NITRO

PERFORMANCE NITRO HELICOPTER

BERT KAMMERER EDITION

1.0.2

Index

Safety notice

Operate the helicopter in open areas with no people nearby.
Follow your country air regulation rules.
You may need to join a local club and become a member before flying the model.

Do NOT operate the helicopter in the following places and situations (or else you risk injury or death): 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 models. 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:vBefore flying the helicopter, ensure that all screws and bolts are tightened. A single loose screw may cause a major accident.

Replace all broken or defective parts with new ones, as damaged parts can 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 or muffler 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.

A message from Bert Kammerer:

I want to personally thank you for purchasing the Bert Kammerer edition Nitron 90 from Tron. The founders and owners of Tron have found the perfect formula for performance, style and function and I am delighted to have teamed up with them to improve an already incredible product. I am sure you will enjoy your kit as much as I have.

About Bert Kammerer:

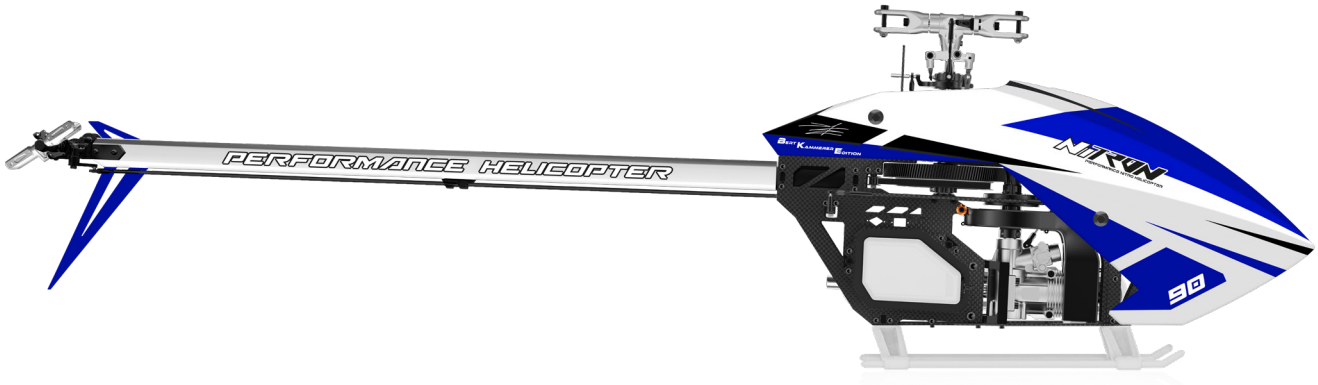
Bert Kammerer is a well renowned RC helicopter pilot. Known for his groundbreaking contributions and expertise in piloting, designing and testing RC helicopters, he has collaborated with top industry companies to push the boundaries of innovation.

Bert is one of a few select pilots who have assisted manufacturers to reach new heights of capability and popularity among both hobbyists and professionals. He has been featured on international TV shows, including Discovery Networks among others.

With his impressive track record, Tronhelicopters teamed up with Bert Kammerer to elevate the already amazing Nitron 90 to new heights.

The result?
Pure brilliance!

Experience the next level of RC helicopter design and performance!



Features

- New white/blue color scheme (painted boom and tail fin)
- Clear anodized aluminum head & tail rotors
- Switch cut-out built into the frame
- New innovative clutch design
- New aluminum motor fan (as light as plastic fan)
- Tail idler pulley for increased tail performance
- New “wear free” tail push rod design
- Micro servo adapter for throttle servo
- Supersonic mounts all around
- Maingear 137 T /MOD 09
- Engine pinion 17T
- Tail maindrive pulley 101T
- Tail pulley 20T /19T (20T stock)
- Tail gear ratio (5.05 stock)
- Max main blade lenght = 705mm / 105mm tail
- Heavy duty one way bearing and hub design
- Octa boom design with oval side shapes, no boom supports needed

PERFORMANCE NITRO HELICOPTER

About Tron Helicopters

Ricky has been known in the RC helicopter industry for many years, with experience in the development and production of model helicopters. His journey dates back to the early days of Synergy Helicopters, a company he took over in 2010 following the passing of Stephen Fan.

Dario is a well-respected name in the RC helicopter community, with a long and accomplished career working with some of the most recognized brands in the industry. His contributions include the development and testing of iconic products such as the MSH Protos helicopter series and the renowned MSH Brain FBL unit. Dario also served as a long-time factory pilot and R&D contributor for SpinBlades. In 2017, Dario shifted gears to compete in FPV racing, where he excelled and earned the title of official FPV-FAI World Champion.

Joachim has earned a stellar reputation for his knack for turning visionary product ideas into market successes. With a strong foundation in innovative product design and business strategy, he's worked alongside leading manufacturers to bring bold concepts to life. As the visionary founder and driving force behind Xnova Motors, Joachim was instrumental in shaping the brand's identity and fueling its growth from the very beginning.

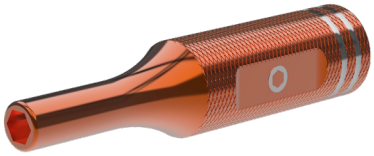
CAUTION:
This radio controlled helicopter is not a toy.
The product is not suitable for children under 14 years of age.

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

You are responsible for the assembly, 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
	2* 5.5mm Wrenches for tail shaft nut
	Hex drivers 1.5mm/2mm/2.5mm/3mm/4mm/5mm
	TR501-518 Pair of customized nut wrench for tail shaft assembly. Optionally available at your Dealer.
	Sprag Grease (Isoflex LDS18 Special A)
	Adjustable Wrench
	Canopy Reamer (optional)

Electronics required

	3 mini, full size or low profile servos for the swash plate
	1 full size or low profile servo for the tail and 1 micro, mini or full size servo for the throttle
	90/105 class engine with muffler
	2S lipo or regulator, switch (optional), glow igniter, plug and starter
	FBL Unit, such as Brain/iKon, Mikado Neo/Evo, Futaba, Spirit, BeastX, Spektrum or Nexus/RF FBL

Information on equipment

Pre-assembled parts streamline the packing process with less waste and facilitate a quicker build.

This approach ensures assembling the helicopter is fast and straightforward. Additionally, it guarantees a high standard of quality control, ensuring all components fit precisely without any unexpected issues or missing parts.

The provided drawings serve as references for part identification and clarification. Screws requiring checking or loctiting are clearly labeled in the manual. Only remove these designated screws, apply Loctite 243 as instructed, and securely tighten them back into place.

Main blade recommendation for NiTron 90 (690mm-705mm length).

Tail blade recommendation for NiTron 90 (105mm-115mm length).

You will need:
Loctite 243 = blue

Head assembly

The center hub assembly has been pre-assembled at the factory.

Disassembly is not required if you use FIGURE 1 = medium as the default dampening configuration!

This makes building the helicopter quick and easy. You also benefit from a high level of quality control, ensuring that all parts fit together correctly, with no unpleasant surprises or missing parts.

The following drawings are for reference and parts clarification. We have clearly identified screws that still need to be checked and/or loctited. Only remove screws labeled in the manual, apply Loctite 243, and screw them back in.

FIGURE 1 / MEDIUM
Stock configuration

TR584-870 Head dampeners 70 shore green, for Sport and moderate 3D flying. (standard in kit).

If you prefer to use FIGURE 2, please exchange the green O-rings (70 shore) with the black O-rings (90 shore), which are also included in the kit.

FIGURE 2 / HARD
For hard 3D flying

TR584-890 Head dampeners 90 shore (black) for high rpm and hard 3D flying style. (optional)

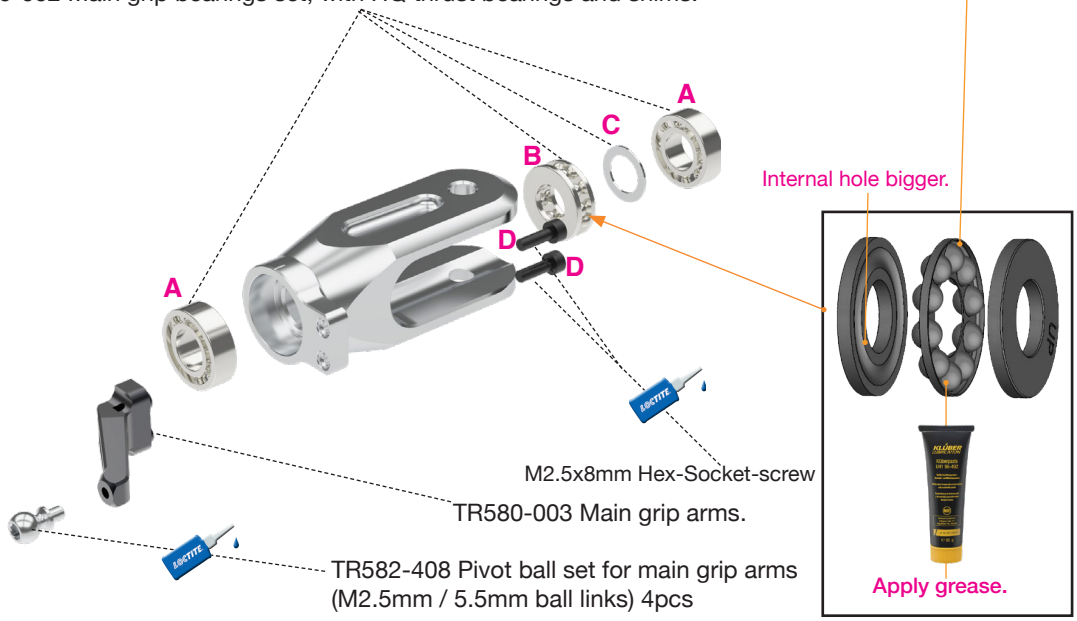
You will need:
Loctite 243 = blue

Head assembly

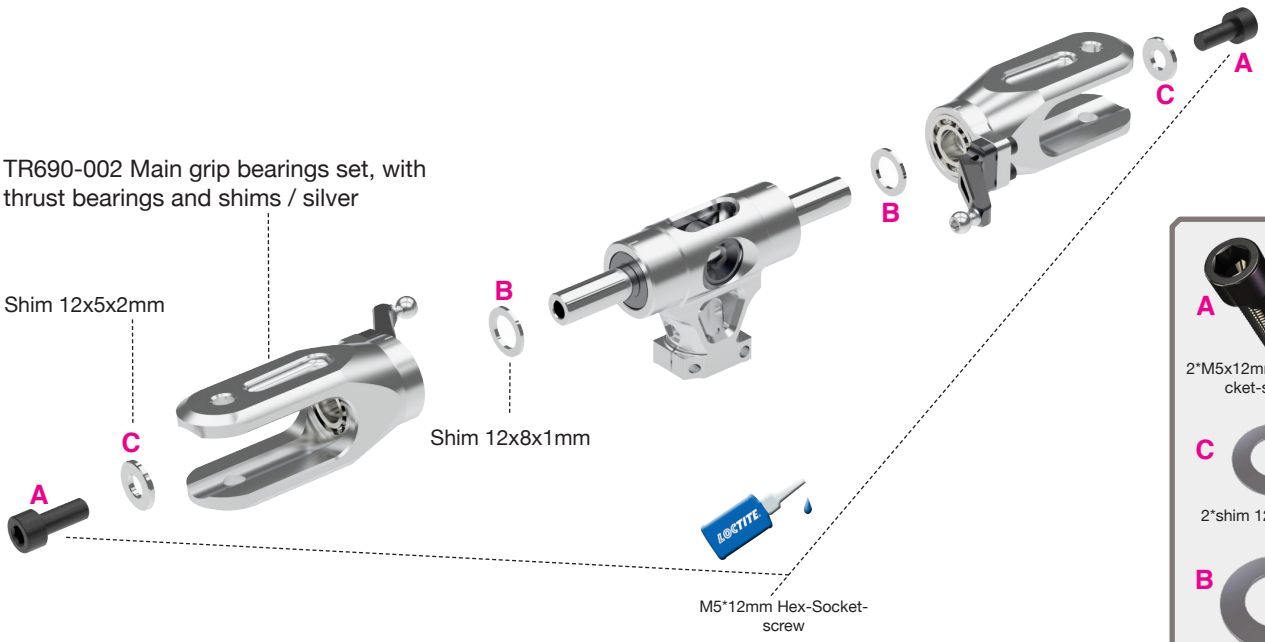
1. Remove the bearings to apply grease to the thrust bearings.
2. Reassemble them in the order shown in the render below.
3. Assemble the main grip arms and apply Loctite 243 to screws labeled as **D**.
4. Assemble the pivot balls and apply Loctite 243.

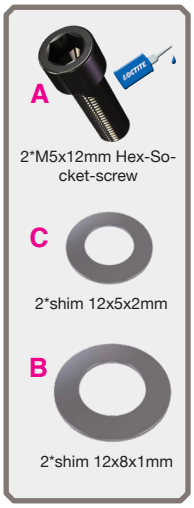
The blade grip have been pre-assembled at the factory. Disassembly is required to apply grease to the thrust bearings.

TR 680-002 Main grip bearings set, with HQ thrust bearings and shims.



TR690-002 Main grip bearings set, with thrust bearings and shims / silver

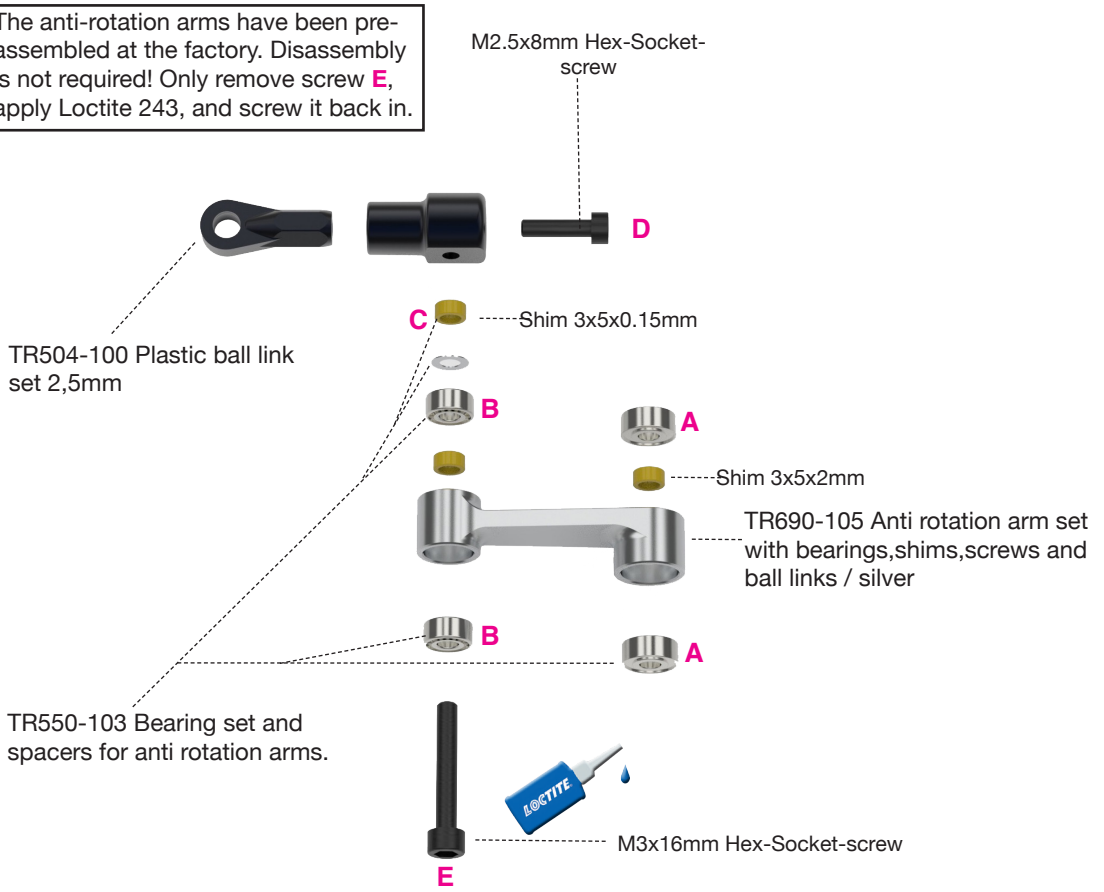


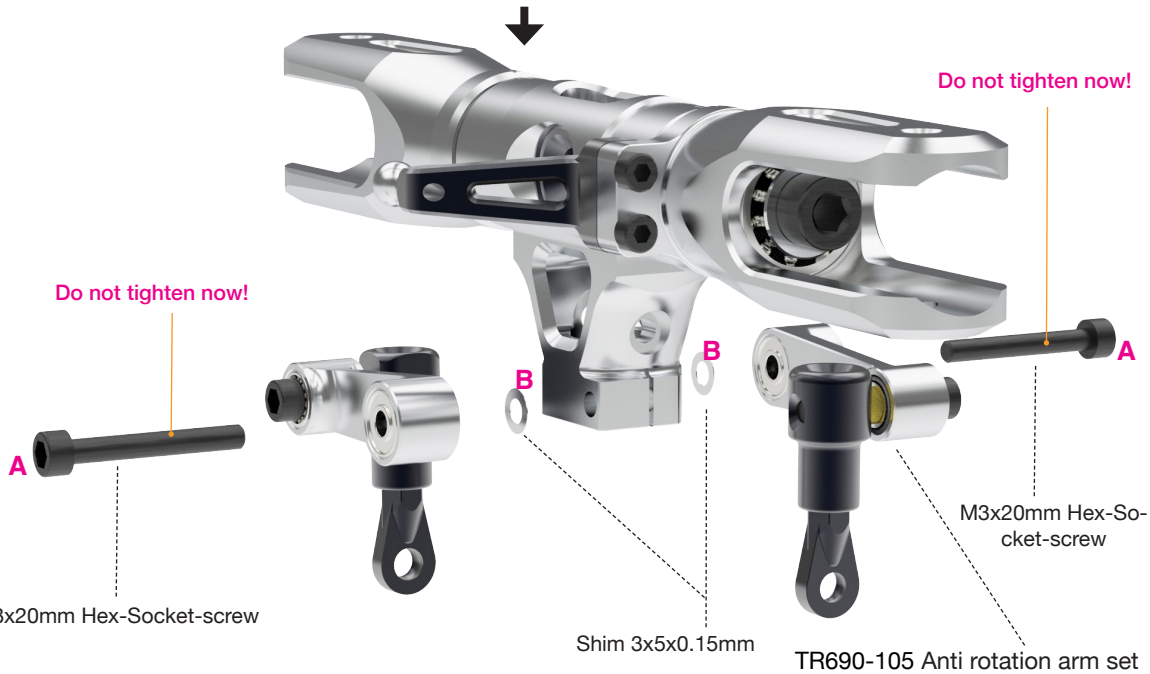


You will need:
Loctite 243 = blue

Head assembly

The anti-rotation arms have been pre-assembled at the factory. Disassembly is not required! Only remove screw **E**, apply Loctite 243, and screw it back in.



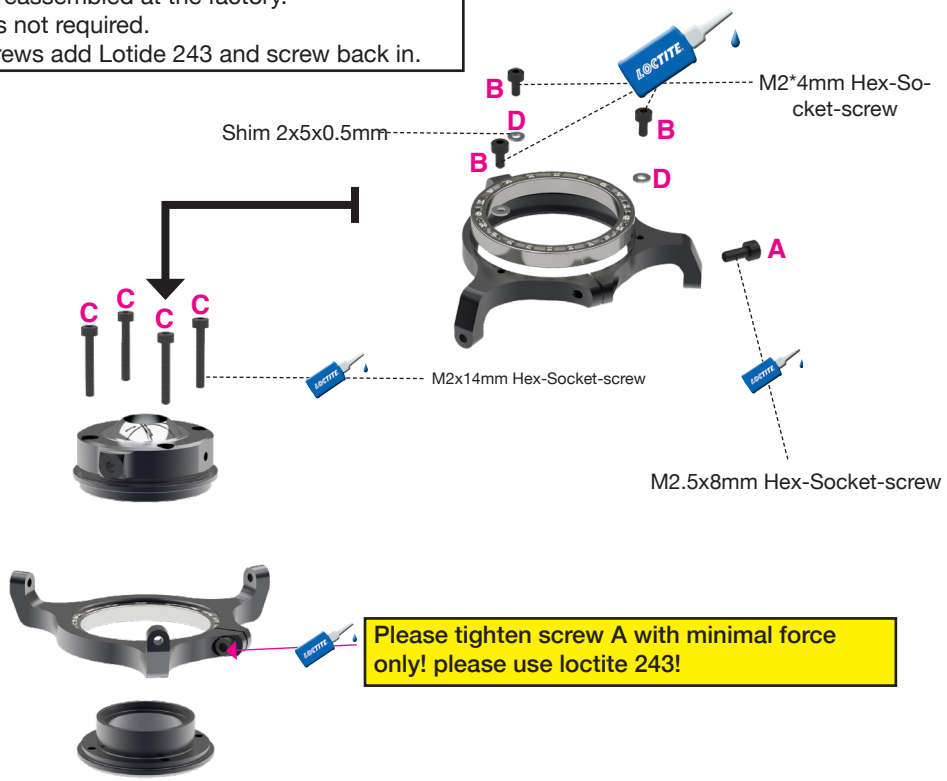


Important note!
Do not tighten the M3*20mm screws here. Apply Loctite 243 and tighten them after assembling the main shaft to the center hub.

You will need:
Loctite 243 = blue

Head assembly

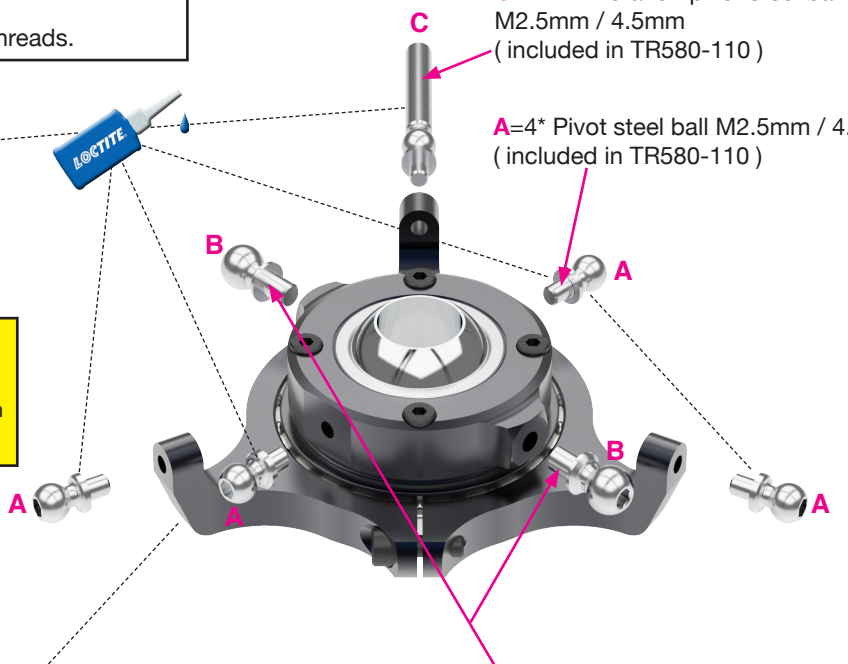
Swashplate is preassembled at the factory.
Disassembling is not required.
Only remove screws add Lotide 243 and screw back in.



Swashplate is preassembled at the factory.
Disassembling is not required.
Please use loctite 243 on all pivot ball threads.

TR580-110 Pivot steel ball set for head. (16pcs.)

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

Head assembly

1. Insert main shaft into center hub first.
2. Tighten screw **B to lock nut D.**
3. Tighten the screws **A =M3x20mm** which are shown on page 13 left and right step by step (use loctite 248).Make sure the shim A do not fall out.

TR502-230 Linkage rod set. Contains 3* rod for linkage of swashplate servo or swasplate to main grip. (Rod for servos to swashplate and swashplate to grip arms are identical)

TR704-100 Plastic ball link

M3x20mm Hex-Socket-screw

Groove indicates CCW thread!

1* Lock nut M3

D

TR704-100 Plastic ball link

A

B

(20mm)

2* Linkage rod, swashplate to main grip.

CW thread!

TR504-100 Plastic ball link set 2,5mm

E

12mm

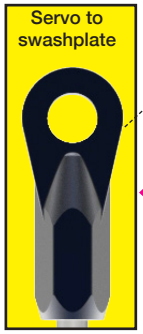
Kepp shim E in a save place! You will need it at page 44

C

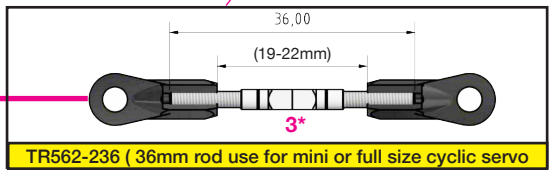
C

TR682-104 Hollow main shaft

Do not tighten yet!
Keep gap equal!
2*M3x12mm Hex-Socket-screw



TR504-100 Plastic ball link set 2,5mm



TR562-236 (36mm rod use for mini or full size cyclic servo

Note:
The linkage distance between the servo and swashplate (19mm-22mm) may vary depending on the servo manufacturer and the positioning of the spline.

Additionally, using either a mini or full-size servo will affect this measurement. As a general guideline, use the length of the swashplate to main grip (20mm) as a reference, and adjust accordingly once the assembly is complete.

E 1* Shim 1x10x0.3mm

A 1*M3x20mm Hex-Socket-screw

B 2*M3x12mm Hex-Socket-screw

D 1* Lock nut M3

You will need:
Loctite 243 = blue

Tail assembly

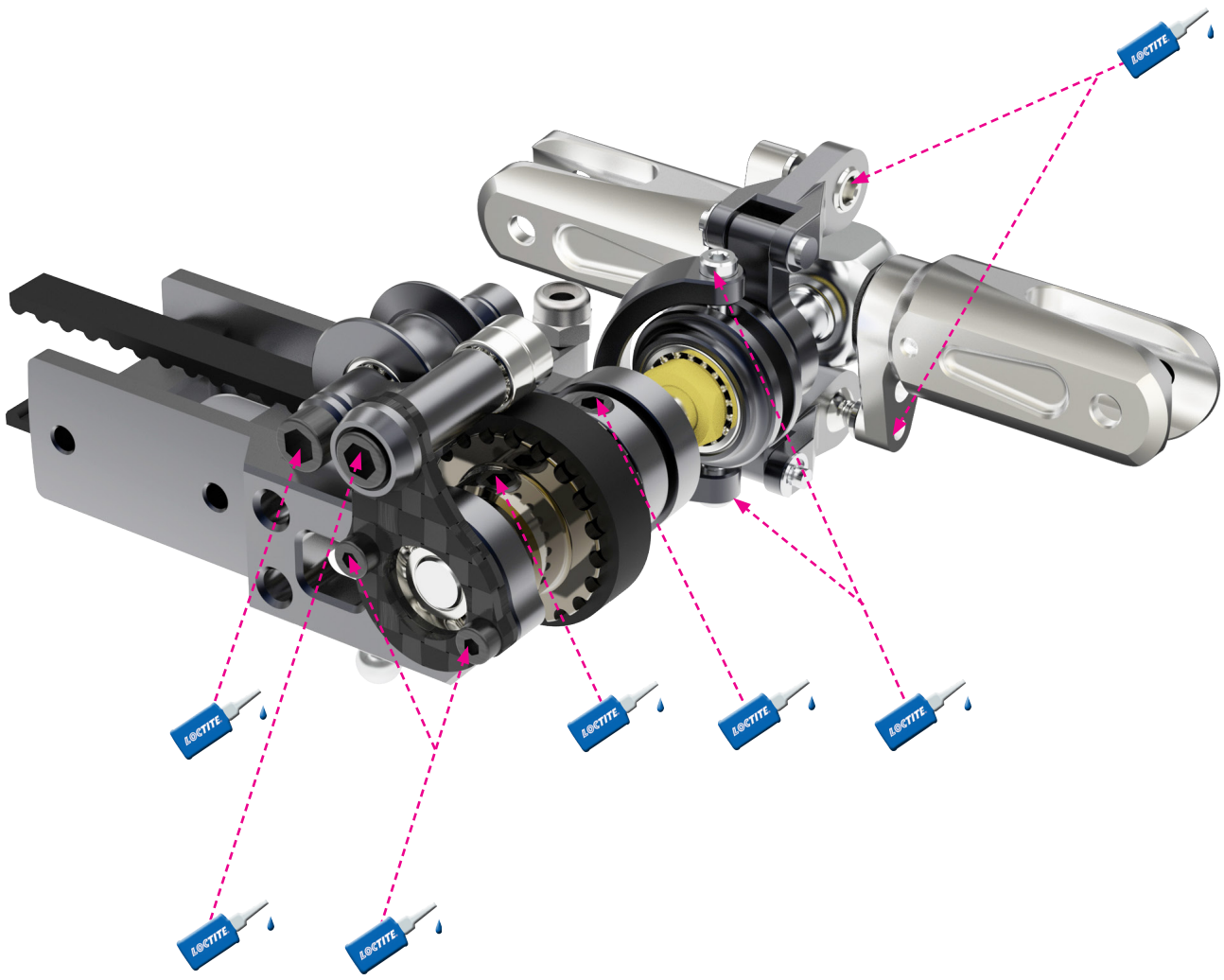
The tail housing assembly have been pre-assembled at the factory.

Removal of all screws to add thread lock is necessary!

This makes the helicopter build very quick and easy. You also benefit from a high level of quality control as we ensure all parts fit together correctly, eliminating unpleasant surprises and missing parts.

The tail thrust bearings have been greased by the factory! If you are building a new kit, it is not necessary to remove the tail blade holders to add grease to the thrust bearings!

Pay attention to the two M2.5x8mm (A) screws that hold the tail pitch arm support, as shown on page 17. These screws need to be loctited as well!



=Remove screw, add locktite and screw it back in

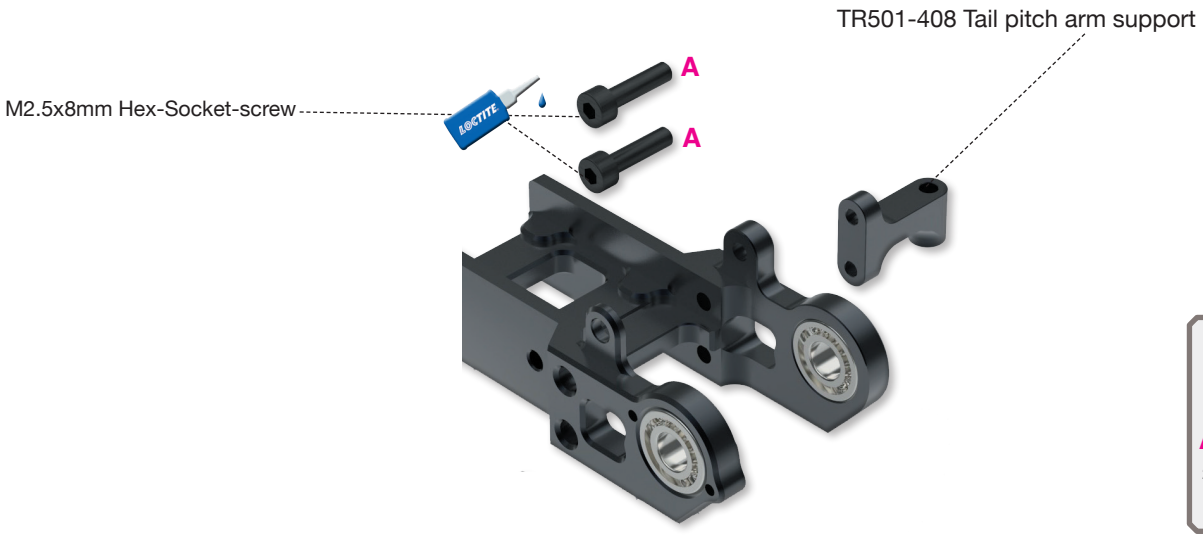
You will need:
Loctite 243 = blue

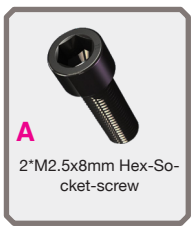
Tail assembly

1. The following drawings showing the tail drive housing are for reverence and parts clarification.
2. **Keep in mind that when purchasing spare parts separately, you should add Loctite where specified!**


2*Radial Bearing 5x11x4mm

The tail case bearings ar assembled at the factory. Disassembly is not required.

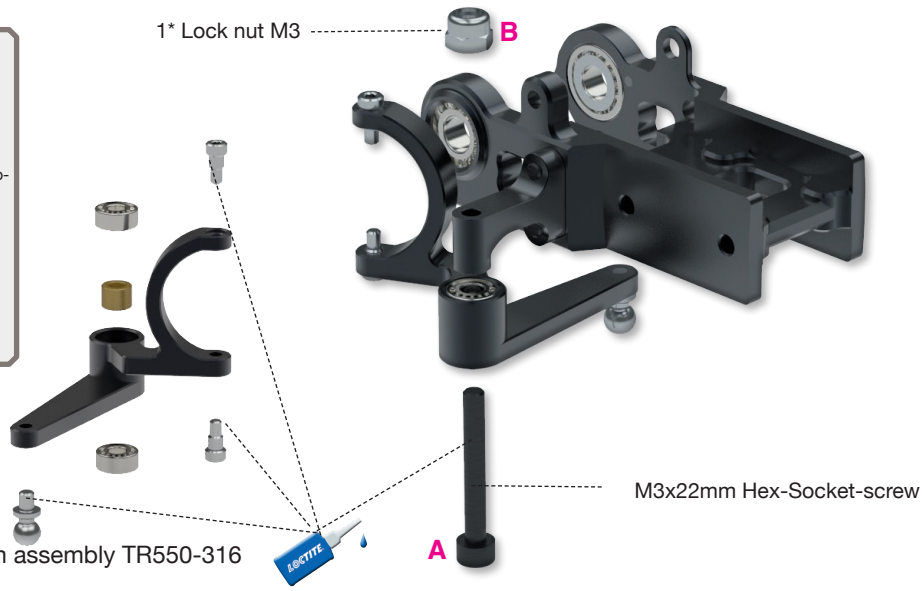


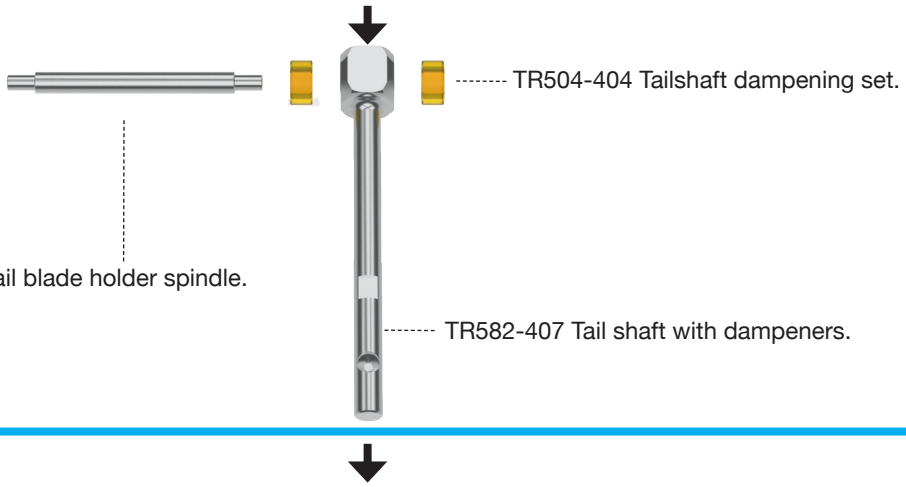

A
2*M2.5x8mm Hex-Socket-screw

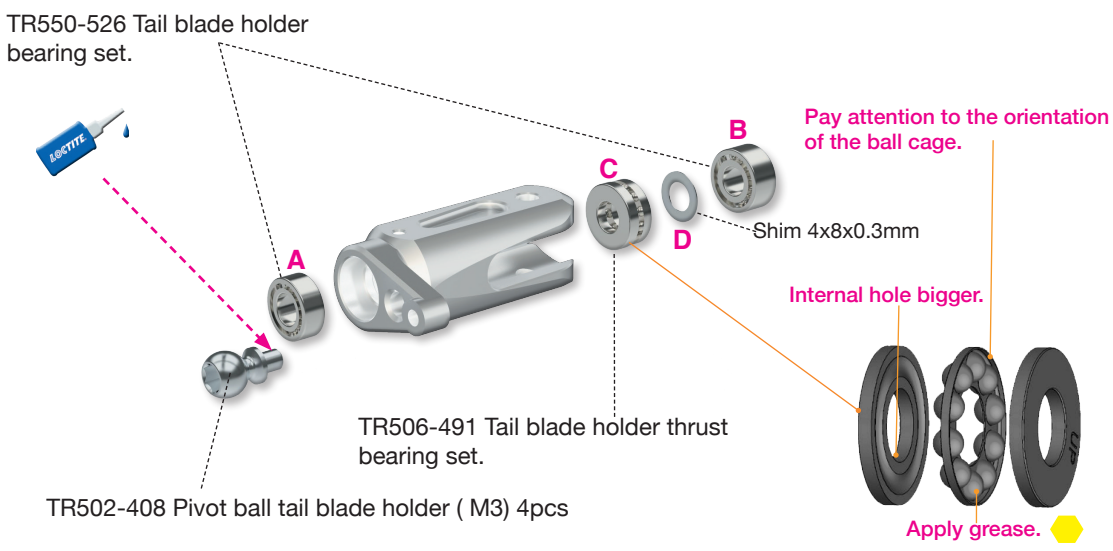
Keep in mind that when purchasing spare parts separately, you should add Loctite where specified!

You will need:
Loctite 243 = blue

Tail assembly

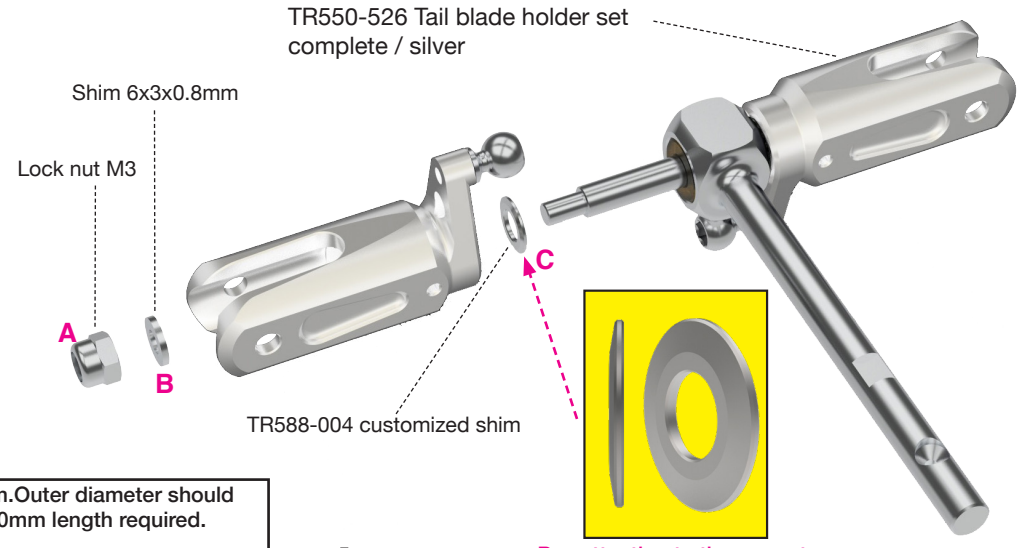






You will need:
Loctite 243 = blue

Tail assembly



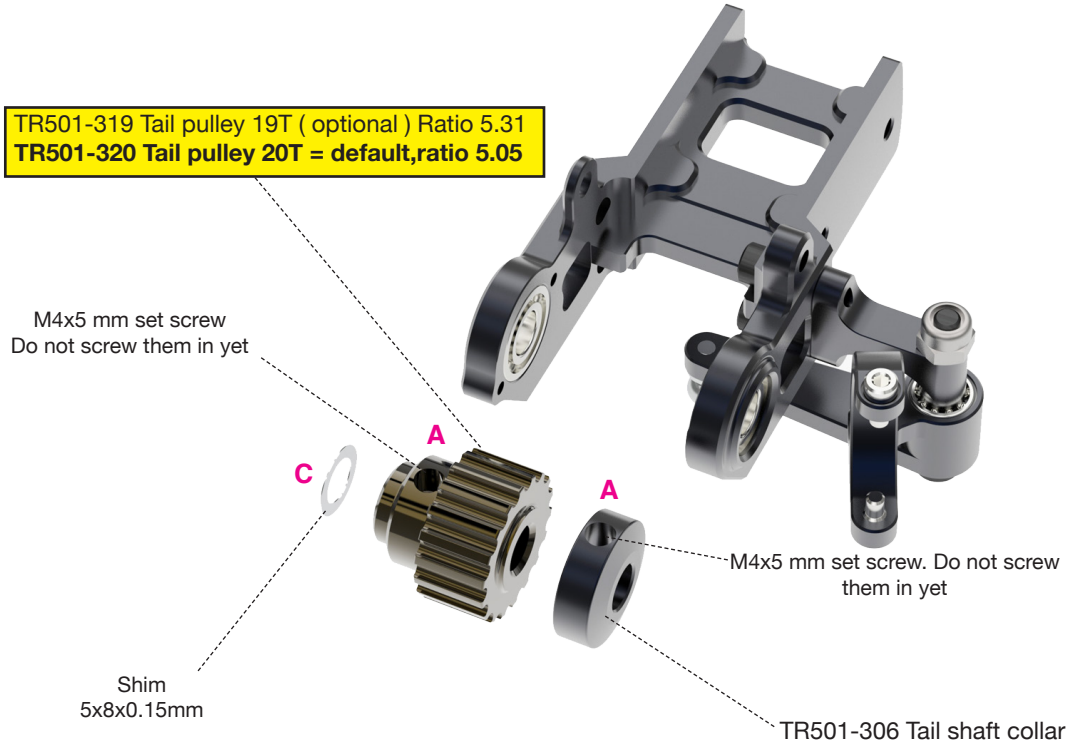
Wrench size for nut B = 5.5mm.Outer diameter should not exceed 9.2mm and min. 20mm length required. Optional (TR:501518)

Pay attention to the correct orentation of the shim!

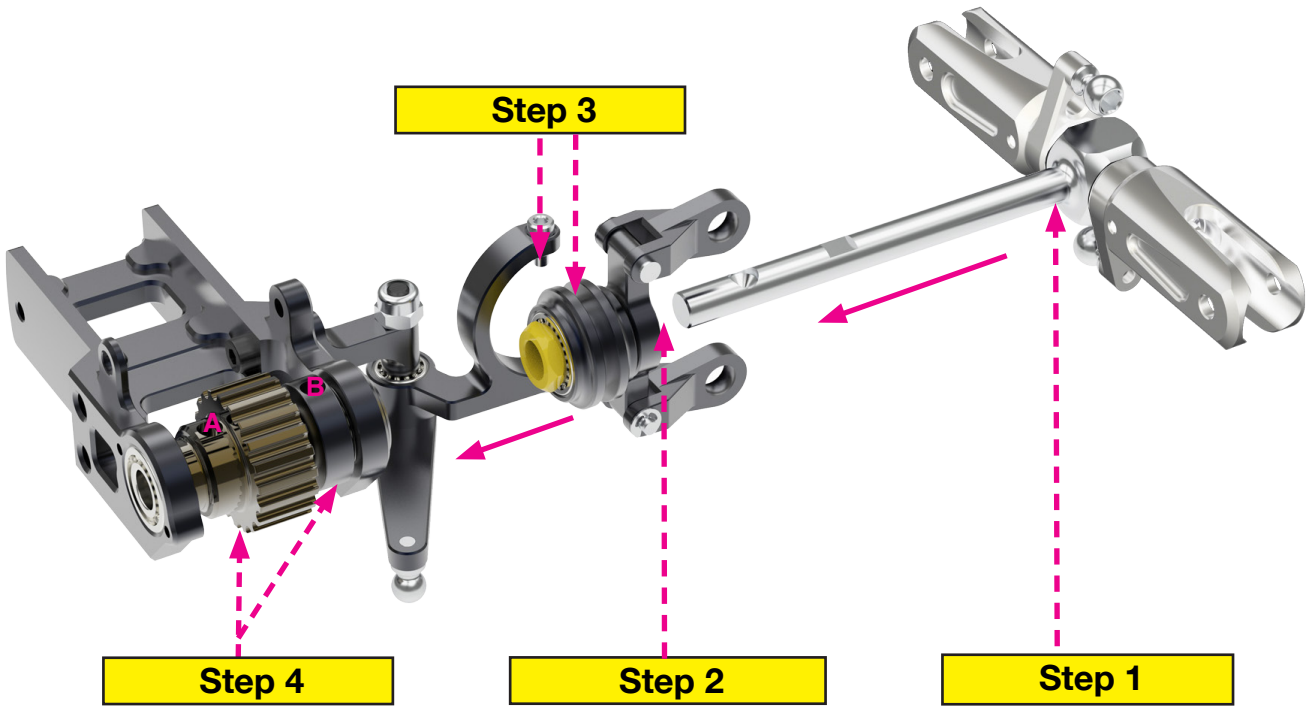
The tail pitch slider is assembled at the factory. Disassembly is not required.

You will need:
Loctite 243 = blue

Tail assembly



1. Insert the tail shaft **(step 1)** into the tail pitch slider **(step 2).** Ensure the pulley aligns with the pitch pins **(step 3)** then slide the tail shaft into the tail housing bearings, tail shaft collar, tail pulley, and the shim (12x8x0.5 / C) **Step 4.**
2. Align the flat spot on the tail shaft with the set screws.
3. Slightly tighten the 2 set screws (A-B) on the pinion and collar. **DO NOT APPLY LOCTITE TO THEM IN THIS STEP. REFER TO PAGE 22!**



You will need:
Loctite 243 = blue

Tail assembly

1. Attach the tail slider pitch links to the tail blade grip pivot balls. Refer to the render below for the correct order.
2. Assemble the carbon tail idler plate **(Figure 1).**
3. Add tail belt.


TR687-316 Tail grip screws / 4pcs

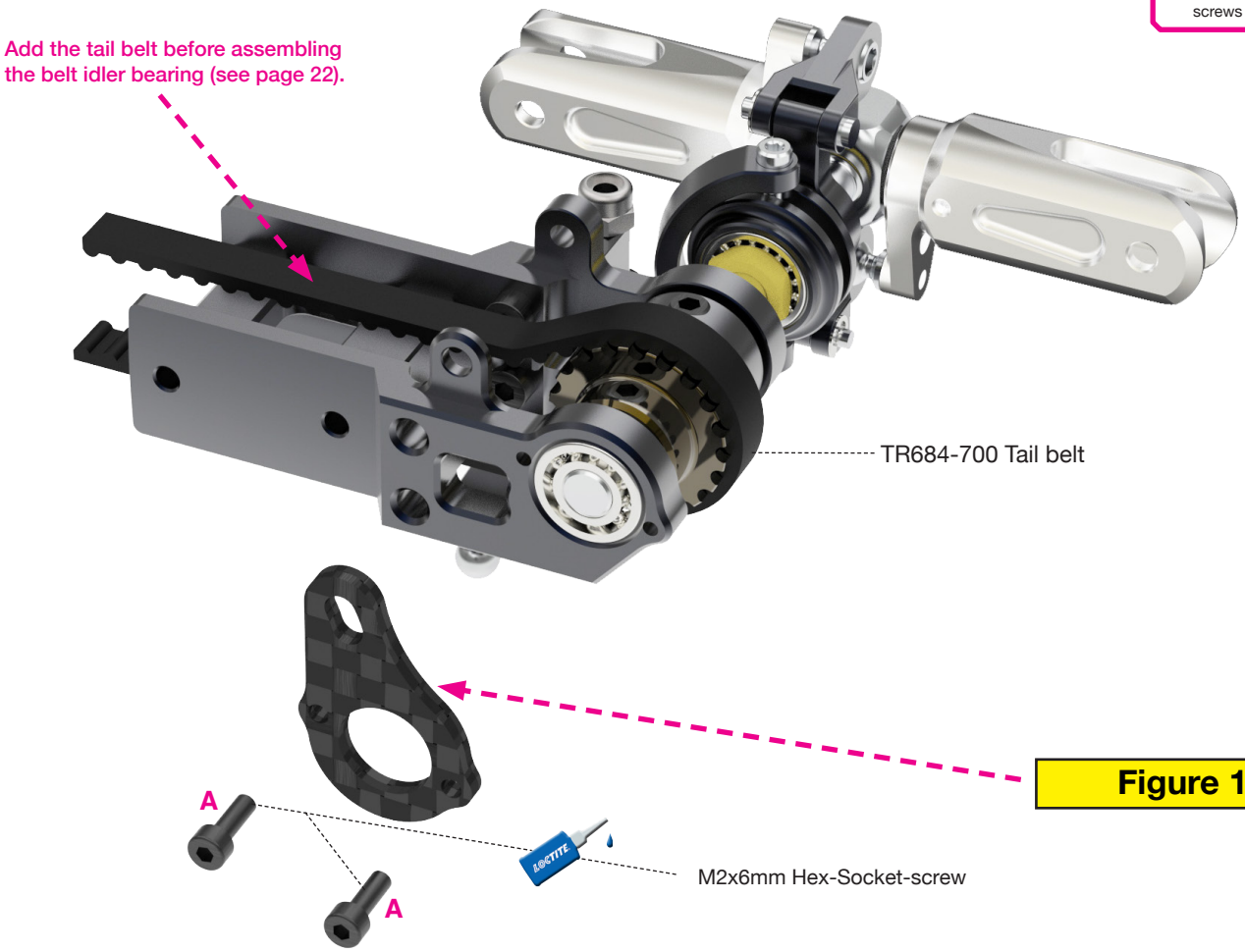


Figure 1

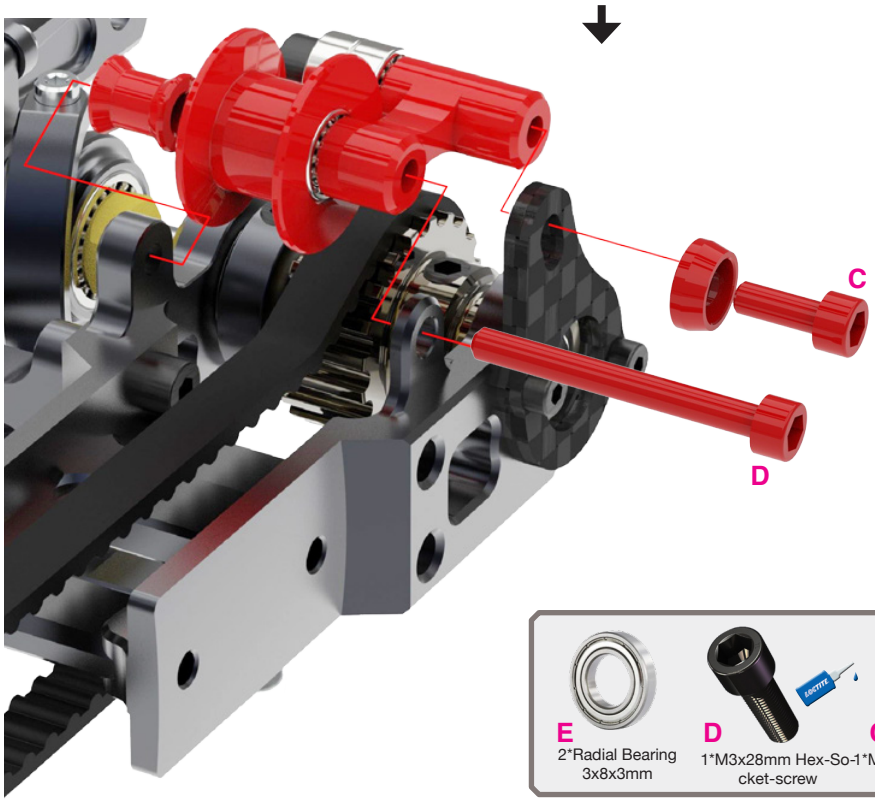
TR550-407 Mounting brackets Belt pusher / complete assembly

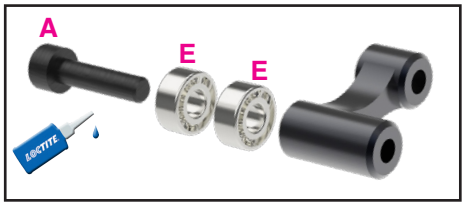
This tail performance upgrade can be used for Tron 5.5 V1 / Nitron 50 and 90 / Tron 5.8 and Tron 7.0 DNAMIC

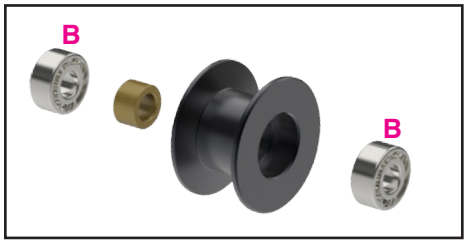
2*M2x6mm Hex-Socket-screw

You will need:
Loctite 243 = blue

Tail assembly

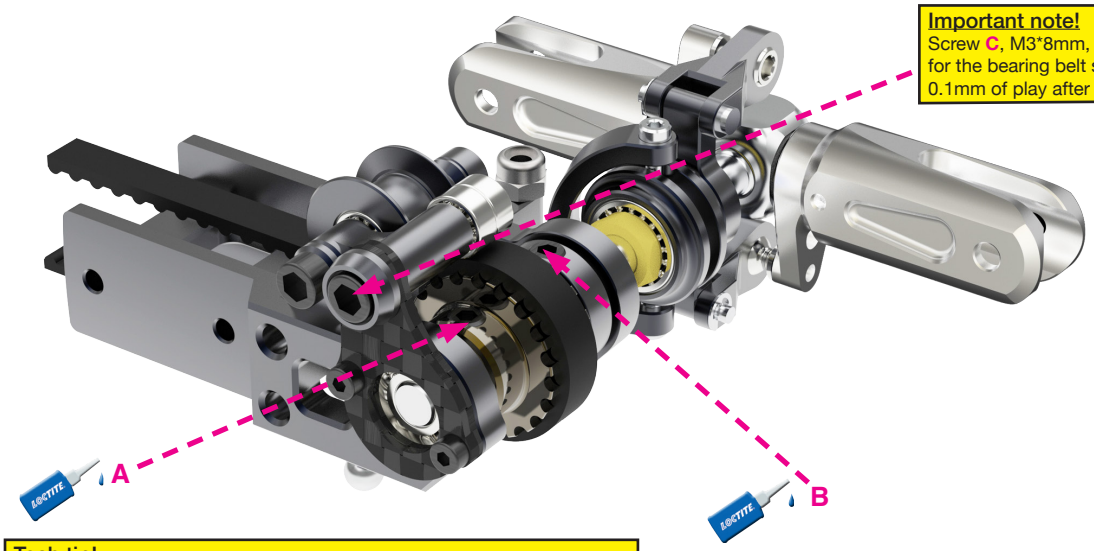






The collar design is to remove tail shaft lateral play.

1. After tighten the pulley set screw **A** ,slightly push the collar to the right while pushing the tail shaft to the left side.
2. Then tighten the set screw **B** on the collar.



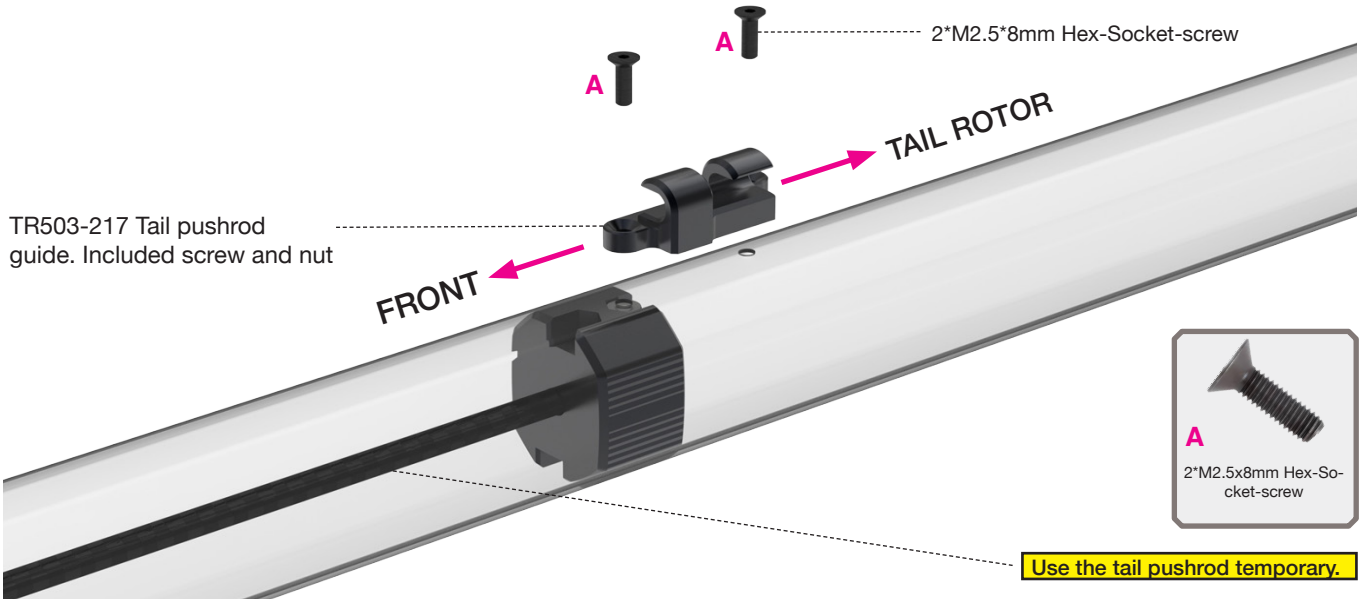
Important note!
Screw **C**, M3*8mm, can be used to adjust the play for the bearing belt space. Leave approximately 0.1mm of play after the belt is under tension.

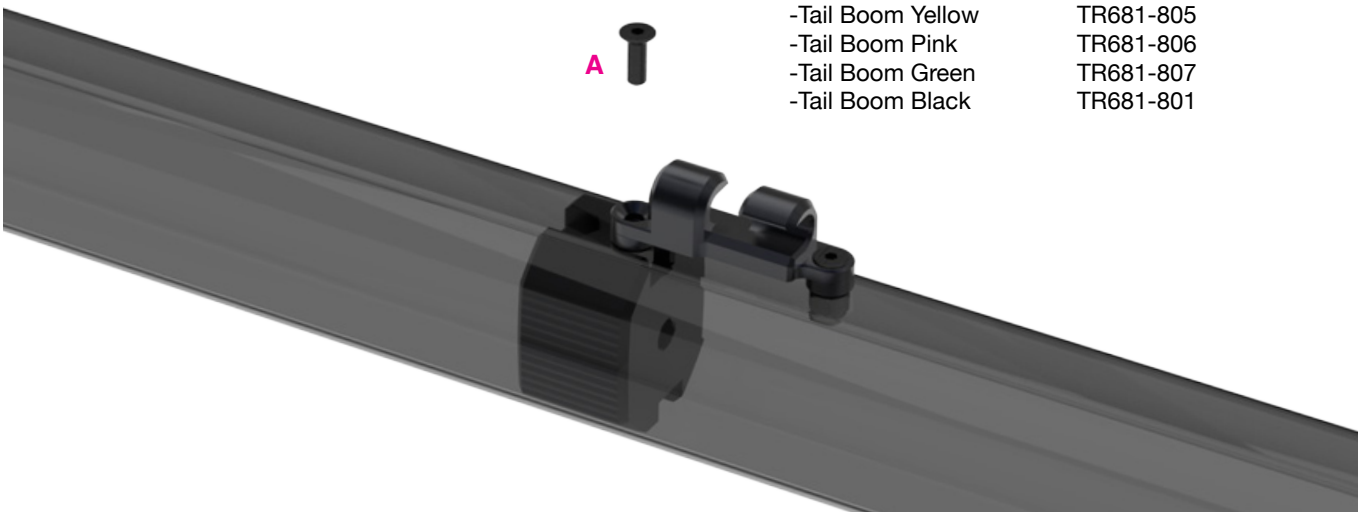
Tech tip!
Pay attention to the orientation of the flat spots on the tail shaft when tightening the set screws. Use a minimal amount of Loctite 243 for the set screws.

Boom assembly

TR504-501 New tail pushrod assembly tool for T5.5/5.8/Nitron

Insert the tail push rod with the nuts facing up into the boom. Ensure that when you tighten the screws for the tail push rod guide, your mounting device faces up as shown in the illustration.



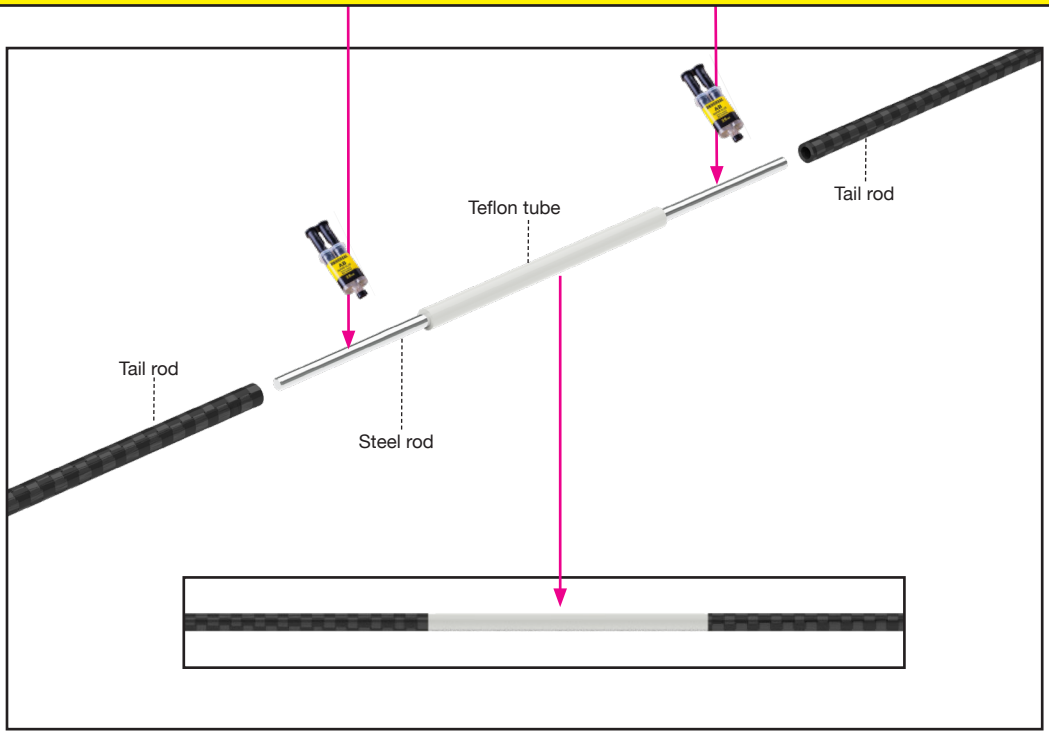


-Tail Boom white	**TR690-801/ stock**
-Tail Boom Yellow	TR681-805
-Tail Boom Pink	TR681-806
-Tail Boom Green	TR681-807
-Tail Boom Black	TR681-801

You will need:
2 component epoxy

Teflon tail rod assembly

Bond the steel rod to the Teflon tube and secure it to the two tail rod pieces using epoxy adhesive.

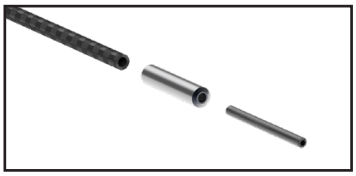


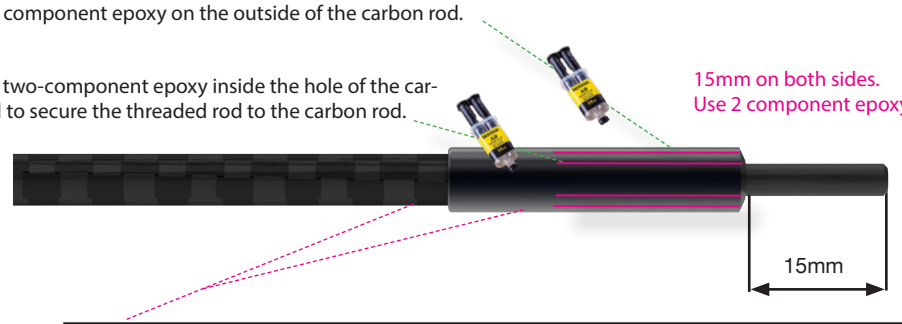
Apply a two-component epoxy to glue the thread into the tail push rod and the shell on the outside of the rod. This double safety measure ensures that the thread cannot turn if you adjust the ball-link after the assembly has fully hardened.

Apply 2 component epoxy on the outside of the carbon rod.

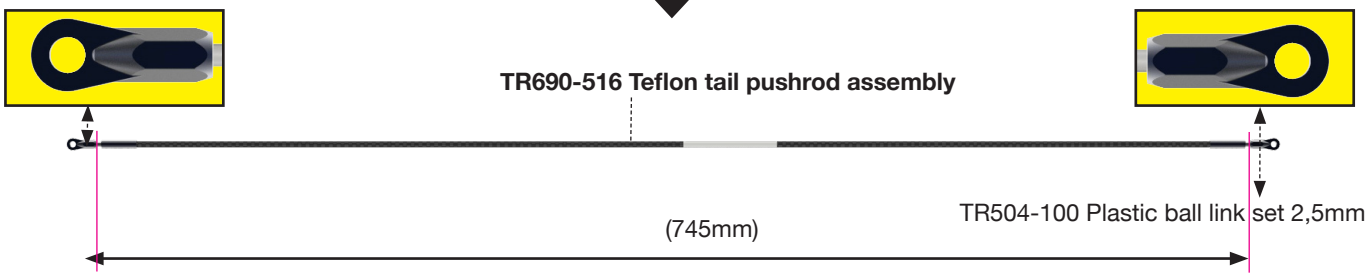
Apply a two-component epoxy inside the hole of the carbon rod to secure the threaded rod to the carbon rod.

15mm on both sides.
Use 2 component epoxy!





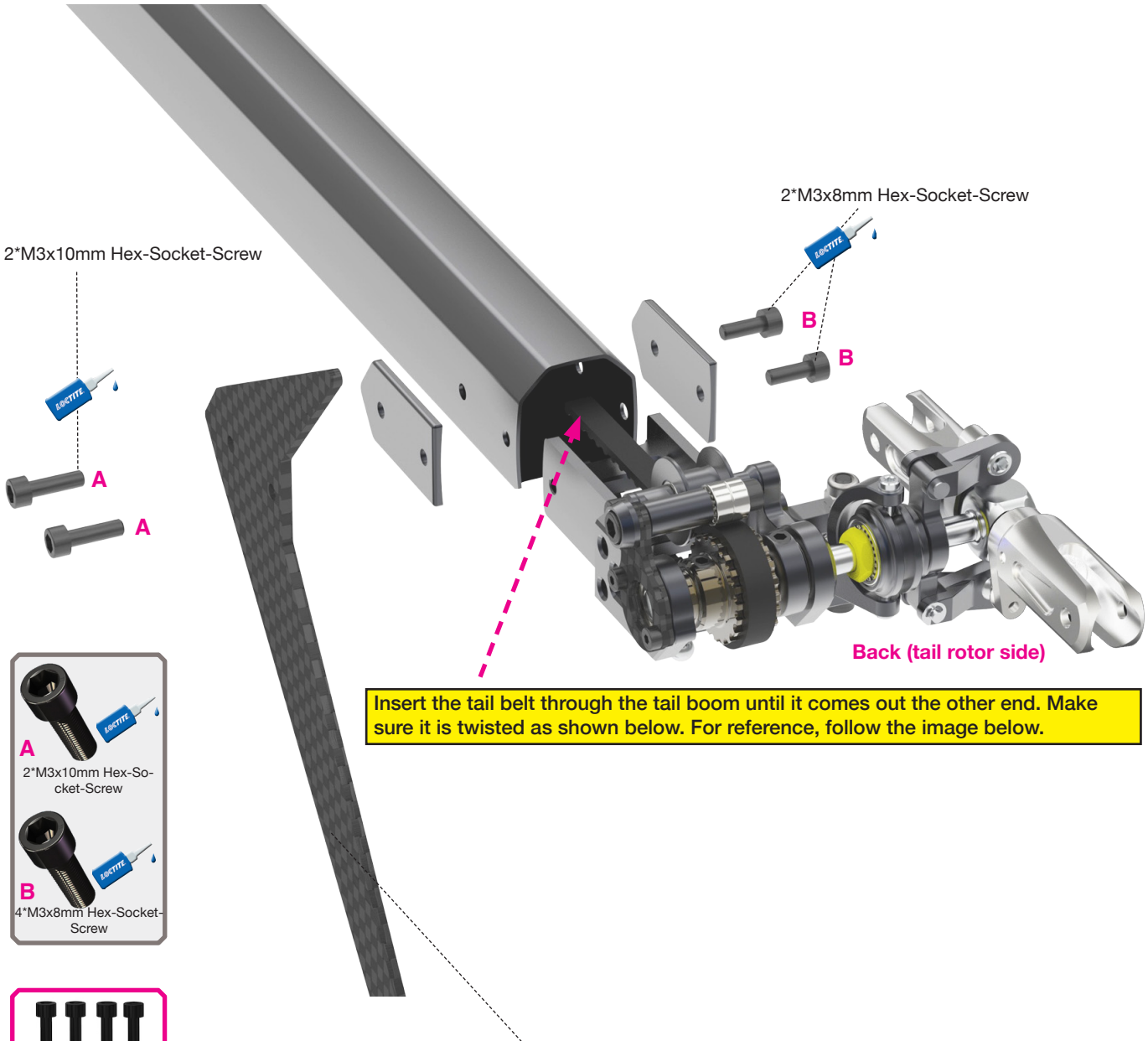
Ensure that the assembly remains stationary while drying. Secure it on both sides to prevent any movement.



You will need:
Loctite 243 = blue

Tail box to tail boom assembly

Front (main frame side)



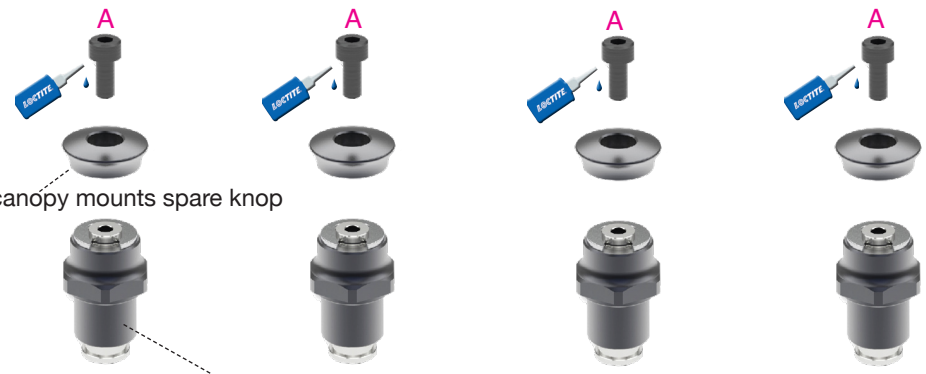
Insert the tail belt through the tail boom until it comes out the other end. Make sure it is twisted as shown below. For reference, follow the image below.

-Tail Fin blue **TR695-409 / stock**
-Tail Fin Yellow
-Tail Fin Pink
-Tail Fin Green

You will need:
Loctite 243 = blue

Supersonic mounts

Apply loctite to M2.5X6mm screw !

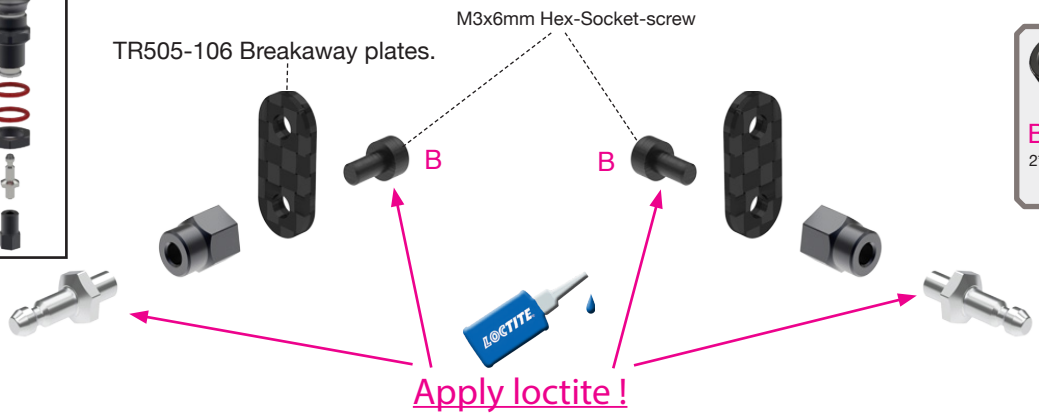


TR701-180 Supersonic canopy mounts spare knop

TR694-245 Supersonic canopy mounts (4pcs)

TR704-246 Rear canopy mounts

Rear canopy mounts

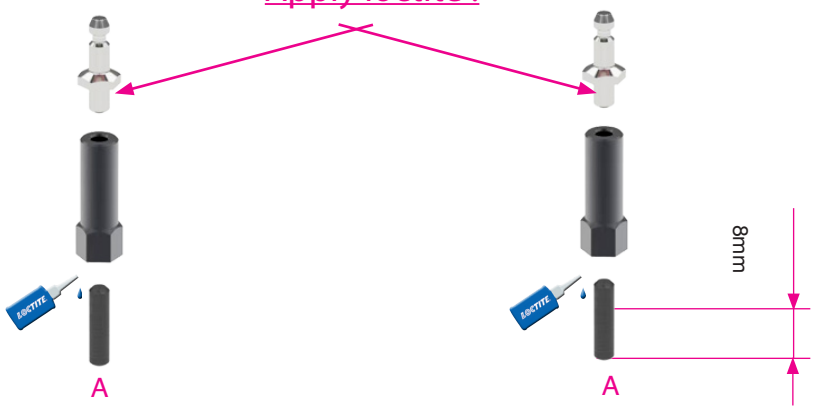


Apply loctite !

TR704-246 Rear canopy mounts

Front canopy mounts

Apply loctite !

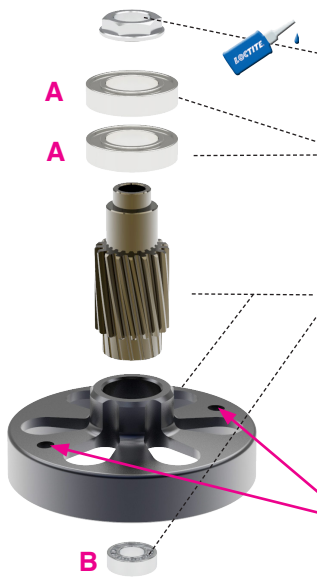


Additional Note: The TR704-246 rear canopy mounts are also used on the rear side of the main frame in the Tron 7.0

You will need:
Loctite 243 = blue

Clutch bell assembly

Engine pinion size for Nitron = 17T



TR692-008 Nitron 90 Engine pinion nut

TR692-106 Bearing set 2* 12*8*9 bearing / 2* 10*8*4 bearing and nut.

TR692-017, 17T pinion included clutch bell. (assembled by factory, no action required)

Clutch and pinion are pre-assembled and eliminating the need for any balancing.

Magnets for the RPM sensor are included in the kit. Please use CA glue and ensure the magnets are oriented correctly according to your sensor's specifications.

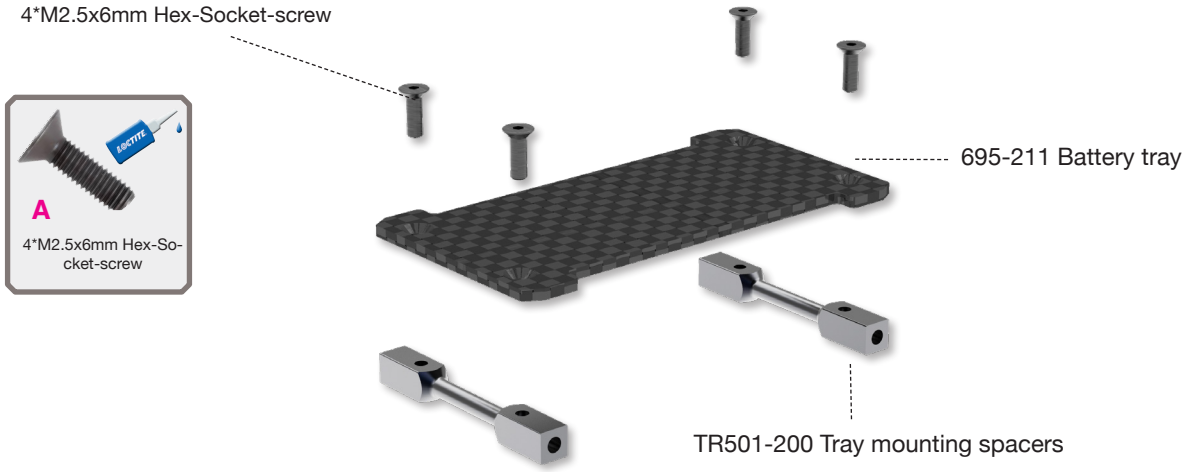
Clutch assembly is preassembled at the factory.
Disassembling is not required.
Only remove screws add Lotide 243 and screw back in.

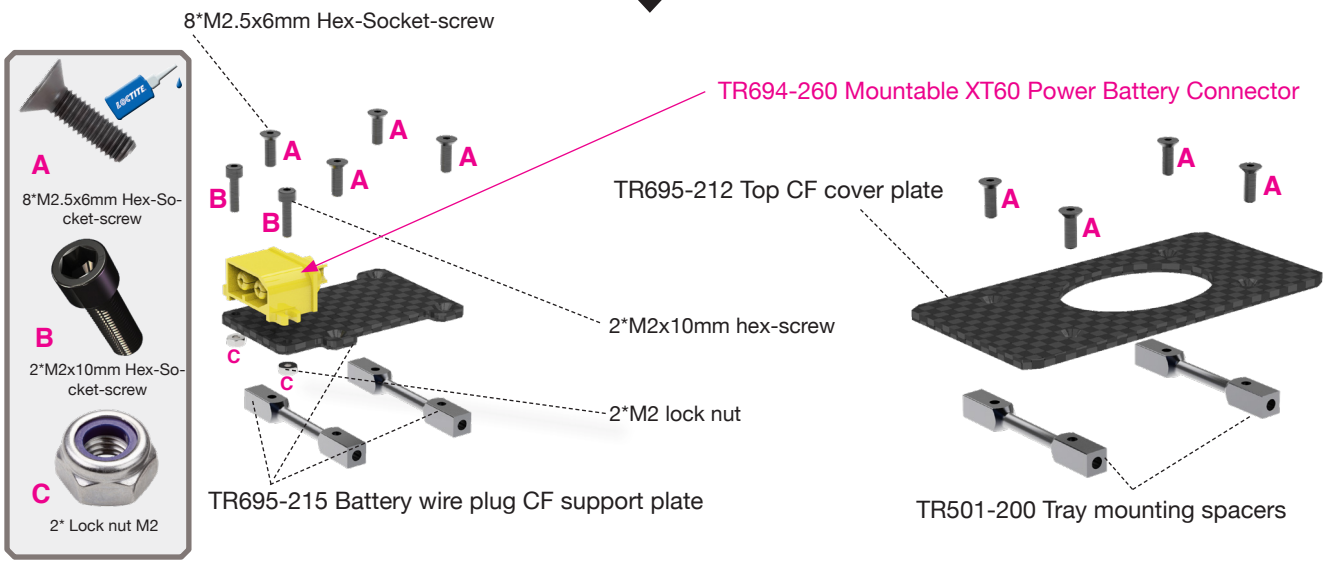
TR692-106 Bearing set

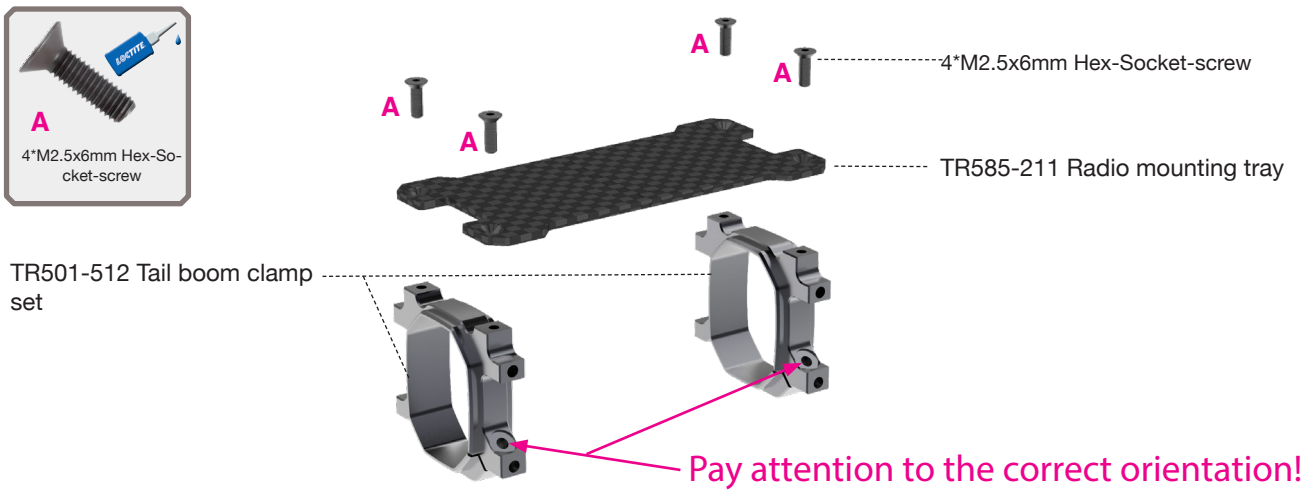
Clutch assembly is preassembled at the factory.
Disassembling is not required.
Only remove screws add Lotide 243 and screw back in.

You will need:
Loctite 243 = blue

Carbon tray assembly

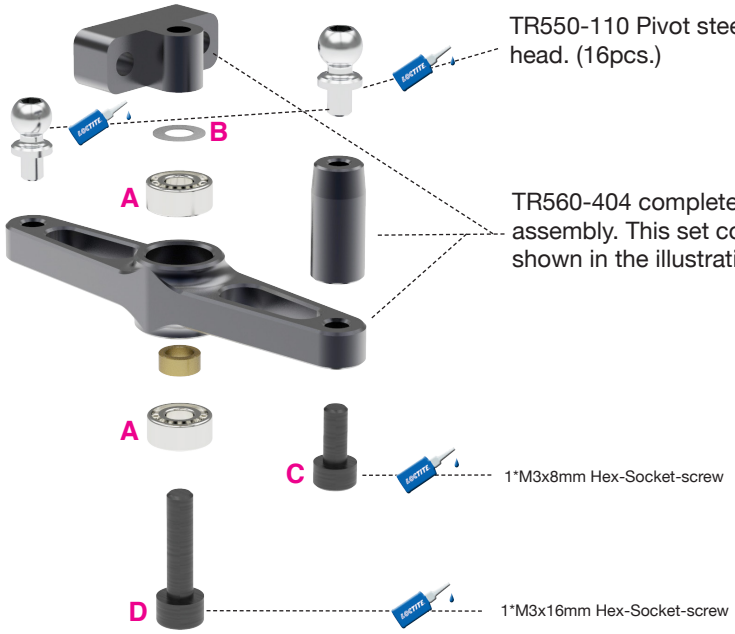




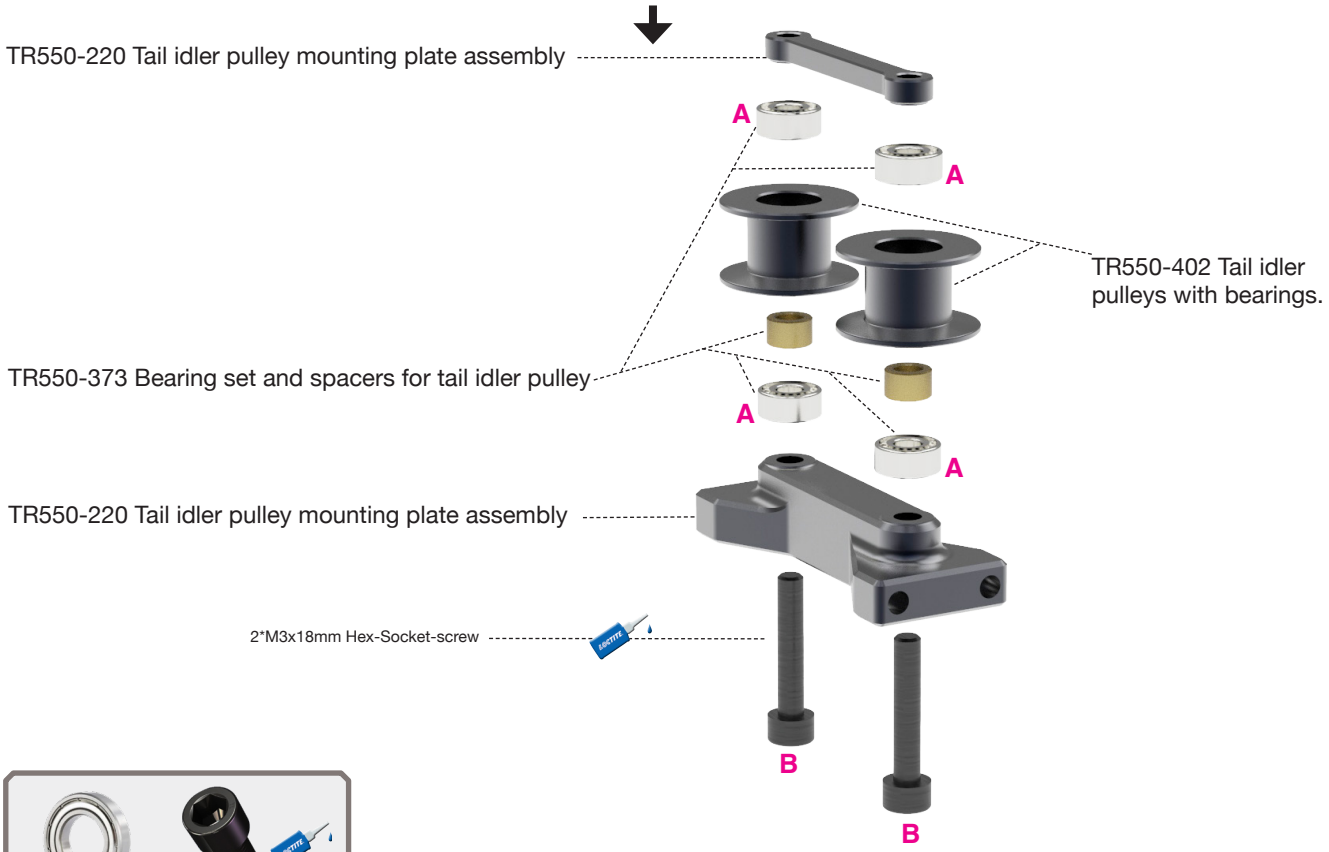


You will need:
Loctite 243 = blue

Tail pitch arm and belt guide pulley



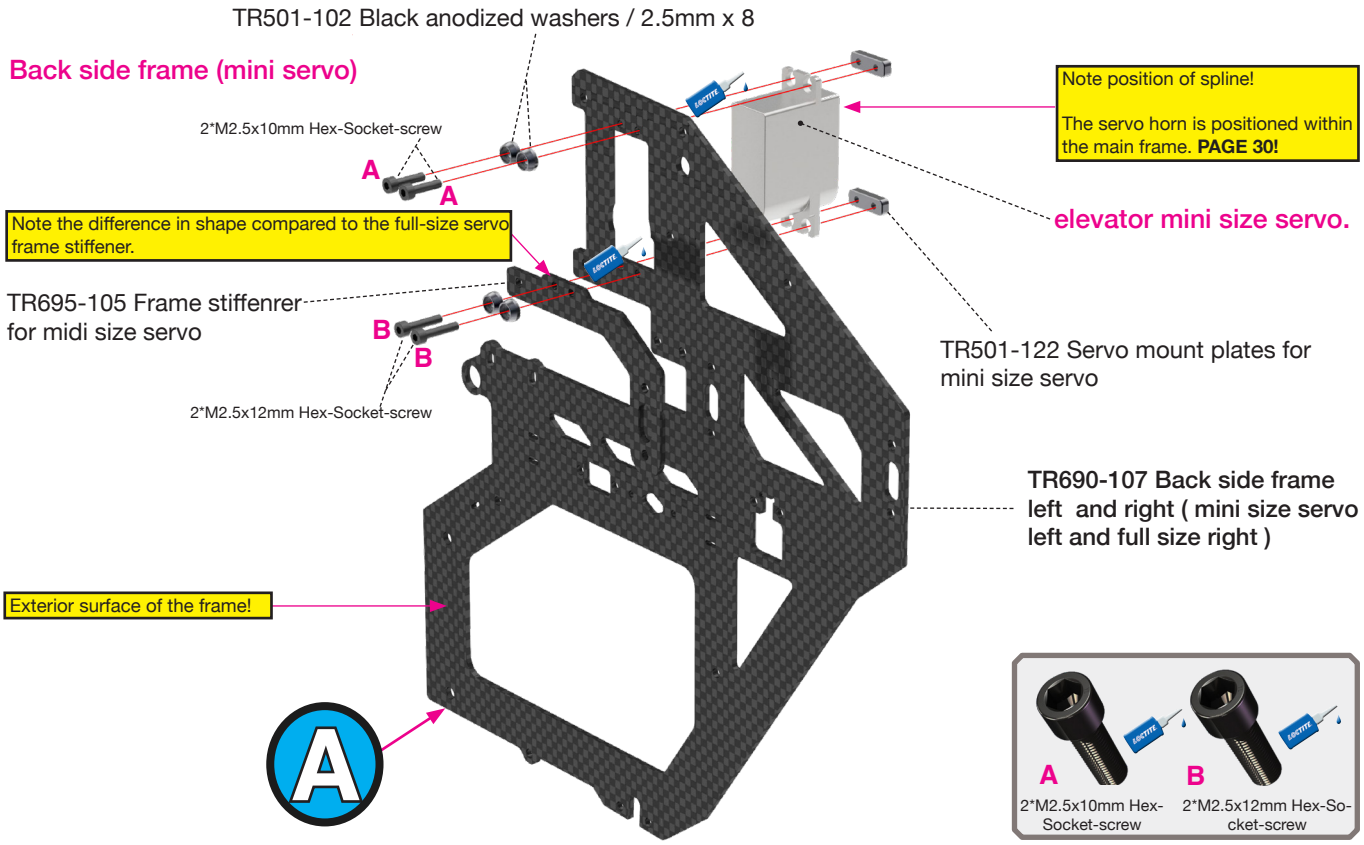
Tail pitch slider assembly is preassembled at the factory.
Disassembling is not required.
Only remove screws add Lotide 243 and screw back in.



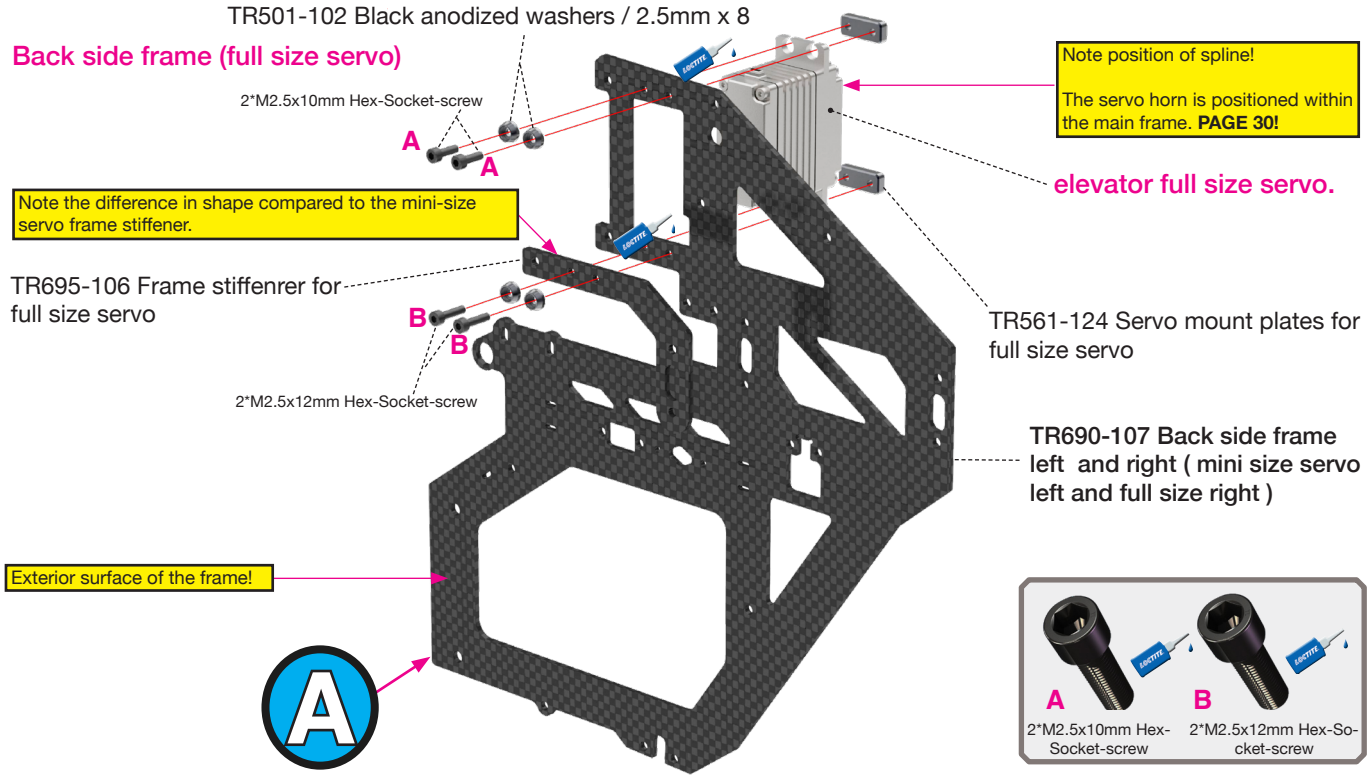
Belt guide assembly is preassembled at the factory.
Disassembling is not required.
Only remove screws add Lotide 243 and screw back in.

You will need:
Loctite 243 = blue

(left) rear frame assembly



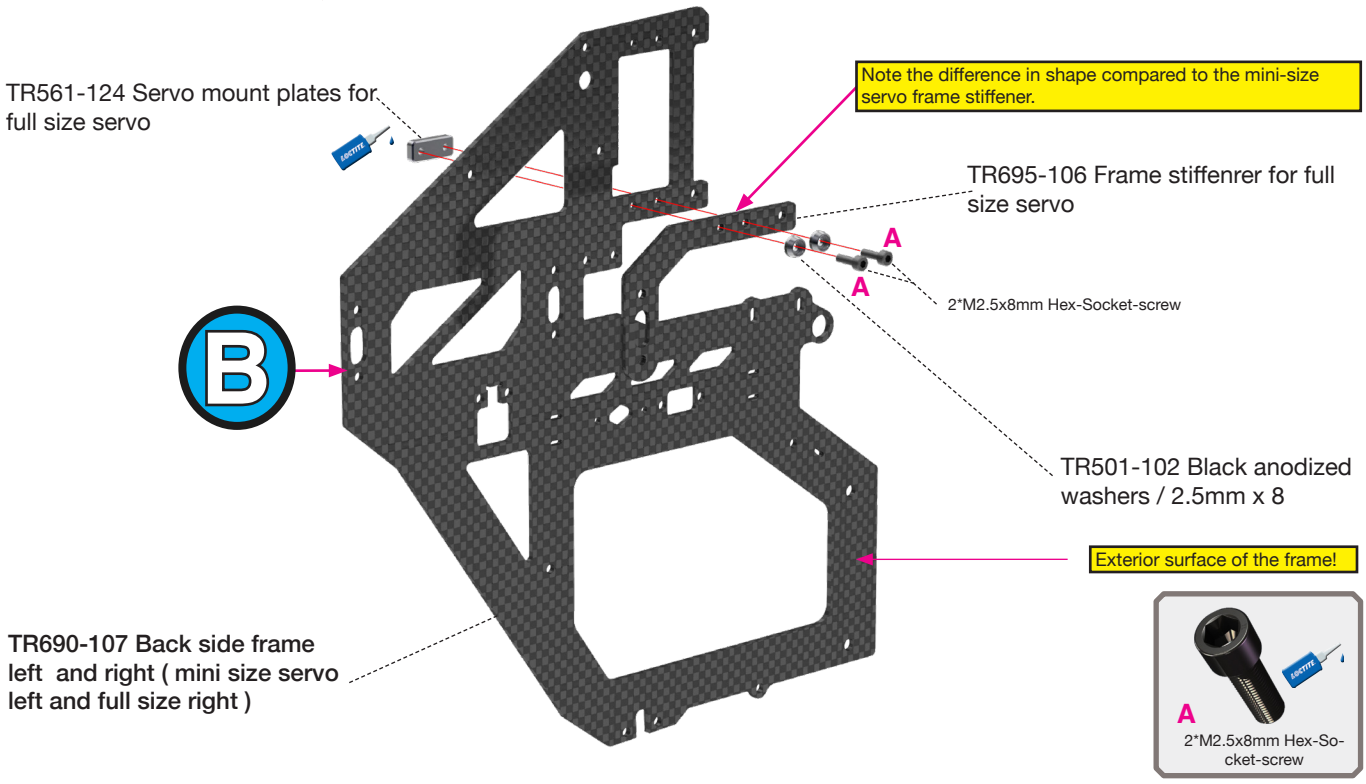
Rear frames are fully interchangeable. You can install either the full-size or mini elevator servo on either side of the helicopter, depending on your preference for the right or left side of the rear main frame. The illustration depicts the elevator servo mounted on the left side. Just ensure that the orientation of the servo and the spline matches to what is shown in the illustration.



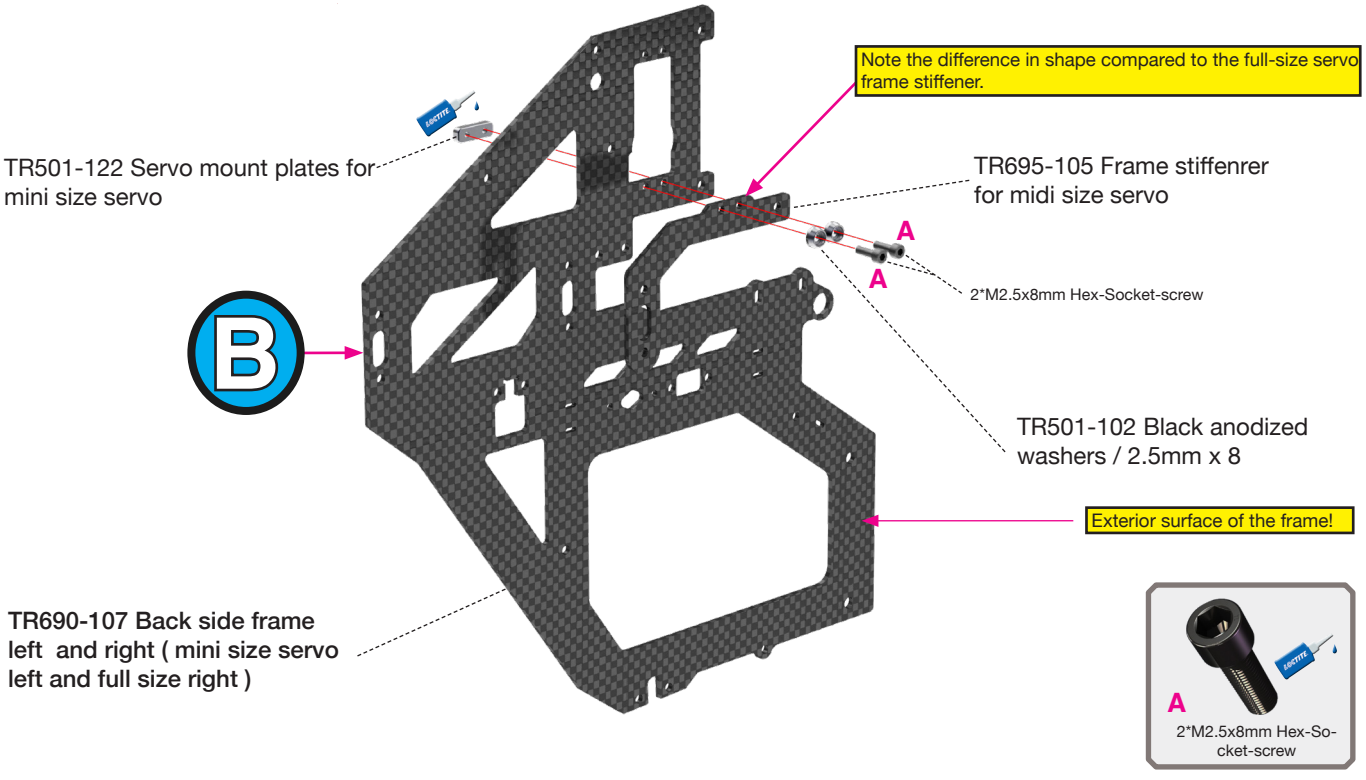
You will need:
Loctite 243 = blue

(right) rear frame assembly

Back side frame (full size servo)



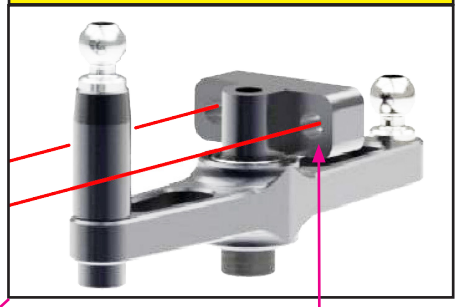
Back side frame (mini servo)



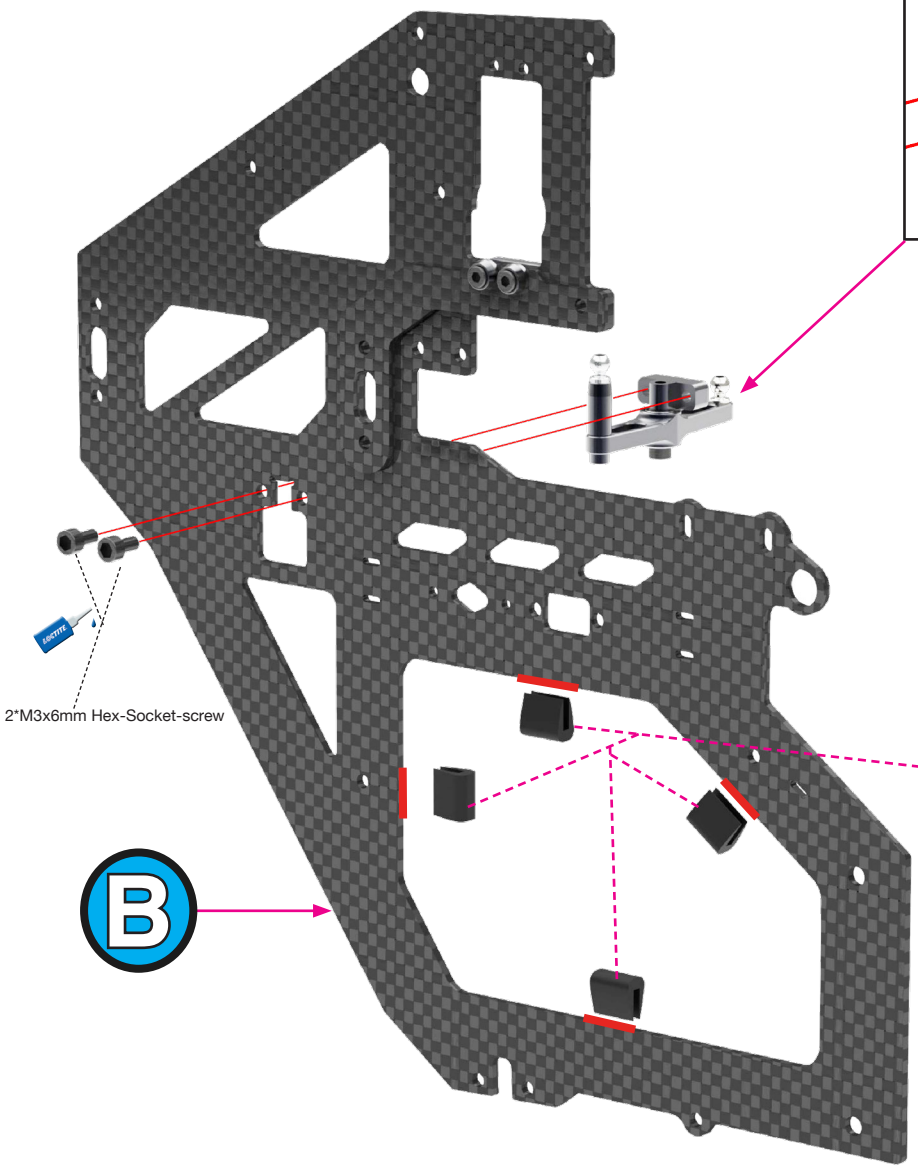
You will need:
Loctite 243 = blue

(right) rear frame assembly

Assemble the tail slider arm assembly to the backside of the frame, ensuring the correct orientation.



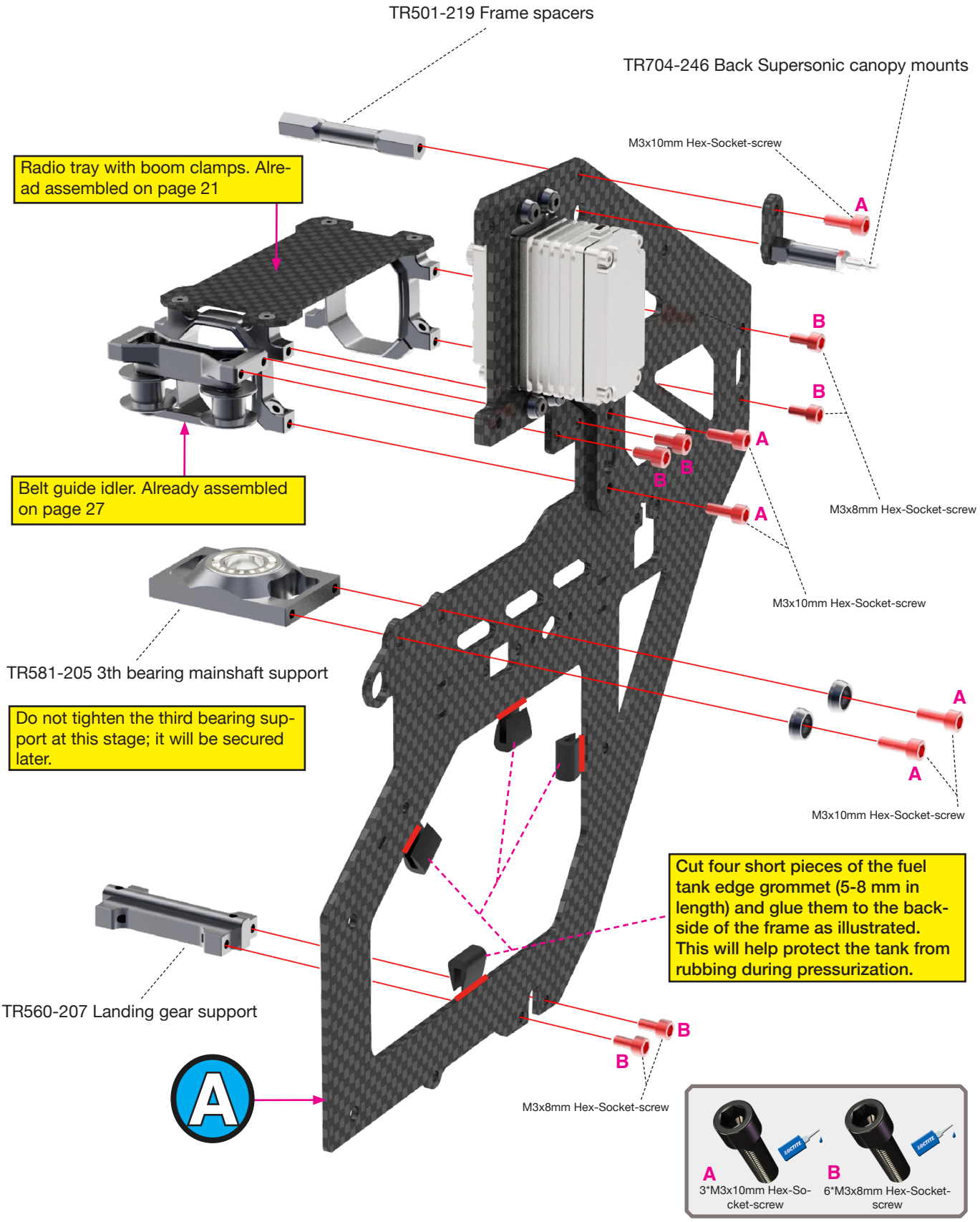
Note orientation!



Cut four short pieces of the fuel tank edge grommet (5-8 mm in length) and glue them to the backside of the frame as illustrated. This will help protect the tank from rubbing during pressurization.

You will need:
Loctite 243 = blue

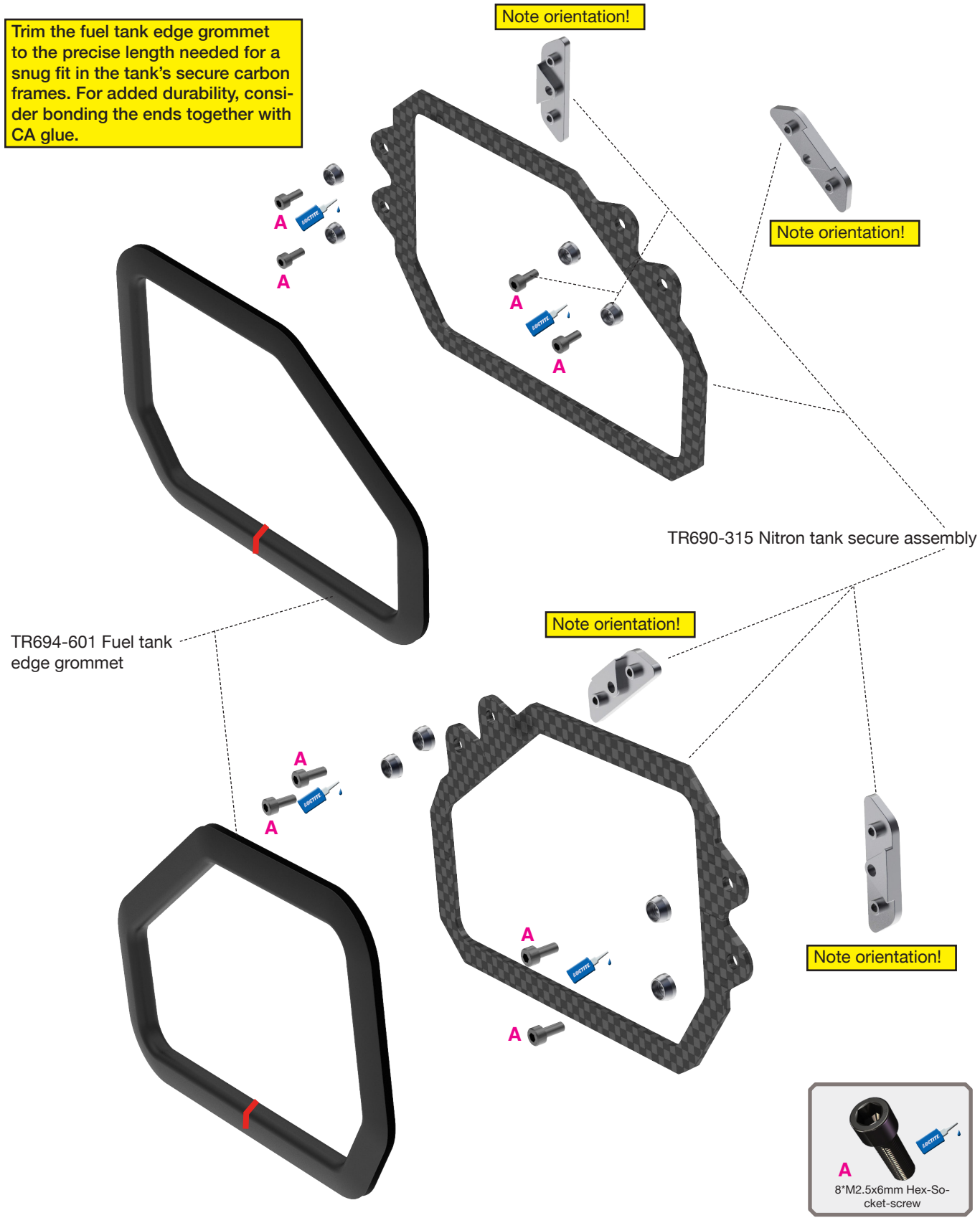
(left) rear frame assembly



You will need:
Loctite 243 = blue

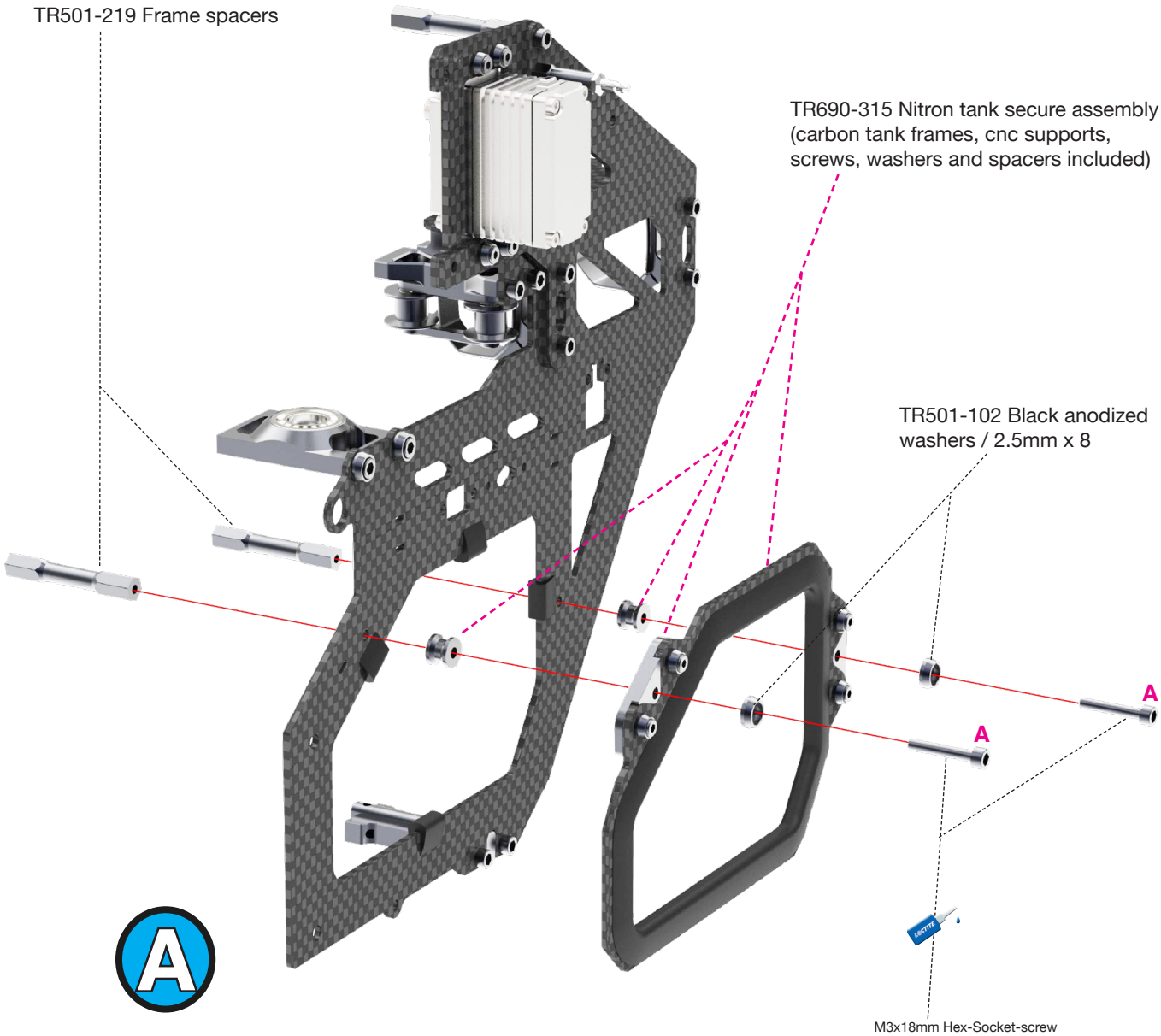
Fuel tank frame assembly

Trim the fuel tank edge grommet to the precise length needed for a snug fit in the tank's secure carbon frames. For added durability, consider bonding the ends together with CA glue.



You will need:
Loctite 243 = blue

(left) rear frame assembly

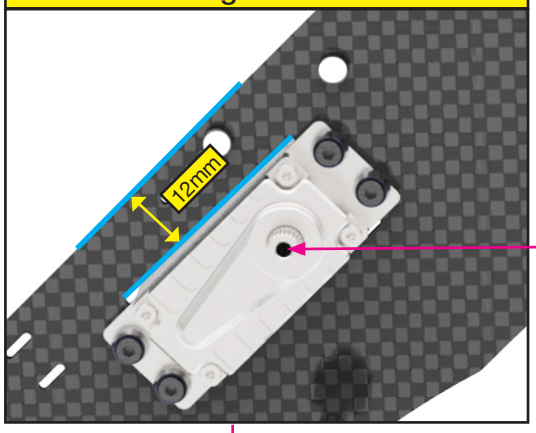


You will need:
Loctite 243 = blue

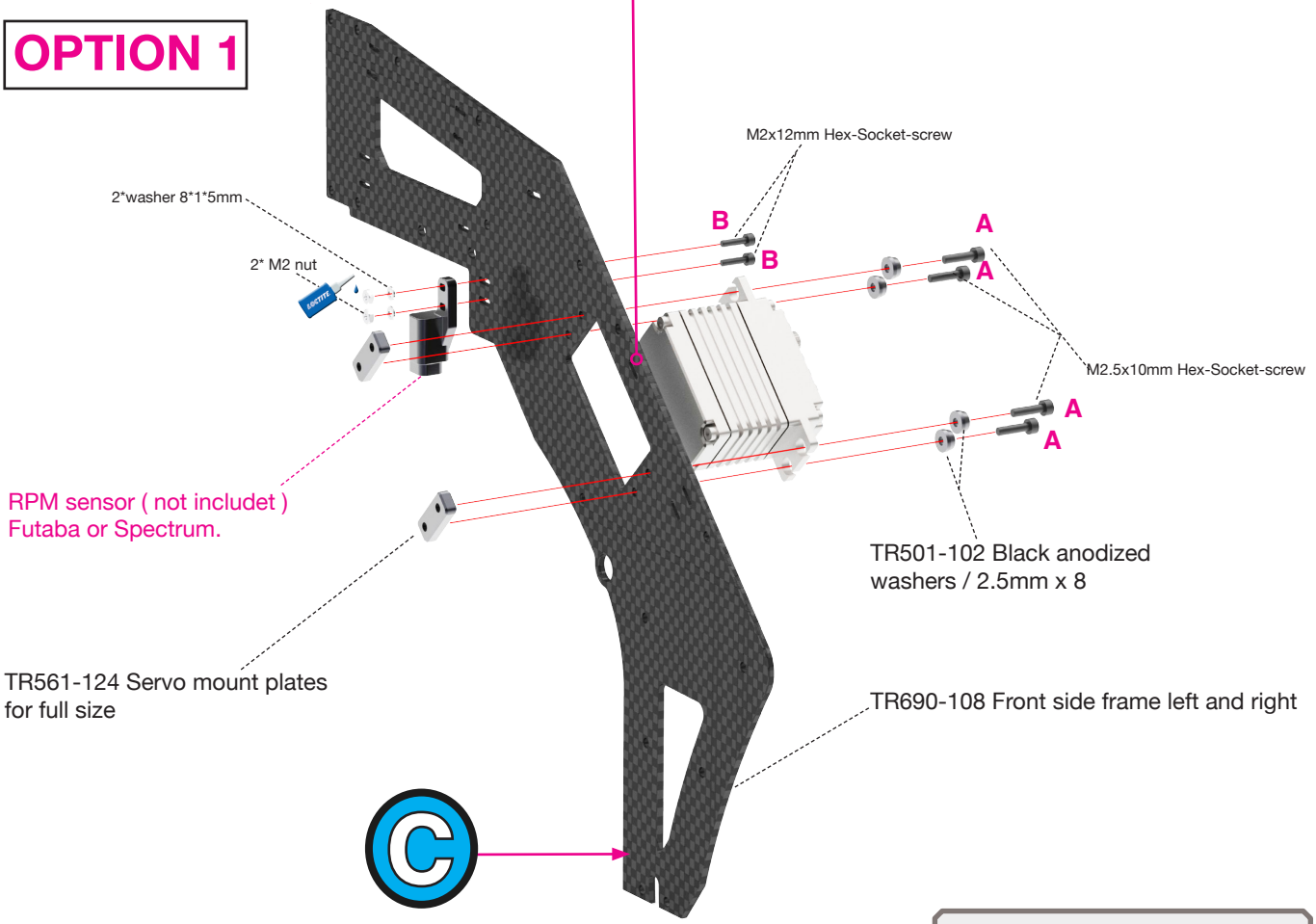
Left side throttle servo front frame assembly

Left front side frame (full size throttle servo = default)

SHORT DISTANCE FROM TOP!
The throttle servo cutout on the left-front frame differs from the tail servo cutout on the right-side front frame.



OPTION 1



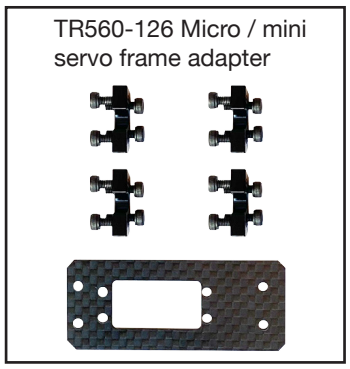
You will need:
Loctite 243 = blue

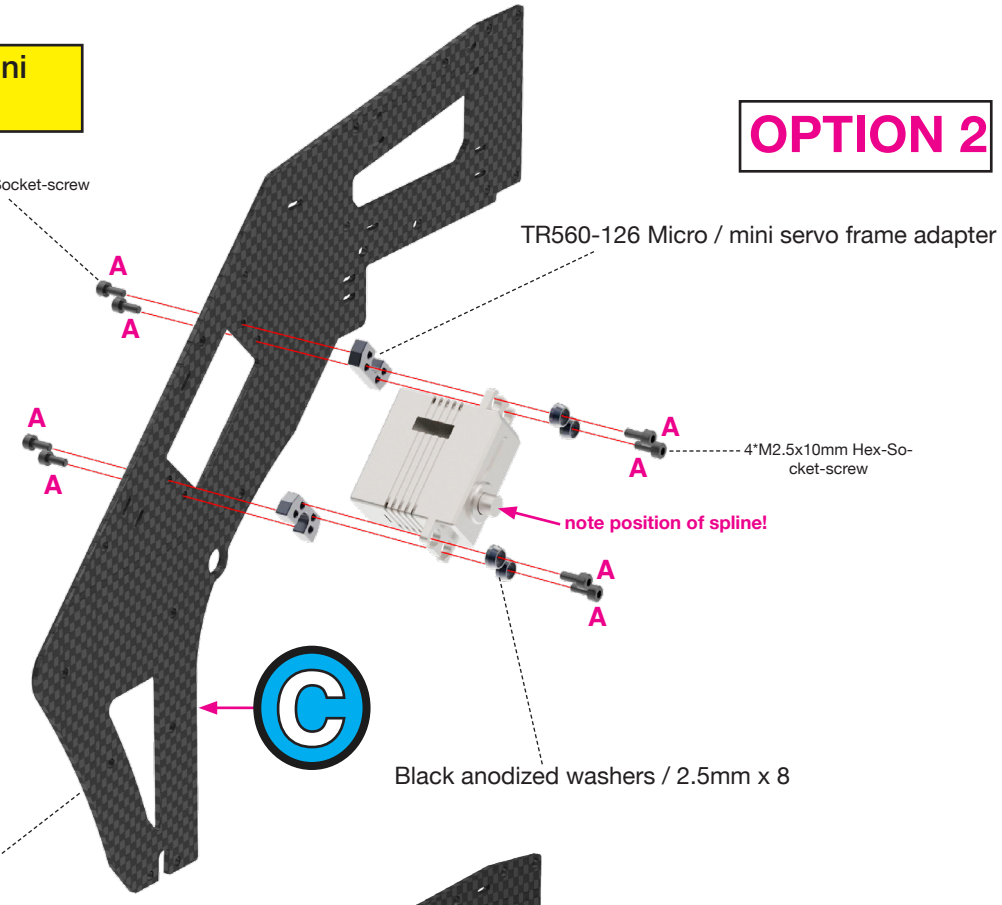
Left side throttle servo front frame assembly

Left front side frame (mini throttle servo option)

OPTION 2

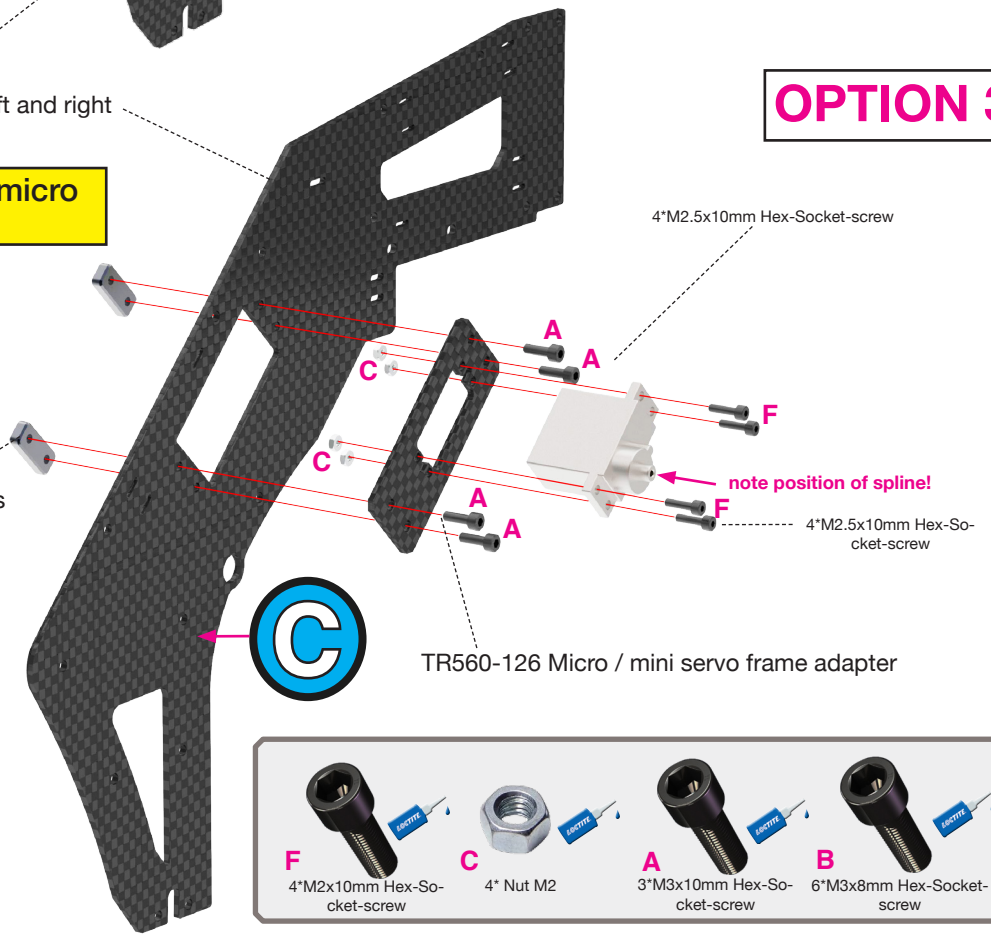
TR560-126 Micro / mini servo frame adapter





Left front side frame (micro throttle servo option)

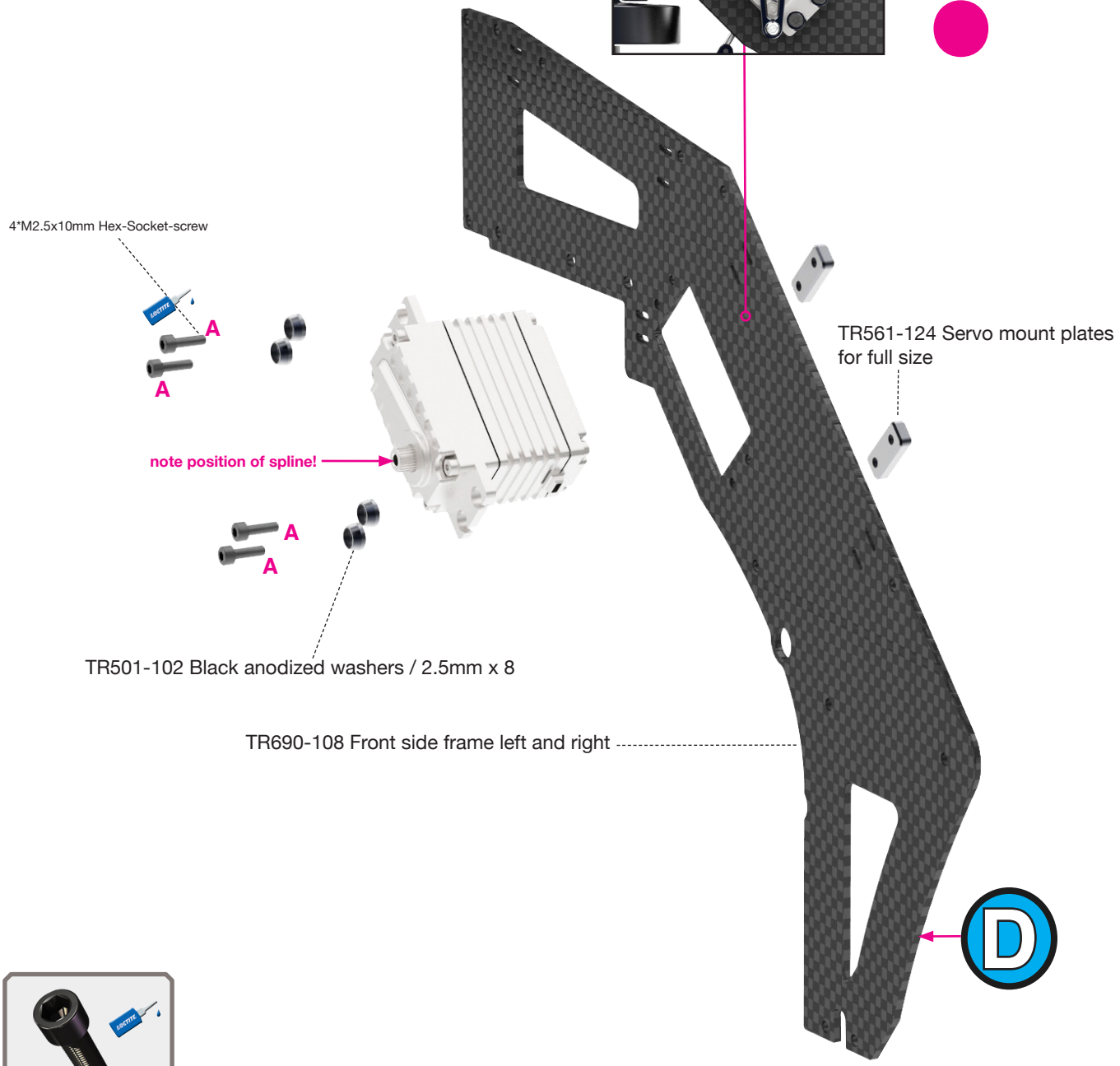
OPTION 3



You will need:
Loctite 243 = blue

Right side tail servo front frame assembly

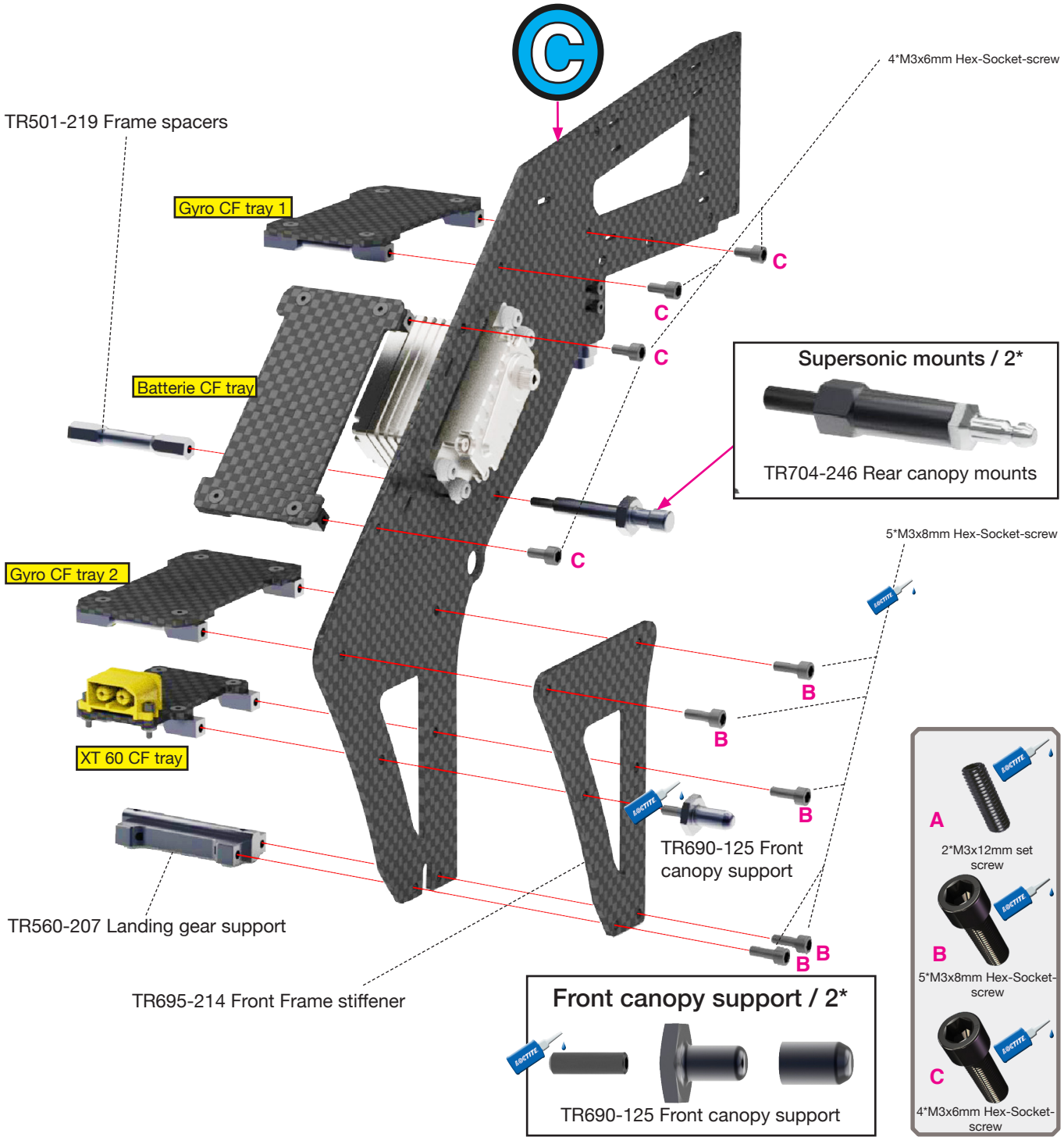
LONG DISTANCE FROM THE TOP!
The tail servo cutout on the right-front frame differs from the throttle servo cutout on the left-side front frame.



You will need:
Loctite 243 = blue

Left side throttle servo front frame assembly

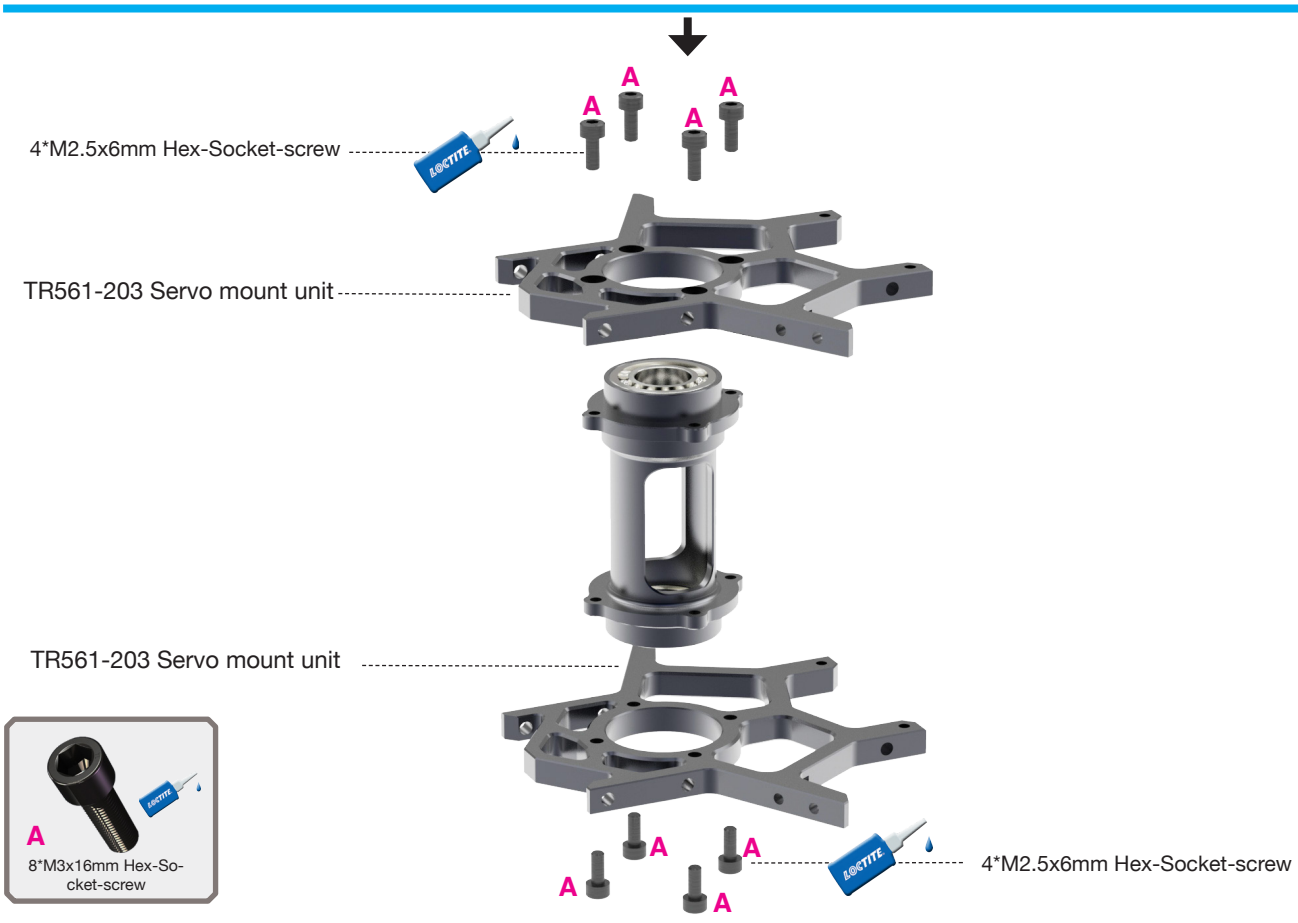
1. Assemble gyro CF tray, batterie CF tray, Gyro tray 2 and XT 60 CF tray to the left throttle servo main frame C
2. Assemble the front side supersonic mounts.
3. Assemble the front frame stiffener CF plate to frame C
4. Assemble the front canopy support to frame C



You will need:
Loctite 243 = blue

Servo frame assembly

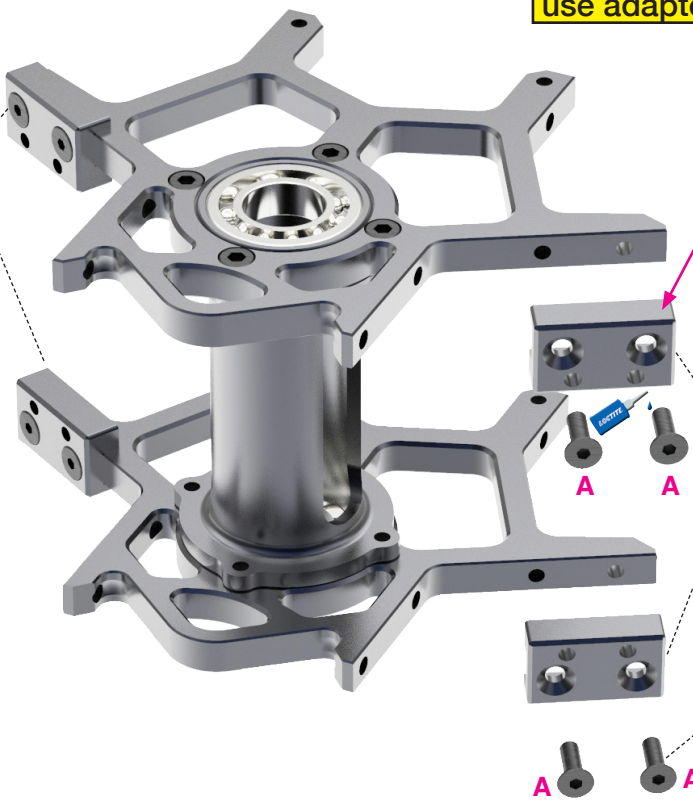
The mainshaft support tube has been assembled at the factory. Disassembly is not required, and no Loctite is needed to secure the bearings. If the bearings need to be replaced, you may want to use a hair dryer to slightly heat up the support tube.



You will need:
Loctite 243 = blue

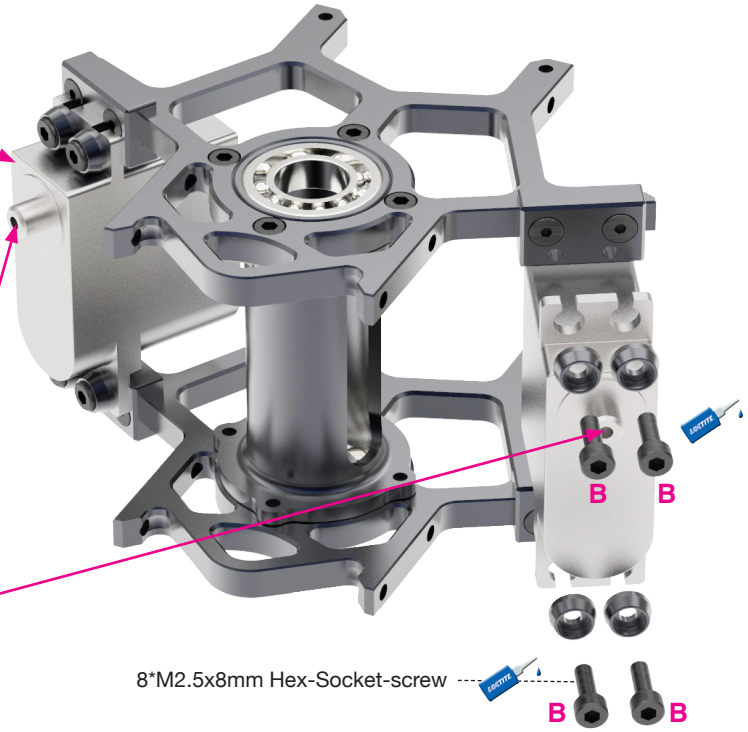
Servo frame assembly (mini cyclic servo)

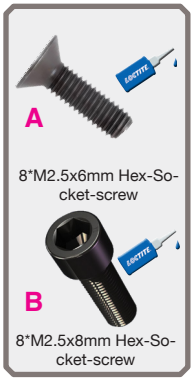
For midi size cyclic servos use adapters. (included in kit)



Tech tip!
Use 2* M2.5*6mm screws crosswise for easy centering by the screw head when align servo position. Assemble the M2.5 scew until the head enters the recess of the servo mounting holes. Then use the other 2 crossbars to fix the servo. Remove the temporary center screws and mount the remaining M2.5x10mm with the washer.

Mini size cyclic servos

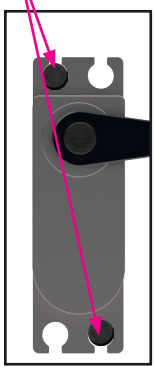


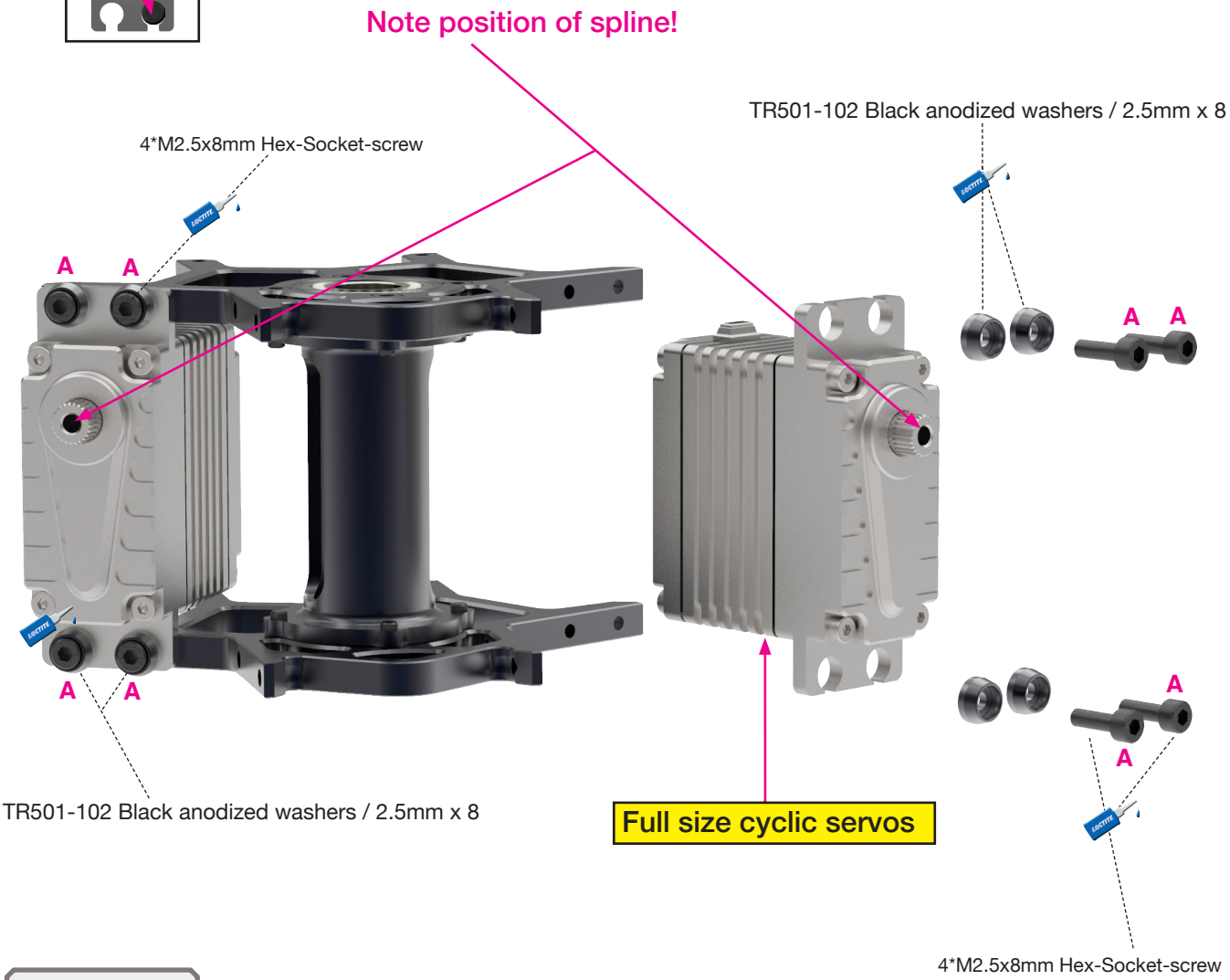


You will need:
Loctite 243 = blue

Servo frame assembly (full size cyclic servo)

Tech tip!
Use 2* M2.5*6mm screws crosswise for easy centering by the screw head when align servo position. Assemble the M2.5 scew until the head enters the recess of the servo mounting holes. Then use the other 2 crossbars to fix the servo. Remove the temporary center screws and mount the remaining M2.5x10mm with the washer.

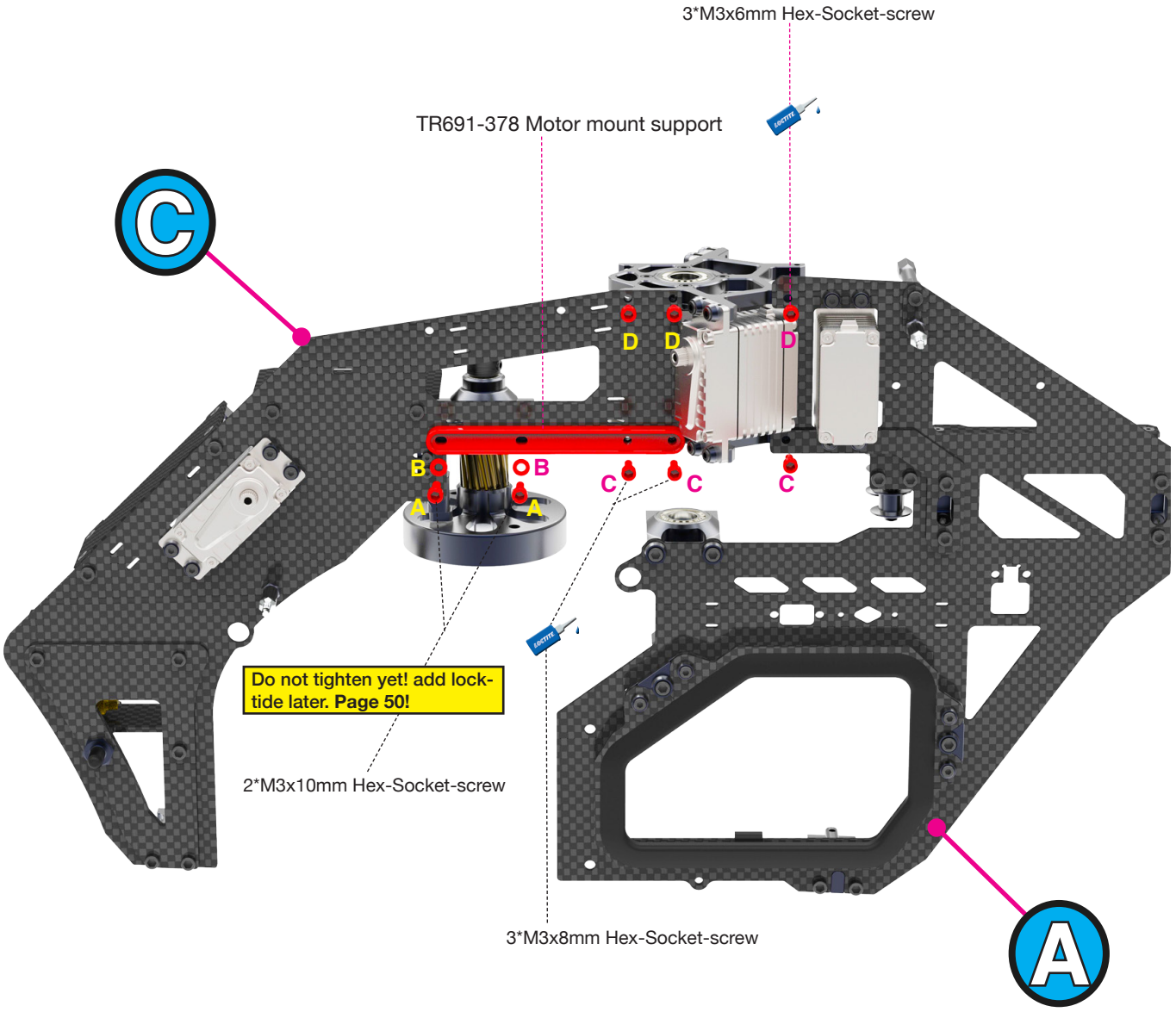




You will need:
Loctite 243 = blue

Assembling main frame C and A to servo frame

1. Attach the throttle servo left front main frame (C) to the servo mount frame.
2. Attach the rear frame (A) for the elevator servo to the servo mount frame.
3. Attach the motor mount support to the servo mount frame using two C-type screws. Apply Loctite to the C-type screws.
4. Install A-type screws with B shims. Do not fully tighten them at this stage, and do not apply Loctite.

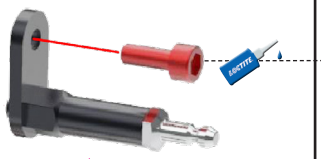


You will need:
Loctite 243 = blue

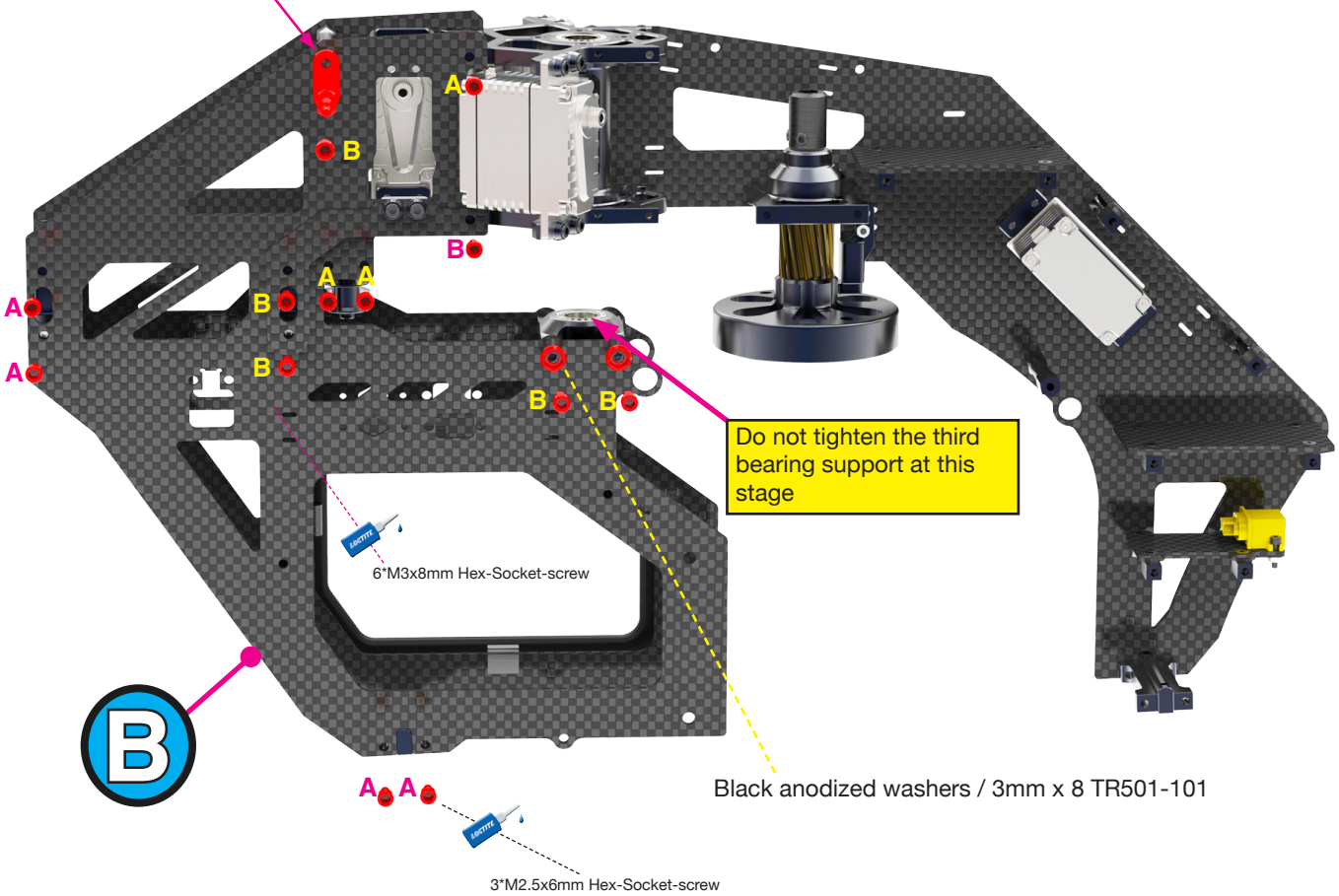
Assembling main frame B to servo frame

1. Attach the right-side rear main frame (B) to the servo mount frame.
2. Attach the rear supersonic canopy mount to the main frame (B).

Supersonic mounts / backside
TR704-246 Rear canopy mounts



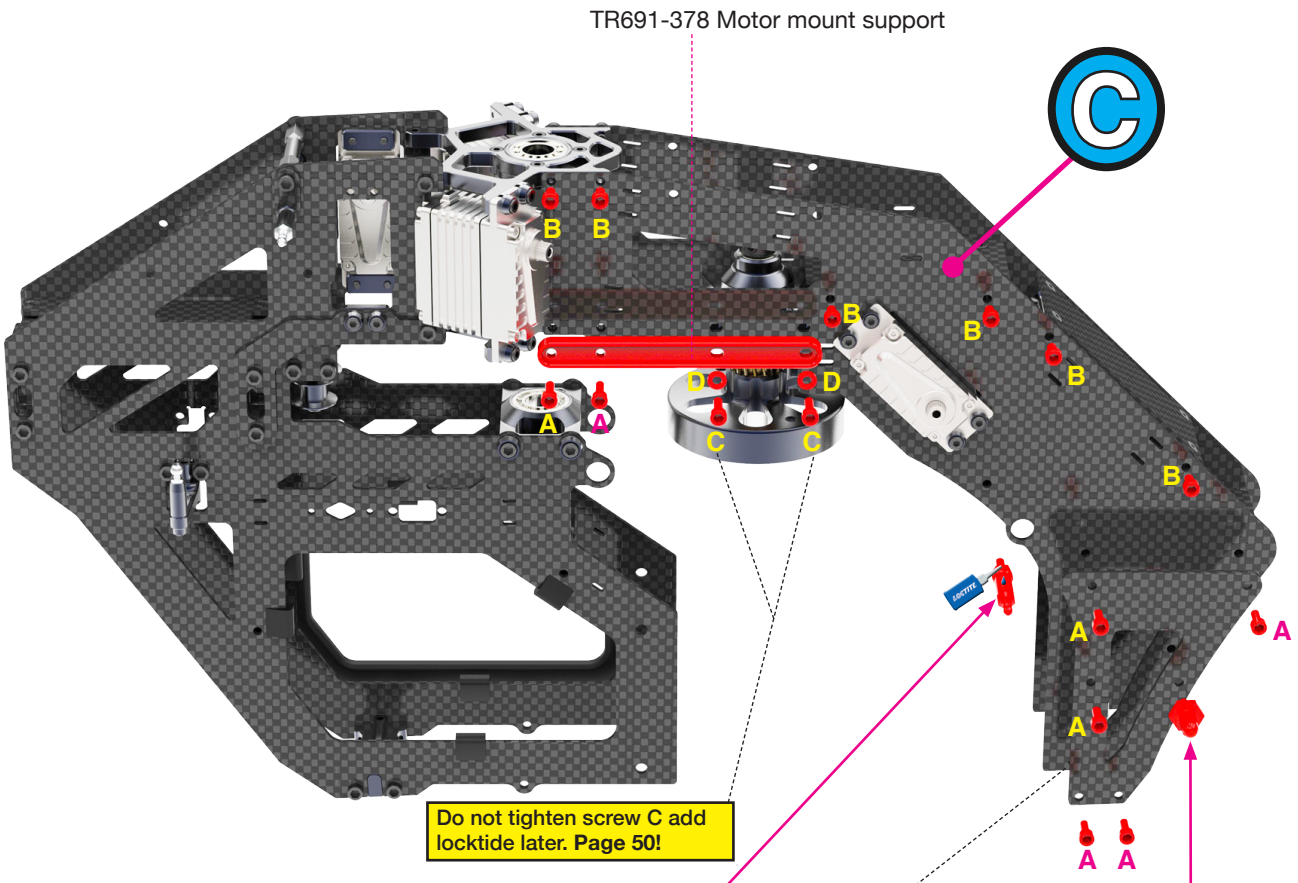
M3x10mm Hex-Socket-screw



You will need:
Loctite 243 = blue

Assembling main frame C to servo frame

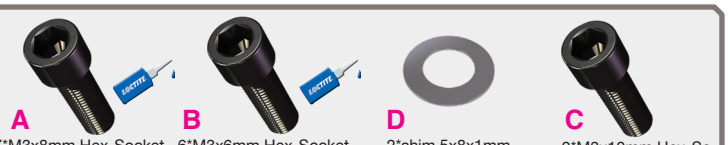
1. Insert main gear assembly into frame = step 1
2. Insert rotor head assembly through bearing support tube, **dont forget to add shim E** = step 2 and 3.
3. Make sure your main shaft glide true the one way bearing sleeve and line up with the jesus bolt screw holes.
4. Insert jesus bolt screw, **B** and secure it with the M3 nut lock, **C**
5. Move down the main shaft collar to have zero up and down play on the rotor head assembly, then tighten screw **A** step by step = step 4.
6. Make sure to have an equal gap on the collar to achieve best holding results for the main shaft= step 3



Supersonic mounts / frontside

Front canopy support / 2*

TR690-125 Front canopy support



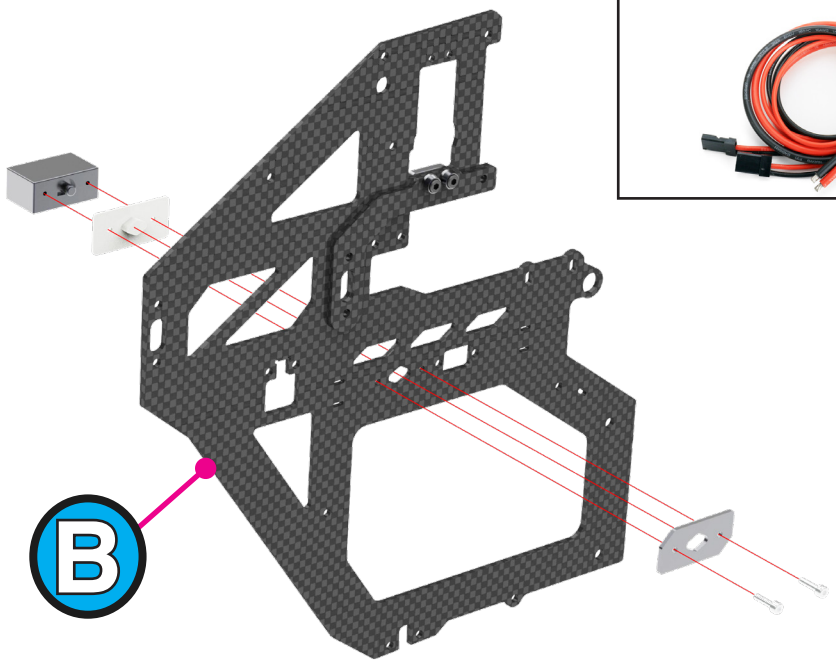
You will need:
Loctite 243 = blue

Switch assembling

The render displays the individual B-side main frame for a clearer understanding of the switch mounting position. At this stage, the B-frame has already been assembled to the servo frame, as shown on previous pages. However, the switch mounting location remains easily accessible.

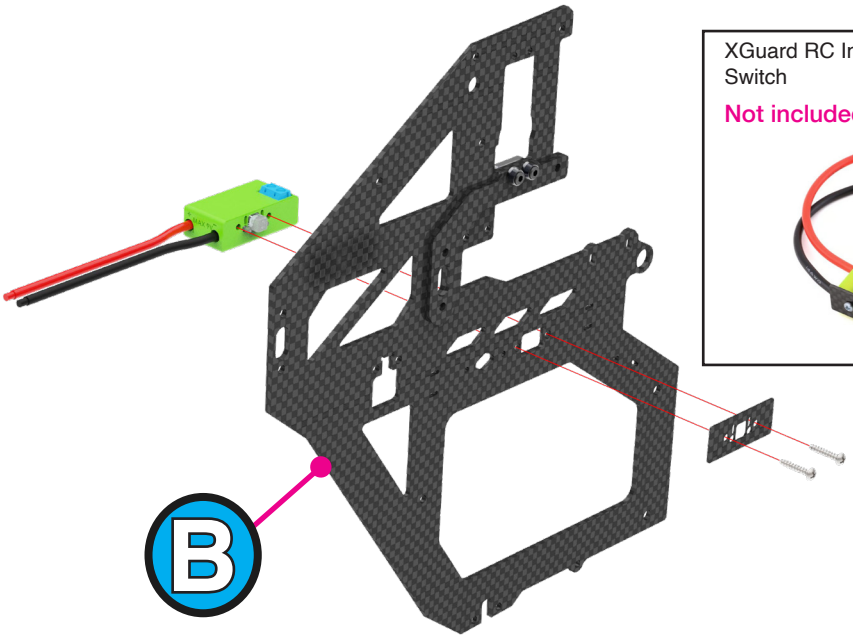
Xpert RC B3212 ELECTRONIC SWITCH

Not included.



XGuard RC IntelliSwitch Intelligent Power Switch

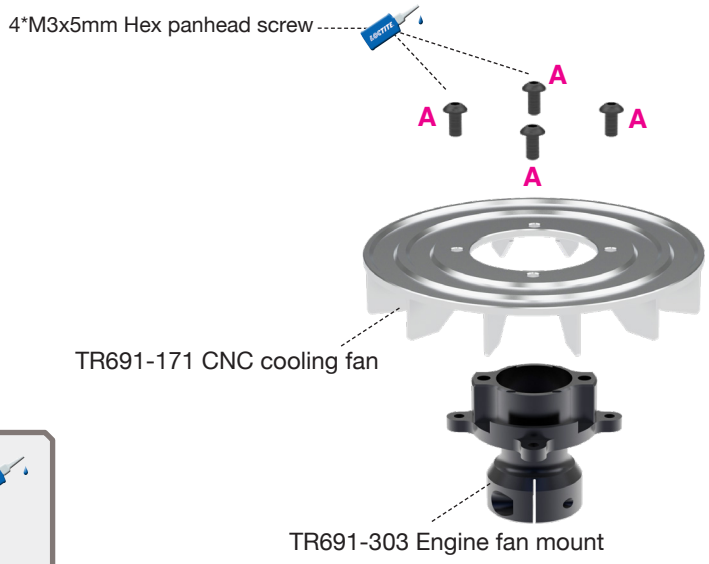
Not included.



You will need:
Loctite 243 = blue

Fan assembling

Take care when assembling the engine fan to the engine. Please dont hold or press the fan by hand on the finns and tide the lock nut. Finns may bend. Use a propper engine piston blocker.

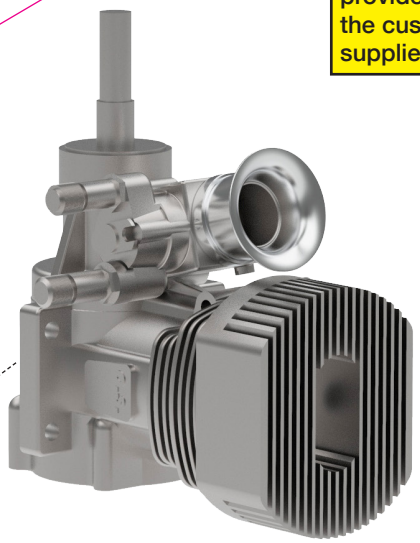



Nut is povided by engine manufacturer

2*M3x12mm Hex-Socket-screw

Note: OS engines use the default shim provided by OS. For YS engines, use the custom 0.4mm crankshaft shim supplied by us.

(Washer is provided by engine manufacturer)



Engine is not included

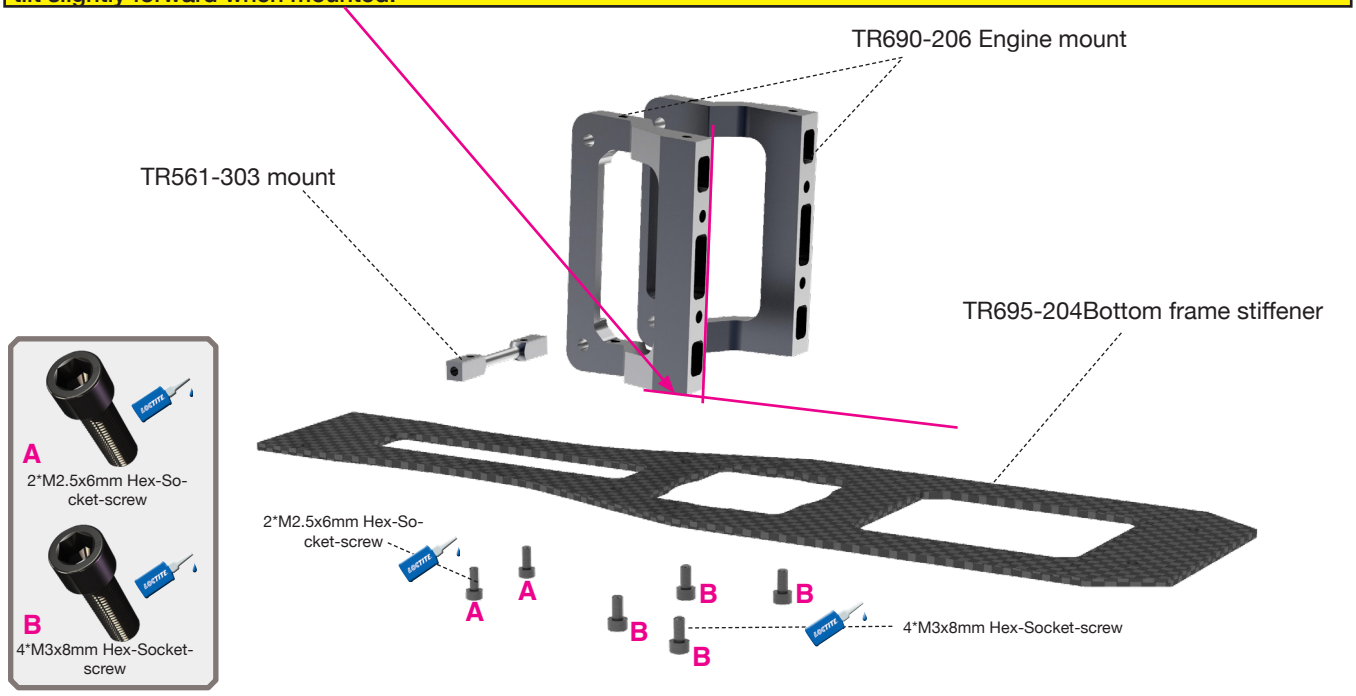
You will need:
Loctite 243 = blue

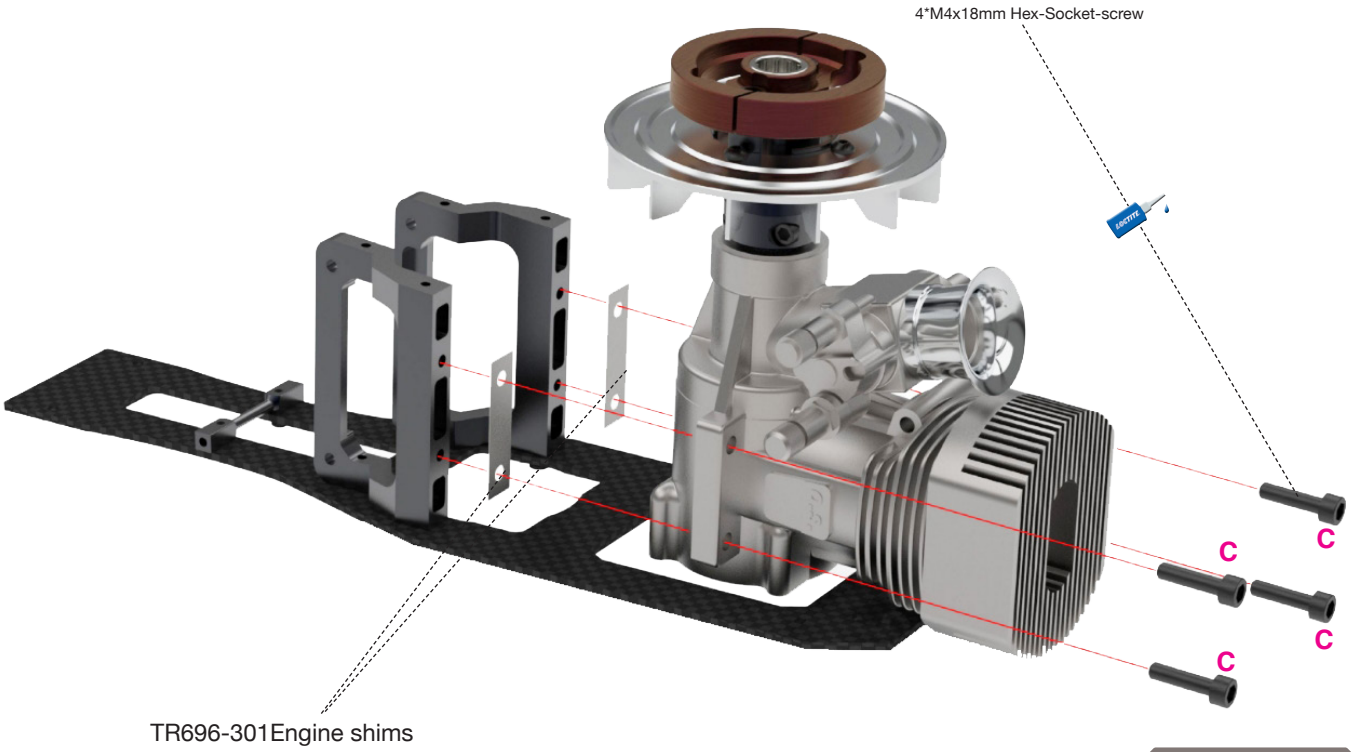
Clutch assembling

You will need:
Loctite 243 = blue

Engine assembling

Ensure the correct positioning of the engine mount: it has a slight angle on the bottom side, which causes the engine to tilt slightly forward when mounted.

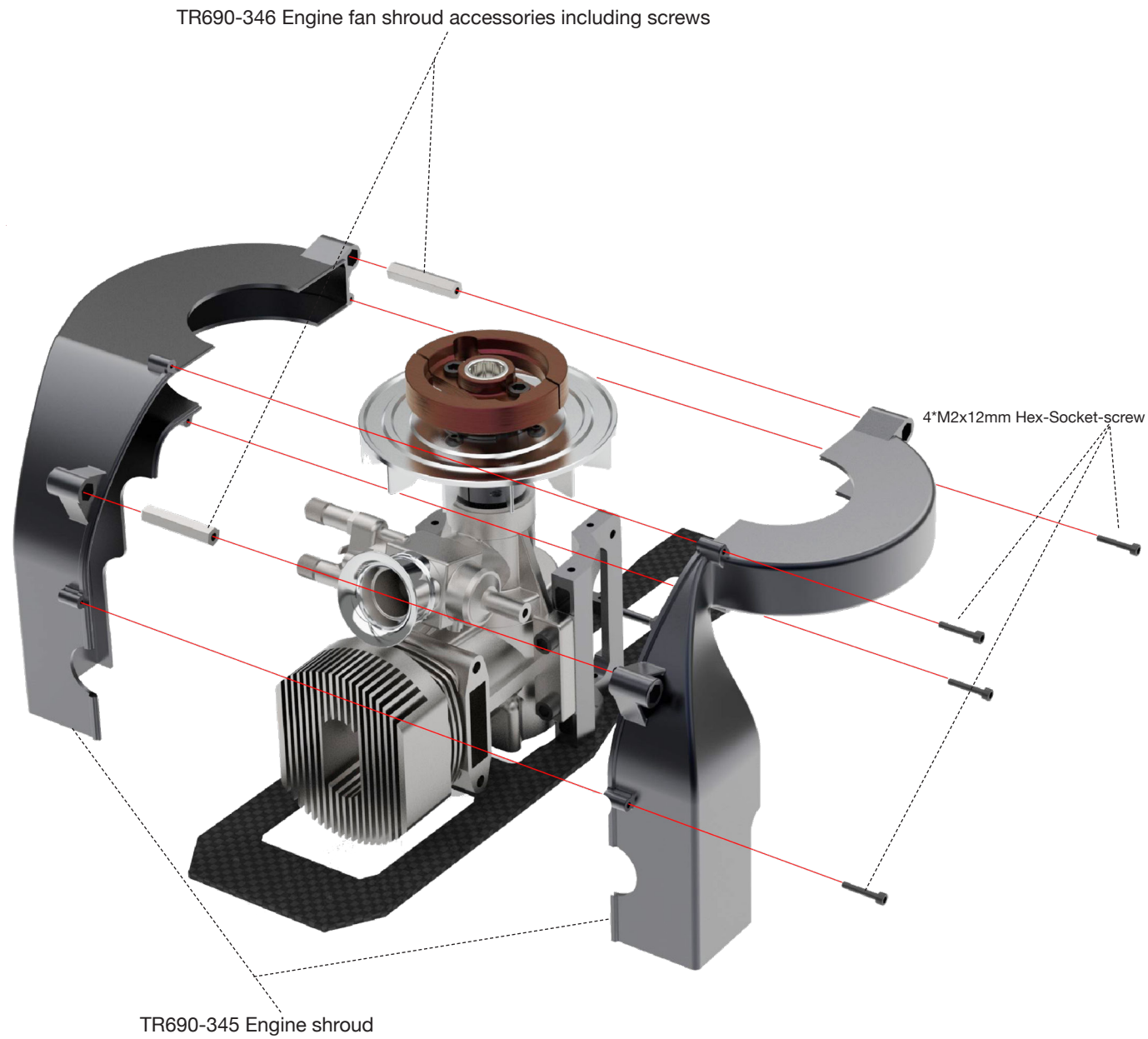




Engine shim is used to adjust the gear play of the main gear. Due to manufacturing tolerances, slight adjustments may be needed to ensure proper fit and function. By default, the engine shim should be installed.

You will need:

Assembling fan shroud

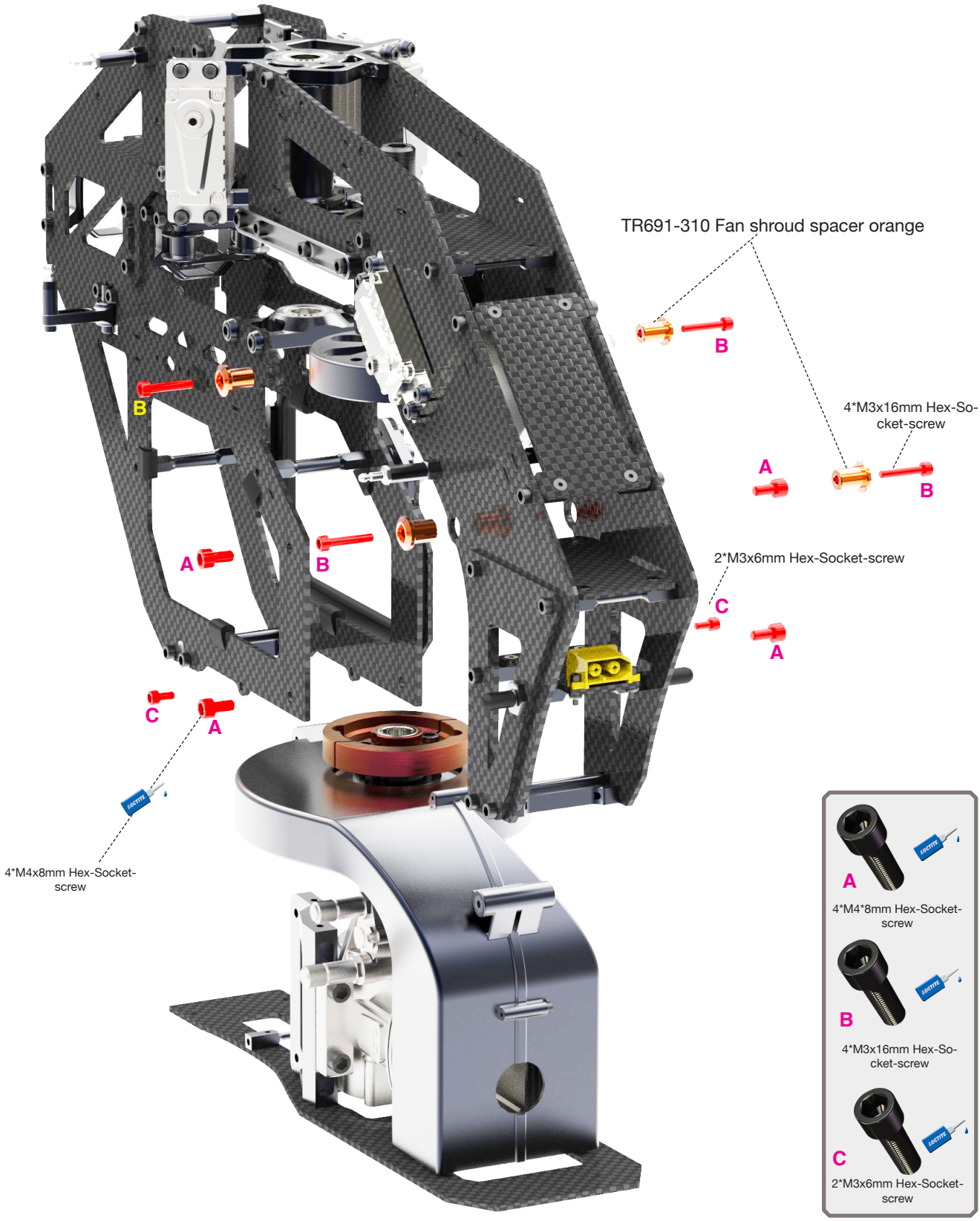


B
4*M2x10mm Hex-Socket-screw

You will need:
Loctite 243 = blue

Engine to frame assembly

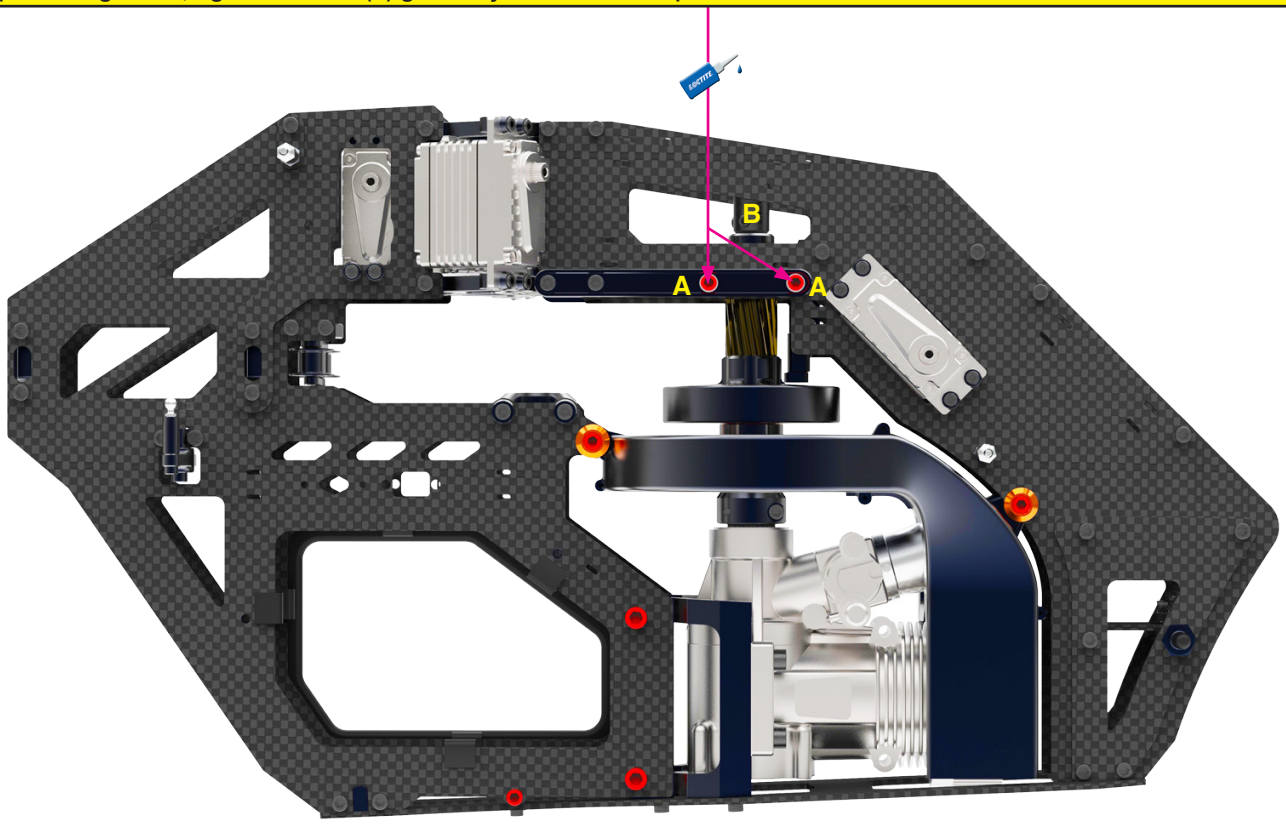
The engine, along with the bottom plate and fan shroud, can be easily assembled or disassembled from the main frame in a short time, allowing for quick and efficient maintenance.



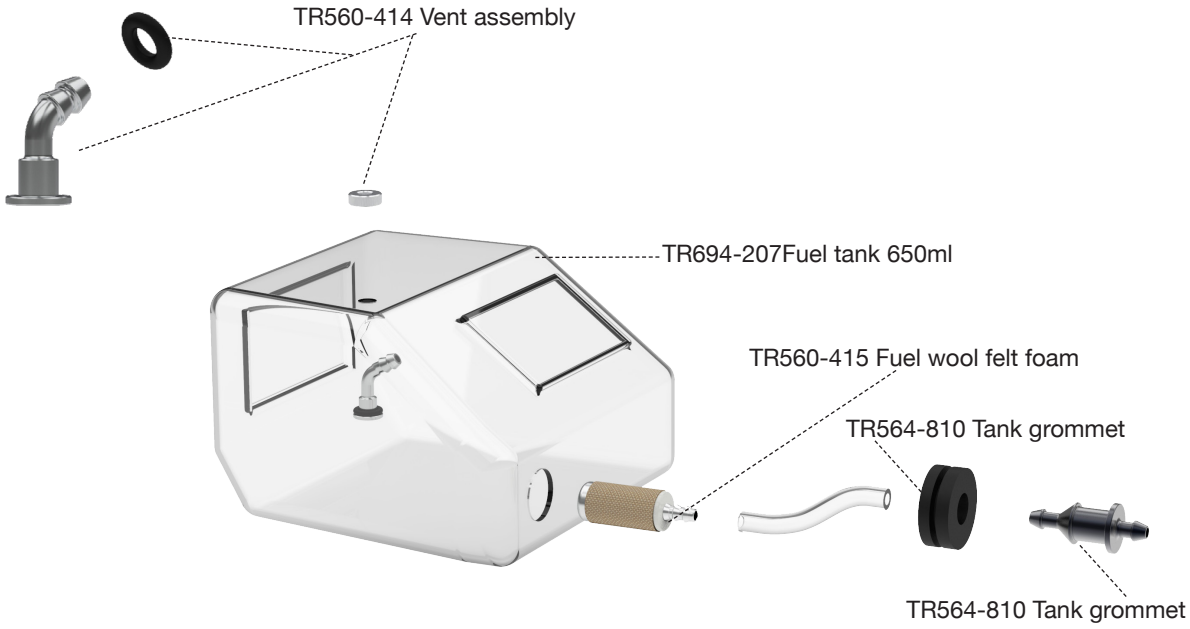
You will need:
Loctite 243 = blue

Clutch alignment

Rotate the starter shaft (B) counterclockwise against engine compression to lock the one-way bearing in the clutch, which will automatically align the clutch assembly. Then, tighten the four M3x8mm screws (A) on the clutch support. For optimal alignment, tighten screws (A) gradually in a crisscross pattern.



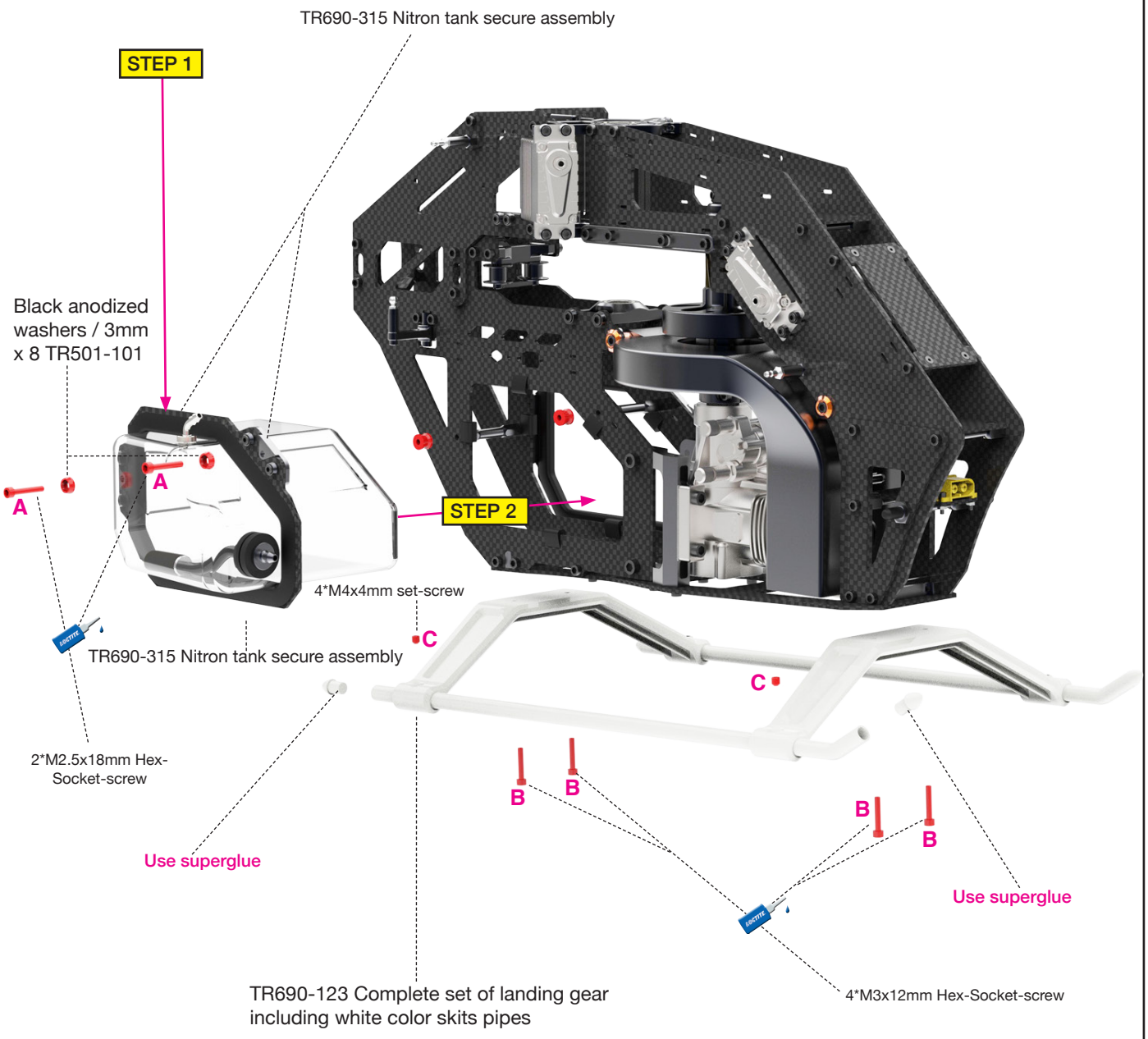
Rotate the starter shaft (B) counterclockwise against engine compression to lock the one-way bearing in the clutch, which will automatically align the clutch assembly. Then, tighten the four M3x8mm screws (A) on the clutch support. For optimal alignment, tighten screws (A) gradually in a crisscross pattern.



You will need:
Loctite 243 = blue

Landing gear and tank assembly

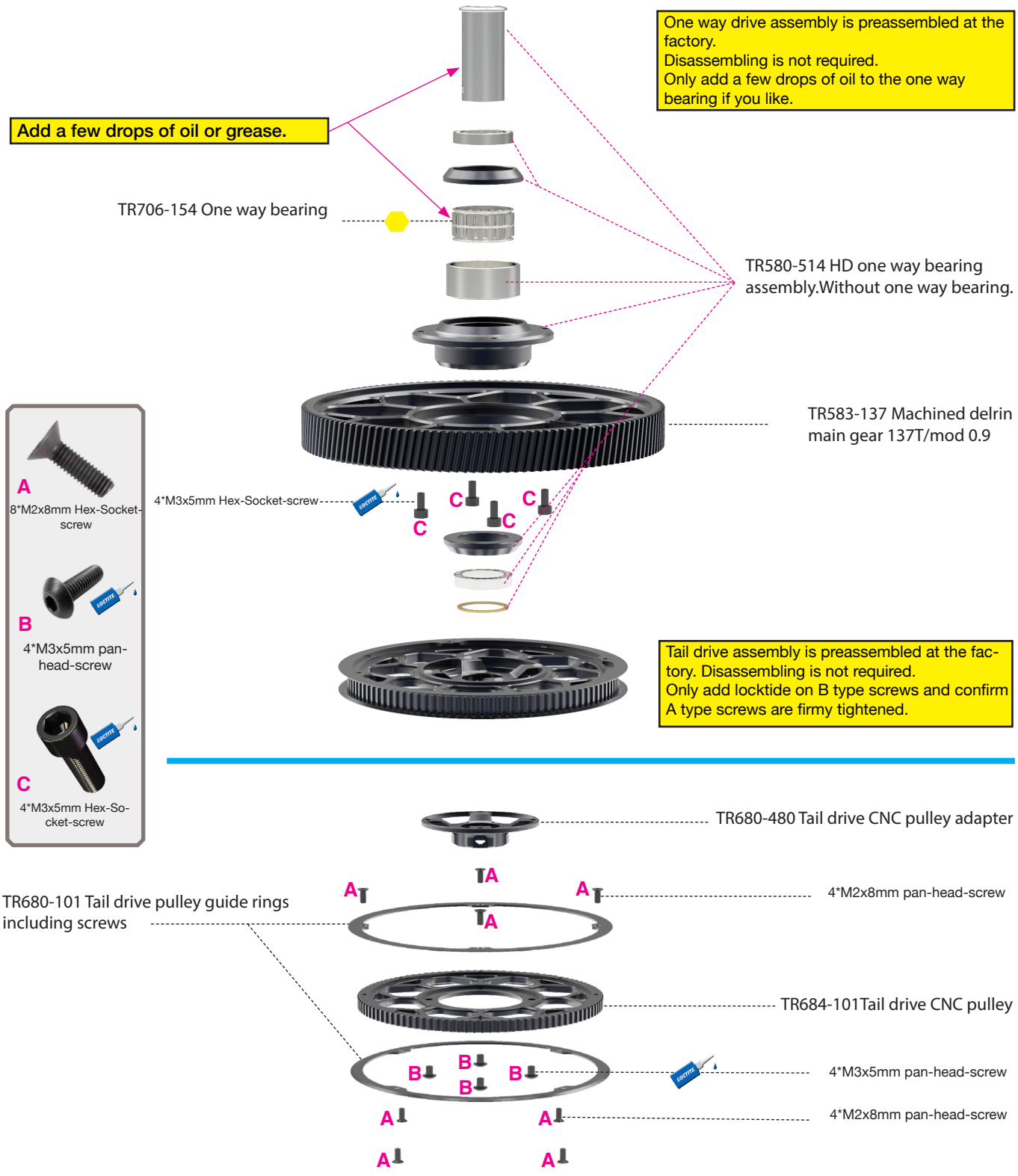
1. Carefully slide the tank securing frame assembly which is already prepaired on page 35 over the tank, **STEP 1.**
2. Position the tank inside the main frame as shown in the illustration, **STEP 2.**
3. Assemble the landinggear to the main body.



You will need:
Loctite 243 = blue
Grease = yellow

Main drive assembly

Main drive assembly is preassembled at the factory.
Disassembling is not required.
Just remove **4*A=M2.5x6mm screw and 4*B=M3x6mm** add loctite 243 and screw back.



You will need:
Loctite 243 = blue

Tail boom to main frame assembly

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

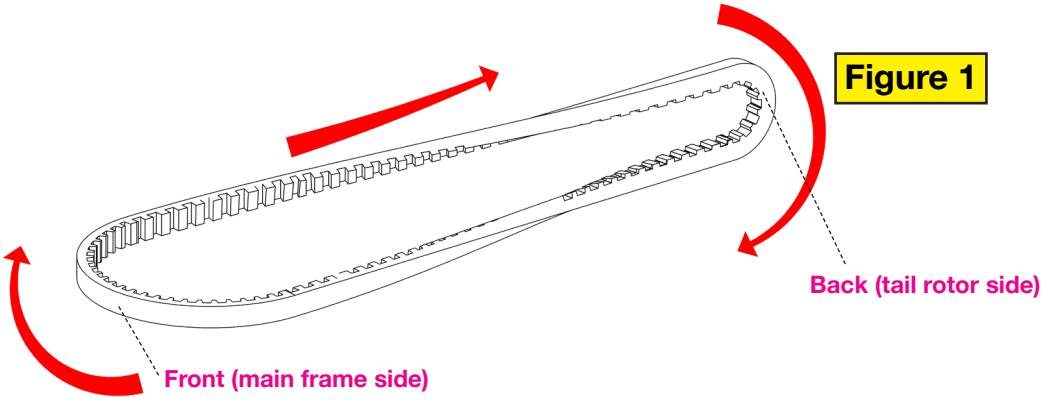
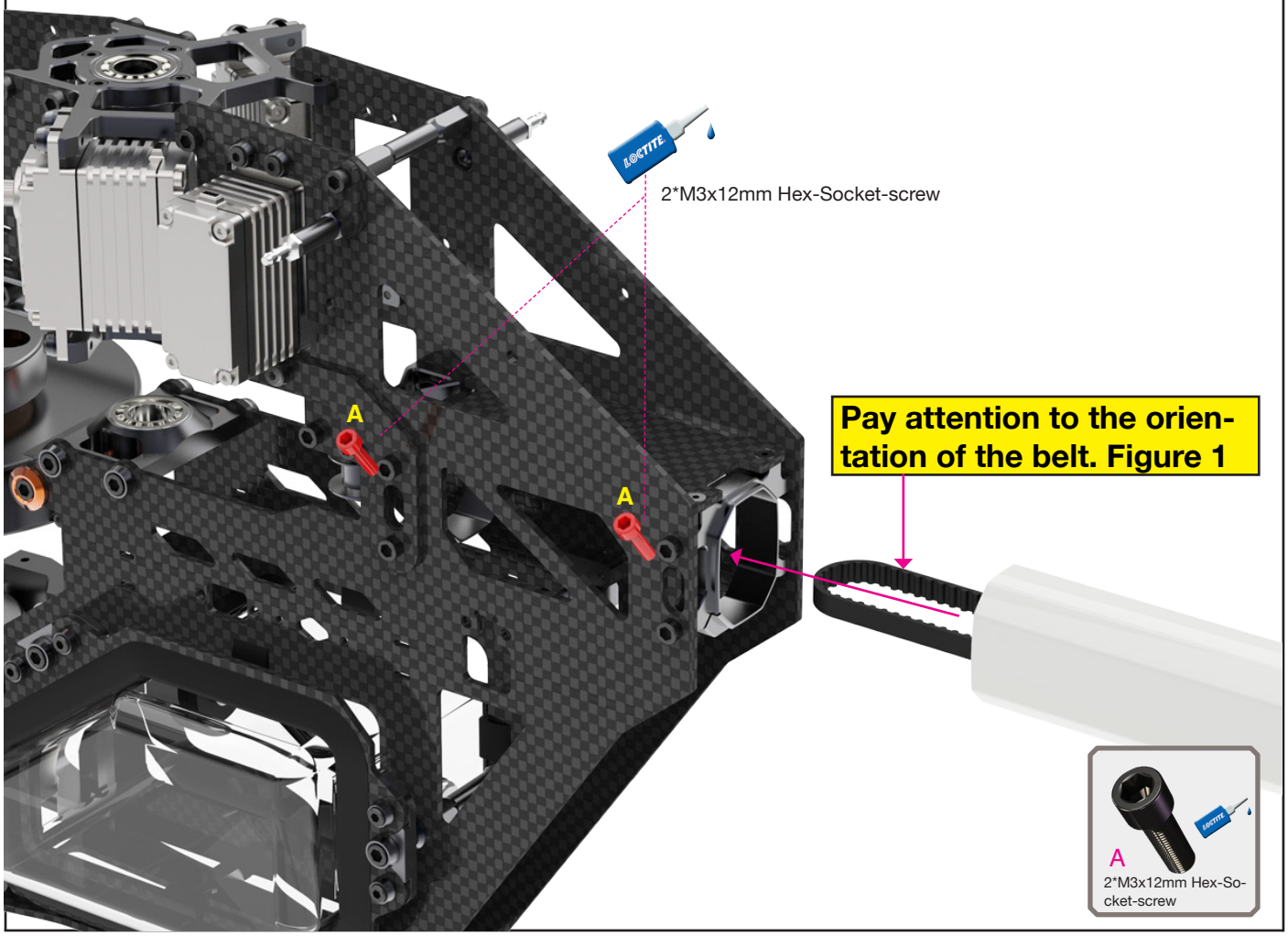


Figure 1

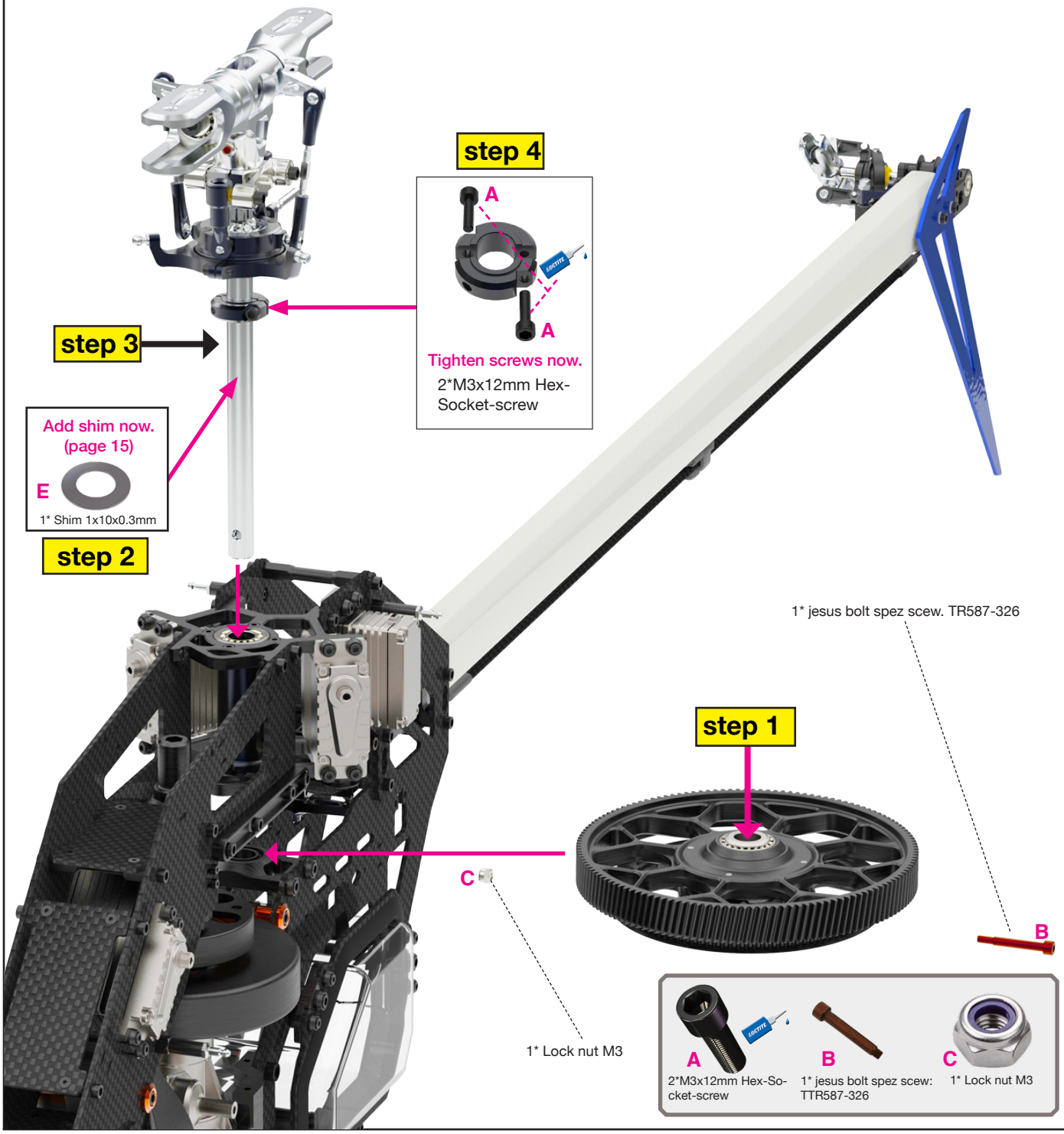
1. Insert boom as shown into the tail boom clamps, pay attention to the corect orientation of the tail belt.
2. Slide the belt through the idler pulleys from the belt tensioner, use a cable tie for help.
3. Pull the tail belt over the front belt drive pulley.
4. Pull the boom backwards and apply tension to the belt.
5. Tighten the boom clamp screws with screw **A**. Add loctite 243 / blue!
6. Ensure the tail is rotation in the corect direction when turning the main rotor head clockwise. (Figure1)
7. Apply (3) turns on the belt tensioner set screw. **See also page 51.**



You will need:
Loctite 243 = blue

Head and main drive

1. Insert main gear assembly into frame = step 1
2. Insert rotor head assembly through bearing support tube, **dont forget to add shim E** = step 2 and 3.
3. Make sure your main shaft glide true the one way bearing sleeve and line up with the jesus bolt screw holes.
4. Insert jesus bolt screw, **B** and secure it with the M3 nut lock, **C**
5. Move down the main shaft collar to have zero up and down play on the rotor head assembly, then tighten screw **A** step by step = step 4.
6. Make sure to have an equal gap on the collar to achieve best holding results for the main shaft= step 3

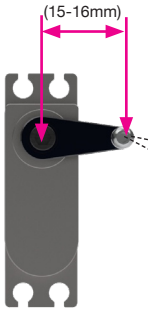


You will need:
Loctite 243 = blue

Mini size cyclic servo

We offer two options for the cyclic servo setup.
If you choose to use mini cyclic servos, install the CNC mini servo adapter (**TR561-125**) included in the kit for the two front servos, **(pitch and aileron).**
Use the compatible rear main frame designed with the cutout for mini cyclic servos.

Mini size elevator servo



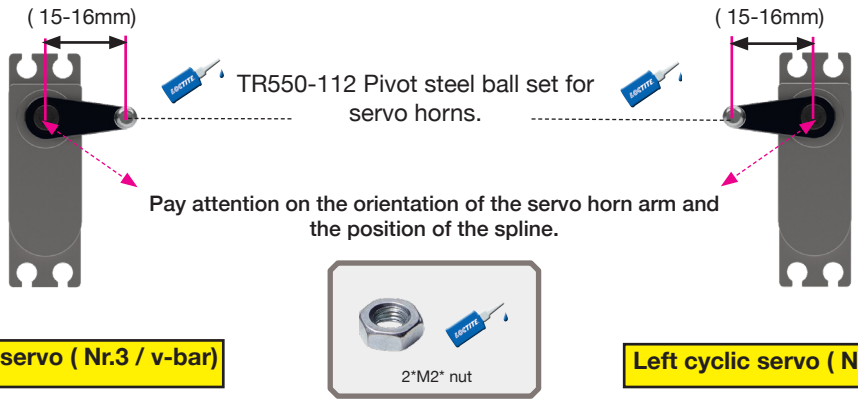
1. Servo horn position at 90 degree and ball link length for FULL SIZE ELEVATOR SERVO.
2. Please note: The length of the servo horn ball link may vary slightly depending on the servo manufacturer and the flybar manufacturer brand.

1* Nut M2

TR550-112 Pivot steel ball set for servo horns

1* Nut M2 for secure pivot steel bal

Mini size pitch and aileron servo



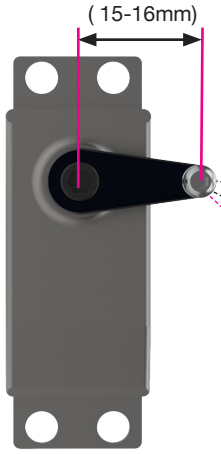
Right cyclic servo (Nr.3 / v-bar)

Left cyclic servo (Nr.2 / v-bar)

You will need:
Loctite 243 = blue

Full size cyclic servo

Full size elevator servo



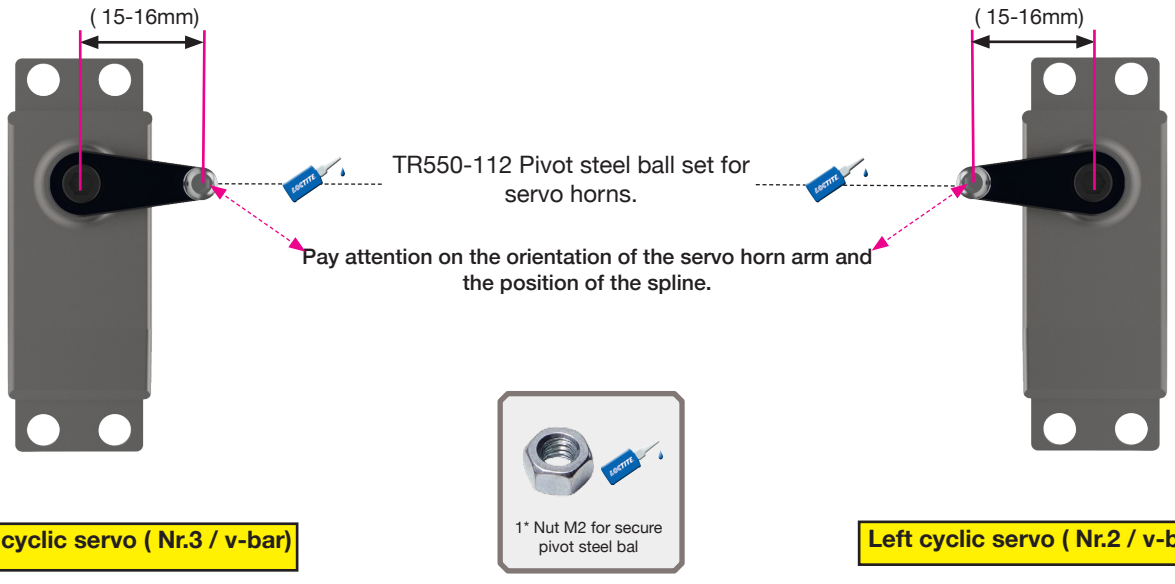
1. Servo horn position at 90 degree and ball link length for **FULL SIZE ELEVATOR SERVO.**
2. Please note: The length of the servo horn ball link may vary slightly depending on the servo manufacturer and the flybar manufacturer brand.

1* Nut M2

TR550-112 Pivot steel ball set for servo horns

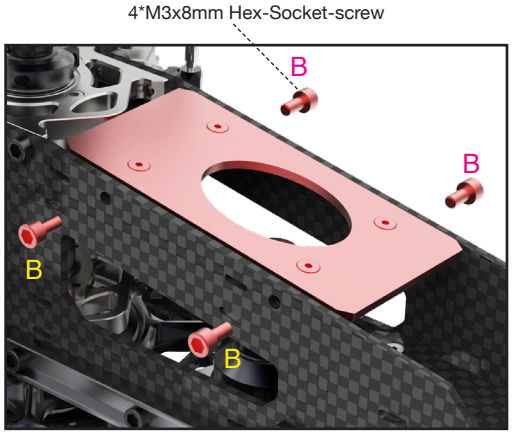
Pay attention on the orientation of the servo horn arm and the position of the spline.

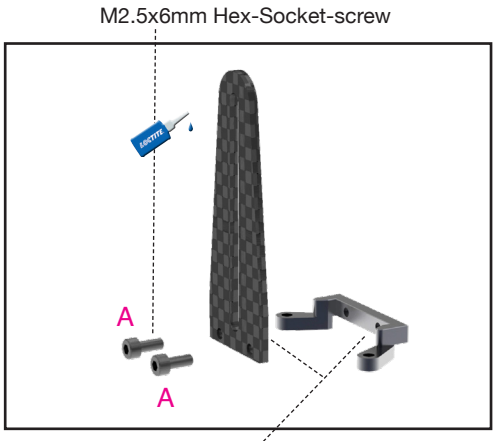
Full size pitch and aileron servo



You will need:
Loctite 243 = blue

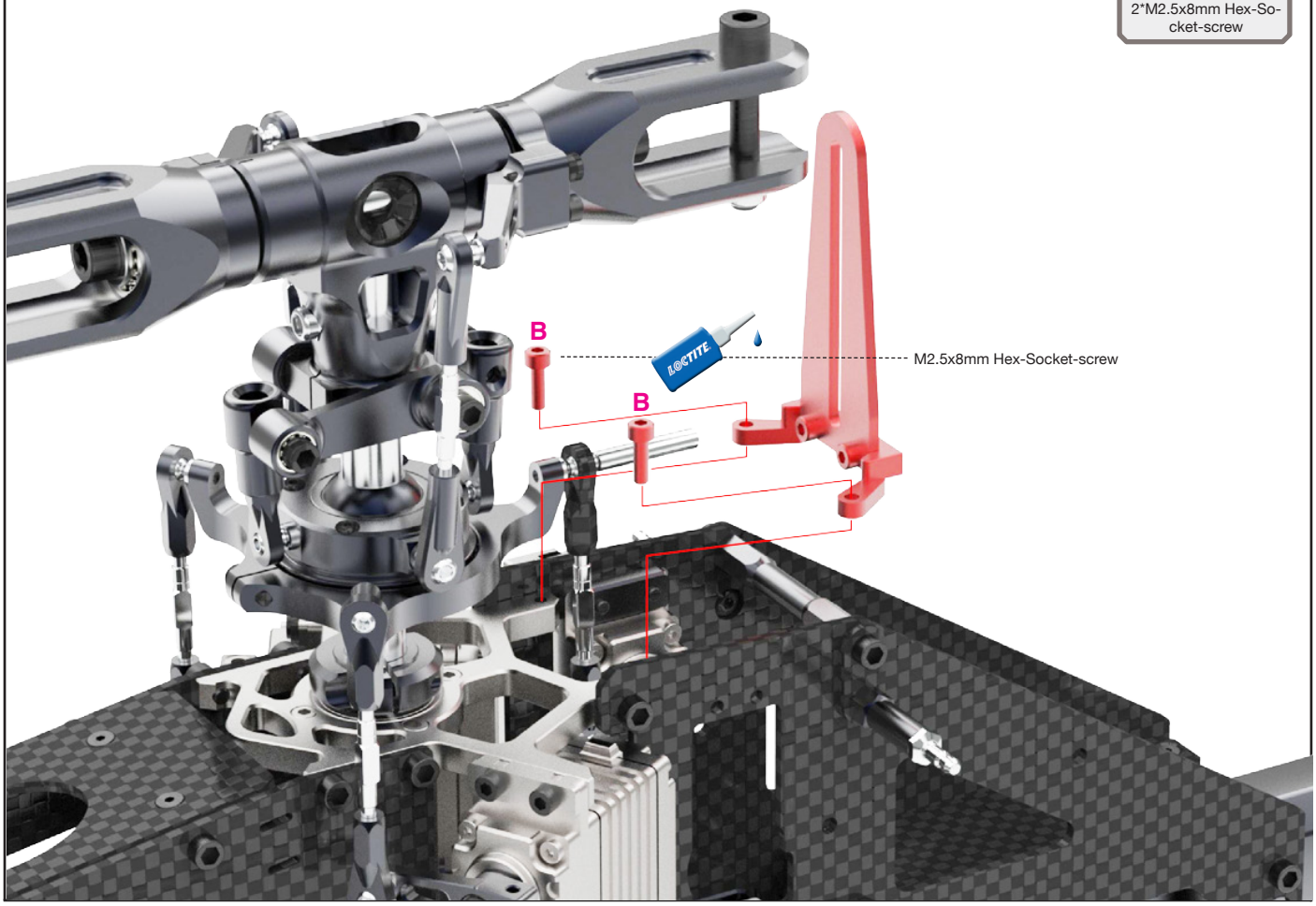
Anti rotation guide





TR550-202 Anti rotation guide.

Tech tip!
Do not apply thread locker (Loctite) to the B-type screws at this stage. You may want to remove the carbon cover plate while wiring your electronics for easier access.

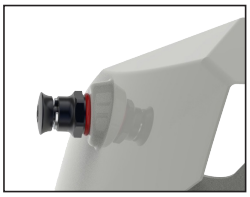


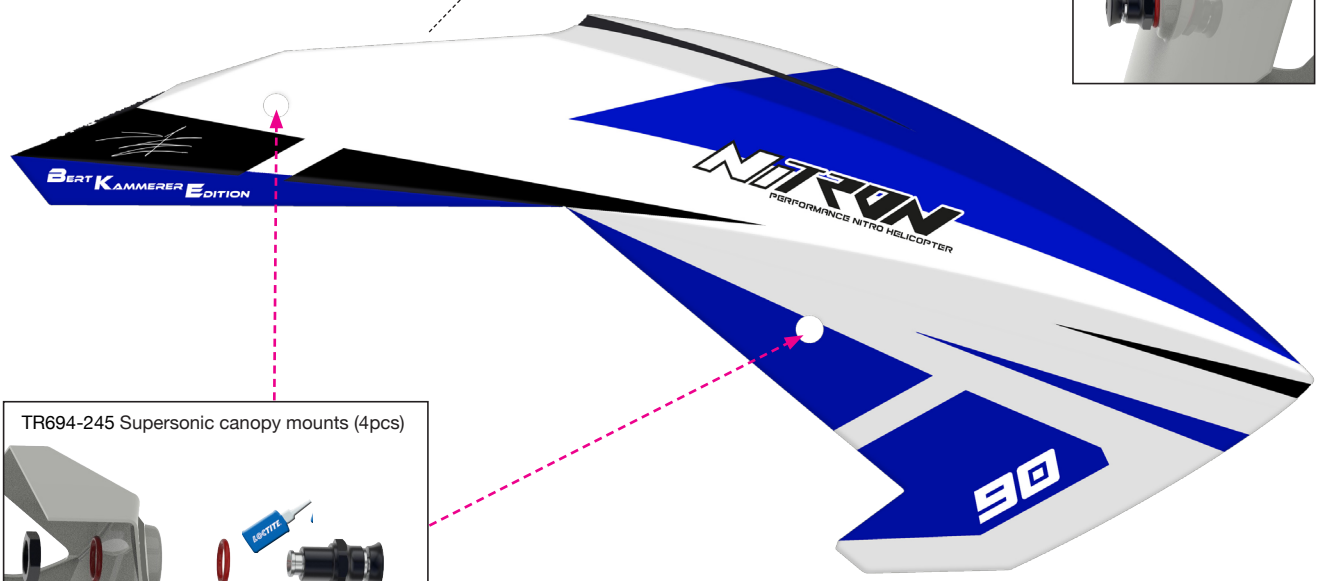
You will need:
Loctite 243 = blue

Supersonic /canopy

1. **Enlarge the real canopy holes to (9mm) use a propper canopy reamer!**
2. **Assemble the supersonic mounts as shown in the illustration (use loctite to secure the nuts)**

Canopy NiTron 90 BK Edition TR692-153.





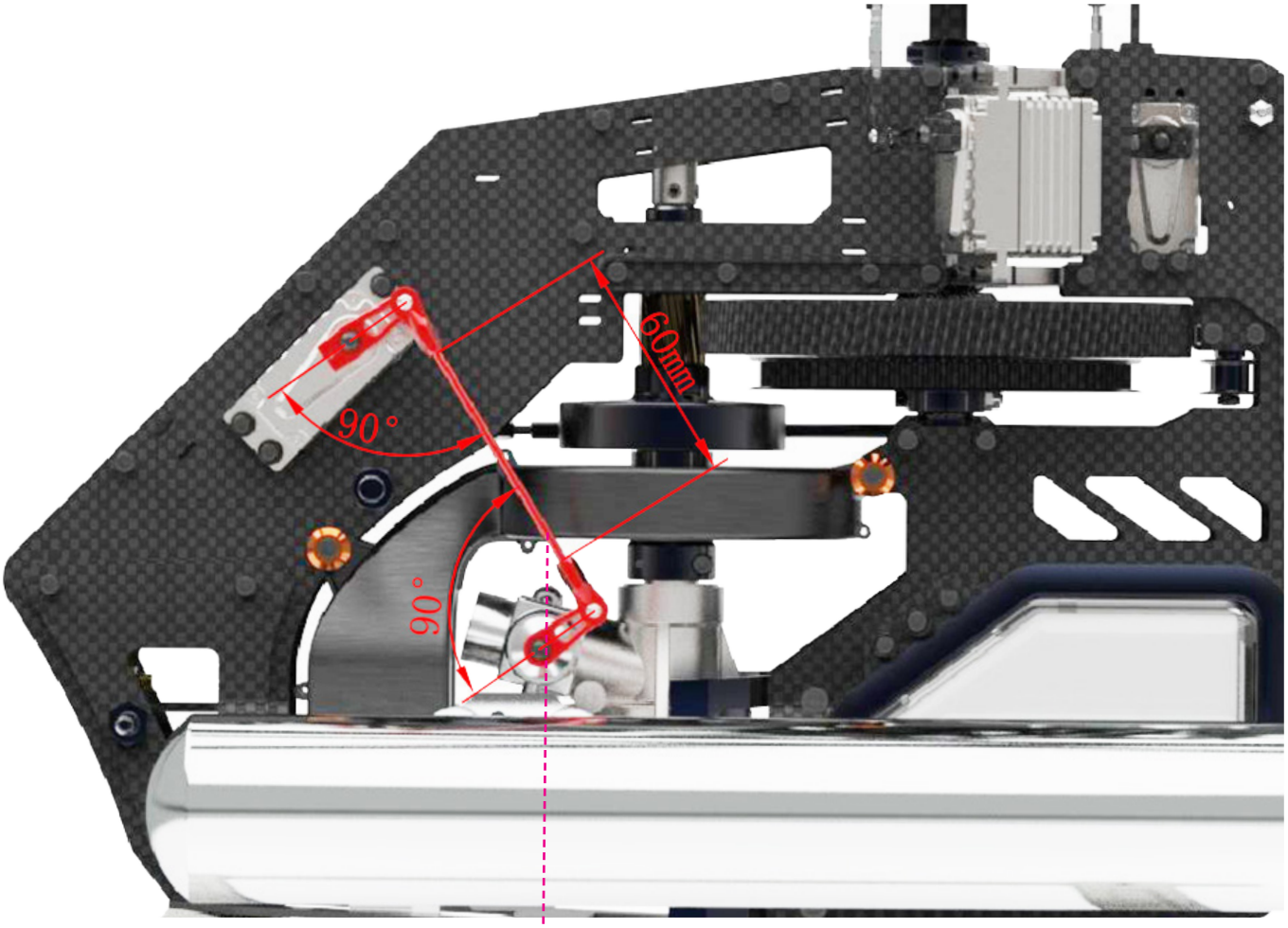
TR694-245 Supersonic canopy mounts (4pcs)

Use a canopy reamer to enlarge the holes to fit the supersonic canopy mounts.

You will need:
Loctite 243 = blue

Throttle servo linkage

1. **Assemble the throttle servo linkage, ensuring a gap of approximately 60mm between the two linkage points.**
2. **Attach the throttle servo horn and the engine servo horn according to the configuration shown in the rendering.**
3. **Adjust your transmitter (TX) settings accordingly to ensure proper operation of the throttle servo and engine servo.**



TR690-515Tail and throttle rod assembly

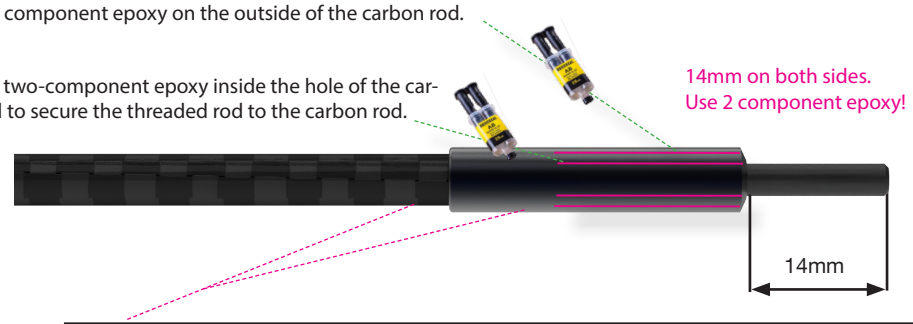
You will need:
2 component epoxy

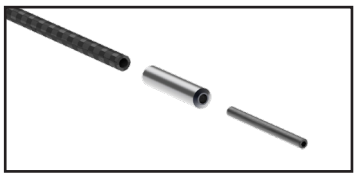
Tail servo linkage

Apply a two-component epoxy to glue the thread into the tail push rod and the shell on the outside of the rod. This double safety measure ensures that the thread cannot turn if you adjust the ball-link after the assembly has fully hardened.

Apply 2 component epoxy on the outside of the carbon rod.

Apply a two-component epoxy inside the hole of the carbon rod to secure the threaded rod to the carbon rod.

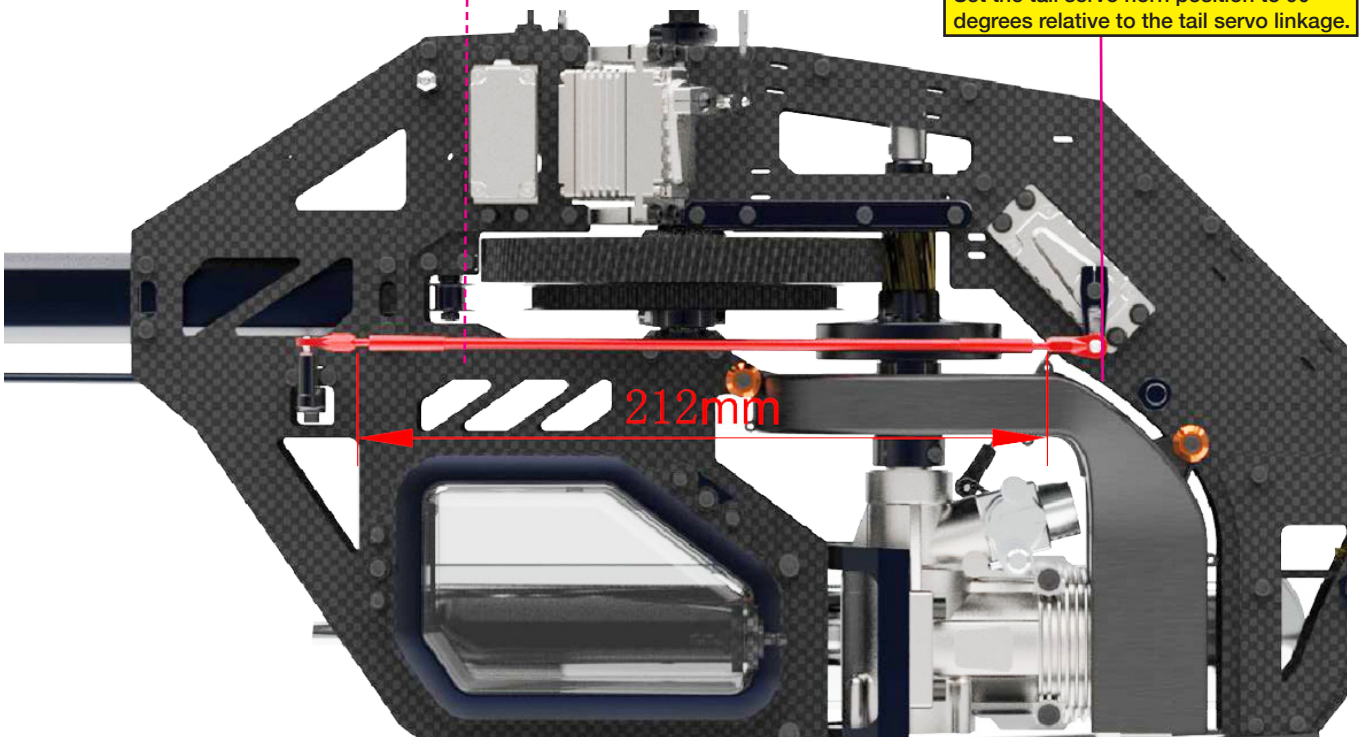




Ensure that the assembly remains stationary while drying. Secure it on both sides to prevent any movement.

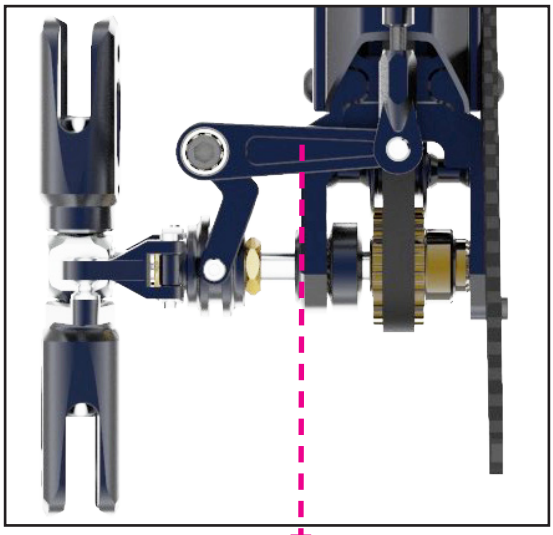
TR690-515Tail and throttle rod assembly

Set the tail servo horn position to 90 degrees relative to the tail servo linkage.



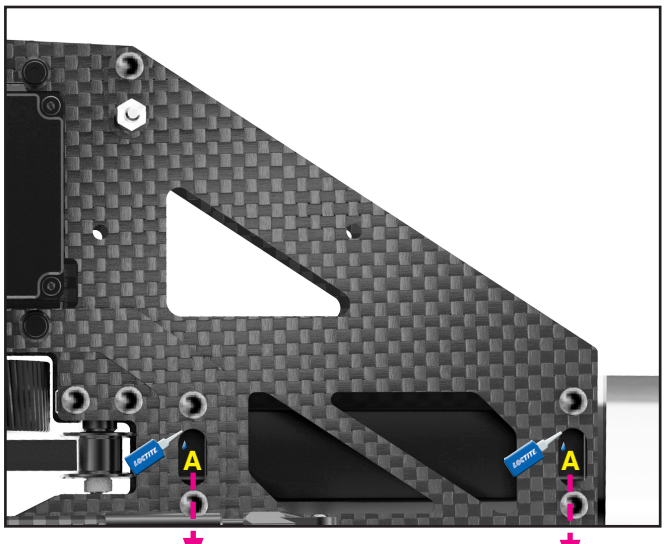
Final setup and pre-flight check

Tail rotor linkage setup.



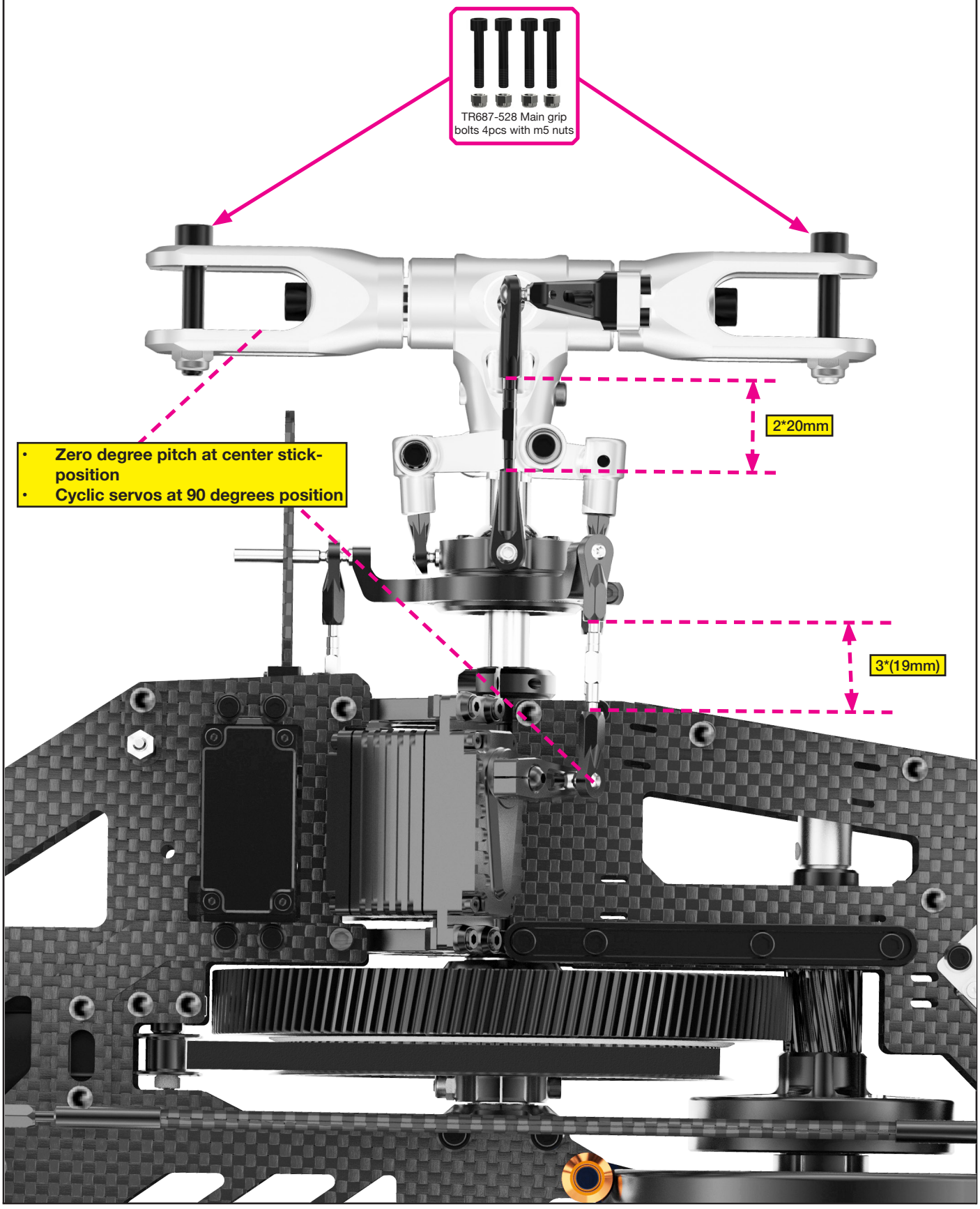
For best tail authority performance adjust center position of your tail pushrod linkage (tail servo) same as shown in the illustration (90°) degree.

Belt tension setup.



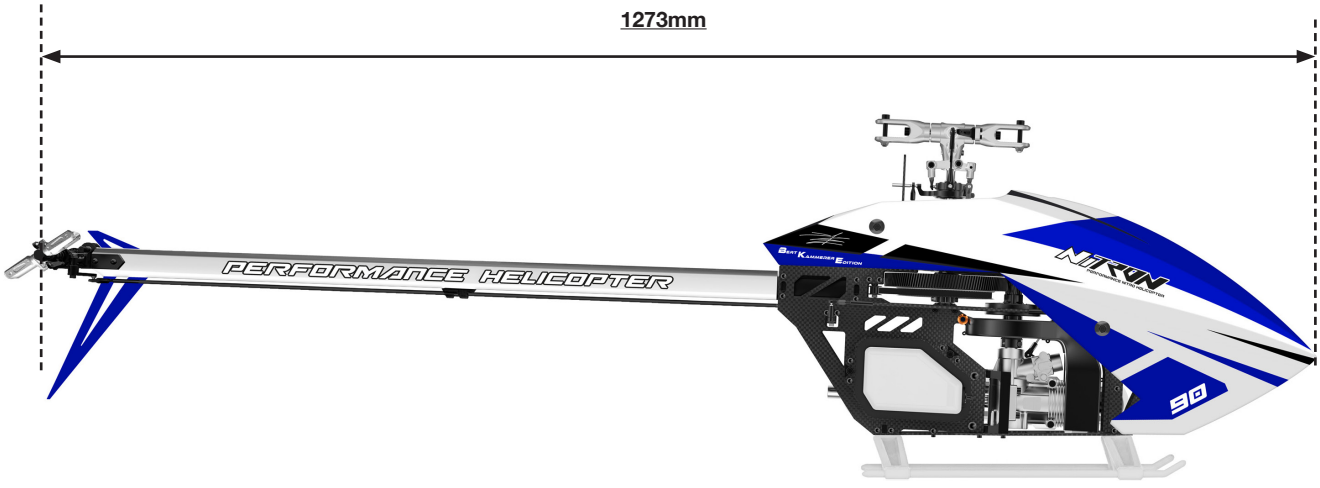
Tighten the tail belt by pulling the tail boom backward. Apply thread locker (Loctite) to the A-type screws and securely tighten them.

Final Setup and Pre-Flight Check



Dimensions and wheight

1. Dry weight = (1780 grams) without blades and electronics
2. Width = 205mm
3. Height = 365mm
4. Length = 1273mm
5. Max main blade size = 705mm
6. Max tail blade size = 115mm



Preflight Check and Gear Ratios

1. Make sure your battery supply for your electronics is fully charged, monitor draw to ensure your supply is always safe.
2. Inspect your blades for possible damage and ensure they are tight.
3. Inspect your linkages to make sure they are all in place and not have been popped off turing transport of your model.
4. Confirm that the FBL unit is correctly setup and initialized.
5. Make sure your canopy is secured safely.
6. If you are a beginner, always seek advice by a experienced pilot, especially for your first flight.

Recommended head speeds

Flying styles	Head speed
Beginner and sport flying	1700-1800 rpm
Advanced sport, 3D flying	1800-1950 rpm
Hardcore 3D flying.	1950-2000 rpm

Regular Checks and Maintenance

Regular maintenance is essential for nitro-powered helicopters due to their higher vibration levels compared to electric-powered models. Follow these guidelines:

Bolt Inspection: Regularly check that all bolts remain tight. Due to the increased vibrations, the use of high-quality thread lock is strongly recommended.

Ball Link Wear: Ball links will wear out over time, particularly the two links connecting the swashplate to the blade grips. Inspect these frequently and replace them if any slop develops.

Muffler Screws: Tighten muffler screws after the first few flights, as heat and vibrations tend to cause them to loosen.

Fuel Filter: Install a fuel filter in your tubing, including the tank-to-engine line and/or refill tube, to ensure clean fuel delivery.

Dampener Wear: Tail and head dampeners degrade over time. Replace them if the rubber shows excessive wear or deterioration.

Main and tail rotor gear ratios.

	Main gear	Pinion	Ratio	Tail drive	Tail	Ratio	
INCLUDED IN KIT	**137**	**17T**	**8.05**	101T	18T	5.31	
				101T	**20T**	**5.05**	**INCLUDED IN KIT**

Contact:
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tronhelicopters.com