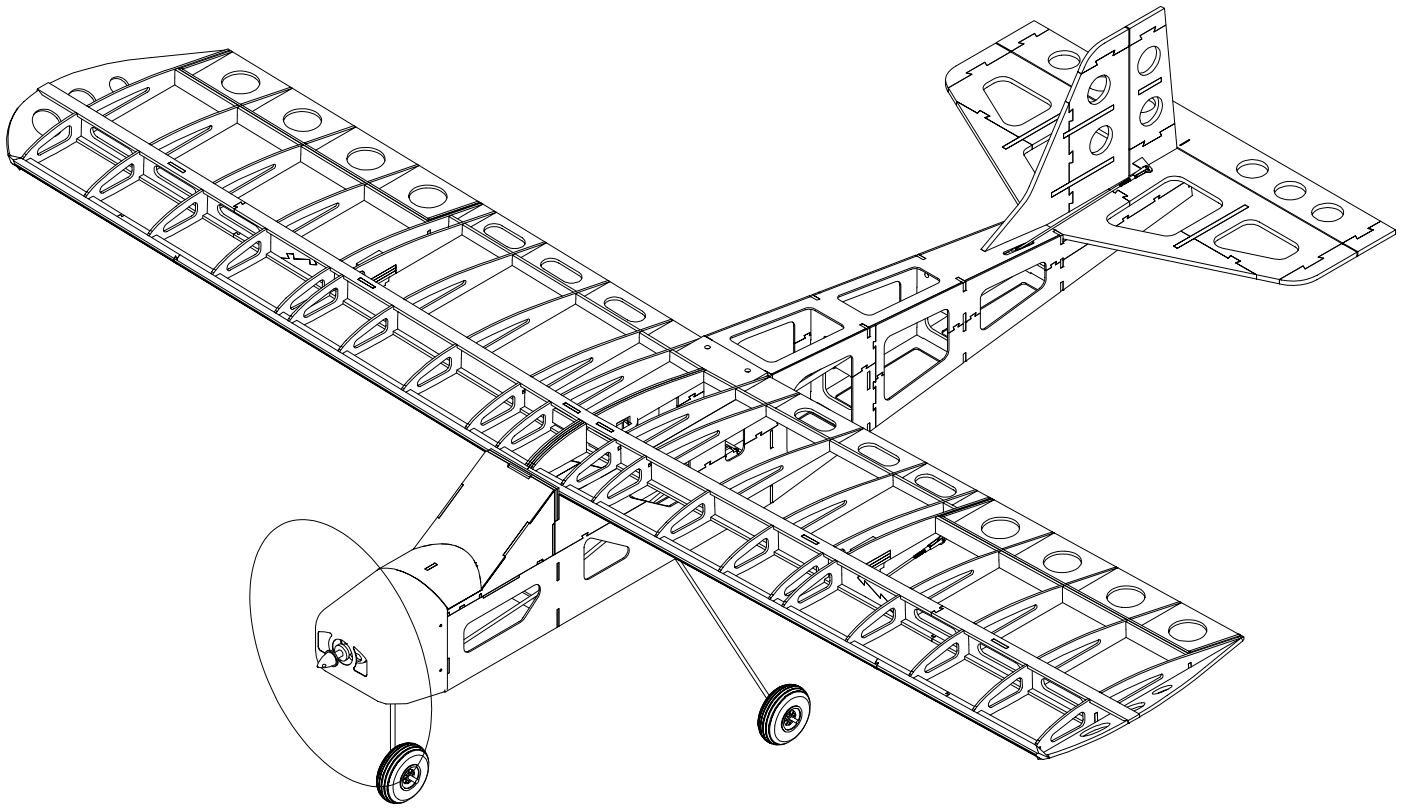
MOLT MODELS

SPECIALIZING IN PARKFLYER WARBIRDS...EXCELLING IN TRAINERS



Tyro150

Molt Models Background Design Philosophy

When I was first introduced to this hobby in 1985, the first plane my Dad and I flew was one of the typical .40 sized glow powered trainers still available today. Since then however, technological advances in both electric motors and batteries have completely changed the look of radio controlled model airplanes. These changes also brought forth a completely different style of trainer airplane. Many of these new electric powered trainers are wonderfully stable and easy to fly. However, in my opinion, they lack flight characteristics that I associate with the typical .40 sized glow powered trainer that truly prepare the novice pilot for the next level of flying. The Molt Models Tyro150 contains all the capabilities associated with the typical .40 sized glow powered trainer, but includes the simplicity of electric flight and a much lower wing loading.

The Molt Models design philosophy is comprised of methods that enhance appearance and all around flight performance. The first thing you'll notice about a Molt Models kit is that the majority of wood parts, illustrations and plans are CAD based. These items are derived from the same 3D modeling environment that the plane was designed in. My goal is to cut down on wordy instructions and use a more visual approach that will get you from kit to airborne in as little time as possible.

Molt Models Tyro150

Thank you for purchasing the Molt Models Tyro150. This kit represents a true first in 4-channel electric trainers in that it possesses characteristics that make it both enjoyable to build and more importantly, fly. I sincerely hope that you enjoy your new Molt Models kit. Please visit us at www.moltmodels.com for updates and information on future kits.

Manual Revisions

Rev 0- Initial release

Molt ModelsTyro150 Specifications	
Length:	45.5 in
Wing Span:	54 in
Wing Area:	558 in^2
Flying Weight:	37.0 ~ 45.0 oz
Wing Loading:	9.52 ~ 11.61 oz/ft^2
Power System:	150~250 W see next section of manual)
Functions:	Aileron, Elevator, Rudder, & Throttle
Battery Pack:	3S1P, 1200mAh or larger Lithium Polymer

Components you will need to complete the Tyro150 kit:

- (1) Power system
  - Motor Type = Radial mount brushless outrunner
    - *Power = 150~250 W*
    - *Kv = 1000~1250 RPM/Volt*
    - *Weight = 2.5~3.5 oz*
    - *Propeller size = 10x5~12x6*
  - ESC Type = appropriate for selected motor
  - Battery connector = appropriate for selected motor
- (1) Receiver
  - *4-channel receiver with Y-harness*
    - *Or*
  - *6-channel receiver (flaperon setup)*
- (2) 12" servo extensions (for aileron lead extensions through wing)
- (4) Servos (HS-81, HS-81MG, HS-85BB, HS85MG or equivalent)
- (2) Rolls of Solarfilm covering

Supplies and tools you will need to complete the Tyro150 kit:

- Hobby knife and blades
- Ruler
- Covering iron
- Fine tip ink pen
- Fine/medium sand paper
- 5-minute epoxy
- Thin CA glue and fine extension tip
- 40W soldiering iron
- Soldier paste/flux
- Soldier

General model building tips, orientation, and how to use this manual

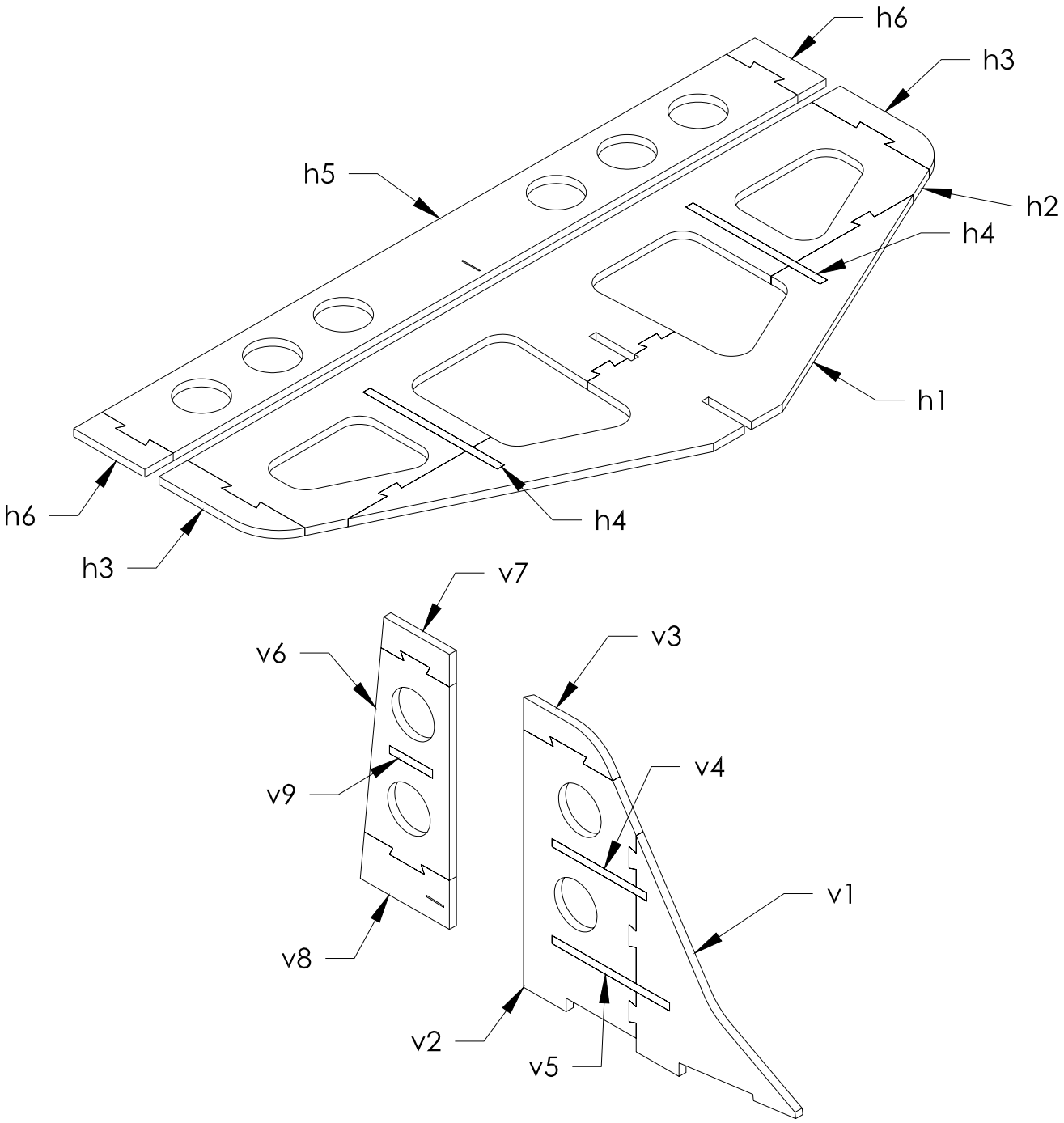
First and foremost, this kit **is** for the first time wood kit builder. However, it is still important that you study this manual and get help from an experienced builder if you run into trouble. **Please be sure to read through the following instructions before attempting to build your Tyro150.** Having a good idea of what to expect as you progress will cut down on mistakes and allow you to better organize your project. Checkboxes have been provided in front of each step, allowing you to easily keep track of your work.

Thin CA glue is suitable for almost all the build sections of this model. If another type of glue is necessary for a certain build section it will be recommended in that segment.

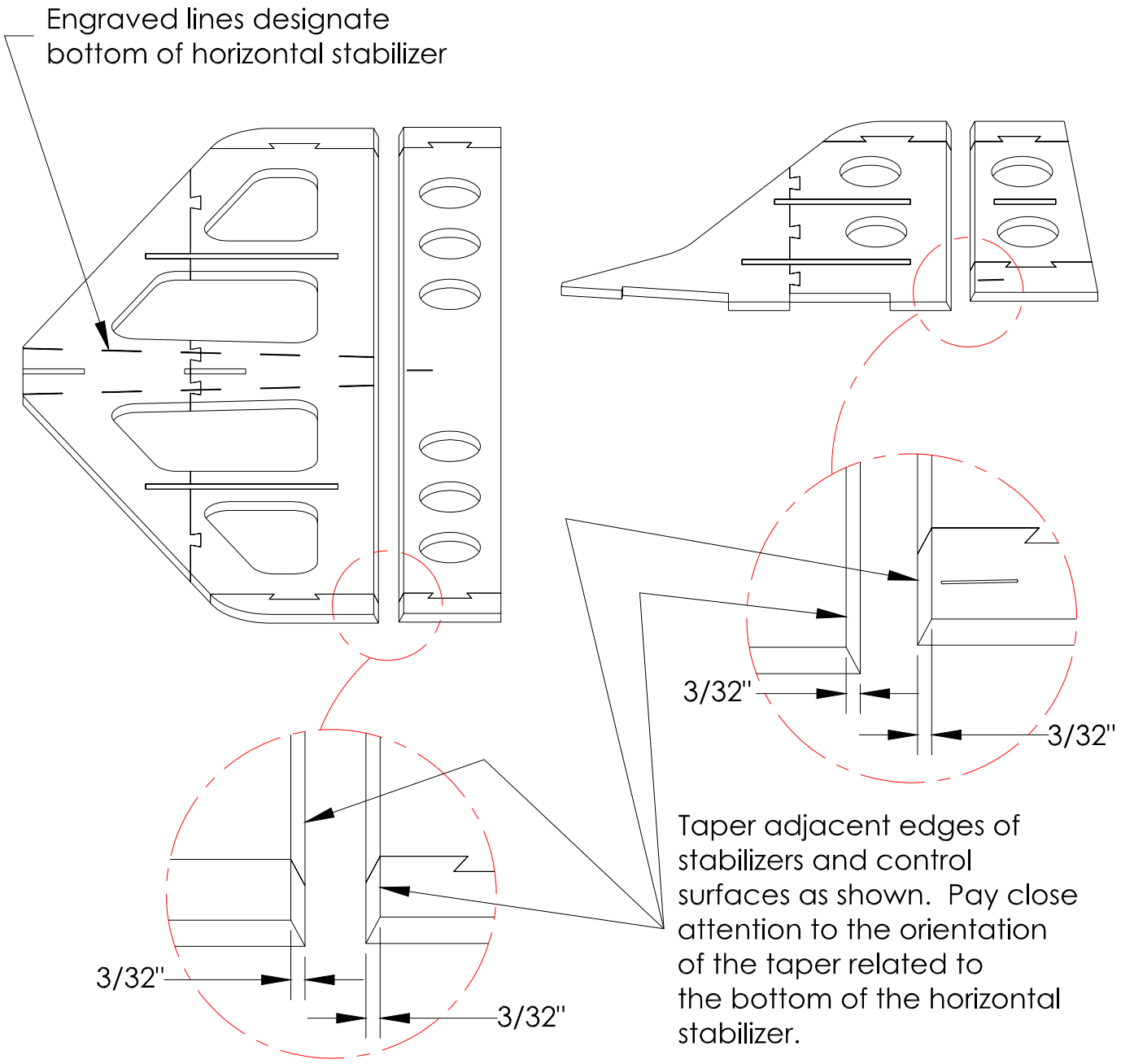
Standing behind the plane orients the left and right side of the model. These building instructions refer to areas of the model in this manner. All dimensions are presented in English units.

Each section of this manual is organized by showing portions of the plane being built from general construction all the way to covering. However, most experienced builders prefer to completely build each component to the point where it is ready to be covered, build the next components, and then cover all the components at the end of the building process. Feel free to use the checkboxes to help keep track of where you are in the building process regardless of which method you choose to follow.

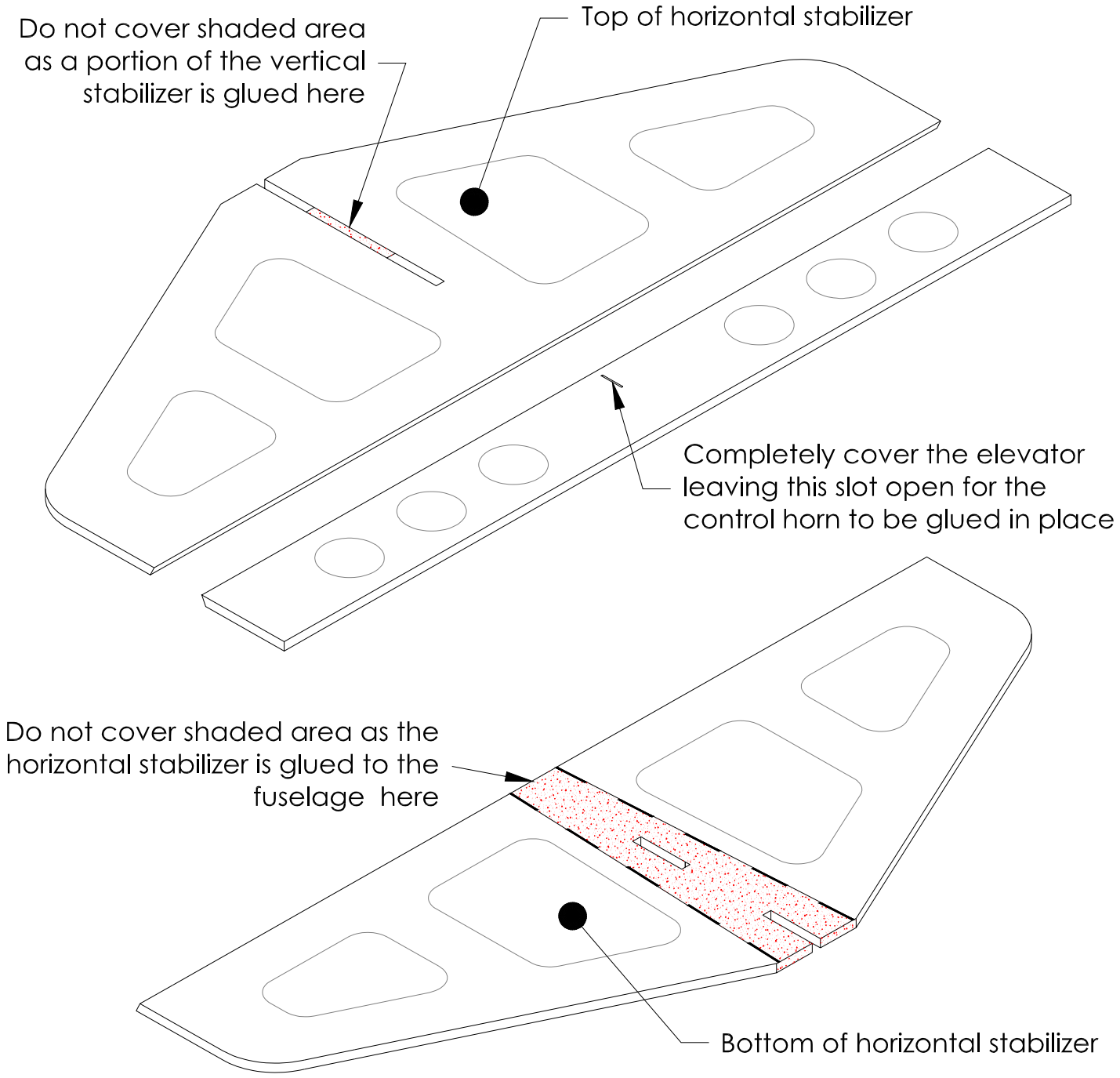
❑ Horizontal stabilizer, vertical stabilizer, elevator, and rudder construction



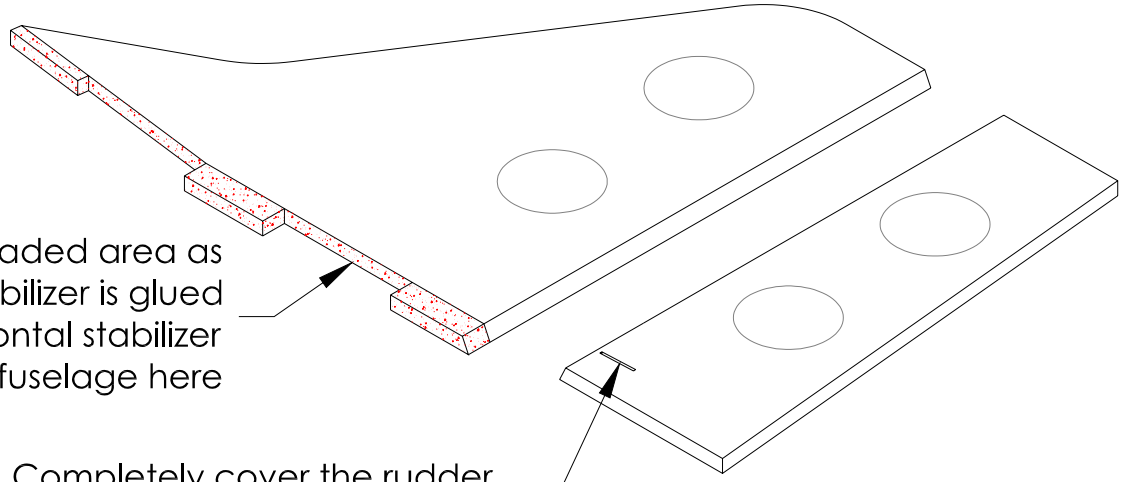
❑ **Horizontal stabilizer, vertical stabilizer, elevator, and rudder sanding** (for covering hinges)



❑ Horizontal stabilizer, vertical stabilizer, elevator, and rudder covering

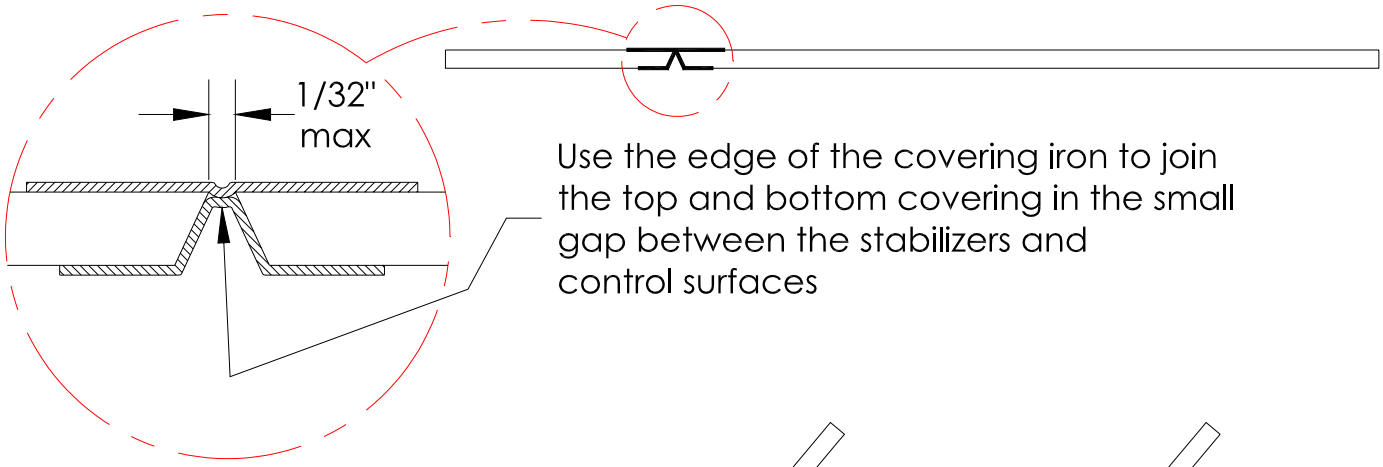


❑ Horizontal stabilizer, vertical stabilizer, elevator, and rudder hinging

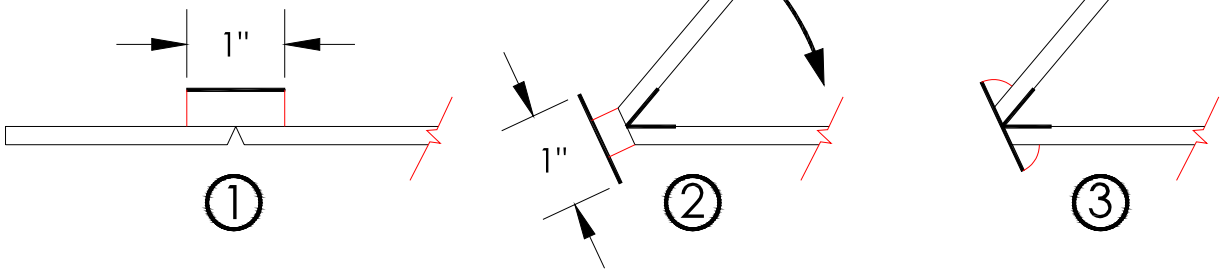


Do not cover shaded area as the vertical stabilizer is glued to both the horizontal stabilizer and fuselage here

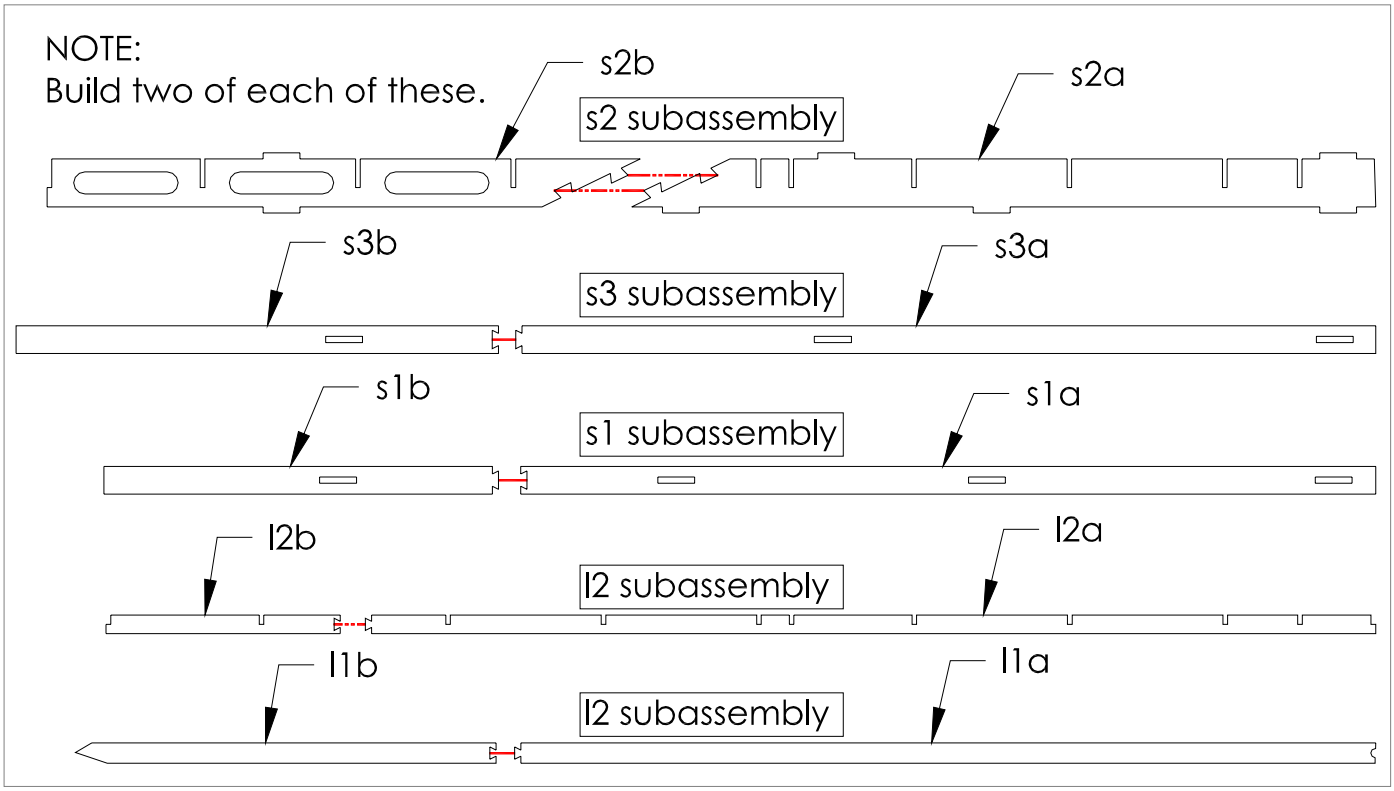
Completely cover the rudder leaving this slot open for the control horn to be glued in place

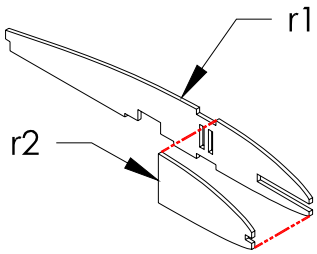


Use the edge of the covering iron to join the top and bottom covering in the small gap between the stabilizers and control surfaces

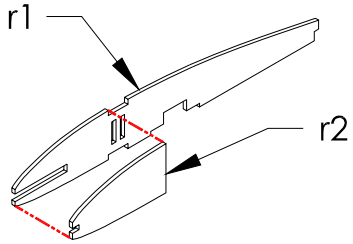


❑ Wing construction





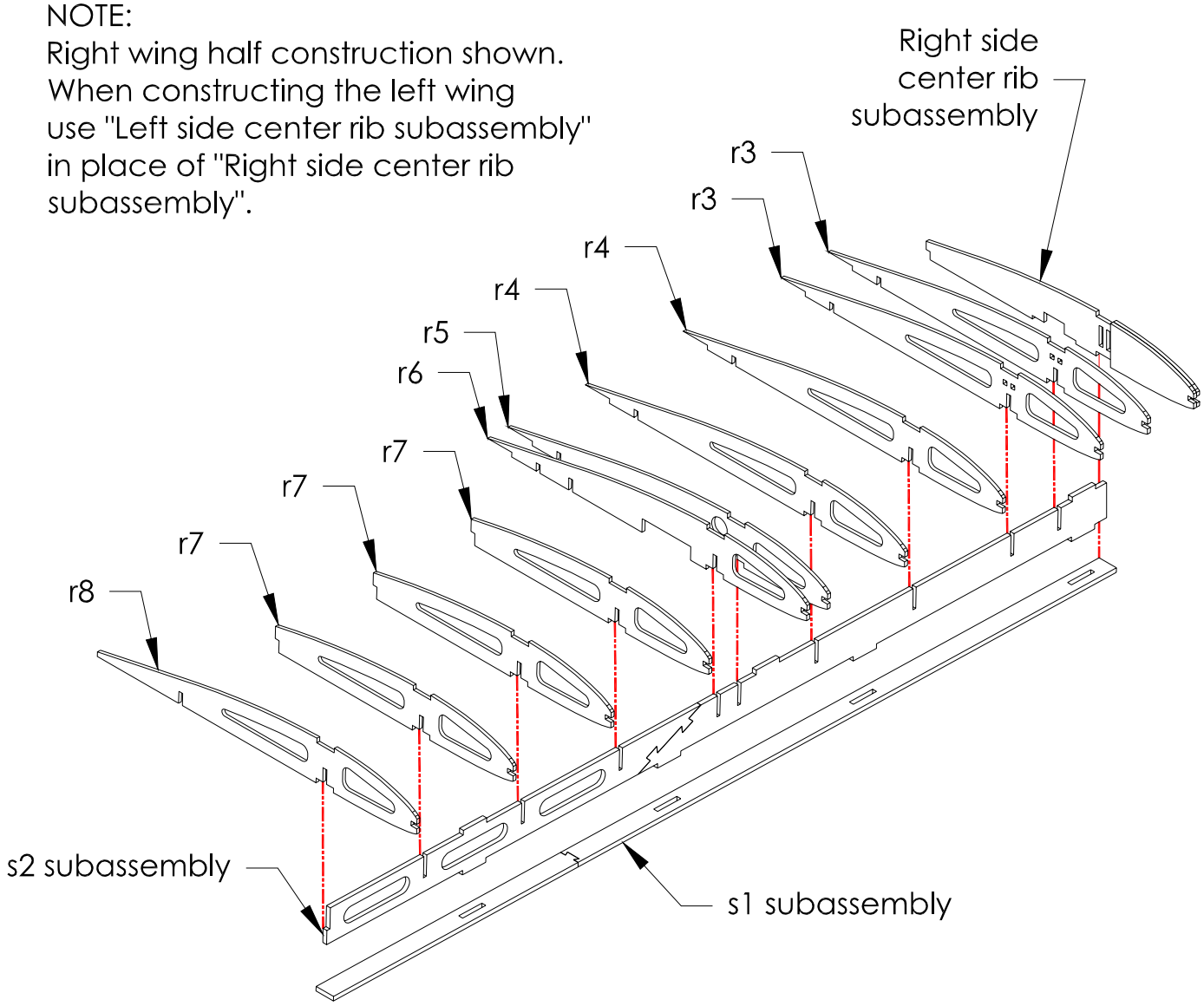
Right side center rib subassembly



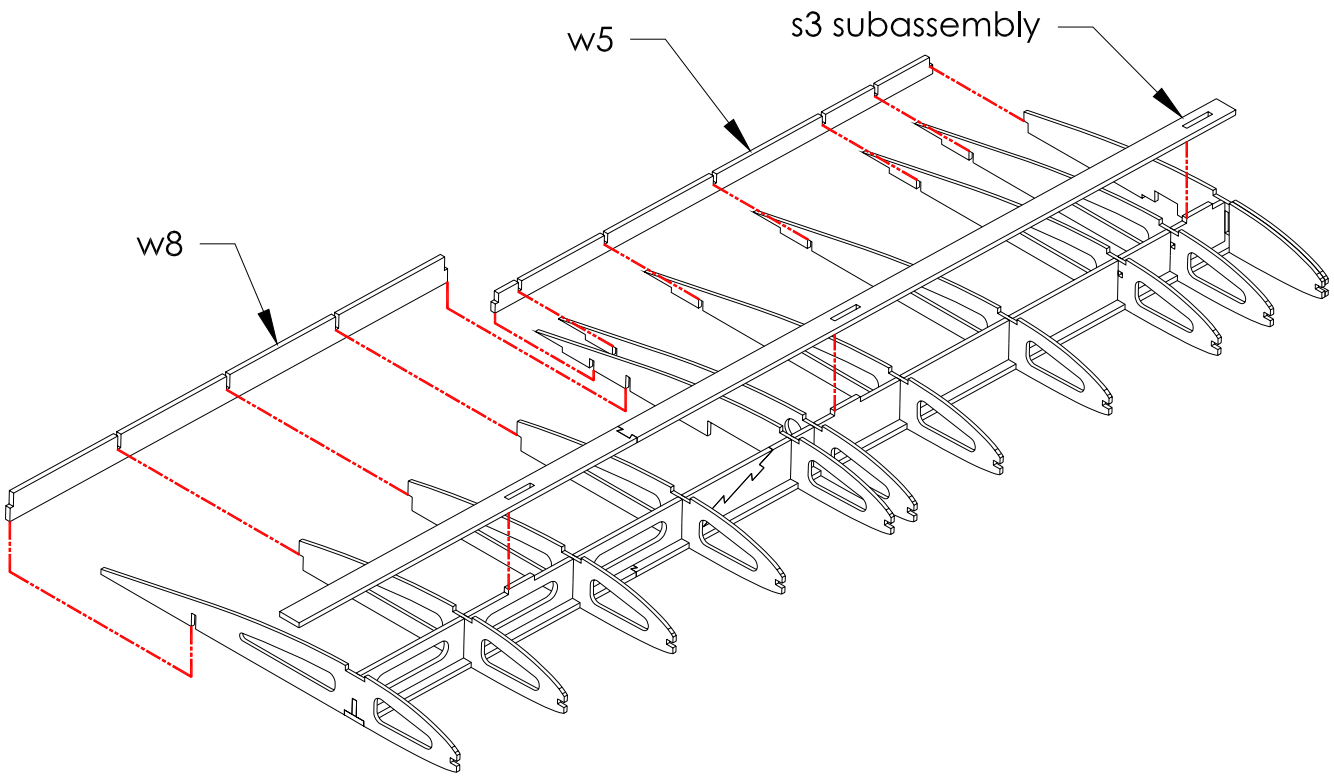
Left side center rib subassembly

❑ Wing construction (continued)

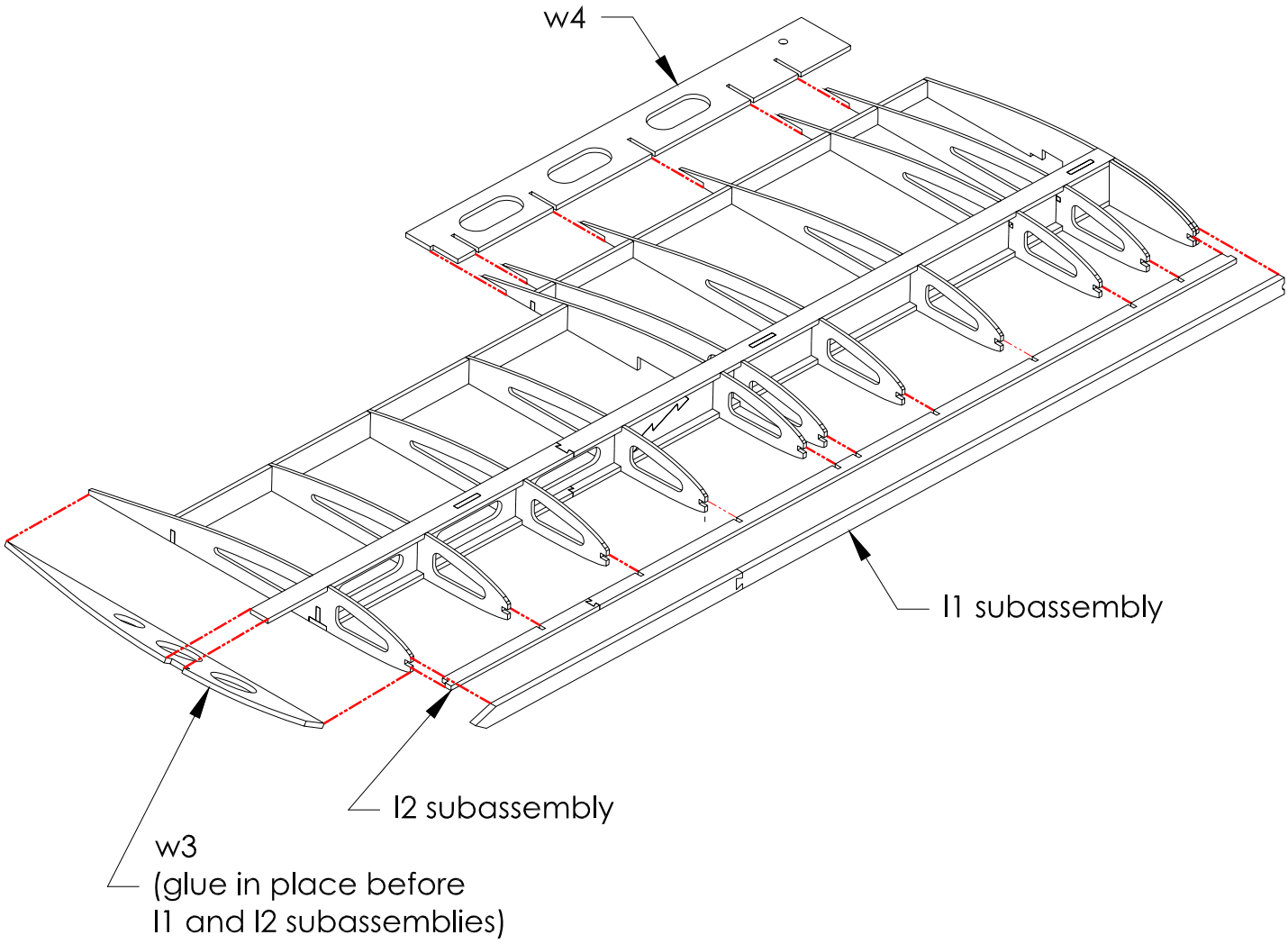
NOTE:
Right wing half construction shown.
When constructing the left wing use "Left side center rib subassembly" in place of "Right side center rib subassembly".



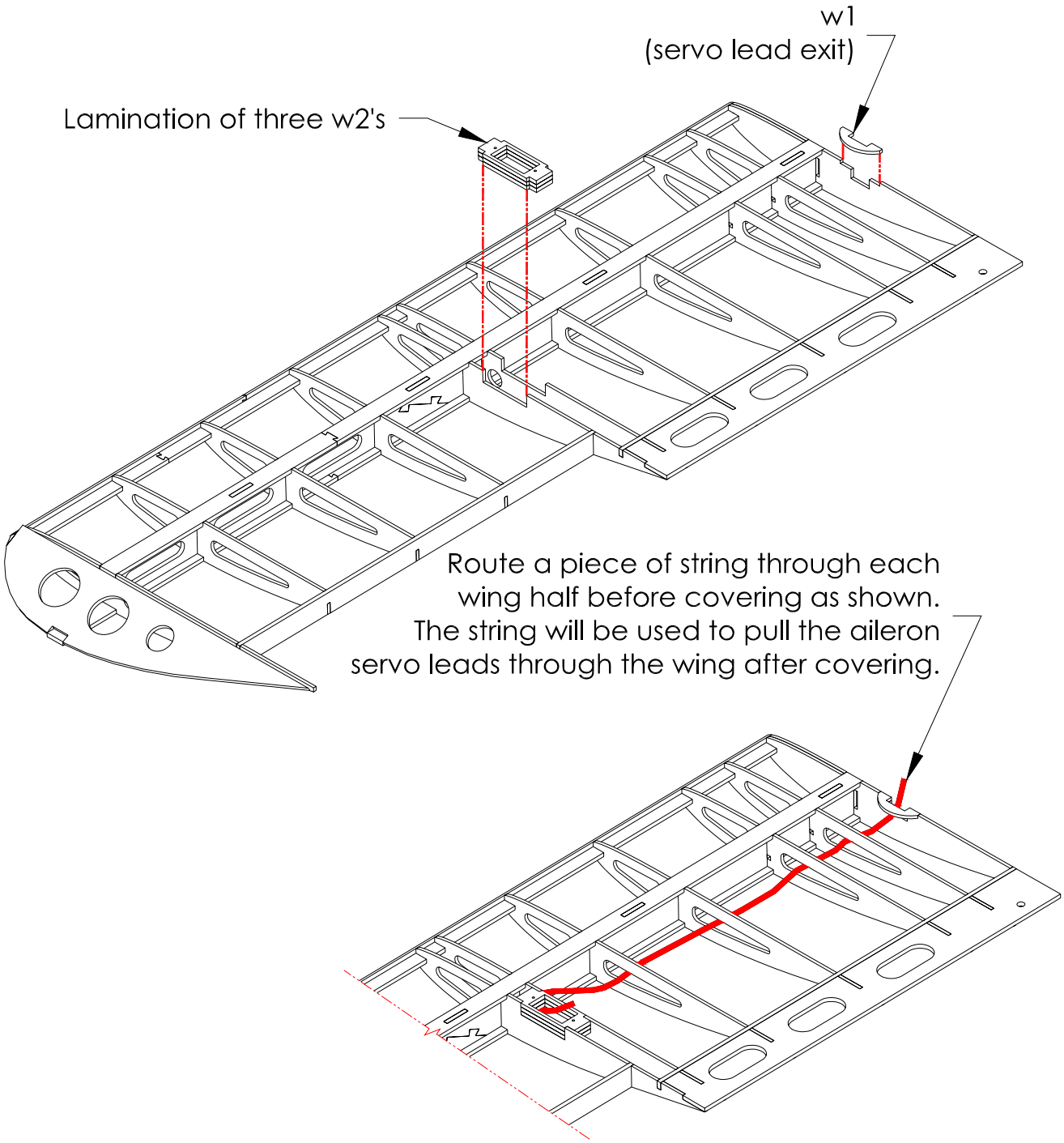
❑ Wing construction (continued)



❑ Wing construction (continued)



❑ Wing construction (continued)



❑ Wing construction (continued)

NOTE:
Be sure to build both right and left wing halves. They should be mirror images of each other

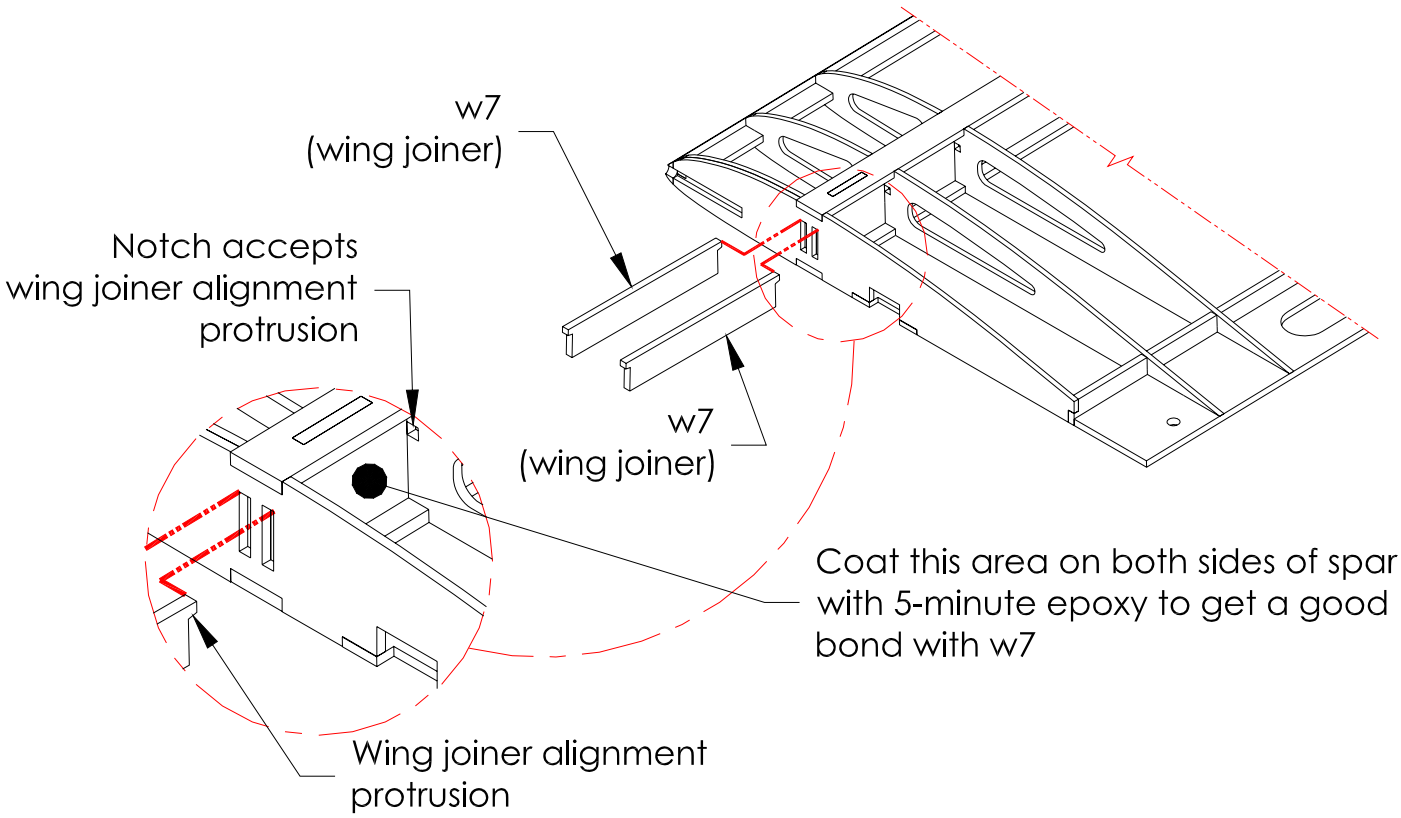
Right wing half

NOTE:
When both wing halves are complete, sand them smooth to remove any excess glue and high spots.

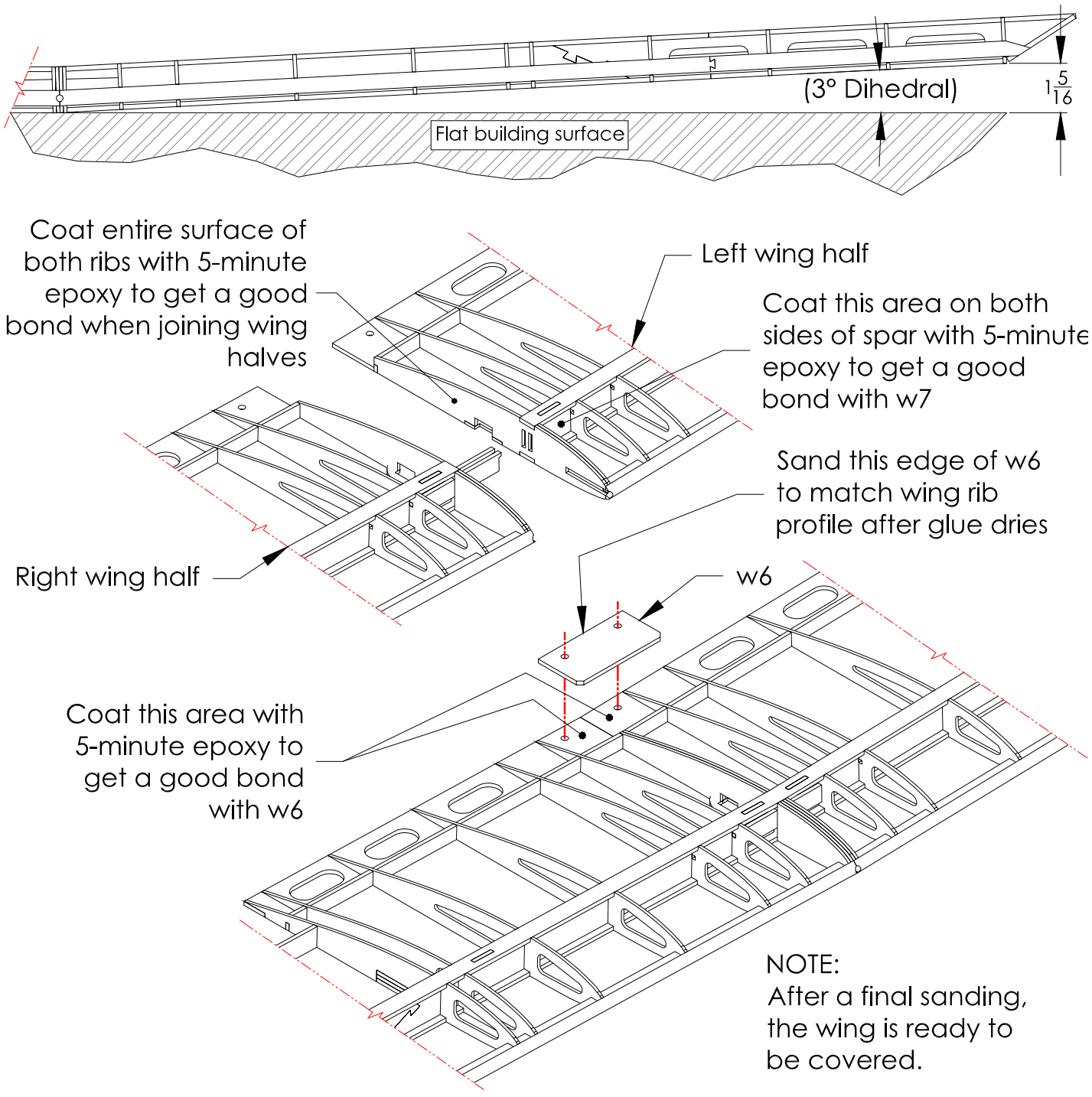
Left wing half

Sand the leading edge as shown, removing the shaded portions

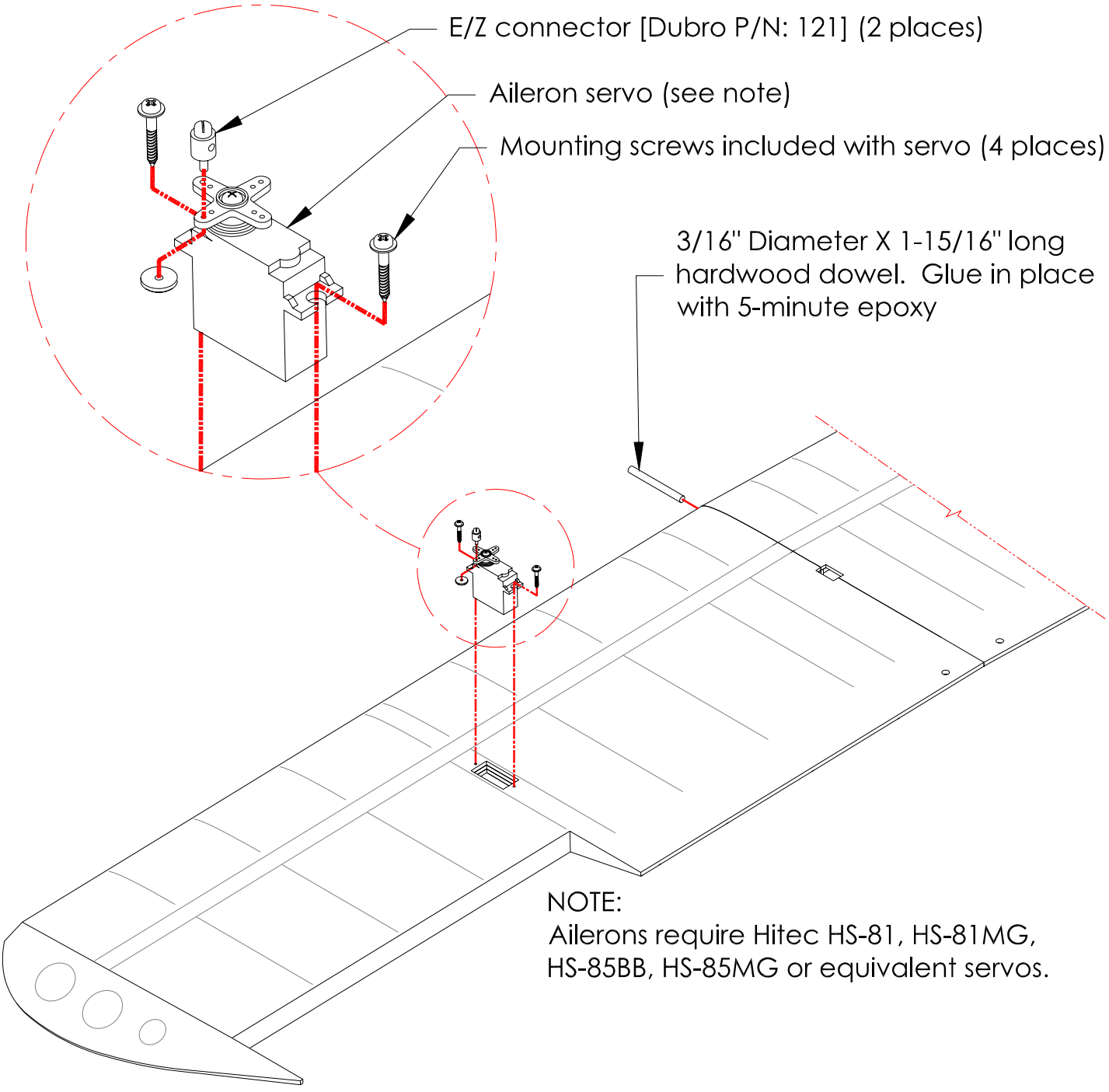
❑ Wing construction (continued)



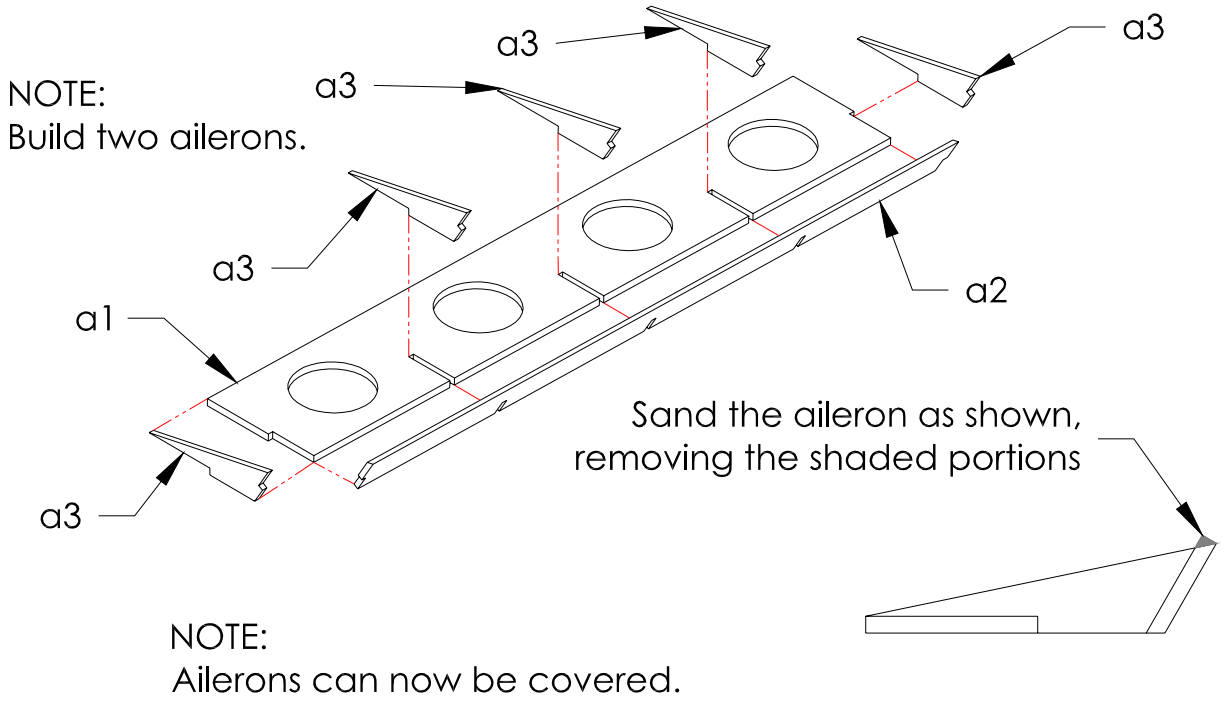
❑ Wing construction (continued)



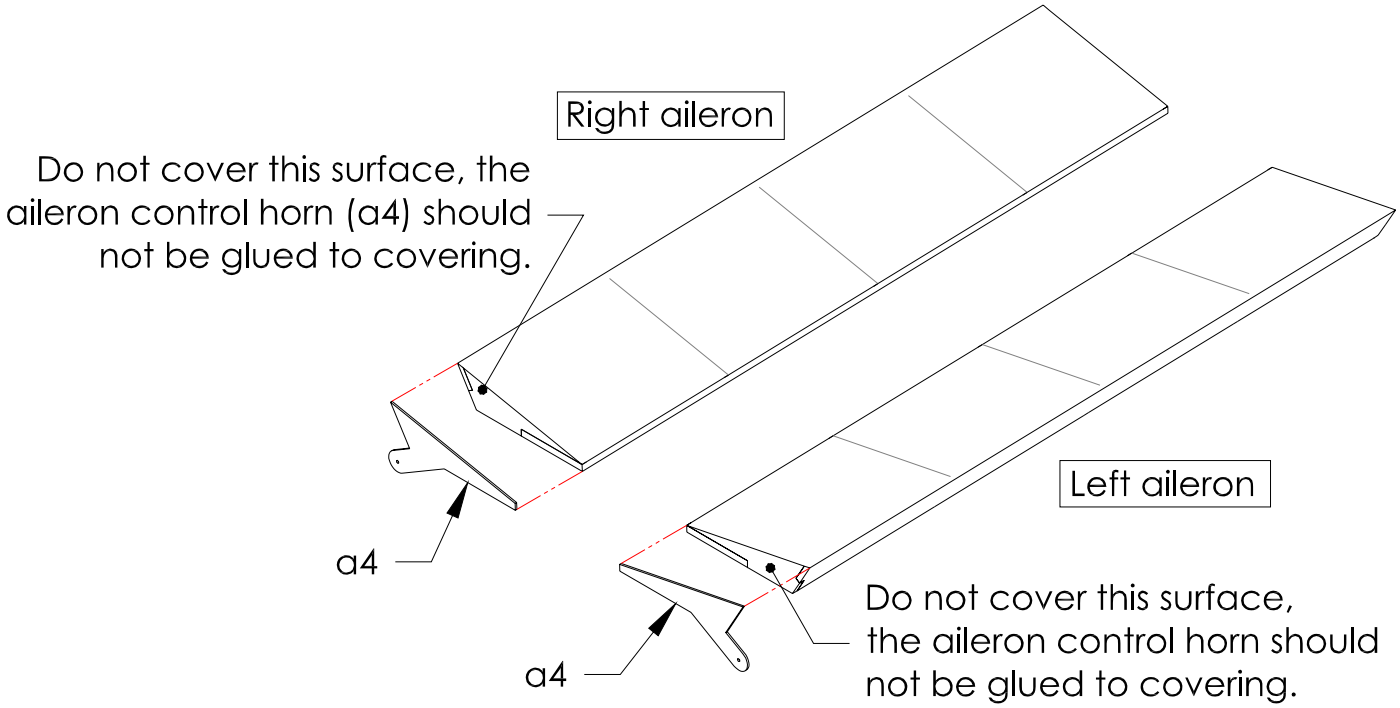
❑ Wing covering and hardware installation



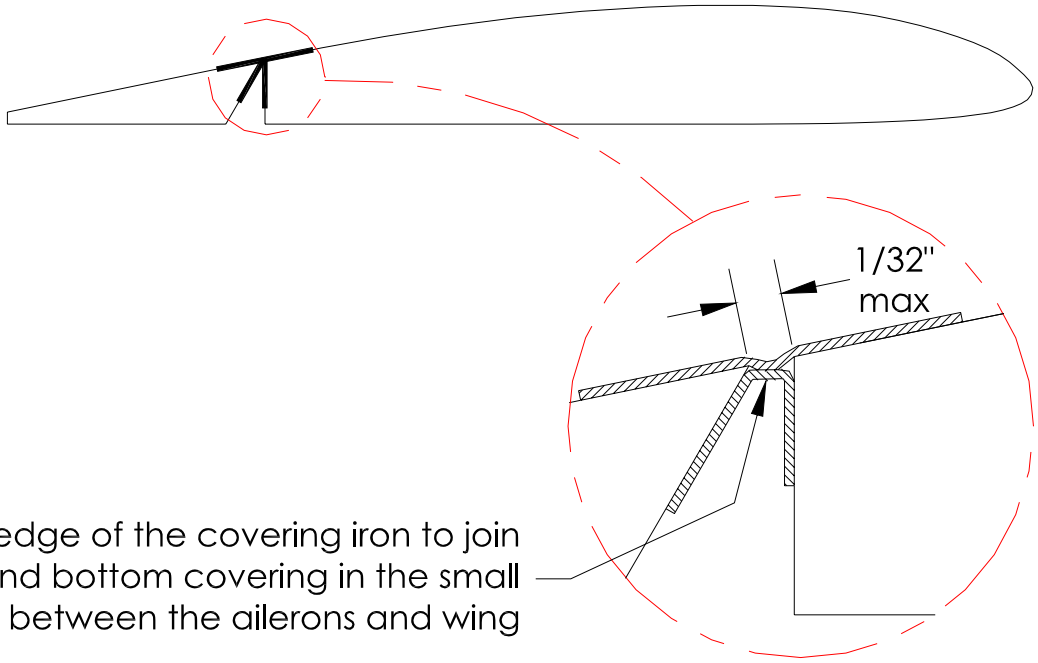
Aileron construction and covering



NOTE:
Ailerons can now be covered.

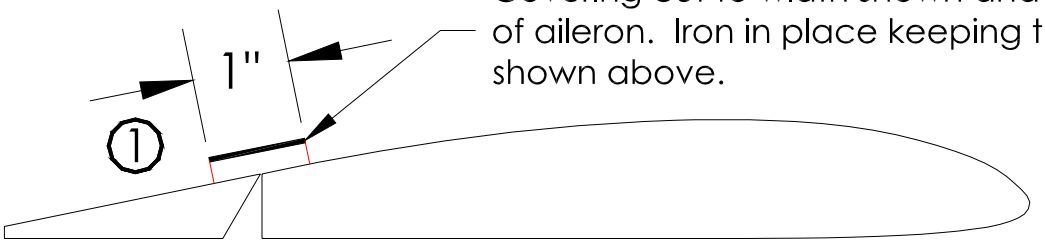


❑ Wing and aileron hinging

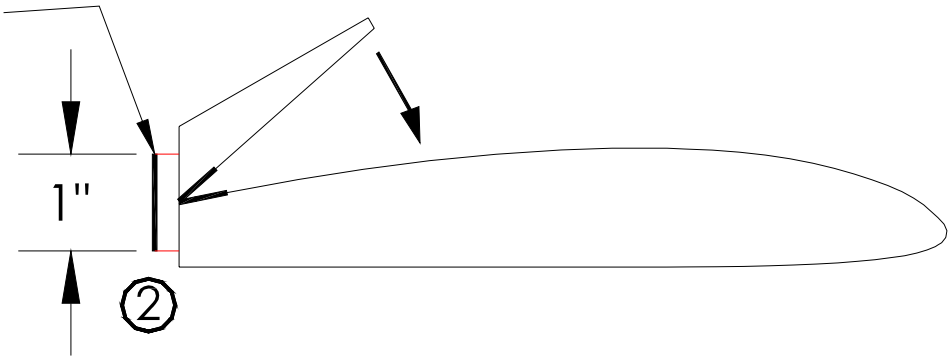


Use the edge of the covering iron to join the top and bottom covering in the small gap between the ailerons and wing

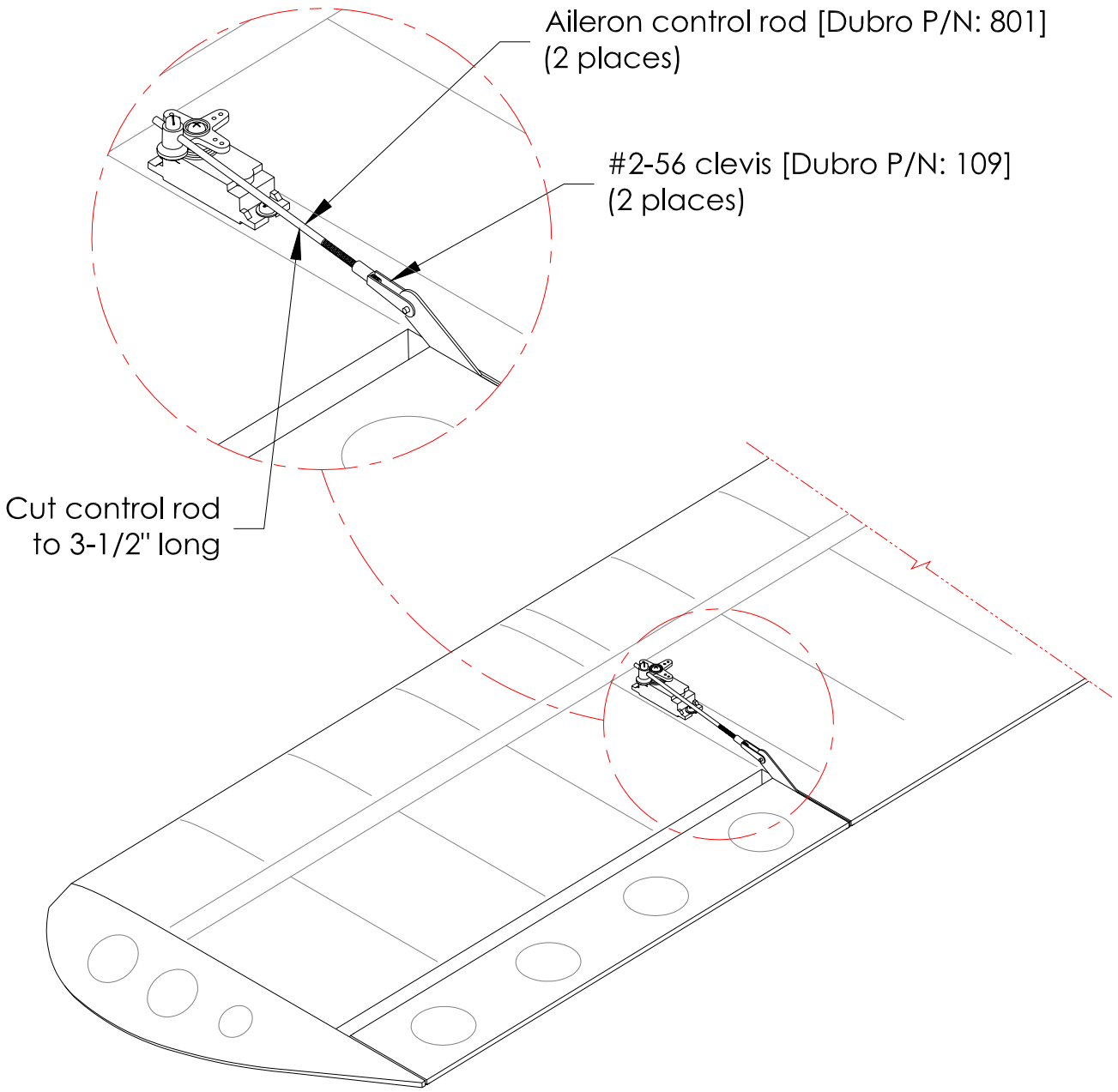
Covering cut to width shown and entire length of aileron. Iron in place keeping the gap shown above.



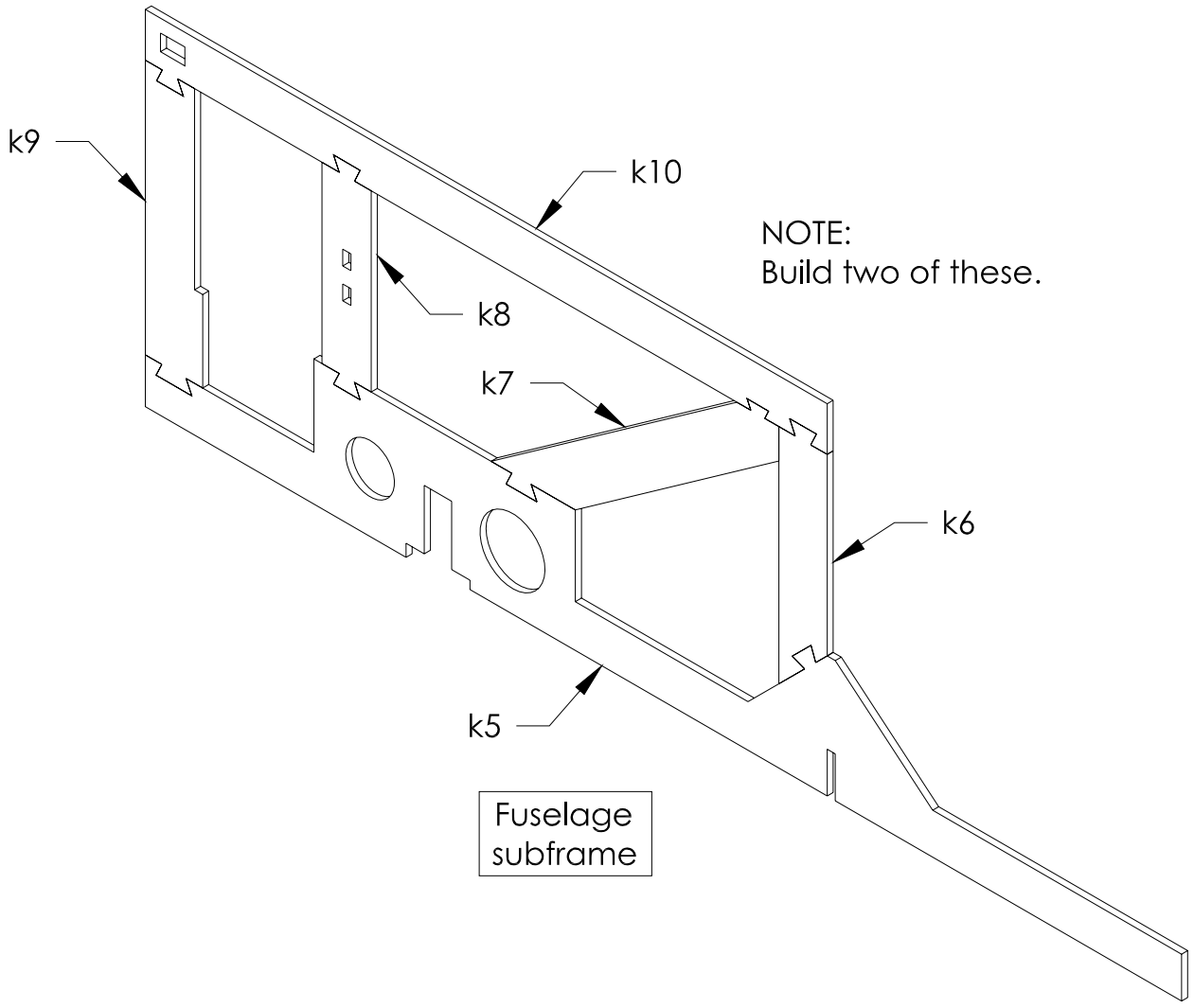
Covering cut to width shown and entire length of aileron. Iron top and bottom covering together in the gap.



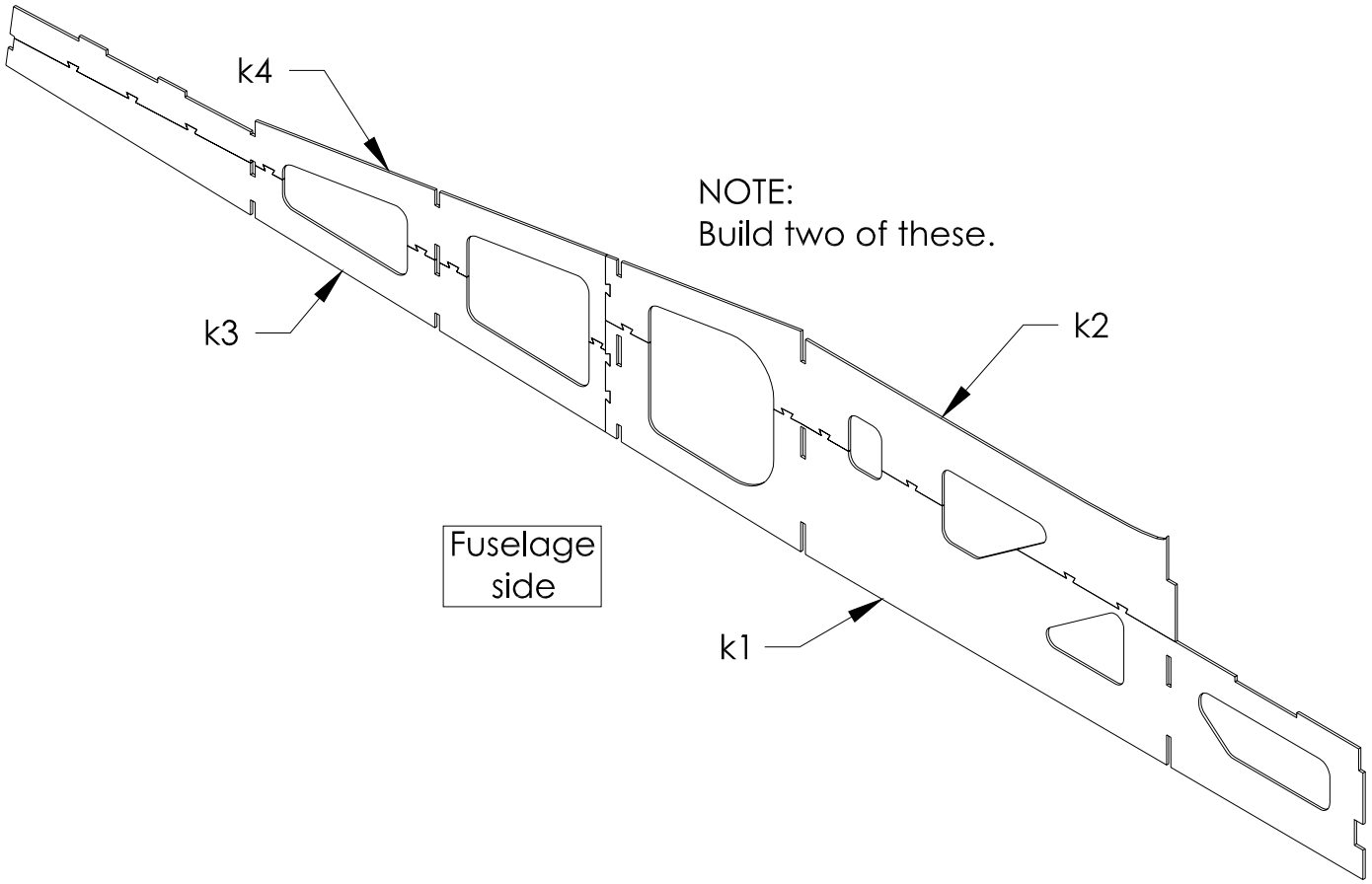
❑ Aileron control rod installation



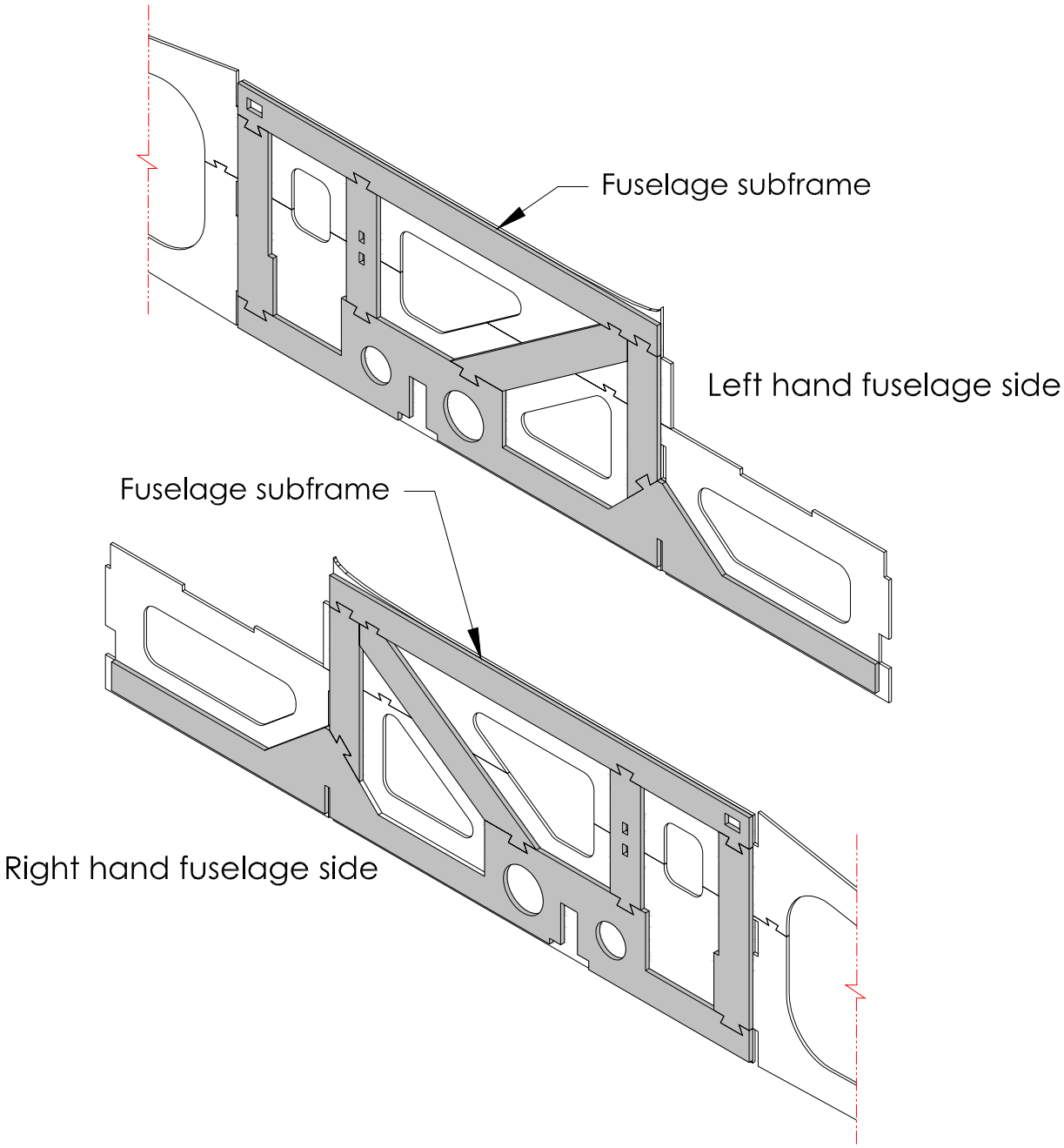
❑ Fuselage construction



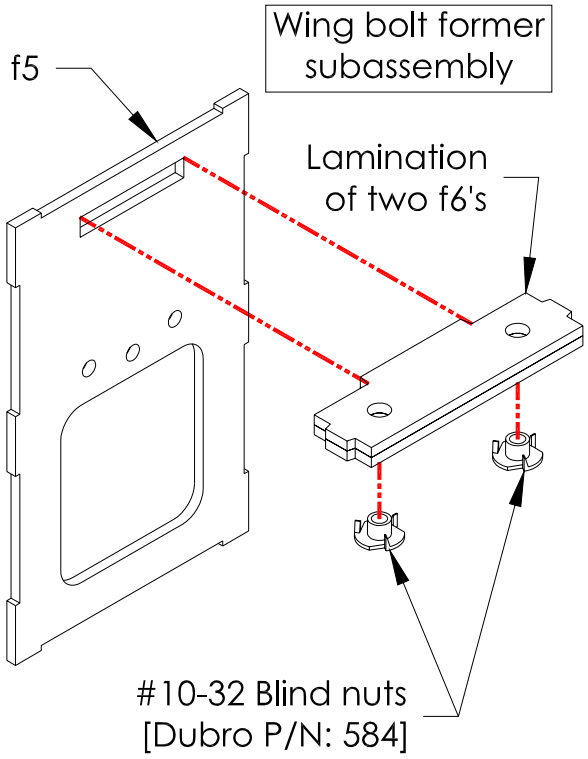
❑ Fuselage construction (continued)

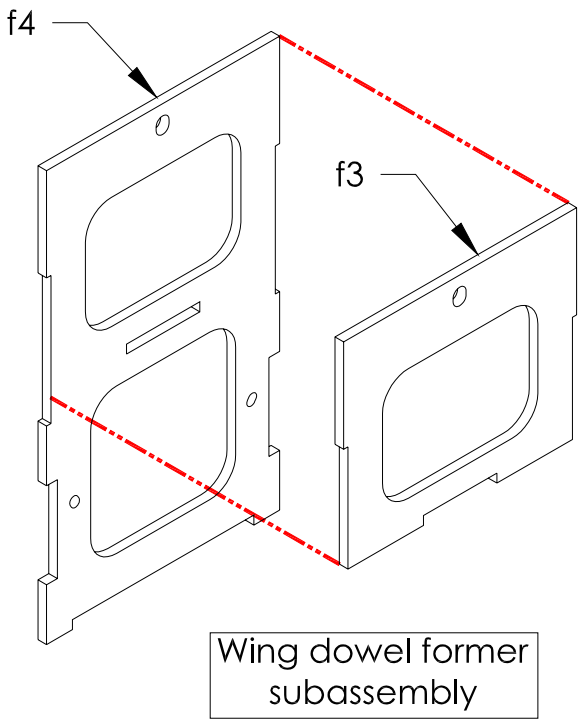


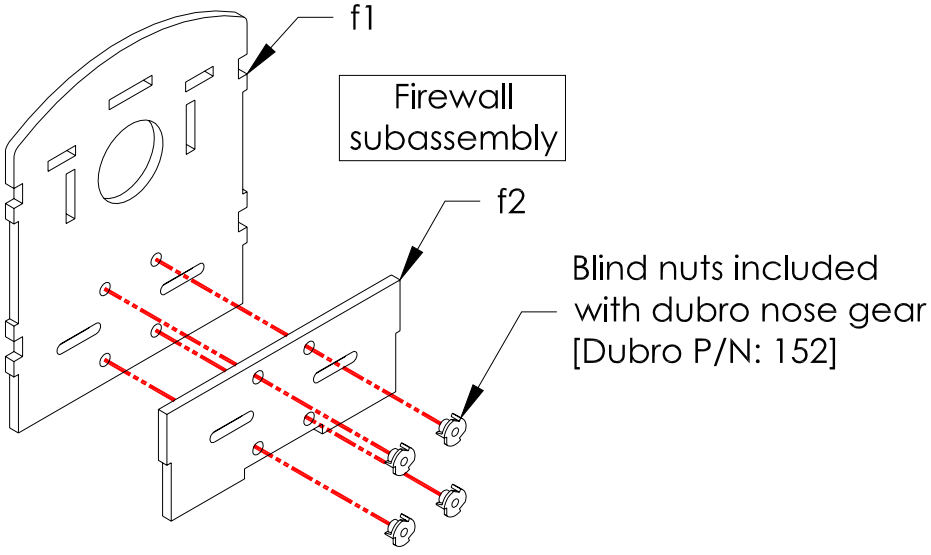
❑ Fuselage construction (continued)



❑ Fuselage construction (continued)

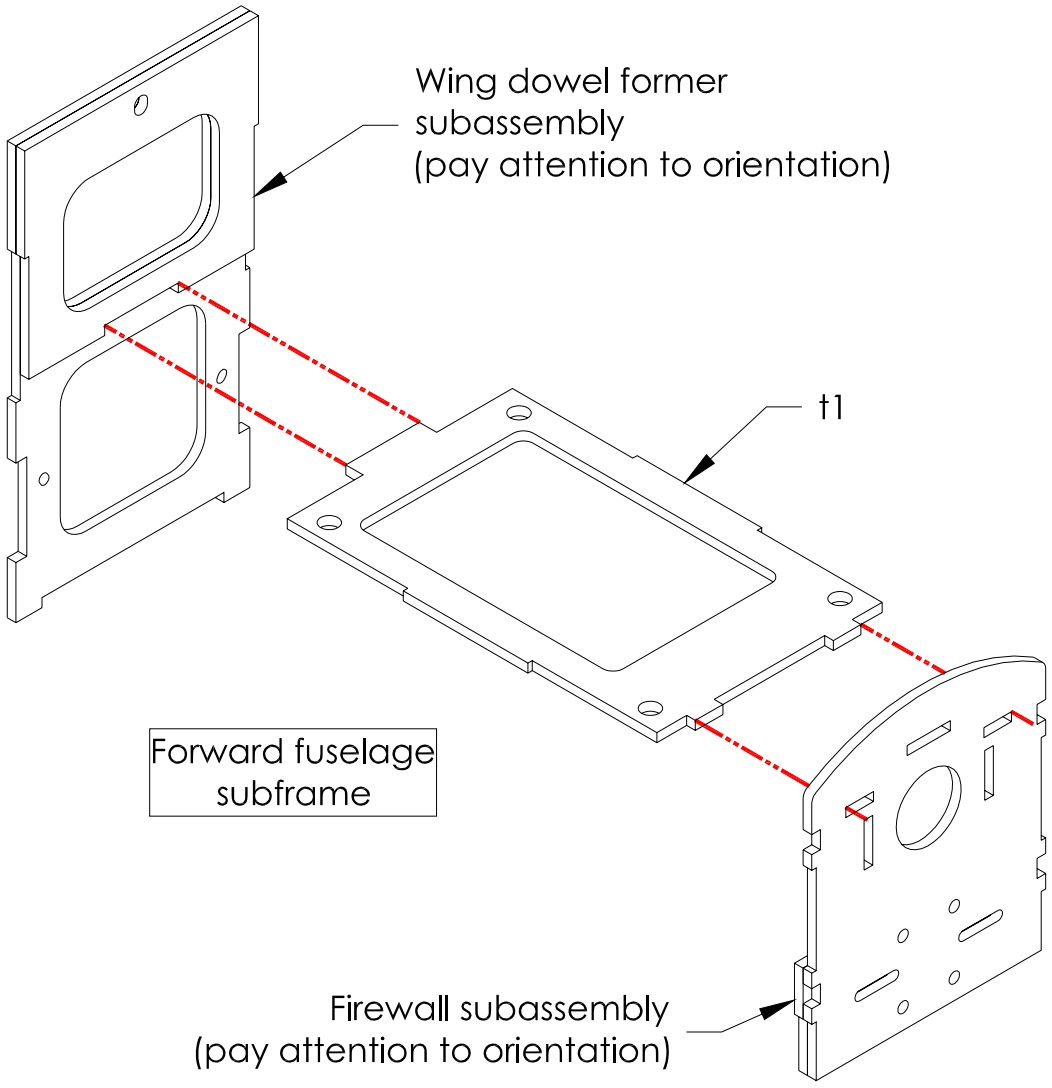




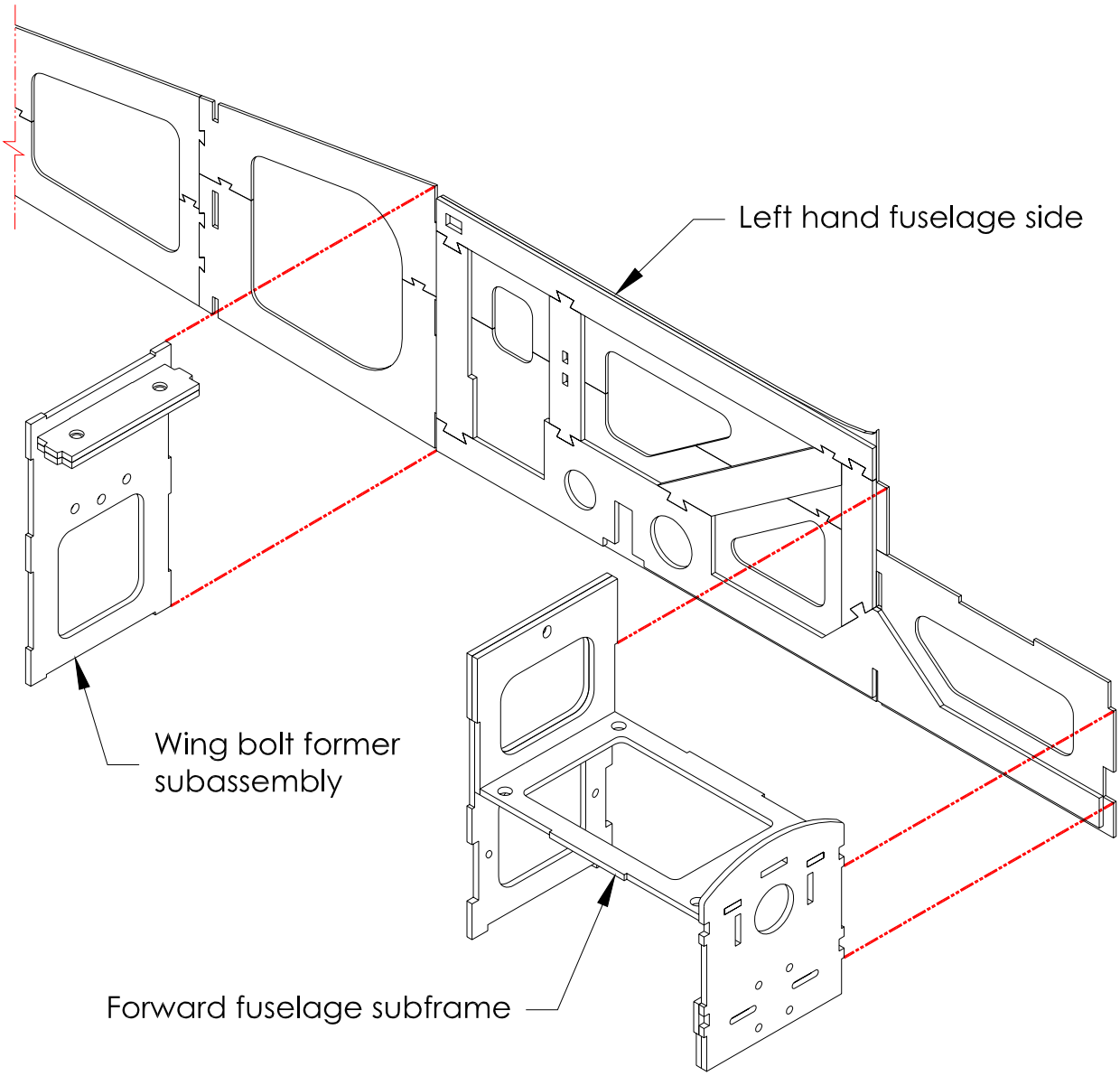


Tip:
Blind nuts are easily installed by using any screw with the same thread series. Start by pressing the blind nut into it's corresponding hole with your thumb. Next, insert a screw through the opposite side, and tighten it until the prongs of the blind nut are completely seated in the part. Finish by putting a small drop of thin CA glue on the flange of the blind nut to keep it secure. Be careful to not get any glue on the threads.

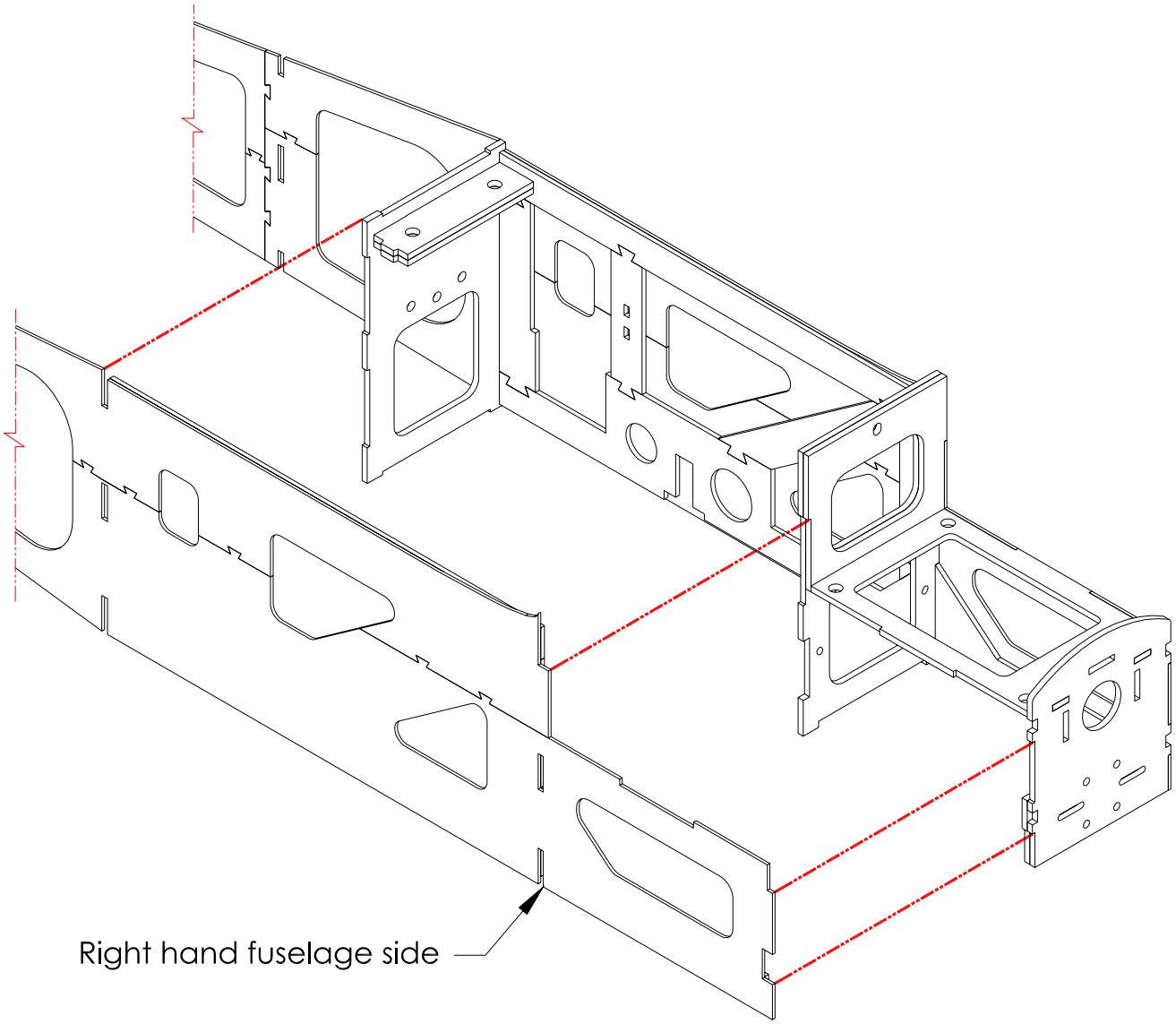
❑ Fuselage construction (continued)



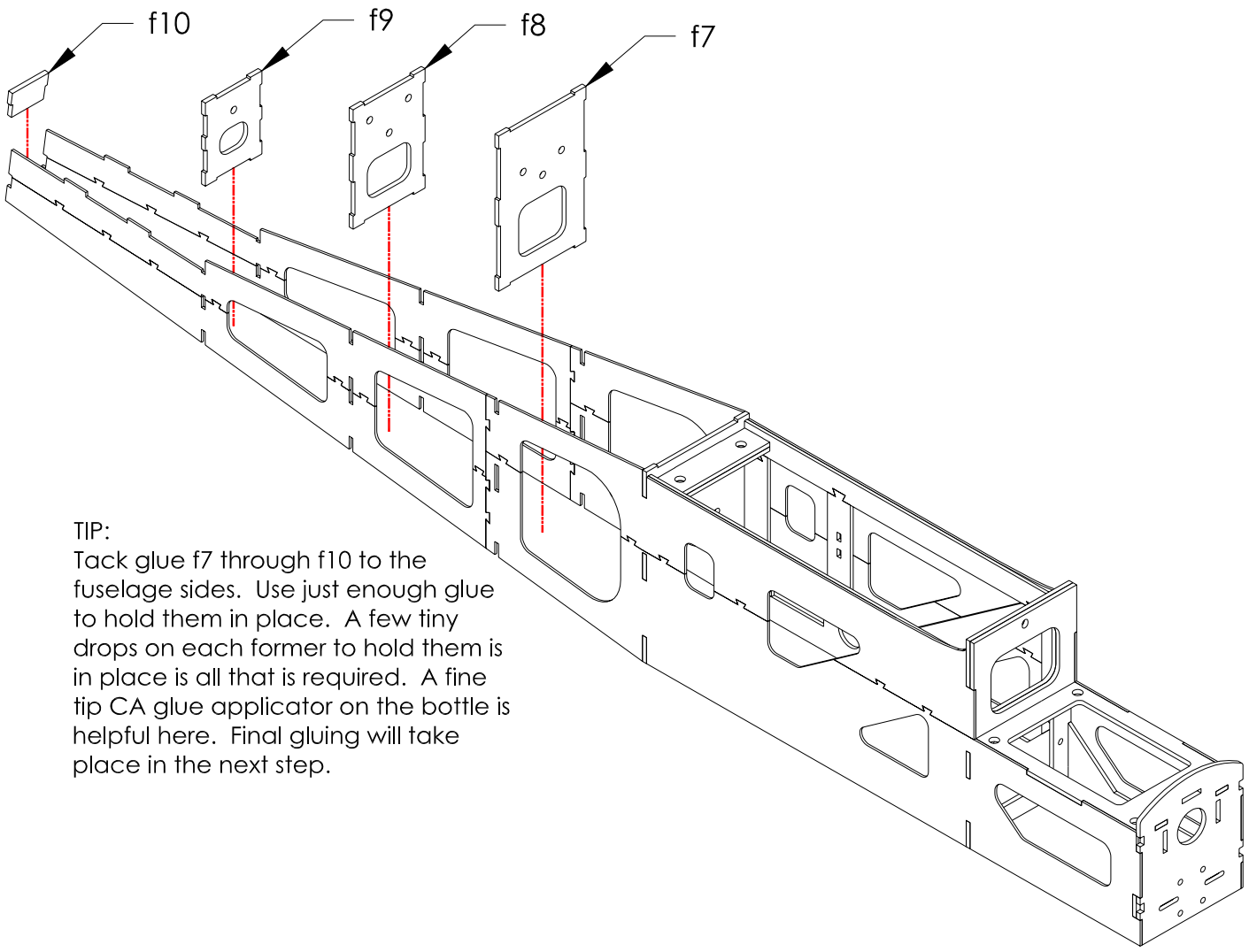
❑ Fuselage construction (continued)



❑ Fuselage construction (continued)

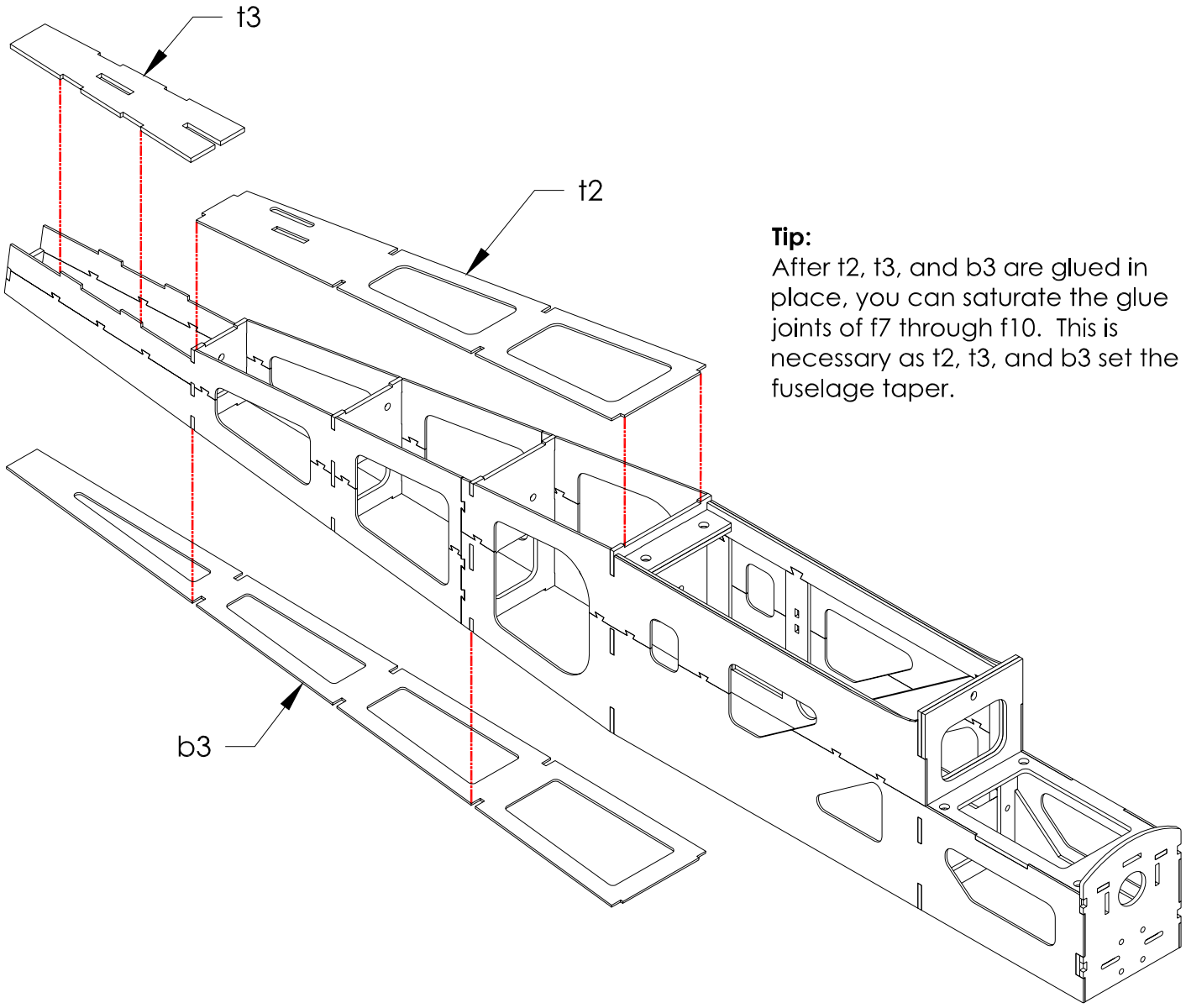


❑ Fuselage construction (continued)



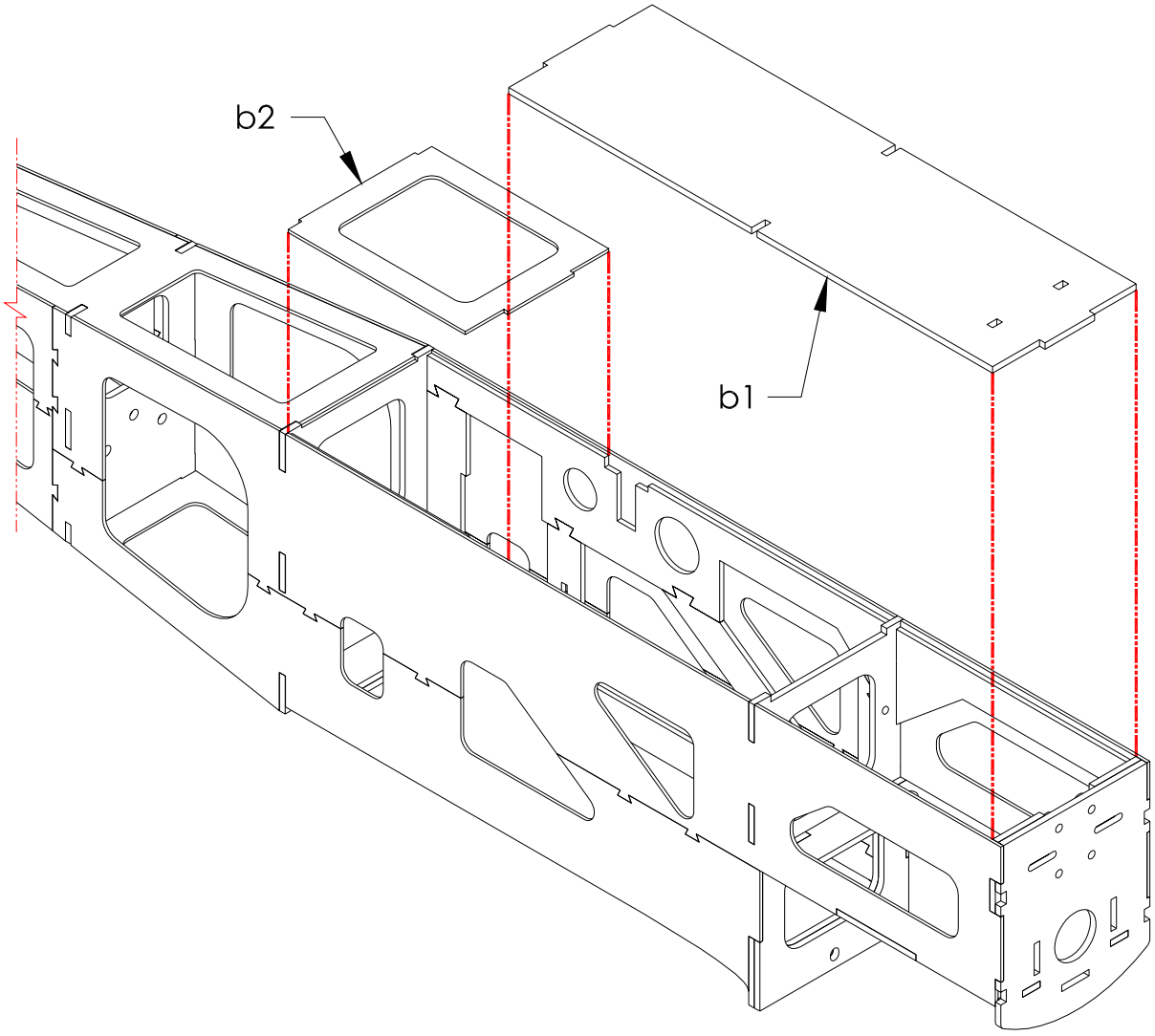
TIP:
Tack glue f7 through f10 to the fuselage sides. Use just enough glue to hold them in place. A few tiny drops on each former to hold them is in place is all that is required. A fine tip CA glue applicator on the bottle is helpful here. Final gluing will take place in the next step.

❑ Fuselage construction (continued)

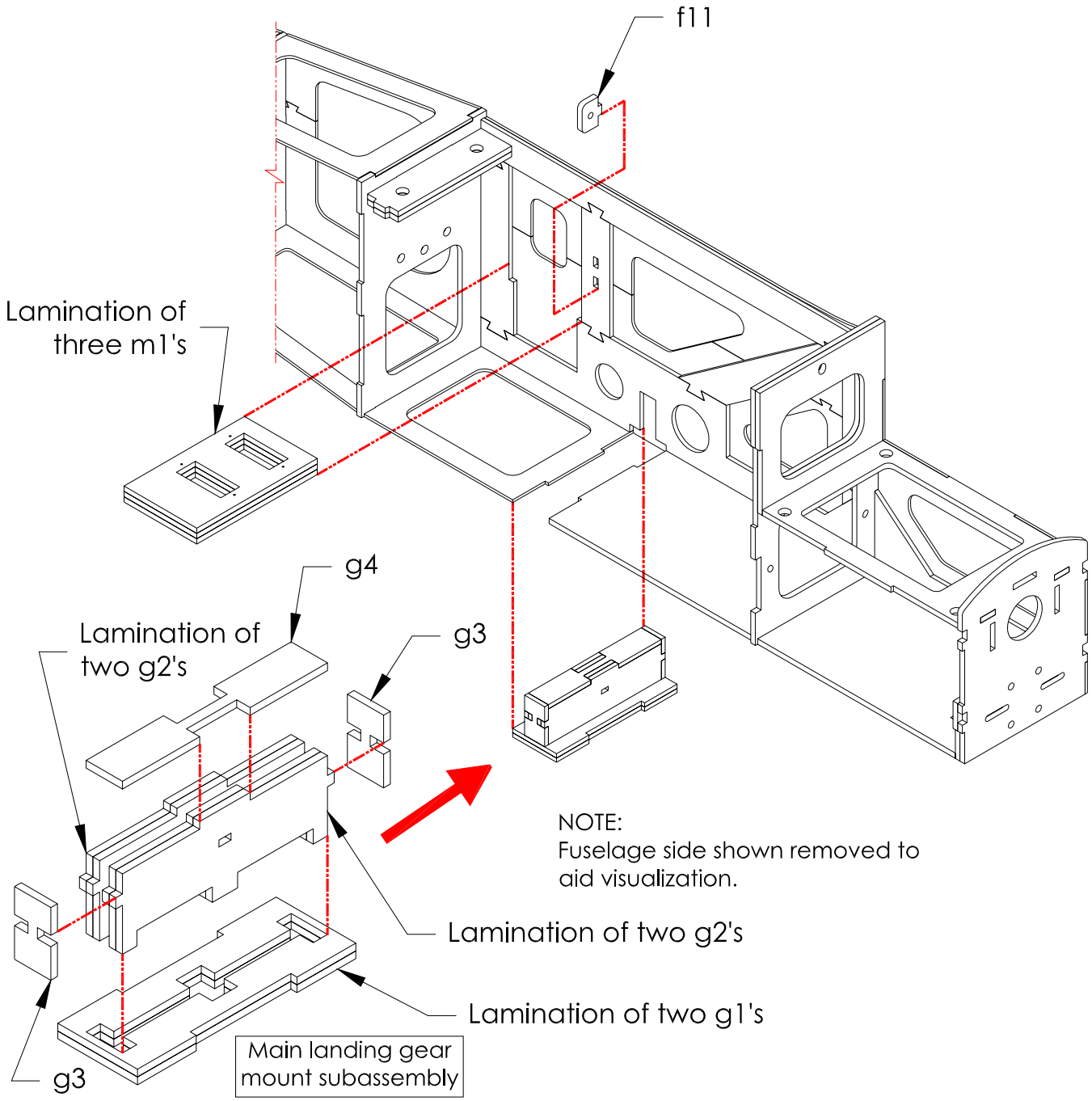


Tip:
After t2, t3, and b3 are glued in place, you can saturate the glue joints of f7 through f10. This is necessary as t2, t3, and b3 set the fuselage taper.

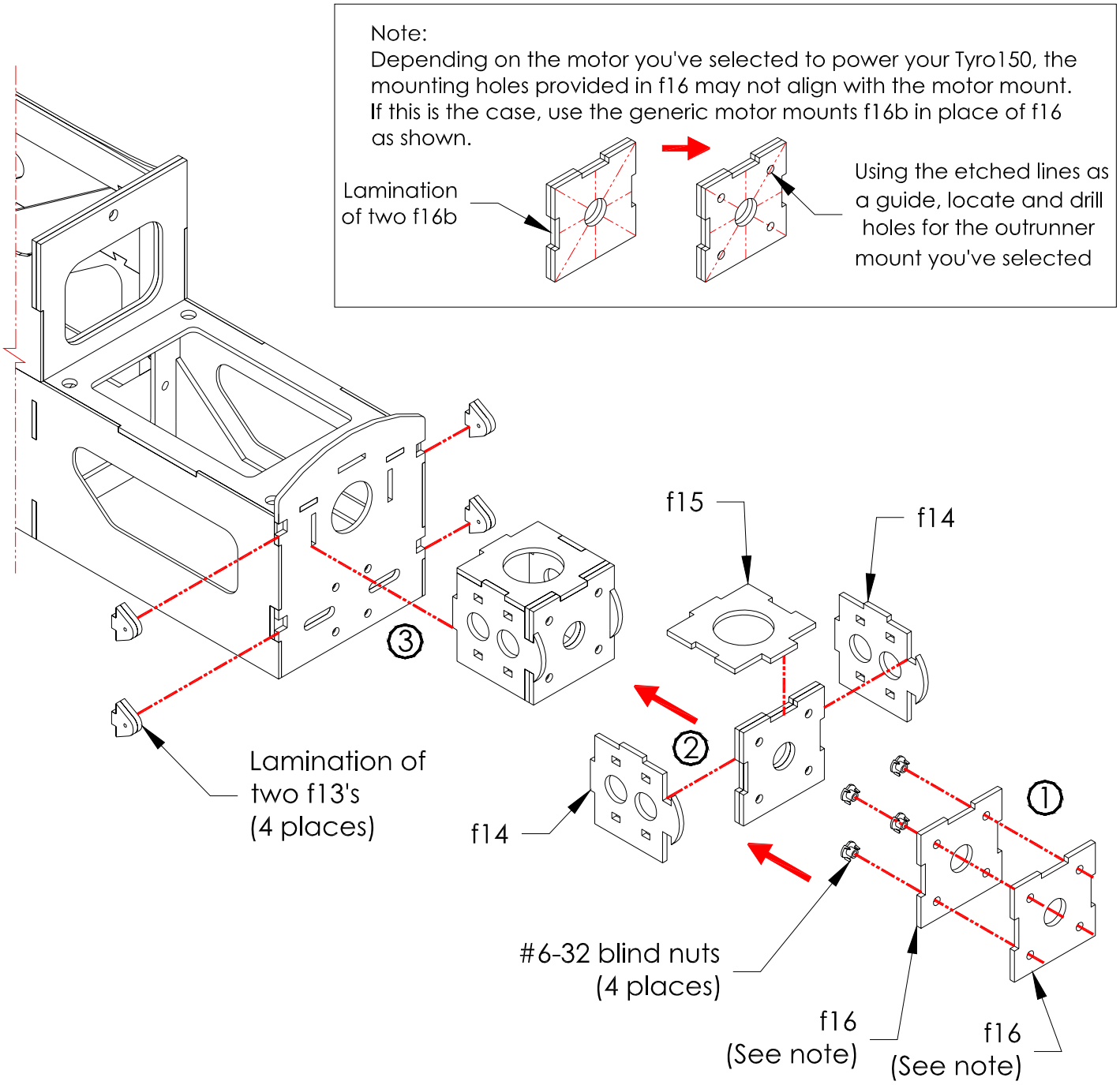
❑ Fuselage construction (continued)



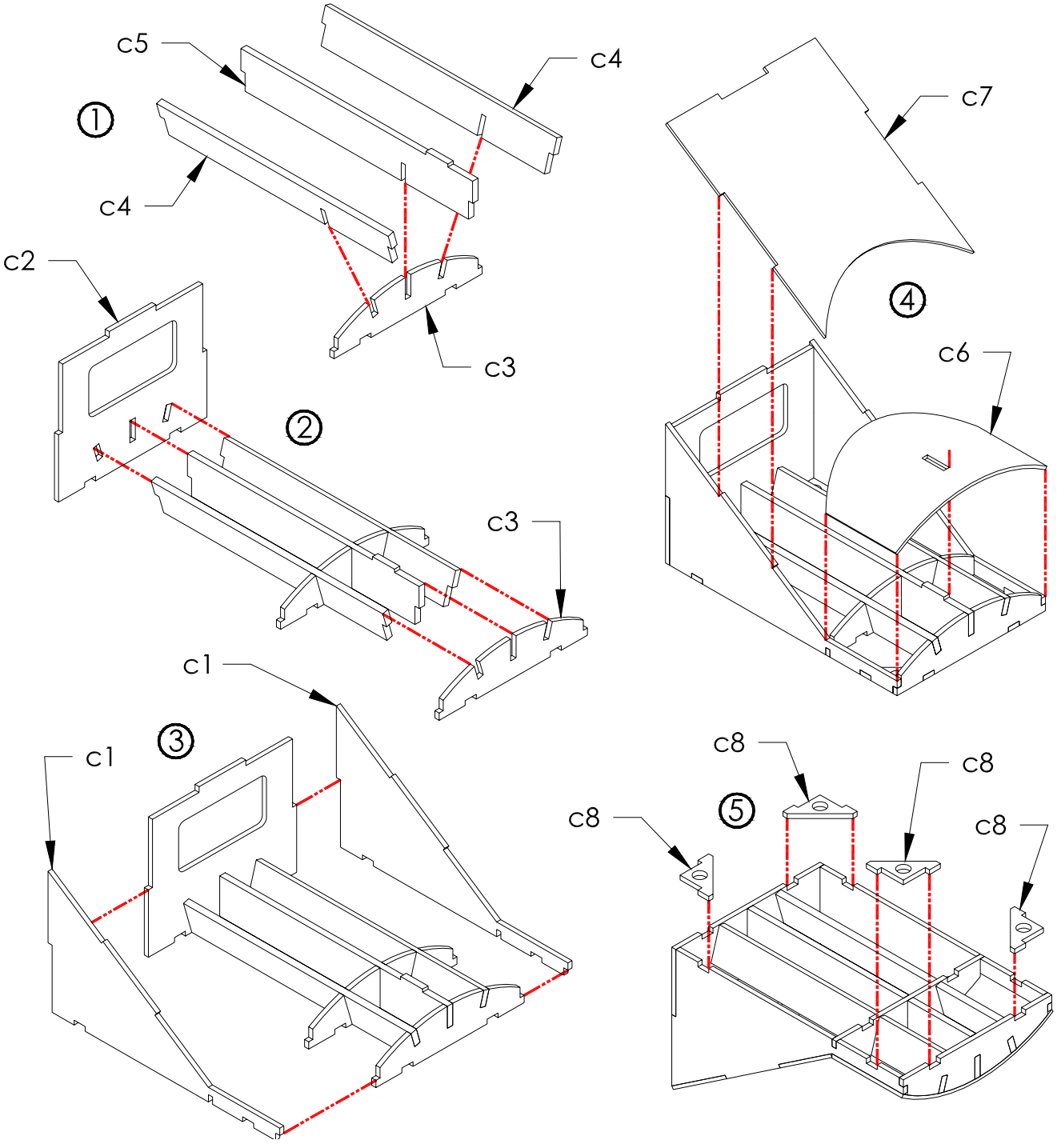
❑ Fuselage construction (continued)



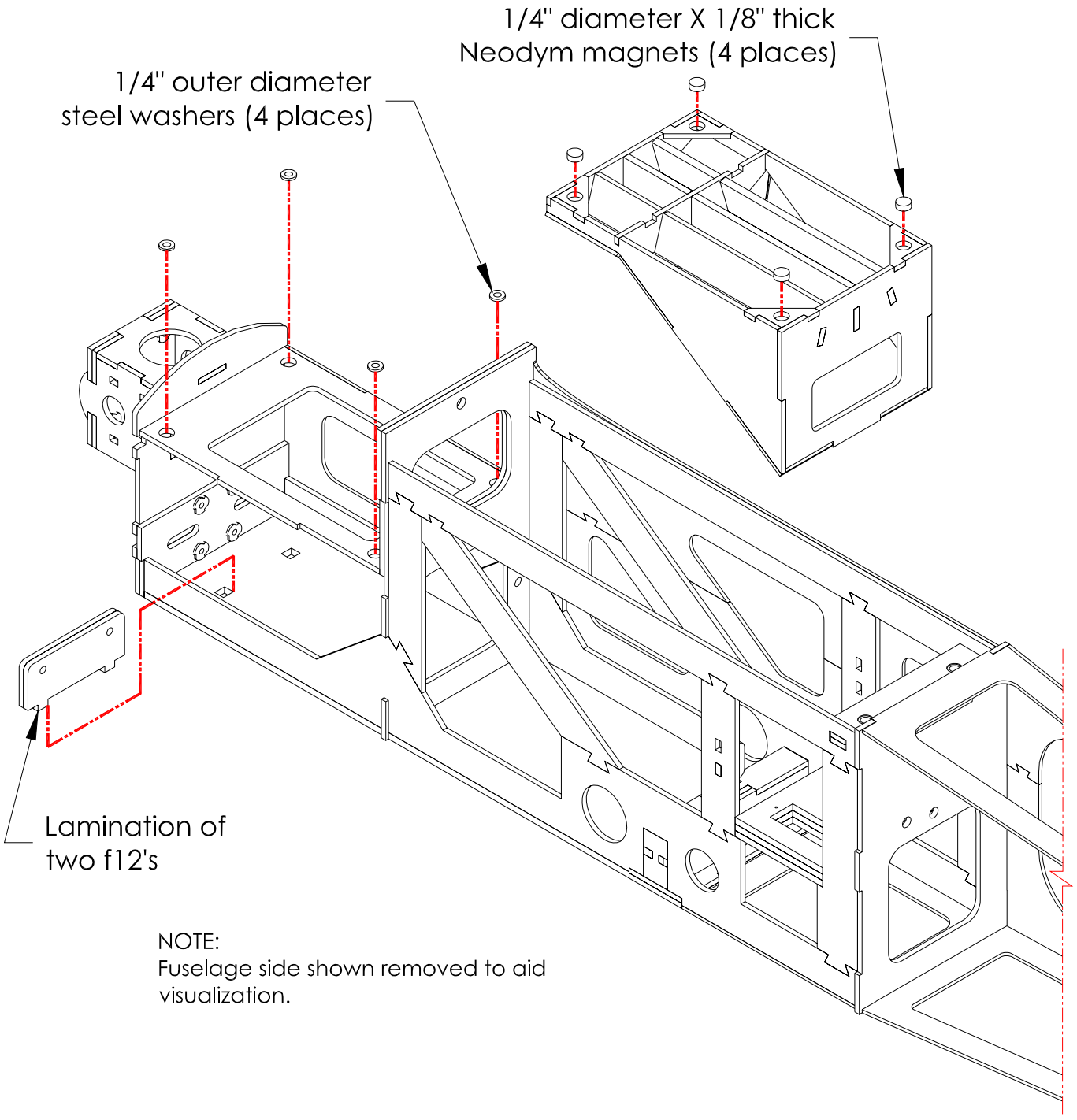
❑ Fuselage construction (continued)



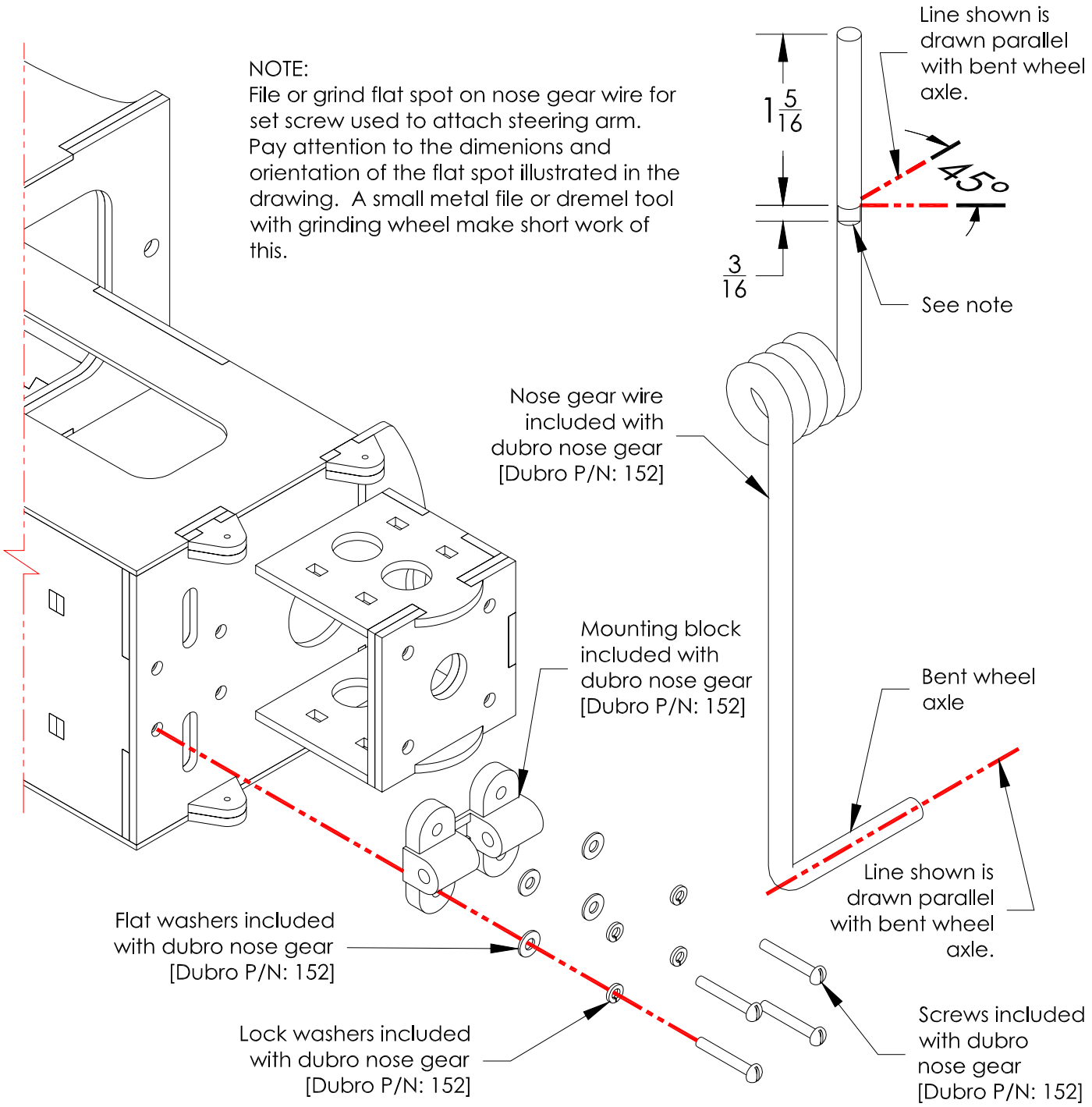
❑ Fuselage construction (continued)



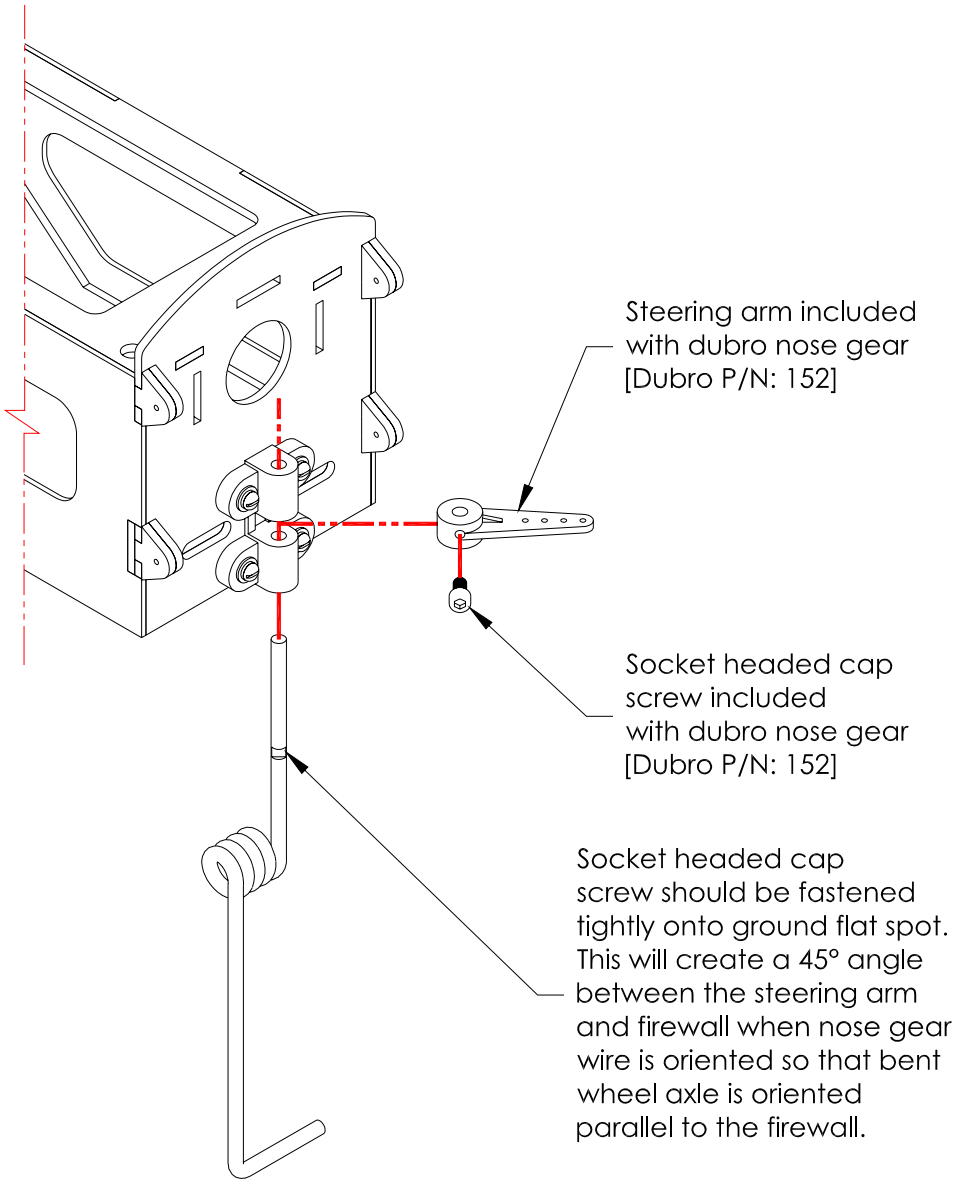
❑ Fuselage construction (continued)



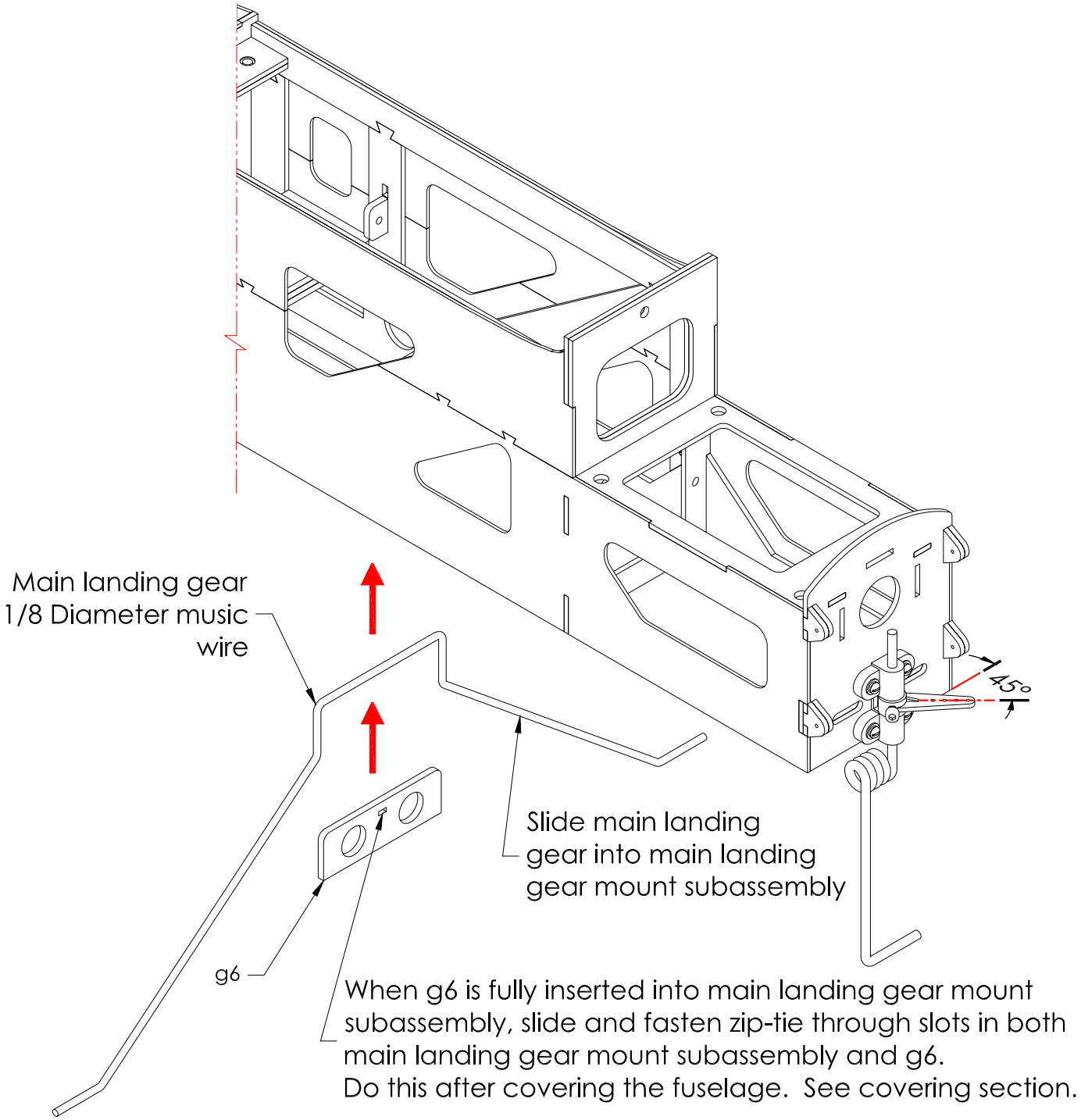
❑ Fuselage nose gear installation



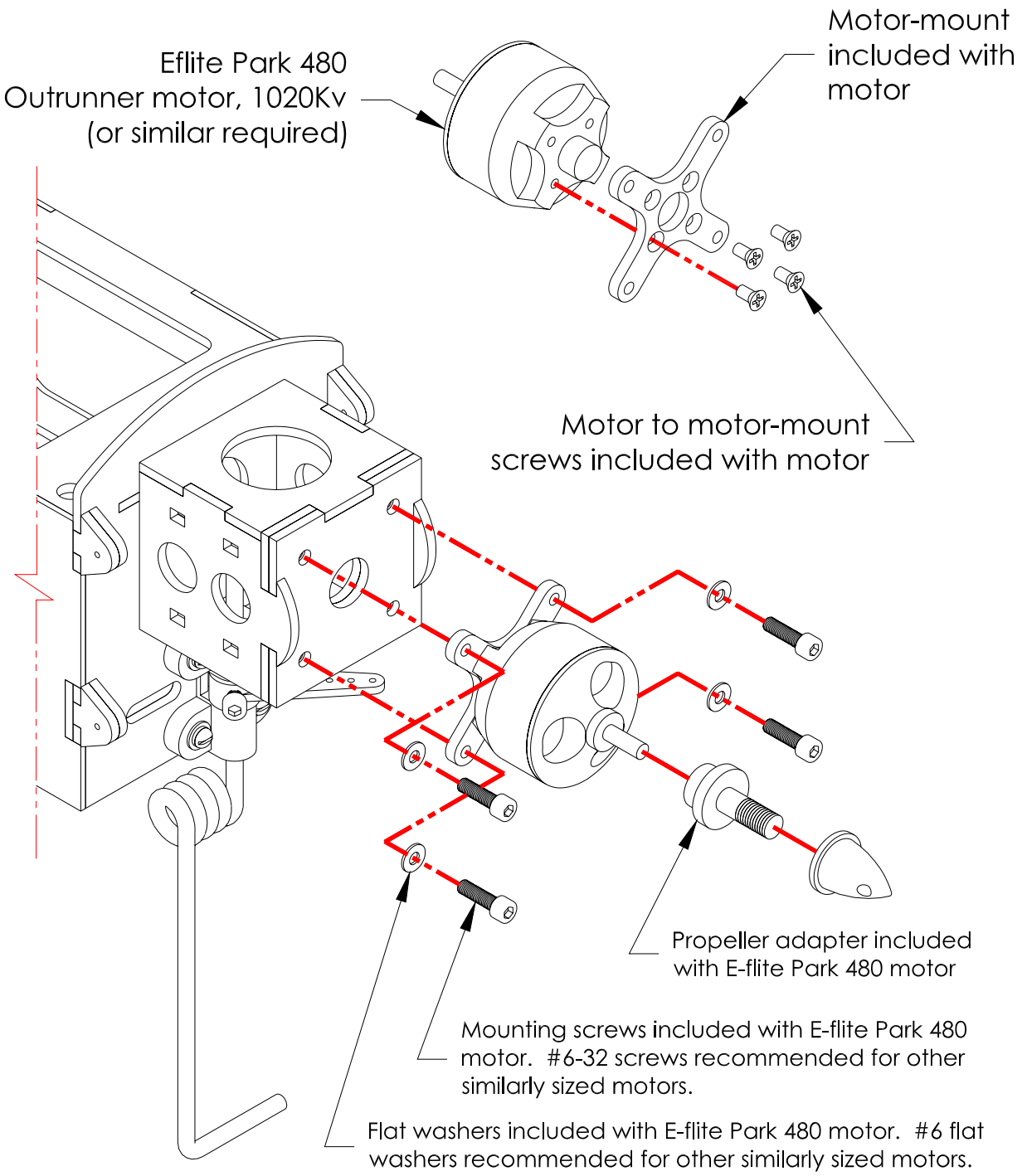
❑ Fuselage nose gear installation (continued)



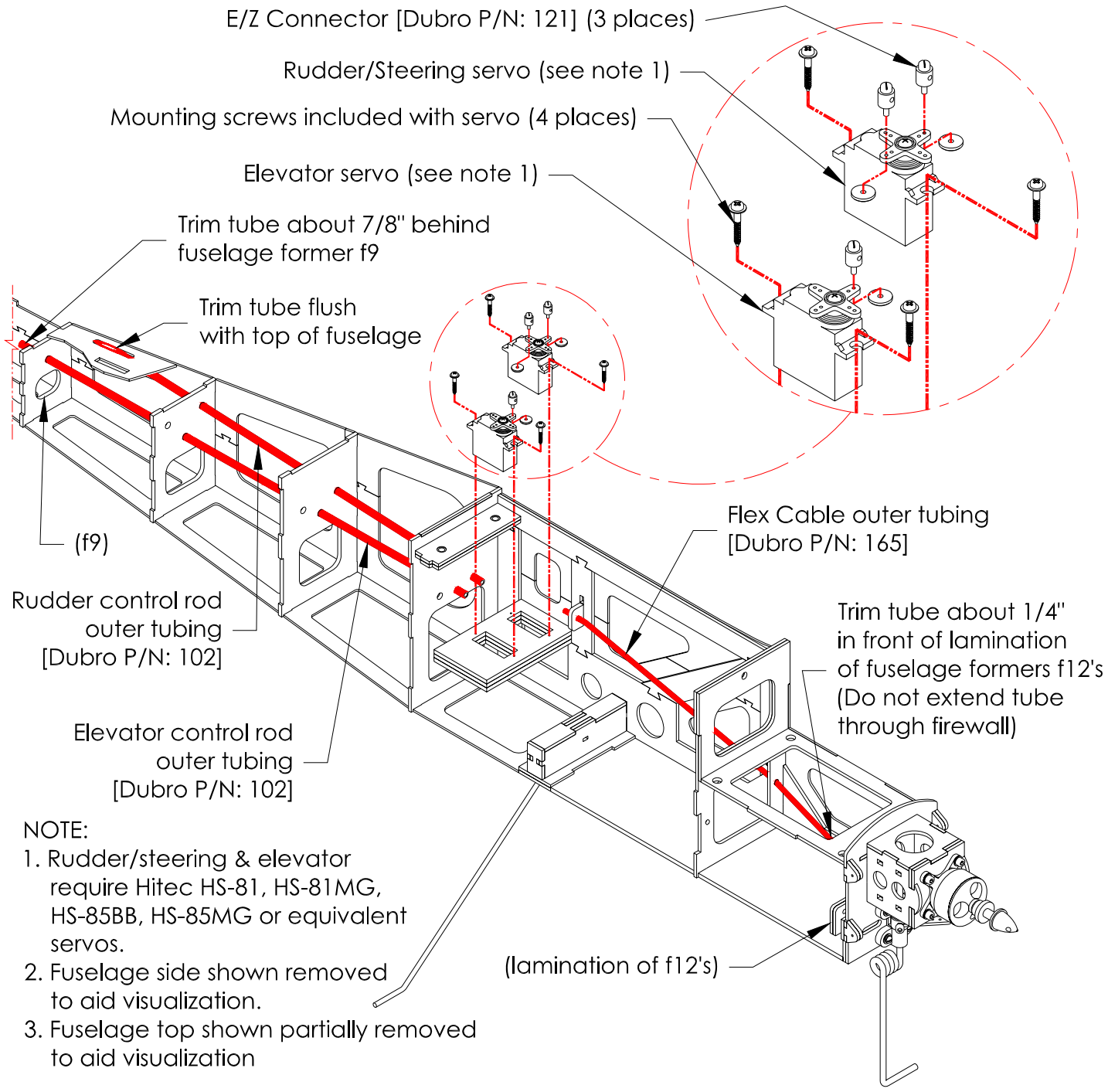
❑ Fuselage main gear installation



❑ Fuselage motor installation

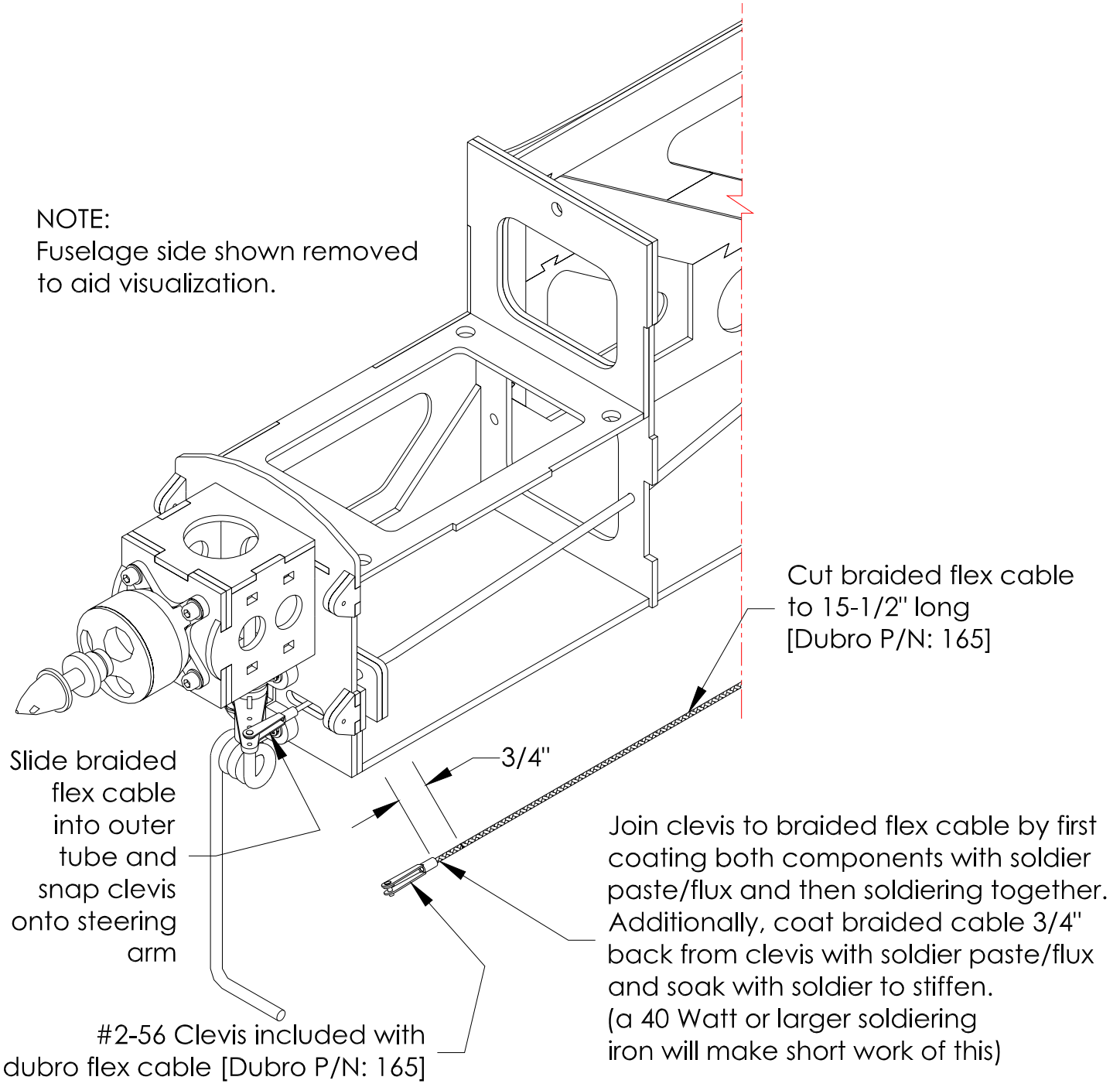


❑ Fuselage controls and hardware installation

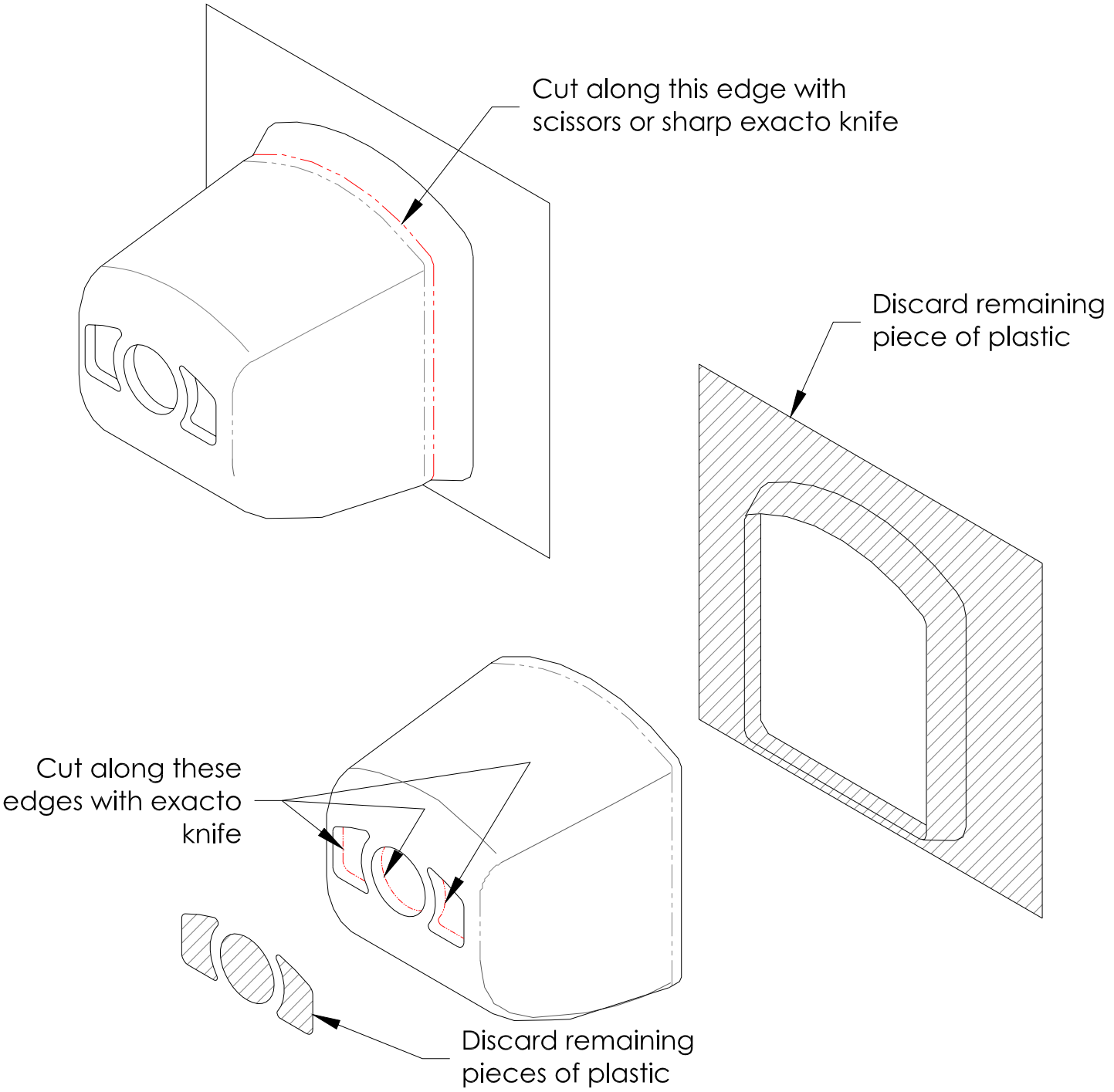


NOTE:
1. Rudder/steering & elevator require Hitec HS-81, HS-81MG, HS-85BB, HS-85MG or equivalent servos.
2. Fuselage side shown removed to aid visualization.
3. Fuselage top shown partially removed to aid visualization

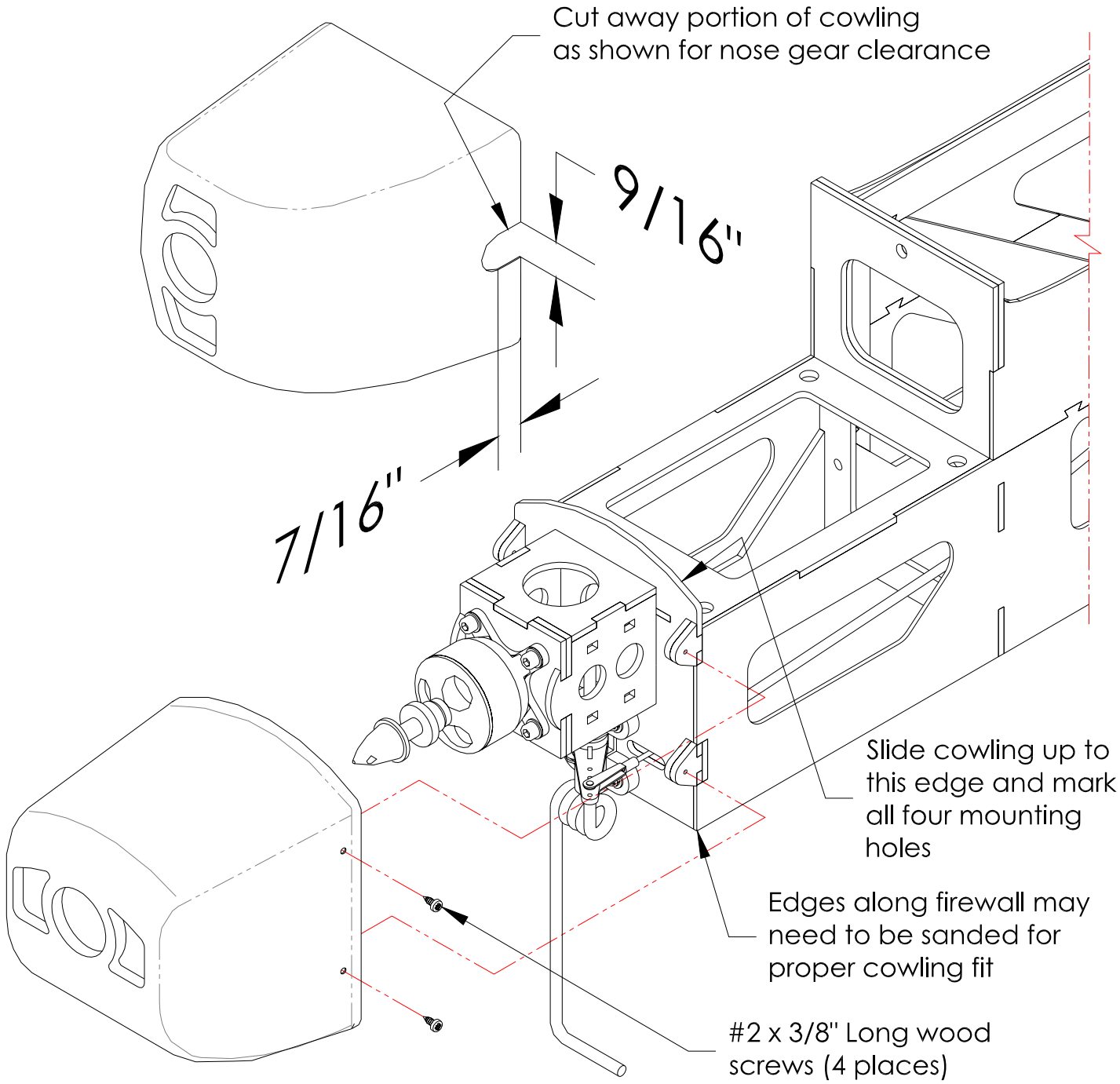
❑ Fuselage steering control cable installation



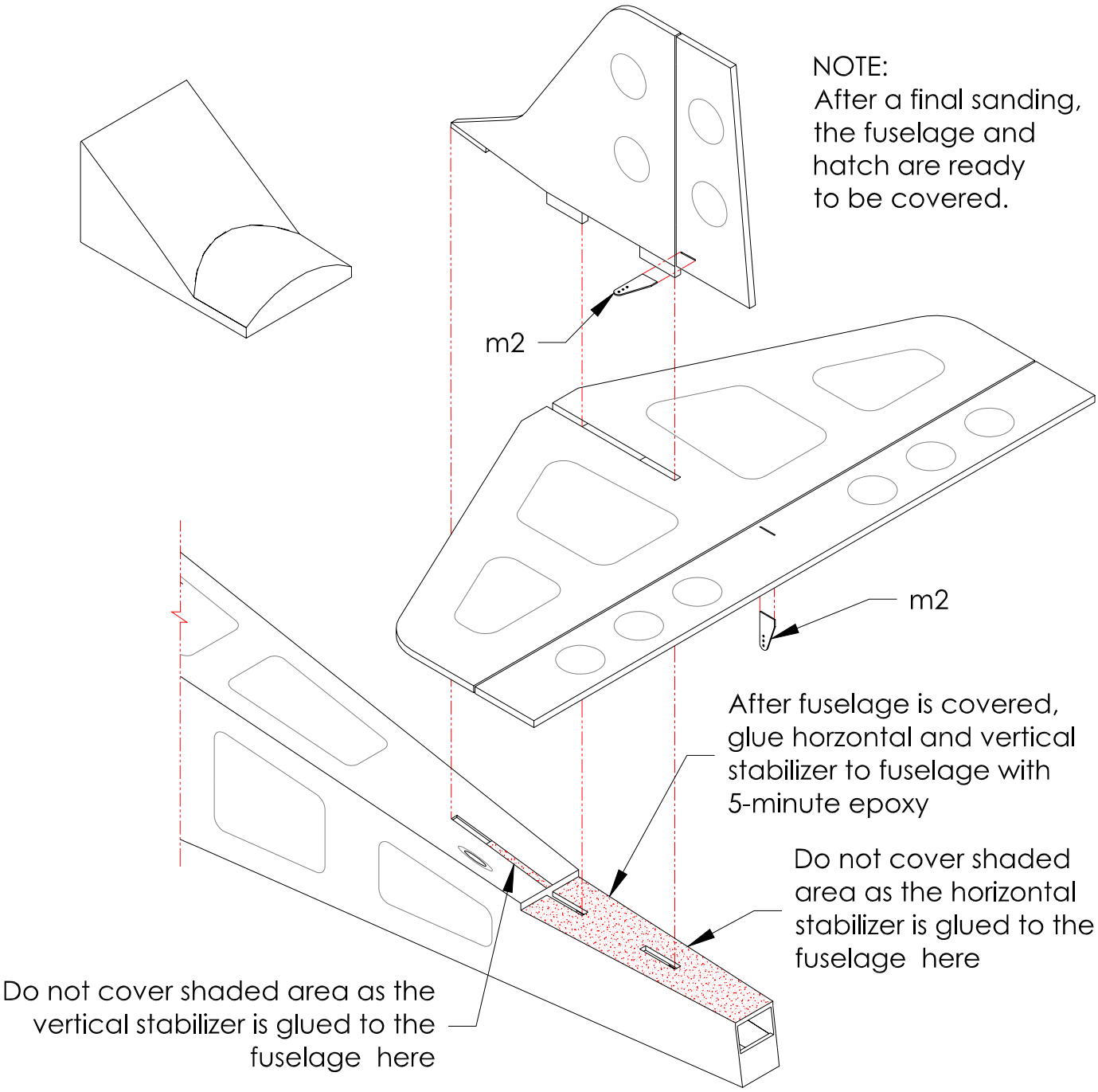
❑ Fuselage cowl trimming



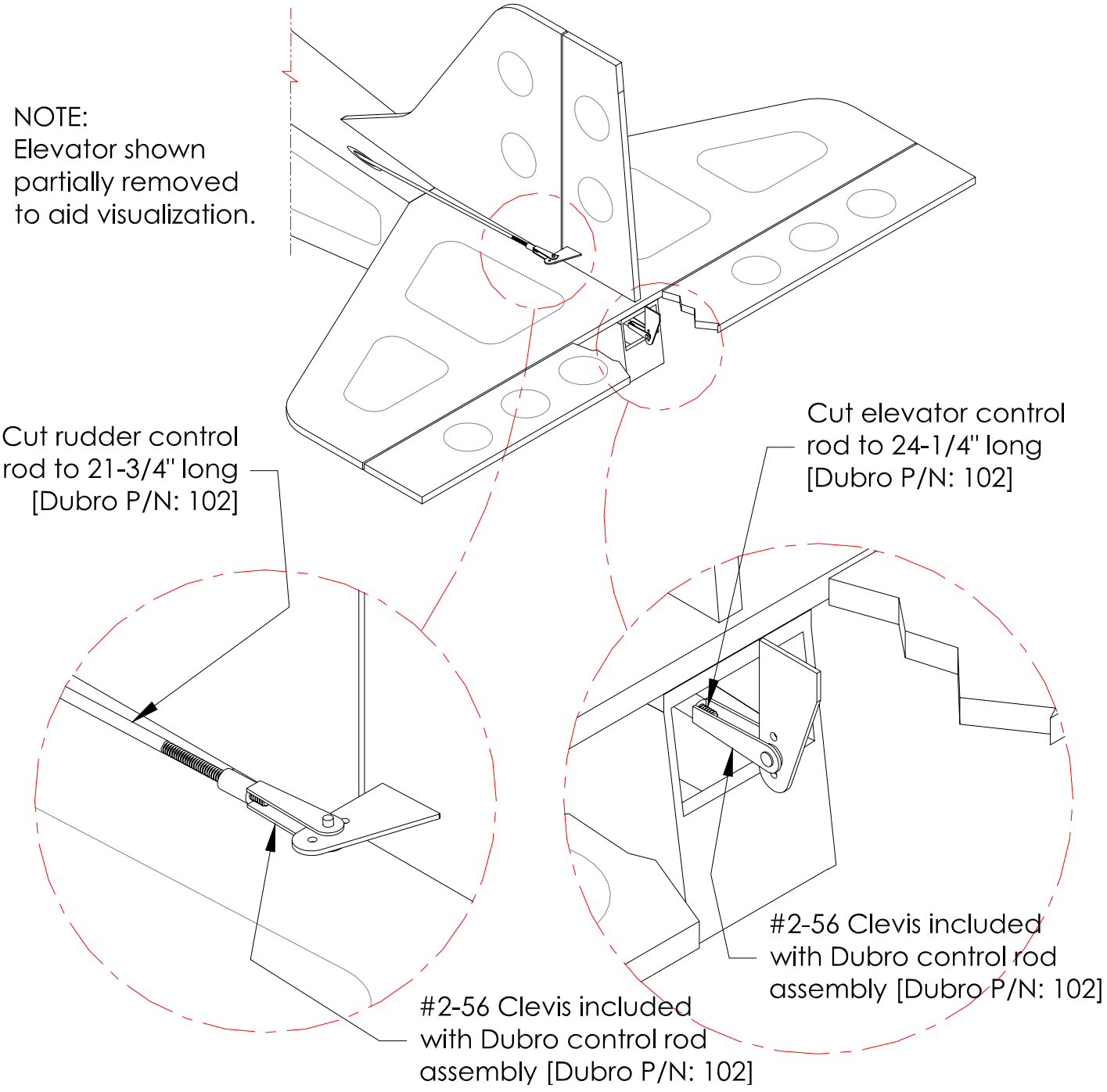
❑ Fuselage cowl fitting and installation



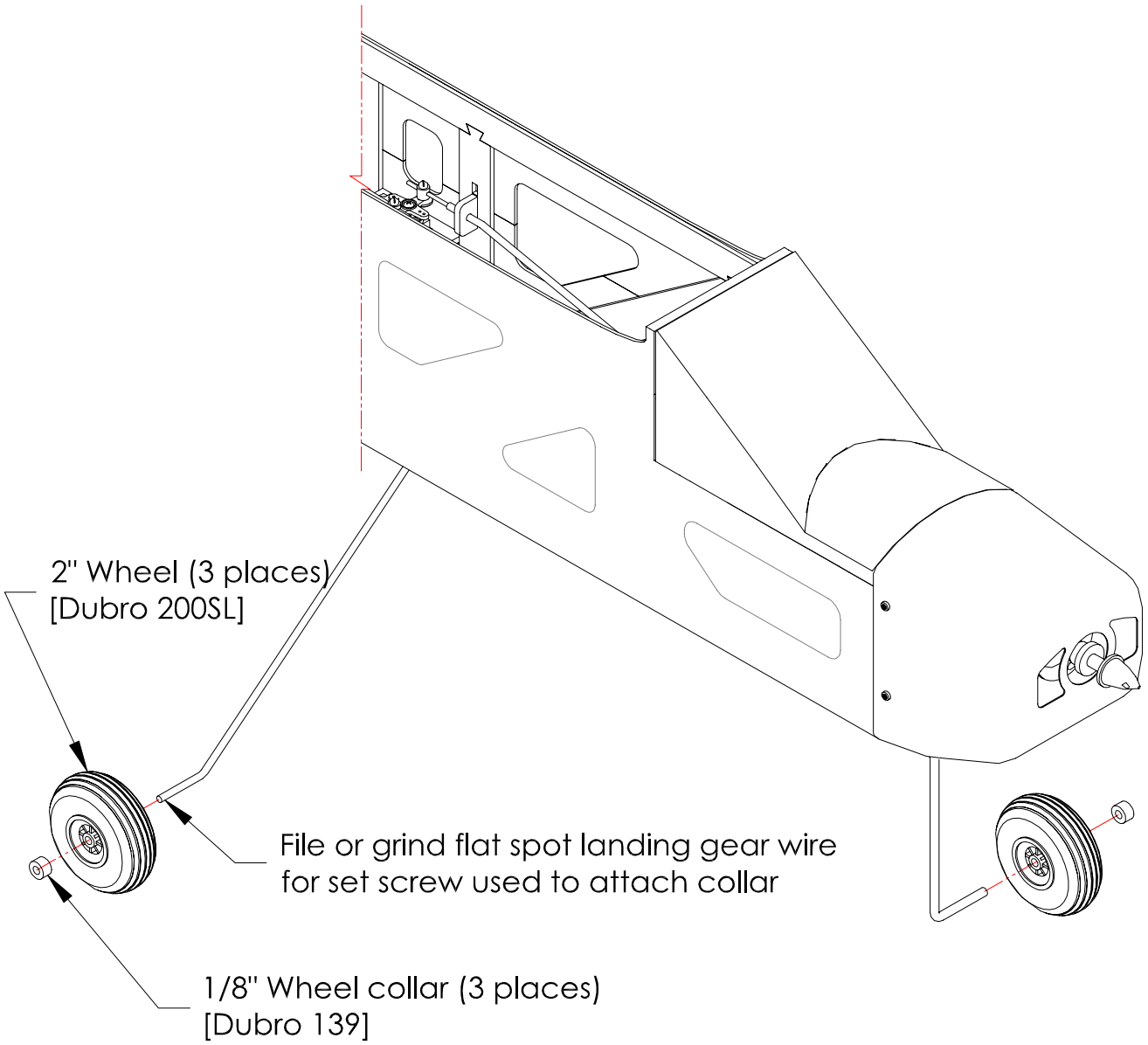
❑ Fuselage and hatch covering, and stabilizer/control surface installation



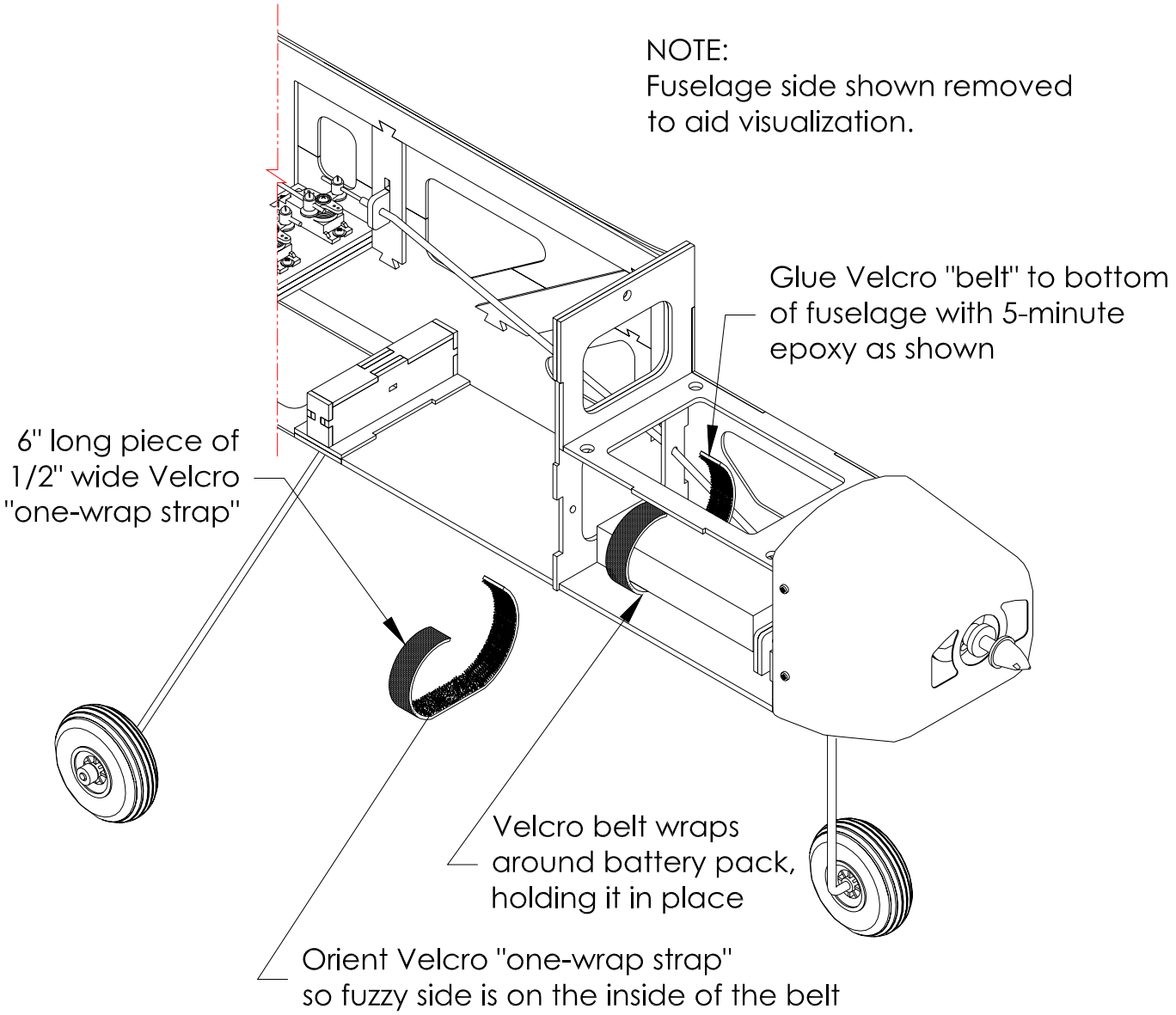
❑ Elevator and rudder control rod installation



❑ Wheel and wheel collar installation



❑ Battery belt installation



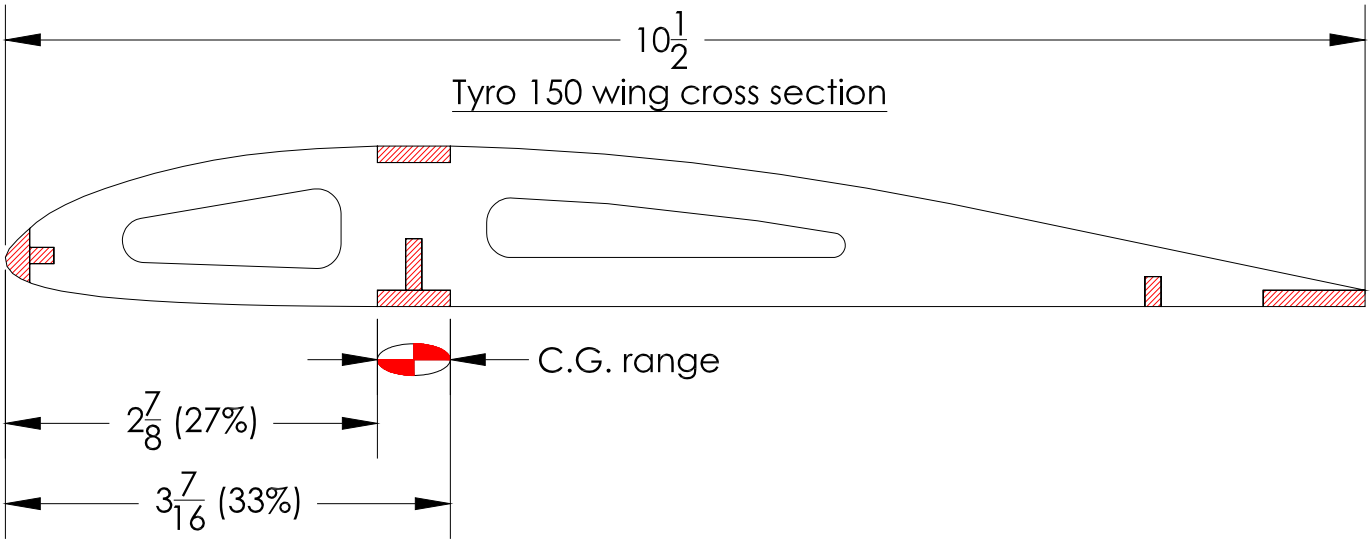
❑ Control surface and steering setup

I recommend you start with the following amount of control surface settings:
Ailerons: 1/2" both directions
Rudder: maximize in either direction
Elevator: 1/2" either direction
(Please note these are measured from the trailing edge of the control surfaces)

Please make sure all control surfaces return to the center position when no inputs are made on the transmitter. Additionally, take time to make sure the nose gear wheel is properly aligned so your Tyro150 will track straight on takeoff and landing. Rolling the fuselage and watching to see if the fuselage tracks straight will accomplish this. If needed, make the necessary adjustments at the E/Z connector located on the rudder/steering servo until your fuselage rolls straight and true.

❑ Balance

I recommend you start by balancing your Tyro150 within the following center-of-gravity range (C.G. range). Always remember, a slightly nose heavy plane will at least fly, a slightly tail heavy plane may not.



(After your test flight, feel free to move the balance point to get the desired performance.)

❑ Pre-Flight

With proper setup and balance you're ready for your first flight with the Tyro150. If this is the very first time you've attempted to fly a radio-controlled model airplane, please get help from someone with flying experience. I cannot stress this enough, as help from someone that knows how to fly will greatly improve your chance of success. In addition, I highly recommend you purchase the book, "*The Pilot's Guide to Mastering Radio Controlled Flight*", by Scott Stoops. Scott's book is without a doubt, the best text available for learning how to properly fly a radio-controlled model airplane. Scott's book is available for purchase through one of his many distributors or direct at the following address.

http://www.rcpilotguide.com

❑ Flight

On the first flight, get the Tyro150 high enough that you can let off the control sticks to see what it does without risking a crash. The Tyro150 is a very forgiving model and depending on the equipment you chose to finish it, you may have to trim it out as necessary. If you experience some adverse yaw with your Tyro150, I've found that it is quite useful to coordinate the turns by adding some rudder. This can be done manually, or by mixing some rudder output with the aileron channel on a computer transmitter.

"Preparation, I have often said, is rightly two-thirds of any venture." – *Amelia Earhart*

Enjoy your Molt Models Tyro150!