

USA G-103 Twin II

Procedures for safe assembly and dis-assembly of
the glider

(Trailers 1, 2 and 3)

Grob Twin II Glider Rigging

Tools Required:

- Large blade standard screwdriver
- #2 (medium blade) Phillips screwdriver (if installing wheel fairings)
- Needle nosed pliers*
- Wire cutters (side cut)*
- Very large crescent wrench (for removing/installing oxygen tank)
- Scissors
- Short length of .041 safety wire (8") (for trim tab control rod fitting)*
- Tape residue remover
- Water
- Rags
- Gap sealing tape
- Canopy cleaner
- Chocks
- Wing Stands

*Not required for assembly of N228BG

- 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 #1: There is only one removable locking pin, located at the front of the trolley. Remove it and lift the rear of the trolley to clear. Roll trolley rearward to clear front hold down.
 - b. Trailer #2: There are three locking pins. There is one each at the center top, the bottom front, and one at the rear bottom.
 - c. Trailer #3: There is no trolley. The horizontal stab is stored in the trailer overhead.
- 2) Remove the tail boom tie down strap.
 - a. Trailer #1 does not have a tie down strap.
- 3) Roll the fuselage on its dolly out of the trailer, position will vary with each particular trailer.
 - a. Trailer #1: Release the fuselage dolly securing pins with the operating lanyard. Roll the fuselage rearward until rear dolly wheels contact stops on the end of the loading ramp.
 - b. Trailer #2: Place the glider 30 feet behind the trailer. The extra distance is necessary to allow maneuvering the wings. This is explained later.
 - c. Roll the fuselage on dolly rearward until the rear dolly wheels contact the stops on the end of the loading ramp.
- 4) Verify the main wheel fairing is installed.
 - a. If it has been removed and installation is desired, lift the tail boom while someone slides the wheel fairing in place. Secure the fairing with screws.
- 5) Remove the rudder lock.
- 6) Remove the front and rear canopies. Remember to detach the safety lanyard first. Safely set aside.
- 7) 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.

- 8) Remove rear seat back center cushion using standard screwdriver by unlocking Dzus fasteners imbedded in body of the cushion.
- 9) 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, push the locking sleeve outboard, then rotate so it stays in the unlocked position (pins not in slots).
- 10) 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.
- 11) Remove the fuselage hold down webbing.
 - a. Trailer #1: Remove fuselage-dolly holding straps. Retain the two fuselage-dolly securing bolts and wedge nuts in a safe place for use during de-rigging at a later time.
- 12) Push fuselage backwards in dolly so all wing-fuselage fittings are accessible and the dolly will not obstruct the installation of the wings. Cradle of the dolly should be just aft of the nose wheel.
- 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 surface 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.
 - a. 8BG will not require the safety wire. All connections are automatic.
- 29) Remove horizontal stabilizer from storage trolley. Ensure the lockdown bolt at the front of the horizontal stabilizer is pulled 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.
 - a. 8BG does not require a connection for the trim control rod or the elevator control rod. All connections are automatic.
- 32) After the 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 prior to replacing the rear seatback cushion.
- 37) Reinstall rear seatback cushion.
- 38) Reinstall both canopies. Attach the safety lanyards.
- 39) With an individual guarding each wingtip, slide fuselage backwards off the fuselage dolly.
- 40) Chock the main wheel.
- 41) Accomplish a complete positive control check, including the rudder.
- 42) 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.
- 43) Install battery. Check that the battery hold down plate and securing pin are functional.
- 44) Check tow release mechanism and wheel brake for proper function.
- 45) Check for proper tire inflation.
- 46) Check for proper and current paperwork in glider (airworthiness certificate, aircraft registration, weight & balance information, flight manual, equipment manuals, USA flight log).
- 47) Remove old tape residue from the wing root gap on both sides of fuselage. Install new gap sealing tape.
- 48) Remove old tape residue from the horizontal stabilizer to vertical stabilizer connection gap. Install new gap sealing tape.
- 49) Remove old tape residue from the cover for the lockdown bolt on the leading edge of the horizontal stabilizer. Install new gap sealing tape.
- 50) Check the condition of the gap sealing tape on the wheel fairings. Remove old tape residue and re-tape if necessary.

- 51) Check the condition of the gap sealing tape on for the ailerons and elevator.
Remove old tape residue and re-tape if necessary.
- 52) Clean the canopy with water, plexiglass cleaner and clean cotton rag
(microfiber cloth is preferable).
- 53) Replace horizontal stabilizer trolley into trailer and secure.
 - a. Trailer #3: No horizontal stabilizer trolley.
- 54) Return fuselage trolley and any other assembly/disassembly equipment and materials to trailer and close up.

Grob Twin II Glider De-Rigging

Tools Required:

Large blade standard screwdriver
 #2 (medium blade) Phillips screwdriver (if removing wheel fairings)
 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

*Not required for assembly of N228BG

- 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 #1: There is only one removable locking pin, located at the front of the trolley. Remove it and lift the rear of the trolley to clear. Roll trolley rearward to clear front hold down.
 - b. Trailer #2: There are three locking pins. There is one each at the center top, the bottom front, and one at the rear bottom.
 - c. 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) Pull fuselage dolly out of trailer.
 - a. Trailer #1: Roll the dolly rearward until rear dolly wheels contact stops on the end of the loading ramp. Hold down attachment strips should be oriented to rear of dolly.
 - b. Trailer #2: Place fuselage dolly under nose of glider.
 - c. Trailer #3: Roll the fuselage on dolly rearward until the rear dolly wheels contact the stops on the end of the loading ramp.
- 5) Wing support slings:
 - a. Trailer #1 and #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.
- 6) If main wheel fairing removal is desired.
 - a. Remove tape from wheel fairing. Clean tape residue.
 - b. Remove wheel fairing securing screws.
 - c. Lift the tail boom while someone slides the wheel fairing from wheel.
- 7) Remove front wheel fairing if desired.
 - a. Remove tape from wheel fairing. Clean tape residue.
 - b. Remove wheel fairing securing screws.

- c. Remove fairing.
- 8) Pull fuselage onto dolly. Align dolly cradle slightly aft of nose wheel.
- 9) Place wing stands under wingtips.
- 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.
 - a. 8BG: Wire cutters and pliers are not needed.
- 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) Remove horizontal stabilizer by shifting the stabilizer forward, then lift to expose the elevator and trim tab connections. Disconnect elevator quick disconnect. Clip safety wire from trim tab connection, remove the wire and disconnect the fastener.
 - a. 8BG: There are no elevator or trim tab connections.
- 18) 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.
- 19) Remove the front and rear canopies. Remember to detach the safety lanyards first. Safely set aside.
- 20) 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.
- 21) Lock the spoilers.
- 22) Remove rear center seat back cushion using standard screwdriver by unlocking Dzus fasteners imbedded in body of cushion.
- 23) Open access panel in baggage compartment and disconnect four control surface fasteners (ailerons and spoilers).
- 24) Unlock main wing fittings on fuselage. There are two fittings under the baggage deck and two fittings behind the rear seat back cushion. For each fitting, slide the locking nut inboard and rotate so it stays in the unlocked position.
- 25) 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!
- 26) After removal, the wing will need to be rotated so that the tip enters trailer first, leading edge down.
- 27) 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.
- 28) 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 opposite sides of the trailer. i.e. The left wing is stored on the right side of the trailer.

- b. Trailer #3: Place the individual support stands on the wings prior to placing the wings in the trailer.
- 29) 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: Omit this step, the support stands have been previously installed.
- 30) Push wing all the way forward until wing root passes 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.
- 31) Repeat the wing removal for the other wing.
- 32) Pull fuselage forward on dolly.
- a. Trailer #1: Pull fuselage forward on dolly until metal straps may be secured in place with supplied fuselage-dolly securing bolts.
 - b. Trailer #2 and #3: Pull fuselage forward on dolly until rear bracket of dolly is approximately 1" in front of forward wing pin opening. Caution, fuselage is not very secure in dolly.
- 33) If removal of the main wheel pant is desired, remove tape at wheel pant and then remove securing screws.
- 34) Have one person lift the tail boom while another person slides the wheel pant out from around main wheel. Clean tape residue.
- 35) Replace and verify the security of all equipment/accessories in cockpit (ballast, cushions, seat belts, oxygen tank).
- 36) Recover all tools from cockpit. A second individual must verify no unwanted objects are present prior to replacing the rear seat cushion.
- 37) Re-install rear center seat cushion.
- 38) Reinstall front and rear canopies. Attach the safety lanyards.
- 39) Remove all desired objects from front and rear side pockets.
- 40) Remove TE probe from vertical stabilizer and store in secure/safe location in glider. Cover the TE probe opening with tape.
- 41) Install the pitot tube cover.
- 42) Roll fuselage attached to dolly up trailer ramp and into trailer.
- a. Trailer #1: The fuselage dolly has securing clips at the rear end of travel for the dolly. The dolly should snap in place when the dolly rolls all of the way forward. Be sure to check the security of the dolly, that it is locked in position. The locking mechanism may need to be held open with the operating lanyard while placing the dolly in the full aft position of the trailer.
 - b. 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.
 - c. Trailer #3: The nose cone of the fuselage will dock securely in the forward retainer when the fuselage is in the proper position.
- 43) Secure the tail boom tie down strap.
- a. Trailer #1: Tie down strap is not installed.
- 44) 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.
- 45) Return any other assembly/disassembly equipment and materials to trailer and close up.