

EXTRA330L-100CC ARF

ASSEMBLY MANUAL



Thank you for choosing the Extra330L-100CC. We put great effort into making This plane the best model you will ever build and fly. We provide you with the highest quality kit and performance possible. We wish you great success in the assembly and flying of the new Extra330L ARF.

WARNING

An R/C aircraft is not a toy! If misused, it can cause serious bodily harm and property damage. Fly only in open areas, and AMA (Academy of Model Aeronautics) approved flying sites. Follow all instructions included with your plane, radio, and engine.

KIT CONTENTS



EXTRA330L-100CC

Basic Aircraft Parts:

Fuselage with pre-installed vertical fin ?covered,
firewall fuel-proofed, pre-drilled three holes
for the tail wheel assembly:

- (4) M4 blind nuts installed for main landing gear
- (4) M3 blind nuts installed for mounting the stab.
- (6) M3 blind nuts installed for mounting the cowl-
ing.

Hatch cover for the landing gear installed by (2)
T2.6x16mm PWA screws

Canopy base—painted, with (4)M3 blind nuts in-
stalled

- (1) Tinted Canopyglue d on the canopy base and
painted, installed on the fuselage by (4)

M3x10mm hex style bolts

- (4) 3mm flat washer for the mounting of the canopy
- (4) #6 bonded washer for the mounting of the
canopy
- (1) Antenna tube installed

Left Wing with Aileron --Covered:

- M4 blind nuts installed for the wing mounting.
- (2) located pins installed
- (7) pin point hinges glued
- (2) Aileron servo string installed

Right Wing with Aileron --Covered:

- M4 blind nuts installed for the wing mounting.
- (2) located pins glued
- (7) pin point hinges installed
- (2) Aileron servo string installed

Horizontal Stabilizer with elevator assembly with

(10) pin point hinges (glued)---covered

Rudder with (6) pin point hinges (not glued) " covered

SUB ASSEMBLIES:

#1:

- (1) Fiberglass Cowling-painted with (6) screws holes
- (6) M3x15mm hex style bolts for mounting cowling
- (6) 3mm flat washers for mounting cowling
- (6) #6 bonded plastic washers for mounting cowling.

#2:

- (1) 5mm 7075 Aluminum Main Landing Gear --- painted
- (2) 5mm AL Axle Bolts
- (2) M8 lock nuts
- (4) 5mm i.d. Wheel Collars with set-screws
- (2) 110mm Dia. Main Wheels (Lite Type)
- (4) M3x15mm hex style bolts for mounting wheel pants
- (4) 3mm flat washer for mounting wheel pants
- (4) 3mm split ring lock washer for mounting wheel pants
- (4) M4x25mm hex head bolts for mounting main landing gear
- (4) flat washers for mounting main landing gear
- (4) split ring lock washers for mounting main Landing gear.

#3:

- (2) Wheel Pants" Left and 1 Right---Painted
- (4) M3 blind nuts installed in the wheel pants, 2 per side.

#4:

- (1) AL Tail Wheel Assembly -- Large

#5:

- (1) 40mm o.d. Anodized Aluminum Tube for wing joint
- (2) 12.5mm o.d. Anodized Aluminum Tube for stab joint "one front and one rear
- (4) M4x30mm Hex head bolts for wing mounting
- (4) #8 bonded washers for wing mounting
- (4) 4mm split ring lock washer for wing mounting
- (4) M3x12mm Hex style head bolts for stab mounting
- (4) #6 bonded washer for stab mounting

#6:

- (2) 4-40 2-1/2" two end threaded pushrod with nuts for elevator
- (4) 4-40 3" two end threaded pushrod with nuts for ailerons
- (1) 1.8x300mm threaded pushrod with metal clevis for throttle
- (4) 4-40 ball link for elevator
- (8) 4-40 ball link for aileron

#7:

- (2) 1x1300mm plastic coated pull-pull steel cable.
- (4) 4-40 Metal R/C links with metal clevises and nuts
- (2) 4-40 ball link for rudder
- (4) 3.5x5mm brass pull-pull swaging tubes
- (8) AL double control horns
- (48) T2.6x16mm Phillips head mounting screws

#8:

- 800cc Gas Fuel Tank assembly
- Additional 4mm brass tubes
- 3 feet of fuel line for gas (large)

#9:

- Throttle servo plate
- Engine mounting template (DA100 and 3W100)
- Engine baffling balsa wood
- Plywood cover for the pipe entrance
- (8) T2.6x10mm PWA screws for the cover installing
- (1) 160x70x6mm foam for the fuel tank.
- (2) 300x80x6mm foam for the receiver and battery
- (8) Nylon Ties for the fuel tank mounting
- (1) 610x20mm Velcro
- (2) 610x100x1.6mm balsa wood sheets
- (1) 600x300mm D21052 Oracover covering

#10:

- (24) 6mm aluminum engine stand offs.

#11:

- (2) Skirt for the main landing gear--painted, 1 left and 1 right
- (4) M3x6mm Hex style head bolts
- (4) 3mm flat washers
- (4) 3mm split ring lock washers

ITEMS NEEDED TO COMPLETE

Hardware:



- 100CC Gas engine and ignition with mufflers or headers with canisters or pipes, mounting bolts, nuts, and washers.
- 4" spinner and propeller
- 4 x aileron servos (min 130 in./oz. torque)
- 2 x rudder servo (min 130 in./oz. torque)
- 2 x elevator servo (min 130 in./oz. torque)
- 1 x throttle servo (fast / Reliable)
- Servo extensions - 3 x Y harnesses and 2 x 6," x 12," 4 x 18," 2 x 24," 2 x 36"
- 1 Receiver (PCM, 8 channel or higher)
- 2 x Receiver batteries (min 4.8 volt / 1700ma)
- 1 x ignition battery (min 4.8 volt / 1700 ma)
- 3 Switch / Charge jacks

Tools:



- Allen wrenches US and Metric.
- Dremel cutting disc and sanding drum tool
- Electric drill and selection of bits
- Flat head screwdriver
- Hobby heat gun
- Hobby iron
- Masking tape
- Modeling knife
- Needle nose pliers or crimping tool
- Paper towels
- Pen, pencil or felt tipped marker
- Phillips screwdriver
- Ruler and tape measure
- Scissors
- T pins
- Waxed paper
- Wire Cutters

Adhesives:



- 15-30 Minute epoxy
- Blue Loctite
- Epoxy mixing cups, sticks, brushes
- CA kicker (optional)
- Thick, thin and medium CA
- Rubbing alcohol
- Wipes

TIGHTENING AND RE-SHRINKING THE COVERING

1. Open your kit slowly and take care not to damage any parts of the kit. Remove all parts from their plastic protective covers for inspection. Before doing any assembly or installation of any decals it is very important to re-shrink or retighten the already applied covering. Due to the shipping process, heat and humidity changes from different climates, the covering may become loose and wrinkle in the sun. If you take the time to re-tighten the covering, you will be rewarded with a long lasting beautifully covered model.



2. Using your covering iron with a soft sock, gently apply pressure and rub in the covering. If any bubbles occur, your iron may be to hot. Reduce heat and work slowly.



3. If bubbles persist, use a small pin to punch holes in the bubble to relieve trapped air and reheat.



4. Use your heat gun with extreme caution. Take care not to apply too much heat to one area for long periods of time. This may cause the trim colors to over shrink and pull away leaving unsightly gaps on the color lines. The trim stripes are especially vulnerable to over heating and over shrinking.



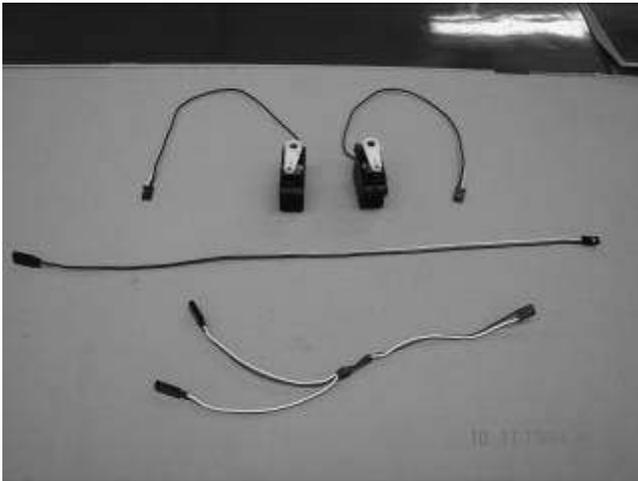
5. Your model is covered with Ultracote covering. In case of repairs, the colors are:
Midnight Blue #885
Bright Yellow #872
Silver #881
White #870

Tightening and re-shrinking the covering is now complete.

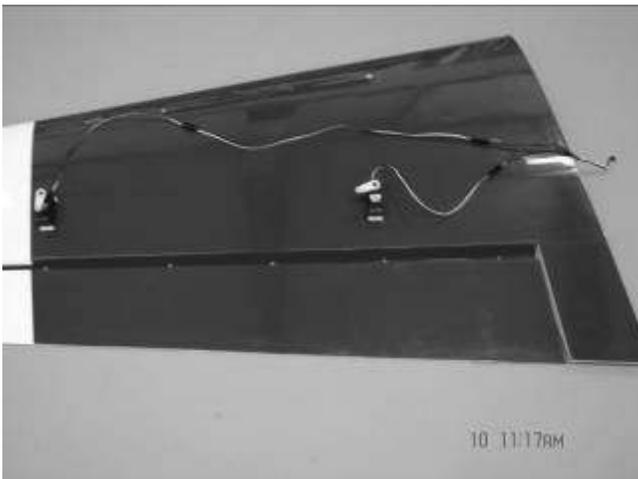
WING ASSEMBLY

Aileron Servo Installation

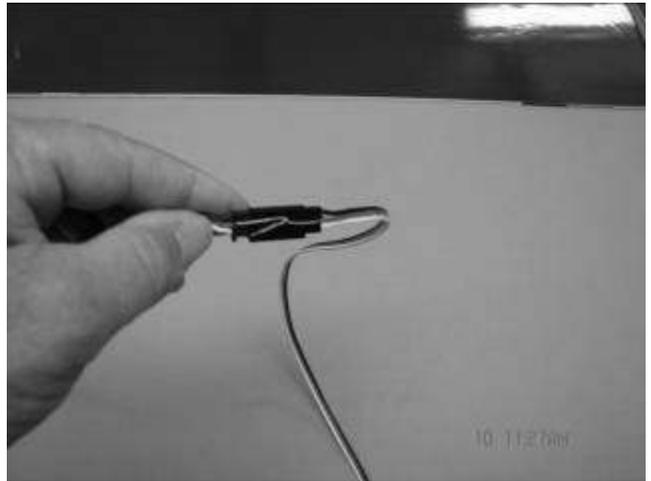
1. The ailerons have been pre-hinged and glued to the wing panels and are ready for flight. No other steps are necessary for hinging. Gather one wing panel, two aileron servos, 1 11 Y harness, and 1 24" servo extension as shown below for servo installation.



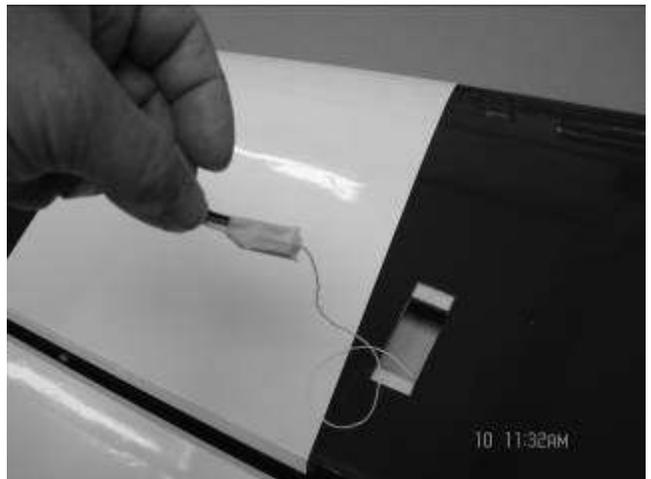
2. Layout the servos, extensions and Y harness on the wing to test fit the installation and ensure servo leads are the correct size.



3. Attach the 24" extension to the outboard servo lead and secure with safety wire, string, tape, or other method. Ensure the plugs will not come apart from vibration or light tension.



4. Fasten the pull string from the outboard servo hole to the male plug of the servo extension. Secure with tape so that the string pulls from the front end of the plug to assist in drawing the servo wire through the wing without hanging up inside the wing.



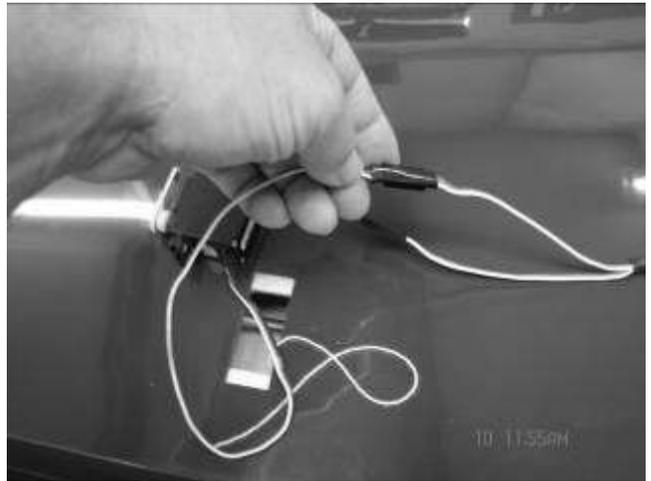
5. Draw the 24" servo extension through the wing and pull through the wing root rib.



6. Attach one female end of the Y harness to the inboard servo lead.



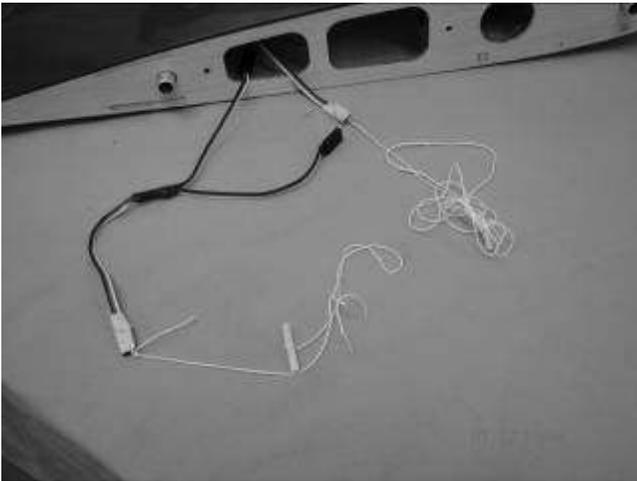
7. Secure the servo plugs with safety wire, string, tape, or other method. Ensure the plugs will not come apart from vibration or light tension.



8. Fasten the pull string from the inboard servo hole to the male plug of the Y harness. Secure with tape so that the string pulls from the front end of the plug to assist in drawing the servo wire through the wing without hanging up inside the wing.



9. Pull the 24" extension from the outboard servo and the Y harness from the inboard servo out of the root rib as shown.



10. Plug the remaining female end of the Y harness into the male end of the 24" extension and secure as before. Secure the servo plugs with safety wire, string, tape, or other method. Ensure the plugs will not come apart from vibration or light tension.



11. Tuck the excess servo wires inside the wing root as shown.



12. Install servo in servo well with the output arm toward the leading edge of the wing and mark locations of servo mounting holes.



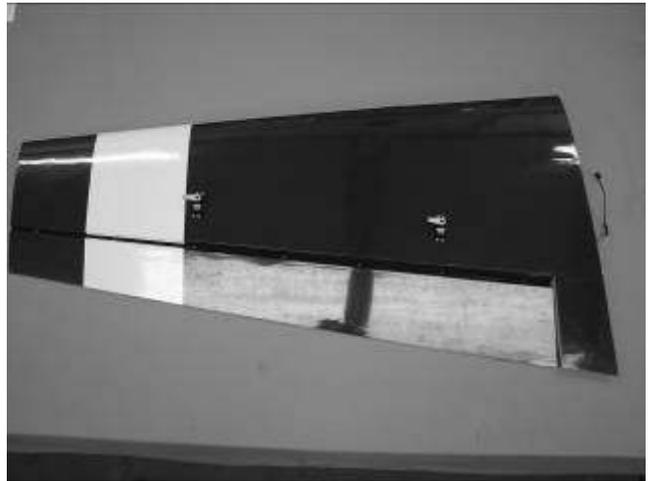
13. Remove servo and use a 1/16 bit to drill servo mounting holes.



14. Install servo with servo mounting screws.



15. Repeat mounting steps for other servo so that both aileron servos are mounted in bottom of wing as shown.



Aileron Control Linkage Installation

1. Use a ruler against the outboard side of the servo case to project a line to the leading edge of the aileron and mark as shown.



- From that mark measure 1/2" toward the wing tip and mark the leading edge of the aileron as shown. This mark will be the center of the aileron control horn.



- Gather the aileron control linkage parts as shown below. There are 2 pushrods, 4 ball link assemblies, 2 left and 2 right side control horns, and 12 wood screws for each wing panel.

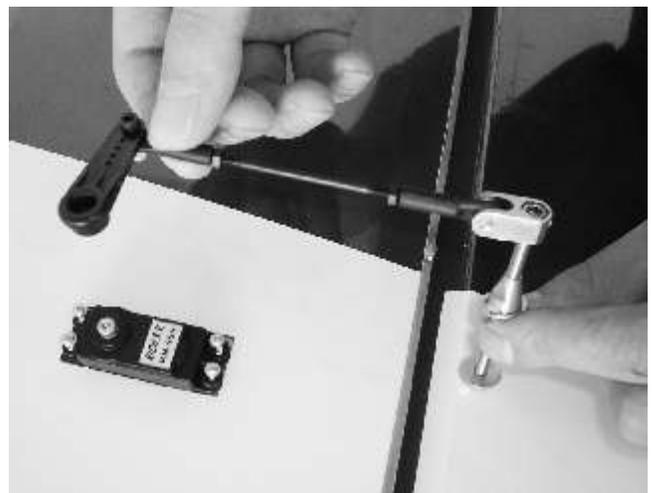


- Assemble two pushrod and control horn assemblies as shown. The ball link goes between the left and right sides of the control horn sides and is secured with a nylon lock nut.

IMPORTANT: Mount the ball link for the inboard control horn in the bottom hole. Mount the ball link for the outboard horn in the middle hole. This will eliminate servo binding.



- Tape the inboard trailing edge of the aileron to the trailing edge of the wing in the neutral position. Plug the servo into the receiver and turn on. Ensure the servo is centered and the servo arm is parallel to the aileron hinge line. Attach front ball link to servo arm. Adjust the length of the pushrod so that the leading edge of the control horns are aligned with the bottom leading edge of the aileron. Center the control horn over the mark as shown.



STAB AND ELEVATOR ASSEMBLY

Elevator Servo Installation

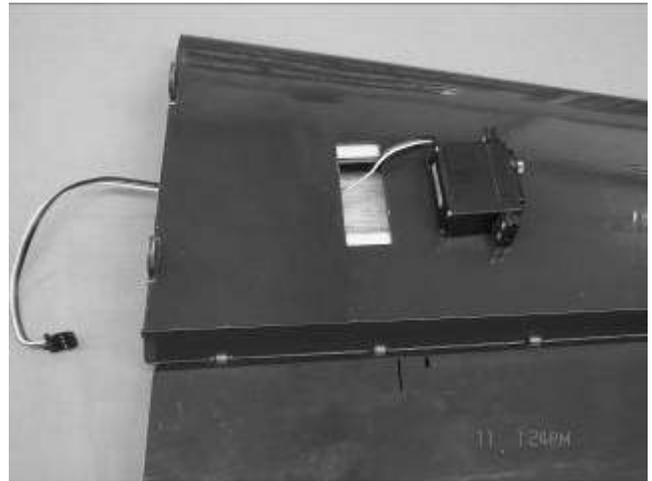
1. The elevators have been pre-hinged and glued to the stabs and are ready for flight. No other steps are necessary for hinging. Gather the stabs and elevators, two elevator servos, and two 36" servo extensions as shown below.



2. Gather the elevator control linkage parts as shown below. There are 2 pushrods, 4 ball link assemblies, 4 metal threaded RC links, 2 left and 2 right side control horns, and 12 wood screws for each stab and elevator.



3. Feed the servo wire through the pre-cut elevator servo well and out the root rib of the stab as shown.



4. Install servo in servo well with the output arm toward the leading edge of the stab and mark locations of servo mounting holes.



5. Remove servo and use a 1/16 bit to drill servo mounting holes.



6. Install servo with servo mounting screws.



Elevator Control Linkage Installation

1. Assemble two pushrod and control horn assemblies as shown. The ball link goes between the left and right sides of the control horn sides and is secured with a lock nut.



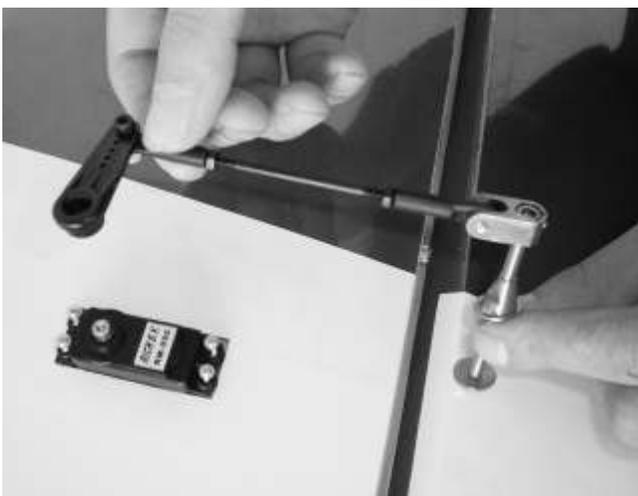
2. Use a ruler against the outboard side of the servo case to project the line to the leading edge of the elevator and mark as shown.



3. From this mark measure 1/2" toward the stab tip and mark the leading edge of the elevator as shown. This mark will be the center of the elevator control horn.



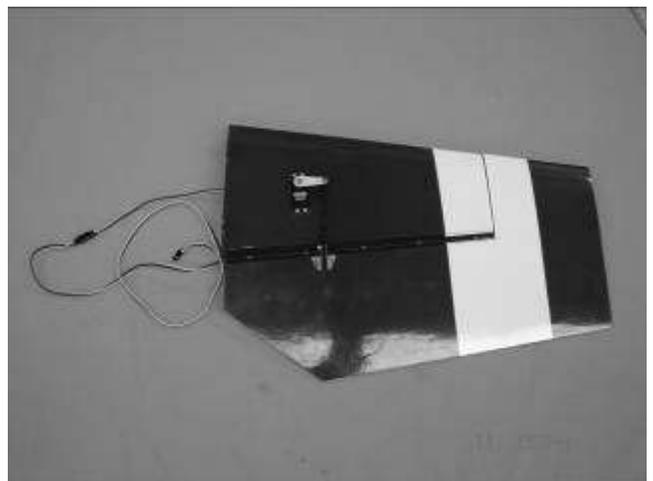
4. Use a 1/16 bit to drill the control horn mounting holes.



5. Plug the servo wire into the female end of the 36" extension and secure the servo plugs with safety wire, string, tape, or other method. Ensure the plugs will not come apart from vibration or light tension.



6. Ensure the servo does not bind at center or either end point at full deflection.
7. Repeat the above steps for the other stab and elevator.



RUDDER AND TAILWHEEL ASSEMBLY

Rudder Installation

1. Gather the rudder, six hinges and epoxy materials as shown. Use 15–30 minute epoxy to ensure adequate working and cleanup time.



2. Prep all hinges for installation by applying Vaseline petroleum jelly or light oil to the hinge joint. This ensures no epoxy gets into the hinge during assembly.



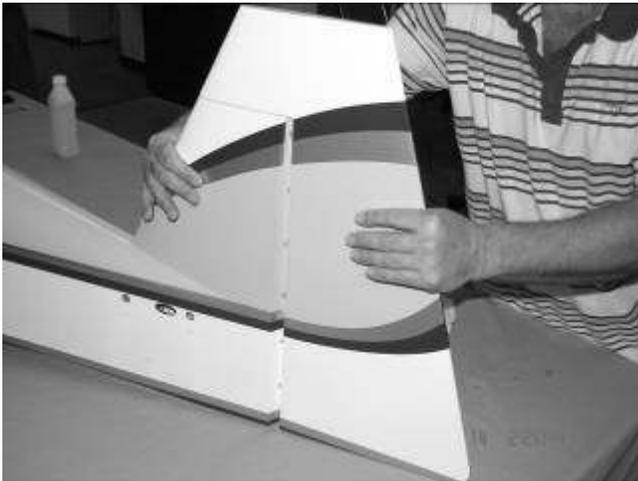
3. Mix epoxy in mixing cup and use a tapered stick to apply the epoxy inside the pre-drilled holes in the trailing edge of the fin. Apply epoxy to one side of each hinge and insert the hinge completely into the hole. Ensure the hinge axis is vertical and parallel to the trailing edge of the fin before epoxy cures. Wipe away excess epoxy with alcohol wetted wipes.



4. Epoxy the hinges into the fin first and allow epoxy to fully cure.

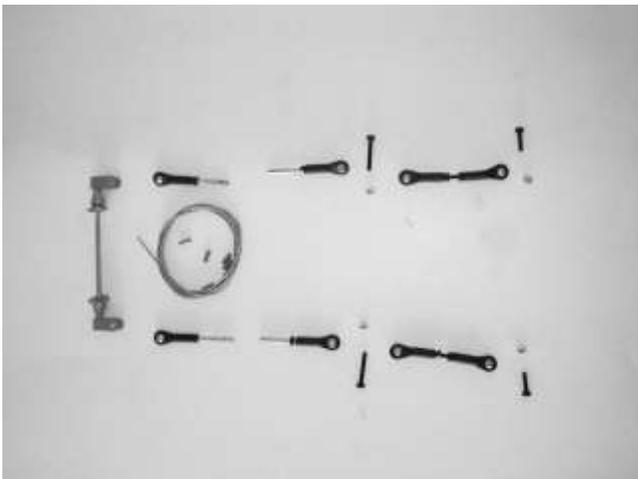


5. Mix epoxy in mixing cup and use a tapered stick to apply the epoxy inside the pre-drilled holes in the leading edge of the rudder. Apply epoxy to each hinge. Carefully slide the rudder onto each hinge and against the trailing edge of the fin. Wipe away excess epoxy with alcohol wetted wipes. Ensure there is no gap between fin and rudder.



Rudder Control Horn Installation

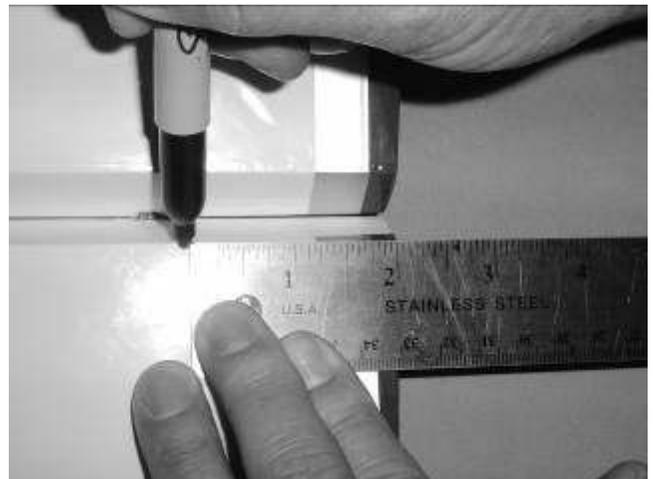
1. Gather the rudder control linkage parts shown below. Rudder cable, 2 ball link assemblies, 4 threaded metal RC links, 4 threaded couplers, 4 brass swaging tubes, 2 left and 2 right side control horns, and 12 wood screws.



2. Gather the rudder control horn parts as shown below. 2 ball link assemblies and 2 left and 2 right side control horns. Assemble the ball links between the control horns as shown. Secure with lock nut.



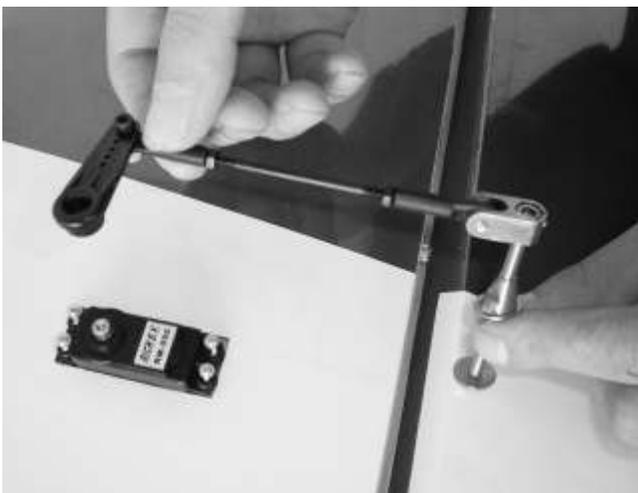
3. Measure up from base of rudder 2" and mark place a mark on the rudder leading edge.



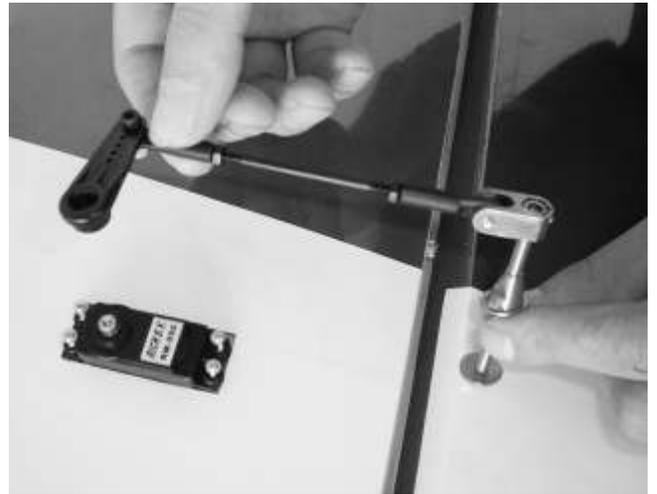
4. Center the rudder control horn over the mark and mark the locations of the control horn mounting holes.



5. Use a 1/16 bit to drill control horn mounting holes.

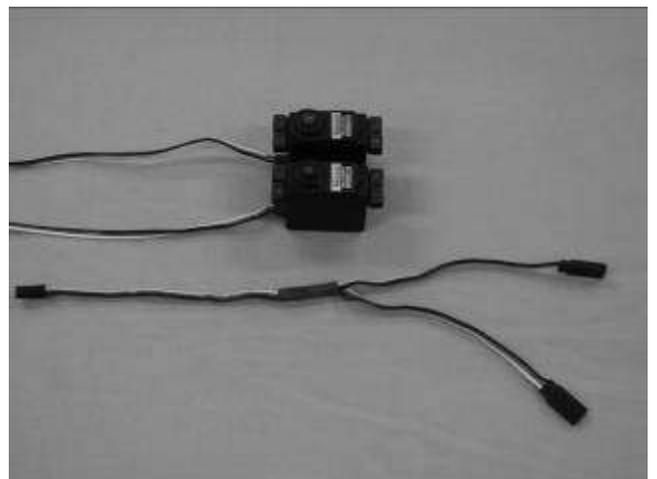


6. Mount rudder control horns using six wood screws.
7. Repeat the above steps for mounting the other side rudder control horn.

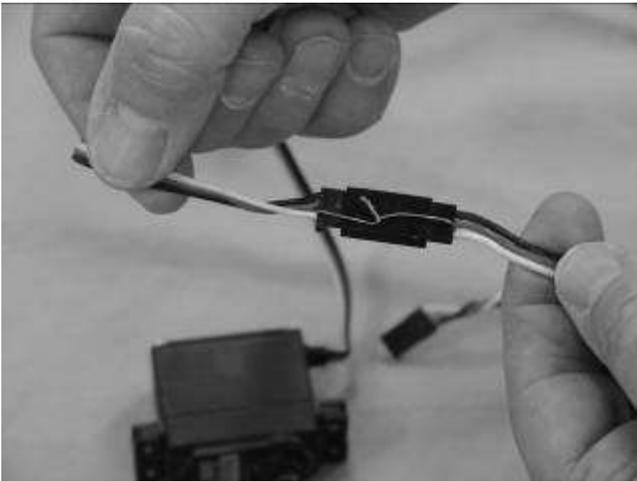


Rudder Servos Installation

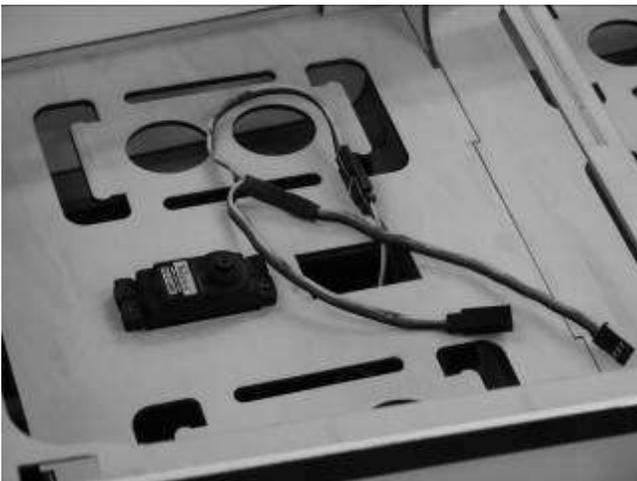
1. Gather the two rudder servos and a Y harness as shown below.



2. Attach the Y harness to one of the rudder servo leads and secure with safety wire, string, tape, or other method. Ensure the plugs will not come apart from vibration or light tension.



3. Install the aft rudder servo with the output shaft forward.



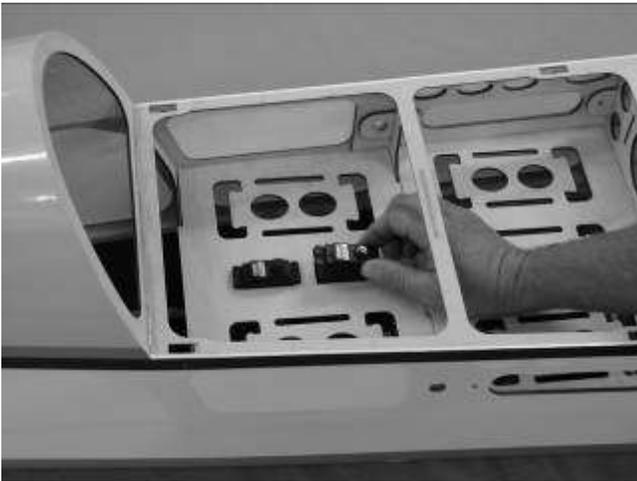
4. Pull the servo lead and Y harness up through the forward servo cutout.



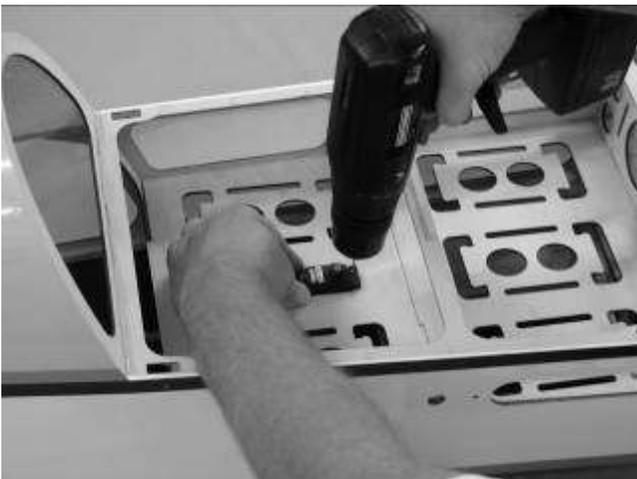
5. Attach the Y harness to the forward rudder servo leads and secure with safety wire, string, tape, or other method. Ensure the plugs will not come apart from vibration or light tension.



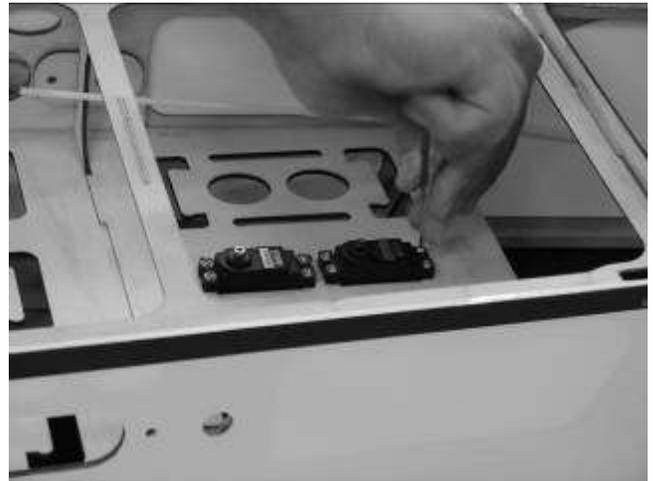
6. Push the wires under the rudder servo tray and install the forward servo.



7. Mark and use a 1/16 bit to drill the rudder servo mounting holes.



8. Install rudder servos with servo screws.



Rudder Pull-Pull Cable Installation

1. Gather the rudder control linkage parts shown below. 2 Rudder cables, 2 threaded metal RC links, 4 threaded couplers, and 4 brass swaging tubes.



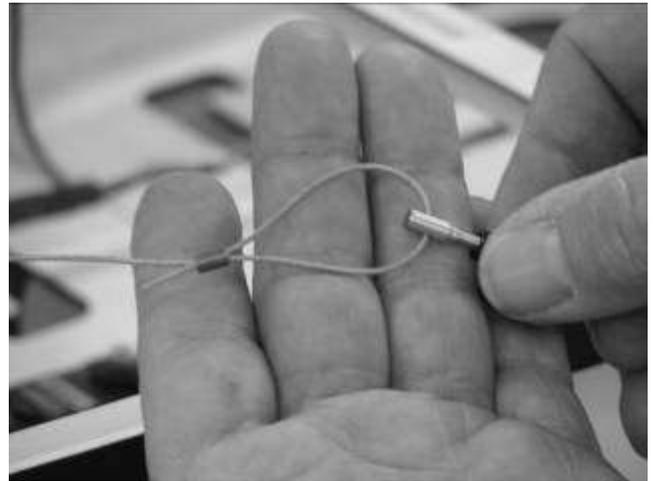
2. Feed the rudder cable through the cable exit tube in the tail of the fuse toward the front. Repeat on other side.



3. Pull the rudder cables out of the fuse tail to the rudder servo tray.



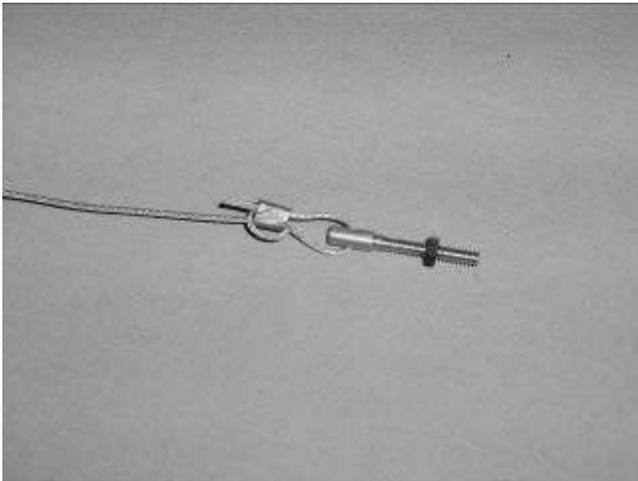
4. Insert rudder cable through the brass swage tube, then through the threaded coupler hole, and back through the brass swage tube as shown.



5. Loop the cable back through the brass swage tube as shown.



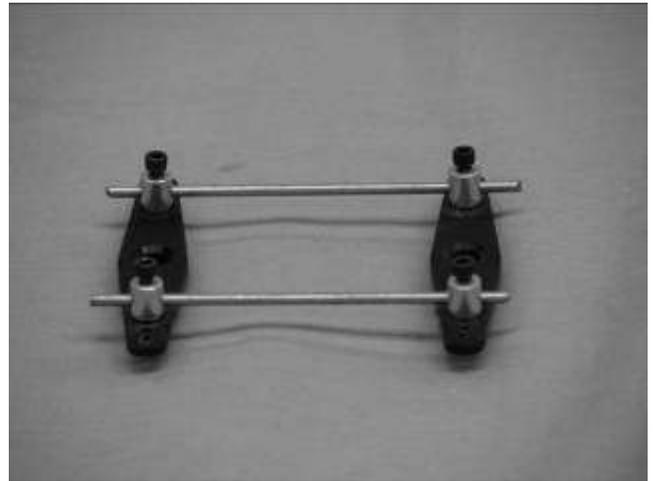
6. Tighten the second loop through the brass swage tube and crimp the brass tube with a crimping tool or pliers. Cut off excess cable as shown. A drop of thin CA may be applied to the swage tube to help secure the cable.
7. Repeat above steps for the other side rudder cable.



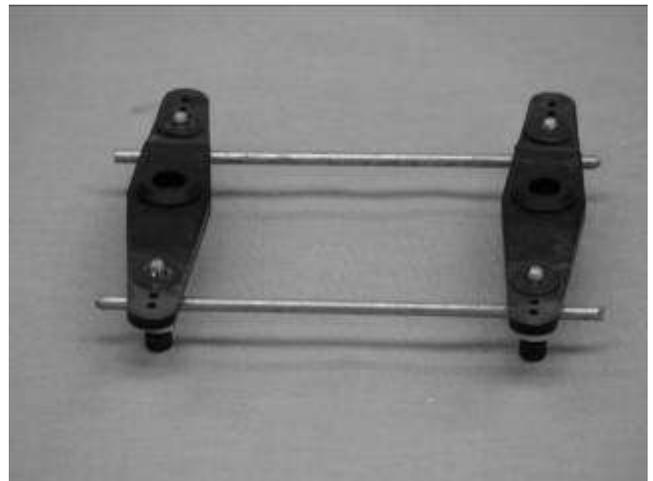
8. Attach a metal threaded RC link to each threaded coupler. Attach the RC links to the rudder servo arm and then attach the servo arm to the aft rudder servo as shown. A large servo arm 2 3/4 to 3" is required.



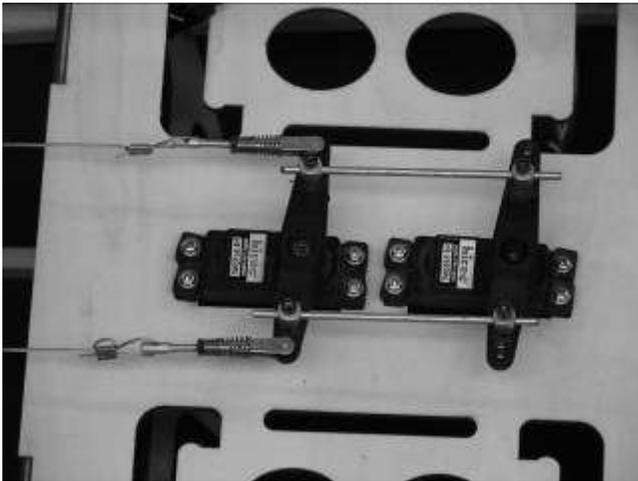
9. Build the rudder servo arm couplers as shown. We recommend 4-40 Easy Links and 4-40 wire rods for ease of assembly and adjustment.



10. If 4-40 easy links are used be sure to use metal clips on the bottom of the easy links.



11. Attach the rudder servo coupler assembly to the rudder servos as shown. Do not tighten the easy link set screws until the rudder servos are powered up and centered.



12. Optional ball link rudder servo coupler assembly is shown below. Use 4-40 all thread with copper, brass, or carbon tubes over the all thread rod to give adequate strength.



13. Plug the rudder servo Y harness into the rudder channel of the receiver and power up. Turn on transmitter to center rudder servos. Tighten easy link set screws or adjust optional ball links so that servos do not fight each other at center or at either end point.



14. Tape the rudder balance tab to the top leading edge of the vertical fin in the neutral position as shown. This ensures the rudder is straight when the cables are attached.



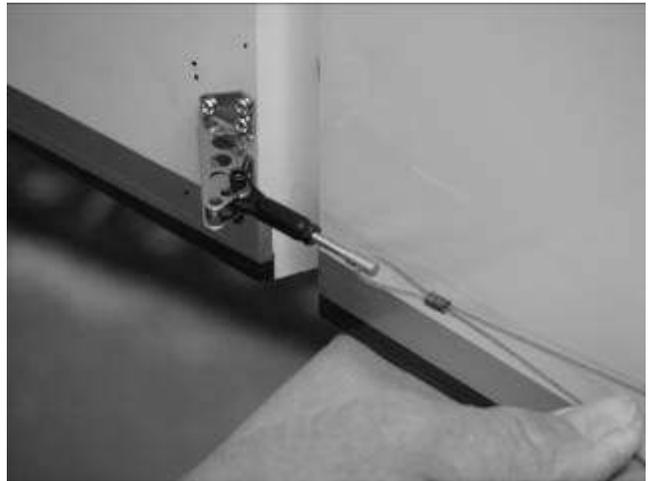
15. Remove ball links from the rudder control horns. Attach two threaded couplers to ball links as shown.



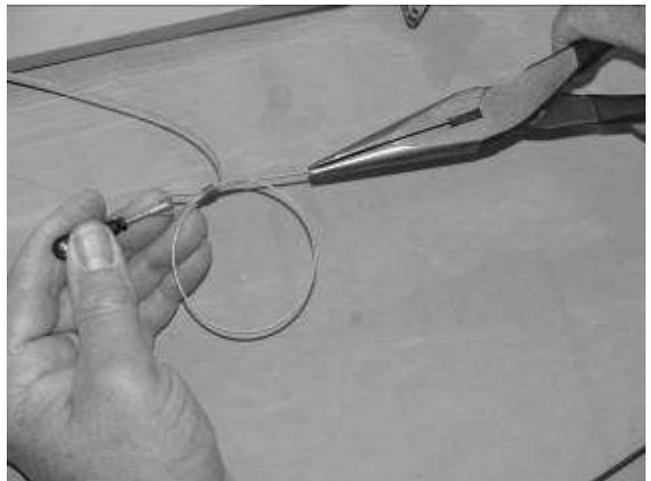
16. Hold the threaded coupler below the cable attach holes to thread into the ball link as shown. Do not hold coupler at the top where the cable hole is located. This may cause burrs on the coupler that can eventually cut the rudder pull cable.



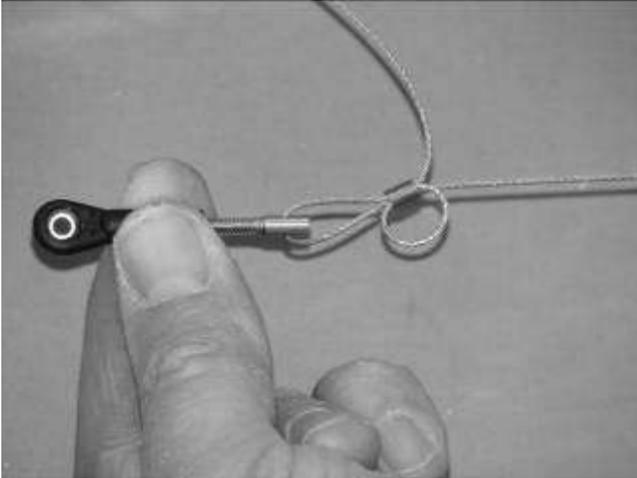
17. Attach ball link to rudder control horn on both sides of the rudder. Thread the rudder cable through a brass swage tube, then the threaded coupler, and back through the brass swage tube on both sides. Pull light tension on the cable through the coupler on both sides as shown. The loop through the coupler should be approximately 1/2" long.



18. Loop the cable back through the brass swage tube as shown.



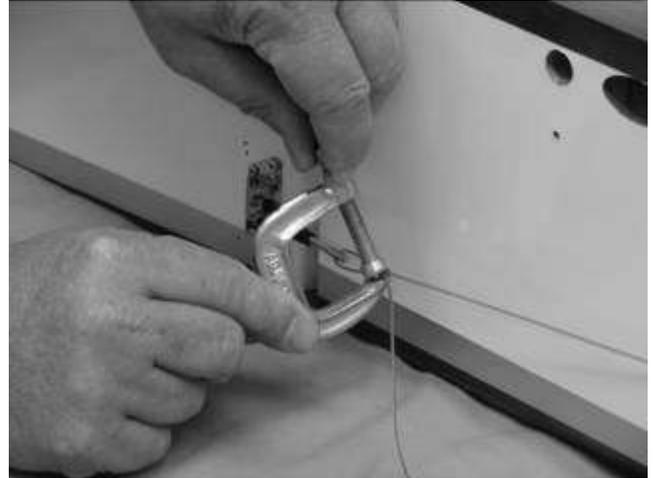
19. Tighten the second loop through the brass swage tube as shown.



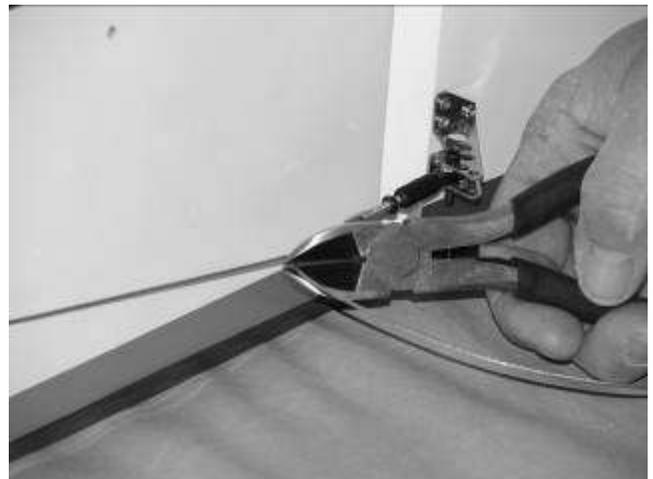
20. Crimp the brass tube with a crimping tool or pliers.



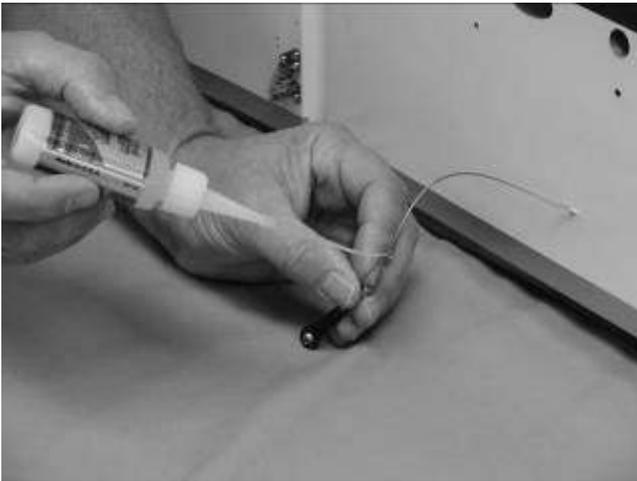
21. If additional crimping is needed a small C-Clamp may be used for additional crimping pressure.



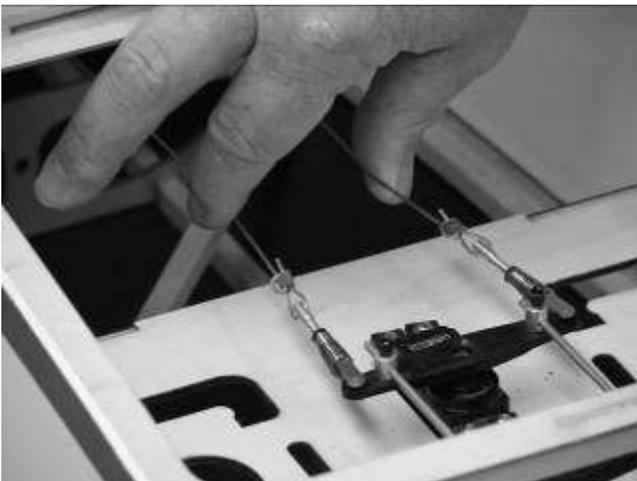
22. Cut off excess cable as shown.



23. A drop of thin CA may be applied to the swage tube to help secure the cable



24. Adjust rudder pull-pull cables to desired tension by screwing in or out on the threaded couplers and or ball links. Make all adjustments with the rudder servos still powered up and centered, and the rudder still taped in the neutral position. Ensure the servos do not fight each other at center or at either end point.



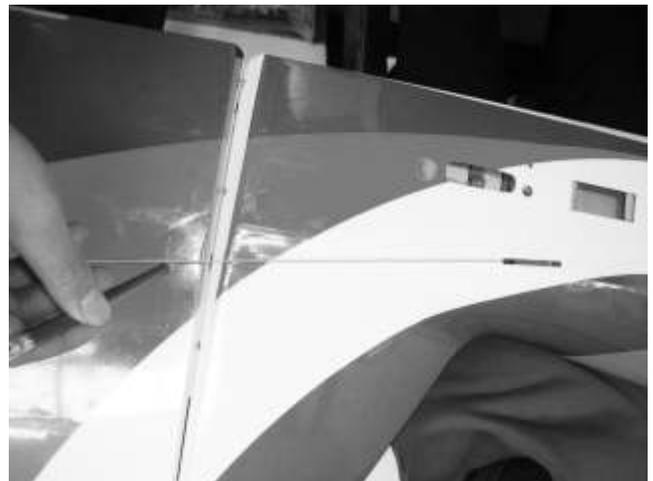
Tail Wheel Installation

1. Gather the tail wheel parts shown below. Tail-wheel strut and 2 leaf springs, 3 tail wheel mounting screws, steering tiller, 2 mounting screws and 2 steering springs.



2. Note: The tail wheel steering tiller mounting holes in the bottom of the rudder may be pre-drilled for you. If so, the following steps for marking and drilling the tail wheel steering tiller mounting holes may be skipped.

Mark a line 90° to the rudder centerline on the trailing edge of the rudder bevel as shown.



3. Mark a line parallel to the rudder centerline approximately 2" back from the leading edge of the rudder.



4. Position the tail wheel steering tiller as shown on the lines.



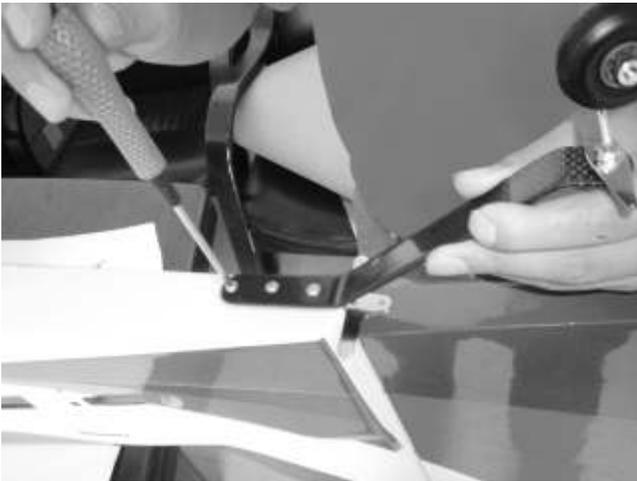
5. Mark the location of the tail wheel steering tiller mounting holes.



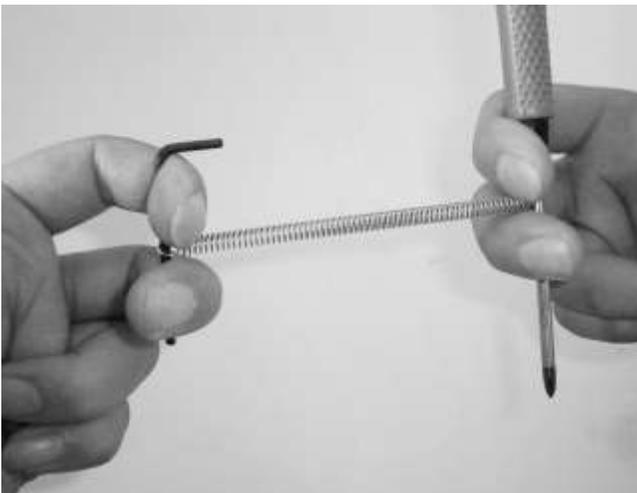
6. Use a 1/16 bit to drill the tail wheel tiller mounting holes.



7. Apply a drop of thick CA to the mounting screws before inserting in the holes.



8. Mount the tail wheel steering tiller using two wood screws.



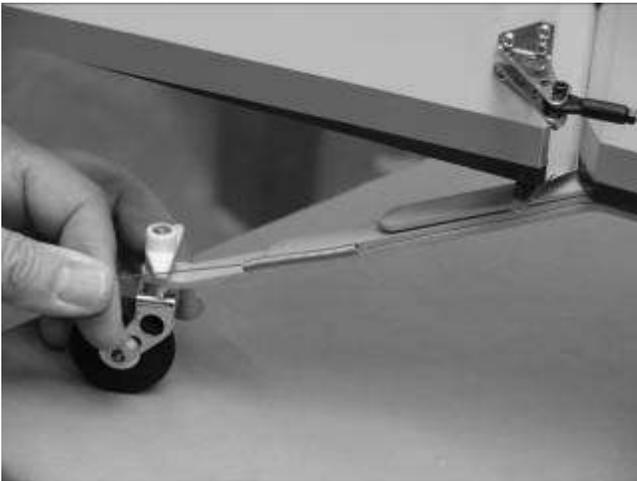
9. Stack the tail wheel springs on the tail wheel strut with the shortest spring on top. Position the tail wheel and springs on the bottom of the fuse. Place a drop of thick CA on tail wheel strut mounting screws before inserting in the pre-drilled mounting holes on the bottom rear of the fuse.



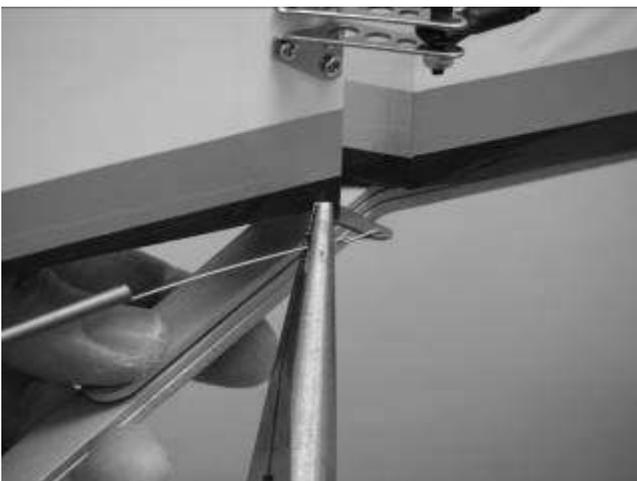
10. Mount the tail wheel struts and springs using three wood screws.



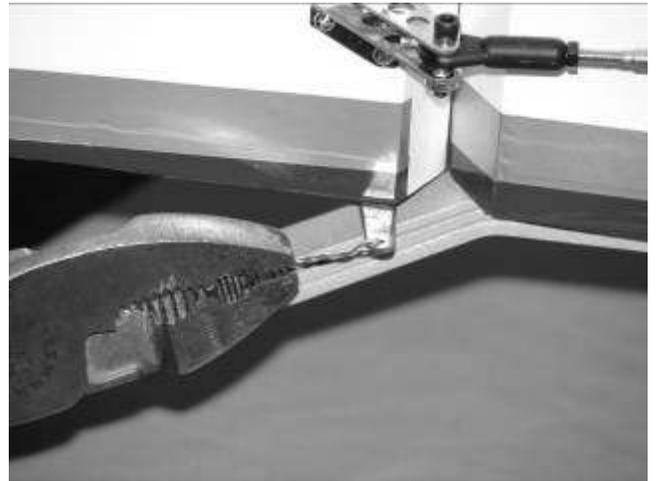
11. Attach the steering springs on both sides of the tail wheel to the rudder tiller and tail wheel tiller. Center the springs between both tillers.



12. Use pliers to bend spring wire through the tiller holes before applying tension to the springs. Slightly stretch the springs and then bend through the tail wheel tiller while holding tail wheel straight.



13. Use pliers to twist spring ends closed around the tillers after desired tension and direction adjustments are complete.



14. Tail wheel final assembly is complete.



MAIN LANDING GEAR ASSEMBLY

Main Landing Gear Installation

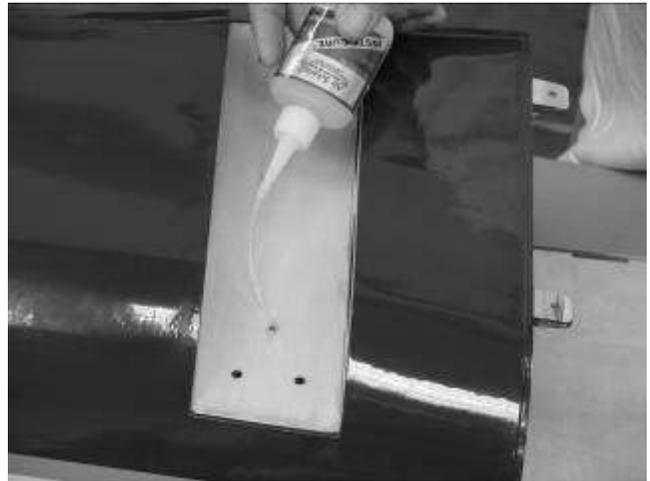
1. Gather the landing gear parts as shown below. Landing gear strut, 4 mounting bolts, washers, and lock washers, landing gear cover with mounting screws, gear cuffs, and mounting screws.



2. Remove landing gear cover from fuselage.



3. Place a few drops of thin CA in the gear cover mounting holes to harden the wood.



4. Note that the trailing edge of the landing gear strut is tapered. The tapered edge goes toward the rear of the fuselage.



5. Assemble the landing gear bolts with lock washer and flat washer as shown.



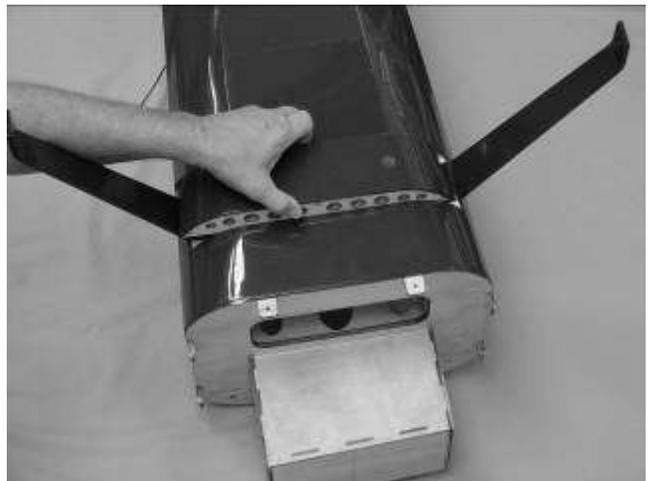
6. Use a drop of blue lock tite on landing gear bolts before attaching the landing gear.



7. Bolt landing gear strut to fuse with 4 bolts and washers. Ensure tapered edge of the gear strut is facing toward the rear.



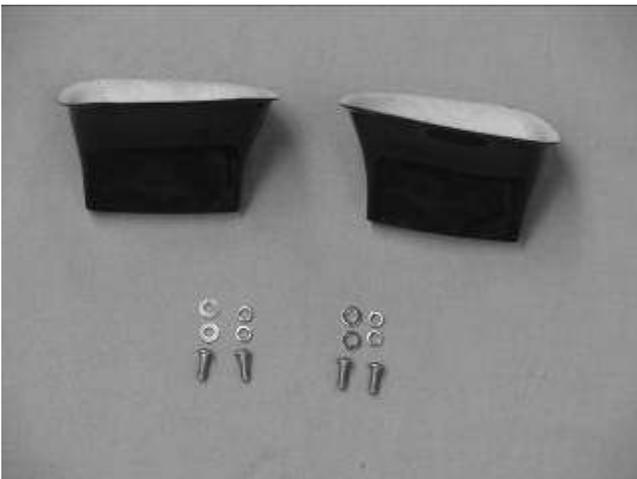
8. Reinstall the gear cover.



9. Screw the gear cover in place with the two wood screws.



10. Gather the landing gear cuffs, mounting bolt, flat washers, and lock washers.



11. Note: There is a right and left gear cuff. The curved edge of the gear cuff is the trailing edge and faces toward the rear.



12. Slide the gear cuff onto the proper gear strut.



- Slide the lock washer then the flat washer on the cuff mounting bolt. Use a drop of blue lock tite on each bolt before installing the bolt.



- Install left and right gear cuff as shown.

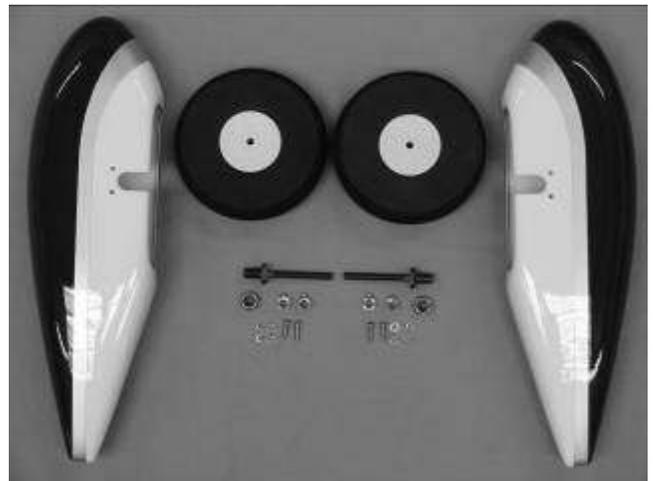


- Final gear assembly with cuff installed.

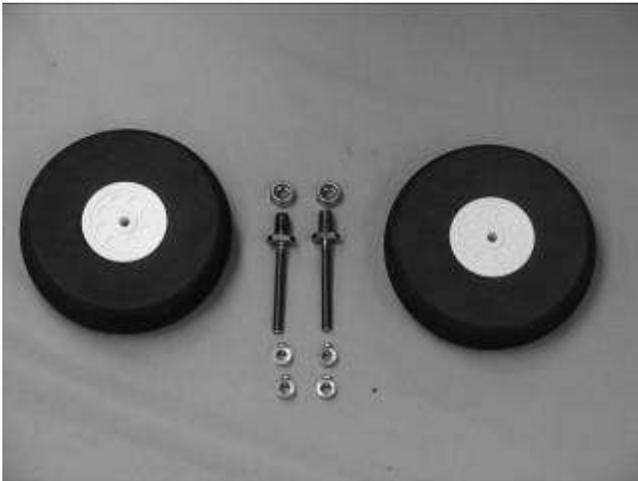


Wheels and Wheel Pants Installation

- Gather the wheel and wheel pant parts as shown below. 2 wheels, 2 axle assemblies, 2 wheel pants and 4 mounting bolts.



2. Gather the wheels, axles, and collars as shown below.



3. Install the axle into the gear strut with nylon lock nut **but do not tighten.**



4. Snug axle to gear strut with the flat sides vertical but do not tighten. Align axle with wheel pant slot.



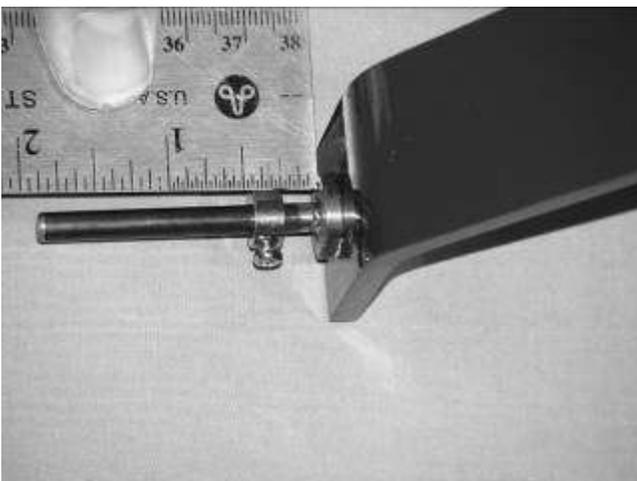
5. Slide wheel pant over axle and install the wheel pant mounting bolts to hold the wheel pant in alignment. Use the wheel pant axle cut out to align the flat sides of the axle bolt and then tighten the axle so it does not rotate during final tightening.



6. Remove the wheel pant and use wrenches to permanently tighten the axle to the gear strut.



7. Install the inner wheel collar with a 1/4" space between axle bolt and collar. Tighten the wheel collar in place.



8. Install the wheel and outer wheel collar. Use blue lock tite on the wheel collar set screw before final tightening.



9. Slide the lock washer then the flat washer on the wheel pant mounting bolts. Use blue lock tite on the bolts before final tightening.



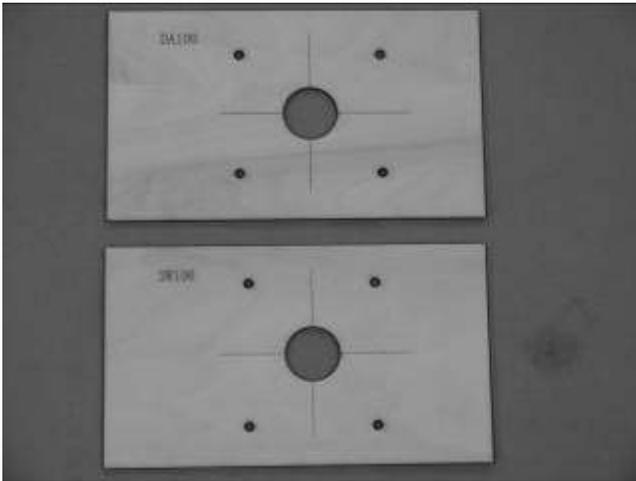
10. Install wheel pants with two mounting bolts.
11. Repeat above steps for other wheel and wheel pant.



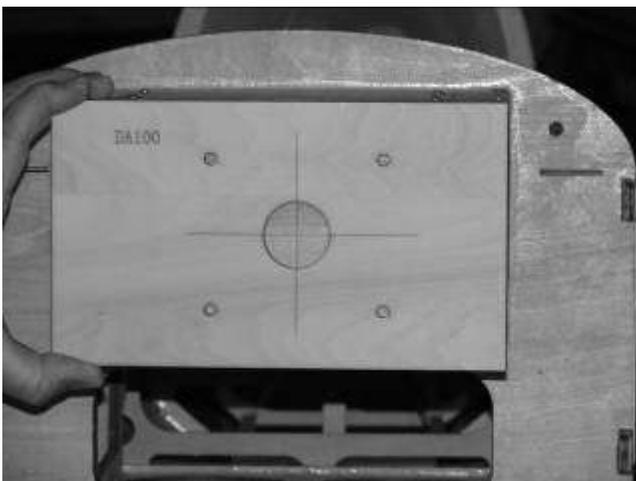
ENGINE, THROTTLE, MUFFLERS, TANK, AND COWL INSTALLATION

Engine Installation

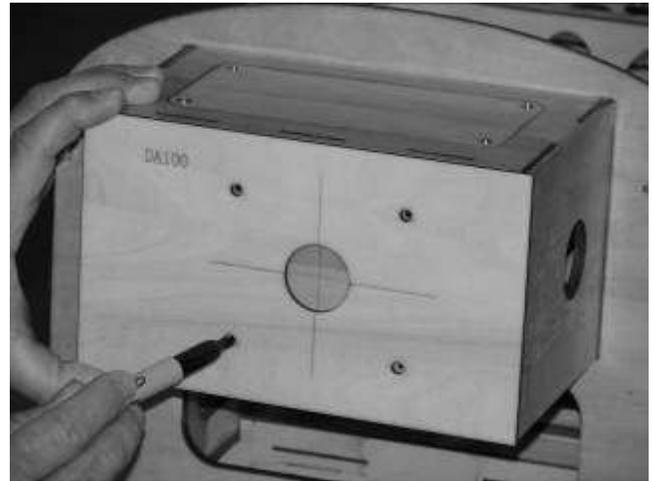
1. Locate the laser cut engine mounting template for either the DA-100 or 3W-100, 106. If other engines are used the templates may be modified for any mounting pattern.



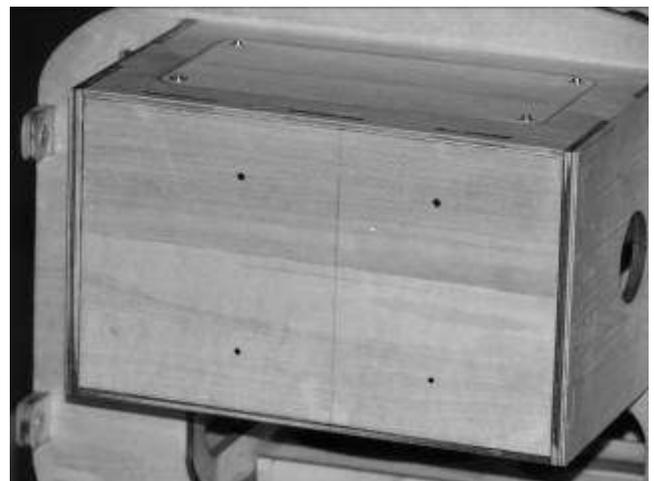
2. Line up the template with the firewall thrust lines.



3. Mark the location of the engine mounting holes.



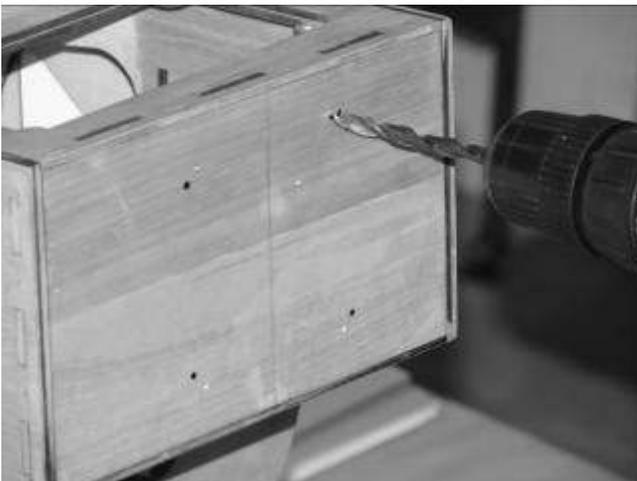
4. Engine mounting holes after marking with the template.



5. Center punch the engine mounting hole locations.



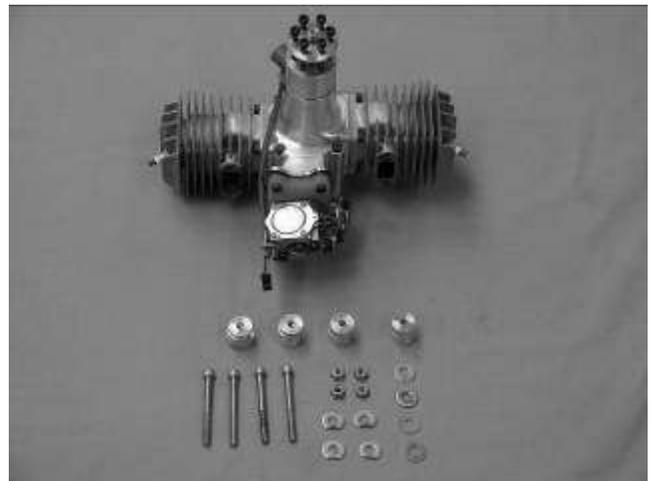
6. Use a 1/4 drill to drill the engine mounting holes.



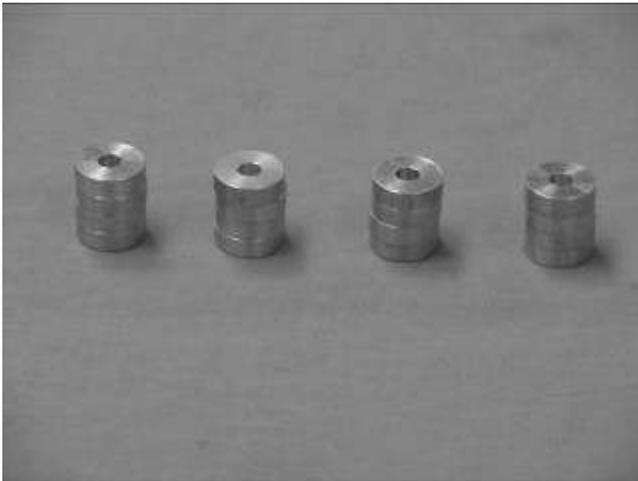
7. Engine mounting holes after drilling.



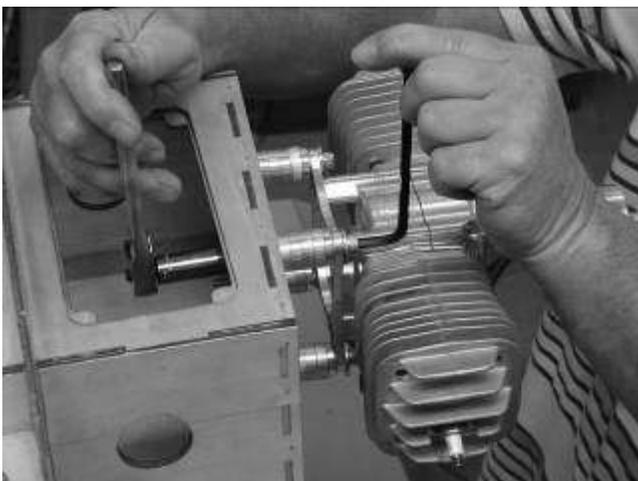
8. Gather the engine and mounting hardware as shown. 4 mounting bolts, 4 locknuts, 8 washers, and 24 spacers.



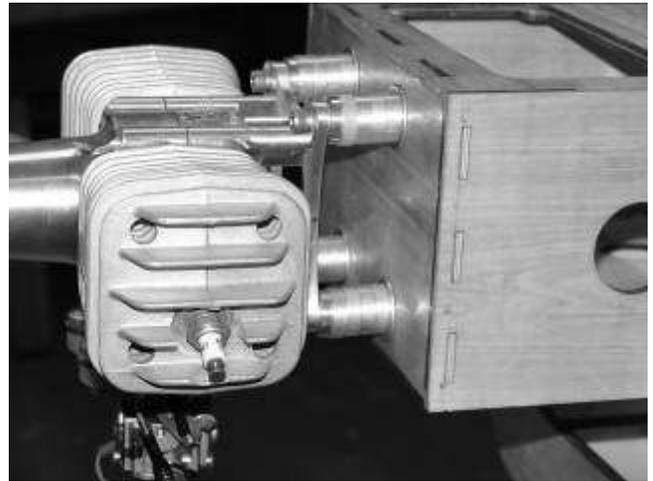
9. The required distance from the firewall to the front of the prop mount on the engine is 7 5/8." 24 spacers are included to set the proper stand off distance for the engine used.



10. Insert the 4 bolts through the engine mount, spacers and washers. Insert the bolts through the firewall and add washers and lock nuts. Tighten firmly. Use lock tite to secure



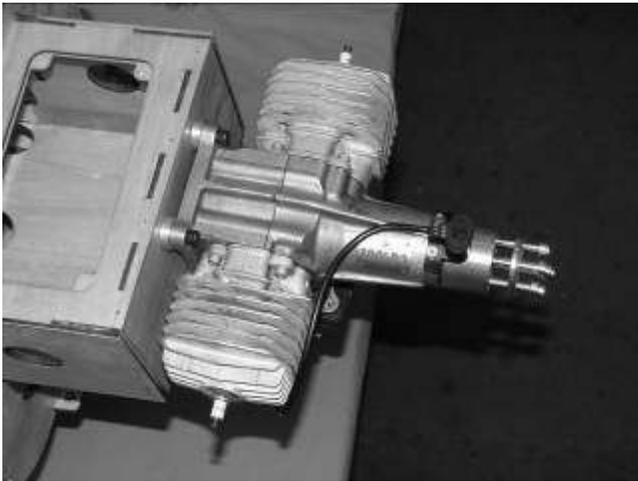
11. For the DA-100 use 5 spacers on each mounting bolt. Use 4 flat fender washers between the spacers and firewall to distribute bolt pressure.



12. Use the flat fender washers on the back side of the firewall as shown to distribute bolt pressure.

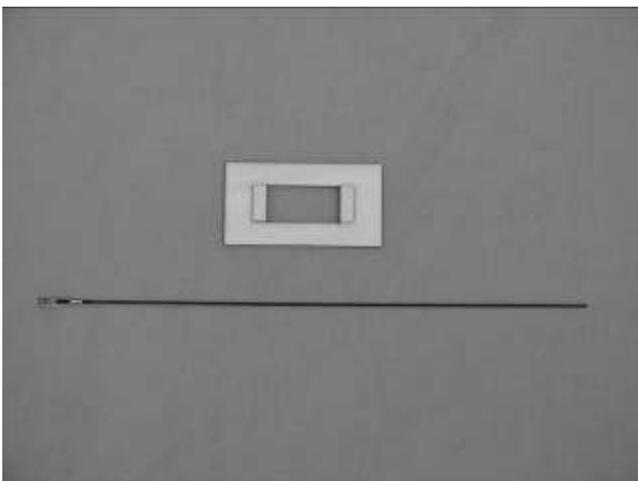


13. For the 3W-100, 106 only one spacer is required on each mounting bolt as shown.

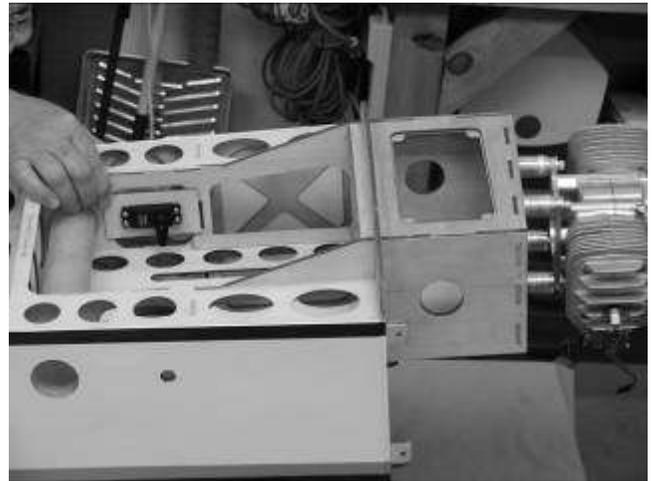


Throttle Servo Installation In Fuse

1. Locate the plywood throttle servo mount and pushrod for under engine box throttle servo mounting. If the throttle servo is mounted inside the fuse a flex cable pushrod is recommended such as a Sullivan Gold-N-Rod cable #508.



2. Insert the throttle servo into the mounting plate with the output shaft forward. Mark and drill the throttle servo mounting holes. Mount the throttle servo in the plate with servo screws. Mark and drill the throttle servo plate mounting holes in each corner of the plate. Locate the throttle servo mounting plate on the same side of the fuse as the throttle arm on the engine carburetor.

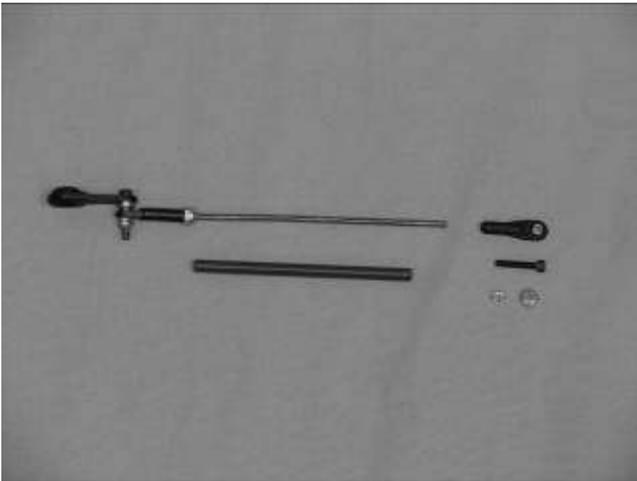


3. Align the servo mounting plate to give the least resistance on the throttle cable. Mount the throttle servo mounting plate to the fuse side with servo screws. Glue a small wood block with a hole drilled in it to the fuse floor to support the throttle cable as shown. Run the cable to the front of the firewall and connect to the carburetor throttle arm.

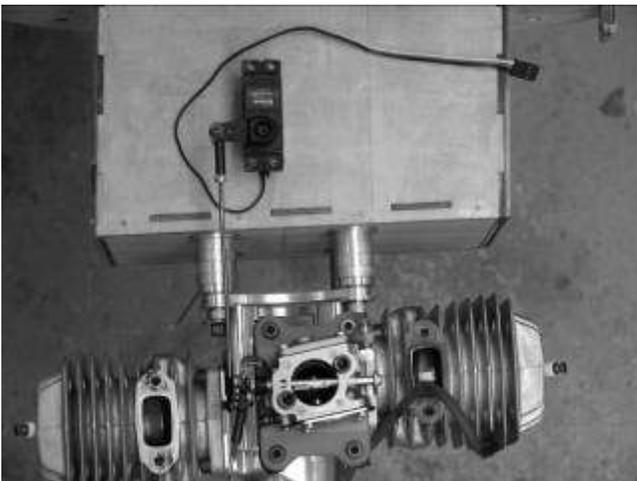


Alternate Throttle Servo Installation Under Engine Box

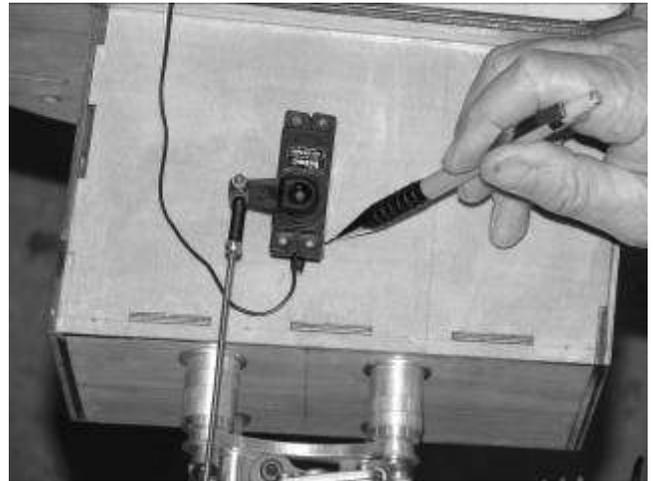
1. Gather the throttle pushrod parts as shown below. 2 ball link assemblies, 4-40 all thread rod, and 1 carbon or brass sleeve with 1/8 ID. **These parts are not included in the kit.**



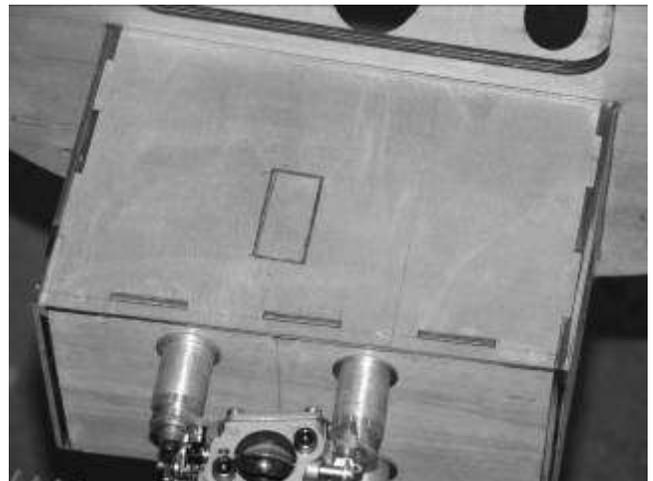
2. Position throttle servo on bottom of engine box so the servo output arm lines up with the engine carburetor throttle arm.



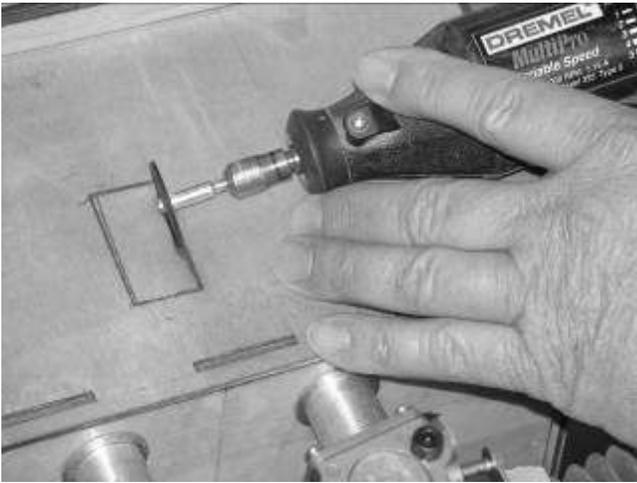
3. Trace around the base of the servo to mark location of throttle servo.



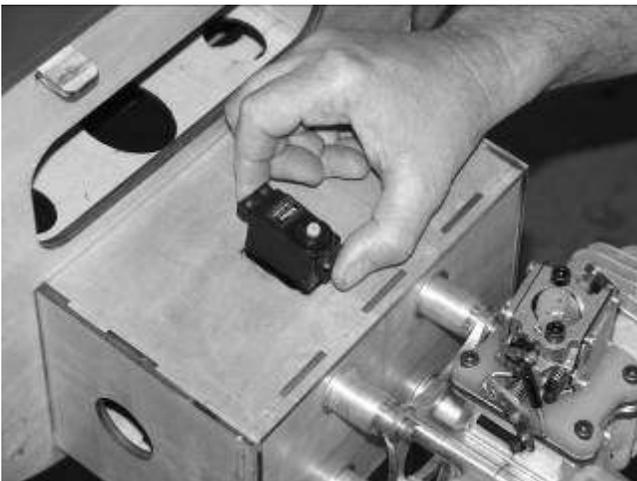
4. Throttle servo location marked prior to cutting out.



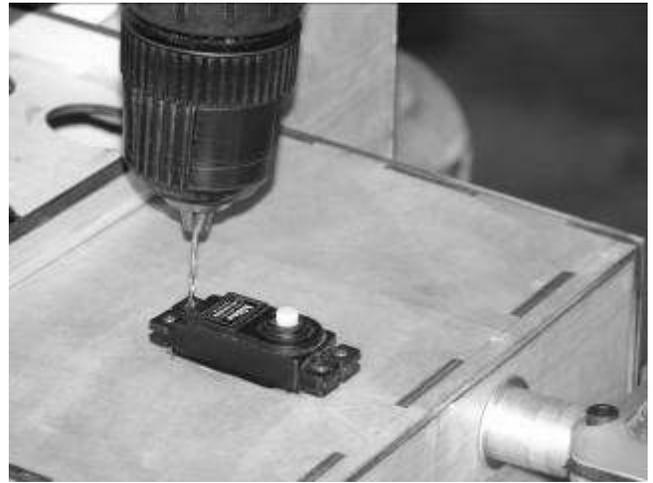
5. Cut out throttle servo location with rotary cutter or small modeling saw.



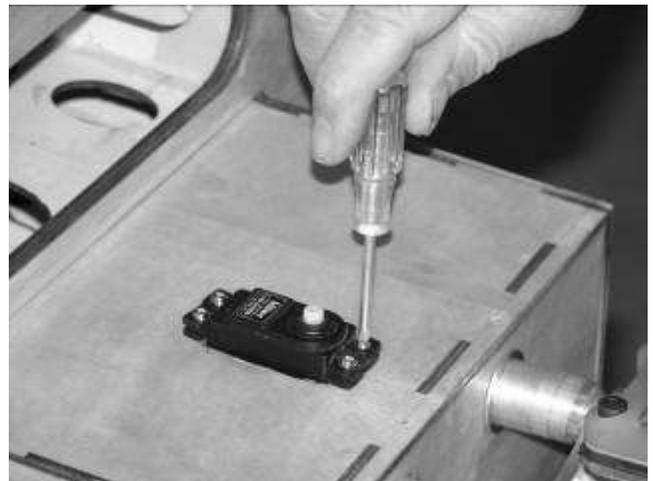
6. Insert throttle servo into cutout with output shaft forward.



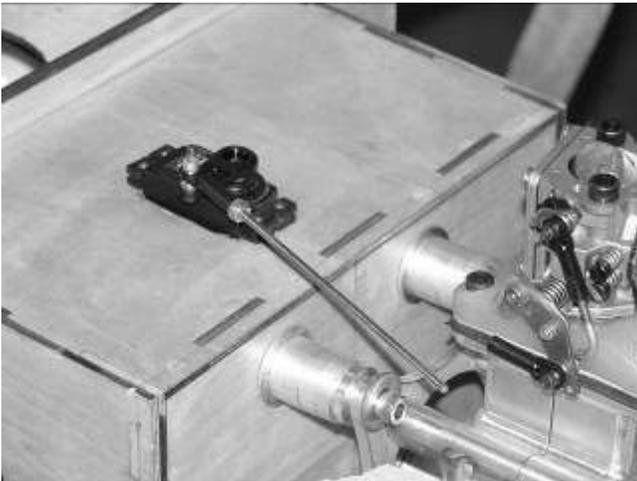
7. Mark location and drill servo mounting holes using a 1/16 bit.



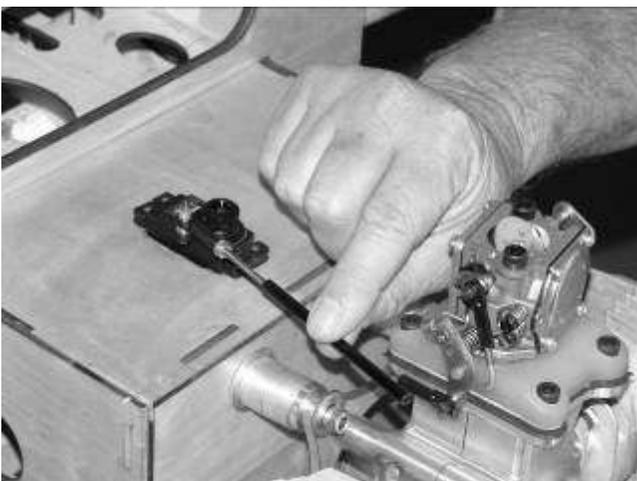
8. Install throttle servo with servo screws.



9. Position, measure and cut throttle pushrod to required length.



10. Slide carbon or brass outer sleeve over the 4-40 all thread rod.



11. Connect the throttle pushrod to the carburetor with 4-40 ball link and nylon lock nut.



Header And Canister Installation

1. Gather the header and canister parts as shown:
 - 1 – 70mm drop MTV 2570L left header
 - 1 – 70mm drop MTV 2570R right header
 - 2 – KS 460 canisters
 - 2 – Teflon couplers
 - 4 – clamps
 - 1 – plywood aft canister mount



2. Iron the bottom covering to ensure it is tight and well sealed to the wood.



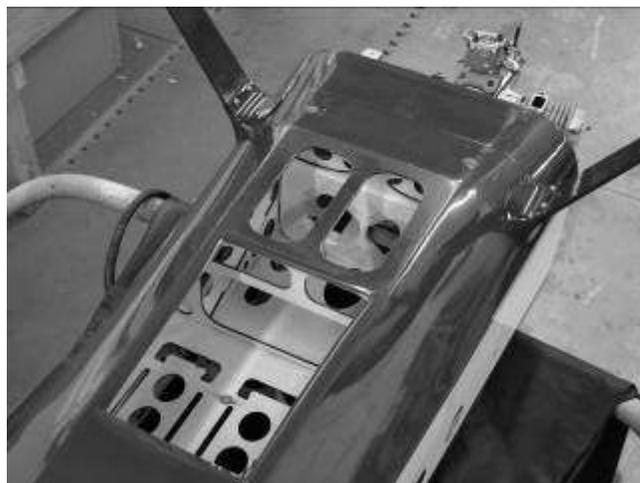
3. Use a modeling knife to cut away covering in the two bays behind the main landing gear.



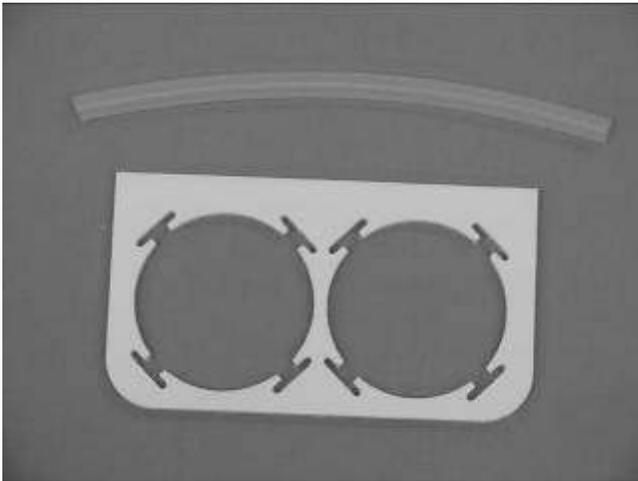
4. Removing the covering is necessary to give access to install the canister mounts and canisters.



5. Covering removed from both bays on fuselage belly.



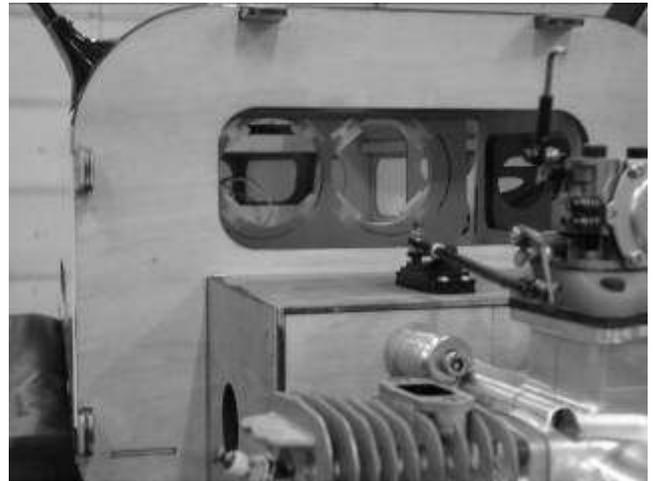
6. Gather the plywood canister mount and silicon tube for vibration isolation mounts. Cut 8 1" pieces and slide into the plywood cutouts in the canister mount. Canister mount available from canister or engine manufacturer.



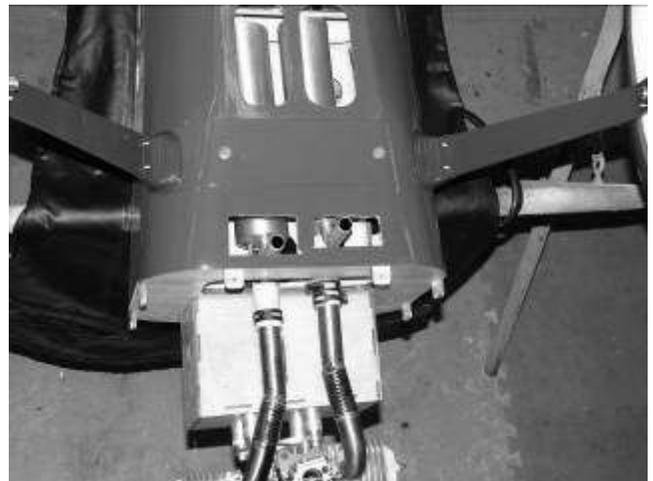
7. Position canister mount against backside of the landing gear former.



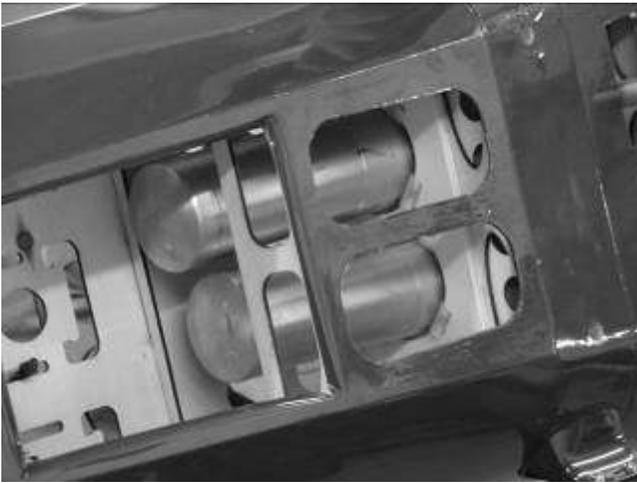
8. Canister mount should align with canister tunnel under main landing gear mount.



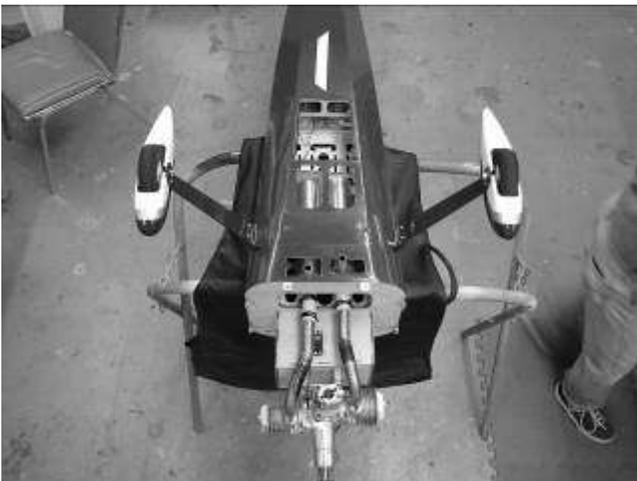
9. Install headers, couplers, clamps, and canisters to get a good dry fit before gluing plywood canister mount to the back of the main landing gear former. Cut exit holes for canister stinger exhaust pipes if necessary. This will only be necessary with front exit canisters.



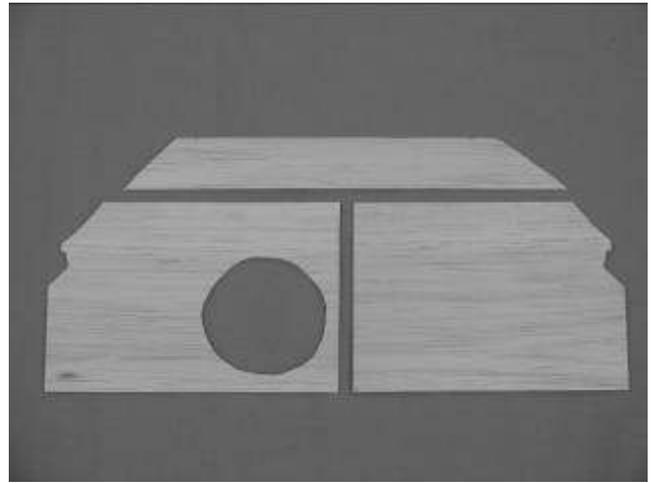
10. After dry fit adjustments are made glue the plywood canister mount to the back of the main landing gear former with epoxy or medium CA.



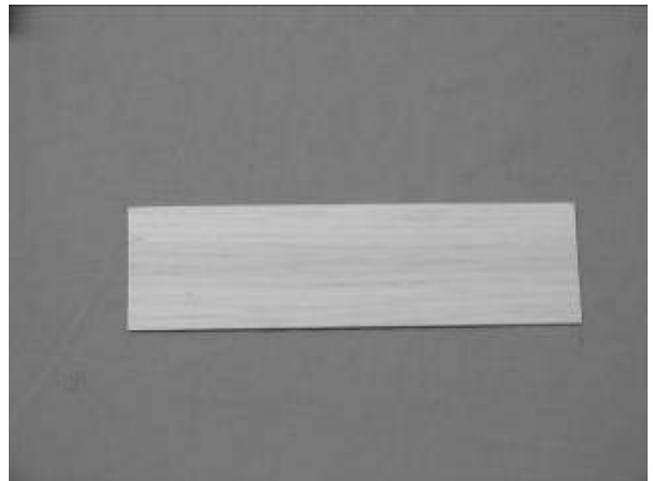
11. View of headers and canisters after installation with exhaust stinger exit holes.



12. Locate the supplied balsa sheets to make bottom canister baffling. You will cut balsa sheet to fit the back side of the former at the rear of the canisters.



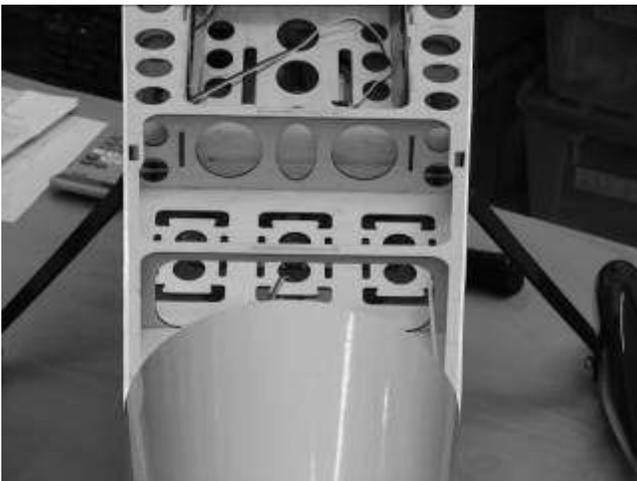
13. Locate supplied balsa sheet to make the top side canister baffle shown below. You will cut this to fit the top back portion of the former just behind the wing tube. The canister baffles are used to help direct air flow and to keep air from pressurizing at the rear of the fuse and blowing out the covering.



14. Dry fit the bottom canister baffles to the back side of the former at the rear of the canisters. After dry fit adjustments are made glue the bottom balsa canister baffles in place.



15. The top balsa canister baffle is installed on the back side of the former just behind the wing tube.



16. Dry fit the top balsa canister baffle behind the former.



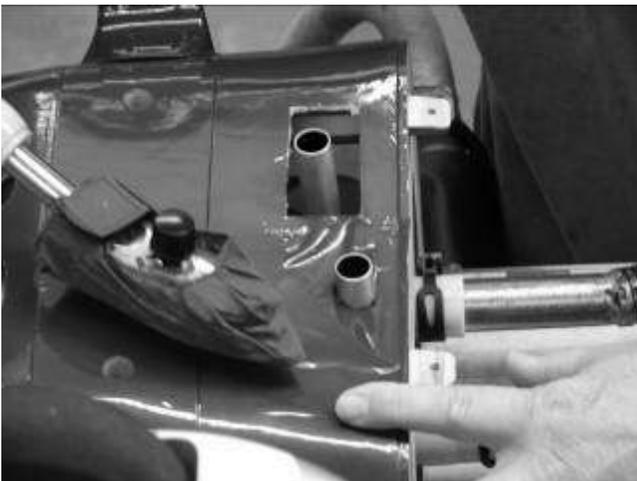
17. After dry fit adjustments are made glue the top balsa canister baffle in place.



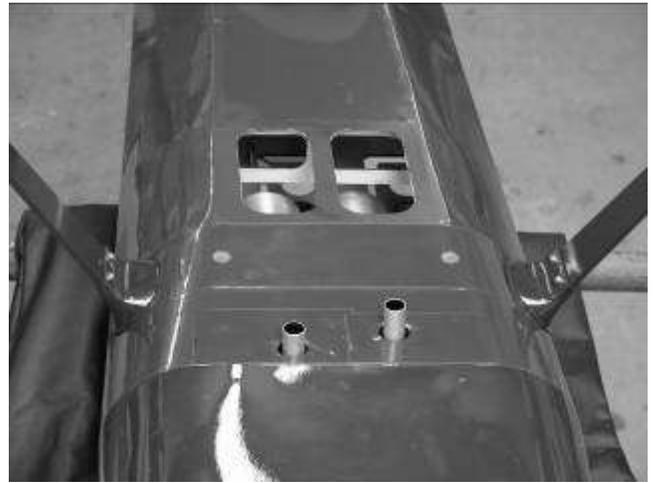
18. Use provided covering material to re-cover the aft bay. Seal the covering material securely.



19. Cover around the exhaust stinger exit holes if necessary.



20. Leave the two bays under the canisters open for cooling air exits.



Alternate Muffler Installation

1. Locate the front former cover and 8 mounting screws as shown.



2. **Note: This step may have already been done for you.** Position the front former cover over the center of the canister tunnel entry hole as shown. Mark location of the pre-drilled baffle mounting holes on the front former.



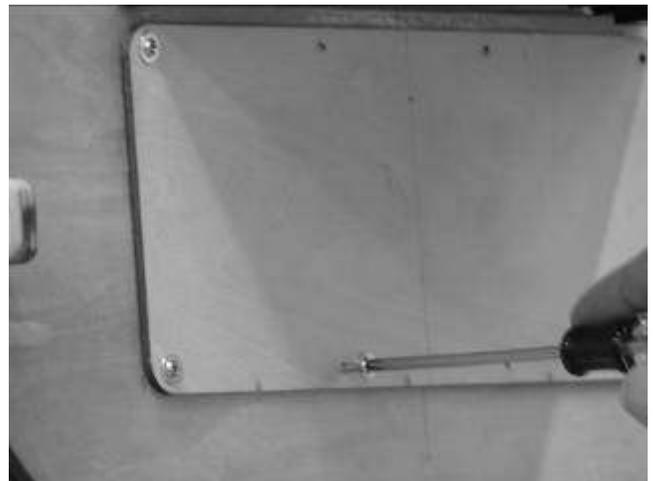
3. **Note: This step may have already been done for you.** Use a 1/16 bit to drill the cover mounting holes.



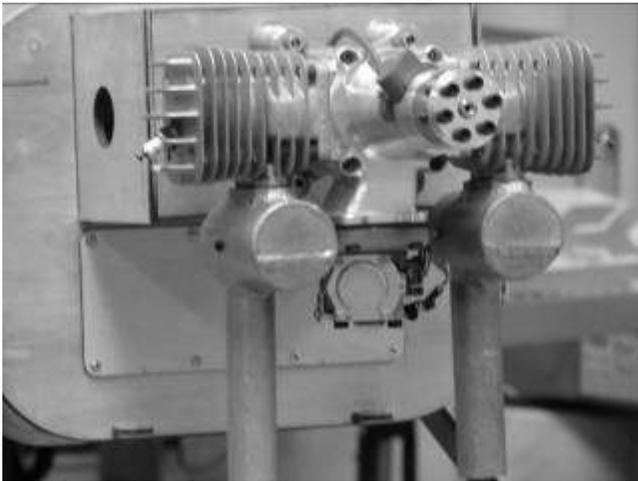
4. Place a drop of medium CA on each screw before inserting in the mounting holes.



5. Install the front former cover with eight wood screws.

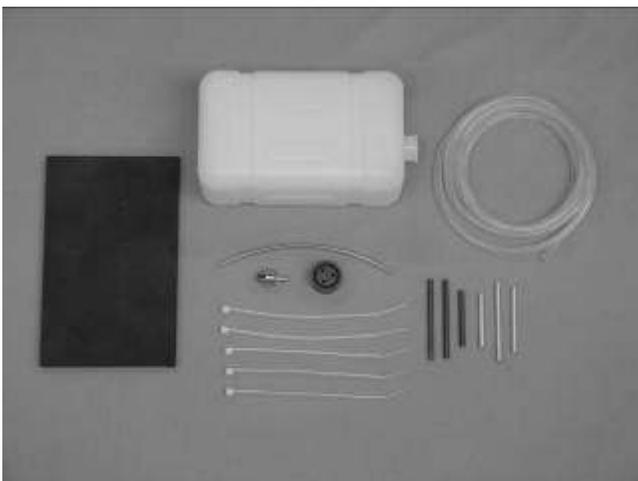


6. Front former cover installed below the engine box.



Fuel Tank Installation

1. Gather the fuel tank parts as shown below. Fuel tank parts, fuel tubing, and foam rubber.



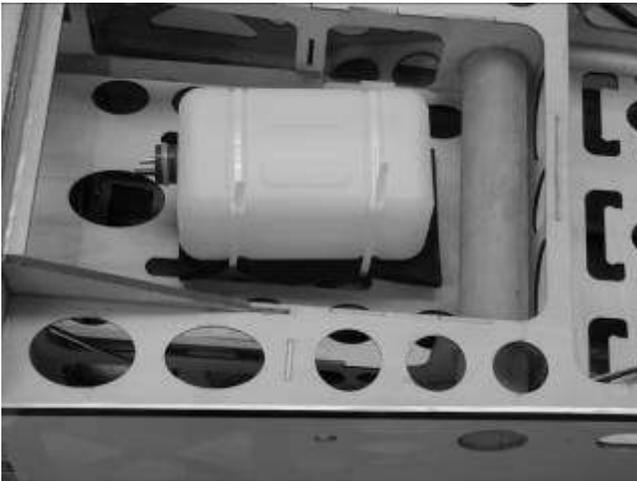
2. Assemble the fuel tank as shown below. Use large diameter tube for pick-up and small diameter tube for the vent. Secure the fuel tubing with nylon ties to the pick-up tube and clunk.



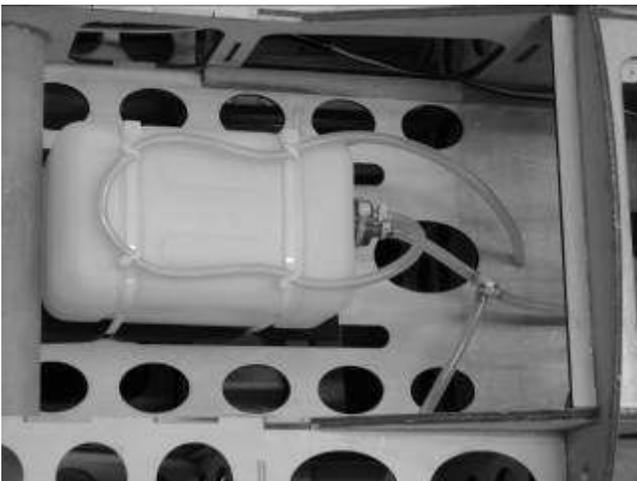
3. Insert the rubber stopper into the tank with the small diameter vent tube at the top of the tank. Secure the stopper with a nylon tie.



4. Install the fuel tank with the foam rubber underneath and nylon ties as shown.



5. Install the fuel tubing as shown with small nylon ties. You will need an after market fuel T and fuel filling dot. **Note: We recommend the vent line looping to the rear of the fuel tank as shown to prevent fuel spilling out when the model's tail is lifted or flying a down line.**



6. Install the fuel filling dot as desired on the side of the fuse. Do not allow the fuel dot to interfere with the leading edge of the wing.

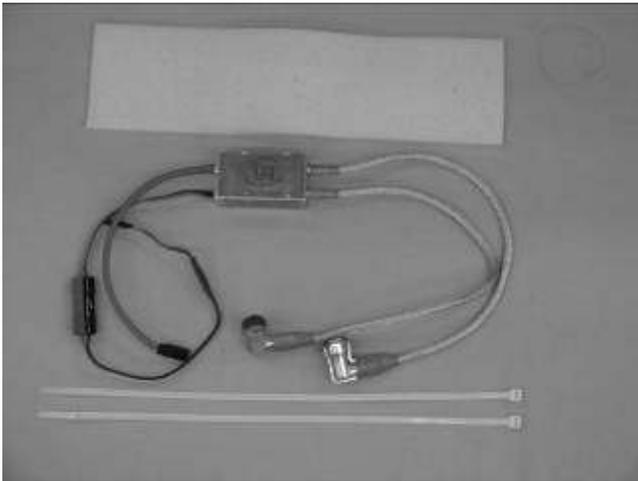


7. Drill two fuel line holes in the bottom of the engine box floor for vent line and fuel pick up line. Secure fuel vent line to the front former as shown. Connect the fuel pick up line to the engine carburetor fuel intake nipple.

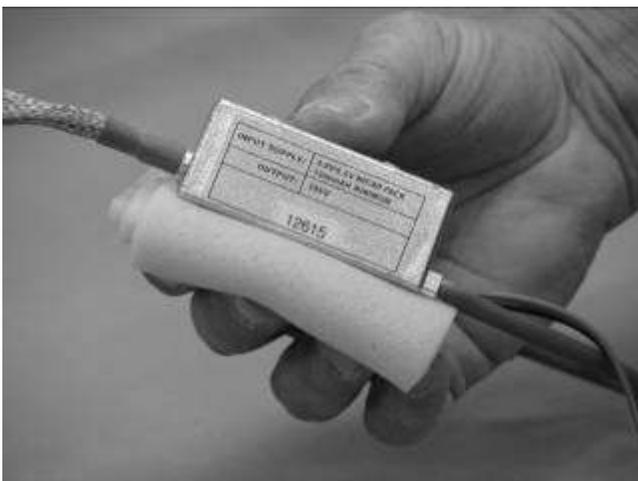


Ignition Installation

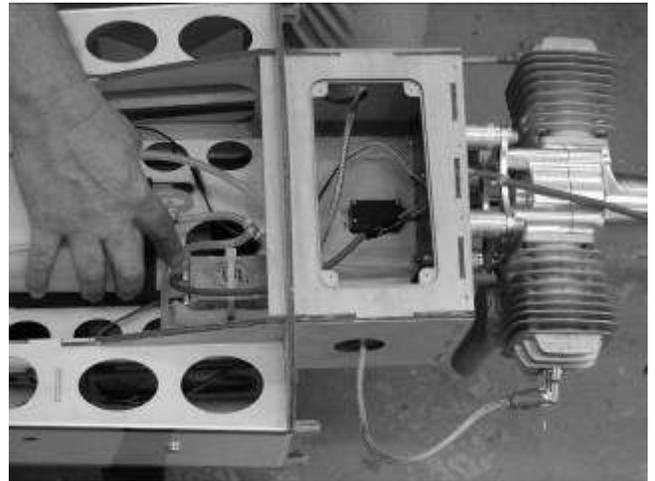
1. Gather the engine ignition parts as shown below. Engine ignition, nylon ties, and foam rubber.



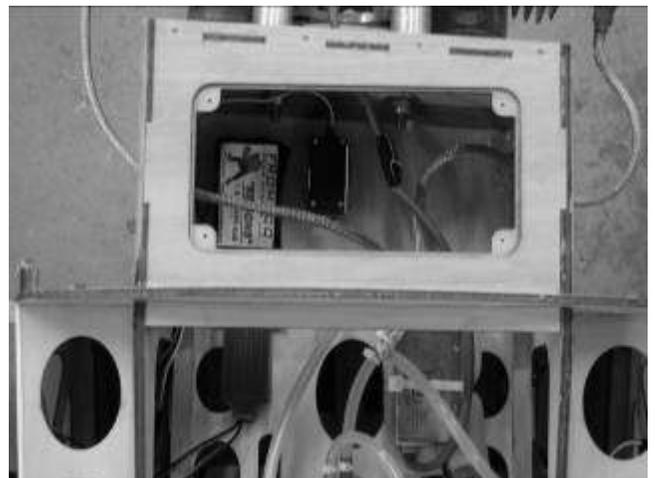
2. Place the foam rubber below the ignition box as shown.



3. Position the engine ignition on the forward fuse floor and secure with a nylon tie as shown. Route the ignition wires to the engine as shown.



4. Install the ignition battery and regulator if required as desired. A typical installation is shown below.



Engine Cowl Installation

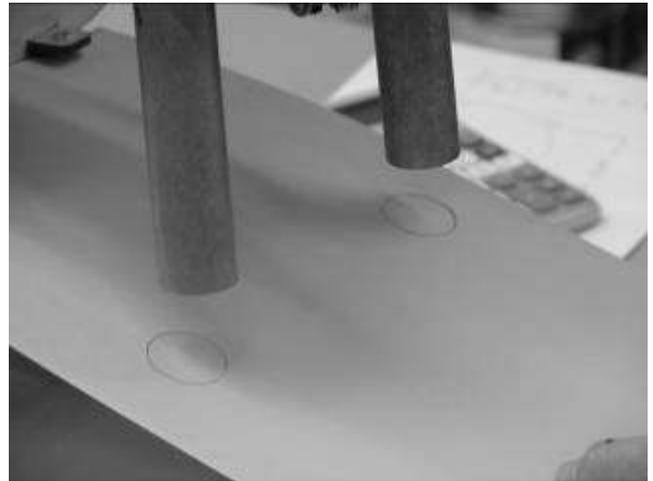
1. **The following steps for cutting out the cowl-
ing are not required if headers and canis-
ters are used.** Use a file folder or large enve-
lope for a cowl fitting template. Tape or bolt,
using the lower cowl mounting bolts, the aft
edge of the template to the bottom of the front
former as shown.



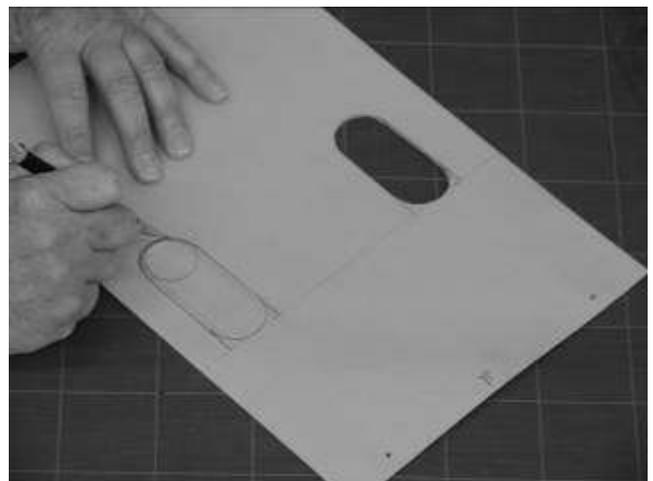
2. Lift the template so that it contacts the bottom
of the muffler exhaust stacks.



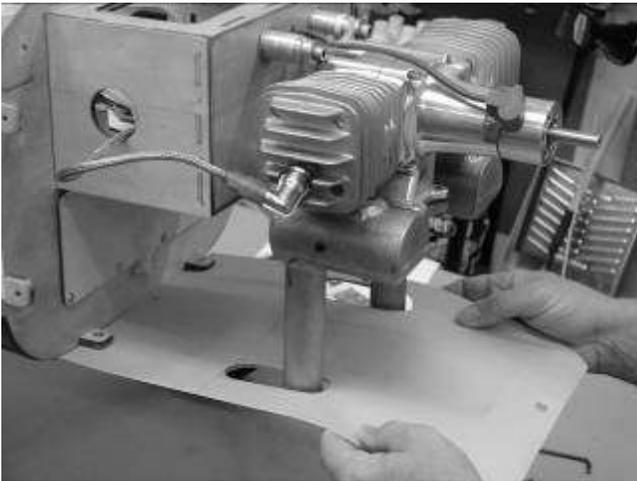
3. Trace the location of the exhaust stack exit
holes.



4. Extend holes towards former by drawing a 3
1/2" long hole. This will allow the cowl-
ing to slip over the stacks. Allow a 1/4" clearance
around the outside edge of the exhaust stack
tubes.



5. Trial fit the template until the proper size holes are achieved. Do not forget to account for the curve at the bottom of the cowl.



6. After adequate dry fit is achieved with template, remove the template and position on the bottom of the cowl using the bottom cowl mounting bolts to ensure proper location.



7. Use a rotary cutting tool and sanding drum to cut the exhaust stack exit holes as needed.



8. Measure and cut out an air exit hole in the template. The exit hole should be a minimum of 7" X 2 1/2" to provide adequate cooling air exit.



9. Use the template to mark the exit air hole location on the bottom of the cowl.

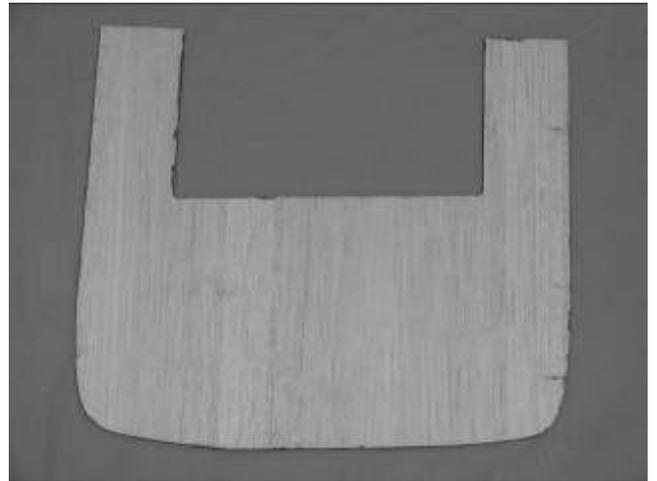


10. Use a rotary cutting tool to cut out the air exit hole in the bottom of the cowl.

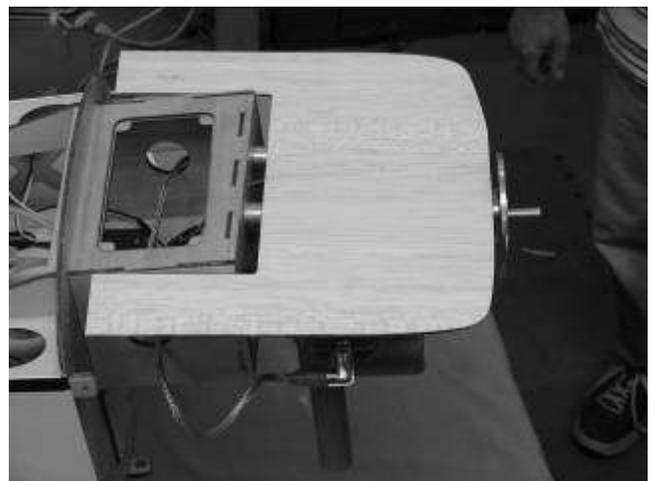


Cowl Baffle Installation

1. Locate the pre-cut balsa cowl baffle as shown.



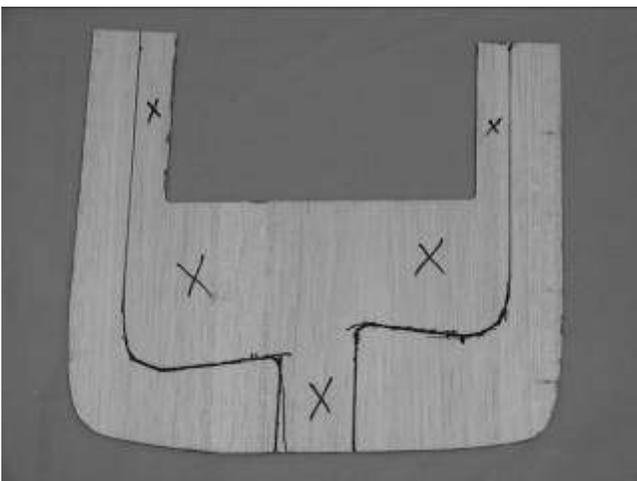
2. Position cowl baffle on top of engine. Use spinner back plate to position the baffle where it will be inside the cowl. This is approximately 3/8" behind the spinner back plate.



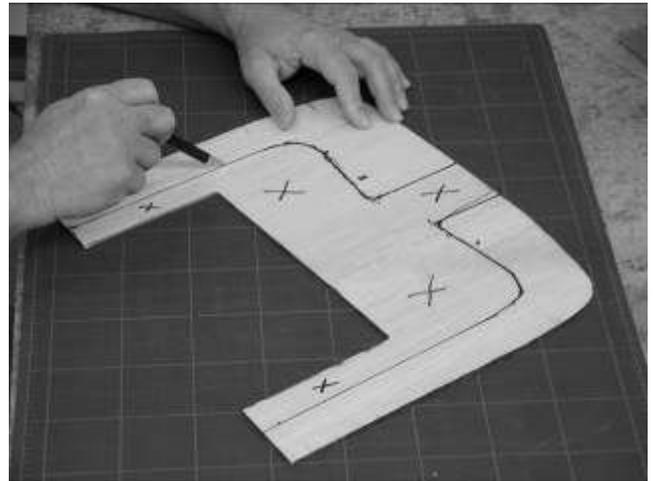
3. From the bottom side of the baffle mark the outline of the engine. Make sure you mark a left and right side before cutting the baffle.



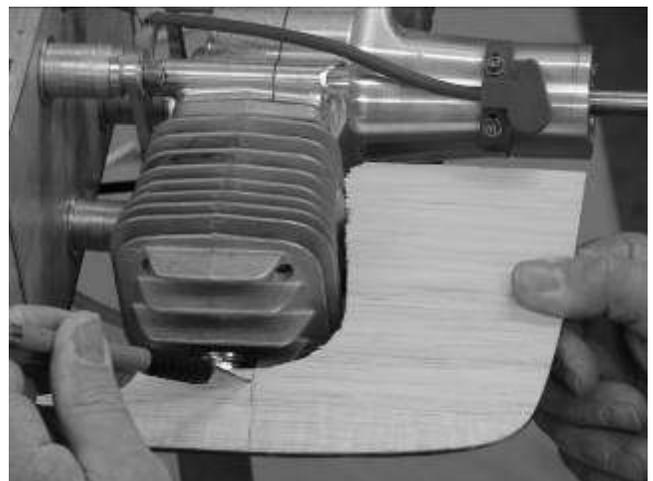
4. Bottom of cowl baffle after marking. The X areas will be cut away and discarded.



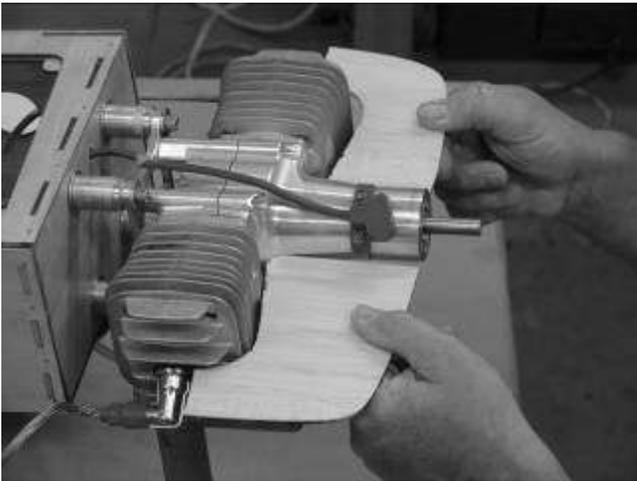
5. Use a hobby knife or jig saw to cut the balsa cowl baffle.



6. Dry fit the baffle around the engine shape. This is a try, cut, sand, try, cut, and sand process. Go slow and make small cuts to get a good precise fit. The goal is to get the baffle as close to the engine as possible to force the cooling air through the cooling fins not down below the baffle. This process will take some time.



7. Dry fit as many times as needed to get a good



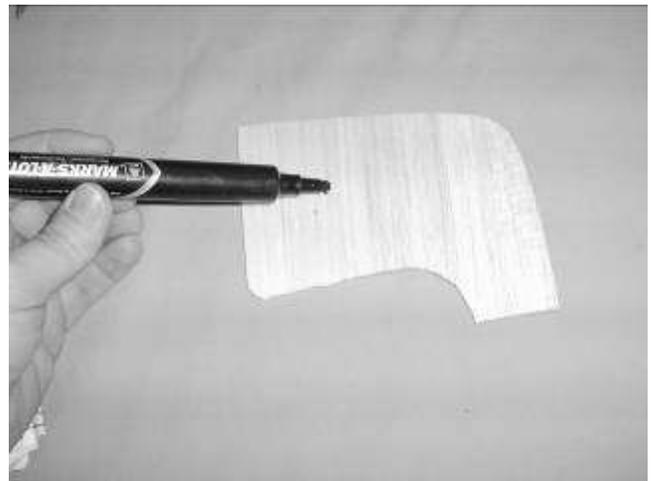
8. Tape the baffle inside the cowl as shown.



9. Attach the cowl and continue the dry fit, cut, and sand process until an exact fit is achieved.



10. After the final fit is achieved the balsa may be colored with a black marker or painted to match the cowl color if desired.

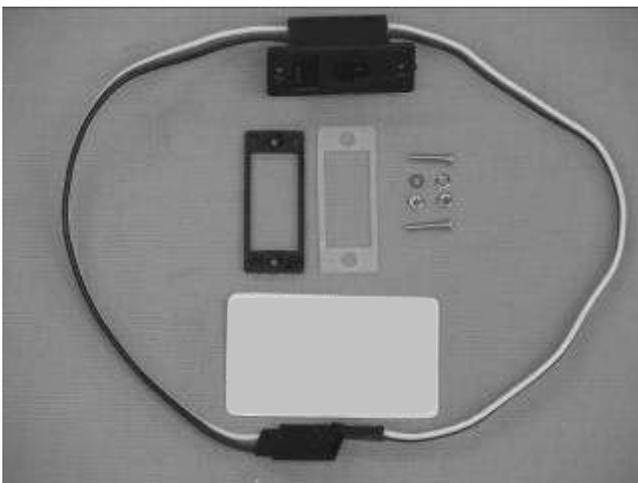


11. After the final fit and finish is complete, glue the balsa baffles inside the cowl as shown.



RADIO INSTALLATION

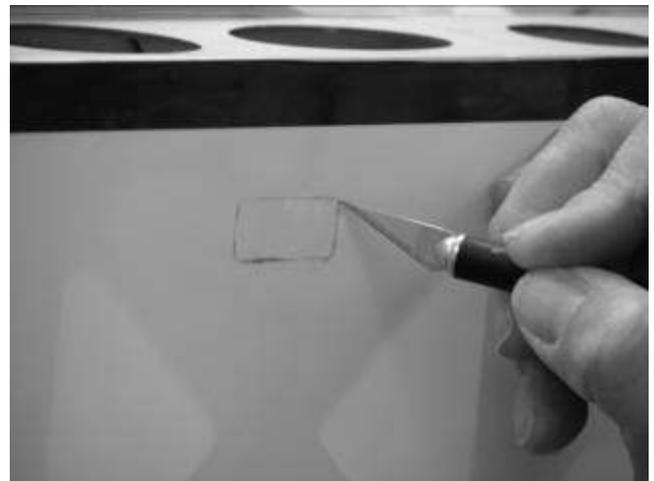
1. Gather the switches and mounting hardware to be used. We used three switches, two for receiver batteries, and one for ignition battery. The installation steps are the same for all switches.



2. Switch location is at the discretion of the builder. We chose to place the switches toward the front of the fuse on each side. Mark location for switches using switch template.



3. Use a modeling knife to cut out the switch holes.



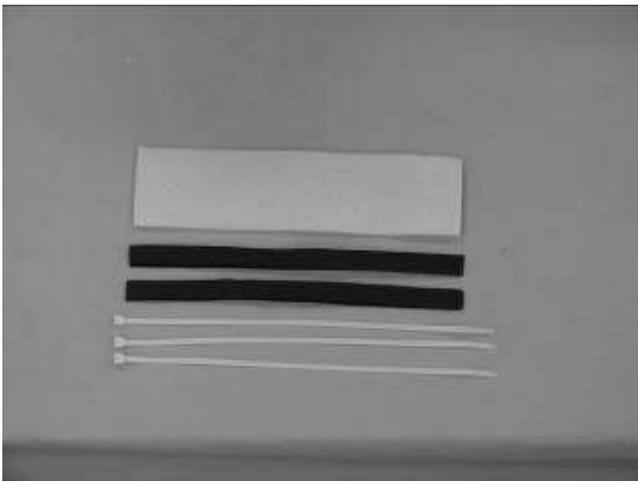
4. Slide switch wires inside fuse through the switch cutout.



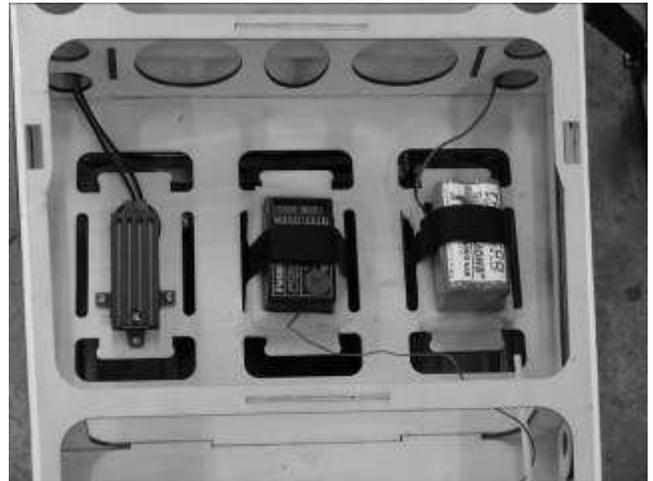
5. Mount switches in accordance with the switch instructions and hardware.



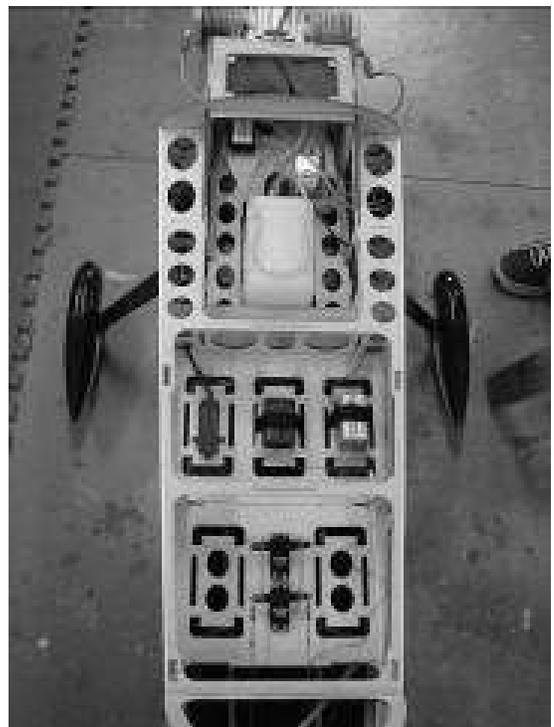
6. Gather the supplied radio mounting hardware as shown below. Foam rubber, Velcro straps, and nylon ties.



7. Mount the radio components as desired using the radio tray cutouts. Ensure all wires and plugs are secure and not subject to chafing when routed through the radio tray and formers.

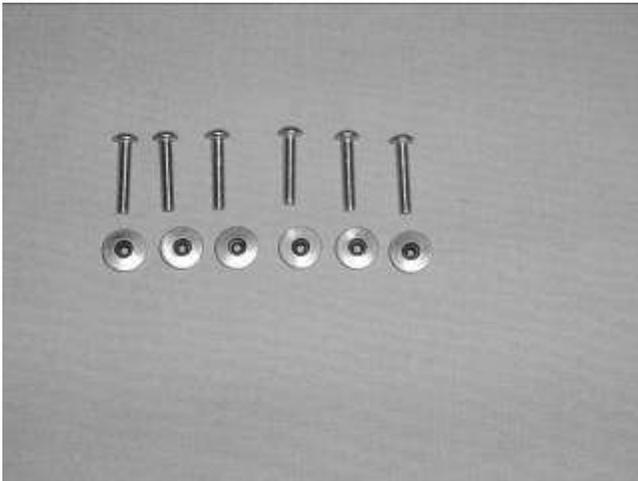


8. Typical installation of RC equipment.



PRE-FLIGHT PREPARATION

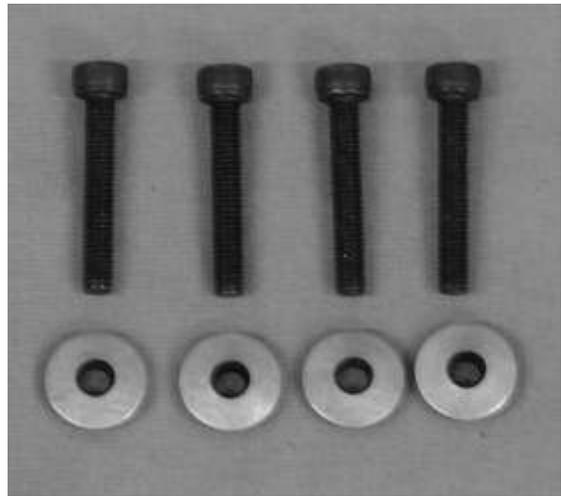
1. Gather the 6 cowl mounting bolts and 6 small rubber backed #6 washers.



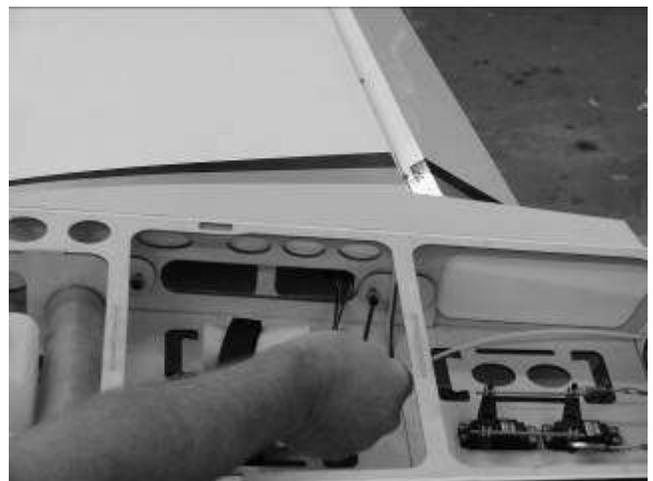
2. Mount the cowl using the cowl mounting bolts and rubber backed washers. The rubber backed washers are to prevent the fiberglass cowl from cracking and to prevent bolts from vibrating loose under normal engine vibration.



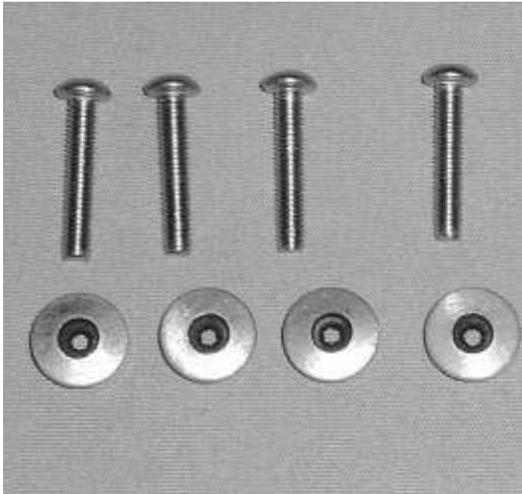
3. Gather the 4 wing mounting bolts and 4 rubber large backed #8 washers.



4. Slide the wing tube in the fuse wing tube sleeve. Slide the wings on the wing tube and plug in the aileron servo plugs. Slide the rubber backed washers on the wing mounting bolts and insert bolts through the fuse side and into the wing root blind nuts. Tighten snugly but do not over tighten and crack the fuse or wing root wood.



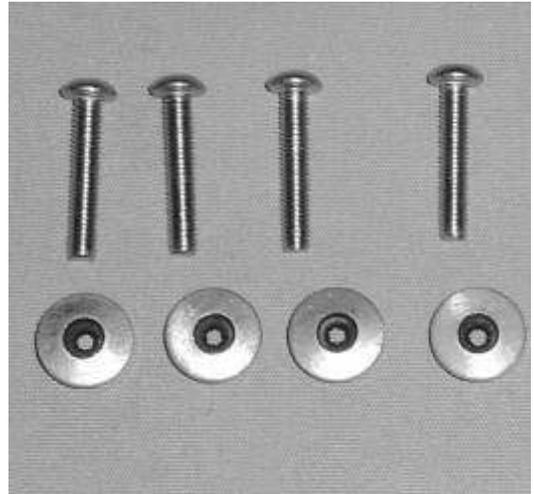
5. Gather the 4 stab mounting bolts and 4 small rubber backed #6 washers.



6. Slide the stab tube in the fuse stab tube sleeve. Slide the stabs on the stab tube and plug in the elevator servo plugs. Slide the rubber backed washers on the stab mounting bolts and insert bolts through the stab mounting tabs and into the fuse blind nuts. Tighten snugly but do not over tighten and crack the stab mounting tabs or the fuse sides.



7. Gather the 4 hatch mounting bolts and 4 small rubber backed #6 washers.



8. Slide the rubber backed washers on the hatch mounting bolts and insert bolts through the hatch mounting holes and into the fuse blind nuts. Tighten snugly but do not over tighten and crush the hatch or the fuse sides.

