

USA G-103 Twin Astir

Procedures for safe assembly and dis-assembly of
the glider

(Trailers 2 and 3)

Grob Twin Astir Glider Rigging

Tools Required:

- Needle nosed pliers
- Wire cutters (side cut)
- Very large crescent wrench (for removing/installing oxygen tank)
- Scissors
- Short length of safety wire (8") (for trim tab control rod fitting)
- Tape residue remover
- Water
- Rags
- Gap sealing tape
- Canopy cleaner
- Chocks
- Wing Stands

- 1) Disengage the horizontal stabilizer storage trolley locking pins and remove the horizontal stabilizer trolley from the trailer. When handling the trolley, use extreme caution. It will tip over. Lash the trolley to the eyebolt on the left side of the trailer to secure it upright.
 - a. Trailer #2: There are three locking pins. There is one each at the center top, the bottom front, and one at the rear bottom.
 - b. Trailer #3: There is no trolley. The horizontal stab is stored in the trailer overhead.
- 2) Remove the tail boom tie down strap.
- 3) Roll the fuselage out of the trailer. Position will vary with each particular trailer. CAUTION: The pitot tube at the top of the vertical stabilizer is easily damaged during fuselage roll-out.
 - a. Trailer #2: Place the glider 30 feet behind the trailer. The extra distance is necessary to allow maneuvering the wings. This is explained later.
 - b. Roll the fuselage on dolly rearward until the rear dolly wheels contact the stops on the end of the loading ramp.
- 4) Remove the rudder lock.
- 5) Remove the front and rear canopies. Remember to detach the safety lanyards first. Safely set aside.
- 6) Remove all loose objects and accessories (total energy probe, ballast, cushions, batteries, etc.) from cockpit and baggage area. If the oxygen tank is installed, remove it.
- 7) Ensure main wing fittings on fuselage are unlocked. There are two fittings on either side of the fuselage under the baggage deck and two fittings on either side of the fuselage behind the rear seat back cushion. For each fitting, slide the locking nut inboard and rotate so it stays in the unlocked position (pins not in slots).
- 8) Ensure the spoiler arm and control rods under the aft cargo deck are in the proper position. It will be impossible to rotate them to the proper position once the wings are installed.
- 9) Remove the protective tennis ball covers from the aileron control rods.
- 10) Remove fuselage dolly hold down webbing.
- 11) Lower the main gear.
- 12) Push the fuselage rearward in the dolly until it is just supported on the dolly. If the dolly remains too far aft during the assembly, you will not be able to

remove it. The front wheels of the fuselage dolly will be lifted slightly off of the ground.

- 13) Place wing stands at appropriate positions on either side of fuselage.
- 14) While wings are still in trailer wipe main wing fittings clean. Also clean the wing fittings on the fuselage.
- 15) Find four able bodied individuals to install the wings. Two people will be needed to lift and maneuver each individual wing root and two will be needed to lift and maneuver the wingtip. While manipulating the wing it is imperative to communicate all actions!
- 16) The right wing is installed first.
 - a. Trailer #2: The right wing is stored on the left side of the trailer.
- 17) Slide the right wing from trailer, remove from support sling/choke collar and guide the spar into place in the fuselage. Do not fully seat the wing into the fuselage at this time. Leave about 12" between wing root and fuselage.
 - a. Trailer #2: The wings are stored opposites sides of the trailer. i.e. The left wing is stored on the right side of the trailer.
 - b. Trailer #3: Remove the individual support stands from the wings and replace in the trailer.
- 18) Support the end of the wing with a stand. Ensure someone is actively guarding the tip at all times.
- 19) At the wing root, unlock the spoilers by pushing in on the spoiler control rod.
- 20) Lubricate all spigots and sockets at the wing root and on the fuselage with a thin coating of grease. Use grease sparingly.
- 21) Maneuver the wing into the fuselage.
 - a. Gently move the wing vertically, as well as fore and aft. Use the wing root/fuselage gap as a reference to determine fore/aft wingtip movement. USE CAUTION: The trailing edge of the wing root is easily damaged when moving the wingtip aft!
 - b. At times, supporting the wing root from below will assist in proper installation.
- 22) Once the wing is fully seated, rotate the right main wing fittings so they spring inboard with the red pin seated in the slot.
- 23) With an individual guarding the right wingtip on the outer wing stand, repeat the procedure for the left wing installation.
- 24) Secure and tighten all four wing-fuselage fittings. Move the wingtip fore and aft strongly while tightening the locknuts. After the locknuts are hand tight, the red indicator pin must not touch the bottom of the socket.
- 25) Connect all four control connections (ailerons and spoilers).
- 26) After the wing-fuselage connections are made and the control connections are accomplished, a separate individual must verify the security of the connections. All eight of them!
- 27) Use three individuals to install the horizontal stabilizer/elevator.
- 28) Obtain a short length of safety wire and pliers.
- 29) Remove horizontal stabilizer from storage trolley. Ensure the lockdown bolt at the front of the horizontal stabilizer is puller completely forward.
 - a. Trailer #3: There is no trolley. The horizontal stabilizer is stored inside the roof of the clamshell door.
- 30) Position the horizontal stabilizer above the vertical stabilizer and lower with the elevator angled upwards.
- 31) Attach the elevator control quick disconnect. Then connect and secure the trim control fitting with safety wire.
- 32) After the elevator connection is secured, a separate individual must verify the security of the connections.

- 33) Lower the horizontal stabilizer on to the top of the vertical stabilizer and gently push the horizontal stabilizer aft so the two pins slide into their connecting sockets.
 - a. Use the positioning marks on each side of the vertical stabilizer to verify the horizontal stabilizer is seated correctly.
- 34) Tighten the wing bolt clockwise until secure. The wingnut must be horizontal in order to close the leading edge cover. Close the cover.
- 35) Install the TE probe and tape the connection. Install the pitot tube probe cover.
- 36) Recover all tools from cockpit. A second individual must verify no unwanted objects are present.
- 37) Reinstall both canopies. Attach the safety lanyards.
- 38) With an individual guarding each wingtip, slide fuselage backwards off dolly.
- 39) Chock the main wheel.
- 40) Accomplish a complete positive control check, including the rudder.
- 41) Install oxygen bottle. Prior to installation, check the latest date stamped on oxygen tank. If date is older than 5 years, do not re-install tank in glider. It must be tested prior to use.
- 42) Install battery. Check that the battery hold down plate and securing pin are functional.
- 43) Check tow release mechanism and wheel brake for proper function.
- 44) Check for proper tire inflation.
- 45) Check for proper and current paperwork in glider (airworthiness certificate, aircraft registration, weight & balance information, flight manual, equipment manuals, USA flight log).
- 46) Remove old tape residue from the wing root gap on both sides of fuselage. Install new gap sealing tape.
- 47) Remove old tape residue from the horizontal stabilizer to vertical stabilizer connection gap. Install new gap sealing tape.
- 48) Remove old tape residue from the cover for the lockdown bolt on the leading edge of the horizontal stabilizer. Install new gap sealing tape.
- 49) Check the condition of the gap sealing tape on for the ailerons and elevator. Remove old tape residue and re-tape if necessary.
- 50) Clean the canopy with water, plexiglass cleaner and clean cotton rag (microfiber cloth is preferable).
- 51) Replace horizontal stabilizer trolley into trailer and secure.
 - a. Trailer #3: No horizontal stabilizer trolley.
- 52) Return fuselage trolley and any other assembly/disassembly equipment and materials to trailer and close up.

Grob Twin Astir Glider De-Rigging

Tools Required:

- Needle nosed pliers
 - Wire cutters (side cut)
 - Very large crescent wrench (for removing/installing oxygen tank)
 - Scissors
 - Tape residue remover
 - Water
 - Rags
 - Gap sealing tape
 - Chocks
 - Wing Stands
 - Aileron control rod tennis ball covers
- 1) Disengage the horizontal stabilizer storage trolley locking pins and remove the horizontal stabilizer trolley from the trailer. When handling the trolley, use extreme caution. It will tip over. Lash the trolley to the eyebolt on the left side of the trailer to secure it upright.
 - a. Trailer #2: There are three locking pins. There is one each at the center top, the bottom front, and one at the rear bottom.
 - b. Trailer #3: There is no trolley. The horizontal stab is stored in the trailer overhead.
 - 2) Move glider into position with nose towards trailer, position approximately 10' from trailer door.
 - a. Trailer #2: Place the glider 30 feet from trailer door. The extra distance is necessary to allow maneuvering the wings. This is explained later.
 - 3) Verify rudder lock installed on the glider.
 - 4) Keep rudder lock installed on the glider.
 - 5) Pull fuselage dolly out of trailer.
 - a. Trailer #2: Roll the fuselage dolly so it is positioned firmly under the nose of the glider.
 - b. Trailer #3: Roll the fuselage on dolly rearward until the rear dolly wheels contact the stops on the end of the loading ramp.
 - 6) Pull fuselage onto dolly. Pull dolly aft until it is very secure and the front wheels of the dolly are lifted off of the ground.
 - 7) Wing support slings:
 - a. Trailer #2: Pull the slings/choke collars all the way to the open door of trailer in preparation to hold the wingtips.
 - b. Trailer #3: Remove wing support stands from trailer and slide into place on the glider wingtips.
 - 8) Place wing stands under wingtips.
 - 9) Remove all gap sealing tape with the exception of the tape at the aileron and elevator gaps.
 - 10) Remove all tape from main wing root to fuselage gap. Clean tape residue.
 - 11) Remove tape at the horizontal stabilizer to elevator gap. Clean tape residue.
 - 12) Remove all tape from tailplane lockdown bolt cover. Clean tape residue.
 - 13) Obtain wire cutters and needle nose pliers.
 - 14) Use three individuals to remove the horizontal stabilizer/elevator.
 - 15) Open tailplane lockdown bolt cover and unscrew lockdown bolt by unscrewing locking bolt counter-clockwise.
 - 16) Pull locking bolt to full forward position.

- 17) Loosen horizontal stabilizer by shifting the stabilizer forward, then lift the rear to expose the elevator connection.
- 18) Clip safety wire from elevator control rod connection, remove the wire. Then release the quick disconnect.
- 19) Fully remove horizontal stabilizer and place in storage rack (place with leading edge down). When handling the trolley, use extreme caution. It will tip over. Lash the trolley to the eyebolt on the left side of the trailer to secure it upright.
 - a. Trailer #3: The horizontal stabilizer is stored inside the roof of the clamshell door.
- 20) Remove the front and rear canopies. Remember to detach the safety lanyards first. Safely set aside.
- 21) Remove aft headrest.
- 22) Remove all loose objects and accessories (ballast, cushions, oxygen tank, batteries, etc.) from cockpit and baggage area.
 - a. If the oxygen tank is installed, remove it. Check the latest date stamped on the tank. If date is older than 5 years, do not re-install tank in glider. It must be tested prior to use.
- 23) Lock the spoilers.
- 24) Open access panel in back and disconnect four control surface fasteners (ailerons and spoilers)
- 25) Loosen strut locknuts (front and rear) for the left wing. Slide locking ring completely inward and twist so ring remains in place.
- 26) Find four able bodied individuals to install the wings. Two people will be needed to lift and maneuver each individual wing root and two will be needed to lift and maneuver the wingtip. While manipulating the wing it is imperative to communicate all actions!
- 27) After removal, the wing will need to be rotated so that the tip enters trailer first, leading edge down.
- 28) Remove the left wing first. If necessary a slight up and down motion on the wingtip will help the wing slide out. USE CAUTION if moving the wingtip fore and aft. You may damage the wing root trailing edge in doing so.
- 29) When the wing is removed from the glider, maneuver into position for storage in the trailer, leading edge down. If there is any wind, wait as long as possible to rotate the leading edge down.
 - a. Trailer #2: The wings are stored opposites sides of the trailer. i.e. The left wing is stored on the right side of the trailer.
- 30) Slide wing into wing sling and slide wing completely forward until wing completely fills sling. (it will act as an aileron control lock as well as a support.)
 - a. Trailer #3: There are no slings in the trailer. Place the individual support stands on the wings prior to placing the wings in the trailer.
- 31) With one or two people inside the trailer holding the wingtip away from the sidewall of the trailer, push wing all the way forward until wing tip passes the small stop on the main wing support at front to trailer (small lip). This lip stops the wing from moving forward when transported in trailer.
- 32) Repeat the wing removal for the other wing.
- 33) With two people lifting the fuselage (use the cockpit side gunnels), push the fuselage dolly rearward until the aft edge of the dolly is 1" from the main gear doors. As before, the front wheels of the dolly will be slightly off of the ground.
- 34) Raise the main gear.
- 35) Remove all desired objects from front and rear side pockets.
- 36) Replace the front and rear canopies. Re-connect the safety lanyards.

- 37) Remove the total energy probe and place it in a safe/secure place in the front cockpit.
- 38) Place tape over the total energy probe orifice and the pitot tube opening.
- 39) Replace the oxygen tank.
- 40) Replace all headrests, fasten seat belts. If the battery is to be transported in the glider, secure it in the holding bracket behind the front seat.
- 41) Recover all tools from cockpit. A second individual must verify no unwanted objects are present prior to storing the glider.
- 42) Remove all desired objects from front and rear side pockets.
- 43) Place tennis balls on the end of either side spoiler control rods.
- 44) Make certain the fuselage is plumb vertically and roll the fuselage dolly up the ramp and into the trailer. USE CAUTION that the pitot tube does not contact the front brace of the doghouse on the top of the trailer.
 - a. Trailer #2: Prior to rolling the fuselage of the glider into the trailer, attach the mock Tost ring to the nose release hook of the glider.
 - b. Trailer #2: After the glider fuselage has been rolled into position in the trailer, attach the front chain to the Tost hook and tension modestly.
 - c. Trailer #3: The nose of the glider will not seat securely in the nose docking port of the trailer. Pad well to avoid damage.
- 45) The fuselage dolly will contact the wing roots unless the wings are pulled outboard while moving the fuselage forward.
- 46) Secure the tail boom with the tie down strap.
- 47) Replace horizontal stabilizer into trailer and secure. When handling the trolley, use extreme caution. It will tip over.
 - a. Trailer #3: No horizontal stabilizer trolley.
- 48) Return any other assembly/disassembly equipment and materials to trailer and close up.