

Pawnee Operating Procedures / Tow Procedures

Currency

Club Tow pilots should tow as often as possible to support the club and maintain a high skill level towing or maintain proficiency in other ways such as flying other airplanes or gliders. If you haven't towed in a few months, you are encouraged to make a couple take-offs and landings in the Pawnee before towing on your scheduled tow day. In addition, tow pilots should review standard tow signals and be familiar with this Pawnee Operating Procedure. To maintain tow currency per FAR 61.69, you must make at least 3 PIC glider flights while being towed within a 24 month period or 3 simulated tows in an airplane while accompanied by a tow pilot who is current. The Chief Tow Pilot is responsible for keeping the Pawnee Operating Procedure up to date and distributed to tow pilots.

For tow signals, go to the SSA Web Site, select Soaring Safety, flight training, flight training videos, SSA signals and click on SSA Signals to watch video on SSA Signals.

Engine Starting

Oil temperature must be at least 60 degrees before starting, use space heater for heating. For initial starts, 3 primer strokes, lock primer, one quick full open and close throttle, rich mixture, throttle about ½ inch open, landing light off, master on, carb heat off and start. The Pawnee starts on the left mag and goes to both when you release the start switch. Warm starts, rich mixture, one quick open and close throttle, open throttle about ½ inch, landing light off, master on, carb heat off and start. Don't use the primer for warm starts.

Turn on radio to 122.8 and transponder to ALT.

Taxi

Taxi slowly at low RPM to save on brake replacement cost, don't ride brakes during taxi. Use lean mixture for all ground operations, lever to just above the blue line on mixture control. Don't use landing light or carb heat during taxi, air intake to the engine is not filtered with carb heat on.

Warm Up

After checking the mags at about 1,800 rpm (stick back Pawnee into the wind), turn carb heat on and observe rpm drop, leave carb heat on for about 30 seconds and observe if rpm increases. An increase in rpm is an indication of carb ice and precautions need to be taken during glider towing. More on carb ice in the cool down section.

After completion of the mag and carb heat checks, the oil temp should be about 70 degrees and OK for the warm up flight. If oil pressure exceeds 90 psi on the initial warm up flight (red light), reduce power a couple hundred rpm, the climb will be a little slower. The oil cooler is certified for 120 psi which triggers a cooler bypass valve if exceeded.

A pattern flight is all that is required to warm the engine and verify all functions are working correctly. Use the same runway for your warm up flight that will be used for towing. Enter entrance to RW11 and taxi ways on angle to prevent prop strike. Stay hydrated, a water bottle holder is provided in front of throttle.

Cross Wind

The Pawnee can handle 15 mph direct cross winds which may exceed the comfort or skill level of some pilots, so know your limits and make decisions accordingly. If you have used all the controls to or near their limit before landing or your gut signal is telling you it doesn't look good, go around and find another runway that aligns better with the wind. The Pawnee will run out of rudder control before aileron limit. Your decision to cancel ops for wind conditions that exceed your comfort level is much better than explaining your decision to the FAA in an accident review. If you don't feel comfortable with the wind on the warm up flight, it will be worse with a glider in tow.

The go around procedure is full power, pitch for climb, raise flaps slowly when a climb rate is established. The use flaps for takeoff is not encouraged but one notch will shorten the takeoff roll a little, raising flaps with glider on tow has to be done slowly. If you require flaps for takeoff, find a longer runway.

Even though you and the Pawnee may handle a given cross wind without a glider on tow, some glider pilots have problems staying straight behind the tow plane on takeoff. The take-off performance of the Pawnee is decreased in a cross wind, plus more performance decrease with pilots of the K7 and K13 who hesitate getting the nose skid off the ground and more performance decrease if the glider drifts downwind before the tow plane takes off. If the glider drifts too far off line, the tow pilot runs out of control and given all the performance decreases, will be near the end of the runway sliding

sideways on take-off. This is not a good position for an abort, if it looks like you won't clear the trees, the best choice is release the glider.

Taking chances usually don't end up well, when using RW29, you should be off the runway a couple hundred feet before the end of the runway, if not, you should do something different, like use all of RW 29 or RW 5-23 grass or cancel ops. FYI, yellow cones are placed at 200 foot intervals.

Density Altitude/Takeoffs

Before hooking up to a glider, the tow pilot must verify carb heat off, mixture rich, radio on, transponder to ALT, oil pressure, flaps up and alternator charging. Before the takeoff roll, verify rope slack out, glider canopy closed, no one in front of glider and no people or equipment in front of the tow plane.

When density altitude is about 2,500, a full tank of fuel and low wind speed, the Pawnee will use more than the approximate 800 feet required for most take-offs when towing a glider. Add 2 people to the glider, a pilot that doesn't get the nose skid of the K7-K13 off the ground quickly, or 2 people in the K21, glider not pushed back to the taxiway or glider not aligned with the tow plane, the trees at the end of the runway look much taller. As you can see, the little things add up to reduce performance on the take-off. You may decide to use all of RW 29 for more favorable conditions or cancel ops, remember that little voice in the gut, your best test of conditions is all the runway rather than at the taxi with a glider.

You will see only about 2350 rpm on the initial takeoff roll with a glider on tow, it will increase to about 2400 at lift off then increase to a normal 2500 once out of ground effect when tow-speed is reached. If you see less than 2300 rpm at the start of the tow, check if carb heat is on or perhaps not full throttle. Never lean the mixture for take-off or glider tow. Pay attention to takeoff distances and RPM under normal conditions, you should be flying at 60 mph, release the glider or abort when necessary.

If you detect spoilers out during the takeoff and are safely climbing, attempt radio contact with the glider, if no contact wait until you have a few hundred feet of altitude before giving the rudder waggle signal. The rudder waggle signal is often taken as a release signal.

Watch the fuel gage, we can tow for 2 hours most of the time before getting fuel. Some tow pilots don't fill the tank to max at the end of the day, so you may not get 2 hours of towing on a tank. You should get fuel when the gage is down to the horizontal line before empty. Try to plan your fuel stop to prevent the glider pilot from sitting in a hot glider waiting for you. During the afternoon when temperature is highest, if fuel is

required, put in about 15 gallons rather than filling the tank, a full tank reduces takeoff performance and requires heavy back force on the stick to lift off the runway.

FYI, the length of RW 11-29 is 1810 feet, when taking off from RW 29, west of the taxiway, subtract 350 ft, another 200 for the rope, 800 for the takeoff roll, 460 ft remains for most normal take-offs (about 2 cones before the end of the runway). Add up all the other things mentioned above plus not off the runway by 60 mph, your lift off will be near the end of the runway. Pay attention to the details, we don't have much margin for error when using RW 29, slightly more margin on RW 11. An abort decision should be part of your emergency procedure before takeoff.

Elevator Trim

The Pawnee elevator trim is not the same that many of us are familiar with, it's more of a leveler than a trim, the Pawnee trim uses springs to set the entire elevator. Some improvements were made to make it at least functional. My recommendation is to set it on the ground for towing and just leave it there. To set for pitch up, pull the stick back and set the trim for about 4 inches elevator up from level and leave it there for towing and engine cool down which may require a little forward stick. If no one moves the trim, it never needs setting. The trim lever actually is not long enough to overcome the elevator pressure during a glider tow.

Note: If the trim is not set about 4 inches up on the ground, you will use more than normal runway overcoming elevator pressure for lift off with glider in tow, less pressure is required as you burn fuel from the tank.

Tow Procedure

Plan the glider tow upwind from the airport and distance such that the glider can return to the airport due to a rope break, tow hook failure or Pawnee engine failure. Allow the tow plane to drift down wind on the take off for an easier glider return on simulated or actual rope breaks.

The Pawnee needs at least 700 feet over Lake Madison to return to the airport if an engine fails, runway 23 may be a better choice. You should have an emergency procedure for every takeoff. Best glide is 65-70 mph with flaps up.

Tow speed for the K7 and K13 is 65-70 mph and 70-75 for K21 and private gliders. Your climb rate increases with the ball centered and use of thermals. Allow speed to momentarily increase about 5 mph when passing through thermals then ease back to tow speed, this procedure reduces glider oscillations. Using the horizon as your reference helps maintain a constant speed and reduces oscillations through thermals.

When using RW 11, be aware of traffic taking off on RW 5 and look for RW 5 traffic when making a left turn at the end of RW 23. Also be aware of traffic entering downwind for RW 23 when taking off from RW 11.

Your landing procedure should include an aim point and fly to the point. Turn base to final at about a 45 degree angle to the aim point. Make main wheel landings to save damage to the tail wheel, about 60 mph just before touch down is a good target speed while pulling back on the stick slightly, forward on the stick at touch down and allow tail to come down slowly. Better landings are made with level attitude rather than tail low. Don't use breaks unless actually required. Turn mixture lean on the ground.

Cool Down

A revised check list was put in the cockpit of the Pawnee that describes the cool down procedure. You probably have noticed that the new engine cools down much slower than the old one due to thicker cylinder walls. After verifying glider release, make a level turn while reducing power 100-200 rpm, full flaps, slowly reduce rpm to 2000 and 80-85 mph, the rest of the cool down is at 90-95 mph. It is important to raise flaps one notch for the last 1K of altitude before entering the pattern to finish the cool down procedure to about 300 degrees. On the last 1000 feet, it's also OK to reduce power to 1800 rpm. Apply full flaps under all wind conditions for the landing, once in the pattern use any rpm as required. The 90-95 mph gets you down fast so staying close to the airport will reduce tow cycle time and save fuel. Watch for gliders and other airplane traffic.

Carb heat is normally not used or required on the cool down but if you detect or suspect carb ice apply heat, but shut it off on short final. With carb heat on engine air is not filtered, lean mixture on the ground.

The POH for the Pawnee does not recommend carb heat unless operating in known ice conditions. This is due to mounting of the carburetor below the oil pan on the Lycoming Engine which provides some heat. If you detect carb ice it most likely will be at the initial run up before the warmup flight or during the warm up takeoff. The AOPA web site has some good articles on carb ice, go to site and search for carb ice, you may have to sign in.

It's the pilot's option to use carb heat if you suspect carb ice or use anytime you get carb ice, shut it off just before landing. If you actually get carb ice, in addition to carb heat, you should lean the mixture to keep the engine running until the ice is melted. I have never experienced carb ice flying the Pawnee.

Parking

When parking the tow plane at the launch area, position the tow plane to prevent prop wash toward tent, people and gliders. A left turn to parking at RW29 and right turn at RW11 will put the tow rope in a better position for the next hook up.

Glider Retrieves

Usually glider retrieves will be mostly from airports. Verify that adequate fuel is available to make the flight, a tow rope is usually stored in the Pawnee storage compartment if needed and take a tail dolly for the glider. Unless you are familiar with the airport, you may want to release the tow rope before departing or release the rope over the retrieve airport before landing. Some time is saved by starting the retrieve flight from a glider tow release in the direction of the retrieve airport.

The tow plane can be used to tow a glider to the airport take off point, tow slow and watch glider from the rear-view mirror.

For glider retrieves from out landings other than airports, get a report from the glider pilot of field conditions and permission from owner of the property to land. Unless you feel confident that the risk to land in a farmer's field is low, don't, retrieve by trailer instead. Permission from the farmer is also required to trailer a glider to and from his property.

Pawnee/Daily Log

At the end of the tow day, fill the Pawnee fuel tank, retain the fuel receipt, use dry ink pin to enter next fuel (2 hours) tach time on windshield, complete the Pawnee log, clean bugs off the Pawnee, enter fuel quantity and dollar amount in the daily flight log and number of tows. Put the daily log with fuel receipt, cash or checks in a pouch and put pouch in the treasurer cove slot.

When putting the Pawnee in the hangar, do not allow anyone to push the Pawnee by the propeller, propeller spinner, or wing leading edge. Push only from the wing struts.

Verify all Pawnee cockpit switches are turned off, the rotating beacon switch is left on as a double check that the master was turned off.