

# **RFM**

**PERFORMANCE HELICOPTER**

# **7.0**

***ADVANCE***

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# About Tronhelicopters

**The company Tronhelicopters was founded 2019 in Switzerland by Dario Neuenschader, Ricky Yin and Joachim Etter. (EMT team)**

## About us:

### **Dario Neuenschwander.**

Dario has long been known in the RC helicopter scene for many years.

He was heavy involved in the designs of the Protos Helicopters series and the development of the famous MSH Brain FBL unit. Dario also did R&D work for SpinBlades where he is a longtime Factory Pilot.

In 2017 Dario took a break from RC Helicopters to get involved to FPV racing. He did well and took the official FPV-FAI world champion title in 2017.

### **Joachim Etter**

Known for his business ideas and his ability to make products a success in combination with his designs. Before that, he was closely associated with various manufacturers, for whom he did designs and business consultancy. Joachim was also the key founder, designer and builder of the xnovamotors brand.

### **Ricky Yin**

Ricky is deeply involved in the manufacture, development and production of rc model helicopters for a very long time.

That goes back to the beginnings of Synergy Helicopters, which he took over in 2010 after Stephen Fan passed away.

# TRON

PERFORMANCE HELICOPTER 7.0 ADVANCE

## Features.



- Supersonic canopy mounts included in the kit. ( front and backside )
- New state of the art unique and compact belt tensioner.
- Herringbone split CNC main gear and motor pinion for super quiet and efficient performance.
- New paint scheme on high visibility canopy for perfect orientation in flight. ( 2 options available )
- Semi fusion lower frame and tail fin for awesome look and visibility.
- Dry weight= (2190) grams without blades and electronics.
- 12mm hollow main shaft.
- 10mm feathering shaft.
- Real full carbon mainframe.
- Motor mounting features a bearing block supported pinion, reducing overall wear on the power system and drive train.
- Compatible with a wide range of motor sizes, 4030, 4035, 4525, 4530, 4535 (6mm shaft required min. length 20mm and 520 - 560kv.
- 16 T motor pinion included in the kit. (6mm bore diameter)
- Octa boom design with oval side shapes.
- Perfectly thought-out servo layout in conjunction with the FBL system and ESC.
- Easy cable routing with various options to ensure a clean setup. Modern, sporty and functional design.
- Wide battery compartment with quick lock and release system.



## safety notice

Operate the helicopter in open areas with no people nearby.

Follow your countries air regulation rules.

You may need to join a local club and become a member before you can fly the model.

Do NOT operate the helicopter in the following places and situations (or else you risk severe accidents)

In places where children gather or people pass through in residential areas and parks, indoors and in limited space in windy weather or when there is rain, snow, fog or other precipitation.

If you do not observe these instructions you may be held liable for personal injury or property damage!

Always check the R/C system prior to operating your helicopter.

Keep in mind that other people around you might also be operating a R/C model. Never use a frequency which someone else is using at the same time. Radio signals will be mixed and you will lose control of your model. If the model shows irregular behavior, bring the model to a halt immediately and disconnect the batteries. Investigate the reason and fix the problem. Do not operate the model again as long as the problem is not solved, as this may lead to further trouble and unforeseen accidents. In order to prevent accidents and personal injury, be sure to observe the following: Before flying the helicopter, ensure that all screws are tightened. A single loose screw may cause a major accident.

Replace all broken or defective parts with new ones, as damaged parts lead to crashes. Never approach a spinning rotor. Keep at least 5 meters/yards away from a spinning rotor blades. Do not touch the motor immediately after use. It may be hot enough to cause burns. Perform all necessary maintenance.

**PRIOR TO ADJUSTING AND OPERATING YOUR MODEL, OBSERVE THE FOLLOWING**

Operate the helicopter only outdoors and out of people's reach as the main rotor operates at high rpm!

Note that a badly assembled or improperly adjusted helicopter is a safety hazard!

In the beginning, novice R/C helicopter pilots should always be assisted by an experienced pilot.

**SAFETY FIRST! ALWAYS.**

## Safety notice

**CAUTION:**

This radio controlled helicopter is not a toy.

The product is not suitable for children under 14 years of age.

**SAFETY PRECAUTIONS:**

This kit includes some preassembled components. Please check for any loose screws and tighten them before you proceed with assembly. Use loctite where required as shown in this manual!

You are responsible for assembly, safe operation, maintenance, inspection and adjustment of the model.

Before beginning assembly, please read these instructions thoroughly.

Check all parts. If you find any defective or missing parts, contact your local dealer.

For the USA market, The Academy of Model Aeronautics (AMA) is a national organization representing modelers in the United States.

Please refer to the National Model Aircraft safety code from Academy of Model Aeronautics.

## Tools required

	2 component epoxy
	Loctite 243 / medium strength
	Grease
	2x 7mm Wrenches for tail shaft nut
	Hex screwdriver 1.5mm/2mm/2.5mm/4mm/5mm
	TR701-518 Pair of customized nut wrench for tail shaft assembly. Optionally available at your Dealer.
	SPRAG GREASE (SUCH AS ISOFLEX LDS18 Special A)

## Electronics required



3x full size servo for swashplate



1 full size servo for tail



BL motor. 4030-4535 / 500-560KV










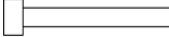















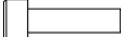
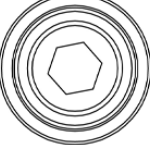
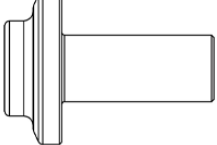











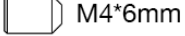




















ESC 6S-12S 112A-205A

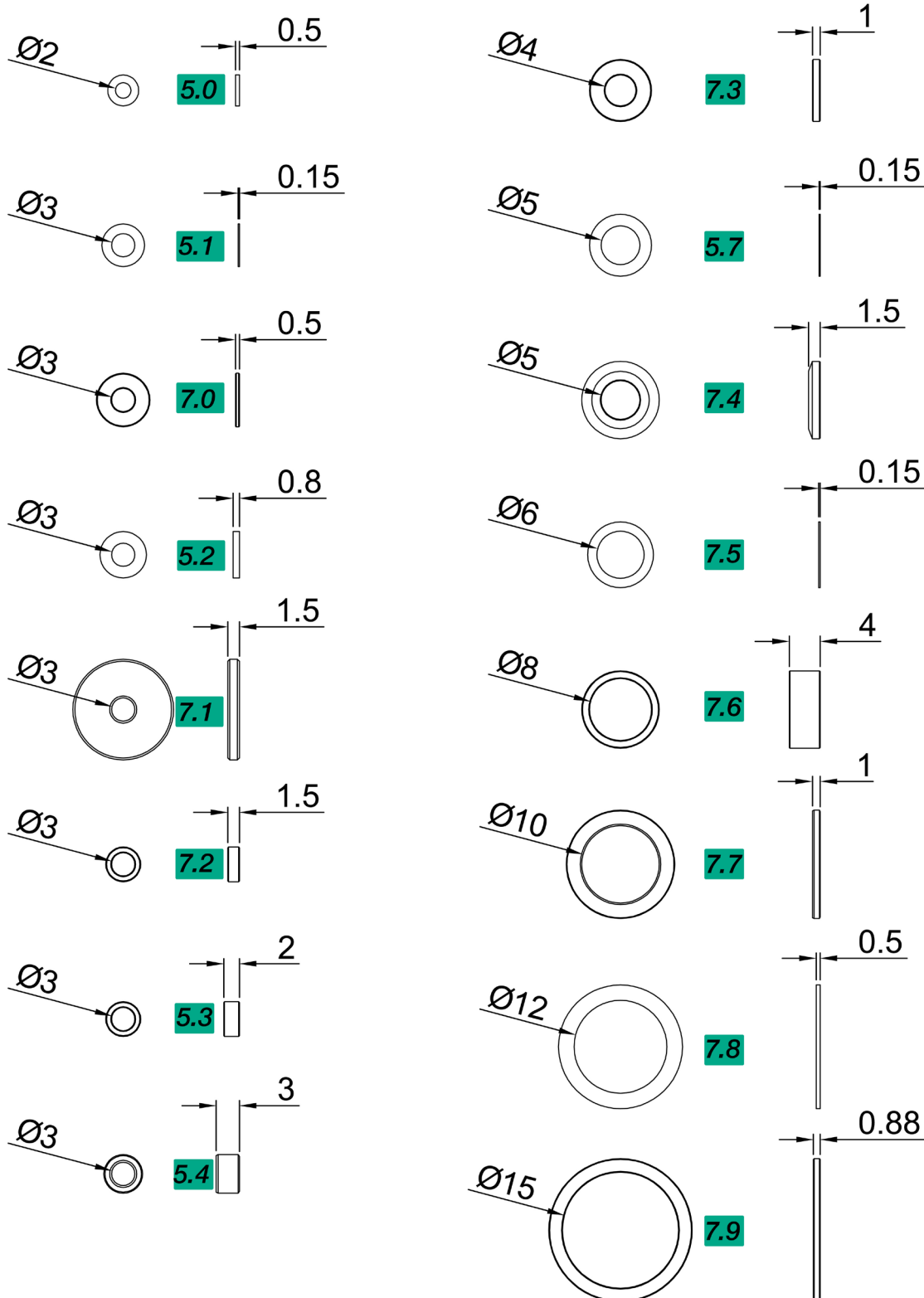


FBL device and receiver with 6 channel transmitter.

## Screws and nuts

 <b>1.0</b>	 M2*4mm	 <b>2.5</b>	 M3*18mm
 <b>1.1</b>	 M2*6mm	 <b>2.6</b>	 M3*25mm
 <b>1.2</b>	 M2*16mm	 <b>2.7</b>	 M3*40mm
 <b>1.3</b>	 M2.5*6mm	 <b>2.8</b>	 M4*10mm
 <b>1.4</b>	 M2.5*6mm	 <b>2.9</b>	 M4*26.5mm
 <b>1.5</b>	 M2.5*8mm	 <b>3.0</b>	 M4*40mm
 <b>1.6</b>	 M2.5*10mm	 <b>3.1</b>	 M7*15mm
 <b>1.7</b>	 M3*6mm	 <b>3.2</b>	 M3*12mm
 <b>1.8</b>	 M3*8mm	 <b>3.3</b>	 M4*5mm
 <b>1.9</b>	 M3*6mm	 <b>3.4</b>	 M4*6mm
 <b>2.0</b>	 M3*8mm	 <b>3.5</b>	 M2 Nut
 <b>2.1</b>	 M3*10mm	 <b>3.6</b>	 M3 Nylon Nut
 <b>2.2</b>	 M3*12mm	 <b>3.7</b>	 M4 Nylon Nut
 <b>2.3</b>	 M3*16mm	 <b>3.8</b>	 M5 Nylon Nut
 <b>2.4</b>	 M3*17.8mm		


## Shims and washers.



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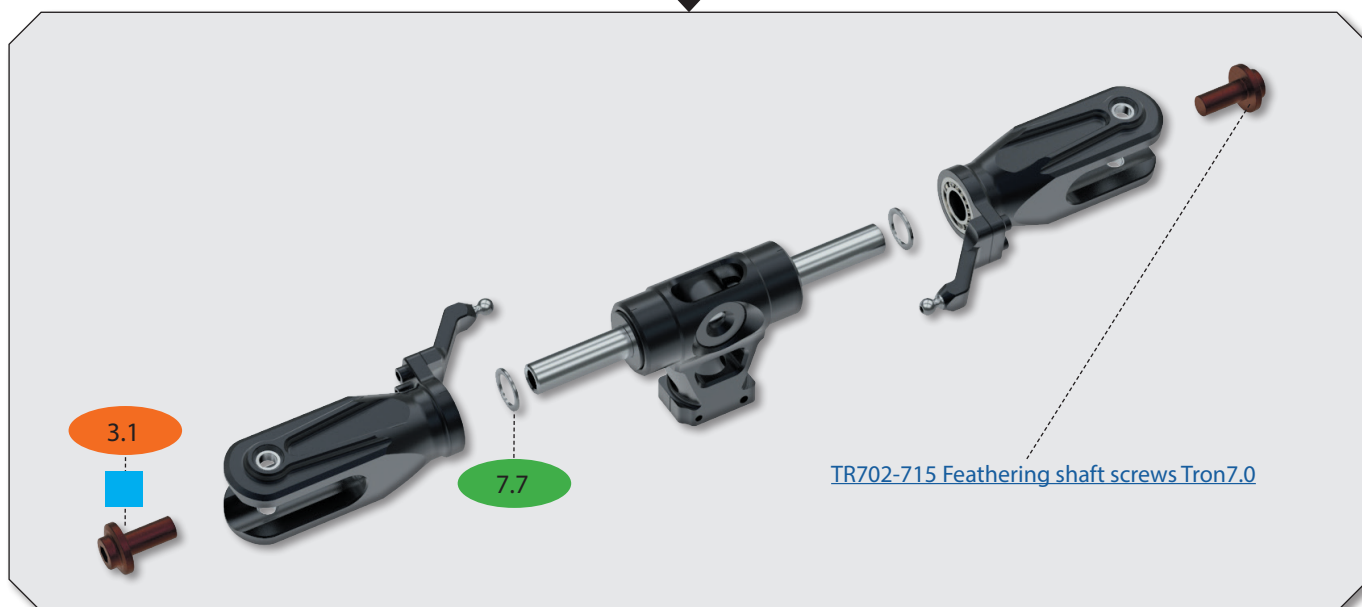
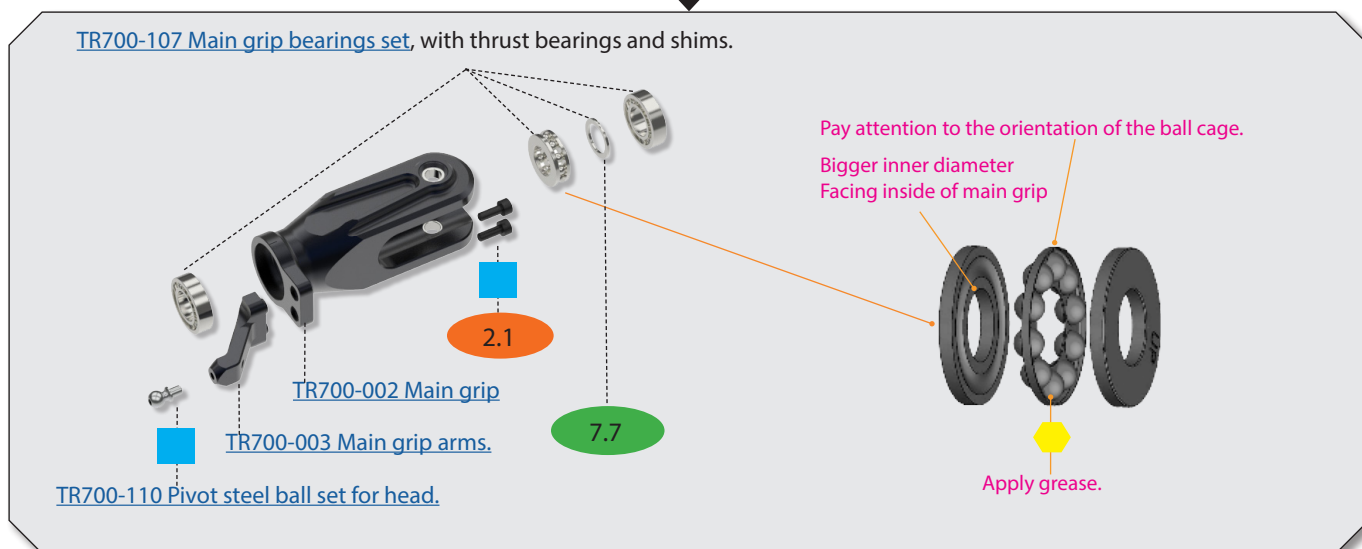
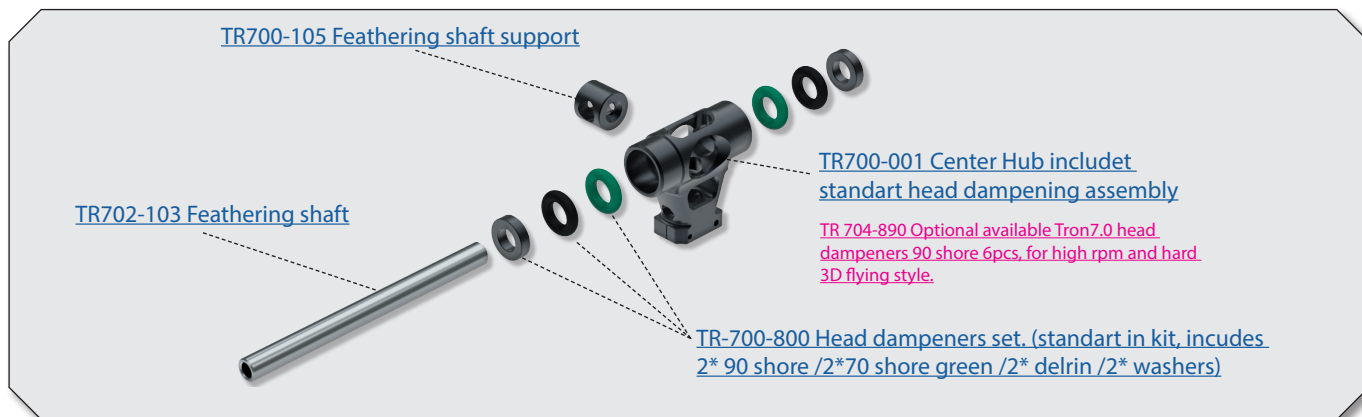
You will need:

Loctite 243 = blue 

Grease = yellow 

## Head assembly


**IMPORTANT NOTE: ALL PRE-ASSEMBLED PARTS NEEDS TO BE DISASSEMBLED AND LOCKTITED!**



# TRON

PERFORMANCE HELICOPTER 7.0 ADVANCE

You will need:

Loctite 243 = blue 

## Head assembly

[TR704-100 Plastic ball link set 2,5mm](#)

1.6

**Important note!**

The ball links have a larger and a smaller diameter. Always make sure the larger diameter is pointing towards the pivot ball when assembling!

5.1

[TR700-103 Bearing set and spacers for anti rotation arms](#)

5.1

[TR700-105 Anti rotation arm set with bearings,shims,screws and ball links](#)

2.5



Do not tighten now!

2.6

Do not tighten now!

5.2

[TR700-105 Anti rotation arm set with bearings,shims,screws and ball links](#)

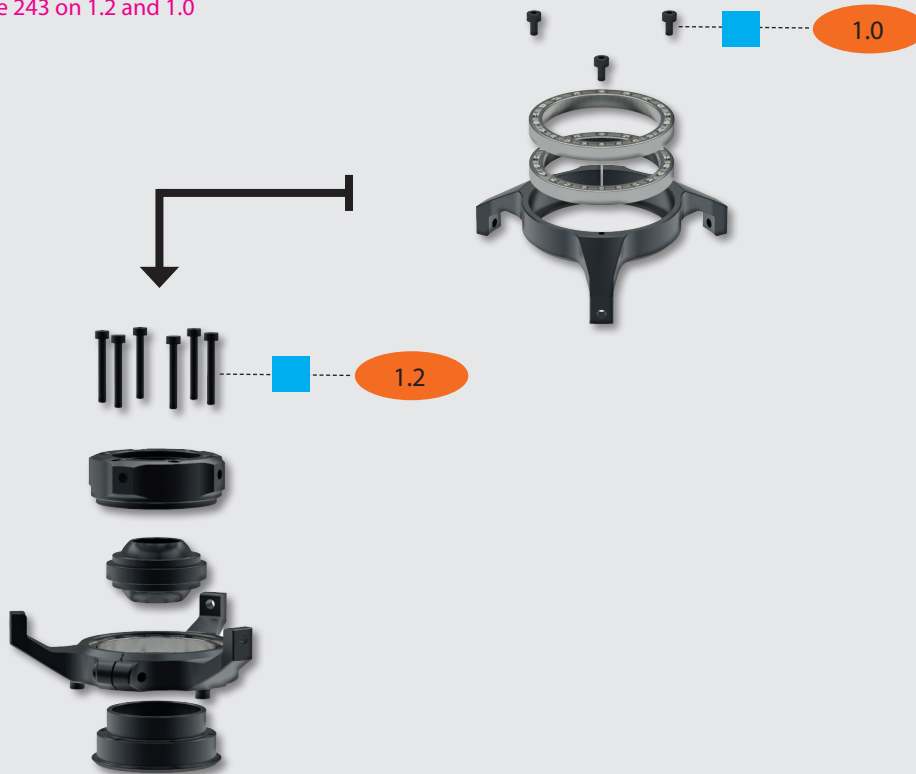


You will need:

Loctite 243 = blue

## Head assembly

Swashplate is preassembled in factory.  
Please use loctite 243 on 1.2 and 1.0



[TR700-110 Pivot steel ball set for head. \(16pcs.\)](#)



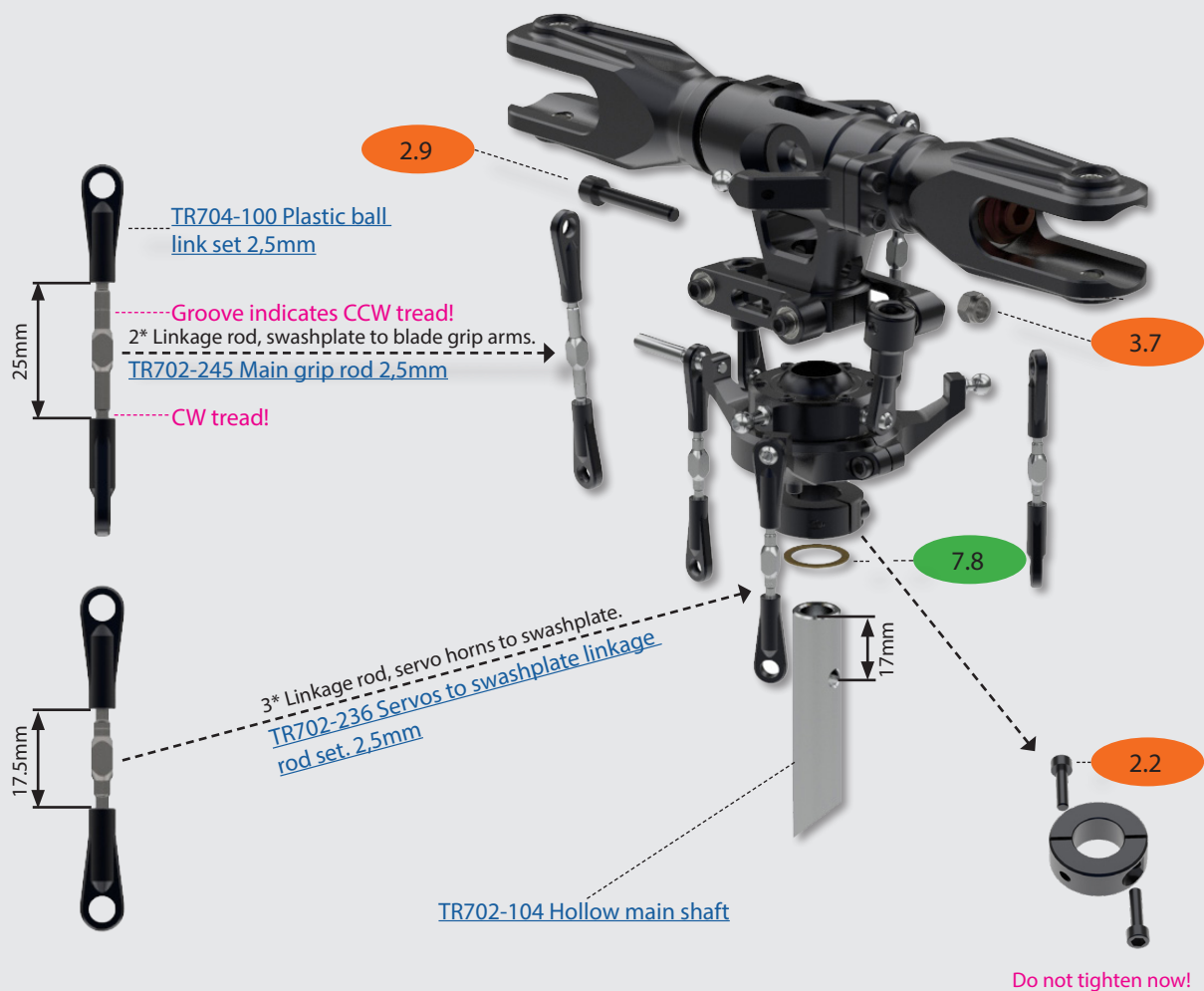
Pay special attention when tighten the screw. Apply only a little force. Overtighten of the screw may result in swahsplate bearing damage.

You will need:

Loctite 243 = blue

## Head assembly


1. Insert main shaft into center hub first.
2. Tighten screw 2.9
3. Tighten screw 2.6 left and right step by step (use loctite 248). Make sure the shim 5.2 do not fall off. (page 12)



### Important note!

The ball links have a larger and a smaller diameter. Always make sure the larger diameter is pointing towards the pivot ball when assembling!


You will need:

Loctite 243 = blue 

## Tail assembly

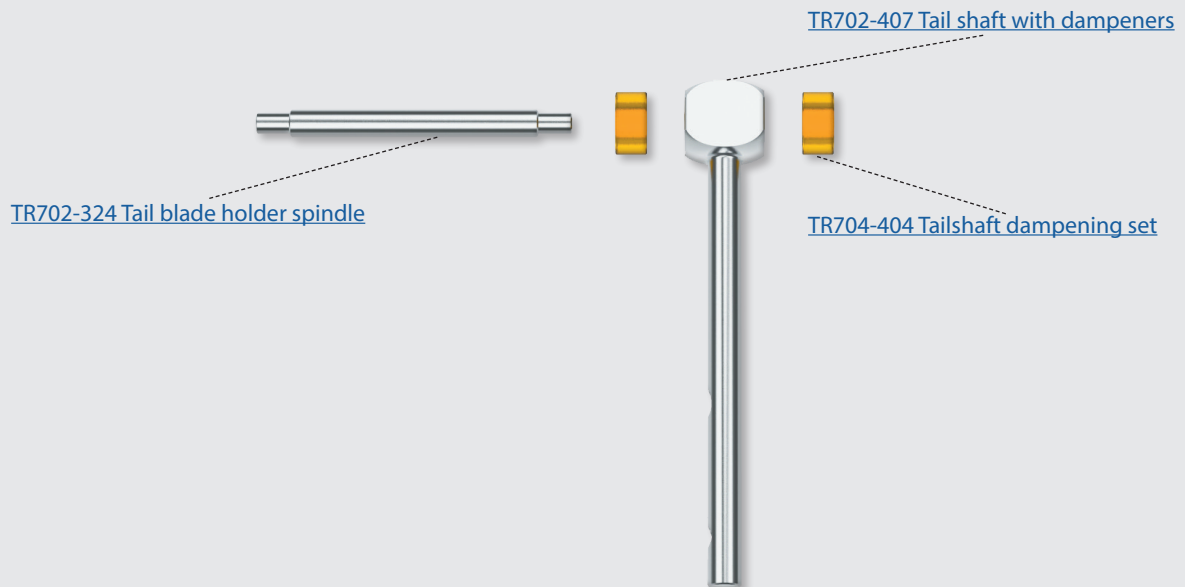


You will need:

Loctite 243 = blue 

Grease = yellow 


## Tail assembly



# TRON

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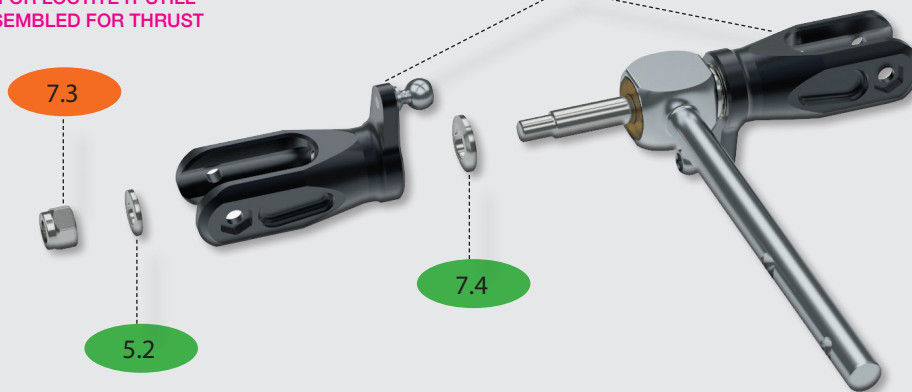
You will need:

Loctite 243 = blue 

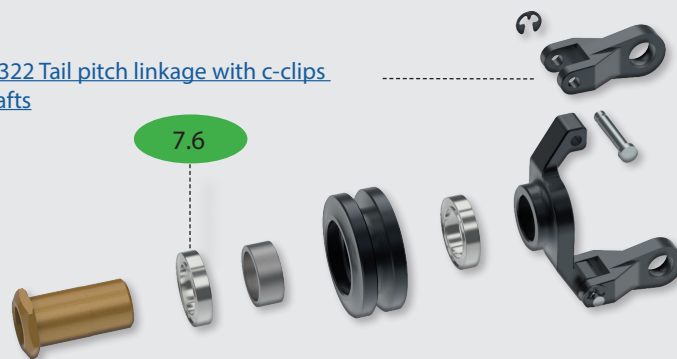
## Tail assembly

DESPITE BEING A LOCKNUT SO IT WON'T NEED DISSASSEMBLY FOR LOCTITE IT STILL NEEDS TO BE DISSASSEMBLED FOR THRUST BEARING GREASE

[TR700-525 Tail blade holder set complete](#)



[TR550-322 Tail pitch linkage with c-clips and shafts](#)



Option parts available!

- TR700-322 Tron7.0 tail pulley 22T
- TR700-323 Tron7.0 tail pulley 23T

**IMPORTANT NOTE!**  
DO NOT EXCEED 1600 HEAD SPEED ON MAIN ROTOR-  
HEAD WHYLE USE ONE OF THIS OPTION PARTS.

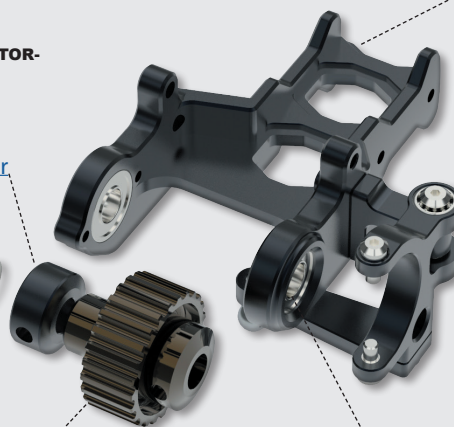
[TR700-403 Tail case assembly including bearings](#)

[TR701-306 Tail shaft collar](#)

7.5

[TR701-325 Tail pulley 25T \(stock\)](#)

[TR706-613 Tail case bearings](#)



# TRON

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You will need:

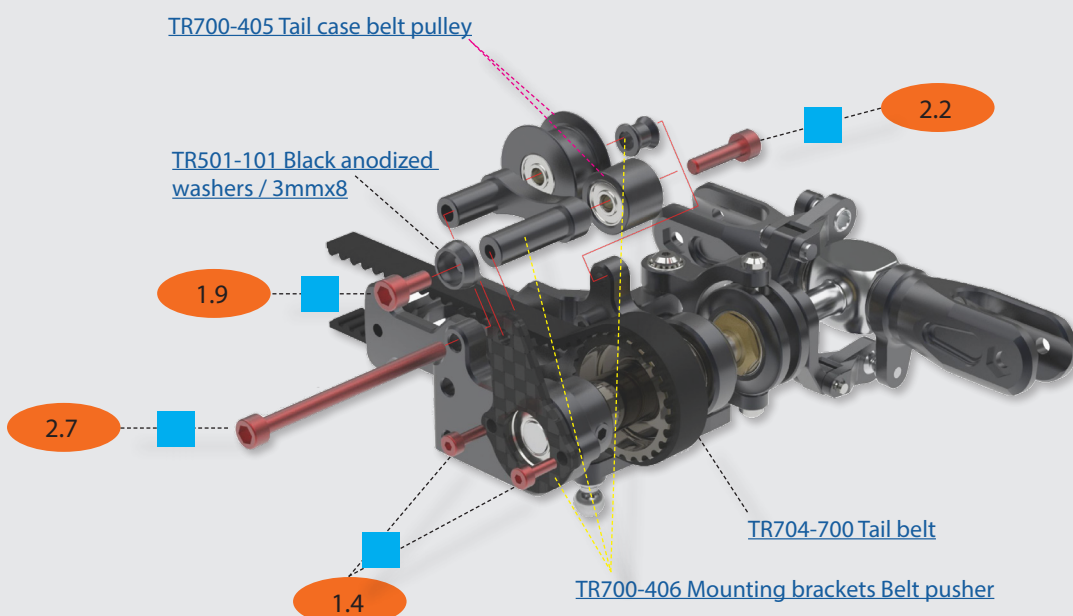
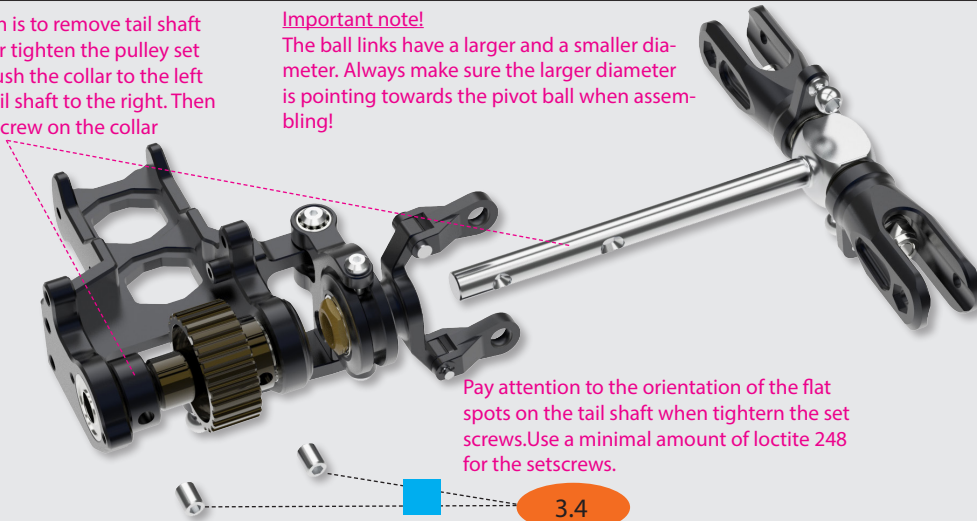
Loctite 243 = blue

## Tail assembly

The collar design is to remove tail shaft lateral play. After tighten the pulley set screw, slightly push the collar to the left while pull the tail shaft to the right. Then tighten the set screw on the collar

### Important note!

The ball links have a larger and a smaller diameter. Always make sure the larger diameter is pointing towards the pivot ball when assembling!



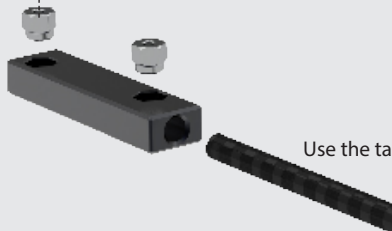
You will need:

A little bit of patience when assembling it for the first time

## Tail assembly

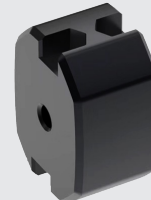
3.6

Insert nuts into the tail pushrod mounting device.  
Use the same direction as shown in the illustration.



Use the tail pushrod temporary.

A new tool is now available. This will make the assembly of the pushrod guide very simple.



[TR704-501 New tail pushrod assembly tool for Tron 7.0](#)



----- This side of the boom will be assembled to the main frame side!

Insert the tail push rod with the nuts facing up into the boom.  
Make sure your mounting device facing up like shown in the illustration.

1.8



[TR703-216 Tail pushrod guide](#)

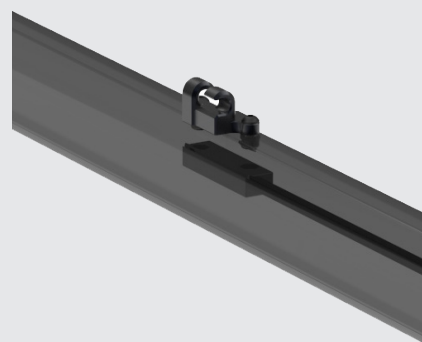
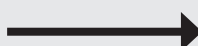
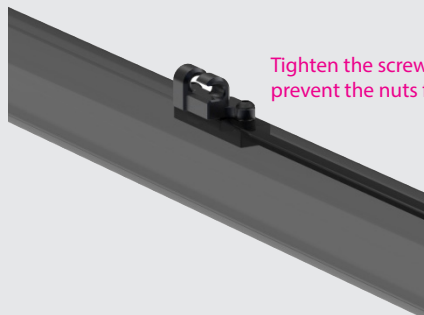


Pay attention of the orientation the guide!

[TR701-814 Tail boom including tail pushrod guide](#)



Tighten the screws while holding pressure to prevent the nuts from coming off the fixture!



Pull the mounting device out from the nuts.





# TRON

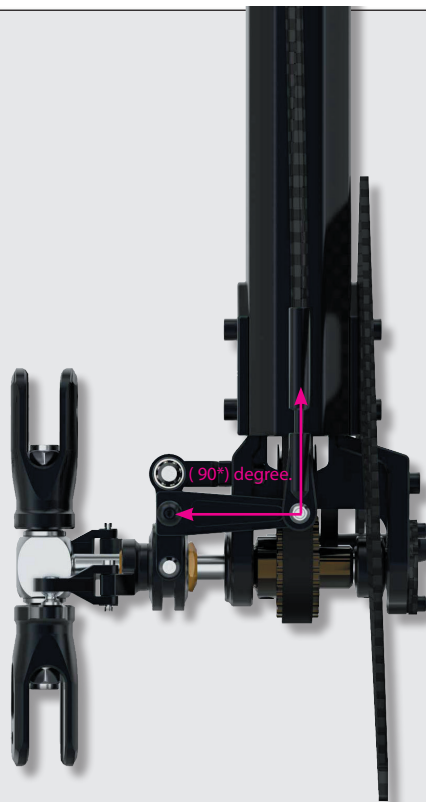
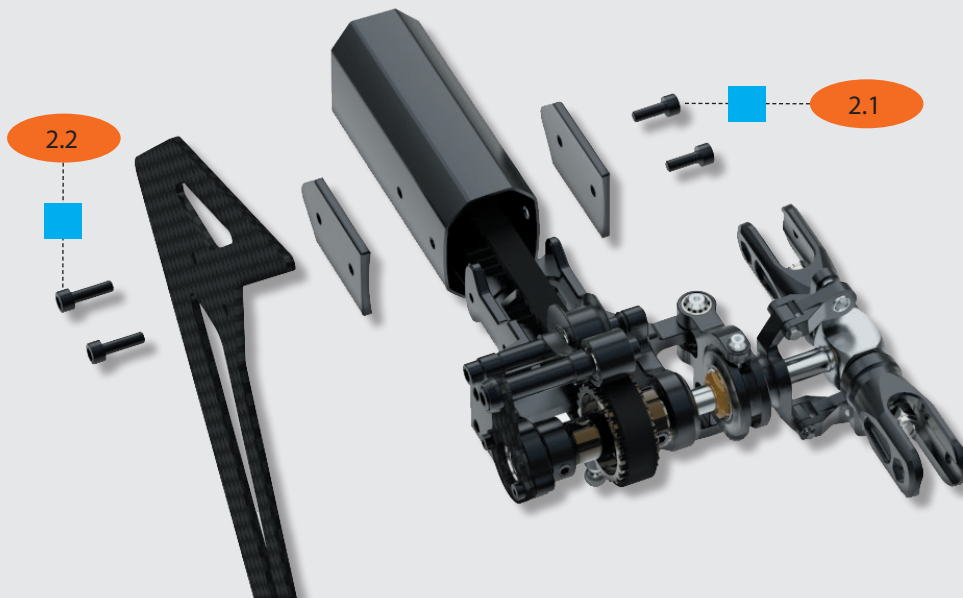
PERFORMANCE HELICOPTER 7.0 *ADVANCE*

You will need:

Loctite 243 = blue




## Tail assembly



For best tail authority performance adjust center position of your FBL controller ( tail servo) same as shown in the illustration ( 90\*) degree.

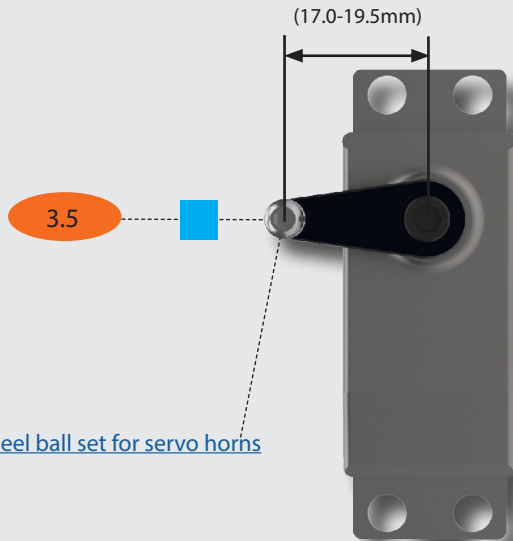
You will need:

Loctite 243 = blue 

## Servos preparation

Cyclic servo arm lenght for Tron 7.0 ( 3\* full size )

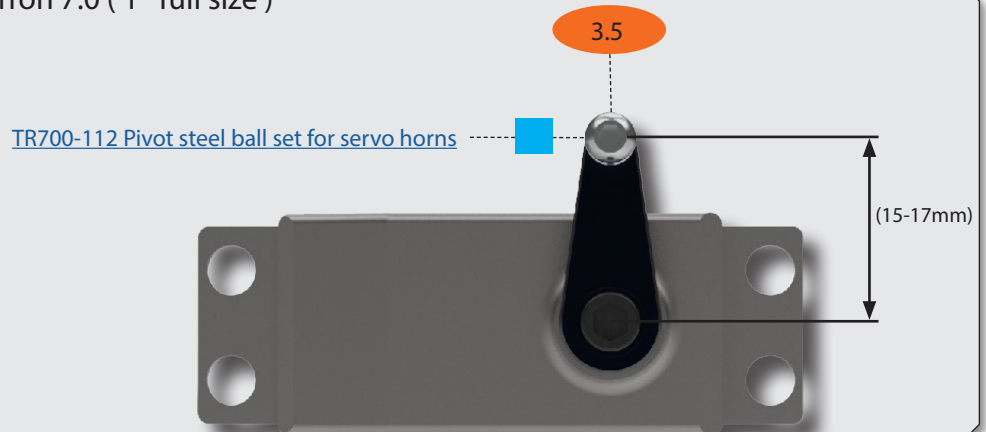
17.00-19.5mm, depending on the brand of the servos and the mounting position of the servos. Make sure that all 3 swashplate servos are mounted in the same way. Depending on the best possible geometry.



[TR700-112 Pivot steel ball set for servo horns](#)



Tail servo arm lenght for Tron 7.0 ( 1\* full size )



[TR700-112 Pivot steel ball set for servo horns](#)

You will need:

Loctite 243 = blue



## Battery tray

[TR700-711 Battery tray assembly](#)

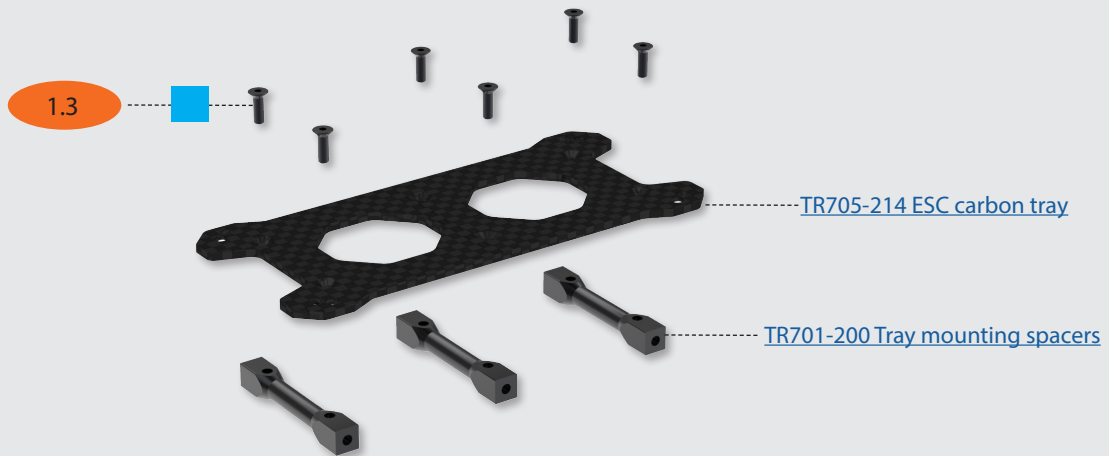
Please pay attention to the direction and position the batterie pin lock support is assembled.  
Please see page Nr. 27.



1.3

You will need:  
Loctite 243 = blue

## Upper main frame assembly

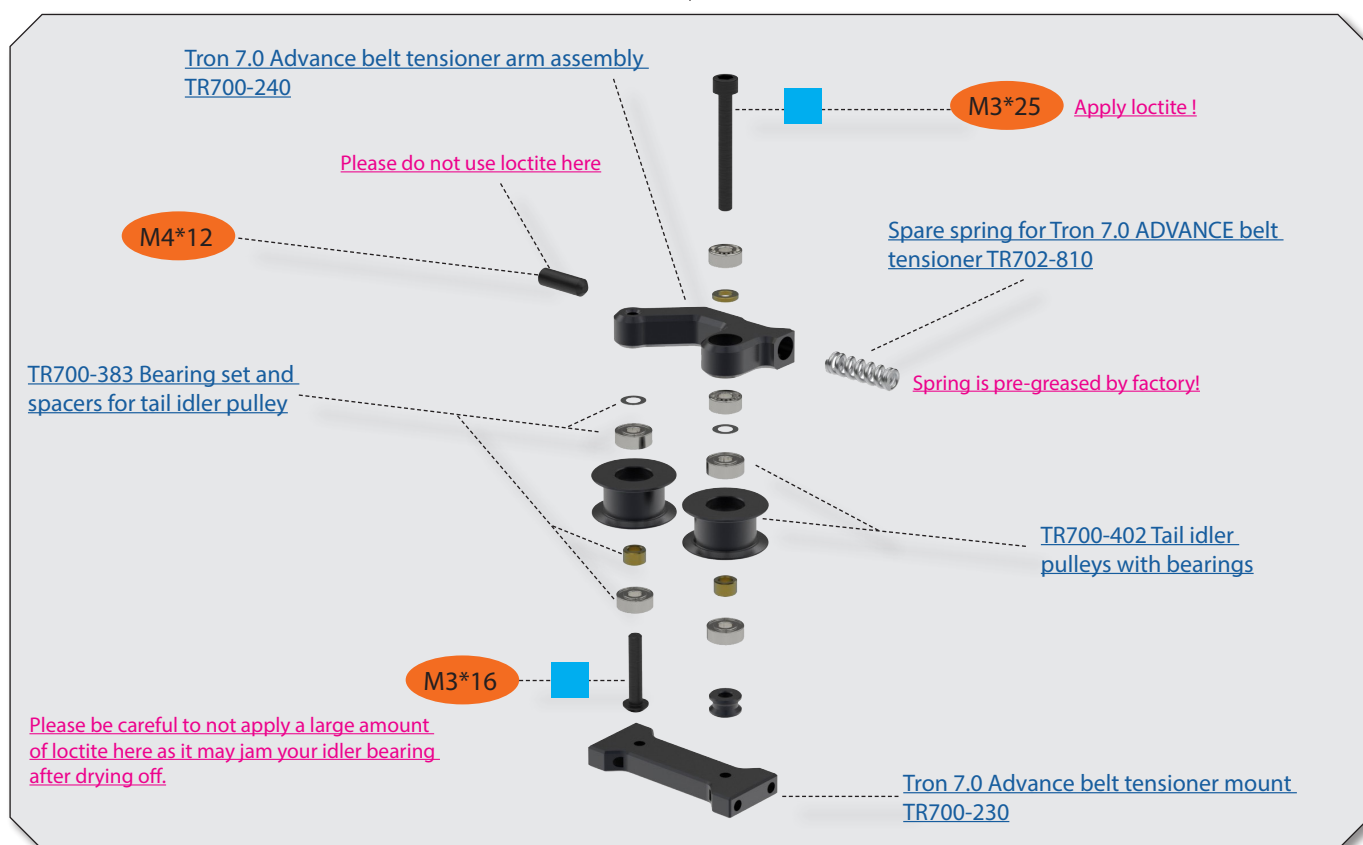
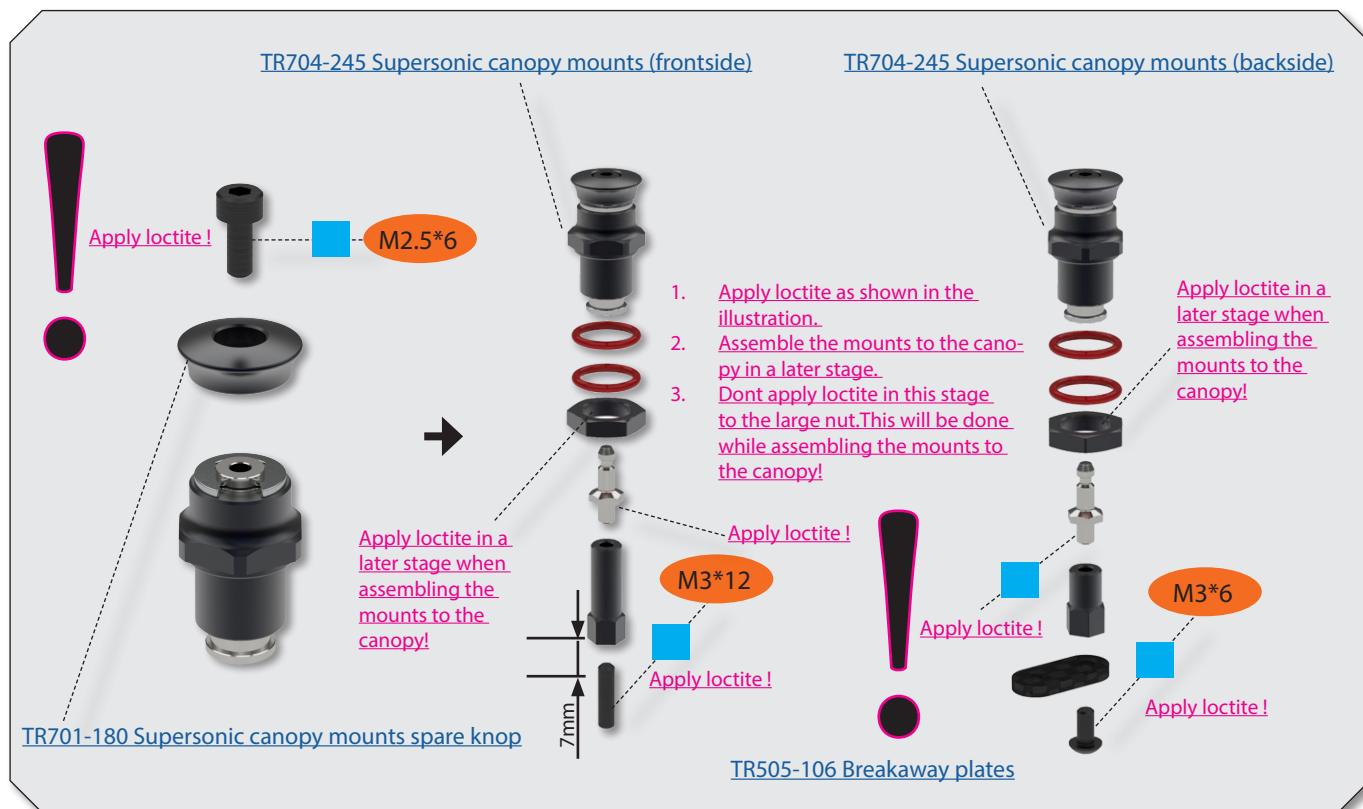


WE DO RECOMMEND TO INSERT THE TAIL BOOM WHILE TIGHTEN THE 1.7 SCREWS TO ENSURE BOOM CLAMPS ARE ALIGNED!

You will need:

Loctite 243 = blue

## Upper main frame assembly



# TRON

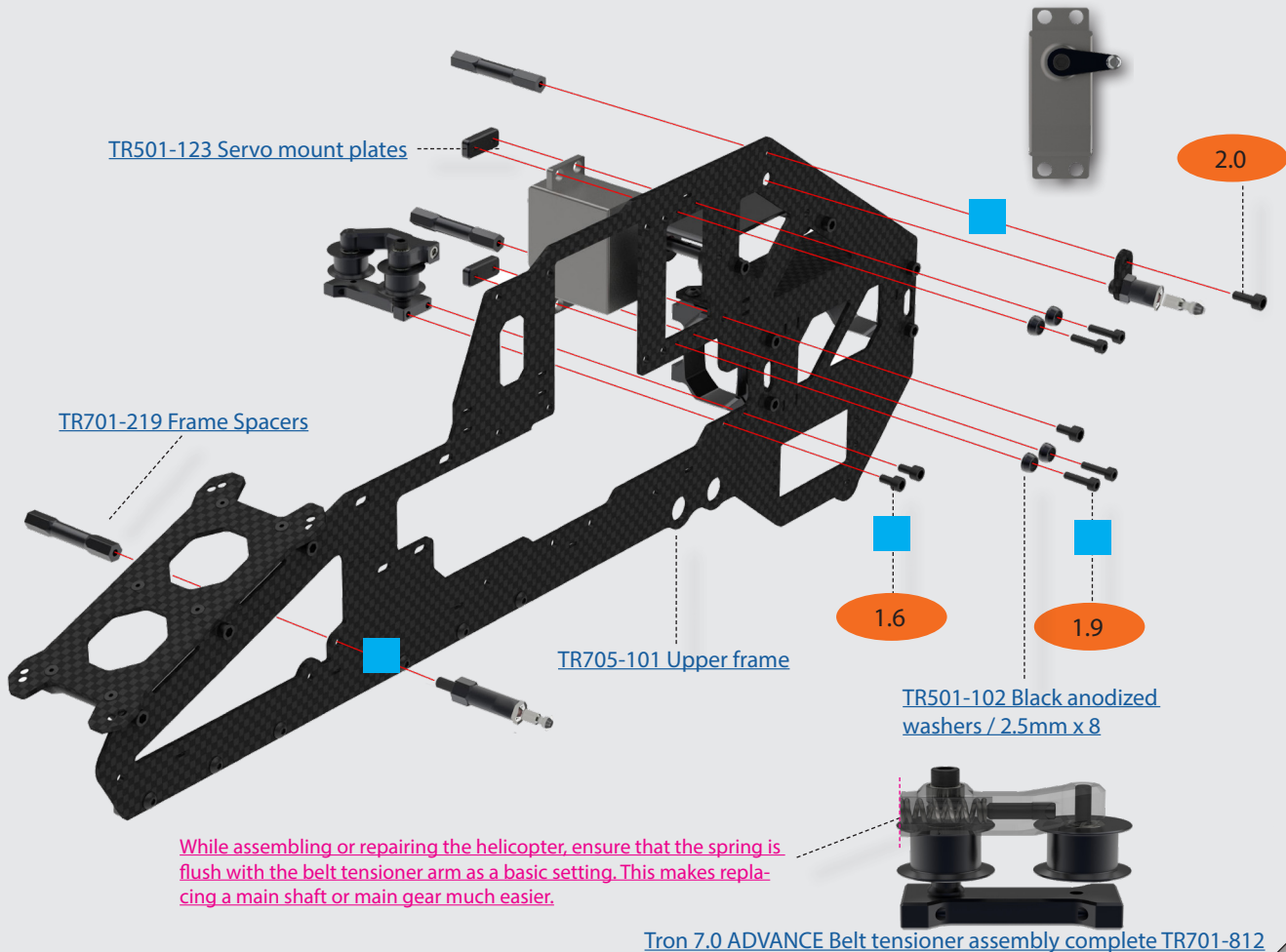
PERFORMANCE HELICOPTER 7.0 ADVANCE

You will need:

Loctite 243 = blue

## Upper main frame assembly

NOTE SERVO SPLINES AND HORN POSITION



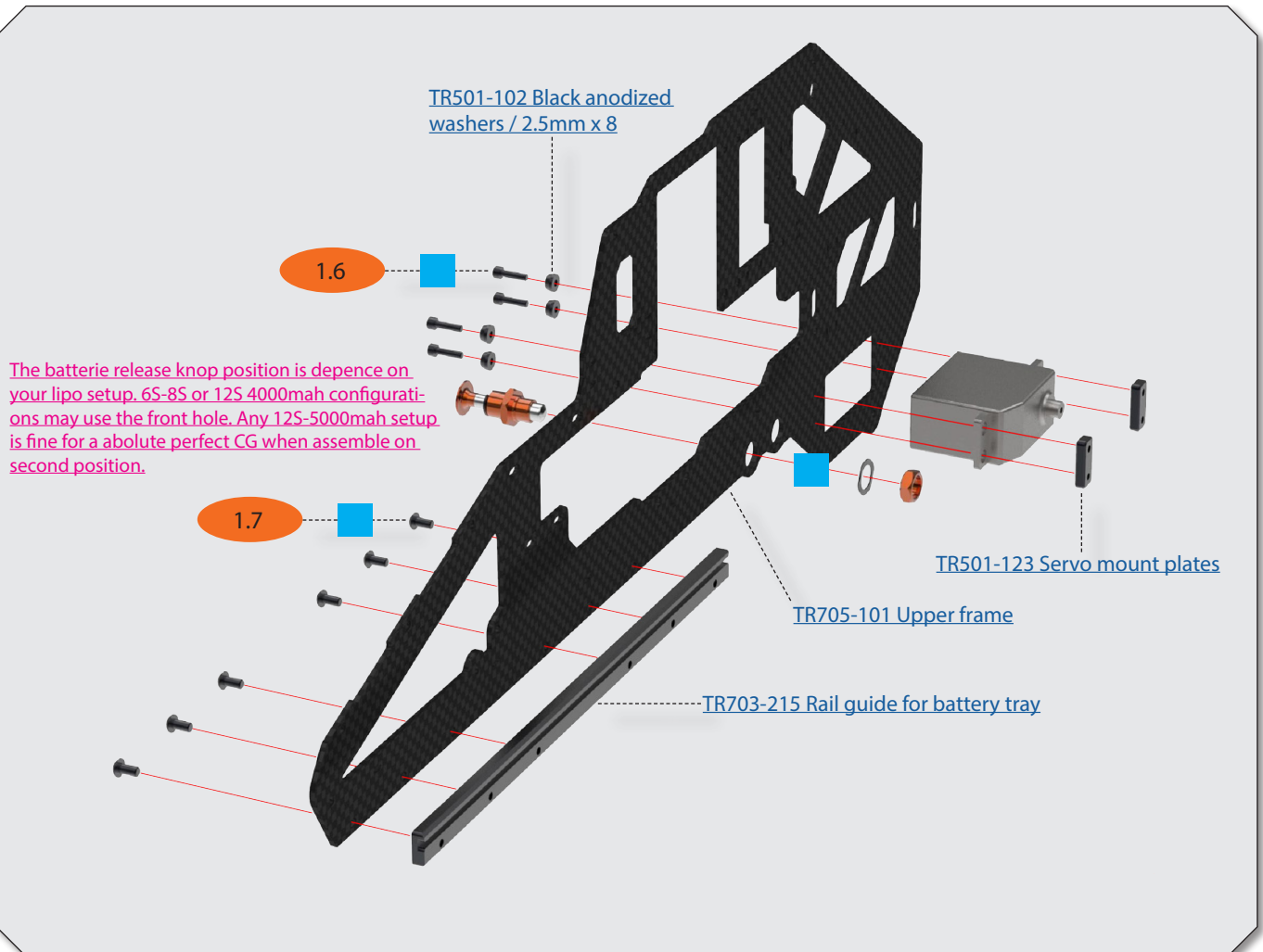
Pre-assembled by factory.



You will need:

Loctite 243 = blue

## Upper main frame assembly



You will need:

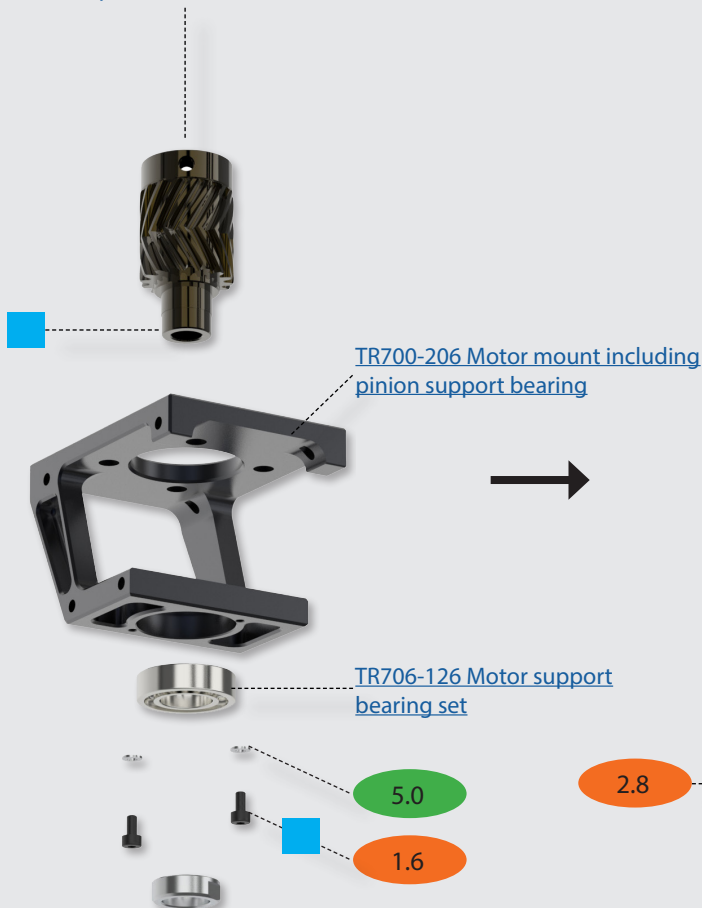
Loctite 243 = blue

## Motor mount and pinion

Available pinions for Tron 7.0

- 15T 6mm = TR702-115
- 16T 6mm = TR702-116 / INCLUDED IN KIT
- 17T 6mm = TR702-117

[Tron 7.0 ADVANCE CNC 16T Herringbone motor pinion TR702-116](#)



BL motor 4030-4535 size (not included)





You will need:

Loctite 243 = blue

## Servo frame and motor support

TR706-105 Main shaft bearing set

TR701-204 Main shaft support with bearings

TR701-203 Servo mount unit

TR501-203 Cross member

1.7

TR701-203 Servo mount unit

1.4

TR506-105 Main shaft bearing set

When final assembling of the main gear, press shaft support up versus the main gear assembling to remove up and down play. (page 37)

TR701-205 3rd bearing block

TR701-378 Motor mount support

1.9

2.1

5.2

2.0

2.0

TR501-101 Black anodized washers / 3mm

DO NOT TIGHTEN THE SCREWS NOW OR THE MAIN GEAR WILL BE DIFFICULT TO INSERT AND MAIN SHAFT WILL NOT BE PERFECTLY ALIGNED TO SLIDE IN PLACE

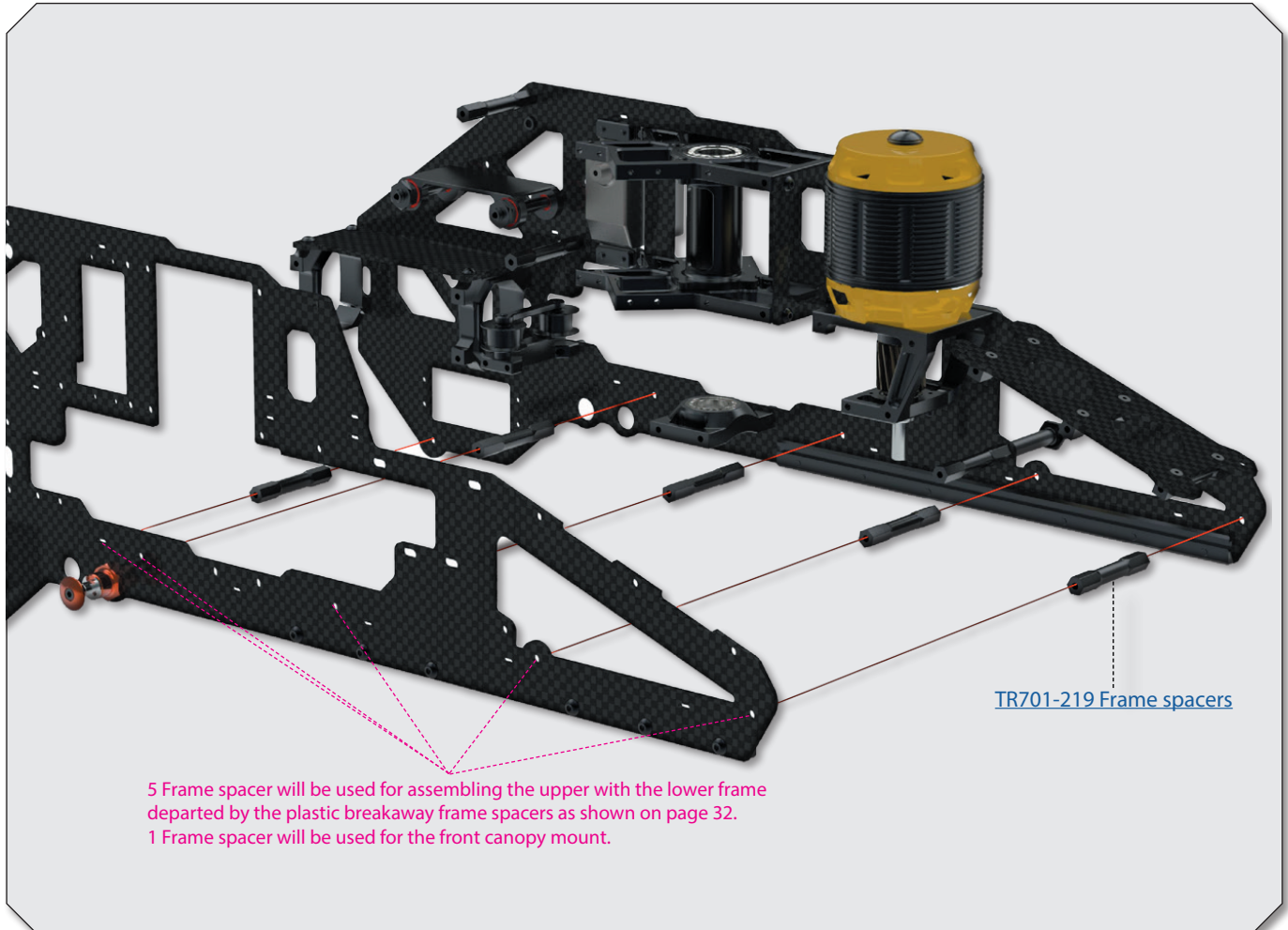
# TRON

PERFORMANCE HELICOPTER 7.0 ADVANCE

You will need:  
Loctite 243 = blue



## Upper and lower main frame assembly

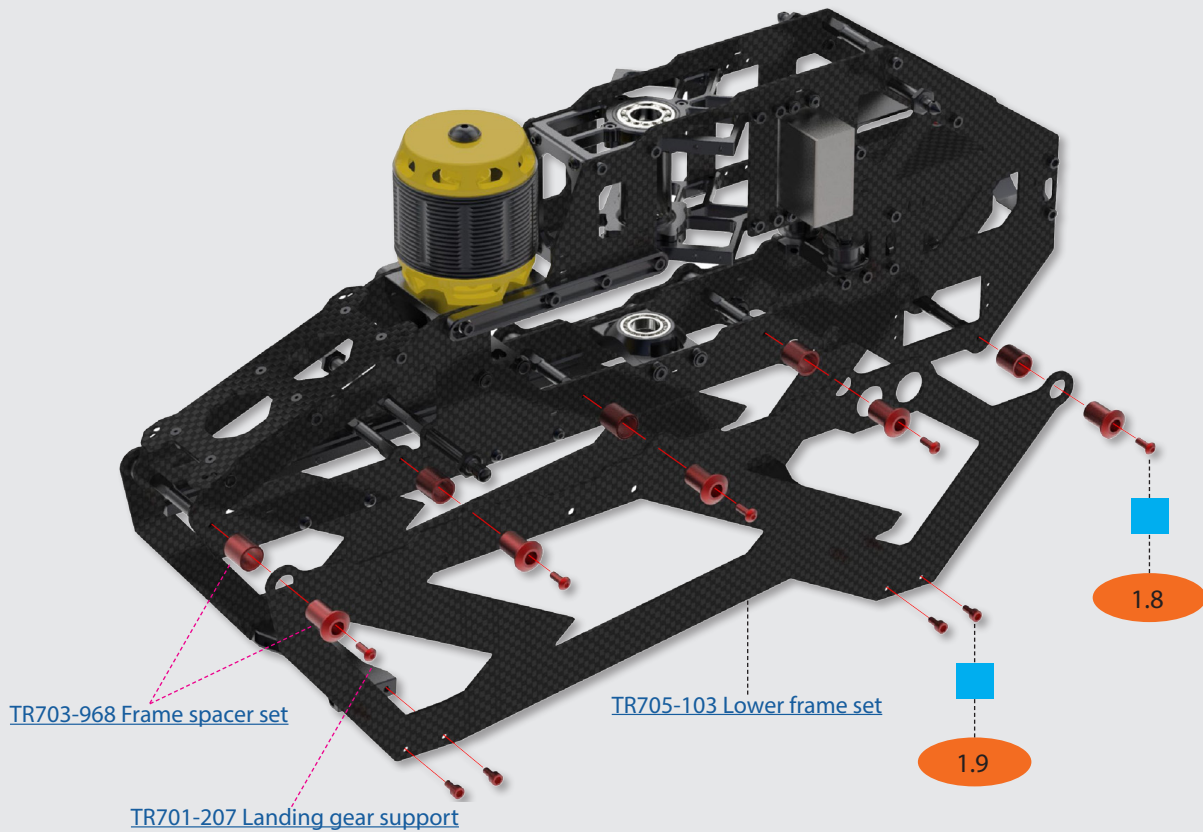


# TRON

PERFORMANCE HELICOPTER 7.0 ADVANCE

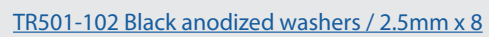
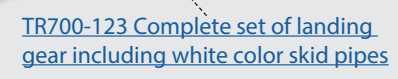
You will need:  
Loctite 243 = blue

## Upper and lower main frame assembly





## Landing gear and cyclic servos



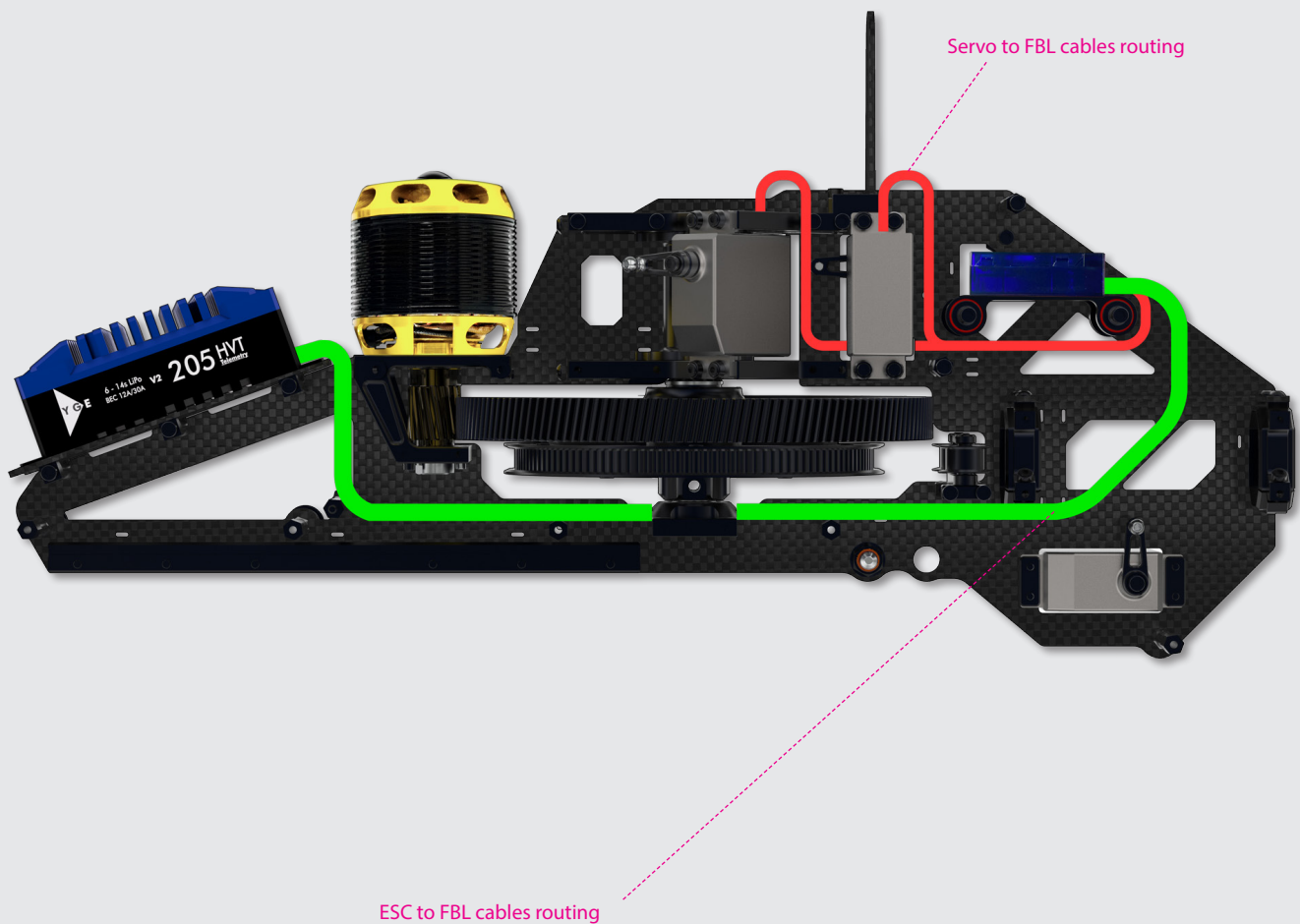
# TRON

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## Tips

## Wiring

Additionally, you may want to use servo wire protection shrink tube to avoid cuffing or cutting on servo wires. Please make sure all edges on the frames which are in contact with wires are eased with sandpaper.



# TRON

PERFORMANCE HELICOPTER 7.0 ADVANCE

## Tips

## Wiring




For best fitting of canopy, route your ESC battery cables as shown in the illustration. Canopy handling will be very easy and fast.



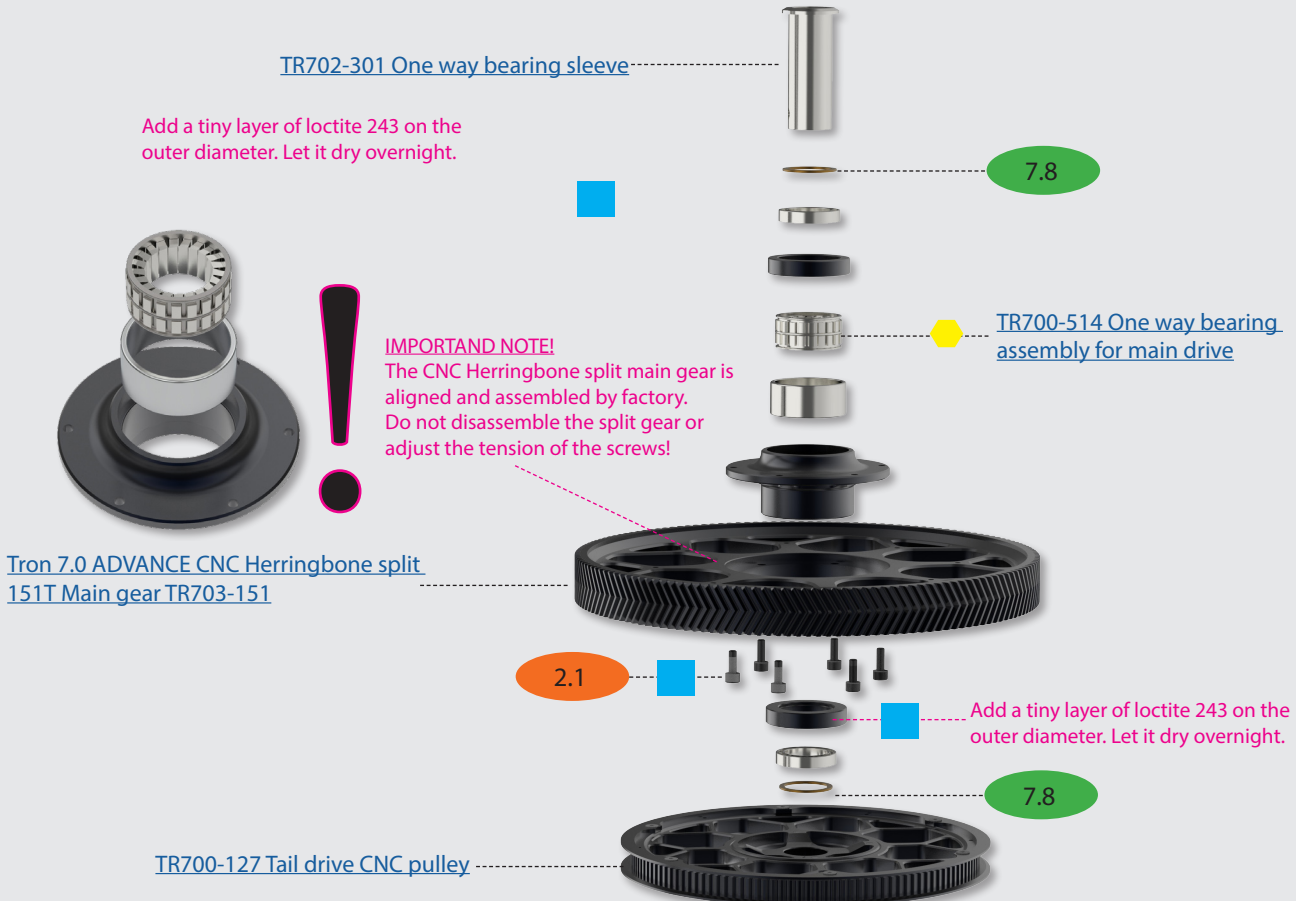
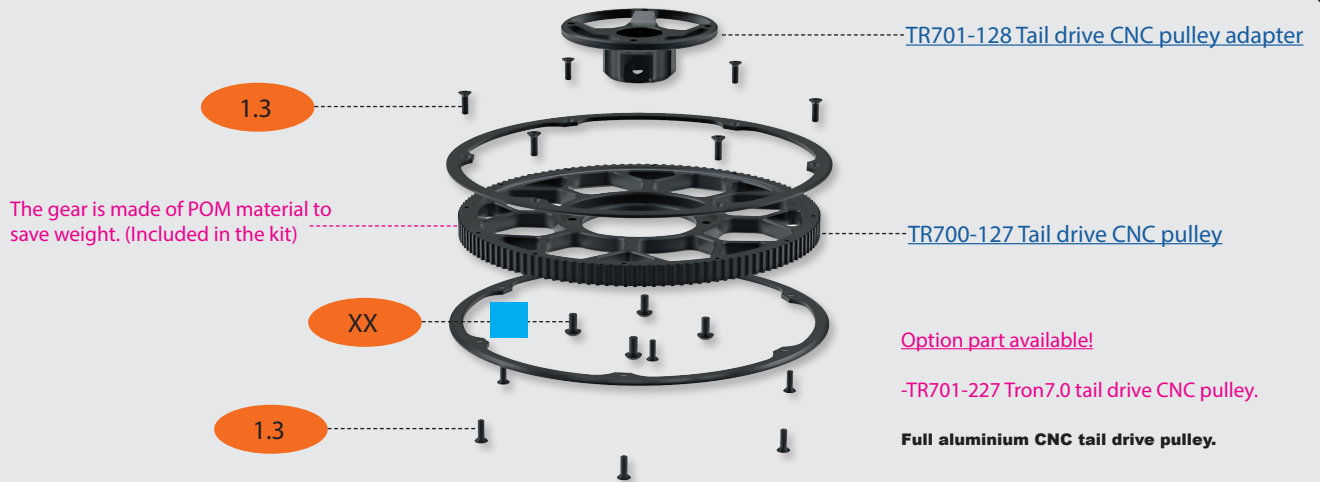
For best fitting of canopy, route your ESC battery cables as shown in the illustration. Canopy handling will be very easy and fast.

You will need:

Loctite 243 = blue 

Grease = yellow 

## Main drive preparation



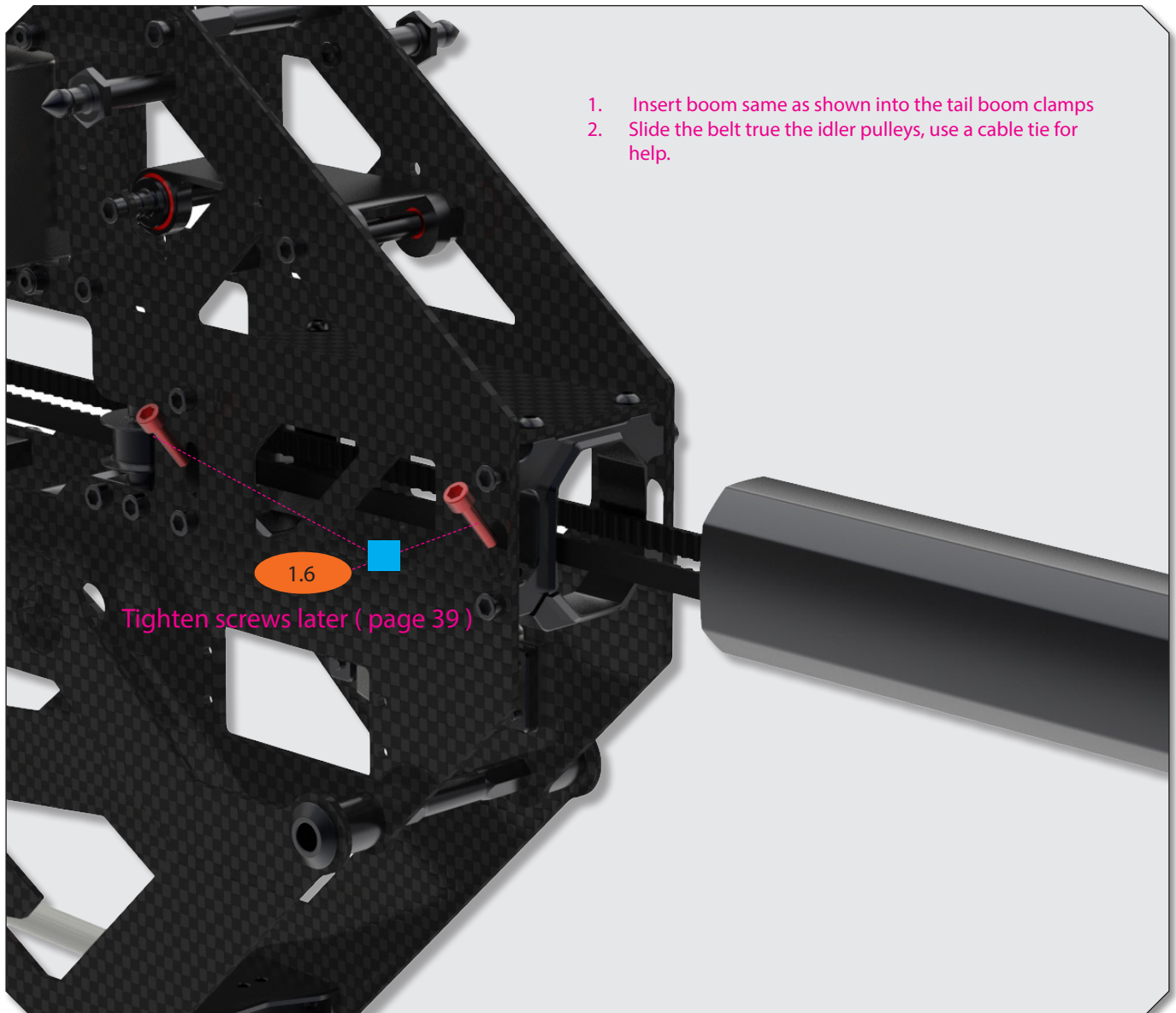
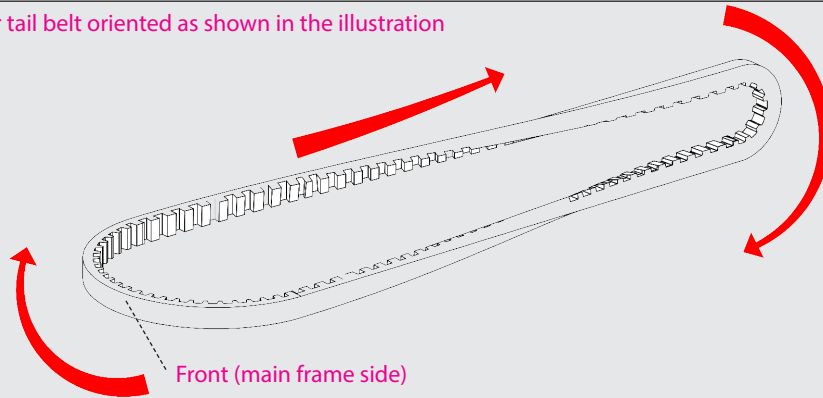


You will need:  
Loctite 243 = blue



## Tail boom and herringbone main gear alignment.

Ensure to have your tail belt oriented as shown in the illustration



1. Insert boom same as shown into the tail boom clamps
2. Slide the belt true the idler pulleys, use a cable tie for help.

1.6

Tighten screws later ( page 39 )

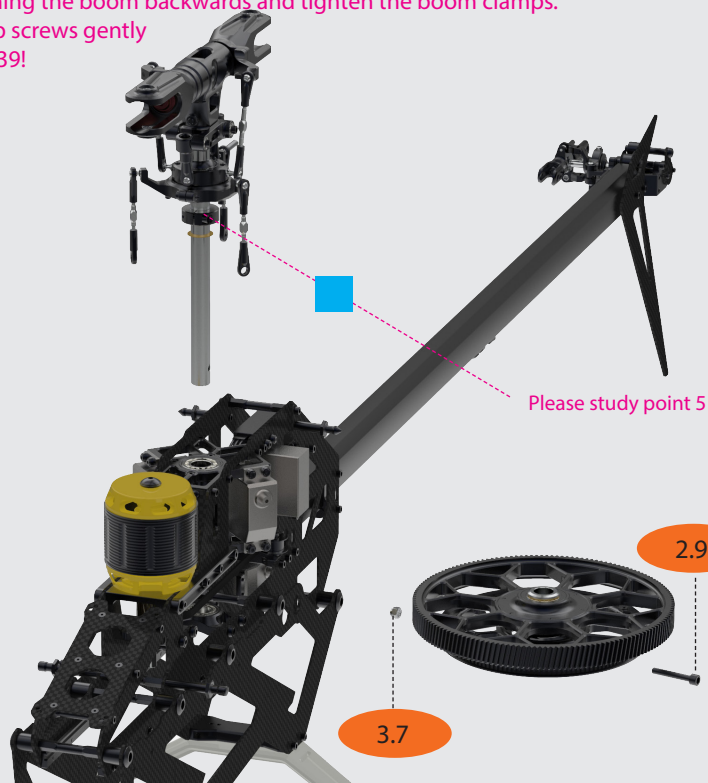


You will need:

Loctite 243 = blue

## Head and main drive

1. Insert main gear assembly into frame while pulling tail belt over drive pulley
2. Insert rotor head assembly
3. Make sure your main shaft glide true the one way bearing sleeve and line up with the Jesus bolt screw 2.9 and the lower main shaft bearing support.
4. Hold the lower main shaft bearing support versus the one way bearing assembly and tide up the screws.
5. Move down the main shaft collar to have zero up and down play on the rotor head assembly, then tighten screws equally.
6. Make sure to have an equal gap on the collar to achieve best holding results for the main shaft.
7. Tighten the belt by pushing the boom backwards and tighten the boom clamps.
8. Tighten the boom clamp screws gently
9. Set belt tensioner page 39!

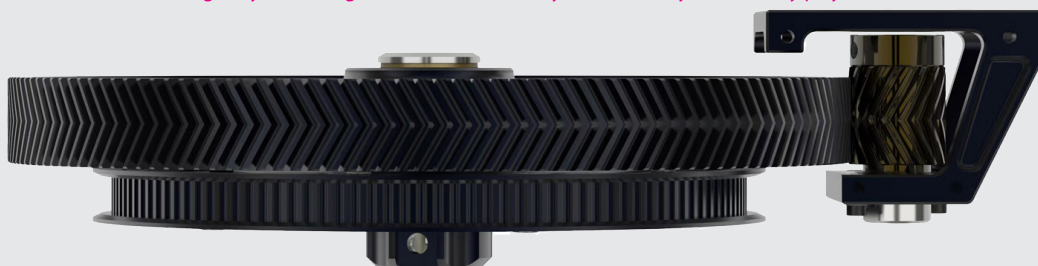


### **IMPORTANT NOTE!**

Thanks to the flexible split design, which compresses under load, it detects and compensates for even the smallest vertical displacements. This way the main gear always will stay in the perfect position. In addition, no vertical alignments or adjustments are required thanks to the motor Pinion's unique design.

### **FOR MOTOR PINION VERSUS MAIN GEAR PLAY /GAP ADJUSTMENT PROCEED AS FOLLOWING:**

- Assemble all 4 screws to your motor mount but do not tighten them up.
- Carefully slide the motor mount versus the main gear until you have a contact.
- Carefully turn you main gear by hand without adding clearance. You should feel a smooth and free spinning of the main gear. No clearance is required.
- Carefully tighten the motor mount screws crosswise, use loctite.
- Check again: your main gear should rotate freely and smoothly without any play.



# TRON

PERFORMANCE HELICOPTER 7.0 ADVANCE

You will need:

Loctite 243 = blue

## Anti rotation guide

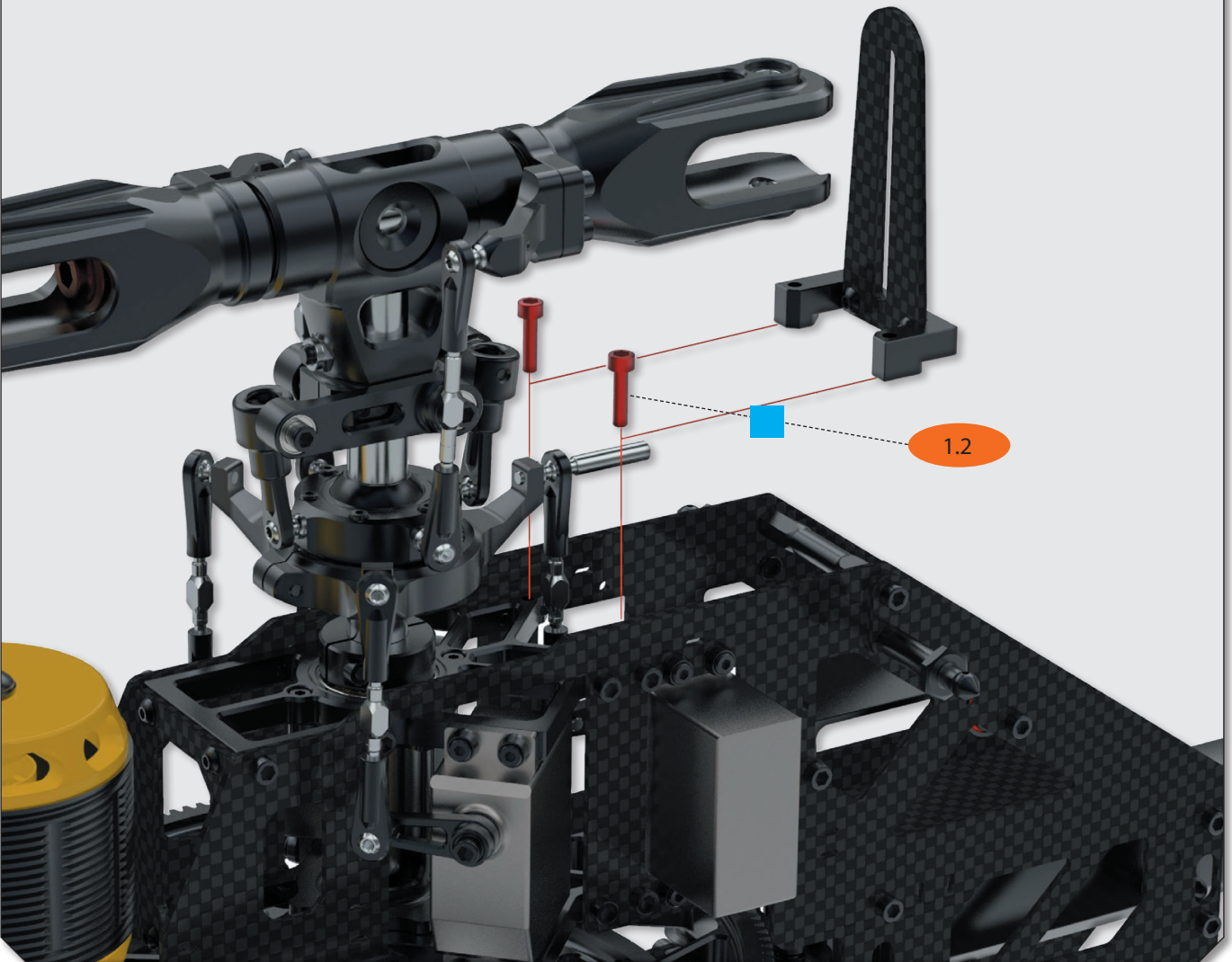
Sanding the edges on the guide makes assembly easier.

TR700-201 Anti rotation guide

1.7



1.2



## Tips

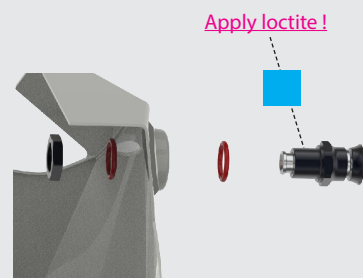
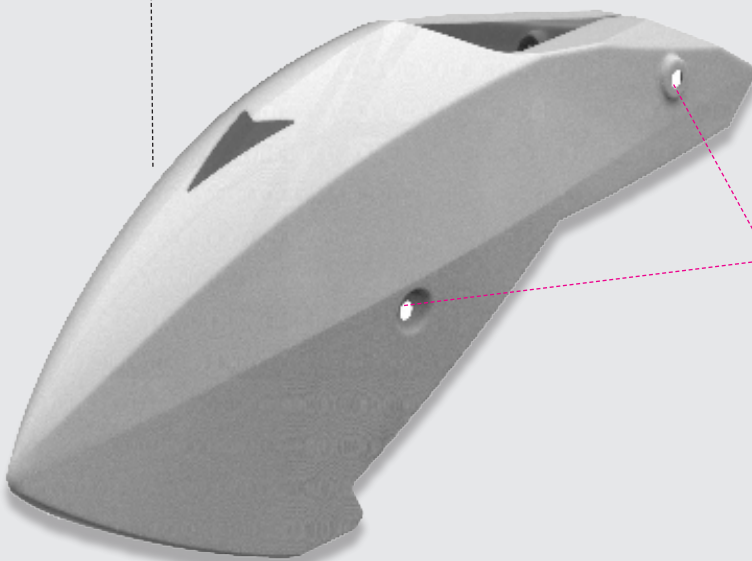
## Belt tensioner and canopy



1. Tension the tail belt as you normally would at room temperature
2. Tighten the 2 boom clamp screws.
3. Apply around 5-6 full turns on the set screw which will preload the spring now.
4. Enjoy flying, no matter it's cold or hot or whatever without of readjusting your tail belt tension. Let him do the work.:

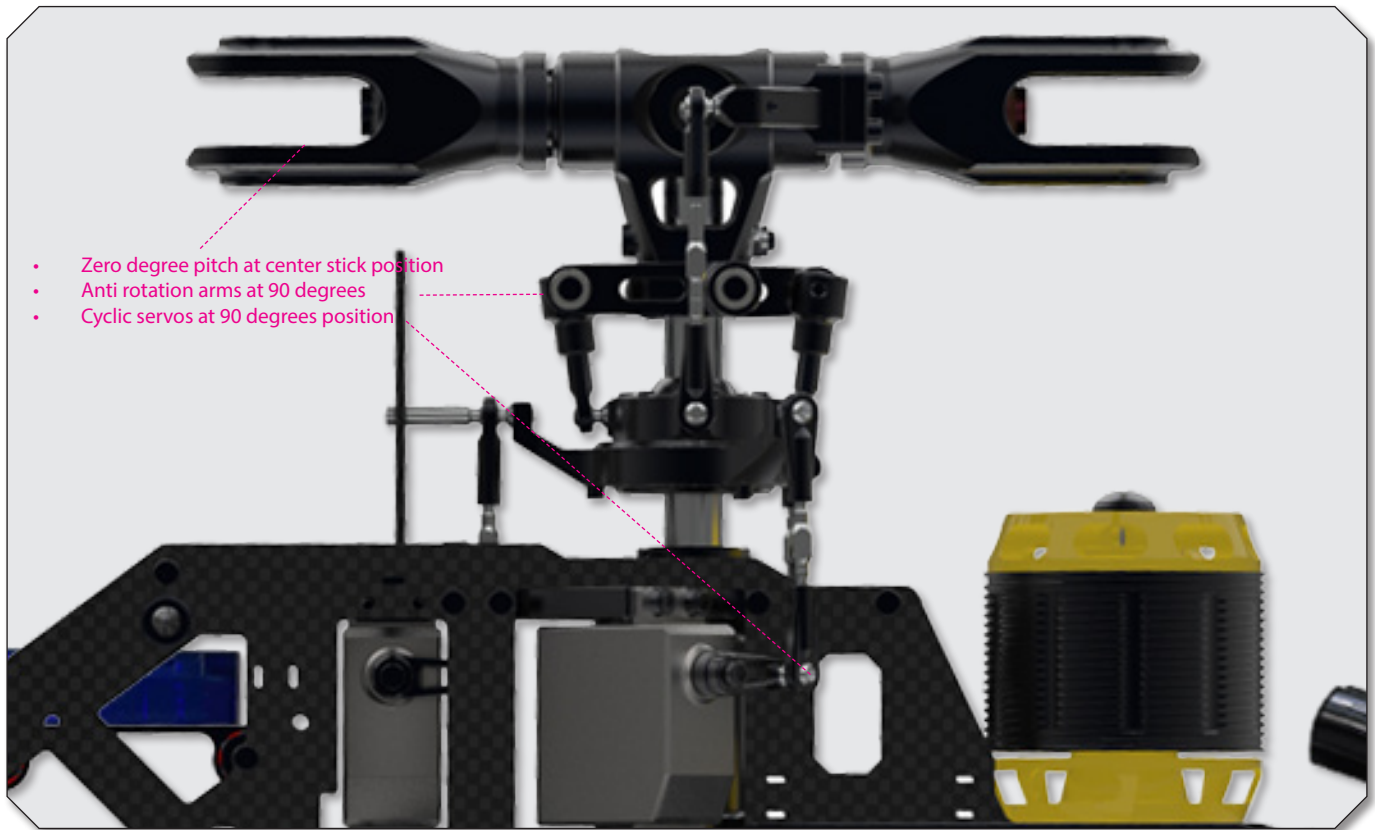
[Tron 7.0 ADVANCE canopy gray yellow TR702-159](#)

[Tron 7.0 ADVANCE canopy orange-white TR702-158](#)

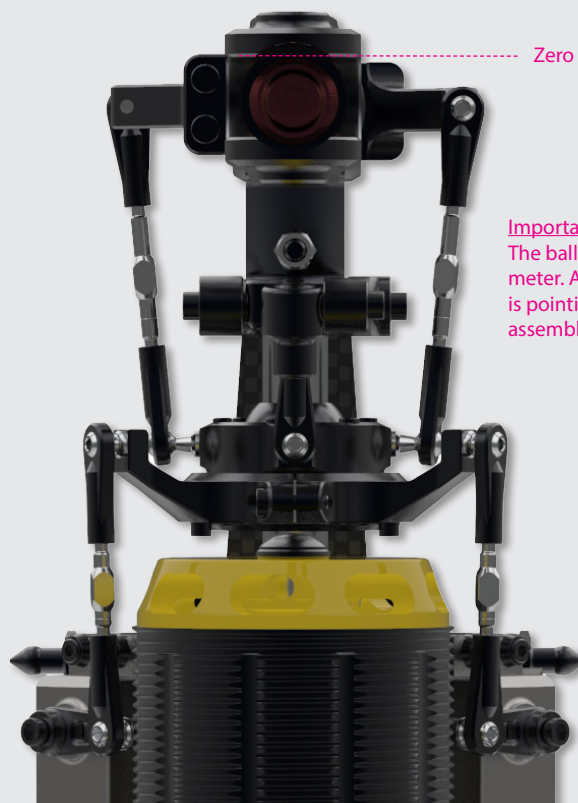


1. Enlarge the holes in the canopy slightly than the supersonic mounts will fit true.
2. Apply a tiny layer loctite as shown in the illustration.
3. Tighten them slightly.
4. Put the canopy on the helicopter so they can settle on the perfect position.
5. Carefully remove the canopy and re-tighten the nuts.

## Final setup and pre-flight check



1. Disconnect your Motor wires from the ESC!
2. FBL controller should be to set to the mode where you can level your servo center position and, or swashplate level mode.
3. Fine tune your servo center position as precise as you can by the position of the servo horns. For finetuning use Sub trims in the FBL software.
4. Adjust your linkage from the servos to the swashplate as shown in the illustration. (90 degree)
5. Adjust your swashplate to Blade grip linkage to achieve 0 pitch at center stick position.
6. Continue setup as required in your FBL controller software.



### Important note!

The ball links have a larger and a smaller diameter. Always make sure the larger diameter is pointing towards the pivot ball when assembling!

## Pre-flight check and gear ratios

### Recommended head speed.

1. Make sure your battery tray is securely locked. Use 4 battery straps.
2. Inspect your blades for possible damage and if they are slightly tighten.
3. Inspect your linkages if they all in place and not have been popped off during transport of your model.
4. Confirm that the FBL unit is correctly initialized.
5. Make sure your canopy is secured safely. (2 pins on backside are fine)
6. If you are a beginner, always seek advice by an experienced pilot, specially for your first flight.

Flying styles	Head speed
Beginner and sport flying.	1500-1900rpm.
Advanced sport, 3D flying.	1900-2200rpm.
Hardcore 3D flying.	2200-2400rpm.

### Main and tail rotor gear ratios.

INCLUDED IN KIT

Main gear	Pinion	Ratio	Tail drive	Tail	Ratio
151	15T	10.06	127T	23T	5.52
151	16T	9.43	127T	22T	5.77
151	17T	8.88			

Make sure to check your model on regular basis, do a preflight check every time you plan to fly your model. Max. head speed for main rotor head must not exceed 2600 RPM!

**IMPORTANT NOTE!**

DO NOT EXCEED 1600 HEAD SPEED ON MAIN ROTORHEAD WHEN USE 22T OR 23T TAIL PULLEY

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