MANUAL

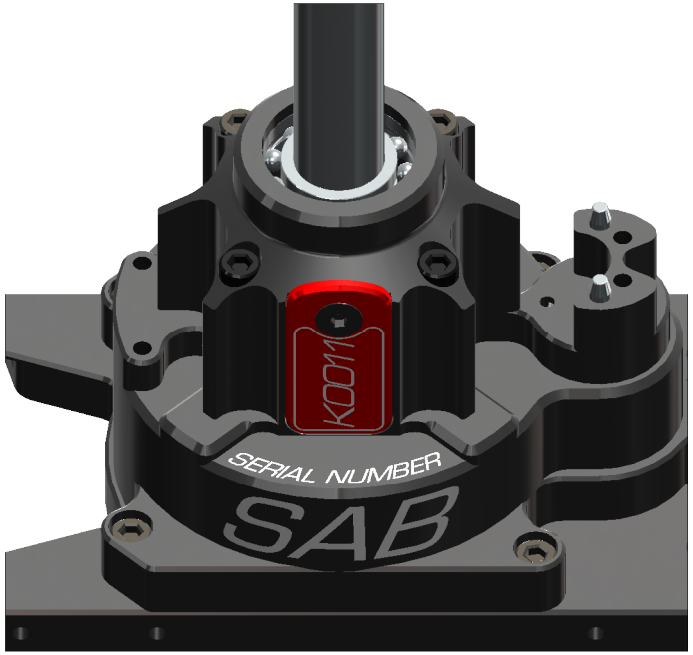
IL GOBLIN S5 · S7

IL GOBLIN

THE ITALIAN HELI

SAB HELI DIVISION

Please read this user manual carefully, it contains instructions for the correct assembly of the model.
Please refer to the website *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 website 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.

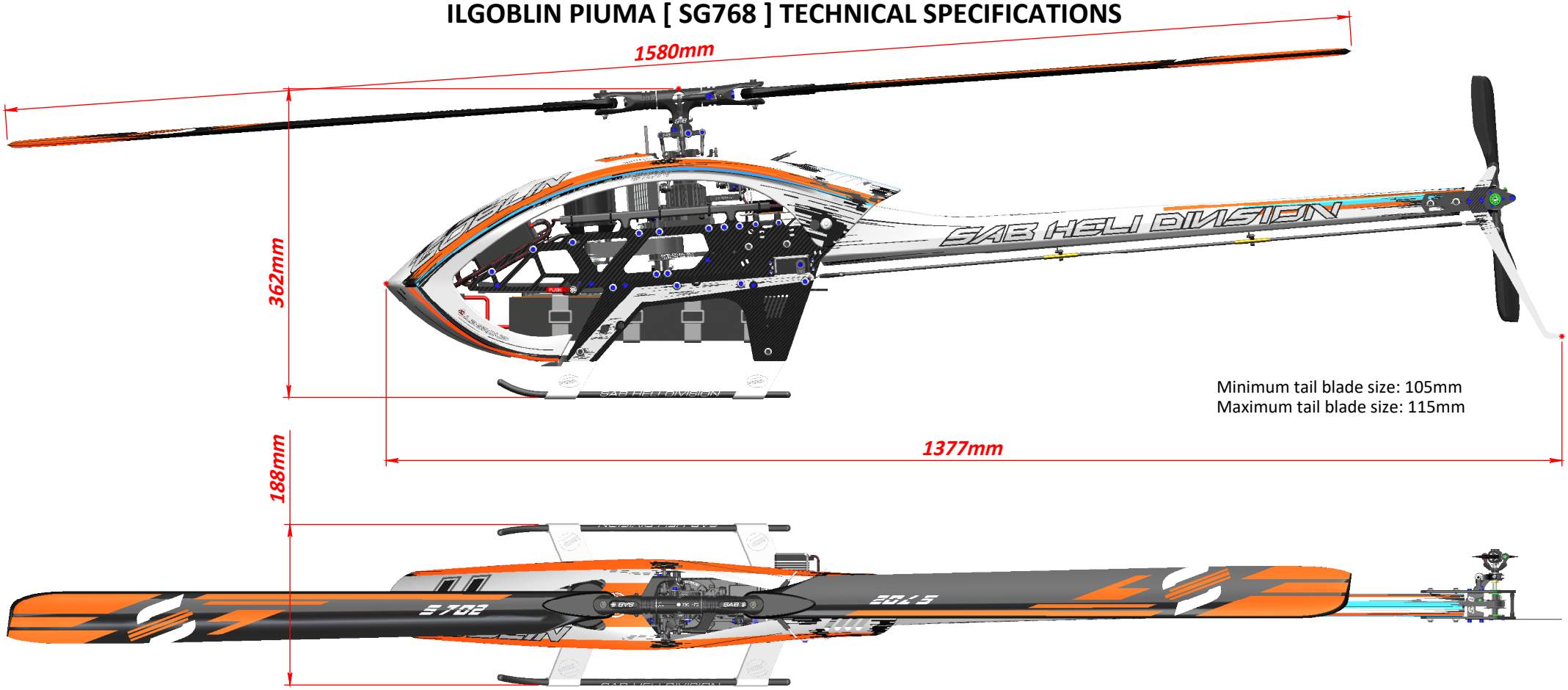
The Serial number is also engraved in the Aluminum part.

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

SAB Heli Division

INDEX

ILGOBLIN PIUMA [SG768] TECHNICAL SPECIFICATIONS



- **AIRFRAME weight:** 1995 gr (no blades, no battery, no Electronics).
- **Main rotor diameter:** 1580 mm (with 702 mm blade).
- **Main blade length:** 650 to 730mm.
- **Tail rotor diameter:** 292 mm (with 110 mm tail blade).
- **Tail blade length:** 105 to 115 mm.
- **Main shaft: 12 mm, Tail shaft: 6 mm.**
- **Molded carbon tail boom .**

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

- **Main Rotor Ratio:** 11.3 to 8.9 (21T included: 10.2:1).
- **Tail Rotor Ratio:** 4.8-4.1:1 (23T included: 4.6:1).
- **Motor:** 12S, 480/560 KV.
- **Battery room:** 50x60x300 mm.

KIT Includes:

- 21T motor pulley (other pulley sizes available).
- 1 battery trays with integrated connectors.

- S702 Orange (702 mm main blade).
- S110 Orange (110 mm tail blade).

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.
*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 designated for 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.

*Speed controller.

*Batteries: 6S – 6000mAh.
12S – 5000mAh.

*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.

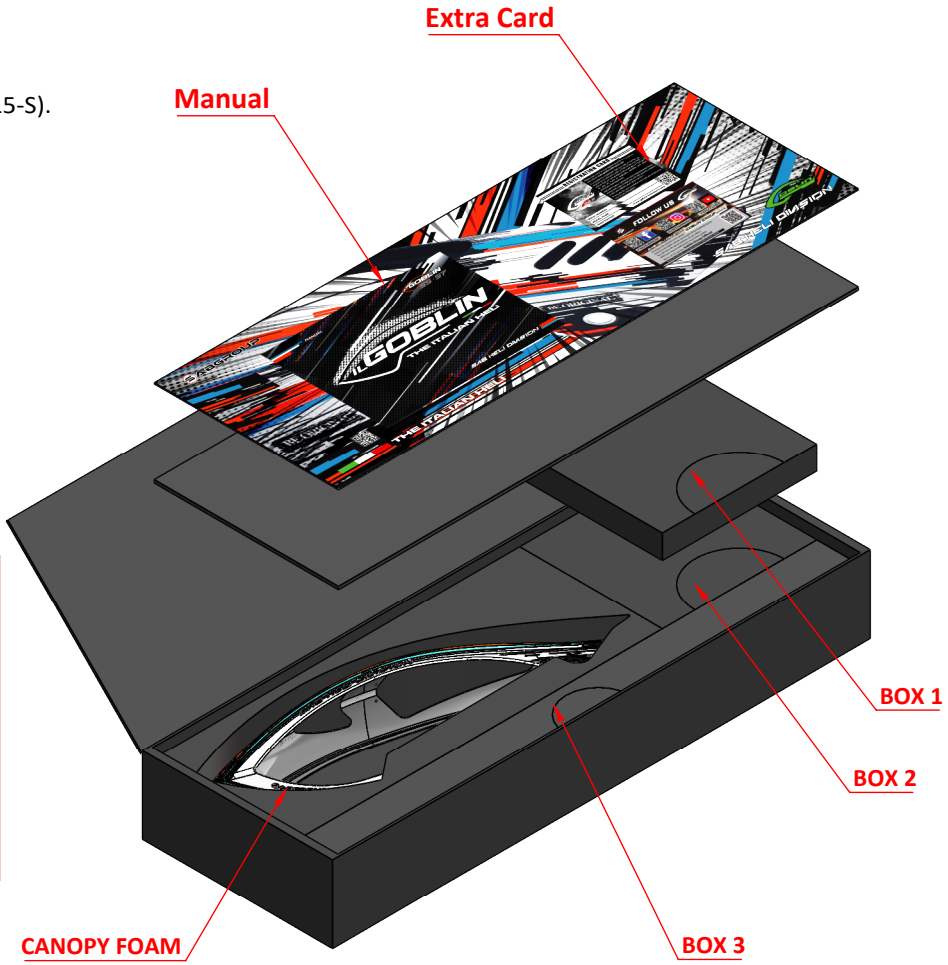
TOOLS, LUBRICANTS, ADHESIVES

*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.

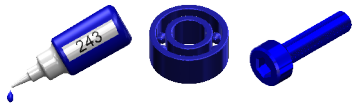
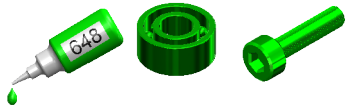
*Pitch Gauge (for set-up).
*Soldering equipment (for motor wiring).

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:

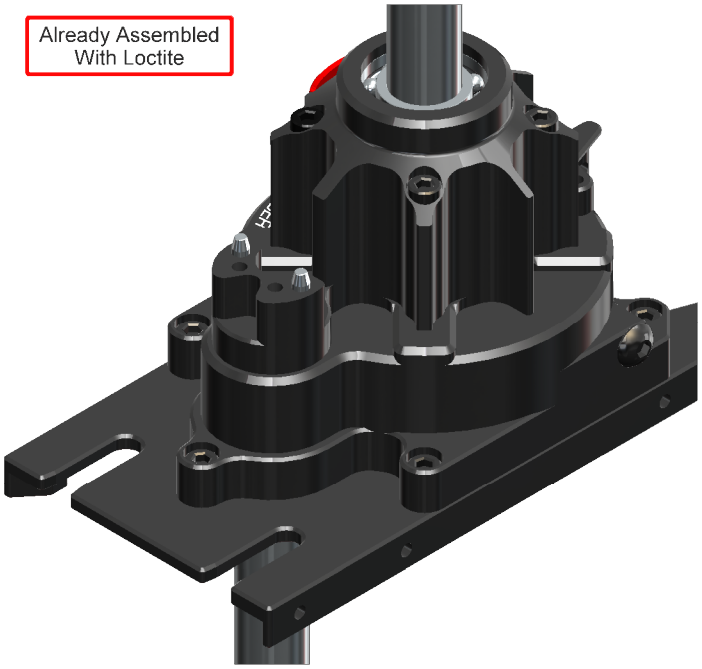
Important	 Blue screw and blue bearing in the illustration means you need to use: **Threadlocker Medium Strength (SAB HA116-S)**	 Green screw and Green bearing in the illustration means you need to use: **Use retaining compound (SAB HA115-S)**
BOX XX, BAGXX Indicates that for this assembly phase you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

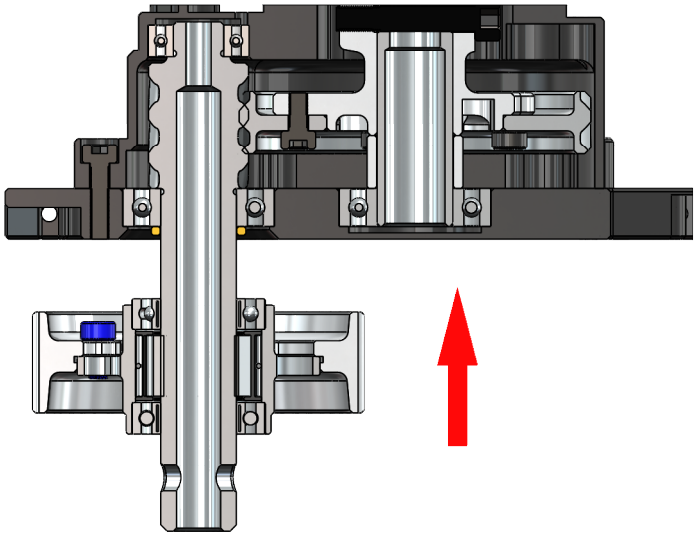
The assembly process is described in the following chapters. Each chapter provides you with the box, bag and/or foam numbers you will need for that chapter. The information is printed in a black box in the upper corner of the page.

BOXES 1-2 , BAG FOR PAGE 5

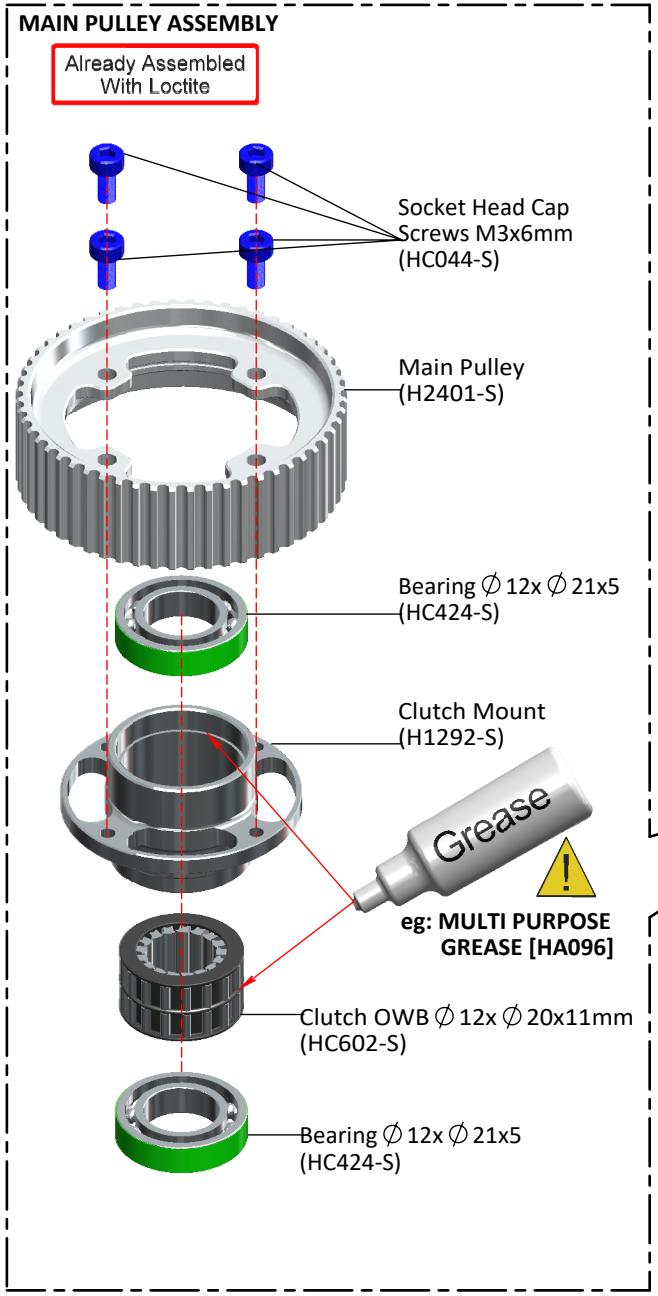
TRANSMISSION GROUP ASSEMBLED AND VERIFIED

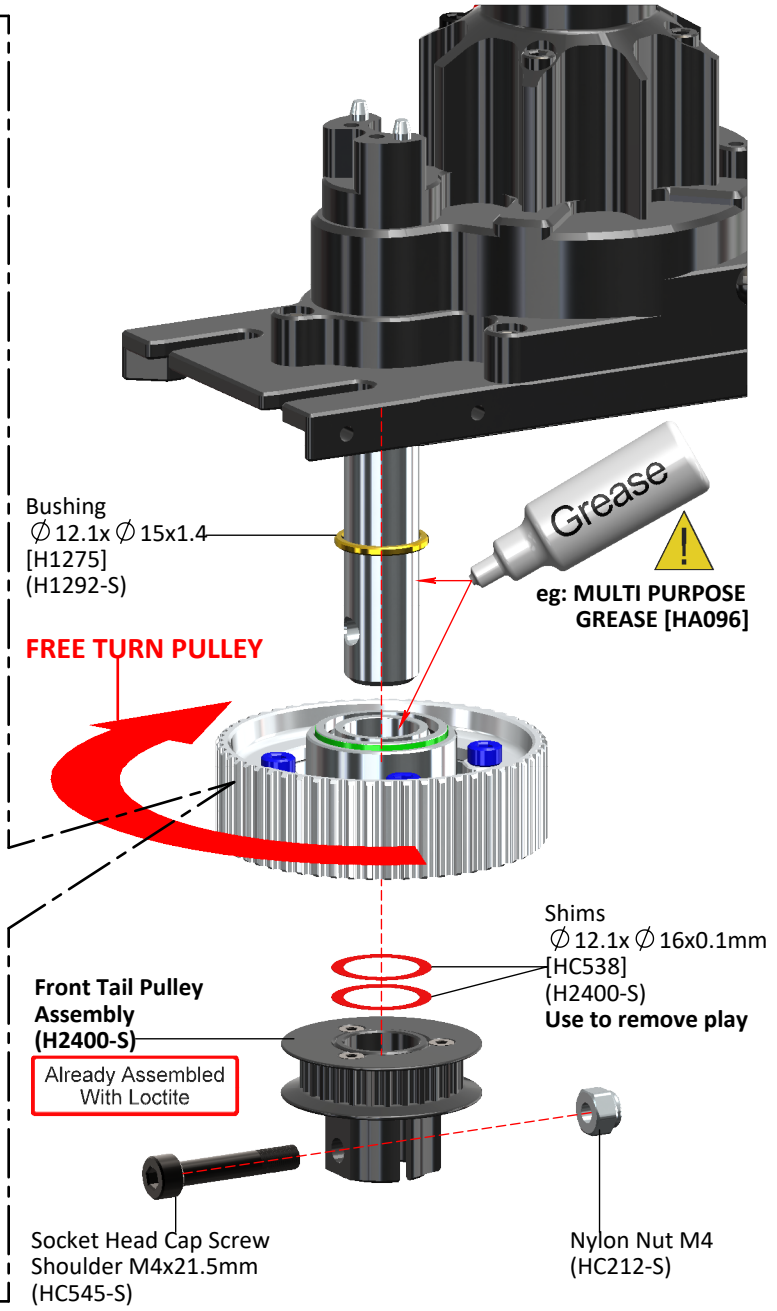
The unit is ready to use. Check **page 37** for more information.

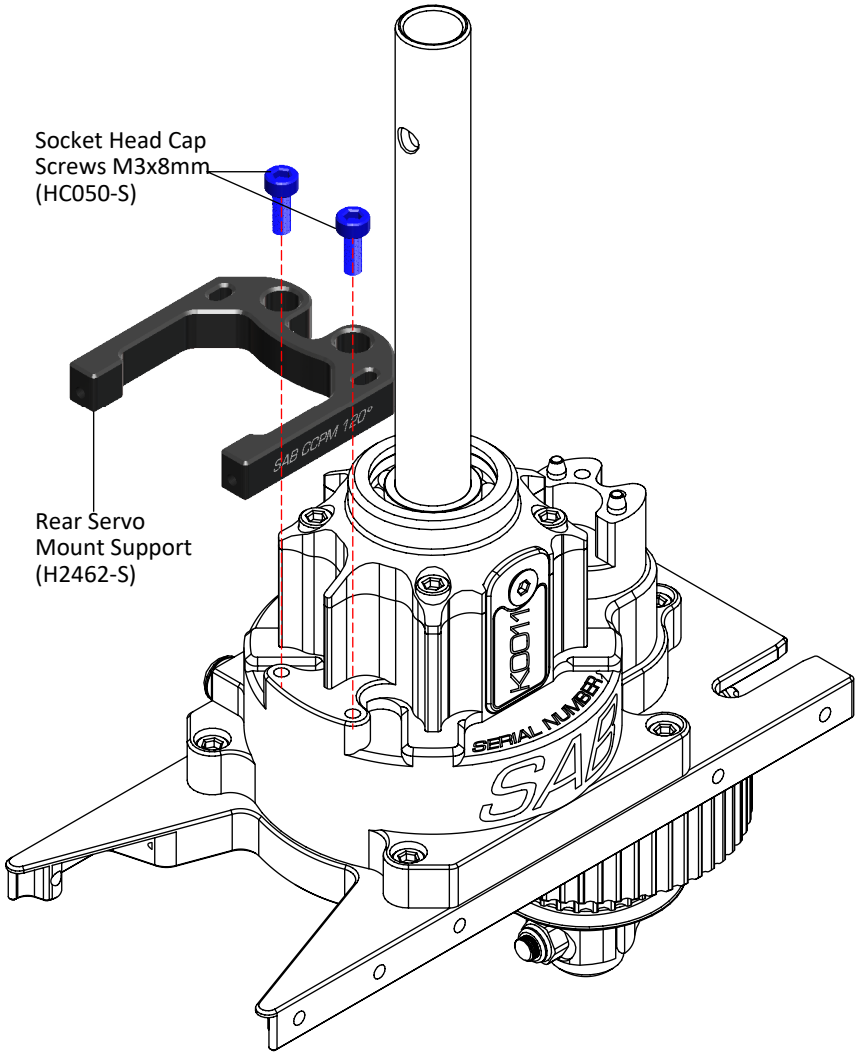




MAIN PULLEY ASSEMBLY



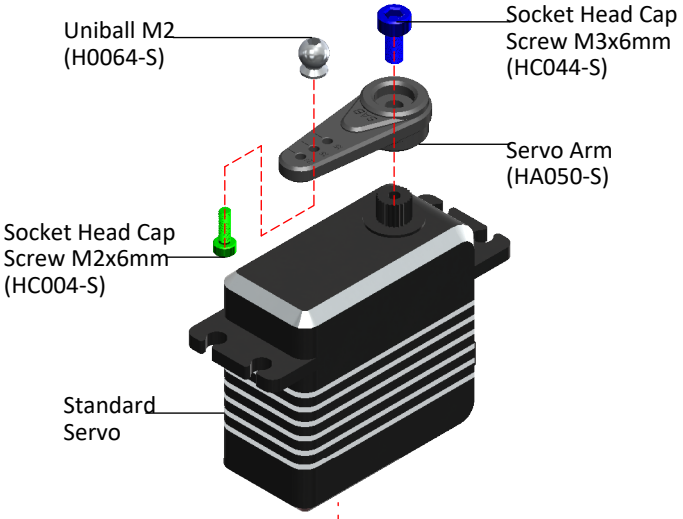




SERVO ASSEMBLY

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)**



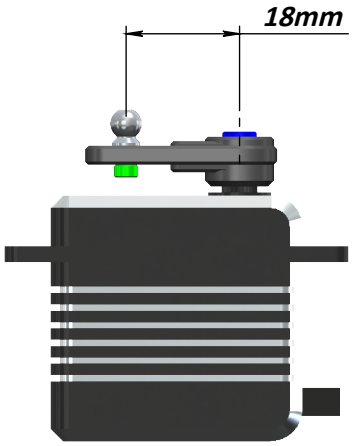
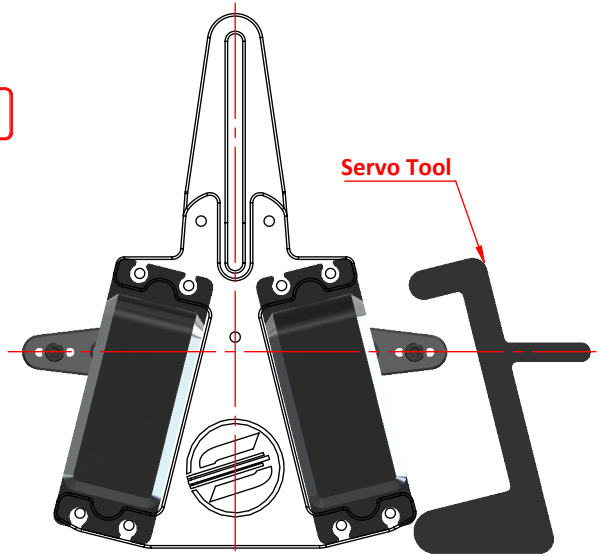
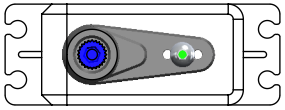


Fig. 3



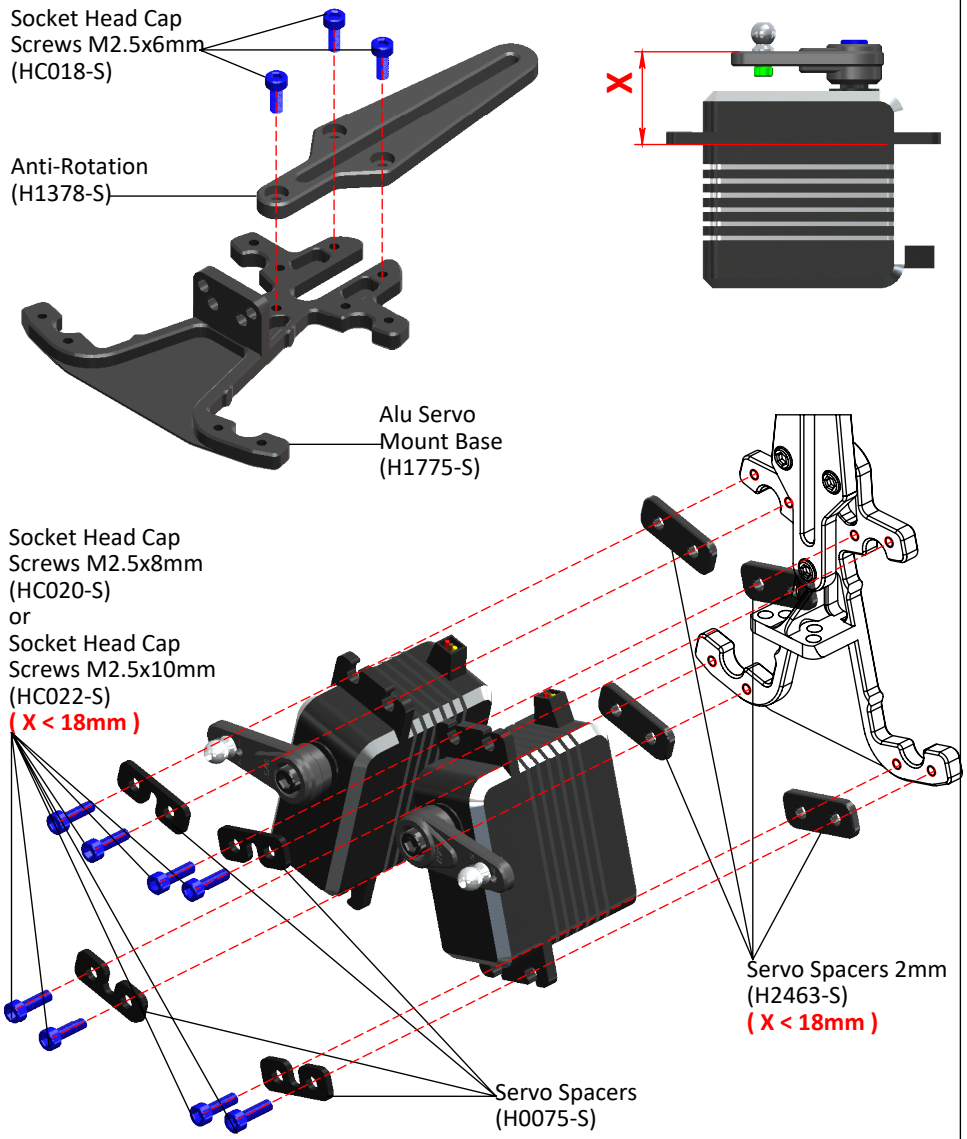
Front Servos

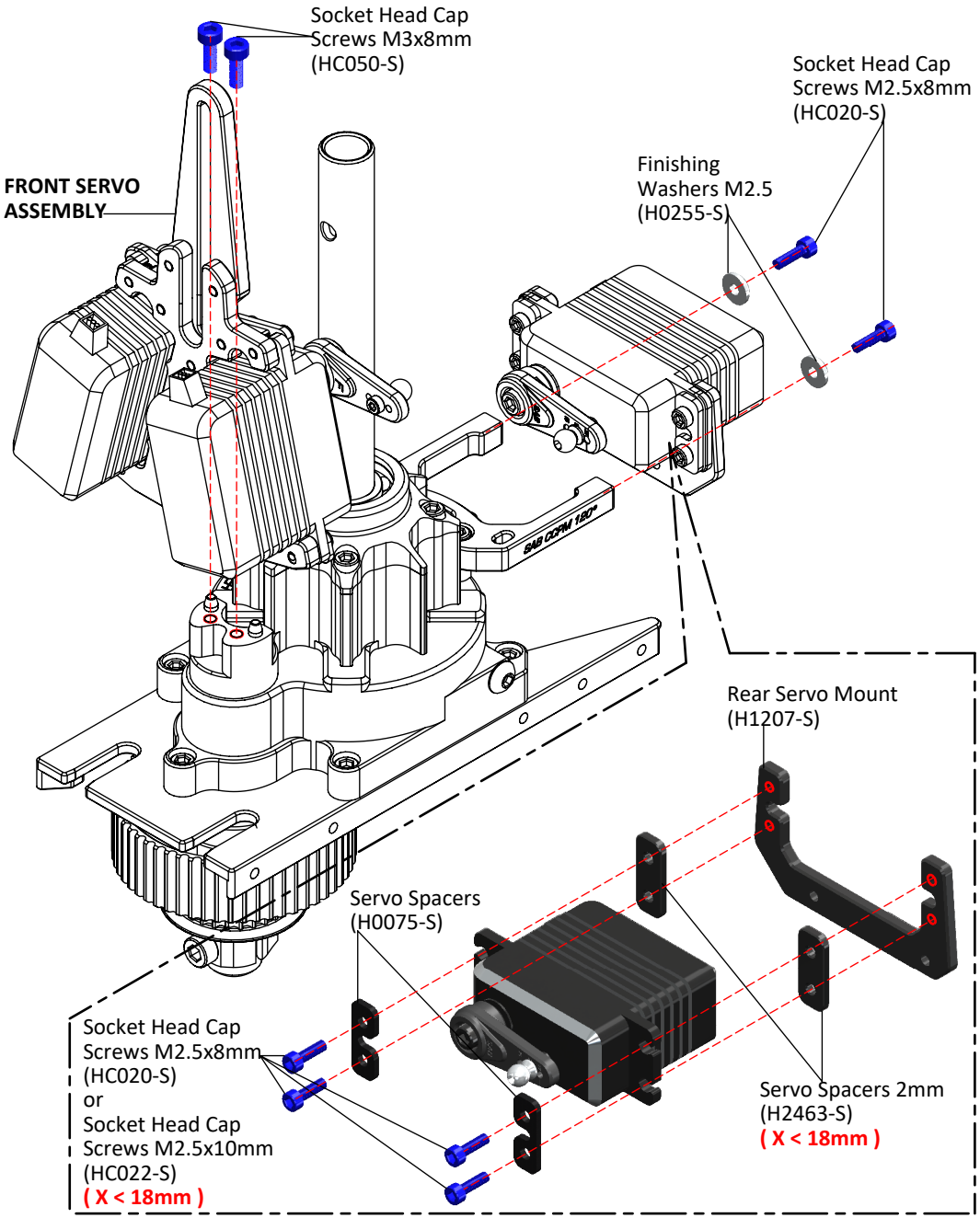


Rear Servo

BOX 1, BAG FOR PAGE 7

FRONT SERVO ASSEMBLY

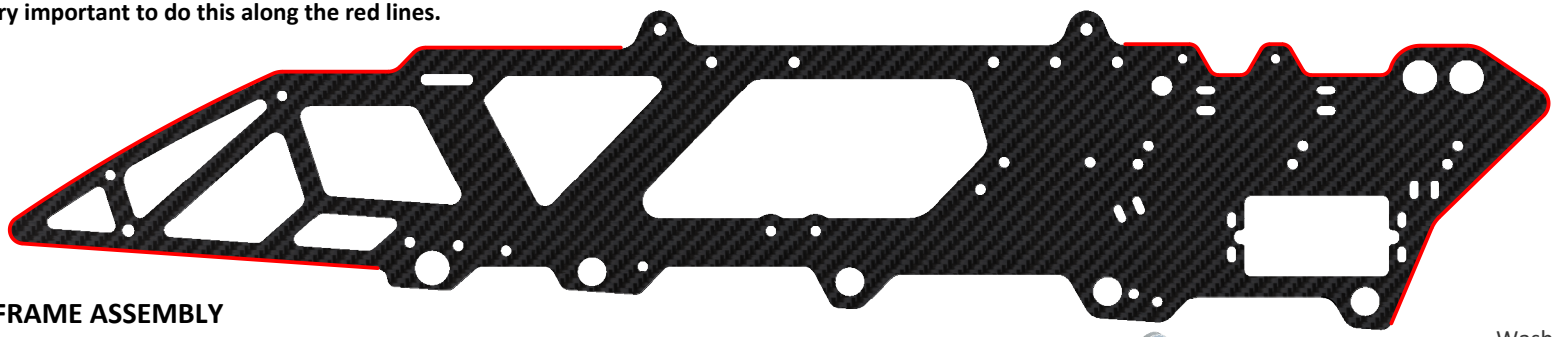




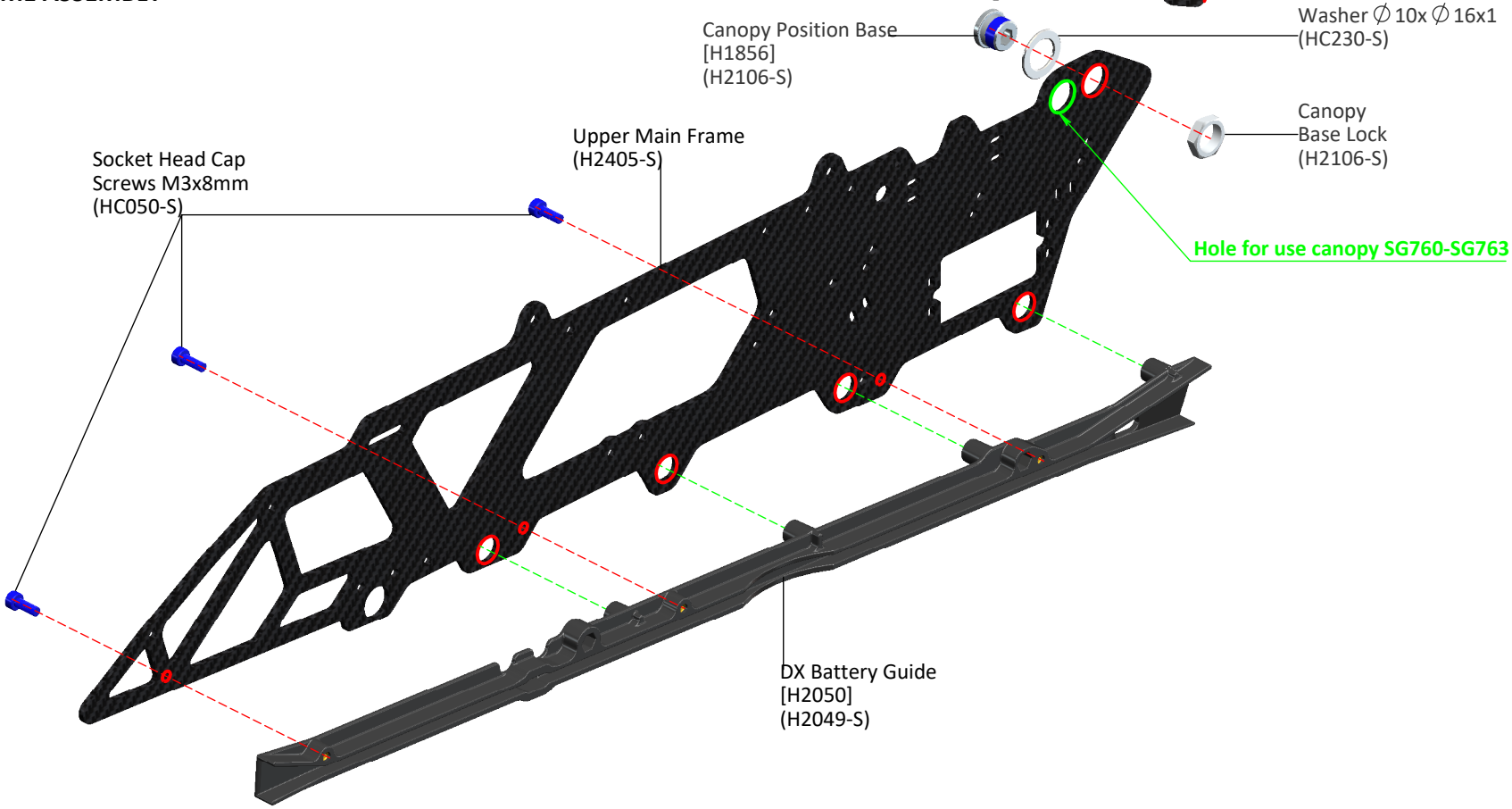
BOXES 1-3, BAG FOR PAGE 8

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.

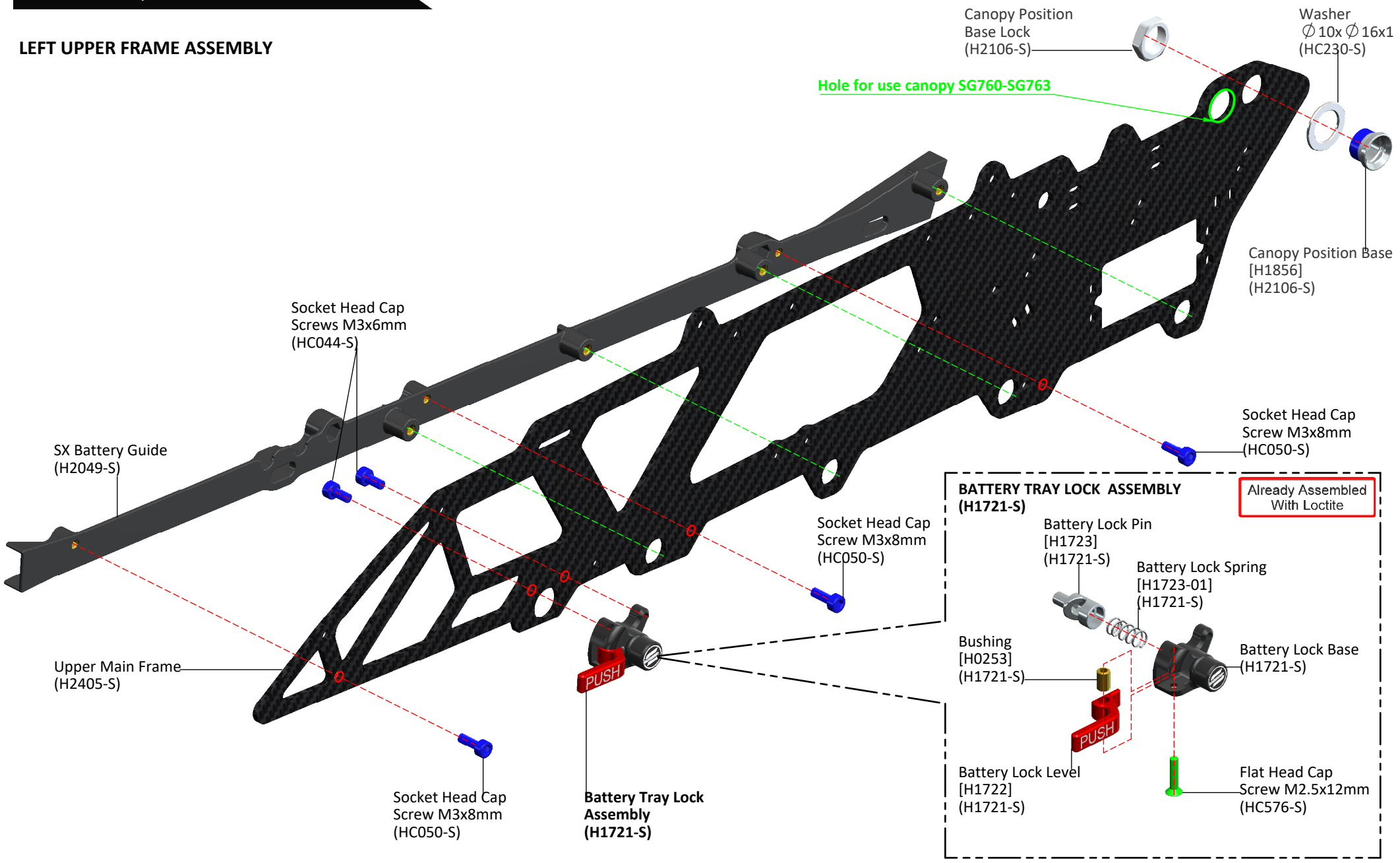


RIGHT UPPER FRAME ASSEMBLY

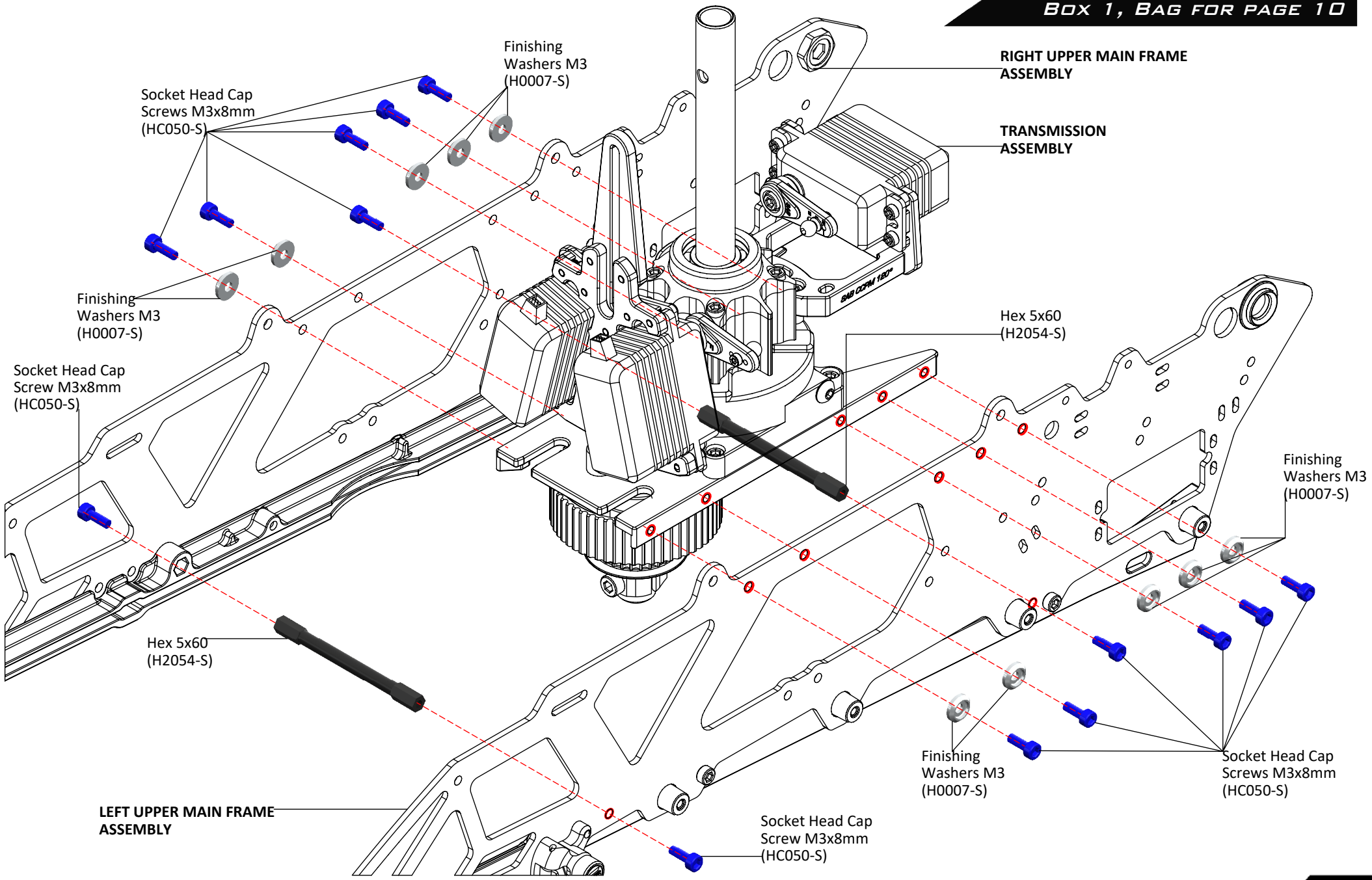


BOXES 1-3, BAG FOR PAGE 9

LEFT UPPER FRAME ASSEMBLY

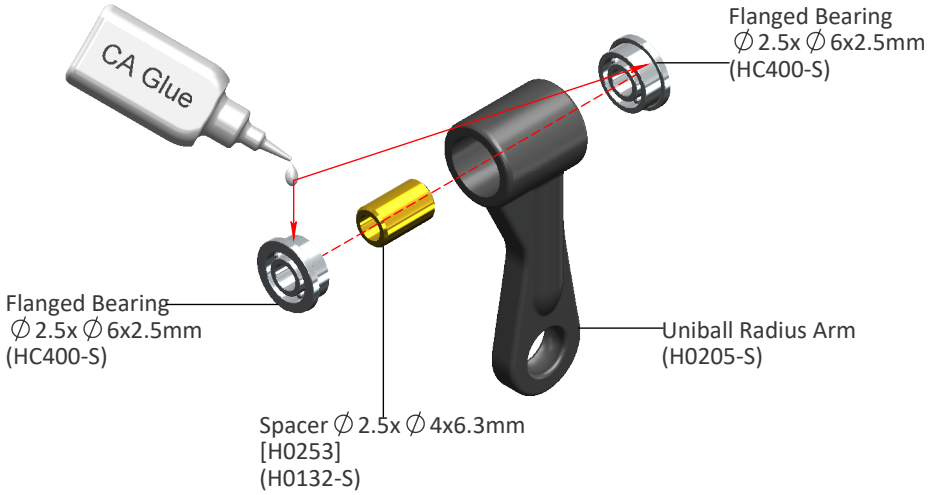


BOX 1, BAG FOR PAGE 10

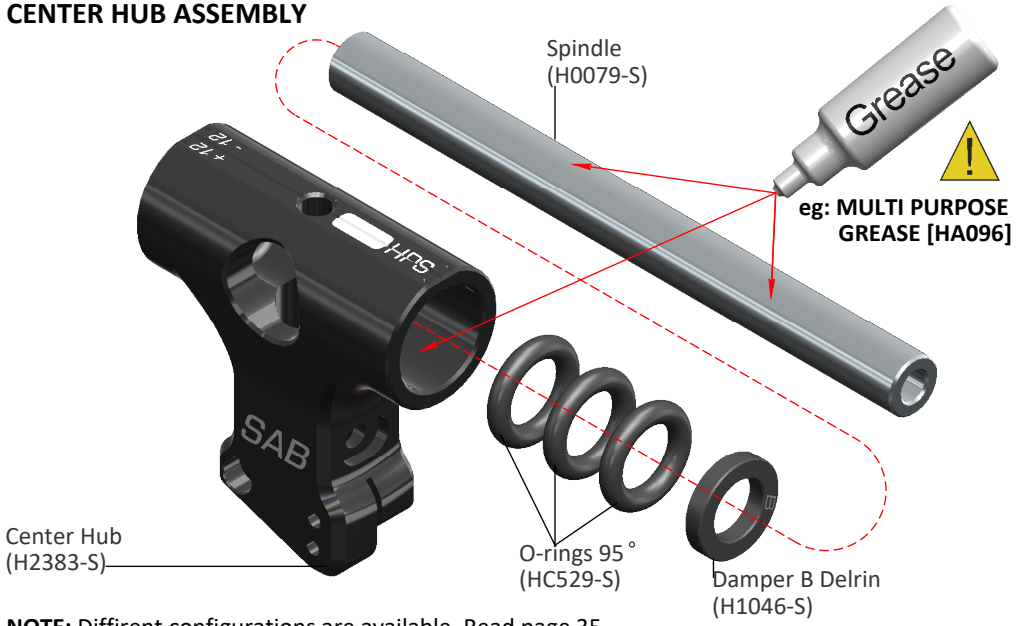


BOXES 1-2, BAG FOR PAGE 11

UNIBALL RADIUS ARM ASSEMBLY ...X2

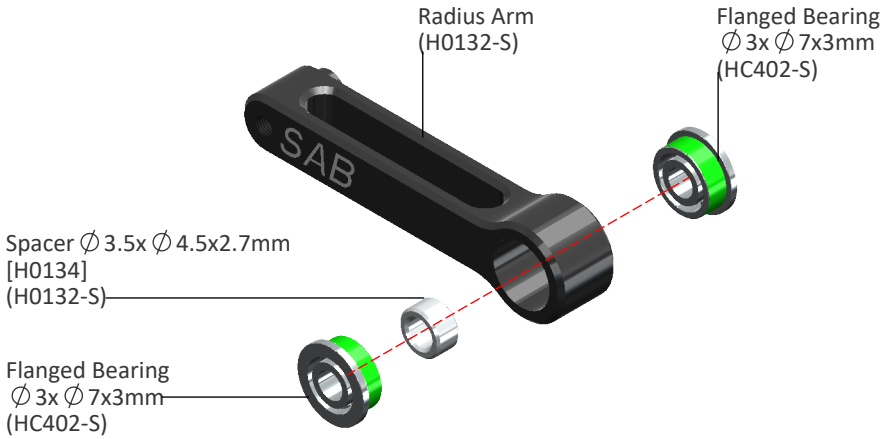


CENTER HUB ASSEMBLY



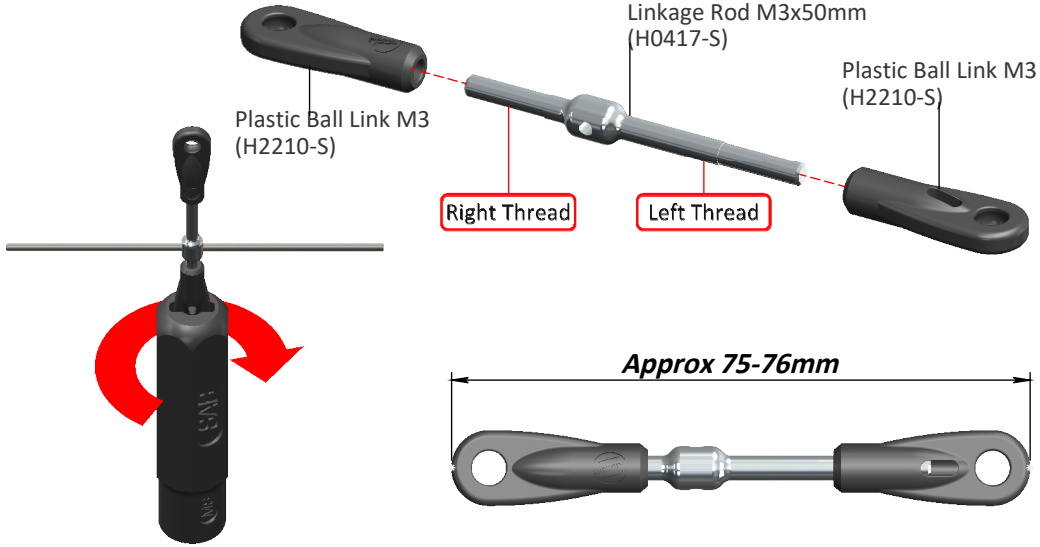
NOTE: Diffirent configurations are available. Read page 35.

RADIUS ARM ASSEMBLY ...X2



PLEASE USE GREEN THREAD LOCK to secure the bearings to the radius arms. Failure to secure the bearing will result in excessive slop/play.

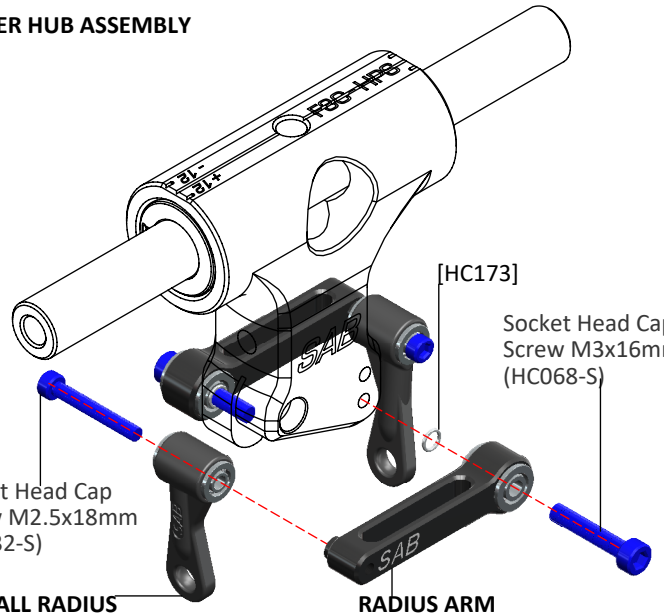
LINKAGE ROD A ASSEMBLY ...X2



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

BOXES 1-2, BAG FOR PAGE 12

CENTER HUB ASSEMBLY



NOTE:

Shim ∅ 10x ∅ 16x0.2mm[HC232-S][Bag Shims]. After approximately 40/50 flights, please check preload, you can add one 0.2mm shim (HC232) on each side if preload has changed. However, we suggest to replace the o-rings after about 100 flights.

eg: MULTI PURPOSE GREASE [HA096]

Bearing ∅ 10x ∅ 19x5mm (HC422-S)

Washer ∅ 10x ∅ 16x1mm (HC230-S)

Socket Head Cap Screw M6x10mm (HC124-S)

Washer ∅ 6x ∅ 14 x1.5mm (HC194-S)

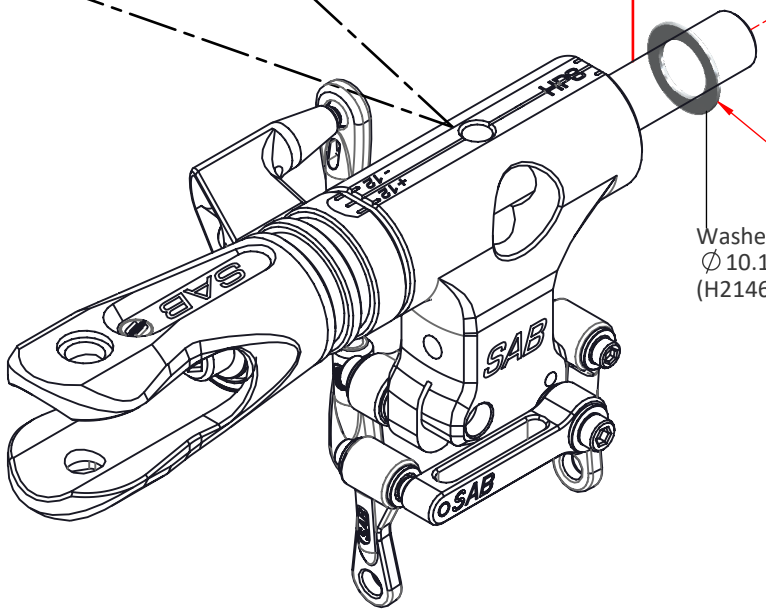
Note: Smaller ID

Thrust Bearing ∅ 10x ∅ 18x5.5mm (HC438-S)

Note: Larger ID

Blade Grip Assembly (H1790-S)

Already assembled with 1 bearing

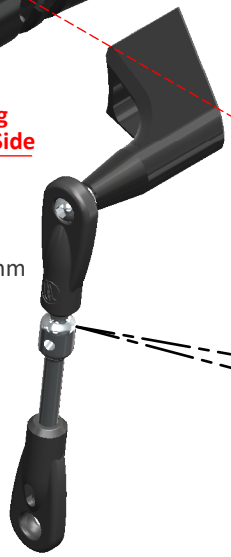


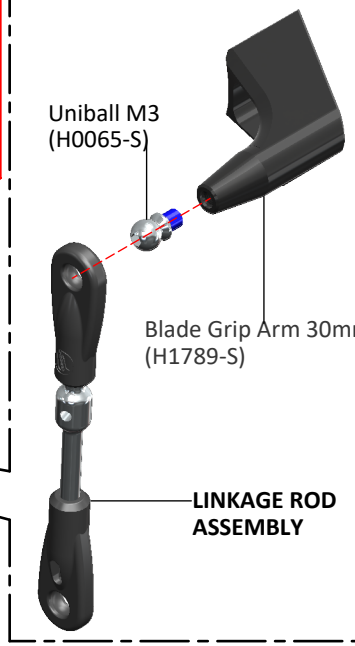
Lip Facing Bearing Side

Washer with LIP ∅ 10.1x ∅ 16x1mm (H2146-S)

Suggested:
Use this hole to apply grease after several flights

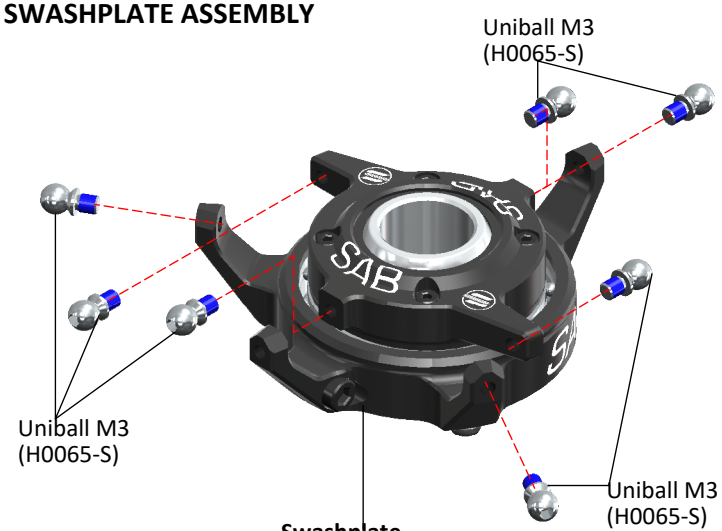
Socket Head Cap Screw M4x10mm (HC102-S)





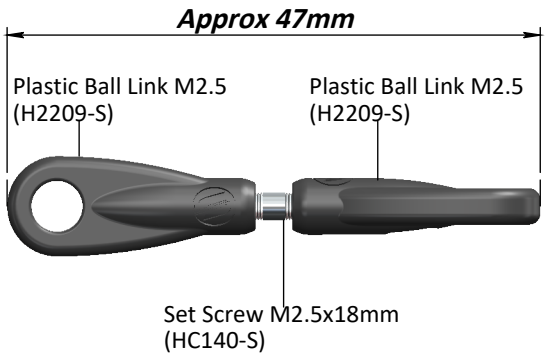
Boxes 1-2, Bag for page 13

SWASHPLATE ASSEMBLY



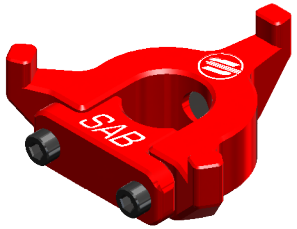
BOX 1, BAG FOR PAGE 14

LINKAGE ROD B ASSEMBLY ... X3



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

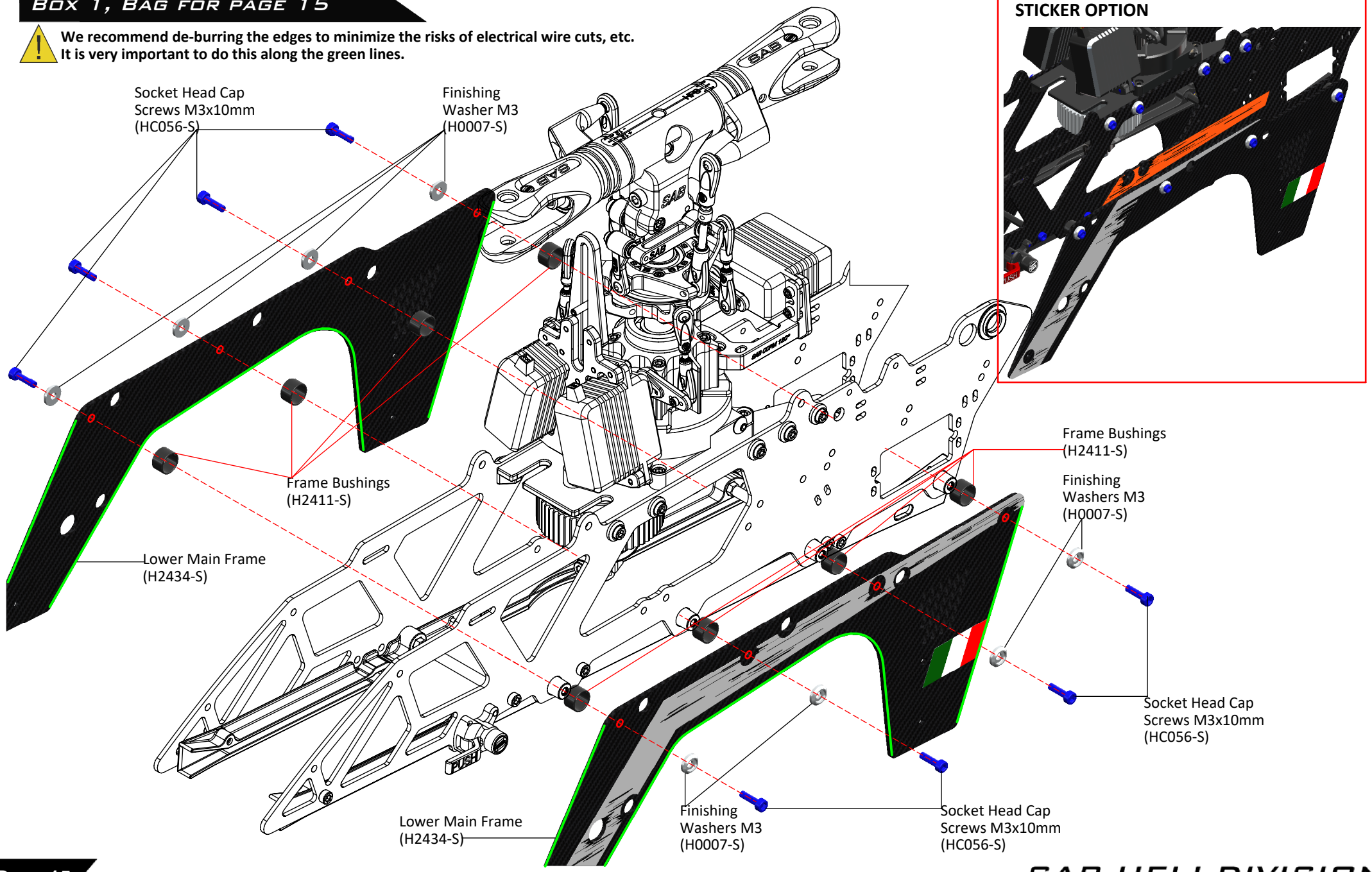
SUGGESTED:
You can use the Swashplate Leveler H2461-S
(Not included KIT)



LOWER SIDE FRAME INSTALLATION

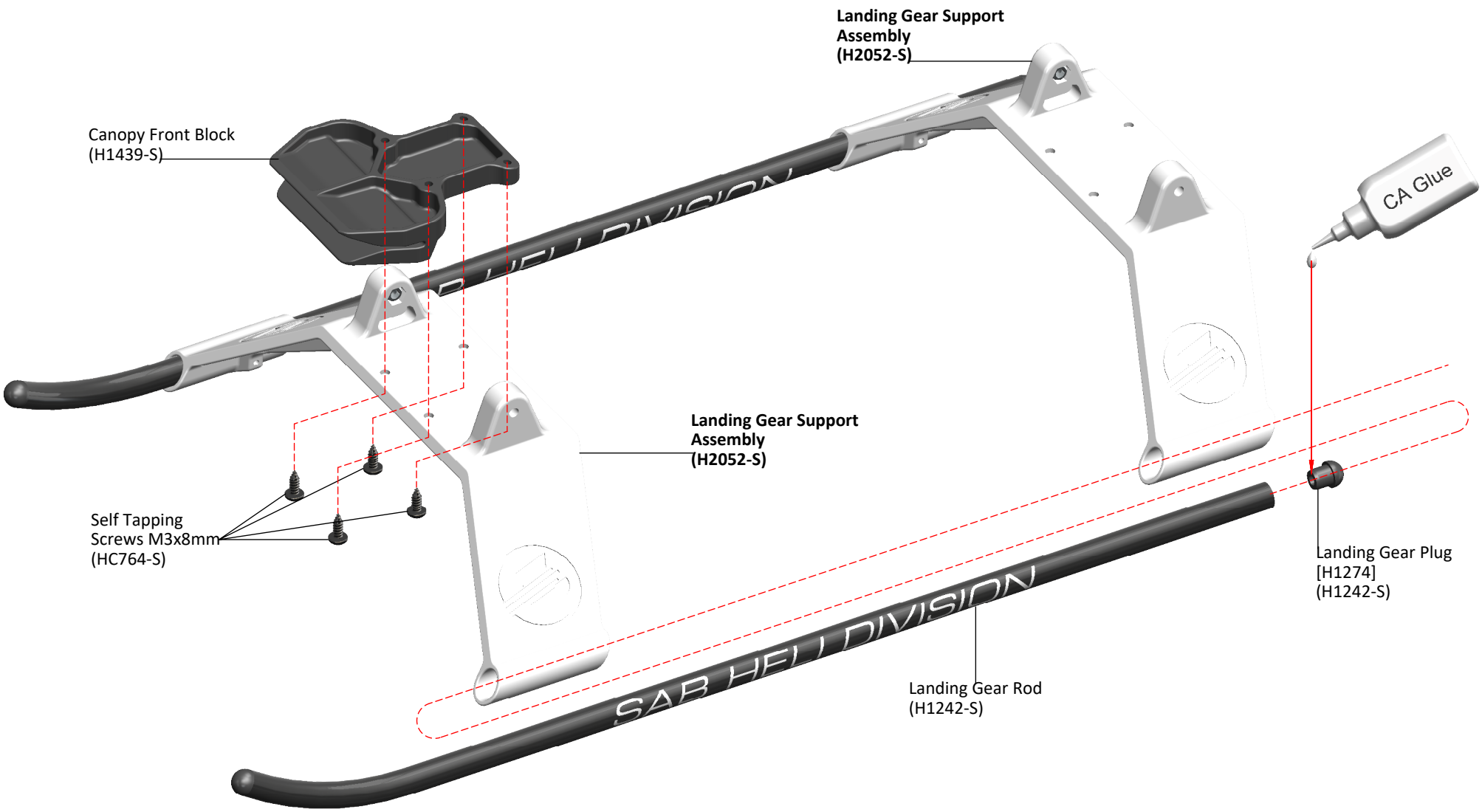
Box 1, Bag for page 15

We recommend de-burring the edges to minimize the risks of electrical wire cuts, etc.
It is very important to do this along the green lines.

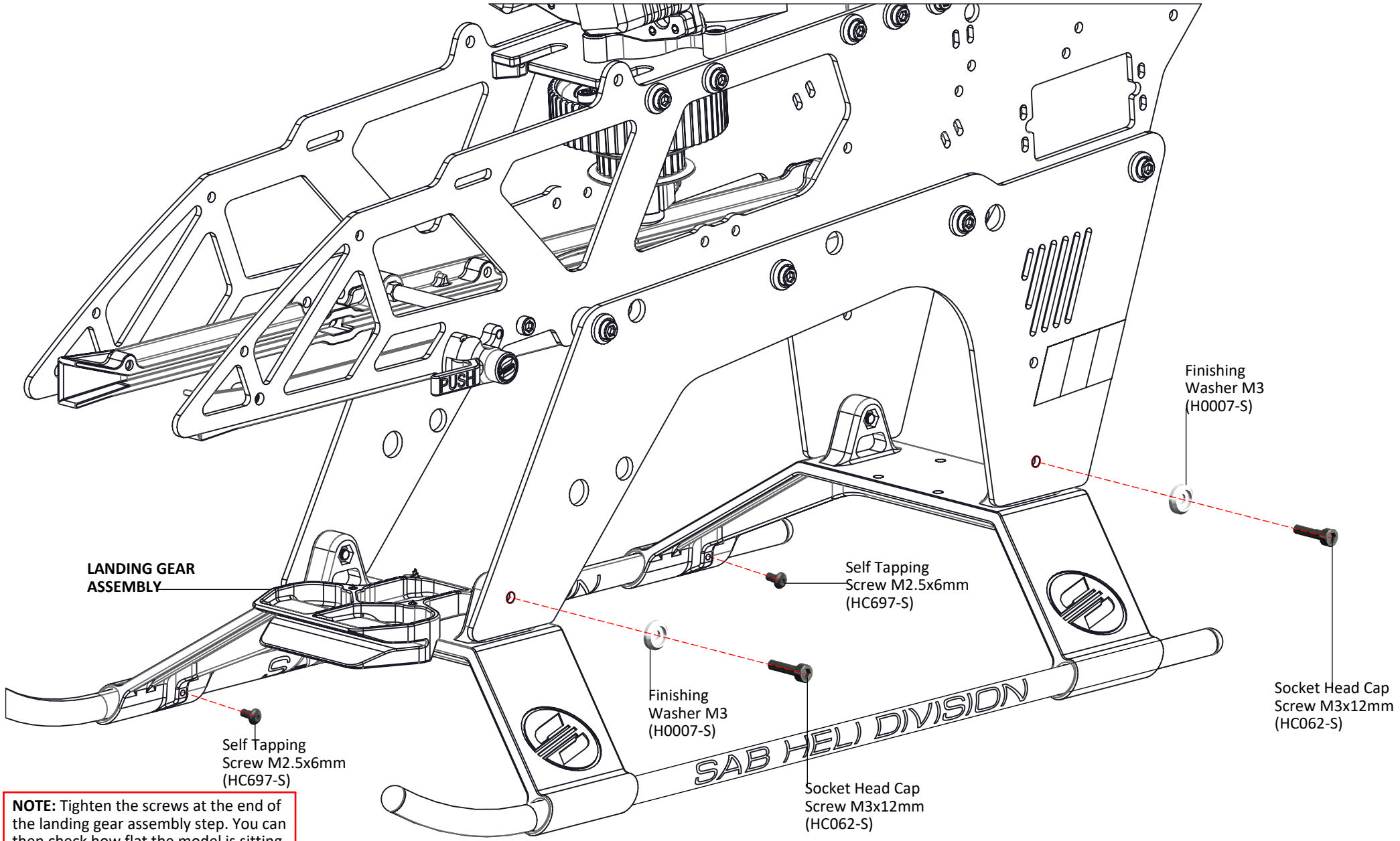


STICKER OPTION

BOXES 1-3, BAG FOR PAGE 16



Box 1, Bag for page 17



NOTE: Tighten the 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 215 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:

H0126-19-S - **19T** Pinion = ratio **11.3:1**

H0126-20-S - **20T** Pinion = ratio **10.7:1**

H0126-21-S - **21T** Pinion = ratio **10.2:1**

H0126-22-S - **22T** Pinion = ratio **9.8:1**

H0126-23-S - **23T** Pinion = ratio **9.3:1**

H0126-24-S - **24T** Pinion = ratio **8.9:1**

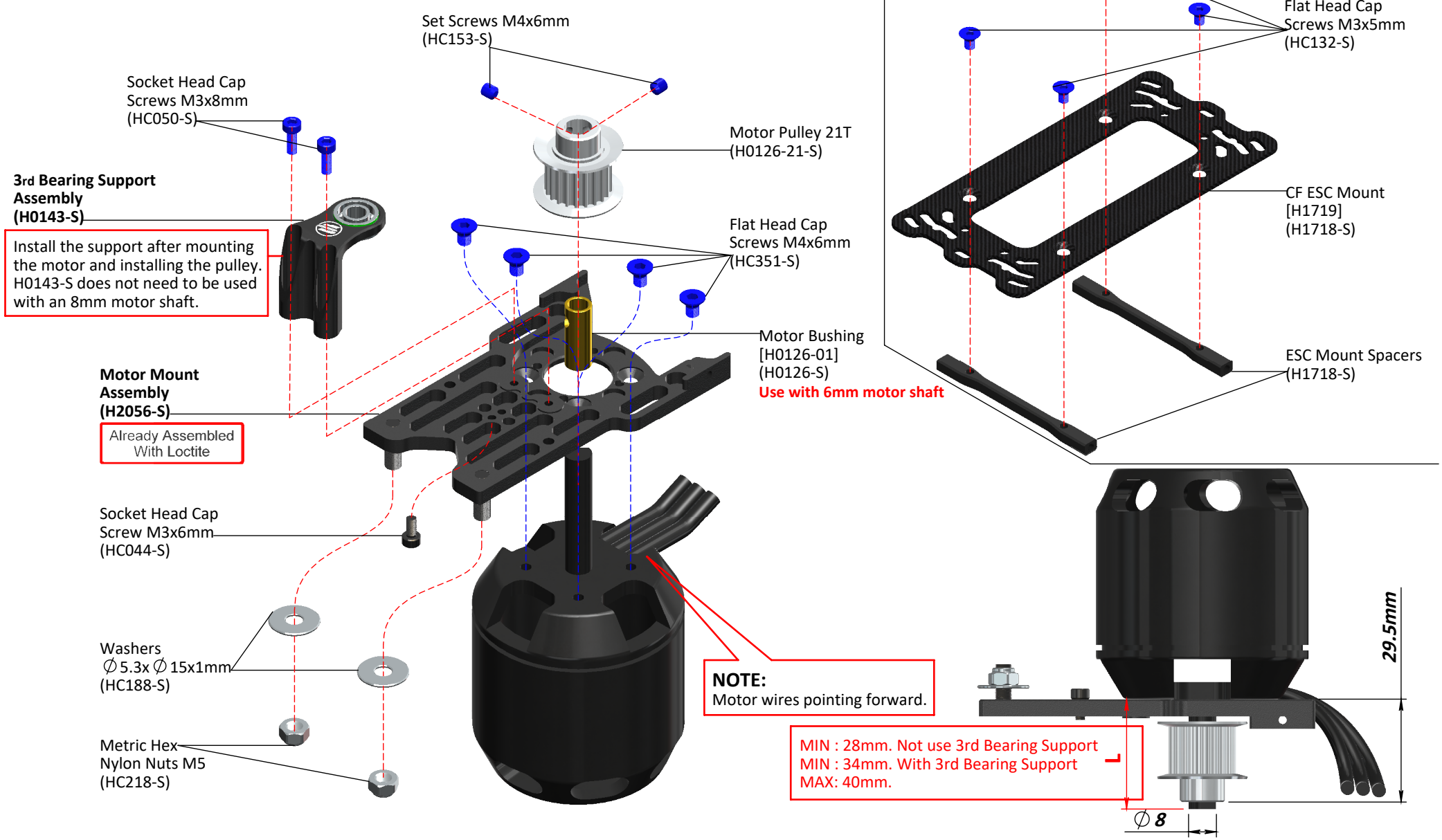
ILGOBLIN PIUMA CONFIGURATIONS

Rev:01

Battery	Motor	ESC	Pinion (a, b)	RPM Max (a, b)	Pitch
6S - 5500mAh 5000/7000 mAh	Kontronik Pyro 650-103 L	HW 150A V4 Scorpion Tribunus III 06-160A KOLIBRI 140 LV-I YGE Saphir 125	20T / 21T	1850/1950	± 12
	HKIV-4025-1100KV(6mm) X-NOVA 4025-1120Kv		19T / 20T		
	EGODRIFT 4230 Eclipse / 1070 Kv		21T		
12S 4500/5500 mAh	Scorpion HK5-4525-535kV Xnova 4525-530kv lightning	HV180 V5 Kosmik 170HV YGE 185HVT	21T / 22T	2000/2100	± 13
	Pyro 750-560 TENGU 4525HT/550KV	SCORPION III 14-150A	20T / 21T		

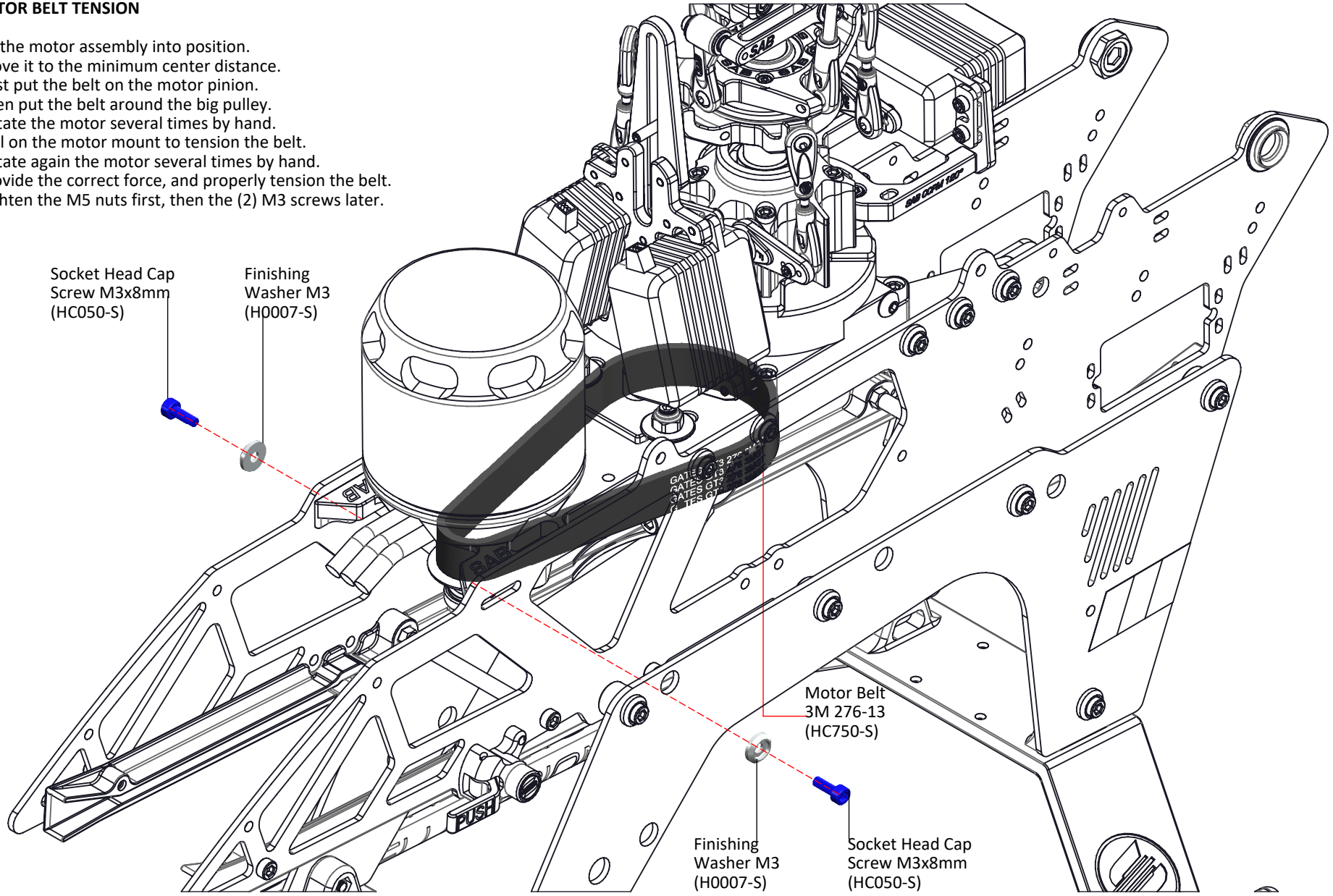
INSTALLATION OF THE MOTOR/ESC

BOXES 1-2, BAG FOR PAGE 19

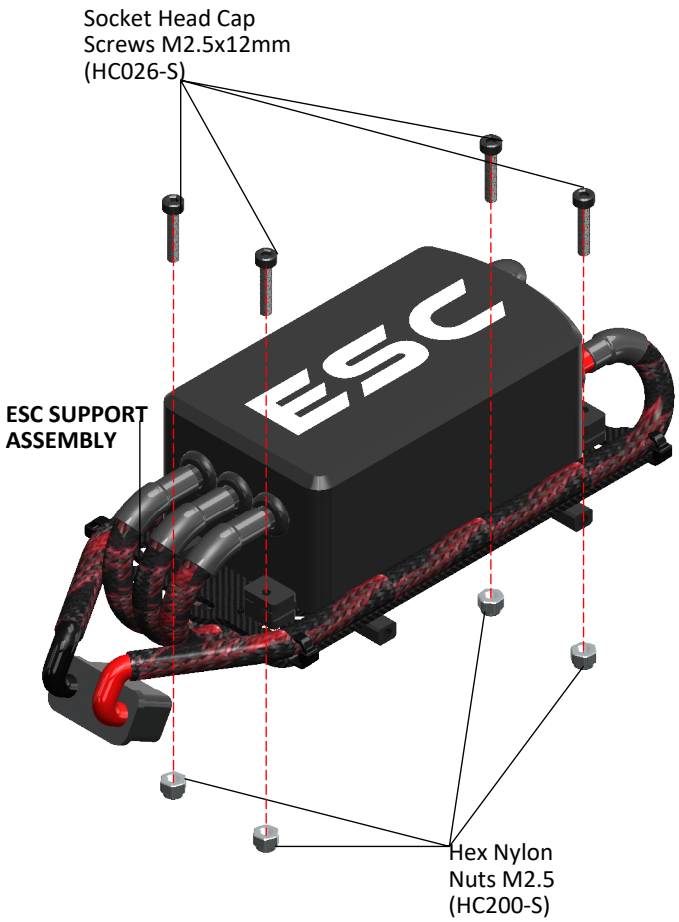


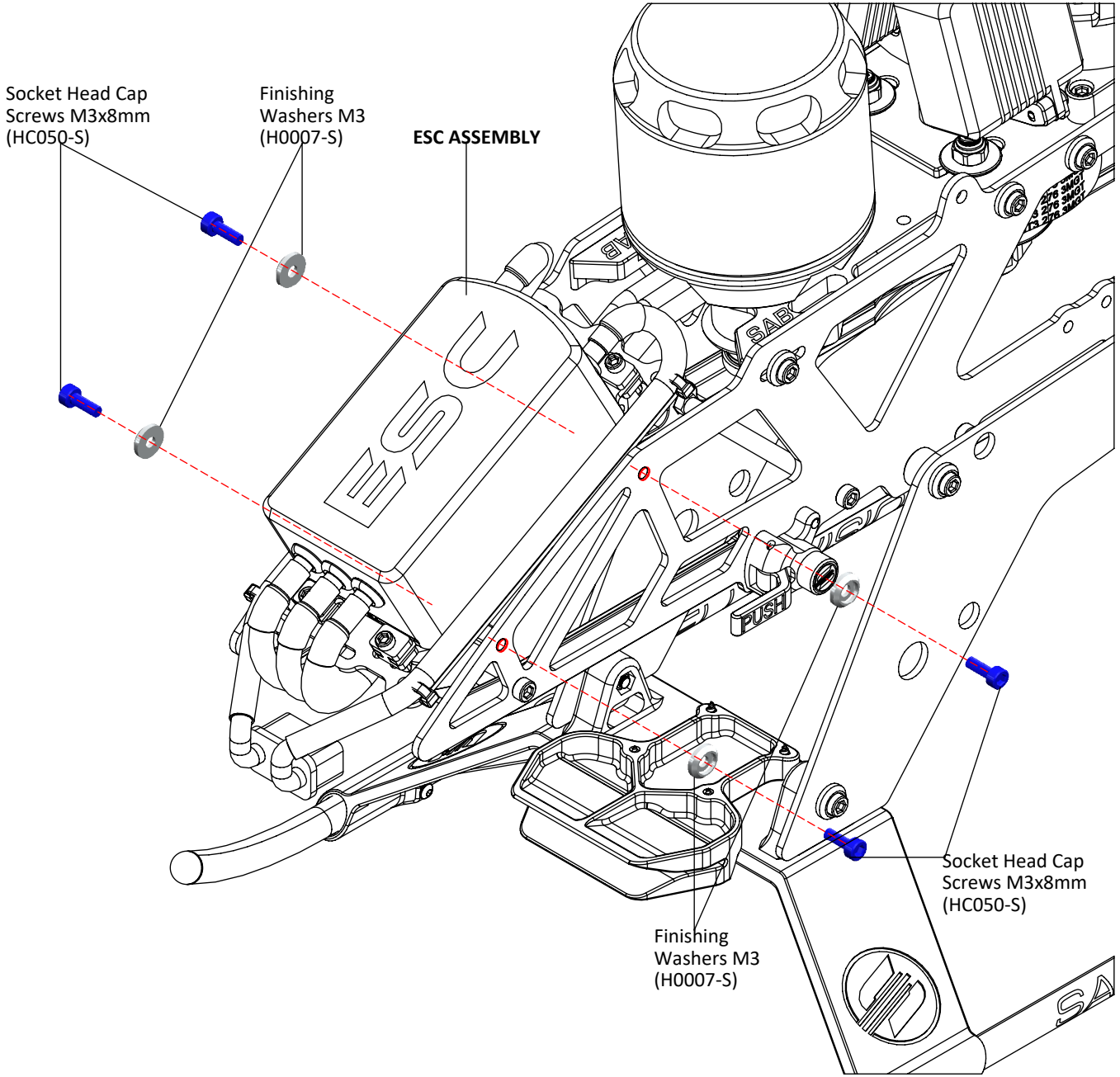
MOTOR BELT TENSION

*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.



Box 1, Bag for page 21





BOXES 1-2, BAG FOR PAGE 22

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.

eg: MULTI PURPOSE GREASE [HA096]

Button Head Cap Screw M4x6mm (HC096-S)

Smaller ID

Thrust Bearing ∅5x∅10x4mm (HC435-S)

Larger ID

Spacer ∅7.5x∅10x0.5mm [H0349] (H0330-S)

Tail Blade Grip Assembly (H1893-S)

Already Assembled With Loctite

Socket Head Cap Screw M2x6mm (HC004-S)

Bearing ∅5x∅10x4mm (HC411-S)

Already Assembled

Spacer ∅5x∅8.5x0.75mm (H0330-S)

O-ring (HC335-S)

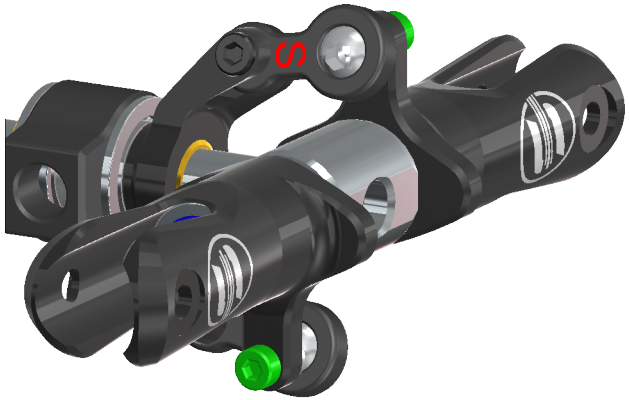
Spindle Shaft (H0329-S)

Tail Shaft (H2386-S)

eg: MULTI PURPOSE GREASE [HA096]

Uniball M2.5 (H0064-S)

TAIL PITCH SLIDER ASSEMBLY



TAIL PITCH SLIDER ASSEMBLY

Note: S >> Left Side

Socket Head Cap Screw M2x6mm (HC004-S)

Bushings ∅2x∅3x3mm [H0076] (H0261-S)

Note: S >> Right Side

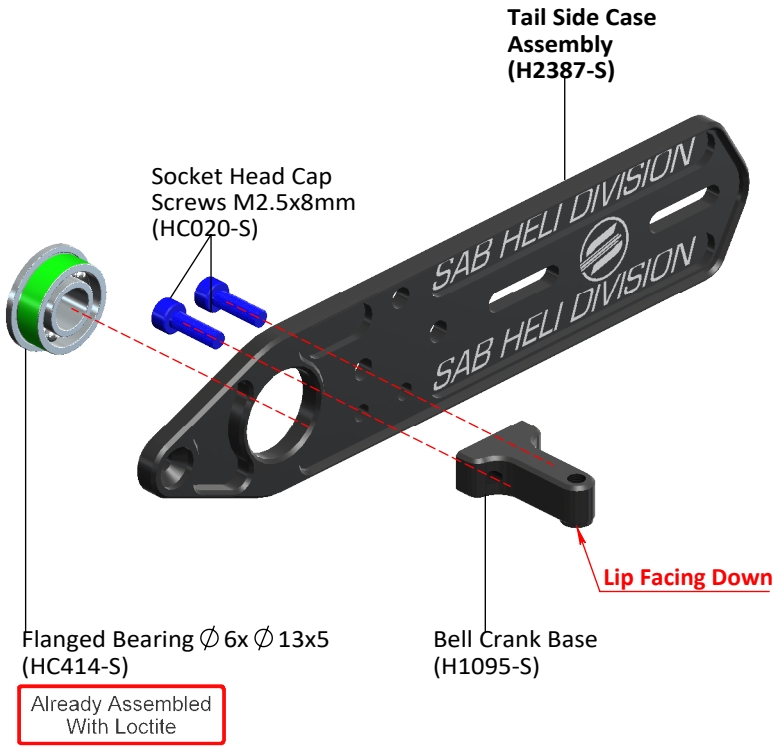
Tail Pitch Slider Links (H0261-S)

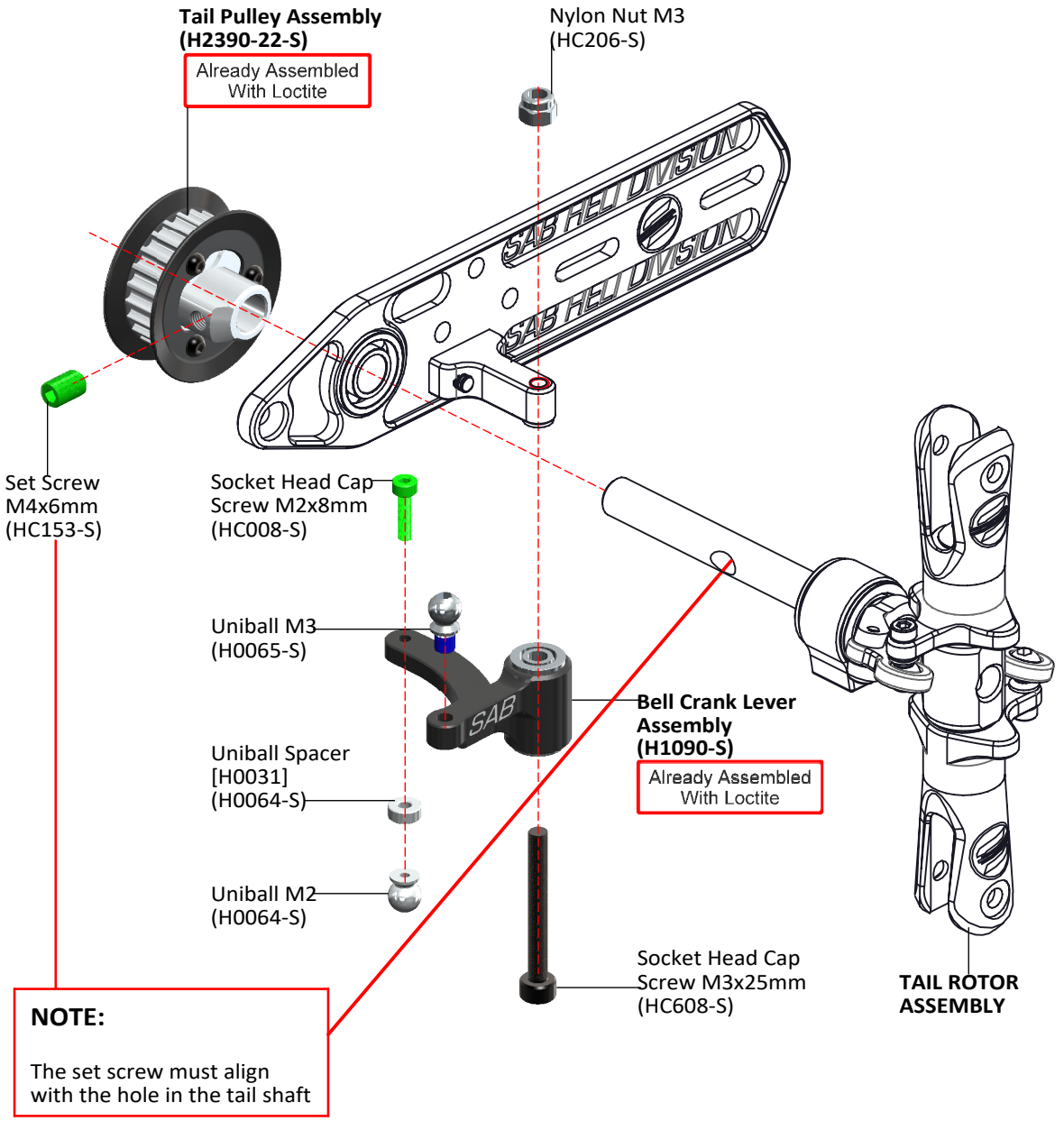
Tail Pitch Slider Assembly (H1112-S)

Already Assembled With Loctite

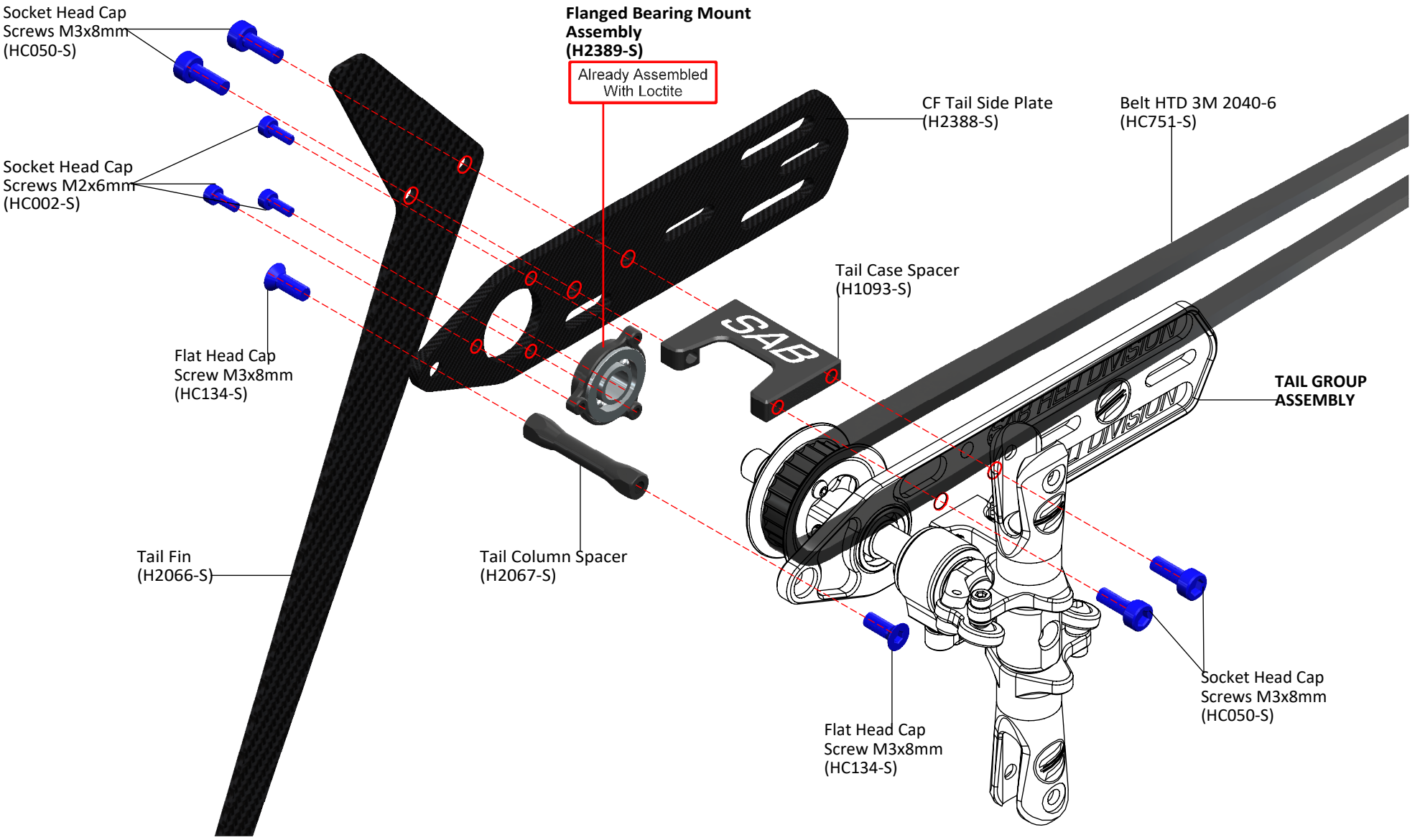
Socket Head Cap Screw M2x6mm (HC004-S)

BOXES 1-2, BAG FOR PAGE 23



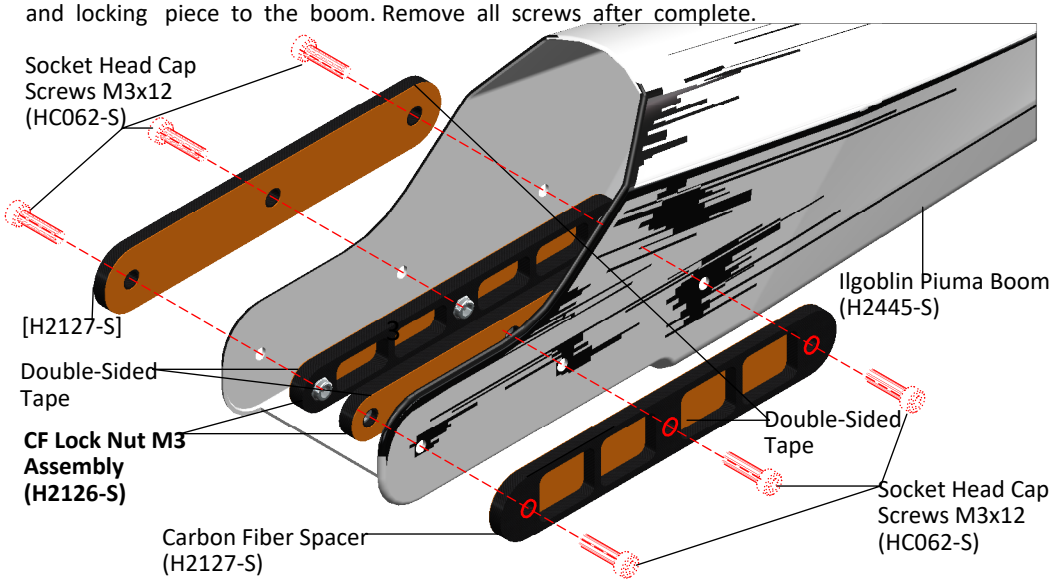


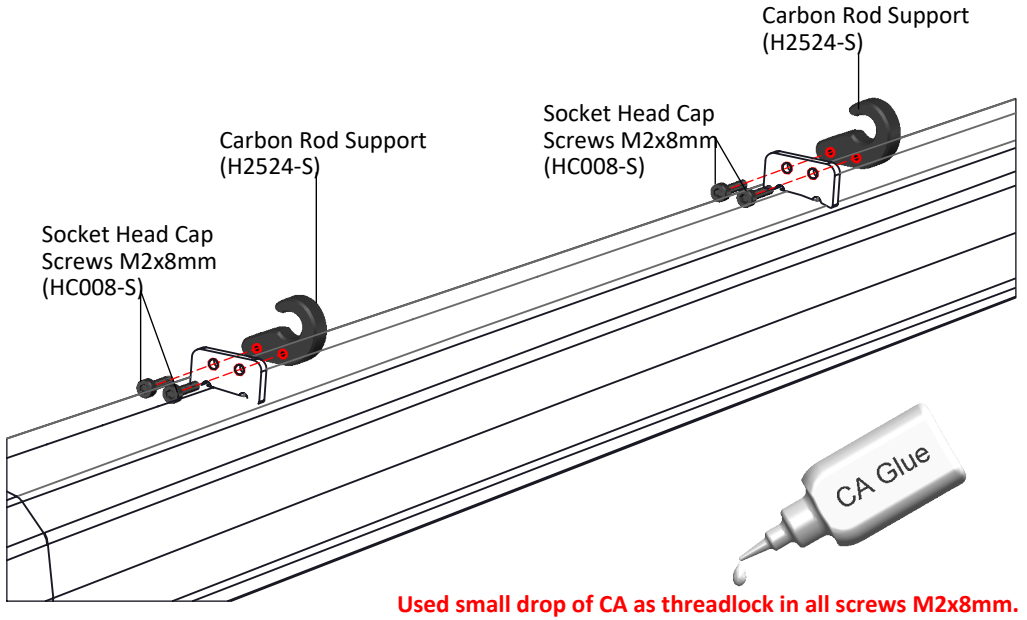
BOX 1, BAG FOR PAGE 24



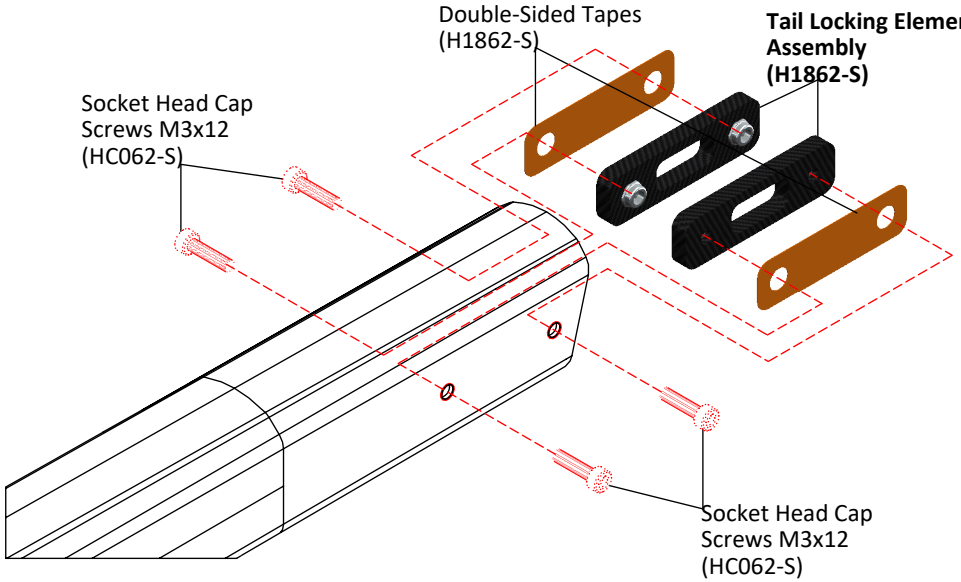
BOXES 1-3, BAG FOR PAGE 25

SUGGESTION: You can use M3x12 screws to aid in mounting the spacer and locking piece to the boom. Remove all screws after complete.

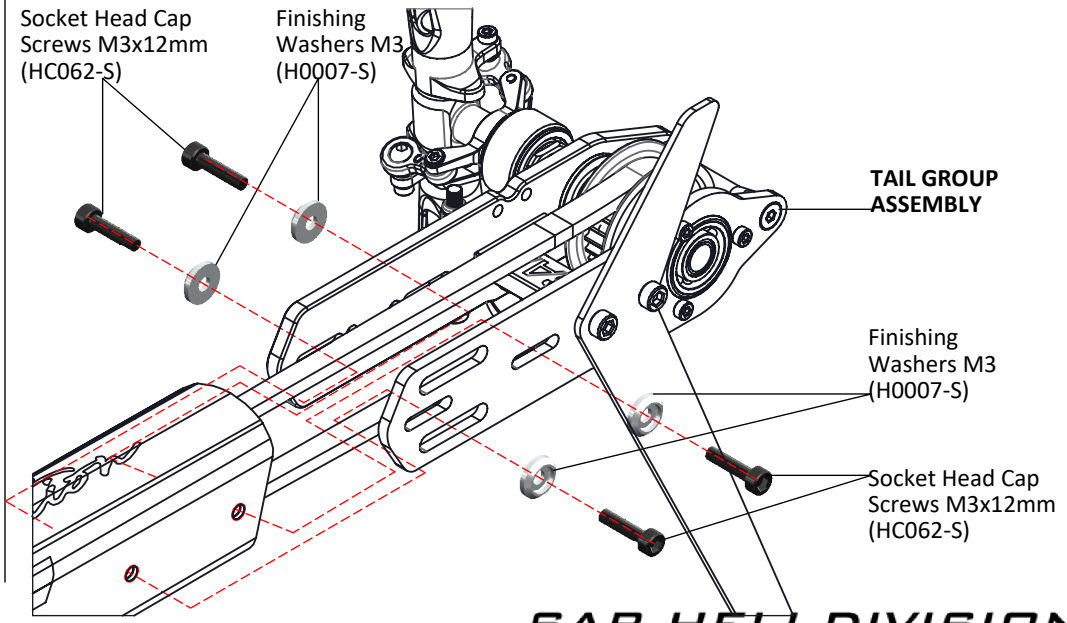




Used small drop of CA as threadlock in all screws M2x8mm.

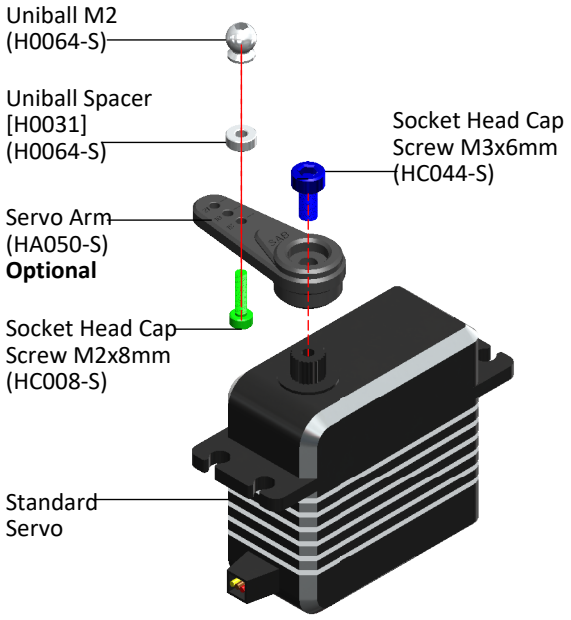


NOTE: Do not tighten the M3x12 at this moment.

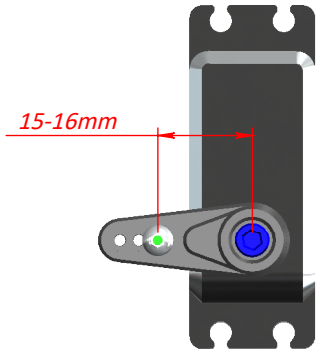


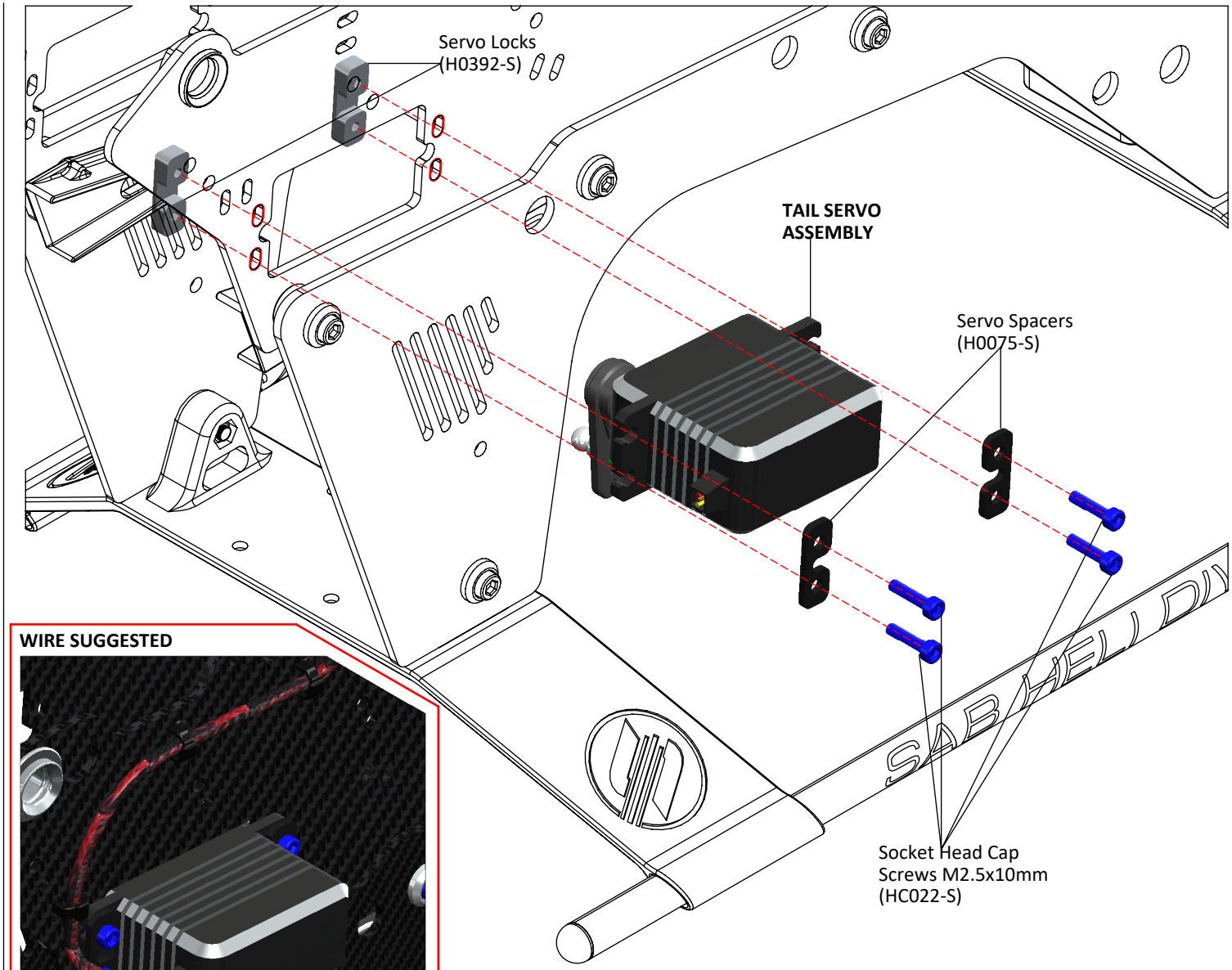
BOX 3, BAG FOR PAGE 26

TAIL SERVO ASSEMBLY



The distance between the axis and the ball must be around 15mm - 16mm





WIRE SUGGESTED

Box 1, Bag for page 27

TAIL BOOM ASSEMBLY

To fit the tail belt, loosen the tail case by loosening the 4 M3 screws (**Figure 1**).

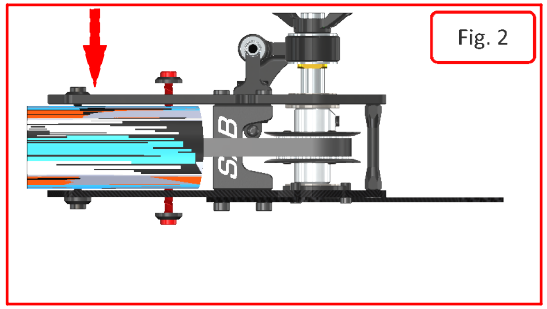
*Install the belt onto the tail front pulley, checking the direction of rotation.

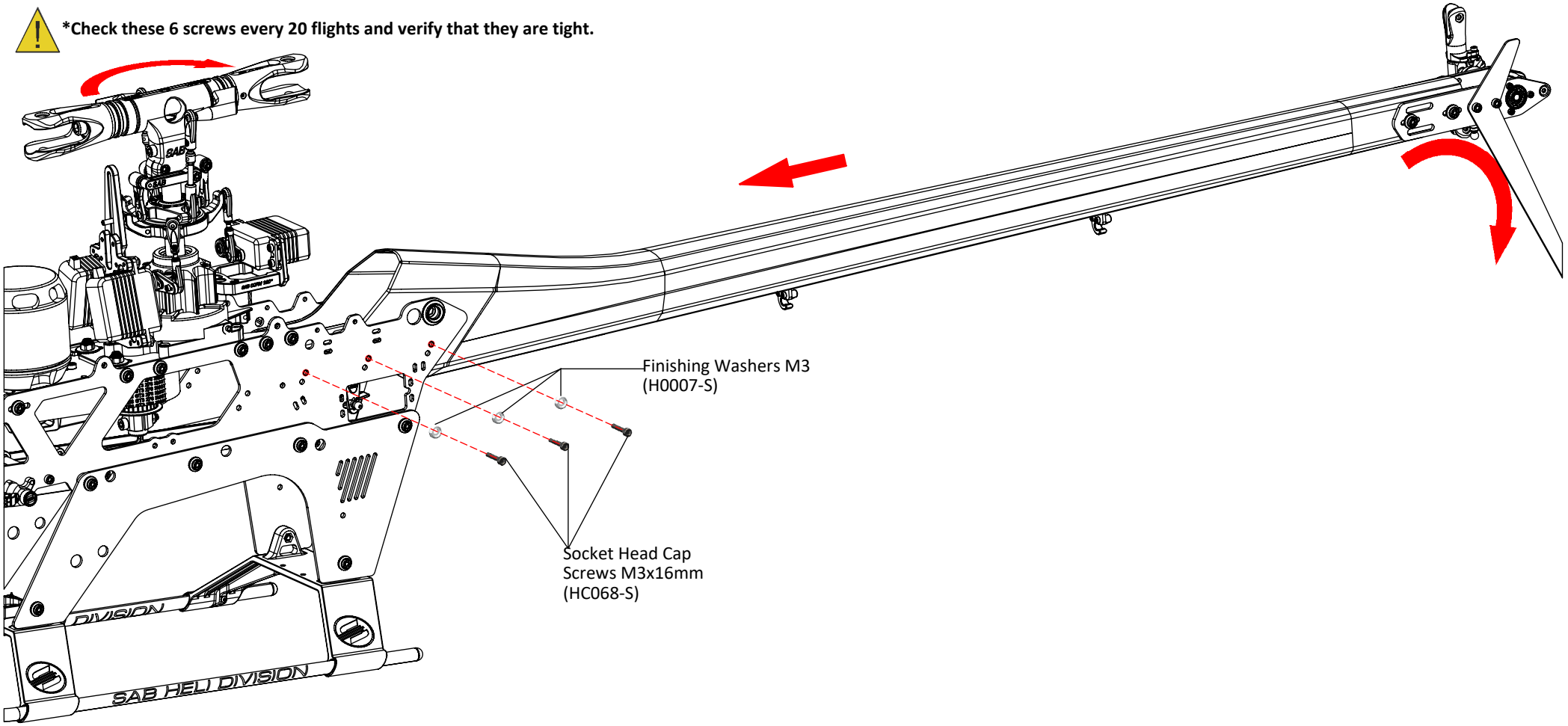
*Insert and tighten the 6 M3 screws.

*Rotate the tail drive several times by hand.

*Tension the tail case by hand and slowly tighten the 2 BLACK screws in (**Figure 2**).

***Check these 6 screws every 20 flights and verify that they are tight.**





TAIL BELT TENSION

To provide the correct tail belt tension, you can use the **"zig-zag"** method.

Figure 1, Loosen the 2 **RED** screws and the **BLUE** screw, then push the tail side in the direction indicated by the red arrow. While pushing, tighten the **BLUE** screw.

Figure 2, Loosen the 2 **RED** screws and the **YELLOW** screw, then push the tail side as indicated by the red arrow. While pushing, tighten the **YELLOW** screw. Continue adjusting step by step until the tail belt is sufficiently tight. Note that a Hard 3D flying style will require more tension; once you achieve the desired tension, ensure all screws are tight and the tail shaft is perfectly aligned and straight.

Figure 3, The tail output shaft must be perpendicular to the boom mid-line.

Fig. 1

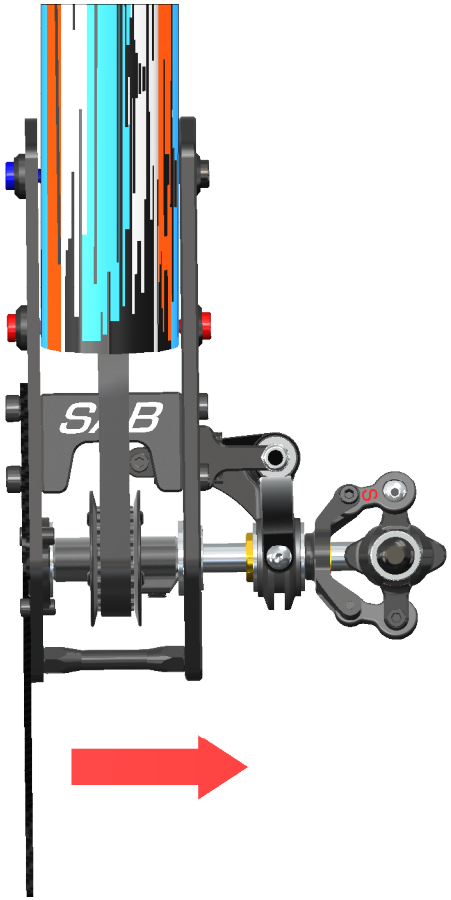


Fig. 2

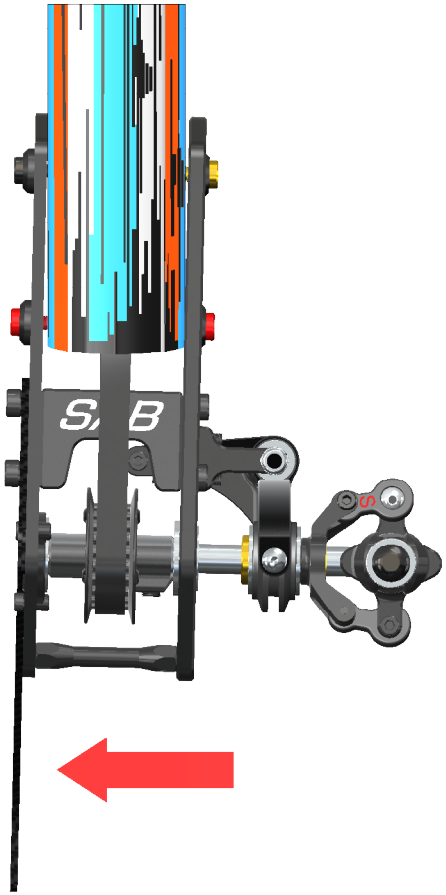
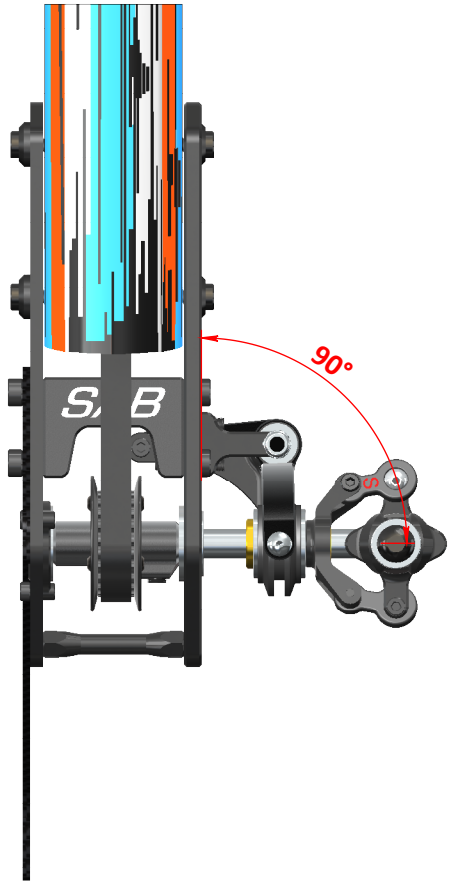
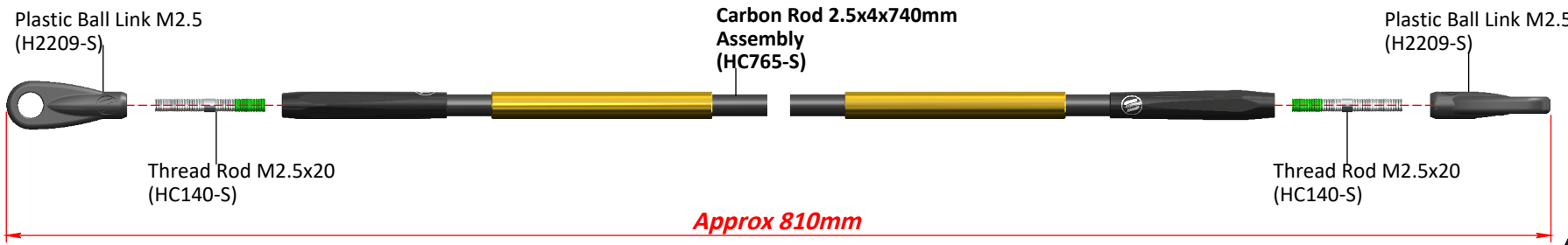


Fig. 3



Box 3, Bag for page 29



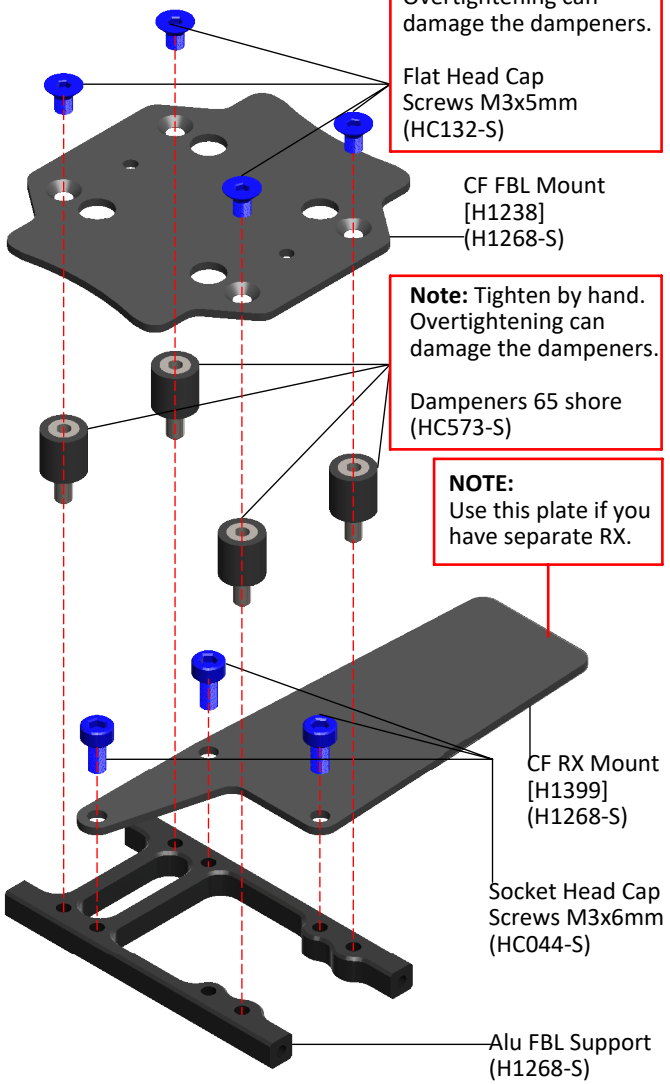
NOTE:
The carbon rod is slightly bent, generating a little preload against the carbon rod support.

Glue the brass bushing onto the carbon rod, making sure it is centered with respect to the movement in the Delrin support. Glue with 1 drop of CA glue.

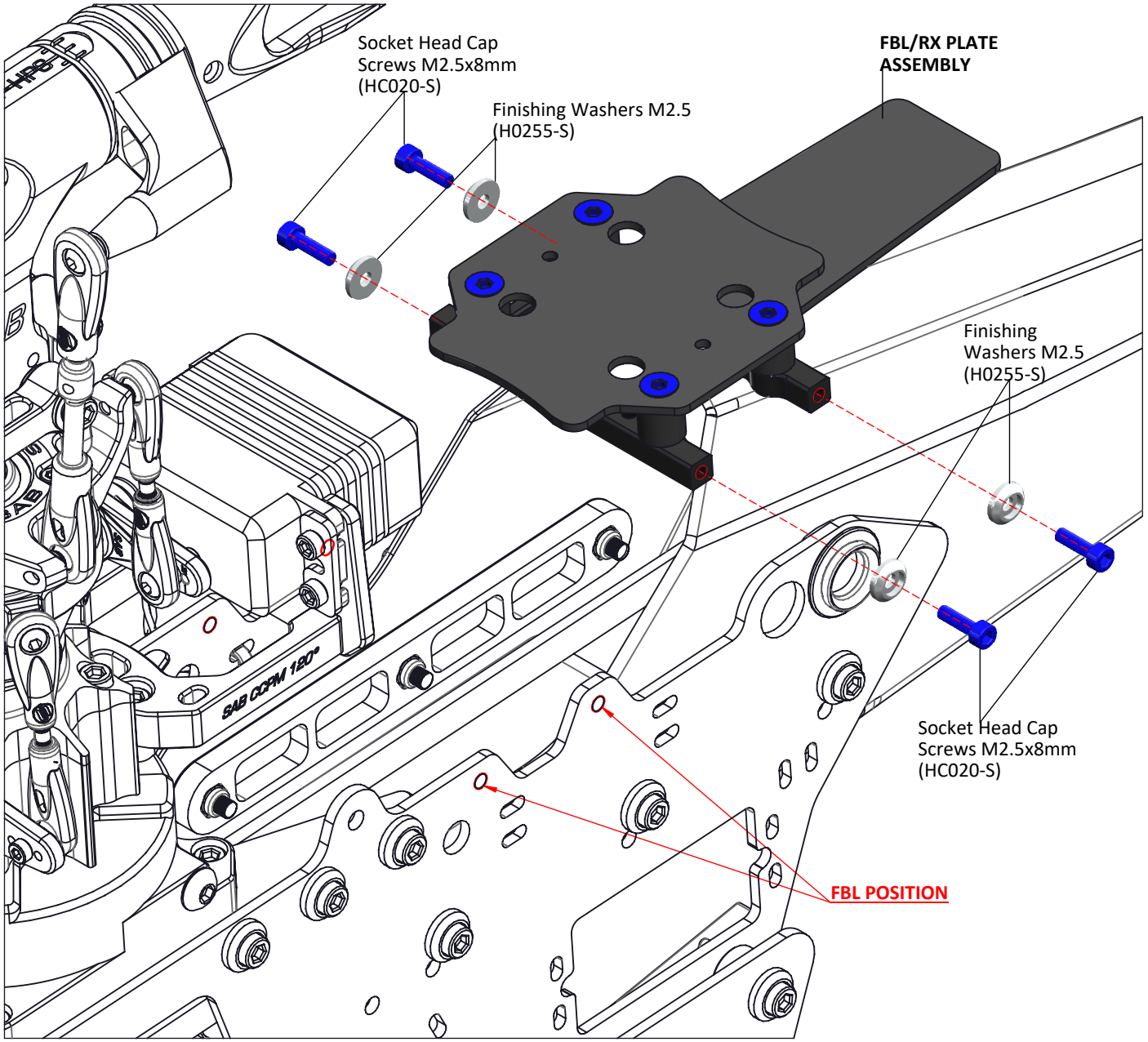
BOX 1, BAG FOR PAGE 30

FBL/RX PLATE ASSEMBLY

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

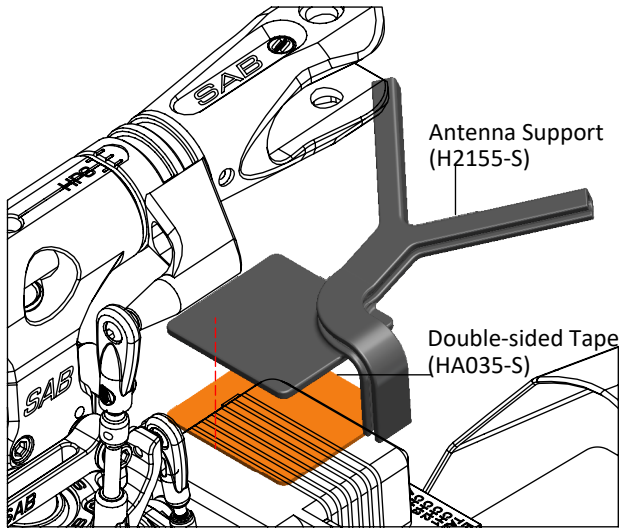


If you do not want to use the dampeners, you can setup a rigid FBL mount support using the screws and bushings contained in bag 30-2



Box 1, Bag for page 31

In bag 31-2, you can find a “3D Printed” antenna support.
Use it as desired with your RX system.



Socket Head Cap
Screw M3x8mm
(HC050-S)

Note:
You can use a small piece of heat shrink tube to secure the antenna wires in place.

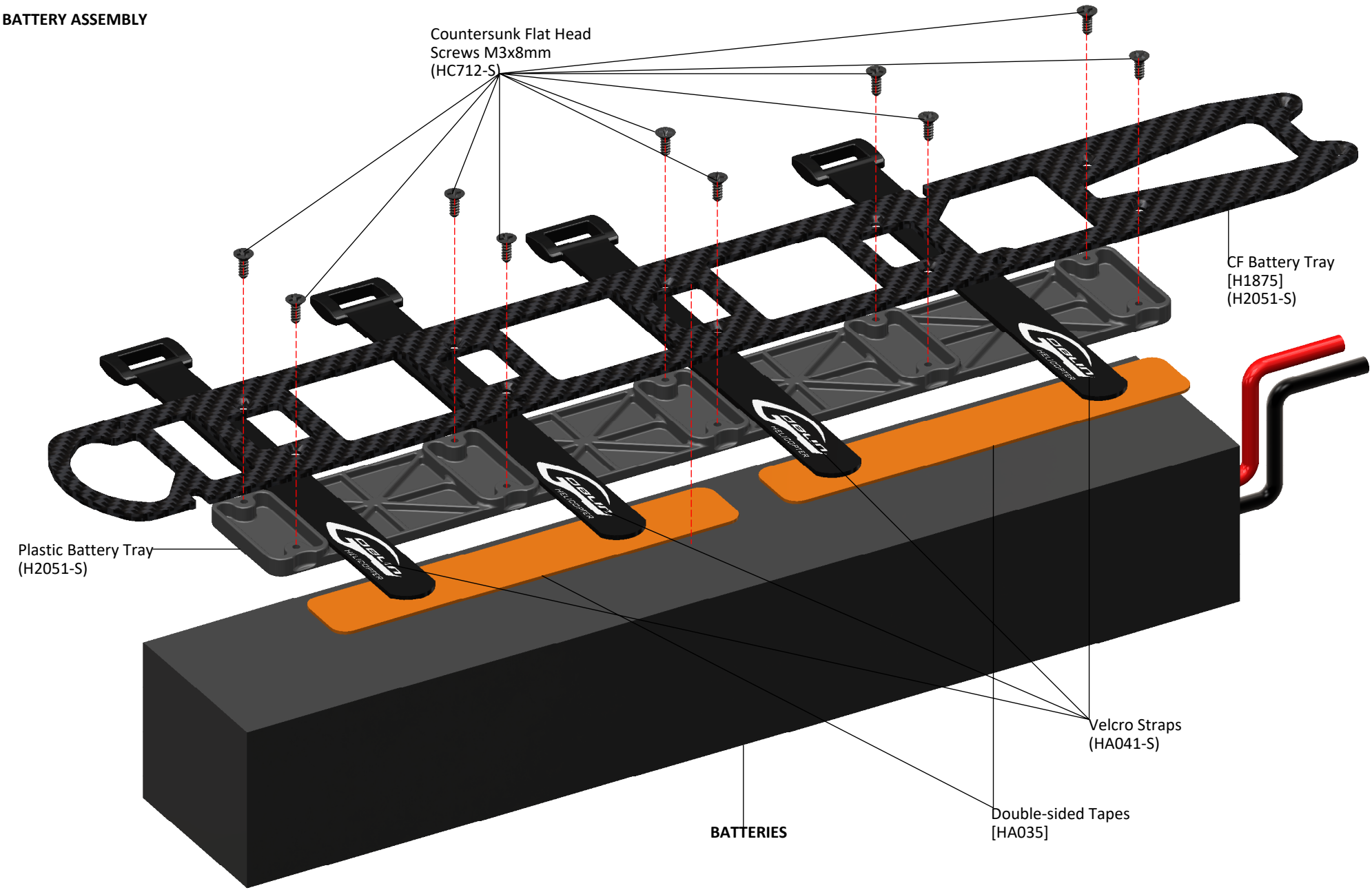
Socket Head Cap
Screw M3x8mm
(HC050-S)

Wire Support
(H1798-S)

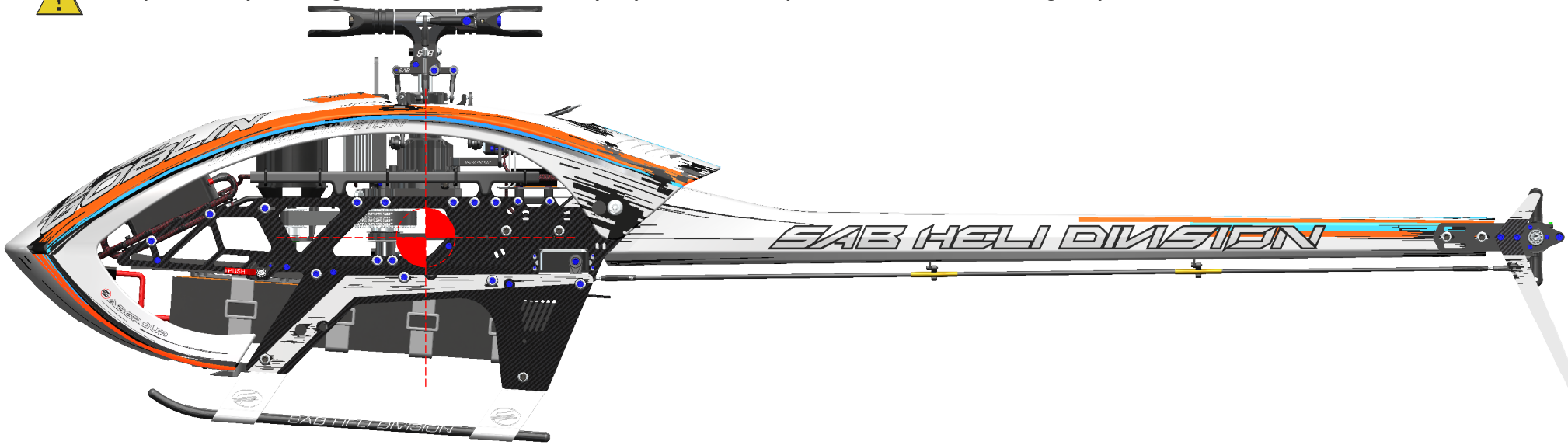
Zip-Tie

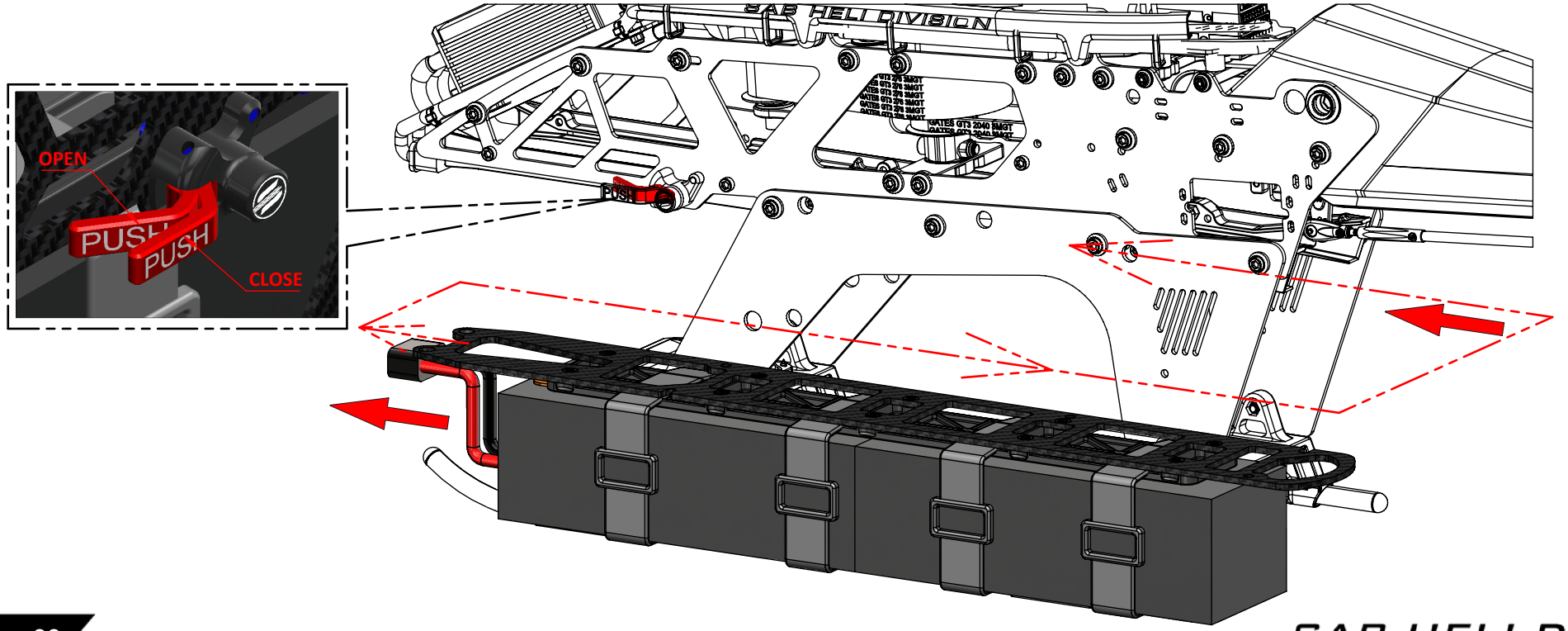
BOX 1, BAG FOR PAGE 32

BATTERY ASSEMBLY



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





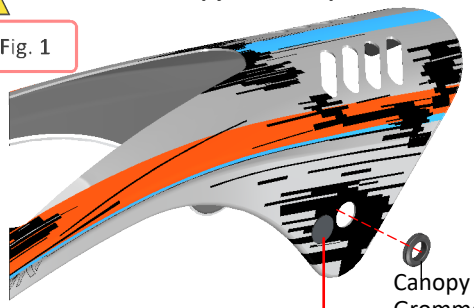
CANOPY

*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.**

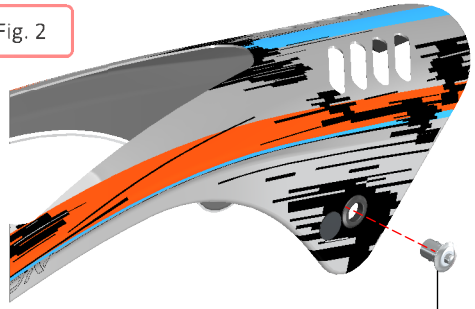
Fig. 1



Canopy Grommet (HA021-S)

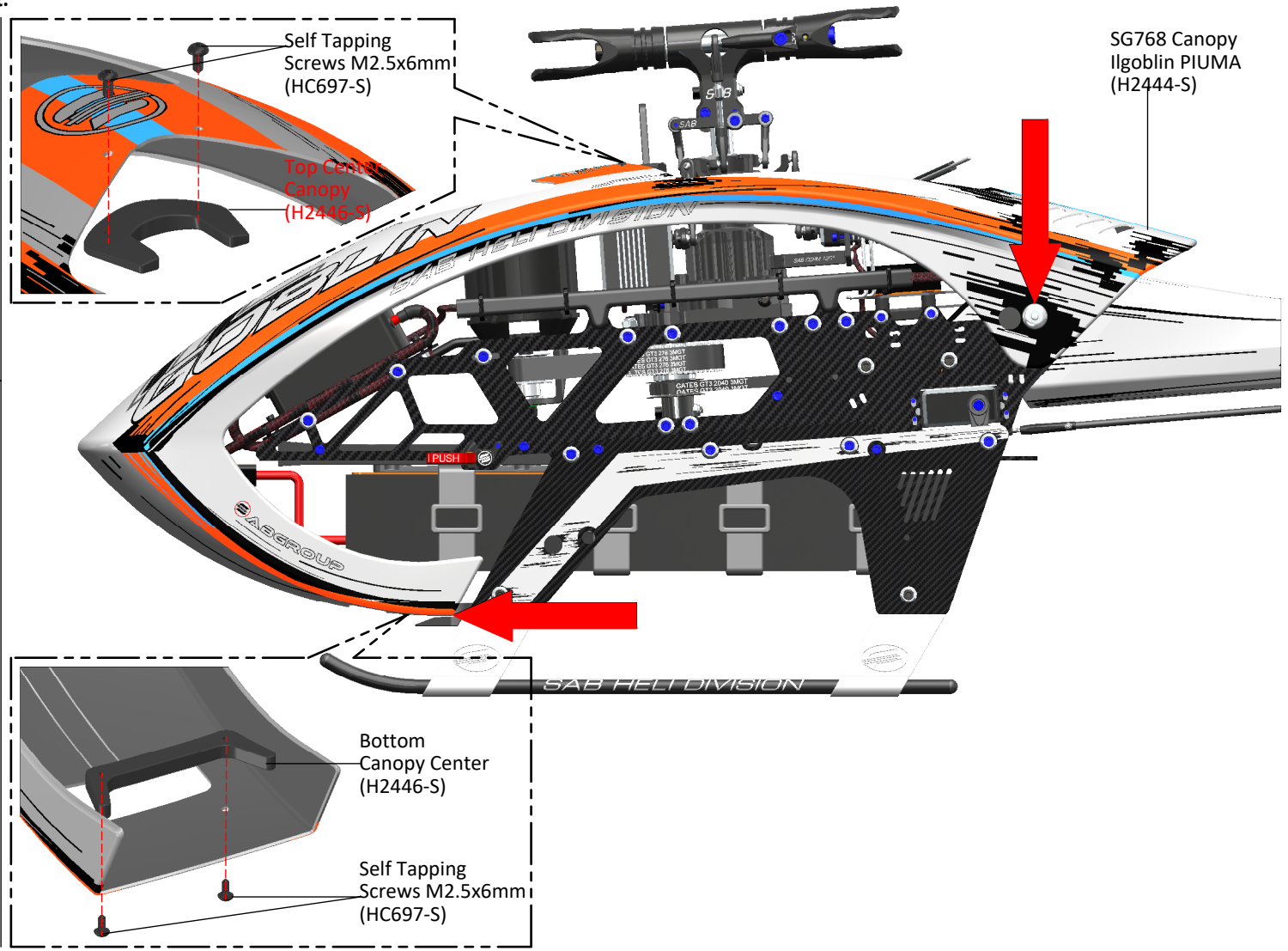
Remove cap and install canopy grommet this position if you want use on KIT SG760-SG763

Fig. 2



CANOPY KNOBS ASSEMBLY (H2106-S)

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 1, BAG FOR PAGE 35

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 2100rpm.

*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 O-ring and dampers you can get different responses of the model.

O-ring
80 Shore: Soft for smooth response
90 Shore: Firm for direct and precise response
Damper
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].

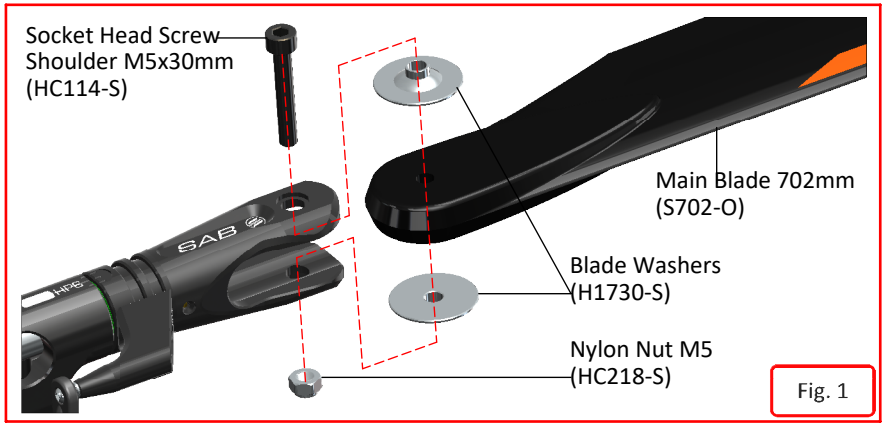


Fig. 1

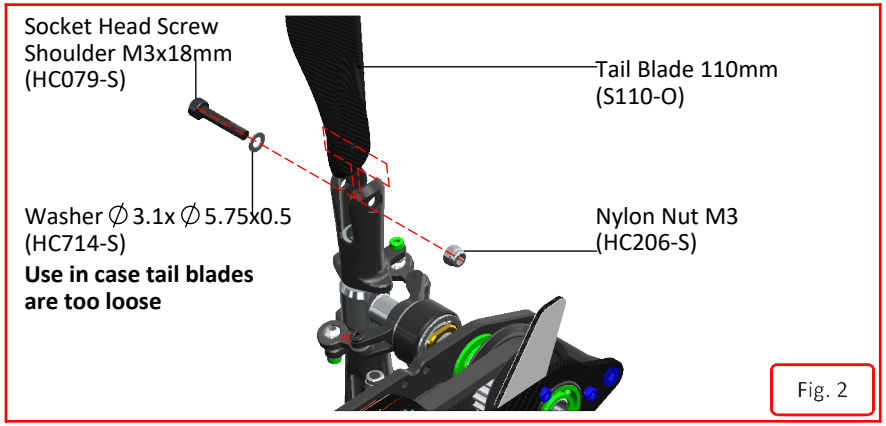


Fig. 2

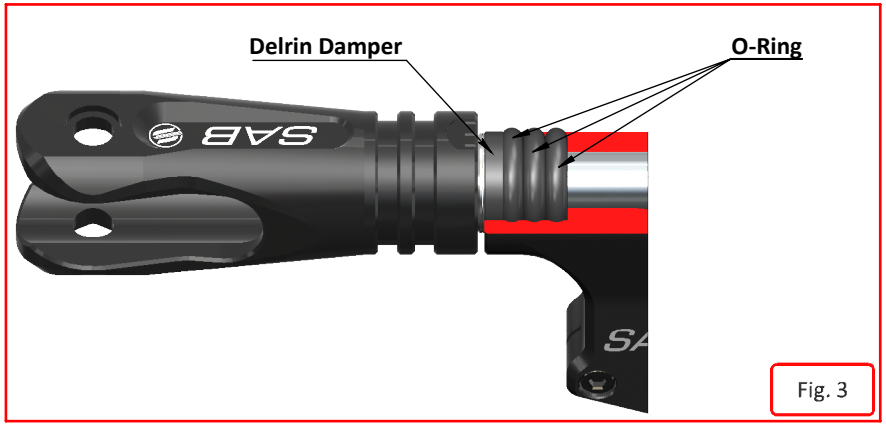
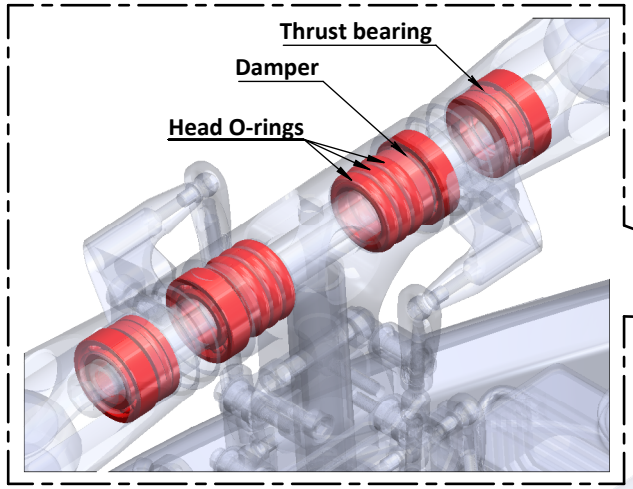


Fig. 3

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.



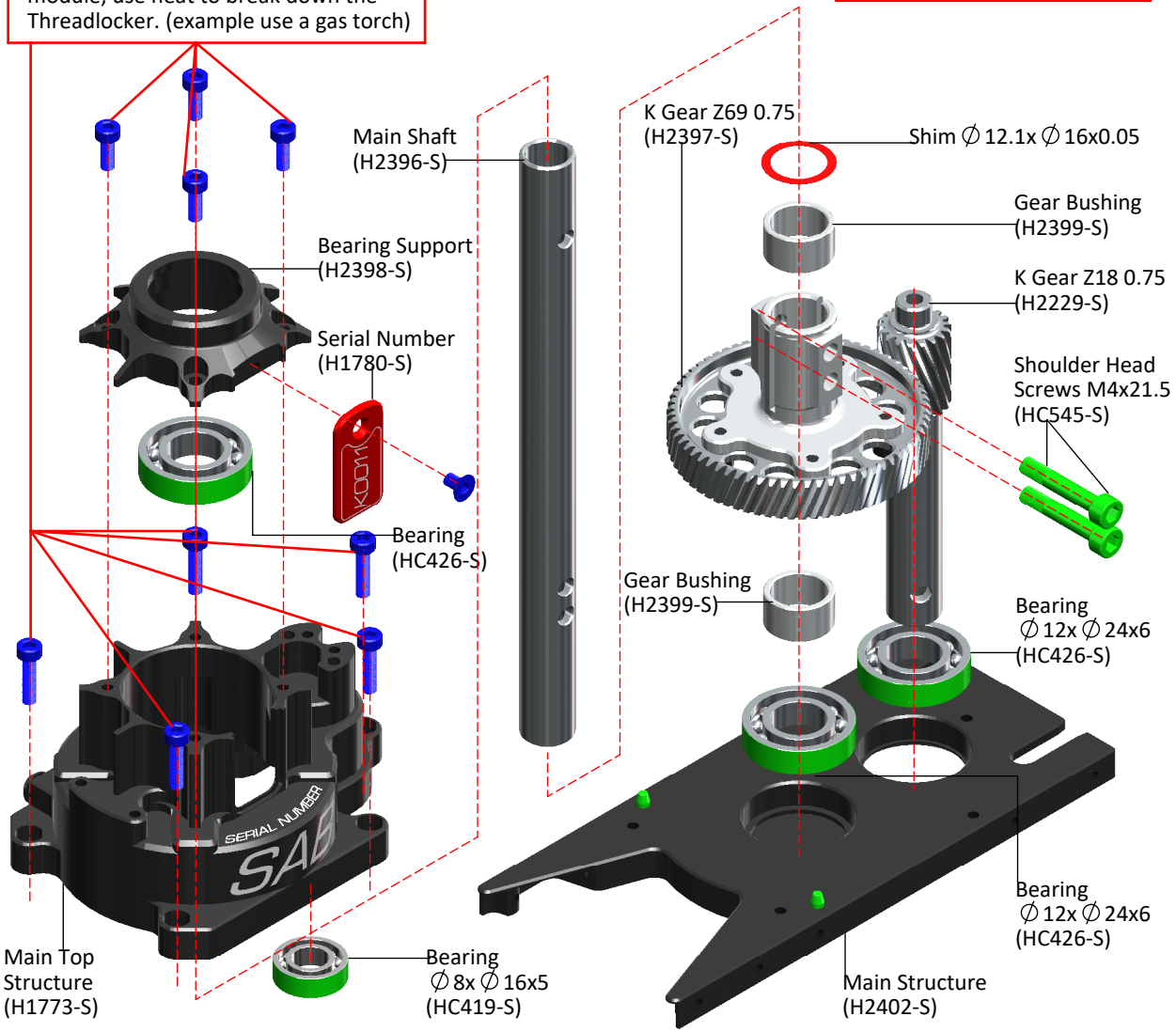
TRANSMISSION MODULE

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

Explode and Spare Parts

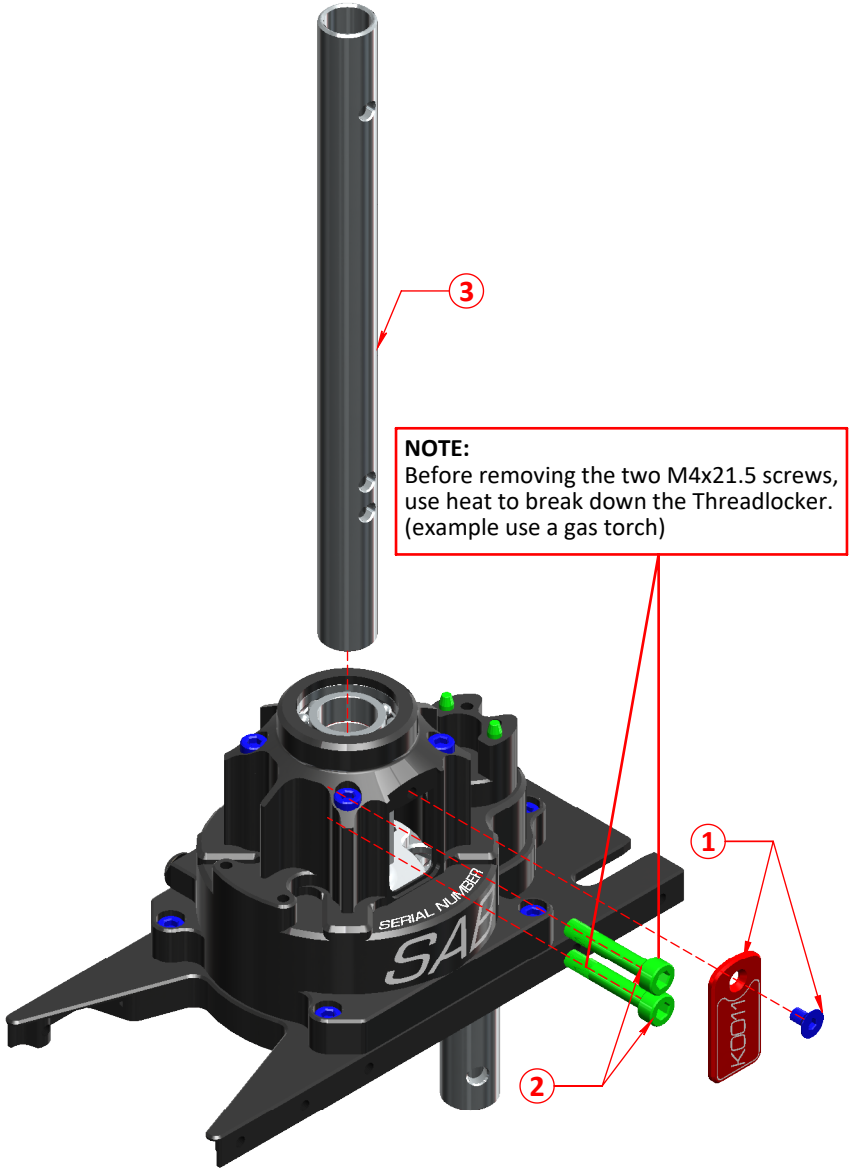
NOTE:
Before opening the transmission module, use heat to break down the Threadlocker. (example use a gas torch)

Use SAB HA076 Grease inside the module.



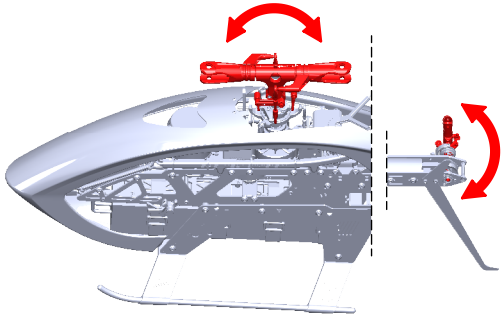
MAIN SHAFT REPLACEMENT

For replacing the main shaft:
*Remove the serial number plate.
*Remove the two M4x21.5 screws.
*Remove and replace the main shaft.
*Screw in the two M4x21.5 screws, with high force and using retaining compound.

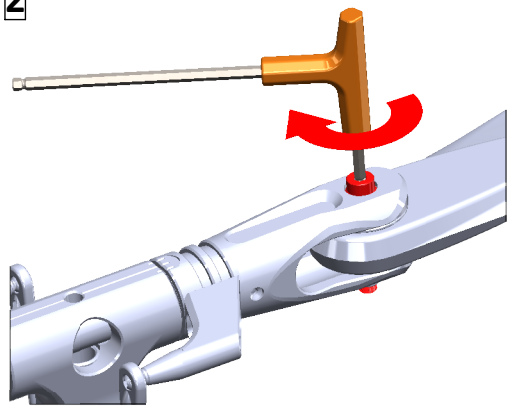


NOTE:
Before removing the two M4x21.5 screws, use heat to break down the Threadlocker. (example use a gas torch)

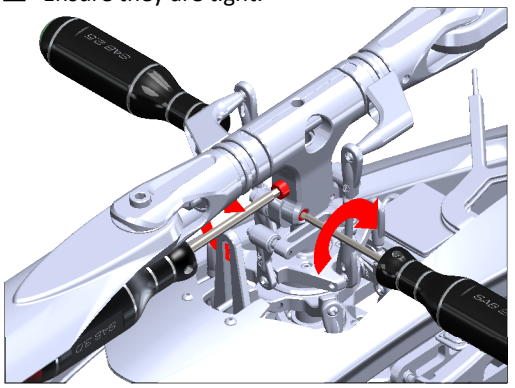
1 **Check the dampening on the main and tail rotor to be the same as always.**



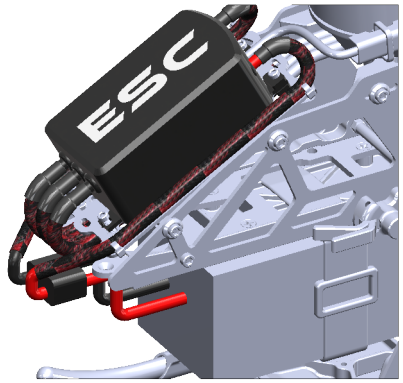
2 **Tighten the main blades before flight.**



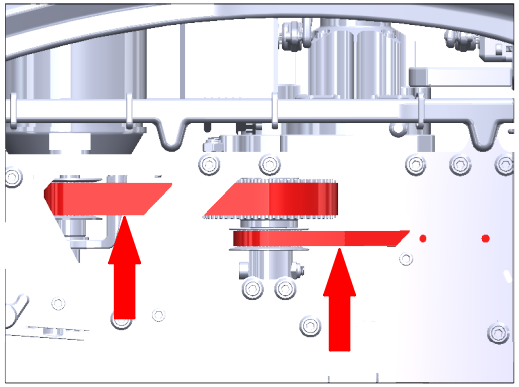
3 **Check main hub screws(M4 and 2 M3)**
Ensure they are tight.



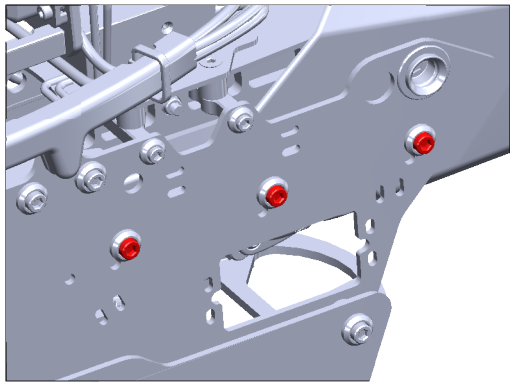
4 **Check all power connectors (Good mechanical connection).**



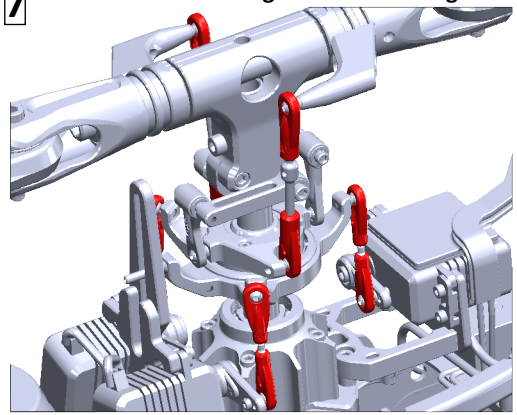
5 **Check Tail & Motor belt tension.**
The tension has to be tight.



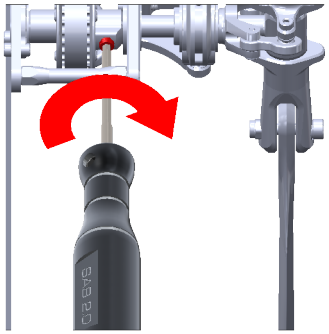
6 **Regularly check these 6 M3 screws.**
Ensure they are always fully tightened.



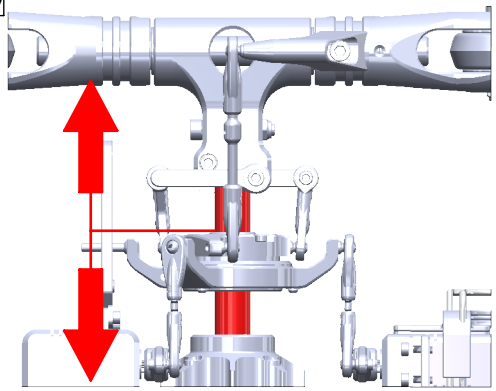
7 **Check the Main Linkages & Servo Linkages**



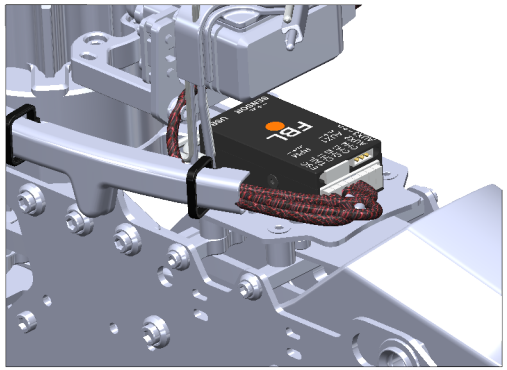
8 **Check tail pulley set screws:**
Ensure they are tight.
(It is suggested use a bit of retaining compound.)



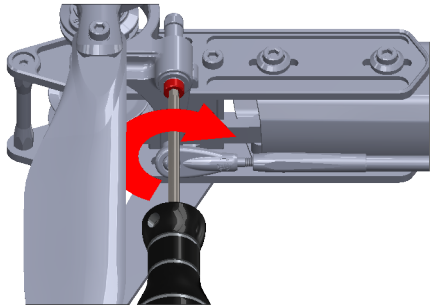
9 **Check for vertical play of the main shaft.**



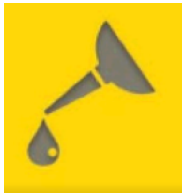
10 **Check if the FBL-RX connectors are OK (hot glue is recommended).**



11 **Check the M3 bell crank:**
Belt crank movement must be smooth and the screw locked.
(It is suggested use a bit of retaining compound.)



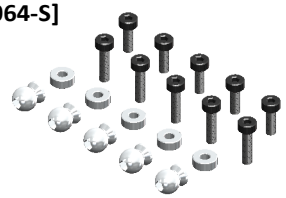
12 **Be sure the follow parts are properly lubricated**
*Main shaft/swashplate
*Tail slider/tail shaft
*Carbon rod/carbon rod support
*All thrust bearings
*All plastic balls connections



Finishing Washer M3
[H0007-S]

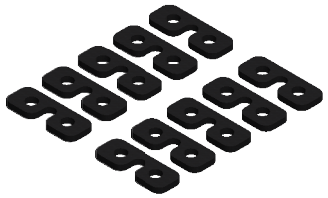
- 10 x Finishing Washers M3.

Uniball M2
[H0064-S]



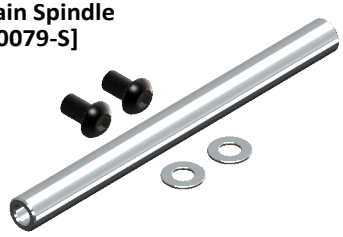
- 5 x Uniball M2.
- 5 x Uniball Spacers.
- 5 x Head Cap Screws M2x6.
- 5 x Head Cap Screws M2x8.

Servo Spacer
[H0075-S]



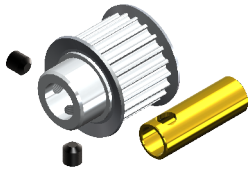
- 10 x Servo Spacers.

Main Spindle
[H0079-S]



- 1 x Main Spindle.
- 2 x Washers ∅ 6,1x ∅ 14x1,8.
- 2 x Button Head Cap Screws M6x10.

Motor Pulley
[H0126-16/24-S]



- 1 x Motor Pulley Z19/24.
- 1 x Motor Bushing.
- 2 x Set Screws M4x4mm.

Radius Arm SET
[H0132-S]

- 2 x Radius Arm Sets.

3rd Bearing Motor Mount
[H0143-S]

- 1 x 3rd Bearing Motor Mount.
- 1 x F.Bearings ∅ 6x ∅ 13x5 .
- 2 x Socket Head Cap Screws M3x8.

Plastic Radius Arm
[H0205-S]

- 2 x Plastic Radius Arms.

Finishing Washer M2,5
[H0255-S]

- 10 x Finishing Washers M2,5.

Tail Pitch Slider Link
[H0261-S]

- 2 x Tail Pitch Slider Links.
- 2 x Bushings ∅ 2x ∅ 3x3.
- 2 x Head Cap Screws M2x6.

Tail Spindle
[H0329-S]

- 1 x Tail Spindle.
- 2 x Button Head Cap Screws M4x6.

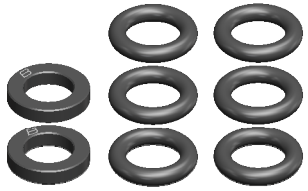
Spacer Set For Tail Rotor
[H0330-S]

- 2 x Tail O-rings.
- 2 x Washers ∅ 5x ∅ 8,9x0,75.
- 2 x Washers ∅ 7,5x ∅ 10x0,5.

Linkage Rod M3x50
[H0417-S]

- 2 x Linkage Rods M3x50mm.
- 4 x Plastic Ball Linkages.

Damper Derlin
[H1046-S]

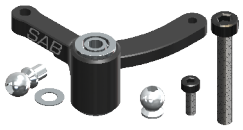


- 2 x Dampers B.
- 6 x O-rings 95 Shore.

Reference Pin
[H1048-S]

- 1 x Reference Pin.

Bell Crank Clever
[H1090-S]



- 1 x Bell Crank Lever ASM.
- 1 x Socket Head Cap Screw M3x22.
- 1 x Socket Head Cap Screw M2x6.
- 2 x Washers ∅ 3,2x ∅ 6x0,1.

Tail Case Spacer
[H1093-S]

- 1 x Tail Case Spacer.
- 4 x Socket Head Cap Screws M3x8.

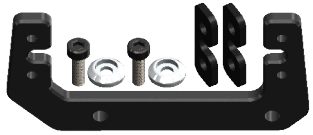
Bell Crank Support
[H1095-S]

- 1 x Bell Crank Support.
- 2 x Socket Head Cap Screws M2,5x8.

Tail Pitch Silder
[H1112-S]

- 1 x Tail Pitch Slider ASM.
- 2 x Tail Linkages.
- 2 x Bushings.
- 2 x Socket Head Cap Screws M2x6.

Back Servo Mount
[H1207-S]

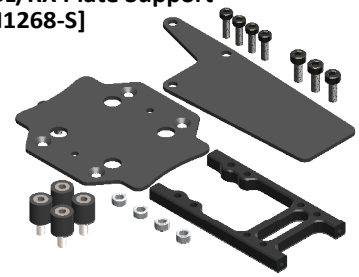


- 1 x Back Servo Mount.
- 2 x Finishing Washers M2,5.
- 2 x Servo Spacers.
- 2 x Socket Head Cap Screws M2,5x8.

Landing Gear Rod D8x335
[H1242-S]

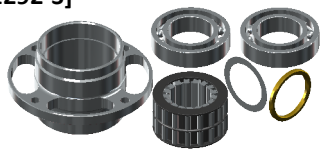
- 2 x Landing Gear Rods D8x335.
- 4 x Plastic Plugs.

FBL/RX Plate Support
[H1268-S]



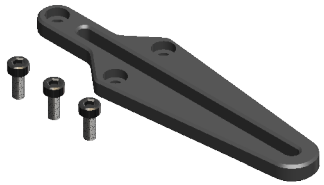
- 1 x FBL/RX Plate Support SET.

OWB Support 12mm
[H1292-S]



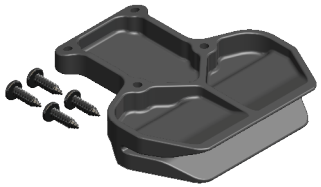
- 1 x OWB Support 12mm.
- 2 x Bearings ∅ 12x ∅ 21x5.
- 1 x OWB ∅ 12x ∅ 20x11.
- 1 x Bushing ∅ 12,1x ∅ 15x1,4.
- 1 x Shim ∅ 12,1x ∅ 16x0,1.

Anti-rotate Swashplate
[H1378-S]



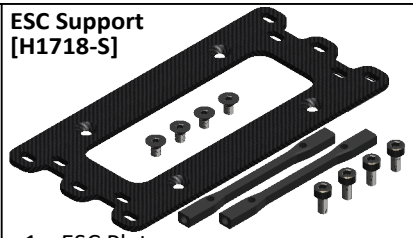
- 1 x Anti-rotate Swashplate.
- 2 x Socket Head Cap Screws M2,5x6.

Canopy Front Lock
[H1439-S]



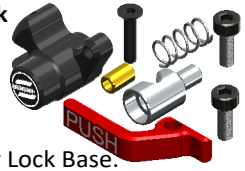
- 1 x Canopy Front Lock.
- 4 x Self Tapping Screws M3x10.

ESC Support
[H1718-S]



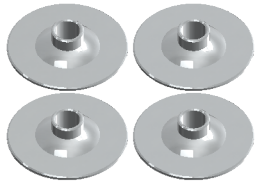
- 1 x ESC Plate.
- 2 x ESC Frame Spacers.
- 4 x Socket Head Cap Screws M3x6.
- 4 x Flat Head Cap Screws M3x5.

Battery Lock
[H1721-S]



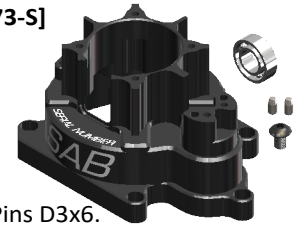
- 1 x Battery Lock Base.
- 1 x Battery Lock Level.
- 1 x Battery Lock Pin.
- 1 x Battery Lock Spring.
- 1 x Bushing ∅ 2,5x ∅ 4x6,3.
- 1 x Flat Head Cap Screw M2,5x12.
- 2 x Socket Head Cap Screws M3x6.

Main Blade Washer
[H1730-S]



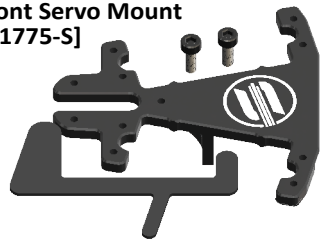
- 4 x Main Blade Washers.

Bottom Gear Box Case
[H1773-S]



- 2 x Pins D3x6.
- 1 x Bottom Gear Box Case.
- 1 x Button Head Cap Screw M4x6.
- 1 x Ball Bearing ∅ 8x ∅ 16x5.

Front Servo Mount
[H1775-S]



- 1 x Front Servo Mount.
- 1 x Servo Align Tool.
- 2 x Socket Head Cap Screws M3x8.

Serial Number
[H1780-S]

- 1 x Serial Number.
- 1 x Flat Head Cap Screw M3x5mm.

Blade Grip Arm 30
[H1789-S]

- 2 x Blade Grip Arms 30.
- 2 x Uniball M3.
- 2 x Socket Head Cap Screws M4x10.

Main Blade Grip
[H1790-S]

- 1 x Main Blade Grip.
- 1 x Washer ∅ 10x ∅ 16x1.
- 1 x Washer ∅ 6,1x ∅ 14x1,8.
- 1 x Socket Head Cap Screw M6x10.
- 1 x T.Bearing ∅ 10x ∅ 18x5,5.
- 2 x Ball Bearings ∅ 10x ∅ 19x5.

Plastic Wire Cover
[H1798-S]

- 1 x Plastic Wire Cover.
- 2 x Socket Head Cap Screws M3x8.

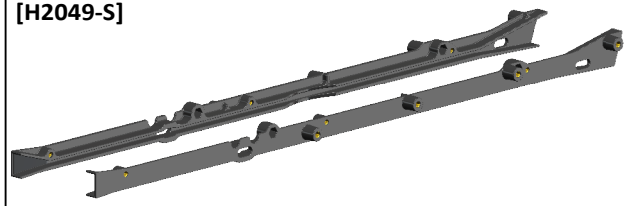
Tail Locking Element 30
[H1862-S]

- 2 x Tail Locking Elements 30.
- 2 x Double-sided Tapes.
- 4 x Nylon Nuts M3.

Tail Blade Grip
[H1893-S]

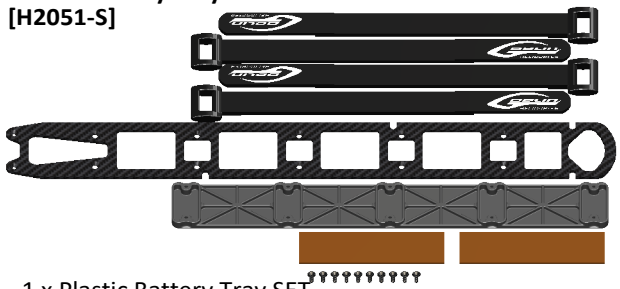
- 2 x Tail Blade Grips.
- 2 x Washers ∅ 7,5x ∅ 10x0,5.
- 2 x Button Head Cap Screws M4x6.
- 4 x Ball Bearings ∅ 5x ∅ 10x4.
- 2 x T.Bearings ∅ 5x ∅ 10x4.

Battery Guide 700
[H2049-S]



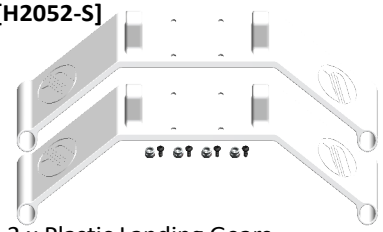
- 1 x Battery Guide SX 700.
- 1 x Battery Guide DX 700.

Plastic Battery Tray
[H2051-S]



- 1 x Plastic Battery Tray SET.

Plastic Landing Gear
[H2052-S]

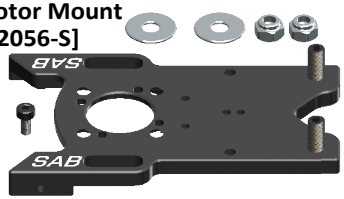


- 2 x Plastic Landing Gears.
- 4 x Nylon Nuts M3.
- 4 x Self Tapping Screws M2,2x6.

HEX 5 Spacer M3x60
[H2054-S]

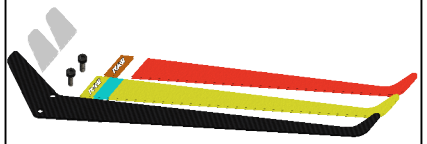
- 2 x HEX 5 Spacers M3x60.

Motor Mount
[H2056-S]



- 1 x Motor Mount 700.
- 1 x Socket Head Cap Screw M3x6.
- 2 x Washers ∅5,3x∅15x1.
- 2 x Nylon Nuts M5.
- 2 x Set Screws M5x16.

Carbon Fiber Tail Fin
[H2066-S]



- 1 x Carbon Fiber Tail Fin.
- 2 x Socket Head Cap Screws M3x8.
- 1 x Sticker Set.

Tail Column Spacer
[H2067-S]

- 1 x Tail Column Spacer.
- 2 x Flat Head Cap Screws M3x8.

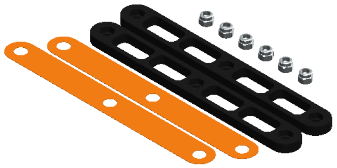
3rd Bearing Support
[H2079-S]

- 1 x 3rd Bearing Support.
- 4 x Finishing Washers M3.
- 4 x Socket Head Cap Screws M3x8.
- 1 x Bearing ∅12x∅18x4.

Canopy Quick Release
[H2106-S]

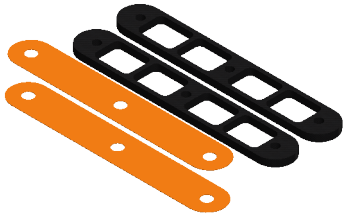
- 2 x Canopy Quick Releases.

CF Lock Nut M3 Boom
[H2126-S]



- 2 x CF Lock Nuts M3 Boom.
- 2 x Double-sided Tapes.
- 6 x Nylon Nuts M3.

Carbon Fiber Spacer Boom
[H2127-S]



- 2 x CF Boom Spacers.
- 2 x CF Boom Spacer Tapes.

Washer ∅10,1x∅16x1 LIP
[H2146-S]

- 4 x Washers ∅10,1x∅16x1.

SLS Antenna 700
[H2155-S]

- 1 x SLS Antena 700.
- 1 x Double-sided Tape.

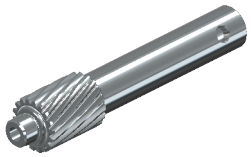
Plastic Ball Linkage M2.5
[H2209-S]

- 10 x Plastic Ball Linkages M2.5.

Plastic Ball Linkage M3
[H2210-S]

- 10 x Plastic Ball Linkages M3.

Pinion Z18xD12
[H2229-S]



- 1 x Pinion Z18xD12.

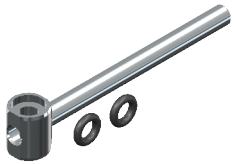
Swashplate D12
[H2326-S]

- 1 x Swashplate SET ASM.
- 7 x Uniballs M3.
- 1 x Reference Pin.

Main Hub D12
[H2383-S]

- 1 x Main Hub D12.
- 1 x Socket Head Cap Screw M3x12.
- 1 x Nylon Nut M4.
- 1 x Socket Shoulder Screw M4x24.

Tail Shaft D6
[H2386-S]



- 1 x Tail Shaft D6.
- 2 x O-rings Shore 70.

Alu Tail Side Plate
[H2387-S]

- 1 x Alu Tail Side Plate.
- 1 x Flanged Bearing ∅6x∅13x5.

CF Tail Side Plate
[H2388-S]

- 1 x CF Tail Side Plate.

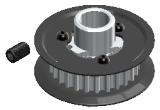
Cabon Rod Support
[H2524-S]

- 2 x Carbon Rods Support.
- 4 x Socket Head Cap Screws M2x8.

Tail Bearing Mount
[H2389-S]

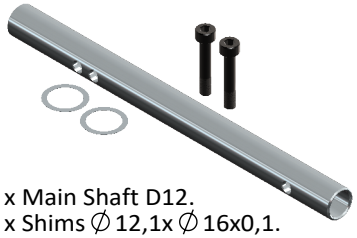
- 1 x Tail Bearing Mount.
- 3 x Socket Head Cap Screws M2x5.
- 1 x Flanged Bearing ∅ 6x ∅ 13x5.

Tail Pulley Z21/Z26
[H2390-21/26-S]



- 1 x Tail Pulley Z21/Z26.
- 2 x Tail Pulley Z21/Z26 WS.
- 6 x Button Head Cap Screws M2x4.
- 1 x Set Screw M4x6mm.

Main Shaft D12
[H2396-S]

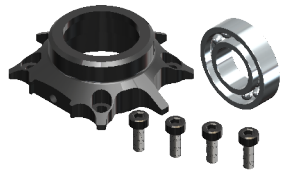


- 1 x Main Shaft D12.
- 2 x Shims ∅ 12,1x ∅ 16x0,1.
- 2 x Socket Shoulder Screws M4x21,5.

Main Gear Z68
[H2397-S]

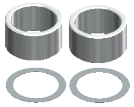
- 1 x Main Gear Z68.
- 1 x Main Gear Mount D12.
- 5 x Socket Head Cap Screws M3x6.
- 2 x Socket Shoulder Screws M4x21.5.

Top Gear Box Case D12
[H2398-S]



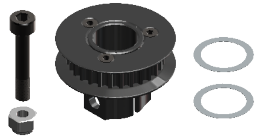
- 1 x Top Gear Box Case D12.
- 4 x Socket Head Cap Screws M3x8.
- 1 x Bearing ∅ 12x ∅ 24x6.

Gear Bushing
[H2399-S]



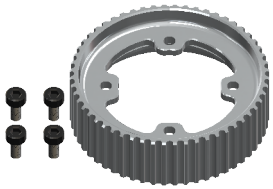
- 2 x Bushings ∅ 12,2x ∅ 15,2x8,5.
- 2 x Shims ∅ 12,1x ∅ 16x0,1.

Front Tail Pulley Z28
[H2400-S]



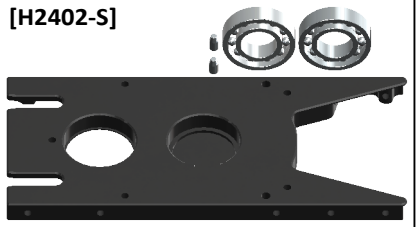
- 1 x Front Tail Pulley Z28 ASM.
- 1 x Nylon Nut M4.
- 2 x Shims ∅ 12,1x ∅ 16x0,1.
- 1 x Socket Shoulder Screw M4x21,5.

Main Pulley Z56x16
[H2401-S]



- 1 x Main Pulley Z56x16.
- 4 x Socket Head Cap Screws M3x4.

Main Plate 12mm Shaft
[H2402-S]

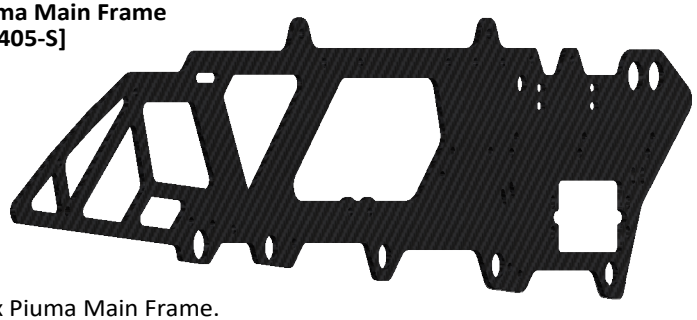


- 1 x Main Plate 12mm Shaft.
- 2 x Pins 3x6.
- 2 x Ball Bearings ∅ 12x ∅ 24x6.

Back Servo Mount Support
[H2462-S]

- 1 x Back Servo Mount Support.
- 2 x Socket Head Cap Screws M3x8.

Piuma Main Frame
[H2405-S]



- 1 x Piuma Main Frame.

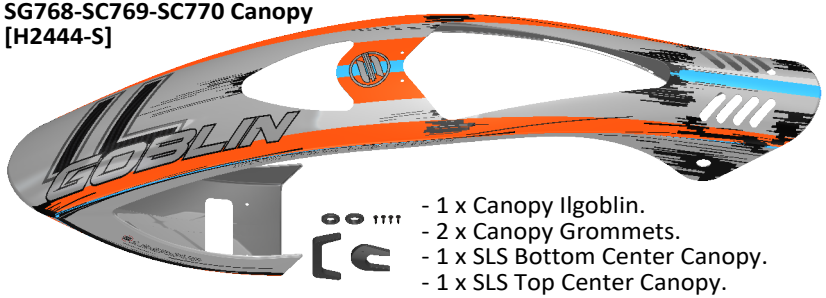
Frame Bushing ∅ 8.25x ∅ 10x6
[H2411-S]

- 8 x Bushings ∅ 8,25x ∅ 10x6.

Lower Main Frame
[H2434-S]

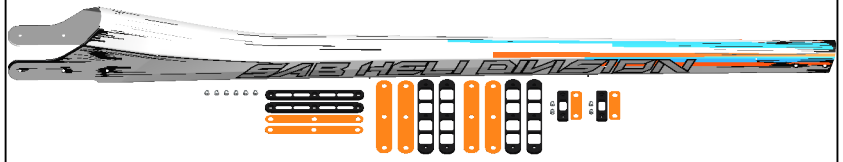
- 1 x Lower Main Frame.

SG768-SC769-SC770 Canopy
[H2444-S]



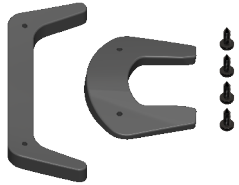
- 1 x Canopy Ilgoblin.
- 2 x Canopy Grommets.
- 1 x SLS Bottom Center Canopy.
- 1 x SLS Top Center Canopy.
- 4 x Self Tapping Screws M2,2x6.

SG768-SC769-SC770 Boom Ilgoblin
[H2445-S]



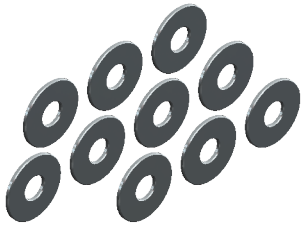
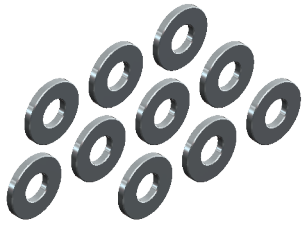
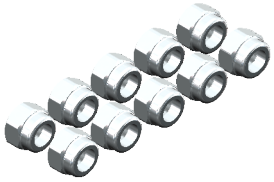
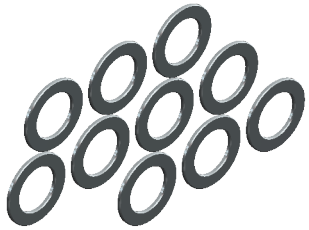
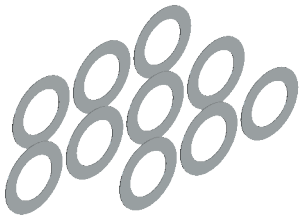
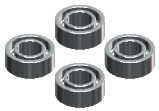
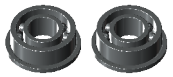
- 1 x Boom Ilgoblin.
- 1 x Hardware SET.

Canopy Centering SET
[H2446-S]



- 1 x Bottom Center Canopy.
- 1 x Top Center Canopy.
- 4 x Self Tapping Screws M2,2x6.

[HC004-S]  - 10 x Socket Head Cap Screws M2x6mm.	**[HC008-S]**  - 10 x Socket Head Cap Screws M2x8mm.	**[HC018-S]**  - 10 x Socket Head Cap Screws M2,5x6mm.	**[HC020-S]**  - 10 x Socket Head Cap Screws M2,5x8mm.	**[HC022-S]**  - 10 x Socket Head Cap Screws M2,5x10mm.	**[HC026-S]**  - 10 x Socket Head Cap Screws M2,5x12mm.
[HC028-S]  - 10 x Socket Head Cap Screws M2,5x15mm.	**[HC032-S]**  - 10 x Socket Head Cap Screws M2,5x18mm.	**[HC038-S]**  - 10 x Button Head Cap Screws M3x4mm.	**[HC044-S]**  - 10 x Socket Head Cap Screws M3x6mm.	**[HC050-S]**  - 10 x Socket Head Cap Screws M3x8mm.	**[HC056-S]**  - 10 x Socket Head Cap Screws M3x10mm.
[HC062-S]  - 10 x Socket Head Cap Screws M3x12mm.	**[HC068-S]**  - 10 x Socket Head Cap Screws M3x16mm.	**[HC079-S]**  - 2 x Socket Head Cap Shoulder Screws M3x18mm. - 2 x Nylon Nuts M3.	**[HC096-S]**  - 10 x Button Head Cap Screws M4x6mm.	**[HC098-S]**  - 10 x Button Head Cap Screws M4x8mm.	**[HC102-S]**  - 10 x Socket Head Cap Screws M4x10mm.
[HC103-S]  - 10 x Socket Head Cap Screws M4x15mm.	**[HC105-S]**  - 10 x Socket Head Cap Screws M4x12mm.	**[HC111-S]**  - 10 x Socket Head Cap Shoulder Screws M4x24.	**[HC114-S]**  - 2 x Socket Head Cap Shoulder Screws M5x30mm. - 2 x Nylon Nuts M5.	**[HC124-S]**  - 10 x Socket Head Cap Screws M6x10mm.	**[HC132-S]**  - 10 x Flat Head Cap Screws M3x5mm.

[HC134-S]  - 10 x Flat Head Cap Screws M3x8mm.	**[HC140-S]**  - 10 x Thread Rod M2,5x20.	**[HC150-S]**  - 10 x Set Screws M3x20.	**[HC153-S]**  - 10 x Set Screws M4x6.	**[HC181-S]**  - 10 x Washers ∅3x∅7x1.	**[HC188-S]**  - 10 x Washers ∅5,3x∅15x1.
[HC194-S]  - 10 x Washers ∅6,1x∅14x1,8.	**[HC200-S]**  - 10 x Nylon Nuts M2,5.	**[HC206-S]**  - 10 x Nylon Nuts M3.	**[HC212-S]**  - 10 x Nylon Nuts M4.	**[HC218-S]**  - 10 x Nylon Nuts M5.	**[HC230-S]**  - 10 x Washers ∅10x∅16x1.
[HC232-S]  - 10 x Washers ∅10x∅16x0,2.	**[HC243-S]**  - 1 x Thread Rod M2x60. - 2 x Uniball Linkages M2.	**[HC335-S]**  - 4 x O-rings Shore 70.	**[HC351-S]**  - 10 x Flat Head Cap Screws M4x6mm.	**[HC400-S]**  - 4 x Flanged Bearings ∅2,5x∅6x2,6mm.	**[HC402-S]**  - 4 x Flanged Bearings ∅3x∅7x3mm.
[HC406-S]  - 4 x Ball Bearings ∅5x∅9x3mm.	**[HC411-S]**  - 4 x Ball Bearings ∅5x∅10x4mm.	**[HC414-S]**  - 4 x Flanged Bearings ∅6x∅13x5mm.	**[HC419-S]**  - 4 x Ball Bearings ∅8x∅16x5mm.	**[HC422-S]**  - 2 x Ball Bearings ∅10x∅19x5mm.	**[HC425-S]**  - 2 x Ball Bearings ∅12x∅18x4mm.

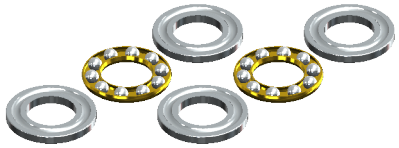
[HC426-S]

- 2 x Ball Bearings ∅12x∅24x6mm.

[HC435-S]

- 2 x Thrust Bearings ∅5x∅10x4mm.

[HC438-S]

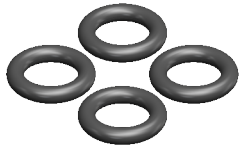


- 2 x Thrust Bearings ∅10x∅18x5,5mm.

[HC490-S]

- 10 x Self Tapping Cap Screws M2,2x6mm.

[HC529-S]

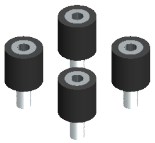


- 4 x O-rings 95 Shore.

[HC545-S]

- 10 x Socket Head Shoulder Cap Screws M4x21.5mm.

[HC573-S]

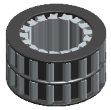


- 4 x Rubber Pins M3 65 Shore.

[HC576-S]

- 10 x Flat Head Cap Screws M2,5x12mm.

[HC602-S]



- 1 x Clutch OWB ∅12x∅20x11mm.

[HC608-S]

- 10 x Socket Head Cap Screws M3x25mm.

[HC712-S]

- 10 x Countersunk Flat Screws M3x8mm.

[HC714-S]

- 10 x Washers ∅3,1x∅5,75x0,5.

[HC750-S]

- 1 x Belt HTD 3M 276-13mm.

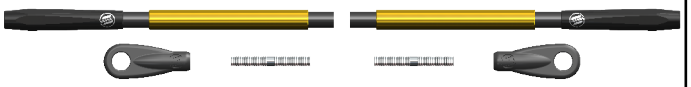
[HC751-S]

- 1 x Belt HTD 3M 2040-6mm.

[HC764-S]

- 10 x Self Tapping Head Cap Screws M3x8mm.

[HC765-S]



- 1 x Carbon Rod KIT.

[HA016-S]

- 1 x Wrench Nuts M8.

[HA021-S]

- 5 x Canopy Grommet.

[HA035-S]

- 2 x Double-sided Tape 30x10x1mm.

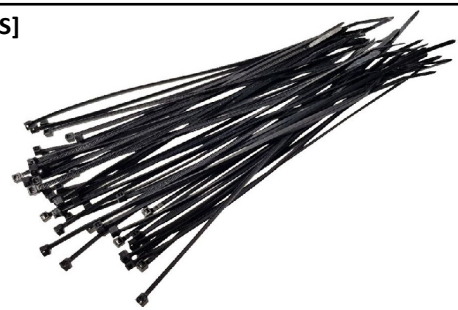
[HA041-S]

- 2 x Straps 20x250mm.

[HA043-S]

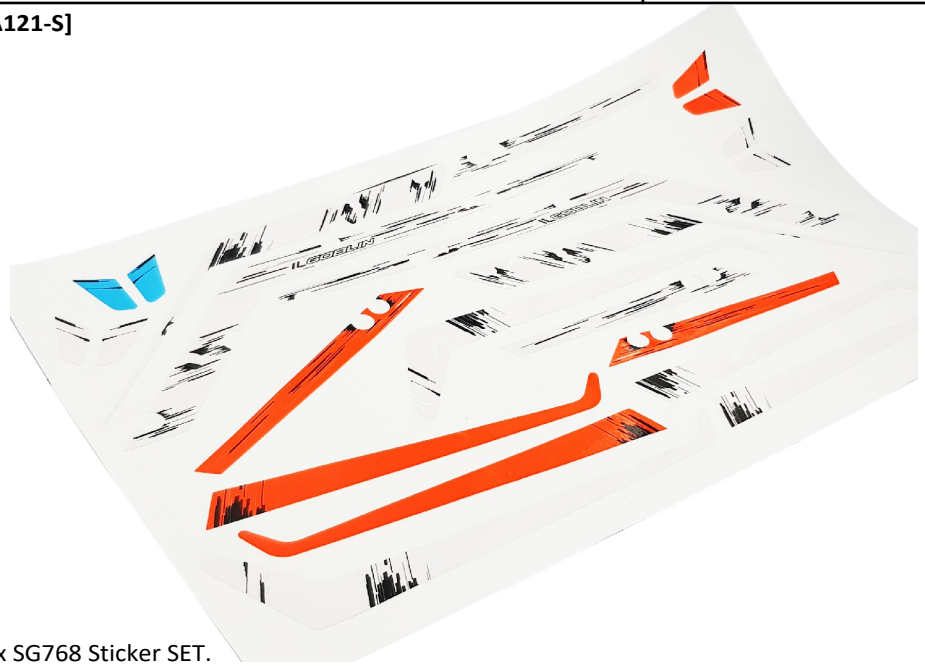
- 1 x Foam Blade Holder.

[HA058-S]



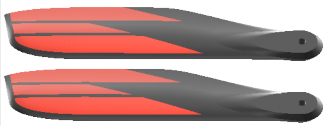
- 1 x Zip Tie 2.5x200mm.

[HA121-S]



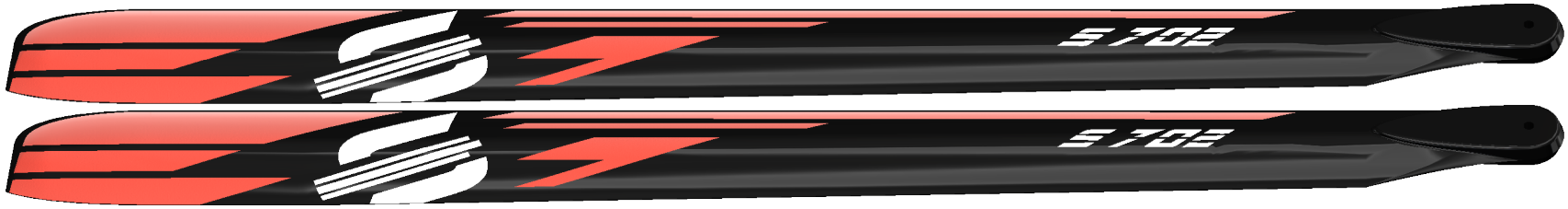
- 1 x SG768 Sticker SET.

[S110-O]



- 1 x Tail Blade 110.

[S702-O]



- 1 x Main Blade 702.

The manual can be downloaded here

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Release 1.0 - December 2025

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