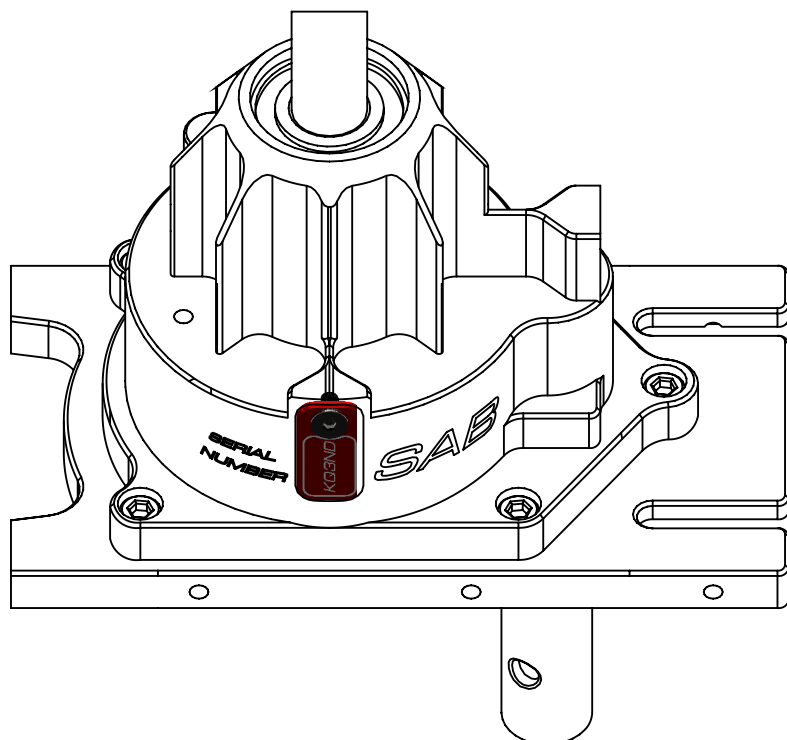


SAB HELI DIVISION



Please read this user manual carefully, it contains instructions for the correct assembly of the model.
Please refer to the web site www.goblin-helicopter.com for updates and other important information.



VERY IMPORTANT

You will find your serial number on the RED plate of the transmission module and on the product card included with your kit.
Please take a moment to register your kit online via our web site at:

<http://www.goblin-helicopter.com>

It is extremely important that you take a moment to register your helicopter with us. This is the only way to ensure that you are properly informed about changes to your kit, such as upgrades, retrofits and other important developments. SAB Heli Division cannot be held responsible for any issues with your model and will not provide support unless you register your model.

The Serial number is also engraved in the Aluminum part.

Thank you for your purchase, we hope you enjoy your new Goblin helicopter!

SAB Heli Division

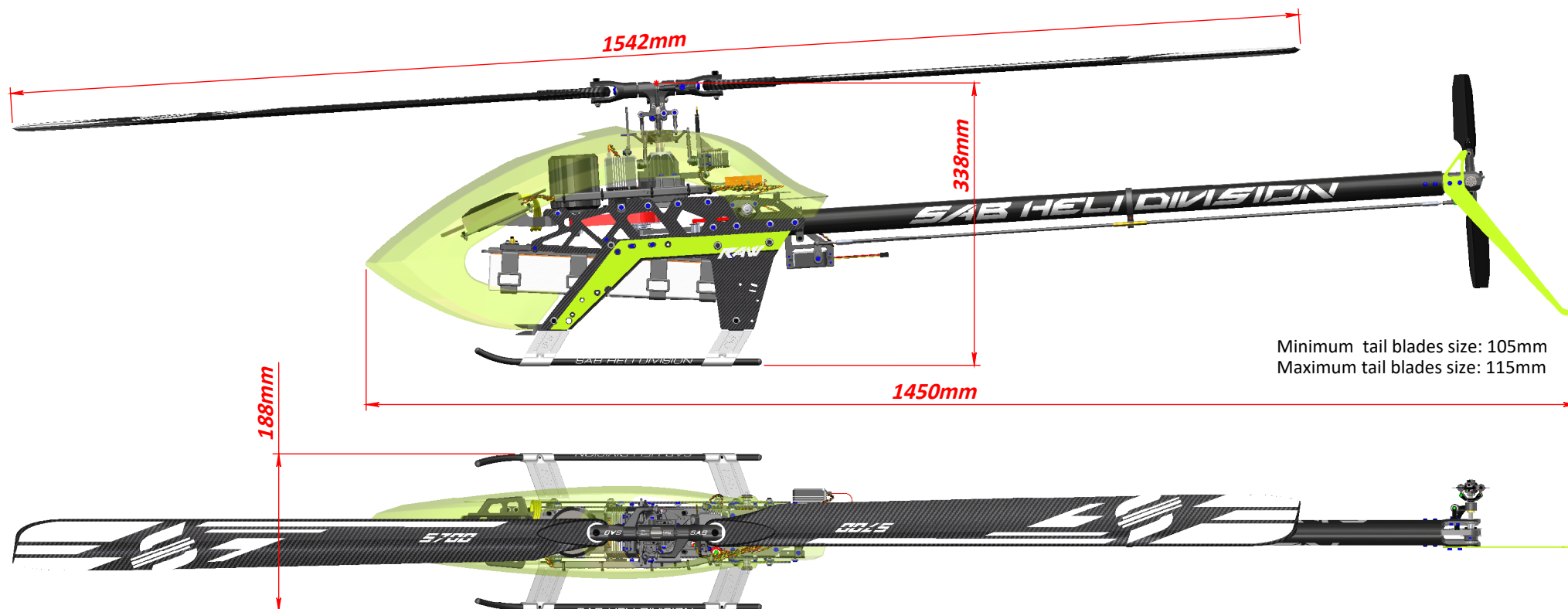
INDEX

1 – INTRODUCTION
2 – IMPORTANT NOTES
 3 – NOTE FOR ASSEMBLY
 4 – CARBON ROD ASSEMBLY
 5 – TRANSMISSION GROUP ASSEMBLY
 6 – SWASHPLATE SERVOS ASSEMBLY
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 12 – LANDING GEAR INSTALLATION
 13 – ENGINE UNIT ASSEMBLY
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 15 – TAIL BOOM ASSEMBLY
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17 – INSTALLATION BATTERY/FBL/RX
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GOBLIN RAW PIUMA TECHNICAL SPECIFICATIONS



- **AIRFRAME weight:** 2200gr (with blades, no battery, no electronics).
- **Main rotor diameter:** 1542 mm (with 700 mm blades).
- **Main blade length:** 650 to 730mm.
- **Tail rotor diameter:** 276 mm (with 105 mm tail blades).
- **Tail blade length:** 105 to 115 mm.

KIT Includes:

- 20T motor pulley (other pulley sizes available).
- 2 battery trays with straps.

- **Cyclic Servos:** Standard size 40mm.
- **Tail Servo:** Standard size 40mm.

- **Main Rotor Ratio :** 12 to 9 (20T included: 10.77:1).
- **Tail Rotor Ratio :** 4.9-5.1:1 (22T included: 5.1:1).



RAW PIUMA is an ultralight 700 class model. The recommended main rotor RPM limit is 2000 RPMs.

IMPORTANT NOTES

- *This radio controlled helicopter is not a toy.
- *This radio controlled helicopter can be very dangerous.
- *This radio controlled helicopter is a technically complex device which has to be built and handled very carefully.
- *This radio controlled helicopter must be built following these instructions. This manual provides the necessary information to correctly assemble the model.
It is necessary to carefully follow all the instructions.
- *Inexperienced pilots must be monitored by expert pilots.
- *All operators must wear safety glasses and take appropriate safety precautions.
- *A radio controlled helicopter must only be used in open spaces without obstacles, and far enough from people to minimize the possibility of accidents or of injury to property or persons.
- *A radio controlled helicopter can behave in an unexpected manner, causing loss of control of the model, making it very dangerous.
- *Lack of care with assembly or maintenance can result in an unreliable and dangerous model.

***Neither SAB Heli Division nor its agents have any control over the assembly, maintenance and use of this product. Therefore, no responsibility can be traced back to the manufacturer. You hereby agree to release SAB Heli Division from any responsibility or liability arising from the use of this product.**

SAFETY GUIDELINES

- *Fly only in areas dedicated to the use of model helicopters.
- *Follow all control procedures for the radio frequency system.
- *It is necessary that you know your radio system well. Check all functions of the transmitter before every flight.
- *The blades of the model rotate at a very high speed; be aware of the danger they pose and the damage they may cause.
- *Never fly in the vicinity of other people.

DAMAGE LIMITS

SAB HELI DIVISION SHALL NOT BE LIABLE FOR SPECIAL, INDIRECT OR CONSEQUENTIAL DAMAGES, LOSS OF PROFITS OR PRODUCTION OR COMMERCIAL LOSS IN ANY WAY CONNECTED WITH THE PRODUCT, WHETHER SUCH CLAIM IS BASED IN CONTRACT, WARRANTY, NEGLIGENCE, OR STRICT LIABILITY. Further, in no event shall the liability of SAB Heli Division exceed the individual price of the Product on which liability is asserted. As SAB Heli Division has no control over use, setup, final assembly, modification or misuse, no liability shall be assumed nor accepted for any resulting damage or injury. By the act of use, setup or assembly the user accepts all resulting liability. If you as the Purchaser or user are not prepared to accept the liability associated with the use of this Product, you are advised to return this Product immediately in new and unused condition to the place of purchase.

LIMITED WARRANTY

SAB Heli Division reserves the right to change or modify this warranty without notice and disclaims all other warranties, express or implied.

(a) This warranty is limited to the original Purchaser ("Purchaser") and is not transferable. REPLACEMENT AS PROVIDED UNDER THIS WARRANTY IS THE EXCLUSIVE REMEDY OF THE PURCHASER. This warranty covers only those Products purchased from an authorized SAB Heli Division dealer. Third party transactions are not covered by this warranty. Proof of purchase is required for warranty claims.

(b) Limitations- SAB HELI DIVISION MAKES NO WARRANTY OR REPRESENTATION, EXPRESS OR IMPLIED, ABOUT NONINFRINGEMENT, 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- SAB Heli Division's sole obligation hereunder shall be that SAB Heli Division will, at its option, replace any Product determined by SAB Heli Division to be defective. In the event of a defect, this is the Purchaser's exclusive remedy. Replacement decisions are at the sole discretion of SAB Heli Division. 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.

ADDITIONAL COMPONENTS REQUIRED

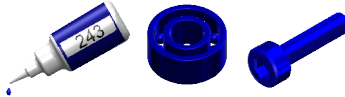
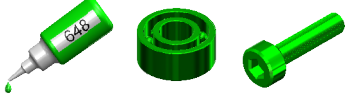
- *Electric Motor (See page 20 for more info).
- *Speed controller (See page 20 for more info).
- *Batteries (See page 20 for more info).
- *1 flybarless 3 axis control unit.
- *Radio power system.
- *3 cyclic servos.
- *1 tail rotor servo.
- *6 channel radio control system on 2.4 GHz.

TOOLS, LUBRICANTS, ADHESIVES

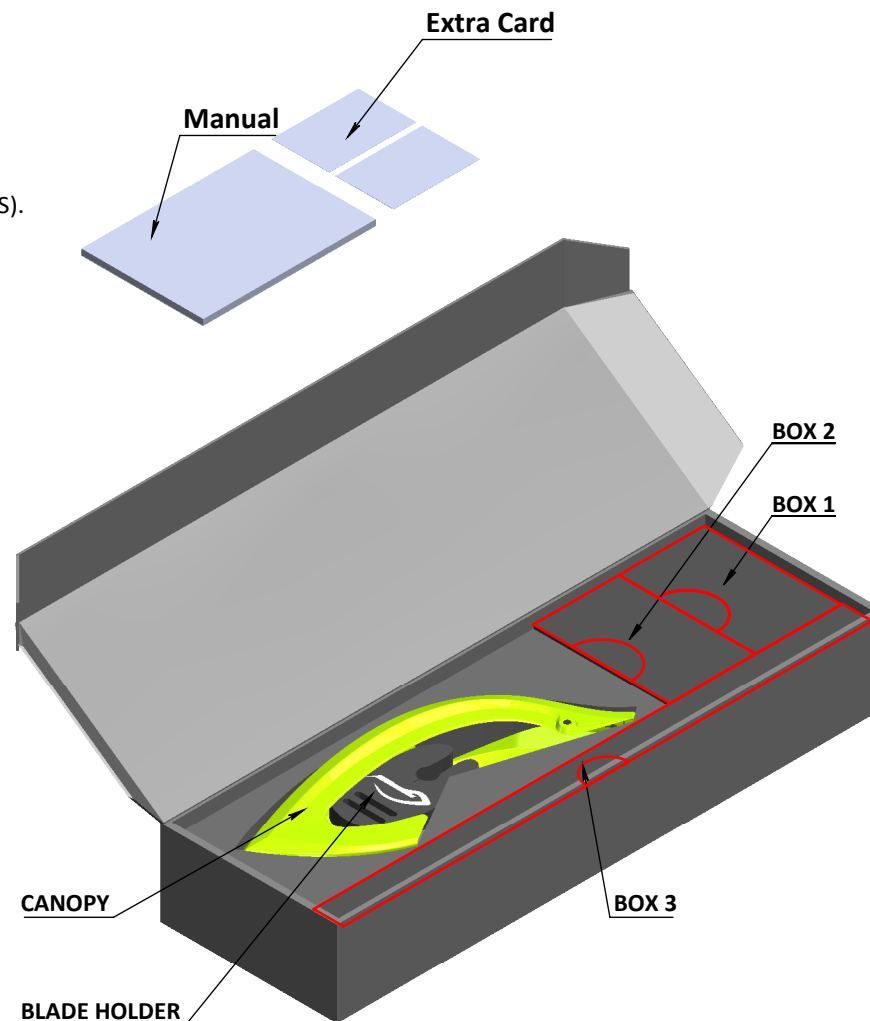
- *Generic pliers.
- *Hexagonal driver, size 1.5, 2, 2.5, 3mm.
- *4/5mm T-Wrench.
- *5.5mm Socket wrench (for M3 nuts).
- *8mm Hex fork wrench (for M5 nuts).
- *Medium threadlocker (SAB p/n HA116-S).
- *Strong retaining compound (SAB p/n HA115-S).
- *Spray lubricant (eg. Try-Flow Oil).
- *Synthetic grease (eg. Microlube 261).
- *Cyanoacrylate adhesive.
- *Pitch Gauge (for set-up).
- *Soldering equipment (for Engine wiring).

NOTES FOR ASSEMBLY

Please refer to this manual for assembly instructions for this model. Follow the order of assembly indicated. The instructions are divided into chapters, which are structured in a way that each step is based on the work done in the previous step. Changing the order of assembly may result in additional or unnecessary steps. Use thread lockers and retaining compounds as indicated. In general, each bolt or screw that engages with a metal part requires thread lock. It is necessary to pay attention to the symbols listed below:

 Important	 Blue screw and blue bearing in the illustration means you need to use: Thread Locker Medium Strength (SAB HA116-S)	 Green screw and Green bearing in the illustration means you need to use: Use retaining compound (SAB HA115-S)
BOX xx, BAGxx Indicates that for this assembly phase you need materials that are: BOX xxx, BAG xxx.	 Use CA Glue	 Use Proper Lubricant

INSIDE THE MAIN BOX THERE ARE:

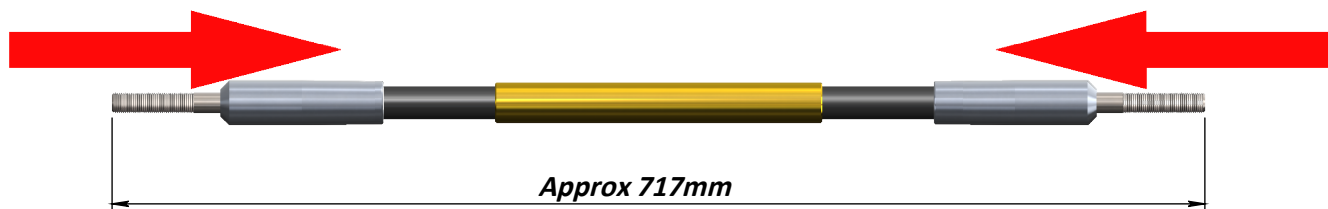
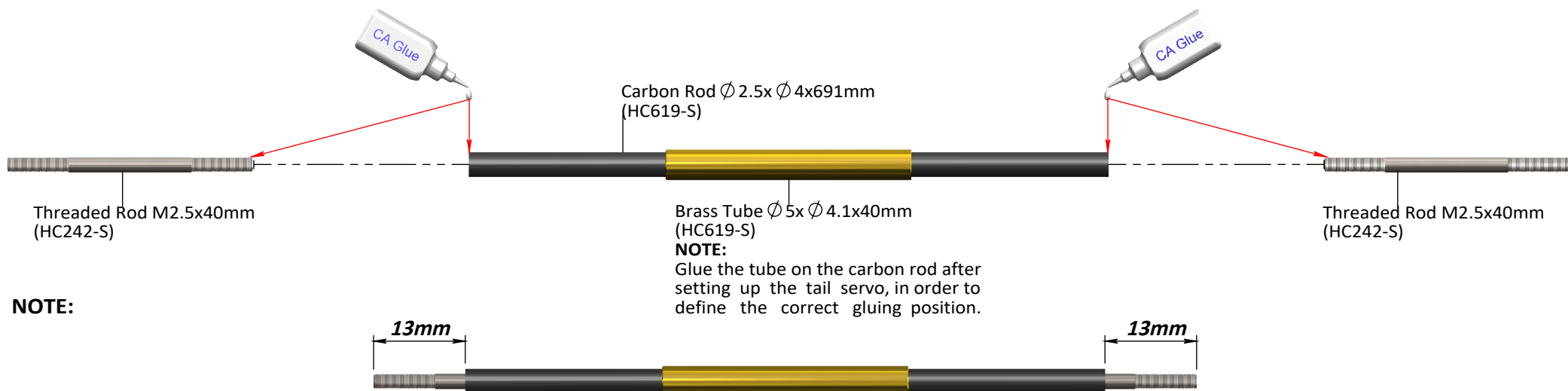


The assembly process is described in the following chapters. Each chapter provides you with the box, bag and/or foam numbers you will need for that chapter. The information is printed in a black box in the upper corner of the page.



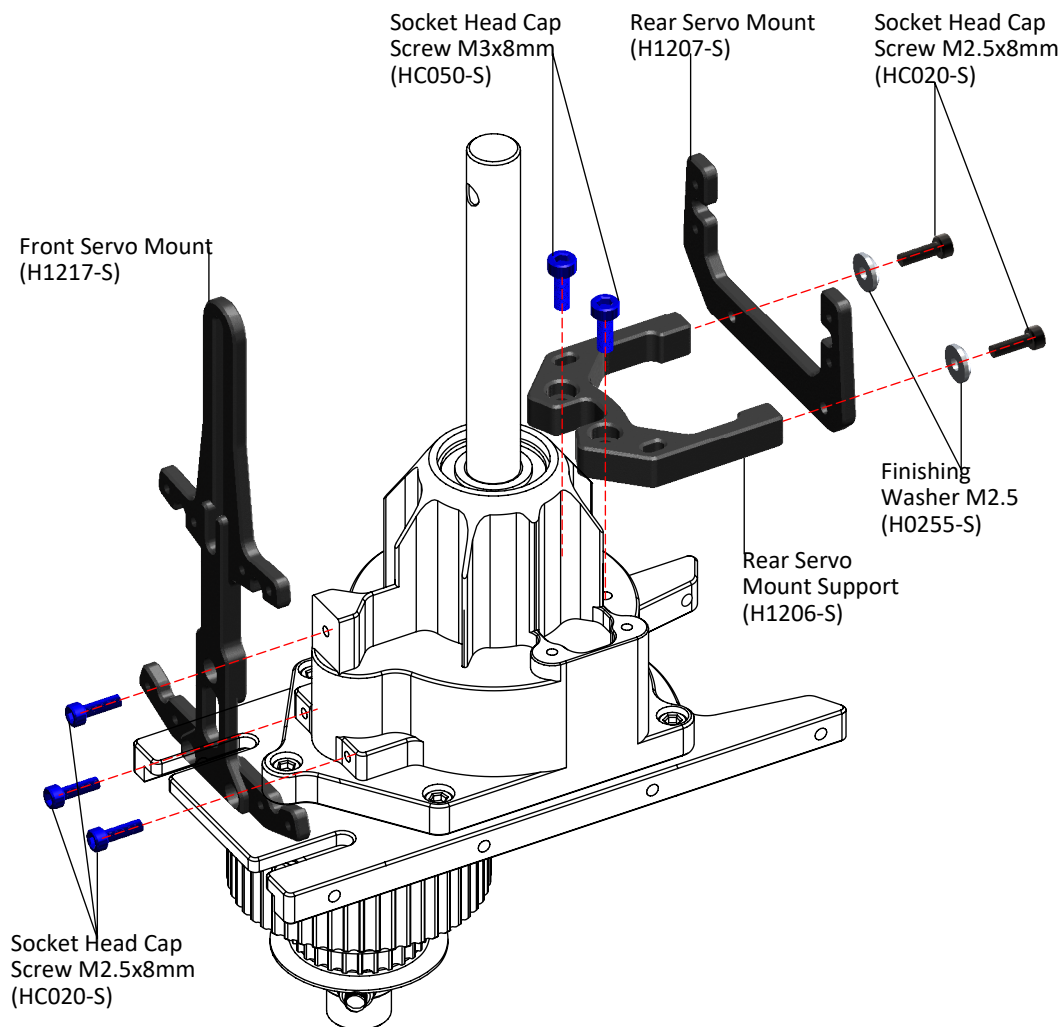
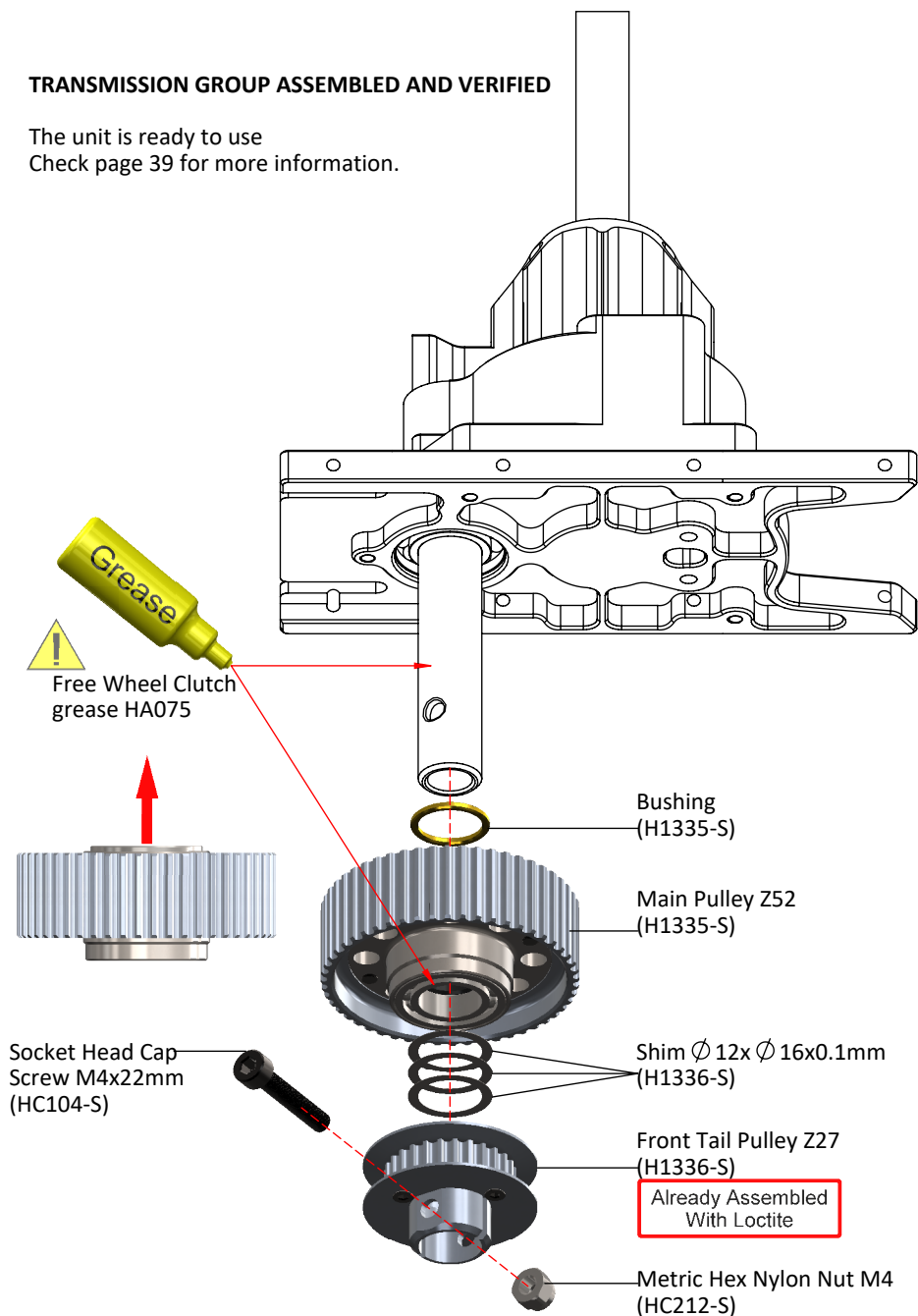
It is suggested to arrange all the bags on a table, ordering them in a row by page number. Doing this first will make it easier to find the bags during the assembly process.

BOX 3, BAG FOR PAGE 5



TRANSMISSION GROUP ASSEMBLED AND VERIFIED

The unit is ready to use
Check page 39 for more information.



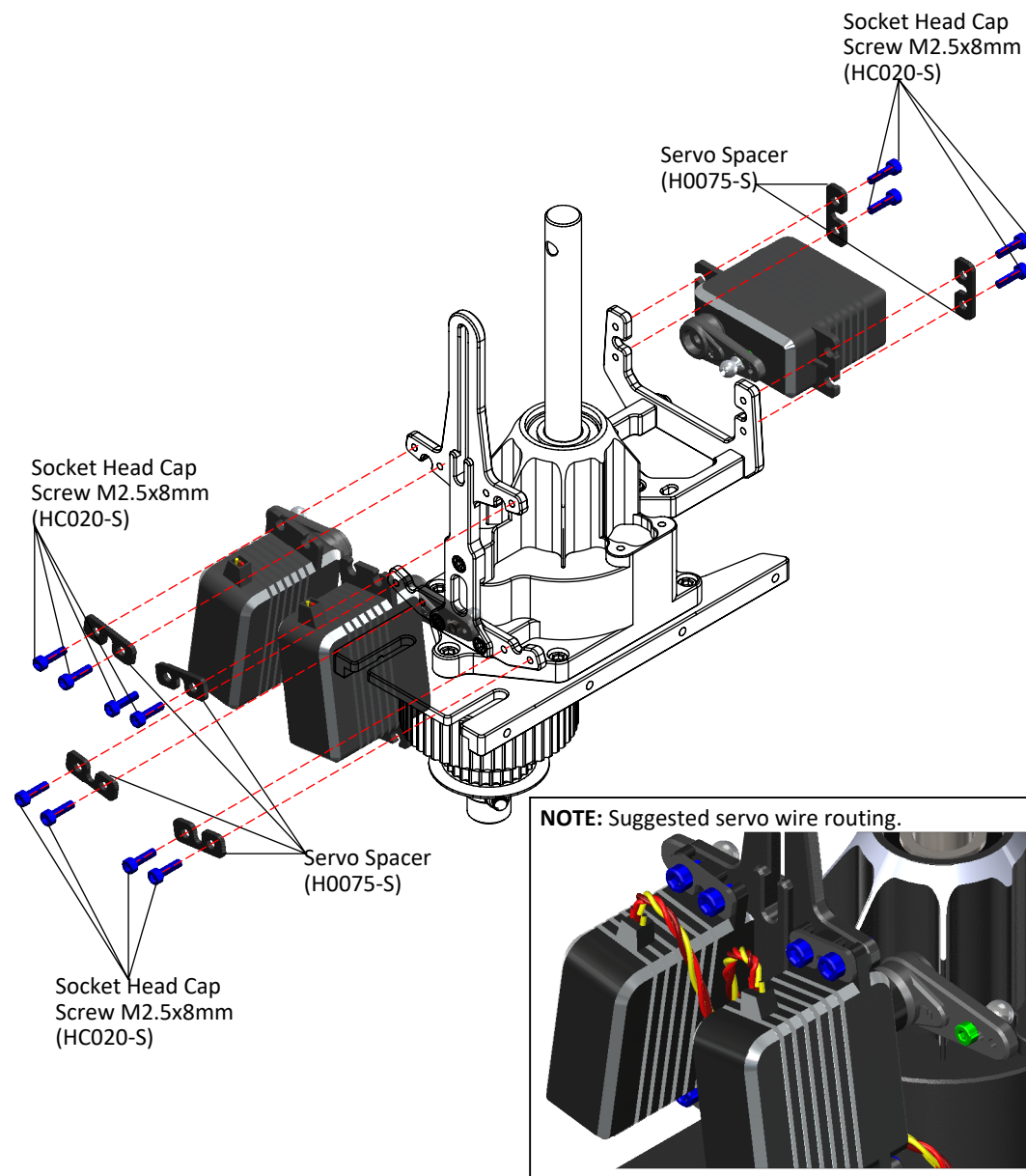
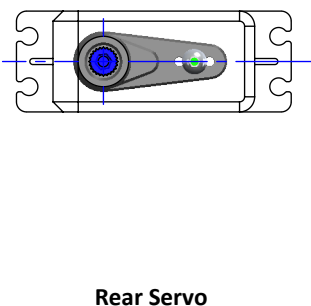
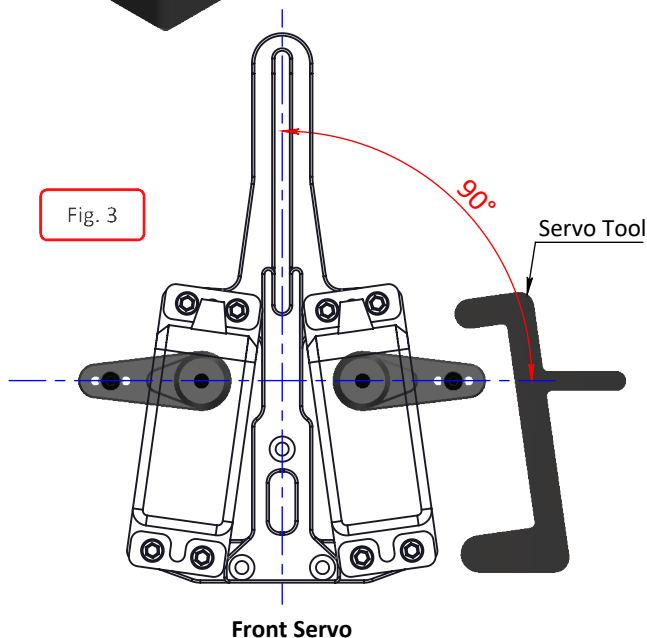
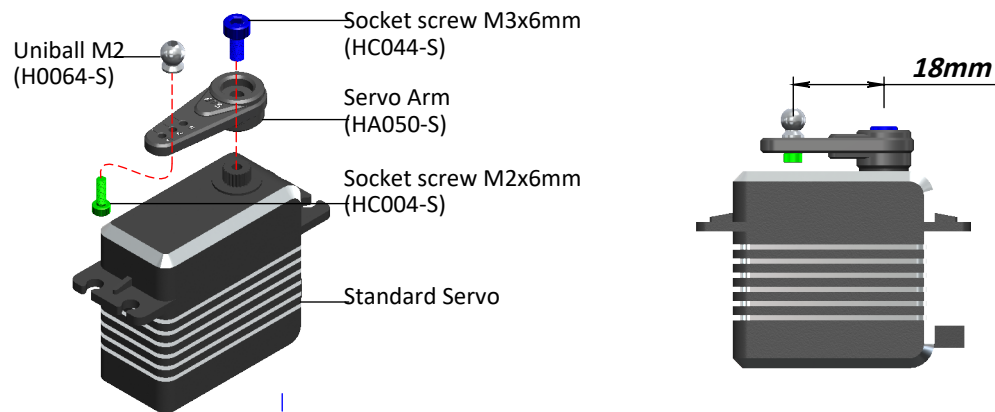
BOX 1, BAG FOR PAGE 7

SERVO ASSEMBLY

The linkage ball must be positioned 18 mm out on the servo arm. The recommended servo arm to use is: SAB p/n [HA050/HA051].

Ensure the alignment of the servo arms (and sub trim is set) before installation of the servos in the model.

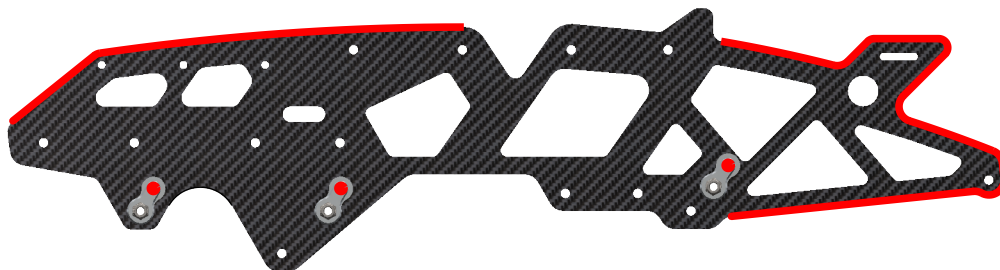
Proceed with installation following the instructions below. You can use the G10 servo tool to align the front servo arms with the theoretical horizontal line. **(Figure 3)**



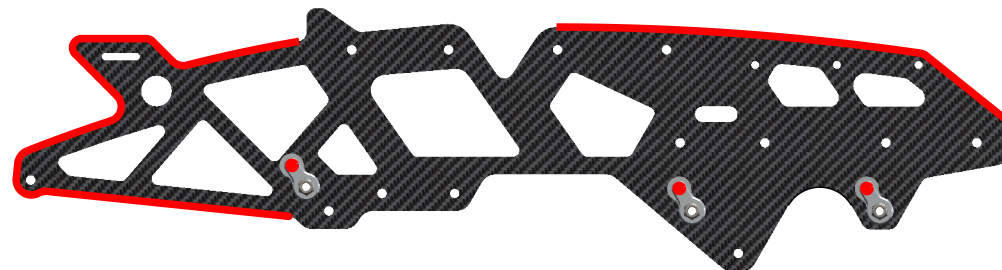
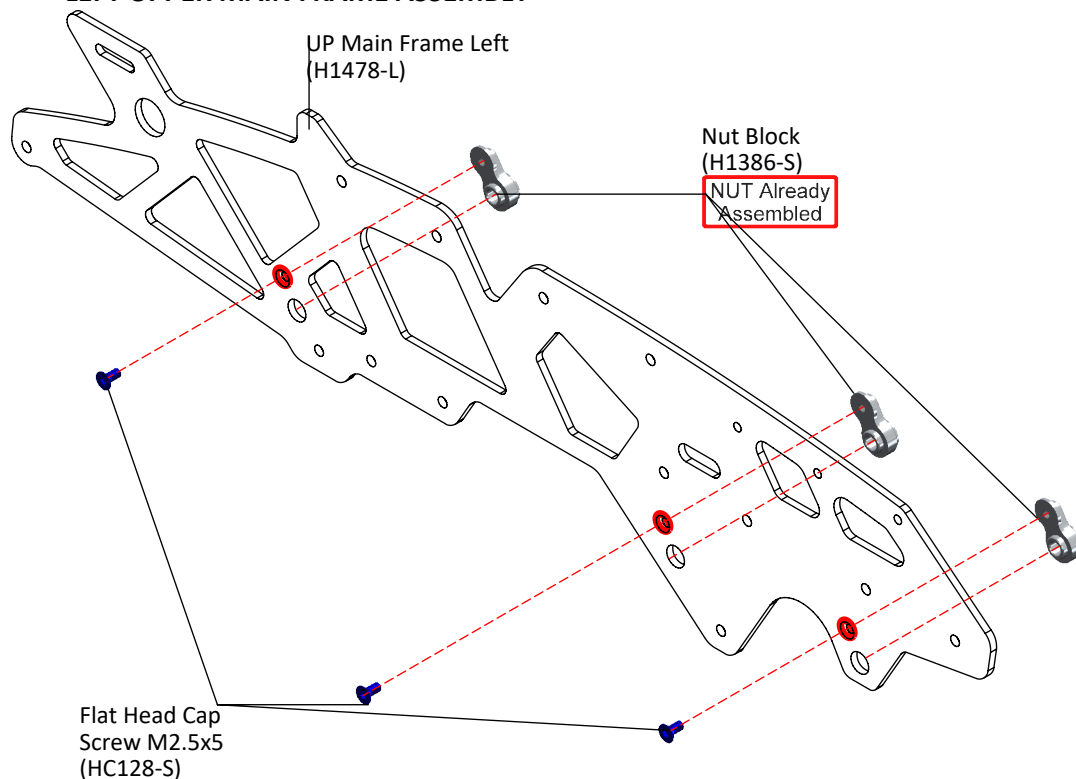
CARBON FRAME



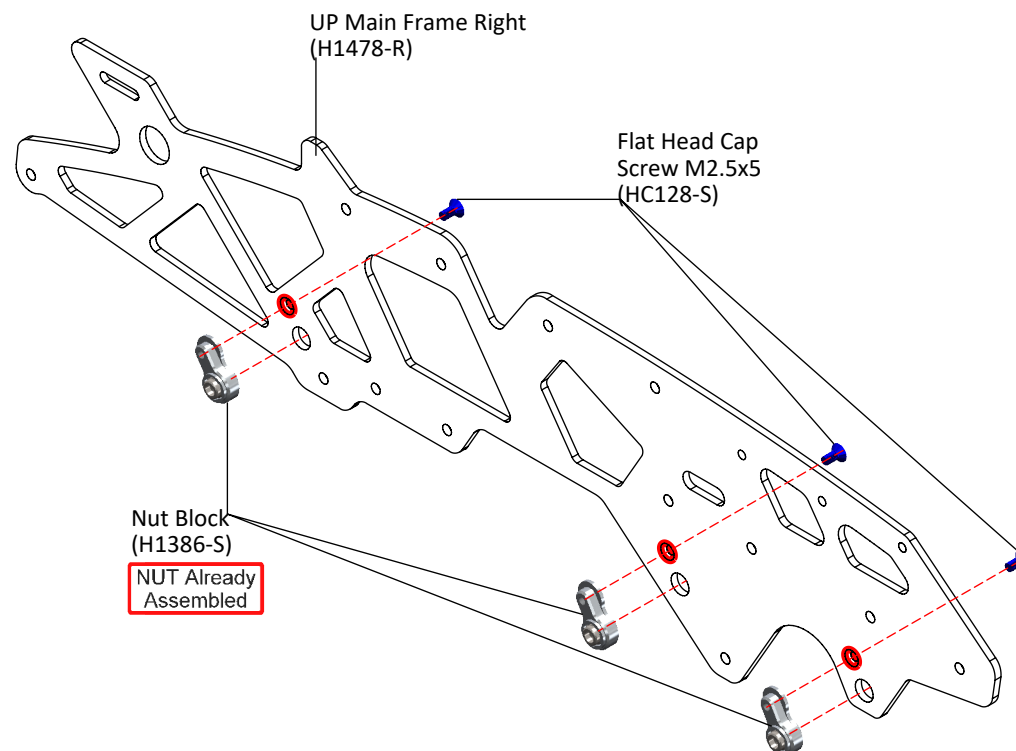
The manufacturing process of the carbon parts often leaves micro-burrs and sharp edges. We recommend de-burring the edges to minimize the risks of electrical wire cuts, etc. Very important in red line zone.



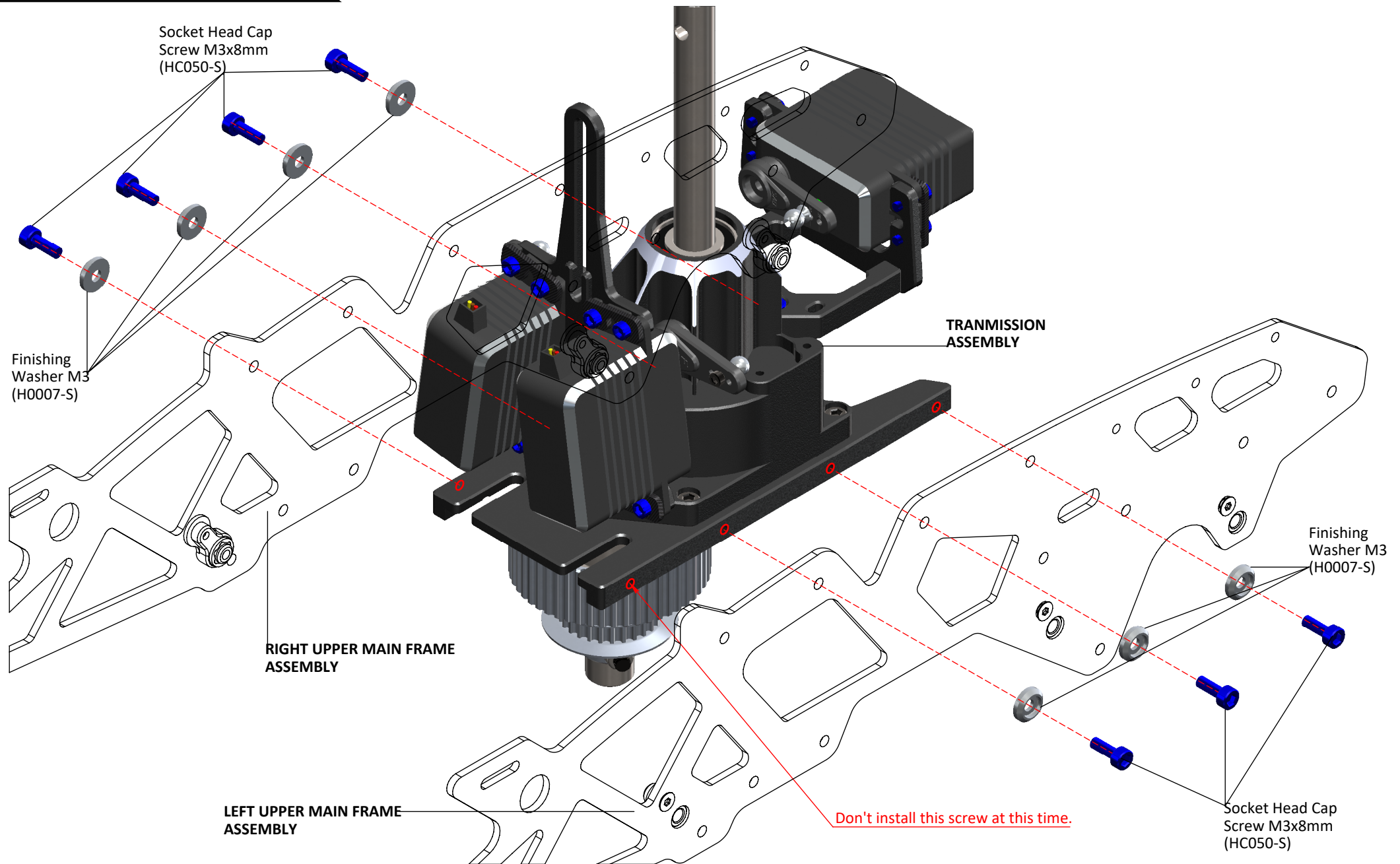
LEFT UPPER MAIN FRAME ASSEMBLY



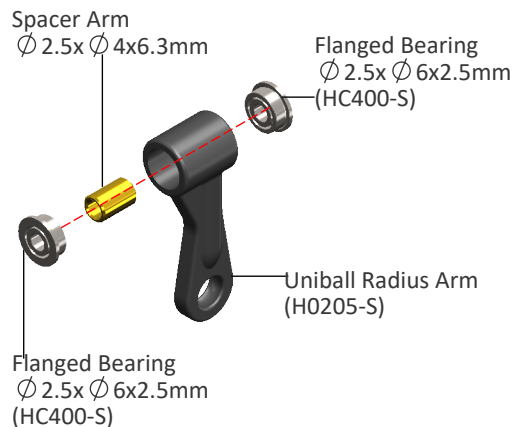
RIGHT UPPER MAIN FRAME ASSEMBLY



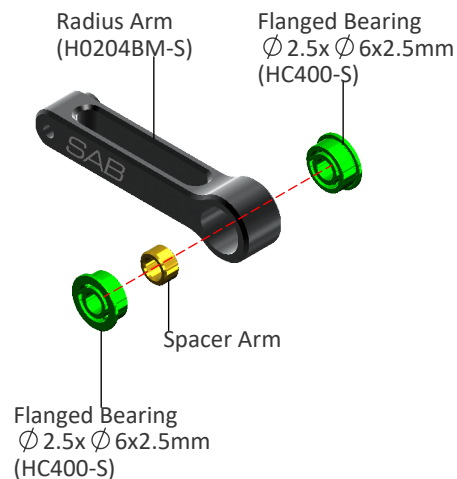
BOX 1, BAG FOR PAGE 9



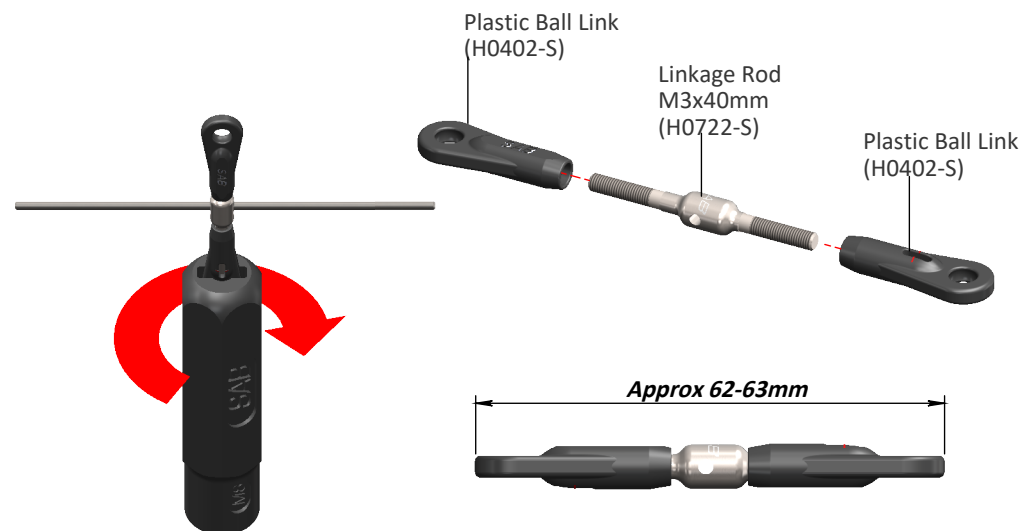
UNIBALL RADIUS ARM ASSEMBLY ...x2



RADIUS ARM ASSEMBLY ...x2

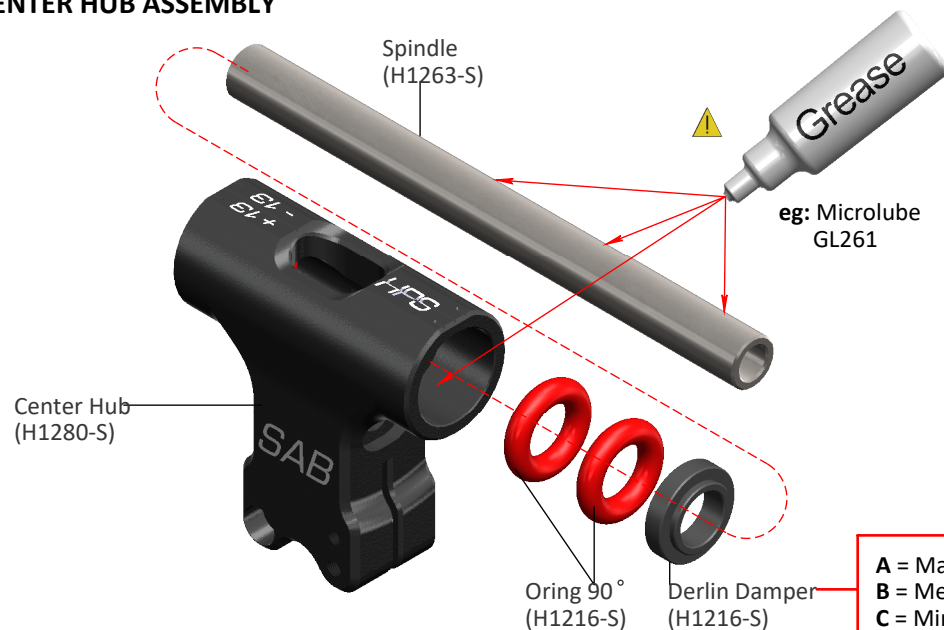


LINKAGE ROD ASSEMBLY ...x2



Note: You can use HA016 to assembly the plastic ball link.

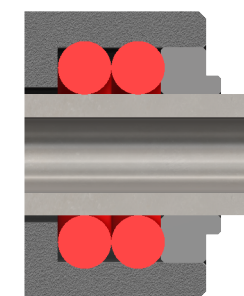
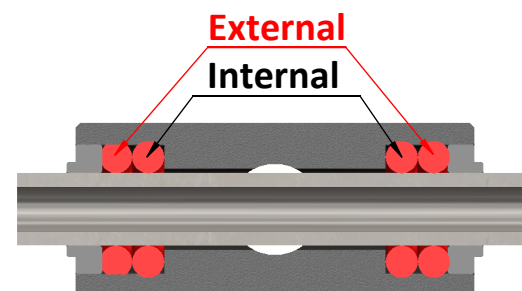
CENTER HUB ASSEMBLY



O-RING SET UP

Internal = 70°, External = 90° → Sport.

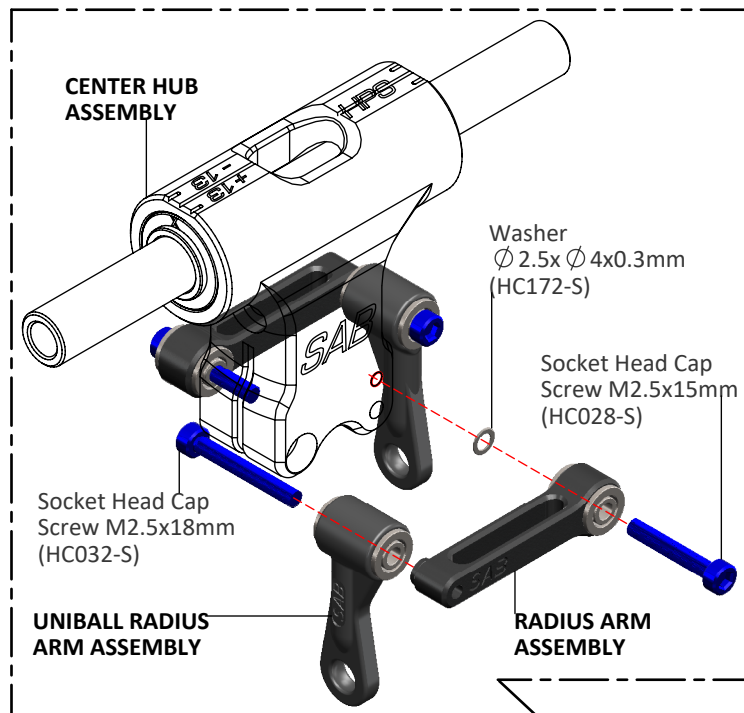
Internal = 90°, External = 90° → 3D.



A = Max movement of the spindle, feeling more elastic. (Sport)
B = Medium. (Soft 3D)
C = Min movement of the spindle, feeling more direct. (3D)

NOTE: The small lip faces out towards the blade grip.

BOX 1, BAG FOR PAGE 11

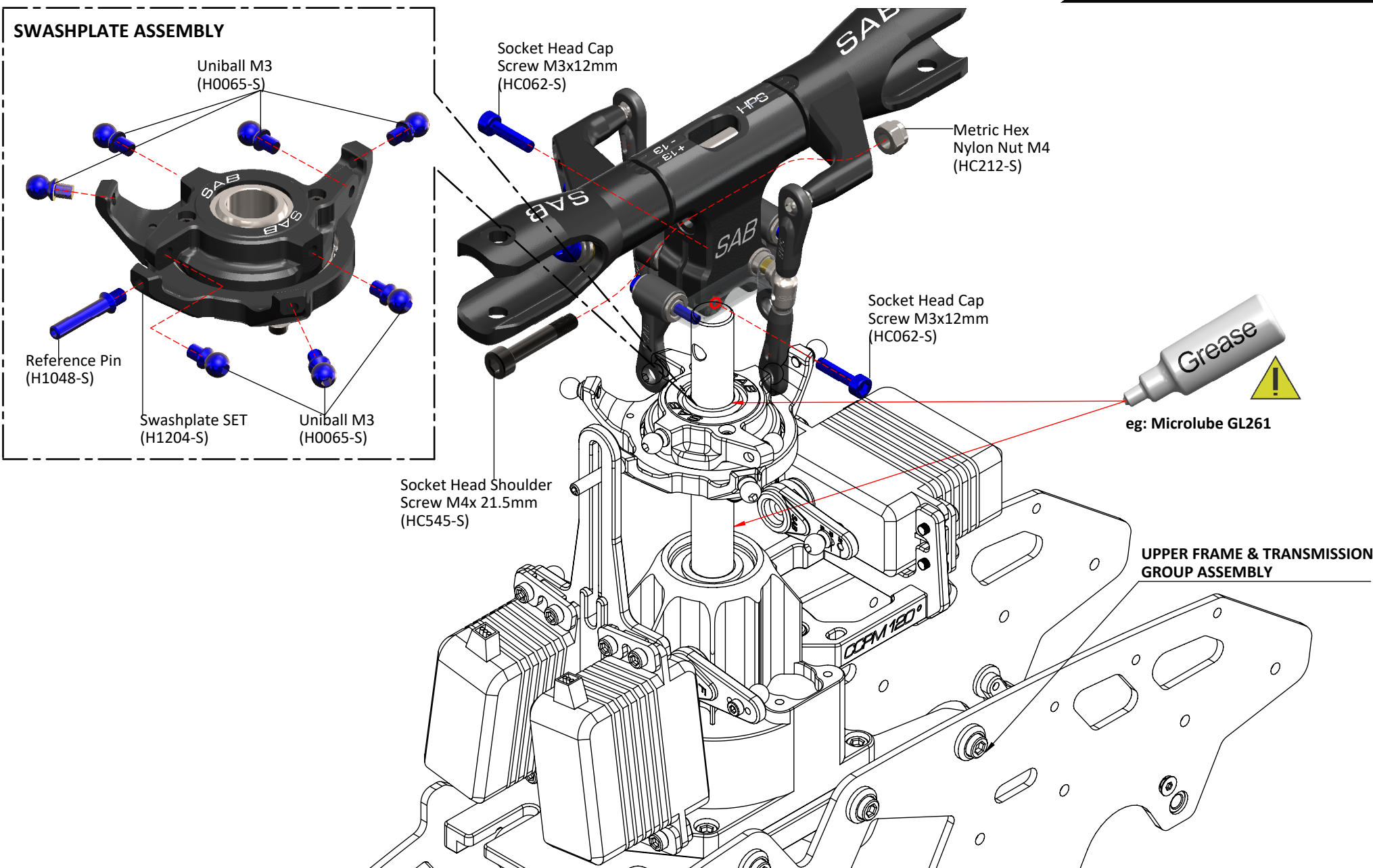


NOTE:

It is a normal (especially with the $90^\circ + 90^\circ$ O-ring set-up) to feel tight after initial assembly as the axial preload is usually high when the helicopter is brand new. The preload will loosen up after 2-5 flights allowing the system to become smooth.

Shim $\varnothing 8 \times \varnothing 14 \times 0.2\text{mm}$ [HC228-S] [Bag11-4]. After approximately 40/50 flights, please check preload, you can add one 0.2mm shim (HC228) on each side if preload has changed. However, we suggest to replace the o-rings after about 100 flights.

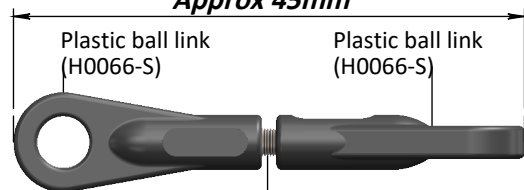




BOX 1, BAG FOR PAGE 13

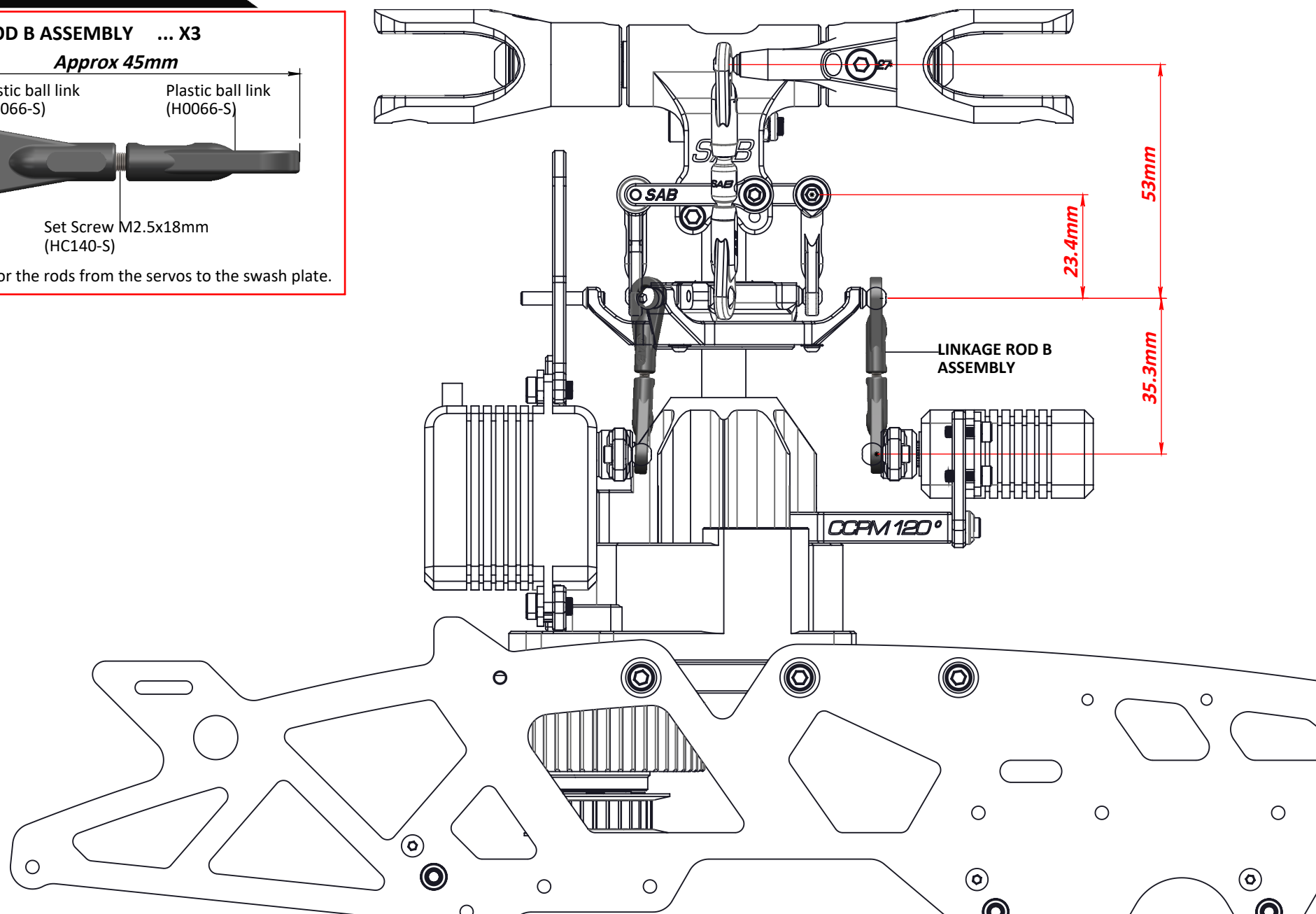
LINKAGE ROD B ASSEMBLY ... X3

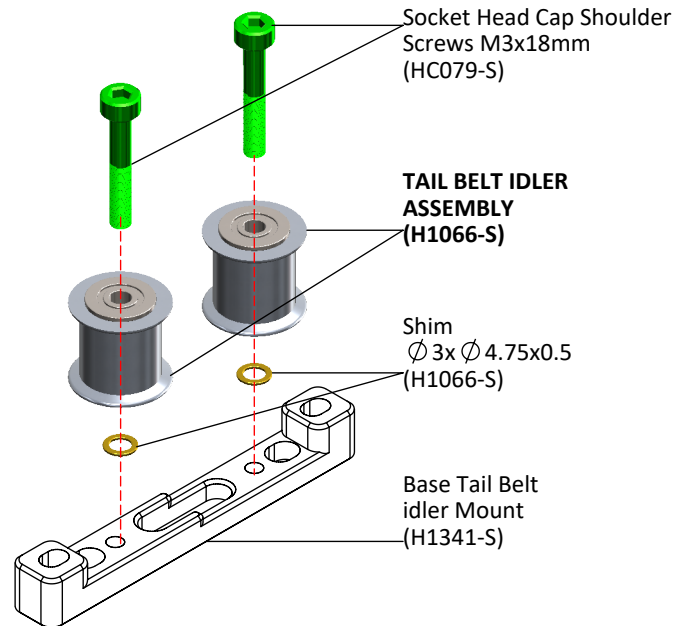
Approx 45mm



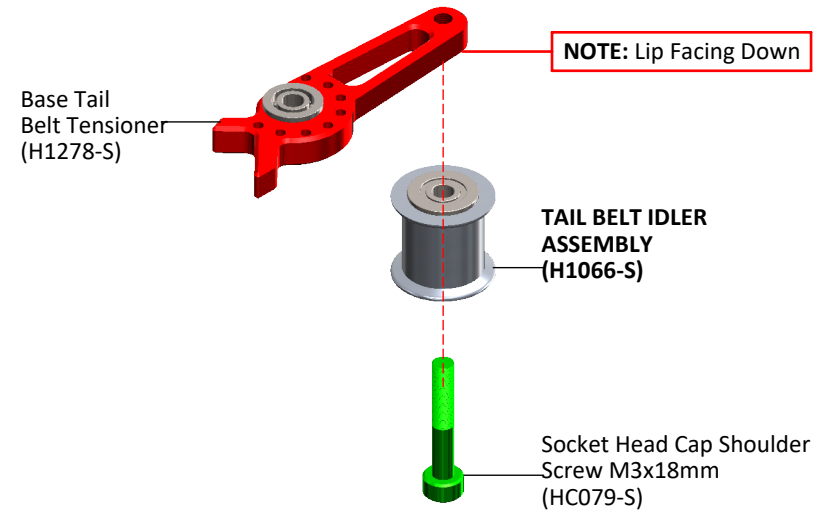
Set Screw M2.5x18mm
(HC140-S)

Initial length for the rods from the servos to the swash plate.

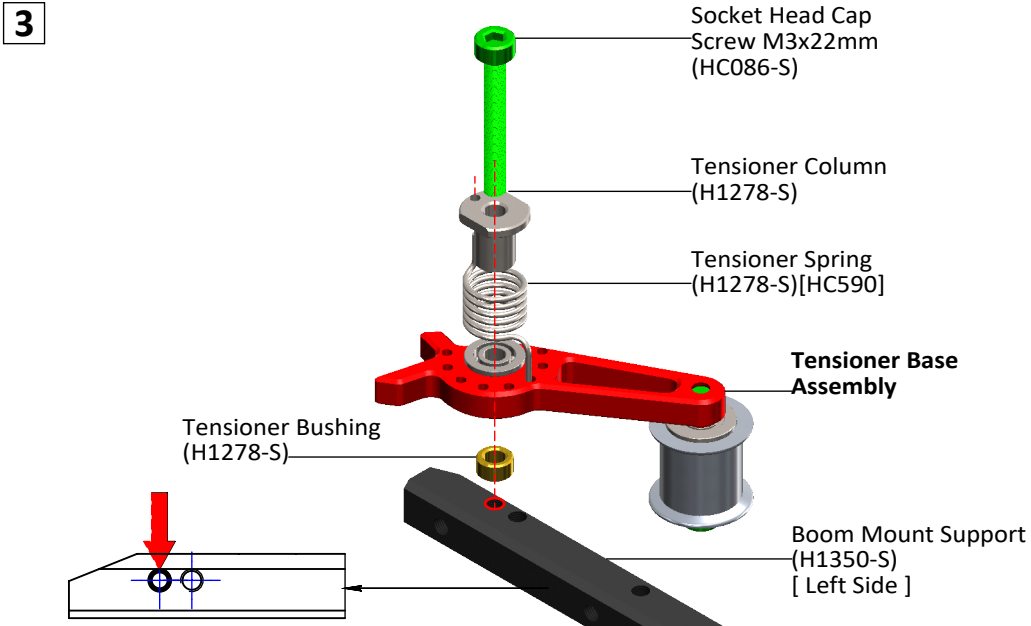




1

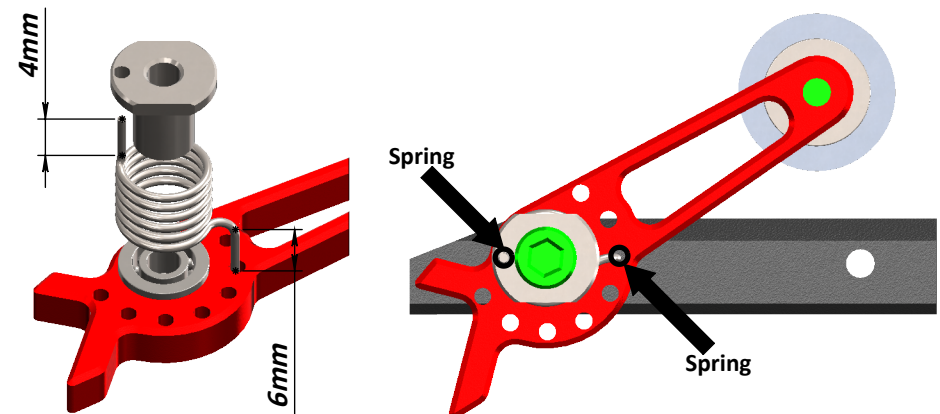


2

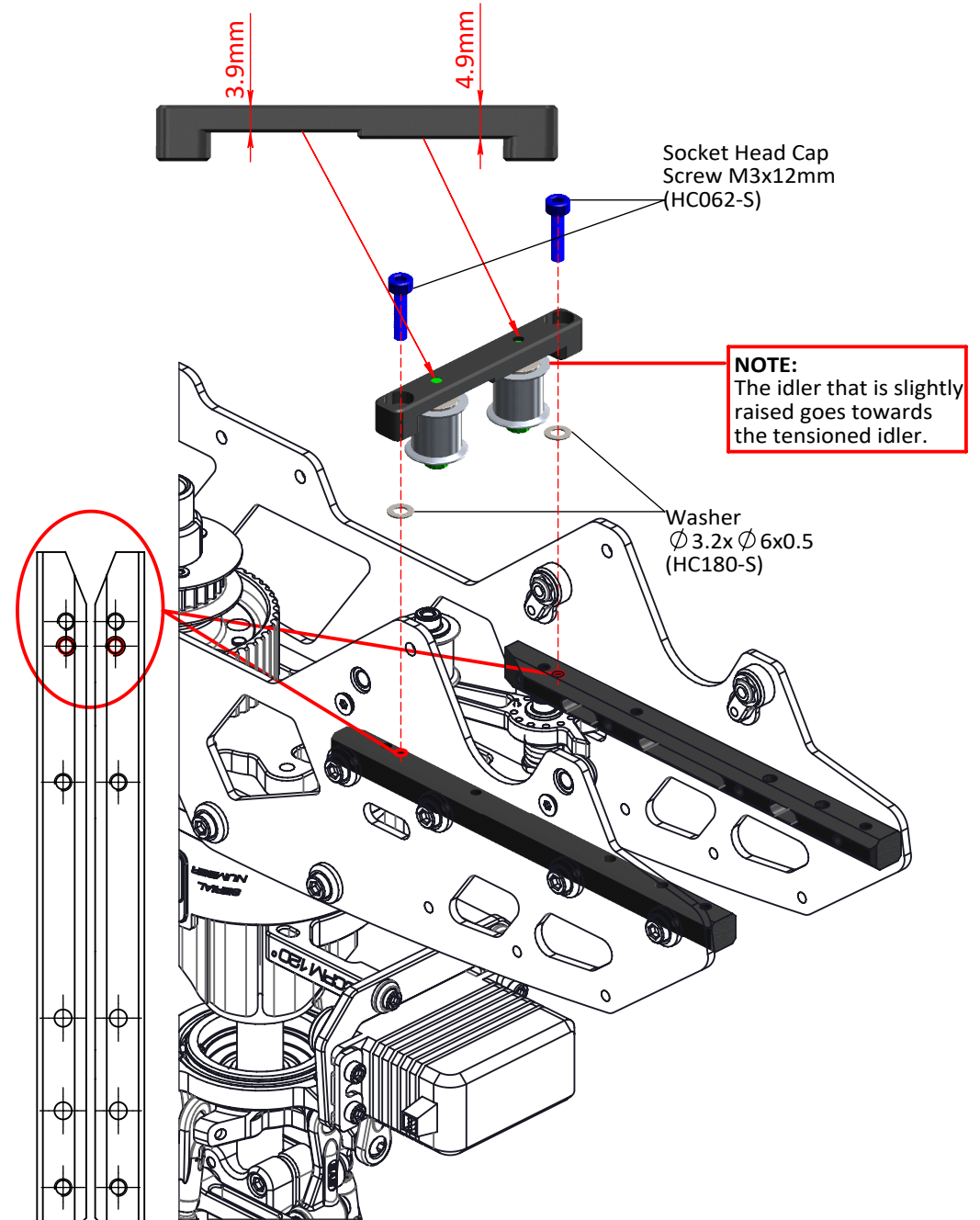
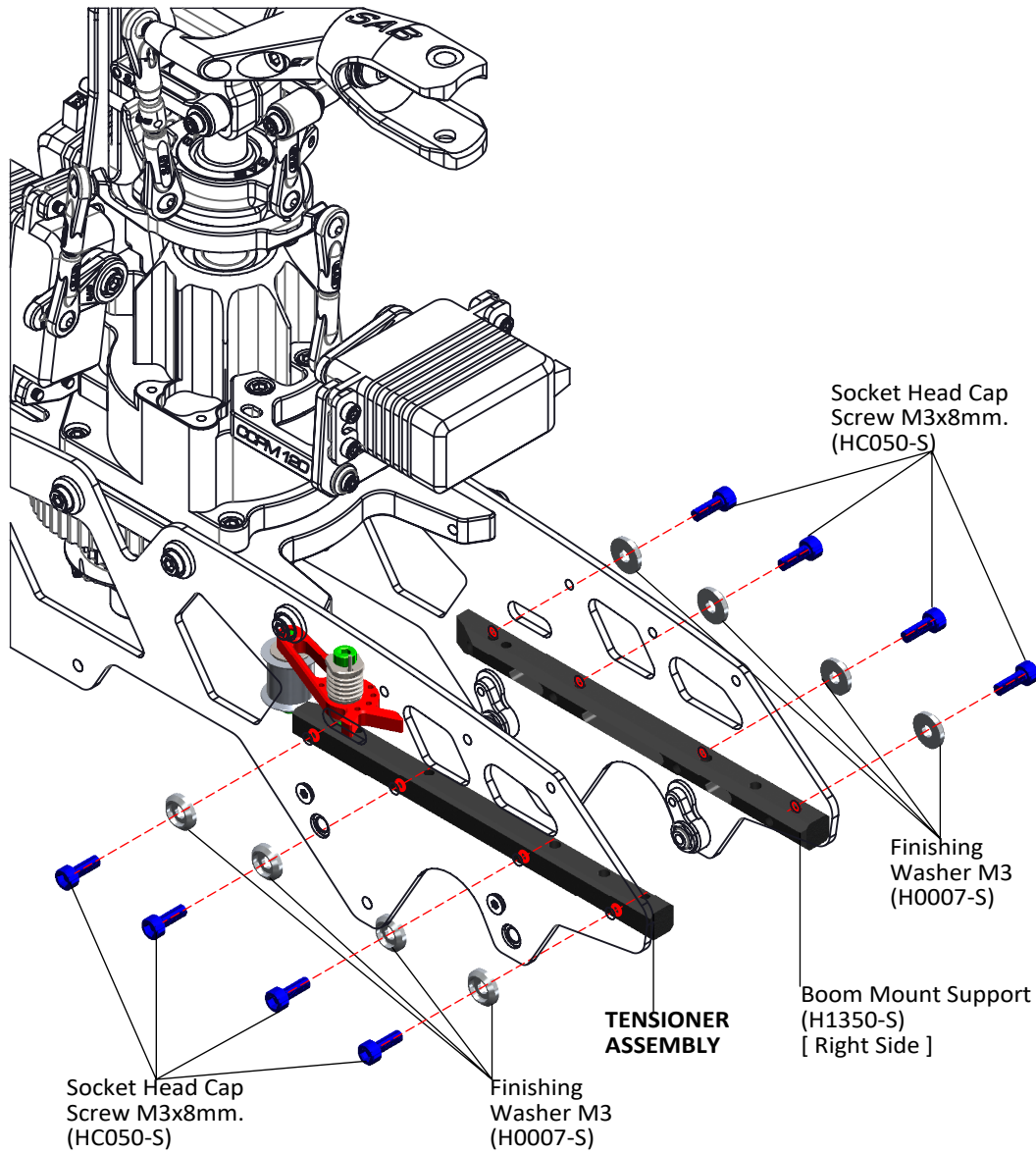


3

NOTE: Position without Spring pre-load.



BOX 1, BAG FOR PAGE 15

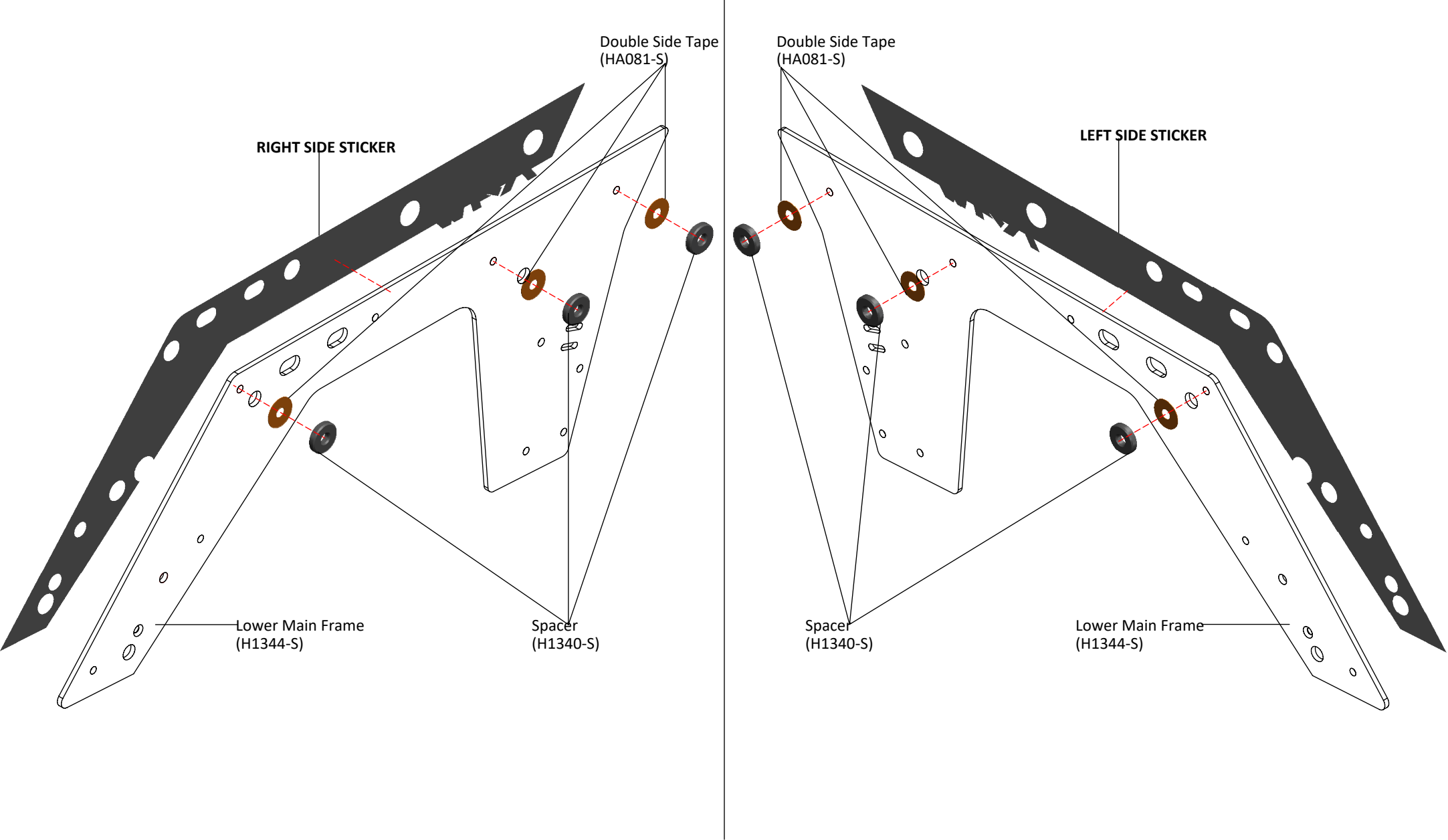


LOWER SIDE FRAME ASSEMBLY

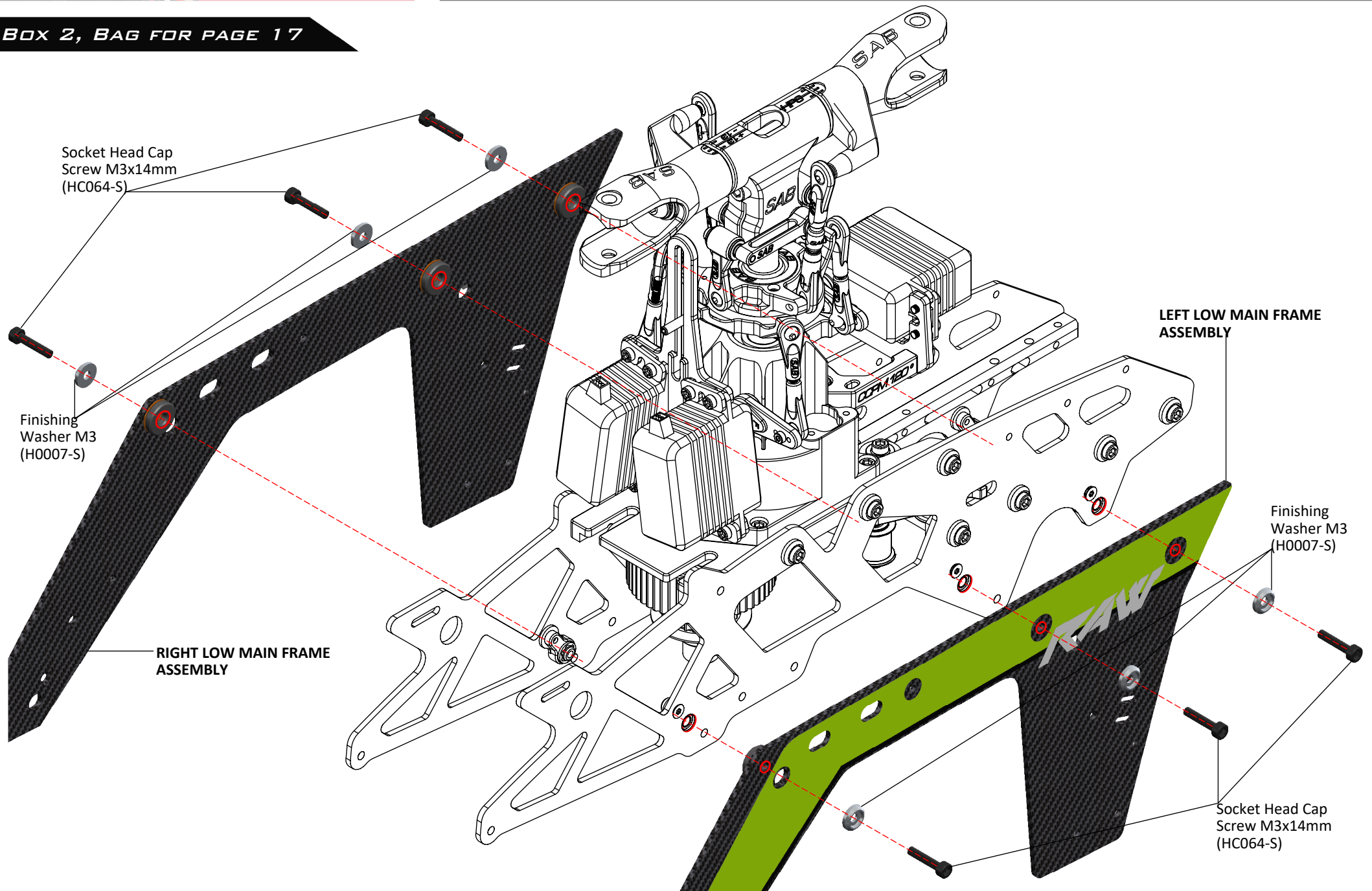
BOX 1, BAG FOR PAGE 16

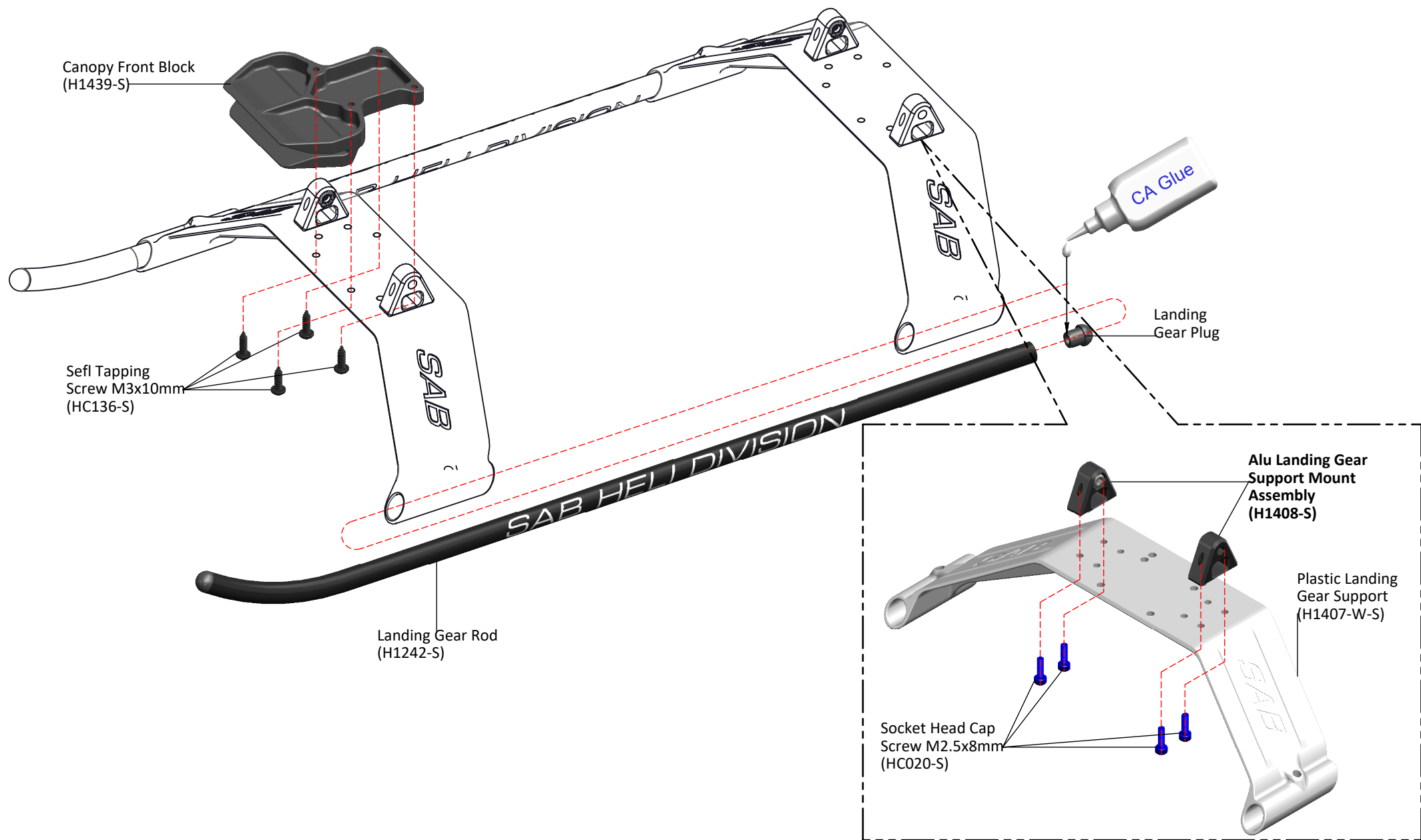
LOWER RIGHT MAIN FRAME ASSEMBLY

LOWER LEFT MAIN FRAME ASSEMBLY

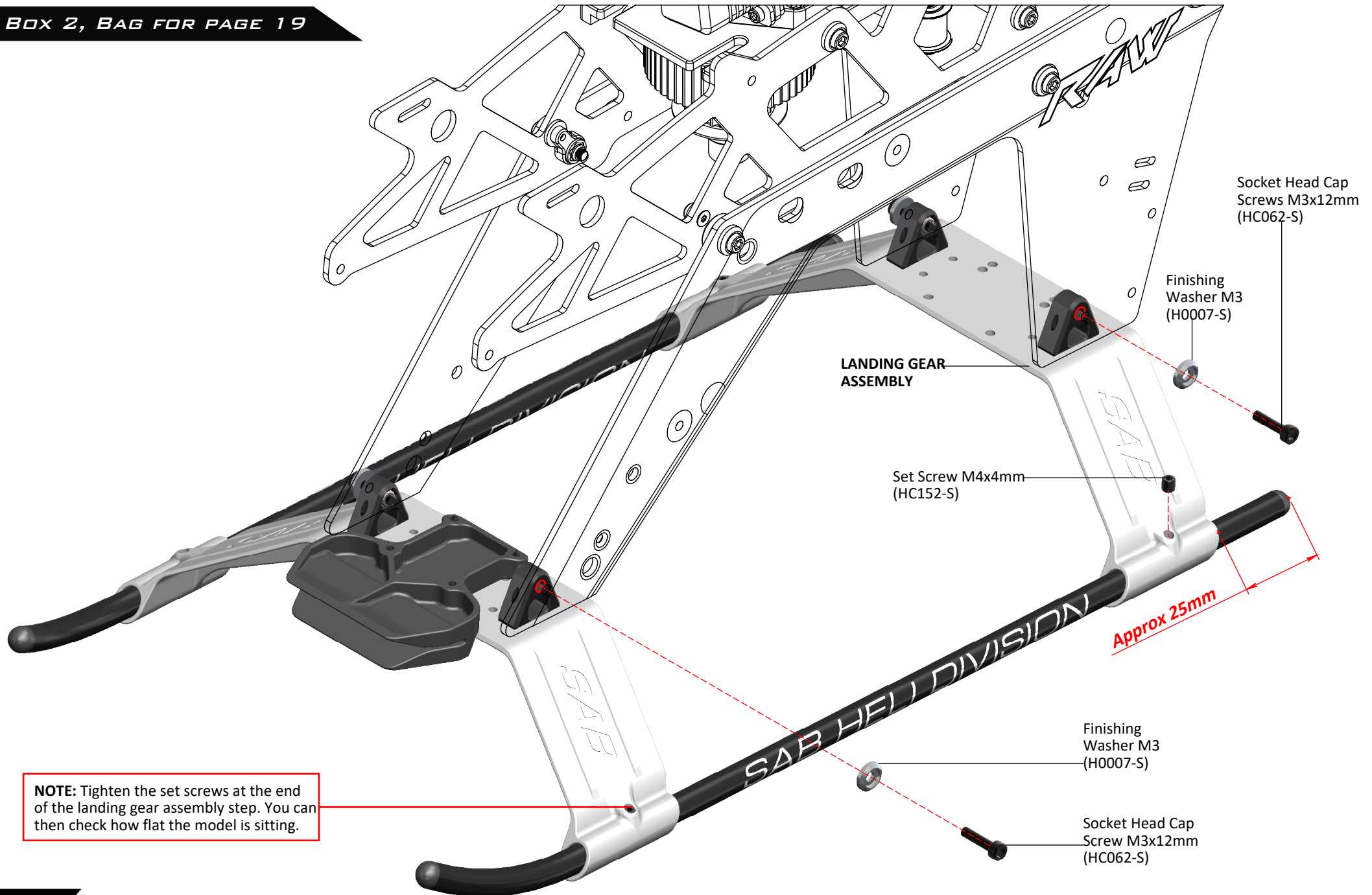


BOX 2, BAG FOR PAGE 17





BOX 2, BAG FOR PAGE 19



NOTE: Tighten the set screws at the end of the landing gear assembly step. You can then check how flat the model is sitting.

TRANSMISSION SETUP

It is important to choose the right reduction ratio to maximize efficiency based on your required flight performance.

It is recommended to use wiring and connectors appropriate for the currents generated in a helicopter of this class.

If you are using a head speed calculator which requires a main gear and pinion tooth count, use 216 teeth for the main gear

(this takes into account the two stage reduction) and the tooth count of your pulley as the pinion count.

BELOW IS A LIST OF AVAILABLE REDUCTION RATIOS:

H0015-18-S - **18T** Pinion = ratio **12.0:1**

H0015-21-S - **21T** Pinion = ratio **10.3:1**

H0015-24-S - **24T** Pinion = ratio **9.0:1**

H0015-19-S - **19T** Pinion = ratio **11.4:1**

H0015-22-S - **22T** Pinion = ratio **9.8:1**

H0015-25-S - **25T** Pinion = ratio **8.6:1**

H0015-20-S - **20T** Pinion = ratio **10.8:1**

H0015-23-S - **23T** Pinion = ratio **9.4:1**

H0015-25-S - **26T** Pinion = ratio **8.3:1**

GOBLIN RAW PIUMA CONFIGURATIONS					
Rev:01					
Battery	Motor	ESC	Pinion (a, b)	RPM Max (a, b)	Pitch
6S-5500 mAh (5000/6000 mAh)	Kontronik Pyro 650-103 L	HW 150A V4 Scorpion Tribunus II 06-120A KOLIBRI 140 LV-I YGE 135LVT	20T / 21T	1850/1950	± 12
	HKIV-4025-1100KV (6mm) X-NOVA 4025-1120 Kv		19T / 20T		
	EGODRIFT Tengu 4025HT/1190Kv		18T / 19T		
12S-3300 mAh (2800/5000 mAh)	HKIV-4025-520KV (6mm)	HW 130A V4 Scorpion Tribunus 12-130A KOLIBRI 140 HV-I YGE Aureus 135	20T / 21T	1850/1950	± 13
	X-NOVA 4025-560 EGODRIFT Tengu 4025HS/550Kv Scorpion HKII 4030-540		19T / 20T		

Rev:01



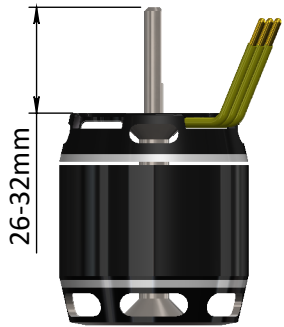
RAW PIUMA is an ultralight 700 class model. The recommended main rotor RPM limit is 2000 RPMs.

BOX 2, BAG FOR PAGE 21

Set Screw M4x6mm
(HC153-S)
(on the flat slot of the motor shaft)

NOTE

Max height of the motor shaft: 32mm
Min height of the motor shaft: 26mm



Set Screw M4x4mm
(HC152-S)

Motor Pulley 20T
(H0015-20-S)

Flat Head Cap
Screw M3x5mm
(HC132-S)

Motor Mount
(H1215-S)

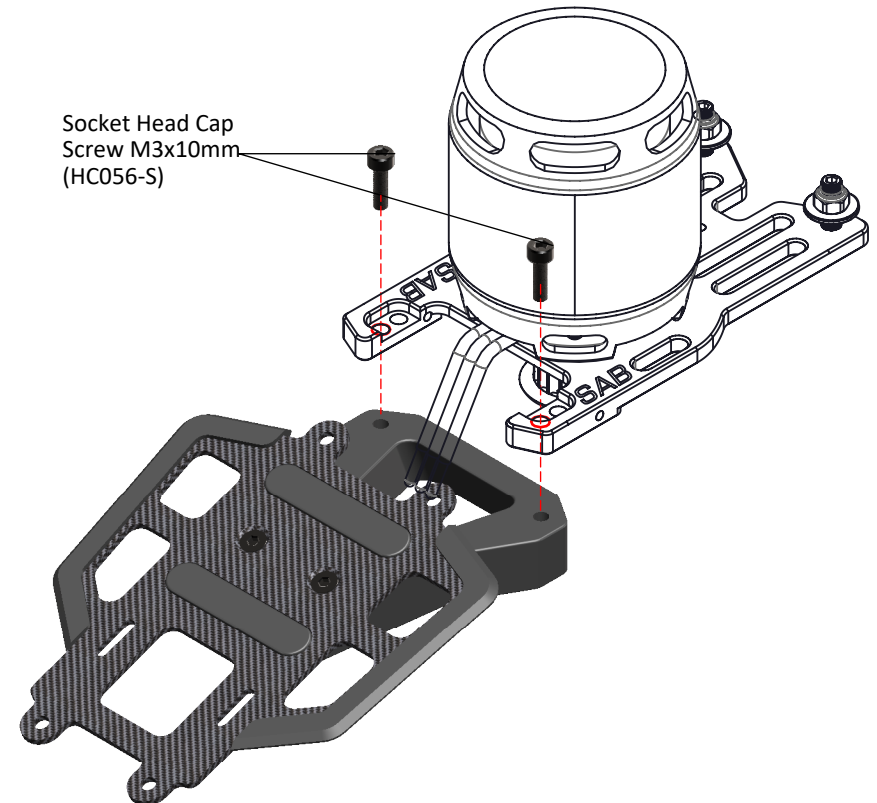
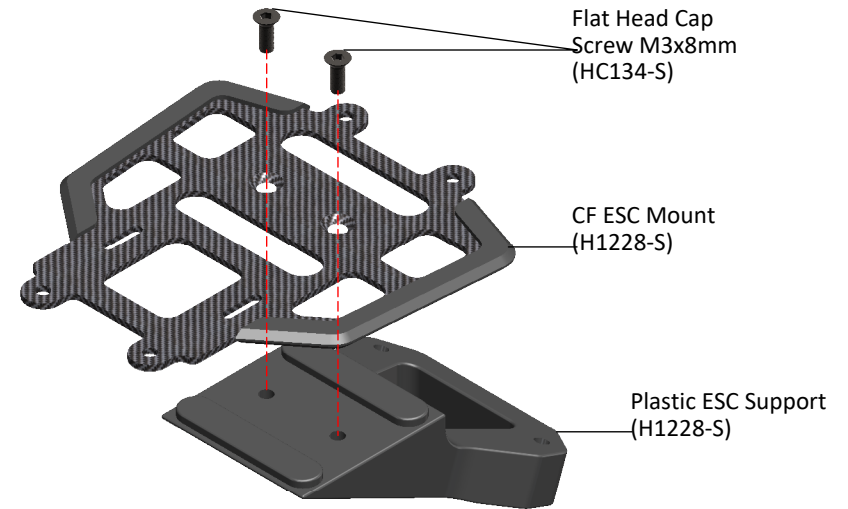
Socket Head Cap
Screw M3x6mm
(HC044-S)

Washer
Ø 4.3x Ø 11x1mm
(HC184-S)

Metric Hex
Nylon Nut M4
(HC212-S)

Motor Bushing
Use with 5mm
motor shaft

NOTE
Motor wires
pointing forward.

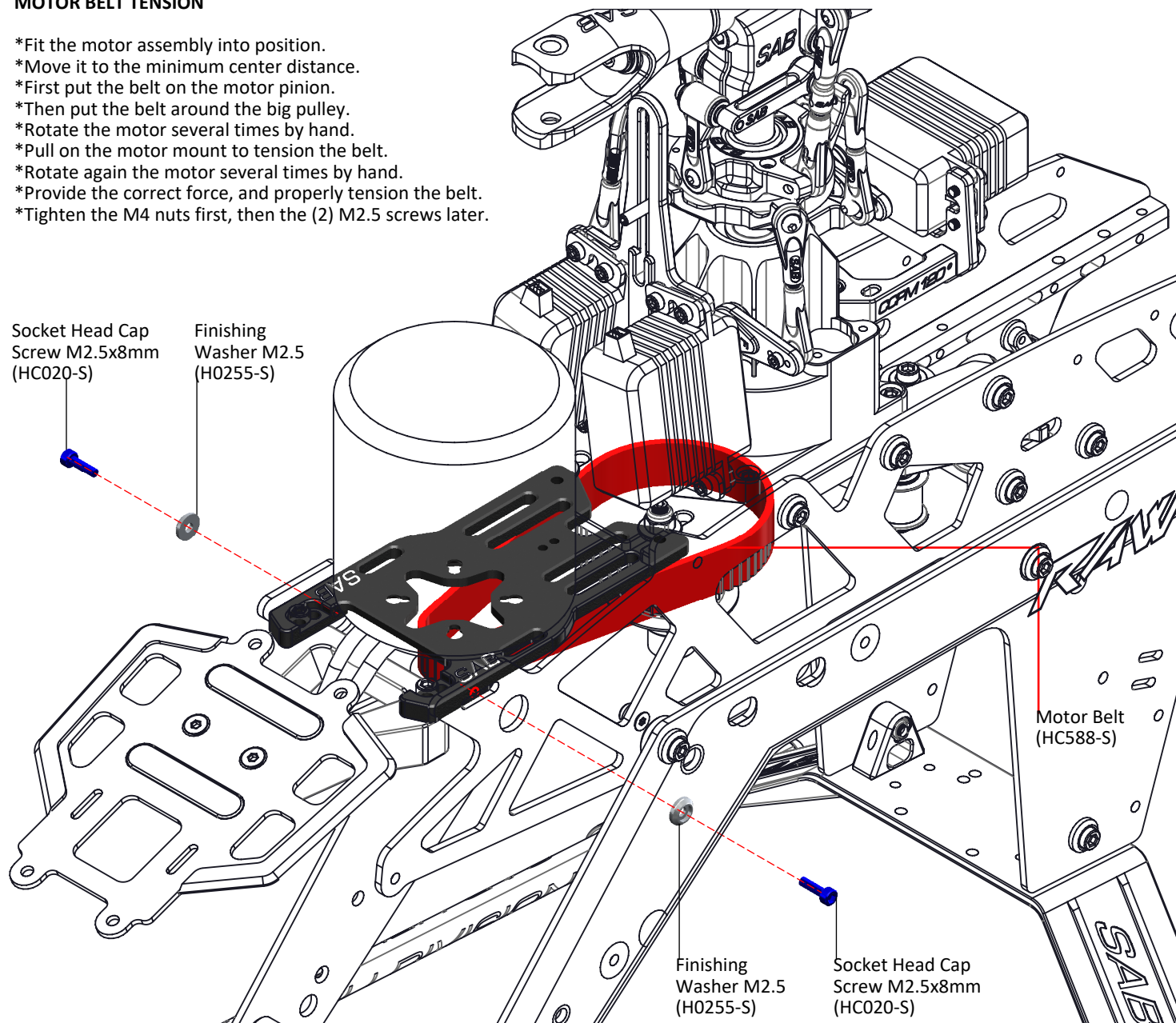


MOTOR BELT TENSION

- *Fit the motor assembly into position.
- *Move it to the minimum center distance.
- *First put the belt on the motor pinion.
- *Then put the belt around the big pulley.
- *Rotate the motor several times by hand.
- *Pull on the motor mount to tension the belt.
- *Rotate again the motor several times by hand.
- *Provide the correct force, and properly tension the belt.
- *Tighten the M4 nuts first, then the (2) M2.5 screws later.

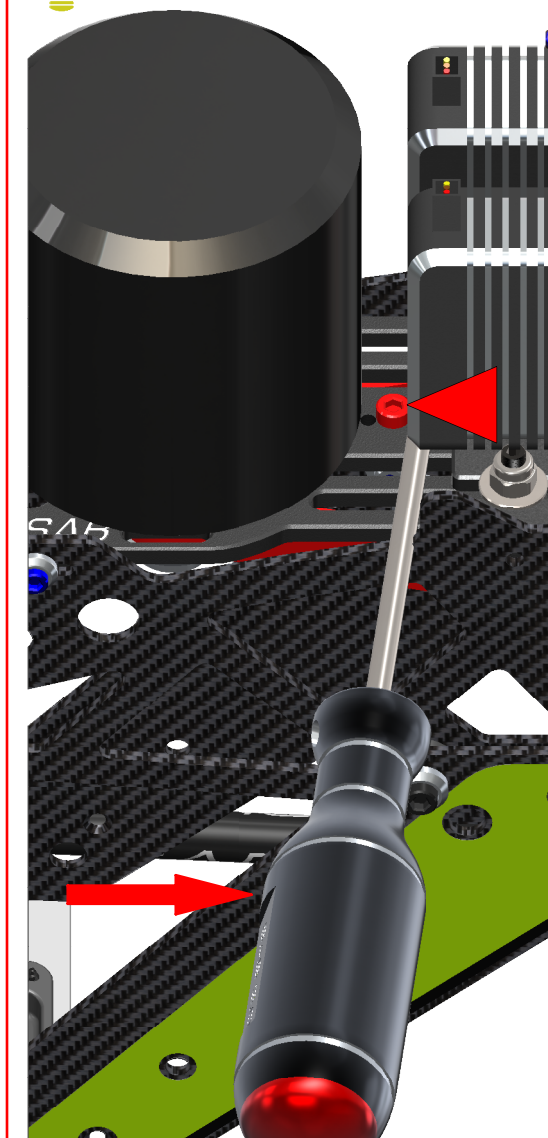
Socket Head Cap
Screw M2.5x8mm
(HC020-S)

Finishing
Washer M2.5
(H0255-S)



NOTE

You can use a 4-5mm shaft as a lever to set proper motor belt tension.

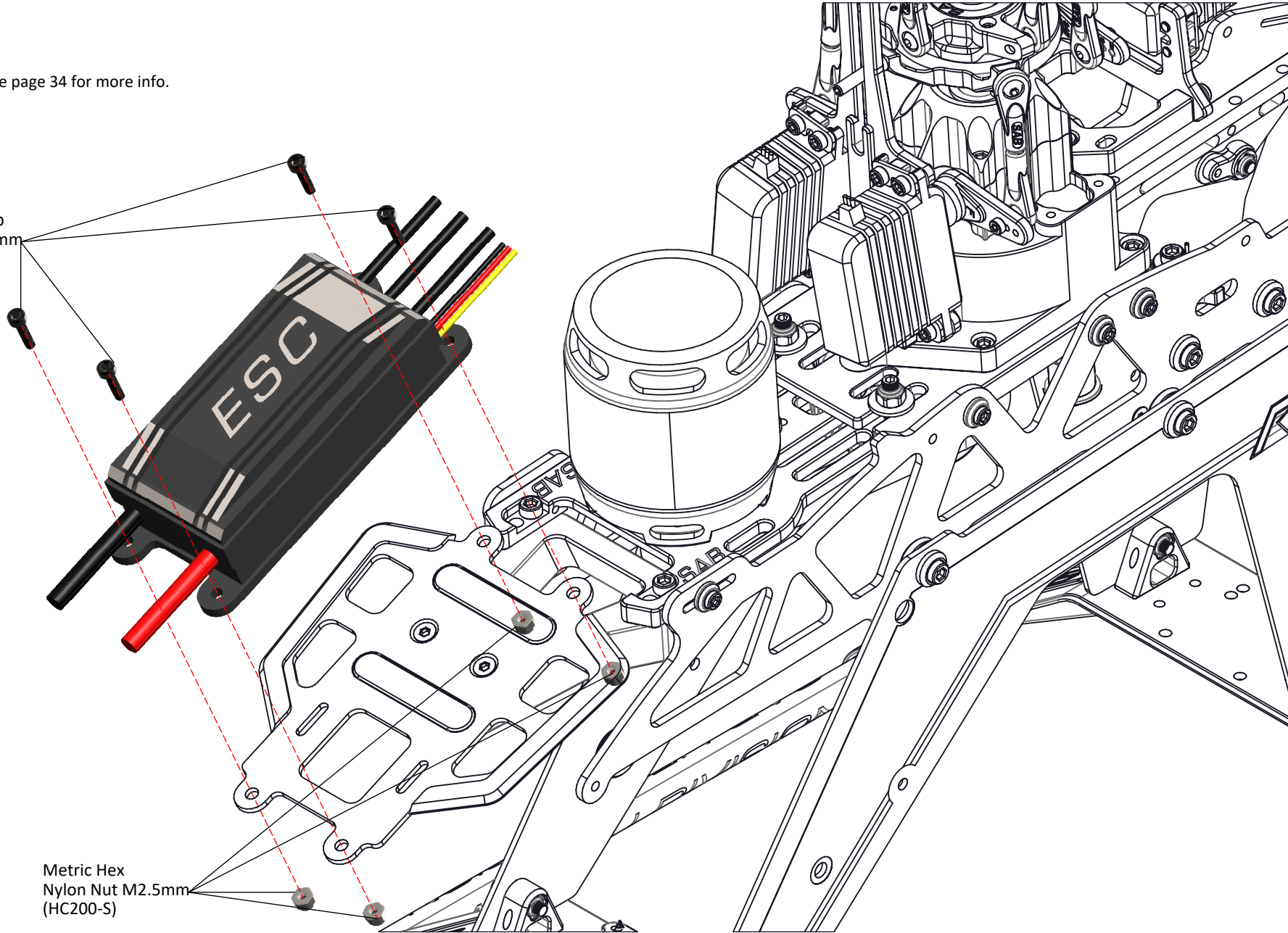


BOX 2, BAG FOR PAGE 23

NOTE:
 For install wire see page 34 for more info.

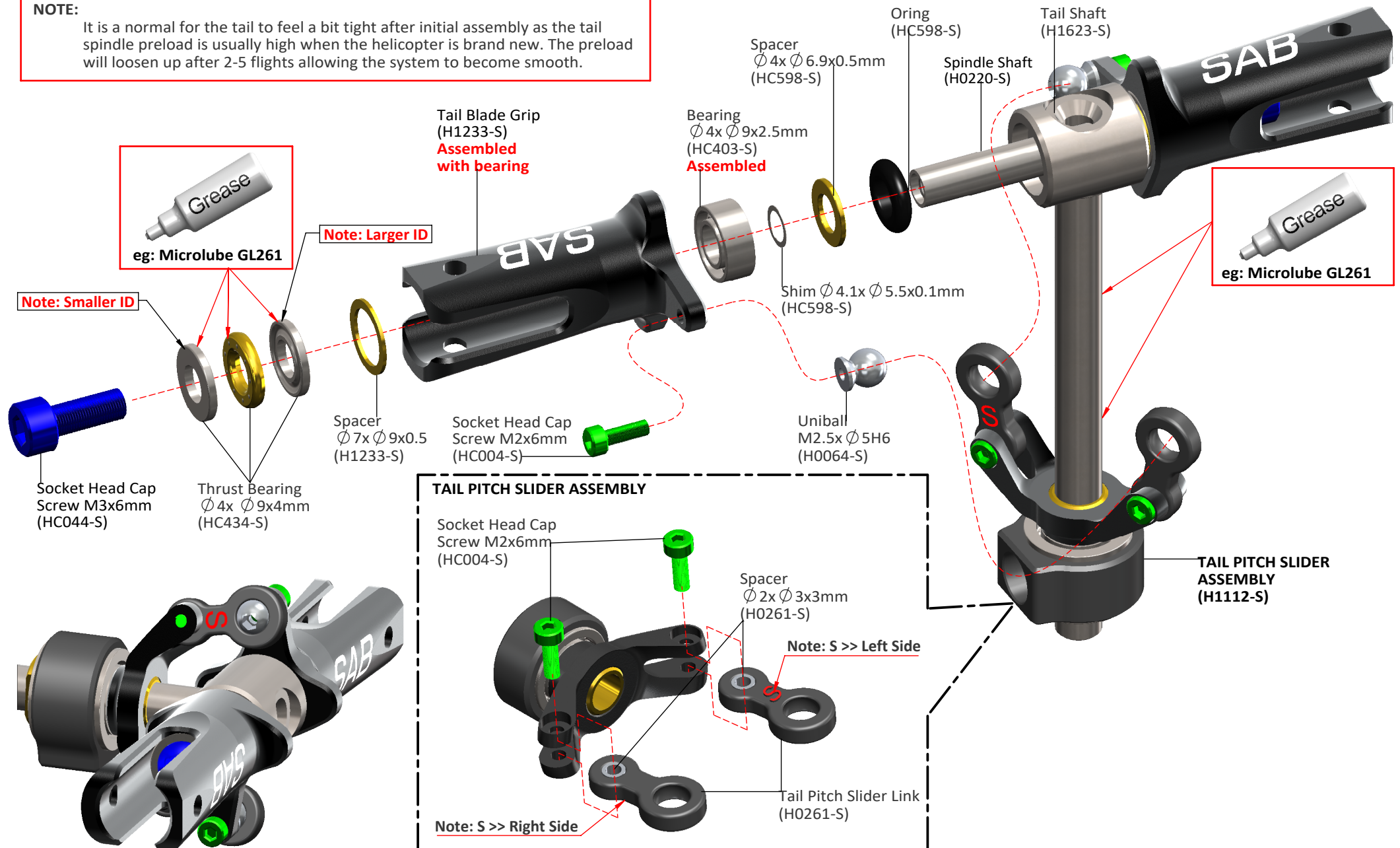
Socket Head Cap
Screw M2.5x10mm
(HC022-S)

Metric Hex
Nylon Nut M2.5mm
(HC200-S)

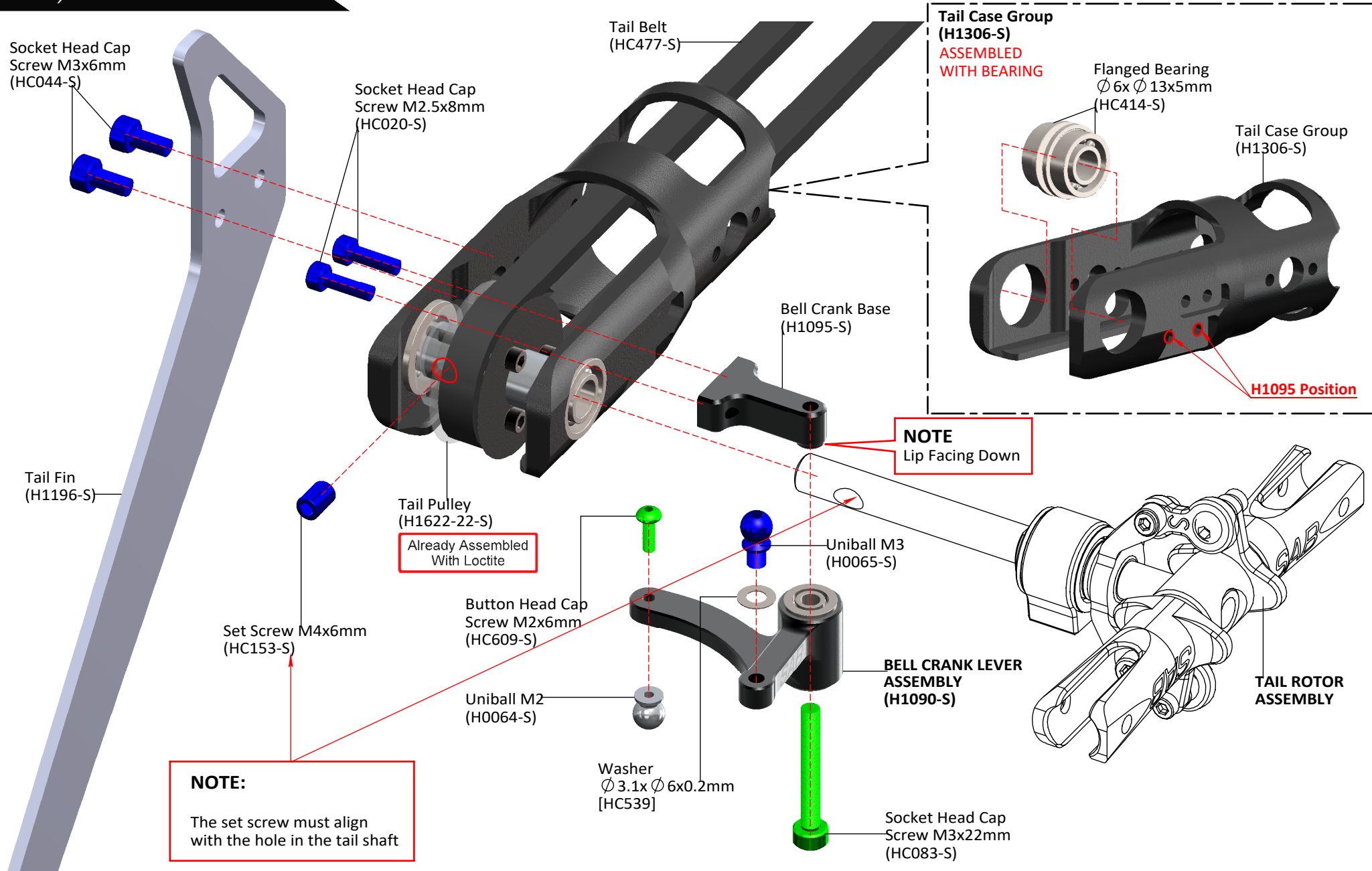


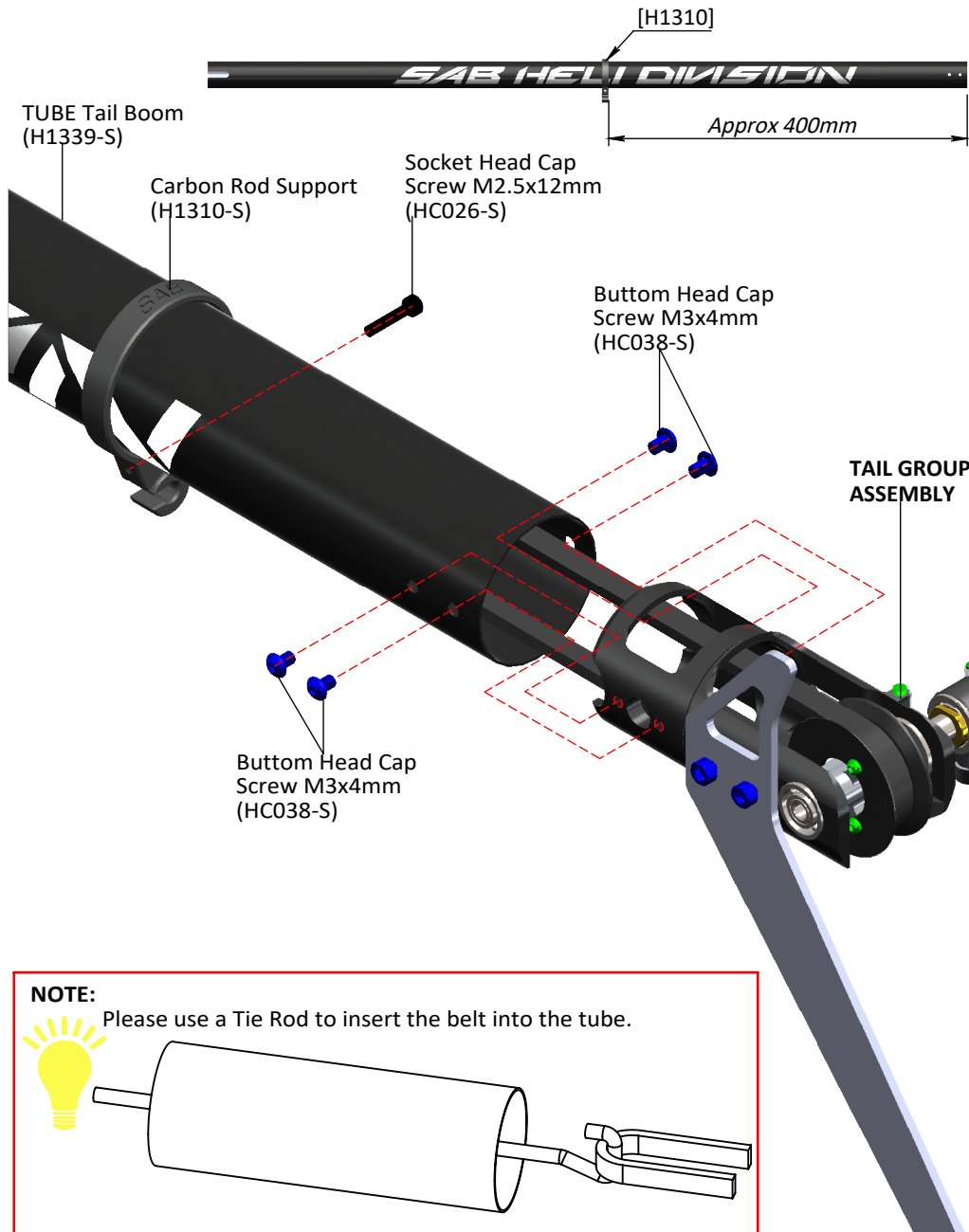
NOTE:

It is normal for the tail to feel a bit tight after initial assembly as the tail spindle preload is usually high when the helicopter is brand new. The preload will loosen up after 2-5 flights allowing the system to become smooth.

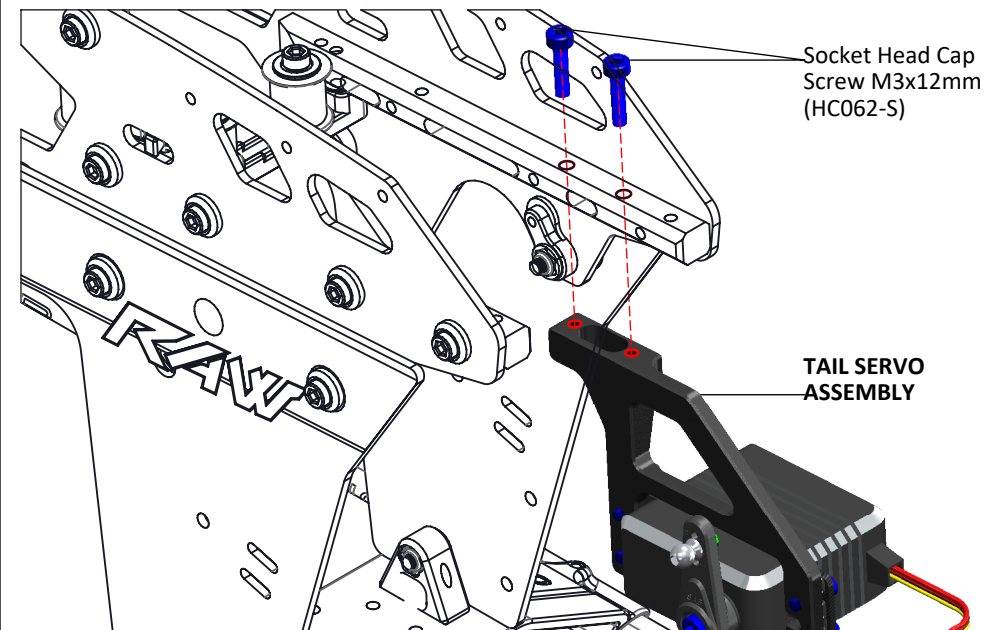
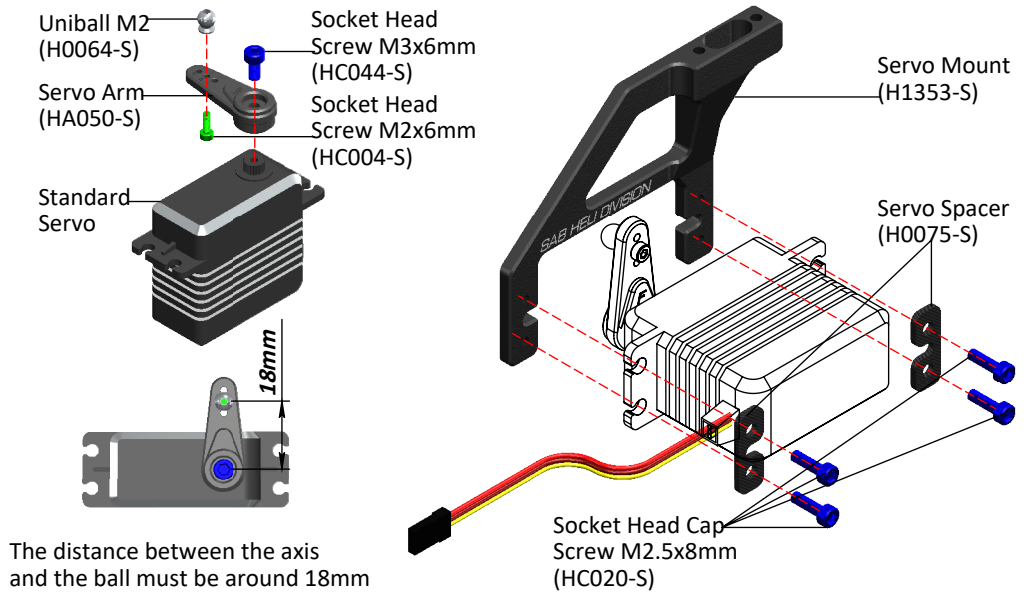


BOX 2, BAG FOR PAGE 25





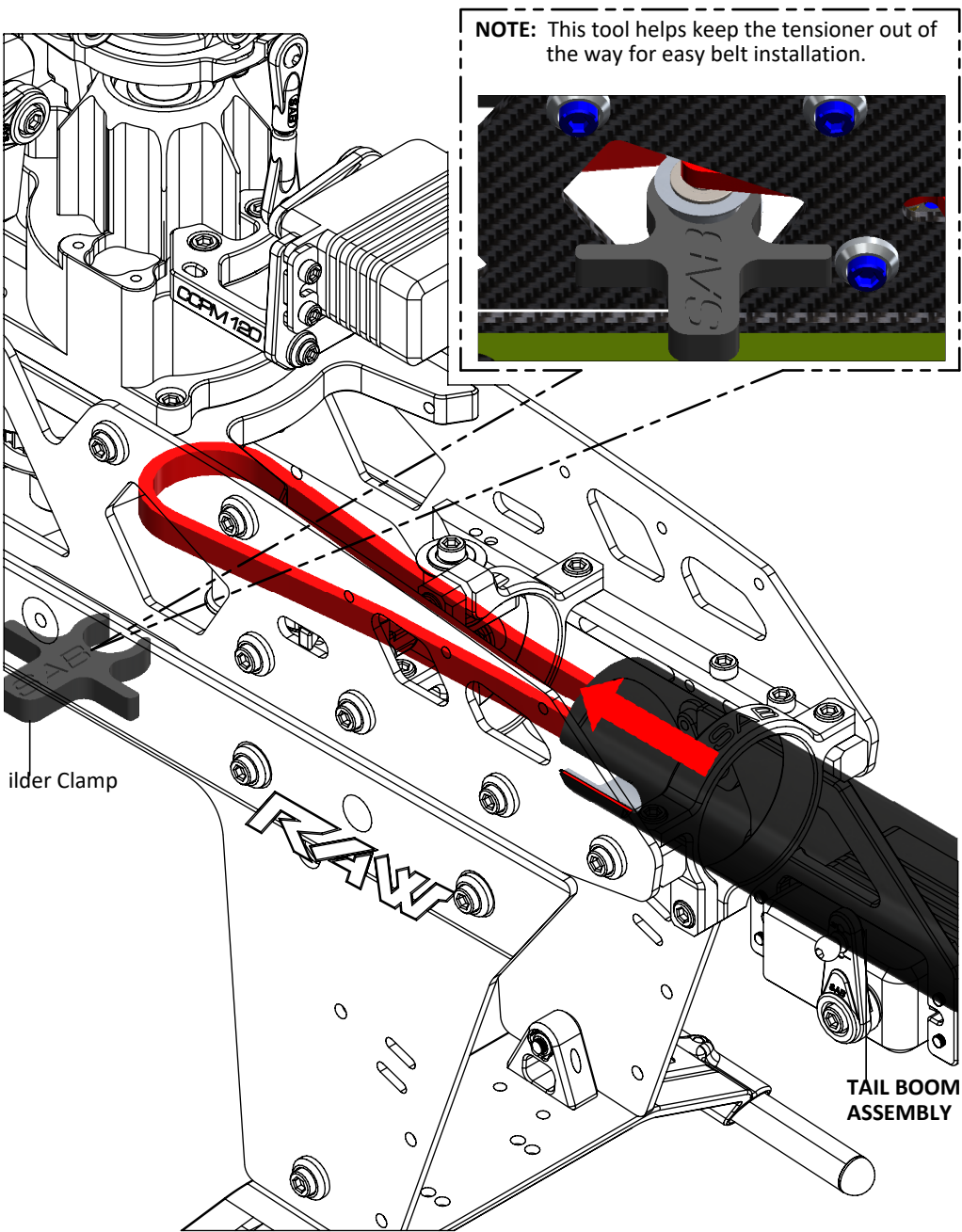
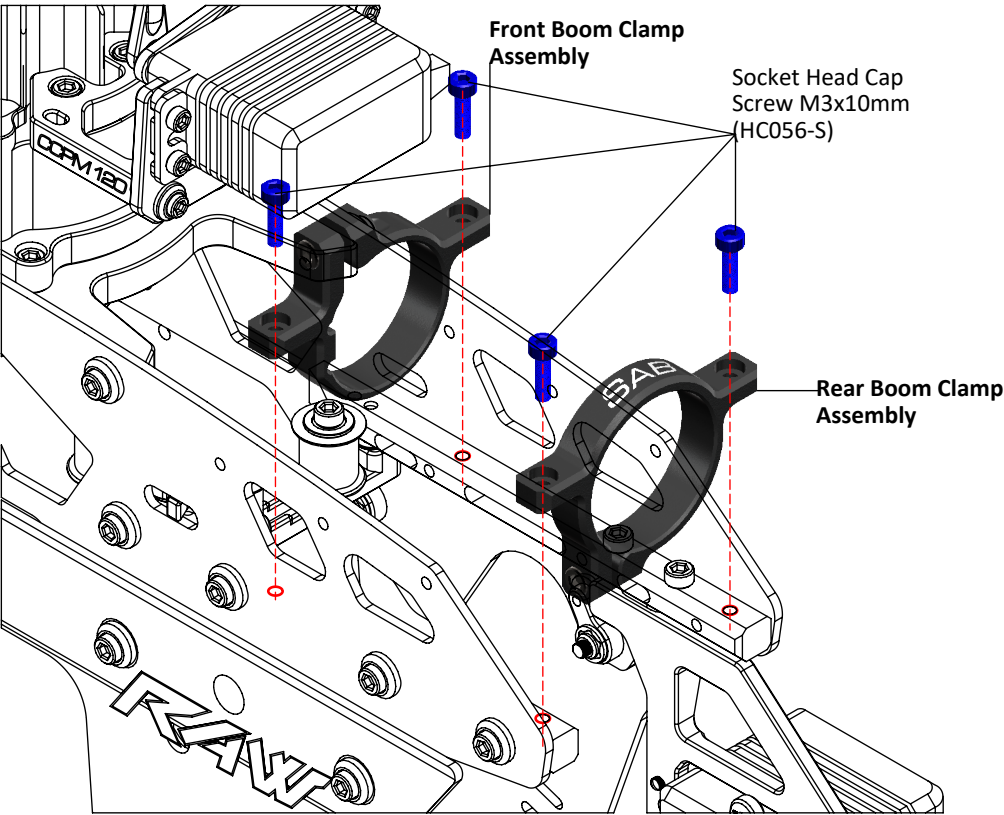
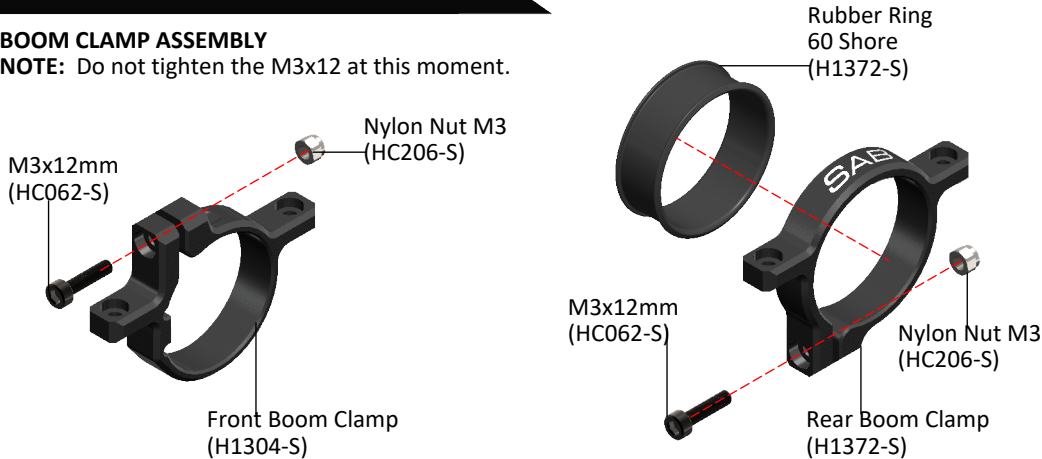
TAIL SERVO ASSEMBLY



BOX 2, BAG FOR PAGE 27

BOOM CLAMP ASSEMBLY

NOTE: Do not tighten the M3x12 at this moment.



TAIL BOOM ASSEMBLY

To fit the tail belt, loosen the tail boom by loosening the 2 M3 screws (Fig.1).

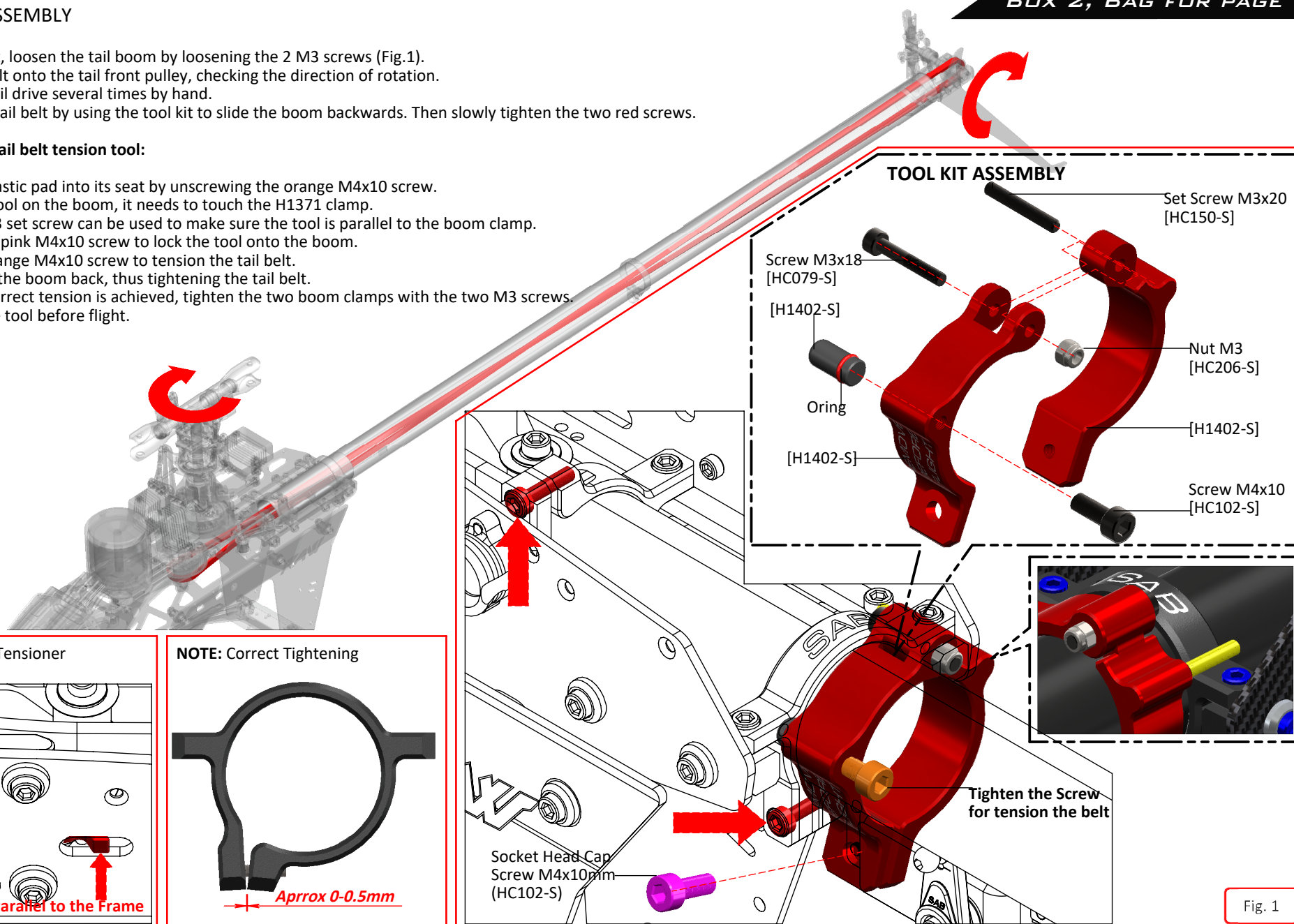
*Install the belt onto the tail front pulley, checking the direction of rotation.

*Rotate the tail drive several times by hand.

*Tension the tail belt by using the tool kit to slide the boom backwards. Then slowly tighten the two red screws.

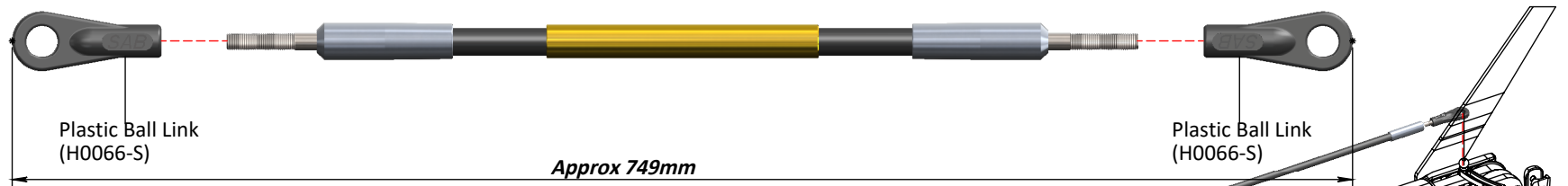
How to use the tail belt tension tool:

1. Push the plastic pad into its seat by unscrewing the orange M4x10 screw.
2. Install the tool on the boom, it needs to touch the H1371 clamp.
3. Tighten the pink M4x10 screw to lock the tool onto the boom.
4. Turn the orange M4x10 screw to tension the tail belt.
5. Once the correct tension is achieved, tighten the two boom clamps with the two M3 screws.
6. Remove the tool before flight.



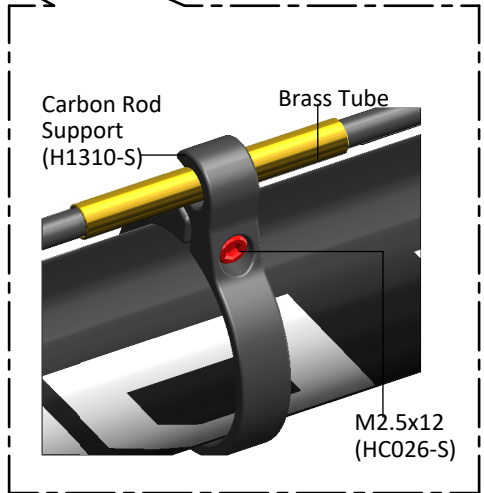
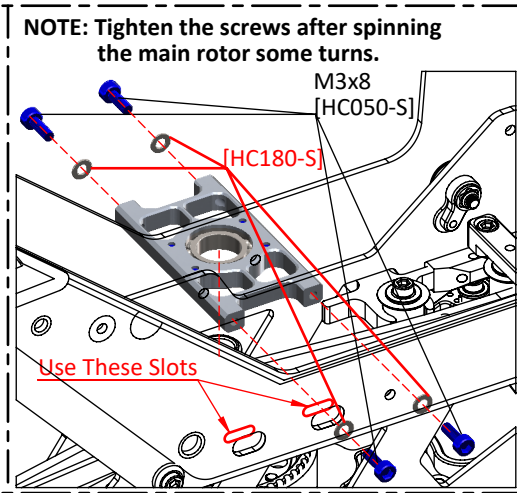
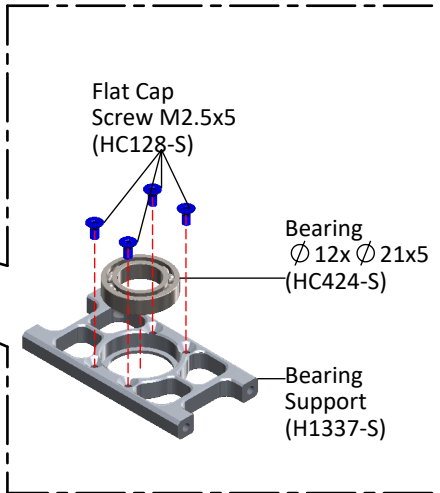
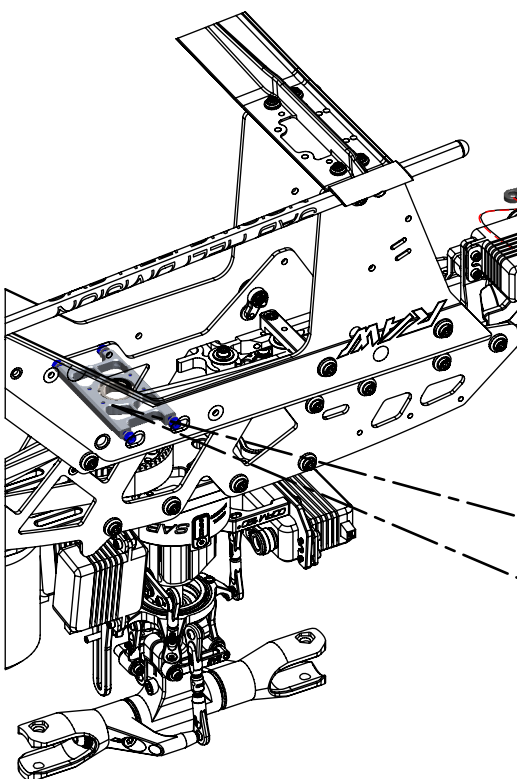
BOX 2, BAG FOR PAGE 29

Before installing the plastic link on the threaded rod, be sure that you have waited at least 12 hours for the glue to fully cure.

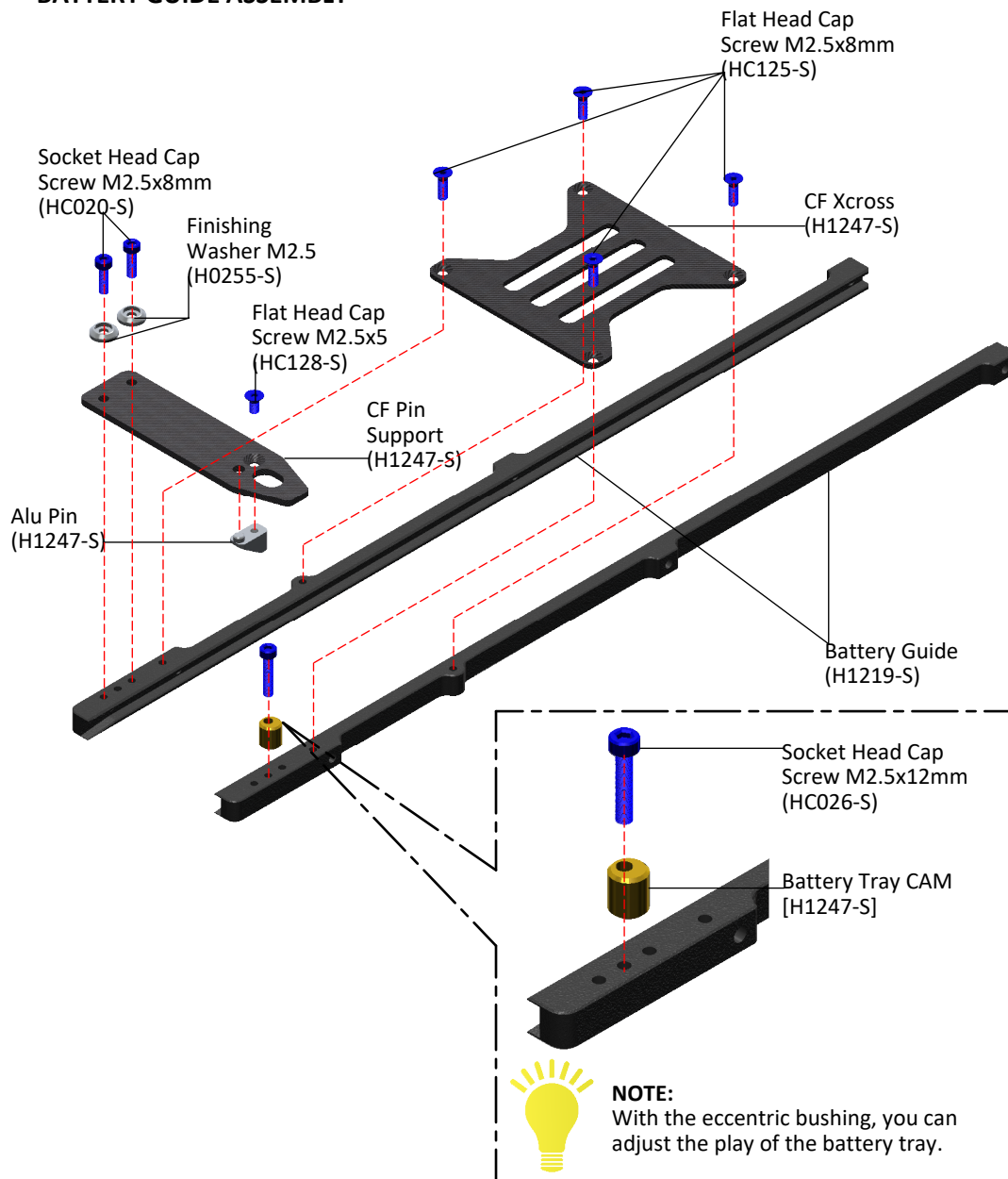


NOTE:
Before installing the plastic link onto the ball, be sure the tail push rod moves smoothly. You can open up H1310-S if you need to.

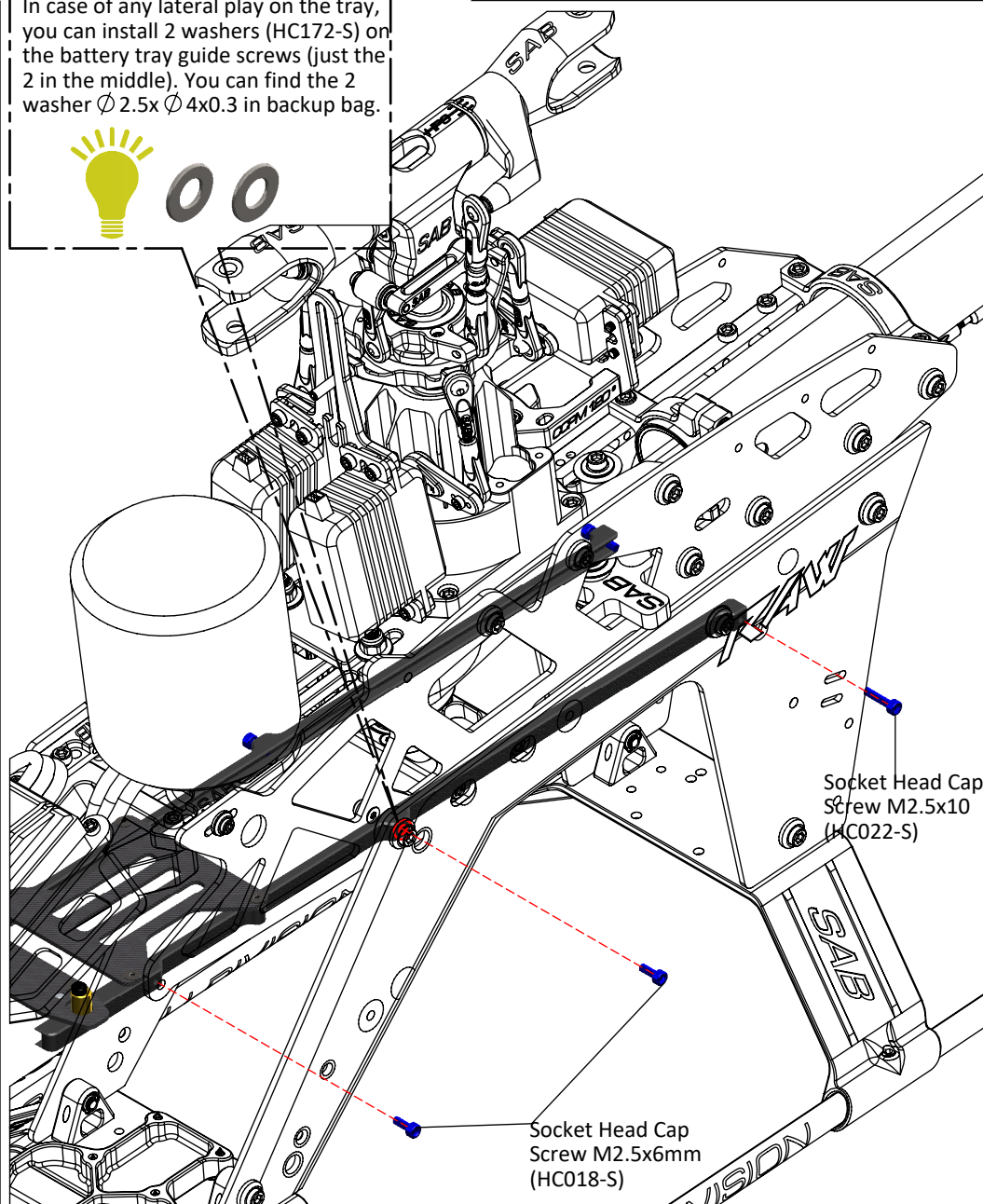
NOTE:
The carbon rod is slightly bent, generating a little preload against the carbon rod support.



BATTERY GUIDE ASSEMBLY



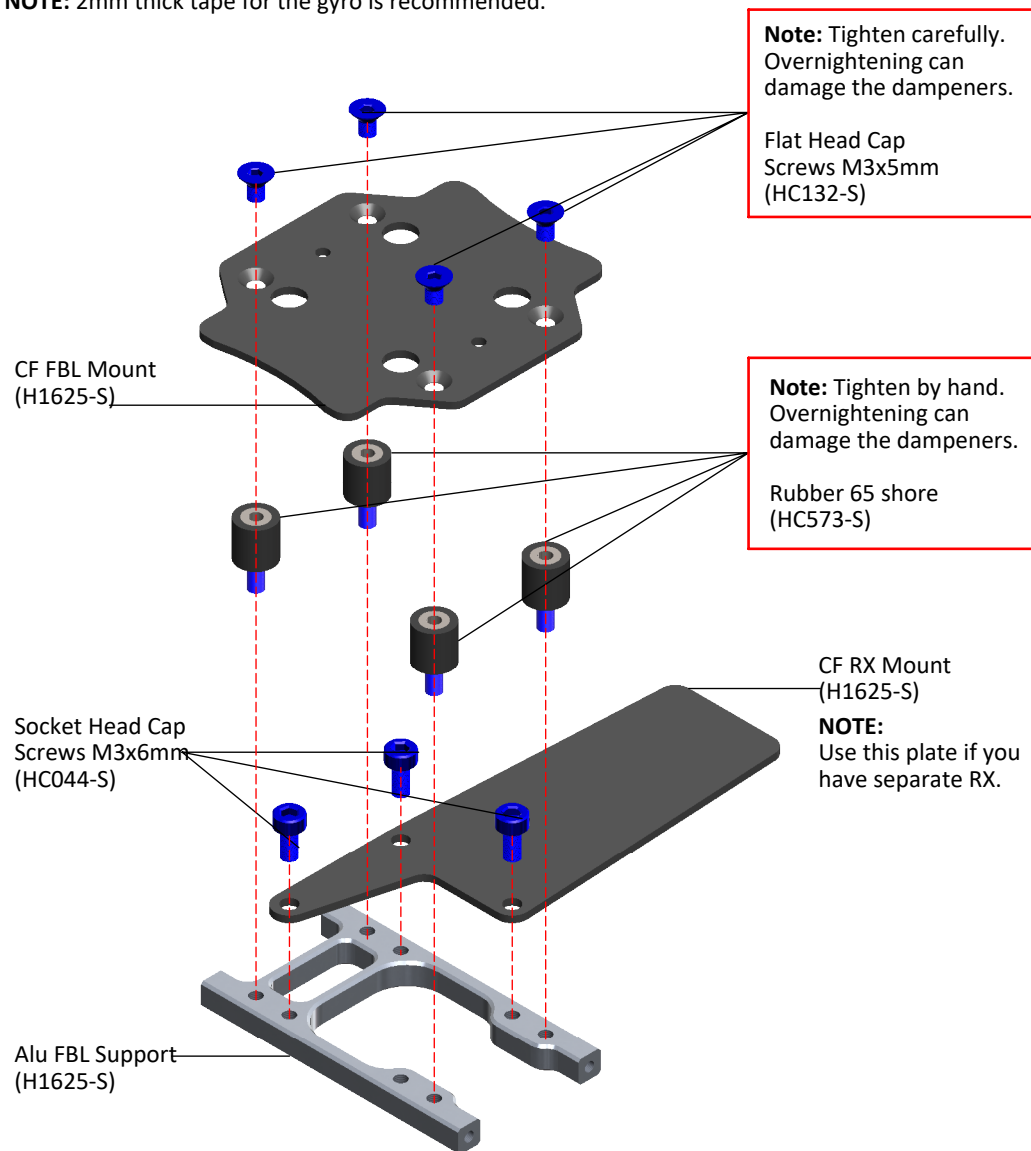
In case of any lateral play on the tray, you can install 2 washers (HC172-S) on the battery tray guide screws (just the 2 in the middle). You can find the 2 washer $\varnothing 2.5 \times \varnothing 4 \times 0.3$ in backup bag.



BOX 2, BAG FOR PAGE 31

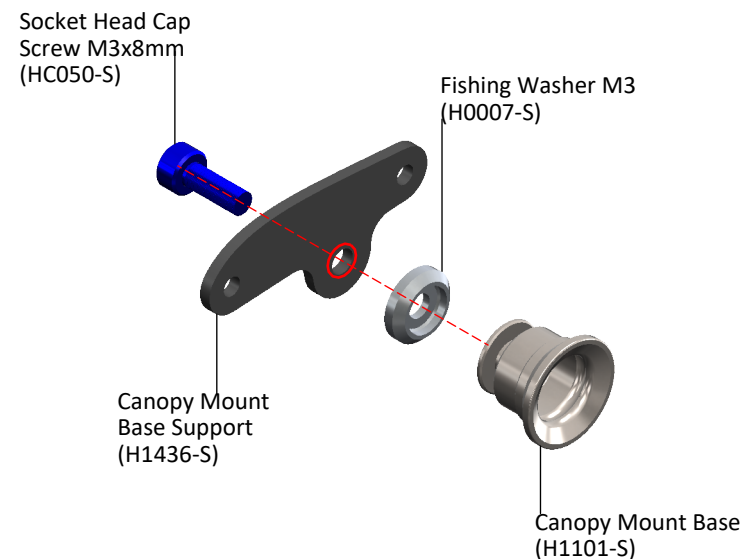
FBL/RX PLATE ASSEMBLY DAMPENERS OPTION

NOTE: 2mm thick tape for the gyro is recommended.

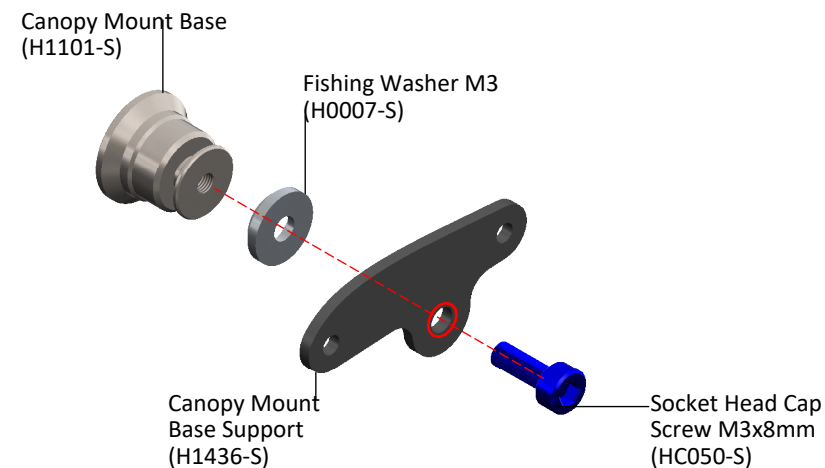


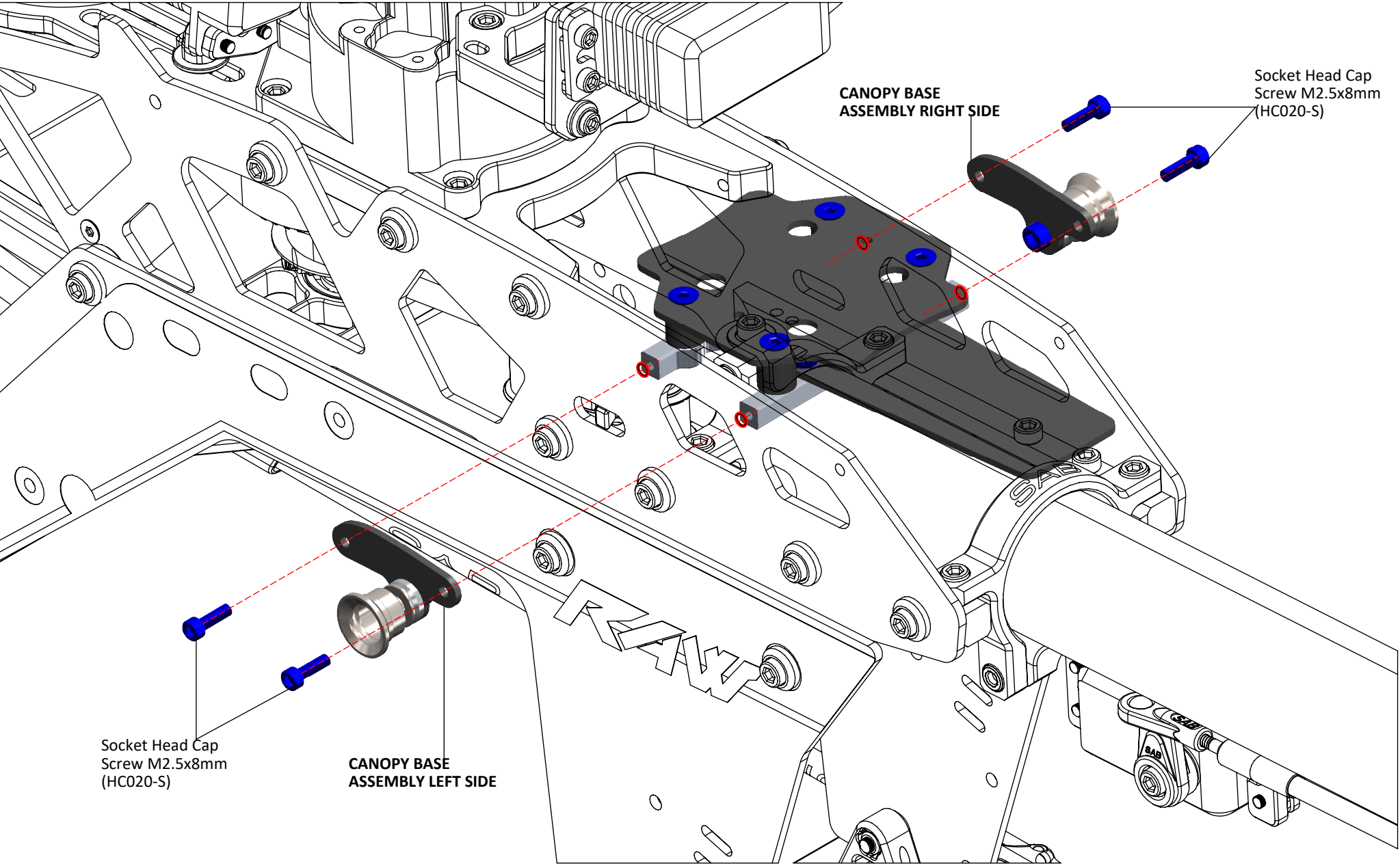
If you do not want to use the dampeners, you can setup a rigid FBL mount support using the screws and bushings supplied in bag 33-2

CANOPY BASE ASSEMBLY LEFT SIDE



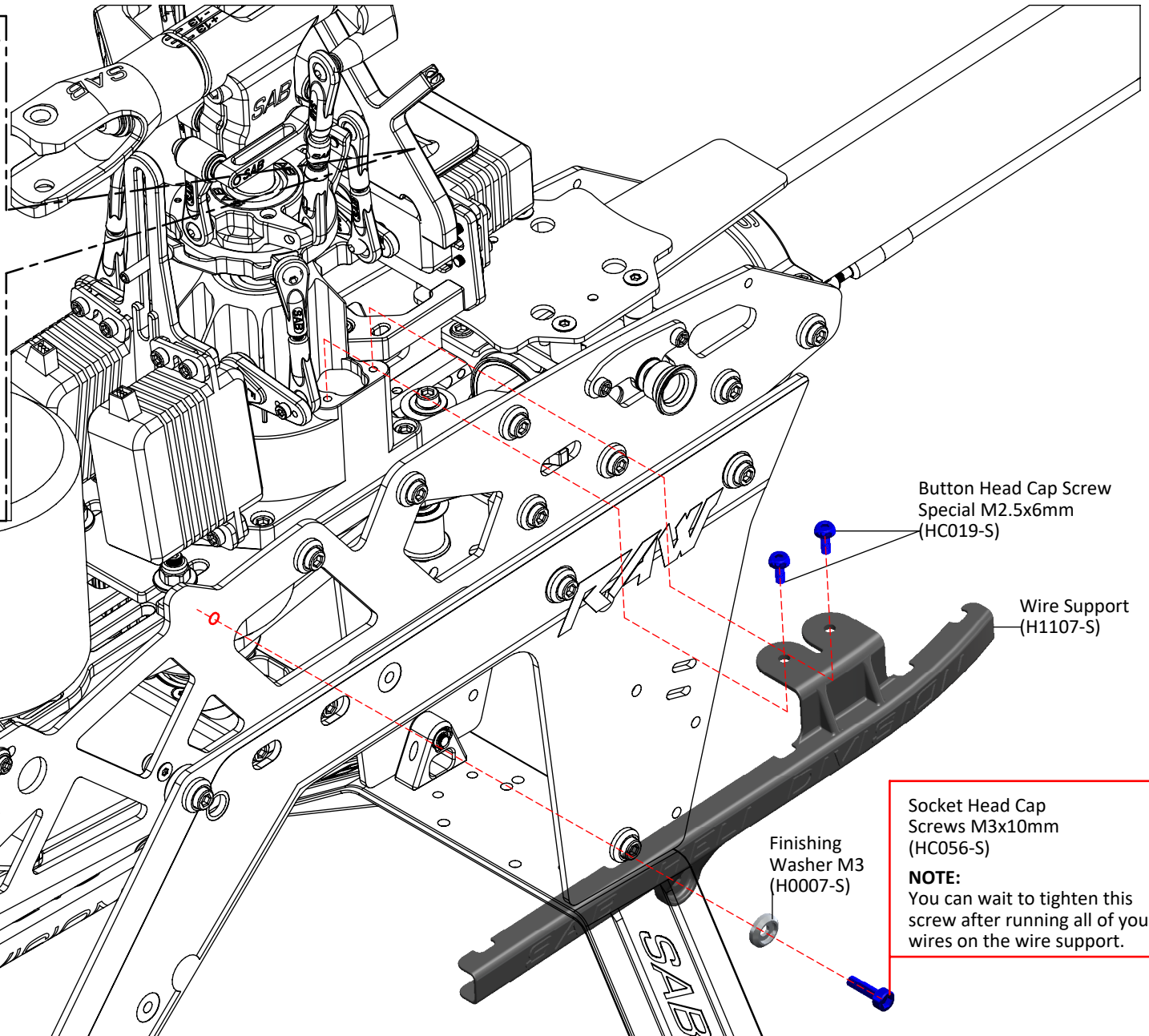
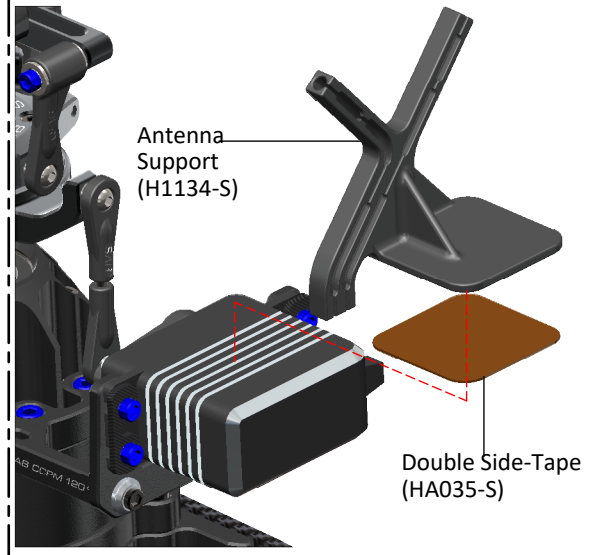
CANOPY BASE ASSEMBLY RIGHT SIDE



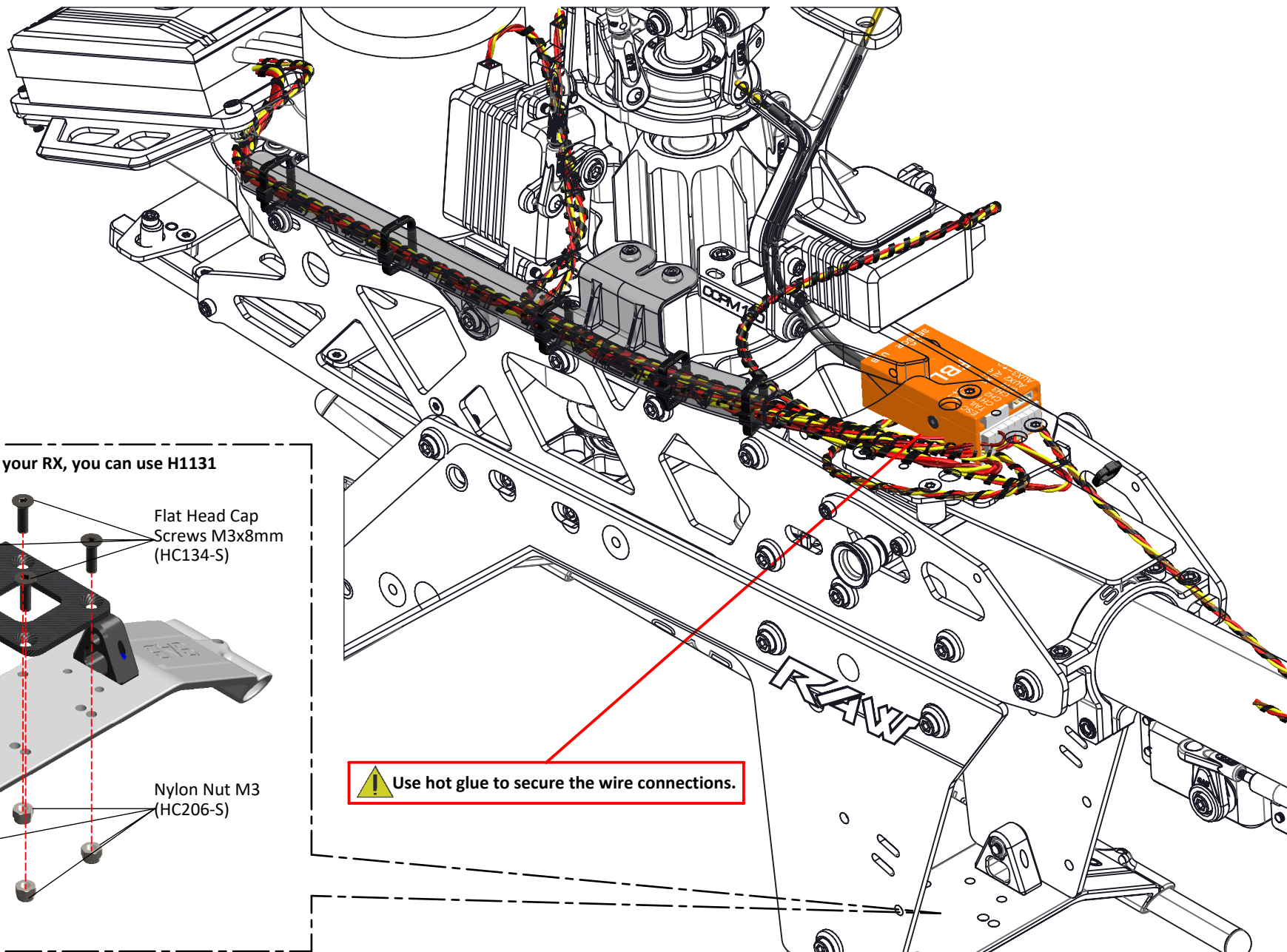


BOX 2, BAG FOR PAGE 33

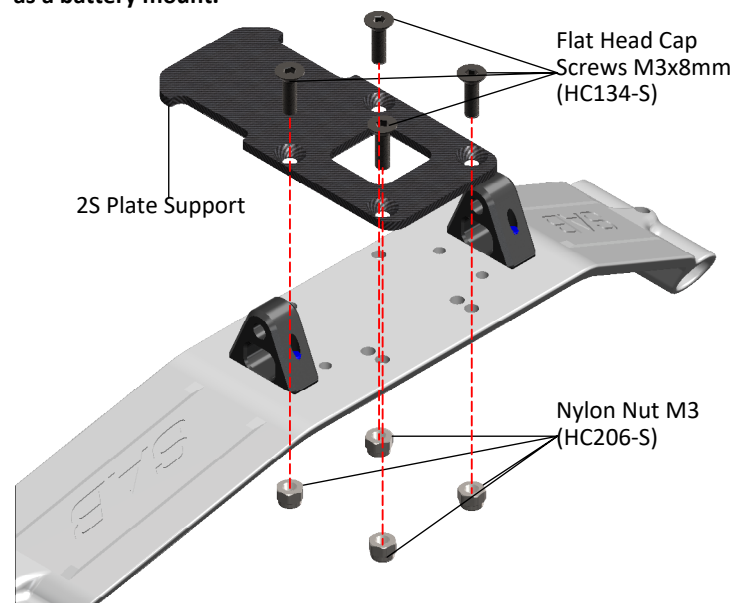
In bag 33-2, you can find a "3D Printed" antenna support. Use it as desired with your RX system.



NOTE:
You can wait to tighten this screw after running all of your wires on the wire support.



If you use a 2s battery to power your RX, you can use H1131 as a battery mount.



⚠ Use hot glue to secure the wire connections.

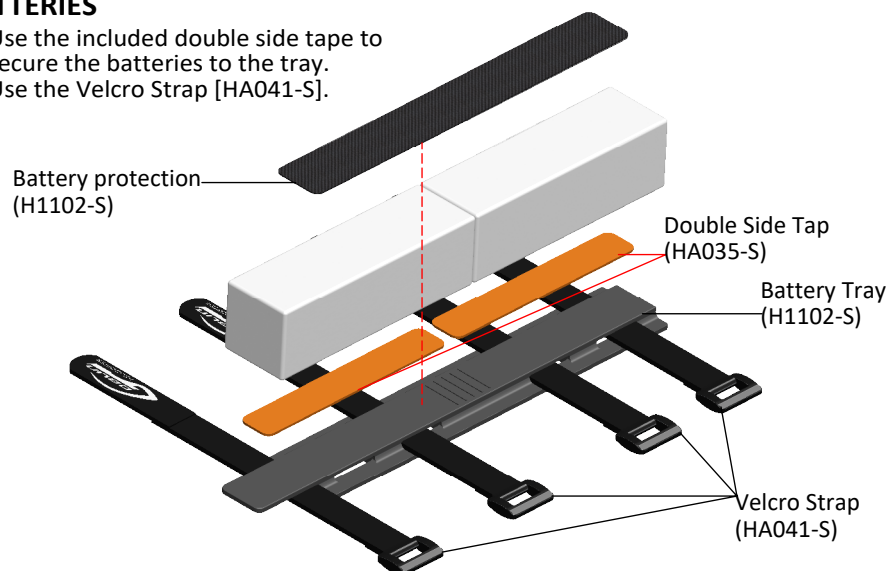
BOX 2, BAG FOR PAGE 35

! Before permanently mounting the batteries onto the battery tray, check the ideal position for the best center of gravity.



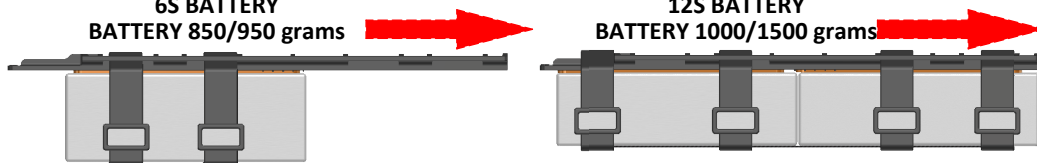
BATTERIES

Use the included double side tape to secure the batteries to the tray.
Use the Velcro Strap [HA041-S].



6S BATTERY
BATTERY 850/950 grams

12S BATTERY
BATTERY 1000/1500 grams



6S BATTERY



12S BATTERY

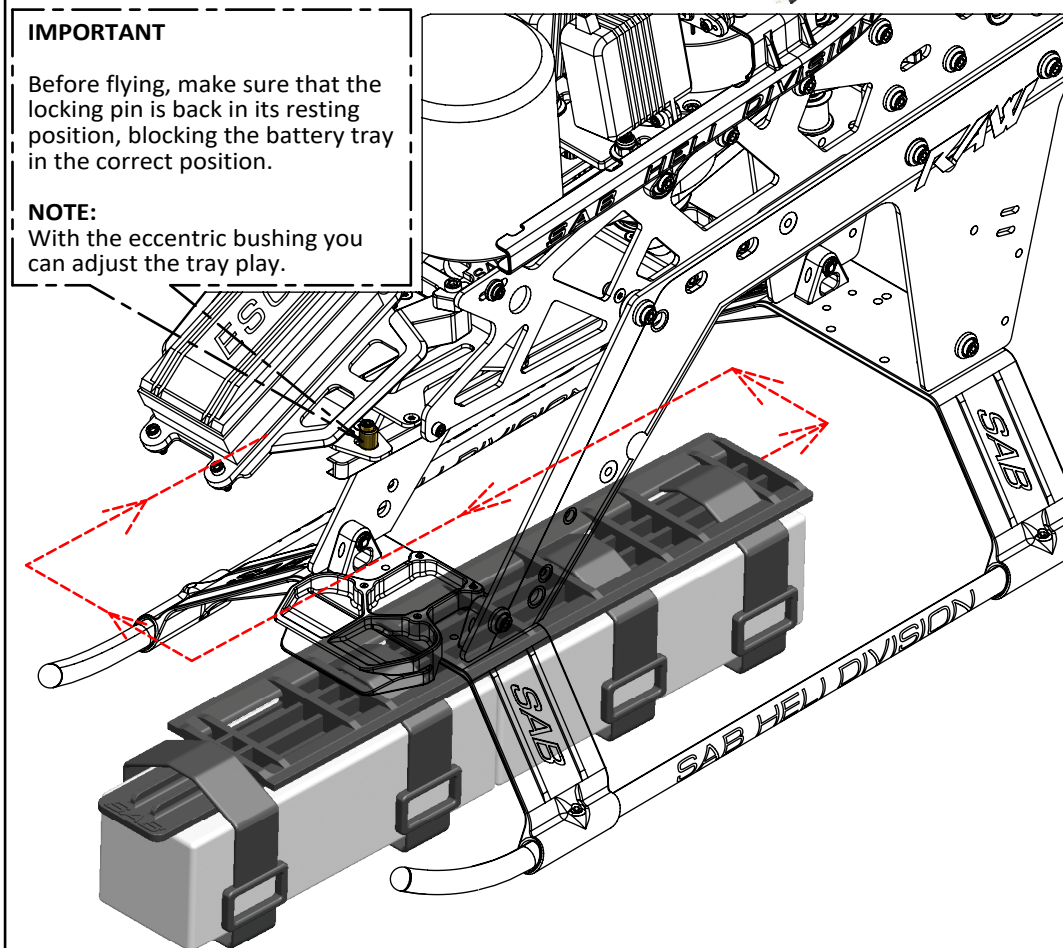


IMPORTANT

Before flying, make sure that the locking pin is back in its resting position, blocking the battery tray in the correct position.

NOTE:

With the eccentric bushing you can adjust the tray play.



CANOPY



- *Install Canopy grommets (**Figure.1**) and the two quick knobs (**Figure.2**)
- *Fit the canopy in the red arrow zone, and insert the knobs.
- *Confirm the canopy is secure prior to each flight.

Fig. 1

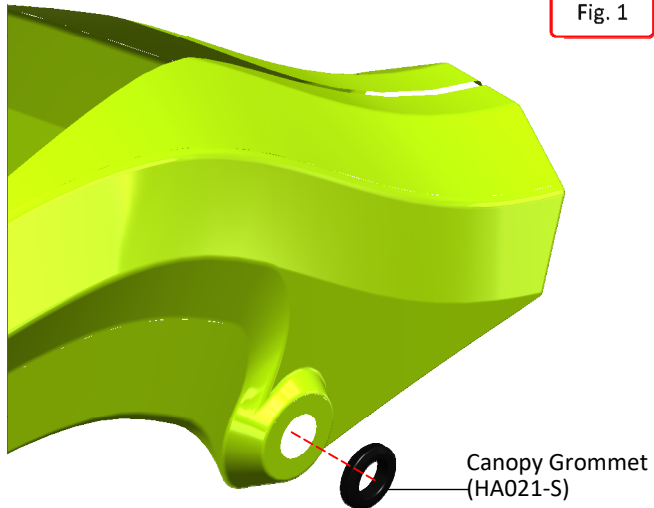
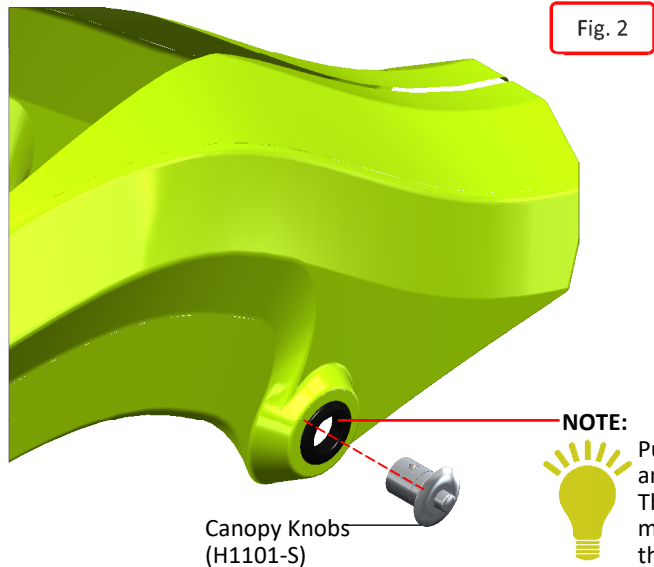


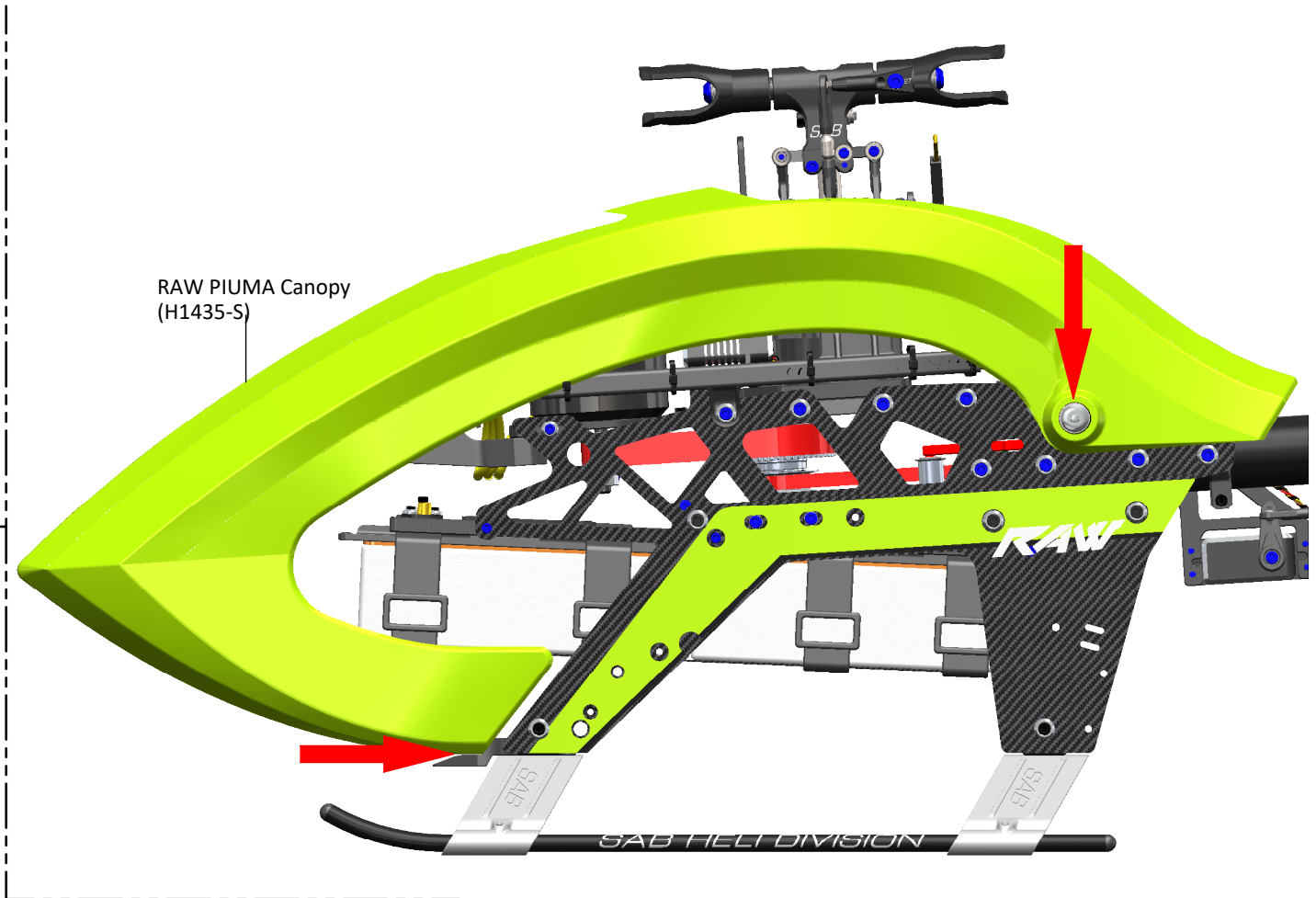
Fig. 2



NOTE:



Put a very small drop of CA glue on the grommet and then insert the quick release canopy mount. This way when you remove the canopy, the mounts can not come off. Be careful not to block the quick release mechanism with glue.



BOX 2, BAG FOR PAGE 37

OPERATIONS BEFORE FLIGHT

- *Set up the remote control and the flybarless system with utmost care.
- *It is advisable to test the correct settings of the remote and flybarless system without main blades or tail blades fitted.
- *Check that all wiring is isolated from the carbon/aluminum parts. It is good practice to protect them at the points where they are at most risk.
- ⚠ ***Be sure of the gear ratio by carefully confirming the motor pulley tooth count being used. The forces generated on the mechanics greatly increase with higher RPM and therefore for safety reasons, we recommend not exceeding 2000 RPM**
- *Fit the main blades and tail blades. (Figure.1 and Figure.2)
- *Please make sure the main blades are tight on the blade grips, you should be able to violently jerk the head in both directions and the blades should not fold. Failure to tighten the blades properly can result in a boom strike. To fold the blades for storage, it is advisable to loosen them.
- *Check the collective and cyclic pitch. For 3D flight, set about +/-13°.
- *It is important to check the correct tracking of the main blades. On the Goblin, in order to correct the tracking, adjust the main link rod. This is provided with a right/left thread system that allows continuous fine adjustments of the length of the control rod; for this adjustment it is not necessary to detach the ball link.
- *Confirm the canopy is secure prior to each flight.
- ⚠ ***Perform the first flight at a low headspeed, 1600 RPM.**
After this first flight, do a general check of the helicopter. Verify that all screws are correctly tightened.

IN FLIGHT

ABOUT HEAD

The HPS head allows for a very broad range of dampening setups. The dampers are composed of 2 O-ring (that defines the rigidity) and a technopolymer damper (that defines the maximum possible movement of the spindle). Using different Oring and dampers you can get different responses of the model.

Oring 70 Shore: Soft for smooth response

Oring 90 Shore: Firm for direct and precise response

Dampers A = Max movement of the spindle, feeling more elastic.

Dampers B = Medium.

Dampers C = Min movement of the spindle, feeling more direct.

The KIT include C damper and B damper.

Use C damper , if you have some wobble in flight you can change to the B damper.

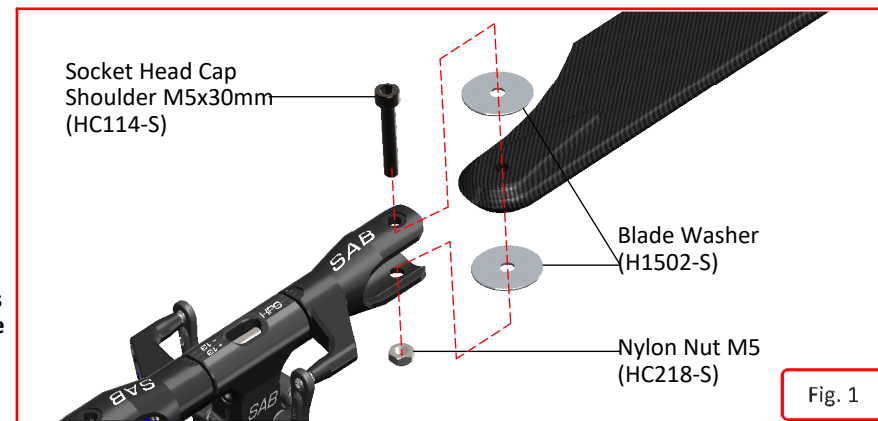


Fig. 1

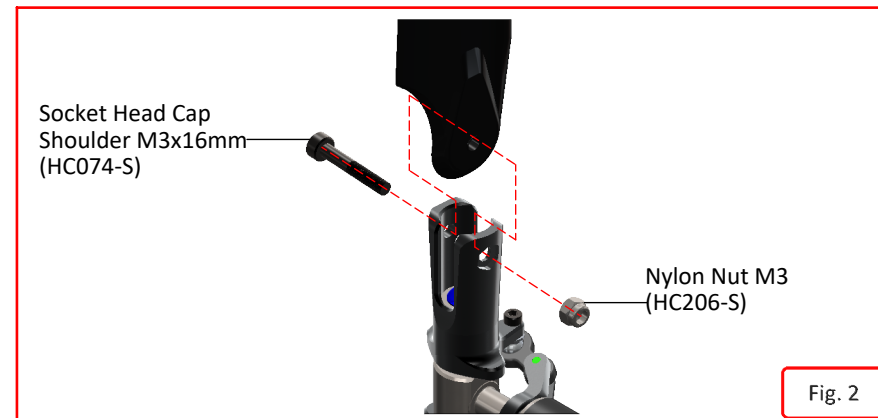


Fig. 2

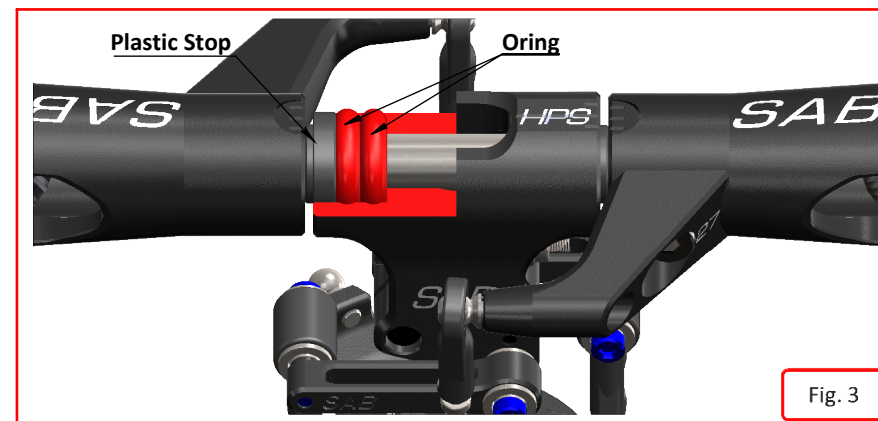


Fig. 3

MAINTENANCE

Take a look at the red parts.

Check them frequently. All other parts are not particularly subject to wear.

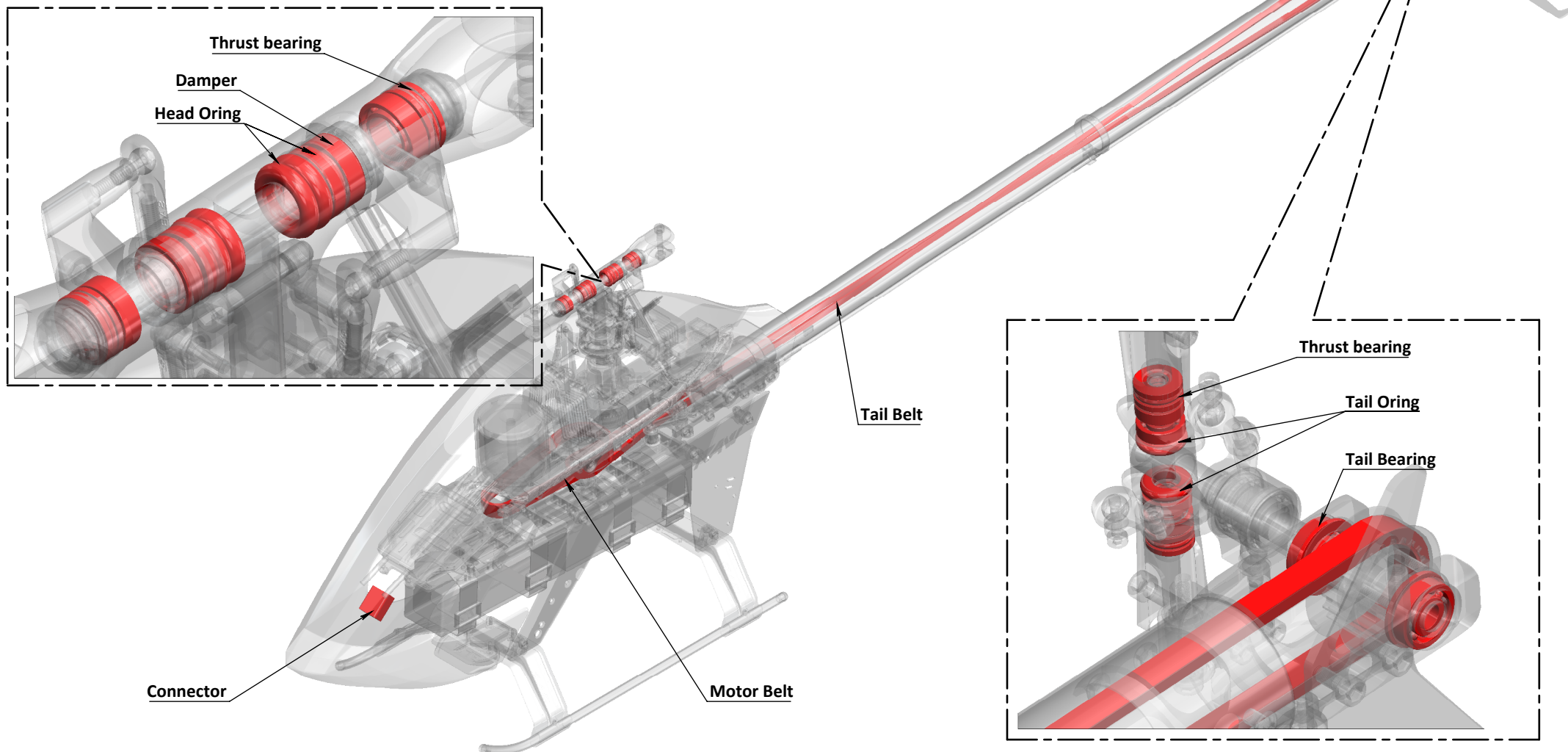
The lifespan of these components varies according to the type of flying.

On average it is recommended to check these parts every 20 flights. In some instances, based on wear, these parts should be replaced every 100 flights.

Periodically lubricate the tail slider movement and its linkages as well as the swash plate movement and its linkages.

To ensure safety you should do a general inspection of the helicopter after each flight. You should check:

- Proper belt tension (engine belt and tail belt).
- Proper isolation of the wires from the carbon and aluminum parts.
- All screws and bolts remain tight.



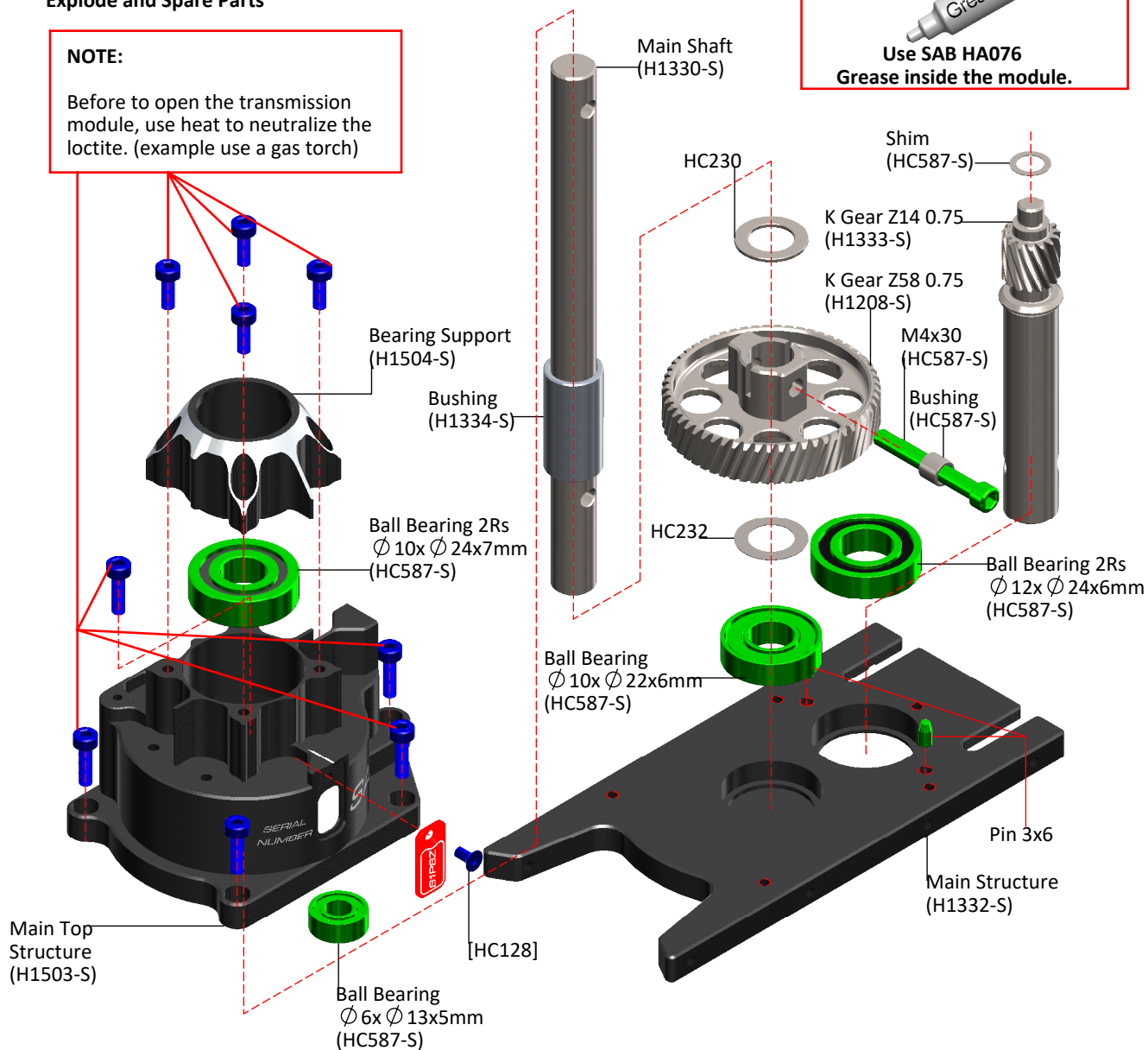
TRANSMISSION MODULE

The transmission module is supplied assembled and verified, ready to be used.

Explode and Spare Parts

NOTE:

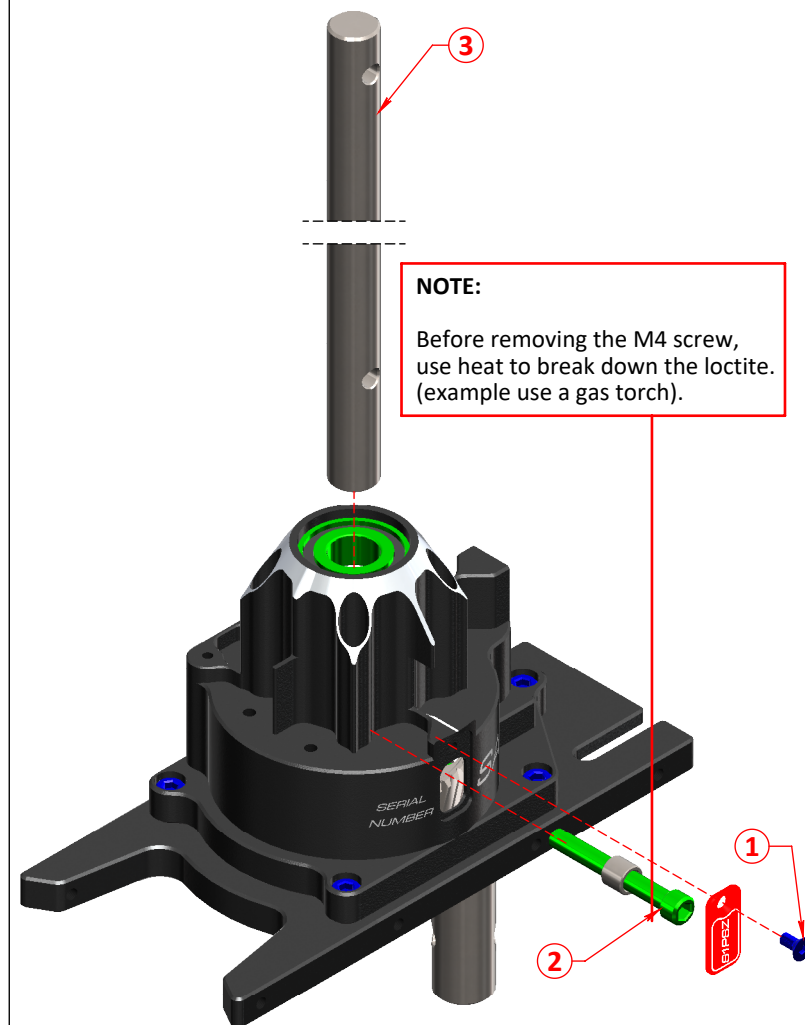
Before to open the transmission module, use heat to neutralize the loctite. (example use a gas torch)



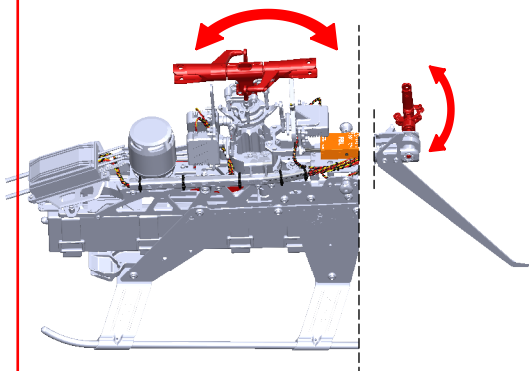
MAIN SHAFT REPLACEMENT

For replacing the main shaft:

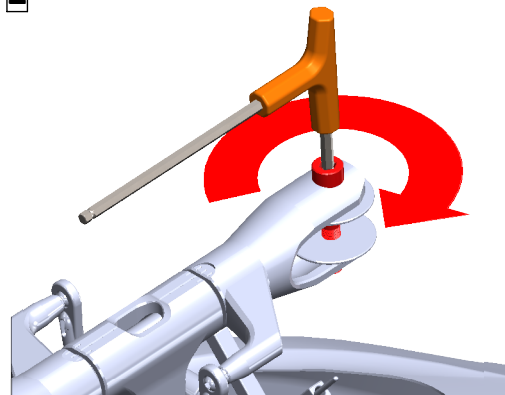
- *Remove the serial number plate
- *Remove the M4 screw
- *Remove and replace the main shaft
- *Screw in the M4 screw, with high force and using green loctite



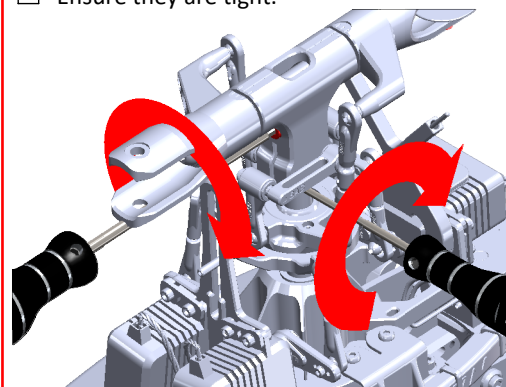
- 1** Check the dampening on the main and tail rotor to be the same as always.



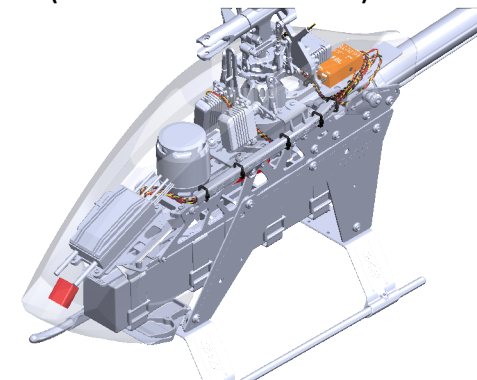
- 2** Tighten the main blades before flight.



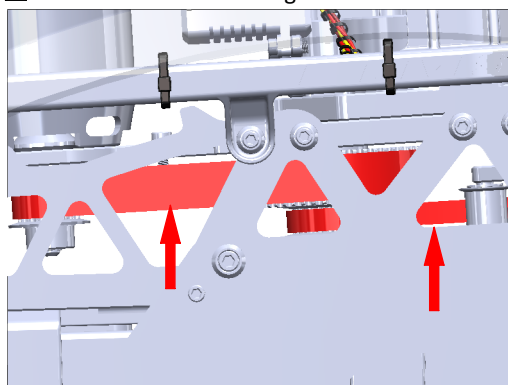
- 3** Check main hub screws(M4 and 2 M3)
Ensure they are tight.



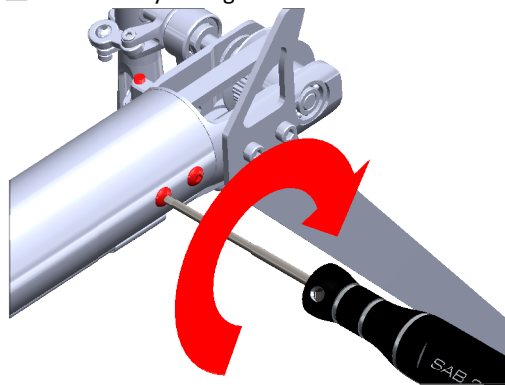
- 4** Check all power connectors
(Good mechanical connection).



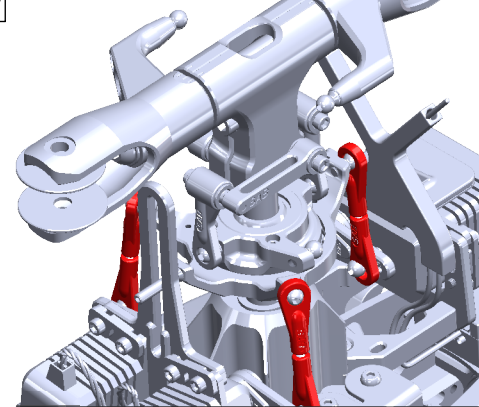
- 5** Check Tail & Motor belt tension.
The tension has to be tight.



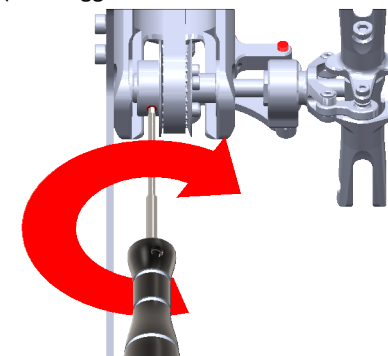
- 6** Check the 4 M3 Tail group screws.
Ensure they are tight.



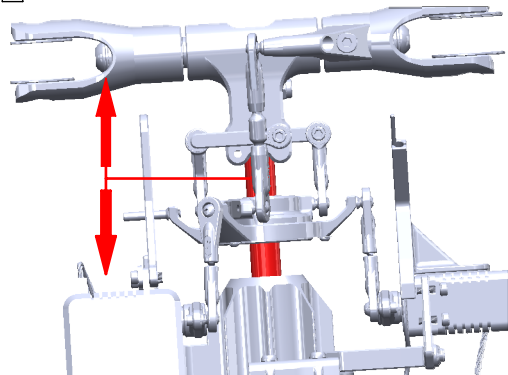
- 7** Check the Main Linkages & Servo Linkages



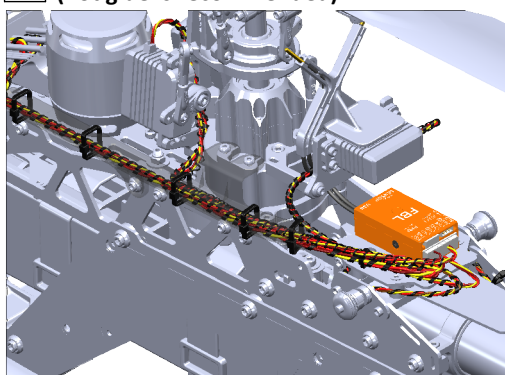
- 8** Check tail pulley set screws:
Ensure they are tight.
(It is suggested use a bit of Green Loctite.)



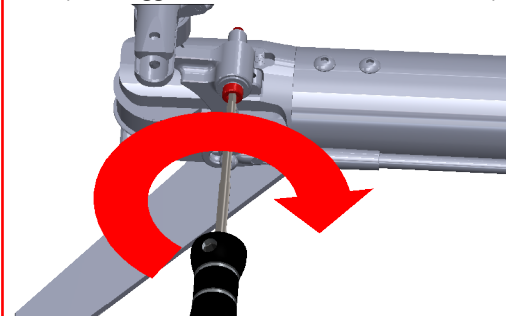
- 9** Check for vertical play of the main shaft.



- 10** Check if the FBL-RX connectors are OK
(hot glue is recommended).



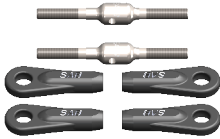
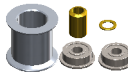
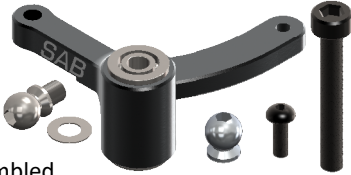
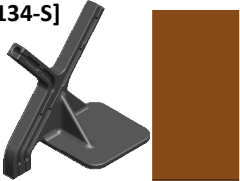
- 11** Check the M3 bell crank:
Bell crank movement must be smooth
and the screw locked.
(It is suggested use a bit of Green Loctite.)



- 12** Be sure the follow parts are properly lubricated

- *Main shaft/swashplate
- *Tail slider/tail shaft
- *Carbon rod/carbon rod support
- *All thrust bearings
- *All plastic balls connections



Finishing Washer M3 [H0007-S]  - 10 x Finishing Washers M3.	Motor Pulley 19T - 26T [H0015-19-S to H0015-26-S]  - 1 x Motor Pulley. - 2 x Set Screw M4x4mm.	Spacer [H0062-S]  - 4 x Spacer $\varnothing 7x \varnothing 9x0,5mm$.	Uniball M2 5H6 [H0064-S]  - 5 x Uniballs M2. - 5 x Uniball Spacers. - 5 x Head Cap Screws M2x8. - 5 x Head Cap Screws M2x6.	Uniball M3x4 5H3 [H0065-S]  - 5 x Uniballs M3x4 5H3.5.	Plastic Ball Link [H0066-S]  - 10 x Plastic Ball Link.
Servo Spacer [H0075-S]  - 10 x Servo Spacers.	Radius Arm HPS [H0204BM-S]  - 2 x Radius Arm. - 2 x Spacer Arm 2.5x4x6.3. - 2 x Spacer Arm 2.5x4x3mm. - 2 x Uniball Radius Arm.	Radius Plastic Arm [H0205-S]  - 2 x Radius Plastic Arm.	Spacer [H0219-S]  - 2 x Spacer $\varnothing 4x \varnothing 6,9x0,5mm$.	Tail Spindle [H0220-S]  - 1 x Tail Spindle. - 2 x Head Cap Screws M3x6.	
Finishing Washer M2.5 [H0255-S]  - 10 x Finishing Washer M2.5.	Plastic Tail Linkage [H0261-S]  - 2 x Plastic Tail Linkage. - 2 x Grip Link Bushing. - 2 x Head Cap Screws M2x6.	Plastic Ball Link [H0402-S]  - 5 x Plastic Ball Link.	Linkage Rod [H0722-S]  - 2 x Linkage Rod. - 4 x Plastic Ball Link.	Reference Pin [H1048-S]  - 1 x Reference Pin.	Ilder Tensioner [H1066-S]  - 1 x Ilder Tensioner. - 1 x Bushing. - 1 x Shim $\varnothing 3x \varnothing 5x0.5mm$. - 2 x Flanged Bearing 3x8x3.
Tail Bell Crank Lever [H1090-S]  - 1 x Uniball M2. - 1 x Uniball M3. - 1 x Shim. - 1 x Bell Crank Lever Assembled. - 1 x Socket Screws M3x22mm. - 1 x Button Screws M2x6mm.	Bell Crank Base [H1095-S]  - 1 x Bell Crank Base. - 2 x Socket Screw M2.5x8mm.	Canopy Mount [H1101-S]  - 2 x Canopy Mount SET. - 2 x Head Cap Screws M3x6.	Battery Tray [H1102-S]  - 1 x Plastic Battery Tray. - 2 x Double side Tape. - 1 x Battery Protection. - 4 x Veclo Strap.		
Wire Cover [H1107-S]  - 1 x Wire Cover. - 1 x Finishing Washer M3. - 1 x Head Cap Screws M3x8mm. - 2 x Button Cap Screws M2.5x6mm.	Tail Pitch Slider [H1112-S]  - 1 x Tail Pitch Slider Asm. - 2 x Slider Linkage. - 2 x Socket Screws M2x6mm. - 2 x Spacer.	Antena Support [H1134-S]  - 1 x Antena Support. - 1 x Double Side-Tape.	Tail Fin [H1196-S]  - 1 x Tail Fin. - 1 x Sticker SET. - 2 x Head Cap Screw M3x8mm.		



- 2 x Blade Grips Arm.
- 2 x Uniball M3.
- 2 x Socket Screw M4x8.



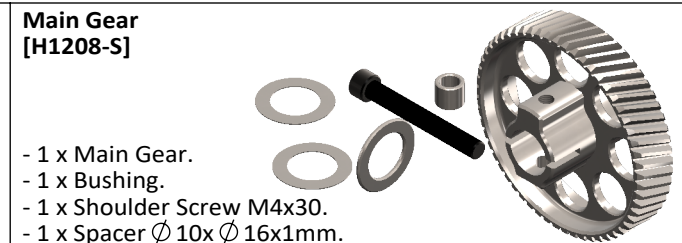
- 7 x Uniball M3.
- 1 x Reference Pin.
- 1 x Swashplate Assembly.



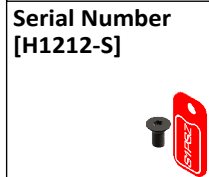
- 1 x Rear Servo Support.
- 2 x Socket Screws M3x8mm.



- 1 x Rear Servo Mount.
- 2 x Servo Spacer.
- 2 x Finishing Washer M2.5.
- 2 x Socket Screw M2.5x8mm.



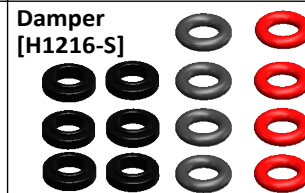
- 1 x Main Gear.
- 1 x Bushing.
- 1 x Shoulder Screw M4x30.
- 1 x Spacer $\varnothing 10 \times \varnothing 16 \times 1 \text{mm}$.
- 2 x Shim $\varnothing 10 \times \varnothing 16 \times 0.2 \text{mm}$.



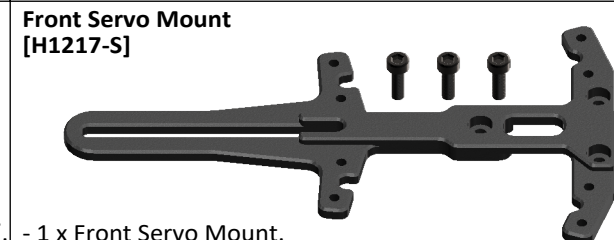
- 1 x Serial Number.
- 1 x Flat Screw M2.5x5mm.



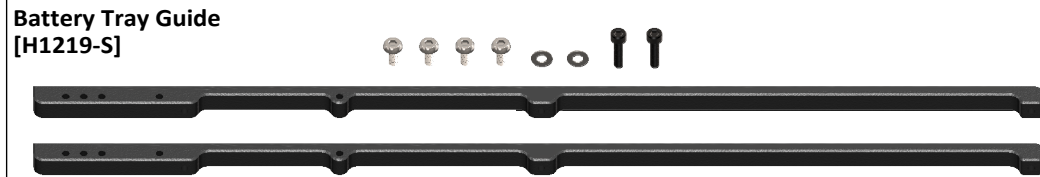
- 1 x Motor Mount.
- 2 x Set Screws M4x15mm.
- 2 x Nylon Nuts M4.
- 2 x Washers $\varnothing 4.3 \times \varnothing 11 \times 1$.
- 2 x Finishing Washers M2.5.
- 2 x Head Cap Screws M2.5x8mm.



- 2 x Damper A.
- 2 x Damper B.
- 2 x Damper C.
- 4 x Oring 70°.
- 4 x Oring 90°.



- 1 x Front Servo Mount.
- 3 x Socket Screws M2.5x8mm.



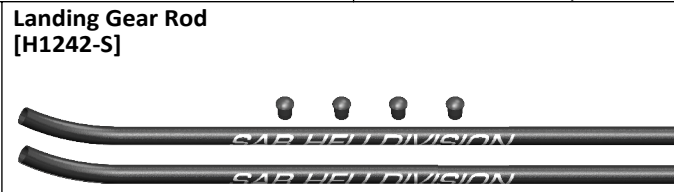
- 2 x Battery Tray Guide.
- 4 x Button Screws M2.5x6mm.
- 2 x Socket Screws M2.5x10mm.
- 2 x Washer $\varnothing 3.2 \times \varnothing 6 \times 0.5 \text{mm}$.



- 1 x CF ESC Plate.
- 1 x Plastic ESC Support.
- 4 x Ny Lon Nut M3.
- 2 x Flat Cap Screw M3x8mm.
- 2 x Socket Head Cap M3x10mm.



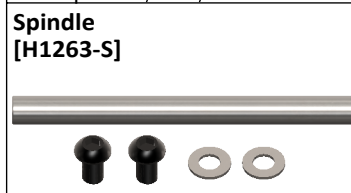
- 2 x Tail Blade Grip.
- 4 x Bearing $\varnothing 4 \times \varnothing 9 \times 2.5$.
- 2 x Spacer $\varnothing 7 \times \varnothing 9 \times 0.5$.
- 2 x Thrust Bearing $\varnothing 4 \times \varnothing 9 \times 4$.
- 2 x Socket Screw M3x6mm.
- 2 x Socket Screw M2x6mm.



- 2 x Landing Gear Rod.
- 4 x Plug.



- 1 x Xross Battery.
- 1 x Carbon Pin Support.
- 1 x Head Cap M2.5x12mm.
- 2 x Head Cap M2.5x8mm.
- 5 x Flat Screws M2.5x5mm.
- 1 x Alu Pin.
- 1 x Brass lever.
- 2 x Washer M2.5.



- 2 x Spindle.
- 2 x Button Screws M6x10mm.
- 2 x Washer.



- 1 x Bushing.
- 1 x Base Tail Belt Tensioner.
- 1 x Tensioner Column.
- 1 x Tensioner Spring.
- 1 x Shoulder Screw M3x22.
- 2 x Flanged Bearing $\varnothing 3 \times \varnothing 7 \times 3$.



- 1 x Center Hub.
- 1 x Nylon Nut M4.
- 1 x Socket Screw M4x21.5mm.
- 2 x Socket Screw M3x12mm.



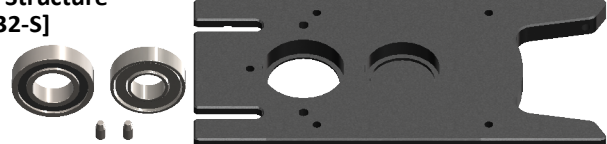
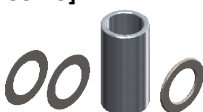
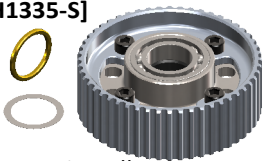
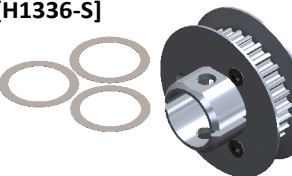
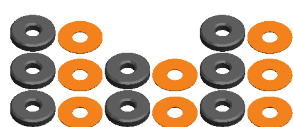
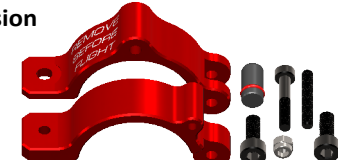
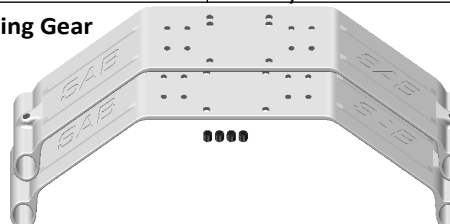
- 1 x Front Boom Block.
- 2 x Socket Screws M3x10.
- 1 x Socket Screw M3x12.
- 1 x Nylon Nut M3.

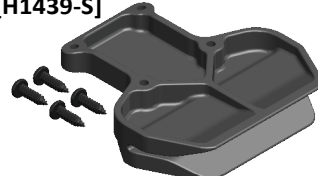
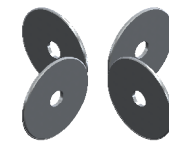
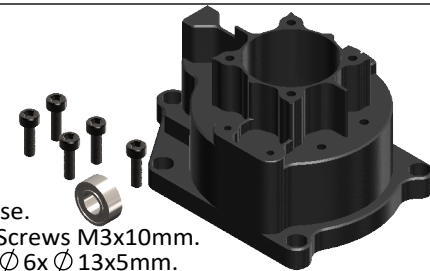
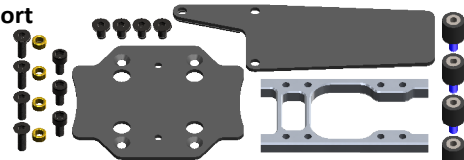


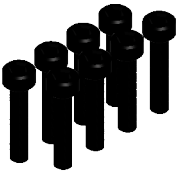
- 1 x Tail Case Group.
- 4 x Button Screw M3x4mm.

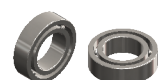
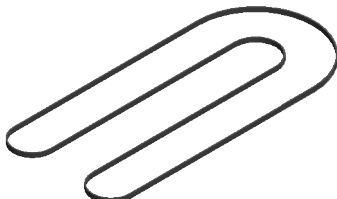
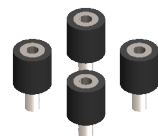


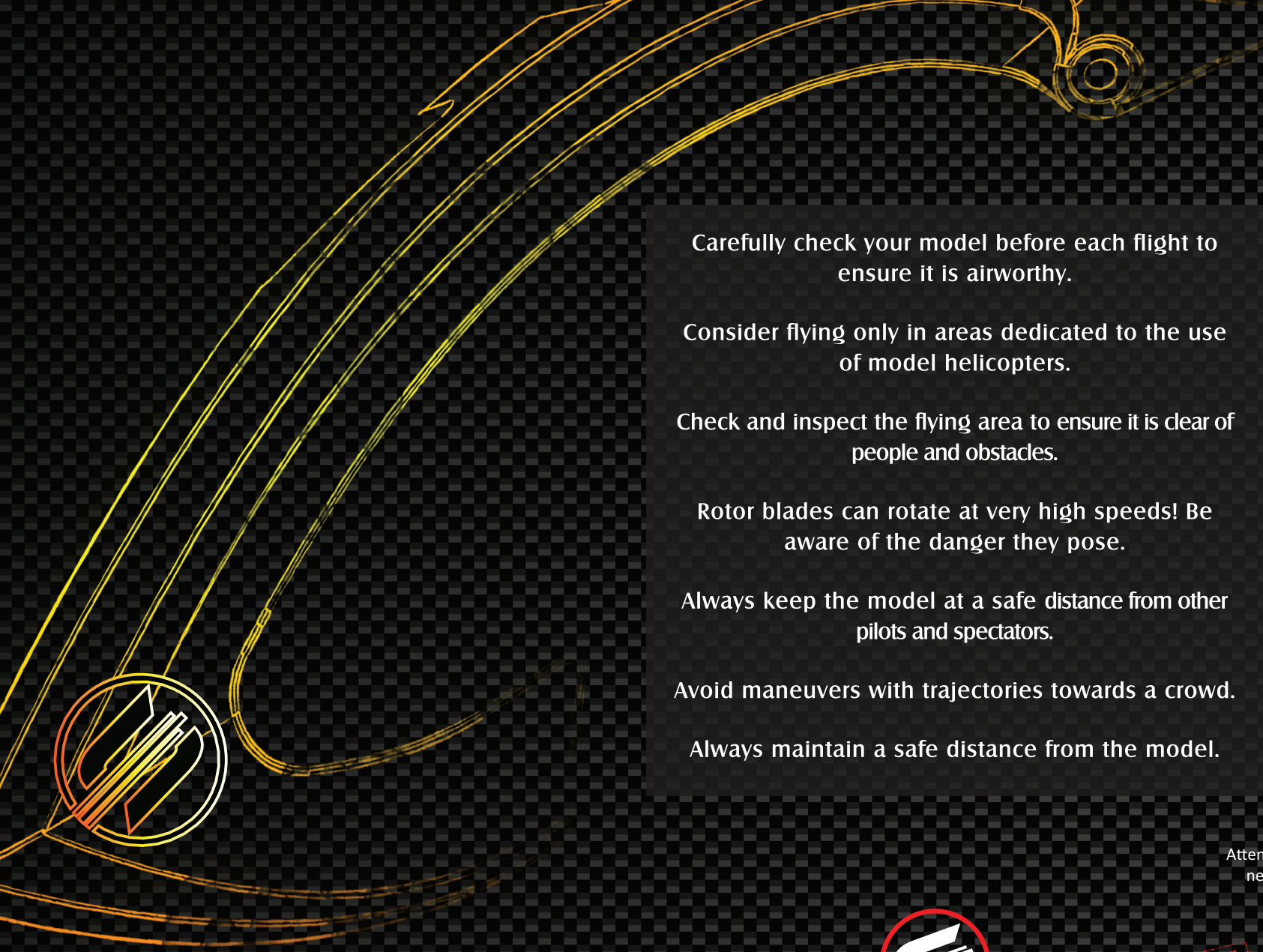
- 1 x Carbon Rod Support.
- 1 x Socket Screw M2.5x12mm.

Main Shaft [H1330-S]  - 1 x Main Shaft. - 1 x Shoulder Screw M4x30. - 1 x Bushing. - 2 x Shim $\varnothing$ 10x $\varnothing$ 16x0.2mm.	Main Structure [H1332-S]  - 1 x Main Structure. - 2 x Pin 3x6. - 1 x Bearing $\varnothing$ 10x $\varnothing$ 22x6mm. - 1 x Bearing 2RS $\varnothing$ 12x $\varnothing$ 24x6.	Pinion [H1333-S]  - 1 x Pinion. - 2 x Shim $\varnothing$ 6x $\varnothing$ 9 x 0.2mm.	Gear Bushing [H1334-S]  - 1 x Gear Bushing. - 2 x Shim $\varnothing$ 10x $\varnothing$ 16x0.2mm. - 1 x Washer $\varnothing$ 10x $\varnothing$ 16x1mm.
Main Pulley [H1335-S]  - 1 x Main Pulley SET. - 1 x Bushing. - 1 x Shim $\varnothing$ 12x $\varnothing$ 16x0.1mm.	Front Tail Pulley [H1336-S]  - 1 x Front Tail Pulley SET. - 3 x Shim $\varnothing$ 12x $\varnothing$ 16x0.1mm.	Bearing Support [H1337-S]  - 1 x Bearing Support. - 1 x Bearing $\varnothing$ 12x $\varnothing$ 21x5mm. - 4 x Socket Screw M3x8mm. - 4 x Flat Screw M2.5x5mm. - 4 x Washer $\varnothing$ 3x $\varnothing$ 6x0.5mm.	Carbon Fiber Tube Boom [H1339-S]  - 1 x CF Tube Boom.
Frame Spacer [H1340-S]  - 8 x Frame Spacer. - 8 x Double Side Tape.	Tail Belt Idler Mount [H1341-S]  - 1 x Tail Belt Idler Mount. - 2 x Socket Screw M3x12mm. - 2 x Shim $\varnothing$ 3x $\varnothing$ 6x0.5mm.	LOWER Main Frame [H1344-S]  - 1 x LOWER Main Frame. - 1 x Yellow Sticker.	Boom Mount Support [H1350-S]  - 1 x Boom Mount Support. - 4 x Finishing Washer M3. - 4 x Socket Screws M3x10.
Tail Servo Mount [H1353-S]  - 1 x Tail Servo Mount. - 2 x Socket Screw M3x12mm.	Boom Block [H1372-S]  - 1 x Boom Block. - 2 x Socket Screws M3x10. - 1 x Socket Screw M3x12. - 1 x Nylon Nut M3.	Block NUT M3 [H1386-S]  - 5 x Block NUT M3. - 5 x Nylon NUT M3.	Tail Boom Tension [H1402-S]  - 1 x Clamp 1. - 1 x Clamp 2. - 1 x Derlin. - 1 x Oring. - 1 x Nylon Nut M3. - 1 x Set screws M3x20mm. - 1 x Shoulder Screw M3x18mm. - 2 x Socket Screws M4x10mm.
Plastic Landing Gear [H1407-S]  - 2 x Plastic Landing Gear. - 4 x Set Screws M4x4mm.	Alu Landing Gear Mount [H1408-S]  - 2 x Alu Landing Gear Mount. - 8 x Socket Screws M2.5x8mm.	Main Blade Grips [H1411-S]  - 2 x Blade Grip. - 4 x Bearing $\varnothing$ 8x $\varnothing$ 14x4mm. - 2 x Thrust Bearing $\varnothing$ 8x $\varnothing$ 14x4mm. - 2 x Washer $\varnothing$ 11x $\varnothing$ 13.5x0.5mm. - 2 x Button Screws M4x10mm.	Canopy Base Support [H1436-S]  - 2 x Canopy Base Support.

Front Canopy Block [H1439-S]  - 1 x Front Canopy Block. - 4 x Self Tapping Screw M3x10.	Main Frame [H1478-S]  - 1 x Main Frame.	Main Blade Washer [H1502-S]  - 4 x Main Blade Washer.	Top Case [H1503-S]  - 1 x Main Case. - 5 x Socket Screws M3x10mm. - 1 x Bearing Ø 6x Ø 13x5mm.	
Bearing Support [H1504-S]  - 1 x Bearing Support. - 4 x Socket Screws M3x8mm. - 1 x Bearing Ø 10x Ø 24x7mm.	Canopy RAW PIUMA [H1516-S]  - 2 x Grommet. - 1 x Canopy Raw PIUMA.	Tail Pulley 22T/23T [H1622-22-S]/[H1622-23-S]  - 1 x Tail Pulley 22T/23T. - 1 x Set Screw M3x6mm.		Tail Shaft [H1623-S]  - 1 x Tail Shaft. - 1 x Tail Hub. - 2 x Oring.
FBL/RX Support [H1625-S]  - 1 x FBL Support. - 1 x FBL Plate. - 1 x RX Plate. - 4 x RX Plate. - 4 x Rubber. - 4 x Flat Screw M3x5mm. - 4 x Flat Screw M3x10mm. - 3 x Socket Screw M3x6mm.	[S700]  - 2 x Main Blade.			
[S105]  - 2 x Tail Blade.	[HA016-S]  - 1 x Wrench Nut M8.	[HA035-S]  - 2 x Double side tape 30x100x1.	[HA043-S]  - 1 x Blade Holder.	[HA044-S]  - 2 x Strap 16x205mm.
[HA045-S]  - 2 x Velcro Tape 36 x 100mm.	[HA050-S]/[HA051-S]  - 4 x Servo Horn.	[HA075-S]  - 1 x Free Wheel Clutches grease.	[HA076-S]  - 1 x Tranmissions module grease.	

[HC002-S]  - 8 x Head Cap Screws M2x5mm.	[HC004-S]  - 8 x Head Cap Screws M2x6mm.	[HC014-S]  - 8 x Head Cap Screws M2x12.	[HC018-S]  - 8 x Head Cap Screws M2.5x6.	[HC019-S]  - 8 x Button Cap Screws M2.5x6.	[HC020-S]  - 8 x Head Cap Screws M2.5x8.
[HC022-S]  - 8 x Head Cap Screws M2.5x10.	[HC026-S]  - 8 x Head Cap Screws M2.5x12.	[HC028-S]  - 8 x Head Cap Screws M2.5x15.	[HC032-S]  - 8 x Head Cap Screws M2.5x18.	[HC038-S]  - 8 x Button Cap Screws M3x4.	[HC044-S]  - 8 x Head Cap Screws M3x6.
[HC050-S]  - 8 x Head Cap Screws M3x8.	[HC056-S]  - 8 x Head Cap Screws M3x10.	[HC062-S]  - 8 x Head Cap Screws M3x12.	[HC064-S]  - 8 x Head Cap Screws M3x14.	[HC068-S]  - 8 x Head Cap Screws M3x16.	[HC074-S]  - 2 x Shoulder Screws M3x16. - 2 x Nylon Nut M3.
[HC079-S]  - 2 x Shoulder Screws M3x18. - 2 x Nylon Nut M3.	[HC086-S]  - 8 x Head Cap Screws M3x22.	[HC102-S]  - 8 x Head Cap Screws M4x10.	[HC104-S]  - 8 x Head Cap Screws M4x22.	[HC114-S]  - 2 x Nylon Nut M5. - 2 x Shoulder Screws M5x30.	[HC122-S]  - 8 x Button Cap Screws M6x10.
[HC125-S]  - 8 x Flat Cap Screws M2.5x8.	[HC128-S]  - 8 x Flat Cap Screws M2.5x5.	[HC132-S]  - 8 x Flat Cap Screws M3x5.	[HC134-S]  - 8 x Flat Cap Screws M3x8.	[HC135-S]  - 8 x Flat Cap Screws M3x10.	[HC136-S]  - 8 x Tapping Cap Screws M3x10.

[HC140-S]  - 8 x Set Screws M2.5x18mm.	[HC150-S]  - 8 x Set Screws M2.5x20mm.	[HC152-S]  - 8 x Set Screws M4x4mm.	[HC153-S]  - 8 x Set Screws M4x6mm.	[HC172-S]  - 8 x Washer $\varnothing 2.5 \times \varnothing 4 \times 0.3$ mm.	[HC180-S]  - 8 x Washer $\varnothing 4.3 \times \varnothing 11 \times 1$ mm.
[HC193-S]  - 8 x Washer $\varnothing 6 \times \varnothing 12 \times 1$ mm.	[HC200-S]  - 8 x Nylon Nut M2.5.	[HC206-S]  - 8 x Nylon Nut M3.	[HC212-S]  - 8 x Nylon Nut M4.	[HC218-S]  - 8 x Nylon Nut M5.	[HC228-S]  - 5 x Washer $\varnothing 8 \times \varnothing 14 \times 0.2$ mm.
[HC230-S]  - 5 x Washer $\varnothing 10 \times \varnothing 16 \times 1$ mm.	[HC232-S]  - 5 x Washer $\varnothing 10 \times \varnothing 16 \times 0.2$ mm.	[HC242-S]  - 3 x Threaded Rod M2,5x40mm.	[HC400-S]  - 4 x Flanged Bearing $\varnothing 2.5 \times \varnothing 6 \times 2.6$ mm.	[HC403-S]  - 4 x Ball Bearing $\varnothing 4 \times \varnothing 9 \times 2.5$ mm.	[HC417-S]  - 2 x Ball Bearing $\varnothing 8 \times \varnothing 14 \times 4$ mm.
[HC434-S]  - 2 x Thrust Bearing $\varnothing 4 \times \varnothing 9 \times 4$ mm.	[HC437-S]  - 2 x Thrust Bearing $\varnothing 8 \times \varnothing 14 \times 4$ mm.	[HC477-S]  - 1 x Tail Belt HTD 3M - 2004.	[HC538-S]  - 5 x Washer $\varnothing 12 \times \varnothing 16 \times 0.1$ mm.	[HC545-S]  - 8 x Head Cap Screw Shoulder M4x21.5.	[HC573-S]  - 4 x Rubber Pin 65 Shore.
[HC582-S]  - 8 x Head Cap Screw Special M4x8mm.	[HC587-S] - 1 x Alu Bushing. - 1 x Ball Bearing $\varnothing 10 \times \varnothing 24 \times 7$ mm. - 1 x Ball Bearing 10 x 22 x 6 mm. - 1 x Ball Bearing 2RS $\varnothing 10 \times \varnothing 22 \times 6$. - 1 x Ball Bearing 2RS $\varnothing 10 \times \varnothing 24 \times 6$. - 2 x Pin 3x6mm.	- 1 x Head Cap Shoulder M4x30. - 1 x Bushing. - 1 x Shim $\varnothing 6 \times \varnothing 9 \times 0.2$ mm. - 1 x Ball Bearing $\varnothing 6 \times \varnothing 13 \times 5$ mm. - 2 x Shim $\varnothing 10 \times \varnothing 16 \times 0.2$ mm. - 1 x Washer $\varnothing 10 \times \varnothing 16 \times 1$ mm.	[HC588-S]  - 1 x Motor Belt.	[HC619-S]  - 1 x Carbon Rod $\varnothing 3 \times \varnothing 4 \times 691$ mm - 2 x Plastic Ball Linkage - 1 x Brass Tube.	- 2 x Thread Rod M2.5x40. - 2 x Aluminum Bush.



Carefully check your model before each flight to ensure it is airworthy.

Consider flying only in areas dedicated to the use of model helicopters.

Check and inspect the flying area to ensure it is clear of people and obstacles.

Rotor blades can rotate at very high speeds! Be aware of the danger they pose.

Always keep the model at a safe distance from other pilots and spectators.

Avoid maneuvers with trajectories towards a crowd.

Always maintain a safe distance from the model.



GOBLIN RAW PIUMA

Release 1.0 - April 2022

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