Swift

ELECTRIC R/C HELICOPTER

ARF Instruction Manual

Mechanical Specs:
Main Rotor Blades: 520-550mm
Tail Rotor Diameter: 21cm
Length: 105cm
Height: 34.4cm
Weight: 1.54kg (configured with brushless motor and servos)

Electronic Specs:
Speed Control: 50-80 Amp
Motor: 900-1250kv (based on battery)
Battery: 4S-6S Li-Po or 12 cell NiMH or NiCd
Pinion: 9-15 tooth
Head Speed: 1600-2100 RPM

Century Helicopter Products

Designed and Developed in USA

Product Warning!

This radio controlled model is not a toy! This model is recommended for persons over the age of 18. Users under the age of 18 should be supervised for their safety. This model is a precision machine requiring proper assembly and setup to avoid accidents. It is the responsibility of the owner to operate this product in a safe manner as it can inflict serious or even lethal injury. It is recommended that if you are in doubt of your abilities, seek assistance from experienced radio control helicopter modelers and associations. As manufacturer, we assume no liability for the use of this product. If you are not prepared to operate this model safely, do not continue building this model.

*Product Note: In order to make improvements to this product, specifications may be altered without prior notice.

Introduction

Congratulations on your purchase of Century Helicopter Product's latest version of our Swift series RC helicopter model. The Swift helicopter is not only ideal for beginners new to the hobby, but also for the intermediate and right on through to the expert and 3D flyers. A 6 channel helicopter radio is recommended as the bare minimum to take advantage of the helicopter programming included in these radios. You may wish to check with us or your local dealer for compatible components.

Pre-assembly Information

This model comes almost ready to fly. It is still a dangerous helicopter model and should not be considered a toy. It is up to the pilot/modeler to verify all parts and assemblies prior to spool up. Various assemblies have been pre-assembled, only requiring the final assembly and installation of the various sub-assemblies. The screws and nuts required for each step are packaged in the same bag as the parts for that step. Be careful not to lose any of the hardware when opening each bag. Care has been taken in filling and packing of each bag. Inspect all bolts and connections for safety as parts may have shifted in storage or transport.

Warranty

Your new equipment is warranted to the original purchaser against manufacturer defects in material and workmanship for 30 days from the date of purchase. During this period, Century Helicopter Products will repair or replace, at our discretion, any component that is found to be factory defective at no cost to the purchaser. This warranty is limited to the original purchaser and is not transferable. This warranty does not apply to any unit which has been improperly installed, mishandled, abused, or damaged in a crash, or to any unit which has been repaired or altered by any unauthorized agencies. Under no circumstances will the buyer be entitled to consequential or incidental damages. This limited warranty gives you specific legal rights. You also have other rights which may vary from state.

Table of Contents

Century Helicopter Products
1740 Junction Ave. C.
San Jose, CA 95112
Fax: (408) 451-1156
www.centuryheli.com

WARNING

For Lithium Polymer and NiMH/NiCD cell or battery packs purchased.

1. Never fast-charge any battery type unattended.
2. Never charge Li-Poly cells or battery packs at any rate unattended.
3. Only charge Li-Poly cells or battery packs with a charger designed specifically for lithium polymer chemistry.
4. Li-Poly cells can ignite because of unmatched cell capacity or voltage, cell damage, charger failure, incorrect charger setting and other factors.
5. Always use the correct charging voltage. Li-Poly cells or battery packs may ignite if connected to a charger supplying more that 6 volts per cells.
6. Always assure the charger is working properly.
7. Always charge Li-Poly cells or battery packs where no harm can result, no matter what happens. We suggest a brick box or likeness. Have sand handy in a bucket for any need to extinguish any fire. NEVER use water on any cells or battery packs.
8. Never charge a cell or battery pack in a model. A hot pack may ignite wood, foam, plastic, or etc.
9. Never charge a cell or battery pack inside a motor vehicle or in a vehicle's engine compartment.
10. Never charge a cell or battery pack on a wooden workbench or on any flammable material.
11. If a cell or battery pack is involved in a crash:
    a. Remove the cell or battery pack from model.
    b. Carefully inspect the cell or battery pack for shorts in the wiring or connections. If in doubt, cut all wires from cell or battery pack.
    c.Disassemble the pack
    d. Inspect cells for dents, cracks and splits. Dispose of damaged cells.
12. Dispose of cells or battery packs as follows:
    a. Discharge: with the cells or battery pack in a safe area, connect a moderate resistance across the terminals until the cell or battery pack is discharged. CAUTION: cell or battery pack may be hot.
    b. Discard:
       i. NiMH: place in regular trash
       ii. NiCD: recycle (cadmium is toxic)
       iii. Li-Poly: puncture plastic envelope, immerse in salt water for several hours and place in regular trash.
13. Handle all cells or battery packs with care, as they can deliver high currents if shorted. Shorting by a wedding ring, for example, will remove a finger.
14. Always store cells or battery packs in a secure location where they cannot be shorted or handled by children.
15. When constructing a battery pack, always use cells of the same capacity (mAh)
16. DO NOT store fully charged or discharged batteries in your helicopter.

** Century Helicopter Products will not be liable for any damages that may occur to your helicopter due to any misuse or mishandling as explained above.

** Century Helicopter Products, its successors, heirs and assignees are not responsible in way for any and all bodily injury(s) and/or property damage that may occur from the use of, or caused by in any way from Lithium Polymer and NiMH/NiCD cells or battery packs offered by and or distributed by Century Helicopter Products.

Required items for operation

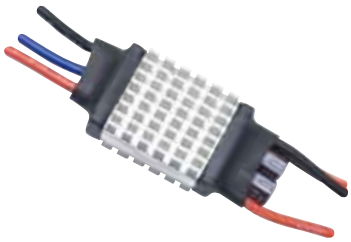
This is the general list of items required to get the Swift helicopter flying. Century produces a full spectrum of accessories and tools to assemble your helicopter. The Swift is a mechanical cyclic collective pitch mixing type helicopter requiring a standard helicopter radio (the helicopter radio does not require eCCPM type mixing for this model). The Swift uses 4 servos to operate critical systems. Gyroscopes are required to operate the model safely.

IMPORTANT: 6 Channel helicopter radio or better with 120^{O} eCCPM mixing required.

Necessary Items "Not Included" in the kit.

PG2000 II Dual Rate Piezo Gyro
#CN2018 (or equivalent)

Brushless Electric Motor

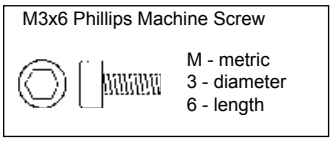


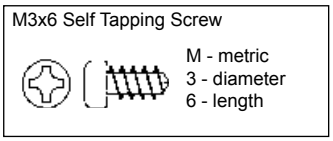
#CNE455
Electron 55 Brushless Speed Control w/ Heat Sink

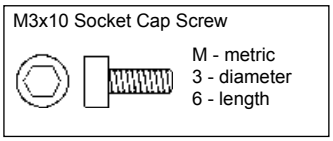
Power plant battery pack
4S-6S Li-Po or
12 Cell NiMH

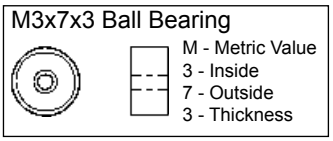
Fastener and ball bearing dimensions

Hardware Description and Identification: M3x6 = 3x6mm and can refer to screws or ball bearings.









WARNING: Do not overtighten bolts or screws possibly damaging threads of bolts or components.

Recommended Tools & Accessories

The tools and materials listed below are
<u>the minimum needed to build the helicopter:</u>

Screwdrivers - Slotted and Phillips head
Long-Nosed Pliers
Allen Wrenches - 1.5mm, 2.0mm, 2.5mm + 3.0mm
Appropriate Socket Wrench
Hobby Scissors
Double Sided Foam Tape (1/16" - 3/32")
Foam Rubber (Radio Packing)
Thread lock liquid (e.g. Locktite)
Hobby Grease (Super Lube)
Oil to lubricate sliding shafts
Epoxy

In addition, the following will make assembly and setup
<u>easier, and prove useful later in your model toolbox:</u>

Part#CN2015	Hardened Tip Hex Screw Driver Set
Part#CN2026	Pitch Gauge with Paddle Gauge
Part#CN2034A	15^{0} Curve Tip Ball link Pliers
Part#CN2052	Main Blade Balancer
Part#CN2055	Ball Link Sizing Tool
Part#CN2070	Universal Flybar Lock
Part#CN2219	Ball Link Easy Driver
Part#CN2255	Control Rod Gauge
Part#CNWI26555	5.5mm Nut Driver
Part#CNWI26570	7.0mm Nut Driver

Hobby scissors
#CN2262

Main Blade Pitch Gauge
w/PaddleGauge
#CN2026

Locktite
#CN2025BS blue
#CN2025RS red

Needle Nose Plier
& Cutter Pliers

Lubrication
#CN2024T

Package contents: Opening The Swift 16 ARF for the first time

Time to inventory your Hawk Pro! The helicopter is assorted into multiple bags contained inside the box. Each bag will have some parts that are not associated with that specific part bag. We recommend organizing all hardware and pieces and inventory them then keep them with their respective bags. It is common to have a few screws and/or washers left on the side after the build.

Inventory List: Items Contained In The Swift 16 ARF Box

Canopy
•Polypropylene canopy
•Canopy Grommets (4)

Windshield
•Tinted Windshield (requires cutting)

Forward Mechanics
•Main Frames
•Electronics Tray
•Rotor Head
•Main Gear
•Motor Mounting Plate
•Hardware
•Ball Bearings

Landing Gear Pack
•Plastic Landing Struts
•Aluminum Landing Skids

Hardware Pack
•Linkage Rod (4)
•Battery Band (4)
•M2 Nut (12)
•M2 Servo Ball (6)
•M2.5x12 Washer-Head Screw (4)
•M3x12 Phillips Machine Screw (2)
•M3x12 Self Tapping Screw (8)
•Elevator Servo Spacers (2)
•Servo Mounting Tabs (6)
•M2.5x12 Self Tapping Screw (12)
•M3x25 Socket Shoulder Screw (2)
•M3 Lock Nut (2)
•M3x16 Socket head cap screw (2)
•M3 Washer (2)
•M3 Lock Nut (4)
•M3x15 Socket Head Cap Screw (4)
•M3x6 Flat Washer (4)

Windshield Hardware
•M2x5 Self Tapping (5)

Rudder Control Rod & Tail Boom Support Struts Pack
•M2.5x5 Machine Screw (4)
•Rudder Control Rod
•Tail boom Support Strut (2)

Battery Tray & Vertical Fin Pack
•Carbon Battery Support
•Vertical Fin

Tail Rotor Assembly
•Tail Boom, Gearbox
•Horizontal Fin
•Tail Blades
•Rudder Servo Mounts
•Transmission Gears
•Drive Belt
•Hardware
•Ball Bearings
•Rudder Control Rod Guide

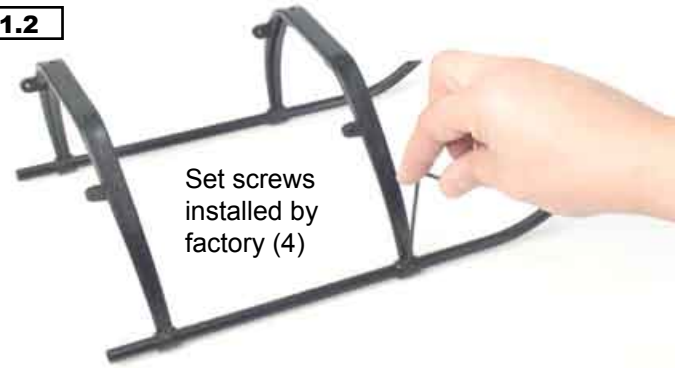
Decal Sheet
•Swift Canopy Decals & Stickers

Main Rotor Blades
•Main Rotor Blades (2)
•Main Blade Root End (4)
•Main Blade Hardware
•Tracking Tape

Section 1: Combining Main Frame, Battery Plate & Landing Gear

1.1

1.2



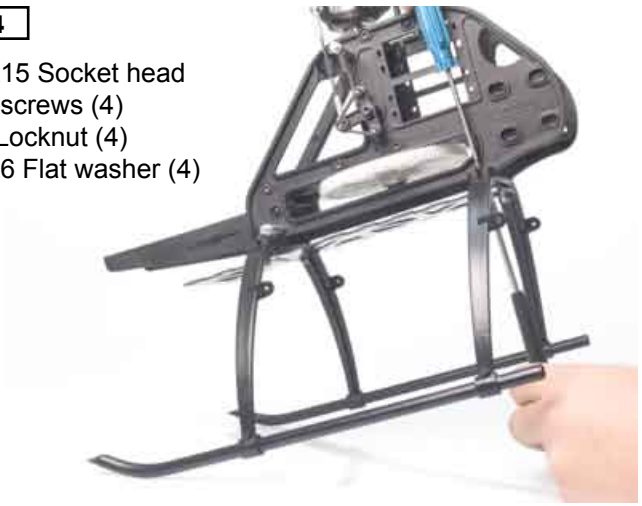
(1.1) Align the holes in the carbon fiber battery plate with the holes in the two plastic landing struts.

(1.2) Assemble the landing gear as pictured with the plastic mounting posts facing rearward (away from the curved part of the skids). Tighten the four set screws when aligned (Set screws are mounted in the landing struts from the factory).

1.3

1.4

M3x15 Socket head
cap screws (4)
M3 Locknut (4)
M3x6 Flat washer (4)



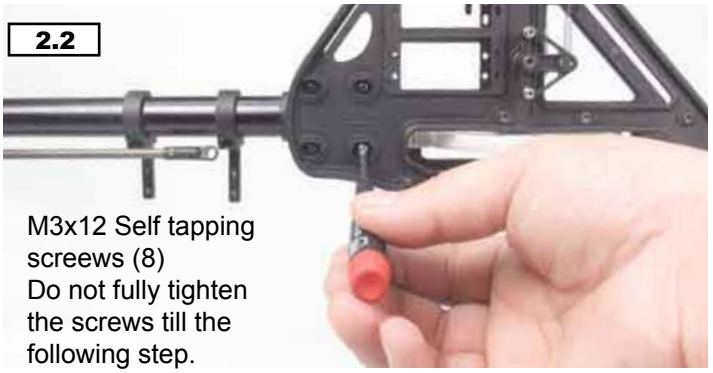
(1.3) Align the mounting points on the main frame with the holes in the landing struts and the battery tray.

(1.4) Place the landing struts below the main frame then the battery tray below the landing struts aligned as pictured and use the provided hardware to join them (4pc M8x15 bolt & M3 lock nut).

Section 2: Combining Tail Assembly & Main Frame Assembly

2.1

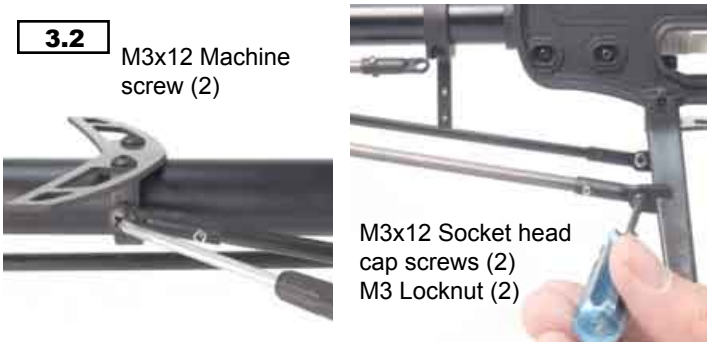
2.2



(2.1) Align the mounting posts from the front transmission gearbox with the mounting posts at the rear of the main frame. The horizontal fin on the tail boom facing should face up so the rudder pushrod and tail boom support struts hang below the tail boom.

(2.2) Using the hardware provided attach the tail section to the frame section. **Do not fully tighten the screws till the following step**.

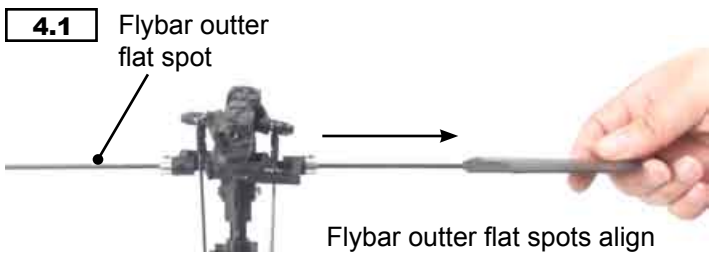
Section 3: Aligning Tail Gear Mesh & Landing Support Struts

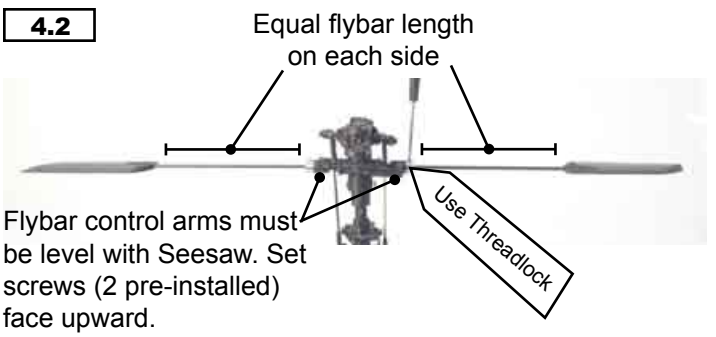


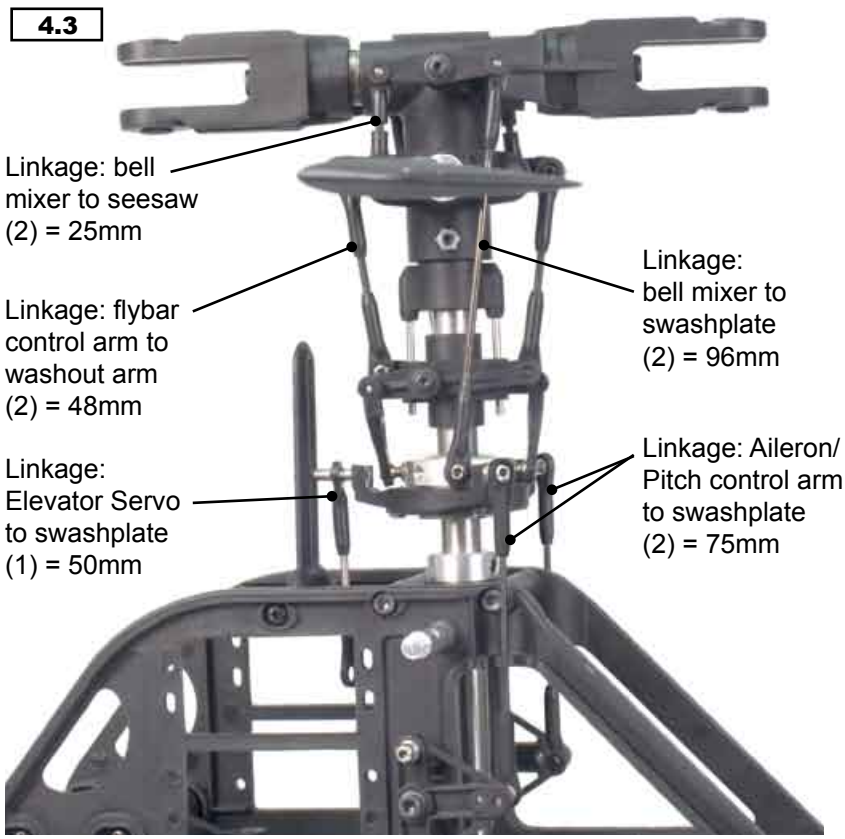
(3.1) Align the transmission gear mesh before fully tightening the screws holding the frame and tail sections. Good alignment is smooth and free of resistance without slipping or skipping teeth. (HINT:) place a piece of paper between the gears to give proper clearance.

(3.2) Attach the tail boom support struts to the horizontal fin clamp and the rear mounting posts on the landing struts as shown by tightening the four set screws. (HINT:) To help prevent rotation of the horizontal fin mount, wrap the area under the horizontal fin mount with a few layers of electrical tape.

Section 4: Final Rotor Head Adjustments & Linkage







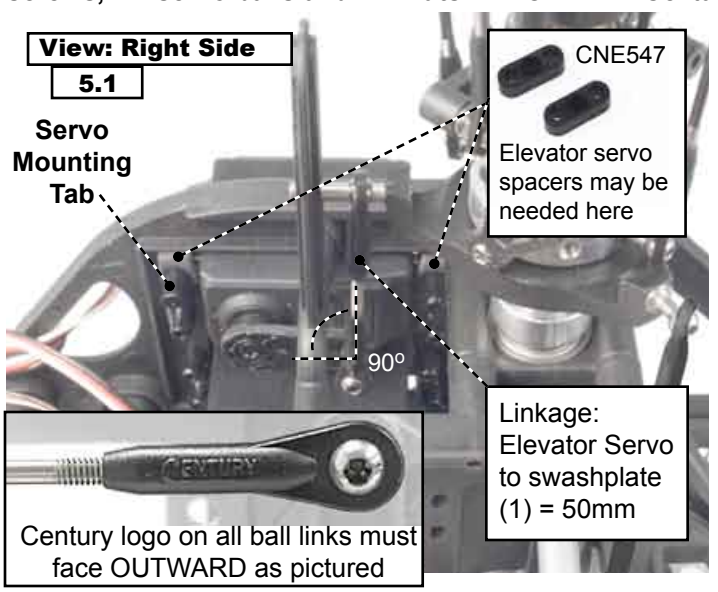
(4.1) The flybar is not fastened by the facotry and requires alignment. Adjust the flybar until the outter flat spots align with the set screws in the flybar control arms (set screws facing upward and flybar control arms are flush up against the seesaw).

(4.2) Make certain that the flybar is equal in length on both sides of the rotor head before tightening the flybar control arms. Set the flybar control arms flush and level to the seesaw and **tighten the set screws using locktite**.

(4.3) It is important to check the linkages of the helicopter before installing servos to be sure the lengths are correct. In this diagram we will show you the correct rotor head linkage lengths. Linkage lengths are based on the distance between centers of the metal control balls.

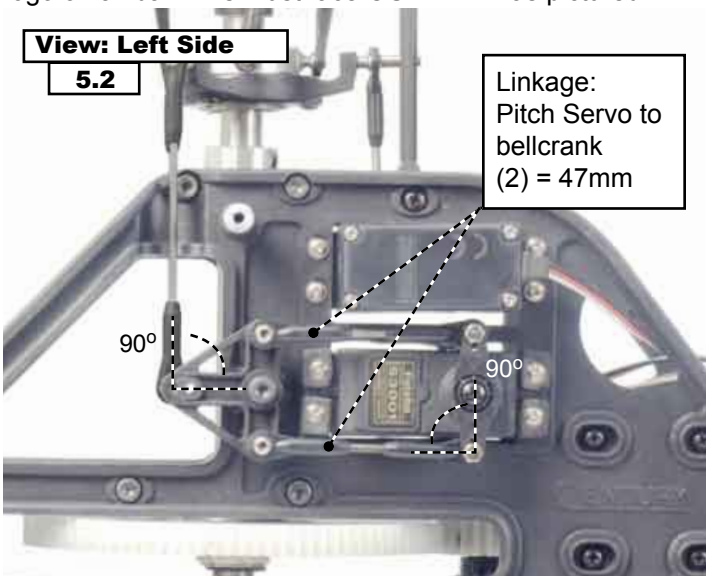
Section 5: Installing Servos & Servo Linkage

Installing servos and linkage to the airframe. Before beginning this section you should center all servos using the radio. All servo arms must be set with linkages as pictured at 90 degree angles. **All servos mount with M2.5x12 self tapping screws, M2 servo balls and M2 Nuts.** IMPORTANT: Century logo on all ball links must face OUTWARD as pictured.



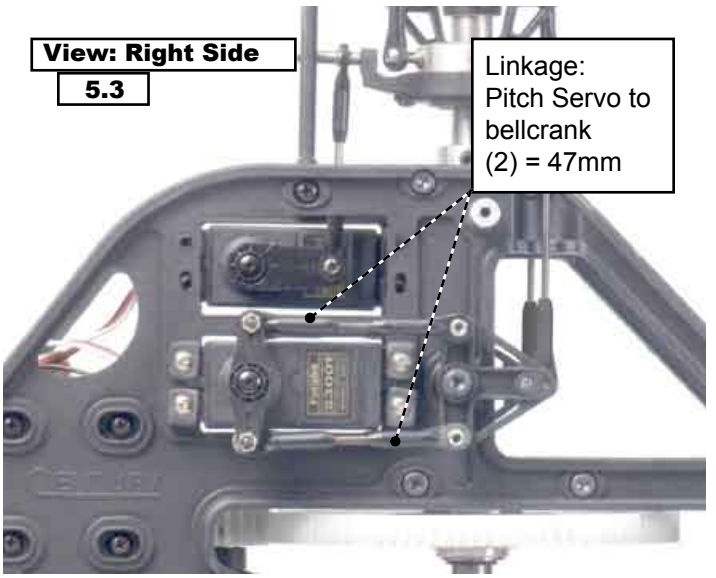
(5.1) The elevator servo will mount with a half servo arm on the upper opening of the left side of the main frame. Use the 4 servo screws and 2 servo mounting tabs to mount the elevator servo with the servo arm output facing toward the rear inside of the frame (pictured above).

Place one servo ball to the pitch servo arm facing inside toward the frame. Attach one 50mm linkage to the servo arm ball then to the ball on the back of the swashplate.



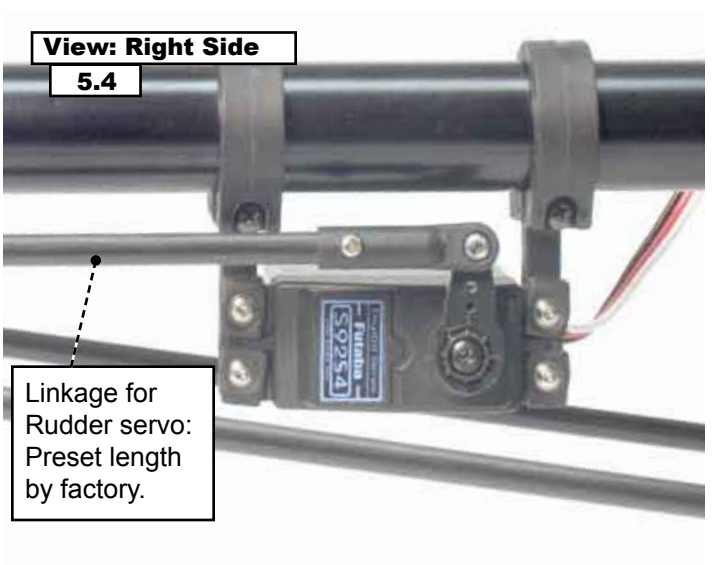
(5.2) The pitch servo will mount with a full servo arm on the lower opening of the left side of the main frame. Use the 4 servo screws and 2 servo mounting tabs to mount the pitch servo with the servo arm further toward the rear of the frame (pictured above).

Place two servo balls to the pitch servo arm facing inside toward the frame. Attach 2 of the 47mm linkages to the servo arm balls then to the balls on the pitch bellcrank.



(5.3) The aileron servo will mount with a full servo arm on the lower opening of the right side of the main frame. Use the 4 servo screws and 2 servo mounting tabs to mount the aileron servo with the servo arm further toward the rear of the frame (pictured above).

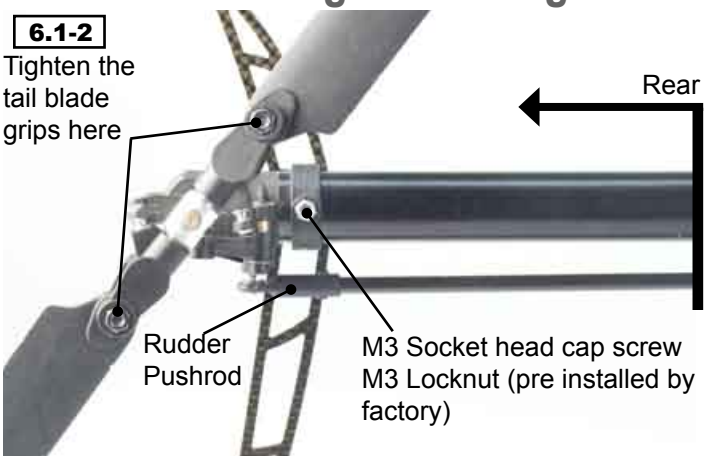
Place two servo balls to the aileron servo arm facing inside toward the frame. Attach 2 of the 47mm linkages to the servo arm balls then to the balls on the aileron bellcrank.

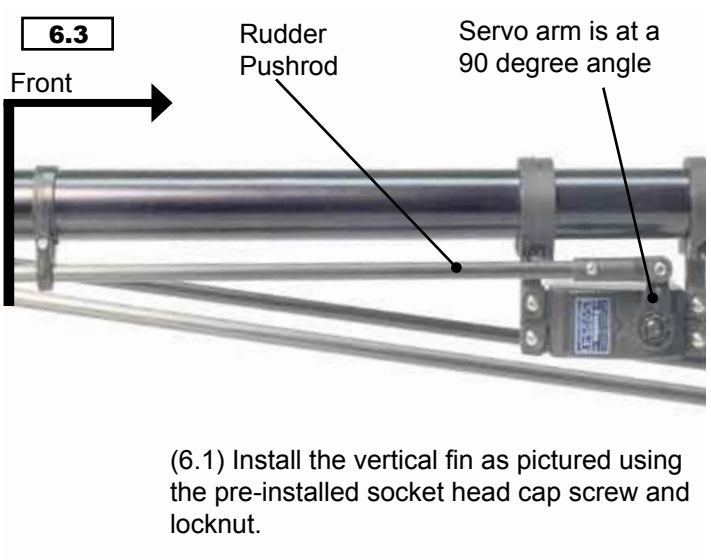


(5.4) The rudder servo will mount with a half servo arm on the servo bracket on the tail boom. Use the 4 Servo screws and 2 servo mounting tabs to mount the servo with the servo output facing the forward right side of the helicopter (pictured above).

Use a servo ball on the outside of the servo arm. Attach the front end of the rudder control rod to the servo ball.

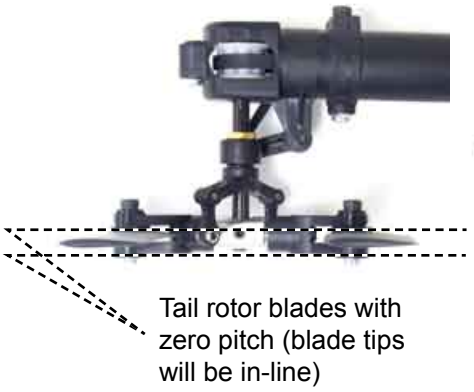
Section 6: Setting Tail Linkage & Blades

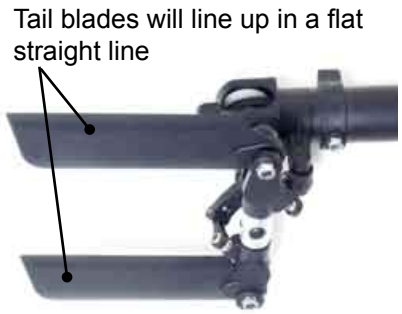




(6.1) Install the vertical fin as pictured using the pre-installed socket head cap screw and locknut.

Hint: Setting zero pitch for tail blades

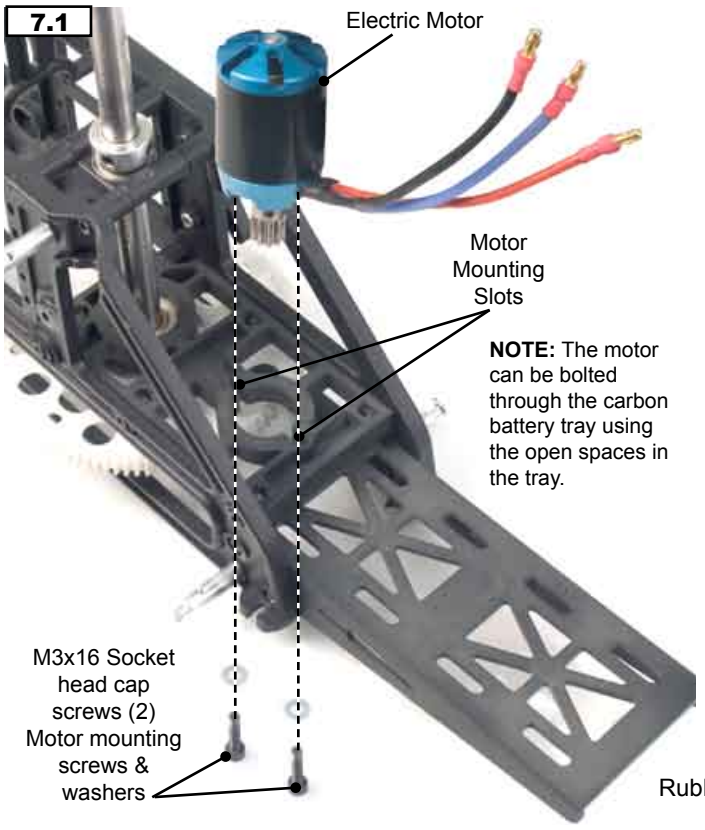




(6-2) The rudder pushrod controls the position of the tail pitch plate. The tail pitch plate should be first set in the middle position of the tail rotor shaft. The tail blades should have no pitch in that position. Tighten the tail rotor blades until the blade grips hold firm and will still fold back in the event of a blade strike.

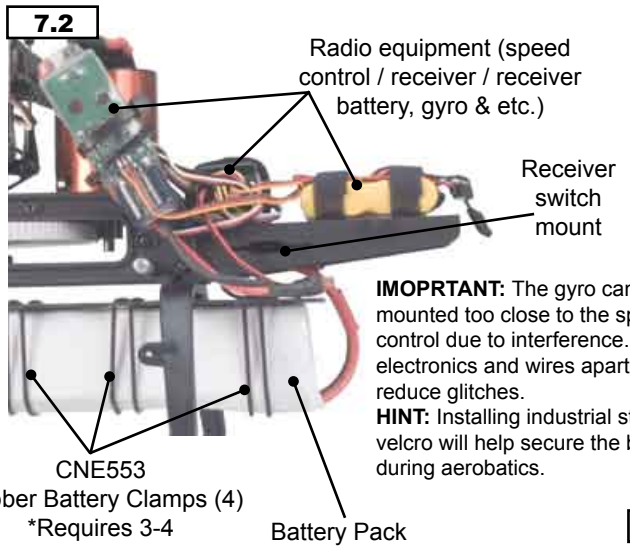
(6.2) Adjust the position of the rudder servo bracket so that the tail pitch plate is centered on the tail rotor shaft while the servo arm is at a 90 degree angle (as pictured).

Section 7: Mounting Motor & Electronics



(7.1) The key to installing the motor is the gear mesh. The elongated slots for mounting the motor allow space to adjust the mesh between the motor pinion gear and the main gear. Install the motor to the motor mounting plate and secure with hardware provided by the manufacturer of the motor.

(7.2) Install the batteries and control system neatly onto the electronics tray. When installing electronics make sure that wires are not going to come into contact with moving parts.

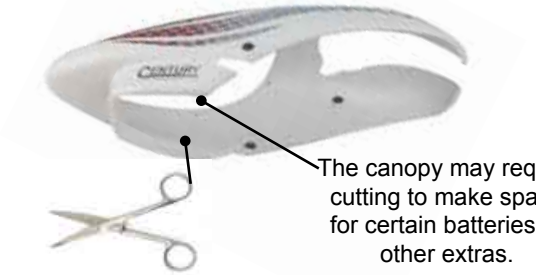


Section 8: Mounting The Canopy

(8.1) Cut the windshield of the canopy to align with the windshield lip of the canopy. Use the supplied hardware to attach the windshield to the canopy. **(HINT:)** Use Krylon 'Fusion' paint if painting.

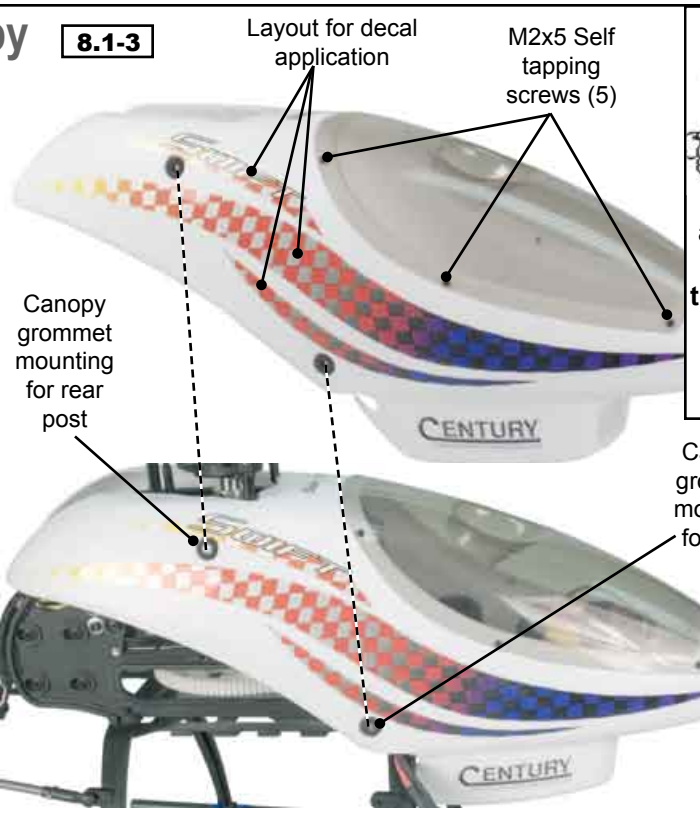
(8.2) **Use soap and water to clean the canopy before applying decals.** Decals are designed for application as pictured. Mount the decals in such a way that they do not come too close to the canopy mounting grommets.

(8.3) Mount the canopy to the front of the helicopter using the four grommet posts as shown. Be sure that the rotor head linkage is not obstructed and the swashplate has room to move.



The canopy may require cutting to make space for certain batteries or other extras.

8.1-3



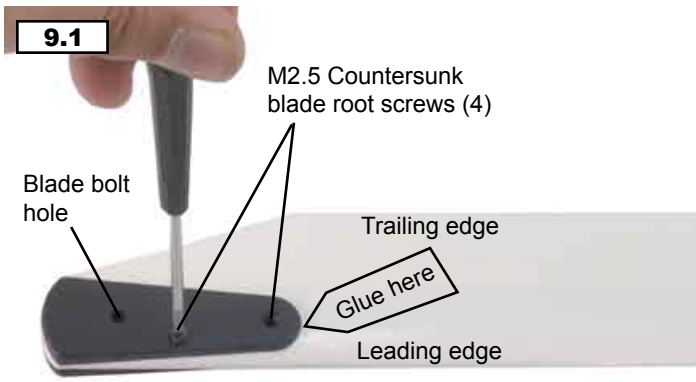
Use soap and water to clean the canopy before applying decals.

Section 9: Preparing, Mounting & Tracking The Main Rotor Blades

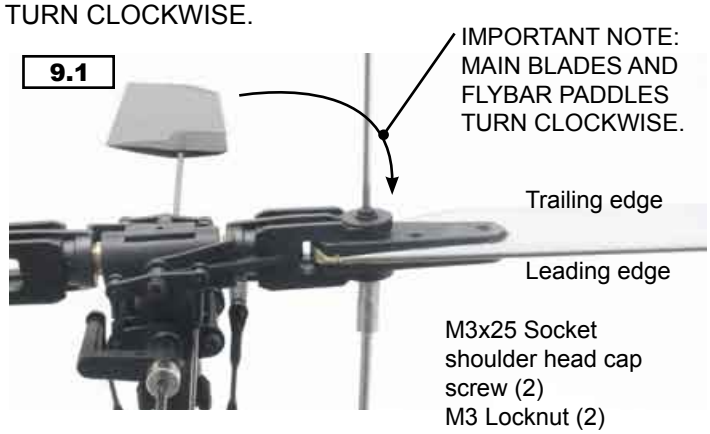
(9.2) Each rotor blade has 3 holes drilled in the root. Use epoxy to glue the plastic root ends to the exposed wood pre-cut by the factory. Use the countersunk screws to secure the root ends to the blades and let the glue dry.

(9.3) Use the 2 M4x30 blade bolts and M4 locknuts to secure the blades to the blade grips on the main rotor head.Main rotor blades should have their leading edge turning clockwise.
IMPORTANT NOTE: MAIN BLADES AND FLYBAR PADDLES TURN CLOCKWISE.

9.1



9.1

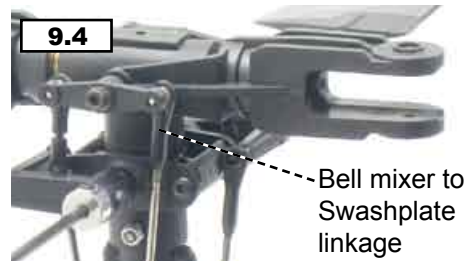


Tracking Adjustment:

(9-3) Tracking refers to trimming the actual pitch of the main rotor blades to be equal. On the first flight, bring the rotor head up to speed without leaving the ground and look at the side or profile of the rotor disk (FROM A VERY SAFE DISTANCE, MAKING SURE TO WEAR EYE PROTECTION).

(9-4) Only one rotor blade should be visible, if there are two distinctive blades then the tracking linkage must be changed. Observe which blade is tracking above the other by marking one first. Track that blade lower by shortening the 'bell mixer to swashplate' linkage rod.

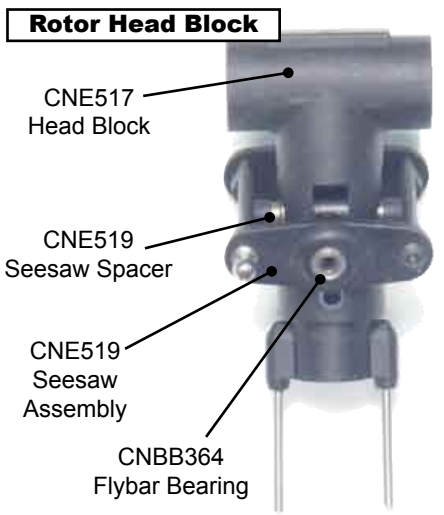
9.4



 ASSEMBLY COMPLETE! MODELER IS RESPONSIBLE FOR COMPLETENESS AND SAFETY OF THE MODEL.

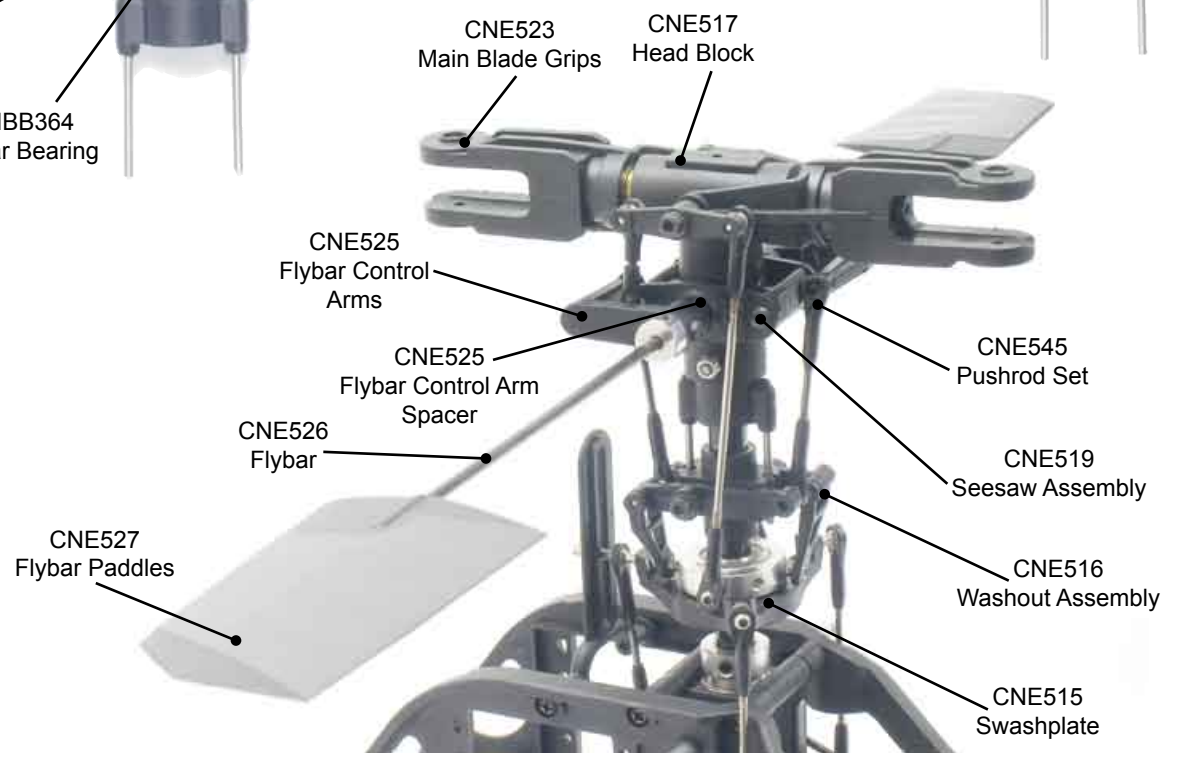
Construction Details: Rotor Head Assembly

Rotor Head Block

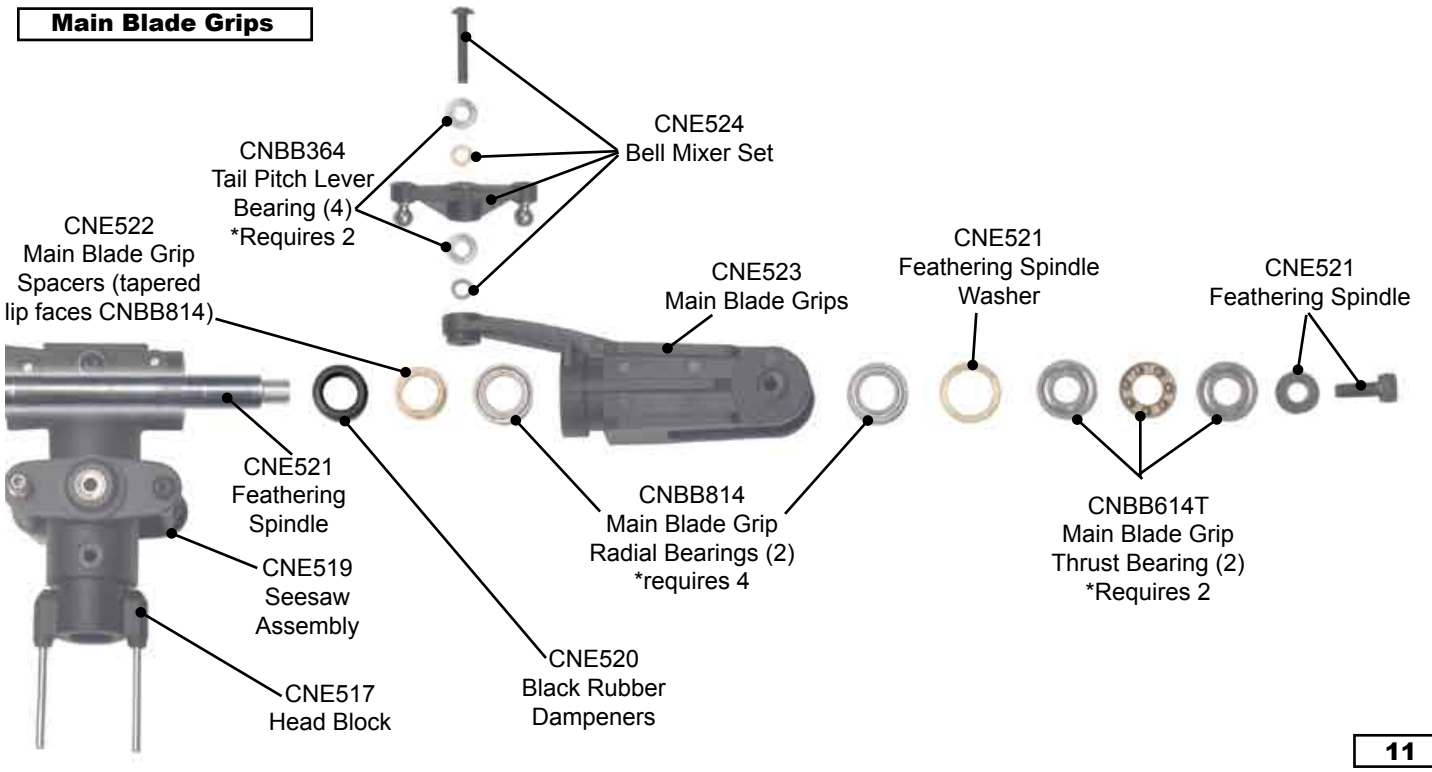


Seesaw Shaft

Main Rotor Head



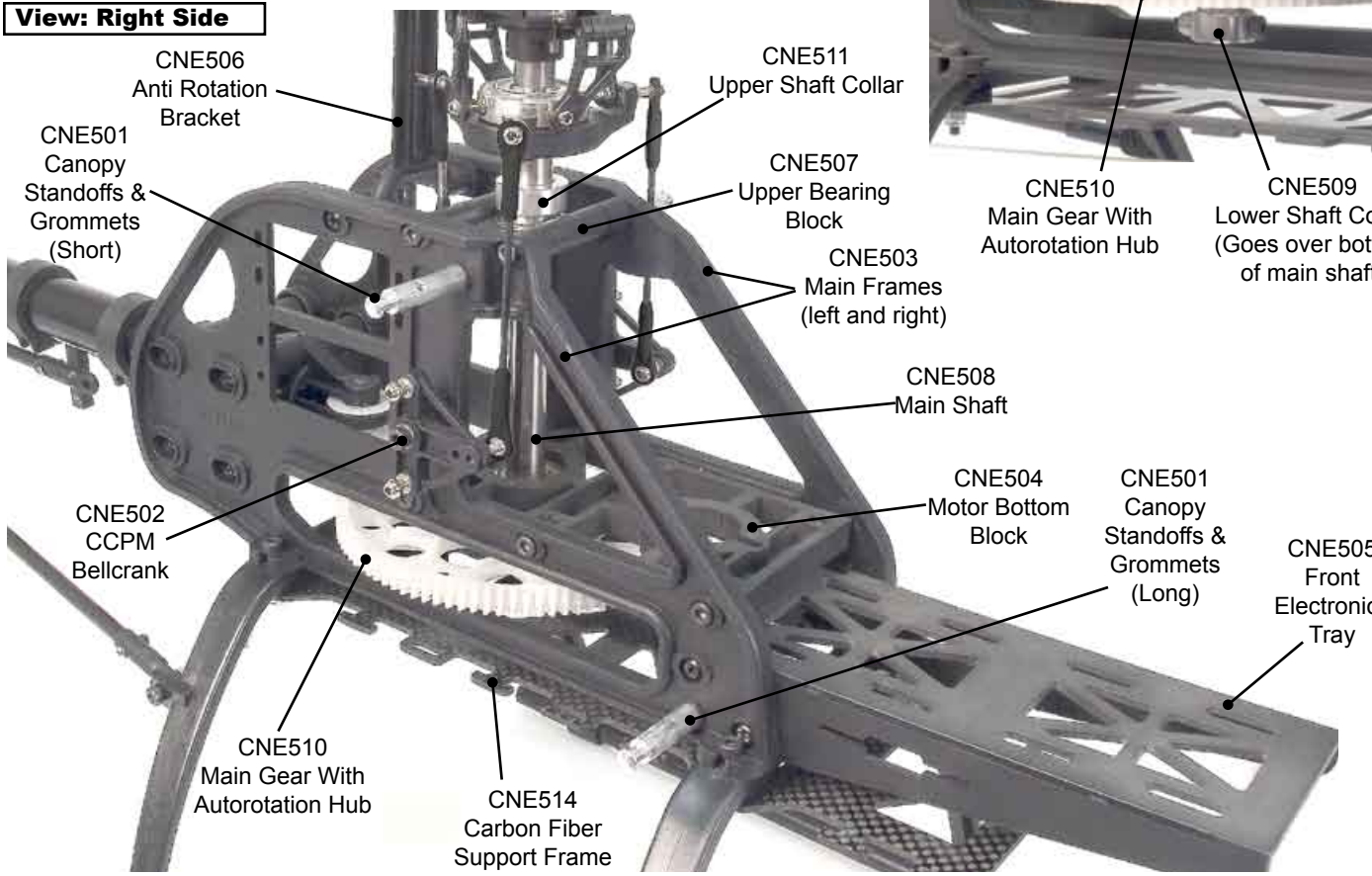
Main Blade Grips



Construction Details: Main Frame Assembly

Attach the carbon fiber battery plate to the bottom portion of the main frame

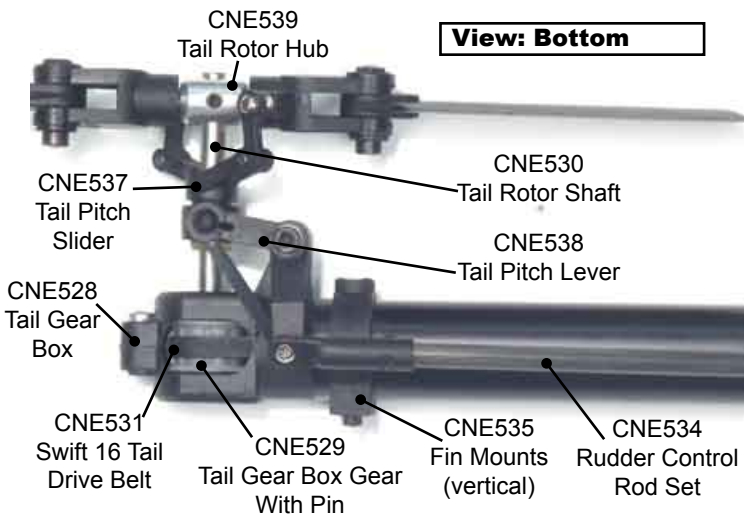
View: Right Side



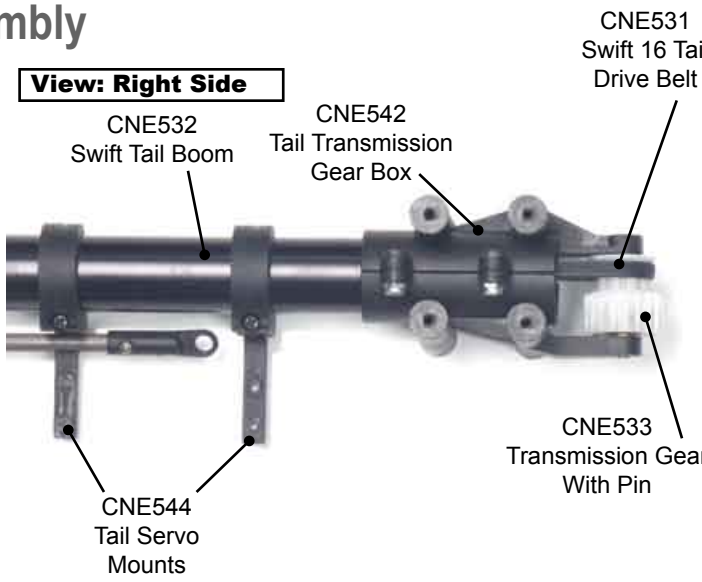
Main Gear Bottom

Construction Details: Tail Drive Assembly

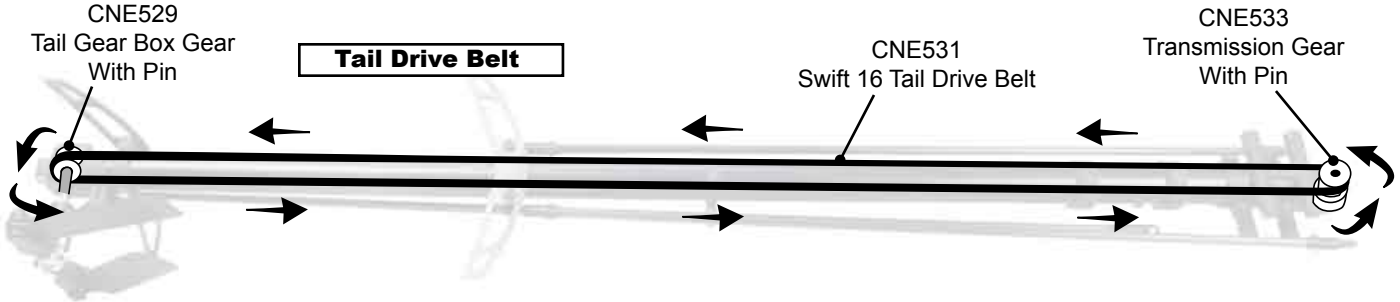
View: Bottom



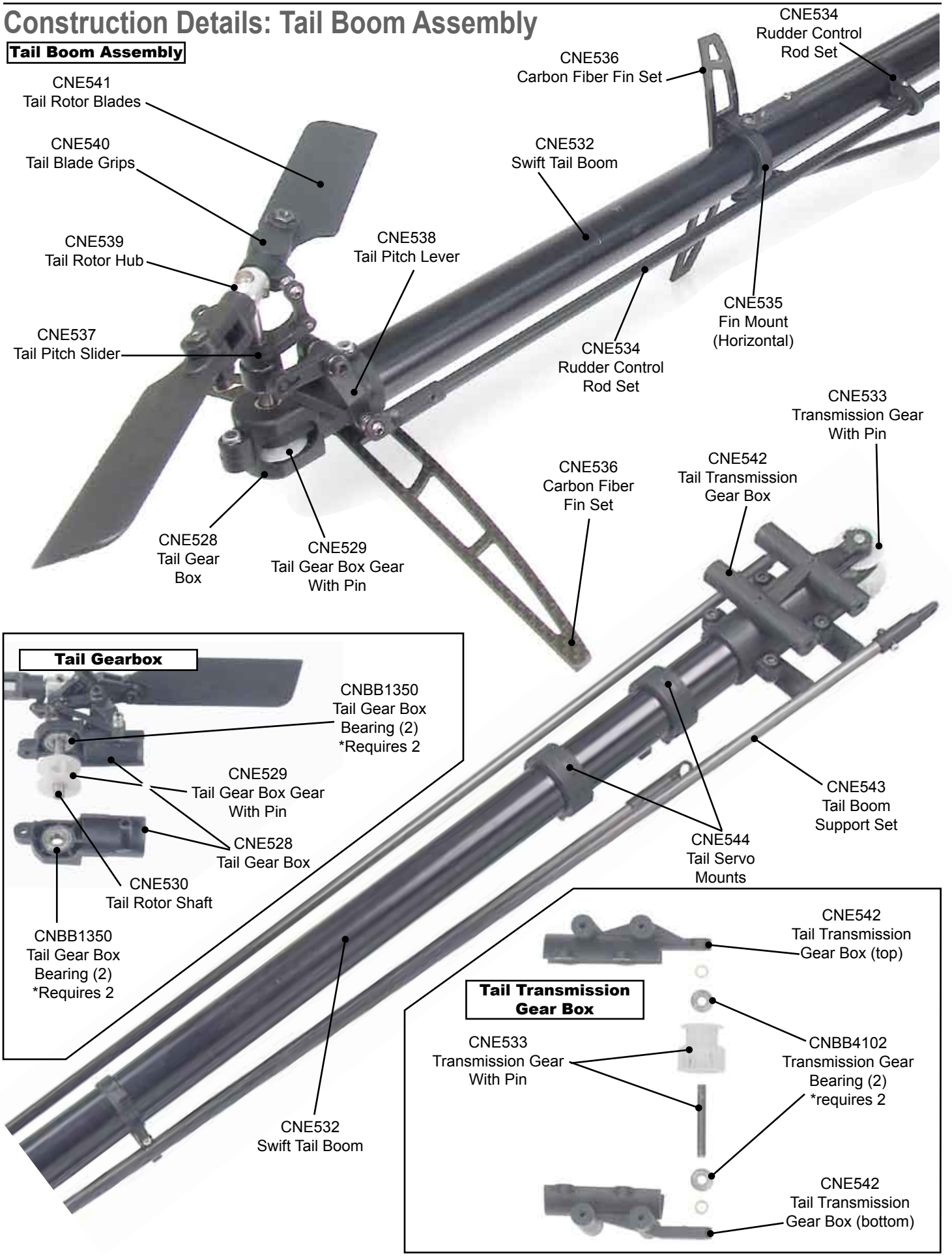
View: Right Side



Tail Drive Belt

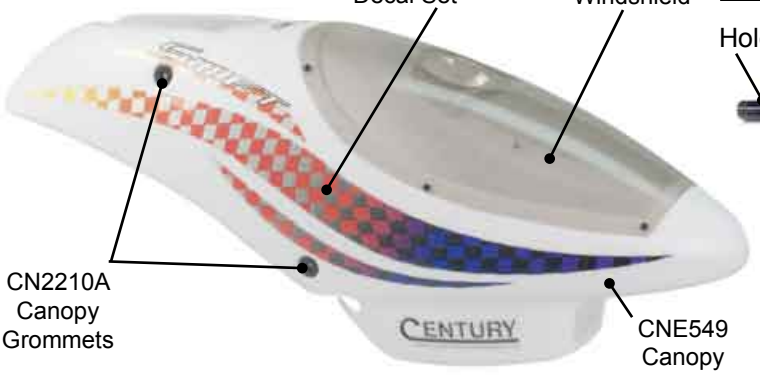


Construction Details: Tail Boom Assembly

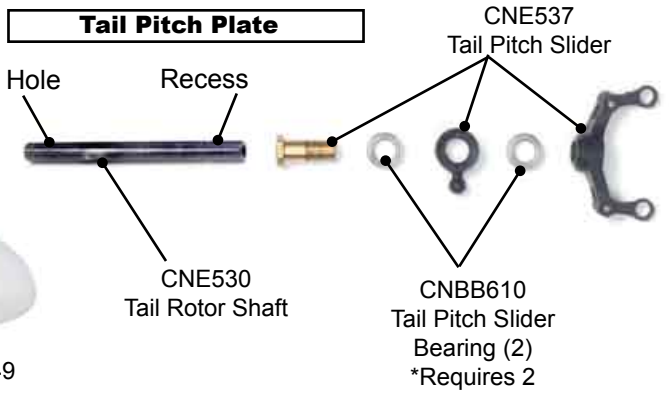


Construction Details: Sub Assemblies

Canopy & Decal

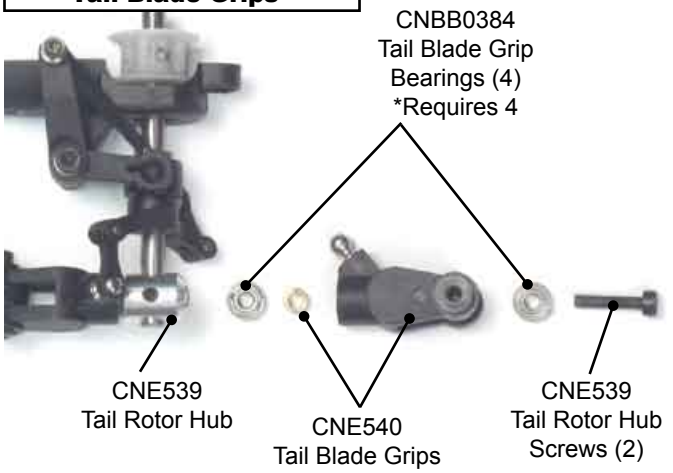


Tail Pitch Plate

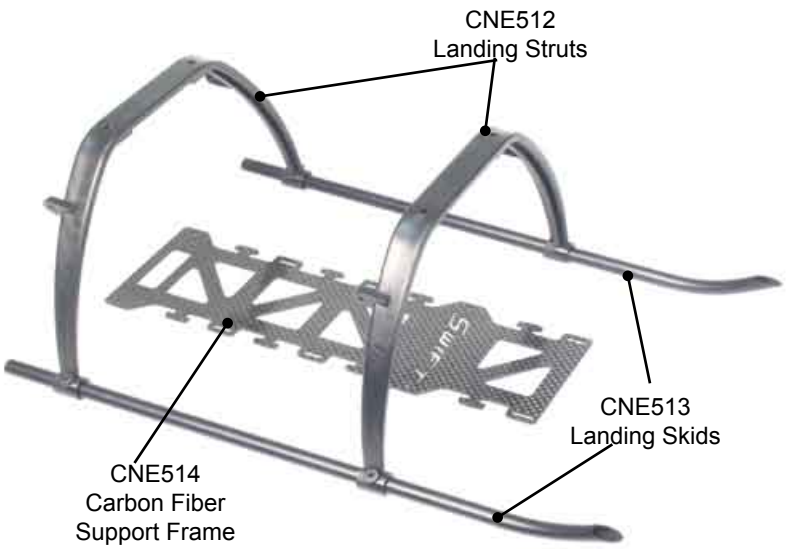


CCPM Bellcranks

Tail Blade Grips



Landing Gear



Tail Pitch Lever

Swift Replacement Parts

CNE501
Canopy Standoffs &
Grommets

CNE502
CCPM Bellcrank Set

CNE503
Main Frames
(Left and right)

CNE504
Motor Bottom Block

CNE505
Front Electronics Tray

CNE506
Anti Rotation Bracket

CNE507
Upper Bearing Block

CNE508
Main Shaft

CNE509
Lower Shaft Collar

CNE510
Main Gear With
Autorotation Hub

CNE510A
Main Gear Only

CNE510B
Autorotation Hub &
Bearing Only

CNE511
Upper Shaft Collar

CNE512
Landing Struts

CNE513
Landing Skids

CNE514
Carbon Fiber
Support Frame

CNE515
Swashplate

CNE516
Washout Assembly

CNE517
Head Block

CNE518
Seesaw Shaft

CNE519
Seesaw Assembly

CNE520
Black Rubber
Dampeners

CNE521
Feathering Spindle

CNE522
Main Blade Grip
Spacers

CNE523
Main Blade Grips

CNE524
Bell Mixer Set

CNE525
Flybar Control
Arms

CNE526
Flybar

CNE527
Flybar Paddles

CNE528
Tail Gear Box

CNE529
Tail Gear Box Gear
With Pin

CNE530
Tail Rotor Shaft

CNE531
Swift 16 Tail Drive Belt

CNE532
Swift Tail Boom

CNE533
Transmission Gear
With Pin

Swift Replacement Parts (Continued)

CNE534
Rudder Control
Rod Set

CNE535
Fin Mounts

CNE536
Carbon Fiber Fin Set

CNE537
Tail Pitch Slider

CNE538
Tail Pitch Lever

CNE539
Tail Rotor Hub

CNE540
Tail Blade Grips

CNE541
Tail Rotor Blades

CNE542
Tail Transmission
Gear Box

CNE543
Tail Boom
Support Set

CNE544
Tail Servo
Mounts

CNE545
Pushrod Set

CNE546
Ball Link Set
(22 Long, 4 Short)

CNE547
Elevator Servo
Spacers (2)

CNE548
520mm Main
Blades

CNE549
Canopy

CNE550
Windshield

CNE551
Decal Set

CNE552
M3x5x3.5 Spacers (10)
*Requires 7

CNE553
Rubber Battery
Clamps (4)
*Requires 4

CNE554
Swift Crash Kit

CNBB1030
Rotor Hub Bearing (2)
*Requires 2

CNBB364
CCPM Bell Crank
Bearing (4)
*Requires 4

CNBB364
Tail Pitch Lever
Bearing (4)
*Requires 2

CNBB0730
Seesaw Bearing (2)
*Requires 2

CNBB0384
Tail Blade Grip
Bearings (4)
*Requires 4

CNBB1350
Tail Gear Box
Bearing (2)
*Requires 2

CNBB614T2
Main Blade Grip
Thrust Bearing (2)
*Requires 2

CNBB814
Main Blade Grip
Radial Bearings (2)
*Requires 4

CNBB1019
Upper Bearing
Block Bearing (1)
*Requires 1

CNBB4102
Transmission Gear
Bearing (2)
*Requires 2

CNBB610
Tail Pitch Slider
Bearing (2)
*Requires 2

CNBB364
Bell Mixer Bearing (4)
*Requires 4