

Hawk Sport

Instruction Manual



SPECIFICATIONS

⇒ Main Rotor Diameter	49.5 in.
⇒ Tail Rotor Diameter	9.3 in.
⇒ Overall Length	46 in.
⇒ Height	16.2 in.
⇒ Engine	32 ~ 38
⇒ Ball Bearings	31

Century Helicopter Products

Designed and Developed in USA

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Introduction

Congratulations on your purchase of Century Helicopter Product's latest version of our HAWK series RC helicopter model. The HAWK Sport helicopter is not only ideal for beginners new to the hobby, but also for the intermediate 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. The expert to 3D flyers would certainly be using a good 8 to 10 channel helicopter radio. You may wish to check with us or your local dealer for compatible components.

Warning

This radio controlled model is not a toy! It 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 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.

Pre-assembly Information

Upon opening the kit, all the major component parts are packaged in numbered bags to correspond to specific sections of the manual, greatly facilitating assembly. 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. However mistakes do happen, if there is a parts shortage or any hardware missing, please feel free to contact us at:

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Necessary Items "Not Included" in the kit.



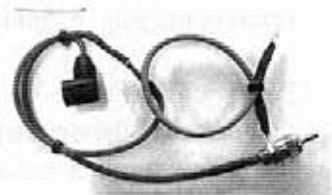
6 Channel Helicopter Radio or Equiva-



PG2000 II dual rate piezo gyro
CN2018 (or equivalent)



32-38 Helicopter Engine



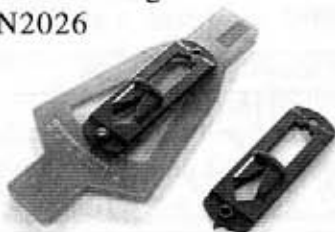
Remote Glow Adapter
CN2222



*Optional Tune Muffler
#CN3033

Necessary Tools for Assembly and Adjustments

Main Blade Pitch Gauge
w/Paddle Gauge
#CN2026



Needle Nose
Plier & Cutter
Pliers



15% or 30%
Heli Fuel



12Volt Start Battery



12 Volt
Starter

5.5mm & 7mm nut
drivers, Phillips Screw
Driver, 3mm & 4mm hex
drivers



4 Way
Wrench
#CN2031



Ball Link
Plier
#CN2034



Metric
Ruler



Fuel
Line



Glow Driver w/Charger



Electric or Hand
Fuel Pump

Hobby
Scissors



Whip Antenna



Fuel Filter



Glow Plug



CN2024T
Lubrication

Tie-
Wraps



Loctite
CN2025B



Servo Tape



Allen Key Set CNBN10946



Hobby Knife













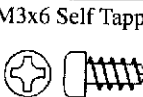
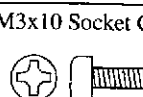
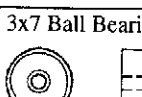


Hawk Sport Construction Manual

This manual has been written for the Hawk Sport helicopter kit CN1000B. This instruction manual covers the full step by step construction of the kit as a supplement to the Quick Start Guide. The Hawk Sport 80% assembled helicopter can be assembled in just 3 hours by simply following the Quick Start Guide and referencing this manual on steps that are more complicated.

Every attempt has been made to ease the assembly of your kit, at each step where there are complex assemblies you can read the detailed description here while following the pictures in the Quick Start Guide. Remember to take a few minutes before each step to carefully examine the step in order to become familiar with the parts and assembly sequence before beginning that step.

Symbols used to help assist you in building the kit:

 Full Scale Drawing	 Repeat Steps as specified	 Partially tighten	 Helpful Tip
 Apply oil	 Apply threadlock	 Purchased Separately	 Cut away Shaded Portion
 Special Attention	 Apply JB Weld	 Apply Grease	
Tip 1 Remove oil residue from fasteners before applying any threadlock agent.	Tip 2 Tap holes with machine screws before installing steel balls in plastic.	Tip 3 Tap holes with machine screws before installing self tap screws in plastic.	Tip 4 Tap holes with machine screws carefully in plastic holes with bottoms.
Hardware Description and Identification:			
M3x6 = 3x6mm and can refer to screws or ball bearings.			
 M - metric 3 - diameter 6 - length	 M - metric 3 - diameter 6 - length	 M - metric 3 - diameter 6 - length	 M - metric 3 - inside Ø 6 - outside Ø

Recommended Tools & Accessories

The tools and materials listed below are the minimum needed to build the helicopter:

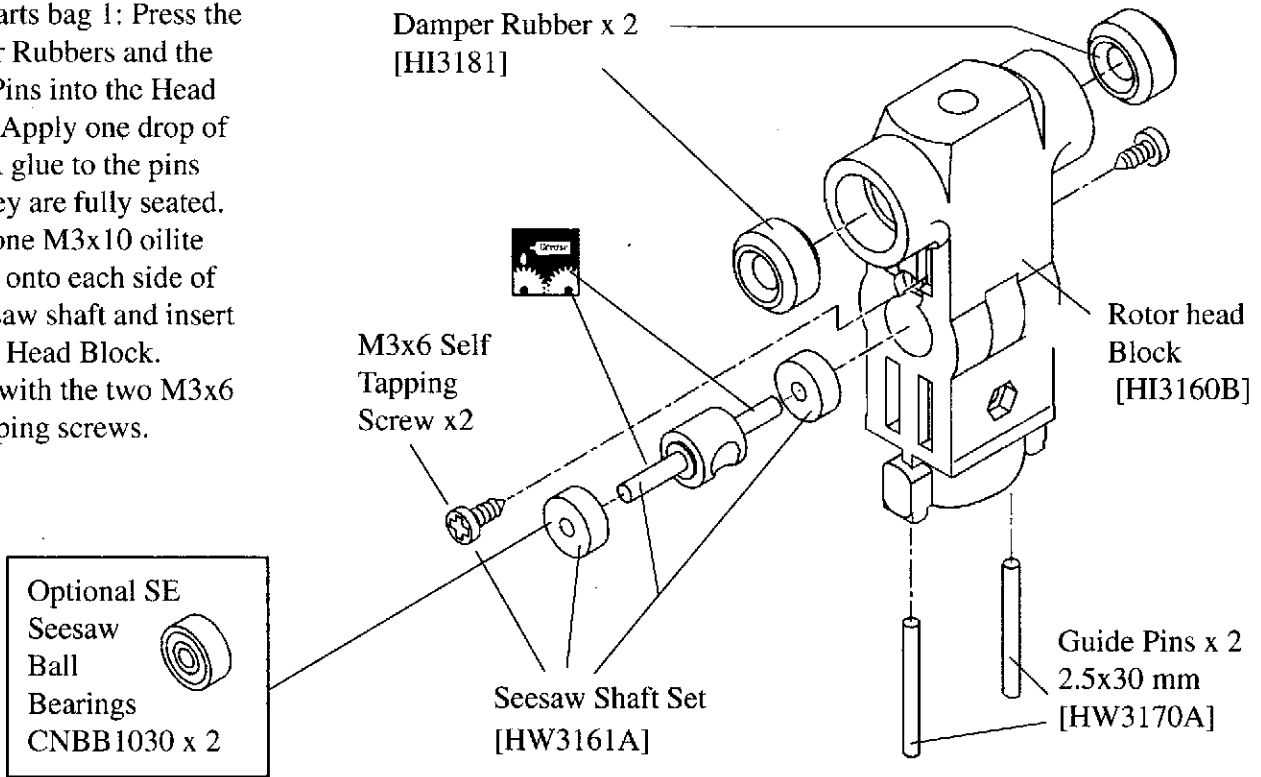
Screwdrivers - Slotted and Phillips head.
 Long-Nosed Pliers.
 Allen Wrenches - 1.5mm, 2.0mm, 2.5mm.
 (supplied in kit) + 3.0mm
 Appropriate Socket Wrench
 (glow plug wrench for engine shaft nut)
 Hobby Scissors
 Double Sided Foam Tape (1/16" - 3/32")
 Foam Rubber (radio packing)
 JB Weld (bond clutch lining)
 Thread lock liquid (e.g. Locktite)
 Hobby Grease (Super Lube)
 Oil to lubricate sliding shafts.
 "Y" Harness for 4 Ch Airplane Radio with 5 servo

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

Part#CN2015 Hardened Tip Hex Screw Driver Set
 Part#CN2026 Pitch Gauge with Paddle Gauge.
 Part#CN2034 15° Curve Tip Ball link Pliers.
 Part#CN2052 Main Blade Balancer.
 Part#CN2054 Special Glow Plug Wrench Set.
 Part#CN2055 Ball Link Sizing Tool.
 Part#CN2070 Universal Flybar Lock.
 Part#CN2155 Piston Locking Tool.
 Part#CN2219 Ball Link Easy Driver.
 Part#CN2255 Control Rod Gauge.
 Part#CNWI26555 5.5mm Nut Driver.
 Part#CNWI26570 7.0mm Nut Driver..

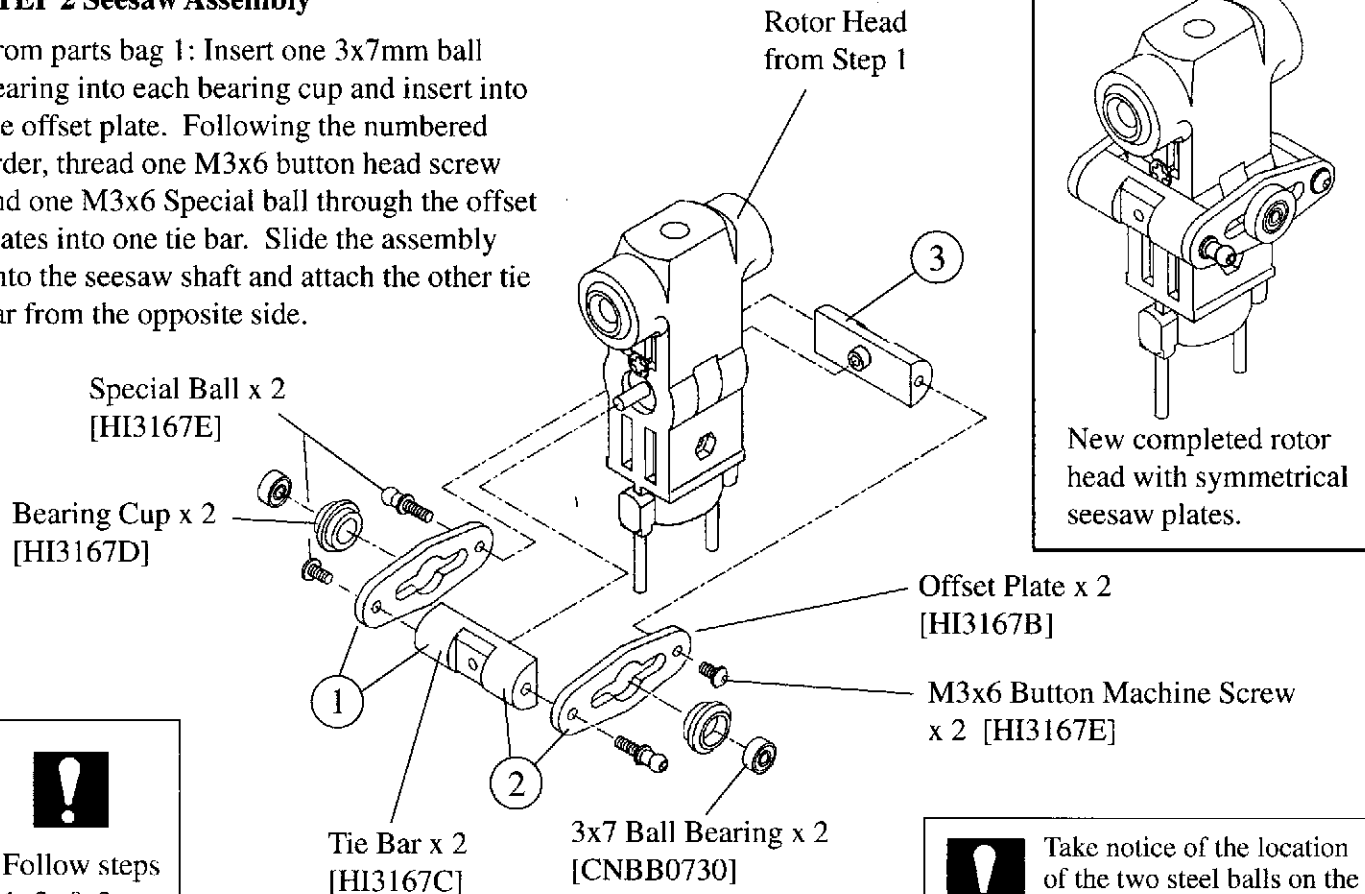
STEP 1 Main Rotor Head

From parts bag 1: Press the Damper Rubbers and the Guide Pins into the Head Block. Apply one drop of thin CA glue to the pins after they are fully seated. Install one M3x10 oilite bearing onto each side of the seesaw shaft and insert into the Head Block. Secure with the two M3x6 self tapping screws.



STEP 2 Seesaw Assembly

From parts bag 1: Insert one 3x7mm ball bearing into each bearing cup and insert into the offset plate. Following the numbered order, thread one M3x6 button head screw and one M3x6 Special ball through the offset plates into one tie bar. Slide the assembly onto the seesaw shaft and attach the other tie bar from the opposite side.



Follow steps 1, 2, & 3.

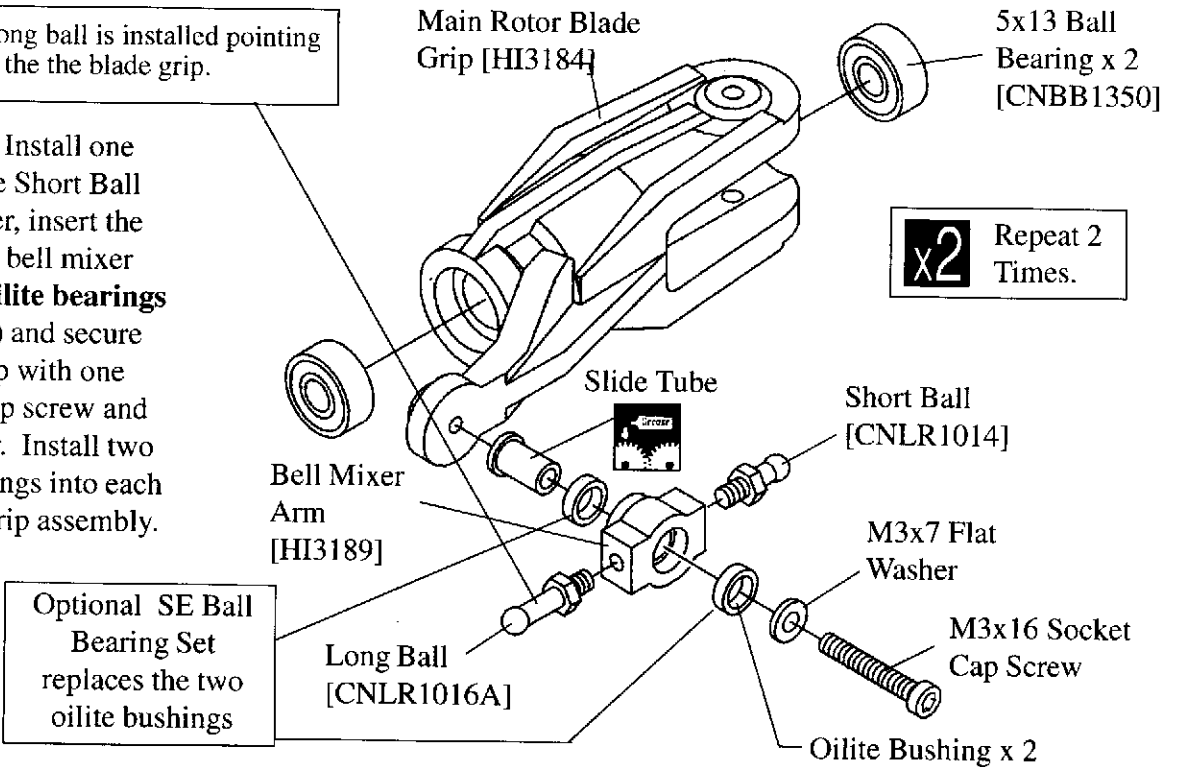


Take notice of the location of the two steel balls on the offset plates.

STEP 3 Main Blade Grip Assembly

! Note, the long ball is installed pointing away from the the blade grip.

From parts bag 1: Install one Long Ball and one Short Ball into the Bell Mixer, insert the slide tube into the bell mixer arm (**Note: the oilite bearings are pre-installed**) and secure onto the blade grip with one M3x16 Socket Cap screw and M3x7 Flat washer. Install two M5x13 Ball Bearings into each end of the blade grip assembly. Complete the second blade grip in exactly the same way.

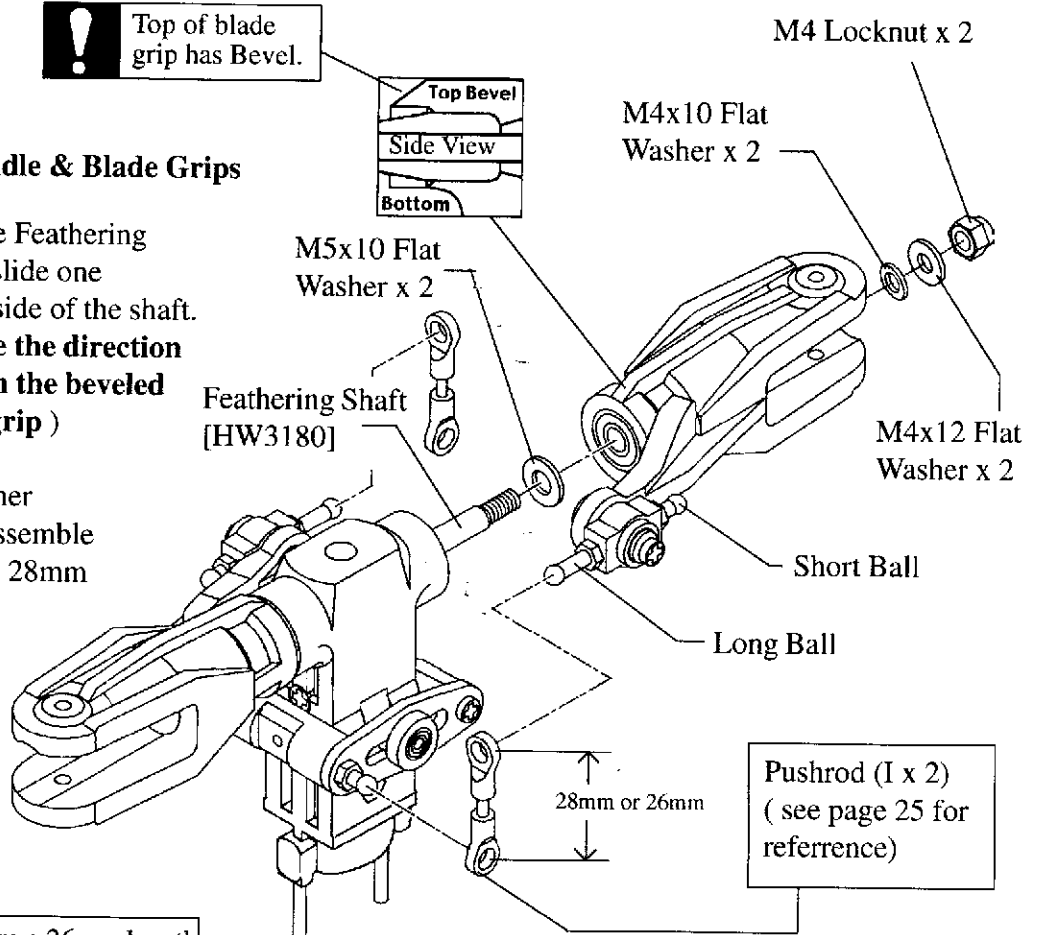


Optional SE Ball Bearing Set replaces the two oilite bushings

! Top of blade grip has Bevel.

STEP 4 Feathering Spindle & Blade Grips

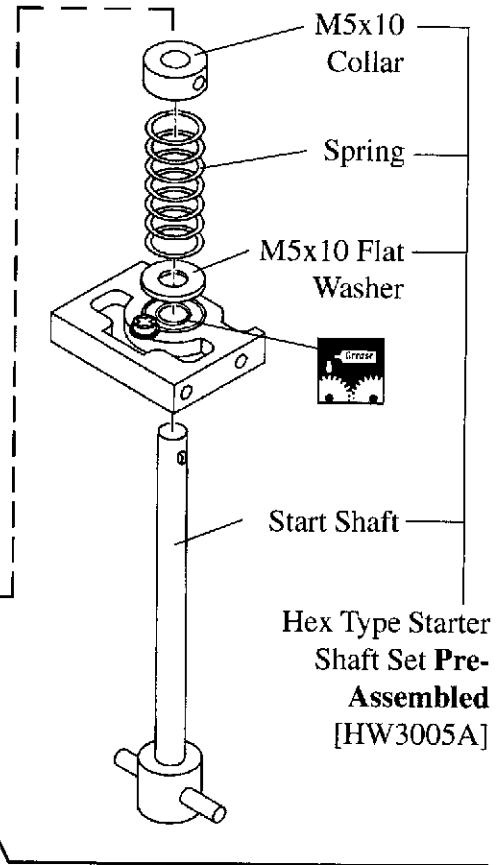
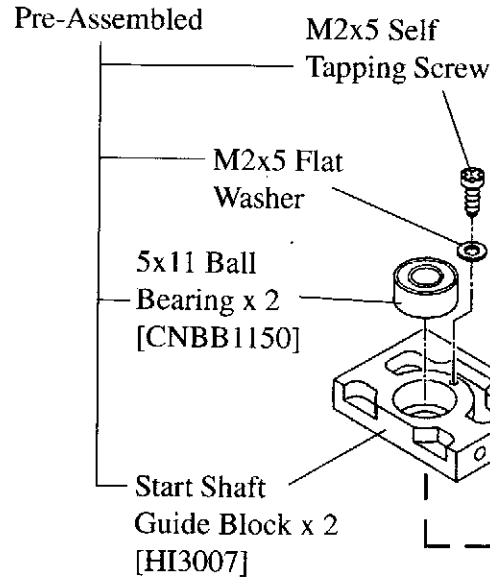
From parts bag 1: Insert the Feathering Shaft into the head block, slide one 5X10mm Washer on each side of the shaft. Install the blade grip (**Note the direction of the bell mixer arm with the beveled edge on top of the blade grip**) followed by one 4x10mm Washer, one 4x12mm Washer and one 4mm Locknut. Assemble Pushrod "T" x 2, measuring 28mm center to center distance following the table on page 25, and connect the seesaw ball to the long ball on the bell mixer.



! Pushrod "T" will require a 26mm length for a 3D setup - see page 25.

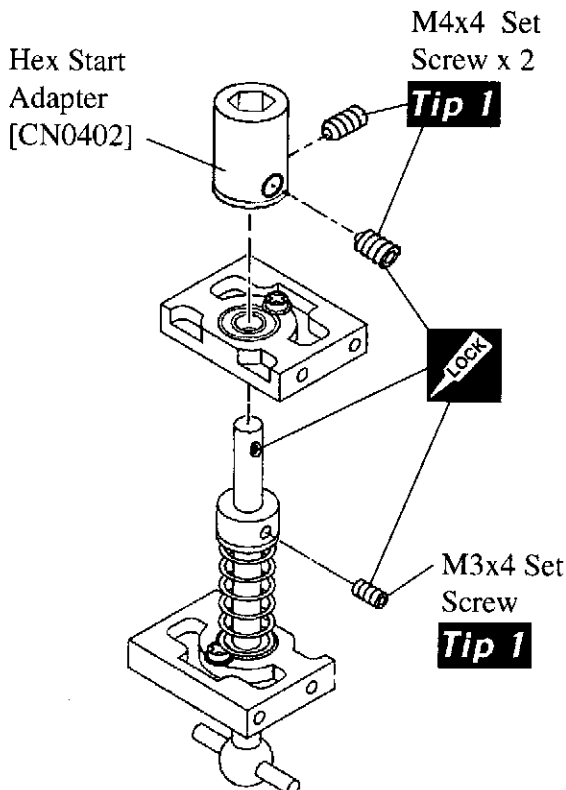
STEP 7 Starting Shaft Bearing Blocks

From parts bag 2: the Start Shaft Guide Blocks are pre-assembled. Slide the Starter Shaft through one of the block assemblies with the M5x11 Ball Bearing facing up then slide the M5 flat washer, spring and finally the M5x10 Collar



Hex Starter Extension (Optional Part#CN0426)

STEP 8 Engine Start Shaft



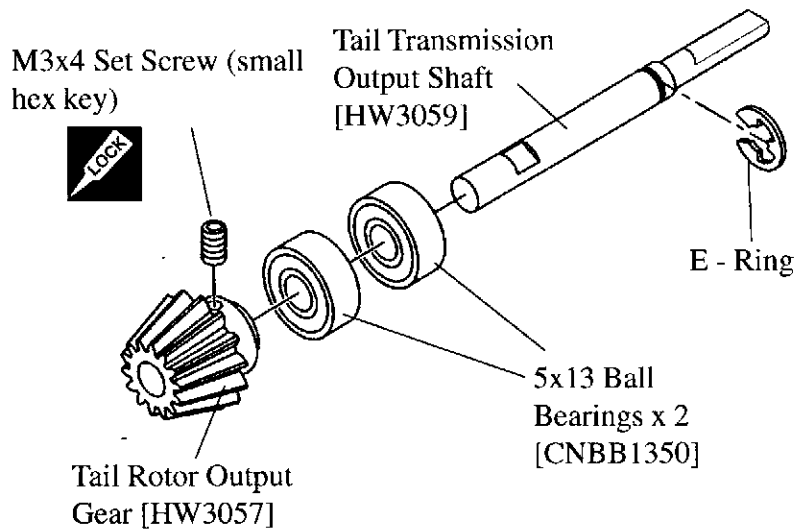
From parts in bag 2: After sliding the top bearing block in place, attach the hex start adapter to the starting shaft HW3005A using threadlock on both the shaft and the **two M4x4 set screws**. Align one set screw to fit into the machined indentation in the hardened start shaft. Apply some lubricant on the shaft after assembly to ensure smooth vertical movement inside the inner races of the bearings when engaging and disengaging of the start system.

Tip When removing the hex start wand after the engine is started, it is recommended that you use a two step procedure.

- #1: Lift the hex wand upwards just enough to disengage the start system while keeping the wand inserted in the hex coupler (CN0402).
- #2: After the coupler has stopped turning, then remove the wand from the hex coupler.

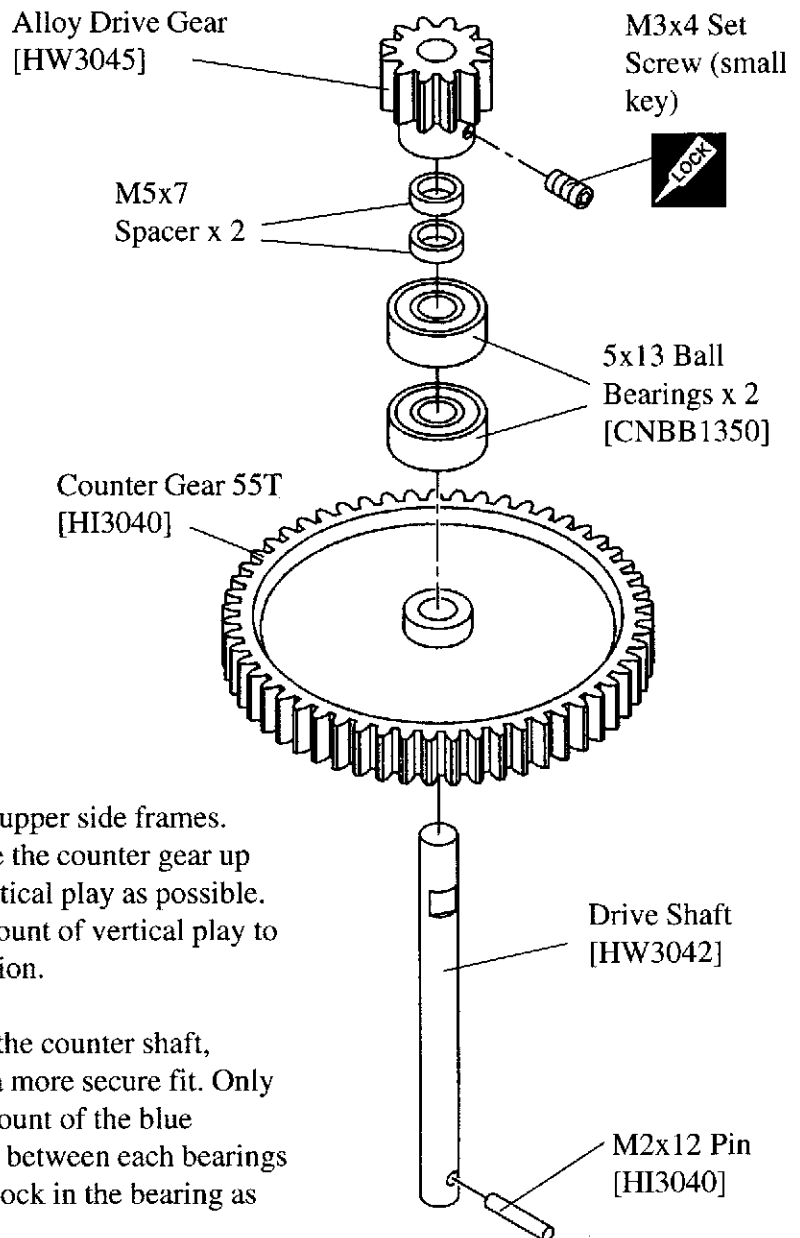
STEP 9 Tail Transmission Output Gear

From parts bag 2: Assemble the Tail Transmission Output Gear assembly. Install the E-Ring (be careful not to lose it, it can easily spring away during installation). Slide the two Ball Bearings onto the front of the Tail Rotor Output Shaft. Using threadlock, insert one 3x4mm Set Screw into the gear, Note where the flat spot is on the shaft, slide the gear on and tighten the set screw (**Make sure the set screw is positioned over the flat spot**).



STEP 10 Counter Gear Assembly

From parts bag 2: Assemble the engine drive gear assembly. Start by inserting the guide pin into the hole in the end of the Drive Shaft. Insert the shaft through the Counter Gear (make sure the pin is fully seated in the recessed slot at the bottom of the gear) then slide the two M5x13 Ball Bearings followed by the two M5x7 spacers. Using locktite, insert one 3x4mm Set Screw into the Alloy Drive Gear, then slide the gear onto the shaft taking care to position the set screw over the flat spot on the shaft. Secure the drive gear to the shaft.



! Careful setup in the drive train will ensure trouble free operation.

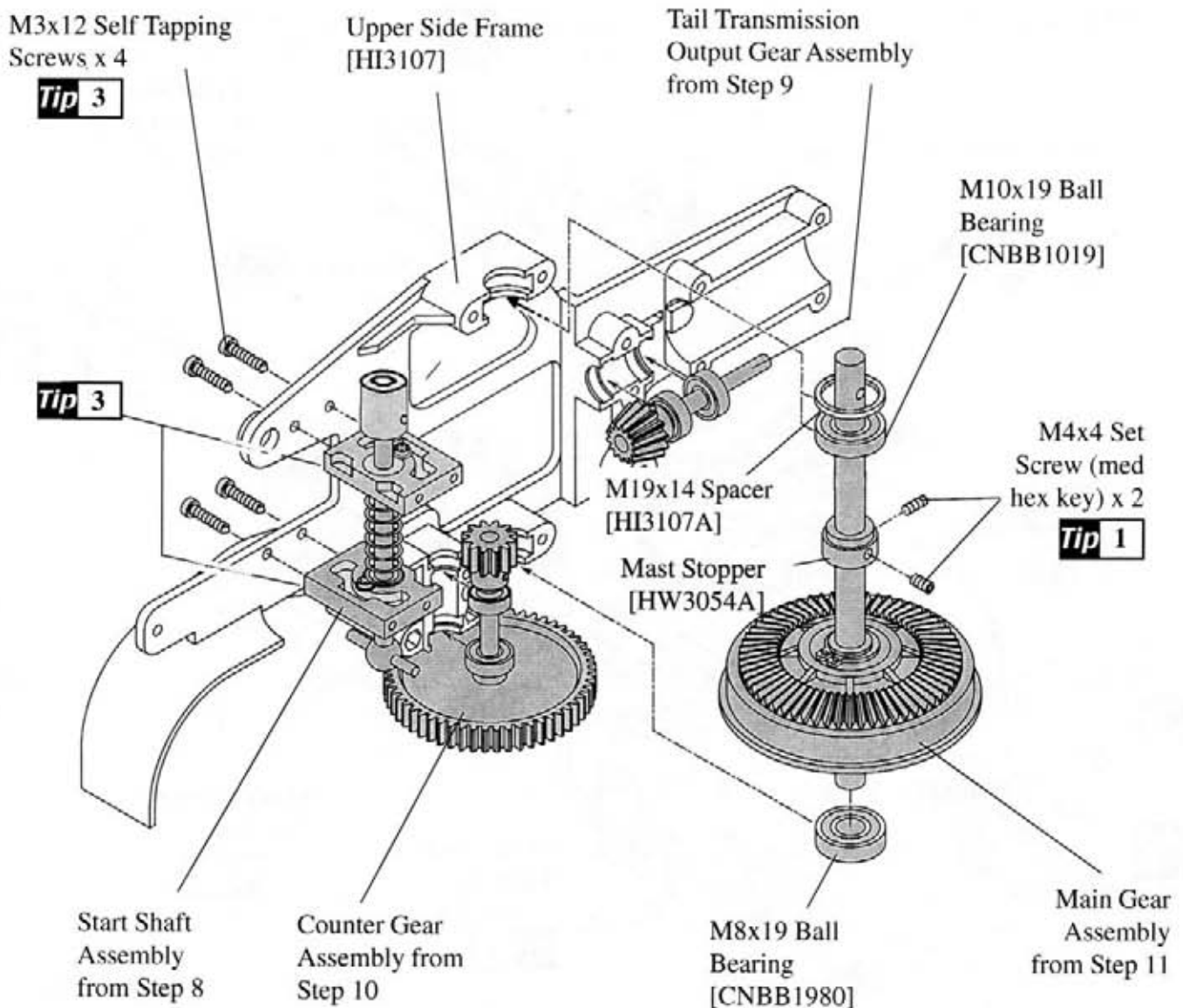
Test fit the gear assembly into one half of the upper side frames. While holding the alloy drive gear, try to slide the counter gear up and down on the shaft. Adjust for as little vertical play as possible. It is normal and necessary to have a small amount of vertical play to allow for expansion due to heat during operation.

A small amount of red locktite to the top of the counter shaft, between it and the pinion gear will make for a more secure fit. Only use blue locktite on the set screw. A small amount of the blue locktite can be applied carefully on the shaft between each bearings and the shaft. **Warning**, do not get any shaftlock in the bearing as damage to the bearing may result.

STEP 13 Upper Side Frames

From parts bag 2: Install two M4x5 Set Screws (*note-do not apply locktite at this time*) into the Mast Stopper (*note that the raised inner diameter must face the ball bearing*) and slide the mast stopper on the main shaft followed by one M10x19 Ball Bearing and one M14x19 Spacer (*the spacer must be installed on top of the bearing*). Slide one M8x19 Ball Bearing from the bottom of the main shaft.

Attach the starter shaft assembly to the left side upper side frame with four M3x12 Self Tapping Screws (*Tip 2- observe the correct orientation of the block assemblies*). Position the main gear/main shaft assembly, (*note the orientation of the mast stopper, the raised inner diameter should be facing upward, towards the inner race of the top bearing*) the counter gear assembly and the tail transmission output shaft assembly in their designated locations (see diagram below) on the upper right side frame (*make sure the bearings are fully seated in the recesses*).

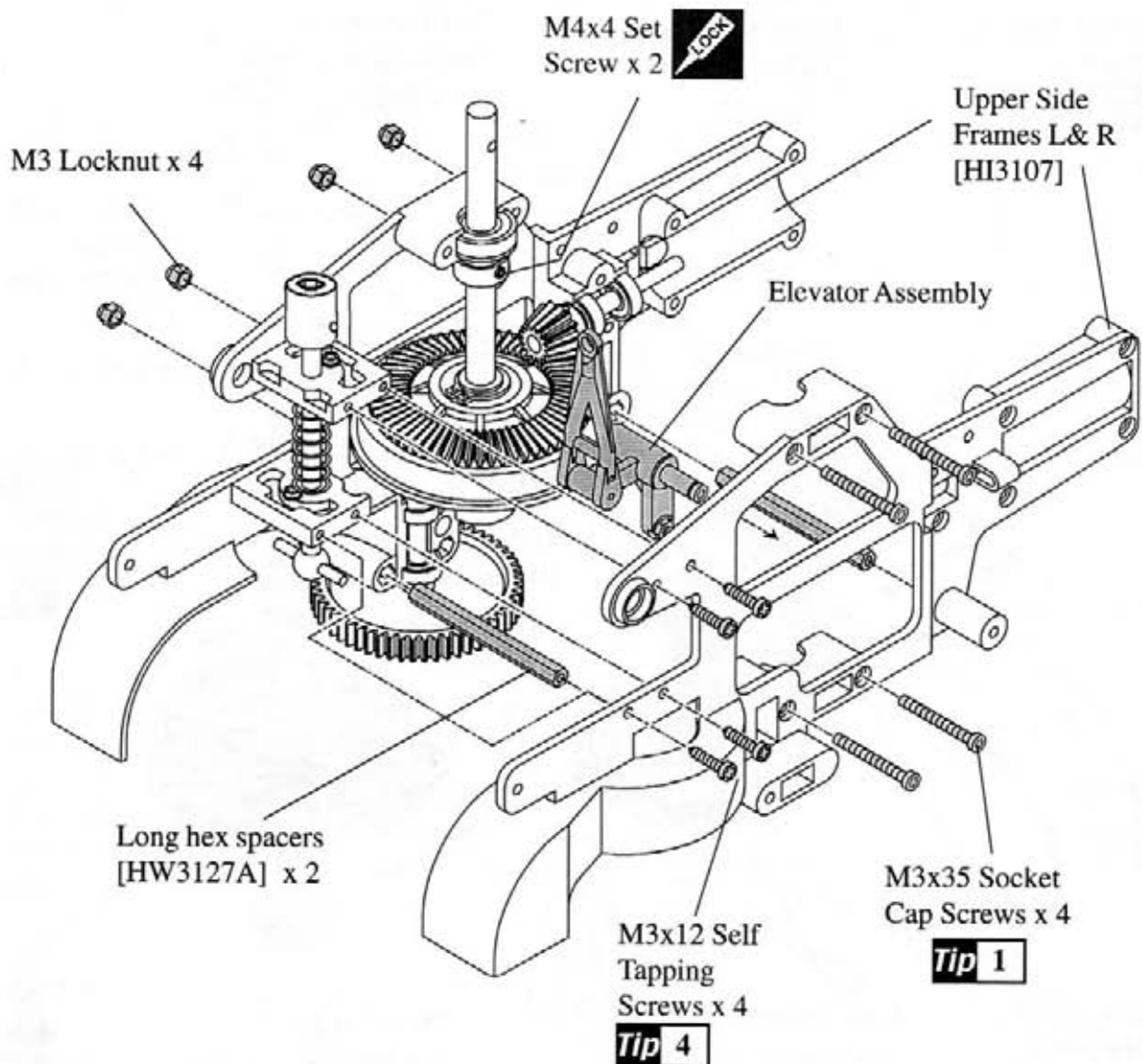


Tip 3 Be careful when tightening the eight 3x12mm self tapping screws into the start shaft block assemblies as excessive force can strip the plastic holes.

STEP 14 Upper Frame Assembly

From parts bag 2: Insert the two long Hex Spacers at the specified locations in the diagram (**note: the front hex spacer is installed into the forward-most hole**). Install the upper left side frame, taking care that the bearings are aligned with the mating recesses and secure the frames with four M3x35 Socket Cap Screws (**Tip 1-do not use threadlock when using locknuts**) through the main shaft bearing block positions and four M3 locknuts. It is advised to position the elevator assembly between the side frames at this time in order to reduce the amount of installation positioning later.

While pushing down on the main shaft (make sure the main gear rotates freely), push the mast stopper against the upper ball bearing insuring that the side of the stopper with the raised inner portion is facing upwards, Apply threadlock to the set screws and tighten in place. Attach the remaining four 3x12mm Self Tapping Screws (**Tip 4**) to the starting shaft blocks.

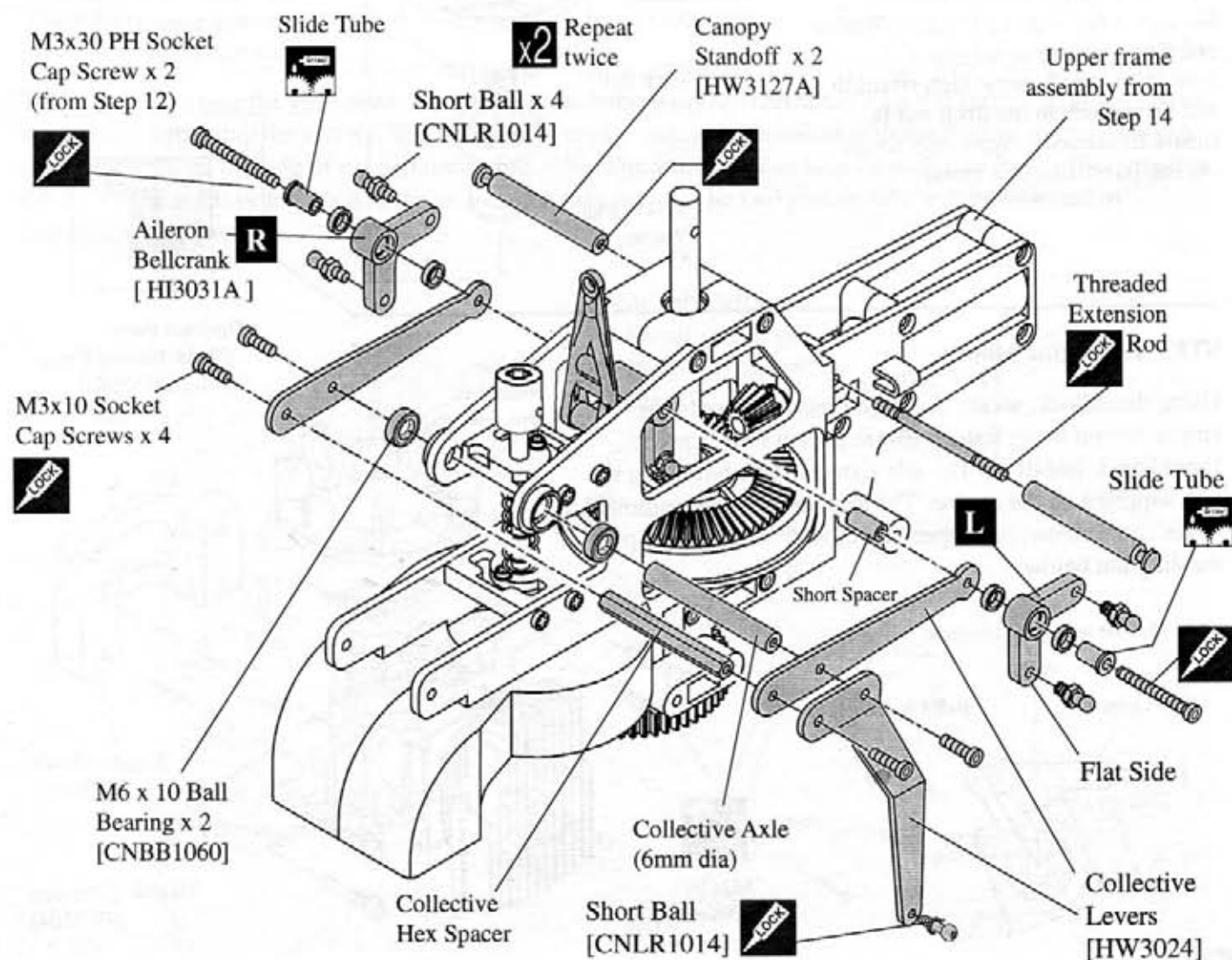


! The gear mesh between the main gear and the tail transmission output shaft may be a snug fit at first, but it will become smooth after a few flights. This is the normal wear in process.

STEP 15 Collective and Aileron Levers

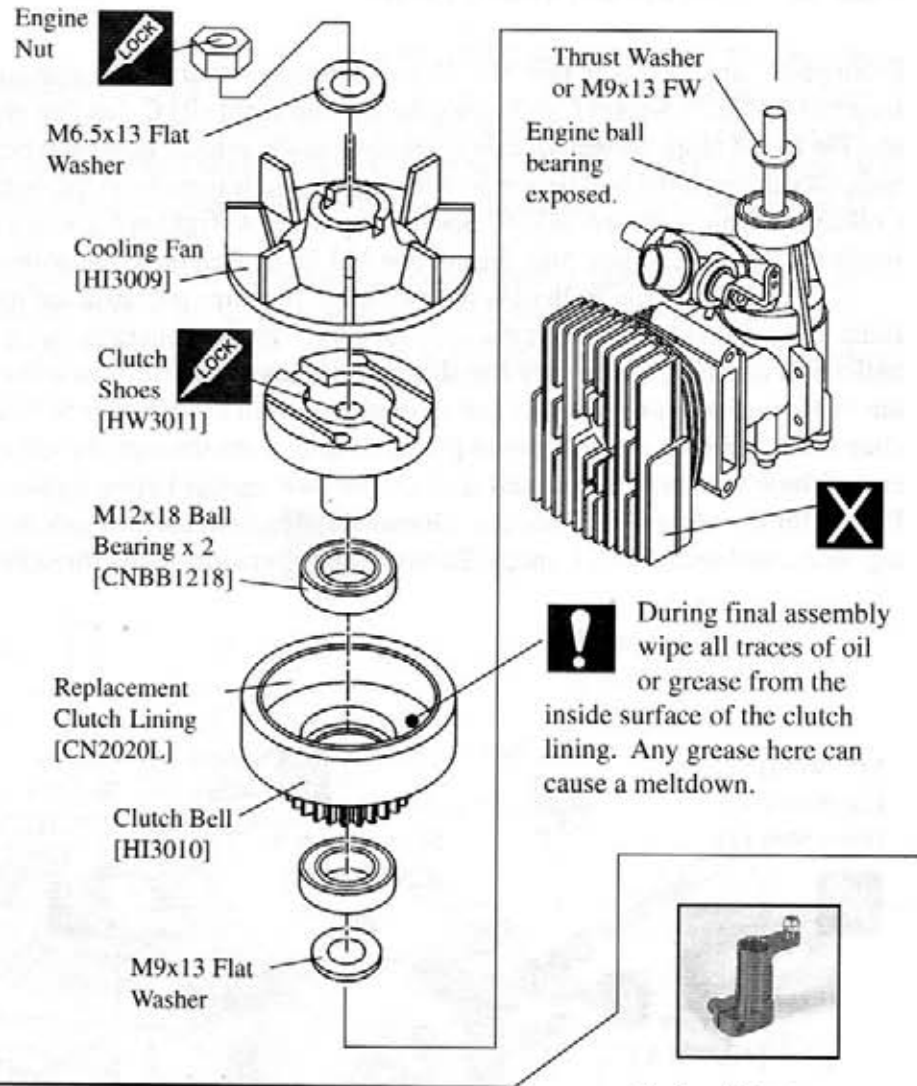
From parts bag 2: Press in two M6x10 ball bearings into the front side frames for the collective axle. Insert two M3x10 Socket Cap Screws through the right (R) Collective arm and attach the collective axle (notice that the round 6mm collective axle is attached at the middle hole) and hex spacer using threadlock. Slide the assembly through the ball bearings in the upper side frames from the right. Using threadlock attach the Left Collective Arms with two M3x10 Socket Cap Screws. Tighten the screws insuring the collective lever moves freely with no side to side play. Install one M3 Short Ball on to the collective lever using threadlock.

The left Aileron Bellcrank has two oilite bearings pre-installed into the bellcrank, install the two Short Balls to the flat side and insert the slide tube through the bellcrank using a small amount of lubricant (**the bellcrank is offset, make sure the slide tube is inserted from the offset side**). Starting on the left side, remove the 3x30mm Socket Cap Screw and short spacer from the elevator bellcrank (previously assembled in Step 12), slide the left aileron assembly onto the screw and insert through the left collective lever. Apply threadlock to the end of the screw threads now and slide on the short spacer before tightening into the elevator bellcrank axle. Repeat for the other side. Slide one Threaded Extension Rod through the upper position of the tail output bearing recess and secure two Canopy Standoffs (one per side) using threadlock.



STEP 16 Clutch, Fan & Engine Mounting

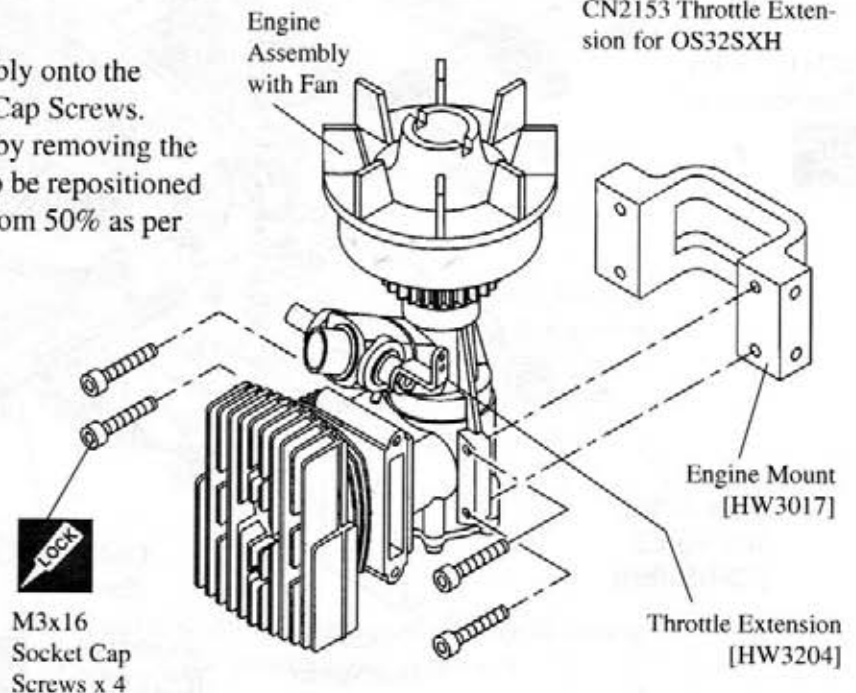
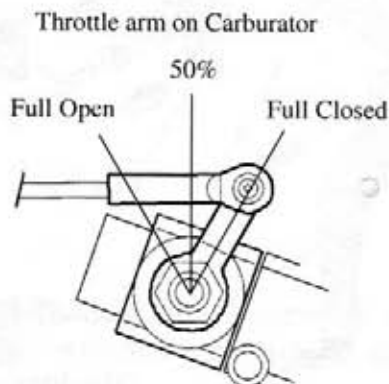
From parts bag 3: Remove all parts from the engine crankshaft until you can see the front ball bearing. Install the M9x13 Flat washer (or washer provided by engine manufacturer), insert the Ball Bearings into the clutch bell assembly and place on the crankshaft. Clean the threads on the crankshaft and on the clutch, carefully apply blue threadlock on the last 6mm of crankshaft threads nearest the bearing (be careful not to get threadlock into the ball bearings) and on the threads in the clutch. Thread the clutch onto the crankshaft until the crankshaft can be seen through the top. Insert the fan, keying it to the clutch. Wrap a cloth over the fan (provides grip to the fan without breaking the fins) and tighten until the clutch stops, torque an additional 1/16 of a turn. [CN2155 Optional Parts] makes this easier. Secure the fan with the M6.5x13 Washer and the engines prop nut onto the crankshaft. **Apply some high strength red threadlock to the prop nut to insure its security** Again only torque the nut 1/16th of a turn more.



(Optional Parts)
CN2153 Throttle Extension for OS32SXH

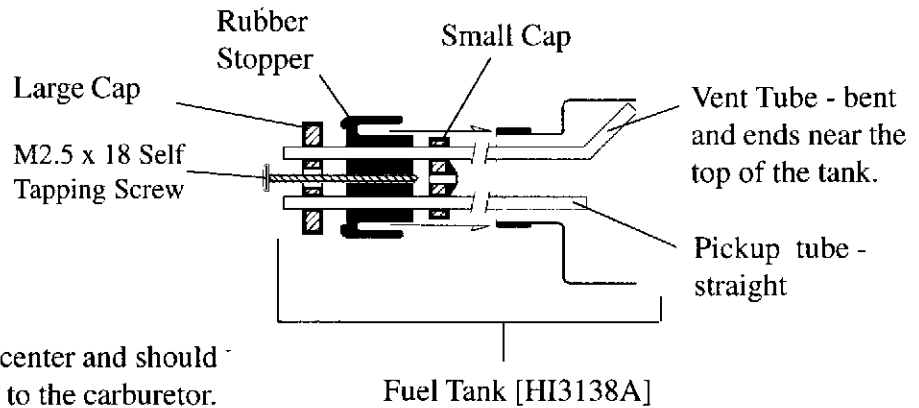
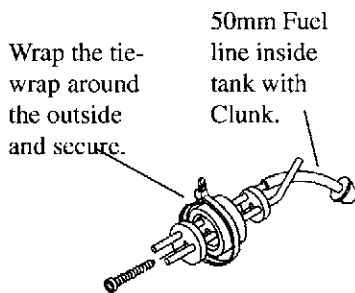
STEP 17 Engine Mount

Using threadlock, secure the engine assembly onto the engine mount using four 3x16mm Socket Cap Screws. From bag 4, install the Throttle Extension by removing the arm supplied on the engine. The arm has to be repositioned to get equal throw, both open and closed from 50% as per the diagram below.



STEP 18 Fuel Tank & Fittings

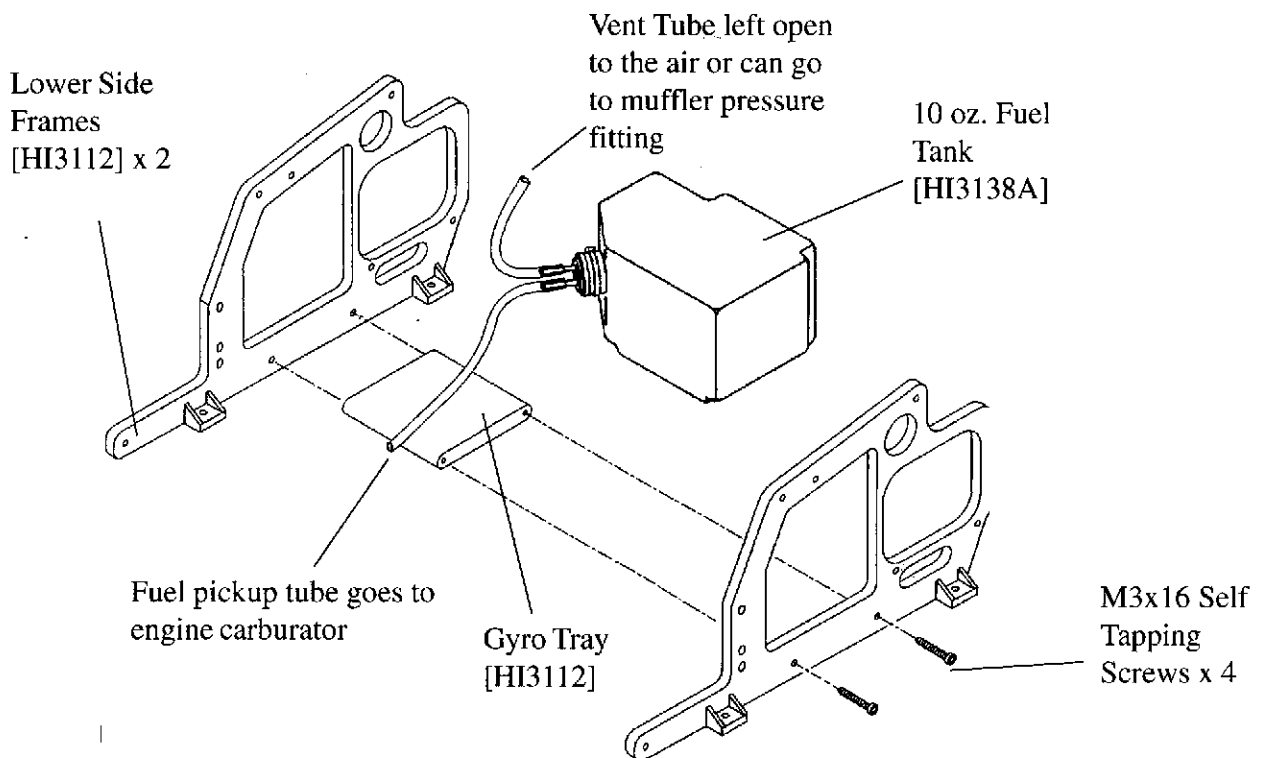
From parts bag 3: Insert the two pieces of aluminum tubing through the large cap, rubber stopper and small cap, bend the long aluminum vent tube upwards (make sure the tube comes to the top of the fuel tank) and attach the short piece of fuel line and clunk to the short straight piece of tubing. Test fit the assembly into the Fuel Tank and make sure that the clunk reaches to about 1/8" from the back of the tank and can move around freely. Insure the vent tube is near the top of the tank but does not touch it. Install the tie wrap around the outside of the rubber cap. Finally tighten the long self tapping screw to seal the tank.



Note: The fuel tank opening is off-center and should be installed upwards to align closer to the carburetor.

STEP 19 Lower Frame Assembly

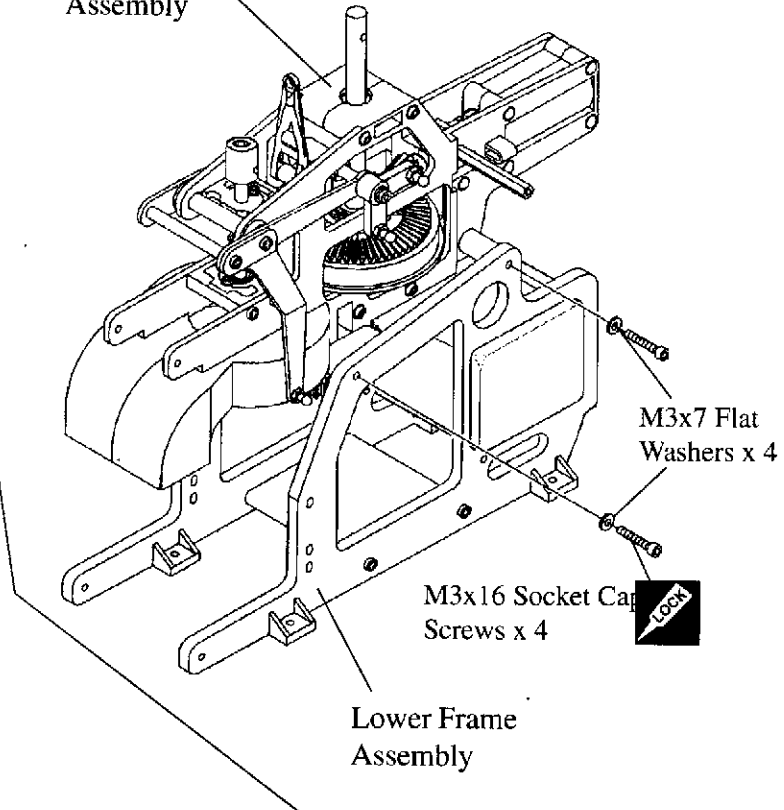
From parts bag 3: Slide the Fuel Tank into position and assemble the Lower Frames with four M3x16 Self Tapping Screws into the gyro plate. **NOTE:** Lay the bottom of the sideframes on a flat surface to align the two sides when tightening the screws. The fuel tank opening should be installed with the fittings on the right side to insure they are on the side of the carburetor fuel inlet. The vent tube can later be plug into the muffler pressure fitting (see step 23) or left open to the air as some may prefer. The fuel pickup tube will be attached to carburetor. (see step 21)



STEP 20 Upper & Lower Frames

Using threadlock, attach the lower frame assembly to the upper frame assembly with four M3x16 Socket Cap Screws and four M3x7 Washers.

Upper Frame Assembly

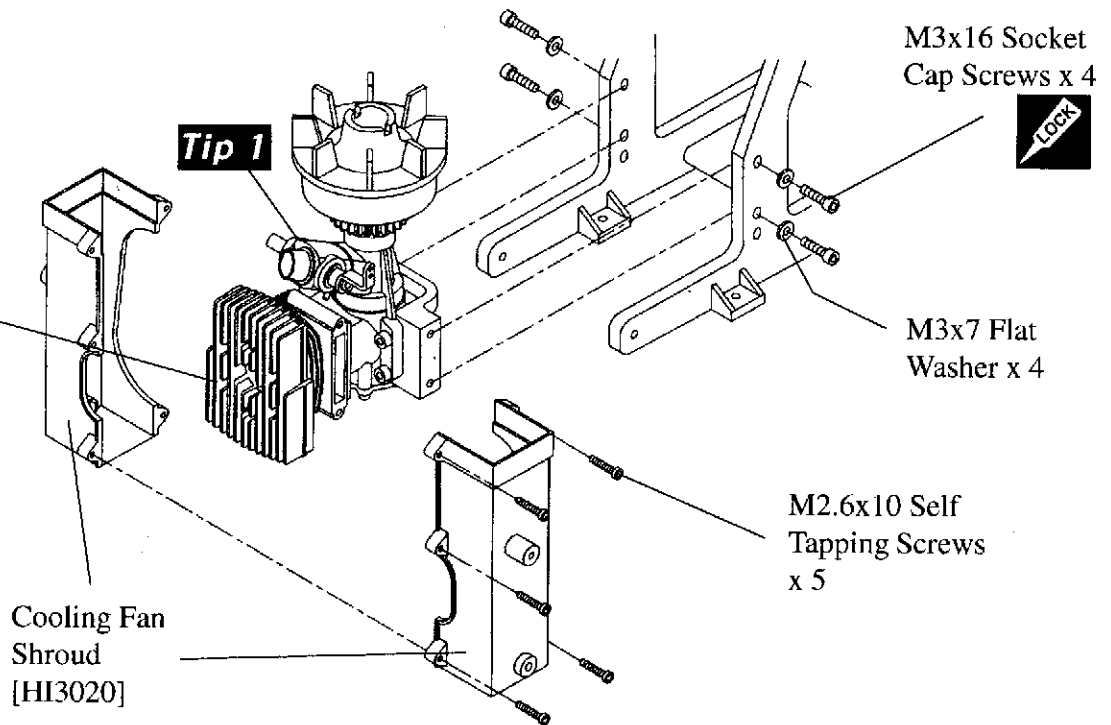


STEP 21 Engine Cooling Fan Shroud

Assemble the Lower Cooling Fan Shroud over the head of the engine using parts from bag 3. Assemble the two halves using the five M2.6x10 Self Tapping Screws. Loosely install the engine assembly into the lower side frames using four 3x16mm Socket Cap Screws and four 3x7mm Large Flat Washers. Position the lower shroud to overlap the upper shroud, adjust the engine height by sighting from the side. Slide the engine upwards until the clutchbell gear is properly meshed with the counter gear, then threadlock the screws in place. At this time, plug the fuel line to the carburator (**Tip 1** -installing a fuel filter between tank and carburator will help prevent any fuel contamination from entering the carburator and causing engine failure). Now check the starting shaft, loosen the collar and adjust its height to insure the start shaft can fully disengage from the cooling fan. **NOTE:** use threadlock on set screws of collar.

Engine Assembly installed onto mount.

Tip 1

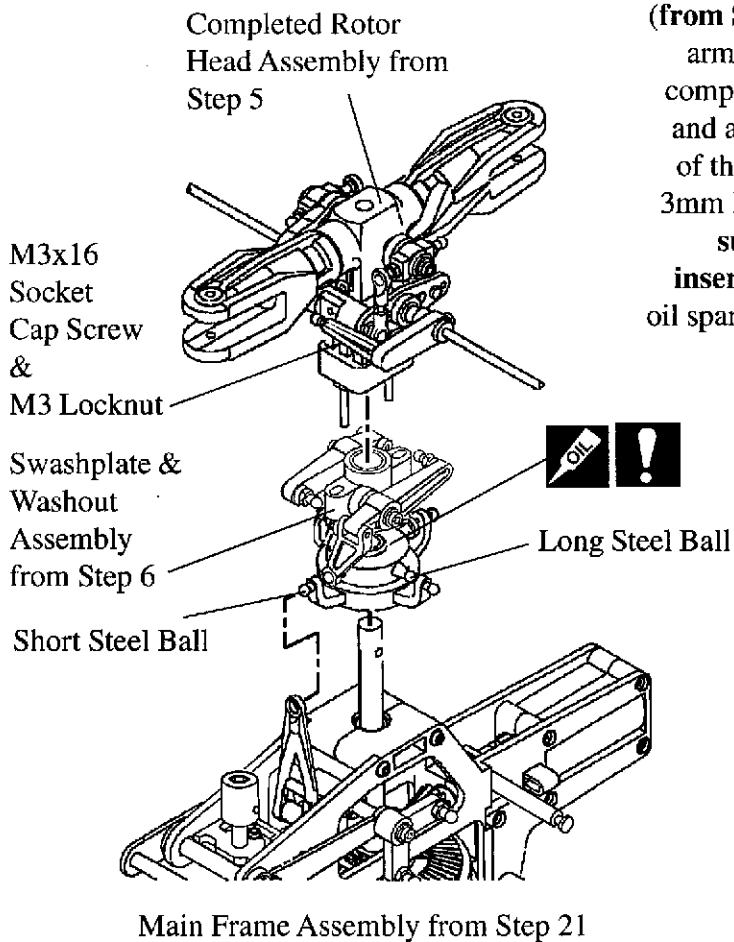


For proper gear mesh, insure the counter gear has minimum vertical play on it's shaft.



Cooling Fan Shroud [HI3020]

STEP 22 Final Rotor Head Assembly

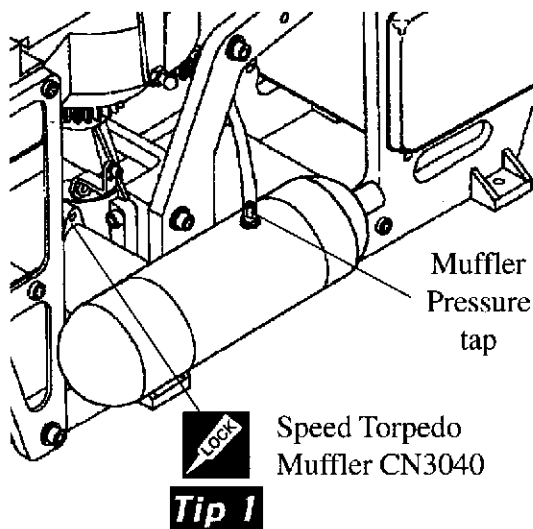


Remove the M3x16 Socket Cap Screw from the top of the main shaft. Slide the swashplate and washout assembly (**from Step 6**) onto the main shaft and snap the elevator lever arm onto the single front ball on the swashplate. Slide the completed rotor head assembly (**from Step 5**) onto the shaft and align the hole in the head block with the hole in the top of the main shaft. Insert one M3x16 Socket Cap Screw and 3mm locknut (**from Bag 2**) to secure the two. (**Note: Make sure the pins in the rotor head block are aligned and inserted into the holes in the washout unit.**) Apply some oil sparingly to the washout hub assembly to insure they slide smoothly.

Following assembly, move the collective lever fore and aft to the endpoints. The swashplate and washout unit should be very smooth throughout the movement range. If not, inspect the fit of the washout guide to the pins in the rotor head, these pins can be bent slightly if binding. Also check the collective axle, the screws here may be too tight. The fit of the ball links sometimes can cause binding, with time these will break in.

These few points are the most common which will cause servo strain leading to premature wear and can make the collective control a little vague.

STEP 23 Attaching the Muffler



Attach the muffler to the engine with the screws provided with the muffler (**Tip 1**- using hi-temp threadlock). Attach the pressure tap to the top of the muffler and the M4x6 Phillips Machine screw to the bottom hole in the muffler, remember to use hi-temp RTV sealer or threadlock on these parts.

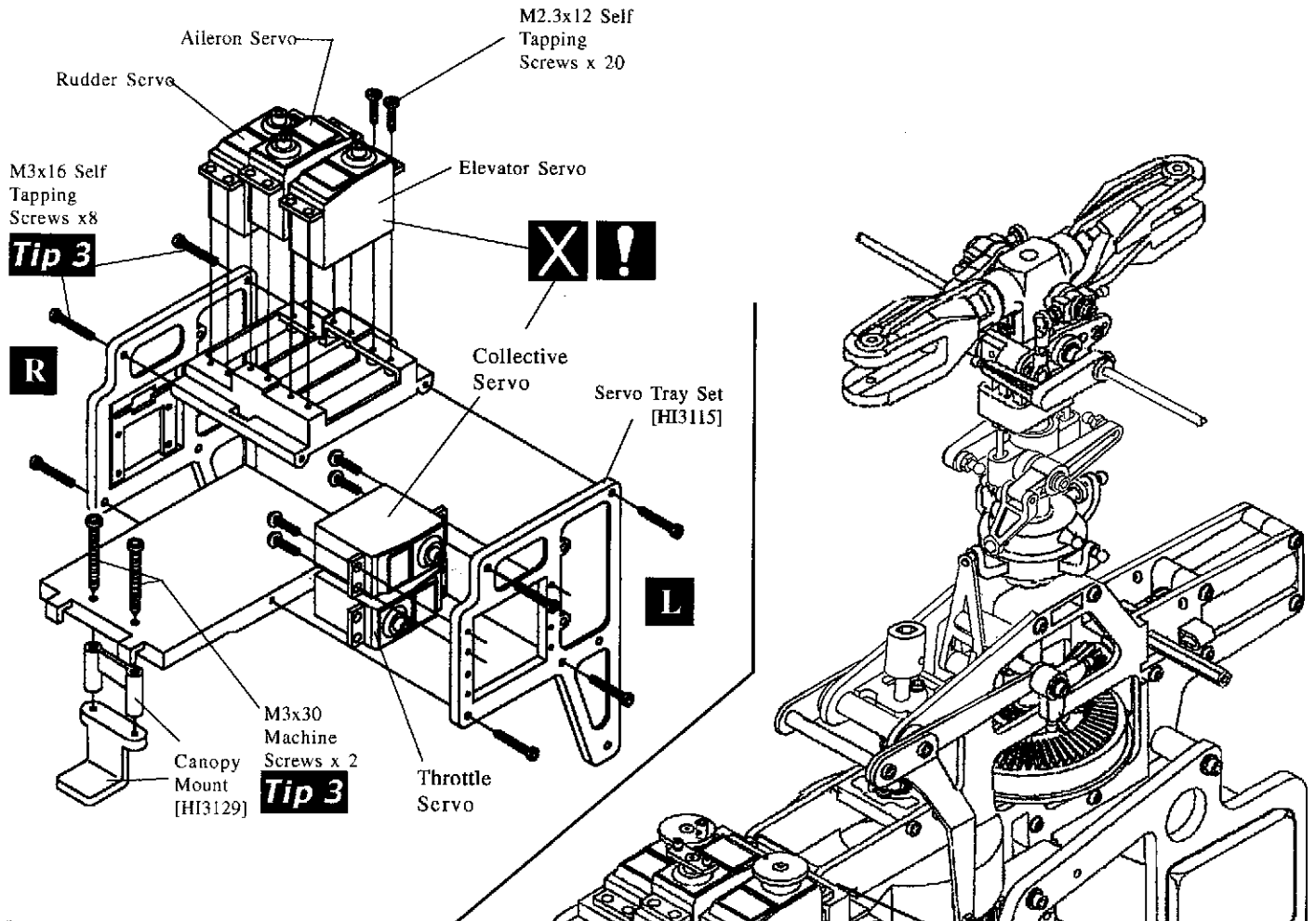
Tip For a good seal between the muffler and the exhaust port, use a gasket made from thin aluminum, brass or exhaust gasket material. To properly seal the fit, after running the engine for several minutes on the first run, shut down the engine and re-tighten the bolts, while the engine is still hot. The extra 1/8 to 1/4 turn on the bolts will seat the muffler in place.



Optional CN3055H High Performance Tuned Pipe available.

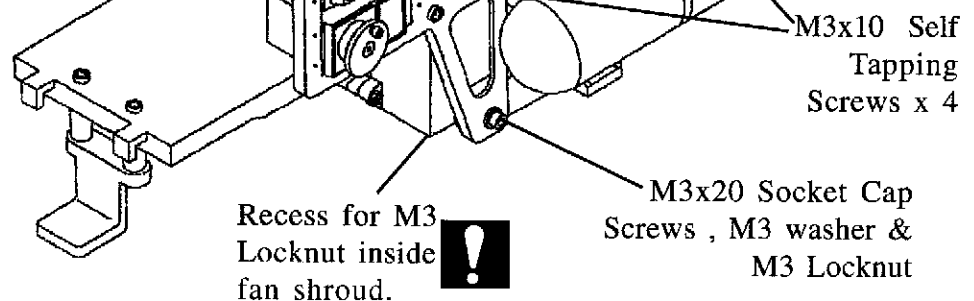
STEP 24 Servo Frame Assembly

From parts bag 5: Assemble the servo tray using eight M3x16 Self Tapping Screws. This is a good time to install the collective and throttle servos (note orientation) from the *inside* of the left servo frame. (Note, use the rubber grommets provided with the servos, you can use the screws that came with your servos or the screws provided in the kit). Attach the rudder (yaw), aileron (roll cyclic) and elevator (fore/aft cyclic) servos insuring proper orientation, to the top servo tray. Attach the canopy mount using two M3x30 Phillips Machine Screws through the top of the lower servo tray, through the plastic spacer and into the canopy mount.



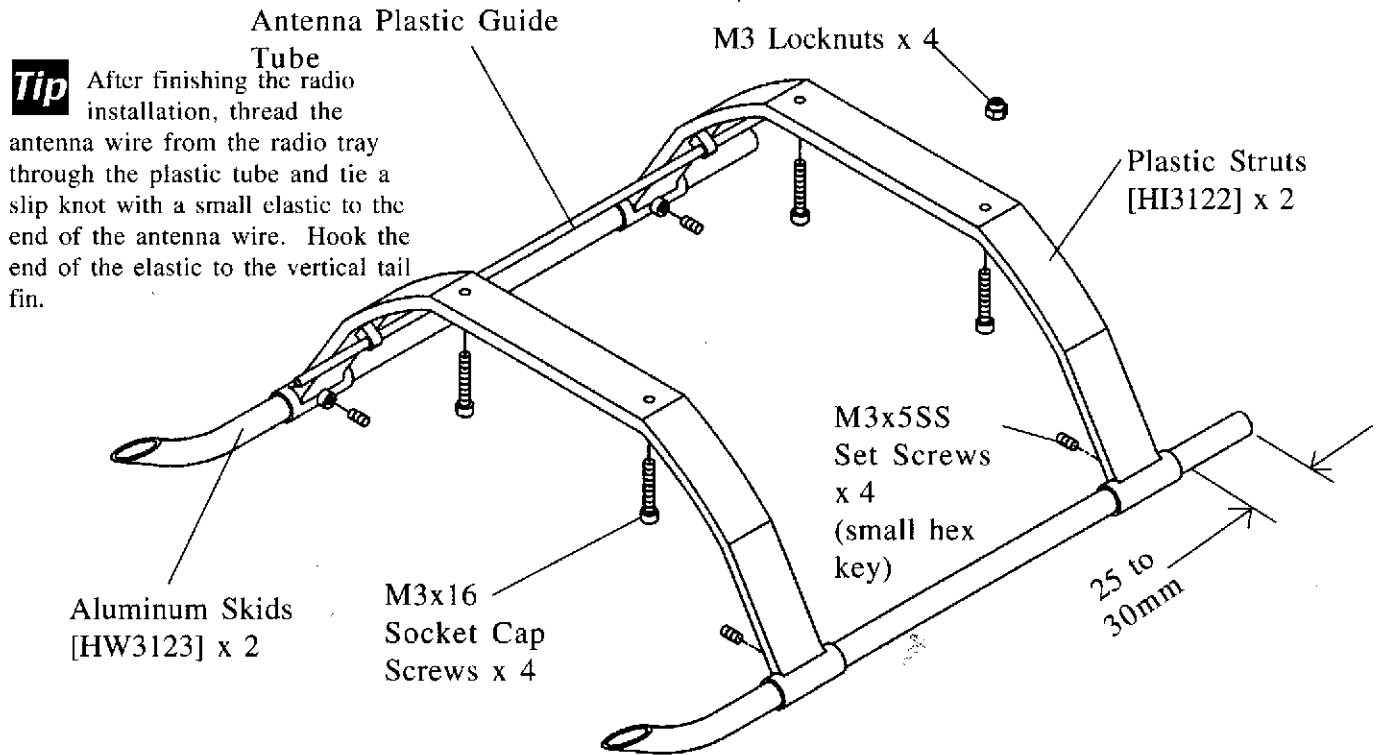
STEP 25 Main Mechanics

Attach the servo tray assembly to the mechanics using four M3x10 Self Tapping Screws, two M3x20 Socket Cap Screws and two M3 Washers. The two Locknuts for the cap screws are inserted into the recess inside the bottom of the fan shroud.



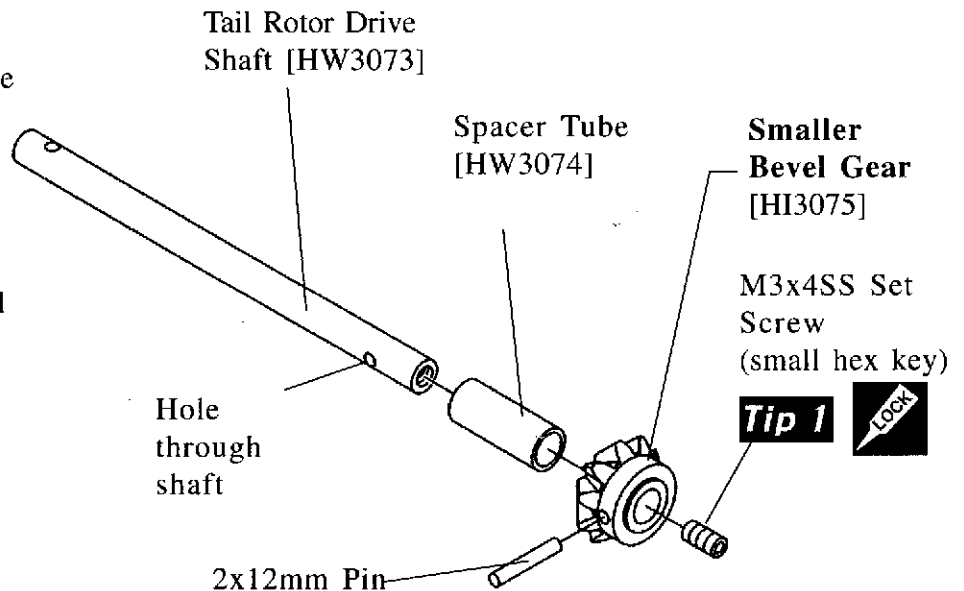
STEP 26 Landing Gear

From parts bag 6: Assemble the landing gear by sliding the Aluminum Skids through the Struts, start the four M3x5 Set Screws into the struts, but do not tighten at this time. (Do not use any threadlock). Set the distance from the rear of the skid to the strut at 25 to 30mm. Attach the landing gear to the main mechanics using four M3x16 Socket Cap Screws and locknuts. **Now set the skids into their desired position and tighten the 4 set screws. Be careful not to strip the holes in the struts.**



STEP 27 Tail Output Shaft

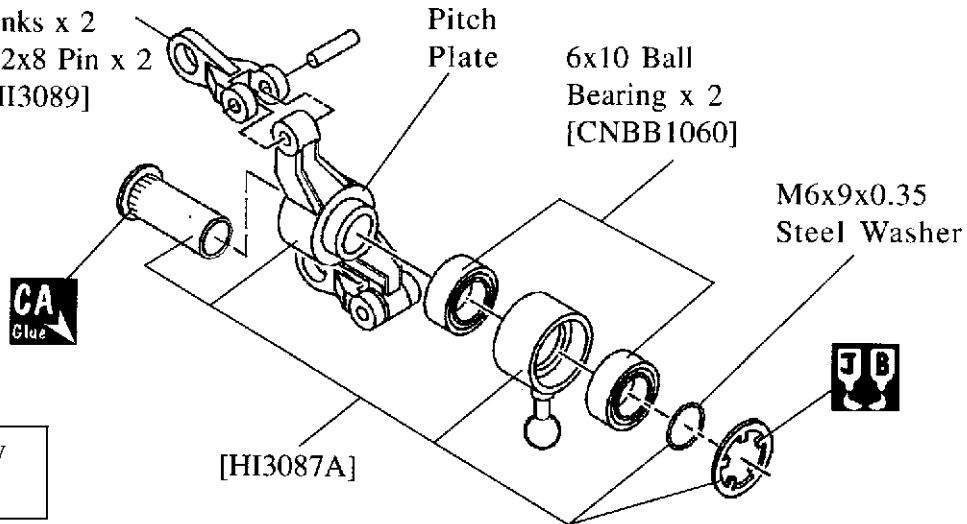
From parts bag 7: Notice that the Tail Rotor Drive Shaft has 2 holes, one through the shaft and one drilled partially into the shaft. Slide the **SMALLER** Bevel Gear with the teeth facing inward from the end with the through hole. Position the gear by aligning the holes. Press the M2x12 Pin through and secure with one M3x4 Set Screw using threadlock. Slide the Spacer Tube onto the shaft and position against the gear.



STEP 28 Tail Pitch Plate

From parts bag 7: The Tail Pitch Plate and Tail Pitch Ball Links are pre-assembled. (Note: apply some JB weld to the outside of the lock ring to avoid the assembly loosening. Apply CA type glue to bond the brass slide tube to the pitch plate.) Put this assembly aside for later.

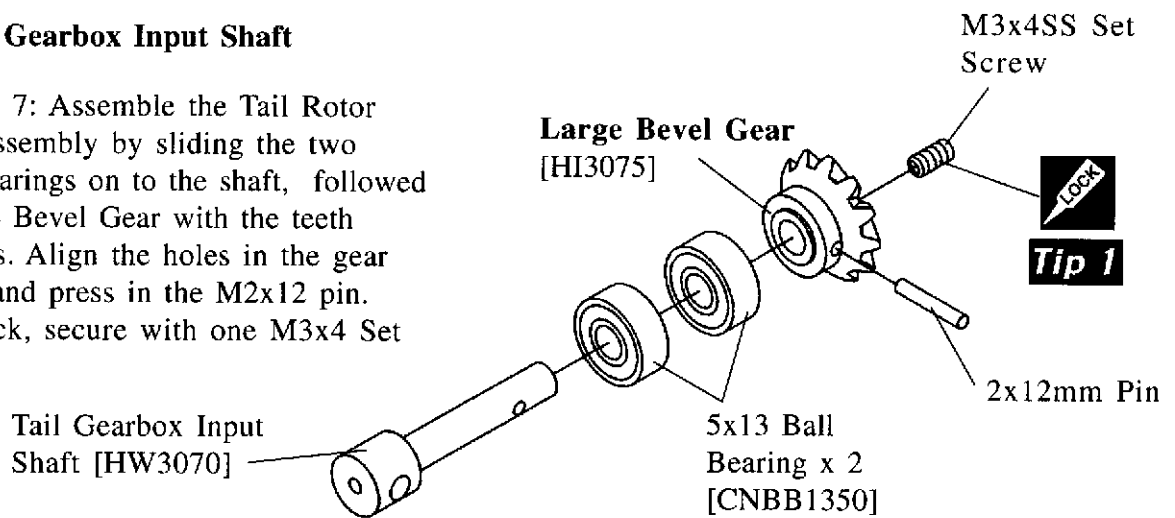
Tail Pitch Ball Links x 2
M2x8 Pin x 2
[HI3089]



Warning, do not get any glue in the bearings.

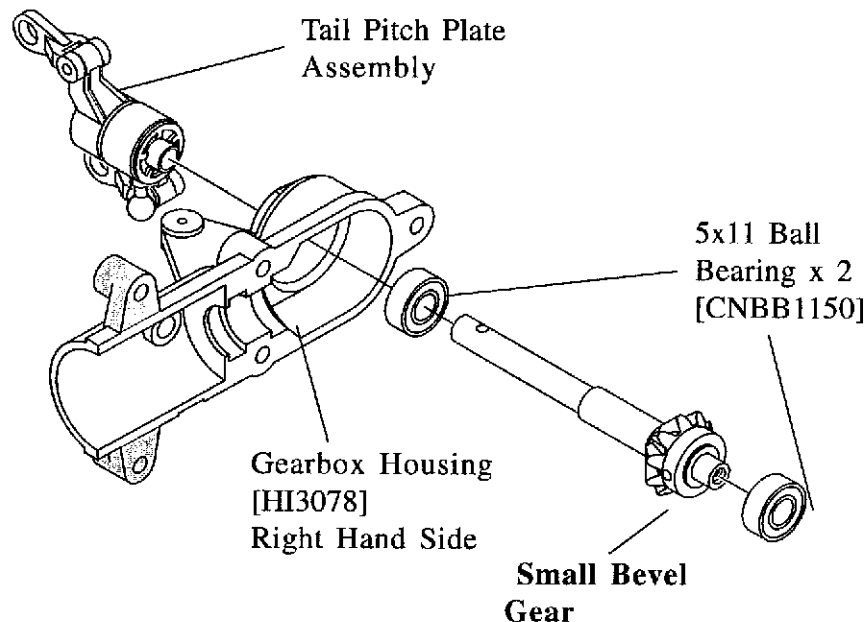
STEP 29 Tail Gearbox Input Shaft

From parts bag 7: Assemble the Tail Rotor Output Shaft assembly by sliding the two M13x5 Ball Bearings on to the shaft, followed by the **LARGE** Bevel Gear with the teeth facing outwards. Align the holes in the gear with the shaft and press in the M2x12 pin. Using threadlock, secure with one M3x4 Set Screw.



STEP 30 Tail Output Shaft Assembly

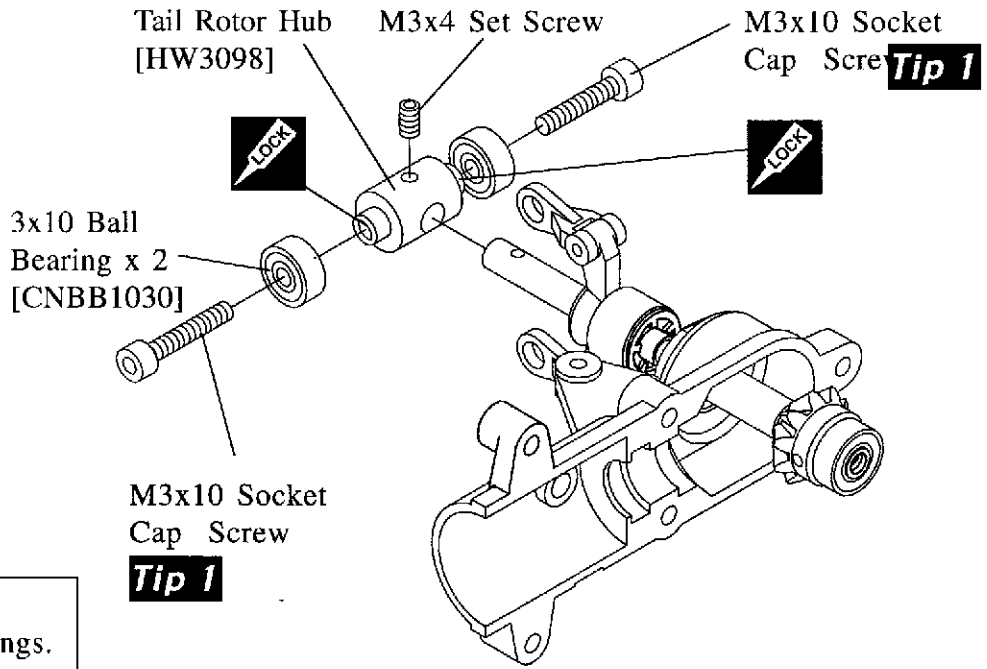
Slide one of the two M11x5 Ball Bearings onto each end of the Tail Rotor Drive Shaft assembly and insert through the inside of the right side of the Tail Rotor Gearbox Housing. Make sure the bearing is fully seated into the recess. Slide the tail rotor pitch plate assembly onto the shaft.



STEP 31 Tail Rotor Hub

From parts bag 7: Install the Tail Rotor Hub onto the tail rotor output shaft (position the hub so the hole is aligned over the indent hole on the shaft) and secure with one M3x4 set screw using threadlock. Insert one M3x10 Socket Cap Screw through one M3x10 Ball Bearing (apply the threadlock to the inside threads of the hub) and into the tail rotor hub. Repeat for the other side.

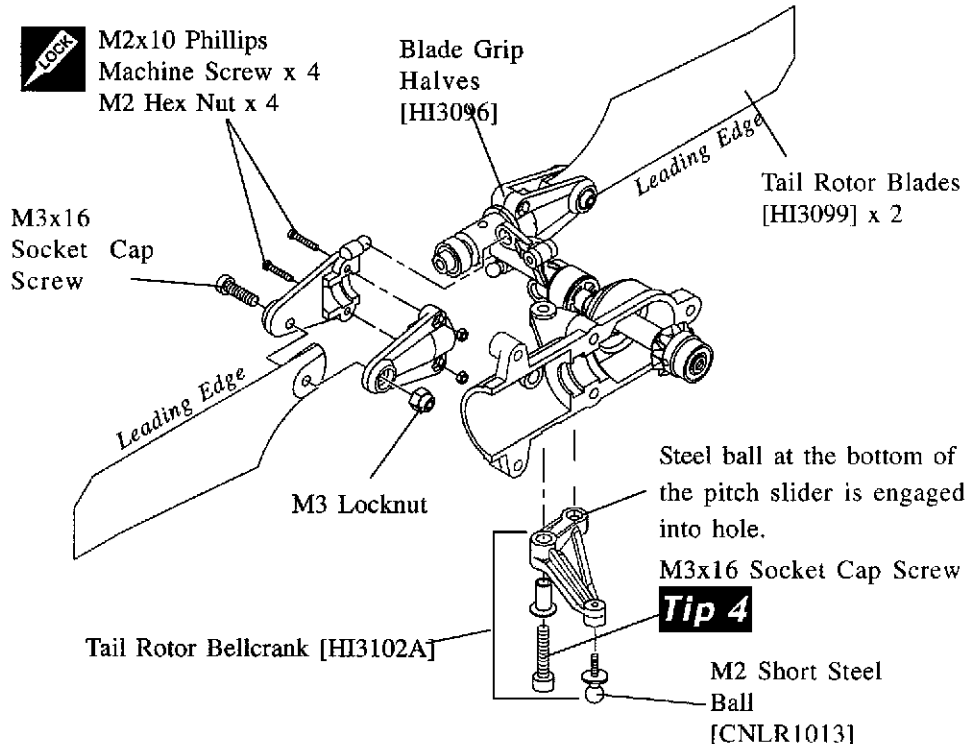
! Avoid getting any threadlock in the bearings.



STEP 32 Tail Rotor Grips & Tail Rotor Pitch Lever

From parts bag 7: Using threadlock on the two M2x10 Phillips Machine Screws and 2mm Nuts, assemble both Blade Grip Halves over the bearings with the nuts facing to the gearbox. Snap the two balls from the tail rotor grip into the adjoining pitch slider links. Install the Tail Rotor Blades using two M3x16 Socket Cap Screws and M3 locknuts. Note the direction of the blades on the diagram, the straight leading edge of the blade should be on the same side as the ball on the blade grip.

Install the M2 Short Steel Ball, threaded from the bottom of the bellcrank. Install the tail rotor bellcrank onto the tail rotor gear box with one M3x16 Socket Cap Screw, inserted through the brass bushing with the washer side on the bottom (**make sure the steel ball at the bottom of the pitch slider is engaged into the end of the tail rotor bellcrank**) and thread into the hole on the tail rotor gearbox.

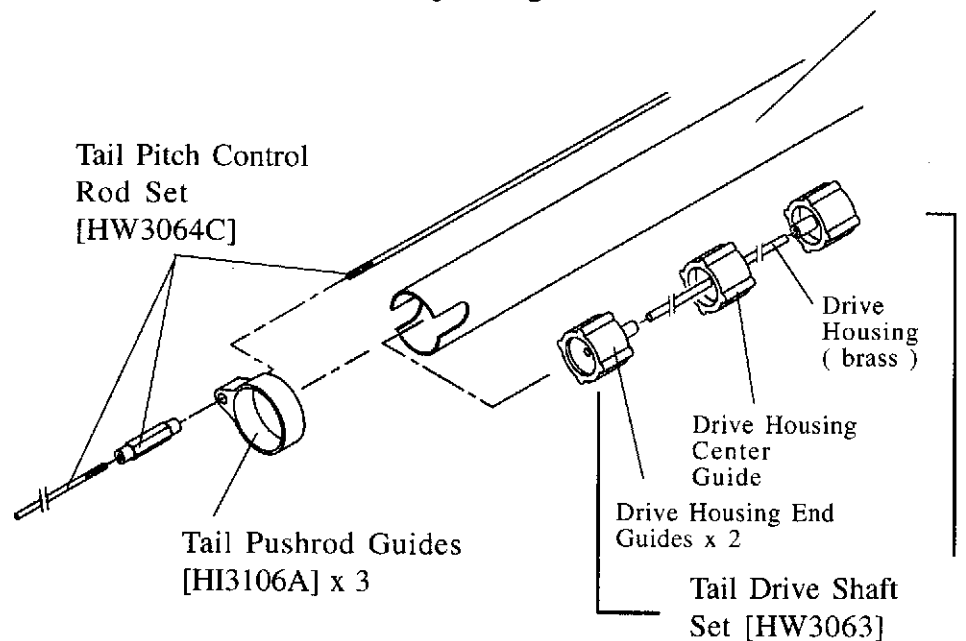


Tip

After flying the model, if a buzzing vibration is noticed on the ends of the vertical or horizontal fin, you can remove the complete tail rotor assembly with the hub and further balance it using a High Point balancer. Careful sanding of the rotor blades is all that would be needed.

STEP 33 Tail Drive Shaft Guides

From Bag 7: Insert three tail drive shaft Guides on to the Brass Tail Drive Housing, found in the bottom of the box (Note that one guide has a larger center hole than the others, slide this one to the center of the brass tube) and add the remaining two onto the ends. Glue the guides into position using Zap Ca on the brass tube. Insert the new assembly into the tailboom from the end with the 2 holes and position the assembly centered in the tailboom (gentle tapping with a wooden dowel will ease the insertion of the guides). Secure inside the boom by dripping some Ca glue down the tube. Be careful not to get any between the wire drive and the tube. Slide the three tail pushrod guides onto the tailboom. From the rear, thread the long pushrod through the guides with the bent section at back. Screw the pushrod connector found in bag #4 onto the front of the long pushrod, the short pushrod will be attached to this later in Step 43.



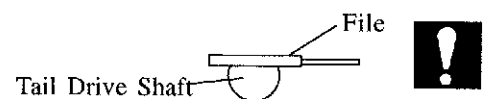
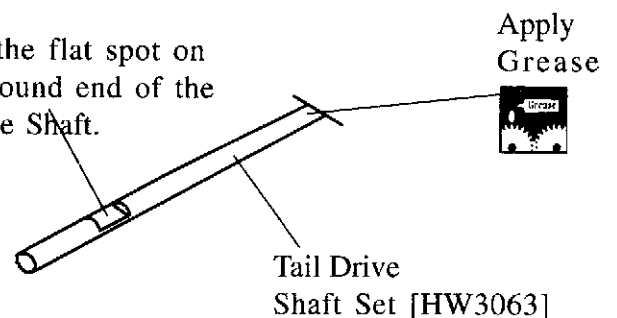
Make sure the brass tubing is glued to the internal guides for the tail boom. Also, after radio set up is complete glue the pushrod guides using a single drop of Zap Ca. One drop will stop the pushrod from binding and still be able to remove them later.

STEP 34 Tail Drive Shaft

The Tail Drive Shaft has one end flattened to engage into the front of the boom, the other end has been marked for a 3mm flat spot. Using a flat file, grind the flat spot until 1/4 of the material has been removed from the diameter. This will provide solid seating for one of the two 4x4mm Set Screws from the tail rotor input shaft.

Thoroughly grease the tail drive shaft and insert the newly filed end into the end of the tailboom with the slots. Once the shaft exits the tailboom, degrease both ends of the shaft.

Deepen the flat spot on the the round end of the Tail Drive Shaft.



A flat file is the ideal tool for the job, alternately careful use of a Dremel Moto Tool will work. It is important that the flat be at least 1/4 of the diameter but no more than 1/3 to avoid weakening the material.

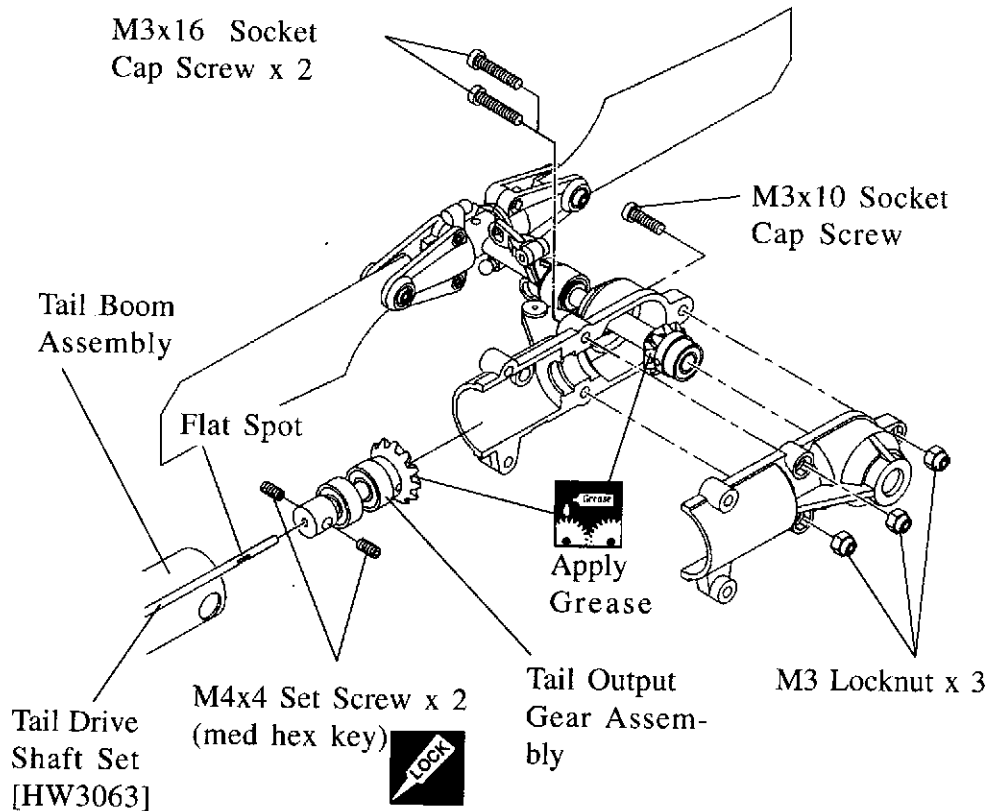
STEP 35 Tail Gearbox Assembly

Attach the tail input gear assembly onto the rear of the drive wire shaft using threadlock on the two M4x4 Set Screws (insure the filed flat spot is aligned with one of the set screws).

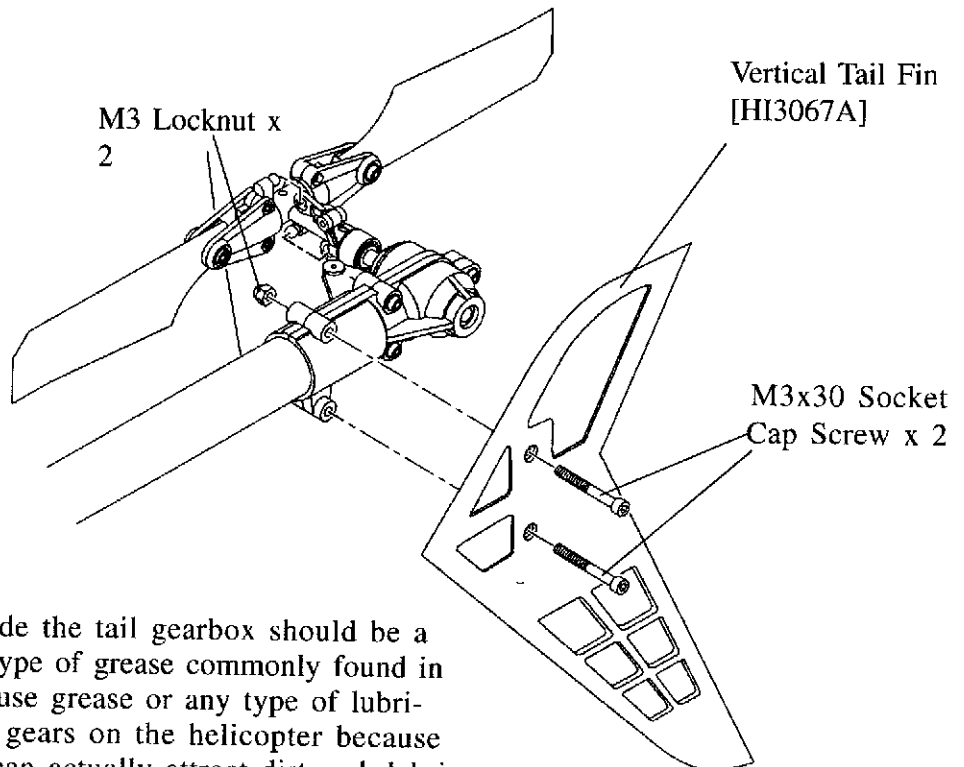
Position the two gear assemblies into the right gear box half (insure the 2 bevel gears are meshed properly and the ball bearings are fully seated in their recesses) and liberally grease the gears

before attaching the left side. Position the gear box halves such that the molded pins are fitted into the key holes in the end of the tail boom. Secure

with one M3x10 Socket Cap Screw and M3 locknut at the back of the gearbox and two M3x16 Socket Cap Screws with M3 locknuts at the middle of the gearbox. Install the Vertical Fin with two M3x30 Socket Cap Screws and M3 locknuts through the molded fin and into the front mounts of the tail rotor gearbox.



Tip Apply red locktite to the drive shaft end and insert into the gearbox input shaft. Do not use on set screws, only locking the wire shaft to the input shaft.

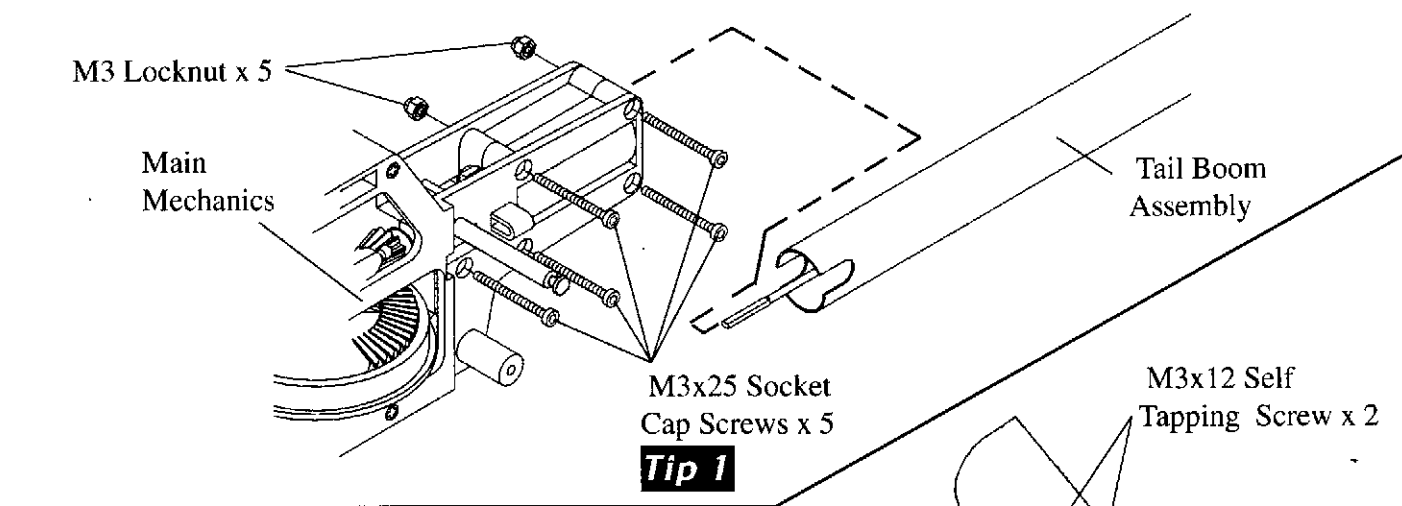


Tip

Grease to be used inside the tail gearbox should be a teflon or light lithium type of grease commonly found in a hobbyshop. Do not use grease or any type of lubricant on the remaining gears on the helicopter because they are exposed and can actually attract dirt and debris that can lead to a failure.

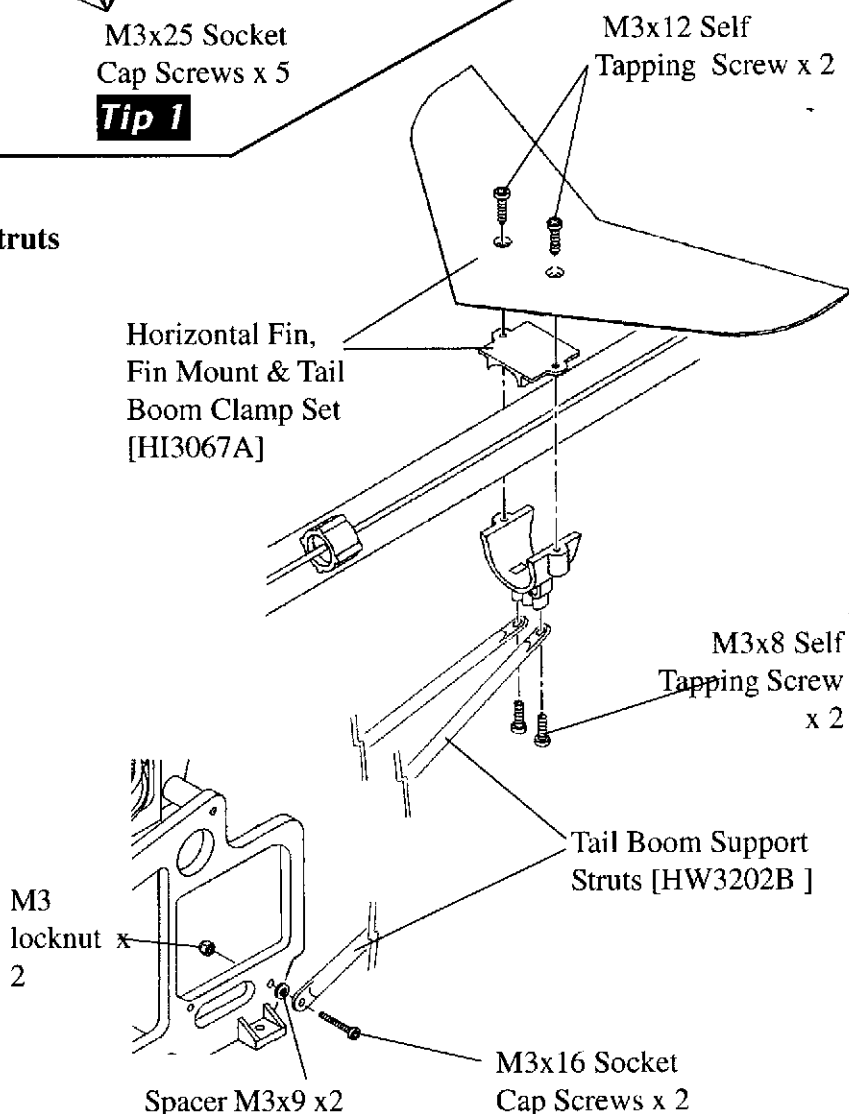
STEP 36 Attach Tailboom to Mechanics

Attach the tail boom assembly to the main mechanics by sliding the tailboom tube into the mounting hole at the rear of the upper frame using five M3x25 Socket Cap Screws and M3 Locknuts. Slowly press the tailboom in, being careful to engage the flattened end of the drive wire into the slotted tail rotor output gear shaft. The slots on the end of the tailboom will self align with molded pins inside the upper side frame. Take your time and the wire will slide in. Once engaged, press the tail boom in completely until it is fully seated. Hold the main gear from moving and try to turn the tail rotor to insure proper engagement, you should not be able to turn the tail rotor. If you can rotate it, the drive wire is probably not properly seated into the slot in the front output shaft. Connect the short rudder pushrod to the coupler at this time.



STEP 37 Horizontal Fin & Tail Boom Struts

Position the horizontal fin with two pushrod guides ahead and one pushrod guide behind. Insert two M3x12 Self Tapping Screws through the Horizontal Fin, then the horizontal fin mount and finally into the tailboom clamp capturing the tailboom. Position the fin along the tailboom at the position where the Tail Boom support struts can be attached. Secure the support struts to the fin mount with a M3x8 Self Tapping Screws. Attach the front of the two support struts to the lower frame assembly using two M3x16 Socket Cap Screws, M3x9 Spacer and M3 locknut. Verify the long tail rotor control pushrod is inserted through the fin clamp and the three guides along the tailboom.



STEP 38 Pushrod Setup and Adjustments

All the control pushrods are pre-assembled. All that is left is fine tuning of the length depending on the flying style before the pushrods can be attached. Carefully look at the plastic ball ends, press the ball link over the steel ball with the "Century" name visible, this is the correct installation direction. **It is very important that before you install the pushrod linkages that you first charge your radio then remove all the servo horns from the servos and center all the mechanical or electronic trims on the radio.**

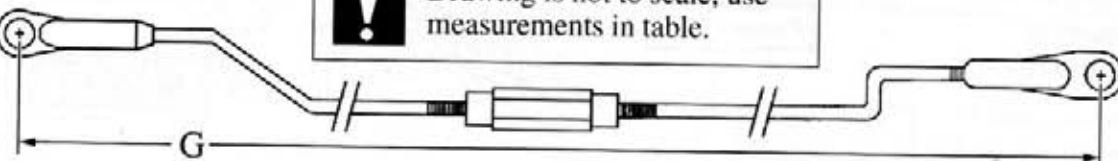
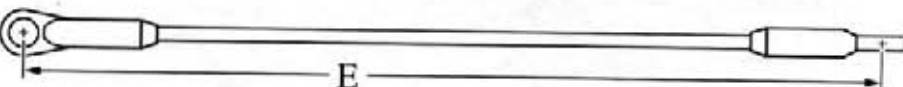
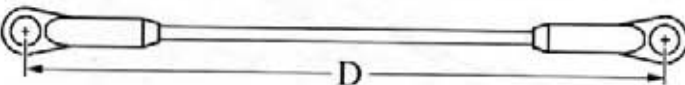
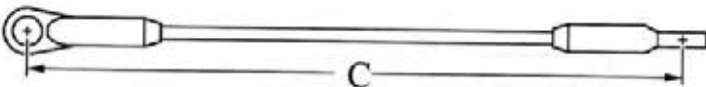
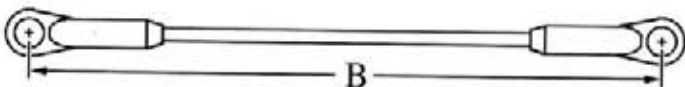
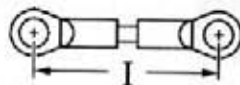
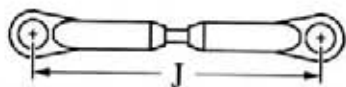


Note: All dimensions are in millimeters and are measured from the centers of the control balls.

Ball Link Set
[HI3145]

Pushrod Set
[HW3192]

Due to the different type of radio and servos that are chosen to install in to the helicopter, match each pushrod to the lengths in the table for optimum setup.



! Drawing is not to scale, use measurements in table.

Location	Pushrod	Sport	3D
Washout to flybar (2)	A	44	47
Throttle servo	B	96	96
Bell mixer to SWP (2)	C	97	99
Collective servo	D	95	93
Elevator servo	E	128	128
Aileron servo (2)	F	151	151
Bell mixer to seesaw (2)	I	28	26
Ail. Bellcrank to SWP (2)	J	54	54
Tail rotor pushrod	G	887	887

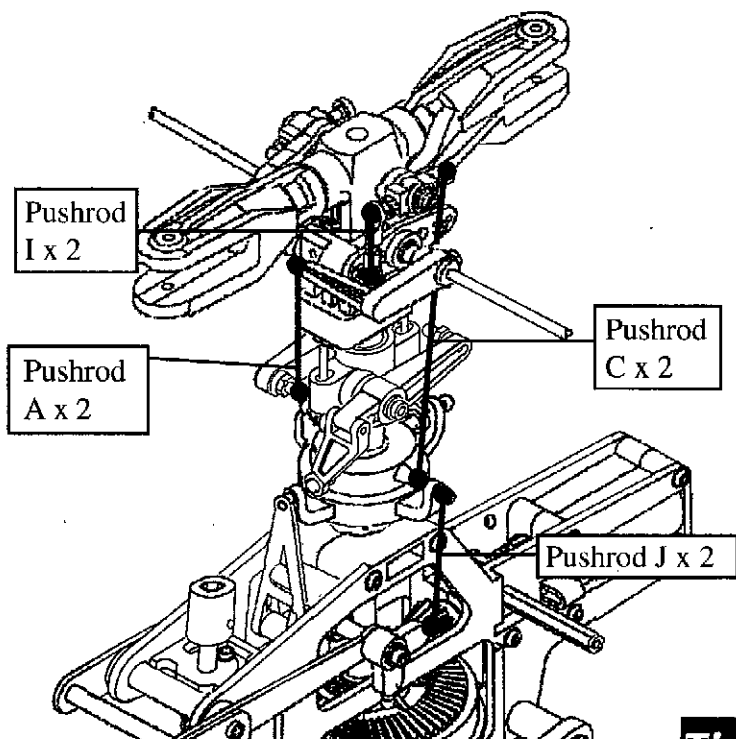


(Optional Part)

CN2255 Control Rod Setup Gauge - Easily duplicate pushrods by attaching a master pushrod and match new pushrods as they are assembled. Gauge has millimeter scale for accurate lengths center to center.

Tail Pitch
Control Rod
& Connector
[HW3064C]

STEP 39 Rotor Pushrod Setup



Replacement Linkage Rod Set #[HW3192]
 Adjustable Cyclic Links (J) #[HW3035A]
 Plastic Ball Links (15 long, 4 short) #[HI3145]

When attaching all pushrods, make sure that any two pushrods that should be the same length actually are the same length at this time. Otherwise it will be difficult later to figure out the source of any linkage problems.

- 2 Flybar Arm to Washout pushrods (A)
- 2 Bell Mixer (short ball) to Seesaw (I)
(pushrod was installed in Step 4)
- 2 Bell Mixer (long ball) to Swashplate (C)
- 2 Ail. Bellcrank to Swashplate pushrods (J)

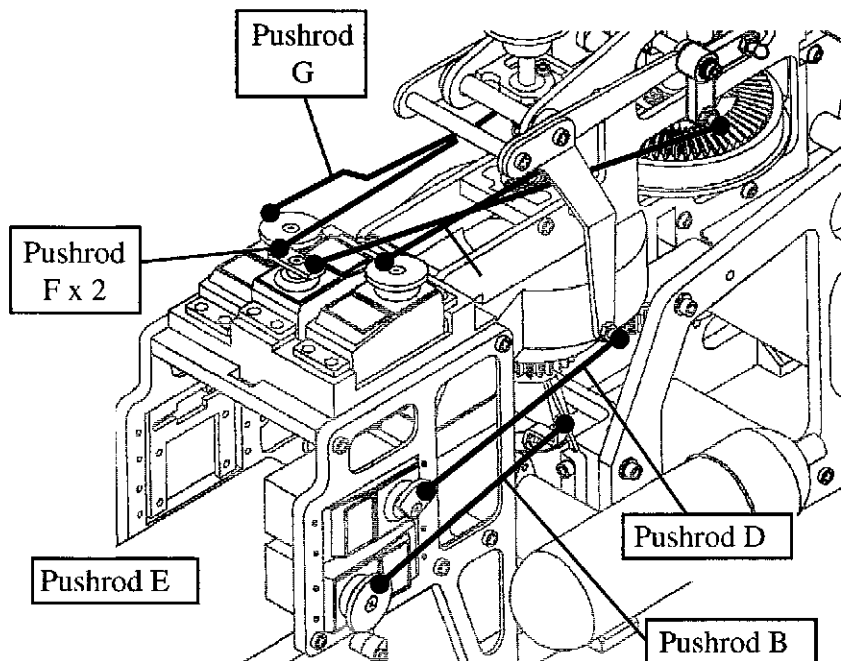
Tip

When removing the rotor head, simply remove the pushrods that attach to the outer ring of the swashplate. After removing the bottom M3x16 Socket Cap Screw from the autorotation unit and loosening the mast stopper set screws, the entire rotor head can be removed.

STEP 40 Lower Pushrod Overview

The lower linkages are shown here to illustrate the general setup and layout of the servo linkages to the respective control surfaces.

It is important that the next few steps be studied carefully and tested in regards to moving the transmitter stick to the up, down, left and right limits to verify that the servo is not binding anywhere in its travel. Also, a common mistake is to mount the collective and throttle servos from the outside (having the grommets and eyelets on the outside) of the servo frames. The problem is not noticeable until the canopy is attached and these pushrods rub against it.

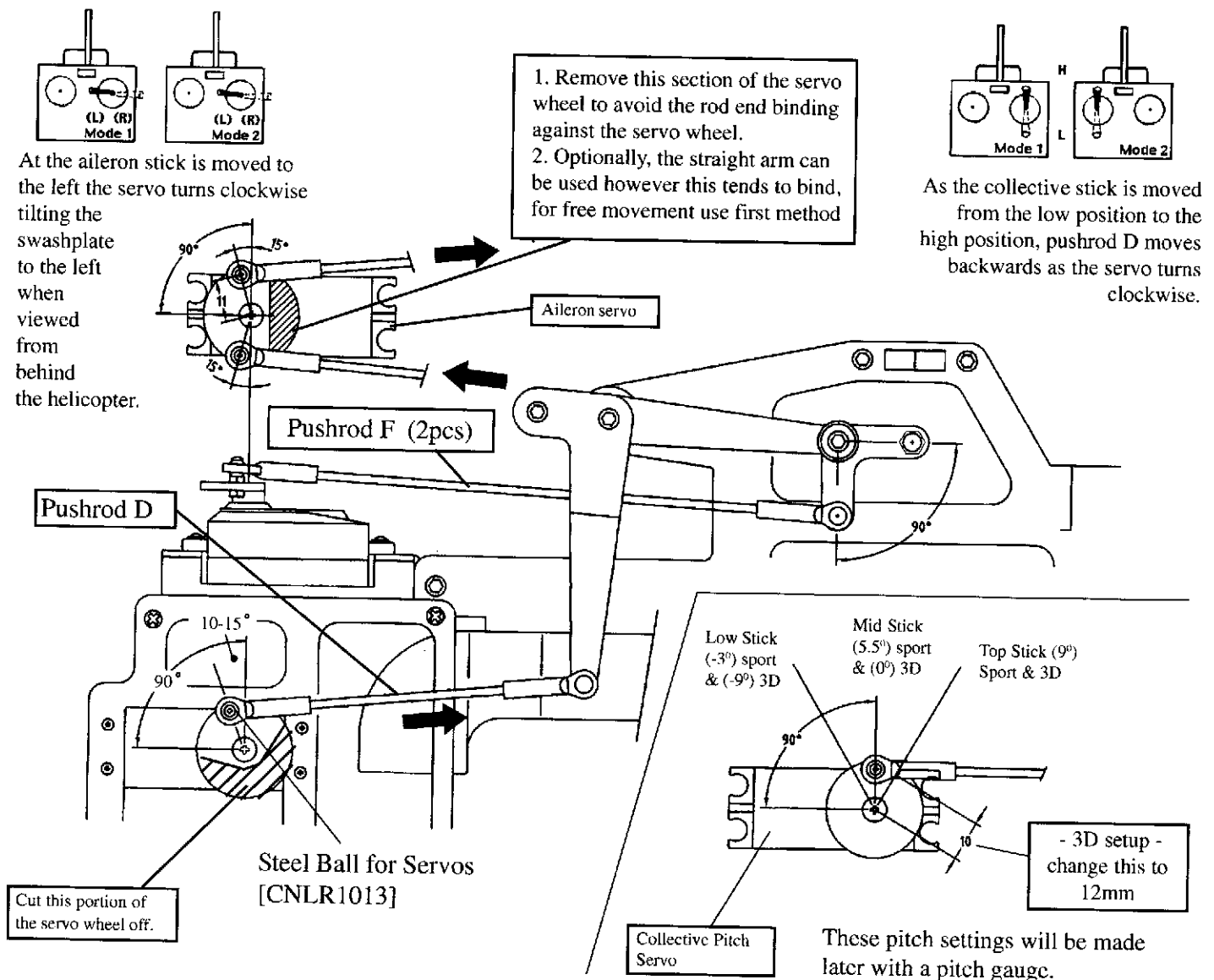


STEP 41 Aileron & Collective Linkage

The Aileron linkage controls the side to side tilt of the swashplate which in turn causes the helicopter to pitch/move to the left or right (hence the name roll cyclic pitch).

Using threadlock on the steel nut only, attach two steel balls with two M2 Hex nuts to a round servo arm at a distance of 10 to 11mm from the center of the servo (this range may vary depending on your particular radio) and 10 -15 degrees ahead of the center of the servo. You are trying to get a 90 degree angle between the line described by the pushrods and the line described between the center of the servo and the ball joint on the servo wheel. This will eliminate any stress (wear) on the servo and any undesired collective/cyclic mix. With the radio turned on and the trim centered, attach the servo horn and the Aileron Bellcrank Pushrods (F). Some slight adjustment may be necessary to have the swashplate sit level or 90 degrees to the main shaft when viewed from the the front or back. Move the Aileron stick completely in both directions to insure that there is no binding in the linkages.

For the Collective Servo, use threadlock on the nut only to attach one steel ball with one M2 Hex nut to the servo horn at a distance of 10-12mm from the center of the servo. With the Collective/Throttle stick on the radio in the center press the servo horn onto the collective servo so the ball is at 75-80 degrees to the servo as shown. Attach the Collective Arm Pushrod (D) and move the Collective stick completely in both directions to insure that there is no binding in the linkages.



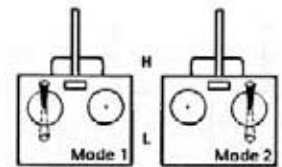
STEP 42 Elevator Linkage

The elevator pushrod controls the tilt of the swashplate forward and backward which causes the helicopter to pitch forward or backward (hence fore-aft cyclic pitch).

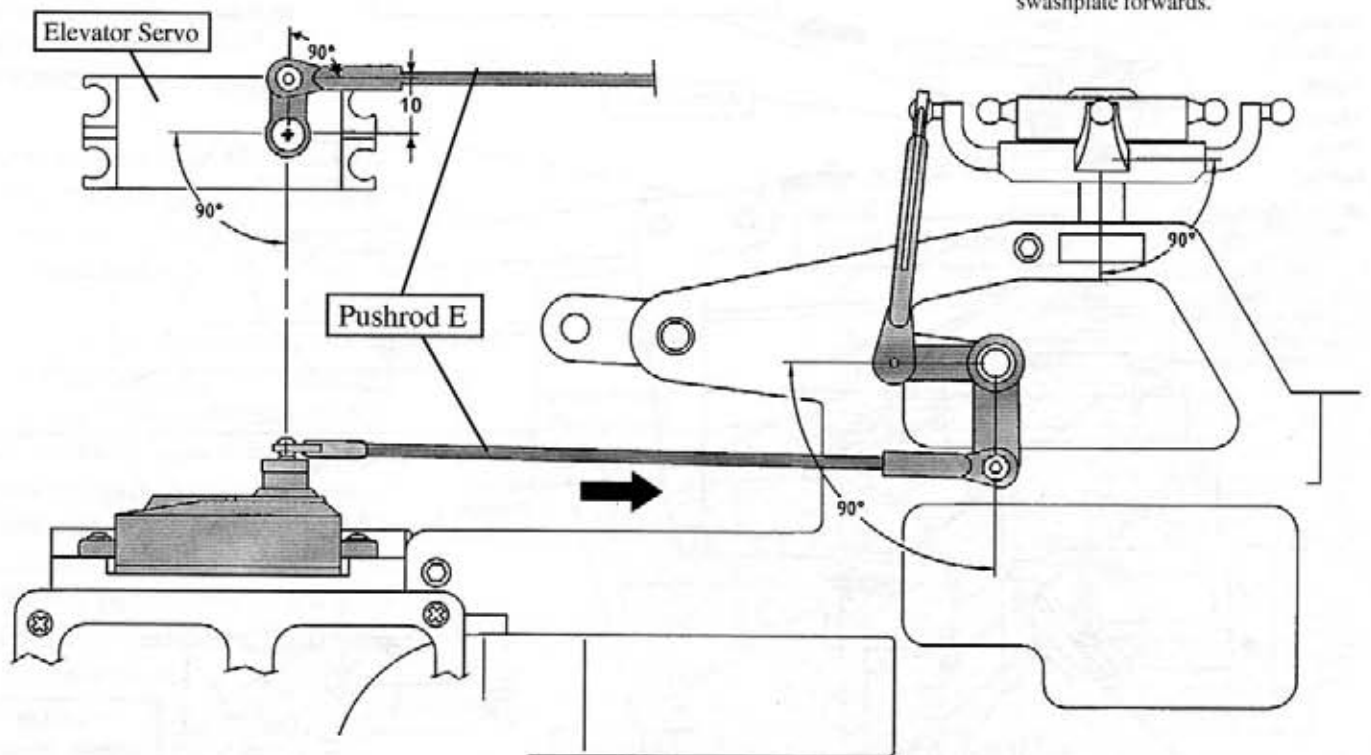
Use a servo horn in the shape of a cross and trim the 3 of the 4 arms off. Using threadlock on the nut only, install one steel ball and one M2 Hex nut at a distance of 10mm from the center of the servo. With the radio on and the elevator trim set at the center, attach the elevator pushrod (E) to the elevator bellcrank, then attach the servo horn at an angle of 90 degrees to the servo. **It is important that the swashplate sit at 90 degrees to the main shaft when viewed from the side.**

Tip When trimming the helicopter for stable and stationary hovering using the electronic sub-trim on the transmitter, typically the elevator servo is labeled backwards. Conventions typically use U for up and D for down. Intuition tells you that if the helicopter is moving backwards then a little U-up trim is needed. Be careful, as in reality to trim the elevator to stop the backwards movement, the value for D-down needs to be increased.

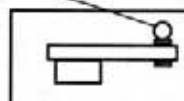
Tip We have repeated mentioned to only use threadlock on the nut only for the steel control balls for the servo horns. The reason is the plastic used in the servo horns becomes very brittle when regular locktite is used, it is better to make sure it does not contact the plastic.



As the elevator stick is moved upwards the elevator pushrod will move backwards tilting the swashplate forwards.



Steel Ball for Servos
[CNLR1013]



Install one steel ball into the servo arm on top secured with one M2 Hex nut.

STEP 43 Rudder Linkage

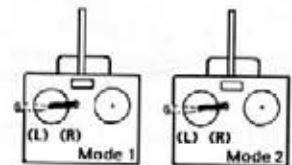
The pushrod changes the pitch of the tail rotor blades to increase or decrease the torque compensation and to rotate the nose of the helicopter about the main shaft.

Use a servo horn in the shape of a cross and trim 3 of the 4 arms off. Using threadlock on the nut only, install one steel ball and one M2 Hex nut at a distance of 10-14mm from the center of the servo. Thread the front part of the tail rotor control pushrod (the short part) (G) through the rear guide in the upper frames. Thread the rear end of it into the hex connector and attach the ball link to the servo end. Having the radio on and the rudder trim centered, press the servo horn onto the servo set at 90 degrees to the servo and align the rudder bellcrank to 70 degrees as shown in the diagram.

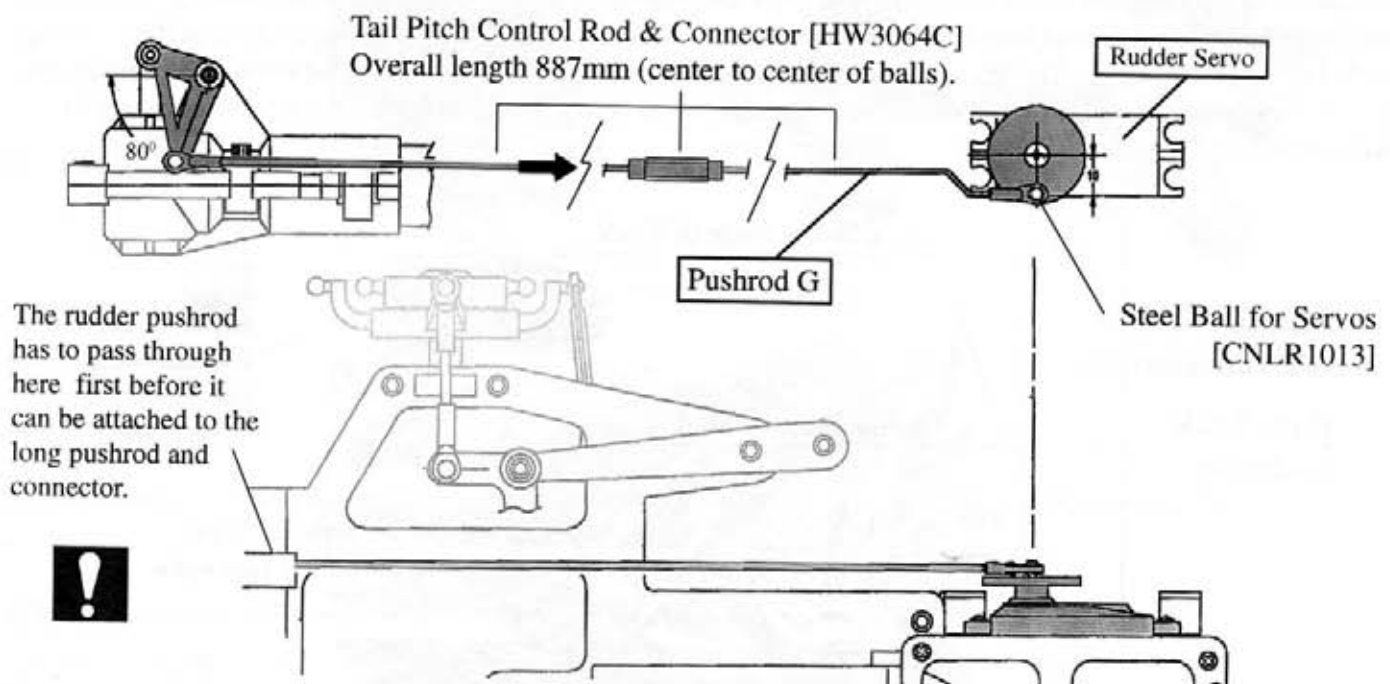
Tip

The accuracy of the rudder pushrod really comes down to the type of gyro that will be installed in the helicopter. From a beginner standpoint, a *heading-lock* or *rate* gyro are good choices however, if the *heading-lock* type of gyro is selected make sure that the rudder servo speed is within the range specified by the gyro manufacturer. Choosing a *heading-lock* gyro and using a regular servo will lead to premature failure of the servo, crashing the helicopter.

Our general recommendation is to get a piezo rate gyro but if *heading-lock* is desired, get one with both modes.

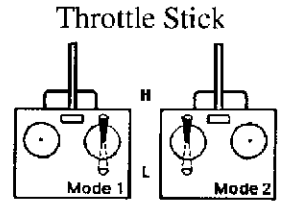
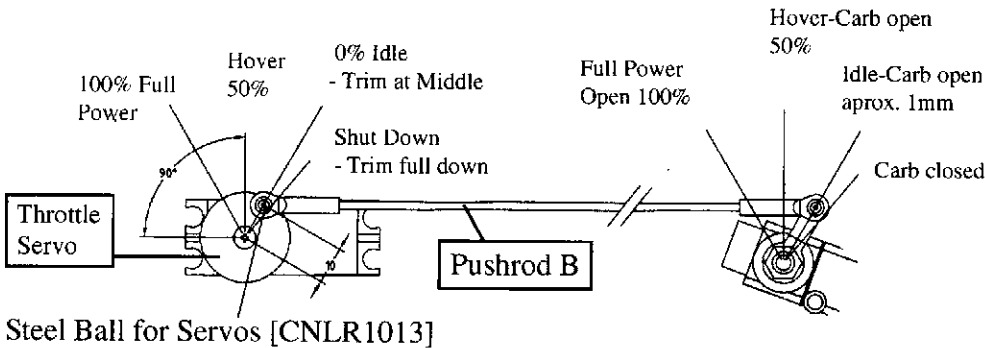


As the rudder stick is to the right the rudder pushrod will move forwards increasing the thrust in the tail blades rotating the nose to the right.



STEP 44 Throttle Linkage

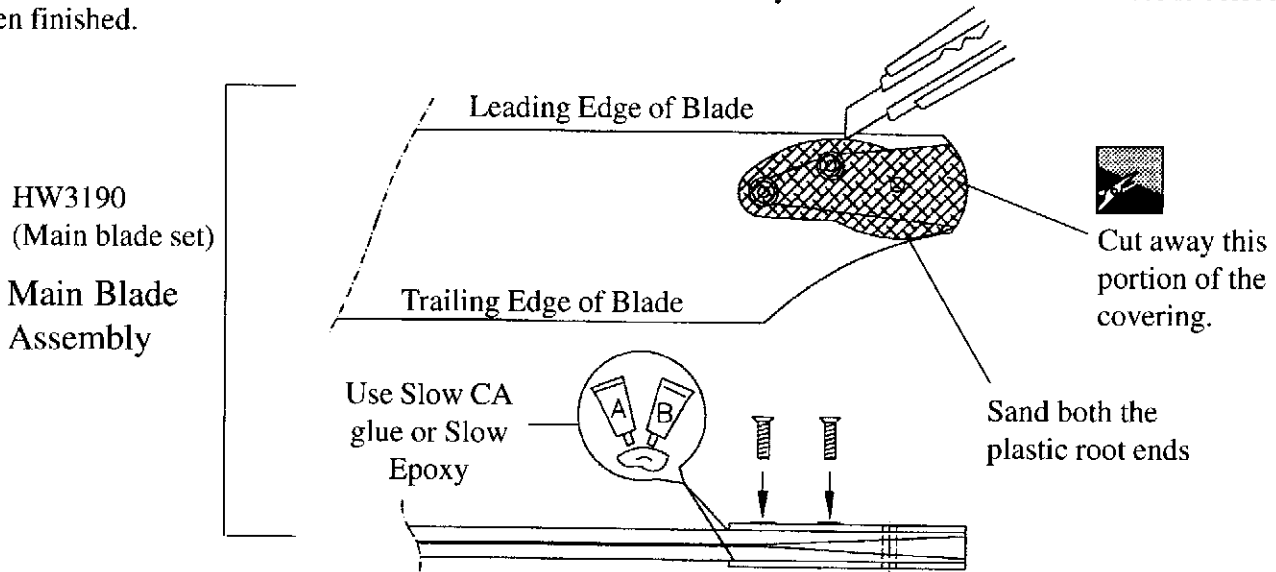
From Bag 4: Using threadlock on the nut only, attach one steel ball with one M2 Hex nut, to both the Throttle servo horn and the Throttle Extension from Step 17. Position the ball at 10mm from the center of the servo and in the outermost hole on the metal throttle arm. With the radio on, the throttle stick centered and the trim in the center, press the servo horn onto the servo so the ball is at 90 degrees to the servo (the hovering position). Move the throttle stick to the low/idle position and lower the trim fully down, while holding the loose end of pushrod (B), check that the ball link centers exactly over the steel ball on the servo horn. If necessary, increase or decrease the ATV low setting to bring them into alignment. The external trim on the throttle stick will allow the engine to idle well, yet shut down the engine when the trim is fully lowered or a "Throttle Cut" switch is thrown. Repeat the procedure for the throttle stick at 100%-full power position. Remember that it is important that the servo does not bind. If the ATV settings are more than 10 points different, it is better to reposition the carburetor lever.



As the throttle stick is moved from the low position to the high position, pushrod B moves backwards as the servo turns counter clockwise.

STEP 45 Assembly of ARF Main Blades

The Main Rotor Blades in the Hawk kit are pre-built and balanced, the only work required is to glue the blade grip root ends to the blades (**Please note that this step is necessary to insure the blades will not separate from the helicopter during flight!!**). Temporarily install the root ends (see note) onto the blades by cutting the covering over the holes and using a pencil, mark the outline of the plastic parts on the covering. Remove the root ends and mark a second line about 3mm inside the first and trim away this internal portion of the covering with a sharp hobby knife. Using some sandpaper roughen the plastic root ends and glue them in place with Slo CA or slow epoxy glue. Install the blades onto the rotor head to dry. This will insure the thickness is correct when finished.



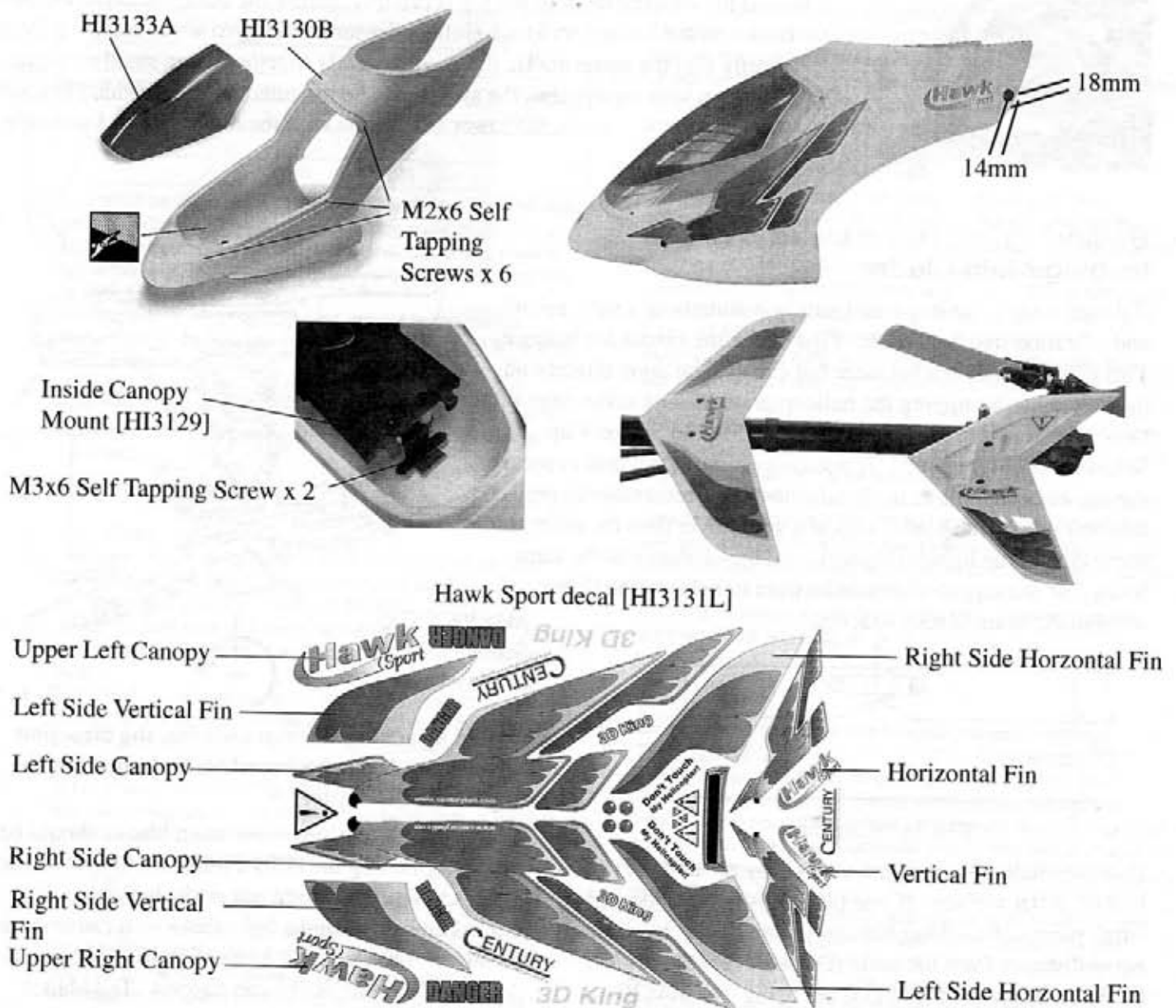
Note: The plastic blade grips have a top and a bottom which are different when viewed from the large end. Test fit the parts to be sure that the total thickness of the blades are 12mm. The 3mm brass tube and four M4x20 flat washers are not needed on the helicopter.

Step 46 Canopy & Decals

The Canopy has a line molded into the plastic to follow when trimming the windshield part out, be careful, trim the innermost line leaving the 6mm band for attaching the windshield. Using a sharp hobby knife carefully scribe a line several times into the plastic until you cut through the material. Similarly trim the clear windshield along the provided line, to make it easier to see the line, use a non-permanent marker and trace the line, any extra ink can be removed with rubbing alcohol. Test fit the windshield by taping it to the canopy. Some additional trimming may be necessary to get a good neat fit. From Bag 5: the inside canopy mount can be installed (**note the direction of the mount, the wider opening faces the rear**) with two M3x6 Self Tapping Screws approximately 134mm from the back of the bottom. The clear windshield can be attached using six M2x6 Self Tapping Screws in Bag 4, drill six 1mm holes at the locations shown.

Step 47 Canopy Mounts


The canopy should be test fitted before the two holes for the rear canopy mount are marked and drilled. Insure the canopy and windshield clears all control rods, radio gear and muffler. Then mark and drill two 1/4" holes for the rear canopy mounts and insert the two rubber grommets.

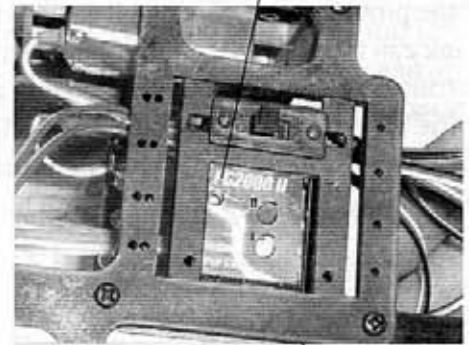


Radio Components & Balancing

Gyro Mounting

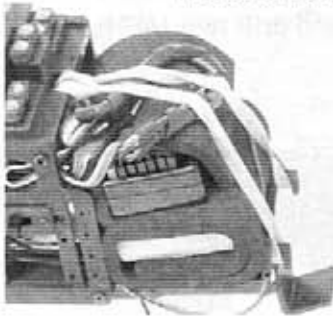
For the PG2000II, the gyro can be mounted below the switch on the right side of the mechanics. It is extremely important that the gyro is attached using only the supplied two sided tape onto a clean flat surface. Keep all wires and components away from the gyro housing. Do not use straps or elastics to secure the gyro. Install the gyro using at least a 1/8" double sided foam tape (supplied with gyro). Put a full strip along the bottom of the gyro unit and press onto the surface. For a good bond make sure both surfaces are clean and dry.

 (Recommended Gyro)
PG2000II



Foam tape included with gyro.

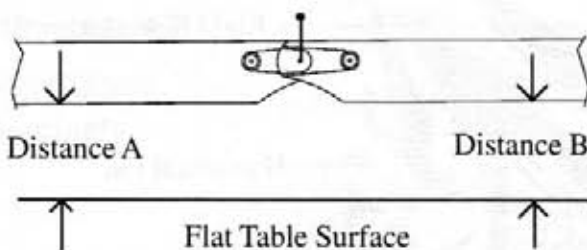
Receiver & Battery Pack Mounting



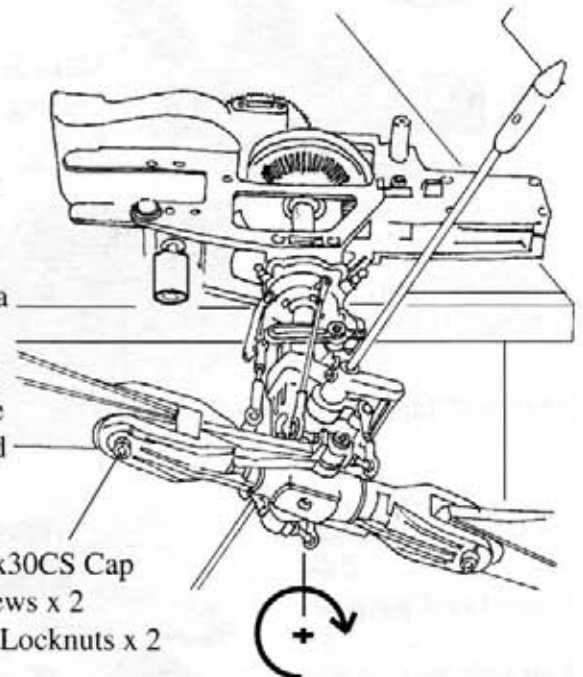
Using foam rubber, wrap the battery pack & receiver. Using two #64 elastic bands, looped through the front of the top servo tray, secure the components to the two hooks on the lower servo tray. Collect the servo and gyro wires and plug them neatly into the receiver. Tie these wires neatly together using small tie wraps. Depending on your equipment, the switch can be mounted on the provided bracket or on the lower side frame with the double sided foam tape.

Balancing the Rotor Head & Attaching Main Blades

Balance is the most important part in maintaining a safe, reliable and vibration free helicopter. First check the blades for balance. This can be done on a balancer but can also be done directly on the helicopter by tipping the helicopter on its side at the edge of a table and attaching the blades with two M4x30 Socket Cap Screws and M4 locknuts. Temporarily remove the bolt to secure the autorotation unit so the head spins free (remember to replace this bolt!!). If one blade stops at a spot lower than the other, add some tape to the lighter (higher) until they balance at the same level. The same procedure can be used to balance the flybar without the main blades attached.



Bolt the blades together and support by the ends of the bolt off a flat surface. If one blade tips to one side add small pieces of tracking tape until both blades hang an equal distance from the table (Distance A = B). Attach the Main Blades to the helicopter using two M4x30 Socket Head Cap Screws and M4 Locknuts.



M4x30CS Cap Screws x 2
M4 Locknuts x 2

When attaching the main blades, the direction of rotation is clockwise, when looking from the top of the helicopter.

****Blade Bolt tension on the main blades should be set by tightening the bolts a little at a time until the blades will hold straight out as the helicopter is tipped on its side and a light shake will cause them to move. Too tight and a vibration may occur, too loose and a boom strike can happen. Tail blades can be set much looser.**

Setup and Installation of PG2000II Gyro (purchased separately)

The connectors on the gyro have been selected to be universal for the range of radios and servos on the market.

Warning, if any radio system is used other than those listed make sure same polarity is maintained and double check your connections, otherwise you risk damaging the PG2000II gyro.



Transmitter Settings:

The PG2000II is truly "plug and play" with your radio, the following chart shows the basic settings for your transmitter.

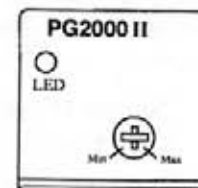
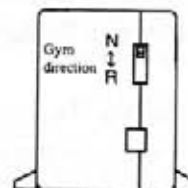
		Rudd	Gear/Aux
Servo Reverse		N	N
Travel* (ATV or EPA)	H	100%	100%
	L	100%	100%
Revo Mix	Up	18%	
	Down	16%	

- 1 - End point settings (ATV or EPA) for the rudder channel and gear/aux channel (the channel that you have plugged the RED gain lead into) are set at 100 and 100. If you have a radio that has special channel 5 gyro software then set this at max ATV on both ends.
- 2 - Rudder sub-trim and rudder trim are set in the middle.
- 3 - Revo Mixing settings are at an initial setting of 18% up and 16% down.
- 4 - With the TX turned on and the tail rotor servo / gyro connected, attach the tail rotor servo arm so that it is at 90 degrees to the tail rotor control rod when the TX stick is centered.

Helicopter Servo Set-up:

- 1 - (As Before)
- 2 - The tail rotor control rod, tail rotor bellcrank and tail rotor control slider are set up mechanically as per the instructions in your helicopter kit manual.
- 3 - Attach the ball joint or Z-bend of the tail rotor control rod to the tail rotor servo arm at a distance of 10 to 14 mm from center.
- 4 - Turn on your radio, leaving the tail rotor control rod disconnected from the servo arm. Now move the tail rotor control stick on the TX fully to the left and fully to the right and try to attach the control rod when at both ends. If there is not enough rod travel to allow this (binding) then move the attachment point further in on the servo arm. If there is room for even more movement of the control rod at each end, then move the attachment point further out on the servo arm.
- 5 - Move the TX rudder control stick fully to the left and slowly rotate the tail rotor through one complete rotation, and note any binding. Do the same with the TX rudder control stick set fully to the right. If there is binding anywhere, investigate and adjust the servo arm attachment points accordingly.

Only use a plastic screw driver to make changes.



Final Bench Adjustments

- 1 - Turn on the transmitter, and then the receiver. DO NOT move the helicopter until the gyro has initialized. The green LED at the top left of the gyro will flash green for a few seconds then turn to a solid green, this will indicate that the gyro is now initialized. NOTE: whenever the radio is turned on before flight, it is important that you allow time for this initialization to take place before moving the helicopter.
- 2 - Check for proper rudder direction. With the tail rotor in the vertical position, and looking from the rear of the helicopter, move the TX stick fully to the right. Note the TRAILING edge of tail rotor blades, they should move to the right. With full left stick, they should move to the left. If they do not, then reverse the rudder direction in the TX.
- 3 - Check for the proper gyro direction. With the radio on and the gyro initialized, rotate the nose of the helicopter to the right and insure that it causes the trailing edge of the tail rotor blades to move to the right.
- 4 - Set the TX gain to 75% and 45%
 - A - If you are using a radio that does not have gyro gain software, then the gain of the gyro will be adjusted by the settings of the ATV's in whatever aux channel you have used. Settings of 0 to 100 ATV in one direction will adjust gains upward from 50% to 100% relatively (e.g. 0 ATV is 50% gain, 50 ATV is 75% gain and 100 ATV is 100% gain). Settings of 0 to 100 ATV in the other direction will adjust gains downwards from 50% to 0% (e.g. 0 ATV is 50% gain, 50 ATV will be 25% gain and 100 ATV will be 0% gain).
 - B - If you are using channel 5 of a TX that has gyro gain specific software then you can adjust the two switch settings directly with the percentage number you desire. In this case, I would suggest 75% and 65% for a start setting.
 - C - If you have a radio in which there is no channel available for remote gain settings then you just leave the aux lead free and you will be able to operate the gyro as a single gain unit, using the mechanical pot on the front of the gyro to adjust the gain. Clockwise rotation will increase gain and counter-clockwise rotation will decrease the gain. A good place to start would be a setting of 50%.

Field/Flight Gyro Adjustments to optimize gain settings.

- 1 - Setting the gain at hover rotor speed, gain 1. Bring the helicopter into a hover. If the tail wags, decrease the gain setting. If it does not wag, then increase the gain settings until it just starts to wag. Then decrease slightly and test to insure no wag when giving a rudder command and releasing it. Then set gain 2 to 15% less.
- 2 - Setting the gain at the higher speeds for aerobatics and fast forward flight. Select gain 2. Take the helicopter into fast forward flight. If the tail wags during any maneuver then turn down this gain setting until it stops.
- 3 - In the hover, set the rudder trim so that the helicopter heading does not drift when pointed directly into the wind.

Final Adjustments - Radio Setup

Now that the servo installation into the helicopter is finished the following pages should be reviewed. As various types of radios can be used to setup the helicopter, some of the following information may not apply.

Servo Direction (Servo Reversing)

Check that all servos move in the correct directions, see the diagram on pg 36.

Dual Rates

For beginners (using the flybar weights) the dual rate values should be set at 100% for both switch positions until hovering has been mastered.

Position #1: (high rate) 100%

Position #2: (low rate) 75%

Exponential

The exponential function allows you to adjust the sensitive of the cyclic controls around the center of the stick position. This should be left at 0% (linear) until all trimming is complete.

Trims

The trims on the outside of your transmitter are used to fine tune the servo center positions while testing in-flight. If the trim has to be moved more than 5 or 6 divisions then mechanically readjust the linkage length to set the trim back in the center.

Throttle Mixing

If your radio has some mixing facilities, it is recommended that you use them to mix throttle with some other controls for aerobatic and 3D flying. Set the mixes so that they add throttle when using fore-aft cyclic (elevator), left-right cyclic (aileron) and tail rotor (rudder).

Travel Adjustment (endpoints)

Use endpoint adjustments to adjust how far the servo is allowed to move in either direction. Try to always keep the same amounts on each side of center. If binding occurs simply reduce the travel in that direction or use a smaller servo arm. ** Note: by changing one side only (high or low stick) the servo travel is no longer equal which may result in an improper control response. It is better to set the high/low adjustments the same, or make actual pushrod adjustments.

Pitch & Throttle Curve Adjustments

We adjust these curves in order to achieve a constant rotor speed at all collective pitch settings. This will reduce the amount tail rotor compensation during flight and aerobatics and keep the engine always at its optimum power RPM. This can only be achieved through adjusting the individual values which control the pitch and throttle at a given stick position until a constant rotor speed is achieved.

Pitch Curve Adjustment

The following chart shows the values for the collective pitch measured in degrees which are made on the helicopter using a pitch gauge. The Travel Adjustment function (if available makes these settings easy). For the beginner it is recommended to set the low stick position to 0 degrees to avoid damaging the helicopter while reducing the power during the first few flights. These settings will need slight adjustment to keep the helicopter at a consistent height at mid stick.

Suggested Pitch Curve Values

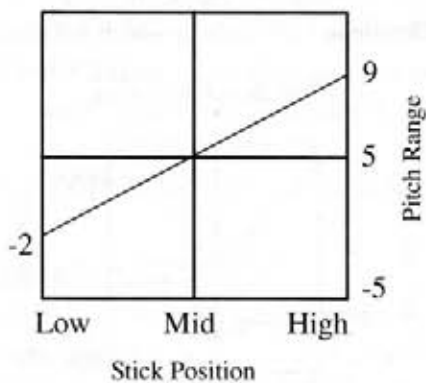
Flight Mode	Setup Method	Low Pitch (low stick)	Hovering (mid stick)	High Pitch (high stick)
N	Beginner	0	5	9
N	Hovering	-2	5	9
1	Stunt & Aerobatics	-5	5	9
2	3D**	-9	0	9
H	Autorotation	-5	5	12

(N - Normal flight mode, 1 - Stunt mode one, 2 - Stunt mode two, H - Throttle hold-autorotation)

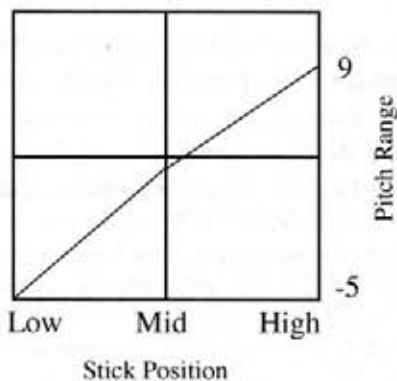
Note** In order to avoid binding at high pitch angles the flybar control arms may need to be reset at an angle of 10-15 degrees down from parallel.

Pitch Curve

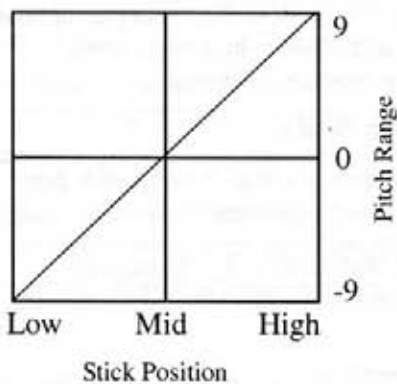
Hovering - (linear) Normal Flight Mode



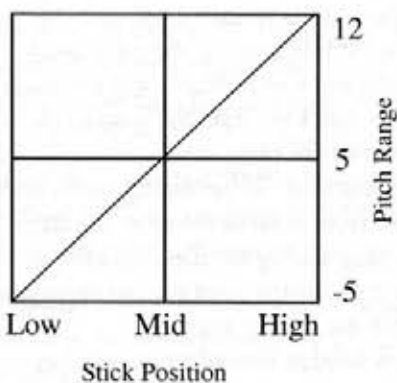
Aerobatic Flying - Flight Mode 1



3D Flying - Flight Mode 2



Autoration - Throttle Hold

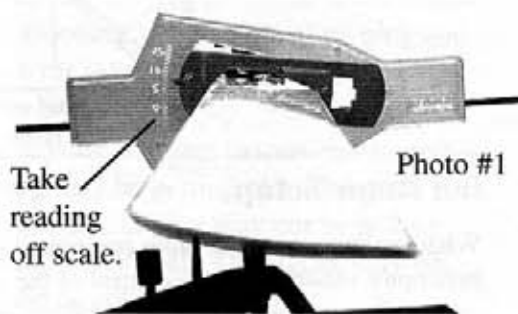


Using Pitch & Flybar Paddle Gauge CN2026 (Purchased Separately)

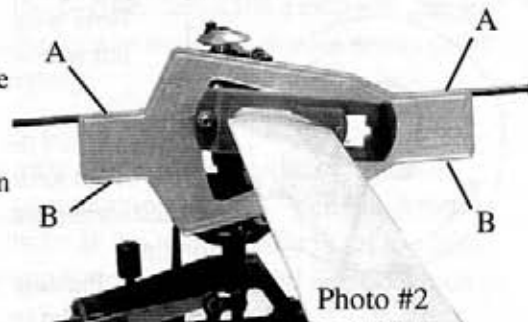
Before making accurate pitch readings or aligning paddles, the helicopter should have all linkages attached at the factory normal settings with the servos connected, working and moveable to the endpoints of the servo without binding. Also have the swashplate set level in the fore/aft and left/right directions. Turn the radio on and take different readings at the different throttle/collective stick positions.

Pitch Gauge

1. Loosen the thumb screw on the back side of the gauge, open the jaws and position the gauge on the blade near the rotor head, see photo#2.
2. Position the flybar perpendicular (90°) to the main shaft.
3. Take 3 readings: at low pitch, at hover pitch and high pitch.
4. To read the blade pitch, while looking at the gauge in photo#2, align the bottom or top by sighting the edge of the gauge parallel to the flybar. When these are parallel, read the value at the pointer on the scale.
5. Repeat this process for the opposite blade, make changes in the radio or in the length of pushrod C if necessary.

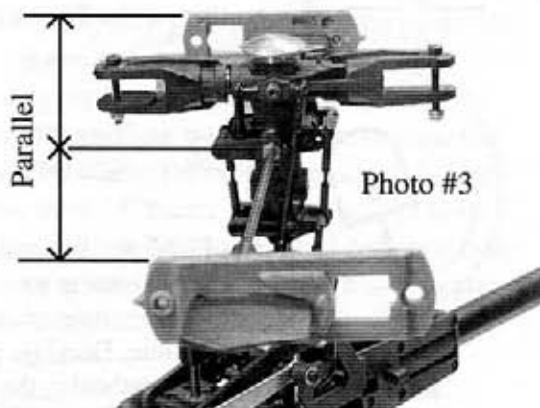


Sighting Edges A or B



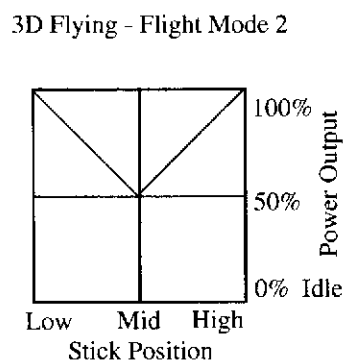
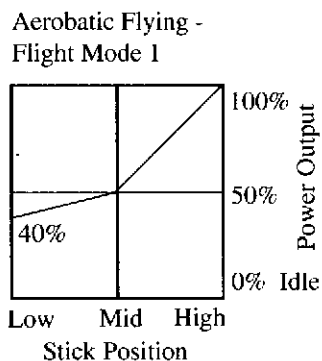
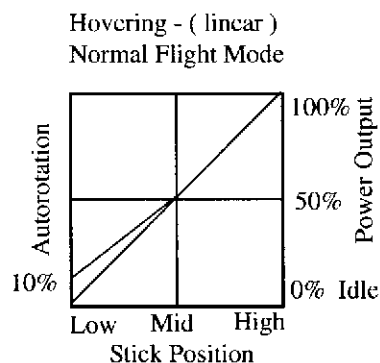
Flybar Paddle Alignment Gauge

1. Make sure the flybar is centered in the rotor head using a ruler. Install the flybar control arms and paddles on each side. Leave the set screws on the control arms slightly loose so they rotate but do not slide.
2. Disassemble the center part of the pitch gauge and slide one paddle gauge on each flybar paddle. Adjust the paddles until both gauges are parallel to each other, as in photo#3.
3. Make sure the swashplate is level, align the paddles to the flybar control arms and tighten the set screws.



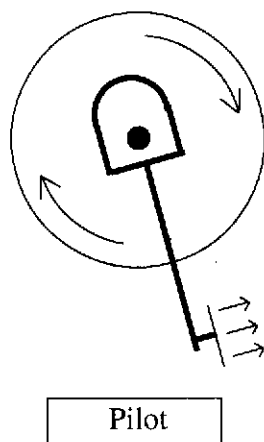
Throttle Curve Adjustments

After several tanks of fuel the engine will be run-in, at this time you can modify throttle settings. Remember that the smoother the engine the less adjustment required. Not all engine /muffler /fuel combinations are the same which will shift some of the values shown below.



Tail Rotor Setup

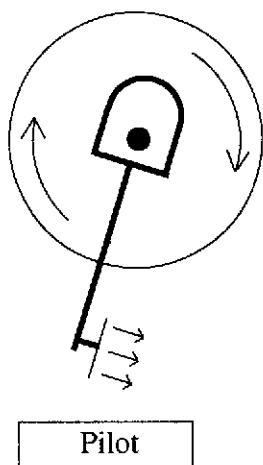
What separates airplane radio equipment from the helicopter version is in the control of the individual curves discussed earlier and in the Revo-mixing. Take a moment to consider the helicopter hovering in front of you - tail in.



- 1 Nose rotates left at hover.

Problem: Not enough pitch in tail rotor to match torque setting of engine.

Action: Increase pitch by shortening the rudder pushrod. If the yawing is minimal, then one can apply some right rudder trim at the Transmitter.



- 2 Nose rotates right at hover.

Problem: Too much pitch in tail rotor to match torque setting of engine.

Action: Decrease pitch by lengthening the rudder pushrod. If the yawing is minimal, one can apply some left rudder trim at the transmitter.

Once the tail rudder pushrod is adjusted correctly so the tail does not rotate (don't consider wind now) the revolution mixing can be adjusted.

Revolution Mixing

The revolution mixing function allows the helicopter to climb or descend without the tail rotating. There is a high & low setting on the helicopter radio.

The values shown will vary depending on engine, blade pitch and fuel but provide a starting point for the beginner. For each flight mode setting, there will be different Revo-mixing amounts. For forward flight the settings will be lower than hovering due to the aerodynamic forces effecting the helicopter. Here is a starting point for revo values:

High Stick Setting: 40	Normal Flight Mode
Low Stick Setting: 20	

These values correspond to the total travel for the tail rotor pitch. To adjust the high setting, hold the helicopter at hover and increase the throttle/collective to maximum so the helicopter climbs steadily. Notice the direction the nose

rotates:	Nose rotates
High & Low	left increase revo value to increase tail pitch. right decrease revo value to decrease tail pitch.

To adjust the low setting, start from a high hover and decrease the throttle to descend, notice which direction the helicopter rotates.

Gyro Gain Adjustment

The gyro assists in holding the tail rotor, actually compensating for changes in wind direction or quick stick movements.

First check that the gyro is installed correctly by watching the rudder servo. While holding the rotor head move the rudder stick to the right and observe the direction the servo arm moves. Now quickly rotate the nose to the left, the servo horn should move in the same direction as it does when given a right stick command. If the rudder servo horn moves in the opposite direction, reverse the gyro direction.

Generally the starting setting for the gyro gain is 60%, keep increasing the gain setting until the tail starts wag back and forth, then reduce the setting slightly.

Problem: Tail rotor makes sudden uncontrolled rotation.

Solution: Reverse gyro direction switch.

Before Flying your Hawk Sport Helicopter

Before each flight, check that all bolts and screws are tight. Simply flying your helicopter, may loosen any screws which were not threadlocked or secured with a lock nut.

First Flights For the beginner pilot, a training pod is strongly recommended to assist in learning to hover the helicopter with substantially reduced risk of crashing. These systems provide the training capability to allow pilots to become familiar with the helicopter controls and how they relate to the behavior of the helicopter before actually leaving the ground.

Starting Your Engine

Fuel 15-30% Helicopter fuel is recommended as it contains more oil. Use a fuel filter between the fuel gallon and the heli to remove any dirt that could stall the engine. Fuel the helicopter by removing the fuel line from the carburator and replace when finished.

Needle Valve Following the engine manufacturers instructions, turn the main needle valve until closed and open to the setting the instructions call for. Different engines will have different settings.

Radio Always turn the transmitter on first, then the helicopter & gyro, When finished, reverse the procedure, first turn off the heli & gyro, then the transmitter. If the radio acts erratically or intermittently, find the problem before starting the engine.

Glow Plugs Remove the canopy (or use the optional remote glow plug connector) and connect the 1.5V glow driver to heat the glow plug. Warning!! glow plugs operate at 1.5V not 12V.

Engine Before starting the engine, check that the carb barrel is rotated to the idle setting and make sure the electric starter is turning in the counterclockwise direction.

Starting If you do not already have a 6mm hex start wand, you will need the optional CN0426. Set the TX for low throttle with the trim centered. Holding the rotor head in one hand, insert the hex shaft into the coupler and press down slightly to engage the starting shaft into the fan. Engage the starter until the engine starts. If the engine does not start recheck all previous points. Remove the start wand using the two step system described on page 8. NOTE: The main blades should not turn until the engine RPM is above idle.

Stopping To stop the engine, with the throttle stick in the low position, move the trim all the way to the low position.

If the Engine Does Not Start

Q. The engine does not turn easily with the starter.

A. The starter battery may be too weak or the engine is flooded. For flooding, remove the glow plug and turn the engine over several times to clear the combustion chamber of fuel and retry.

Q. The engine rotates and tries to start but doesn't.

A. The glow plug may be getting old. The glow plug batteries are weak. The engine may not be getting enough fuel or too much fuel. The starter may be turning the wrong direction.

Q. The engine just does not start.

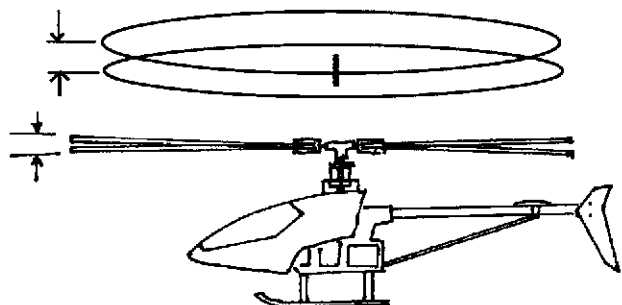
A. The glow plug may be burned out. Fuel may not be getting to the engine, check for a clogged fuel line, dirt in the carburator or the main needle needs to be opened out slightly.

Q. The engine starts but immediately stops.

A. There is a clog in the fuel line, the carburator barrel is not open enough at idle. Open the throttle trim by 1-2 clicks as the main needle is set too lean Helicopter engines have a low speed needle which is factory set, beginners should not adjust it!!

Adjusting the Blade Tracking

Pitch In steps 34-35 you set the pitch range using a pitch gauge and adjusting the radio and the pushrods on the servo horns to specific lengths. Once the helicopter is flying the pitch setting have to be fine tuned. Using appropriate training gear, increase the throttle until just before the helicopter lifts off. Sight the rotor disk from 15' back. If there appears to be 2 rotor disks then adjust Pushrod C until only one disk appears. Using colored tape mark one blade so you can adjust the correct blade.

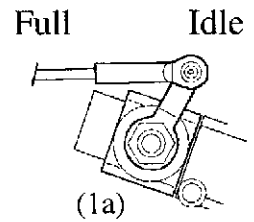


Starting the engine for the first time.

The model engine is the single most difficult part of model helicopters to the beginner, second only to learning to fly. For this reason we have taken the time to go through starting the engine the first time for you. This should help you to understand the basic operation and tuning of the engine.

Items to recheck:

1) Servo direction for the throttle channel - Turn on the transmitter switch, then the switch on the helicopter, move the throttle/collective stick to the low position, the carburetor arm should look exactly like the diagram (1a). Watch the throttle servo. As you raise (increase) the left stick the throttle pushrod will move towards the front of the helicopter. All carburetors work the same, the barrel of the carburetor rotates counter-clockwise as it opens. If this does not happen you need to reverse the servo direction and reset the throttle arm in Step 17. Starting the engine at full power will possibly damage the engine and can damaged clutch components on the helicopter.



2) Fueling the engine - Open the gallon of fuel and insert draw line from the fuel pump into the fuel, remove the fuel line at the carburetor inlet and connect to the fueling line of the fuel pump. Remove the pressure line from the muffler. Fill the tank until you start to see fuel in the pressure line. Reverse the pump for 1 second and reattach the pressure line to the muffler. Disconnect the lines starting with the fueling line and reconnect to the line to the carburetor. Recap the fuel to keep moisture out. Only fuel the model when you are setup and actually ready to start the engine, it is common for the carburetor to fill with fuel while sitting on the bench over a brief period of time. More common is the engine flooding while trying to start. In this case, as you are starting with an electric starter the engine initially turns easily but soon slows down.

3) Last pre-flight checks. Make sure that both the radio Tx and Rx have been charged overnight and the glow starter (if rechargeable). Do a range check, walk away from your helicopter with the antenna fully collapsed to 30 paces and have someone verify that all control surfaces are operating. If you do not make this distance have an experienced modeler check over your setup, do not fly until then. Be sure the throttle control stick is set to the idle position.

4) Cranking the engine over.

- Prime the engine by moving throttle stick to half (**insure the glow plug driver is not connected to the engine**) and crank the engine over for 10 to 15 seconds until you can see fuel come up the fuel line and into your carburetor. Then keep it turning over for another few seconds to insure the fuel has entered the combustion chamber. If fuel does not rise into the carb then check for blockage, proper needle valve opening and proper carburetor barrel opening (approximately 1/16 of an inch).
- Move the throttle stick to the low position with the trim in the center.
- **NOW** connect the glow plug to the 1.5V glow driver battery
- Place one hand firmly on the rotor head. **You must always hold onto the rotor head during start up.** Should the engine start anywhere above idle you will only have a few seconds to put the starter down and pull the fuel line off the carburetor line going to the engine. It is important to make sure you are standing/kneeling on the fuel line side to facilitate this.
- Place the start wand into the hex coupler and push down. Before you start, rotate the coupler counter clockwise until you feel the compression increase. Rotate the shaft past that point to insure the engine isn't flooded.
- Press the button on the electric starter to turn the engine over. There will be an initial popping sound as the engine turns over and within a few seconds the engine should start. When it does, continue to hold the rotor head, disengage the start wand as instructed on page 8 and put down the electric starter. Disconnect the glow driver and move the throttle trim down or up until the engine continues to run at the lowest speed without quitting. If the engine starts to die simply move the trim up one or two clicks. Do not move the throttle stick from the low position at this time.

5) If the engine does not start. Do not continue to crank the engine over if it does not start after a few attempts. When a brand new engine does not start there are only three major possibilities: a) the glow plug is not hot enough or already burned out b) not enough fuel is getting to the carburetor c) too much fuel is entering the carburetor. Assuming you have gone through step 1 on this page. Connect the starter to a 12Volt source and verify that the starter will turn the starting hex coupler counter-clockwise.

- a) Remove and check the glow plug, is the glow plug dry or wet? Connect the glow driver to the glow plug and verify that the element glows a bright orange color, If you get a dull orange glow then your glow starter is not supplying enough power to the glow plug or your plug is no good.
- b) If the glow plug is wet, then the engine is receiving fuel. If the glow plug is dry, no fuel is reaching the engine. Try re-priming the engine, point #1 step 4. Again verify that the engine is receiving fuel.
- c) Is the engine is very difficult to turn over, to the point that the electric starter has difficulty to turn the engine? If yes, you have filled the engine and carburetor with too much fuel. Do not force the starter as you can damage the starter or engine. This will lead to the stripping of the hex coupler on the start shaft. First, disconnect the glow starter, and pickup the helicopter. Pinch off the muffler pressure line and tip forwards and backwards with the muffler side down. This will drain the muffler of any raw fuel that may have collected there. Next turn the coupler to 90 degrees past the highest compression point. This will open the exhaust port and drain any excess raw fuel from the crankcase into the muffler. Clear the muffler and try to start again. If you have the same problem, remove the glow plug and spin the engine (without) plug and any excess fuel will be expelled, replace glow plug and try again.

If the engine still doesn't start, contact an experience modeler to help you with starting the engine, the problem may be very simple.

Basic Hovering

Hovering When all is set, ready and checked, attach your training gear/pod and start the engine.

- (1) Place the helicopter pointing into the wind and stand behind the model about 15' away - tail pointing to you.
- (2) Always watch the nose of the helicopter, move the rudder left and the nose should move left.
- (3) Start by increasing the throttle slowly until the helicopter rises 2-6 inches off the ground then set it back down.
- (4) Repeat this process until you become comfortable holding the model in the same spot for a few seconds. Then land and take a deep breath.

When you become more comfortable, you can gradually increase altitude (be very careful not to get too high) as you are now just practising taking off and landing. This is the most basic but required skill to learn.

Beyond Hovering

It cannot be stressed enough that mastering the hovering skill is crucial to becoming a good helicopter pilot. As you progress in your learning, always practice hovering until you are completely comfortable in holding the helicopter in any position or altitude. Perfecting hovering enables you to more easily and safely move on to all the other types and styles of flying, from fast forward flight to loops and rolls to 3D aerobatics and anything you want to do with your HAWK Sport helicopter. The HAWK Sport can be set up for all of these various disciplines. Have fun!!

Pre-Flight Checklist

1. After turning the radio on, move each servo separately, looking for unusual or excessive movement.
2. Clean & lubricate the main shaft above the swashplate & the tail output shaft area of the pitch slider.
3. Inspect the main and tail rotor grips for play or binding.
4. Turn the main gear in both directions to feel if a problem is developing in the drive train.
5. Check the glow plug and fuel lines for signs of wear.

PRE-FLIGHT CHECK UP & TRIM ADJUSTMENTS

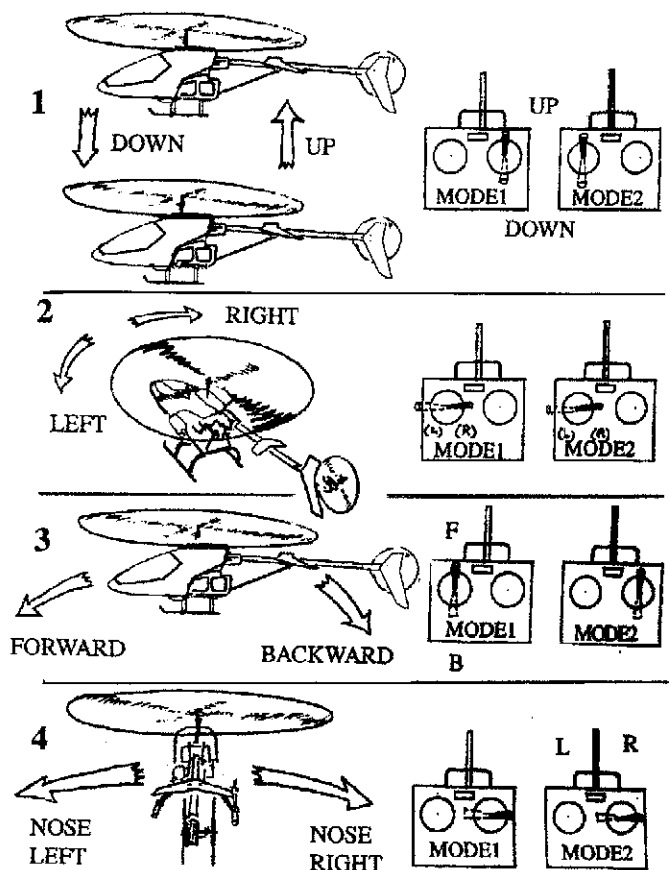
All trim adjustments are to allow you to lift the helicopter straight up and can be made one click or detent at a time on the radio.

(1) **Collective & Throttle:** Slowly raise the throttle stick, the helicopter should lift off at half stick. If it tends not to lift off, increase the hover pitch and/or hover throttle settings on the radio. If the helicopter lifts off before mid stick decrease these settings.

(2) **Rudder:** When the helicopter is ready to take off, trim first for no yaw, then use the rudder stick to control the Left & Right Yaw axis. Note, now is a good time to make the final adjustments on the gyro (see gyro manual).

(3) **Elevator:** If at hover the helicopter tends to move forward, move the trim down, if it moves backward move the trim upwards. Use the elevator stick to control this fore-aft axis.

(4) **Roll (Aileron):** If at hover the helicopter tends to move left, move the trim right, if the helicopter moves to the right move the trim left. Move the Aileron stick to control the helicopter Right-Left movement.



Hawk Sport Replacement Parts

CN2230H4	CRASH KIT -(Main Blades, Main Shaft, Tail Boom, Feathering Shaft and Flybar)	1	HW3127A	HEX SPACER & CANOPY MOUNT SET	1
HW3000	HARDWARE PACK	1	HI3129	CANOPY MOUNT & HARDWARE	1
CN0402	HEX START COUPLER	1	HI3130B	CANOPY	1
HW3005A	STARTER SHAFT SET	1	HI3131L	HAWK SPORT DECAL SET	1
HI3007	STARTER SHAFT BEARING BLOCKS	1	HI3132H	HAWK SPORT INSTRUCTION MANUAL	1
HI3009	COOLING FAN	1	HI3133A	CLEAR WINDSHIELD (for HI3130B)	1
HI3010	CLUTCH BELL & LINING	1	HI3138A	FUEL TANK	1
HW3011	CLUTCH SHOES	1	HI3145	BALL LINKS (16 LONG & 6 SHORT)	1
HW3017	ENGINE MOUNT	1	HI3146B	SWASHPLATE WITH STEEL BALL END	1
HI3020	COOLING FAN SHROUD	1	HI3152C	WASHOUT SET	1
HW3024	COLLECTIVE PITCH LEVER SET	1	HI3152A	RADIUS LINK WITH PIN	2
HI3031A	AILERON BELLCRANKS (L&R CYCLIC) 2		HI3160B	ROTOR HEAD BLOCK	1
HI3032B	ELEVATOR LEVER SET (LONG)	1	HW3161A	FLYBAR SEESAW SHAFT SET	1
HI3032C	ELEVATOR LEVER ONLY (LONG)	1	HI3167A	FLYBAR SEESAW COMPLETE SET	1
HI3035A	ADJUSTABLE CYCLIC PUSHROD LINKS 2		HI3167B	SEESAW OFF SET PLATE	2
HI3040	COUNTER DRIVE GEAR	1	HI3167C	SEESAW TIE BAR	2
HW3042	PRIMARY DRIVE SHAFT	1	HI3167D	SEESAW BEARING CUP	2
HW3045	ALLOY DRIVE GEAR 13T	1	HI3167E	SPECIAL BALL M3X6	2
HW3050	AUTOROTATION BEARING SET	1	HW3170A	WASHOUT PINS	2
HW3053A	10mm MAIN SHAFT	1	HW3173	FLYBAR	1
HW3054A	10mm MAIN SHAFT LOCK RING	1	HI3176	STABILIZER CONTROL ARM	2
HI3056	MAIN GEAR	1	HI3179	FLYBAR PADDLES	2
HW3057	TAIL DRIVE BEVEL GEAR	1	HW3180	FEATHERING SHAFT	1
HW3059	TAIL DRIVE PRIMARY SHAFT	1	HI3181	DAMPING RUBBERS	2
HW3062	TAIL BOOM	1	HI3184	ROTOR BLADE GRIP	2
HW3063	TAIL DRIVE SHAFT SET	1	HI3189	MIXING ARM SET	1
HW3064C	TAIL PITCH CONTROL ROD & CONNECTOR	1	CN2322	MAIN ROTOR BLADES (PAIR)	1
HI3067A	TAIL FIN SET	1	HW3192	LINKAGE SET (11 RODS)	1
HW3070	TAIL GEARBOX INPUT SHAFT	1	HW3202B	T/B SUPPORT STRUTS (PAIR)	1
HW3073	TAIL GEARBOX OUTPUT SHAFT	1	HW3203	BRASS BEARING SET	1
HW3074	TAIL GEARBOX SPACER TUBE	1	HW3204	THROTTLE EXTENSION	1
HI3075	TAIL GEAR SET	1	HI3206	TAIL PUSHROD COUPLER	1
HI3078	TAIL GEARBOX L&R	1	CNBB0730	Bearings 3X7X3 (Flybar, Elevator Lever)	2
HI3087A	TAIL PITCH SLIDER SET	1	CNBB1019	Bearings 10X19X6 (Top Main Shaft)	2
HI3089	TAIL PITCH BALL LINKS	2	CNBB1030	Bearings 3X10X4 (Seesaw, Tail Grips)	2
HI3096	TAIL BLADE GRIP SET	1	CNBB1060	Bearings 6X10X3 (Collective Axle, Pitch Plate)	2
HW3098	TAIL ROTOR HUB	1	CNBB1150	Bearings 5X11X4 (Start Shaft, Tail Shaft)	2
HI3099	TAIL ROTOR BLADES (PAIR)	1	CNBB1350	Bearings 5X13X4 (Counter shaft, Blade grips)	2
HI3102A	TAIL PITCH LEVER SET	1	CNBB1150	Bearings 5X11X4 (Start shaft, Tail Shaft)	2
HI3106A	TAIL CONTROL ROD CLAMPS	3	CNBB1980	Bearings 8X19X6 (Bottom Main Shaft)	2
HI3107	UPPER SIDE FRAMES	2	CNBB1218	Bearing 12x18x4 (Clutch Bell)	1
HI3107A	10mm BEARING SPACER 14x19x1	2	HW3050	Autorotation Bearing 12X18X16	1
HI3112	LOWER SIDE FRAMES	2	CNLR1014	Stainless M3 Ball joint with short standoff	2
HI3115	SERVO MOUNT FRAME SET	2	CNLR1015	Stainless M3 Ball joint with medium standoff	2
HI3122	LANDING STRUTS (PLASTIC)	2	CNLR1016A	Stainless M3 Ball joint with long standoff	2
HW3123	LANDING SKIDS (METAL)	2	CNLR1013	M2 Ball joint with short standoff	2
			CN3040	Torpedo Muffler 32-38	1

Hawk Sport Upgrade Parts & Accessories

CNBB1001	14 pc Ball Bearing Upgrade Set		CN2208B	Metal Swashplate Anti-rotation Bracket - black	
CN0427	Hex start wand with one-way bearing		CN2208P	Metal Swashplate Anti-rotation Bracket - purple	
CN0520	Carbon Torque Tube Tail Drive System		CN2212P	Aluminum Tail Rotor Grips(2) - purple	
CN2005	Main Blade Transport Supports		CN2212G	Aluminum Tail Rotor Grips(2) - gold	
CN2007A	Trainer Pod 30-50 w/4 Legs		CN2212B	Aluminum Tail Rotor Grips(2) - black	
CN2015	Hardened Tip Hex Wrench Set (1.5mm/2.0mm/2.5mm/3.0mm tips)		CN2213	2oz Header Tank w/ Machined Mount Bracket - purple	
CN2016A	4.8V Battery Monitor/Alarm		CN2214B	Air Filter (OS32-46, TT36-46)	
CN2018	PG-2000II Dual Rate Remote Gain Piezo Gyro		CN2215B	Machined Head Button (threaded) - black	
CN2022	Single rate micro piezo gyro		CN2215P	Machined Head Button (threaded) - purple	
CN2046	Basic Heli Setup Tool Kit (pitch gauge, blade balancer & pliers)		CN2216	Rear Tail Rotor Servo Mount Set	
CN2052	Accuratech Blade Balancer - blue		CN2217P	Machined Color Caps - purple	
CN2056	CNC Machined Aluminum Swashplate		CN2218P	Machined Color Washers - purple	
CN2079	Fast 3-D Hot dog fly bar paddles (R red, O orange, Y yellow)		CN2221	6mm Feathering Spindle System w/ Thrust Bearings	
CN2122	Carbon fiber Flybar stiffeners 30		CN2126H	Ultra Light Carbon Graphite Tail Boom	
CN2137	2 oz Header Tank w/ Universal Bracket - purple		CN2239C	Carbon tail boom mount for rear rudder servo	
CN2155	Piston Locking Tool - purple		CN2240H	Carbon Graphite 3D Tail Fin Set	
CN2153	Machined Throttle Extension - OS32SX, 46FX, TT36H - purple		CN2128H	Ultra Light Carbon Graphite Tail Boom Supports	
CN2176	CNC machined servo arm pack (5 pcs. Futaba purple)		CN2400	Hurricane Carbon fiber Blades - 550mm Fully Sym	
CN2177	CNC machined servo arm pack (5 pcs. JR purple)		CN2501	Vortex Carbon fiber Blades - 550mm Fully Sym 3D Pro	
CN2179H	CNC machined servo arm pack (5 pcs. Hitec purple)		CN265522	RotorTech Carbon Blades - 550mm Fully Sym 3D Pro	
CN2202	Aluminum Turbo cooling fan - purple		CN3033	Speed torpedo 30 HV Muffler - Polished Aluminum	
CN2275	CNC Machined Bell Mixing Arms (2)		CN3055H	Millennium Pipe System - Polished Aluminum	

Hawk Sport Replacement Parts



HW3000



CN0402



CN2226



HI3007



HI3009



HI3010



HW3011



HW3017



HI3020



HW3024



HI3031A



HI3032B



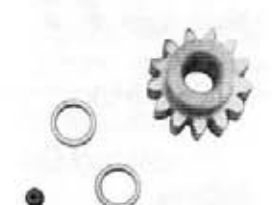
HI3035A



HI3040



HW3042



HW3045



HW3050



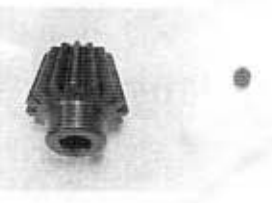
HW3053A



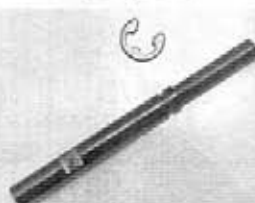
HW3054A



HI3056



HW3057



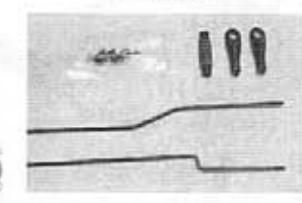
HW3059



HW3062



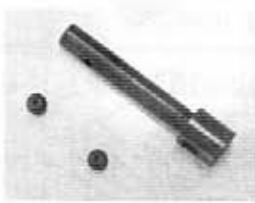
HW3063



HW3064C



HI3067A



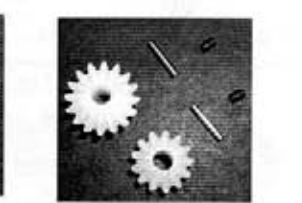
HW3070



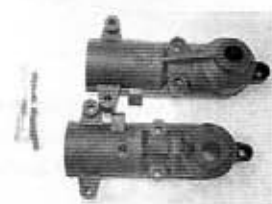
HW3073



HW3074



HI3075



HI3078



HI3087A



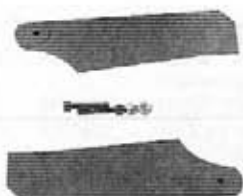
HI3089



HI3096



HW3098



HI3099



HI3102A



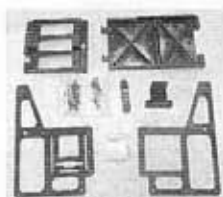
HI3106A



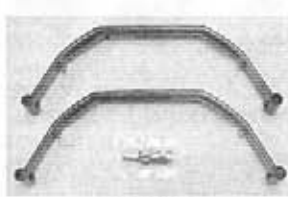
HI3107



HI3112



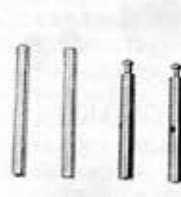
HI3115



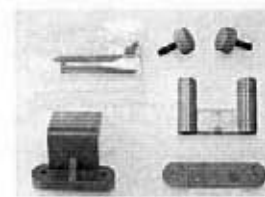
HI3122



HW3123



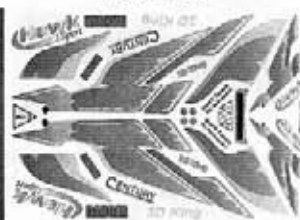
HW3127A



HI3129



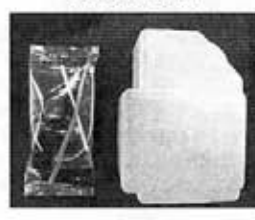
HI3130B



HI3131L



HI3133A



HI3138A



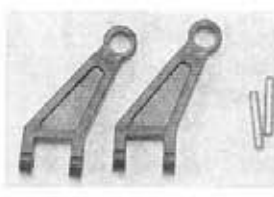
HI3145



HI3146B



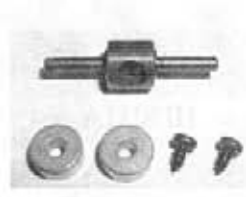
HI3152C



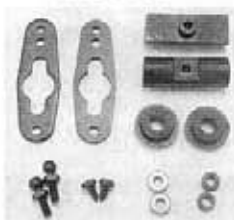
HI3152A



HI3160B



HW3161A



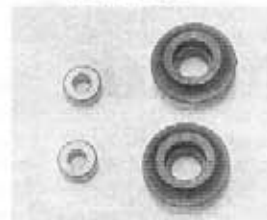
HI3167A



HI3167B



HI3167C



HI3167D



HI3167E



HW3170A



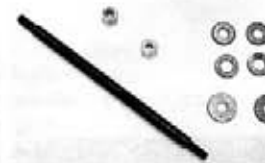
HW3173



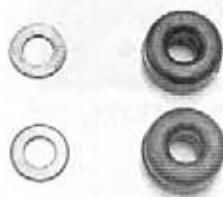
HI3176



HI3179



HW3180



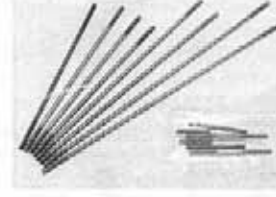
HI3181



HI3184



HI3189



HW3192



HW3202B



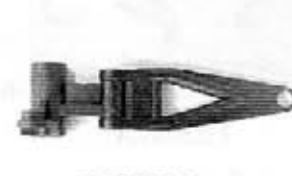
HW3203



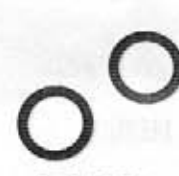
HW3204



CN2322



HI3032C



HI3107A

Century Hawk Sport Upgrades

Fiber Glass Whip Antenna



Kit comes with a hollow fiber tube and CNC base mounts that allow you to insert antenna into the tube. Antenna will be better protected and look so cool.

CN2124 Antenna

CNC Machined Aluminum Servo Arm Pack



Completely eliminate slop from flexing servo arms (purple)

CN2176 (Fut) Arm set
CN2177 (JR/Air) Arm set

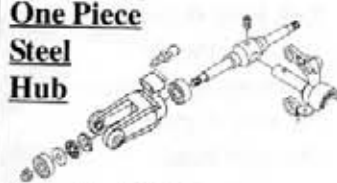
Color Machined Finish Cap & Washer



These caps and washers will add a lot to the looks of our Hawk Sport (colors: Silver, Red, Blue, Gold, Purple, green, black 10pcs/pack)

CN2217 (screw cap)
CN2218 (nut washer)

Triple Ball Bearing Tail Blade Grips & One Piece Steel Hub



Heavy duty dual B.B and a trust bearing tail grip permits solid precise control. One piece hardened steel hub for long-lasting precision and durability.

CN2235 Triple B.B tail assembly

Tuff landing Gear Systems



3 times stronger than most 30-50 size helicopter landing gear. Tuff struts act as shock absorbers to help reduce jolts caused by hard landing.

CN2243 Tuff landing gear

Reversible Hex One Way & Hex Start System



Adapts to starter shaft push into rubber insert. Extension adapts to most starters.

CN0426 Standard hex wand
CN0427 One-way hex start ext.

Color Machined Lock Nut w/Flange



6061T6 machined hardened lightweight aluminum lock nuts. These nuts make you look good (color: silver, red, blue, gold, purple & black 10pc pack).

CN2211 Machined lock nuts

Metal Aileron Bellcrank



Get more Precision aileron movement and improved 3D maneuverability. (Blue)

CNQSC03 Metal aileron arms

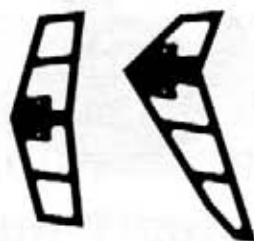
Neon Color 3-D Paddles



Speed up your 3D cyclic response with these lightning quick paddles!

CN2079Y (Neon Yellow)
CN2079R (Glow Red)
CN2079O (Glow Orange)

3-D Carbon Fin set



3D Hot Dog pilots will love this light and durable carbon fiber tail fin set.

CN2240H Tail Fin set

Main Shaft Thrust Bearing Kit



Transfers all loading from the regular radial bearings to the thrust bearing.

CN2220A Thrust Bearing Kit

Metal Washout Arms



Completely eliminate slop on control surfaces. (Blue)

CNQSC01AB Metal washout arm kit

Carbon Fiber Tail Boom



Get that attractive woven Carbon Fiber look with these light carbon fiber tail booms

CN2126H Carbon tail boom

O.S. Throttle Extension



Aluminum C.N.C. machined throttle extension for OS32SXH, 46FXH and TT36H (purple)

CN2153 Throttle extension

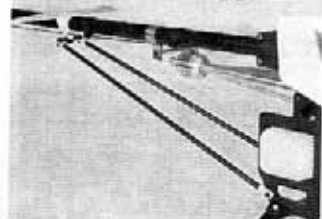
Crash Kit



Hawk Sport crash kit includes 550mm main blade, tail boom, feathering shaft, 10mm main shaft, flybar.

CN2230H4 Hk Sport crash kit

Carbon Graphite Tail Boom Support



Super high quality, extremely light weight and ready to install dual tail boom support kit.

CN2128 Carbon Support

Century Hawk Sport Upgrades

Head Button

(Hawk, Falcon & Phoenix)

Left hand threaded
Black or Purple
anodized head button
for easy stopping of
the rotor head.



CN2215B Black
CN2215P Purple

Fiber Glass Canopy with Carbon Support



CN2242B Light Blue
CN2242G Light Green
CN2242Y Light yellow

Autorotation Slipper Unit



This slipper unit will drive the tail rotor during autorotations, providing accurate rudder control while descending and landing.

CN2231A Slipper Clutch

Ball Bearing Upgrade



Upgrade your Hawk Sport cyclic control system to the number of bearings in the Hawk SE. Now all control bellcranks and arms will be ball bearing supported.

CNBB1001 Bearing upgrade

Machined Elevator Arm w/ Ball Bearing



Incredible smooth operation and improved design allows easy replacement of the ball link when slop develops.

CNQC04 BB elevator arm

CCPM Conversion



Outstanding for rigid, slop free elevator control.

CN1061A CCPM conv. 10mm

Carbon Fly Bar Stiffener



Carbon fiber flybar stiffener with purple aluminum ends will increase precision control for all flight maneuvers. (3mm flybars)

CN2122 for Hawk Sport

Metal Swash Plate Anti-rotation Bracket



Improves timing precision of the swash plate (purple or black)

CN2208P Purple
CN2208B Black

Constant Tail Drive

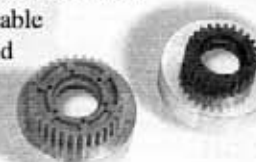
Descending or in autorotations, full tail rotor control is maintained in proportion to the main rotor speed.



CN2263 Constant Tail Drive

Aluminum Clutch Bell

CNC precision machined aluminum clutch bell with replaceable gear and lining



CN2225 Clutch bell w/gear
HI3010A Bell only
HI3010B 2-Stroke Gear (26T)
HI3010C 4-Stroke Gear (33T)
CN2020L Clutch lining (2)

Precision Metal Swashplate



This beautiful CNC precision machined aluminum swashplate will increase precision control for all flight maneuvers. (Silver)

CN2056 Metal Swashplate

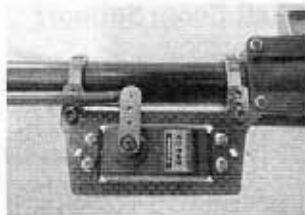
SE 6 mm Head Axle with Thrust Bearings

The 6mm spindle takes the high "G" stresses of 3D better and the thrust bearings make for smoother pitch control at high rotor speeds



CN2221 Conversion Kit

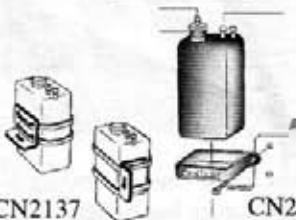
Carbon Tail Servo Mount



Mount the tail servo onto this aluminum/carbon mount for a more direct control rod path to the tail rotor bellcrank.

CN2239C Tail Boom Servo Mount

2 oz Header Tank w/ CNC Machined or Die- cut Mount



CN2137

CN2213 Machined Mount
CN2137 Die Cut Mount

Aluminum Turbo Cooling Fan



Increased air flow, lower engine drag, cooler and smoother high speed operation & cooler clutch shoes.

CN2202 Turbo cooling fan

CENTURY

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