

SYNERGY 766

ASSEMBLY MANUAL AND PART REFERENCE



WWW.SYNERGYRCHELICOPTERS.COM

MANUAL VERSION 5.1.19



Components that are factory assembled provide a reference for model assembly. Disassembly and application of thread lock is required where indicated.

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Congratulations on your purchase of the **Synergy 766** model helicopter kit!

The **Synergy 766** was designed and developed by Matt Botos, a world class competition model helicopter pilot, and is the result of thousands of hours of research and experience.

Before you proceed please verify you have the latest version of this manual by visiting our website at <http://synergrychicopters.com/manuals>. If you have any questions during the assembly process or need clarification on anything in this manual please visit our forums at <http://synergrychicopters.com/forum> where you will find great tips and expert advice.

THIS RADIO CONTROLLED HELICOPTER IS NOT A TOY. IT IS A SOPHISTICATED PIECE OF EQUIPMENT DESIGNED AND INTENDED FOR RECREATIONAL USE ONLY. IF NOT PROPERLY ASSEMBLED, MAINTAINED, AND OPERATED, IT IS CAPABLE OF CAUSING PROPERTY DAMAGE AND BODILY HARM TO BOTH THE OPERATOR AND SPECTATORS. BOTOS DESIGN & DISTRIBUTION, ITS AFFILIATES, AND ITS AUTHORIZED DISTRIBUTORS ASSUME NO LIABILITY FOR DAMAGE THAT COULD OCCUR FROM THE ASSEMBLY OR USE OR MISUSE OF THIS PRODUCT. USE THIS PRODUCT AT YOUR OWN RISK.

Operating a model helicopter requires a high degree of aptitude and meticulousness. If you are new to model helicopters, it is your responsibility to seek help and guidance from experienced modelers. Having an experienced modeler inspect your model and provide instruction will both greatly speed up the learning process and make it much safer for you. For those pilots who will be operating their **Synergy 766** in the United States, we strongly recommend joining the AMA. The AMA is a non-profit organization that provides services to the model aircraft pilots. As an AMA member, you will receive a liability insurance plan to cover against a possible accident or injury. All AMA charter clubs require individuals to hold a current AMA membership prior to operation of their models at their facility. For further information, you can contact the AMA at:

Academy of Model Aeronautics
5151 East Memorial Drive
Muncie, IN 47302
(800) 435-9262
<https://www.modelaircraft.org>



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SPECIFICATIONS:

- Main Blades: 716-806mm
- Available Main Gear Ratio: 9.27-11.58*
- Available Tail Gear Ratios: 4.5 / 4.7 / 5.1*
- Available Boom Sizes: 716 / 766 / 806*
- Tail blades: 106-116mm
- Battery Configuration: 12s-14s
- 64mm frame width

*This kit includes the following:

- 13T main pinion
- 4.7 tail ratio (27T Pinion). See page 8.
- Boom, torque tube, and tail control rod lengths optimized for 766mm main blades. See pages 64-67 for specific sizes.

Optional parts are available from the Synergy RC Helicopters website at <http://www.mattbotos.com/store>.

Main and tail blades are not included.

MAIN FEATURES:

- CNC Machined Helical mod 1 main and auto gears
- Monster-mod 1.25 24T front and rear tail drive bevel gears
- Torque tube tail drive for high efficiency
- Ultra-wide head for rigid, precise control
- Tunable blade grip pitch arm geometry
- 12mm Main Shaft / 10mm Spindle & rocker support
- Dual main shaft thrust bearings
- Serviceable dual-bearing swash plate system
- Quad progressive & adjustable head dampening
- Turnbuckle linkage adjustments
- Low disk loading
- Multiple tail drive ratios
- Locking battery tray with CG adjustment
- Optimized tail arm geometry
- Optimum boom options for each blade size
- 3 panel canopy system with high-visibility paint
- Grease ports for all 6 thrust bearings
- CNC Machined Delrin gears
- Designed and supported in the U.S.A



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DO NOT TIGHTEN BOLTS YET

Frame alignment should be verified once both sides are completely assembled and the main shaft inserted. Unless noted otherwise, do not fully tighten these bolts yet.

101-306 M3x6 Button Head

305-106 Break Away Plate

305-121 Key Chain Canopy Mount 21mm

766-104 Frame Spacer Standard

766-106 Battery Tray Rail

ORIENTATION



DO NOT OVER TIGHTEN!

Bolts threaded into the Delrin Battery Tray Rail require very little holding torque. Do not over tighten or you will strip the threads.

100-351 M3 Nylock Nut

101-306 M3x6 Button Head

100-308 M3x8 Socket Head

766-103 Main Frame

766-107 Panel Standoff Short

(Medium Viscosity)

(Medium Viscosity)

100-306 M3x6 Socket Head

(Medium Viscosity)

100-372 M3x12 Set Screw

766-108 Panel Standoff Long

(Medium Viscosity)

100-306 M3x6 Socket Head



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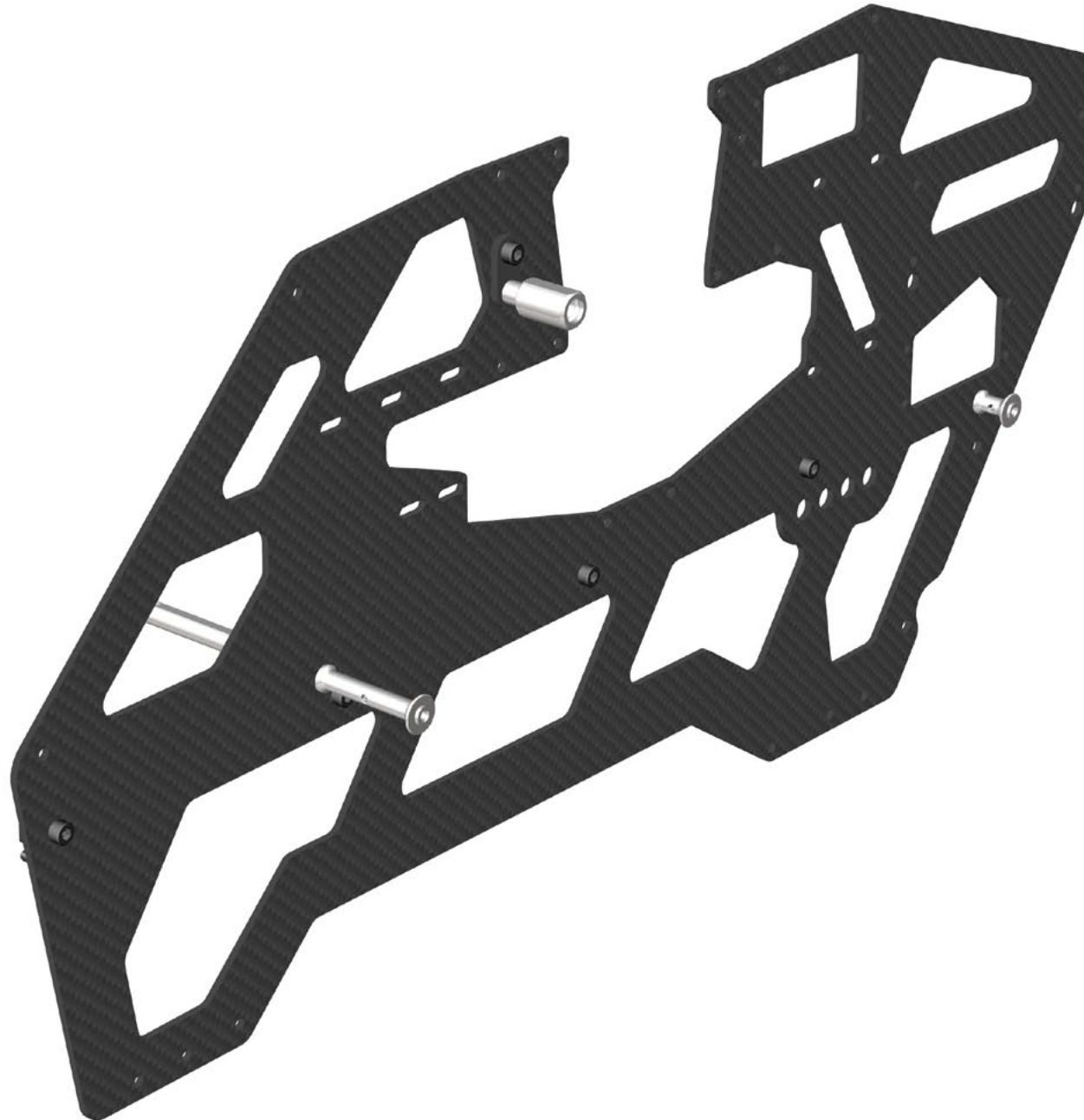
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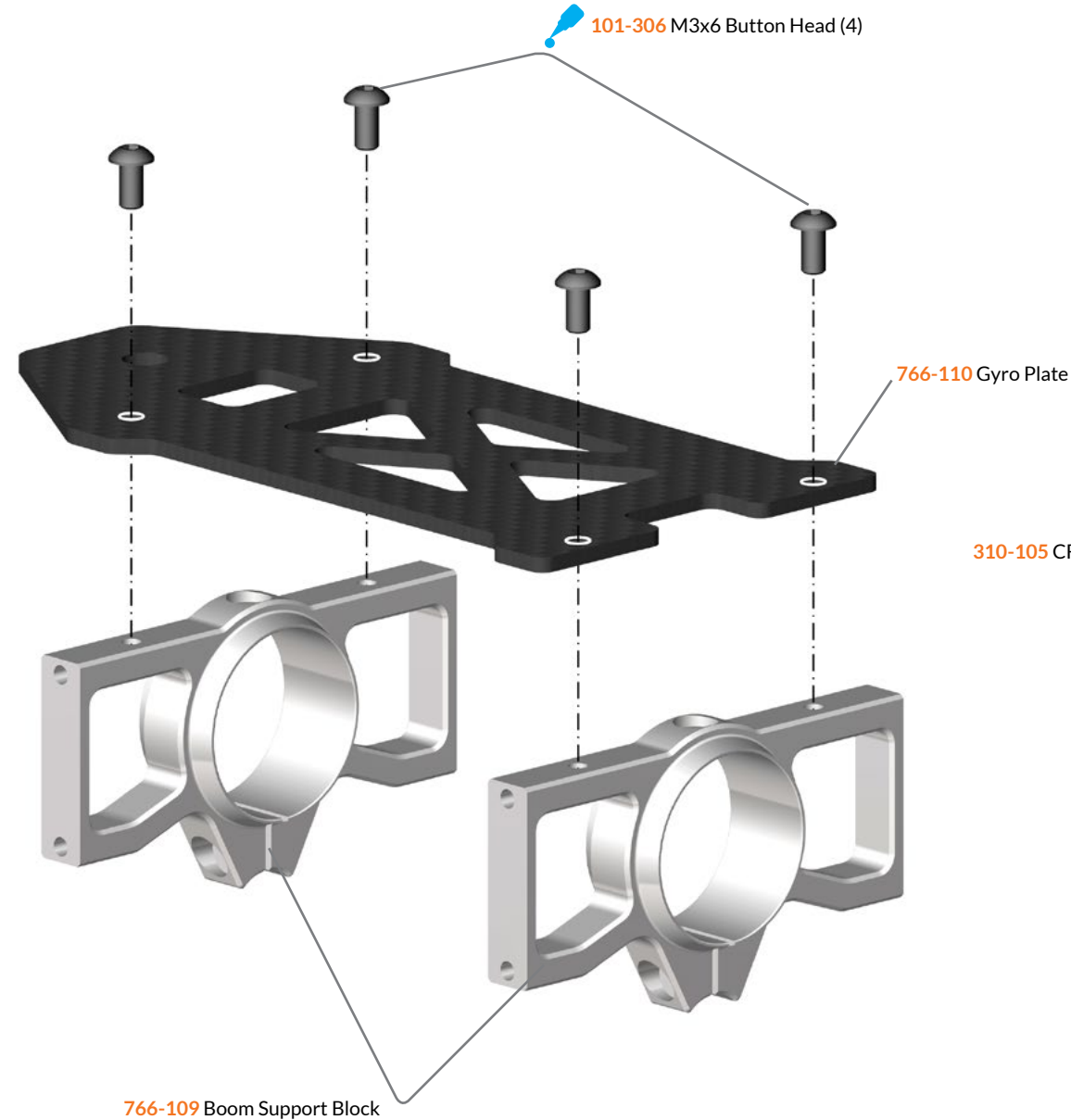
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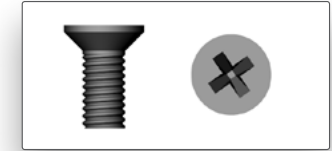
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TIGHTEN THESE 4 SCREWS

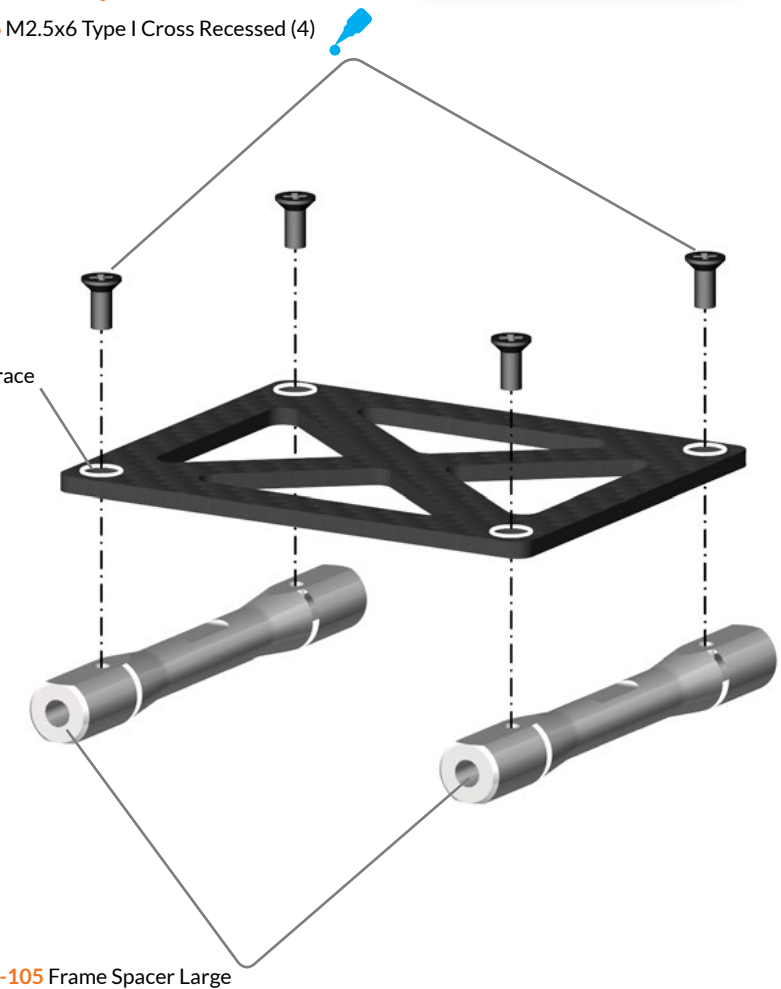
Apply BLUE thread lock to these four (4) screws and tighten fully.



103-256 M2.5x6 Type I Cross Recessed (4)

310-105 CF Lower Frame Brace

766-105 Frame Spacer Large





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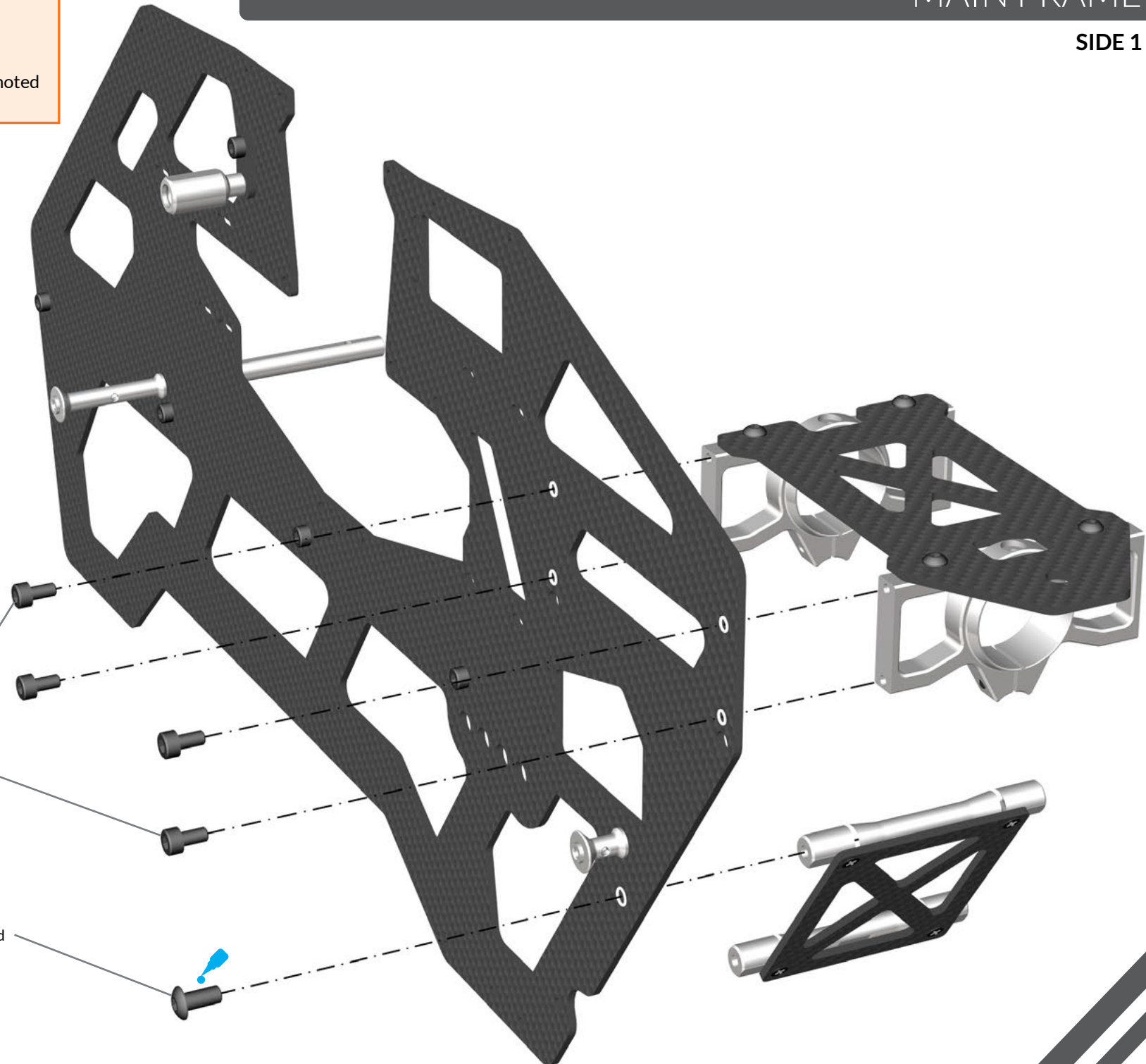


APPLY BLUE THREAD LOCK TO INDICATED BOLTS



100-306 M3x6 Socket Head (4)

100-408 M4x8 Socket Head





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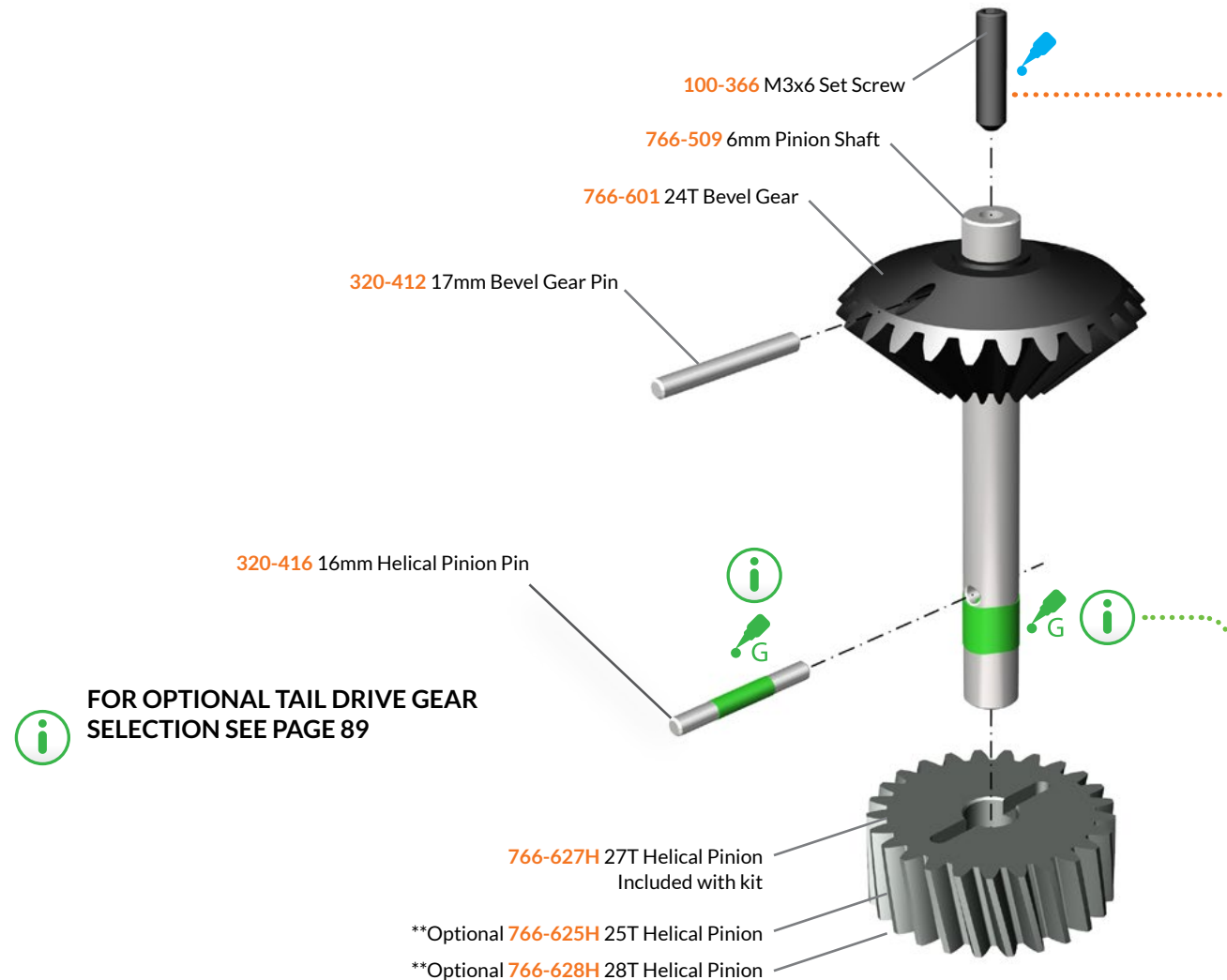
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STOP! **IMPORTANT**

Prior to assembly, thread set screw the entire length of the hole to check for burrs or other obstacles.

Tighten and secure set screw with blue thread lock. This set screw secures the bevel gear pin!



TAIL DRIVE GEAR INSTALLATION

GREEN thread lock secures the pin, gear, and shaft. RED can be used as an alternative retainer. Wipe away excess. Removal may require heat.

**Allow Thread lock to dry prior to installation on the following page. Failure to do so may allow thread lock to wick into the bearings.





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FRONT MUSHROOM BEARING BLOCK ASSEMBLY

766-507 Front Mushroom Gear Bearing Block

766-602 24T Mushroom Gear

108-124 12x18x4 Radial Bearing



PREASSEMBLED COMPONENTS

The 766-301 24T Front Trans Mushroom Gear Block contains radial bearings and mushroom bevel gear which does not require disassembly.

Tip: If repair or disassembly are required, freeze components to easily remove mushroom gear.

BEVEL GEAR BLOCKS

100-310 M3x10 Socket Head (2)

766-508 Gear Shaft Bearing Block

108-614 6x12x4 Radial Bearing

108-614 6x12x4 Radial Bearing

766-508 Gear Shaft Bearing Block

100-310 M3x10 Socket Head (2)



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APPLY BLUE THREAD LOCK TO INDICATED BOLTS AND SET SCREWS

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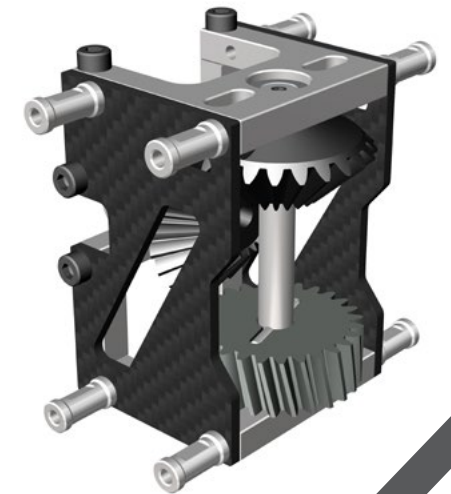
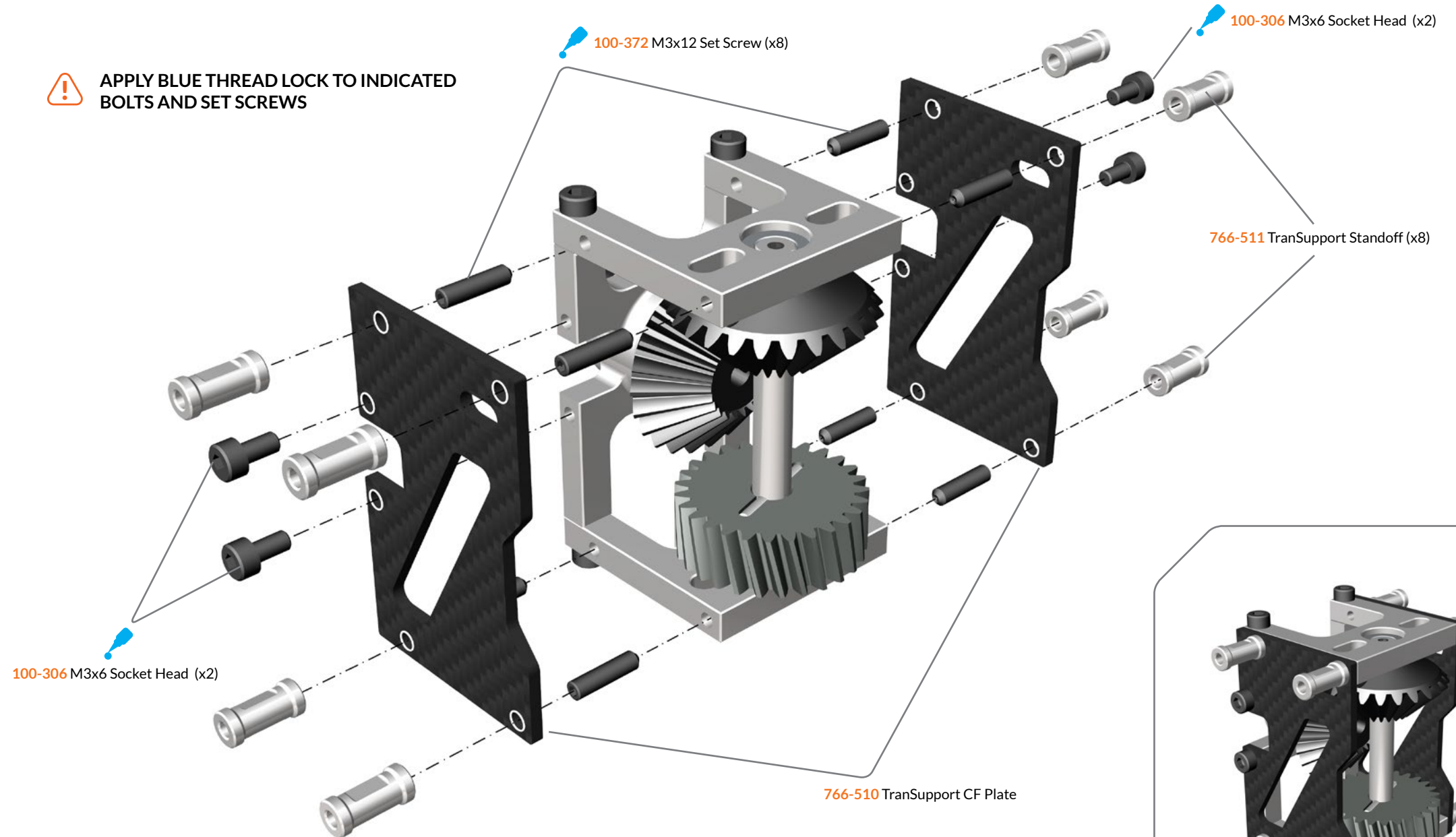
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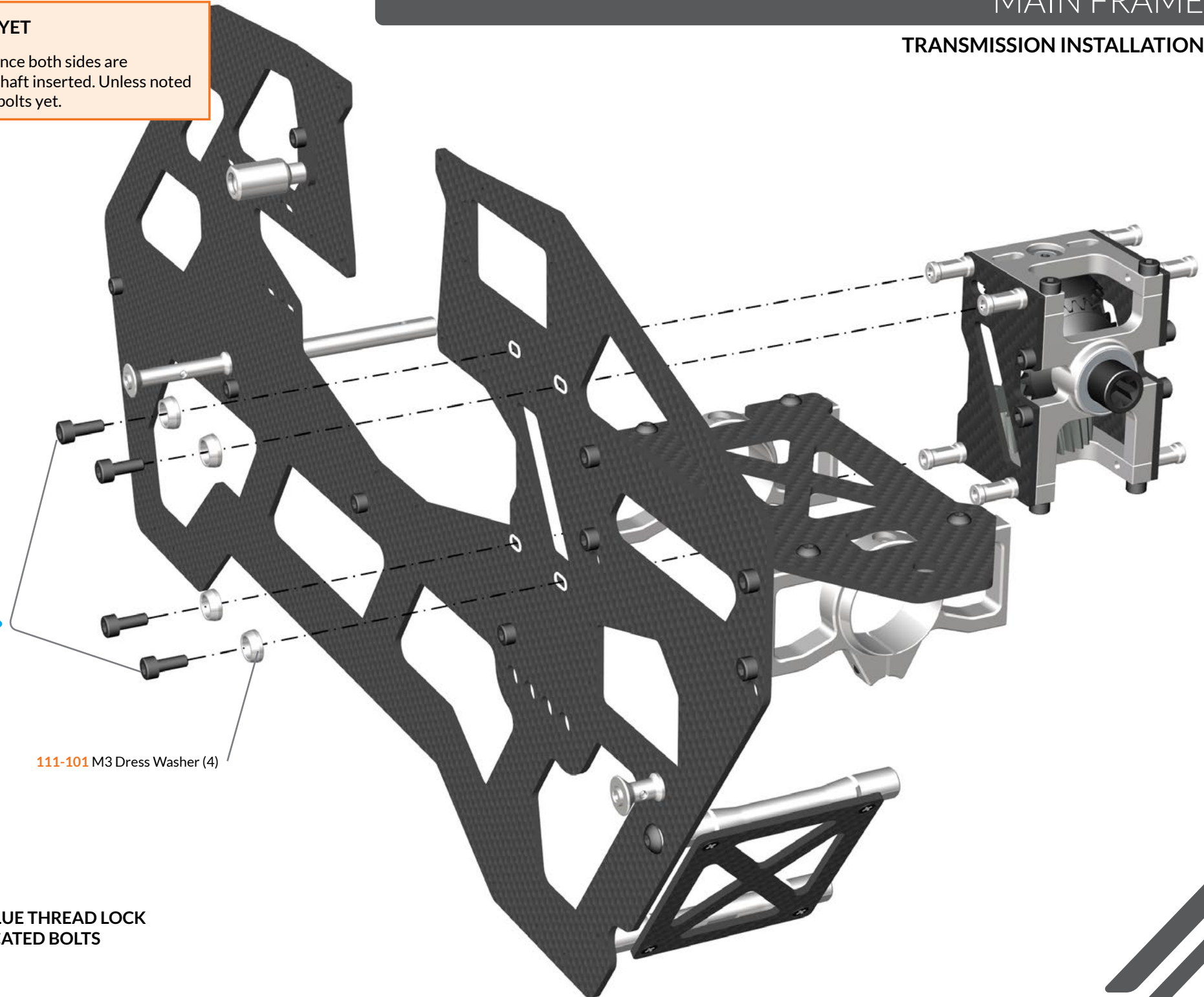
Frame alignment should be verified once both sides are completely assembled and the main shaft inserted. Unless noted otherwise, do not fully tighten these bolts yet.

100-308 M3x8 Socket Head (4)

111-101 M3 Dress Washer (4)



APPLY BLUE THREAD LOCK TO INDICATED BOLTS





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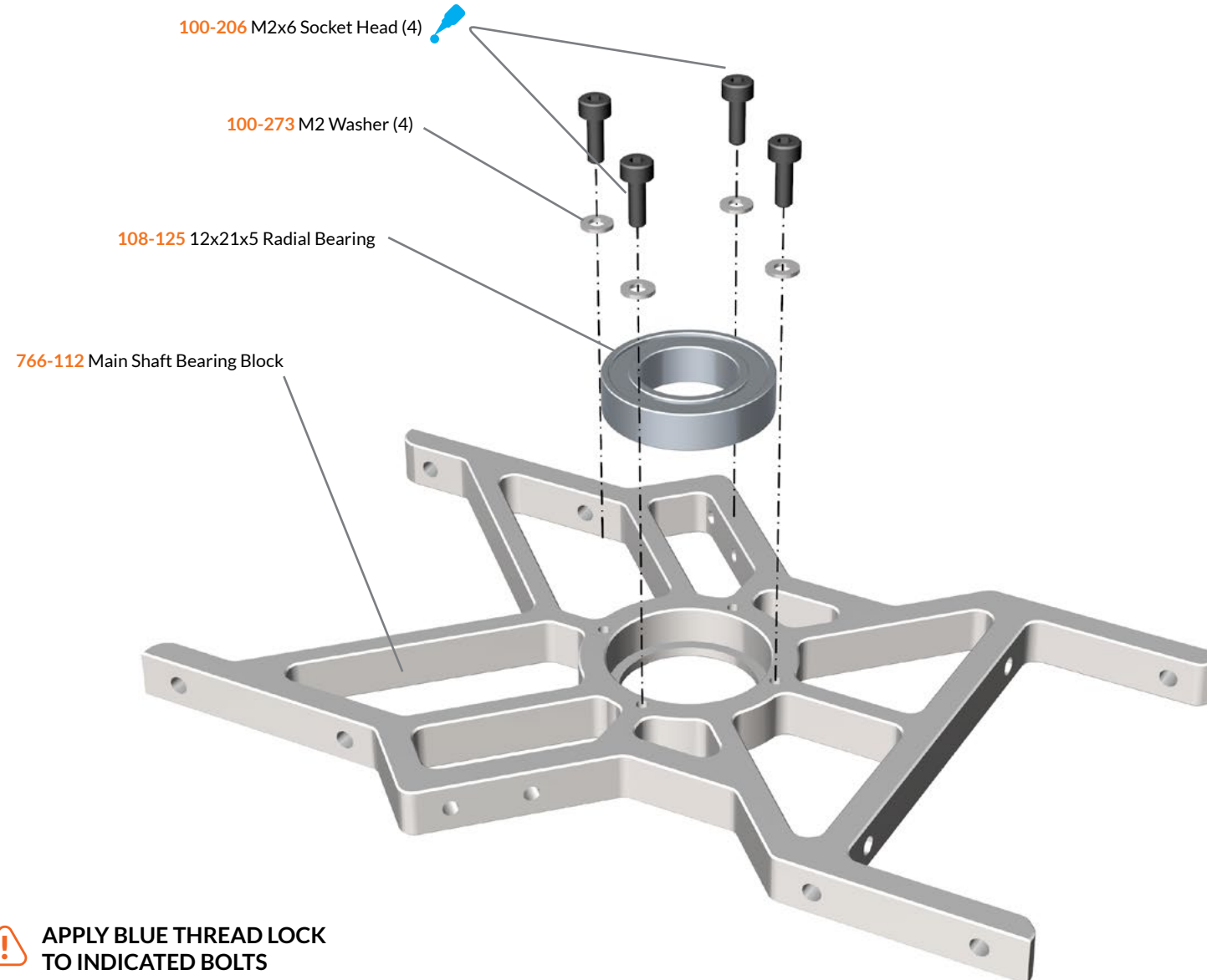
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APPLY BLUE THREAD LOCK
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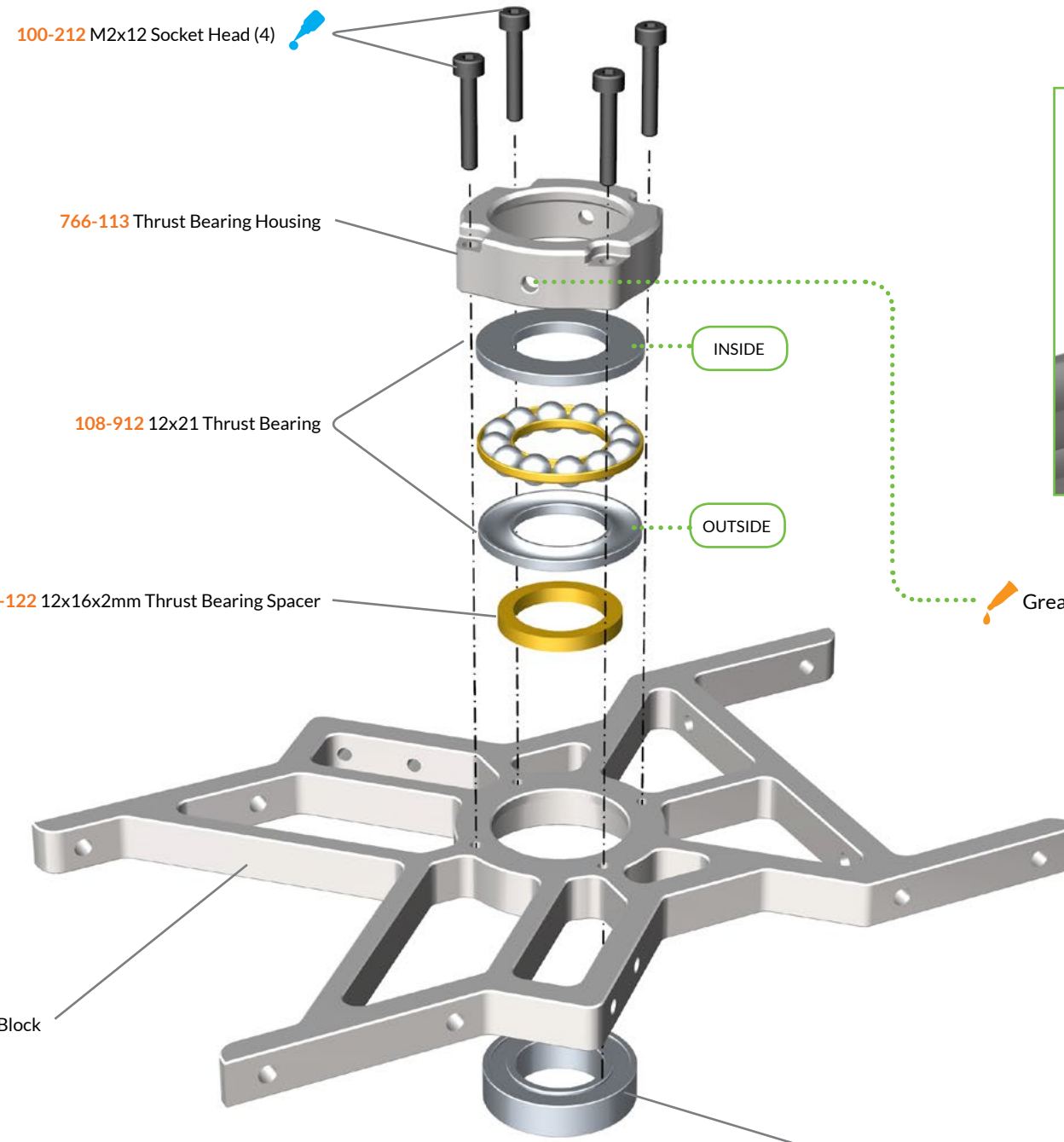
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MIDDLE BEARING BLOCK

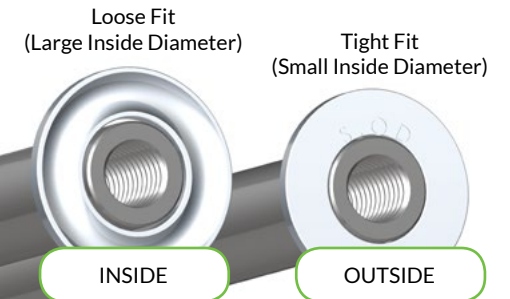


APPLY BLUE THREAD LOCK TO INDICATED BOLTS



THRUST BEARING TIP

Use the main shaft to help determine which sides are the inside and outside halves:



Grease port for maintaining the thrust bearing.

108-125 12x21x5 Radial Bearing
MAY REQUIRE REPLACEMENT AFTER CRASH



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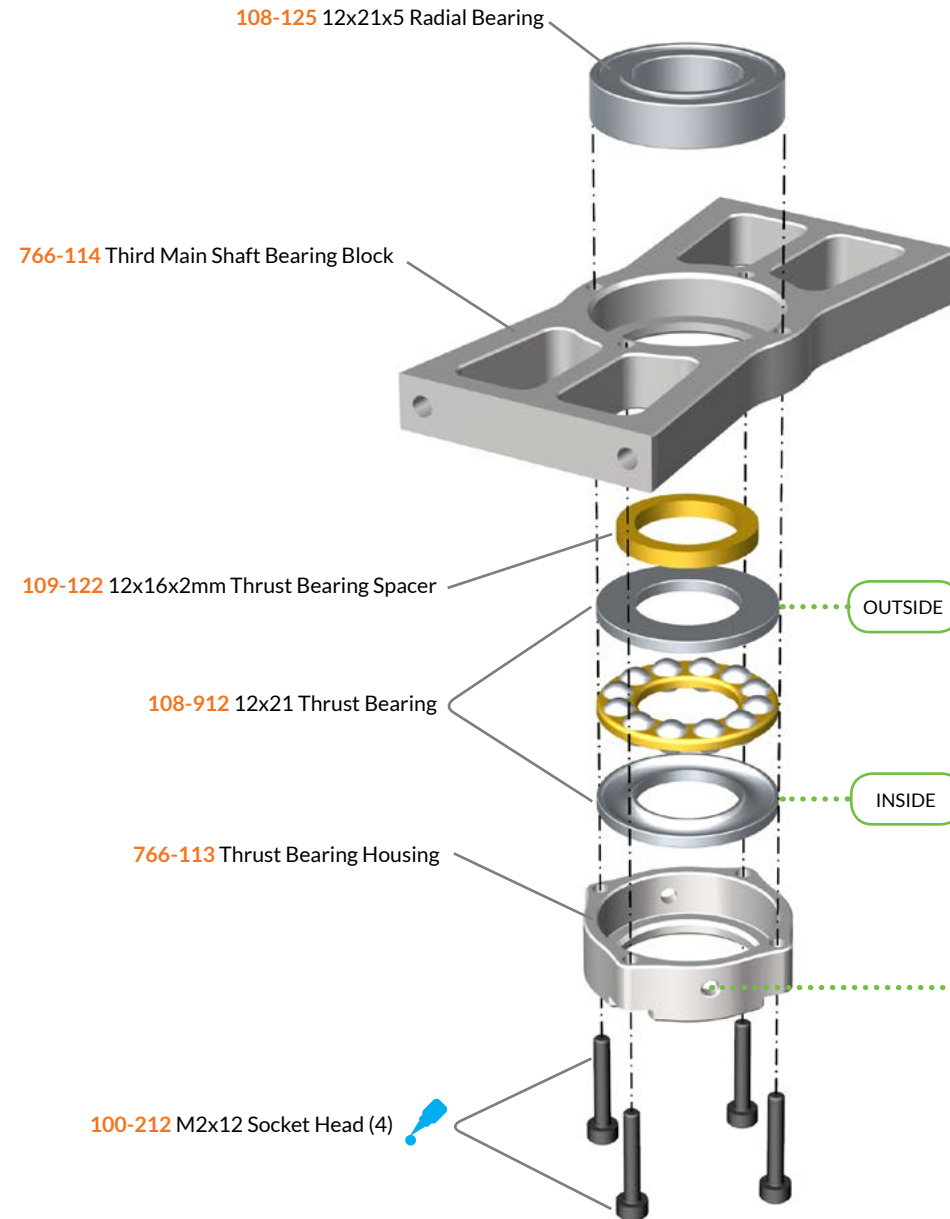
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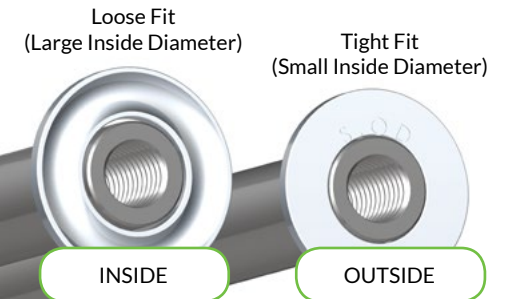


LOWER BEARING BLOCK



THRUST BEARING TIP

Use the main shaft to help determine which sides are the inside and outside halves:





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DO NOT TIGHTEN BOLTS YET

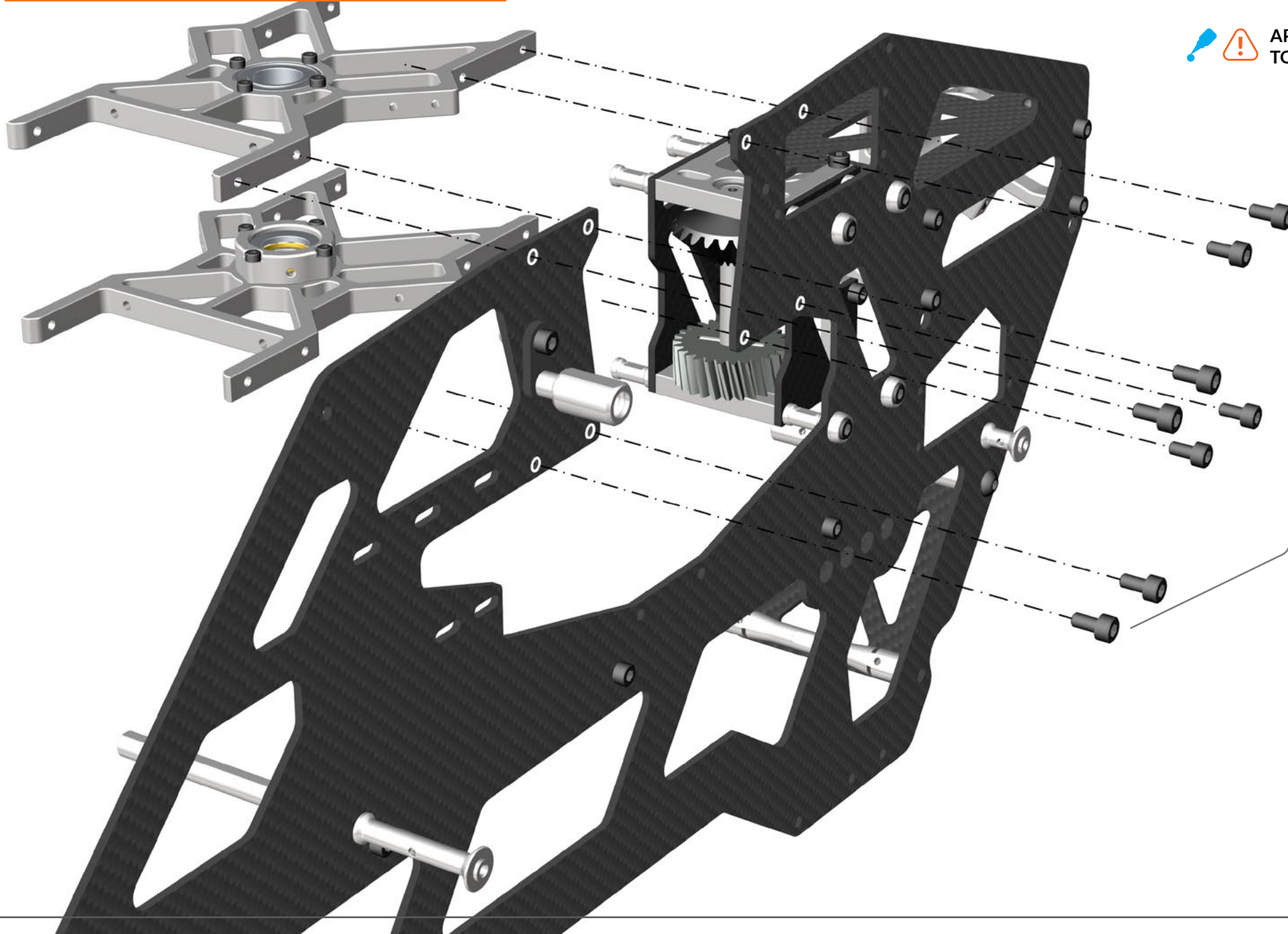
Frame alignment should be verified once both sides are completely assembled and the main shaft inserted. Unless noted otherwise, do not fully tighten these bolts yet.



APPLY BLUE THREAD LOCK TO INDICATED BOLTS



100-306 M3x6 Socket Head (8)





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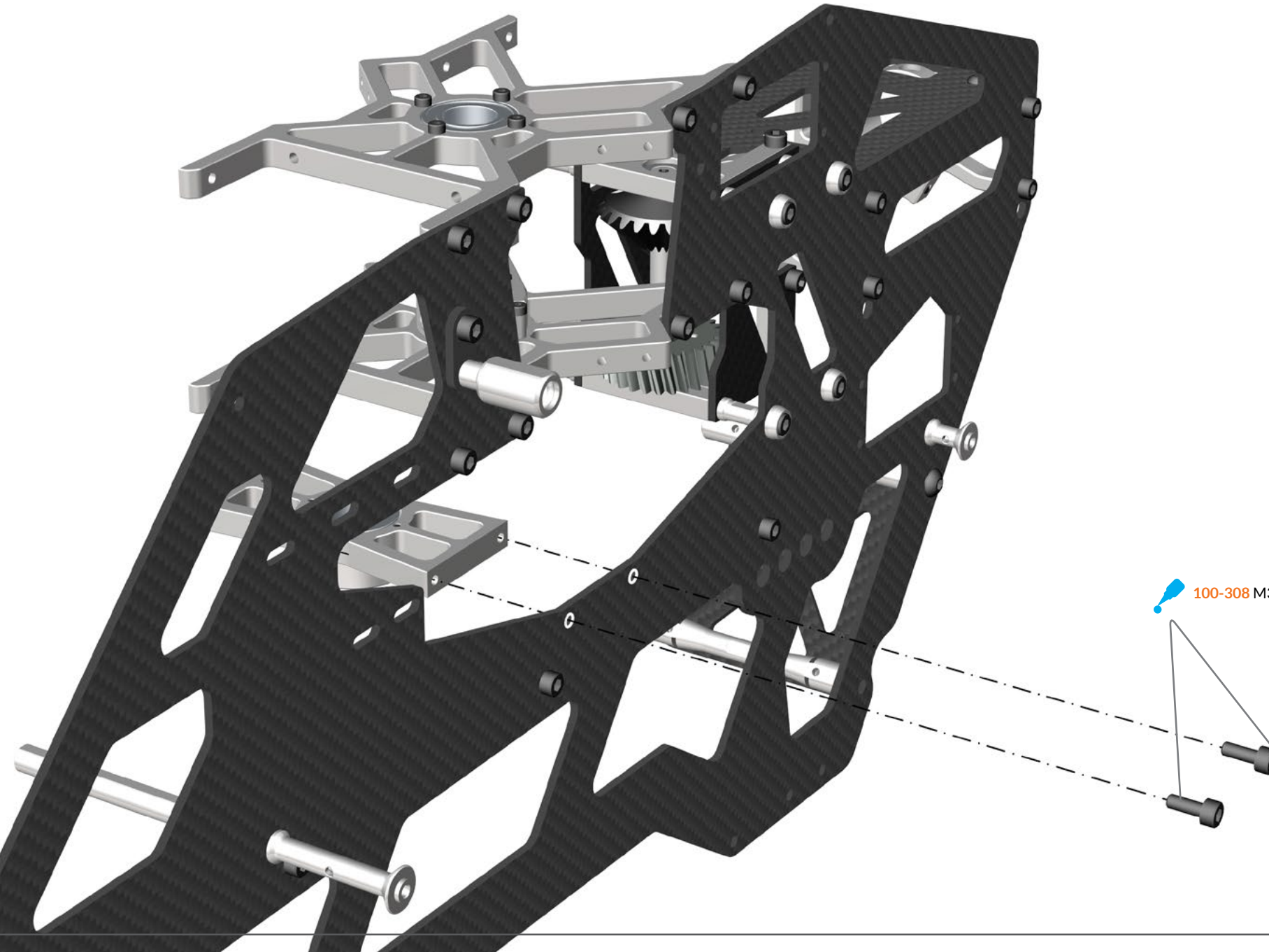
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100-308 M3x8 Socket Head (2)





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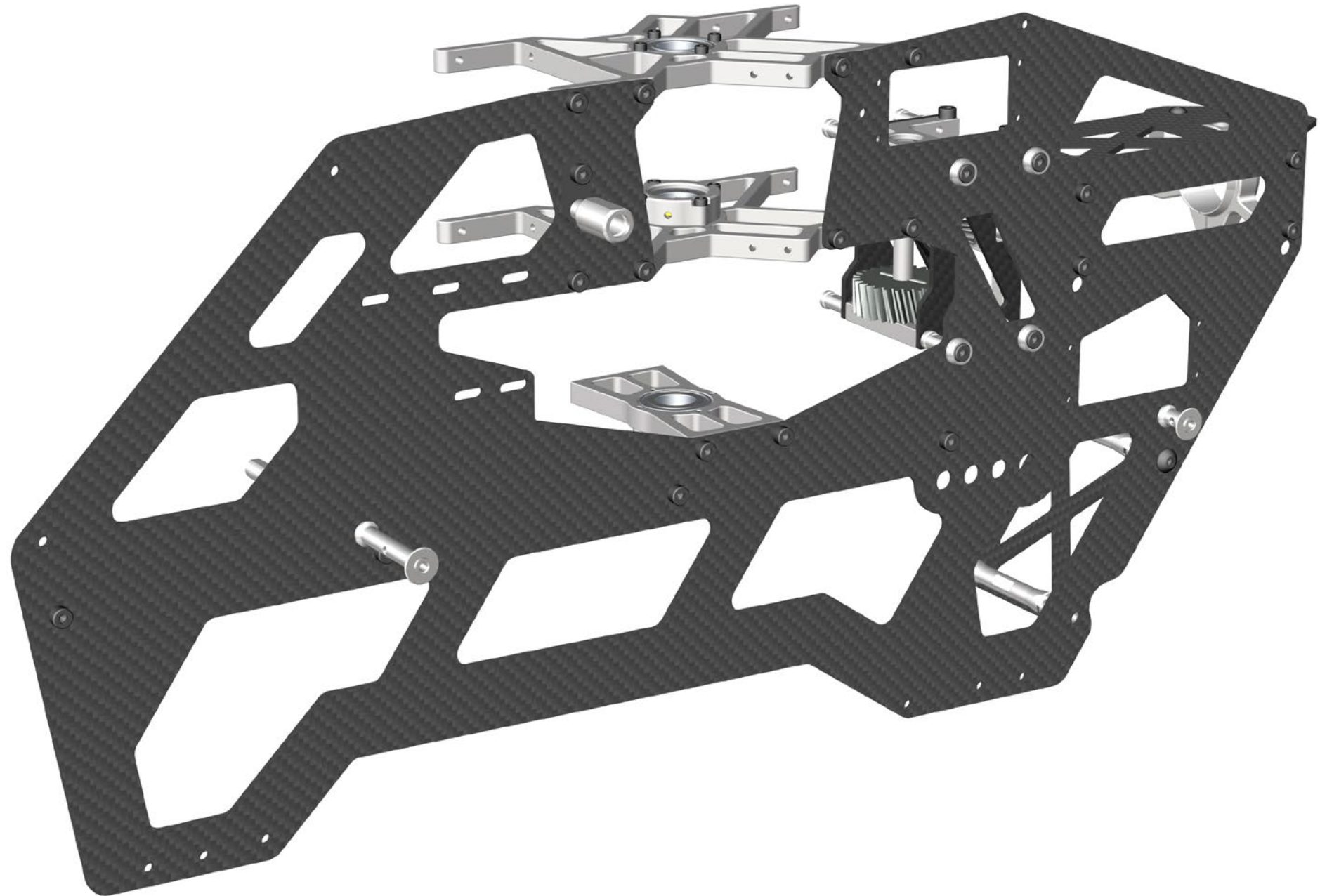
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100-308 M3x8 Socket Head

766-107 Panel Standoff Short

100-306 M3x6 Socket Head (4)

101-306 M3x6 Button Head

305-106 Break Away Plate

305-121 Key Chain Canopy Mount 21mm

101-306 M3x6 Button Head

100-351 M3 Nylock Nut



DO NOT OVER TIGHTEN!

Bolts used to secure the Delrin battery tray rail require very little holding torque. Do not over tighten or you will strip the threads.

ORIENTATION



766-106 Battery Tray Rail



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100-306 M3x6 Socket Head (12)



APPLY BLUE THREAD LOCK TO INDICATED BOLTS





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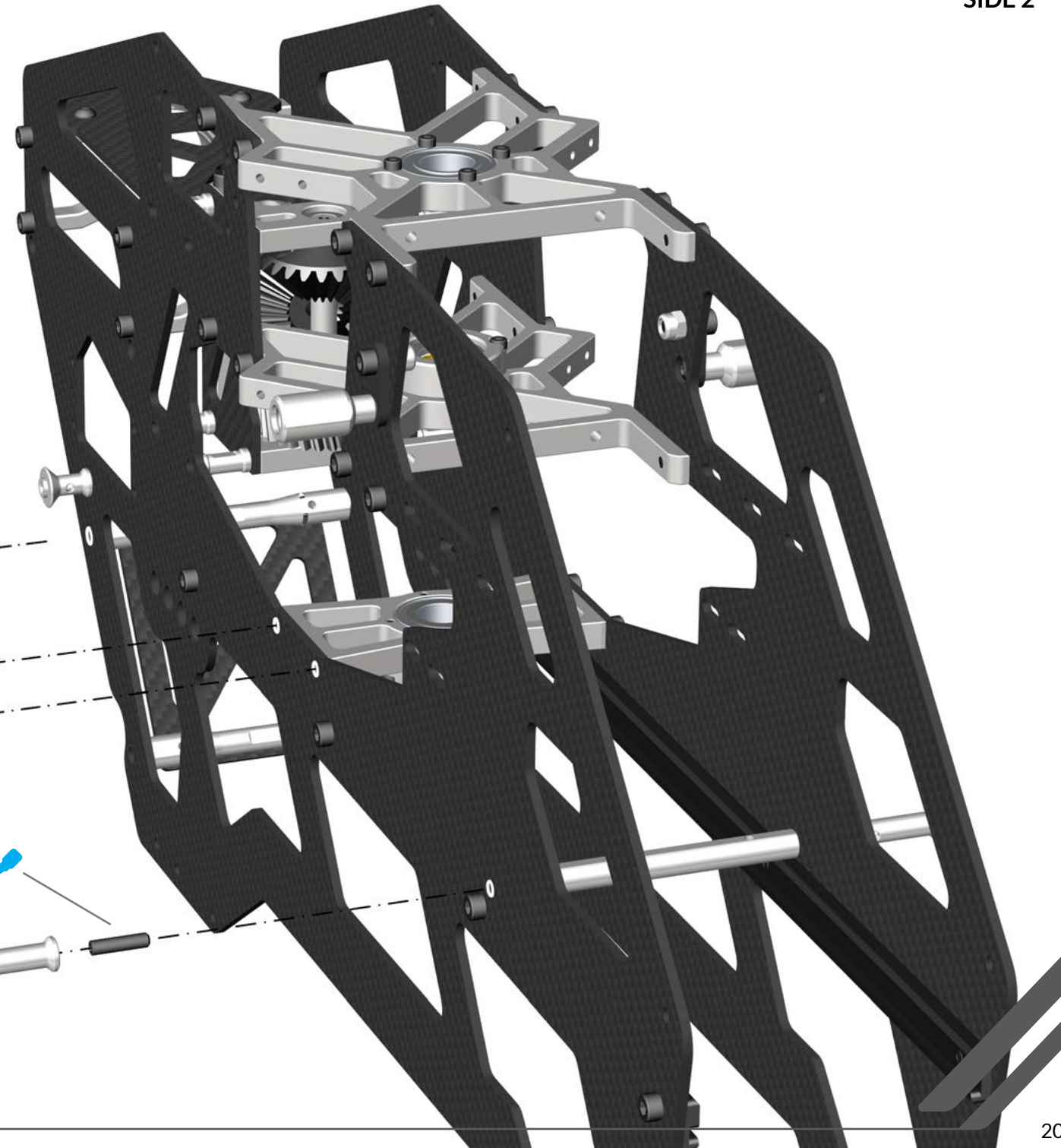
APPLY BLUE THREAD LOCK TO INDICATED BOLTS

100-408 M4x8 Socket Head

100-308 M3x8 Socket Head

100-372 M3x12 Set Screw

766-108 Panel Standoff Long



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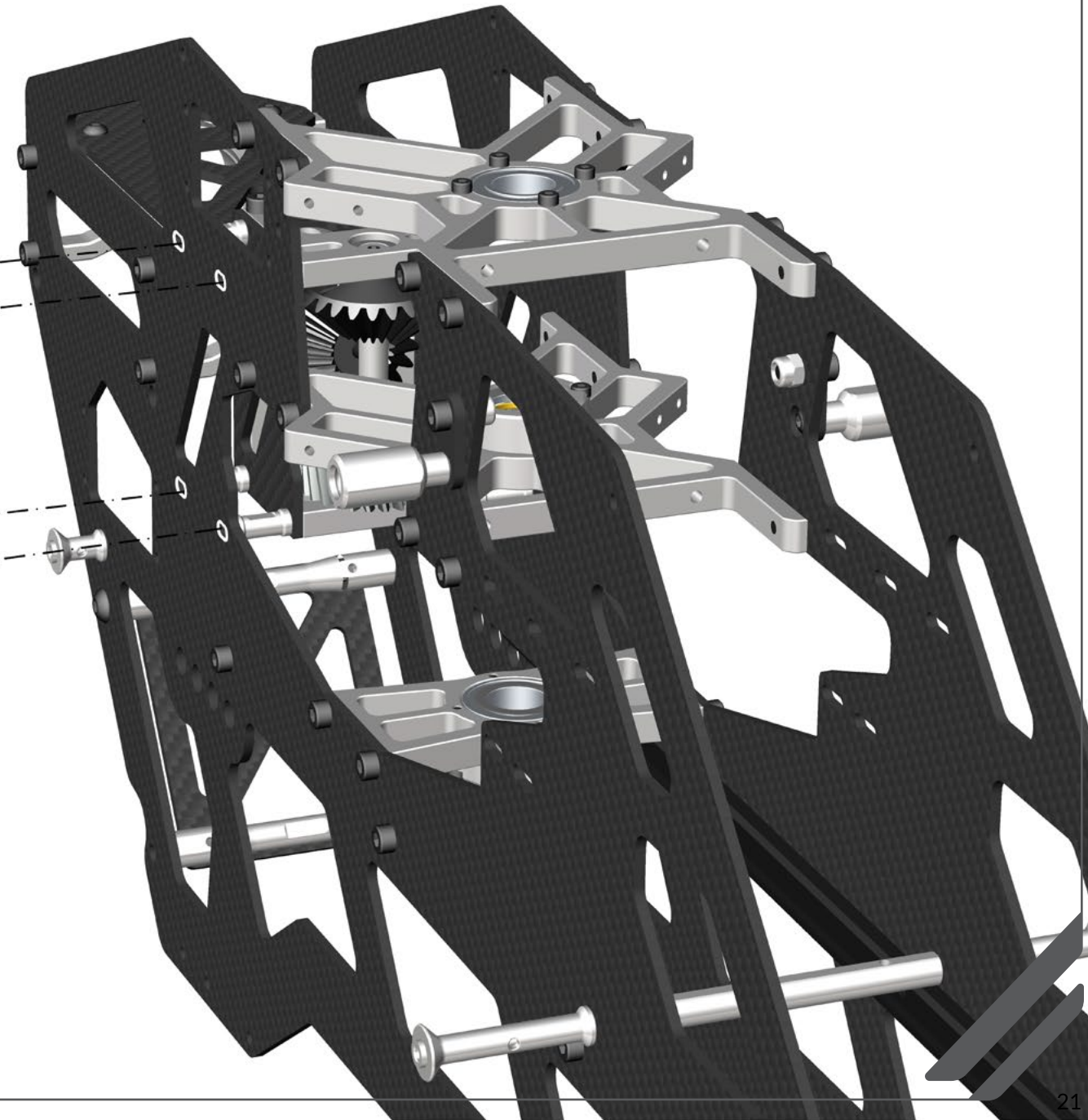
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111-101 M3 Dress Washer (4)

100-308 M3x8 Socket Head (4)



APPLY BLUE THREAD LOCK TO INDICATED BOLTS





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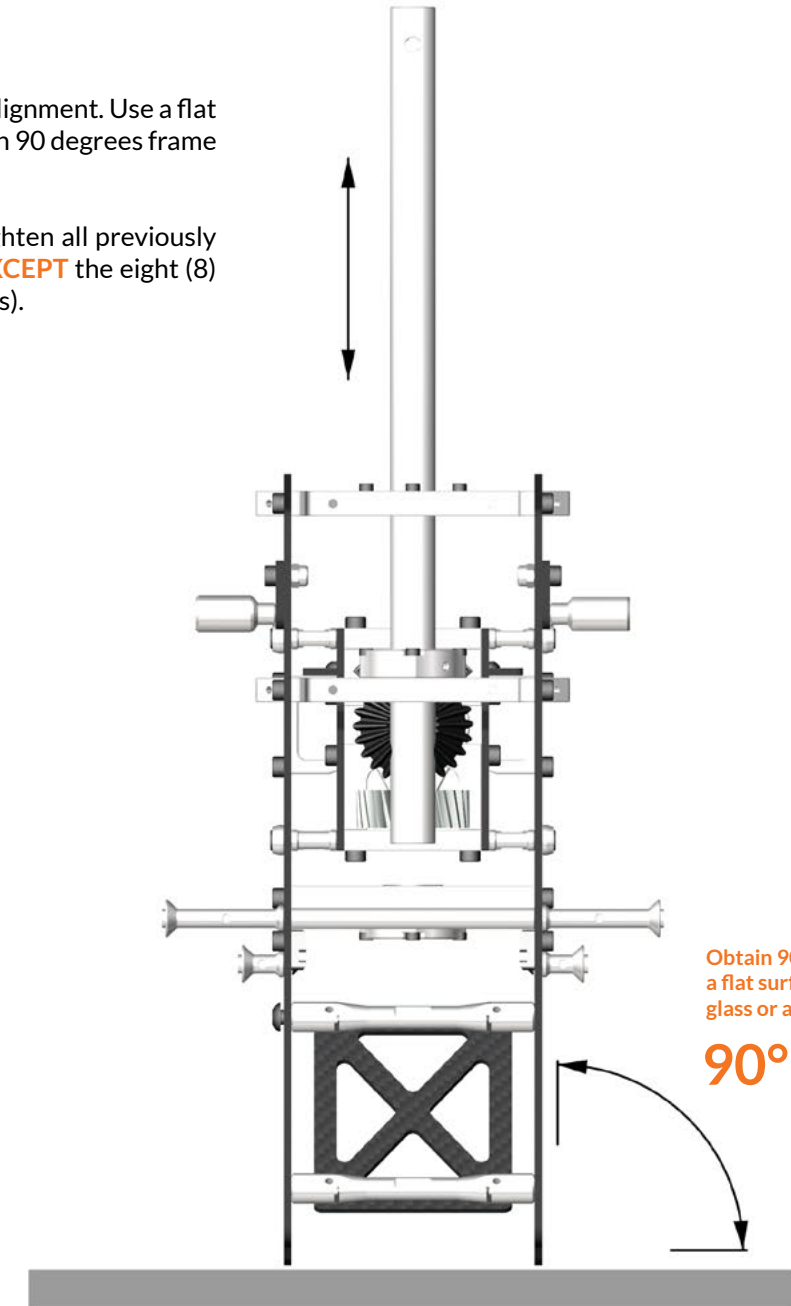
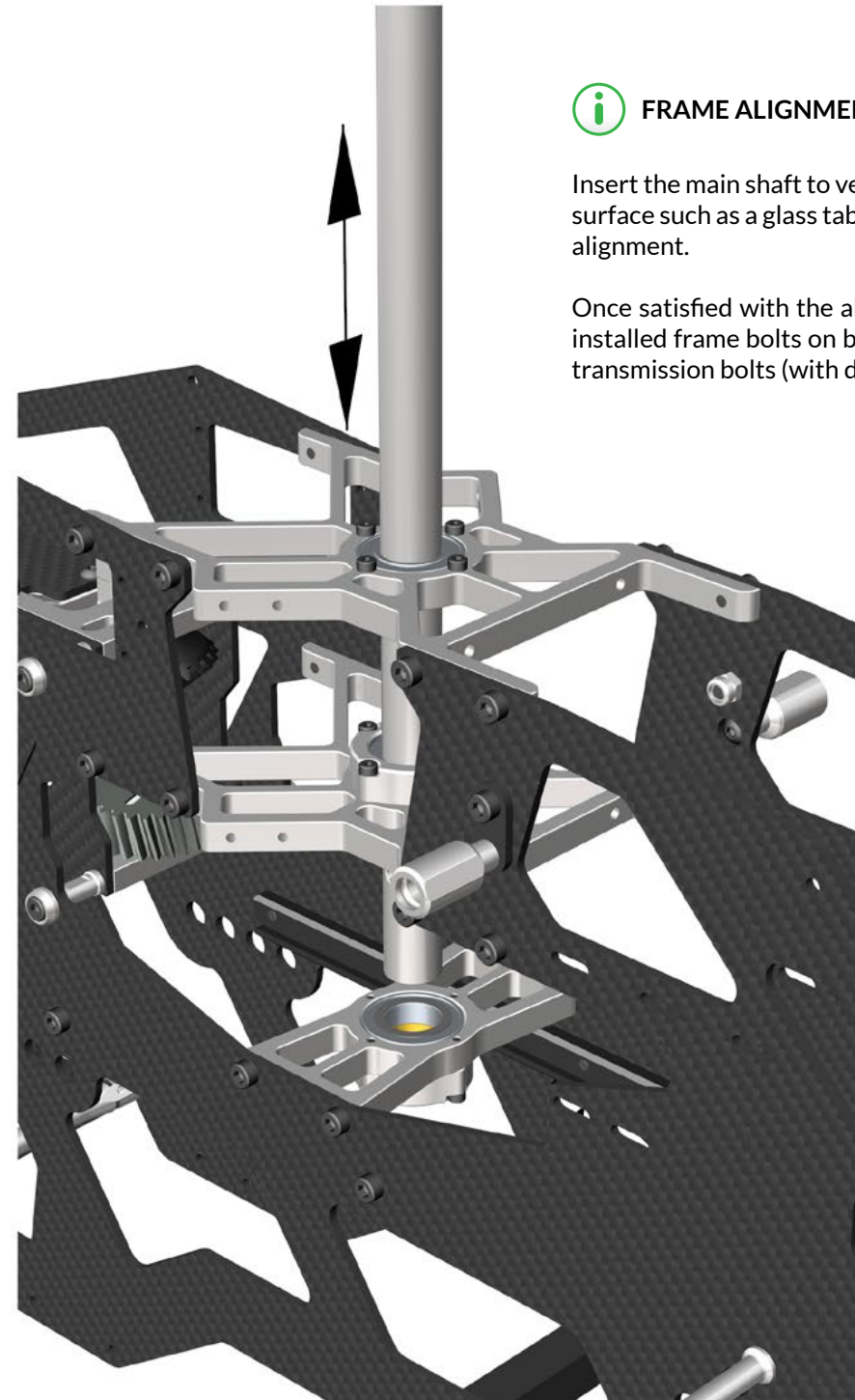
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FRAME ALIGNMENT

Insert the main shaft to verify frame alignment. Use a flat surface such as a glass table and obtain 90 degrees frame alignment.

Once satisfied with the alignment, tighten all previously installed frame bolts on both sides **EXCEPT** the eight (8) transmission bolts (with dress washers).





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APPLY BLUE THREAD LOCK
TO INDICATED BOLTS

310-106 Anti-Rotation Bracket

101-306 M3x6 Button Head (4)





Components that are factory assembled provide a reference for model assembly. Disassembly and application of thread lock is required where indicated.

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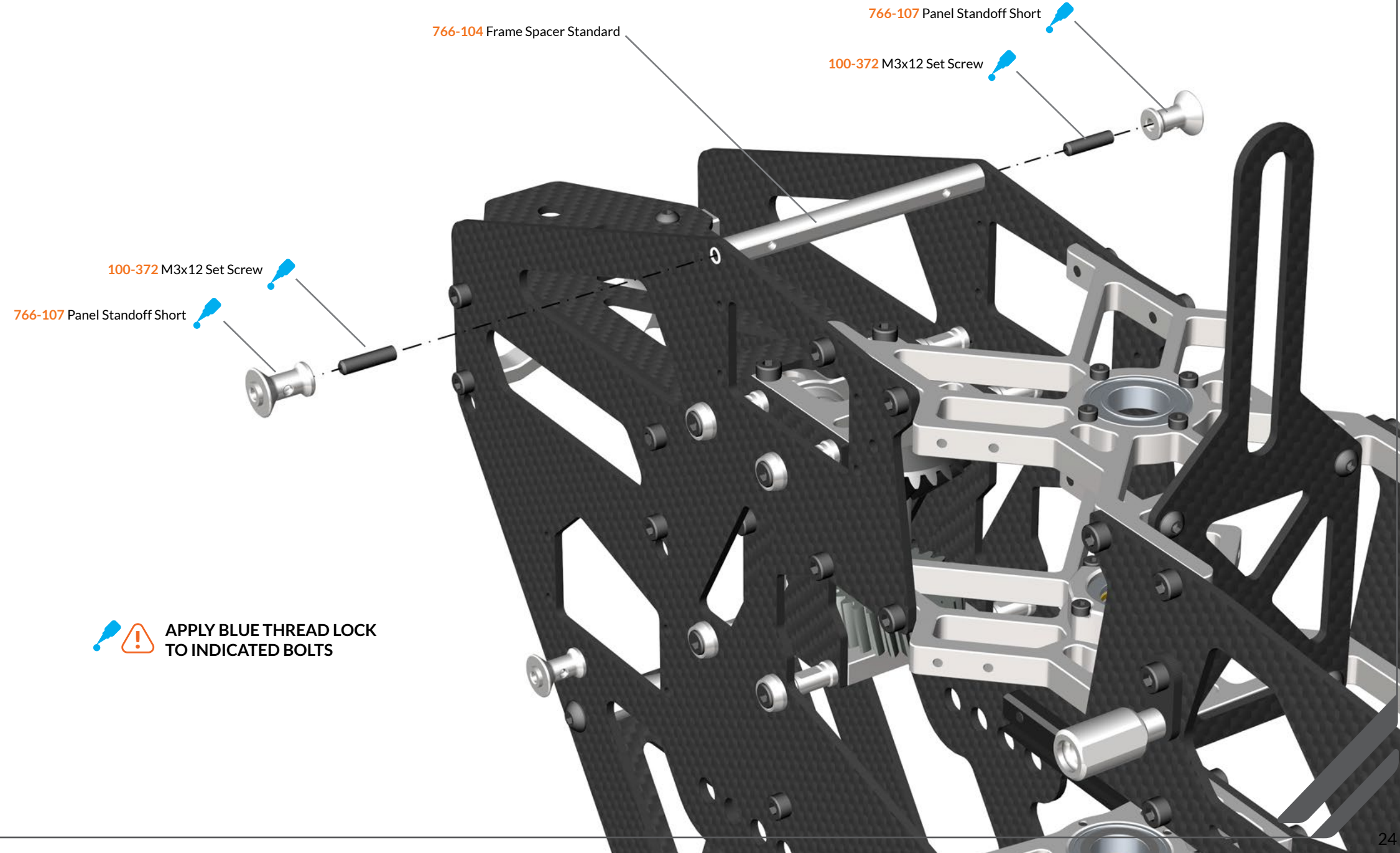
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Components that are factory assembled provide a reference for model assembly. Disassembly and application of thread lock is required where indicated.

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100-306 M3x6 Socket Head (6)

766-116 Landing Gear Mount

766-104 Frame Spacer Standard (2)

100-306 M3x6 Socket Head (6)



APPLY BLUE THREAD LOCK TO INDICATED BOLTS

766-116 Landing Gear Mount



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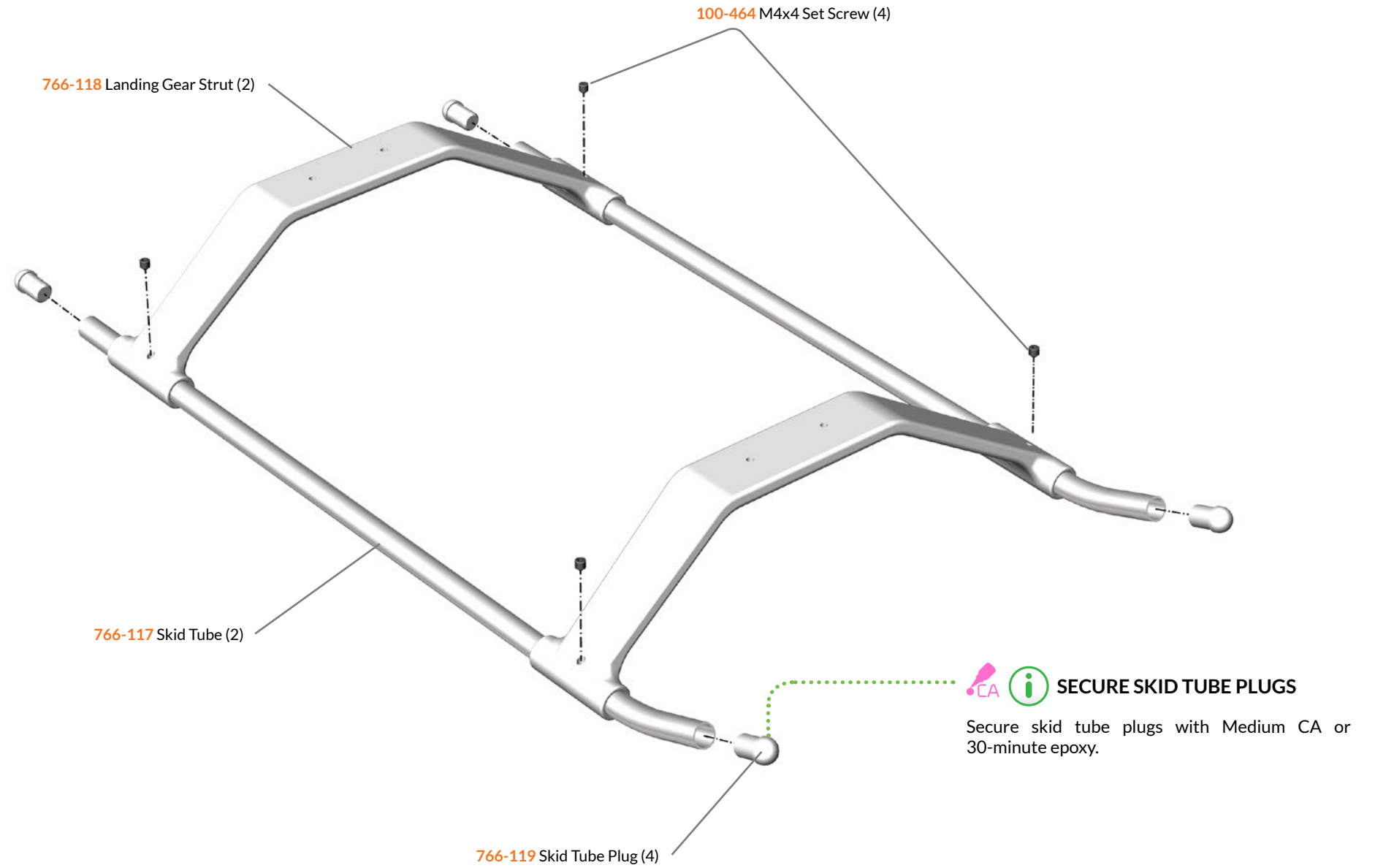
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Components that are factory assembled provide a reference for model assembly. Disassembly and application of thread lock is required where indicated.

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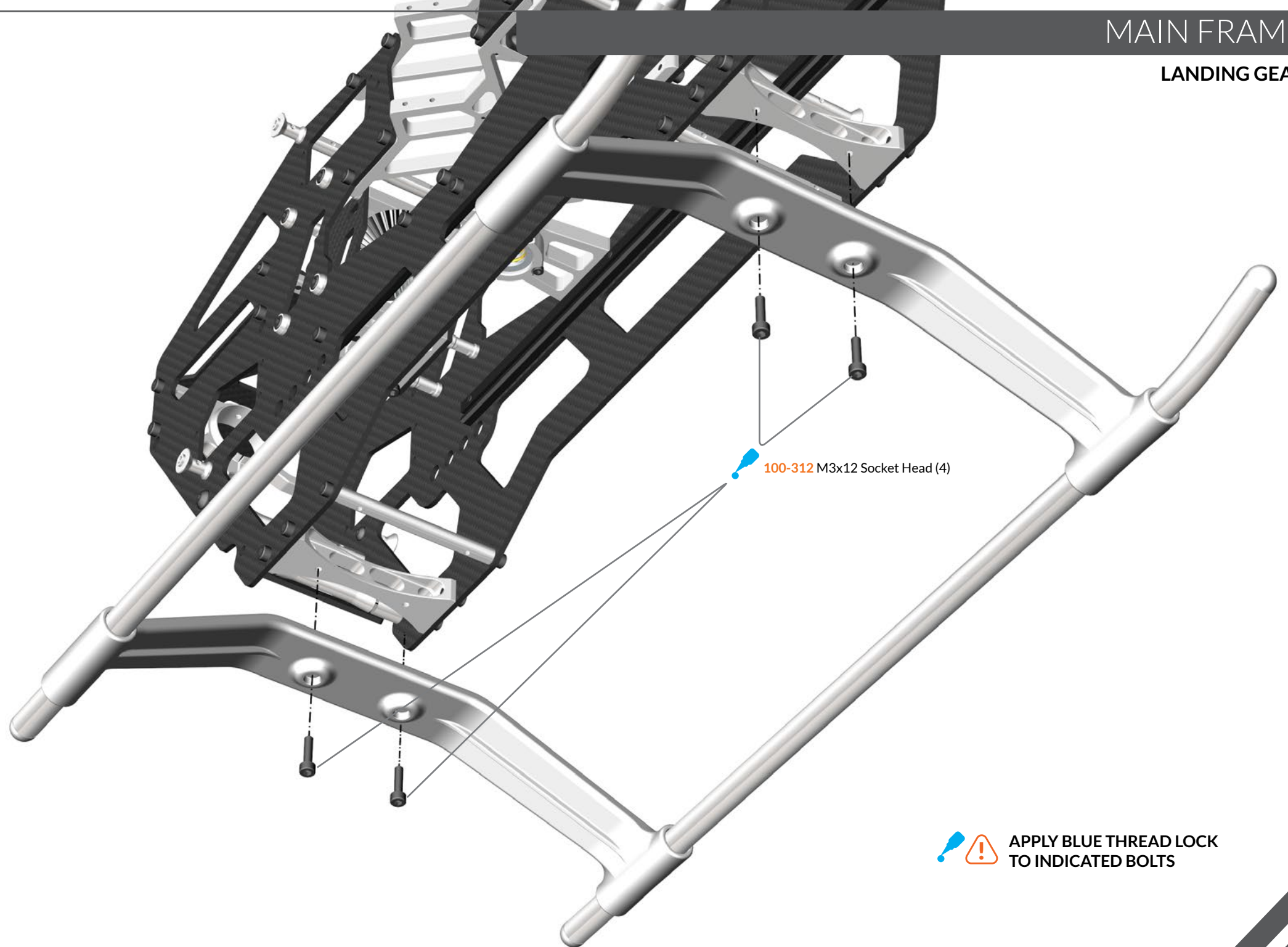
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100-312 M3x12 Socket Head (4)



APPLY BLUE THREAD LOCK TO INDICATED BOLTS



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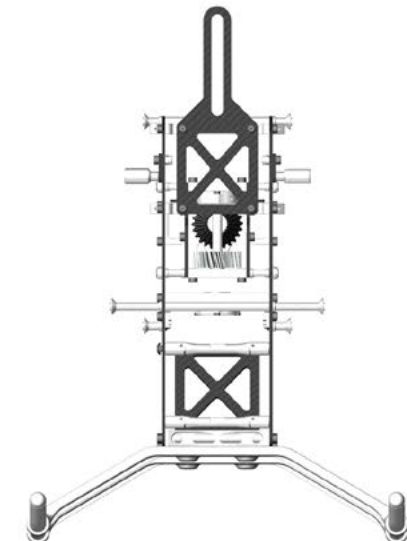
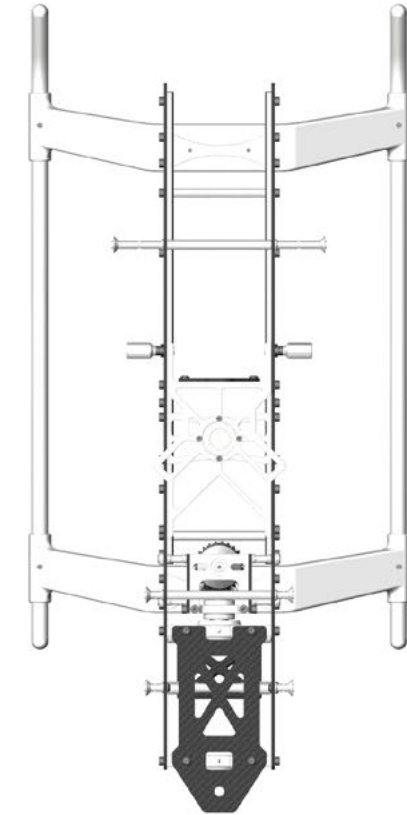
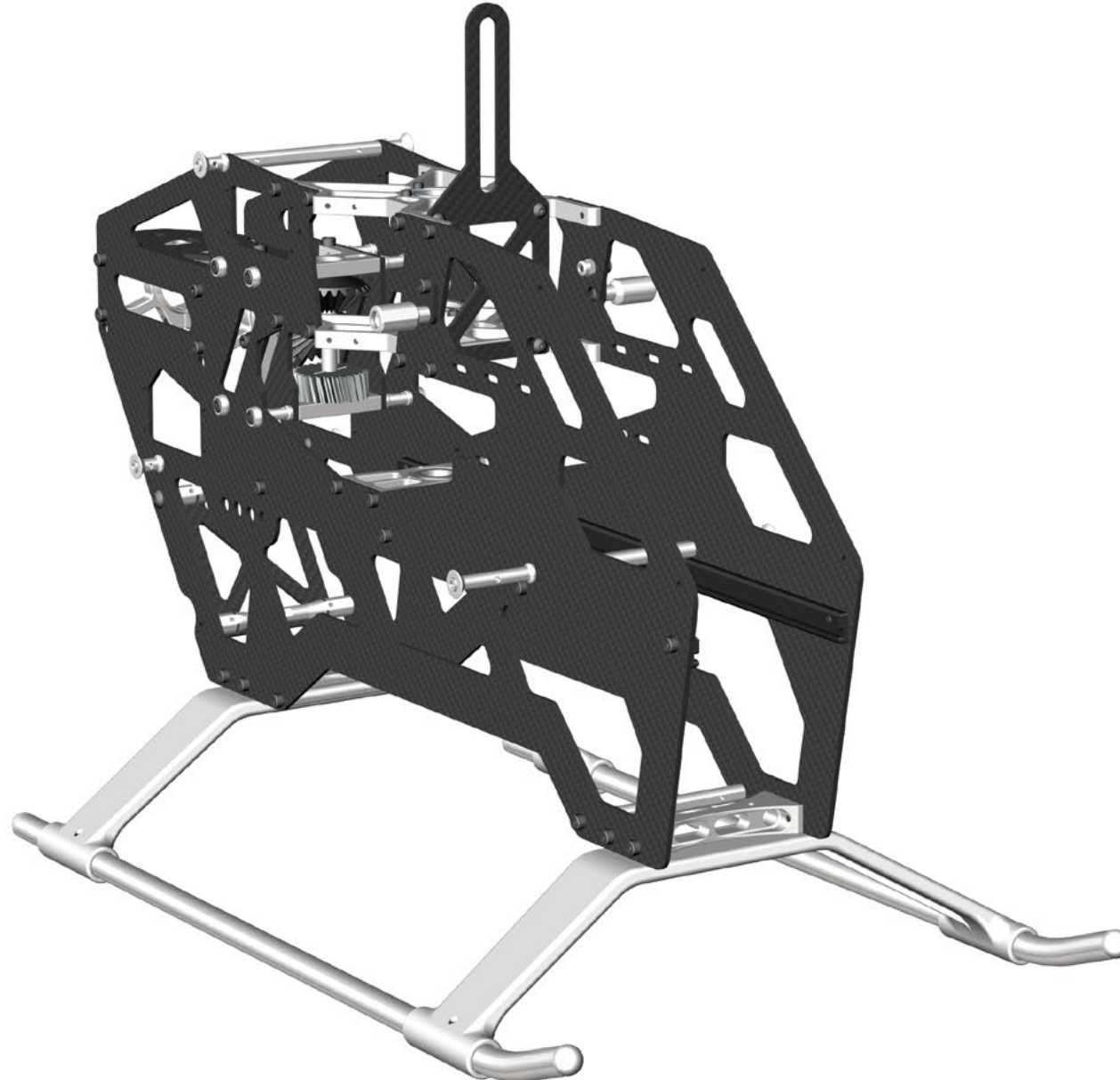
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Components that are factory assembled provide a reference for model assembly. Disassembly and application of thread lock is required where indicated.

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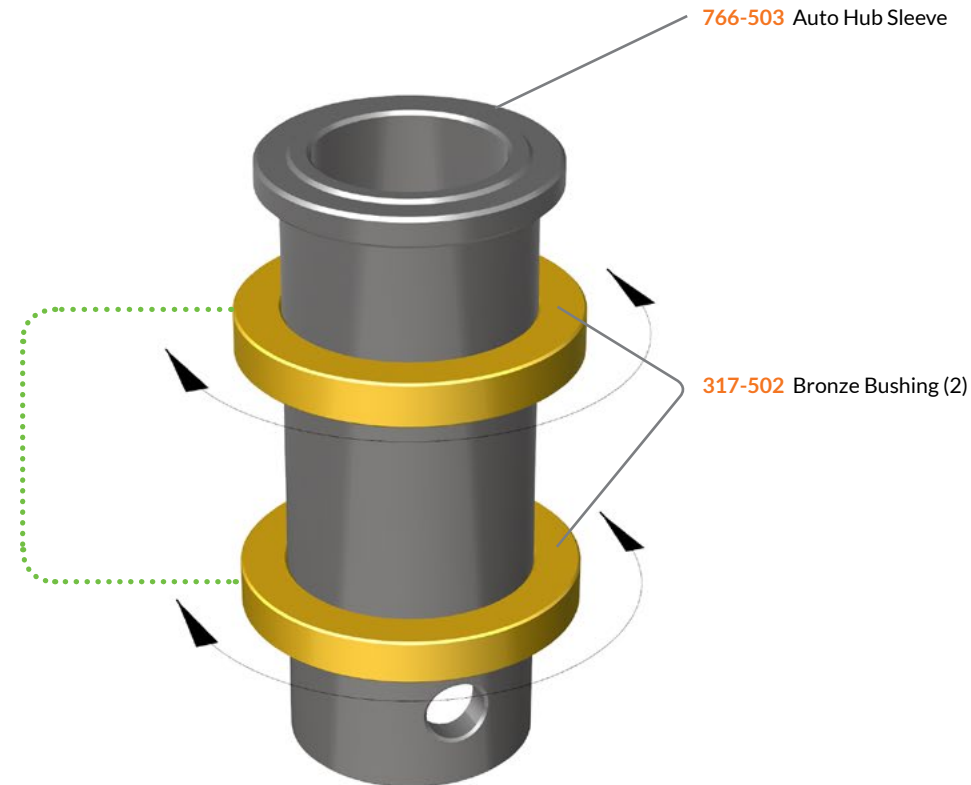
OPTIONS AND CONFIGURATIONS



VERIFY SMOOTH OPERATION

Temporarily install each bronze bushing onto the sleeve to verify smooth rotation.

IF REQUIRED: Using oil as a lubricant and 1000grit wet/dry sandpaper, lightly sand the INSIDE of the bronze bushing.





Components that are factory assembled provide a reference for model assembly. Disassembly and application of thread lock is required where indicated.

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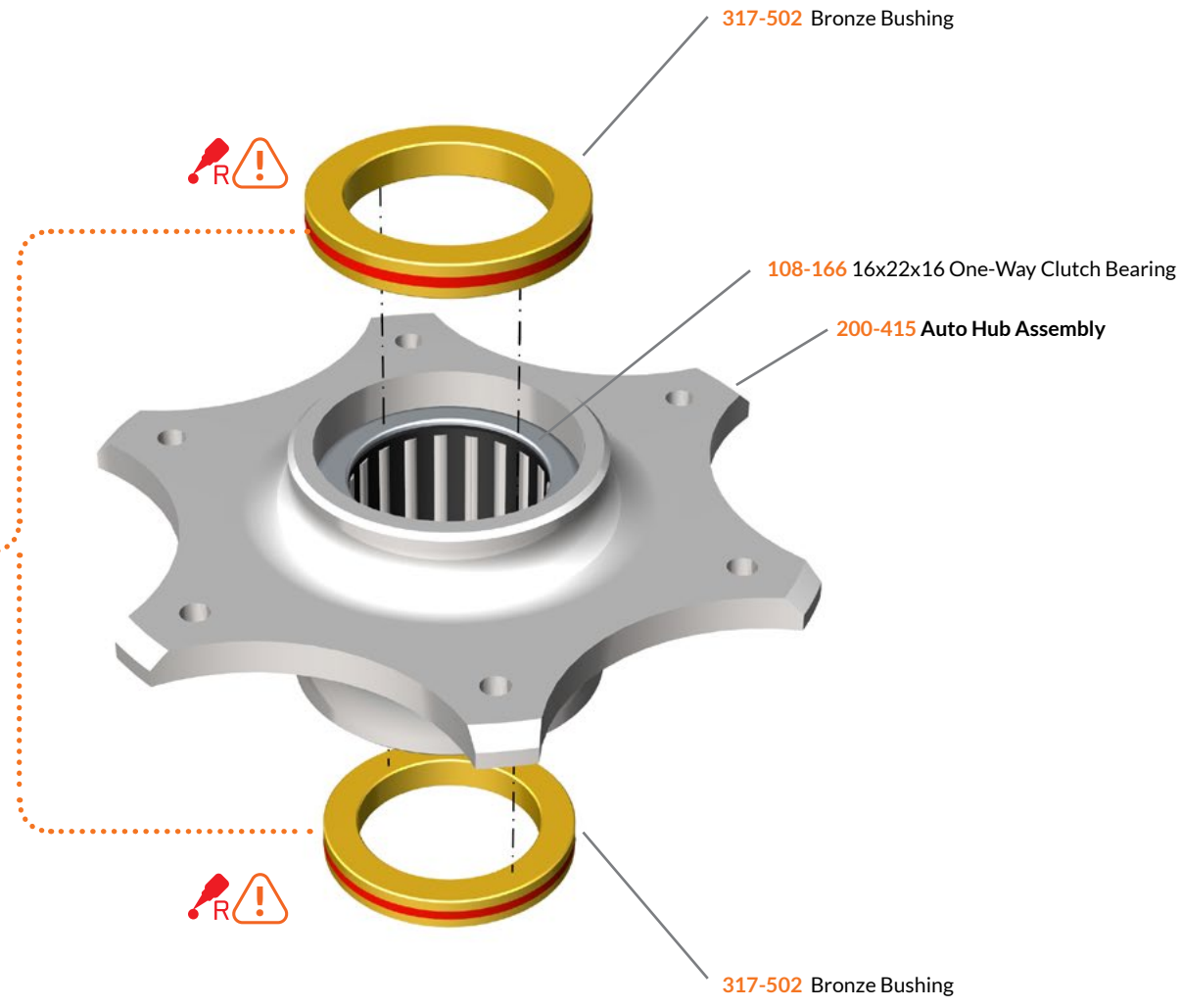
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IMPORTANT!

Apply a thin coating of RED thread lock to the outside of the bronze bushing. Use only a thin layer to prevent contamination of the one-way bearing inside the hub.





Components that are factory assembled provide a reference for model assembly. Disassembly and application of thread lock is required where indicated.

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DO NOT OVER TIGHTEN!

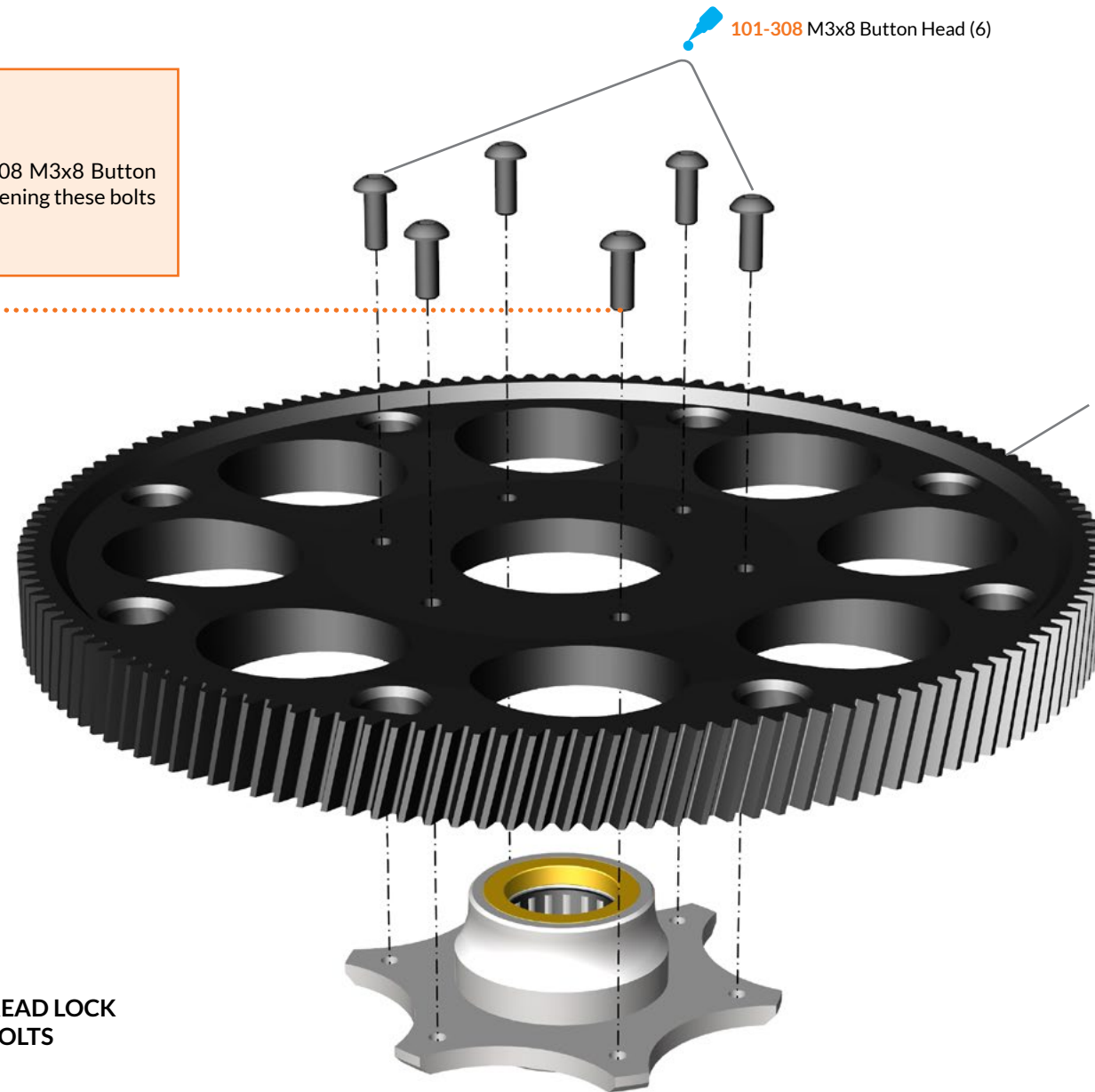
Apply BLUE thread lock to six(6) 101-308 M3x8 Button Head bolts and tighten lightly. Over tightening these bolts may crack the main gear.

101-308 M3x8 Button Head (6)

317-139 139T Helical Main Gear



APPLY BLUE THREAD LOCK TO INDICATED BOLTS





Components that are factory assembled provide a reference for model assembly. Disassembly and application of thread lock is required where indicated.

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DO NOT OVER TIGHTEN!

Apply BLUE thread lock to four(4) 101-308 M3x8 Button Head bolts and tighten lightly. Over tightening these bolts may crack the auto gear.

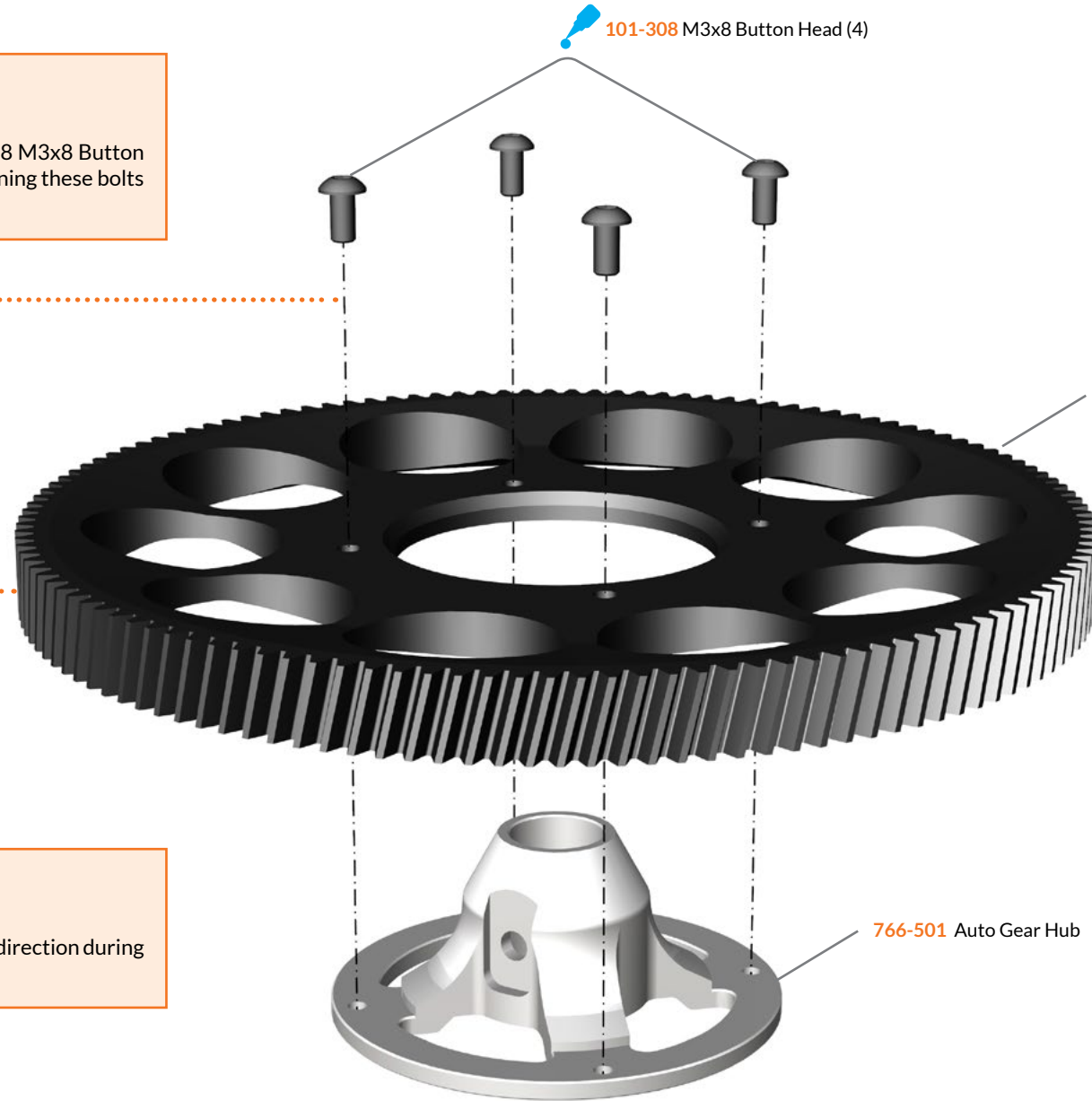


IMPORTANT!

Auto gear has a top and bottom side. Note direction during installation.



101-308 M3x8 Button Head (4)



766-608 127T Helical Auto Gear

766-501 Auto Gear Hub



APPLY BLUE THREAD LOCK TO INDICATED BOLTS



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OIL ONLY!

Apply oil only to the auto sleeve and one-way bearing. Use a lightweight oil such as Tri-flo or other bearing oil.

DO NOT USE GREASE!



NOTE ORIENTATION!

Note orientation of the main auto hub. Bolt heads should always be on the underside facing the auto gear hub.

766-503 Auto Hub Sleeve

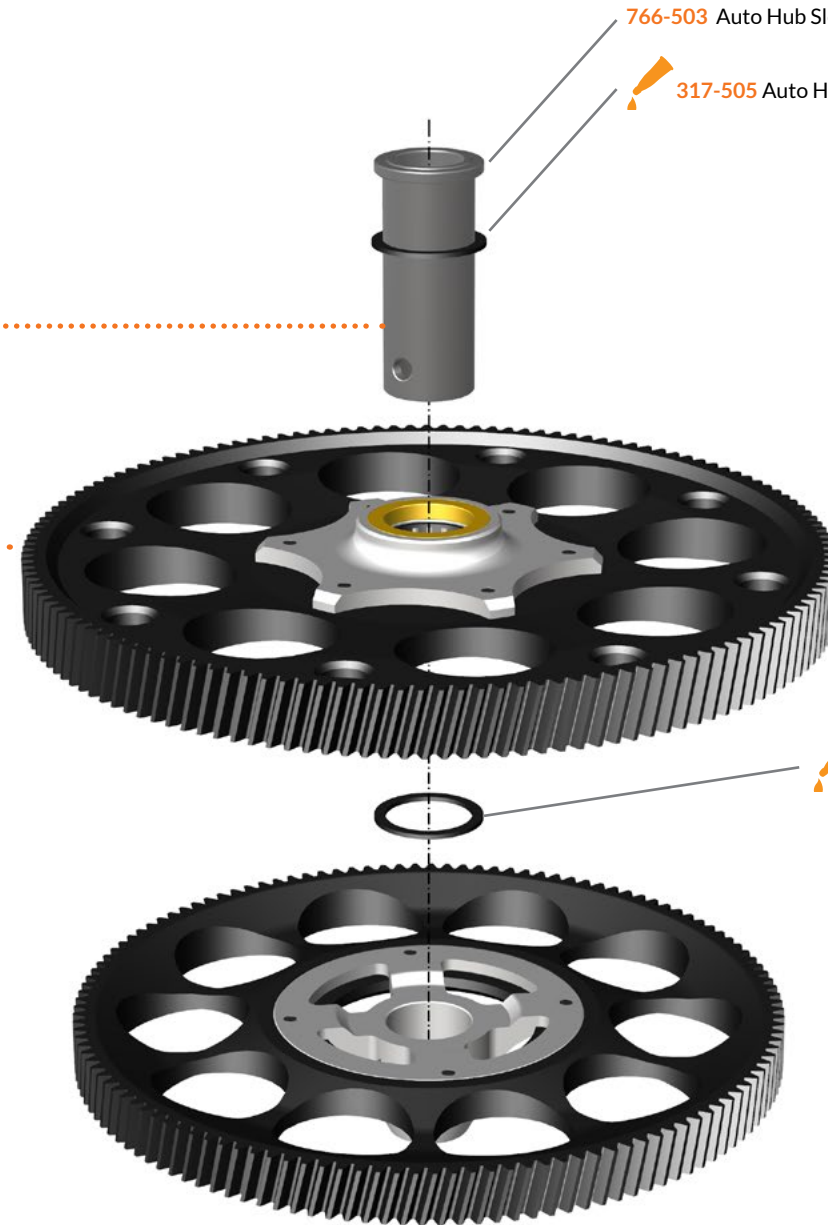
317-505 Auto Hub Delrin Shim



GREASE COMPONENTS

Apply grease to both sides of the Delrin shims. For optimum performance, use extreme pressure synthetic grease, Boto-Lube Part **BD-001**.

317-505 Auto Hub Delrin Shim





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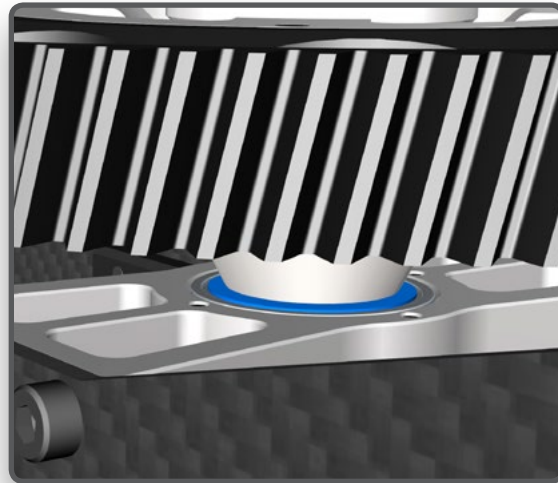
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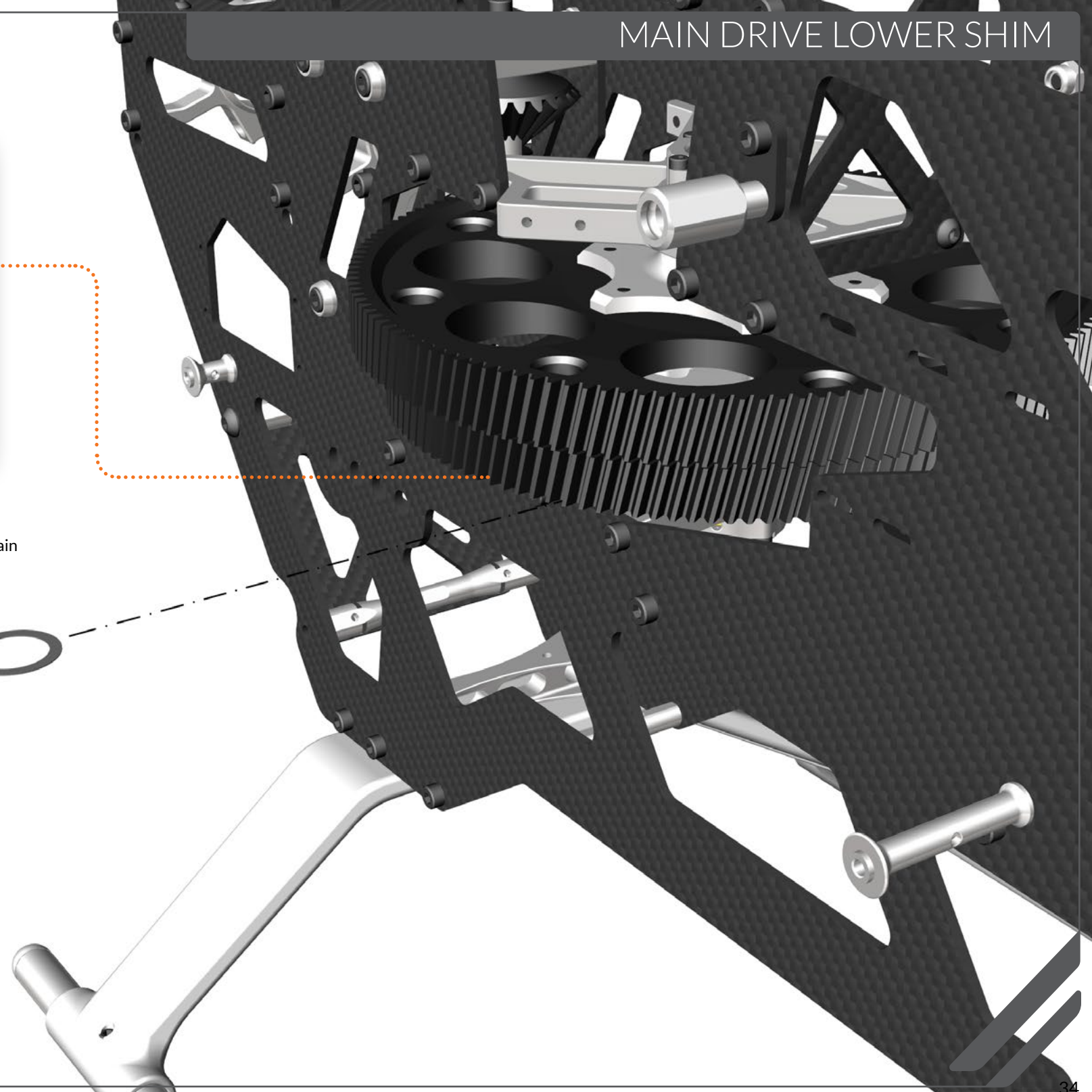
OPTIONS AND CONFIGURATIONS



IMPORTANT!

The 12mm Main Shaft Shim is located below the main drive assembly.

109-112 12mm Main Shaft Shim





Components that are factory assembled provide a reference for model assembly. Disassembly and application of thread lock is required where indicated.

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IMPORTANT!

Note orientation of the main shaft.

9 mm

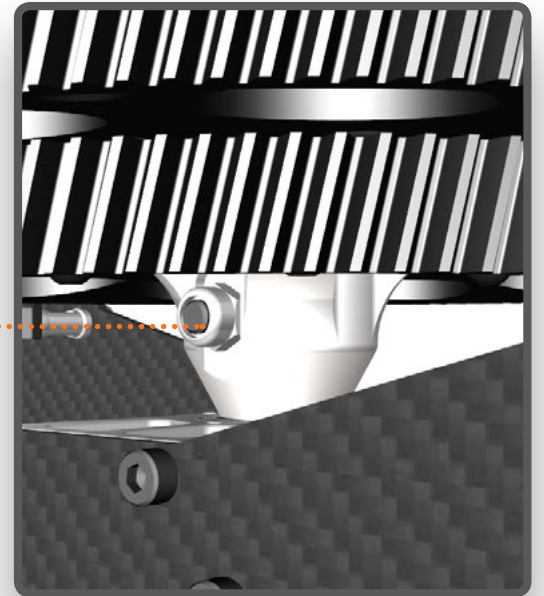
TOP

100-425 M4x25 Shouldered Bolt

100-451 M4 Nylock Nut

24 mm

BOTTOM



DO NOT OVER TIGHTEN!!!

Over tightening this bolt may distort the auto gear hub. Tighten only enough so that bolt is slop free.



Components that are factory assembled provide a reference for model assembly. Disassembly and application of thread lock is required where indicated.

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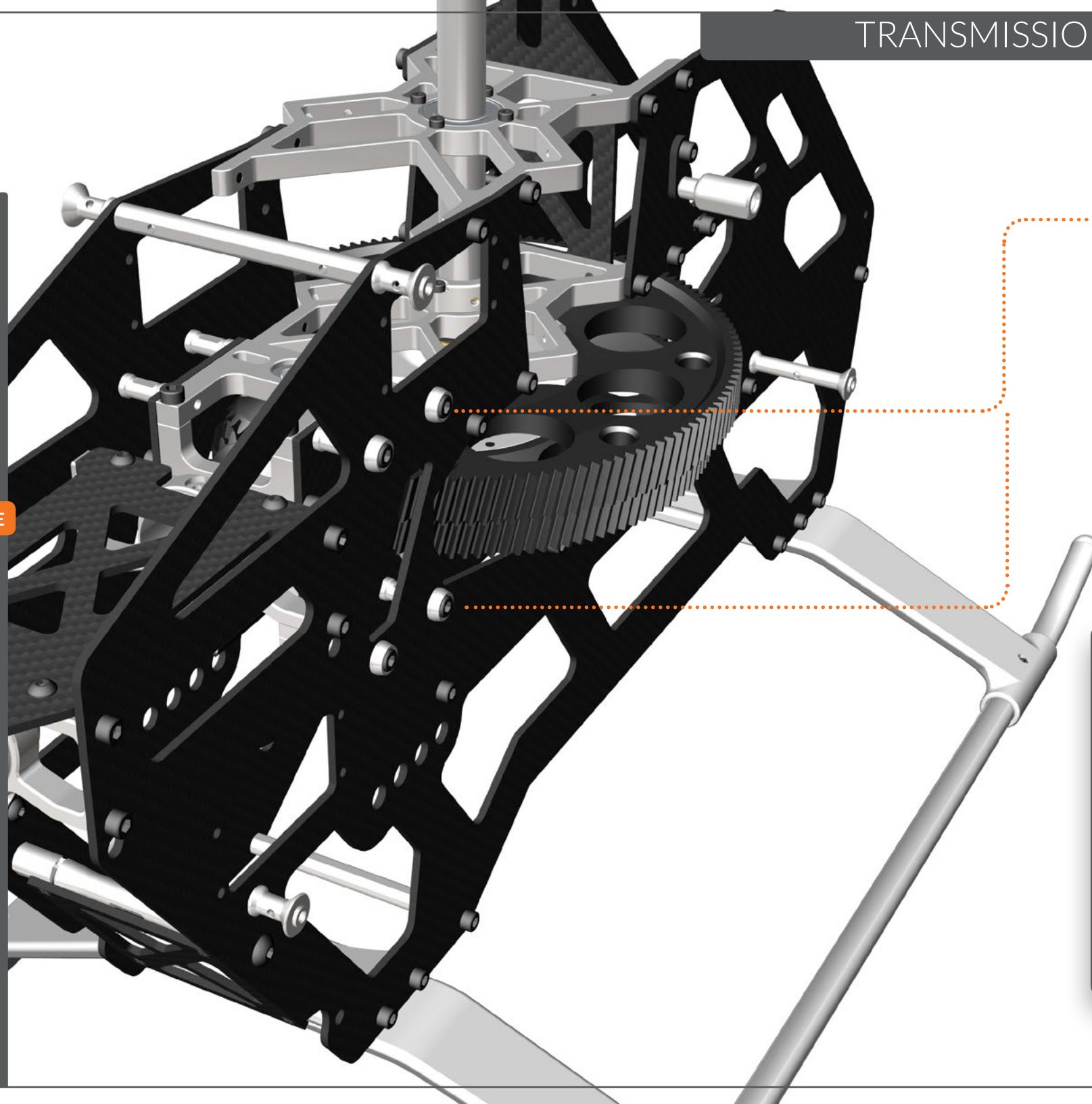
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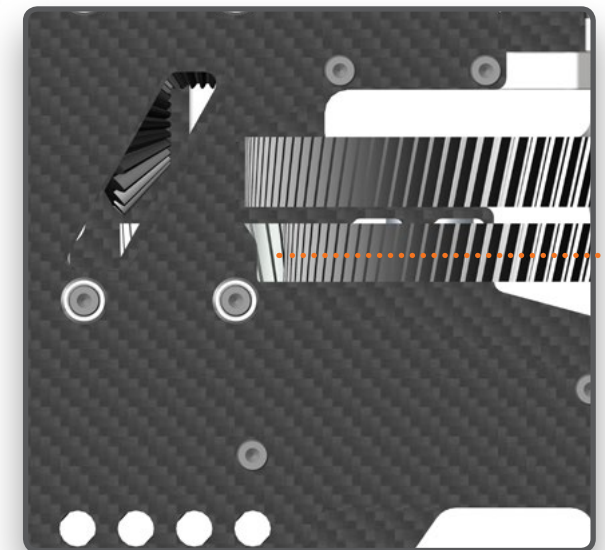
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IMPORTANT!

1. Loosen 8 bolts that secure the transmission
2. Slide transmission forward to mesh tight with the main drive gear.
3. Move the transmission back slightly to obtain 0.1-0.2mm gear backlash.





Components that are factory assembled provide a reference for model assembly. Disassembly and application of thread lock is required where indicated.

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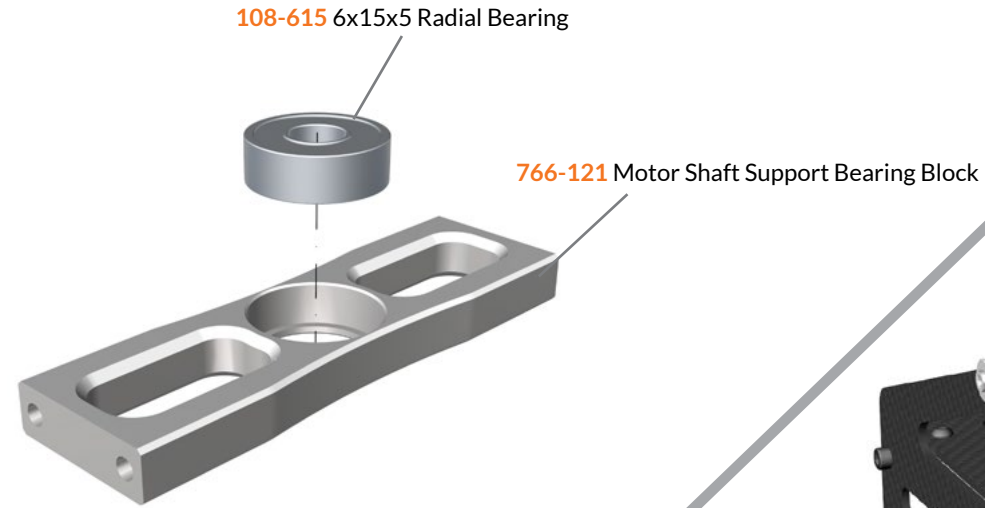
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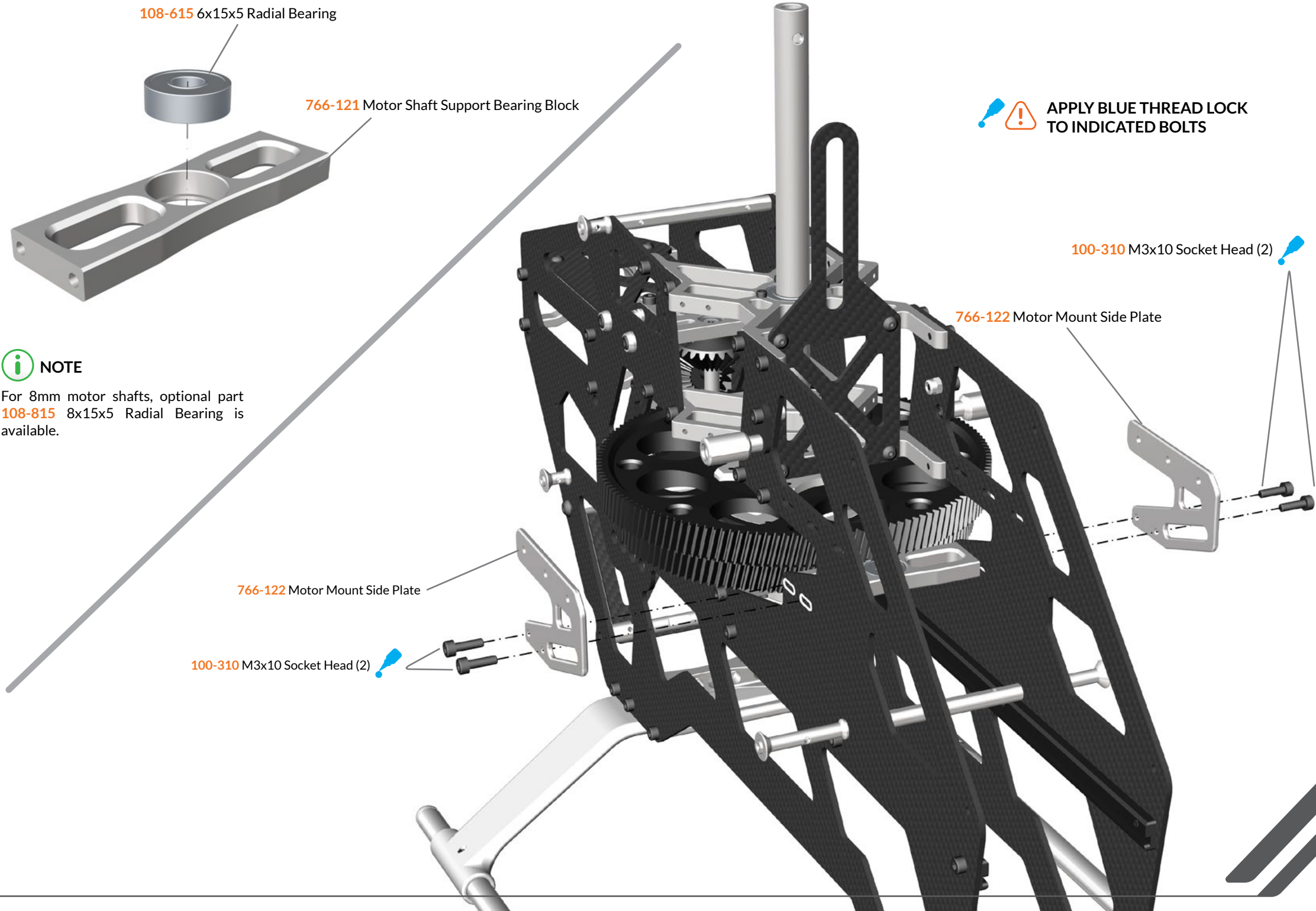


NOTE

For 8mm motor shafts, optional part 108-815 8x15x5 Radial Bearing is available.



APPLY BLUE THREAD LOCK TO INDICATED BOLTS





Components that are factory assembled provide a reference for model assembly. Disassembly and application of thread lock is required where indicated.

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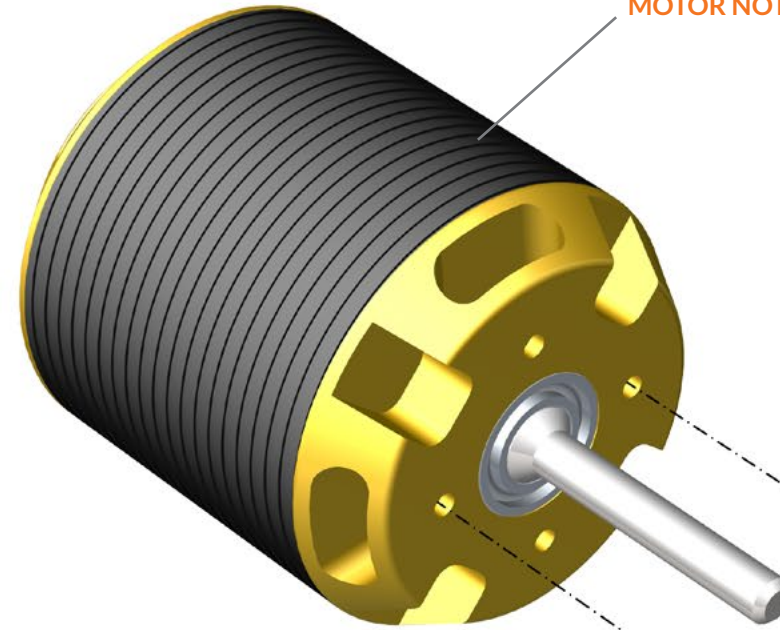
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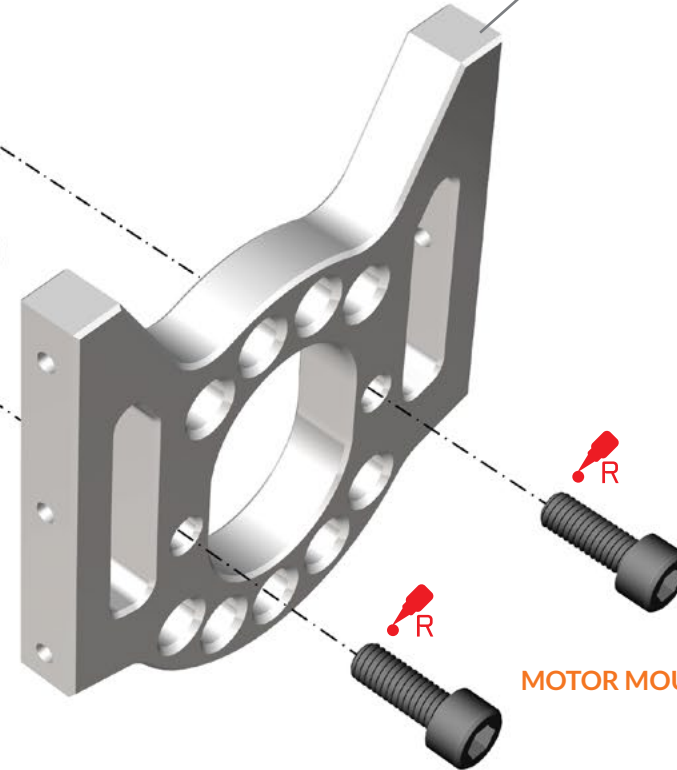
PANEL SYSTEM

OPTIONS AND CONFIGURATIONS

MOTOR NOT INCLUDED



766-123 Motor Mount



MOTOR MOUNT BOLTS NOT INCLUDED



RECOMMENDED MOTORS

12S

Scorpion 4525-520Kv
Scorpion 4530-540Kv
Scorpion 4530-500Kv

14S

Scorpion 4530-450Kv
Scorpion 4535-450Kv





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RECOMMENDED PROCEDURE

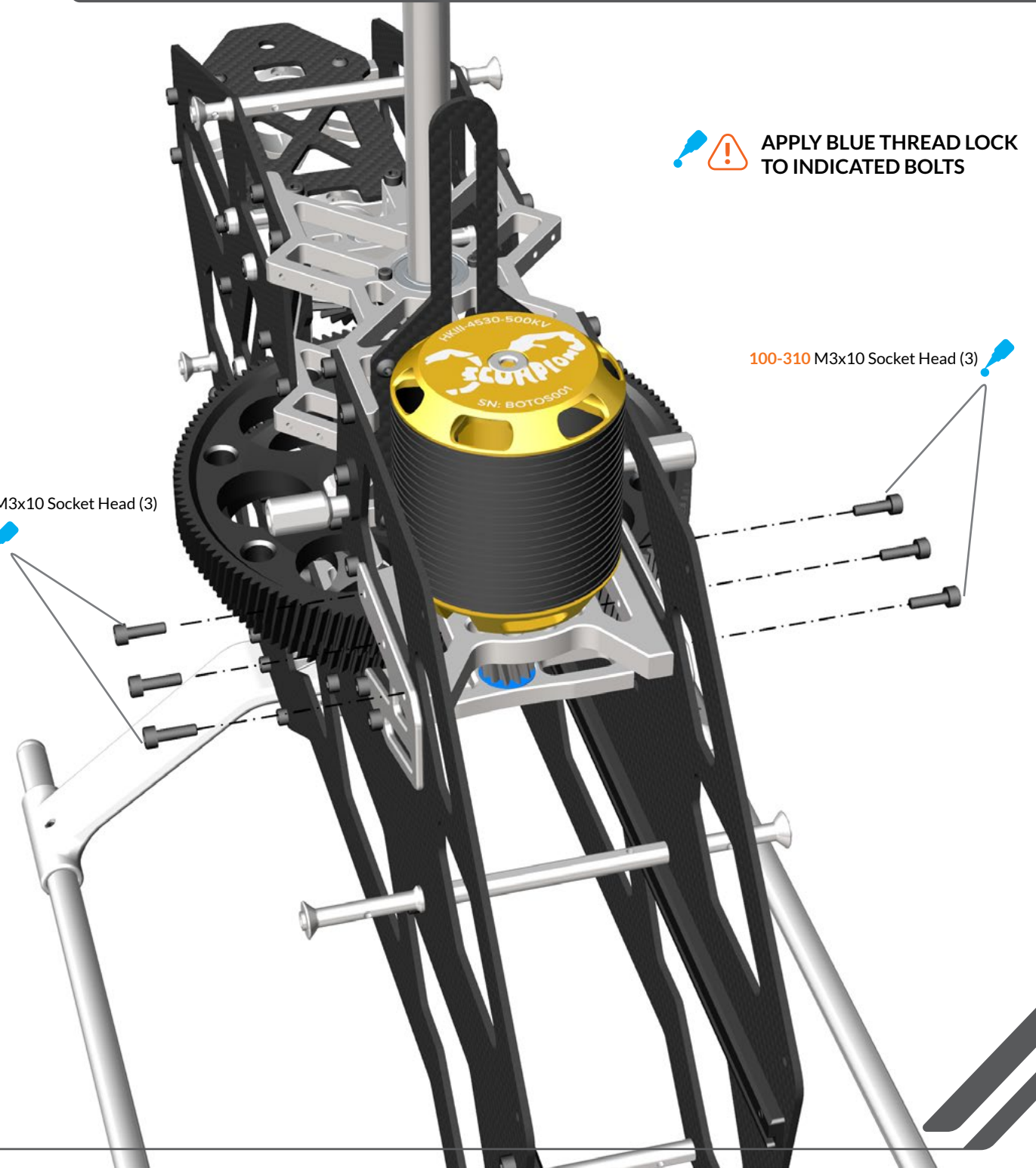
1. Loosely install the pinion onto the motor shaft without set screw.
2. Install the motor mount.
3. Do not fully tighten bolts yet.
4. Adjust pinion height on the following page.



APPLY BLUE THREAD LOCK TO INDICATED BOLTS

100-310 M3x10 Socket Head (3)

100-310 M3x10 Socket Head (3)





Components that are factory assembled provide a reference for model assembly. Disassembly and application of thread lock is required where indicated.

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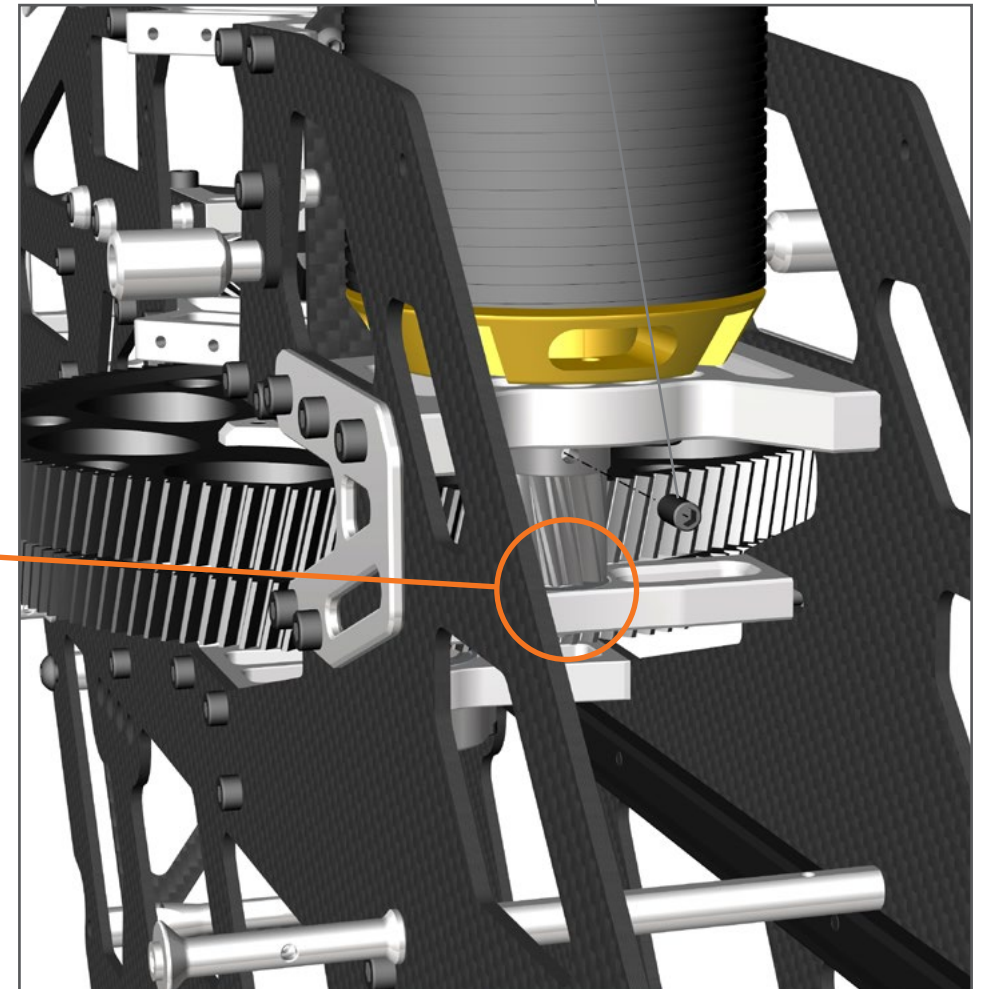
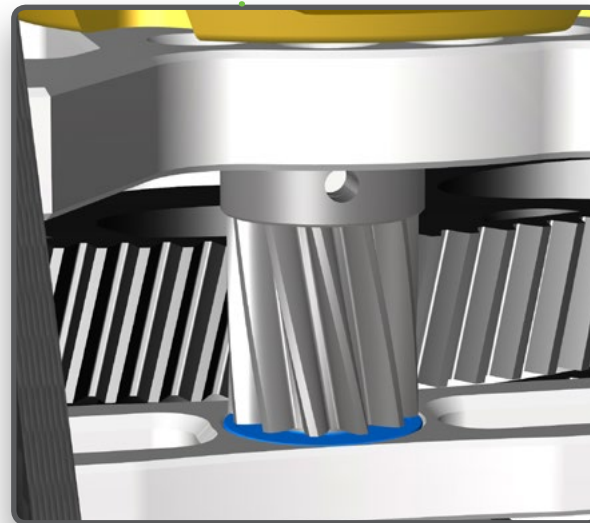


RECOMMENDED PROCEDURE

1. Verify the pinion is resting on lower support bearing
2. Secure the pinion with M4x6 set screw using RED thread lock against the flat spot on the motor shaft.
3. Adjust pinion mesh on the following page.



100-466 M4x6 Set Screw





Components that are factory assembled provide a reference for model assembly. Disassembly and application of thread lock is required where indicated.

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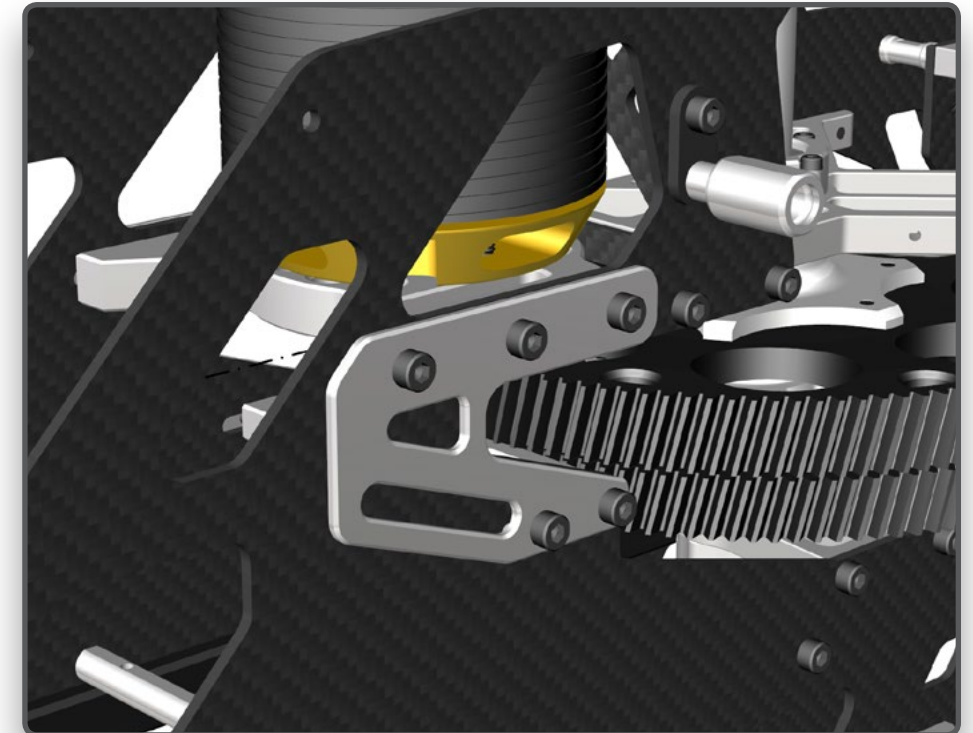
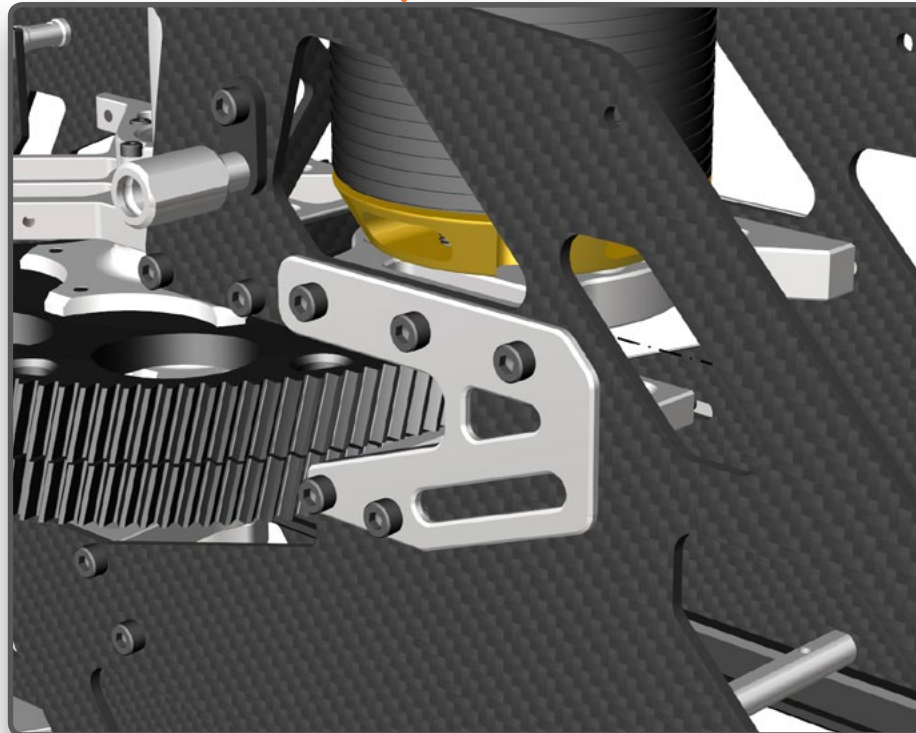
PANEL SYSTEM

OPTIONS AND CONFIGURATIONS



IMPORTANT!

1. Loosen bolts that secure the motor mount and lower motor shaft support block.
2. Slide the assembly to fully mesh with main gear.
3. Adjust the assembly to obtain 0.1-0.2mm gear backlash
4. Fully tighten all motor mount bolts.





Components that are factory assembled provide a reference for model assembly. Disassembly and application of thread lock is required where indicated.



APPLY BLUE THREAD LOCK TO INDICATED BOLTS

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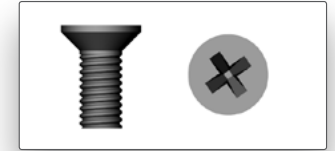
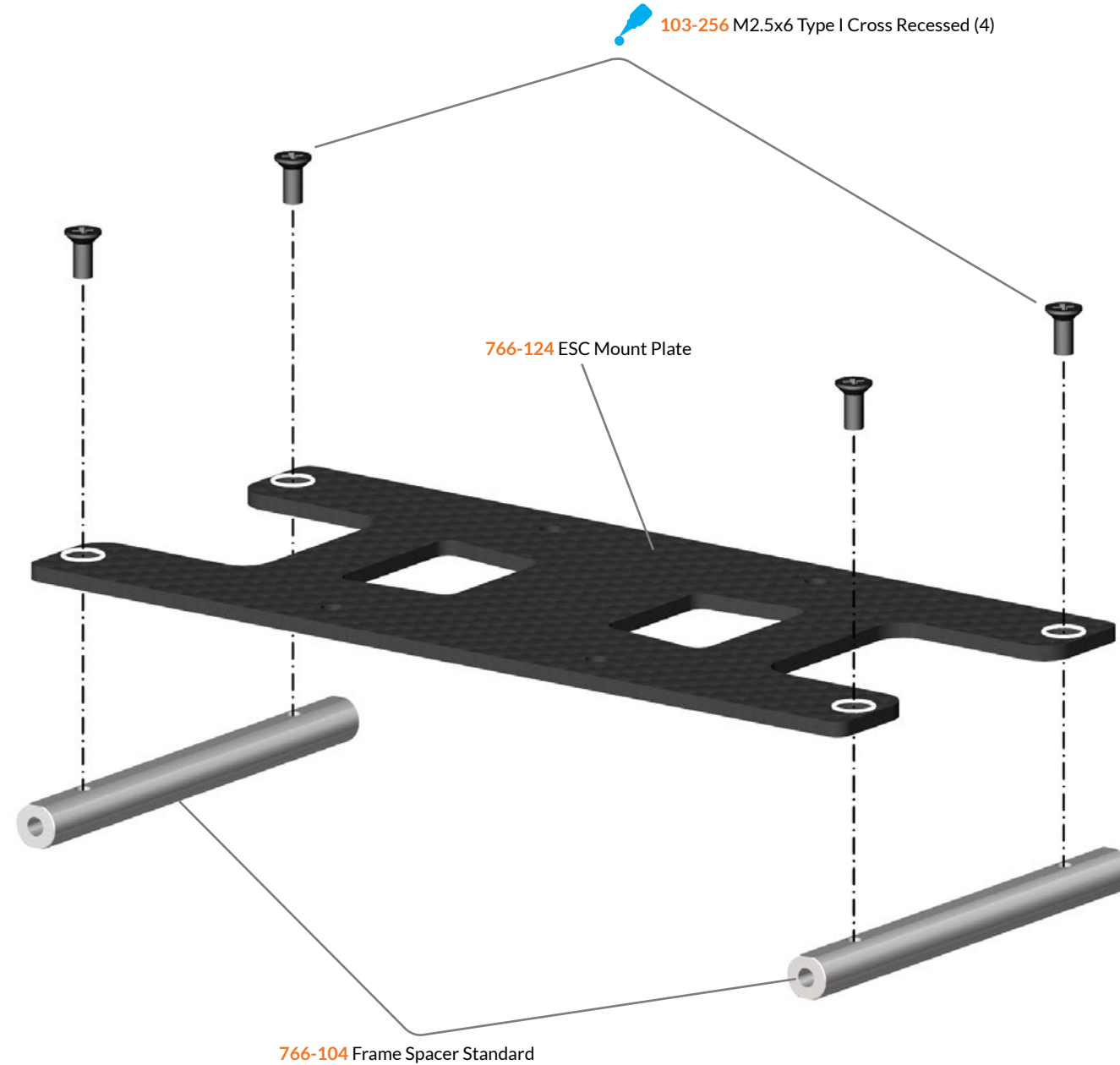
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Components that are factory assembled provide a reference for model assembly. Disassembly and application of thread lock is required where indicated.

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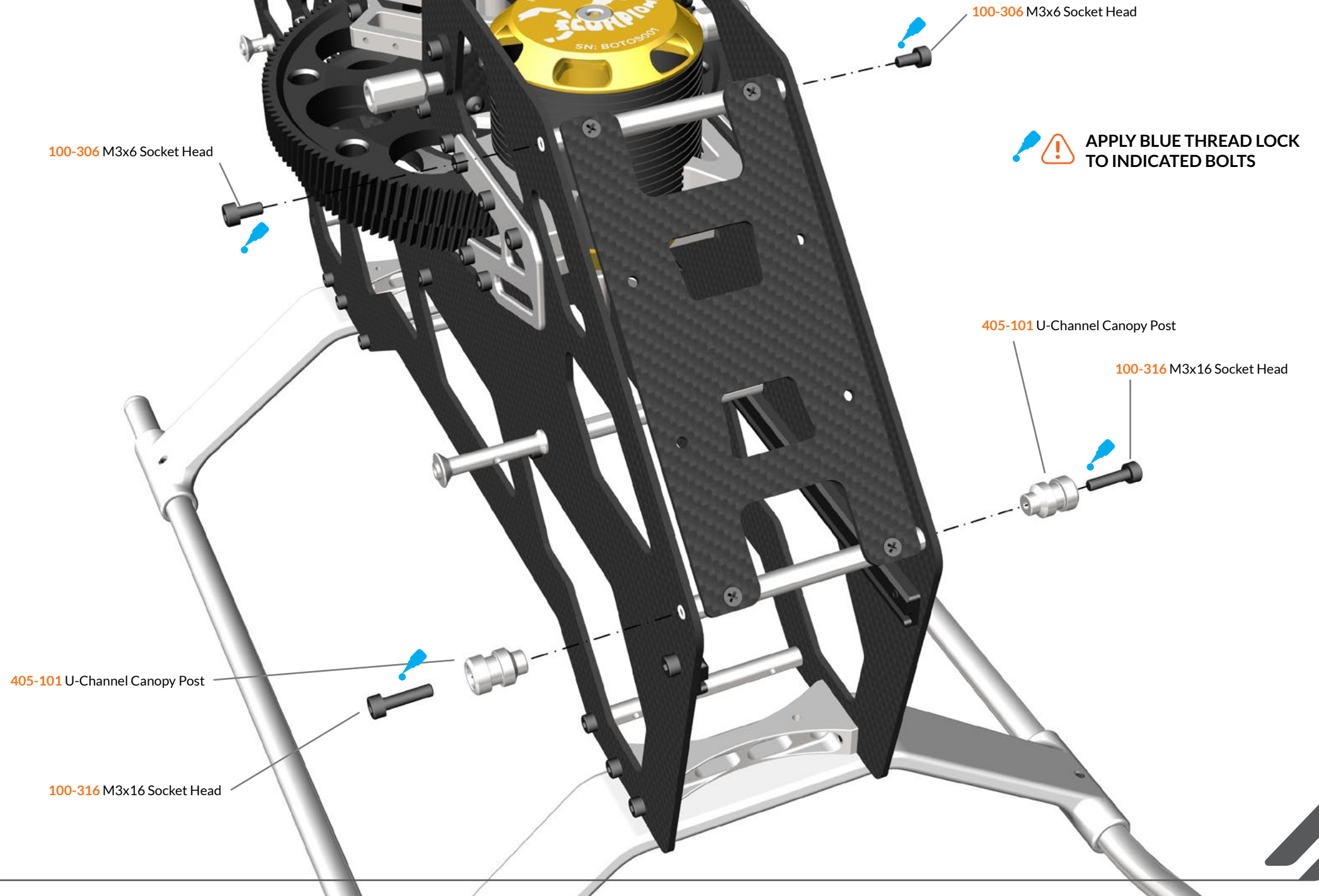
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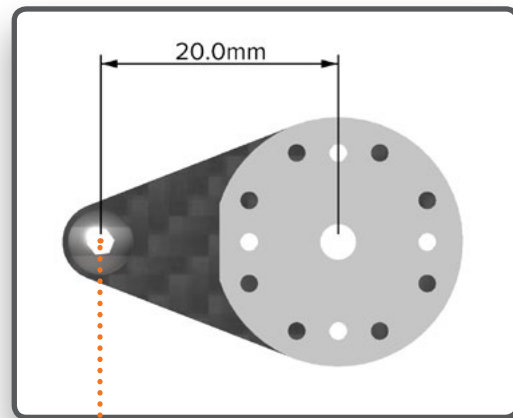
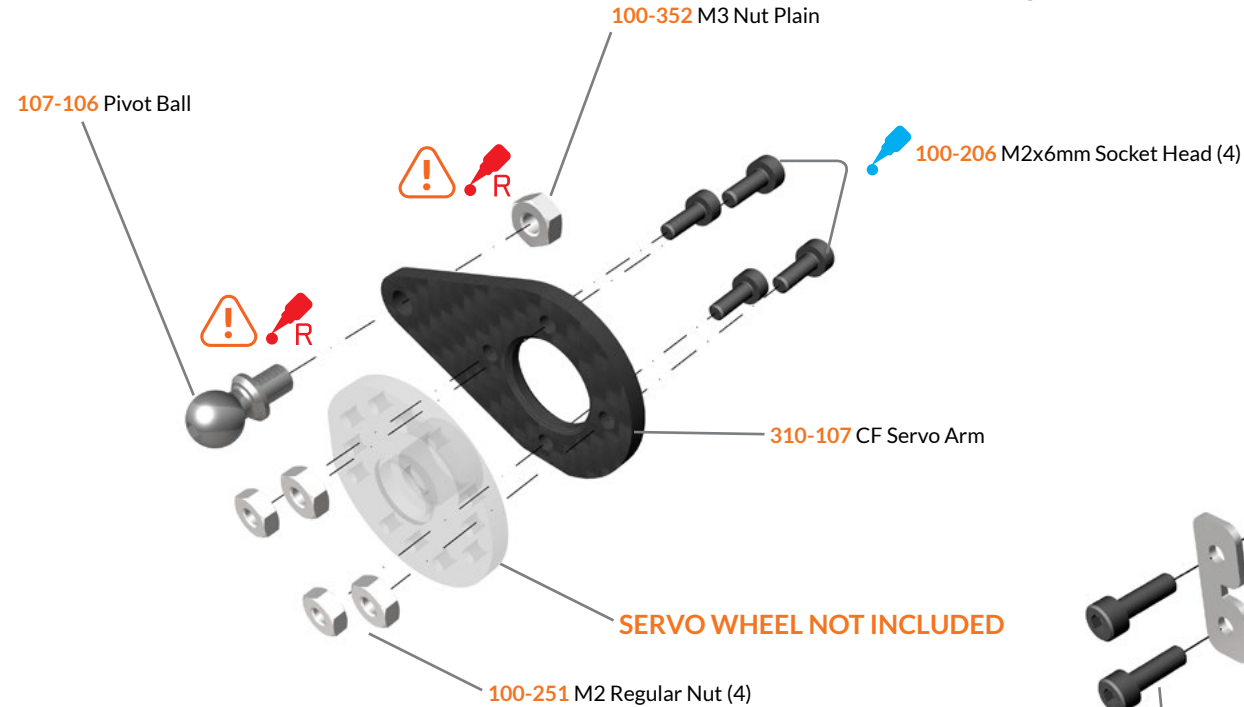
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CARBON FIBER SERVO ARMS (3)



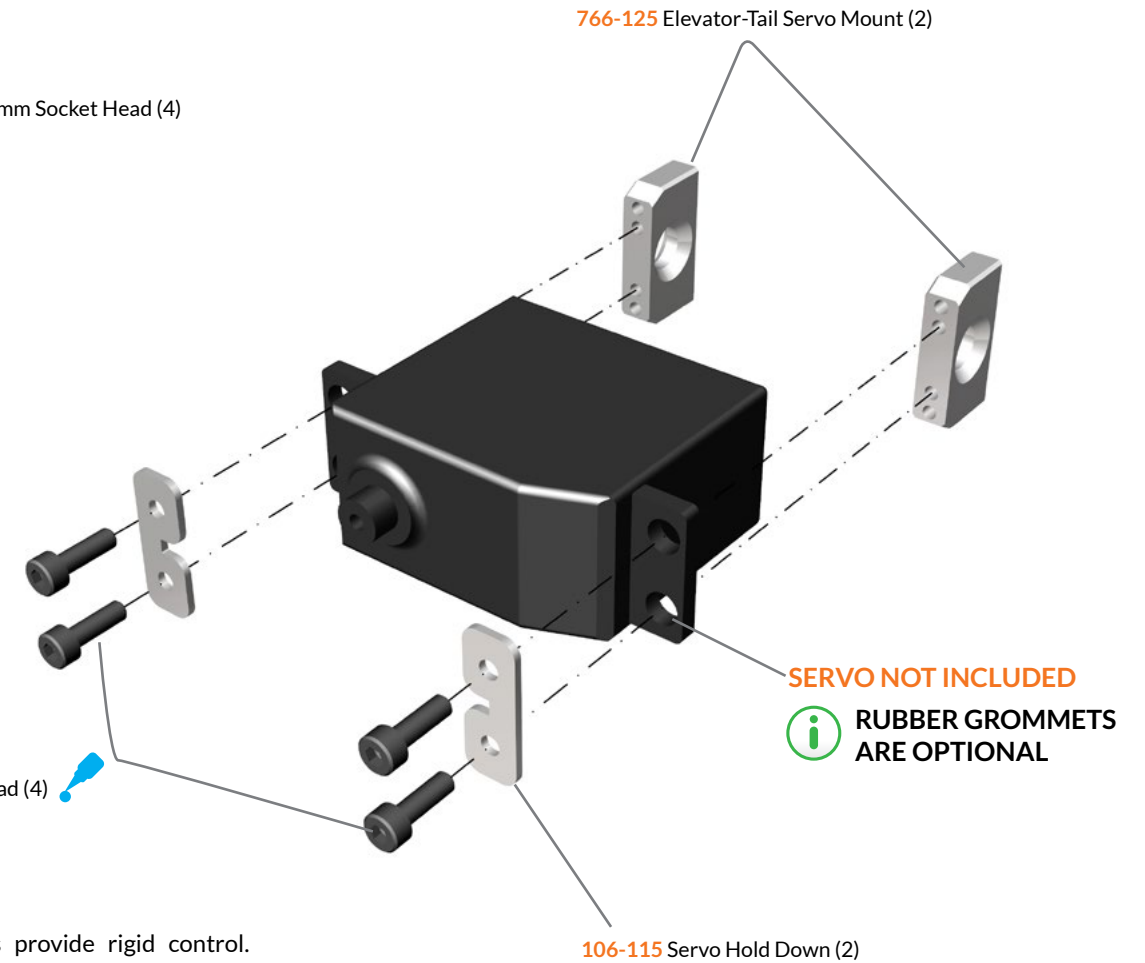
RECOMMENDED SETUP

The carbon fiber combination arms provide rigid control. These are not required but can provide a failure point during a crash which MAY prevent gear or servo damage.



PIVOT BALL LOCATION

If you choose not to use the provided servo arms, the pivot ball should be positioned as close to 20mm as possible. Use appropriate arm for your servo manufacturer.





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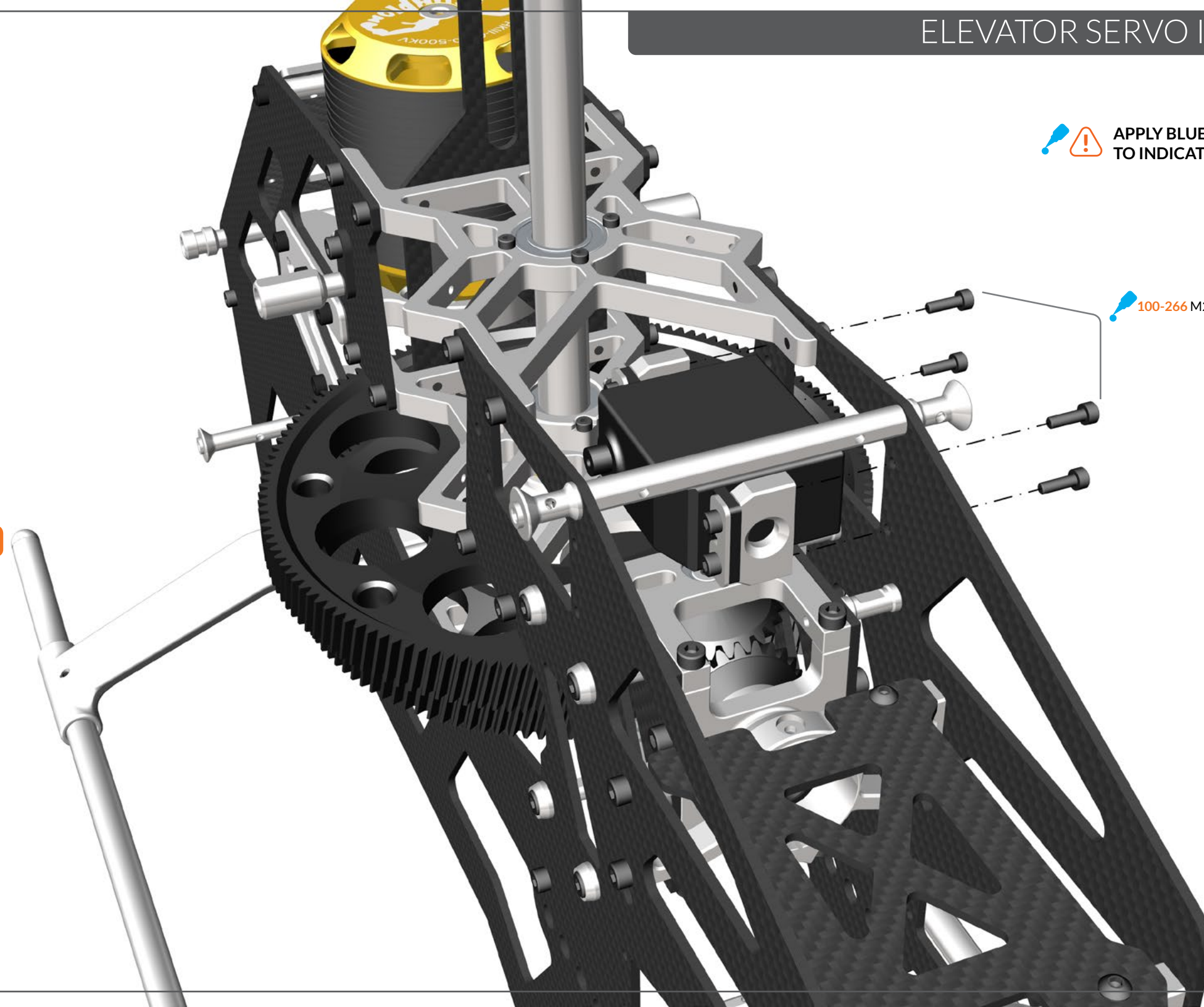
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APPLY BLUE THREAD LOCK TO INDICATED BOLTS



100-266 M2.5x6 Socket Head (4)





Components that are factory assembled provide a reference for model assembly. Disassembly and application of thread lock is required where indicated.

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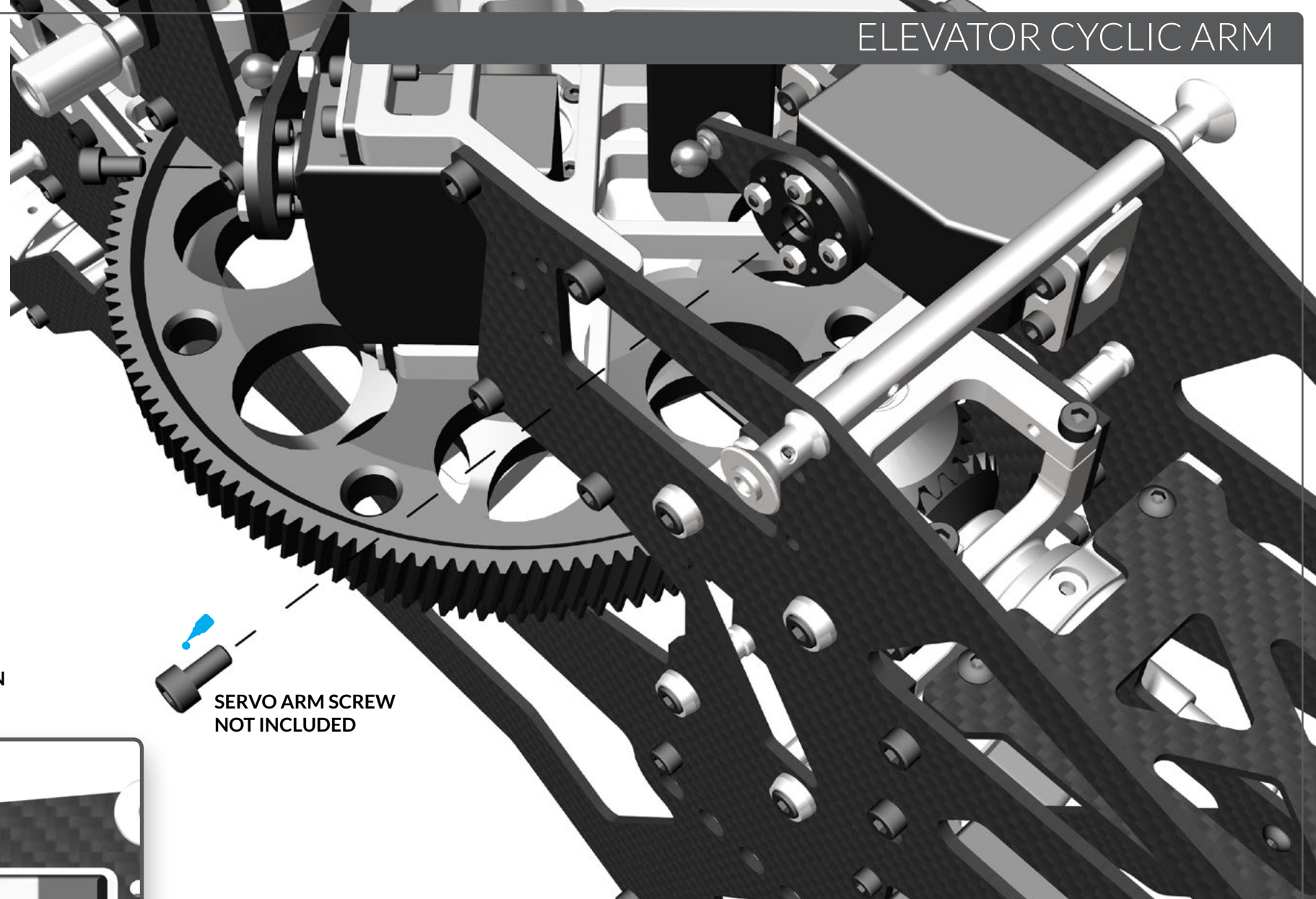
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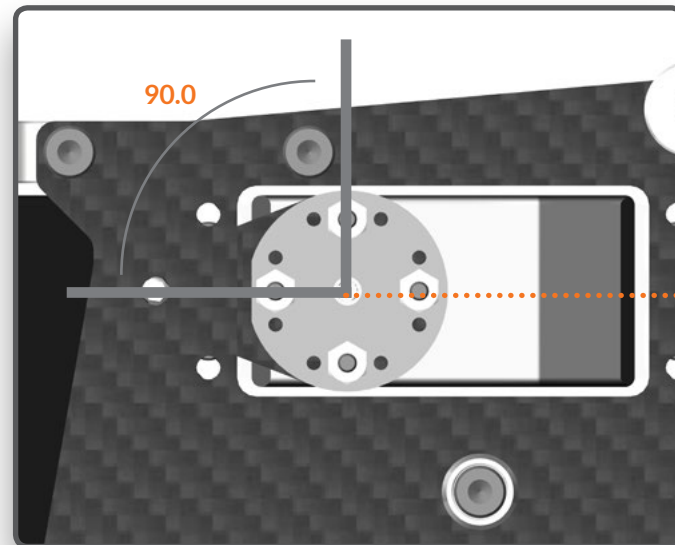
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ELEVATOR SERVO ARM INSTALLATION



SERVO ARM SCREW
NOT INCLUDED

INSTALL SERVO ARM AT 90 DEGREES
USING THE SETUP PROCEDURE FOR
YOUR SPECIFIC FBL UNIT.



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RUBBER GROMMETS
ARE OPTIONAL

106-115 Servo Hold Down (2)

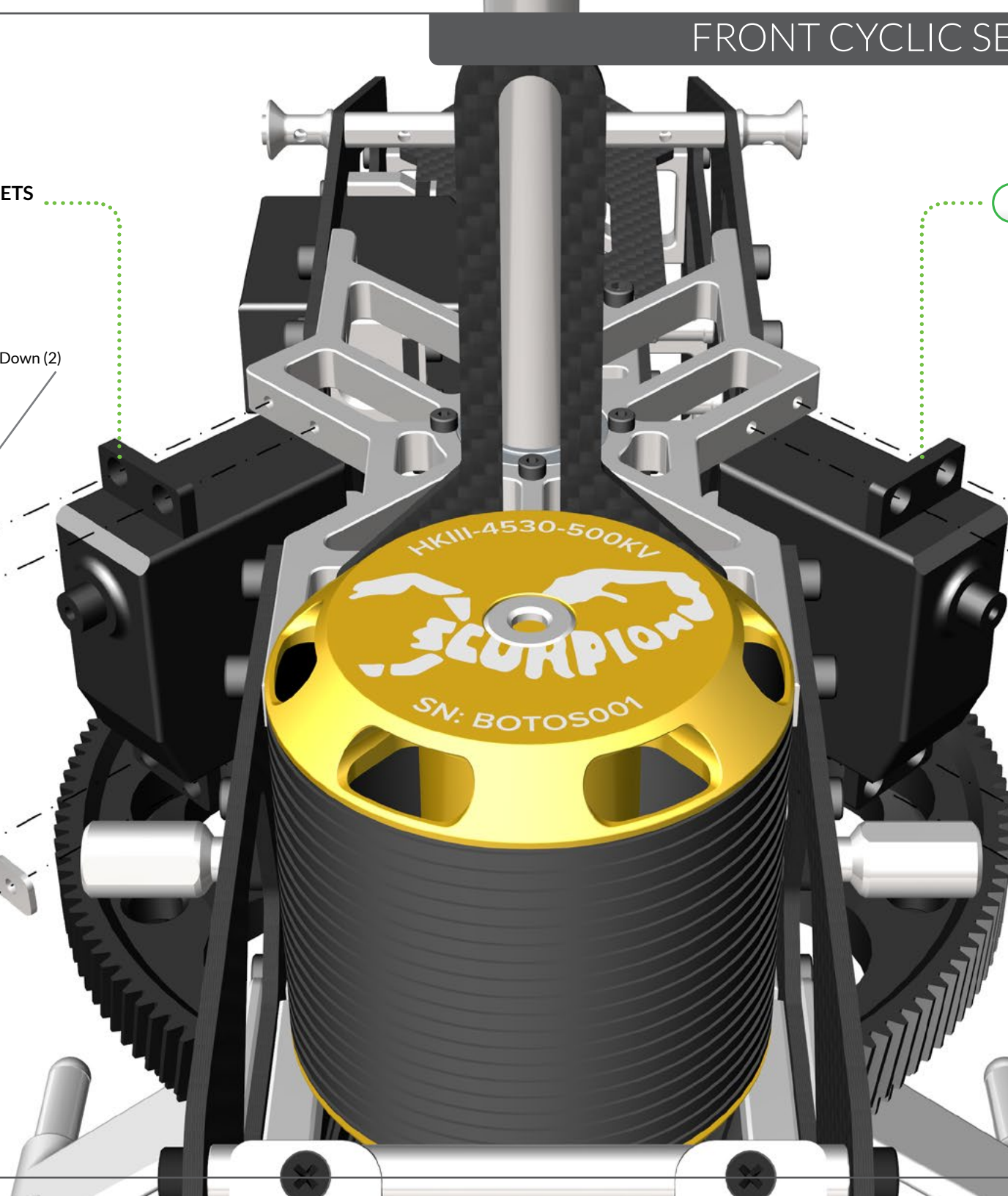
100-268 M2.5x8 Socket Head (4)



RUBBER GROMMETS
ARE OPTIONAL

106-115 Servo Hold Down (2)

100-268 M2.5x8 Socket Head (4)





Components that are factory assembled provide a reference for model assembly. Disassembly and application of thread lock is required where indicated.

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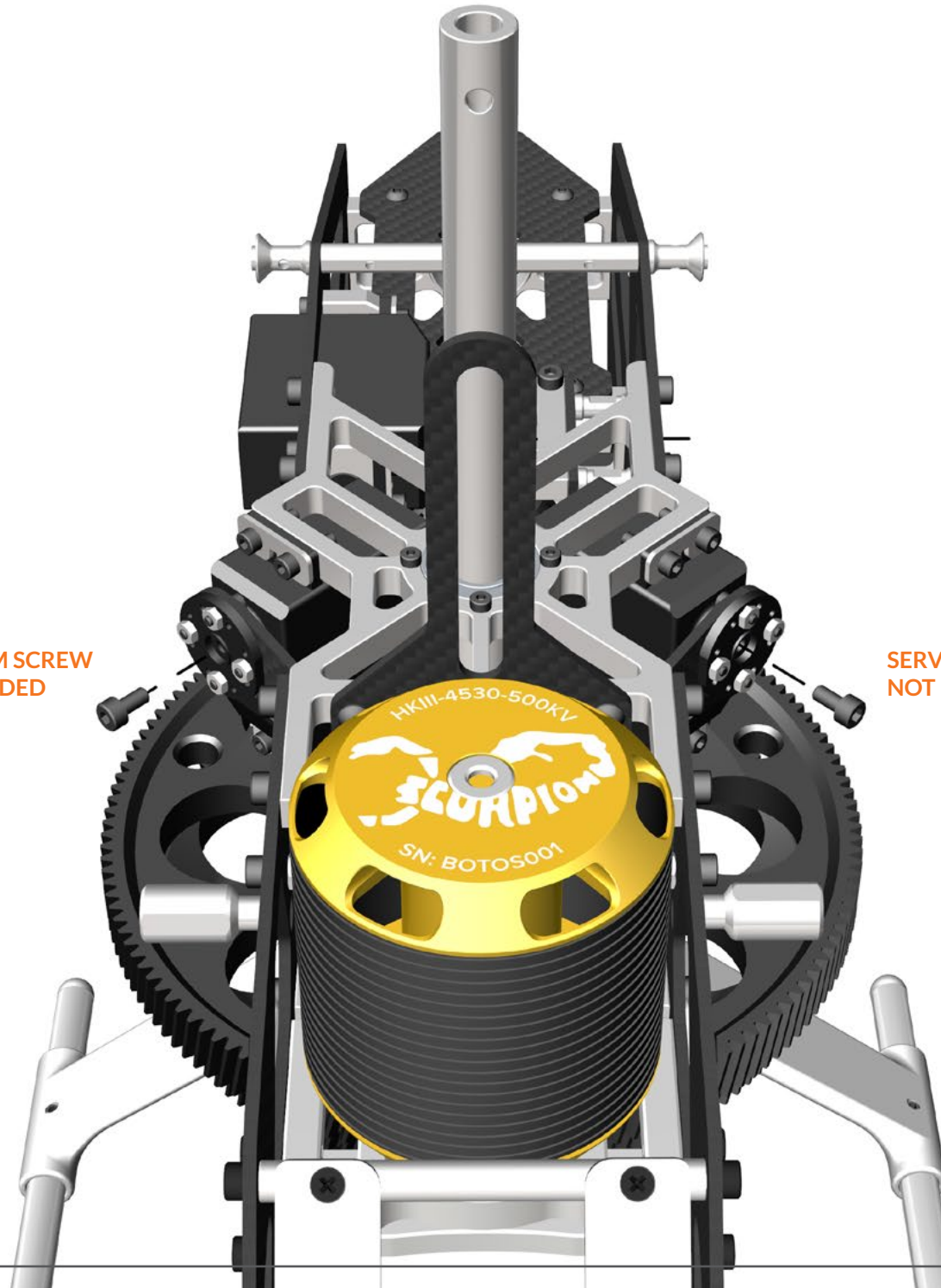
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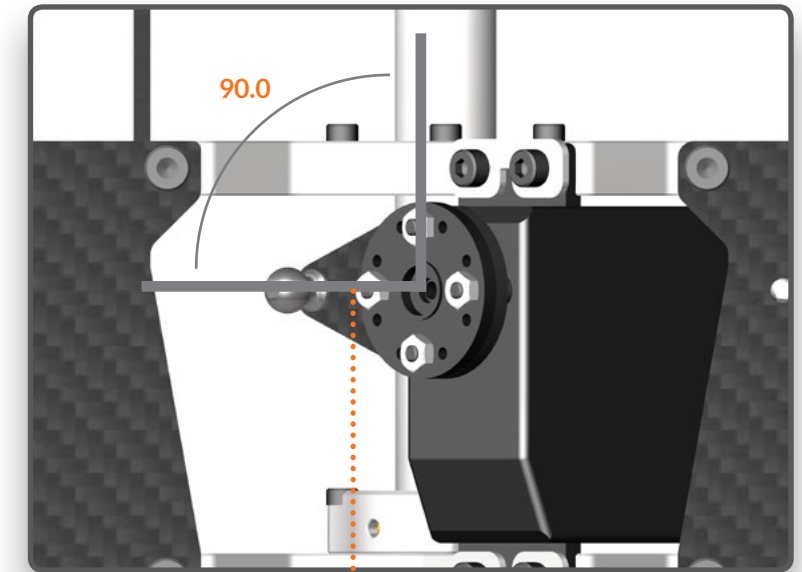
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SERVO ARM SCREW
NOT INCLUDED

SERVO ARM SCREW
NOT INCLUDED



INSTALL SERVO ARM AT 90 DEGREES
USING THE SETUP PROCEDURE FOR
YOUR SPECIFIC FBL UNIT.



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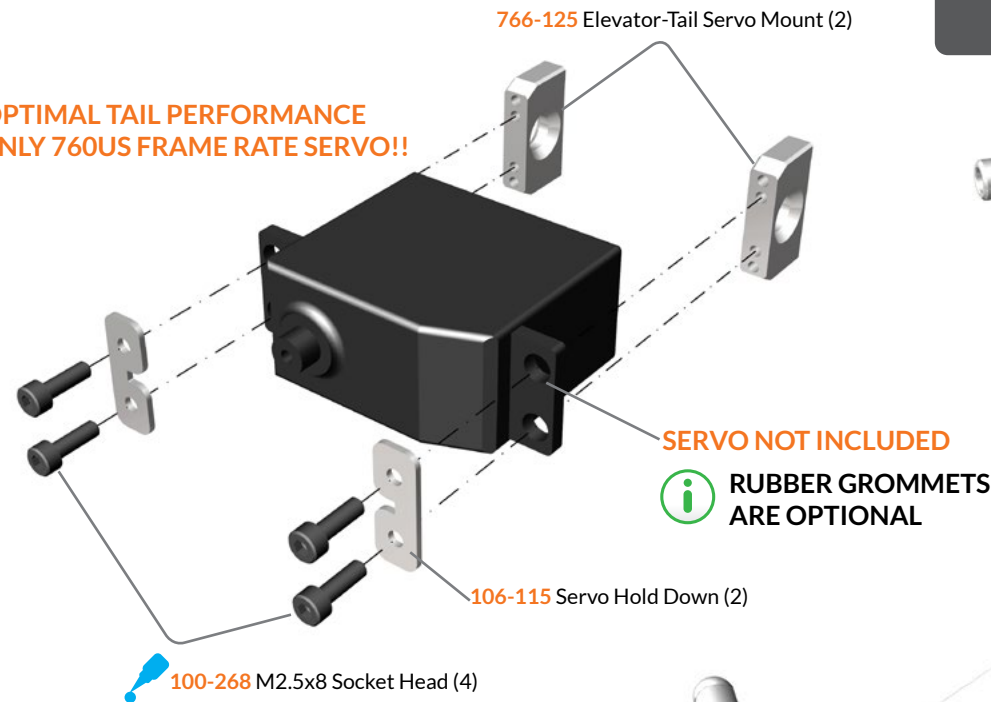
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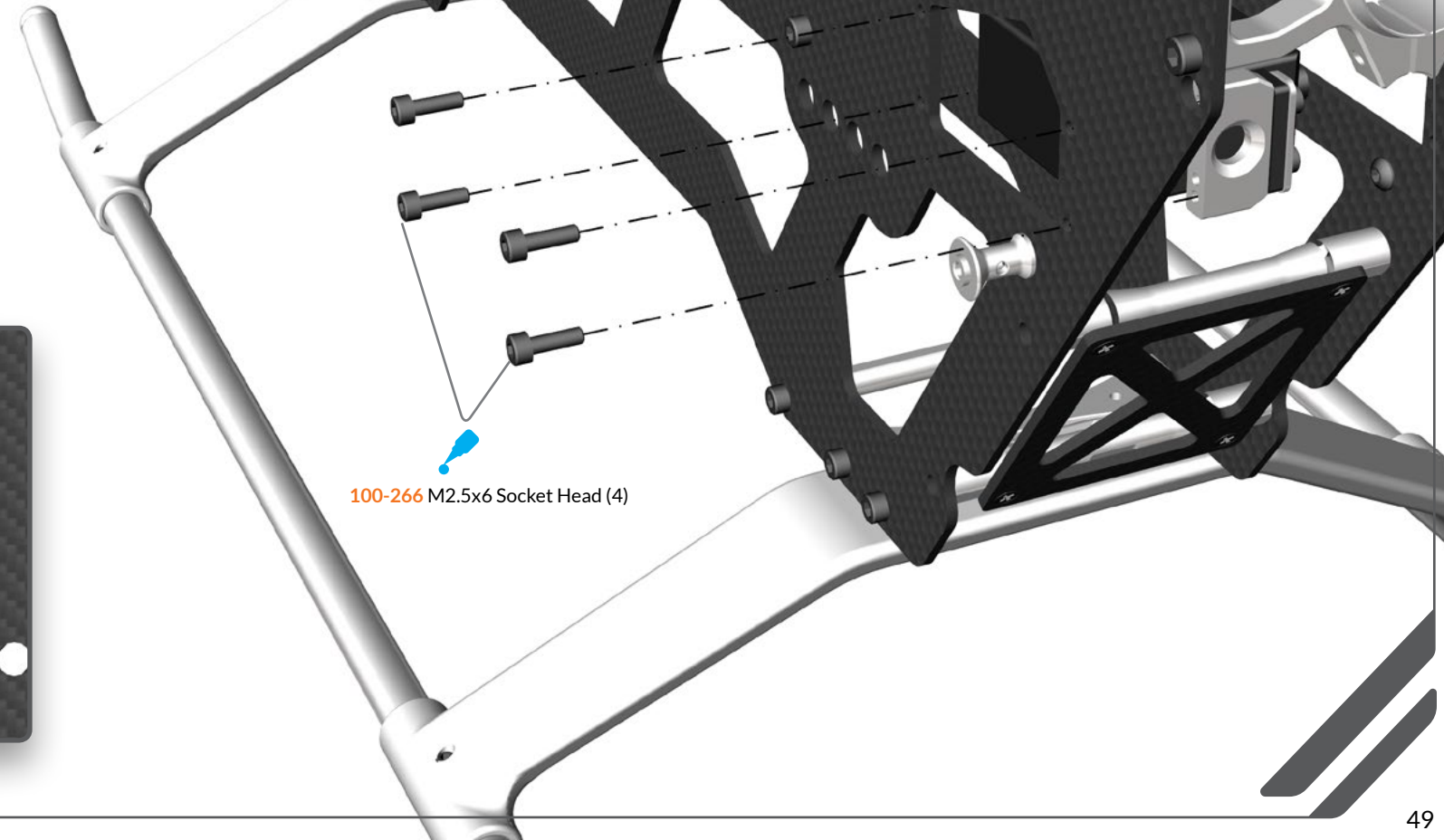
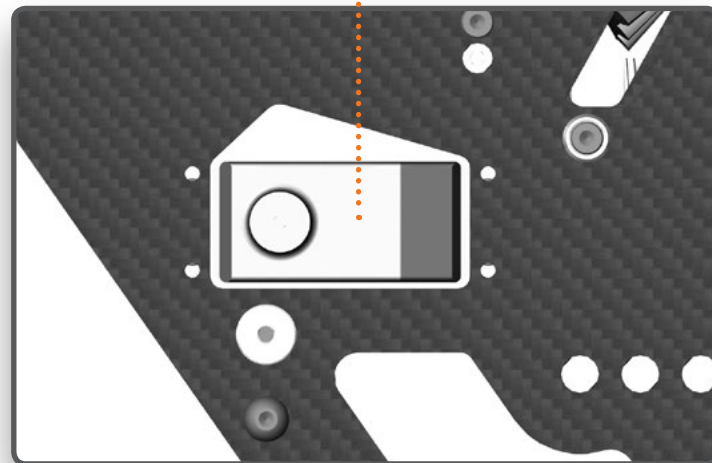
OPTIONS AND CONFIGURATIONS



FOR OPTIMAL TAIL PERFORMANCE
USE ONLY 760US FRAME RATE SERVO!!



NOTE SERVO ORIENTATION!





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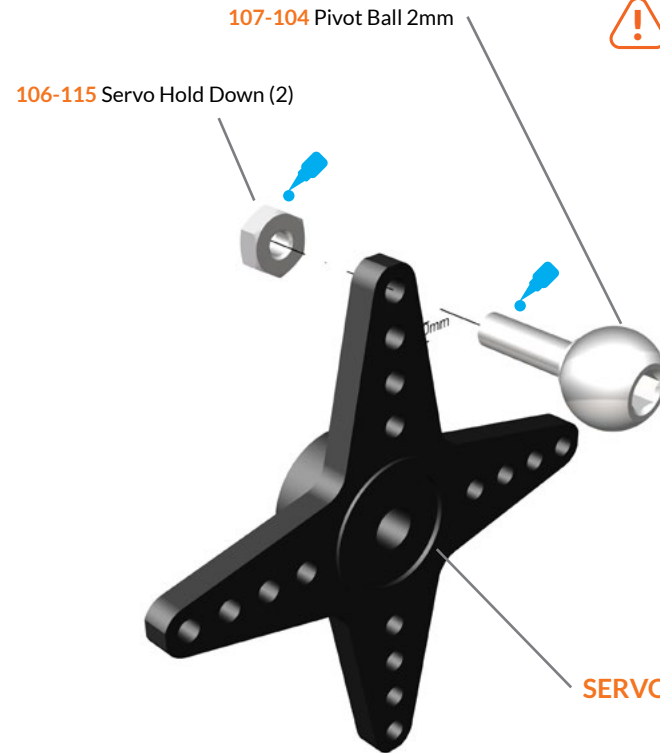
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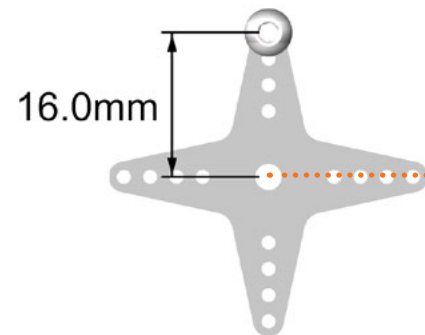
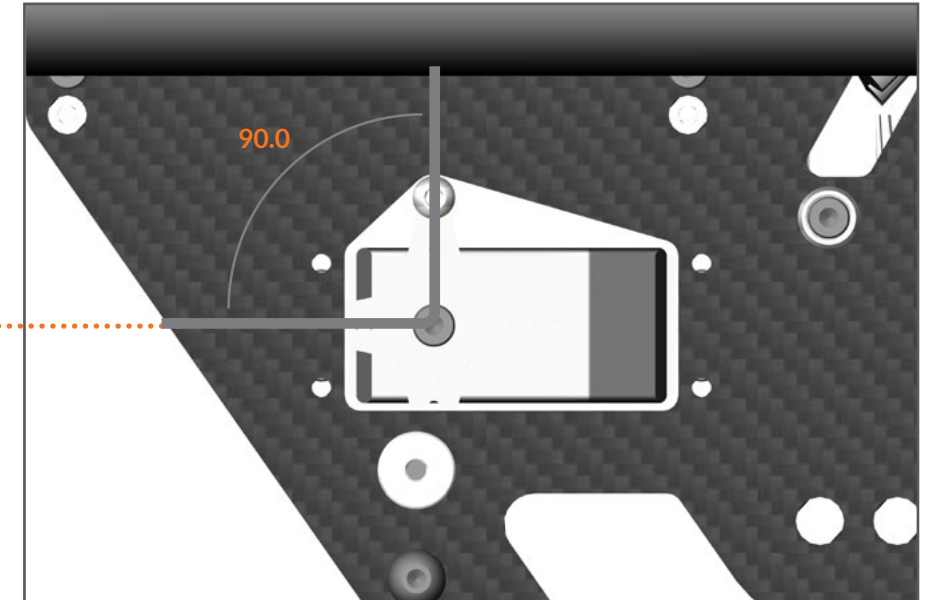
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INSTALL SERVO ARM AT 90 DEGREES FOLLOWING THE SETUP PROCEDURE FOR YOUR SPECIFIC FBL UNIT.



PIVOT BALL LOCATION

Pivot ball should be positioned as close to 16mm as possible. Use appropriate arm for your servo manufacturer.



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200-402 Swash Plate Assembly 12mm



IMPORTANT!

Secure swash pinch bolt to remove inner swash play!

100-310 M3x10 Socket Head

100-216 M2x16 Socket Head (8)



!!!IMPORTANT!!!



DO NOT OVERTIGHTEN 100-216 M2X16 SOCKET HEAD BOLTS!



THESE BOLTS MUST BE REPLACED AFTER EVERY CRASH!!
ROTOR BLADE IMPACT WITH THE GROUND CAN STRESS
FRACTURE THESE BOLTS!

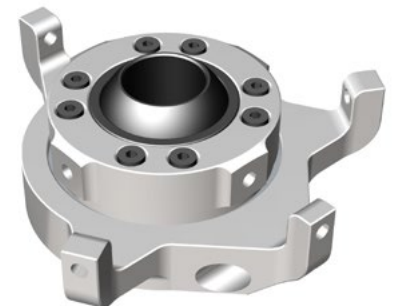
766-207 Upper Inner Swash Ring

766-208 Swash Clam Shell

766-209 Swash Spherical Ball 12mm

108-374 Swash Radial Bearing (2)

766-210 Bottom Inner Swash Ring





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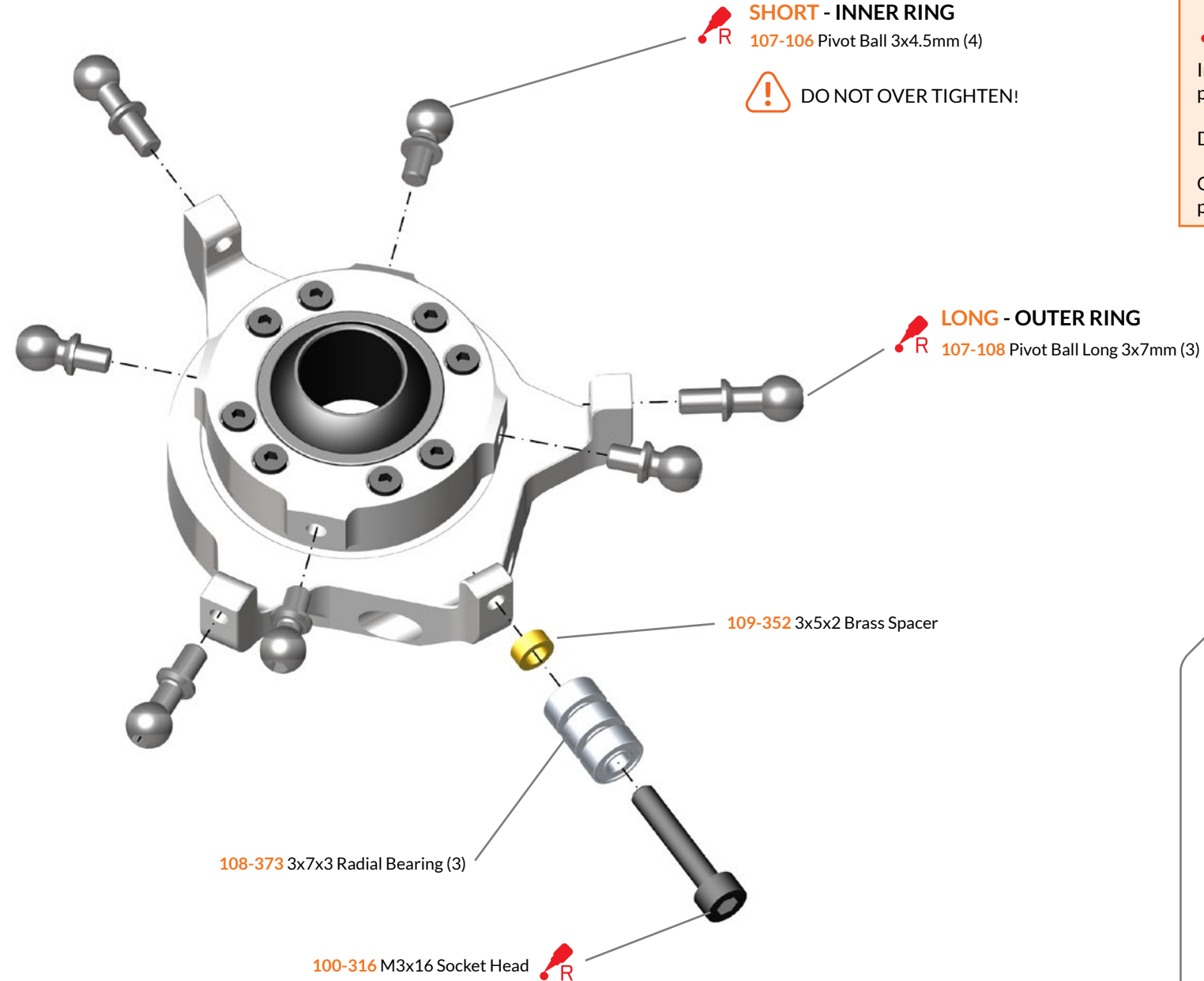
TAIL AND HUB

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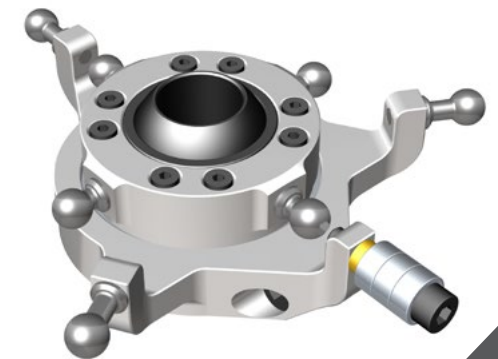


SWASH PIVOT BALLS

Inner swash ring contains four (4) SHORT pivot balls. Apply RED thread lock to secure.

DO NOT OVER TIGHTEN!

Outer swash ring contains three (3) LONG pivot balls. Apply RED thread lock to secure.





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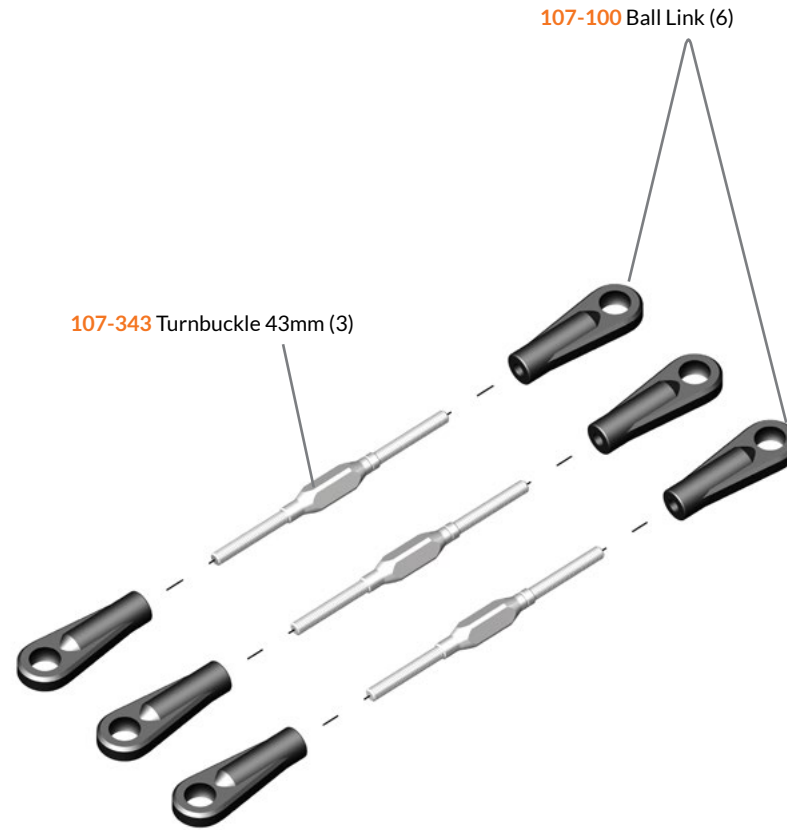
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IMPORTANT!! TURNBUCKLES AND PLASTIC LINKS MUST BE CHANGED AFTER A CRASH. STRESS FRACTURE TO LINKAGE IS NOT ALWAYS VISIBLE.

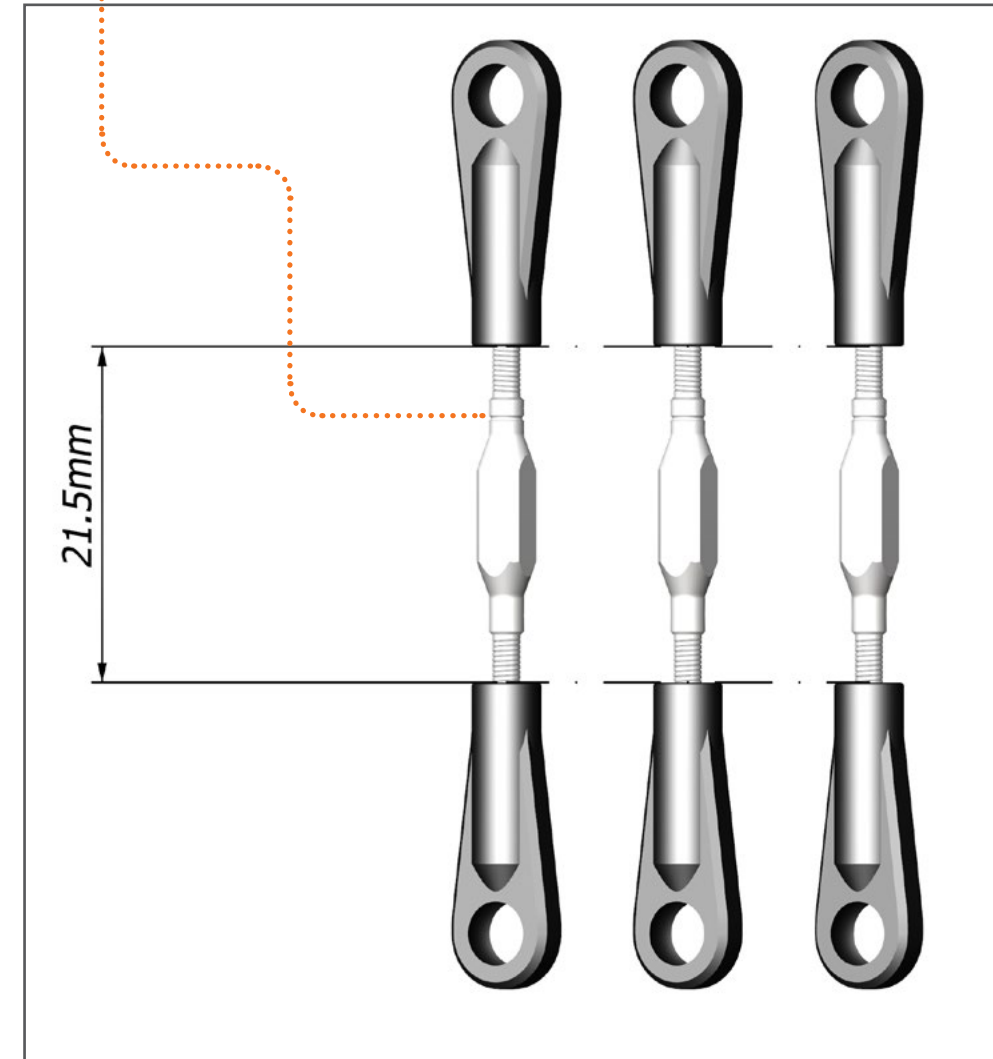


CYCLIC TURNBUCKLE LINKAGES



THREAD INDICATORS AND LINKAGE ORIENTATION

Notice thread indicator mark - this groove indicates left hand threaded side while the opposite side of the link is right hand threaded. Orient all linkages the same for adjustment symmetry.





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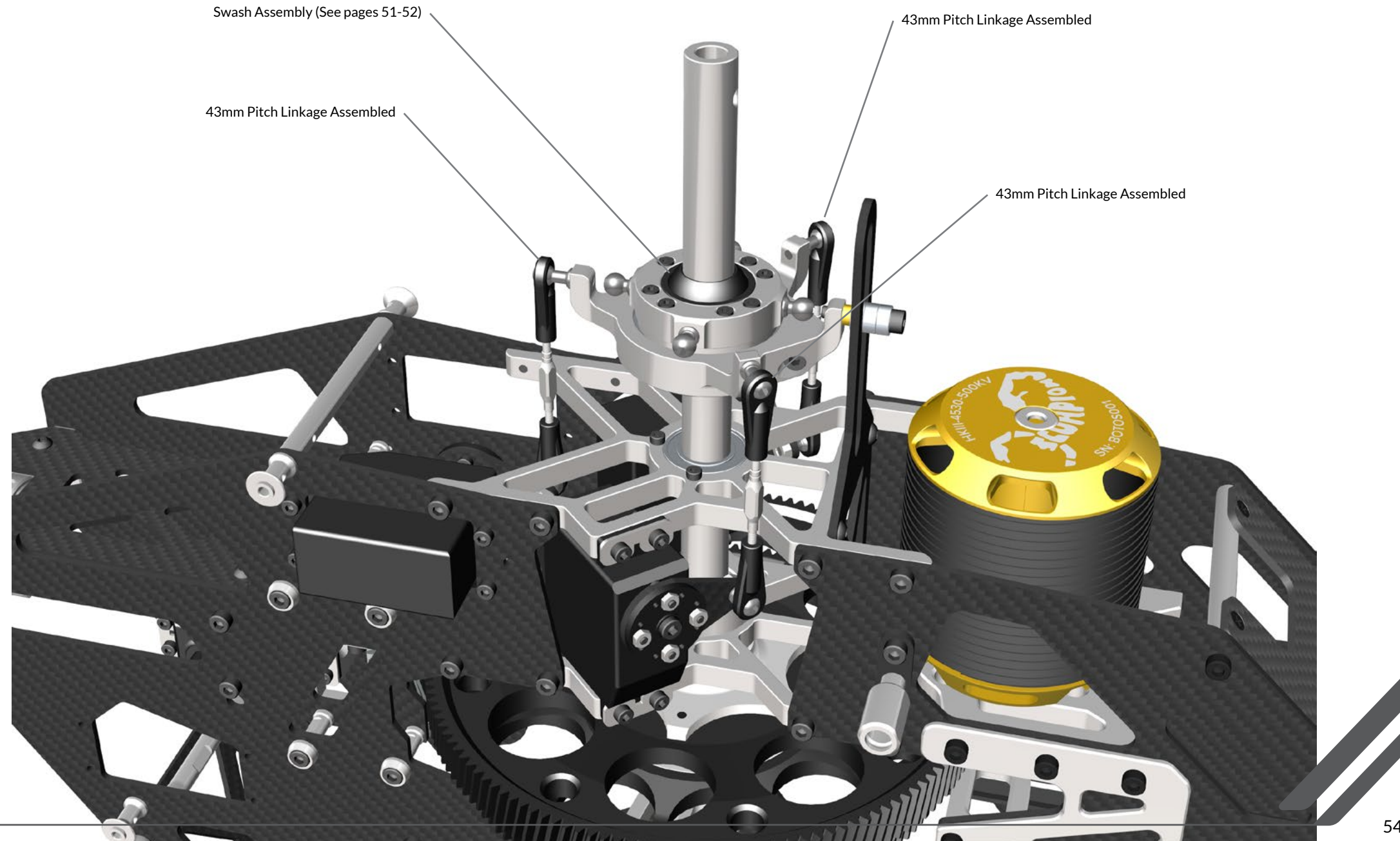
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Components that are factory assembled provide a reference for model assembly. Disassembly and application of thread lock is required where indicated.

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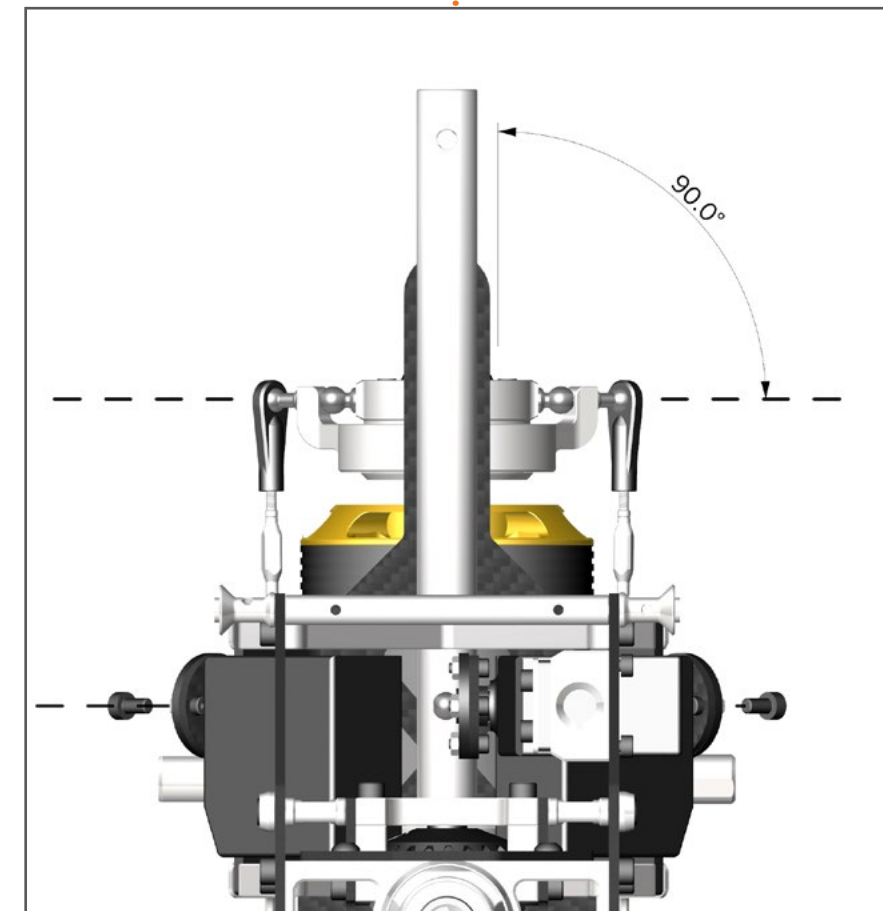
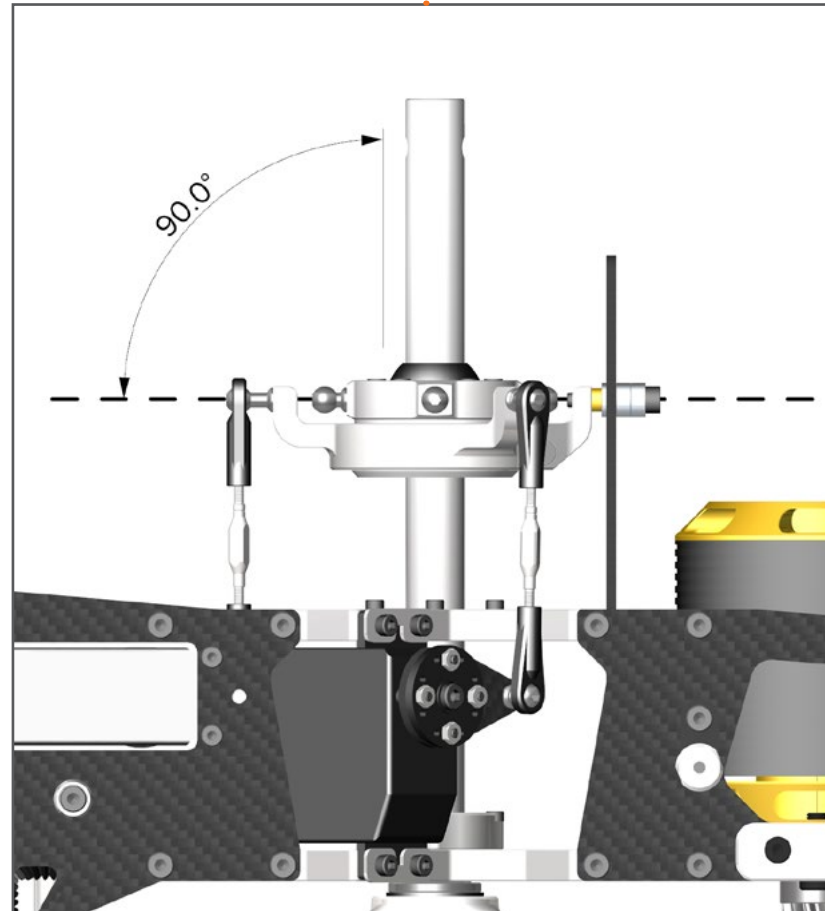
MAIN AND TAIL BLADES

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LEVEL SWASH PLATE USING THE SETUP PROCEDURE FOR YOUR SPECIFIC FBL UNIT.





Components that are factory assembled provide a reference for model assembly. Disassembly and application of thread lock is required where indicated.

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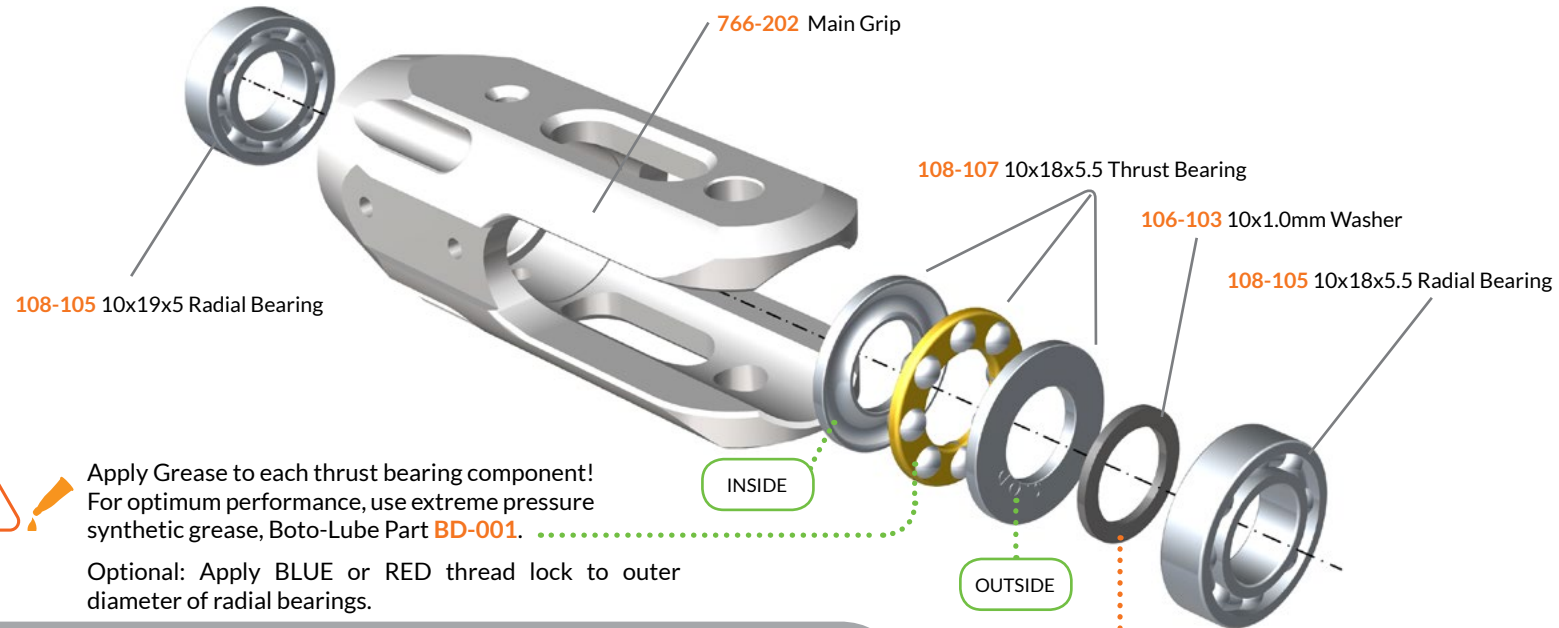
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Apply Grease to each thrust bearing component! For optimum performance, use extreme pressure synthetic grease, Boto-Lube Part **BD-001**.

Optional: Apply BLUE or RED thread lock to outer diameter of radial bearings.

STEP 1

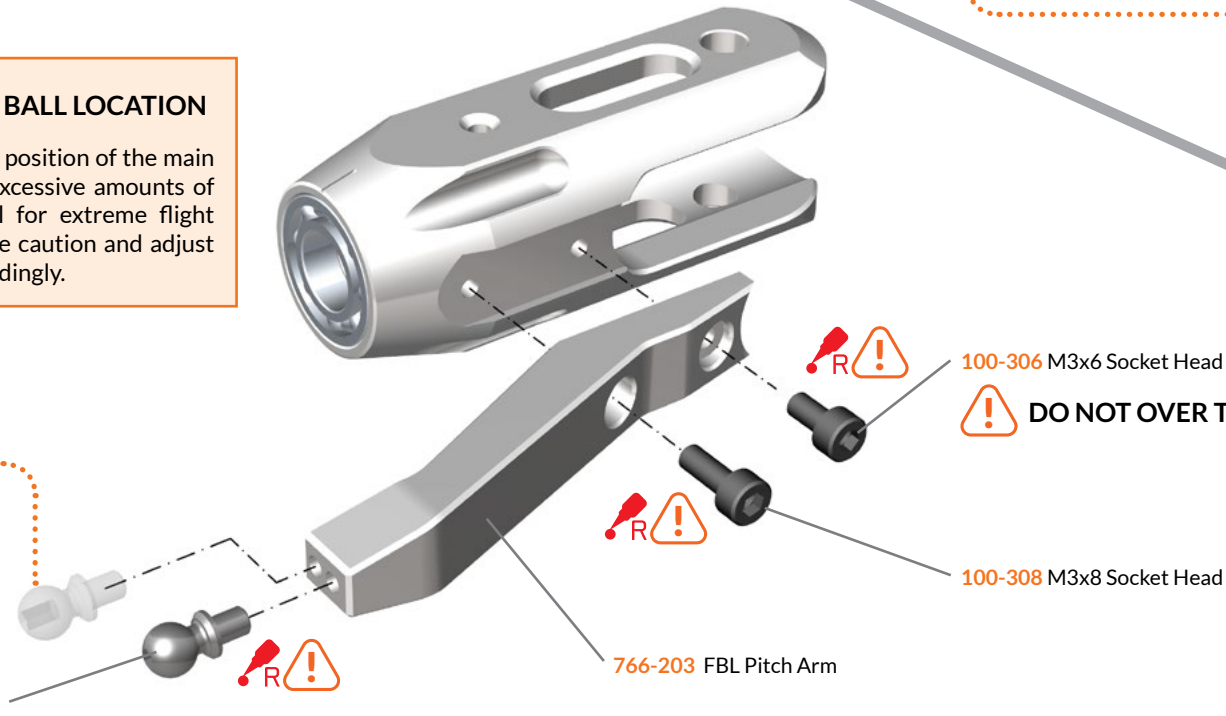
STEP 2



OPTIONAL PIVOT BALL LOCATION

WARNING! Optional inner position of the main pitch linkage will provide excessive amounts of cyclic and collective travel for extreme flight characteristics. Use extreme caution and adjust flybarless parameters accordingly.

107-106 Pivot Ball 3x4.5mm



766-203 FBL Pitch Arm

100-306 M3x6 Socket Head

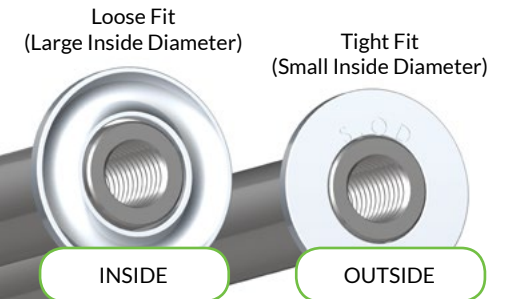
DO NOT OVER TIGHTEN!

100-308 M3x8 Socket Head



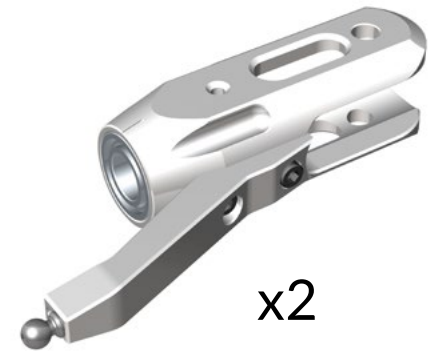
THRUST BEARING TIP

Use the head axle to help determine which sides are the inside and outside halves:



IMPORTANT!

106-103 10x1.0mm Washer is located between Outside Thrust and Radial Bearing.





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ADJUSTABLE HEAD DAMPERS

The Synergy 766 allows for various flight styles, head speeds, and rotor sizes by utilizing an adjustable head damping system.

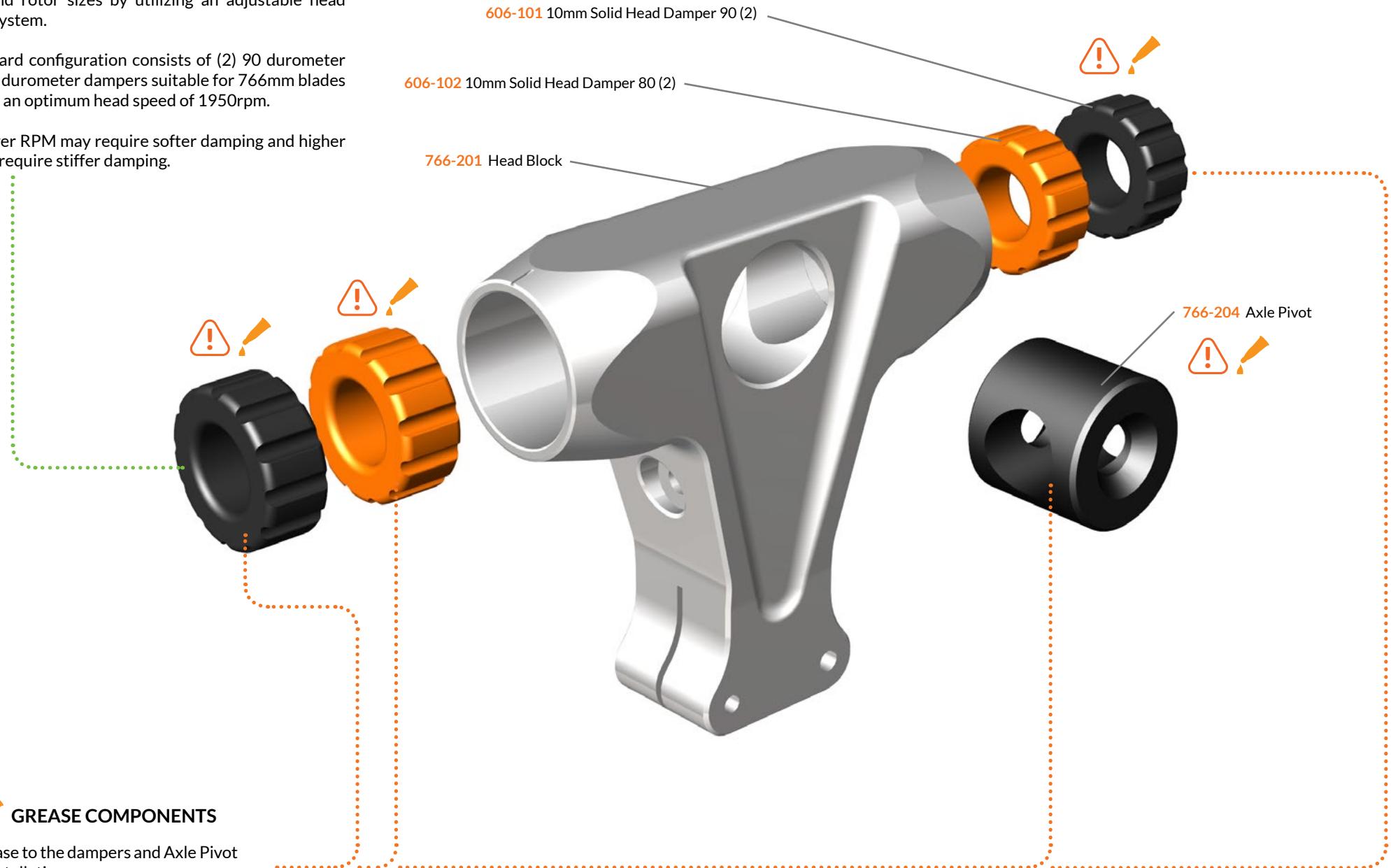
The standard configuration consists of (2) 90 durometer and (2) 80 durometer dampers suitable for 766mm blades running at an optimum head speed of 1950rpm.

Note: Lower RPM may require softer damping and higher RPM may require stiffer damping.



GREASE COMPONENTS

Apply grease to the dampers and Axle Pivot prior to installation.





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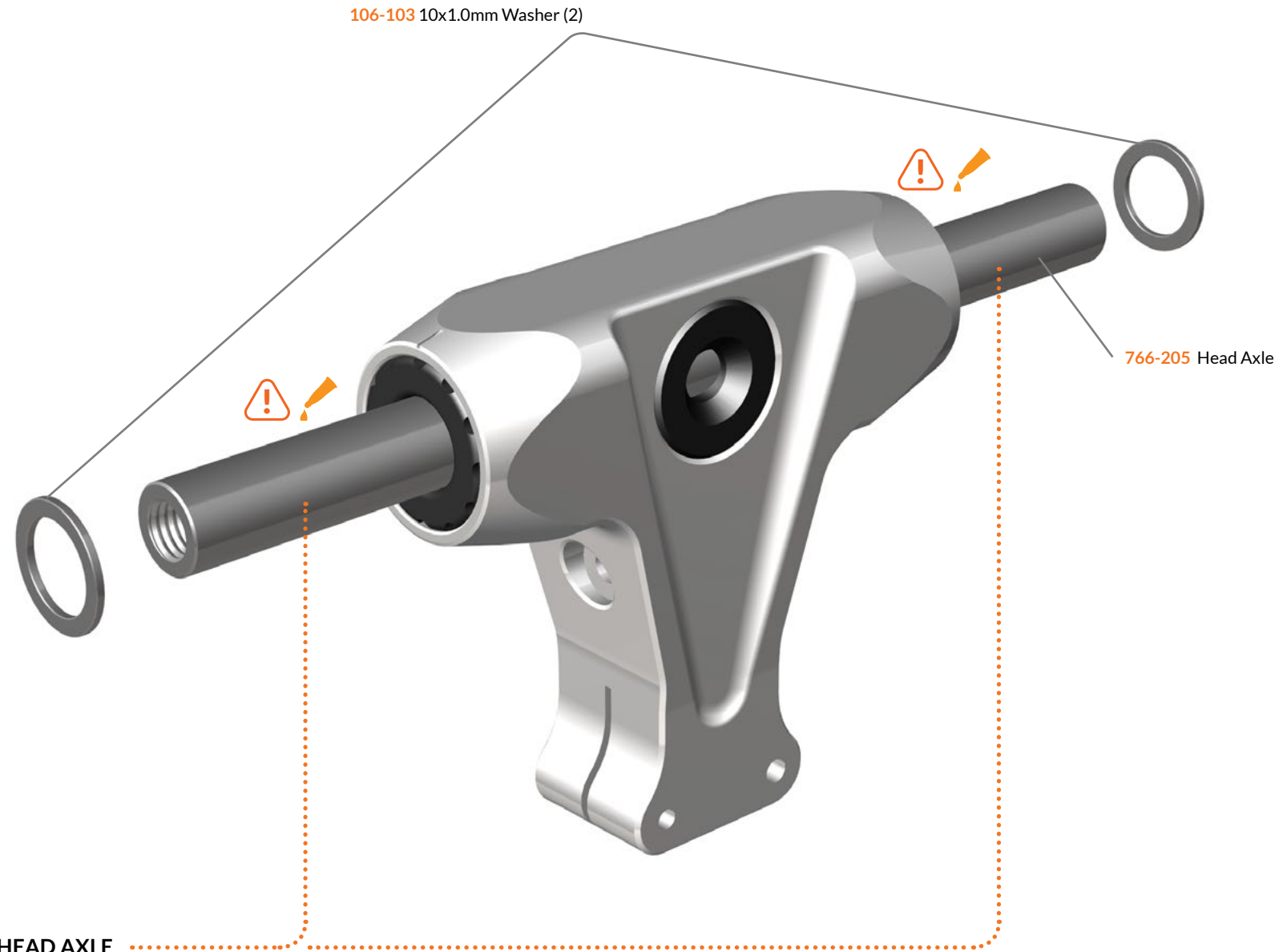
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GREASE HEAD AXLE

Apply grease to the head axle prior to inserting.



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100-616 M6x16 Socket Head (2)

100-654 M6 Washer (2)



MAIN AXLE BOLTS

!!CRITICAL!!

CLEAN BOLT THREADS WITH ACETONE OR ALCOHOL THEN APPLY BLUE THREAD LOCK AND SECURELY TIGHTEN!
THESE ARE LARGE M6 BOLTS, IF YOU CHOOSE TO USE RED HEAT MAY BE REQUIRED TO REMOVE.



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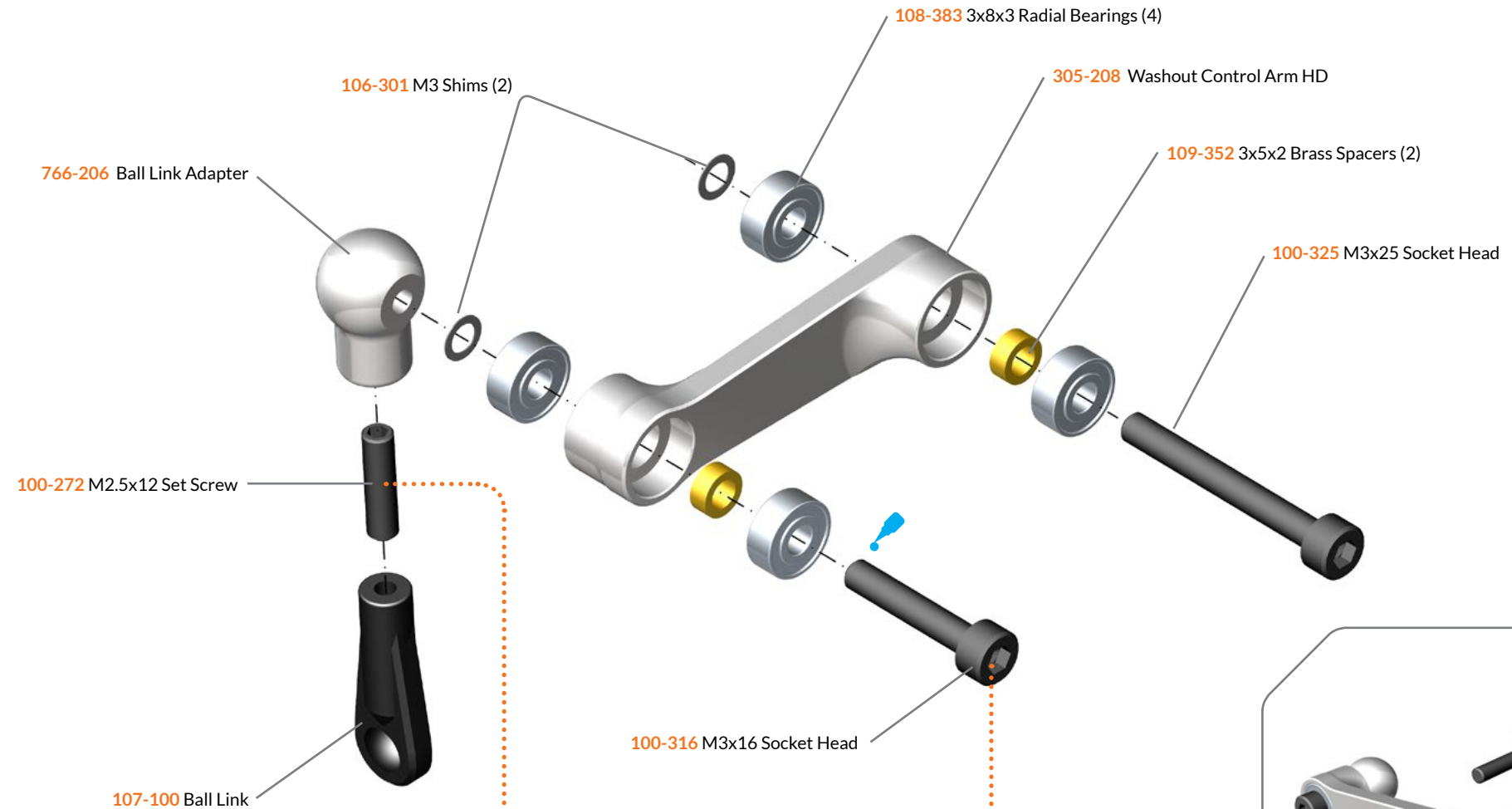
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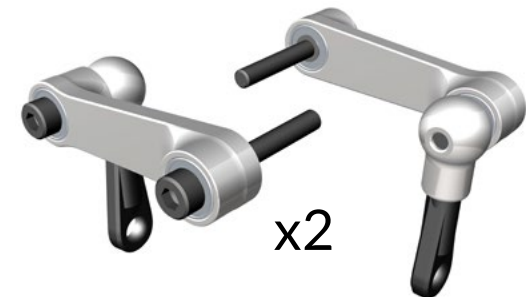


IMPORTANT!

Disassembly: Remove M2.5x12 Set Screw prior to removing M3x16 Socket Head.

Installation: Install M3x16 Socket Head prior to installing M2.5x12 Set Screw.

Failure to do so could destroy the bolt and/or the Ball Link Adapter!





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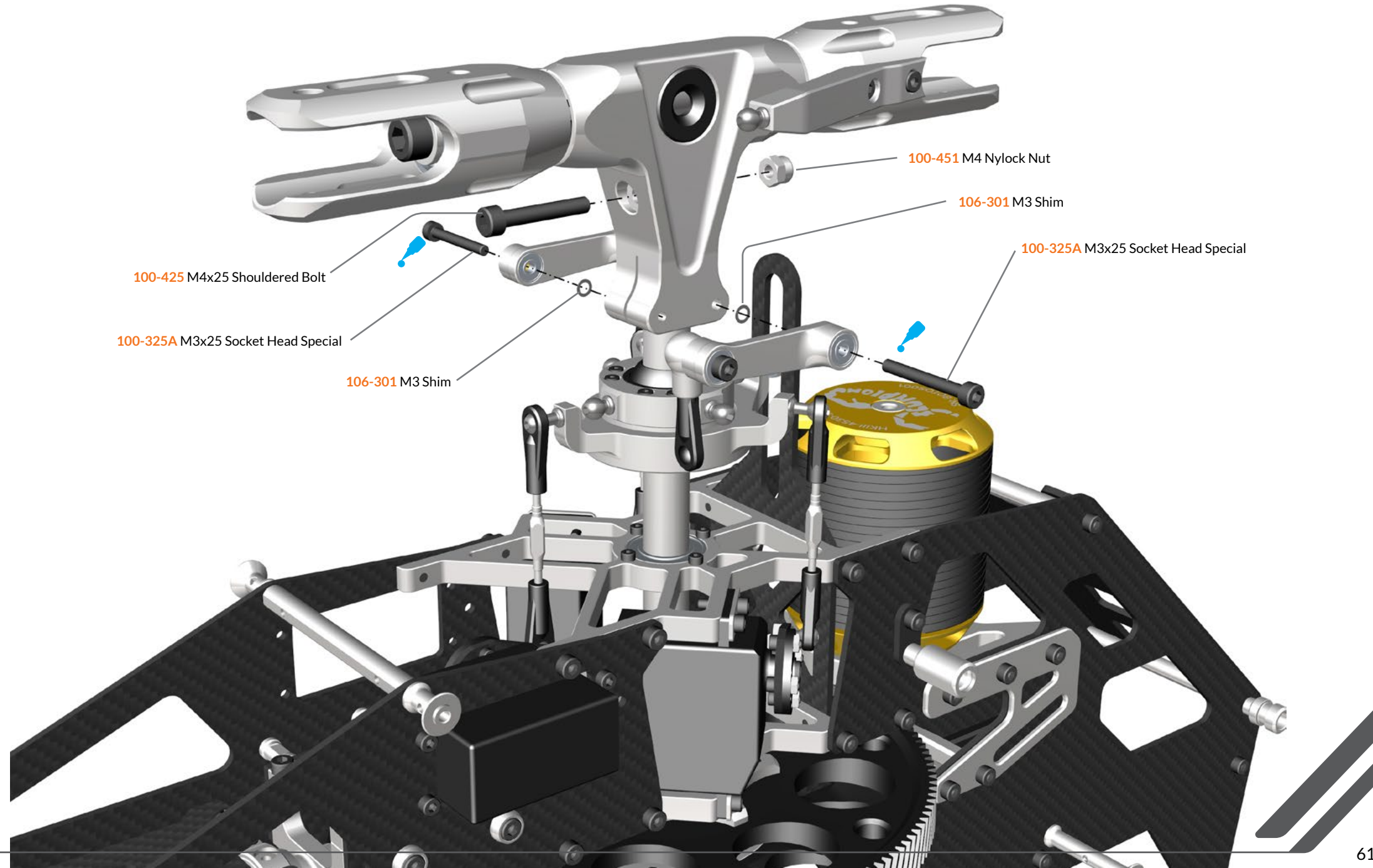
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APPLY BLUE THREAD LOCK TO INDICATED BOLTS





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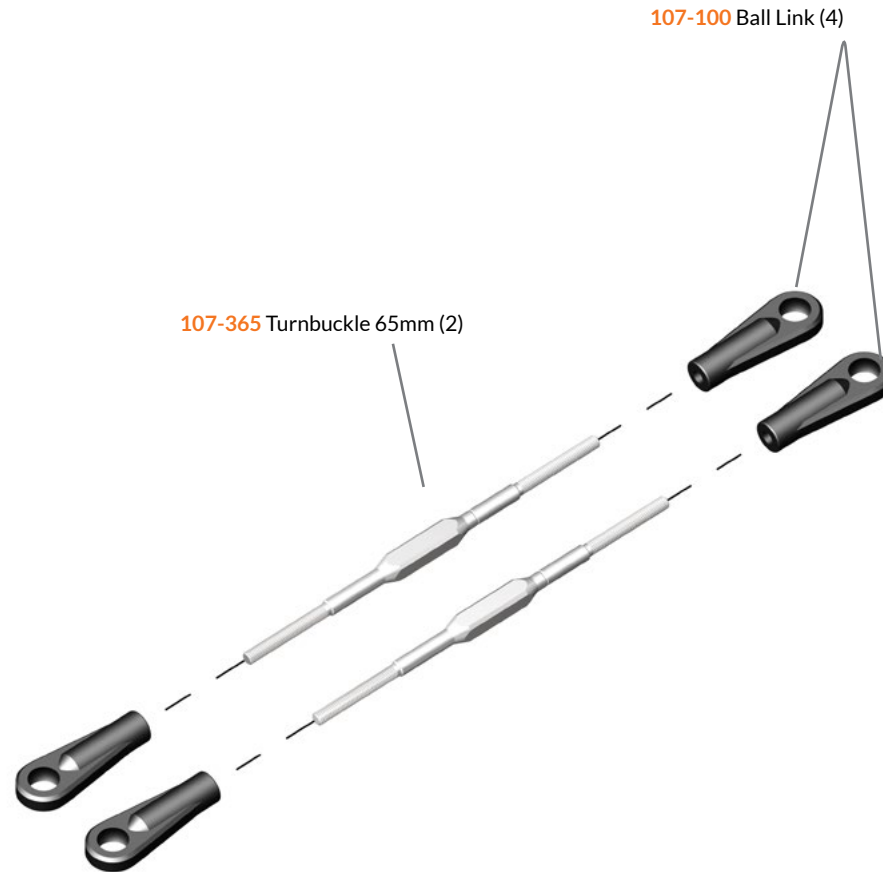
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IMPORTANT!! TURNBUCKLES AND PLASTIC LINKS MUST BE CHANGED AFTER A CRASH. STRESS FRACTURE TO LINKAGE IS NOT ALWAYS VISIBLE.

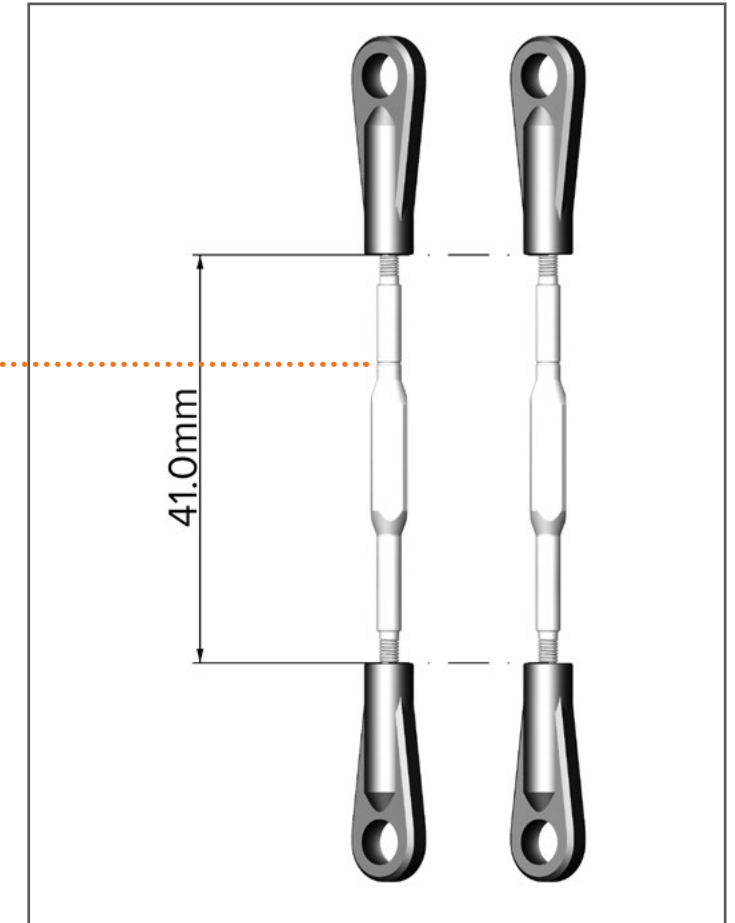


PITCH TURNBUCKLE LINKAGES



LINKAGE ORIENTATION

Notice thread indicator mark - Orient all linkages the same for adjustment symmetry.





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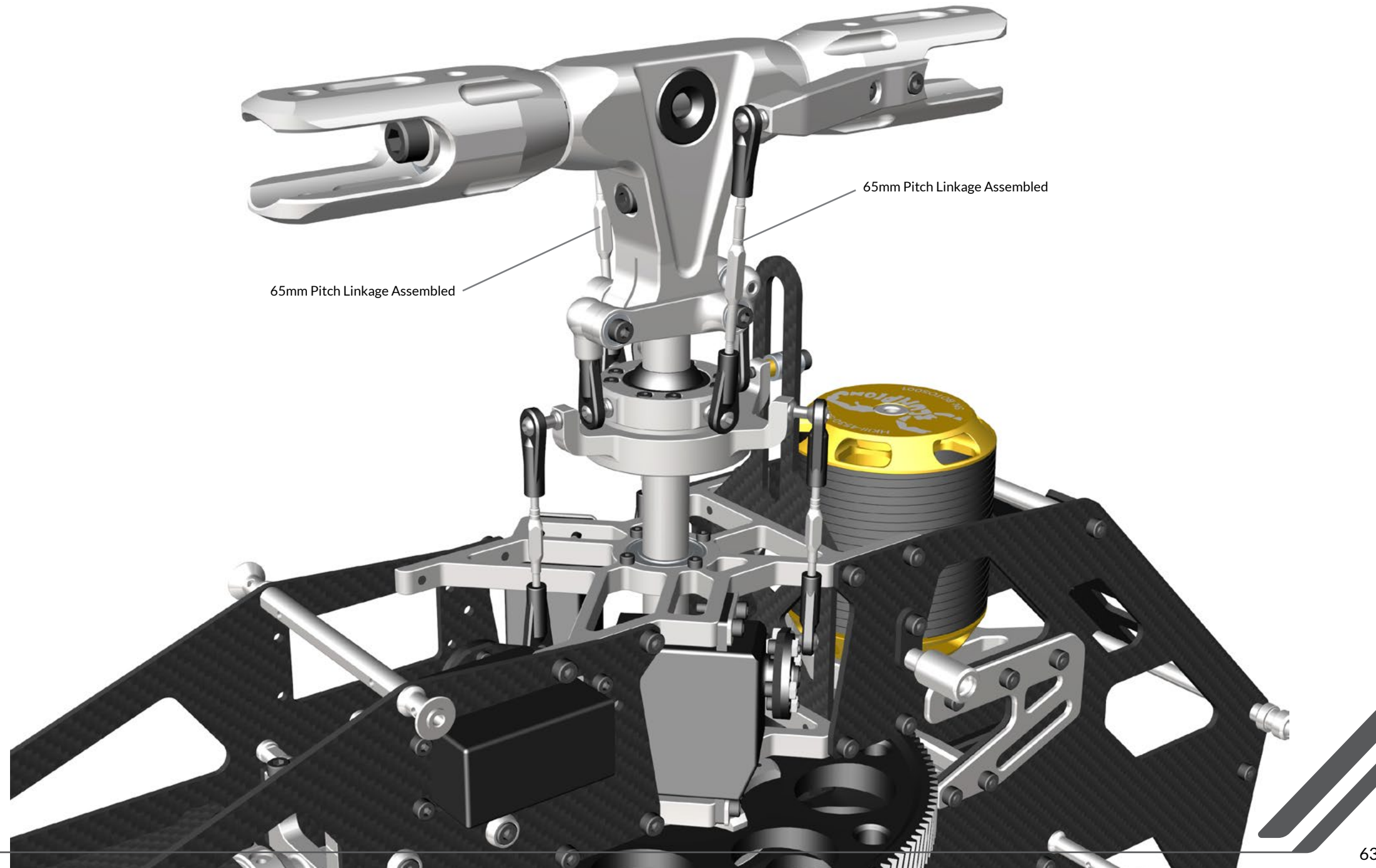
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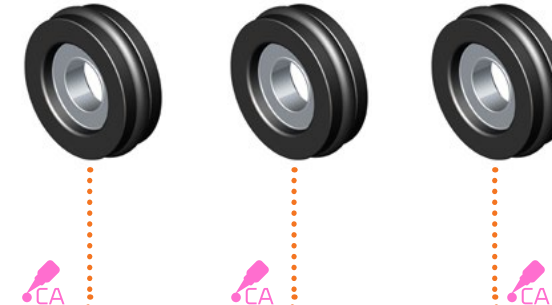
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IMPORTANT!

Fix bearings to torque tube using CA glue. Use caution, do not to allow CA to flow into the bearing.

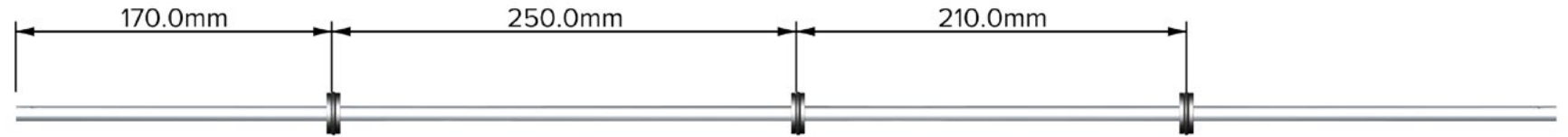


NOTE

Indicated positions are only approximate; it is not necessary to be exact.

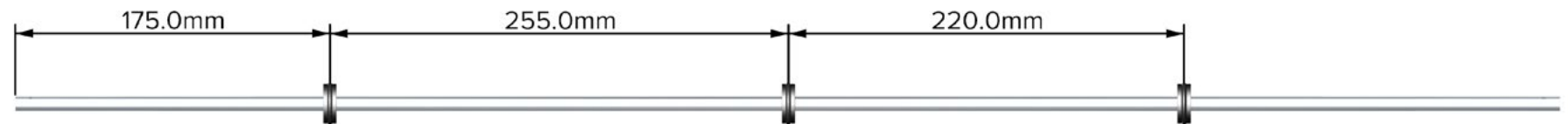
Standard for 766

320-510 Torque Tube 829mm



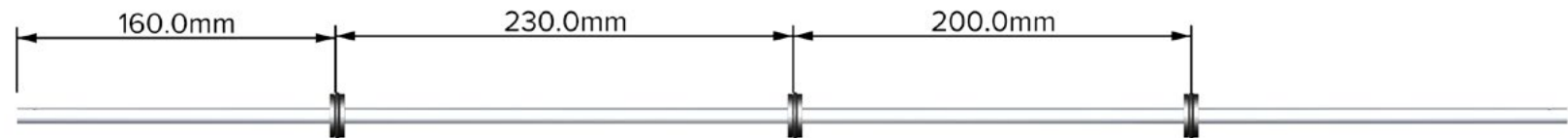
Optional for 806

320-511 Torque Tube 859mm



Optional for 716

320-509 Torque Tube 779mm





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NOTE: See previous page for Torque Tube selection

320-406 11mm Pin (2)

320-507 Cross Torque Tube End (2)

TORQUE TUBE END INSTALLATION

GREEN or RED thread lock provides a secure fitment of the pin and torque tube end. Red can be used as an alternative retainer.

Wipe away excess. Heat will be required for removal.

320-508 Torque Tube Pin Retainer (2)

PIN RETAINER

Secure with glue of choice: CA or 2-part epoxy.

REPEAT FOR BOTH ENDS

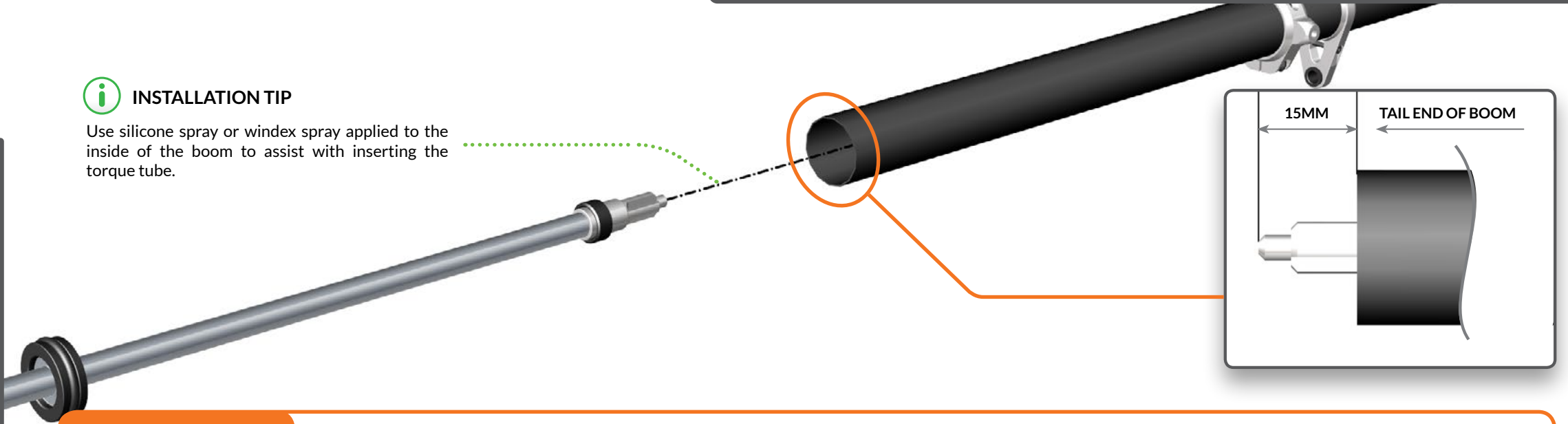


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INSTALLATION TIP

Use silicone spray or windex spray applied to the inside of the boom to assist with inserting the torque tube.



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Standard for 766

766-302 Tail Boom 850mm

Standard 766 Length - 850.0mm

Standard for 806

766-303 Tail Boom 880mm

Optional 806 Length - 880.0mm

Standard for 716

766-301 Tail Boom 800mm

Optional 716 Length - 800.0mm





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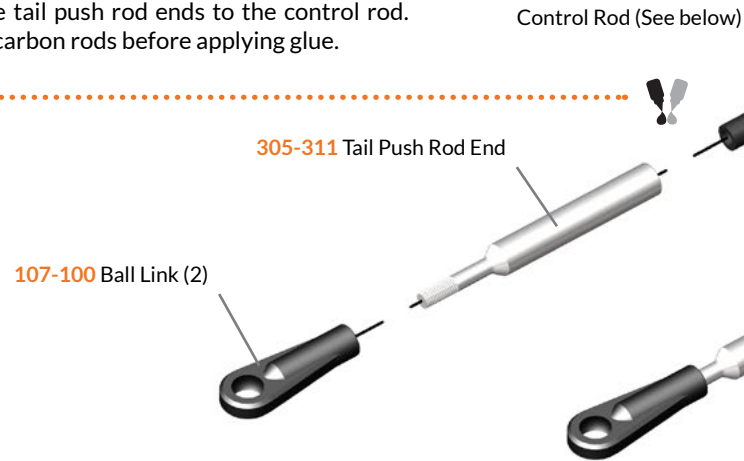
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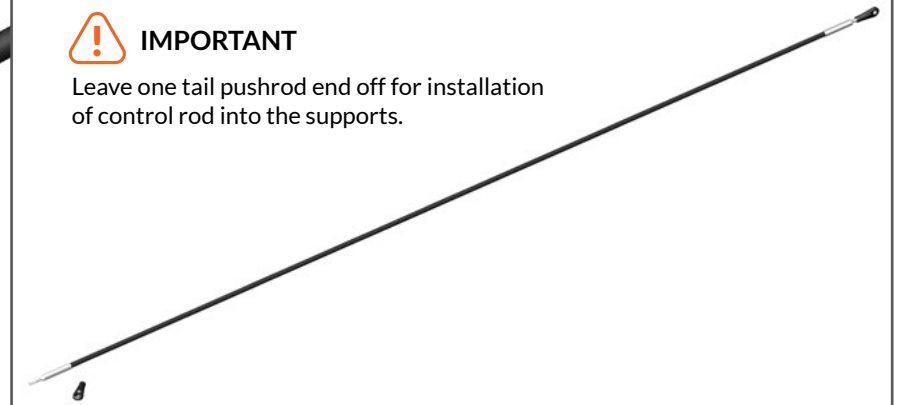
IMPORTANT

USE 30 minute or longer 2-PART EPOXY to secure tail push rod ends to the control rod. Sand carbon rods before applying glue.



IMPORTANT

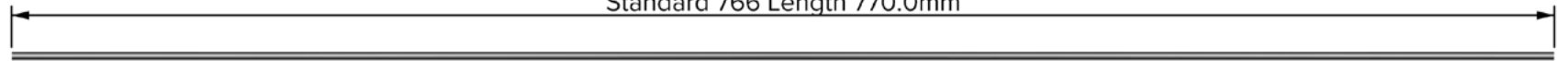
Leave one tail pushrod end off for installation of control rod into the supports.



Standard
for 766

766-306 Carbon Tail Control Rod 770mm

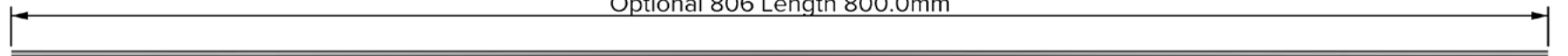
Standard 766 Length 770.0mm



Optional
for 806

766-307 Carbon Tail Control Rod 800mm

Optional 806 Length 800.0mm



Optional
for 716

766-305 Carbon Tail Control Rod 720mm

Optional 716 Length 720.0mm





Components that are factory assembled provide a reference for model assembly. Disassembly and application of thread lock is required where indicated.

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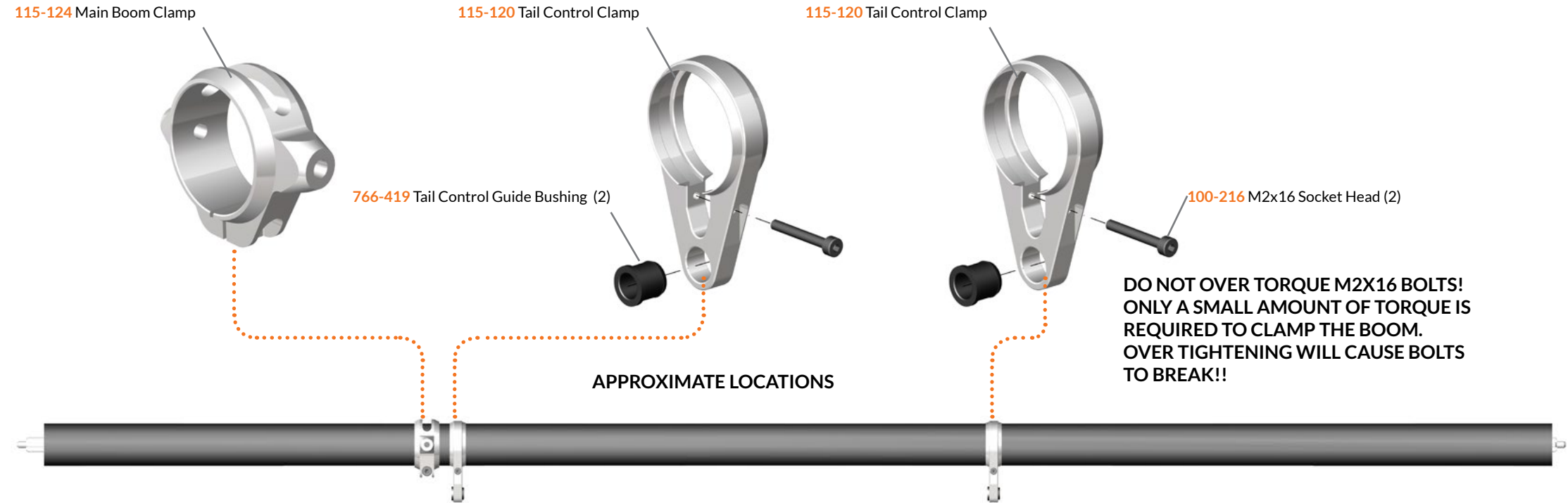
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INSTALL BOOM CLAMP AND TAIL CONTROL GUIDES



INSERT TAIL ROD GUIDE AND THREAD ON BALL LINK





Components that are factory assembled provide a reference for model assembly. Disassembly and application of thread lock is required where indicated.

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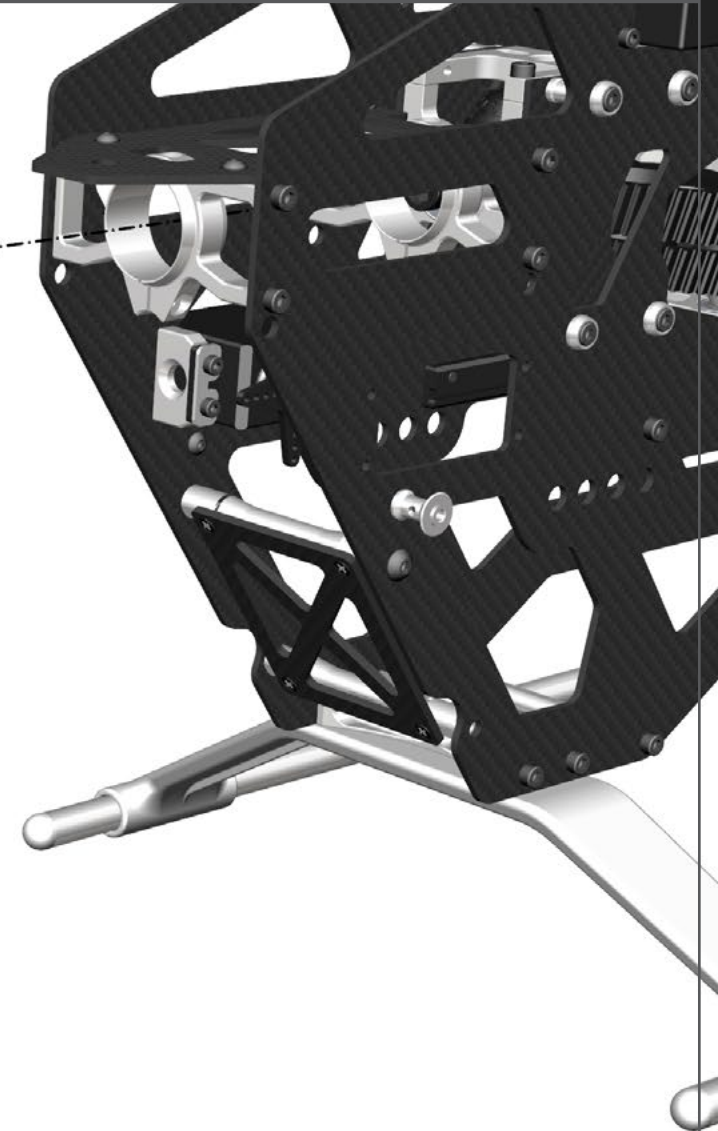
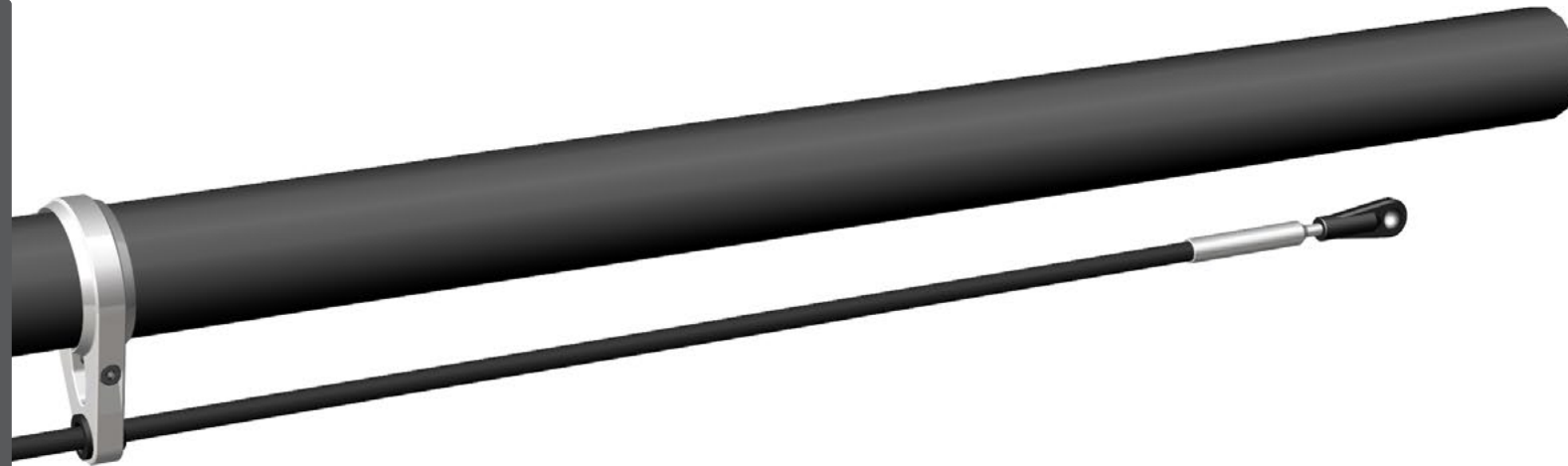
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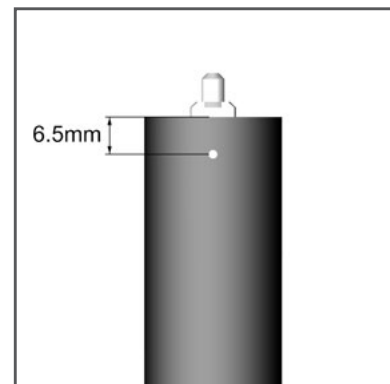


PINNING THE BOOM PREVENTS TWISTING AND SECURES THE BOOM POSITION!

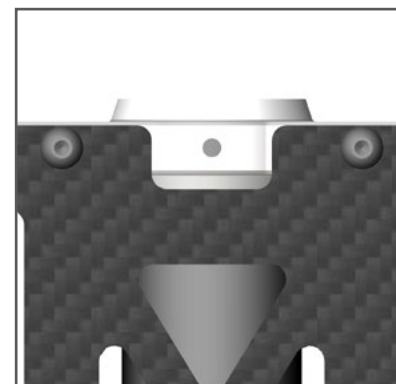


BOOM SHOULD BE FLUSH WITH FRONT OF BOOM SUPPORT BLOCK!

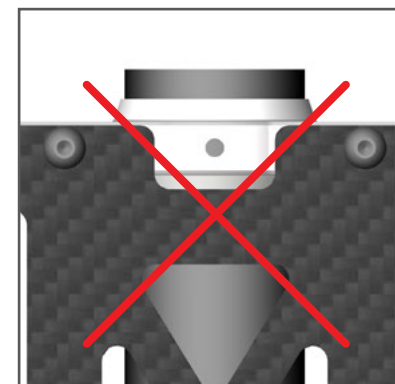
3.0MM (1/8") HOLE LOCATION



CORRECT INSTALLATION



INCORRECT INSTALLATION





Components that are factory assembled provide a reference for model assembly. Disassembly and application of thread lock is required where indicated.

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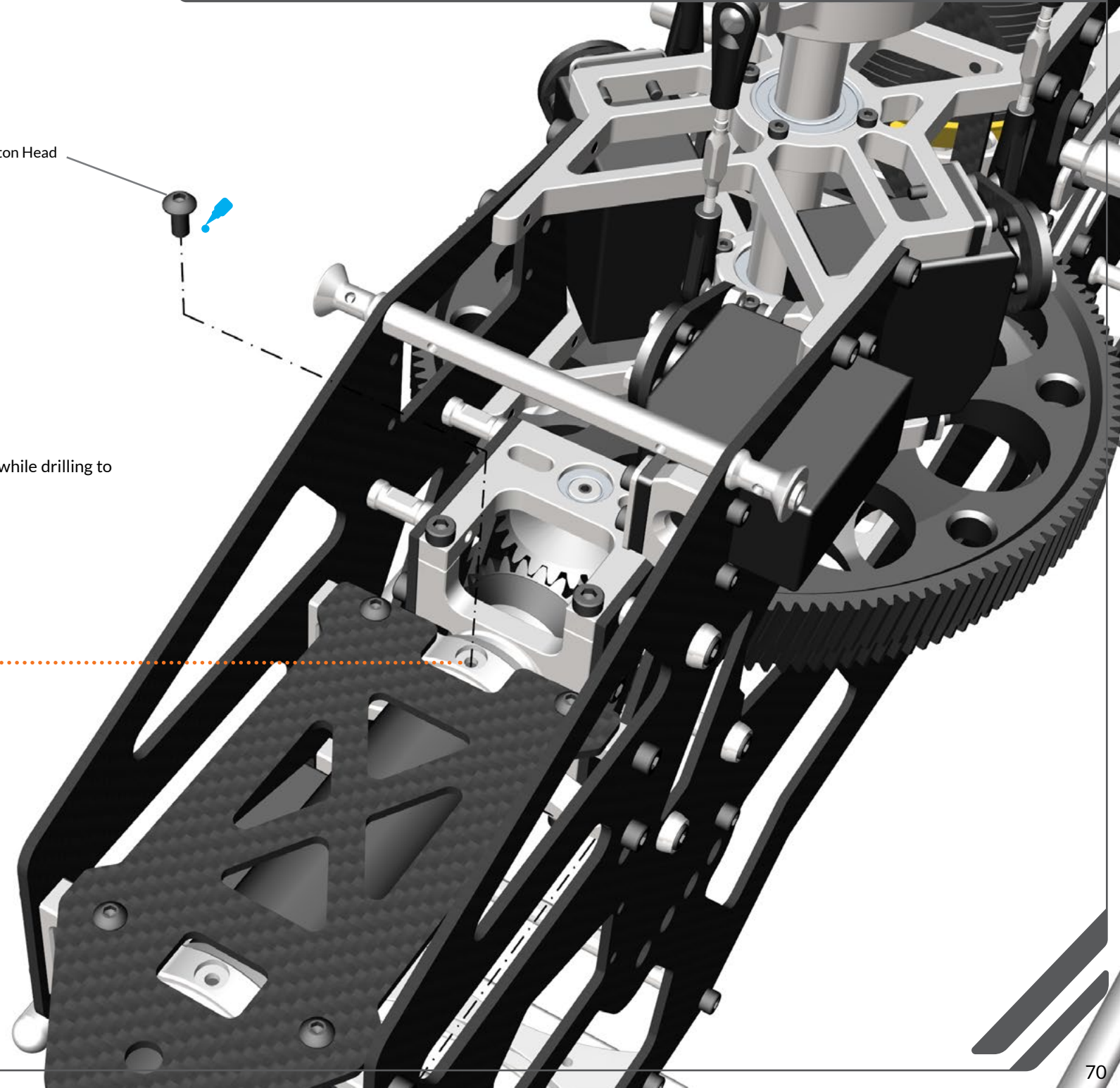
APPLY BLUE THREAD LOCK TO ALL BOLTS

101-306 M3x6 Button Head



IMPORTANT!

Pre-drill boom with 3.0mm or 1/8" drill bit. Take care while drilling to not damage the torque tube. See previous page.





Components that are factory assembled provide a reference for model assembly. Disassembly and application of thread lock is required where indicated.

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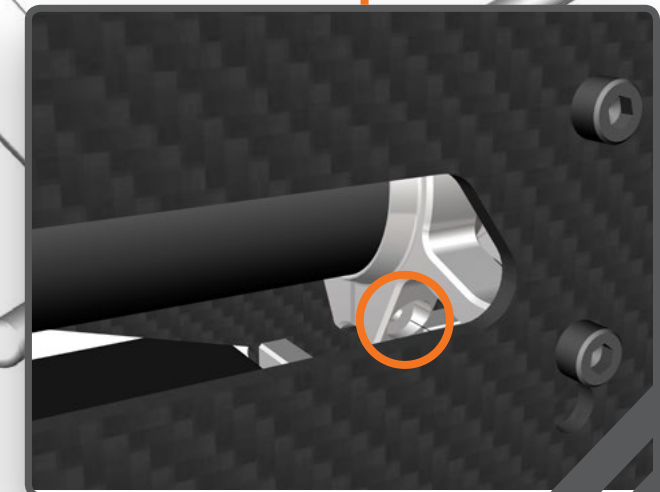
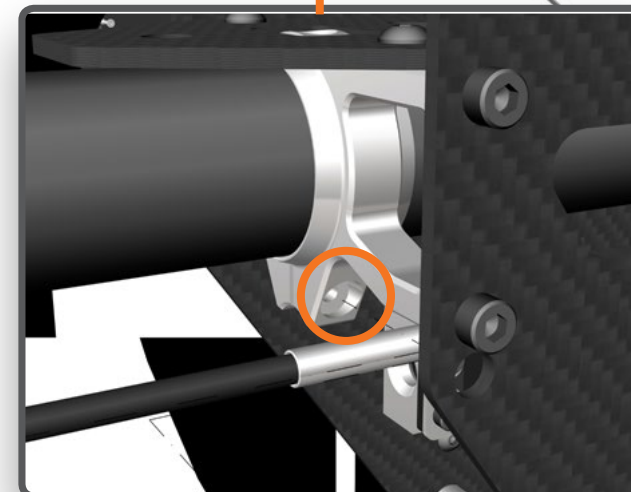


APPLY BLUE THREAD LOCK TO ALL BOLTS

101-310 M3x10 Socket Head (2)



DO NOT OVER TIGHTEN!





Components that are factory assembled provide a reference for model assembly. Disassembly and application of thread lock is required where indicated.

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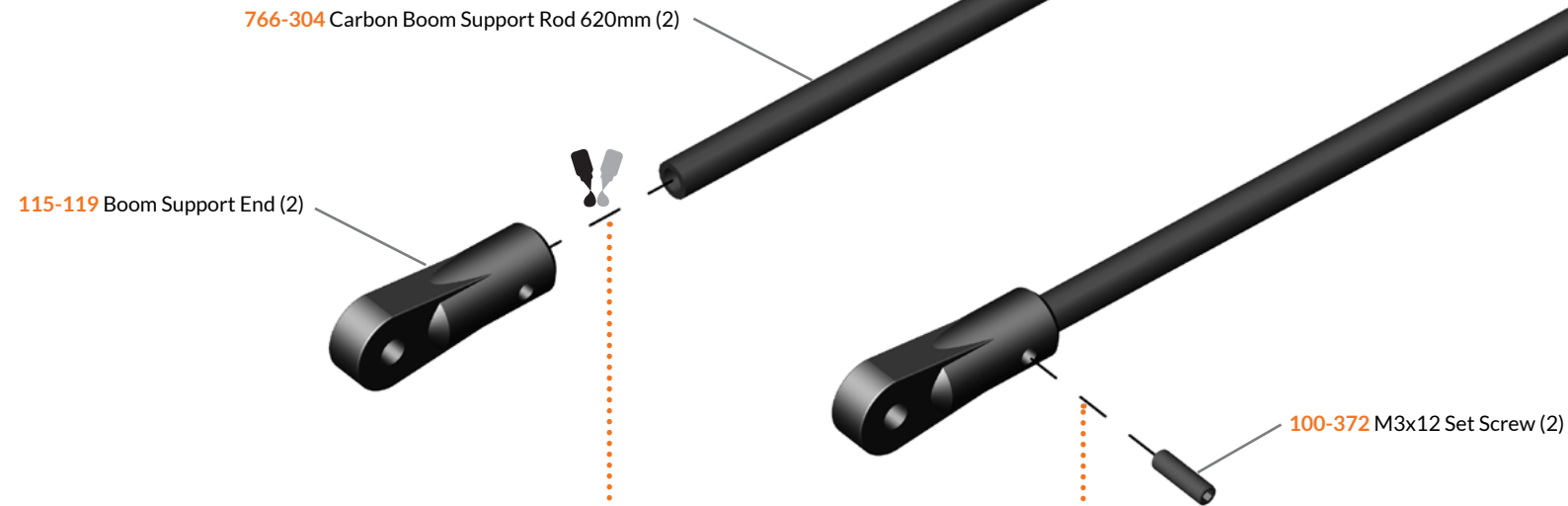
TAIL AND HUB

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SECURE WITH 30 MINUTE EPOXY!

Use 30 minute epoxy or equivalent to secure boom support ends to carbon support rod. Allow to cure then proceed to pin the support rods with M3x12 set screws. Sand carbon before applying glue.

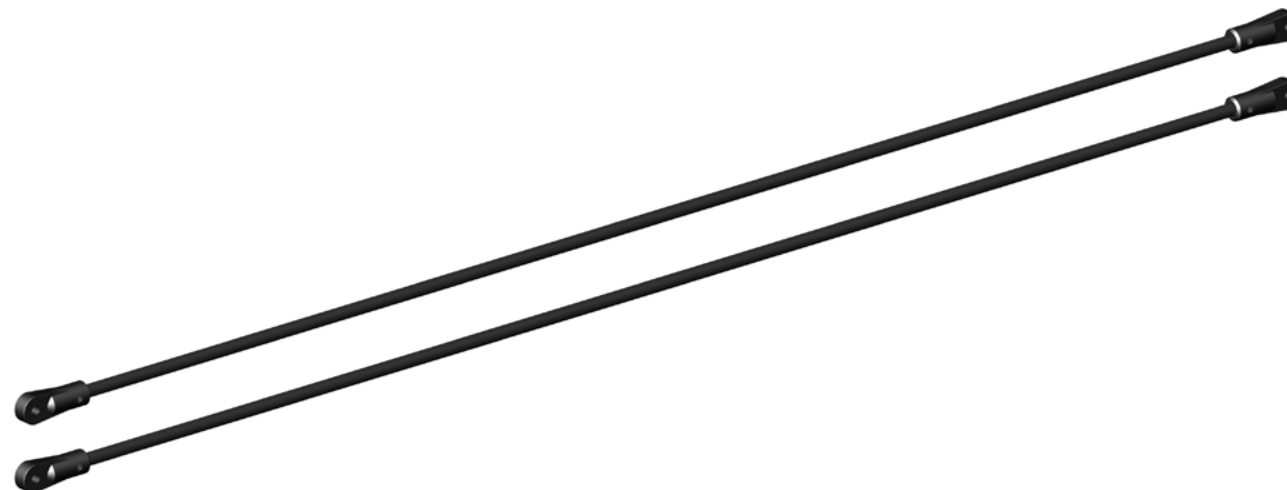
Both ends should be exactly parallel with each other.



IMPORTANT!

Pre-drill support rods with 2.5mm or 7/64" drill bit then insert M3x12 set screw.

DO NOT use 3.0mm or 1/8" drill bit. Set screw should thread into the plastic support ends.





Components that are factory assembled provide a reference for model assembly. Disassembly and application of thread lock is required where indicated.

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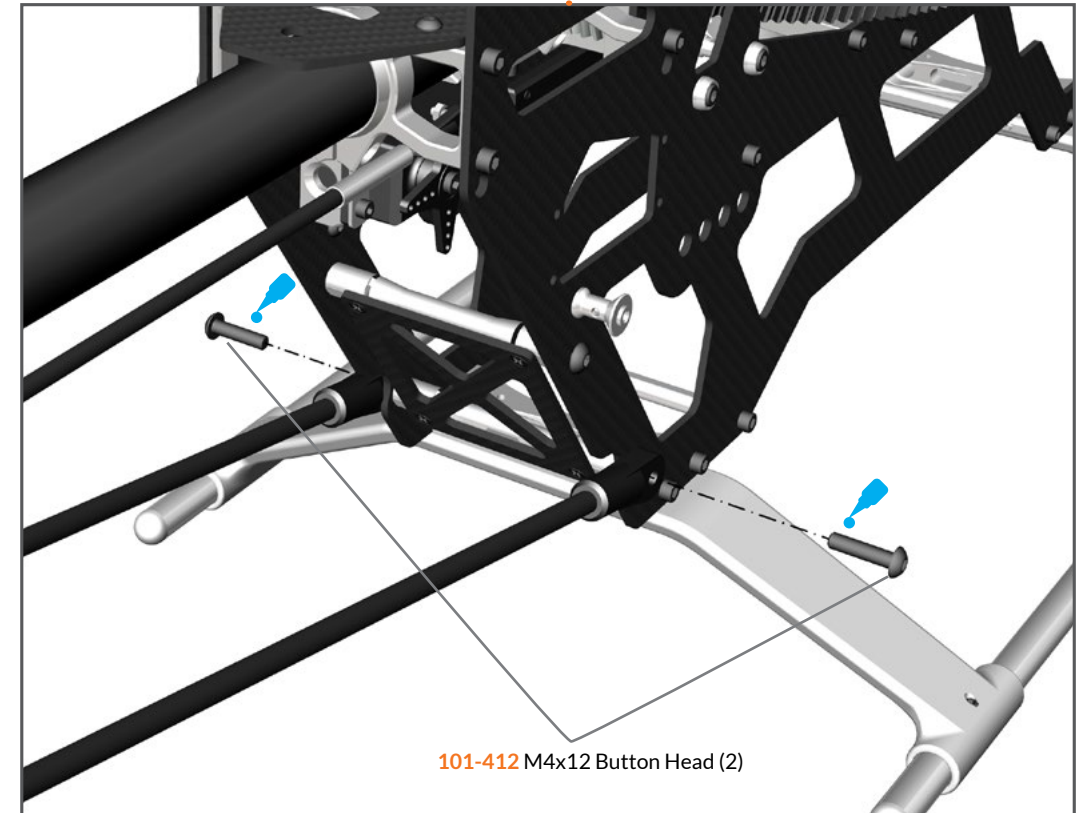
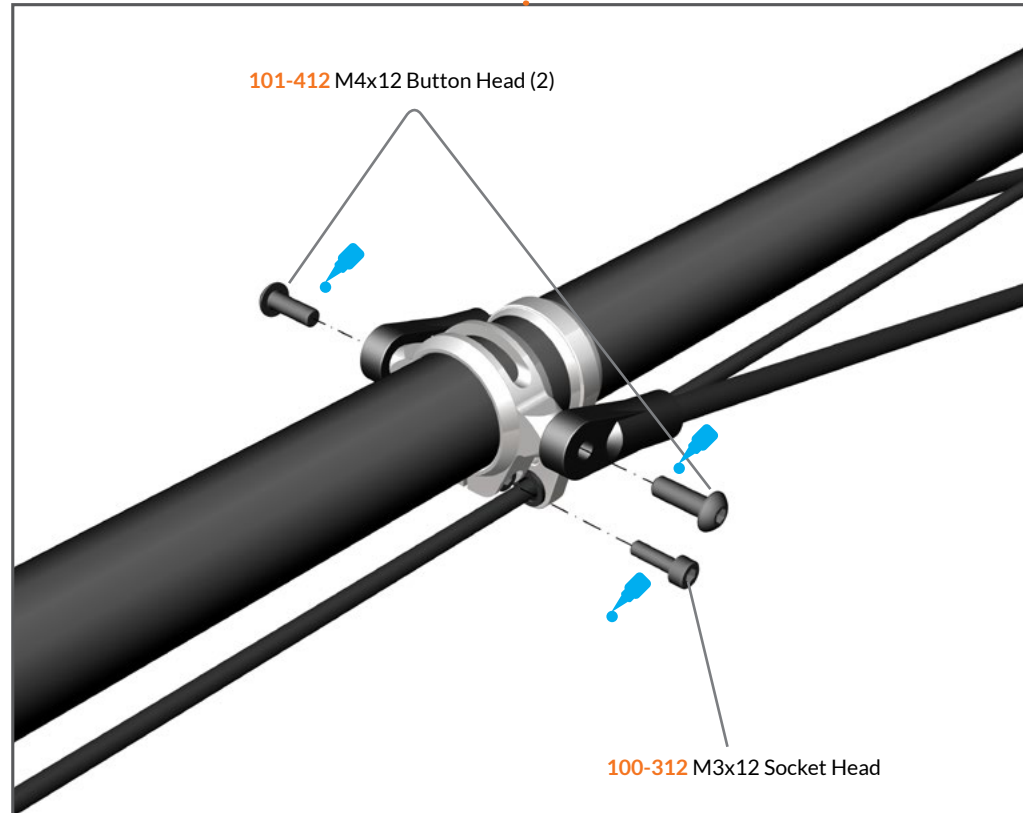
PANEL SYSTEM

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APPLY THREAD LOCK

Apply BLUE thread lock and secure all bolts.





Components that are factory assembled provide a reference for model assembly. Disassembly and application of thread lock is required where indicated.

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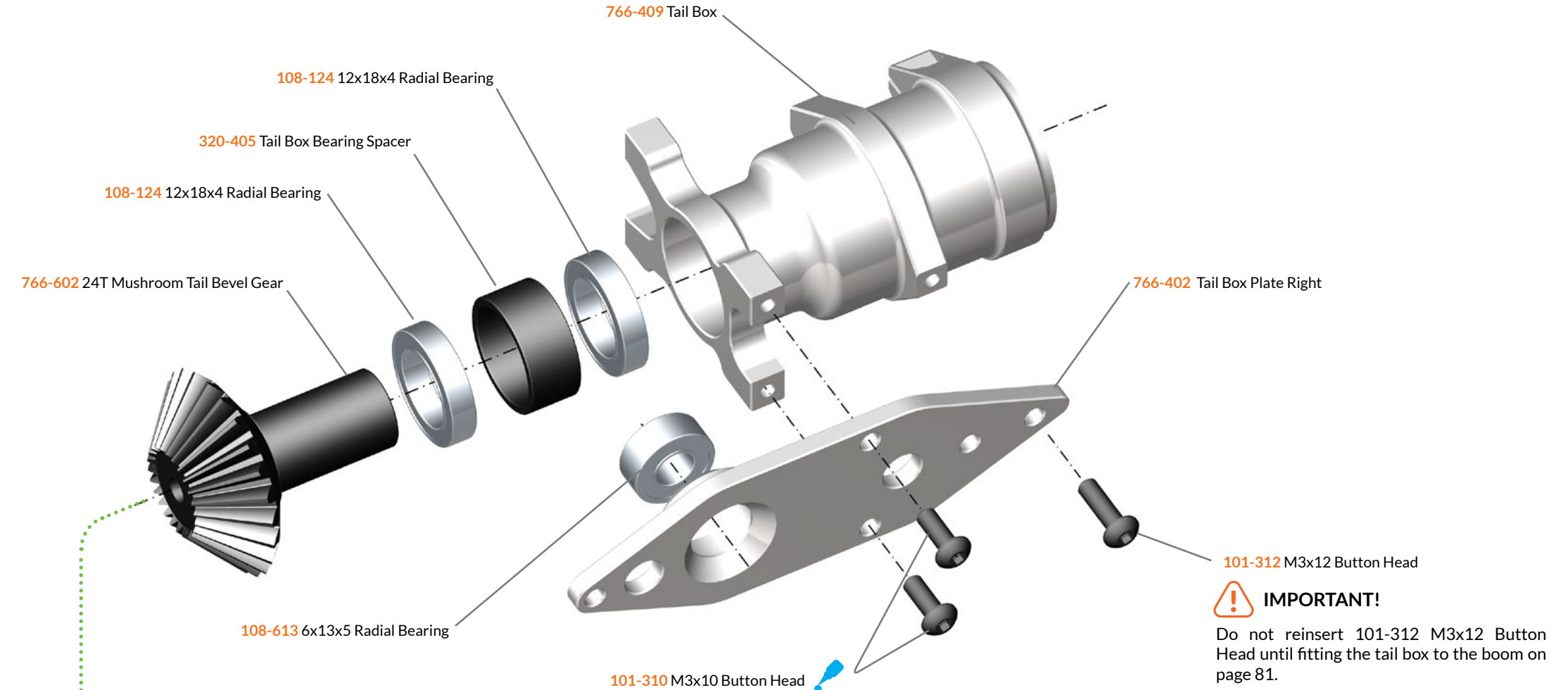
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PREASSEMBLED COMPONENTS

The 766-400 Tail Box contains radial bearings and mushroom bevel gear preassembled from the factory that does not require disassembly.

****Tip:** If repair and disassembly is required, freeze components to easily remove mushroom gear.**



IMPORTANT!

Do not reinsert 101-312 M3x12 Button Head until fitting the tail box to the boom on page 81.

This bolt will pin the tail box into the boom to provide additional support and prevent twisting.



Components that are factory assembled provide a reference for model assembly. Disassembly and application of thread lock is required where indicated.

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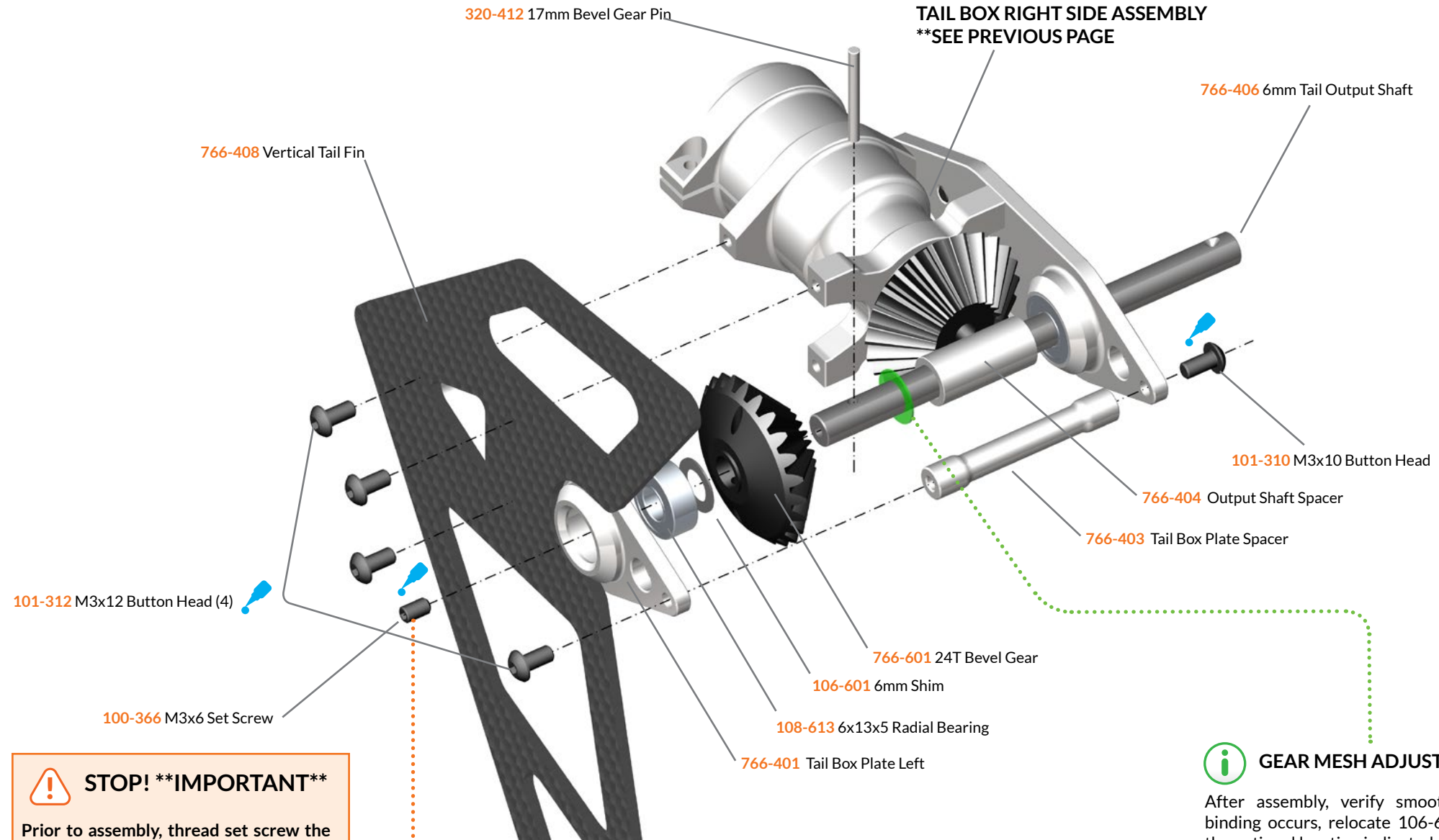
MAIN AND TAIL BLADES

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APPLY BLUE THREAD LOCK TO ALL BOLTS



STOP! **IMPORTANT**

Prior to assembly, thread set screw the entire length of the hole to check for burrs or other obstacles.

Tighten and secure 100-366 M3x6 Set Screw with blue thread lock. This set screw secures the bevel gear pin.



GEAR MESH ADJUSTMENT

After assembly, verify smooth gear mesh. If binding occurs, relocate 106-601 6mm Shim to the optional location indicated.



Components that are factory assembled provide a reference for model assembly. Disassembly and application of thread lock is required where indicated.

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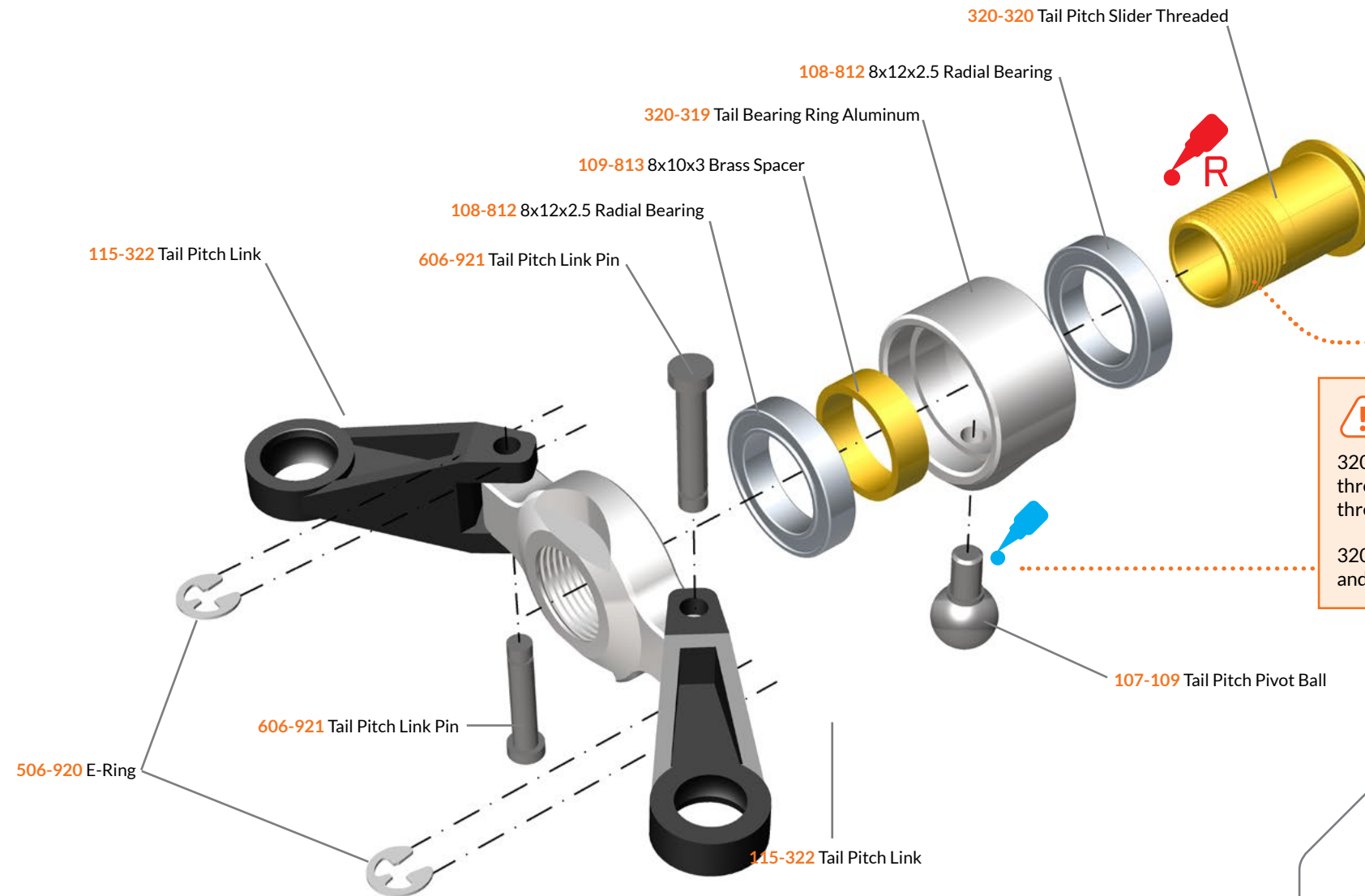
TAIL AND HUB

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IMPORTANT

320-320 Tail Pitch Slider is reverse threaded. Do not over tighten, apply red thread lock and secure gently.

320-320 and 107-109 must be removed and thread lock applied!



LINKAGE SIZING

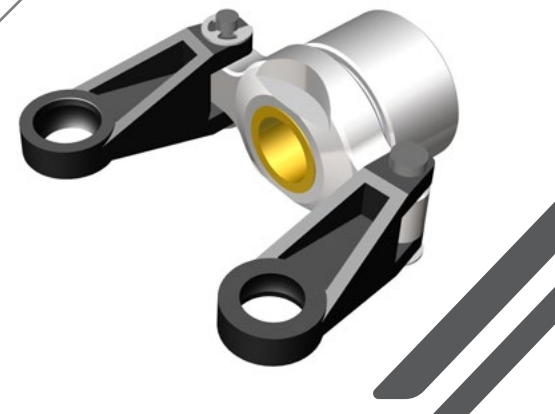
Delrin is strong, flexible yet expands and contracts with changing temperature. For best results use Boto-Sizer tool part #700-001 to properly size all linkages for your specific climate.



PITCH LINKS AND PINS

Pitch links are directional and should only be installed on the ball in the proper direction. Take care to observe large and small opening of the link.

Link Pins can be installed from either side.





Components that are factory assembled provide a reference for model assembly. Disassembly and application of thread lock is required where indicated.

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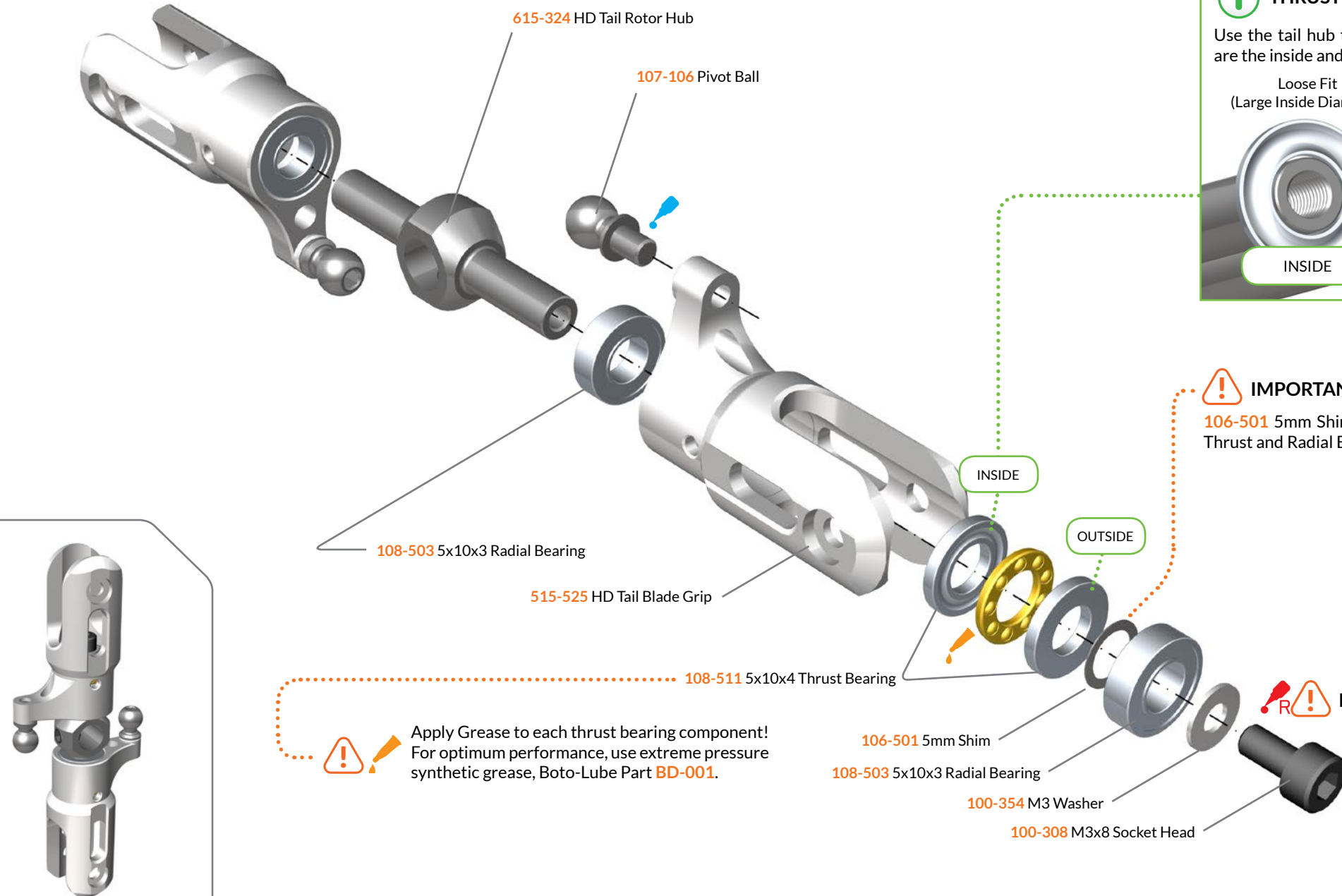
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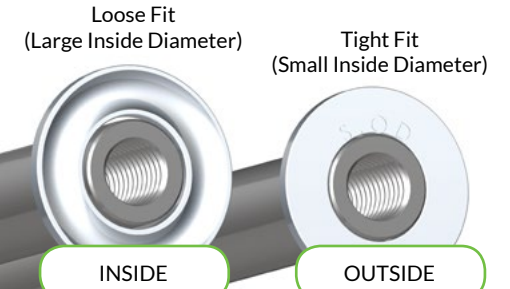


Repeat assembly for both grips.



THRUST BEARING TIP

Use the tail hub to help determine which sides are the inside and outside halves:



IMPORTANT!

106-501 5mm Shim is located between Outside Thrust and Radial Bearing.



Apply Grease to each thrust bearing component! For optimum performance, use extreme pressure synthetic grease, Boto-Lube Part **BD-001**.



RED THREAD LOCK



Components that are factory assembled provide a reference for model assembly. Disassembly and application of thread lock is required where indicated.

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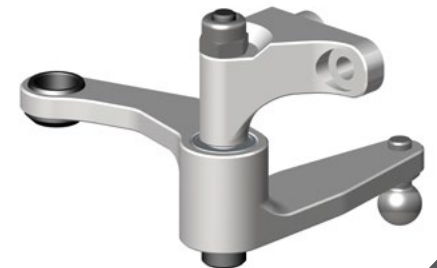
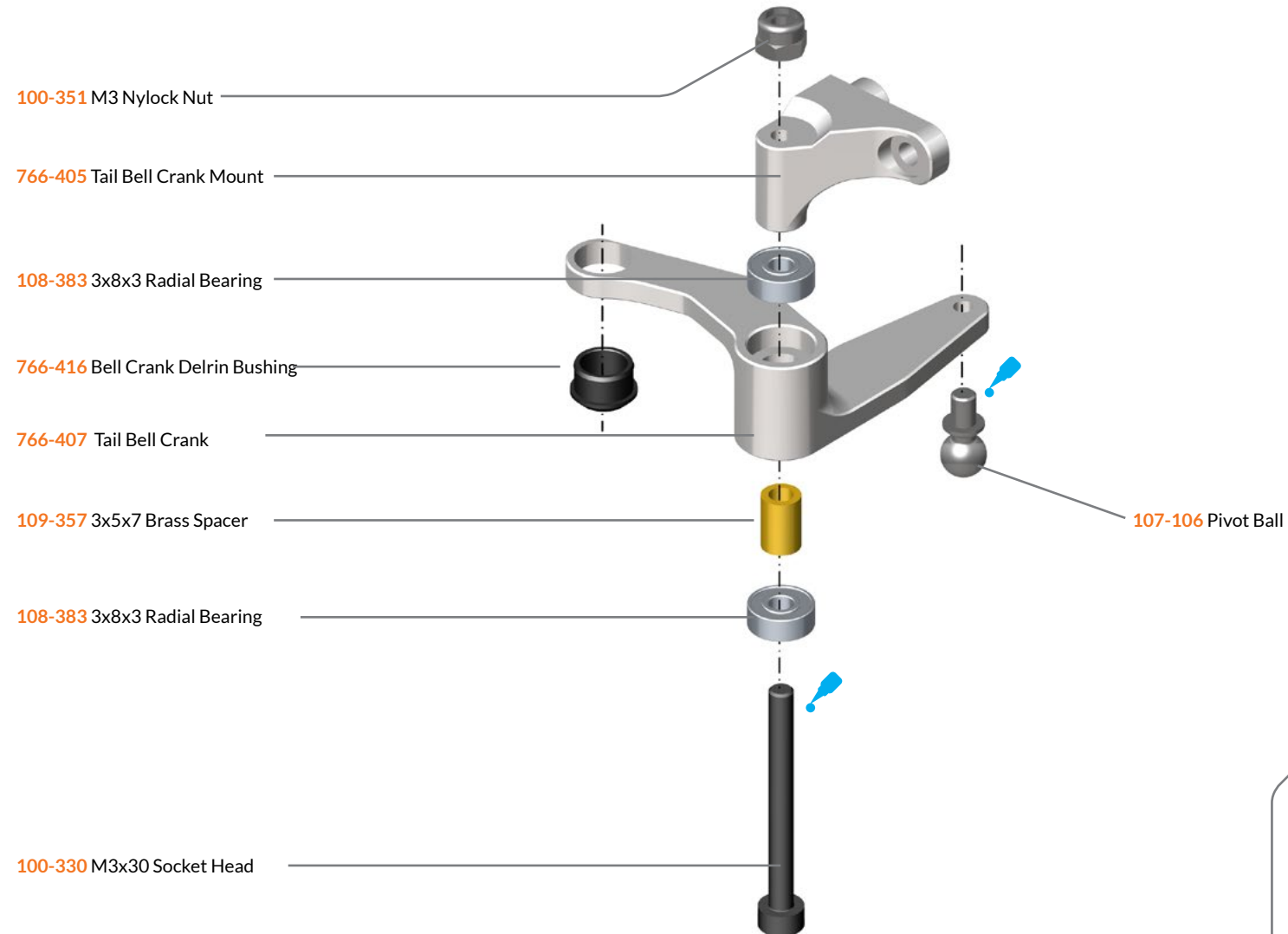
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Components that are factory assembled provide a reference for model assembly. Disassembly and application of thread lock is required where indicated.

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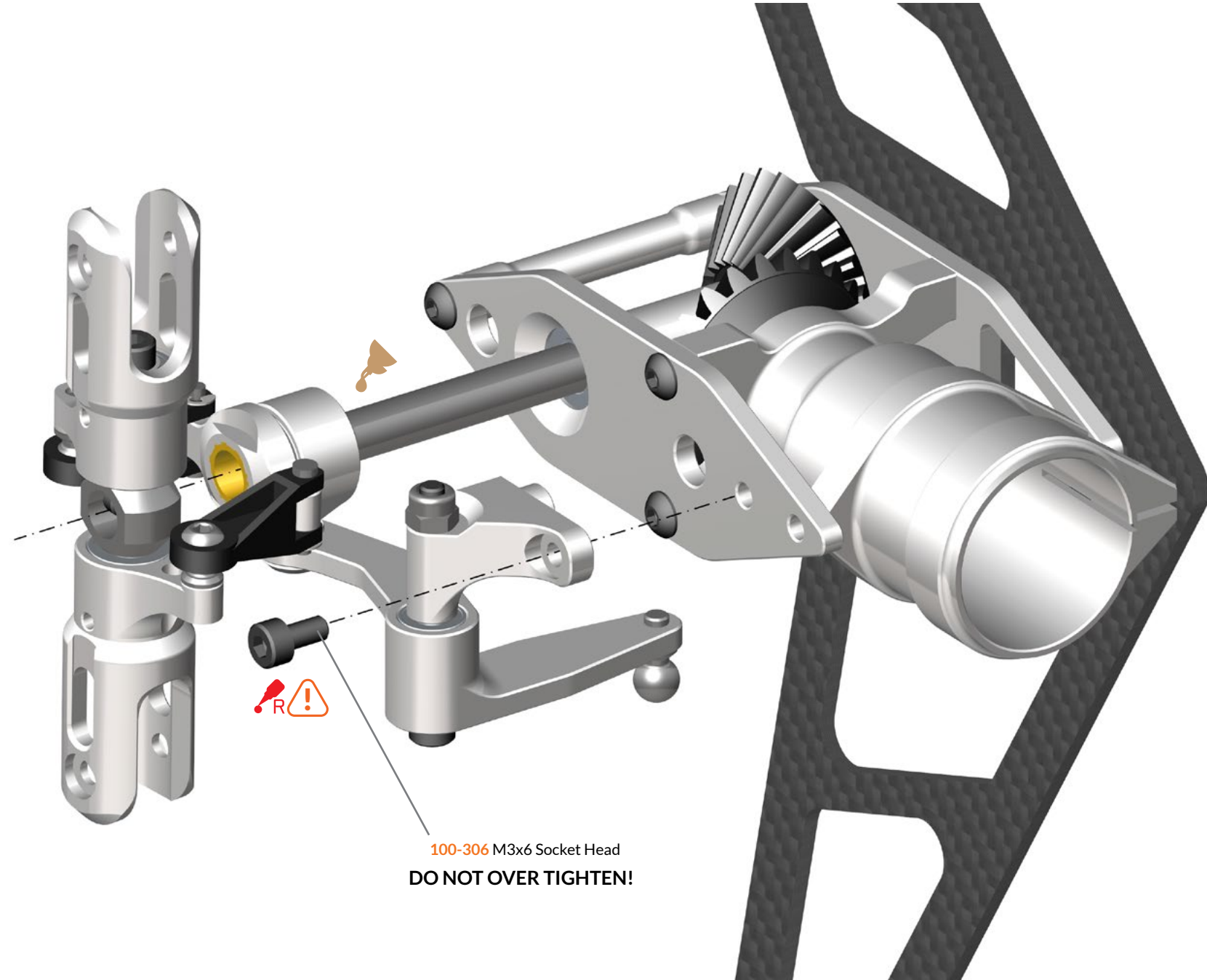
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TAIL HUB AND PITCH SLIDER MOUNTING



100-306 M3x6 Socket Head
DO NOT OVER TIGHTEN!



Components that are factory assembled provide a reference for model assembly. Disassembly and application of thread lock is required where indicated.

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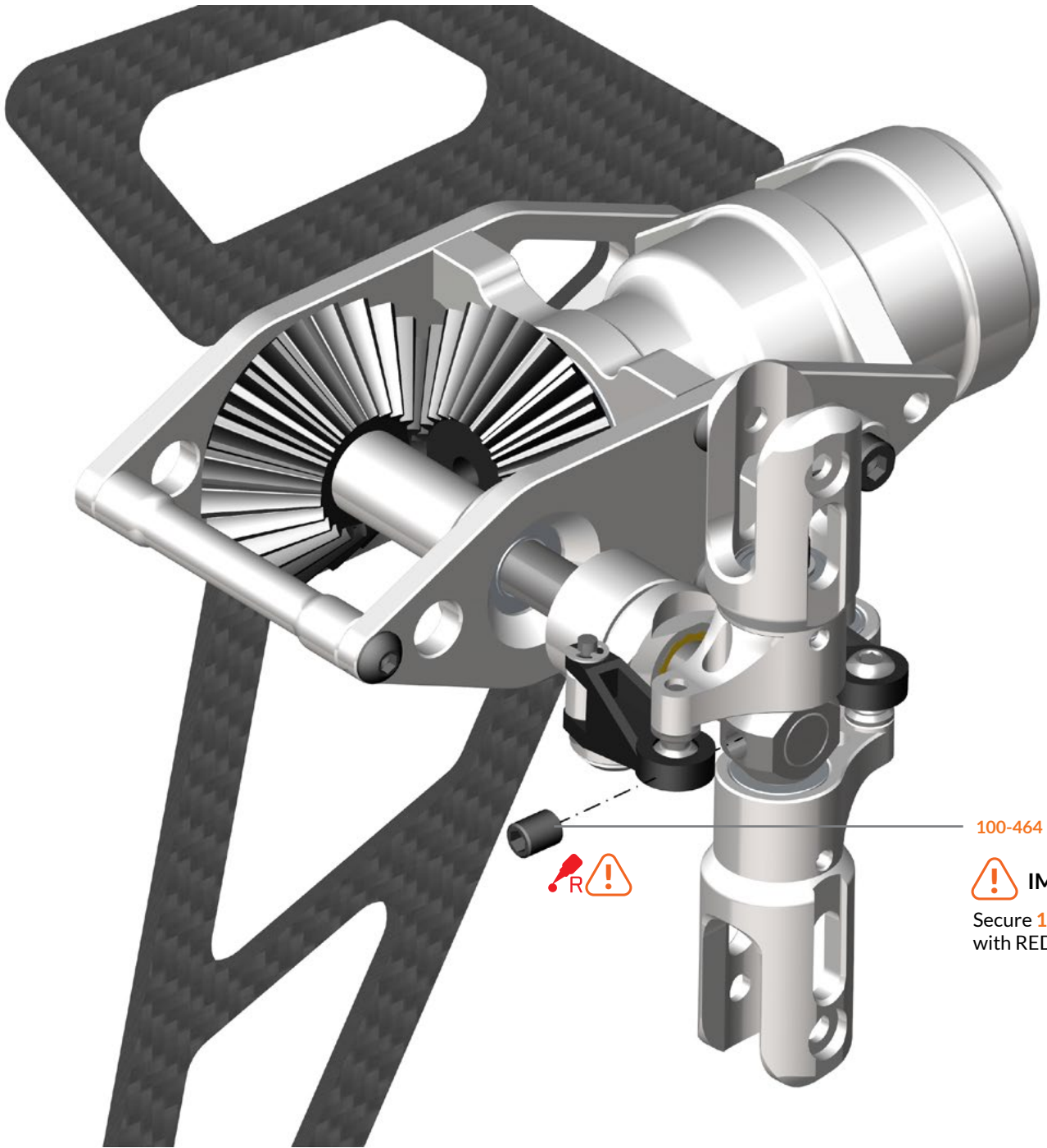
TAIL AND HUB

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100-464 M4x4 Set Screw



IMPORTANT!

Secure 100-464 M4x4 Set Screw with RED thread lock.



Components that are factory assembled provide a reference for model assembly. Disassembly and application of thread lock is required where indicated.

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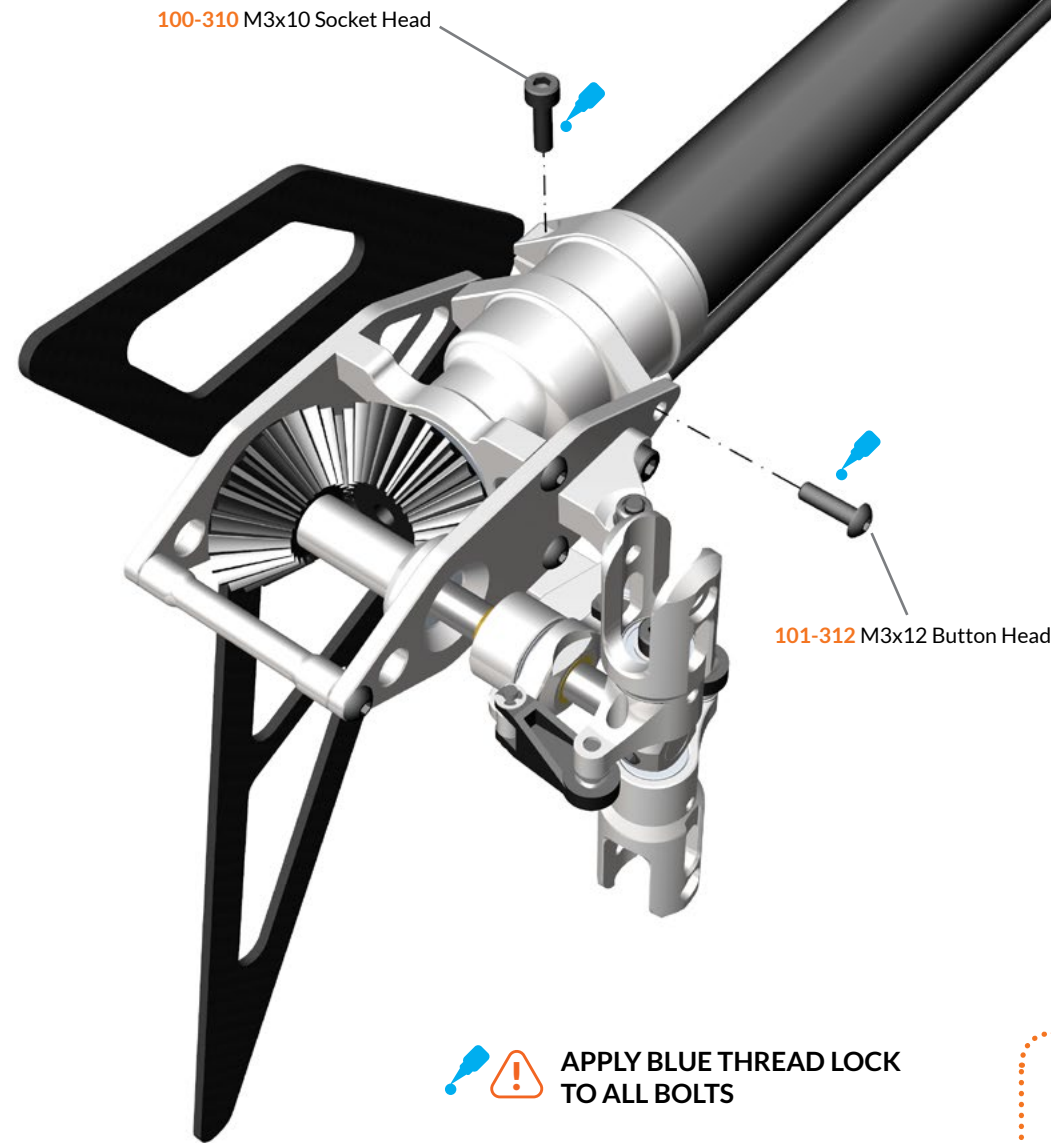
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APPLY BLUE THREAD LOCK TO ALL BOLTS



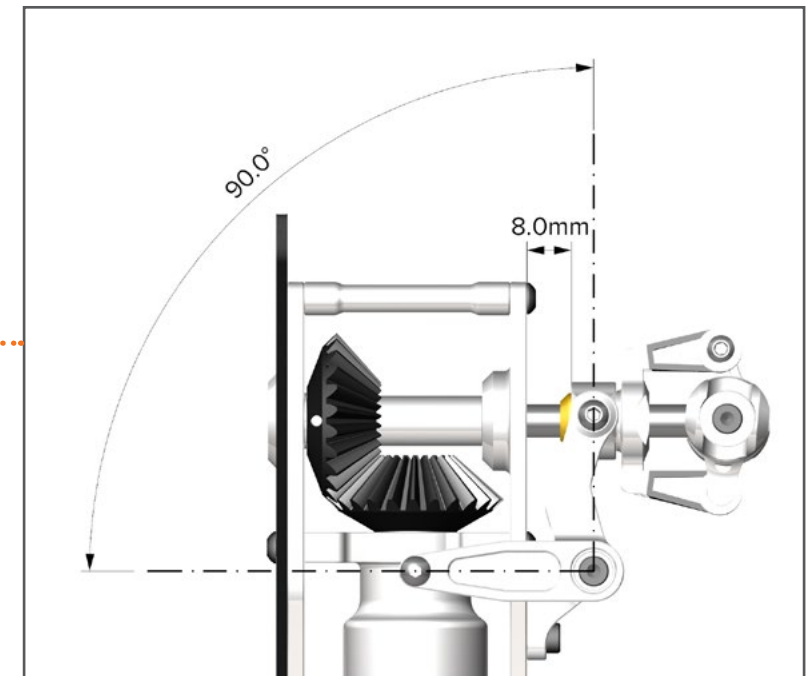
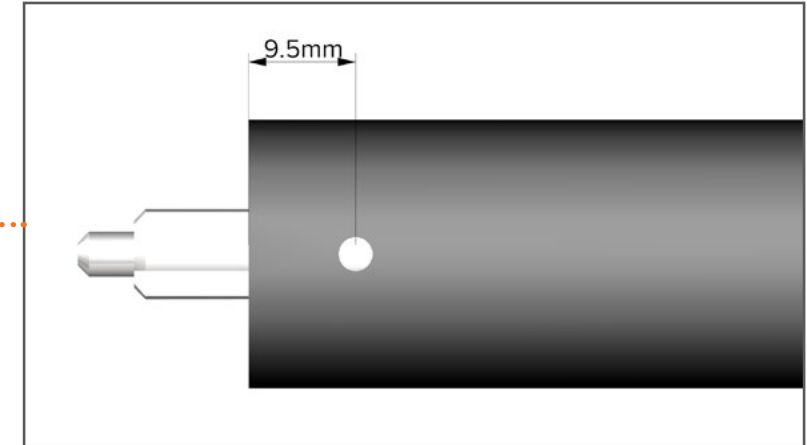
4-5 DEGREES AGAINST TORQUE

Tail blades should be 4-5 degrees against torque at center tail servo position. Following the setup procedure for your specific FBL unit to position the tail servo at center.



PINNING THE TAIL BOX PREVENTS TWISTING AND SECURES THE TAIL POSITION!

3.0MM (1/8") HOLE LOCATION





Components that are factory assembled provide a reference for model assembly. Disassembly and application of thread lock is required where indicated.

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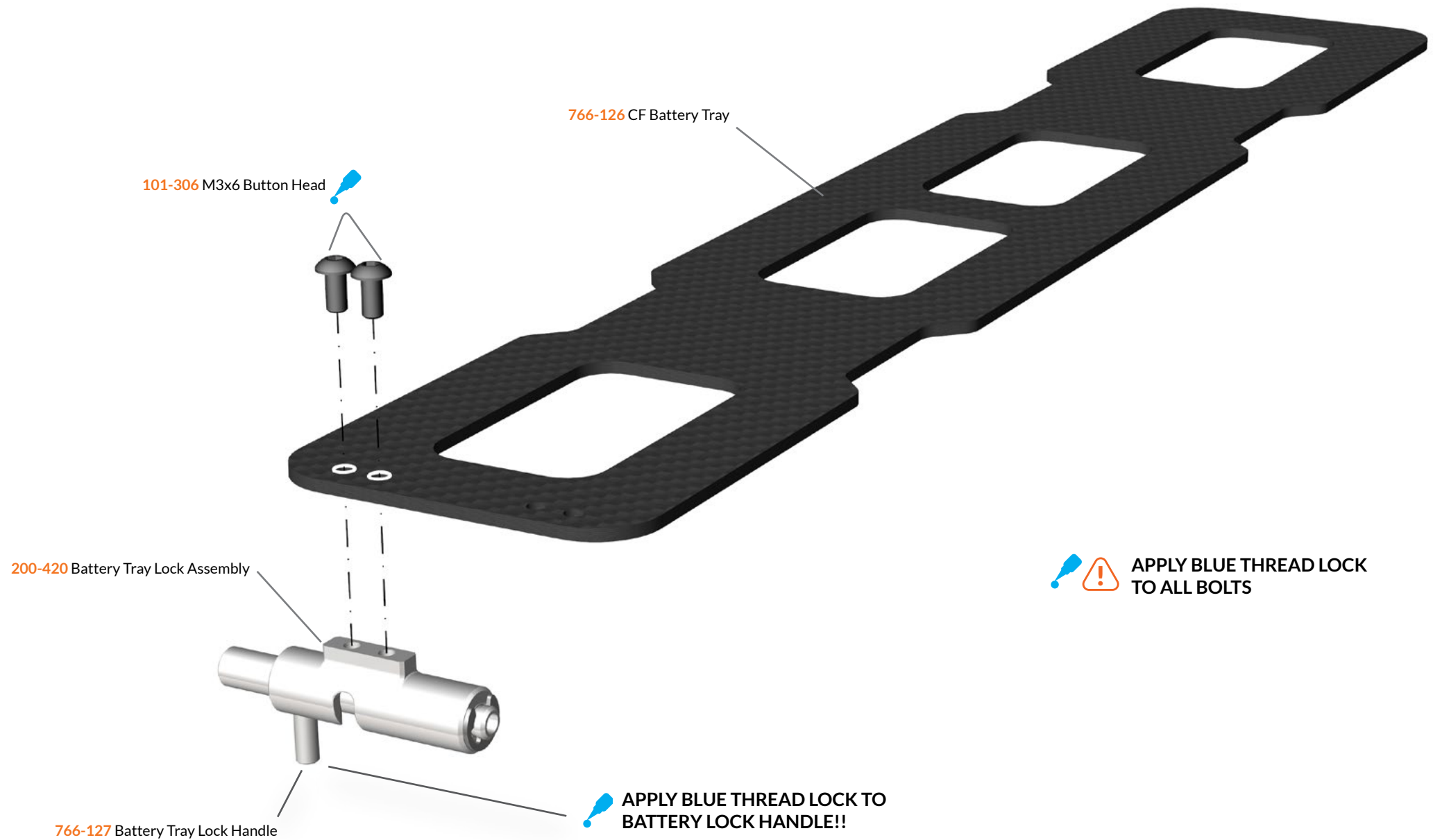
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Components that are factory assembled provide a reference for model assembly. Disassembly and application of thread lock is required where indicated.

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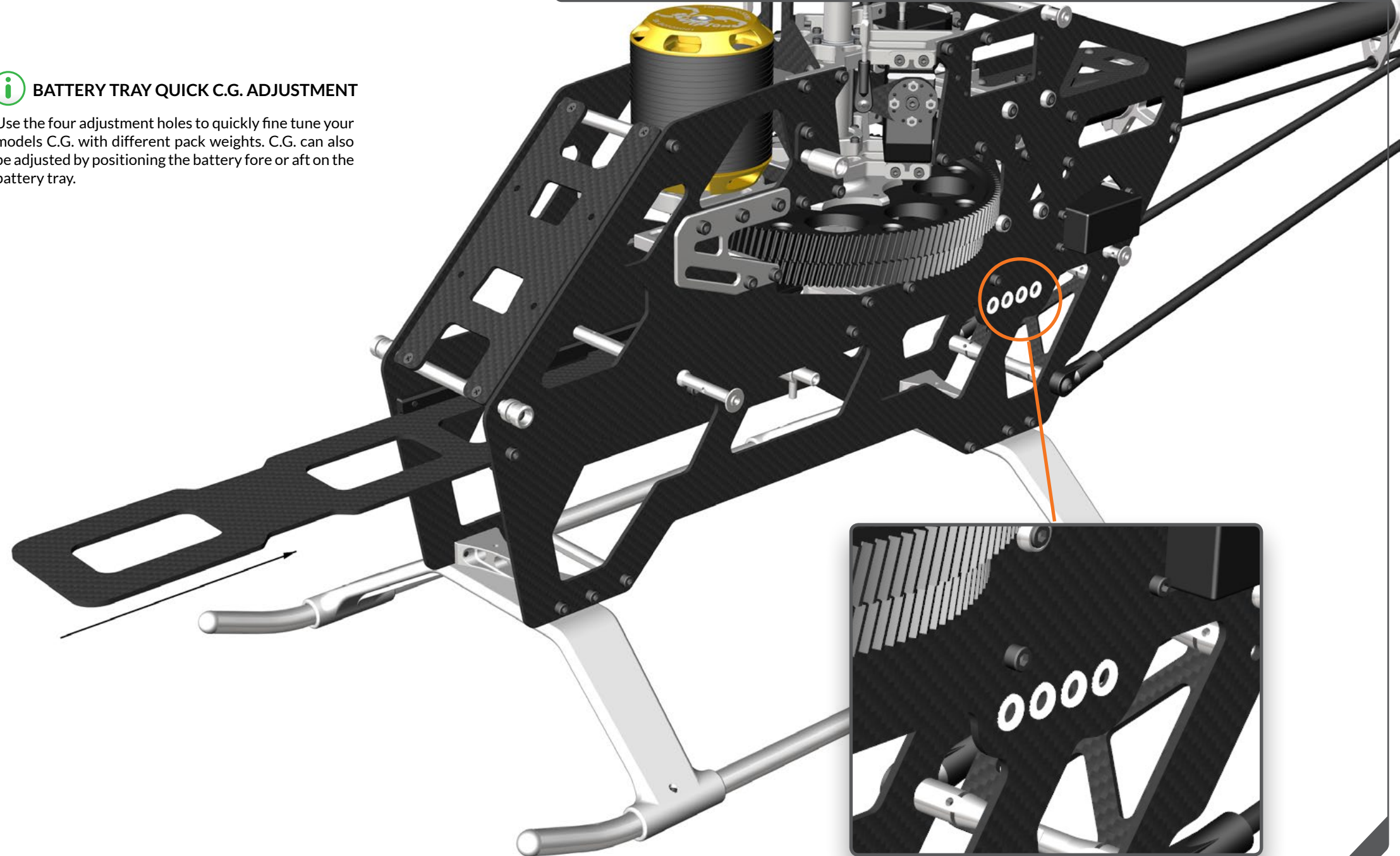
PANEL SYSTEM

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BATTERY TRAY QUICK C.G. ADJUSTMENT

Use the four adjustment holes to quickly fine tune your models C.G. with different pack weights. C.G. can also be adjusted by positioning the battery fore or aft on the battery tray.





Components that are factory assembled provide a reference for model assembly. Disassembly and application of thread lock is required where indicated.

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TIGHTEN EQUALLY!

The key point here is to have both bolts tightened equally so the main blades can lead/lag equally. Both main blades should be able to move with the same amount of force.



SEE PAGE 89 FOR SETUP CONFIGURATIONS

Main Blades Not Included

RB716-1 Rail R-716 Flybarless Main Blade

RB766-1 Rail R-766 Flybarless Main Blade

RB806-1 Rail R-806 Flybarless Main Blade

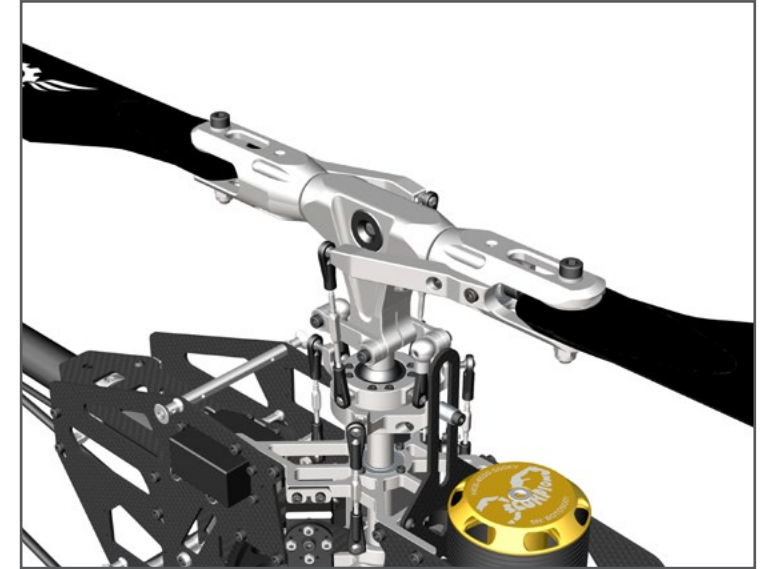
100-535A 5x35mm Shouldered Bolt (2)

310-145 Blade Bolt Adapter 5mm (4)

Blade Spacers Not Included

(Rail Blades sets include spacers but not required for 766 and 806 configurations)

100-551 M5 Nylock Nut (2)





Components that are factory assembled provide a reference for model assembly. Disassembly and application of thread lock is required where indicated.

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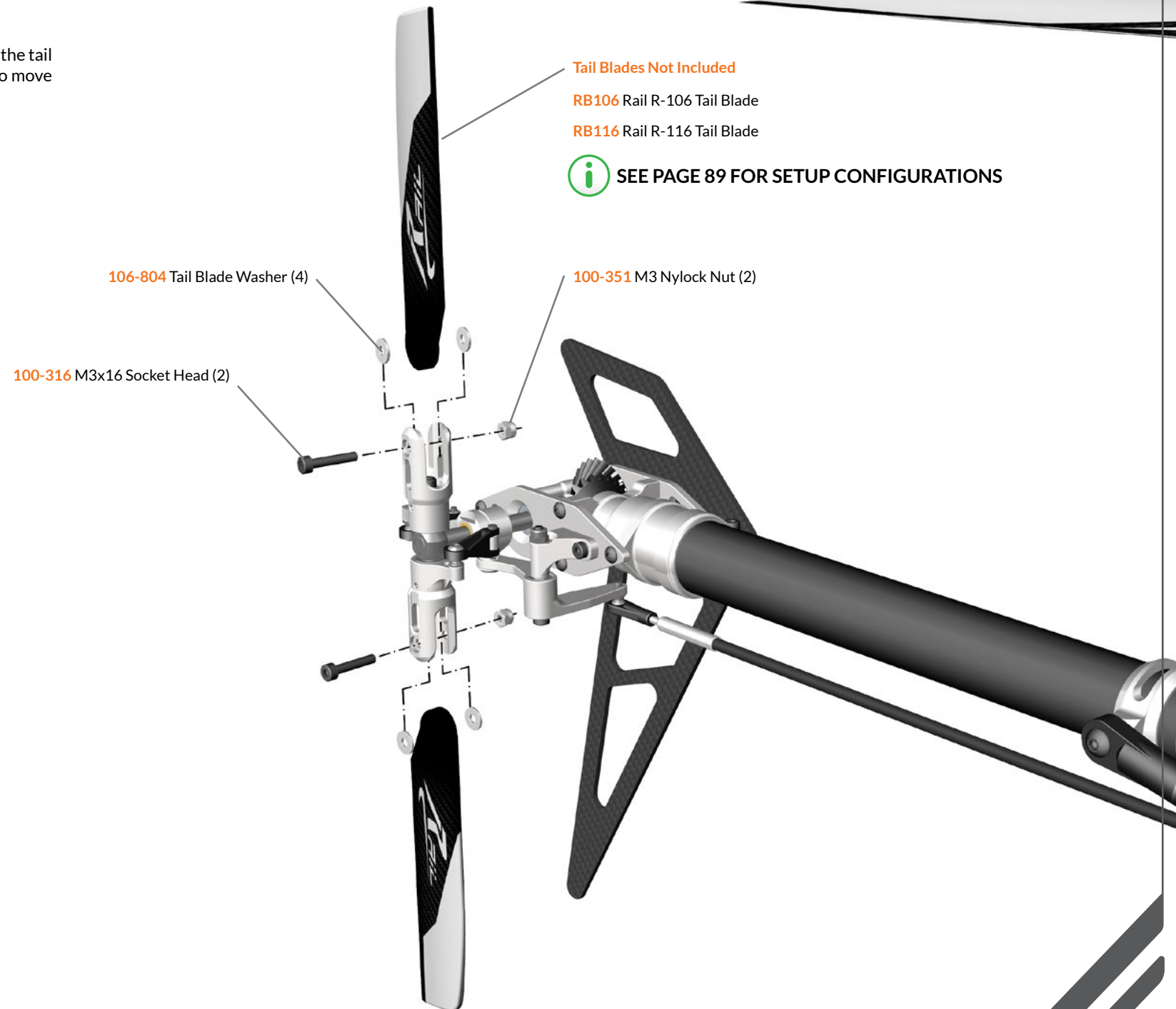


DO NOT OVER TIGHTEN!

The key point here is to have both bolts tightened equally so the tail blades can lead/lag equally. Both tail blades should be able to move with the same amount of force.



TAIL BLADE INSTALLATION





Components that are factory assembled provide a reference for model assembly. Disassembly and application of thread lock is required where indicated.

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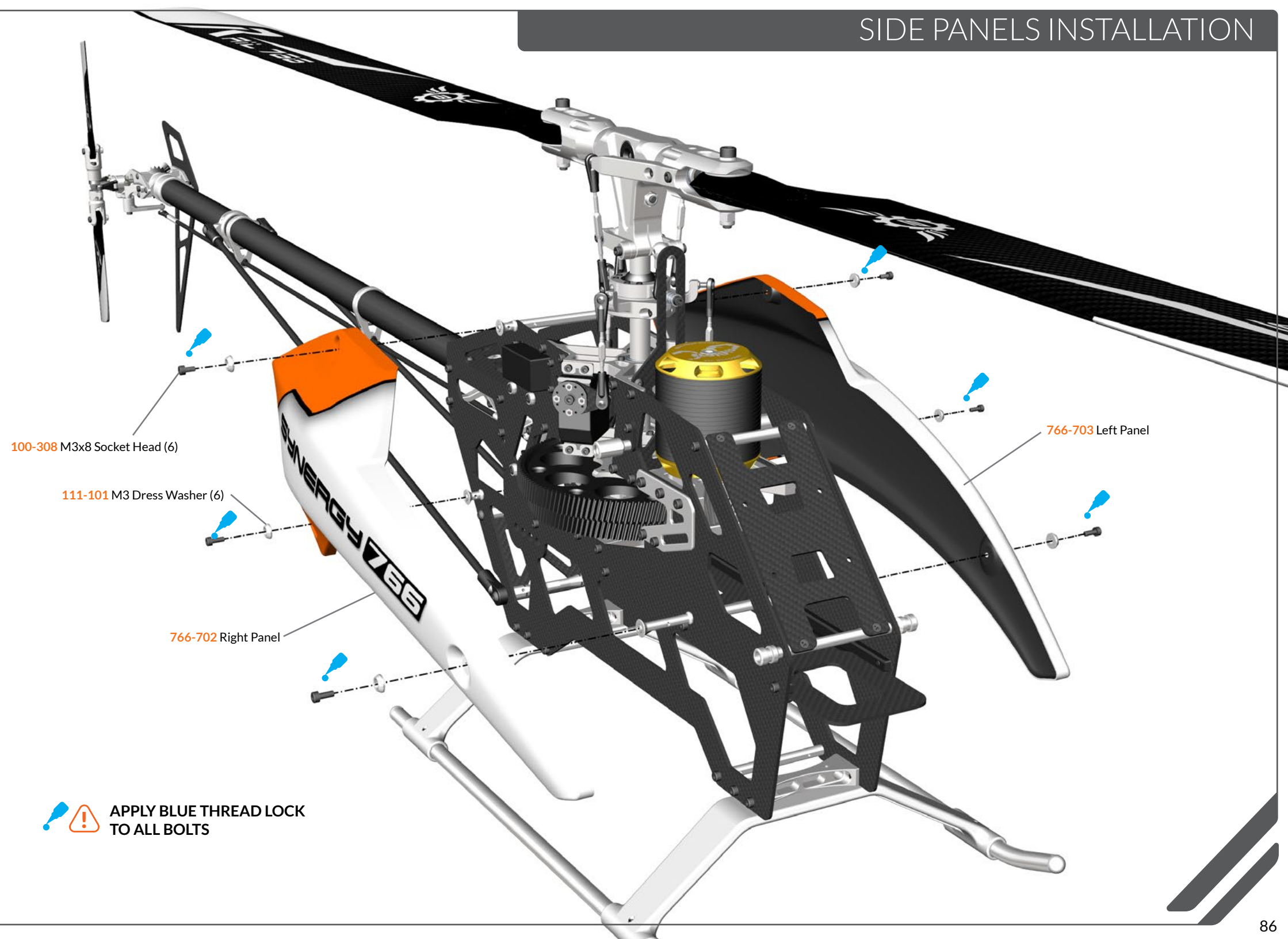
TAIL AND HUB

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100-308 M3x8 Socket Head (6)

111-101 M3 Dress Washer (6)

766-702 Right Panel

766-703 Left Panel



APPLY BLUE THREAD LOCK TO ALL BOLTS



Components that are factory assembled provide a reference for model assembly. Disassembly and application of thread lock is required where indicated.

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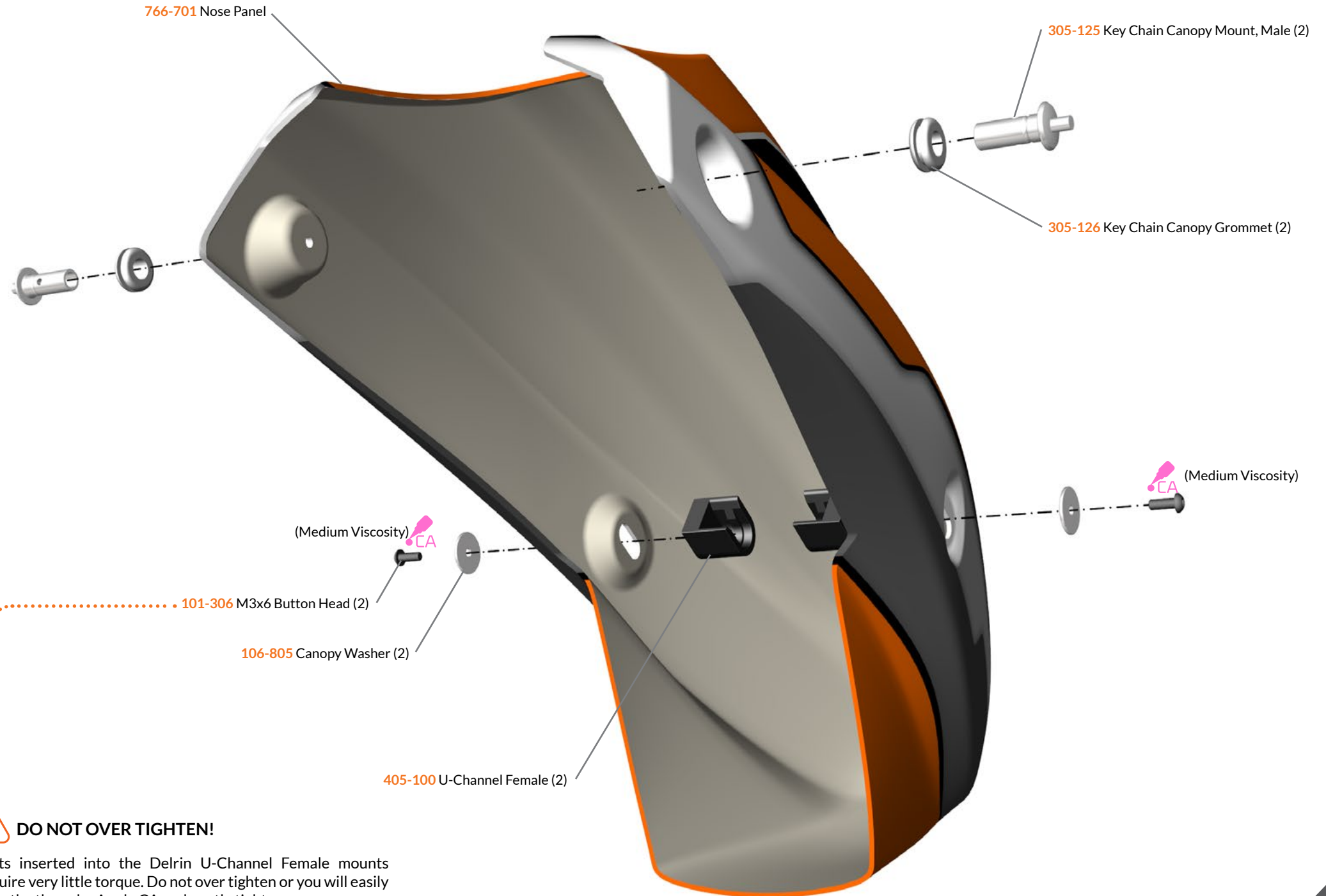
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SYNERGY 766



Components that are factory assembled provide a reference for model assembly. Disassembly and application of thread lock is required where indicated.

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MAXIMUM SUPPORTED HEAD SPEEDS: To maximize efficiency of the power system, increase longevity of all rotating parts and bearings, and minimize mechanical stresses, each blade configuration has a maximum supported head speed. The recommended governor settings are also provided as a general starting point.

Choose a tail configuration based on your highest head speed condition, typically IDLE UP 2. Theses calculations are based on thrust provided near or at maximum allowed tail RPM. Maximum tail RPM for 106mm blades: 10,500 rpm. Maximum tail RPM for 116mm blades: 9,500 rpm.

716

716mm Main Blades

MAX SUPPORTED HEAD SPEED: 2250 RPM

Boom: 766-301
Tail Control Rod: 766-305
Torque Tube: 320-509
Boom Supports: 315-117 or 766-304

Motor and Battery Configurations

	560Kv	520Kv	500Kv	450Kv	400Kv
12S LIPO					
12T (11.6:1)*	1950	1800	1750	1550	1400
13T (10.7:1)	2100	1950	1850	1700	1500
14T (9.9:1)*	2250	2100	2000	1800	1600
15T (9.3:1)*		2250	2150	1950	1750
14S LIPO					
12T (11.6:1)*		2100	2000	1800	1600
13T (10.7:1)		2250	2200	1950	1750
14T (9.9:1)*				2100	1875
15T (9.3:1)*				2250	2000

Tail Blade and Tail Drive Ratio Configurations

HEAD SPEED	DRIVE RATIO	BLADES
UP TO 1850	5.1:1 (Optional 25T*)	116mm+
1900-2150	4.7:1 (Standard 27T)	116mm
2200-2250	4.5:1 (Optional 28T*)	106mm

OPTIONAL PARTS: 12T Pinion: 305-012H
14T Pinion: 305-014H
15T Pinion: 305-015H

25T Tail Pinion: 766-625H
28T Tail Pinion: 766-628H

766

766mm Main Blades

MAX SUPPORTED HEAD SPEED: 2050 RPM

Boom: 766-302
Tail Control Rod: 766-306
Torque Tube: 320-510
Boom Supports: 766-304

Motor and Battery Configurations

	520Kv	500Kv	450Kv	400Kv
12S LIPO				
12T (11.6:1)*	1800	1750	1550	1400
13T (10.7:1)	1950	1850	1700	1500
14T (9.9:1)*		2000	1800	1600
15T (9.3:1)*			1950	1750
14S LIPO				
12T (11.6:1)*	2050	2000	1800	1600
13T (10.7:1)			1950	1750
14T (9.9:1)*			2050	1875
15T (9.3:1)*				2000

Tail Blade and Tail Drive Ratio Configurations

HEAD SPEED	DRIVE RATIO	BLADES
UP TO 1850	5.1:1 (Optional 25T*)	116mm+
1900-2050	4.7:1 (Standard 27T)	116mm

8MM SHAFT PINIONS
13T PINION: 766-505H
14T PINION: 766-506H

806

806mm Main Blades

MAX SUPPORTED HEAD SPEED: 1900 RPM

Boom: 766-303
Tail Control Rod: 766-307
Torque Tube: 320-511
Boom Supports: 766-304

Motor and Battery Configurations

	520Kv	500Kv	450Kv	400Kv
12S LIPO				
12T (11.6:1)*	1800	1750	1550	1400
13T (10.7:1)	1900	1850	1700	1500
14T (9.9:1)*			1800	1600
15T (9.3:1)*			1900	1750
14S LIPO				
12T (11.6:1)*		1900	1800	1600
13T (10.7:1)			1900	1750
14T (9.9:1)*				1900

Tail Blade and Tail Drive Ratio Configurations

HEAD SPEED	DRIVE RATIO	BLADES
UP TO 1850	5.1:1 (Optional 25T*)	116mm+
1900	4.7:1 (Standard 27T)	116mm