Quick Bat 50-70-90

Budget/ Sport/ Pro Helicopters

ASSEMBLY AND MAINTENANCE MANUAL

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INTRODUCTION

Congratulation and thank you for the purchase of great product! It is our sole desire for you to enjoy the quality workmanship and performance of any of our Nitro powered helicopters. We believe we have the latest designs and technology incorporated into our model helicopters. Our CNC parts are produced using the best high density materials & anodized using material hardening finishes with the tightest of tolerances. Our new helicopters feature the latest advances in R/C helicopter design. The simple and mechanically superior EMS design (also known as CCPM) ensures a helicopter that will be more responsive and more stable than any other R/C helicopter you have ever flown. Three servos are attached directly to the Swashplate to ensure precise control. This kit features all metal construction, and a carbon or composite frames are standard. Along with great products, our staffs are RC guys that fly and have hands on experience with total manufacturing & testing of our helicopters. In addition, we stand behind all our products 100% with satisfaction guaranteed. Our kits will be shipped 100% complete and we can assure you that once you fly your helicopter you will love it.

The **BAT series**

We believe you hold in your hands one of the best helicopters manufactured in the world today. The **BAT series of Helis** are part of the famous versions of our Big Nitro Quick line. It is a bigger, stronger frames, yet powerful machine. This baby delivers amazing power smoothly throughout the entire range of its nitro motor. It functions so responsive and stable. The **BAT Pro versions** features a fully machined head, metal grips, dual bearing tail rotor, carbon fiber frames, carbon rudder push rod, and carbon fiber boom supports. The **BAT Sport versions** features a G10 fiberglass frame, machined metal head, molded plastic grips, carbon boom supports, carbon rudder push rod, and dual bearing tail rotor. Our helicopters are carefully designed and tested, and manufactured of the highest quality materials available.

In a short time, you can be flying.

We ask that you please read the entire manual before starting the construction of your **BAT**, and if you have any questions our technical support staff can be reached at

(610) 282-4811 M-F 9-6, S 9-4 Eastern time,
or by email at ***jon@quickworldwide.com***
Irwin@quickworldwide.com

For the latest information and updates, please visit our website at

www.quickworldwide.com

CUSTOMER SERVICE

<table>
<tr>
<td>Quickworldwide
201 South 3rd. St. & 309 N.
Coopersburg, PA 18036

Phone: (610)-282-4811

Fax: (610)-282-4816</td>
<td>Websites:
http://www.hhiheli.com
http://www.quickheli.com
http://www.giantscaleplanes.com</td>
</tr>
<tr>
<td colspan="2">Office Hours:
Mon – Fri: 9:00 – 6:00
Sat: 9:00 -4:00
(Eastern Daylight Time)</td>
</tr>
<tr>
<td colspan="2">Technical Support Personnel:

Irwin – Irwin@quickworldwide.com
Jon – jon@quickworldwide.com</td>
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FEATURES

1. Frame Construction: ALL OUR BAT SERIES frames are made of the highest Quality Black G-10 Frames or Carbon Fiber. These frames are not only rigid but will provide excellent vibration absorption.

2. One-Way Hex Start Shaft System: The one-way bearing allows the engine to idle & continue to run after the starter motor has been removed.

3. Constant Tail Rotor Drive System: The constant tail system will provide full tail authority during engine off maneuvers.

4. Belt driven Tail: Belt Driven tail is not only a reliable way to drive a tail, but is also very smooth and low maintenance.

5. High Quality Ball Bearings: ALL OUR BAT SERIES offers ball bearings on all moving parts.

6. EMS Collective System: The EMS Collective design allows ease of setup with fewer moving parts. EMS constitutes overall design simplicity and currently the standard of helicopter technology.

7. Heavy-Duty Clutch System: Based on the same design as our famous heavy-duty clutch upgrade that fits most popular machines, this clutch will give many years of problem free operation. NEVER HYDRO-LOCK YOUR ENGINE & FORCE START IT. This will ruin the one bearing in the clutch shoe.

8. Control Linkages: The control linkages that are provided with the Quick kits are high quality 2.3-2.5mm stainless steel rods and the rod ends are made of a high quality Delrin. Some of the rods by 2.5 requiring a simple drill in/out on the ball link, instead of forcing the link on.

9. Single Blade Axle Design: The single blade axle design is simple very responsive system, with very consistent flight characteristics.

10. Advanced Airfoil Fly-bar Paddles: These paddles will provide the best both kind of flight characteristics for both 3D & Sport flying. Not only do they provide smooth forward flight, they also provide quick response upon demand.

PRE-ASSEMBLY INFORMATION

Warning

The radio-controlled model helicopter contained in this kit is not a toy. Rather, it is a sophisticated piece of equipment. This product is not recommended for use by children without adult supervision. Radio controlled models such as this are capable of causing both property damage and/or bodily harm to both the operator/assembler and spectators if not properly assembled and operated. Hobbies & Helis assumes no liability for damage that could occur from the mis-assembly and/or use/misuse of this product.

Academy of Model Aeronautics

We strongly encourage all prospective and current R/C aircraft pilots to join the Academy of Model Aeronautics. The AMA is a non-profit organization that provides services to model aircraft pilots. As an AMA member, you will receive a monthly magazine entitled Model Aviation, as well as a liability insurance plan to cover against possible accident or injury. All AMA charter aircraft clubs require individuals to hold a current AMA sporting license prior to the operation of their model. For further information, please contact AMA at:

Academy of Model Aeronautics
5161 East Memorial Drive
Muncie, IN 47302-9252
USA
Phone: (317) 287-1256
www.modelaircraft.org

Before you begin

Quick Helicopter kits are packaged with care and attention to detail. We recommend when you are ready to begin building this model that you examine the kit carefully, inspect the contents of each package, and read and understand these instructions thoroughly before starting assembly.

REQUIRED TOOLS

Phillips Screw Driver

Ball End Drivers
HHI7050 - Ball end drivers only
HHI7051 - Ball end driver combo

Bubble Blade Balancer
HHI7010
High Point Balancer
DUB499

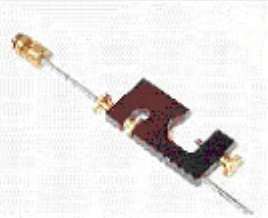
Piston Head Lock
HHI7020

Composite Paddle Gauges
HHI7000

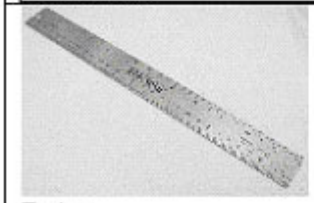
4 PIECE ALLEN DRIVER SET HHI7332

Tool Tips are a lifetime guarantee

Pitch Gauge
HHI7001



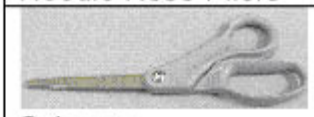
Universal FlybarLock
HHI7040



Ruler

Hobby Knife

Needle Nose Pliers



Scissors

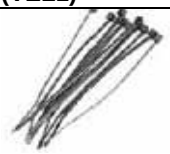
A Dremel Tool, sandpapers, and a round file would be helpful.

HARDWARE & OPTIONAL ACCESSORIES

GLUES AND THREAD LOCK COMPOUNDS

 Ca Glue. …GBG1	 JB Weld…JBW8265S	 Locktite. …….PT40

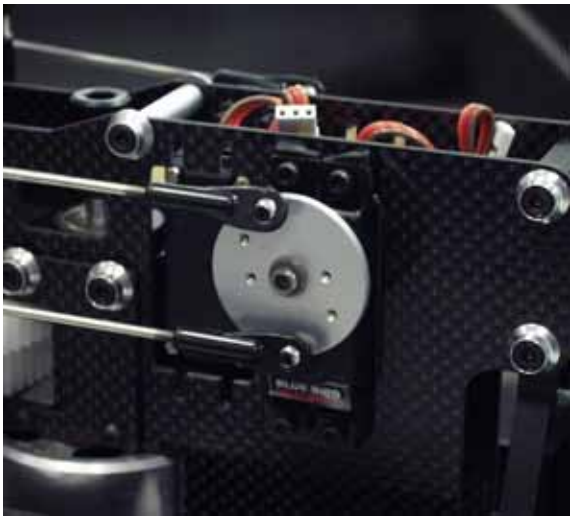
RADIO MOUNTING ACCESSORIES

 **Velcro Pads (VEL1)**	 **Receiver Hold down Straps HHI55** 2 pk $4.99 (yellow, orange, Pink, Black) HHI55-4 4 pk $8.99 (2yellow & 2orange or 2Pink & 2Black)**
 **Wire Ties HHIWT01X**	 **Spiral Wrap HHI2811 3' Combo Pk (3' small, 3' medium) HHI2812 5' Combo Pk (5' small, 5' medium)**
 HHI 2200 Receiver Strong Box	 **Fuel line retaining clips** QUI9022 **Simple plastic fuel cutoff** HHI2820

OTHER HARDWARE & OPTIONAL ACCESSORIES

4MM FLYBAR STIFFENERS
HHI 402

SKID STOPS - AVAILABLE ASSORTED
HHI2052 Round Green, HHI2045 Round Pink, HHI2045LB Round Light Blue, HHI2046W Triangle Light Blue, HHI2045FL Round Fluorescent Red, HHI2042 Round Gray



Servo Arms and Wheels available.

For all the Bat series helicopters you will need 3 full arms, short full arms, or wheels for the three collective servos. You will need either a half arm or a short half arm for the throttle and rudder.

Purple

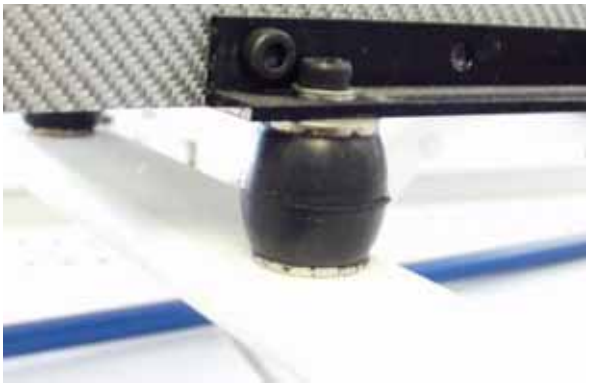
	JR/Airt.	Fut/GWS/GP/FMA	Hitec
Half Arm	HHI1011	HHI1010	HHI1013P
Short Half	HHI1031	HHI1030	HHI1033P
Full Arm	HHI1001	HHI1000	HHI1003P
Short Full	HHI1021	HHI1020	HHI1023P
28mm Wheel	HHI1081	HHI1080	HHI1083P

Blue

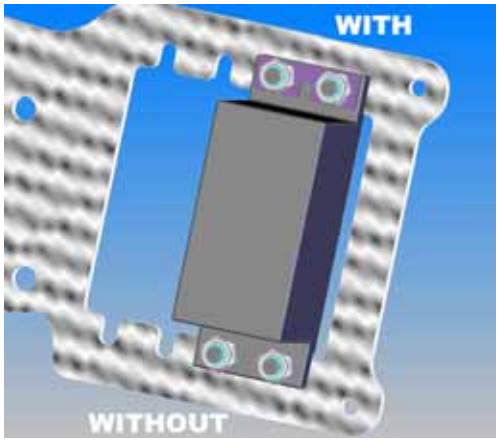
	JR	Fut	Hitec
Half Arm	HHI1011B	HHI1010BB	HHI1013B
Short Half	HHI1031B	HHI1030B	HHI1033B
Full Arm	HHI1001B	HHI1000BB	HHI1003B
Short Full	HHI1021B	HHI1020BB	HHI1023B
28mm Wheel	HHI1081B	HHI1080B	HHI1083B

Gold

	JR	Fut	Hitec
Half Arm	HHI1011G	HHI1010G	HHI1013G
Short Half	HHI1031G	HHI1030G	HHI1033G
Full Arm	HHI1001G	HHI1000G	HHI1003G
Short Full	HHI1021G	HHI1020G	HHI1023G
28mm Wheel	HHI1081G	HHI1080G	HHI1083G



LANDING GEAR DAMPENERS
HHI2004



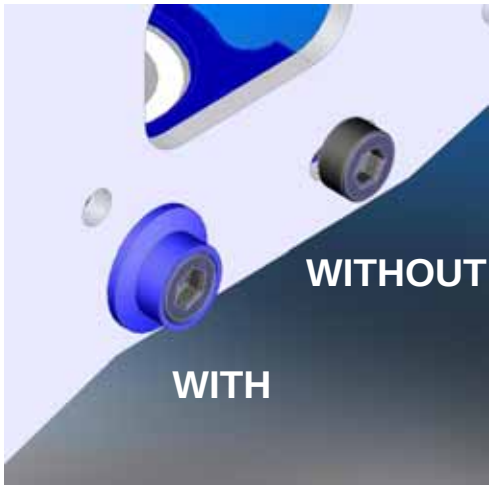
SERVO FIXING PLATES

- **Transmits force of fastener to plastic instead of rubber. Make sure that you install the fixing plate on whichever side has the rubber exposed on not on the frame.**

HHI1205 SERVO MOUNTING KIT

- **Includes hardware and fixing plates to mount 5 servos**

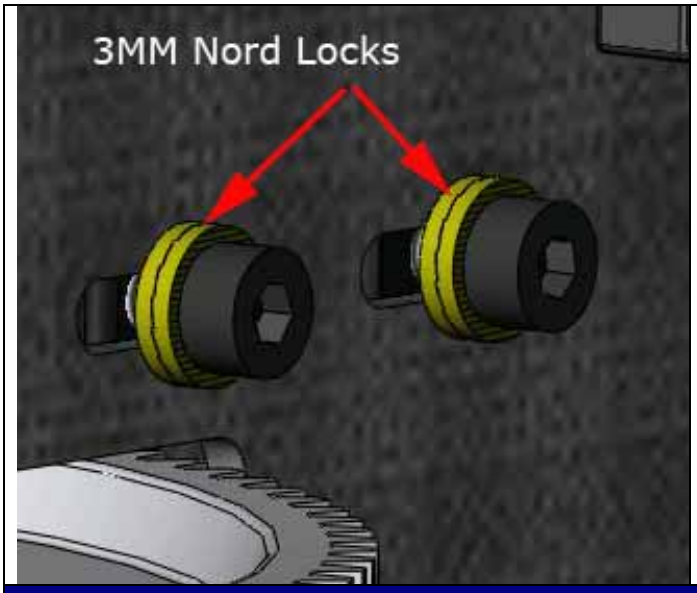
BASE LOAD ANTENNA
HHI 5300 Purple
HHI5301 Gold
HHI5302 Blue



FINISHING CAPS

- Adds color and style
- Distributes force across larger surface area

	3mm (20 pcs in a package)	4mm (8 pcs in a package)
BLACK	HHIM11100B	HHIM11110
BLUE	HHIM11103	HHIM11108
GOLD	HHIM11101	HHIM11106
GREEN	HHIM11100G	---
PURPLE	HHIM11100	HHIM11105
RED	HHIM11100R	HHIM11109
SILVER	HHIM11100	HHIM11107



Nord-Lock Washers

HHI2730 3mm, 10 sets per pack
HHI2740 4mm, 10 sets per pack
HHI2741 6mm, 5 sets per pack
HHI2742 8mm, 5 sets per pack

BLADES

Generally, we stock our own go-quick blades and SAB blades. Please check the website for what's available.

Mufflers

QWW stocks the Zimmerman line of Stainless Steel Mufflers. These mufflers are specially designed to increase performance while maintaining quiet operation.
50 Sized – ZIM2615 $89.99
70 Sized – ZIM26152 $119.99
90 Sized – ZIM26153 $129.99

Accessory Packs

There are three accessory packs that we put together. The best accessory pack is #1 (HHI2100), it includes most every accessory that we make for the helicopter. The second is the recommended items we would like to see any pilot use (HHI2110). The third pack is our basic accessory pack. These are the items that we really think you should have for your helicopter (HHI2120).

Accessory Pack #1 (HHI2100)- The following items are included in the $229.99 Accessory Pack (This is the pack that will deck your machine out with all the accessories.)

Wire Ties (HHIWT01)are good for attaching you bundled wires to your frames, and can be used for many other applications.

Finishing Caps (HHIM11103)- Blue (3 packs are required for the whole kit) - These really finish the look of the helicopter. They also add additional support for the cap head bolts.

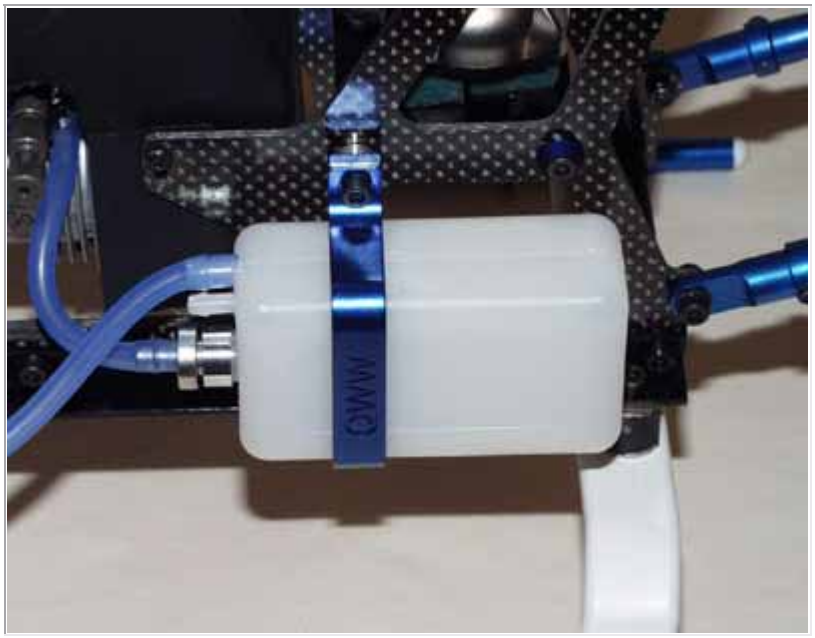
	3mm (20 pcs in a package)	4mm (8 pcs in a package)
BLACK	**HHIM11100B**	**HHIM11110**
BLUE	**HHIM11103**	**HHIM11108**
GOLD	**HHIM11101**	**HHIM11106**
GREEN	**HHIM11100G**	**---**
PURPLE	**HHIM11100**	**HHIM11105**
RED	**HHIM11100R**	**HHIM11109**
SILVER	**HHIM11100**	**HHIM11107**

Blade Sack (HHI6062)- A blade sack is a must for anyone who owns a helicopter. It protects your main rotor blades from getting banged around in the car or whenever you take your blades off. This sack holds 4 sets of blades.

ALL OUR BAT SERIES

Header Tank with blue clamp (HHI5512)**-** The header tank is an item that provides a constant fuel flow to the carburetor. This item is great for anyone from the beginner all the way up to the advanced pilot.

HHI5511B is the part # if you want it with the black clamp.

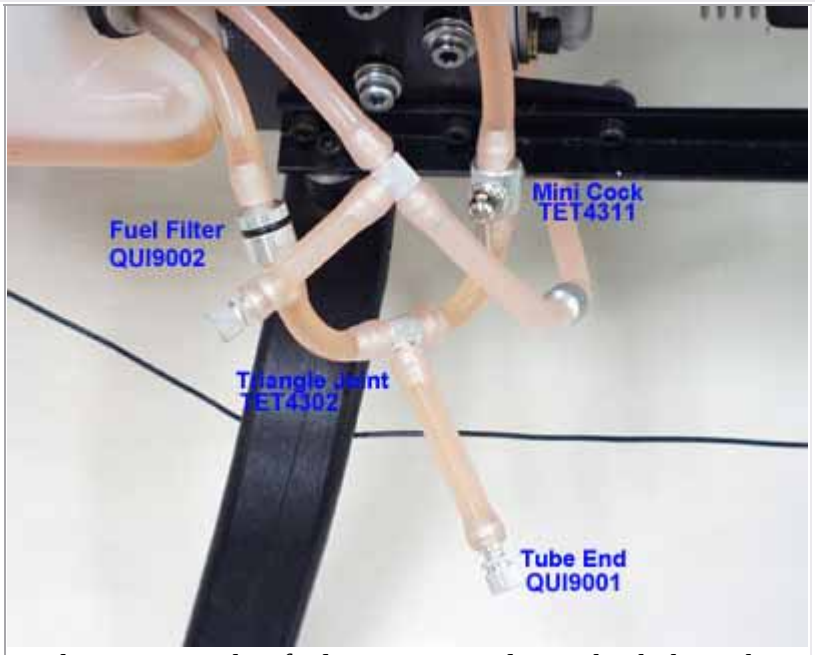


Fuel Filter (QUI9002)- A fuel filter is required because of the dirt and dust that can get into your fuel at the field.

Mini Cock (fuel cutoff valve) (QUI9006)- The mini cock is a simple valve that you can either have on or off. This is good for filling the helicopter and for shutting the helicopter off.

Triangle Joint QUI9014- The triangle joint is used in the fuel system of the helicopter. It is generally used for the filling of the helicopter. It would go before the mini cock going to the carburetor. When you fill the helicopter you close off the valve and fill.

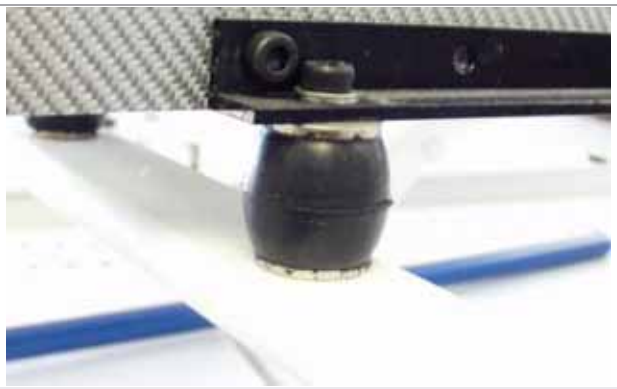
Tube Ends QUI9001 - The tube end is used to plug the end of the line when you are not filling the helicopter.



We have many other fueling options; please check the website for details.

Landing Gear Dampeners are a nice item for any helicopter. They reduce the amount vibration that transmits through the helicopter.

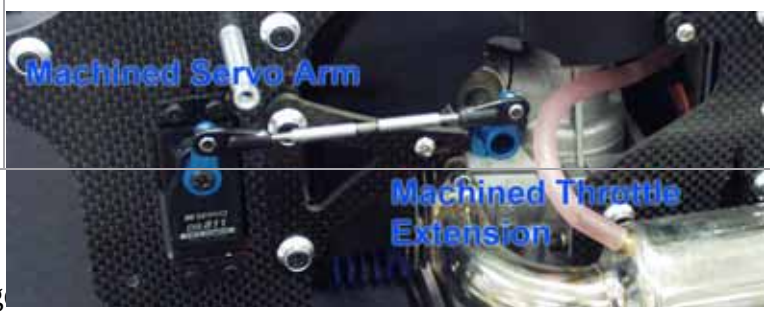
HHI2004



4mm Flybar Stiffeners (Blue) - Flybar stiffeners are a must for anyone going from a beginner's hovering to mild aerobatics. They stiffen the 4mm flybar so that is does not flex providing a more crisp response.

Throttle Extension - The throttle extension makes the setup of the throttle very easy. It clamps onto the throttle barrel of the carburetor and help produce linear throttle curves.

HHI2560B Blue
HHI2560G Gold
HHI2560 Purple



Machined Servo arm set - The aluminum servo arms provide a lot of extra strength to the control system. When you use plastic arms they flex and can produce interactions (Interaction is when you put a specific command into the helicopter but the helicopter doesn't produce the desired output.), but the aluminum arms don't flex at all.

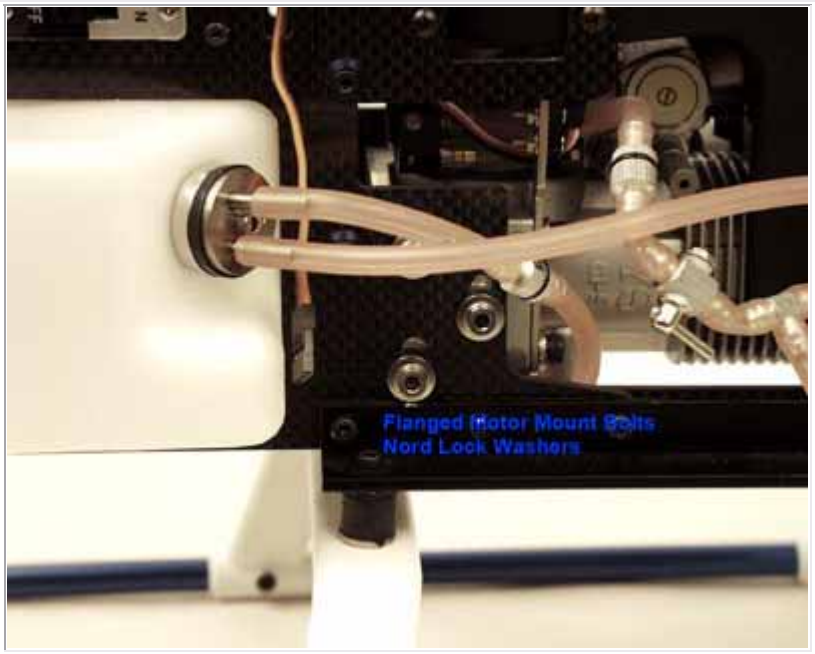
A set includes 5 machined aluminum arms. There is a chart above with the styles to choose from. We use two short full, or full arms on the 3 ccpm servos, and one half arm or short half arm on the throttle and rudder servos.

Velcro Straps HHI55 - are a nice item that holds down your electronics. They make it easy to make adjustments to your receiver, governor, etc.

Receiver Strong Box HHI2200 - The receiver strong box is another essential for any helicopter. This box protects the receiver in the helicopter. It is made of an extremely hard and durable plastic.

Base Loaded Antenna - The base loaded antenna takes the place of the long antenna that comes with any stock receiver. The base is anodized in blue and is a very nice piece.

HHI 5300 Purple
HHI5301 Gold
HHI5302 Blue

Nord-lock washers are a nice item to use in many locations like the motor mount or anywhere else you don't want anything to shift. **HHI2730 3mm, 10 sets per pack** **HHI2740 4mm, 10 sets per pack** **HHI2741 6mm, 5 sets per pack** **HHI2742 8mm, 5 sets per pack**	
Boom Brace - The boom brace goes in between the dual boom supports and stiffens the whole systems up. HHI4067 Silver HHI4068 Blue	

Skid Stops - The skid stops slide over top of the skids and cushion your landings a bit. They also prevent scratching if you hover over top of concrete or asphalt. **SKID STOPS - AVAILABLE ASSORTED** HHI2052 Round Green, HHI2045 Round Pink, HHI2045LB Round Light Blue, HHI2046W Triangle Light Blue, HHI2045FL Round Fluorescent Red, HHI2042 Round Gray	
Security Clips HHI2815- These prevent any loose connections in your servo leads.	
Spiral Wrap Combo (3/16&1/4) - Spiral wrap is a nice accessory. It makes the installation on your servo wires very clean. 3' combo is included in this accessory pack. HHI2811 3' Combo Pk (3' small, 3' medium) HHI2812 5' Combo Pk (5' small, 5' medium)	

The following items are included in the $169.99 Accessory Pack
(These are the recommended items.) HHI2110

Fuel Filter	**Base Loaded Antenna - Blue**
Receiver Strong Box	**Throttle Extension - 30 Size**
Landing Gear Dampeners	**Mini Cock (fuel cutoff valve)**
Skid Stops, Small, White	**30/46 Flybar Stiffeners with Blue caps**

Machined Servo arm set	**Finishing Caps - Blue (3pks required for whole kit)**
Velcro Straps	**Spiral Wrap Combo (3/16&1/4)**
Header Tank - Blue	
The following items are included in the $69.99 Accessory Pack (These are the items that are really essential.) HHI2120	
Fuel Filter	**Machined Servo arm set**
Receiver Strong Box	**Velcro Straps**
Landing Gear Dampeners	**Header Tank with Blue Clamp**
Skid Stops, Small , White	**Throttle Extension**

OTHER REQUIREMENTS

Radios:

Any radio that supports EMS/CCPM Mixing will work fine. Hobbies & Helis & its distributors carry various lines of helicopter radios.

Note: Please consult the instruction for your Gyro for setting the overall travel and limits to ensure proper operation and travel of Tail Pitch Slider.

Servos:

Any sport servo will offer acceptable performance. However, because servos operate all critical functions of the helicopter, they can be the single most important component that contributes to proper function of the helicopter. Due to the nature of EMS collective, we suggest the use of digital servos to enhance and ensure matched servo timing without servo interaction.

Locktite Warning (CRITICAL):

This is a general warning about the use of Locktite and its importance. *Locktite must be used anywhere that a metal fastener* i.e. (M2, M3, M4 Cap Head Bolts, Set Screws etc.) ***is threaded into a metal part*** i.e. (Bearing Blocks, Cross-members, etc.)**. Failure to use Locktite can result in loosening of critical operating components, loss of control of the model, and can lead to a crash.**

PART LIST

- In your kit, parts are bagged according to each major assembly and are labeled “Bag 1, Bag 2, etc.” You will note that the heading for each assembly indicates which bag correlates with each assembly.
- For a good installation, only open up the bag that you need for particular assembly.
- Please check the parts in that bag against the parts list shown for each assembly as well as each subassembly to make sure there are no missing parts.
- Small parts such as nuts and bolts can be put into containers or trays to prevent losing parts.
- Part No. with ***** means that part is not included in the kit.
- The colors of drawings in this manual may look different from the parts you have in the kit.

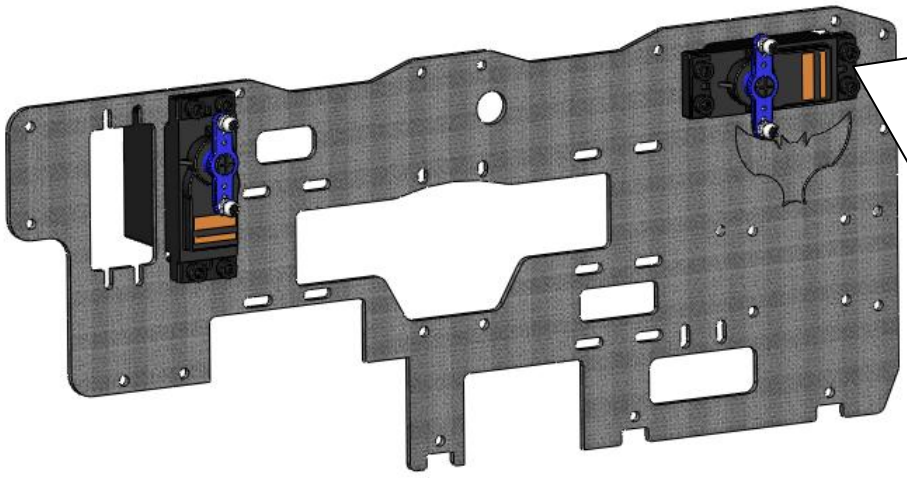
No.	Bag No.	Description	Quantity	Check
1	Bag 1	For Upper Frame Assembly	1	
2	Bag 2	For Lower Frame Assembly	1	
3	Bag 3	Landing Gear	1	
4	Bag 4	Driving System	1	
5	Bag 5	For Tail Assembly	1	
6	Bag 6	Control System	1	
7	Bag 7	Head Rotor	1	
8	Bag 8	Linkage	1	
9	Frame	Frame	1	
10	HB	Hardware Bag	1	
11	Loose in Box	Canopy Carbon Push Rod Tail Gear Belt Tail Boom Flybar Decal Sheet Instruction CD	1 1 1 1 1 1 1	

SECTION 1: UPPER FRAMES Bag 1

- In your kit, parts are bagged according to each major assembly and are labeled “Bag 1, Bag 2, etc.” You will note that the heading for each assembly indicates which bag correlates with each assembly.
- For a good installation, only open up the bag that you need for particular assembly.
- Please check the parts in that bag against the parts list shown for each assembly as well as each subassembly to make sure there are no missing parts.
- Small parts such as nuts and bolts can be put into containers or trays to prevent losing parts.
- No. with ***** means that part is not included in the kit.
- Colors of the parts in the drawings may look differently from ones in the kit.

1-1 Servo Installation

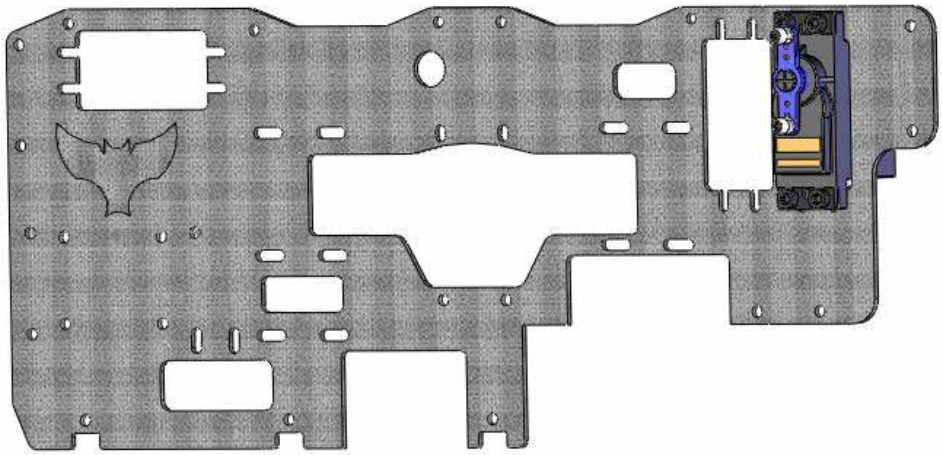
No.	Bag#	Description	Part #:	Qty
1	Step	L. Upper Frame		1
2*****		Servo		2
3	HB	M2.5x14 Cap Head Bolt	HHI2.5M14	8
4	HB	M2.5 Locknut	HHI2.5MLN	8



Depending on your servo type you may get better servo rod angles by mounting the servo on the inside of the frame. Shown here is with the servo on the outside. You want to have the rods as straight as possible.

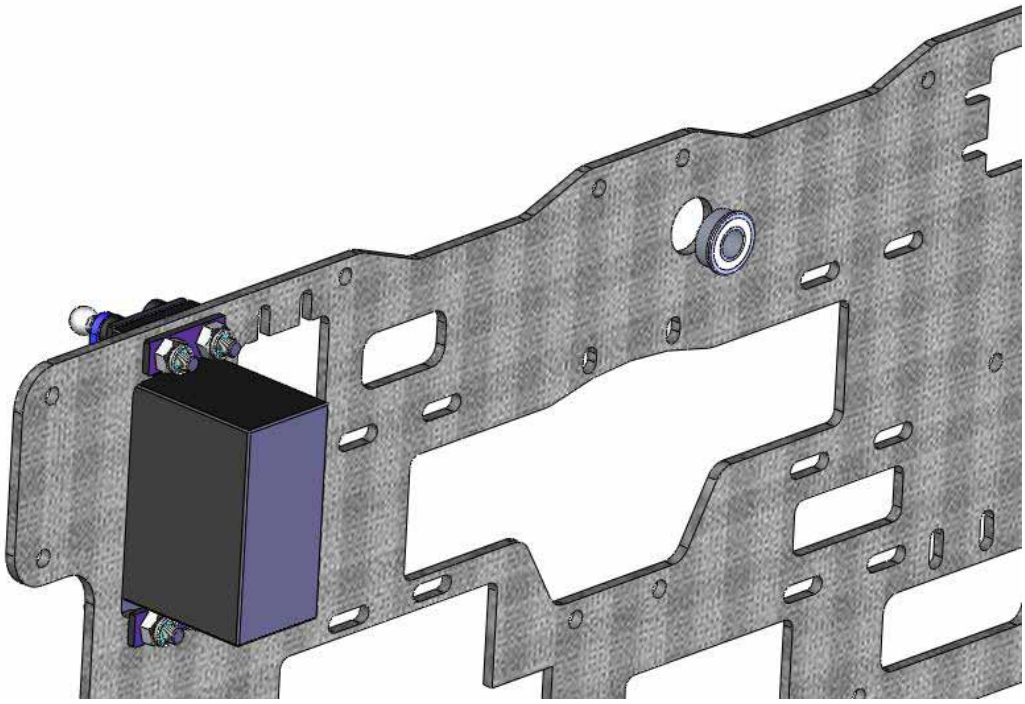
***** Part No. with ***** means that part is not included in the kit.
Note: The servos come with anti-vibrating rubber, insert them on the servos first. We recommend using the servo fixing plates to protect and get the best performance from the servos. Please see “*Hardware & Optional Accessories*” for more details. The rear elevator servo can be mounted from either the inside or the outside of the frames. Mounting from the outside will make for easier maintenance in the event you will need to replace a servo gear set or to replace the servo. Mounting from the inside will give you better alignment/straighter linkage rods.

No.	Bag#	Description	Part #:	Qty
1	Step	Right Upper Frame		1
2*****		Servo		1
3	HB	M2.5x14 Cap Head Bolt	HHI2.5M14	4
4	HB	M2.5 Locknut	HHI2.5MLN	4

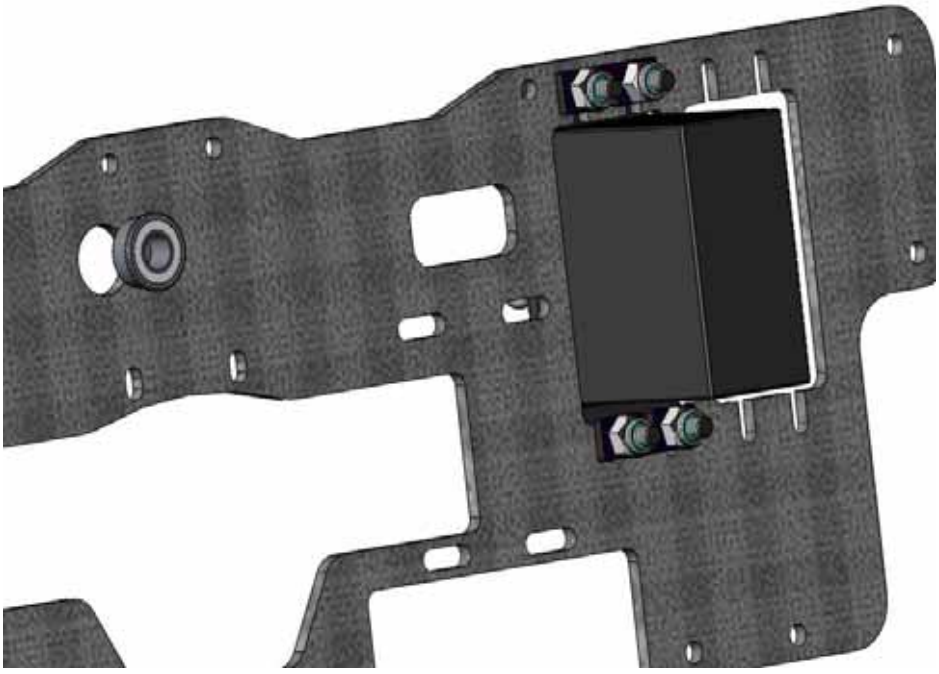


1-2 ELEVATOR SHAFT BEARINGS

No.	Bag#	Description	Part #:	Qty
1	Frame	Upper Frame (from Frame Bag)		2
2	1	5X10X4Flanged Bearing	BRG05104F	2

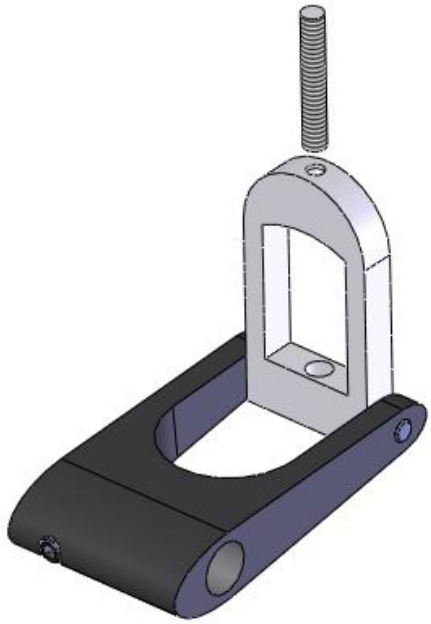


Note: The holes on the frames are designed for “push-fit” feature. Sometime you may have to use a round “rat tail file” before pushing the bearings in. The bearing flange mates against the inside of the frame. The flange is set on the inside of the frames. The elevator shaft will hold the bearing in place.

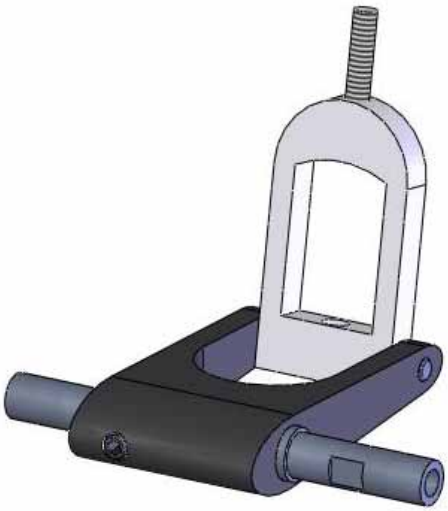


1-3 ELEVATOR SHAFT FOLLOWER

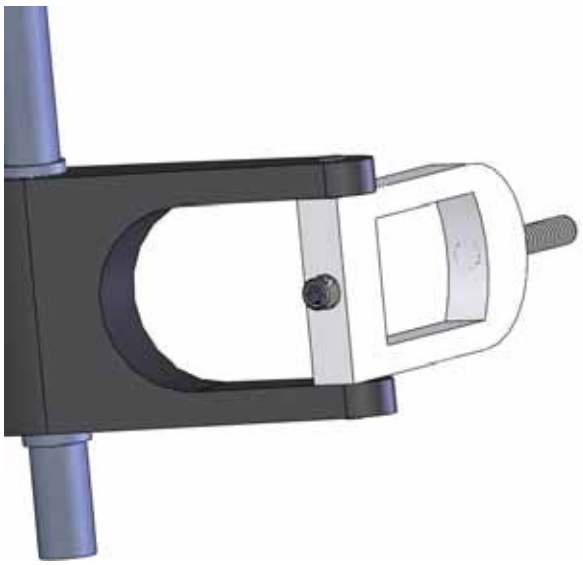
No.	Bag#	Description	Part #:	Qty
1	1	Elevator Control Unit	QC568	1
2	HB	M2.5x12 Set Screw	HHI2.5M12SS	1
3	HB	M3x5 Set Screw	HHI3M5SS	1
4	1	Elevator Shaft	QC337	1



Install the M2.5 set Screw into the elevator control unit



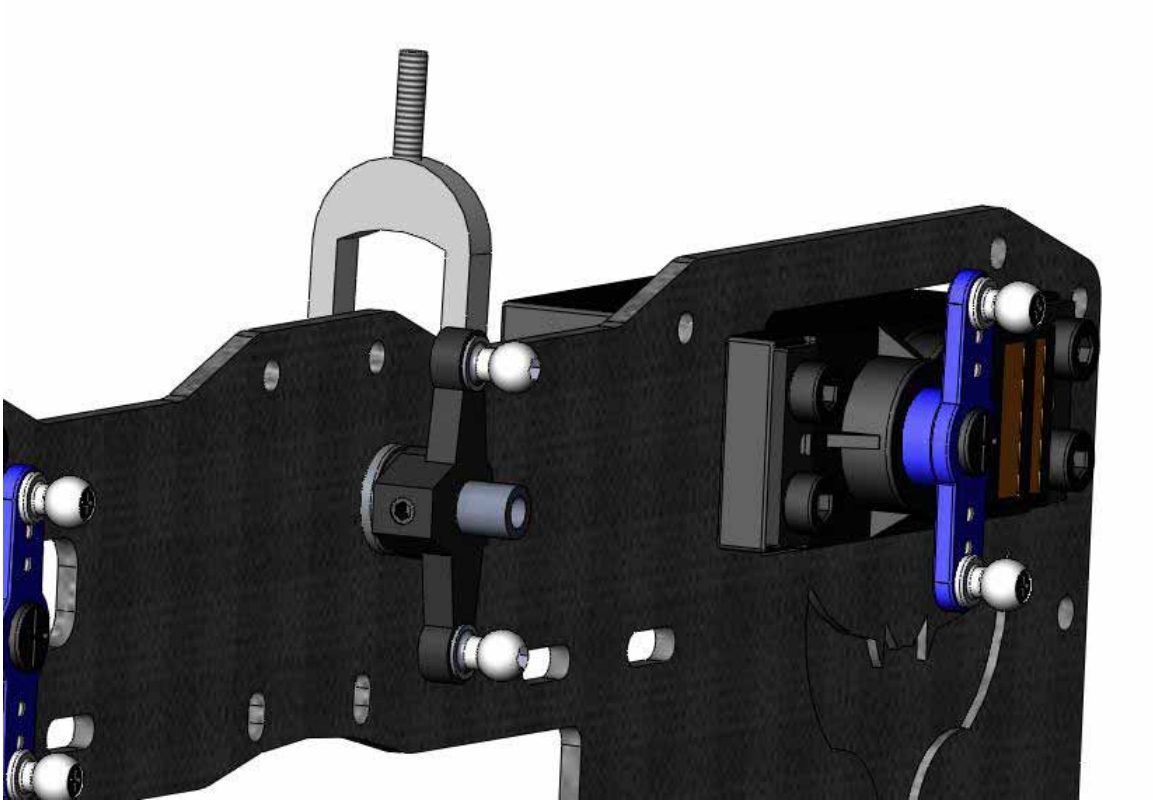
Attach the unit to the elevator control shaft using an M3x5 set screw. Be careful to install the shaft so the flat for the elevator bell crank comes out the same side you have your servo on. In our case we have is on the left side.



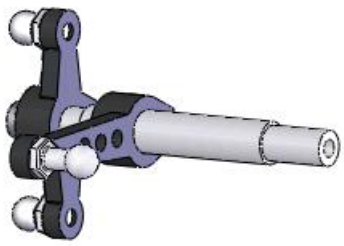
Install an M3x5 set screw into the bottom of the elevator control unit to secure the pin.

1-4 Elevator Shaft Installation

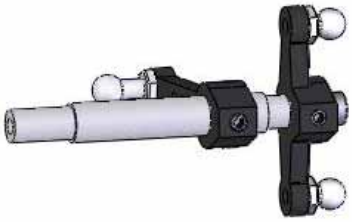
No.	Bag#	Description	Part #:	Qty
1	1	Outer Elevator Arm	QC552	1
2	HB	M3x4 Pivot Ball	HHI3M4PS	2
3	1	Elevator Assembly		1

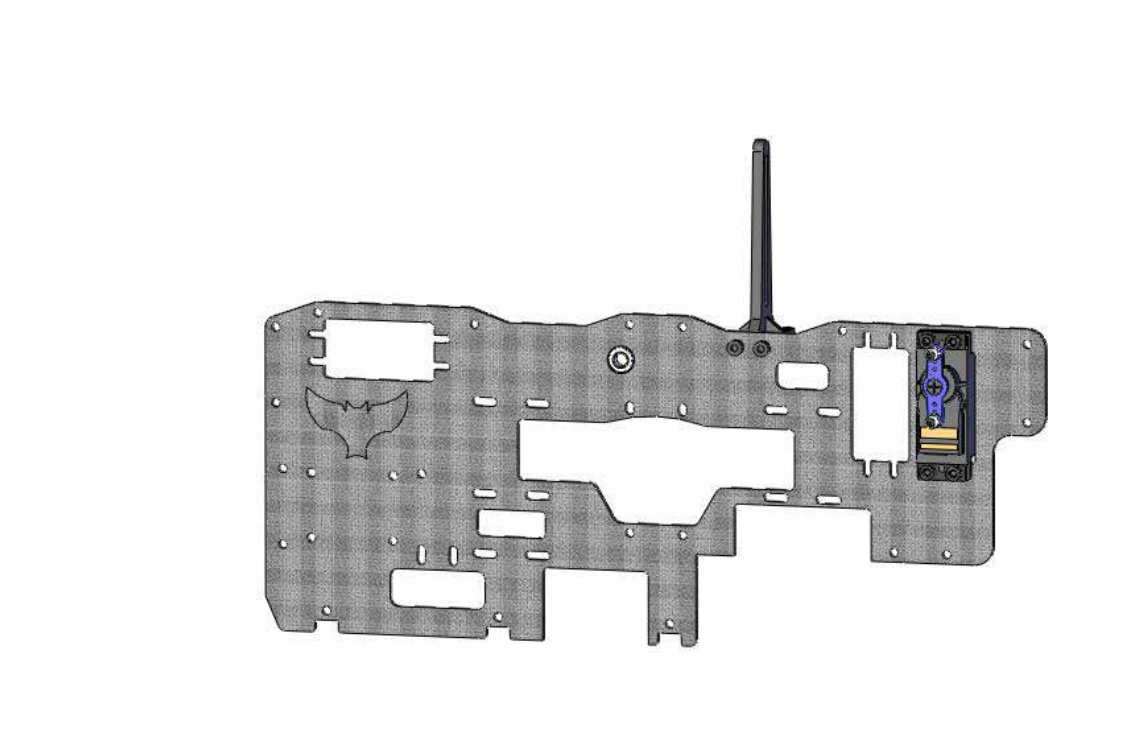


Install the elevator assembly into the bearing in the upper frame assembly and attach the outer elevator arm with an M3x5 set screw. Install two M3x4 pivot balls into the elevator arm.



If you are building a budget series bat helicopter you will be using this style of elevator lever. You will assemble it onto the elevator shaft the same was as the other style with an M3x5 set screw. Install an M3x7 pivot ball stud into the arm.

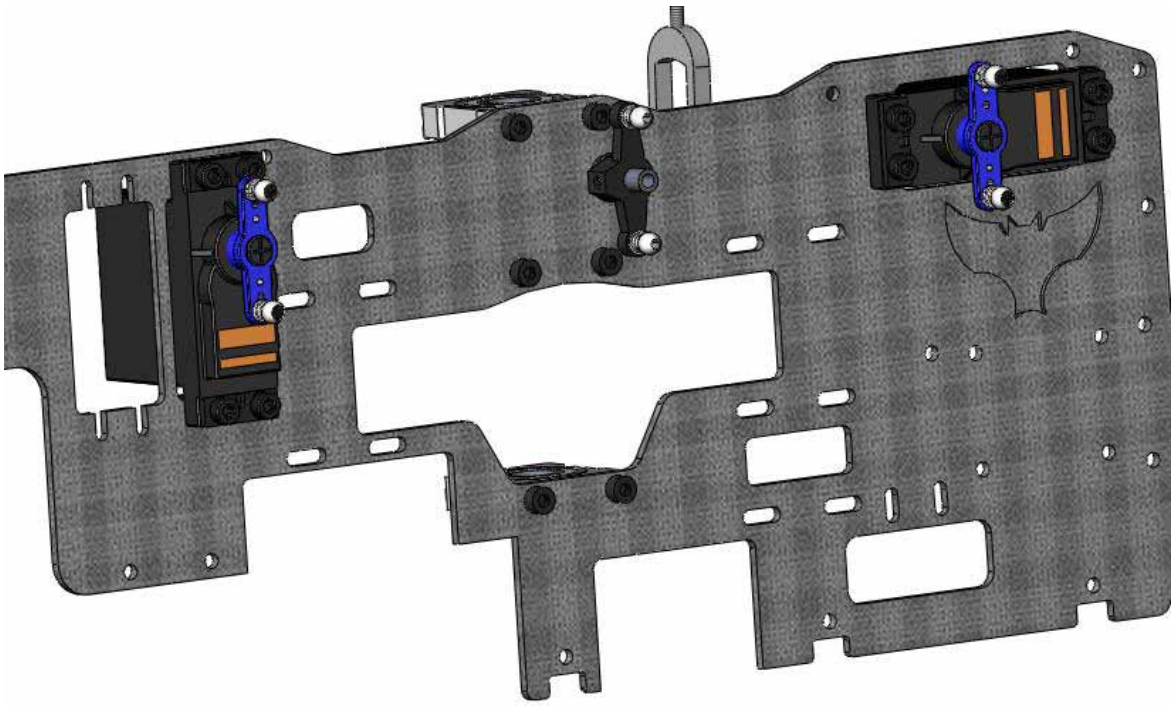


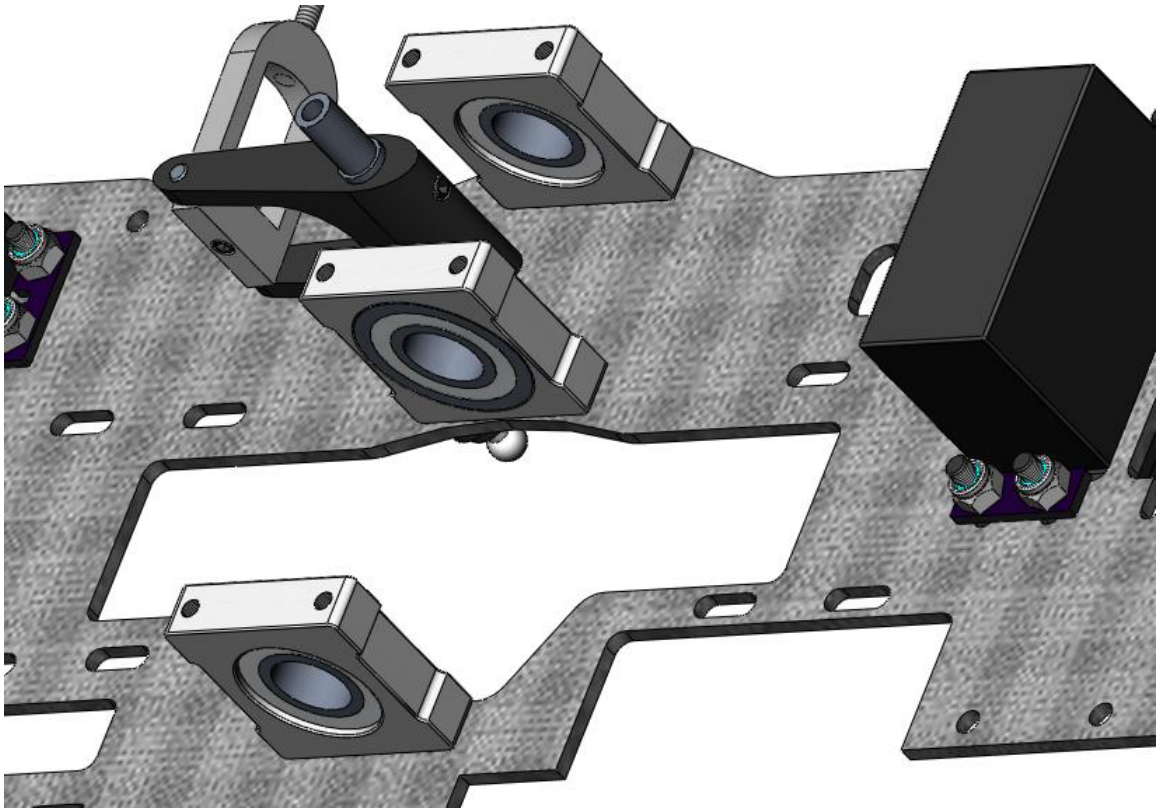


This step is only for the budget series helicopters. Install the Swashplate anti-rotation guide to the main frame using 2 M3x8 cap head bolts. You will install two on the opposite side when the other frame half is attached.

1-5 Main Shaft Bearing Block Installation

No.	Bag#	Description	Part #:	Qty
1	1	Main Shaft Bearing Block	QF310	3
2	HB	M3x6 Button Head Screw	HHI3M06B	6
3	1	Elevator Assembly		1



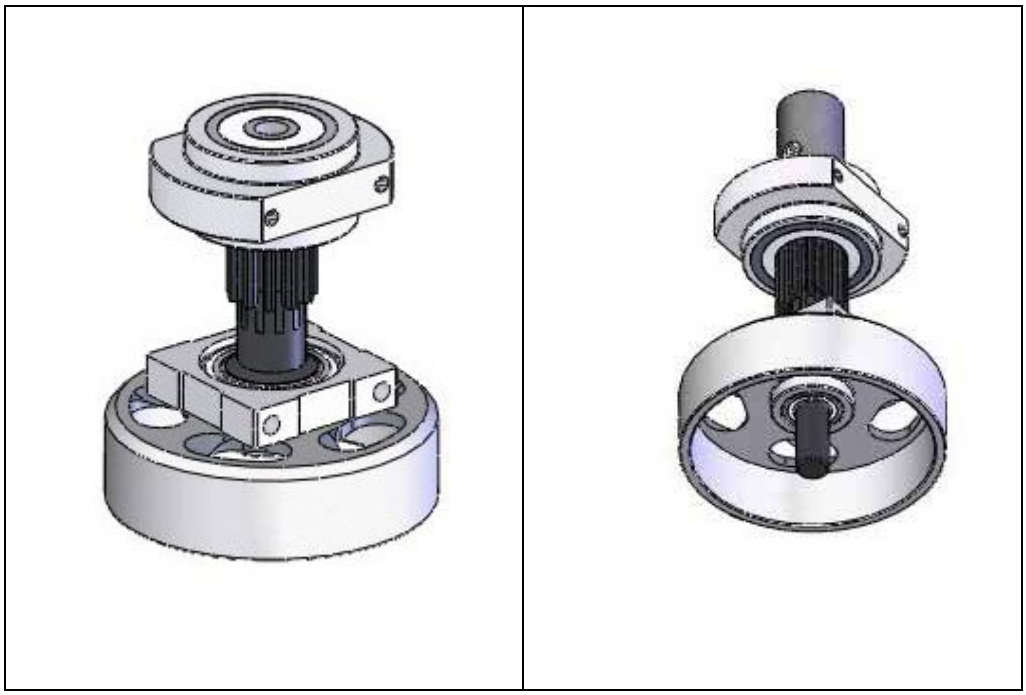


Attach the three main shaft bearing blocks to the upper frame. Be sure that the flanges for the two upper main shaft bearing blocks face each other. By flange, we mean the side of the bearing block

that has the smaller diameter. The lower main shaft bearing block will have the flange facing the bottom of the helicopter. The budget series bat will not have a 3rd lower main shaft bearing block.

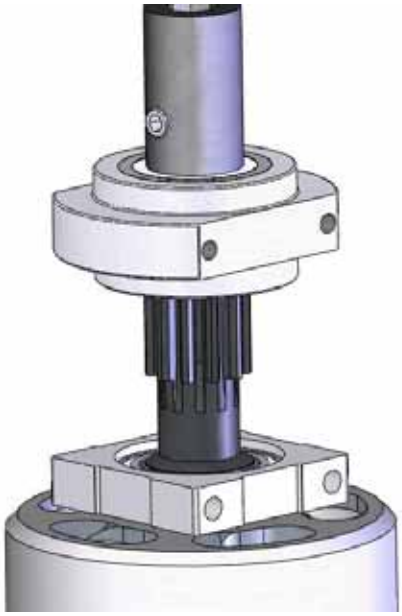
2-1 Clutch Bell Assembly and Installation

No.	Bag#	Description	Part #:	Qty
1	2	Clutch Bell (50, 70-90)	QD512, QD612	1
2	2	Pinion Gear (11T, 12T)	QD515, QD513	1
3	2	Clutch Bell Bearing Block	QD352	1
4	2	Secondary Clutch Bell Bearing Block	QD509	1
5	2	Start Shaft (50, 70-90)	QD557, QD759	1
6	2	Start Coupler	QD360	1
7	2	Clutch Lining (50, 70-90)	QD550a, QD650a	1
8	HB	M4x4 Set Screw	HHI4M4SS	1

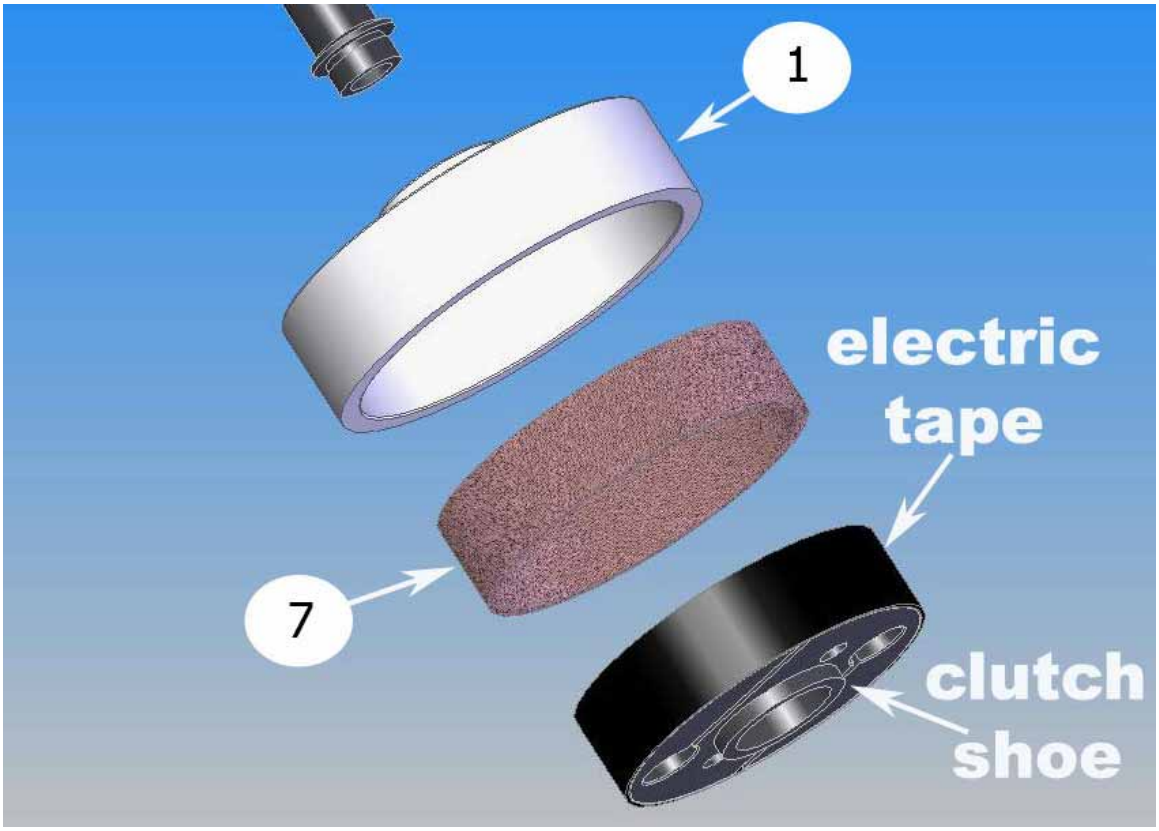


The clutch bell assembly is as follows: The secondary clutch bell bearing block gets installed onto the clutch bell. Next, you need to press the pinion gear into the upper clutch bell bearing block. Then we attach the pinion gear and bearing block to the clutch bell assembly. Next slide the start shaft up into the clutch bell. If you need to replace the bearing on the secondary bearing block, we use two flat head screw drivers and gently wiggle each to pull the bearing block away from the clutch bell. It is also important to note that if the fit from the pinion gear to the start shaft bearing block is not a press fit to

put some Loctite on it to secure it into the bearing. The budget series bat does not use the secondary clutch bell bearing block.



With the start shaft pushed all the way into the clutch bell attach the start coupler with an M4x4 set screw. When assembling this for the 70 or 90 clutch bells, you will use three 5x7x2 spacers between the clutch bell bearing block and the start coupler.



Install the clutch lining into the clutch bell. The recommended adhesives for installing the clutch lining are JB Weld or 30 Min + Epoxy. Prepare the clutch bell by scuffing the interior with an x-acto blade or sand paper. Put the Clutch Lining in the Clutch Bell and mark it for cutting. Cut the Clutch Lining. Apply the adhesive thin and even and finish the installation by inserting and finishing the clutch lining. Trick: Wrap electric tape around the Clutch Shoe to keep even pressure against the liner to prevent any high spots from developing. Then insert the Clutch Shoe into the Clutch Bell. Clean up any excess adhesive. Let it sit there until the adhesive dries then take the Clutch Shoe out and electric tape off. See the label on the adhesive bottle for drying time. Don't worry about it if you end up with a little high spot when you install your engine assembly and you have a little high spot when you spin your clutch bell, it will break in within the first few flights.

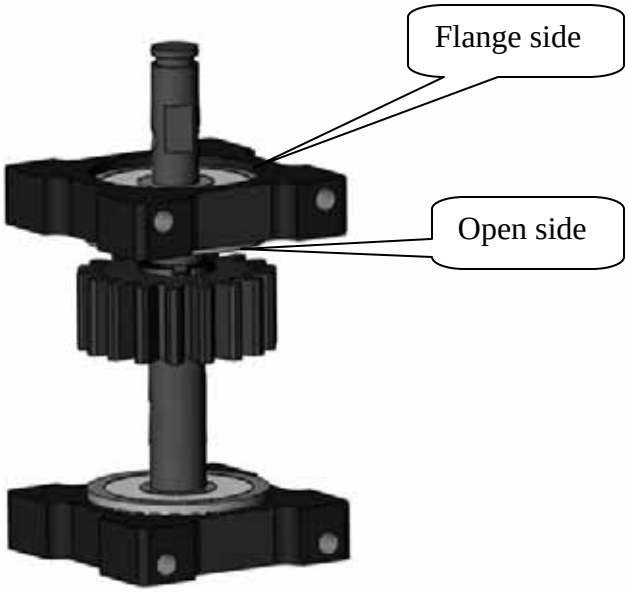
3-1 Counter Gear Assembly

No.	Bag#	Description	Part #:	Qty
1	3	Counter Gear	QD551B	1
2	3	Counter Gear Shaft	QD551A	1
3	3	Counter Gear Lock Pin	QD551C	1
4	HB	M4 E-Clip	HHI4ME	1

Slide counter gear lock pin into the counter gear shaft. Then slide the counter gear down the shaft and capture the pin in the groove

Install the M4 E-Clip into the groove to secure the counter gear.

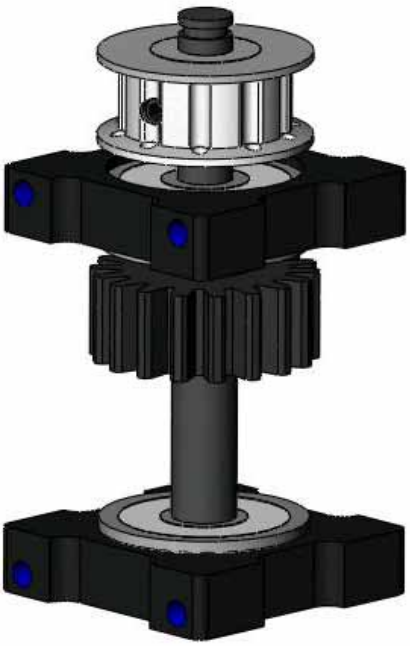
No.	Bag#	Description	Part #:	Qty
1	3	Counter Gear Bearing Block	QD553	2
2	3	Q50 Pulley Gear	QD554	1
3	3	Q50 Pulley Gear Side Plate	QD504	1
4	3	Pulley Gear Lock Pin	QD554A	1
5	HB	M4 E-Clip	HHI4ME	1
6	3	Q70-90 Pulley Gear	QT356	1
7	HB	M3x5 Set Screw	HHI3M5SS	1



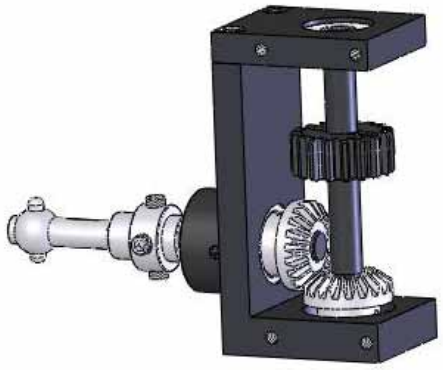
Next, install the two counter gear bearing blocks. Be sure that the flange face the top on the upper block and down on the lower block.

Now, slide the pulley gear side plate onto the counter gear shaft and slide through the pulley gear lock pin.

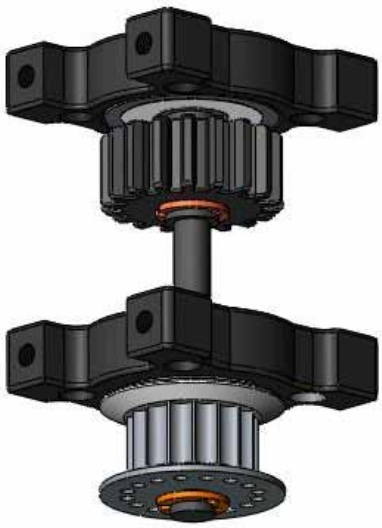
Now you can side on the pulley gear and secure it with the M4 E-clip.

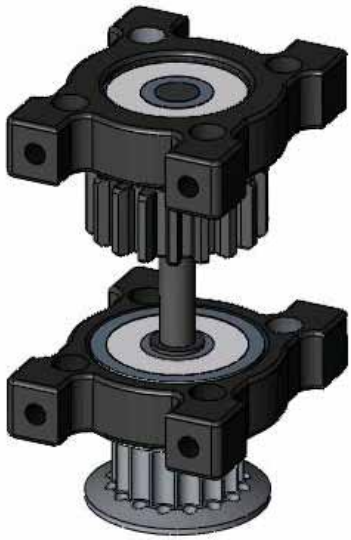


If you are building a 70 or 90 helicopter, you will have a pulley like this for the coarse belt. It is simply secured in place with an M3x5 set screw onto the flat on the shaft.



If you have the shaft drive assembly for your helicopter please see the separate shaft drive instructions for the assemblies of the counter gear assembly and tail assembly.

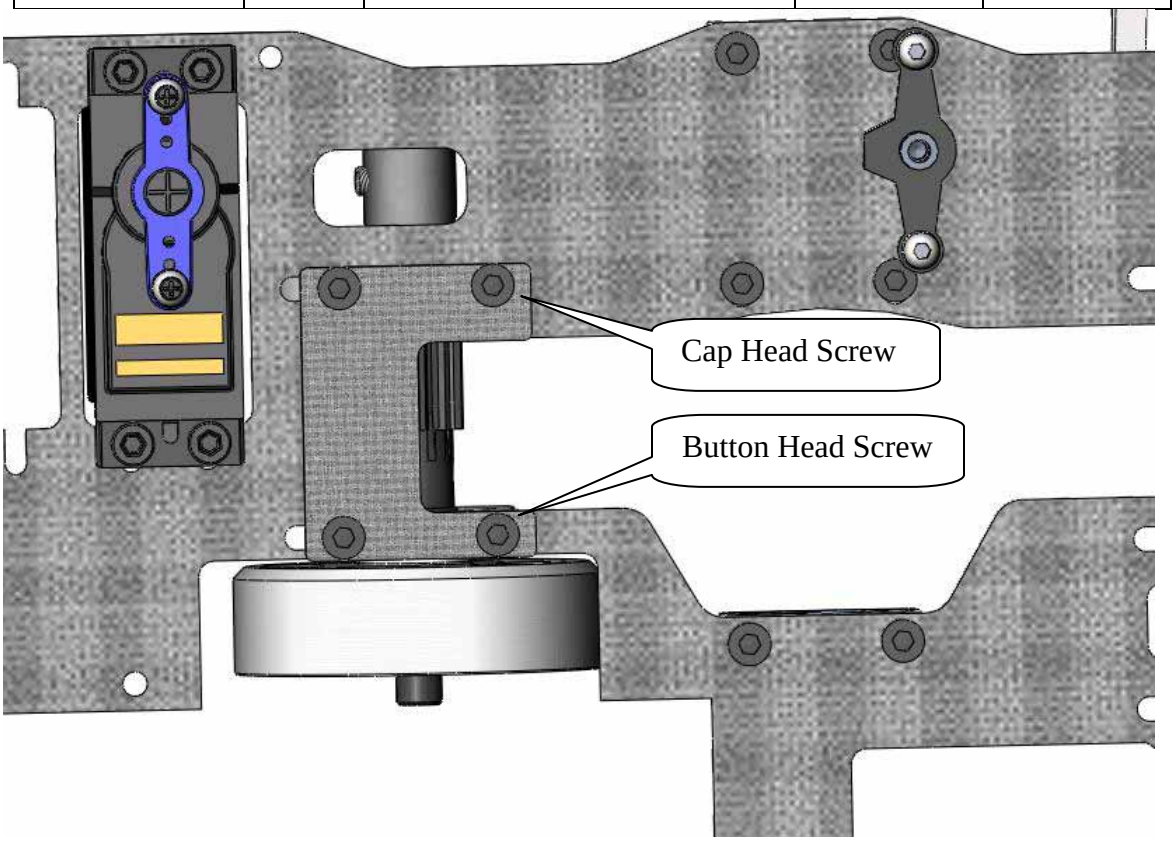




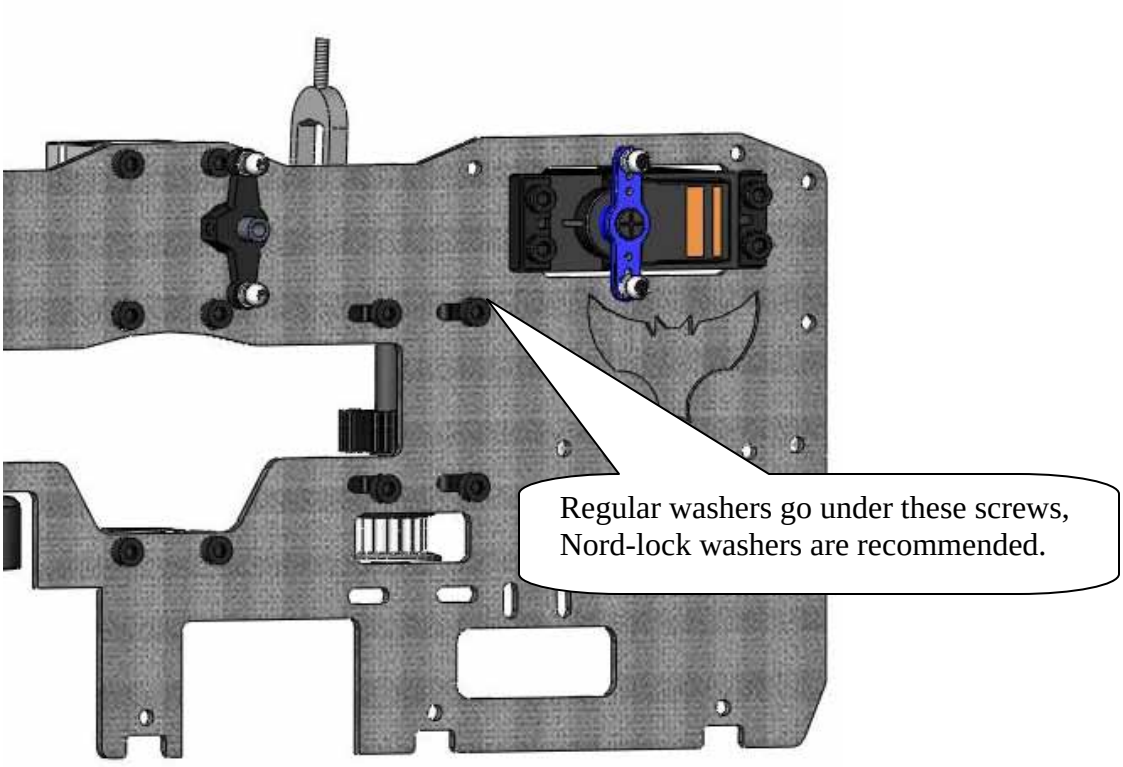
If you are building the budget series of bat helicopters, your counter gear assembly will look like this. It is assembled the same way as the regular bat counter gear assembly except that this one will work off the top gear for the budget bat auto hub.

4-1 Clutch Bell Assembly Installation

No.	Bag#	Description	Part #:	Qty
1		Clutch Bell Assembly		1
2	Frame	Clutch Bell Doubler		1
3	HB	M3x10 Socket head cap screw	HHI3M10C	2
4	HB	M3x10 Button head cap screw	HHI3M10BH	2
5	HB	M3x8 SOCKET HEAD CAP SCREW	HHI3M08C	4
6	HB	M3 Washer	HHI3MW	4



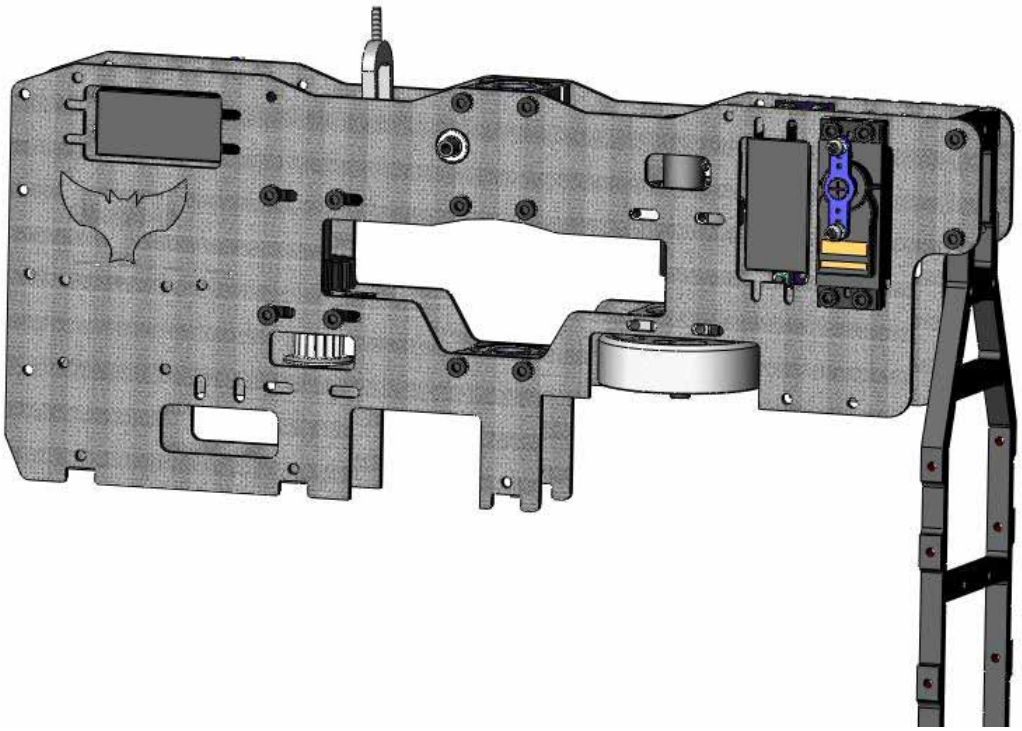
Now, attach your clutch bell assembly to the main frame. You will need (2) M3x10 SOCKET HEAD CAP SCREW, (2) M3x10 button head screws, and one of the doubler plates. Use two of the M3x10s in the upper holes and the two BUTTON HEAD CAP SCREWS in the lower holes. You can leave this sort of loose for now. It will need to be adjusted later when the main gear is installed for proper gear mesh.



Now attach your counter gear assembly using (4) HHI3M08C (3 X 8mm SOCKET HEAD CAP SCREW) screws. Leave this slightly loose until you are ready to adjust gear mesh. Included are 4 M3 washers to use on the slots. It is recommended that you upgrade these to M3 Nord-lock washers to prevent any bearing block movement than can result in the main gear stripping out.

5-1 Main Frame Assembly

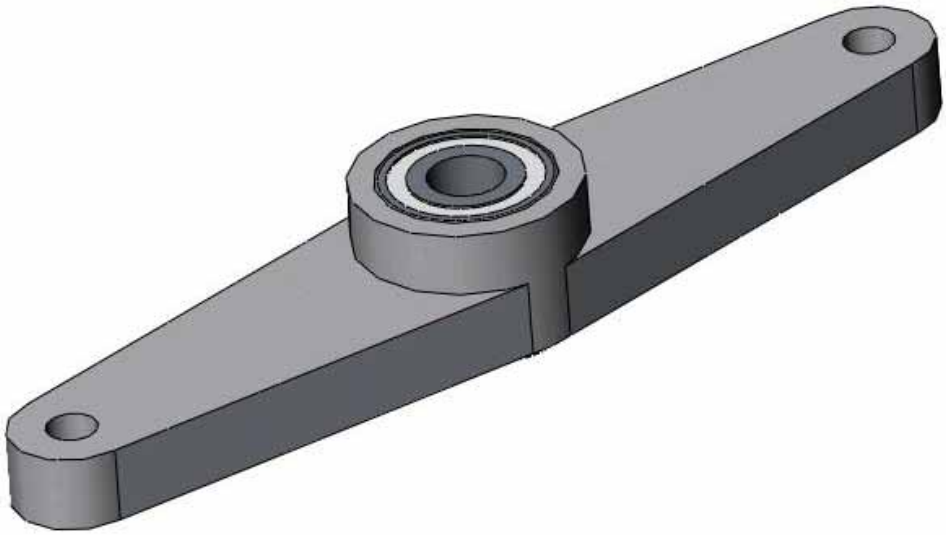
No.	Bag#	Description	Part #:	Qty
1	Frame	Clutch bell bearing block doubler		1
2	HB	M3x8 SOCKET HEAD CAP SCREW	HHI3M08C	10
3	HB	M3x10 SOCKET HEAD CAP SCREW	HHI3M10C	2
4	HB	M3x10 BUTTON HEAD CAP SCREW	HHI3M10BH	2
5	HB	M3 Washer	HHI3MW	4



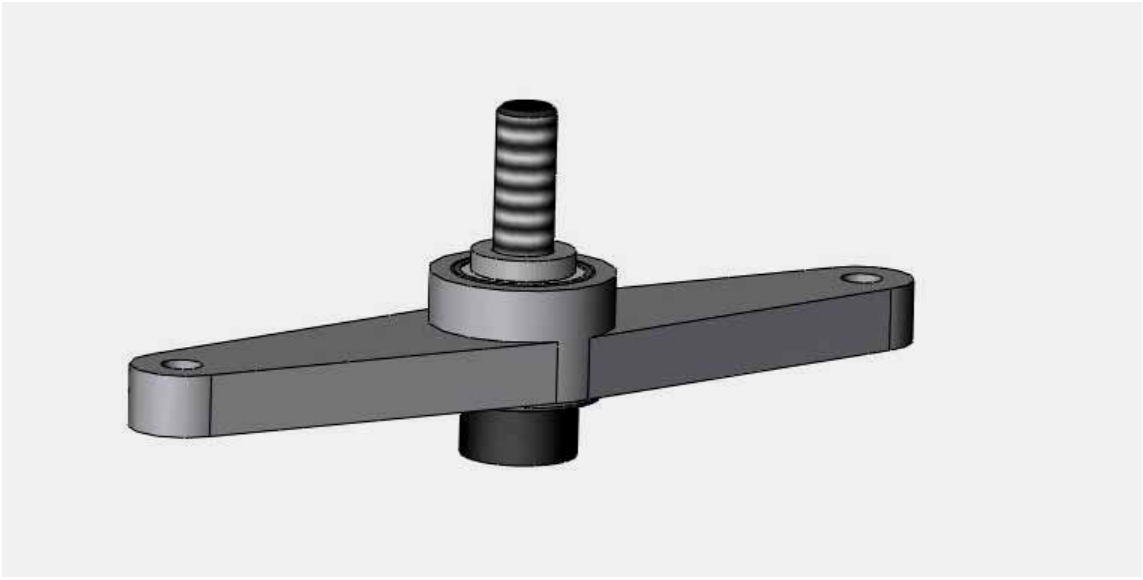
Now attach the two frame halves together. Use (4) M3x8 cap head screws to attach at the Counter gear assembly. Use (6) M3x8 cap head screws for attaching the main shaft bearing blocks. Locate your 2nd clutch bell bearing block doubler. Use (2) M3x10 socket head cap screws to attach the upper bearing block on the clutch bell assembly to the main frame. Use (2) M3x10 button head screws to attach the clutch bell assembly's lower bearing block.

5-1 Rudder Bell-crank assembly

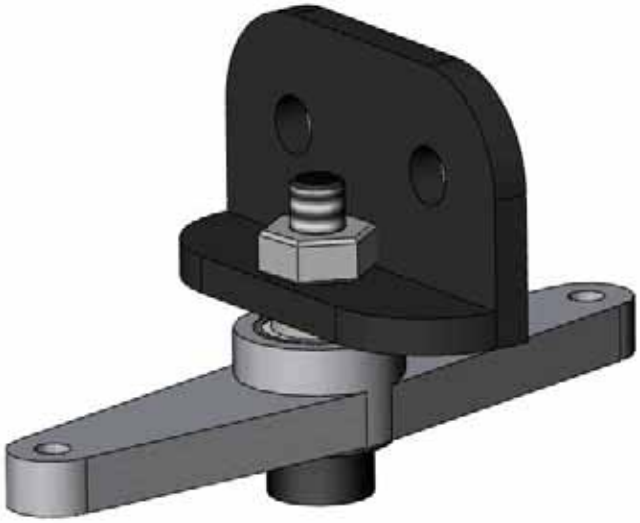
No.	Bag#	Description	Part #:	Qty
1	6	Rudder Bell Crank	HHIES40	1
2	HB	M3x14 SOCKET HEAD CAP SCREW	HHI3M14C	1
3	HB	3x5x3 spacer	HHI3M5X3	1
4	6	Rudder Pushrod Mount	QFE1109	1
5	6	M3 Locknut	HHI3MLN	3
6	HB	Shim ball	HHI2030	2
7	HB	M2x10 Shim ball screw	HHI2M10PH	2
8	HB	M3x10 SOCKET HEAD CAP SCREW	HHI3M10C	2



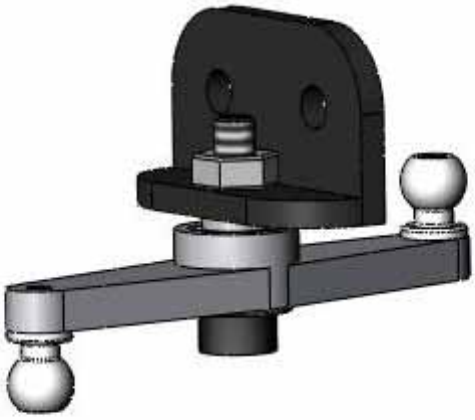
Locate your rudder bell crank.



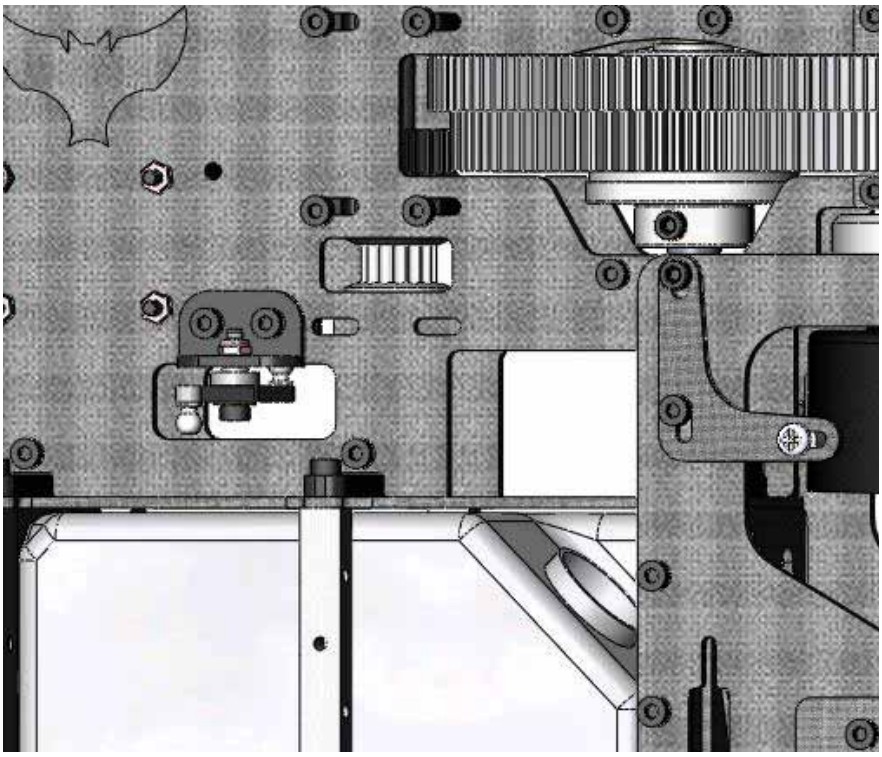
Insert an M3x14 cap head screw as shown. Slide a 3x5x3 spacer onto the screw,



Locate your rudder bell crank mount and attach the Bell crank assembly with an M3 Locknut.



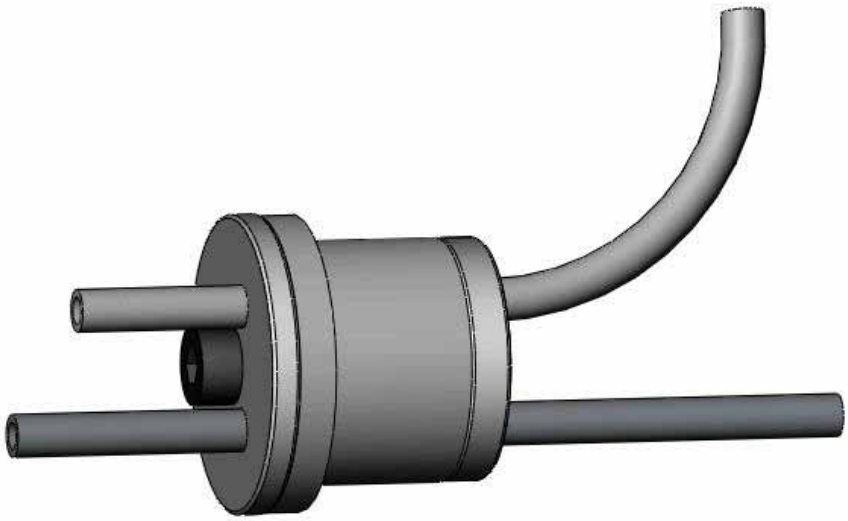
Attach two shim balls to the bell crank assembly with two M2x10 Philips head screws.



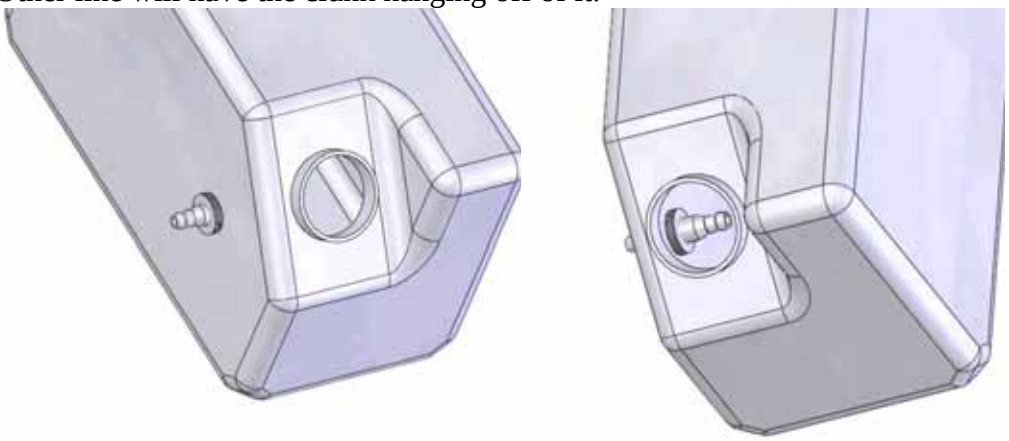
Next, attach the completed assembly to the helicopter with two M3x10 cap head screws and M3 lock nuts. The bat 50 uses the rudder bell crank on the right hand side as if you were sitting in the helicopter. The 70 and 90 Bats go onto the opposite side. This is due to how the fan shroud gets mounted in the helicopters.

6-1 FUEL TANK ASSEMBLY

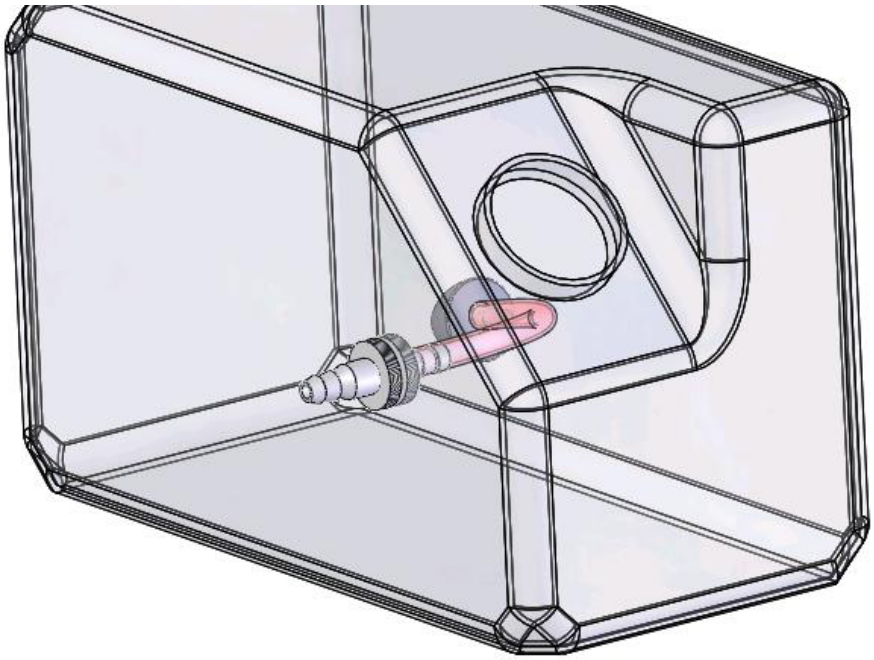
No.	Bag#	Description	Qty
1	Loose in box	Tank Clunk	1
2*****		12 cm Hose	1
3	Loose in box	Long Tube	2
4	Loose in box	Tank Rubber Plug	1
5	Loose in box	Short Tube	1
6	Loose in box	Tank Fuel Plug Bottom Flange	1
7	Loose in box	Tank Fuel Plug Top Flange	1
8	Loose in box	M3x25 Cap Head Bolt	1
9	Loose in box	Fuel Tank	1
Fuel tank assembly comes in a set. Part #: QF623			



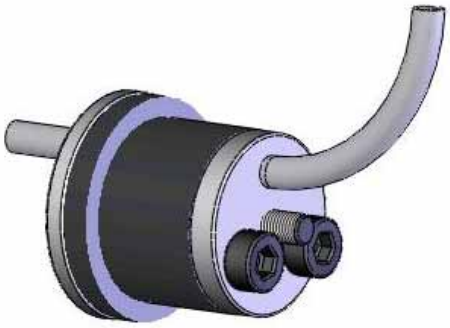
You can run your fuel tubing two ways. One is to use two tubes coming out of the fuel tank stopper. The one that curves upward will go for the fuel tank pressure line. The Other line will have the clunk hanging off of it.



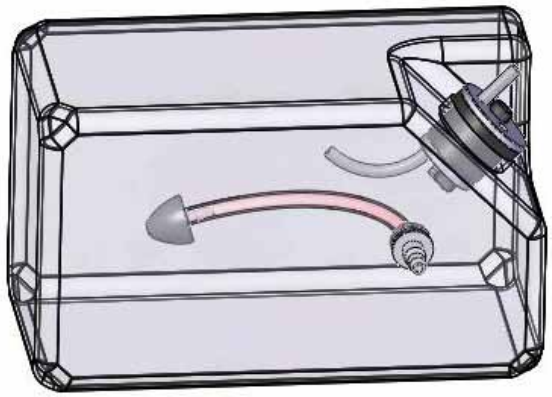
The alternate way of doing your fuel system is to add a fuel nozzle on the size of the tank.



Add your clunk line and clunk to this nipple.



You will only need one line for fuel tank pressure so the other two holes in the stopper can be plugged off. This can be done with a few M3 bolts. When the stopper is tighten it will seal around the bolts.

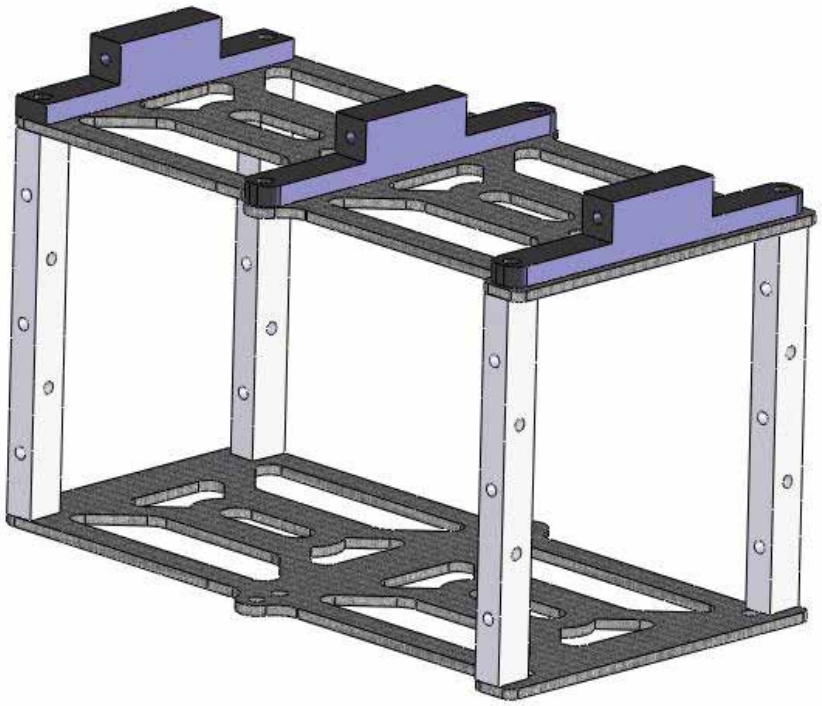


- There are three (3) lines (stainless steel fuel tubing) that need to be constructed for the tank assembly. Depending on the engine you use, you may need only two (2) lines. One line is the fuel pick-up line and requires a length of silicon fuel tubing running from end of alum. Tube to clunk – which should be centered in tank. The other line is pressure-line, which should be bent to reach the top of the tank on the inside. The third line will generally be plugged. Tighten rubber stopper screw. Also you can add a length of tube to the vent line and cut the silicone at the end on the bias and allow that to go to the top of the tank for maximum capacity.

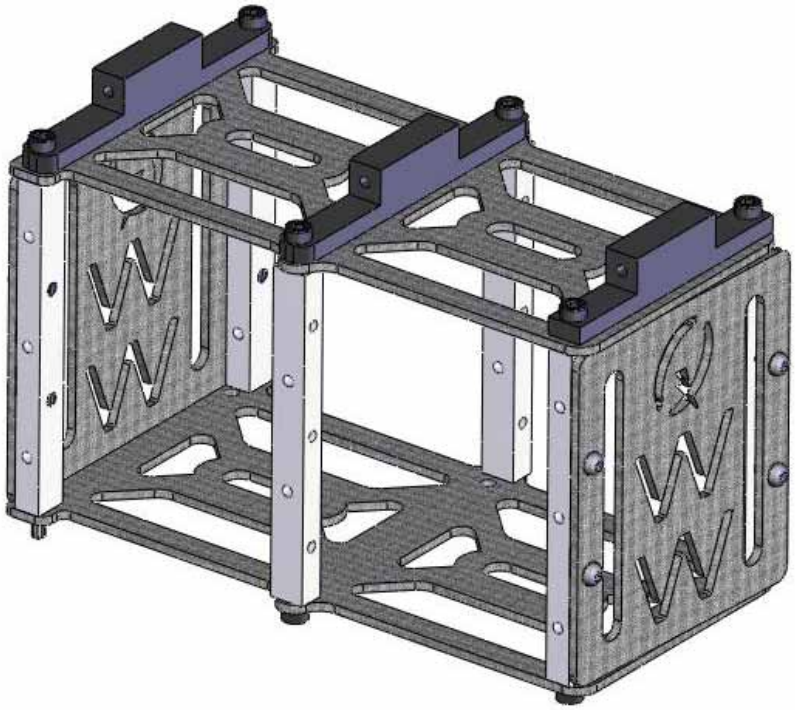
- Insert the whole construction into the Fuel Tank. Continue tightening but do not over tighten or you will ruin rubber stopper!

6-2 Fuel Tank Frame Assembly

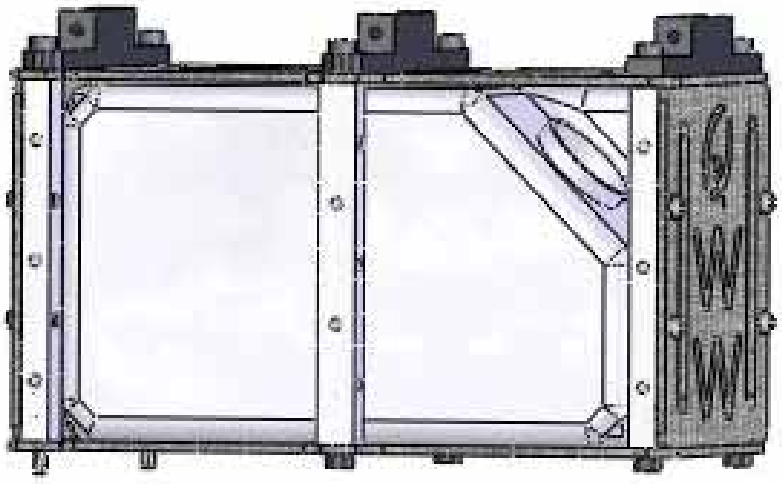
1	6	Frame Mount (short)	QDE813	1
2	6	Frame Mount (long)	QDE812	2
3	6	Fuel Tank Upright Crossmembers	QF508	6
4	Frame	Fuel Tank Frames		2
5	Frame	Front Fuel Tank QWW Plate		1
6	Frame	Rear Fuel Tank QWW Plate		1
7	HB	M3x12 SOCKET HEAD CAP SCREW	HHI3M12C	6
8	HB	M3x10 SOCKET HEAD CAP SCREW	HHI3M10C	4
9	HB	M3x12 Set Screw	HHI3M12SS	2
10	HB	M3x8 BUTTON HEAD CAP SCREW	HHI3M8BH	8
11	HB	M3x8 Cap Head Screw	HHI3M08C	6



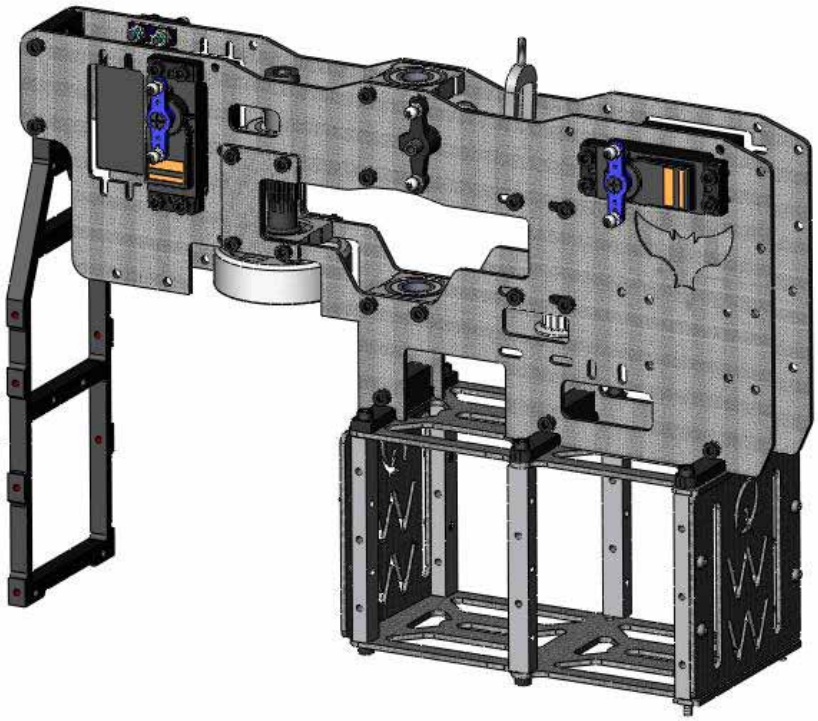
Assemble the fuel tank assembly as shown. You will have one shorter upper to lower mounting block and two longer ones. The longer ones go on the two rear sets of holes.



Assemble the fuel tank assembly as shown. Use M3x12 cap head screws on the top 6 screws. Slide the complete fuel tank into the cage and secure it in place with the lower plate. The front two plate holes are secured with M3x10 cap screws. The front and rear QWW plates are optional. You can leave these off to save weight if you want. The QWW plates are not included on the budget series bat helicopters.



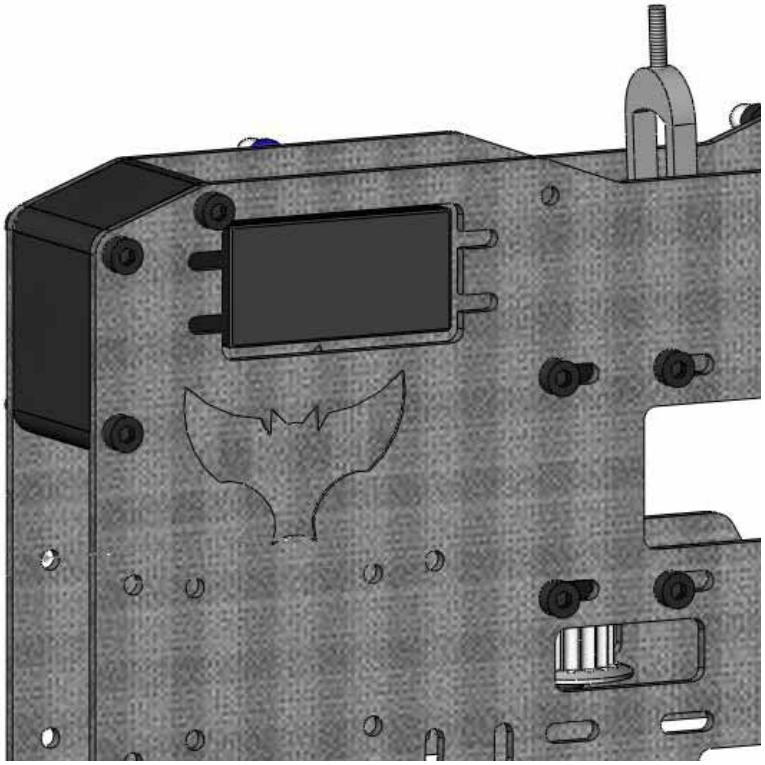
Install the M3x12 set screws into the rear two cross member-uprights. Attach the front and rear QWW stiffener plates with the M3x8 button head screws. It is a good idea to put a little foam tape or padding on either side of the fuel tank. This will add a little vibration isolation for the fuel tank.



Attach the completed fuel tank assembly to the upper frame assembly with six M3x8 cap head screws.

Rear Cross member Install

1	7	26mm One-piece frame cross member	1
2	HB	M3x8 SOCKET HEAD CAP SCREW	6

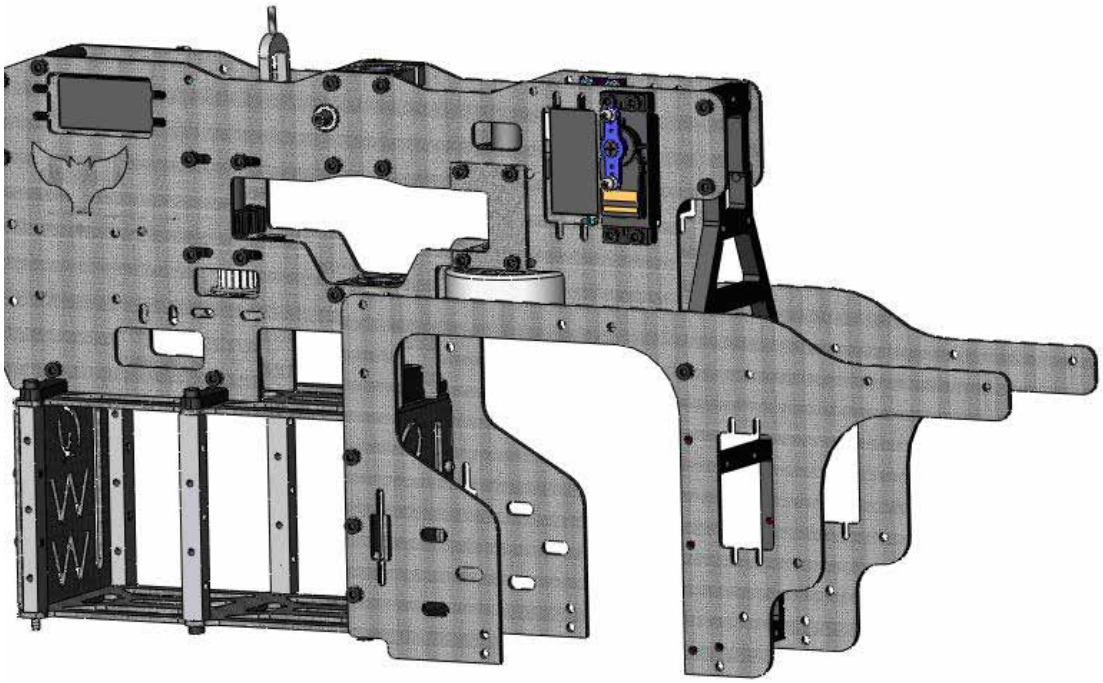


Attach the rear cross member to the helicopter using six M3x8 cap head screws.

7 Engine Frame Assembly

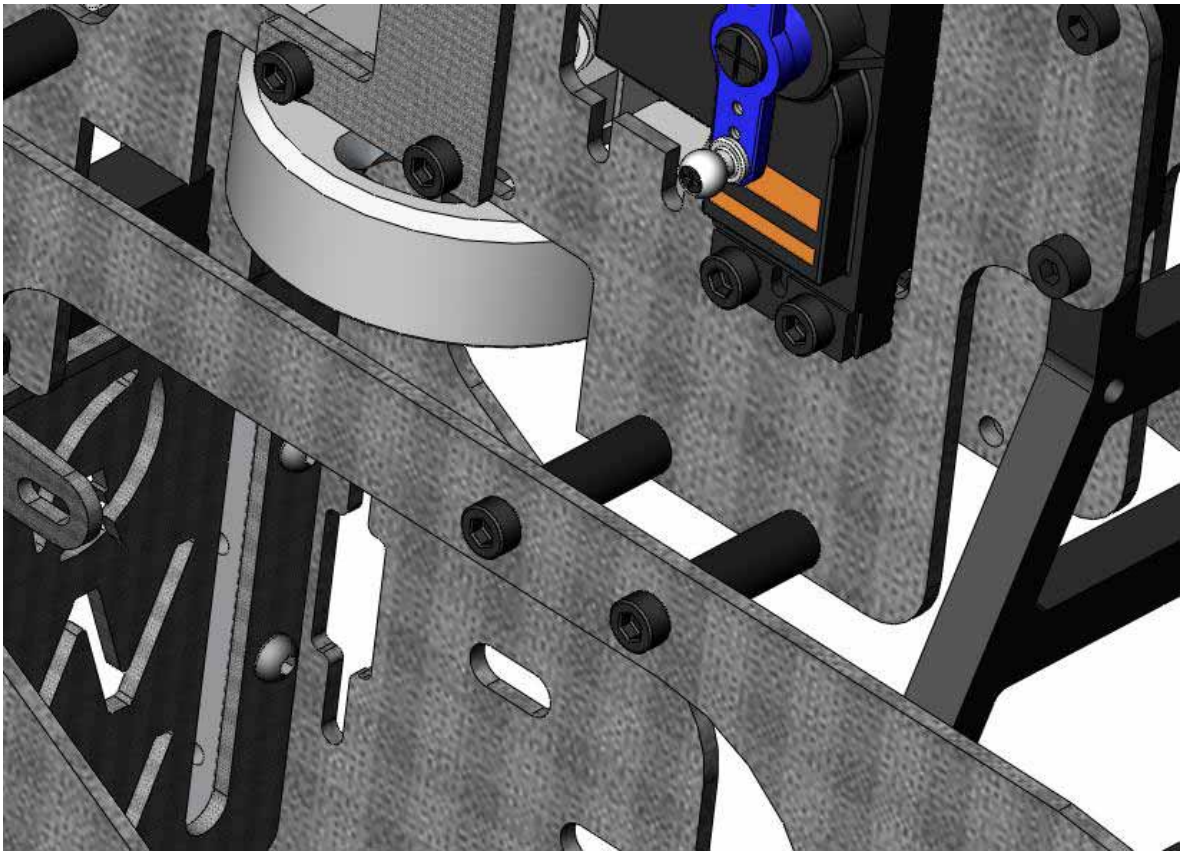
1	Frame	Engine Frame Side Frame		2
2	HB	M3x8 SOCKET HEAD CAP SCREW	HHI3M8C	14
3	8	Radio Tray	QF656 (QF656a CNC Cut)	1
4	HB	M3x25	HHI3M25C	4
5	8	18mm Spacer	QF574	4
6	8	26mm Cross members	QF311	2

Next attach the lower engine frame. There are three M3x8 cap head screws in the rear and one M3x8 in the front. The other holes will be used by doublers later, so it is not necessary to install screws just yet.

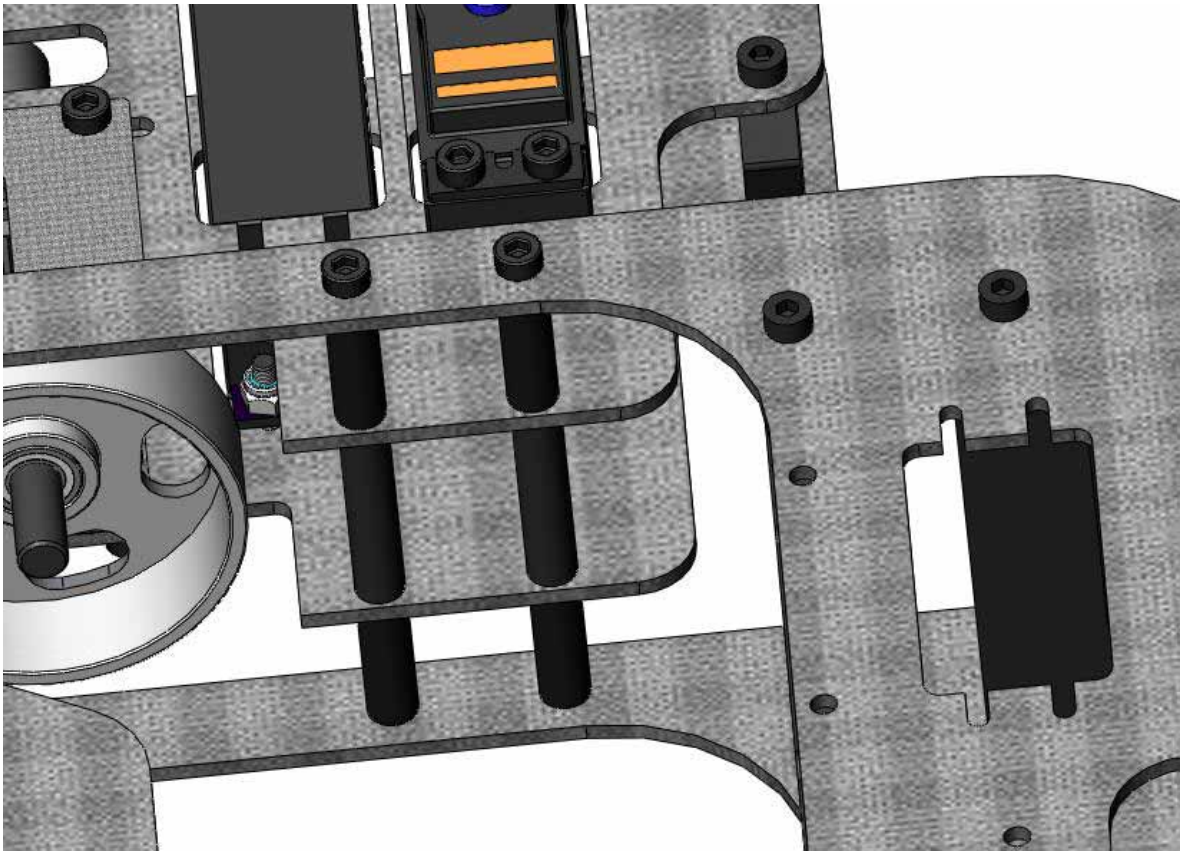


Now, attach the second engine frame piece. You will use four M3x8 screws just like the previous step.

Now we will attach the radio tray. There are 3 M3x8 cap head screws needed for each side.



Now we can install the two frame cross members. First, gather four M3x25 cap head screws and four 18mm frame spacers. Slide the bolt through the frame slide an 18mm spacer onto the bolt and slide the bolt through the hole in the main frame assembly.

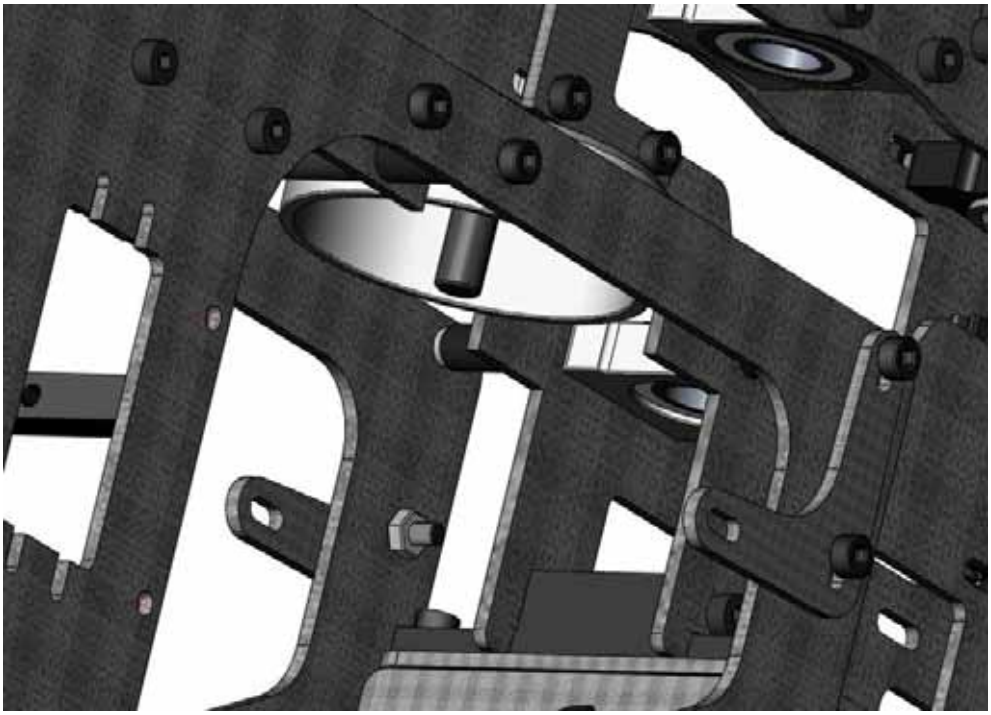


Locate two 26mm cross members. Remember to Loctite all screws and screw the outer spacers into the inserted 26mm cross members in the frame.

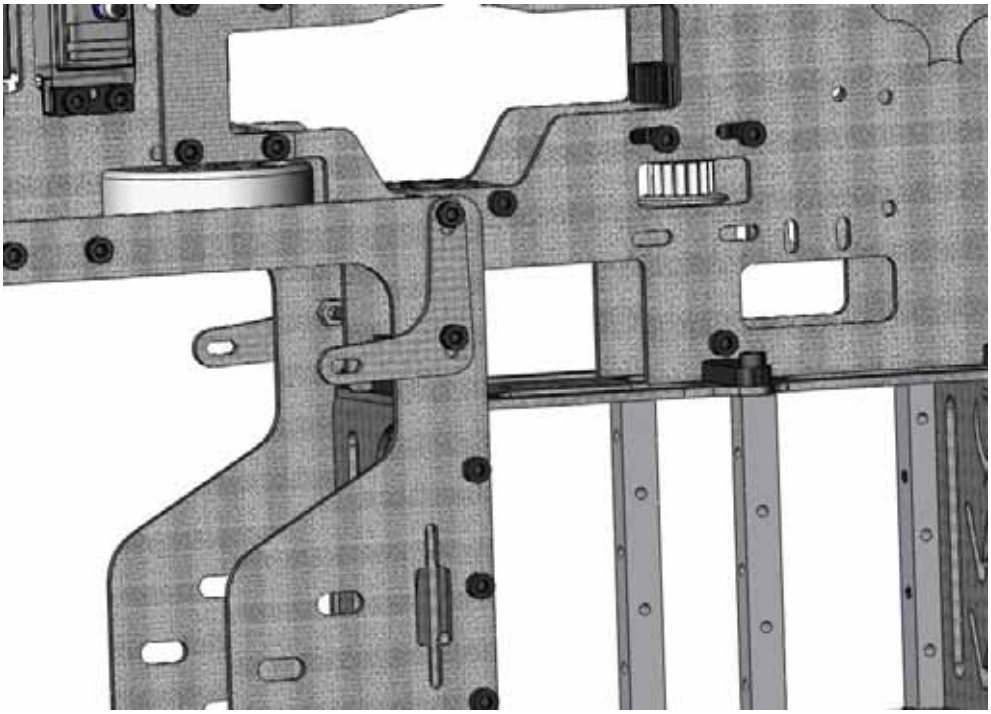
7-2 Fan Shroud Installation

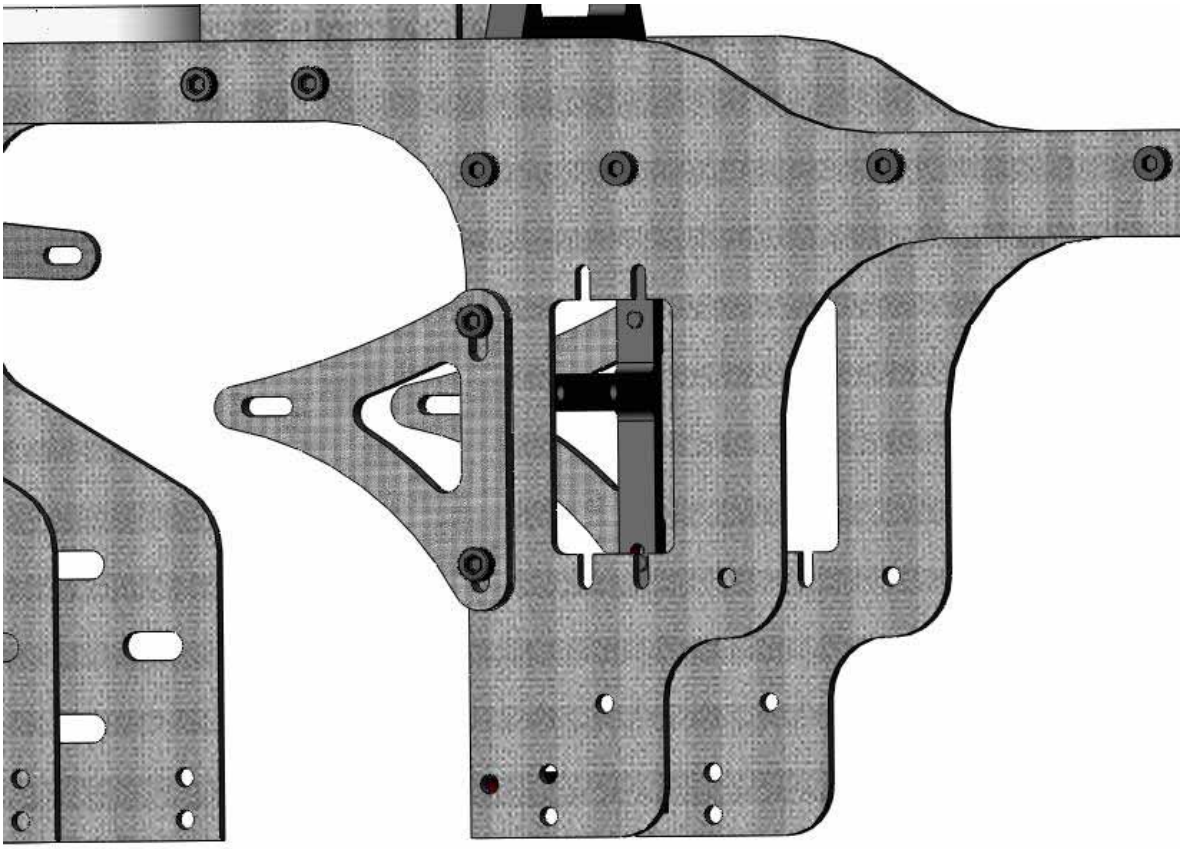
1	Frame	Rear Fan Shroud Mount		2
2	8	18mm Spacer	QF574	2
3	HB	M3x25 SOCKET HEAD CAP SCREW	HHI3M25C	2
4	HB	M3x8 SOCKET HEAD CAP SCREW	HHI3M08C	4
5	HB	M3 Locknut	HHI3MLN	2
6	Frame	Front Fan Shroud Mount		2
7	HB	M3x10 SOCKET HEAD CAP SCREW	HHI3M10C	4
8	LIB	Fan Shroud (50, 70-90)	QD569, QD667	1
9	HB	3x6x5mm Spacer	QT352A	4
10	HB	M2.5x10 Phillips Head Screw	HHI2.5M10P	4
11	8	26mm Cross members	QF311	1

If you are installing the fan shroud on the 70 or 90 disregard these first few steps and read down to the 70/90 section.

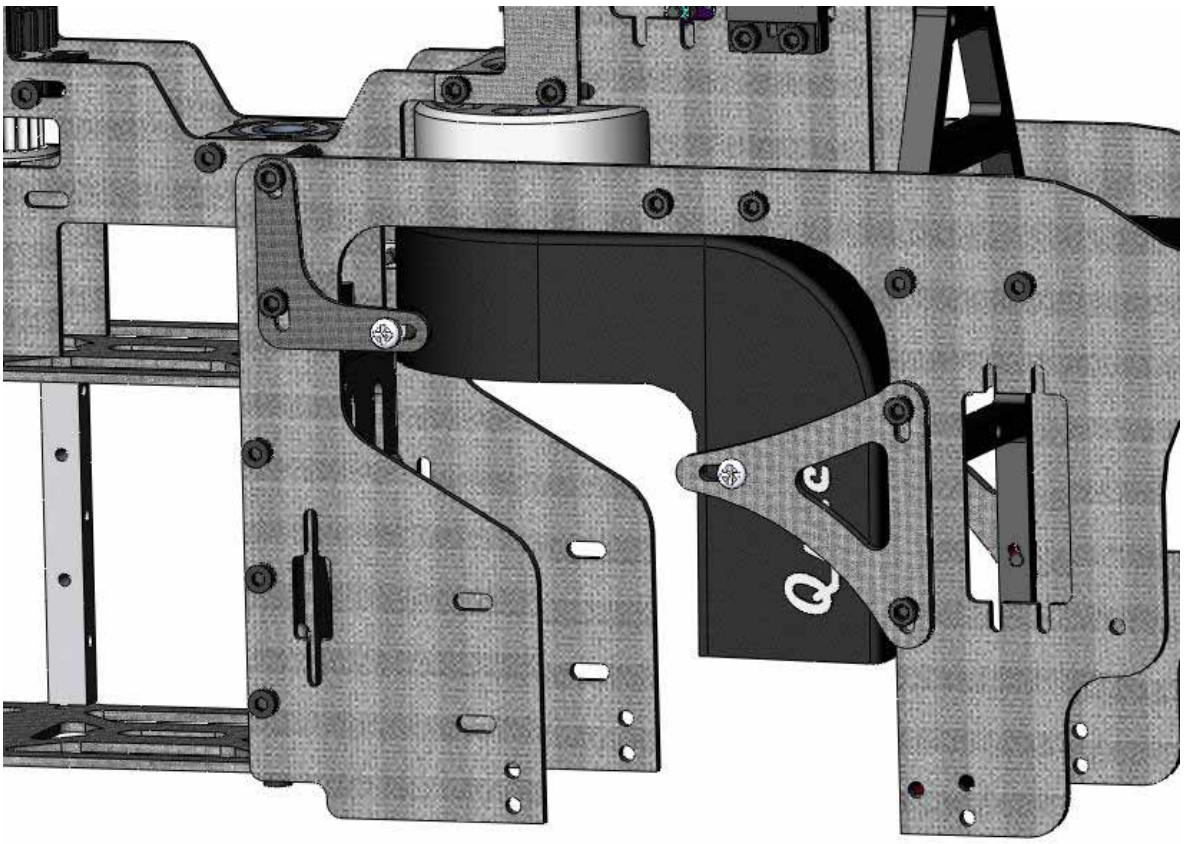


Next we will attach our rear fan shroud mounts. For the upper hole we will use an M3x25 cap head screw. Remove the M3x8 cap head screw in the lower main shaft bearing block. Install the new screw through the fan shroud mount, then through the engine frame, then through an 18mm spacer, and finally into the bearing block. You can leave this sort of loose for now, until the fan shroud is installed and adjusted. The lower screw is an M3x8 cap head screw and a lock nut.

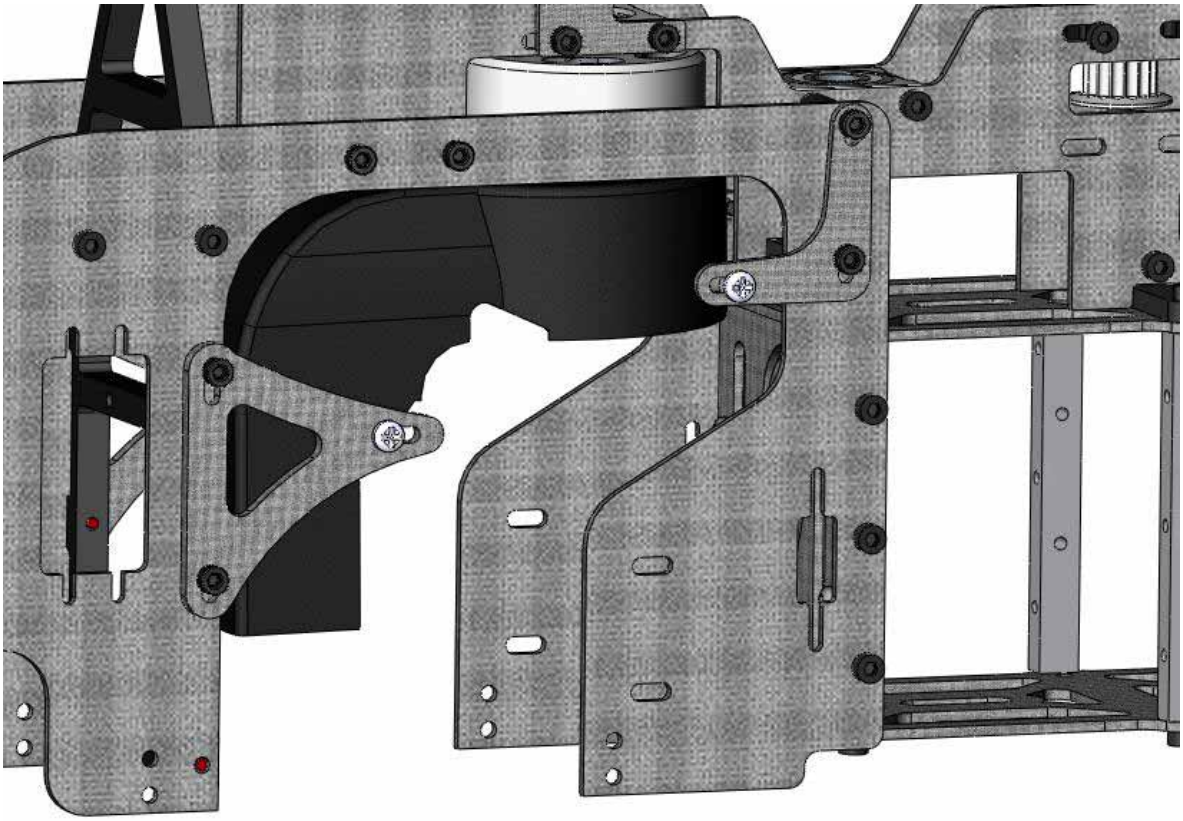




Now install the front fan shroud mounts. Use two M3x10 cap head screws for each. Leave these a bit loose as well until we install the fan shroud.

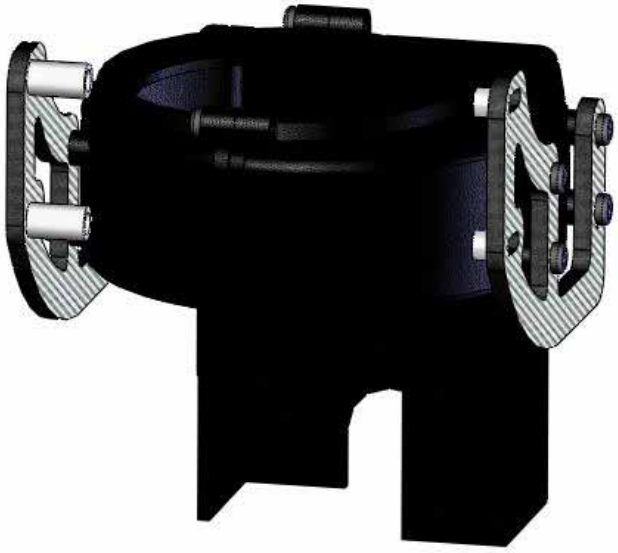


Install the fan shroud as shown. Attach the fan shroud using (4) M2.5x10 self tapping screws. Use a 3x6x5mm spacer between each mount and the fan shroud.

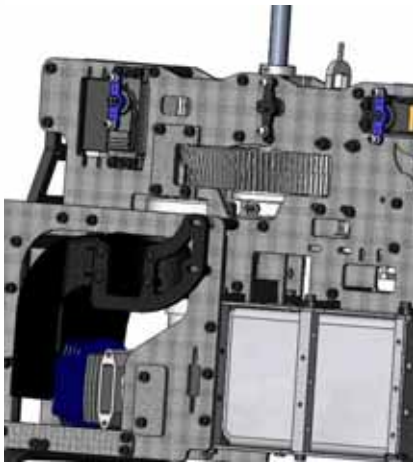


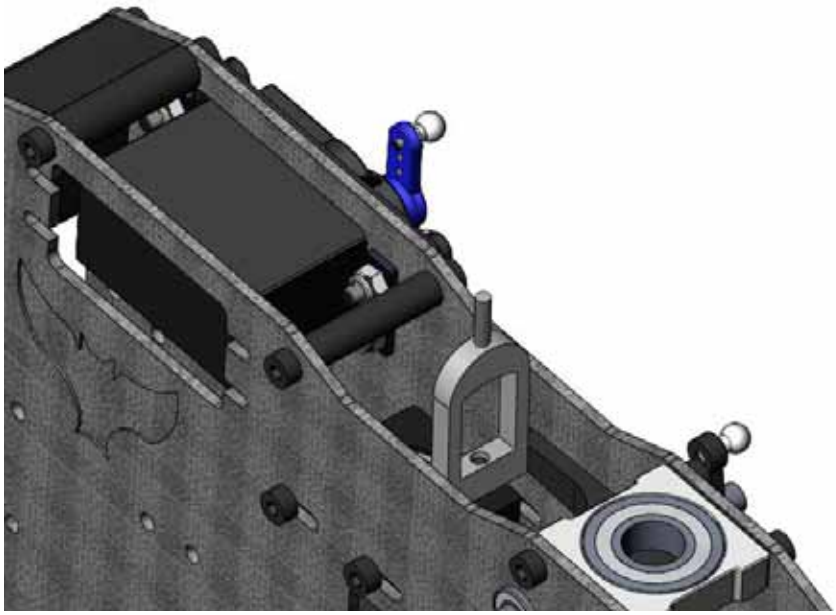
If you are installing the fan shroud on the 70 or 90 follow the coming steps and disregard these.

Locate your fan shroud in the box. Attach the two halves together with 3 M2.6x10 screws.



Locate the two fan shroud mounts. They will be in your frame bag. Attach them to either side using 4 M2.6x10 self tapping screws. On the Right side of the helicopter when you attach the assembly to the helicopter you will use 2 3x5x3 spacers. On the other side, you will use 2 9mm spacers.

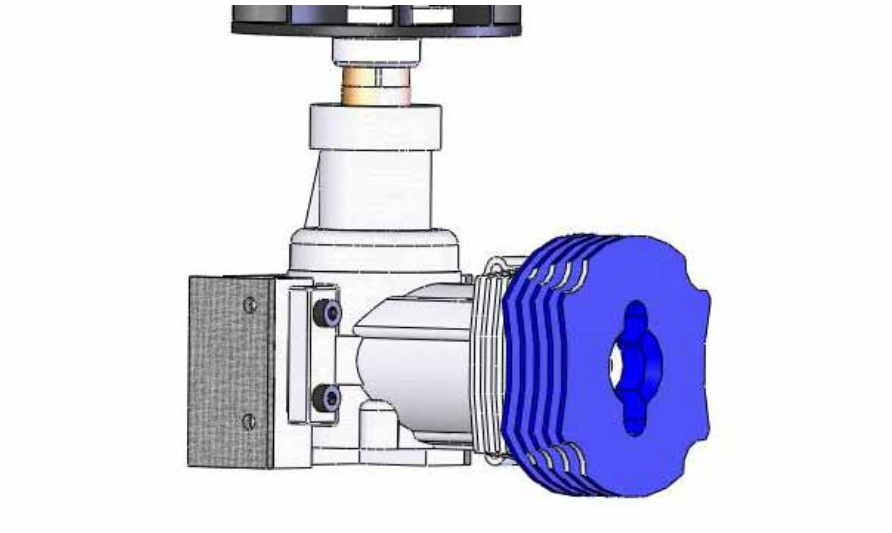




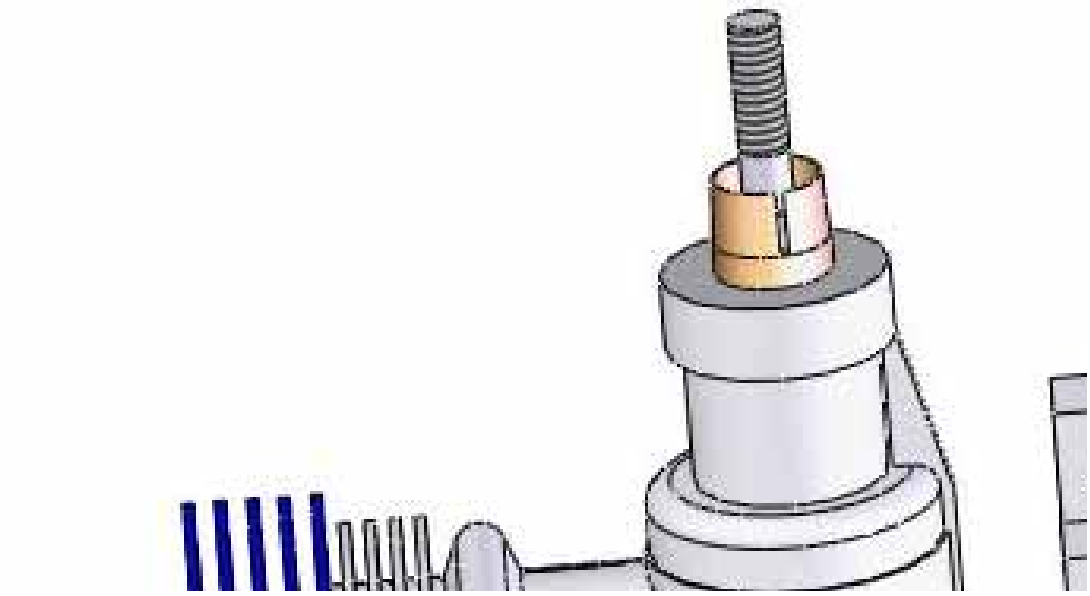
Install the upper frame cross member with two M3x8 cap head screws.

8-1 Motor Installation

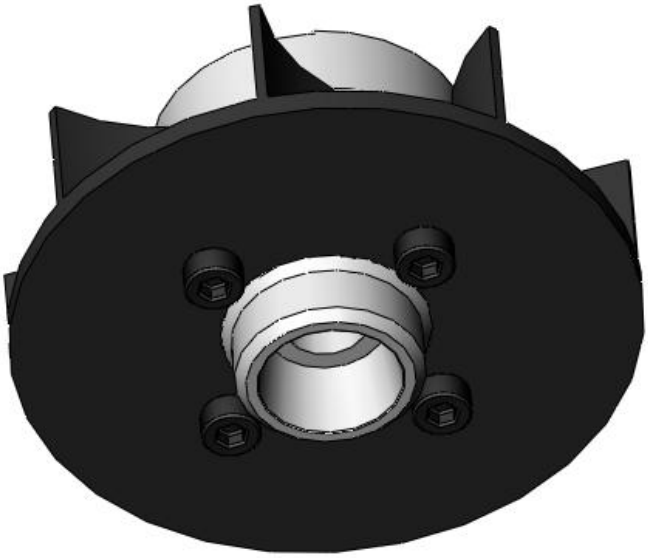
1	Not Included	Engine (we recommend OS)		1
2	9	Motor Mount (50, 70-90)	QD568	1
3	HB	M3x10 SOCKET HEAD CAP SCREW	HHI3M10C	4
4	9	Engine Washer (Brass Spacer)	QD563A	1
5	9	Lower Engine Collet (50, 70-90)	QD563C, QD663	1
6	9	Upper Engine Collet	QD563B	1
7	9	Fan Hub (50, 70-90)	QD562, QD662	1
8	9	Fan (50, 70-90)	QD556a Plastic/ QD556 CNC, QD669 Plastic/ QD666 CNC	1
9	HB	M3x8 SOCKET HEAD CAP SCREW	HHI3M08C	6
10	9	Clutch Shoe (50, 70-90)	QD565, QD665	1
11	Frame	3mm Motor Mount Spacer		2
12	Frame	Motor Mount Doubler		2
13	HB	M3x12 SOCKET HEAD CAP SCREW	HHI3M12C	4



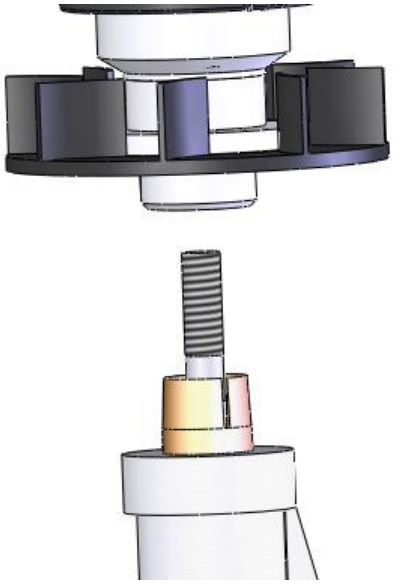
Attach the motor mount to the motor using four M3x10 cap head screws. Using Nord-lock washers are a nice accessory to use here. The motor mount is not symmetric. The end that has the further distance to the end from the screw hole will down as shown in the picture.



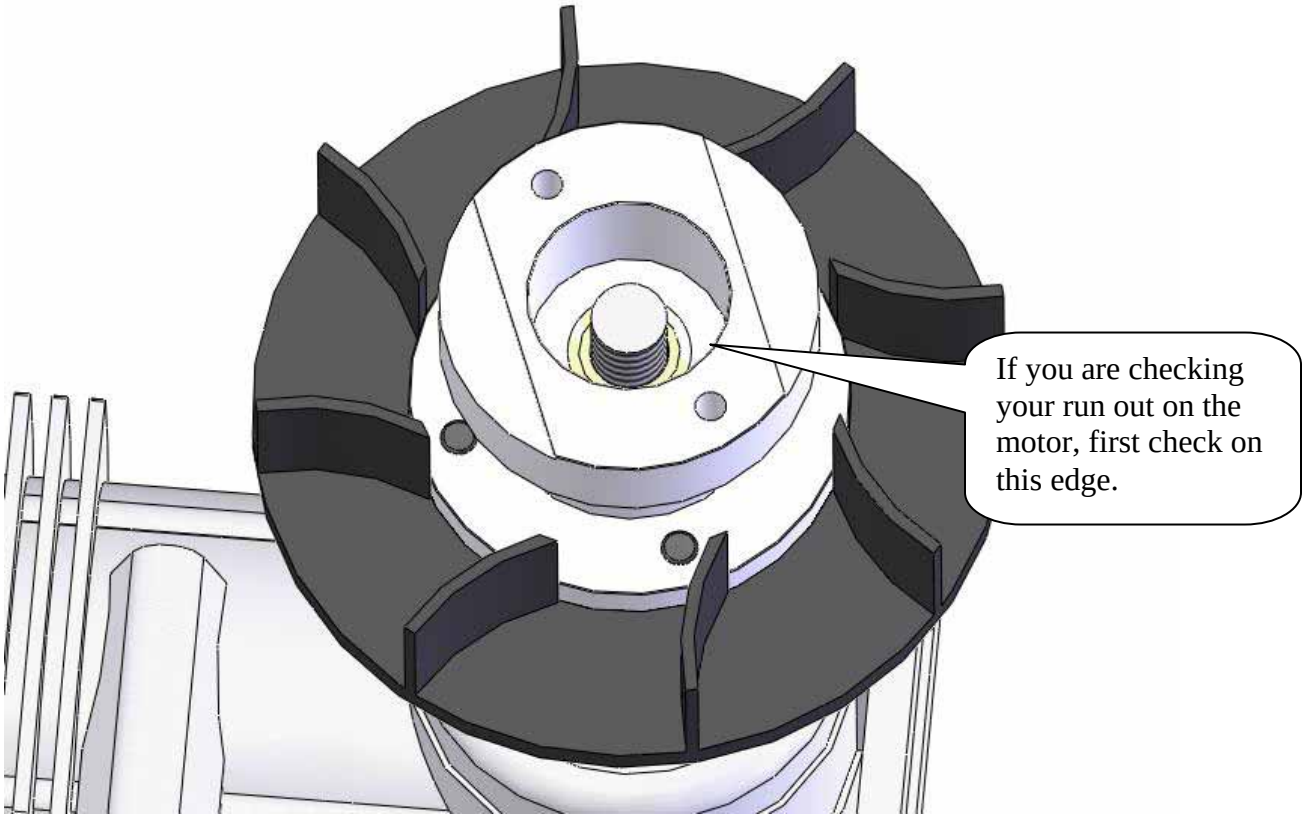
Next, install the engine collets. First is the one that just looks like a spacer/washer. Then the larger conical collet goes on.



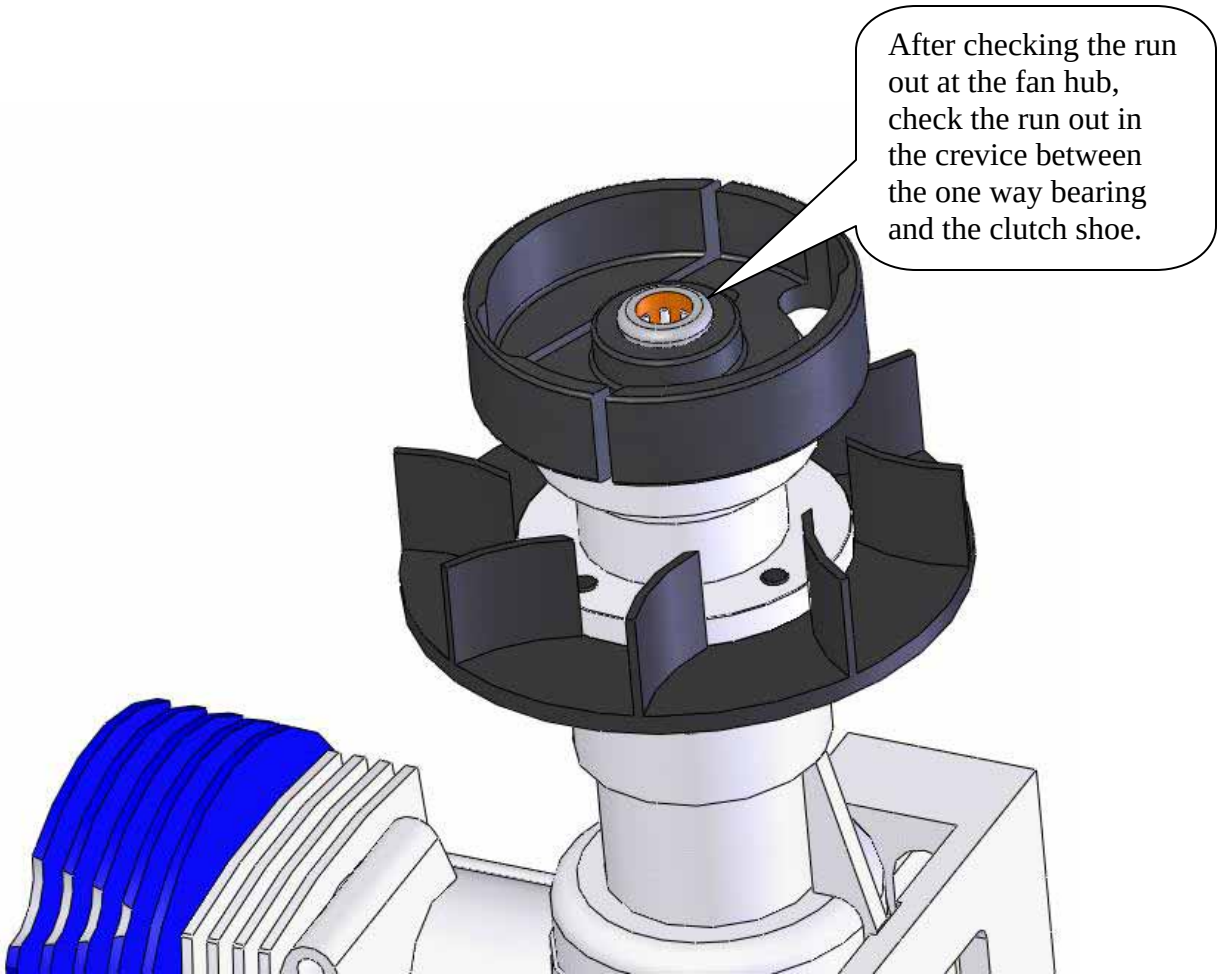
Attach the fan to the fan hub using four M3x8 cap head screws.



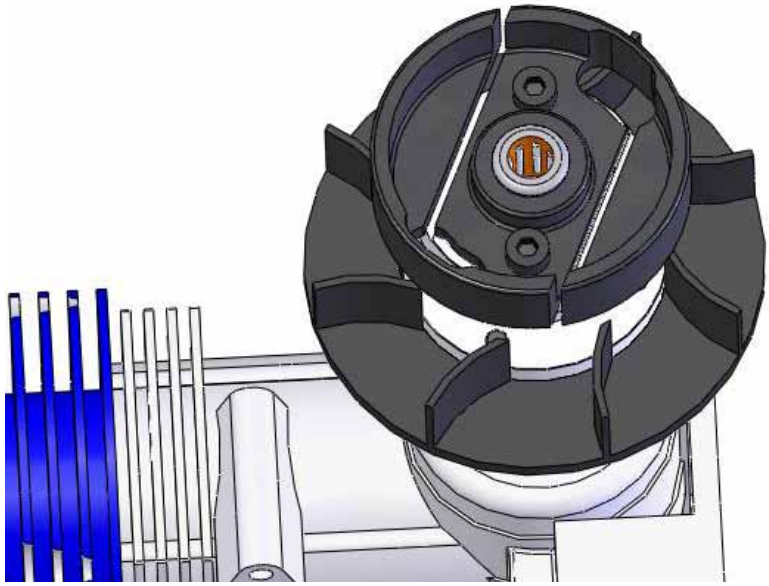
Slide the fan hub assembly onto the crank shaft.

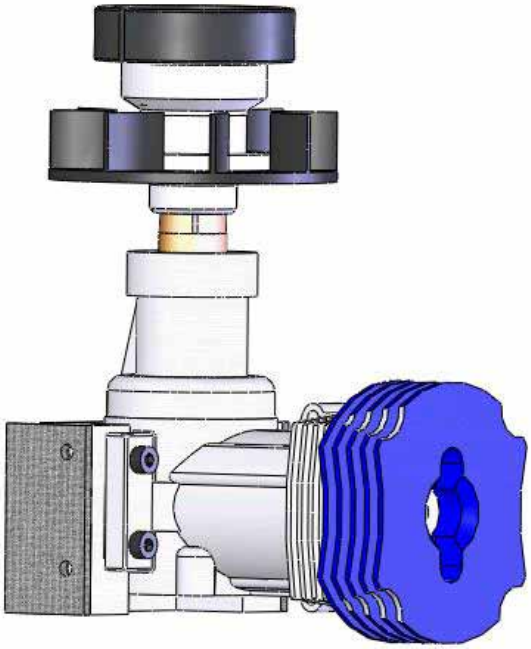


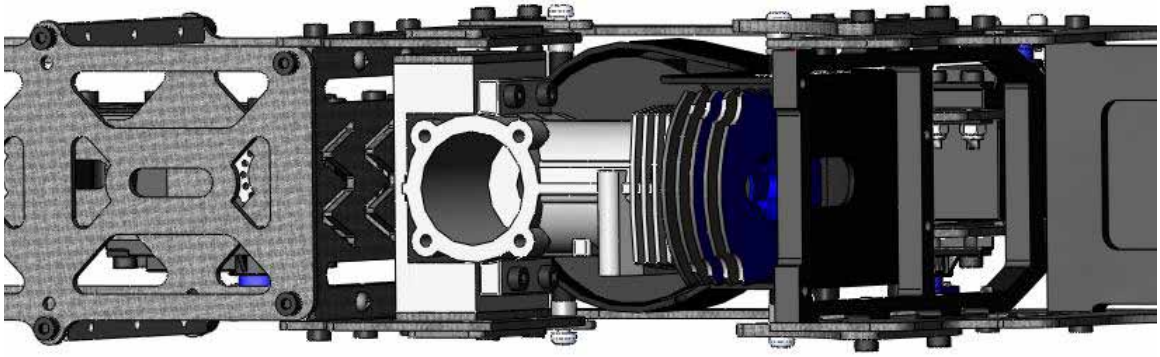
Slide the second smaller conical collet down onto the crank shaft. The tapered side goes down into the cavity. Secure the fan hub with the prop nut that is included with the motor. Note: It is important to use a Dial Indicator to check the run out of the Engine Assembly. Most of the vibration problems come from this. The run out should be no more than 0.004 inch (0.10 mm).



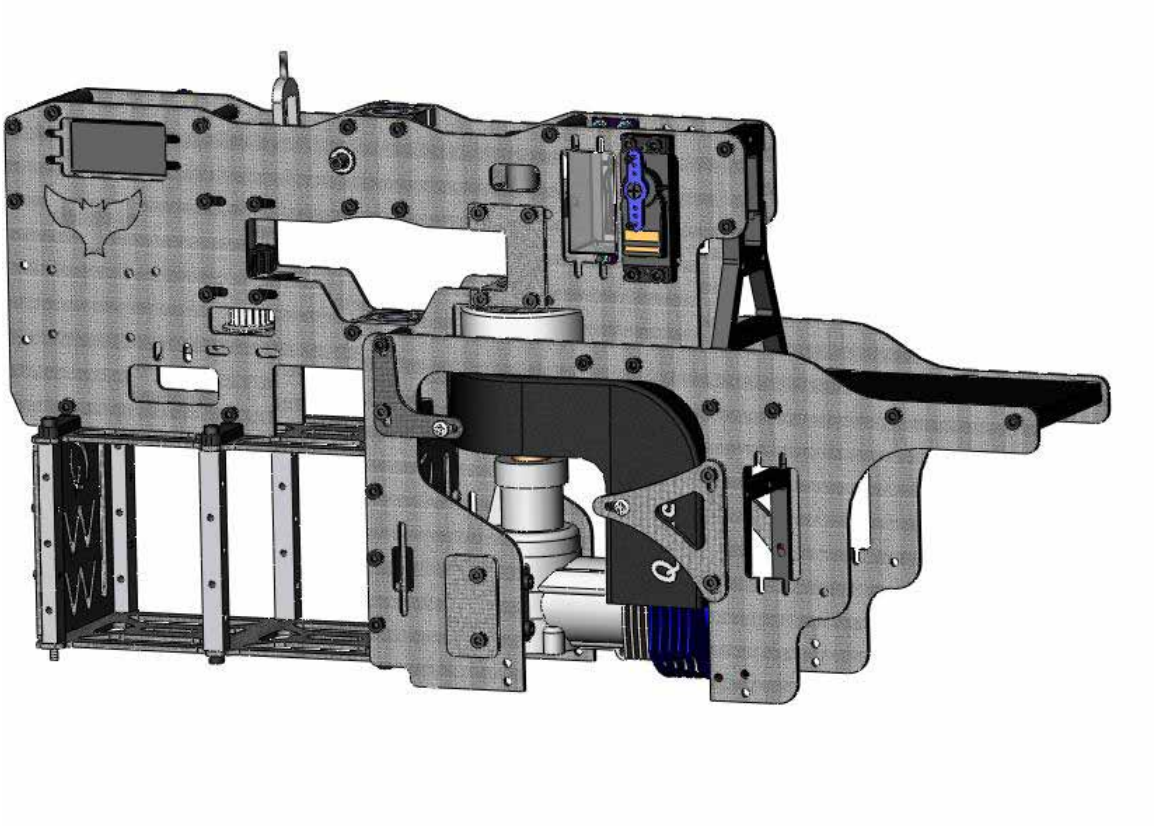
Attach the clutch shoe to the fan hub using two M3x8 cap head screws.



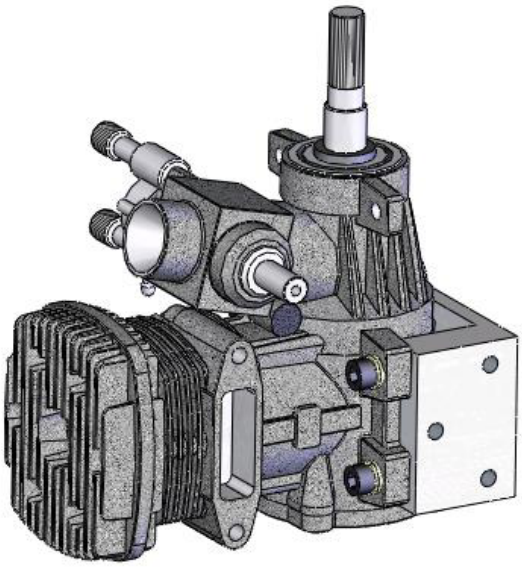




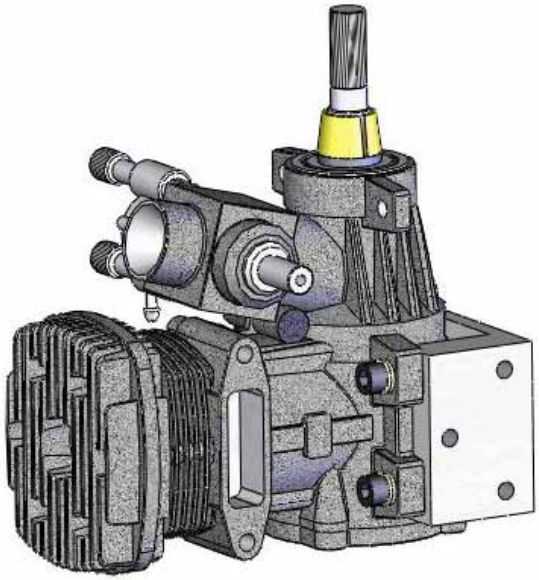
The next step is to install the motor assembly into the helicopter. There is a 3mm spacer on either side of the motor mount. You can CA or silicone these into place to make it a bit easier to get everything to line up when installing the motor.



Secure the motor in the helicopter using four M3x12 cap head screws. There is a motor mount double plate provided for the outside of the frame as well.

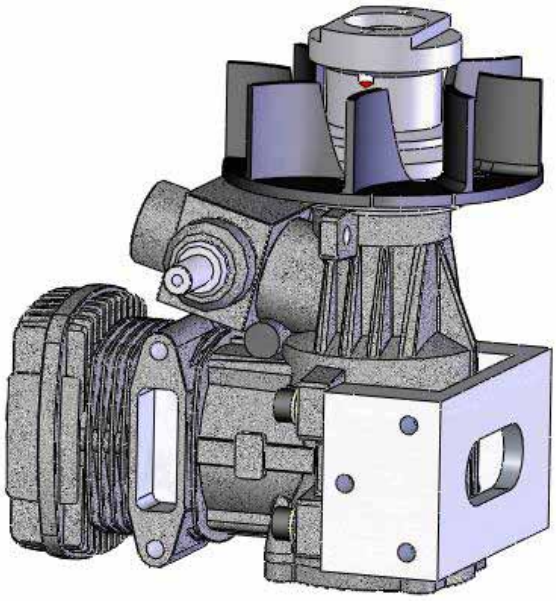


If you have the 70 or 90 helicopters you can follow these steps. They are basically the same as the 50 assembly, with some different hardware. Attach the motor mount using four M4x12 Cap Head Screws.

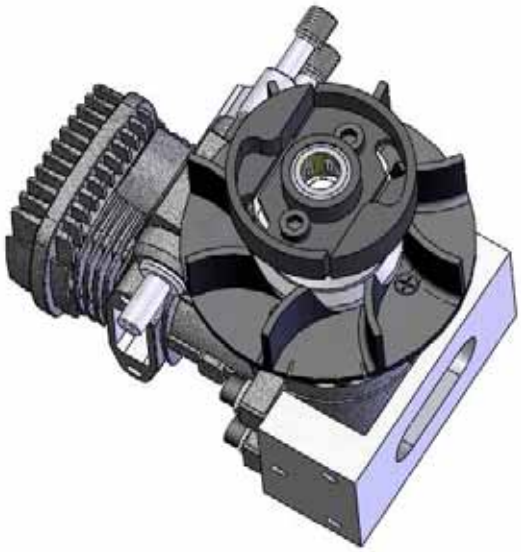


Slide the Collet onto the shaft.

Locate your fan hub and fan. The fan fits over the fan hub from the top as it is pictured here.



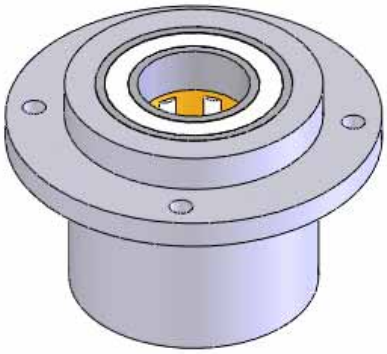
Slide your fan hub onto your crank shaft and secure it in place with the prop nut that came with the engine.



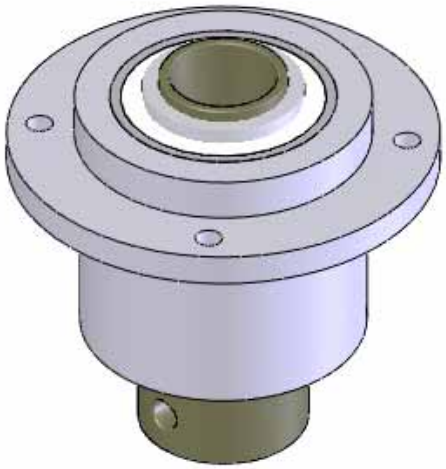
Next, attach the clutch shoe to the fan hub.

9 Drive System

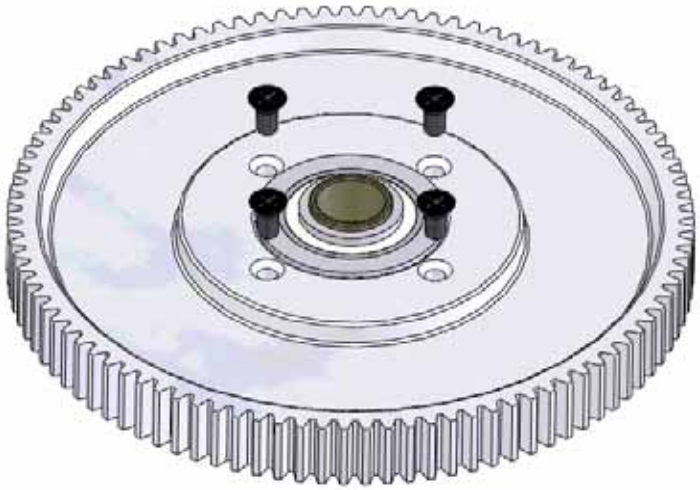
1	10	Autorotation Hub (comes in set with sleeve, bearings, and spacer.)	QD754	1
2	10	Autorotation Sleeve	QD603	1
3	10	Autorotation Spacer	QD601	1
4	10	97T Main Gear	QD558 Molded/ QD558a CNC	1
5	10	M3x6 Flat Head Screw	HHI3M06F	4
6	10	88T Main Gear	QD355 Molded/ QD358a CNC	1
7	10	3mm Main Gear Spacer		2
8	10	Lower Main Gear Hub	QD760	1
9	HB	M3x12 SOCKET HEAD CAP SCREW	HHI3M12C	4
10	10	Main Shaft	QD560	1
11	HB	M3x35 SOCKET HEAD CAP SCREW	HHI3M35C	1
12	HB	M3 Locknut	HHI3MLN	1



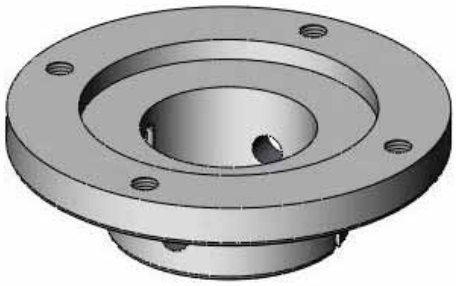
Locate your autorotation hub assembly.



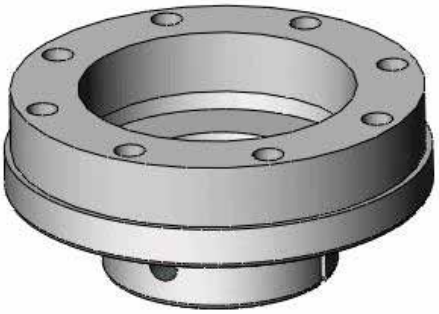
Locate your auto rotation sleeve and spacer. You will slide your auto rotation sleeve into your hub and slide the spacer on the top. You can leave the spacer off until you are ready to install the unit into the helicopter.



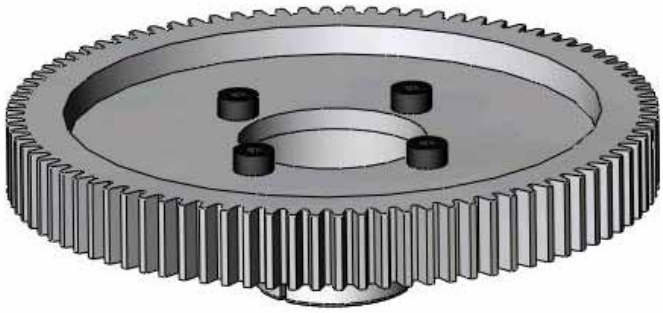
Attach the upper 97T main gear to the auto rotation hub using (4) M3x6 flat head screws. When you install the screws on both gears, tighten the screws in a cross wise fashion to get equal pressure on the gear and ensure that the gears sit flush onto their hubs.



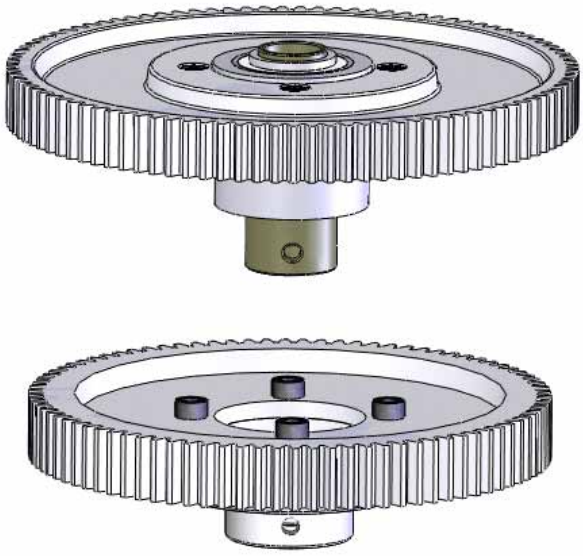
Next locate your lower main gear hub.



You will also need the lower auto rotation hub spacer rings. There are two stacked.

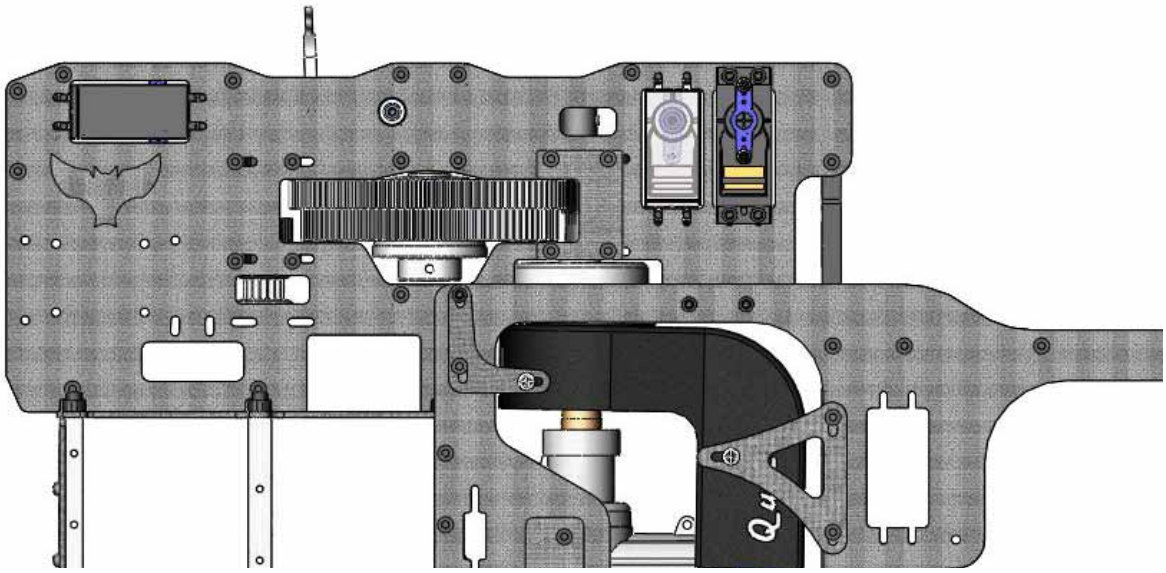


Attach the lower main gear to the lower main gear hub using (4) M3x12 cap head screws.

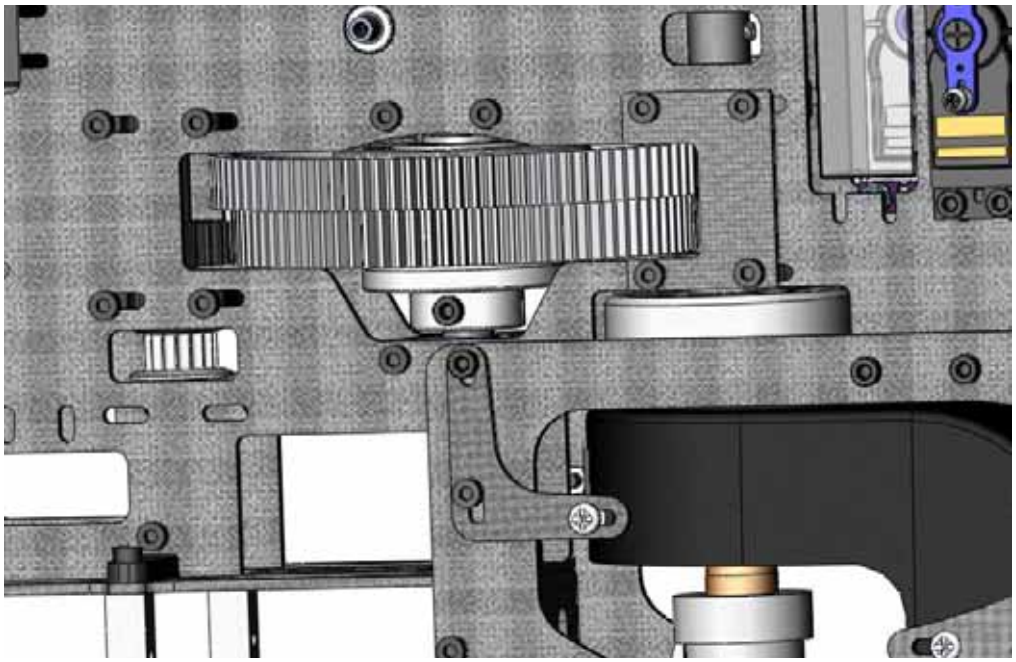


Now slide the lower main gear assembly onto the upper main gear assembly.

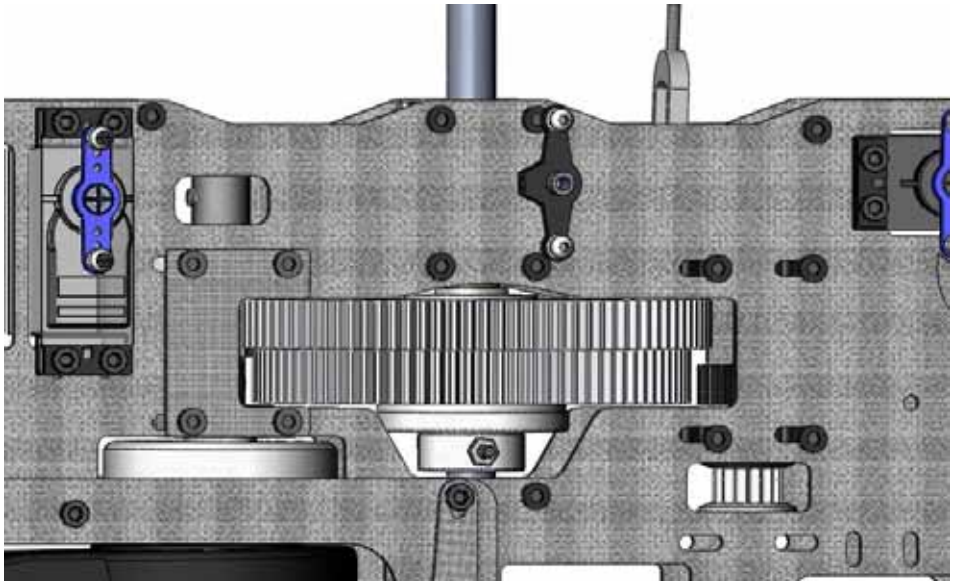
The result should look like this.



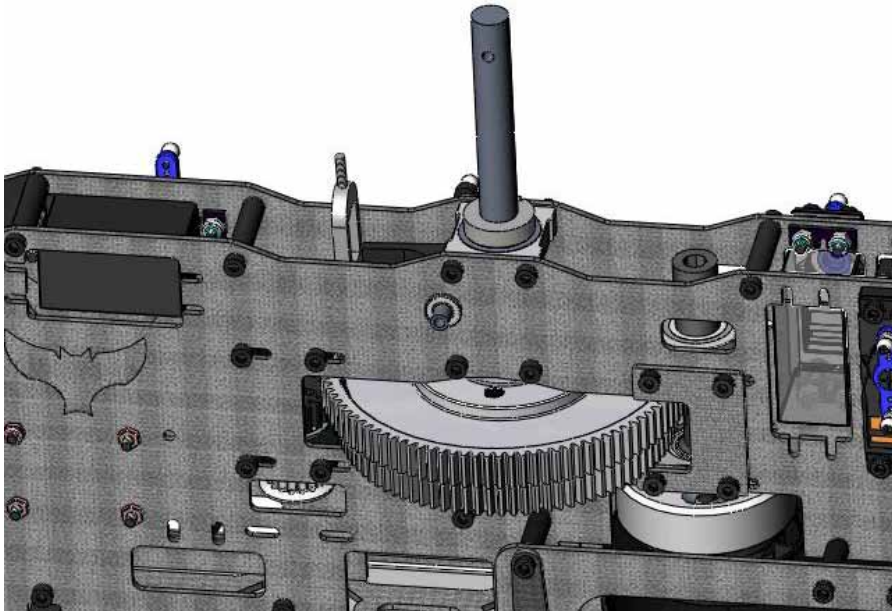
Now, Slide the assembled unit into the helicopter as shown above.



Next, you will slide your main shaft through the main gear hub assembly. The end with the longer distance to the hole goes in first. It will be the end going in first. Attach the main gear assembly using an M3x30 cap head screw and an M3 Locknut.



The lower main shaft bearing is vertically slotted so that you can adjust the height of the main gear to get the positioning perfect.



Slide the main shaft collar onto the main shaft. While pulling up on the main shaft to remove any play and tighten the collar with the supplied M2.5x8 cap head screw.

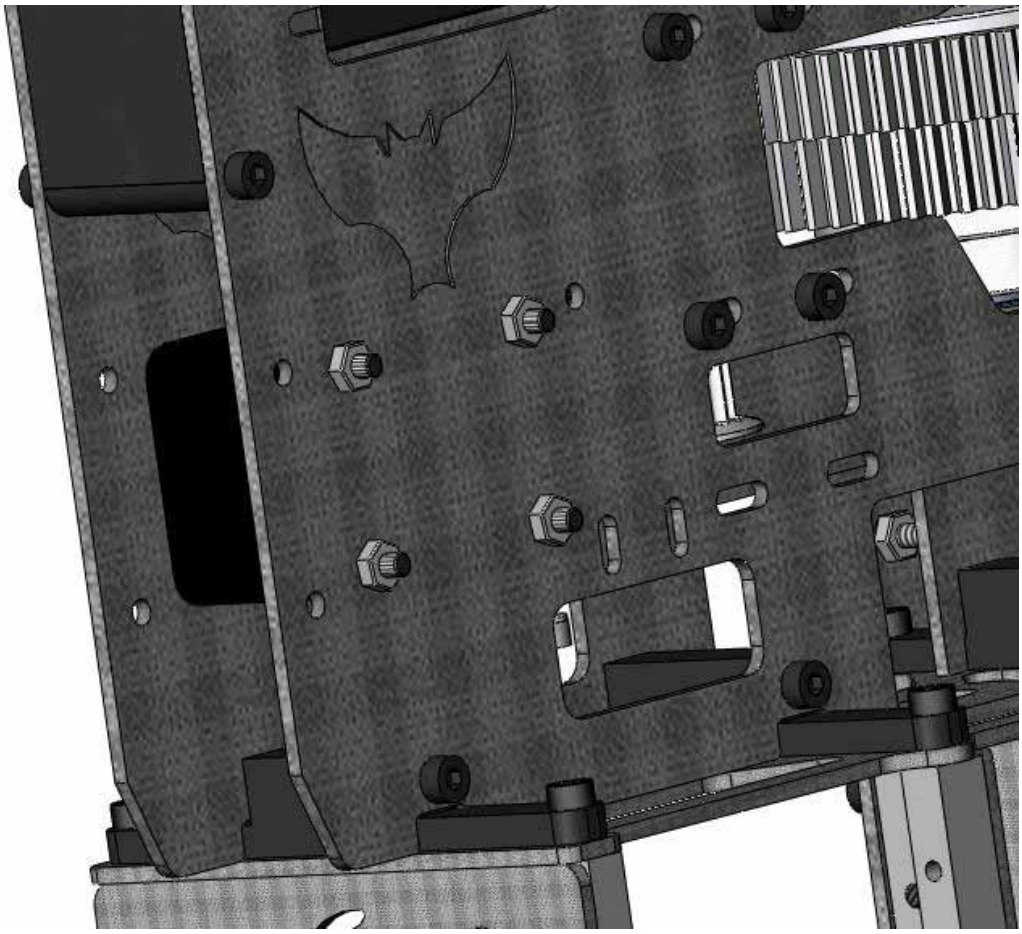
Once you have your gears in place you can set your gear meshes for both the start shaft bearing block/clutch bell assembly and the counter gear bearing block assembly. What you will want to do is take a piece of notebook paper and fold it in half to get a double thickness. Put the paper in between the two gears; push the gears as close to one another as possible and lock down the screws. When you remove the paper you will have a nice gear mesh. Be sure that you get them push tightly together while the paper is in there, too loose a mesh and you will end up stripping gears.

If you are building a budget bat you will have an autorotation assembly that will look like this. The gear slides up from the bottom and attached with (4) M3x6 Flat Head Screws.

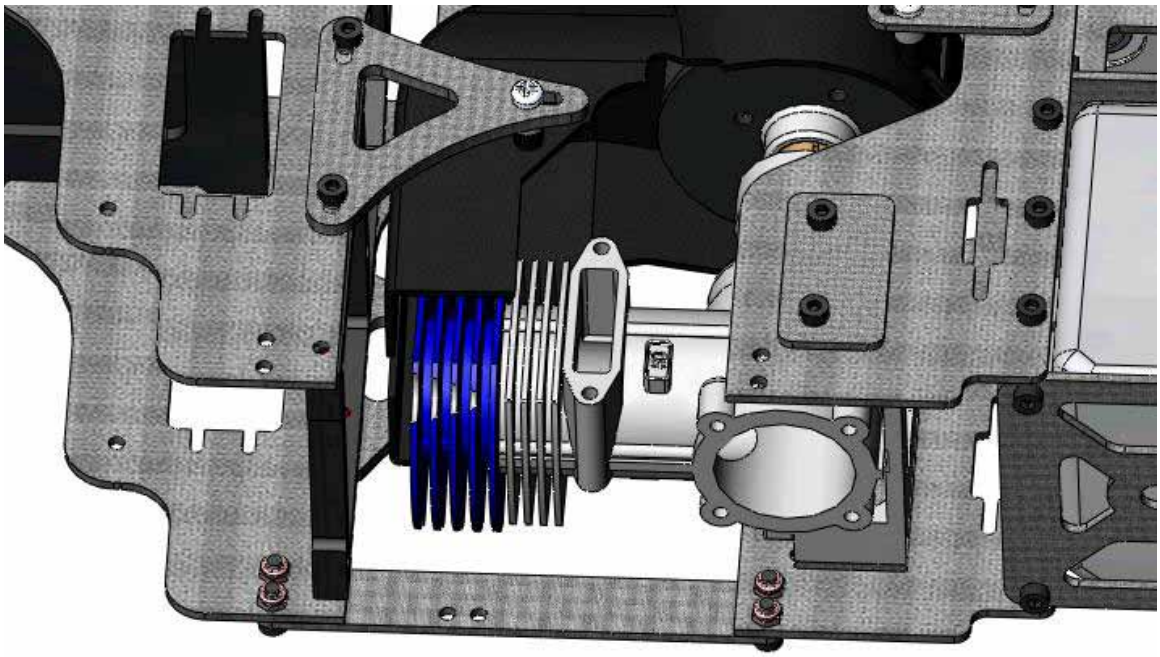
This is how it will end up looking from the top side. You will Slide the main shaft into the auto rotation hub in the same way as detailed earlier. Attach the autorotation hub to the main shaft using an M3x16 cap head screw and M3 Locknut.

9 Drive System

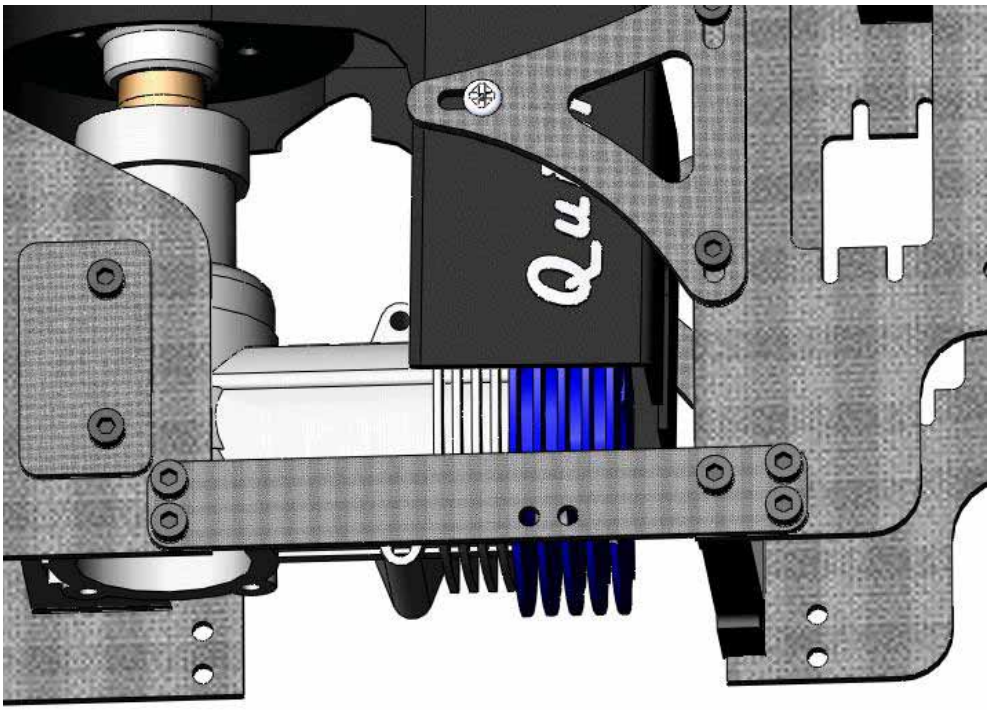
1	10	Boom Holder (50, 70-90)	QF363, QF658	2
2	HB	M3x35 SOCKET HEAD CAP SCREW	HHI3M35C	4
3	HB	M3 Locknut	HHI3MLN	4
4	Frame	Landing Gear mounts		2
5	HB	M3x8 SOCKET HEAD CAP SCREW	HHI3M08C	10
6	HB	M3 Locknut	HHI3MLN	8
7	10	Landing Gear Mount	QF514	1
8	10	Landing Gear Dampeners	HHI2004	2
9	HB	M3x12 Set Screws	HHI3M12SS	2



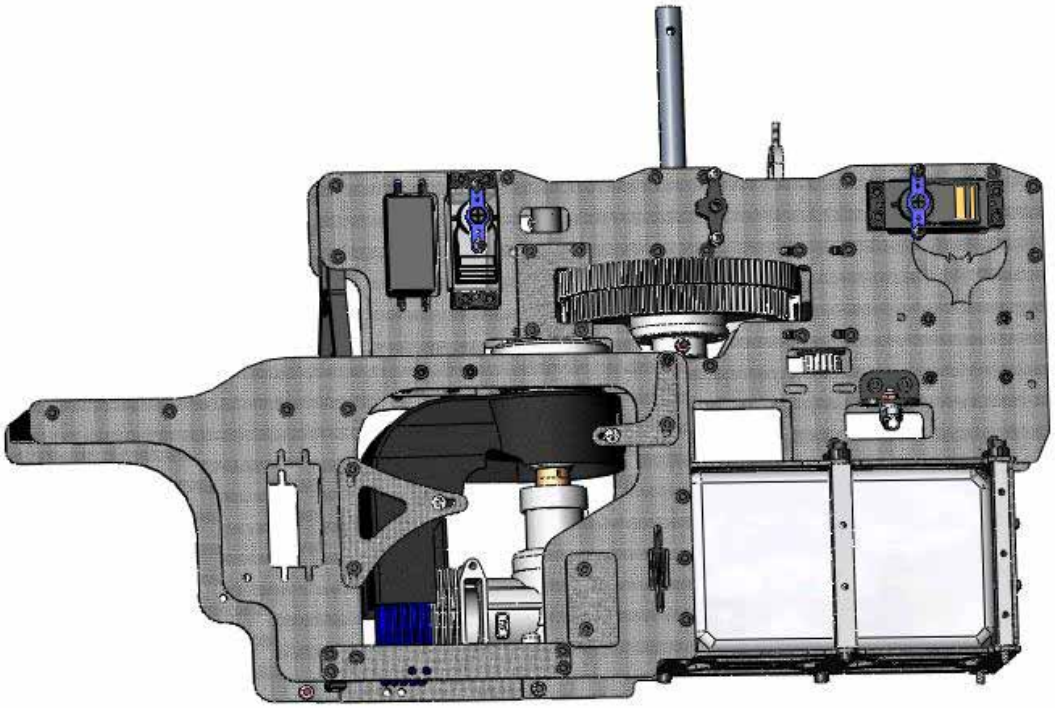
Now you can install the plastic boom holder blocks. Install the blocks with four M3x35 cap head screws and lock nuts.



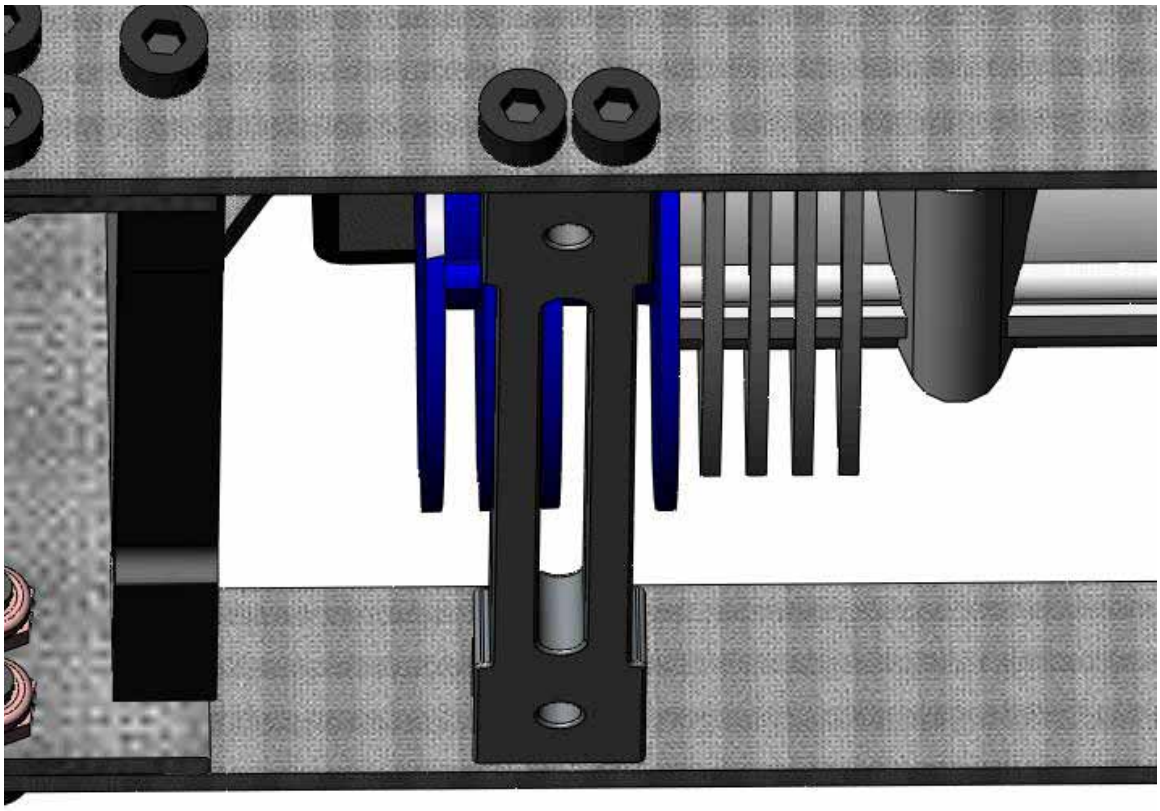
Attach the landing gear mounting plate to the engine frame with five M3x8 cap head screws and four lock nuts.



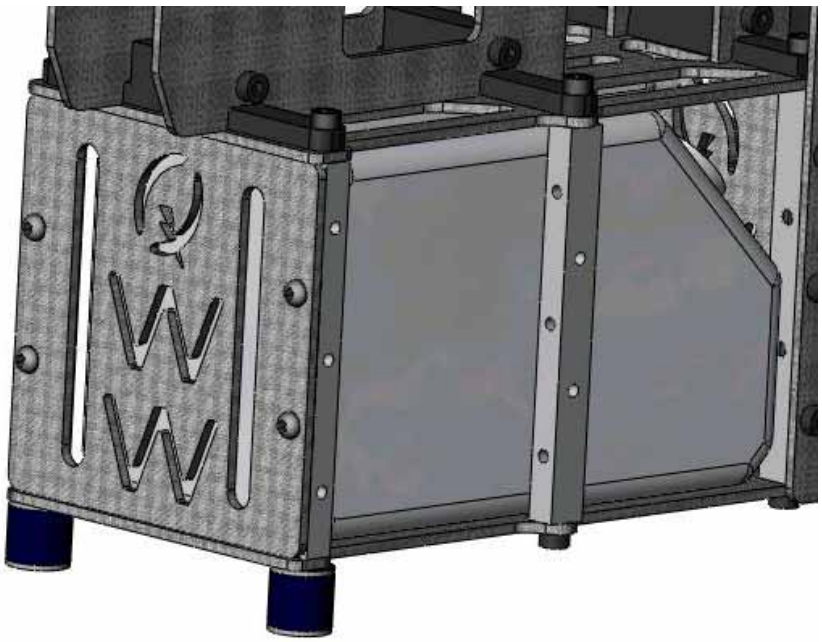
Four bolts will go through the plate and be attached with the lock nuts and the fifth will go into the bulkhead.



Attach the second mount in the same way as the first side.



Attach the landing gear mount with four M3x8 cap head screws.

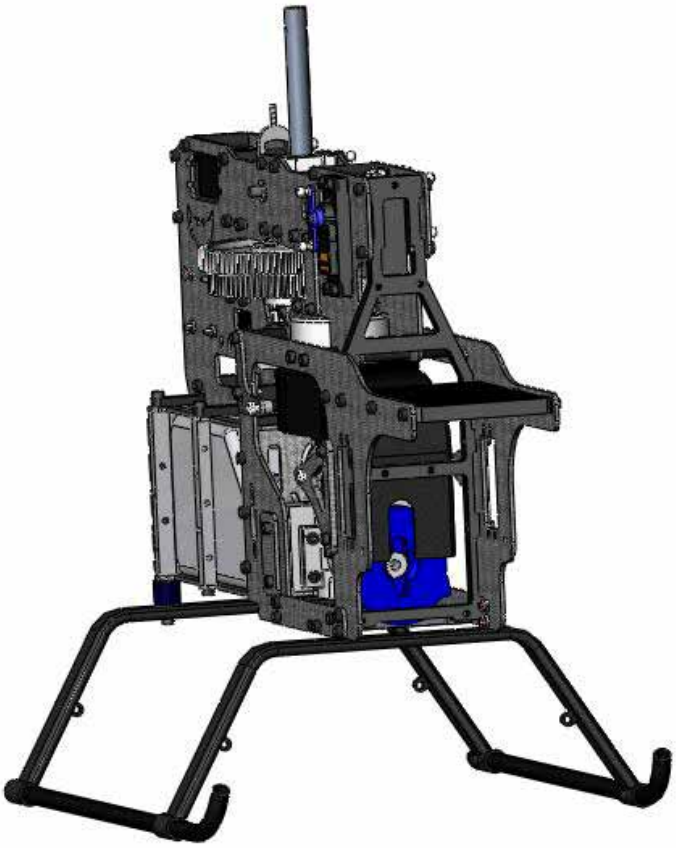


Attach two landing gear dampeners to the fuel tank assembly. Find two M3x12 set screws and install them into the landing gear dampeners using Loctite. Next, thread them into the rear fuel tank cross members.

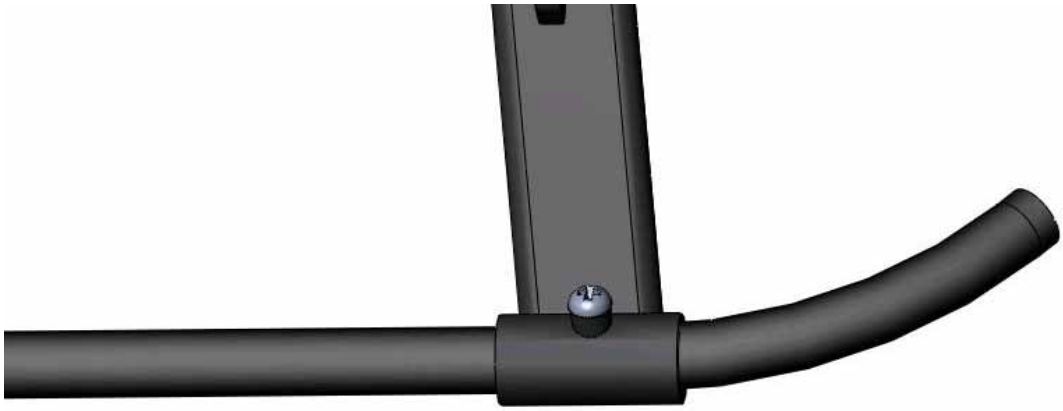
10 Landing Gear Assembly

1	11	Landing Gear Strut	2
2	11	Landing Gear Skid	2
3	11	Skid tube end	4
4	HB	M3x10 SOCKET HEAD CAP SCREW	4
5	HB	M2.5x6 Self tapping screw	4
Landing Gear comes in a set. HHI4000 is plain black. Set the website for more colors that are available.			

Attach the landing gear to the dampeners as shown. Use two M3x10 cap head screws. You will need to drill two M3 or 1/8" holes in the plastic to mount the landing gear. It is 70mm from hole to hole on the rear landing gear and 60 on the front one. **TIP:** One method for aligning the holes properly is to take a piece of masking tape and put it on the mount for the helicopter. Mark the holes with a magic marker or pen and then transfer the tape to the landing gear and drill the holes.



Attach the front landing gear mount to the landing gear mount using two M3x10 cap head screws. Epoxy in the skid tube ends.

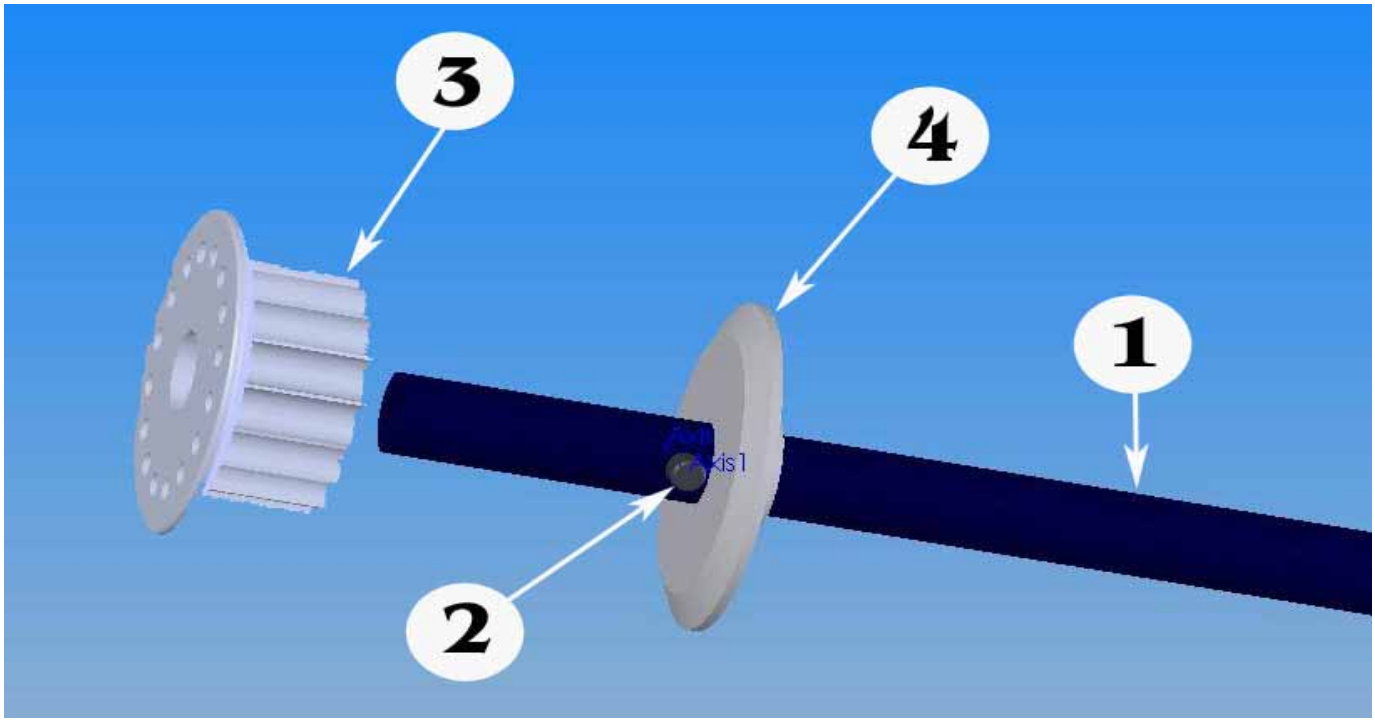


Secure the landing gear skids with (4) M2.5x6 self tapping screws.

SECTION 11: TAIL ASSEMBLY Bag 5

11 TAIL PULLEY GEAR ASSEMBLY

No.	Bag#	Description	Part #:	Qty
1	12	Tail Output Shaft	QT557	1
2	12	Tail Gear Lock Pin	QT520b	1
3	12	Tail Pulley Gear (50, 70-90)	QT556, QT356	1
4	12	Tail Gear Side Plate	QT520a	1
5	*****	JP Weld glue		1

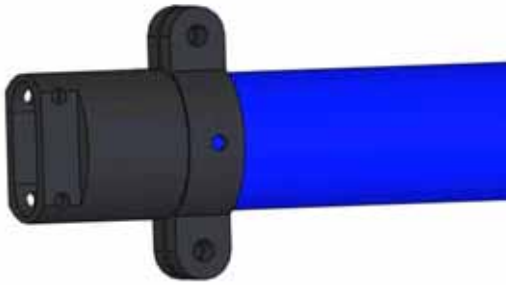
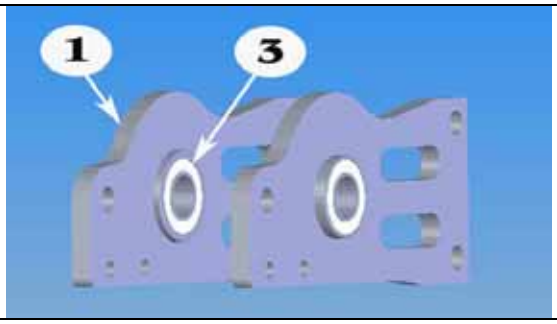


Remember apply JP Weld glue around the pin.

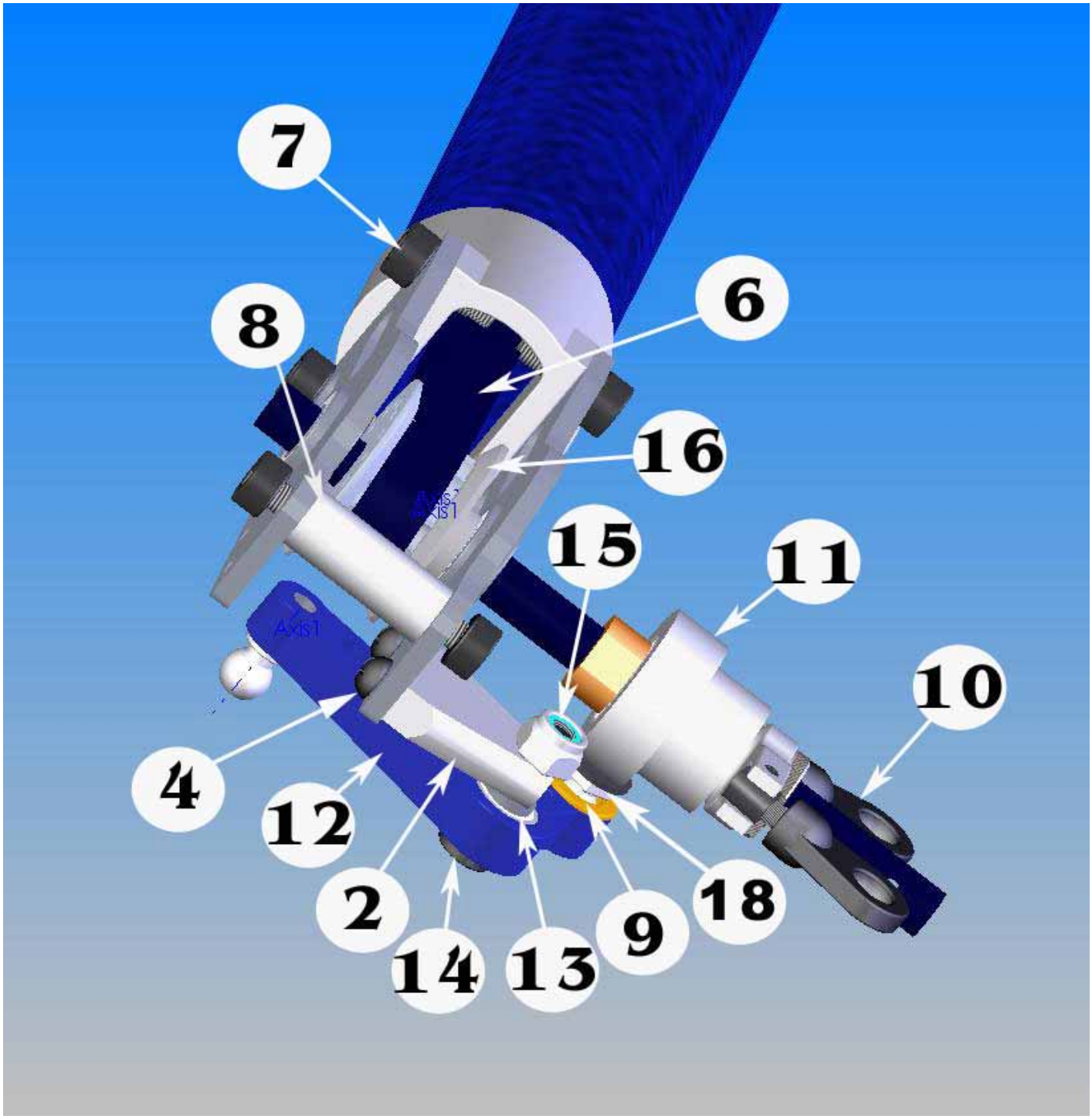
11 TAIL ROTOR ASSEMBLY

No	Bag#	Description	Part #:	Qty
1	Frame	Tail Case Side Plate	QT563	2
2	12	Tail Pitch Lever Mount	QT351C	1
3	12	5X10X4Flange Bearing	BRG05104F	2
4	HB	M2x6 Phillips Screw	HHI2M06P	2
5	In box	Tail Boom (in Box) (50, 70-90)	QT554, QT654	1
6	In box	Timing Belt (in Box) (50, 70-90)	QT555, QT655	1
7	HB	M3x6 Cap Head Bolt	HHI3M06C	6
8	12	Tail Case Cross Member	QT359	1
9	HB	M3x4Pivot Ball Stud	HHI3M4PS	2
10	12	M2.3 Medium Ball Link	HHI2022	2
11	12	Tail Pitch Slider	QT351	1
12	12	Tail Pitch Control Lever	QT350	1
13	HB	M3x5x1 Spacer	HHI3M5X1	1
14	HB	M3x16 Cap Head Bolt	HHI3M16C	1
15	HB	M3 Locknut	HHI3MLN	1
16	12	Tail Pulley Gear Assy		1
17	HB	M2.5x6 Screw	HHI2.5M06P	1
18	HB	M3x7 Flat Washer	HHI3MW	1

***If you have the shaft drive tail or one piece SE tail box assemblies, please see their own instruction manuals in the main instruction screen when you open the instruction CD.

First, to prevent the Boom End from rotating, drill a 2.5mm hole on a side of the Boom End, then secure with an M2.5x6 screw.	
Install the Bearings into the Tail Case Side Plates. The flanges should be inside. Sometimes, the holes are too tight; you have to sand them a little bit.	

Note: Normally you just need one M3x5x1 Spacer between the Tail Pitch Control Lever and Tail Pitch Lever Mount but you may need two of them in some cases (if you do not have enough clearance for the lever.)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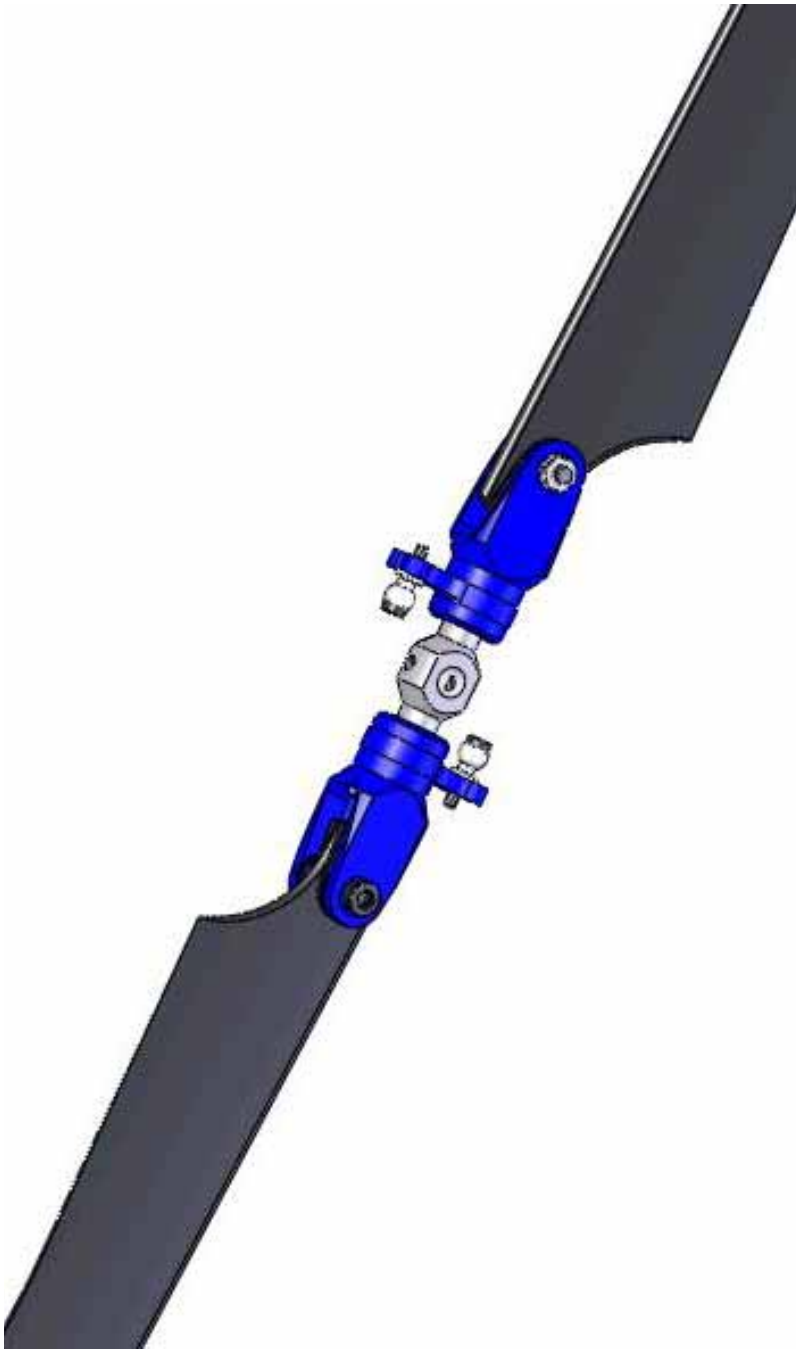
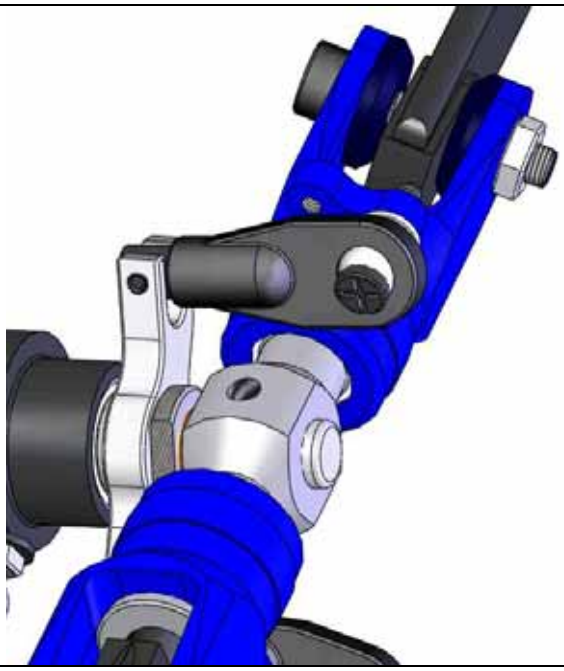
11 TAIL ROTOR INSTALLATION

No.	Bag#	Description	Part #:	Qty
1	12	Dual Bearing Tail Rotor	QT365	1
2	HB	M3x22 Cap Head Bolt	HHI3M22C	2
3	12	Tail Blade (50, 70-90)	HHI6305, HHI6340	2
4	12	Tail Blade Spacer	QT365b (come in set with Blade grips).	4
5	HB	M2x8 Phillips Screw	HHI2M08P	2
6	HB	Shim Ball	HHI2030	2
7	HB	M3x6 Cap Head Bolt	HHI3M06C	2
8	HB	M3x5 Set Screw	HHI3M5SS	1
9	12	Horizontal Fin Mount	QT360H	1
10	12	Vertical Fin Mount	QT360	2
11	12	Horizontal Fin*	QF662 (comes in a set. Vertical and horizontal)	1
12	12	Vertical Fin*		1
13	HB	M3 Locknut	HHI3MLN	4
14	HB	M3x30 Cap Head Bolt	HHI3M30C	2

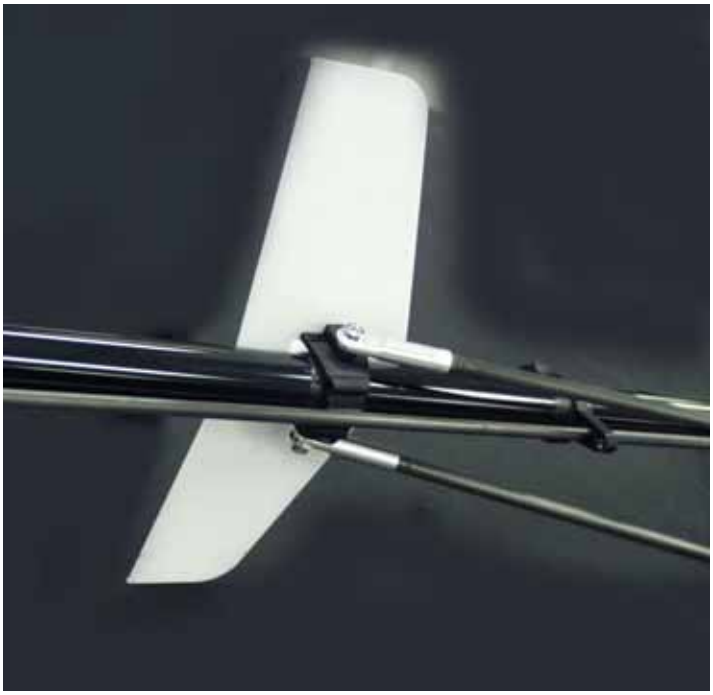
- Carbon Fin Set is also available for option. (HHI4155C)



After installing all the parts as shown above, slide this subassembly on the output shaft then secure it with one M3x5 Set Screw. Be sure that the set screw hits the milled flat on the shaft.	

Wrap electric tape around the boom couple times where you are going to install the fin mounts. Note: Fin set may look lightly differently from the one in the kit.

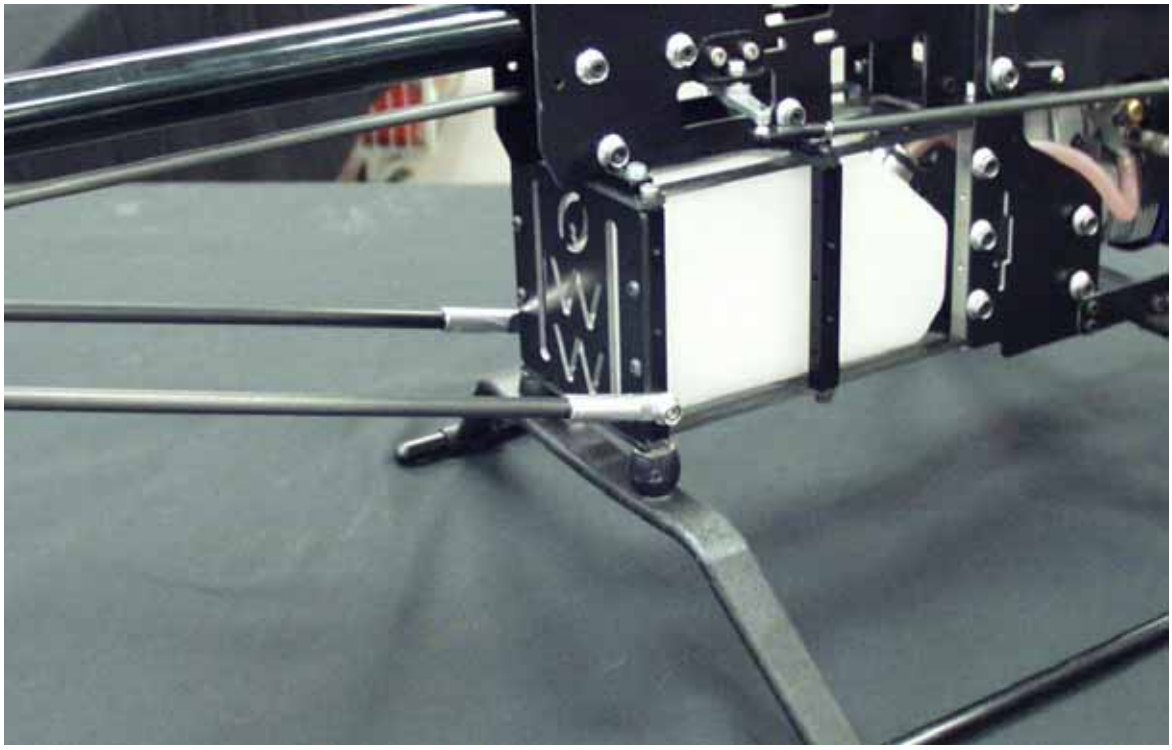
It is a good idea after you mount your fin onto the helicopter to add a small hole to each fin mount and insert a small self tapping screw to ensure the fin cannot twist and get into the tail rotor assembly.



11 TAIL INSTALLATION

No.	Bag#	Description	Part #:	Qt.
1		Main Assembly		1
2	Step 12-3	Tail Assembly		1
3	In box	Boom Support	HHI4062	2
4	12	Boom Support End		4
5	HB	M3x12 Cap Head Bolt	HHI3M12C	2
6	HB	M3x8 Cap Head Bolt	HHI3M08C	2
7	HB	M3 Locknut	HHI3MLN	6
8	HB	M3X45 Cap Head Bolt	HHI3M45C	4
10*****		CA Glue		1

- Note for installing the timing belt: Turn the Tail assembly so that the Tail Output Shaft pointing upward put the belt onto the Transmission, then twist the Tail Assembly 90^{o} to the right. Make sure the belt not too tight or loose. Tighten the four screws on the boom holders.
- Measure the Boom Support carefully before cutting. It is a good idea if you install one end of the rod first, then make the measure then cut it. Remember apply CA Glue, Epoxy, or JB Weld for the rods when installing into the Support Ends.



The pro series comes with carbon boom supports with aluminum ends. The Sport and Budget series come with fiberglass composite rods and plastic ends. Either one is assembled the same way. Cut the rod to length using a dremel cutoff wheel or something similar that won't split the rod. You just want the rod to be long enough that it won't allow the tail blades to hit the horizontal fin. Shorter is ok. Once they are cut to length glue the ends on with either epoxy or jb weld.

SECTION 12: CONTROL SYSTEM Bag 6

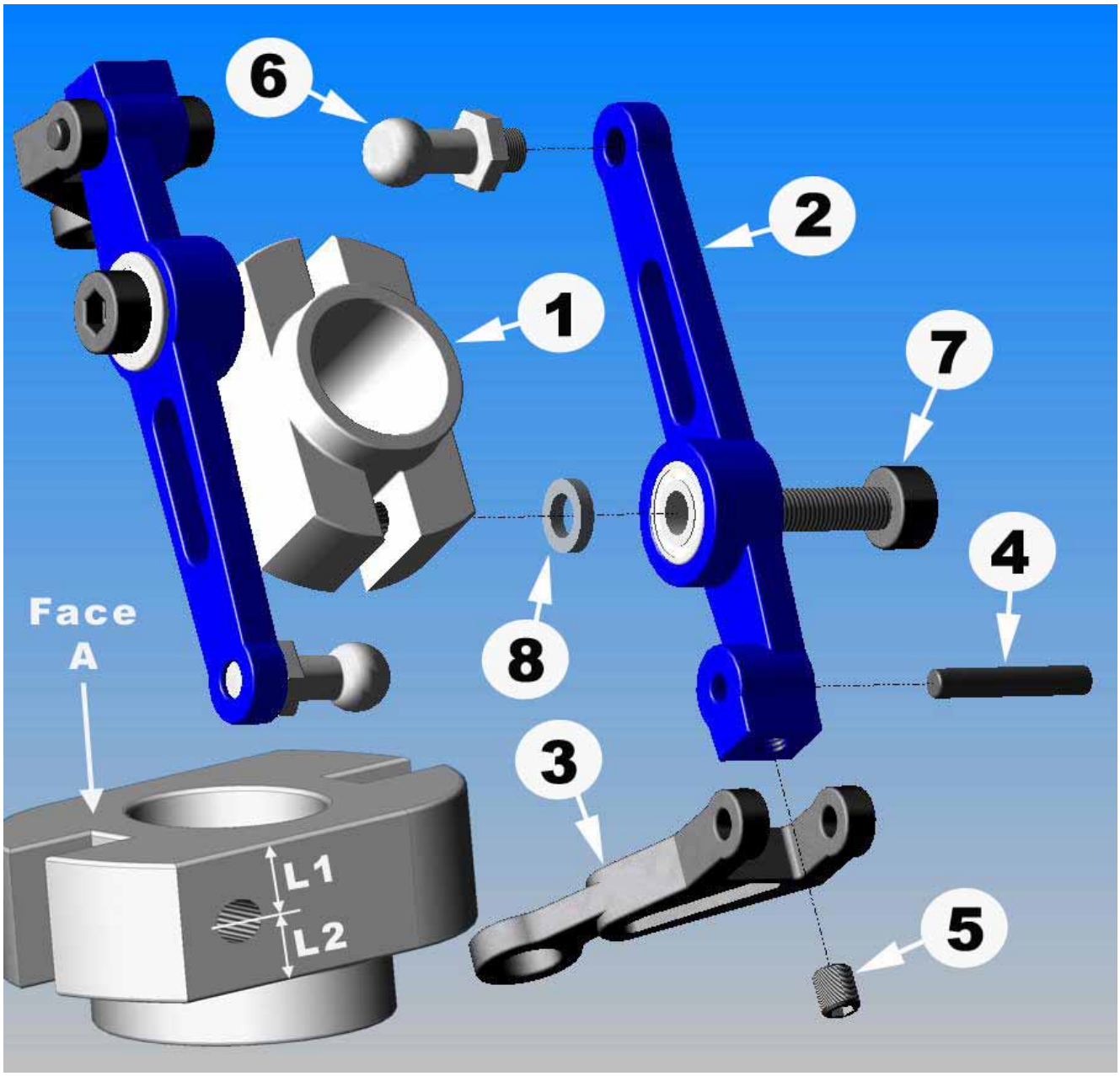
12 SWASHPLATE ASSEMBLY

No.	Bag#	Description	Part #:	Qty
1	13	Swashplate Complete	QC558	1
2	HB	M3x7Pivot Ball Stud	HHI3M7PS	4
3	HB	M3x12 Pivot Ball Stud	HHI3M12PS	3
4	HB	M2X4 Phillips Screws	HHI2M04P	3

There are 3 M2 holes tapped in the lower ring of the Swashplate install the M2x4 Phillips head screws there. The lower outer ring of the Swashplate will get the M3x12 pivot balls, and the inner ring will get the M3x7 pivot balls. On the budget series bat you will add a straight pin to the 4th open position on the outer ring of the Swashplate.

12 WASHOUT ASSEMBLY

No.	Bag#	Description	Part #:	Qty
1	6	Washout Base	QC304	1
2	6	Washout Arm	QC357	2
3	6	Washout Link	QC358	2
4	6	Washout Link Pin	QC359	2
5	HB	M3x5 Set Screw	HHI3M5SS	2
6	HB	M3x7Pivot Ball Stud	HHI3M7PS	2
7	HB	M3x12 Cap Head Bolt	HHI3M12C	2
8	HB	M3X5X1 Spacer	HHI3M5X1	2

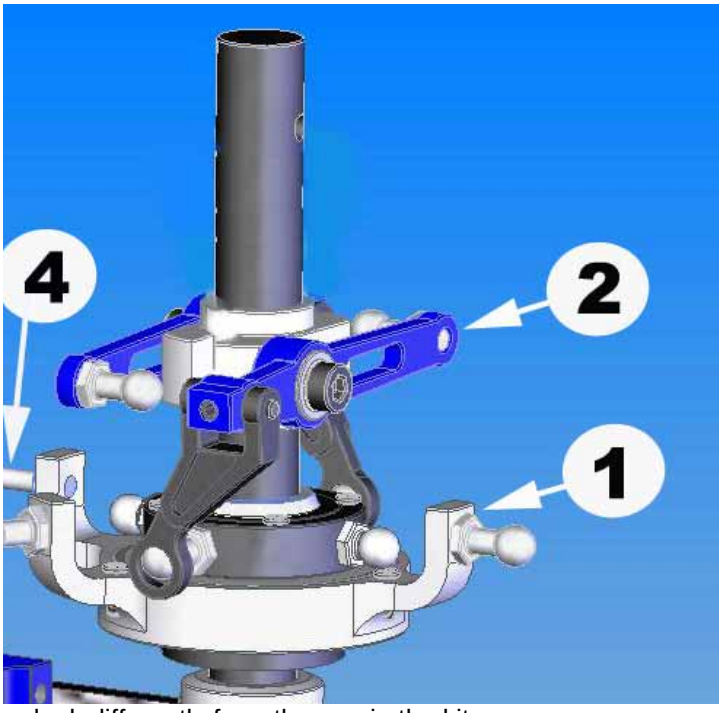


Note: There are some versions of the Washout Base (Item No. 1). All of them work the same but they should be installed appropriately:

- If L1 is shorter or equal to L2, face A should go up.
- If L1 is longer than L2, face A should go down.

12 CONTROL SYSTEM INSTALLATION

No.	Bag#	Description	Qty
1	Sep 6-1	Swashplate Assembly	1
2	Step 6-2	Washout Assembly	1
3	Step 5	Assembly up to step 5	1



Note: the frame may look differently from the one in the kit.

Connect the Washout Links to the 3x7 Pivot Studs on the Washplate.

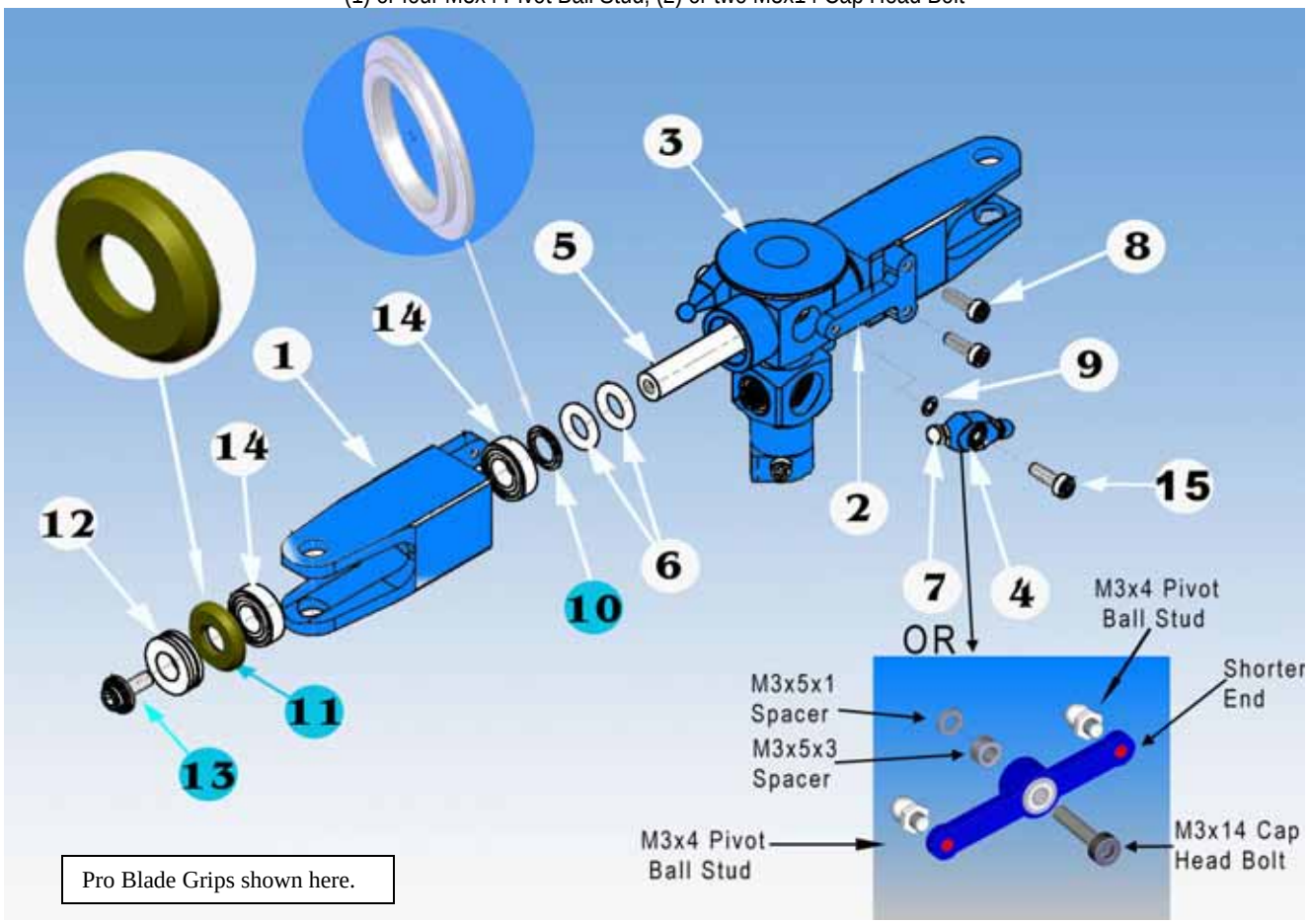
SECTION 13: ROTOR HEAD

13 MAIN ROTOR HUB ASSEMBLY

No.	Bag#	Description	Part #:	Qty
1	7	Main Blade Grip*	QH553 Pro/ QHL356 Sport	2
2	7	Pitch Arm**	QH554	2
3	7	Center Hub	QH331	1
4	7	Hiller Arm	QH652	2
5	7	Head Spindle	QH550	1
6	7	Dampener O-Ring	QHL354	4
7	HB	M3x7 Pivot Ball Stud(1)	HHI3M7PS	2
8	HB	M3x10 Cap Head Bolt**	HHI3M10C	4
9	HB	M3X5X3 Spacer	HHI3M5X3	2

10	7	Head Spindle Spacer	QHL353	2
11	7	Thrust Bearing Spacer	QH556	2
12	7	8x16x5 Thrust Bearing	BRG08165T	2
13	7	M5x8 Flange Cap Head	HHI5M08C	2
14	7	8x16x5 Regular Bearing	BRG08165R	4
15	HB	M3x12 Cap Head Bolt(2)	HHI3M12C	2

**Sport version: Pitch Arms is built in the Main Blade Grips so there is no M3x10 Cap Head Bolts
(1) or four M3x4 Pivot Ball Stud; (2) or two M3x14 Cap Head Bolt

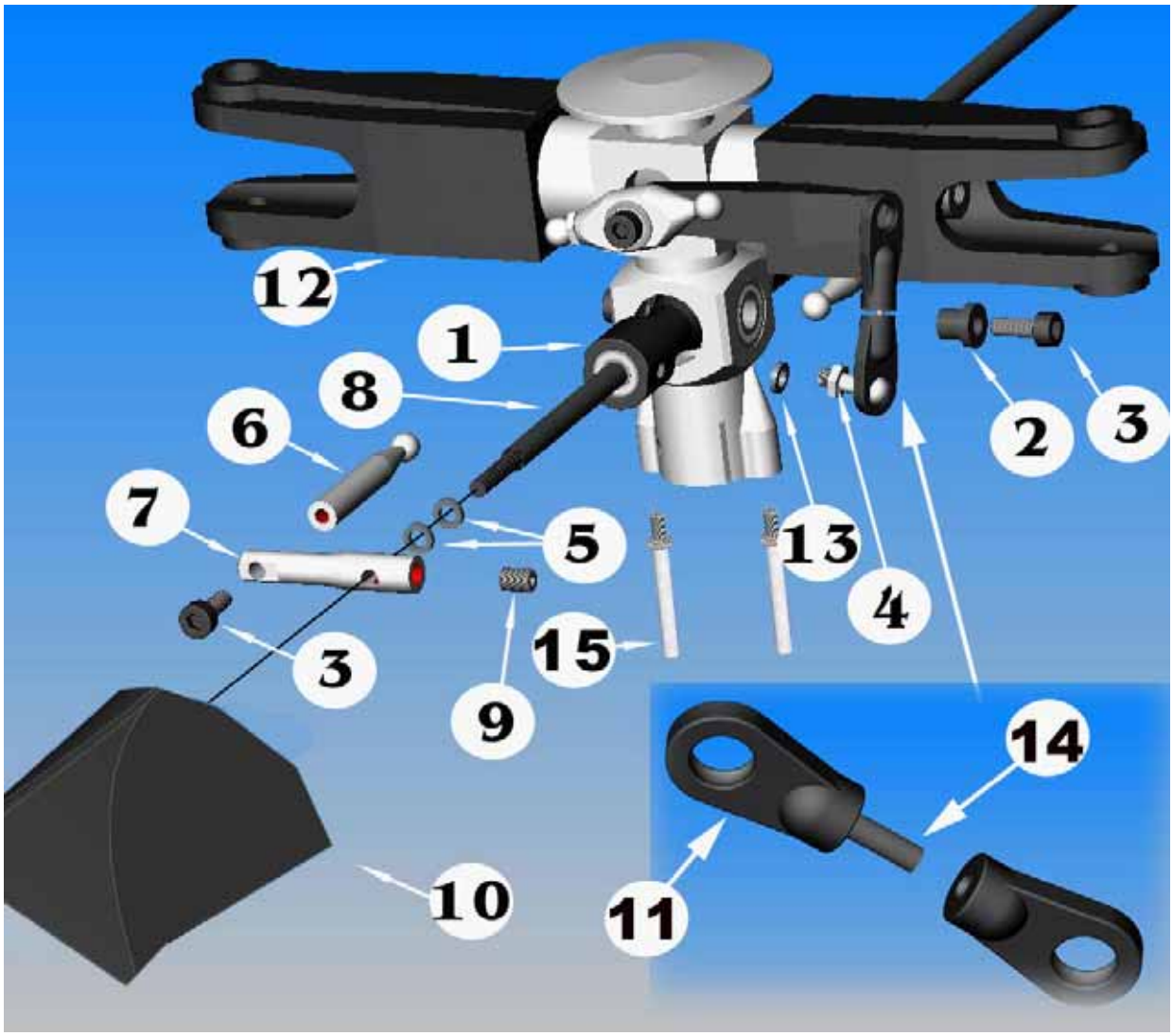


Note: The beveled edge of the Thrust Bearing Spacer (No. 11) should be face away from the Center Hub. The flanges of the bearings of the Hiller Arms should face outside. The Thrust Bearing has three parts: two race washers and caged ball bearings. The caged ball bearings will be between two race washers. In some cases, you may get different version of the Thrust Bearing: one race washer, one flat washer, and caged ball bearings in your kit. That is fine; it still works the same. In this case, you need to install the flat washer first (next to Thrust Bearing Spacer-No. 11), then the caged ball bearings, the race washer goes last. There are spare shim washers included in the head bag. These will allow you to fine tune the head. The more shims you add will stiffen the response in flight. Be careful that you do not add too many making the bearings bind. For the novice pilot you will only want to use 1 shim on either side. Having the helicopter with a softer feel to your fingers will help when starting out.

13 FLYBAR & SEESAW ASSEMBLY

No.	Bag#	Description	Part #:	Qty
1	7	Seesaw	QH357	1
2	7	Seesaw Collar	QH358	2
3	HB	M3x8 Cap Head Bolt	HHI3M08C	4
4	HB	M3x7 Pivot Ball Stud	HHI3M7PS	2
5	HB	M4x6x1 Spacer	QH644	4
6	7	Fly-Bar Control Arm A	QH642	2
7	7	Fly-Bar Control Arm B	QH145	2
8	In	4mm Standard Flybar	QUIEX20	1
9	HB	M3x5 Set Screw	HHI3M5SS	2
10	7	4mm Fly-Bar Paddle	QUI30101	2
11	7	Short Ball End	HHI2020	4
12		Main Rotor Hub	QH331	1
13	HB	M3x7 Flat Washer	HHI3M7FW	2
14	7	2.3x10mm Linkage Rod	HHIR23010	2
15	7	Washout Anti-rotation	QC549	2
16*****		Epoxy Glue/JP Weld		1

- There are two holes in the paddles. For regular setup, use the hole that is further from the letter “Quick” on the paddles.
- Although the drawing does not show the other side of the head, you should repeat the same assembly for that side.
- Fly-bar should be balanced on the Seesaw. Measure the distance on either side with a ruler to be sure they are equal.
- Connect the Short Ball Ends to the cooperated ball of the Hiller Arms.
- Make sure to apply Epoxy Glue/JP Weld to the thread on Flybar and the Flybar Paddle (after you finish the Setup)
- Quick offers a heavy 50 gram paddle/flybar combo as an option. QH669 is the part number. The heavy paddle combo is a nice option for the beginner. This will slow down the response of the helicopter.



Note: The Center Hub and Flybar Control Arm shown may look differently from the ones in the kit.

No.	Bag#	Description	Part #:	Qty
1		Completed Rotor Head		1
2		Helicopter		1
3	HB	M3x20 Cap Head Bolt	HHI3M20C	1
4	HB	M3 Locknut	HHI3MLN	1

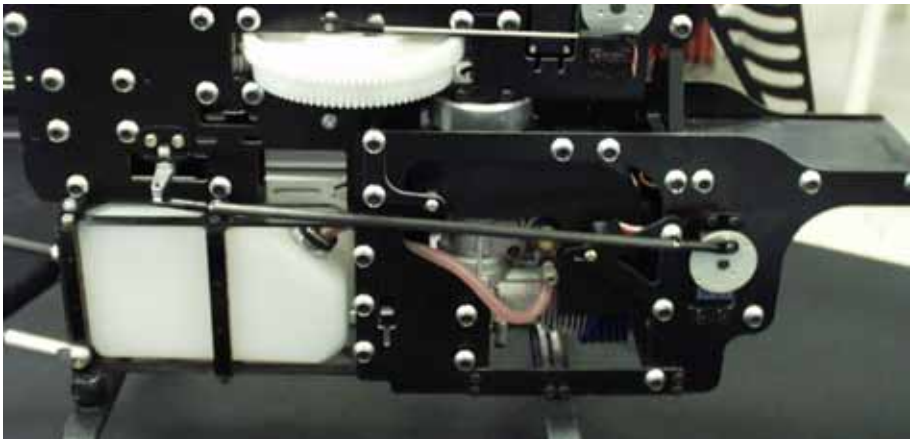
Install the Head Assembly into the Main Shaft, and then secure it by one M3x20 Cap Head Bolt and one M3 Locknut.

LINKAGE RODS & SETTINGS

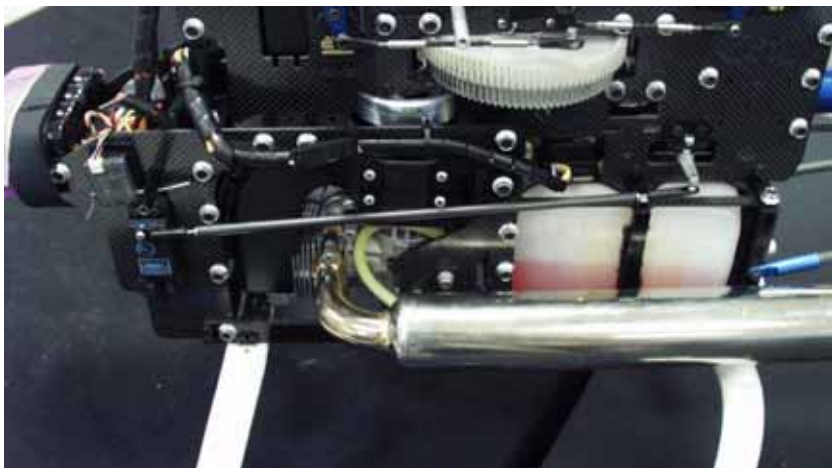
14 RUDDER PUSH ROD ASSEMBLY

No.	Bag#	Description	Part #:	Qty
1	In box	Rudder Push Rod	HHI4073	1
2	8	Rudder Push Rod End	HHI4073A	2
3	8	Pushrod Guide Clamp-on		1
4	HB	Shim Ball	HHI2030	1
5	HB	M2x8 Phillips Screw	HHI2M08P	1
6*****		Servo Arm		1
7*****		M3 Servo Phillips Screw		1
8	8	2.3mm Long Ball End	HHI2022	2
9*****		CA Glue		1
10*****		Electric Tape		1

For installing the rudder push rod you will need to make a rod that will go from the rudder servo to the rudder bell crank.

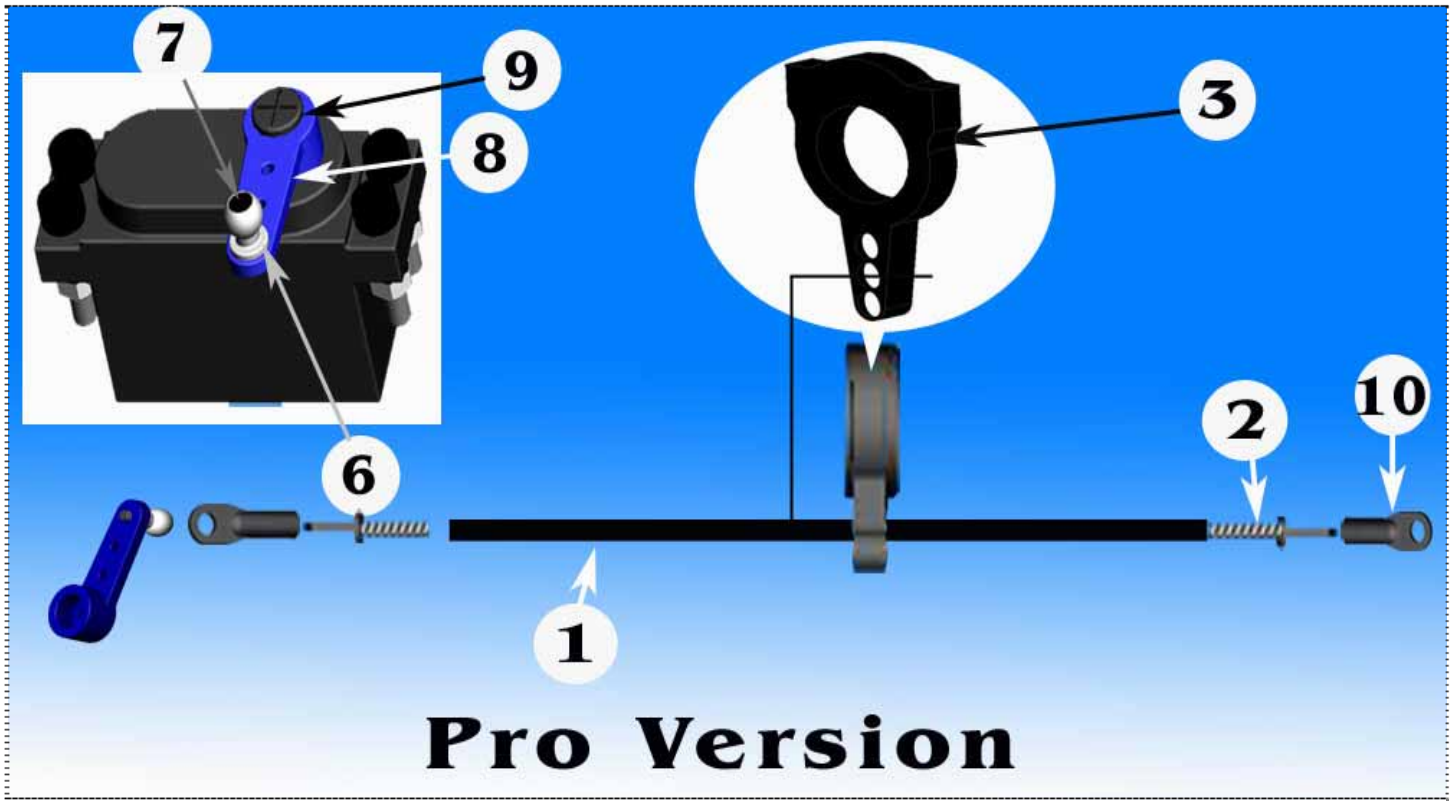


For the 50 sized helicopters you will need a carbon rod cut to 200mm. Glue in the ends, and thread on a long ball end on each end. The ending rod should be ~250mm from ball to ball. You simply want to have your servo at straight up and down at neutral and then have the bell crank in the rear perpendicular to the side frame.



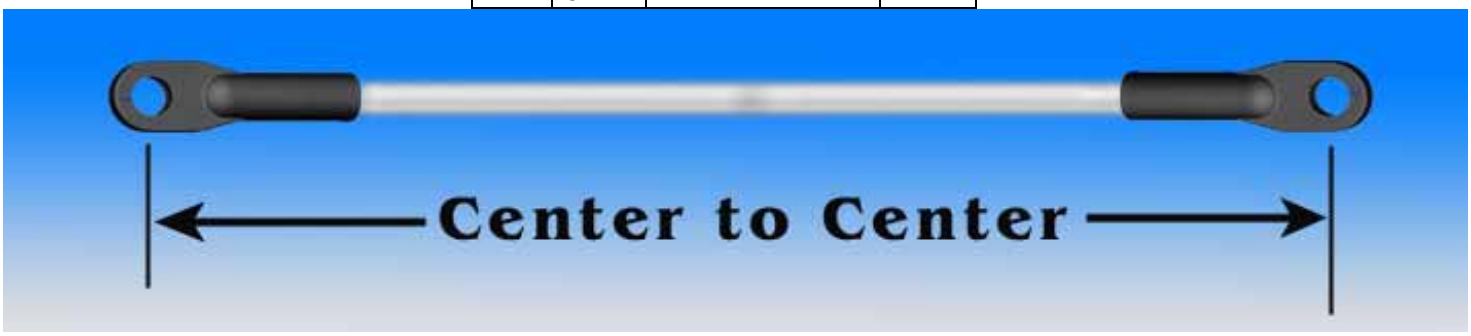
For the 70 and 90 sized helicopters you will need to cut a carbon rod to 210mm. Glue in the ends, and thread on a long ball end on each end. The ending rod should be ~263mm from ball to ball. You simply want to have your servo at straight up and down at neutral and then have the bell crank in the rear perpendicular to the side frame.

For the 50 Version, the diameter of the Pushrod Guide Clamp-on is a little bit bigger than the diameter of the boom. Cut off 5-6 teeth of the clamp and wrap the Boom with a couple of wraps of electrical tape to keep it from slipping. You can secure it with some CA glue to be sure it cannot move.



14 LINKAGE ASSEMBLY

No.	Bag#	Description	Qty
1	8	2.3 Long Ball End	28
2	8	2.3x25mm Rod	2
3	8	2.3x35mm Rod	3
4	8	2.3x40mm Rod	2
5	8	2.3x65mm Rod	2
6	8	2.3x80mm Rod	2
7	8	2.3x90mm Rod	1
8	8	2.3x100mm Rod	2

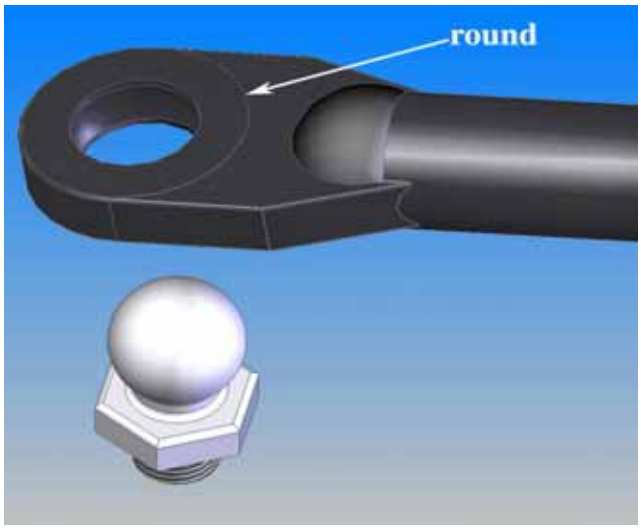


Coding the Rod Assembly:

All the Linkages should be assembled with dimensions measured center to center and coded as following:

No.	Code	Rod Description	Center to Center	Qty	
1	A	2.3x25mm Rod	51.5 mm	2	The lengths of linkages are used for reference only. Final adjustments might need to be made after setup.
2	B	2.3x35mm Rod	64 mm	3	
3	C	2.3x40mm Rod	66.5 mm	2	
4	D	2.3x65mm Rod	94.5 mm	2	
5	E	2.3x80mm Rod	110 mm	2	
6	F	2.3x90mm Rod	124mm	1	
7	G	2.3x100mm Rod	133 mm	2	

IMPORTANT: Look close to a ball end; you will see one side is different from the other. One has a round marked on it. The other is just plain. When installing a ball link into a pivot ball stud (or a shim ball) the side with a round should face away from a ball stud (or shim ball.)

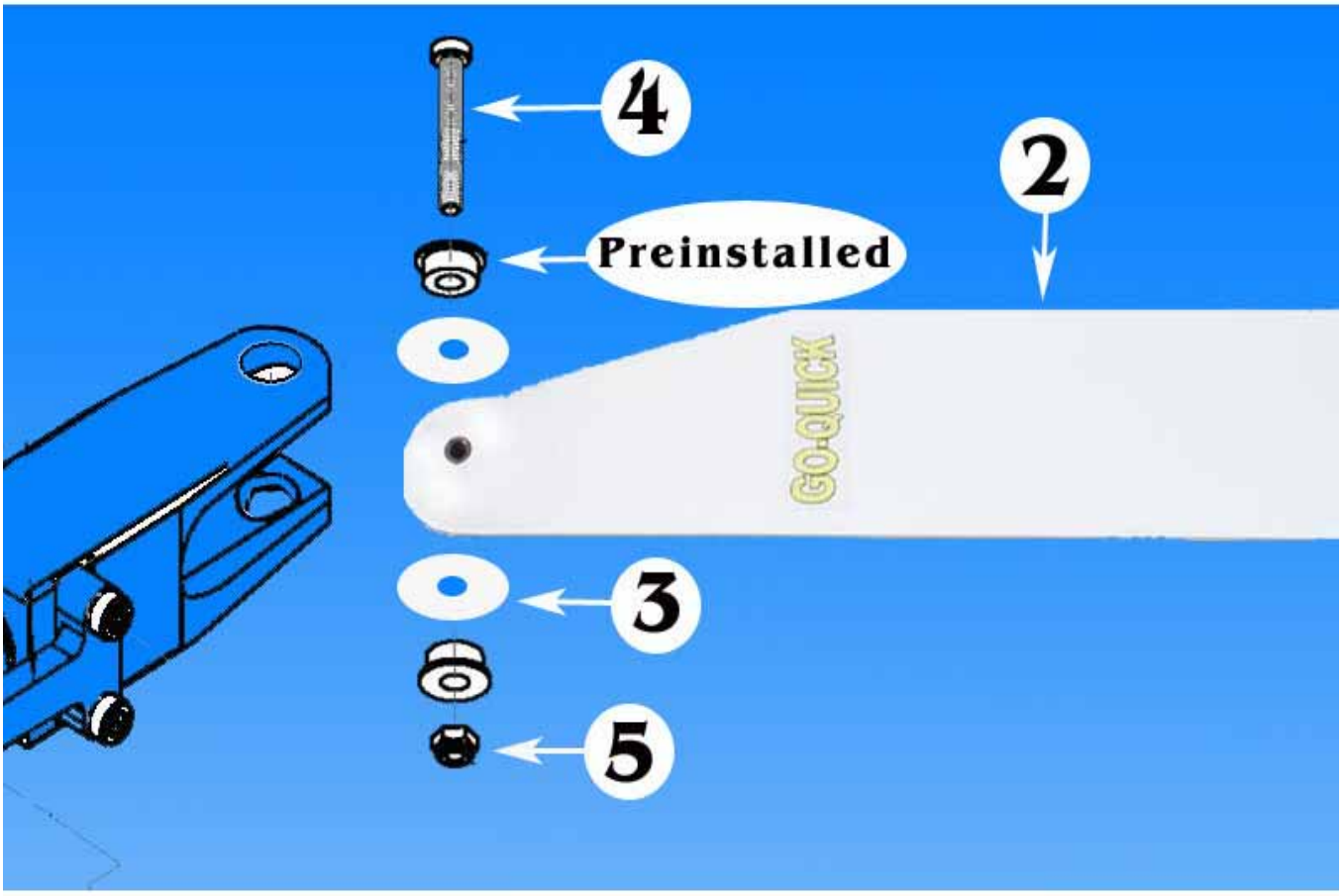


Special Note:

Linkage rods may be 2.3 to 2.6 mm diameter it makes no real difference whether you received one or the other or some combination of each.

MAIN BLADE INSTALLTION

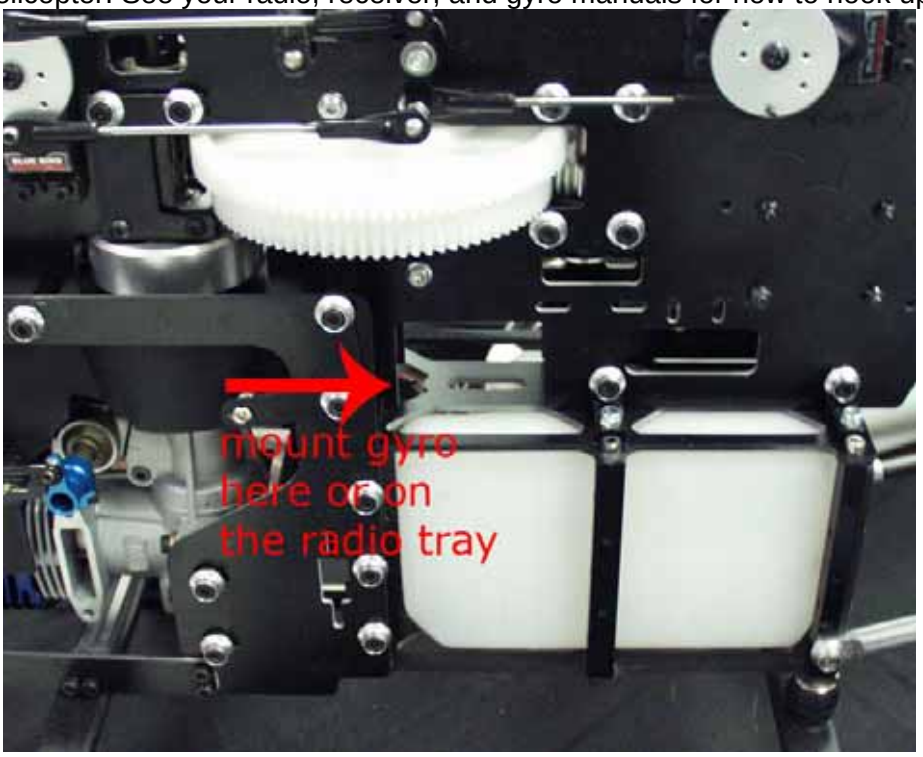
No.	Bag#	Description	Qty
1	Step 8-4	Helicopter (up to step 8-4)	1
2*****		Main Blade	2
3*****		Main Blade Spacer	4
4	8	M4x30 Cap Head Bolt	2
5	8	M4 Locknut	2

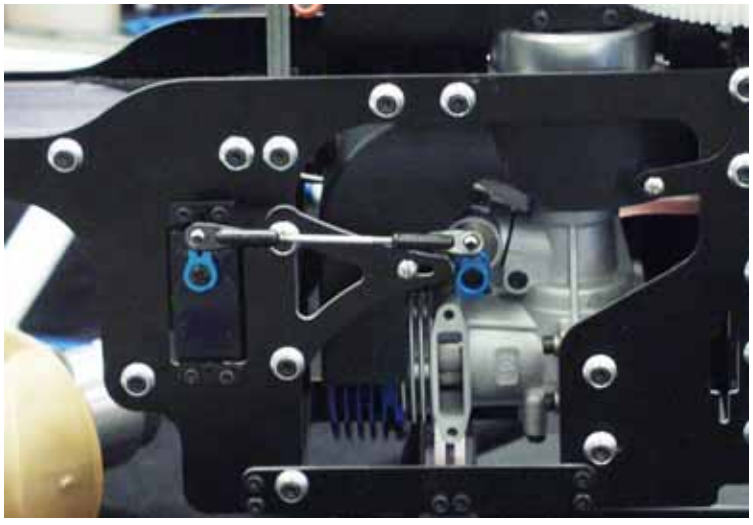


RADIO SETUP

No.	Bag#	Description	Qty
1	Step 8-5	Helicopter (up to step 8-5)	1
2	*****	Radio	1
3	*****	Receiver	1
4	*****	Gyro	1
5	*****	Battery for Receiver	1

Before setting up the radio, you have to install the receiver, gyro, and batteries for your helicopter. See your radio, receiver, and gyro manuals for how to hook up.





CCPM Helicopter Setup (for all Quick Helicopters)

General

Instead of giving you the exact length of each linkage rod we will explain to you what you are trying to achieve. This is the same for all Quick helicopters. Another thing worth mentioning is that all controls on our helicopters are leading edge controlled. We have three such controls on our helicopter and they are Main blades, Tail blade and flybar control arms. For example the main blade pitch arms should be mounted so they are in front of the blades in the direction of travel, clockwise if you look at the helicopter from above, see picture 4.

Your radio manual will be needed during this set up.

Swashplate

First, set your radio so that all travel values are at 100%. If you have a radio with Swash Mixing set, set those values to 50% (Aileron, Elevator, and Pitch.) Then use servo reversing so that all servos are moving in the right direction. If Pitch operates reversed, change the value in the Swash Mixing from + to -.

Step 1: First set your radio up so that all servos are moving in the right direction and adjust all travel values to 100%. If you have a radio with Swash mixing values set those to 50% (Pitch, Aileron and Elevator).

Now center both radio sticks (including “throttle”) and center all trim and sub-trim values. When this is done turn your receiver pack on. Now mount the servo arms at a 90^{o} angle towards the linkage rod. In our non push pull helis this will be horizontal. Use the mounting position on the servo arm that will be closest to 90^{o}, not all servos will line up 100% correct. If they are visible off from the 90^{o} position the use the sub-trim function in your radio for fine tuning, do not use regular trim for this, see picture 1.

Now you have a good start and the rest of the setup will become easier.

Step 2: Connecting the Swashplate at the right distance. This is done by moving your Pitch (throttle) stick all the way down, see picture 2. When the servos are in this position adjust the length of the linkage rods so the Swashplate is located towards the bottom, but still leaves enough room for left/right (aileron) and front/back (elevator) travel. During such travel, portions of the Swashplate will move below the Swashplate position archived during Pitch full down radio stick position. So make sure you leave enough room for this extra travel, see picture 2 for recommended height. Also make sure that all 3 linkage rods between the servo arms and the Swashplate are the same, so the Swashplate is level. It should not tilt in any direction; unless your right radio stick is moved. If it lilts, and all linage rods are the same length, then go back to step one and make sure your three servo arms have the same neutral position (horizontal on non push pull helis).

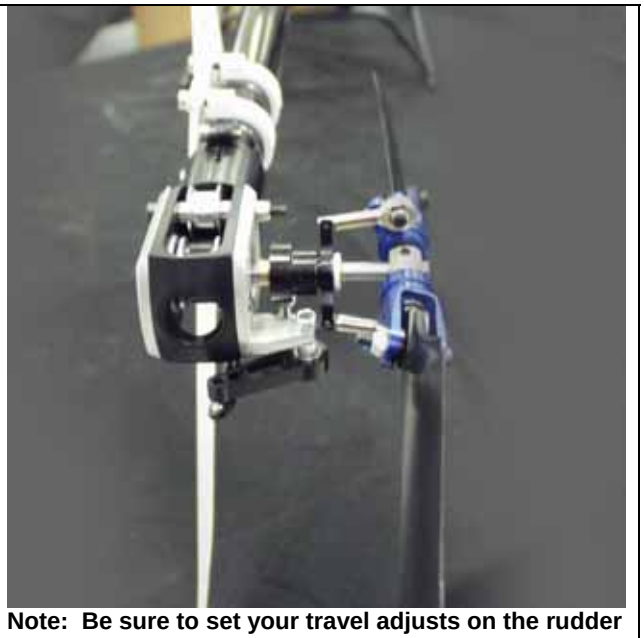
	
Picture 1, Swash center	**Picture 2, Swash Down**

Step 3: Connecting the Washout assembly. Connect the fixed length plastic “A” arms to the Swashplate, connect to the two longer pivot studs, if all four are the same length then any two will do. The next step is to adjust the length of the linkage rod between the Washout Arm and the Flybar connection point. Turn your radio and receiver back on and center both sticks. Now adjust the length of the flybar linkage so the washout arms are level (horizontal), see picture 1. Also make sure your flybar arms and flybar-paddles are level (horizontal), when adjusting the linkage. After the length is adjusted make sure that you have free travel in all directions and stick positions. When the Pitch stick is all the way up it should look like picture 3. As you can see there is still plenty of room for aileron and elevator travel. Now adjust the Washout Anti-rotation pin height so the pin is still in the guide slot of the washout base during all travel positions. For the Left/Right Washout Anti-rotation position, line the attachment point of the plastic washout “A” arm on the Swashplate up with flybar linkage connection point. The imaginary line between these points should be vertical.

Now you are almost done, only one set of links left, and the length of those links will be depending on your desired setup whether it's Aerobatic or normal flying. Please refer to the Pith travel setup table for this final link length.

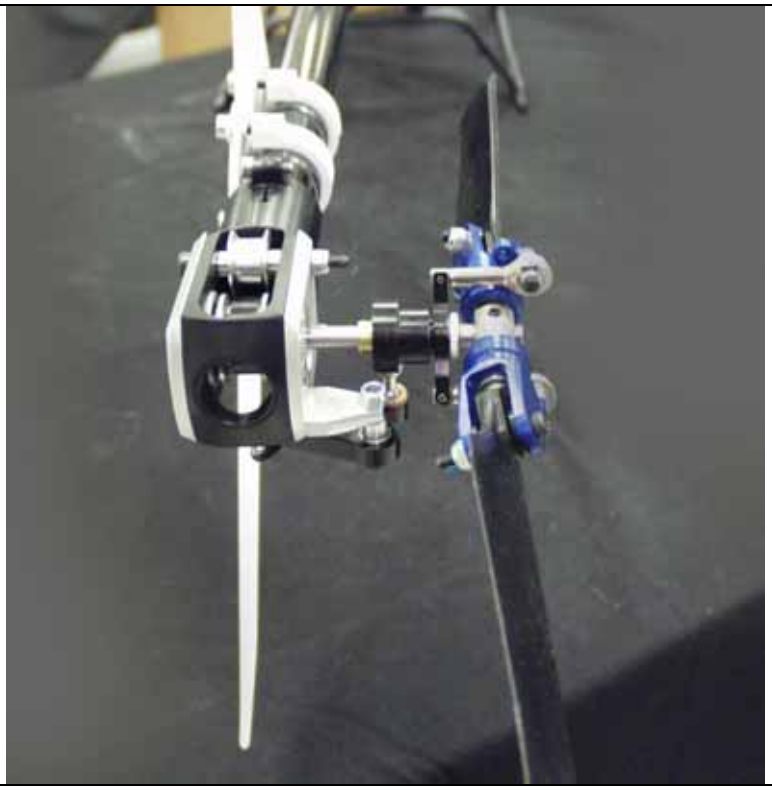
Picture 3, Swash Up

Picture 5, Tail Center



Note: Be sure to set your travel adjusts on the rudder to avoid the tail pitch slider from contacting the tail pitch lever mount. If your gyro does not have this function, put a little piece of fuel tubing on the shaft to make a rubber stopper.

Picture 6, Tail Positive Thrust



Picture 7, Tail Negative Thrust

Pitch Travel Setup		
Collective Position	**Normal Flying**	**Aerobatic**
Up (100%)	+10°	+10°
Center (50%)	+5°	+0°
Down (0%)	-3°	-10°

Throttle Curve Setup				
Collective Position	**Fuel**		**Electric** (non governor mode)	
	Normal Flying	**Aerobatic**	**Normal Flying**	**Aerobatic**
Up (100%)	100%	100%	85%	85%
Center (50%)	70%	60%	75%	75%
Down (0%)	10%	100%	0%	85%

Tail

First adjust the servo arm position like you did with the swash, make sure your trim and sub-trim values are centered. Attach the servo arm so it's 90° to the tail pushrod (vertical). Now adjust your two plastic ball ends, for the push rod, so they are screwed on about half way onto the threaded pushrod guide end piece. This will allow you have maximum amount of adjustment available in both directions. Use the outer holes on the tail blade grips for the ball link attachments. When this is done cut the carbon pushrod to a length that will achieve about 3° of positive pith on your tail blades, when the servo is in its neutral (vertical) position. Then glue the two end pieces on to the pushrod with CA glue, don't forget to insert the pushrod guides first.

When this is done you should have 3° of positive tail blade pitch. The tail should spin counter clockwise looking at the right side of the helicopter with the nose to your right and tail to your left. See pictures 5-8.

Note: Please consult the instruction for your Gyro for setting the overall travel and limits to ensure proper operation and travel of Tail Pitch Slider.

Throttle

The throttle cure will be affected by several conditions; some of them are, motor choice, blades choice, elevation, temperature, helicopter weight and type of helicopter. So in order to explain this I will explain what you are looking for. Your goal is to achieve a constant head speed once the helicopter is airborne. If you ad pitch (climb) you need to ad power (throttle) to compensate for the added resistance a higher blade pitch creates. If during climb your head speed drops, then you need to add throttle to that particular stick position, and reversed if you have an increase in rpm. If during max climb out you experience an increase in head speed then you need to give the blades a higher pitch, do not try to adjust the max climb rpm by reducing throttle. There are other ways of achieving this by using cyclic mixing, however we will stay away from this for now. Follow the pitch guidelines in the table above, and if you need more pitch at max power because the rpm is increasing, then add pitch. 10° is just a guideline and will work in most setups, but a powerful motor or a light helicopter might need more. For rpm adjustment during anything other than full stick deflection you should use the throttle.

A short recap, adjust throttle to adjust rpm during anything other than full collective. At full collective adjust the pitch. See the Throttle table for general setup.

Final Words

These are guidelines and will get you going but might not be 100% accurate in regards to all helicopters. Especially the throttle curve table should be considered as initial guidelines. As mentioned before it's greatly affected by your equipment. As you become more familiar and proficient with your helicopter you can change the pitch and throttle curves to your flying style.

8-7 CANOPY MOUNTING

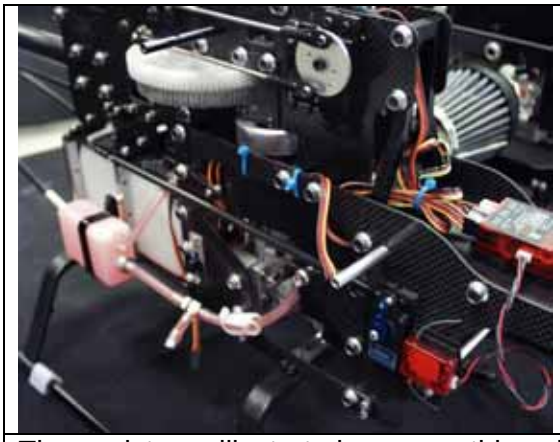
No.	Bag#	Description	Qty
1		Helicopter	1
2	In box	Canopy	1
3	8	Canopy Grommet	4
4	HB	M3x10 Cap Head Bolt	4

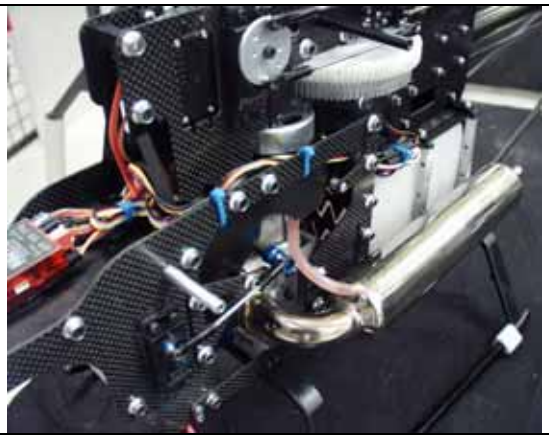
- Put the Canopy on the helicopter, mark the right positions for 4 holes, and then drill four 5.5mm holes.
- Install the Canopy Grommets on the Canopy.
- Secure the Canopy by 4 M3x16 Cap Head Bolts.

Note: The frame may look differently from the one in the kit.

PRE-FLIGHT CHECKS

- The rotor flybar and shaft must be straight.
- The flybar and control paddles must tilt in the proper direction and operates smoothly throughout the whole range.
- Check the swashplate to make sure it move smoothly and clean.
- When control input are given to tilt the swashplate, make sure no control arms or pushrods are binding.
- Check the two control paddles for level, parallel, and proper direction.
- Make sure the batteries are fully charged and the fuel tank is full.
- Make sure the radio and receiver are on and all controls operate properly before flight.
- There should be no interference of radio signal in your flying zone. Range check the radio.
- Always grab onto the helicopter main rotor head when turning on the helicopter.





These pictures illustrate how everything should be neatly wired up and strapped down before your helicopters first flights.

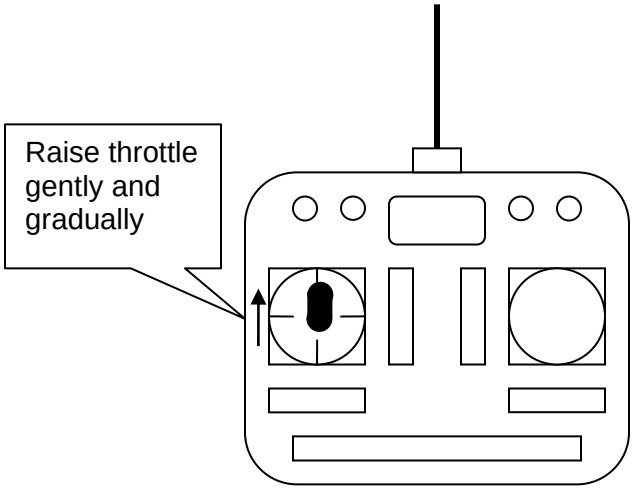
WARNINGS

- Do not operate helicopters in rainy, windy, or snowy condition.
- Operate helicopter in a safe zone away from crowds, traffic, or distractions.
- Use the proper batteries to prevent damage to the motor and equipment.
- Make sure all the batteries are fully and properly charged and the fuel tank is full.
- Make sure all the controls operate properly before flight.
- The main and tail rotors blades operate at very high speed (rpm); therefore, make sure nothing can come into contact with them while they are spinning.
- Perform a range check on the radio before flying.
- Make sure the transmitter and receiver are turned on before starting the engine
- Keep a safe distance when operating a helicopter.
- Do not fly for a long period of time. Take some rests during flights.
- Motors are often very hot after operation. So be careful when handling or touching them immediately after flying.

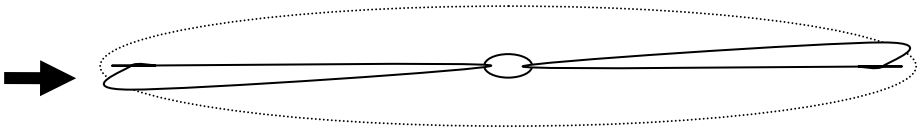
ADJUSTMENTS

Tracking Adjustment: The tips of the main rotor blades should follow the same path when they rotate. We call the main rotor blades are in track.

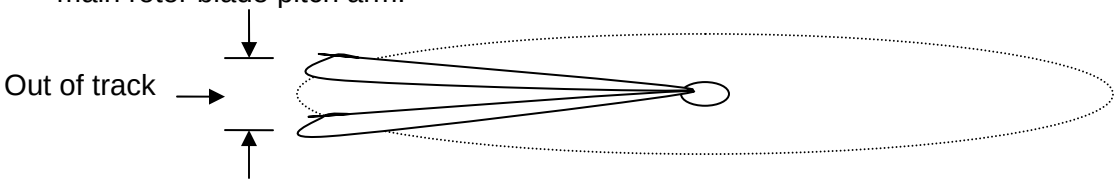
(a) Rev up the motor until the helicopter becomes light on its landing gear.



(b) If the main rotor blades are in track, it's good.



(c) If the blades are out of track, then adjust one of the pushrods that connect to the main rotor blade pitch arm.

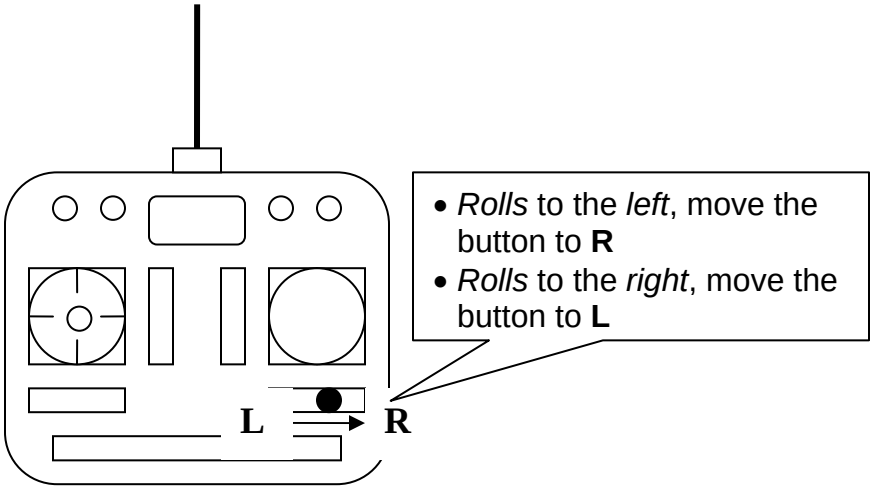


Repeat steps (a) to (c) until the blades are in track.

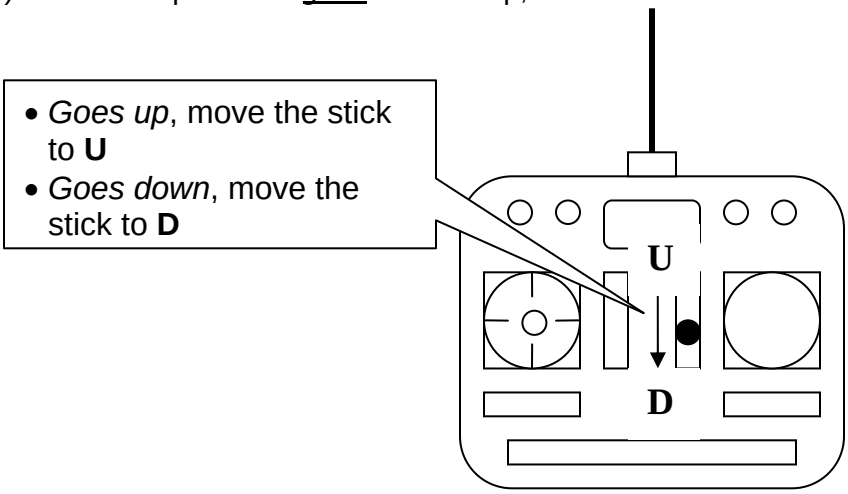
Trimming: Most of new built helicopters are unstable. But if you trim your helicopter properly, you will stop it from drifting away or yawing by itself quickly**.** Followings are instructions for trimming your helicopter.

(a) If the helicopter nose starts to *yaw* left or right, adjust the tail rotor push rod to compensate. If using a Heading Hold Gyro, do not adjust the trim lever on the radio.

(b) If the helicopter *rolls* to left or right, then:



(c) If the helicopter nose *goes* down or up, then:



HOW TO HOVER

Basic maneuver for a pilot is learning how to hover a helicopter. When the helicopter is floating in a stationary position in the air, we call that hovering. Use the following procedure to practice your hovering:

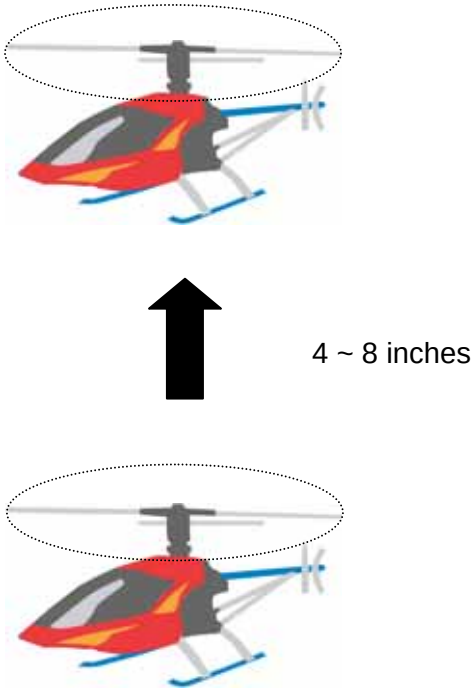
(a) Make sure everything is clear in the flying zone. Stand at least 30 feet (10 meters) behind the helicopter.

(b) Check the main rotor fore/aft and left/right cyclic to make sure the main rotor is following to your cyclic command before taking off. Make sure the helicopter nose will swing in your desired directions by moving the tail rotor control stick.

(c) Now, increase the throttle/collective gently to lift the helicopter landing gear off the ground to no more than 4 inches (10 cm). At the beginning, it is very difficult for the pilot to keep the helicopter from moving. It will also be difficult to know if the helicopter is in trim or not for a beginner. Keep going on the practice close to ground you will develop your skills.

(d) Keep practicing lifting your helicopter no more than 8 inches (20cm) from the ground until you feel comfortable with control commands. Once you can keep it at one place, then it is time to slowly increase the height a few inches in each fight. Soon, you will

be able to hover the helicopter confidently at a few feet high. Beginners should always practice hovering close to ground since in an emergency situation; you can drop the throttle and collective quickly without making any big damage.

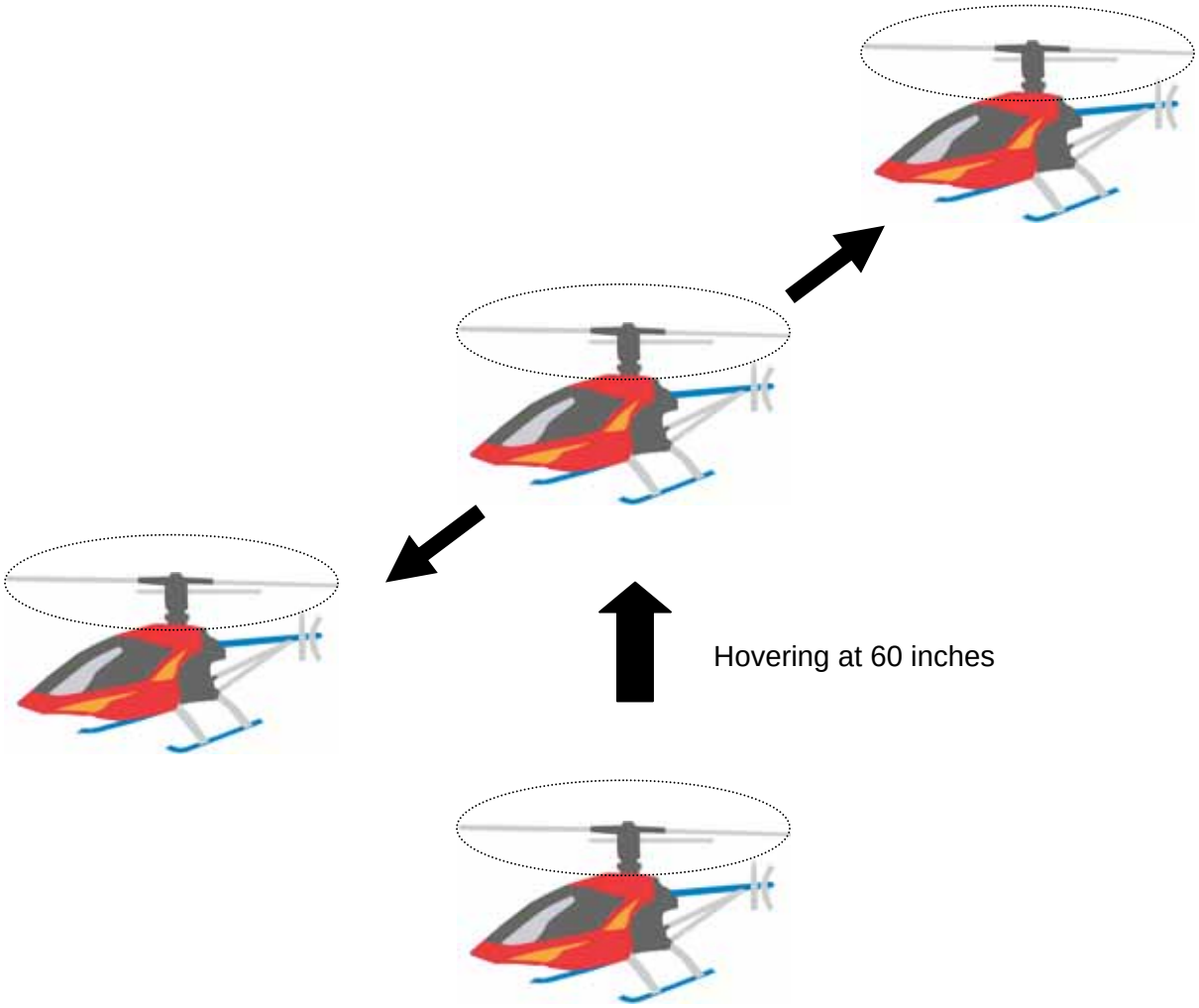


(e) Stand behind the helicopter so you can watch the nose of the helicopter. A left tail rotor command will yaw the helicopter nose to the left, and a right command will yaw to the right. Also, a left cyclic command will cause the helicopter to translate left., Start practice hovering while standing to either side of the model after you can comfortably hover the helicopter at 3 feet (1m) high without drifting. Finally, you need to learn hovering the model from any positions. When you can confidently hover a helicopter at any altitude and at any position, you have mastered most of the fundamental control movements of a helicopter.

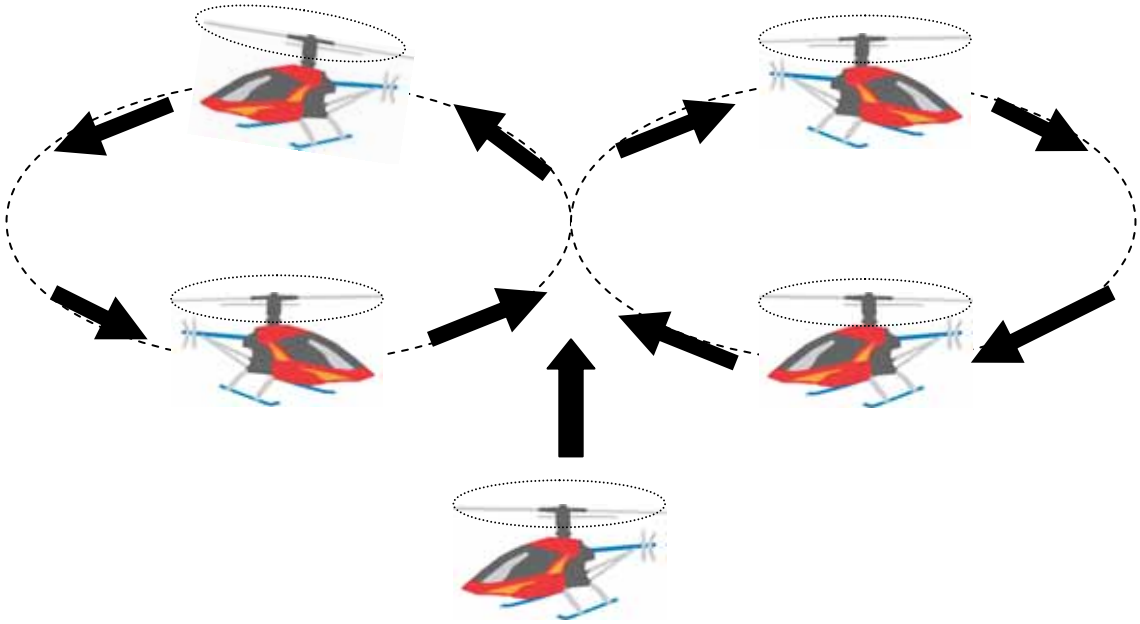
HOW TO FLY FORWARD

Once you have mastered hovering fight:

(a) Let's begin the exercise of changing positions by practice moving the helicopter to the left or right slowly from 60 inches (1.5 m) above the ground.



(b) Once you have been comfortable with all the movements and controls in the previous step, start using some tail rotor control to make the helicopter point slightly to the left or right as you fly it to the left or right. Keep practicing the figure-eight path as shown below, you will master all basic control movements of a helicopter.



AFTER-FLIGHT CHECKS

After each flight, the helicopter should be thoroughly inspected:
(a) Unplug the batteries.
(b) Check every bolt, nut, and screw to make sure none has loosened due to vibration.
(c) Check every rotating and movable part like head rotor, swashplate, tail rotor, to ensure they still move smoothly and properly.
(d) Check all movable parts, such as gears, ball links, belt, etc. for unusual wear.
(e) Clean up the helicopter then lubricate every moving part with oil to ensure a smooth operation in the future.
(f) Keep the helicopter in a cool and dry place. Avoid storage under direct sun light or near heat.
(g) Please replace any damaged parts if they are discovered during maintenance.

WHAT IF THE HELICOPTER CRASHED

Turn off everything and check the helicopter immediately. If any item is damaged, replace the damaged parts to ensure safe operation. Do not try to glue any broken or damaged plastic or carbon parts specially broken rotor blades. The followings are parts that should be inspected right away:

- Main and tail rotor blades.
- Flybar, main shaft, head spindle, and tail output shaft.
- All the gears.
- Tail boom and supports for cracks.
- Vertical and horizontal fins.
- Frames.
- All pushrods.
- Servos, motor, and batteries.

SPECIFICATIONS

Specification	Quick 50
Blades	Quick 580-600 mm
Length	1115 mm
Height	450 mm
Fully Equipped Weight	~ 7.5 lbs (3.40 kg)
Engine	50-70
Frame Thickness	2.0-2.2 mm
Spindle	8.0 mm
Main Shaft	10 mm
Canopy	Fiberglass
Flying	Aerobatic / 3D