

MANUAL

IL 590
GOBLIN

IL

GOBLIN

HELICOPTER


THE ITALIAN HELI

62

SAE 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



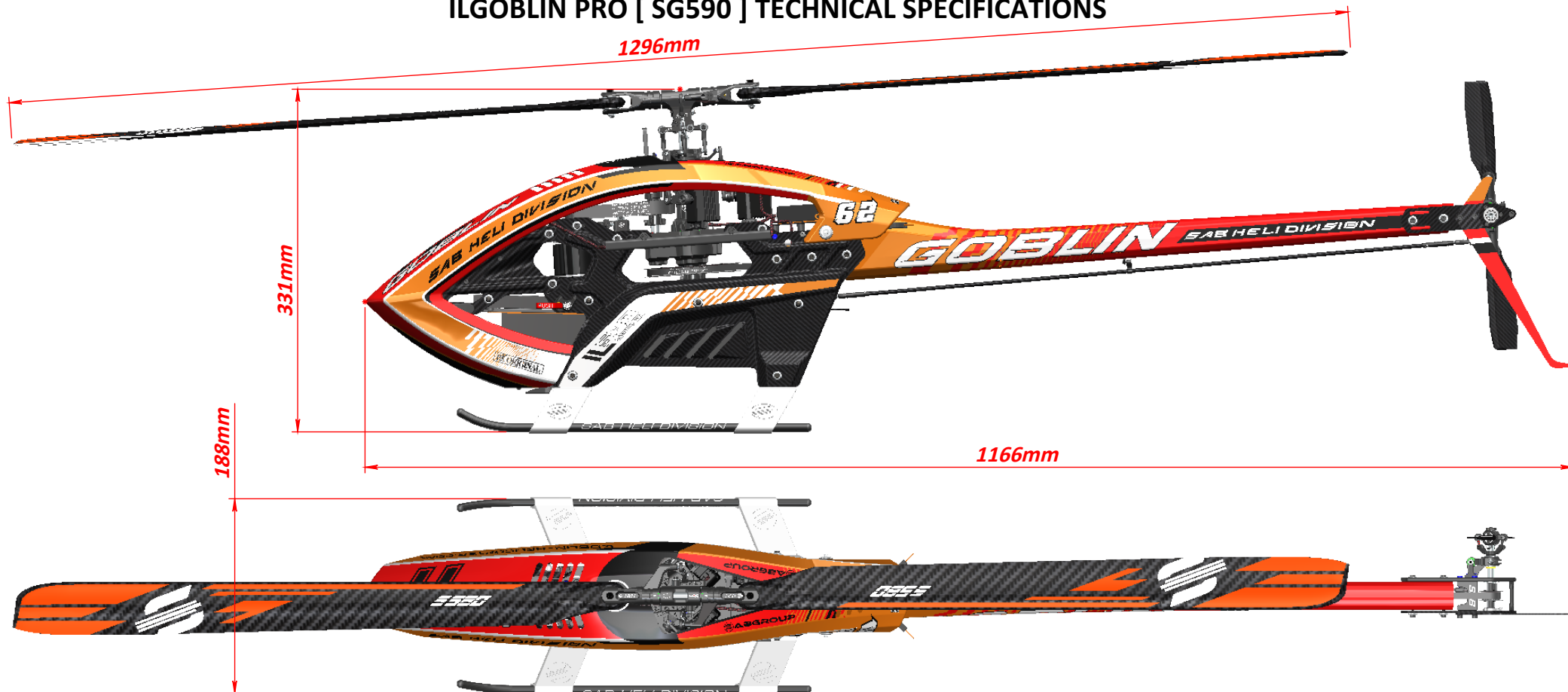
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ILGOBLIN PRO [SG590] TECHNICAL SPECIFICATIONS



- **AIRFRAME weight:** 1820 gr (with blades, no battery, no Electronics).
- **Main rotor diameter:** 1296 mm (with 580 mm blade).
- **Main blade length:** 550 to 590mm.
- **Tail rotor diameter:** 262 mm (with 95 mm tail blade).
- **Tail blade length:** 90 to 105 mm.
- **Main shaft:** 10 mm, Tail shaft: 6 mm.
- **Molded carbon tail boom .**

KIT Includes:

- 20T motor pulley (other pulley sizes available).
- 1 battery trays with integrated connectors.

- **Cyclic Servos:** Mini size 35mm.
- **Tail Servo:** Standard size 40mm.
- **Main Rotor Ratio:** 12.1 to 6.9 (20T included: 9.7:1).
- **Tail Rotor Ratio:** 5.1-4.6:1 (19T included: 4.8:1).
- **Motor:** 6S 1000-1200 Kv, 12S 500-600 Kv.
- **Battery room:** 50x50x300 mm.

- S580 Orange (580 mm main blade).
- S95 Orange (95 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.

NOTE FOR ASSEMBLY



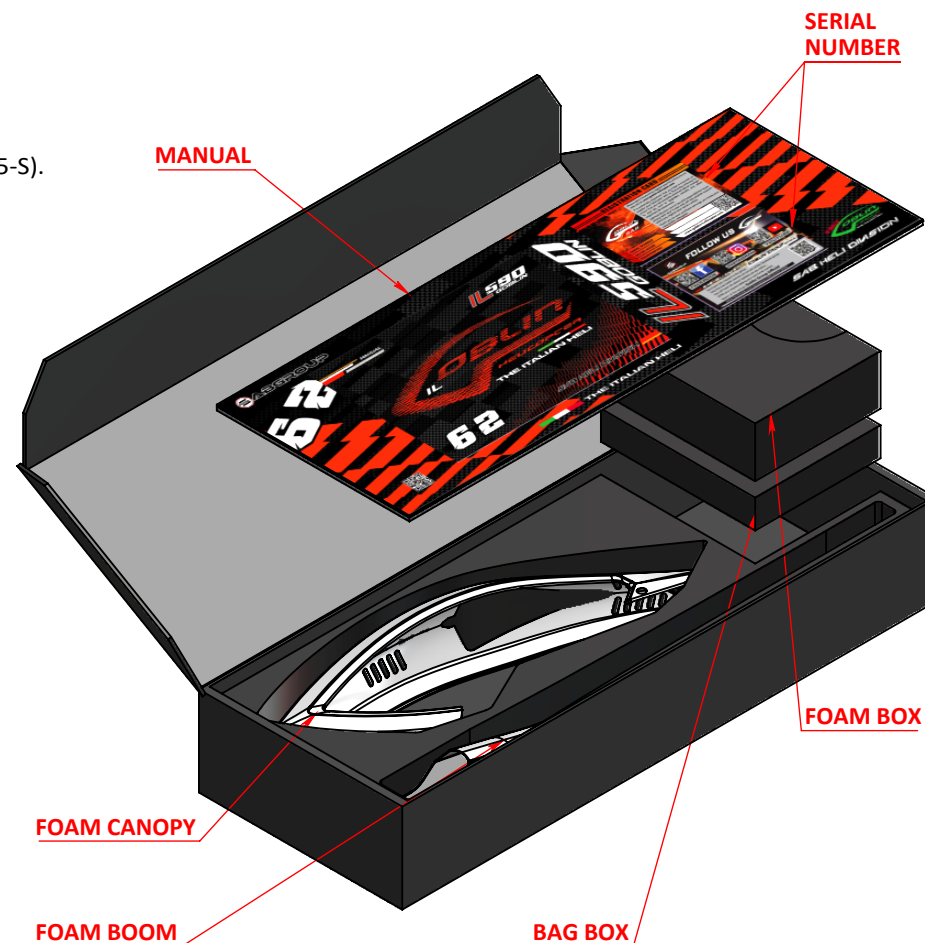
ADDITIONAL COMPONENTS REQUIRED

- *Electric Motor.
- *Speed controller.
- *Batteries: 6S - 5000/6000 mAh.
12S - 3000/4000 mAh.
- *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

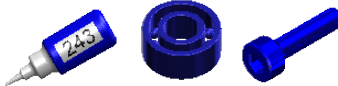
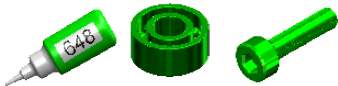
- *Generic pliers.
- *Hexagonal driver, size 1.5, 2, 2.5, 3mm.
- *4/5mm T-Wrench.
- *5.5mm Socket wrench (for M3 nuts).
- *8mm Hex fork wrench (for M5 nuts).
- *Medium threadlocker (SAB p/n HA116-S).
- *Strong retaining compound (SAB p/n HA115-S).
- *Spray lubricant (eg. Try-Flow Oil).
- *Synthetic grease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

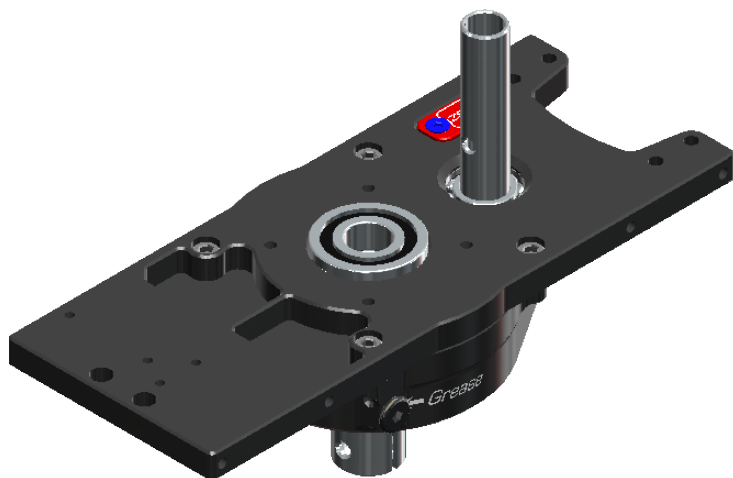


TRANSMISSION GROUP ASSEMBLY

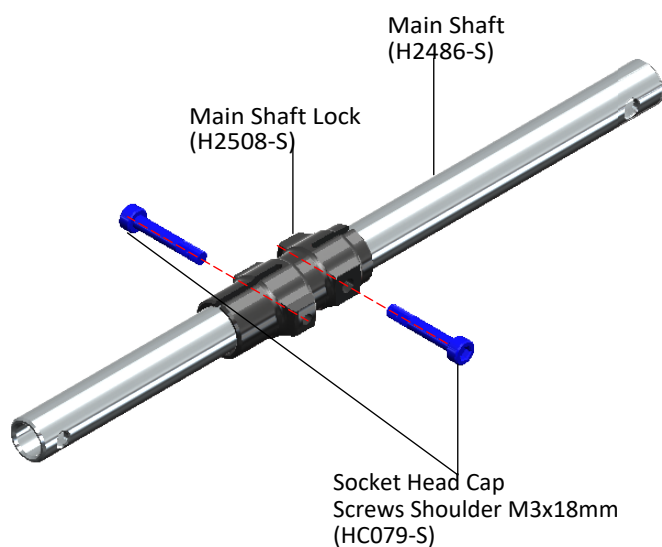
BOX 1 , BAG FOR PAGE 5

TRANSMISSION GROUP ASSEMBLED AND VERIFIED

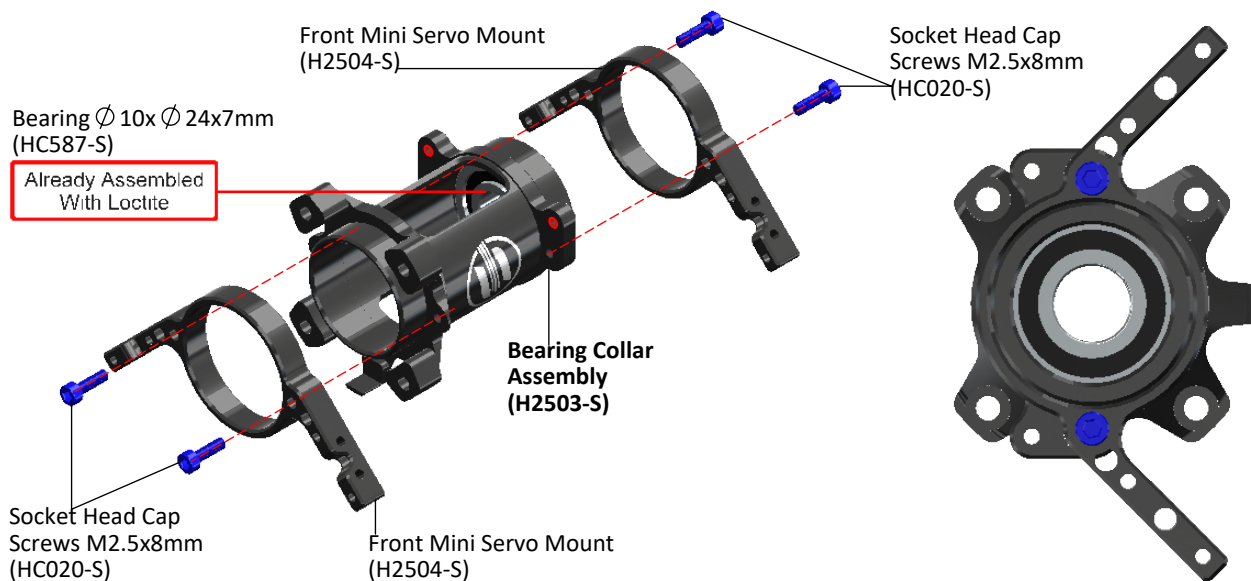
The unit is ready to use. Check **page 36** for more information.



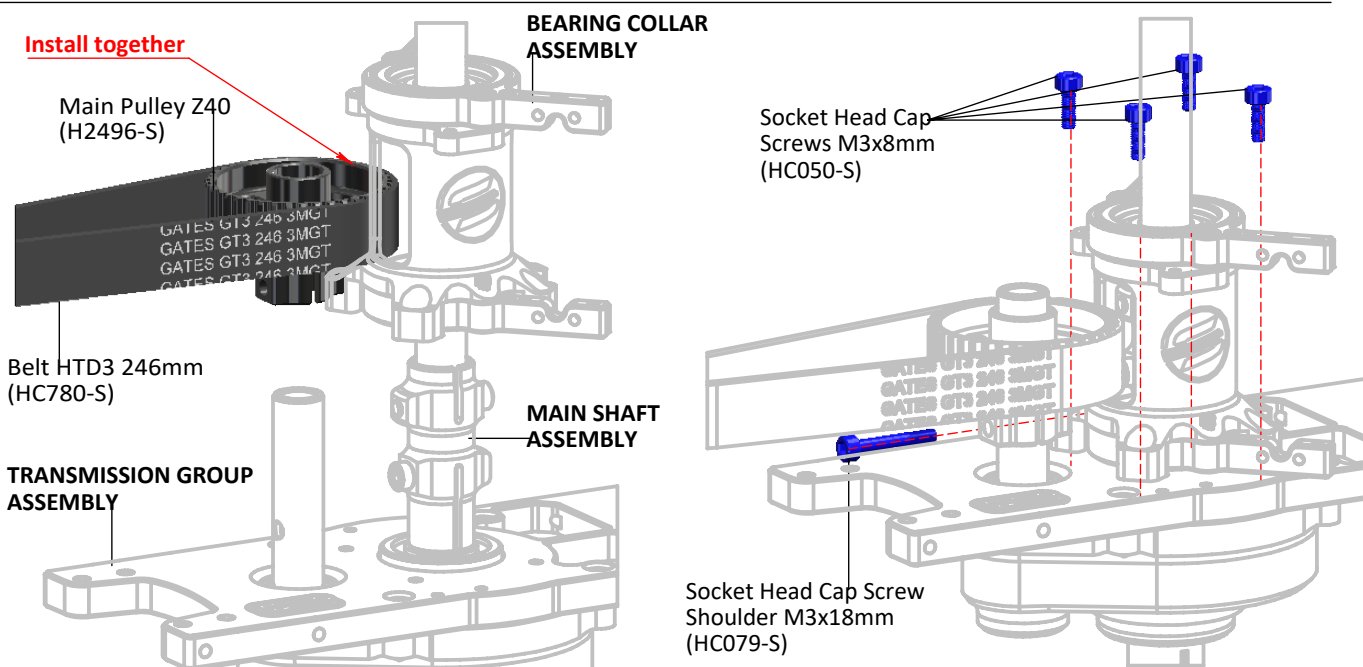
MAIN SHAFT ASSEMBLY

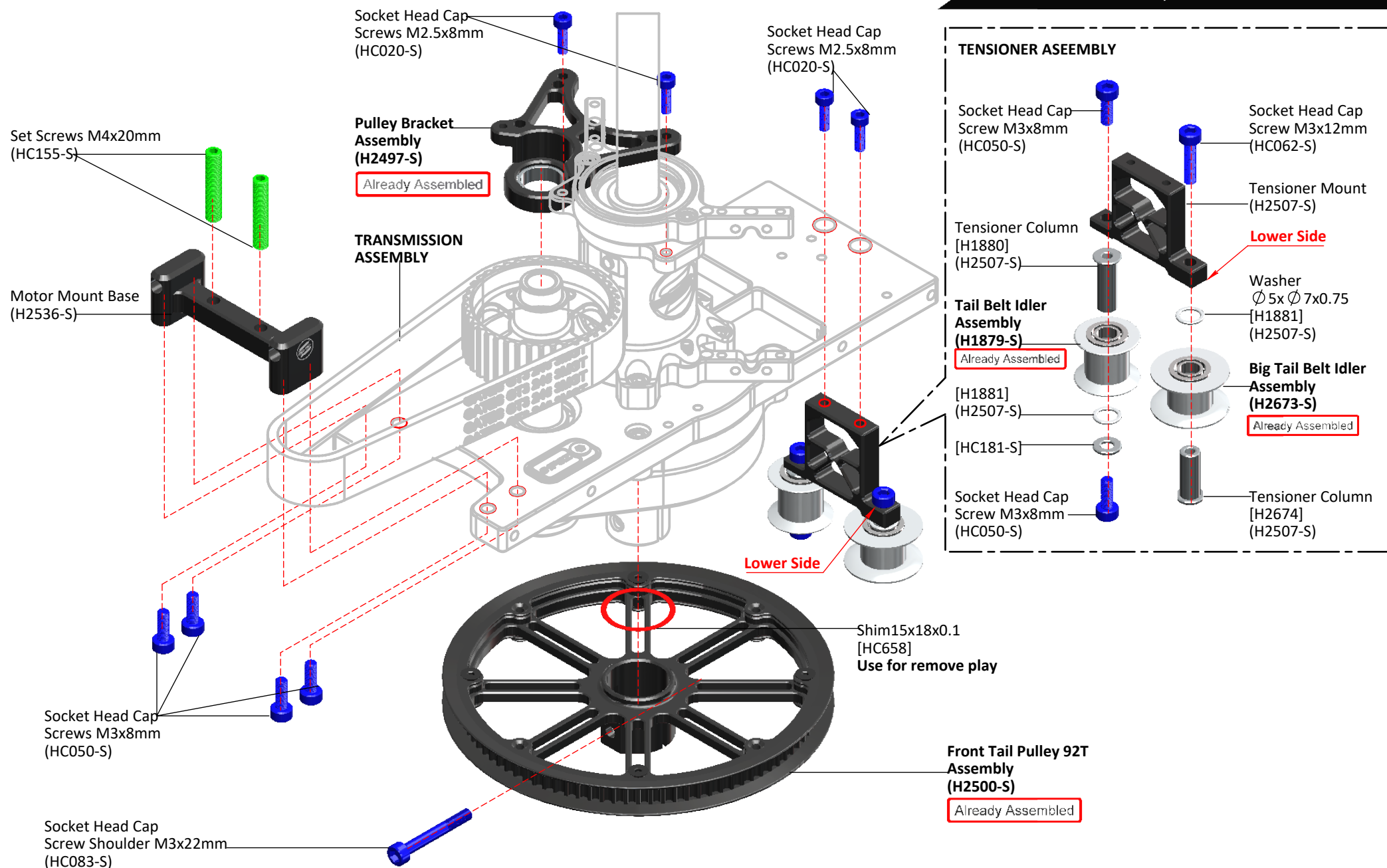


BEARING COLLAR ASSEMBLY



Install together







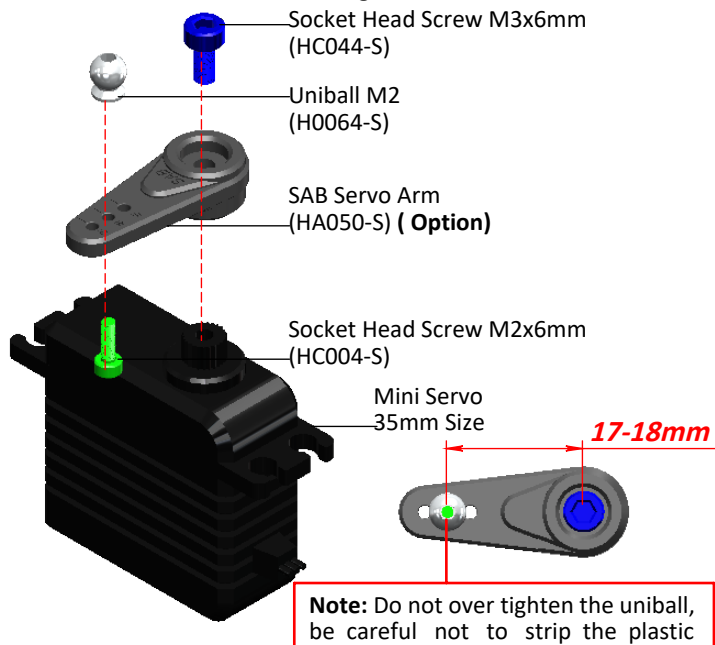
SWASHPLATE SERVOS ASSEMBLY

BOX 1, BAG FOR PAGE 7

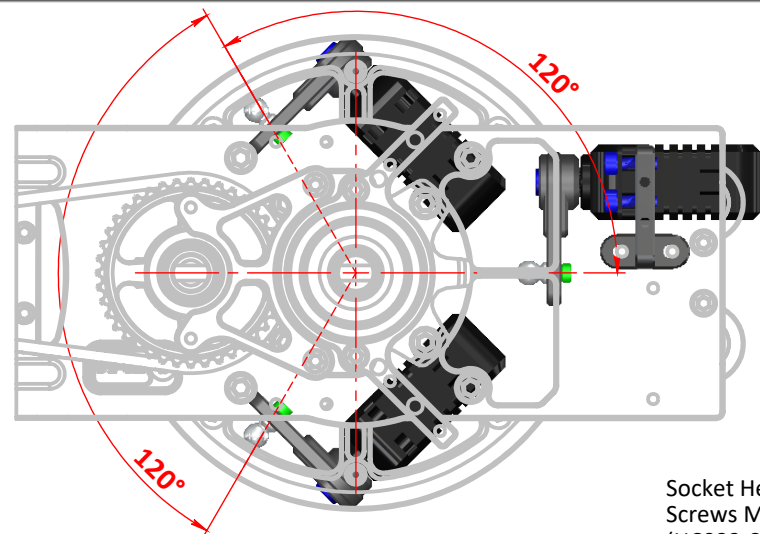
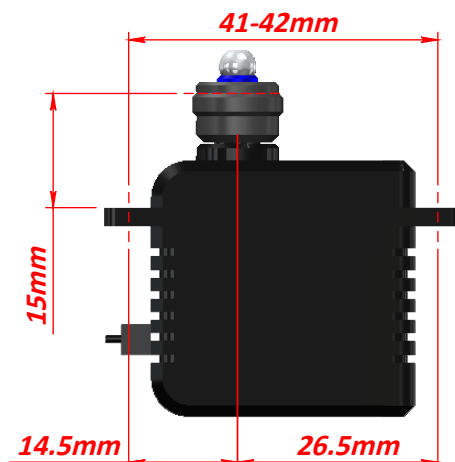
SERVO ASSEMBLY

The linkage ball must be positioned 17-18mm out on the servo arm. The recommended servo arm to use is: SAB p/n [HA050]. Ensure the alignment of the servo arms before installation of the servos in the model.

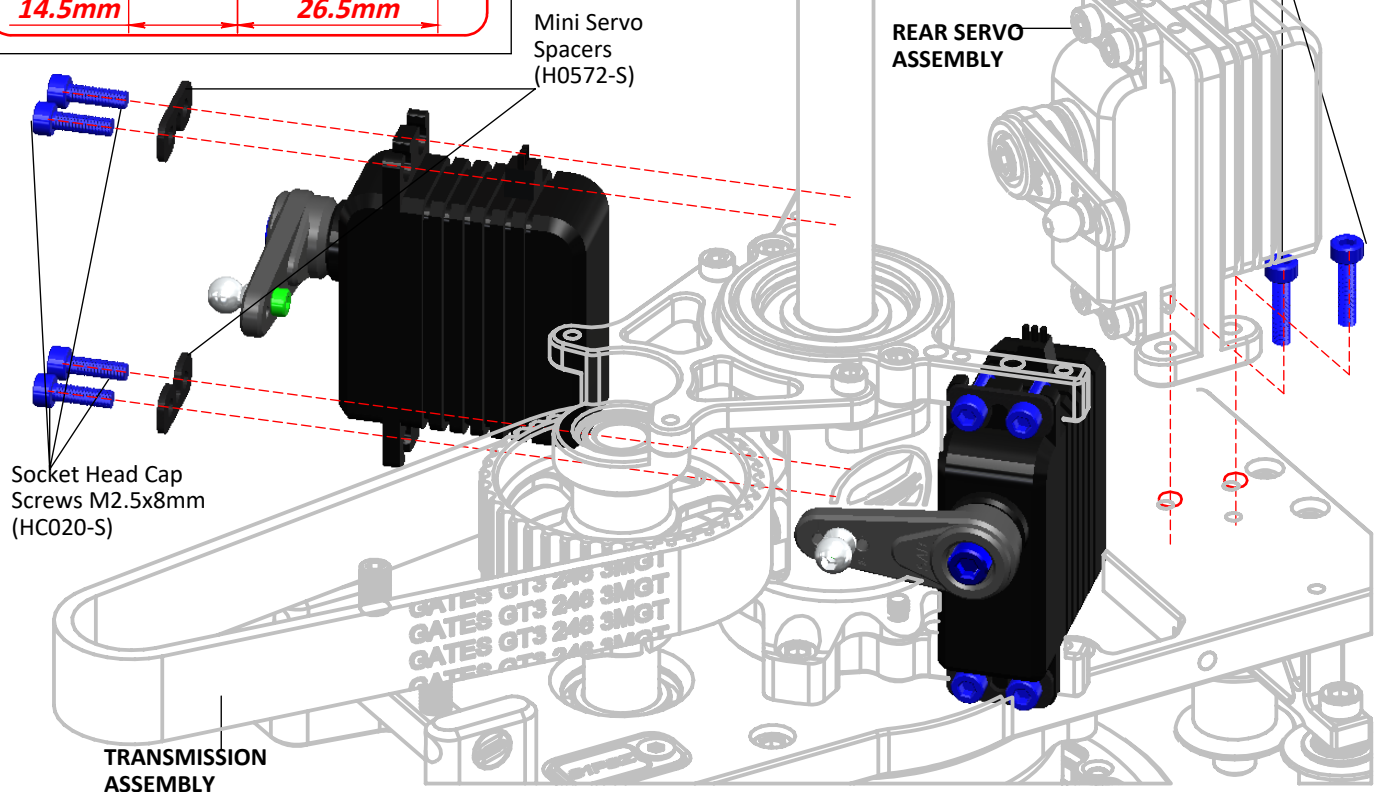
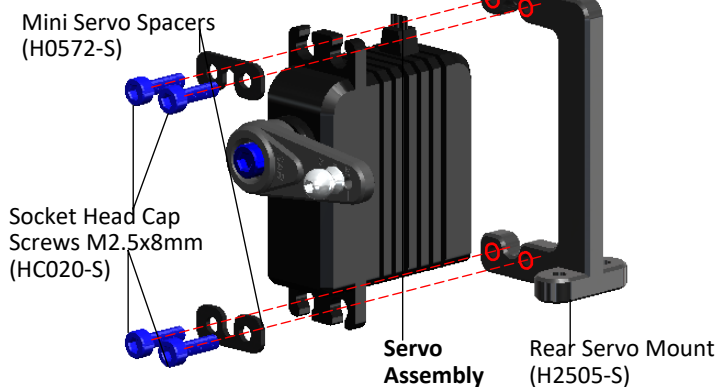
Proceed with installation following the instructions below.



SERVO DIMENSION

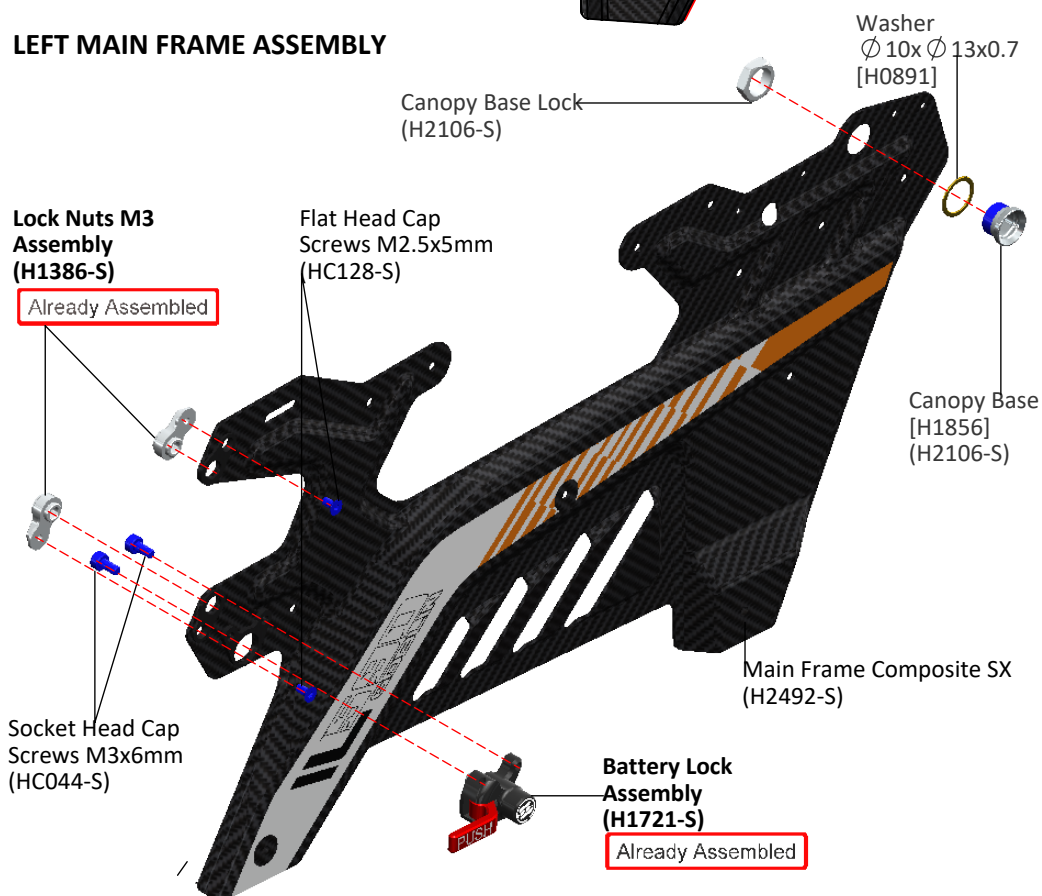


REAR SERVO ASSEMBLY





LEFT MAIN FRAME ASSEMBLY

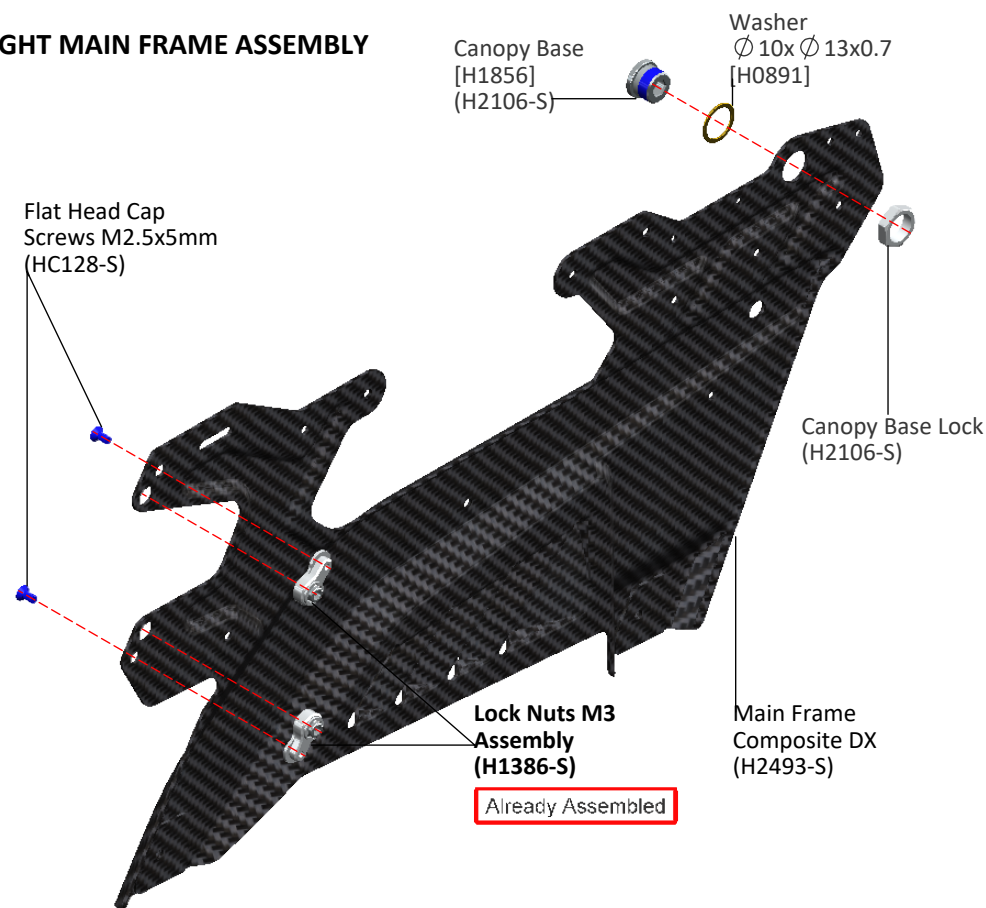


CARBON FRAME



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.

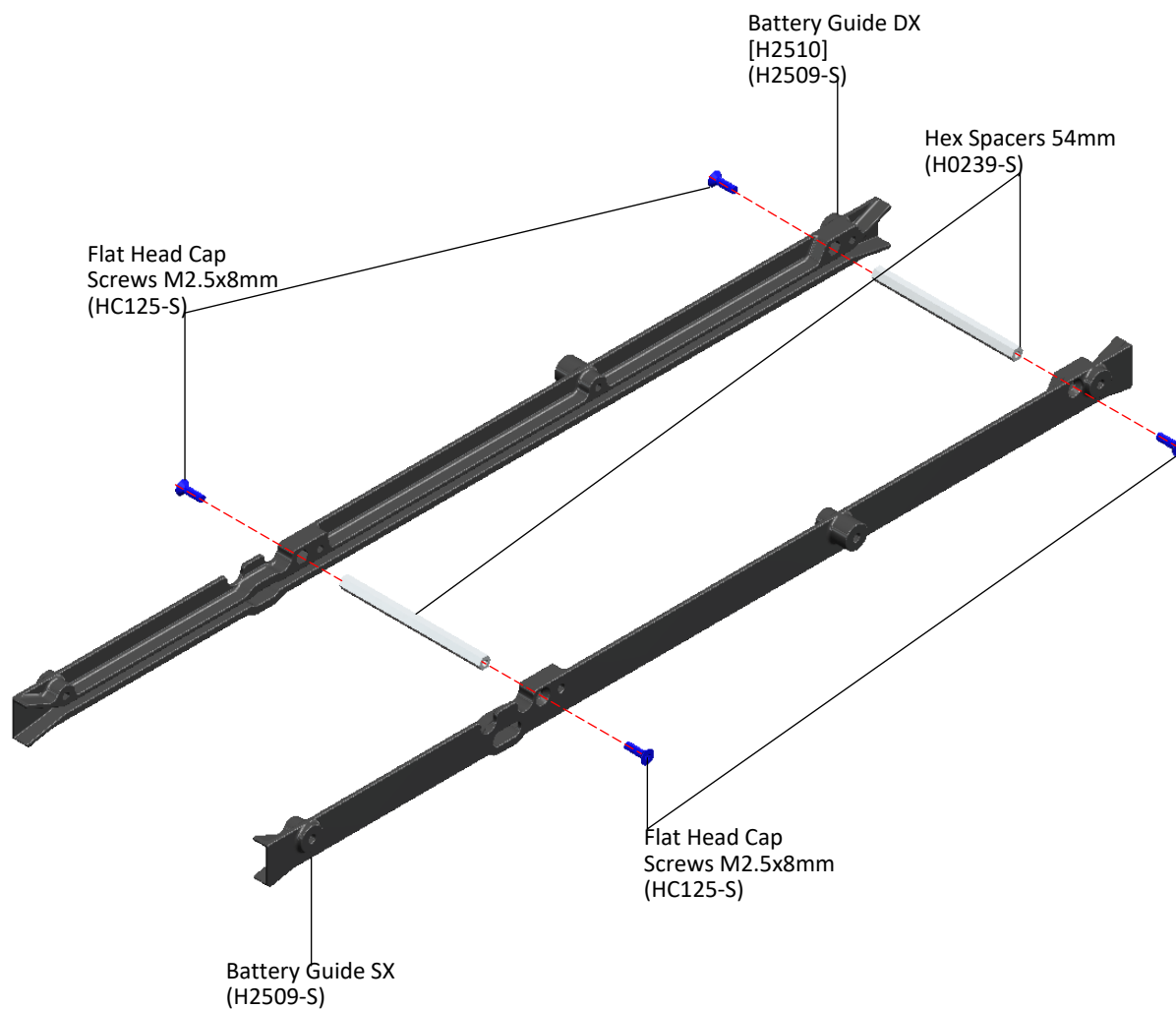
RIGHT MAIN FRAME ASSEMBLY



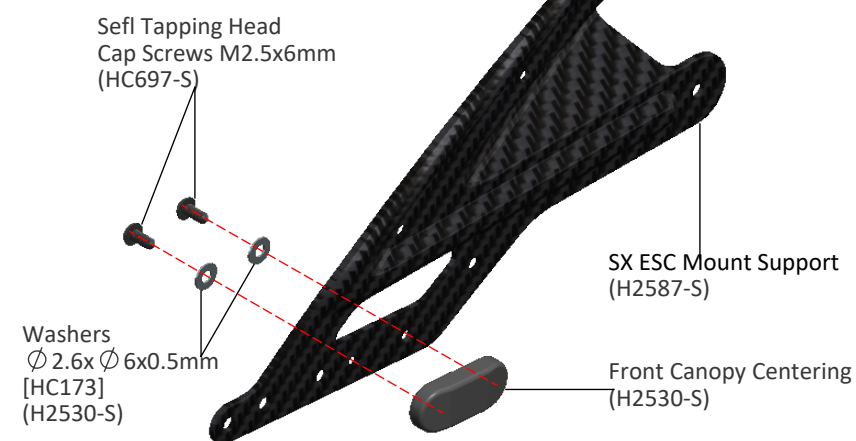


BOX 1, BAG FOR PAGE 9

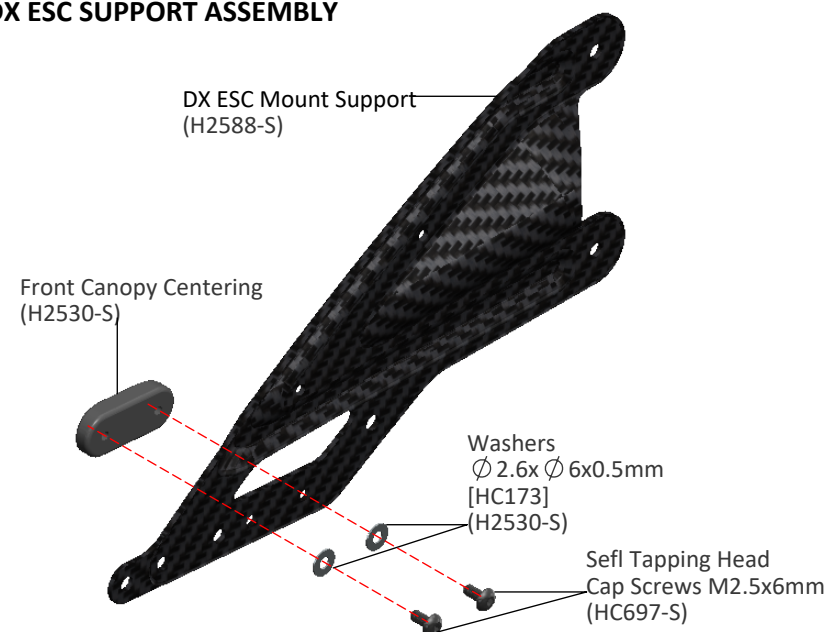
BATTERY GUIDE ASSEMBLY

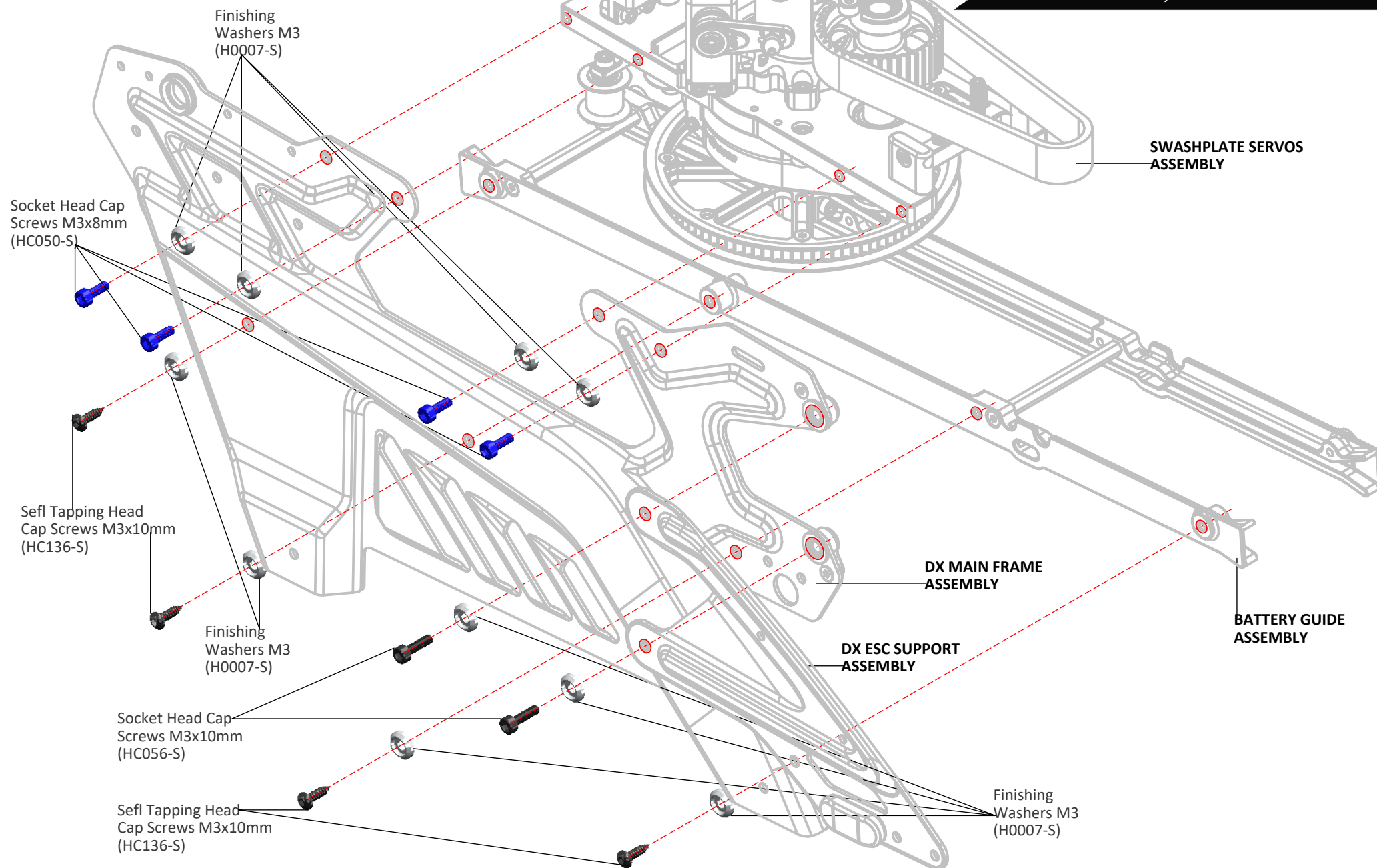


SX ESC SUPPORT ASSEMBLY



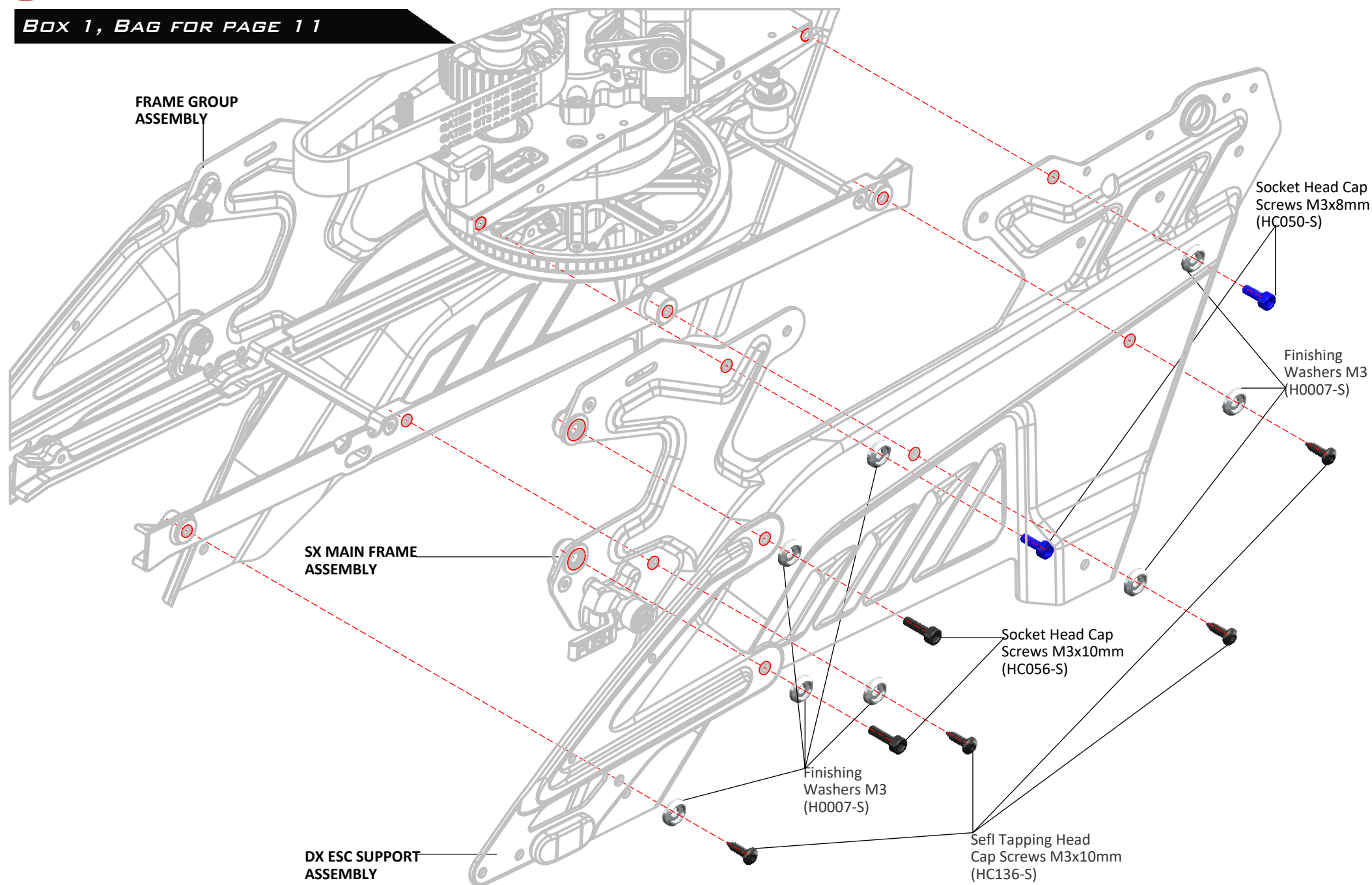
DX ESC SUPPORT ASSEMBLY



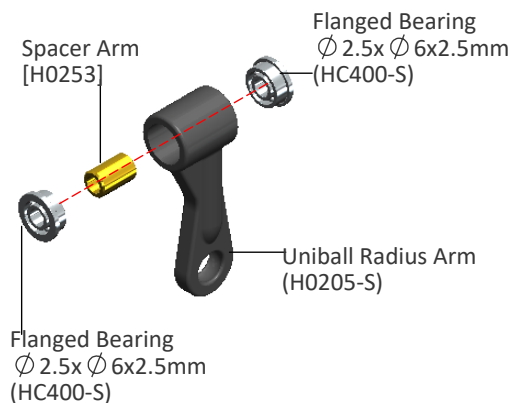




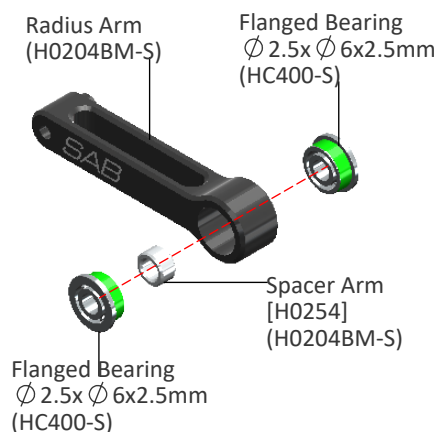
BOX 1, BAG FOR PAGE 11



UNIBALL RADIUS ARM ASSEMBLY ...x2

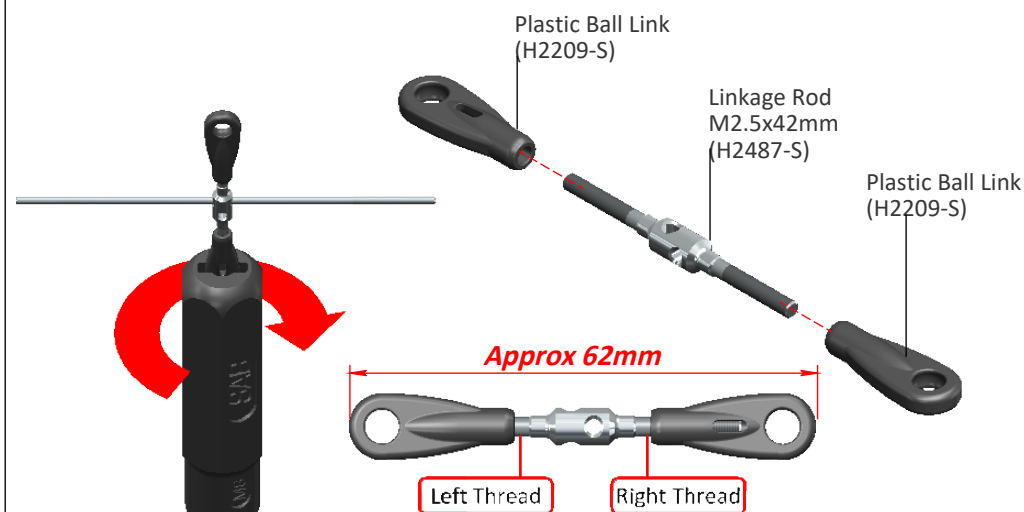


RADIUS ARM ASSEMBLY ...x2



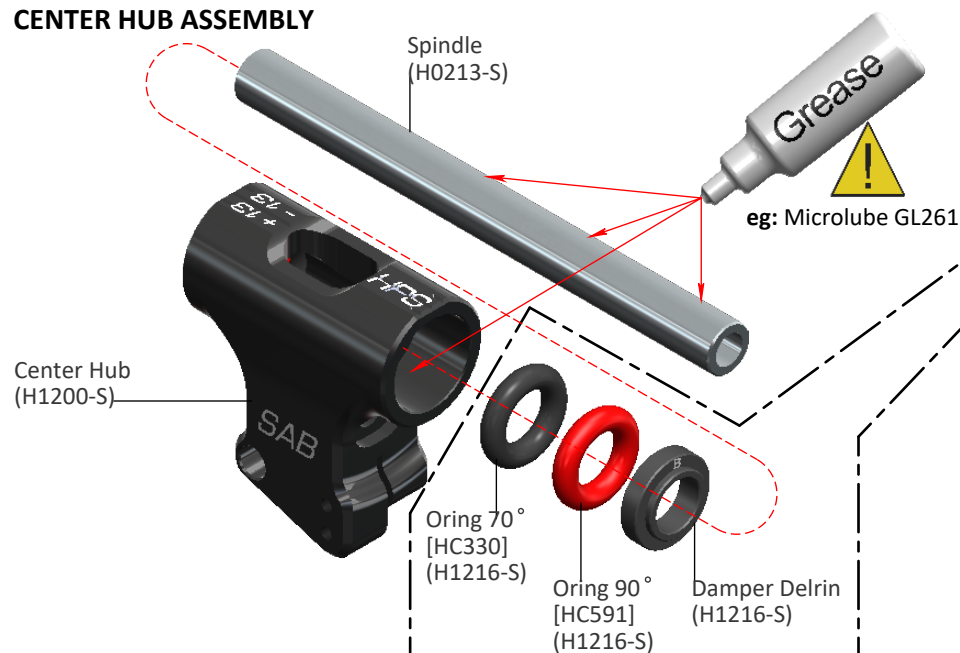
PLEASE USE GREEN THREAD LOCK
to secure the bearings to the radius
arms. Failure to secure the bearing
will result in excessive slop/play.

LINKAGE ROD ASSEMBLY ...x2



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

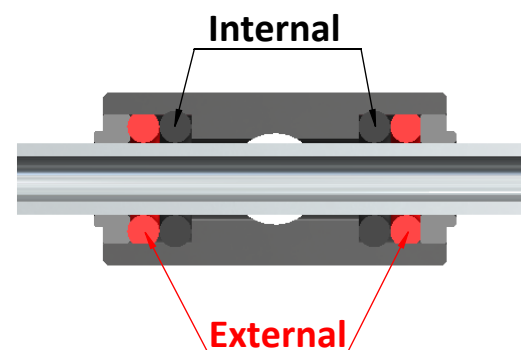
CENTER HUB ASSEMBLY



HEAD SET UP

H1216-B: Internal =70°, External =90° → Sport & 3D flight.

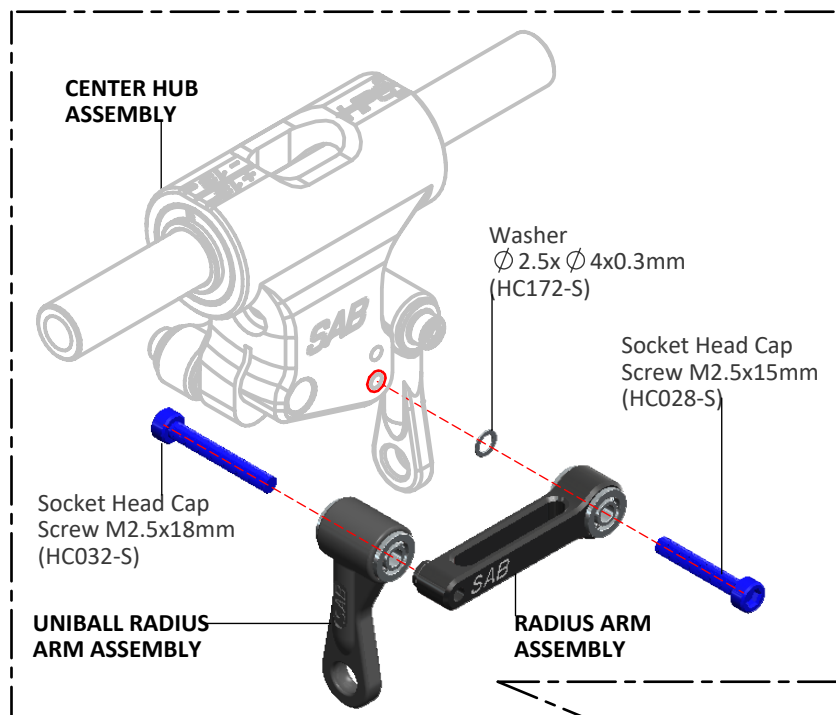
H1216-C: Internal =70°, External =90° → Hard 3D.



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



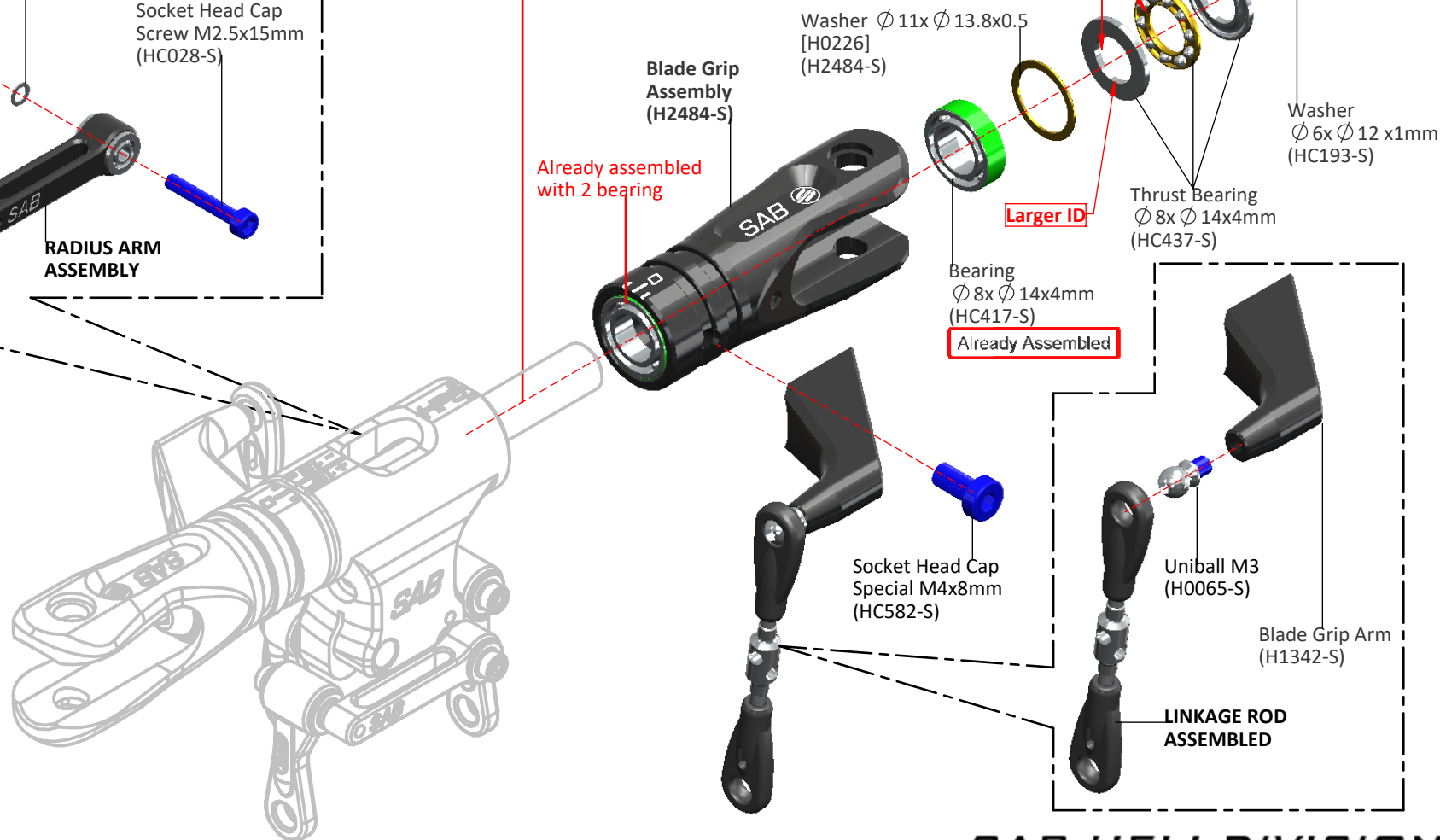
BOX 1, BAG FOR PAGE 13

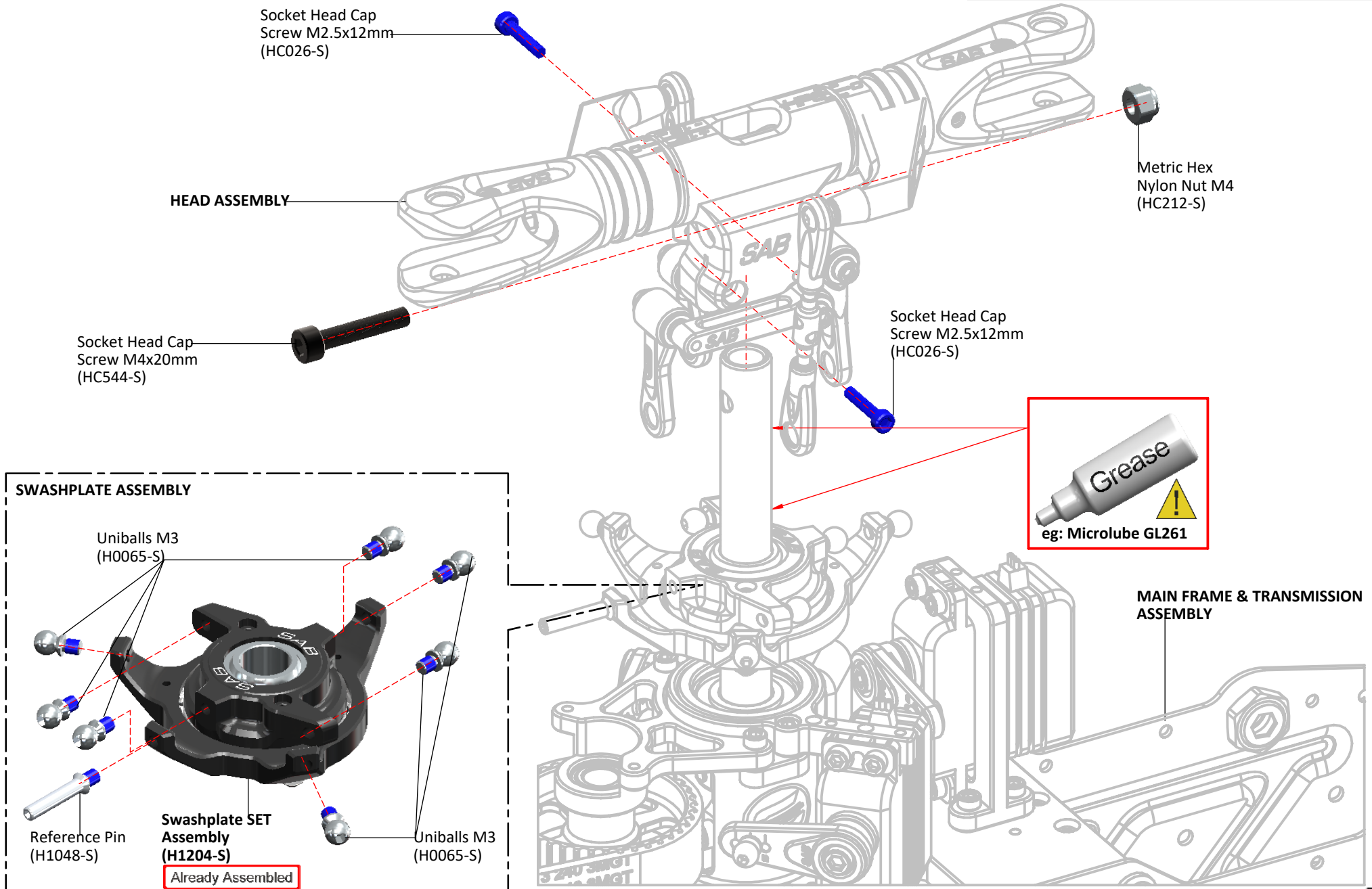


NOTE:

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

Shim $\phi 8 \times \phi 14 \times 0.2\text{mm}$ [HC228-S] [Bag13-4].
After approximately 40/50 flights, please check preload, you can add one 0.2mm shim (HC228) on each side if preload has changed. However, we suggest to replace the o-rings after about 100 flights.





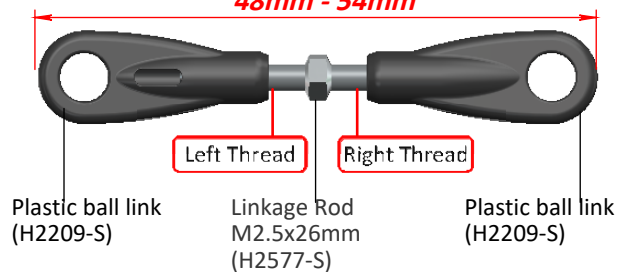


ASSEMBLING OF THE MODULES

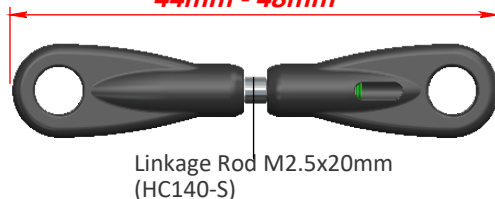
BOX 1, BAG FOR PAGE 15

Option depending on the size of the servos.

48mm - 54mm



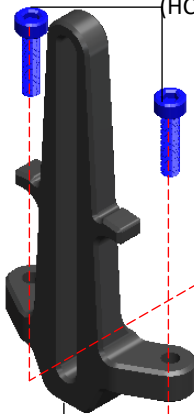
44mm - 48mm



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

ANTI-ROTATION GUIDE ASSEMBLY

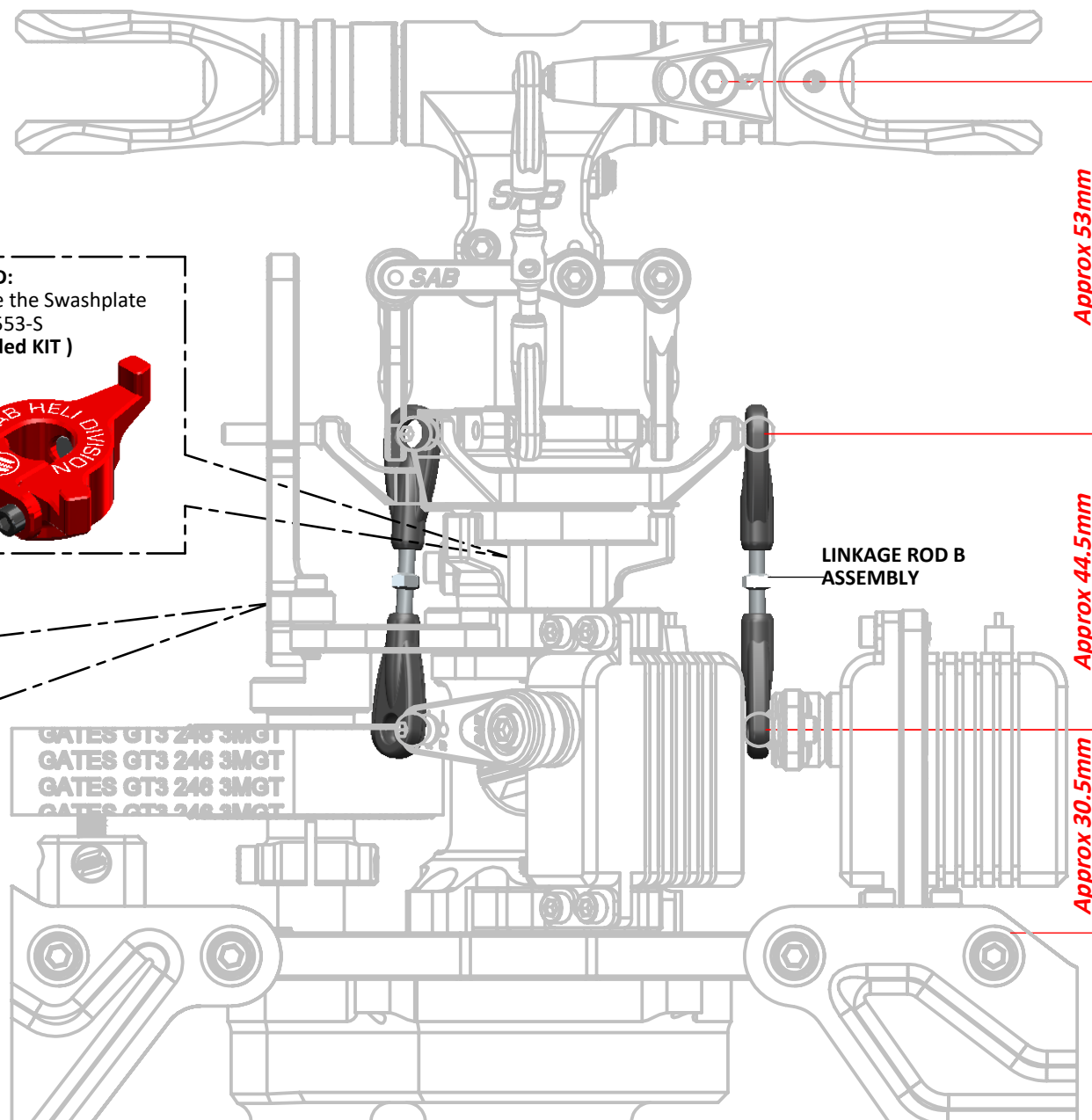
Socket Head Cap
Screws M2.5x10mm
(HC022-S)



Anti-Rotation Guide
(H2506-S)

SUGGESTED:

You can use the Swashplate
Leveler H2553-S
(Not included KIT)



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 194 teeth for the main gear

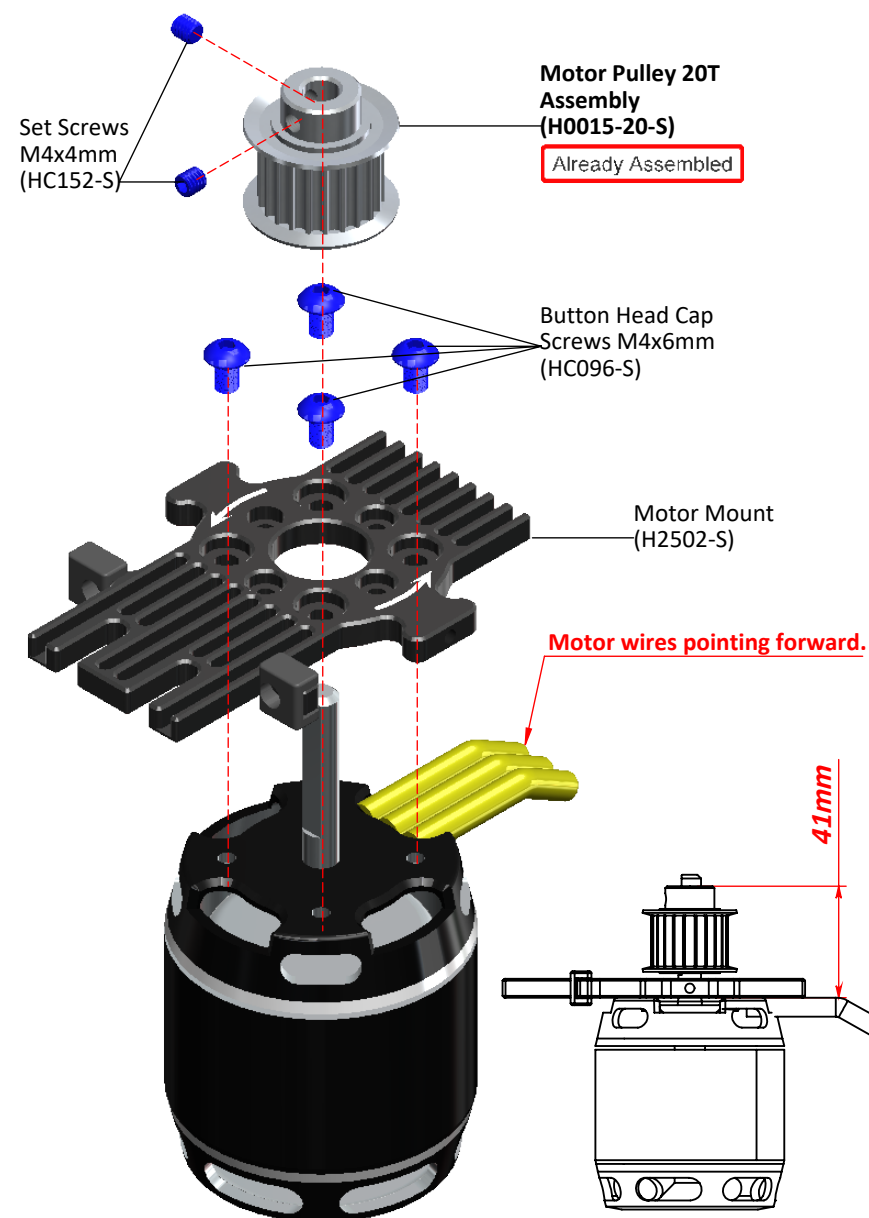
BELOW IS A LIST OF AVAILABLE REDUCTION RATIOS:

H0015-18-S - 18T Pinion = ratio	10.8 : 1	H0015-22-S - 22T Pinion = ratio	8.8 : 1
H0015-19-S - 19T Pinion = ratio	10.2 : 1	H0015-23-S - 23T Pinion = ratio	8.4 : 1
H0015-20-S - 20T Pinion = ratio	9.7 : 1	H0015-24-S - 24T Pinion = ratio	8.1 : 1
H0015-21-S - 21T Pinion = ratio	9.3 : 1		

These are pulleys for motors with a 6 mm shaft.

IL GOBLIN 590 CONFIGURATIONS (BLADES 580mm)					
BATTERY	MOTOR	ESC	Pulley (A, B)	RPM Max (A, B)	Pitch
6S-5500 mAh (5000/6000 mAh)	Kontronik Pyro 650-103 L	HW Platinum 150A V5 Scorpion Tribunus II 06-120A YGE 135LVT	22T / 23T	2350 / 2460	
	Scorpion HK5-4026-1115 (6mm)		21T / 22T	2420 / 2520	± 13
	X-NOVA 4025-1120 Kv		20T / 21T	2450 / 2550	
	EGODRIFT Tengu 4025HT/1190Kv				
12S-3000 mAh (2800/3700 mAh)	Scorpion HK5-4026-545 (6mm)	HW 130A V4			
	X-NOVA 4025-560	HW 180A V5	22T / 23T	2550 / 2650	± 13
	EGODRIFT Tengu 4025HS/550Kv	Scorpion Tribunus III 14-120A			
	Pyro 650-62 L	YGE Aureus 135	20T / 21T	2550 / 2650	

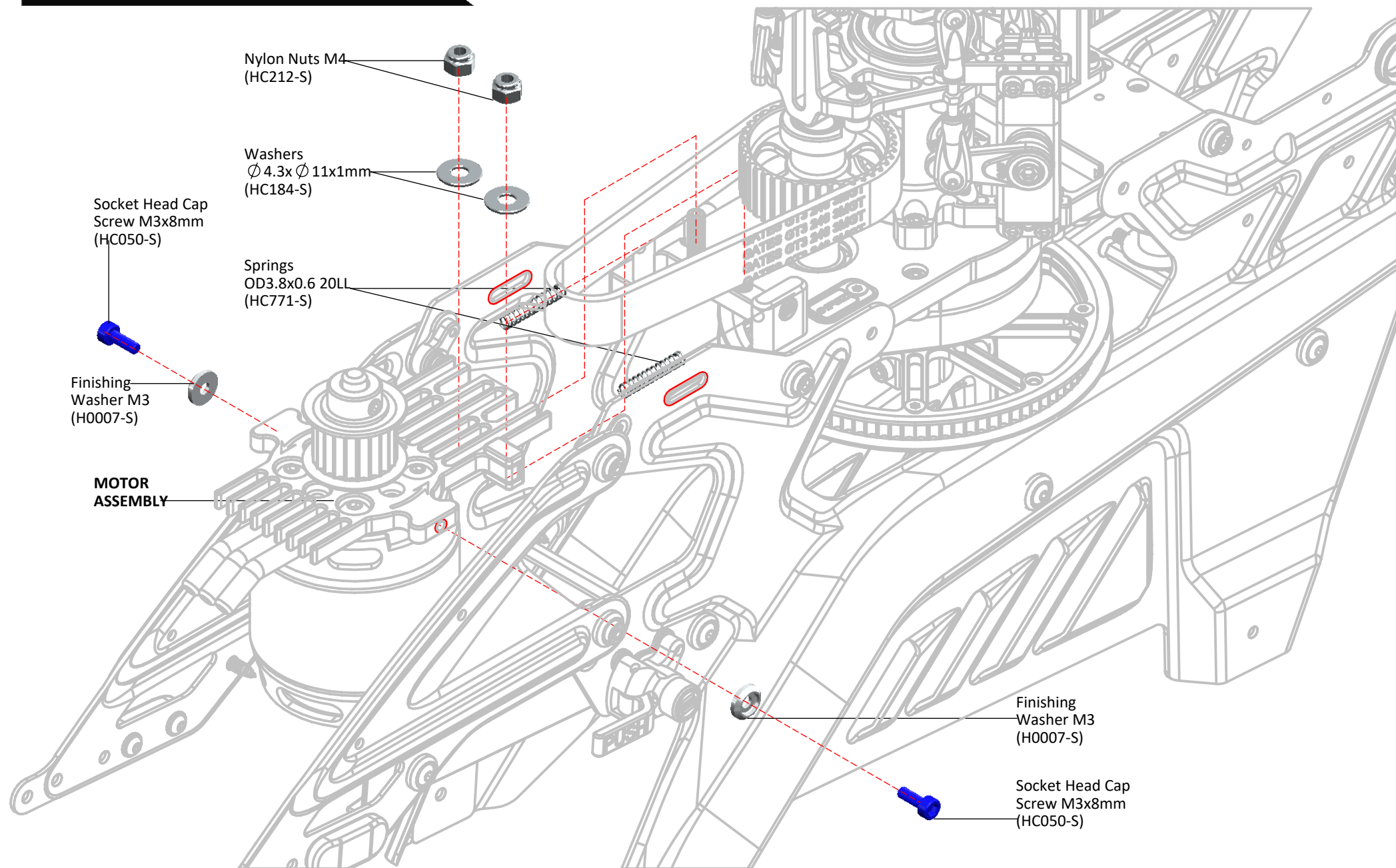
NOTE: For safety reason we recommend not exceeding 2600 RPM.



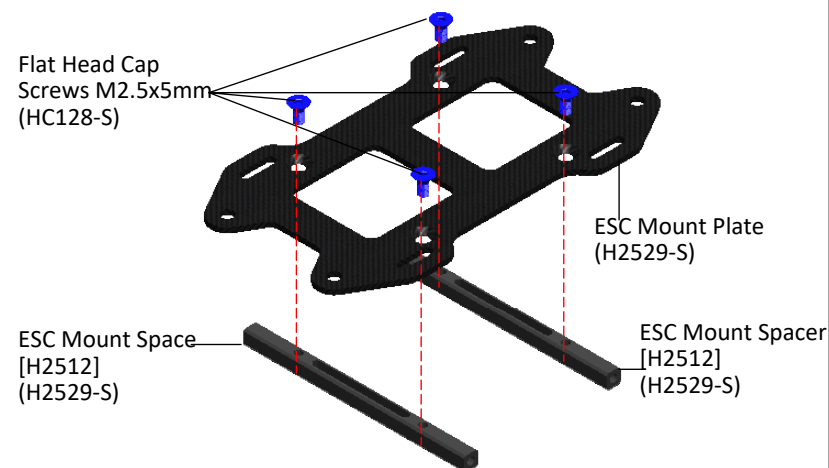


INSTALLATION OF THE MOTOR

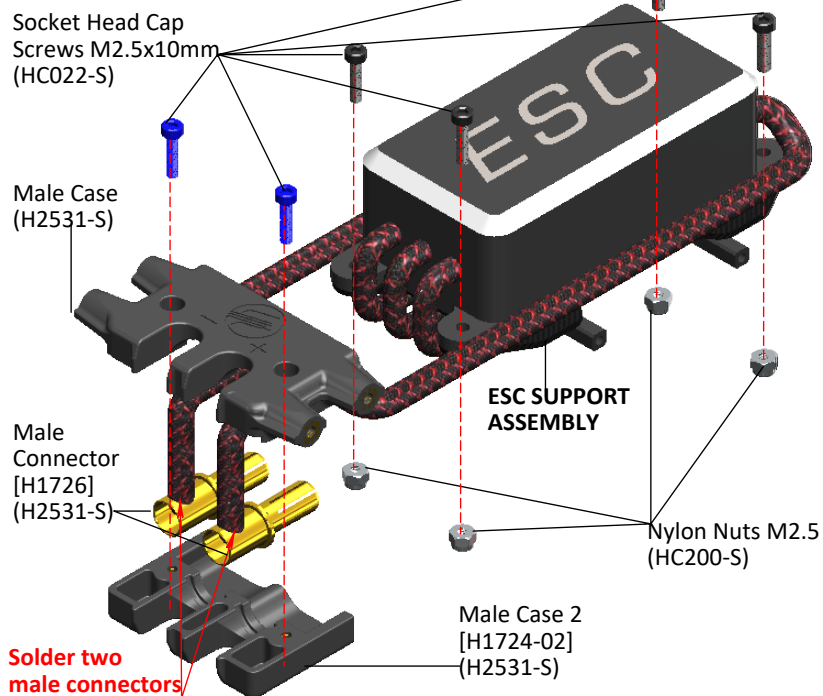
BOX 1, BAG FOR PAGE 17



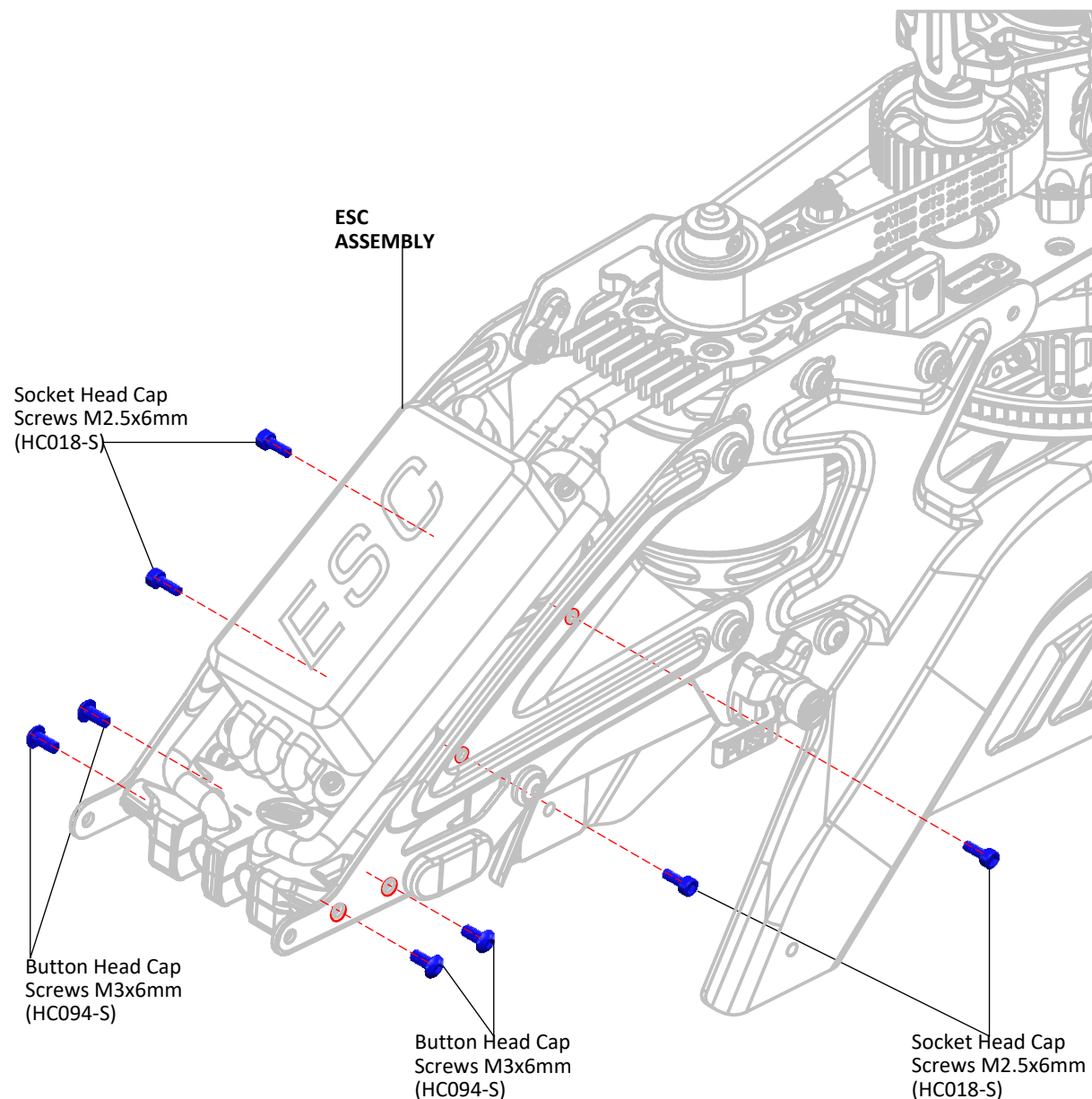
ESC SUPPORT ASSEMBLY



ESC ASSEMBLY



ESC ASSEMBLY





TAIL GROUP ASSEMBLY

BOX 1, BAG FOR PAGE 19

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.



Button Head Cap Screw M4x6mm (HC096-S)

Spacer $\phi 7.5 \times \phi 10 \times 0.5 \text{mm}$ [H0349] (H0330-S)

Tail Blade Grip Assembly (H1893-S)

Already Assembled With Loctite

Bearing $\phi 5 \times \phi 10 \times 4 \text{mm}$ (HC411-S)

Already Assembled

Spacer $\phi 5 \times \phi 8.5 \times 0.75 \text{mm}$ (H0330-S)

Delrin Bushing [H2570] (H2386-S)

Already Assembled

Spindle Shaft (H0329-S)

Uniball M2.5 (H0064-S)

Tail Shaft Assembly (H2386-S)

TAIL PITCH SLIDER ASSEMBLY

Thrust Bearing $\phi 5 \times \phi 10 \times 4 \text{mm}$ (HC435-S)

Socket Head Cap Screw M2x6mm (HC004-S)

TAIL PITCH SLIDER ASSEMBLY

Note: S >> Left Side

Socket Head Cap Screw M2x6mm (HC004-S)

Bushings $\phi 2 \times \phi 3 \times 3 \text{mm}$ [H0076] (H0261-S)

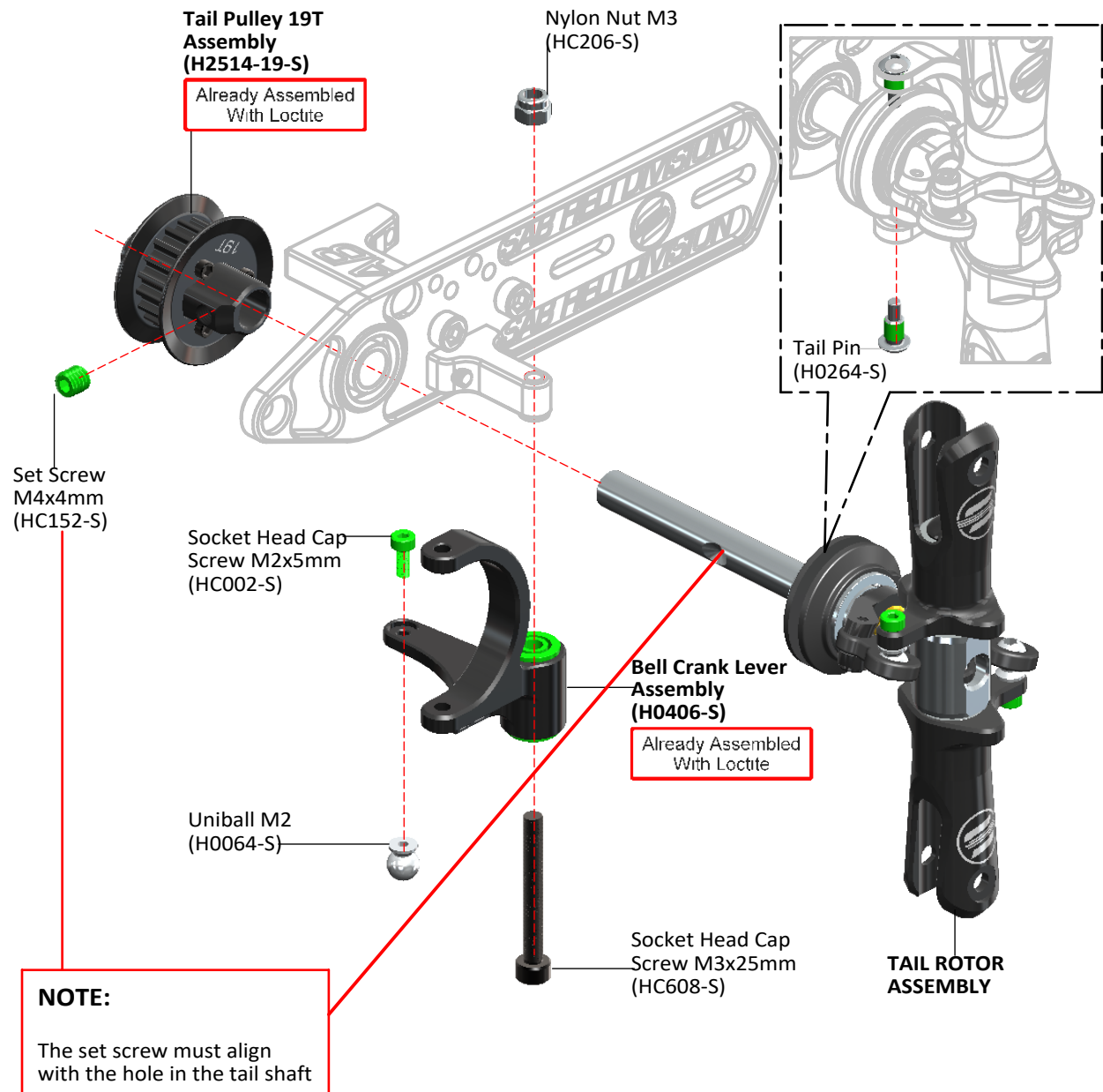
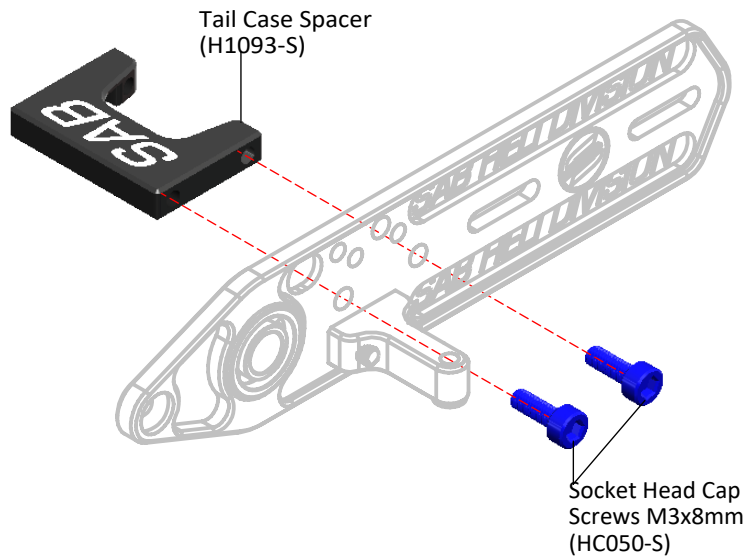
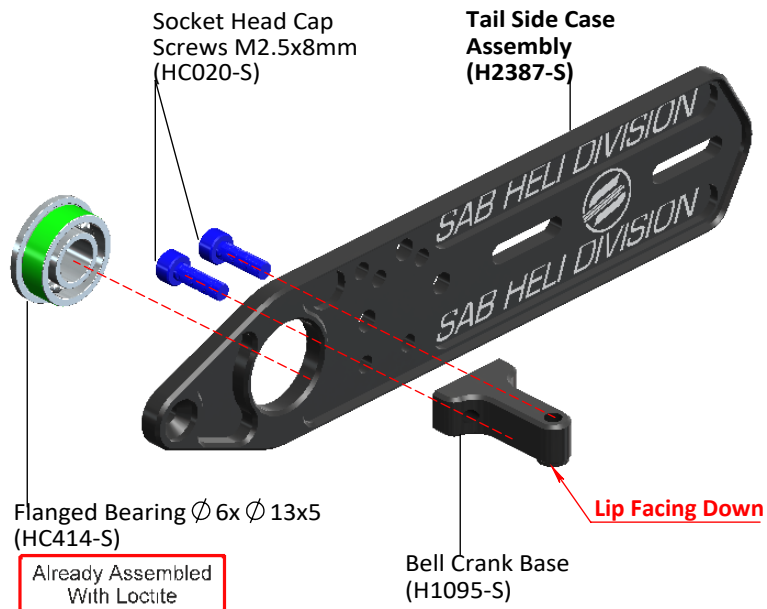
Tail Pitch Slider Assembly (H2525-S)

Already Assembled With Loctite

Tail Pitch Slider Links (H0261-S)

Socket Head Cap Screw M2x6mm (HC004-S)

Note: S >> Right Side





TAIL GROUP ASSEMBLY

BOX 1, BAG FOR PAGE 21

Socket Head Cap
Screws M3x8mm
(HC050-S)

Socket Head Cap
Screws M2x6mm
(HC002-S)

Flat Head Cap
Screw M3x8mm
(HC134-S)

Tail Fin
(H2535-S)

Flanged Bearing Mount
Assembly
(H2389-S)

Already Assembled
With Loctite

Tail Side Plate
(H2388-S)

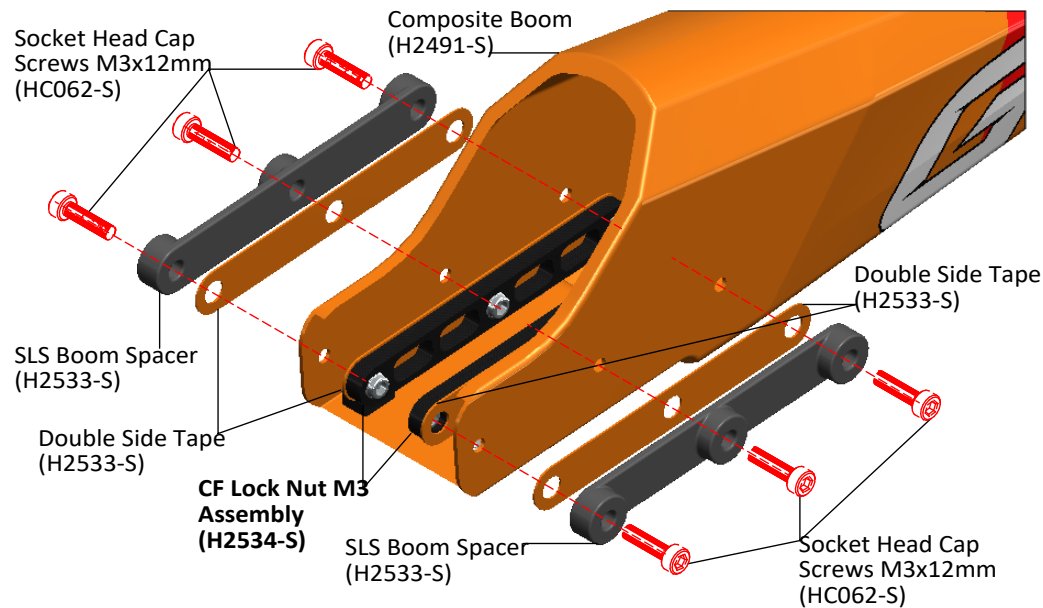
Belt HTD 3M 1737-6
(HC768-S)

TAIL GROUP
ASSEMBLY

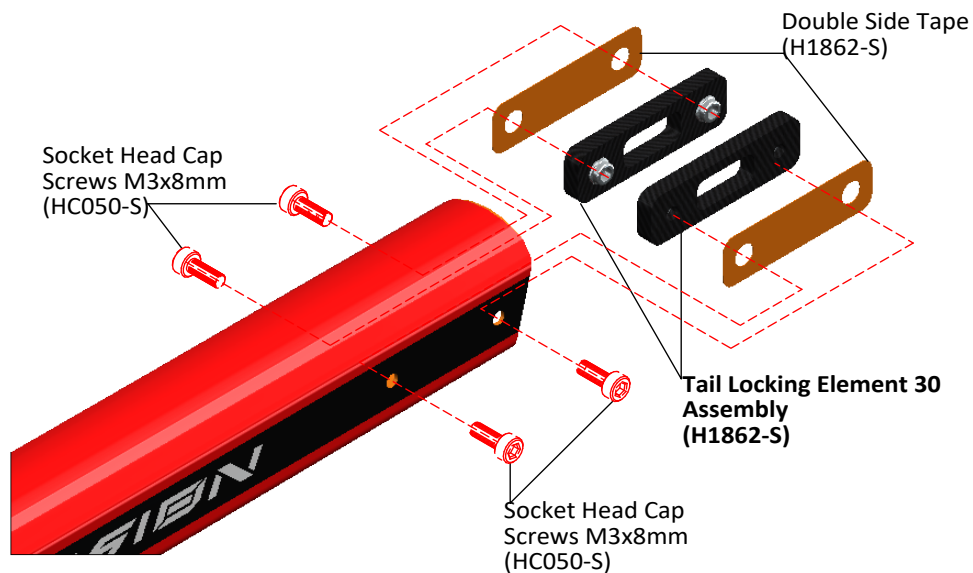
Tail Column Spacer
(H2067-S)

Flat Head Cap
Screw M3x8mm
(HC134-S)

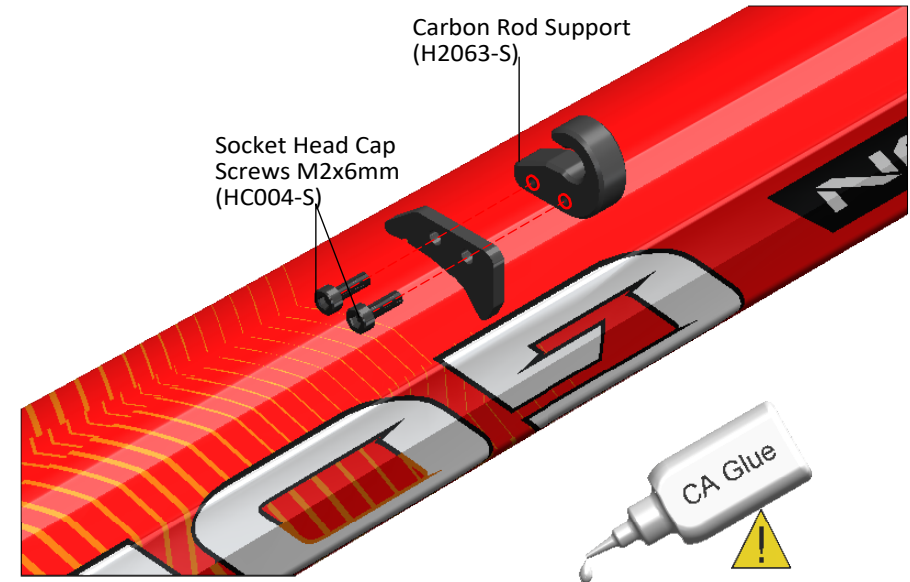
SUGGESTION: You can use M3x12 screws to aid in mounting the spacer and locking piece to the boom. Remove all screws after complete.



SUGGESTION: You can use M3x8 screws to aid in mounting the spacer and locking piece to the boom. Remove all screws after complete.

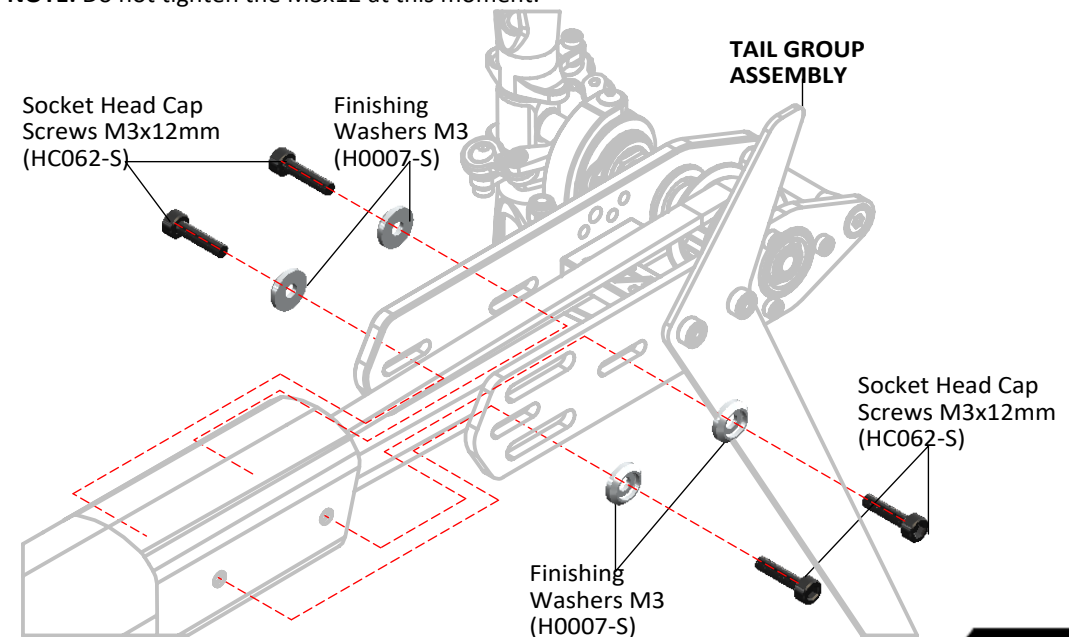


BOX 1, BAG FOR PAGE 22



Use small drop of CA as threadlock in all screws M2x6mm.

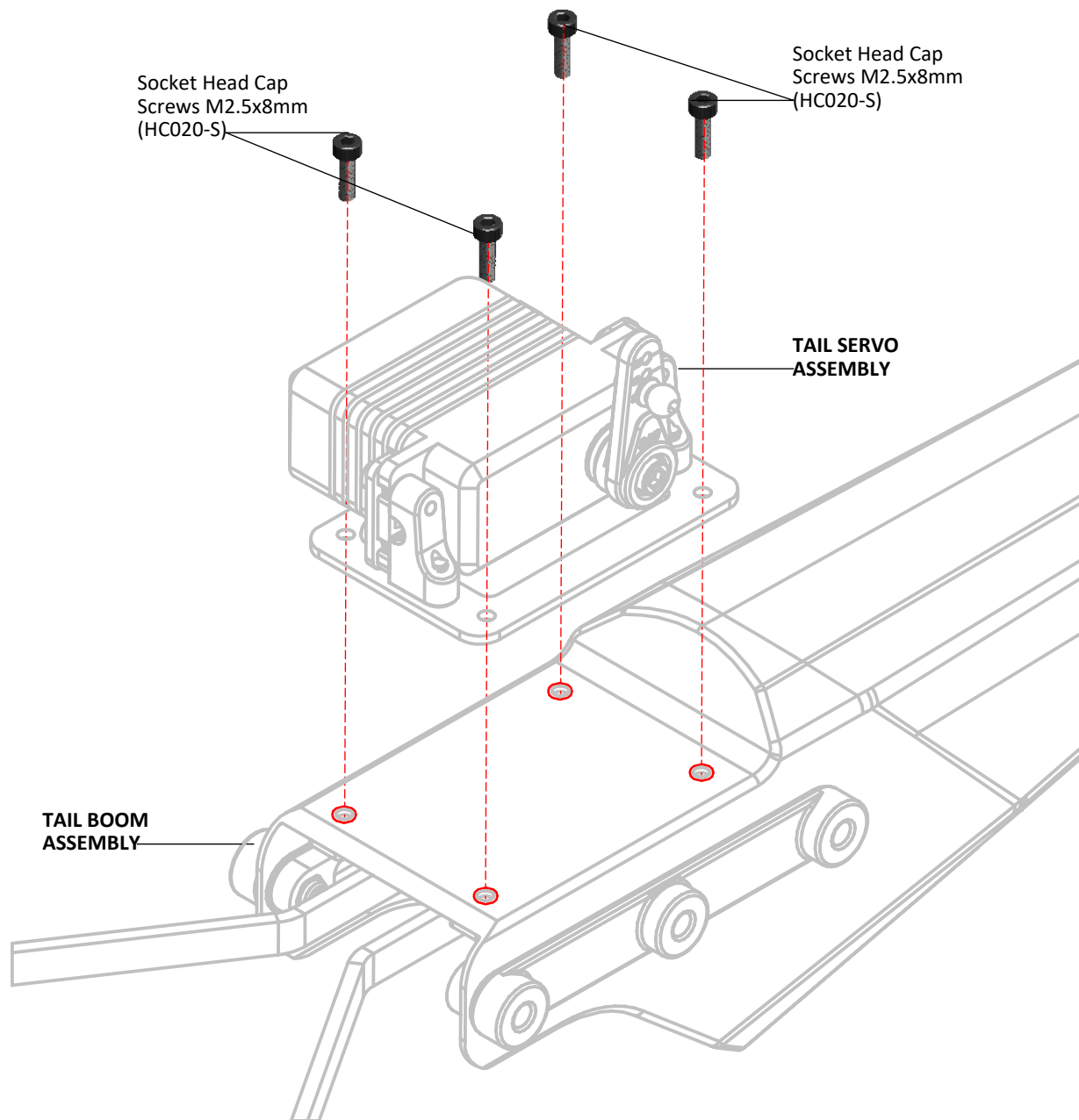
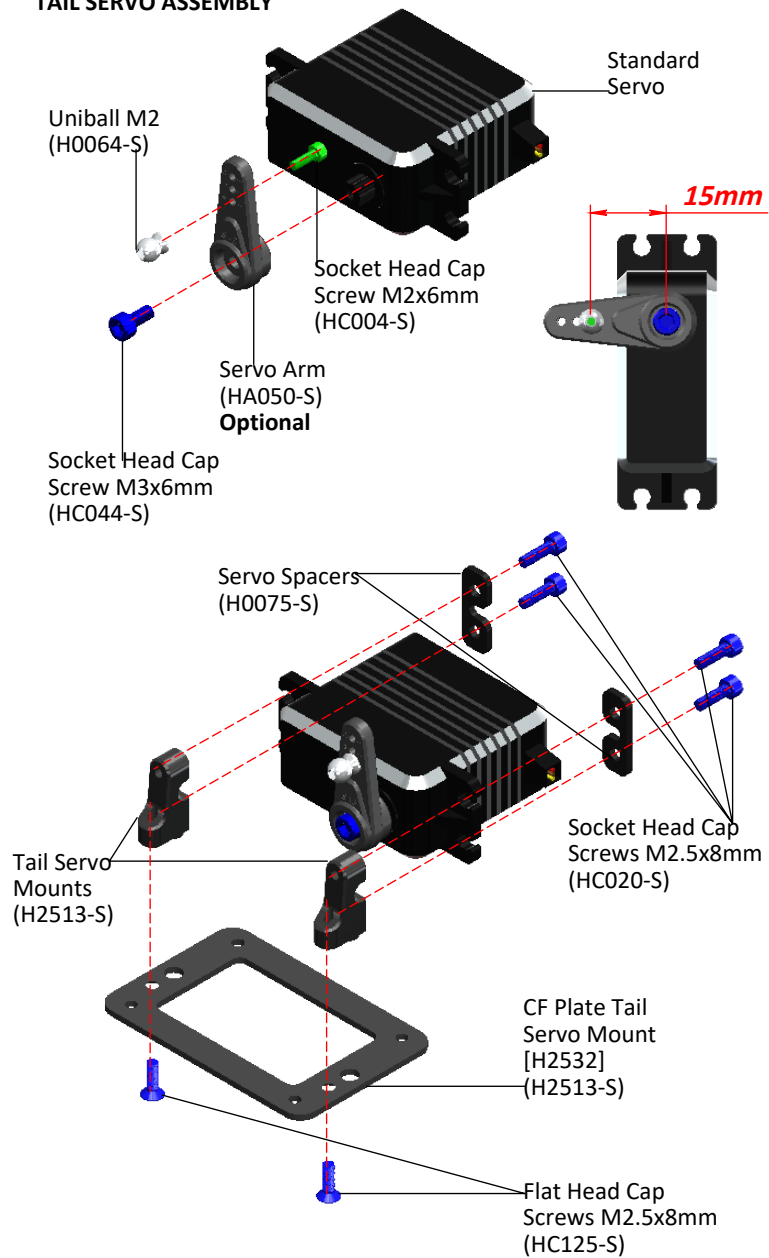
NOTE: Do not tighten the M3x12 at this moment.



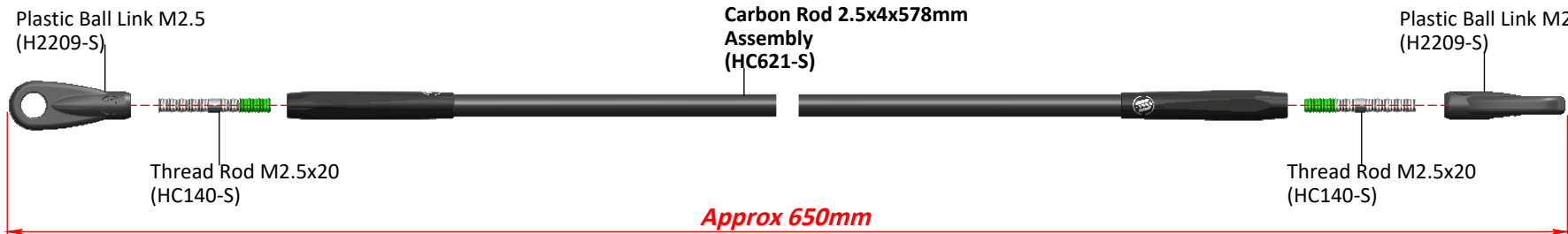


BOX 1, BAG FOR PAGE 23

TAIL SERVO ASSEMBLY

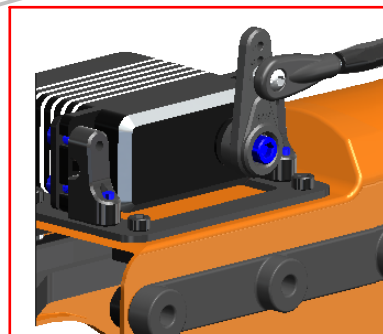
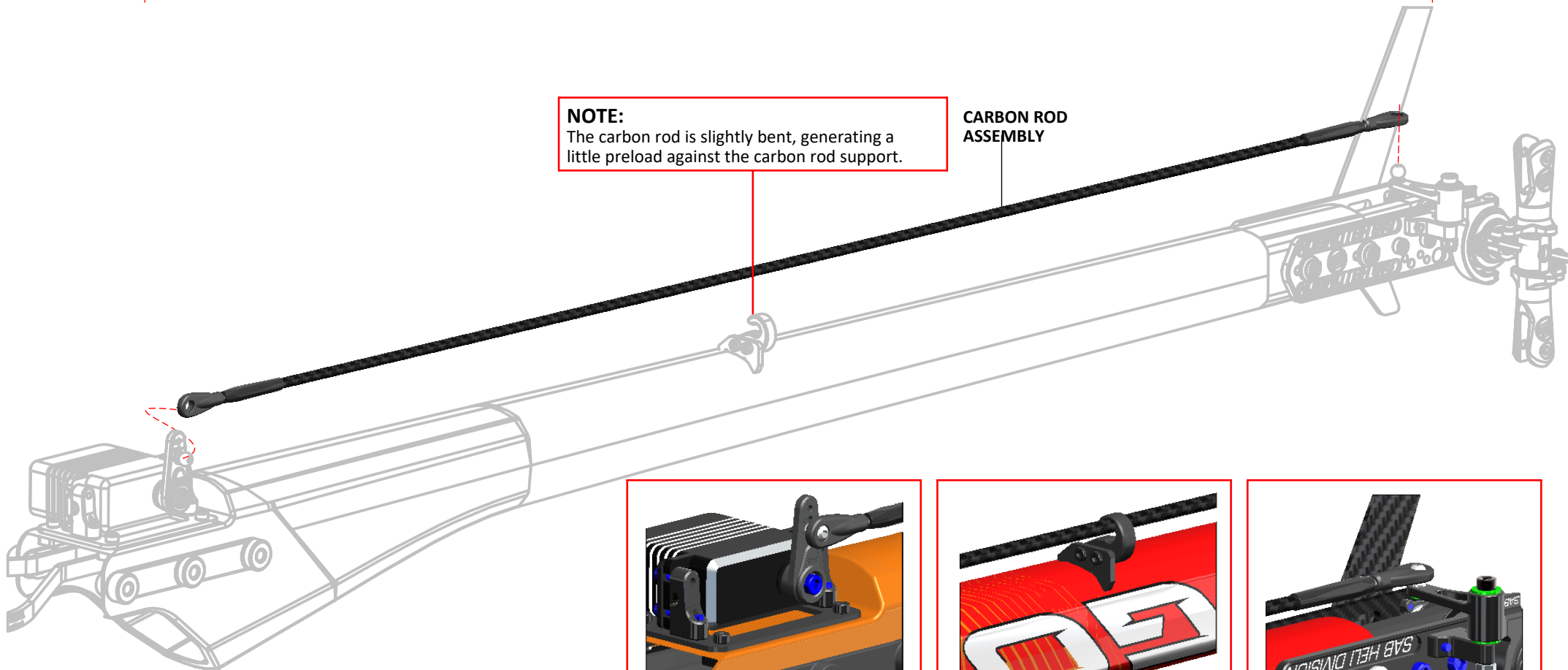


BOX 1, BAG FOR PAGE 24



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

CARBON ROD ASSEMBLY



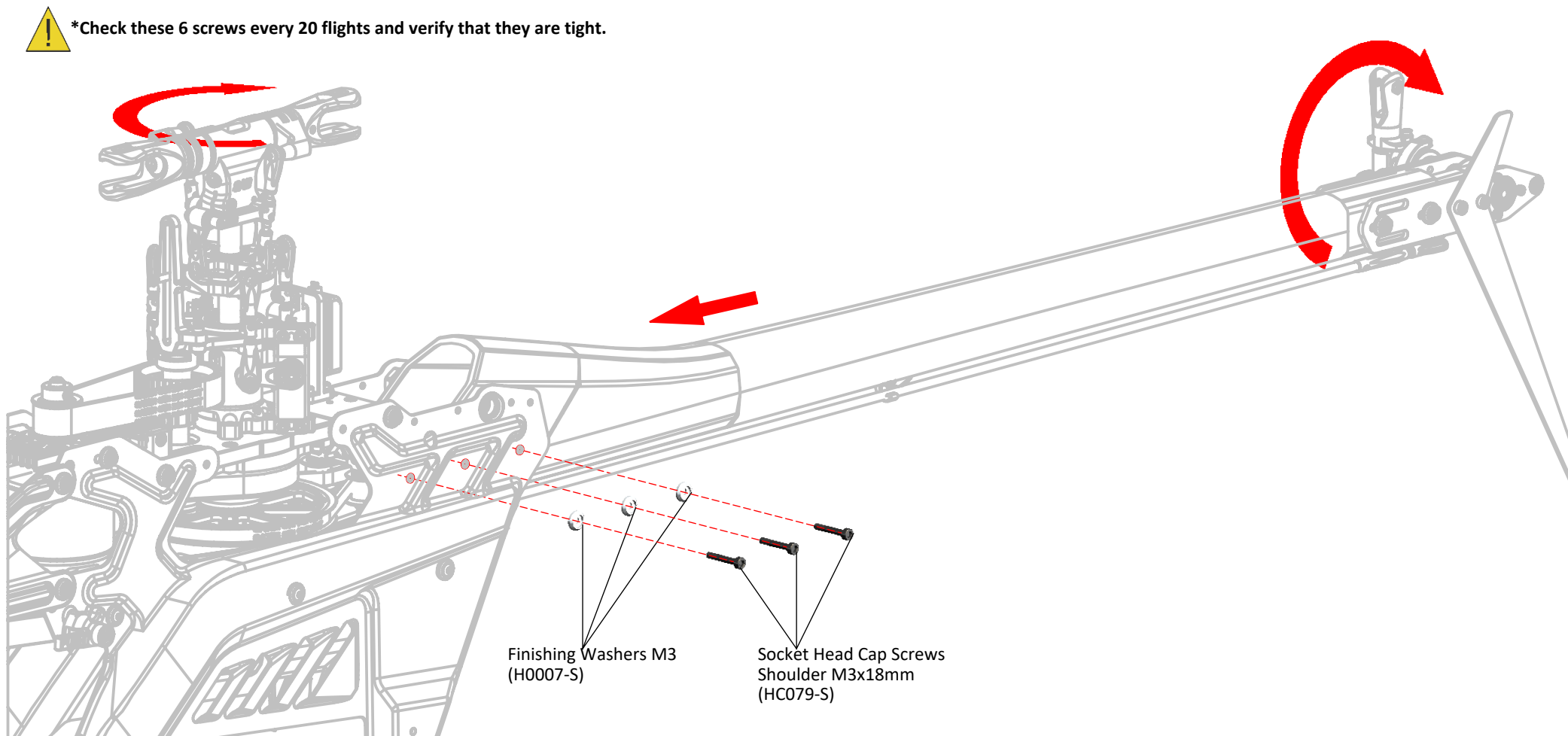
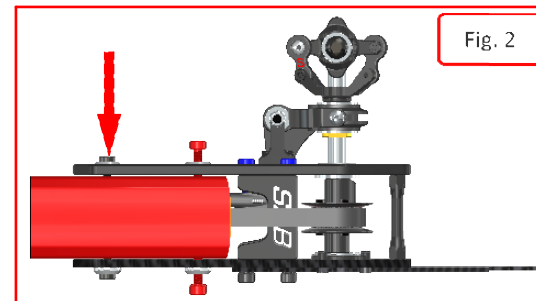
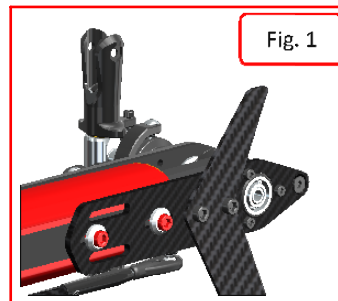


BOX 1, BAG FOR PAGE 25

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.



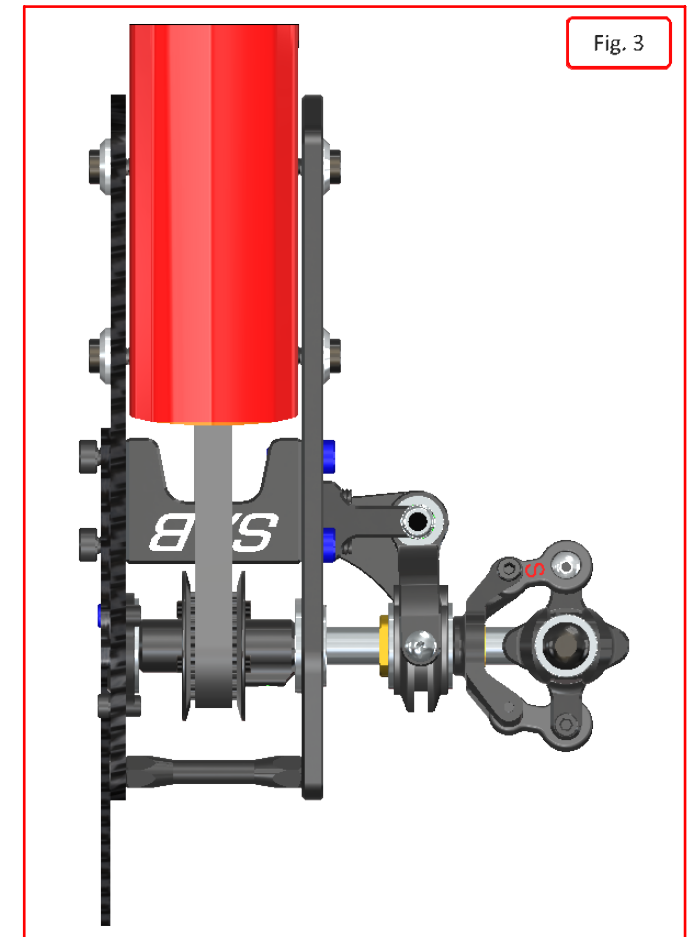
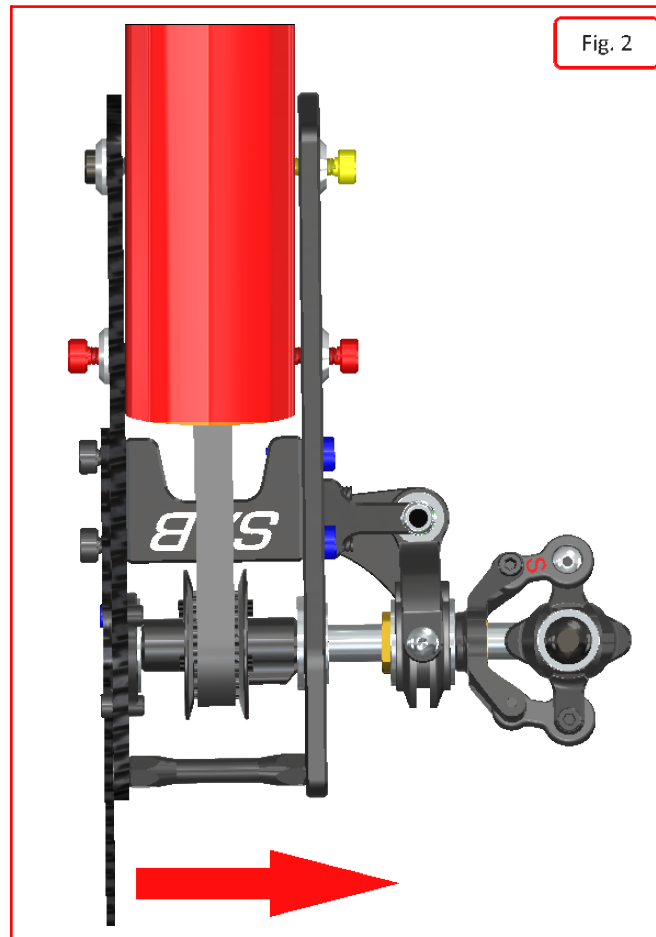
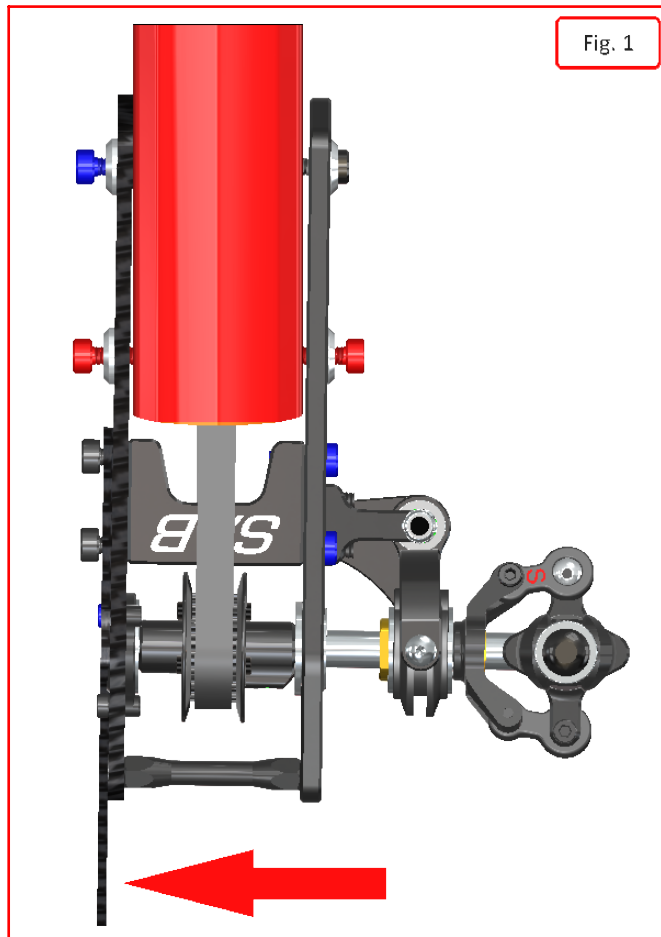
TAIL BELT TENSION

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.

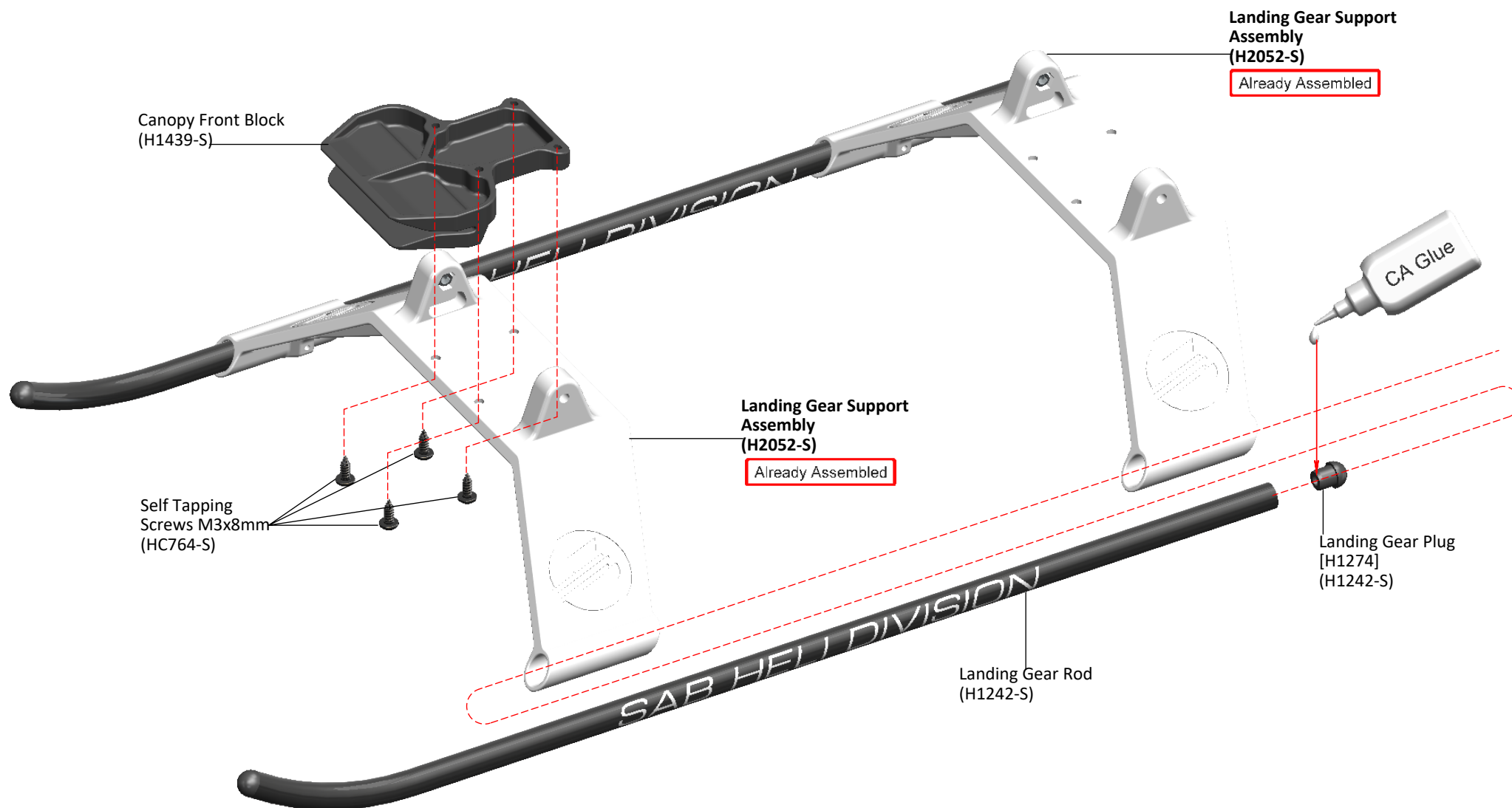
Figure 2, Loosen the 2 **RED** screws and the **YELLOW** screw, then push the tail side as indicated by the red arrow. While pushing, tighten the **YELLOW** screw. Continue adjusting step by step until the tail belt is sufficiently tight. Note that a Hard 3D flying style will require more tension; once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

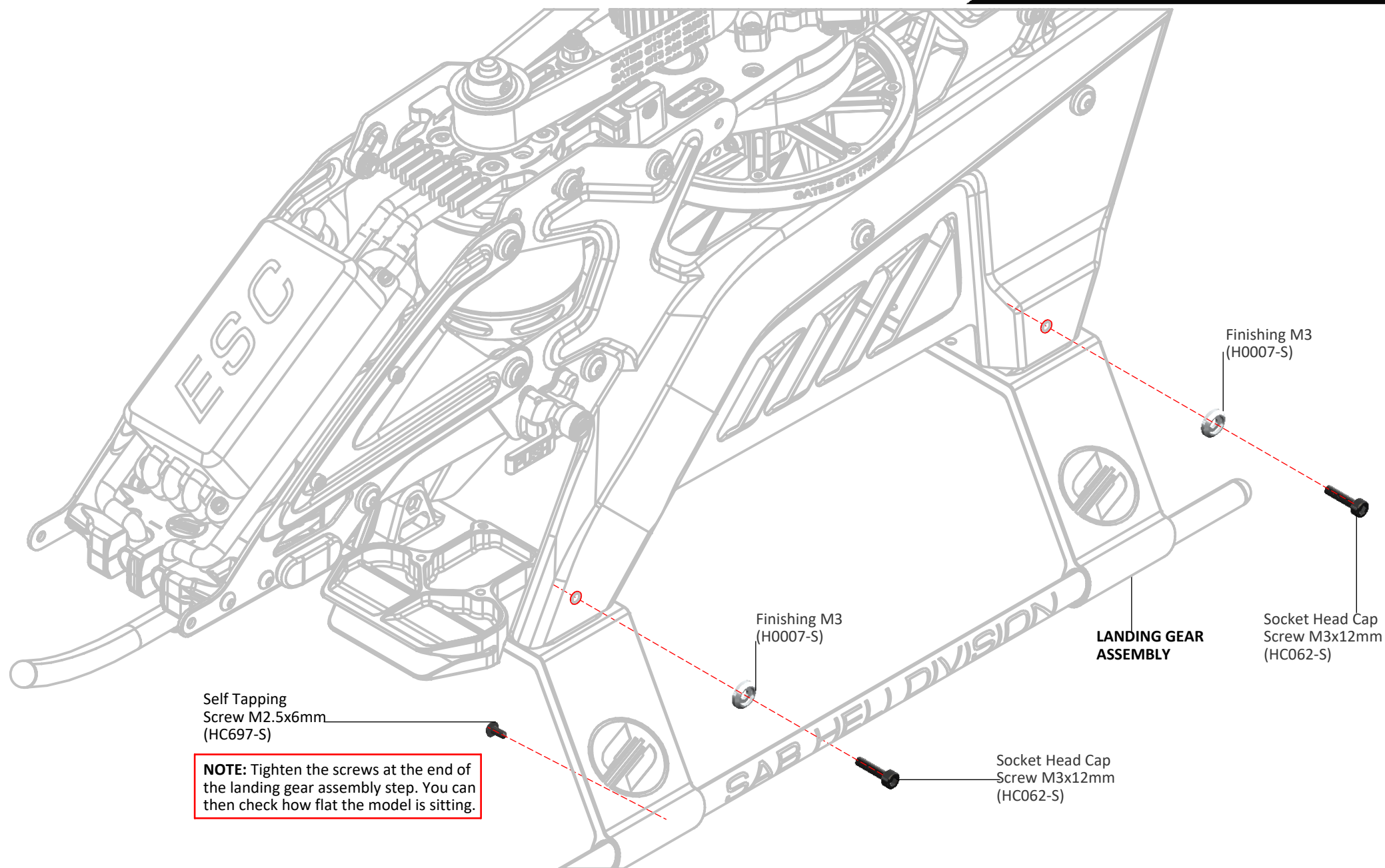
Figure 3, The tail output shaft must be perpendicular to the boom mid-line.





BOX 1, BAG FOR PAGE 27







BOX 1, BAG FOR PAGE 29

FBL/RX PLATE ASSEMBLY DAMPENERS OPTION

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

Note: Tighten carefully.
Overtightening can
damage the dampeners.

Flat Head Cap
Screws M3x5mm
(HC132-S)

Note: Tighten by hand.
Overtightening can
damage the dampeners.

Rubbers 65 shore
(HC573-S)

FBL Plate
(H2551-S)

Alu FBL Support
[H1625]
(H2551-S)

If you do not want to use the dampeners, you can setup a rigid FBL mount support using the screws and bushings supplied in bag 29-2.

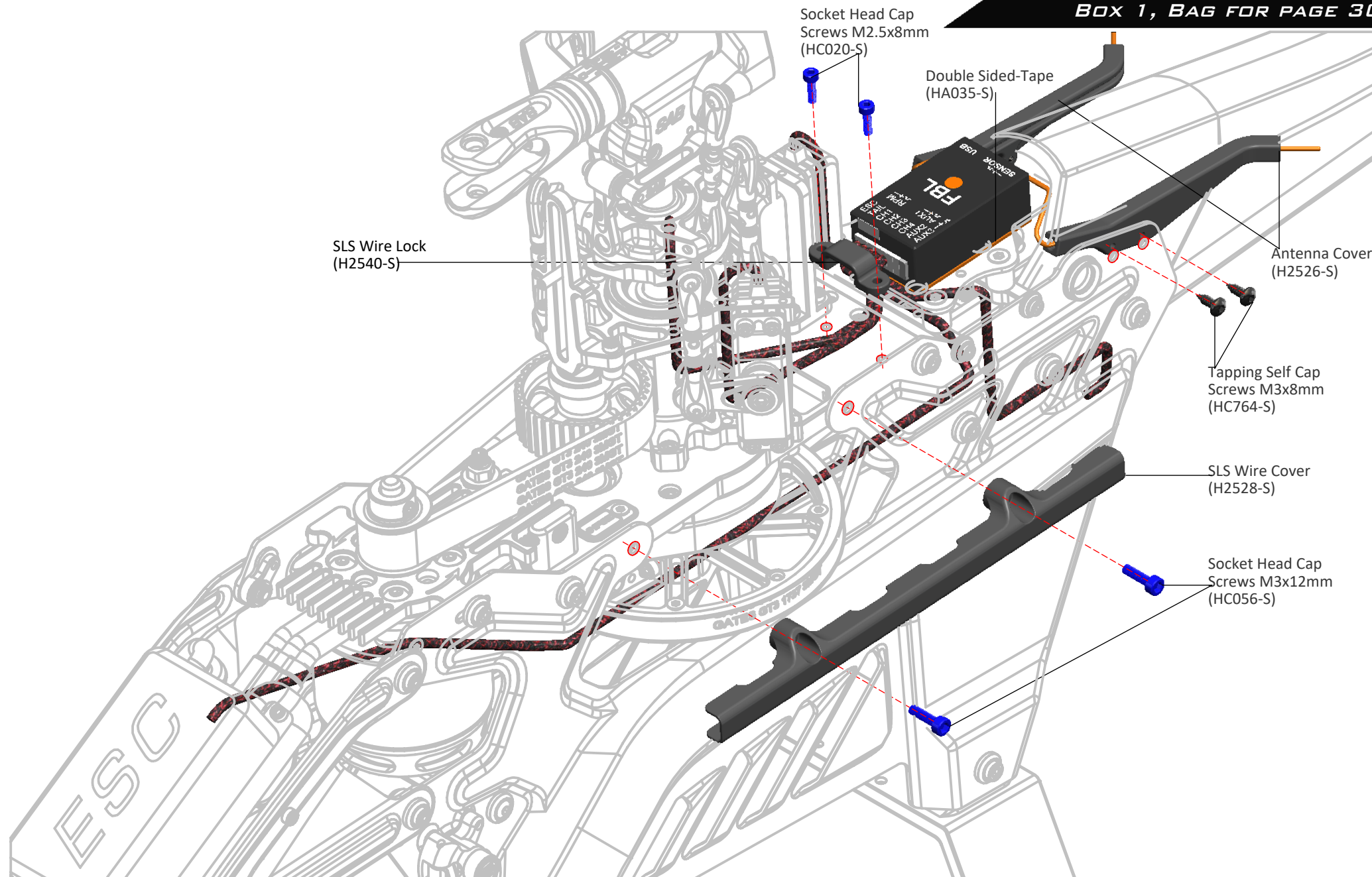
Bottom Head Cap
Screws M2.5x6mm
(HC019-S)

FBL PLATE
ASSEMBLY

Bottom Head Cap
Screws M2.5x6mm
(HC019-S)

FBL POSITION

BOX 1, BAG FOR PAGE 30





INSTALLATION CANOPY

BOX 1, BAG FOR PAGE 31

CANOPY

*Install Canopy grommets (Figure.1) and the two quick knobs (Figure.2).

*Fit the canopy in the red arrow zone, and insert the knobs.



*Confirm the canopy is secure prior to each flight.

Fig. 1

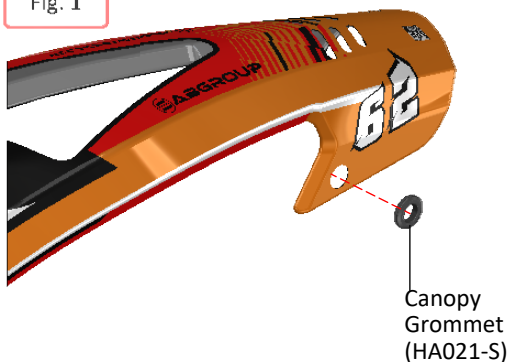
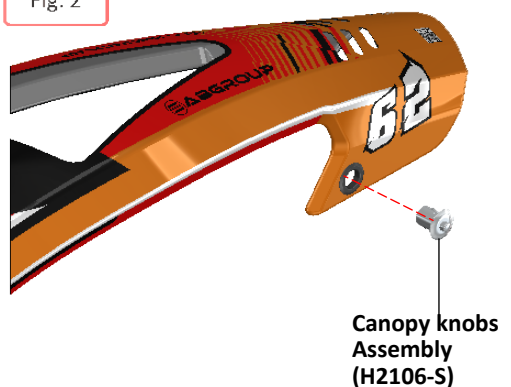
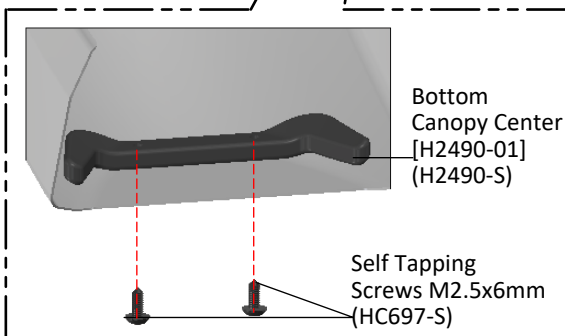
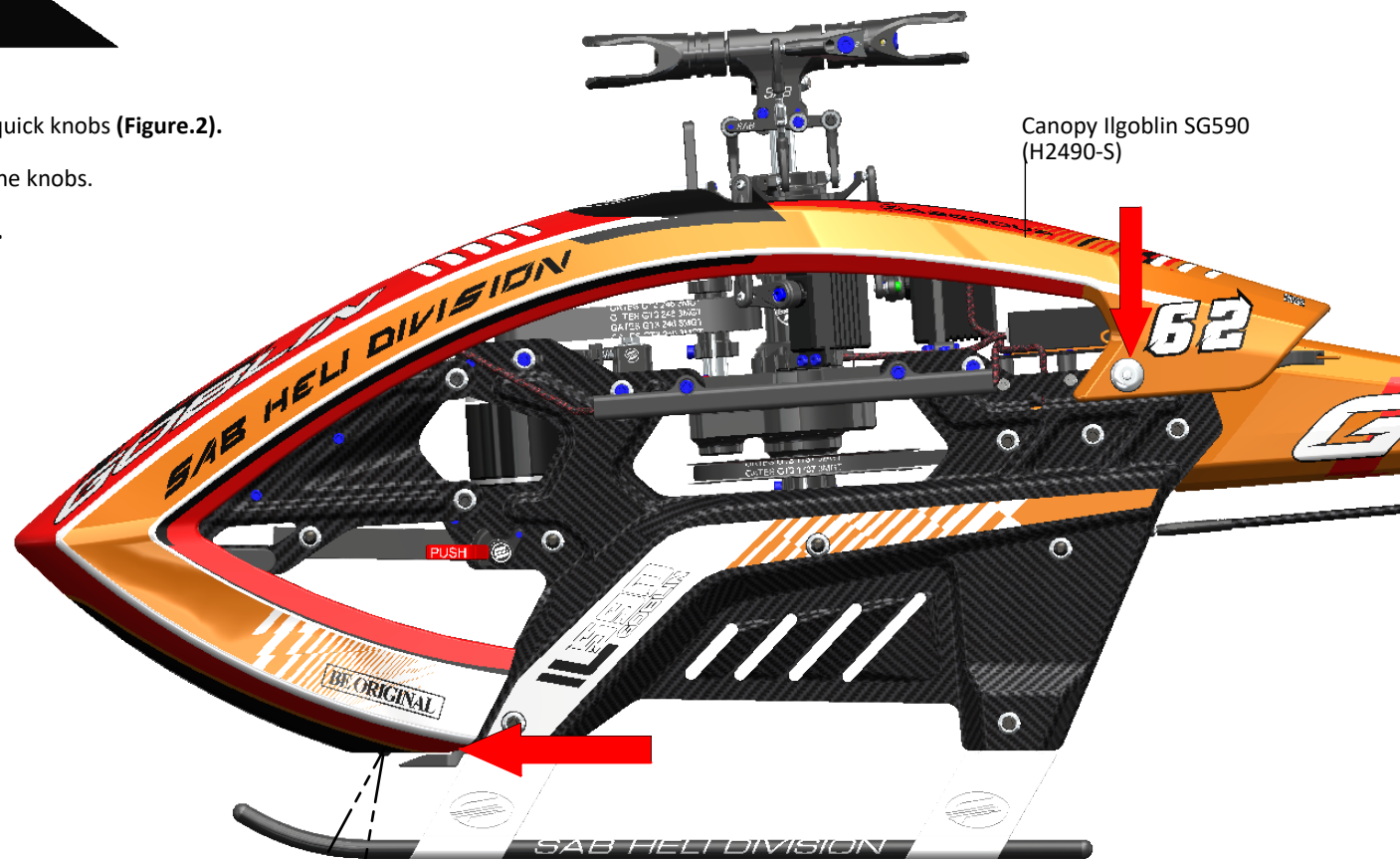


Fig. 2



NOTE:

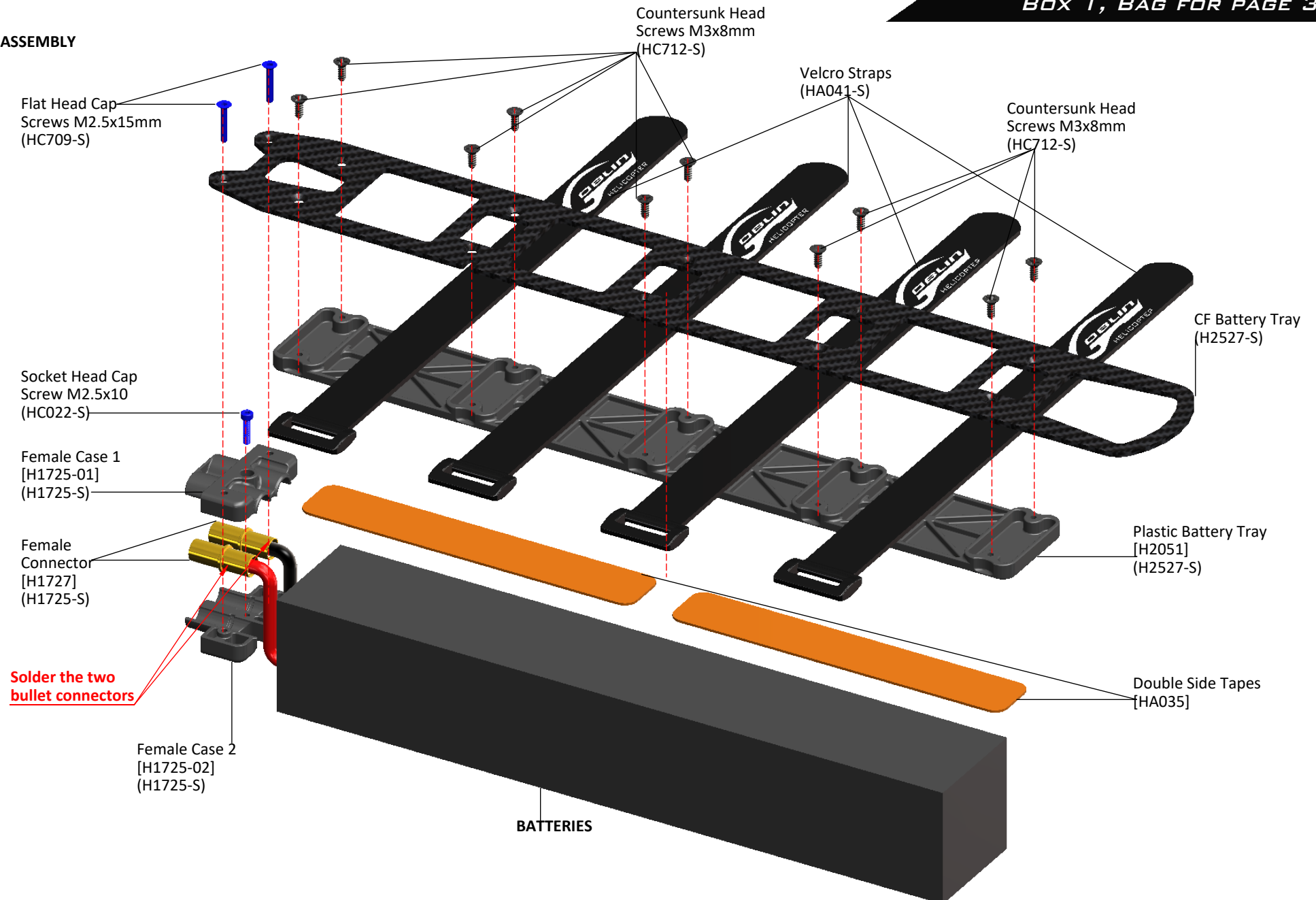
Put a very small drop of CA glue on the grommet and then insert the quick release canopy mount. This way when you remove the canopy, the mounts can not come off. Be careful not to block the quick release mechanism with glue.



SUGGESTED: Dimensional check, to verify the correct alignment of the arm.

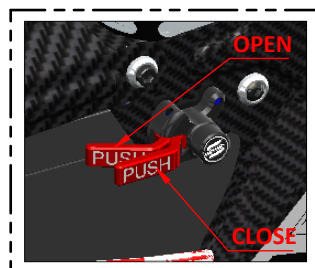


BATTERY ASSEMBLY





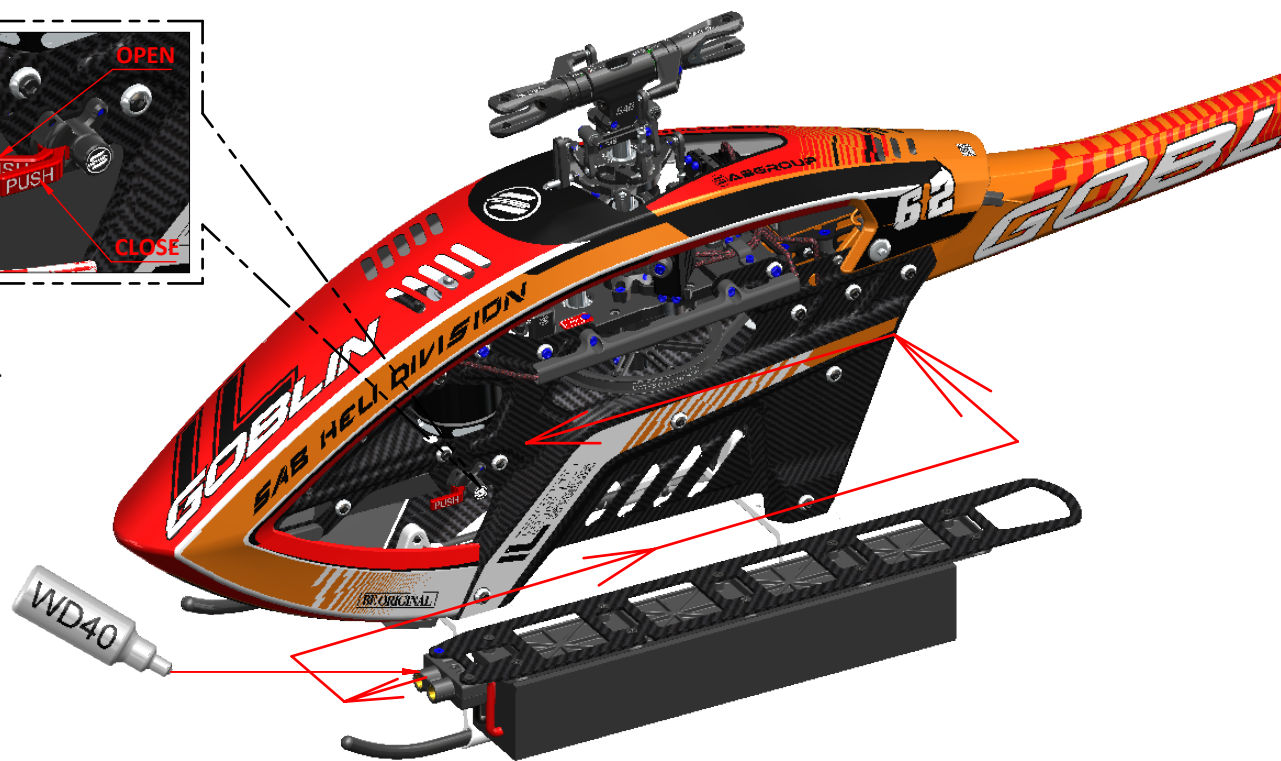
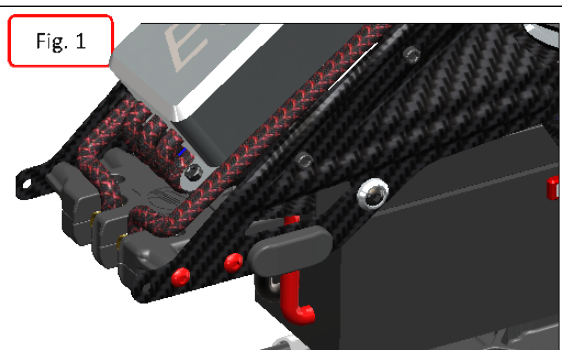
Before permanently mounting the batteries onto the battery tray, check the ideal position for the best center of gravity.



Ensure Correct Connector Alignment

- * Ensure the connector is correctly aligned before proceeding.
- * Place the battery tray with the connector into its designated position.
- * Unscrew the 2+2 M3 screws of the connector **Fig.1**.
- * Slightly move the components as needed to ensure proper alignment.
- * Tighten the screws securely.

Fig. 1



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 **2600rpm**.
- *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 2 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

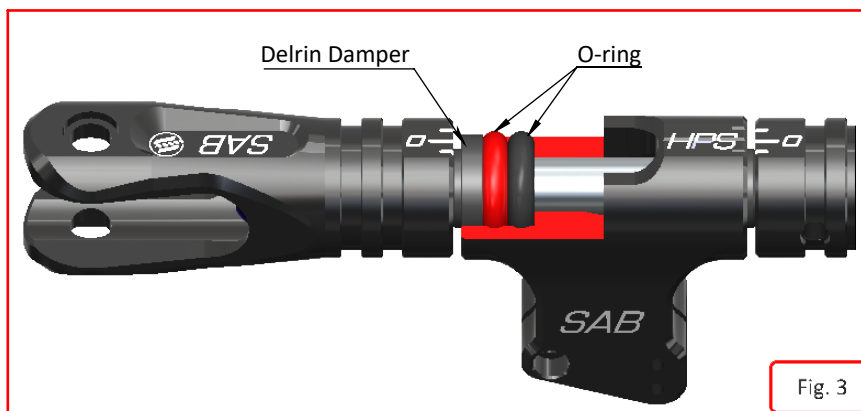
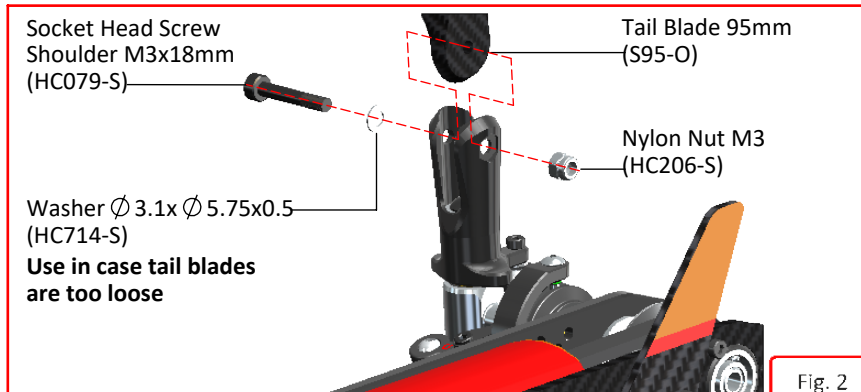
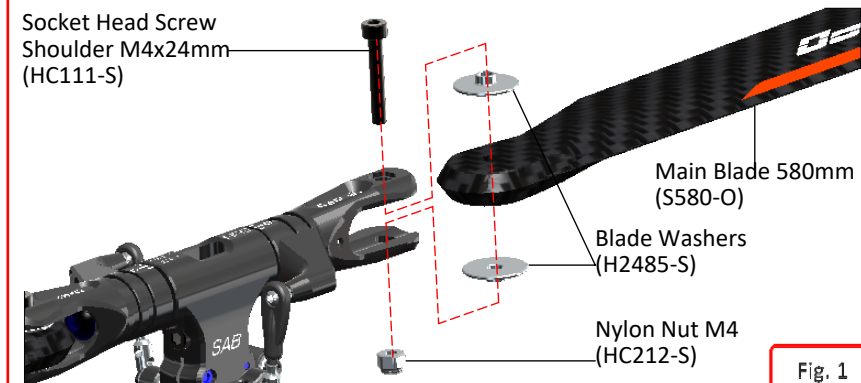
- 70 Shore: Soft for smooth response.
- 90 Shore: Firm for direct and precise response.

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, C damper H1216-B, H1216-C with 70 Shore O-ring + 90 Shore O-ring [other Setting >>p/n H1216-S.

BOX 1, BAG FOR PAGE 34





MAINTENANCE

Take a look at the red parts.

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

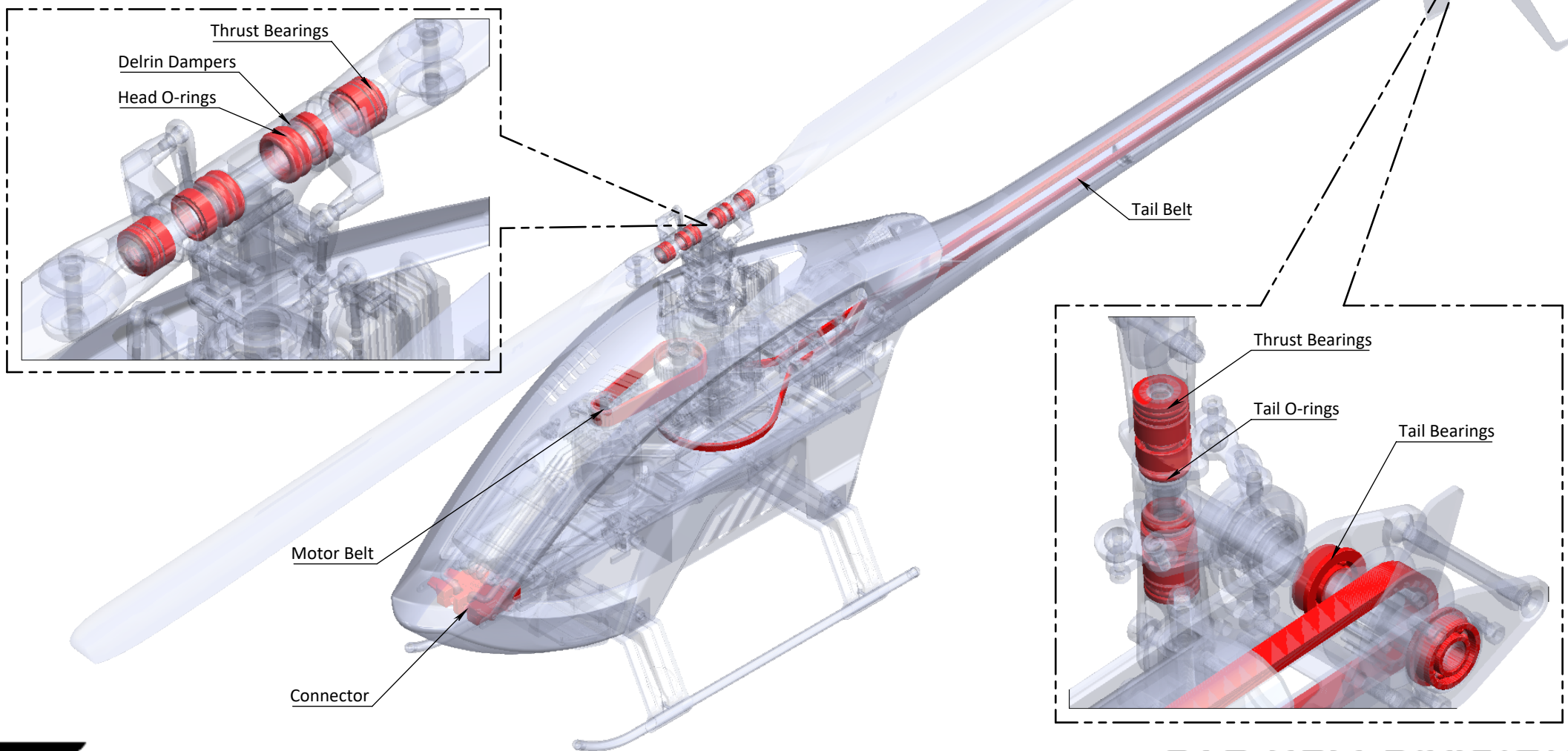
The lifespan of these components varies according to the type of flying.

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.



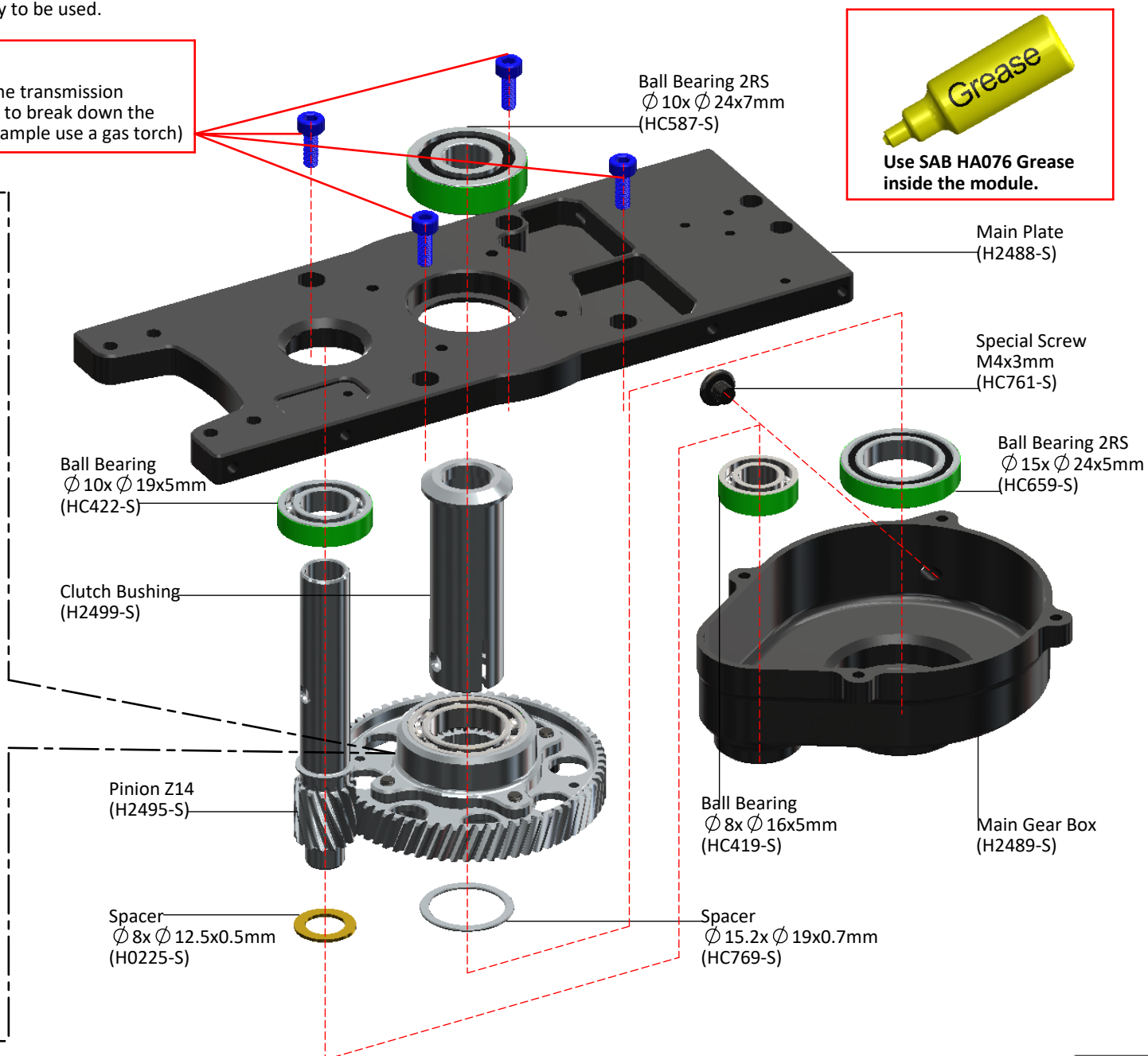
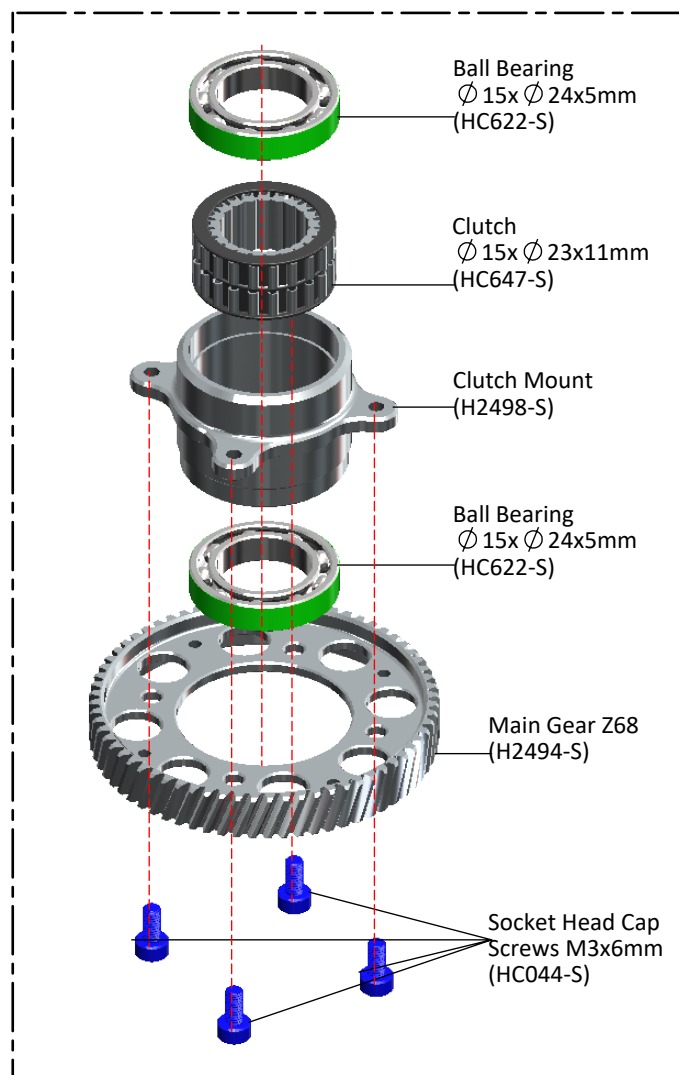
TRANSMISSION MODULE

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

EXPLODE AND SPARE PARTS

NOTE:

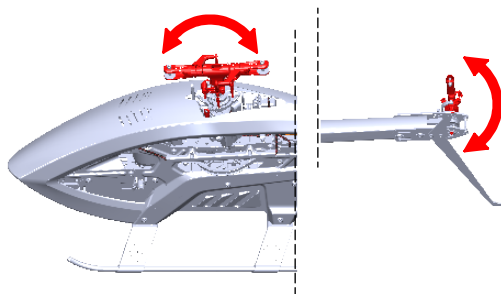
Before opening the transmission module, use heat to break down the Threadlocker. (example use a gas torch)



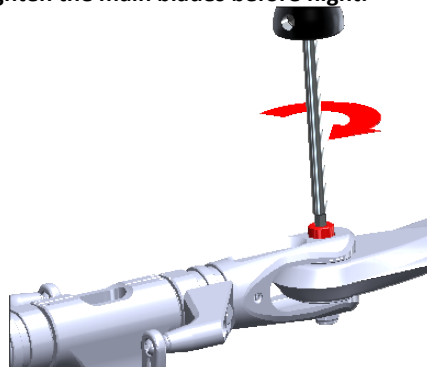
Use SAB HA076 Grease
inside the module.



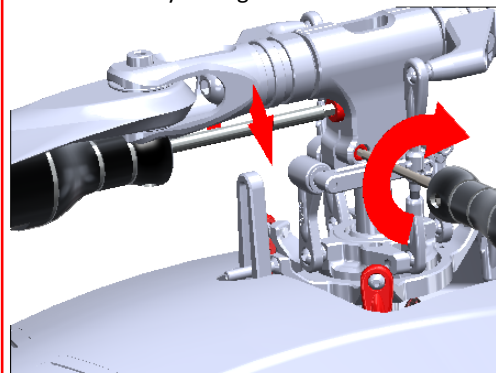
- 1** Check the dampening on the main and tail rotor to be the same as always.



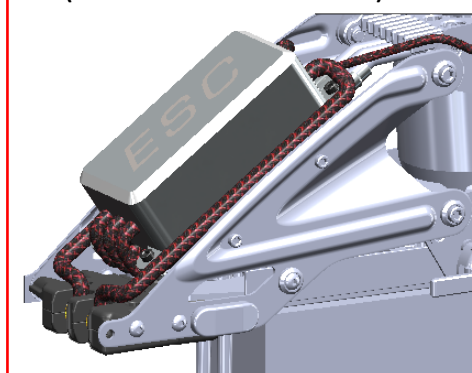
- 2** Tighten the main blades before flight.



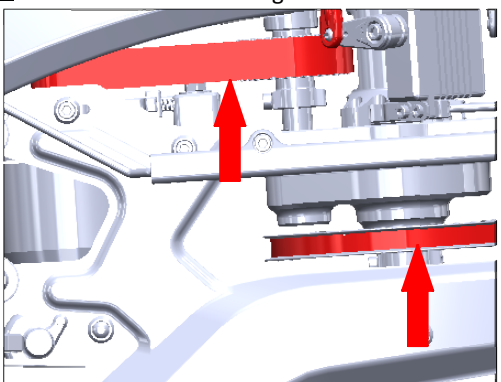
- 3** Check main hub screws(M4 and 2 M3)
Ensure they are tight.



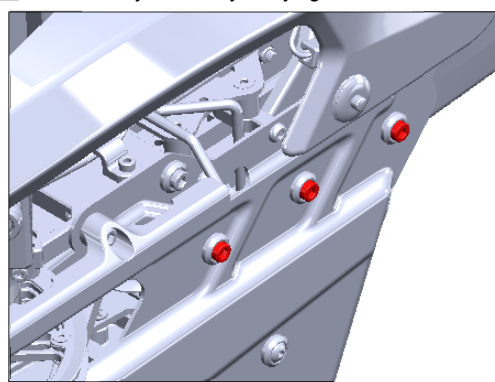
- 4** Check all power connectors
(Good mechanical connection).



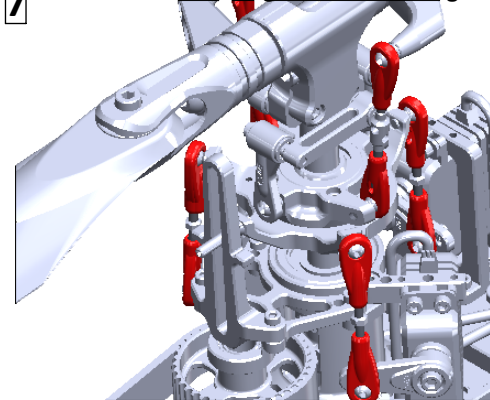
- 5** Check Tail & Motor belt tension.
The tension has to be tight.



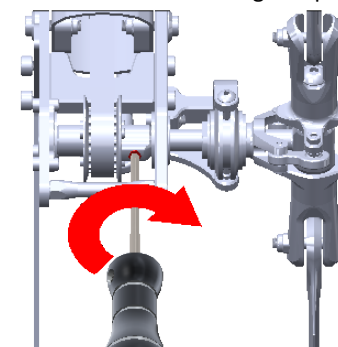
- 6** Regularly check these 6 M3 screws.
Ensure they are always fully tightened.



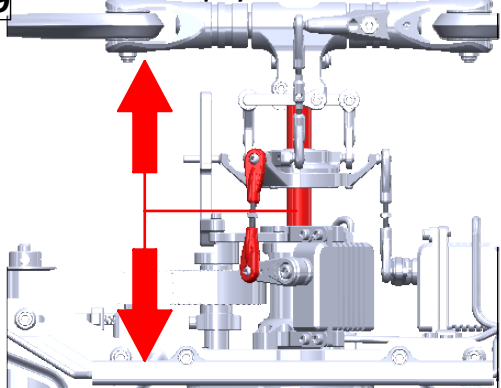
- 7** Check the Main Linkages & Servo Linkages



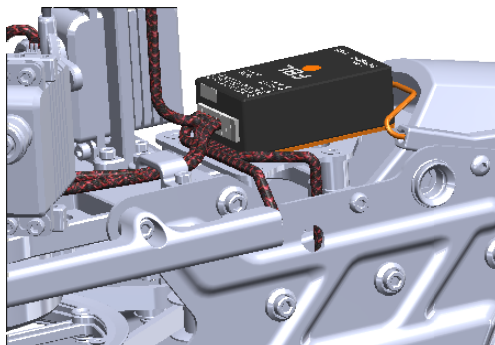
- 8** Check tail pulley set screws:
Ensure they are tight.
(It is suggested use a bit of retaining compound.)



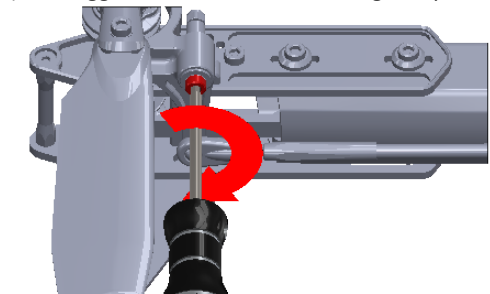
- 9** Check for vertical play of the main shaft.



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

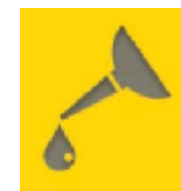


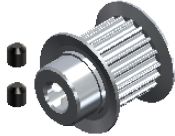
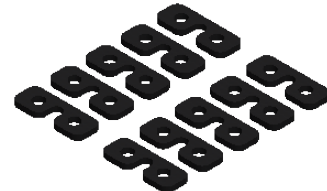
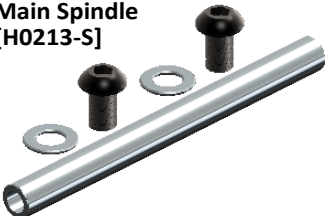
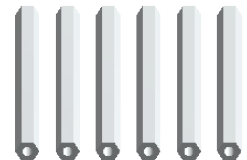
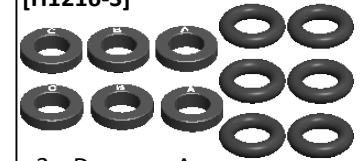
- 11** Check the M3 bell crank:
Bell crank movement must be smooth and
the screw locked.
(It is suggested use a bit of retaining compound.)



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

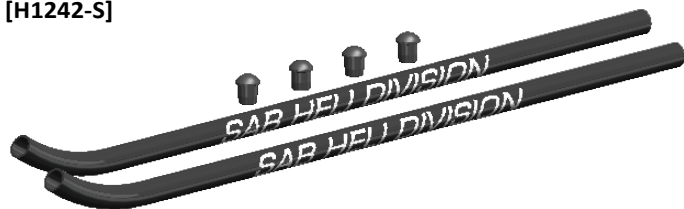
- *Main shaft/swashplate
- *Tail slider/tail shaft
- *Carbon rod/carbon rod support
- *All thrust bearings
- *All plastic balls connections



Finishing Washer M3 [H0007-S]  - 10 x Finishing Washers M3.	Motor Pulley [H0015-18/24-S]  - 1 x Motor Pulley Z18/24. - 2 x Set Screws M4x4.	Uniball M2 [H0064-S]  - 5 x Uniball M2. - 5 x Uniball Spacers. - 5 x Head Cap Screws M2x6. - 5 x Head Cap Screws M2x8.	Uniball M3 [H0065-S]  - 5 x Finishing Washers M3.	Servo Spacer [H0075-S]  - 10 x Servo Spacers.	Radius Arm SET [H0204-S]  - 2 x Radius Arm Sets.
Plastic Radius Arm [H0205-S]  - 2 x Plastic Radius Arms.	Main Spindle [H0213-S]  - 1 x Main Spindle. - 2 x Washers $\varnothing 6,1 \times \varnothing 12 \times 1$. - 2 x Button Head Cap Screws M6x10.	Spacer $\varnothing 8 \times \varnothing 12,5 \times 0,75 \text{mm}$ [H0225-S]  - 2 x Spacer $\varnothing 8 \times \varnothing 12,5 \times 0,75$.	Spacer 54mm [H0239-S]  - 6 x Spacer 54mm.	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 $\varnothing 2 \times \varnothing 3 \times 3$. - 2 x Head Cap Screws M2x6.
Tail Pin [H0264-S]  - 2 x Tail Pin.	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 $\varnothing 5 \times \varnothing 8,9 \times 0,75$. - 2 x Washers $\varnothing 7,5 \times \varnothing 10 \times 0,5$.	Bell Crank Clever [H0406-S]  - 1 x Bell Crank Lever SET.	35mm Servo Spacer [H0572-S]  - 4 x 35mm Servo Spacers.	Reference Pin D3xM3 [H1048-S]  - 1 x Reference Pin D3xM3.
Tail Case Spacer [H1093-S]  - 1 x Tail Case Spacer. - 4 x Head Cap Screws M3x8.	Bell Crank Support [H1095-S]  - 1 x Bell Crank Support. - 2 x Head Cap Screws M2,5x8.	Center Hub [H1200-S]  - 1 x Center Hub. - 1 x Head Cap Screw M4x20. - 2 x Head Cap Screws M2.5x12. - 1 x Nylon Nut M4.	Swashplate D8 [H1204-S]  - 1 x Swashplate D8 SET.	Serial Number [H1212-S]  - 1 x Serial Number. - 1 x Flat Cap Screw M2.5x5.	Damper [H1216-S]  - 2 x Dampers A. - 2 x Dampers B. - 2 x Dampers C. - 4 x O-rings 70°. - 4 x O-rings 90°.



Landing Gear Rod
[H1242-S]



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

Blade Grip Arm 27
[H1342-S]



- 2 x Blade Grip Arm.
- 2 x Head Cap Screws M4x8.
- 2 x Uniball M3.

Block Nut M3
[H1386-S]



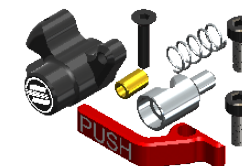
- 5 x Block Nuts M3.
- 5 x Nylon Nuts M3.

Canopy Front Lock
[H1439-S]



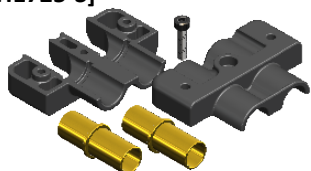
- 1 x Canopy Front Lock.
- 4 x Self Tap Screws M3x10.

Battery Lock
[H1721-S]



- 1 x Battery Lock SET.

Female Connector
[H1725-S]



- 1 x Male Connector Case 01.
- 1 x Male Connector Case 02.
- 2 x Male Connector.
- 1 x Head Cap Screw M2.5x10.

Tail Locking Element 30
[H1862-S]



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

Tail Belt Idler D9x12.5
[H1879-S]



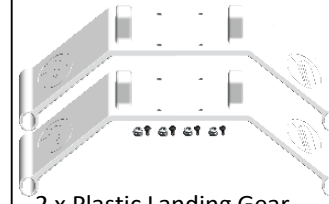
- 2 x Tail Belt Idler D9x12.5.
- 4 x F.Bearing $\phi 5x \phi 9x3$.

Tail Blade Grip
[H1893-S]



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

Plastic Landing Gear
[H2052-S]



- 2 x Plastic Landing Gear.
- 4 x Nylon Nut M3.
- 4 x Self Tap Screws M2.5x6.

Carbon Rod Support
[H2063-S]



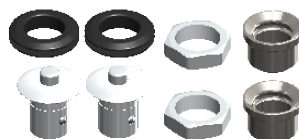
- 2 x Carbon Rod Supports.
- 4 x Head Cap Screws M2x8.

Tail Column Spacer
[H2067-S]



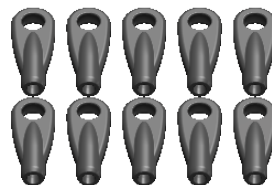
- 1 x Tail Column Spacer.
- 2 x Flat Cap Screws M3x8.

Canopy Quick Release
[H2106-S]



- 2 x Canopy Quick Releases.

Plastic Ball Linkage M2.5
[H2209-S]



- 10 x Ball Linkages M2.5.

Tail Shaft D6
[H2386-S]



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

Alu Tail Side Plate
[H2387-S]



- 1 x Alu Tail Side Plate.
- 1 x F.Bearing $\phi 6x \phi 13x5$.

CF Tail Side Plate
[H2388-S]



- 1 x CF Tail Side Plate.

Tail Bearing Mount
[H2389-S]



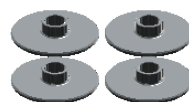
- 1 x Tail Bearing Mount.
- 3 x Head Cap Screws M2x5.
- 1 x F.Bearing $\phi 6x \phi 13x5$.

Main Blade Grip
[H2484-S]



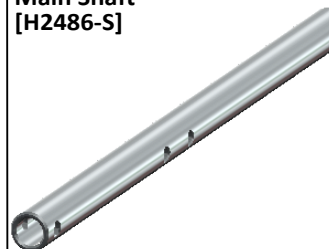
- 1 x Main Blade Grip ASM.
- 1 x Washer $\phi 11x \phi 13,8x0,5$.
- 1 x Washer $\phi 6x \phi 12x1$.
- 1 x Button Cap Screw M6x10.
- 1 x T.Bearing $\phi 8x \phi 14x4$.

Main Blade Washer
[H2485-S]



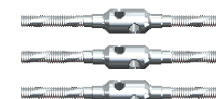
- 4 x Main Blade Washer.

Main Shaft
[H2486-S]



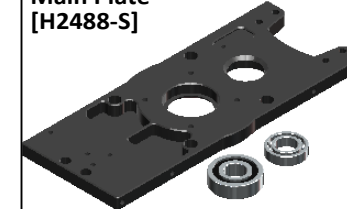
- 1 x Main Shaft.

Linkage M2.5x42
[H2487-S]



- 3 x Linkages M2.5x42.

Main Plate
[H2488-S]



- 1 x Main Plate.
- 1 x Bearing $\phi 10x \phi 19x5$.
- 1 x Bearing 2RS $\phi 10x \phi 24x7$.

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Tail Pulley 18T-20T
[H2514-18/20-S]



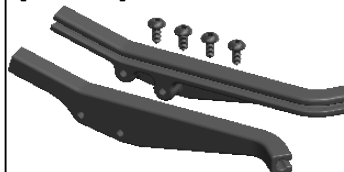
- 1 x Tail Pulley 18T-20T ASM.
- 1 x Set Screw M4x4.

Tail Pitch Slider D6 SET
[H2525-S]



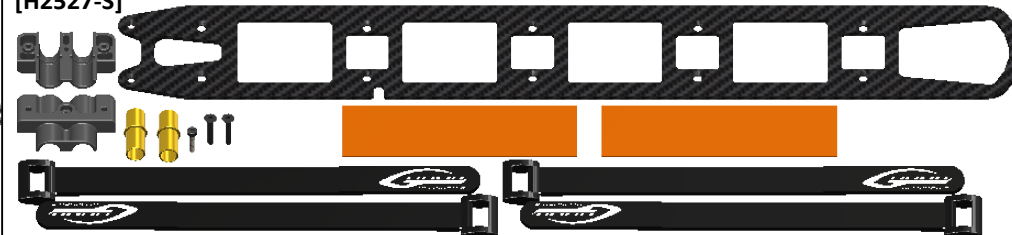
- 1 x Tail Pitch Slider D6 SET.

SLS Antenna Wire Cover
[H2526-S]



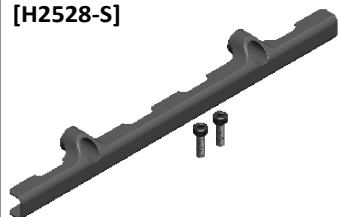
- 1 x Antenna Wire Cover SX.
- 1 x Antenna Wire Cover DX.
- 4 x Self Tap Screws M2,5x6.

Battery With Connector
[H2527-S]



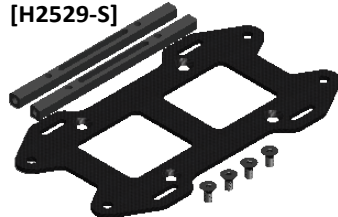
- 1 x Battery Tray With Connector SET.

SLS Wire Cover
[H2528-S]



- 1 x SLS Wire Cover.
- 2 x Head Cap Screws M3x10.

CF ESC Mount
[H2529-S]



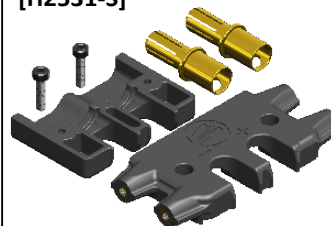
- 2 x CF ESC Mounts.
- 2 x ESC Mount Spacers.
- 4 x Flat Cap Screws M2,5x5.

SG590 Canopy Centering
[H2530-S]



- 1 x Bottom Canopy Centering.
- 2 x Side Canopy Centerings.
- 4 x Washers $\varnothing 2,6 \times \varnothing 6 \times 0,5$.
- 6 x Self Tap Screws M2,5x6.

Male Connector
[H2531-S]



- 1 x Male Connector SET.

SLS Boom Spacer
[H2533-S]



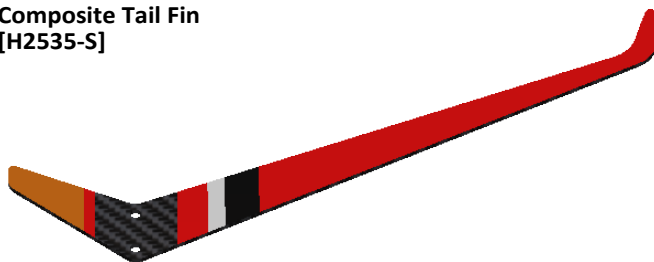
- 2 x SLS Boom Spacers.
- 2 x Double Sided-Tape.

CF Lock Nut M3
[H2534-S]



- 2 x CF Lock Nuts M3.
- 6 x Nylon Nuts M3.
- 2 x Double Sided-Tape.

Composite Tail Fin
[H2535-S]



- 1 x Composite Tail Fin.
- 2 x Tail Fin Stickers.

Motor Mount Base
[H2536-S]



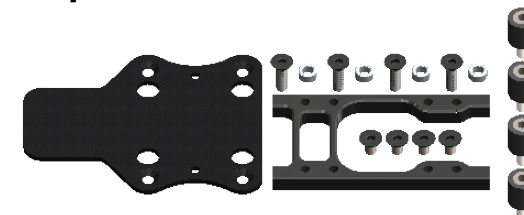
- 1 x Motor Mount Base.
- 2 x Set Screws M4x20.
- 4 x Head Cap Screws M3x8.

SLS Wire Mount
[H2540-S]



- 1 x SLS Wire Mount.
- 2 x Head Cap Screws M2,5x8.

FBL Mount SET
[H2551-S]



- 1 x FBL Mount SET.

Linkage M2,5x26mm
[H2577-S]



- 3 x Linkages M2,5x26mm.

SX ESC Mount Support
[H2587-S]



- 1 x SX ESC Mount Support.

DX ESC Mount Support
[H2588-S]



- 1 x DX ESC Mount Support.

Big Tail Belt Idler
[H2673-S]



- 2 x Tail Belt Idler D9x19x10,5.
- 4 x F.Bearing $\varnothing 5 \times \varnothing 9 \times 3$.

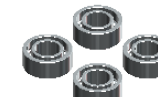
Wrench Tool M8
[HA016-S]

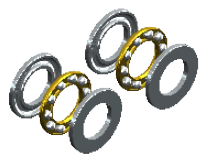
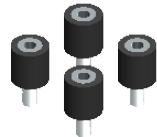
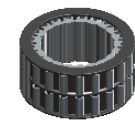
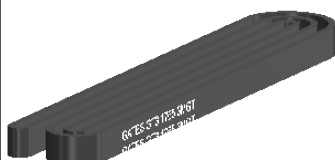


- 1 x Wrench Tool M8.

Canopy Grommet [HA021-S]  - 5 x Canopy Grommets.	Double-Sided Tape [HA035-S]  - 2 x Double-Sided Tapes.	Strap 20x250mm [HA041-S]  - 2 x Straps 20x250mm.	Zip-tie [HA058-S]  - 1 x Zip-tie SET.	Blade Holder [HA078-S]  - 1 x Blade Holder.	
[HC002-S]  - 10 x Socket Head Cap Screws M2x5mm.	[HC004-S]  - 10 x Socket Head Cap Screws M2x6mm.	[HC008-S]  - 10 x Socket Head Cap Screws M2x8mm.	[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.	[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.
[HC064-S]  - 10 x Socket Head Cap Screws M3x14mm.	[HC079-S]  - 2 x Socket Head Cap Screws Shoulder M3x18mm. - 2 x Nylon Nuts M3.	[HC082-S]  - 10 x Socket Head Cap Screws Shoulder M3x20mm.	[HC094-S]  - 10 x Button Head Cap Screws M3x6mm.	[HC096-S]  - 10 x Button Head Cap Screws M4x6mm.	[HC111-S]  - 10 x Socket Head Cap Screws Shoulder M4x24mm.



[HC122-S]  - 10 x Button Head Cap Screws M6x10mm.	[HC125-S]  - 10 x Flat Head Cap Screws M2,5x8mm.	[HC128-S]  - 10 x Flat Head Cap Screws M2,5x5mm.	[HC132-S]  - 10 x Flat Head Cap Screws M3x5mm.	[HC134-S]  - 10 x Flat Head Cap Screws M3x8mm.	[HC136-S]  - 10 x Self Tapping Head Cap Screws M3x10mm.
[HC140-S]  - 10 x Thread Rod M2,5x20mm.	[HC152-S]  - 10 x Set Screws M4x4mm.	[HC155-S]  - 10 x Set Screws M4x15mm.	[HC172-S]  - 10 x Washers Ø 2,5x Ø 4x0,3.	[HC181-S]  - 10 x Washers Ø 3x Ø 7x1.	[HC184-S]  - 10 x Washers Ø 4,3x Ø 11x1.
[HC193-S]  - 10 x Washers Ø 6,1x Ø 12x1.	[HC200-S]  - 10 x Nylon Nuts M2,5.	[HC206-S]  - 10 x Nylon Nuts M3.	[HC212-S]  - 10 x Nylon Nuts M4.	[HC335-S]  - 4 x O-rings Shore 70.	[HC400-S]  - 4 x Flanged Bearings Ø 2,5x Ø 6x2,6mm.
[HC411-S]  - 4 x Ball Bearings Ø 5x Ø 10x4mm.	[HC414-S]  - 2 x Flanged Bearings Ø 6x Ø 13x5mm.	[HC417-S]  - 2 x Ball Bearings Ø 8x Ø 14x4mm.	[HC419-S]  - 2 x Ball Bearings Ø 8x Ø 16x5mm.	[HC422-S]  - 2 x Ball Bearings Ø 10x Ø 19x5mm.	[HC435-S]  - 2 x Thrust Bearings Ø 5x Ø 10x4mm.

[HC437-S]  - 2 x Thrust Bearings Ø 8x Ø 14x4mm.	[HC544-S]  - 10 x Socket Head Cap Screws M4x20mm.	[HC573-S]  - 4 x Rubber Pin M3.	[HC582-S]  - 10 x Socket Head Cap Special Screws M4x8mm.	[HC587-S]  - 2 x Ball Bearings Ø 10x Ø 24x7mm.	[HC608-S]  - 10 x Socket Head Cap Screws M3x25mm.
[HC621-S]  - 1 x Carbon Rod KIT.	[HC622-S]  - 2 x Ball Bearings Ø 15x Ø 24x5mm.	[HC647-S]  - 1 x Clutch Ø 15x Ø 23x11.	[HC697-S]  - 10 x Self Tapping Head Cap Screws M2,5x6mm.	[HC709-S]  - 10 x Flat Head Cap Screws M2,5x15mm.	[HC712-S]  - 10 x Countersunk Head Screws M3x8mm.
[HC714-S]  - 10 x Washers Ø 3,1x Ø 5,75x0,5mm.	[HC761-S]  - 10 x Bottom Head Cap Special Screws M4x3mm.	[HC764-S]  - 10 x Self Tapping Head Cap Screws M3x8mm.	[HC768-S]  - 1 x Belt HTD 3M 1765-6mm.	[HC769-S]  - 2 x Washers Ø 15,2x Ø 19x0,7mm.	[HC771-S]  - 2 x Spring OD3.8x0.5 20LL. - 2 x Spring OD3.8x0.6 20LL. - 2 x Spring OD3.8x0.7 20LL.
[HC780-S]  - 1 x Belt HTD 3M 246-13mm.	[S95-O]  - 1 x Orange Tail Blade 95mm.	[S580-O]  - 1 x Orange Main Blade 580mm.			



SAB Futaba Servo Arm
[HA050-S]



- 4 x SAB Futaba Servo Arms.

SAB JR Servo Arm
[HA051-S]



- 4 x SAB JR Servo Arms.

Plastic Cable Wrap Protector 1000mm
[HA056-S]



- 1 x Plastic Cable Wrap Protector 1000mm.

Freewheel Bearings Lubricant
[HA075-S]



- 1 x Freewheel Bearings Lubricant.

Transmission Module Grease
[HA076-S]



- 1 x Transmission Module Grease.

Multi Purpose Grease
[HA096-S]



- 1 x Multi Purpose Grease.

Retaining Compound High Strength Bonding
[HA115-S]



- 1 x Retaining Compound High Strength Bonding.

Thread Locker Medium Strength
[HA116-S]



- 1 x Thread Locker Medium Strength.

SAB Tool Kit
[HM054-S]



- 1 x SAB Tool Kit.

SAB Goblin 500/570 Carry Bag
[HM059-S]



- 1 x SAB Goblin 500/570 Carry Bag.

Tail Pulley 18T
[H2514-18-S]



- 1 x Tail Pulley 18T ASM.
- 1 x Set Screw M4x4mm.

Tail Pulley 20T
[H2514-20-S]



- 1 x Tail Pulley 20T ASM.
- 1 x Set Screw M4x4mm.

STD Front Servo Mount
[H2537-S]



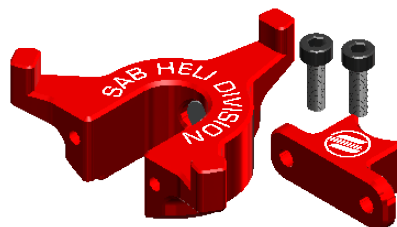
- 1 x Front STD Servo Mount UP.
- 1 x Front STD Servo Mount DOWN.
- 4 x Socket Head Cap Screws M2,5x8mm.

STD Rear Servo Mount
[H2539-S]



- 1 x Rear STD Servo Mount.
- 2 x Socket Head Cap Screws M2,5x10mm.

SG590 Swashplate Leveler
[H2553-S]



- 1 x Swashplate Leveler 01.
- 1 x Swashplate Leveler 02.
- 1 x Magnet D5x6mm.
- 2 x Socket Head Cap Screws M2,5x8mm.

The manual can be downloaded here

IL 590
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SG590

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Release 1.0 - September 2026

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