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Instructions for the use of the Pilot buddy restraint.

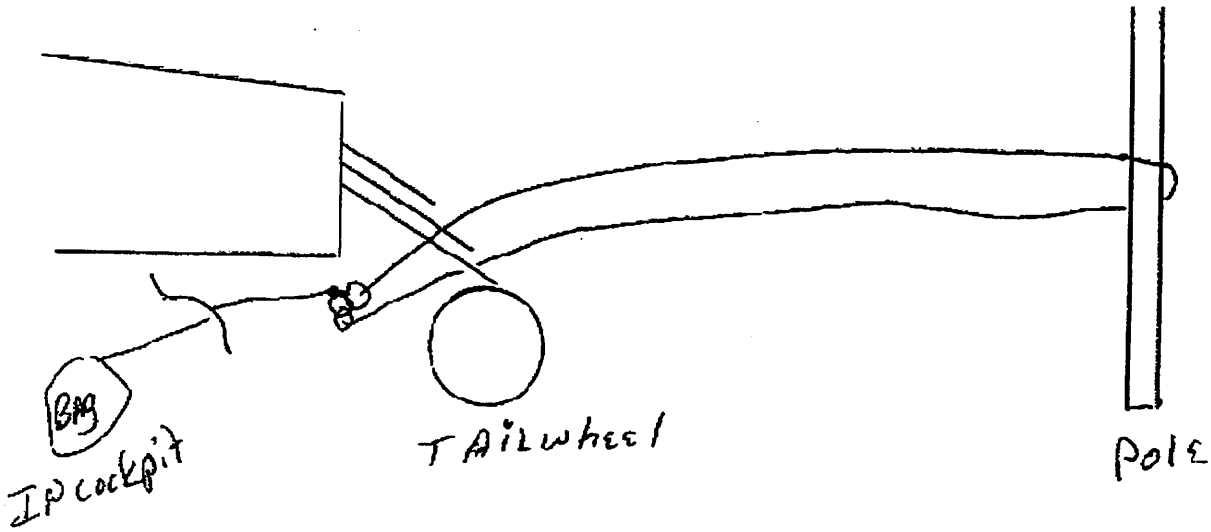
Pilot buddy is used to restrain an aircraft when no other means is available. We recommend tie downs at both wings and the tail as the best means for restraining an aircraft during storage or start.

Pilot buddy consist of a storage pouch, a 20 foot lanyard to a release shackle, and a 4 yard closed loop that can be affixed from that shackle (near the tail wheel), to some substantial fixture like a guard or parking post, a fence post, tree, tie down ring, or grounding point which is capable of sustaining an 800 pound pull.

After affixing the closed loop between the aircraft tail at a substantial location (like the tail spring), and around the selected appropriate fixed point on mother earth, the bag and lanyard is placed in the cockpit where it will not be disturbed during the start process. The lanyard may not be secured tightly or pulled as that will release the shackle and closed loop, unfastening the restraint.

Please use the checklists provided for maximum safety.

After starting the aircraft and restoring the throttle to idle, and after making ready for ground movement, the lanyard in the cockpit is pulled to release the spring shackle. This release will allow the closed loop to open, and the entire pilot buddy may withdrawn into the cockpit and stowed in its bag for future use.



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HAND PROP CHECKLIST

1. The prop is ALWAYS hot (even when you think it's not).
2. Complete the preflight per manufacturer's checklist, and ready the cockpit for departure.
3. Prime engine then lock the primer (if equipped).
4. Tie down the airplane in a tie down space, chock the airplane (small chocks with a cord work best). INSTALL the PILOT BUDDY.
5. Do not start with the tail of the airplane pointed toward a hangar door, automobiles, or persons.
6. Remove any loose articles of clothing including pens and sunglasses and shirttails.
7. Avoid propping on loose gravel- prop only on solid ground.
8. Use good signals from cockpit to ground:
   a) "MAGS OFF". b) never use mags on- always use "CONTACT" or "MAKE IT HOT".
   b) Do not turn the prop unless you hear an appropriate response.
9. Prepare the engine for start by priming and carefully pulling through the propeller using techniques appropriate for your particular aircraft. After priming the engine flip a few blades with the mags *OFF* to draw the fuel into the cylinders. Remember the blade is hot even when it's not.
10. Turn the Fuel valve to the OFF position. (the engine will fire and run for up to 30 seconds on fuel in the carburetor bowl).
11. Throttle is closed to idle or cracked very slightly.
12. Locate the propeller so that the compression cycle is coming on when blade you pull is near 10 o'clock for a right-handed engine. (2 o'clock position for a left-handed engine.)
13. Call "THROTTLE SET, CCONTACT" to the pilot.
14. The pilot sets the throttle to the normal start position at idle-slightly cracked, and also selects the IMPULSE magneto ON (with the other magneto OFF).
15. Prop from the front on solid ground.
16. Stand close to the propeller and swing away. Do not lean in and don't be timid. Use of a leg to kick yourself back and away from the propeller is a time proven technique. You want to encourage this motion away from the airplane. You should end up standing about 4 to 6 feet away from the engine and slightly to the right of your original position.
17. After a failed start call "MAGS OFF" or "COLD" and get a response before moving the propeller blade.
18. After the engine starts, move quickly to the side and behind the plane of blade rotation so the pilot can see you and not worry and so you do not accidentally walk into the prop. Remember that the propeller is almost invisible. There have been serious injuries and fatalities because a person reached into the whirling propeller to remove chocks.)
19. Walk behind the wing and get into the airplane
20. Turn the fuel valve ON.
21. Switch on the other magneto, and do all the other usual after start checks.
22. After the engine is stabilized at idle, un-tie the airplane from the tie down. (NOT the PILOT BUDDY)
23. Climb into the airplane, hold the brakes and pull the chocks (using cords).
24. Pull the PILOT BUDDY lanyard to release the tie down loop.
25. Pull the PILOT BUDDY lanyard and loop into the cockpit and stow them into the storage pouch provided.

Instructions for continued airworthiness and long-term use of the Pilot Buddy:

Inspect the PILOT BUDDY at each use for wear of the nylon, for nicks or other degradation.

Replace the Loop line each 6 years or when nicks or other damage to the line or loop is detected which could weaken the PILOT BUDDY restraint materials

Parts, materials and support available from Dorcliff-Aerocrafts LLC
At 602-740-5546, or WWW.DORCLIFF-AEROCRAFTS.COM

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HAND PROP OVERVIEW

Hand propping an engine can be very dangerous, and should not be accomplished without a qualified pilot at the controls to operate the engine. There are basically 2 ways to do it. From the front or back. I prefer the front because I am less likely to trip over a strut or tire if the airplane jumps. The most common mistake I see is not standing close enough to the prop. Stand close and pull your body away as you swing. This moves your whole body in the right direction. Standing away causes you to lean in and finish with your head low leaning into the prop! The second mistake is wrapping *(your fingers around)* the blade as others have mentioned. From the front the pitch of the blade almost allows you to lay your hands flat on the blade but I usually wrap one knuckle. Any injury or other accident may be considered by the FAA to be "Careless and Reckless operation", subject to a regulatory review and sanctions against the pilot.

I believe that hand propping is like spins - "You can't learn much about it by simply talking about it" The main thing with swinging a propeller is that its DANGEROUS. Propellers KILL, so the whole procedure is designed to minimize exposure to risk as much as possible. But the risk can NOT be ***eliminated***. So the golden rule for prop swinging is the same as for anything else to do with flying - if in doubt, chicken out.

- To swing the prop, you need to get your arm up above your shoulder-level, and then bring down beneath your shoulder-level. So the airplane design should put the prop-spinner at about shoulder-level.
- If you lift your arm, and then swing it down and analyze the way your hand moves when doing this, you'll find that your hand swings not just downwards, but forwards as well. So, to give the prop-disk this angle as well, the airplane design should be a taildragger. Combine these two, and you see that swinging something like a PA28 or C150 is going to be rather dangerous.

The second requirement, is an 'engine' designed for swinging.

- the engine should preferably be of a low compression, to allow you to EASILY move the prop with one hand. High compression engines CAN be swung, but require two hands, which makes the technique more dangerous.
- the propeller should be two-bladed, to allow a LARGE gap to follow your hand before the next propeller-blade, three-bladed props CAN be swung but are more likely to take your fingers off, as the gap between your fingers and the chopper is a lot smaller!
- one of the magnetos should be an impulse magneto, and the other mag should NOT. The impulse mag produces a spark with a wind-up spring to fire lots of energy at the right time when swinging the prop. (It helps to know WHICH mag is the impulse one - usually the left one, but worth checking!) And ideally, the magneto switching should be via separate switches, to allow you to positively control which mag is/is not selected. (select the impulse coupling mag)
- The engine rotation should be left-handed for swinging by the more-common non-southpaws. Yup - that means that most US planes aren't designed for swinging!

The third requirement is for TWO 'people' who know what they're doing.

- The 'propeller swinger' is the boss, because they're the one putting their arms/life at risk here. The person in the cockpit MUST obey all instructions from the 'prop swinger', and MUST always be thinking about the swinger's safety.

Knowing all of this there are those rare times when a pilot wishes the security of a portable restraint system attached at the tail, or when the pilot unwisely chooses to prop the aircraft without the benefit of qualified assistance.

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REGULATIONS

USA FAA can invoke sanctions or penalties for a failed or unsafe propping incident under the auspice of FAR 91.13- Careless and Reckless Operation

Australia Civil **Aviation Regulation** (CAR) 231-"Manipulation of propeller", permitted **hand** starting when assistance from a licenced pilot or appropriately qualified person was not readily available. Although the aircraft was positioned approximately 50 m from the maintenance facility that carried out the inspection, the pilot had not sought assistance from the engineering staff. The maintenance organisation reported that a battery cart was available and the aircraft was fitted with an external power source receptacle.

Additionally, CAR 231 required the person manipulating the propeller to know the correct starting procedures for the aircraft. When attempted, without assistance from another qualified person at the controls, the **regulation** required that adequate provision was made to prevent the aircraft from moving forward, and that no one was on board the aircraft. The pilot reported that he had been shown the **hand** starting technique during basic flying training about six years previously. The instructor had demonstrated the technique on a Cessna 150 training aircraft. Although the technique had been demonstrated during that training, the pilot could not recall being briefed on all of the safety precautions associated with **hand** starting procedures.

HAND PROPPING STORIES FROM THE NET

Your message about the strange methods of hand propping brought back an early memory. When I was a kid, I worked for Butler Aviation at ORD. This was in the very early '60s and in the days when DC-3s, Lodestars, and Learstars were king-of-the-hill in corporate aviation.

It was one of those very cold and windy winter mornings. None of our equipment could be started when I arrived for my shift at 0400. You'd have to ask the night shift why they didn't keep things running. We finally got a small heater cart started and were using that in turn to get others started and slowly working toward larger equipment. GPU carts were also dead.

During this, there was a corporate aircraft, a DC-3 if I remember correctly, that just HAD to leave. They couldn't wait for the larger heaters and/or GPUs. By that time we had one of the small tugs (baggage cart mover) rooming. The pilot gets this brilliant idea. He wants to know if we have a long piece of heavy rope. We do. He says get it and also asks for one of the stands we use for cleaning windows on large aircraft. He climbs up and puts umpteen turns of rope around the spinner of one of the props. He then tells us to hook the other end of the rope to the tug. We then realize this guy thinks he has a big lawn mower.

Before that, we went through the exercise of manually moving the prop through quite a few revolutions to loosen things up. The tug was then used to pull the rope, slow at first and then a bit faster on each successive try. After more tries, the damn thing actually started. After running for awhile he was able to get enough power to get the other one started. Don't know what kind of damage this may have caused, but he was happy and was able to leave. This is a true story. I was the one driving the tug.

Jim..

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FWIW

100% of all glider pilots don't hand prop.

0.1 % of motor glider pilots hand prop and 0% handprop in flight.

100% of piston airplanes have props

95% of all piston pilots have never handpropped

5% have handpropped.

3% of this 5% are single armed pilots who state they will not handprop in the future but feel they know the procedures very well (now).

1.9% of this group claim to handprop daily and spend their time on computer bulletin boards and in airport cafes advising the 95% how to handprop.

0.1% of this group are no-armed pilots who have multiple handpropping experiences and claim they would handprop again if they could.

There is one statistically insignificant person who drives around different airports in a tow tug with a bungee cord offering to tug-prop cabin twins.....

-dab

- Hand propping does not have to be a gut wrenching, sado-masochistic exercise in self destruction.
- I know of many people today, including an FAA inspector, who solo hand props HER own airplane, a J-3 cub.
- I know of no FAA reg that says you can't hand prop or that says you must have a qualified pilot at the controls. Many mechanics (not pilots) regularly hand prop and taxi airplanes.

Having said all this, I do agree that hand propping has caused many needless accidents and many injuries and fatalities. But, like anything else connected with flying, it can be done safely with proper instruction and practice.

HAVE FUN, FLY SAFE, BE CAREFUL.