# Instruction Manual







# **TUCANO 60CC SCALE 1:4 ¼ ARF**

#### **SPECIFICATION**

- Wingspan: 2567mm (101in)
- Length: 2190mm (86.2 in)
- Flying weight: 11-13 kg
- Wing area: 101 dm2
- Wing loading: 99g/dm2
- Wing type: Naca airfoils
- Covering type: Genuine ORACOVER®
- Retract gear type: Air-retract With CNC Suspension Metal Struts (included)
- Spinner size: 115mm (included)
- Radio: 6 channel minimum (not included)
- Servo: 10 standard hi-torque servo: 2 aileron; 2 flap; 2 elevator; 1 rudder; 1 retract; 1 throttle; 1 steering nose. (not included)
- Recommended receiver battery: 6.0V 2400/2600mAh NiMH (2) (not included)
- Servo mount: 21mm x 42 mm
- Propeller: suit with your engine

- Engine: 50-60 CC gas engine (two stroke) (not included)
- Motor: brushless outrunner 2600-3000 W, 190 KV (not included)
- Gravity CG: 141 mm (5.5 in) Back from the leading edge of the wing, at the fuselage
- Control throw Ailerons: Low: 12mm up/down, 10% expo; High: 15mm up/down, 10% expo
- Control throw Elevators: Low: 12mm up/down, 12% expo; High: 15mm up/down, 12% expo
- Control throw Rudder: Low: 30mm right/left, 15% expo; High: 45mm right/left, 15% expo
- Control throw Flaps: Mid: 25mm down; Landing: 35mm down
- Experience level: Intermediate
- Plane type: Scale Military

#### RECOMMENDED MOTOR AND BATTERY SET UP

- Motor: Hacker A60 (not included)
- Propeller: 22x10 E; 22x12 E APC (not included)
- Lipo cell: 12 cells / 5500 6000mAh (not included)
- Esc: 120-160A / HV (not included)

#### TOOLS AND SUPPLIES NEEDED.

- · Medium C/A glue
- 30 minute epoxy
- 6 minute epoxy
- · Hand or electric drill
- · Assorted drill bits
- · Modeling knife
- · Straight edge ruler
- 2 bender plier
- · Wire cutters
- Masking tape
- Thread lock
- · Paper towels
- · Rubbing alcohol

#### NOTE:

To avoid scratching your new airplane, do not unwrap the pieces until they are needed for assembly. Cover your workbench with an old towel or brown paper, both to protect the aircraft and to protect the table. Keep a couple of jars or bowls handy to hold the small parts after you open the bag.

Please trial fit all the parts. Make sure you have the correct parts and that they fit and are aligned properly before gluing! This will assure proper assembly. The TUCANO 60CC SCALE 1:4 ¼ ARF is hand made from natural materials, every plane is unique and minor adjustments may have to be made. However, you should find the fit superior and assembly simple.

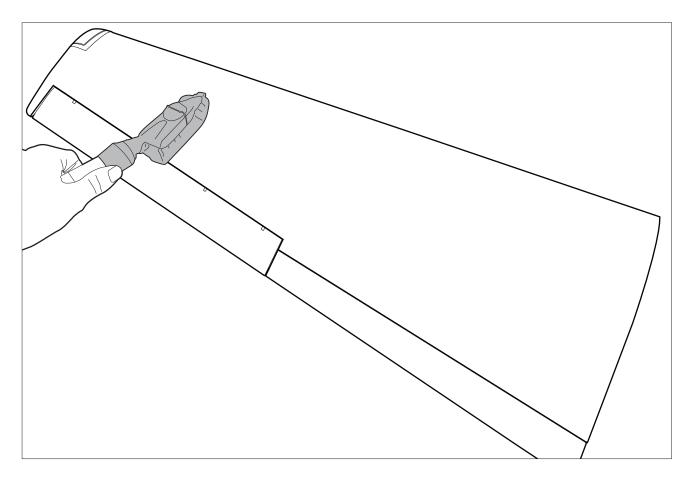
The painted and plastic parts used in this kit are fuel proof. However, they are not tolerant of many harsh chemicals including the following: paint thinner, C/A glue accelerator, C/A glue debonder and acetone. Do not let these chemicals come in contact with the colors on the covering and the plastic parts.

#### **SAFETY PRECAUTION:**

- · This is not a toy
- Be sure that no other flyers are using your radio frequency.
- · Do not smoke near fuel
- Store fuel in a cool, dry place, away from children and pets.
- · Wear safety glasses.
- The glow plug clip must be securely attached to the glow plug.
- Do not flip the propeller with your fingers.
- Keep loose clothing and wires away from the propeller.
- Do not start the engine if people are near. Do not stand in line with the side of the propeller.
- Make engine adjustments from behind the propeller only. Do not reach around the spinning propeller.

#### **PREPARATIONS**

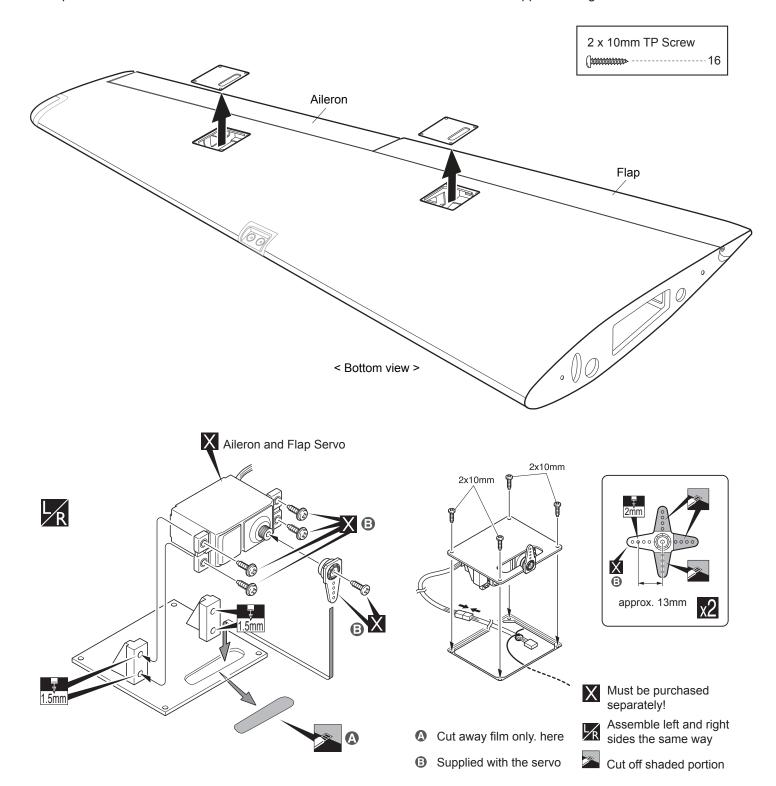
Use a covering iron with a covering sock on high heat to tighten the covering if necessary. Apply pressure over sheeted areas to thoroughly bond the covering to the wood.

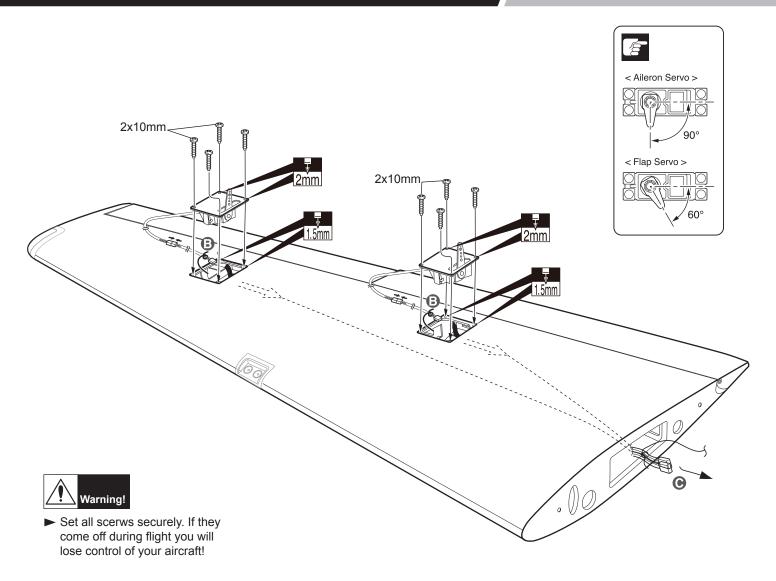


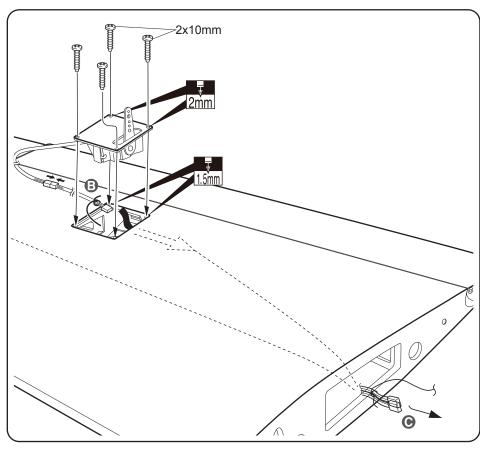
#### **INSTALLING THE AILERONS AND FLAPS**

#### SERVOS

- 1. Install the rubber grommets and brass eyelets onto the aileron servo.
- 2. Using a modeling knife, remove the covering from over the pre-cut servo arm exit hole on the aileron servo tray / hatch. This hole will allow the servo arm to pass through when installing the aileron pushrods.
- 3. Place the servo into the servo tray. Center the servo within the tray and drill pilot holes through the block of wood for each of the four mounting screws provided with the servo.
- 4. Using the thread as a guide and using masking tape, tape the servo lead to the end of the thread: carefully pull the thread out. When you have pulled the servo lead out, remove the masking tape and the servo lead from the thread.
- 5. Place the aileron servo tray / hatch into the servo box on the bottom of the wing and drill pilot holes through the tray and the servo box for each of the four mounting screws. Secure the servo tray in place using the mounting screws provided .
- 6. Repeat step # 2 # 5 to install the second aileron servo in the opposite wing half.

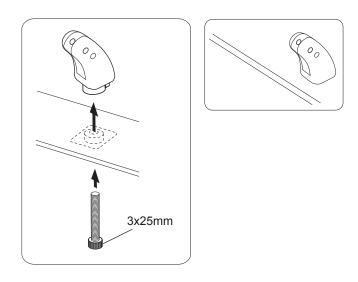


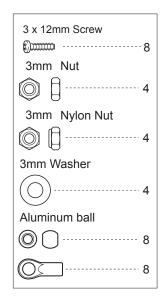


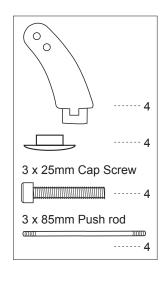


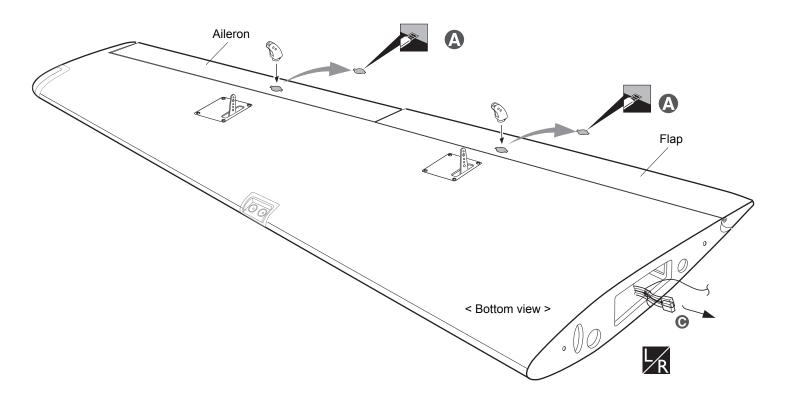
- Tie the string.
- Pull out servo cord with string.

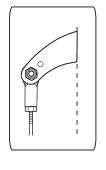
## **INSTALLING THE AILERONS AND FLAPS LINKAGES**

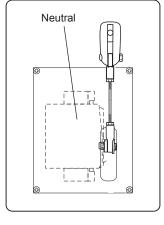






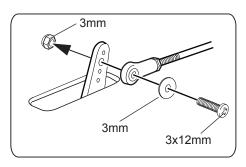


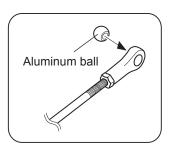


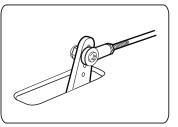


- A Cut away film only here.
- Pull out servo cord with string.
- Cut off shaded portion
- Assemble left and right sides the same way

## TUCANO 60CC

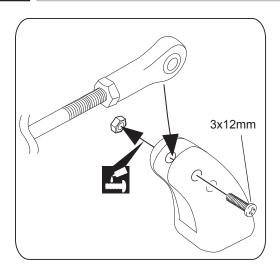


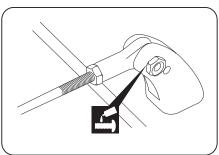


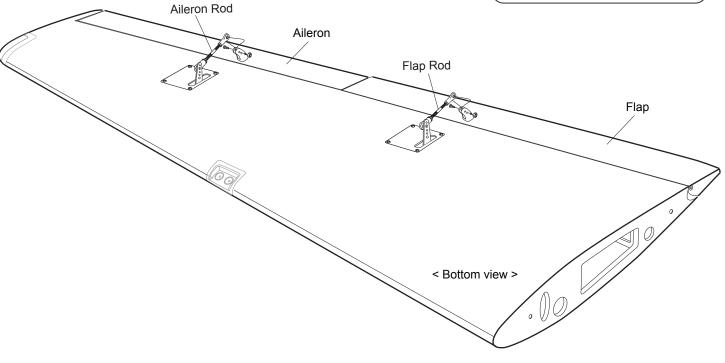


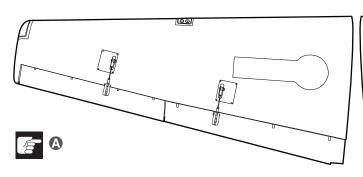


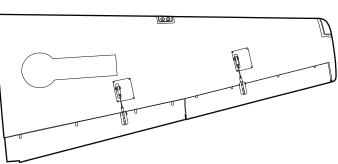
➤ Set all screws securely. If they come off during flight you will lose control of your aircraft!







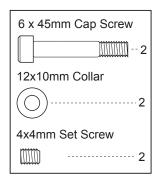


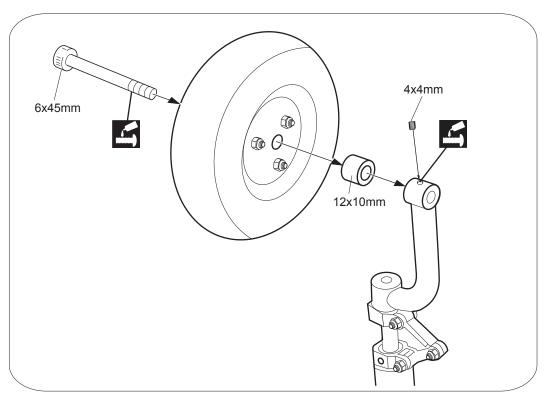


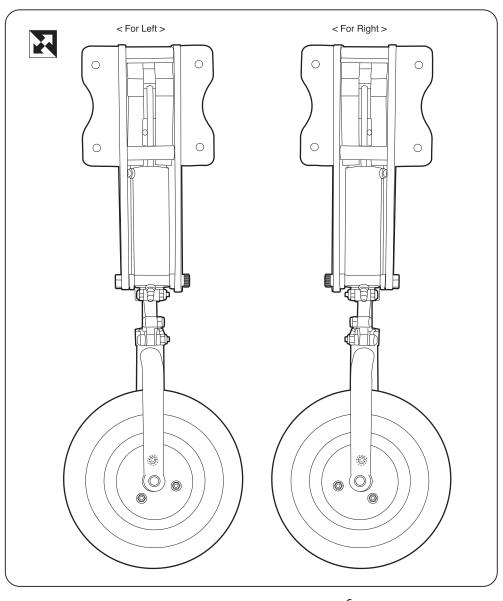
A Install flap servos like the illustration.

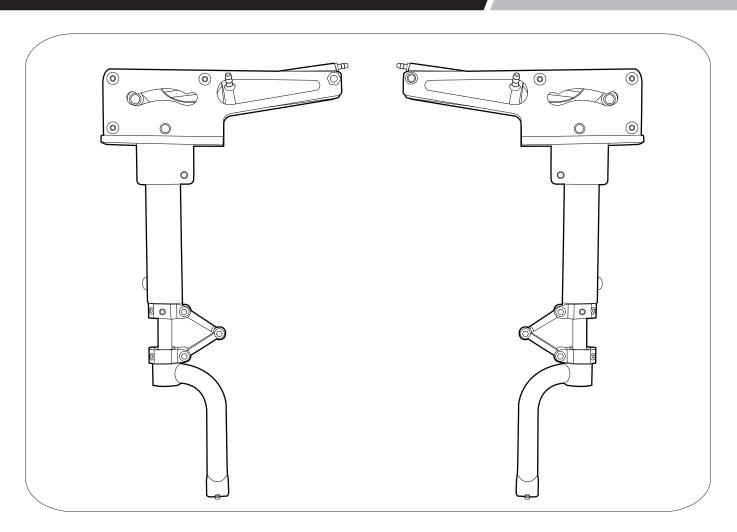
Apply threadlocker (screw cement).

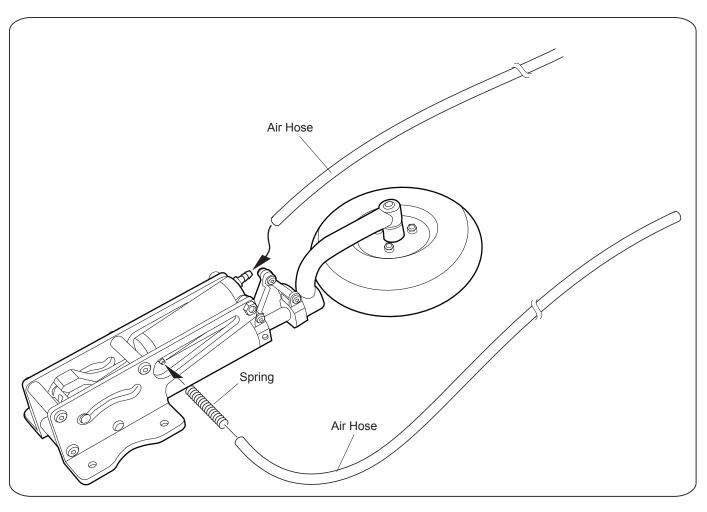
## **INSTALLING THE MAIN LANDING GEAR**

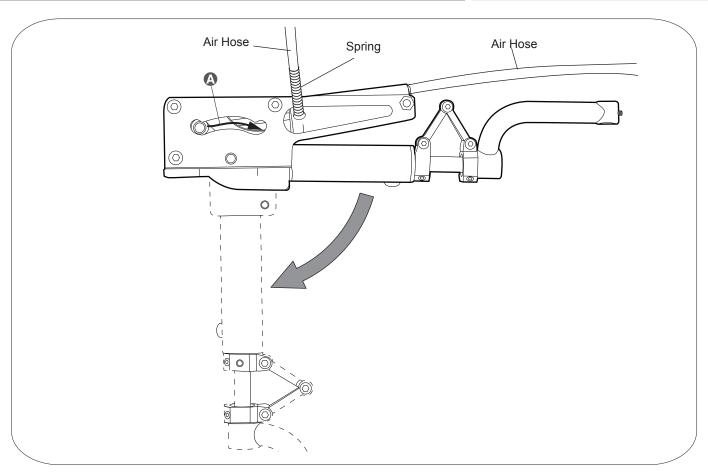


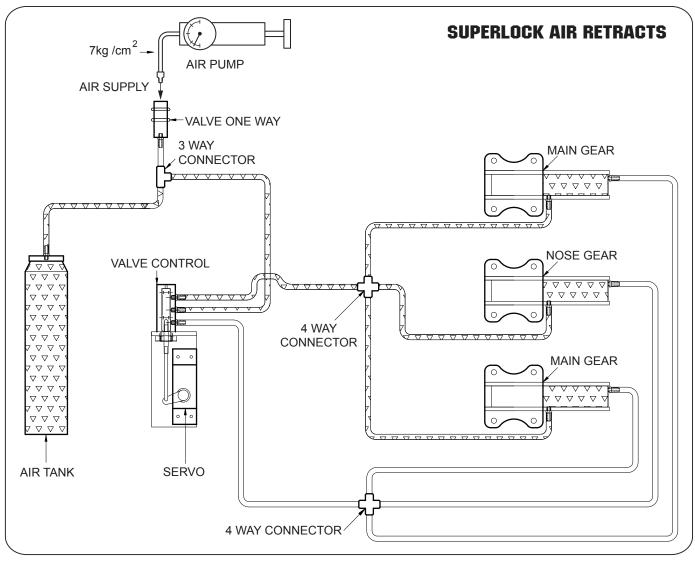


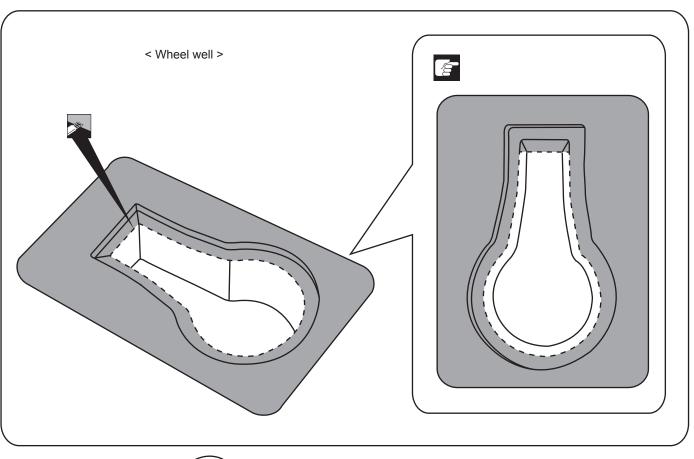


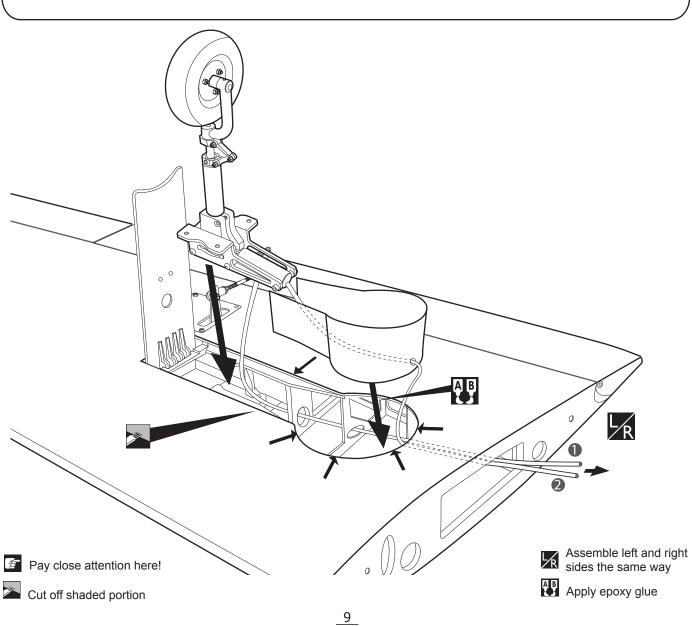


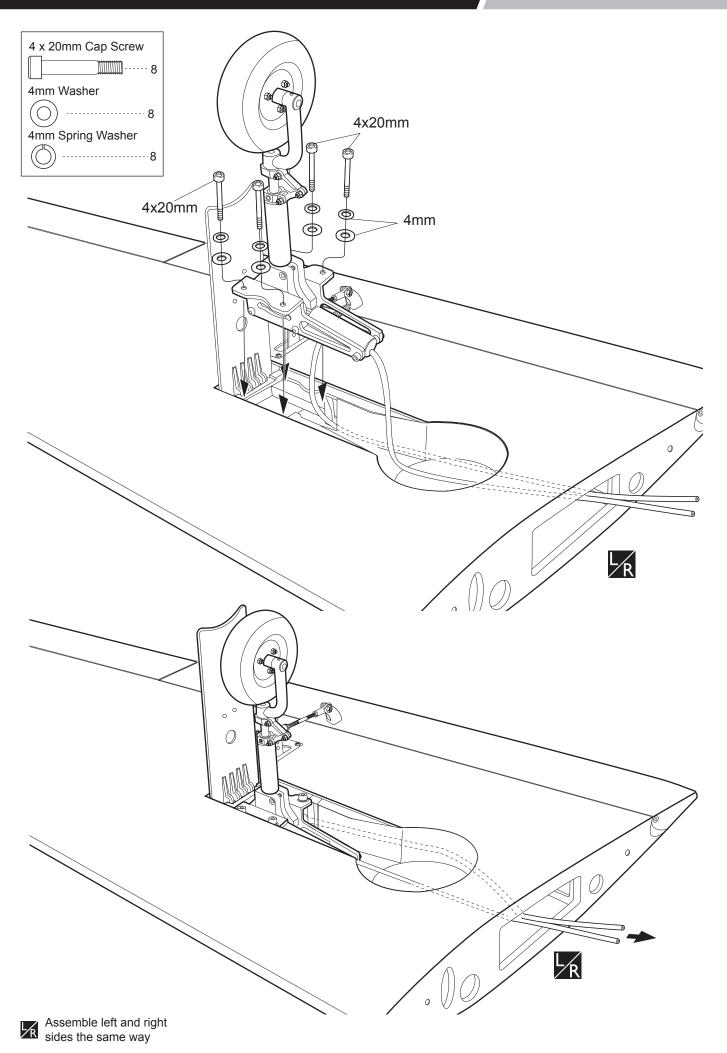


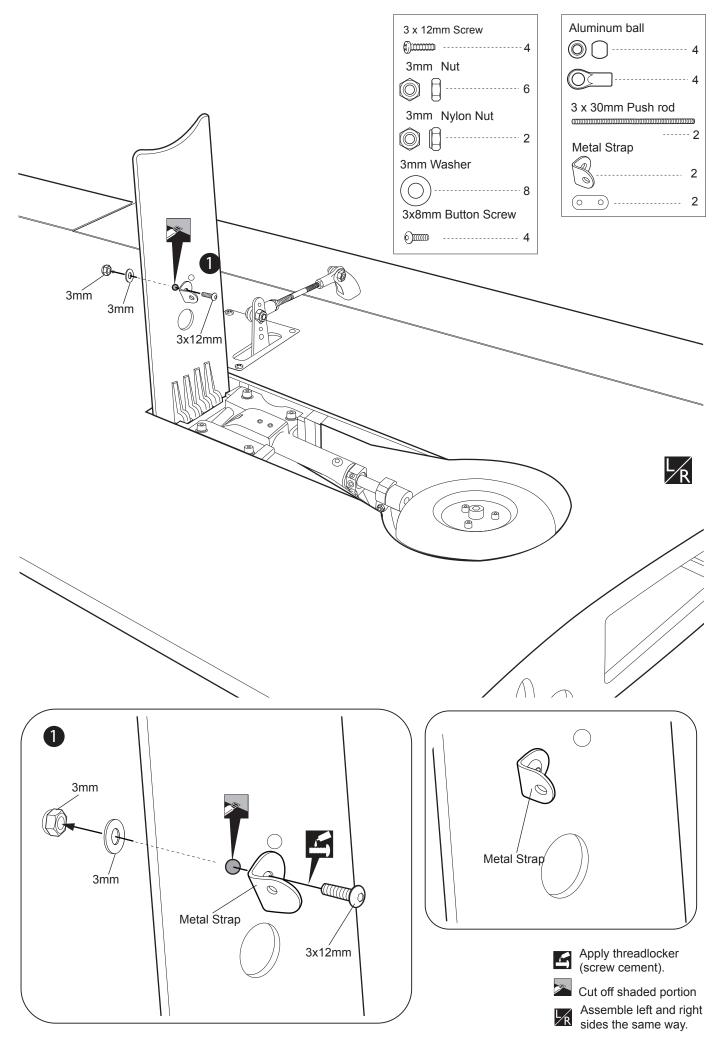


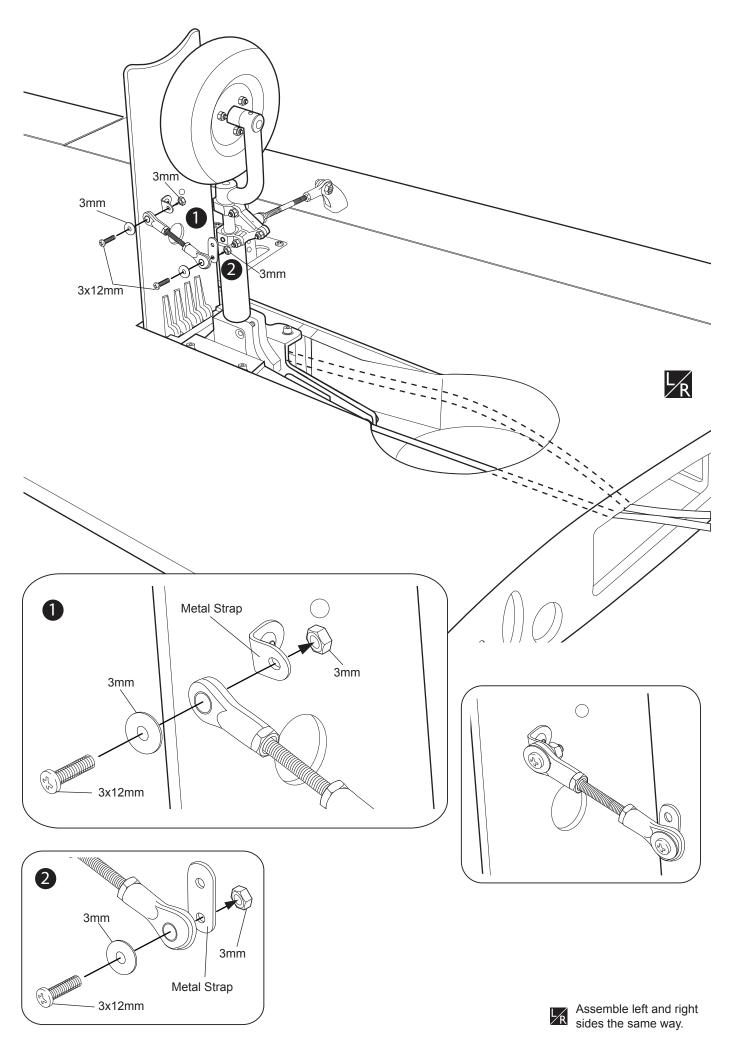


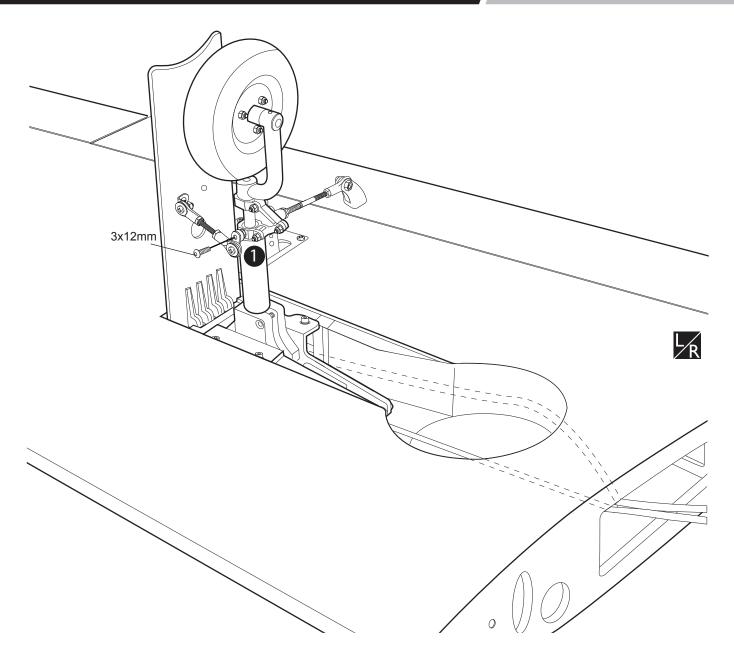


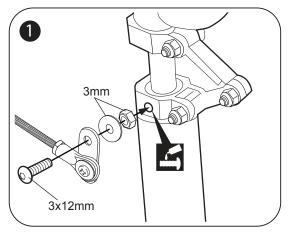


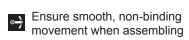






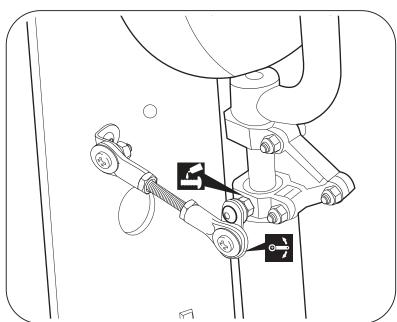


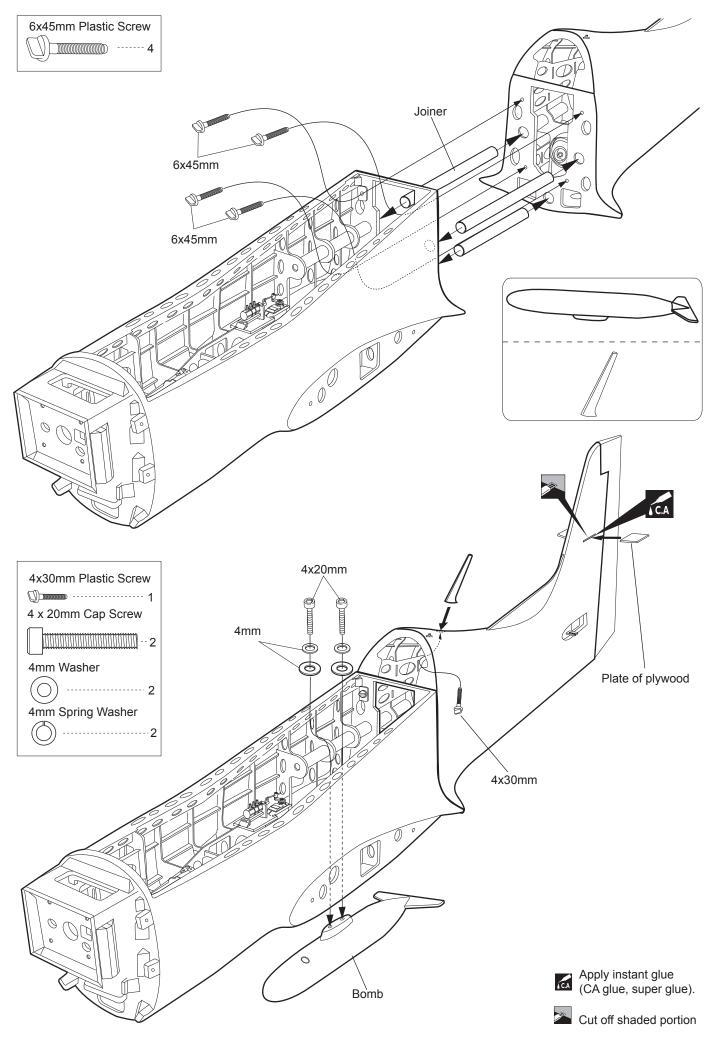


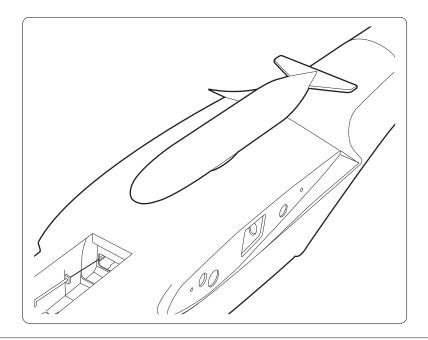


Apply threadlocker (screw cement).

Assemble left and right sides the same way.



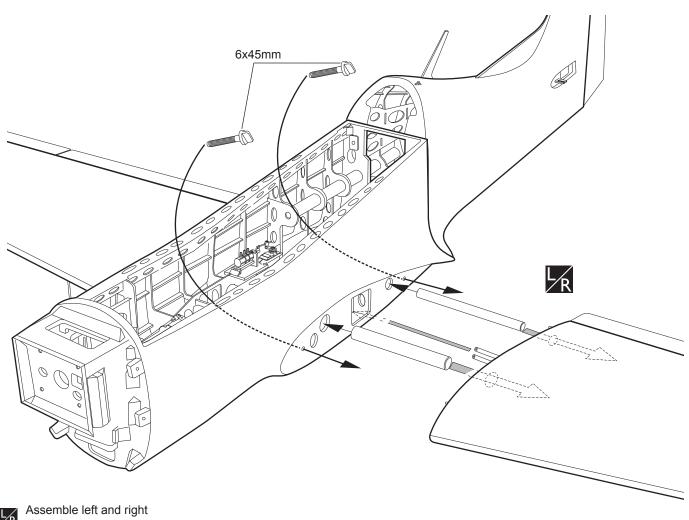




# **SECURE THE WING TO THE FUSELAGE**

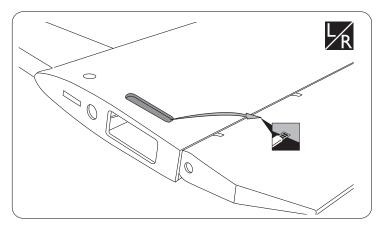
Attach the wings to the joiner tube and secure the wing panels to the fuselage.





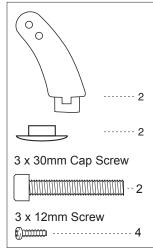
#### **INSTALLING THE ELEVATOR SERVO**

- 1. Remove the covering from the horizontal stabilizer.
- 2. Install two servo to the horizontal stabilizer as shown.
- 3. Repeat these step as installing the aileron control horn.

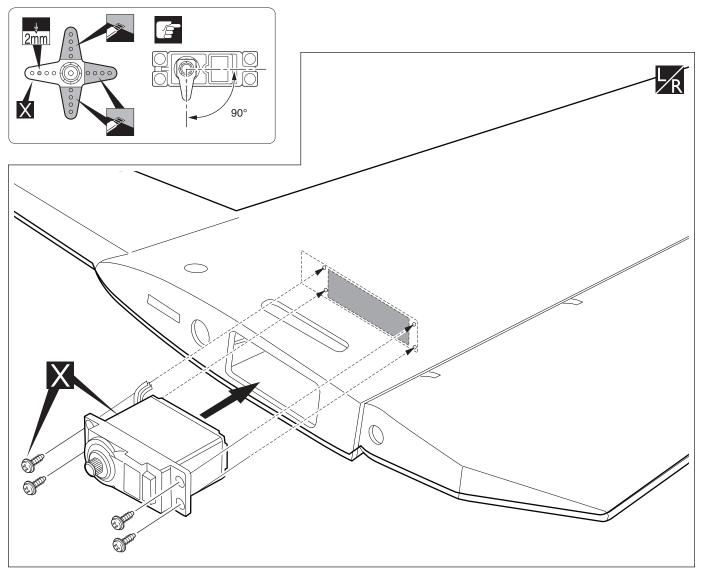


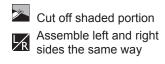
#### **INSTALLING THE ELEVATOR LINKAGES**

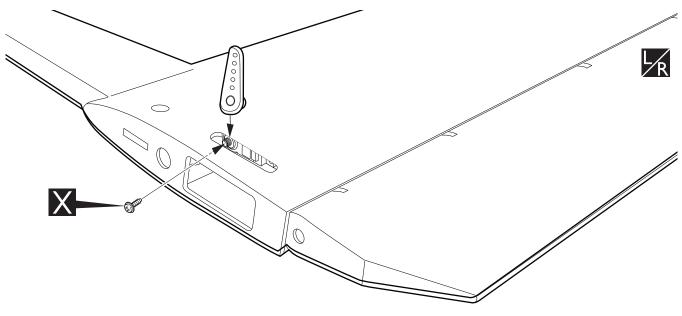
. Repeat these step as installing the aileron linkages.

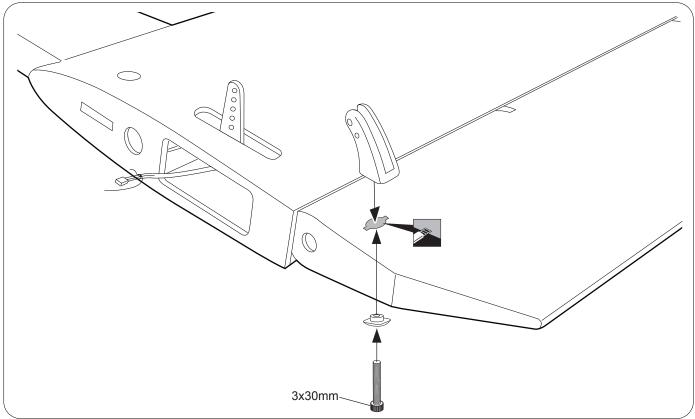


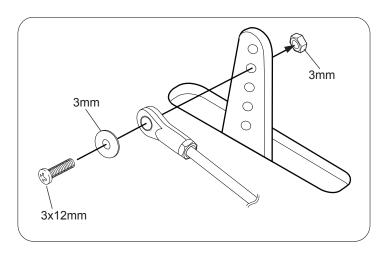


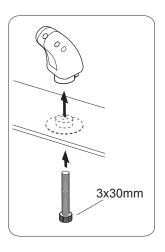






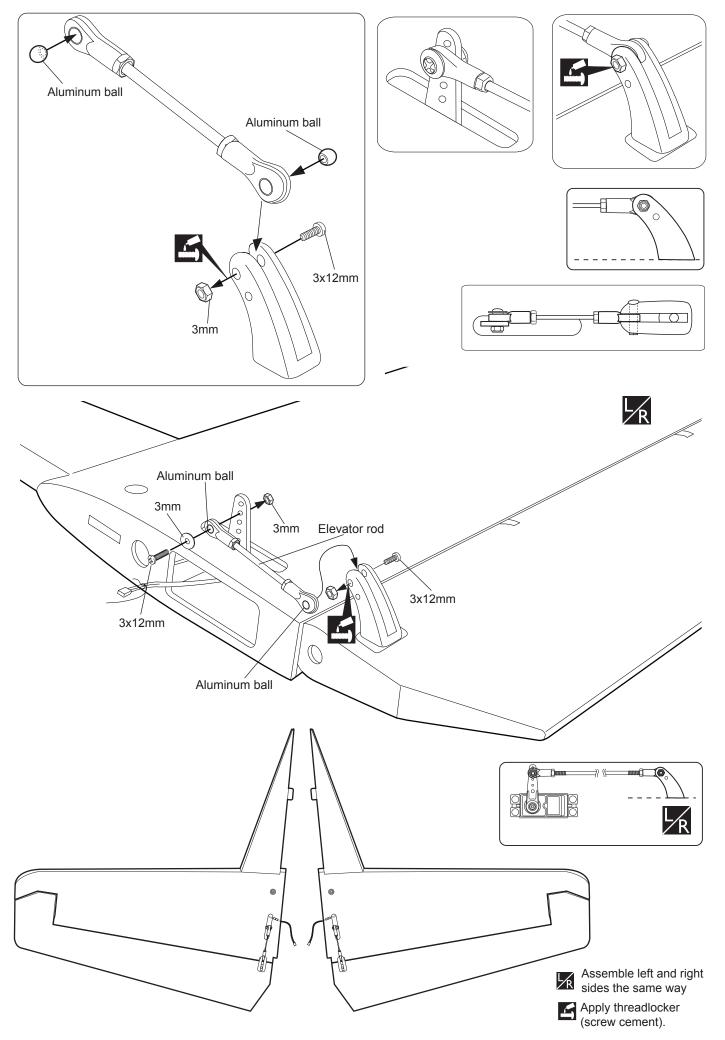






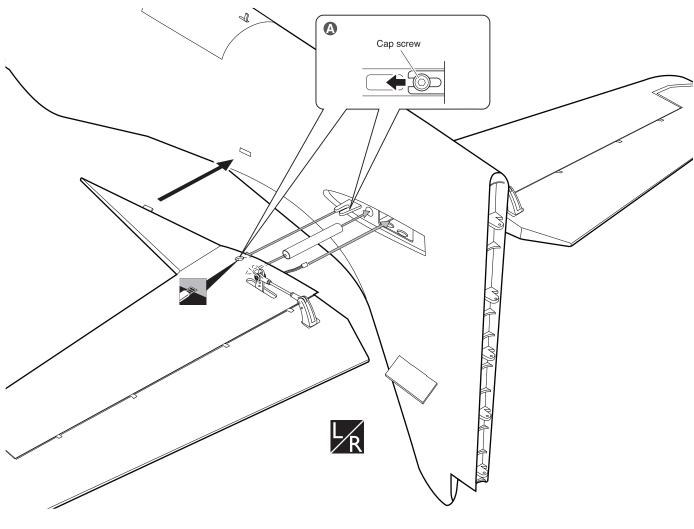
Cut off shaded portion

Assemble left and right sides the same way.

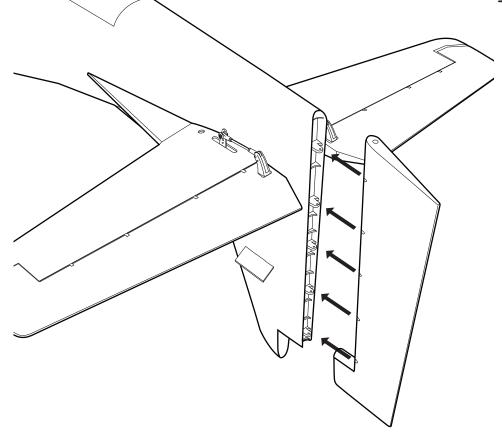


# HORIZONTAL STABILIZER INSTALLATION

(A) Main wing must be inserted and attached completely before fixing with screw.



# **RUDDER INSTALLATION**

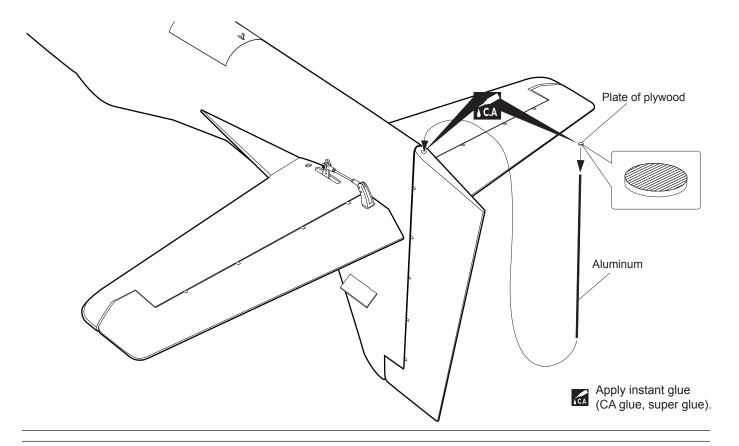




Make certain plane is aligned accurately per the diagram. A mis-aligned plane can fly erratically and cause accidents.

Cut off shaded portion

Assemble left and right sides the same way.



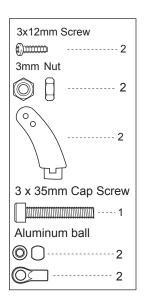
#### **INSTALLING THE RUDDER LINKAGES**

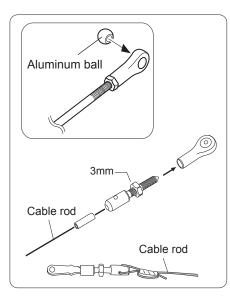
The rudder is controlled by two metal cables. Install the rudder linkages and cables as below.

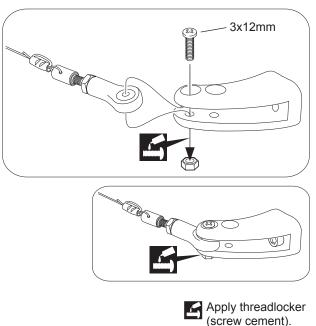
- 1. Use a hobby knife to remove the covering from the openings for the rudder control cables.
- 2. The rudder has a block wood plate for mounting the control horn. Two control horn in positioned on both side rudder (left and right).
- 3. Install the control horn to the rudder.
- 4. Slide a crimp onto the cable, then pass the cable through the threaded cable end. Pass the cable back into the crimp and use crimping pliers to secure the crimp to the cable. Guide the cable into the fuselage to the position for the rudder servo.

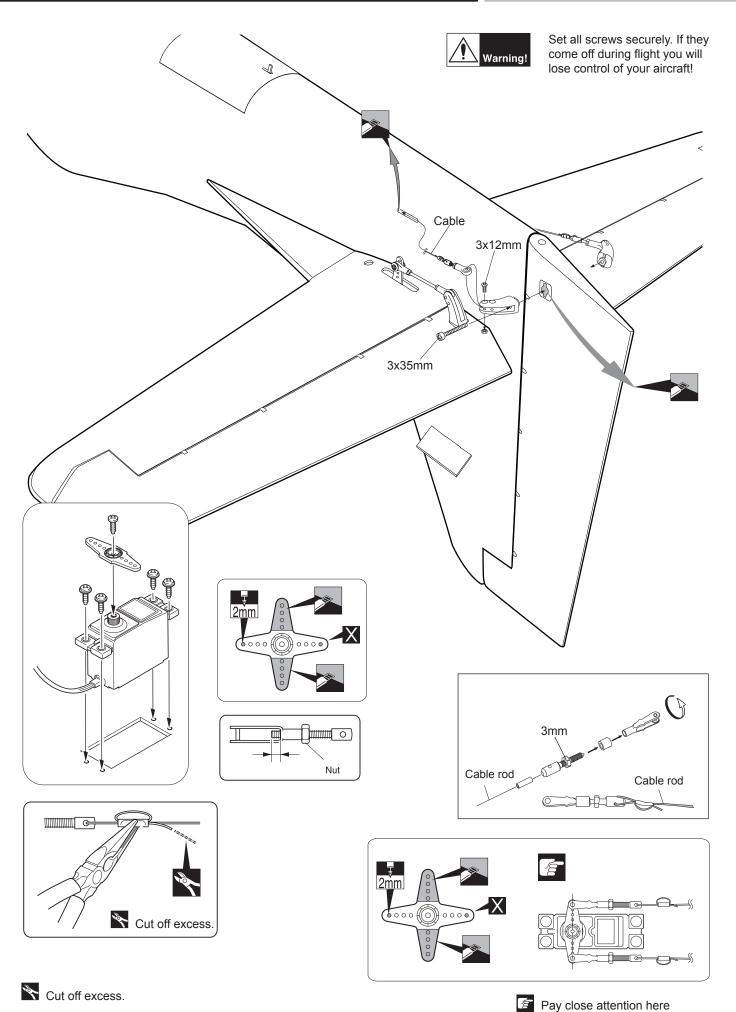
- 5. Thread the metal connector to the link ball.
- 6. Center the rudder servo using the radio and install the servo arm. Attach the metal clevis to the rudder servo arm.
- 7. Slide a crimp onto the cable, then pass the cable through the threaded cable end. Pass the cable back into the crimp and use crimping pliers to secure the crimp to the cable.
- 8. Thread the metal connector to the metal clevis.
- Attach the clevis to the rudder servo. There should be light tension on each of the wires when installed properly.

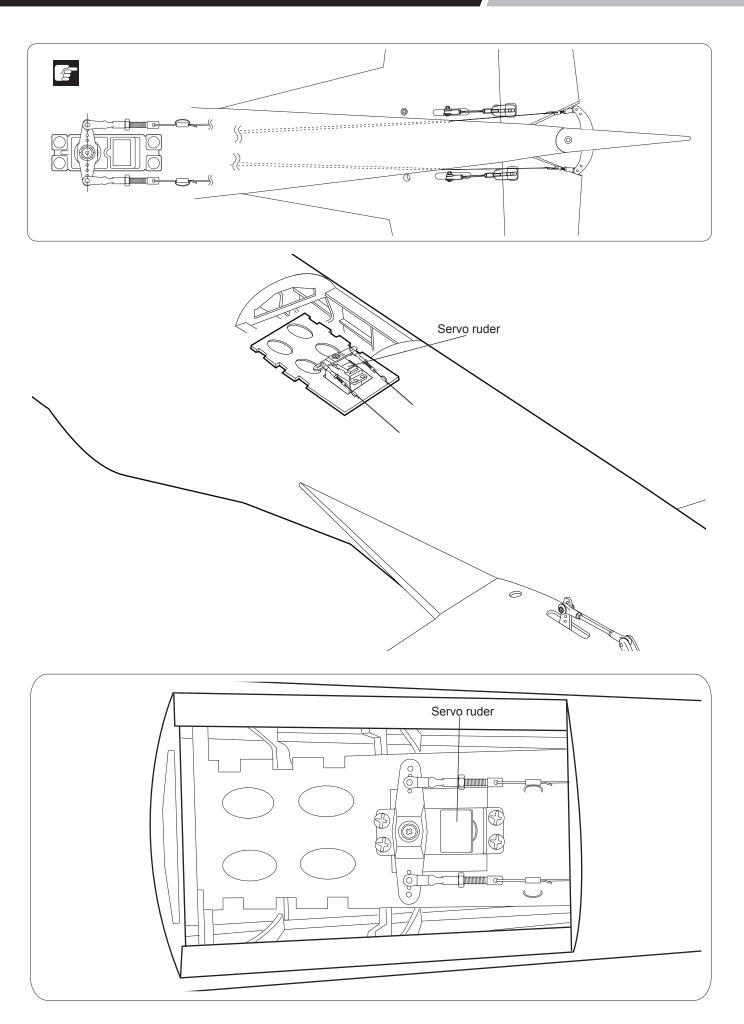
**Note:** Remember use thread locking compound to secure.



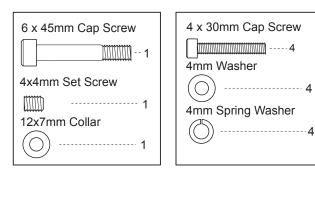


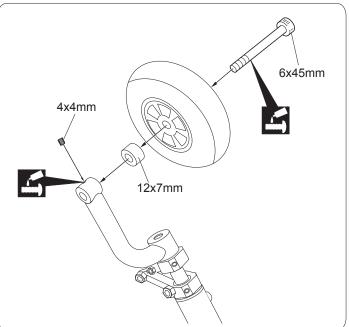


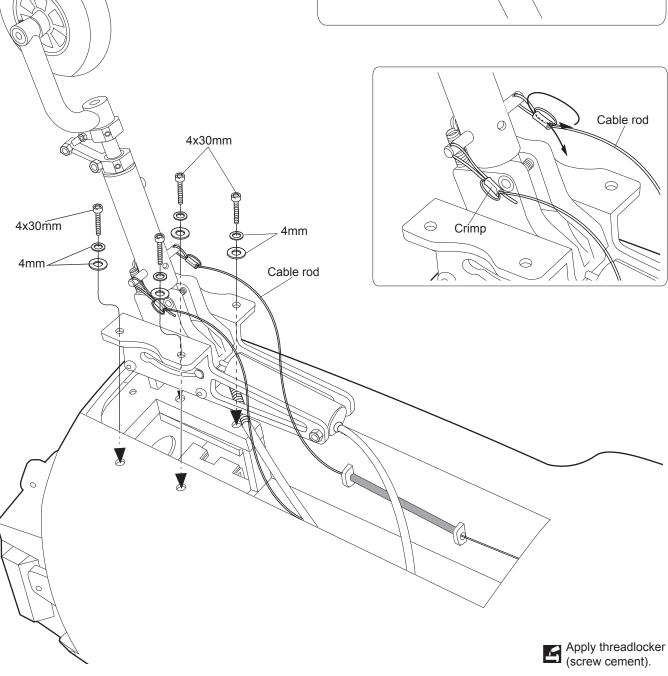


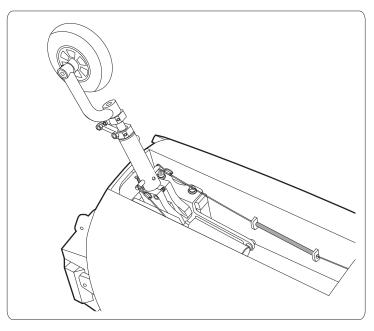


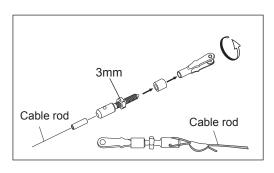
#### **INSTALLING THE NOSE GEAR RETRACT**

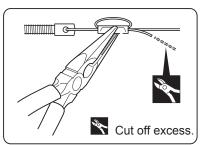


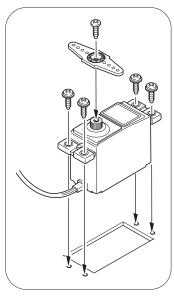


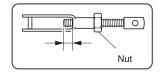


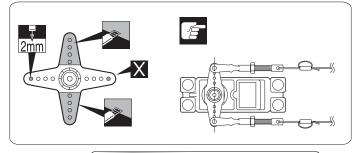






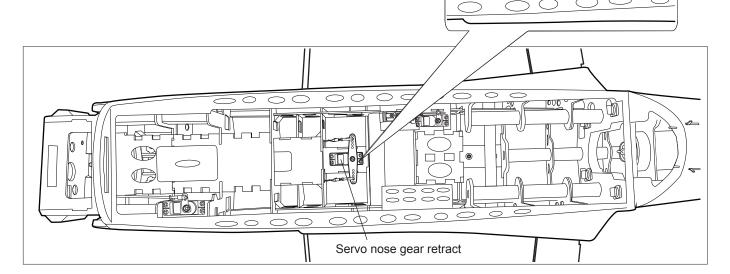






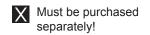
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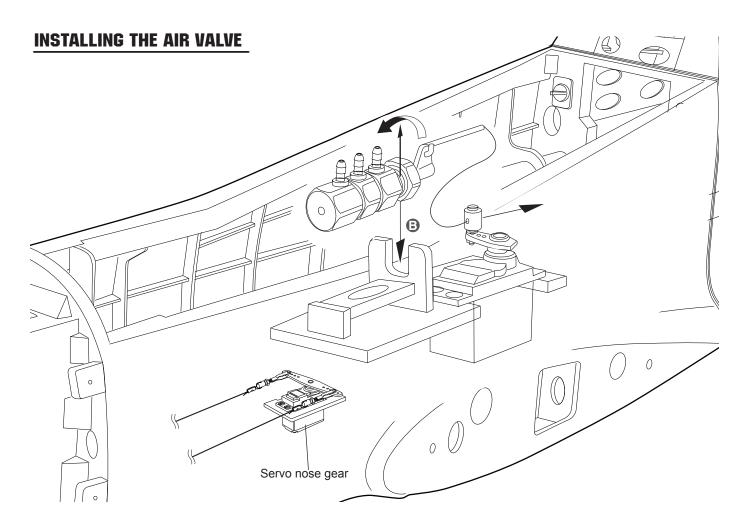
Servo nose gear retract

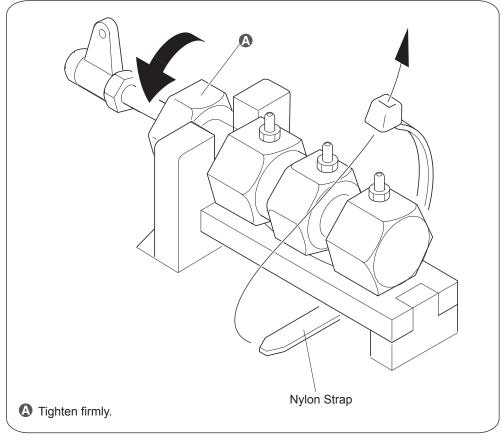


Cut off shaded portion

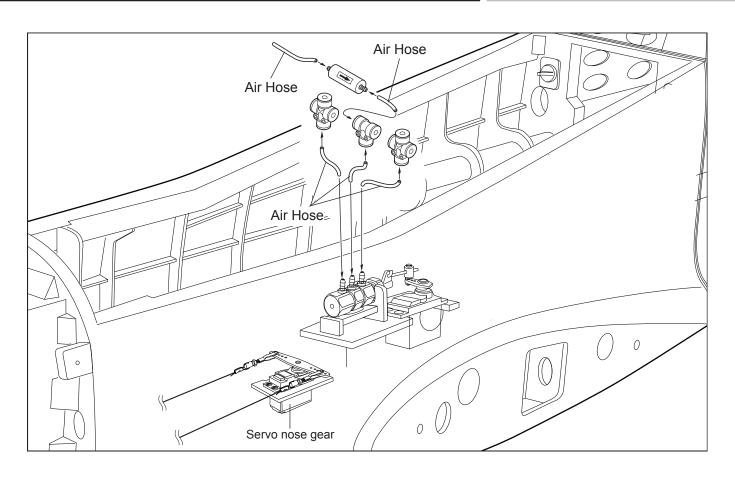
Pay close attention here

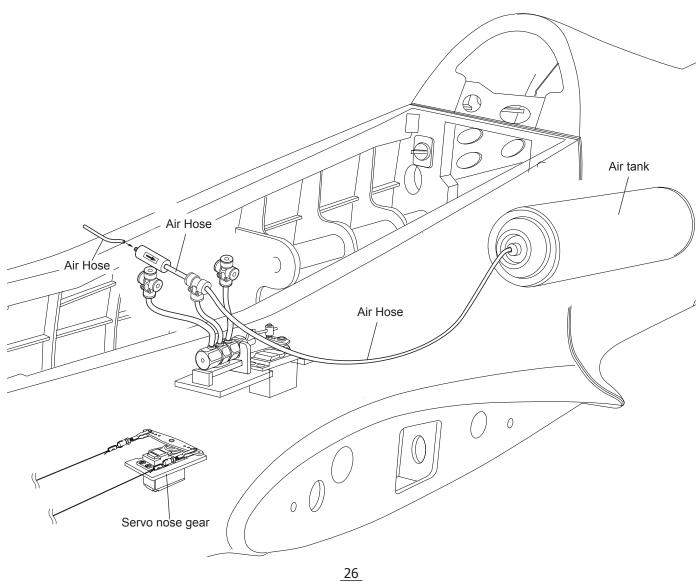


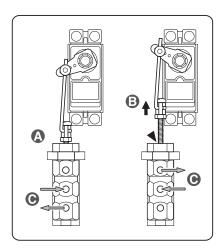




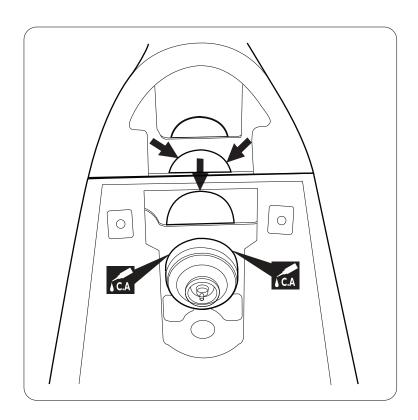
- A Tighten firmly.
- B Loosen nut.

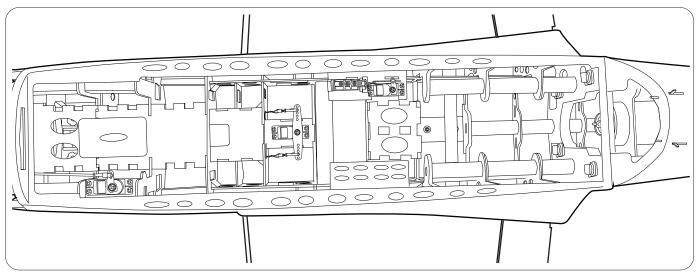


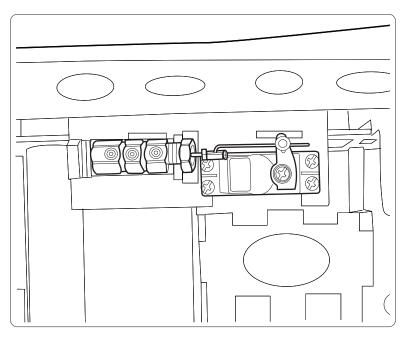




- A Use linkage to push the piston in all the way.
- B Keep the piston inside the marked area.
- Air flow direction.







#### **INSTALLING THE FUEL TANK**

- 1. The stopper has been pre-assembled at the factory.
- 2. Using a modeling knife, cut one length of silicon fuel line (the length of silicon fuel line is calculated by how the weighted clunk should rest about 5mm away from the rear of the tank and move freely inside the tank). Connect one end of the line to the weighted clunk and the other end to the nylon pick up tube in the stopper.
- Carefully bend the second nylon tube up at a 45 degree angle (using a cigarette lighter). This tube will be the vent tube to the muffler.
- 4. Carefully bend the third nylon tube down at a 45 degree angle (using a cigarette lighter). This tube will be vent tube to the fueling valve.

When the stopper assembly is installed in the tank, the top of the vent tube should rest just below the top surface of the tank. It should not touch the top of the tank.

5. Test fit the stopper assembly into the tank. It may be necessary to remove some of the flashing around the tank opening using a modeling knife. If flashing is present, make sure none of it falls into the tank.

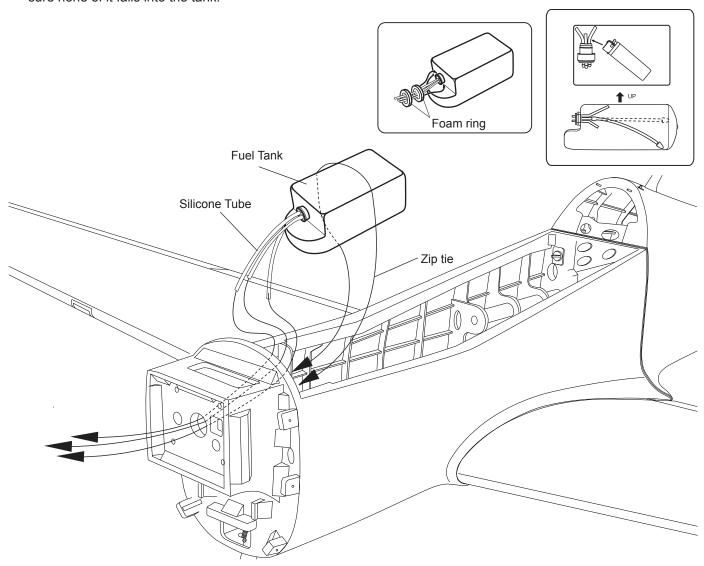
- 6. When satisfied with the alignment of the stopper assembly tighten the 3mm x 20mm machine screw until the rubber stopper expands and seals the tank opening. Do not over tighten the assembly as this could cause the tank to split.
- 7. Using a modeling knife, cut 3 lengths of fuel line . Connect 2 lines to the 2 vent tubes and 1 line to the fuel pickup tube in the stopper.
- 8. Feed three lines through the fuel tank compartment and through the pre-drilled hole in the firewall. Pull the lines out from behind the engine, while guiding the fuel tank into place. Push the fuel tank as far forward as possible, the front of the tank should just about touch the back of the firewall.

Blow through one of the lines to ensure the fuel lines have not become kinked inside the fuel tank compartment. Air should flow through easily.

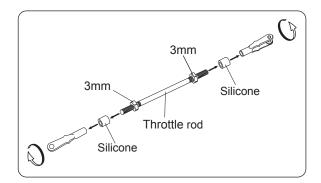


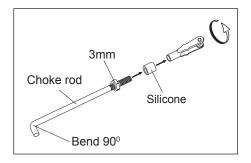
Do not secure the tank into place permanently until after balancing the airplane. You may need to remove the tank to mount the battery in the fuel tank compartment.

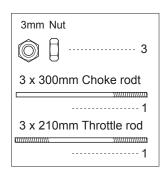
9. Secure the fuel tank.



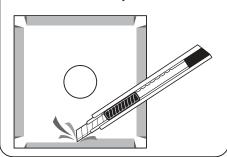
## **INSTALLING THE ENGINE**

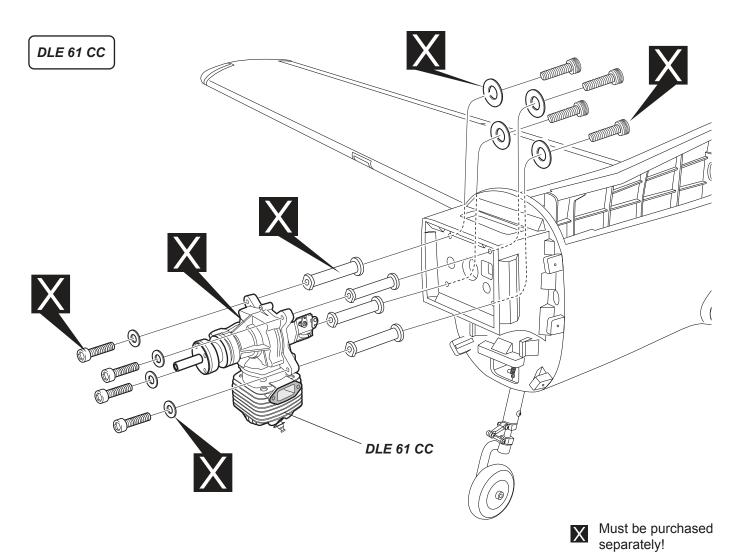




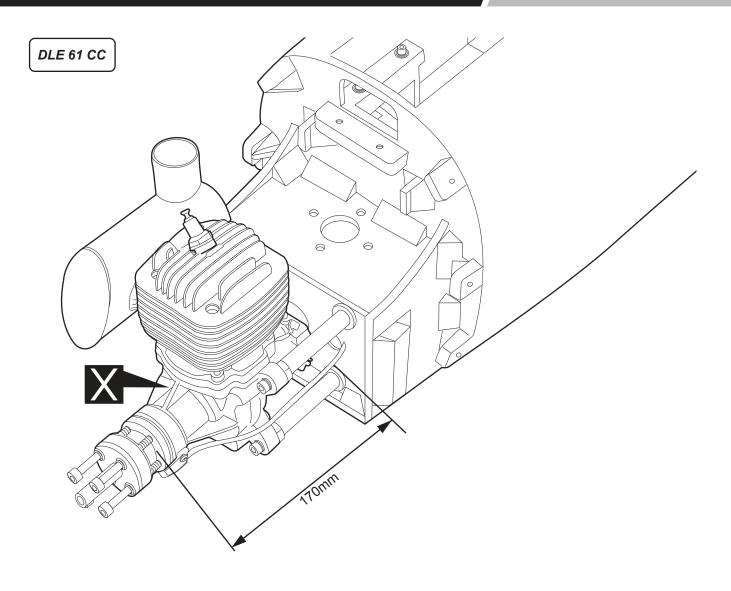


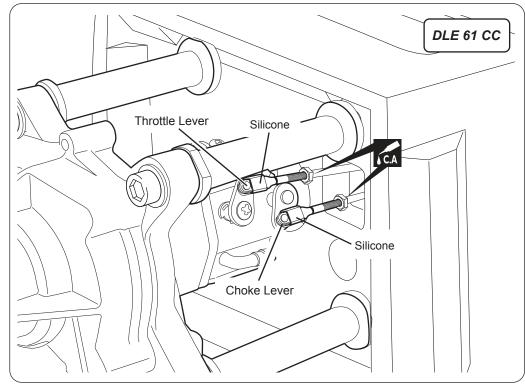
May be you also need to trim some wood from the tri-angle wood for the installation is easy.





29



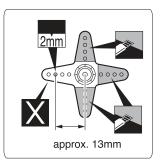


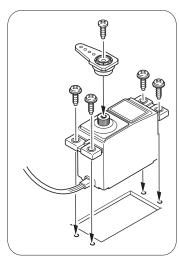
Apply instant glue (CA glue, super glue).

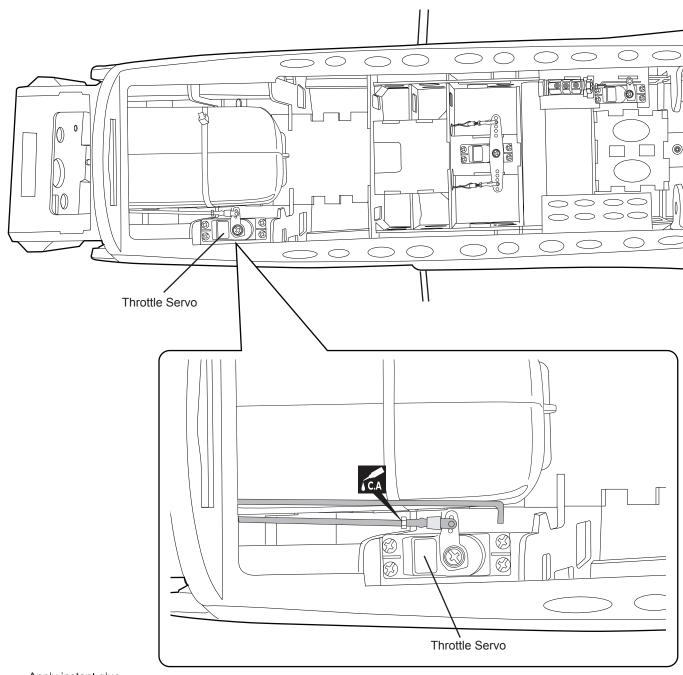
X Must be purchased separately!

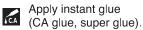
#### **INSTALLING THE THROTTLE**

1. Plug the throttle servo into the receiver and turn on the radio system. Check to ensure that the throttle servo output shaft is moving in the correct direction. When the throttle stick is moved forward from idle to full throttle, the throttle barrel should also open and close using this motion. If not, reverse the direction of the servo, using the transmitter.









Cut off shaded portion

X Must be purchased separately!

#### **MOUNTING THE COWL**

- Remove the muffler and needle valve assembly from the engine. Slide the fiberglass cowl over the engine.
- Measure and mark the locations to be cut out for engine head clearance, needle valve, muffler. Remove the cowl and make these cutouts using a rotary tool with a cutting disc and a rotary sanding drum attachment.
- Slide the cowl back into place. Align the front of the cowl with the crankshaft of the engine. The front of the cowl should be positioned so the crankshaft is in the middle of the precut opening. Hold the cowl firmly in place using several pieces of masking tape.

- 4. While holding the cowl firmly in position, drill 1,6mm pilot holes through both the cowl and the side edges of the firewall.
- 5. Using a 3mm drill bit, enlarge the holes in the cowling.

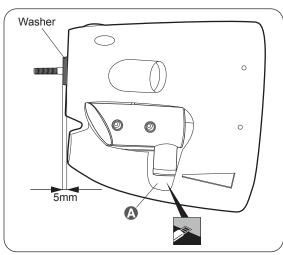


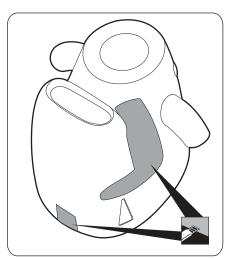
Enlarging the holes through the cowl will prevent the fiberglass from splitting when the mounting screws are installed.

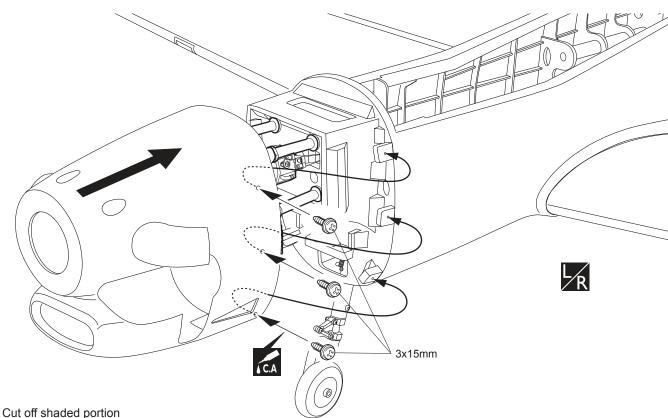
- 6. Slide the cowl back over the engine and secure it in place using four screws.
- 7. Install the muffler. Connect the fuel and pressure lines to the carburator, muffler and fuel filler valve. Tighten the screws completely.

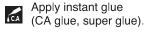


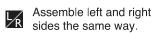
Trim the cowling so it will match your engine

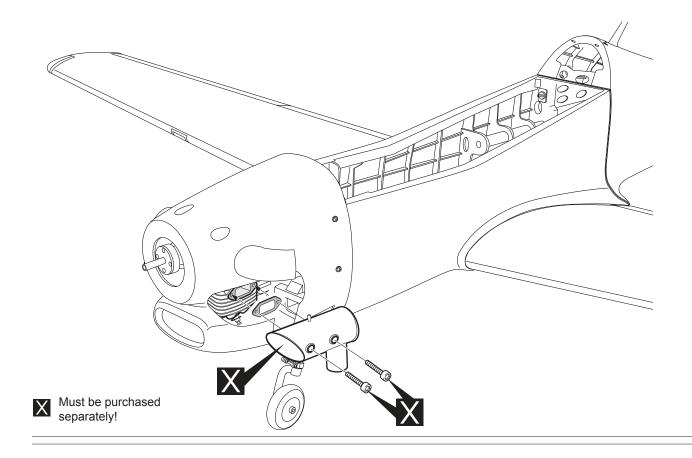












#### **INSTALLING THE SPINNER**

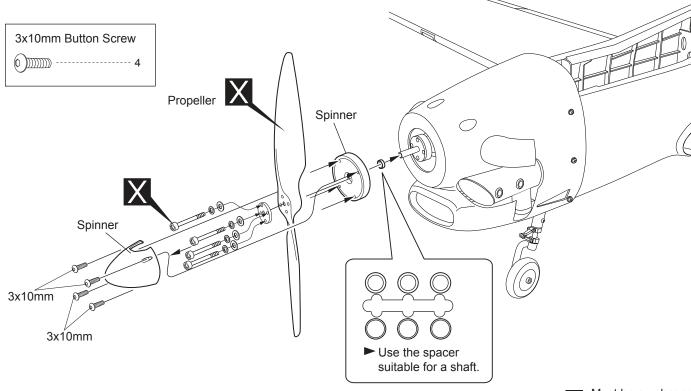
Install the spinner back-plate, propeller and spinner cone.



The propeller should not touch any part of the spinner cone. If it dose, use a sharp modeling knife and carefully trim away the spinner cone where the propeller comes in contact with it.



- ➤ Securely tighten the nut holding the propeller for it not come off when the motor is spinning. If coming off, there is a high risk of injury!
- Always ensure propeller and spinner are balanced. If unbalanced, vibration may result at high rotation and cause damage or injury.



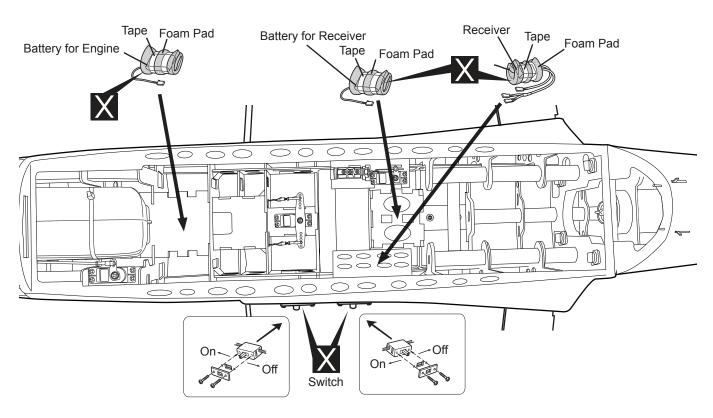
#### **INSTALLING THE RECEIVER AND BATTERY**

- Plug the servo leads and the switch lead into the receiver. You may want to plug an aileron extension into the receiver to make plugging in the aileron servo lead easier when you are installing the wing. Plug the battery pack lead into the switch.
- 2. Wrap the receiver and battery pack in the protective foam to protect them from vibration. Use a rubber band or masking tape to hold the foam in place.

Do not permanently secure the receiver and battery until after balancing the model.

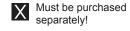
#### **INSTALLING THE SWITCH**

- The switch should be mounted on the fuselage side, opposite the muffler, close enough to the receiver so the lead will reach. Use the face plate of the switch cut out and locate the mounting holes.
- 2. Cut out the switch hole using a modeling knife. Use a 2mm drill bit and drill out the two mounting holes through the fuselage side.
- 3. Secure the switch in place using the two machine screws provided with the radio system.

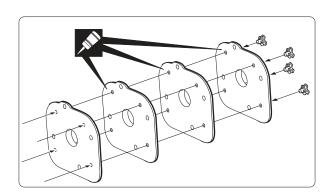




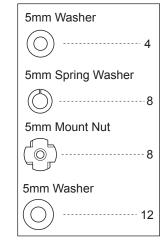
Attach securely. Disconnection during flight will cause loss of control and may result in an accident

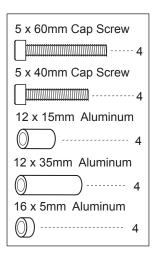


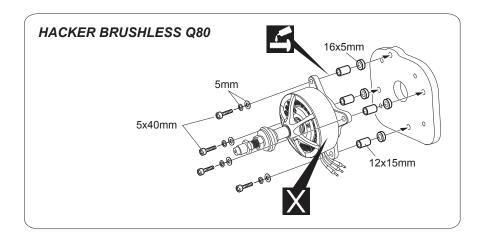
#### **INSTALLING THE ELECTRIC MOTOR (EP VERSION)**

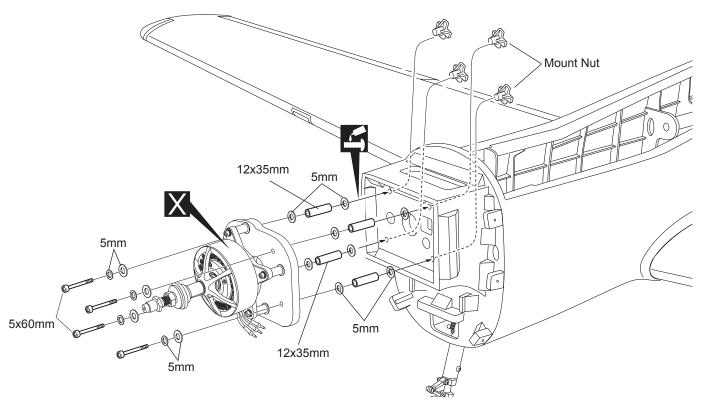


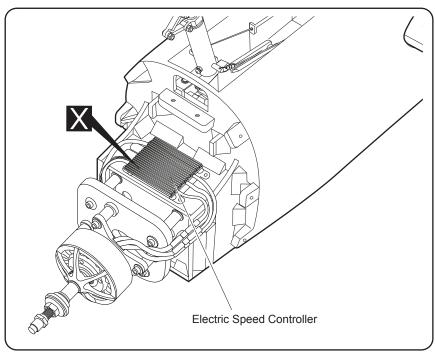


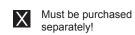


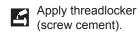


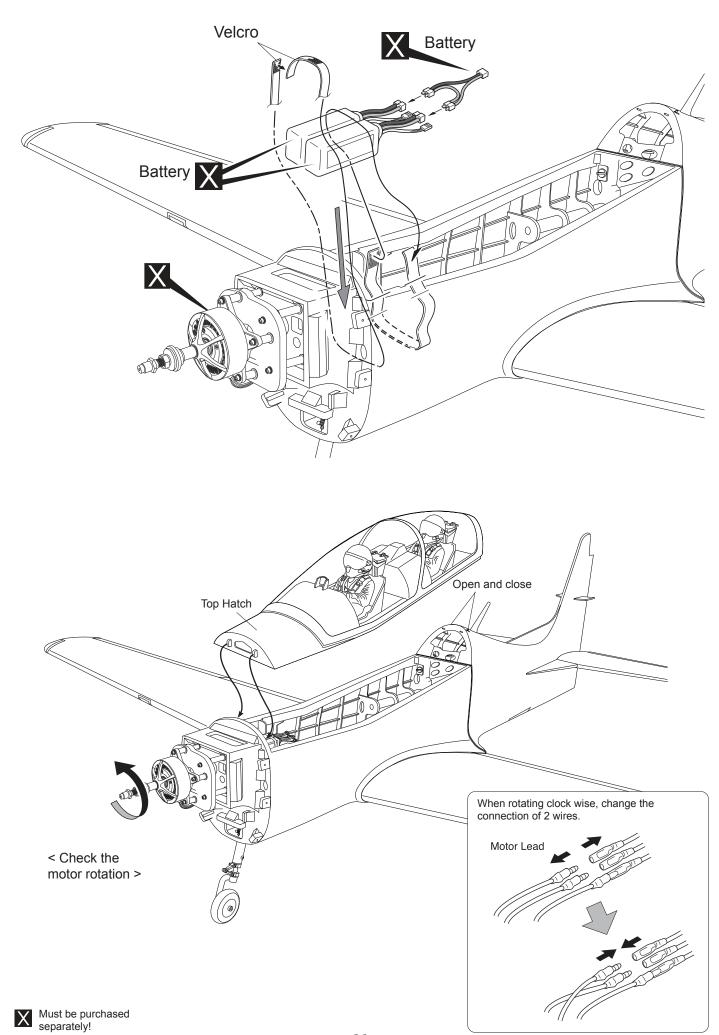








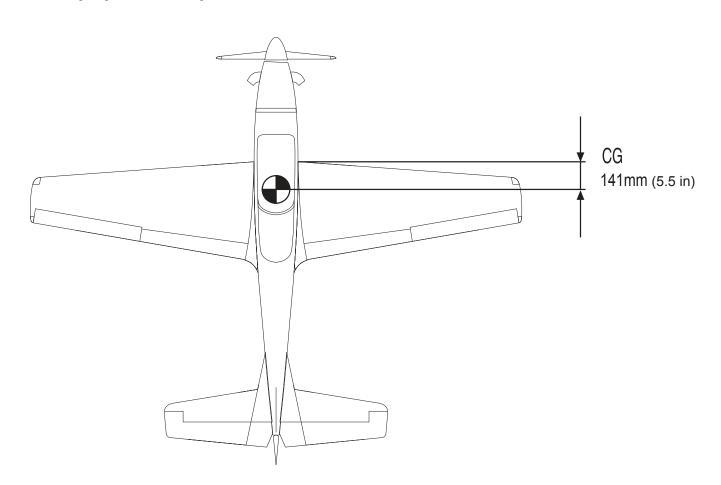




#### **BALANCING**

- It is critical that your airplane be balanced correctly. Improper balance will cause your plane to lose control and crash.
  - THE CENTER OF GRAVITY IS LOCATED 141mm (5.5 in) BACK FROM THE LEADING EDGE OF THE WING, AT THE FUSELAGE. BALANCE A PLANE UPSIDE DOWN WITH THE FUEL TANK EMPTY.
- 2. Mount the wing to the fuselage. Using a couple of pieces of masking tape, place them on the top side of the wing 141mm (5.5 in) back from the leading edge, at the fuselage sides.

- 3. Turn the airplane upside down. Place your fingers on the masking tape and carefully lift the plane.
- 4. If the nose of the plane falls, the plane is nose heavy. To correct this first move the battery pack further back in the fuselage. If this is not possible or does not correct it, stick small amounts of lead weight on the fuselage under the horizontal stabilizer. If the tail of the plane falls, the plane is tail heavy. To correct this, move the battery and receiver forward or if this is not possible, stick weight into the firewall. When balanced correctly, the airplane should sit level or slightly nose down when you lift it up with your fingers.



## **LATERAL BALANCE**



After you have balanced a plane on the C.G. You should laterally balance it. Doing this will help the airplane track straighter.

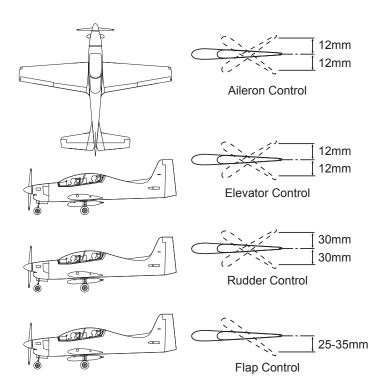
- Turn the airplane upside down. Attach one loop of heavy string to the engine crankshaft and one to the tail wheel wire. With the wings level, carefully lift the airplane by the string. This may require two people to make it easier.
- 2. If one side of the wing fall, that side is heavier than the opposite. Add small amounts of lead weight to the bottom side of the lighter wing half's wing tip. Follow this procedure until the wing stays level when you lift the airplane.

#### **CONTROL THROWS**

- 1. We highly recommend setting up a plane using the control throws listed.
- 2. The control throws should be measured at the widest point of each control surface.
- 3. Check to be sure the control surfaces move in the correct directions.

#### Low rate:

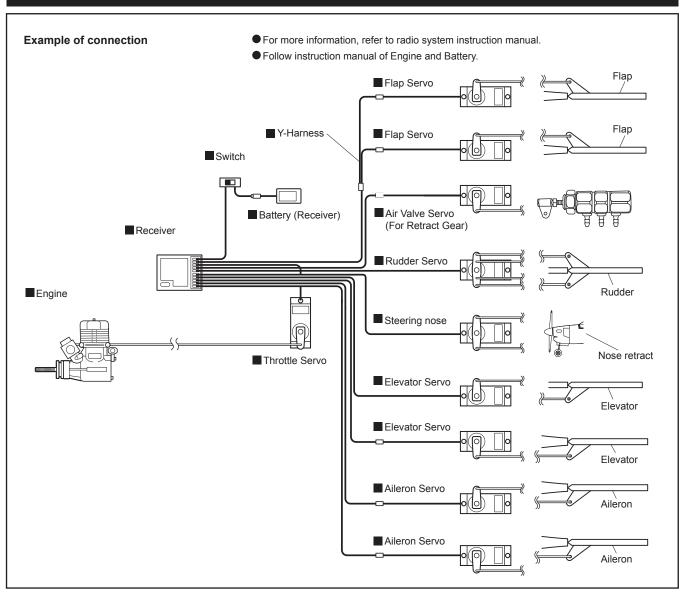
Aileron	I2mm up	12mm down
Elevator	I2mm up	12mm down
Rudder	30mm right	30mm left
Flap	25-35mm down	

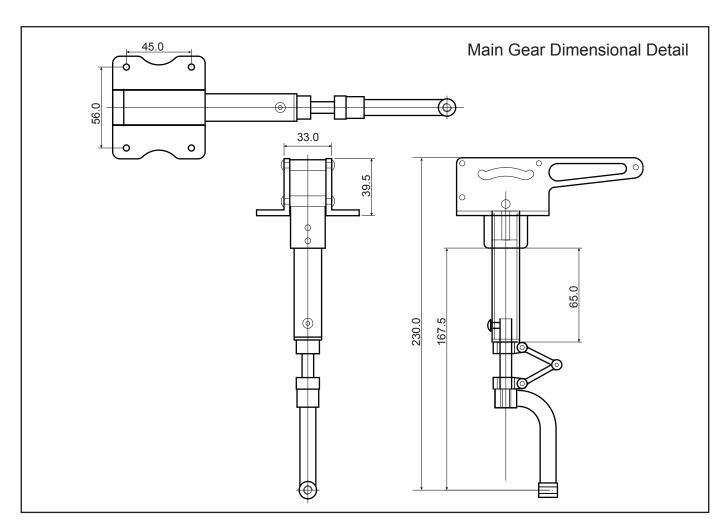


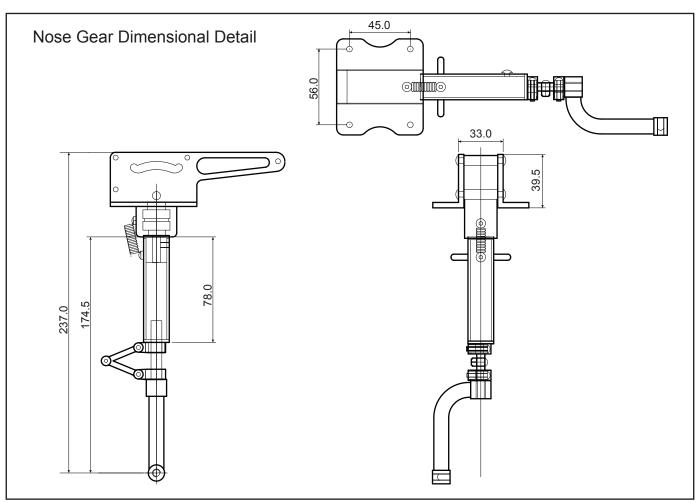
#### **FLIGHT PREPARATION PRE FLIGHT CHECK**

- 1. Completely charge your transmitter and receiver batteries before your first day of flying.
- Check every bolt and every glue joint in your plane to ensure that everything is tight and well bonded.
- 3. Double check the balance of the airplane
- 4. Check the control surface
- 5. Check the receiver antenna. It should be fully extended and not coiled up inside the fuselage.
- 6. Properly balance the propeller.

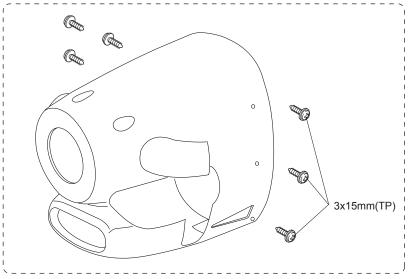
# FOR YOUR RADIO INSTALLATION BASIC CONNECTION FOR AIRPLANE AND ADJUSTMENT OF SERVOS

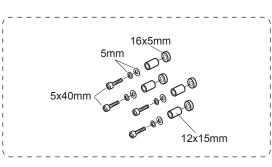


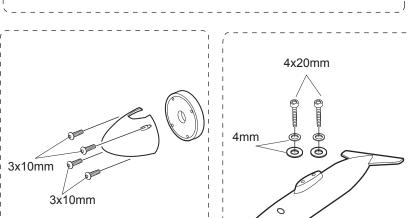


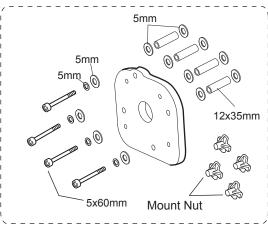


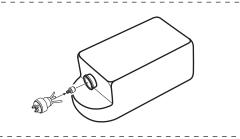
# **EXPLODED VIEW**

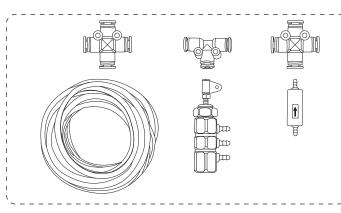


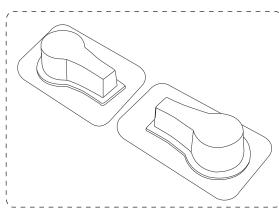


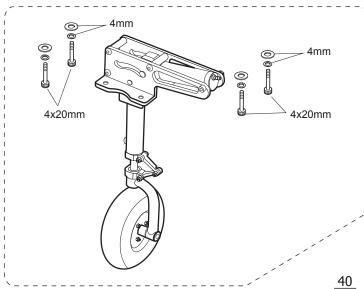


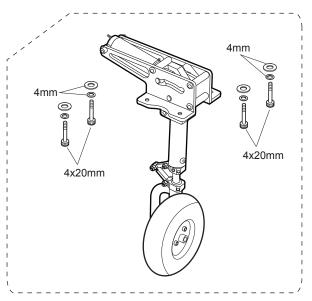


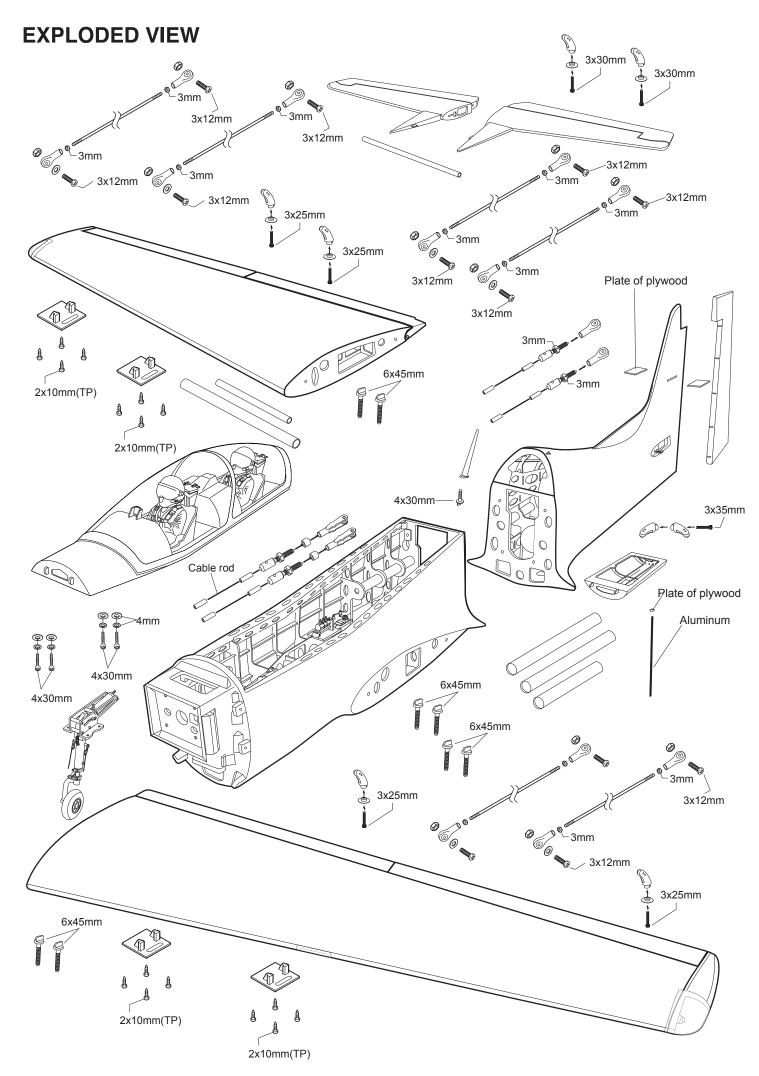












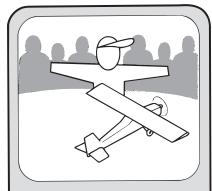
# I/C FLIGHT WARNINGS



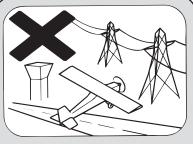
Always operate in open areas, away from factories, hospitals, schools, buildings and houses etc. **NEVER** fly your aircraft close to people or built up areas.



THE PROPELLER IS DANGEROUS Keep fingers, clothing (ties, shirt sleeves, scarves) or any other loose objects that could be caught or drawn in, away from the propeller. Take care at **ALL** times.



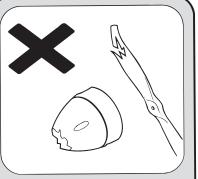
Keep all onlookers (especially small children and animals) well back from the area of operation. This is a flying aircraft, which will cause serious injury in case of impact with a person or animal.



**NEVER** fly near power lines, aerials or other dangerous areas including airports, motorways etc.



**NEVER** use damaged or deformed propellers or spinners.



DO NOT dispose of empty fuel containers on a fire, this can lead to an explosion.

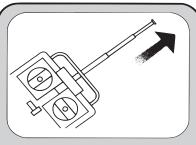


**NEVER** fly in wet conditions or on windy or stormy days.

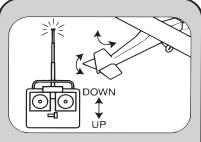


**ALWAYS** adjust the engine from behind the propeller, and do not allow any part of your body to be in line with the propeller.

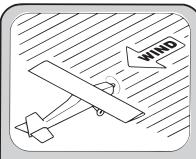
# I/C FLIGHT GUIDELINES



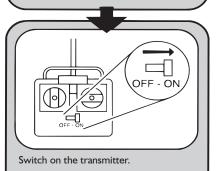
When ready to fly, first extend the transmitter aerial.

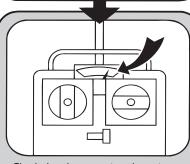


Operate the control sticks on the transmitter and check that the control surfaces move freely and in the CORRECT directions.

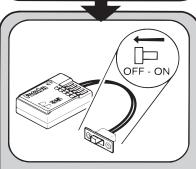


**ALWAYS** land the model INTO the wind, this ensures that the model lands at the slowest possible speed.

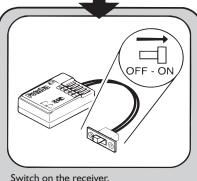




Check that the transmitter batteries have adequate power.

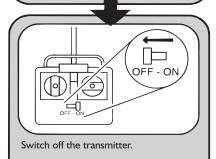


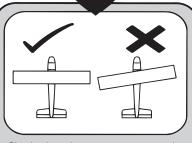
Switch off the receiver.



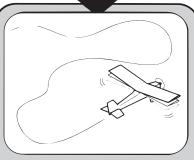
Switch on the receiver.



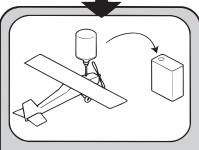




Check that the wings are correctly fitted to the fuselage.



If the model does not respond correctly to the controls, land it as soon as possible and correct the fault.



Empty the fuel tank after flying, fuel left in the tank can cause corrosion and lead to engine problems.