

# RADIKAL G20 PETROL ENGINE



## Kit Features:

---

Lightweight yet extremely strong G10 or carbon fiber frames.  
High gloss large diameter 25mm tail boom with belt drive system.  
Blade grips accommodate blades 12mm (LT) to 18mm (HD) blade roots.  
300 mL fuel tank for long engine run time.  
Convenient and easy access to spark plug.  
Triple bearing supported blade grips and tail blade grips.  
Machined center dual ball bearing swashplate for 120 degree CCPM.  
Adjustable bell-hiller ratio allows tuning for preferred cyclic response (HD)  
Tunable flight characteristics for stability or speed.

## Specifications:

---

Length: 1366mm  
Height: 381mm  
Width: 260mm  
Main rotor diameter: 1435mm  
Tail rotor diameter: 262mm  
Main rotor blades: 600mm-640mm  
Tail rotor blades: 95mm

# CENTURY

HELICOPTER PRODUCTS

---

## Thank You

Congratulations on the purchase of the latest Century Gasser series, the Radikal G20. You're about to build one of the world's first fully functional 3D aerobatic helicopters powered by the Zenoah 20cc gasoline engine. Be sure to read through and follow the instructions during the build.

---

## Warning

This radio controlled model is not a toy! It is a precision machine requiring proper assembly and setup to avoid accidents. It is the responsibility of the owner to operate this product in a safe manner as it can inflict serious injury otherwise. It is recommended that if you are in doubt of your abilities, seek assistance from experienced radio control modelers and associations. Keep loose items that can get entangled in the rotor blades away from the main and tail blades, including loose clothing, hair, or other objects such as pencils and screwdrivers. Especially keep your hands away from the rotor blades. As manufacturer, we assume no liability for the use of this product.

---

## Flight Guidelines

Please note this checklist is not intended to be a replacement for the content included in this instruction manual. Although it can be used as a quick start guide, we strongly suggest reading through this manual completely before proceeding.

- Always turn the transmitter on first
- Allow the gyro, and receiver to arm and initialize properly
- Do a pre-flight check making sure all electronics are working and look for any mechanical issues
- Fly the model
- Land the model
- Turn off the engine
- Always turn the transmitter off last

---

## General Guidelines

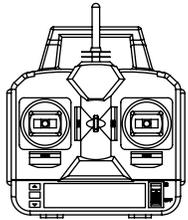
Apply thread lock to all metal to metal thread contact points. Do not apply CA (cyanoacrylate) glue or thread lock to ny-lock nuts (metal nuts with plastic inserts). Diagrams indicated by bounding boxes for screws, bearings, etc. are illustrated at a 1-to-1 ratio. All other illustrations are not drawn to scale. Throughout this manual, you will find building tips. Please follow the tips and use common sense when building.

---

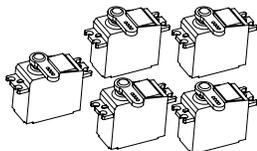
## Pre-assembly Information

Upon opening the kit, all the major component parts are bagged for ease of assembly which correspond to the sections of the manual. Various assemblies have been pre-assembled however, only as a reference assembly. Final assembly is up to the user. Installation onto the particular parts, screws and nuts required for each step are packaged in the same bag as the parts. Be careful when opening each bag as not to lose any hardware. Care has been taken in filling and packing of each bag however mistakes do happen. If there is a parts shortage or missing hardware please contact us at:

Century Helicopter Products  
1740-C Junction Ave.  
San Jose, CA. 95112  
[www.centuryheli.com](http://www.centuryheli.com)



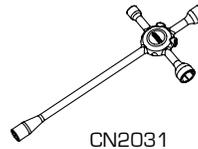
6 CHANNEL  
CCPM TRANSMITTER  
(MINIMUM)



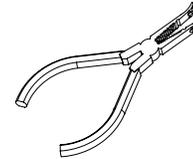
SERVOS X 5



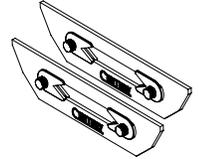
6 CHANNEL RECEIVER  
(MINIMUM)



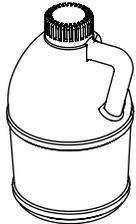
CN2031  
4-WAY WRENCH



CN2034A  
BALL LINK PLIERS



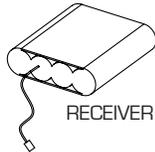
CN2050  
PADDLE GAUGE



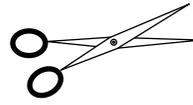
87 TO 92 OCTANE  
GASOLINE



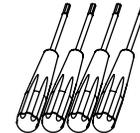
DREMEL TOOL  
OR SIMILAR



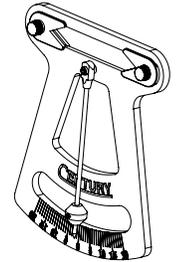
RECEIVER BATTERY



HOBBY SCISSORS



CN2017  
HEX DRIVERS  
1.5, 2.0, 2.5, 3.0, 4.0, 5.0



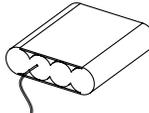
CN2027  
G-FORCE PITCH GAUGE



GYRO



NEEDLE NOSE  
PLIERS



ELECTRONIC  
IGNITION  
BATTERY



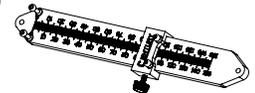
SLOW &  
Medium CA  
GLUE



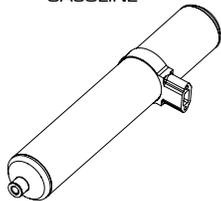
Medium  
[Medium]  
THREAD-  
LOCK



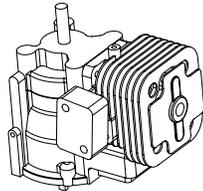
METRIC RULER OR  
SIMILAR MEASURING  
DEVICE



CN2255  
CONTROL ROD  
SETUP GAUGE



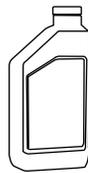
CN3070  
20cc TORPEDO  
GASSER TUNED  
MUFFLER



20CC ZENOAH  
GASOLINE ENGINE



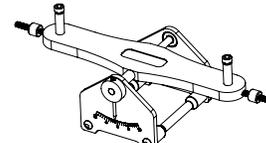
SYNTHETIC  
OIL/GREASE



2-STROKE  
MOTOR OIL



ZIP TIES



CN2051  
ACCURATECH BLADE BAL-  
ANCER V.2



HOBBY KNIFE



600MM TO 660MM  
MAIN ROTOR BLADES

**Warranty Period**

Century Helicopter Products warrants that the Products purchased (the "Product") will be free from defects in materials and workmanship 30 days from the date of purchase by the Purchaser.

**Limited Warranty**

(a) This warranty is limited to the original customer ("Purchaser") and is not transferable. REPAIR OR REPLACEMENT AS PROVIDED UNDER THIS WARRANTY IS THE EXCLUSIVE REMEDY OF THE PURCHASER. This warranty covers only those Products purchased from an authorized Century Helicopter Products dealer. Third party transactions are not covered by this warranty. Proof of purchase is required for warranty claims. Further, Century Helicopter Products reserves the right to change or modify this warranty without notice and disclaims all other warranties, express or implied.

(b) Limitations- CENTURY HELICOPTER PRODUCT MAKES NO WARRANTY OR REPRESENTATION, EXPRESS OR IMPLIED, ABOUT NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OF THE PRODUCT. THE PURCHASER ACKNOWLEDGES THAT THEY ALONE HAVE DETERMINED THAT THE PRODUCT WILL SUITABLY MEET THE REQUIREMENTS OF THE PURCHASER'S INTENDED USE.

(c) Purchaser Remedy- Century Helicopter Products's sole obligation hereunder shall be that Century Helicopter Products will, at its option, (i) repair or (ii) replace, any Product determined by Century Helicopter Products to be defective. In the event of a defect, these are the Purchaser's exclusive remedies. Century Helicopter Products reserves the right to inspect any and all equipment involved in a warranty claim. Repair or replacement decisions are at the sole discretion of Century Helicopter Products. This warranty does not cover cosmetic damage or damage due to acts of God, accident, misuse, abuse, negligence, commercial use, or modification of or to any part of the Product. This warranty does not cover damage due to improper installation, operation, maintenance, or attempted repair by anyone other than Century Helicopter Products. Return of any goods by Purchaser must be approved by Century Helicopter Products before shipment.

**General**

---

- 1) I will not fly my model aircraft in sanctioned events, air shows or model flying demonstrations until it has been proven to be airworthy by having been previously, successfully flight tested.
- 2) I will not fly my model higher than approximately 400 feet within 3 miles of an airport without notifying the airport operator. I will give right-of-way and avoid flying in the proximity of full-scale aircraft. Where necessary, an observer shall be utilized to supervise flying to avoid having models fly in the proximity of full-scale aircraft.
- 3) Where established, I will abide by the safety rules for the flying site I use, and I will not willfully or deliberately fly my models in a careless, reckless and/or dangerous manner.
- 4) The maximum takeoff weight of a model is 55 pounds, except models flown under Experimental Aircraft rules.
- 5) I will not fly my model unless it is identified with my name and address or AMA number on or in the model. (This does not apply to models while being flown indoors.)
- 6) I will not operate models with metal-bladed propellers or with gaseous boosts, in which gases other than air enter their internal combustion engine(s); nor will I operate models with extremely hazardous fuels such as those containing tetranitromethane or hydrazine.

**Radio Control**

---

- 1) I will have completed a successful radio equipment ground range check before the first flight of a new or repaired model.
- 2) I will not fly my model aircraft in the presence of spectators until I become a qualified flier, unless assisted by an experienced helper.
- 3) At all flying sites a straight or curved line(s) must be established in front of which all flying takes place with the other side for spectators. Only personnel involved with flying the aircraft are allowed at or in front of the flight line. Intentional flying behind the flight line is prohibited.
- 4) I will operate my model using only radio control frequencies currently allowed by the Federal Communications Commission. (Only properly licensed Amateurs are authorized to operate equipment on Amateur Band frequencies.)
- 5) Flying sites separated by three miles or more are considered safe from site-to site interference, even when both sites use the same frequencies. Any circumstances under three miles separation require a frequency management arrangement, which may be either an allocation of specific frequencies for each site or testing to determine that freedom from interference exists. Allocation plans or interference test reports shall be signed by the parties involved and provided to AMA Headquarters. Documents of agreement and reports may exist between
  - (1) Two or more AMA Chartered Clubs, (2) AMA clubs and individual AMA members not associated with AMA Clubs, or (3) two or more individual AMA members.
- 6) For Combat, distance between combat engagement line and spectator line will be 500 feet per cubic inch of engine displacement. (Example: .40 engine = 200 feet.); electric motors will be based on equivalent combustion engine size. Additional safety requirements will be per the RC Combat section of the current Competition Regulations.
- 7) At air shows or model flying demonstrations, a single straight line must be established, one side of which is for flying, with the other side for spectators.
- 8) With the exception of events flown under AMA Competition rules, after launch, except for pilots or helpers being used, no powered model may be flown closer than 25 feet to any person.
- 9) Under no circumstances may a pilot or other person touch a powered model in flight.

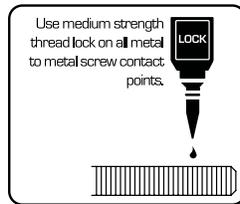
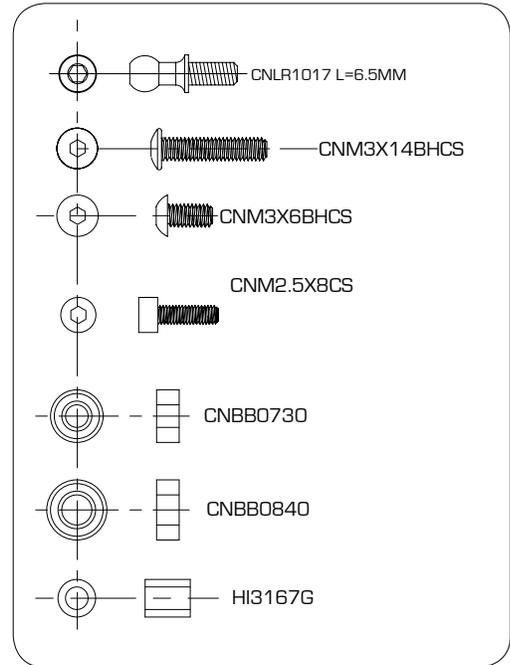
## BAG 1

Do not open all the bags prior to starting assembly. Open the bags step by step as you go through the instruction manual. The components are bagged to make assembly easier. The next few pages will pertain to the assembly of the head. Please follow the instructions based on the head type you own. Make sure to apply threadlock to any screws going into metal.

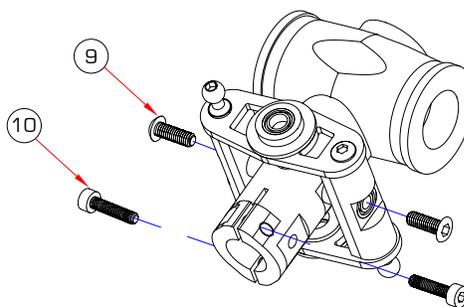
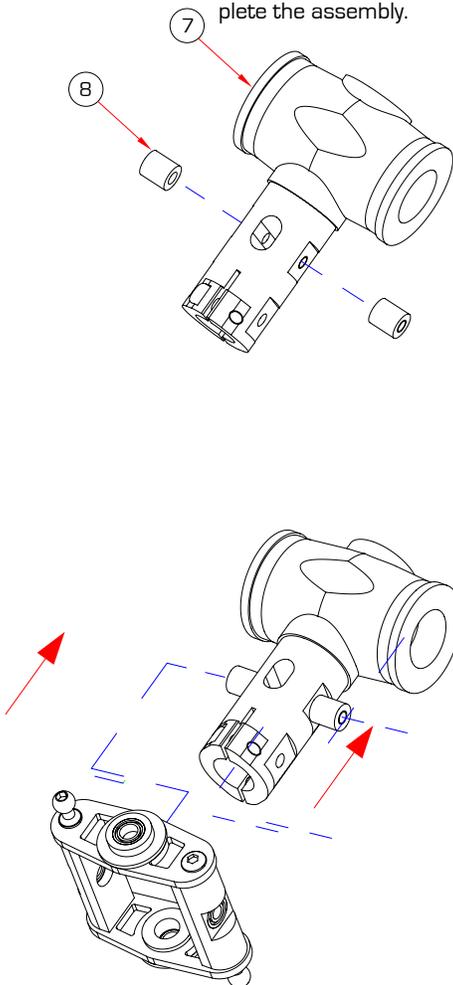
Insert one ball bearing into each bearing cup and insert into the offset plate. Apply one small drop of slow cyanoacrylate glue (Slow CA) to the joint between the backside of the bearing cup and the offset plate. Insert one ball bearing into each tie bar. Using an available M3 socket cap screw, form threads into both ends of the tie bars. Insert one M3x6 button head screw through the right side hole of the offset plate and thread into one tie bar.

Take special care when pressing in these bearings. Do not press in on the inner sleeve of the bearing

Make two identical subassemblies. Note that the bearing cups face outwards from the head block. Insert one M3x14 button head screw through the tie bar bearing, slide one steel spacer and carefully apply Medium threadlock to the exposed threads and insert into the right side of the head block. Do not overtighten. Repeat for the second sub-assembly. Once complete apply a small amount of slow cyanoacrylate glue and insert one CNLR1020 special long thread ball into each offset plate to complete the assembly.



Do not secure all the screws until lining up the components in the following steps.

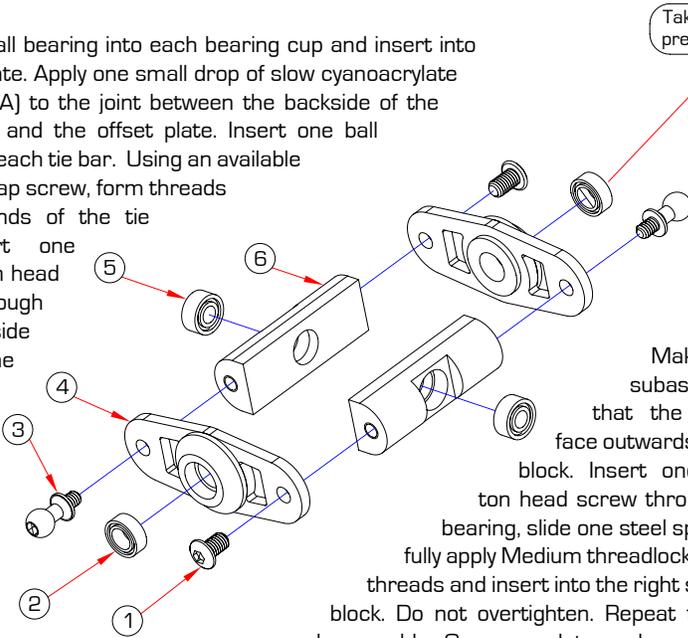


No.	Part #	Description	Qty
1	CNLR1017	Stainless Ball, 3mm Thread, Medium(M3球头螺丝)	2
2	HI3167B	Seesaw Offset Plates(平衡杆固定片)	2
3	CNBB0730	3x7x3 Ball Bearing(轴承)	2
4	HI3167G	Seesaw Tie Bar Set(平衡杆控制臂)	2
5	CNM3X6BHCS	M3x6 Button Head Cap Screws(伞头螺丝)	2
6	CNBB0840	4x8x3 Ball Bearing(轴承)	2
7	HI6160A	NX Rotor Head Yoke(主旋翼中心座)	1
8	HI3167G	3x5x6 Seesaw Tie Bar Set(铁套)	2
9	CNM3X14BHCS	M3x14 Button Head Cap Screws(伞头螺丝)	2
10	CNM2.5X8CS	M2.5x8 Cap Screws(杯头螺丝)	2

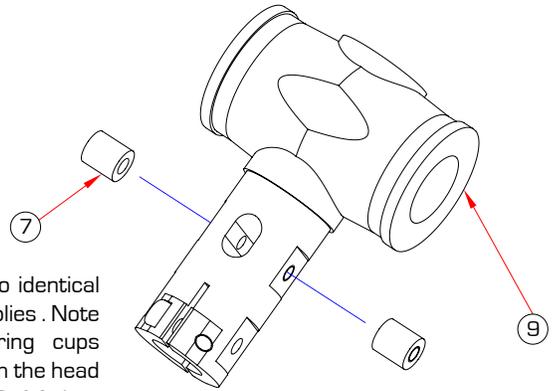
## BAG 1

Do not open all the bags prior to starting assembly. Open the bags step by step as you go through the instruction manual. The components are bagged to make assembly easier. The next few pages will pertain to the assembly of the head. Please follow the instructions based on the head type you own. Make sure to apply threadlock to any screws going into metal.

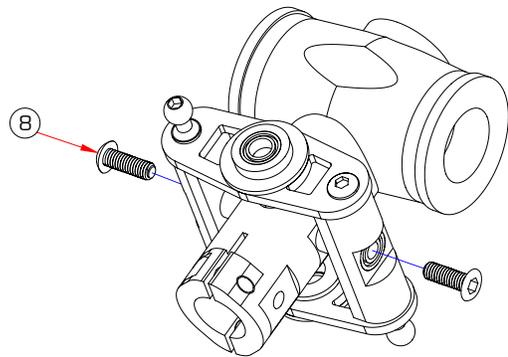
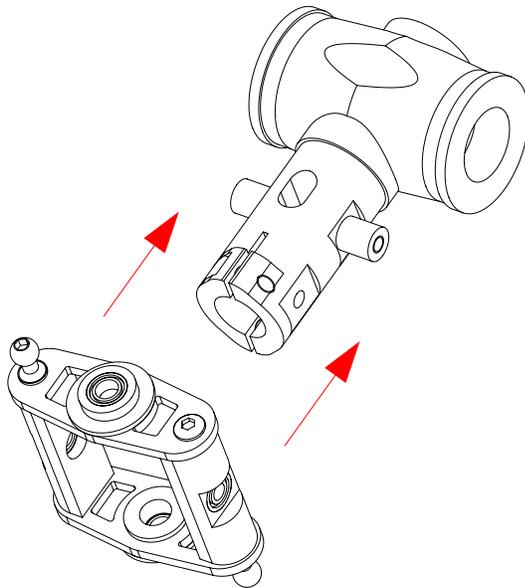
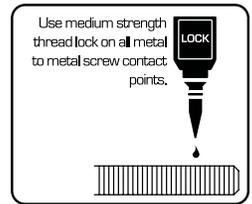
Insert one ball bearing into each bearing cup and insert into the offset plate. Apply one small drop of slow cyanoacrylate glue (Slow CA) to the joint between the backside of the bearing cup and the offset plate. Insert one ball bearing into each tie bar. Using an available M3 socket cap screw, form threads into both ends of the tie bars. Insert one M3x6 button head screw through the right side hole of the offset plate and thread into one tie bar.



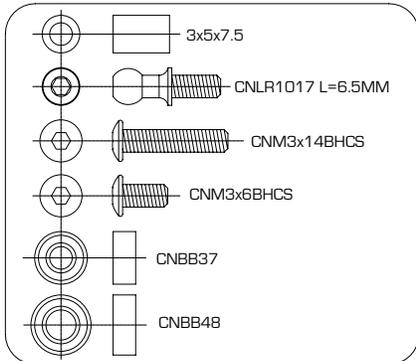
Take special care when pressing in these bearings. Do not press in on the inner sleeve of the bearing



Make two identical subassemblies. Note that the bearing cups face outwards from the head block. Insert one M3x14 button head screw through the tie bar bearing, slide one steel spacer and carefully apply Medium threadlock to the exposed threads and insert into the right side of the head block. Do not overtighten. Repeat for the second sub-assembly. Once complete apply a small amount of slow cyanoacrylate glue and insert one CNLR1020 special long thread ball into each offset plate to complete the assembly.



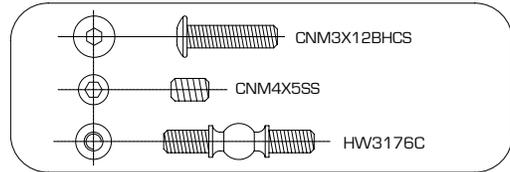
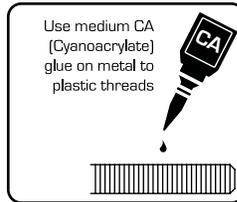
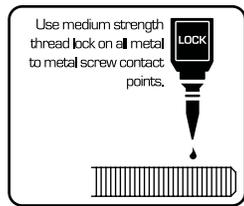
Do not secure all the screws until lining up the components in the following steps.



No.	Part #	Description	Qty
1	CNM3x6BHCS	Button Head Screw[圆头螺丝]M3x6	2
2	CNBB48	Bearing[滚珠轴承]4x8x3	2
3	CNLR1017	Stainless Ball, 3mm Thread, Medium[M3球头螺丝]	2
4	HI3167B	Seesaw Offset Plate[平衡杆控制器]	2
5	CNBB0730	Bearing[滚珠轴承]3x7x3	2
6	HI3167G	Seesaw Offset Plate 2[平衡杆控制器2]	2
7	HI3167S	3x5x7.5 Seesaw Tie Bar Set[铁套]	2
8	CNM3x14BHCS	Button Head Screw[圆头内六角螺丝]M3x14	2
9	HI6160A	Head Block[主旋翼中心筒]	1

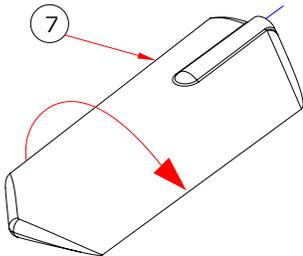
## BAG 1

Pushrod assembly (parts 2 through 4) is already assembled but check that the length is actually 43mm (center to center). As the pushrods are built and installed they should be checked for tightness. Press one ball link onto each double studded steel ball, making sure that pressure is applied from the side of the ball link with circle mark. While holding one flybar control arm, apply a small amount of slow cyanoacrylate glue and thread one end of the double studded steel ball into each standoff. When it becomes difficult to turn with fingers, apply slow CA to the threads and start screwing in the tapered control arm stand-off on the other end of the ball. Slide and center the flybar through the head assembly. Carefully look at the flybar control arm assemblies from the previous step and notice that when installed correctly, the securing set screw is on top. Insert one M4x6x0.5 micro washer #CNLR1006 against each bearing then slide the control arm halves onto each side, so that they match together and the set screw remains on top. Insert one M3x12 button head socket screw to secure the opposite standoff. Hold the tapered standoff using pliers while tightening the screw as the rotor head rotates clockwise.

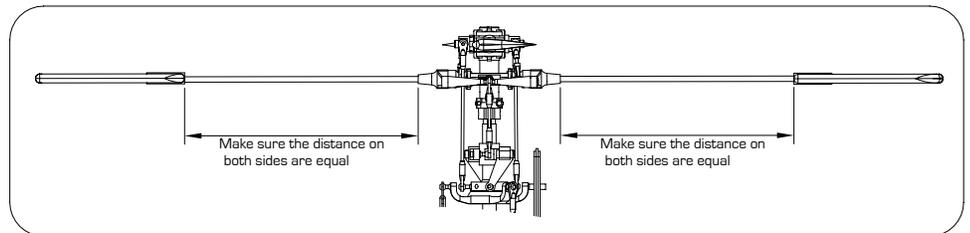


Apply a small amount of cyanoacrylate glue to the special long thread ball.

All ball links are molded to be installed in only one direction. Look carefully at the hole for the ball as that side is 1mm larger.

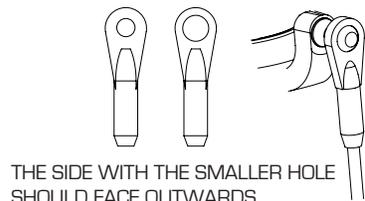


Loosely tighten the M4x5 set screws into the round aluminum inserts aligned with the flat spots on the flybar. Tighten both set screws, one at a time using Medium threadlock. Make a pencil mark 5mm past the threads on both ends of the flybar. Thread the flybar paddles onto the flybar until the mark is reached and align the paddles parallel. Again using the ruler, rotate one paddle or the other to get equal distances while remembering the leading edge of the paddles turn clockwise.



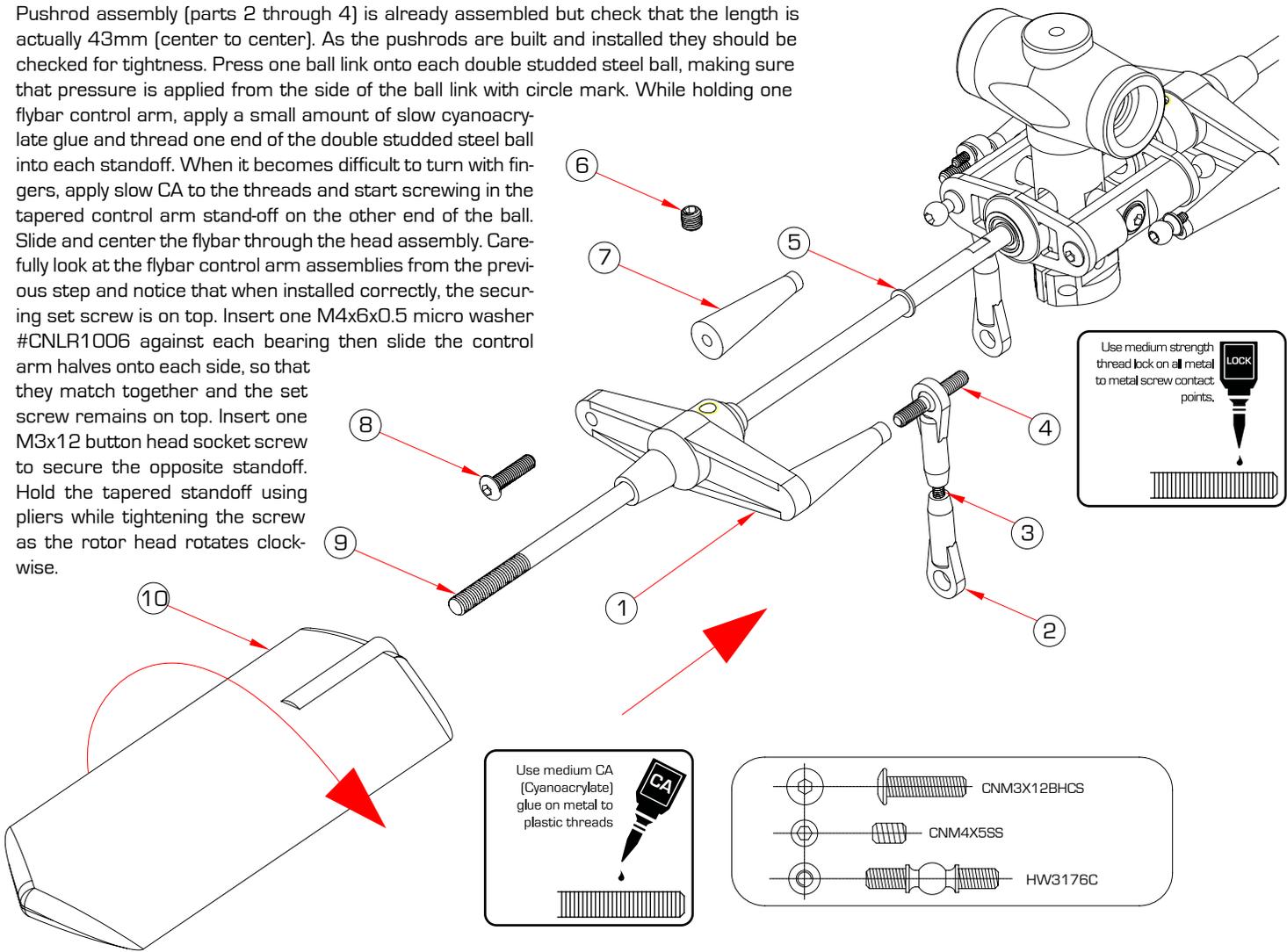
No.	Part #	Description	Qty
1	HI3176C	Flybar Arms[平衡翼控制臂]	2
2	HI6145	Ball Link Set[球头连接头]	2
3	HW6192	Pushrod Set[拉杆]	2
4	HI3176C	Flybar Arms[球头双牙螺线]	2
5	HI3176C	Flybar Arms[平衡翼控制臂]	2
6	CNM3X12BHCS	M3x12 Button Head Cap Screws[圆头螺丝]	2
7	HI6179B	Flybar Paddles[平衡翼]	2
8	HW3173A	4mm Flybar 500mm[平衡杆]	1
9	CNM4X5SS	M4x5 Socket Head Set Screw[无头内六角螺线]	2
10	CNLR1006	M4X6X0.5 Washer[平面垫片]	2

NOTICE SIZE OF HOLES ON BALL LINKS

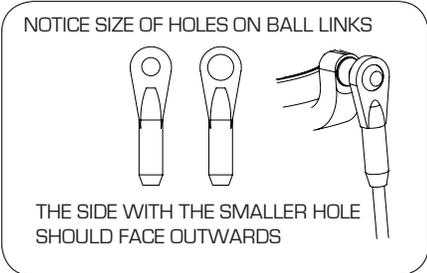
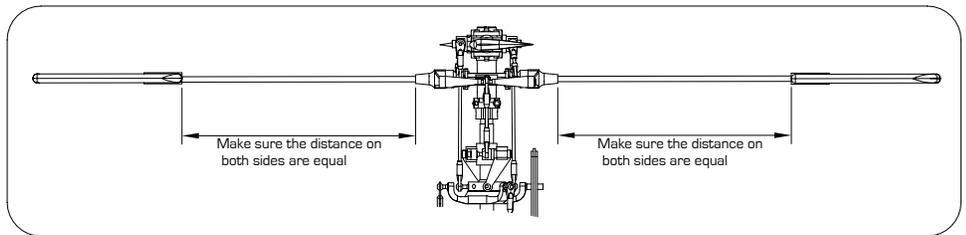


## BAG 1

Pushrod assembly (parts 2 through 4) is already assembled but check that the length is actually 43mm (center to center). As the pushrods are built and installed they should be checked for tightness. Press one ball link onto each double studded steel ball, making sure that pressure is applied from the side of the ball link with circle mark. While holding one flybar control arm, apply a small amount of slow cyanoacrylate glue and thread one end of the double studded steel ball into each standoff. When it becomes difficult to turn with fingers, apply slow CA to the threads and start screwing in the tapered control arm stand-off on the other end of the ball. Slide and center the flybar through the head assembly. Carefully look at the flybar control arm assemblies from the previous step and notice that when installed correctly, the securing set screw is on top. Insert one M4x6x0.5 micro washer #CNLR1006 against each bearing then slide the control arm halves onto each side, so that they match together and the set screw remains on top. Insert one M3x12 button head socket screw to secure the opposite standoff. Hold the tapered standoff using pliers while tightening the screw as the rotor head rotates clockwise.



Loosely tighten the M4x5 set screws into the round aluminum inserts aligned with the flat spots on the flybar. Tighten both set screws, one at a time using Medium threadlock. Make a pencil mark 5mm past the threads on both ends of the flybar. Thread the flybar paddles onto the flybar until the mark is reached and align the paddles parallel. Again using the ruler, rotate one paddle or the other to get equal distances while remembering the leading edge of the paddles turn clockwise.



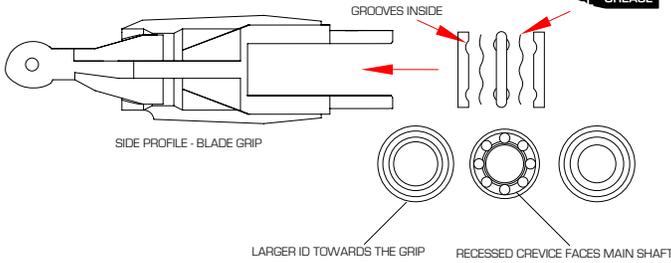
No.	Part #	Description	Qty
1	HI3167C	Seesaw Tie Bars[ 稳定翼控制臂 ]	2
2	HI6145	Ball Link Set[26 Long,4 Short][ 球头连接头 ]	4
3	Hw6192	Pushkod Set[ 拉杆 ]	2
4	HI3167C	M3 Two-tooth Screw Ball[ M3球头双牙螺丝 ]	2
5	CNLR1006	Washer 4x6x0.5[ 平面垫片 ]	2
6	CNM4X5SS	M4x5 Socket Head Set Screw [ 无头内六角螺丝 ]	2
7	HI3167C	Seesaw Tie Bars[ 平衡杆控制臂 ]	2
8	CNM3X12BHCS	M3x12 Button Head Cap Screws[ 圆头内六角螺丝 ]	2
9	HW6173A	4mm FLYBAR 500mm ( 平衡杆 )	1
10	HI6179B	Flybar Paddles[ 平衡片 ]	2

## BAG 1

BELL MIXER RATIOS				STYLE	
●	○	○	●	1:1.6	3D
○	●	○	●	1:1.3	3D & SPORT
○	○	●	●	1:1	SPORT & FAI

Using an available M3 screw, carefully form the threads in the blade grip arm. Slide the M3x18 special socket shoulder screw through the bell mixer arm from the flat side, add one M3x5x3 spacer and apply a drop of Slow Cyanoacrylate glue or Epoxy glue to the end of the threads before installing into the blade grip. Tighten the bolt until there is no end to end movement, but do not overtighten the bolt as you can strip out the hole. Make two assemblies.

### THRUST BEARING INSTALLATION GUIDE

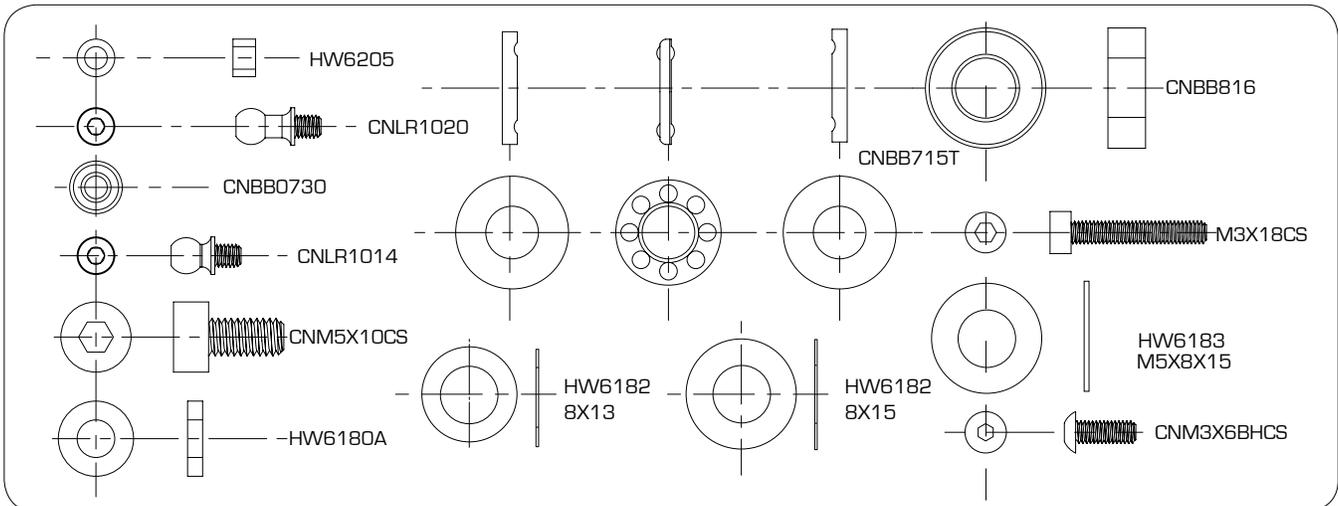


Do not overtighten as you can strip the blade grip.

There are two types of dampeners provided. The hard black plastic dampeners (HI6520A) should only be used for hard 3D flying. Press in the head dampeners into the rotor head block. Lubricate the inside surface of each damper with light oil. Press one M8x16 ball bearing into both ends of each main rotor blade grip.

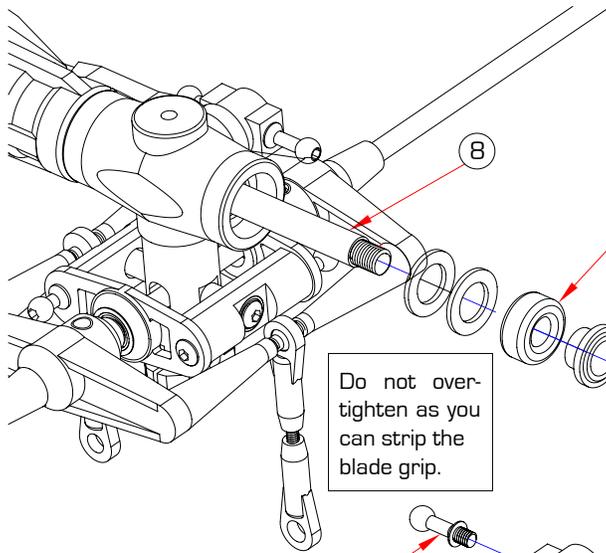
Slide one M14 thrust washer against the bearing closest to the main rotor blade. Make sure that the bearing and the thrust washer are properly seated into the deep end of the blade grip. If necessary use a socket that matches the outside diameter of the bearing and press into position. The 8x13 washer/spacer (#15) is used to adjust tightness of the head. If the head is binding after tightening the M5 bolt (#6), remove one or more spacers from each side. Make two assemblies.

Press one M3x7 flanged ball bearing into one side followed by one M3x5 spacer and another flanged bearing from the opposite side. If the bearing is tight, lightly sand the bell mixer and use Red threadlock to bond the bearing in place. Install the CNLR1014 short steel ball into the single hole side of the bell mixer and install the CNLR1020 medium steel ball using Blue threadlock. Install the medium steel ball according to the table to suit your flying preference. Use the center hole for sport flying. Make two assemblies.



No.	Part #	Description	Qty	No.	Part #	Description	Qty
1	HI6189A	Enhanced Metal Bell Mixer Set (主桨控制臂)	2	10	CNBB816	8x16x5 Bearing (轴承)	4
2	HW6205	M3x5x3 Spacer (垫圈)	2	11	HI6184A	NX Main Rotor Blade Grips (主旋翼夹片)	2
3	CNLR1020	Stainless Ball, 3mm Thread, Medium (M3球头螺丝)	2	12	HW6205	M3x5x3 Spacer (垫圈)	2
4	CNBB0730	3x7x3 Ball Bearing (轴承)	4	13	CNM3X18CS	M3x18 Socket Head Cap Screws (有头内六角螺丝)	2
5	CNLR1014	Stainless Ball, 3mm Thread, Short (M3球头螺丝)	2	14	HW6182	8x15 Head Shim Set (平面垫片)	2
6	CNM5X10CS	M5x10 Socket Head Cap Screws (有头内六角螺丝)	2	15	HW6182	8x13 Head Shim Set (平面垫片)	6
7	HW6180A	M5x10x1 Feathering Shaft with Center Ball (垫圈)	2	16	CNBB816	8x16x5 Bearing (轴承)	4
8	CNBB715T	7x15x5 Blade Grip Thrust Ball Bearing (止推轴承)	2	17	HI6181B	Hard Head Dampeners Black	2
9	HW6183	M5x8x15 Head Shim Set (平面垫片)	2	17	HI6181A	Standard Head Dampeners Red	2

## BAG 1

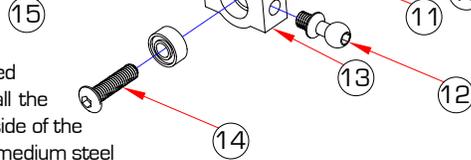


Press in the head dampers into the rotor head block. Lubricate the inside surface of each damper with light oil. Press one M9X13 flat washer into the end of each blade grip. If necessary use a socket that matches the diameter of the washer and press into position. Then press in one M7X13 ball bearing into both ends of each main rotor blade grip. Slide one M9 thrust washer against the bearing closest to the main rotor blade. Make sure that the bearing and the thrust washer are properly seated into the deep end of the blade grip. If necessary use a socket that matches the outside diameter of the bearing and press into position. Torque down on the M5 locknut (#1) until snug making sure the grip still turns without binding. If you tighten down too much, you will crush the thrust bearings. If this happens, you will need to replace the thrust bearings. Make two assemblies.

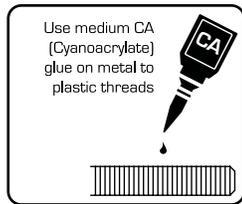
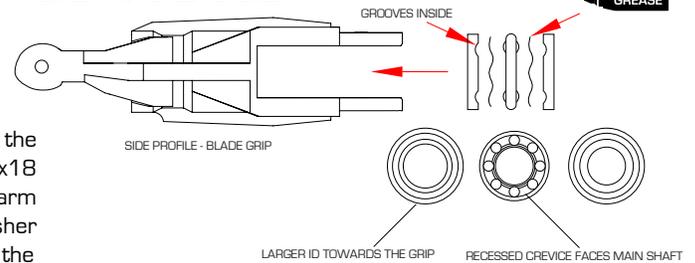
Do not apply threadlock to the nylock nut!

Press one M3x7 ball bearing into one side followed by one M3x5 spacer and another flanged bearing from the opposite side. Install the CNLR1014 short steel ball into one side of the bell mixer and install the CNLR1020 medium steel ball on the opposite side. Secure using Slow Cyanoacrylate glue. Make two assemblies.

Do not over-tighten as you can strip the blade grip.



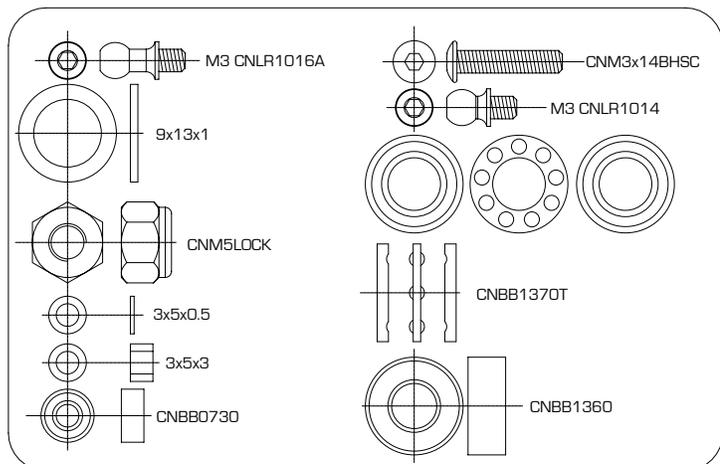
### THRUST BEARING INSTALLATION GUIDE



Using an available M3 screw, carefully form the threads in the blade grip arm. Slide the M3x18 button head cap screw through the bell mixer arm from the flat side, add one M3x5x0.5 micro washer and apply a drop of Slow Cyanoacrylate glue to the end of the threads before installing into the blade grip. Tighten the bolt until there is no end to end movement, but do not overtighten the bolt as you can strip out the hole. Make two assemblies.

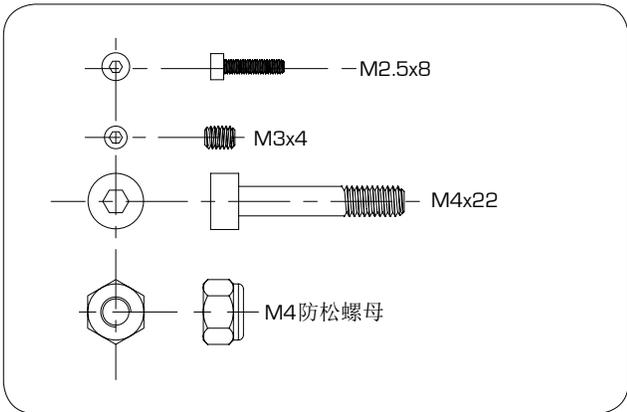
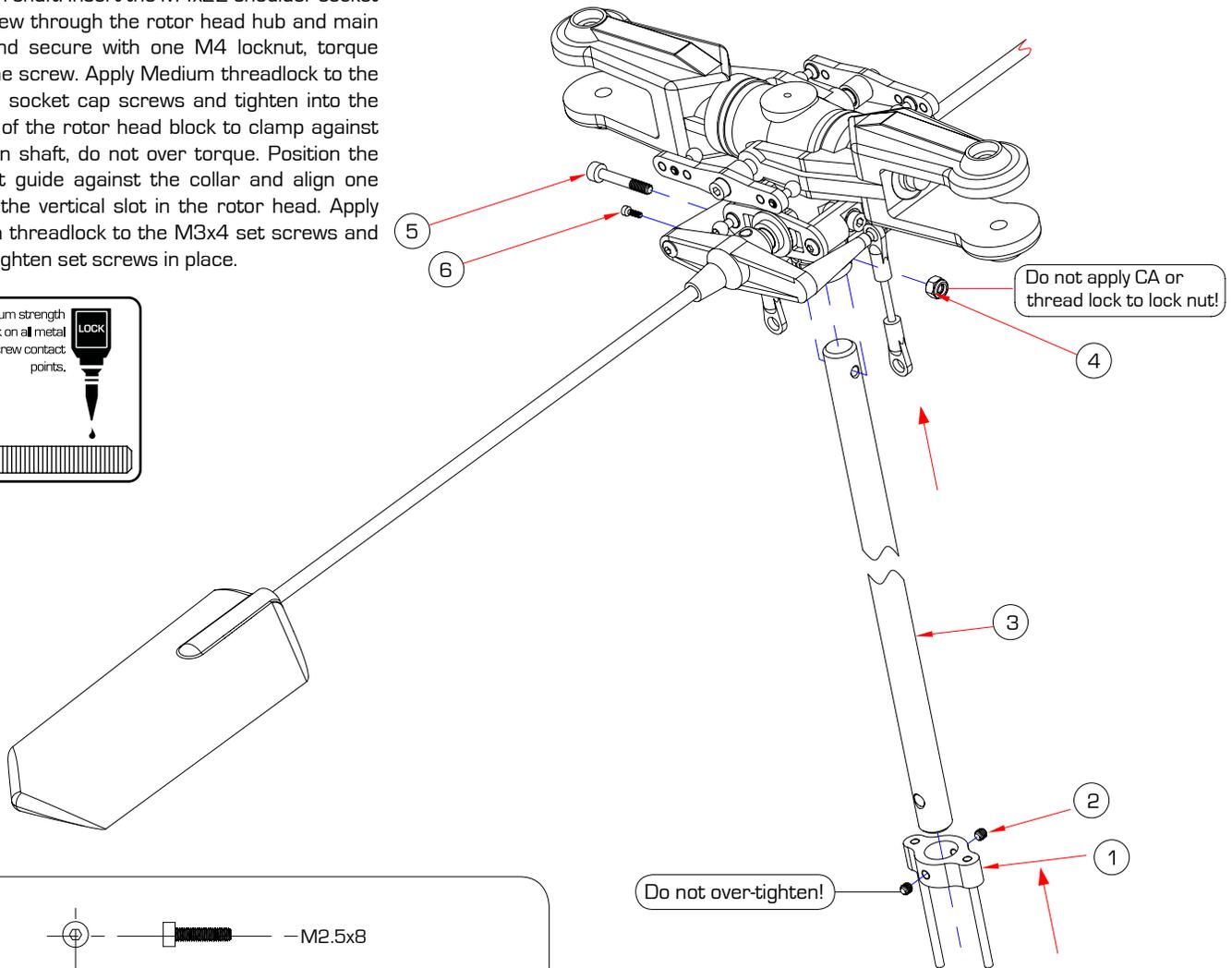
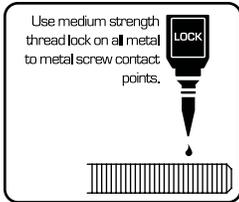
Red dampener is used for normal flight #HI6181A. Black dampeners are used for 3D flight #HI6181B.

No.	Part #	Description	Qty
1	CNM5LOCK	M5 Locknut[M5 防松螺母]	2
2	CNBB1370T	Thrust Ball Bearing[止推轴承]7x13x4.5	2
3	CNM9X13FW	Washer[垫片]9x13x1	8
4	CNBB1370	Bearing[滚珠轴承]7x13x4	4
5	HI3184	Main Rotor Blade Grip[主桨夹片]	2
6	HW6180S	Spacer[铝套]	2
7	HI6181B	Dampener Rubber[橡胶圈]	2
8	HW6180C	7mm Feathering shaft[横轴]	1
9	CNLR1003	Washer[垫片]3x5x0.5	2
10	CNBB0730	Bearing[滚珠轴承]3x7x3	4
11	HW6205	Spacer[铁套]3x5x3	2
12	CNLR1014	M3 Linkage Ball[M3 球头螺丝牙长3.5mm]	2
13	HI3189A	Bell Mixer Arm[混控臂]	2
14	CNM3x14BHSC	Button Head Socket Screw[圆头内六角螺丝M3x14]	2
15	CNLR1016A	M3 Long Linkage Ball[M3 球头螺球头12mm]	2



## BAG 1

Slide the washout guide and the rotor head onto the main shaft. Insert the M4x22 shoulder socket cap screw through the rotor head hub and main shaft and secure with one M4 locknut, torque down the screw. Apply Medium threadlock to the M2.5x8 socket cap screws and tighten into the bottom of the rotor head block to clamp against the main shaft, do not over torque. Position the washout guide against the collar and align one hole to the vertical slot in the rotor head. Apply Medium threadlock to the M3x4 set screws and evenly tighten set screws in place.



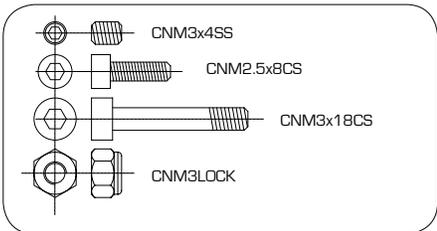
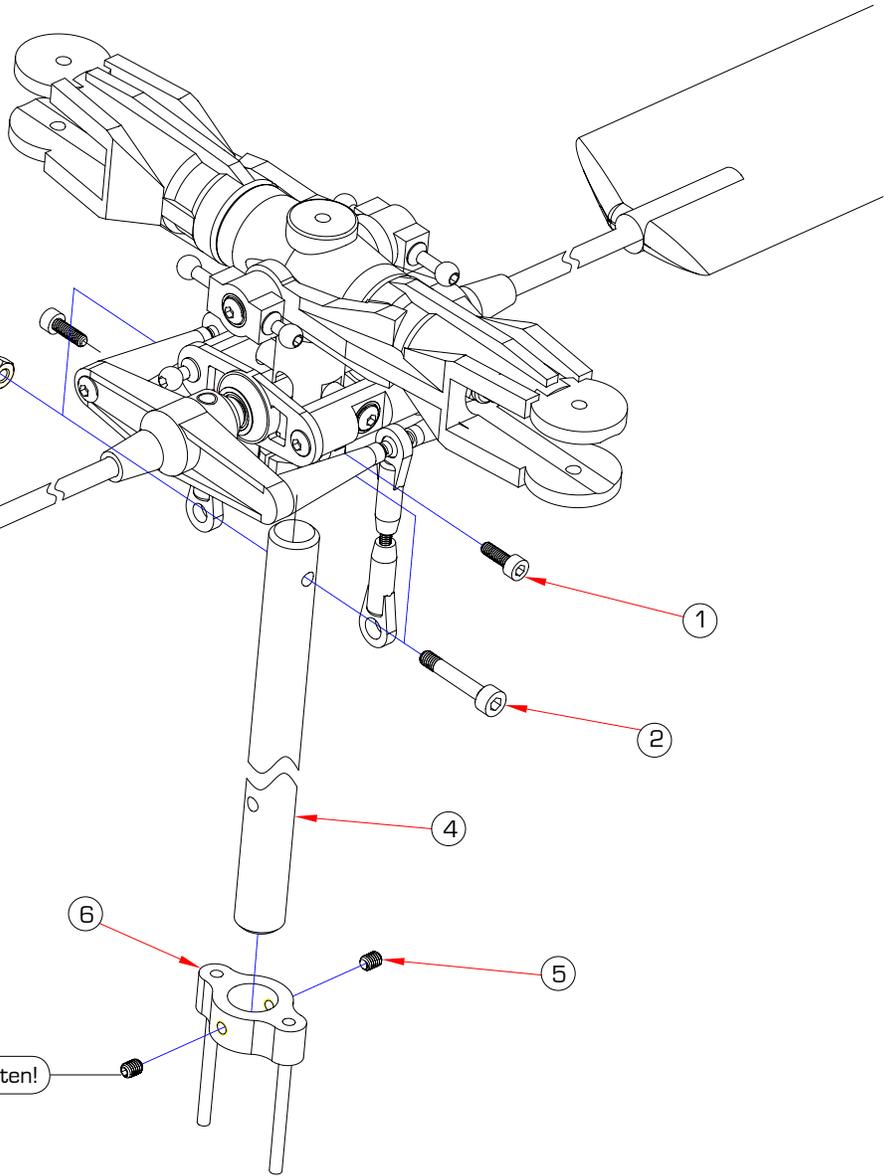
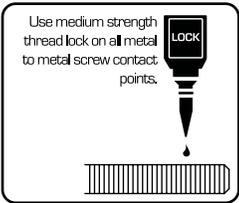
No.	Part #	Description	Qty
1	HI6153	Aluminum Washout Guide[ 剪型臂导柱]	1
2	CNM3x4SS	M3x4 Socket Head Set Screw[ 无头内六角螺钉]	2
3	HW6053A	10mm Main Shaft[ 主轴]	1
4	CNM4LOCK	M4 Lock-nut[M4 螺母]	1
5	CNM4x22CS	M4x22 Cap Screws[ 杯头内六角螺钉]	1
6	CNM2.5x8CS	Cap Screw[ 杯头内六角螺钉]M2.5x8	2

## BAG 1

Slide the washout guide and the rotor head onto the main shaft. Insert the M3X18 shoulder socket cap screw through the rotor head hub and main shaft and secure with one M3 locknut, torque down the screw. Apply Medium threadlock to the M2.5x8 socket cap screws and tighten into the bottom of the rotor head block to clamp against the main shaft, do not over-torque. Position the washout guide against the collar and align one hole to the vertical slot in the rotor head. Apply Medium threadlock to the M3x4 set screws and evenly tighten set screws in place.

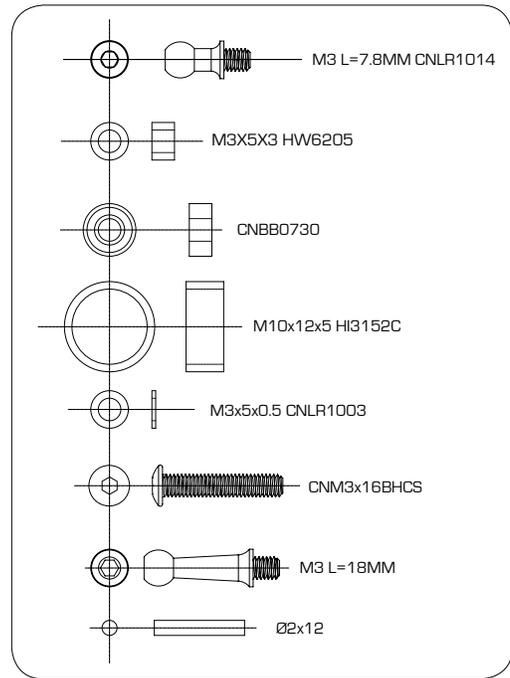
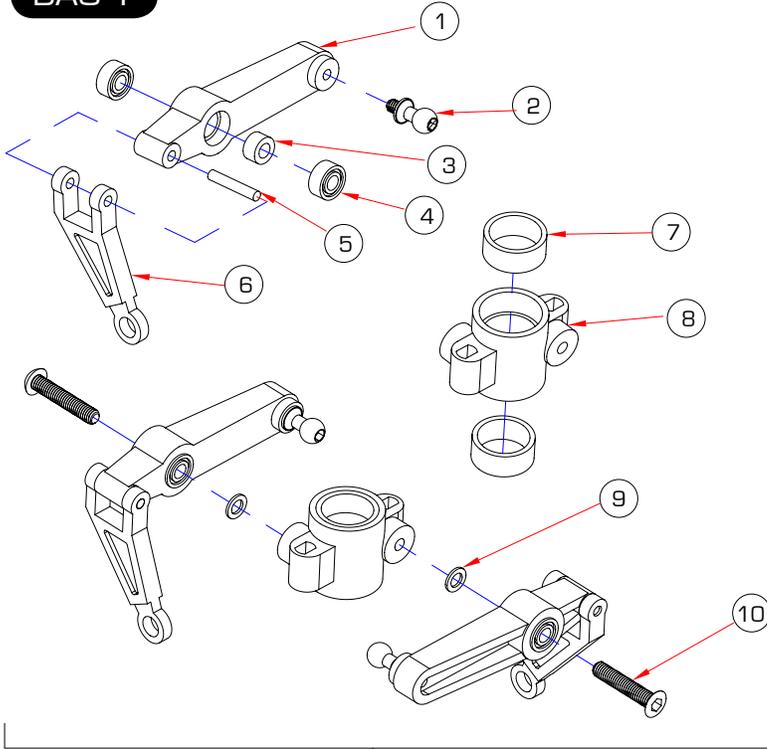
Do not apply CA or thread lock to lock nut

Do not over-tighten!



No.	Part #	Description	Qty
1	CNM2.5x8CS	Cap Screw[杯头内六角螺丝]M2.5x8	2
2	CNM3x18CS	Cap Screw[杯头内六角螺丝]M3x18	1
3	CNM3LOCK	M3 Locknut[防松螺母]	1
4	HW3053B	Main Shaft[主旋翼轴]	1
5	CNM3x4SS	Set Screw[无头内六角螺丝]M3x4	2
6	HI6153	CNC Washout Guide[剪型臂滑座]	1

## BAG 1

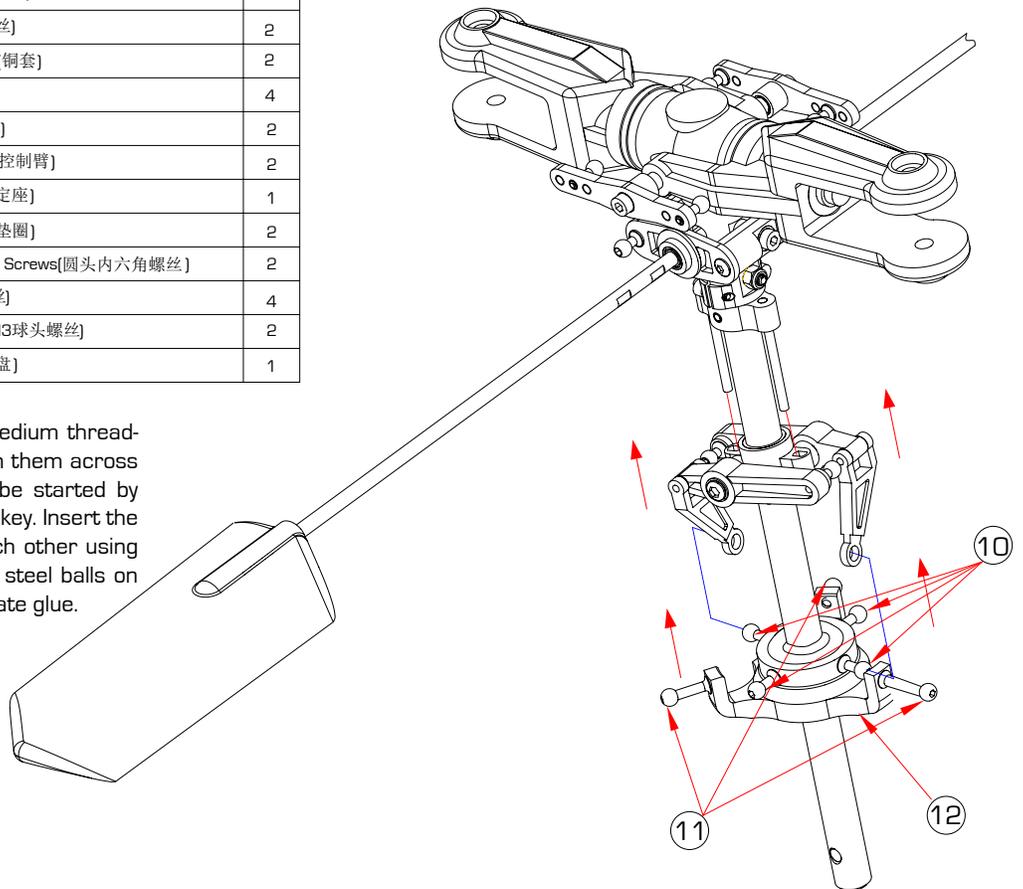


Comes pre-assembled

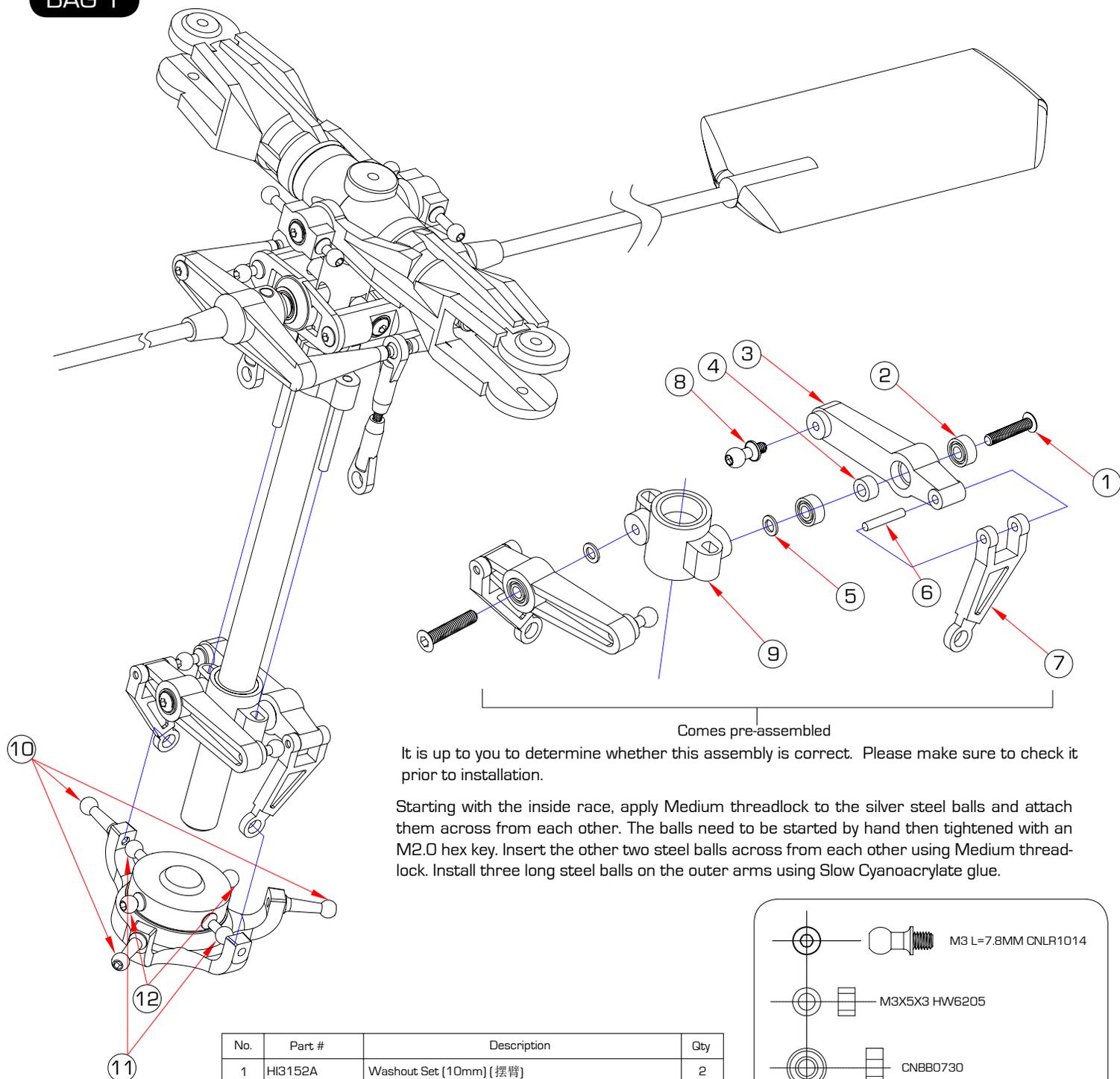
It is up to you to determine whether this assembly is correct. Please make sure to check it prior to installation.

No.	Part #	Description	Qty
1	HI3152A	Washout Set (10mm) [摆臂]	2
2	CNLR1014	M3 Ball Link[M3球头螺丝]	2
3	HW6205	3x5x3 Bellcrank Spacer[铜套]	2
4	CNBB0730	3x7x3 Bearing[轴承]	4
5	HI3152A	Radius Link w/ Pin[插销]	2
6	HI3152A	Radius Link w/ Pin[三角控制臂]	2
7	HI3152C	Washout Set (控制臂固定座)	1
8	CNLR1003	3x5x0.5 Micro Washer[垫圈]	2
9	CNM3x16BHCS	M3x16 Button Head Cap Screws[圆头内六角螺丝]	2
10	CNLR1014	M3 Ball Link[M3球头螺丝]	4
11	CNLR1021	M3 Ball Link L=18MM[M3球头螺丝]	2
12	HW6146C	Radikal Swashplate[十字盘]	1

Starting with the inside race, apply Medium threadlock to the silver steel balls and attach them across from each other. The balls need to be started by hand then tightened with an M2.0 hex key. Insert the other two steel balls across from each other using Medium threadlock. Install three long steel balls on the outer arms using Slow Cyanoacrylate glue.



## BAG 1

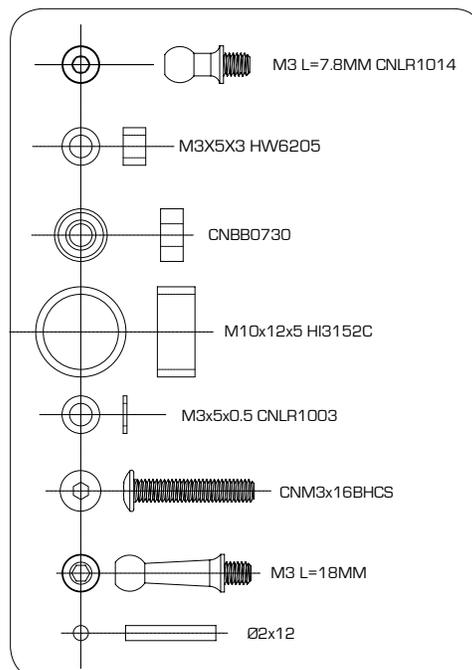


Comes pre-assembled

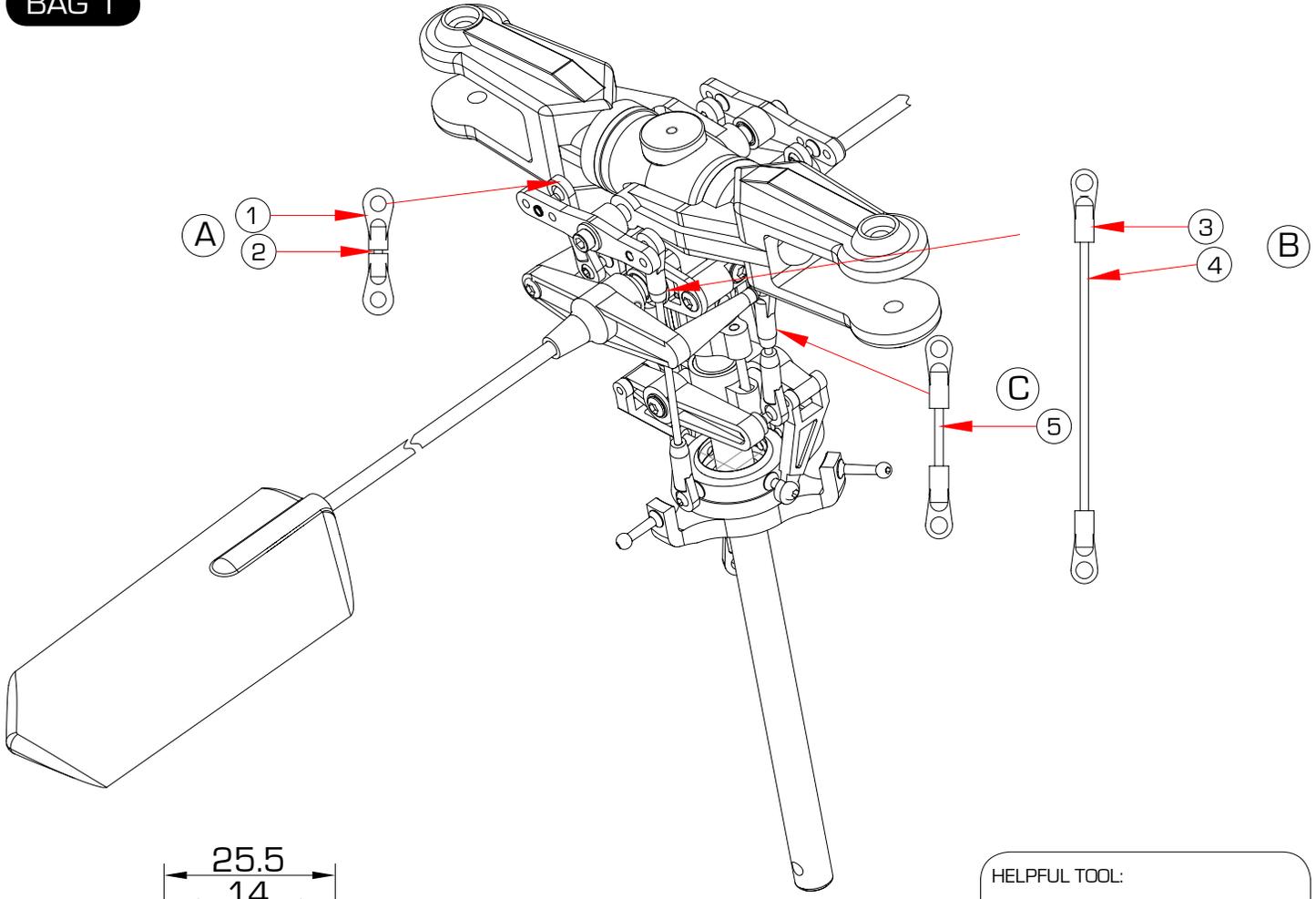
It is up to you to determine whether this assembly is correct. Please make sure to check it prior to installation.

Starting with the inside race, apply Medium threadlock to the silver steel balls and attach them across from each other. The balls need to be started by hand then tightened with an M2.0 hex key. Insert the other two steel balls across from each other using Medium threadlock. Install three long steel balls on the outer arms using Slow Cyanoacrylate glue.

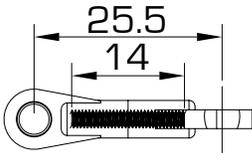
No.	Part #	Description	Qty
1	HI3152A	Washout Set (10mm) [摆臂]	2
2	CNLR1014	M3 Ball Link(M3球头螺丝)	2
3	HW6205	3x5x3 Bellcrank Spacer(铜套)	2
4	CNBB0730	3x7x3 Bearing(轴承)	4
5	HI3152A	Radius Link w/ Pin(插销)	2
6	HI3152A	Radius Link w/ Pin(三角控制臂)	2
7	HI3152C	Washout Set(控制臂固定座)	1
8	CNLR1003	3x5x0.5 Micro Washer(垫圈)	2
9	CNM3x16BHCS	M3x16 Button Head Cap Screws(圆头内六角螺丝)	2
10	CNLR1014	M3 Ball Link(M3球头螺丝)	4
11	CNLR1021	M3 Ball Link L=18MM(M3球头螺丝)	2
12	HW6146C	Radikal Swashplate[十字盘]	1



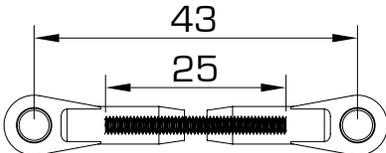
BAG 1



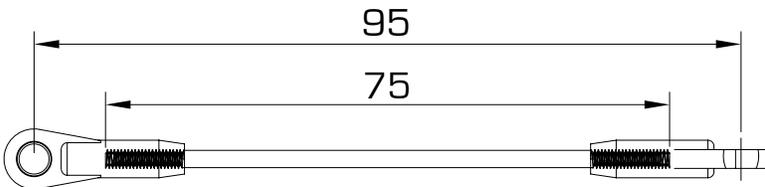
A



B

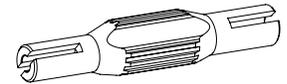


C



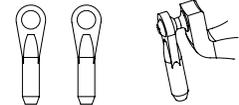
DRAWN TO A SCALE OF 1-TO-1. YOU CAN MATCH YOUR LINKS UP TO THIS PAGE FOR PROPER MEASUREMENTS.

HELPFUL TOOL:



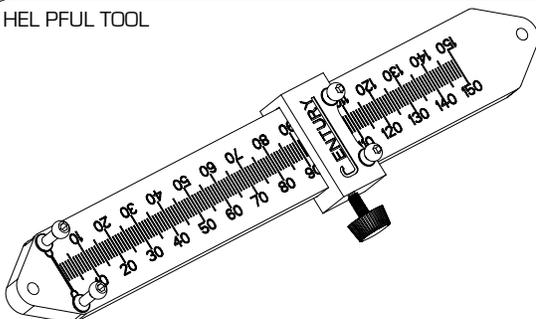
PART# CN2219A: BALL LINK EASY DRIVER

NOTICE SIZE OF HOLES ON BALL LINKS



THE SIDE WITH THE SMALLER HOLE SHOULD FACE OUTWARDS

HELPFUL TOOL

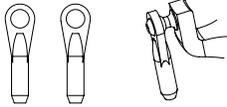


PART# CN2255: CONTROL ROD SETUP GAUGE

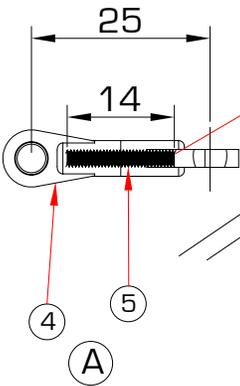
No.	Part #	Description	Qty
1	HI6145	Ball Link Set (26 Long, 4 Short)[球头连接杆]	4
2	HW6192A	Pushrod Set[连杆]	2
3	HI6145	Ball Link Set (26 Long, 4 Short)[球头连接杆]	8
4	HW6192A	Pushrod Set[连杆]	2
5	HW6192A	Pushrod Set[连杆]	2

## BAG 1

NOTICE SIZE OF HOLES ON BALL LINKS



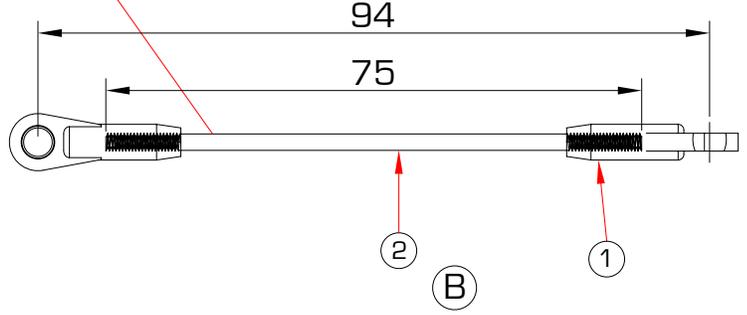
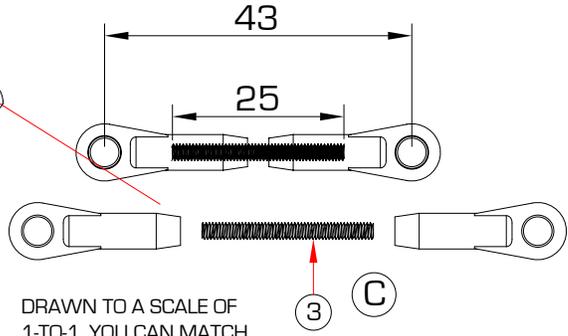
THE SIDE WITH THE SMALLER HOLE SHOULD FACE OUTWARDS



HELPFUL TOOL:

PART# CN2219A: BALL LINK EASY DRIVER

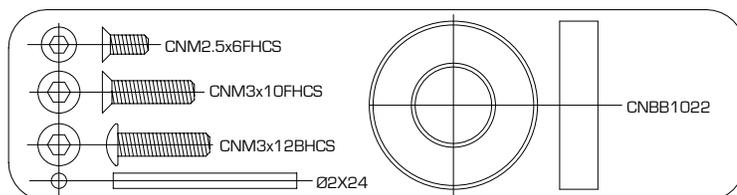
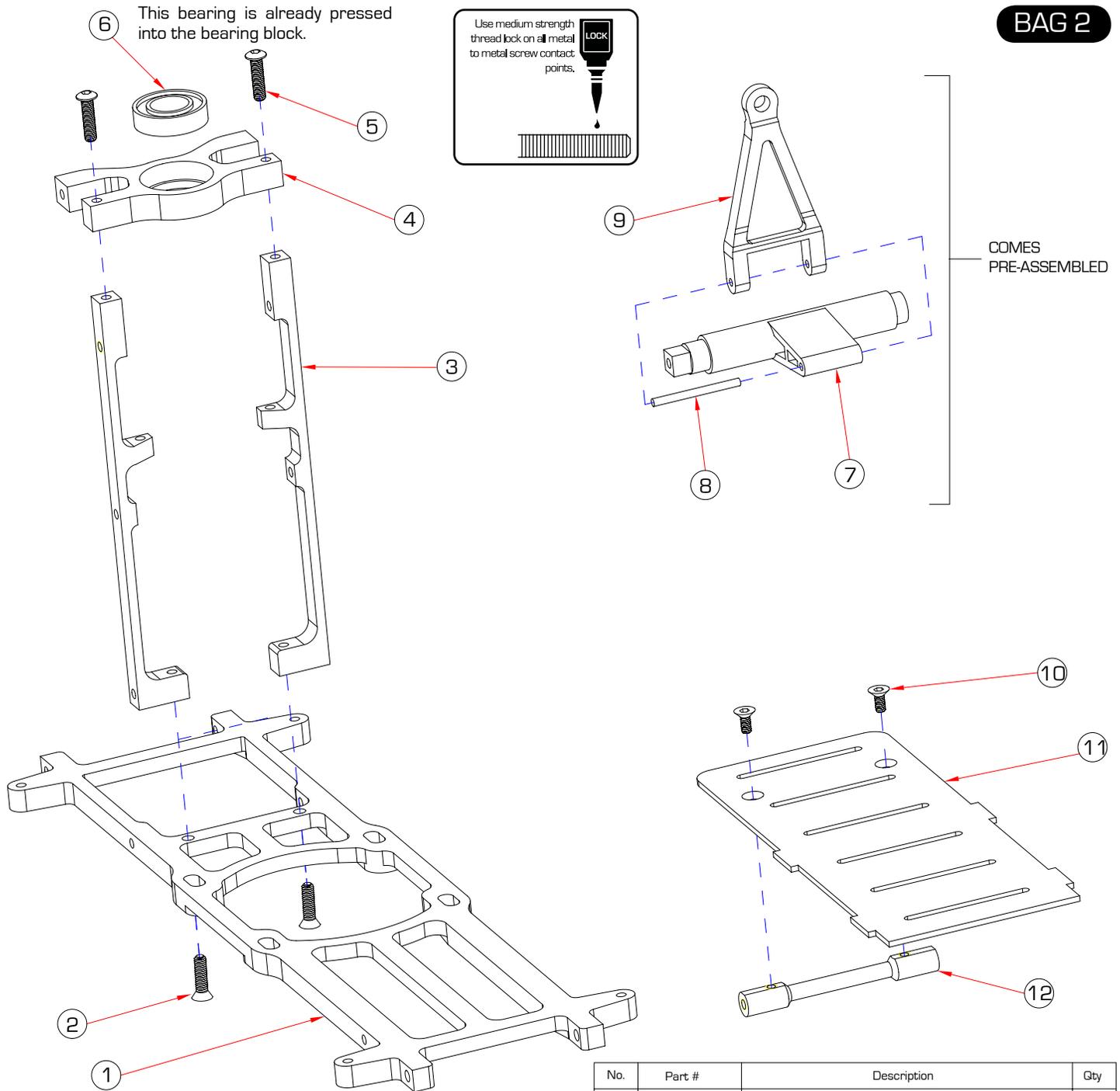
DRAWN TO A SCALE OF 1-TO-1. YOU CAN MATCH YOUR LINKS UP TO THIS PAGE FOR PROPER MEASUREMENTS.



HELPFUL TOOL

PART# CN2255: CONTROL ROD SETUP GAUGE

No.	Part #	Description	Qty
1	HI6145	Ball Link[ 塑胶球头连接头 ]	8
2	HW3192A	Pushrod[ 连杆 ]L=80MM	2
3	HW6192	Pushrod[ 连杆 ]L=25MM	2
4	HI6145	Short Ball Link[ 短塑胶球头连接头 ]	4
5	HW6192	Pushrod[ 连杆 ]L=14MM	2



No.	Part #	Description	Qty
1	HW6117G20	Landing Gear Frame(引擎座底板)	1
2	CNM3x10FHCS	Flush Head Cap Screws(斜头内六角螺丝)M3x10	2
3	HW6119	Box Frame Support(机身加强支架)	2
4	HW6042G	Lower Main Shaft Bearing Block(主轴下轴承座)	1
5	CNM3x12BHCS	Button Head Cap Screw(圆头内六角螺丝)M3x12	2
6	CNBB1022	Bearing(滚珠轴承) 10X22X5	1
7	HI6032G	A-Arm Base(A型控制臂座)	1
8	HI6032G	Pin(插销)Ø2x24	1
9	HI6032G	A-Arm(A型控制臂)	1
10	CNM2.5x6FHCS	Flush Head Cap Screws(斜头内六角螺丝)M2.5x6	2
11	HI6113	Electronics Plate(电子点火固定板)	1
12	HW6113S	Aluminum Post(铝柱)	1

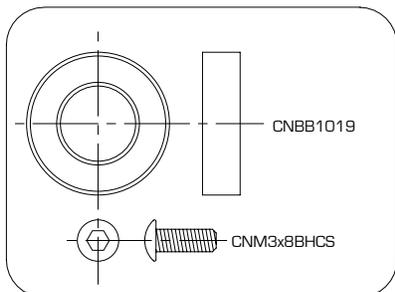
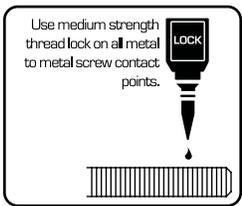
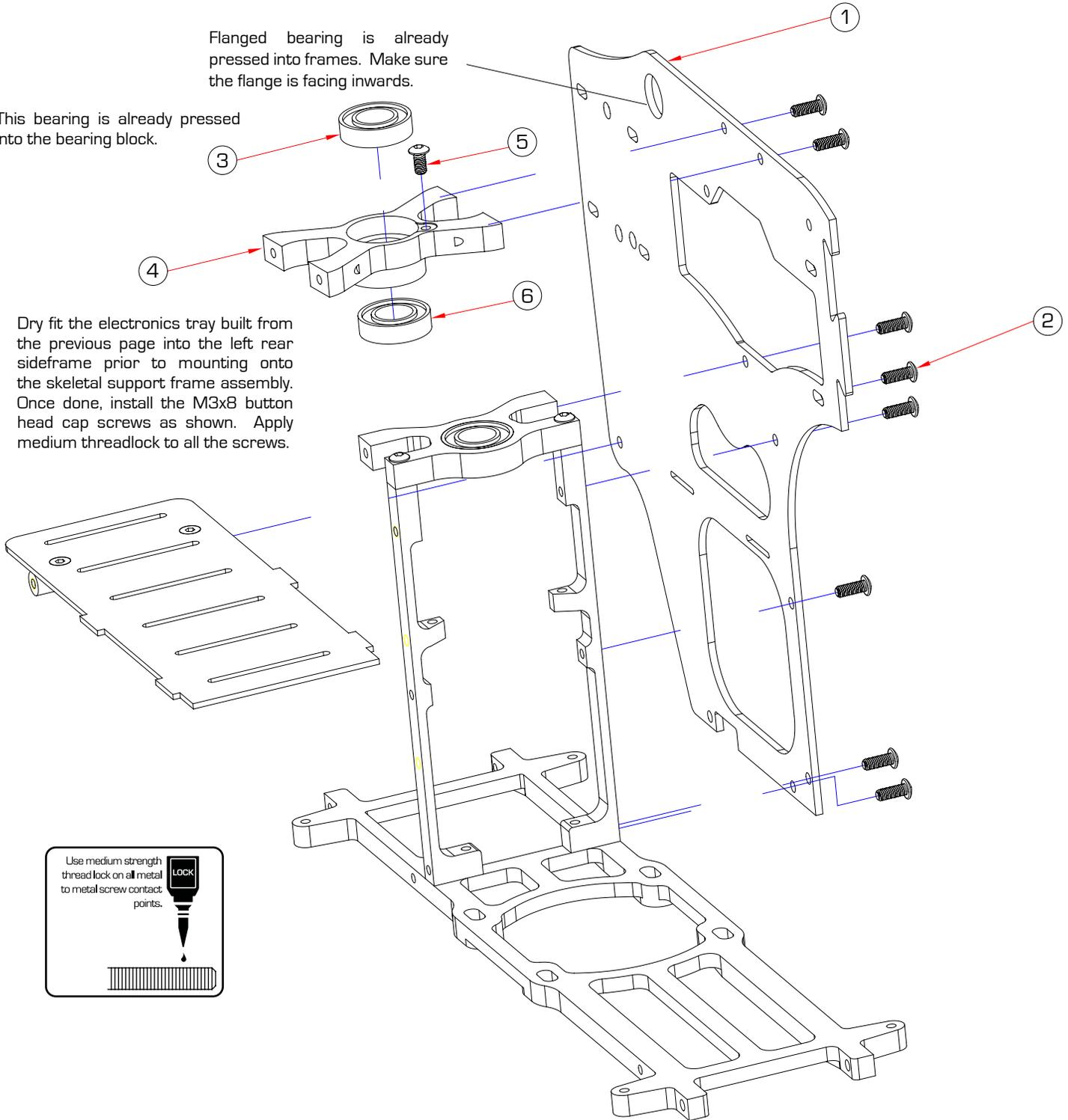
If you have carbon fiber frames, just add a "C" to the end of the frame part number.

BAG 2

Flanged bearing is already pressed into frames. Make sure the flange is facing inwards.

This bearing is already pressed into the bearing block.

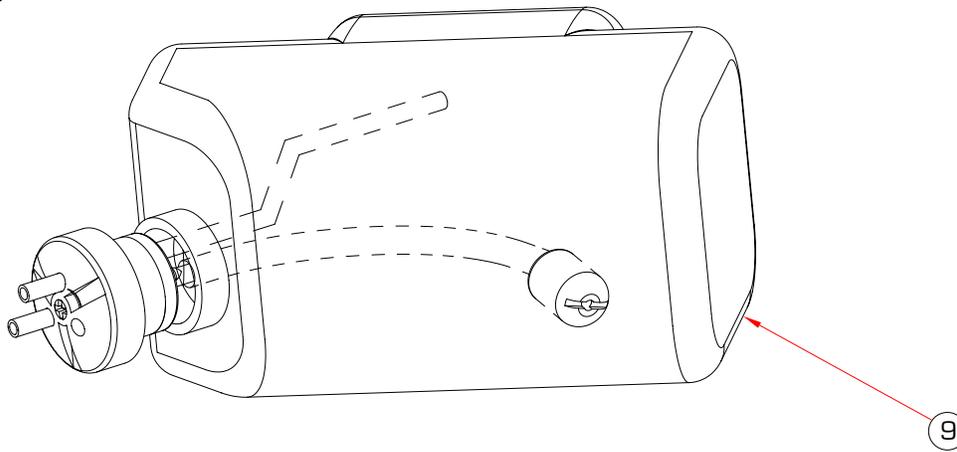
Dry fit the electronics tray built from the previous page into the left rear sideframe prior to mounting onto the skeletal support frame assembly. Once done, install the M3x8 button head cap screws as shown. Apply medium threadlock to all the screws.



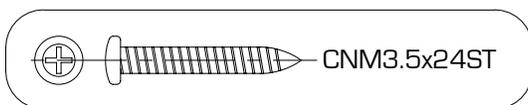
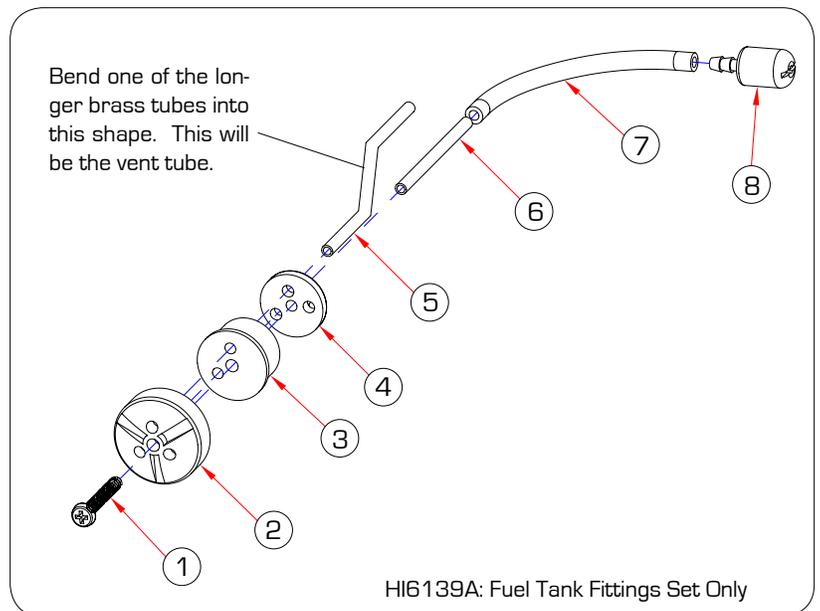
No.	Part #	Description	Qty
1	H16116L	Main Frames[ 左右后侧板]	2
2	CNM3x8BHCS	Button Head Cap Screw[ 圆头内六角螺丝M3x8]	8
3	CNBB1019	Bearing[ 滚珠轴承]10x19x5	2
4	HW6042GU	Upper Bearing Block[ 主轴上轴承座]	1
5	CNM3x6BHCS	Button Head Cap Screw[ 圆头内六角螺丝M3x6]	1
6	CNBB1019	Bearing[ 滚珠轴承]10x19x5	1

If you have carbon fiber frames, just add a "C" to the end of the frame part number.

BAG 2



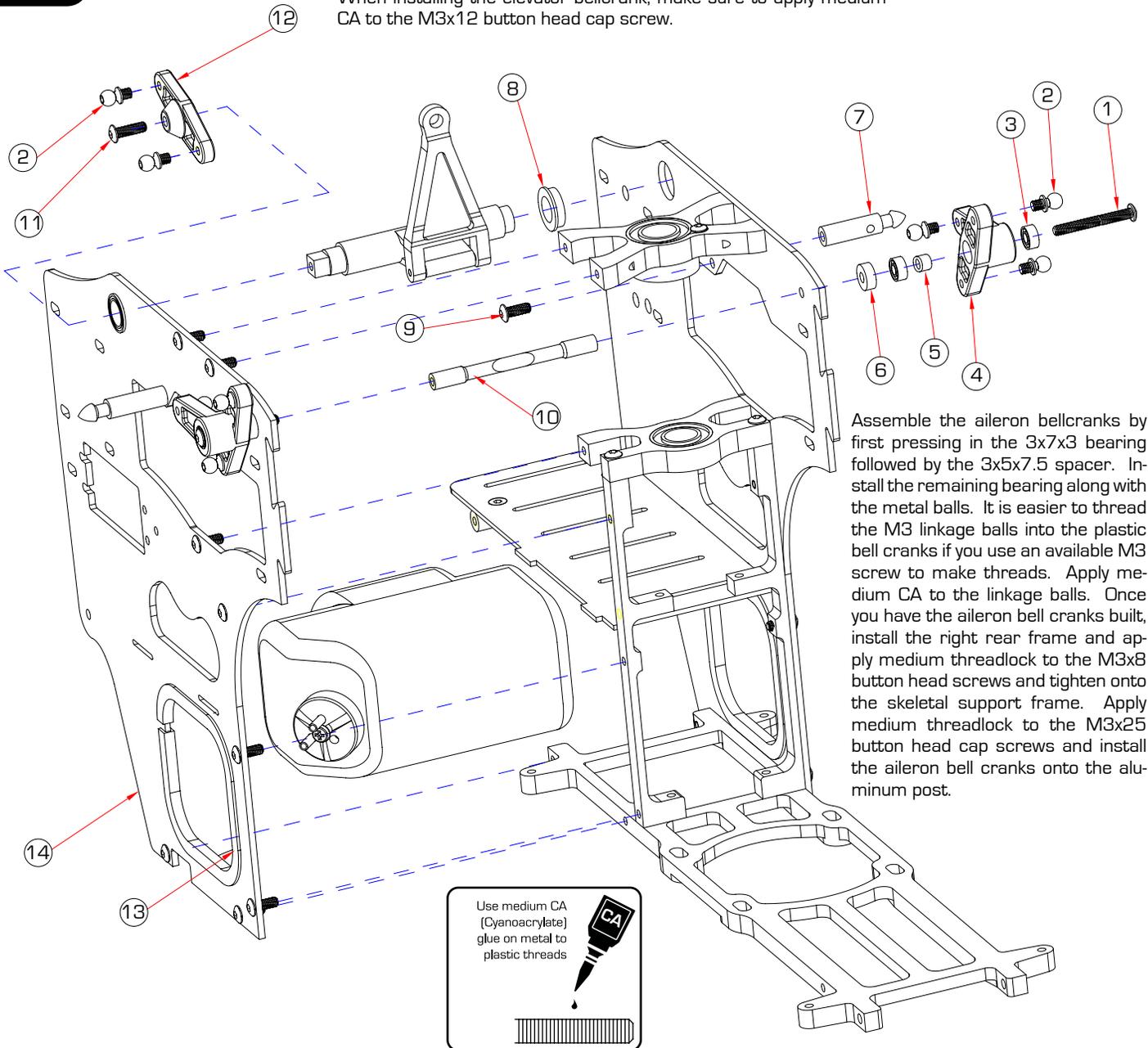
Pay close attention when assembling the fuel tank. The vent tube must be bent and facing upwards when installed into the rubber stopper. There are 3 holes on the rubber stopper but notice only 2 are through holes. Cut the fuel line and attach the clunk to the line. Then attach the fuel line to the short brass tube. When cutting the fuel line, make sure you have enough slack in the fuel line so the clunk can reach all corners of the fuel tank. After installing the shorter brass tube with the fuel line, install the vent tube. Make sure the vent tube is positioned to point upwards in the fuel tank. Once you have everything positioned, slowly turn the M3.5x24 Phillips screw so that you barely grab the end of the small cap (#4). Once you insert the fuel tubing assembly into the tank, it will be very difficult to get this small cap out if you happen to drop it within the fuel tank. Making sure you still have the small cap (#4) attached to the fuel tubing assembly, push the fuel tubing assembly into the tank and start tightening the Phillips screw. This will pull the small cap (#4) closer to the large cap (#2) and expand the rubber stopper. Once tightened, gently tug on the assembly to make sure it is properly installed. It should not come out of the fuel tank.



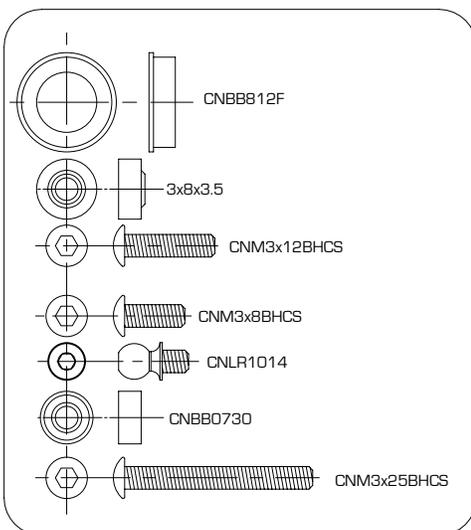
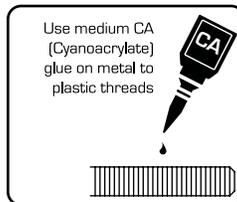
No.	Part #	Description	Qty
1	HIG139	Tapping Screw( 十字紧固螺丝)M3.5x24	1
2	HIG139	Large Cap( 油箱盖)	1
3	HIG139	Rubber Stoper( 油箱塞)	1
4	HIG139	Small Cap( 油箱塞固定座)	1
5	HIG139	Long Tube-straight( 长直铜油管)	1
6	HIG139	Pickup Tube-straight( 短直铜油管)	1
7	HIG139	Fuel Tubing( 塑胶油管)	1
8	HIG139	Fuel Tank Set( 吸油嘴)	1
9	HIG139	Fuel Tank( 油箱)	1

## BAG 2

When installing the elevator bellcrank, make sure to apply medium CA to the M3x12 button head cap screw.



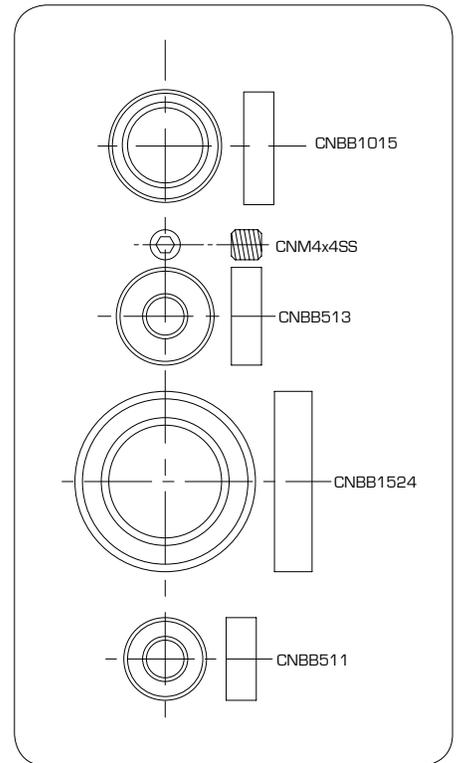
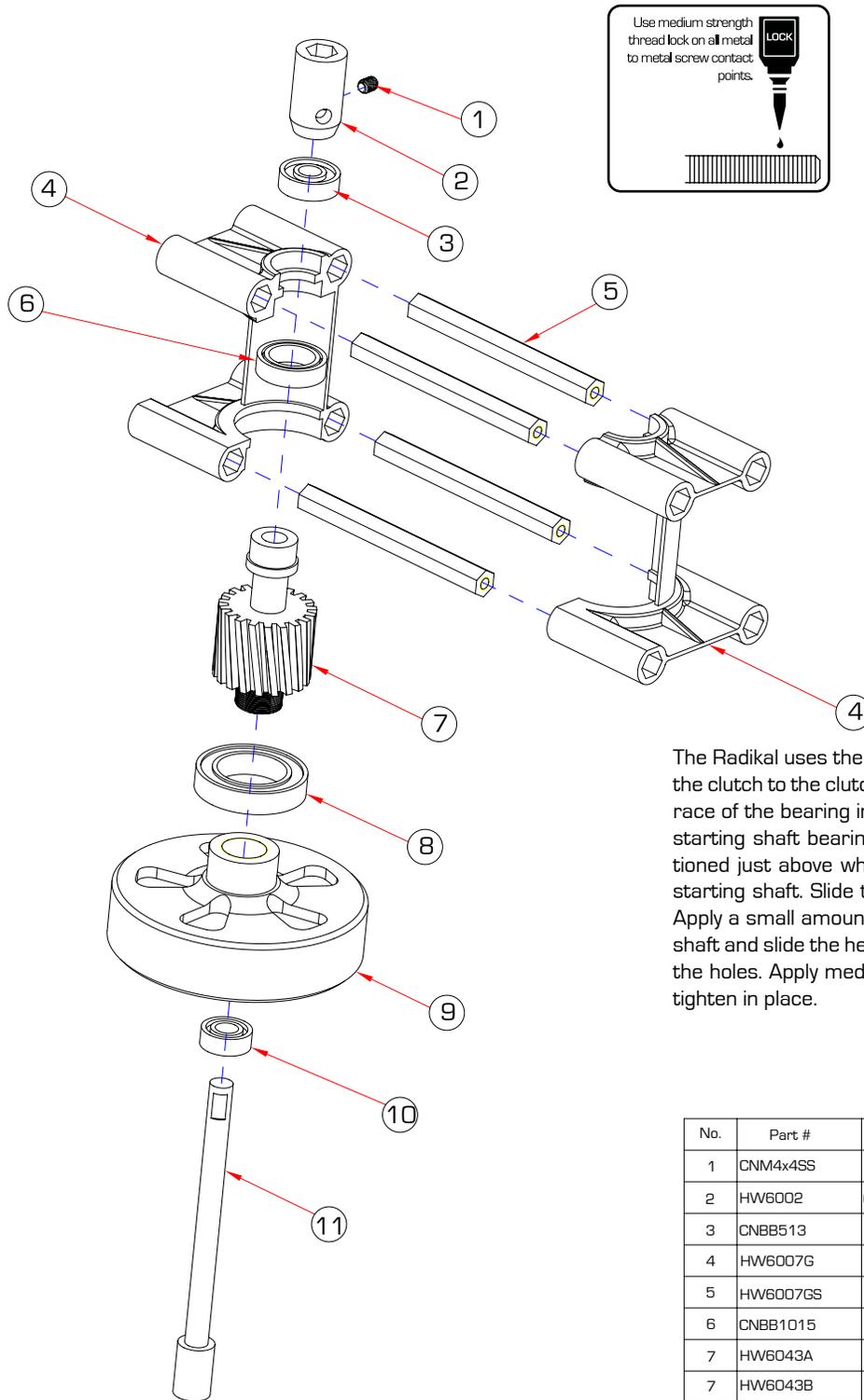
Assemble the aileron bellcranks by first pressing in the 3x7x3 bearing followed by the 3x5x7.5 spacer. Install the remaining bearing along with the metal balls. It is easier to thread the M3 linkage balls into the plastic bell cranks if you use an available M3 screw to make threads. Apply medium CA to the linkage balls. Once you have the aileron bell cranks built, install the right rear frame and apply medium threadlock to the M3x8 button head screws and tighten onto the skeletal support frame. Apply medium threadlock to the M3x25 button head cap screws and install the aileron bell cranks onto the aluminum post.



No.	Part #	Description	Qty
1	CNM3x25BHCS	Button Head Cap Screw( 圆头内六角螺约M3x25	2
2	CNLR1014	M3 Linkage Ball( 球头螺约)	8
3	CNBB0730	Bearing( 滚珠轴承)3x7x3	4
4	HI6031G	Bell Crank( 左右控制臂)	2
5	HI6031G	Bellcrank Spacer( 垫片)3x5x7.5	2
6	HI6031G	Bellcrank Spacer( 垫片)3x8x3.5	2
7	HW6125B	Canopy Standoff( 机头罩支架)	2
8	CNBB812F	Elevator Lever Flange Bearing( 带边滚珠轴承)	2
9	CNM3x8BHCS	Button Head Cap Screw( 圆头内六角螺约M3x8	10
10	HI6031S	Aluminum Post( 铝柱)	1
11	CNM3x12BHCS	Button Head Cap Screw( 圆头内六角螺约M3x12	2
12	HI6032GB	Elevator Bellcrank( 控制臂)	1
13	HI6139B	Fuel Tank Isolators( 油箱橡胶垫)	2
14	HI6116R	Right Rear Frame( 右后侧板)	1

If you have carbon fiber frames, just add a "C" to the end of the frame part number.

## BAG 2



The Radikal uses the regular starting shaft and hex coupler as to align the clutch to the clutchbell. Clean both the starting shaft and the inside race of the bearing inside the clutchbell and the inside race of the top starting shaft bearing. Apply a small amount of Red threadlock positioned just above where the bottom clutchbell bearing will sit on the starting shaft. Slide the starting shaft up through the bearing blocks. Apply a small amount of medium threadlock to the top of the starting shaft and slide the hex coupler in place aligning the flat spot with one of the holes. Apply medium threadlock to the two M4x4 set screws and tighten in place.

Clean the top of the pinion gear and the inside surfaces of both the upper and lower bearings inside the clutch shaft bearing block using alcohol. Apply a small amount of Red threadlock to the top edge of the clutch gear where it will contact the bearing. Press the bearing block in place, firmly seating the bearing against the top of the pinion gear.

No.	Part #	Description	Qty
1	CNM4x4SS	Set Screw[无头内六角螺丝]M4x4	2
2	HW6002	6mm Hex Coupler[六角启动头]	1
3	CNBB513	Bearing[滚珠轴承]5x13x4	1
4	HW6007G	Bearing Block[轴承座]	2
5	HW6007GS	Long Hex Spacers[六角铝柱]L=52MM	4
6	CNBB1015	Bearing[滚珠轴承]10x15x4	1
7	HW6043A	Alloy Drive Gear 14T For LT Version[合金传动齿轮]	1
7	HW6043B	Alloy Drive Gear 16T For HD Version[合金传动齿轮]	1
8	CNBB1524	Bearing[滚珠轴承]15x24x5	1
9	HW6013G	Clutch Bell Assembly[离合器罩]	1
10	CNBB511	Bearing[滚珠轴承]5x11x4	1
11	HW6006	Starting Shaft[启动轴]	1



It is not so apparent how the propeller hub is attached to the engine. A 13mm lock nut is supplied in the kit to aid in the removal of the propeller hub.



First undo the nut and remove the propeller washer. Screw down the original nut onto the stud followed by the locknut.



Install the supplied 13mm locknut and tighten down onto the shaft.



Tighten down on the top lock nut while applying opposite force (unscrewing) to the second nut using the Zenoah supplied wrench. This will allow you to lock the nuts together.



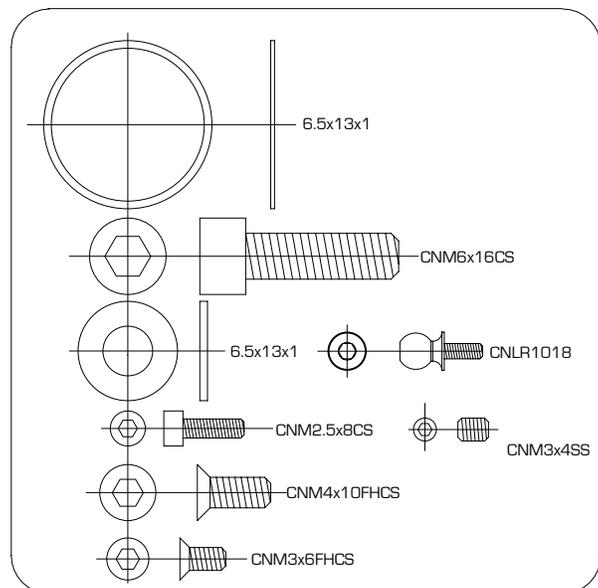
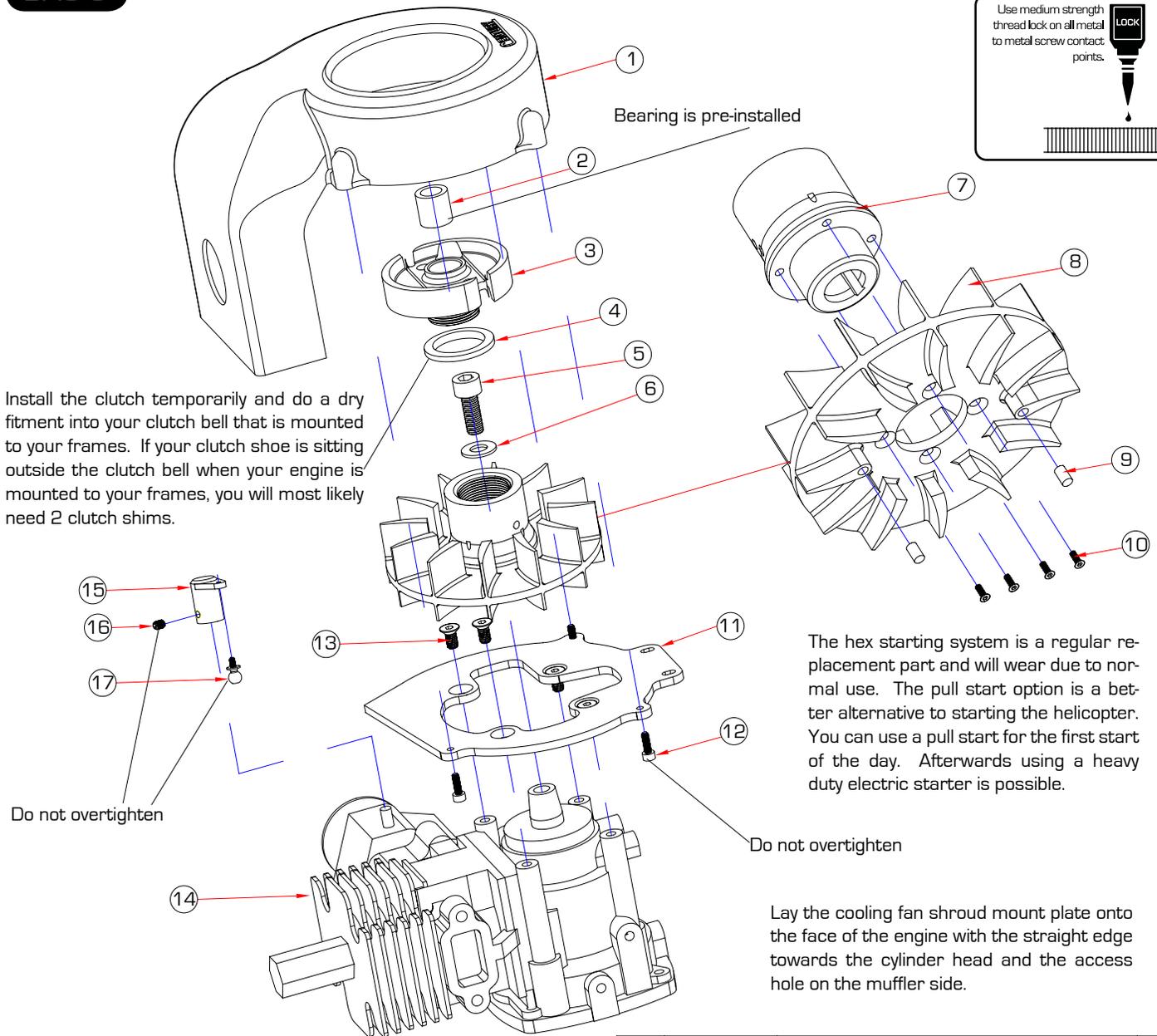
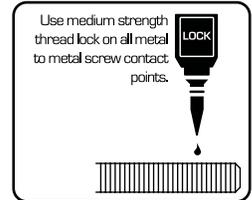
Because you have no use for the propeller hub, you can use a wrench or vice to grab onto the hub while trying to undo the stud. Grabbing onto this aluminum hub may damage the hub but it's of no use in this build. Once this stud is loosened, you can remove the propeller hub.



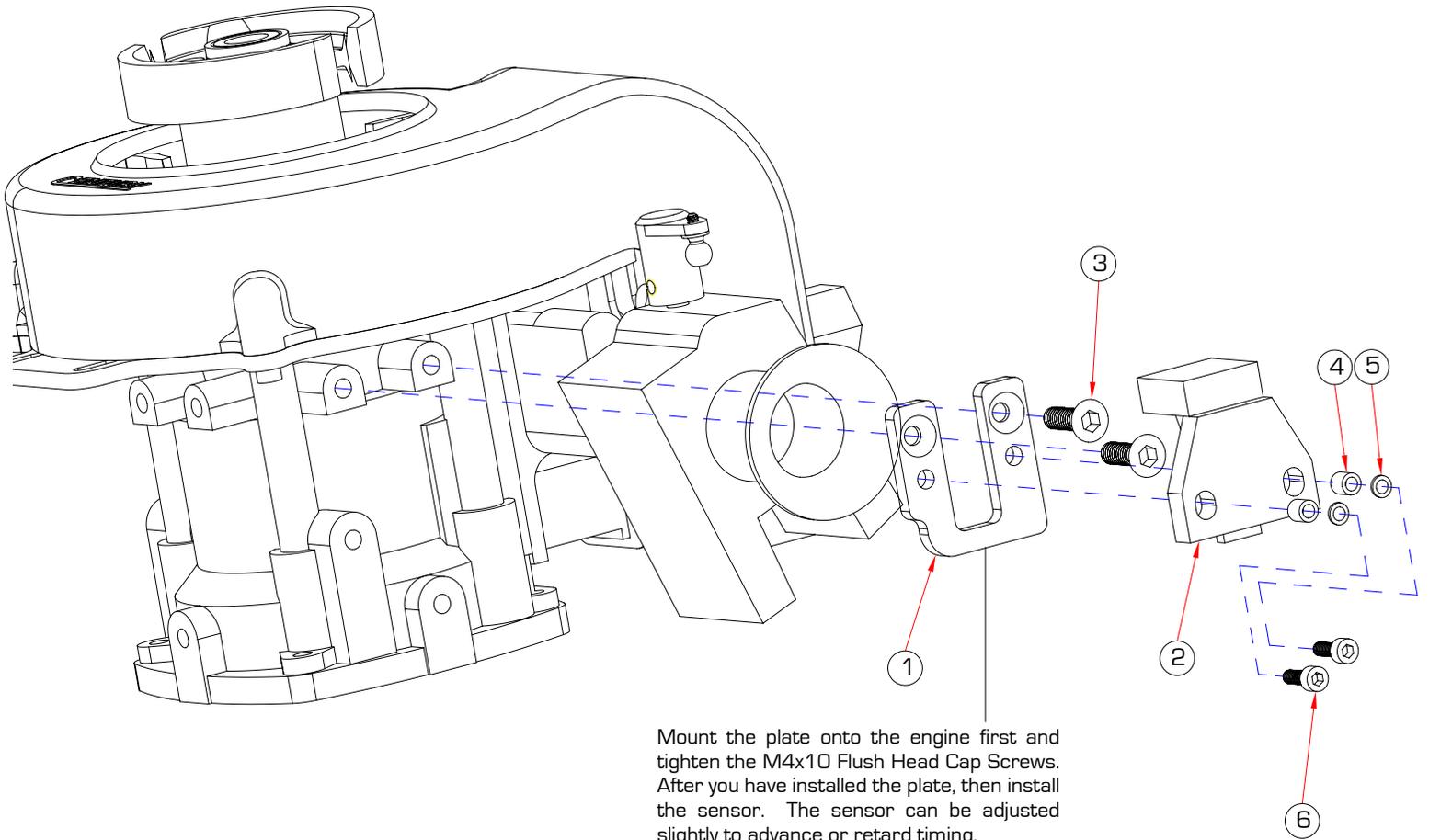
Remove the stud and hand tighten it a few threads into the crank. With the propeller hub still in the vice, gently tap on the head of the stud with a hammer while supporting the engine with your other hand. This will loosen the hub from the crank shaft.



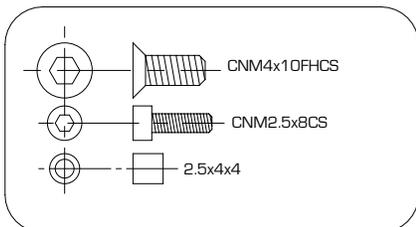
**MAKE SURE NOT TO LOSE THIS KEY!** It is very important to retain this key for the following steps. Without this key, you cannot mount your fan and clutch assembly. After you have removed the hub, remove the bottom plate and flush head cap screws. Set these aside as you will not be needing them for the rest of the build.



No.	Part #	Description	Qty
1	HI6020G	Plastic Cooling Shroud( 风扇罩)	1
2	CN2263K	Auto Hub Assembly(8mm)[ 单向轴承]	1
3	HW6011G	Clutch Shoe( 离合器)	1
4	HW6011GS	Clutch Shim(垫片)20x22x0.5	1
5	CNM6x16CS	Cap Screw[ 杯头内六角螺丝]M6x16	1
6	CNM6.5x13FW	Washer[ 垫片]6.5x13x1	1
7	HI6009GBKH	Cooling Fan Hub( 风扇座)	1
8	HI6009GBK	Cooling Fan( 风扇)	1
9	HI6009GM	Magnet( 磁铁)	2
10	CNM3x6FHCS	Flush Head Cap Screws[ 斜头内六角螺丝]M3x6	4
11	HW6118W	Cooling Shroud Mount Plate[ 挡风板]	1
12	CNM2.5x8CS	Cap Screw[ 杯头内六角螺丝]M2.5x8	3
13	CNM4x10FHCS	Flush Head Cap Screws[ 斜头内六角螺丝]M4x10	4
14	ZENE20EIN	Engine( 引擎) OT INCLUDED	1
15	HW6192B	Carburetor Arm( 化油器控制臂)	1
16	CNM3x4SS	Set Screw( 无头内六角螺丝]M3x4	1
17	CNLR1018	Ultra Short Steel Ball( 球头螺丝)	1

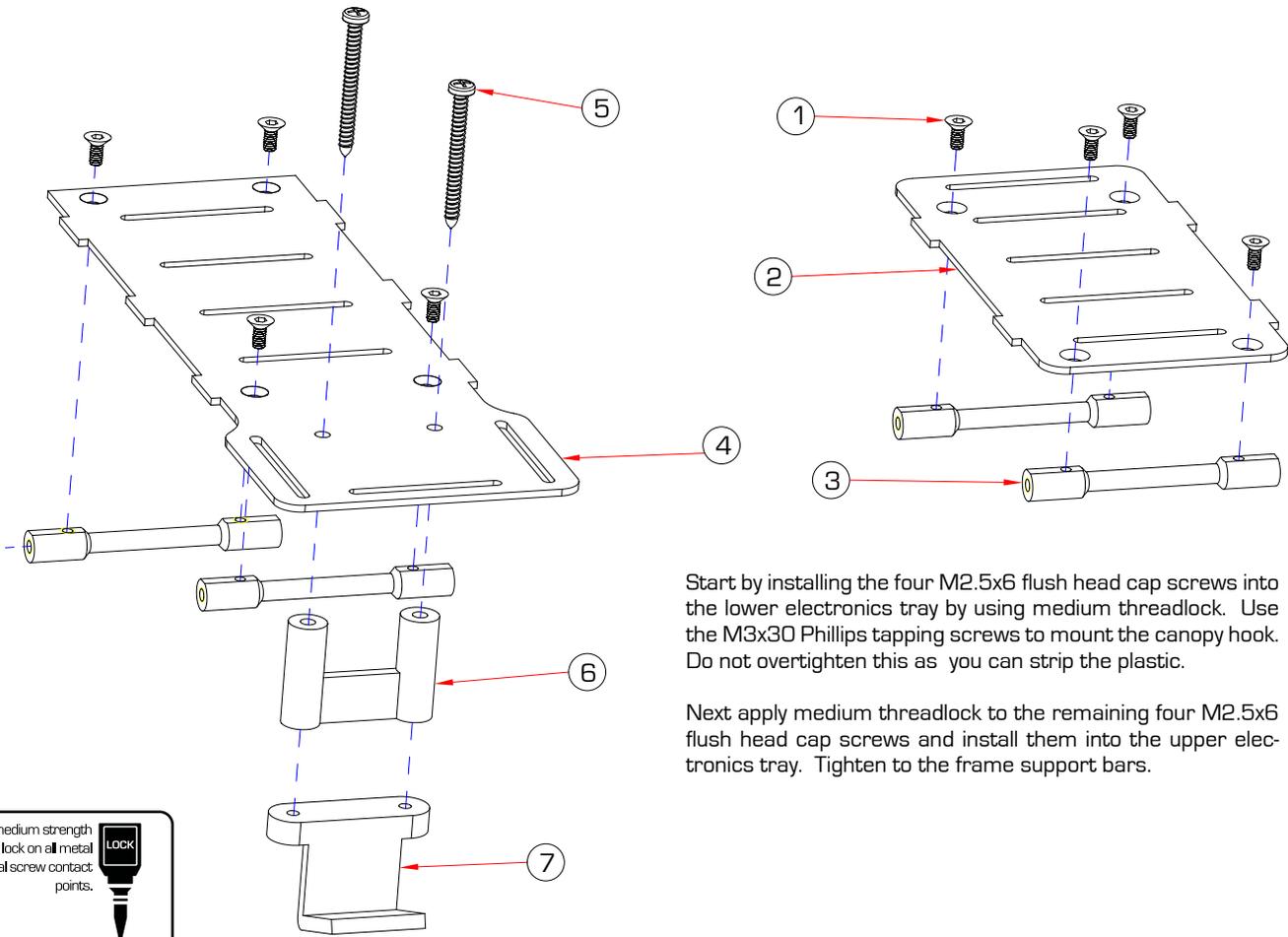


Mount the plate onto the engine first and tighten the M4x10 Flush Head Cap Screws. After you have installed the plate, then install the sensor. The sensor can be adjusted slightly to advance or retard timing.



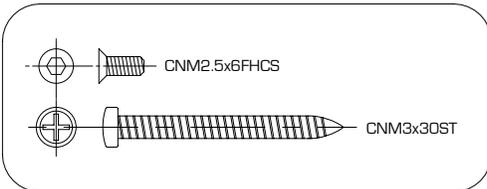
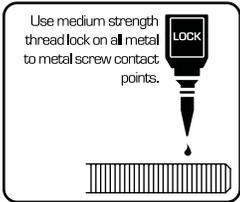
No.	Part #	Description	Qty
1	HI6010	Sensor Adaptor Board[感应器固定板]	1
2	Not Included	Sensor[感应器]	1
3	CNM4x10FHCS	Flush Head Cap Screws[斜头内六角螺絲]M4x10	2
4	HI6010	Copper Sleeve[铜套]2.5x4x4	2
5	CNLR1003	Washer[垫片]3x5x0.5	2
6	CNM2.5x8CS	Cap Screw[杯头内六角螺絲]M2.5x8	2

**BAG 3**



Start by installing the four M2.5x6 flush head cap screws into the lower electronics tray by using medium threadlock. Use the M3x30 Phillips tapping screws to mount the canopy hook. Do not overtighten this as you can strip the plastic.

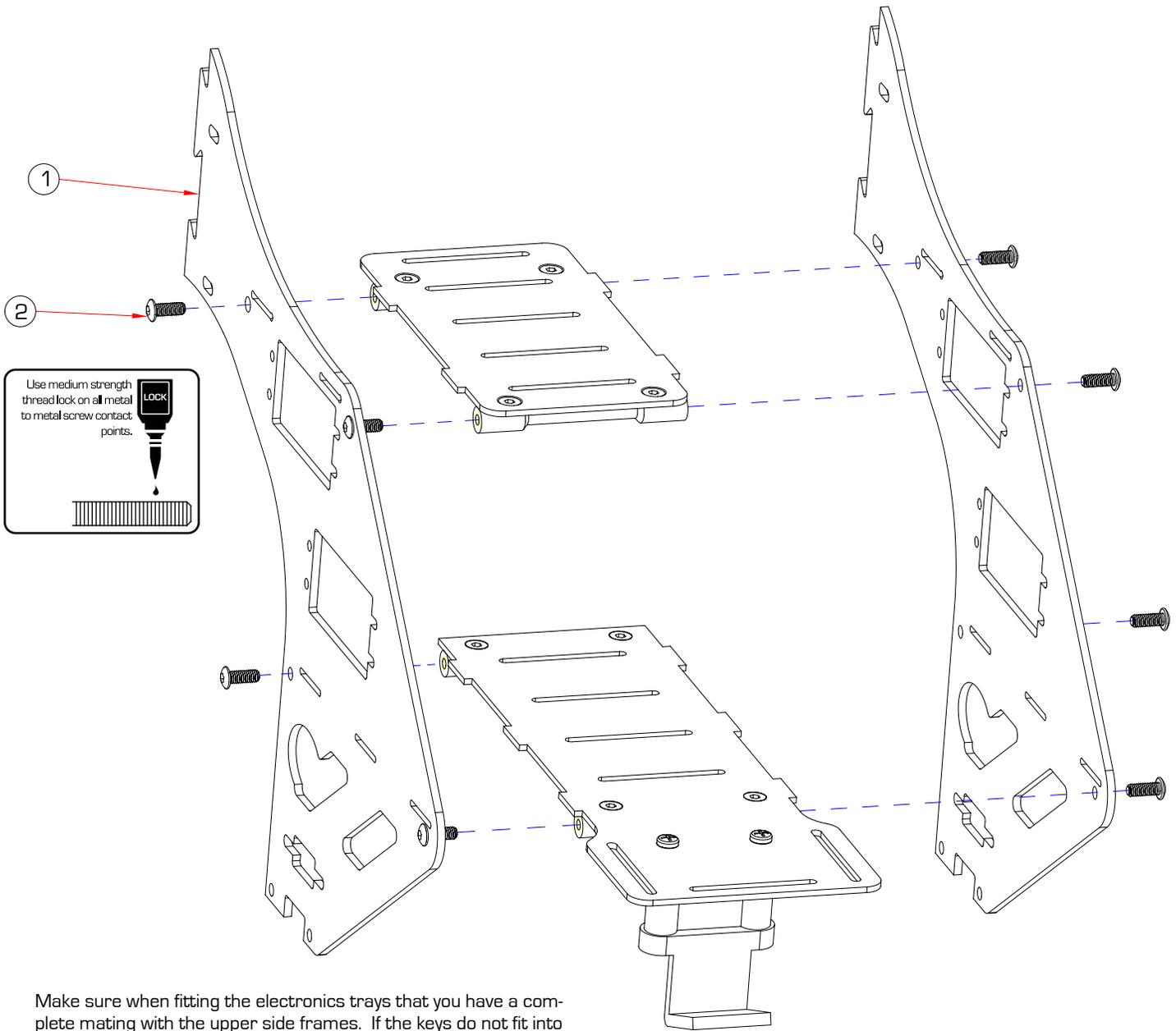
Next apply medium threadlock to the remaining four M2.5x6 flush head cap screws and install them into the upper electronics tray. Tighten to the frame support bars.



No.	Part #	Description	Qty
1	CNM2.5x6FHCS	Flush Head Cap Screws( 斜头内六角螺丝)M2.5x6	8
2	HWS113A	Upper Electronics Tray( 变速器固定板)	1
3	HWS113AS	Frame Support Bar( 铝柱)	4
4	HI6113B	Lower Electronics Tray( 接收机固定板)	1
5	CNM3x30ST	M3x30 Phillips Tapping Screws( 自攻螺丝)	2
6	HI3129	Canopy Mount Spacer ( 机头罩扣座)	1
7	HI3129	Canopy Mount Hook( 机头罩扣)	1

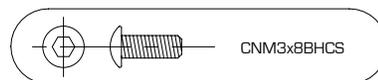
If you have carbon fiber frames, just add a "C" to the end of the frame part number.

**BAG 3**



Make sure when fitting the electronics trays that you have a complete mating with the upper side frames. If the keys do not fit into the slots on the upper side frames and you tighten down on the screws, your frame will be crooked.

Apply medium threadlock to the eight M3x8 button head cap screws and tighten down.



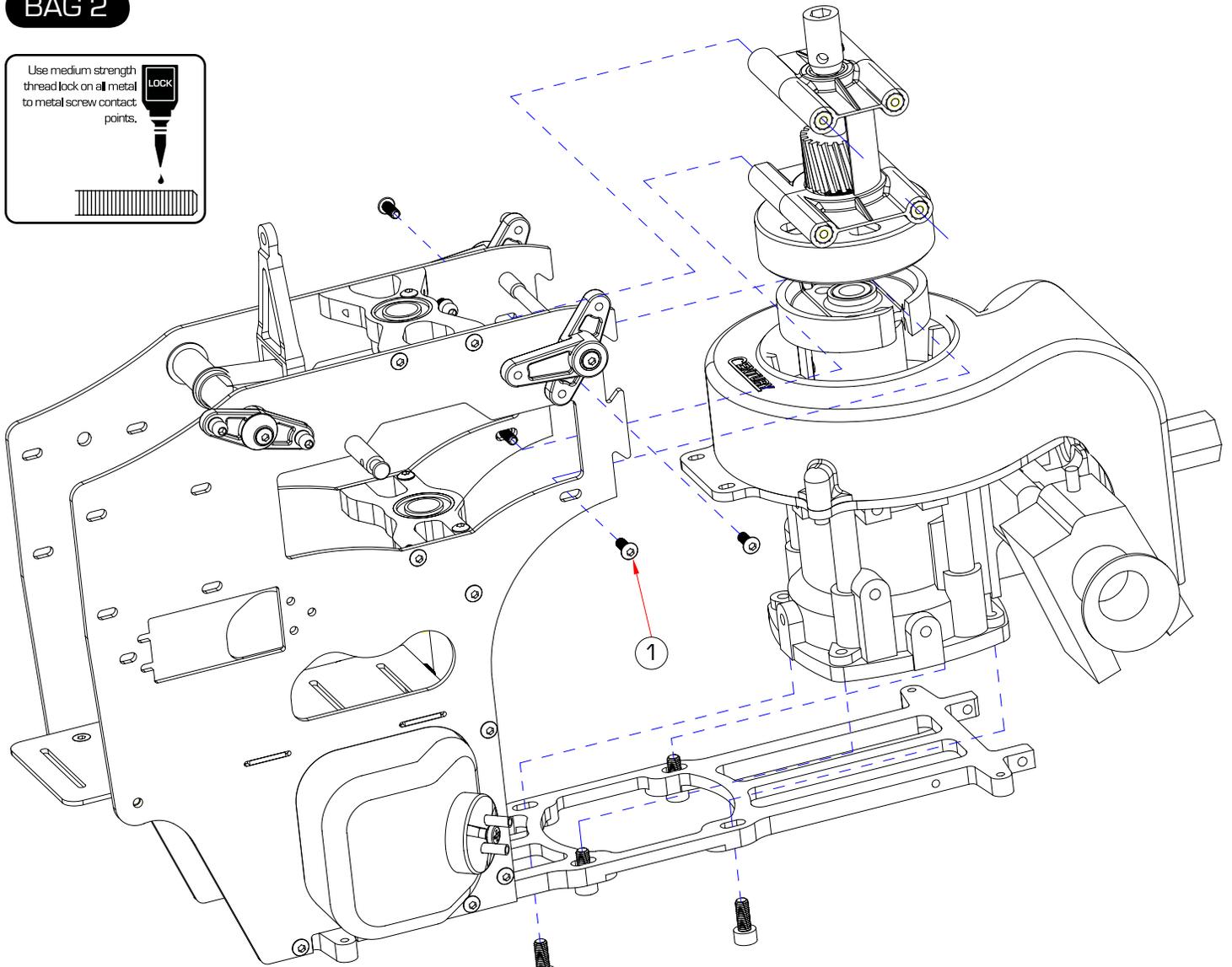
No.	Part #	Description	Gty
1	HI6115GL	Front Frames (前侧板)	2
2	CNM3x8BHCS	Button Head Cap Screw(圆头内六角螺丝)M3x8	8

If you have carbon fiber frames, just add a "C" to the end of the frame part number.

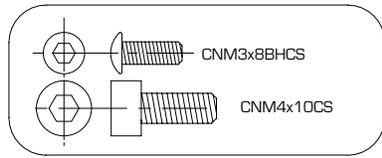
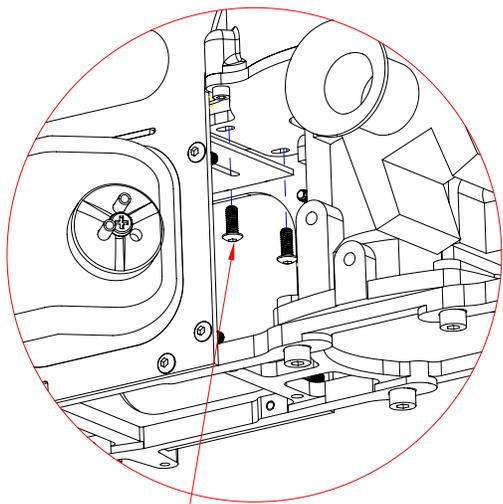
**BAG 2**

Use medium strength thread lock on all metal to metal screw contact points.

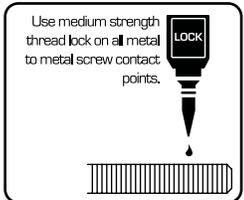
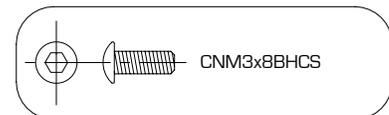
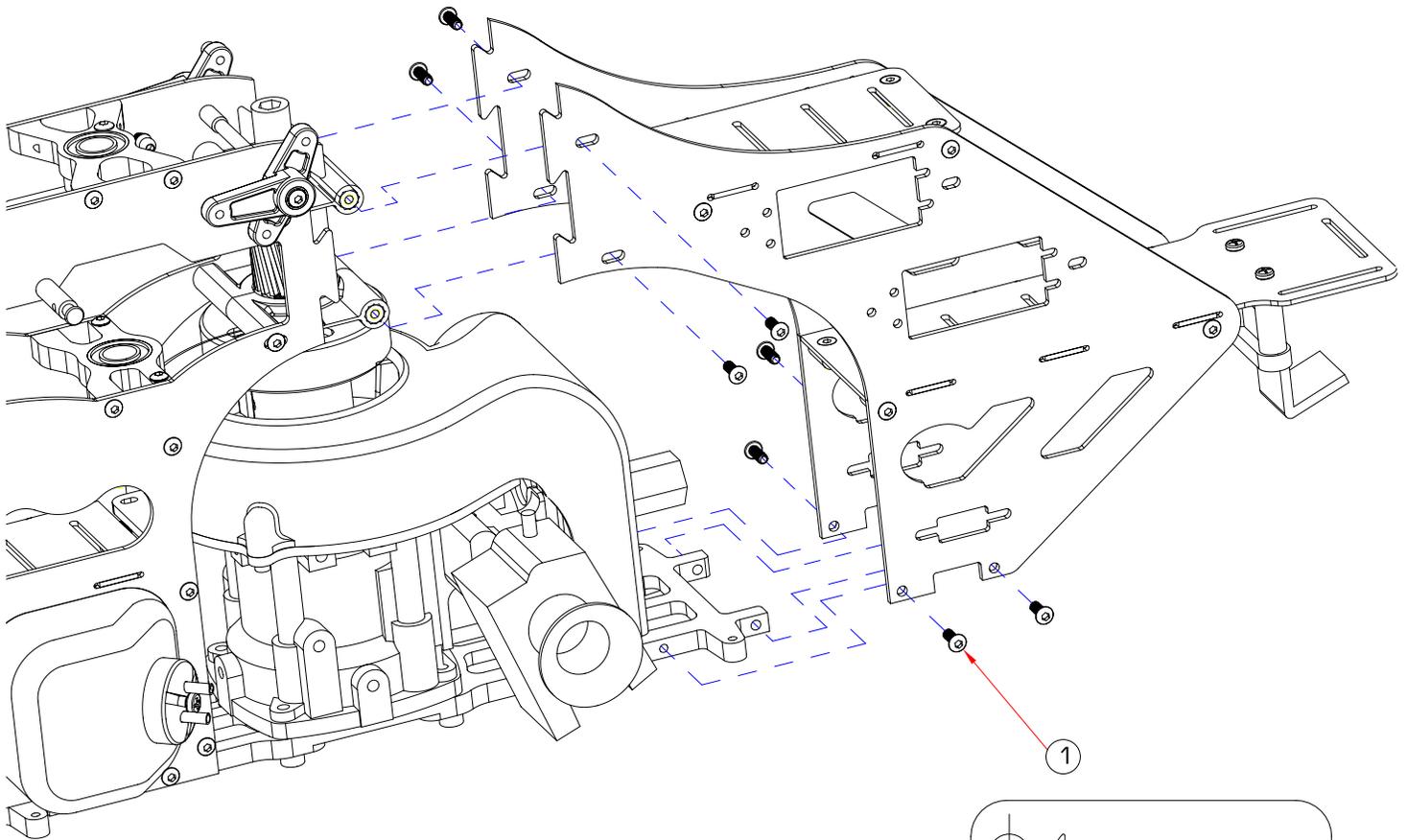




Loosely fit the CNM4X10 cap screws that hold the engine on the plate. Then line up the bearing assembly in the upper portion of the frames. Keep this loose for now until you are ready to mesh the pinion gear with the main gear.



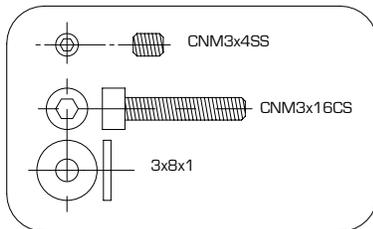
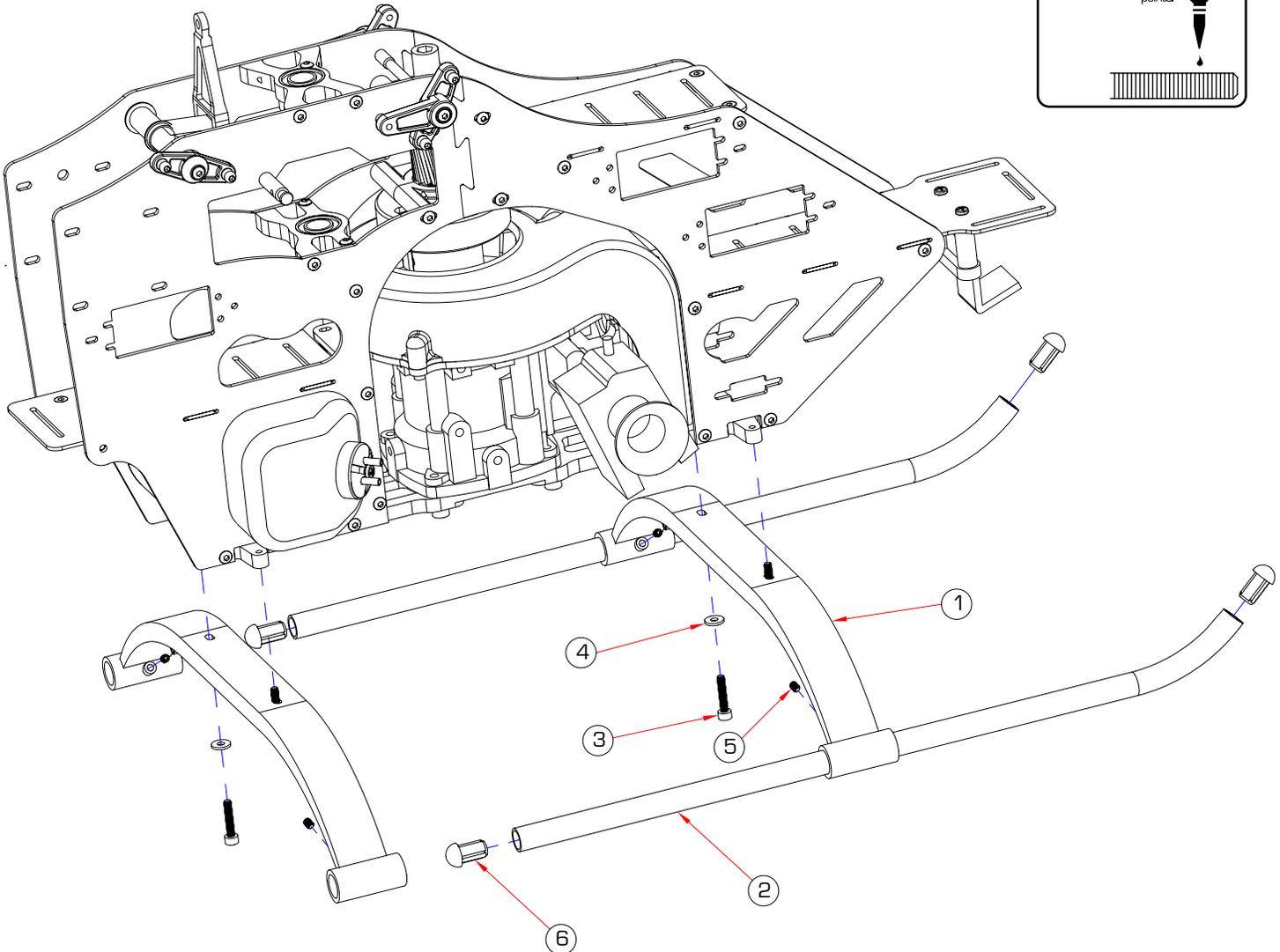
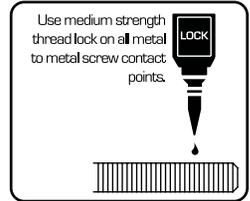
No.	Part #	Description	Qty
1	CNM3x8BHCS	Button Head Cap Screw (圆头内六角螺丝) M3x8	6
2	CNM4x10CS	Cap Screw (杯头内六角螺丝) M4x10	4



When mounting the front frames to the rear frames, make sure the keyed split matches up properly prior to tightening the eight M3x8 button head cap screws. This is very important as you can warp the frames if it's not set in place when tightening down. Prior to installing the eight M3x8 button head cap screws, be sure to use medium threadlock.

No.	Part #	Description	Qty
1	CNM3x8BHCS	Button Head Cap Screw( 圆头内六角螺丝M3x8	8

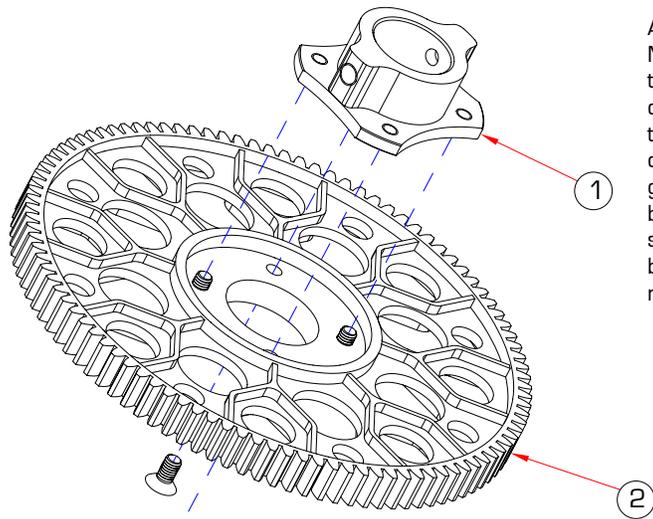
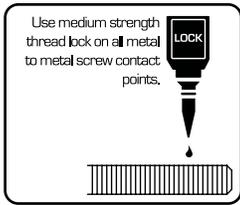
**LANDING GEAR PACKAGE**



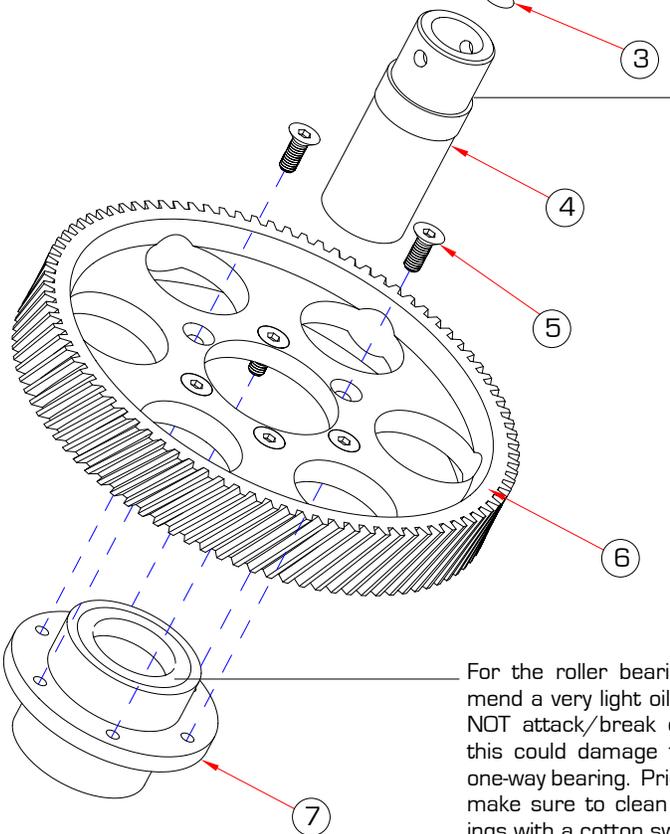
Install the landing skids onto the landing struts one side at a time. After installing the landing skids, position the landing struts on the skids so that they match up with the mounting positions on the frames. Place the washers onto the M3x16 cap screws and then apply medium threadlock. Install the screws through the landing struts and tighten onto the frames. Turn the landing skids so that the curve towards the front is facing straight up. Make sure you have approximately 28mm of skid showing out the back. Install the four M3x4 set screws to lock the skids into place. Do not tighten these too much as you can crack the plastic struts. Lastly, install the landing skid stoppers.

No.	Part #	Description	Qty
1	HI3122A	Plastic Struts(脚架)	2
2	HW3123A	Aluminum Skids(脚架弯管)	2
3	CNM3x16CS	Cap Screw(杯头内六角螺约M3x16)	4
4	CNM3x8FW	M3x8x1 Flat Washers(垫片)	4
5	CNM3x4SS	Set Screw(无头内六角螺约M3x4)	4
6	HW3123A	Landing Skids Stopper(脚架塞)	4

## BAG 3

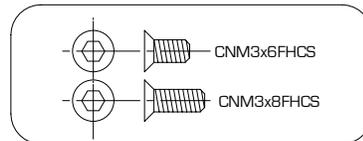


Apply medium threadlock to the four M3x6 flush head cap screws and install through the tail drive gear tightening onto the driven tail hub. Apply medium threadlock to the six M3x8 flush head cap screws and install onto the main gear with the auto-rotation one way bearing. Make sure the flush head cap screws are installed onto the concave beveled side of the screw holes on the main gear.

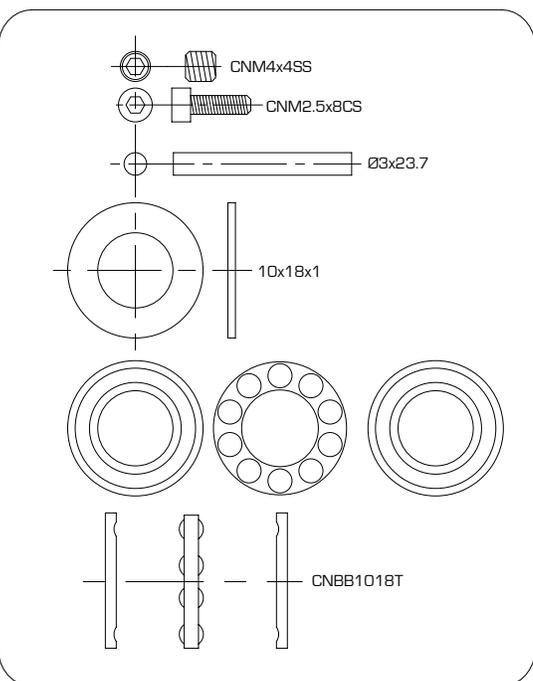
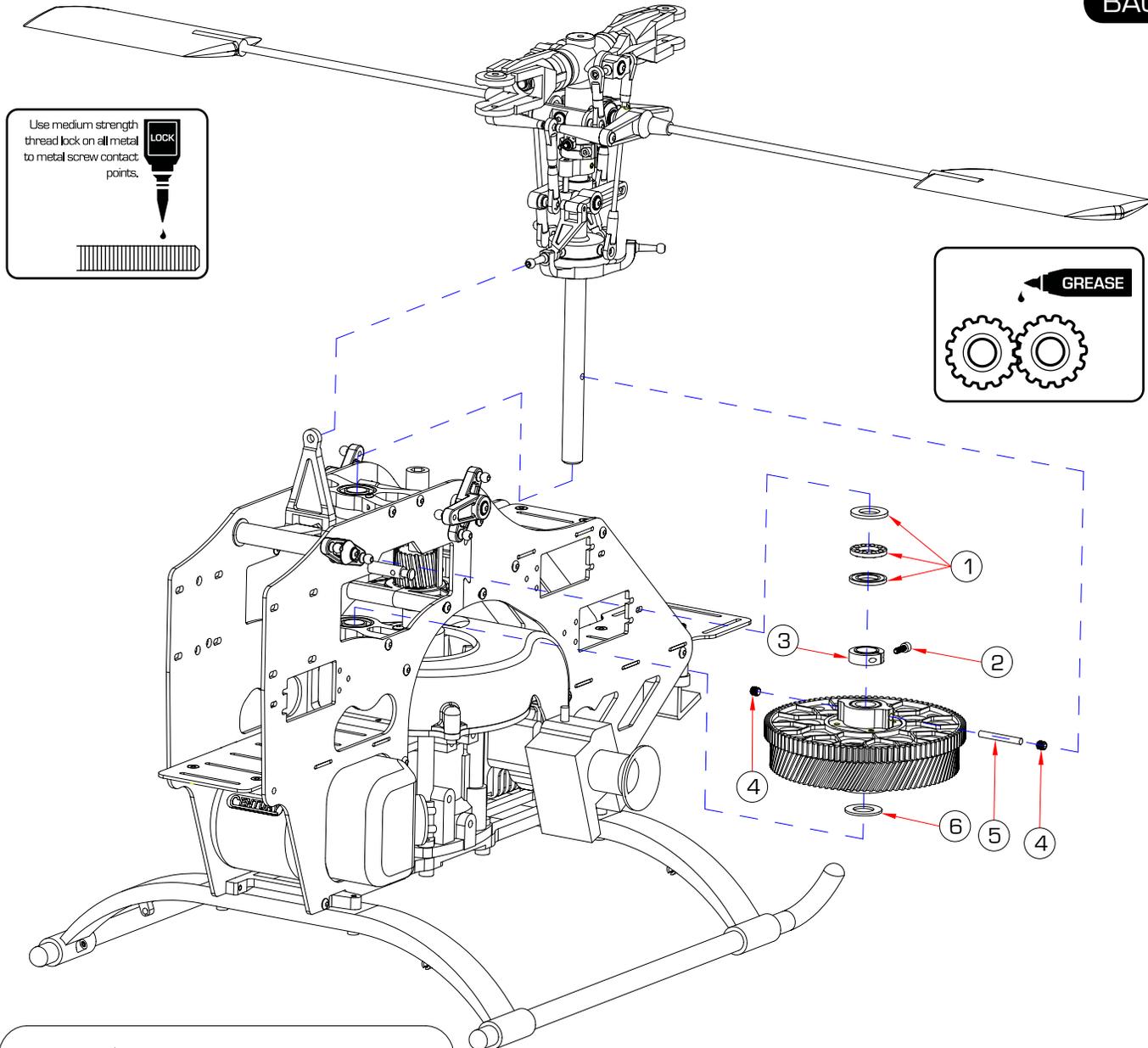


Be sure to clean the inside and outside of the main shaft sleeve with alcohol prior to installation.

For the roller bearings, we recommend a very light oil. The oil **MUST NOT** attack/break down plastic as this could damage the cage in the one-way bearing. Prior to applying oil, make sure to clean the roller bearings with a cotton swab making sure there is no debris in the bearings.



No.	Part #	Description	Qty
1	HW6057A	Driven Tail Hub(传动主齿轮座)	1
2	HI6057	Tail Drive Gear(传动主齿轮)	1
3	CNM3x6FHCS	Flush Head Cap Screws[斜头内六角螺丝]M3x6	4
4	HW6057C	Main Shaft Sleeve(主齿轮铁套)	1
5	CNM3x8FHCS	Flush Head Cap Screws[斜头内六角螺丝]M3x8	6
6	HI6057C	Main Gear 90T [斜齿轮]	1
7	HW6057D	One-way Bearing(单向轴承座)	1



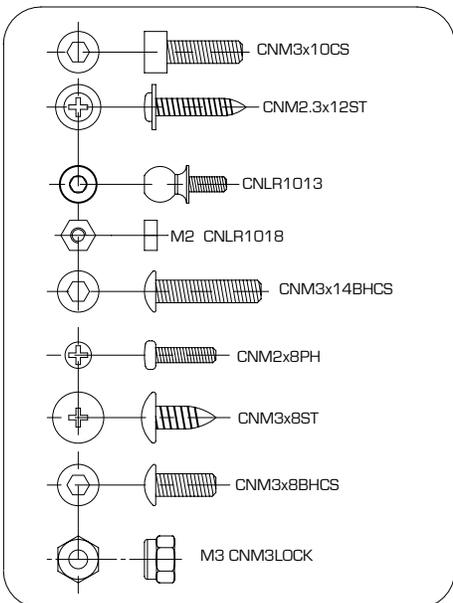
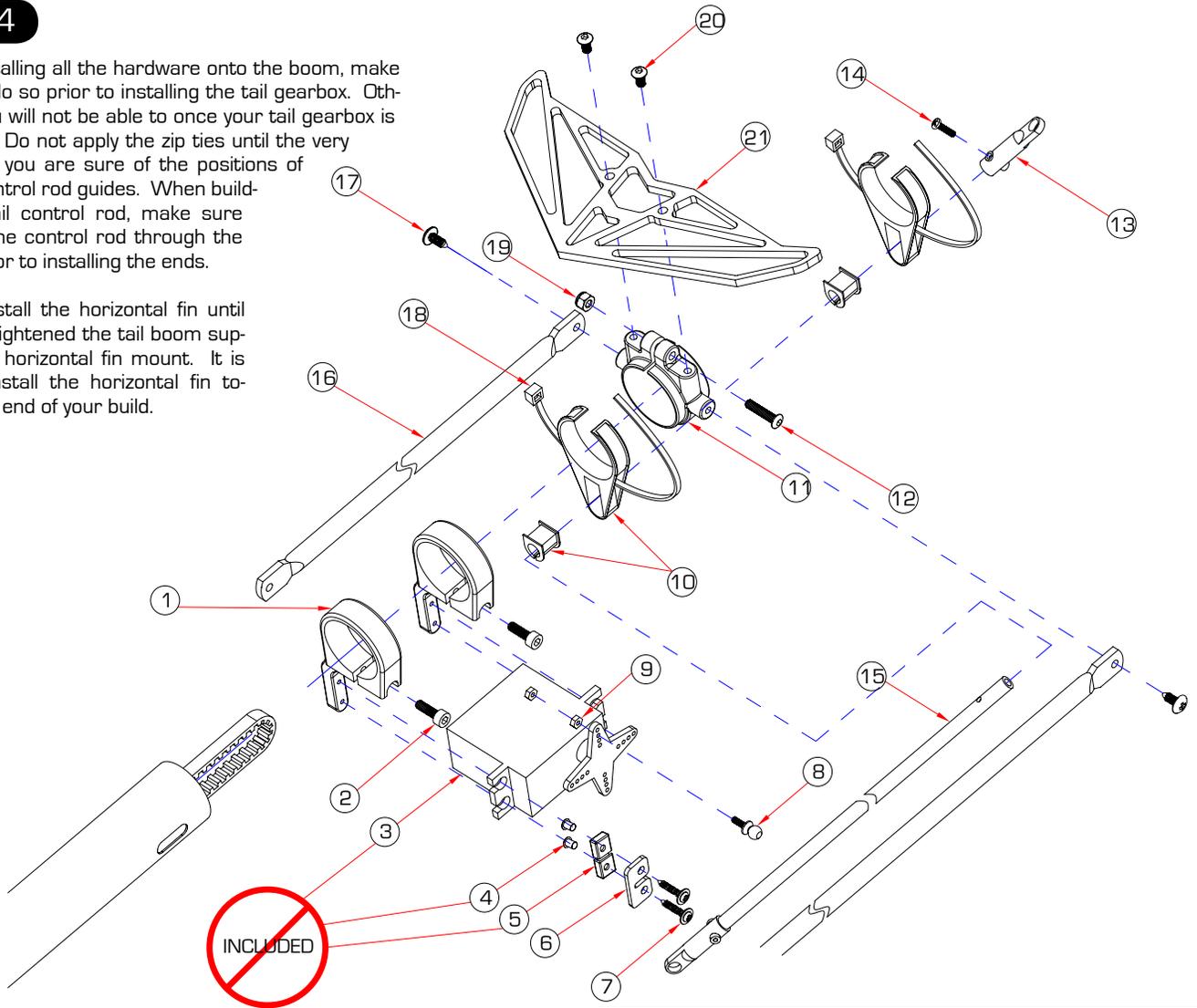
Apply grease to the thrust bearing. Place the Main Gear assembly into the frames. Insert the main shaft with head assembly through the bearing blocks while lining up the thrust bearing, and mast stopper while going through the Main Gear assembly. Line up the whole in the Main Shaft with the hole on the Driven Tail Hub. With the help of needle nose pliers or hemostats, place the Pin (#5) through while making sure you have it going through the Main Shaft. Install the 2 M4x4 set screws making sure you have them evenly threaded on both sides. When installing the Mast Stopper (#3), make sure it is pushed up to the top prior to tightening the M2.5x8 Cap Screw.

No.	Material No.	Description	Qty
1	CNBB1018T	Thrust Bearing[ 止推轴承]10x18x5.5	1
2	CNM2.5X8CS	Cap Screw[ 杯头内六角螺母]M2.5x8	1
3	HW6054	Mast Stopper[ 主轴限位块]	1
4	CNM4x4SS	Set Screw[ 无头内六角螺母]M4x4	2
5	HW6057AS	Pin[ 插销]Ø3x23.7	1
6	HW6057DS	Copper Washer[ 铜垫片]10x18x1	1

## BAG 4

When installing all the hardware onto the boom, make sure you do so prior to installing the tail gearbox. Otherwise you will not be able to once your tail gearbox is mounted. Do not apply the zip ties until the very end when you are sure of the positions of the tail control rod guides. When building the tail control rod, make sure to place the control rod through the guides prior to installing the ends.

Do not install the horizontal fin until you have tightened the tail boom supports and horizontal fin mount. It is best to install the horizontal fin towards the end of your build.



No.	Part #	Description	Qty
1	HI6080B	Tail Servo Mount[ 尾翼伺服机座 ]	2
2	CNM3x10CS	Cap Screw[ 杯头内六角螺絲 ]M3x10	2
3	NOT INCLUDED	Servo[ 伺服机 ]	2
4	NOT INCLUDED	Copper Rivet[ 铜铆钉 ]	2
5	NOT INCLUDED	Anti-Vibration Pad[ 防震胶垫 ]	2
6	HI3205A	Servo Mounting Plate[ 伺服机固定板 ]	2
7	CNM2.3x12ST	Self Tapping Screws[ 尖尾自攻螺絲 ]M2.3x12	4
8	CNLR1013	Steel Ball 2mm Thread[ m2 球头螺絲 ]	1
9	CNLR1018	M2 Hex Nuts[ m2 六角螺母 ]	2
10	HI6106B	Adjustable Tail Guides[ 尾拉杆固定座 ]	1
11	HI6068A	Horizontal Fin Mount[ 水平翼固定座 ]	1
12	CNM3x14BHCS	Button Head Screw[ 圆头内六角螺絲 ]M3x14	1
13	CNE543	Tail Boom Support Strut End[ 连杆头 ]	2
14	CNM2x8PH	Phillips Screw[ 圆头十字螺絲 ]M2x8	2
15	CNE543	Tail Control Rod[ 尾舵控制连杆 ]	1
16	HW3202C	Tail Boom Support Struts[ 尾支撑杆 ]	2
17	CNM3x8ST	Self Tapping Screws[ 尖尾自攻螺絲 ]M3x8	2
18	HI6106B	Zip Tie[ 扎带 ]	1
19	CNM3LOCK	M3 Locknut[ M3 螺母 ]	1
20	CNM3x8BHCS	Button Head Screw[ 圆头内六角螺絲 ]M3x8	2
21	HI6067GH	Horizontal Fin[ 水平翼 ]	1

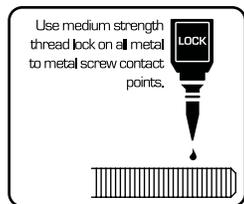
If you have carbon fiber frames, just add a "C" to the end of the frame part number.

## BAG 4

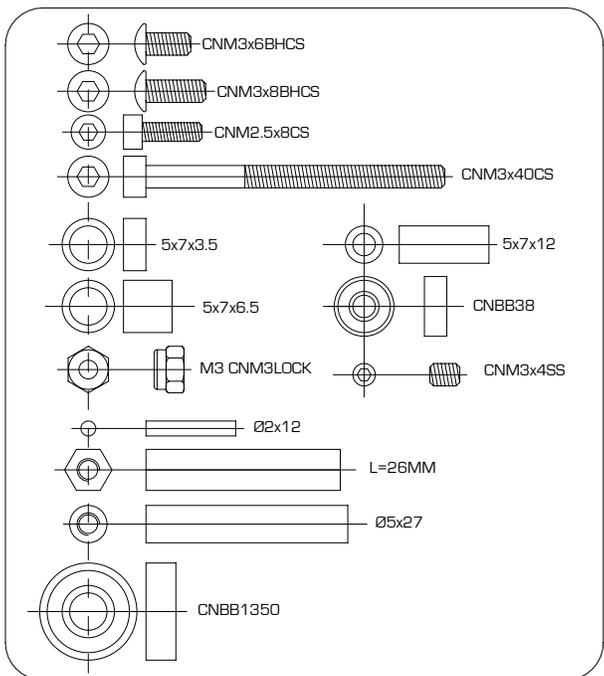
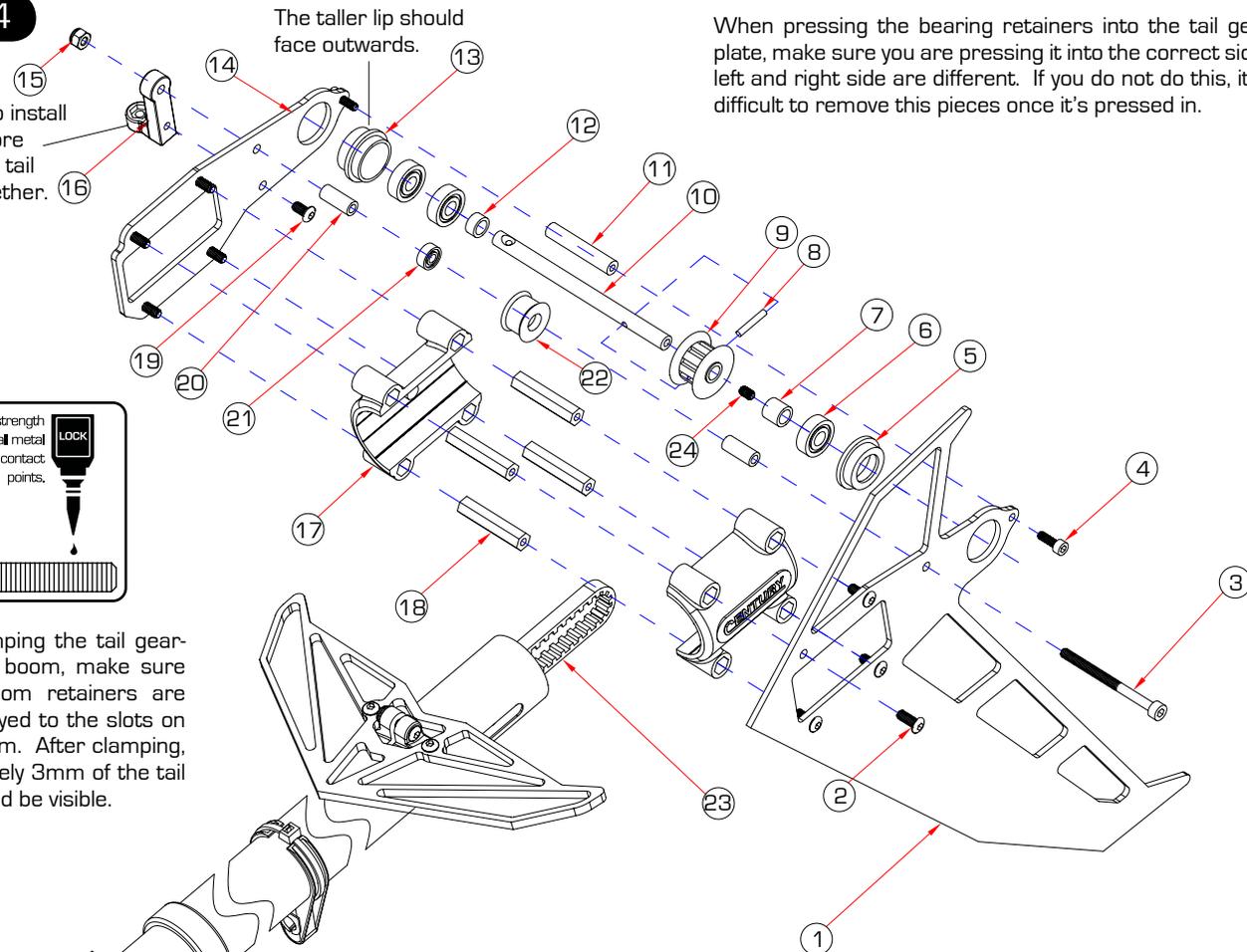
Make sure to install this first before clamping the tail gearbox together.

The taller lip should face outwards.

When pressing the bearing retainers into the tail gear box plate, make sure you are pressing it into the correct side. The left and right side are different. If you do not do this, it will be difficult to remove this pieces once it's pressed in.



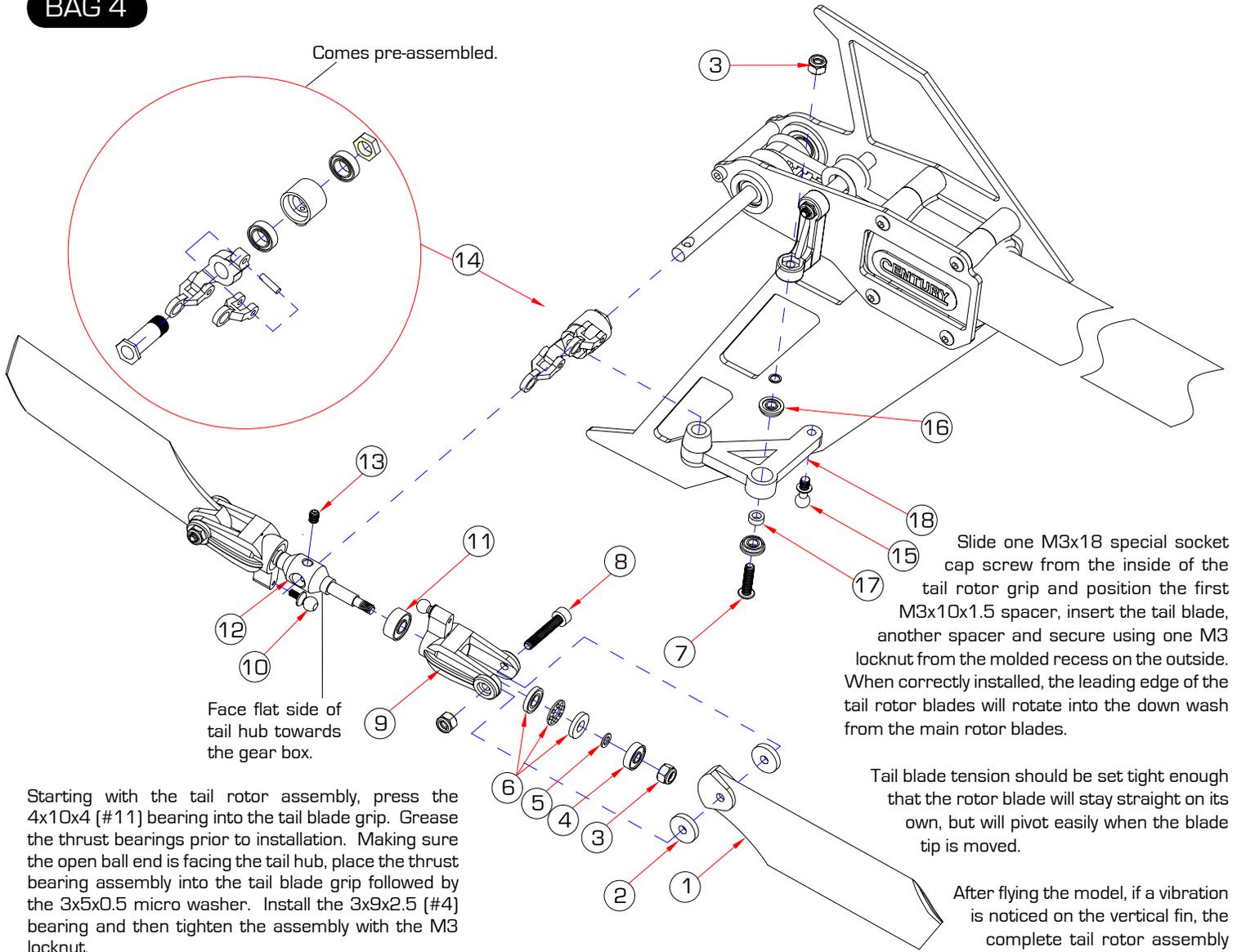
When clamping the tail gearbox to the boom, make sure the tail boom retainers are properly keyed to the slots on the tail boom. After clamping, approximately 3mm of the tail boom should be visible.



No.	Part #	Description	Qty
1	HI6067GV	Vertical Fin(垂直翼)	1
2	CNM3x8BHCS	Button Head Screw(圆头内六角螺絲)M3x8	8
3	CNM3x40CS	Cap Screw(杯头内六角螺絲)M3x40	1
4	CNM2.5x8CS	Cap Screw(杯头内六角螺絲)M2.5x8	1
5	HI6078H	Bearing Units(轴承套)	1
6	CNBB1350	Bearing(滚珠轴承)5x13x4	3
7	HW6073B	Spacer Units(铝套)M5x7x6.5	1
8	CNE529	Lock Pin(插销)Ø2x12	1
9	CNE529	Tail Gear(尾皮带轮)	1
10	HW6073B	Tail Output Shaft(尾翼轴)	1
11	HW6078TP	Threaded Spacer(铝柱)Ø5x27	1
12	HW6073B	Spacer Units(铝套)5x7x3.5	1
13	HI6078H	Tail Gearbox Bearing Retainer(双轴承套)	1
14	HW6078TP	Tail Gear Box Plate-Right(尾齿轮箱夹片)	1
15	CNM3LOCK	M3 Locknut(M3螺母)	1
16	HI6078B	Tail Pitch Bellcrank "L" Arm(L臂)	1
17	HI6078B	Tail Gear Box(尾齿轮箱)	2
18	HI6078B	Short Threaded Hex Spacer(六角铝柱)L=26mm	4
19	CNM3x6BHCS	Button Head Screw(圆头内六角螺絲)M3x6	1
20	HI6078P	Spacer(铝套)3x5x12	2
21	HI6078P	Bearing(滚珠轴承)3x8x3	1
22	HI6078P	Tail Belt Tensioner Pulley(皮带压轮)	1
23	HI6631	Tail Belt(皮带)	1
24	CNM3x4SS	Set Screw(无头内六角螺絲)M3x4	1

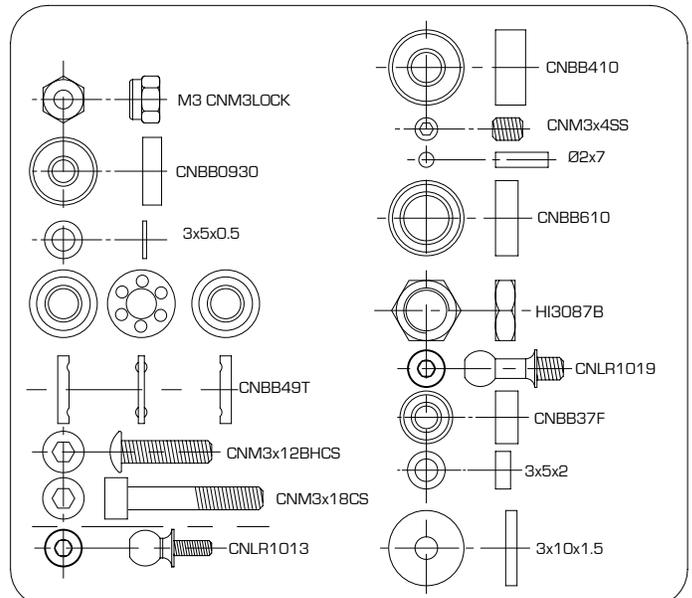
If you have carbon fiber frames, just add a "C" to the end of the frame part number.

## BAG 4



Starting with the tail rotor assembly, press the 4x10x4 (#11) bearing into the tail blade grip. Grease the thrust bearings prior to installation. Making sure the open ball end is facing the tail hub, place the thrust bearing assembly into the tail blade grip followed by the 3x5x0.5 micro washer. Install the 3x9x2.5 (#4) bearing and then tighten the assembly with the M3 locknut.

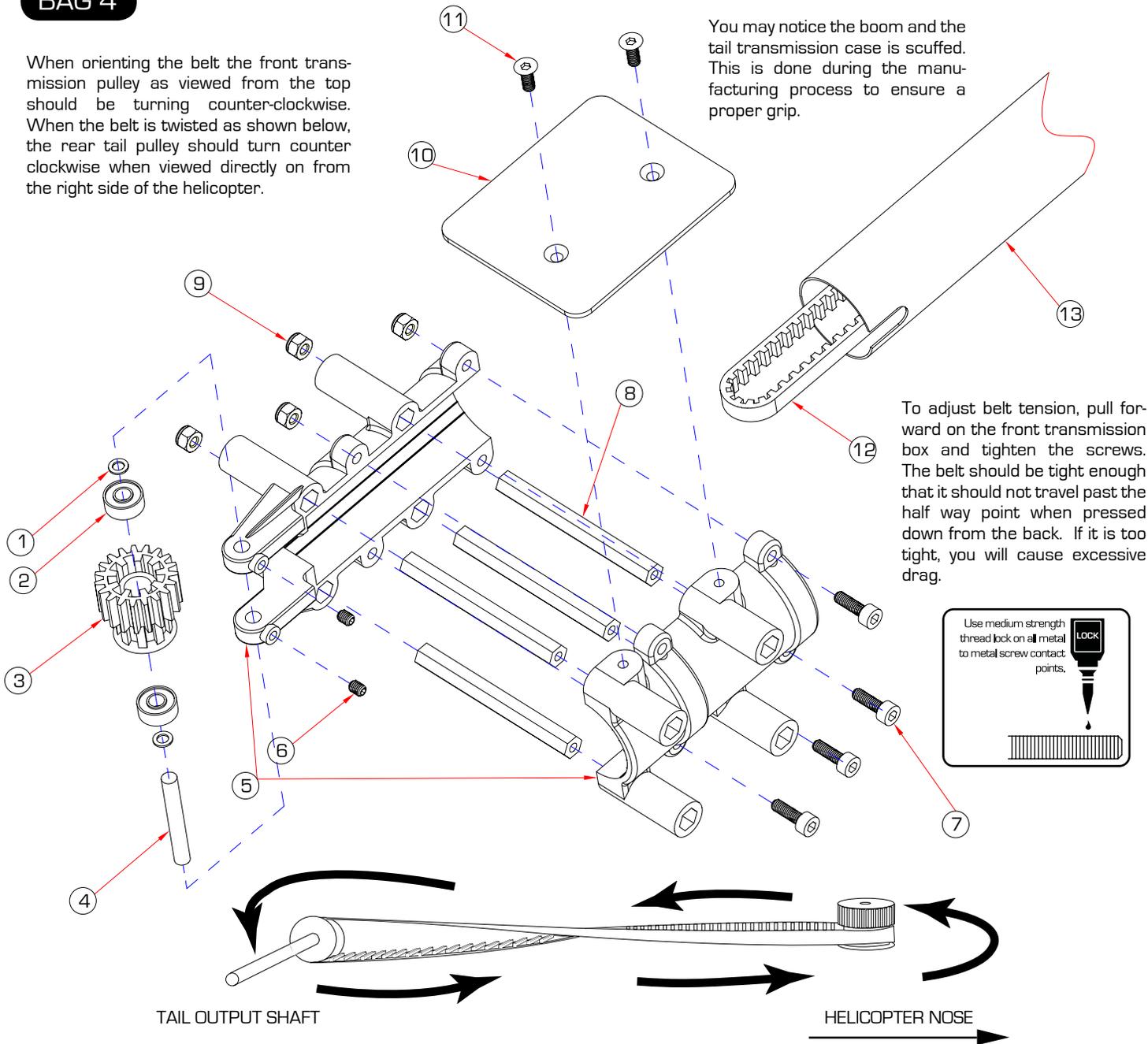
No.	Part #	Description	Qty
1	HI6099A	Tail Rotor Blades(尾旋翼)	2
2	HW6204	Micro Washer(垫片)3x10x1.5	4
3	CNM3LOCK	M3 Locknut(M3 螺母)	3
4	CNBB0930	Bearing(滚珠轴承)3x9x2.5	2
5	CNLR1003	Micro Washer(垫片)3x5x0.5	3
6	CNBB49T	Thrust Ball(止推轴承)d4xD9x4	2
7	CNM3x16BHCS	Button Head Screw(圆头内六角螺钉)M3x16	2
8	CNM3x18CS	Cap Screw(杯头内六角螺钉)M3x18	2
9	HI6096A	Tail Rotor Grip(尾旋翼夹片)	2
10	CNLR1013	Steel ball 2mm Thread(m2 球头螺丝)	2
11	CNBB410	Bearing(滚珠轴承)4x10x4	2
12	HW3098A	Steel Tail Rotor(尾旋翼中心座)	1
13	CNM3x4SS	Set Screw(无头内六角螺钉)M3x4	1
14	HI3087B	Tail Pitch Plate(尾翼控制臂翅)	1
15	CNLR1019	M3 Linkage Ball(球头螺丝) L=13MM	1
16	CNBB37F	Flange Bearing(带边滚珠轴承)3x7x3	2
17	HI6102	Bellcrank Spacer(铁套)3x5x2	1
18	HI6102	Tail Bellcrank Lever(尾控制臂)	1



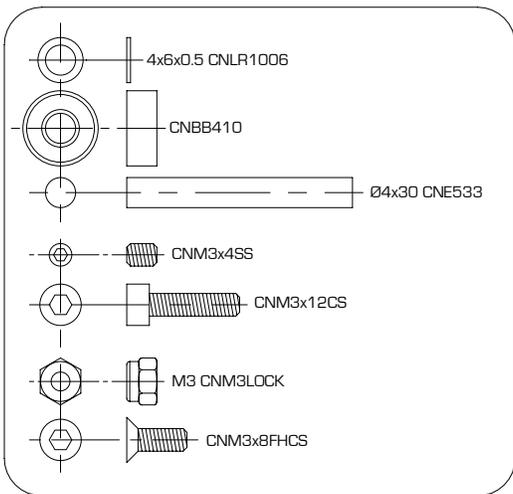
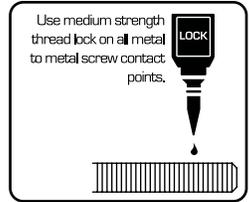
**BAG 4**

When orienting the belt the front transmission pulley as viewed from the top should be turning counter-clockwise. When the belt is twisted as shown below, the rear tail pulley should turn counter clockwise when viewed directly on from the right side of the helicopter.

You may notice the boom and the tail transmission case is scuffed. This is done during the manufacturing process to ensure a proper grip.



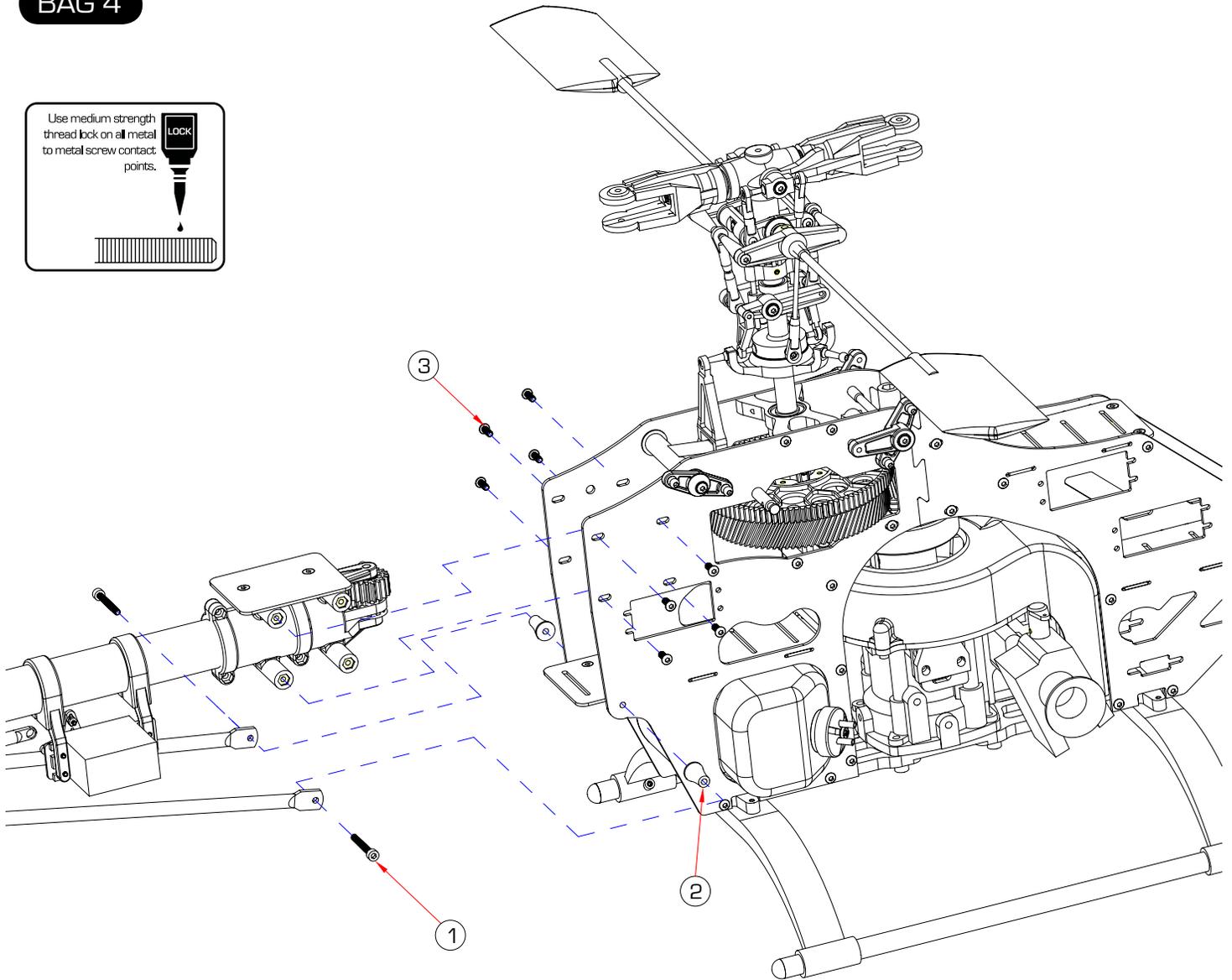
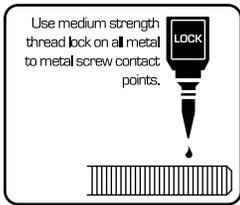
To adjust belt tension, pull forward on the front transmission box and tighten the screws. The belt should be tight enough that it should not travel past the half way point when pressed down from the back. If it is too tight, you will cause excessive drag.



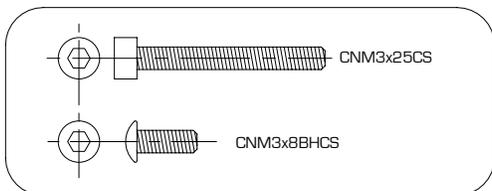
No.	Part #	Description	Qty
1	CNLR1006	Micro Washer[垫片]4x6x0.5	2
2	CNBB410	Bearing[滚珠轴承]4x10x4	2
3	CNE538	Transmission Gear[皮带输入齿轮]	1
4	CNE533	Lock Pin[插销]M4x30	1
5	HI6060B	Upper Transmission Case[尾管夹片]	2
6	CNM3x4SS	Set Screw[无头内六角螺钉]M3x4	2
7	CNM3x12CS	Button Head Cap Screw [杯头内六角螺钉]M3x12	4
8	HW6007GS	Long Hex Spacers[长六角铝柱]L=52MM	2
9	CNM3LOCK	M3 Locknut[M3螺母]	4
10	HI6117A	Head Lock Gyro Plate[陀螺仪板]	1
11	CNM3x8FHCS	Flush Head Cap Screws[斜头内六角螺钉]M3x8	2
12	HI6631	Tail Belt Drive[皮带]	1
13	HW6062G	Tailboom[尾管]	1

If you have carbon fiber frames, just add a "C" to the end of the frame part number.

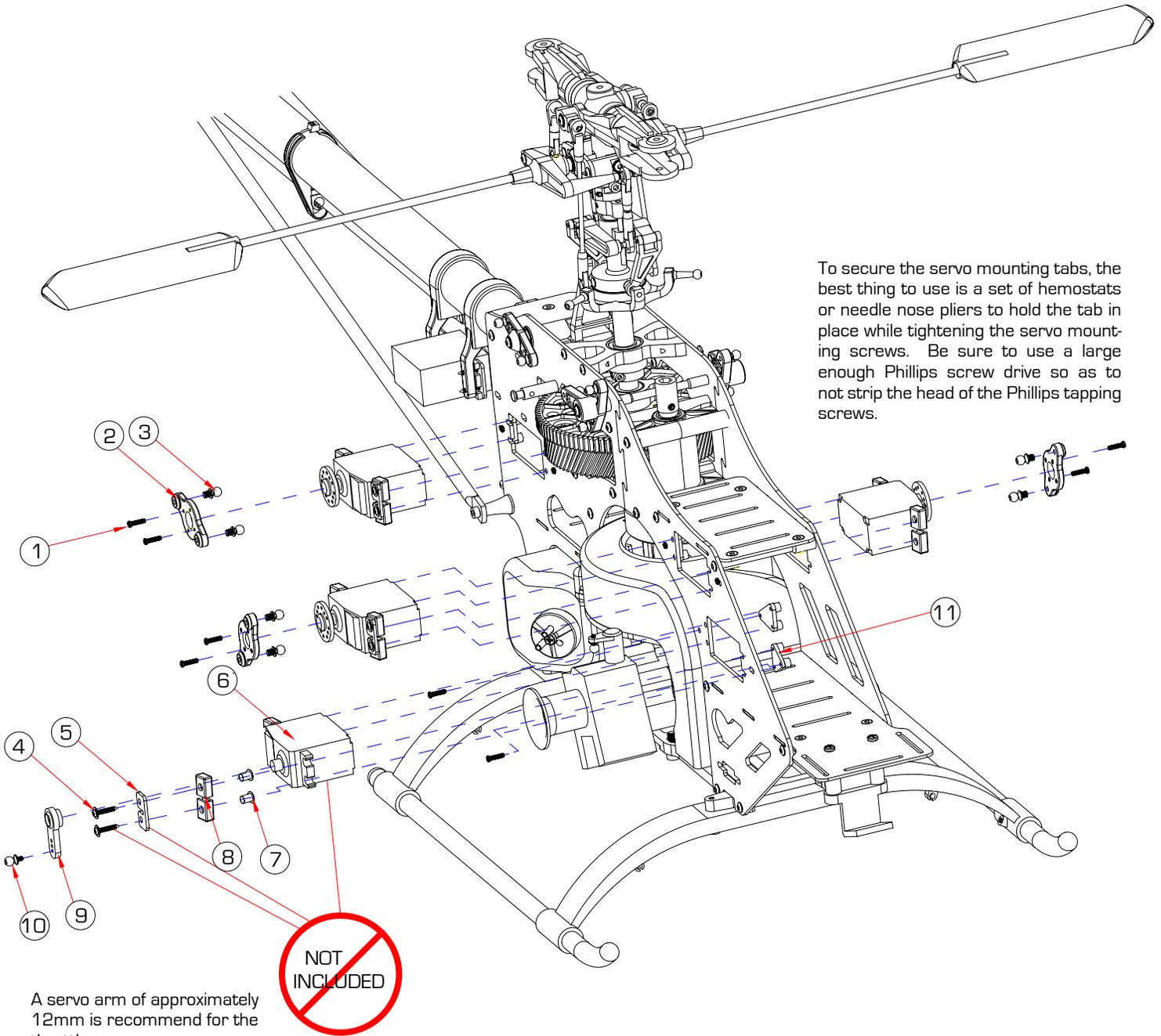
## BAG 4



Install the tail assembly onto the main frames by using threadlock on eight the M3x8 button head cap screws. Make sure to install two screws opposite of each other on either side and tighten down making sure the transmission gear is properly meshed with the tail drive gear. If you are unsure about proper gear mesh, use a strip of paper slightly taller than the tail drive gear and pass it between the gears as you spin the tail drive gear. As the paper passes through from one side of the frames to the other, a nice zig-zagged pattern should develop. If it is a very faint zig-zag pattern or no pattern appears, the gear mesh is too loose. If the paper comes through crushed, the gear mesh is too tight. After the tail assembly is installed on the main frame, install the tail boom braces using the two M3x25 cap screws and boom support posts making sure to apply medium threadlock.

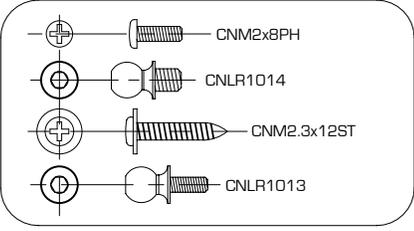


No.	Part #	Description	Qty
1	CNM3x25CS	Cap Screw[ 杯头内六角螺约M3x25	2
2	HW6202BS	Boom Support Posts[ 铝柱]	2
3	CNM3x8BHCS	Button Head Cap Screw[ 圆头内六角螺约M3x8	8

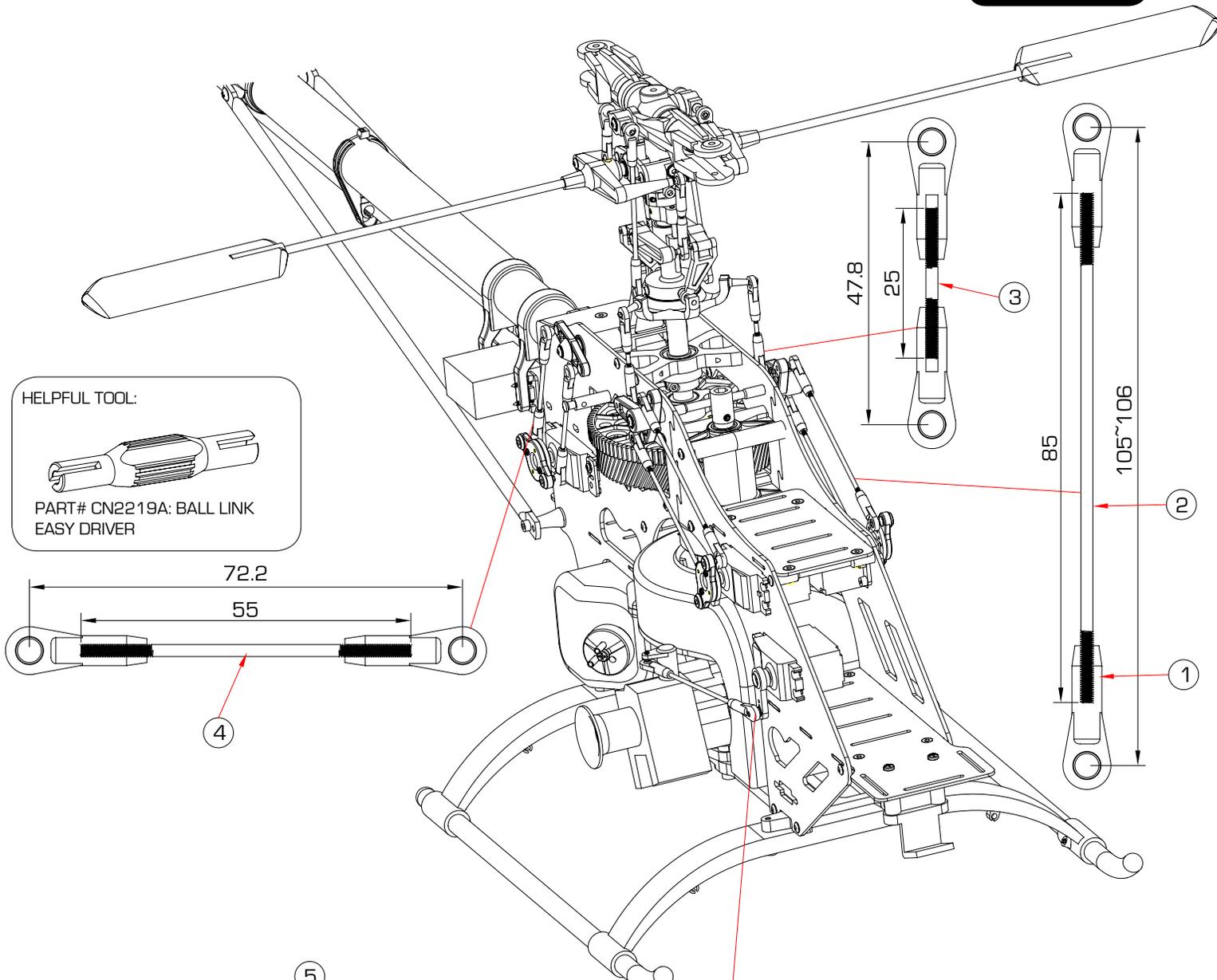


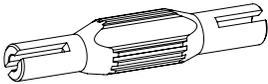
To secure the servo mounting tabs, the best thing to use is a set of hemostats or needle nose pliers to hold the tab in place while tightening the servo mounting screws. Be sure to use a large enough Phillips screw drive so as to not strip the head of the Phillips tapping screws.

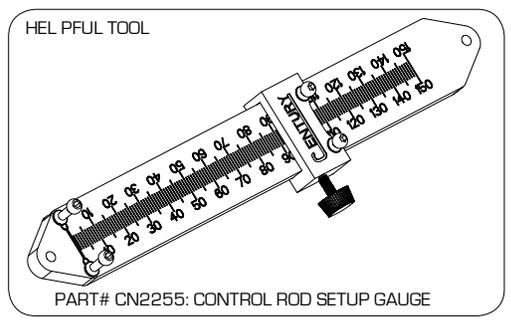
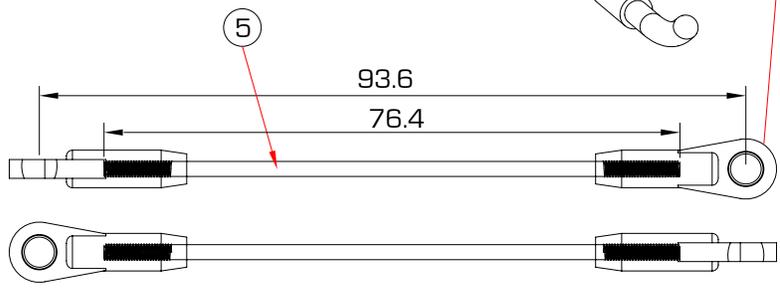
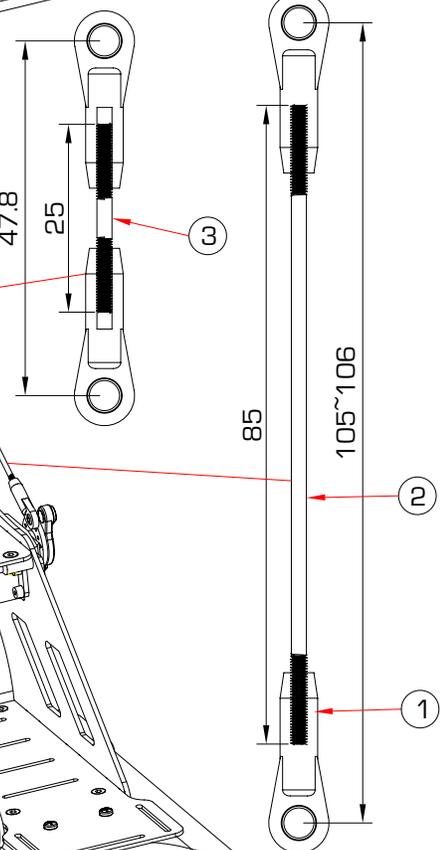
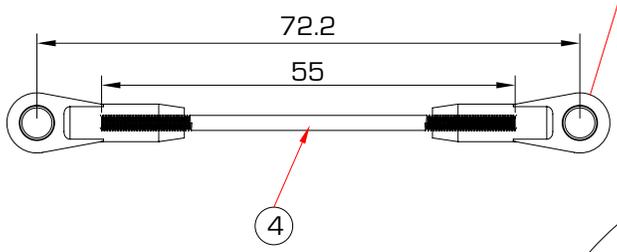
A servo arm of approximately 12mm is recommend for the throttle servo.



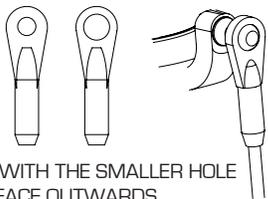
No.	Part #	Description	Qty
1	CNM2x6PH	Phillips Screw( 十字螺丝)M2x6	10
2	HW6192C	Pitch Compensators(伺服机控制臂)	3
3	CNLR1014	M3 Linkage Ball( 球头螺丝)	6
4	CNM2.3x12ST	Self Tapping Screws( 尖尾自攻螺丝)M2.3x12	16
5	HI3205A	Servo Mounting Plate(伺服机固定板)	8
6	NOT INCLUDED	Servo( 伺服机)	4
7	NOT INCLUDED	Copper Rivet( 铜铆钉)	16
8	NOT INCLUDED	Anti-Vibration Pad( 防震胶垫)	8
9	CN2288	Metal Servo Arm( 金属伺服机控制臂)	1
10	CNLR1013	Steel Ball 2mm Thread(M2 球头螺丝)	1
11	HI3205B	Servo Mount Tabs( 伺服机固定座)	8



HELPFUL TOOL:  
  
 PART# CN2219A: BALL LINK EASY DRIVER



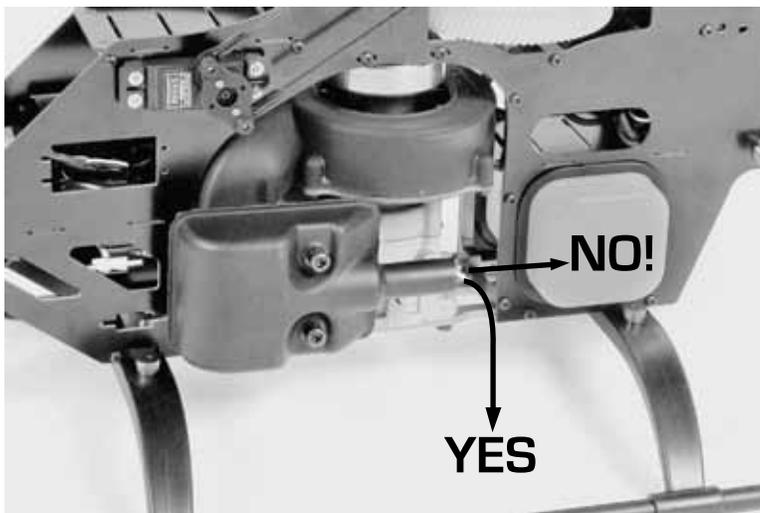
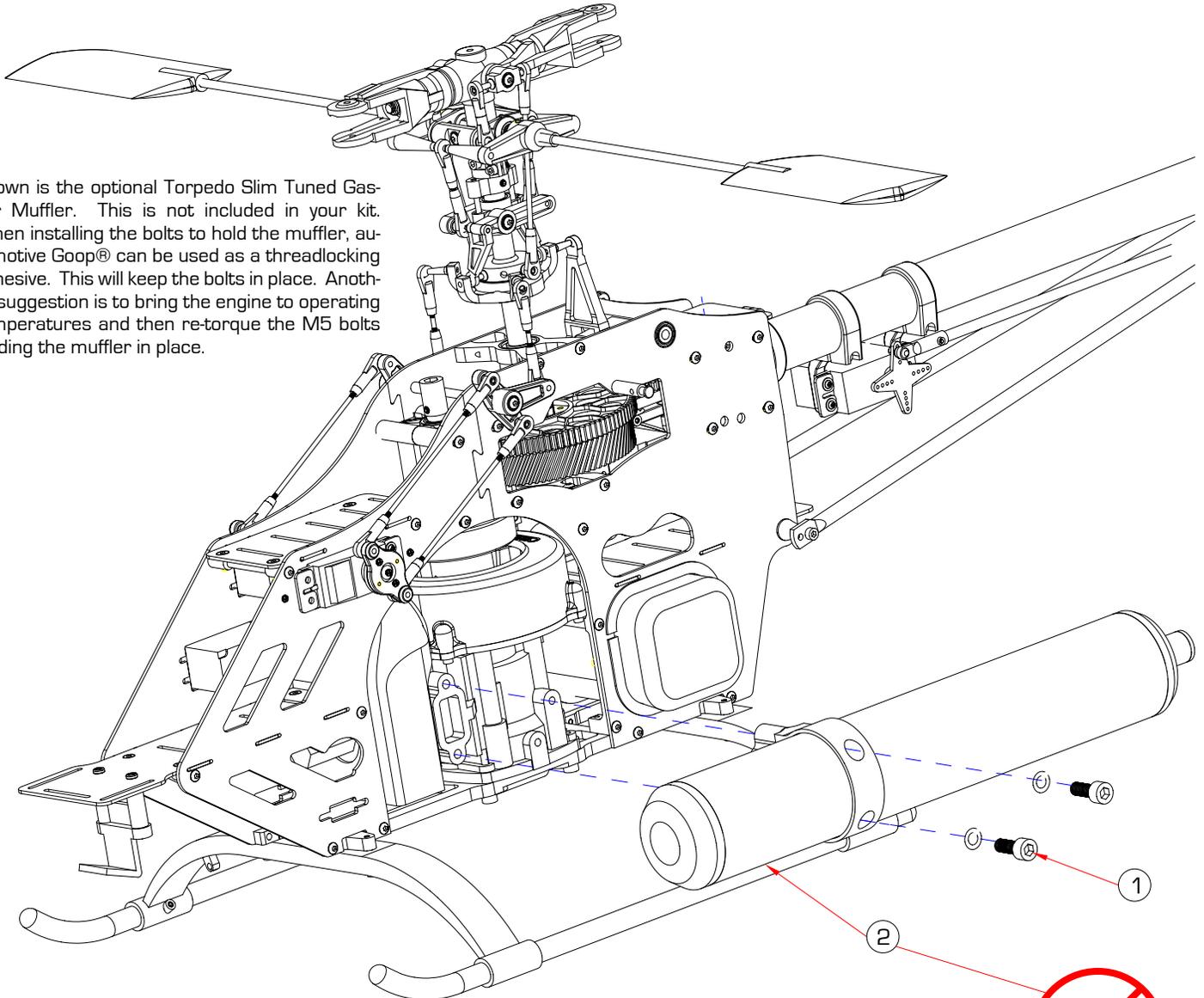
NOTICE SIZE OF HOLES ON BALL LINKS



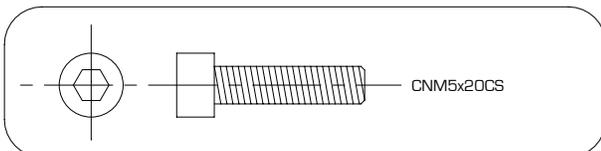
THE SIDE WITH THE SMALLER HOLE SHOULD FACE OUTWARDS

No.	Part #	Description	Qty
1	HI6145	Ball Link(塑胶球头连接头)	18
2	HW6192D	Pushrod(连杆)L=85MM	4
3	HW6192D	Pushrod(连杆)L=25MM	2
4	HW6192D	Pushrod(连杆)L=55MM	2
5	HW6192D	Pushrod(连杆)L=80MM	1

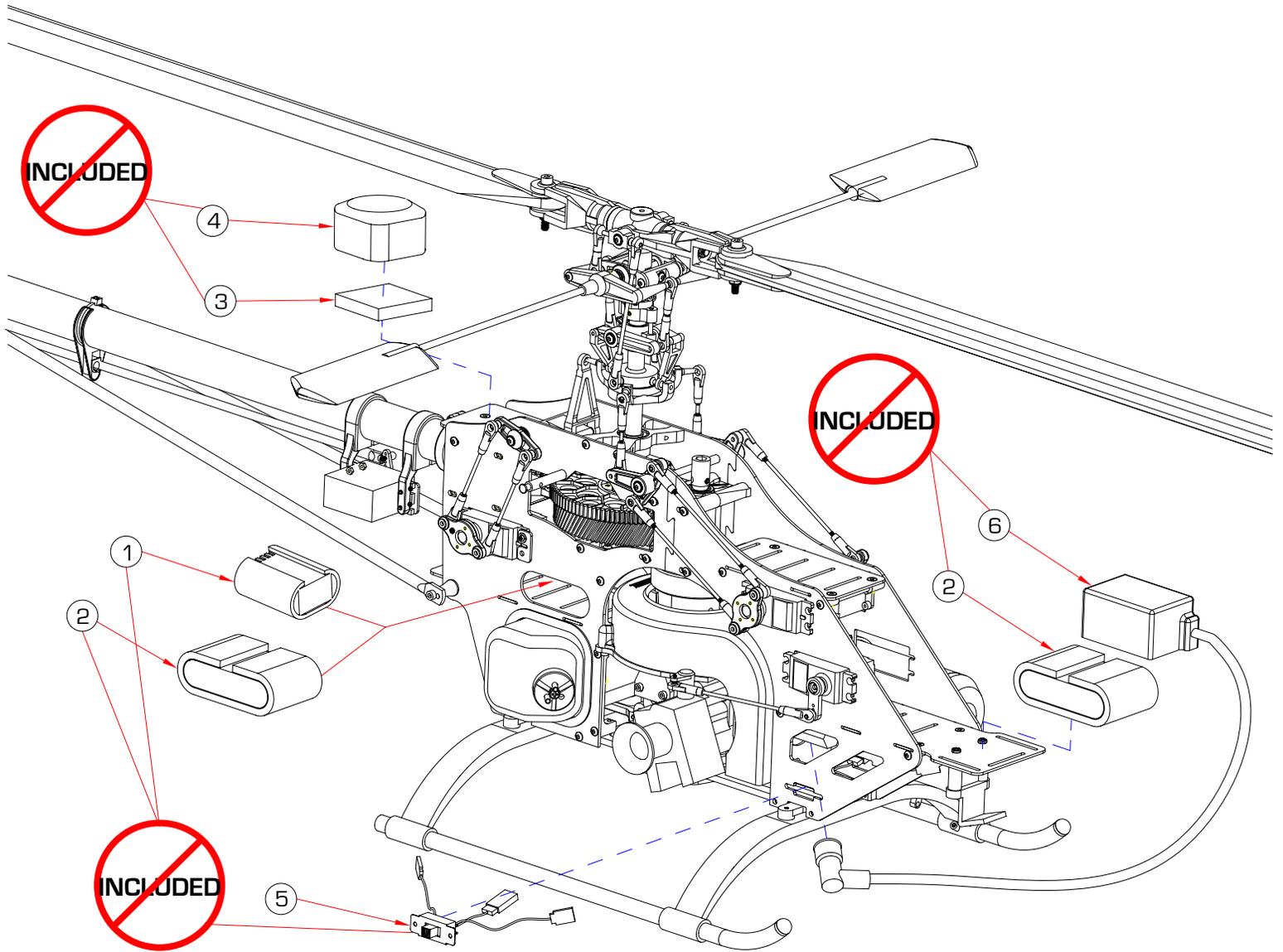
Shown is the optional Torpedo Slim Tuned Gasser Muffler. This is not included in your kit. When installing the bolts to hold the muffler, automotive Goop® can be used as a threadlocking adhesive. This will keep the bolts in place. Another suggestion is to bring the engine to operating temperatures and then re-torque the M5 bolts holding the muffler in place.



If you purchased a Zenoah G20 engine, the engine package should include the stock black box muffler. This muffler can be used however, if installed without any modifications, it is **VERY DANGEROUS** as the muffler tip is pointed directly at the fuel tank. **DO NOT USE IT THIS WAY!** If you choose to use the stock muffler, you will need to deflect the muffler tip downwards and away from any components that can be affected by heat. It is highly recommended to purchase a muffler such as the Torpedo Slim (CN3070) or equivalent.

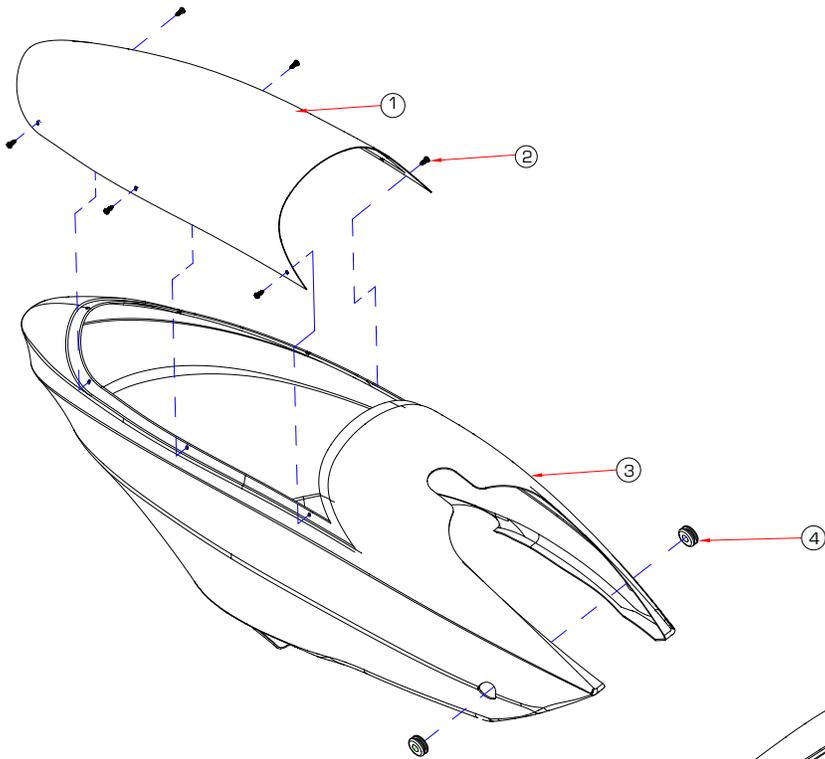


No.	Part #	Description	Qty
1	CNM5x20CS	Cap Screw( 杯头内六角螺 丝)M5x20 (Comes With Muffler)	2
2	CN3071	Torpedo Slim Gas Muffler(排气管) [Optional]	1



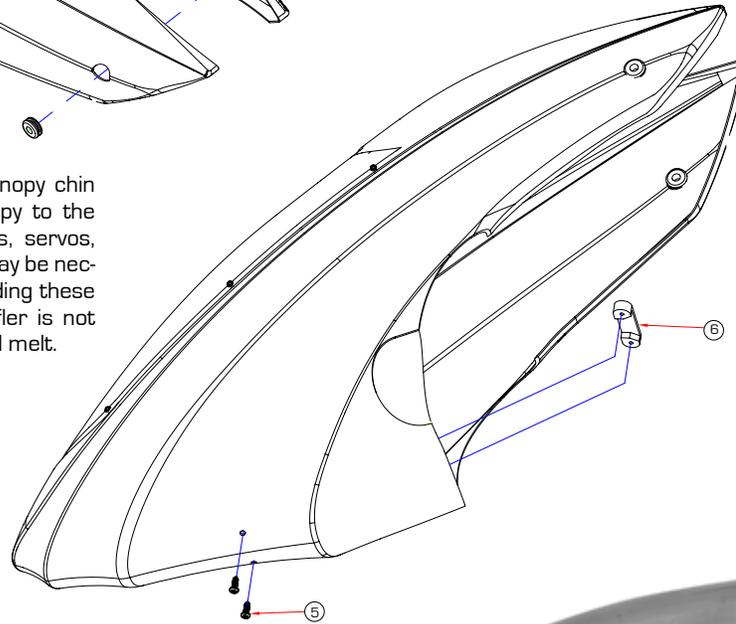
The electronics configuration is shown as an example of how to mount the electronics. It is not necessary to mount your electronics this way.

No.	Part #	Description	Qty
1	NOT INCLUDED	Receiver[接收机]	1
2	NOT INCLUDED	Receiver Battery[电池]	2
3	NOT INCLUDED	Gyro Isolation Foam[防震垫片]	1
4	NOT INCLUDED	Gyro[陀螺仪]	1
5	NOT INCLUDED	On/Off Switch[开关]	1
6	NOT INCLUDED	Electronic Ignition[电子点火]	1

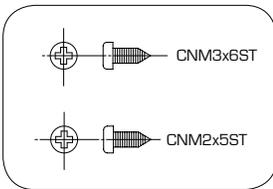


It will be necessary to cut the windshield out from the mold. It is recommended to use curved hobby scissors for this process. If the lines are not smooth, you can use 200 grit sandpaper to sand the edges.

Prior to making the holes for the canopy chin mount, you should mount your canopy to the mechanics making sure any linkages, servos, etc...are not touching the canopy. It may be necessary to cut the canopy to avoid binding these linkages. Also, make sure your muffler is not touching the canopy as the canopy will melt.

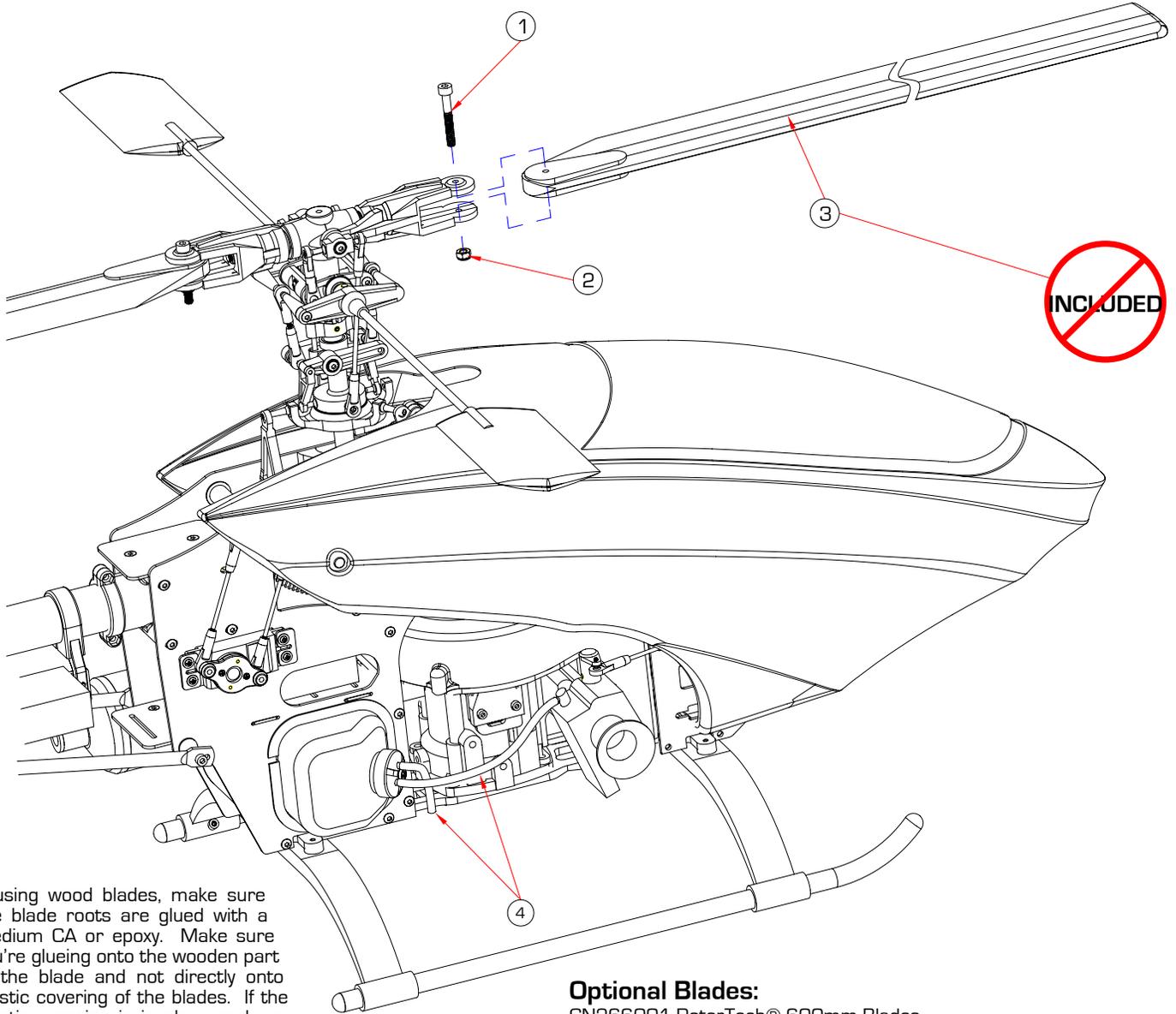


When drilling the holes into the canopy for the grommets, do not oversize these holes. If you do this, the grommets will not stay in place. If you have a hard time mounting the grommets onto the canopy standoffs, you can use a dab of oil.



Apply the decals as shown. If you need a better reference, the box cover is also a good image to follow.

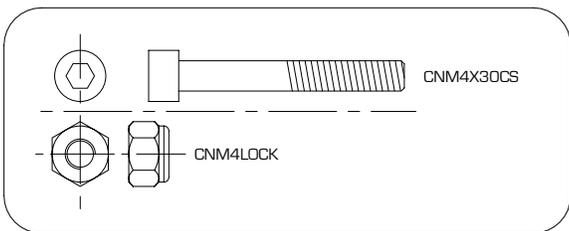
No.	Part #	Description	Qty
1	HI6133G	Tinted Windshield(透明罩)	1
2	CNM2x5ST	Screw(螺丝)	6
3	HI6130G	Canopy(机头)	1
4	CN2210A	Canopy Grommets(橡皮环)	2
5	CNM3x6ST	M3x6 Phillips Tapping Screws[尖尾螺丝]	2
6	HI3129C	Canopy Mount(机头固定座)	1
7	HI6131G	Decal Sheet	1



If using wood blades, make sure the blade roots are glued with a medium CA or epoxy. Make sure you're glueing onto the wooden part of the blade and not directly onto plastic covering of the blades. If the plastic covering is in place and contacting the plastic blade roots, make sure to cut this away prior to glueing. It is recommended to fly this model with carbon fiber blades however, when flying with wooden blades, make sure to keep the head speed below 1850RPM.

**Optional Blades:**

- CN266001 RotorTech® 600mm Blades
- CN266166C RotorTech® 610mm Blades
- CN266266C RotorTech® 620mm Wide Cord Blades
- CN266466C RotorTech® 640mm Wide Cord Blades
- CN2342 AeroTech 620mm Wide Cord Wood Blades
- CN2343 AeroTech 640mm Wide Cord Wood Blades



No.	Part #	Description	Qty
1	CNM4x30CS	Cap Screw( 杯头内六角螺约)M4x30	2
2	CNM4LOCK	M4 Locknut(M4 螺母)	2
3	NOT INCLUDED	Rotorblades(螺旋桨)	2
4	HIG139	Gas Fuel Line(油管)	1

If you have the HD head, the main blade screw and bolt are going to be M5 parts.

Congratulations on finishing the build of the Radikal G20 helicopter. Please follow your instruction manual on setting up your transmitter and gyro systems. Also it is very important that you follow the instructions included with the Zenoah G20 engine for the break in process and finally tuning the engine. If the steps are not followed your engine will not perform at it's optimal levels.

