

Fuselage Dolly Considerations.

By Bill Vickland

A fuselage dolly is essential to a two-person assembly/disassembly process. Also, if the dolly permits the fuselage to stand unattended, it can eliminate the need to place the wings on the ground while the fuselage is being loaded. Thus, a well-designed dolly will speed the assembly and disassembly process greatly.



The design requires two 1 & 1/5 inch angle rails welded to the trailer frame. It will also require some kind of latch to hold the dolly assembly to the trailer. No attachments are therefore required between the fuselage and the trailer directly. A small hand winch can be installed to crank the fuselage into position, which will be required if the wings are already mounted on the trailer.

My first attempt at a dolly design used an approach like those you would see in glass-bird trailers. It included a large semi-circular padded four-wheeled dolly that was difficult to extract the fuselage from. That is not the way to go. My recent design includes the following features, which eliminate the sequence of problems in my early designs.

1. The fuselage rests on the skid rather than the tire so that the distance between the dolly and the fuselage does not change with tire pressure. Without this, undue stress is applied to the connecting links and the securing pins in the spar carry-thru. The roller in the center of the picture will lift the skin free of the channel iron frame that the skid rides in.



2. The dolly is equipped with two 4x4 inch pads that hold the fuselage upright when the wings are not installed and the restraining arms are not connected. This permits the fuselage to stand alone after both wings have been removed. However, it also means that you will need a wing stand to hold the one installed wing if you want to make this a two man operation. The pads should not be in direct contact with the fuselage. You don't want any friction when you roll the fuselage off of the dolly.



3. An aluminum restraining bar is used within the main spar carry-thru with a consistent downward force applied to the bottom of the carry-thru rather than either the rear carry through or the guide pin holes in the carry through. My carry through bar is made from the scrap 3 x 3/8 aluminum I used to make the metal skid for the glider. I use pins in the guide holes in the carry thru to secure the bar, but the entire load is downward on the bottom of the carry-thru. I would not recommend the use of the rear spar carry-thru as is done on the Schweizer trailers especially those that use only the short stub that looks like the rear spar fitting. I have seen damage to the tubing that results from fuselage rocking, which is aggravated by a soft tire that permits some slack in the system.



4. Two restraining arms are attached to the carry through bar with quick release pins or tractor pins. The arms swing clear of the lower surface of the wing when the wings are attached. This permits the fuselage to be rolled off of the dolly without making contact with the wings or fuselage.

5. The dolly uses two load carrying solid rubber tires located directly under the fuselage restraining bar, rather than four tires. Thus, the whole fuselage/dolly system can be maneuvered by lifting the elevators inboard leading edge. With a four-wheeled dolly, where the forward wheels are forward of the restraining arm attach point, the lifting load on the elevator is increased substantially. This is most notable as the fuselage is rolled from level ground onto an inclined trailer. The two small wheels on the dolly only support the dolly when it is not holding the fuselage. This makes it easier to roll it in and out of the trailer and across the ground.



6. A foot operated lever with a roller wheel in contact with the skid lifts the skid up from the dolly channel and permits the fuselage to be up from the dolly. The roller wheel lever applies about a 10 to 1 mechanical advantage, so you will be exerting about 40 pounds of force to lift the fuselage from the dolly. This allows the fuselage to clear the two saddle pads and the channel that supports the skid. The picture shows the lever lifting the fuselage.



After the fuselage is lifted from the dolly, leave your foot on the lever and push back on the wing until the fuselage is separated from the dolly.



7. An additional feature that secures the tail of the 1-26 without having to install a tailwheel tie-down bolt will also simplify loading and unloading the glider. This consists of a bracket that is just wide enough to hold the tail wheel assembly, but still grabs the two nuts on the tail wheel axle. In another design, I have also modified tail wheel axle that included two 3/8 extensions, one on each side of the axle. The Schweizer trailer has a six inch wide channel to roll the fuselage on without a dolly. I cut a two inch slot in the channel about 8 inches long that allowed the tail wheel assembly to drop into the slot, and then added two pieces of flat stock that trapped the tail wheel axle as the fuselage moved forward. The tail wheel rested on the piece of channel from the center that was bent down about two inches and re-welded. At some point in the future, I will get a picture of this and include here if anyone is really interested.

