



82"

LASER



Assembly Manual

Congratulations on your new Apex Aerotech aircraft, and thank you for supporting our brand! We're excited to welcome you to the Apex Aerotech community. Our team is dedicated to creating high-quality, high-performance aircraft, and we can't wait for you to enjoy everything your new model offers.

While each aircraft is built with care and precision, these are advanced machines that must be handled responsibly. As the builder and pilot, you are fully responsible for the assembly, setup, and safe operation of your model. Because we cannot verify how each aircraft is completed or flown, Apex Aerotech cannot accept liability for injury, property damage, or any other loss resulting from the use of this product. By operating this aircraft, you agree to accept full responsibility for its use.

To encourage safe and responsible flying, we recommend joining the Academy of Model Aeronautics (AMA) or the equivalent organization in your home country. These groups offer helpful guidelines, legal protections, insurance coverage, and access to approved flying sites.

For safety, always land your aircraft immediately if any part becomes loose, detaches, or if the model behaves unusually. This helps prevent potential/further damage and unsafe situations.

Thank you again for choosing Apex Aerotech. We appreciate your support and wish you safe flights and many great experiences with your new aircraft!

Apex Aerotech Contact

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LASER

The Apex Aerotech 82” Laser is a modern tribute to one of the most iconic aerobatic aircraft designs of all time. Inspired by the legendary full-scale Laser made famous by Leo Loudenslager throughout the 1980s and 1990s, this model captures the spirit of a golden era in aerobatics, pioneering competition and airshow performance. Loudenslager’s dominance in the Laser 200 helped cement the platform as a benchmark for smooth, predictable handling and unmatched precision. The Apex Aerotech 82” Laser carries that legacy forward, delivering an aircraft that feels locked in and confidence inspiring.

Purpose-built as a truly optimized 50–60cc platform, the 82” Laser is an exceptional match for engines in this class. It delivers strong, authoritative performance without ever feeling underpowered, while maintaining the friendly flight characteristics and stability pilots expect. Apex Aerotech’s refined aerodynamic design enhances tracking, improves slow-speed behavior, and ensures consistent performance across the entire flight envelope—from smooth precision aerobatics to aggressive XA maneuvers.

Gas or electric, the 82” Laser is equally at home with a 50–60cc engine or a high-performance 12S electric setup. Apex Aerotech is also thrilled to pair the 82” Laser with the new GA-85 power package, developed alongside Dualsky. Designed specifically as a perfect 12S electric solution for 80–85” aircraft, the GA-85 is an ideal match for the 82” Laser. This package includes the GA-6000 motor and the Apex/Dualsky Summit 160XHV ESC, delivering a seamless combination of power and efficiency. Installation for both gas or electric configurations has been thoughtfully engineered for simplicity and efficiency, making the assembly process straightforward.

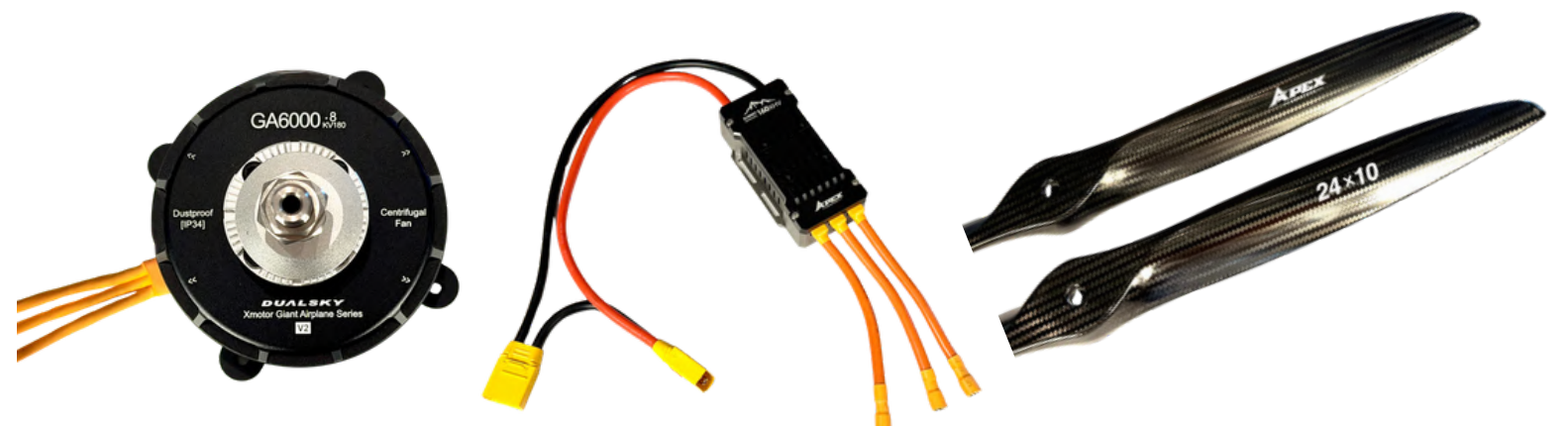
Visually, the aircraft features a striking and perfectly fitting color scheme. Designed by Clint Sweet, the “Retro” livery blends timeless inspiration with modern execution. The bold red, white, and blue scheme pays homage to the unmistakable look of the original Laser 200, while incorporating contemporary styling elements that give it a fresh, dynamic presence both in the air and on the ground.

Beyond its flight performance and visual presence, the 82” Laser is packed with features that prioritize practicality and rapid assembly. Minus the addition of your electronics and power setup, the Laser comes pre-prepped for unmatched convenience in its class!

RECOMMENDED EQUIPMENT:



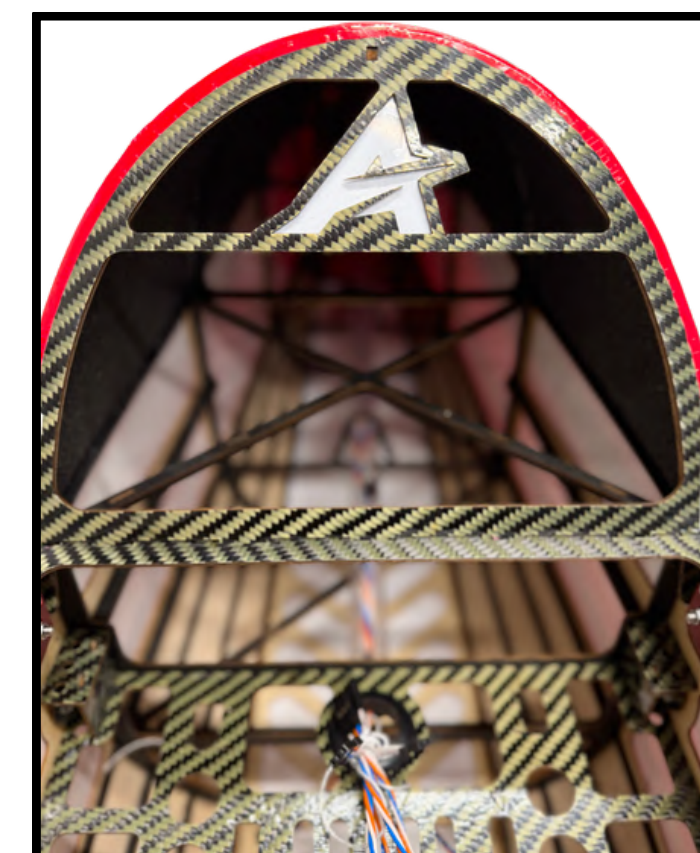
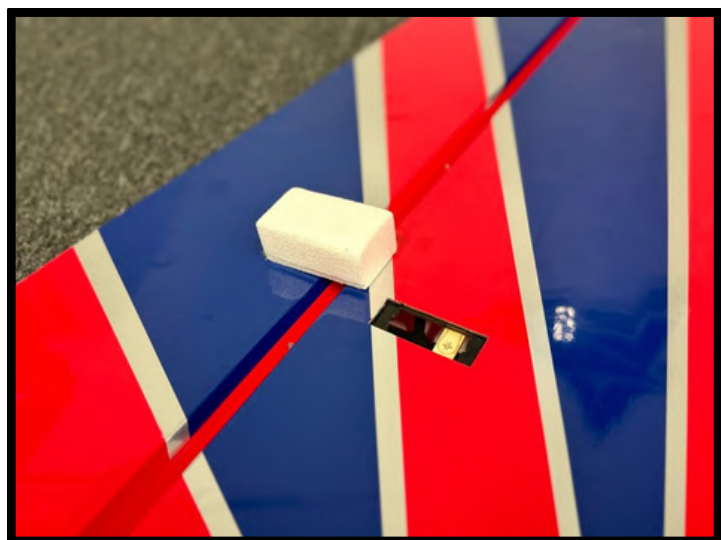
- **50-60CC GAS ENGINE OR APEX GA-85 POWER PACKAGE**
- **60CC APEX/DUALSKY ALUMINUM ENGINE MOUNT (25MM) IF RUNNING GAS, APEX/DUALSKY DA2GA CONVERSION MOUNT FOR GA-6000 MOTOR**
- **QTY. 5 STANDARD SIZE SERVOS (MINIMUM 400 OZ. IN. TORQUE), QTY. 1 STANDARD SIZE THROTTLE SERVO IF RUNNING GAS SETUP**
- **22-24" CARBON FIBER PROP (APEX 24X10 RECOMMENDED)**
- **10 CHANNEL RADIO AND RECEIVER SETUP**
- **12S SETUP FOR ELECTRIC (TWO 6S 5000-6000MAH BATTERIES)**
- **HEADER DROP: 50MM**



SERVO ARM SETUP:

- **QTY. 2 1.25" APEX ALUMINUM CLAMPING STYLE M3 ARMS (AILERONS)**
- **QTY. 2 2.0" APEX ALUMINUM CLAMPING STYLE M3 ARMS (ELEVATOR)**
- **QTY. 1 1.5" APEX ALUMINUM CLAMPING STYLE M3 ARMS (RUDDER)**
- **QTY. 1 1.25" APEX ALUMINUM CLAMPING STYLE M3 ARM (THROTTLE)**





Unboxing and Prep

Before beginning assembly, it's important to prepare the aircraft's covering. Each model experiences multiple environmental changes during transit from the factory, to our headquarters, and finally to your door. These shifts in temperature and humidity can naturally affect the covering and underlying wood structure.

We highly recommend taking a few minutes to inspect all covering seams and surfaces to ensure they are fully secure. Using a covering iron with its supplied cover or sock, lightly go over any seams or areas that need tightening. A heat setting of approximately 250-270°F is ideal. Avoid excessive heat—overheating can cause unnecessary shrinking or distortion. If you are new to working with film-covered aircraft, start with a lower heat setting and increase gradually as needed.

Some wrinkles are normal on newly manufactured wood aircraft. The amount of visible wrinkling depends largely on the wood's moisture content. Aircraft stored or shipped in higher-humidity environments may show fewer wrinkles due to the wood swelling slightly, while lower-humidity environments may allow the wood to contract, and covering to produce more visible wrinkles.

You may use a heat gun to remove certain wrinkles if you are experienced and comfortable with the technique. However, it is strongly recommended to attempt correction with the iron first, as it offers more control and reduces the risk of overheating or distorting the covering.

Taking the time to properly prep the covering will help ensure a clean finish and long-term durability of your aircraft. Additionally, we recommend taking a few moments to inspect all glue joints throughout the airframe. If desired, reinforce any joints with a small amount of CA adhesive.

Apex Aerotech aircraft also feature numerous factory-installed components, including—but not limited to—control horns, hinges, and other pre-installed items. Before flying, carefully inspect these components to ensure they are secure, properly bonded, and operating correctly. While every aircraft is thoroughly inspected during manufacturing, shipping and handling can occasionally affect factory-installed components, making this final inspection an important step in the assembly process.

LASER COVERING CODES (MANUFACTURED BY FLFRC)

RED/BLUE ("RETRO")

-009-1 DARK RED

-011-1 DARK BLUE

-016-1 SILVER

-014-1 WHITE

YELLOW ("VELOCITY")

-010-2 CADMIUM YELLOW

-009-2 RED

-015-1 BLACK

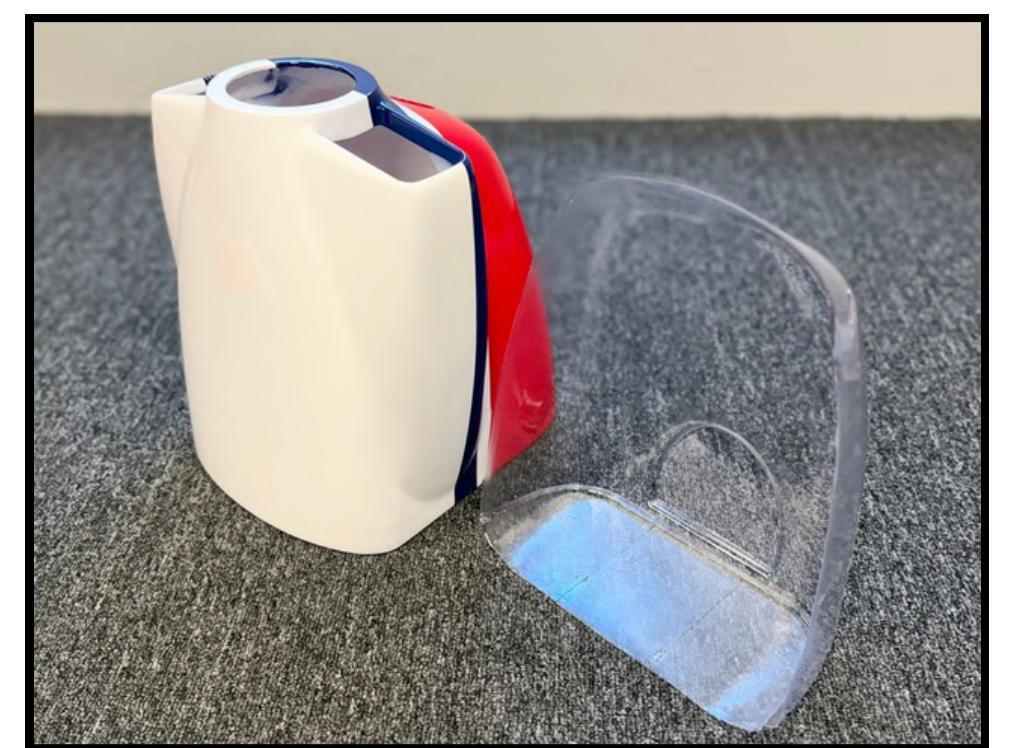
-016-1 SILVER



82" Laser Features

Features:

- Quick release mechanisms for wings, stabs, and canopy
- Pre-installed and painted control horns
- Pre-installed cockpit and pilot figure
- Cowl cutting template
- Pre-installed and labeled extensions
- Pre-installed servo lead connectors for ailerons and elevators
- 17oz Apex fuel tank included
- Included livery matching carbon fiber spinner
- Includes three 5mm (15mm total) spacers for easy spinner gap alignment with Apex/Dualsky mounts, for both gas and electric!
- Electric motor baffles included
- Quick release/attach side force generators
- Removable rudder
- Painted landing gear
- Aluminum canopy pin receptacles
- Wing bags, stab bags and canopy cover
- Removable hatches for fuselage access
- Carbon fiber/Kevlar-laminated structure throughout
- High quality decal package
- Blind nuts installed in wingtips for night lights
- Pre-cut cowling pressure lip opening for hot-air exit



Specifications:

Wingspan: 82"

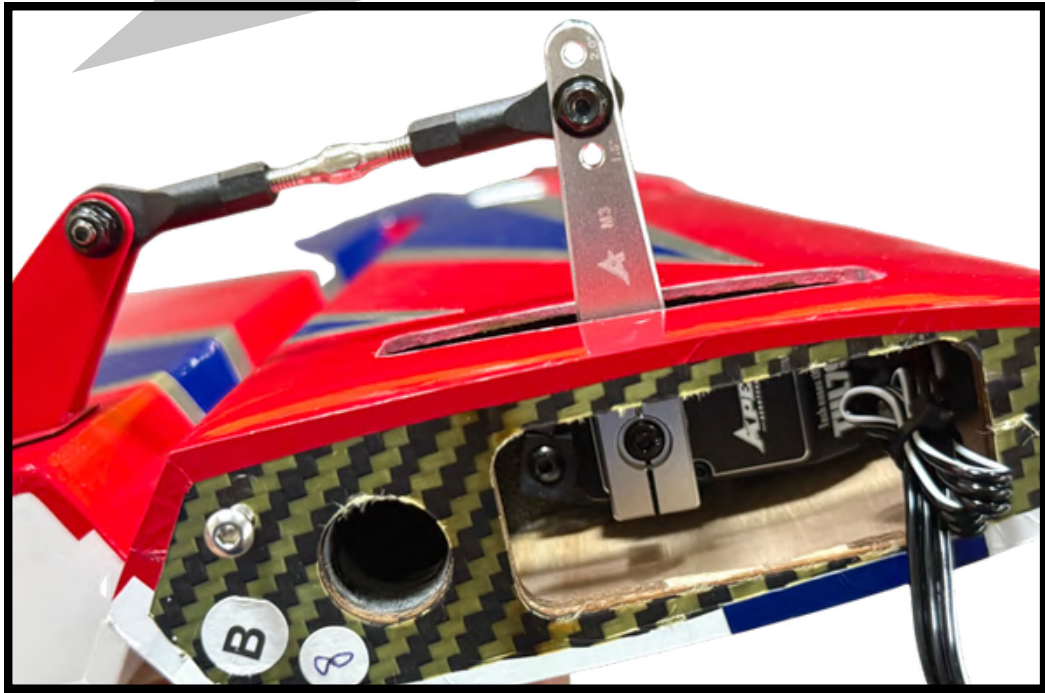
Length (with spinner): 82"

Weight: 16-18 lbs





82" LASER ARF+



Apex Aerotech is thrilled to introduce the ARF+ aircraft configuration! The 82" Laser is available in this configuration, featuring factory-installed Apex/Theta THL798 servos paired with Apex aluminum clamping-style servo arms. Combined with the many other pre-installed, convenient features of the 82" Laser, the ARF+ configuration makes for an extremely rapid giant scale aircraft assembly. Install your power system and receiver, complete the final setup, and your Laser is ready to go!

Since the ARF+ configuration comes with the servos and servo arms pre-installed, the servo installation steps in this manual can be disregarded during the ARF+ assembly process.



Landing Gear Installation



Locate the following items:

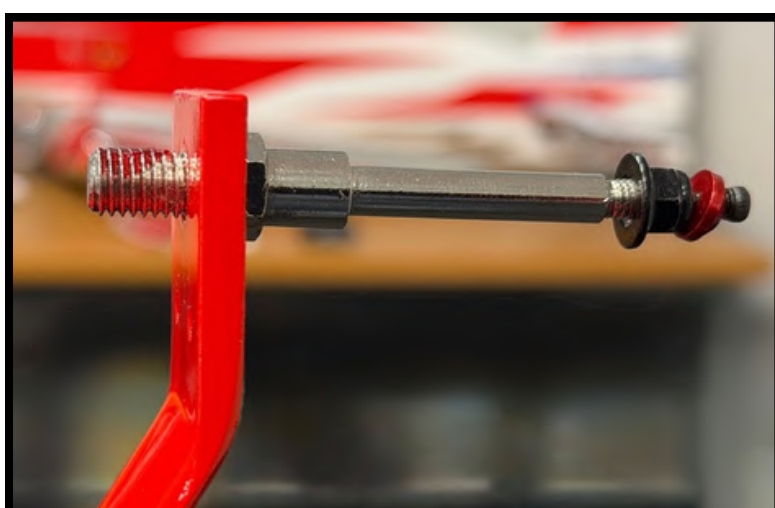
- Carbon fiber landing gear
- Wheels
- Axles
- Wheel pants
- Landing gear cuffs (fairings)



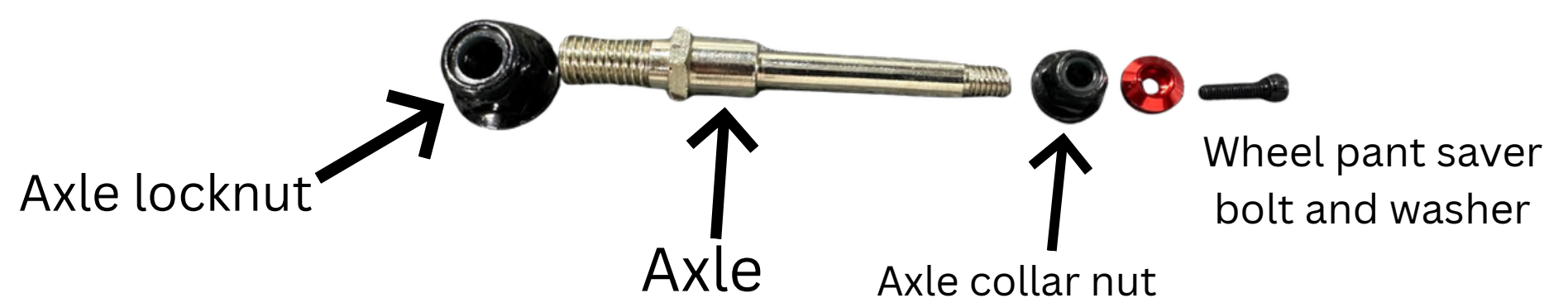
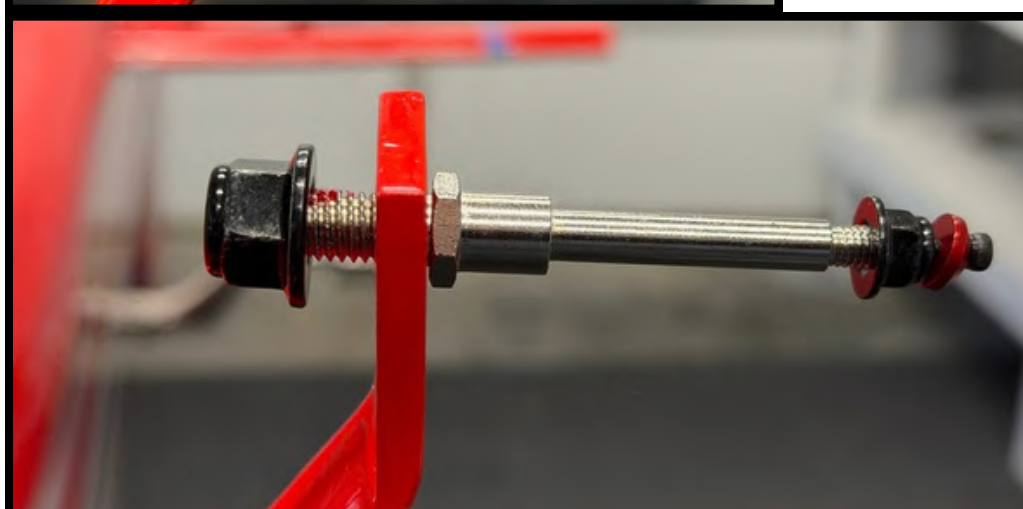
The main landing gear is secured with four bolts. The bolt pattern is keyed to ensure correct installation orientation. It is recommended to apply blue Loctite to these bolts before installation.

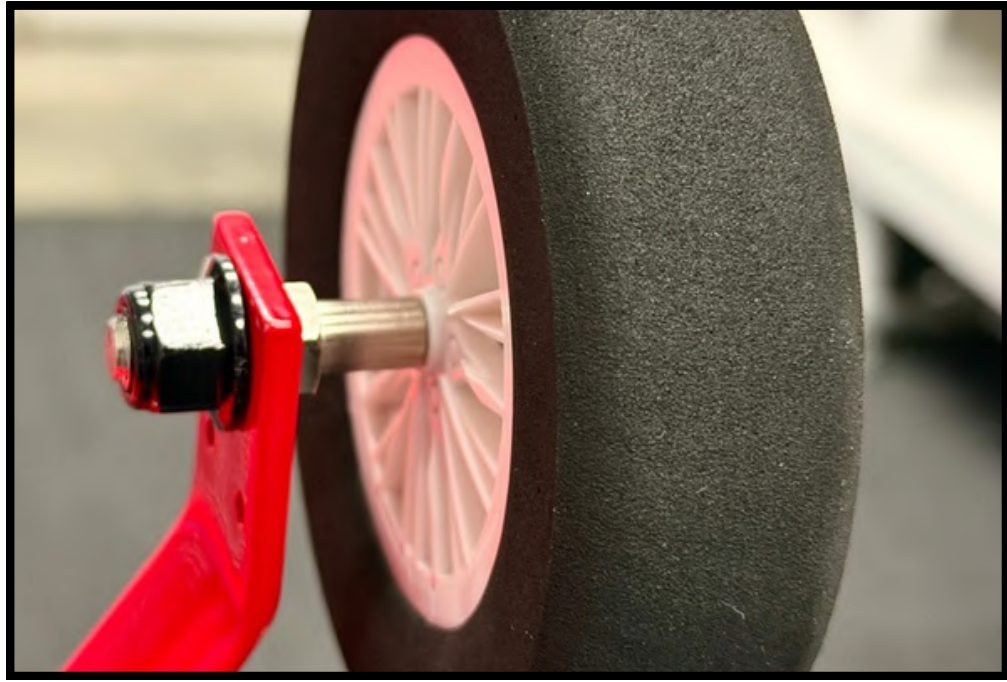


Before installing the axles, now is a good time to slide the landing gear cuffs onto the gear legs.

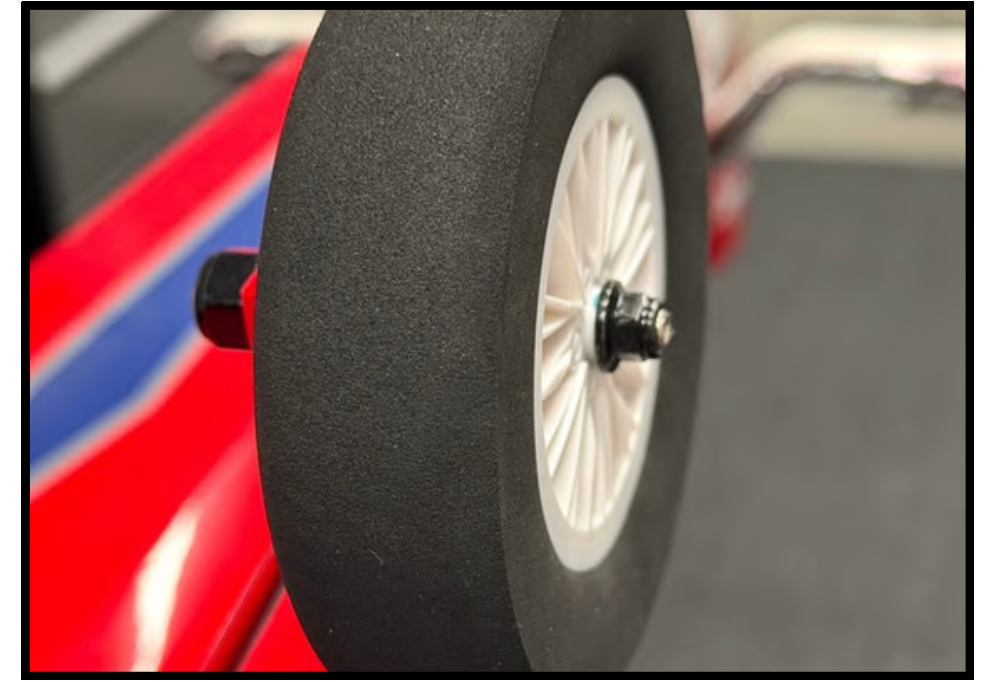


First, slide the threaded end of the axle into the landing gear leg. Install and tighten the axle locknut. Align the axle so the hex portion is oriented vertically. This orientation ensures the wheel pant can be installed correctly.

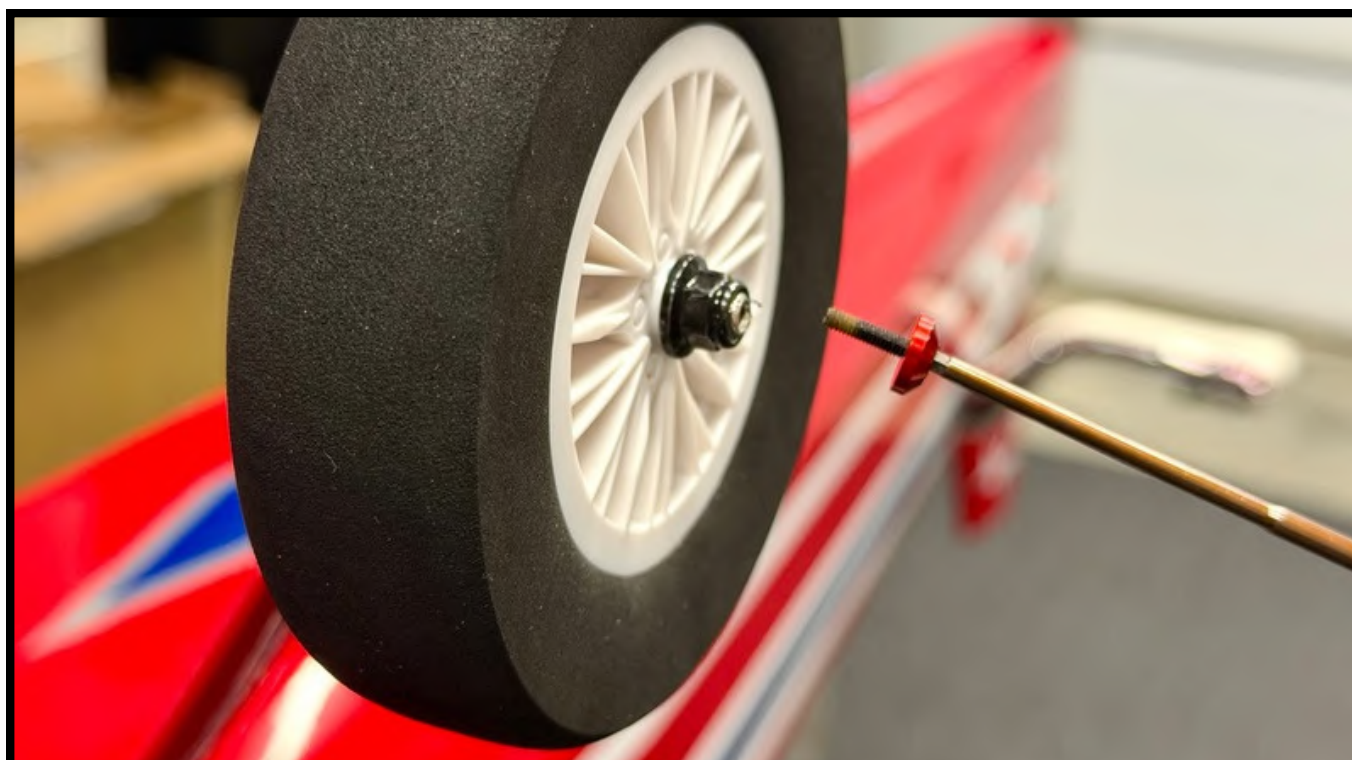




Axle tightened to the landing gear leg with the wheel and axle collar nut installed.



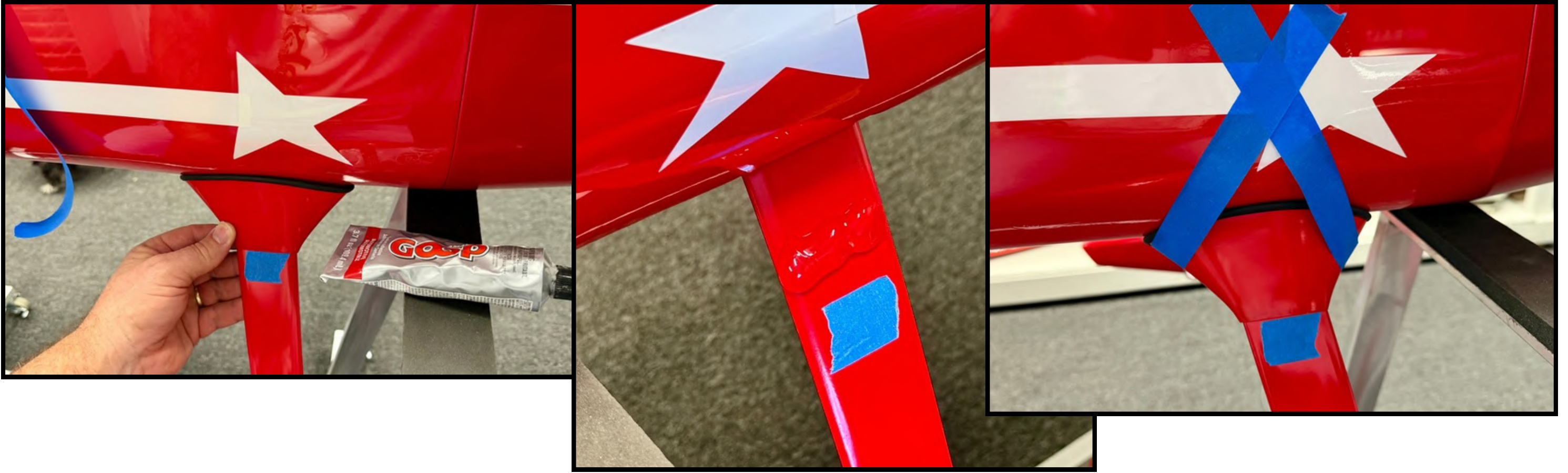
Next is the wheel pant installation. Locate the wheel pants, the two mounting bolts, and the wheel pant saver bolt and washer. Insert the two wheel pant mounting bolts into the provisions in the landing gear leg. Position the wheel pant and thread the bolts into the wheel pant. It is recommended to apply blue Loctite to the wheel pant mounting bolts before installation.



Apex Aerotech aircraft feature a built-in wheel pant saver system. Thread the wheel pant saver bolt and washer into the end of the axle. Make sure the hole on the wheel pant is aligned with the threaded axle opening.

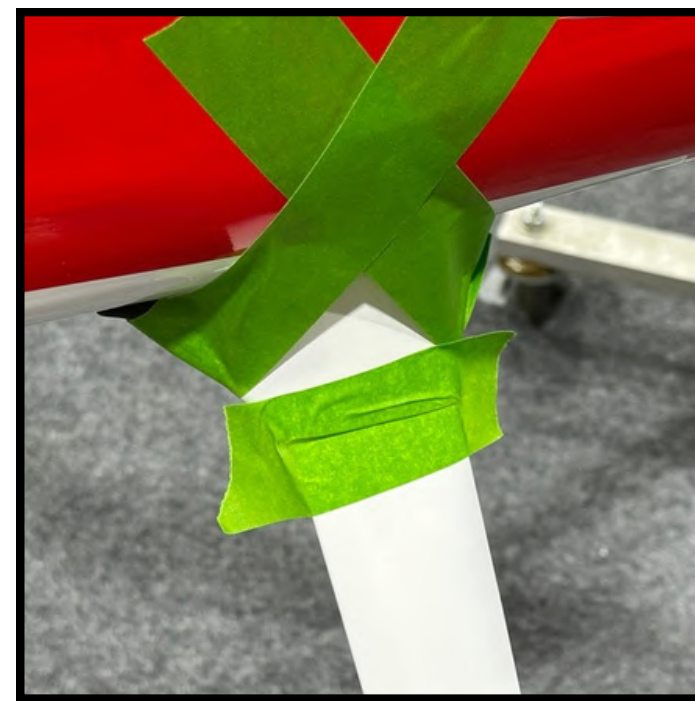


Apply blue Loctite



Landing gear cuff installation requires GOOP (or a similar rubberized adhesive) along with masking tape to hold the cuffs in position while the adhesive cures. The gear cuff is glued to the landing gear only, not the fuselage. This allows the landing gear to be removed later if needed.

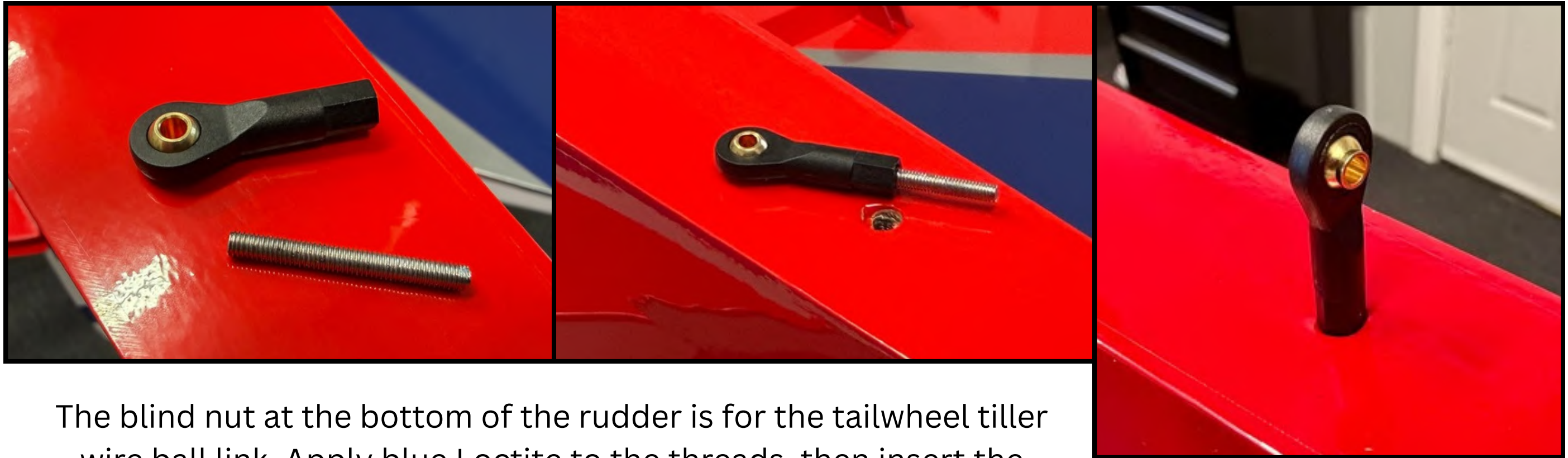
- Slide the landing gear cuff up against the fuselage until it is properly positioned. Use a piece of masking tape to mark the location of the gear cuff for reference.
- Slide the cuff back down the gear leg. Apply a bead of GOOP to both sides of the landing gear leg, just above the reference mark, then slide the cuff back up into position against the fuselage.
- Use masking tape to hold the gear cuff in place up against the fuselage. If desired, place a piece of tape and crease it along the joint between the bottom of the gear cuff and the gear leg to help prevent excess GOOP from spreading.



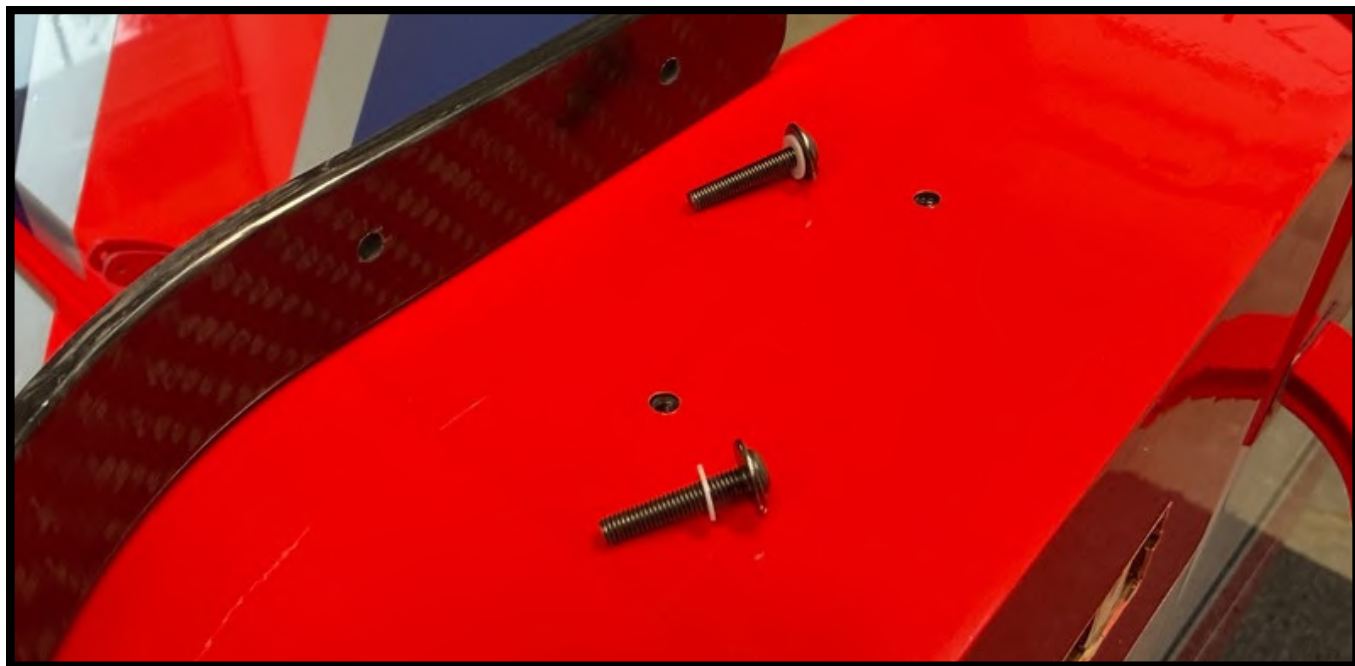
**Keep the aircraft in an upright position while the adhesive cures to prevent any adhesive from dripping onto the fuselage.*

Tailwheel and Rudder Installation

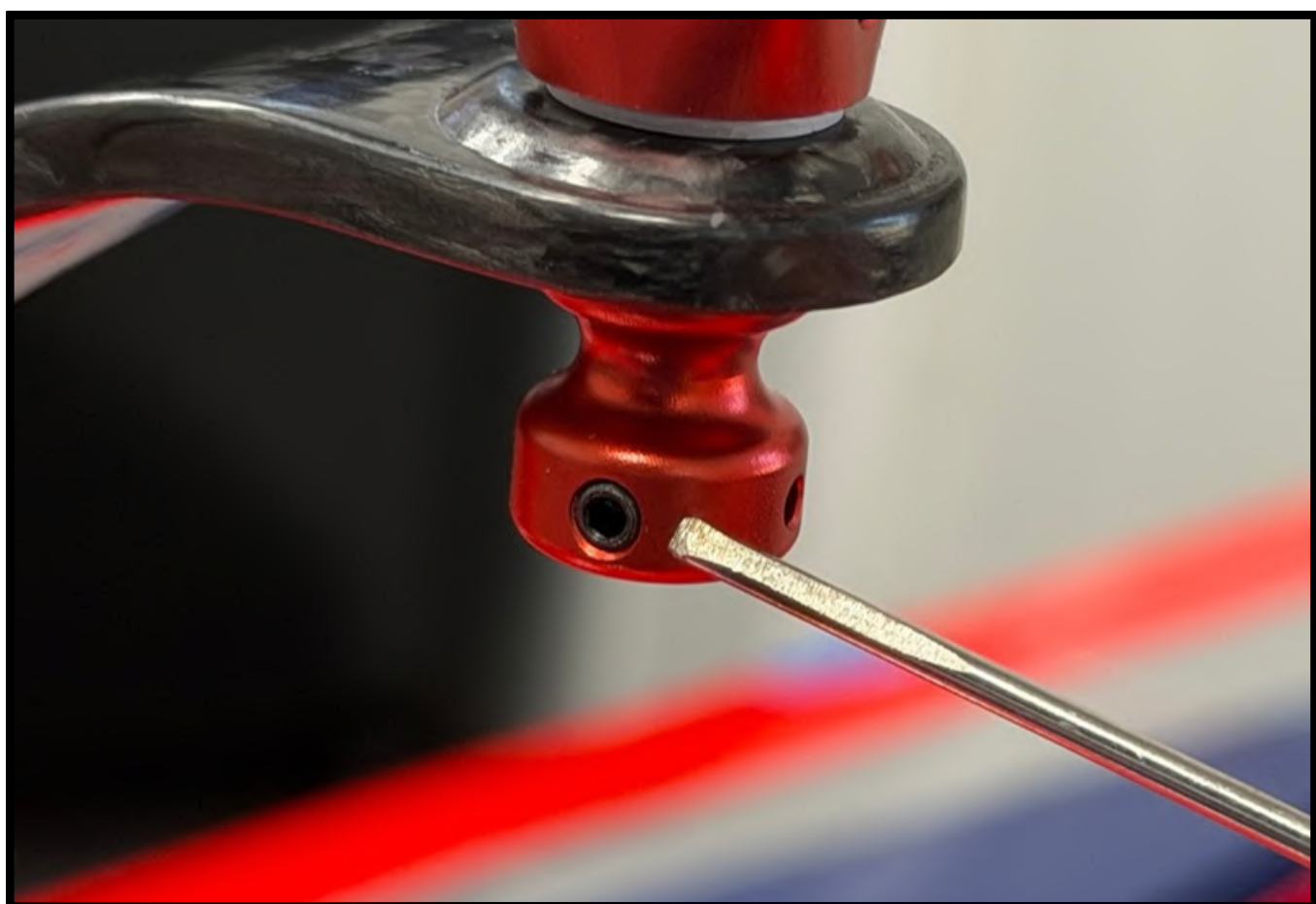




The blind nut at the bottom of the rudder is for the tailwheel tiller wire ball link. Apply blue Loctite to the threads, then insert the threaded tiller wire ball link into the provisional blind nut.



The tailwheel is installed using two bolts. Apply blue Loctite to the bolts before tightening.

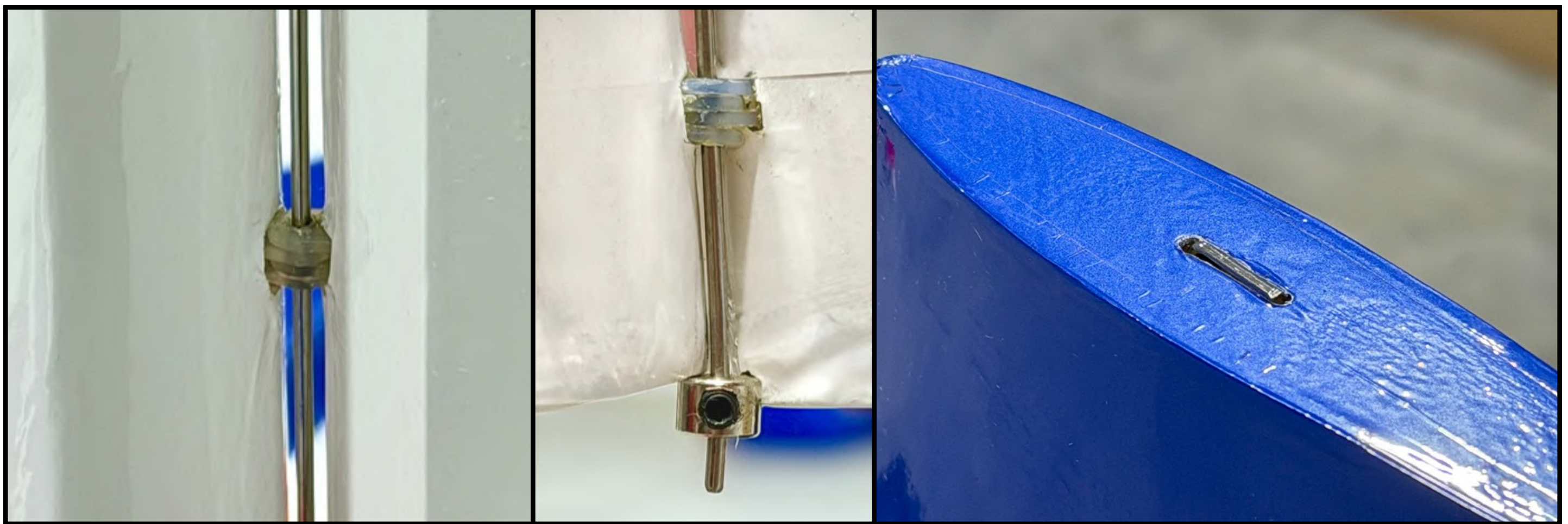


Be sure to install the flat portion of the tiller wire into the tailwheel swivel mount. Apply Loctite to the set screw before tightening.



Bend the tiller wire so it aligns with the opening of the ball link. Applying heat while the wire is off and away from the aircraft is a simple and effective method to achieve the correct bend.

Verify that the rudder moves freely and achieves full deflection in both directions.

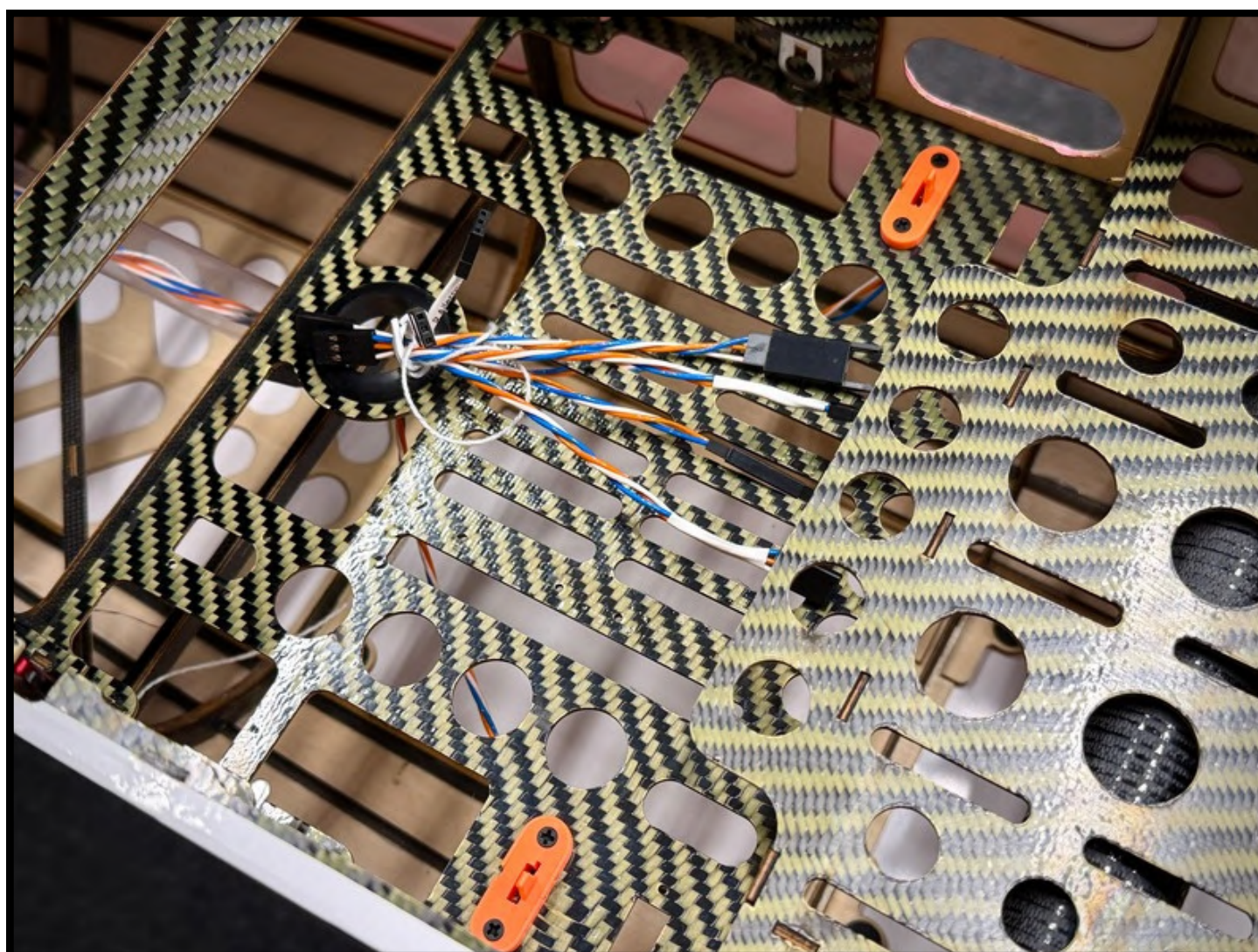


The Laser features a removable rudder. To install:

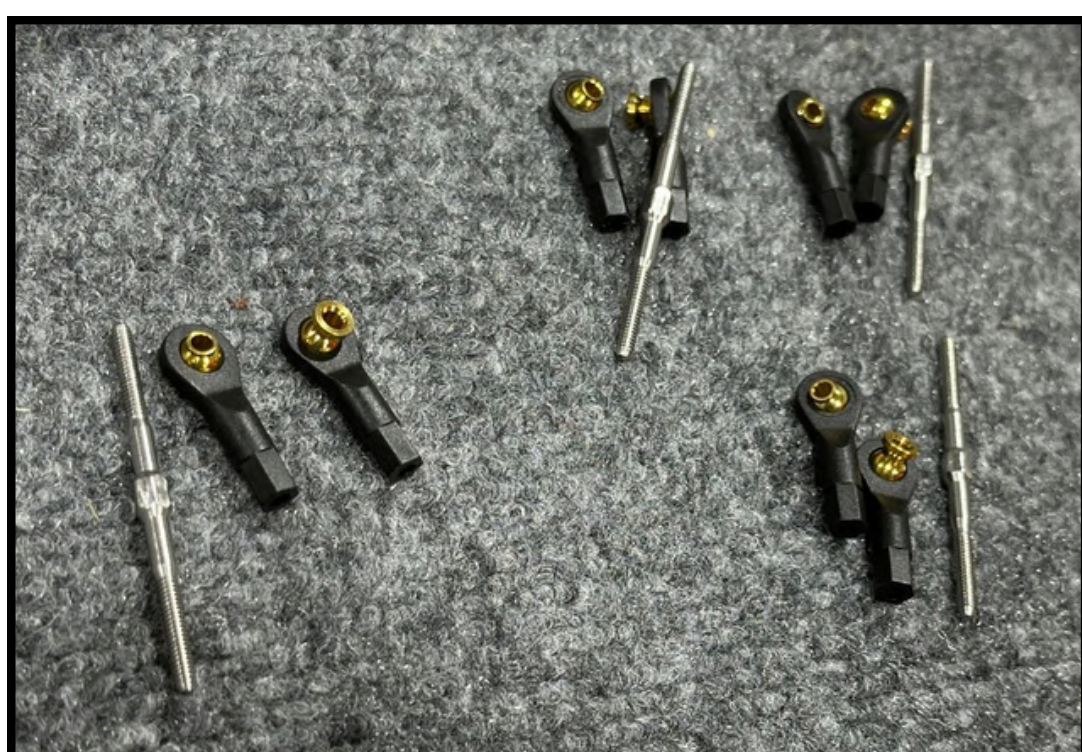


1. Align the rudder hinges.
2. Slide the hinge pin through the opening at the top of the rudder and down through the hinge holes.
3. The 90-degree bend at the top of the wire will sit in the provision at the top of the rudder.
4. At the bottom, secure the hinge wire with the collar and set screw. Apply blue Loctite to the set screw.

Aileron Servo Installation



The 82" Laser features pre-installed aileron servo lead quick connectors in the fuselage, with the leads conveniently routed to the receiver mounting location.



Turnbuckles and ball links



Assembled control linkage. The flanged ball link will be positioned against the servo arm.

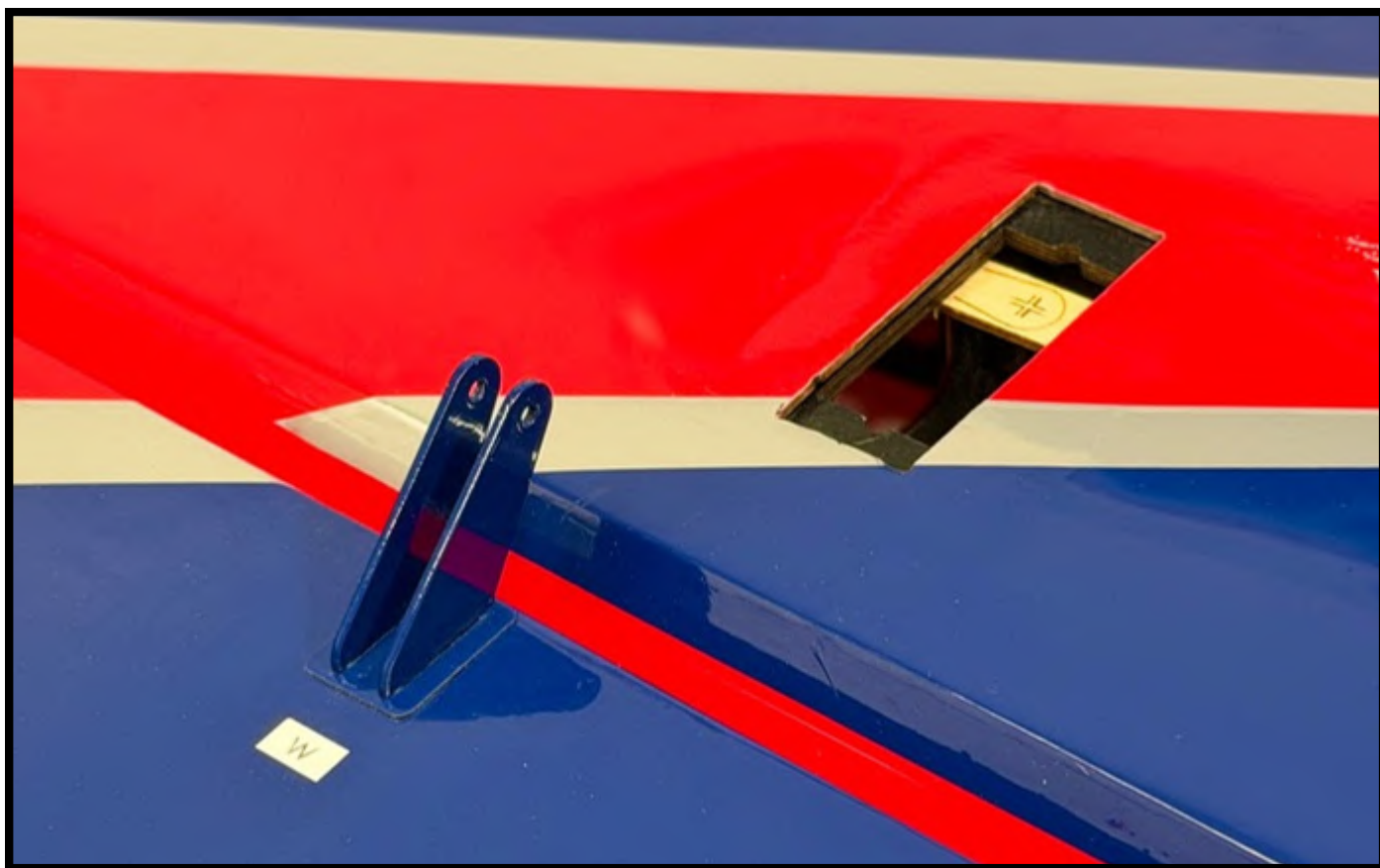


Control linkage items:

- Turnbuckle
- Ball Link
- Bolt
- Locknut



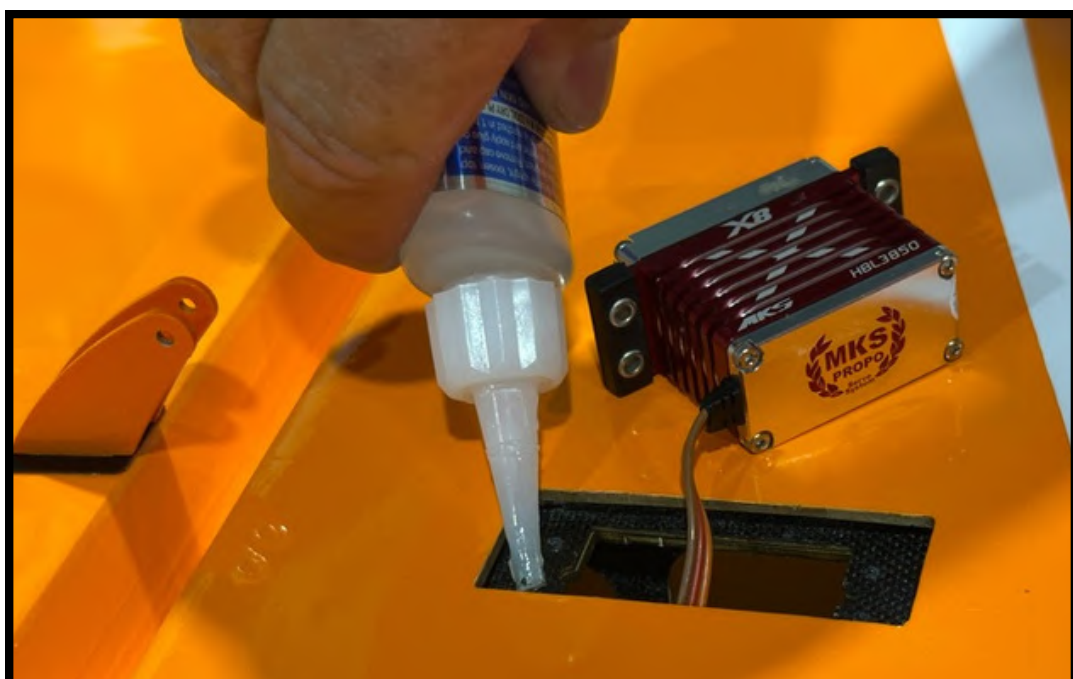
Turnbuckle wrench



The 82" Laser also features pre-installed, painted control horns. Additionally, each servo bay includes servo arm orientation indicators to show the correct servo arm orientation during installation.



Prep your servos by properly installing the provided rubber grommets and eyelets.



To install the servos, first run the servo screws into the mounts to create the threaded holes. Remove the screws, then apply thin CA into the holes to harden the threads and help prevent stripping. Once the glue has cured, reinstall the servos.



Note that the flanged ball link is installed against the servo arm. Apex hardware features built-in flanges, eliminating the need for additional washers.

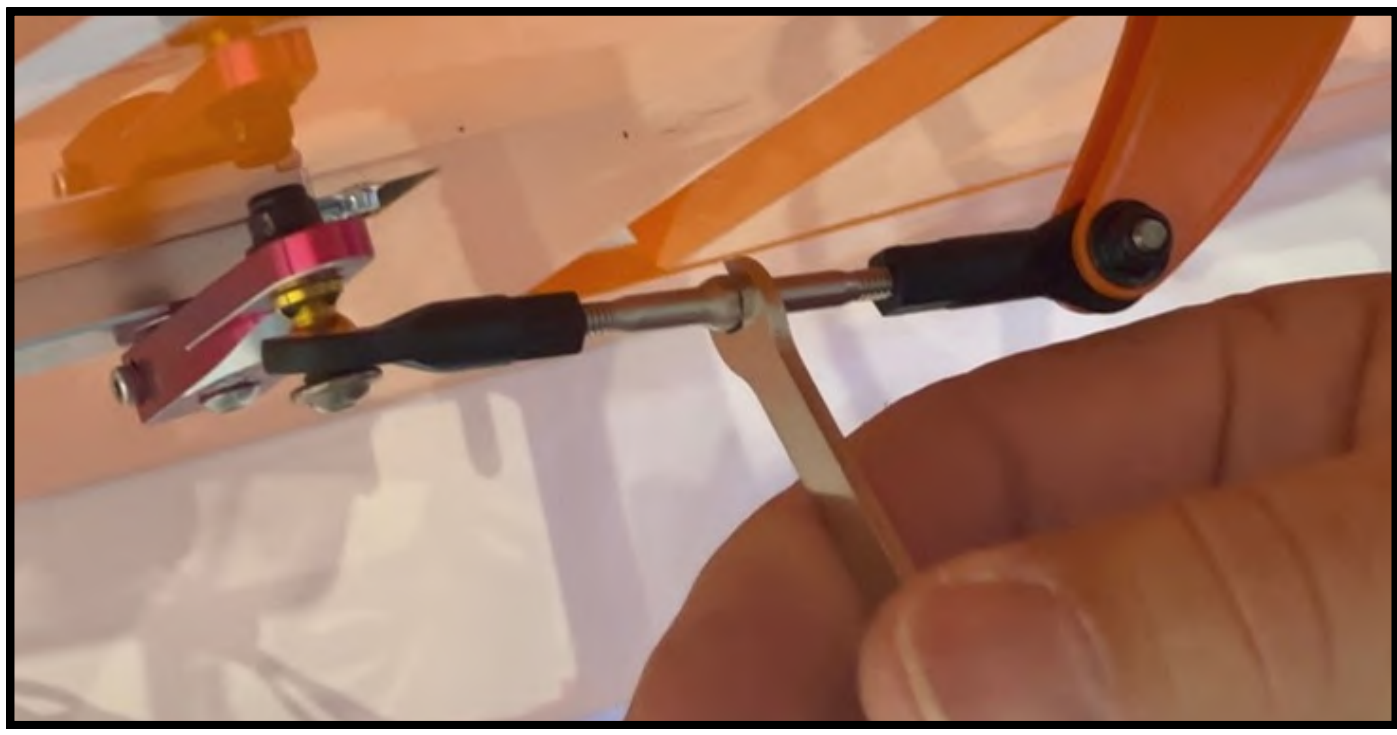


For convenience, you may use a servo centering tool (such as the Spektrum Smart Checker) to center the servos before installing the servo arms. Mount the servo arm as close to 90 degrees to the servo casing as possible.



For best performance and optimal resolution, install the control linkage at the 1.25-inch hole on the servo arm.





For setup, first adjust the turnbuckle mechanically to roughly center the control surfaces. Then, use your radio's sub-trim to fine-tune the control surfaces for precise alignment.

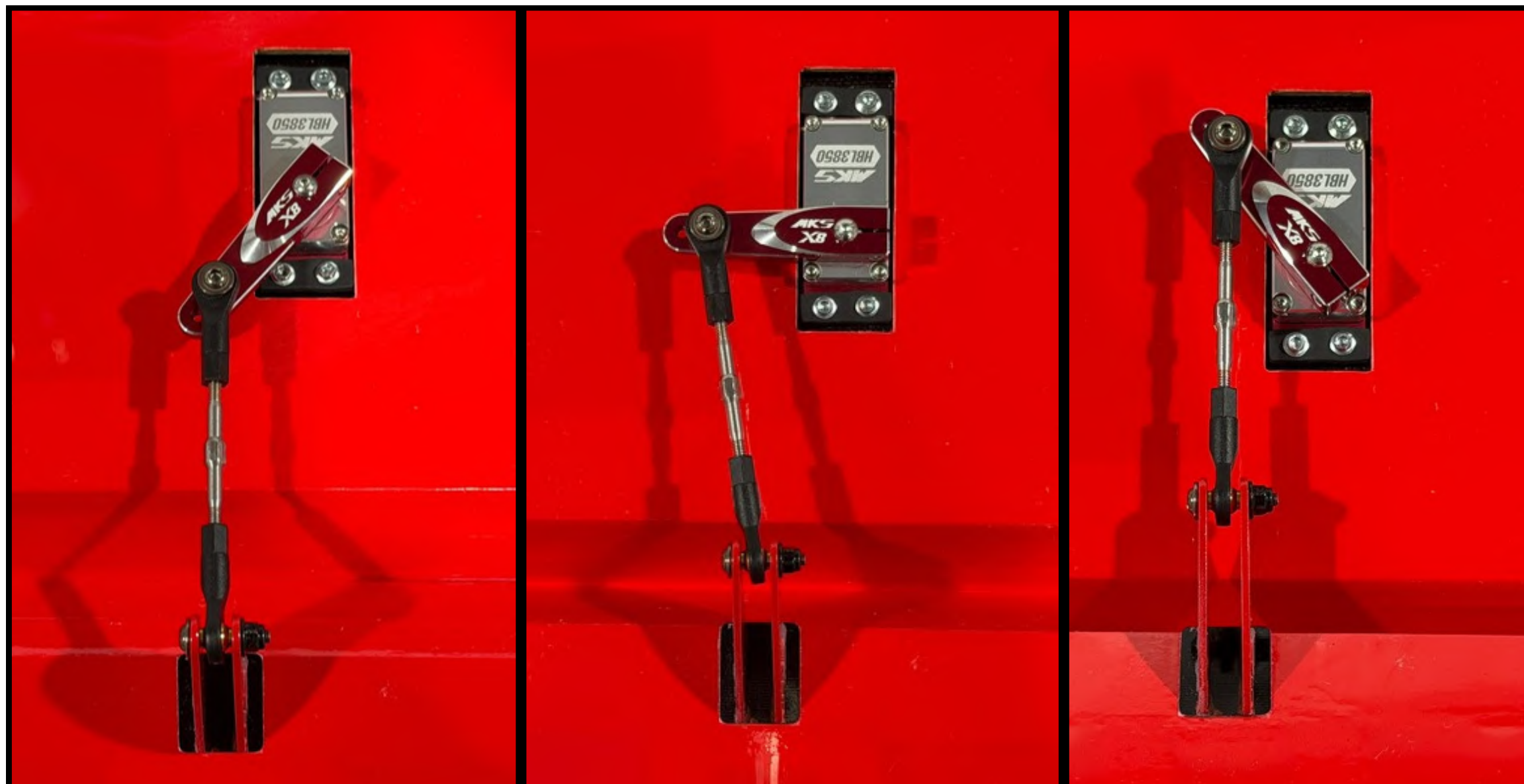


Always apply blue Loctite to all servo arm bolts.



It is highly recommended to use an aluminum clamping-style servo arm on all surfaces (for example, the Apex Standard aluminum servo arm).

PROPER AILERON LINKAGE GEOMETRY

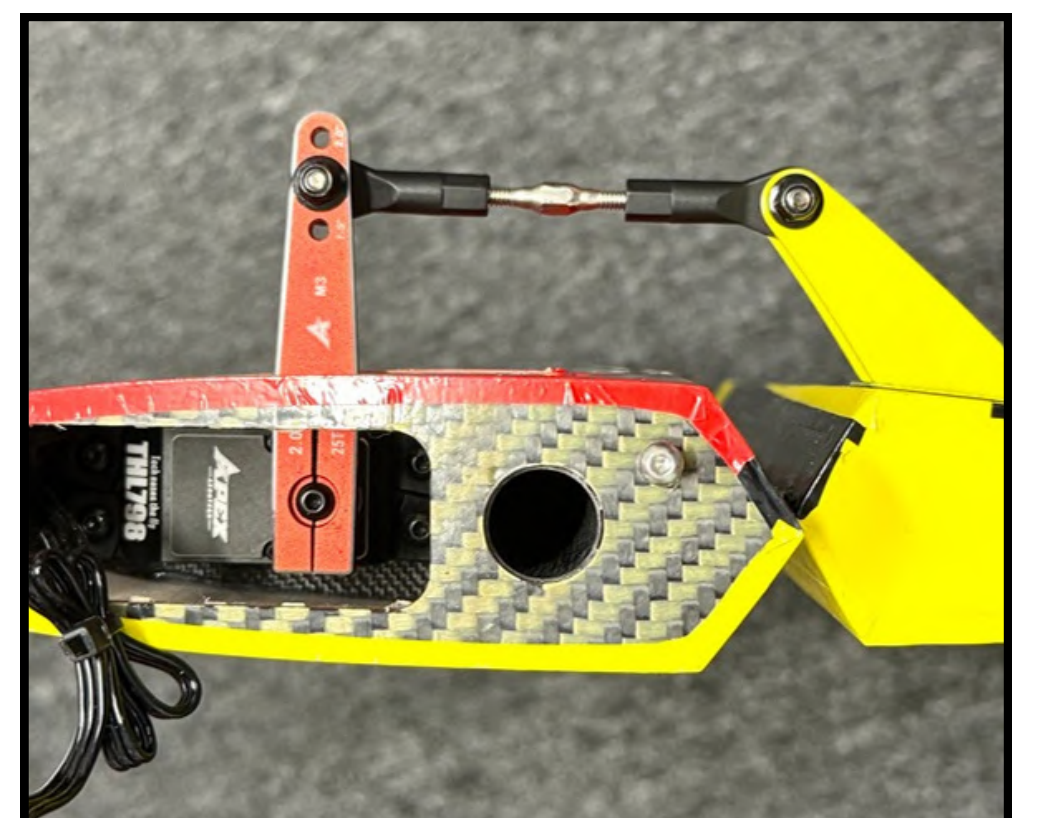


UP

NEUTRAL

DOWN

Elevator Servo Installation



Mount the elevator servo using the same method as the aileron servo. Feed the servo lead back through the root of the horizontal stabilizer. As before, a servo centering tool may be used to center the servo prior to installing the servo arm.

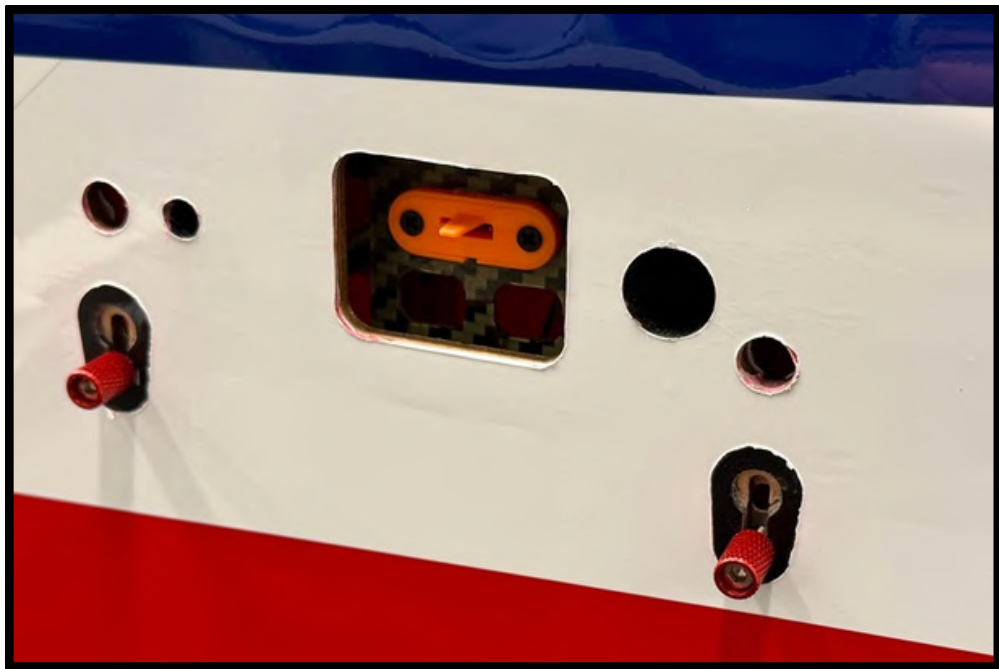


Install the linkage at the 1.75" position on the servo arm.

Position the flanged ball link against the servo arm.



The Laser features pre-installed elevator servo lead quick-connectors installed in the fuselage. The connectors are attached to the pre-installed, pre-routed servo extensions.



Rudder Servo Installation



Install the rudder servo linkage in the outer hole of a 1.5" servo arm. Refer to the servo arm orientation indicator to ensure the servo is installed in the correct orientation. The pre-installed rudder servo extension features built-in connector clips for added security. A pull string is attached to the servo extension inside the fuselage and can be used to route the servo lead through the guide tube after the servo is installed.



Notice the angle when viewing the linkage at neutral from behind (tail view). The linkage will straighten as it is deflected in either direction.

Rudder Servo Linkage Installation and Geometry

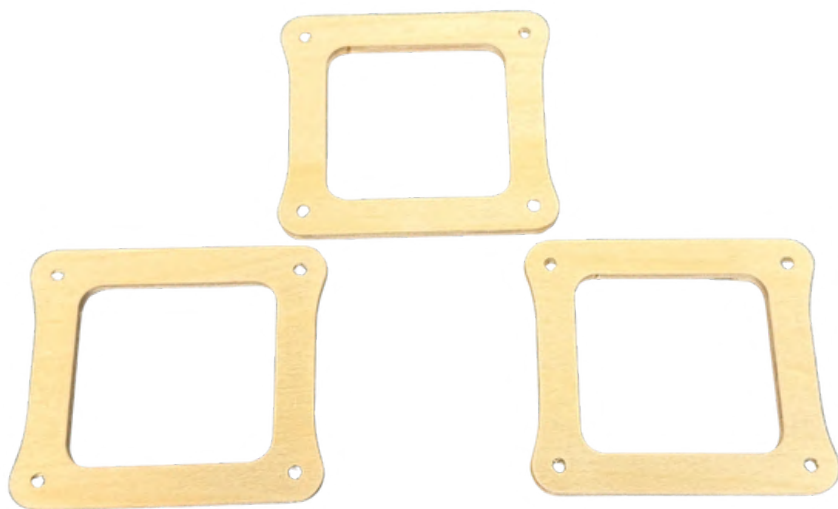
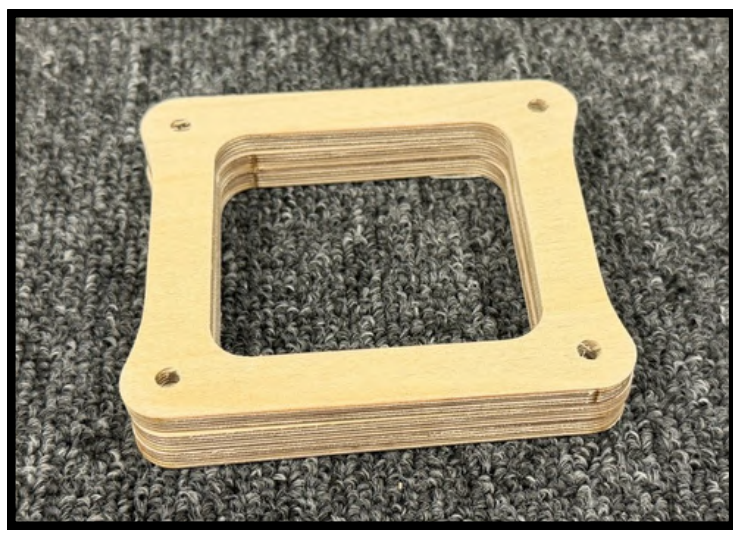


LEFT

NEUTRAL

RIGHT

Power Unit Installation



The 82" Laser is designed for convenient installation of both gas and electric power systems. Throughout this manual, the installation photos will demonstrate the installation of the GA-6000 electric motor (part of the GA-85 Power Package) and the DA-60 gas engine.

The 82" Laser includes three 5mm plywood spacers (15mm total thickness). These spacers can be used in conjunction with engine standoffs or motor mounts, depending on your power system. For the GA-6000 electric installation, we recommend the Apex/Dualsky ME2DA conversion mount. For 60cc single-cylinder gas engine installations, we recommend the Apex/Dualsky 60cc aluminum 25mm engine mount.

The following are approximate standoff lengths for various power system configurations to achieve a clean spinner-to-cowl gap:

GA-6000 (GA-85 Package): 68-70mm

ME2DA conversion mount is 55mm; add the provided 5mm wooden spacers.

DA-60: 35-37mm

Use the 25mm aluminum 60cc engine mount, then add the provided wooden spacers.

GP-61: 25mm

Only the 25mm aluminum 60cc engine mount needed.

DA-50: 72-74mm

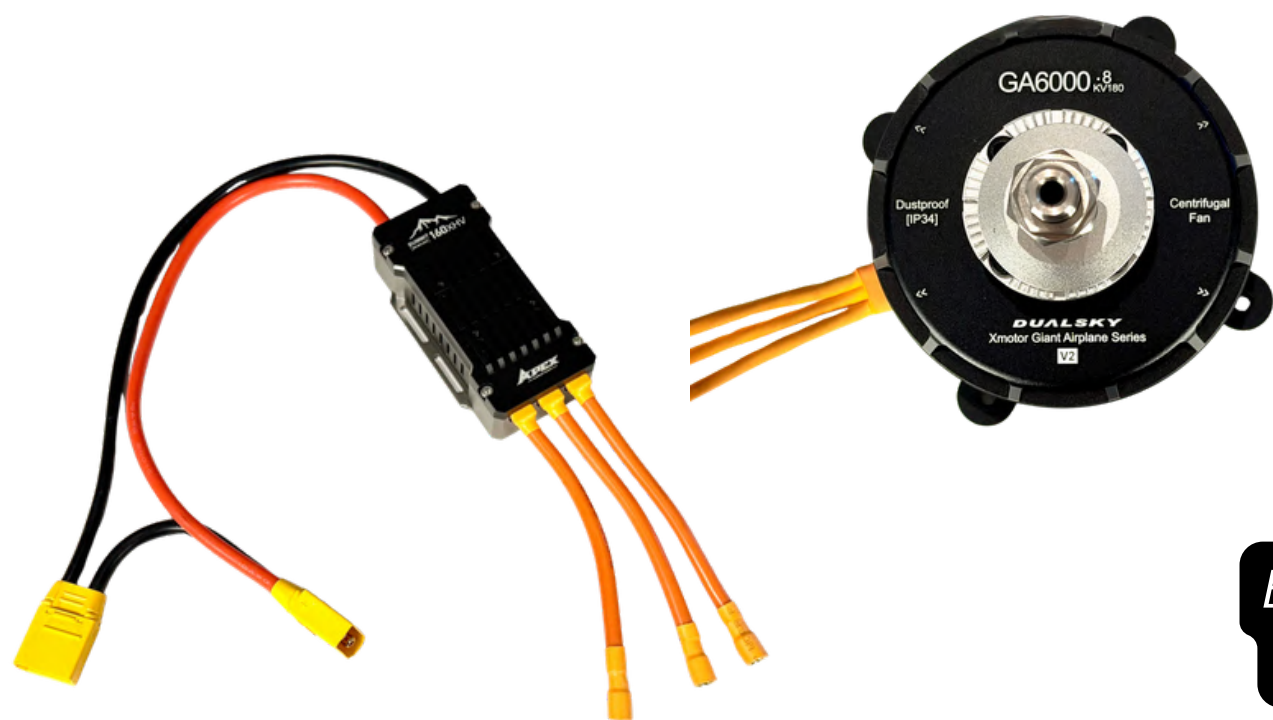


The firewall is pre-marked with bolt patterns for multiple engine configurations. For reference, the Apex/Dualsky ME2DA conversion mount uses the same firewall bolt pattern as the DA-60. The mount then adapts to the GA-6000 motor bolt pattern, allowing you to use the same firewall mounting holes when converting from a gas to an electric power system, or vice versa.



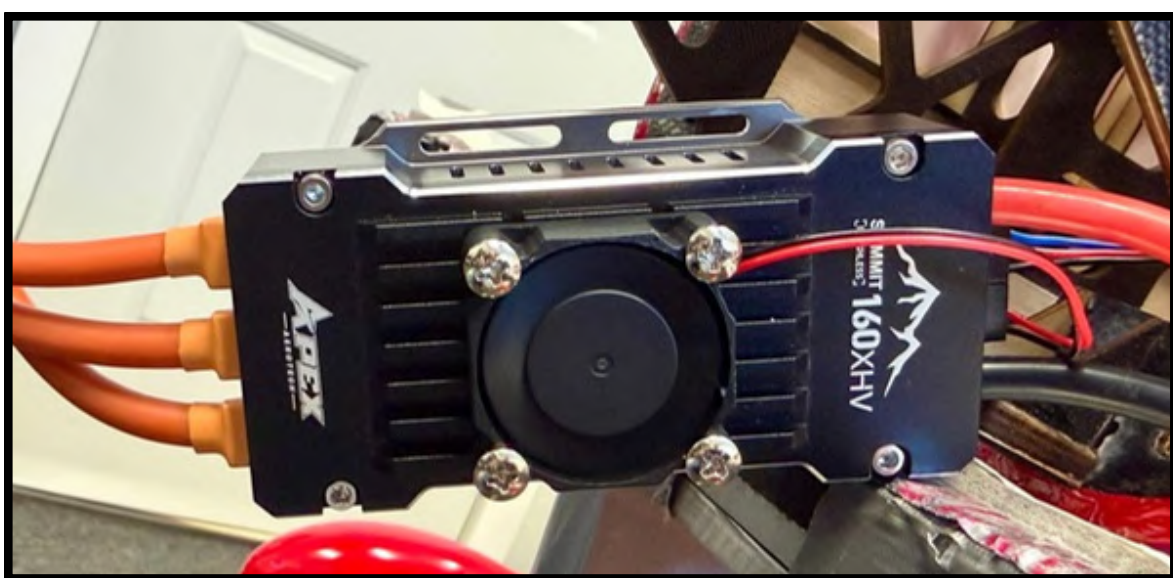
Drill the firewall mounting holes corresponding to your selected power system configuration.

Electric

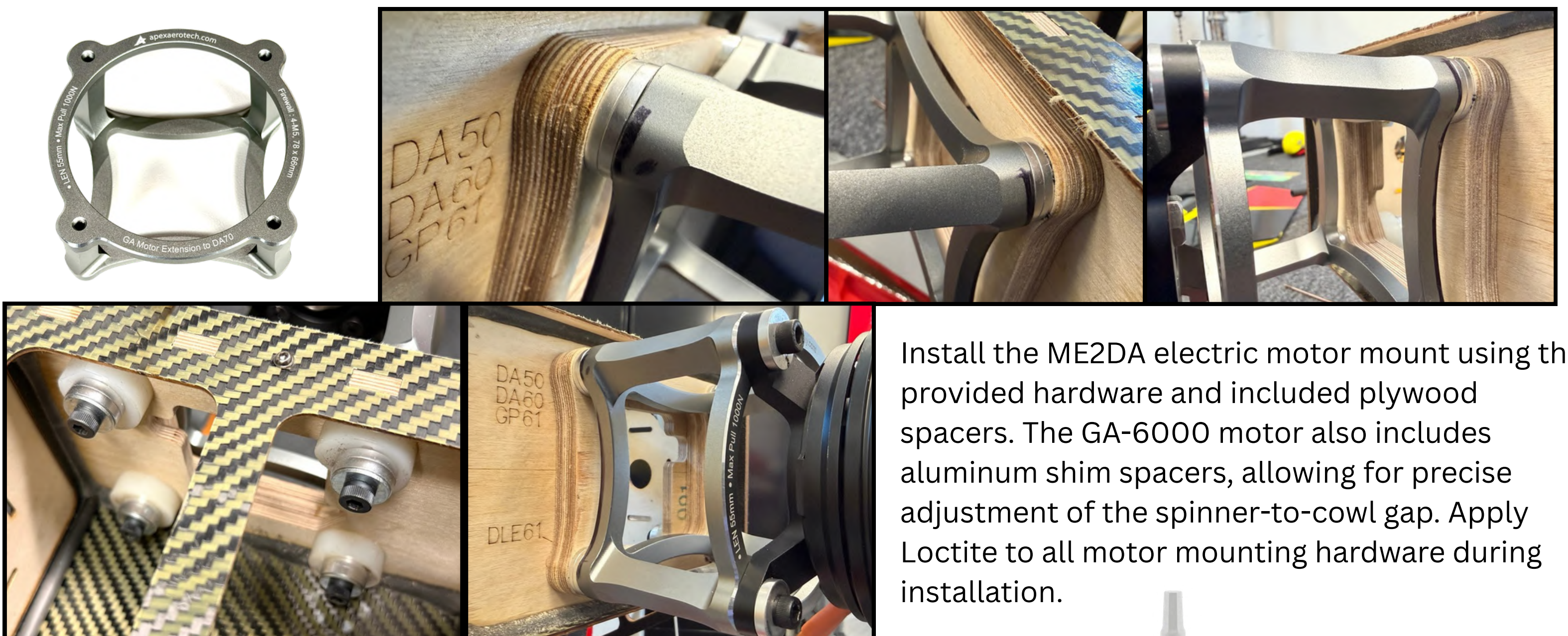


First, connect the motor to the ESC using the bullet connectors and verify the motor rotates in the correct direction. If the rotation is incorrect, swap any two of the three motor wires. Once the correct rotation has been confirmed, we recommend securing the connections with heat-shrink tubing.

Before operating the ESC, bind the transmitter to the receiver with the throttle trim fully lowered. Additionally, we recommend following the ESC manual to perform throttle calibration before the first flight.



Installation of the included external cooling fan on the Summit 160XHV ESC is highly recommended.

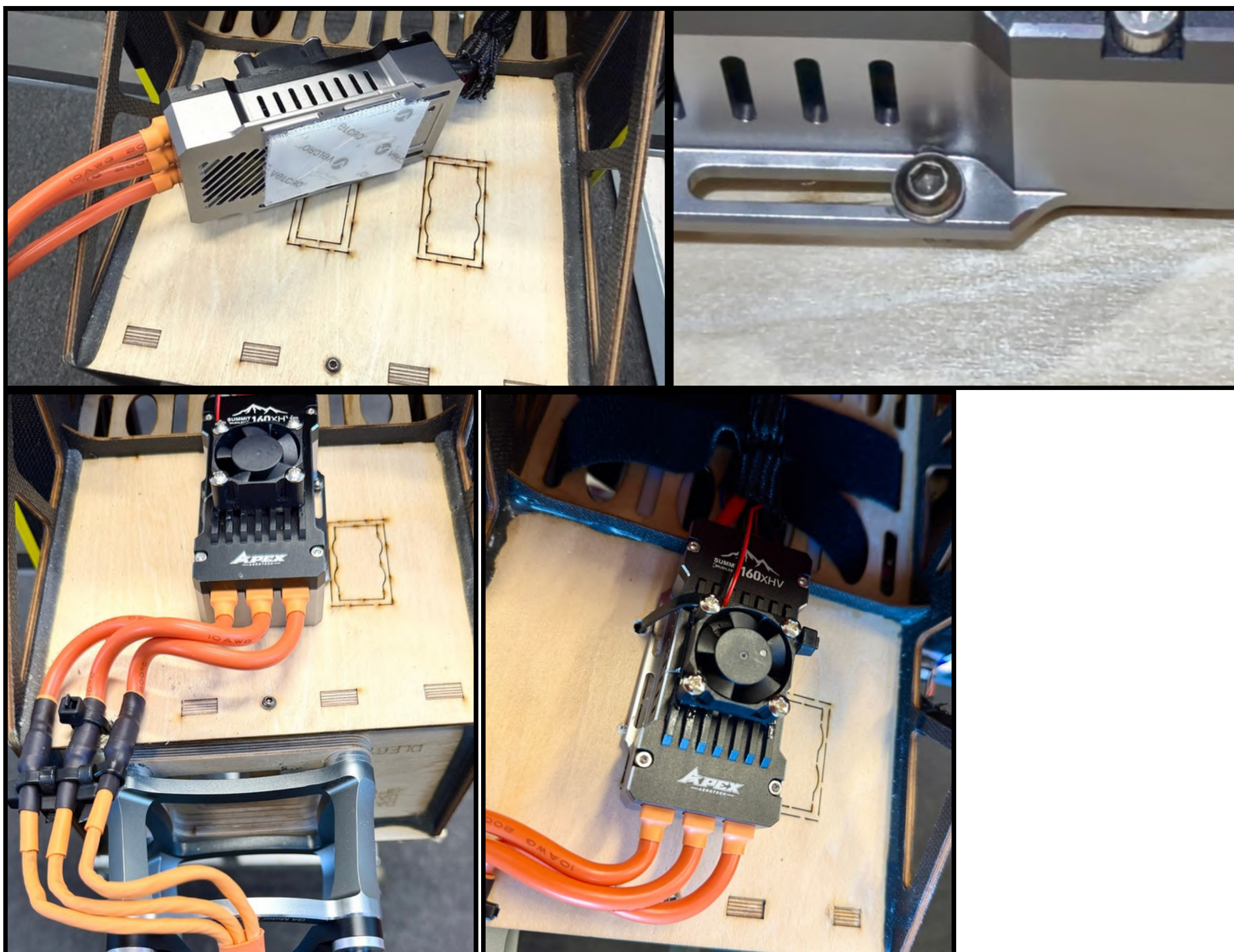


Install the ME2DA electric motor mount using the provided hardware and included plywood spacers. The GA-6000 motor also includes aluminum shim spacers, allowing for precise adjustment of the spinner-to-cowl gap. Apply Loctite to all motor mounting hardware during installation.

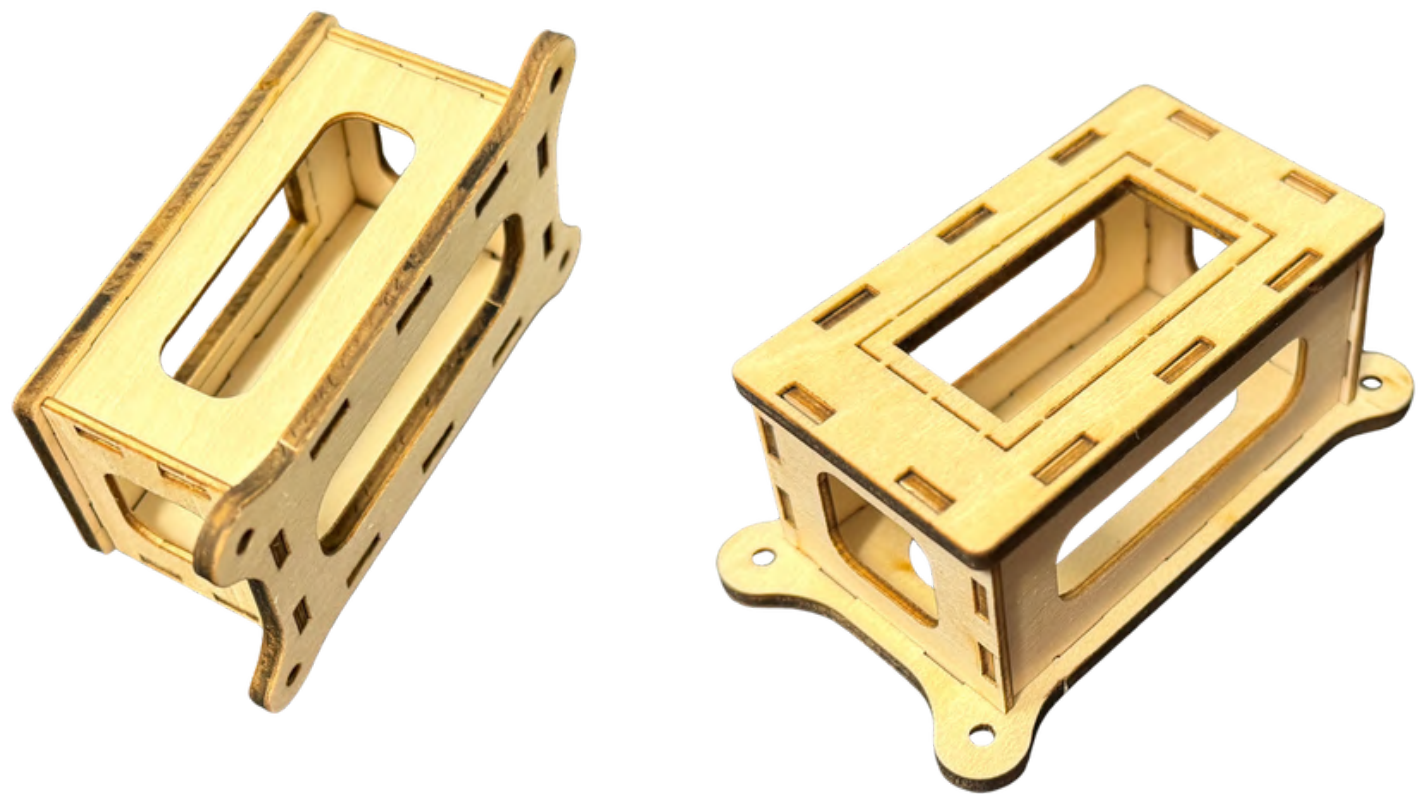
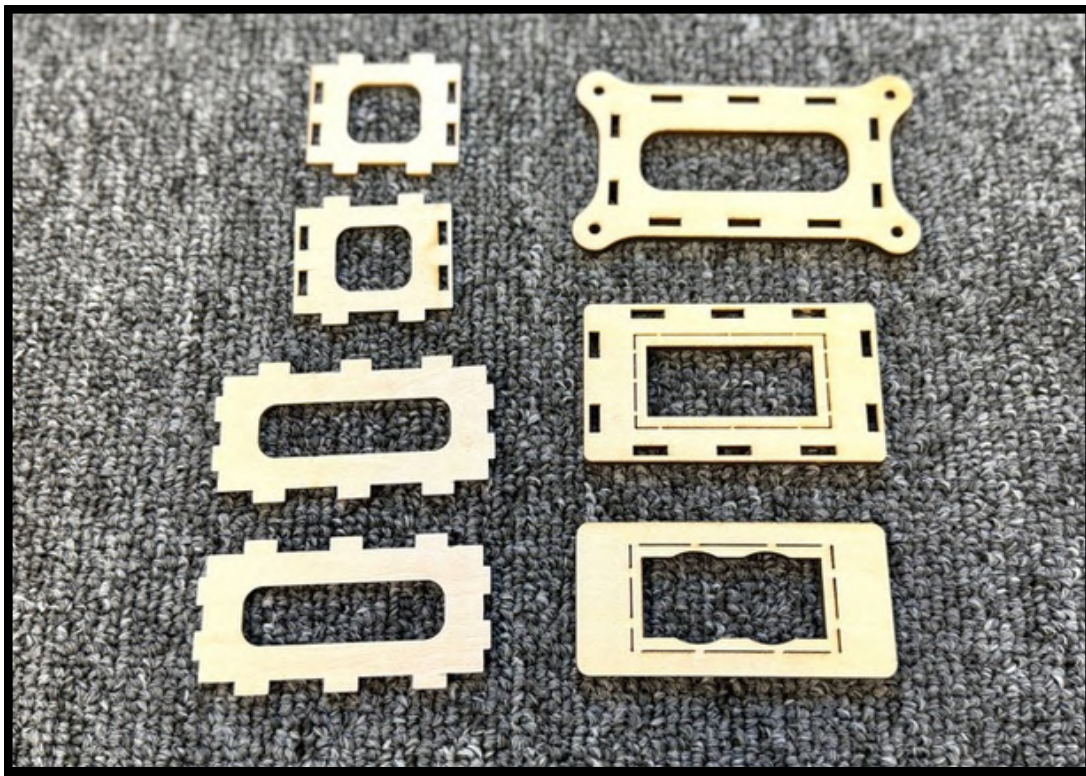




Mount the GA-6000 to the ME2DA motor mount using the hardware supplied with the GA-6000. Apply Loctite to all mounting bolts during installation



To mount the ESC, first attach adhesive-backed Velcro to the bottom of the motor box and the underside of the ESC. As shown in the photo, be sure not to obstruct the cooling vents on the bottom of the ESC. For added security, the ESC can be secured using either cable ties or wood screws through the integrated side mounting tabs. Finally, secure the motor-to-ESC wires as shown to prevent chafing and minimize unnecessary movement during flight.

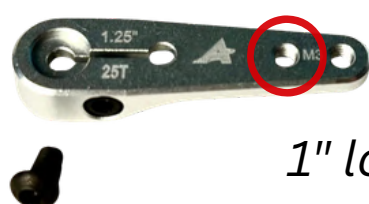


The Laser includes a throttle servo mount kit designed for installation inside the motor box. Assemble the mount and bond the components together using CA adhesive. Once assembled, the mount can be glued and/or screwed to the inside of the motor box, positioning it to align with the throttle arm orientation on your carburetor. The photo shown illustrates the recommended location for the DA-60 installation.



The goal of the throttle servo setup is to achieve similar values for both the positive and negative endpoints. At half throttle, the servo arm should be approximately 90° to the servo case. The linkage can be adjusted mechanically to help achieve this alignment. Observe the position of the carburetor butterfly at each throttle setting to verify proper movement.

Servo torque is not critical for a throttle servo. Ideally, select a servo with fast speed and use the 1" servo arm location to achieve the best possible resolution while maintaining necessary travel.



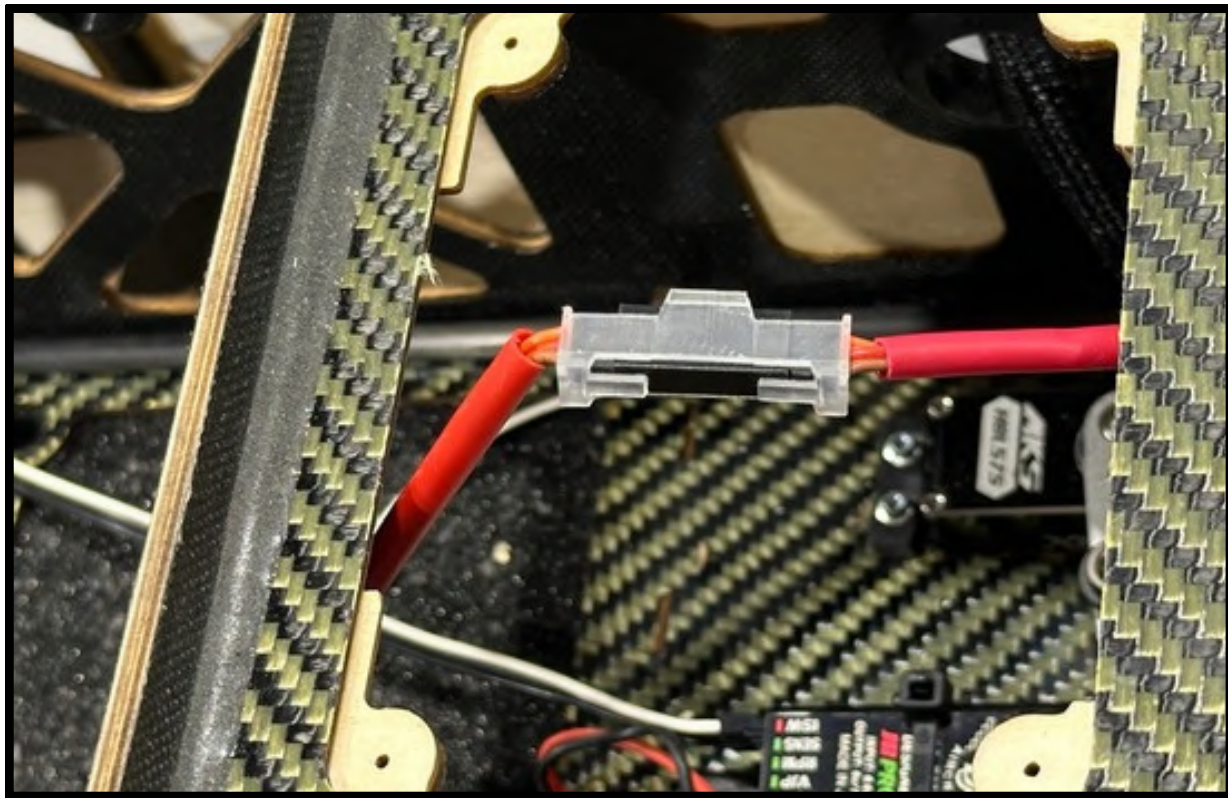
1" location on a 1.25" Apex clamping style servo arm

Based on personal preference and feel, you may choose to use a throttle curve in your radio setup, along with a high idle for flight and a low idle for landing and taxiing.

Ignition Installation



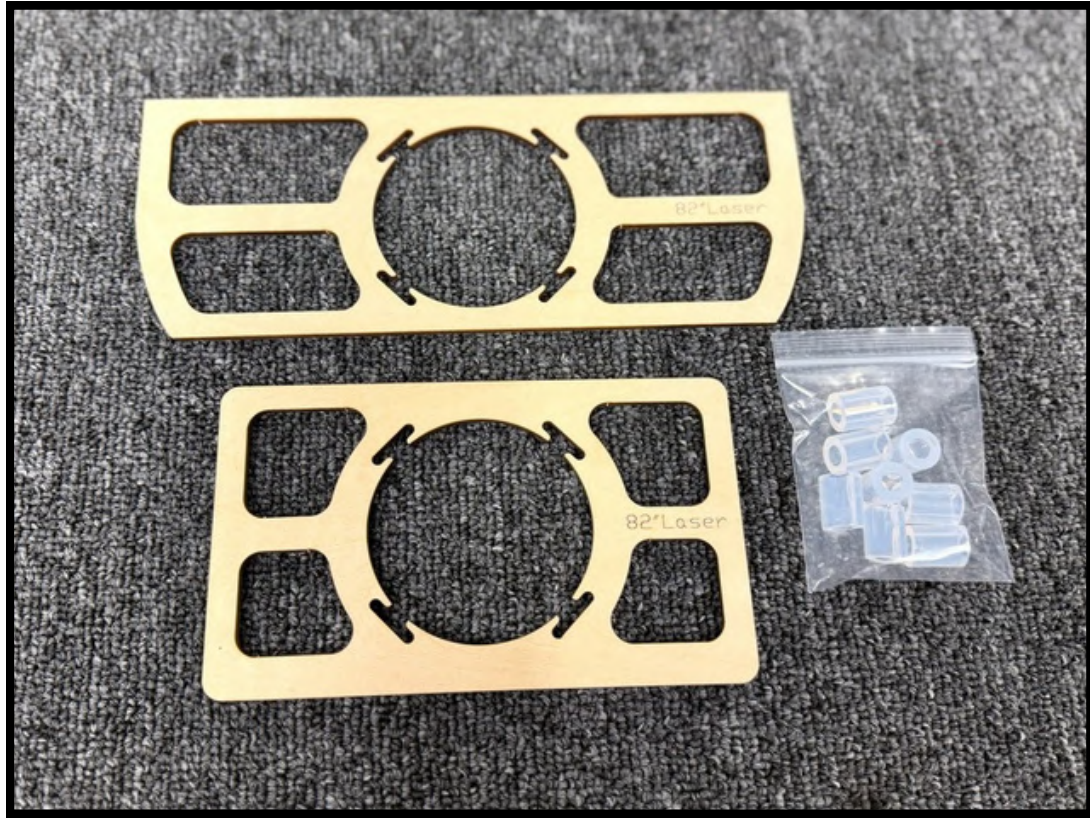
It is recommended to use an ignition switch, such as an iBEC or a JR/DA kill switch. These units eliminate the need for a separate ignition battery (powered by the receiver). The layout shown illustrates the use of the JR/DA ignition switch.



Use a servo safety clip to connect the ignition wires from the ignition module to the engine.

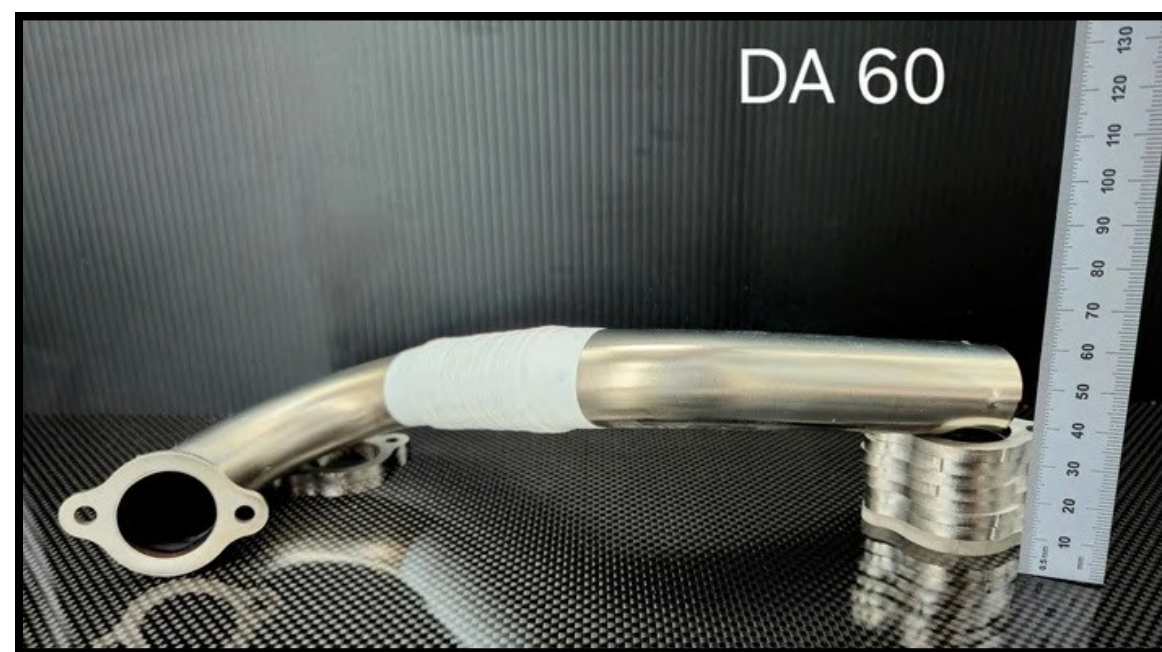
These ignition switches feature an LED light that can be mounted anywhere on the aircraft. The LED indicates whether the ignition is on or off. We typically recommend mounting it on the side of the fuselage near the front, within easy view of the person starting the engine.

Exhaust Installation



There are different exhaust setup options for gas setups on the 82" Laser. For canister or tuned pipe installations, the Laser comes with the proper mounts for installation. To install the mounts, align them with the carbon-laminated brackets in the tunnel and secure them with wood screws. Apply CA to harden the screw threads.

Header drop: 50mm (flex style header recommended)



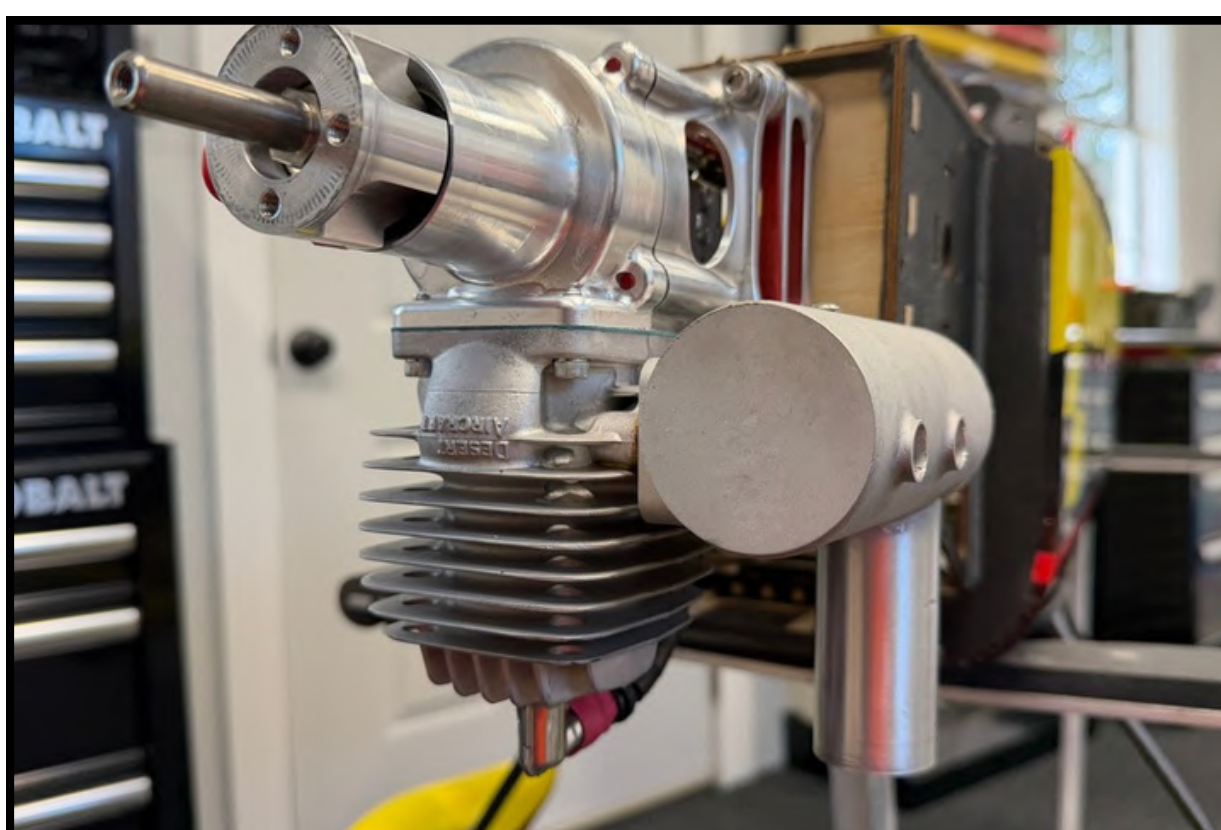
For muffler-equipped gas installations, there are two exhaust configurations: a standard side-mounted muffler or a Pitts-style wraparound muffler. The Pitts-style muffler typically requires less cowl clearance, resulting in minimal cowl modification compared to a standard side-mounted muffler.



Red Loctite will be used for the muffler bolts



Ultra Copper RTV by Permatex is used for gasket application



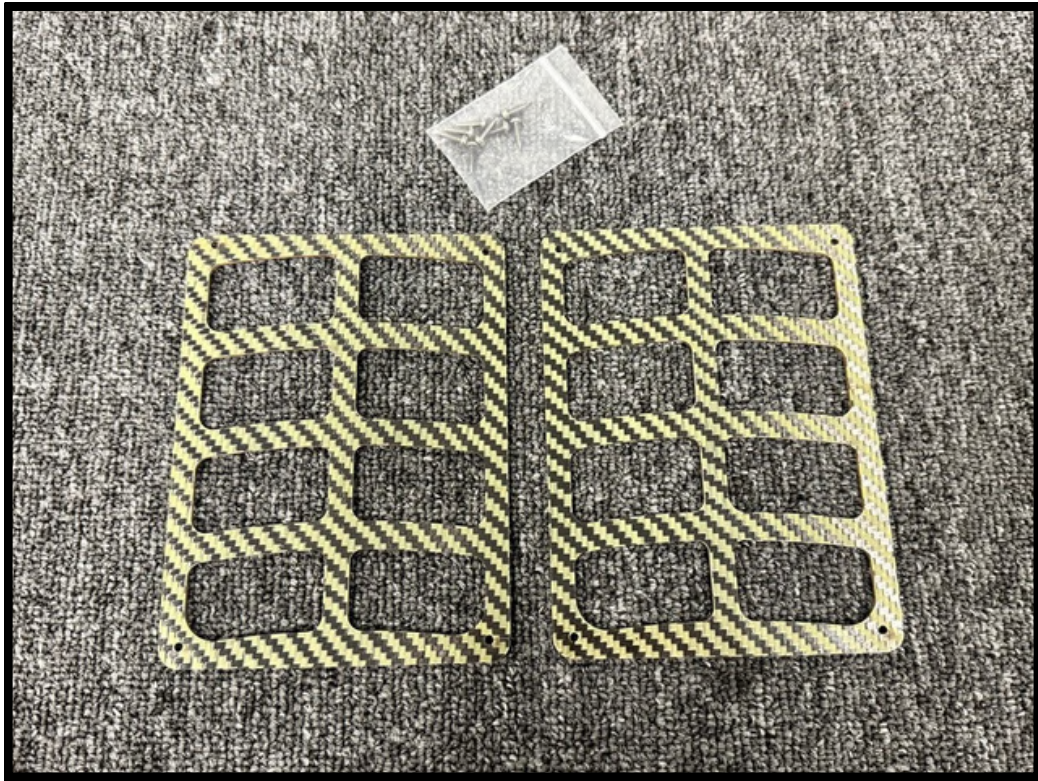
Apply a thin layer of RTV around the engine exhaust port. Do not apply excess RTV, as this may allow material to enter the exhaust port. Place the gaskets over the exhaust ports.

Install the muffler using the provided hardware (bolts and lock washers). Apply red Loctite to the threads. If experienced, an impact driver with an extension may be used. Due to bolt positioning, it may be easiest to insert the bolts through the muffler before placing the muffler on the engine.

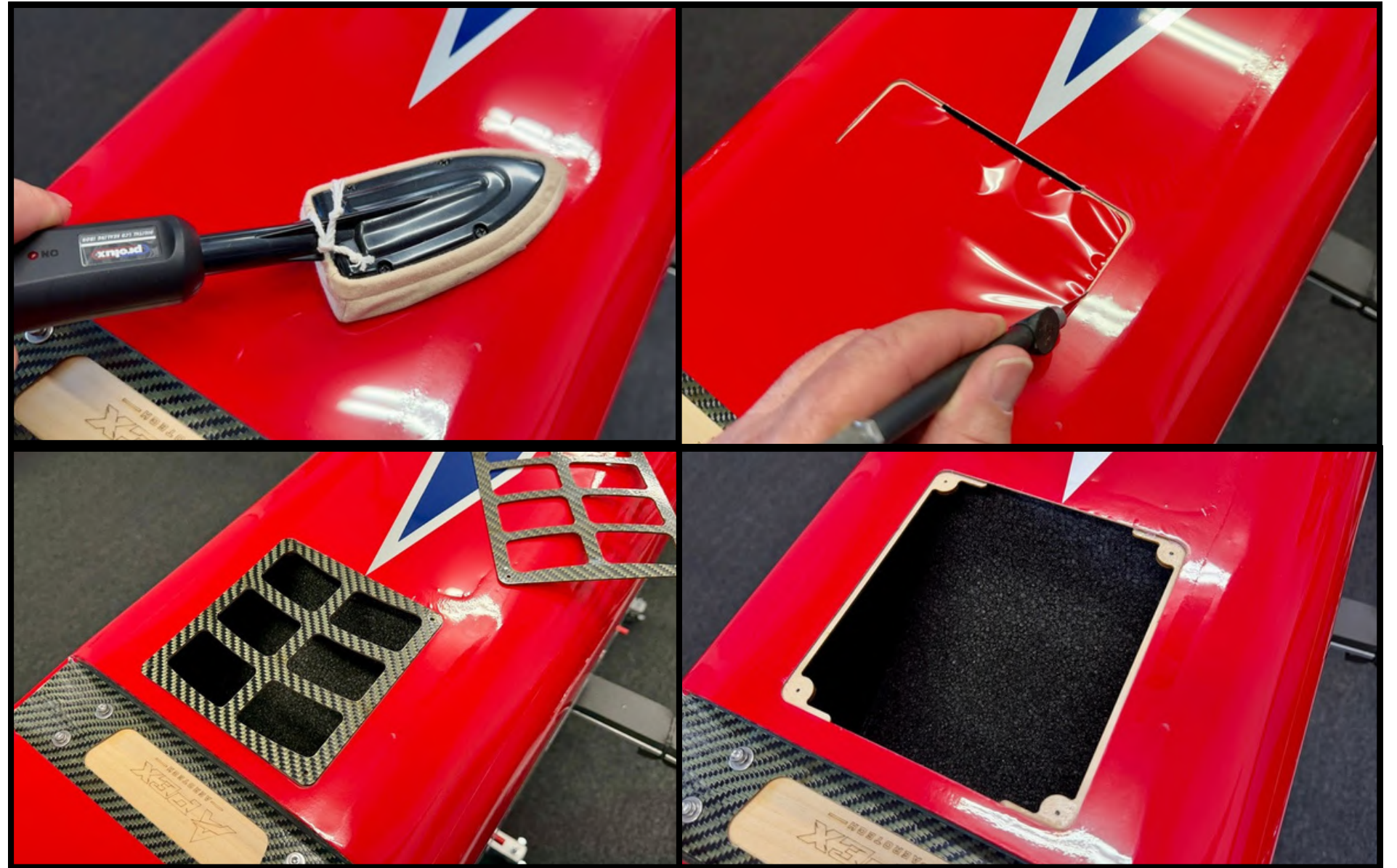
To simplify cowling installation and allow for tighter exhaust openings in the cowling, you may choose to trim approximately 3/4 in. from the muffler length. A pipe cutter may be used to accomplish this.



Hatch Installation

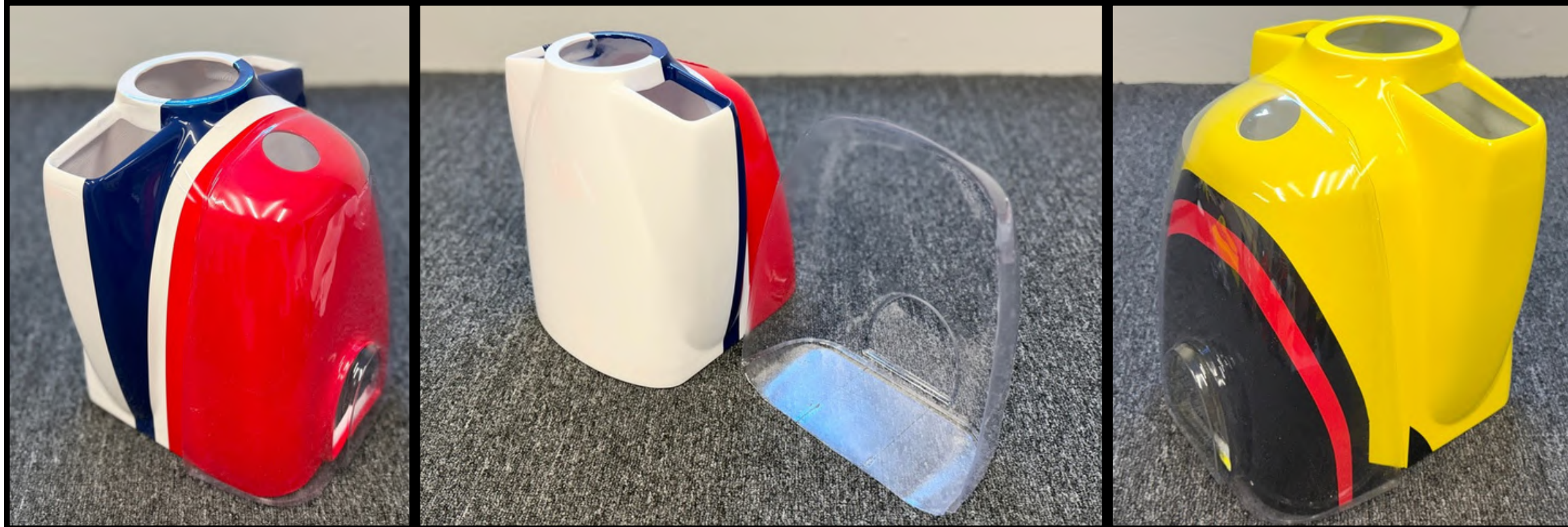


Once you have located the hatch opening, use a covering iron to seal the surrounding covering. Carefully cut away the covering over the hatch opening, then seal the edges of the remaining covering to prevent it from lifting.



The hatches are installed using the provided wood screws. First, thread the screws into the provisional tabs with the hatch in place. Remove the screws and apply a thin layer of CA to the threads. Finally, reinstall the hatch securely.

Cowling Installation



The Laser includes a clear cowl-cutting template to simplify exhaust cutouts.



Align the clear template with the cowling bolt holes. Mark the locations and drill holes in the template. This will allow the template to be mounted in the correct position.



- Mark the exhaust openings on the clear template.
- Cut the openings from the template.
- Reinstall the template onto the cowling and use it to mark the cut locations on the cowling.
- Fit and adjust as needed to ensure smooth cowling installation and removal.



Use a Dremel tool to cut the fiberglass cowling. Be aware that this will generate significant fiberglass dust.



The 82" Laser cowling is designed to provide clearance for the cylinder jug of engines such as the DA-60 and GP-61. Aside from the exhaust opening, the only additional cowl clearance required is for the ignition plug cap. As shown in the photo, this cutout is located at the bottom center of the cowling. To help prevent chafing of the ignition lead, we recommend lining the edge of the cutout with a protective material such as fuel tubing, or rubber trim.

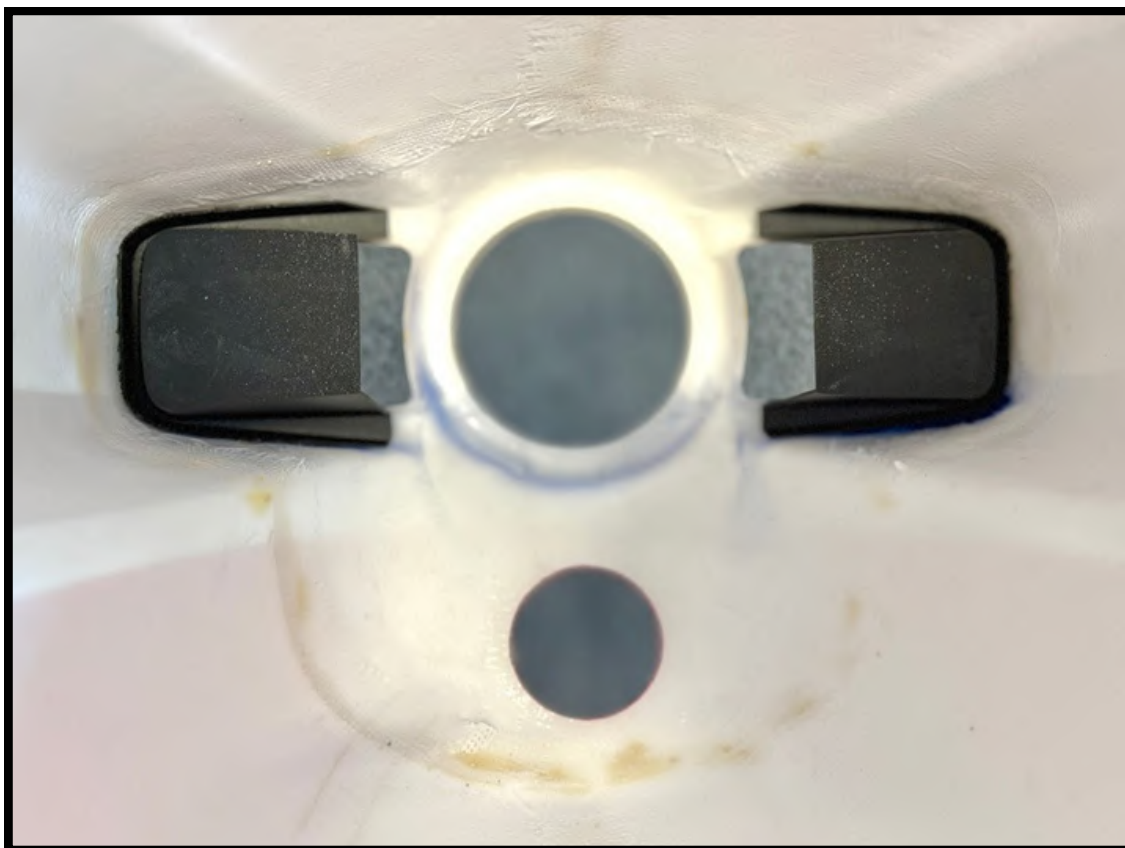
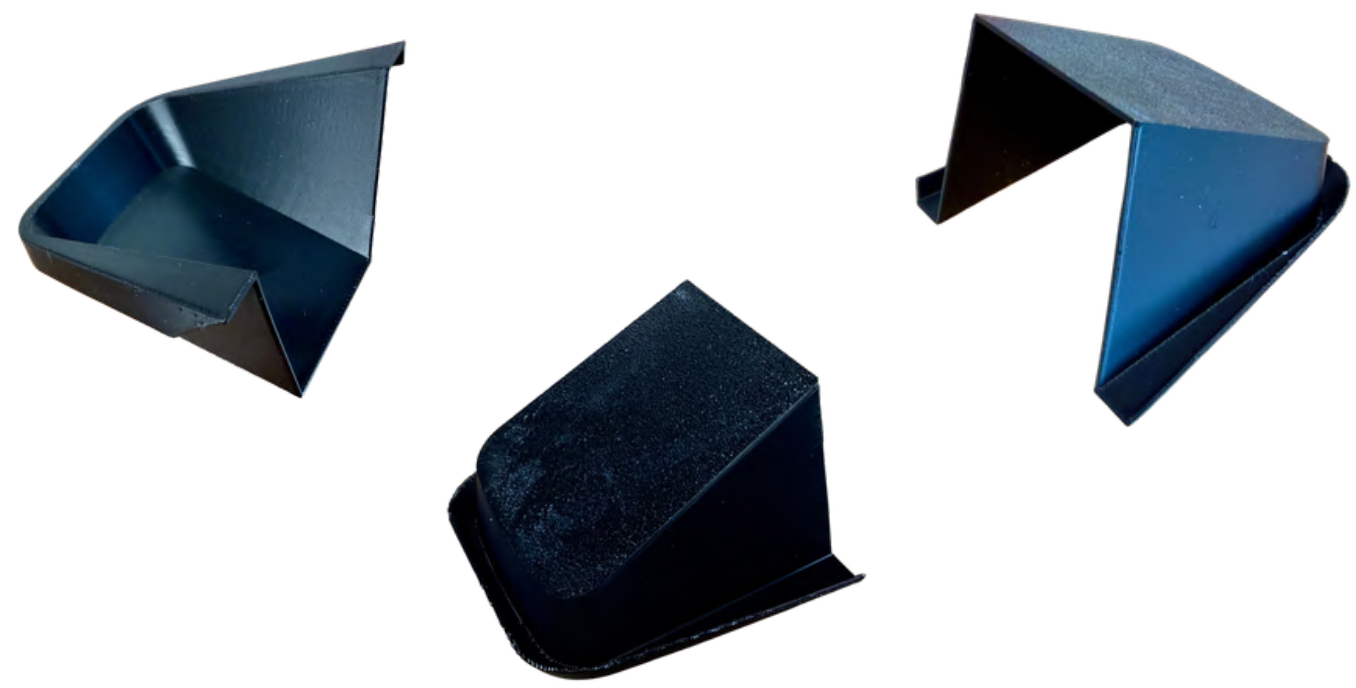
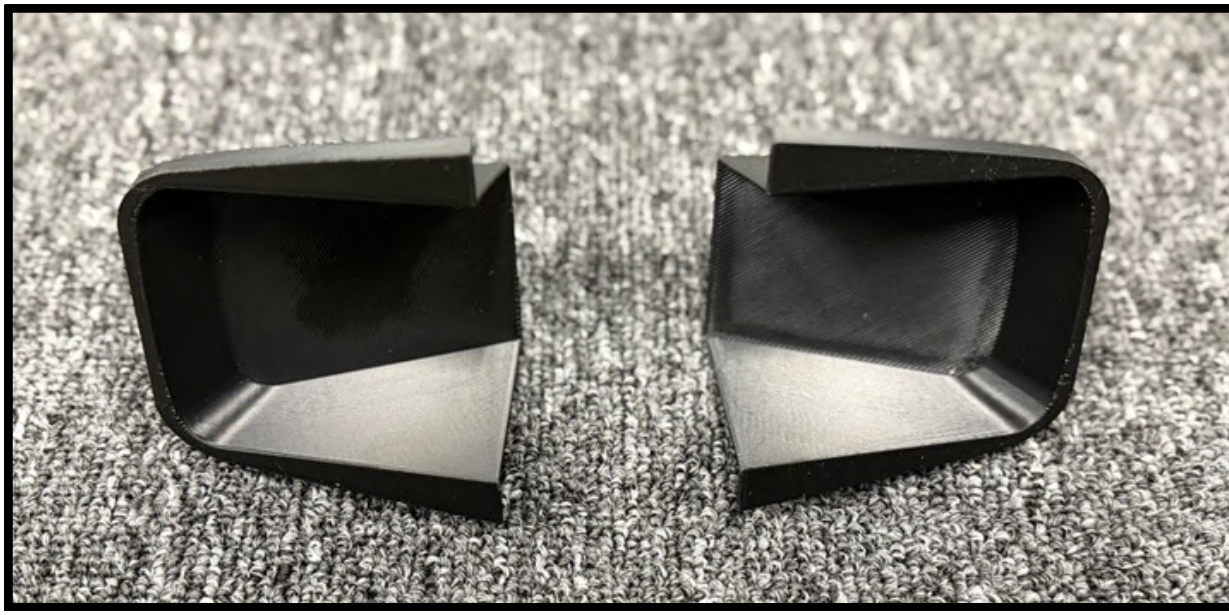


The photo on the left shows the cowl cutout required for a DA-60 equipped with a standard side-mounted muffler. As mentioned previously, a Pitts-style wraparound muffler typically requires significantly less cowl modification.

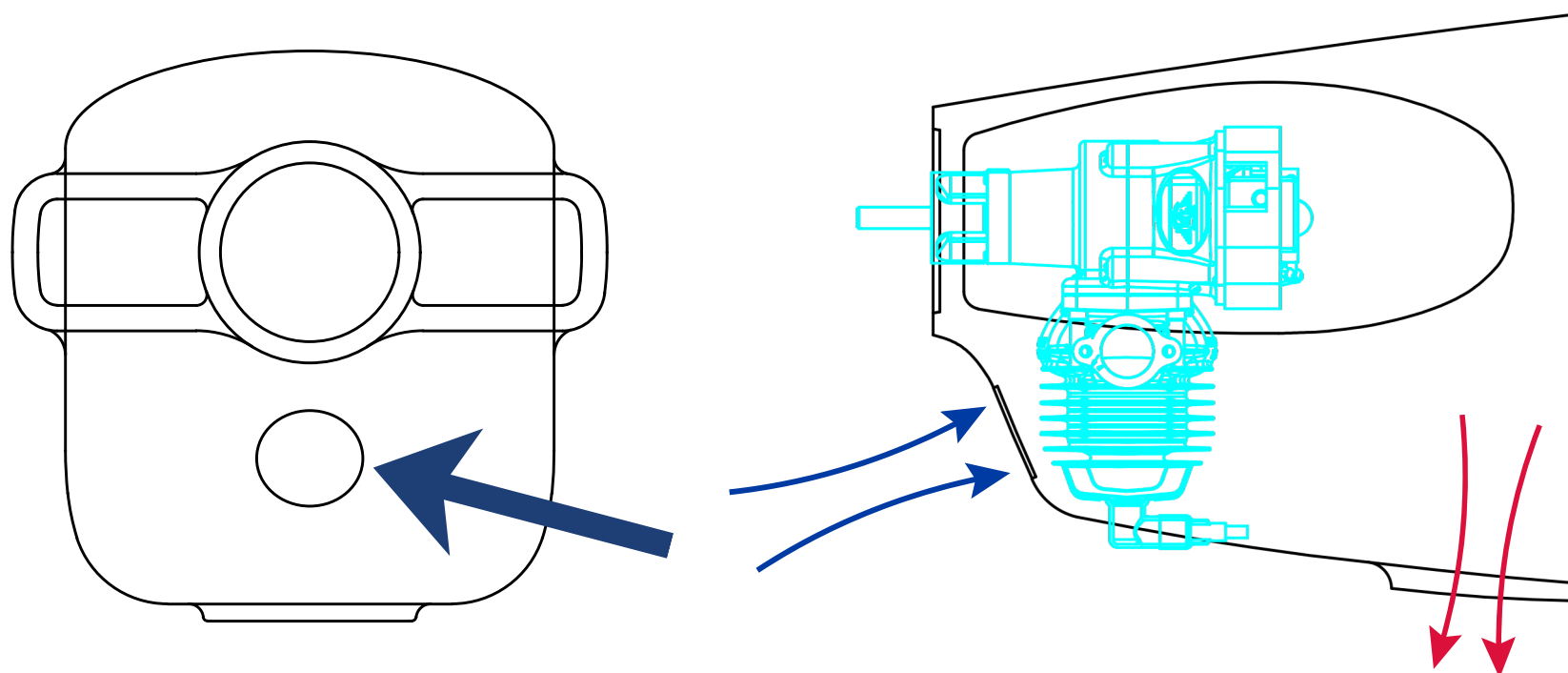


The cowling is secured with four bolts. Two are accessible from inside the fuselage along the top former, and the other two are located on the bottom outside. Apply blue Loctite to all bolts during installation.

Baffling Installation



The 82" Laser features cooling baffles designed to be installed in the cowling inlets. These baffles are precisely fitted for the GA-6000 electric motor installation but may also be used for single-cylinder gas engine applications if desired. Install the baffles using a flexible rubberized adhesive, such as GOOP.



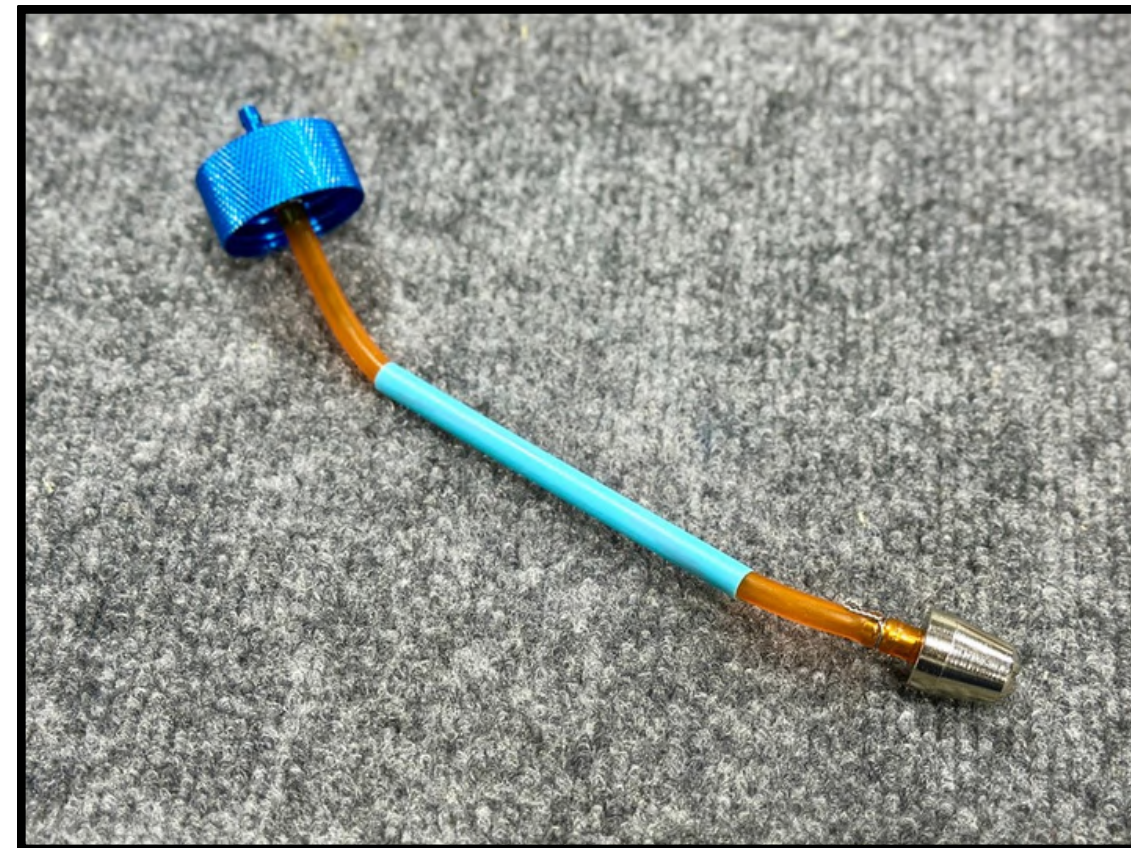
For single-cylinder gas engine installations, installing the baffles is a personal preference. Adequate cylinder cooling can also be achieved through the pre-cut opening in the front of the cowling. Hot air exits through the pre-cut pressure relief opening located on the bottom of the cowling.

Installing the cooling baffles in the cowling inlets is highly recommended for electric motor applications.

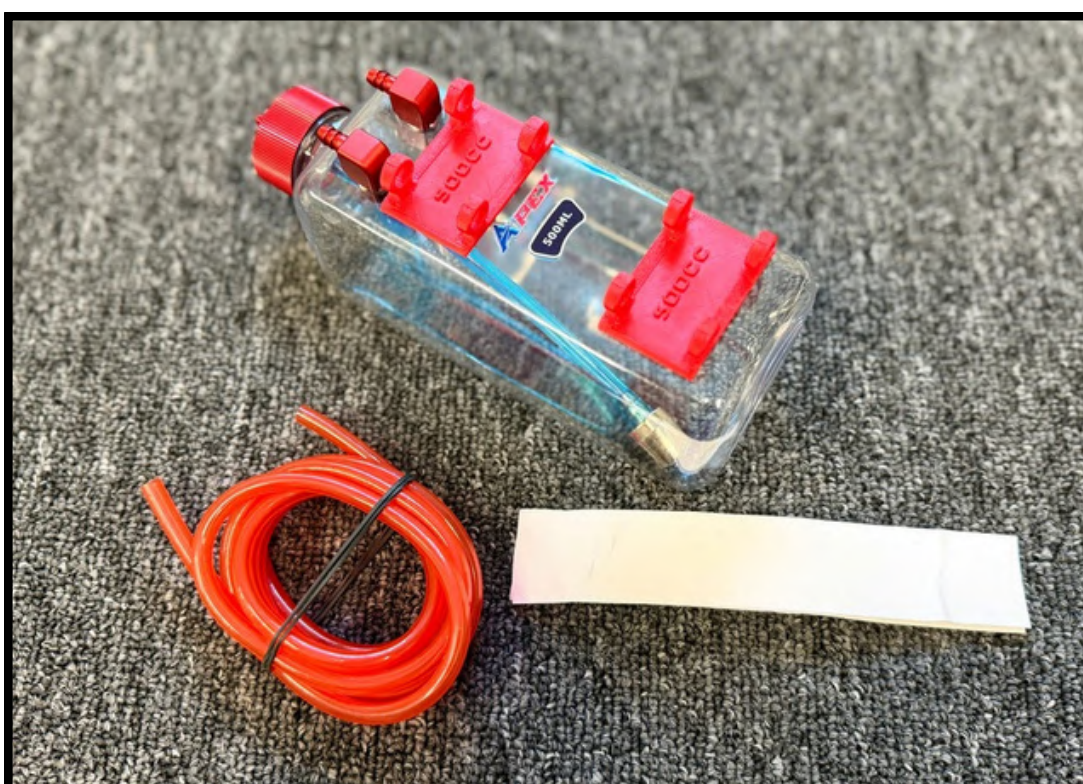
Fuel System Installation



The Laser includes a 500 ml (17 oz) fuel tank for gas-powered setups.



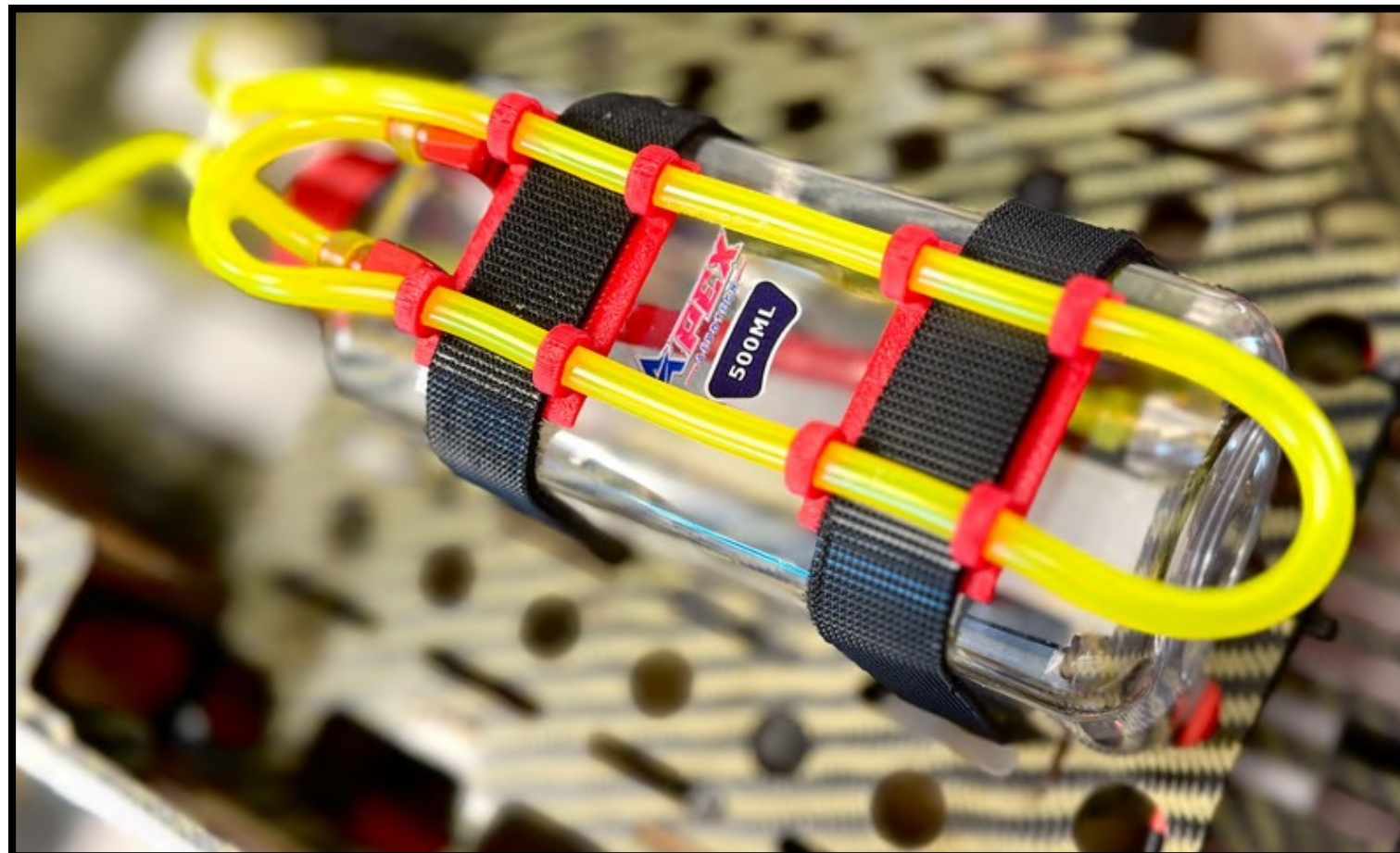
It is recommended to install a plastic straw over the pickup line inside the tank to prevent it from wrapping around itself. Additionally, use safety wire or a small piece of fuel line to secure the fuel line to the tank cap and clunk.



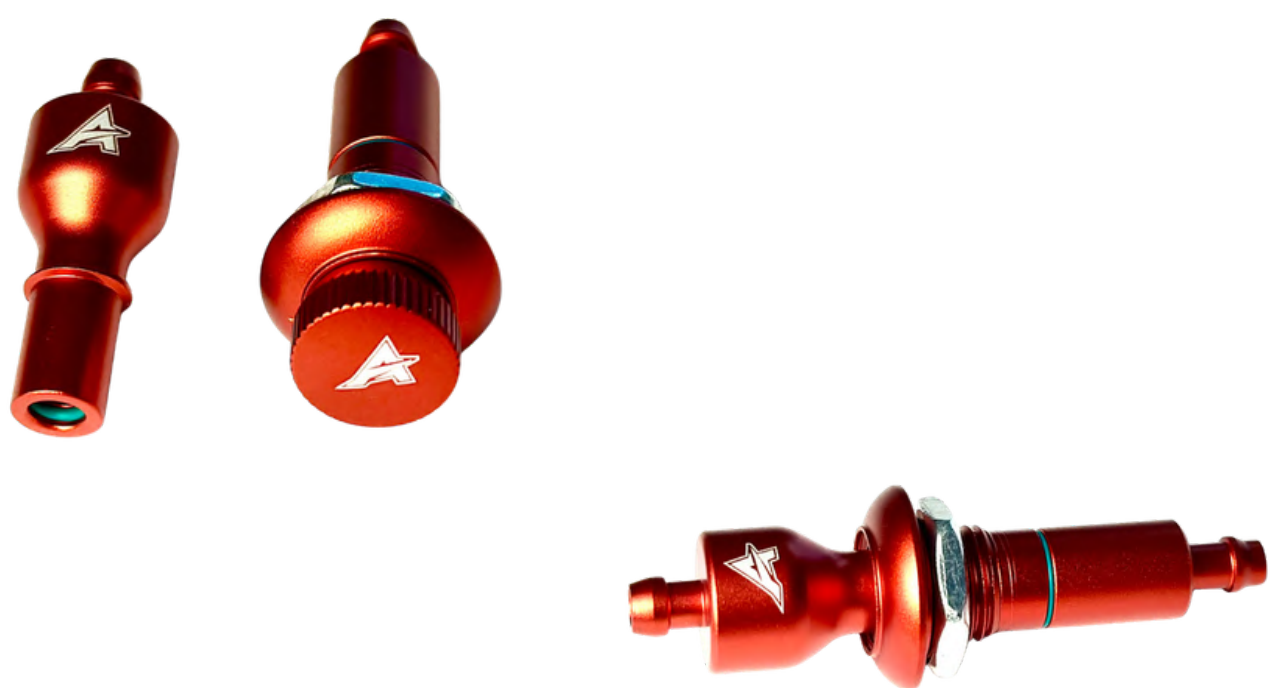
The Laser features fuel tank vent line routing guides. These can be attached to the top of the fuel tank and allow for easy routing of the fuel vent line around the top of the tank. You can also route the Velcro straps through these guides to help secure the fuel tank.



Install the fuel tank on the tank tray located at the center of gravity (CG). If installing a single fuel tank, it may be placed in the center of the tray. Use adhesive-backed Velcro to attach the tank to the tray (one hook strip and one loop strip). Then use Velcro straps to firmly secure the tank to the tray. The tray includes provisions for routing the straps through.



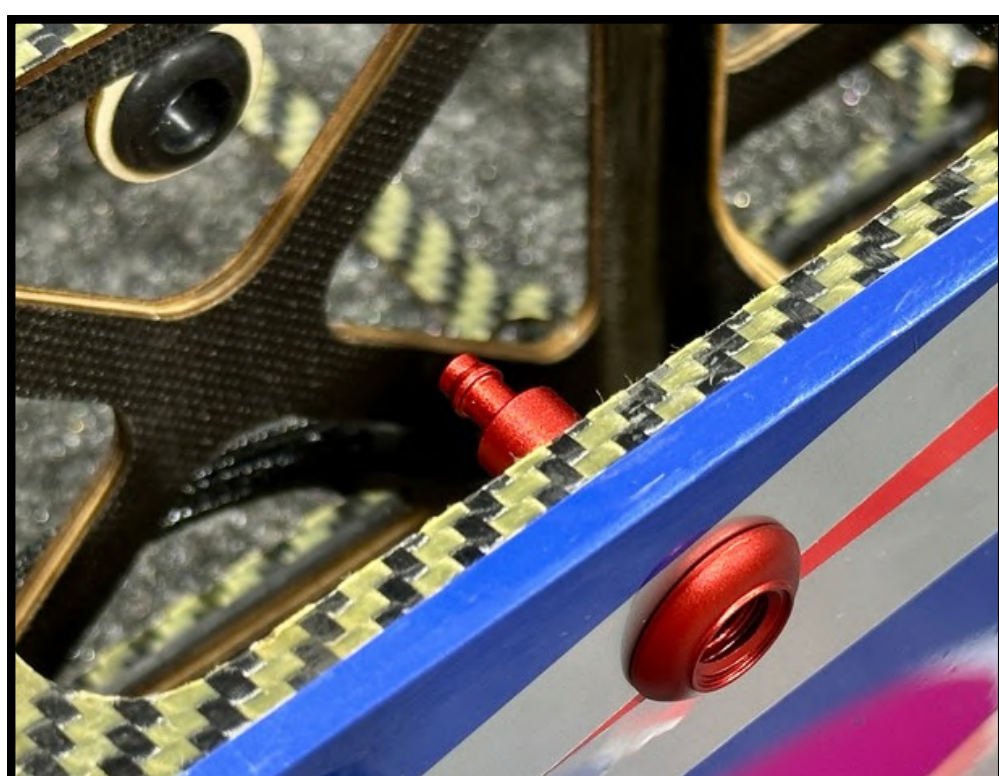
When routing the fuel lines, wrap the vent line around the top of the tank as shown. This helps prevent siphoning during flight. Be sure that all fuel line connections at the fittings, carburetor, and other components are secured with safety wire or a small piece of fuel line used as a clamp.



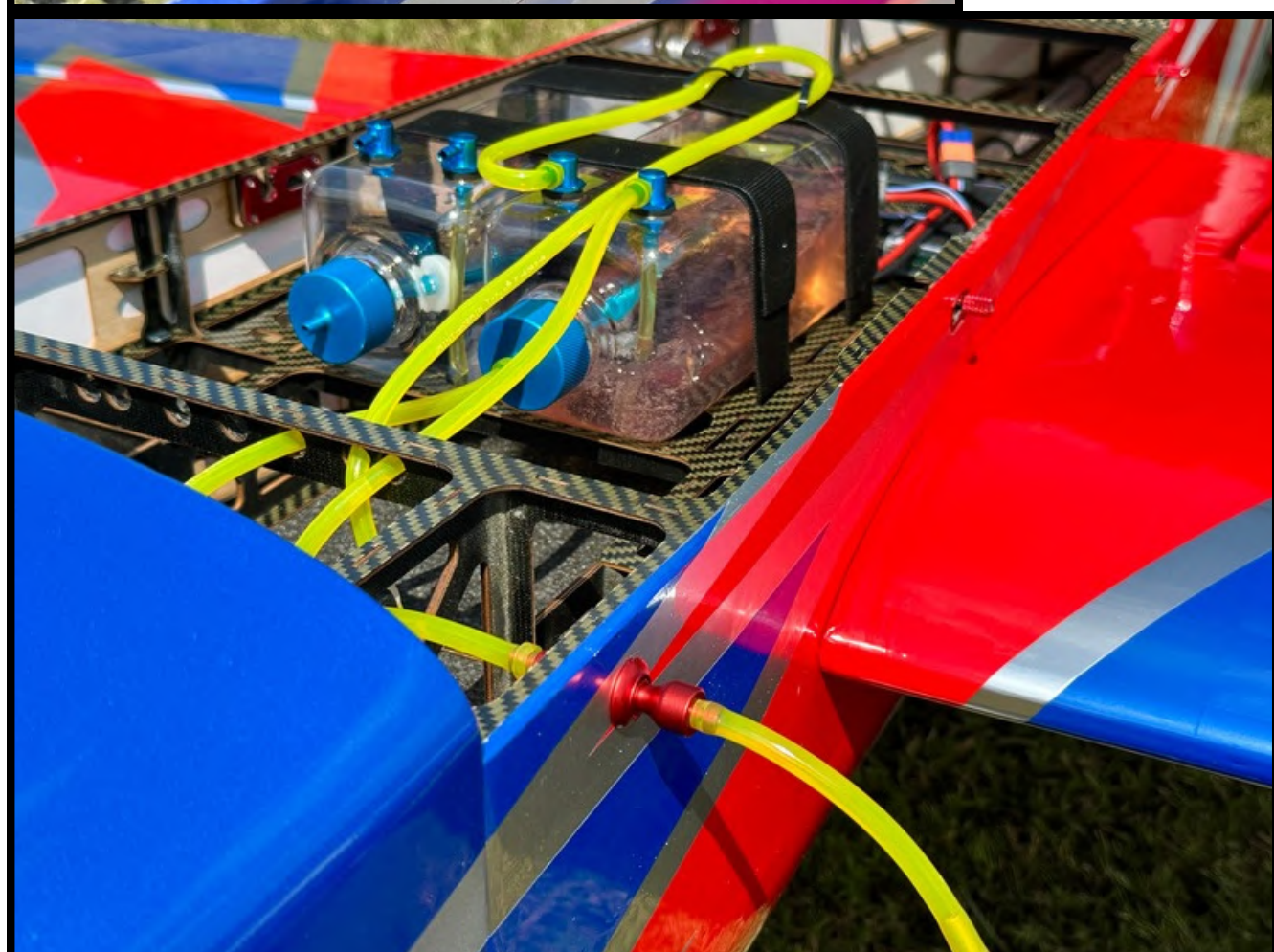
The Apex fuel dots are extremely beneficial for fast fueling and defueling. They allow the aircraft to be fueled without disconnecting any fuel lines. Simply insert the fueller into the receptacle and turn to tighten.



The Laser includes proper provisions for installing the fuel dot. Remove the covering and place the fuel dot into position. From inside the fuselage, tighten the nut against the fuselage to secure it in place. For aesthetics, ensure that the logo is vertically aligned.



It is recommended to leave the cap off the fuel dot (the logo portion) during flight, as vibration may cause it to come off.



Connect the fueller portion of the fuel dot assembly to the fuel line that will attach to your fuel jug. Ensure the fueller is securely threaded into the fuel dot receptacle before turning on the fuel supply.



Fuel vent dots are also available from Apex. These install on the bottom of the aircraft using the three provided wood screws. The Laser includes mounting provisions along the bottom of the fuselage, just in front of the landing gear. There are also hole provisions for routing your vent line to these locations.

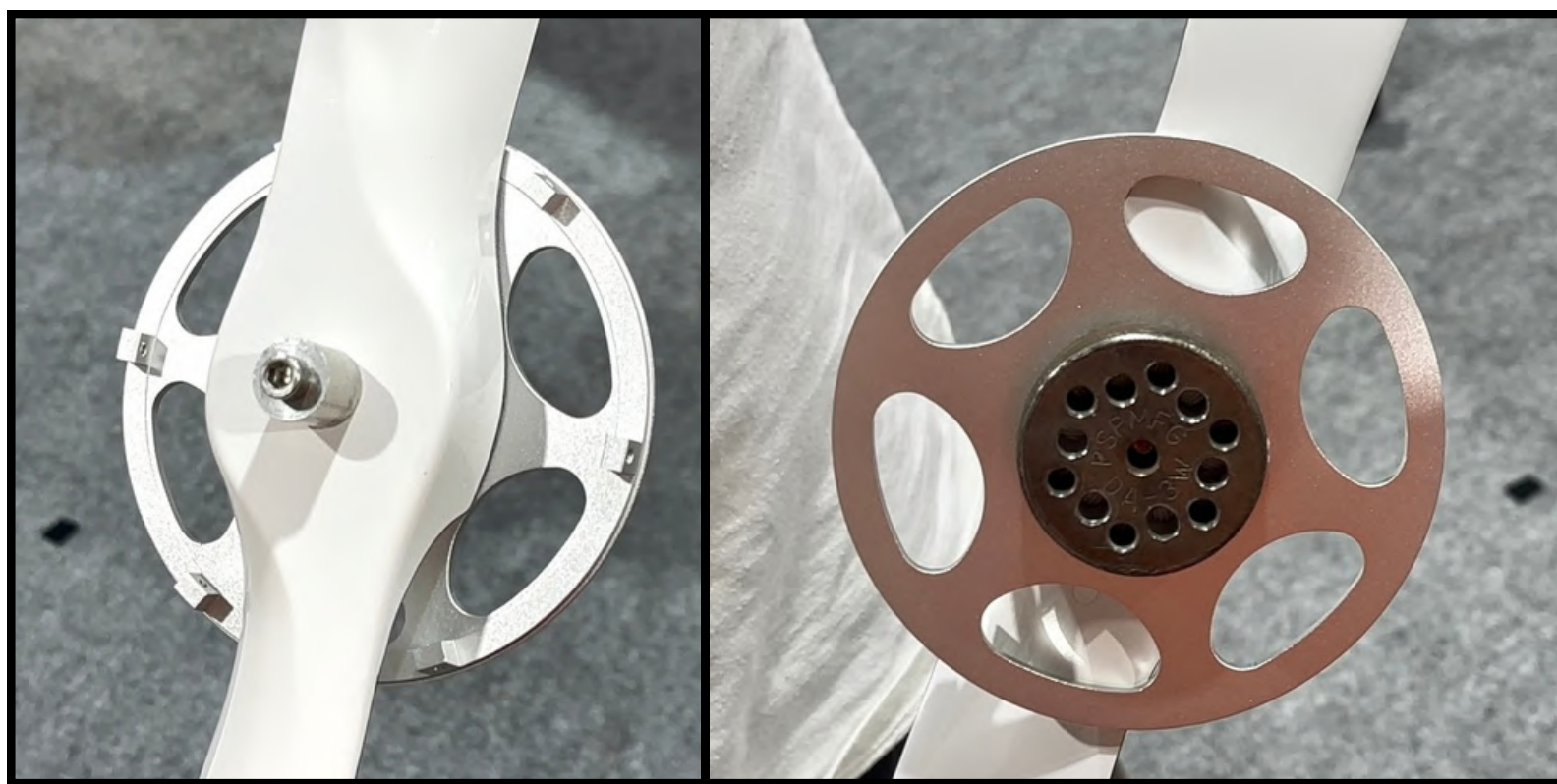


Propeller and Spinner Installation

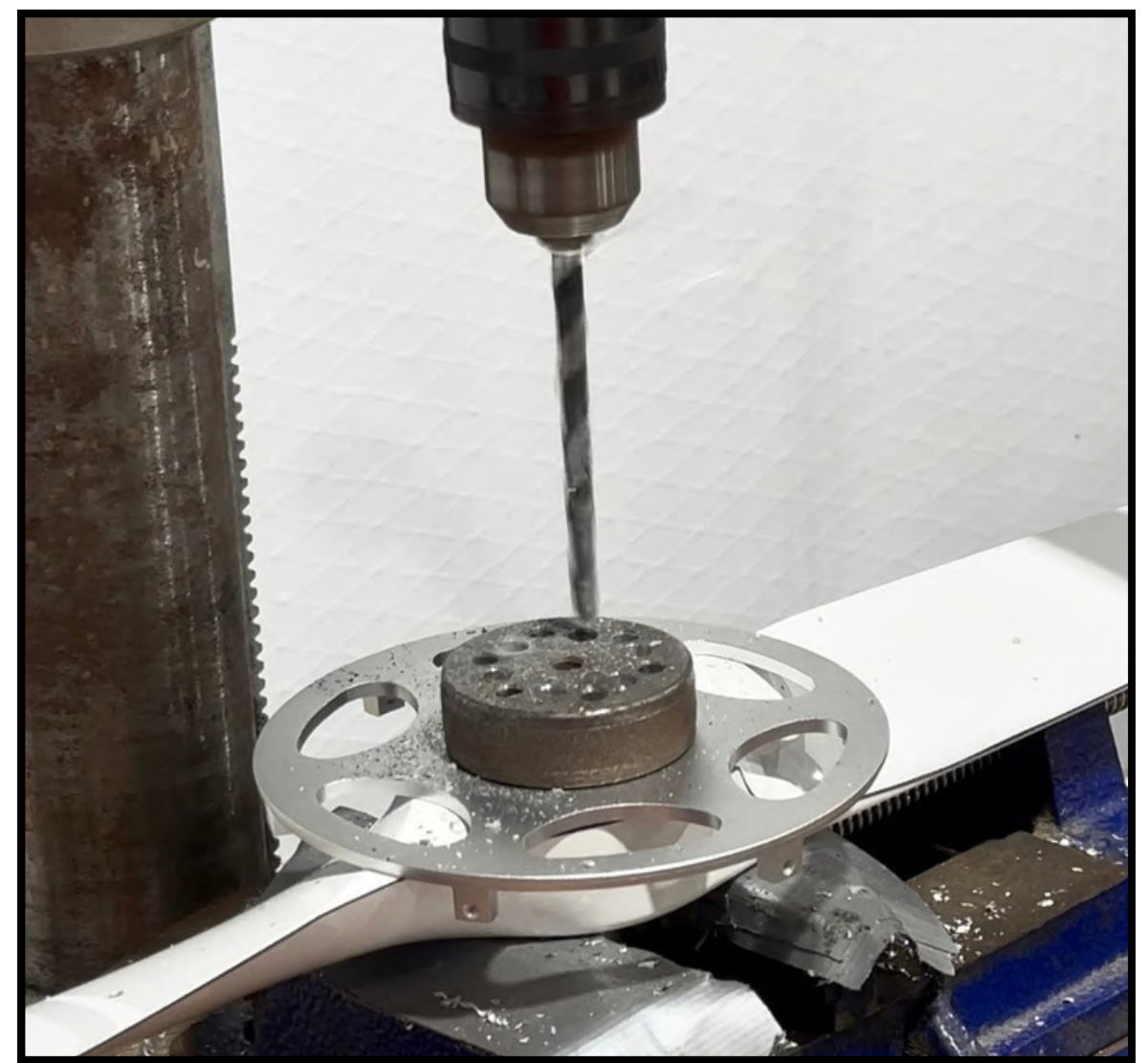
Gas



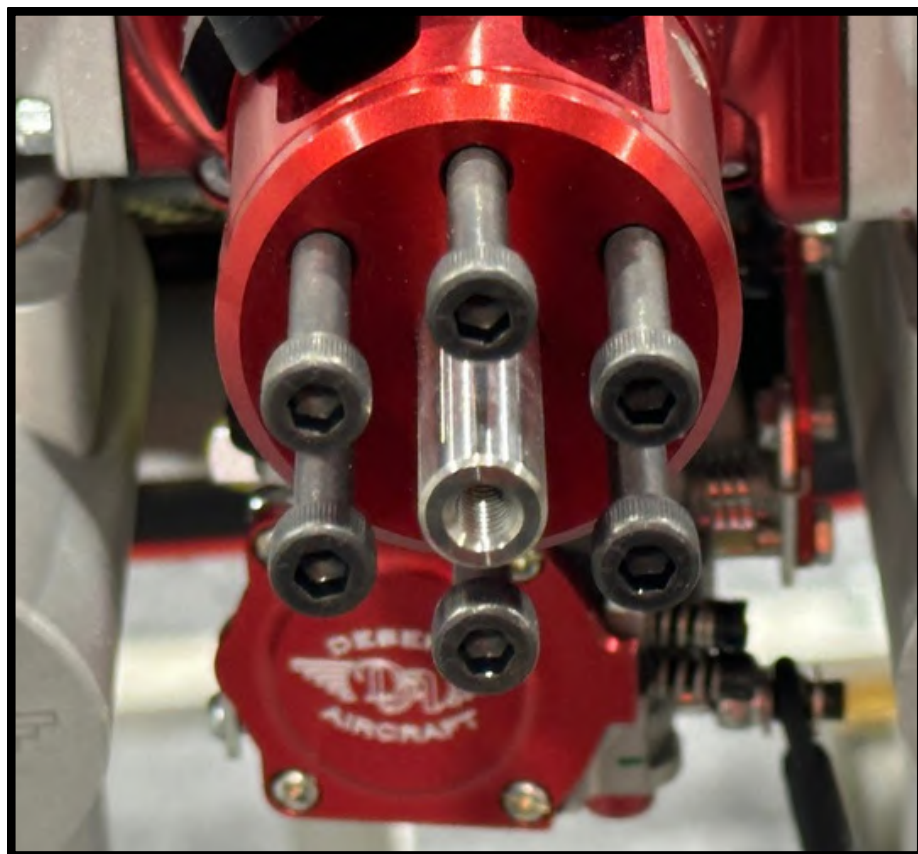
The Laser features an included painted, livery matched carbon fiber spinner. Locate the backplate and the propeller.



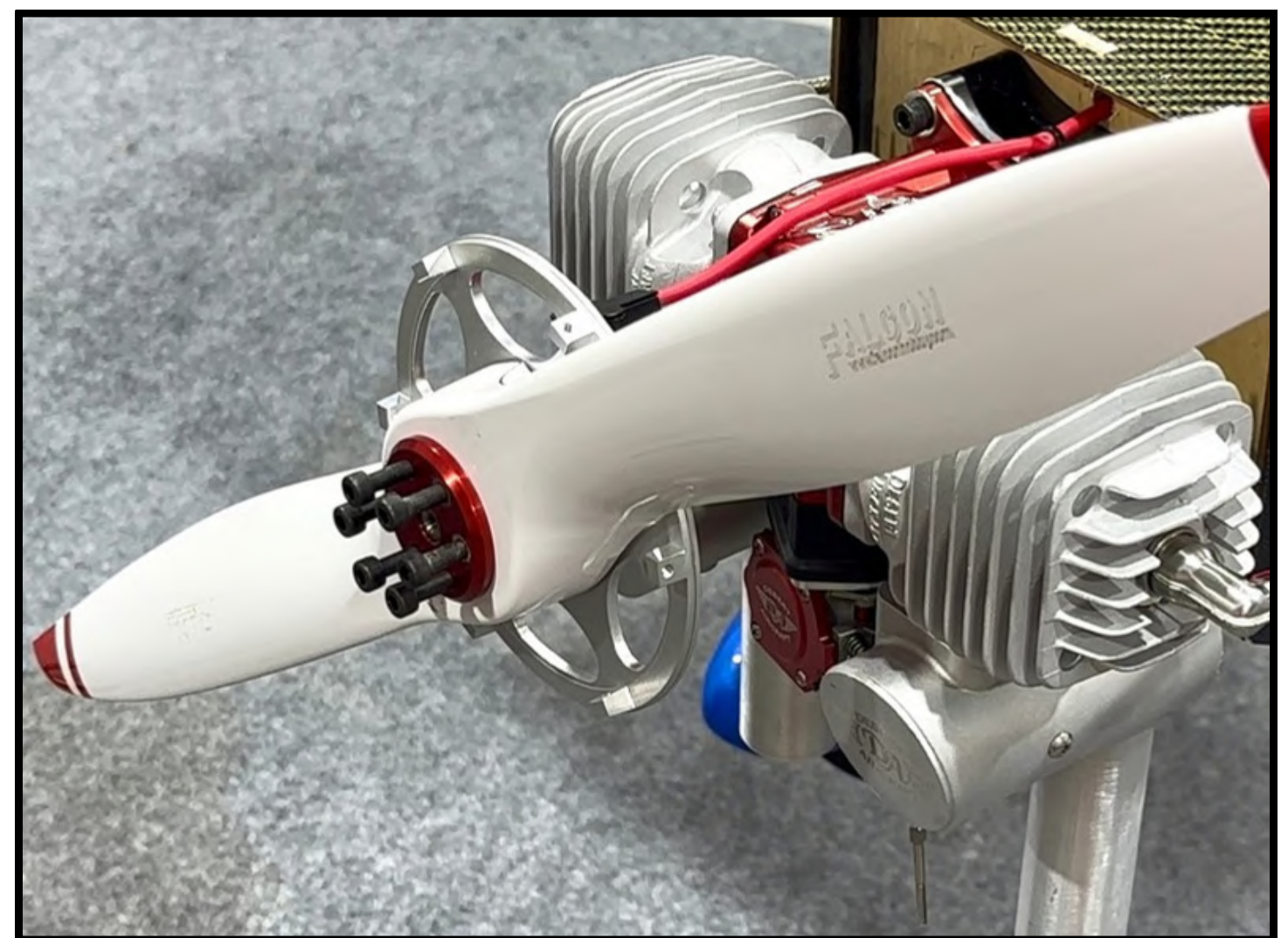
Join the spinner backplate and propeller using the correct drill jig for your engine. Ensure the spinner cone is properly aligned by test-fitting it once the jig is bolted to the propeller and backplate.



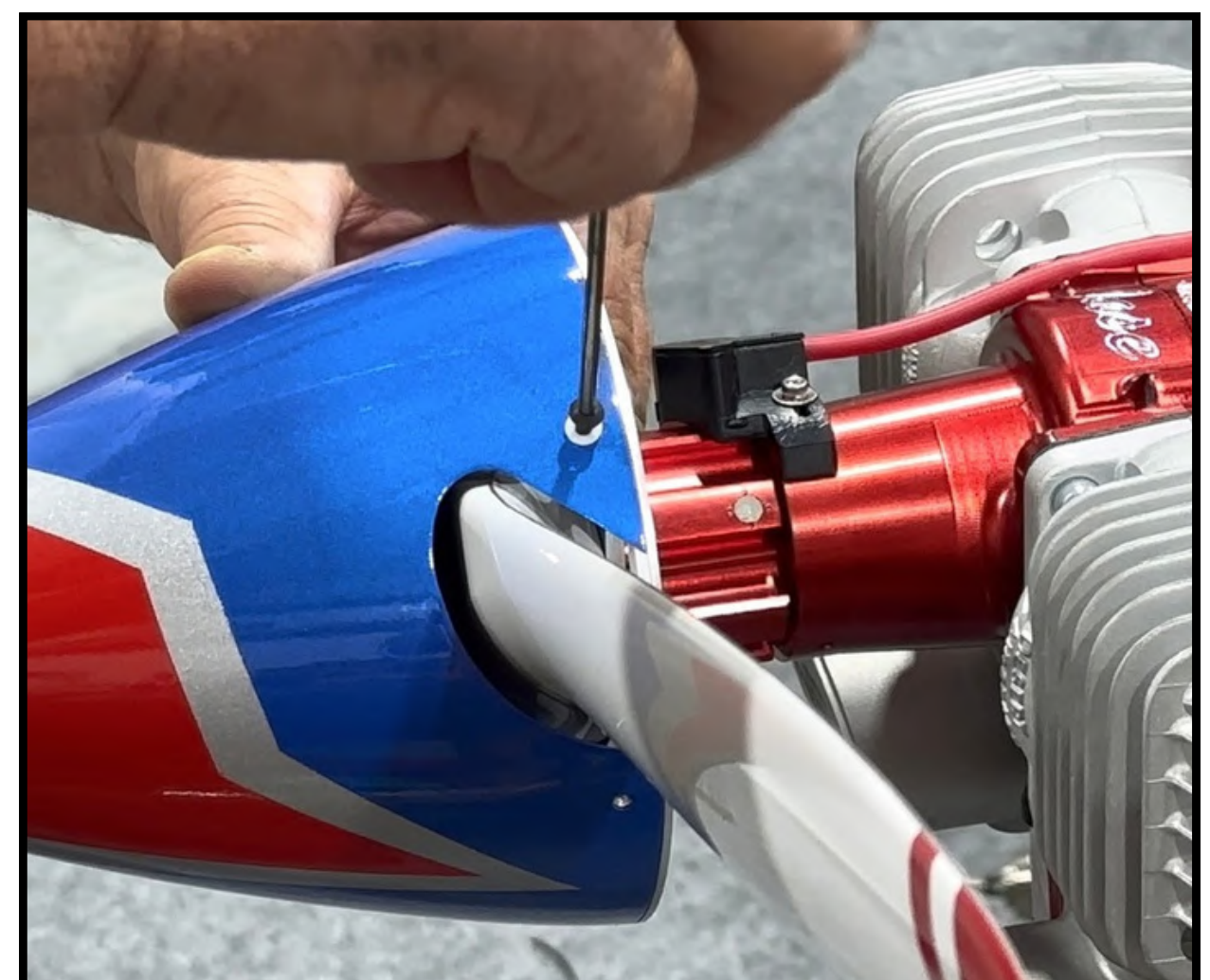
Using a drill press is recommended to achieve the cleanest and most accurately aligned holes.



Install the backplate first, followed by the propeller, and then the prop nut. Use the propeller mounting hardware supplied with your engine.



Use a torque wrench to evenly and correctly tighten the propeller bolts. Torque to approximately 95 in-lbs.



To install the spinner, use the supplied bolts and washers, and apply blue Loctite. Be careful not to overtighten the spinner bolts.

Electric



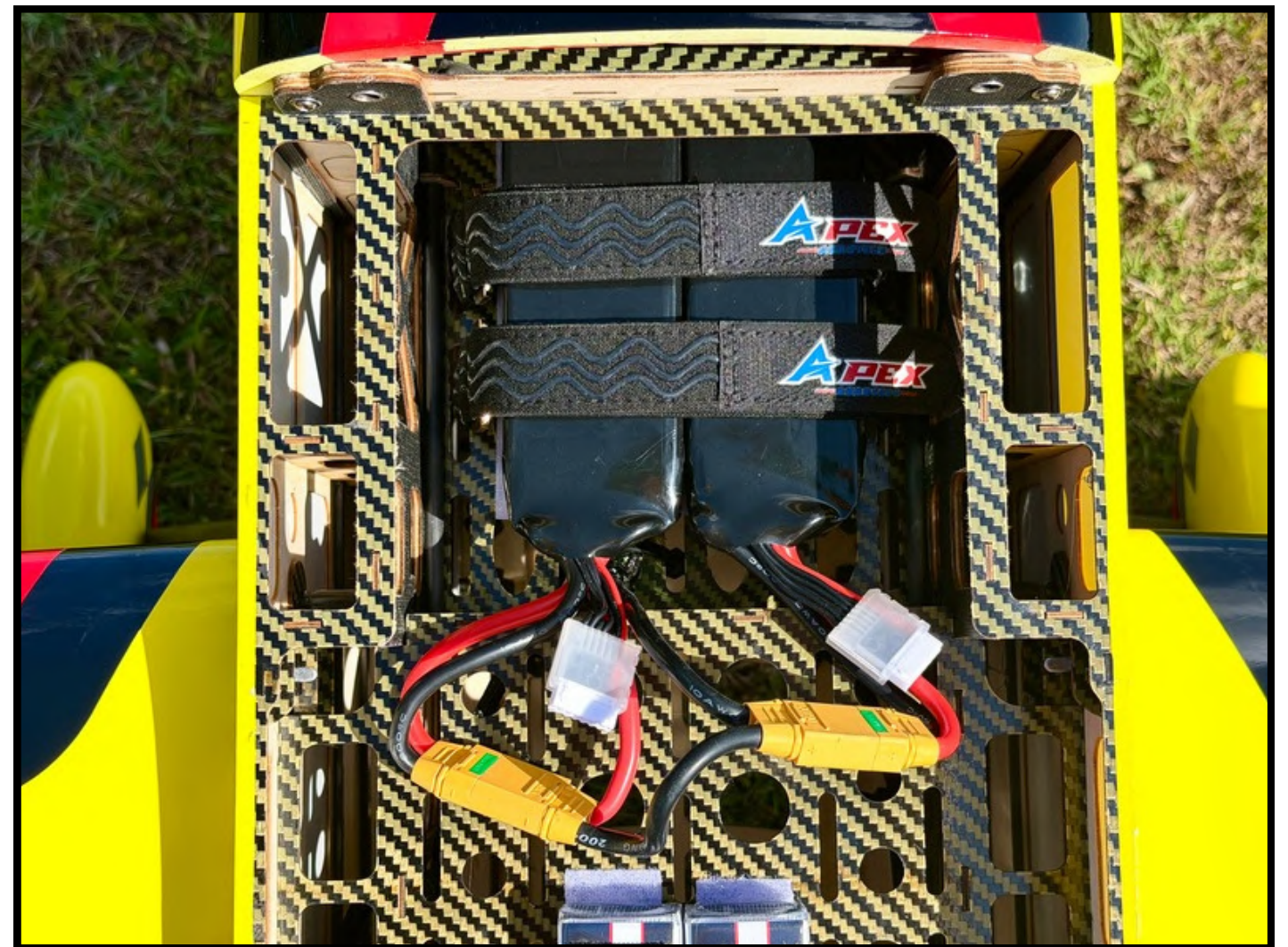
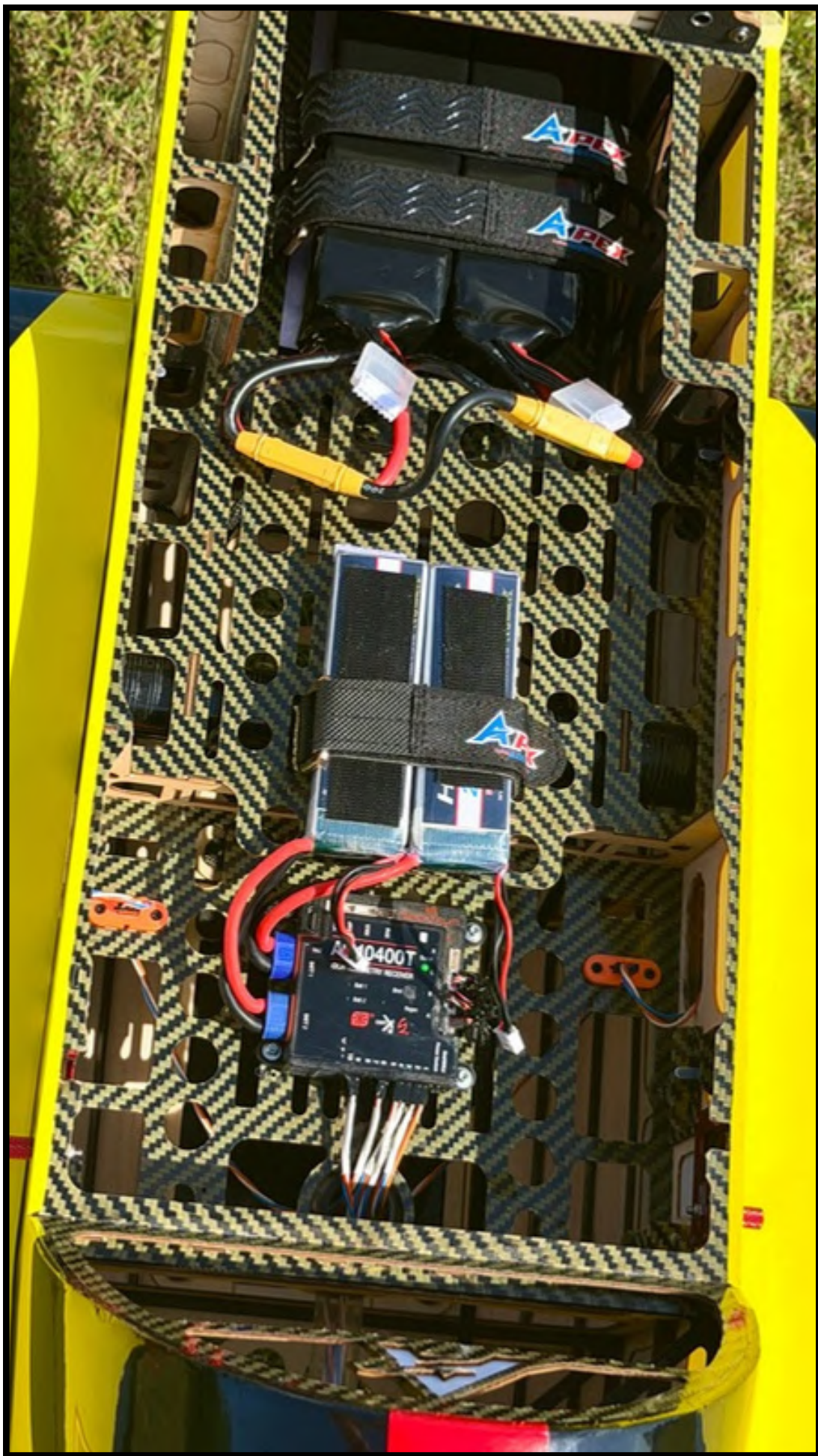
Apex/Dualsky 24x10 prop is a perfect match for the GA-85 Power Package



- Install the spinner backplate over the motor propeller adapter.
- Slide the propeller into place and verify proper clearance between the propeller and spinner cone.
- Install the prop washer, followed by the main prop nut. The flanged side of the main prop nut should face inward and seat into the prop washer.
- Tighten the main prop nut using a 17 mm wrench.
- Install the jam nut with the flanged side facing inward toward the main prop nut.
- Tighten the jam nut using a 14 mm wrench.
- Install the spinner cone using the provided bolts and washers.
- Apply blue Loctite (medium-strength threadlocker) to the spinner mounting bolts before installation.



Radio and Receiver Setup



These photos show the internal setup of the 82" Laser equipped with the GA-85 Power Package. For a 12S electric configuration, we recommend using two 6S 6000 mAh batteries connected in series. The two 6S batteries are mounted on the front battery tray as shown, using the Apex 500mm anti-slip Velcro straps along with adhesive-backed Velcro on the batteries and battery tray. The recommended receiver mounting location is also shown, along with the receiver batteries (two 2S LiPo batteries). The RX battery location can be adjusted to accommodate personal center of gravity (CG) preferences.



The recommended starting point for the Laser's CG is at the center of the wing tube. Apex Aerotech aircraft have a wide and forgiving CG range. This placement is a solid starting point, and you can adjust the batteries to fine-tune the CG to your preference.

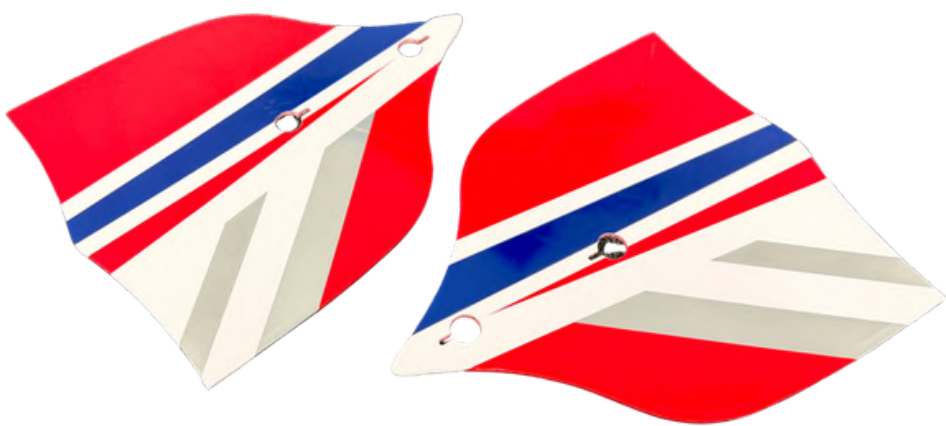
CONTROL SURFACE SETUP:

SURFACE	HIGH RATES	LOW RATES
AILERON	38 DEG. UP, 37 DEG. DOWN 50-55% EXPO	20 DEGREES
ELEVATOR	55-60 DEGREES 50-55% EXPO	15 DEGREES
RUDDER	MAX WITHOUT BINDING 45-55% EXPO	20 DEGREES

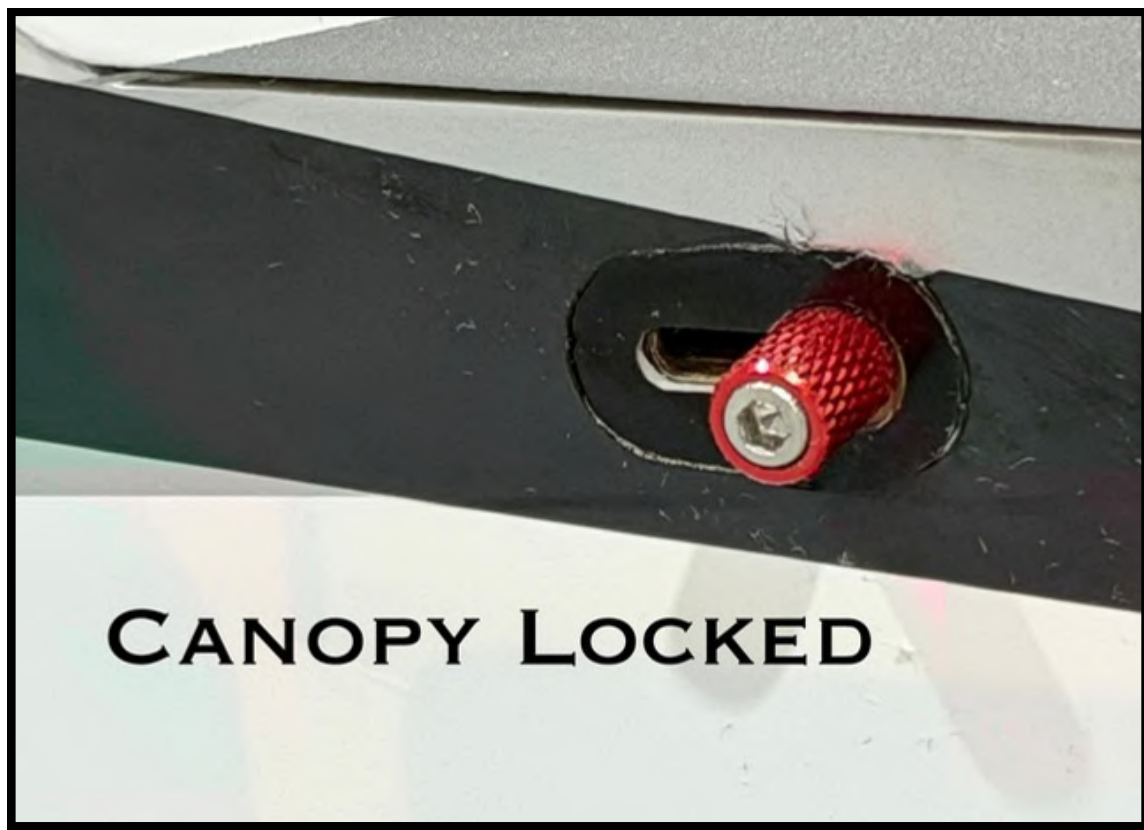


If you have an iPhone, you can easily set up control surface throws using the **Measure** app. Open the app and select the **Level** option. Make sure the value reads zero when the control surface is at neutral and your device is placed on it.

Field Assembly



The Laser includes optional side force generators (SFGs). Installation utilizes a quick-attach/release system for easy installation and removal. To install the SFGs, slide them over the bolts on the wingtip, aligning the openings in the SFG with the mounting bolts. Ensure the bolts are backed out far enough to allow the SFG to fully seat into position, then tighten the thumbscrews to secure them. Applying blue Loctite to the mounting bolts is recommended.



The Laser features a quick-attach/detach system for the canopy, wings, and horizontal stabilizers. Ensure that each mechanism is fully engaged.



The wing latches feature a black tab that prevents the canopy from being installed unless the wing is latched. To secure, use the metal handle and push it all the way down until the black tab is seated flush against the fuselage.

Decal Installation



The Laser includes a high-quality decal sheet that matches your color livery. Each decal is pre-cut for easy use. Simply peel the decal from the sheet, leaving the protective cover in place. After applying the decal, carefully remove the clear cover.

Make sure the surface where the decal will be applied is clean before installation.

Cleaning

It is recommended to take the time to clean your aircraft after use. This is also a good opportunity to inspect the aircraft, ensuring everything is tight and the covering is secure. For basic cleaning, use glass cleaner and paper towels. Spray wax can be applied for a more detailed shine.



Thank you, and congratulations on your 82" Laser! The Laser redefines the 50–60cc class by providing a true high-performance platform for the wide range of single-cylinder gas engines available in this category. Additionally, it is an exceptional platform for 12S electric applications, delivering giant-scale stability while maintaining an incredibly aggressive XA feel. The 82" Laser is a perfect fit for pilots of all experience levels thanks to its ideal size, versatility, and outstanding convenience. We look forward to seeing you enjoy yours!

