

## **Those Who Have and Those Who Haven't ... Yet!**

*By William J. Doyle, Jr., CFII, AGI, IGI, ASC*

I have often heard a quip, "There are two kinds of pilots. Those who have and those who will." We're talking about gear up landings: those who have already done one and those who will do one in the future. Now, what causes gear up landing accidents? While some are caused by equipment failure, most are due to pilot error. If we were to analyze these accidents, we would probably find that most of them had as a common denominator some break from the pilot's established routine. Examples of breaks from routine are go arounds and a heavy work load from ATC on an instrument approach.

Picture this go around scenario. The pilot is mentally focused on landing, the pre-landing checklist has been completed. The aircraft is well established on final then something happens that causes the pilot to reject the landing. The pilot immediately initiates the go around procedure: full power, flaps up a notch, positive rate of climb, pitch for best angle of climb ( $V_X$ ), gear up, flaps up another notch, pitch for best rate of climb ( $V_Y$ ). The pilot stays in the pattern, turning crosswind to downwind to base to final. The pre-landing checklist was done at initial pattern entry, so the pilot does not redo the checklist. While entering the flare, the pilot hears a horn that sounds like the stall warning horn. Seconds later the pilot hears and feels scraping and clunking sounds. Through the windscreen the pilot sees bent propeller blades. So what was wrong with that picture? The pre-landing checklist was only done once. Since the gear was already checked down, it had never been unchecked in the pilot's mind. The FAA recommends that the gear be extended and the pre-landing checklist be completed prior to reaching the base leg in normal landing situations.<sup>1</sup>

When I was a newly-minted CFI, most of my early instructing was transitioning pilots from a Grumman Tiger to a Mooney MSE. The Mooney is an airplane that likes to fly. From a speed perspective, it often proved to be a handful for transitioning pilots. To help them, I borrowed some instrument flying concepts. My rationale was that if it works inbound from the final approach fix at a distance of five or more miles, it should work for a visual approach at a distance of one or two miles. My technique involved an application of pitch, power, and speed brakes to slow the airplane to gear extension speed while still one or two miles outside the pattern. My experience with this also demonstrated that by the time the gear was down and locked, the airplane was at the top of the white arc ( $V_{FE}$ ), where a notch of approach flaps could be applied. At this point, the first pre-landing check or GUMP<sup>2</sup> check would be conducted. On downwind entry, power would be reduced to 18 inches of manifold pressure, followed by another GUMP check. Abeam the approach numbers, power would be reduced to 15 inches of manifold pressure, followed by another GUMP check. On base leg, landing flaps would be set, pitch established for 500 FPM rate of descent, followed by another GUMP check. On final, pitch established for final approach speed, perform final GUMP check, pull throttle to the idle position, flare, and land. The primary point of this procedure was to use the landing gear to produce drag and help the transitioning pilot slow the airplane to a manageable speed. As a secondary point, however, it taught the use of multiple GUMP checks, one for initial gear extension plus one for each pattern leg. For pattern work and go arounds I teach the same procedure, with the gear being extended on the crosswind leg.

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<sup>1</sup> U.S. Department of Transportation, Federal Aviation Administration, Flight Standards Service. **Flight Training Handbook, AC 61 - 21A**, Revised 1980, page 96.

<sup>2</sup> **G**as (turn on boost pump and switch tanks if necessary) **U**ndercarriage (check gear handle and gear lights for indications that gear is down and locked) **M**ixture (push mixture knob to full rich position) **P**rop (push propeller knob to full forward position).

For instrument approaches, you should extend the landing gear at glide slope interception on a precision approach and at the final approach fix on a non-precision approach. I heard of an instance where a pilot, inbound from the final approach fix (FAF) in IMC, was asked to keep his speed above 120 KIAS. In complying with ATC's request to keep his speed up, the pilot forgot to extend his landing gear. I have thought about this accident, not to judge the pilot, but to consider how I would handle it if I were ever in the same situation. First, I would not deviate from my instrument approach procedures. I would still drop the gear at glide slope interception or FAF, depending on the approach. Next, I would consider the airplane's  $V_{LE}$  speed relative to the speed requested by ATC. In the case of a Mooney MSE the  $V_{LE}$  speed is 132 KIAS, so it would be easy to accommodate ATC's speed request with the gear down. If I were flying an airplane with a lower  $V_{LE}$ , I would advise ATC that I was unable to comply<sup>3</sup> and ask them if they wanted to vector me around for another pass or have me execute the missed approach procedure. Also, I execute GUMP checks at the following points: glide slope interception on an ILS, at the FAF for all approaches, and at the middle marker (MM), decision height (DH), and minimum descent altitude (MDA), depending on the facilities available.

In the beginning of this article I mentioned the quip, "There are two kinds of pilots. Those who have and those who will." I feel this quip comes off as fatalistic, since it postulates that everyone who flies a retractable is destined to have a gear up landing accident. The CFI who gave me all of my advanced training, including my transition to retractable gear airplanes, said it differently. He said, "There are those who have and those who haven't yet!" He also said, "GUMP check! GUMP check! GUMP check!"

So, in closing, I will just say that the more GUMP checks you do, the safer you become and your risk of a gear up landing is substantially reduced. To those pilots who would advocate spending money for supplementary gear warning systems, I will say if a gear warning horn does not get the pilot's attention, why would another audio tone make a difference? I will go so far as to say that over-reliance on gear warning systems can add to pilot complacency. There is still no substitute for a thorough and oft-repeated GUMP check.

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<sup>3</sup> FAR 91.3 establishes the Pilot in Command as directly responsible for, and the final authority as to, the operation of the aircraft.