

Communication Summary

03/15/2018

Information from: Ryan Anderson, CFI



Summary & Factual Information: Mr. Anderson stated, in part, that he conducted Mr. David Guo's PA-24 sign off, and high performance and complex training and endorsement. He further reported:

David Guo had recently completed his Private Pilot rating and was wanting to get into the High Performance and Complex portion of his training. My training methods follow the same guide lines with each individual with stories and personal experiences intermixed with the training. This is pretty much my syllabus for the training in the PA24 regardless if they need the H.P. and Complex endorsements as in most cases I have no idea how they were trained by previous instructors.

Day 1 of training:

David and I spent approximately 2 hours of ground instruction prior to any flight.

The basics covered included:

High performance engines

Pre-ignition and detonation of high performance engines

Turbo charging of engines

Introduction to manifold pressure vs. R.P.M.

Constant speed propellers

Various types of propellers for single engine, multi engine and turbo prop airplanes

Propeller governors and how they operate the various propellers

What happens with each governor with an engine failure or loss of oil pressure.

What happens with propellers with nitrogen charges and effects of loss of nitrogen

Basic operation of the propeller controls

Aircraft systems (both in general and what is specific to the PA24)

Different types of systems that run flaps and landing gear

Landing gear and flap system specific to the PA24

Asymmetric flap situations

Relaying stories of actual events and how to cope

Description of the landing gear system and emergency landing gear extension.

Relaying stories of actual emergency landing gear extensions and why they had to occur.

Discussing the PA24 and how the use of the emergency landing gear extension would require a mechanic to reset the gear.

Once the emergency landing gear extension has been accomplished the pilot cannot retract the gear.

Fuel system

Main and aux tanks, capacity and usage.

Use of the fuel boost pump and to be aware that not every airplane with the electric boost pump requires the pump to be on during takeoff and landing. (i.e. the Beechcraft Bonanza)

Both 12 and 24-volt electrical systems.

The electrical system specific to the PA24.

How it affects the flaps.

How it affects the gear.

Alternator switches/breakers.

Relayed a story of a previous student who had the alternator breaker trip on him causing him to lose all electrical making the emergency gear extension necessary.

Relayed a story of personal experience in a PA24 where I had to (with another student) do an emergency landing extension and land with no flaps.

How the electrical system fails to charge a battery that has gone completely dead even when you jump the airplane to start it.

Explaining that for the battery to be charged by the alternator you first need to get at least a minimal charge in the battery to provide enough voltage to open the field for the electricity from the alternator to flow to the battery to fully charge it.

The vacuum pump(s) and how it relates to deicing equipment in some high-performance aircraft.

Brief description of the deice/anti ice systems (and lack thereof) on the PA24.

After these discussions we proceeded out to the aircraft to look at these systems.

We explored the cockpit and various switches including everything we discussed in the class room.

We pulled the floor panel for the landing gear and visually discussed the landing gear and emergency gear extension again. This included pulling the removable extension handle from its position and demonstrating how it inserts into the socket. Once again discussing that it would likely require the handle to be fully extended to get the leverage necessary to get the gear locked into place. Discussed how when you do this that you will feel a positive movement and physical locking of the gear into place. Discussed how with an electrical failure you would not have

a gear down light illuminated but there is the mirror on the left wing that will show at least two of the gear down.

Discussed the fuel system.

Sumping the tanks.

Reading the single fuel gauge.

Proper fuel management

Always take off and land on fullest main tank.

Use the aux tanks only during strait and level flight.

Timing for switching tanks.

Fuel starvation, cause and effect as well as remedies.

Performed an external inspection of the aircraft.

With the checklist performed a complete preflight inspection.

Discussed the various intake orifices, fuel tanks (and venting).

Opened the engine cowl and pointed out all of the equipment including:

The engine.

Air intake. Path of intake air from the front to the injection module.

Air filter and potential icing with alternate air door.

Vacuum pump.

Alternate vacuum source (from the engine intake manifold)

Fuel pumps, both engine driven and electrical boost pump.

Brake fluid reservoir.

Alternator cooling and belt.

Once we thoroughly examined the exterior of the aircraft we proceeded to make the first flight.

Before start up I always mention in N9360P that I have no toe brakes on my side and the ramifications of that fact.

Initial flight tasks (to be performed to satisfactory levels before proceeding to the next):

Full run up according to the check list.

I brief the student on emergency procedures and that I will take the airplane over with a positive exchange of the controls.

Review of the take off and climb out in the check list.

Take off and climb out.

All normal steps and procedures regarding control positions, exterior lighting, aborting take off, V-speeds.

Power utilization.

Landing gear retraction

Maximum speed for retraction.

Retracting the gear at the appropriate time (out of useful runway, positive rate of climb; gear up).

Tapping the brakes prior to retraction.

500' AGL

Flaps retracted.

Fuel boost pump off.

Landing lights off.

RPM to 2500

Climb out and use of cowl flaps.

I take over the aircraft.

The student removes the floor cover for the landing gear mechanism.

The student extends the landing gear to observe the operation of the landing gear.

In the air you get to see the position of everything with the gear up, something that cannot be seen on the ground unless you are on jacks.

We extend and retract the gear a couple of times to observe the operation and again discuss the procedure for emergency extension.

Once the student understands the gear he/she replaces the floor panel.

Performance maneuvers (student back in control of the aircraft):

Medium bank turns in level flight (to get used to the feel of the airplane).

Steep turns (commercial standards).

Slow flight in both the clean and dirty configurations.

Imminent stalls and recovery.

David excelled in each of these maneuvers. I cannot remember how many repetitions we had to perform but most was accomplished on the first try. I felt confident that David was comfortable with each item. He did well enough I demonstrated for him chandelles and had him also perform that maneuver. He was able to perform the chandelle to commercial standards after a couple attempts. We flew for 1.4 hours total and called it a day. When we arrived back into Fargo (KFAR) I took control of the aircraft (N9360P) to demonstrate the traffic pattern while describing every aspect of the pattern.

The profile I teach everyone for this aircraft is:

Prior to entering the pattern, ensure fuel is on fullest main tank.

Power set to 15" M.P./2400 RPM

Trimmed and level flight at pattern altitude puts airspeed at approximately 100 KIAS.

Cleared to land; Boost pump on / all external lights on.

Glide path intercept:

Gear down.

Prop forward.

Mixture forward.

Flaps to approach (bottom of the white arc in the flap position indicator).

Check the gear down indication. (Even with the Commanche which has only one green light I teach to say out loud “three green, down and locked”. Also make a habit of touching the green light at least on the first two call outs. I had gone over other systems in the classroom and the reason for this procedure.)

Maintain 15” M.P.

500’ AGL; flaps to full, “three green, down and locked”, boost pump on, prop and mixture forward.

On final, “three green, down and locked”.

Over the fence, “three green, down and locked”.

Just before the flare take one last quick look at the landing gear indicator.

Airspeeds are observed and discussed after each configuration change. Everything by the numbers. The flare to landing is then discussed and demonstrated. Clear of the runway, after landing checklist accomplished including a review of the cowl flaps needing to now be opened. The student will then taxi the aircraft back to parking where we will have a debrief. David had a few questions that we discussed then scheduled for a second flight the next day.

Flew 1.5 hours with 10 landings. The entire flight was accomplished in the traffic pattern. As during the previous lesson, we accomplished everything according to the checklist, taking our time and going over each item carefully. David performed the takeoff through the 500’ checklist and I took over the aircraft to demonstrate the complete traffic pattern, once again describing each step as I went. Once we were on the takeoff roll again we had a positive exchange of controls back to David. The next 9 landings were performed by David. During these landings I made verbal corrections as needed and he improved each landing. His first landing was acceptable, and he continued to get better as the flight progressed. As the landings are consistently satisfactory I move onto more difficult tasks including: Short and soft field take offs and landings.

No flap landings

Approach to landing with gear up. (demonstrating the effects of the lack of drag with the gear up. i.e. lower power settings and higher airspeeds. This results in a go around)

Emergency (dead stick) landing. (Given a short approach power is removed abeam the numbers and student must make the runway and land.)

The final landing is from a balked take off. I remove the power at 50’ and expect the student to land safely on the remainder of the runway.

David performed each of these tasks above the average of many pilots. I have work with far more experienced pilots, some of whom were working on their commercial license that were not as smooth and proficient as David in the 3 hours of flight time we spent. After we returned to the hanger and accomplished a debrief of the days flight I signed off David's logbook as a PA24 checkout satisfactory as well as gave him his High Performance and Complex endorsements. I did not spend any time working on the IFR profiles with David as he is not instrument rated.

David has had several flights in this aircraft since that point. I have heard from a couple of his passengers (who are also pilots) that David is very diligent in making certain that the gear is down. After the gear up incident David and I met to discuss exactly what happened.

In short, the battery in the airplane fully discharged. David had it jump started and figured everything would be ok from that point on. He failed to remember the lesson about jump starting the airplane with a dead battery. After takeoff David experienced an electrical failure. His gear was partially retracted at the time. He could see the gear in the mirror but still tried to extend the gear manually. He mentioned to me that when he put the lever into the socket he failed to extend the lever but still attempted to get the gear down manually. He could not move the handle at all so thought that it was down and locked. With no electricity being developed he had no green light to verify this.

In his inexperience he became fairly anxious and "just wanted to get the airplane on the ground". He had no radios but brought the airplane in where the gear collapsed on him on the landing roll.

In our debrief of this situation I brought up the fact that he had 4+ hours of fuel on board. I relayed a story of a very similar situation I had only a few months ago and discussed my thought process to him. I told him that he should have orbited off to the side of the airport in view of the tower, taken out his check list, P.O.H. and any other item he had in order to make certain his gear was down. He mentioned to me that he wished he had done just that. Hind sight being 20/20 he sees the problem that he had.

In my experience I have had issues like this in the past. I currently have an ATP, CFI-AIM, 7400 hours and 2000 hours of dual given. I have trained in simulators and multiple aircraft as well as performed the training. When things go wrong my mind still reels a bit. As much as you can discuss emergencies and even practice them, it seems that something unexpected always comes up that you have not trained for.

My advice to every pilot I train is to:

1. FLY THE AIRPLANE!

2. Do not panic.
3. Assess the situation.
4. FLY THE AIRPLANE!
5. Think through your systems and remedies to the problem.
6. Get your checklist out.
7. FLY THE AIRPLANE!
8. Let ATC know there is a problem in any way you can. (You may not have communications.)
9. Call for an emergency if able and if applicable.
10. Do the best you can to get the airplane on the ground safely.

I can attest that the above summary is correct to the best of my knowledge:

Edward F. Malinowski
National Transportation Safety Board
Air Safety Investigator