



# Air Sailing Gliderport

## Tow Pilot Manual

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## **Section 1    Qualifications and Approval**

### ***Safety Committee Concurrence***

Air Sailing Gliderport (ASG) uses two (2) Piper Pawnees as tow planes. The Pawnees are larger and more powerful than most primary tailwheel trainers. They are also single-seat aircraft which do not permit dual instruction. In addition, flying conditions at ASG can be more demanding than what some prospective tow pilots may be used to. For these reasons it is necessary that prospective tow pilots have sufficient tailwheel experience before ever soloing a Pawnee at ASG.

A prospective tow pilot must be vetted and approved by the Chief Tow Pilot.

### ***Pilot Experience and Qualifications***

Both prospective and existing tow pilots must have:

- Air Sailing Gliderport (ASG) tow pilots must be members of ASI.
- Private Pilot certificate or higher with an airplane single-engine land rating.
- Valid medical certificate.
- Current Flight Review [FAR 61.56]
- Current Flight Experience [FAR 61.57]
- High-Performance Endorsement [FAR 61.31(f)] (required for Pawnee operations)
- Tailwheel Endorsement [FAR 61.31(i)]
- Glider Towing Endorsement [FAR61.69]

Prospective Tow Pilots must have the following minimum tailwheel experience before they are allowed to fly a Pawnee, or any other conventional-gear tow plane, at ASG.

- Tailwheel Endorsement
- Minimum of 20 takeoffs after receipt of Tailwheel Endorsement

If deemed appropriate by the ASG Chief Tow Pilot, prospective tow pilots will be evaluated in a two-passenger tailwheel aircraft prior to soloing a Pawnee.

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## ***ASG Specific Tow Pilot Training***

The ASG Chief Tow Pilot, or his designee, will insure that ASG specific training is provided to the prospective tow pilot prior to his towing the general population at ASG. This area specific training shall include the following:

- Complete the Soaring Safety Foundation (SSF) on-line Tow Pilot Course.
- Minimum of ten (10) orientation flights in a Pawnee before towing a glider.
- Minimum of five (5) training flights towing a glider containing either an ASG tow pilot or ASG CFGI. During these flights the following must be practiced and satisfactorily demonstrated.
  - *Hook Up and Launch Procedures*
  - *Pattern Tows*
  - *Rope Breaks*
  - *Slack Line*
  - *Box the Wake*
  - *“Off Tow” Procedures*
- Discussion of retrievals from other airports.
- Discussion of retrievals from dry lake beds.

## ***Tow Pilot Approval***

The ASG Chief Tow Pilot will insure that the prospective tow pilot has the requisite skills, knowledge, and experience, and has met the stated requirements of this Section. The ASG Chief Tow pilot will then inform the new ASG Tow Pilot that he may tow the general population.

## ***Recent Flight Experience***

It is an ASI requirement that ASG tow pilots must meet the currency requirements of FAR 61.57 (carrying passengers) in a Pawnee. This can be regained by performing 3 takeoffs and landings to a full stop within 90 days in a Pawnee.

## ***Exceptions and Deviations***

Any exceptions or deviations to these requirements or procedures must be approved by the ASI Safety Committee.

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## Section 2 General Aero Tow Procedures

This section discusses generic tow plane operating procedures at ASG and is not aircraft specific. This discussion assumes that the tow plane is conventional gear. The following is intended to be a guide to ASG-unique towing procedures and not an exhaustive description of all towing considerations. Refer to the Glider Flying Handbook, Chapters 7 and 12, or the Towpilot Manual by Burt Compton for additional information. Another excellent reference is Aerotowing Gliders by John Marriott. Numerous other texts and websites exist.

### ***Preflight***

Upon arrival at the field, the tow pilot shall conduct a thorough preflight of the tow plane. It's particularly important to inspect the tires for condition and inflation, drain water from fuel tanks and lines (not while inside hangar), and check the condition of the landing gear attachments, tailwheel springs, brakes, and tow hook. Apply engine preheat when ambient temperatures are below freezing. If the fuel tanks are not appropriately filled, refuel before flight operations commence. Verify that the current Tow Sheet has a tachometer entry for the last refueling.

### ***Tow Pilot Safety Responsibilities***

The Tow Pilot is responsible for the safety and proper operation of the tow plane and coordination with ground crew during hook up operations.

The Tow Pilot shall not leave the pilot's seat while the prop is turning.

The Tow Pilot may refuse to perform a tow for any reason.

During the tow, the Tow Pilot is in charge of the flight.

### ***Taxi***

It is important to hold the stick properly during taxi. Controls should be set to "climb into or dive away" from the wind as required. Be vigilant for ground personnel. Ensure that the mixture is leaned during ground operations to reduce plug fouling.

### ***Runup***

Perform run up in accordance with the aircraft operating manual. As a minimum, check mags, carb heat, and controls for freedom of movement, brakes, and fuel quantity.

### ***First Flight of the Day***

ASG encourages tow pilots to make a checkout flight each towing day to check out the tow plane's systems, warm the oil to operating temperature, and to re-familiarize themselves with its handling as required. If the tow pilot has not acted as pilot-in-command of a Pawnee within the last 90 days [current to carry passengers], the tow pilot shall complete three landings prior to the first tow of the day.

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## **Takeoff**

Usually it is the tow pilot who attaches the tow rope to the tow plane. The TOST mechanisms can be sticky; ensure it is fully engaged. Prior to the first tow the tow pilot shall inspect the rope. The tow pilot shall inspect the rope again at the end of the day when putting it away.

When the wing runner signals that they are ready for you, start up and taxi to a position well in front of the glider to be towed. The end of the rope should be abeam the glider with 10-20 feet of slack remaining.

There must be a successful radio communications check. This may be initiated by either the glider or the tow plane. If the communications check is unsuccessful, the launch shall be terminated. Successful radio communications are a pre-launch requirement at Air Sailing.

The wing runner will signal when to stop by holding both arms out to the sides of his body (standard SSA glider signals). After stopping, perform the takeoff check list and observe the wing runner for the next signal.

The takeoff procedure is discussed in detail in the ASG Operating Procedures Manual. When the glider pilot is ready for takeoff he will instruct the wing runner to "raise the wing". The signal to start the takeoff is the glider pilot fanning the glider's rudder back and forth, followed by the wing runner rotating his arm in the takeoff signal. The tow pilot shall acknowledge "ready" by wagging the tow plane's rudder, make a takeoff radio call, release the brakes, and advance the throttle smoothly for takeoff. It is recommended practice to release the brakes prior to advancing the throttle. This slower acceleration allows for a small amount of slack to be removed without stressing the rope and jerking the glider.

For tailwheel aircraft, a proper takeoff begins with back stick to hold the tailwheel down for directional stability. During the acceleration phase, the tail should be raised to a near nose level configuration. This is to insure that the tow plane does not lift off in ground effect at a too slow airspeed.

For safety reasons (dust devils, wind gusts) do not climb out of ground effect too soon. Hold the plane in ground effect as you accelerate to climb speed and then begin the climb. Do not zoom up. It is extremely difficult for a new student to follow this type of maneuver. The need for acceleration in ground effect will be even more noticeable for heavy, two-place, high-performance gliders. Avoid any abrupt changes in your climb angle.

Before attempting operations from dry lakes a discussion with the chief tow pilot, or other experienced tow pilot, should take place.

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Although it is permissible to perform takeoffs (with and w/o a glider) from the dirt, the asphalt runways should be used for the tow plane whenever possible for the following reasons:

- Less rolling resistance for a shorter ground run
- Less dust debris hitting the prop or the glider
- Improved visibility for the glider

For safety reasons, do not perform a takeoff if the glider wing is down. Less experienced pilots often make this mistake. Wing runners assume that no takeoff will occur while they are holding the wing down. Occasionally, takeoffs will be made with the wing of the glider resting on the ground (unassisted takeoff), but you and the wing runner must be informed of this in each individual case. Also, some pilots like to takeoff with partial spoilers. These are all exceptions that must be communicated to the tow pilot and wing runner before attempting to launch.

**Unless you are specifically briefed to do something different ahead of time, never start your takeoff unless:**

1. Glider wing is up
2. Spoilers are closed
3. Canopy is closed
4. All line crew are clear (nobody is standing in front of the wing)
5. You get the radio call (“Standby for rudder” or “Ready for takeoff”)
6. You see the rudder wag and/or Wing runner gives takeoff signal
7. The runway and pattern are clear

Note that “Ready for Takeoff” and “Standby for Rudder” do not mean the same thing. “Ready for Takeoff” means they are ready to go now and no further signals are required. “Standby for Rudder” means they are almost ready to go but you must still wait to see the rudder waggle or the wing runner takeoff signal. Remember, regardless of any signals you receive from anyone else, you are still responsible for checking to make sure it is safe to start your takeoff.

If you abort the takeoff, pull off to the left side of the runway, if possible. Do not stop short; keep the tow plane rolling so the glider does not climb up your back. The glider should pull off to the right, but as some gliders lack directional controllability at low speeds, you cannot depend on the glider pilot being able to point the glider where he or she wishes.

If you feel the tow line break during takeoff, even though you may believe you can stop the tow plane before you reach the end of the runway, continue the takeoff so the glider will have a clear shot at an emergency landing (rollout w/o hitting the tow plane). Emergencies rarely happen, but they do happen, so you should constantly keep in mind what you would do if one did occur.

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During takeoff, be especially alert to the possible emergency situation that may require pulling the emergency release handle. “Controls-to-the-stop” justifies an immediate release. Other situations will require a judgment call. If there is doubt about a safe outcome for the tow plane and pilot, then pull the release.

### ***Aborted Takeoffs***

If you fly tow planes long enough, you will eventually experience an aborted takeoff. An aborted takeoff could be as simple as a rope brake during acceleration to something more complex involving a fault condition with either the tow plane or the glider. The big concern is having the glider rear end the tow plane. The distance between the tow plane and the glider is only 200 feet, a distance which is used up quickly at takeoff speeds. During the takeoff roll, the glider will become airborne before the tow plane. A glider, flying in ground effect, can float a considerable distance. The glider wheel brake is useless in the air and, back on the ground, is not very effective due to the residual lift of the wing which reduces the weight on the tire. The point to remember is that the tow plane can stop faster than the glider. During an aborted takeoff, the tow pilot must take concerted actions to keep the tow plane well in front of the glider.

If an aborted takeoff occurs at speed, pull the emergency release. There is nothing to be gained by keeping the two aircraft attached. If there is any doubt about the location of the glider, the preferred option is for the tow plane to out-run the glider. Do this by continuing to run the tow plane down the runway; if needed, takeoff and go around. If the problem is with the tow plane and you must stop, then pull to the left as far as possible. Hopefully, this will leave enough room on the right side to allow the glider to pass the tow plane. As a power pilot you were probably taught to reduce power and stop on the centerline of the runway. As a tow pilot this is exactly what you don't want to do.

### ***Premature Termination of the Tow (PT3)***

In the event of an actual or simulated rope break, or any other PT3 event, continue to fly straight ahead while maintaining awareness (preferably sight) of the glider's location. Do not reflexively turn left as soon as the glider is off tow, but rather continue to climb to pattern altitude and then fly a normal pattern for landing, always giving the glider priority for all runways.



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## **Climb**

Fly attitude and make minor adjustments to your pitch attitude to maintain tow speed. Do not allow the glider to overpower the tow plane. This will require, at times, heavy control pressures in the tow plane, but it is a necessary evil.

When towing gliders that are unfamiliar to you, inquire as to what tow speed they desire. Unless otherwise stated, assume the following:

- > Schweizer 1-place ships:           Tow speed is ~ 65 MPH IAS
- > Glass and 2-place ships:           Tow speed is ~ 75 MPH IAS

Beware of low tow speeds causing excessive cylinder head or oil temperatures. If you experience a power loss, engine failure, or other emergency after becoming airborne, signal the glider by rocking your wings, maintain safe airspeed, and look for a safe place to land. Execute engine restart procedures, if able. If, after the glider has released, you find you still have partial power, use your own judgment as to whether you will be able to return to the gliderport or be forced to land in the first available field.

Immediately after liftoff, fly runway track for the first 300 – 400 feet AGL. Do not fly runway heading and allow the tow plane to drift downwind. This is contrary to some popular towing beliefs. At ASG we believe that a glider will be in less danger if they accidentally turn downwind after a PTT event.

Normally, make the initial climb (first 1000 feet AGL) within the normal traffic pattern of the gliderport (i.e. crosswind then downwind and then turn on course for the remainder of the climb. This is more important for training flights or lower performance gliders (probably flown by low time pilots). Wind direction and velocity may require a different flight path. First turns should be made into the wind when possible.

During climb, you should NEVER FLY TO A POSITION FROM WHICH THE GLIDER CANNOT RETURN TO THE GLIDERPORT. Fly along straight legs, turning only when necessary to keep from getting too far from the gliderport. Turn with bank angles of between 15 and 20 degrees. Steeper banks are hard for students to follow, while shallower banks take too long to make the turn. Climbing turns in thermals are discouraged unless coordinated with the glider pilot. Students require long straight legs to perform their practice maneuvers (i.e. “Blue Hangar Tow”). However, you can make use of lift even while flying straight legs by directing your course under building clouds, or through areas of known lift. Try to position the glider for release in lift if you can.

NOTE: While towing, the tow pilot shall not determine the release point of the glider. At Air Sailing the glider pilot is responsible for determining when to release.

NOTE: The definitive signal for emergency release is the wing rock. Although ASG does require radios, a radio only call to release is likely to get a “say again” or “please confirm” as a response, and thus a delay. If the glider does not release in a timely

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fashion then you may need to pull your release.

Be aware that pulling the release can be dangerous for the glider. The metal attachment ring could hit the glider canopy or gelcoat and cause damage. The rope can tangle the glider control surfaces. The release is for emergency purposes only.

**CAUTION:** Use discretion when signaling the glider by fanning (wagging) the rudder, use the radio instead. In general, this signal should only be used at a minimum altitude of 1000 feet AGL due to the tendency of glider pilots to mistakenly interpret this as a request for immediate release. If the glider configuration is in question, make a radio call or wait for sufficient altitude prior to fanning the rudder.

When towing on runway 21, before turning left crosswind, make a right turn to line up with the emergency field. Then turn crosswind when the field is no longer an option for the glider.

If towing on runways 03 or 35 turning crosswind will require a turn at a lower altitude because of the rising terrain. The tow pilot and glider pilot should be prepared to deal with a rope break at low altitude. Towing off these runways is non-standard practice.

Avoid flying over the house on the east side of runway 17 near the south end.

## ***Descent***

While the rate of climb is limited by the performance of a particular tow plane, the rate of descent is largely controlled by pilot technique. As this is a club operation, safety and conservation of assets are extremely important in this phase of the tow.

In order to protect our investment and keep repair costs to a minimum, the club has a recommended descent procedure. The essence of proper descent technique is to retain a sufficiently high power setting in the descent so as to prevent rapid cooling of the engine. This is done by maintaining at least 2,000 RPM until entering the pattern.

After glider release, as confirmed by it turning right after release, stop the climb with forward stick while rolling into a left bank, turn left 90 degrees, and avoid climbing above release altitude. Maintain straight and level flight for a few seconds to maximize the lateral separation between yourself and the glider.

Keep your head on a swivel during the descent and try to keep track of aircraft in the pattern, those transiting the area, and the glider you have launched. Glider traffic can be anywhere and a visual lookout is of paramount importance.

Always remember that you are towing a 200-foot rope. Do not fly over people, animals, buildings, or power lines at low altitude. When landing, come in high and slip, if necessary, so the end of the towline clears any obstacles such as the fence at the north end of runway 17. Keep your flight path over clear areas, then land.

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## ***Landing***

Watch for gliders and plan for landing in the most expeditious and safe manner. Although left hand traffic is recommended at ASG, flying a right base entry to land is permitted by the tow plane to expedite landing. For example, a simulated rope break on takeoff from runway 17 lends itself to an easy right base entry for runway 3L.

Pattern tow example: After release of a glider in the downwind of 17, maintain speed and enter a left crosswind and downwind for runway 3L. This assures traffic deconfliction and expedites ground operations. The tow plane should wait at the diagonal taxiway near the tetrahedron for the landing glider to pass.

Be extra vigilant for ground personnel and landing glider traffic. Never cross directly in front of a landing glider. Do not rely on radio calls from the gliders in the pattern. Use your eyeballs as the primary collision avoidance sensor.

Tow Pilots should not use R17 for the sole purpose of expediting operations. The risk of an over-run accident is too great. R17 should only be used if there is a headwind.

## ***Dry Lake Landings***

Dry Lake landings can be tricky. Have a discussion with the Chief Tow Pilot, or another experienced tow pilot, before attempting such a landing. Water (and mud) pool in lower ground so lakes tend to “dry out” from the outside in. Consider landing on the edge rather than the center. This provides better depth perception and improves access for a possible ground retrieve. A dry lake landing is usually done to retrieve a glider.

Establish radio communications with the glider pilot and have him walk the intended landing area and verify its condition. Consider doing a “touch and go” or a “soft field” flare to test the ground before committing to the full stop. Other favorable indications include surface cracks due to drying, vehicle tire tracks, and dust due to your wheels and prop wash. Your risk assessment should include obstructions, surface conditions, useable length, preferred landing and launch directions, and the fact that the glider launch will be unassisted.

## ***Weather Considerations***

Keep alert for changes in the weather. If you see a storm approaching the gliderport, make a radio call to cancel tow operations. Put the tow plane back into the hangar before the weather gets too bad.

## ***Headwork Items***

Do not fly when you are fatigued or ill. Do not wait until you feel you can no longer fly to ask for relief. It gets very hot during the summer soaring season at ASG. Ensure that you are properly hydrated. If you need relief, call on the radio and ask for one. If no relief is available, park the aircraft and take a break; the gliders can wait.

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## ***Securing the Aircraft***

At the completion of flight operations, top off the fuel. Clean the spark plugs by leaning the mixture, then shutdown by pulling the mixture to idle cutoff. When securing the aircraft make sure all switches (mags, master, fuel pump) are off and that the throttle and mixture are closed. At ASG it is common to leave the beacon on to serve as a “tell tail” for the Master left on.

Give the plane a post-flight inspection to identify flight safety hazards. If necessary, take the required actions to ground the aircraft.

Particularly check the induction and exhaust systems for leaks, carburetor and carburetor heat box for security, oil leaks in general, spark plugs and mufflers for security, and the condition of the tail wheel leaf springs. Wipe out oil from the inside of the cowling and on the lower fuselage and landing gear struts. Bring any discrepancies to the attention of the Chief Tow Pilot and enter the discrepancy in the aircraft notebook.

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## Section 3 Piper Pawnee Operations

At Air Sailing Gliderport, ASI operates Red Tow which is a Piper Pawnee “PA25-235 Model D” and NSA operates Blue Tow which is a Piper Pawnee “PA25-235 Model C”. Some preflight procedures are different in each model and the Owners Handbook should be followed for the model you are flying.

The Pawnees were designed as crop dusters and are thus intended for hard work. The light weight of the Pawnee and its large engine give the aircraft excellent towing capability, reliability, and all around safety. Although the maximum gross weight of the plane is 2900 pounds, in our operation we typically operate at about 2000 pounds gross weight. The cockpit design provides nearly 360 degrees of visibility.

The Pawnee’s most unusual feature is its long nose and the downward slope of the cowl. This presents a very unusual picture to the pilot when in level cruise and in the touchdown phase of landing.

### ***V Speeds in MPH IAS***

<b>60</b>	<b>V s0</b>	Stall speed with flaps
<b>61</b>	<b>V s1</b>	Stall speed without flaps
<b>71</b>	<b>V x</b>	Best climb angle
<b>80</b>	<b>V approach</b>	(1.3 x Vs1)
<b>80</b>	<b>V best glide</b>	
<b>83</b>	<b>V y</b>	Best climb rate
<b>109</b>	<b>V fe</b>	Max Flap Extend
<b>120</b>	<b>V a</b>	Maneuvering Speed
<b>124</b>	<b>V no</b>	Max calm air speed
<b>156</b>	<b>V ne</b>	Never exceed

### ***Fuel***

Both Pawnees carry only 36 gallons of useable fuel. This is not a lot of fuel; crop dusters don’t need to carry a lot of fuel. Fuel consumption can be as much as 14 GPH. For both aircraft, refueling is mandatory after 2 hours of tach time.

When refueling Red Tow pay attention to the volume required to fill each tank. If the difference is more than a few gallons it could indicate a problem with the fuel system.

Tow pilots must be very “fuel aware” before performing aero retrieves. The tow plane should be refueled prior to departing for a retrieve. If the entire retrieve cannot be achieved in 2 hours of tach time then provisions must be made for refueling.

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## ***Oil***

Maximum oil capacity is 12 quarts; the oil level should be maintained at or above 9 quarts as measured when cold. If the oil level is found below 9 quarts at the start of an operating day, the tow pilot should add oil to bring the level back to at least 9. This is not critical since the engine can be operated with as little as 3 quarts indicated. During the summer season, straight 50 weight oil (100 AW) is used. 20W50 is used during the cold season.

## ***Tires and Brakes***

The Pawnee has individual toe brakes, including a parking brake pull-tab for each. Main wheel tire pressure is 25-30 psi; tail wheel pressure is 70-80 psi. (Note: the tailwheel tire should be firm and without sidewall bulge)

## ***Starting Procedures***

Red Tow has an electric fuel pump in addition to the engine-driven pump. Blue Tow is gravity fed and does not need electric fuel pumps. Red Tow's electric fuel pump is tested by switching on the Master and noting the fuel pressure rise.

Make sure the fuel pump switch is on during takeoff and landing operations. Fuel pressure should be between 3 and 5 psi.

Prior to engine start, perform a thorough preflight. Check mags off, mixture off, throttle closed and master switch off.

Prime according to the temperature: When cold prime 3-5 strokes. Apply engine preheat when ambient temperatures fall below freezing.

Start the Pawnee on the designated magneto only. Using the incorrect mag can lead to severe kickback while attempting to start. Switch the non-starting mag ON after engine start.

Perform Pre-start cockpit check:

- Controls free
- Seatbelt fastened
- Mixture rich
- Flaps up
- Starting mag ON
- Battery master on
- Fuel pump on (note pressure)
- Crack throttle open ½ inch
- Announce "CLEAR PROP"
- Engage starter

**After engine start, be sure both mags are switched ON.** Keep RPM below 1000 while waiting for oil pressure to rise above minimum pressure. Shut down the engine if no oil pressure indication is noted within 30 seconds.

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Do not leave the primer unlocked or pulled out during start as this may allow excess fuel to be sucked into the engine and contribute to a fire.

Lean the mixture for ground operations.

### ***Engine Runup***

DURING ENGINE RUNUP, ENSURE THAT YOU HOLD THE STICK FULL BACK AND THE BRAKES FIRM.

Set 1800 RPM with mixture setting at RICH. Check mags, left and right, 25 to 125 RPM drop. Check carb heat to see an RPM drop.

Check that engine instruments are normal.

Optionally, lean the engine to “Max Power” (where maximum RPM is achieved) and note this position.

### ***Takeoff***

Advance Mixture to full rich for takeoff. Ltoff will occur at about 60 MPH IAS. Do not try to force or pull the aircraft into the air; let it fly itself off the ground. Takeoffs and tow in the Pawnee are made FLAPS UP and at 65 to 75 MPH IAS (depending on type of glider on tow).

### ***Descent***

Slowly reduce engine RPM during descent to prevent shock cooling.

Try to maintain at least 2,000 RPM in the descent.

Mixture may be retarded to Max Power.

### ***Landing***

Approaching the traffic pattern, perform the landing checklist. About 2100 RPM should hold level flight on downwind. Maintain 80 MPH IAS (minimum) on downwind and base leg while gradually reducing power on base and final.

The following are some typical numbers. For downwind and abeam the approach end of the runway, maintain 1800 – 2100 RPM to maintain level flight. On base leg, maybe 1600 RPM. A typical final approach is made at 80 MPH, full flaps, and 1500-1700 RPM. Touchdown will be at about 60 MPH.

In strong crosswinds, half flaps or no flaps will afford more control and a reduced tendency for the upwind wing to rise during touchdown. There is not a lot of difference between no flaps and full flaps.

CAUTION: At idle throttle and below 75 MPH, the Pawnee can (and usually will) develop a significant sink rate WITHOUT WARNING, particularly with full flaps. The Pawnee does not float at landing speeds. During the flare for landing, avoid getting the nose too high.

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At Air Sailing landings normally are made in the dirt and should be “Wheel” landings. The dirt is more forgiving than asphalt; it provides a rolling resistance that enhances stability and shortens the ground roll. Pawnee wheel landings are easily performed in the dirt.

After landing, all ground operations should be done with the mixture leaned as much as possible.

## **Refueling**

Refuel at 2.0 hours tach time or less. Record the tach time on the tow sheet after fueling. If needed, cross out the previous entry and write down the new time beside the old.

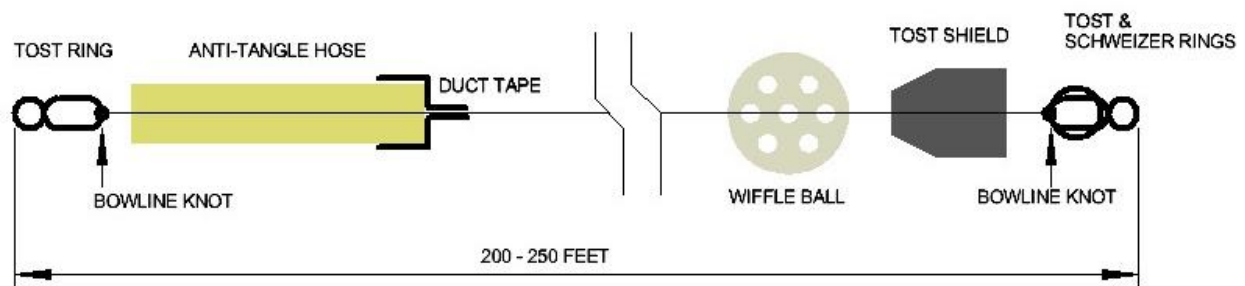
Make a radio call when heading to the fuel pump.

After refueling, check each gas cap for security.

## **Tow Ropes**

Air Sailing uses tow ropes with a manufacturer’s rated breaking strength of 2,000 Lbs. End connection hardware is always tied using a bowline knot. The ASI Operating Procedures Manual discusses maximum and minimum glider weights and the possible need for weak link adapters.

Tow ropes shall be between 200 to 230 feet in length and shall terminate on the glider end with both a standard TOST connector and a Schweizer ring. Tow ropes wear at the glider end. When worn, tow ropes can be “rejuvenated” by cutting off the trailing several feet and re-tying the connectors. This allows several rejuvenations before the rope must be retired. ASI does not use tow ropes less than 200 feet in length.





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## Section 4 Tow Sheets

Listed below are instructions for completing the Tow Sheets.

Start every day with a new Tow Sheet.

Tow Sheets shall be completed and turned in at the end of every tow day.

Remember to record the End-of-Day tach time.

1. Date                      Example format: 6/12/15   or 12 June 2015
  
2. Tow Plane              Make sure you circle which tow plane you are flying. Blue is owned and operated by NSA and Red is owned and operated by ASI and each does separate billings and invoices.
  
3. Tach                      Record the tachometer time at the beginning of each tow. Compare this to the mandatory refueling time prior to each takeoff. DO NOT takeoff if you have reached 2 hours since last refueling.
  
4. Glider                    If using the N-number use at least the last three alpha-numeric characters.  
NSA has a club ship identified as "ZAP"; that is acceptable.  
A club ship or private glider with a two or three letter tail designator may be used.
  
5. Pilot                      Minimum information should be the person's First Initial and Full Last Name. Bird call signs can be confusing and should thus be avoided.  
If the information is not volunteered during the initial radio call then the tow pilot should ask "Pilot's Name?" and it shall be understood that this is the person to be billed.  
This is especially important for a 2 place ship where the "pilot" we recognize is often not the person paying for the tow.
  
6. Release Altitude (Rel Alt)  
Please note 7,000' as 7.0 or 8,400' as 8.4  
Pattern Tow = PT  
Simulated Rope Break = SRB  
Land On Tow = LOT  
Simulated LOT = PT  
Aero Retrieves are billed per tach hour so it is very important to record Start and End tach times. Also record the retrieval location.
  
7. Tow Pilot                Use your initials or last name. If you were a scheduled tow pilot (by the Chief Tow Pilot) then circle the letters (STP) next to your name.
  
8. Notes                    Reserved for administrative use.

9. Full Fuel

**Full Fuel @ is critical and a MUST. This is important because fueling is required every two (2) tach hours.** If this entry is missing, then you are dealing with unknown fuel quantities. You will need to top-off the aircraft and record it before flying.

10. Oil Added

This entry is the amount of oil added during the pre-flight inspection. Oil should be added if the cold dipstick measurement is less than 9 Qts..

Date: _____		BLUE	RED			
Tach	Glider	Pilot	Release Altitude	Tow Pilot	Notes	
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						
Full Fuel @:						
Oil Added:						

END