Rigging Instructions for Grob Acro II (GDEWP)

Introduction:

Coming from the Astir “family” the Grob Acro 2 (EWP) has similar rigging components and, like Astirs, needs to be properly set up and aligned in order to facilitate a smooth and expeditious rig. This guide is a distillation of the things learnt from previous rigs and will hopefully provide a useful guide to anyone rigging this glider in future.

1. Preparing to Rig:

1.1 Pick an area of ground, to do the rigging, that is relatively level. Slope and uneven surfaces present a significant challenge when rigging this glider. This is because the tolerances on the spigots and sockets at the root end of the wings are extremely tight and both wings must be lined up such that each wing aligns perfectly with the other in terms of horizontal and vertical planes where the respective spigots/sockets engage.

1.2 Wind the jockey wheel up such that the two lugs on the rear of the trailer rest on the ground. The aim is to get a straight, gentle slope along the rails. Slide the fuselage out of the trailer making sure to have a couple of helpers to carry the rear fuselage far enough for the tail wheel to touch the ground without the underside of the fuselage scrapping on the trailer rear edge. A double-handled strap has been provided to facilitate this (Figure 1). Wrap it once round the rear fuselage just forward of the fin and use the handles to easily lift the rear out and back until the tail wheel is safely on the ground.

1.3 Keep the fuselage on the belly dolly in the upright position so that the main wheel remains clear of the ground thus minimising the likelihood of unwanted fuselage rotation in the dolly. Hold the fin, look to the front for reference and straighten up the fuselage if required.

1.4 Remove all loose objects and accessories (total energy/pitot probes, parachutes, cushions, batteries, etc.) from the rear cockpit and baggage area.

1.5 Open the access panel on the floor of the baggage compartment. Remove rear seat back centre pad using a standard screwdriver by unlocking the Dzus fasteners. Unlock the Dzus fastners on the seat pads either side and pull the pads forward from the top to enable access to the wing-fuselage fittings. There are two fittings on either side of the fuselage under to baggage deck (rear fittings) and two fittings on either side of the fuselage behind the rear seat pads (front fittings).

1.6 For each fitting, slide the locking nut (threaded) inboard, push the locking sleeve outboard, then rotate so that it stays in the unlocked position (pins not in slots). Note these should all be in the correct position to start with but it is worth checking (Figure 2).

1.7 Ensure that the airbrake arms and control rods under the aft baggage deck are in the proper position. It will be impossible to rotate them to the proper position once the wings are installed.

1.8 Position wing trestles either side such that they will be ready to put under the wings when needed but not in positions that would interfere with sliding the wings out of the trailer and into position on the glider.

1.9 While wings are still in the trailer, wipe the main wing fittings clean. Also clean the wing fittings on the fuselage. Lubricate all spigots and sockets at the wing root and on the fuselage with a thin coating of grease. Use grease sparingly Figures 3 & 4).

2. Wing Rigging:

2.1 Find four able-bodied individuals to install the wings. Two people will be needed to lift and manoeuvre each individual wing root and two will be needed to lift and manoeuvre the wingtip. Whilst manipulating the wing it is imperative to communicate all actions. The right wing is installed first.

2.2 Slide the right wing from the trailer, roll it level. Manoeuvre the wing into the fuselage. 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 and line the spigots up with the sockets. It may also be necessary to lift or lower the front and/or back of the wing at the root end to line up the spigots/sockets. **KEEP FINGERS AWAY FROM THE GAP IF YOU WANT TO KEEP THEM!**

2.3 Get an observer to stand on the left side of the fuselage and get someone to raise or lower the wing tip until the end of the spar is more or less vertically central in the fuselage hole as viewed from the left.

2.4 Rotate the right wing, rear locking sleeve until the slot aligns with the pin and the sleave springs inboard to encapsulate the pin (Figure 5). Leave the front locking sleave undone to enable some positioning movement on the right wing should it be required when aligning with the left wing. Support the right wing with a trestle.

2.5 Slide out the left wing from the trailer, roll it level. Manoeuvre the wing into the fuselage moving it vertically as well as fore and aft in order to line up the spigots and sockets, including the spigot on the end of the right wing spar. The spigots at the end of each spar are the difficult ones. These mate with rose joints in the opposite wing (Figure 6). Rose joints are spherical and able to swivel. If the spigot is even slightly misaligned, they will do this and then the spigot will not enter. At this point it may be necessary to have one or two helpers manoeuvre the right wing tip to help line up spigots and rose joints/sockets from both sides. Have one person watching the two spigots as the second wing is mounted, one on the first wing tip, and make sure that both spigots are aligned both horizontally and vertically (by adjusting the position of both wing tips) before pushing the second wing home. It helps to have both wings resting on trestles so that the correct position can be maintained. Success is achieved with a satisfying clunk as the left wing slides into position. **At this point congratulate yourselves, the hard part is done!**

2.6 Rotate the remaining three locking sleaves until the slots align with the pins and the sleave springs inboard to encapsulate the pins (Figure 7). Secure and tighten all four wing-fuselage locknuts by rotating them clockwise on their threads. Get one person on each wing tip to pull the tips back so that you can further tighten the rear locknuts. Then get these persons to pull the tips forward so you can further tighten the front locknuts. Both wings are now securely in place.

3 Wing Control Connectors:

3.1 Whilst knelt in the rear fuselage facing rearwards, reach into the fuselage below the baggage deck and connect the two aileron connectors (rear) and two airbrake connectors (front). This is accomplished by pressing the slider on the top of each arm and sliding it back so that the pin underneath can be lifted up into the respective ring bearing on the wing side of the control arm. Once released the slider should move forward to prevent the pin from disengaging with the bearing.

3.2 Get a qualified person to independently check the four wing and four control connections before closing the baggage deck access panel and refitting the side and front pads on the rear seat.

4 Fitting the Horizontal Stabiliser/Elevator:

4.1 Use three individuals to install the horizontal stabiliser.

4.2 Remove the horizontal stabiliser from its location in the trailer ceiling. Ensure that the locking bolt at the front of the horizontal stabiliser is pulled completely forward.

4.3 Position the horizontal stabiliser above the fin and lower with the elevator angled upwards. Lower the whole assembly with one person watching and guiding the elevator housing onto the roller bearing at the top of the fin (Figures 8 & 9).

4.4 Gently lower and push back the stabiliser until it engages with the spigots in the fin. It is in the correct position when the red line on the left side of the fin aligns with the red line on the underside of the stabiliser (Figure 10).

4.5 Engage and wind in the locking bolt using its wingnut until it is fully in and just finger tight (Figure 11). The wing nut should be horizontal thus allow the fibreglass cover to be hinged up over it.

4.6 Place one finger vertically on the end of the stabiliser and gently rock it up and down to ensure there is no movement.

4.7 Get a qualified person to independently check that the elevator connection housing is properly located on the roller bearing. The tailplane is now securely in place.

5 Completion Activities:

5.1 Tape up the wing roots and tailplane/fin joints.

5.2 Fit the pitot tube (top) and total energy tube (bottom) on the front of the fin. Use wing tape to secure the joint on the pitot, the total energy tube has a rubber seal.

5.3 Get a qualified person to help you do positive control checks then note the logbook that a rig and positive check has been conducted.

5.4 Lower the belly dolly and slide the glider backwards to clear it.

5.5 Put the belly dolly in the trailer and secure.

CONGRATULATIONS, RIGGING COMPLETE

Points to Note on De-Rigging:

1. Remove tape from wing roots and tailplane/fin.

2. Remove pitot tube and total energy tube and place in front cockpit (closing the trailer lid with them still on the fin will damage them and the surrounding gel).

3. Manoeuvre glider onto the belly dolly such that the rear of the dolly aligns with the rear of the red pattern on the side of the fuselage. Use the tool (located in the trailer tailgate) to raise the belly dolly to the high position so that the fuselage no longer rests on the mainwheel.

4. Remove the tailplane and stow it in the ceiling of the trailer.

5. Remove the central pad and undo the side pads on the rear seat. Open the baggage area floor panel.

6. Disconnect all four controls (2 x ailerons and 2 x airbrakes). Unscrew the nuts on all 4 wing mounts, slide the sleaves outwards so that the clear the pins then rotate them so that the pins can't drop back into the sleave grooves. **If you don't do this the wings will remain attached regardless of pulling.**

7. Remove the wings in any order. Note when sliding the starboard wing into the trailer it may be necessary to get a couple of helpers to lift the root end slightly to clear the felt leading edge holder half-way down the trailer. Put the aileron locks on both wings.

8. Slide the fuselage into the trailer, lifting the tail with the double-handled strap to ensure it goes in without scraping the underside of the fuselage on the trailer floor. Roll the fuselage forward until the tail wheel drops into its retaining hole then secure with the strap.

9. Remember that the trailer is an Anschau, not a Cobra, so the roof must be lowered before the tailgate is lifted. This is because the tailgate engages in the two spigots on the back of the roof.

Helpful Photos:

Figure 1

Figure 2

Figure 3

Figure 4

Figure 5

Figure 6

Figure 7

Figure 8

Figure 9

Figure 10

Figure 11