

Notes for Tug Pilots

Pawnee 235 G-BUXY

Speeds:	Max rough air	120mph
	Flap limiting	109mph
	Never exceed	156mph
	Best climb	80mph
	Max rpm	2575

Daily inspection

- Make sure switches really are off. It is not unknown for them to be kicked on when exiting the cockpit.
- It is also possible to confuse light switches with the master switch.
- Make a careful inspection of the tailwheel and towhook. We have had a tailwheel main attachment bolt break. It is also not unknown for a leaf spring to be cracked.
- Top up oil to about 8 quarts. Do not top up during the day's operations unless there is reason to suspect that an unusual amount has been lost. Topping up when the engine is warm usually leads to overfilling. If you are too enthusiastic about tightening the filler cap, it will be impossible to open when hot.
- The fuel tank holds about 31 UK gallons, but if filled to the brim and then parked on the slope outside the hangar fuel will pour from the vent, which is adjacent to the silencer! Fill only to about 1-2 inches of the brim.
- There has to be at least 7 gallons in the tank to keep the C of G within limits, depending on Pilot Weight. See the loading placard in the aircraft. The aircraft uses 13 UKgph at 75% power (114MPH) and about 1.5 - 2 gallons per 200 ft tow.
- The fuel drain cock is found close to the silencer.
- The wheel brakes are locked on by depressing the toe brakes and then pulling on the wire rings. This needs no force as the rings merely operate a valve. Too vigorous a pull will break something.
- When parking on the slope always use the chocks on both wheels. Do not rely on the brakes to hold it.
- Make a note of the tacho open reading on tech log sheet.
- The Fuel Shut off valve is for emergency use only. Should it be closed from the cockpit it is not possible to fully open it again from the cockpit, and it will need resetting by removing the side panel and manually opening it fully.

Starting procedure

- 1 Brakes on
- 2 Adjust seat, check straps
- 3 Trim fully nose up
- 4 Mixture rich
- 5 Carb heat off

- 6 Prime, 4-8 pumps depending on outside temperature. If the engine is warm, pump the throttle once or twice instead
- 7 Lock primer
- 8 Check fuel on (never leave it turned off)
- 9 Master switch on
- 10 Radio, lights off
- 11 Left Mag only on (both on after engine start)
- 12 Check propeller area clear
- 13 Start engine
- 14 Check oil pressure
- 15 Set idle at 1200rpm
- 16 Allow CHT to show a rise before moving.

Power checks

- 1 Temperatures and pressures
- 2 Throttle to 1800 rpm
- 3 Carb heat
- 4 Mags
- 5 Ammeter showing charge

Oil pressure is normally about 60psi on start-up, but can rise dramatically on take off, usually on the second or third flight of the day. The maximum permitted is 90 psi. If it goes above this on take-off throttle back to 2300 rpm and it should then stabilise at about 80 psi and the throttle can then be fully opened again gently.

Taxying

- The a/c has a steering tailwheel and fairly effective brakes.
- Always taxi obliquely down the slope to the hangar, never straight down the slope. To preserve the propeller do not taxi over the gravel. The nose slopes down and the view is good.
- Get used to the nose down attitude before a first flight because the landing attitude is deceptive for a taildragger.

Flying the aircraft

- If the CHT is 100+ and the oil temperature is rising the engine is warm enough for take off. Because the engine has self adjusting crankshaft balance weights the throttle must be opened slowly on take off; 3 seconds from idle to full power; and making all subsequent throttle adjustments slowly.
- Trim well aft for take off, the spring is quite powerful and out of trim loads are very noticeable. As the take off run starts use only enough forward stick to unload the tailwheel. As you leave the ground spare a glance for the oil pressure (see note above). Full throttle revs are normally around 2400. Climb out at around 80mph. (for towing speeds see below).
- No aerobatics. No spins.
- Full flap should be used for the approach, which at 80mph, with power off, will be fairly steep. It can be landed more slowly, but not on a windy day.

- Landing is very straightforward, much easier than most taildraggers but, remembering the view when taxiing, the hold-off does not need much back stick.
- Cross winds present no great problems but remember those turned down wingtips, a wing down approach is probably not advisable.
- It looks very untidy taxiing with the flaps down.

Towing

- On take off, checking in the mirror that the glider's brakes are not open, open the throttle slowly, keeping the stick back. As the combination starts rolling a small forward movement will be enough to unload the tailwheel.
- Providing it is safe to do so turn before reaching the eastern end of the field to avoid overflying Kingston Deverill.
- Tow wooden gliders at 70mph, Puchacz at 75mph and glass at 80mph, and a bit faster for heavy gliders.

Towing

- We must do everything possible to avoid complaints and consequently the no go areas must be strictly observed.
- Although most glider pilots will want to be dropped upwind, on a day with little wind or with the wind straight down the field the direction of tows should be varied to avoid continual towing over the same area.
- If you want to carry on tugging at The Park don't provoke a complaint.
- No aero-towing is allowed before 9:00am or after 7:30pm or sunset, whichever is the earlier.
- To preserve the cylinder heads when the glider releases, reduce power very slowly to 2000 - 2100rpm and then increase speed and retrim at 110 mph. Because this takes several, height is initially lost slowly and you will very probably gain height. Watch out for the glider you have just towed. Once speed and revs are stabilised the descent is rapid. Recover between 110-120 mph, but be mindful of the max manoeuvring speed of 120 mph and the possibility of having to take evasive action.
- Reduce power to 1500-1700 rpm when joining the circuit.
- To avoid Kingston Deverill and to keep it quiet make a high base leg close to the trees, but preferably keep a trickle of power on to reduce shock cooling.
- Between each tow follow the pre take off check list in the cockpit and perform a mag check by switching off each mag in turn before every tow.

Shutting down

- Dead cut check on the mags.
- Stop the engine by moving the mixture control to fully lean and then switch off mags and master switch. After vacating the cockpit check the switches again, if the master is not off it will flatten the battery.
- At the end of the day refuel but do not replenish the oil. Clean the aircraft using the hose and brush and the leather in the Pawnee locker. Do not turn the fuel off.
- Make sure the aircraft is parked in the hangar with the brakes off.

General

- Aero-tow ropes should be kept on the reels. Inspect before use, including the weak links and test the release.
- A Land Rover emergency vehicle must be on the field.
- All flights must be logged and a record kept of tacho times.
- The use of the Pawnee for any purpose other than tugging will need the permission of the CFI or deputy, or the duty instructor in charge. Other uses are not encouraged. Any flying time is charged at the rate fixed by the committee.
- Tug pilots should be familiar with the BGA Aerotowing Guidance Notes. (Link from BGA website.)
- Aerotows must not be made from the winch launch run due to the danger from the winch rope.

Aerotow retrieves

- Retrieves from other sites need permission as described above.
- The pilot requesting the retrieve must be able to assure the tug pilot that the field is suitable and that permission has been obtained from the field owner or operator.
- The landing is at the discretion of the tug pilot and must not be attempted if he has *any* doubt about its safety.
- Carry the rope in the hopper.
- Refuel before departing.

Tug rope

- The pilot must be aware of the towrope, both in the air and taxiing on the ground to ensure that there is no risk of the rope endangering people or aircraft.
- Keep high to avoid fences and trees. Do not overfly parked aircraft or people with the rope on unless well high and clear. Make sure you allow plenty of room when manoeuvring on the ground. If in doubt, drop the rope – remember the rope can kill

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