e-Aurora

Ultimate 90 Electric

AVANT™

***AVANT Aurora* 90 Electric**

Assembly Manual V2.01

LIABILITY DISCLAIMER

This kit is for a radio controlled (RC) helicopter. RC Helicopters are not toys. Moving parts can present a hazard to operators, bystanders and anyone or anything that could be reached by the RC helicopter. Improper operation, maintenance or assembly can potentially cause a helicopter to pose a danger to persons or objects including but not limited to the possibility of causing serious physical injury and even death. This product is intended to be used by experienced adult radio control helicopter pilots under controlled safety conditions and on locations properly authorized and setup for safe flying and away from other people. Under no circumstance should a minor be allowed to operate this or any radio controlled helicopter without the approval, supervision and direction of his parent or legal guardian who takes full responsibility for the minor's actions. Do not operate an RC helicopter within the vicinity of homes, trees, electrical lines during inclement weather or rain or near crowds of people. After leaving its facilities the manufacturer has no way of maintaining control or supervision over the assembly and/or operation of the helicopter.
The manufacturer and/or its agents assume no responsibility or liability whatsoever for any damages including but not limited to ones generated by incidental or consequential damages.
The operator of the helicopter assumes all responsibility and liability that could be result from the correct or incorrect operation of the helicopter.

Symbols:

 Important,  Correct,  Incorrect,  Danger,  Allow it to set for some time before continuing

Note: Unless indicated otherwise all screws, balls and threads are installed with Blue Loctite

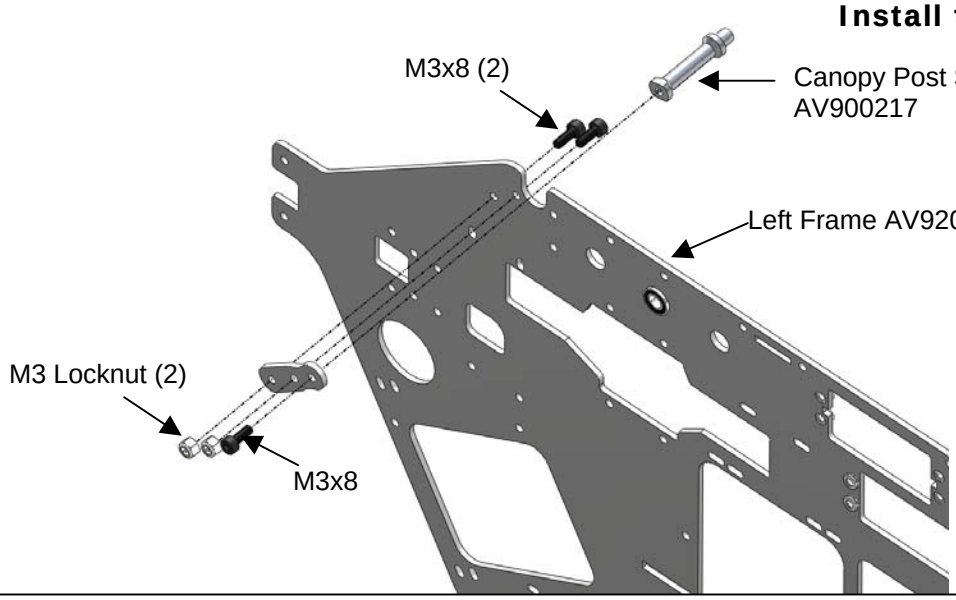
Before you start assembling:

Get the latest manual: It's highly recommended that you get the latest version of the manual. Please download a copy by clicking here and use that copy instead of this one.

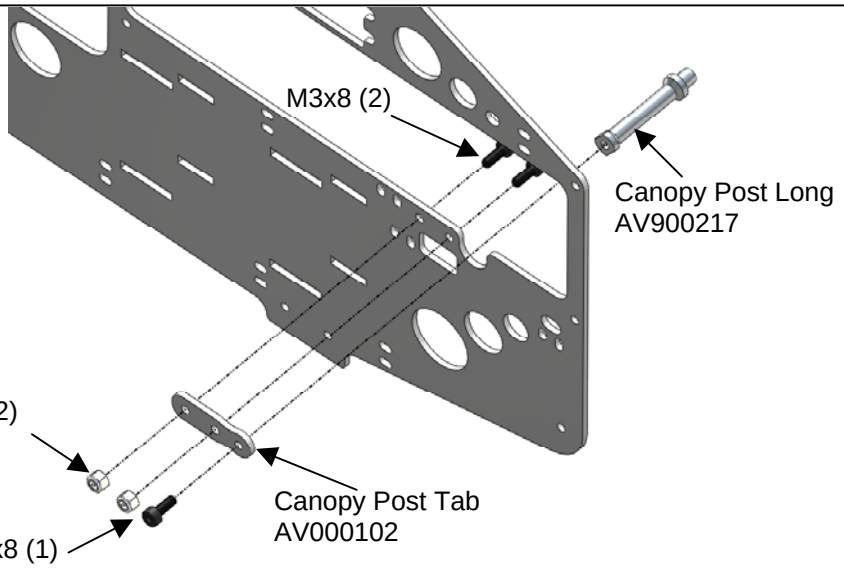
Important: Using a piece of #400 sanding paper sand the edges of the carbon fiber pieces that will be close to any electronic wires. Sharp edges can cut into the electric wires and since carbon fiber is conductive it can possibly create an electrical shortcut. Sharp edges can also cut into power wires creating shorts that could make the motor operation fail. Whenever you're ready to install a carbon fiber piece that will be close to servo wiring make sure to sand its edges to prevent wire chafing and a possible electrical short circuit.

Bag #1

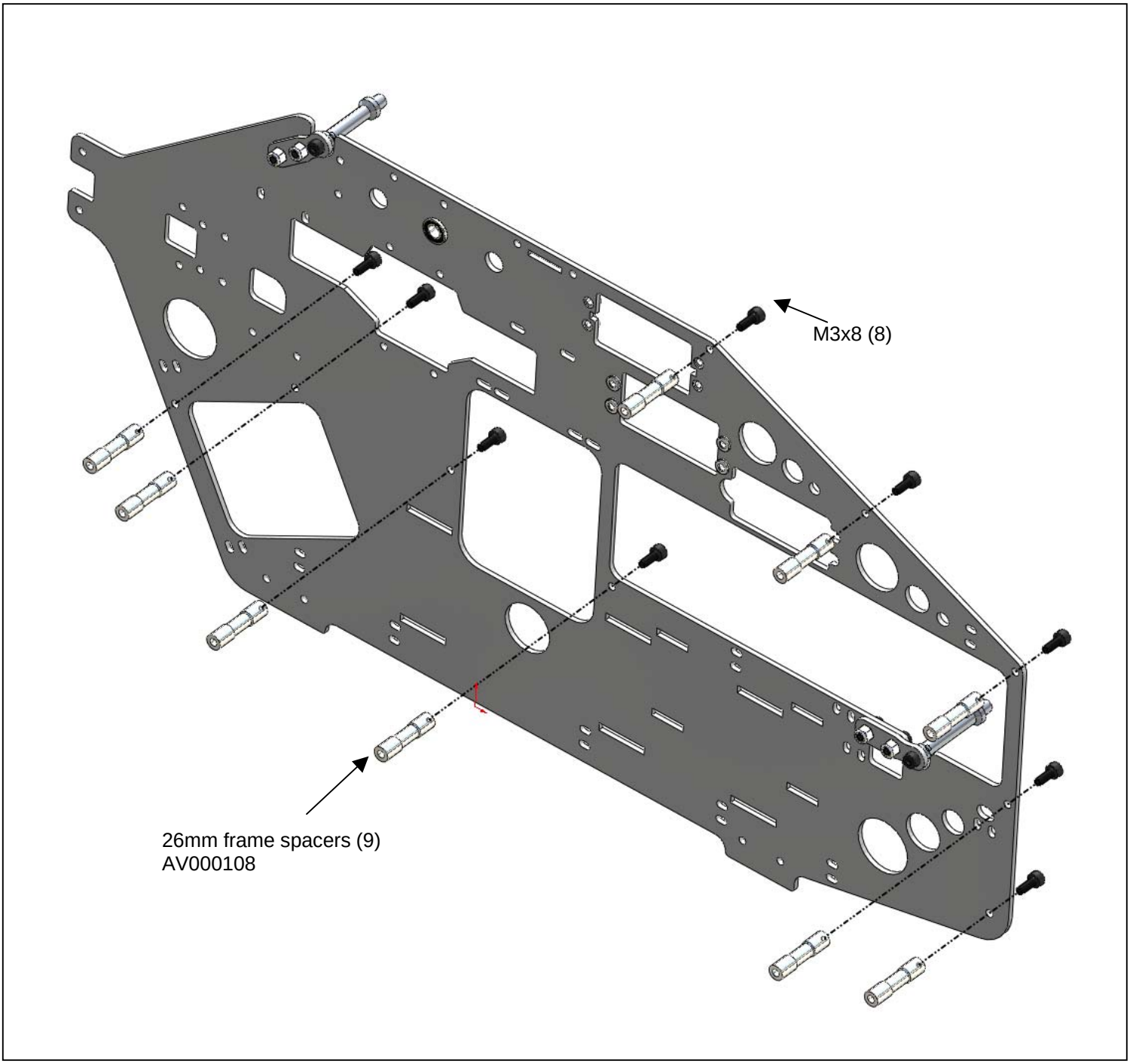
Install the back Canopy Mount



Install the front canopy mount

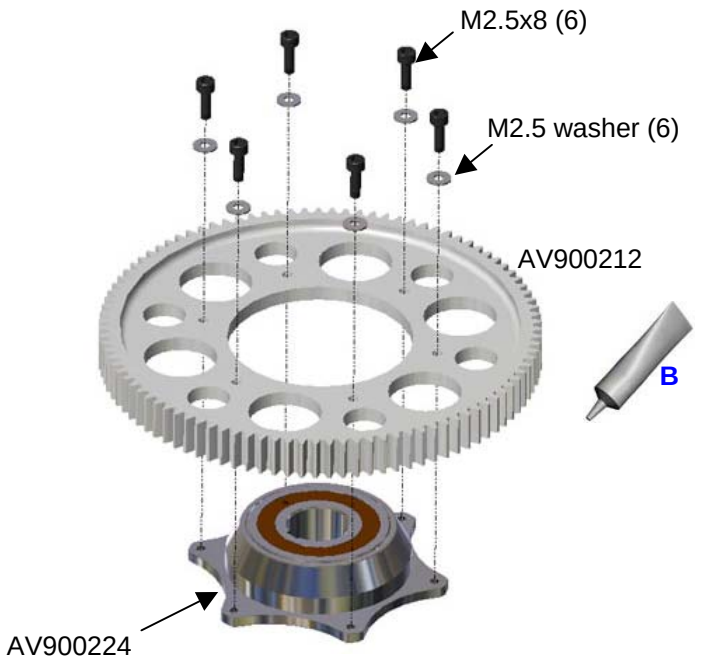


Note: Unless indicated otherwise all screws, balls and threads are installed with Blue Loctite

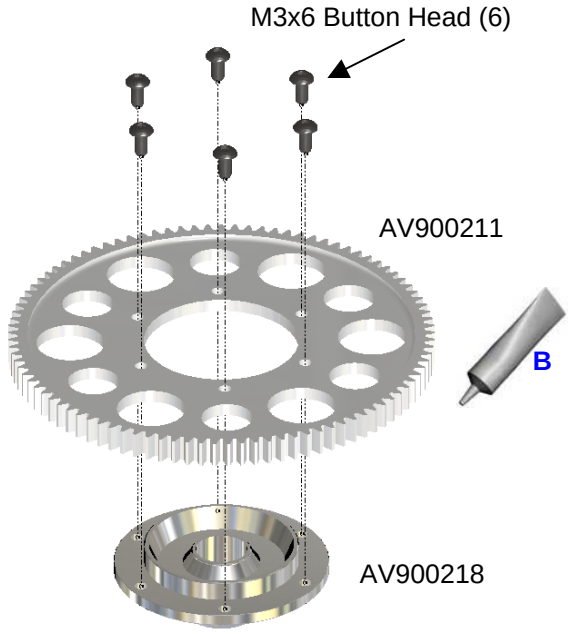


Note: Unless indicated otherwise all screws, balls and threads are installed with Blue Loctite

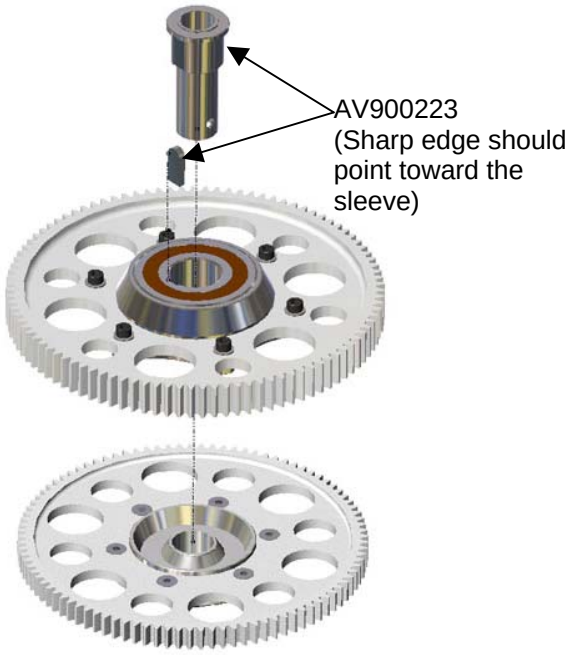
Bag #2

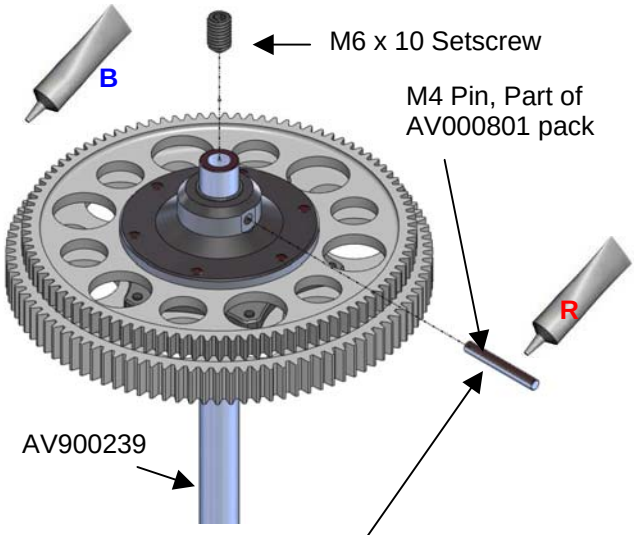


Using six M2.5x8 screws install the Main gear onto the pre-assembled main gear hub



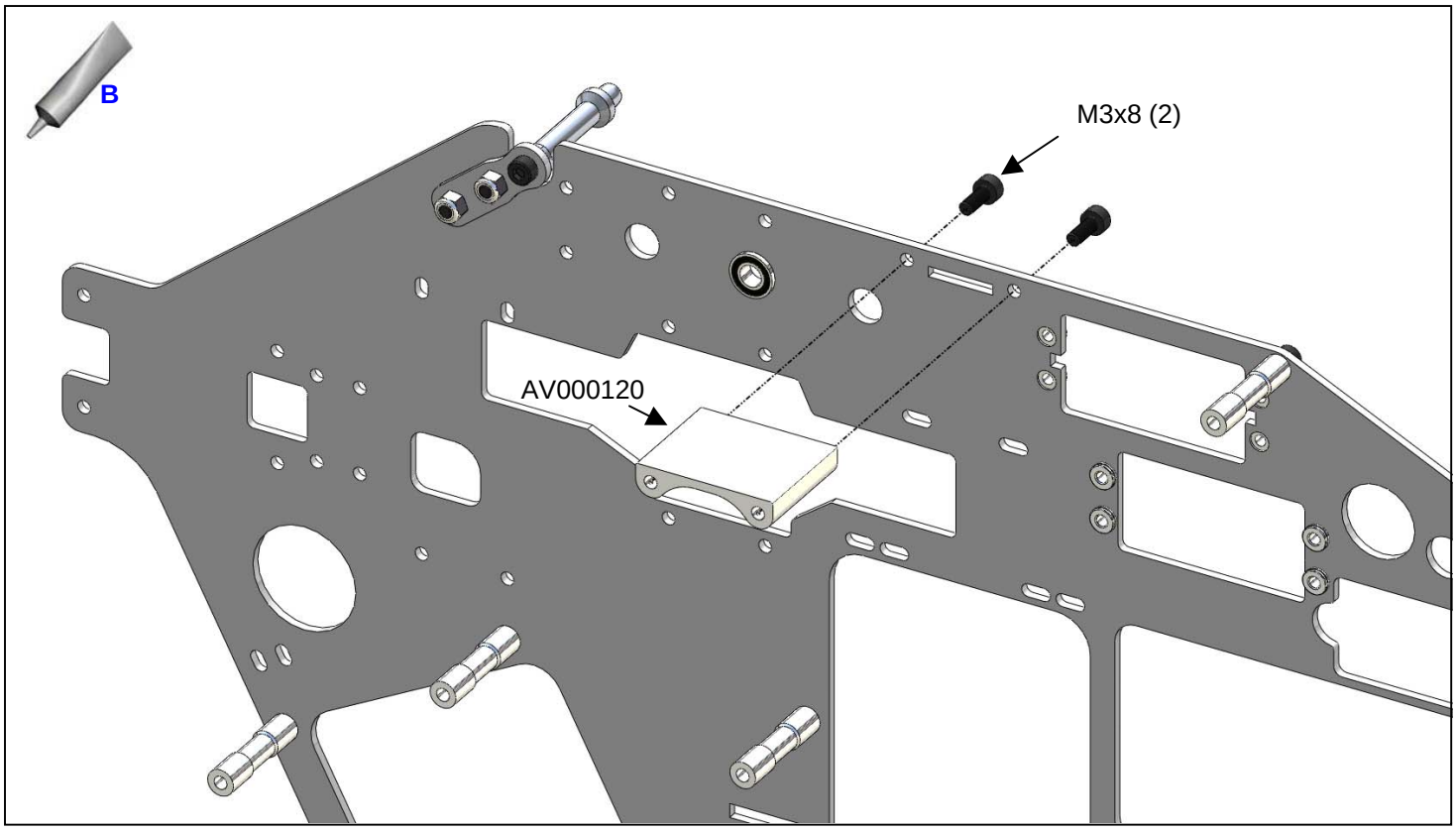
Using six M3x6 button head screws install the constant drive gear onto the constant drive hub.

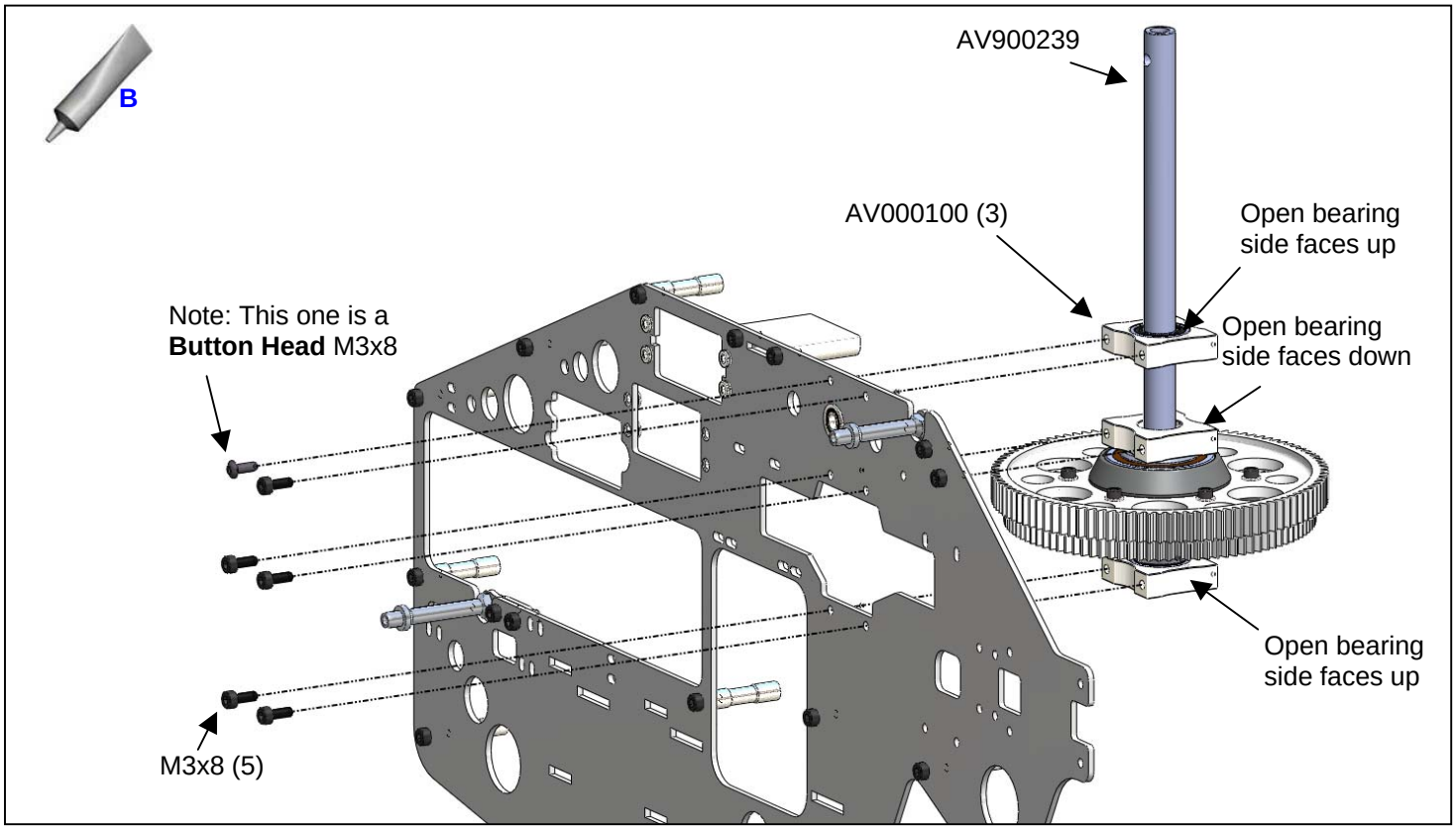




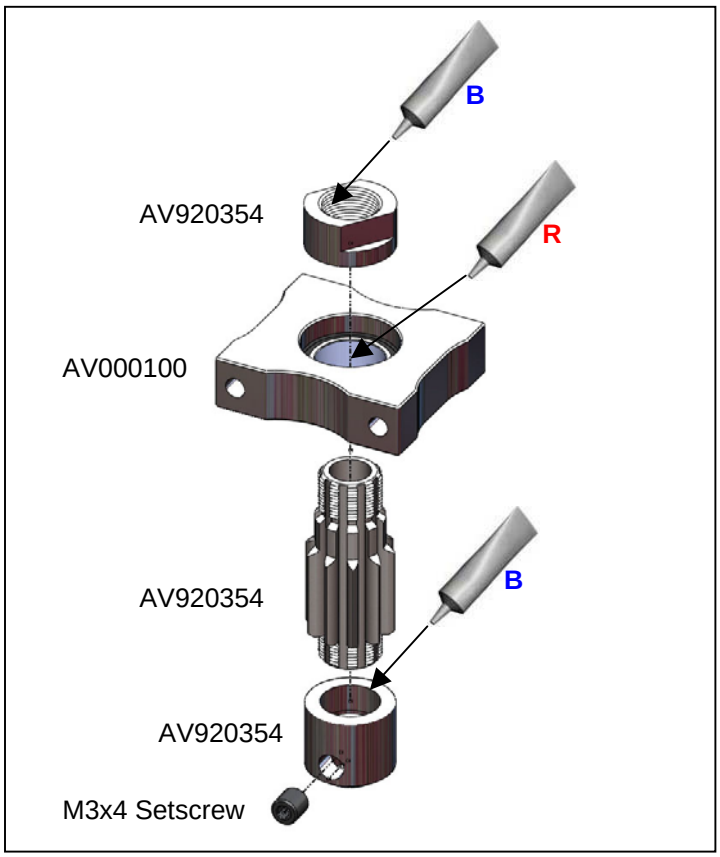
VERY IMPORTANT NOTE**:**
Use Blue or Red Loctite on the mainshaft pin itself. This will prevent it from sliding out even if the setscrew becomes lose. Do not over tighten the M6 setscrew.

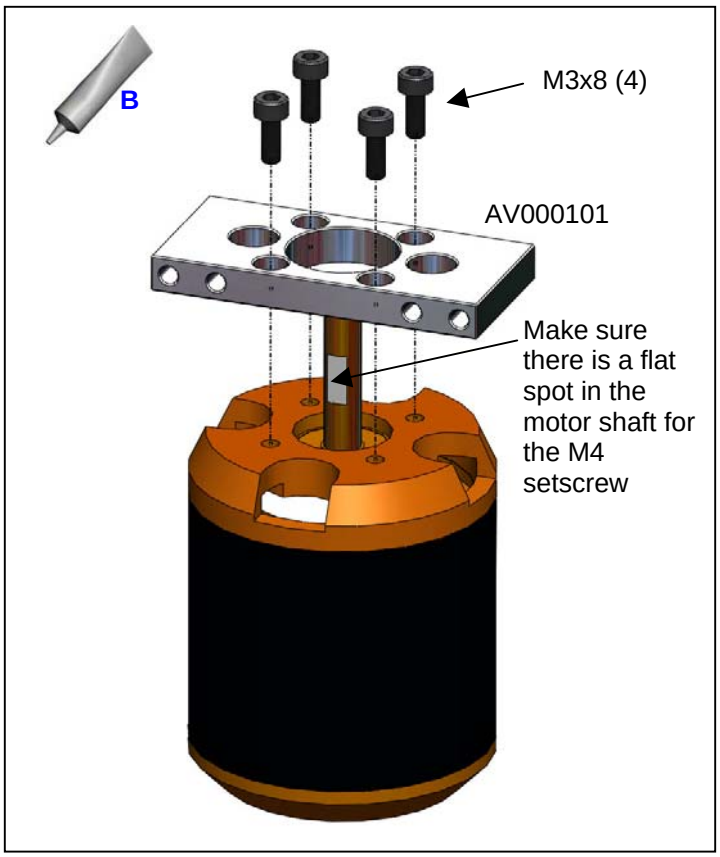
Note: Unless indicated otherwise all screws, balls and threads are installed with Blue Loctite

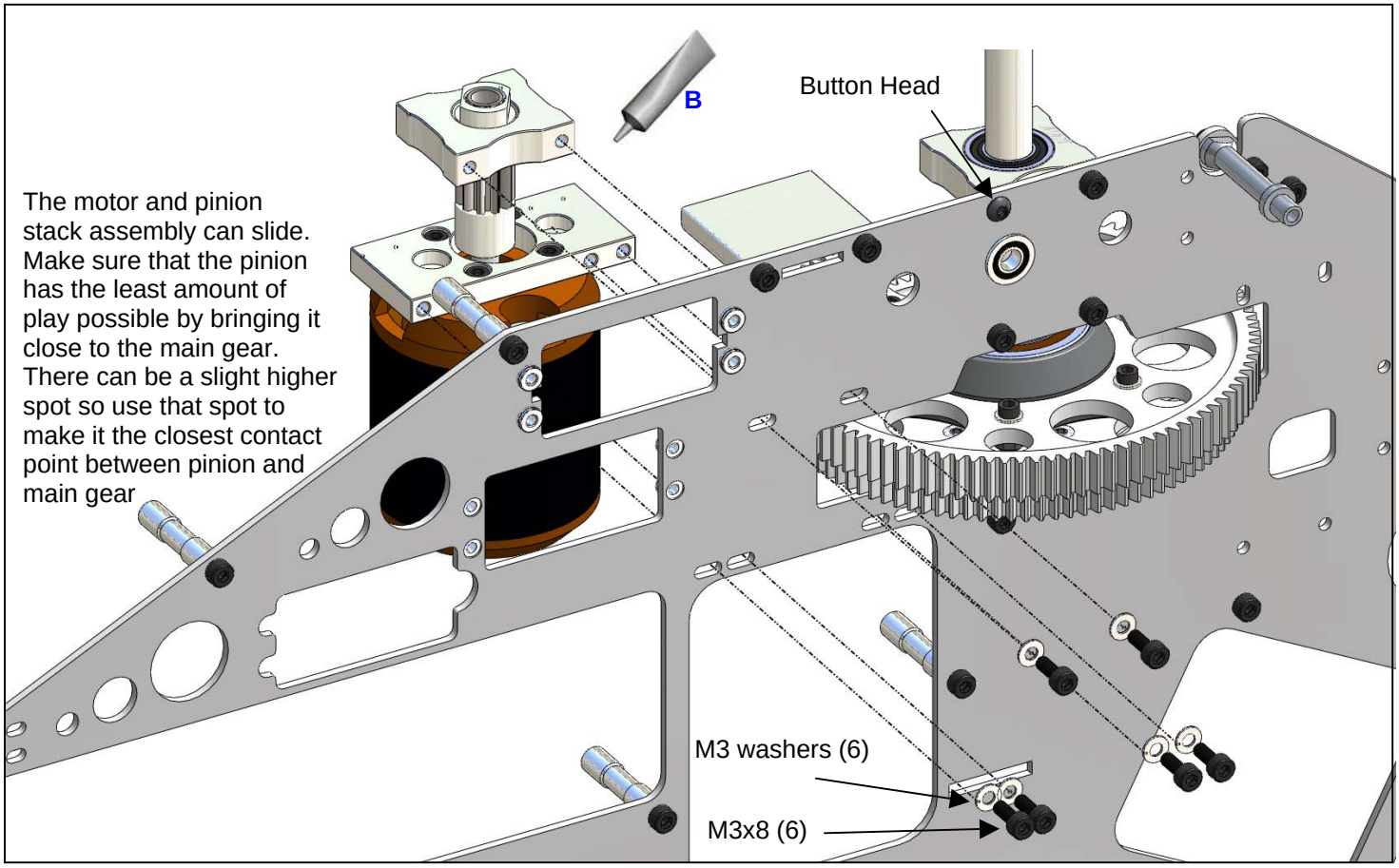




Note: Unless indicated otherwise all screws, balls and threads are installed with Blue Loctite





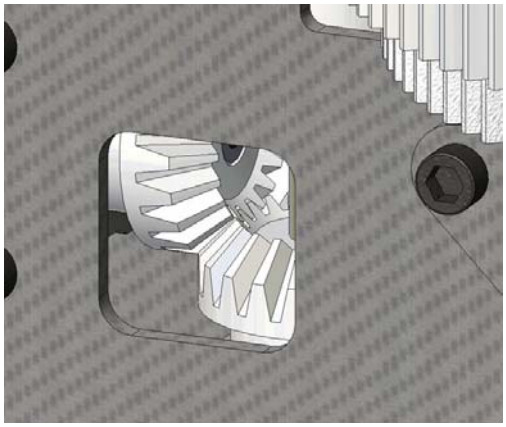


Note: Unless indicated otherwise all screws, balls and threads are installed with Blue Loctite

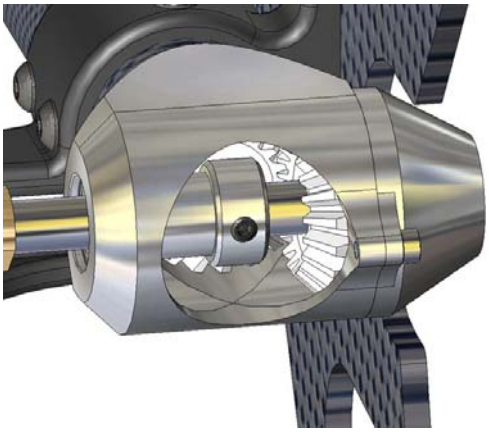
VERY IMPORTANT!!!

READ AND FOLLOW THE TAIL GEAR MESH METHOD
Failure to do so can cause the tail gears to fail in flight

This is the method used to do a correct mesh on the Aurora tail gears. This applies to both the front set (the set inside the frames) and the back set (the set inside the tailcase). The Aurora has a large window to inspect the gears inside the frames as well as the ones inside the tailcase.



Frame inspection window.



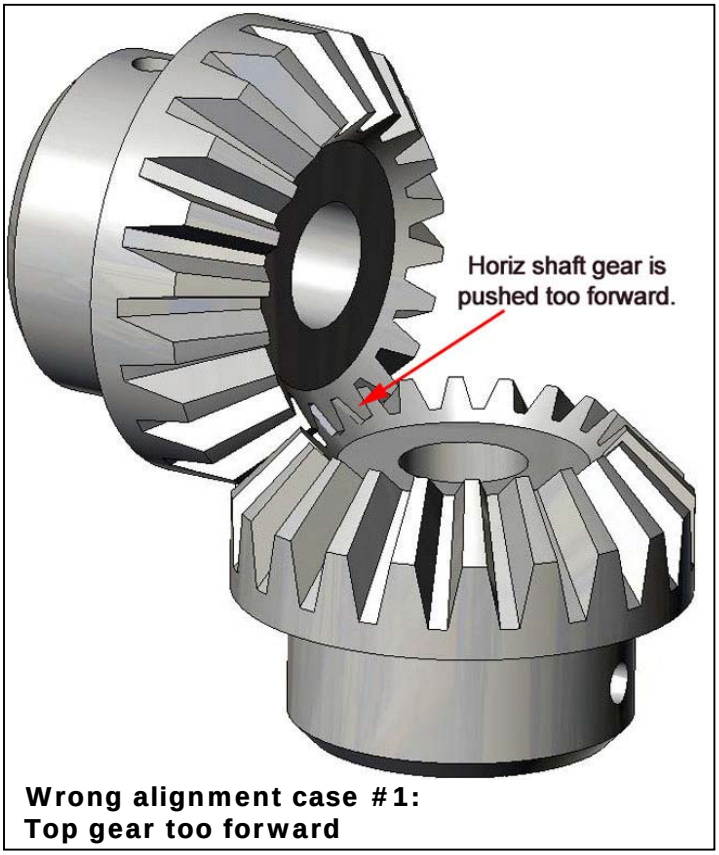
Tailcase inspection window.

There are three things that need to be assured for a correct mesh in the Aurora: Flush alignment, No Play and Lubrication.

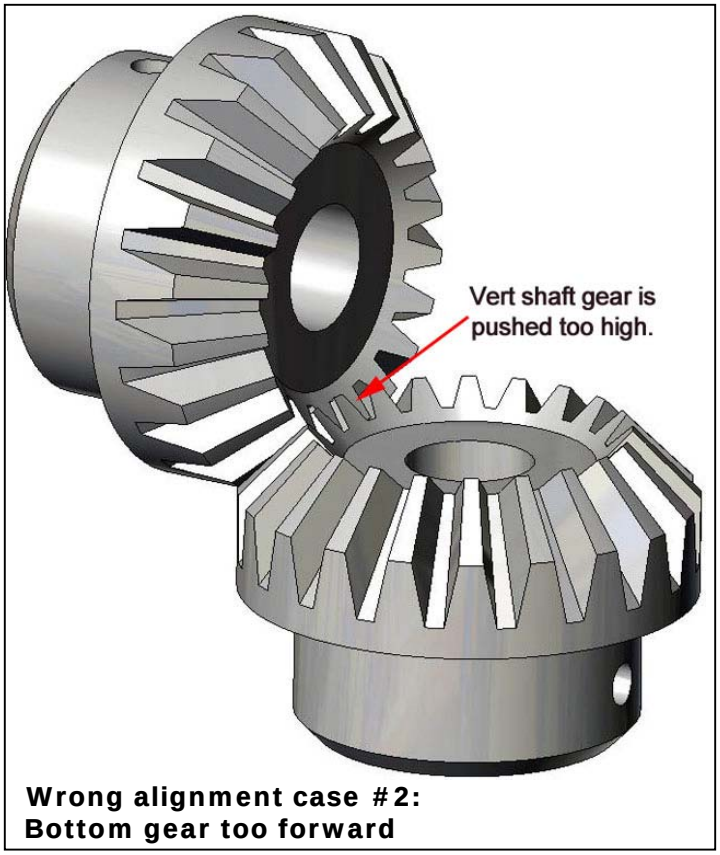
1) **Flush alignment:** Make sure that the gears are aligned so that the inner side of the teeth are in the same plane flush to each other at the point of contact.
2) **No Play:** Make sure there is no play between the gears.
3) **Lubrication:** Make sure to lubricate the gears with silicone spray oil or a few drops of oil like tri-flow before each flying day you can also use nitro fuel as lubricant letting the alcohol evaporate leaving the fuel's oil as lubricant.

1) Flush Alignment:

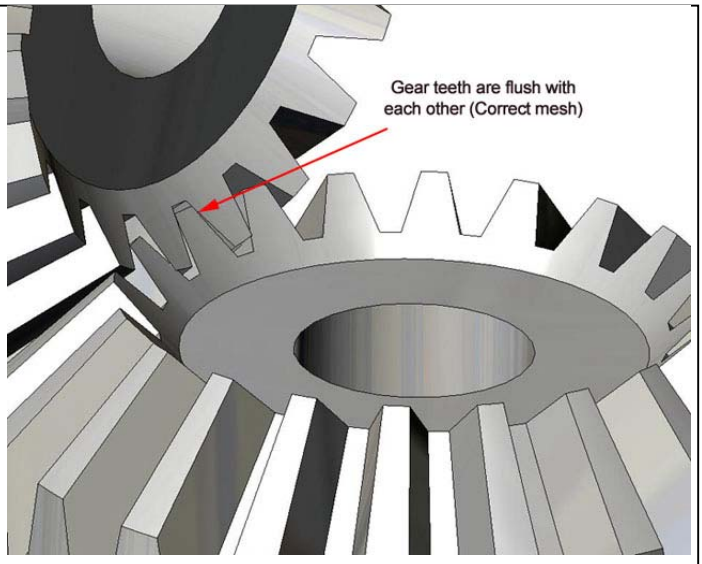
In order to illustrate how to achieve it here's a couple of pictures of gears aligned incorrectly followed by a couple of pictures of correctly aligned ones.



Wrong alignment case #1:
Top gear too forward



Wrong alignment case #2:
Bottom gear too forward



Flush alignment is easily achieved because the kit brings four sets of three bearings spacing washers of 0.1, 0.2 and 0.3mm thickness. Combining them you can get from 0.1mm to 0.6mm spacing (0.1), (0.2), (0.1+0.2), (0.3), (0.3+0.1), (0.3+0.2), (0.3+0.2+0.1). In order to align them flush you simply select thinner washer shims for the one that's too forward or thicker for the one that's not forward enough.

Note: Unless indicated otherwise all screws, balls and threads are installed with Blue Loctite

2) No Play:

The second and very important thing to make sure you have is that there is absolutely no play between the gears.

In order to make sure that there is no play between the gears hold one of the shaft firmly while trying to rotate the other one back and forth. There should be no movement on the gear. If there is movement simply increase the thickness on BOTH shafts the SAME amount so that the flush alignment from step 1 is not lost and try again.

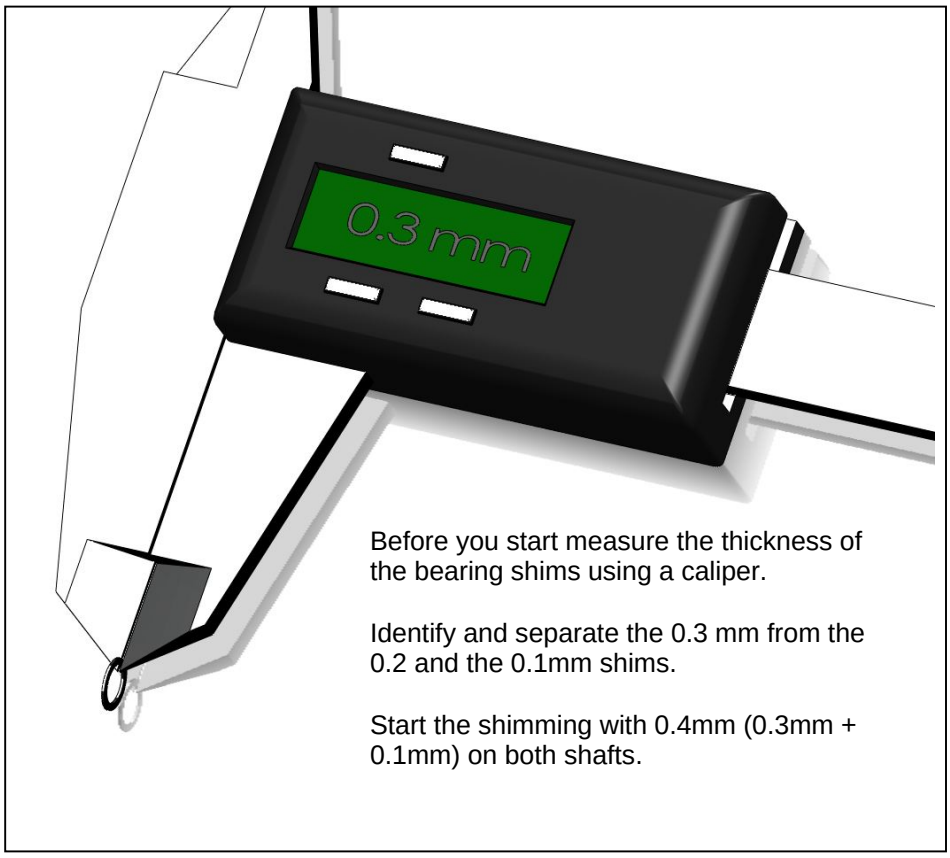
Once set as described it'll take a few flights for the gears to set and break in.

3) Lubrication:

The same oil that will be left as residue from your flight session is used as lubricant. At the beginning of the flight day drop a few drops of fuel rotate the main rotor a few turns and let the alcohol evaporate for a couple of minutes leaving the oil residue for lubrication.

Remember the three steps:

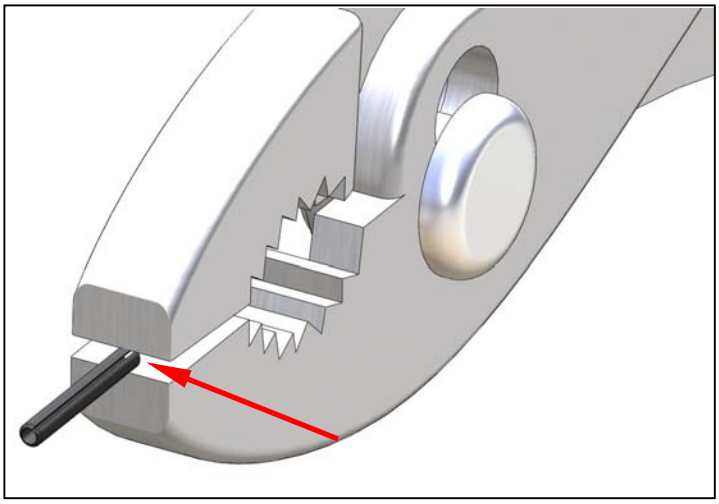
1) Flush alignment
2) No Play
3) Lubrication

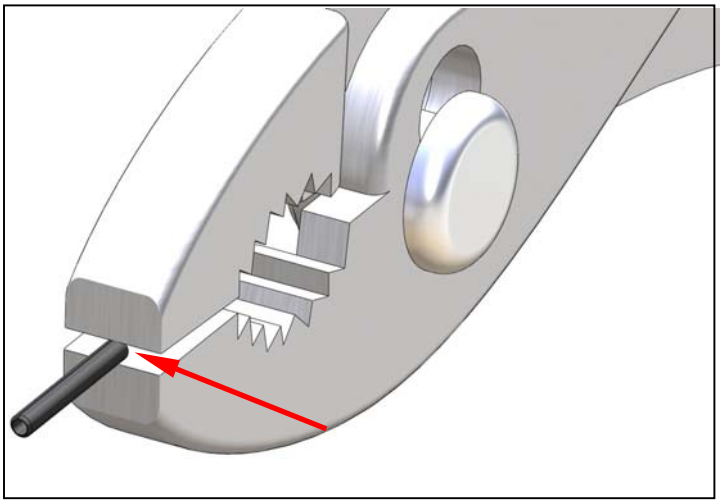


Note: Unless indicated otherwise all screws, balls and threads are installed with Blue Loctite

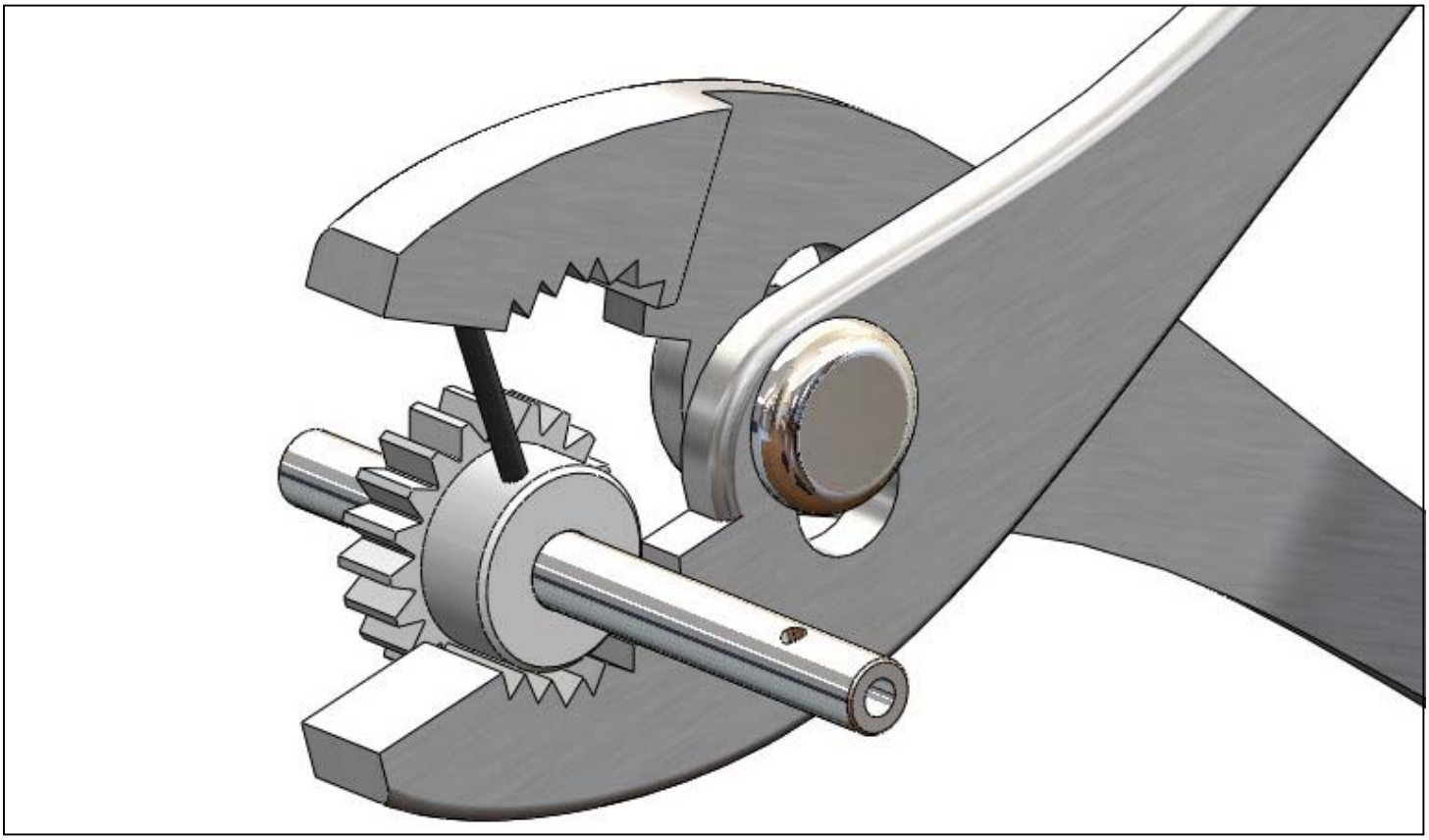
Bag #3

Before inserting the M2 spring pin (black one) you can make it easier to insert it into the 2mm shaft hole by crimping the tip of the spring pin very slightly to make the tip of the pin sharper.





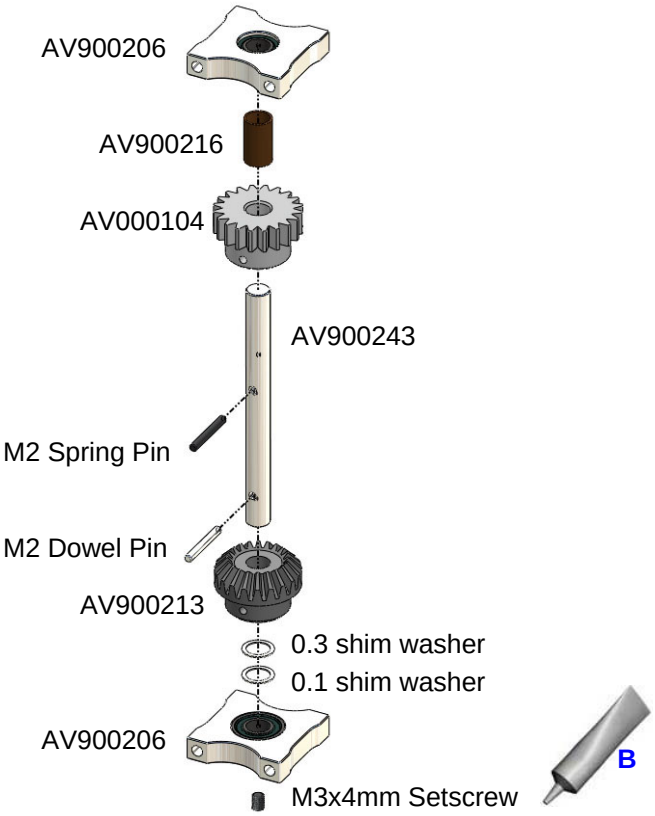
To insert the pin you can use a vise, an arbor press or if you don't have one of those you can also use a set of pliers set in the wider opening as shown in the picture below. If needed you can use some cardboard at the bottom of the gear to protect it from marring.



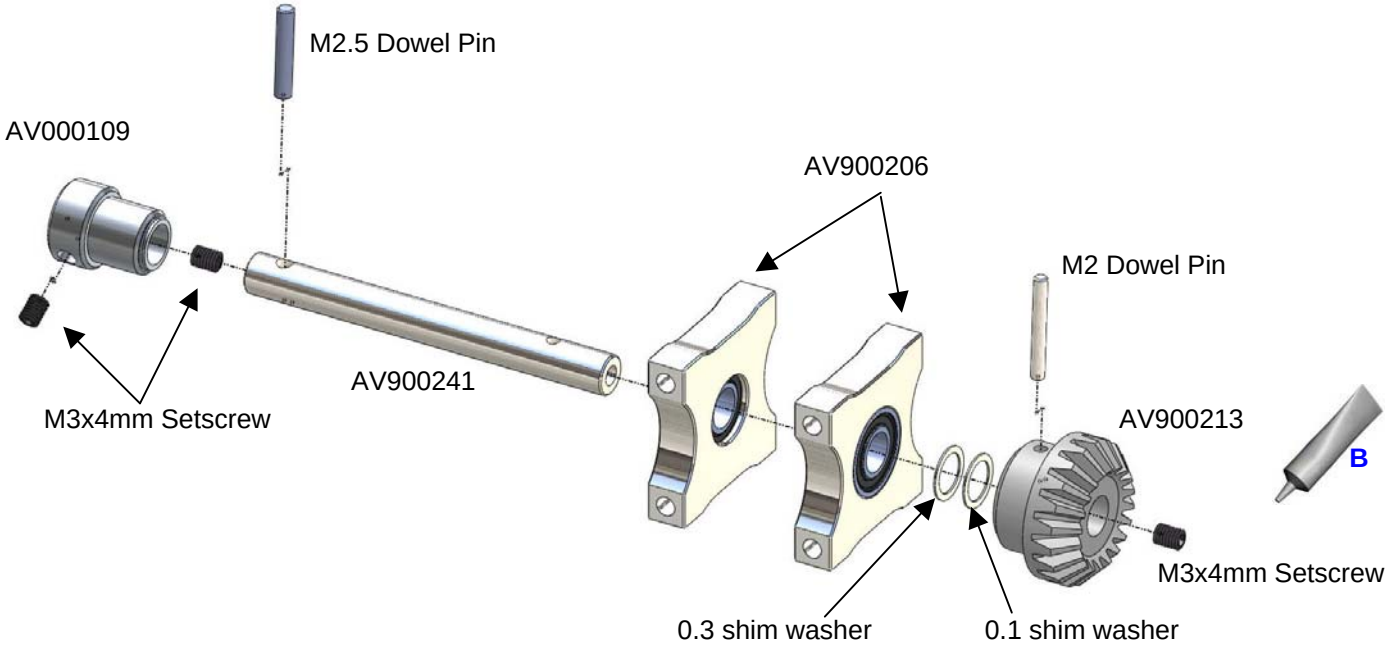
Note: Unless indicated otherwise all screws, balls and threads are installed with Blue Loctite

Assemble the vertical pickup shaft as shown on the picture.

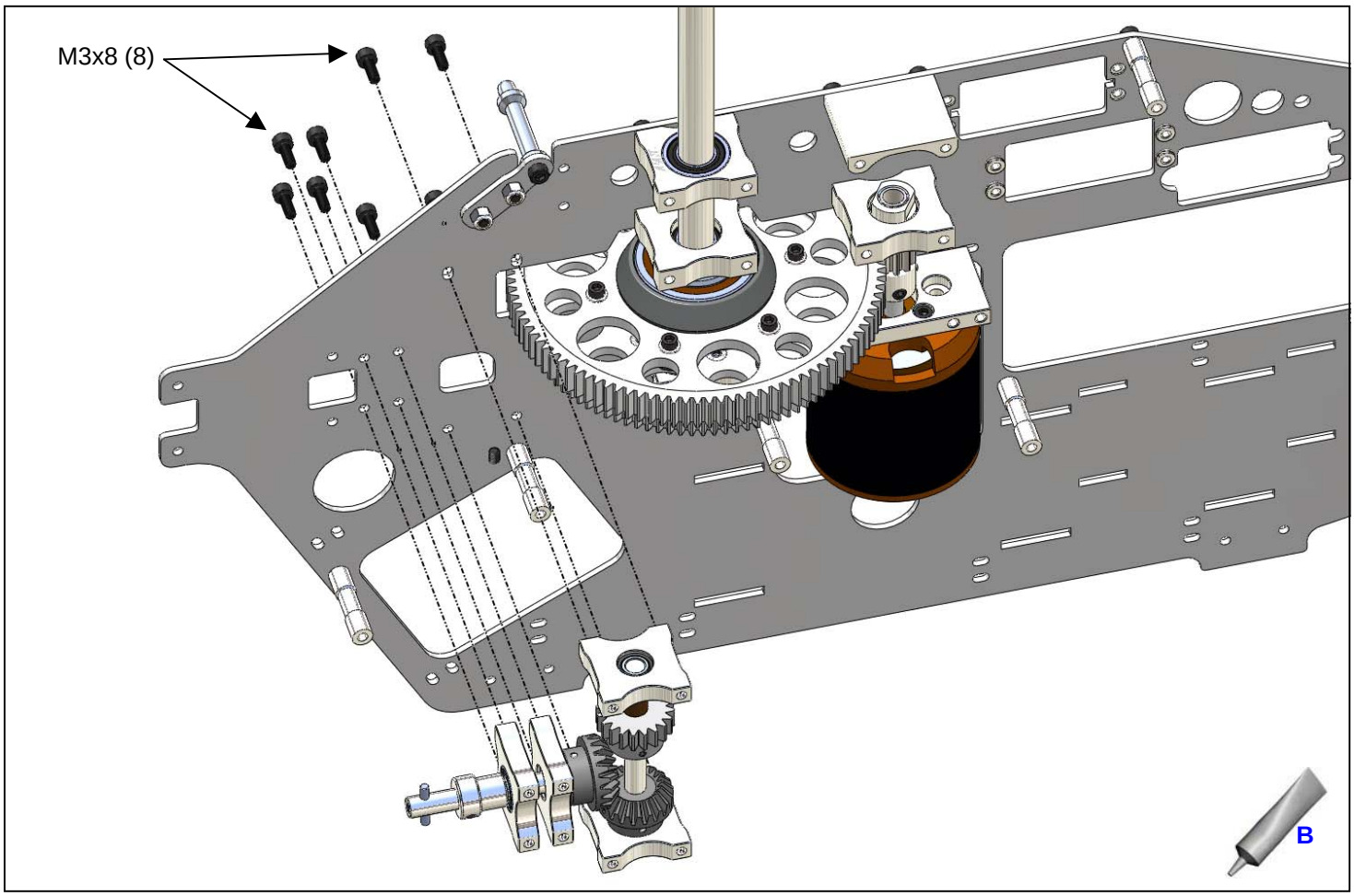
Note that the spring pin (black one) is the one above and the dowel pin (silver one) is the one at the bottom side.

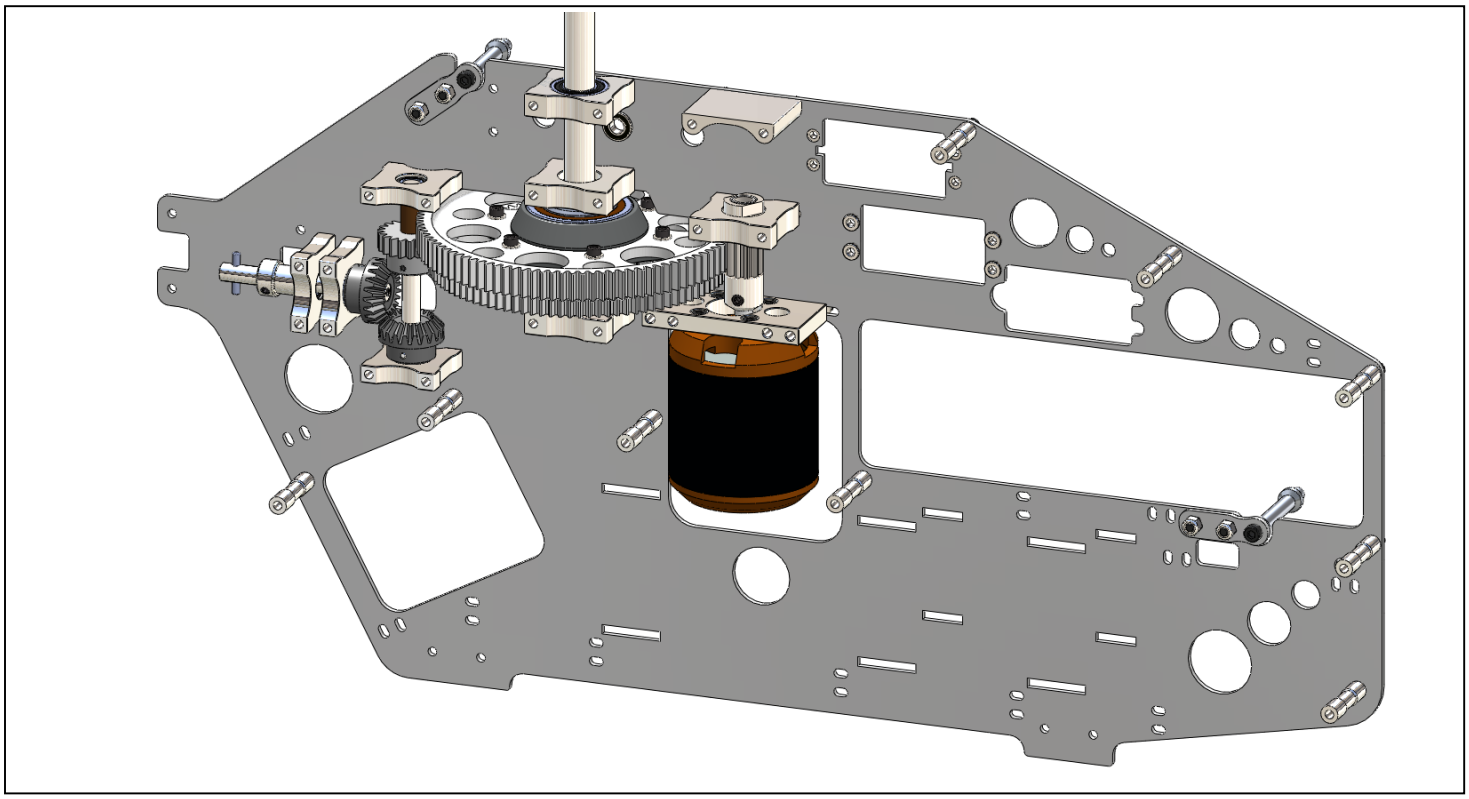


Assemble the torque input shaft assembly as shown. The spacing between the blocks is set by the holes in the frames.



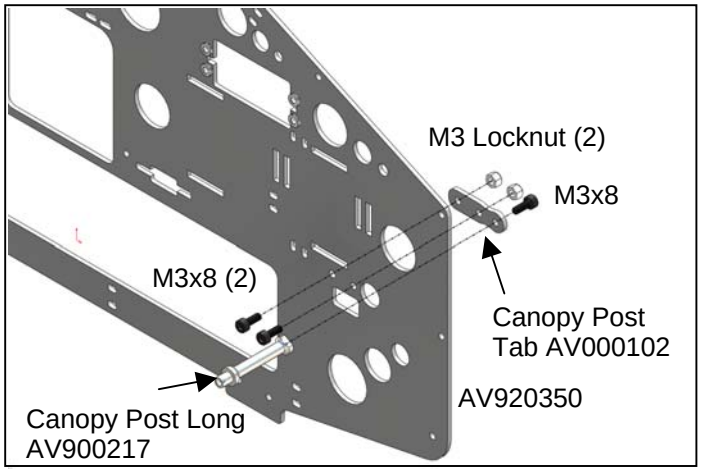
Note: Unless indicated otherwise all screws, balls and threads are installed with Blue Loctite

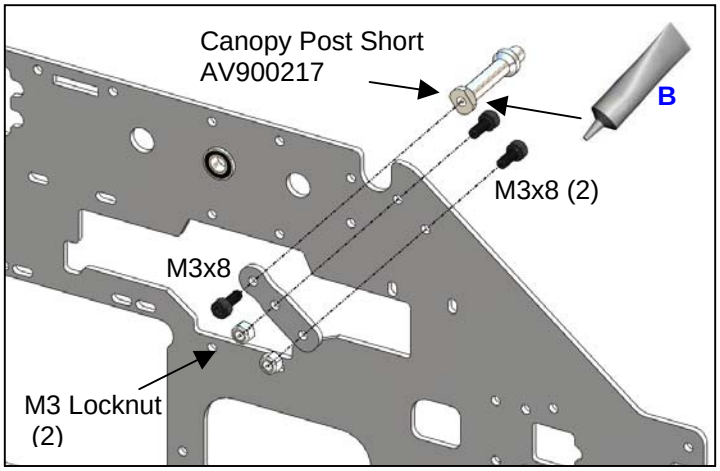


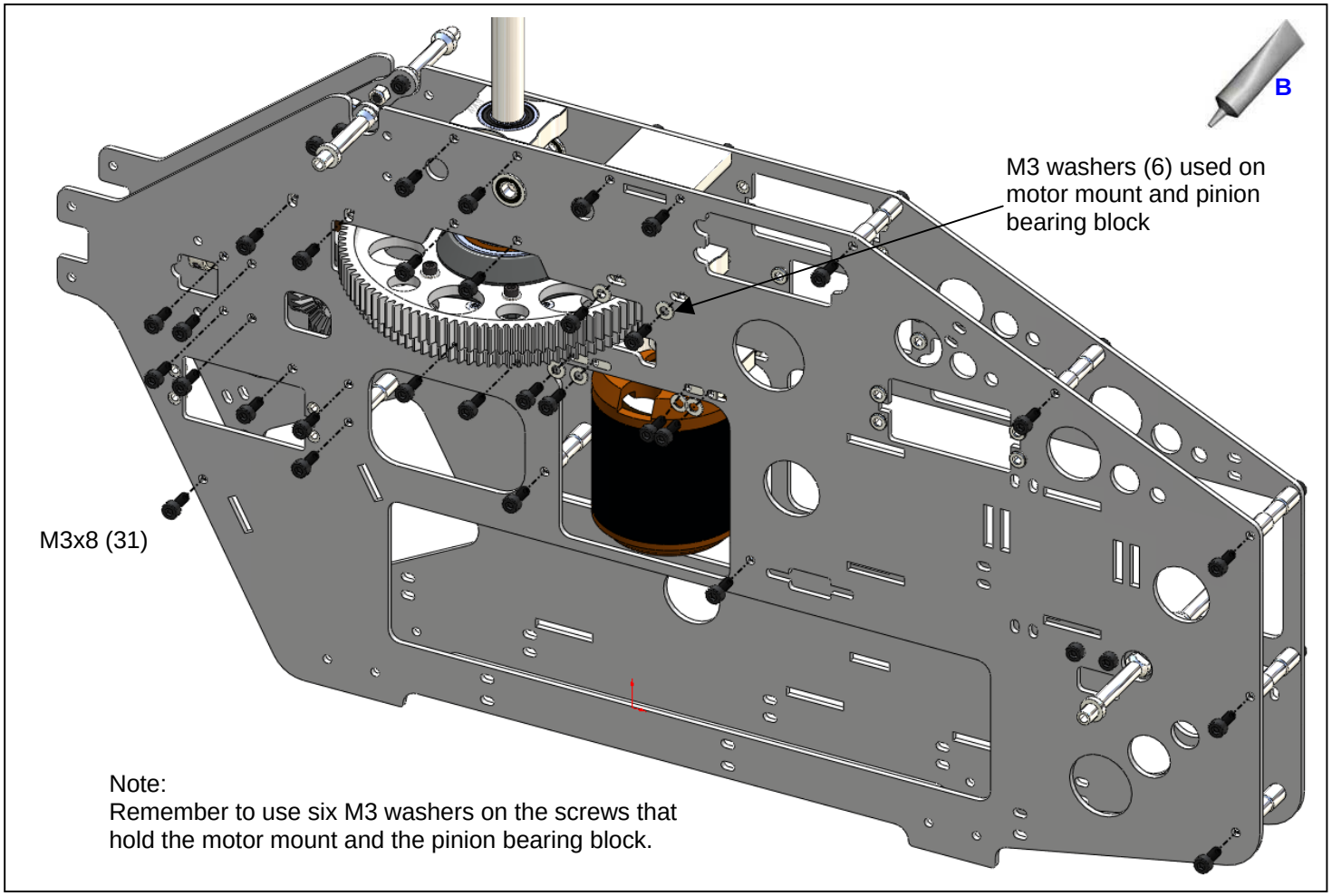


Note: Unless indicated otherwise all screws, balls and threads are installed with Blue Loctite

Bag #4

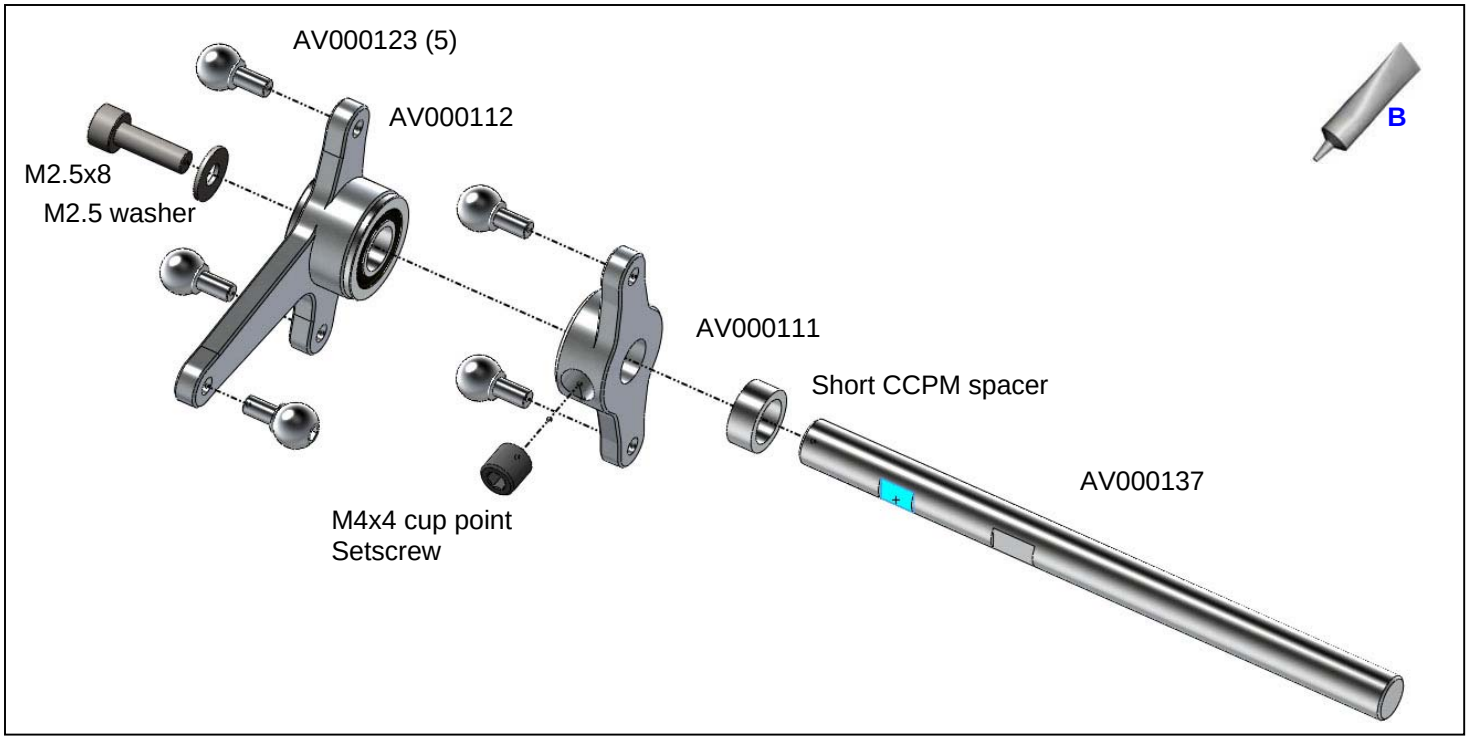


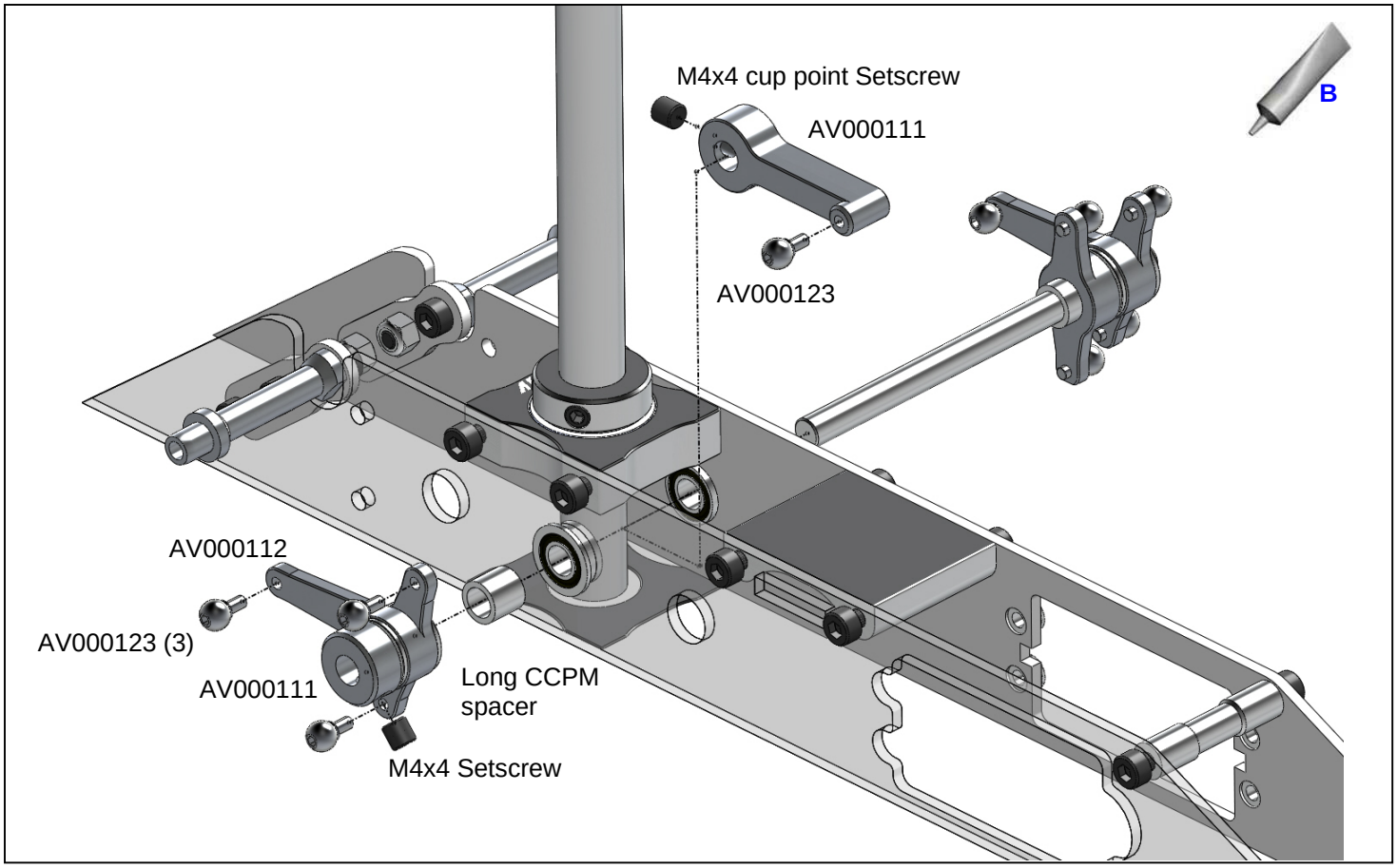




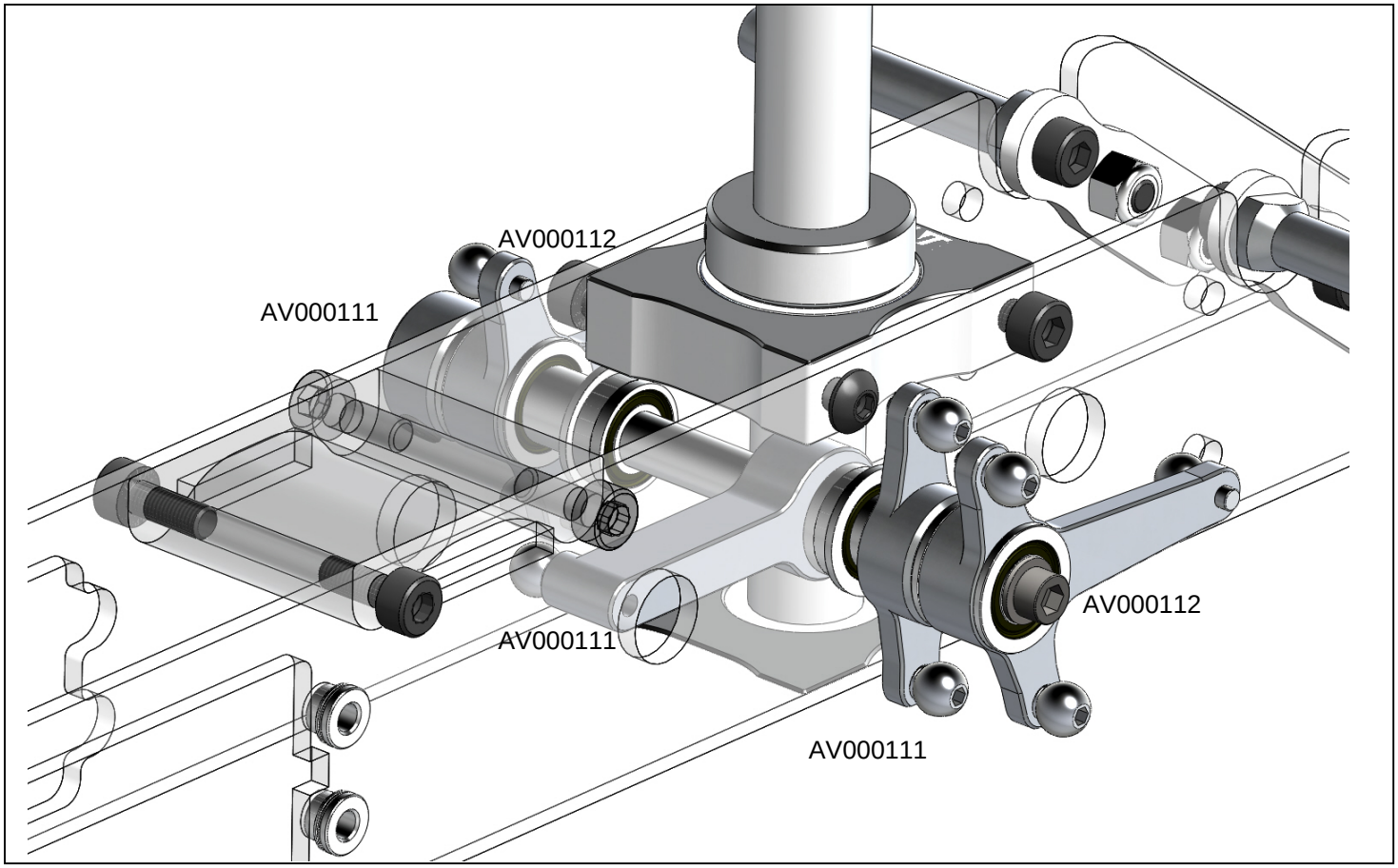
Note: Unless indicated otherwise all screws, balls and threads are installed with Blue Loctite

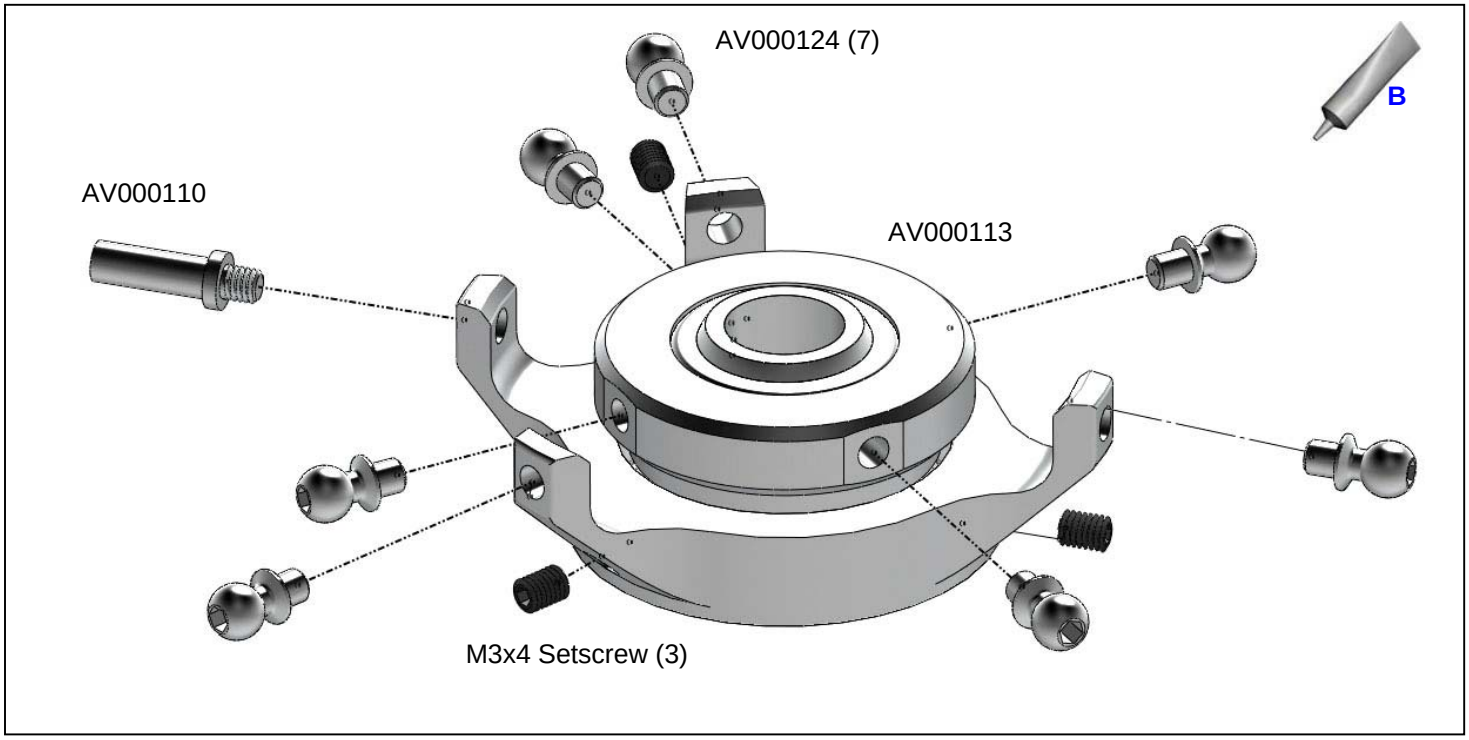
Bag #5



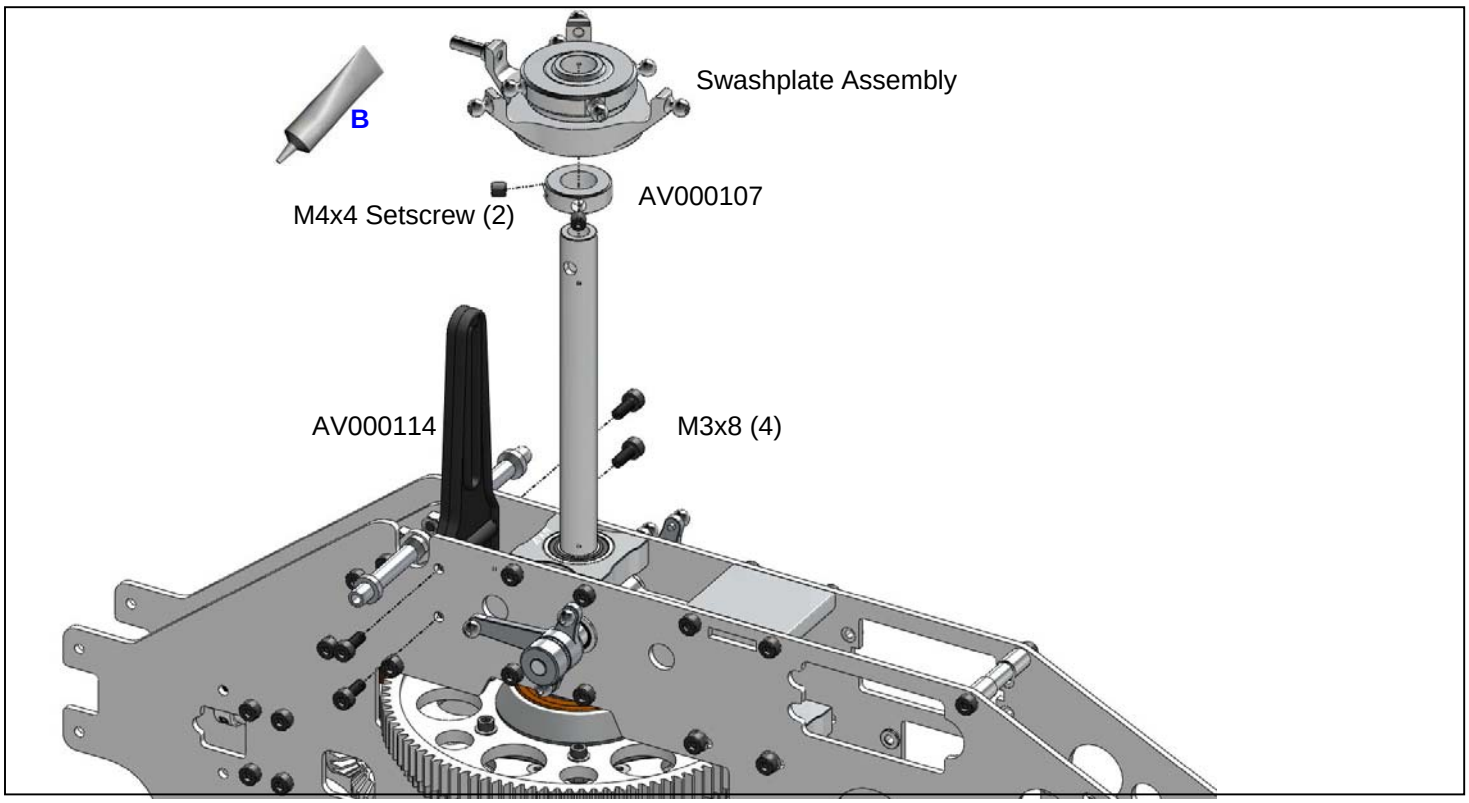


Note: Unless indicated otherwise all screws, balls and threads are installed with Blue Loctite

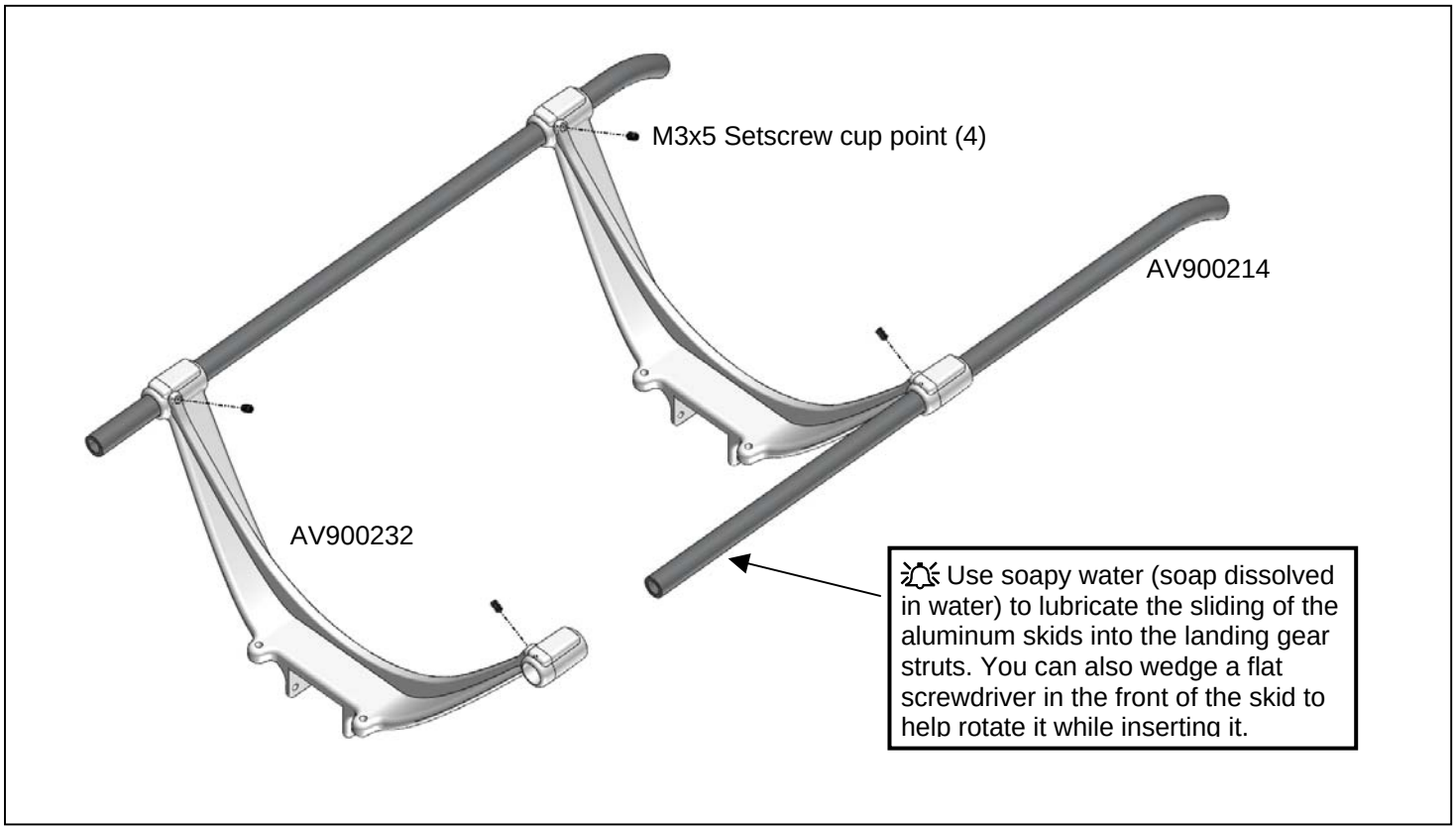




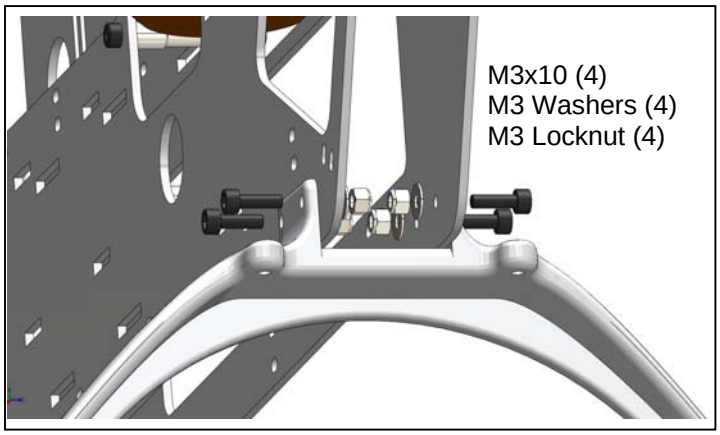
Note: Unless indicated otherwise all screws, balls and threads are installed with Blue Loctite

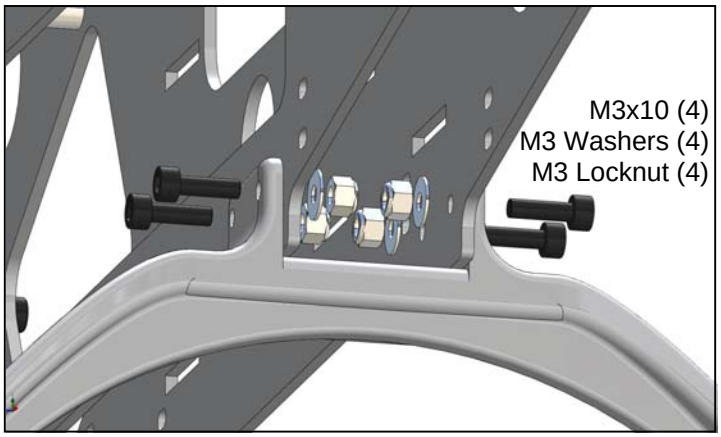


Bag #6

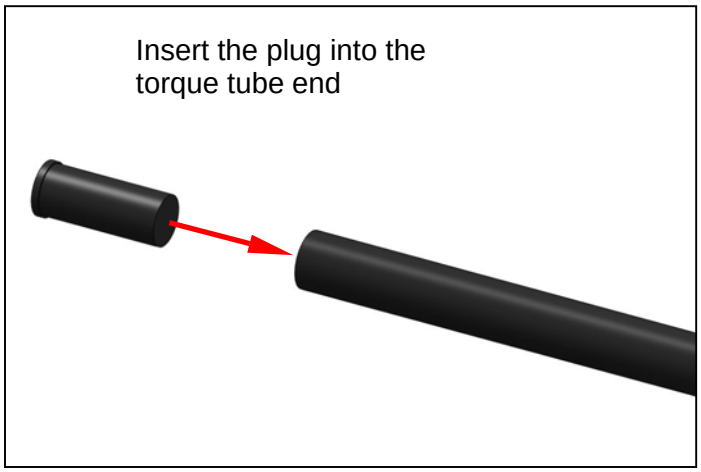


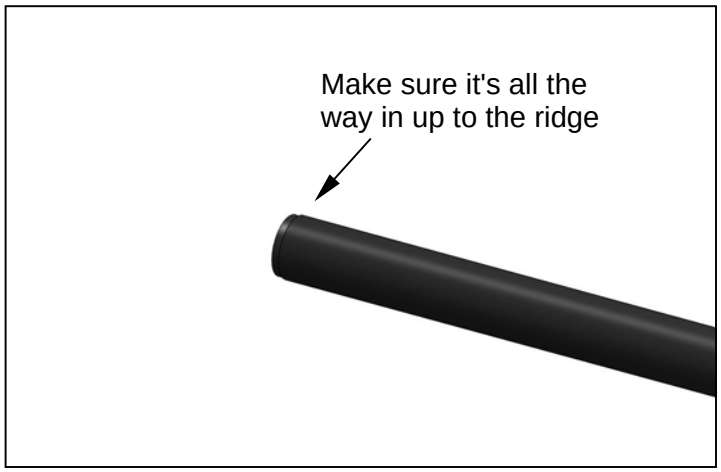
Note: Unless indicated otherwise all screws, balls and threads are installed with Blue Loctite

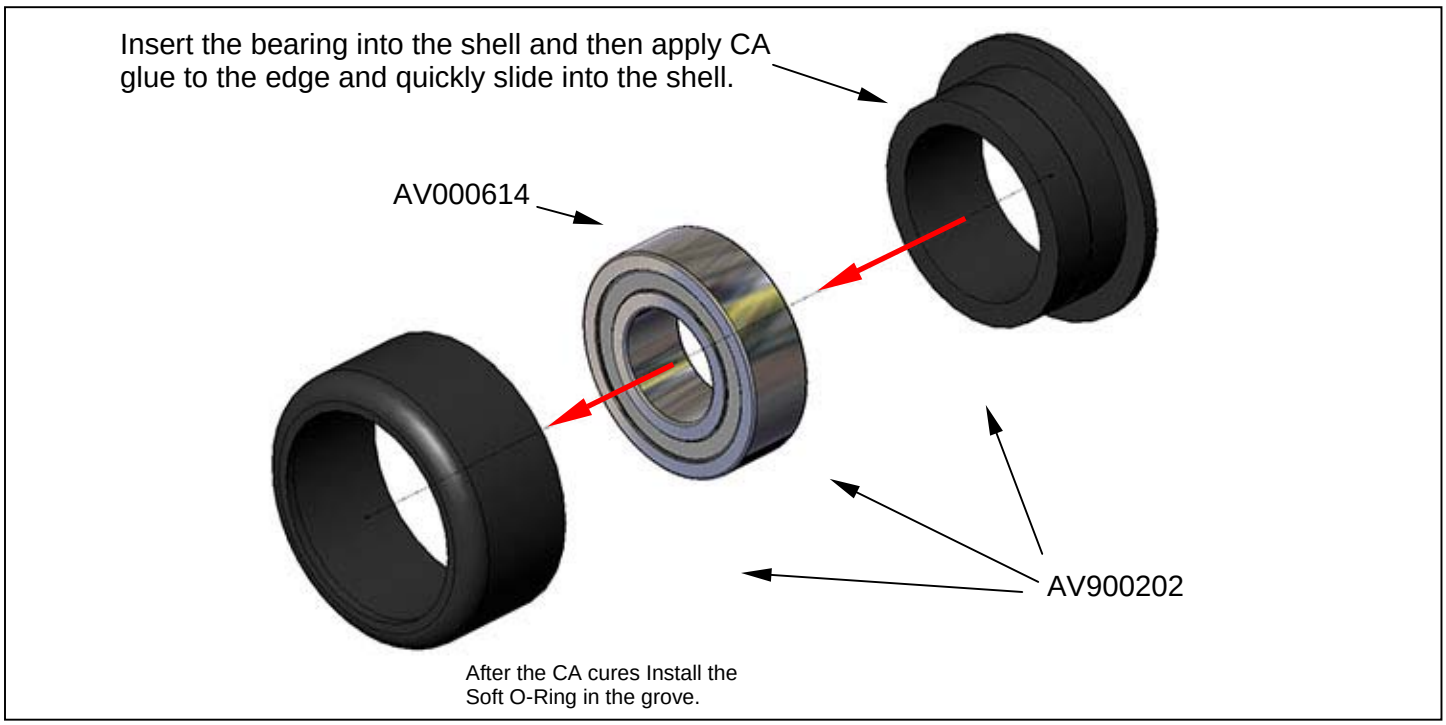




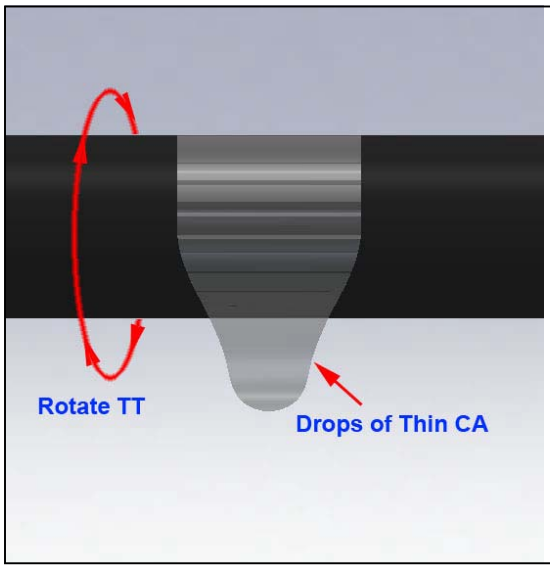
Bag #7
Torque Tube and Tail Assembly:



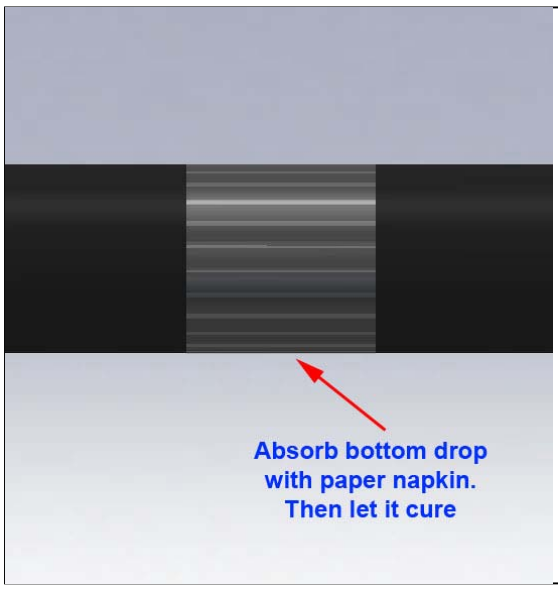




Note: Unless indicated otherwise all screws, balls and threads are installed with Blue Loctite



Put a couple of drops of thin CA on the TT in the area where you're going to install the bearing and while keeping it horizontal rotate the TT making the bead cover the area around where the bearing fits.

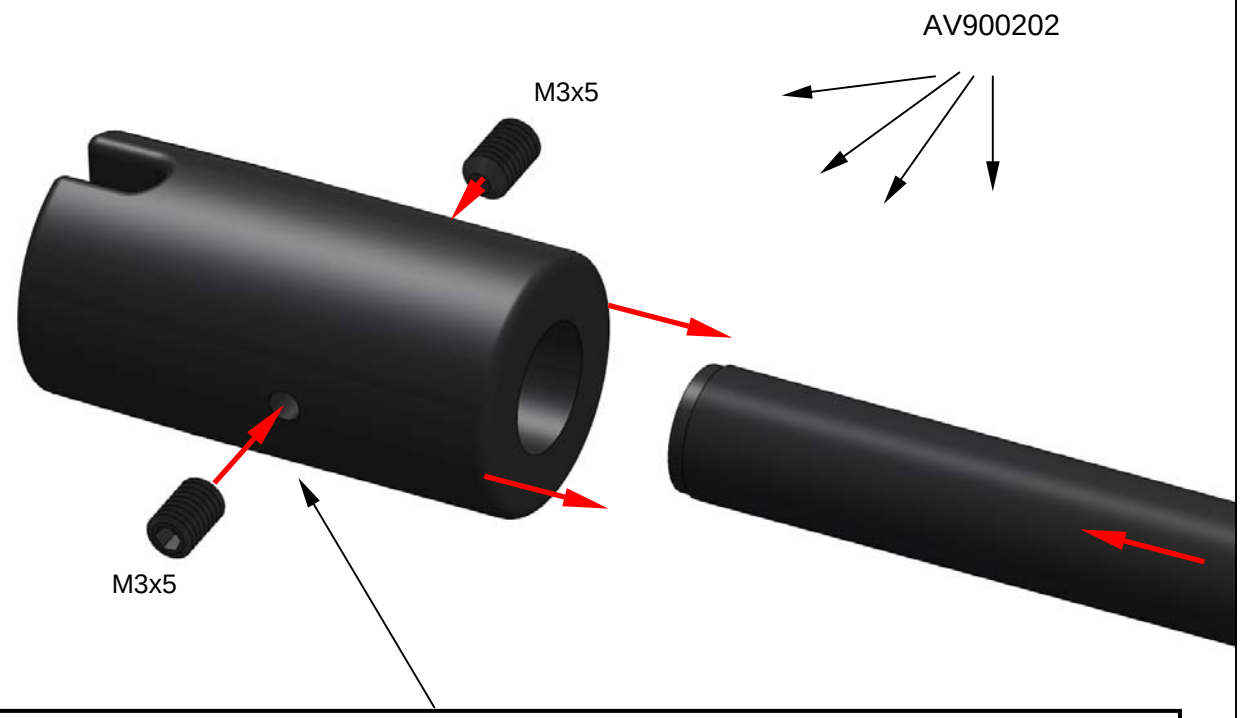


Absorb the excess from the bottom with a paper napkin. If you want to accelerate the cure breath some over the CA to make the humidity of your breath cure the CA.

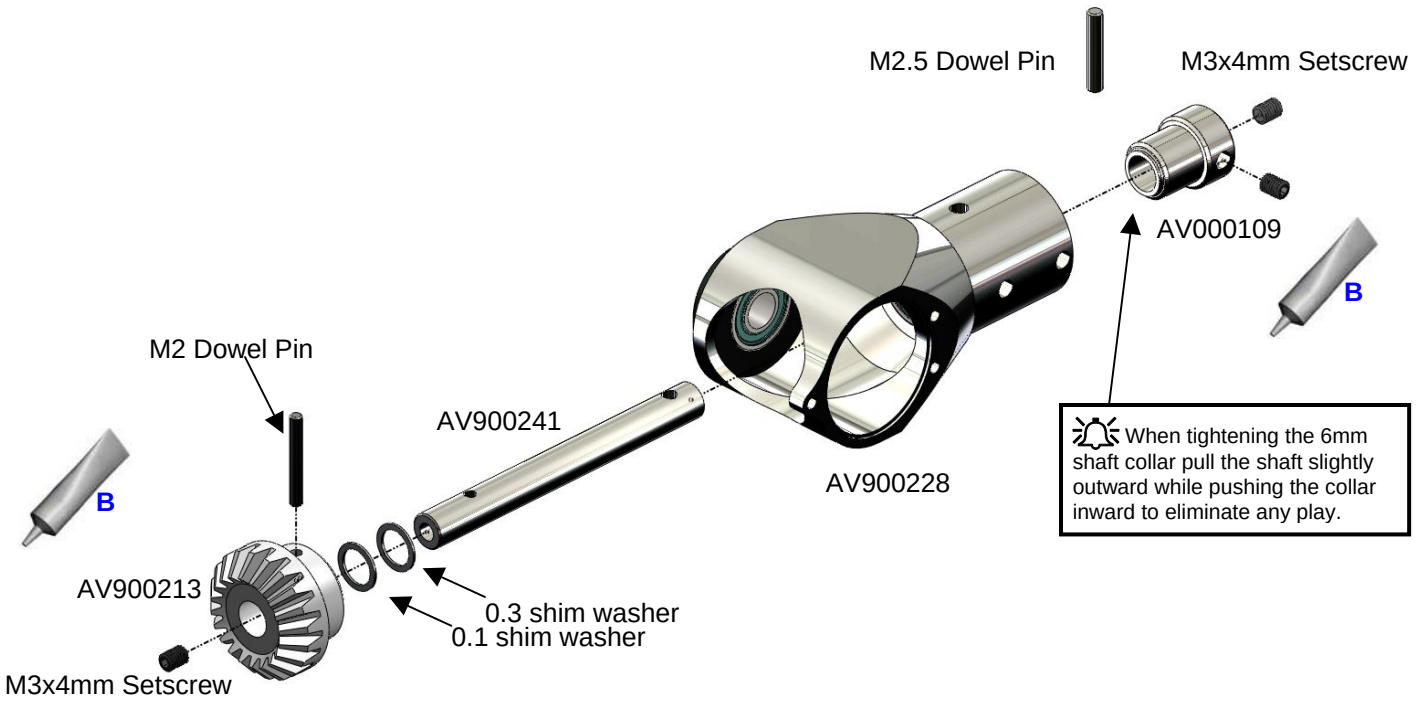
Once you do that your bearing will sit nice and tight on that bed of CA and will allow you to make adjustments by rotating the tube to check for misalignment. After it's aligned put a final drop of CA making it wick in between the bearing inner race and the TT and let it cure.

If you want to make it extra secure you can also use the torque tube connector as a guide for a small drill bit and drill a small notch on the torque tube to help secure the setscrew onto the tube.

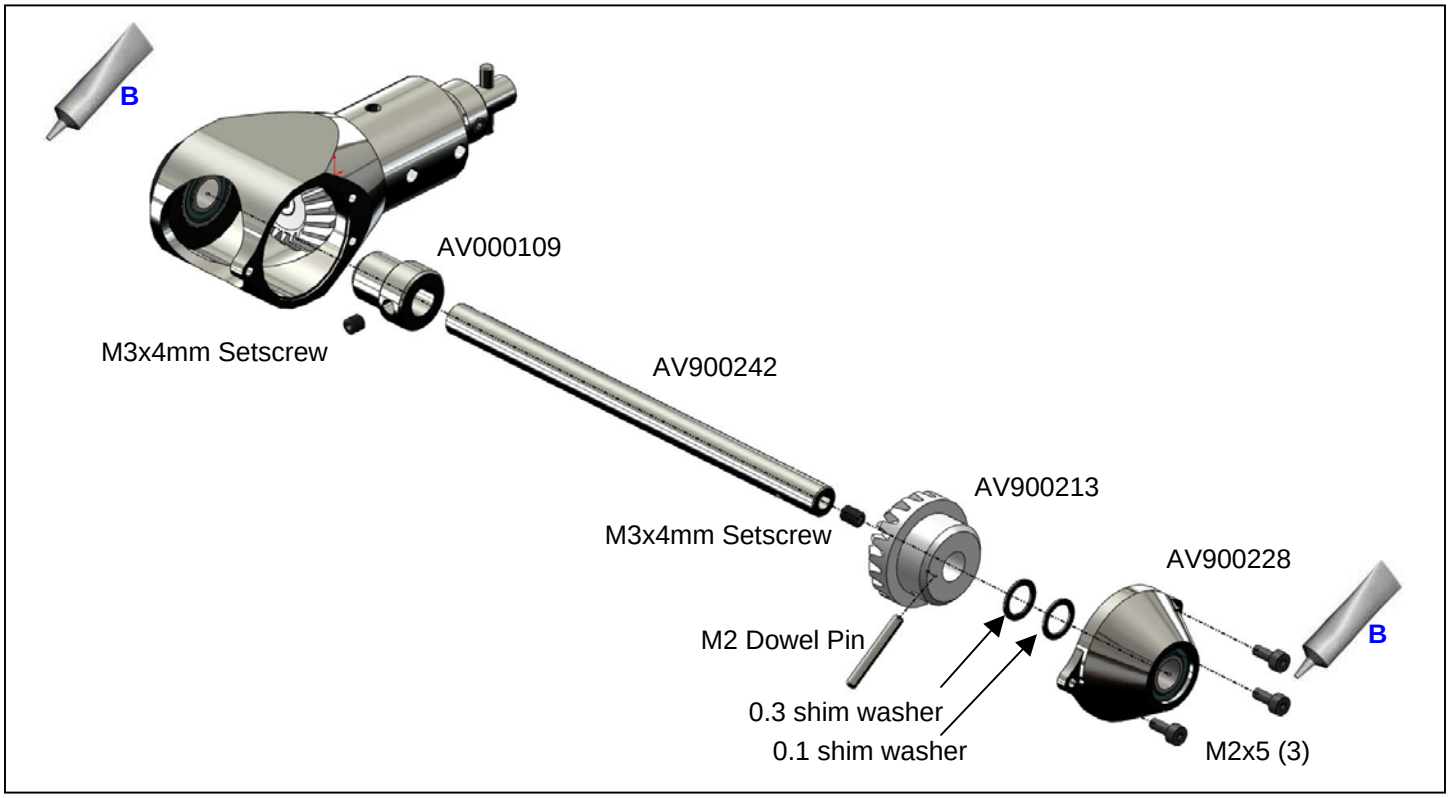
Note: Unless indicated otherwise all screws, balls and threads are installed with Blue Loctite

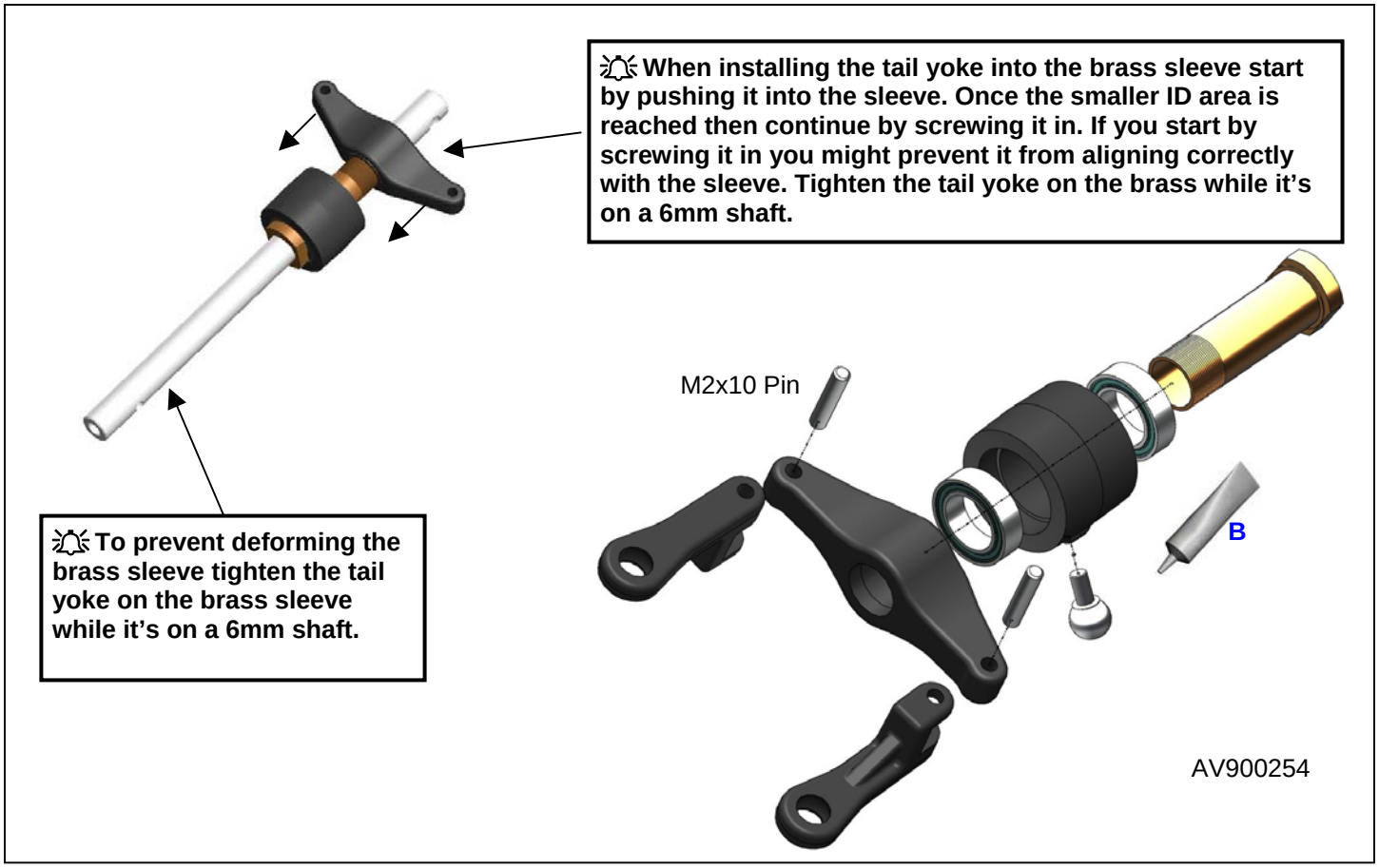


Insert the m3x5mm setscrews and tighten them only until the head is flush with the connector's outside surface. Apply thin CA between the tube and the connector after the setscrews are tightened. If you want to make it extra secure you can also use the torque tube connector's setscrew holes as a guide for a small drill bit and drill a small notch on the torque tube to help secure the setscrew onto the tube..



Note: Unless indicated otherwise all screws, balls and threads are installed with Blue Loctite

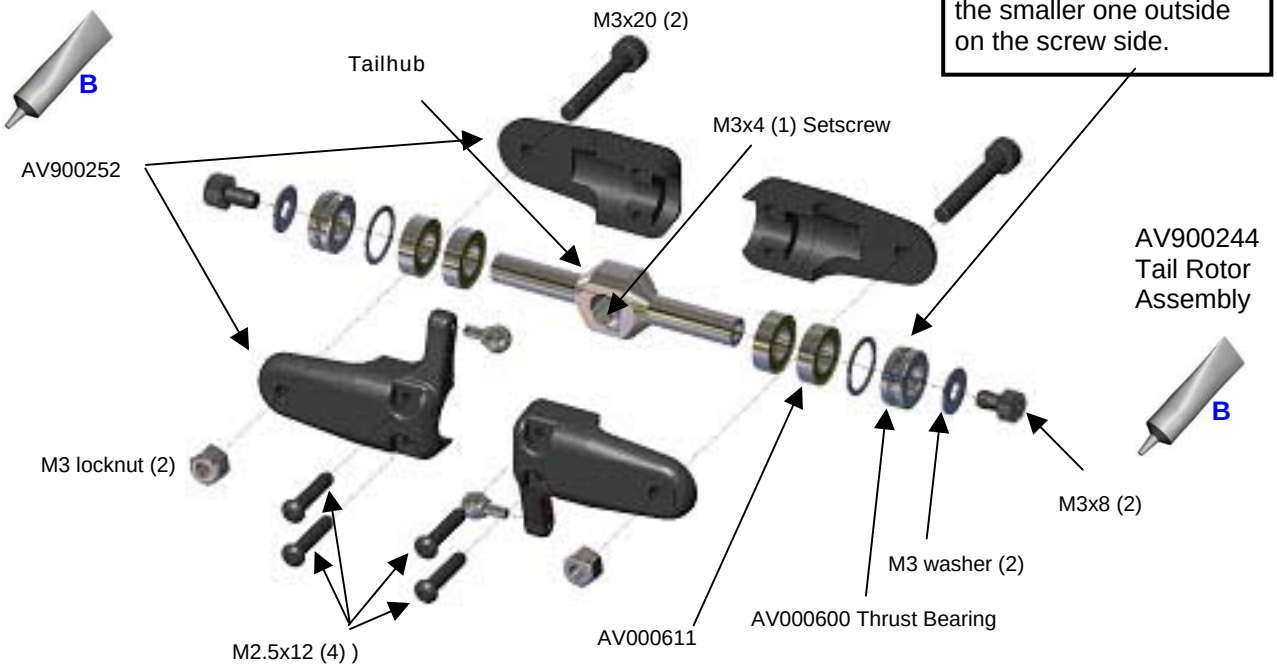


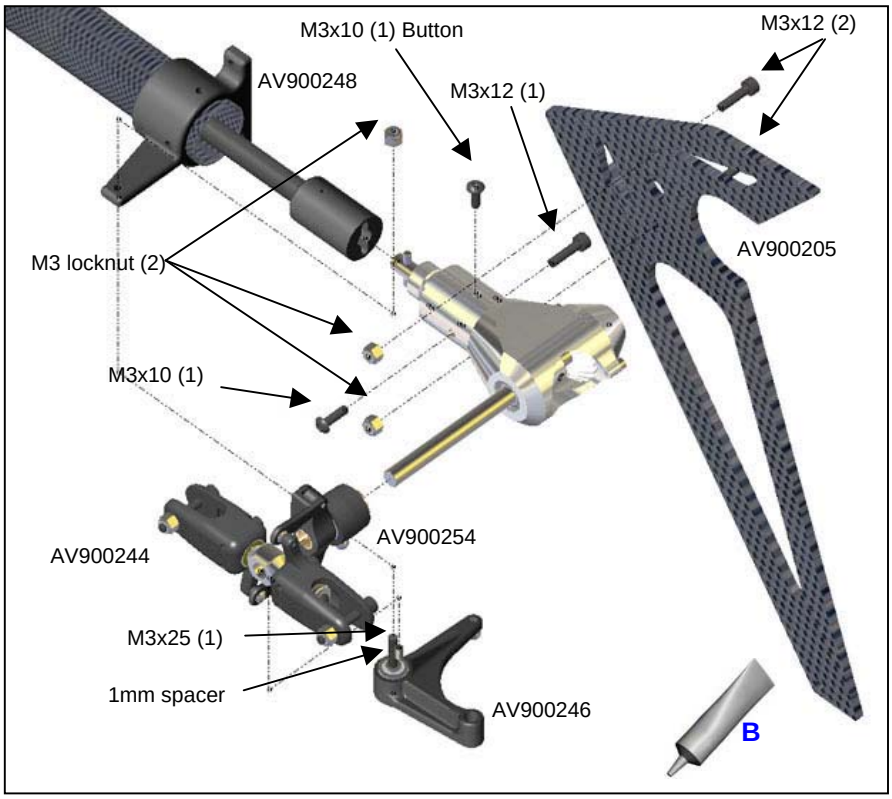


Note: Unless indicated otherwise all screws, balls and threads are installed with Blue Loctite

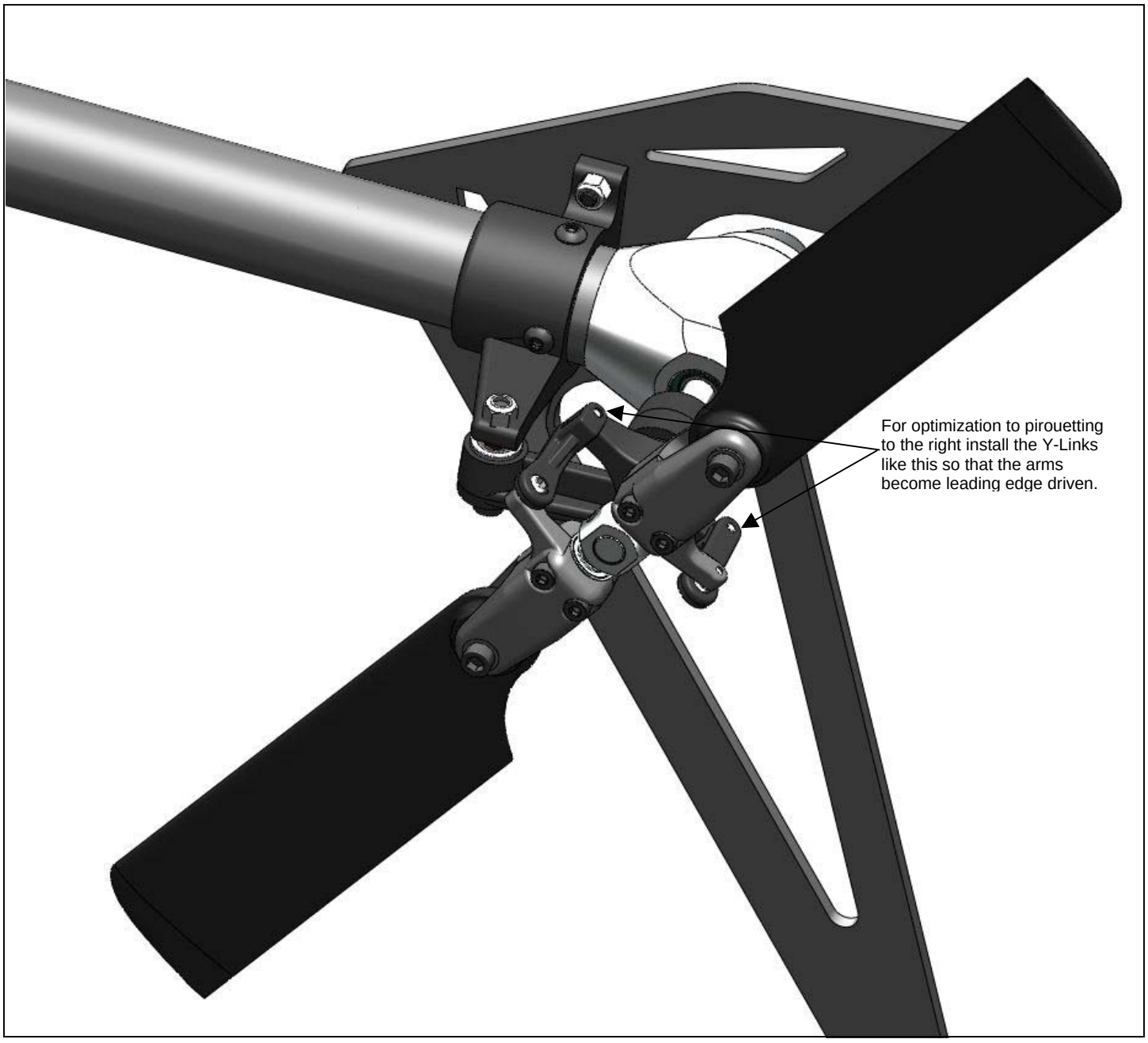
The Tailgrips are designed with an amount of pre-loading for the bearings. This eliminates any play between the bearing and the bladegrip. When tightening the 2.5mm button head screws make sure you keep the grip halves pressed against each other. At the end of the tightening make sure you don't strip the plastic threads by tightening the screws too hard.

The thrust bearings have two different inner diameter race holes. Use the larger one inside and the smaller one outside on the screw side.





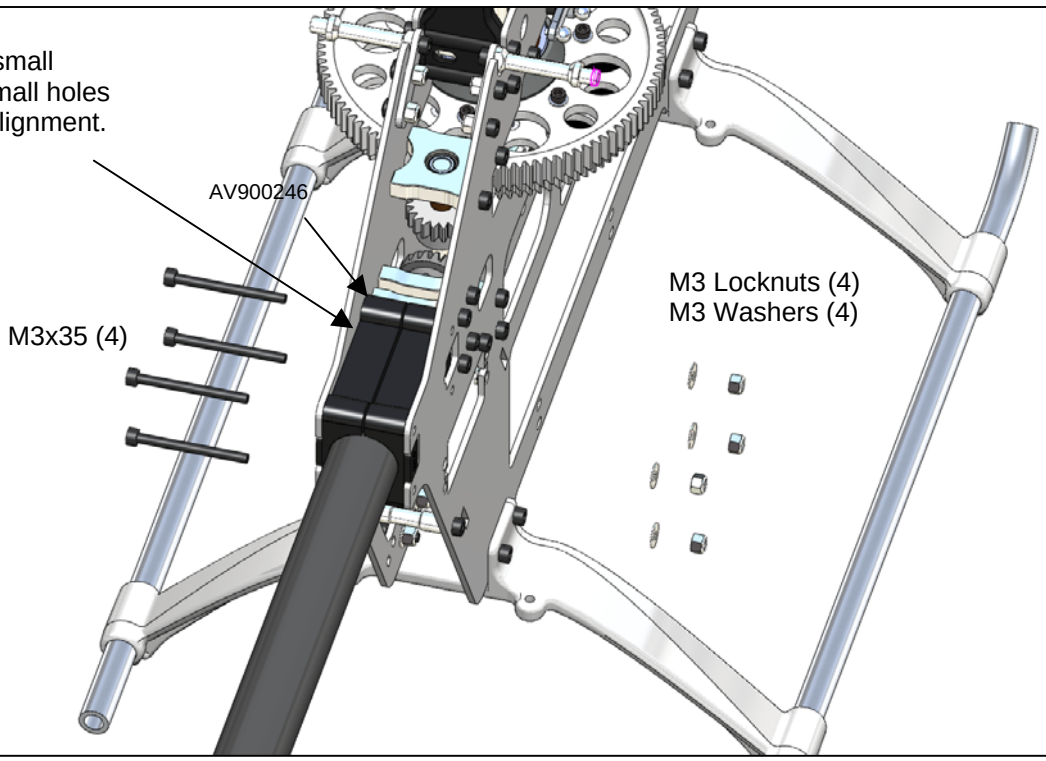
Note: Unless indicated otherwise all screws, balls and threads are installed with Blue Loctite



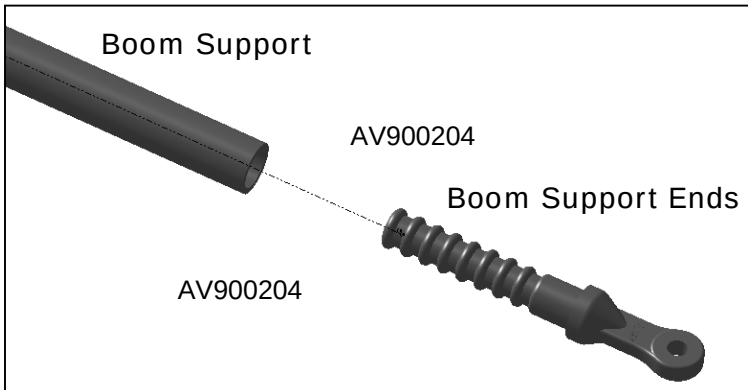
Note for pilots the pirouette mostly to the right.

When installing Y-Links you can optimize the response to right pirouetting by installing the Y-Links as shown on the picture above. To install it simply flip the Y-Link installation on the tail yoke. This will force the configuration to a leading edge arm.

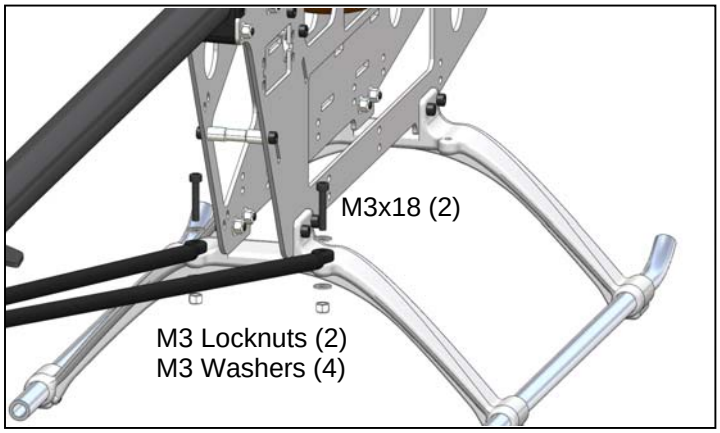
Note: The boomclamp has small plastic spigots that fit into small holes at the end of the boom for alignment.

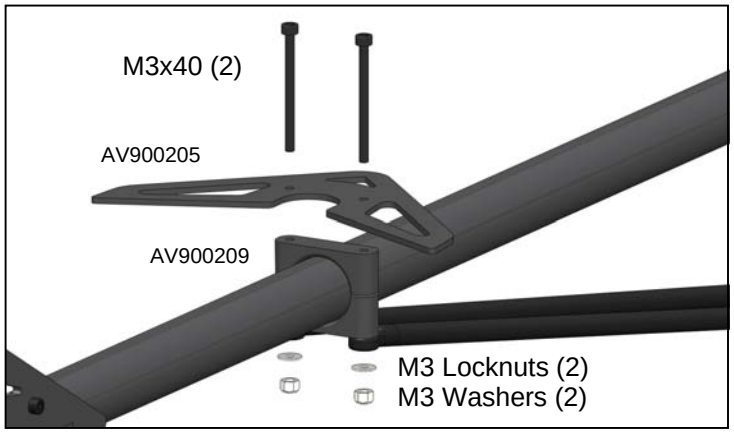


Bag # 8



Clean the inside thoroughly with alcohol or acetone and use **JB Weld or epoxy of at least 30-minute** duration and let it cure before use. Make sure both ends are aligned with the flat faces parallel to each other

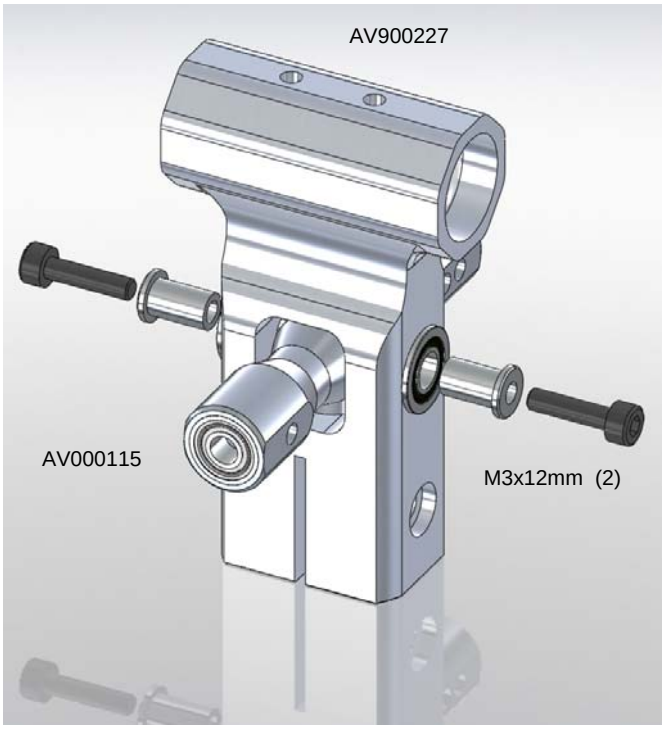




Note: Unless indicated otherwise all screws, balls and threads are installed with Blue Loctite

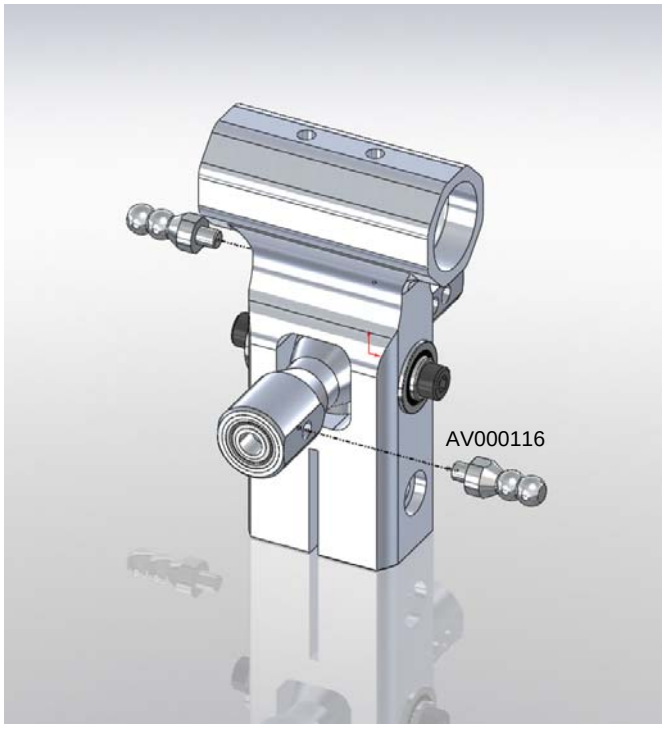
Bag #9: Head assembly

Head Step 1)



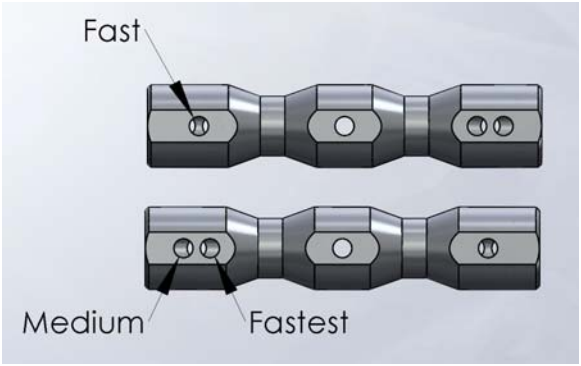
Install the flybar carrier inside the yoke with the spacers and 12mm M3 screws, read below first.

IMPORTANT Note:
Prepare both M3 bolts by cleaning them with rubbing alcohol. Apply a drop of **red Loctite** to a toothpick and insert in center holes of flybar carrier. This will be easiest to do before inserting flybar carrier into the yoke.



Head Step 2) Install the flybar double balls using RED LOCTITE.

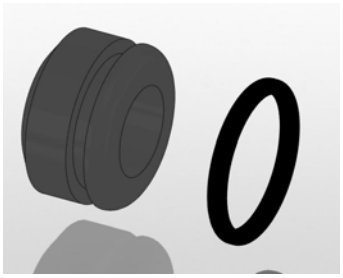
Center hole position is a good overall setting. Rotated flybar and using the hole closer to the yoke makes it faster (Less flybar ratio). Outer hole location makes it more stable (Higher flybar ratio as shown here).



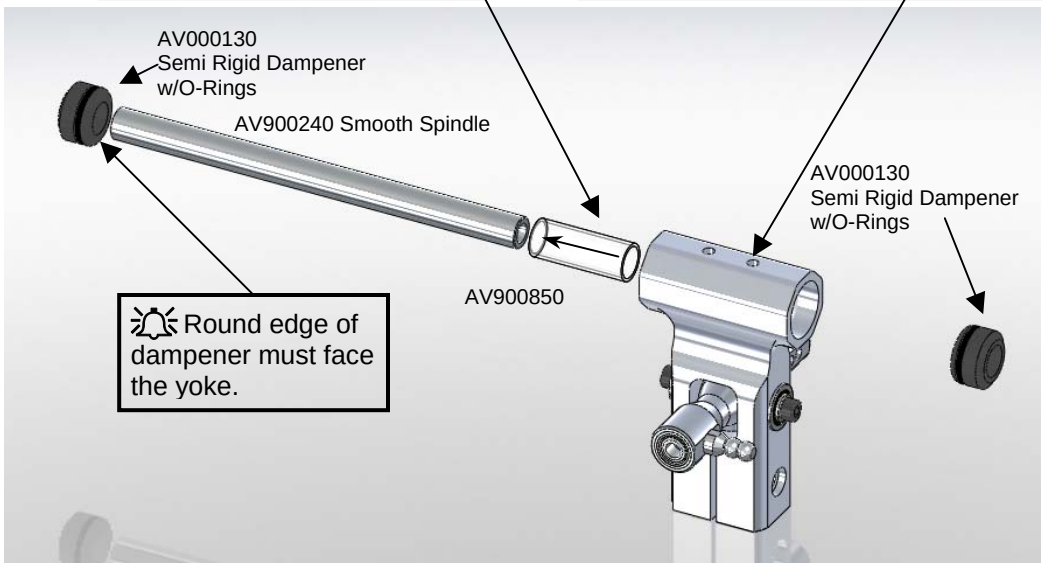
There are three Flybar Carrier Speed settings. Two of them in one side and one on the other side. Make sure the correct side faces the double ball before installing the Flybar Carrier. **Fast (middle single hole) is the default setting**.

Note: Unless indicated otherwise all screws, balls and threads are installed with Blue Loctite

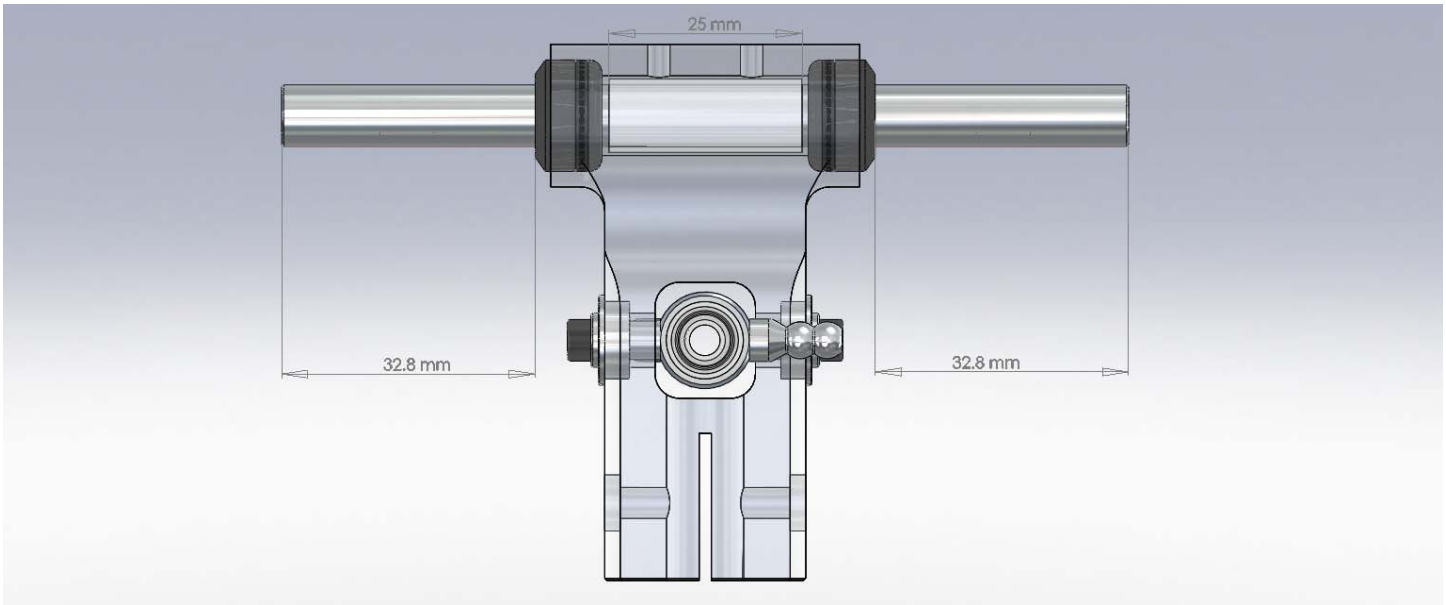
Head Step 3)



Insert the thin O-Ring in the dampener slot



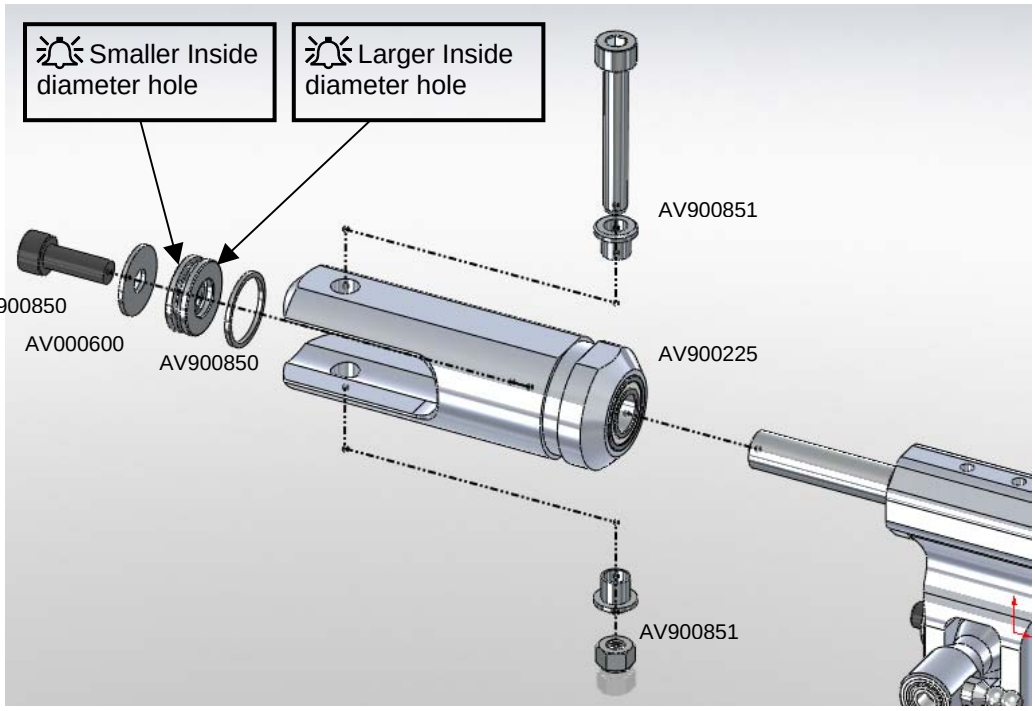
Slide the tubing up to the middle of the spindle, long needle nose pliers work well for this. Applying a very thin coat of liquid soapy water to the head spindle will also make it slide on easier into the yoke. Complete one side of the Rigid Dampener and Thin O-Ring installation, then insert head spindle through one end of head yoke. Use soapy water by dissolving some dishwasher soap into some water and wet the center dampener tube and the inside of the yoke and then insert the spindle with the dampening tube already installed in the center of it. Insert the other Rigid Dampener and Thin O-Ring on the other side.



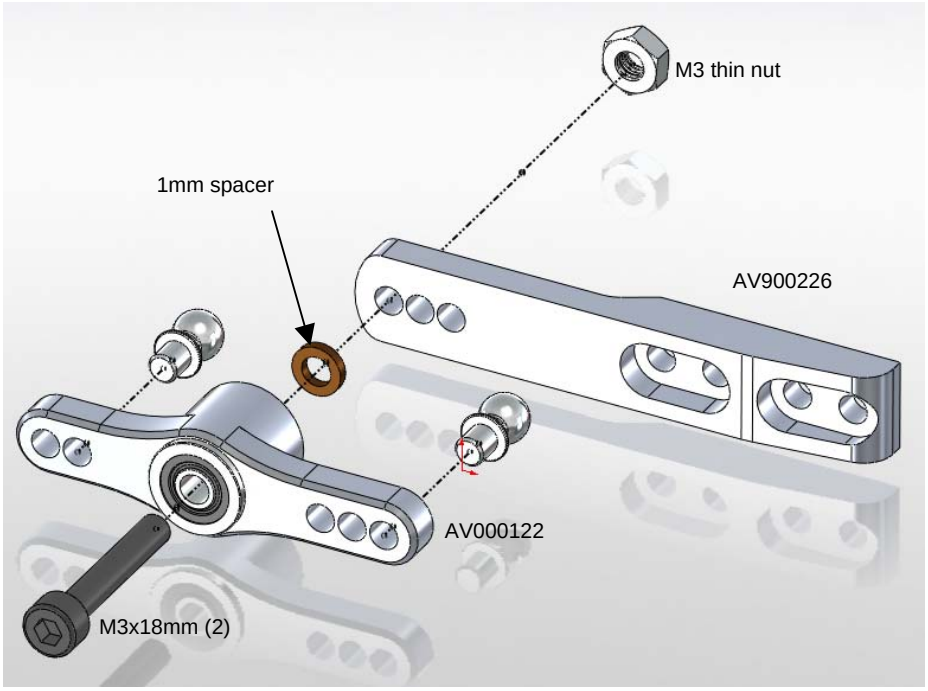
View of components installed inside. Notice that the center tube must be cut to 25mm max in length and the spindle end faces are equally at 32.8mm from the

Note: Unless indicated otherwise all screws, balls and threads are installed with Blue Loctite

Head Step 4)



Important note:
Grease both thrust bearing races and center before installation.
Install the provided 16x1x10 bearing “spacer” first.
Examine the supplied thrust bearing, one of the outer races will have a loose fit on the spindle and that will need to be installed first with the ball race facing out. Next you will need to insert the center part with cup side facing in. Finally you will insert the outer race which has a tighter fit on spindle with the ball race facing in.

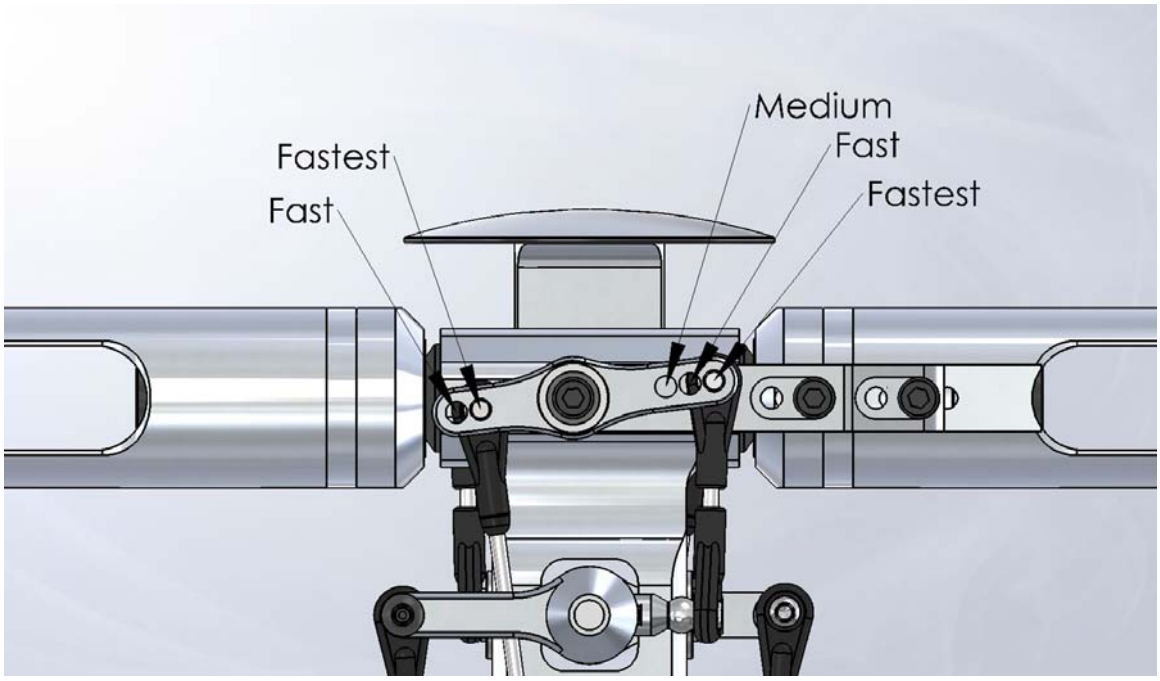


Use two M3 balls per mixing arm. Use **red Loctite** here on all threads and the nut.

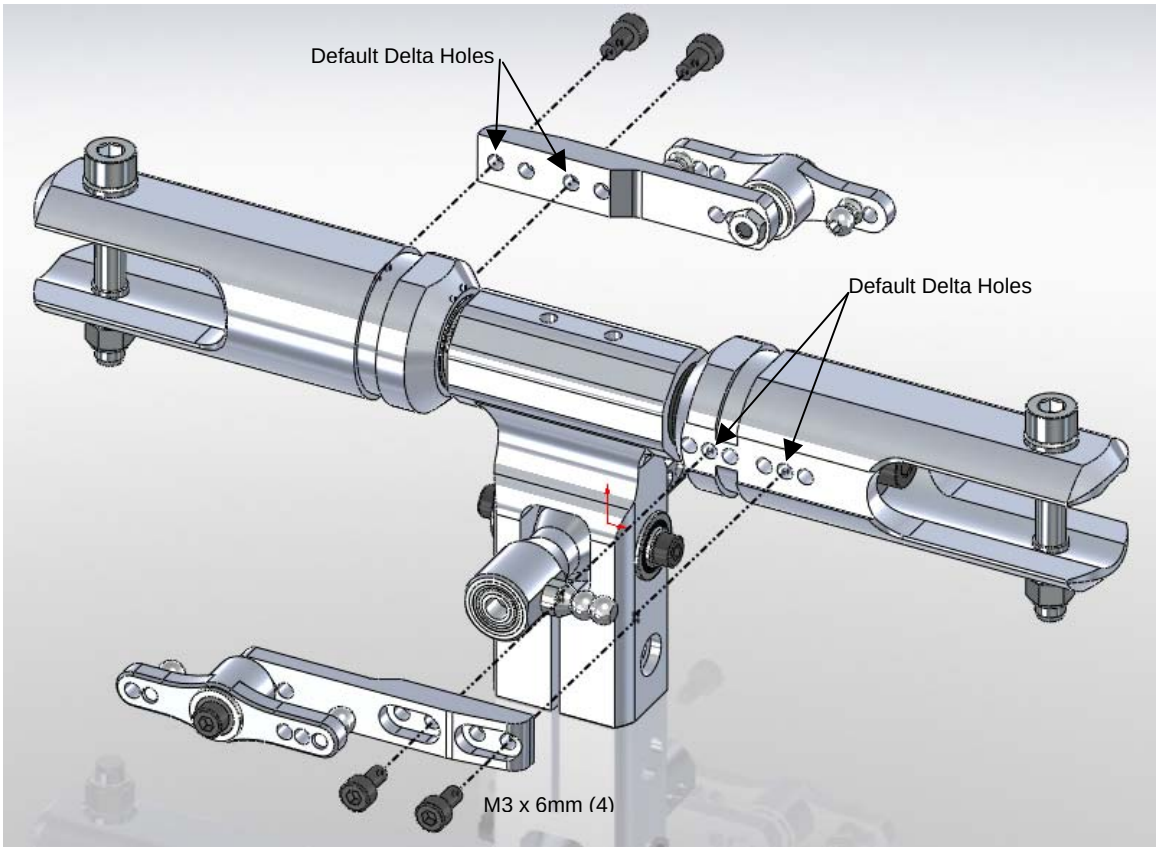
Left ball closer to the center makes it faster (more swashplate to blades input).

Right ball closer to the right makes it also faster (less flybar stabilization).

Note: Unless indicated otherwise all screws, balls and threads are installed with Blue Loctite

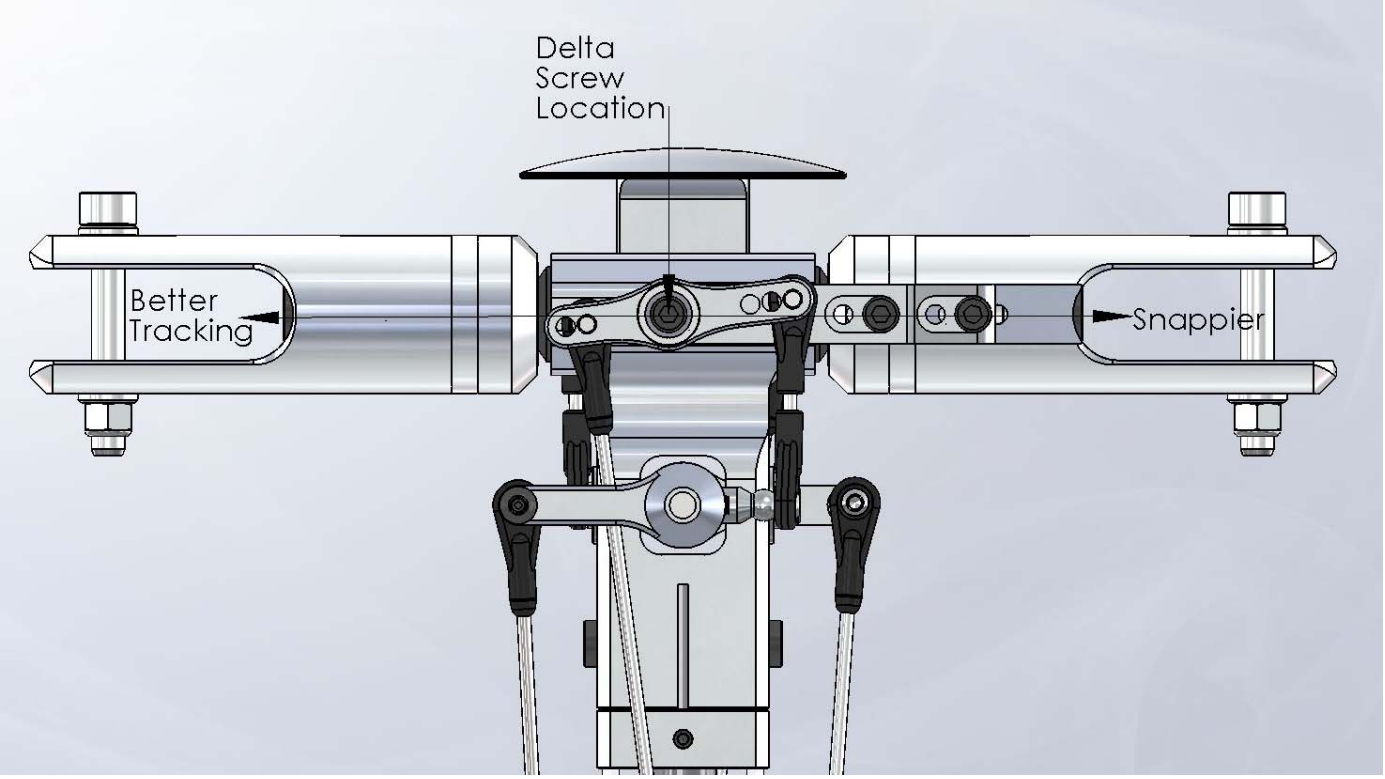


Mixing Arm head speed settings.

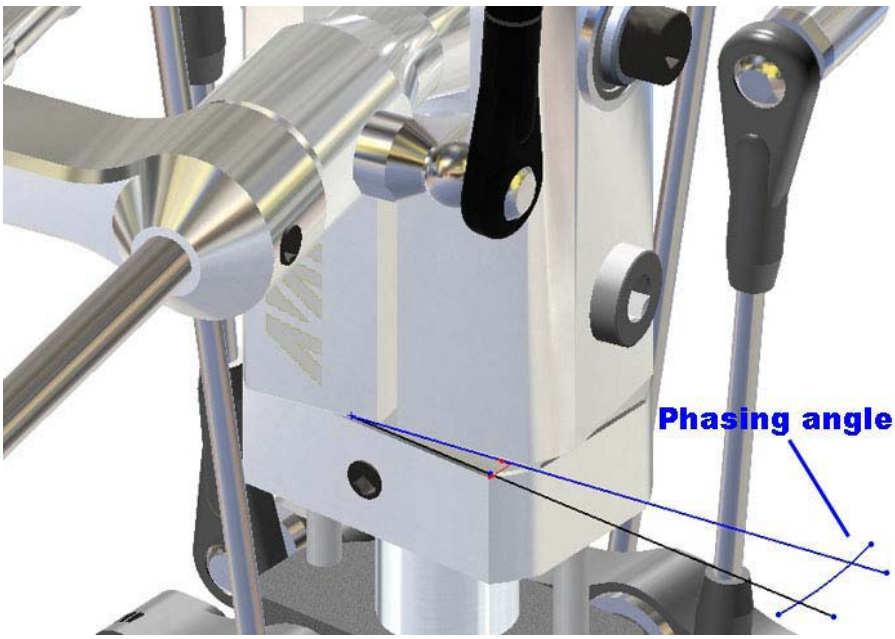


Use four M3 x 6mm bolts. Use red Loctite here on all four bolt threads.
The indicated Delta holes are set to make the faster head setting track better.

Note: Unless indicated otherwise all screws, balls and threads are installed with Blue Loctite



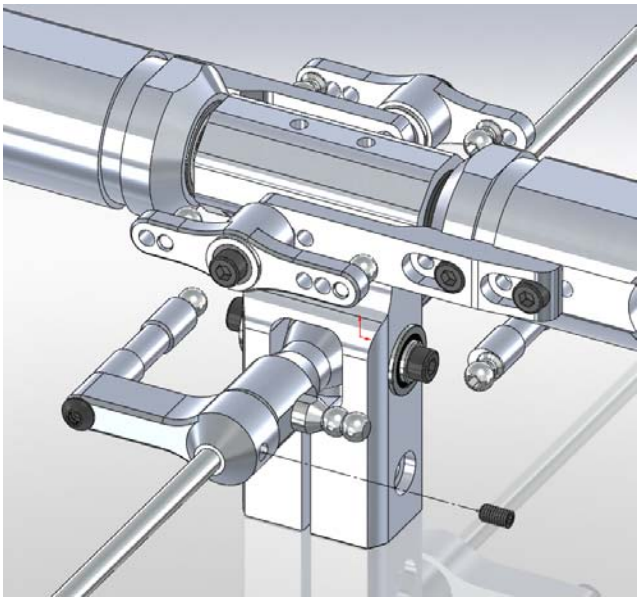
Delta is set by the position of the mixing arm center screw. Closer to the blade grip is snappier and opposite to it tracks better. Below is a more extensive explanation of delta, mixing arm and flybar arm settings for those interested. The default delta position used is position 3



In the programmable you can also adjust the phasing to match your blades lead-lag angle caused by aft or forward Blade CGs and eliminate any tail corkscrewing during rolls. If you need to correct you can start with about 1 degree and build up from there.

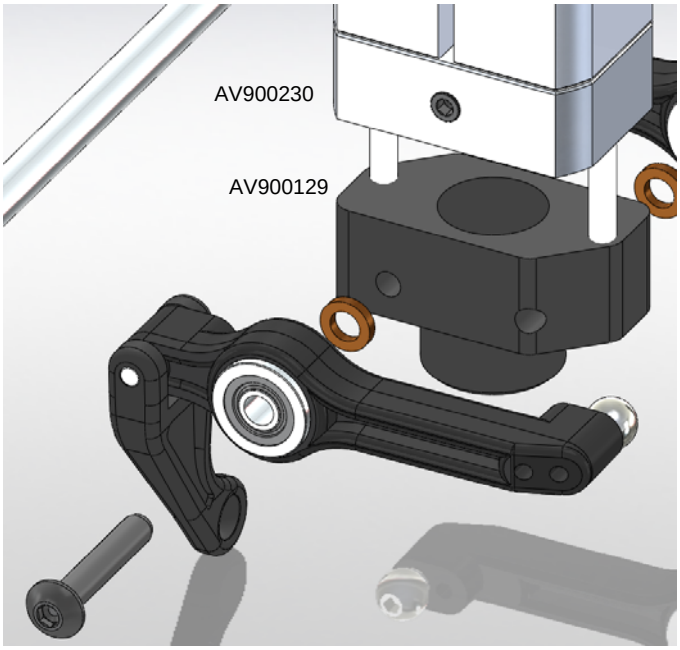
Note: Unless indicated otherwise all screws, balls and threads are installed with Blue Loctite

Install the 555mm flybar and secure with two M4 flat point setscrews. Use **blue Loctite** here.

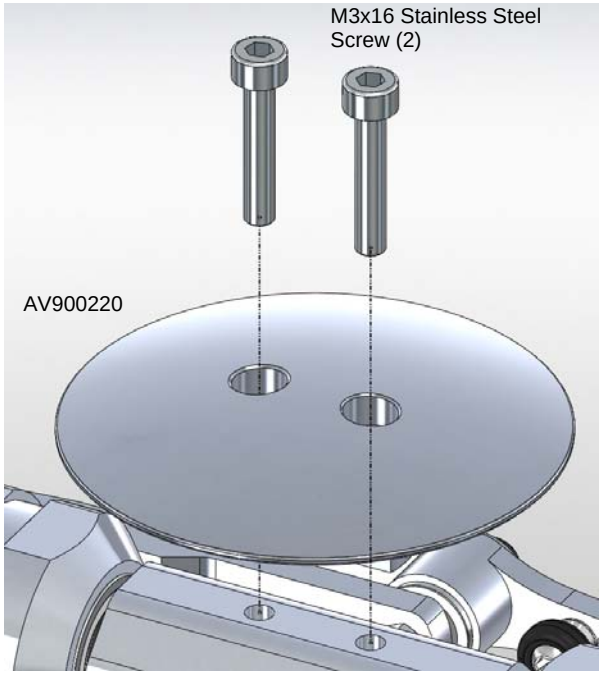


Assemble the washout arm as shown here. Clean any excess plastic flash with an X-Acto knife and make sure the Y-Link rotates easily around the pin.

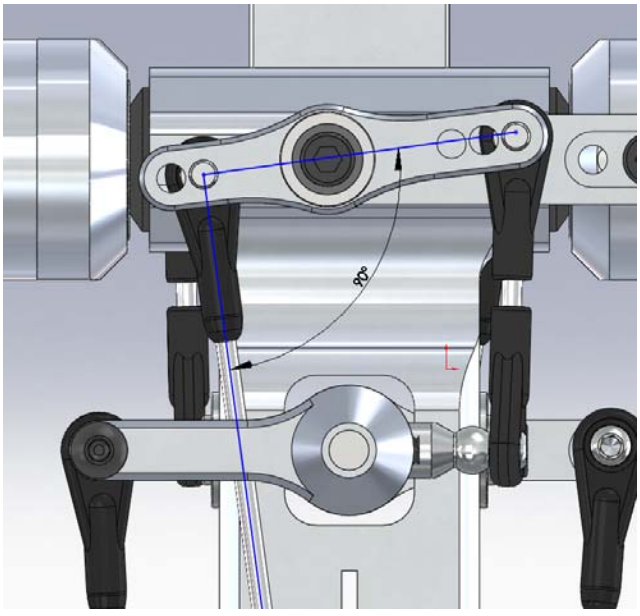
Note: Unless indicated otherwise all screws, balls and threads are installed with Blue Loctite



Use the 1mm spacer to install the washout arms. Use **blue Loctite** here. **Do not tighten the washout arm screws too much otherwise the washout base will bind against the shaft**. It's designed that way so you can tighten it as the washout base wears out with use.

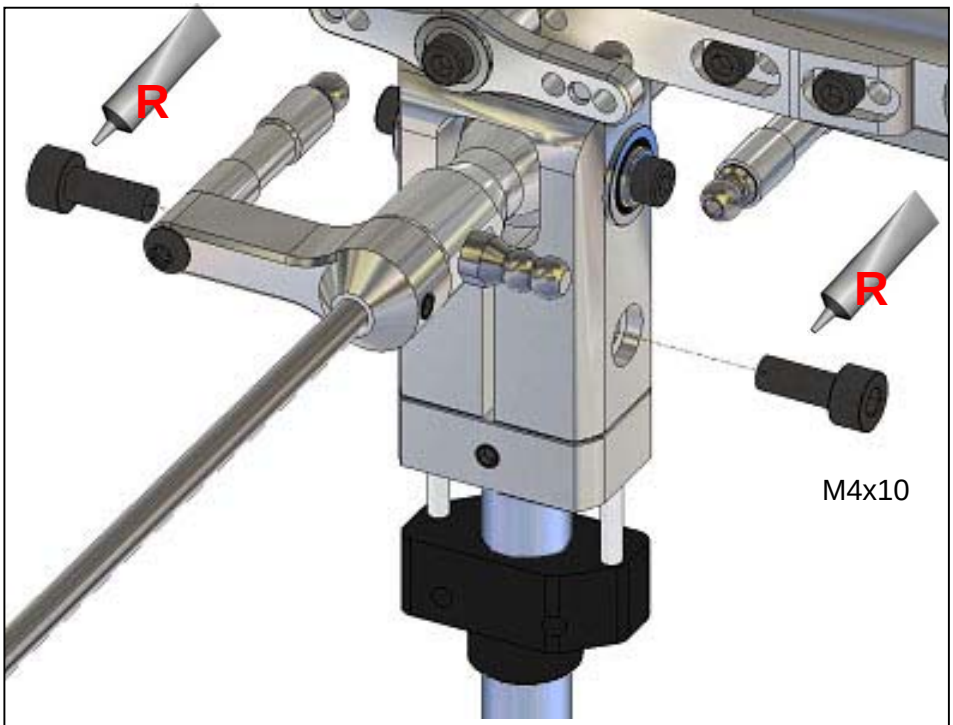


Install the head button with the Stainless steel screws.
Use **blue Loctite** here.



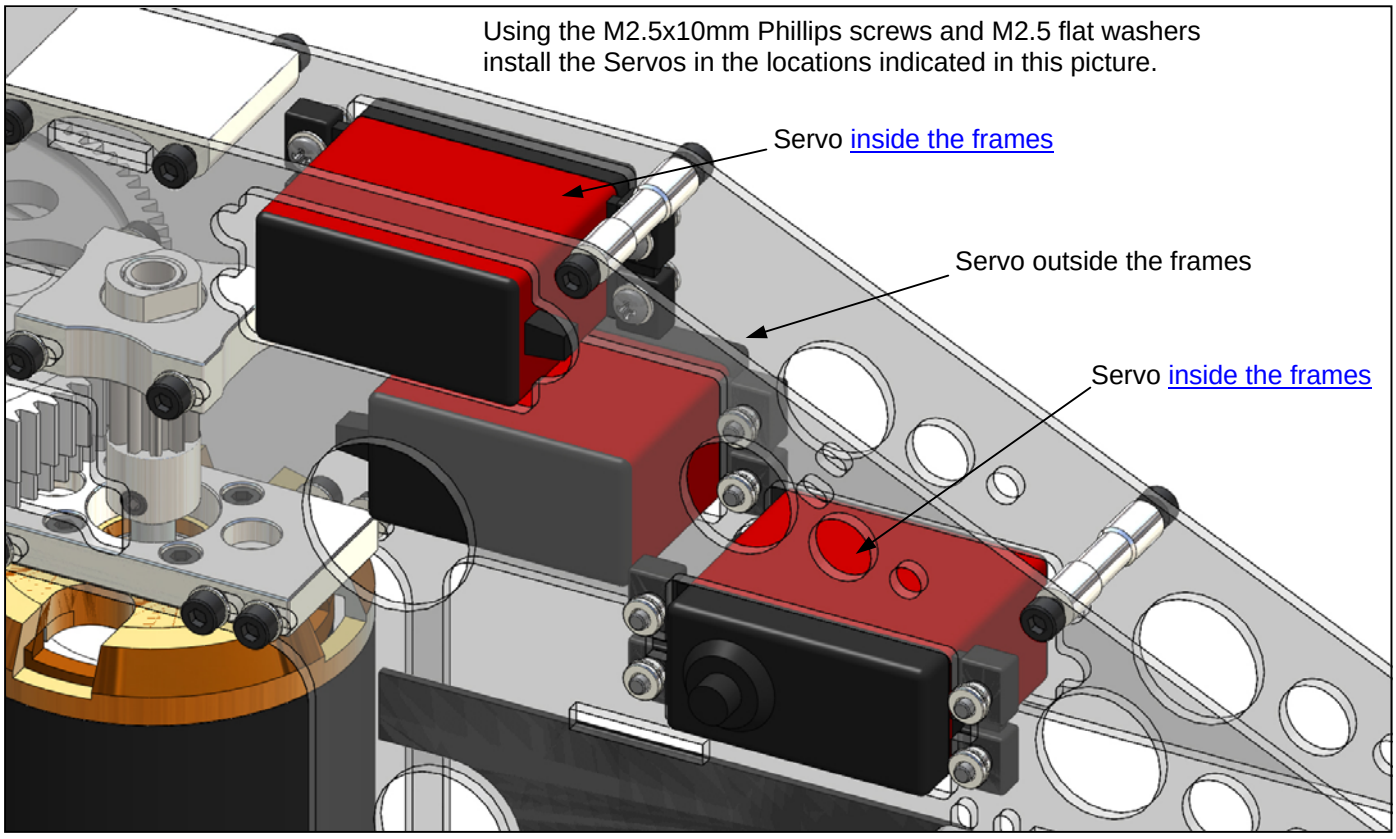
Install the 16mm threaded rod and **short ball links.** Make sure to align the rod and the mixing arm at 90 degrees when the swashplate is level and blades are at zero degrees or you will end up having more negative pitch than positive pitch. It will also cause the rod to appear too short.

Note: Unless indicated otherwise all screws, balls and threads are installed with Blue Loctite

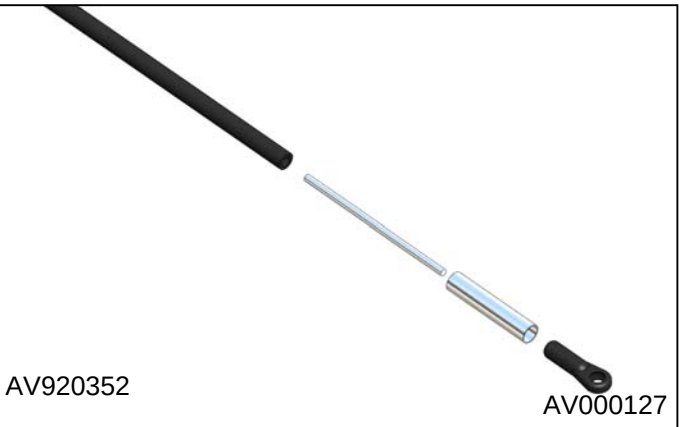


Install two M4 screws onto the Main shaft.

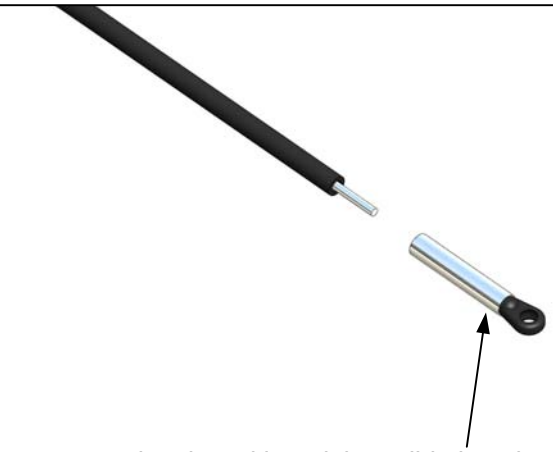
Bag #10



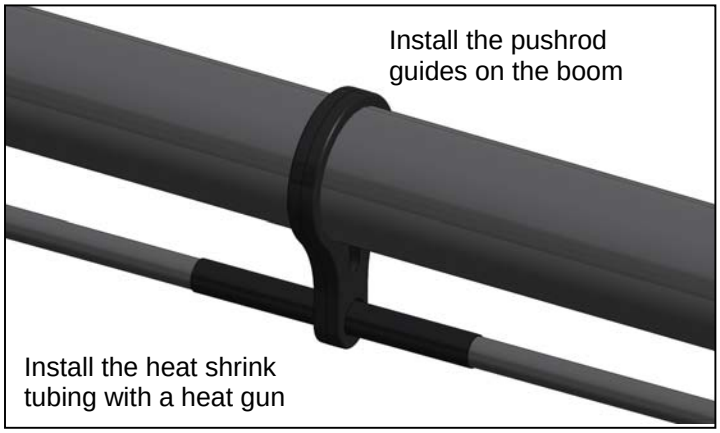
Note: Unless indicated otherwise all screws, balls and threads are installed with Blue Loctite

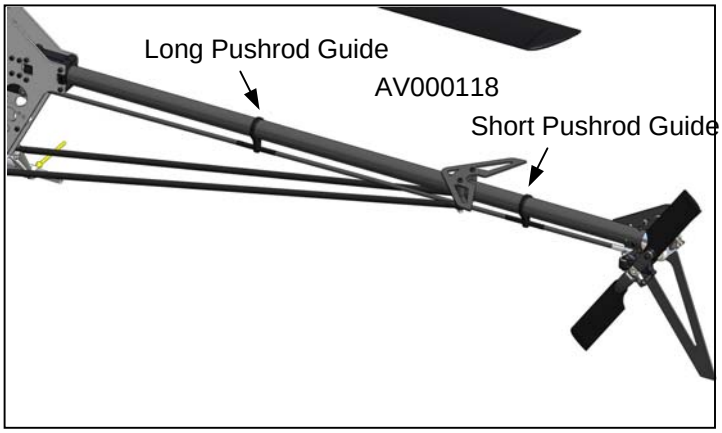


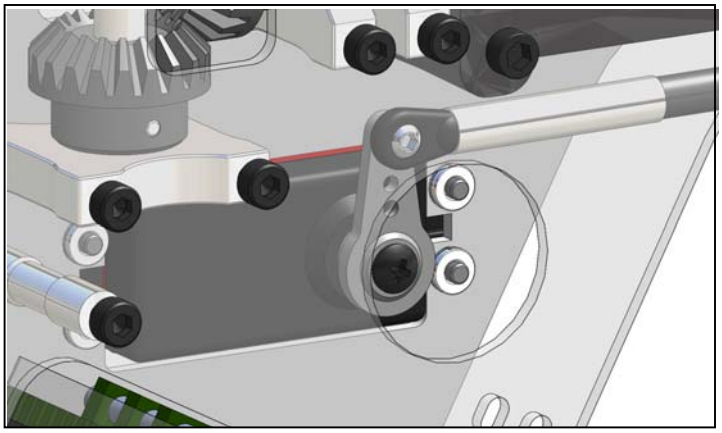
Thread the thick ball link into the 50mm threaded rod and use it to glue the threaded rod into the carbon rod with 30-minute. Epoxy or JB Weld.



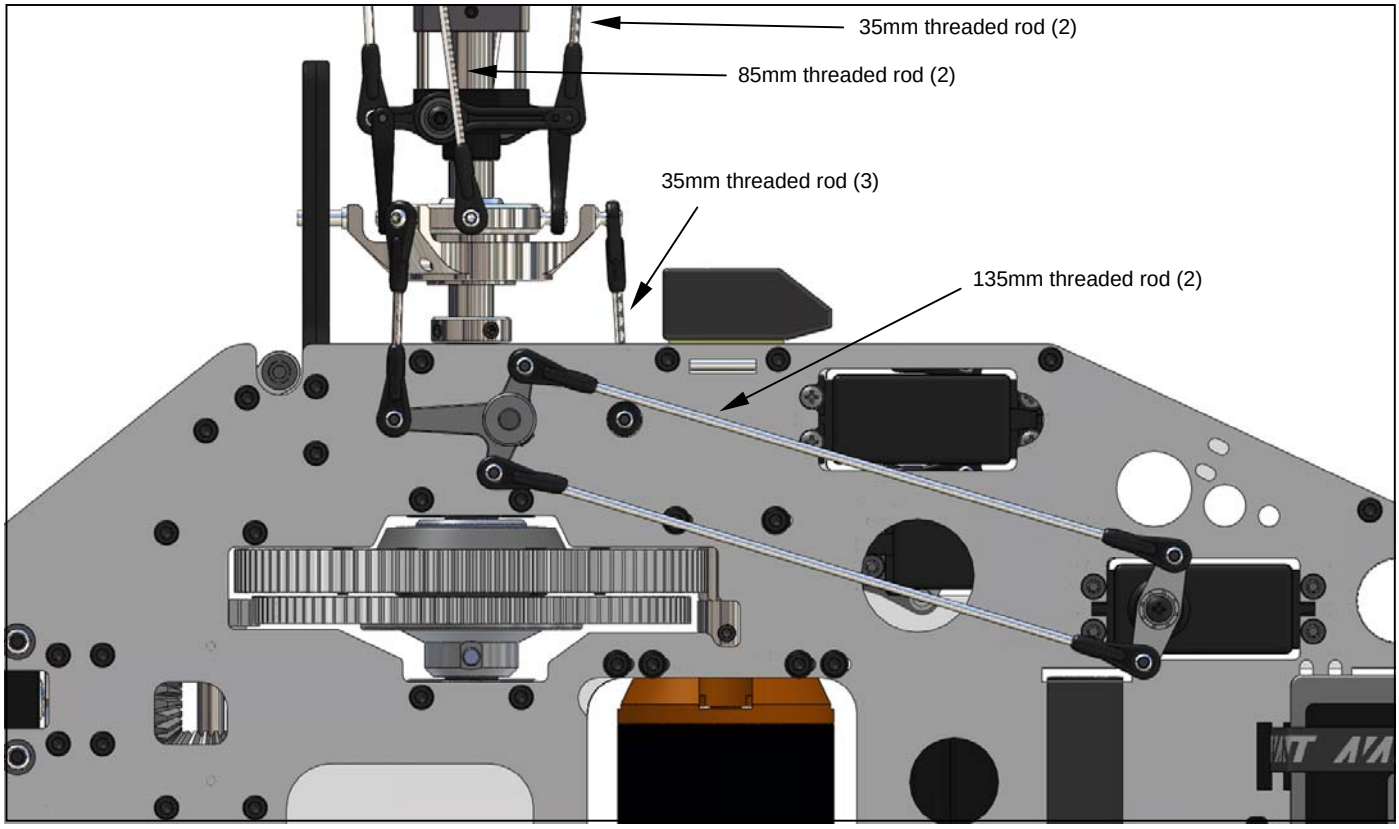
Once cured unthread it and then slide into the sleeve using pliers holding the ball link by the flat areas. Once slid into the sleeve thread it again into the pushrod. This method allows for a tight fit that prevents vibration without the need to glue the sleeve.

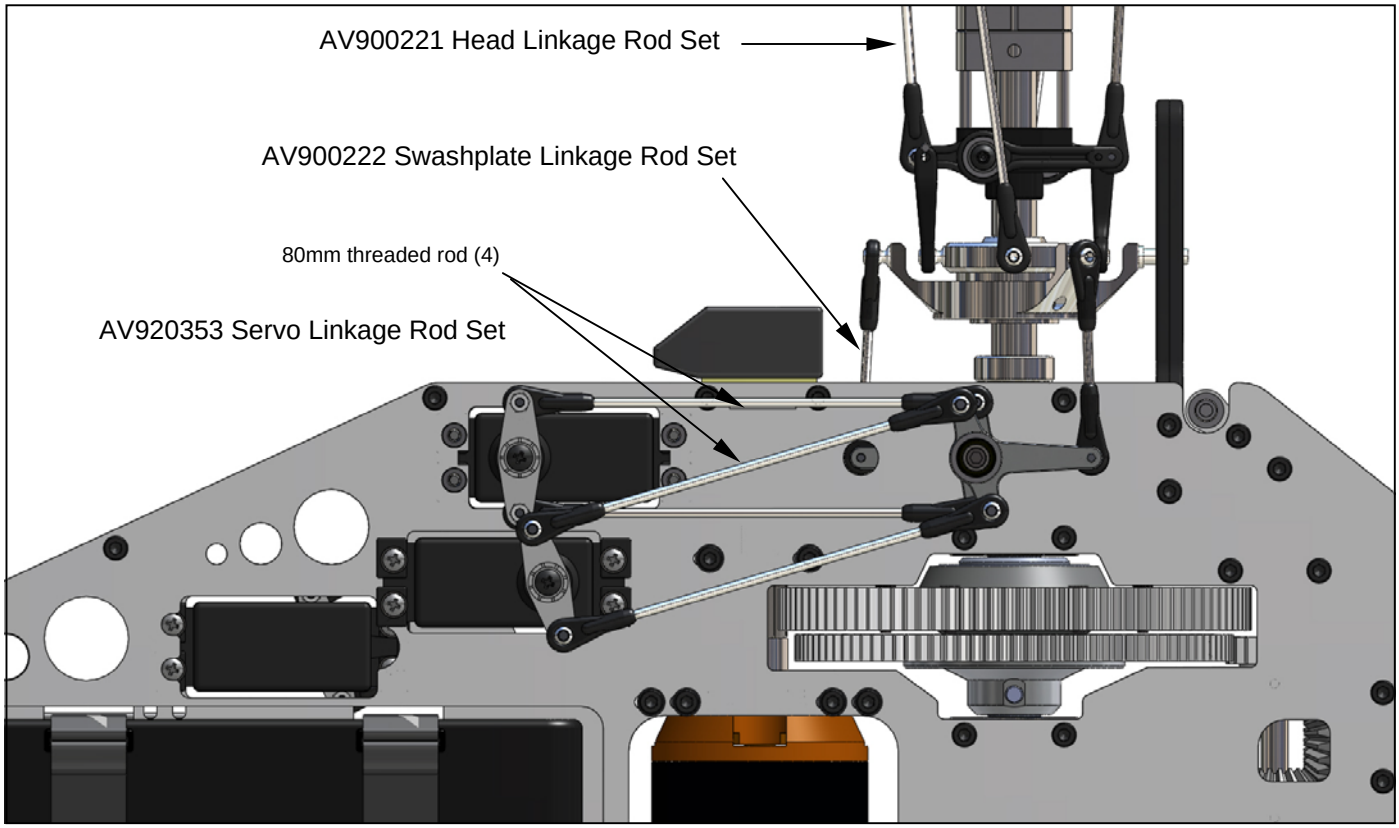




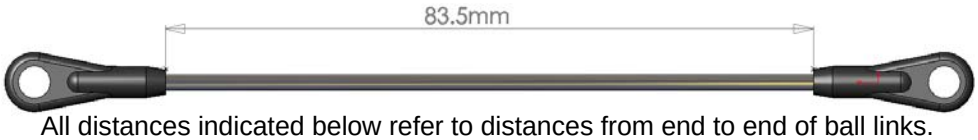


Note: Unless indicated otherwise all screws, balls and threads are installed with Blue Loctite

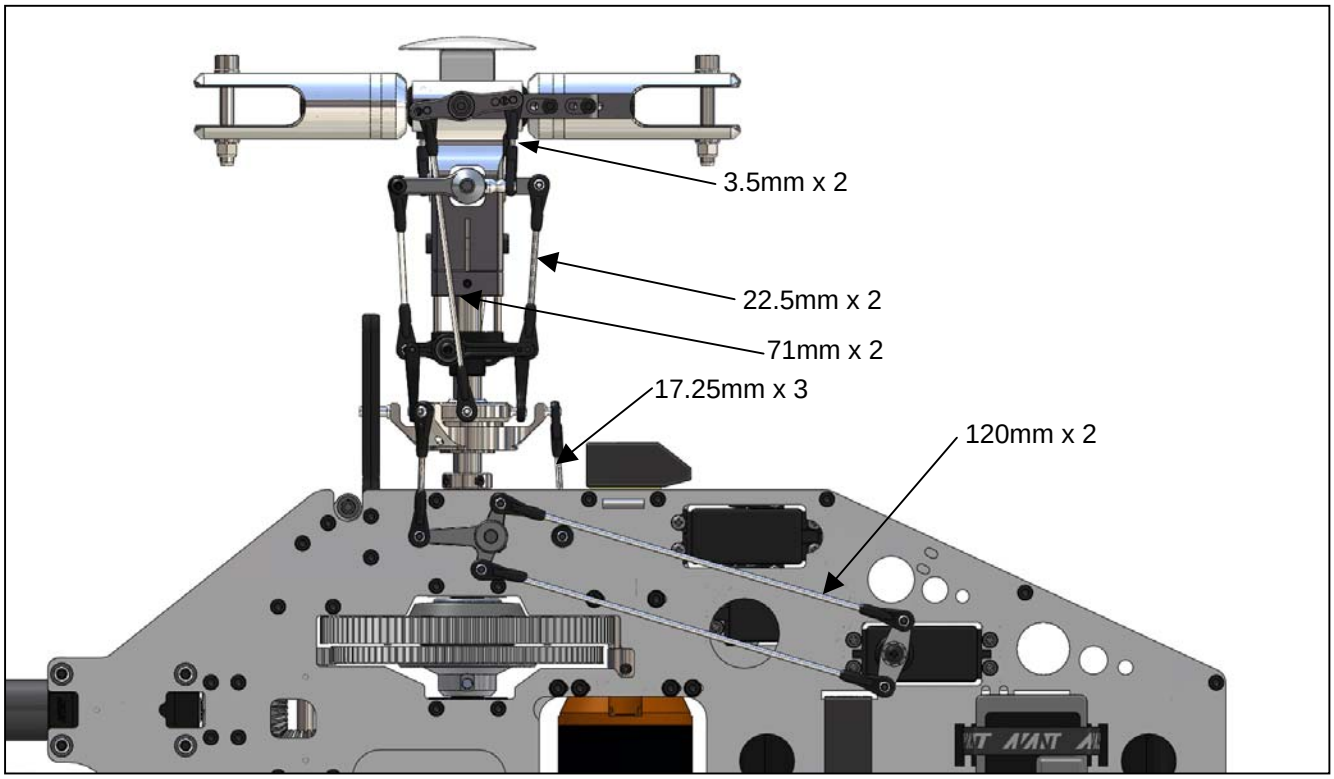




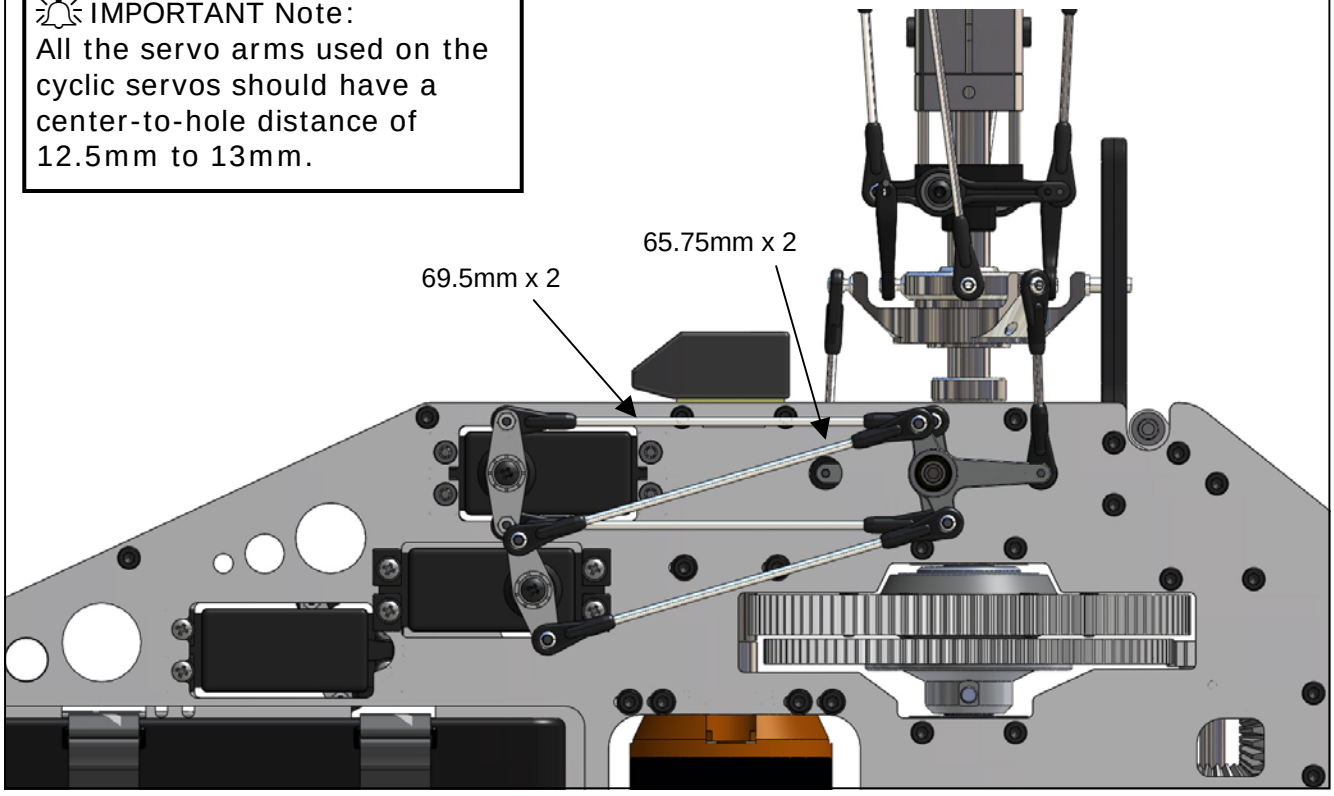
Note: Unless indicated otherwise all screws, balls and threads are installed with Blue Loctite



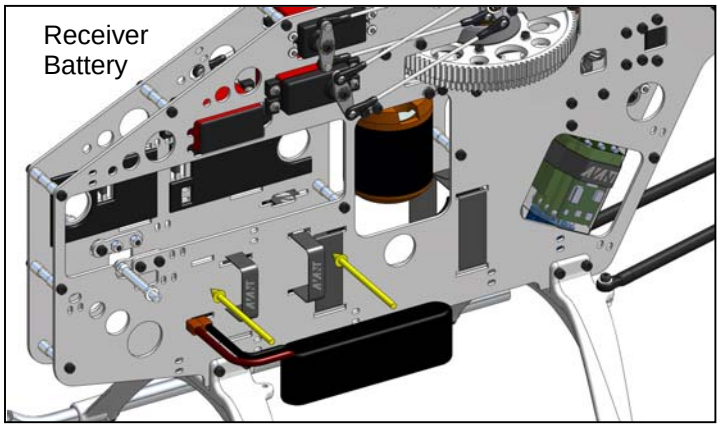
All distances indicated below refer to distances from end to end of ball links.
Different servo brands will cause distances to differ from the ones listed below.

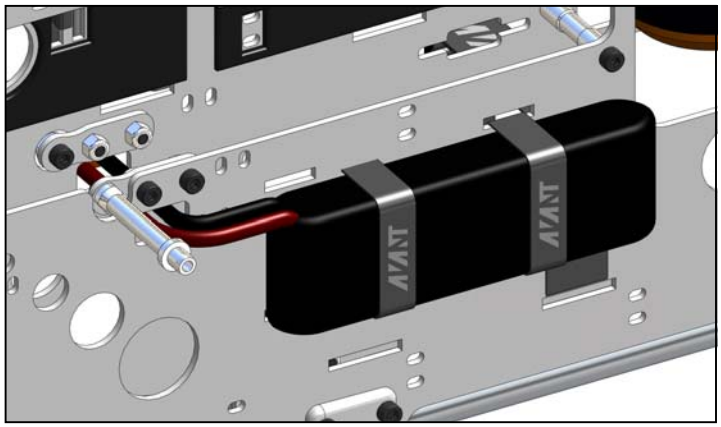


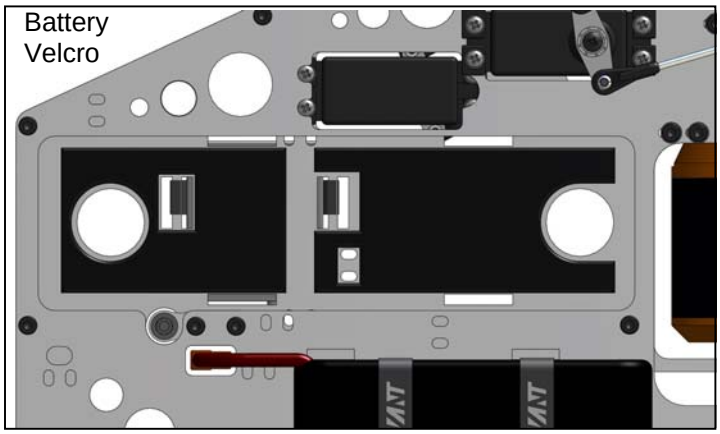
IMPORTANT Note:
All the servo arms used on the cyclic servos should have a center-to-hole distance of 12.5mm to 13mm.

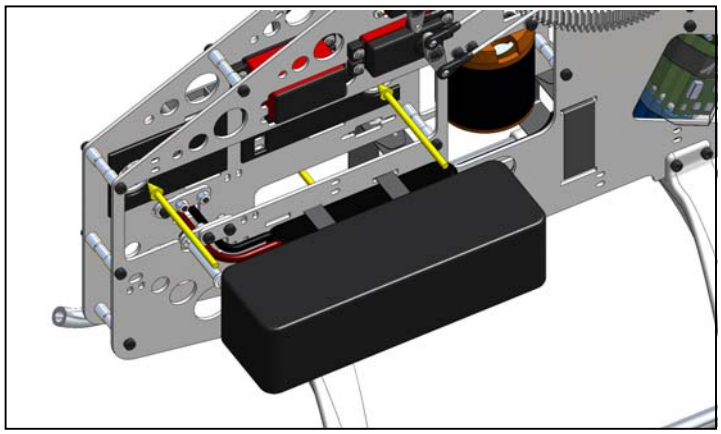


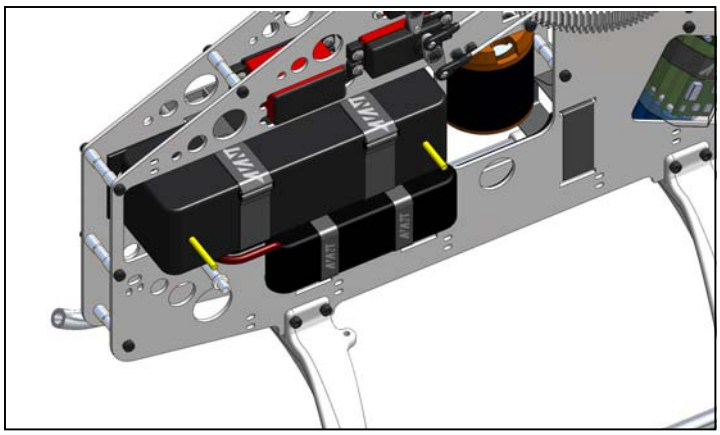
Note: Unless indicated otherwise all screws, balls and threads are installed with Blue Loctite

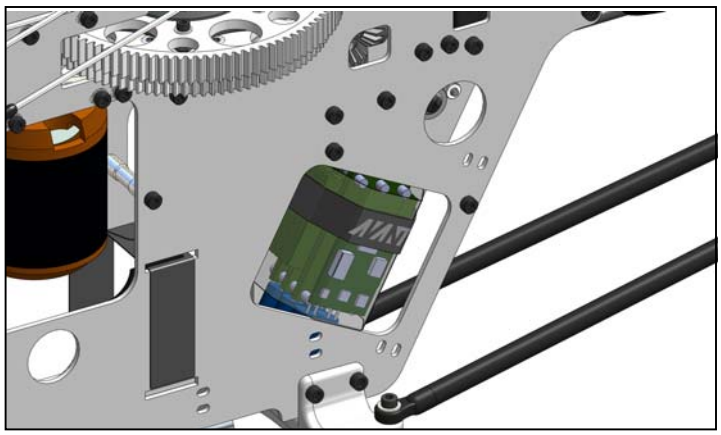


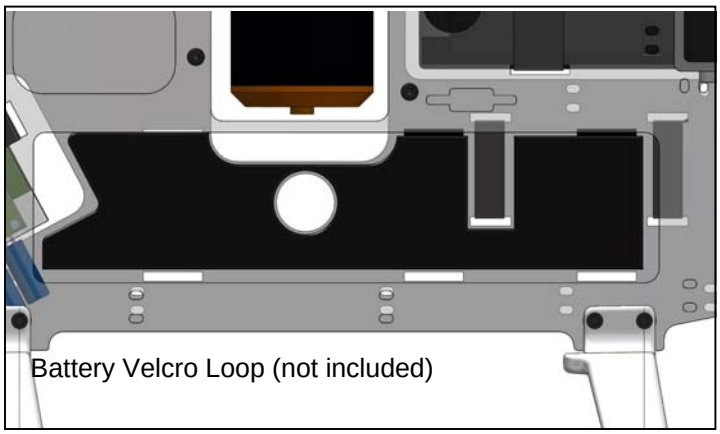


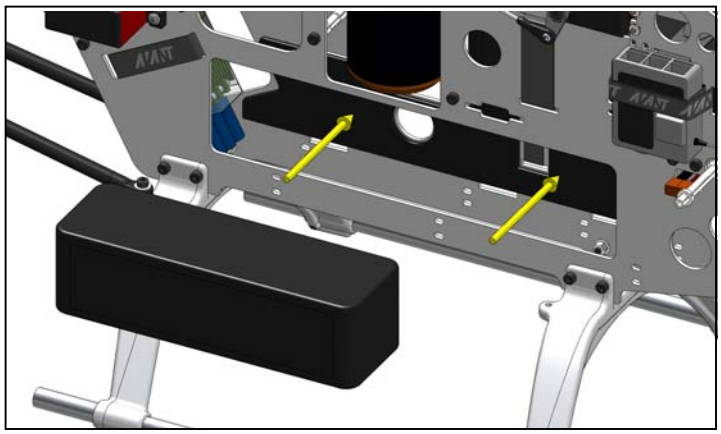




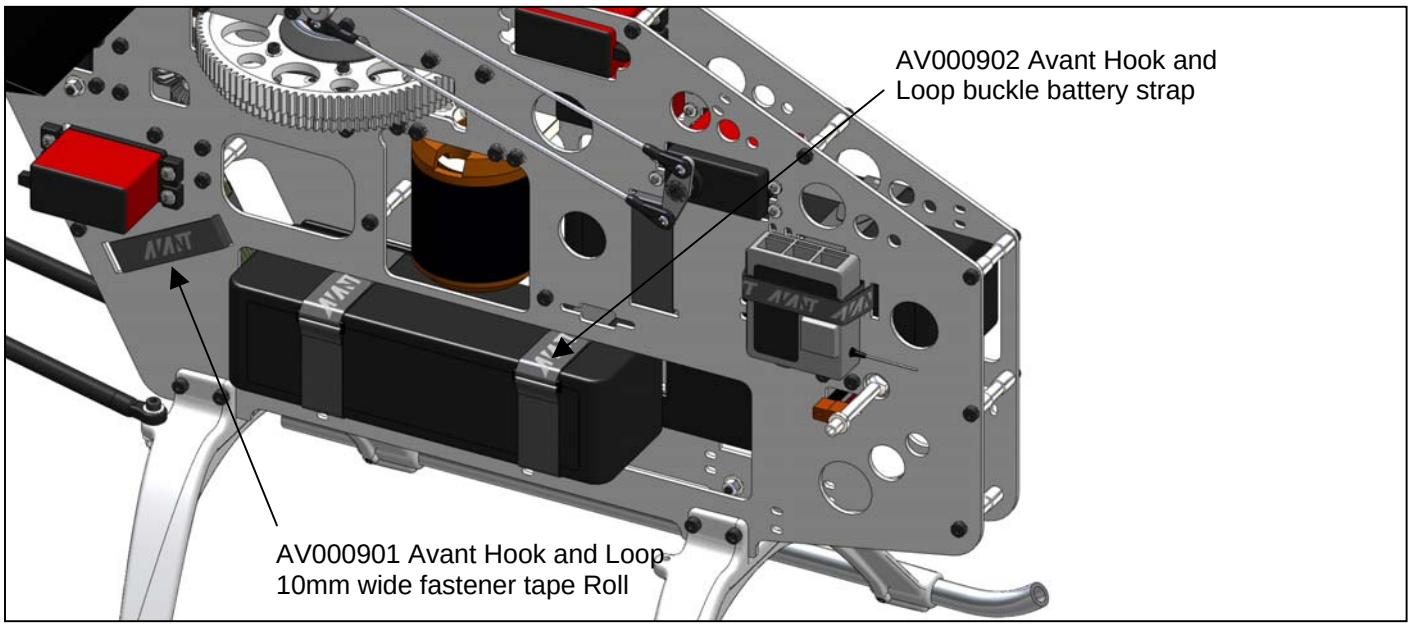








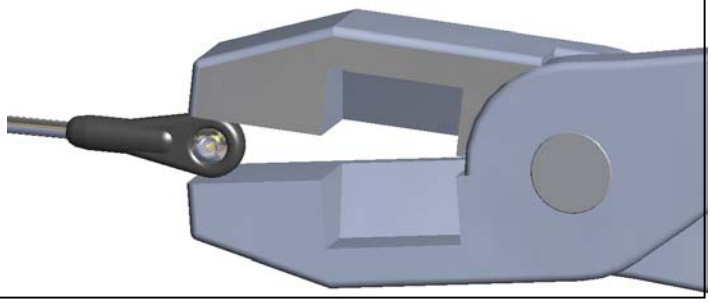
Note: Unless indicated otherwise all screws, balls and threads are installed with Blue Loctite



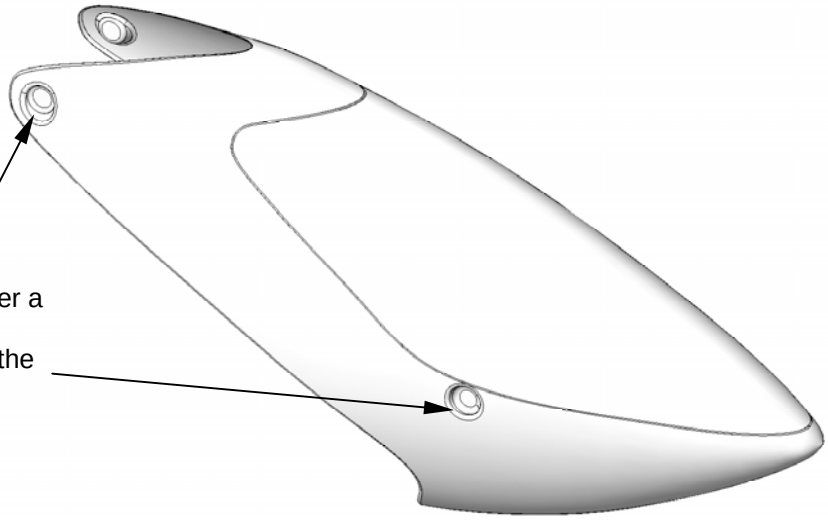
Ball links fit and sizing.

If needed for a final fit you can squeeze the ball link ring slightly with some pliers to make it a bit loser.

Keep in mind that the important thing is to make sure your ball links are secure so check and make sure the balls don't come out easily.



Canopy



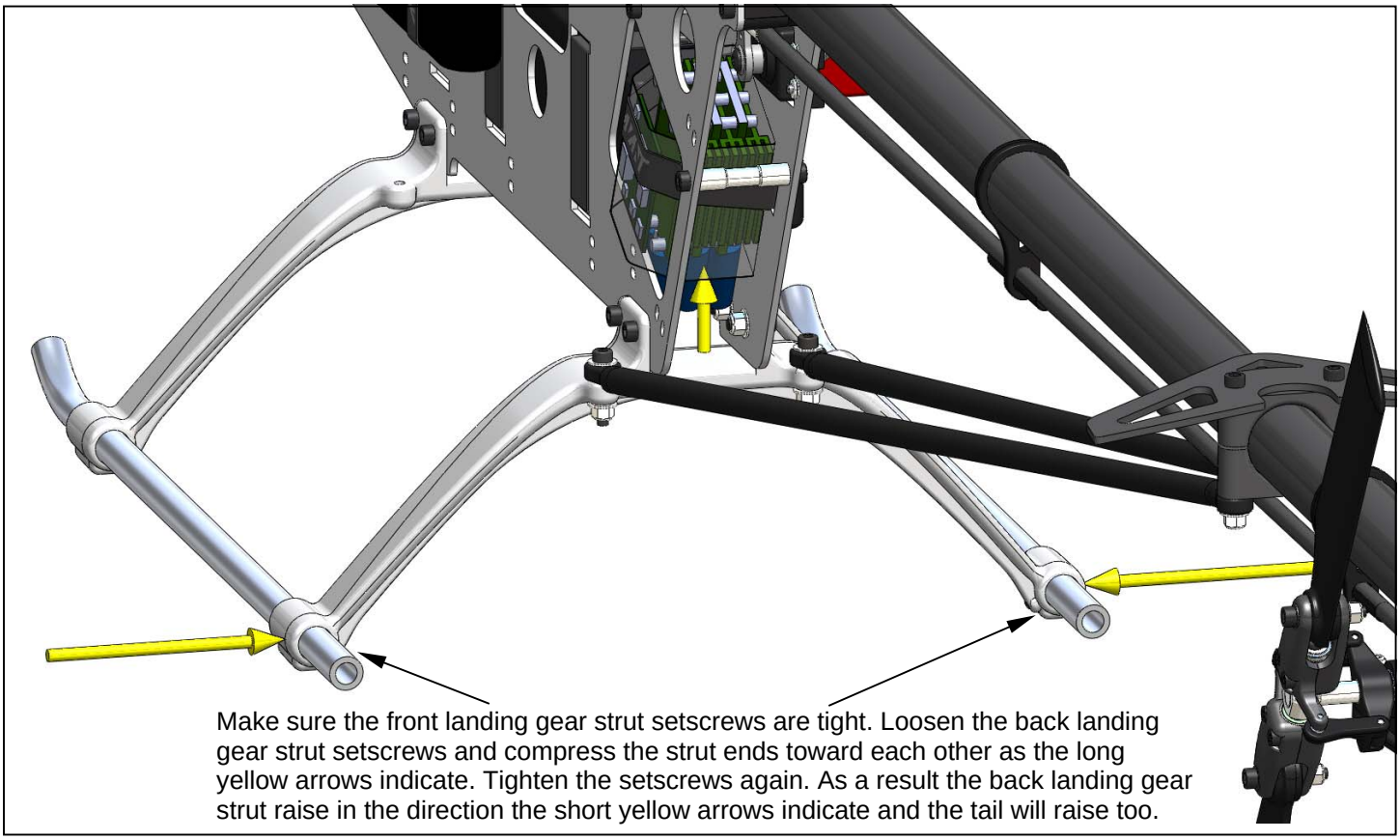
Open four 3/8" (9.5mm) holes with either a hole punch (preferred), a drill bit or a Dremel-type grinding stone and install the four rubber grommets.

Keep in mind that if you get a painted canopy because of it being a manually airbrushed artwork it might contain some minor defects or cosmetically erroneous details. That is normal and is not considered a reason for warranty exchange.

Note: Unless indicated otherwise all screws, balls and threads are installed with Blue Loctite

Adjusting the tail's height above ground:

Since the back landing gear strut of the helicopter holds more weight than the front one there is a natural tendency of the back one to sag a bit more than the front one. Luckily you can adjust them to level the helicopter perfectly as indicated in the picture below.



Make sure the front landing gear strut setscrews are tight. Loosen the back landing gear strut setscrews and compress the strut ends toward each other as the long yellow arrows indicate. Tighten the setscrews again. As a result the back landing gear strut raise in the direction the short yellow arrows indicate and the tail will raise too.

End of Assembly Manual

Note: Unless indicated otherwise all screws, balls and threads are installed with Blue Loctite

APENDIX SECTIONS

Appendix A:

Spare Part Pictures for AVANT Aurora 90 Nitro and Electric.

Appendix B:

Advanced Programming of the Avant Programmable head.

Note: Unless indicated otherwise all screws, balls and threads are installed with Blue Loctite

APENDIX A:

Spare Part Pictures and part numbers for both AVANT Aurora 90 Nitro and Electric

Kits

AV910001	Avant Aurora Ultimate 90 Nitro RC Helicopter Kit 2010 Model
AV920001	Avant Aurora Ultimate 90 Electric RC Helicopter Kit 2010 Model

AV00

AV000100	Avant Metal 10mm Main shaft Square Bearing Block
AV000101	Avant Metal Electric Motor Mount Block
AV000102	Avant Carbon Canopy Post Tabs Set
AV000103	Avant Needle Servo Kit
AV000104	Avant 20T Delrin Spur Gear
AV000106	Avant Nitro Pinion 12 Tooth Assembly
AV000107	Avant 10mm Main Shaft Collar
AV000108	Avant 26mm frame spacers
AV000109	Avant 6mm Collar Shaft Sleeves
AV000110	Avant CCPM Anti-rotation guide Pin
AV000111	Avant CCPM Elevator Arm Set
AV000112	Avant CCPM Metal Aileron Lever Set
AV000113	Avant Metal CCPM Swashplate assembly
AV000114	Avant CCPM Anti-rotation Guide
AV000115	Avant Flybar Carrier
AV000116	Avant Flybar Carrier double balls
AV000117	Avant Flybar Control Arm Assembly
AV000118	Avant Pushrod guide Set for Carbon Boom
AV000120	Avant Gyro mount plate
AV000121	Avant Hex Starter Adapter
AV000122	Avant Metal Mixing Arms
AV000123	Avant Steel balls M2
AV000124	Avant Steel balls M3
AV000125	Avant 26mm Mounting Block for Battery Plate
AV000126	Avant Ball Link long and short set
AV000127	Avant Ball Link Thick Thread
AV000128	Avant Canopy grommets
AV000129	Avant CNC Delrin Washout Base
AV000130	Avant CNC Semi-Rigid Dampener set
AV000131	Avant Plastic tailblade washers
AV000132	Avant Rubber edge strip 6 inch
AV000133	Avant Tail Y-link
AV000134	Avant Washout Arms Set
AV000135	Avant Washout Y-Link
AV000136	Avant 6mm Starter Shaft
AV000137	Avant CCPM 5mm Shaft
AV000138	Avant Black UV-rated Cable ties

AV90

AV900200	Avant Carbon Tail Boom
AV900202	Avant Metal Torque Tube assembly

Note: Unless indicated otherwise all screws, balls and threads are installed with Blue Loctite

AV900204 Avant Carbon Boom Supports
AV900205 Avant Carbon Vertical and Horizontal Fin set
AV900206 Avant Metal 6mm Bearing Block
AV900207 Avant Boom Clamp
AV900209 Avant Horizontal Fin Clamp
AV900211 Avant 97T Constant Drive Delrin Gear
AV900212 Avant 99T Delrin Main Gear
AV900213 Avant Tail Gears set
AV900214 Avant Aluminum Landing Skids
AV900216 Avant Brass Sleeve for 6mm Tail pickup shaft
AV900217 Avant Canopy Mounting Post set
AV900218 Avant Constant Drive Gear Hub for M4 Pin
AV900220 Avant Metal Head Button
AV900221 Avant Head Linkage Rods
AV900222 Avant Swashplate Linkage Rods
AV900223 Avant Main Shaft hub Sleeve for M4 Pin
AV900224 Avant Main Sprag hub Assembly
AV900225 Avant Metal Main Blade Grip Set
AV900226 Avant Metal Head Bladegrip Pitch Arms
AV900227 Avant Metal Yoke Block
AV900228 Avant Tail Case
AV900229 Avant Tail Slider threaded Brass Sleeve
AV900230 Avant Washout Base Guide with pins
AV900231 Avant Clutch Liner strip
AV900232 Avant Landing Gear struts
AV900234 Avant Frame straight Bellcrank
AV900236 Avant Head Flybar special alloy
AV900239 Avant Main Shaft for M4 Pin
AV900240 Avant Smooth Spindle
AV900241 Avant Tail Input/TT Shaft
AV900242 Avant Tail Output Shaft
AV900243 Avant Tail Pickup Shaft
AV900244 Avant Tail Rotor Assembly
AV900246 Avant Tail L Bellcrank
AV900248 Avant Tail Box Clamp for Carbon Boom
AV900252 Avant Tail Blade Grip Set
AV900254 Avant Tail Pitch Yoke
AV900256 Avant Aurora 90 Painted Fiberglass Canopy

AV91

AV910300 Avant Carbon Right Frame
AV910301 Avant Carbon Left Frame
AV910302 Avant Carbon Ratio plates set
AV910303 Avant Carbon Battery Plate
AV910304 Avant Carbon Bottom Plate
AV910305 Avant Carbon Stiffener side plate
AV910306 Avant Nitro Carbon Pushrod Set Long
AV910307 Avant Nitro Carbon Pushrod Set Short
AV910308 Avant Aurora Nitro 90 Servos Linkage Rods

Note: Unless indicated otherwise all screws, balls and threads are installed with Blue Loctite

AV910309 Avant Cooling Fan
AV910311 Avant Fan Shroud Set
AV910312 Avant Clutch
AV910313 Avant Clutch Bell and liner
AV910314 Avant Fan Hub Threaded 5/16-24 (OS)
AV910316 Avant Frame stiffener set
AV910317 Avant Metal Motor mount center
AV910318 Avant Motor mount side
AV910319 Avant Metal 10mm Main shaft Bearing Block
AV910320 Avant Fuel Tank

AV92

AV920350 Avant e-Aurora Carbon Right Frame
AV920351 Avant e-Aurora Carbon Left Frame
AV920352 Avant e-Aurora Carbon Pushrod Set
AV920353 Avant e-Aurora 90 Servos Linkage Rods
AV920354 Avant e-Aurora Pinion 10 Tooth Assembly

Bearings

AV000600 Avant 8x16 Thrust bearing
AV000601 Avant 5x10x4 Thrust bearing
AV000610 Avant 4x10x4 Bearing
AV000611 Avant 5x10x3 Bearing
AV000612 Avant 6x13x5 Bearing
AV000613 Avant 6x12x4 Bearing
AV000614 Avant 8x16x5 Bearing
AV000615 Avant 7x11x3 Bearing
AV000616 Avant 10x19x5 Bearing
AV000617 Avant 12x21x5 Bearing
AV000640 Avant 3x8x4 Flanged Bearing
AV000641 Avant 5x10x4 Flanged Bearing
AV000660 Avant 6x10x12 One-way bearing

Screws

AV000700 Avant M2 x 5mm Grade 12.9 alloy steel Socket head cap screw
AV000705 Avant M2.5 x 8mm Grade 12.9 alloy steel Socket head cap screw
AV000710 Avant M3 x 6mm Grade 12.9 alloy steel Socket head cap screw
AV000711 Avant M3 x 8mm Grade 12.9 alloy steel Socket head cap screw
AV000712 Avant M3 x 10mm Grade 12.9 alloy steel Socket head cap screw
AV000713 Avant M3 x 12mm Grade 12.9 alloy steel Socket head cap screw
AV000714 Avant M3 x 14mm Grade 12.9 alloy steel Socket head cap screw
AV000715 Avant M3 x 18mm Grade 12.9 alloy steel Socket head cap screw
AV000716 Avant M3 x 20mm Grade 12.9 alloy steel Socket head cap screw
AV000717 Avant M3 x 25mm Grade 12.9 alloy steel Socket head cap screw
AV000718 Avant M3 x 35mm Grade 12.9 alloy steel Socket head cap screw
AV000719 Avant M3 x 40mm Grade 12.9 alloy steel Socket head cap screw
AV000740 Avant M4 x 8mm Grade 12.9 alloy steel Socket head cap screw
AV000741 Avant M4 x 10mm Grade 12.9 alloy steel Socket head cap screw
AV000742 Avant M4 x 14mm Grade 12.9 alloy steel Socket head cap screw
AV000743 Avant M4 x 16mm Grade 12.9 alloy steel Socket head cap screw
AV000750 Avant M5 x 14mm Grade 12.9 alloy steel Socket head cap screws

Note: Unless indicated otherwise all screws, balls and threads are installed with Blue Loctite

AV000755	Avant M2.5 x 12 Button Head screw
AV000760	Avant M3 x 6 Button Head screw
AV000761	Avant M3 x 8 Button Head screw
AV000762	Avant M3 x 10 Button Head screw
AV000763	Avant M3 x 16 Button Head screw
AV000764	Avant M3 x 20 Button Head screw
AV000770	Avant M2.5 x 10mm Phillips Pan Head screws
AV000771	Avant M3x16mm Stainless Steel Socket head cap screw
AV000772	Avant Nylon insert Locknut M3
AV000780	Avant Multi Flat Point Setscrew Pack
AV000781	Avant Multi Cup Point Setscrew Pack
AV000782	Avant Multi Washer Pack
AV000783	Avant Multi Plain Nut Pack

Hardware

AV000800	Avant Threaded insert Pack
AV000801	Avant Multi Pin Pack
AV000802	Avant Multi Bearing Spacer Pack
AV900803	Avant Multi Thin Shim Pack
AV900850	Avant Spindle Hardware Pack
AV900851	Avant Main blade M5 Screws and Bushings

Accessories

AV000900	Avant ISOFLEX Special Grease for Sprag Clutches
AV000901	Avant Hook and Loop 10mm wide fastener tape Roll
AV000902	Avant Hook and Loop 20mm wide buckle strap
AV900903	Avant Decal Set for Canopy BLACK and SILVER

Note: Unless indicated otherwise all screws, balls and threads are installed with Blue Loctite

AV00 series

AV000100

AV000101

AV000102

AV000103

AV000104

AV000106

AV000107

AV000108

AV000109

AV000110

AV000111

AV000112

Note: Unless indicated otherwise all screws, balls and threads are installed with Blue Loctite

AV000113

AV000114

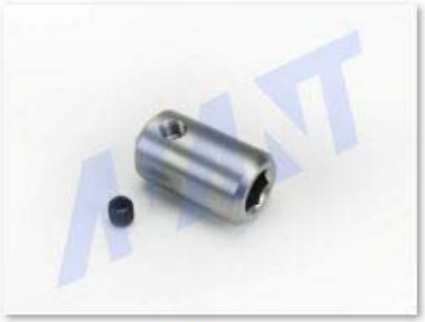
AV000115

AV000116

AV000117

AV000118

AV000120



AV000121

AV000122

AV000123

AV000124

AV000125

Note: Unless indicated otherwise all screws, balls and threads are installed with Blue Loctite

AV000126

AV000127

AV000128

AV000129

AV000130

AV000131

AV000132

AV000133

AV000134

AV000135

AV000136

AV000137

Note: Unless indicated otherwise all screws, balls and threads are installed with Blue Loctite


AV000138


AV000600


AV000601


AV000610


AV000611


AV000612


AV000613


AV000614


AV000615


AV000616


AV000617


AV000640

Note: Unless indicated otherwise all screws, balls and threads are installed with Blue Loctite


AV000641


AV000660


AV000700


AV000705


AV000710


AV000711


AV000712


AV000713


AV000714


AV000715


AV000716


AV000717

Note: Unless indicated otherwise all screws, balls and threads are installed with Blue Loctite

AV000718

AV000719

AV000740

AV000741

AV000742

AV000743

AV000750

AV000755

AV000760

AV000761

AV000762

AV000763

Note: Unless indicated otherwise all screws, balls and threads are installed with Blue Loctite

AV000764

AV000770

AV000771

AV000772

AV000780

AV000781

AV000782

AV000783

AV000800

AV000801

AV000802

AV000900

Note: Unless indicated otherwise all screws, balls and threads are installed with Blue Loctite

AV000901

AV000902

Note: Unless indicated otherwise all screws, balls and threads are installed with Blue Loctite

AV90 Series

AV900200

AV900202

AV900204

AV900205

AV900206

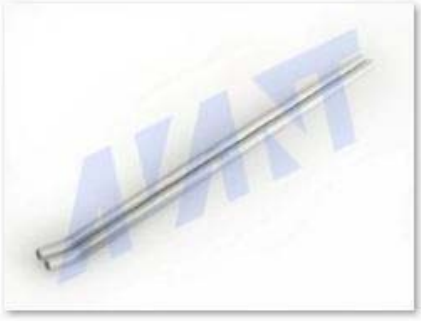
AV900207

AV900209

AV900211

AV900212

AV900213



AV900214

AV900216

Note: Unless indicated otherwise all screws, balls and threads are installed with Blue Loctite

AV900217

AV900218

AV900220

AV900221

AV900222

AV900223

AV900224

AV900225

AV900226

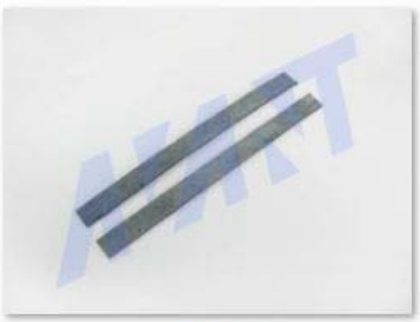
AV900227

AV900228

AV900229

Note: Unless indicated otherwise all screws, balls and threads are installed with Blue Loctite

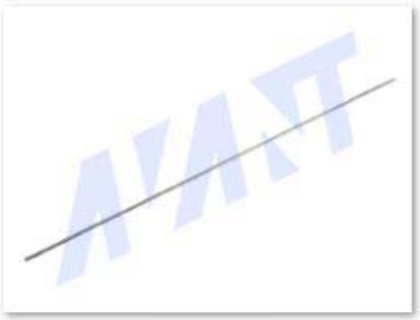
AV900230



AV900231

AV900232

AV900234



AV900236

AV900239

AV900240

AV900241

AV900242

AV900243

AV900244

AV900246

Note: Unless indicated otherwise all screws, balls and threads are installed with Blue Loctite

AV900248

AV900252

AV900254

AV900256

AV900803

AV900850

AV900851

AV900903

Note: Unless indicated otherwise all screws, balls and threads are installed with Blue Loctite

AV91 Series

AV910001

AV910300

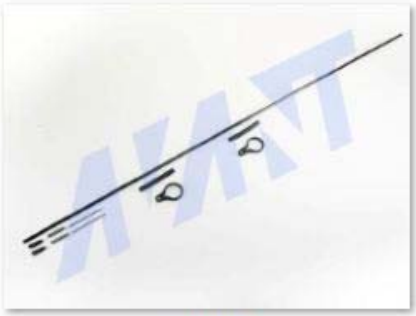
AV910301

AV910302

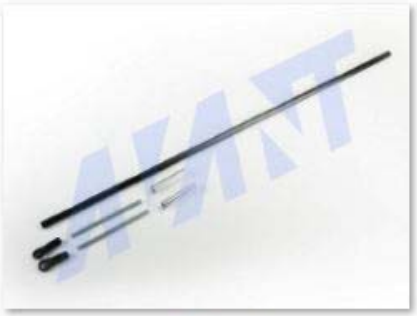
AV910303

AV910304

AV910305



AV910306



AV910307

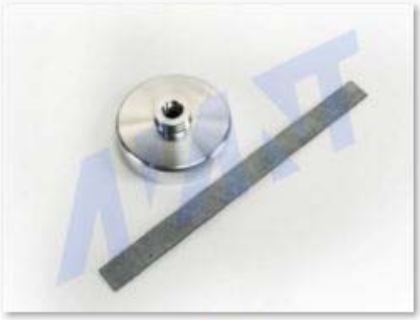
AV910308

AV910309

AV910311

Note: Unless indicated otherwise all screws, balls and threads are installed with Blue Loctite

AV910312



AV910313

AV910314

AV910316

AV910317

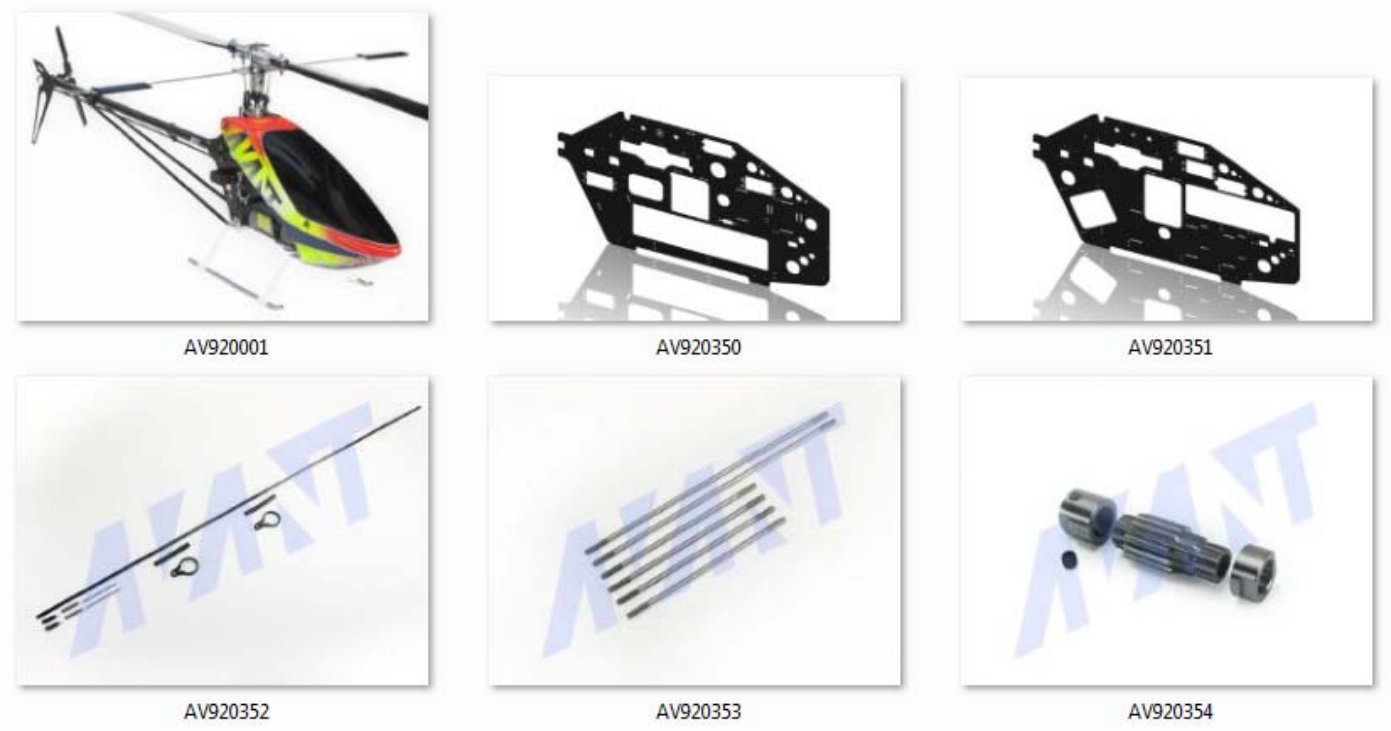
AV910318

AV910319

AV910320

Note: Unless indicated otherwise all screws, balls and threads are installed with Blue Loctite

AV92 Series:



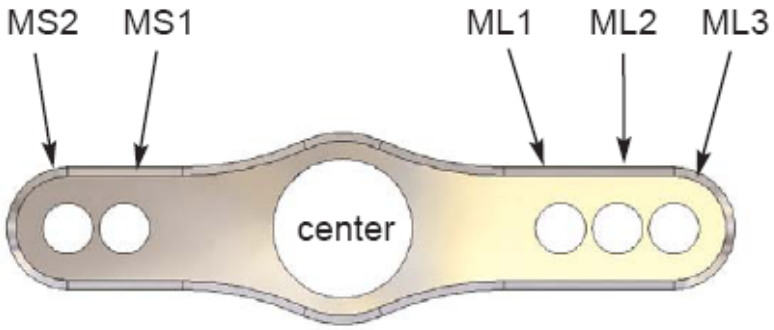
End of Spare parts pictures and list.

Note: Unless indicated otherwise all screws, balls and threads are installed with Blue Loctite

APENDIX B:

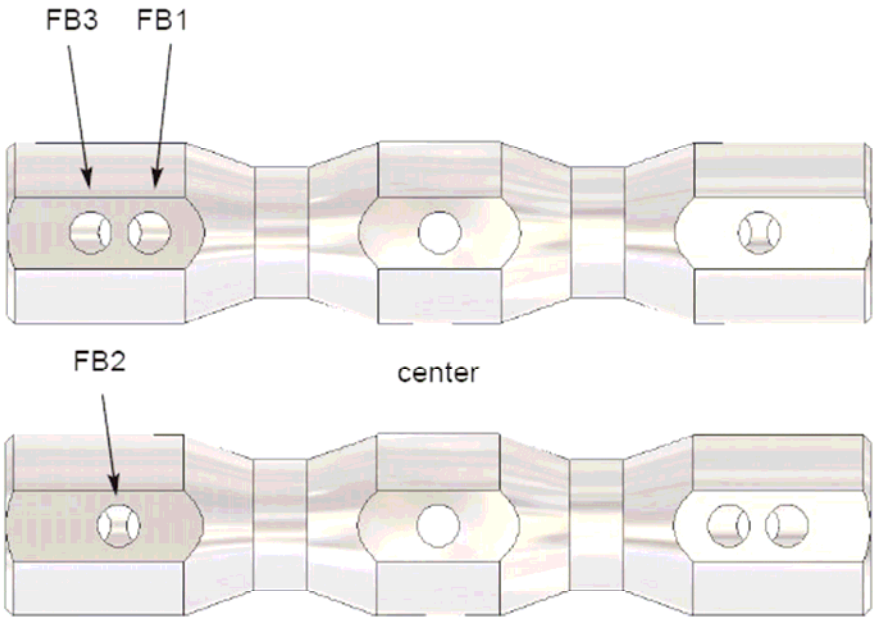
Advanced Programming of the Avant Programmable head

Hole location names for the mixing arms



For the rod coming from the swashplate (left) using holes closer to the center make the head more active and away from center make the head more stable. For the rod from the flybar (right) using holes closer to the center make the head less active or more stable and away from center more active or less stable.
Note: When using the longer side on the swashplate rod rotate the mixing arm so that the longer side is on the left.

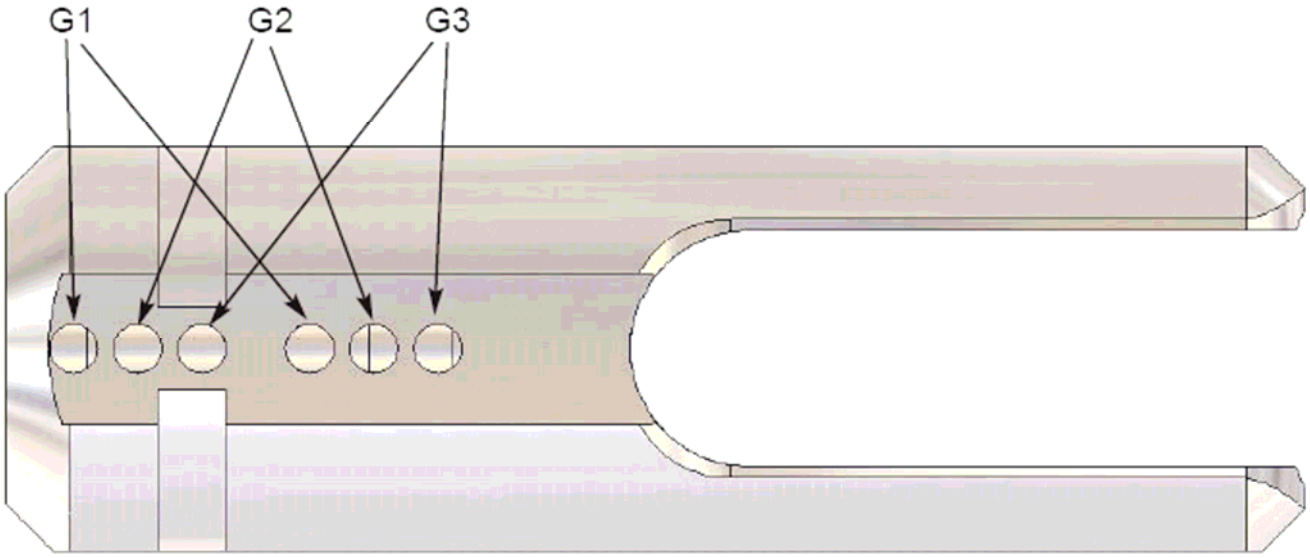
Hole location names for the flybar carrier



On the flybar carrier holes closer to the center pivot are more active and away from the center are more stable.

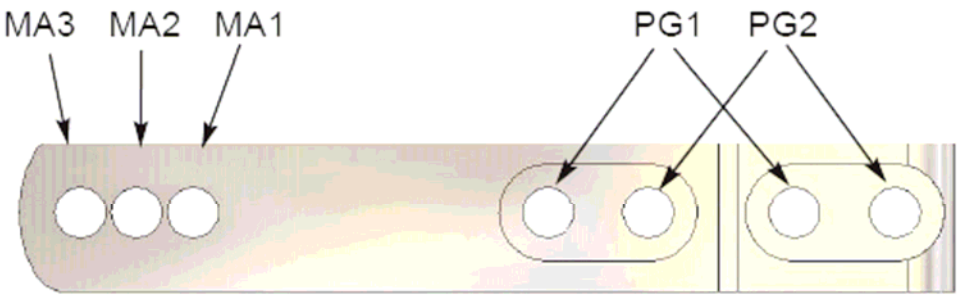
Note: Unless indicated otherwise all screws, balls and threads are installed with Blue Loctite

Hole location names for the blade grip



Holes on the bladegrip and pitch arm affect the delta. Lower delta numbers are more active. Higher delta numbers are more stable. For all the delta settings please see diagram for delta settings in the manual.

Hole location names for the pitch arms



Holes on the bladegrip and pitch arm affect the delta. Lower delta numbers are more active. Higher delta numbers are more stable. For all the delta settings please see diagram for delta settings in the manual.

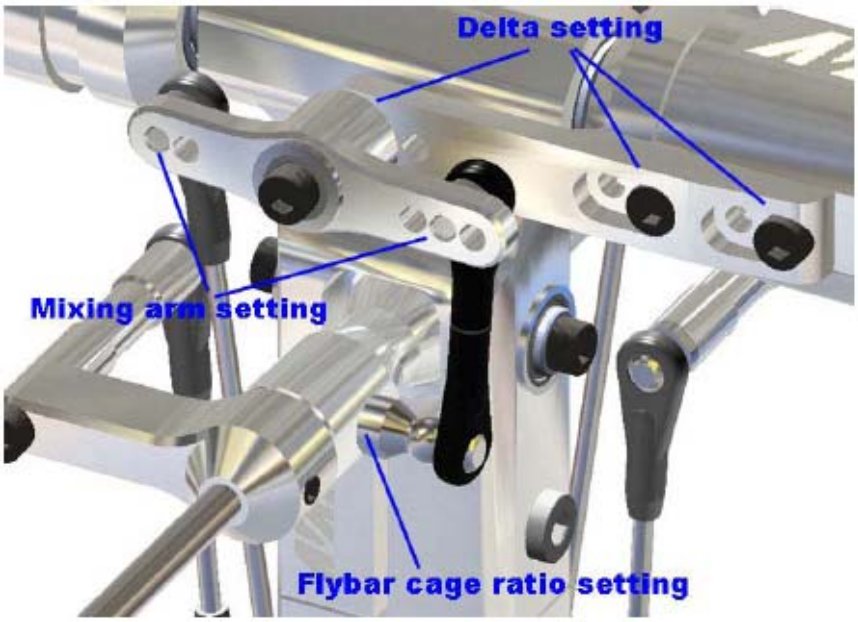
Note: Unless indicated otherwise all screws, balls and threads are installed with Blue Loctite

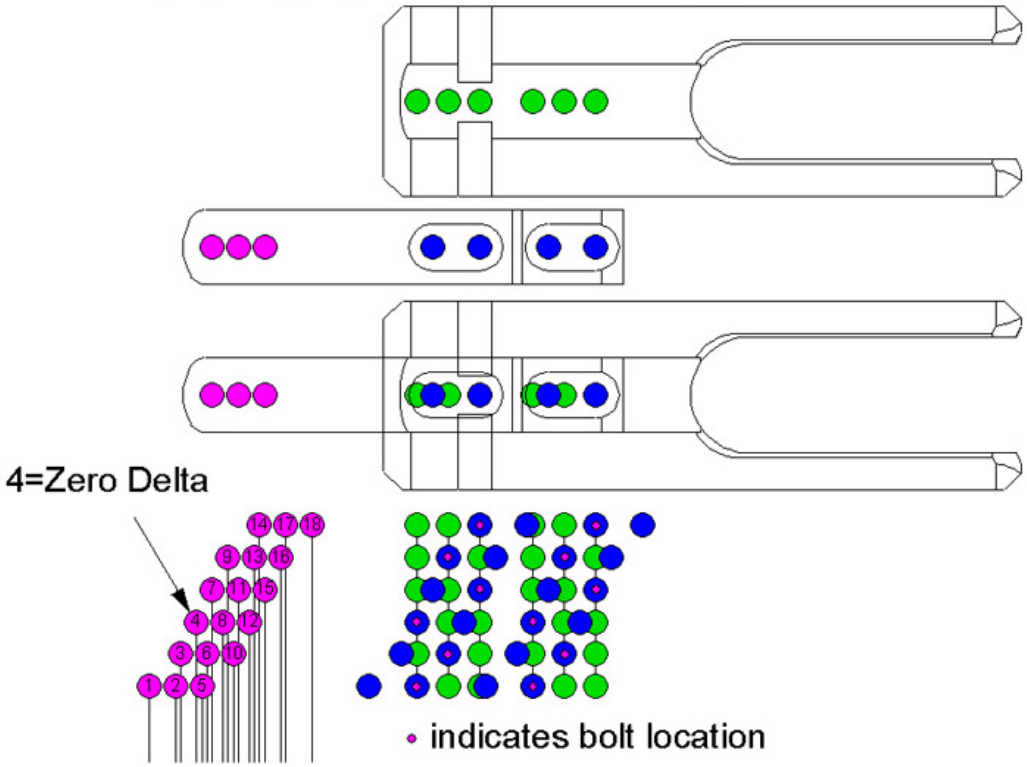
Default Basic Head Settings

Setting	Mixing Arm Swash Rod	Mixing arm Flybar Rod	Flybar	Bladegrip	Pitch Arm Grip Side	Pitch Arm MX arm hole	Resulting Delta
Ultra Stable	ML3	MS1	FB3	G2	PG1	MA1	16
Stable	ML3	MS2	FB3	G3	PG1	MA3	14
Normal	MS2	ML2	FB2	G3	PG2	MA2	11
Active	MS2	ML2	FB2 OR FB1	G3	PG2	MA3	7
Super Active	MS1	ML3	FB1	G2	PG2	MA3	3

Important note:
When using Active and Super Active settings the forces applied to the CCPM servos are larger than normal so plastic servo gears can suffer or break. Metal geared high torque servos are strongly recommended for those settings.

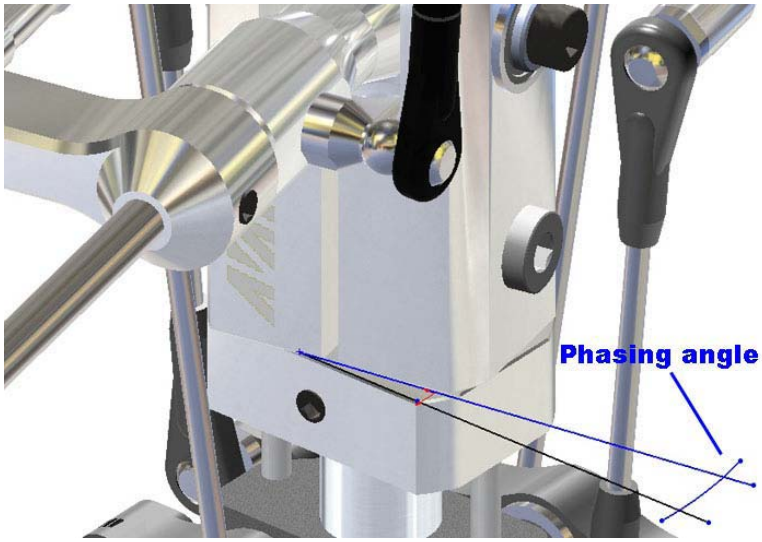
For pilots that want more precise adjustment of the delta settings here's a guide on how to use the hole locations to vary the setting in small increments. A good starting point for the delta setting is position 7. (4 is Zero delta). # 7 position is achieved using holes number G3 on the bladegrip and holes number PG2 and MA3 (letter A on the drawing below) on the bladegrip pitch arm. Lower numbers make the cyclics less responsive. Higher numbers make them more responsive. (The pink dot indicates the location of the bolts)





You can use up to 18 different delta settings in this head.
Setting pictured in the assembly pictures above corresponds to setting number 7, which is a good point for 3D. Lower delta position numbers = more stability (3D). Higher Delta position numbers = more response.
Keep in mind that not all delta setting positions are compatible with all mixing arm ball locations without rod binding against eh flybar cage so those might need to be adjusted.

Note: Unless indicated otherwise all screws, balls and threads are installed with Blue Loctite



If you want you can also adjust the phasing to match your blades lead-lag angle and eliminate any tail corkscrewing during rolls if your blades have some. If you need to correct you can start with about 1 degree and build up from there.

End of Advanced Head Programming Manual

Note: Unless indicated otherwise all screws, balls and threads are installed with Blue Loctite