

Folkerts Michael

From: Folkerts Michael
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Subject: Perspectives from Textron Flight Operations Pilot

Prior to 2016 all Beechcraft piston deliveries were given an entitlement initial course training course at Flightsafety International. FlightSafery has a Baron simulator set up as a 1998 era steam guage Baron, as well as a G1000 equipped Baron simulator. This course was 5 days for the non-G1000 Baron, and the G1000 equipped aircraft was 7 days since it required more avionics training.

Post 2016 the Textron Aviation Piston demonstration and training team provides a 4 day training course to new Baron owners. This includes approximately 16 hours of ground training, and typically 4 two hour flights in the aircraft.

As I worked for FlightSafety in the Baron training program from 2007 until 2015, and now conduct the Baron training course for Textron Aviation, I can speak fairly intelligently for both training courses.

Engine failure during the cruise environment is not only a training task, but is typically the first type of engine failure training we introduce. This is because we like to introduce this type of emergency with plenty of altitude for an increased safety factor. The increased altitude provides the instructor a large safety net, since I have not seen how the student will react when we actually shut the engine down. The major items emphasized during training are listed below, but roughly follow the POH section 3 guidance.

Engine failure training technique:

1. Maintain positive control of the aircraft. This is paramount. Heading/course, airspeed, and general attitude, while keeping track of altitude to ensure the lateral and vertical direction of the aircraft is safe. The reality is control must come first because it doesn't matter how fast you feather the engine if you stall/spin due to lack of airspeed control, or if you lose situational awareness en up impacting terrain the end goal of a successful outcome is compromised.

2. Positively Identify the emergency at hand. If the emergency is determined to be a failed engine positively identify which engine is failed using the POH guidance of "dead foot - dead engine". Then verify the failed

engine by using the POH guidance of retarding the throttle of the suspected engine to verify there is no change in yaw/roll or engine sound.

3. Once verified, a pilot must determine if there is adequate time to troubleshoot the malfunctioning engine. If not, or if the pilot is not sure there is ample time given current terrain, altitude, and climb/sink performance, troubleshooting must be skipped and the propeller must be feathered to recover performance and keep the aircraft on a safe trajectory. Feathering is accomplished by retarding the propeller BEYOND the friction detent, thus dumping all the oil from the propeller hub allowing the blades to proceed to the feathered position.

4. Once feathered, feel free to trim rudder, then ailerons as required. Once trimmed run all engine failure and securing checklists to catch any missed steps and begin accessing & developing a plan for successful flight completion.

Step 3 training notes: I strongly encourage all actions for identification, verification, and feathering be secondary only to primary control of the aircraft. When verifying the suspect engine by regarding the throttle, and especially when retarding the propeller to the feathered position I strongly encourage all actions to be positive, deliberate, and intentional. Trying to feather immediately with the “fastest hands in the west” mentality, will nearly always result in improper action further complicating the situation. It should take no more than 20 seconds when positive control is established to properly “identify, verify, and feather” the propeller.

As the FAA states in the Fundamentals of Instruction handbook, the law of Primacy is powerful. As both FlightSafety (historically) and Textron Aviation (currently) only perform aircraft familiarization training and we do not train people to take their multi engine practical exam, we are not the first multi engine learning, and therefore do not have the benefit of Primacy. As quality of training varies depending on where the pilot completed their initial multi-engine training and certification, there are two VERY COMMON bad habits that we work to change. Many “pilot mill” flight schools focus more on quantity rather than quality. Their instructors are young, and they only teach tricks to get past the check ride.

The first BAD habit is trying to jump ahead of all other steps and feathering first. This is the “fastest hands in the west” mentality. It nearly always results in the pilot diverting focus away from primary aircraft control in an attempt to feather immediately, or the pilot will feather the wrong engine due to the lack of identification and verification.

The second BAD habit is encountered while feathering. Many times pilots have only actually shut down and fully feathered the engine once during training, and once on the check ride. They have more engine failure practice, but the training engine failures typically end up in the instructor setting zero thrust to save time while training, and be easier in the engine. While this is an accepted practice, there are varying ways to ensure the

student receives good quality, realistic training. I prefer to have a student actually feather the propeller after properly maintaining control, identifying, and positively verifying the suspect engine. Immediately after the student pulls the propeller handle into the feather detent, I as the instructor will push it. Back out of the detent (preventing the full feather) and set the throttle to 12 inches for the listed “zero thrust” setting in the POH. This allows the student to continue developing the muscle memory of actually pulling through the detent into feather. Many instructors simply ask the student to retarding the propeller to the detent, but NOT into feather, during zero thrust activities. This results in the student not actually feathering 8 out of 10 times or worse during training. The muscle memory that is developed is to stop at the detent. I have seen in simulator pilot evaluations time and time again, students would be given an engine failure, they would follow the process properly, but when they feathered, they actually left the prop against the detent, but NOT in the feathered position. In their mind they 100% believed they had feathered, but the aircraft was not performing well and they could not figure out why. Even when pointed out, these pilots believed so deeply that they had feathered, that they would argue until absolutely proven wrong. They had no idea. “Train as you fly and you will fly as you train”

58 Baron (IO-550-C engines) single engine performance with propeller windmilling, and flaps approach.

I do not have any official performance charts to derive this from, but I do perform single engine drag demonstrations all the time. I do this by establishing 101 knots (blue line) using 1 engine, while the critical engine (left) is simulated failed. Results below:

I find consistently that the addition of approach flaps adds approximately 150 feet per minute worth of drag, with all other parameters constant.

I find that with the flaps up, and gear up, if I take the propeller from feather (or simulated feather) back to a full forward windmilling condition, the propeller drag indices approximately 400 ft per minute of decent rate.

These drag items are additive, thus having an unfeathered propeller and approach flaps would equate to whatever the current conditions single engine climb/drift down performance would have been from the “climb - one engine inoperative” chart on page 5-32 of the G58 POH minus approximately 550 ft per minute. I am nearly 100% certain the “climb - one engine inoperative” chart for the G58 is unchanged from the Be58 model chart as the horsepower and drag are identical. The only change was avionics.

In conclusion, we train to focus our first priority on maintaining control, and an immediate second to carefully, deliberately & positively “Identify, Verify, and Feather” the failed engine. If a pilot freezes on the controls due to a lack of proper training, or lack of recent training/proficiency, OR if a pilot fails to actually regard the propeller handle all the way to feather, and stops at the detent as I,proper training muscle memory can cause, the drag penalty is rather high. Adding approach flaps, simply doesn’t make sense to me, but I can see a pilot who has not had appropriate aerodynamics and performance training adding flaps to approach in a futile last ditch effort to save a bad situation.

One last note on training. The training has been, and is now offered for free as an entitlement with the new aircraft purchase. It is not mandatory, or required by any regulation to take the factory provided training. Unfortunately we see many pilots who are appropriately multi-engine rated simply not take the training. In many cases they have not completed any multi refresher since they originally completed their multi engine rating. There is no annual, or bi-annual multi proficiency check. Pilots in the U.S. are only required to complete a flight review once every two years in any category and class that they are rated. Capable multi-engine aircraft like the Baron are always “technically” safer, and far more capable than their single engine counterparts. Sadly statistics horrible show that multi-engine aircraft are significantly less safe due to non-proficient pilots. I would love to see some additional regulation in this country involving multi-engine training and required multi-proficiency checks.

Thank you, and I will be available Thursday and Friday this week if you have any further questions.

William Klein
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