

MANLAL GOBLIN 380 KYLE STACY EDITION

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

- Consider flying only in areas dedicated to the use of model helicopters.
- Check and inspect the flying area to ensure it is clear of people orbstacles.
- Rotor blades can rotate at very high speeds! Be aware of the danger they pose.
- Always keep the model at a safe distance from other pilots and spectators.
- Avoid maneuvers with trajectories towards a crowd.
- Always maintain a safe distance from the model.



Goblin 380 Kyle Stacy Manual

Release 1.0 - November 2015

WORLD DISTRIBUTION

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IMPORTANT NOTES

- *This radio controlled helicopter is not a toy.
- *This radio controlled helicopter can be very dangerous.
- *This radio controlled helicopter is a technically complex device which has to be built and handled very carefully.
- *This radio controlled helicopter must be built following these instructions. This manual provides the necessary information to correctly assemble the model. It is necessary to carefully follow all the instructions.
- *Inexperienced pilots must be monitored by expert pilots.
- *All operators must wear safety glasses and take appropriate safety precautions.
- *A radio controlled helicopter must only be used in open spaces without obstacles, and far enough from people to minimize the possibility of accidents or of injury to property or persons.
- *A radio controlled helicopter can behave in an unexpected manner, causing loss of control of the model, making it very dangerous.
- *Lack of care with assembly or maintenance can result in an unreliable and dangerous model.
- *Neither SAB Heli Division nor its agents have any control over the assembly, maintenance and use of this product. Therefore, no responsibility can be traced back to the manufacturer. You hereby agree to release SAB Heli Division from any responsibility or liability arising from the use of this product.

SAFETY GUIDELINES

*Fly only in areas dedicated to the use of model helicopters.

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

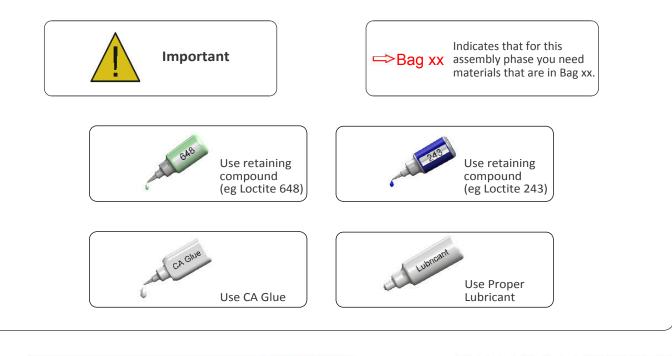
NOTES FOR ASSEMBLY

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:



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ADDITIONAL COMPONENTS REQUIRED

*Electric Motor: 850 - 1000Kv: Maximum diameter 41mm. Maximum height 41mm. Pinion shaft diameter 5 mm.

*Speed controller: minimum 60A , extreme 3D Flight 70-90A.

- *Batteries: 6S-1800 mAh (1500 2600 mAh) .
- *1 flybarless 3 axis control unit.
- *Radio power system, if not integrated with the ESC.
- *3 micro cyclic servos.
- *1 mini (midi) tail rotor servo.
- *6 channel radio control system on 2.4 GHz.

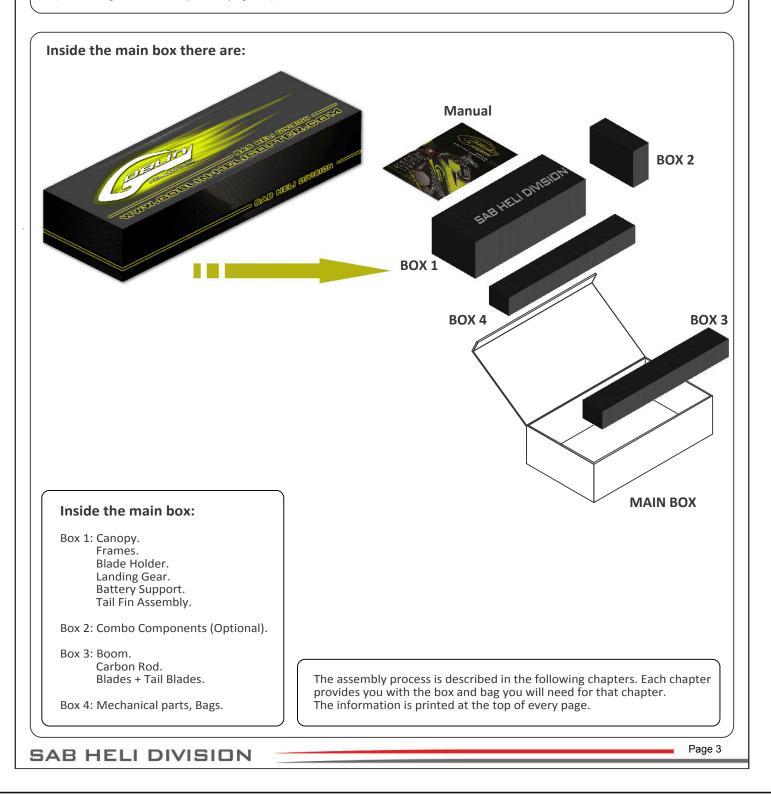
(See configuration examples on page 14).

TOOLS, LUBRICANTS, ADHESIVES

*Generic pliers. *Hexagonal driver, size 1.5,2,2.5mm. *5.5mm Socket wrench (for M3 nuts). *7mm Hex fork wrench (for M4 nuts).

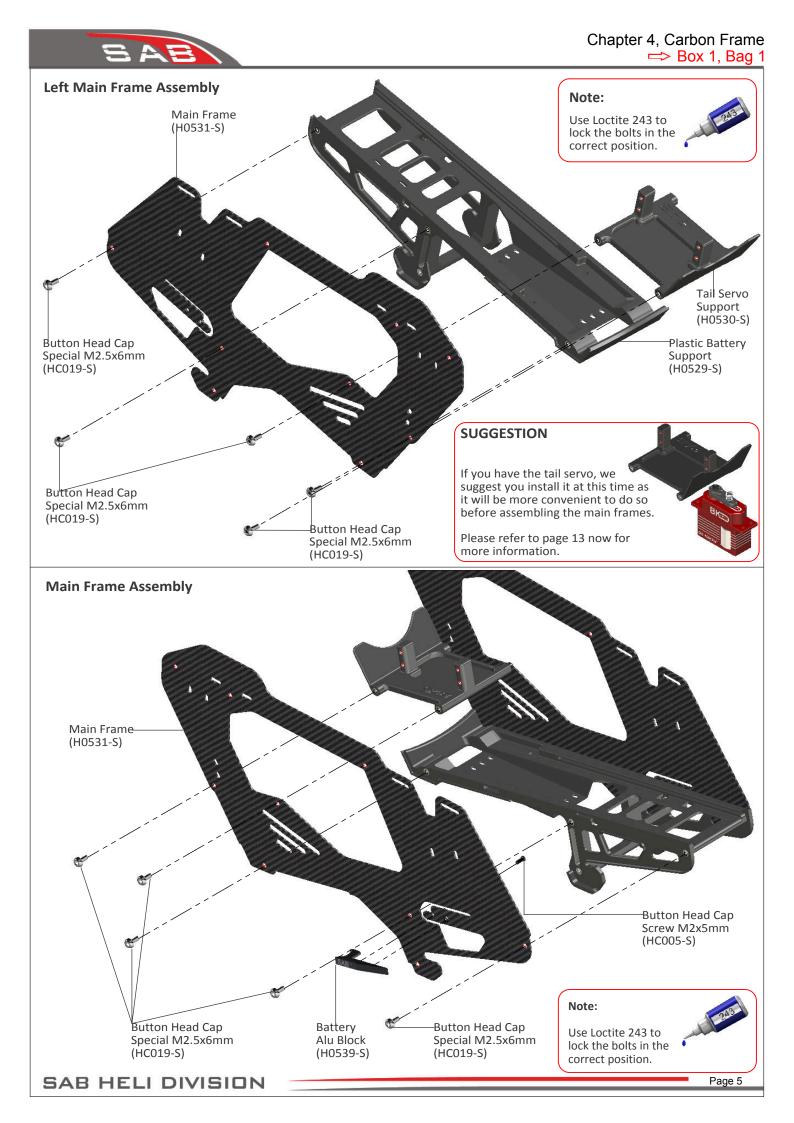
*Medium threadlocker (eg. Loctite 243). *Strong retaining compound (eg. Loctite 648). *Spray lubricant (eg. Try-Flow Oil). *Grease (eg. Microlube GL261). *Cyanoacrylate adhesive.

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

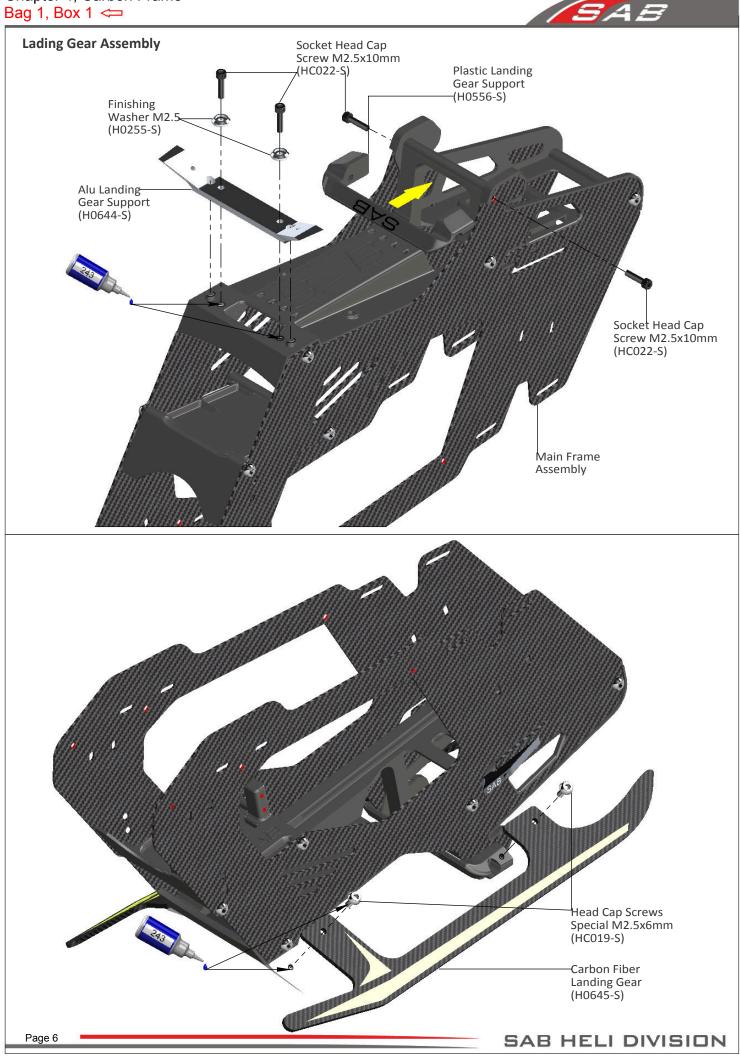


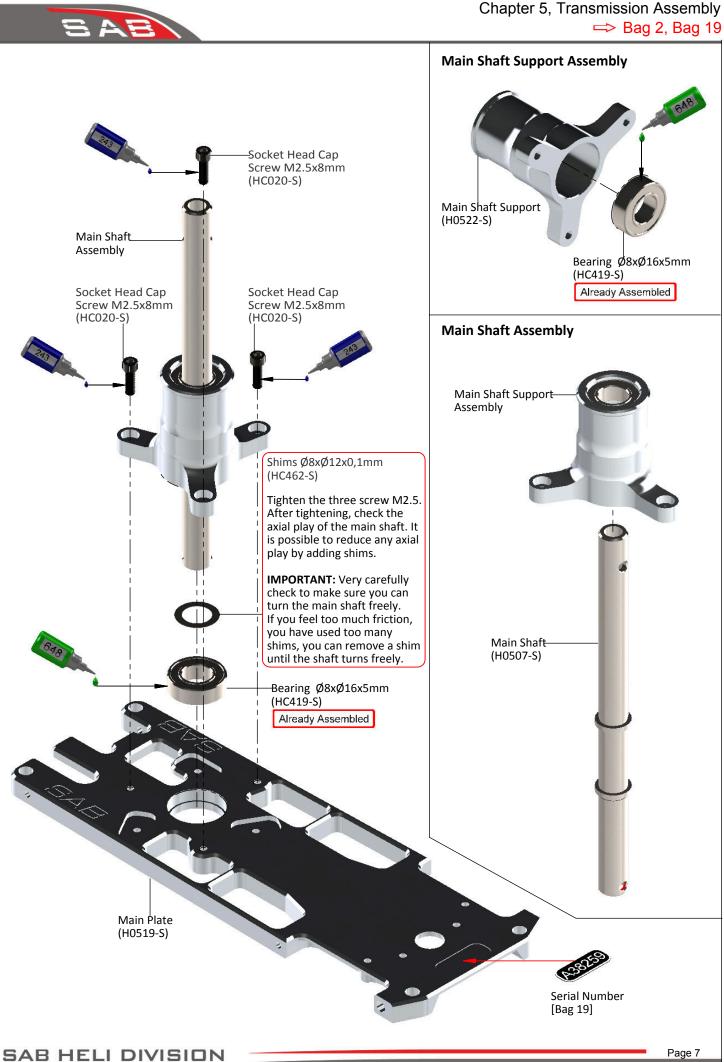




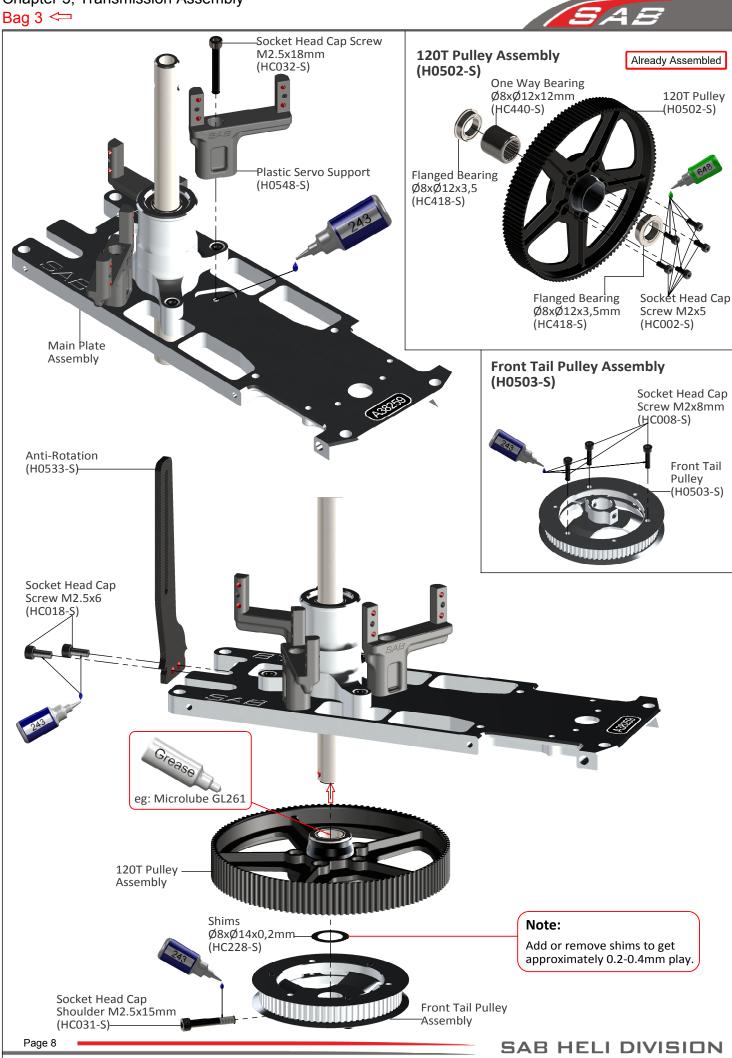


Chapter 4, Carbon Frame

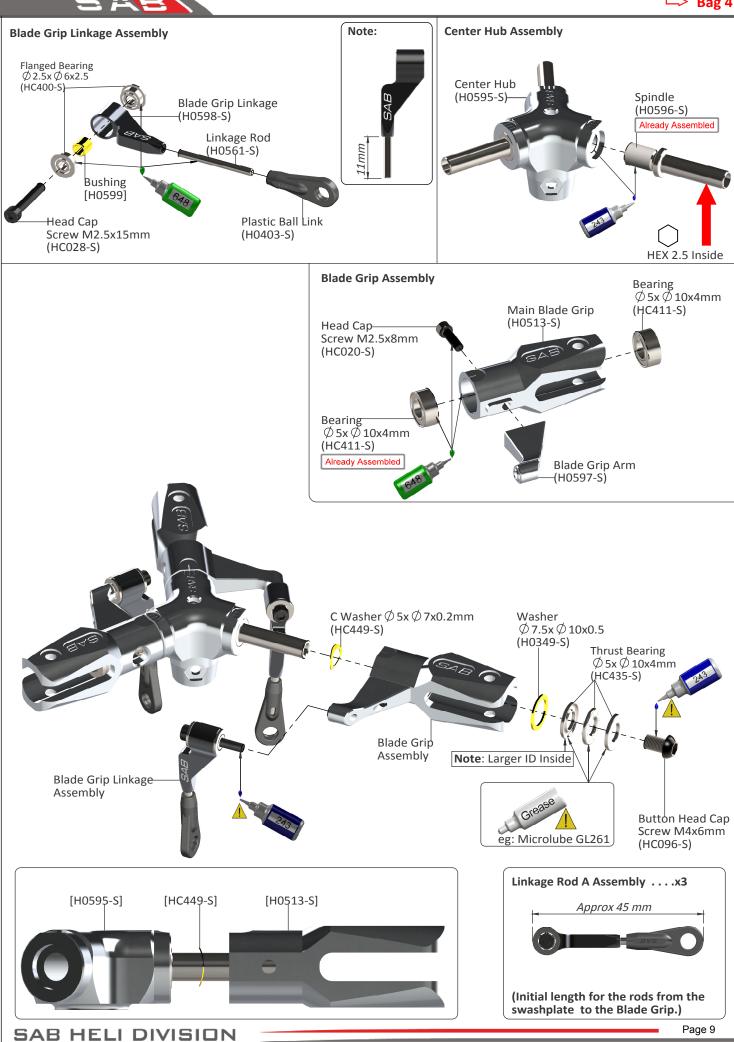




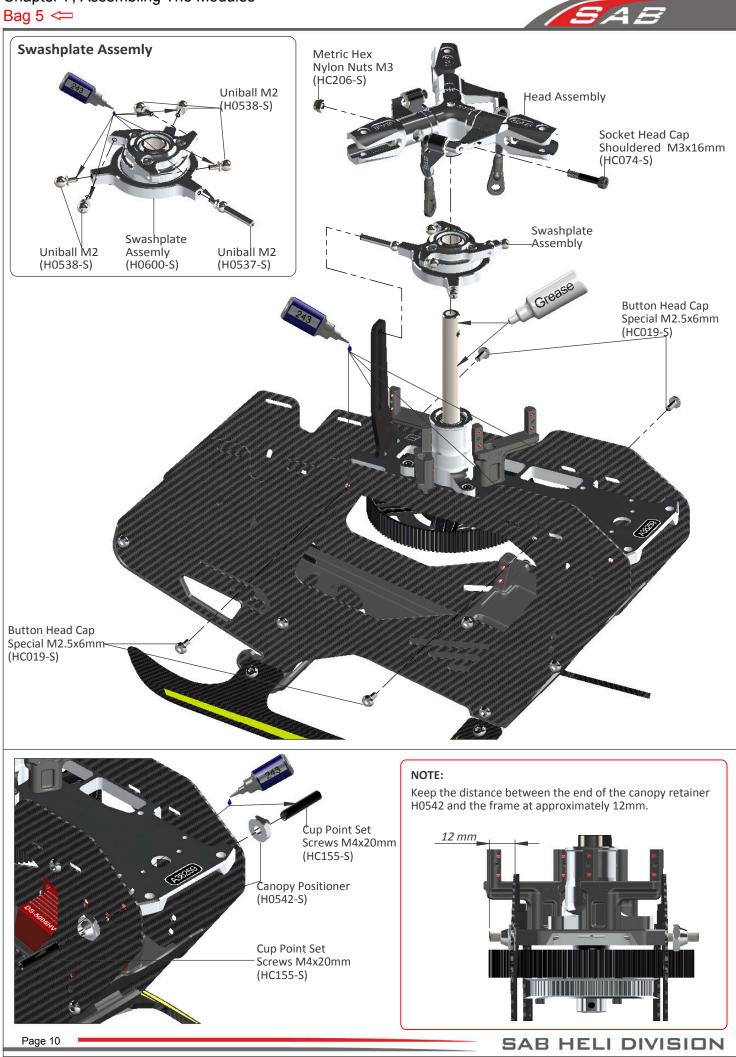
Chapter 5, Transmission Assembly



Chapter 6, Main Rotor Assembly Bag 4



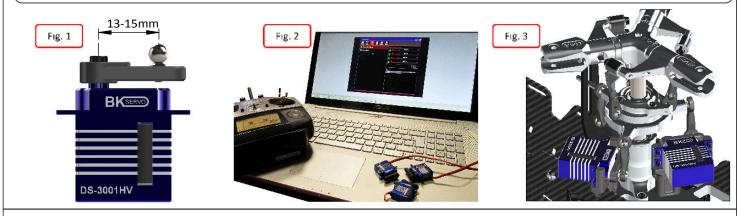
Chapter 7, Assembling The Modules



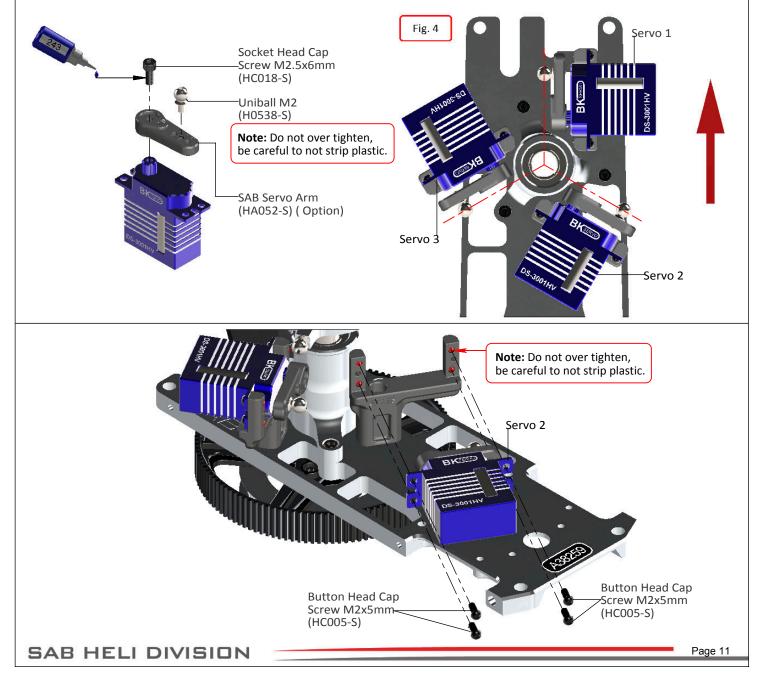


INSTALLATION OF SWASHPLATE SERVOS

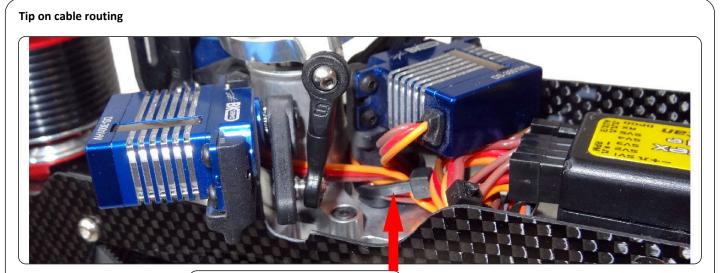
The linkage ball must be positioned approximately **13-15 mm** out on the servo arm (**figure 1**), it is recommended to use the SAB servo arm p/n [HA052]. Because of the 120° placement of the servos in the Goblin, the arms are difficult to access. For this reason it is advisable to ensure alignment of the servo arms (and sub trim) before installation of the servos in the model (**figure 2**). Proceed with installation following the instructions below. **Figure 3** shows a completed installation.



The rods going from the servos to the swash plate must be as vertical as possible. (Red line in Figure 4) Not all servos are equal, so for proper alignment you can choose to use the supplied spacer H0566 under the uniball H0538.

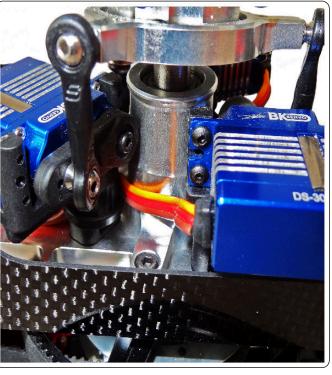


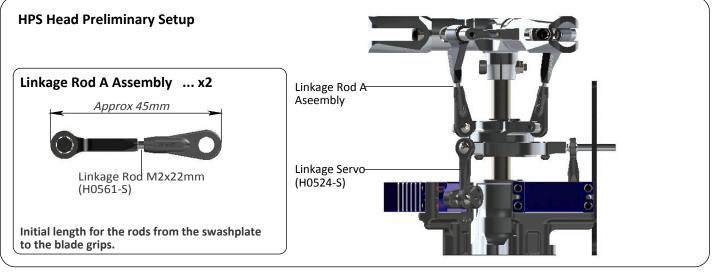




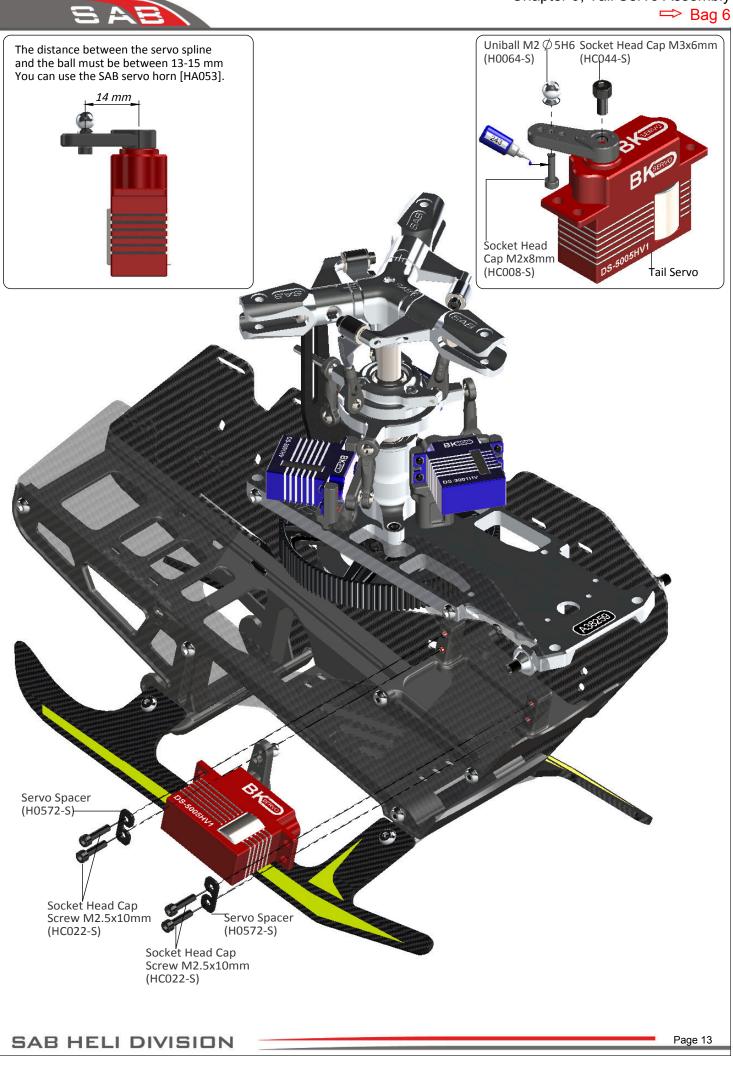
You can use zip-ties to secure the 3 servo cables to the servo support.













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TRANSMISSION SETUP

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

It is possible to optimize any motor and battery combination.

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 **120** teeth for the main gear and the tooth count of your pulley as the pinion count.

Below is a list of available reduction ratios:

H0501-19-S - 19T Pinion = ratio	6.3:1	H0501-22-S - 22T	Pinion = ratio	5.5:1
H0501-20-S - 20T Pinion = ratio	6:1	H0501-23-S - 23T	Pinion = ratio	5.2:1
H0501-21-S - 21T Pinion = ratio	5.7:1	H0501-24-S - 24T	Pinion = ratio	5:1

The Goblin 380 accepts a wide selection of batteries with different capacities. The suggested number of cells is 6.

All batteries from 1500 to 2600 mAh offer good performance.

We recommend the use of an 1800 mAh battery for the perfect compromise between weight and performance (3D flight). Larger capacity batteries (2200-2600) increase flight times at the expense of weight and reduced agility (Sport flight).

Some example configurations:

CONFIGURATION

Motor	ESC	Motor Pulley	RPM Max	Pitch	
Quantum	CC Lite 75	22T	3000	+12 F	
2820-880	HW 60 - Koby 70 - YGE 60	20T	3000	±12.5	
Scorpion	CC Lite 75	22T	3100	- 10 F	
HK 3014-900		20T	3100	±12.5	
X-NOVA	CC Lite 75	23T	3200		
2820-890		21T	3200	±12.5	
	CC Lite 75	21T- <mark>22</mark> T	3200- <mark>3350</mark>	±12.5	
Scorpion	HW 60 - Koby 70 - YGE 60	18T- <mark>19T</mark>	3200- <mark>3350</mark>		
HK 3020-1000	CC Lite 100		3300- <mark>3450</mark>	<u> </u>	
	HW 100 - Koby 90 - YGE 90		3350- <mark>3500</mark>		
KDE 500XF 925-G3	CC Lite 75	22T- <mark>23T</mark>	3200- <mark>3350</mark>		
Kontronik	HW 60 - Koby 70 - YGE 60	20T- <mark>21T</mark>	3200- <mark>3350</mark>	±12.5	
Pyro 380-9	CC Lite 100	23T- <mark>24T</mark>	3350- <mark>3500</mark>	12.5	
X-NOVA 3215-930	HW 100 - Koby 90 - YGE 90	21T- <mark>22T</mark>	3350- <mark>3500</mark>		

Note: Although the Goblin can handle even higher RPMs, for safety reasons we suggest to not exceed 3400 RPM.



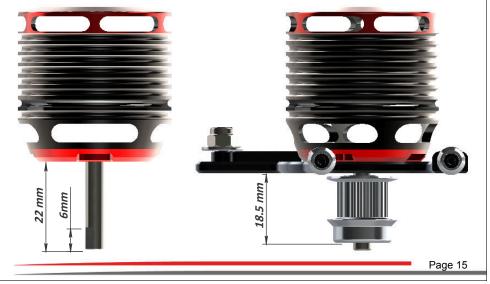


NOTE:

To maximize space for the batteries, it is advisable to shorten the motor shaft. Follow the dimensions given in this drawing. For the cut, you can use an electric tool like a "Dremel" with a cutoff disc.

Additionally, ensure the motor shaft has an appropriate 'flat' for one of the set screws.

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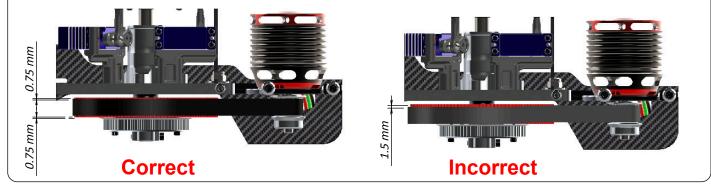




Note:

Check for vertical alignment of the motor pulley. To do this, simply turn the motor several times by hand and check to you see if the belt is aligned properly with the big pulley (one way bearing pulley).

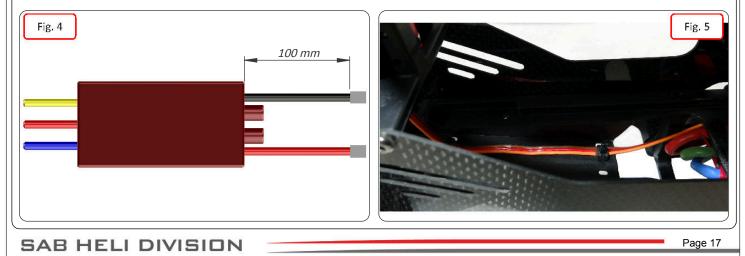
If the belt is riding too high, simply loosen up the motor pulley and drop it just a little bit, if it is riding too low, loosen up the motor pulley and raise it a bit.

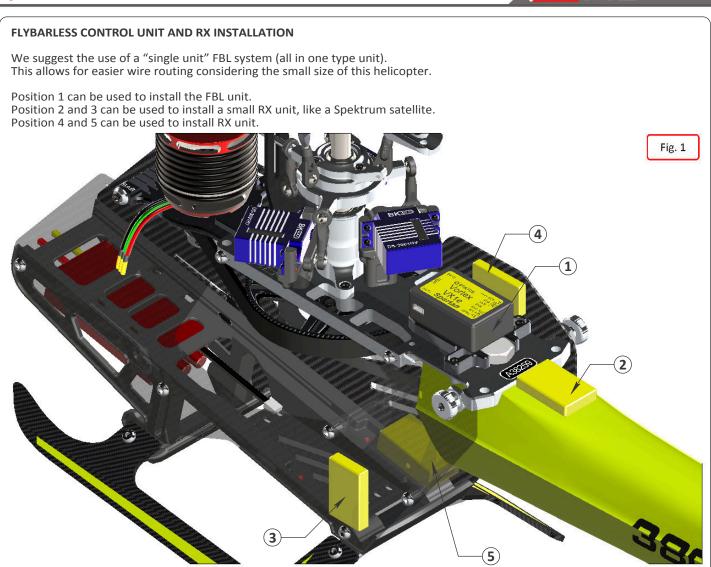


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Figure 4: Shows the suggested length of the battery wire. This length is also compatible with the quick battery connector upgrade. **Figure 5**: Shows the wire that connects the ESC to the receiver or flybarless control system.





Socket Head Cap Screw M2.5x8mm (HC020-S) FBL Unit FBL Unit Doublesided Tape FBL Support (H0564-S)

Fig. 2 shows the unit mounted on the support H0564. Fig. 3 shows the unit directly mounted on the main aluminum plate.

Use your judgment to decide whether you need to install your FBL unit as shown in Fig 2 or Fig 3. This will depend on the size of the FBL unit itself and the arrangement of the wires.

With larger units, the nylon nut can make it difficult to connect the wires to the unit, in this case it is recommended to use the aluminum support H0564.

With smaller units, the unit can be installed directly onto the main plate. This facilitates boom removal in the future if necessary.

We recommend using some type of adhesive to prevent the servo wires and connections from coming unplugged from the receiver or FBL unit. You can use hot glue for this purpose.

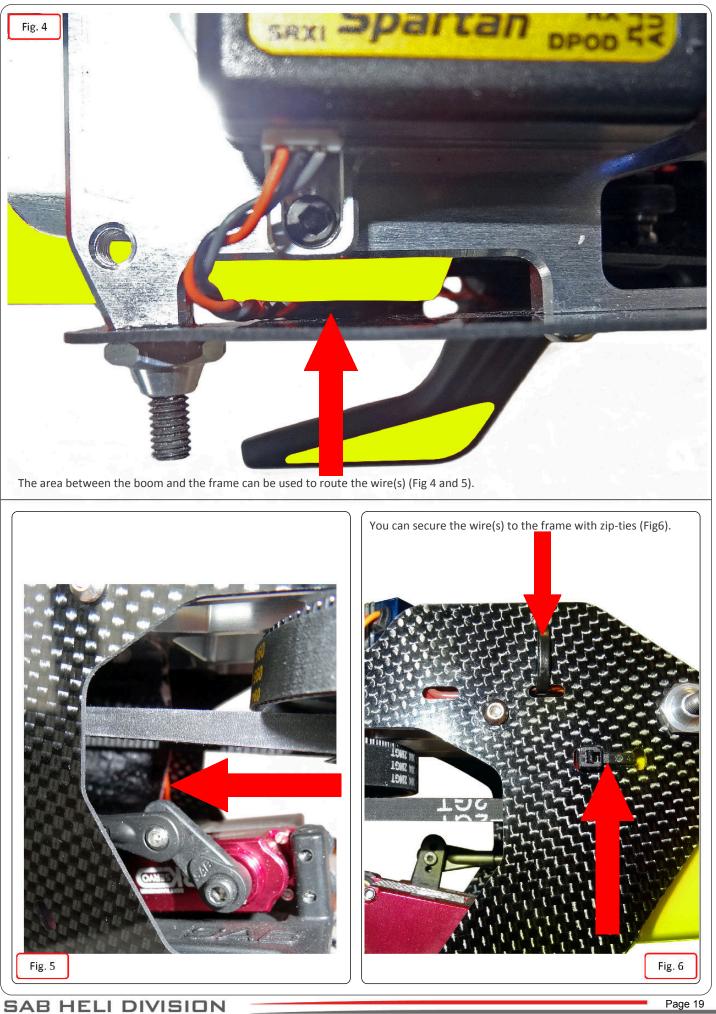


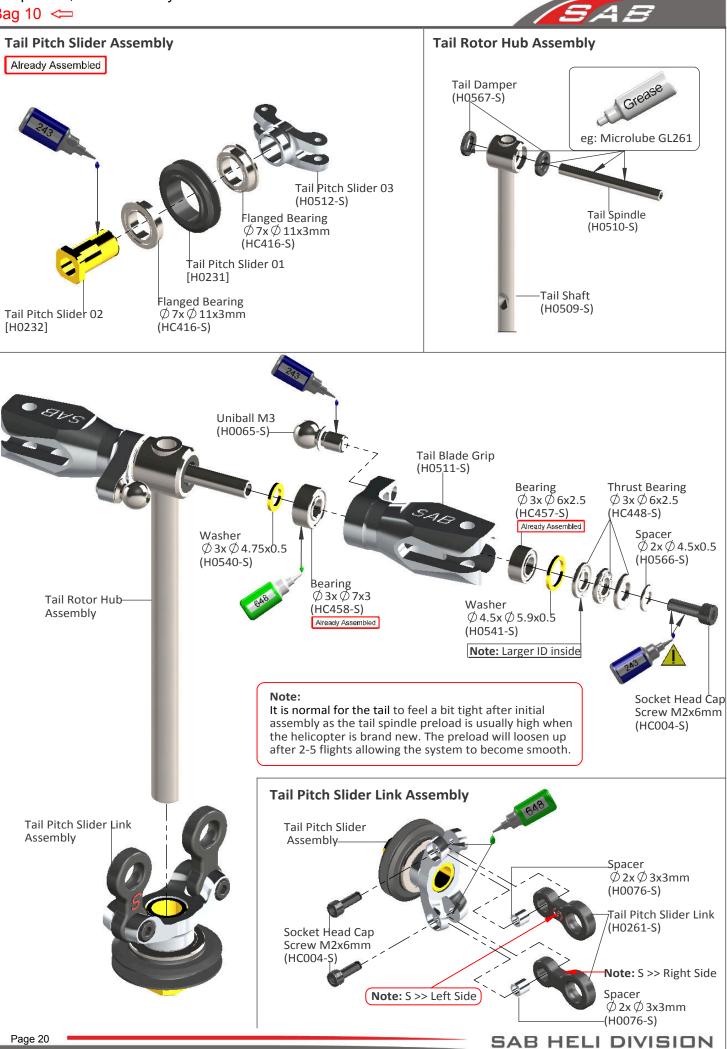


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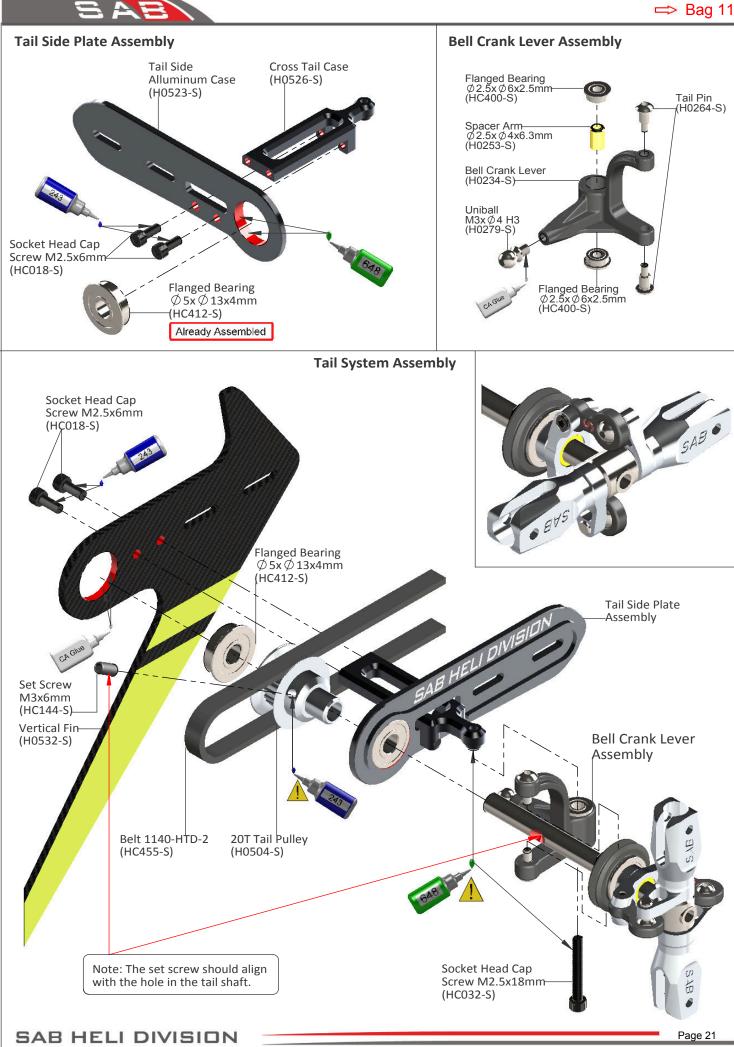
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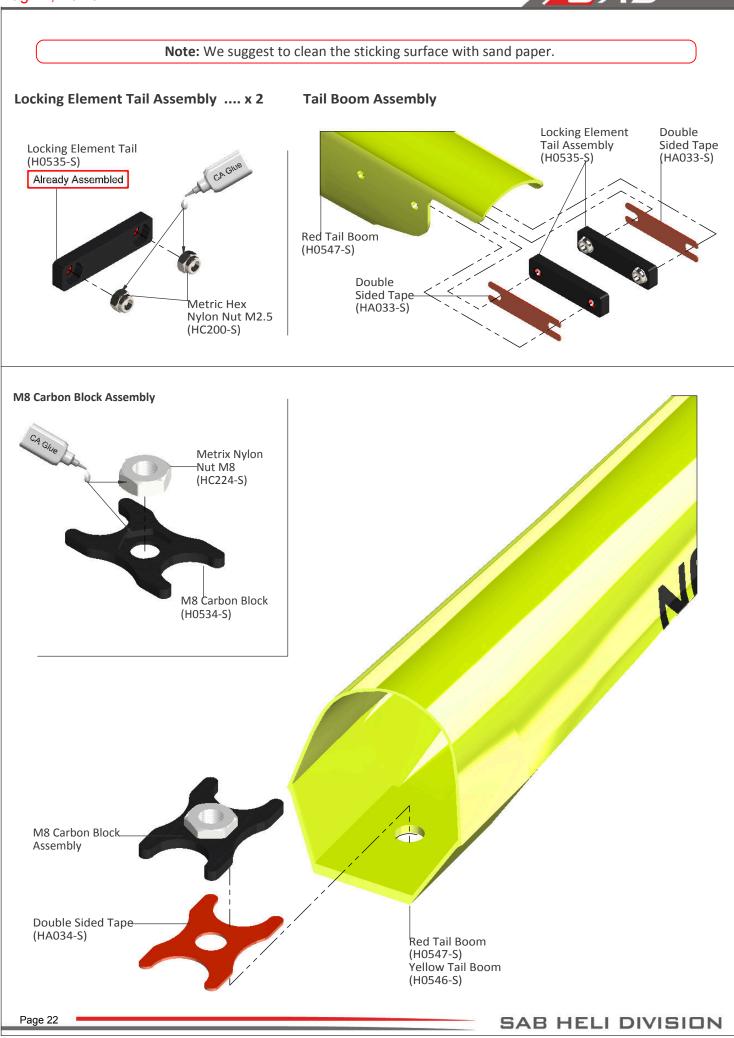


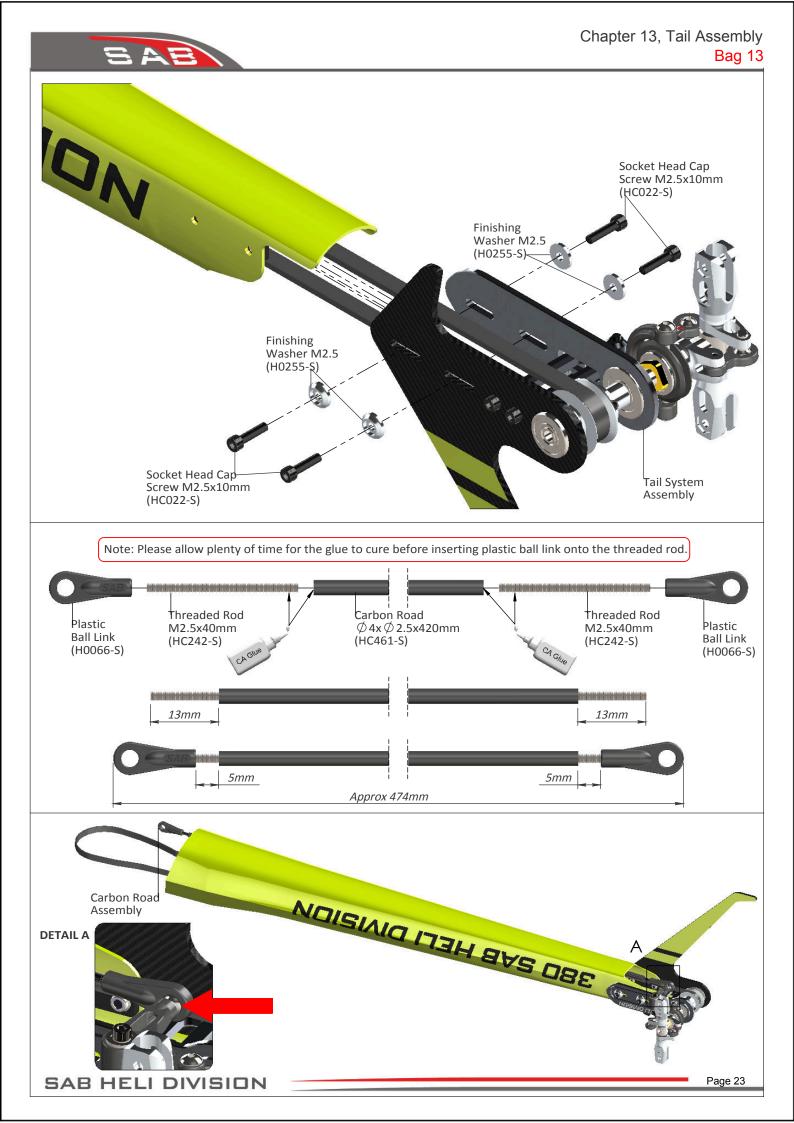




Chapter 13, Tail Assembly









BOOM ASSEMBLY

- * Insert the boom. This operation is easier fitting into the main frame at a slight angle [Fig.1].
- To facilitate boom insertion, you can also unscrew the two bolts that hold the tail servo support tray. * Tighten the M8 nut with HA016 special tool supplied.
- * After installation, connect the tail push rod.* To lock the nut and prevent it from coming loose, install:
- - H0287 (for FBL unit installed on the main plate) [Fig.2]. - H0564 (for FBL unit installed on H0564) [Fig.3].

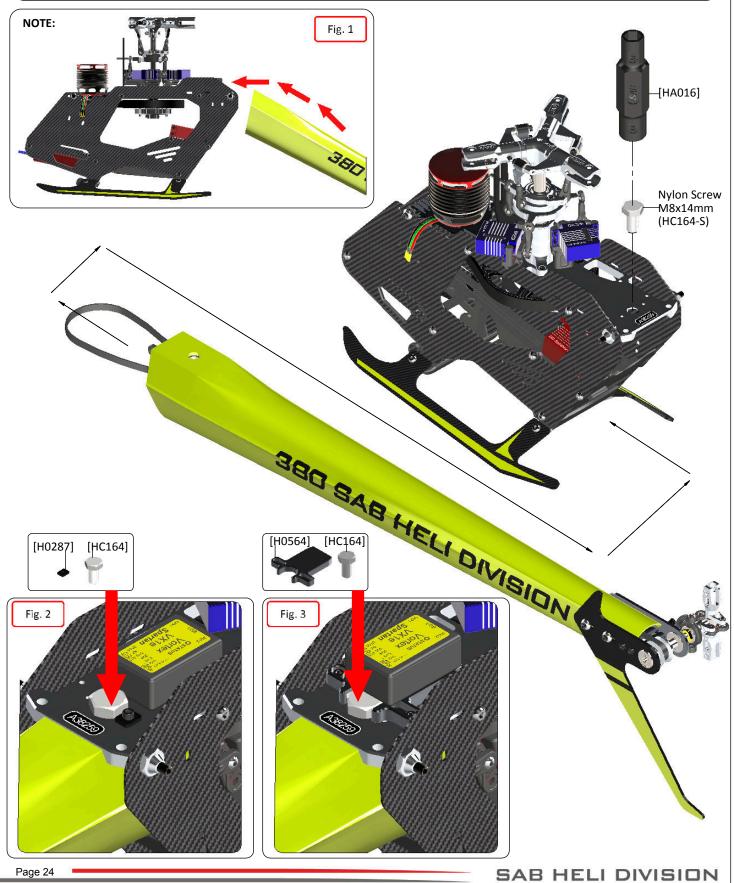




Fig. 1



- *Check for the proper assembly of the tail boom.
- *Loosen the tail case by loosening the 4 M2.5 screws.
- *Install the belt onto the front pulley in the correct direction of rotation (figure 1).
- *Rotate the tail drive several times by hand.
- *Pull the tail case back to increase belt tension.
- *Tighten the 4 M2.5 screws on the tail case.
- *The belt must be very tight.

CANOPY

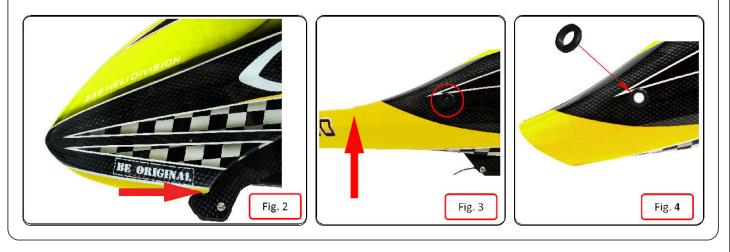
Fit the canopy to the main frame until it stops. [Fig. 2] Fit the canopy holes to the M4 set screws on the model.

Check alignment of the edge on the boom [Fig. 3] If the alignment is correct, enlarge the 2 canopy holes with a reamer up to 10 mm in diameter. If alignment is not OK, enlarge the 2 canopy holes in the appropriate direction up to 10 mm in diameter.

Install the canopy grommets. [Fig. 4]

The canopy can be locked using the knobs H0543. [Fig. 5]

NOTE: If you want to use the rubber edge protector, you must increase the size of the opening in the canopy that goes around the anti-rotation guide by approximately 2 mm per side.



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Fig. 5



BATTERIES

The Goblin has a quick release battery tray system.

The batteries must be installed onto the battery tray to take advantage of the quick release locking system.

Install the battery to the battery tray using double sided tape and the long Velcro straps included (Fig 1 and Fig 2).

Make sure to find the right position of the battery to optimize the center of gravity.

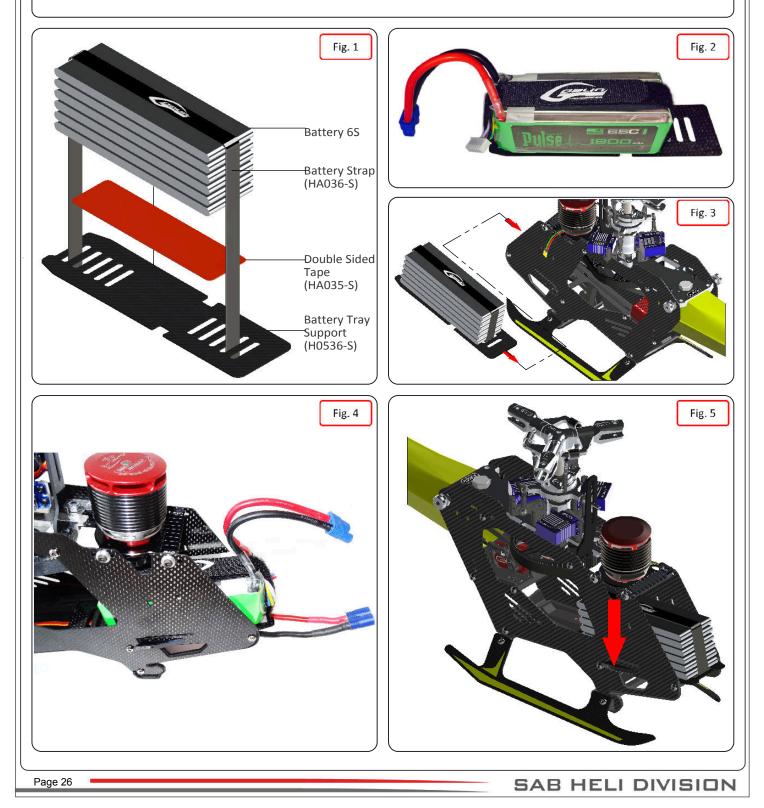
The battery wires arranged as in fig 2 are particularly effective.

To insert the battery, simply align the battery tray in the slots at the front of the helicopter and slide all the way. The battery will lock in place.

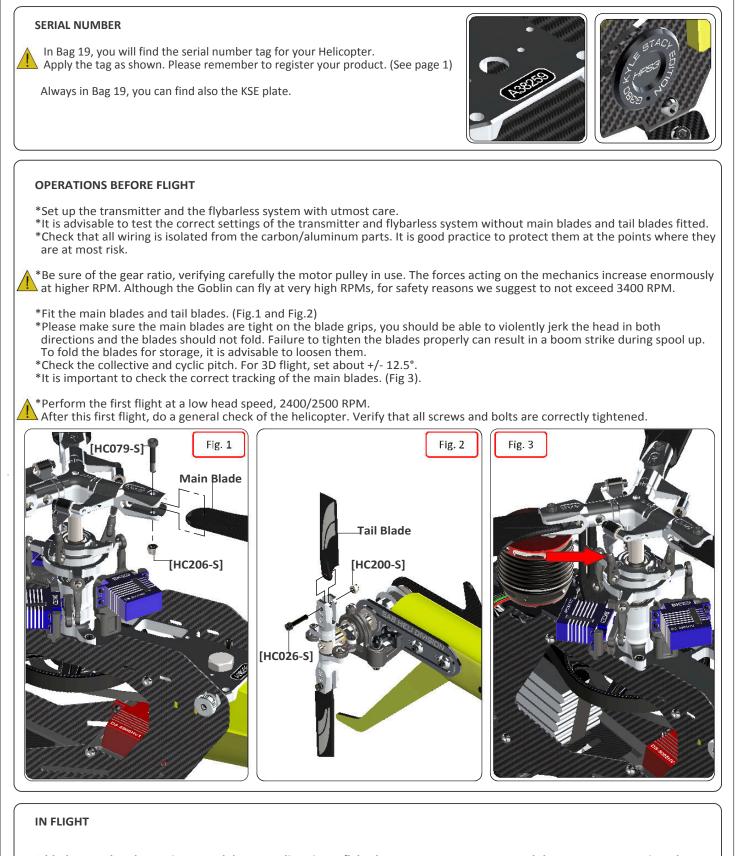
To remove the battery, simply lift up on the locking lever (Fig 5) and pull.

IMPORTANT:

Nake sure the battery is locked in place before flight; the battery tray must be inside the slots on both sides!





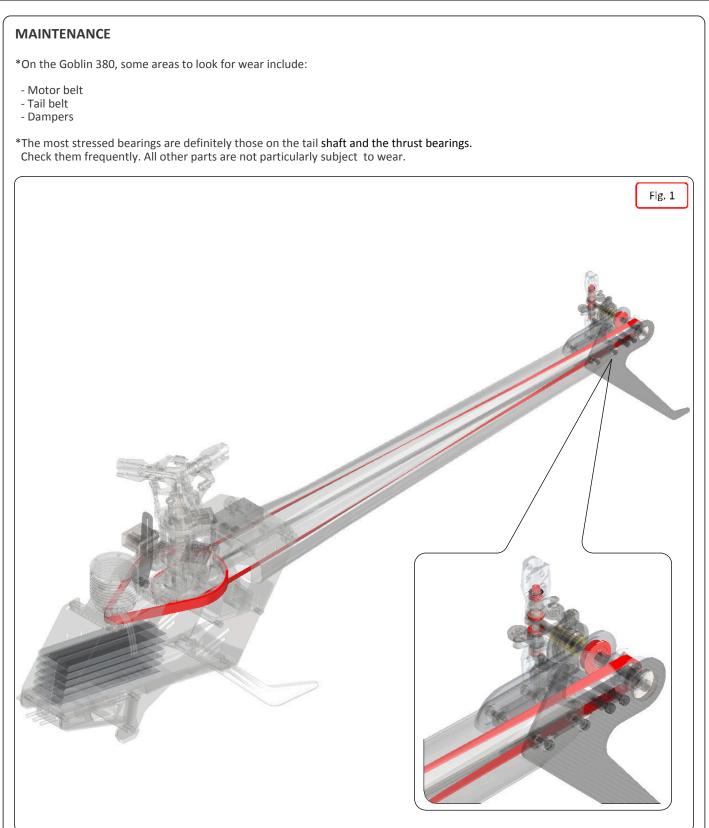


3 blade rotor heads require a much lower cyclic gain on flybarless systems. We recommend that you set your gain at least 30% lower than the gain you normally use on your 2 blade rotor head helicopters. You can start increasing the gain after you complete your first flight. Running too high of a gain can induce a violent oscillation that can potentially cause damage to your helicopter in flight.

If the model is making strange noises, this can be usually attributed to incorrect belt tensions. Check the belts again and tighten if necessary.

It's very important to check the model thoroughly after the first 2-3 flights. Check all bolts, screws, belts, ball links, etc.





*The lifespan of these components varies according to the type of flying. On average it is recommended to check these parts every **20** flights. In some instances, based on wear, these parts should be replaced every **100** flights.

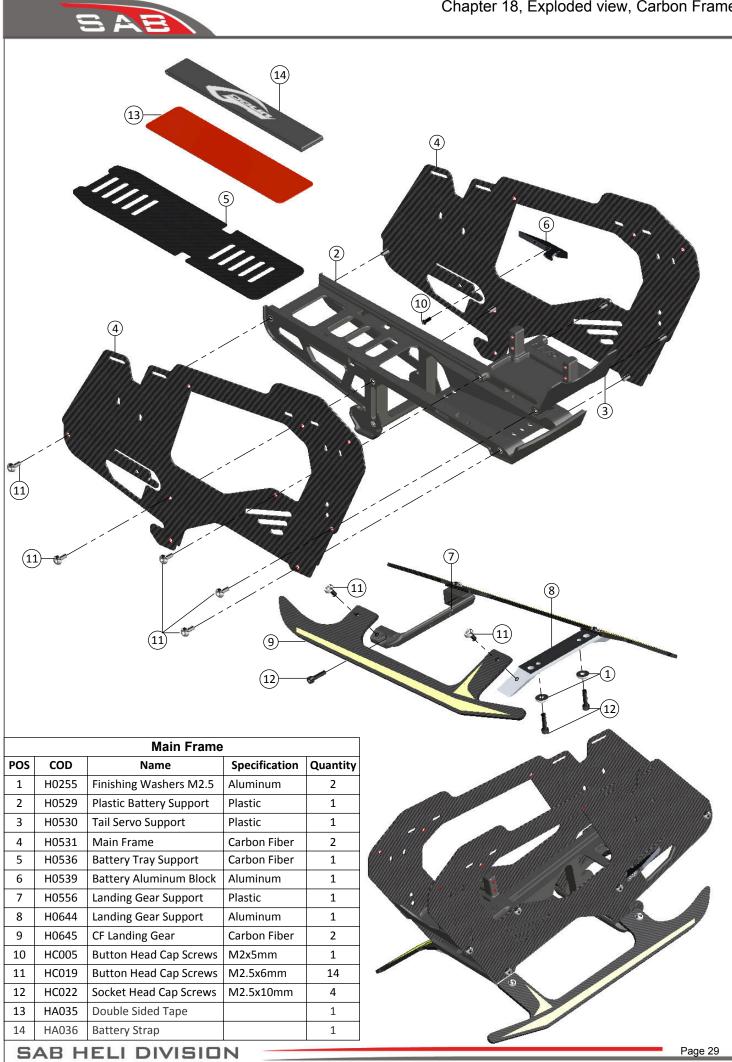
*Periodically lubricate the tail slider movement and its linkages as well as the swash plate movement and its linkages.

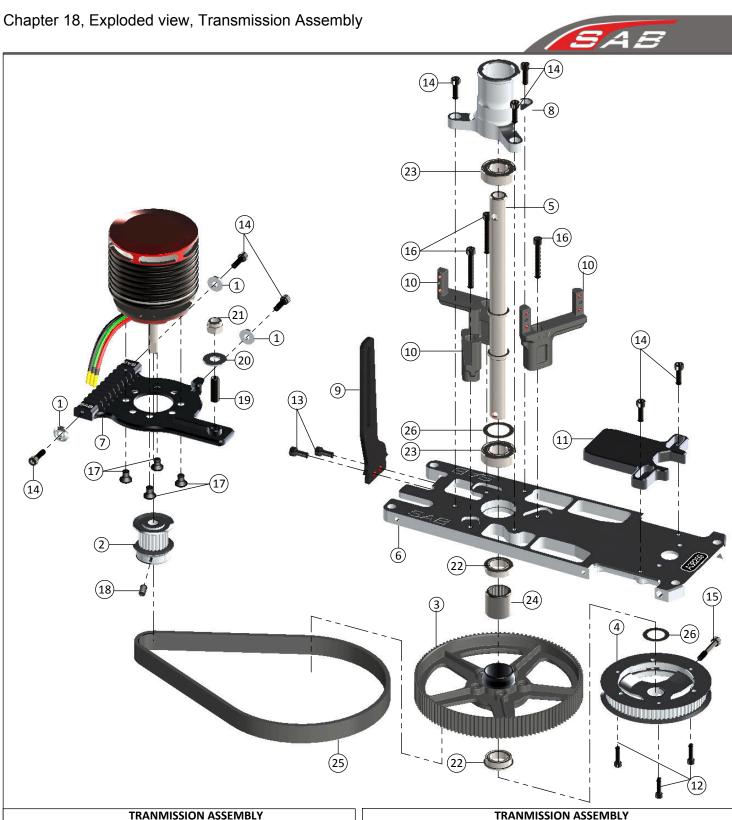
*To ensure safety you should do a general inspection of the helicopter after each flight. You should check:

- Proper belt tension (motor belt and tail belt).

- Proper isolation of the wires from the carbon and aluminum parts.

- All screws and bolts remain tight.





TRANMISSION ASSEMBLY				TRANMISSION ASSEMBLY					
POS	COD	Name	Specification	Quantity	POS	COD	Name	Specification	Quantity
1	H0255	Fnishing Washer M2.5	Aluminum	3	14	HC020	Socket Head Cap Screws	M2.5x8mm	8
2	H0501	21T Motor Pulley ASM	Aluminum	1	15	HC031	Head Cap Screws Shouldered	M2.5x15mm	1
3	H0502	120T Main Pulley	Aluminum	1	16	HC032	Socket Head Cap Screws	M2.5x18mm	3
4	H0503	Fonrt Tail Pulley ASM	Aluminum	1	17	HC132	Flat Head Cap Screws	M3x5mm	4
5	H0507	Main Shaft	Steel	1	18	HC144	Cone Point Set Screws	M3x6mm	1
6	H0519	Main Plate	Aluminum	1	19	HC153	Cone Point Set Screws	M4x12mm	1
7	H0520	Motor Support	Aluminum	1	20	HC184	Washers	Ø4.3xØ11x1mm	1
8	H0522	Main Shaft Support	Steel	1	21	HC212	Metrix Nylon Nut	M4	1
9	H0533	CF Anti-Rotation Guide	Carbon Fiber	1	22	HC418	Flanged Bearing	Ø 8x Ø 12x3.5mm	1
10	H0548	Plastic Servo Support	Plastic	3	23	HC419	Bearing	Ø 8x $Ø$ 16x5mm	2
11	H0564	Flybarless Support	Aluminum	1	24	HC440	One Way Bearing	Ø 8x $Ø$ 12x12mm	2
12	HC008	Socket Head Cap Screws	M2x8mm	3	25	HC454	Motor Belt	304-2GT-09	1
13	HC018	Socket Head Cap Screws	M2.5x6mm	2	26	HC462	Shim Washers	Ø 8x Ø 12x0.2mm	2

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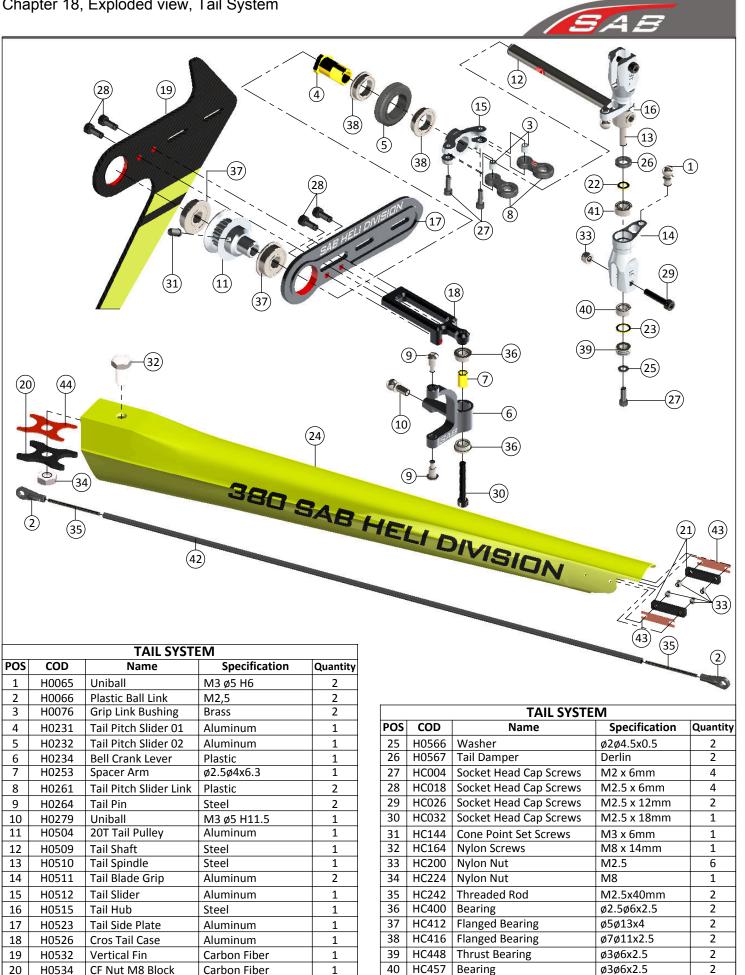
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POS COD Name Specification				Quantity
1	H0349	Washer	ϕ 7,5x ϕ 10x0,5	2
2	H0403	Plastic Linkage Ball	M2	3
3	H0513	Main Blade Grip	Aluminum	3
4	H0524	Linkage Servos	Plastic	3
5	H0537	Uniball M2 Female	Aluminum	1
6	H0538	Uniball M2 Male	Steel	8
7	H0561	Linkage	M2x22mm	3
8	H0595	Main HUB	Aluminum	1
9	H0596	Main Spindle	Steel	3
10	H0597	Main Blade Grip Arm	Aluminum	3
11	H0598	Blade Grip Linkage	Aluminum	3
12	H0599	Bushing	Brass	3

HEAD SYSTEM						
POS	COD	Name	Specification	Quantity		
13	H0600	Swashplate 01	Aluminum	1		
14	HC020	Head Cap Screws	M2.5 x 8mm	2		
15	HC028	Head Cap Screws	M2.5 x 15mm	3		
16	HC074	Head Cap Shoulder	M3 x 16mm	1		
17	HC079	Head Cap Shoulder	M3 x 18mm	3		
18	HC096	Button Cap Screws	M4 x 6mm	3		
19	HC206	Metric Hex Nylon Nuts	M3	4		
20	HC400	Flanged Bearing	ϕ 2x ϕ 6x2.5	6		
21	HC411	Bearing	ϕ 5x ϕ 10x4	6		
22	HC435	Thrust Bearing	\emptyset 5x \emptyset 10x4	3		
23	HC449	C Washer		3		
		DS-3001HV	BK Servo	3		
_	Page 31					





Double Sided Tape 1 SAB HELI DIVISION

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2

1 2

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H0535

H0540

H0541

H0546

Locking Element Tail

Washer

Washer

Red Tail Boom

21

22

23

24

Carbon Fiber

ø3ø4.75x0.5

ø4.5ø5.9x0.5

Carbon Fiber

2

2

2

1

41

42

43

HC458

HC461

HA033

44 HA034

Bearing

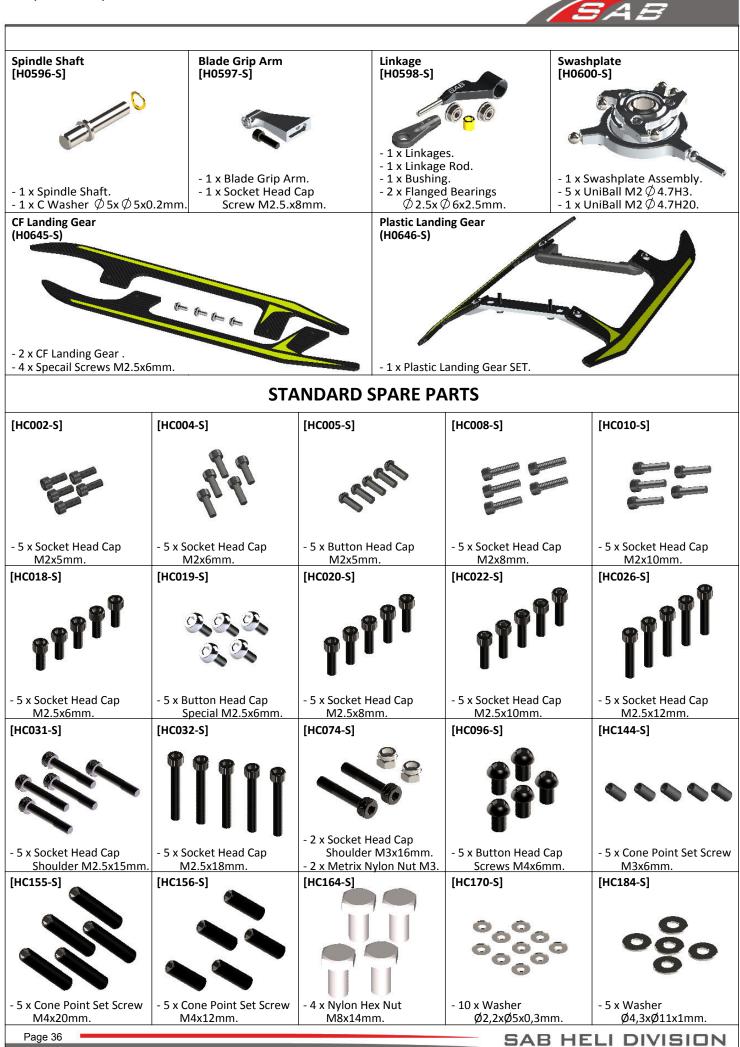
Carbon Rod

Double Sided Tape











	1		1	
[HC200-S]	[HC206-S]	[HC212-S]	[HC224-S]	[HC228-S]
				0
6666		0.00		\sim
				0
- 10 x Metrix Nylon Nut M2.5.	- 10 x Metrix Nylon Nut M3.	- 10 x Metrix Nylon Nut M4.	- 4 x Metrix Nylon Nut M8.	- 4 x Shim Ø8xØ14x0,2mm.
[HC242-S]	[HC400-S]	[HC411-S]	[HC412-S]	[HC416-S]
100			A A	
111	-(0~	0	$(\bigcirc (\bigcirc))$	
- 3 x Thread Rod	- 4 x Flanged Bearing	- 4 x Bearing	- 4 x Flanged Bearing	- 2 x Flanged Bearing
M2,5x40mm. [HC418-S]	Ø2.5xØ6x2.6mm. [HC419-S]	Ø5xØ10x4mm. [HC435-S]	Ø5xØ13x4mm. [HC440-S]	Ø7xØ11x2.5mm. [HC448-S]
[IIC410-3]	[IIC413-3]	[10435-3]	[10440-3]	[ПС446-3]
	60			
Õ	\cup	Carl Carl		I
0				
- 2 x Flanged Bearing Ø8xØ12x3.5mm.	- 2 x Bearing Ø8xØ16x5mm.	- 2 x Thrust Bearing Ø5xØ10x4mm.	 1 x One Way Bearing Ø8xØ12x12mm. 	 - 2 x Thrust Bearing Ø3xØ6x2.5mm.
[HC450-S]	[HC453-S]	[HC454-S]	[HC455-S]	[HC456-S]
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000	00			\$ \$
00	00			\$ \$
- 5 x Washer Ø5xØ7x0.1mm.	- 2 x Oring DI=6,75, S=1,78. - 2 x Oring DI=2.9, S=1,78.	- 1 x Belt 304-2GT-09.	- 1 x Belt 1140-HTD-2.	- 4 x Flanged Bearing Ø2xØ5x2.5mm.
[HC457-S]	[HC458-S]	[HC459-S]	[HC460-S]	[HC461-S]
()	00			""
	00			- 1 x Tail Push Rod
		1 v Pad Poaring	1 v Saborical Boaring	Ø4xØ2,5x420mm. - 2 x Plastic Ball Link.
-	- 4 x Bearing Ø3Ø7x3mm.	- 1 x Rad Bearing Ø25Ø32x4mm.	- 1 x Spherical Bearing Ø12xØ22x7mm.	- 2 x Thread Rod M2,5.
[HC462-S]	[HA016-S]	[HA021-S]	[HA035-S]	[HA036-S]
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00	5,40	0		ala
O O	(Martin Contraction of the Cont	0		e e
- 4 x Shim Ø8xØ12x0.1mm.	- 2 x Wrench Tool M8,M6.	- 4 x Canopy Grommet.	- 2 x Double-sided Tape 1 mm Battery .	- 2 x Battery Straps.
[HA039-S]	[HA052-S]	[HA112-S]	[BW0370-S]	[3BL360-3DW]
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- 1 x Foam Blade Holder.	- 1 x Tail Servo Horn. - 3 x Cyclic Servo Horn.	- 1 x Canopy Edge Protection (1m).	- 2 x Tail Blade 70mm.	- 3 x Main Blade 360.
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