should have been out with their instructors getting good at the procedure.

Although I've only noticed it in the 231 and Rocket, ground effect reduces somewhat the effectiveness of the elevator due to the decrease in down wash. This makes the elevator a little less effective in ground effect. Therefore, you're increasing the probability of a prop strike, by dropping the airplane into ground effect while letting the speed bleed off in the hopes of not stalling the airplane too high off the ground.

Inattention to airspeed or landing attitude caused by fatigue or other distraction can be another cause of the "bounce". Repeat method one above for a prop strike.

So how can we avoid the results of these situations?

Coming in too fast---To belabor the point once again, maintain proper airspeed control on final. This speed WILL vary with landing weight. Please, always do a quick calculation of your landing weight. This is simple if you start out knowing your zero fuel weight. Then just add the weight of the landing fuel on board and take off 5 knots for each 300 lbs under gross you are. Second, at about 8-10 ft AGL smoothly rotate to the landing attitude (about 8° nose up). Keep pulling back on the yoke to hold that attitude until touchdown. **KEEP THE YOKE FULL BACK** until you've stopped. The increased drag of the up elevator will assist in braking. If you should bounce on touchdown, **NEVER, NEVER, NEVER, NEVER** push the yoke forward. Relax back pressure only to the extent of regaining the landing attitude if excess speed is available, or add just enough power to lower the nose to the landing attitude to cushion another bounce if no excess airspeed is available. If your skill level is not up to doing that, then as early as possible add full power and **GO AROUND**.

Untrimmed airplane---I once had a very good pilot friend of mine say that while you want the airplane to do what you want it to do, what you really want is for the airplane to **WANT** to do what you want it to do. Trim is the answer. If you really want to become an outstanding pilot, then the first place to improve after a complete understanding of the pitch power relationship in airplanes is in your ability to properly trim your airplane. If you can't trim your airplane hands off and actually have it fly in the desired pitch attitude whether level or other desired attitude such as a stabilized descent, then you will have an inexcusable diversion of attention trying to hold an untrimmed airplane in a specific attitude. That will come back and bite you as an instrument pilot or VFR pilot in heavy workload related situations. Bounced landings are one of them. I emphasize this because, while I can't remember a pilot I have worked with who could trim his airplane hands off when we started training, I also can't remember one who couldn't do it by the time their training was completed. So we are all capable of learning to do it. If your airplane is properly trimmed, then at the proper approach speed, you can easily pitch it to the proper landing attitude and follow method one for recovery from a bounced landing.

Gusty conditions and/or wind shear---The most challenging situation. Since you don't know if you are going to be bounced by the wind, this situation is most demanding. Speed must be increased by at least 1/2 the gust factor, and runway length is critical in the decision to recover as in method one or to go around. If there is any doubt, go around or go to another airport more suitable to the conditions.

If you've experienced fatigue due to lack of sleep or other cause and are planning a cross country for the following day, do yourself and your airplane a favor and don't go. Poor reflexes may turn even the best of pilots and then their airplanes into mush on bounced landings.

If, after reading this material you get only one thing out of it, it should be that if you bounce a landing, don't try to recover by pushing the nose down. Almost everyone I've worked with wants to do this. You will always be out of phase with the movement you want to do with the nose of the airplane. Remember, if the nose wheel is off the ground there will be no prop strike. Either hold back pressure to keep the nose up and add power to cushion the next touchdown or add full power and go around.

Now, please, no prop strikes.

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