GOBLIN 700 RAW MANUAL

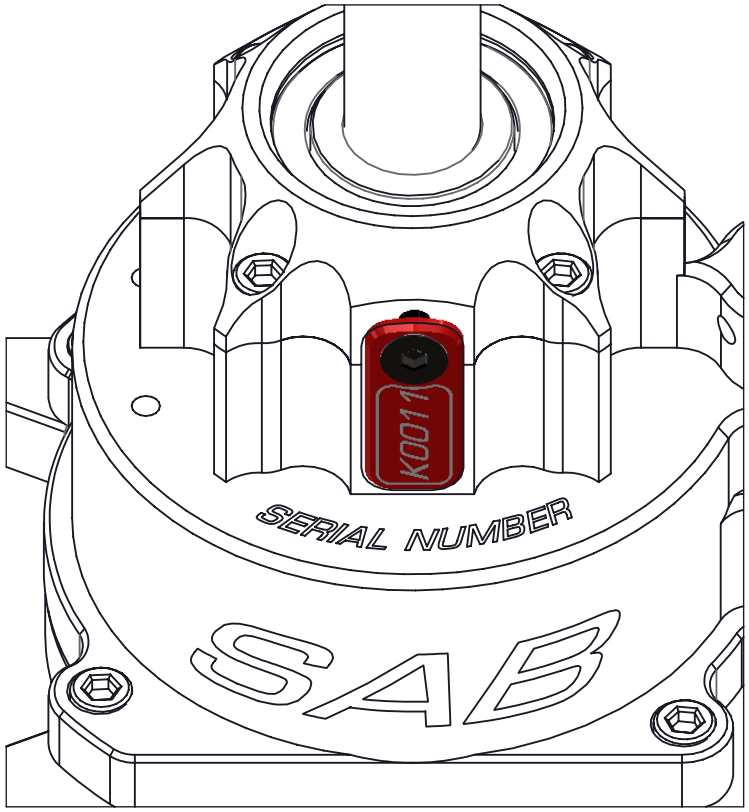
GOBLIN RAW

700

GOBLIN HELICOPTER

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

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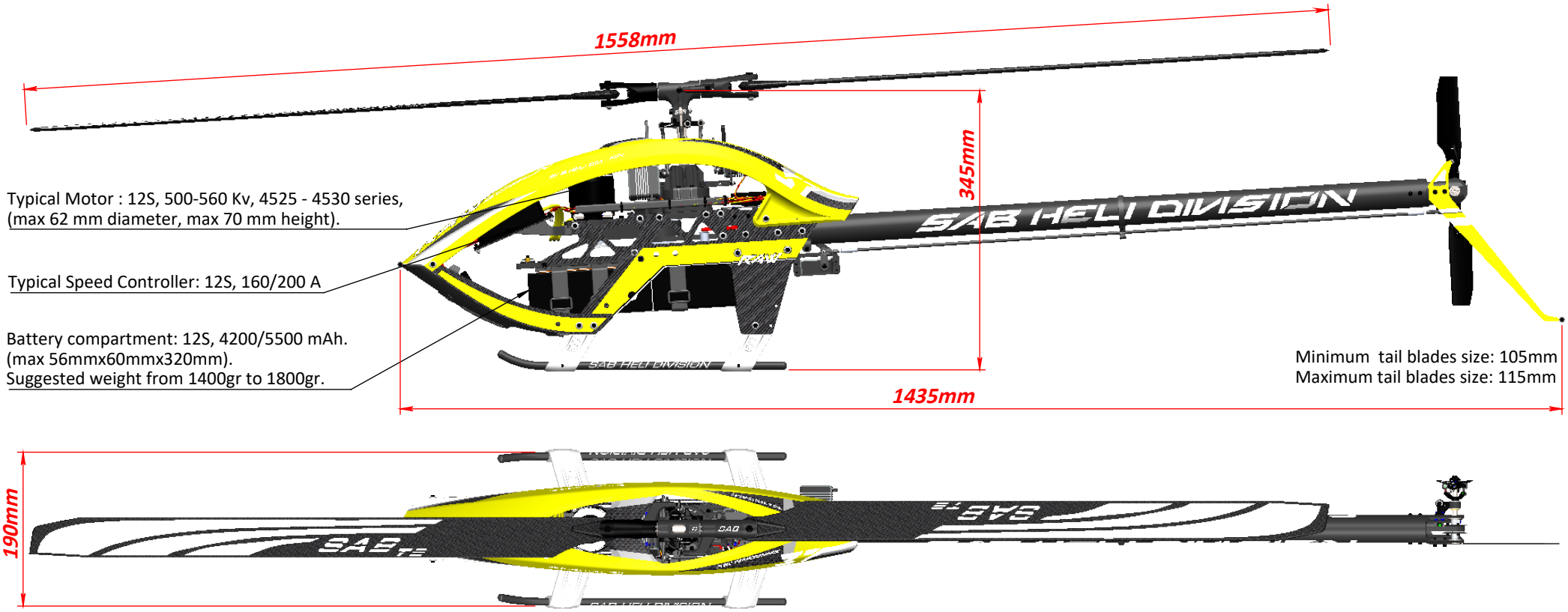
GOBLIN RAW TECHNICAL SPECIFICATIONS



- **AIRFRAME weight:** 2620gr (with blades, nobattery, no electronics).
- **Main rotor diameter:** 1558 mm (with 690 mm blades).
- **Main blade length:** 650 to 730mm.
- **Tail rotor diameter:** 284 mm (with 105 mm tail blades).
- **Tail blade length:** 105 to 115 mm.

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

- **Main Rotor Ratio :** 11.8 to 8.8 (21T included: 10.1:1).
- **Tail Rotor Ratio :** 5.0-4.8:1 (26T included: 4.9:1).

KIT Includes:
- 21T motor pulley (other pulley sizes available).
- 2 battery trays with straps.

- 690 mm main blades.
- 105 mm tail blades.

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 NONIFRINGEMENT, 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

*Speed controller

*Batteries: 12S – 4200/5500mAh

*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

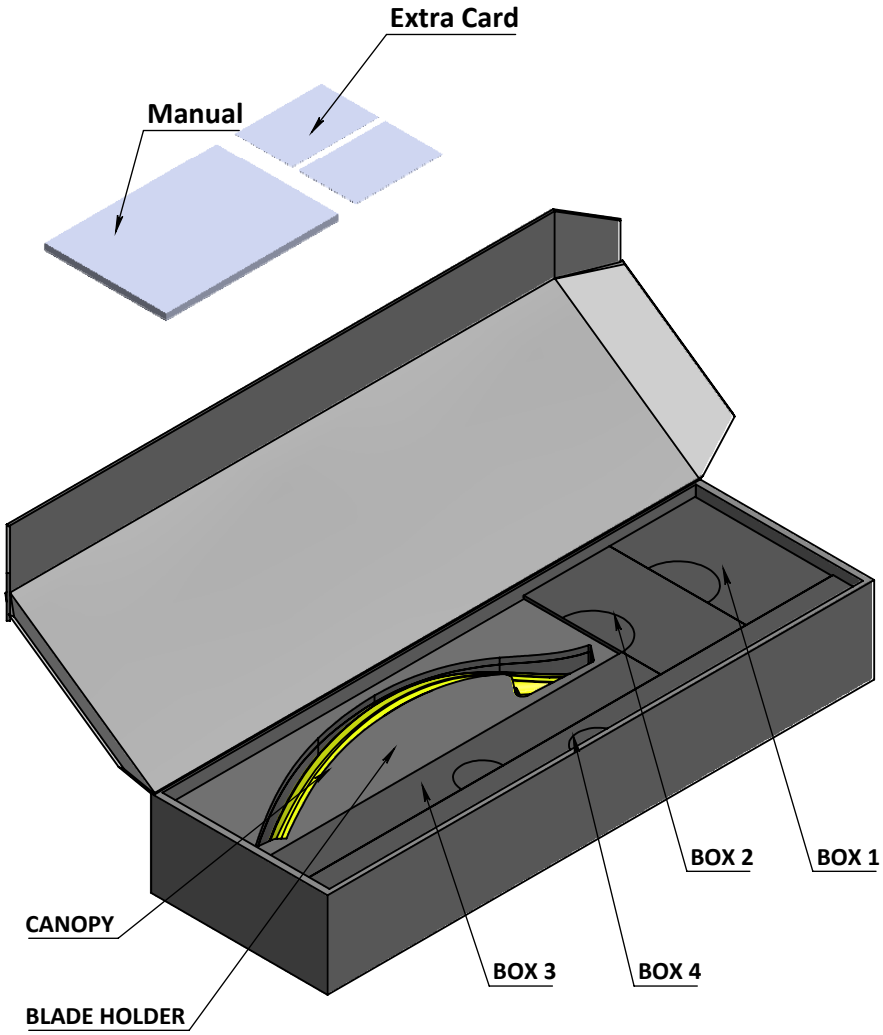
TOOLS, LUBRICANTS, ADHESIVES

*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.

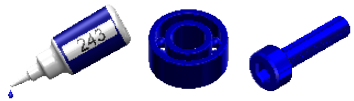
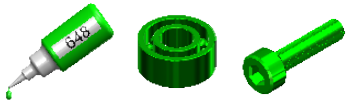
*Pitch Gauge (for set-up).
*Soldering equipment (for motor wiring).

INSIDE THE MAIN BOX THERE ARE:



NOTES FOR ASSEMBLY

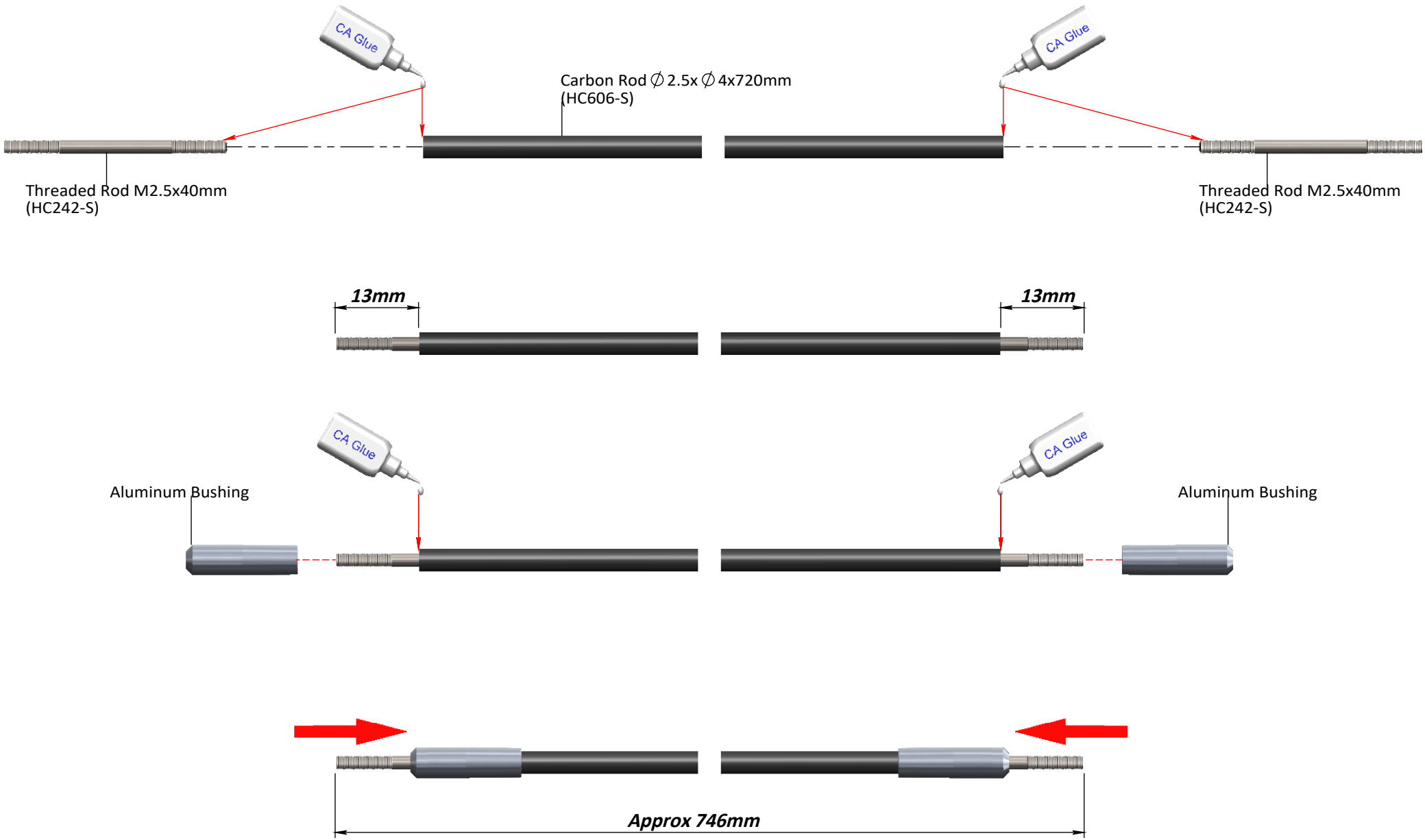
Please refer to this manual for assembly instructions for this model. Follow the order of assembly indicated. The instructions are divided into chapters, which are structured in a way that each step is based on the work done in the previous step. Changing the order of assembly may result in additional 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

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.

CARBON ROD ASSEMBLY

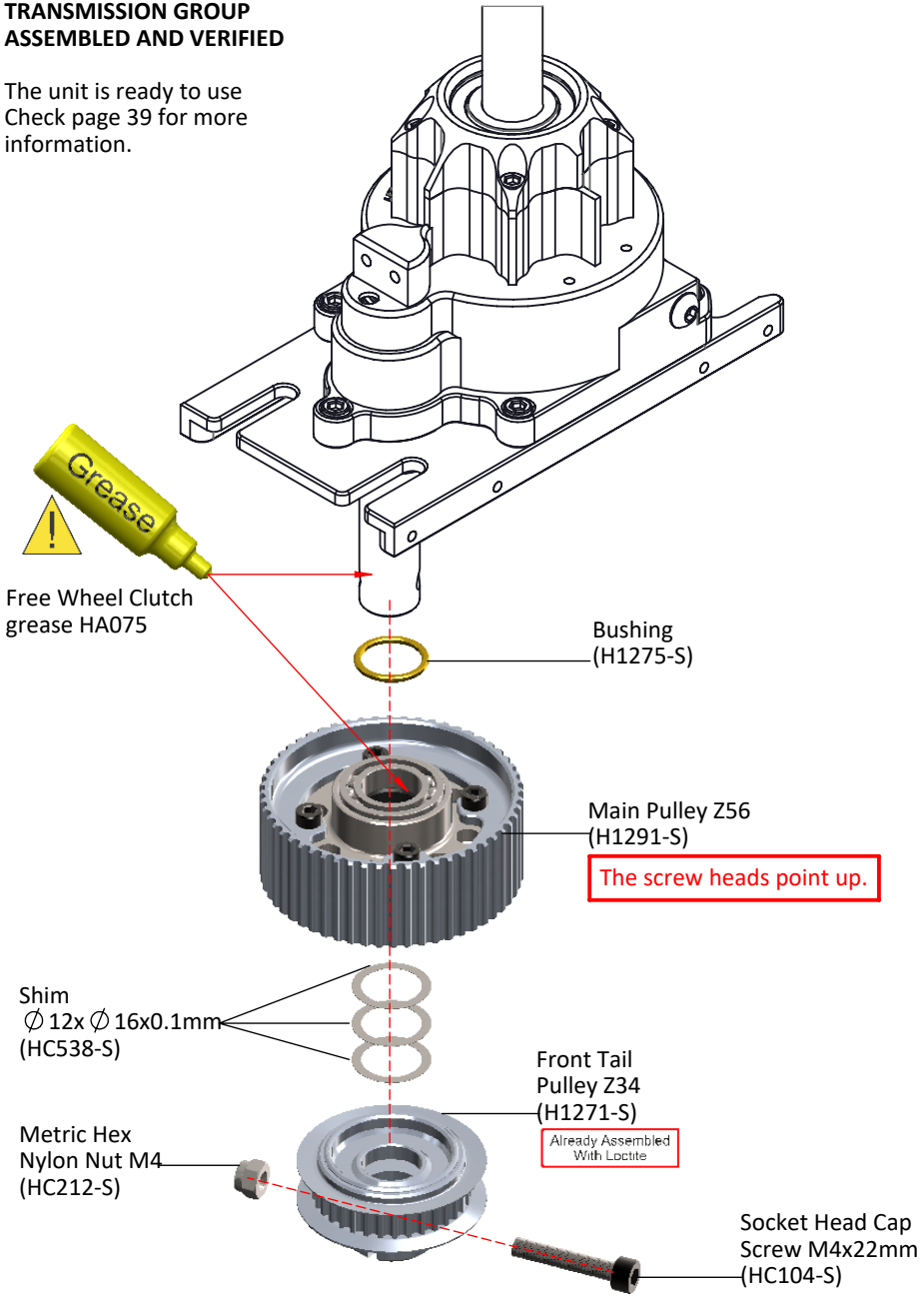
Box 4, Bag for page 5

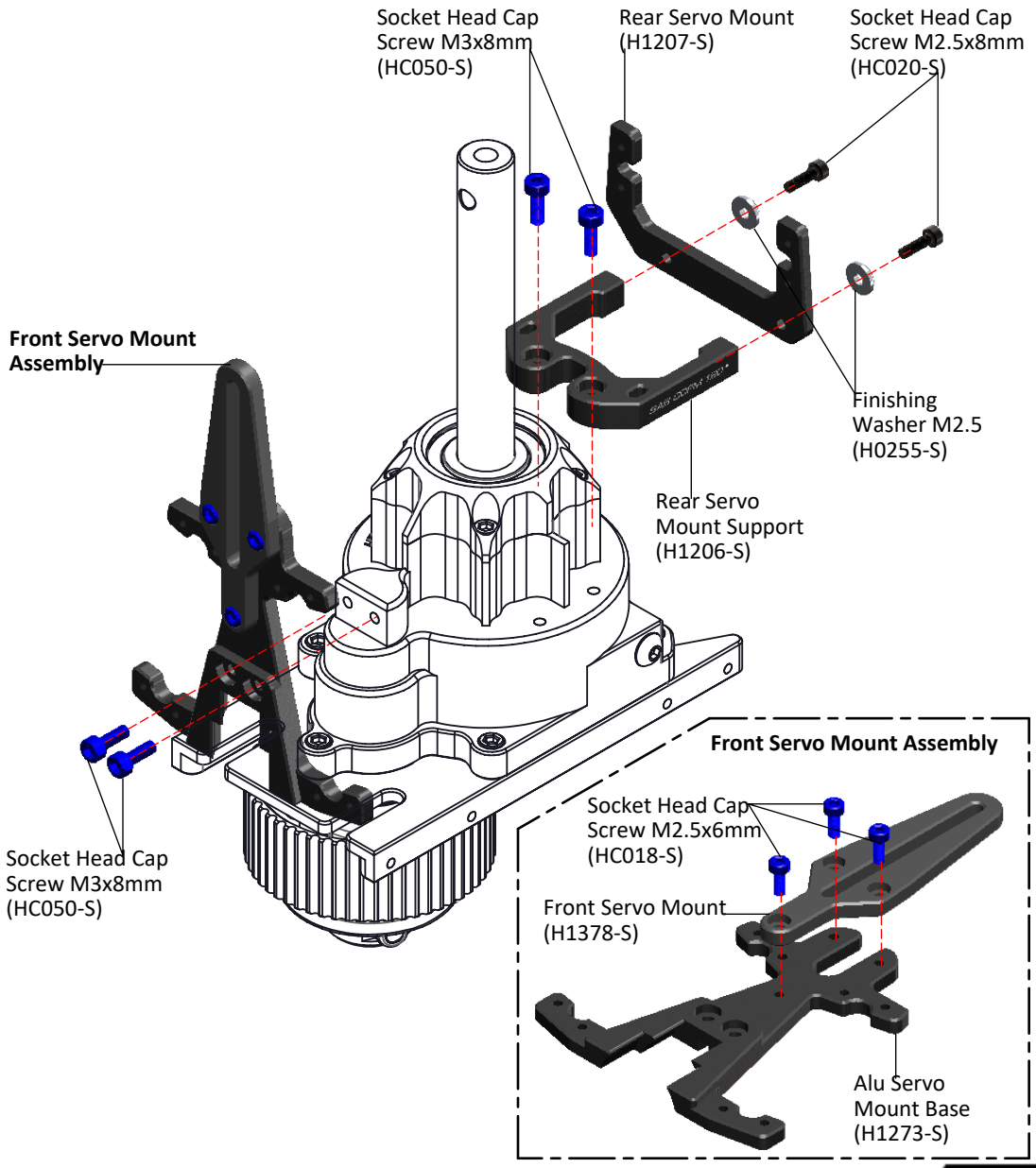


BOX 1, BAG FOR PAGE 6

TRANSMISSION GROUP ASSEMBLED AND VERIFIED

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



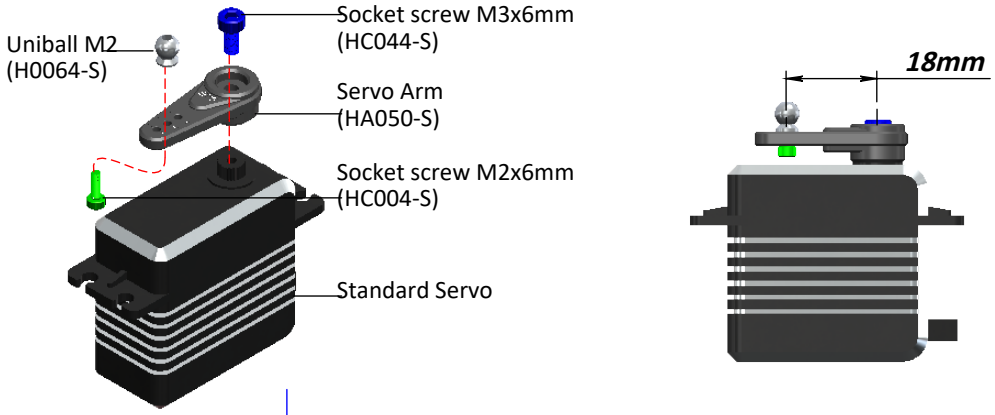


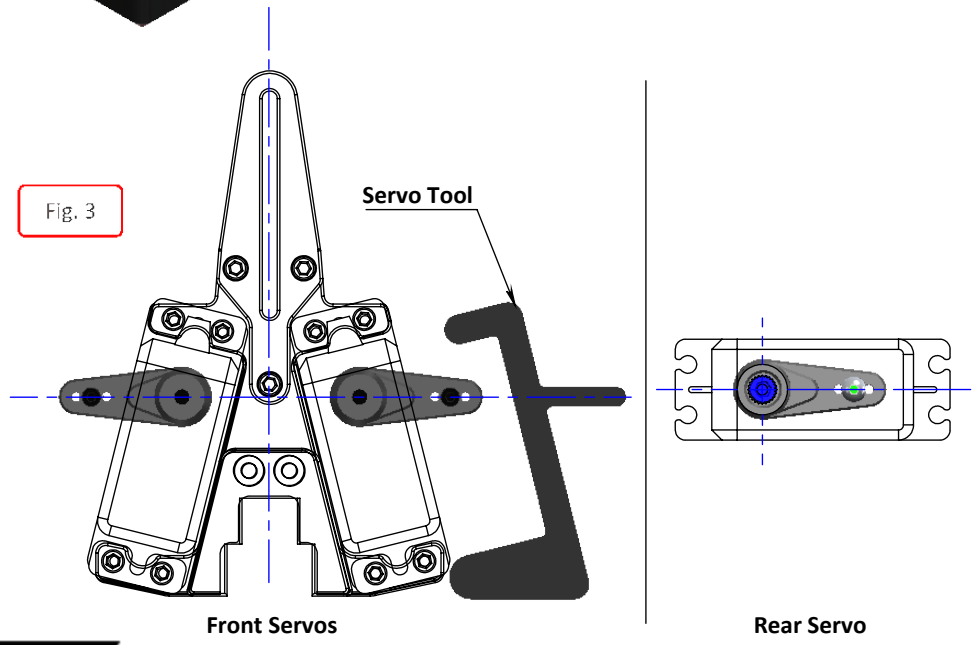
BOX 1, BAG FOR PAGE 7

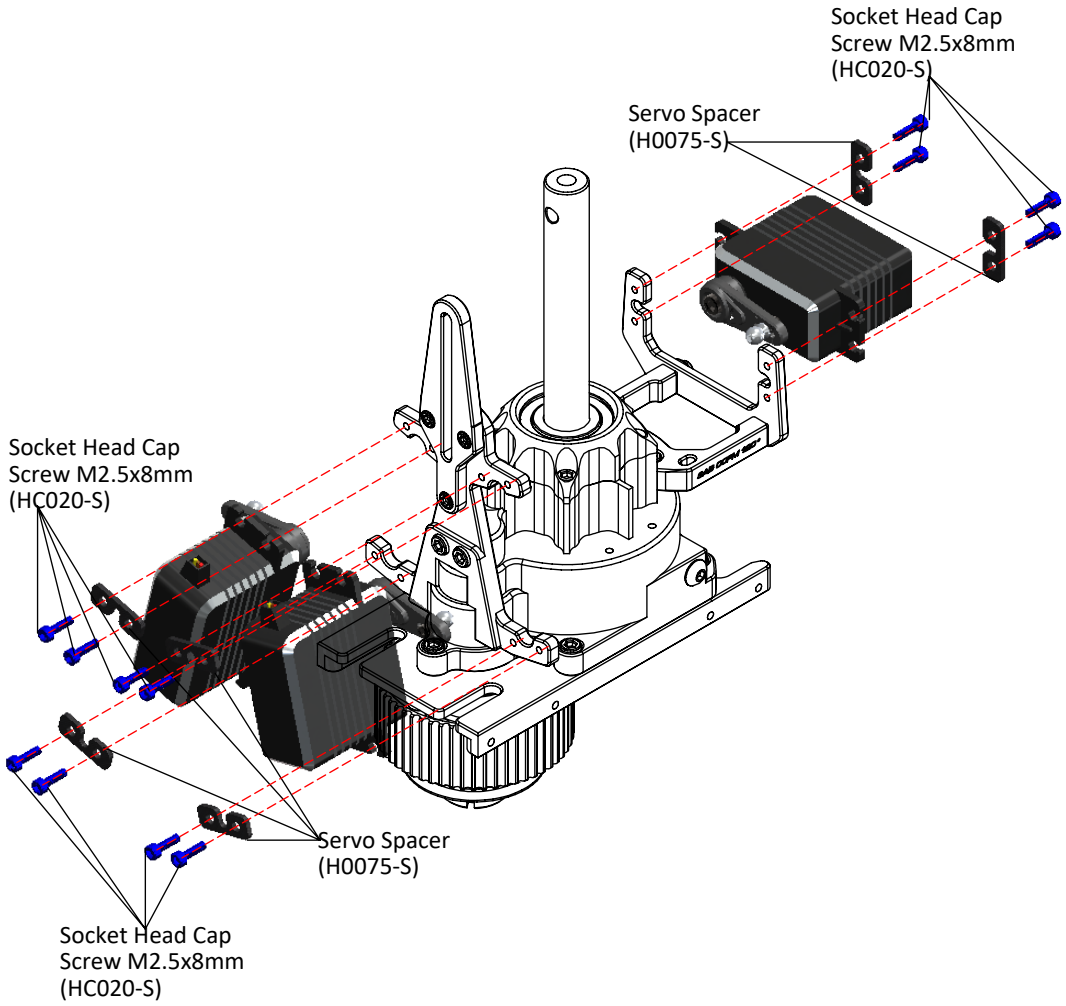
SERVO ASSEMBLY

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)**





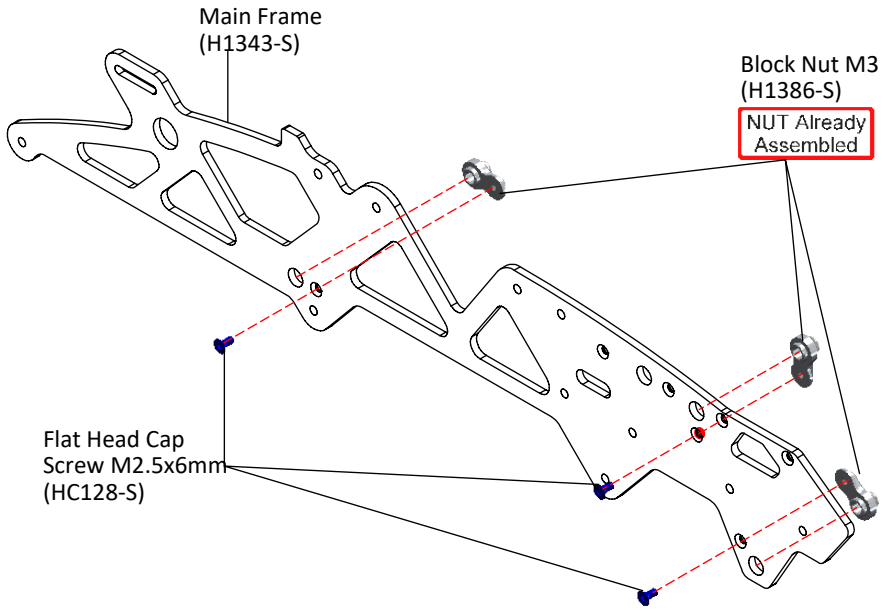


BOX 3, BAG FOR PAGE 8

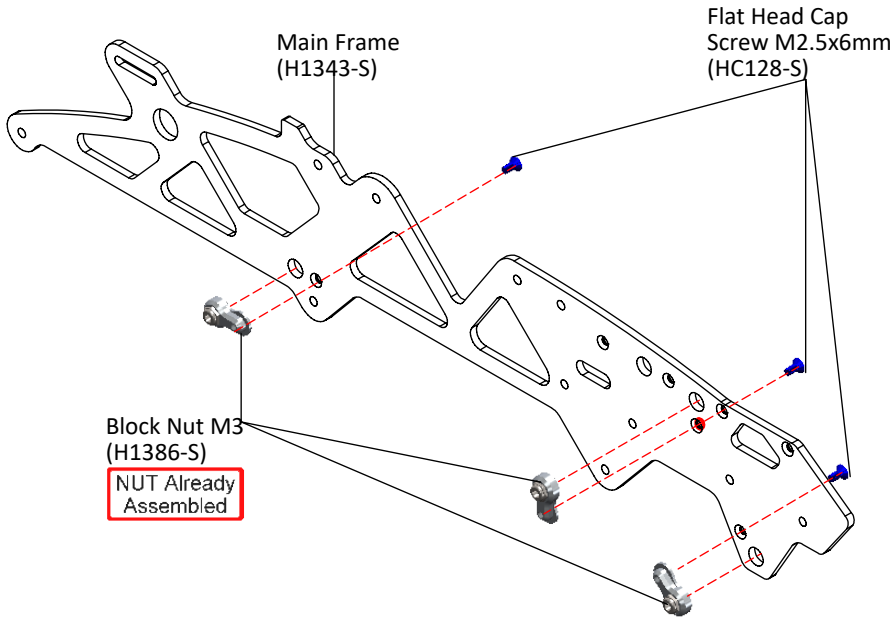
CARBON FRAME

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. It is very important to do this along the red lines.

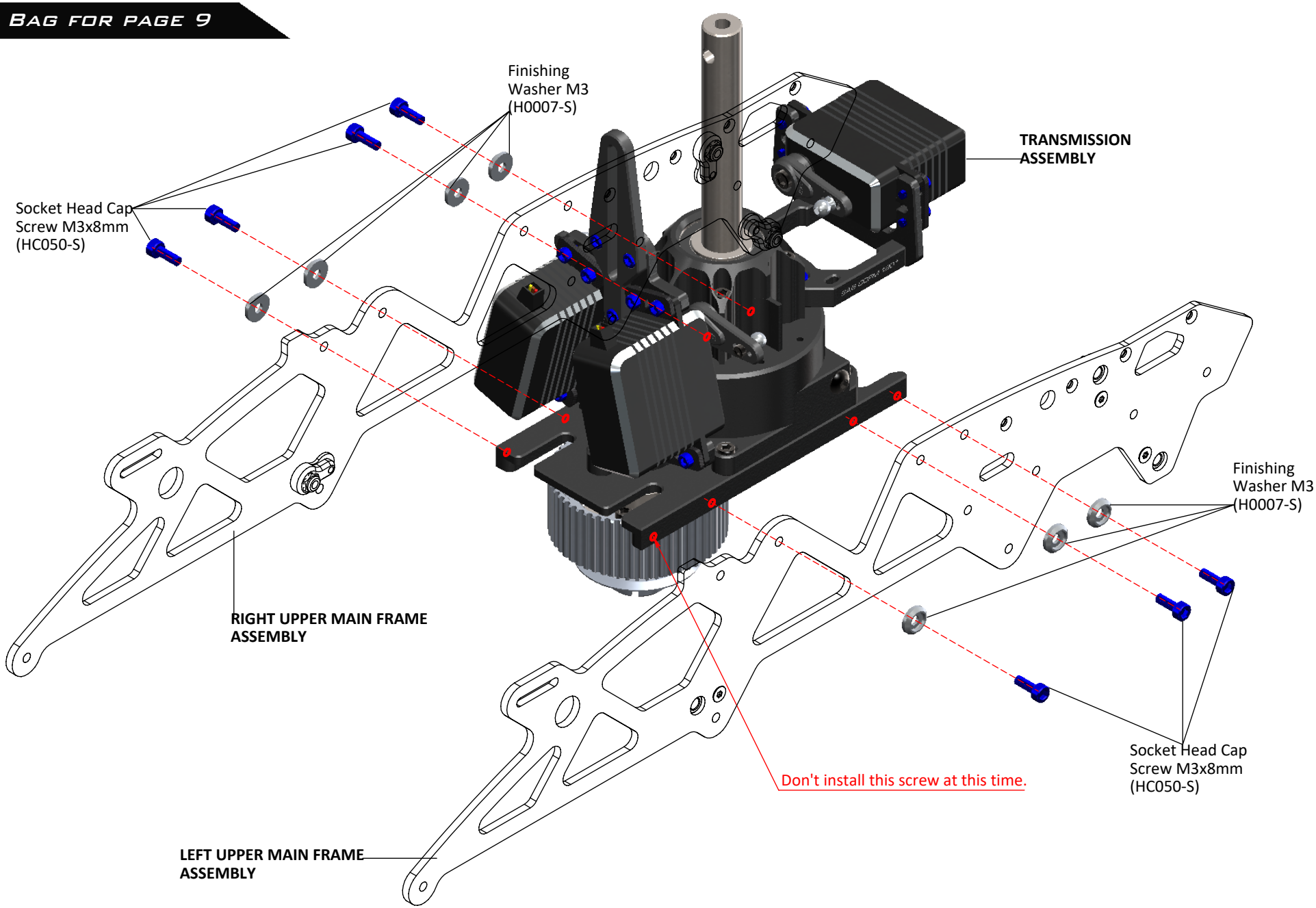
LEFT UPPER FRAME ASSEMBLY



RIGHT UPPER FRAME ASSEMBLY

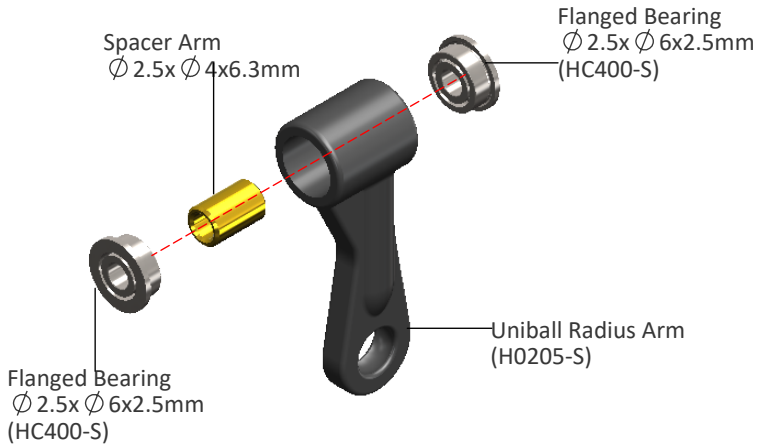


Box 1, Bag for page 9

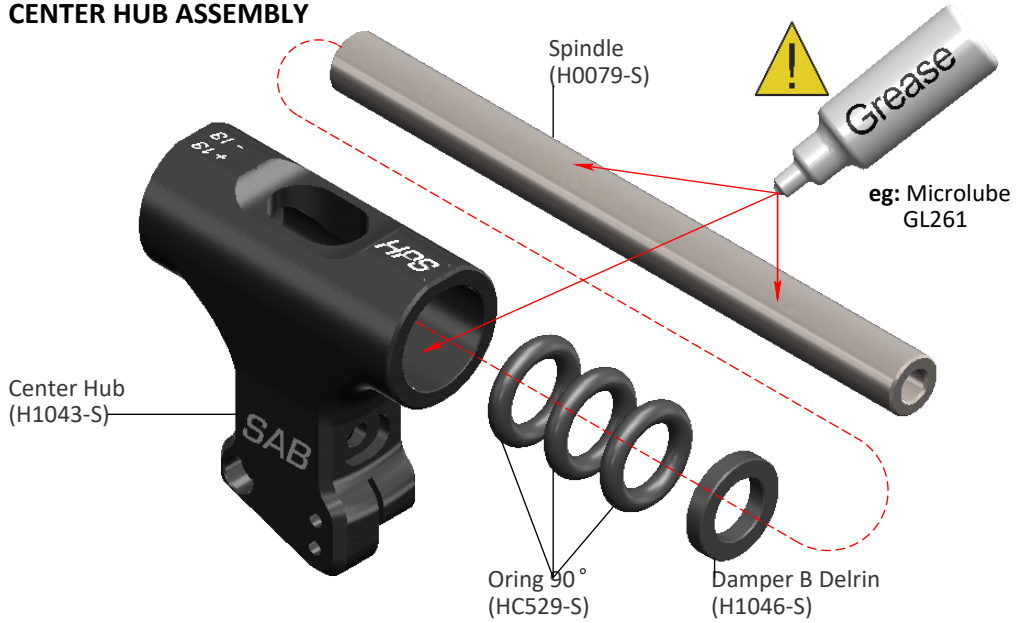


BOX 1, BAG FOR PAGE 10

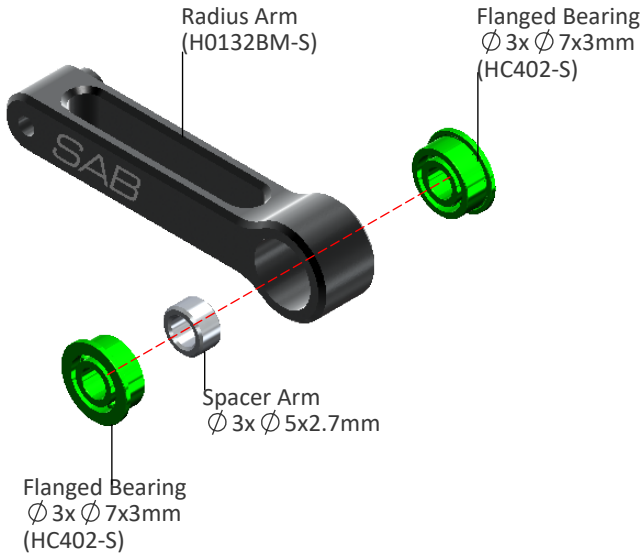
UNIBALL RADIUS ARM ASSEMBLY ...X2



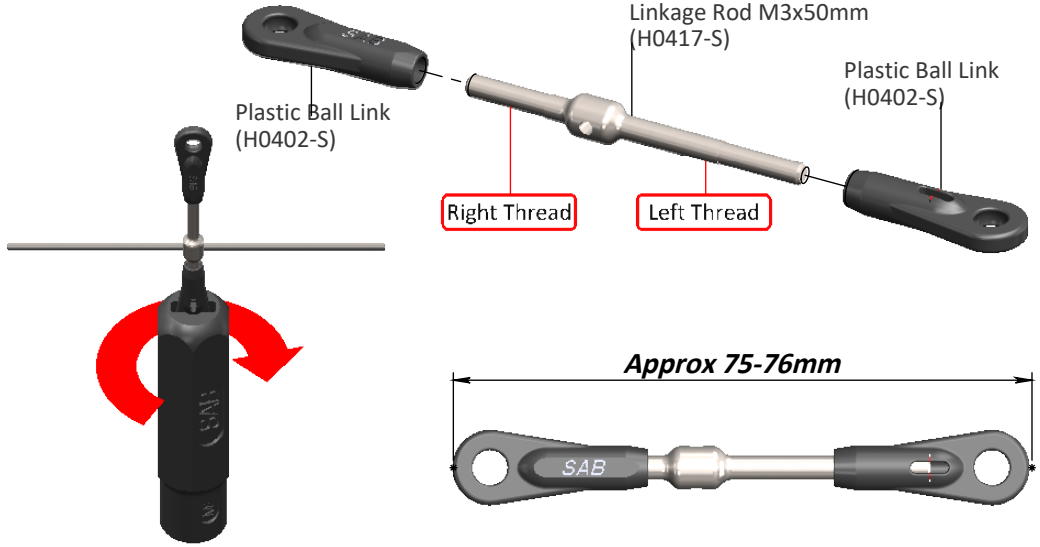
CENTER HUB ASSEMBLY



RADIUS ARM ASSEMBLY ...X2

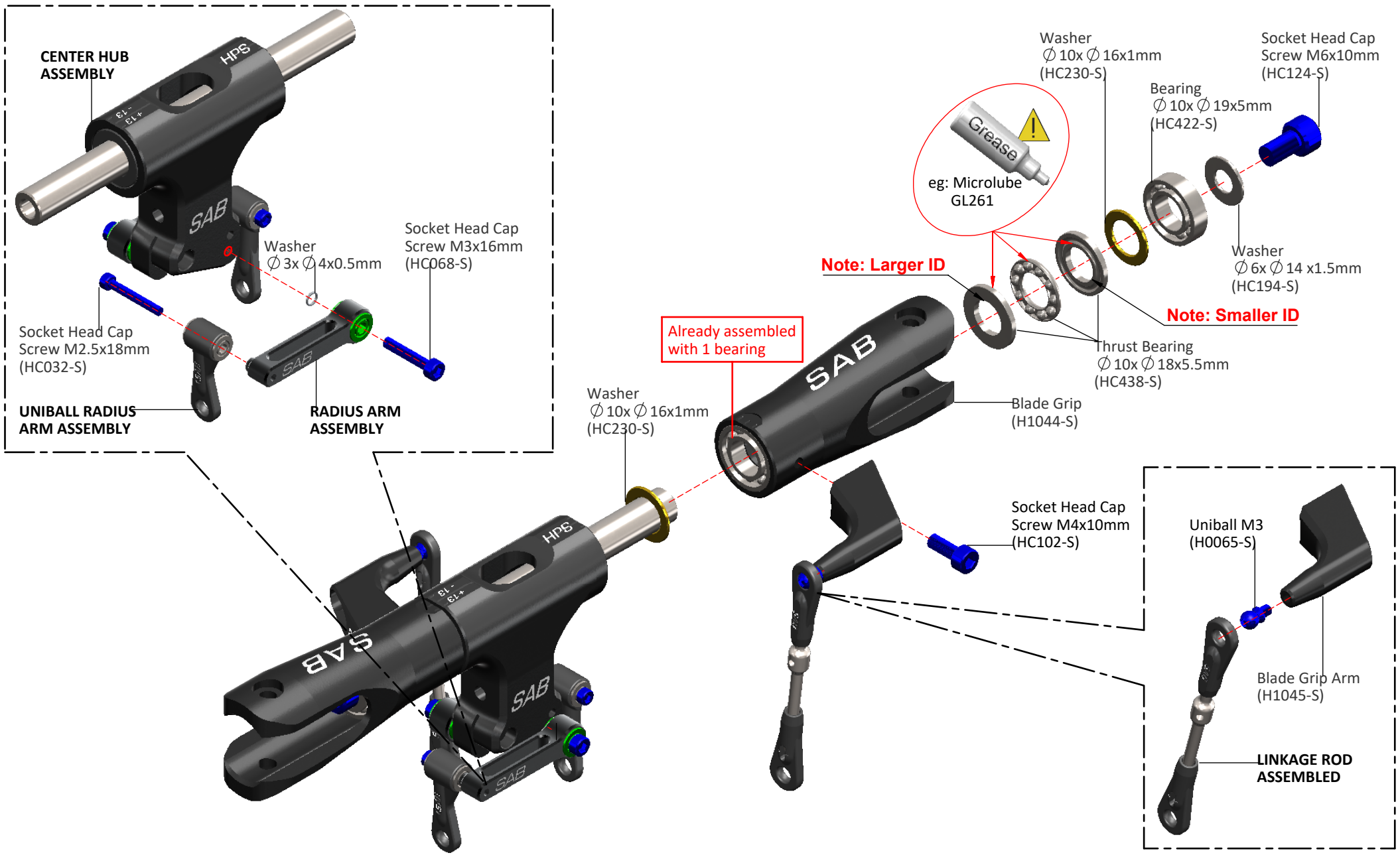


LINKAGE ROD A ASSEMBLY ...X2



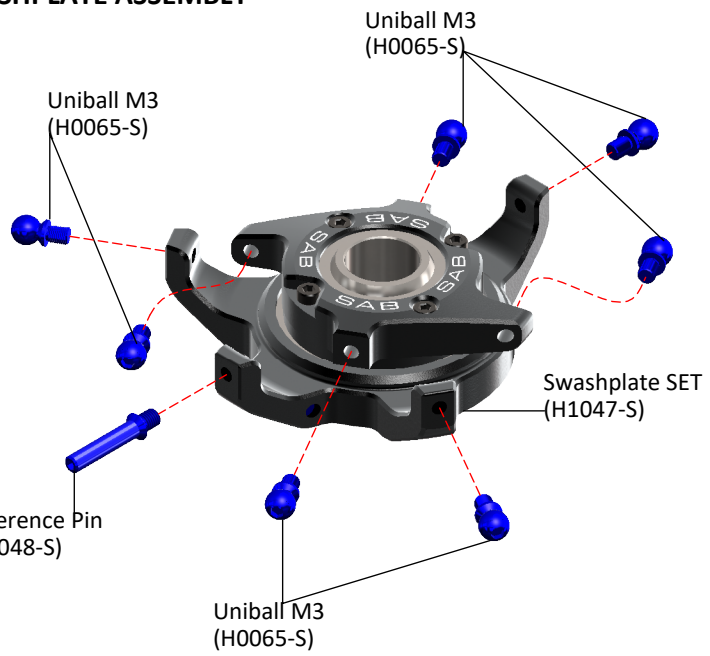
Note: You can use HA016 to easily thread the plastic link onto the rods.

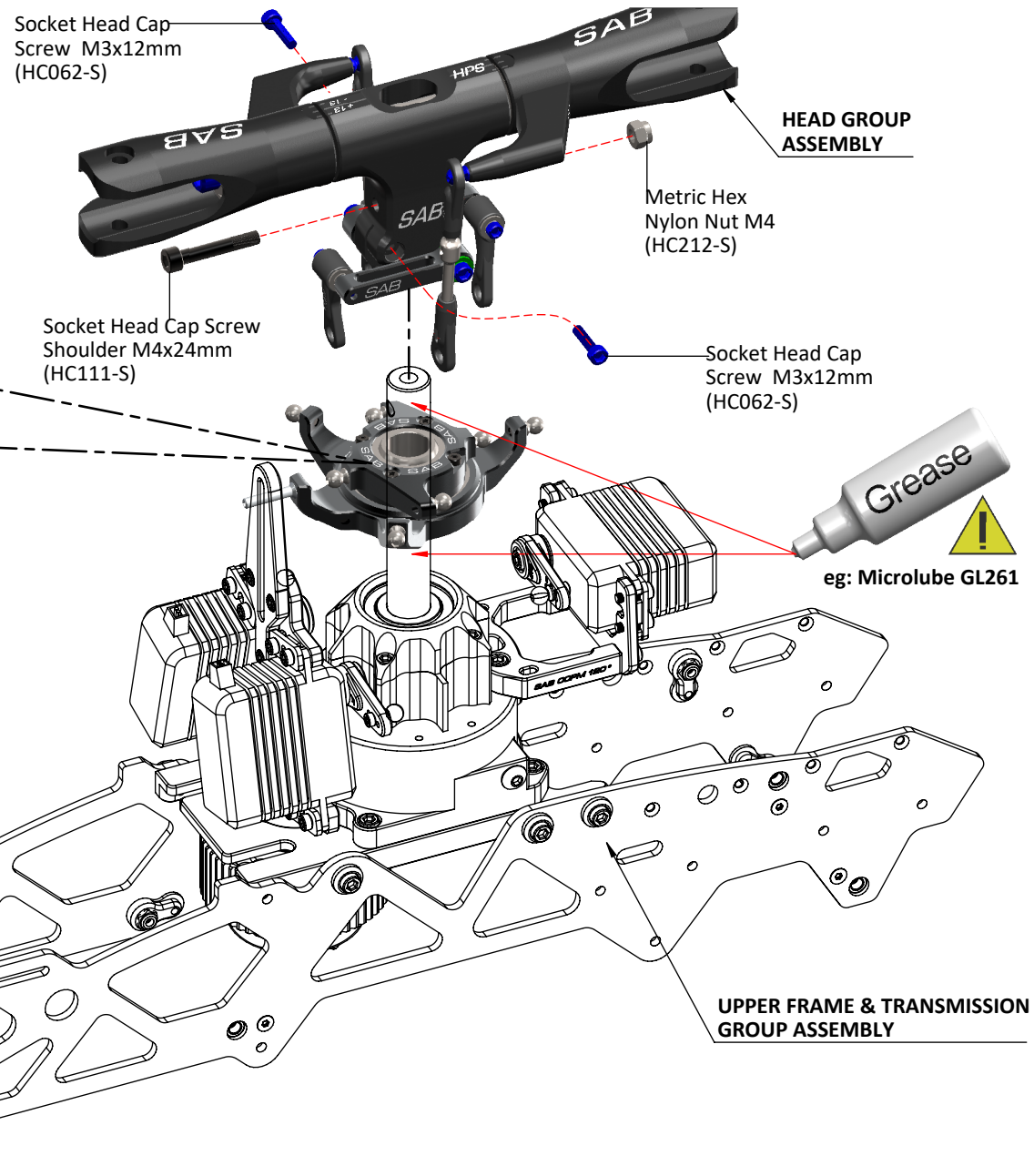
Box 1, Bag for page 11



BOX 1, BAG FOR PAGE 12

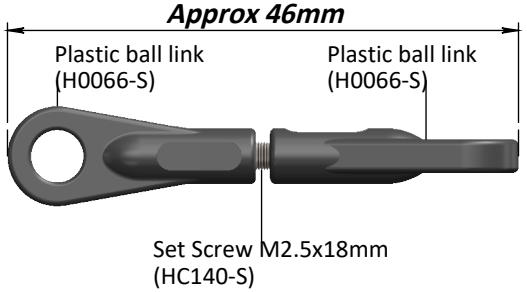
SWASHPLATE ASSEMBLY



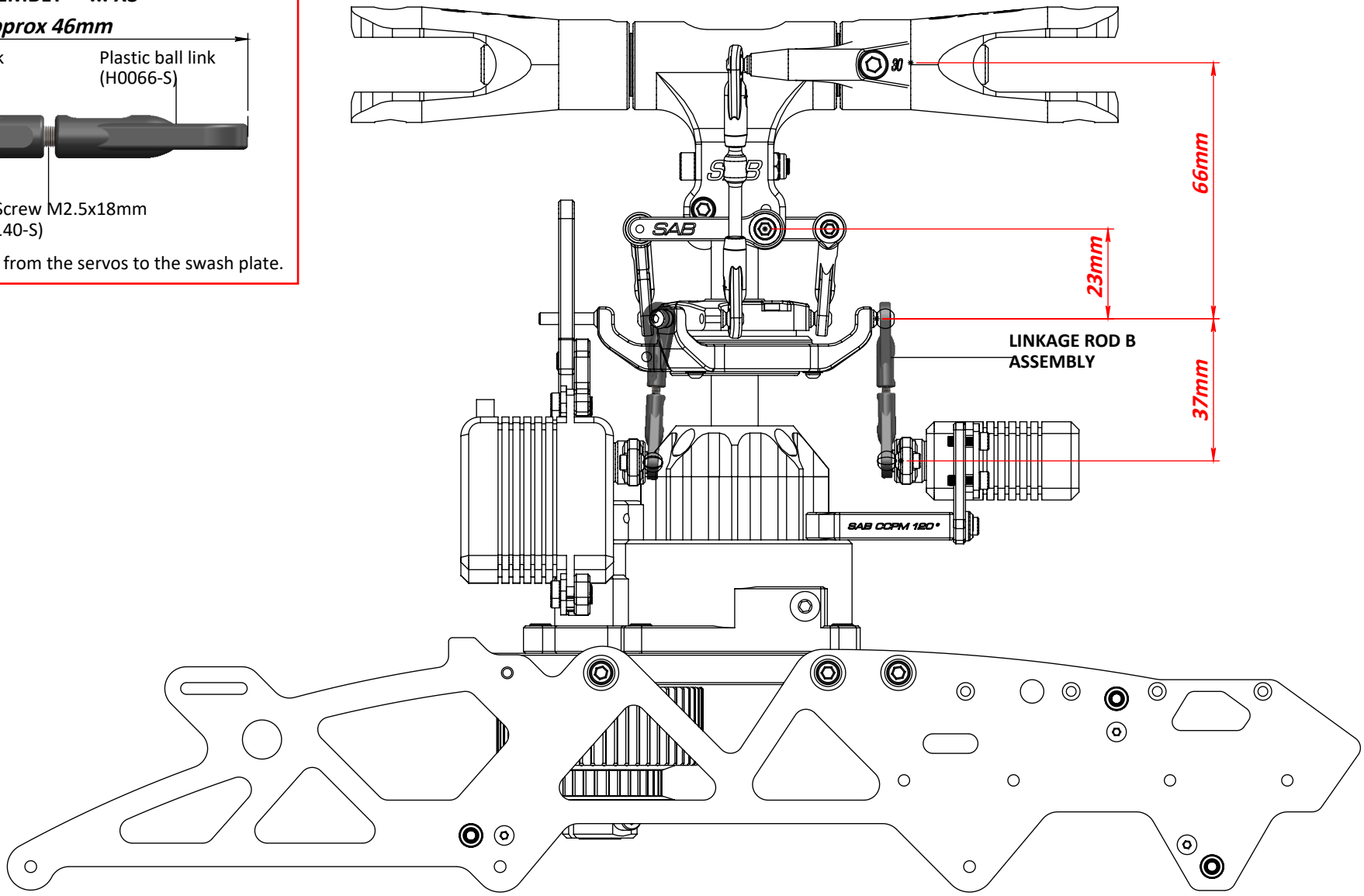


Box 1, Bag for page 13

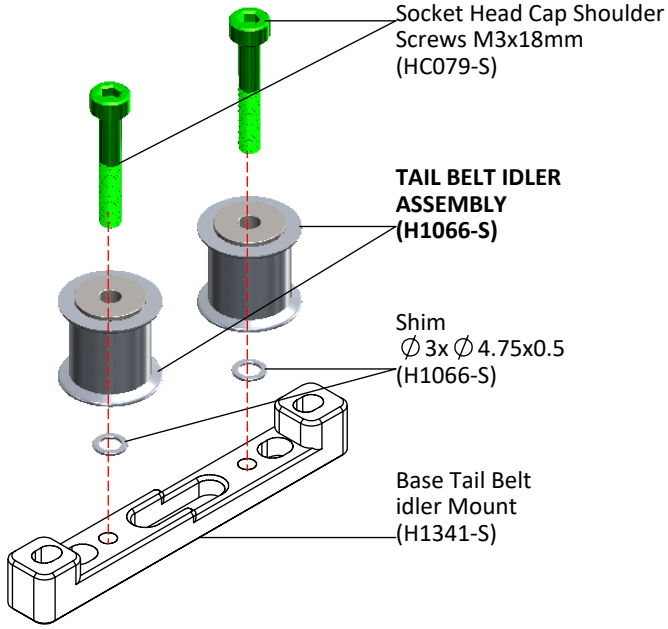
LINKAGE ROD B ASSEMBLY ... X3



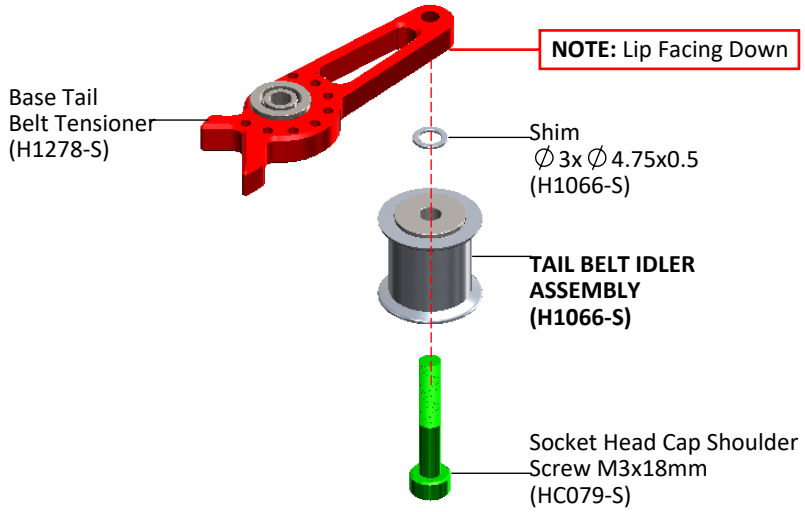
Initial length for the rods from the servos to the swash plate.



BOX 1, BAG FOR PAGE 14

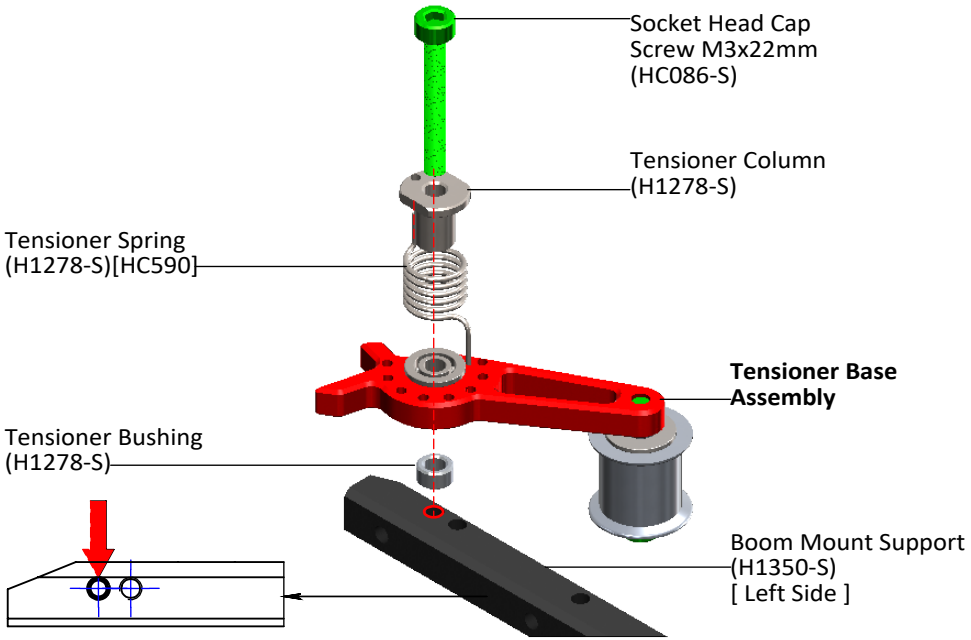


1

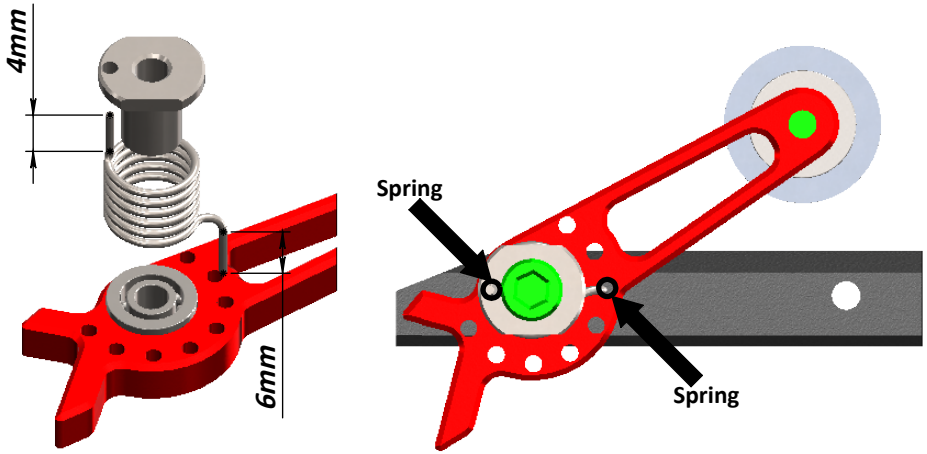


2

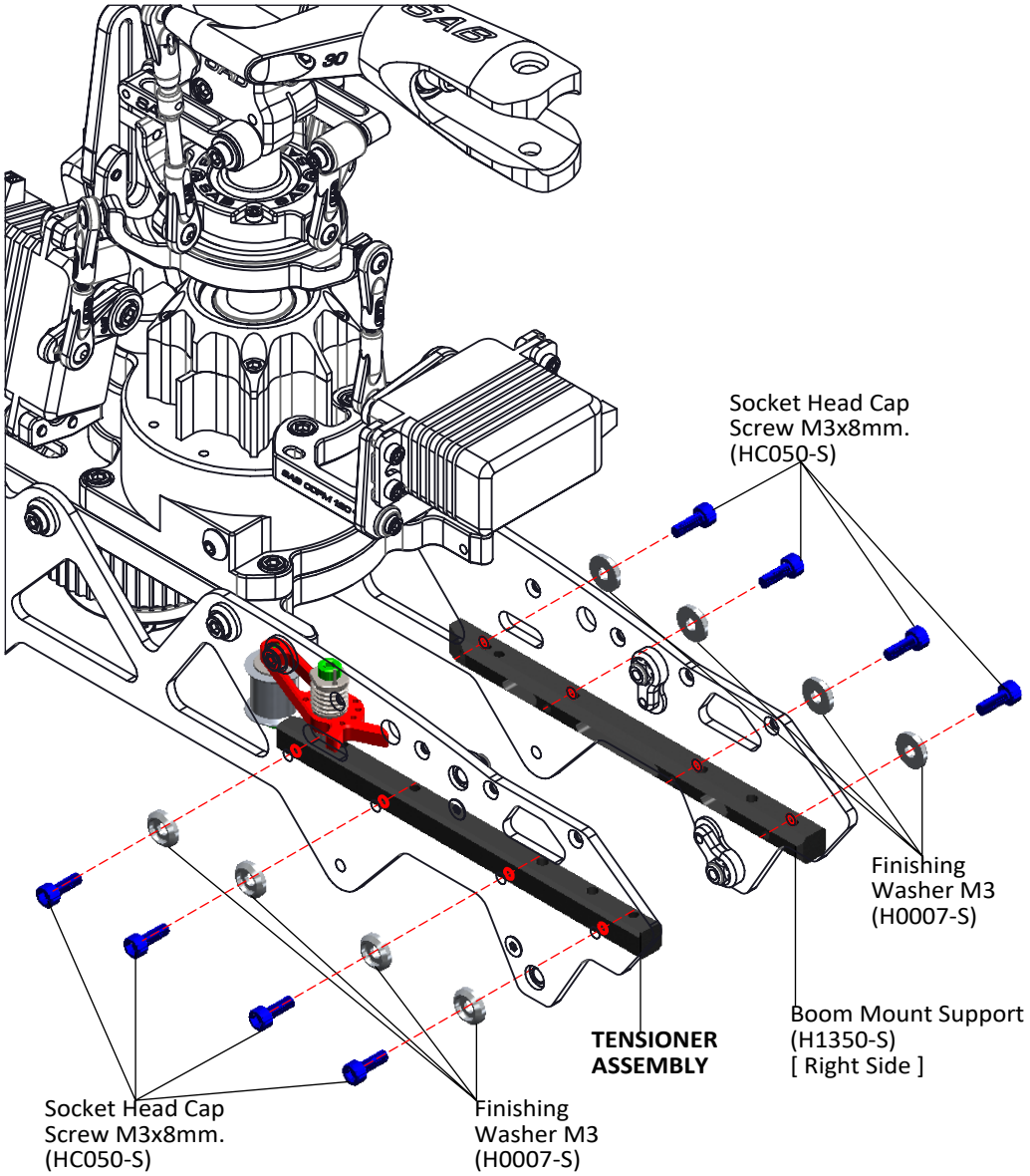
3

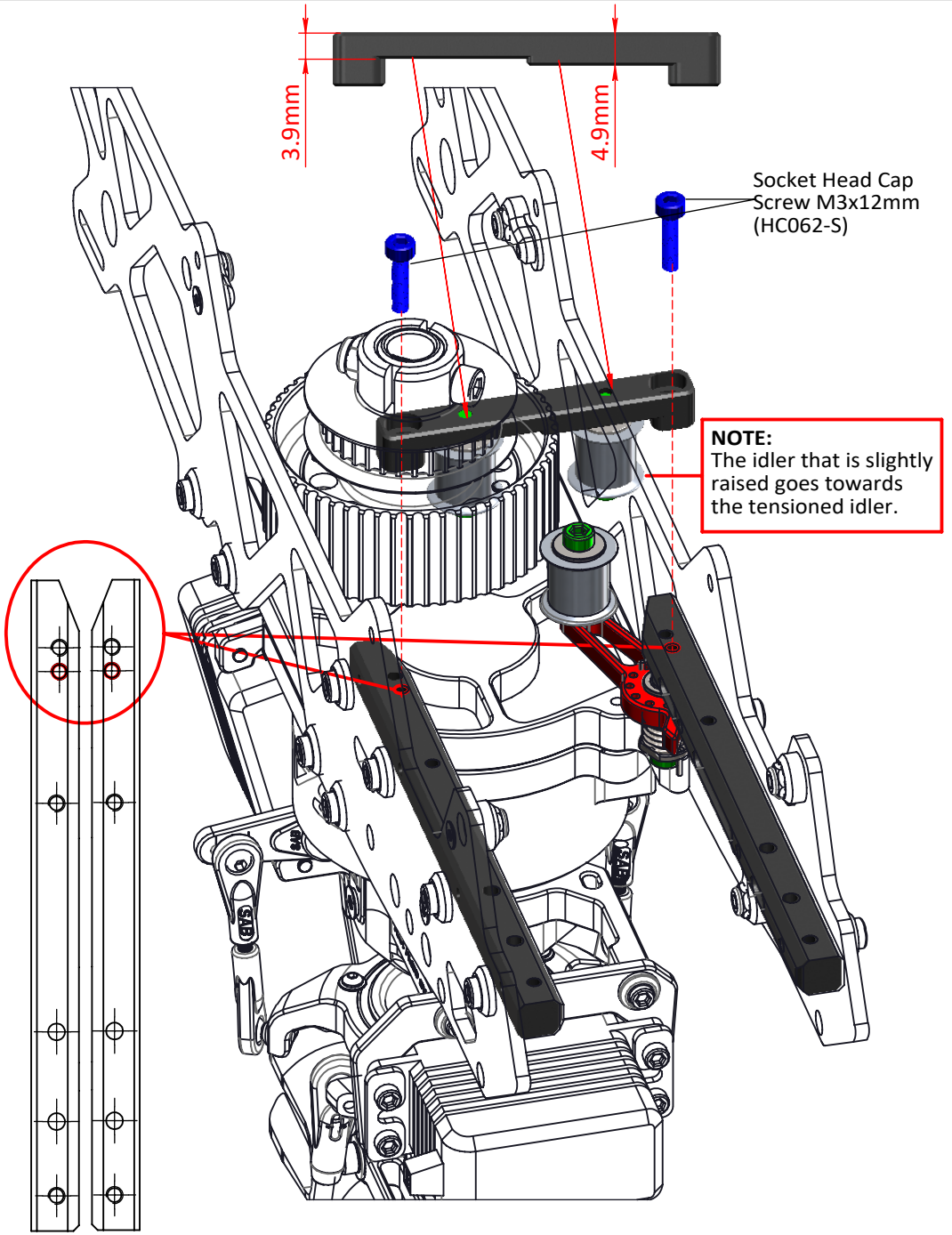


NOTE: Position without Spring pre-load.



Box 1, Bag for page 15

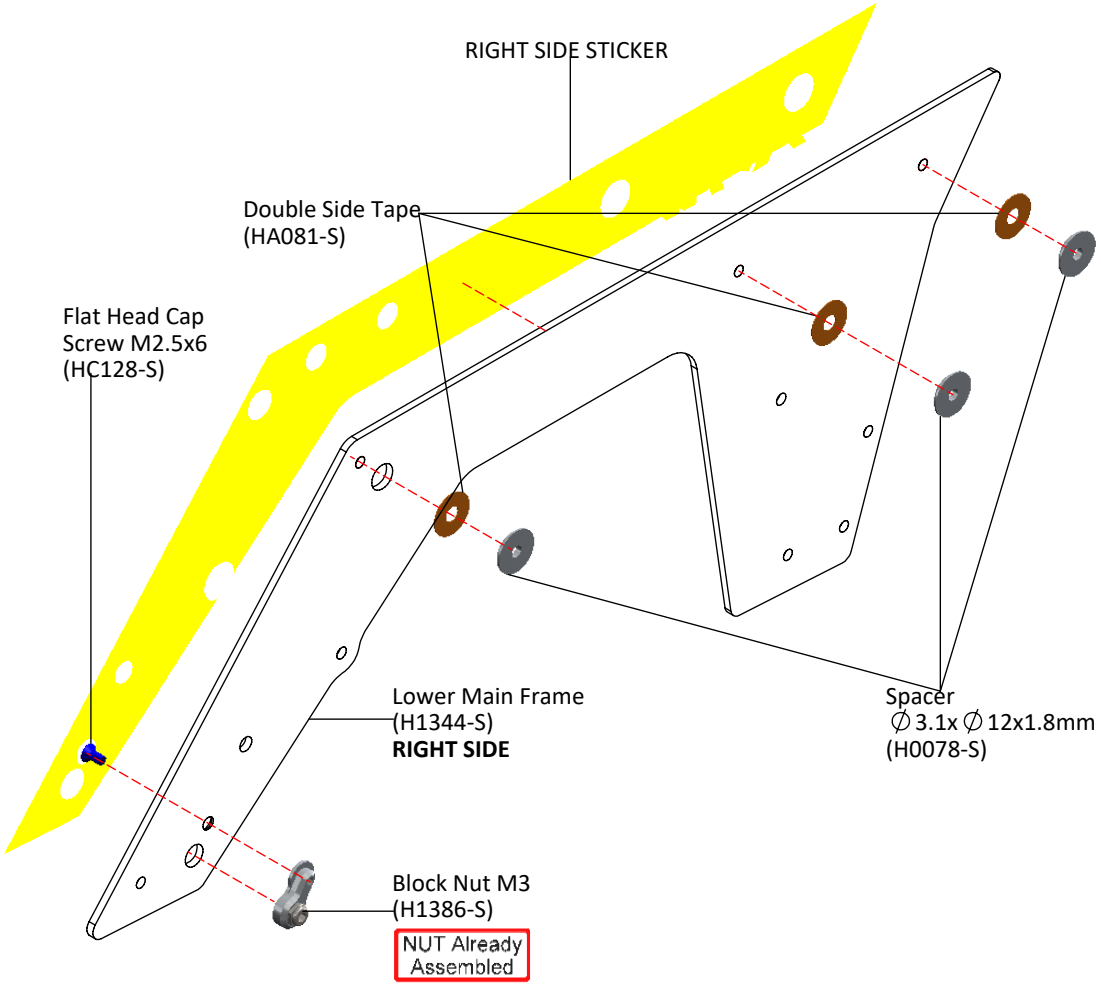




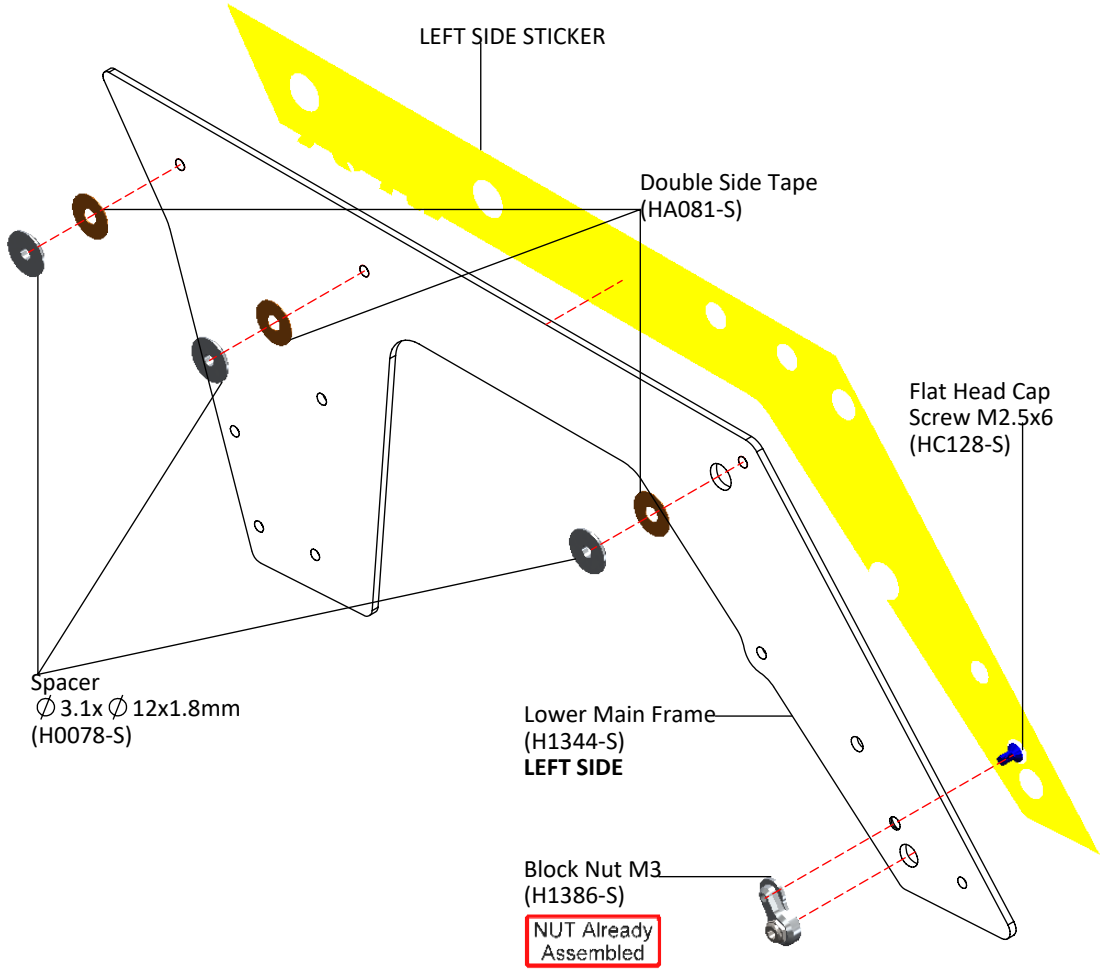
BOX 3, BAG FOR PAGE 16

LOWER SIDE FRAME ASSEMBLY

LOWER RIGHT MAIN FRAME ASSEMBLY

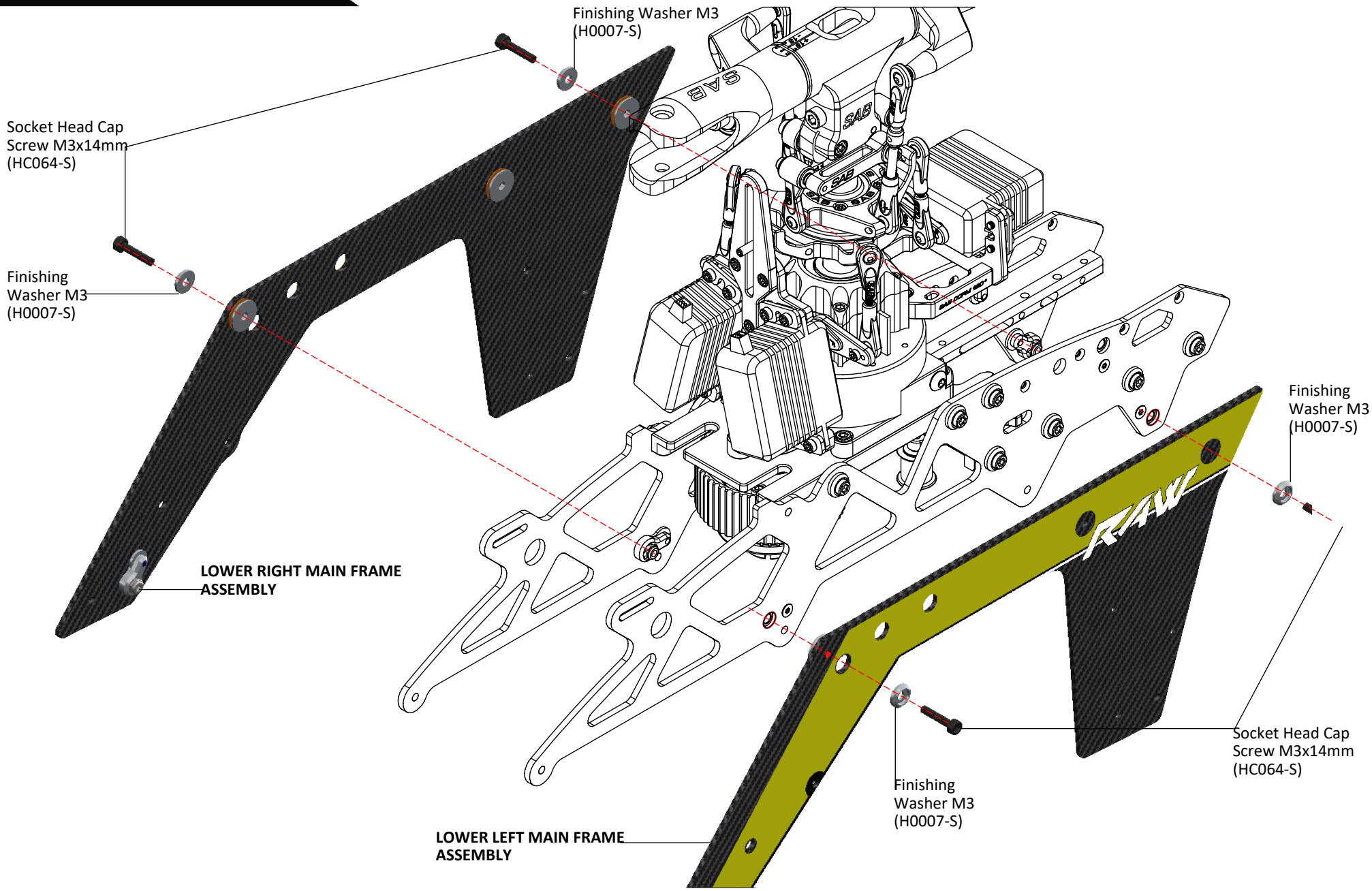


LOWER LEFT MAIN FRAME ASSEMBLY

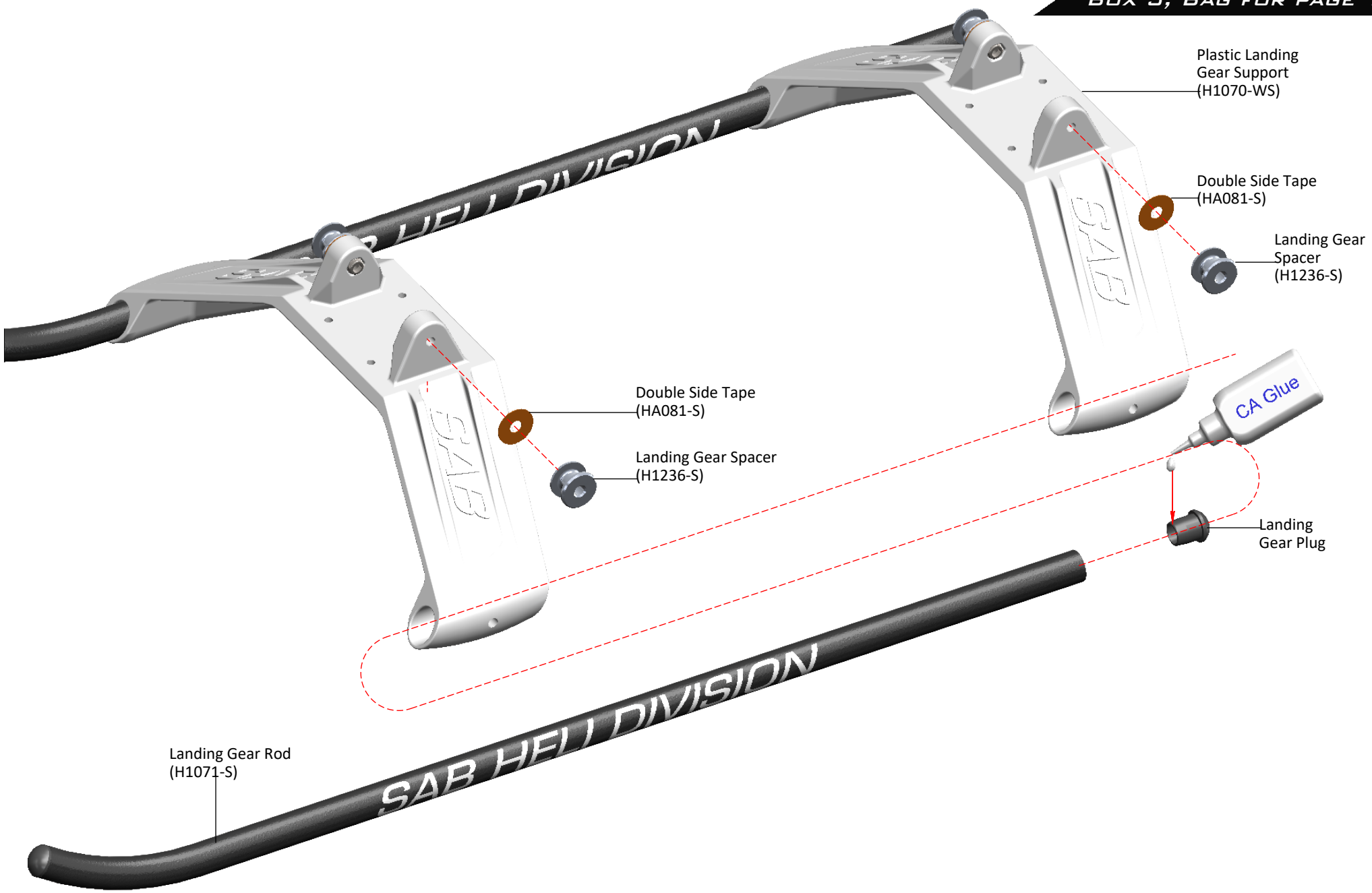


LOWER SIDE FRAME INSTALLATION

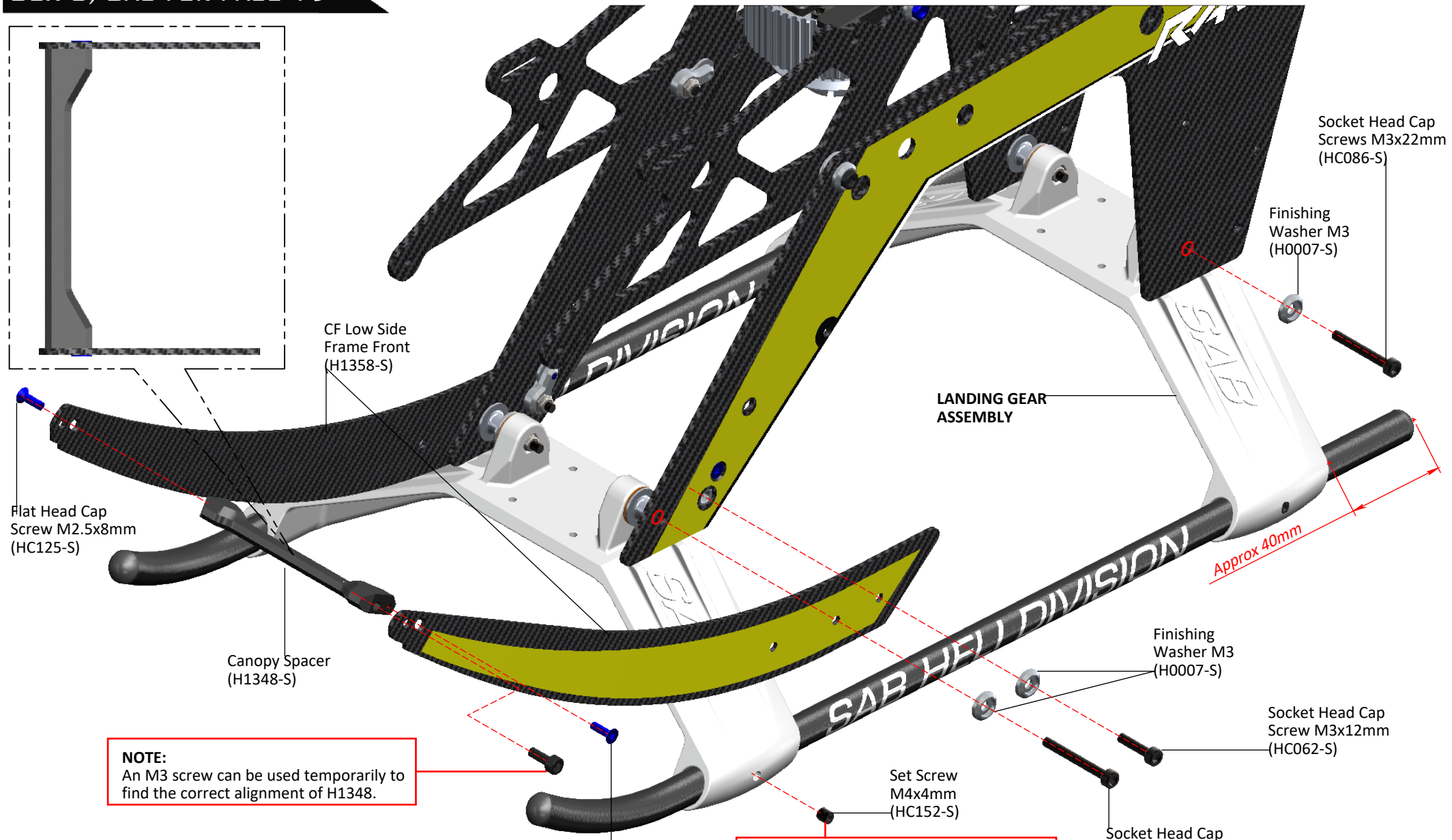
Box 3, Bag for page 17



BOX 3, BAG FOR PAGE 18



Box 3, Bag for page 19



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 212 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:

H0175-18-S - **18T** Pinion = ratio **11.8:1**

H0175-19-S - **19T** Pinion = ratio **11.2:1**

H0175-20-S - **20T** Pinion = ratio **10.6:1**

H0175-21-S - **21T** Pinion = ratio **10.1:1**

H0175-22-S - **22T** Pinion = ratio **9.6:1**

H0175-23-S - **23T** Pinion = ratio **9.2:1**

H0175-24-S - **24T** Pinion = ratio 8**.8:1**

H0175-25-S - **25T** Pinion = ratio **8.4:1**

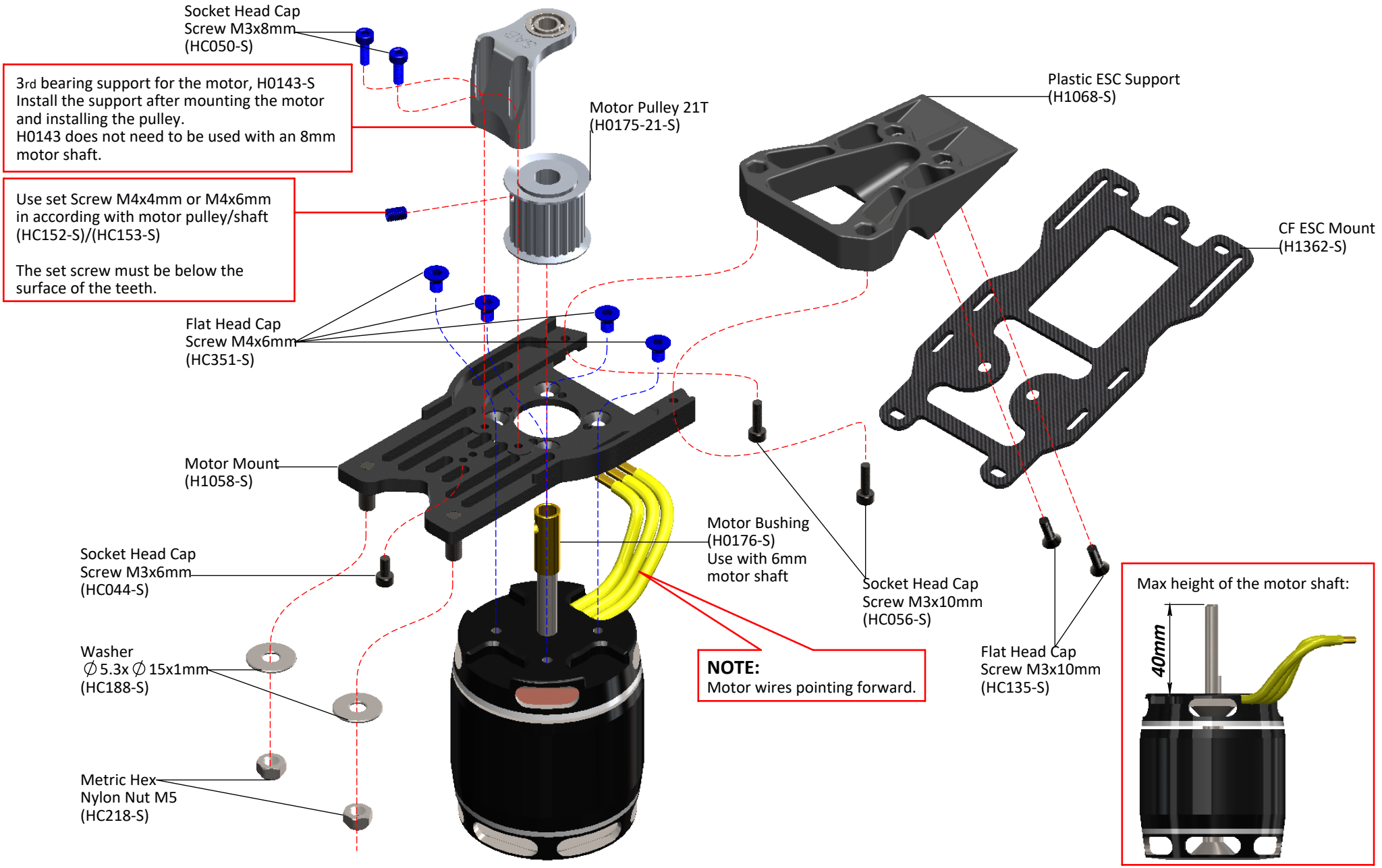
GOBLIN RAW CONFIGURATIONS

Rev:01

Battery	Motor	ESC	Pinion (a, b)	RPM Max (a, b)	Pitch
12S 4200/5500 mAh	Xnova 4525-530kv lightning	HW-200A Kosmik 160 YGE 205HVT SCORPION II 14-200A	**21T / 22T**	**2100/2200**	± 12
	Pyro 750-560 TENGU 4525HT/550KV		**20T / 21T**		
	Scorpion HKII 4525-520 UL		**22T / 23T**		
12S 4500/5500 mAh	Xnova 4530-525kv lightning	HW-200A Kosmik 200 YGE 205HVT SCORPION II 14-200A	**22T / 23T**	**2200/2300**	± 13
	Pyro 800-480		**24T / 25T**		
	Scorpion HKII 4530-540 TENGU 4525HT/550KV		**21T / 22T**		

INSTALLATION OF THE MOTOR/ESC

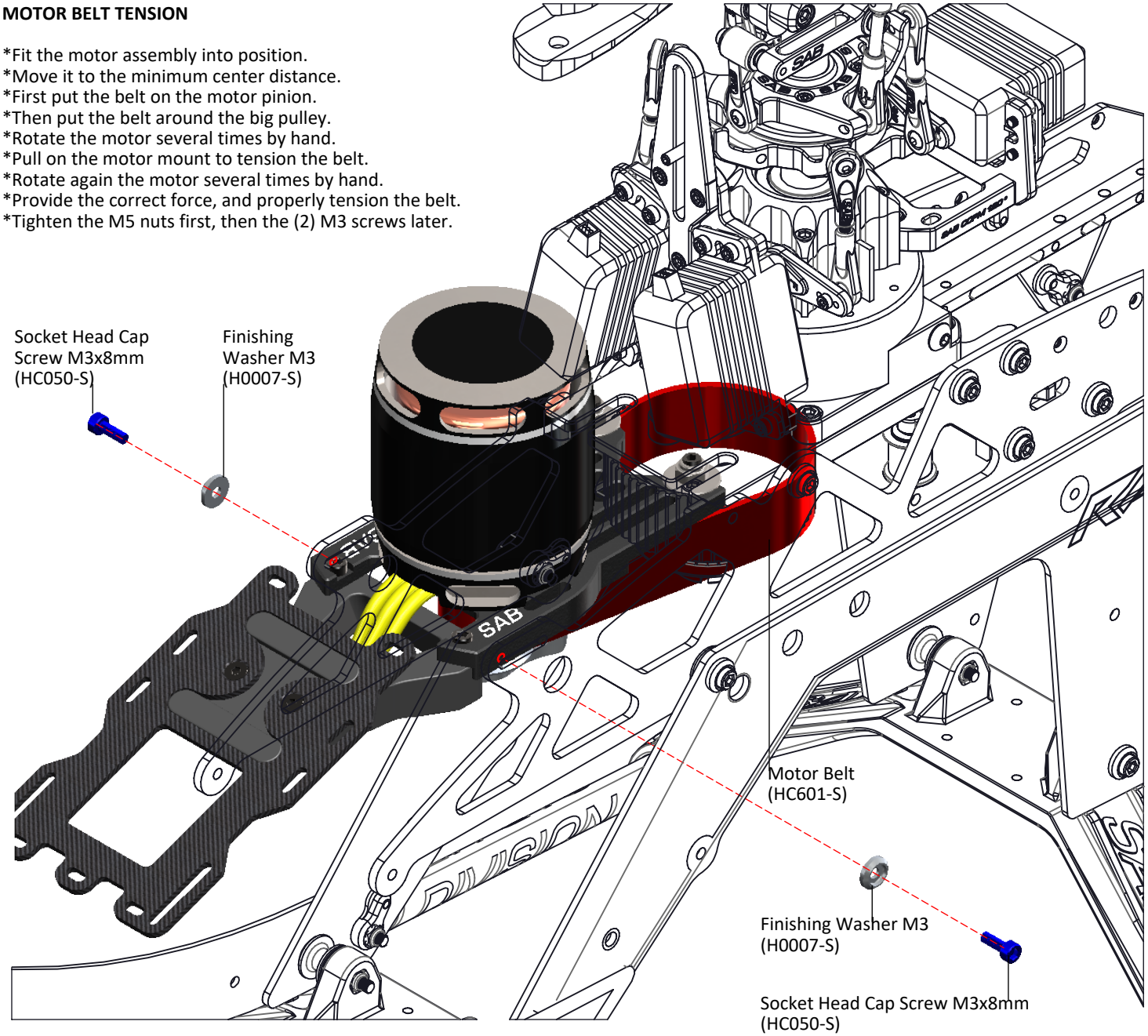
Box 3, Bag for page 21



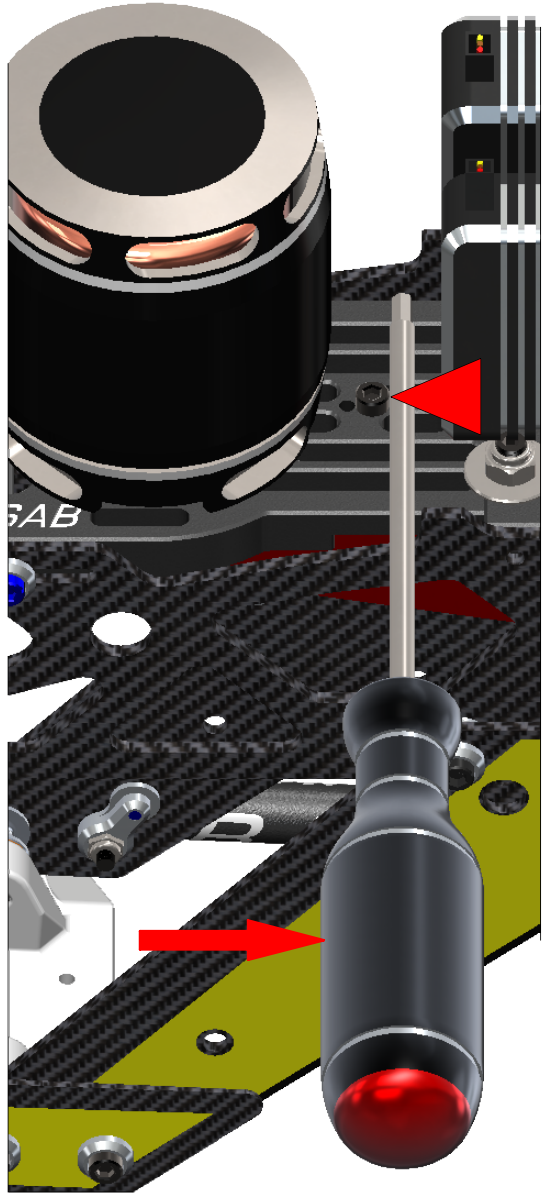
Box 3, Bag for page 22

MOTOR BELT TENSION

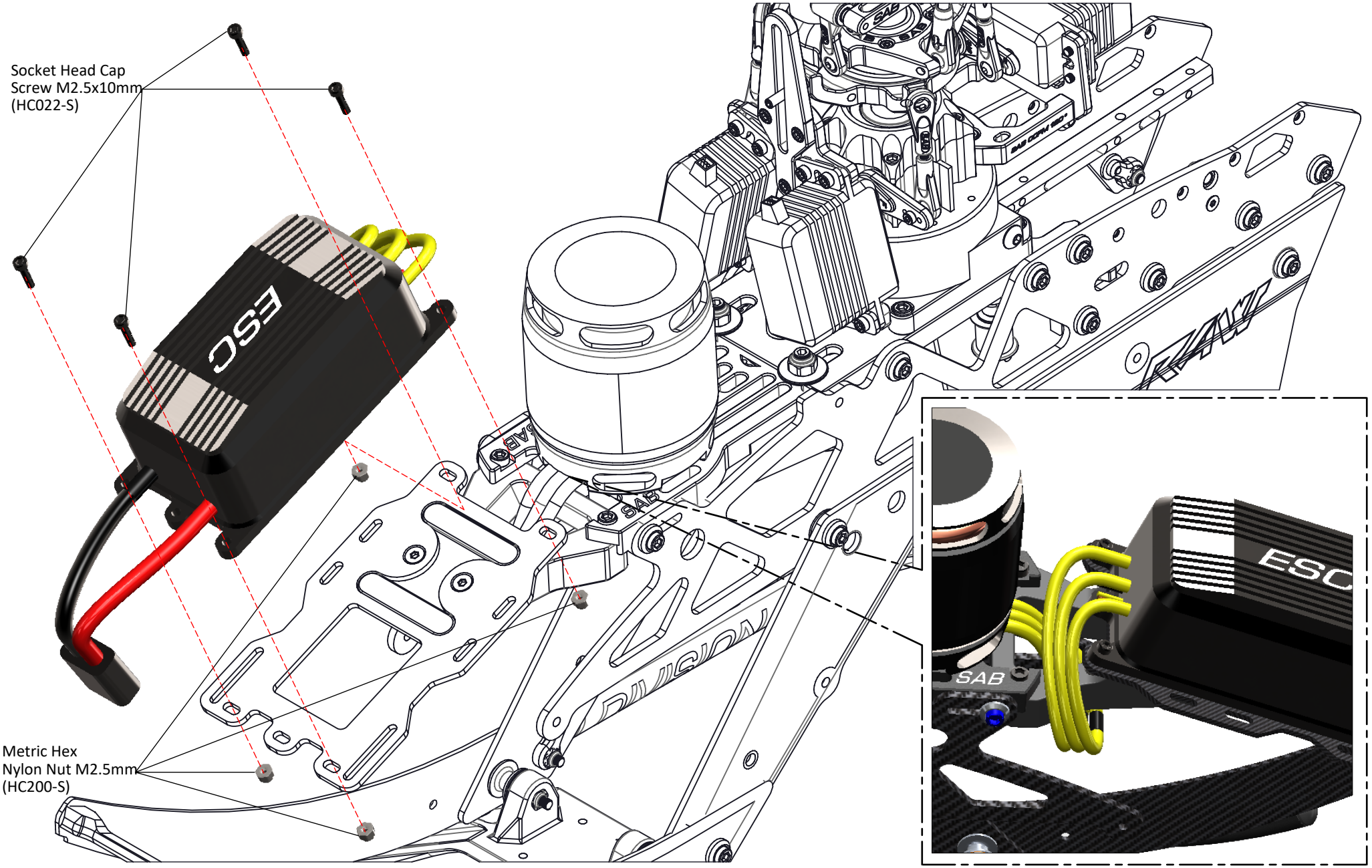
*Fit the motor assembly into position.
*Move it to the minimum center distance.
*First put the belt on the motor pinion.
*Then put the belt around the big pulley.
*Rotate the motor several times by hand.
*Pull on the motor mount to tension the belt.
*Rotate again the motor several times by hand.
*Provide the correct force, and properly tension the belt.
*Tighten the M5 nuts first, then the (2) M3 screws later.



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



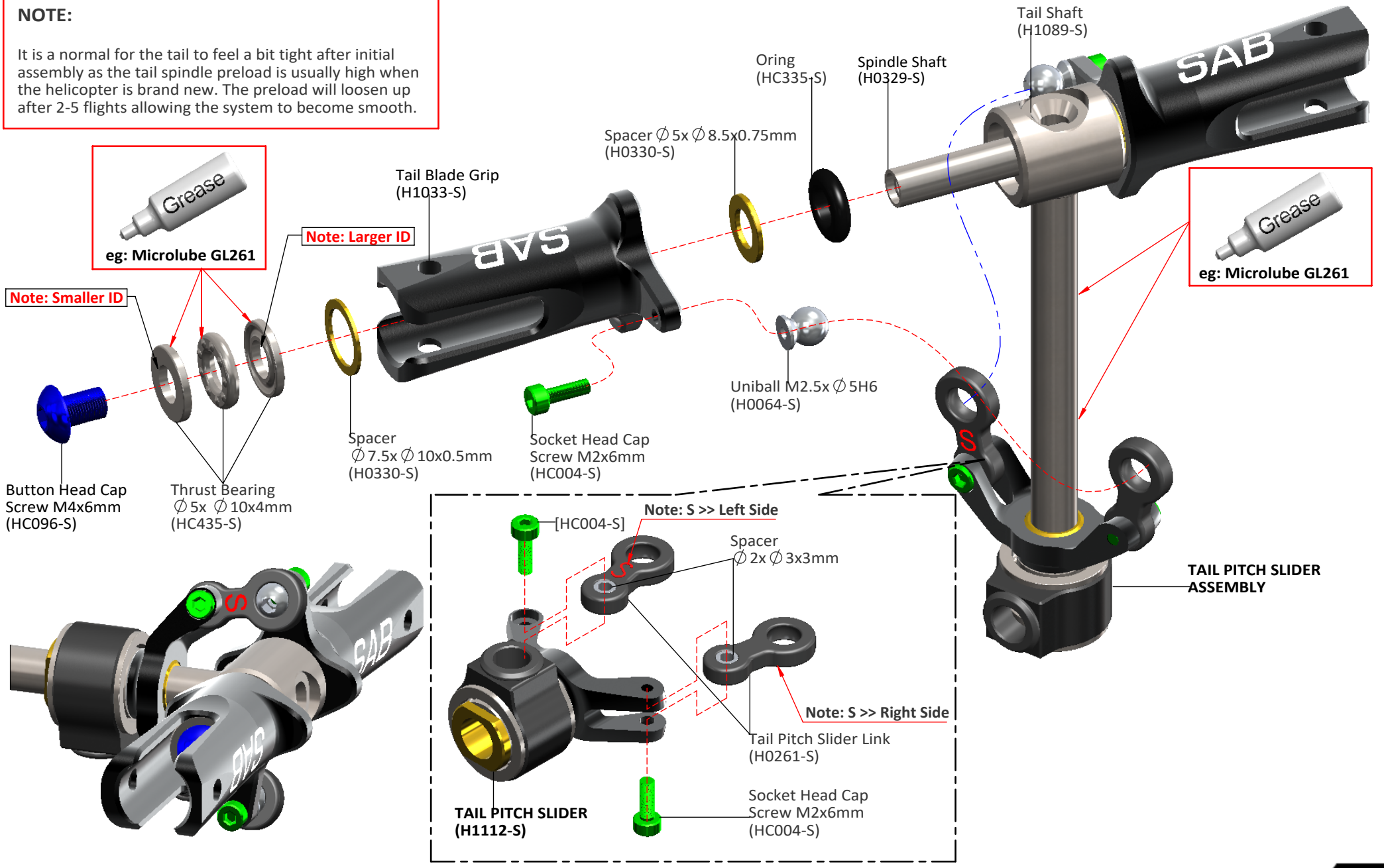
Box 3, Bag for page 23



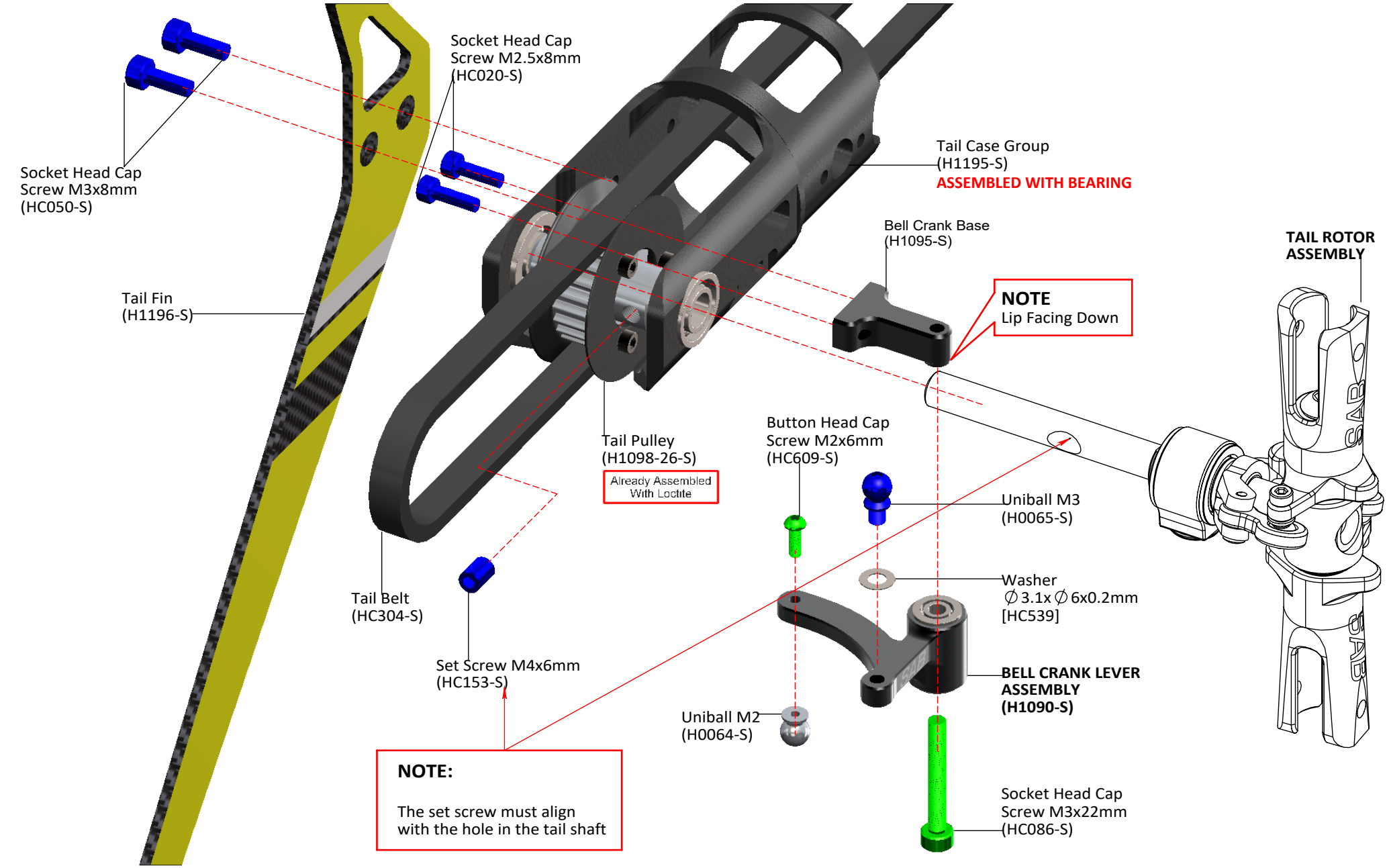
BOX 2, BAG FOR PAGE 24

NOTE:

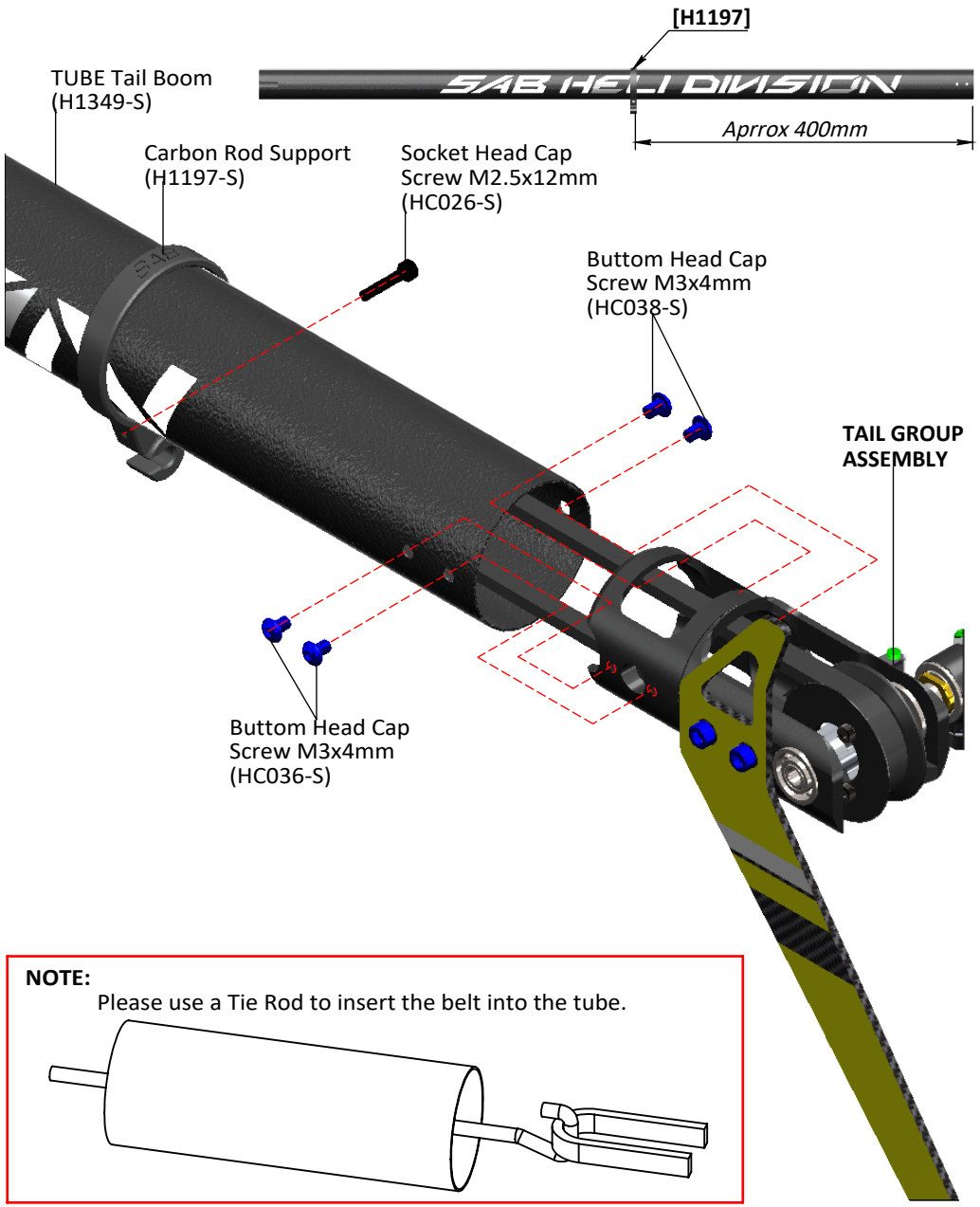
It is a normal for the tail to feel a bit tight after initial assembly as the tail spindle preload is usually high when the helicopter is brand new. The preload will loosen up after 2-5 flights allowing the system to become smooth.



Box 2, Bag for page 25



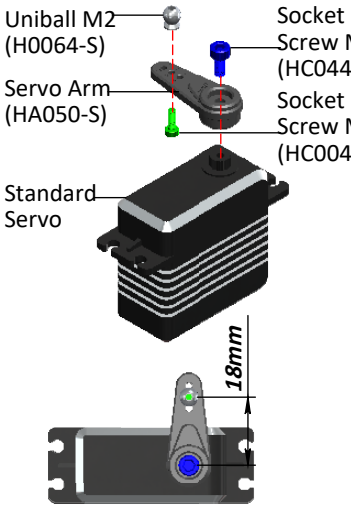
BOX 4, BAG FOR PAGE 26



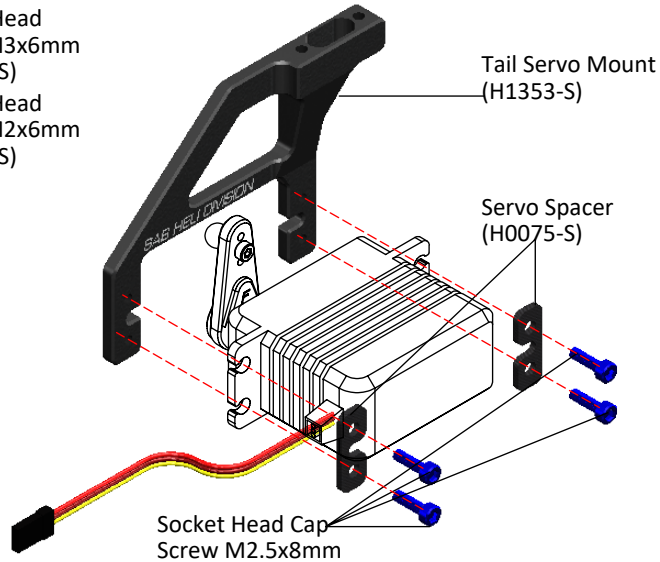
NOTE:

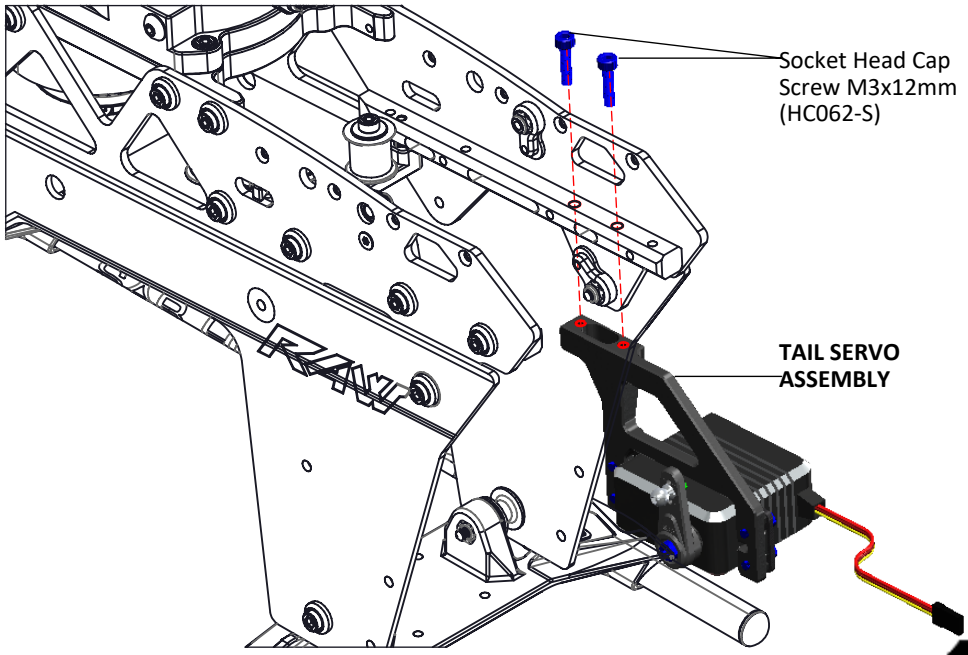
Please use a Tie Rod to insert the belt into the tube.

TAIL SERVO ASSEMBLY



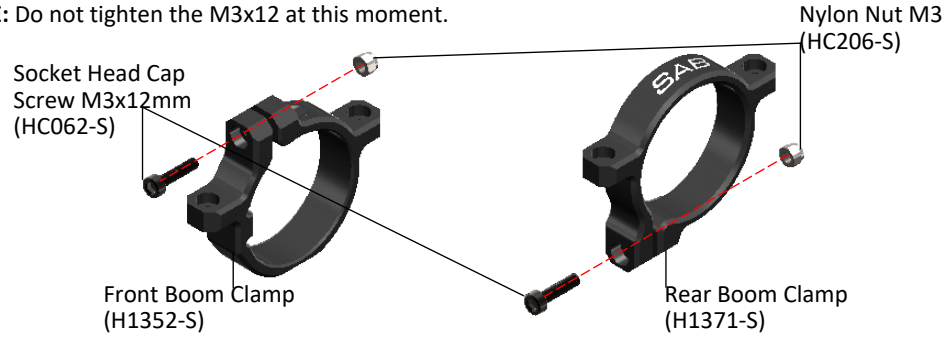
The distance between the axis and the ball must be around 18mm

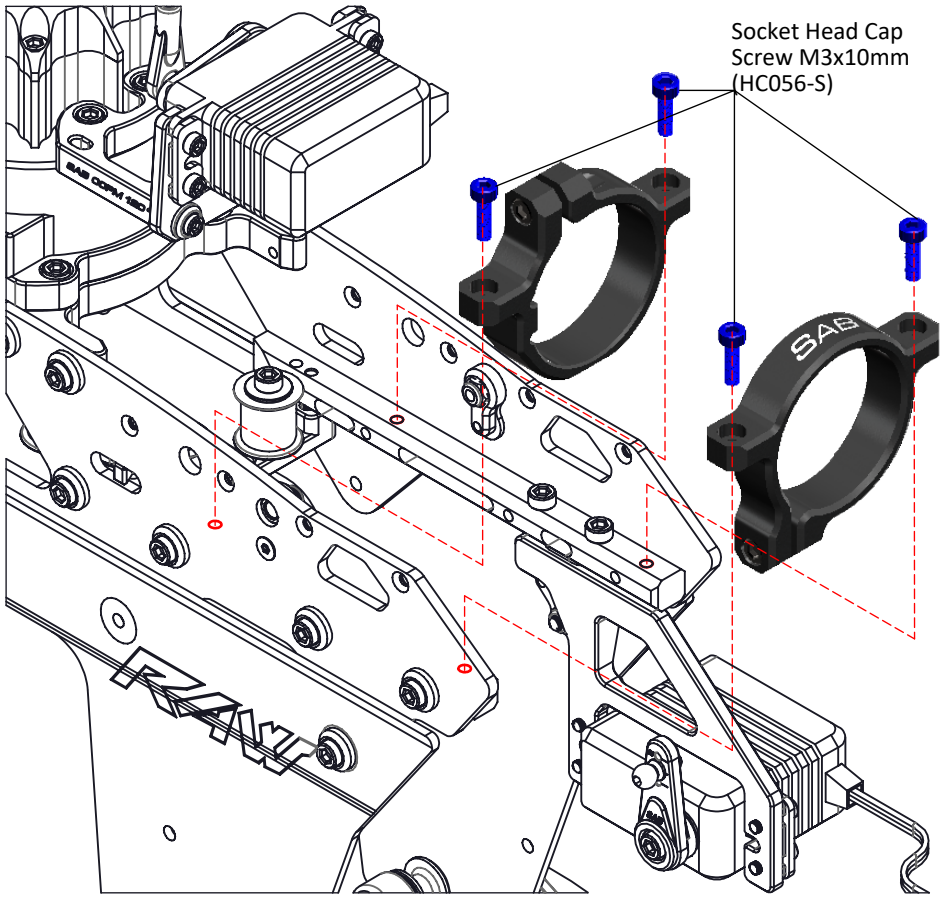




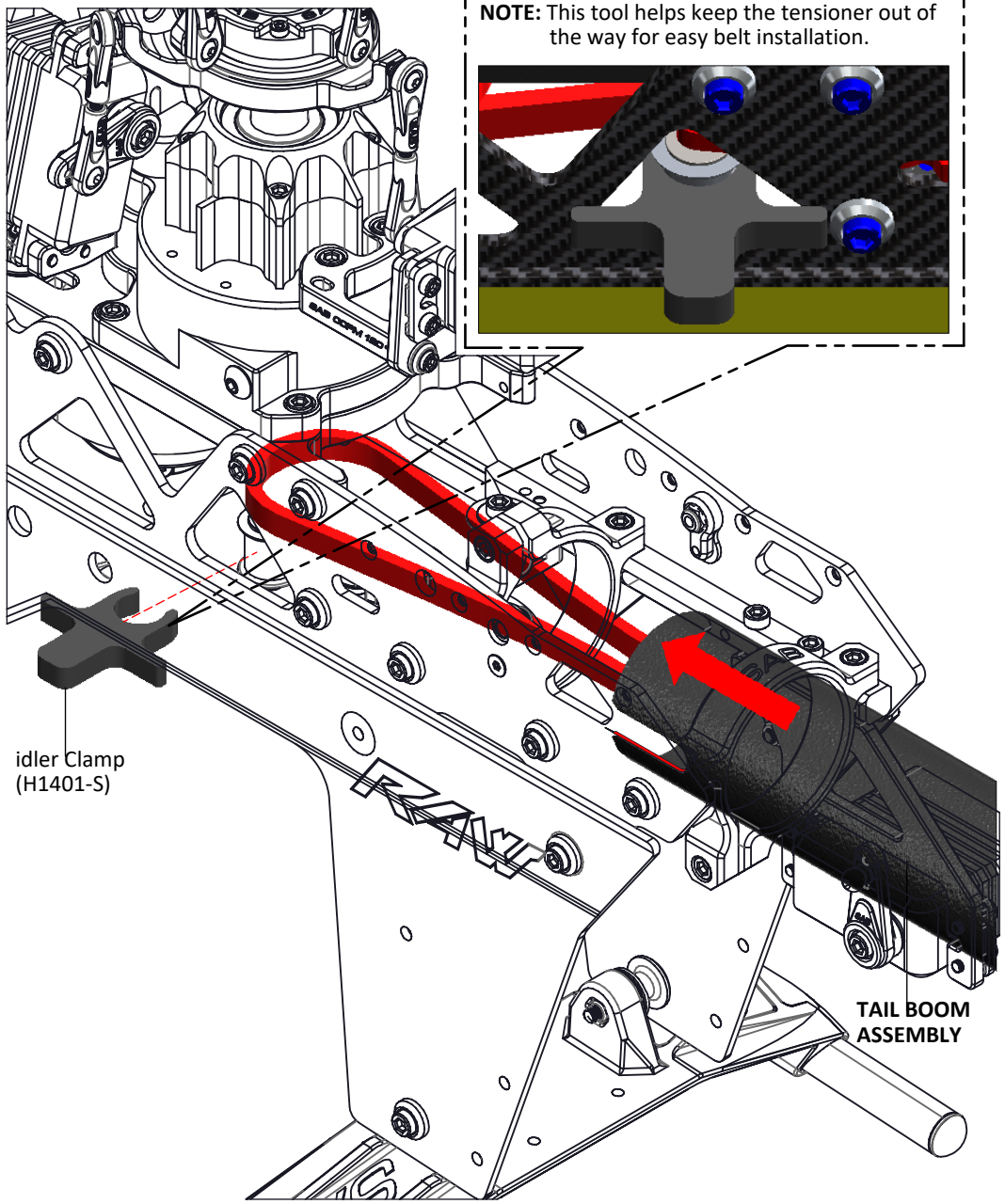
Box 2, Bag for page 27

NOTE: Do not tighten the M3x12 at this moment.





NOTE: This tool helps keep the tensioner out of the way for easy belt installation.



BOX 2, BAG FOR PAGE 28

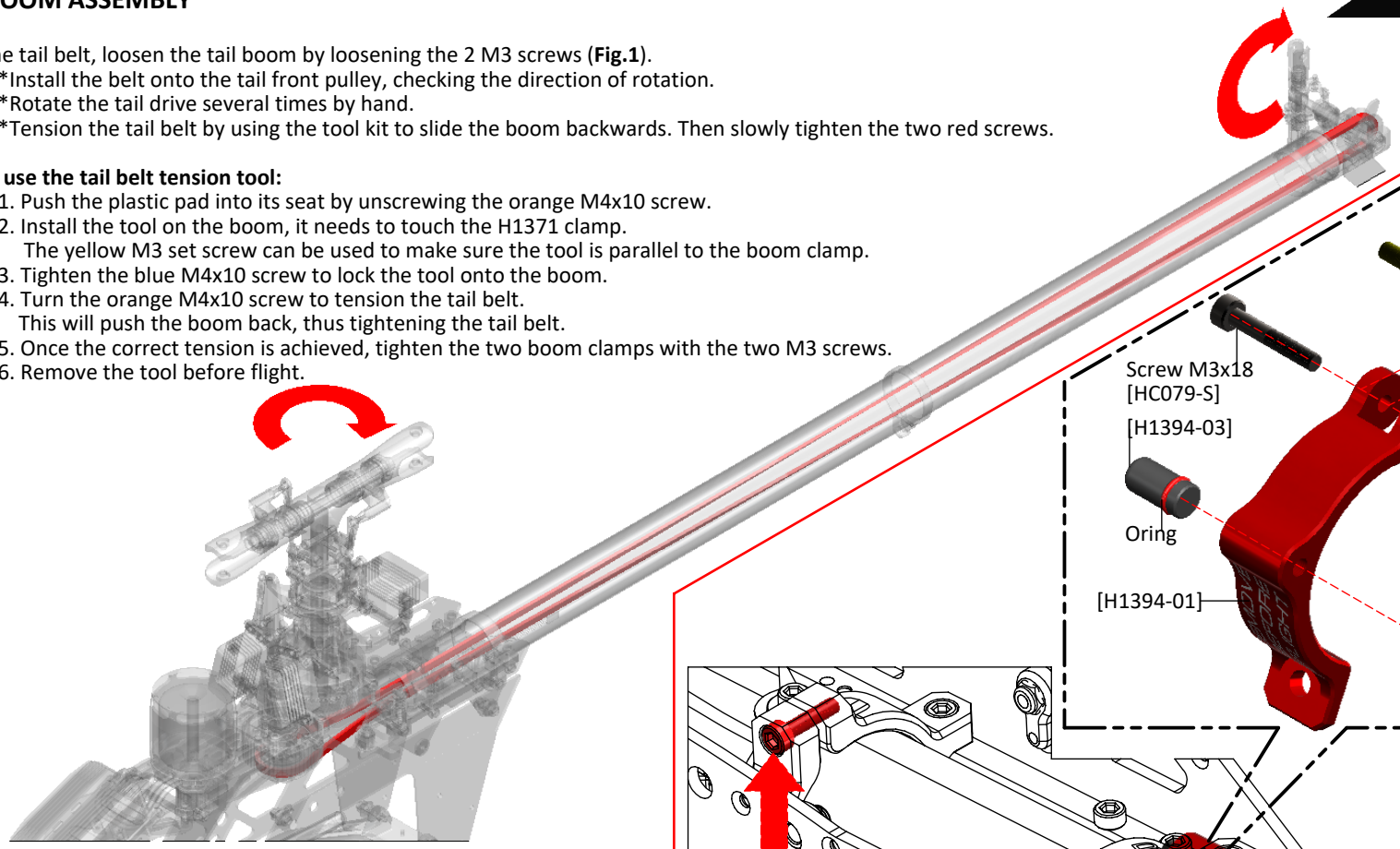
TAIL BOOM ASSEMBLY

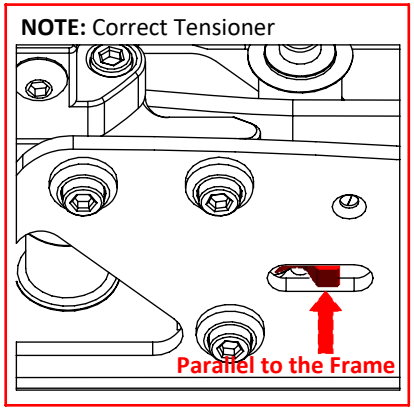
To fit the tail belt, loosen the tail boom by loosening the 2 M3 screws (**Fig.1**).

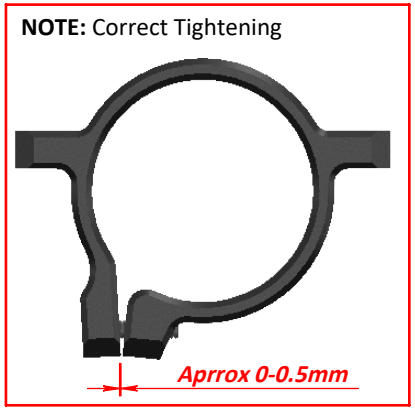
*Install the belt onto the tail front pulley, checking the direction of rotation.
*Rotate the tail drive several times by hand.
*Tension the tail belt by using the tool kit to slide the boom backwards. Then slowly tighten the two red screws.

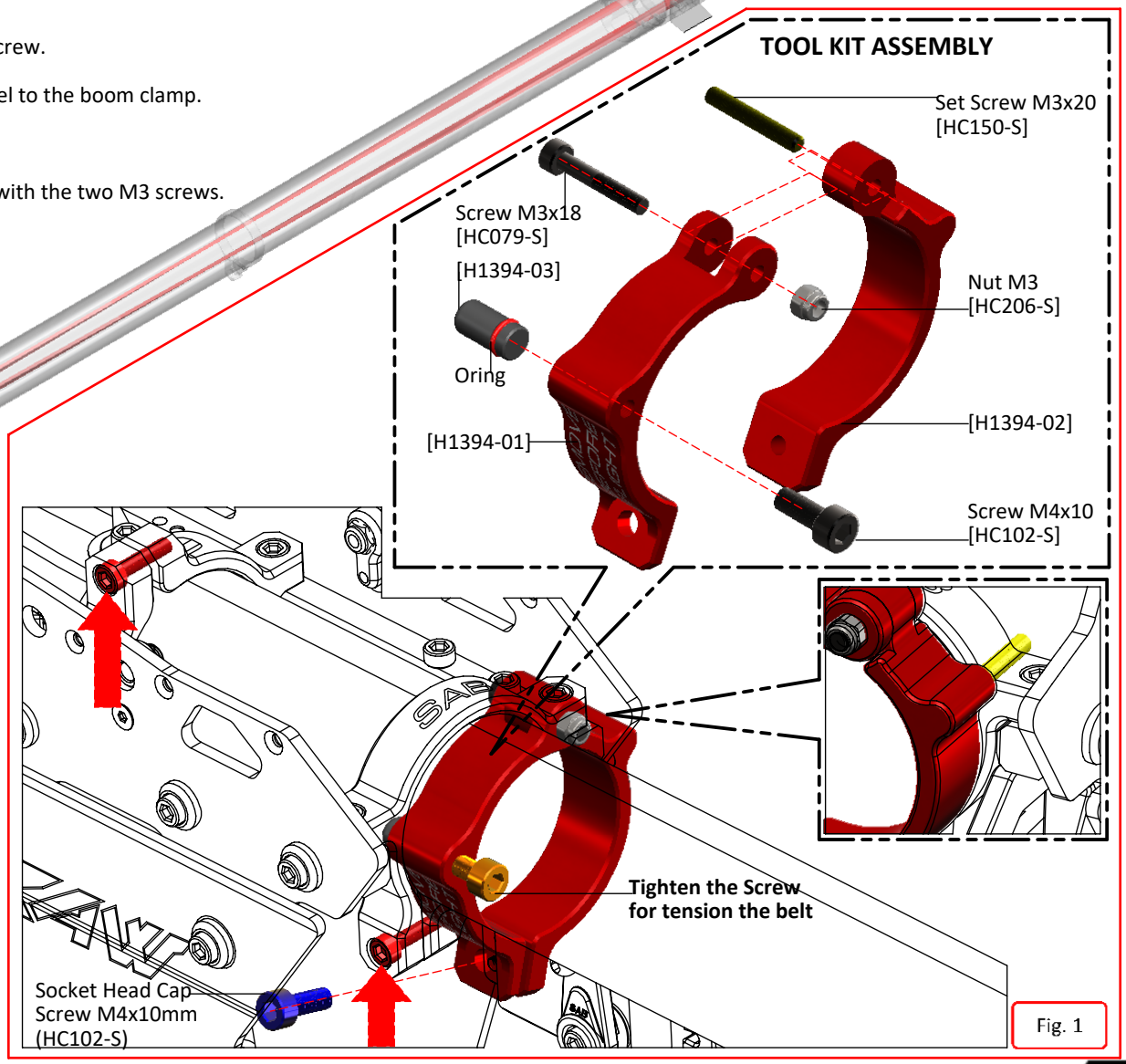
How to use the tail belt tension tool:

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.
   The yellow M3 set screw can be used to make sure the tool is parallel to the boom clamp.
3. Tighten the blue M4x10 screw to lock the tool onto the boom.
4. Turn the orange M4x10 screw to tension the tail belt.
   This will push the boom back, thus tightening 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.







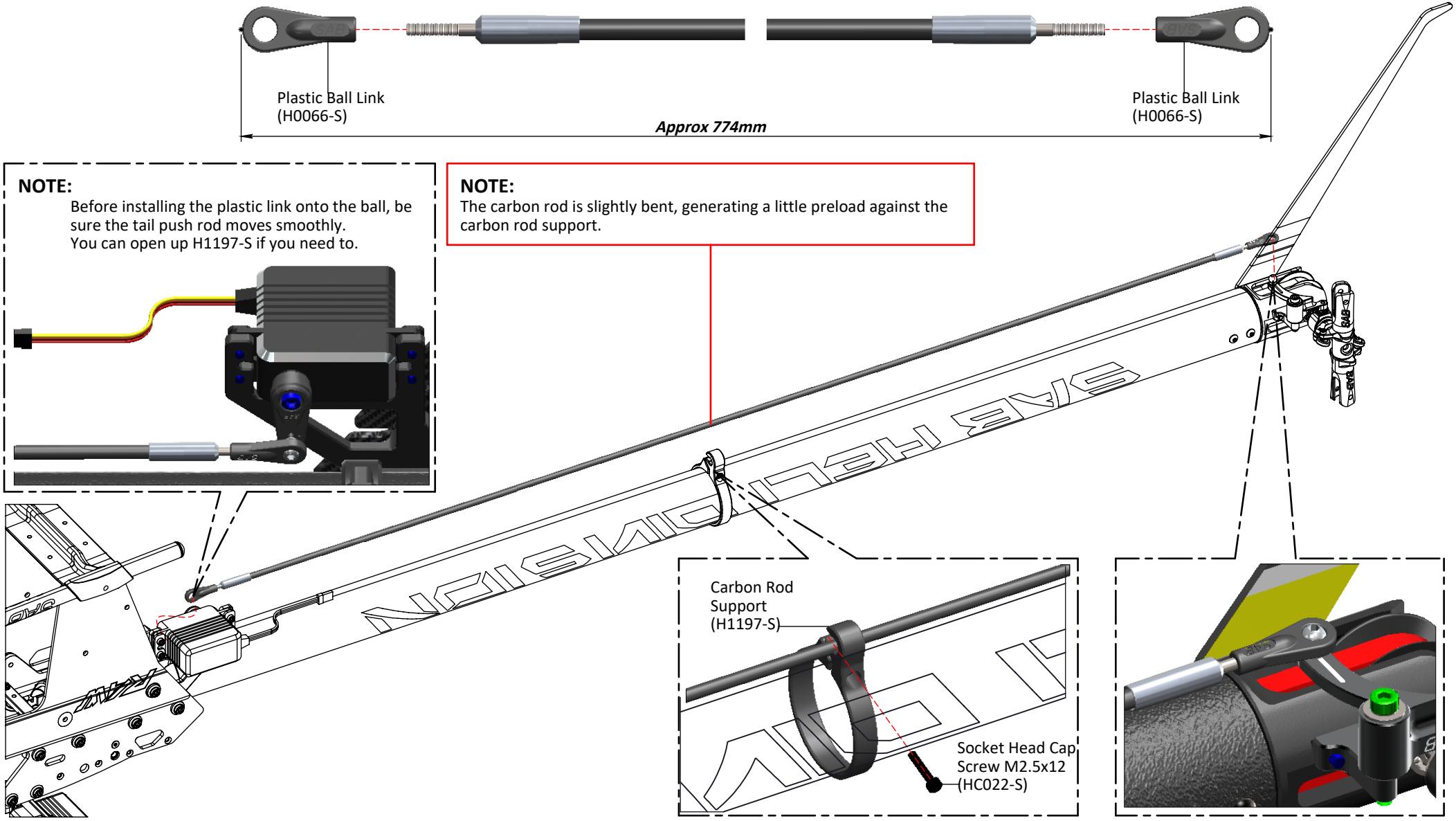


Box 2, Bag for page 29

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.

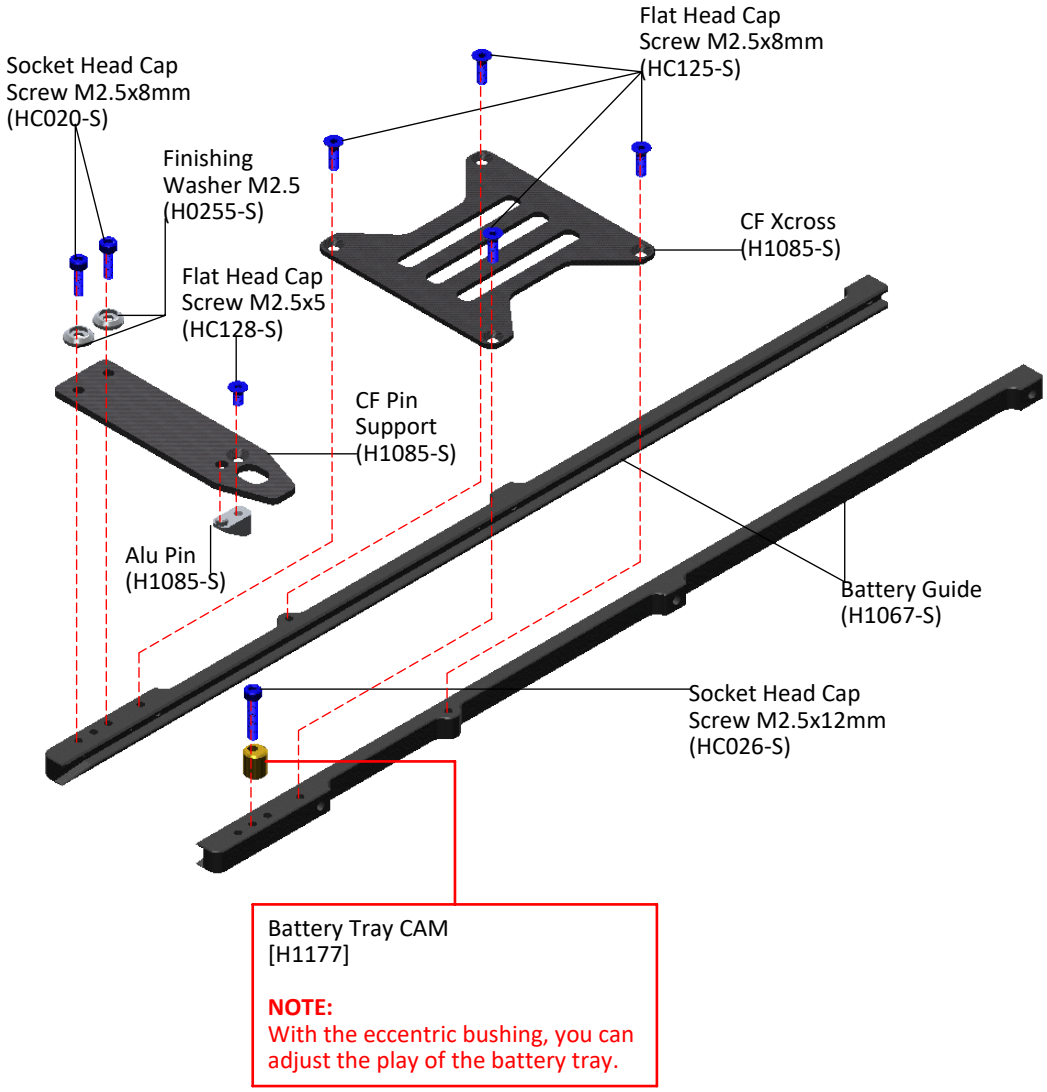
NOTE:
Before installing the plastic link onto the ball, be sure the tail push rod moves smoothly.
You can open up H1197-S if you need to.

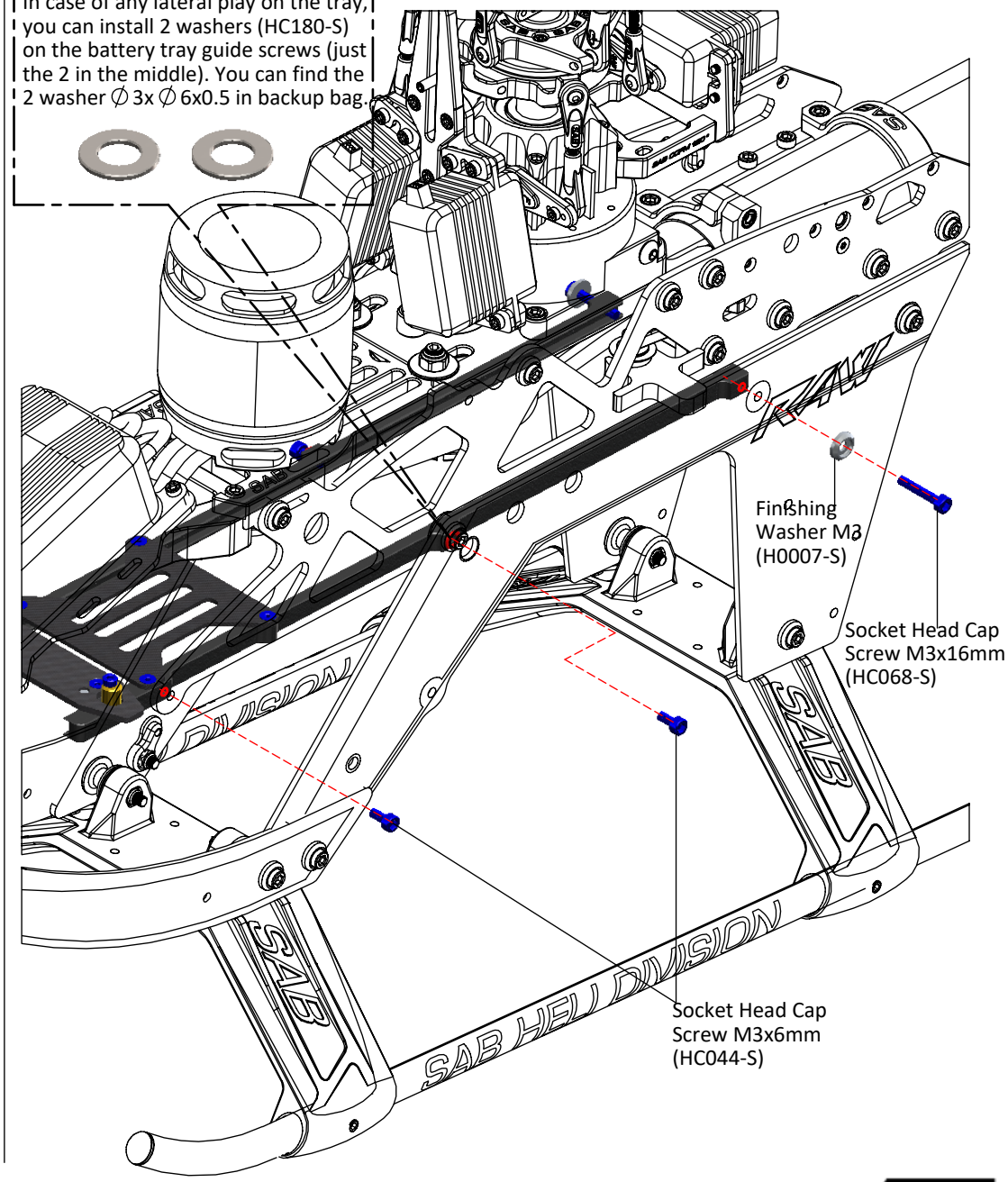
NOTE:
The carbon rod is slightly bent, generating a little preload against the carbon rod support.



BOX 3, BAG FOR PAGE 30

BATTERY GUIDE ASSEMBLY

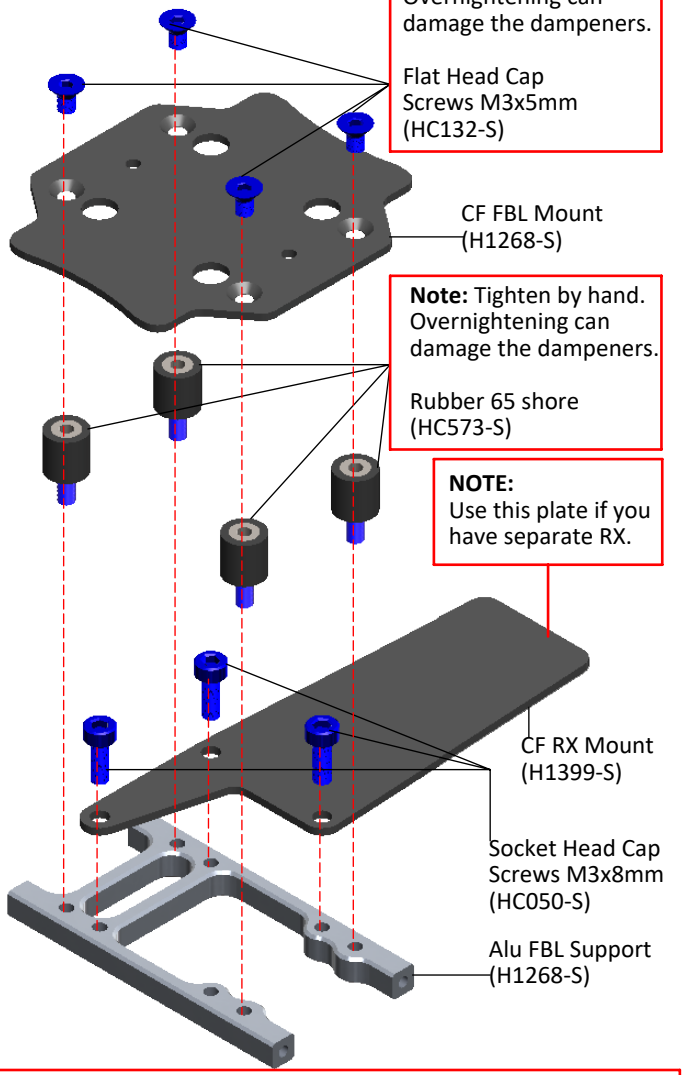




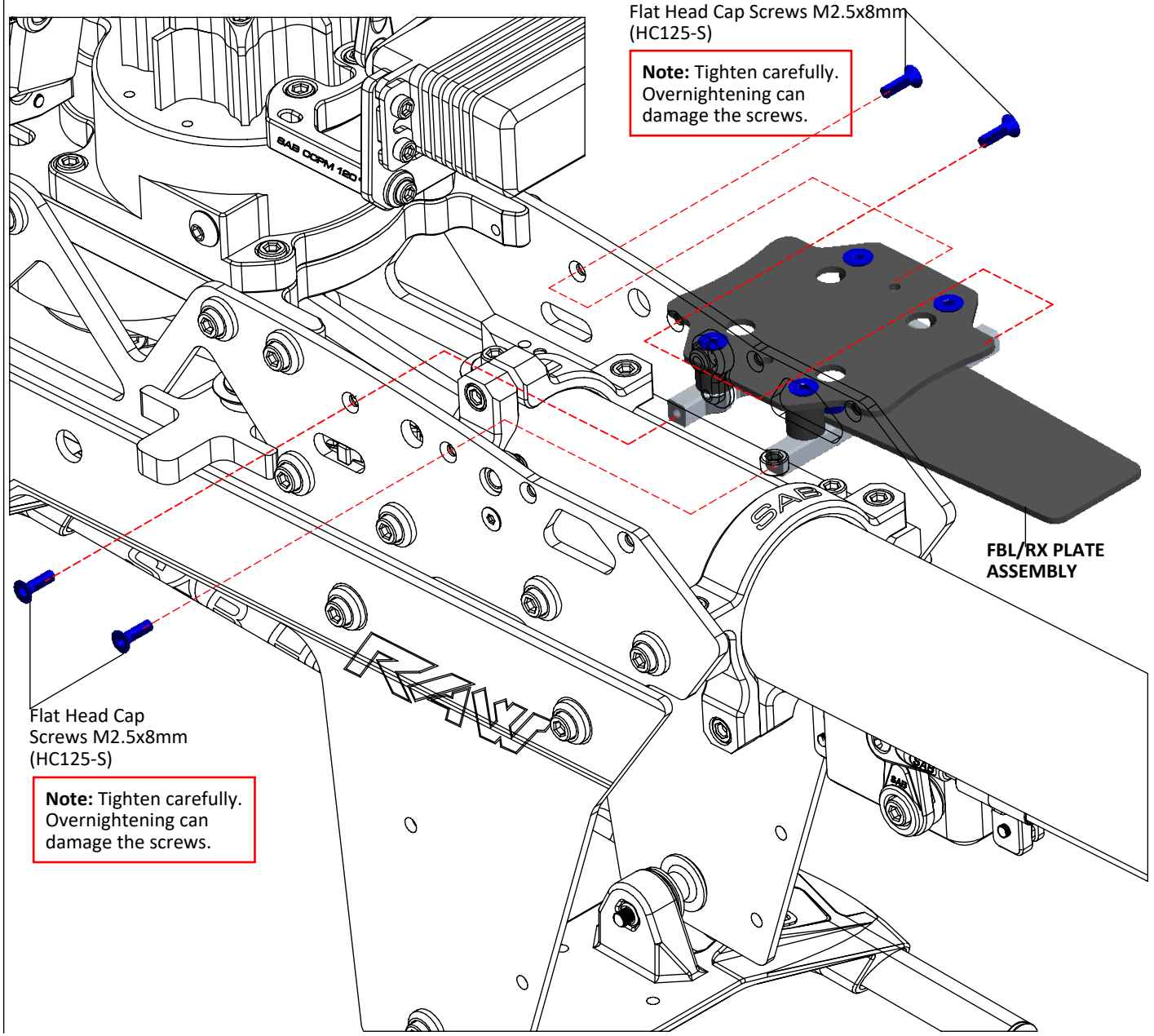
Box 2, Bag for page 31

FBL/RX PLATE ASSEMBLY

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

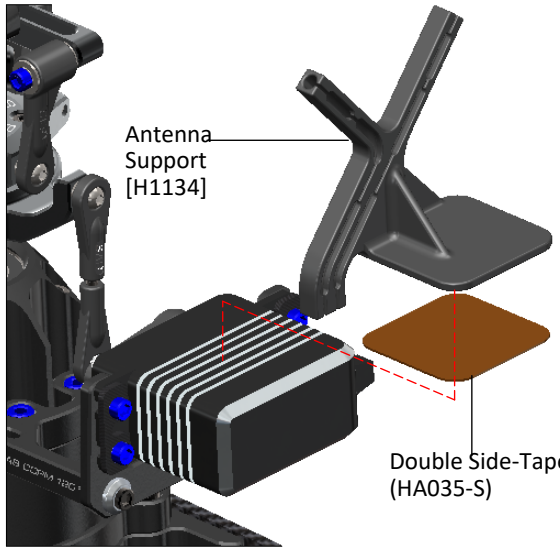


If you do not want to use the dampeners, you can setup a rigid FBL mount support using the screws and bushings contained in bag 31-2



BOX 2, BAG FOR PAGE 32

In bag 32, you can find a “3D Printed” antenna support.
Use it as desired with your RX system.



Button Head Cap Screw
Special M2.5x6mm
(HC019-S)

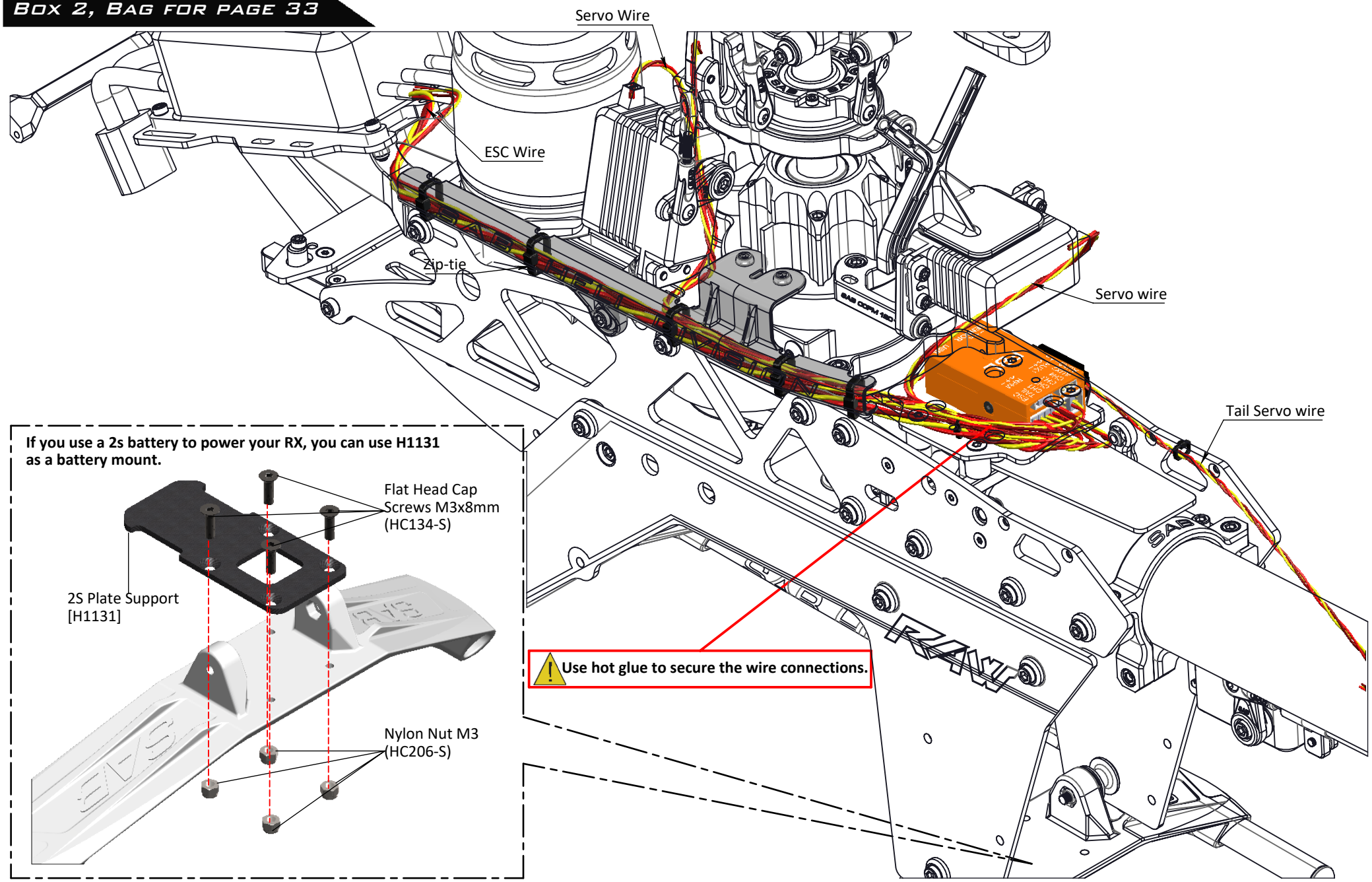
Wire Support
(H1107-S)

Finishing Washer M3
(H0007-S)

Socket Head Cap
Screws M3x10mm
(HC056-S)

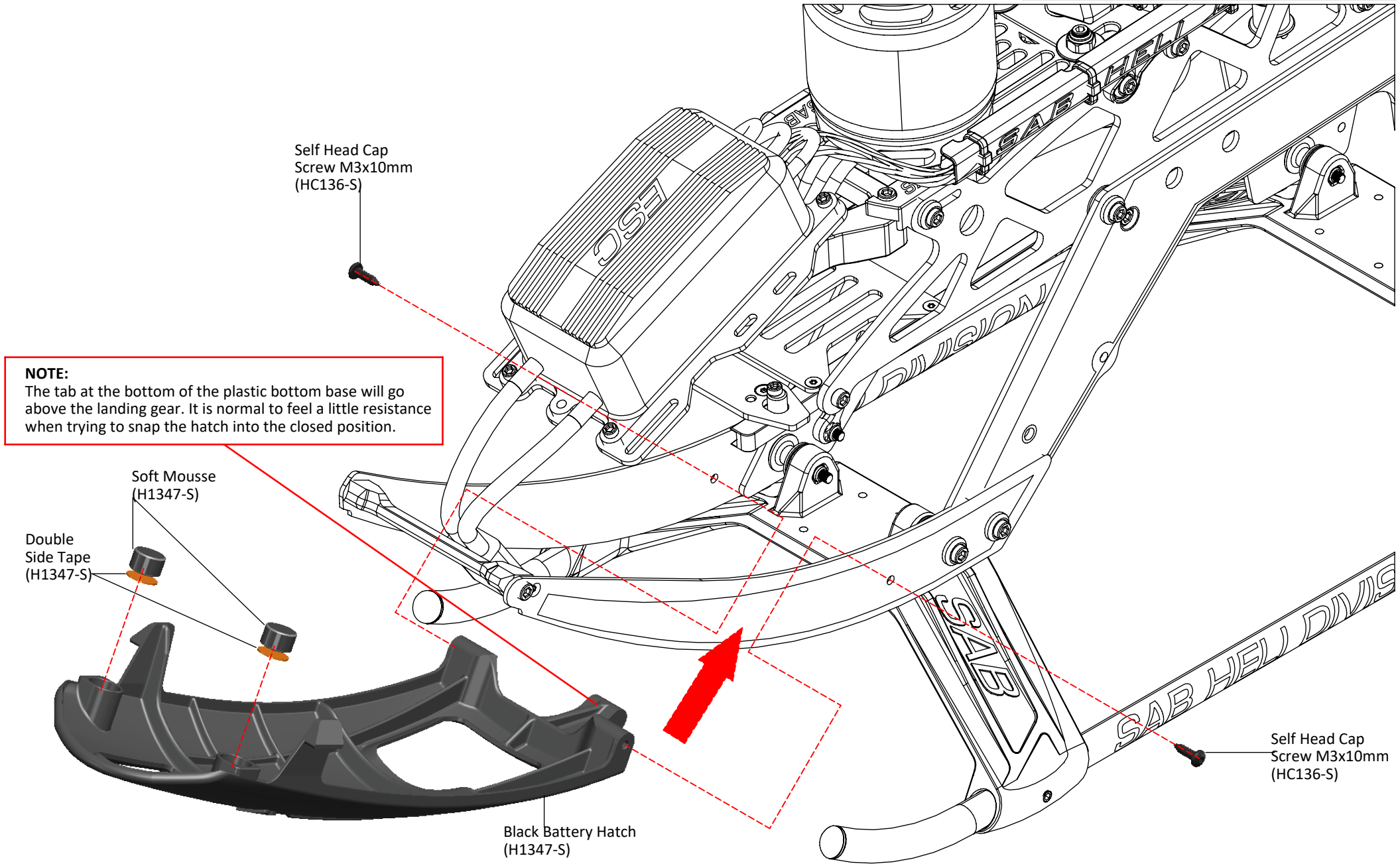
NOTE:
You can wait to tighten this screw after running all of your wires on the wire support.

Box 2, Bag for page 33



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

BOX 2, BAG FOR PAGE 34



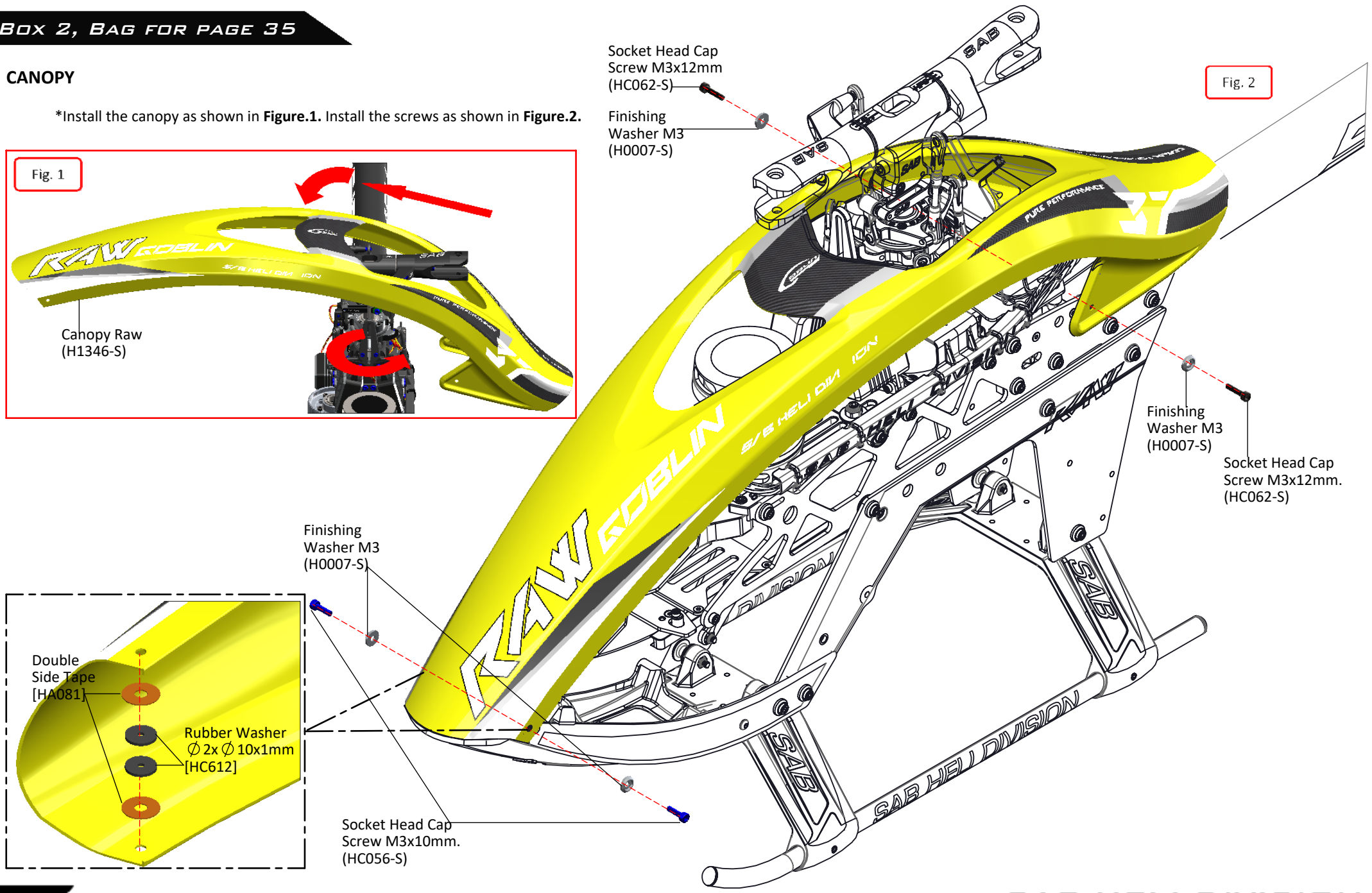
Box 2, Bag for page 35

CANOPY

*Install the canopy as shown in **Figure.1.** Install the screws as shown in **Figure.2.**

Fig. 1

Fig. 2

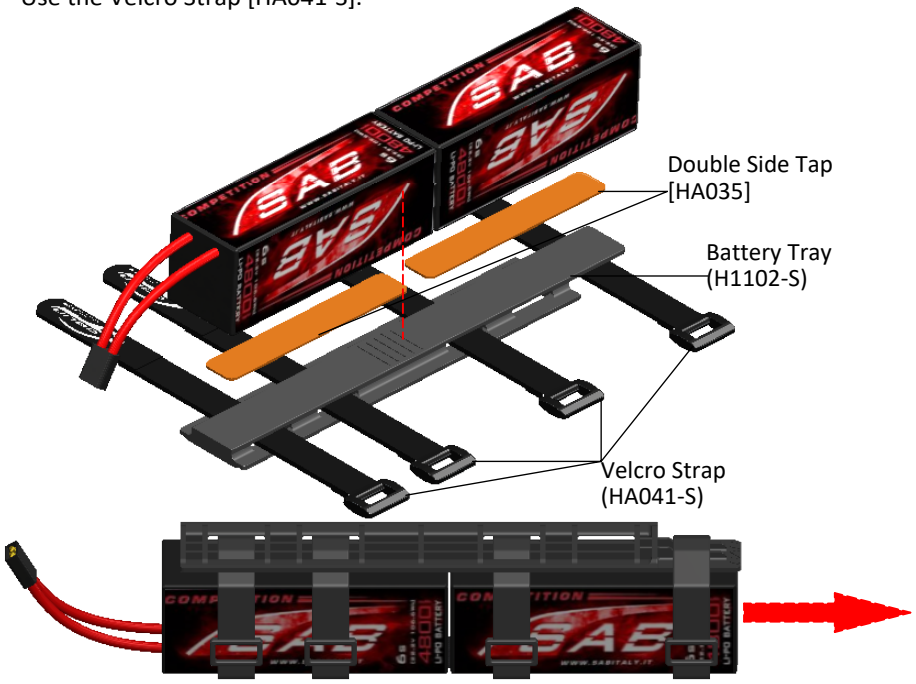


BOX 4, BAG FOR PAGE 36

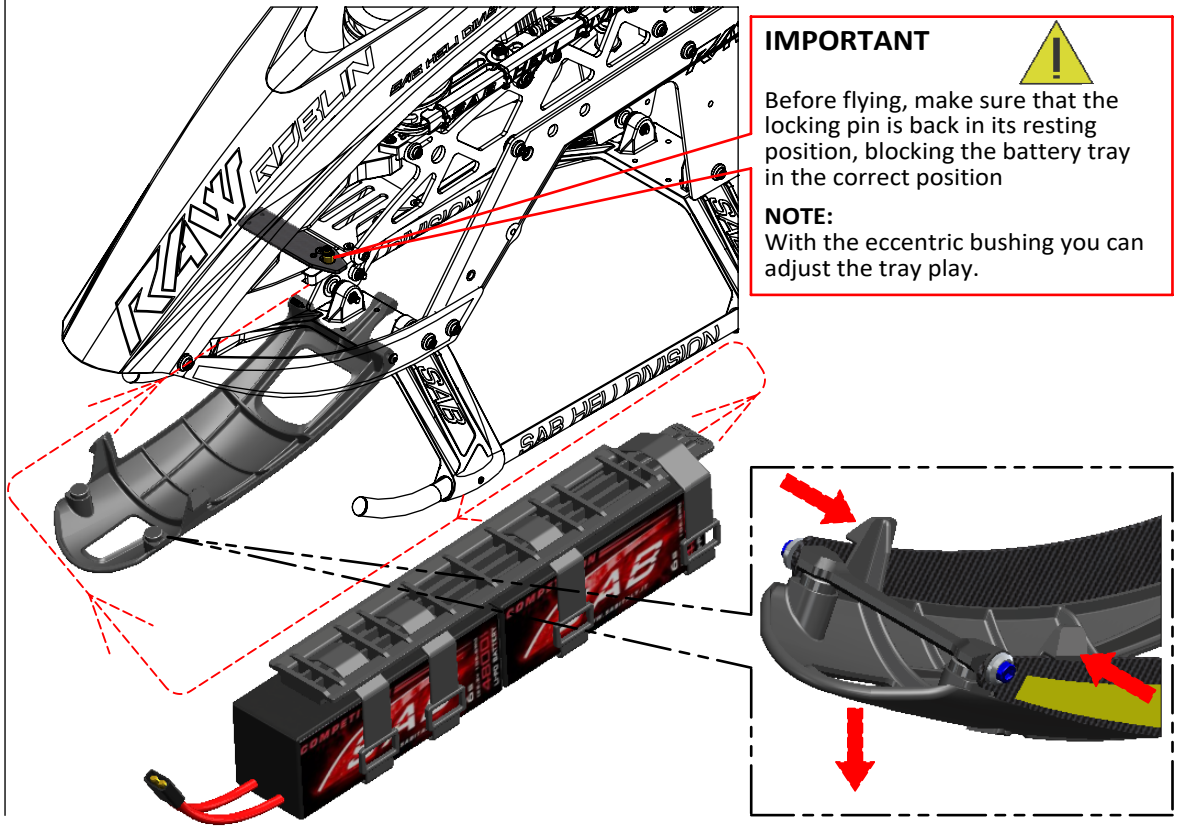
Before permanently mounting the batteries onto the battery tray, check the ideal position for the best center of gravity.

BATTERIES

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



BATTERY 1400/1700 grams



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.

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, verifying carefully the motor pulley in use. The forces acting on the mechanics increase enormously with increasing of rpm. Although the Goblin can fly at high rpm, for safety reasons we suggest to not exceed 2200rpm.

*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.
* Make sure that the battery locking pin is back in its resting position, blocking in correct way the battery tray.

*Perform the first flight at a low headspeed, 1800 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 3 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

80 Shore: Soft for smooth response
90 Shore: Firm for direct and precise response
A = Max movement of the spindle, feeling more elastic.
B = Medium.
C = Min movement of the spindle, feeling more direct.

The kit includes B damper H1046-B with 90 Shore O-ring
[other Setting >>p/n H1135-S, HC530-S].

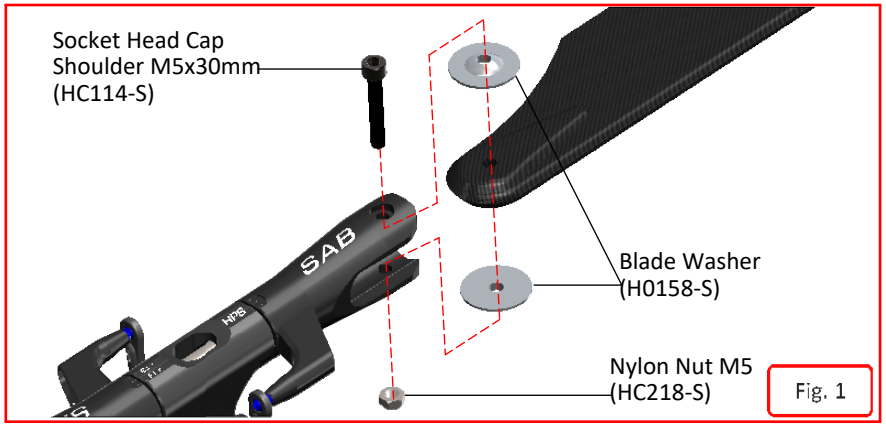


Fig. 1

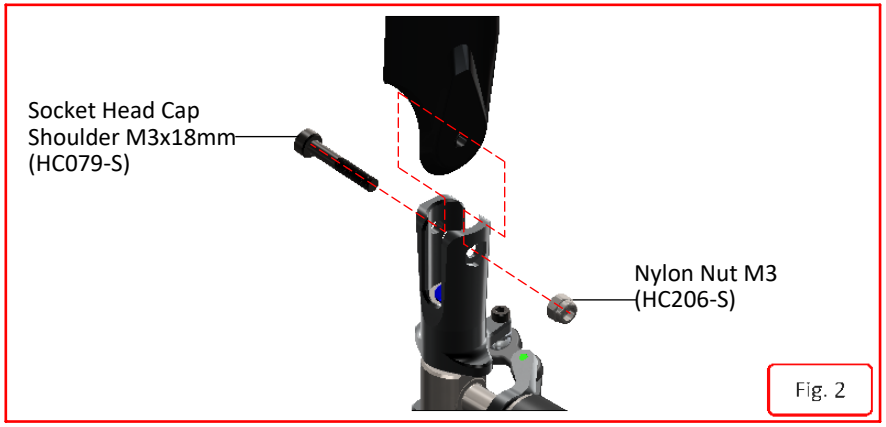


Fig. 2

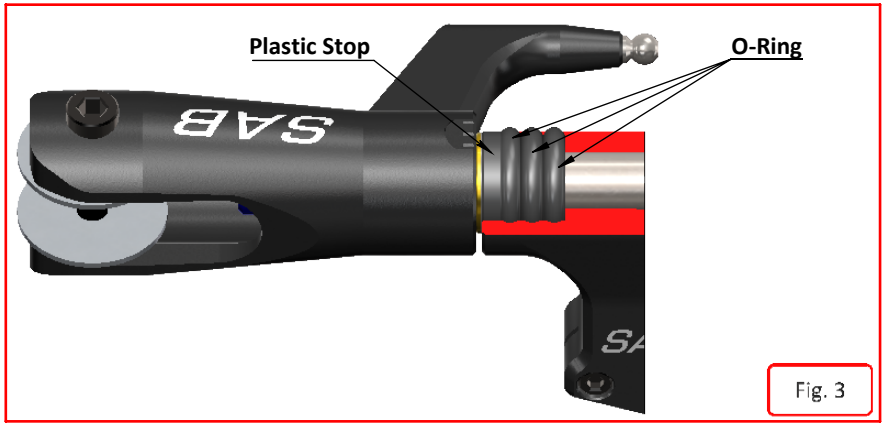
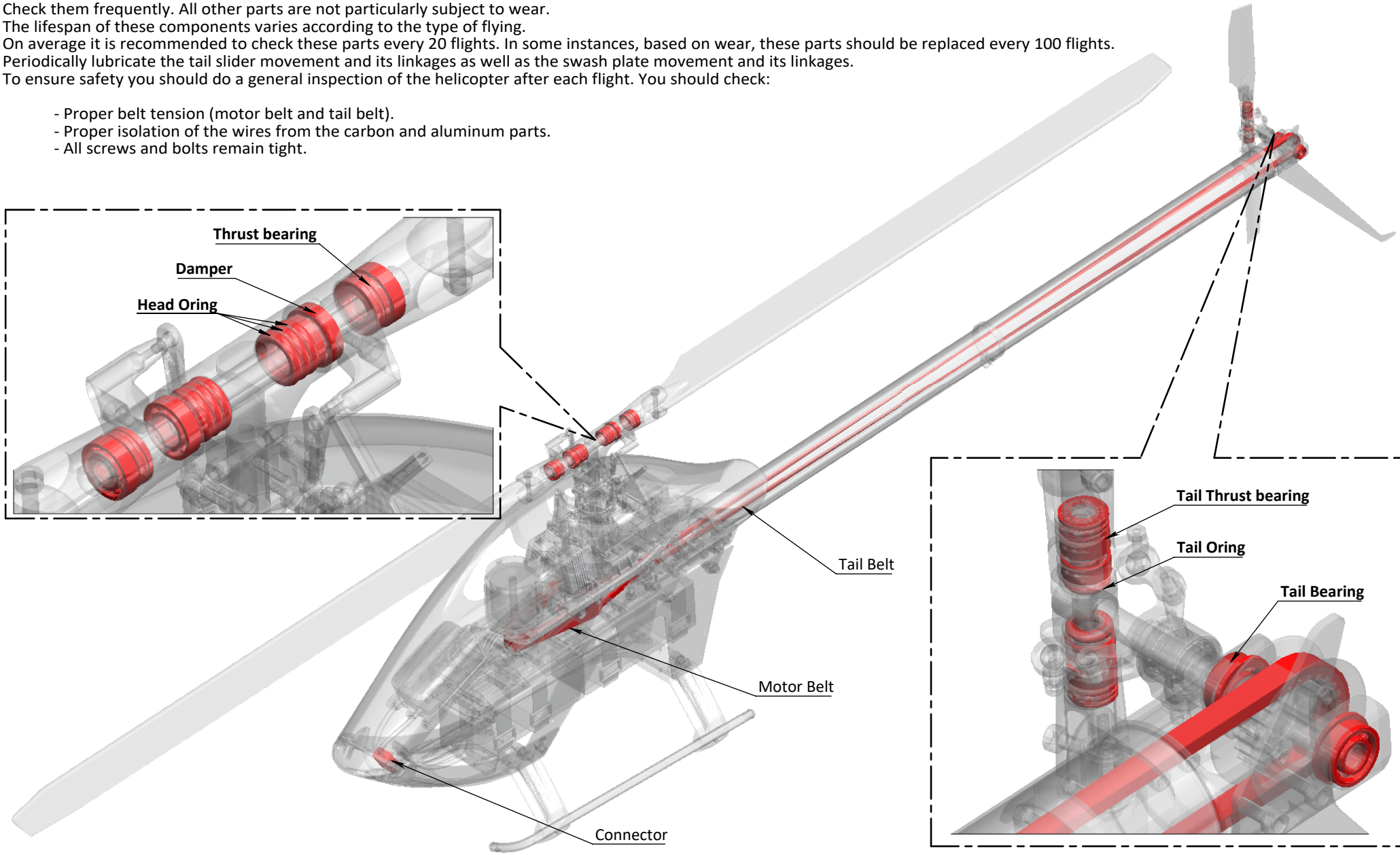


Fig. 3

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

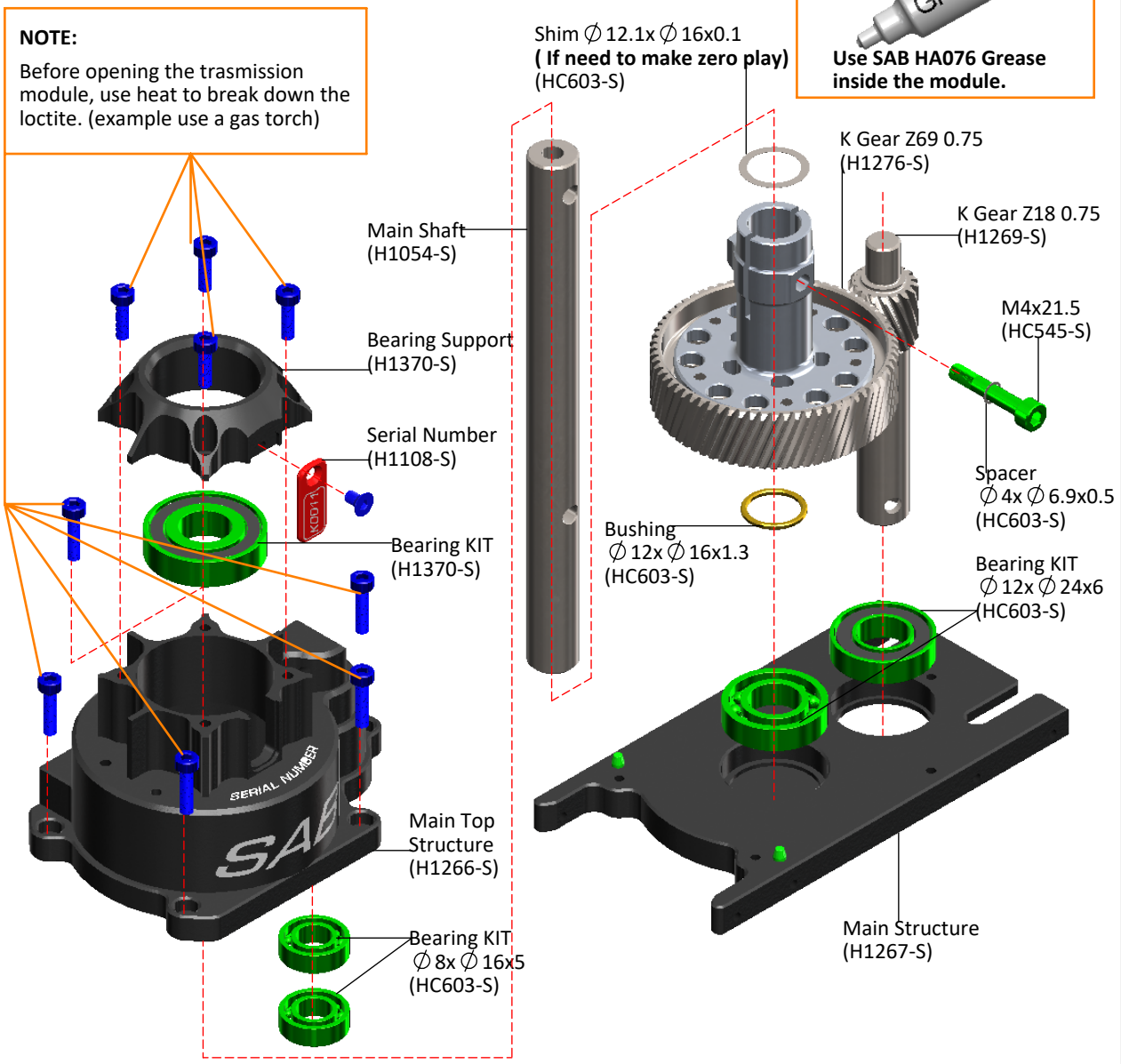


TRANMISSION MODULE

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

Explode and Spare Parts

NOTE:
Before opening the trasmission module, use heat to break down the loctite. (example use a gas torch)

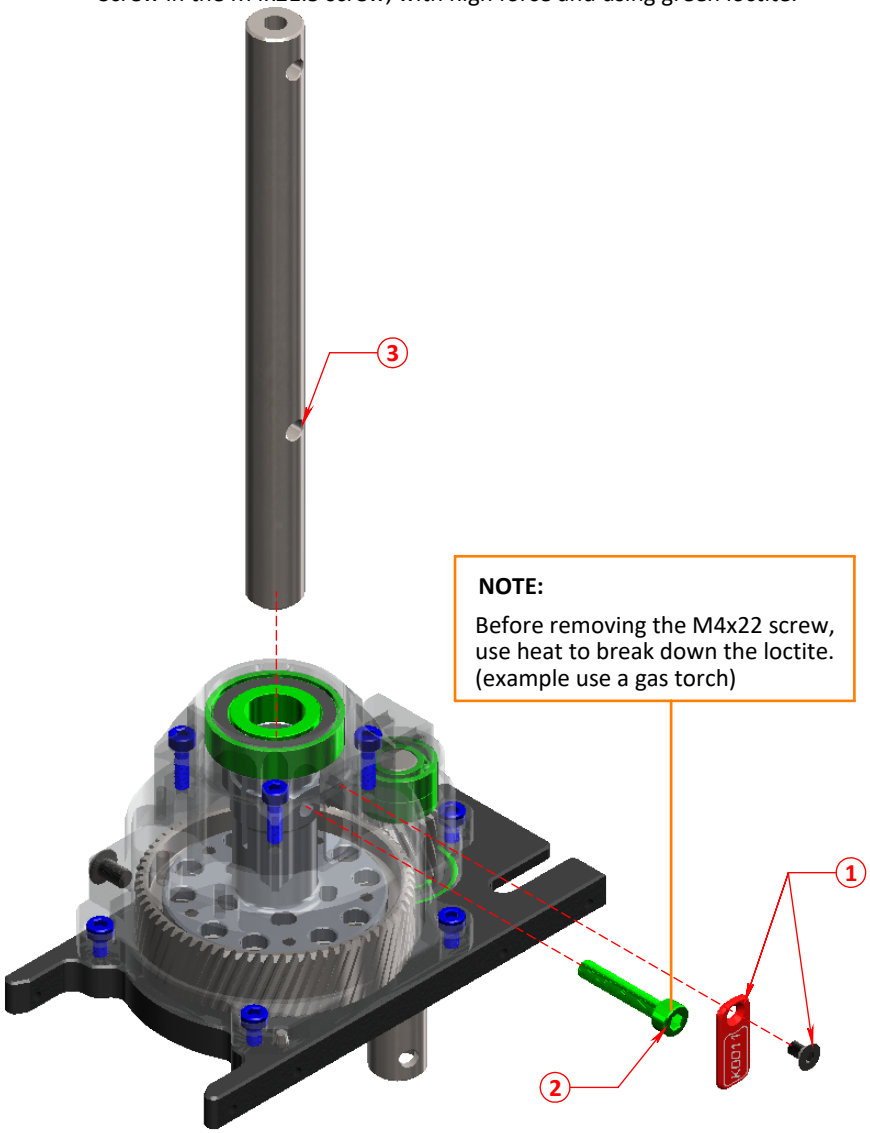


Use SAB HA076 Grease inside the module.

MAIN SHAFT REPLACEMENT

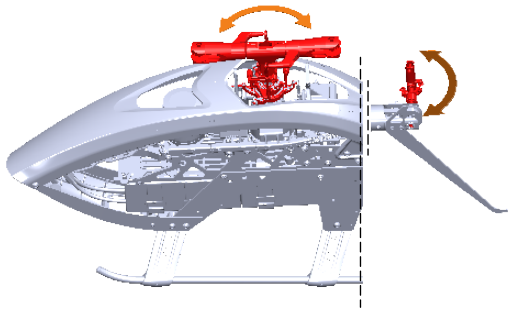
For replacing the main shaft:

*Remove the serial number plate.
*Remove the M4x21.5 screw.
*Remove and replace the main shaft.
*Screw in the M4x21.5 screw, with high force and using green loctite.

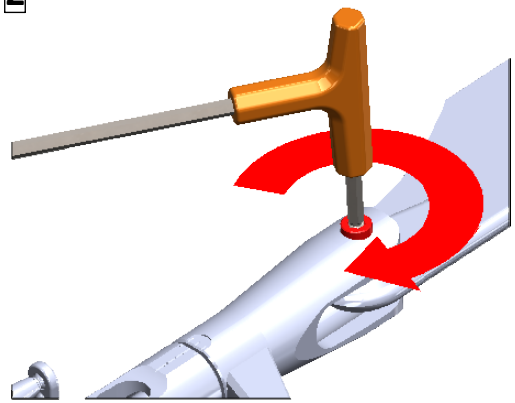


NOTE:
Before removing the M4x22 screw, use heat to break down the loctite. (example use a gas torch)

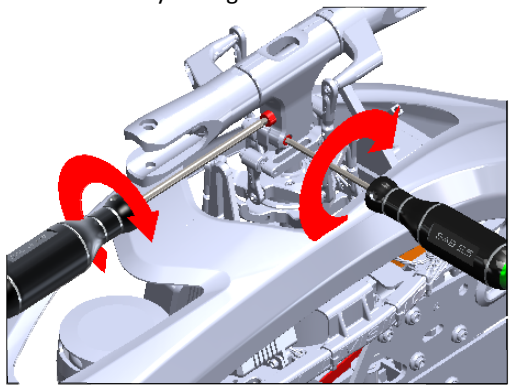
1 **Check the dampening on the main and tail rotor to be the same as always.**



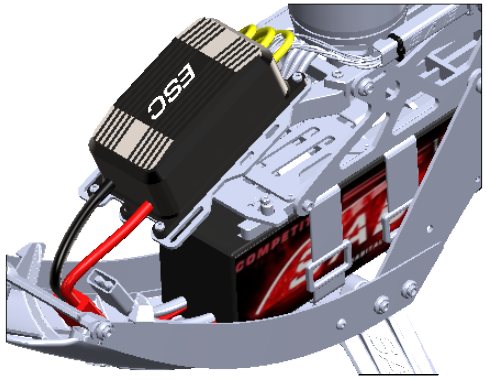
2 **Tighten the main blades before flight.**



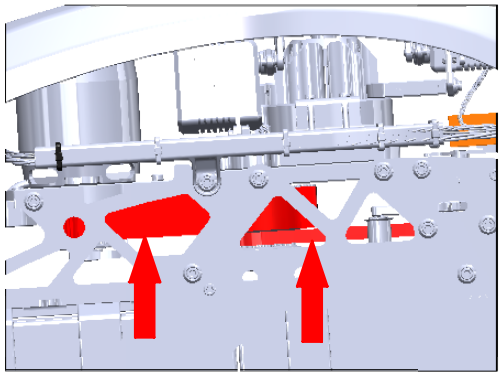
3 **Check main hub screws(M4 and 2 M3)**
Ensure they are tight.



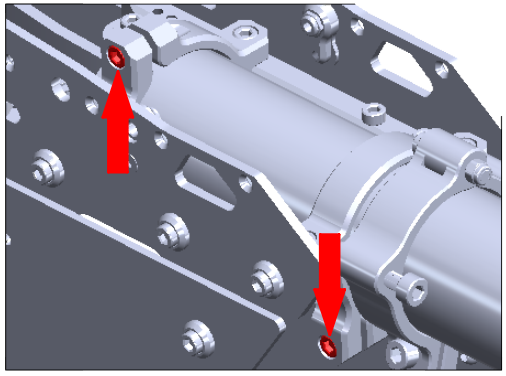
4 **Check all power connectors (Good mechanical connection).**



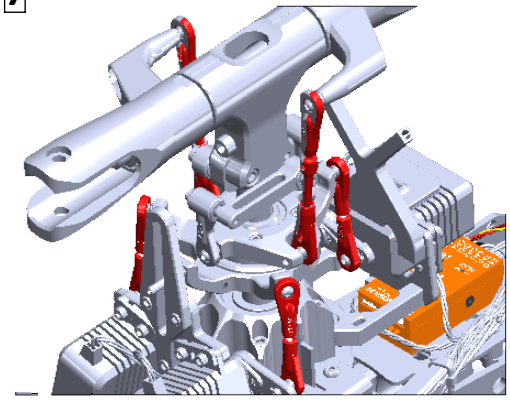
5 **Check Tail & Motor belt tension.**
The tension has to be tight.



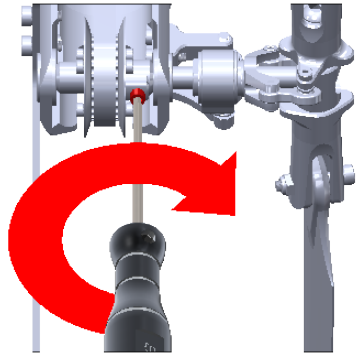
6 **Check the 2 M3 screws in the Clamp.**
Ensure they are tight.



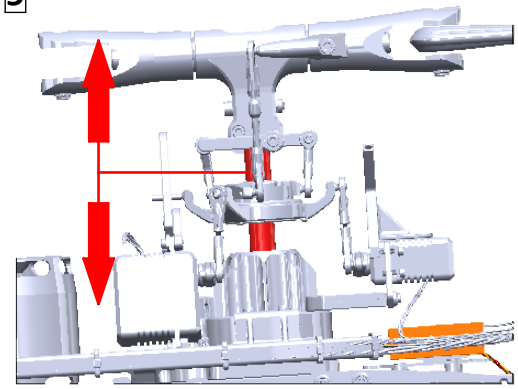
7 **Check the Main Linkages & Servo Linkages**



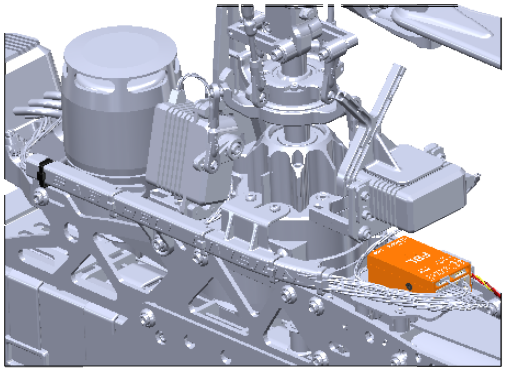
8 **Check tail pulley set screws:**
Ensure they are tight.
(It is suggested use a bit of Green Loctite.)



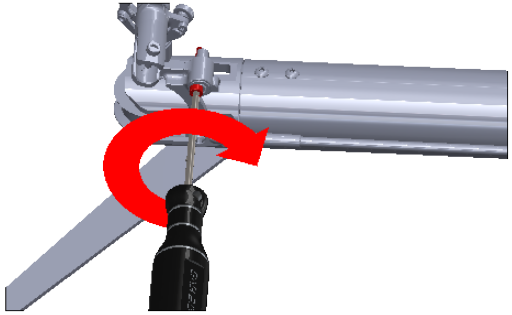
9 **Check for vertical play of the main shaft.**



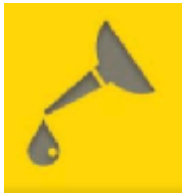
10 **Check if the FBL-RX connectors are OK (hot glue is recommended).**



11 **Check the M3 bell crank:**
Belt 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.

Uniball M2 5H6
[H0064-S]

- 5 x Uniballs M2 5H6.
- 5 x Uniball Spacers.
- 5 x Head Cap Screws M2x8mm.
- 5 x Head Cap Screws M2x6mm.

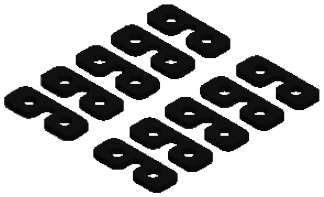
Uniball M3x4 5H3
[H0065-S]

- 5 x Uniballs M3x4 5H3.5.

Plastic Ball Link
[H0066-S]

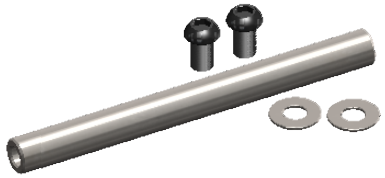
- 10 x Plastic Ball Link.

Servo Spacer
[H0075-S]



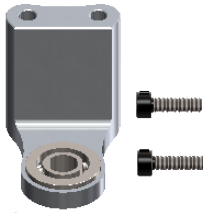
- 10 x Servo Spacers.

Spindle
[H0079-S]



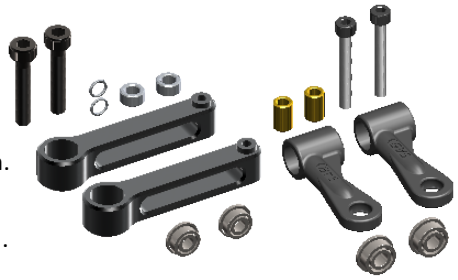
- 1 x Spindle Shaft.
- 2 x Button Cap Screw M6x10mm.
- 2 x Washer ∅ 6x ∅ 14x1.5mm

Bearing Support
[H0143-S]



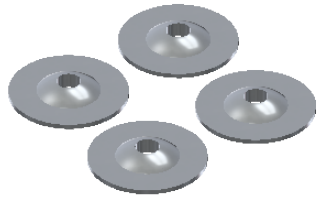
- 1 x Bearing Support.
- 1 x Flanged Bearing ∅ 6x ∅ 13x5mm.
- 2 x Head Cap Screws M3x8mm.

Radius Arm
[H0132BM-S]



-2 x Radius Arms.
-2 x Spacer Arm ∅ 3x ∅ 5x2.7mm.
-2 x Spacer Arm ∅ 2.5x ∅ 4x6.3mm.
-2 x Uniball Radius Arms.
-2 x Head Cap Screws M3x16mm.
-2 x Head Cap Screws M2.5x18mm.
-2 x Washers 3x 4x0.5mm.
-2 x Flanged Bearings ∅ 2.5x ∅ 6x2.5mm.
-2 x Flanged Bearings ∅ 3x ∅ 7x3mm.

Aluminum Blade Spacer
[H0158-S]



- 4 x Aluminum Blade Spacer.

Motor Pulley
[H0175-18 to 25-S]

- 1 x Motor Pulley 18 to 25T.
- 1 x Set Screws M4x4mm.
- 1 x Set Screws M4x6mm.
- 1 x Bushing.

Uniball Radius Arm
[H0205-S]

- 2 x Uniball Radius Arm.

Finishing Washer M2.5
[H0255-S]

- 10 x Finishing Washers M3.

Plastic Tail Linkage
[H0261-S]

- 2 x Plastic Tail Linkage.
- 2 x Grip Link Bushing.
- 2 x Head Cap Screws M2x6mm.

Tail Spindle
[H0329-S]

- 1 x Tail Spindle.
- 2 x Button Cap Screws M4x6mm.

Tail Spacer
[H0330-S]

- 2 x Tail Oring Damper.
- 2 x Washer Ø5xØ8.9x0,75mm.
- 2 x Washer Ø7.5xØ10x0,5mm.

Plastic Ball Link
[H0402-S]

- 5 x Plastic Ball Link.

Main Linkage
[H0417-S]

- 2 x Main Linkage.
- 4 x Plastic Ball Link.

Tail Blade Grips
[H1033-S]

- 2 x Aluminum Tail Blade Grip.
- 4 x Bearing Ø5xØ10x4mm.
- 2 x Thrust bearing Ø5xØ10x4mm.
- 2 x Button Head Cap M4x8mm.
- 2 x Socket Head Cap M2x6mm.
- 2 x Washer Ø5xØ8.9x0,75mm.
- 2 x Washer Ø7.5xØ10x0,5mm.

Center Hub
[H1043-S]

- 1 x Center Hub.
- 2 x Socket Head Cap M4x24mm.
- 2 x Socket Head Cap M3x12mm.
- 1 x Nylon Nut M4.

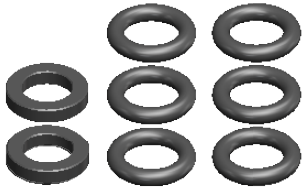
Main Blade Grips
[H1044-S]

- 1 x Blade Grip.
- 1 x Thrust Bearing ∅ 10x ∅ 18x5.5.
- 2 x Bearing ∅ 10x ∅ 19x5mm.
- 1 x Washer ∅ 10x ∅ 16x1mm.
- 1 x Socket Head Cap Screw M4x10.

Blade Grip Arm 30
[H1045-S]

- 2 x Blade Grip Arm.
- 2 x Head Cap Screw M4x10mm.
- 2 x Uniball M3x4 Ø5 H3.5.

Damper
[H1046-S]



- 2 x Damper B.
- 6 x Oring 90 Shore.

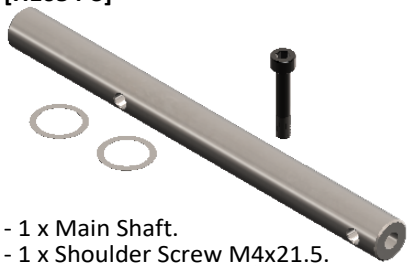
Swashplate
[H1047-S]

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

Reference Pin
[H1048-S]

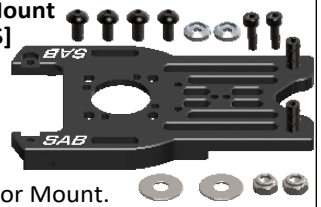
- 1 x Reference Pin.

Main Shaft
[H1054-S]



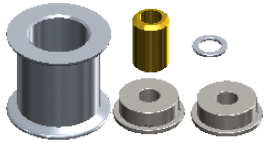
- 1 x Main Shaft.
- 1 x Shoulder Screw M4x21.5.
- 2 x Washers ∅ 12.1x ∅ 16x0.1mm.

Motor Mount
[H1058-S]



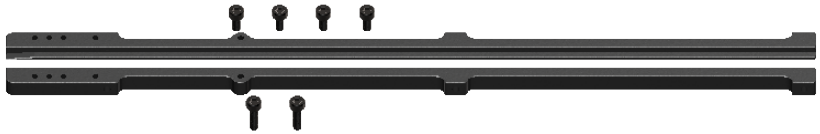
- 1 x Motor Mount.
- 2 x Set Screws M5x15mm.
- 2 x Washers ∅ 5.3x ∅ 15x1mm.
- 2 x Nylon Nuts M5H4.8.
- 2 x Finishing Washers M3.
- 2 x Head Cap Screws M3x10mm.

Tensioner Idler
[H1066-S]



- 1 x Tail Belt Idler.
- 1 x Bushing.
- 2 x Flanged Bearing ∅ 3x ∅ 8x3mm.
- 1 x Washer ∅ 3x ∅ 4.75x0.5mm.

Battery Tray Guide
[H1067-S]



- 2 x Battery Tray Guide.
- 4 x Head Cap Screws M3x6mm.
- 2 x Head Cap Screws M3x10mm.

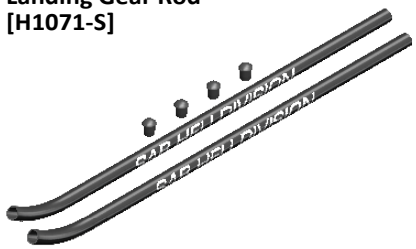
ESC Support
[H1068-S]

- 1 x ESC Support.
- 2 x Head Cap Screws M3x10mm.
- 4 x Nylon Nut M3.

Plastic Landing Gear Support
[H1070-WS]

- 1 x Plastic Support.
- 2 x Set Screws M4x4mm.
- 2 x Nylon Nut M3.

Landing Gear Rod
[H1071-S]

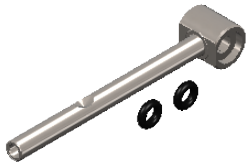


- 2 x Landing Gear Rod.
- 4 x Landing Gear Plug.

Battery Carbon SET
[H1085-S]

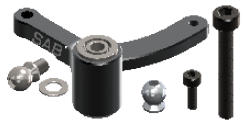
- 1 x Xross Battery.
- 1 x Carbon Pin Support.
- 1 x Head Cap M2.5x12.
- 2 x Head Cap M2.5x8.
- 1 x Alu Pin.
- 1 x Brass lever.
- 2 x Washer M2.5.
- 5 x Flat Screws M2.5x5.

Tail Shaft
[H1089-S]



- 1 x Tail Shaft.
- 1 x Tail Hub.
- 2 x Tail Oring.

Tail Bell Crank Lever
[H1090-S]

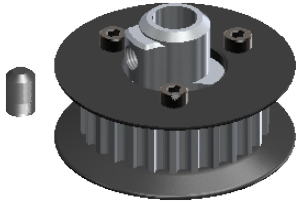


- 1 x Bell Crank Lever Assembled.
- 1 x Head Cap Screws M3x22mm.
- 1 x Head Cap Screws M2x6mm.
- 2 x Washer ∅ 3.2x ∅ 6x0.1mm.

Bell Crank Base
[H1095-S]

- 1 x Bell Crank Base.
- 2 x Head Cap Screws M2.5x8mm.

Tail Pulley 26T
[H1098-S]



- 1 x Tail Pulley 26T.
- 1 x Set Screws M4x6mm.

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.

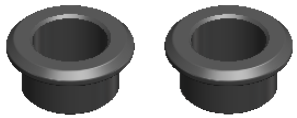
Kraken Serial Number
[H1108-S]

- 1 x Kraken Serial Number.
- 1 x Flat Head Cap Screw M2.5x5.

Tail Pitch Slider
[H1112-S]

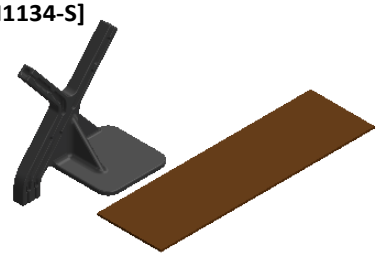
- 1 x Tail Pitch Slider Assembled.
- 2 x Slider Linkage.
- 2 x Head Cap Screws M2x6mm.
- 2 x Spacer.

Tail Slider Bush
[H1115-S]



- 2 x Tail Slider Bush.

Antenna Support
[H1134-S]

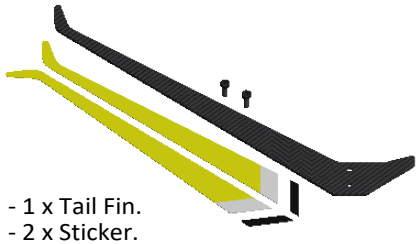


- 1 x Antenna Support.
- 1 x Double Side Tape.

Tail Case Group
[H1195-S]

- 1 x Tail Case Group.
- 4 x Finishing Washer M3.
- 4 x Socket Head Cap Screw M3x6.
- 2 x Flanged Bearing ∅ 6x ∅ 13x5 .

Tail Fin
[H1196-S]



- 1 x Tail Fin.
- 2 x Sticker.
- 2 x Socket Head Cap Screw M3x8.

Carbon Rod Support
[H1197-S]

- 1 x Carbon Rod Support.
- 1 x Socket Head Cap Screw M2.5x12.

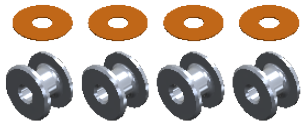
Rear Servo Support
[H1206-S]

- 1 x Rear Servo Support.
- 2 x Socket Head Cap M3x8mm.

Rear Servo Mount
[H1207-S]

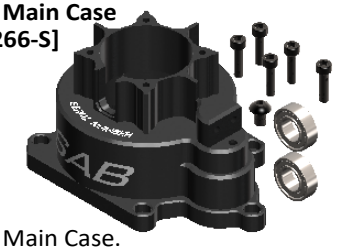
- 1 x Rear Servo Mount.
- 2 x Socket Head Cap M2.5x8mm.

Landing Gear Spacer
[H1236-S]



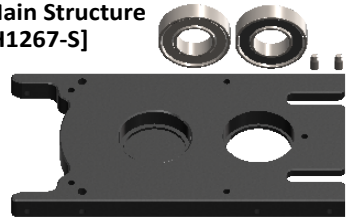
- 4 x Landing Gear Spacer.
- 4 x Double Side Tape.

TOP Main Case
[H1266-S]



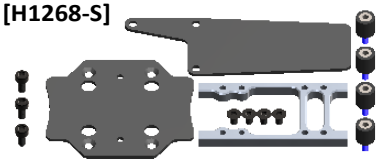
- 1 x Main Case.
- 1 x Buttom Head Cap Screw M4x6.
- 5 x Socket Head Cap Screw M3x12.
- 2 x Flanged Bearing ∅ 8x ∅ 16x5 .

Main Structure
[H1267-S]



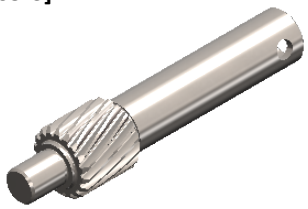
- 1 x Main Structure.
- 2 x Pin 3x8.
- 1 x Bearing ∅ 12x ∅ 24x6mm.
- 1 x Bearing ∅ 12x ∅ 24x6 2RS.

FBL/RX Support
[H1268-S]



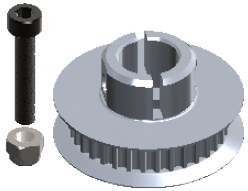
- 1 x Alu FBL Support.
- 1 x RX Support.
- 4 x Rubber.
- 4 x Flat Head Cap Screw M3x5mm.
- 3 x Socket Head Cap Screw M3x6.

Pinion
[H1269-S]



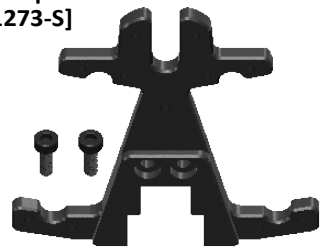
- 1 x Pinion.

Front Tail Pulley 34T
[H1271-S]



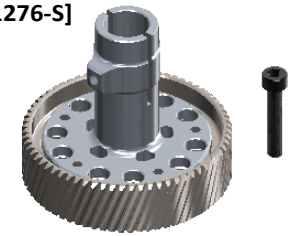
- 1 x Front Tail Pulley 34T.
- 1 x Head Shoulder M4x22mm.
- 1 x Nylon Nut M4.

Swashplate Reference
[H1273-S]



- 1 x Swashplate reference.
- 2 x Head Cap Screws M3x8mm.

Main Gear
[H1276-S]

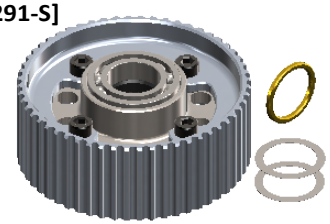


- 1 x Main Gear SET.
- 1 x Head Cap Screws M4x22mm.

Base Tail Belt Tensioner
[H1278-S]

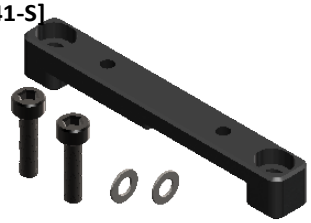
- 1 x Bushing.
- 1 x Base Tail Belt Tensioner.
- 1 x Tensioner Column.
- 1 x Tensioner Spring.
- 1 x Head Screw Shoulder M3x22.
- 2 x Flanged Bearing ∅ 3x ∅ 7x3 .

Main Pulley
[H1291-S]



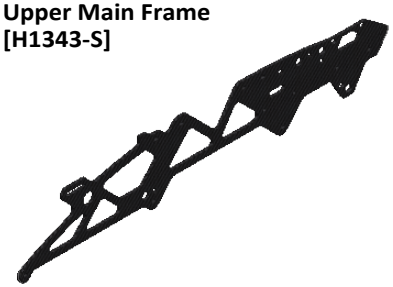
- 1 x Main Pulley SET.
- 1 x Bushing.
- 2 x Shim ∅12x∅16x0.1mm.

Tail Belt Base Idler Support
[H1341-S]



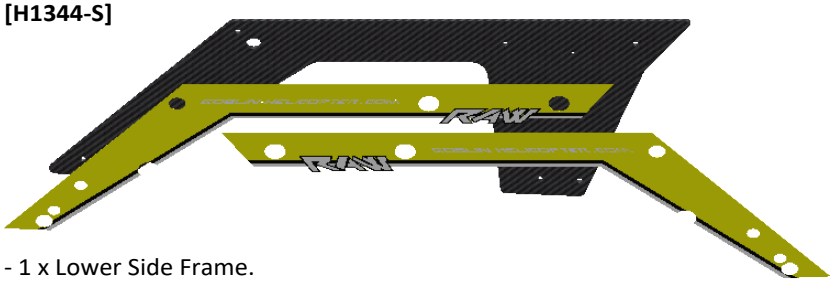
- 1 x Tail Belt Base Ilder Support.
- 2 x Head Cap Screw M3x12mm.
- 2 x Washer.

Upper Main Frame
[H1343-S]



- 1 x Upper Main Frame.

Lower Side Frame
[H1344-S]

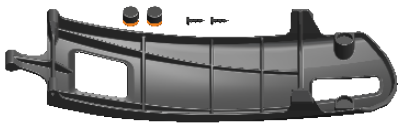


- 1 x Lower Side Frame.
- 1 x Yellow Sticker.

Canopy RAW
[H1346-S]

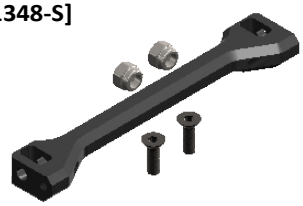
- 1 x Canopy Raw.
- 2 x Rubber Washer.
- 4 x Finishing Washer M3.
- 2 x Head Cap Screw M3x10mm.
- 2 x Socket Head Cap Screw M3x12.

Black Battery Hatch
[H1347-S]



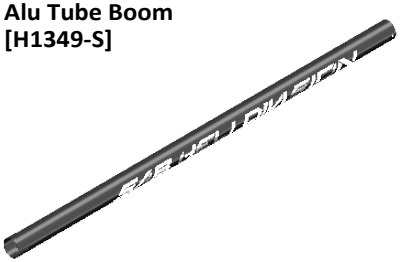
- 1 x Black Battery Hatch.
- 2 x Self Tapping Cap Screw M3x10.
- 2 x Double Side Tape.
- 2 x Mousse.

Canopy Spacer
[H1348-S]



- 1 x Canopy Spacer.
- 2 x Flat Head Cap Screw M2.5x8.
- 2 x Nylon Nut M3.

Alu Tube Boom
[H1349-S]



- 1 x Alu Tube Boom.
- 2 x Sticker.

Boom Mount Support
[H1350-S]

- 1 x Boom Mount Support.
- 4 x Finishing Washer M3.
- 4 x Socket Head Cap Screw M3x10.

Front Boom Clamp
[H1352-S]

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

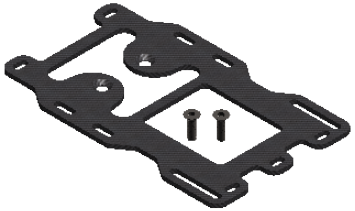
Tail Servo Mount
[H1353-S]

- 1 x Tail Servo Mount.
- 2 x Head Cap Screw M3x12mm.

CF Low Side Frame Front
[H1358-S]

- 1 x Yellow Sticker.
- 2 x CF Low Side Frame Front.

CF ESC Mount
[H1362-S]



- 1 x CF ESC Mount.
- 2 x Flat Cap Screw M3x10mm.

Bearing Support
[H1370-S]

- 1 x Bearing Support.
- 1 x Bearing ∅12x∅28x7mm.
- 4 x Socket Head Cap Screw M3x10.
- 2 x Shim ∅12x∅16x0.1mm.

Rear Boom Clamp
[H1371-S]

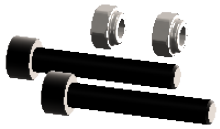
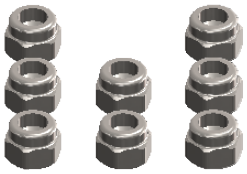
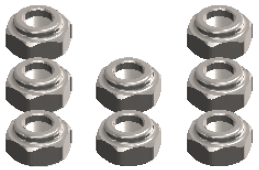
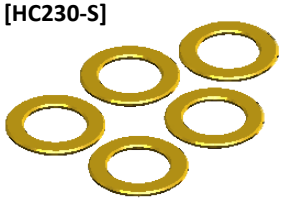
- 1 x Rear Boom Clamp.
- 2 x Socket Head Cap Screw M3x10.
- 1 x Socket Head Cap Screw M3x12.
- 1 x Nylon Nut M3.

Anti Rotation Delrin
[H1378-S]

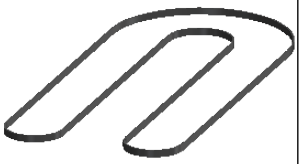
- 1 x Anti Rotation Delrin.
- 3 x Socket Head Cap Screw M2.5x6.

Block NUT M3
[H1386-S]

- 5 x Block NUT M3.
- 5 x Nylon NUT M3.

[HC044-S]  - 8 x Socket Head Cap Screws M3x6mm.	**[HC050-S]**  - 8 x Socket Head Cap Screws M3x8mm.	**[HC056-S]**  - 8 x Socket Head Cap Screws M3x10mm.	**[HC062-S]**  - 8 x Socket Head Cap Screws M3x12mm.	**[HC064-S]**  - 8 x Socket Head Cap Screws M3x14mm.	**[HC068-S]**  - 8 x Socket Head Cap Screws M3x16mm.	**[HC079-S]**  - 2 x Socket Head Cap Shoulder Screws M3x18. - 2 x Nylon Nut M3.
[HC086-S]  - 8 x Socket Head Cap Screws M3x22mm.	**[HC096-S]**  - 8 x Button Head Cap Screws M4x6mm.	**[HC098-S]**  - 8 x Button Head Cap Screws M4x8mm.	**[HC100-S]**  - 8 x Button Head Cap Screws M4x10mm.	**[HC102-S]**  - 8 x Socket Head Cap Screws M4x10mm.	**[HC104-S]**  - 8 x Socket Head Cap Screws M4x22mm.	**[HC111-S]**  - 8 x Socket Head Cap Shoulder Screws M4x24.
[HC114-S]  - 2 x Socket Head Cap Shoulder Screws M5x30. - 2 x Nylon Nut M5.	**[HC124-S]**  - 8 x Socket Head Cap Screws M6x10mm.	**[HC125-S]**  - 8 x Flat Head Cap Screws M2.5x8mm.	**[HC128-S]**  - 8 x Flat Head Cap Screws M2.5x5mm.	**[HC132-S]**  - 8 x Flat Head Cap Screws M3x5mm.	**[HC135-S]**  - 8 x Flat Head Cap Screws M3x10mm.	**[HC136-S]**  - 8 x Self Tapping Cap Screws M3x10mm.
[HC140-S]  - 8 x Set Screws M2.5x18.	**[HC152-S]**  - 8 x Set Screws M4x4mm.	**[HC153-S]**  - 8 x Set Screws M4x6mm.	**[HC176-S]**  - 5 x Washer ∅3x∅4x0.5mm.	**[HC180-S]**  - 5 x Washer ∅3.2x∅6x0.5mm.	**[HC188-S]**  - 5 x Washer ∅5.3x∅15x1mm.	**[HC194-S]**  - 5 x Washer ∅6x∅14x1.5mm.
[HC200-S]  - 8 x Metrix Nylon Nut M2.5.	**[HC206-S]**  - 8 x Metrix Nylon Nut M3.	**[HC212-S]**  - 8 x Metrix Nylon Nut M4.	**[HC218-S]**  - 8 x Metrix Nylon Nut M5.	**[HC230-S]**  - 5 x Washer ∅10x∅16x1mm.	**[HC232-S]**  - 5 x Washer ∅10x∅16x0.2mm.	**[HC242-S]**  - 3 x Thread Rod M2.5x40.

[HC304-S]



- 1 x Tail Belt 2061mm.

[HC335-S]

- 4 x Tail Oring.

[HC400-S]

- 4 x Flanged Bearing
  ∅2.5x∅6x2.6mm .

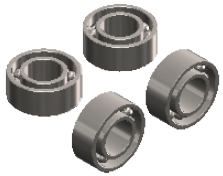
[HC402-S]

- 4 x Flanged Bearing
  ∅3x∅7x3mm .

[HC410-S]

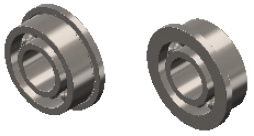
- 4 x Flanged Bearing
  ∅5x∅9x3mm .

[HC411-S]



- 4 x Ball Bearing
  ∅5x∅10x4mm .

[HC414-S]



- 2 x Flanged Bearing
  ∅6x∅13x5mm .

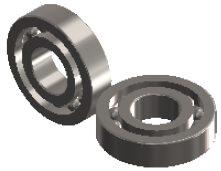
[HC418-S]

- 2 x Flanged Bearing
  ∅8x∅12x3.5mm .

[HC422-S]

- 4 x Ball Bearing
  ∅10x∅19x5mm .

[HC426-S]



- 2 x Ball Bearing
  ∅12x∅24x6mm .

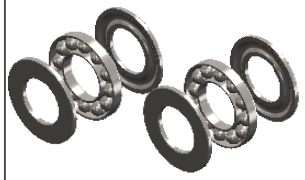
[HC430-S]

- 2 x Rad Bearing
  ∅30x∅37x4mm .

[HC435-S]

- 2 x Thrust Bearing
  ∅5x∅10x4mm .

[HC438-S]



- 2 x Thrust Bearing
  ∅10x∅18x5.5mm .

[HC529-S]

- 6 x O-ring 90 shore.

[HC530-S]

- 6 x O-ring 80 shore.

[HC543-S]

- 5 x Set Screw M5x16mm.

[HC544-S]

- 8 x Head Cap Screw M4x20.

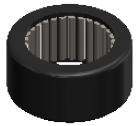
[HC545-S]

- 8 x Head Cap Screw
  Shoulder M4x21.5mm.

[HC601-S]

- 1 x Motor Belt.

[HC602-S]



- 1 x One Way Bearing
  ∅12x∅20x12mm .

[HC603-S]

- 1 xBearing ∅12x∅24x6 2Rs.
- 1 xBearing ∅12x∅24x6.
- 1 xBearing ∅8x∅16x5.
- 2 x Shims ∅12x∅16x0.1.
- 1 x Shim ∅12x∅16x1.3.
- 1 x Shim ∅4x∅7x0.2.
- 1 x M4x21.5 Screw.
- 2 x Pin 3x6.

[HC606-S]

- 1 x Carbon Rod ∅3x∅4x728mm
- 2 x Plastic Ball Linkage
- 2 x Thread Rod M2.5x40.
- 2 x Aluminum Bush.

[HC608-S]

- 8 x Head Cap Screw M3x25.

[HC609-S]

- 8 x Button Cap Screw M2x6.

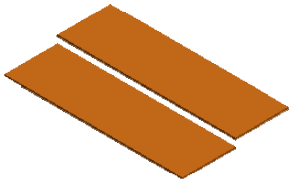
[690-TBS]

- 2 x Main Blades 690mm.

[105-TBS]

- 2 x Tail Blades 105mm.

[HA035-S]



- 2 x Double side
  tape 30x100x1mm.

[HA041-S]

- 2 x Strap 20x250mm.

[HA043-S]

- 1 x Foam Holder.

[HA050-S]/[HA051-S]

- 4 x Servo Horn.

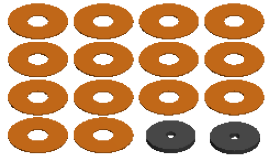
[HA075-S]

- 1 x Free Wheel
  Clutches grease.

[HA076-S]

- 1 x Tranmissions module
  grease.

[HC612-S]



- 2 x Rubber Washer.
- 14 x Double Side Tape.

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

Release 1.1 - February 2021

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