

CHAPTER 6

Preflight and Ground Operations



Operating a glider requires meticulous assembly and preflight. Proper assembly techniques, followed by a close inspection of the glider using checklists contained in the Glider Flight Manual/Pilot's Operating Handbook (GFM/POH), are essential for flight safety. In order to ensure correct and safe procedures for assembly of a glider, students and pilots unfamiliar with glider assembly should seek instruction from a knowledgeable glider flight instructor or certificated private or higher glider pilot. Safely launching a glider requires careful inspection, appropriate use of checklists, and quality teamwork. Launch procedures should be carried out systematically and consistently each time you fly.

ASSEMBLY TECHNIQUES

While preparing to assemble a glider, consider the following elements: location, number of crewmembers, tools and parts necessary, and checklists that detail the appropriate assembly procedures. The GFM/POH should contain checklists for assembling and preflighting your glider. If not, develop your own and follow it every time you fly. Haphazard assembly and preflight procedures can lead to unsafe flying conditions.

Before assembling a glider, find a location that shields the project from the elements and offers enough room for completion. Wind is an important factor to consider during an outdoor assembly. Each wing is an airfoil regardless of whether or not it is connected to the fuselage; even a gentle breeze is enough to produce lift on the wings, making them cumbersome or impossible to handle. If assembling the glider in a spot shielded from the wind, great care must still be taken when handling the wings.

When performing the assembly inside a hangar, ensure there is enough room to maneuver the glider's components throughout the process. Also, consider the length of time you anticipate to complete the entire procedure, and choose an area that allows complete undisturbed assembly. Moving the glider during assembly may cause parts or tools to be misplaced.

Wing stands, pliers, screwdrivers, and lubricants should be on hand when assembling the glider. [Figure 6-1] To stay organized, use a written assembly check-



Figure 6-1. Wing stand used during glider assembly.

list, and keep an inventory of parts and tools. Once the assembly is complete account for all parts and tools. Objects inadvertently misplaced in the glider could become jammed in the flight controls, making control difficult if not impossible.

Depending on the type of glider, two or more people may be required for assembly. It is important for everyone involved to maintain focus throughout the assembly process in order to avoid missed steps. Outside disturbances should also be avoided. Once the assembly is finished, a thorough inspection of all attach points ensures that bolts and pins were installed and secured properly.

TRAILERING

Trailers are used to transport, store, and retrieve gliders. [Figure 6-2] The components of the glider should fit snugly without being forced, be guarded against chafing, and be well secured within the trailer. Once the loading is completed, take a short drive, stop, and check for rubbing or chafing of components.



Figure 6-2. Open and closed trailers.

Prior to taking the trailer on the road, complete a thorough inspection. Inspect the tires for proper inflation and adequate tread; check all lights to make sure they are operating; ensure the hitch is free moving and well lubricated; make sure the vehicle attachment is rated for the weight of the trailer; check the vehicle and trailer brake operation.

When using a trailer, there are other precautions to note. First, avoid towing with too much or too little tongue weight as this causes the trailer to fishtail at certain speeds, and it may become uncontrollable. Second, take care when unloading the glider to avoid damage.

TIEDOWN AND SECURING

Anytime the glider is left unattended it should be tied down. When selecting a tiedown location, choose a spot that faces into the wind if possible. Permanent tiedowns are often equipped with straps, ropes, or chains for the wings and tail, and a release hook for the nose. Check the condition of these tiedowns before use.

If strong winds are expected, tie the spoilers open with seat belts, or place a padded stand under the tail to reduce the angle of attack of the wings. This reduces the pull of the glider against the tiedowns. When securing the glider outside for an extended period of time, install gust locks on the control surfaces to prevent them from banging against their stops in the wind. Cover the pitot tube and the total energy probe to keep spiders, wasps, and other insects or debris from causing an obstruction. [Figure 6-3]

Always use a cover to protect the glider canopy. It can be damaged by blowing dust and sand or scratched by apparel, such as watches or belt buckles. A cover protects the canopy from damage while shielding the interior of the cockpit from ultra-violet (UV) rays. [Figure 6-4]

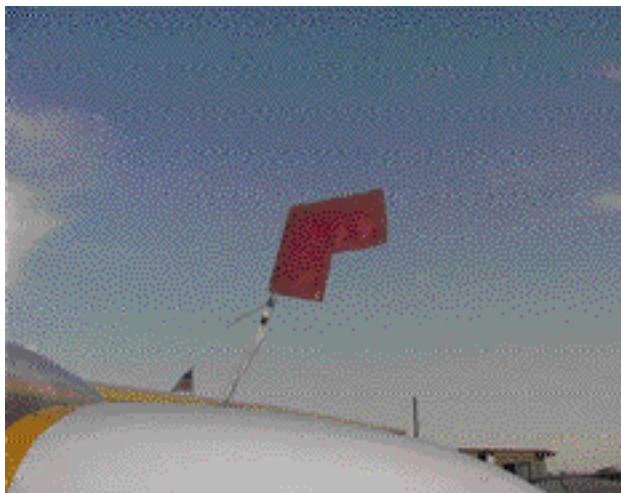


Figure 6-3. Protecting the pitot tube and total energy



Figure 6-4. Protecting the canopy.

GROUND HANDLING

Moving a glider on the ground requires special handling procedures, especially during high winds. Normally, gliders are pushed or pulled by hand or towed with a vehicle. When moving a glider, ensure that all appropriate personnel have been briefed on procedures and signals.

When using a vehicle to tow a glider, use a towrope that is more than half the wingspan of the glider. If one wingtip stops moving for any reason, this length prevents the glider from pivoting and striking the tow vehicle with the opposite wingtip. One half the wingspan plus 10 feet provides safe operation.

When starting, slowly take up slack in the line with the vehicle to prevent sudden jerking of the glider. The towing speed should be no faster than a brisk walk. When towing a glider, always use at least one wingwalker. The wingwalker and the driver of the tow vehicle function as a team, alert for obstacles, wind, and any other factor that may affect the safety of the glider. The driver should always stay alert for any signals from the wingwalkers. [Figure 6-5]

If it is necessary to move the glider during high winds, use two or more crewmembers placed at the wingtips and tail. Also, have a pilot in the cockpit, with the spoilers deployed, holding the controls appropriately to reduce lift on the glider. Strong winds and gusts can cause damage to the glider during ground handling, so exercise care during these conditions.

LAUNCH EQUIPMENT INSPECTION

Prior to making a flight, it is important to inspect the condition of the towrope. The towrope should be free from excess wear; all strands should be intact, and the rope should be free from knots. [Figure 6-6]



Figure 6-5. Positioning the glider for the tow vehicle.

Title 14 of the Code of Federal Regulations (14 CFR) part 91, section 91.309 requires that the strength of the towrope be within a range of 80 to 200 percent of the maximum certificated weight of the glider. A knot in the towrope reduces its strength by up to 50 percent, and causes a high spot in the rope that is more susceptible to wear. Pay particular attention to the ring area that the glider attaches to because this is also a high wear area.

If the towrope exceeds the required strength it is necessary to use a weak link, or safety link, at both ends of

the towrope. The safety link is constructed of towrope with a towring on one end and the other end spliced into a loop. The weak link at the glider attach end of the towrope must be 80 to 200 percent of the maximum certificated operating weight of the glider. The safety link at the tow plane attach end must be of greater strength than the safety link at the glider attach end of the towrope, but not more than 25 percent greater nor greater than 200 percent of the maximum certificated weight of the glider. Towropes and weak links are assembled using a towring that is appropriate for the operation. [Figure 6-7]



Figure 6-6. Inspecting the towrope.

The towhooks on both the glider and the towplane need to be inspected. The two most common types of towhook are an over-the-top design, such as a

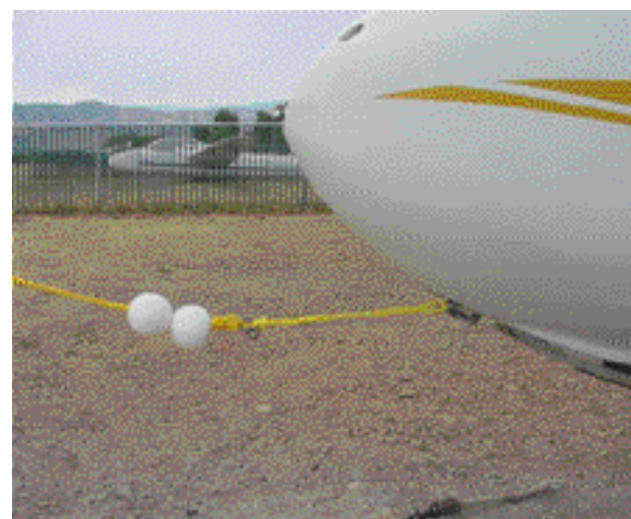


Figure 6-7. The weak link.

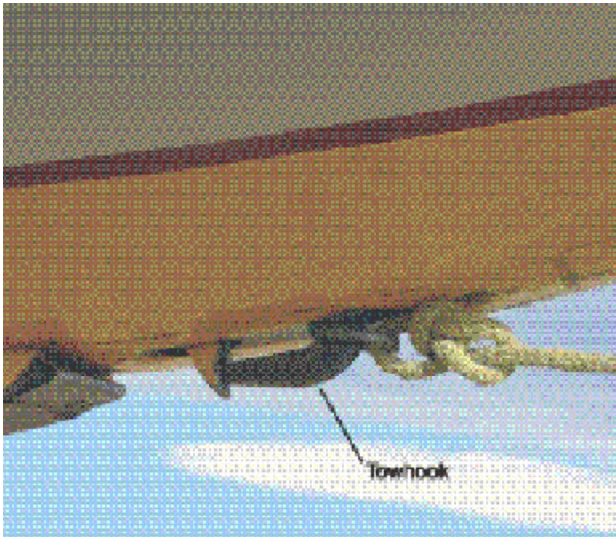


Figure 6-8. Schweizer-type towhook.

Schweizer hook, or a grasping style, such as a Tost hook. Any towhook must be freely operating, and free from damage. [Figure 6-8]

GLIDER PREFLIGHT INSPECTION

A thorough inspection of the glider should be accomplished before launch. A preflight checklist for a glider should be in the GFM/POH. If not, develop a checklist using the guidelines contained in Appendix A—Preflight Checklist.

COCKPIT MANAGEMENT

Prior to launch, passengers should be briefed on the use of safety belts, shoulder harnesses, and emergency procedures. If ballast is used, it must be properly secured. Organize the cockpit so items needed in flight are accessible. All other items must be securely stowed. The necessary charts and cross-country aids should be stowed within easy reach of the pilot.

PERSONAL EQUIPMENT

If a parachute is to be used, 14 CFR part 91 requires that a certified rigger repack it within the preceding 120 days. The packing date information is usually found on a card contained in a small pocket on the body of the parachute.

14 CFR part 91 also requires that the pilot in command (PIC) use supplemental oxygen for flights more than 30 minutes in duration above 12,500 feet, and at all times during a flight above 14,000 feet. If supplemental oxygen is used, the system should be checked for flow and availability.

The glider pilot should carry water on every flight to prevent dehydration. The effects of dehydration on a pilot's performance are subtle, but can be dangerous and are especially a factor in warmer climates.

PRELAUNCH CHECKLIST

Adjustments to the pilot or passenger seats, as well as the pedals, should be made prior to buckling in. At this point, especially if the glider has just been assembled, it is appropriate to do a positive control check with the help of one crewmember. While the pilot moves the control stick, the crewmember alternately holds each aileron and the elevator to provide resistance. This also applies to the spoilers and flaps. This ensures that the control connections are correct and secure. If the stick moves freely while the control surfaces are being restricted, the connections are not secure, and the glider is not airworthy. [Figure 6-9]



Figure 6-9. Positive control check of spoilers.

If the GFM/POH does not provide a specific prelaunch checklist, then a good generic checklist is ABCC-CDD, which stands for:

- A—Altimeter set to correct elevation.
- B—Seat belts and shoulder harnesses fastened and tightened.
- C—Controls checked for full and free movement.
- C—Cable or towrope properly connected to the correct hook.
- C—Canopy closed, locked, and checked.
- D—Dive brakes closed and locked.
- D—Direction of wind checked and emergency plan reviewed.

APPENDIX A—Preflight Checklist

Add to this list any items that are appropriate for your particular glider.

- Begin by assessing the overall condition of the fiberglass or fabric.
- Be alert for signs of damage or excessive wear.
- Check that the canopy is clean and free from damage.
- Verify the interior wing and control connections are safe and secure.
- If a battery is used, ensure that it is charged, and safely fastened in the proper spot.
- Check that seat harnesses are free from excessive wear.
- To prevent it from inadvertently interfering with the controls, buckle and tighten any harness that will not be used.
- Test the tow hook to make sure it is operating correctly.
- Inspect top, bottom, and leading edge of wings, making sure they are free from excess dirt, bugs, and damage.
- Inspect spoilers/dive brakes for mechanical damage. They should be clear of obstructions.
- Inspect the wingtip and wingtip skid or wheel for general condition.
- Inspect ailerons for freedom of movement, the condition of hinges and connections, and the condition of the gap seal.
- Check the condition of flaps for freedom from damage and appropriate range of motion.
- Inspect the general condition of the empennage.
- Check static ports, pitot tube, total energy probe to ensure they are free from obstruction.
- Check top, bottom, and leading edge of tailplane for freedom of bugs, dirt, and damage.
- Check the landing gear for signs of damage or excessive wear. The brake pads should be checked if they are visible, otherwise the brakes can be checked by pulling the glider forward and applying the brakes. It should be noted that the landing gear is frequently a problem area for gliders used in training.
- Check elevator and trim tab for condition of connections, freedom of movement, and condition of gap seal.
- Check rudder freedom of movement and condition of connections.

