

BIG BERTHA 69

Pro/Sport Helicopter



ASSEMBLY & MAINTENANCE
MANUAL

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INTRODUCTION

Congratulation and thank you for the purchase of great product! It is our sole desire for you to enjoy the quality workmanship and performance of any of our Nitro powered helicopters. We believe we have the latest designs and technology incorporated into our model helicopters. Our CNC parts are produced using the best high density materials & anodized using material hardening finishes with the tightest of tolerances. Our new helicopters feature the latest advances in R/C helicopter design. The simple and mechanically superior EMS design (also known as CCPM) ensures a helicopter that will be more responsive and more stable than any other R/C helicopter you have ever flown. Three servos are attached directly to the Swashplate to ensure precise control. This kit features all metal construction, and a carbon or composite frames are standard. Along with great products, our staffs are RC guys that fly and have hands on experience with total manufacturing & testing of our helicopters. In addition, we stand behind all our products 100% with satisfaction guaranteed. Our kits will be shipped 100% complete and we can assure you that once you fly your helicopter you will love it.

The **Big Bertha 69**

We believe you hold in your hands one of the best helicopters manufactured in the world today. The brand new **Big Bertha 69** is the newest version of our Big Nitro Quick line. It is a bigger, stronger frames, yet powerful machine. This baby delivers amazing power smoothly throughout the entire range of its nitro motor. It functions so responsive and stable. The **Big Bertha 69 Pro version** features a fully machined dual-spindle head, metal tail rotor, metal grips, carbon fiber frames, bigger carbon rudder push rod, and carbon fiber boom supports. The **Big Bertha 69 Sport version** features a G10 fiberglass frame, fully machined metal head, carbon boom supports, carbon rudder push rod, and molded tail blade grips. Our helicopters are carefully designed and tested, and manufactured of the highest quality materials available.

In a short time, you can be flying.

We ask that you please read the entire manual before starting the construction of the **Big Bertha 69**, and if you have any questions our technical support staff can be reached at

(610) 282-4811 M-F 9-6, S 9-4 Eastern time,
or by email at chuck@quickworldwide.com.

For the latest information and updates, please visit our website at

www.quickworldwide.com

CUSTOMER SERVICE

<p>Quickworldwide 201 South 3rd. St. & 309 N. Coopersburg, PA 18036</p> <p>Phone: (610)-282-4811</p> <p>Fax: (610)-282-4816</p>	<p><u>Websites:</u> http://www.hhiheli.com http://www.quickheli.com http://www.giantscaleplanes.com</p> <p><u>E-mail:</u> hhi@fast.net</p>
<p><u>Office Hours:</u></p> <p>Mon – Fri: 8:30 – 6:00 Sat: 8:30 – 1:30 (Eastern Daylight Time)</p>	
<p>Technical Support Personnel:</p> <p>Chuck – chuck@quickworldwide.com Jon – jon@quickworldwide.com</p>	

FEATURES

Big Bertha 69

- 1. Frame Construction:** Big Bertha 69 frames are made of the highest quality Carbon Fiber or Black G-10. These frames are not only thick and rigid but will provide excellent vibration absorption.
- 2. One-Way Hex Start Shaft System:** The one-way bearing allows the engine to continue to run after the starter motor has been stopped.
- 3. Constant Tail Rotor Drive System:** provides full tail authority during motor off maneuvers.
- 4. Belt driven Tail:** Smooth, reliable, and low maintenance.
- 5. High Quality Ball Bearings:** Big Bertha 69 offers high quality ball bearings on all moving parts.
- 6. EMS Collective System:** The EMS Collective design allows ease of setup with fewer moving parts. EMS demonstrates overall design simplicity and represents the future of helicopter technology.
- 7. Heavy-Duty Clutch System:** Based on the same design as our famous heavy-duty clutch upgrade that fits most popular machines, this clutch will give many years of problem free operation.
- 7. Control Linkages:** The control linkages are high quality 2.3mm stainless steel rods with Delrin® acetal resin rod ends.
- 8. Single Blade Axle Design:** simple, very responsive, with exceptionally consistent flight characteristics.
- 9. Advanced Airfoil Fly-bar Paddles:** These paddles will provide the best flight characteristics for both 3D & Sport flying: Smooth forward flight, with quick response upon demand.
- 10. Rearward facing Engine Design:** This design provides quick access to the glow plug and is advantageous for easy engine removal.
- 11. Heavy-Duty Bearing Blocks:** Bearing Blocks is specially designed for this model. They couple to high quality bearings to carry and support all high speed moving operations.

PRE-ASSEMBLY INFORMATION

Warning

The radio-controlled model helicopter contained in this kit is not a toy. Rather, it is a sophisticated piece of equipment. This product is not recommended for use by children without adult supervision. Radio controlled models such as this are capable of causing both property damage and/or bodily harm to both the operator/assembler and spectators if not properly assembled and operated. Hobbies & Helis assumes no liability for damage that could occur from the mis-assembly and/or use/misuse of this product.

Academy of Model Aeronautics

We strongly encourage all prospective and current R/C aircraft pilots to join the Academy of Model Aeronautics. The AMA is a non-profit organization that provides services to model aircraft pilots. As an AMA member, you will receive a monthly magazine entitled Model Aviation, as well as a liability insurance plan to cover against possible accident or injury. All AMA charter aircraft clubs require individuals to hold a current AMA sporting license prior to the operation of their model. For further information, please contact AMA at:

Academy of Model Aeronautics

5161 East Memorial Drive
Muncie, IN 47302-9252
USA



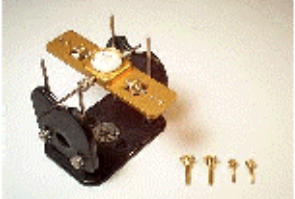



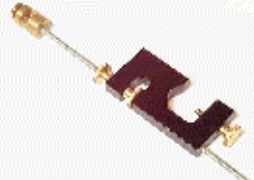


Phone: (317) 287-1256

www.modelaircraft.org

Before you begin

Quick Helicopter kits are packaged with care and attention to detail. We recommend when you are ready to begin building this model that you examine the kit carefully, inspect the contents of each package, and read and understand these instructions thoroughly before starting assembly. It is suggested that you purchase a parts box for the small fasteners and hardware, or use small bowls or other containers.

REQUIRED TOOLS

 <p>Phillips Screw Driver</p>	 <p>Ball End Drivers HHI7050</p>	 <p>Bubble Blade Balancer HHI7010 High Point Balancer DUB499</p>
 <p>Piston Head Lock HHI7020</p>	 <p>HHI7320 – 6pc Nut & Allen Driver Set</p>	 <p>Pitch Gauge HHI7001</p>
 <p>Composite Paddle Gauges HHI7000</p>		 <p>Universal FlybarLock HHI7040</p>
 <p>Ruler</p>	 <p>Hobby Knife</p>	 <p>Needle Nose Pliers Scissors</p>

Dremel Tools and sandpapers would be helpful.

HARDWARE & OPTIONAL ACCESSORIES

GLUES AND THREAD LOCK COMPOUNDS

		
Ca Glue. ...GBG1	JB Weld...JBW8265S	Loctite.PT40

RADIO MOUNTING ACCESSORIES

	
Single Sided Foam Tape... HHI2008	Receiver Hold Down Straps HHI55** \$4.99 2 Per Bag & Colors: Red, White, Purple, Black
	
Receiver Strong Box... HHI2200	Spiral Wrap HHI2809 & HHI2810
	
Wire Ties...HHIWT01	

ENGINES, GLOW PLUGS, AND EXHAUST SYSTEM

ENGINES: we recommend OS70SX but others may work



GLOW PLUGS: OS # 8...OSMG2691



One-Piece Muffler



Two-Piece Muffler



FUEL SYSTEM



Fuel Filter... QUI9002



Tube Ends.... QUI9001



Mini Cock Straight... TET4321



Fuel Tubing.... PRA7092



Triangle Joint. TET4301

OTHER HARDWARE & OPTIONAL ACCESSORIES



3MM FLYBAR STIFFENERS
HHI 402



60 SIZE SKID STOPS
HHI 200 AVAILABLE IN COLORS



SERVO ARM SET

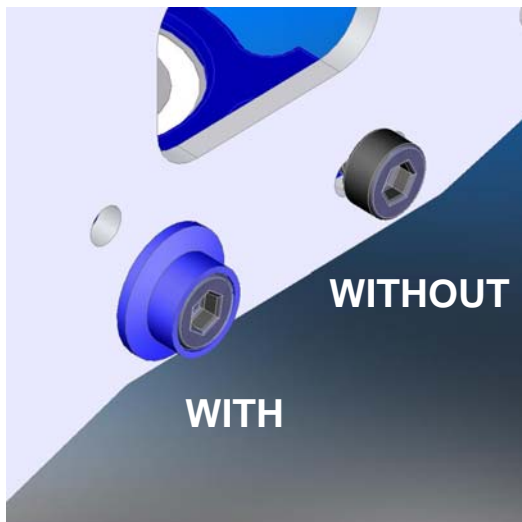


LANDING GEAR DAMPENERS
HHI 2004



BASE LOAD ANTENNA
HHI 53**

AVAILABLE IN BLUE, GOLD,
PURPLE
AND IN 40, 50, AND 72 MHz



FINISHING CAPS

- Adds color and style
- Distributes force across larger surface area

3mm

4mm

(20 pcs in a package) (8 pcs in a package)

BLACK	HHIM11100B	---
BLUE	HHIM11103	HHIM11108
GOLD	HHIM11101	HHIM11106
GREEN	HHIM11100G	---
PURPLE	HHIM11100	HHIM11105
RED	HHIM11100R	---
SILVER	HHIM11100	HHIM11107

OTHER REQUIREMENTS

Radios:

Any radio that supports EMS/CCPM Mixing will work fine. Hobbies & Helis & its distributors carry various lines of helicopter radios.

Note: Please consult the instruction for your Gyro for setting the overall travel and limits to ensure proper operation and travel of Tail Pitch Slider.

Servos:

Any sport servo will offer acceptable performance. However, because servos operate all critical functions of the helicopter, they can be the single most important component that contributes to proper function of the helicopter. Due to the nature of EMS collective, we suggest the use of digital servos to enhance and ensure matched servo timing without servo interaction.

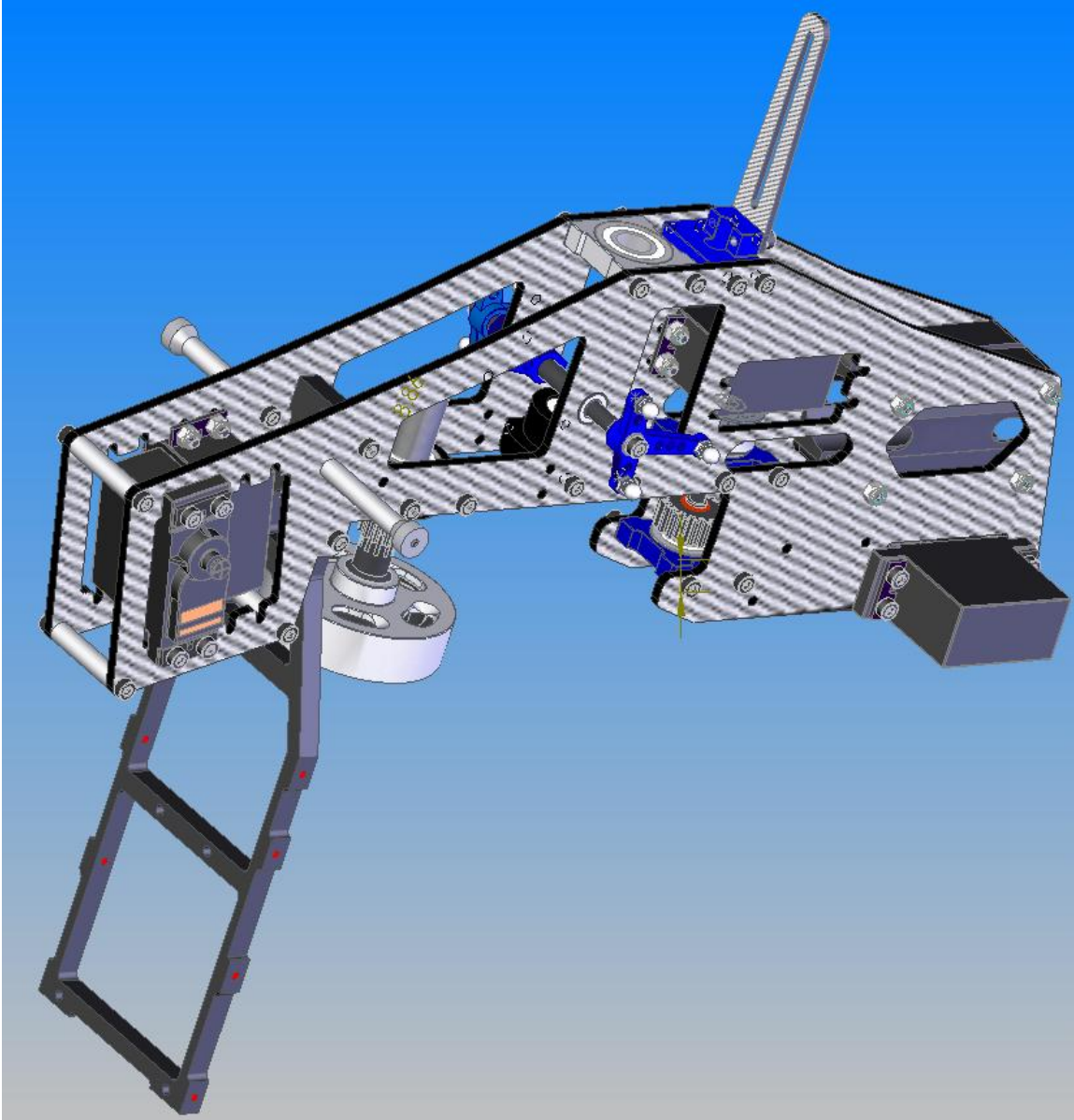
Loctite Warning (CRITICAL):

This is a general warning about the use of Loctite and its importance. *Loctite must be used anywhere that a metal fastener* i.e. (M2, M3, M4 Cap Head Bolts, Set Screws etc.) *is threaded into a metal part* i.e. (Bearing Blocks, Cross-members, etc.). Failure to use Loctite can result in loosening of critical operating components, loss of control of the model, and can lead to a crash.

PART LIST

- In your kit, parts are bagged according to each major assembly and are labeled “Bag 1, Bag 2, etc.” You will note that the heading for each assembly indicates which bag correlates with each assembly.
- For a good installation, only open up the bag that you need for particular assembly.
- Please check the parts in that bag against the parts list shown for each assembly as well as each subassembly to make sure there are no missing parts.
- Small parts such as nuts and bolts can be put into containers or trays to prevent losing parts.
- Part No. with ***** means that part is not included in the kit.
- The colors of drawings in this manual may look different from the parts you have in the kit.

No.	Bag No.	Description	Quantity	Check
1	Bag 1	For Upper Frame Assembly	1	
2	Bag 2	For Lower Frame Assembly	1	
3	Bag 3	Landing Gear	1	
4	Bag 4	Driving System	1	
5	Bag 5	For Tail Assembly	1	
6	Bag 6	Control System	1	
7	Bag 7	Head Rotor	1	
8	Bag 8	Linkage	1	
9	Frame	Frame	1	
10	HB	Hardware Bag	1	
11	Loose in Box	Canopy	1	
		Carbon Push Rod	1	
		Tail Gear Belt	1	
		Tail Boom	1	
		Flybar	1	
		Decal Sheet	1	
		Instruction CD	1	

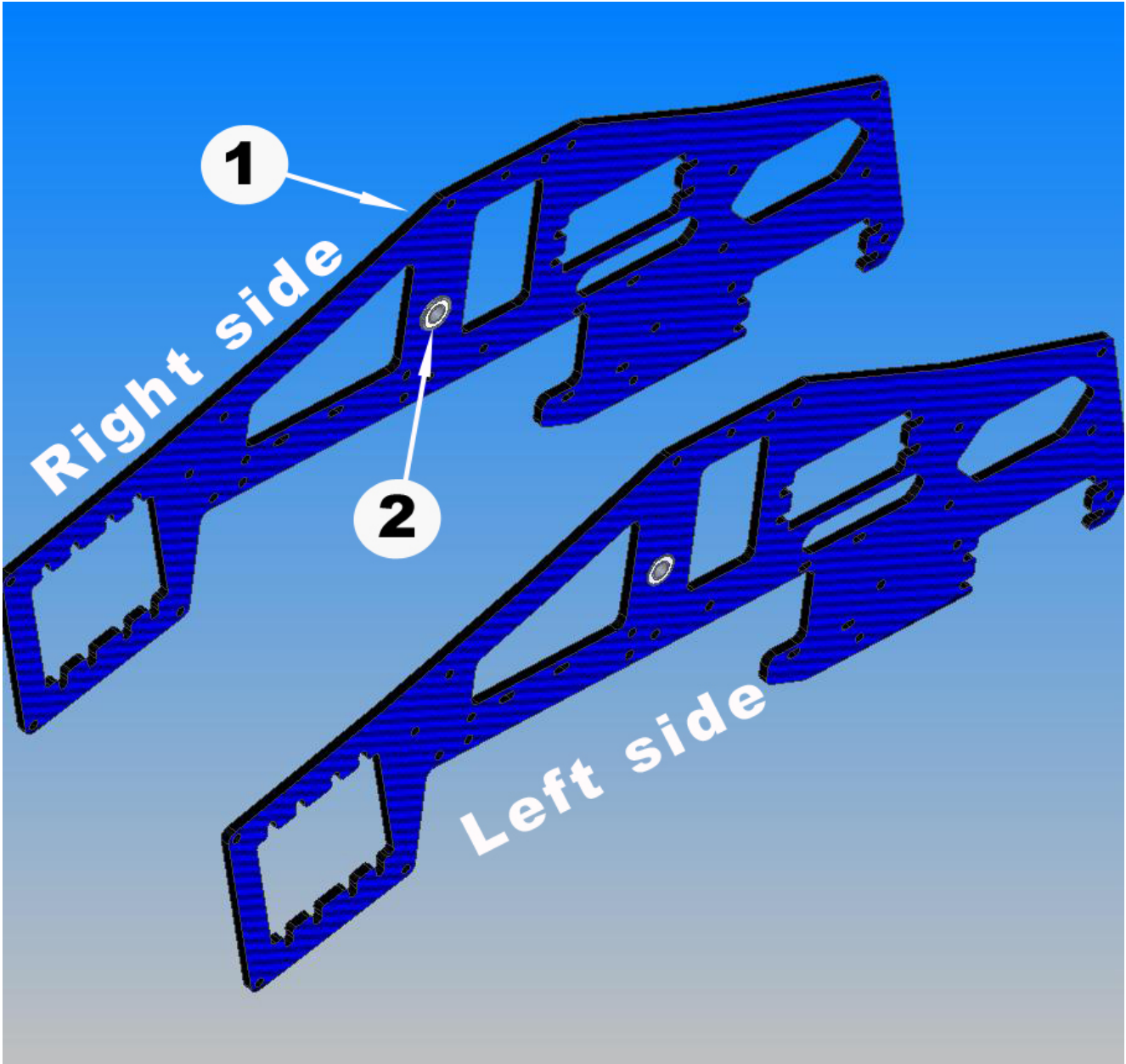


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- For a good installation, only open up the bag that you need for particular assembly.
- Please check the parts in that bag against the parts list shown for each assembly as well as each subassembly to make sure there are no missing parts.
- Small parts such as nuts and bolts can be put into containers or trays to prevent losing parts.
- No. with ***** means that part is not included in the kit.
- Colors of the parts in the drawings may look differently from ones in the kit.

1-1 ELEVATOR SHAFT BEARINGS

No.	Bag#	Description	Qty
1	Frame	Upper Frame (from Frame Bag)	2
2	1	5X10X4Flanged Bearing	2

Note: The holes on the frames are designed for “push-fit” feature. Sometime you may have to sand them a little bit before pushing the bearings in. The bearing flange mates against the inside of the frame.

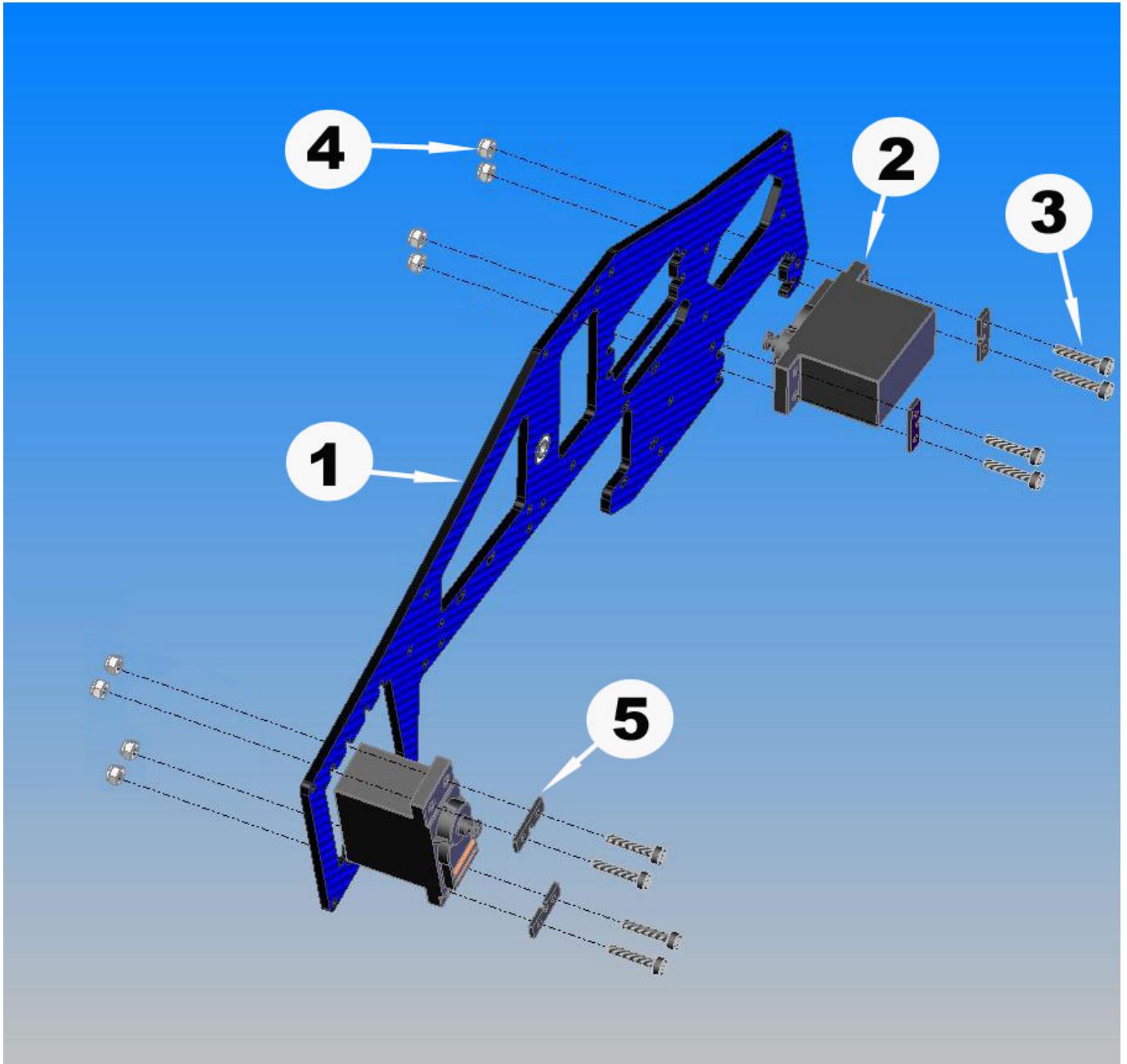


1-2 LEFTAILERON & RUDDER SERVO SUBASSEMBLY

No.	Bag#	Description	Qty	
1	Step 1-1	L. Upper Frame Subassembly	1	Remember to apply Loctite for the Screws (see Loctite Warning on page 11)
2****		Servo	2	
3	HB	M2.5x16 Cap Head Bolt	8	
4	HB	M2.5 Locknut	8	
5	HB	Fixing Plate	4	

**** Part No. with **** means that part is not included in the kit.

Note: Be sure to use the rubber grommets and eyelets that are provided by the servo manufacturer.

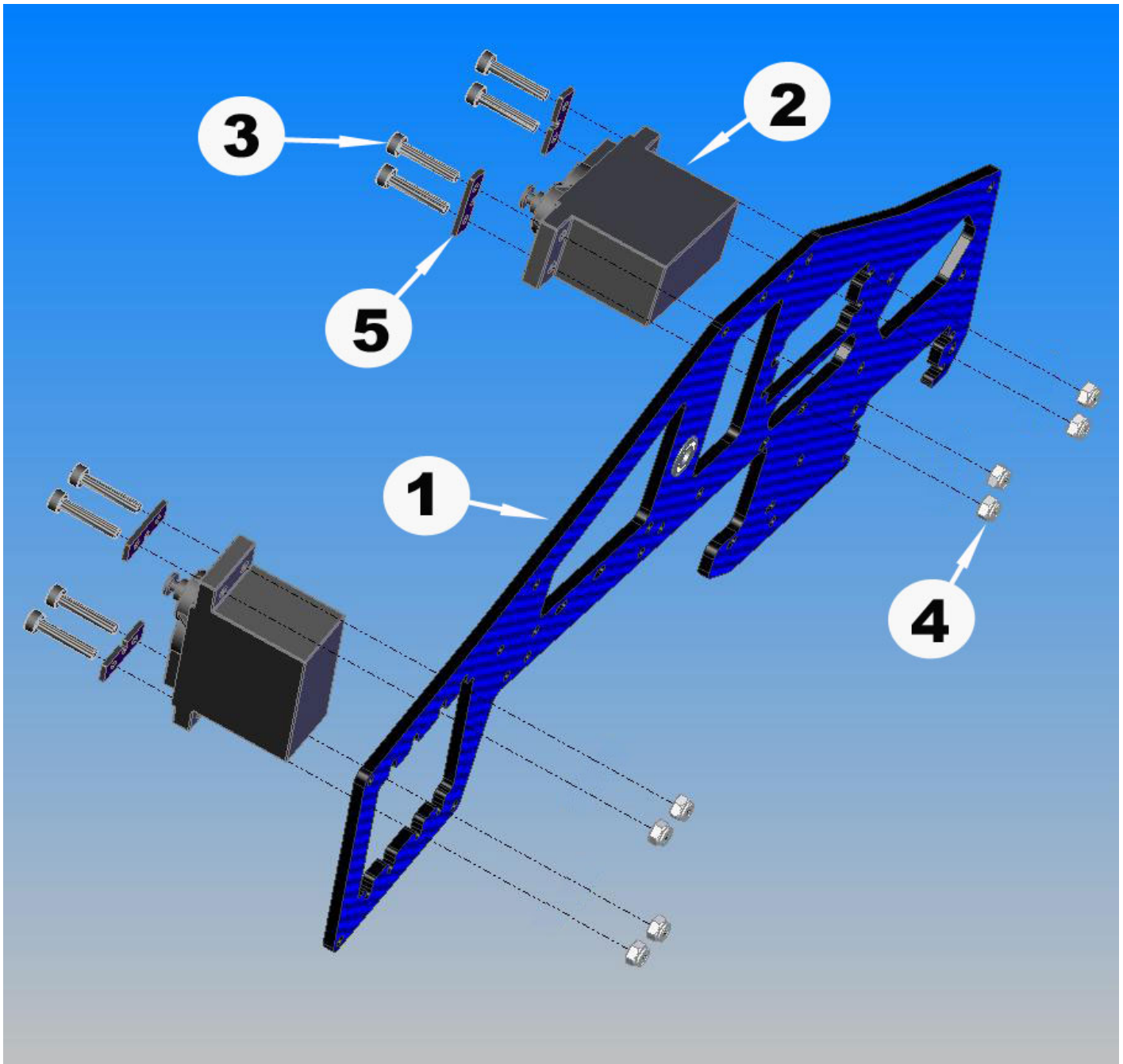


1-3 RIGHT AILERON & ELEVATOR SERVO SUBASSEMBLY

No.	Bag#	Description	Qty
1	Step 1-1	R. Upper Frame Subassembly	1
2****		Servo	2
3	HB	M2.5x16 Cap Head Bolt	8
4	HB	M2.5 Locknut	8
5	HB	Fixing Plate	4

**** Part No. with **** means that part is not included in the kit.

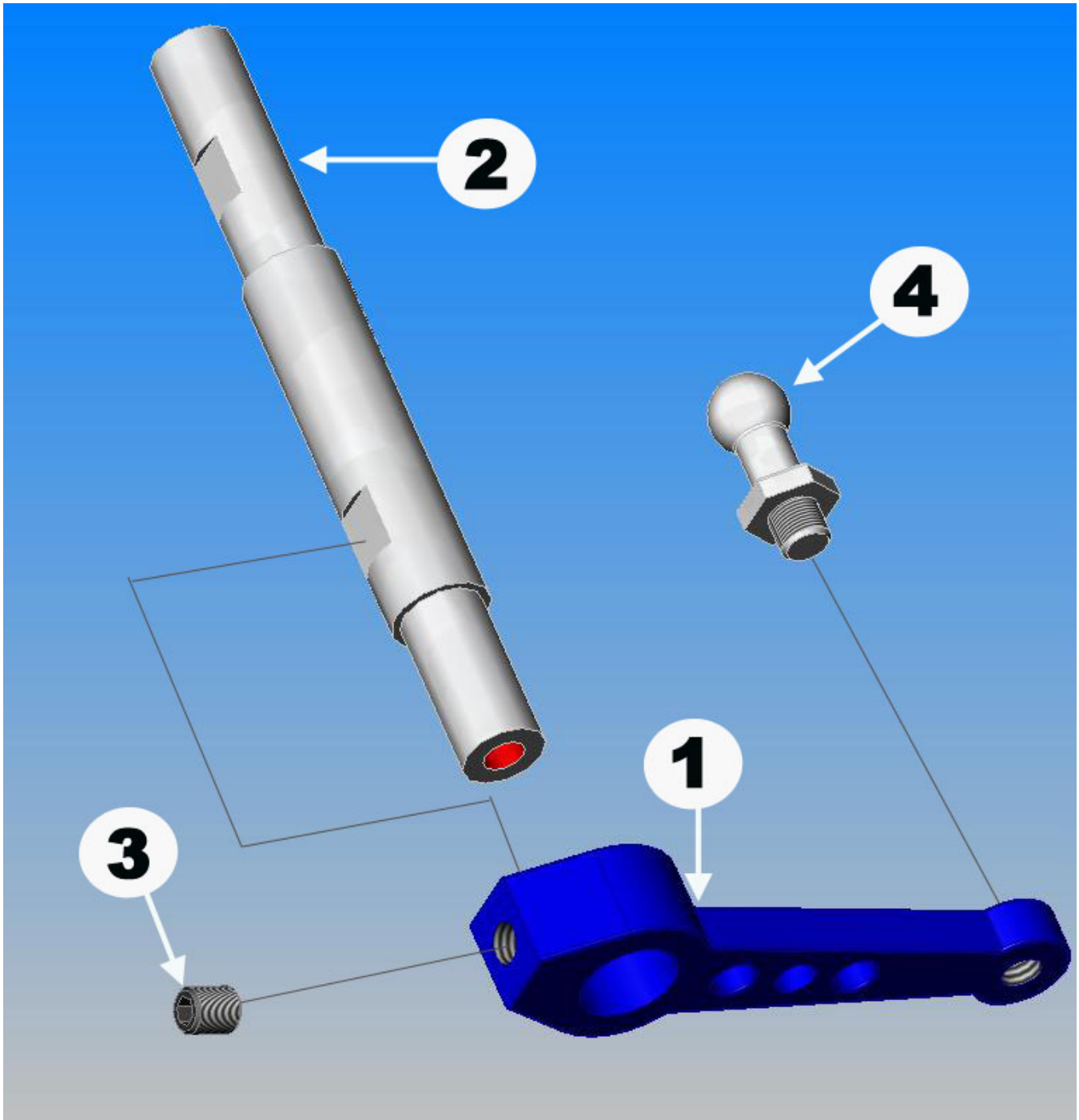
Note: Be sure to use the rubber grommets and brass eyelets that are provided by the servo manufacturer.



1-4 INNER ELEVATOR CONTROL ARM SUBASSEMBLY

No	Bag #	Description	Qty
1	1	Inner Elevator Control Arm	1
2	1	Elevator Control Shaft	1
3	HB	M3x5 Set Screw	1
4	HB	M3x7 Pivot Ball Stud	1

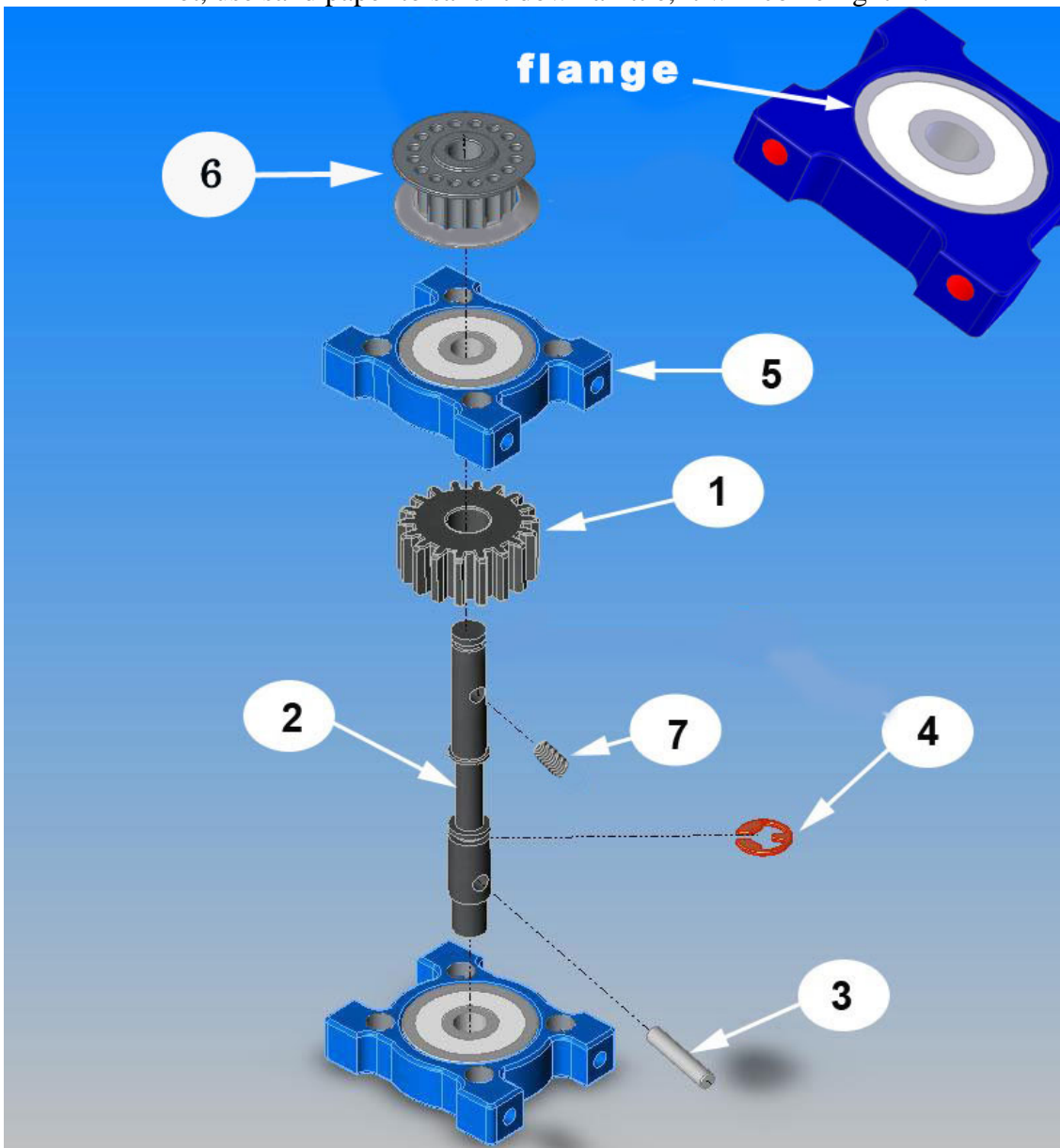
Note: Elevator Control Shaft is designed to fit tightly in M5x11x4 Flange Bearings on the Upper Frames. So before you do the following assembly, check to see if the shaft can go in the bearings or not. If not, use sand paper to sand it down a little, it will come right in.



1-5 TAIL TRANSMISSION ASSEMBLY

No	Bag#	Description	Qty	
1	1	Counter Gear	1	The Bearing Blocks shown may look differently -Install Counter Gear to Counter Gear Shaft using Counter Gear Lock Pin (No. 3) and M4 E-clip to secure it. Apply JP Weld around the Pin. -Put Counter Gear Bearing Block (the lower) in with the Flange facing down -Install Counter Gear Bearing Block (the upper) with the Flange facing up -Install Pulley Gear (No. 6) -Secure Pulley Gear with the M3x3 Set Screw (No. 7) -Secure Pulley Gear with the M3x3 Set Screw (No. 7)
2	1	Counter Gear Shaft	1	
3	1	Counter Gear Lock Pin	1	
4	1	M4 E-clip	1	
5	1	Counter Gear Bearing Block	2	
6	1	Pulley Gear	1	
7	HB	M3x3 Set Screw	1	
8	*****	JP Weld glue	1	

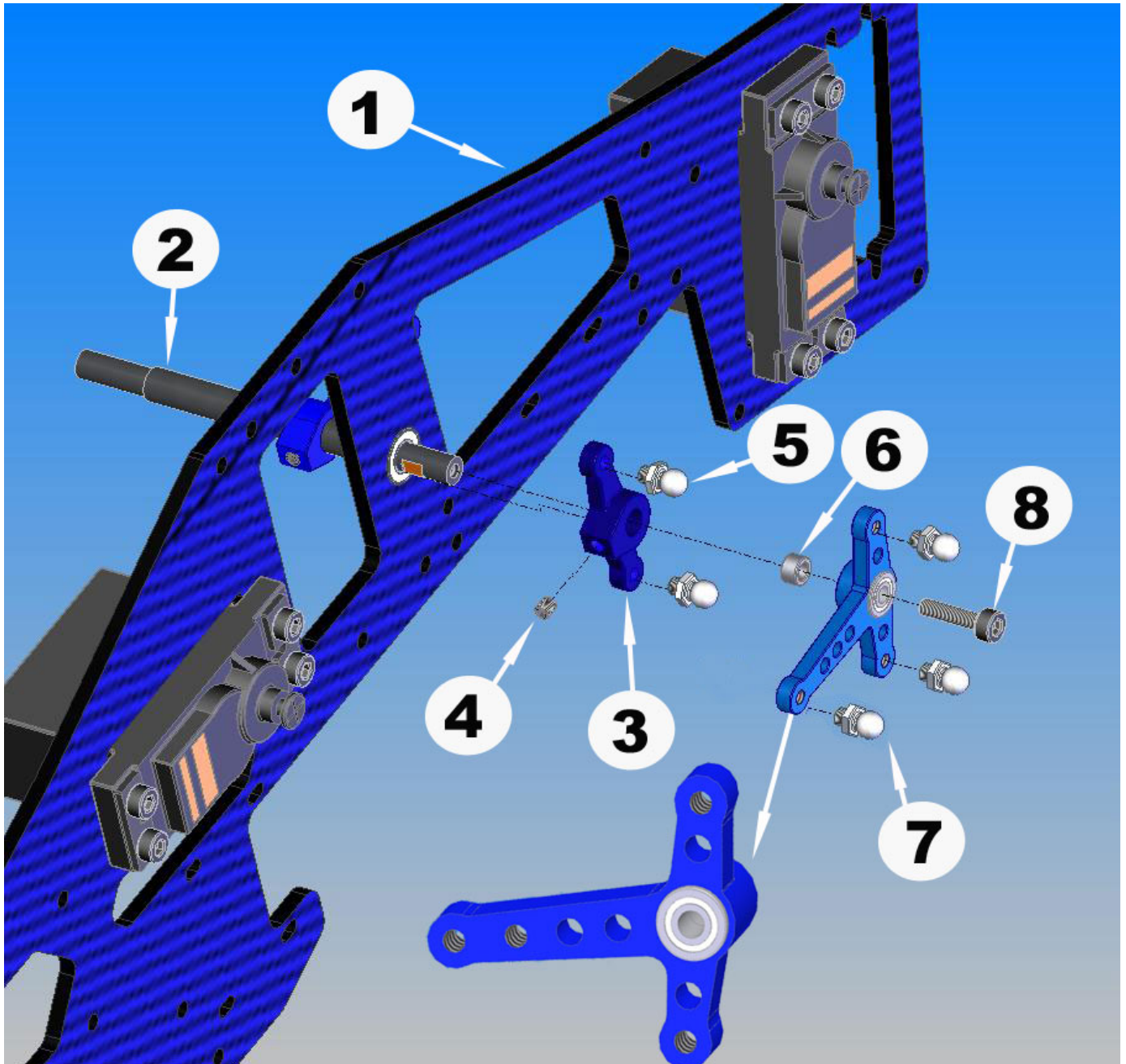
Counter Gear Shaft is designed to fit tightly in bearings on the Bearing Blocks. So before you do the following assembly, check to see if the shaft can go in the bearings or not. If not, use sand paper to sand it down a little, it will come right in.



Note: Counter Gear Bearing Blocks may look differently. Ensure that the Counter Gear Lock Pin is seated all the way down in the slot in the Counter Gear. If it is not seated it will not allow the Bearing Block to go to the proper position and will bind on the Pulley or Gear.

1-6 ELEVATOR CONTROL ARM-RIGHT SIDE

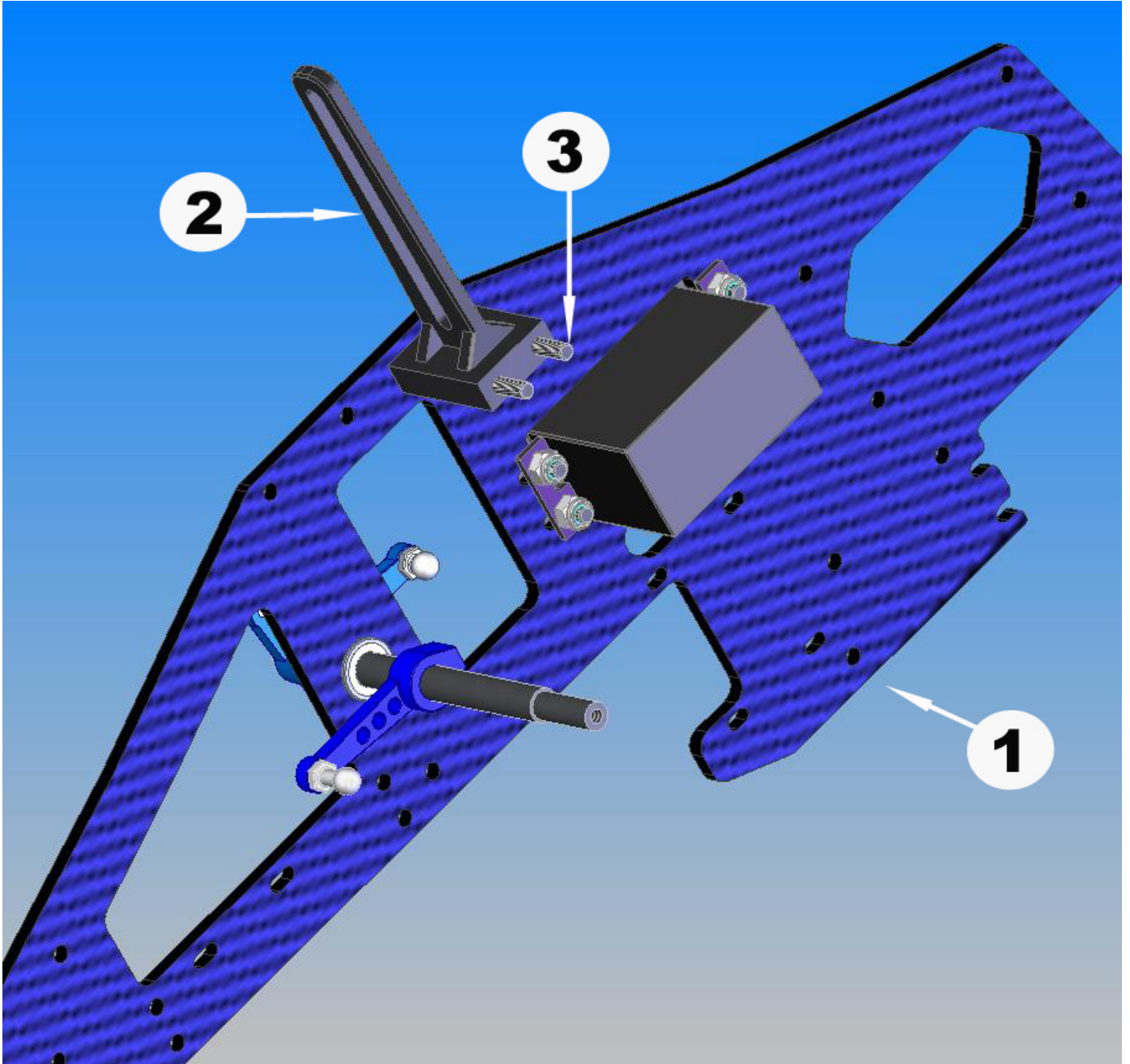
No.	Bag#	Description	Qty
1	Step 1-3	R. A&E Arm Subassembly (step 1-3)	1
2	Step 1-4	Inner El. Ctrl. Arm Subassembly (step 1-4)	1
3	1	Outer Elevator Control Arm	1
4	HB	M3x5 Set Screw	1
5	HB	M3x4 Pivot Ball Stud	5
6	HB	M3x5x3 Spacer	1
7	1	Right Aileron Control Lever	1
8	HB	M3x12 Cap Head Bolt	1



Note: The Elevator Control Shaft is designed to fit tight in the bearings. Sometime, you might have to sand it a little to get it go into the bearings.

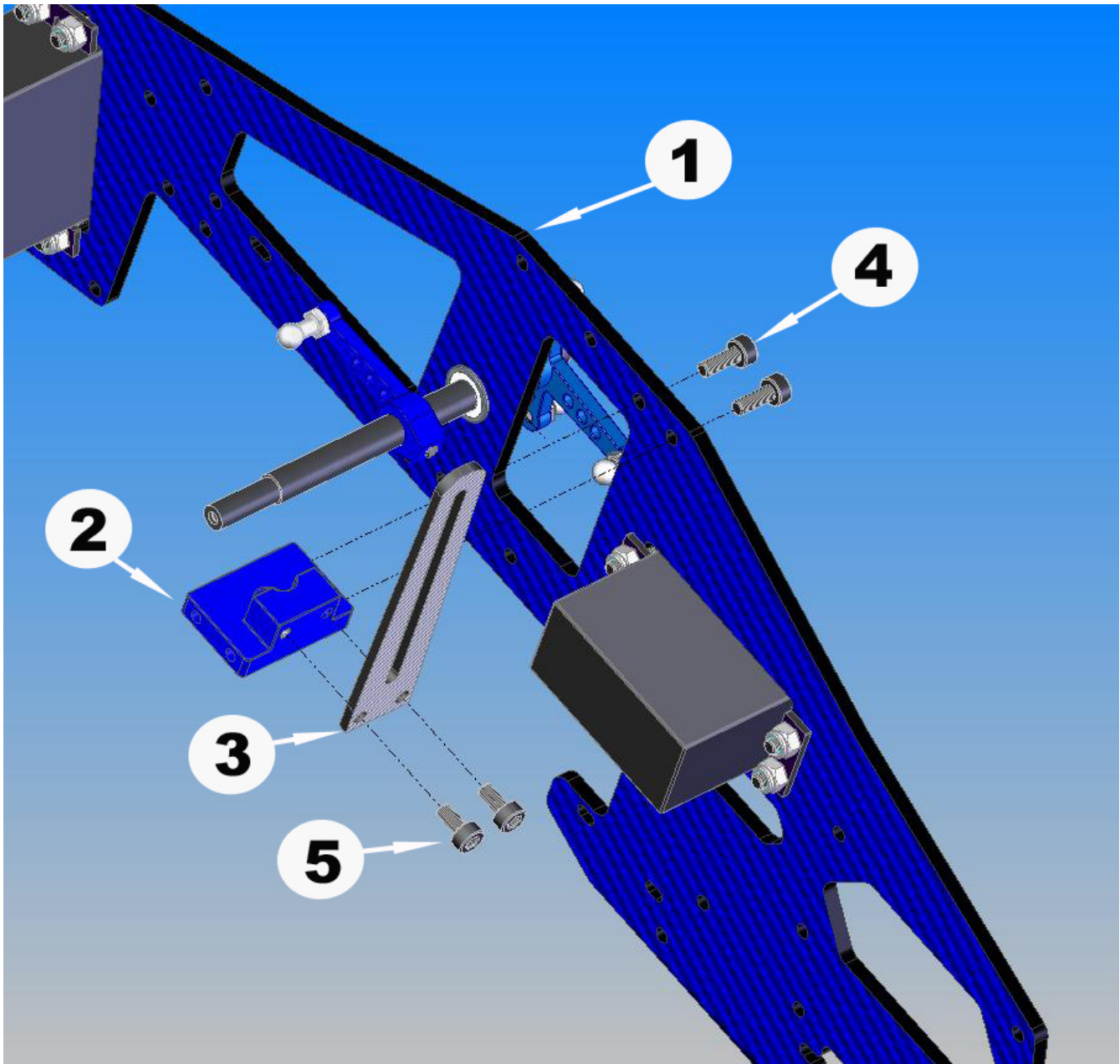
1-7-A ANTI-ROTATION GUIDE ASSEMBLY SPORT VERSION

No.	Bag#	Description	Qty
1	Step 1-6	Right Upper Frame Subassembly	1
2	1	Washout Anti-Rot. Guide	1
3	HB	M3x35 Cap Head Bolt	2



1-7-B ANTI-ROTATION GUIDE ASSEMBLY PRO VERSION

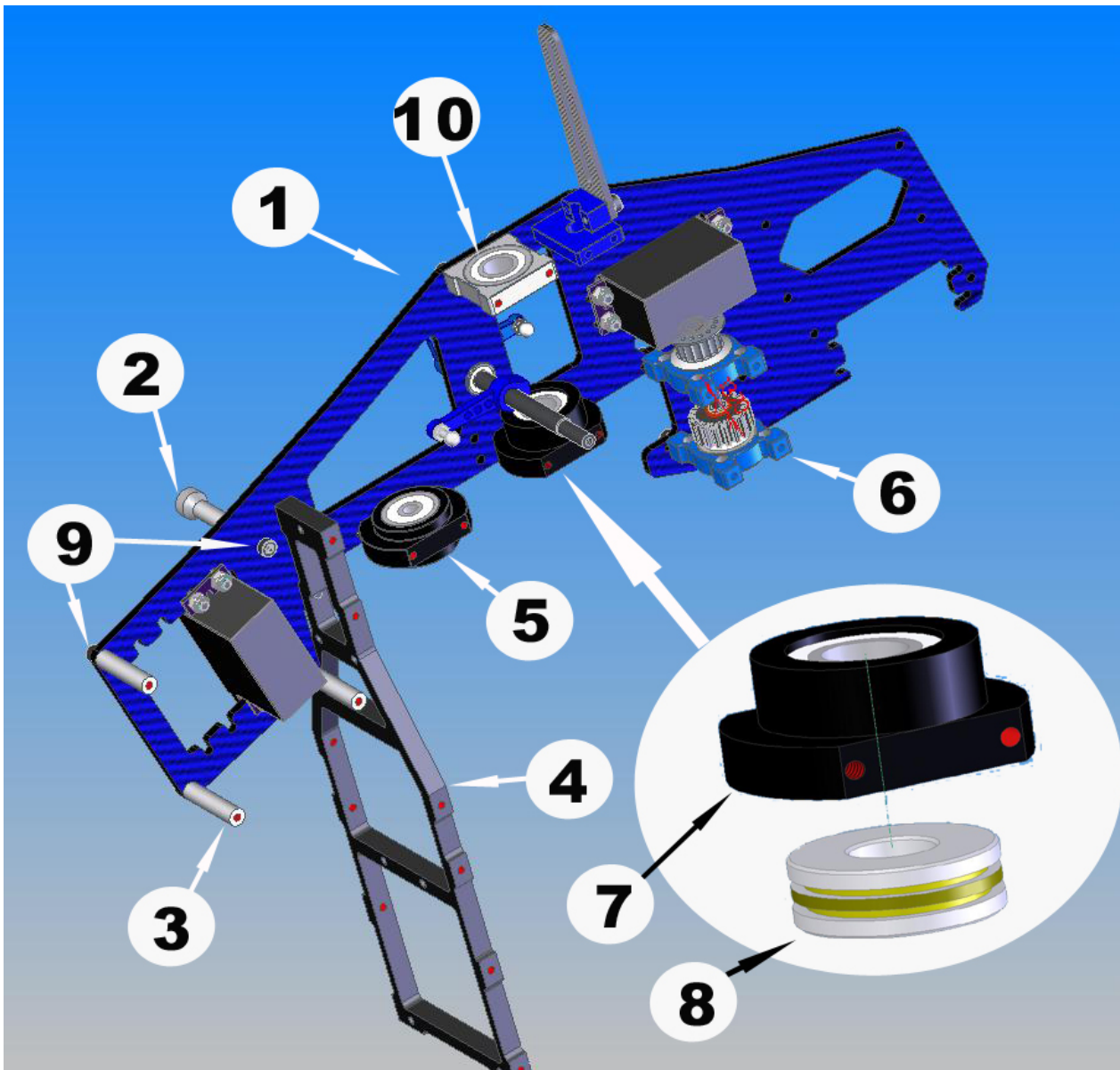
No.	Bag#	Description	Qty
1	Step 1-6	Right Upper Frame Subassembly	1
2	1	Washout Anti-Rotation Guide Base	1
3	Frame	Washout Anti-Rotation Guide	1
4	HB	M3x8 Cap Head Bolt	2
5	HB	M3x6 Cap Head Bolt	2



1-8 RIGHT SIDE ASSEMBLY

No.	Bag#	Description	Qty
1	Step 1-7	Right Upper Frame Subassembly	1
2	1	Short Canopy Standoff	1
3	1	M3x26 Cross Member	3
4	Frame	Bulkhead	1
5	1	Clutch Bearing Block	1
6	Step 1-5	Tail Transmission Assembly	1
7	1	Lower Main Shaft Bearing Block	1
8	1	10x24x9 Thrust Bearing	1
9	HB	M3x8 Cap Head Bolt	16
10	1	Upper Main Shaft Bearing Block	1
11	HB	M3x7 Flat Washer	6

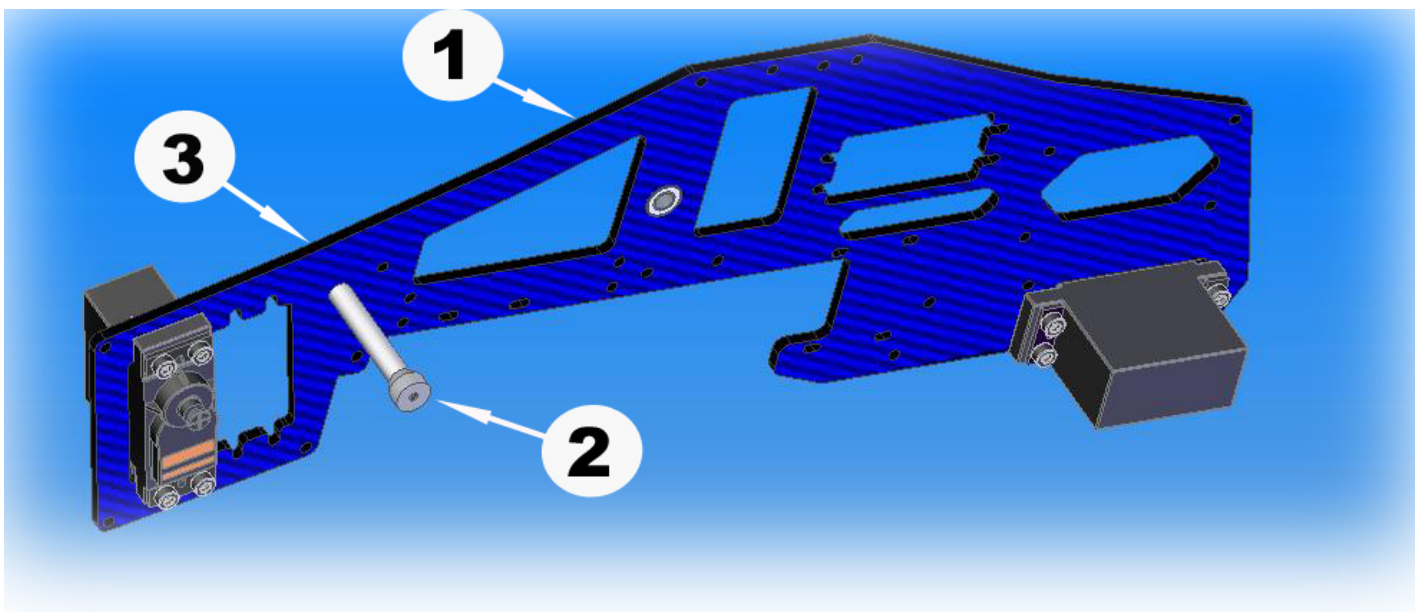
Note: the flange of the Upper Main Shaft Bearing Block should face down. For the Clutch Bearing Block, the side with the smaller bearing should be face up. Use M3x7 Flat Washer when attaching the Tail Transmission Assembly and Clutch Bearing Block to the frame.



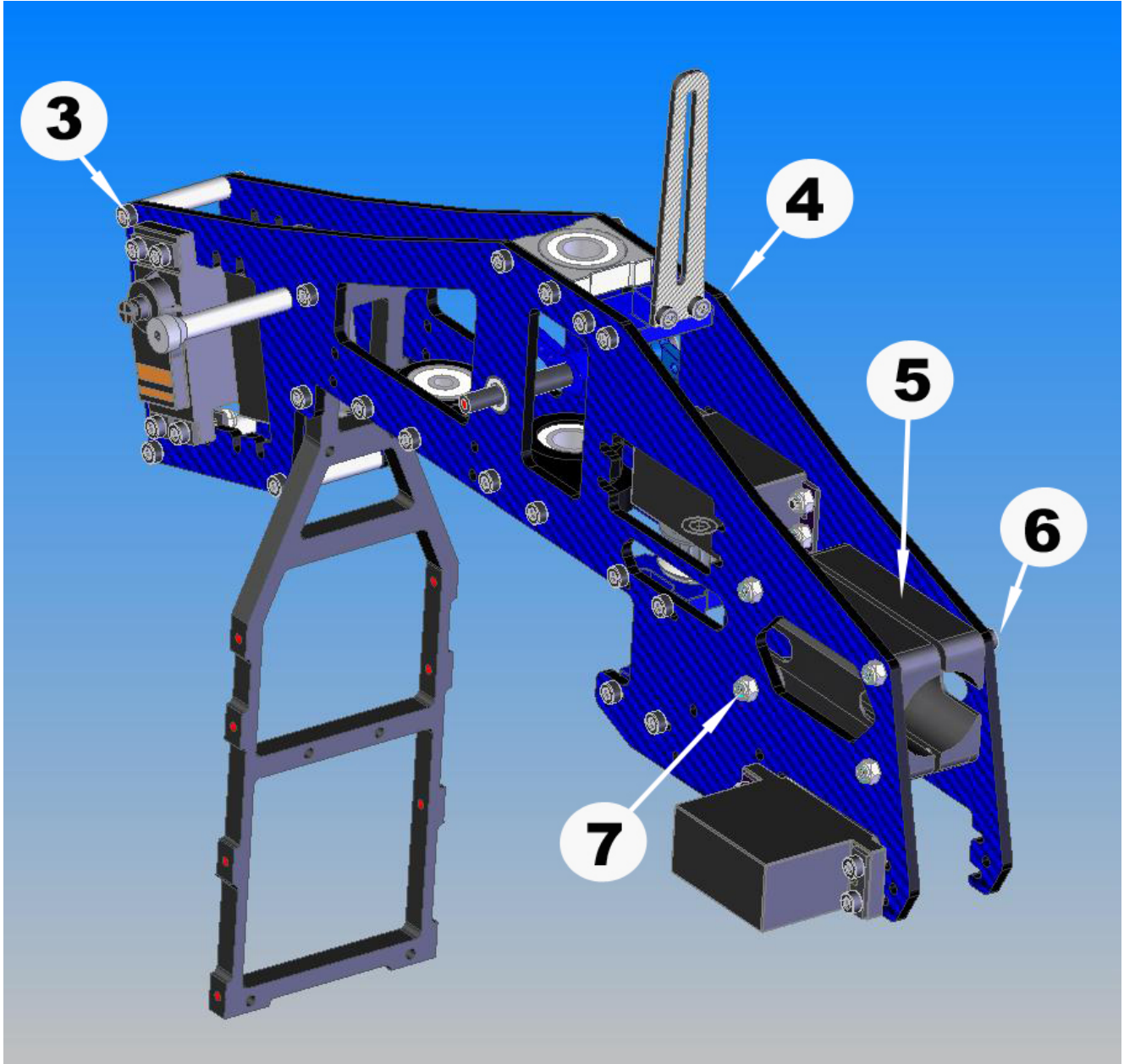
1-9 UPPER FRAME INSTALLATION

No.	Bag#	Description	Qty
1	Step 1-2	Left Upper Frame Assembly	1
2	1	Short Canopy Standoff	1
3	HB	M3x8 Cap Head Bolt	18*
4	Step 1-8	Right Upper Frame Assembly	1
5	1	Boom Holder	2
6	HB	M3x35 Cap Head Bolt	4
7	HB	M3 Locknut	4*
8	1	Left Aileron Arm Control Lever	1
9	HB	M3x4 Pivot Ball Stud	3
10	HB	M3x5x3 Spacer	1
11	HB	M3x12 Cap Head Bolt	1
12	HB	M3x7 Flat Washer	6

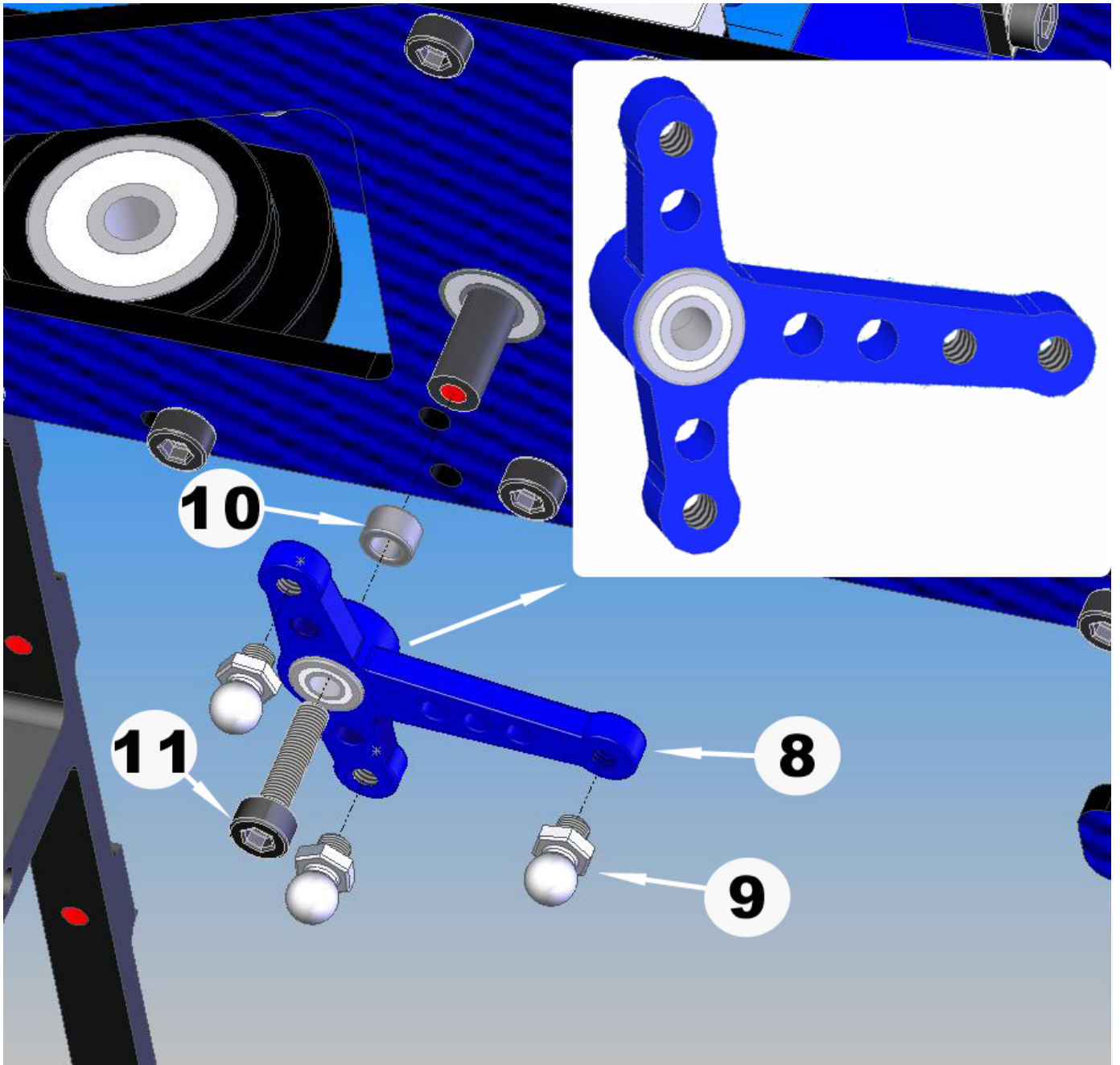
*Note: For the Sport Version, you need 16 M3x8 Cap Head Bolts and 6 M3 Locknuts.



Attach the right side and left side together using M3x8 Cap Head Bolts and M3 Locknuts. Remember to use M3x7 Flat Washer for attaching the Tail Transmission Assembly and Clutch Bearing Block to the frame. For the Boom Holder, keep the locknuts loose for installing the Tail later.



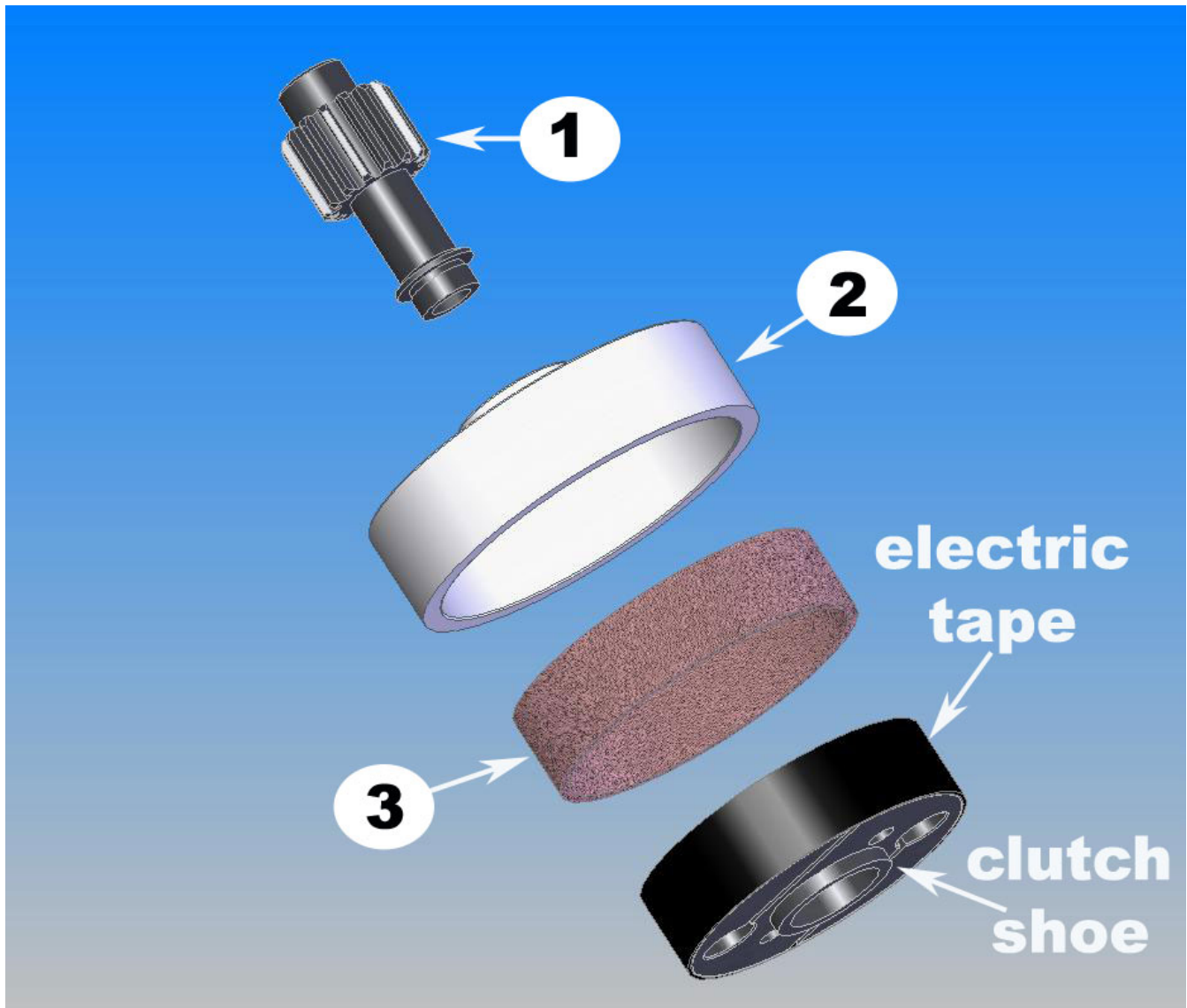
Note: The Elevator Control Shaft is designed to fit tight in the bearings. Sometime, you might have to sand it a little to get it go into the bearings.

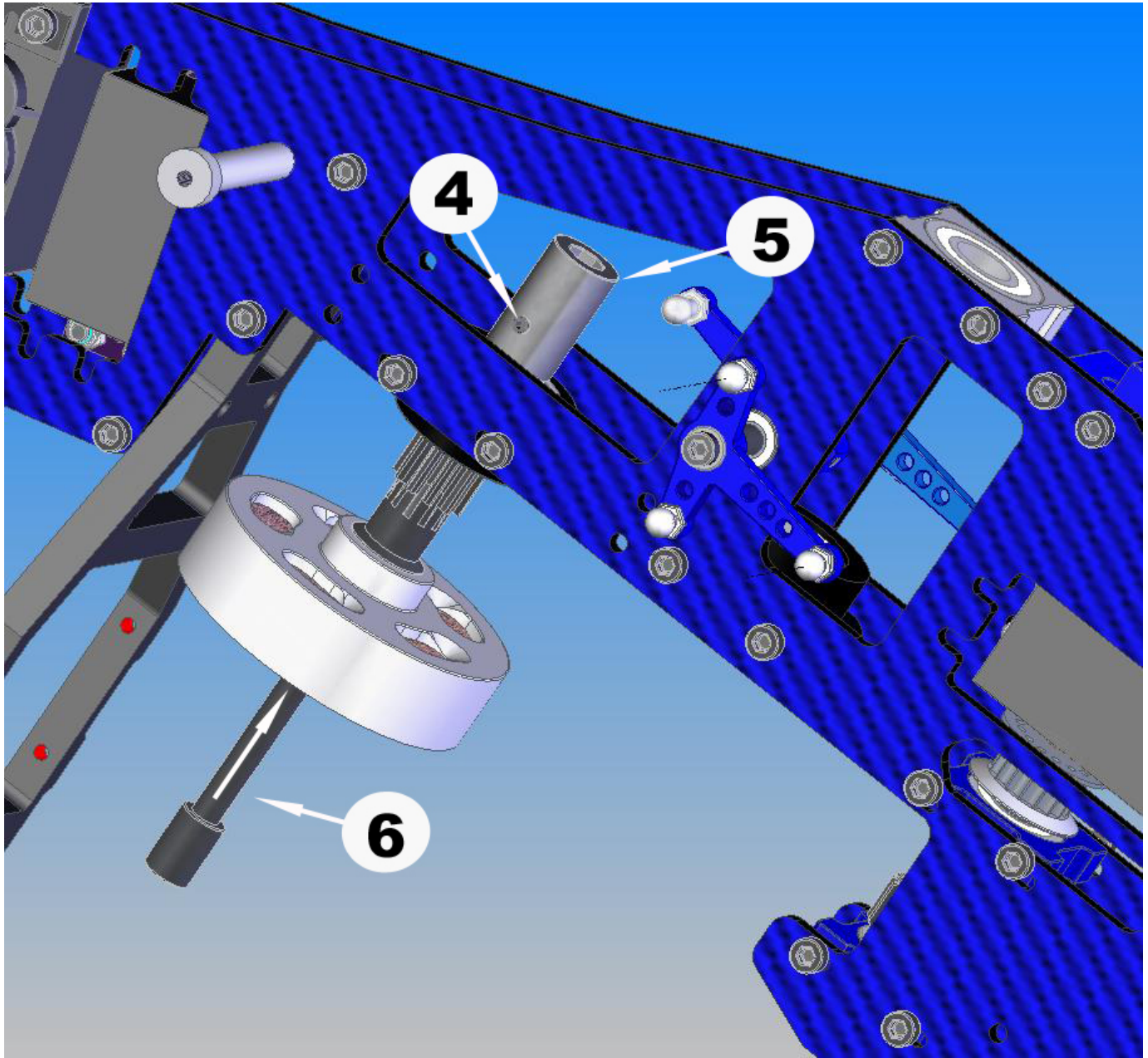


1-10 CLUTCH BELL ASSEMBLY

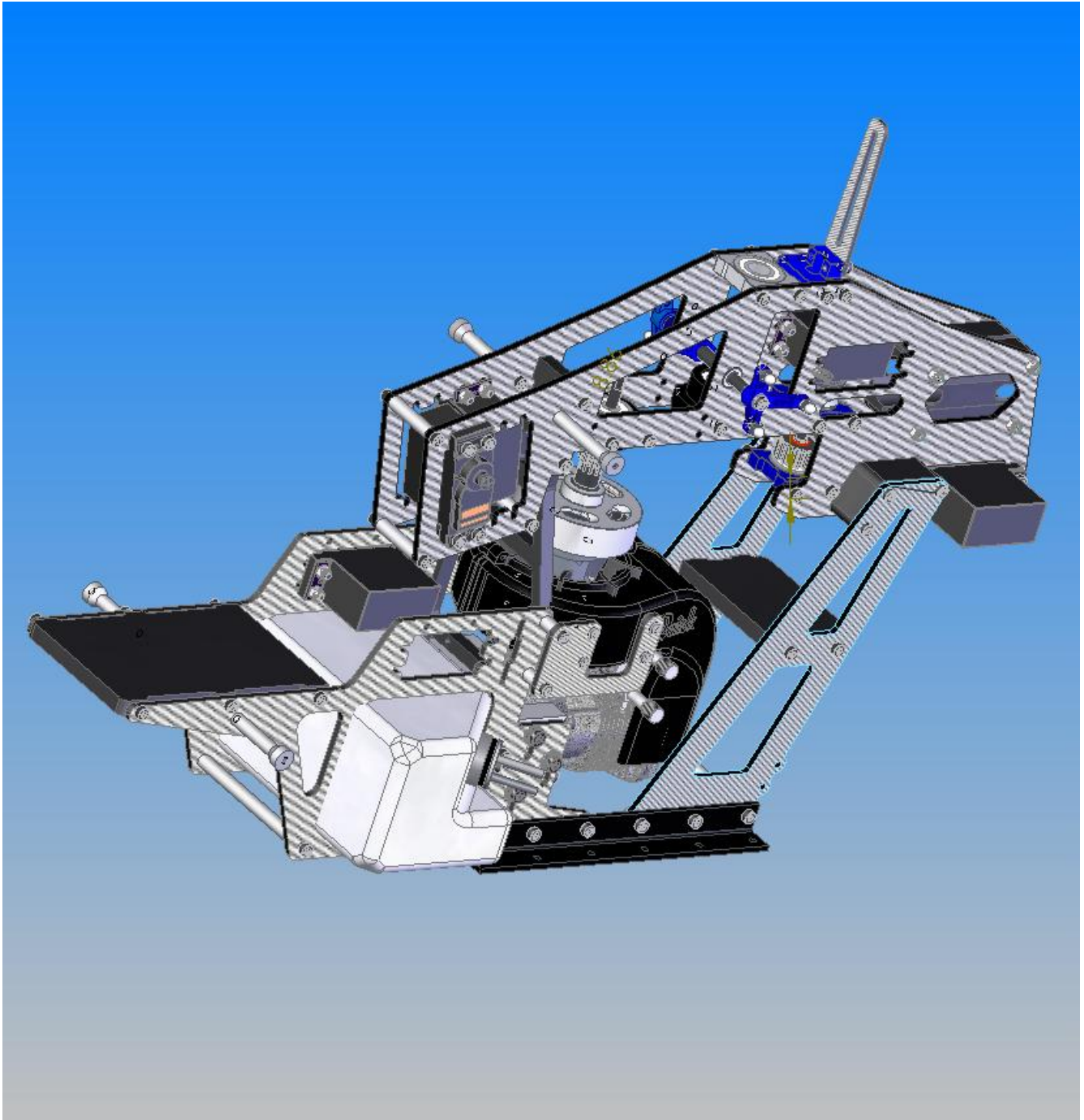
No.	Bag#	Description	Qty
1	1	Pinion Gear	1
2	1	Clutch Bell	1
3	1	Clutch Shoe Lining	1
4	HB	M4x4 Set Screw	1
5	1	Start Coupler	1
6	1	Start Shaft	1
7****		Electronic Tape	1

Install (1) Clutch Lining into (1) Clutch Bell. **Note:** The recommended adhesives for installing the clutch lining are JB Weld or 10 Min + Epoxy. Prepare the clutch bell by scuffing the interior surface rough. Put the Clutch Lining in the Clutch Bell and mark it for cutting (the length is around 143mm). Cut the Clutch Lining. Apply the adhesive thin and even and finish the installation by inserting and finishing the clutch lining. **Trick:** Use electric tape wrap around the Clutch Shoe (in bag # 2) one time. Then insert the Clutch Shoe into the Clutch Bell. Clean up any excess adhesive. Let it sit there until the adhesive dry out then take the Clutch Shoe and electric tape off. Check label on the adhesive bottle for drying time.



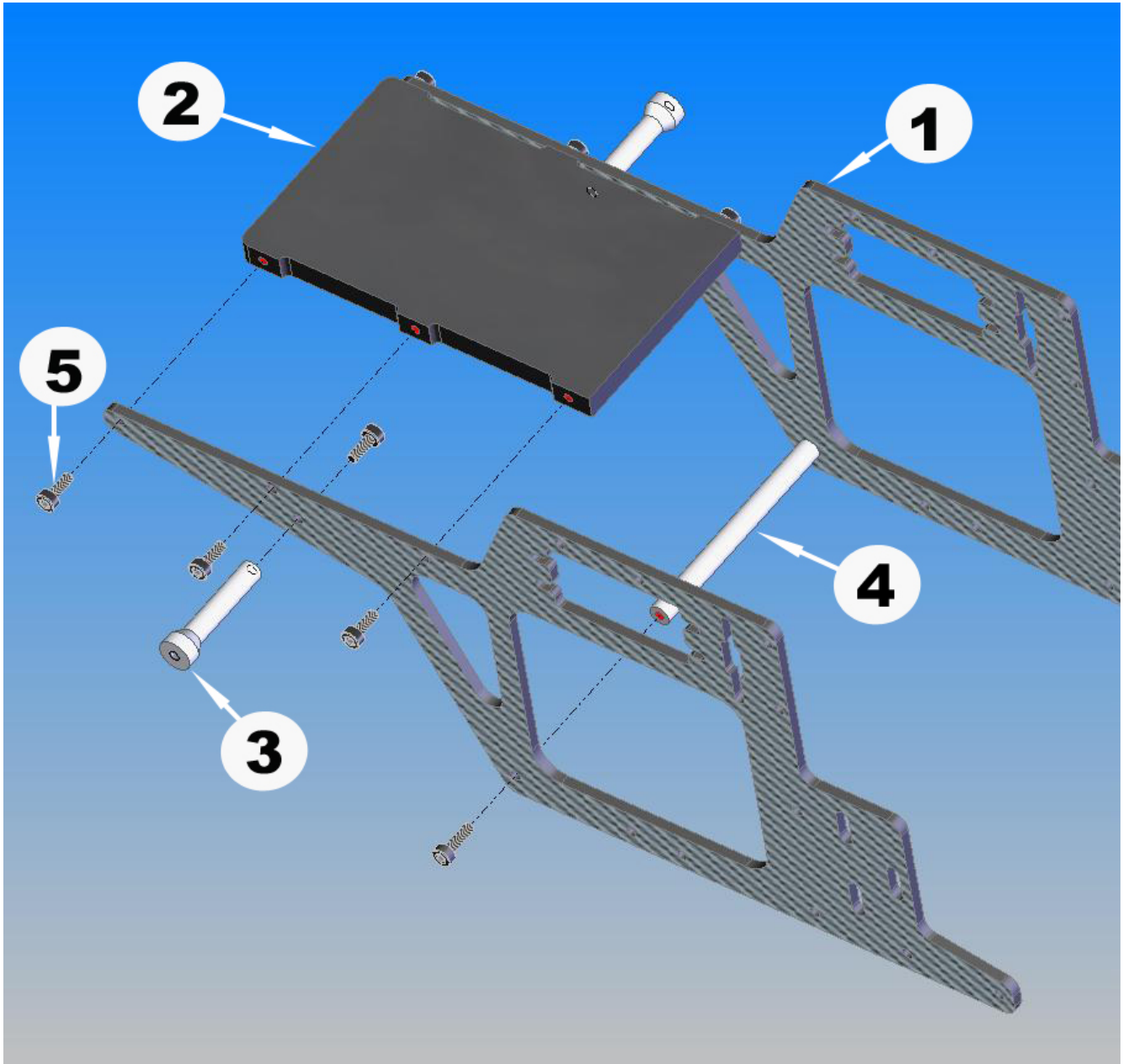


It is very important to use a Dialing Indicator to check the run out of the Clutch Bell. The run out should be no more than 0.004 inch (0.10 mm).



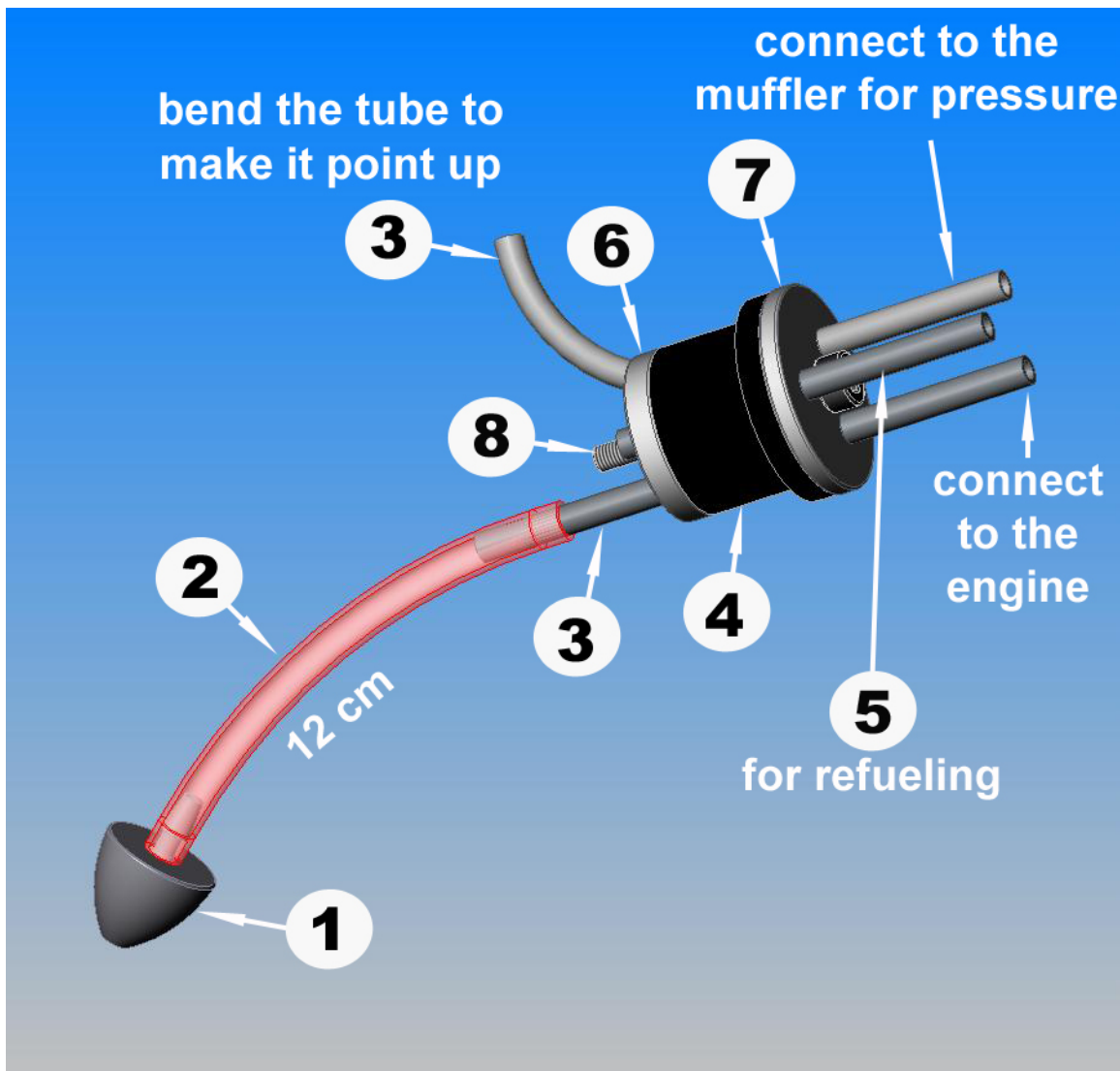
2-1 RADIO TRAY ASSEMBLY

No.	Bag#	Description	Qty
1	Frame	Front Lower Frame	2
2	Frame	Radio Tray	1
3	2	Long Canopy Standoff	2
4	2	M3x66 Cross Member	1
5	HB	M3x8 Cap Head Bolt	10

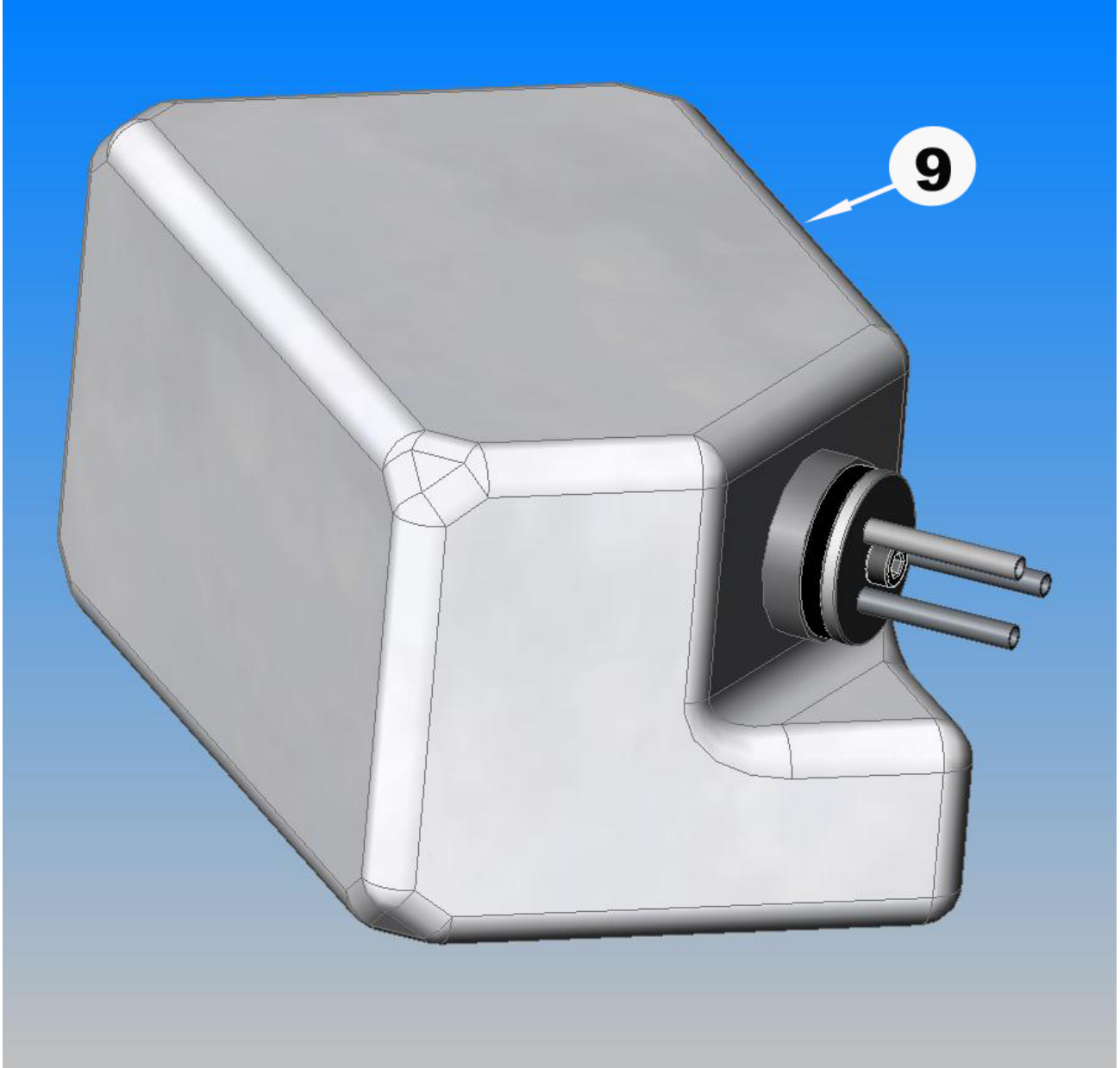


2-2 FUEL TANK ASSEMBLY

No.	Bag#	Description	Qty
1	In box	Tank Clunk	1
2****		12 cm Hose	1
3	In box	Long Tube	2
4	In box	Tank Rubber Plug	1
5	In box	Short Tube	1
6	In box	Tank Fuel Plug Bottom Flange	1
7	In box	Tank Fuel Plug Top Flange	1
8	In box	M3x25 Cap Head Bolt	1
9	In box	Fuel Tank	1



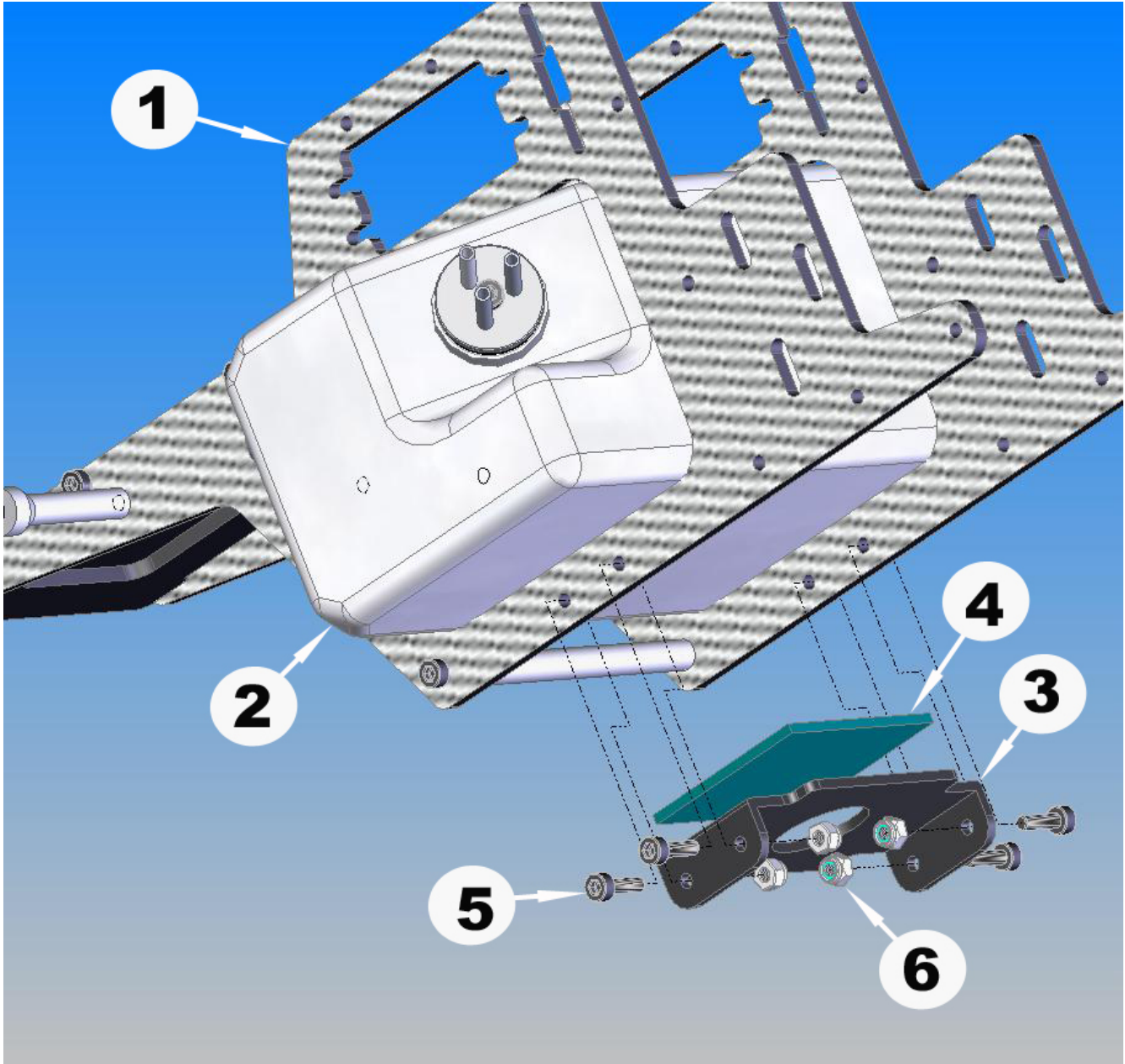
- There are three (3) lines (Aluminum fuel tubing) that need to be constructed for the tank assembly. Depending on the engine you use, you may need only two (2) lines. One line is the fuel pick-up line and requires a length of silicon fuel tubing running from end of alum. Tube to clunk – which should be centered in tank. The other line is pressure-line, which should be bent to reach the top of the tank on the inside. The third line will generally be plugged. Tighten rubber stopper screw – but do not over tighten or you will ruin rubber stopper!
- Insert the whole construction into the Fuel Tank.



2-3 FUEL TANK INSTALLATION

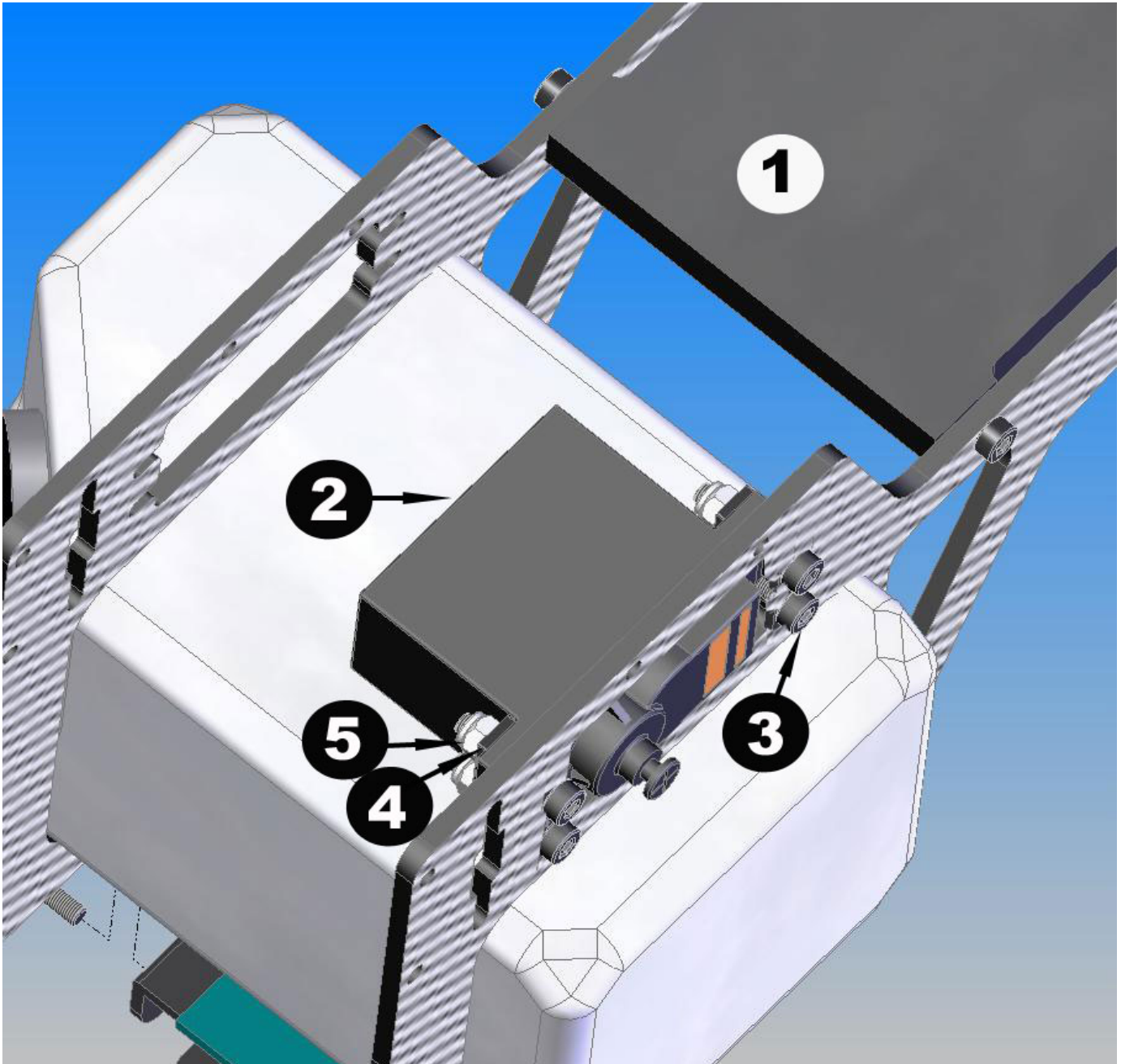
No.	Bag#	Description	Qty
1	Step 2-1	Radio Tray Assembly	1
2	Step 2-2	Fuel Tank Assembly	1
3	2	Fuel Tank Mount Plate	1
4****		Double Side Tape	1
5	HB	M3x10 Cap Head Bolt	4
6	HB	M3 Locknut	4

Fuel Tank fit tightly in Front Frames. Sometimes, the frames need to be sanded a little to fit the tank in.



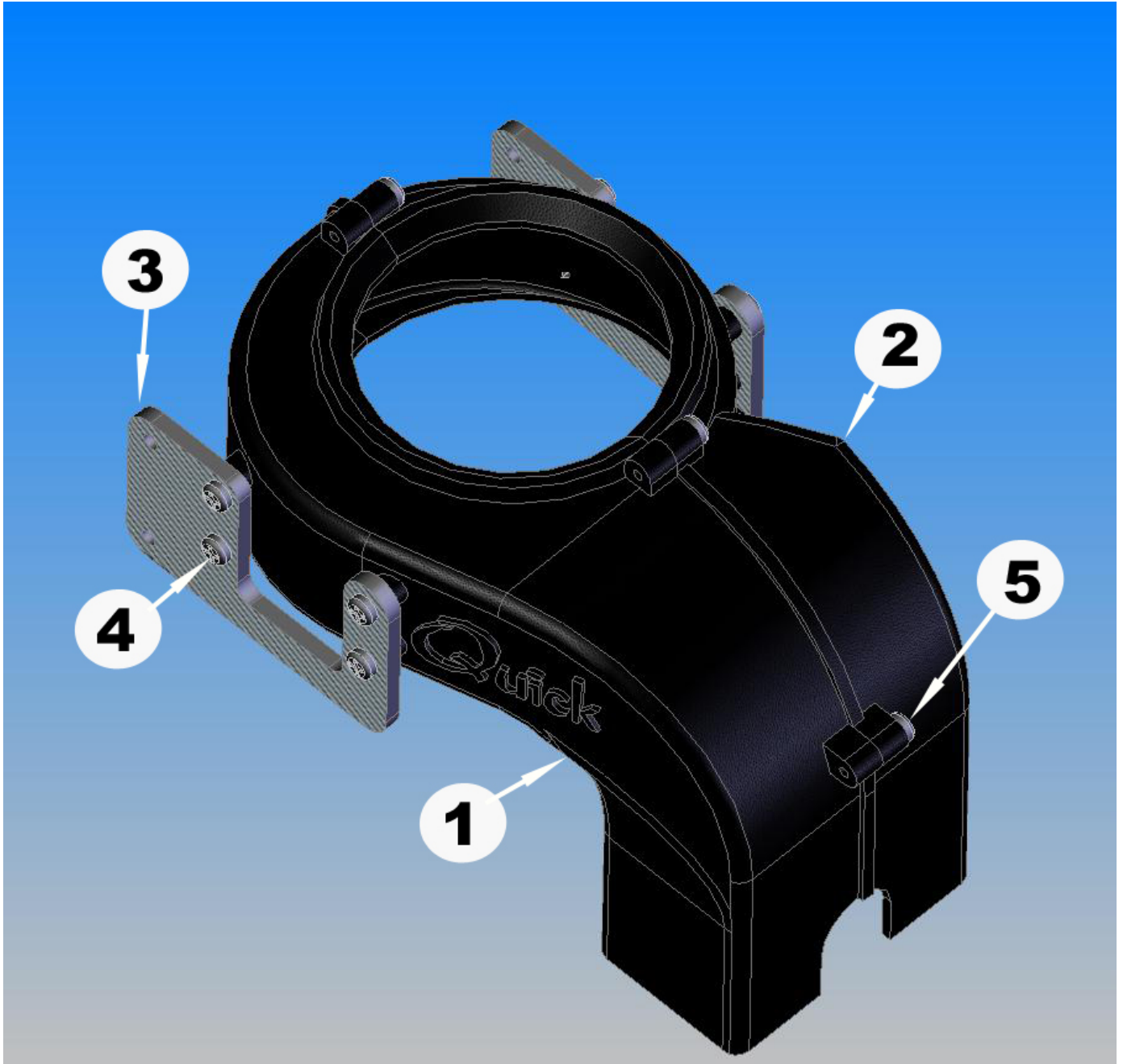
2-4 THROTTLE SERVO ASSEMBLY

No.	Bag#	Description	Qty
1	Step 2-3	Fuel Tank Installation	1
2****		Servo	1
3	HB	M2.5x16 Cap Head Bolt	4
4	HB	Servo Fixing Plate	2
5	HB	M2.5 Locknut	4



2-5 FAN SHROUD ASSEMBLY

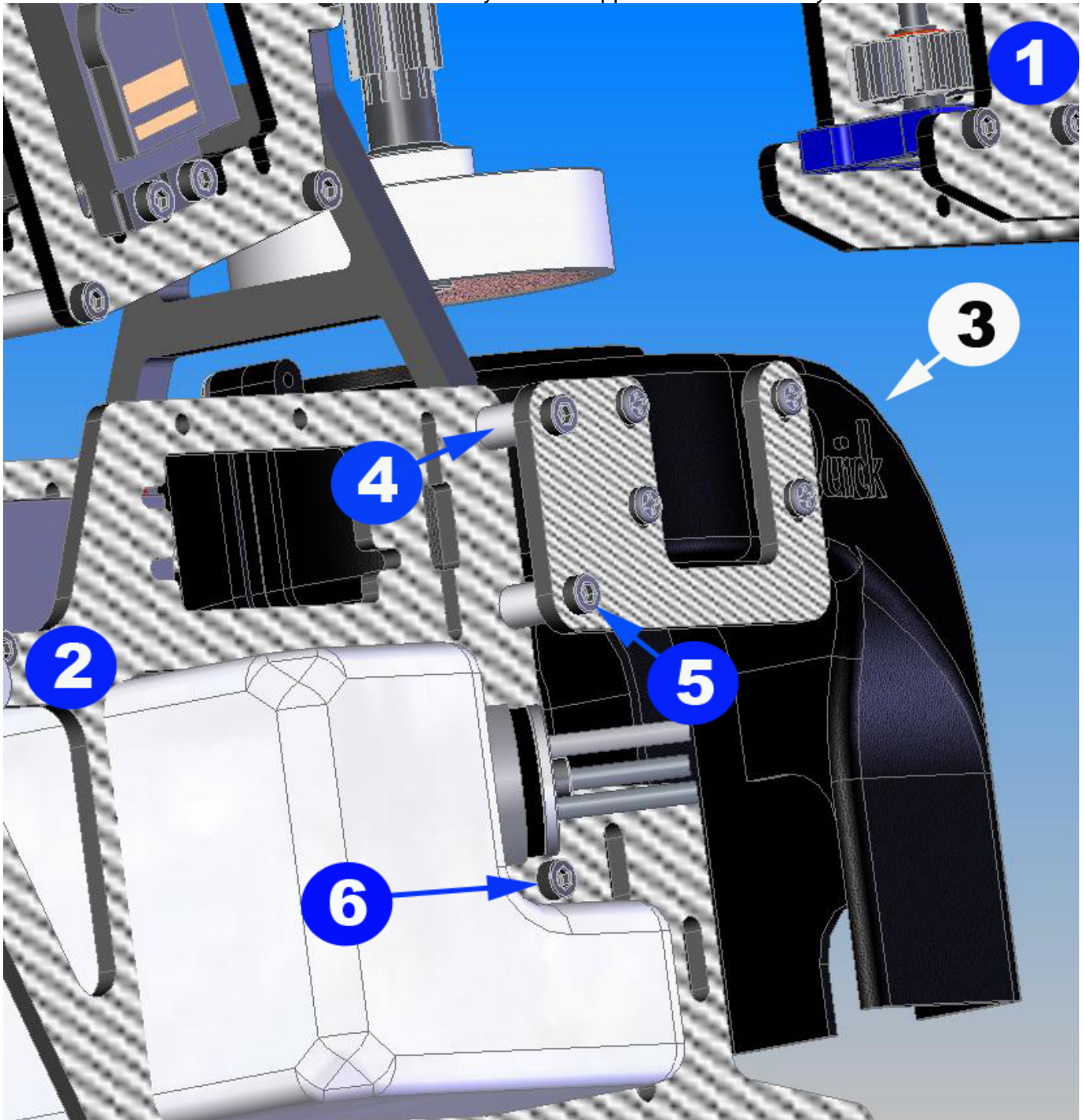
No.	Bag#	Description	Qty
1	In box	Left Fan Shroud	1
2	In box	Right Fan Shroud	1
3	Frame Bag	Shroud Frame	2
4	HB	2.5x6 Cap Head Bolt	8
5	HB	2.5x10 Self-Taping Screw	3

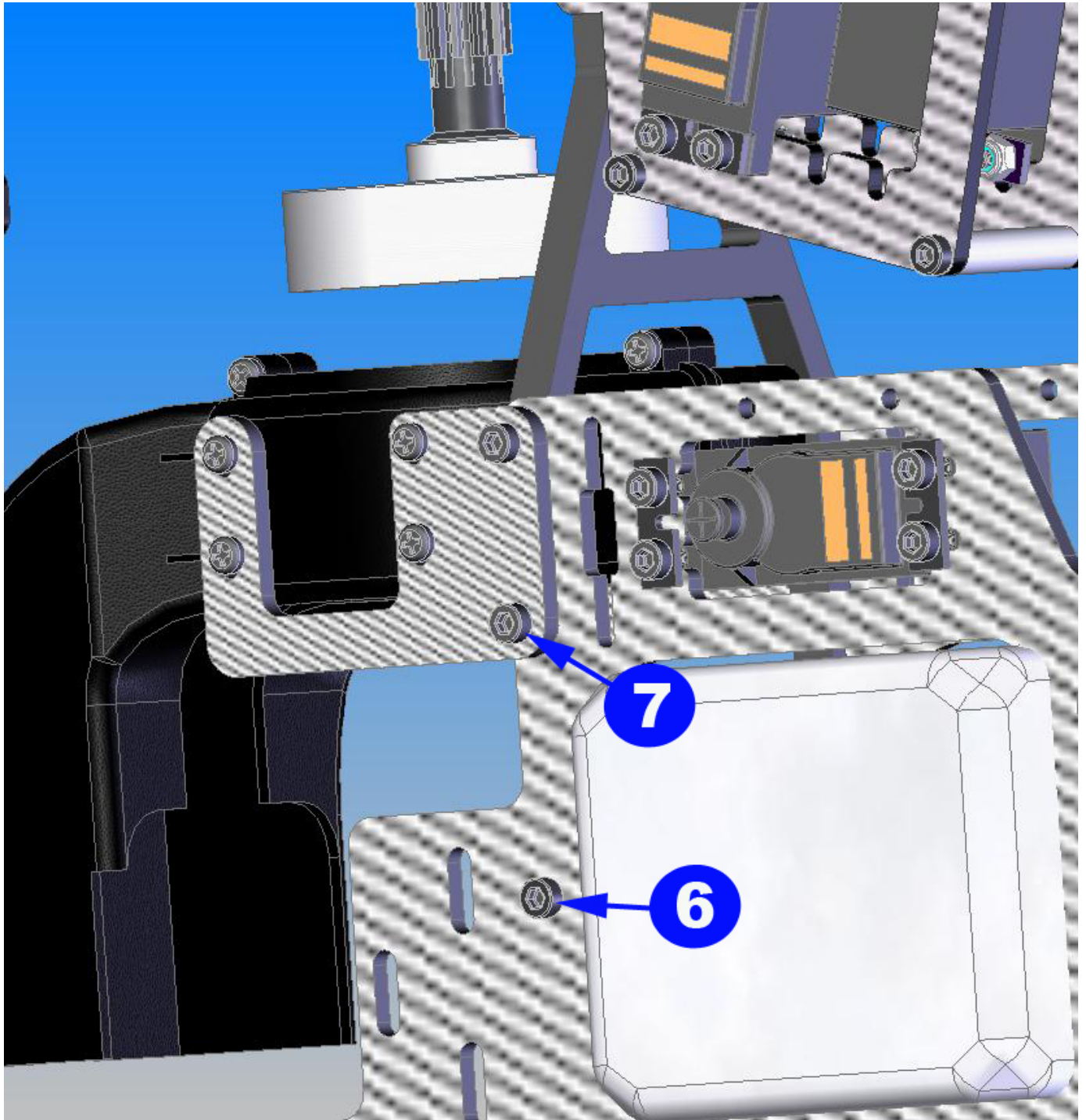


2-6 FRONT LOWER FRAME INSTALLATION

No.	Bag#	Description	Qty
1	Step 1	Upper Frame Assembly	1
2	Step 2-4	Front Lower Frame Assembly	1
3	Step 2-5	Fan Shroud Assembly	1
4	2	M3x6x10 Spacer	2
5	HB	M3x20 Cap Head Bolt	2
6	HB	M3x8 Cap Head Bolt	2
7	HB	M3x10 Cap Head Bolt	2

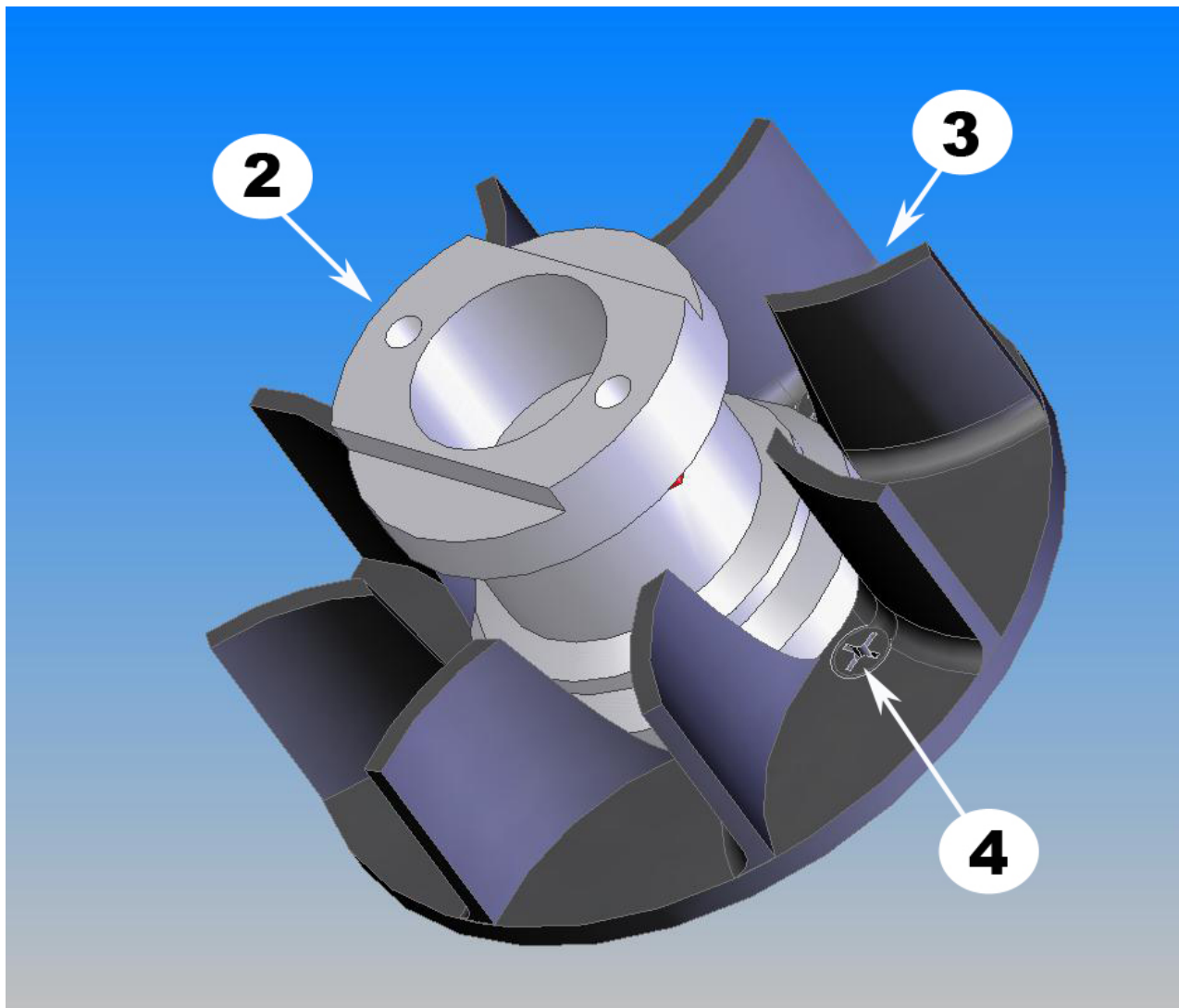
Attach the Front Lower Frame Assembly into the Upper Frame Assembly.

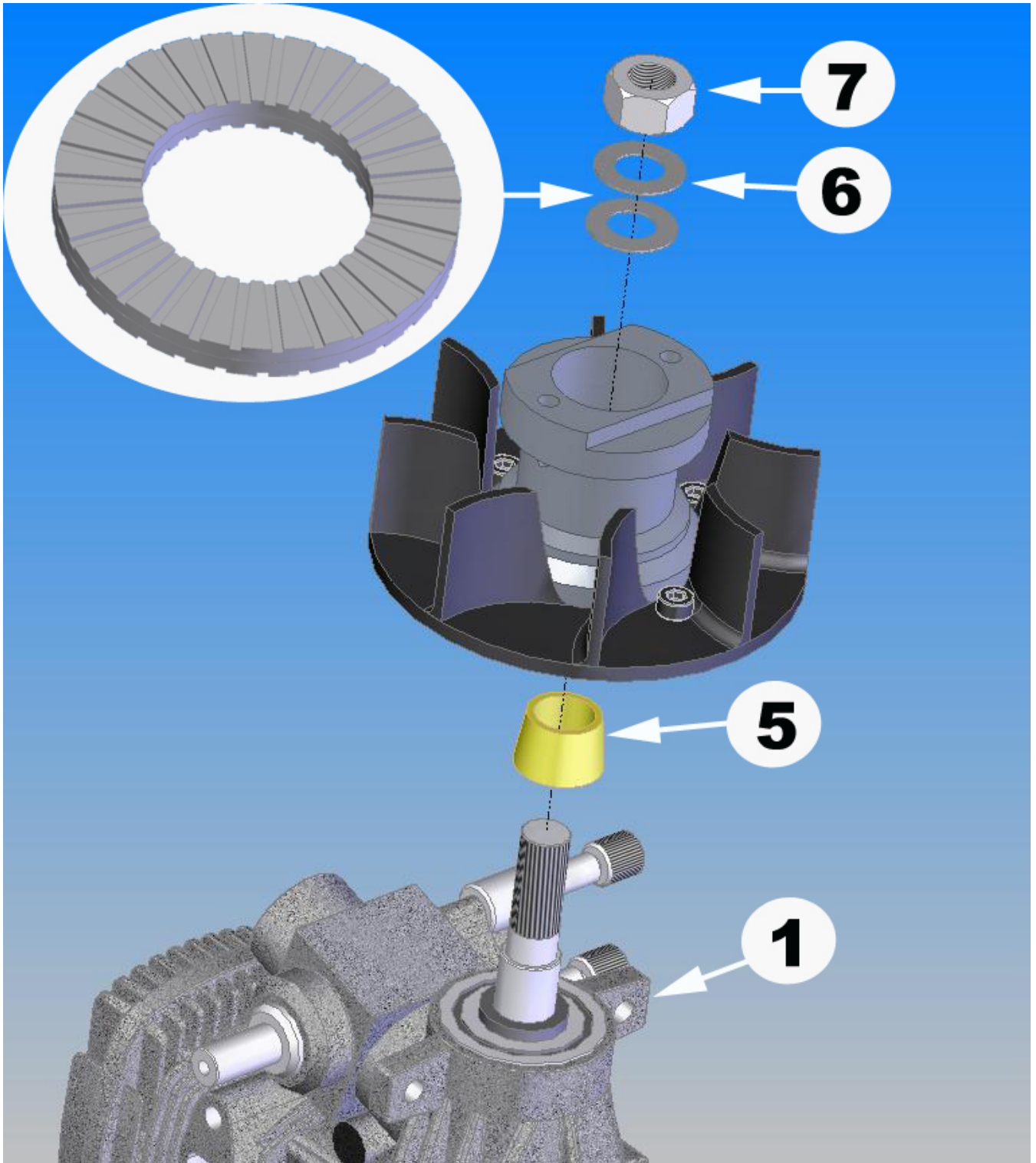


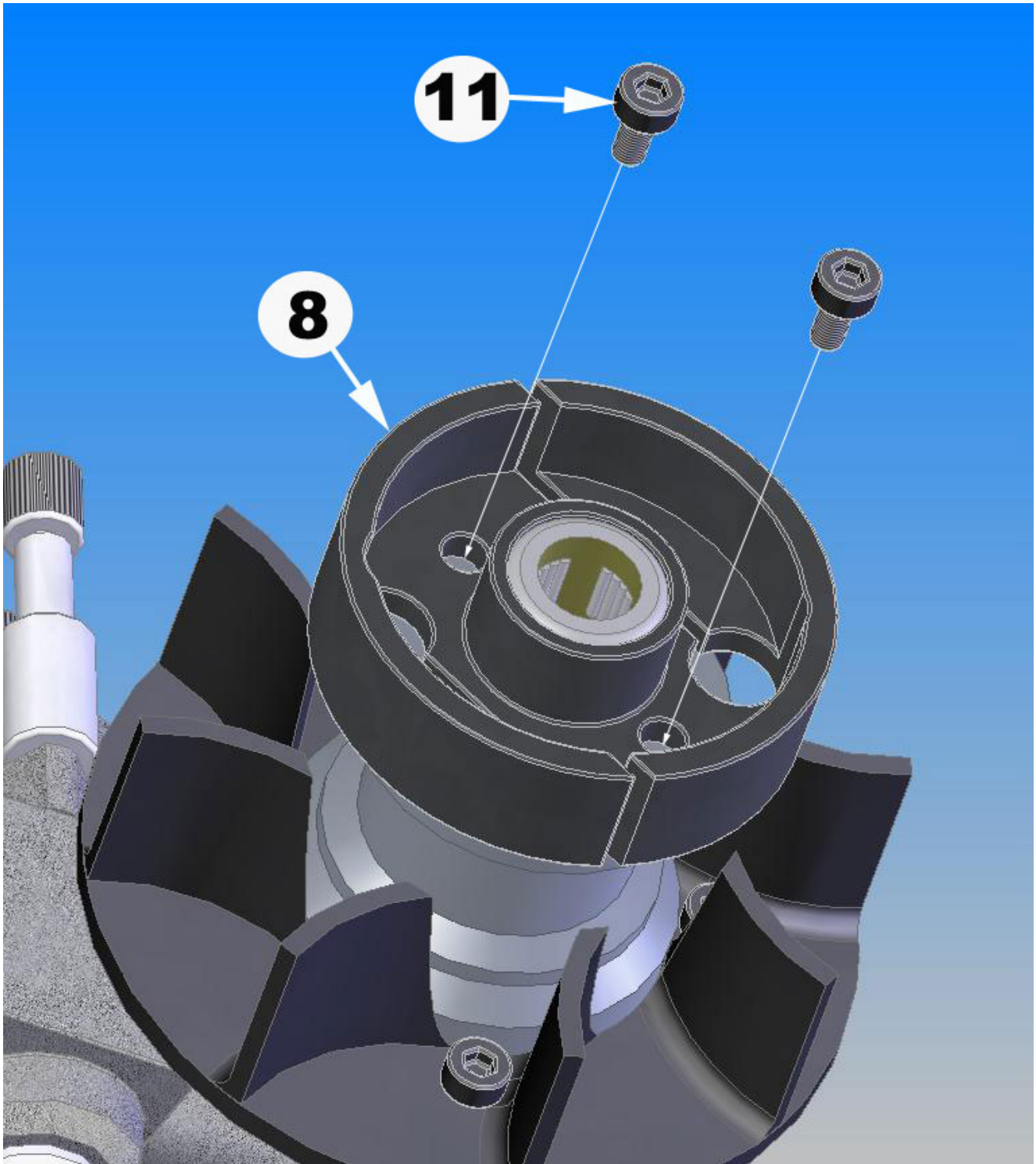


2-7 ENGINE ASSEMBLY

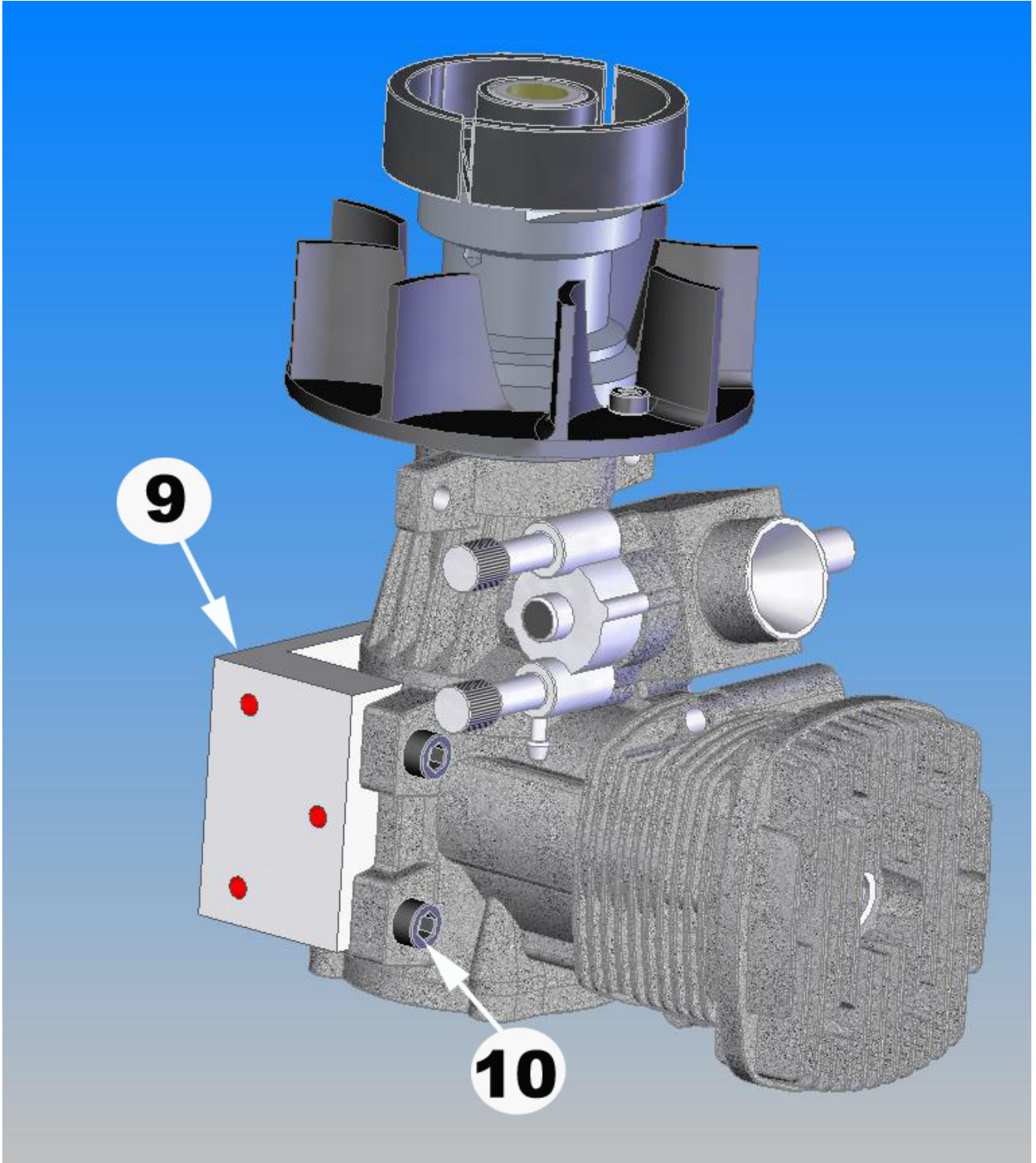
No.	Bag#	Description	Qty
1****		Engine	1
2	2	Fan Hub	1
3	2	Cooling Fan	1
4	HB	M3x6 Flat Head Bolt	4
5	2	Engine Hub Lower Collet	1
6	HB	M8 Nord-Loc Washer	2
7****		M8 Hex Nut	1
8	2	Clutch Shoe	1
9	2	Engine Mount	1
10	HB	M4x12 Cap Head Bolt	4
11	HB	M4x8 Cap Head Bolt	2





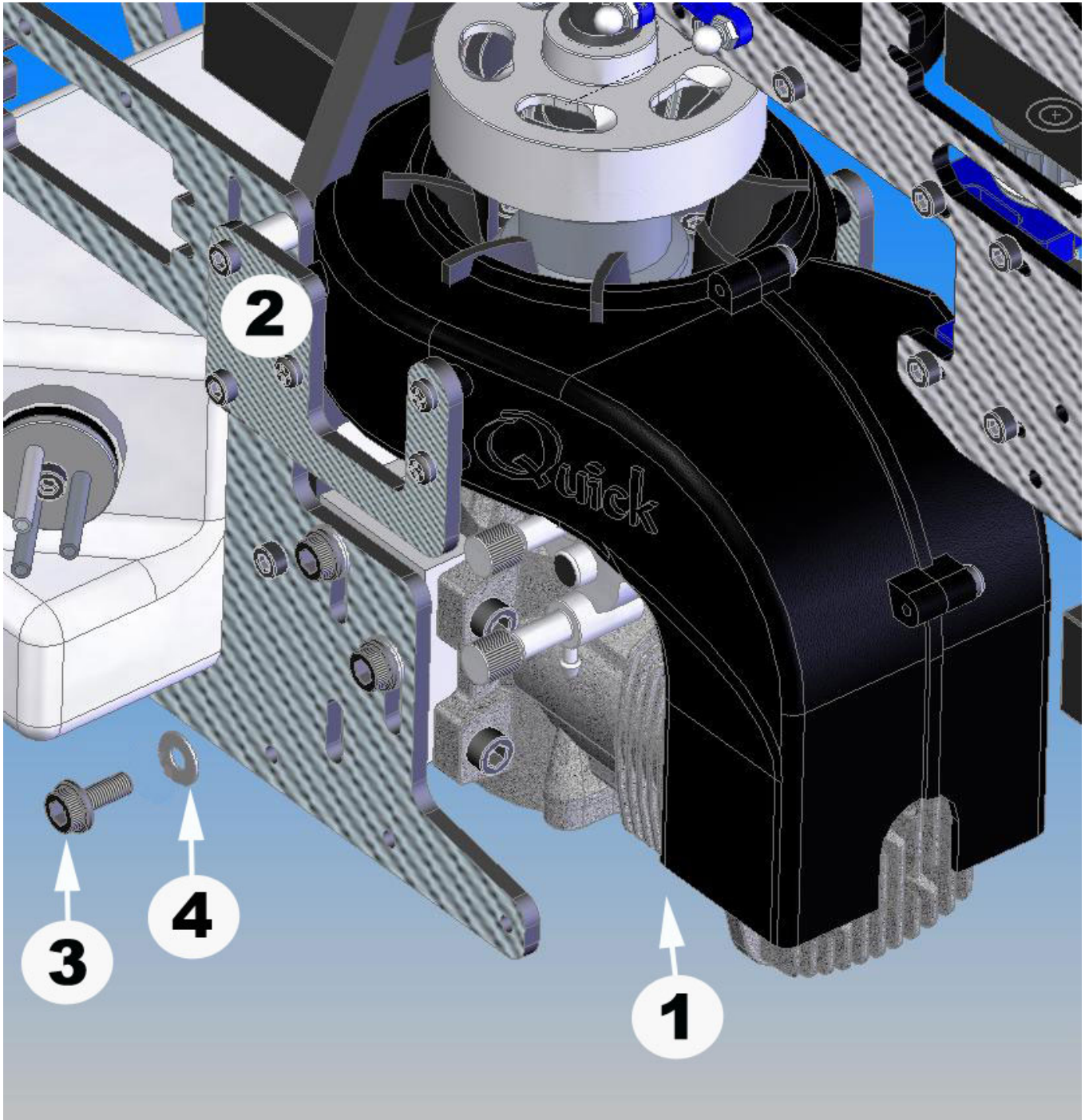


Note: it is very important to use a Dialing Indicator to check the run out of the Engine Assembly. Most of the vibration problems come from this. The run out should be no more than 0.004 inch (0.10 mm).



2-8 ENGINE INSTALLATION

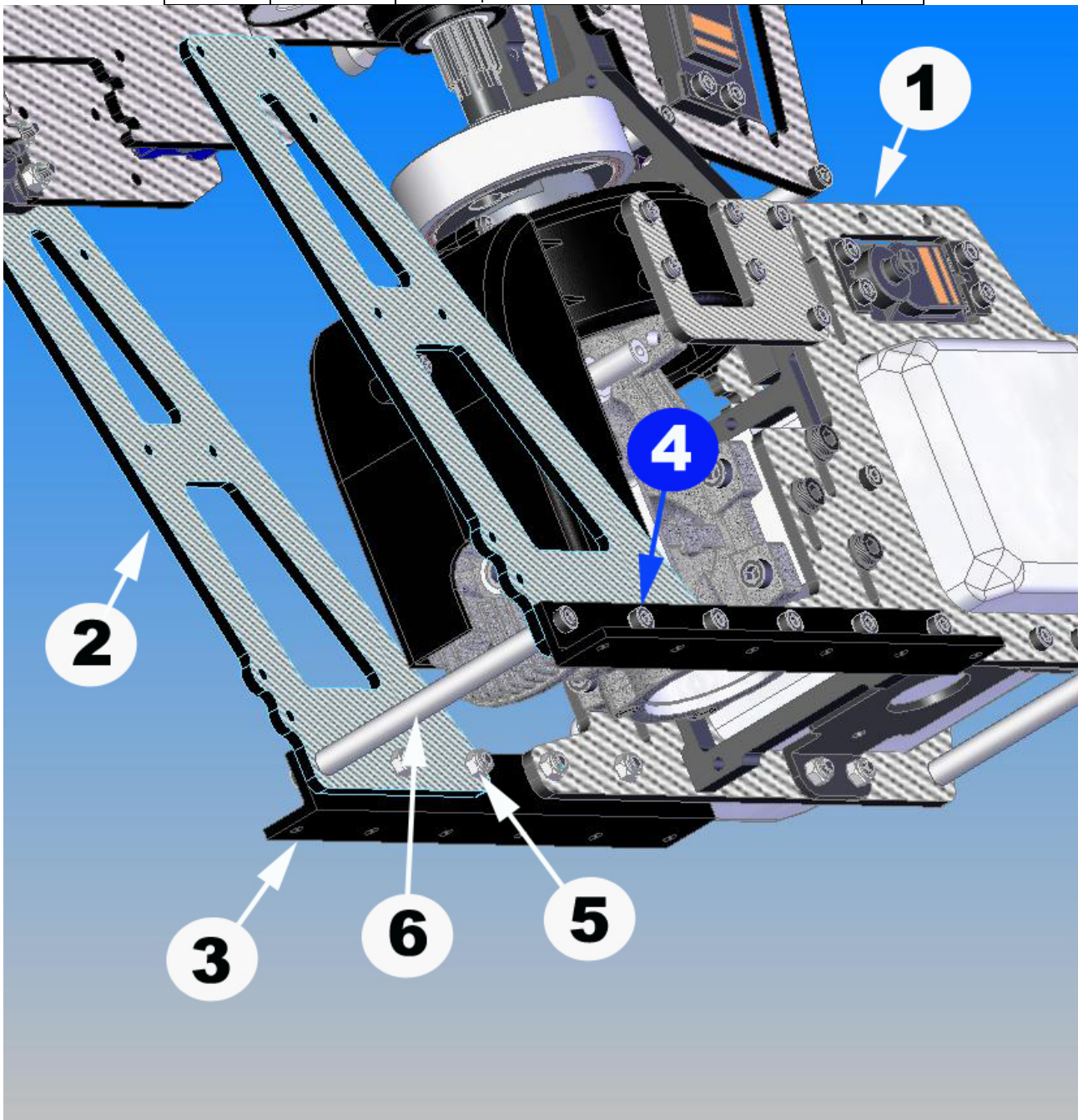
No.	Bag#	Description	Qty
1	Step 2-7	Engine Assembly	1
2	Step 2-6	Assembly up to step 2-6	1
3	HB	M4x10 Flange Cap Head Bolt	6
4	HB	M4 Flat Washer	6



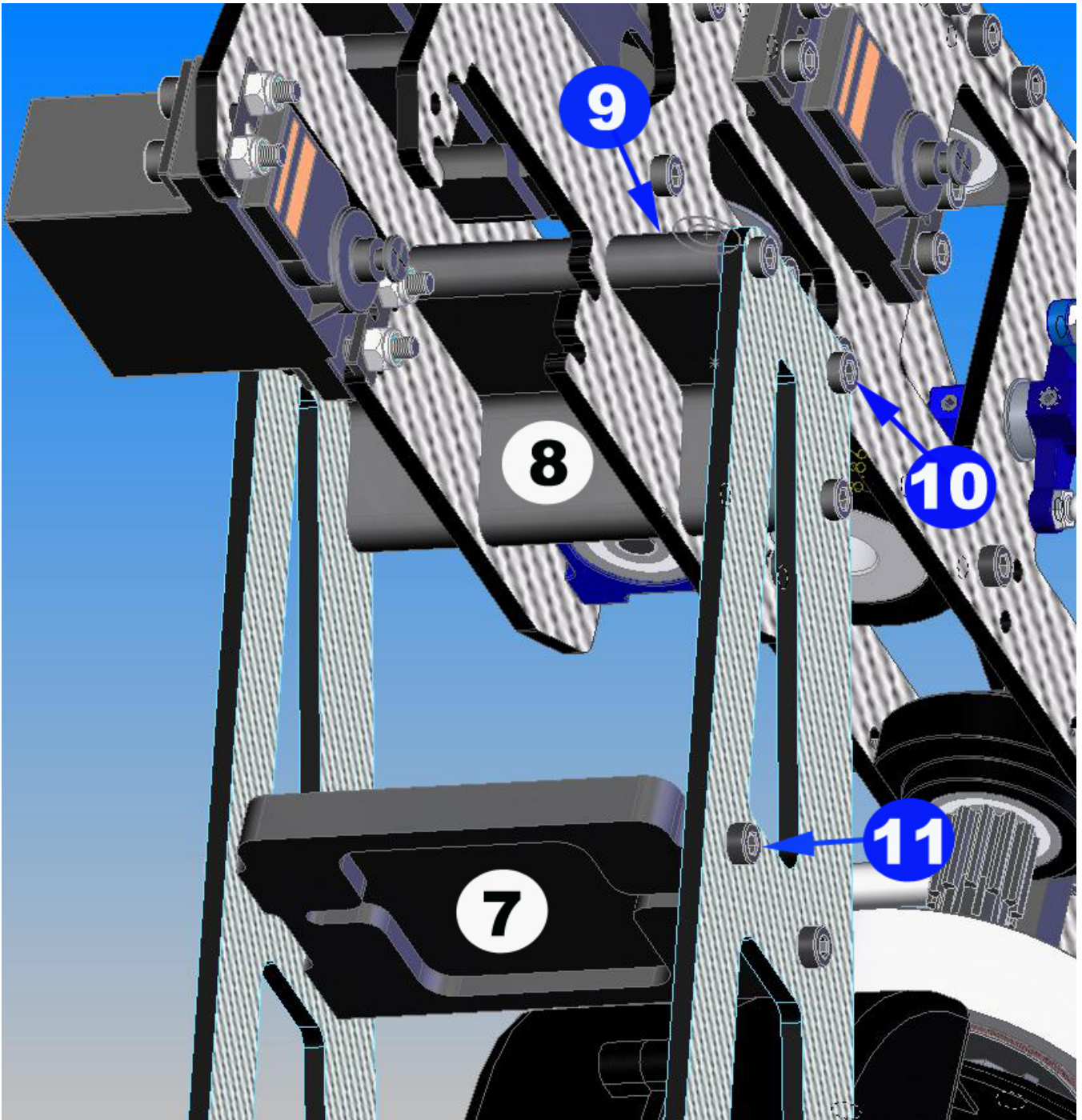
Note: M4 Nord-Lock Washers are recommended to use instead of M4 Flat Washers.

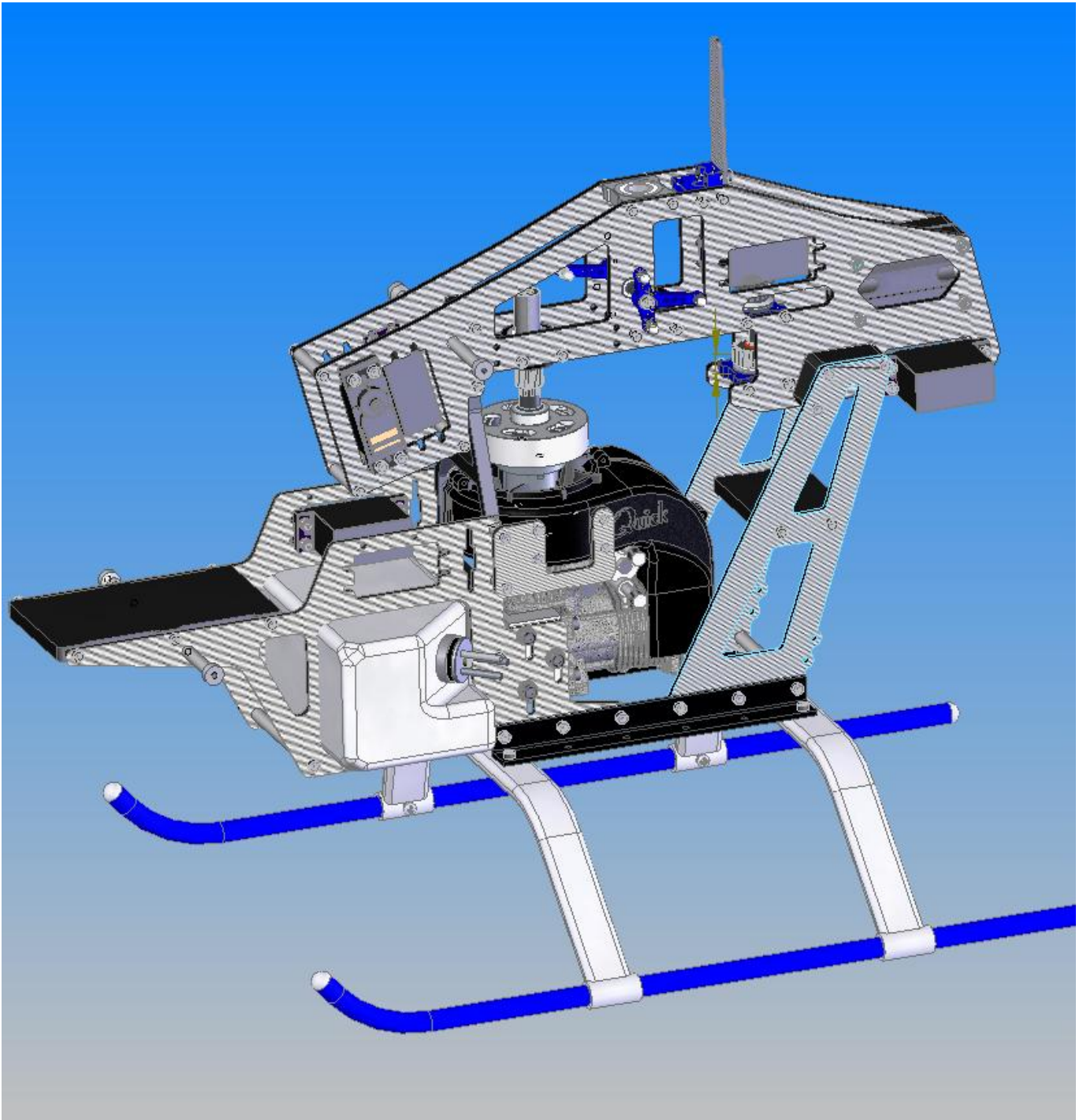
2-9 FRAME ANGLE ASSEMBLY

No.	Bag#	Description	Qty
1	Step 2-8	Assembly up to step 2-8	1
2	Frame	Rear Frame	2
3	Frame	Frame Angle	2
4	HB	M3x10 Cap Head Bolt	12
5	HB	M3 Locknut	8
6	2	66mm Cross Member	1
7	Frame	Gyro Tray	1
8	2	26mm Inner One-Piece Rear Spacer	1
9	2	16mm Outer One-Piece Rear Spacer	2
10	HB	M3x30 Cap Head Bolt	6
11	HB	M3x8 Cap Head Bolt	4



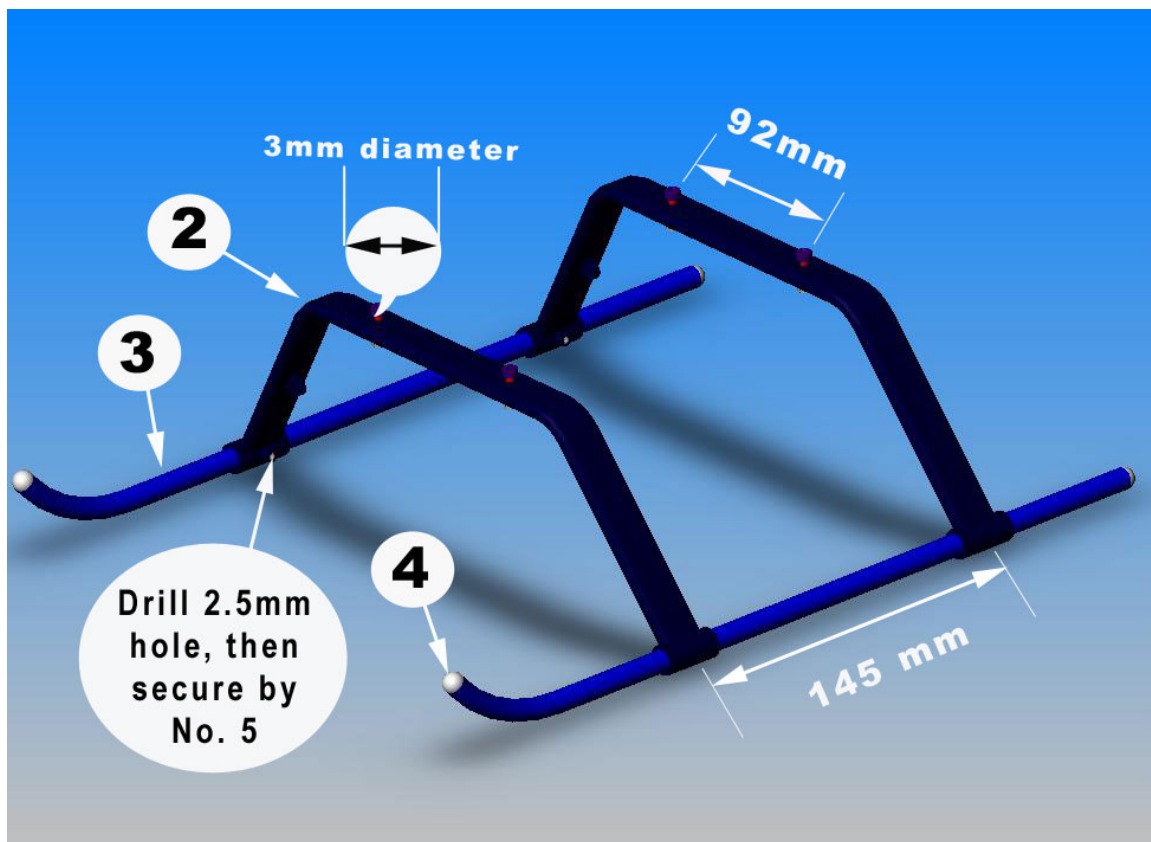
Note: For some kinds of engines, you may have to cut the frame angle to make room for screws to fit.



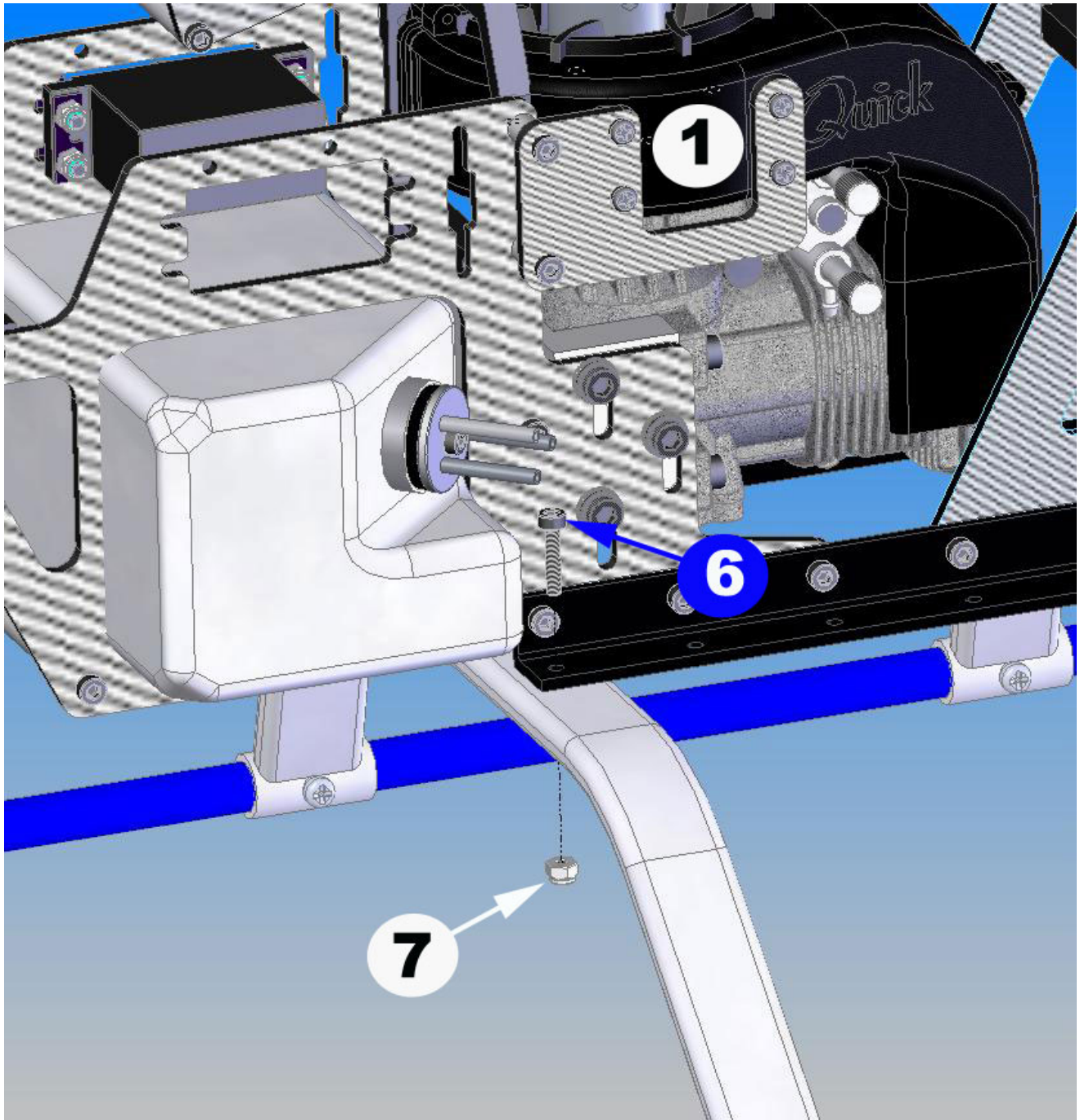


No.	Bag#	Description	Qty
1	Step 2	Assembly up to Section 2	1
2	3	Landing Gear Strut	2
3	3	Landing Gear Skid	2
4	3	Landing Gear End Cap	4
5	3	M2.5x6 Self Taping Screws	4
6	3	M3x14 Cap Head Bolt	4
7	3	M3 Locknut	4
8*****		CA Glue	1

- Drill 4 holes in the Landing Gear Struts with a 3mm drill bit with a spacing of 92mm
- Install the Landing Gear Skids into the Struts.
- Apply CA Glue into the Landing Gear End Cap then insert them into the Skids.
- Drill four 2.5mm holes into the little rounds on the ends of the Struts then secure them with the four M2.5x6 Phillips Screws.



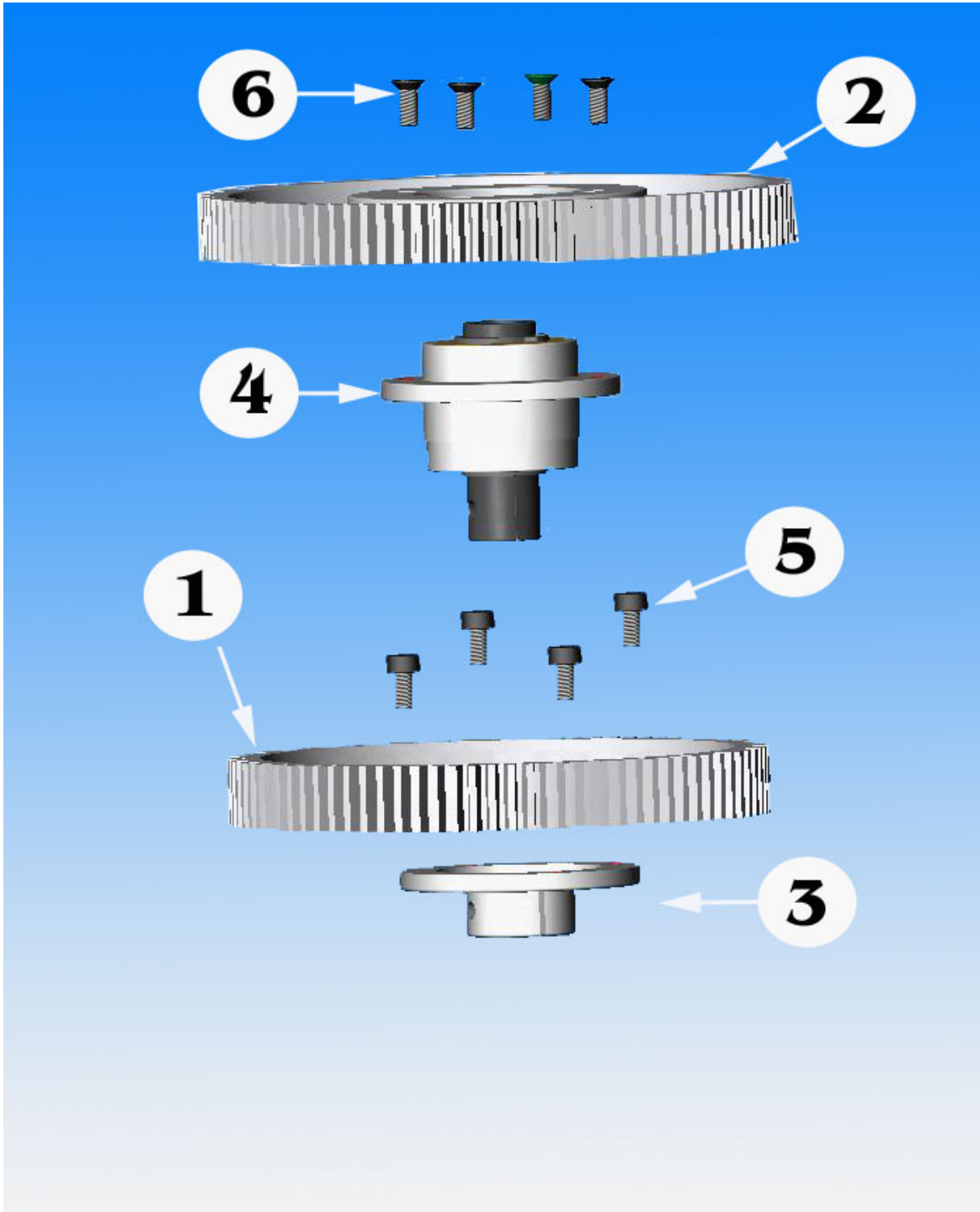
- Install the Main Frames onto the Landing Gear Assembly and secure them with four M3x14 Cap Head Bolts.
- Note: It is recommended to use “Landing Gear Dampener” to reduce vibration. See “Other Hardware & Optional Accessories” to make order. Landing Gear Dampener is installed between the Landing Gear and the Landing Supports.





4-1 MAIN GEAR ASSEMBLY

No.	Bag#	Description	Qty	No.	Bag#	Description	Qty
1	4	Lower Main Gear 88T	1	4	4	Auto-rotation Clutch	1
2	4	Upper Main Gear 97T	1	5	HB	M3x6 Cap Head Bolt	4
3	4	Lower Main Gear Hub	1	6	HB	M3x6 Philip Screw Flat Head	4

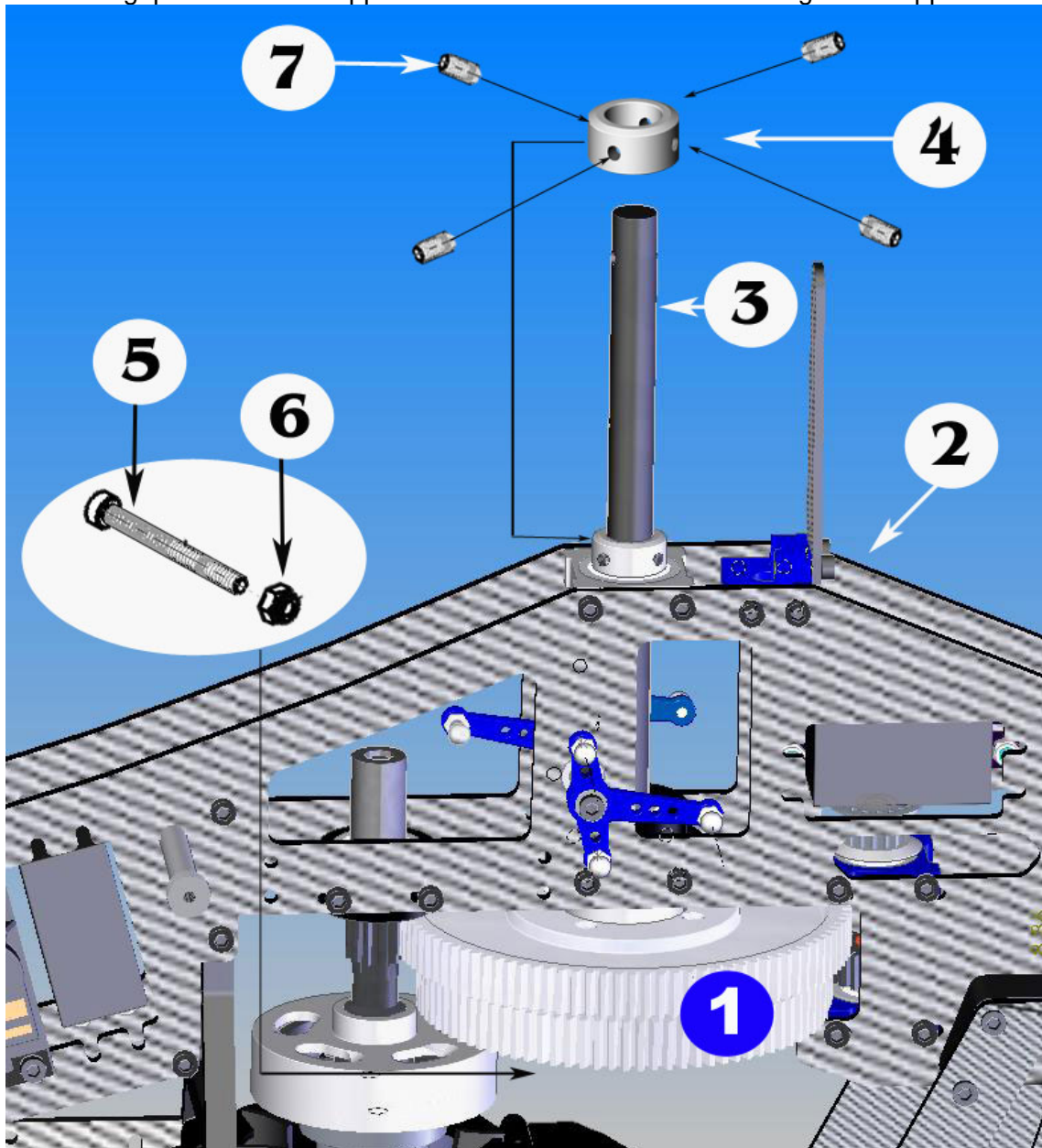


Note: The raised portion of For the Upper Main Gear should be face up.

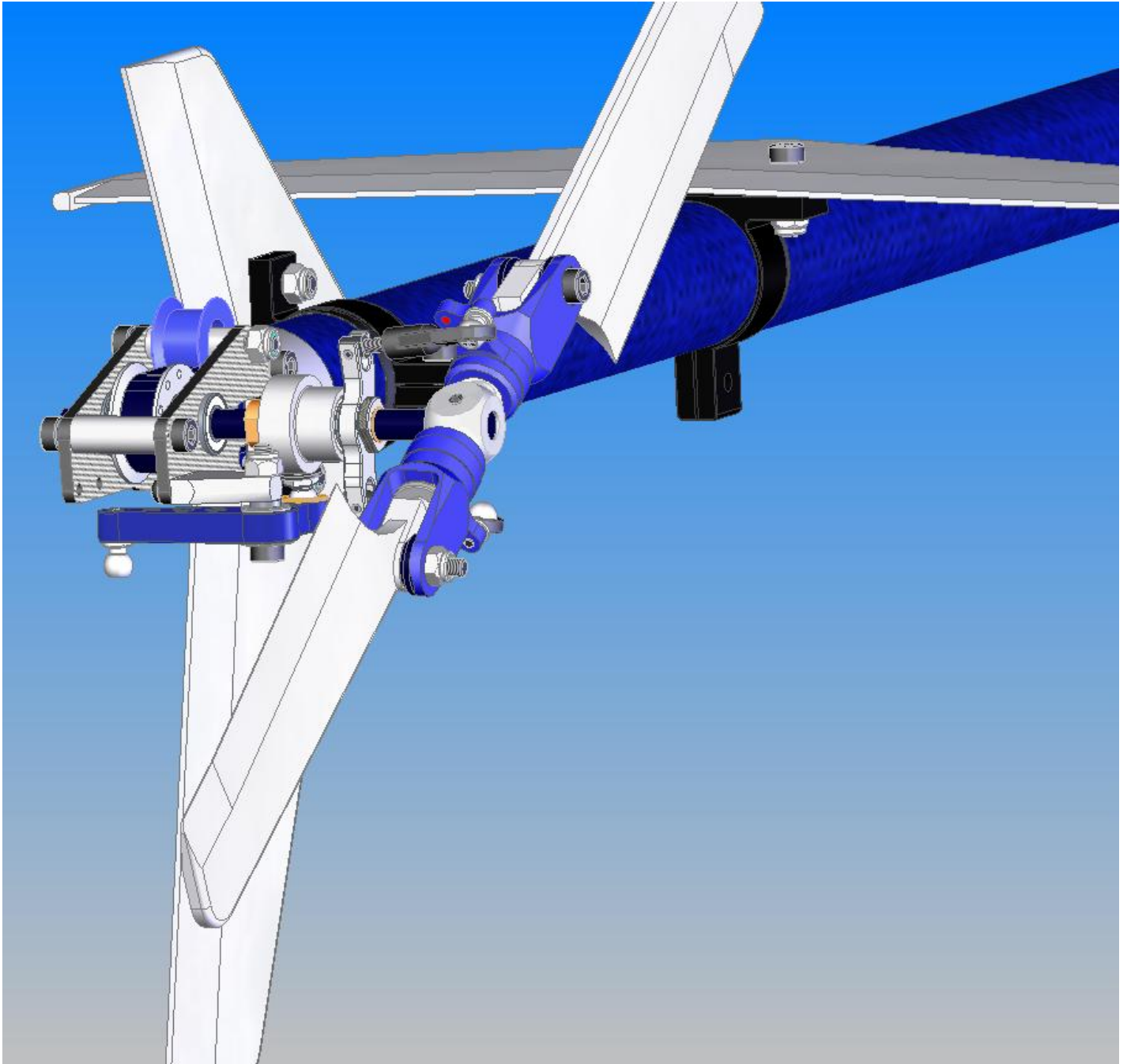
4-2 MAIN GEAR INSTALLATION

No.	Bag#	Description	Qty	No.	Bag#	Description	Qty
1	Step 4-1	Main Gear Assembly	1	5	HB	M3x22 Cap Head Bolt	1
2	Step 3	Assembly up to step 3	1	6	HB	M3 Locknut	1
3	3	Main Shaft	1	7	HB	M3X5 Set Screw	4
4	3	Main Shaft Collar	1				

- Slide the Main Gear Assembly in; install the Main Shaft down, then secure with one M3x22 Cap Head Bolt and one M3 Locknut.
- Put the Upper Main Shaft Collar on, and then secure it with four M3x5 Set Screws. Make sure the Main Gear Hub of the Main Gear Assembly touches the Bearing of the Lower Bearing Block. Leave no gap between the Upper Main Shaft Collar and the Bearing of the Upper Bearing Block.

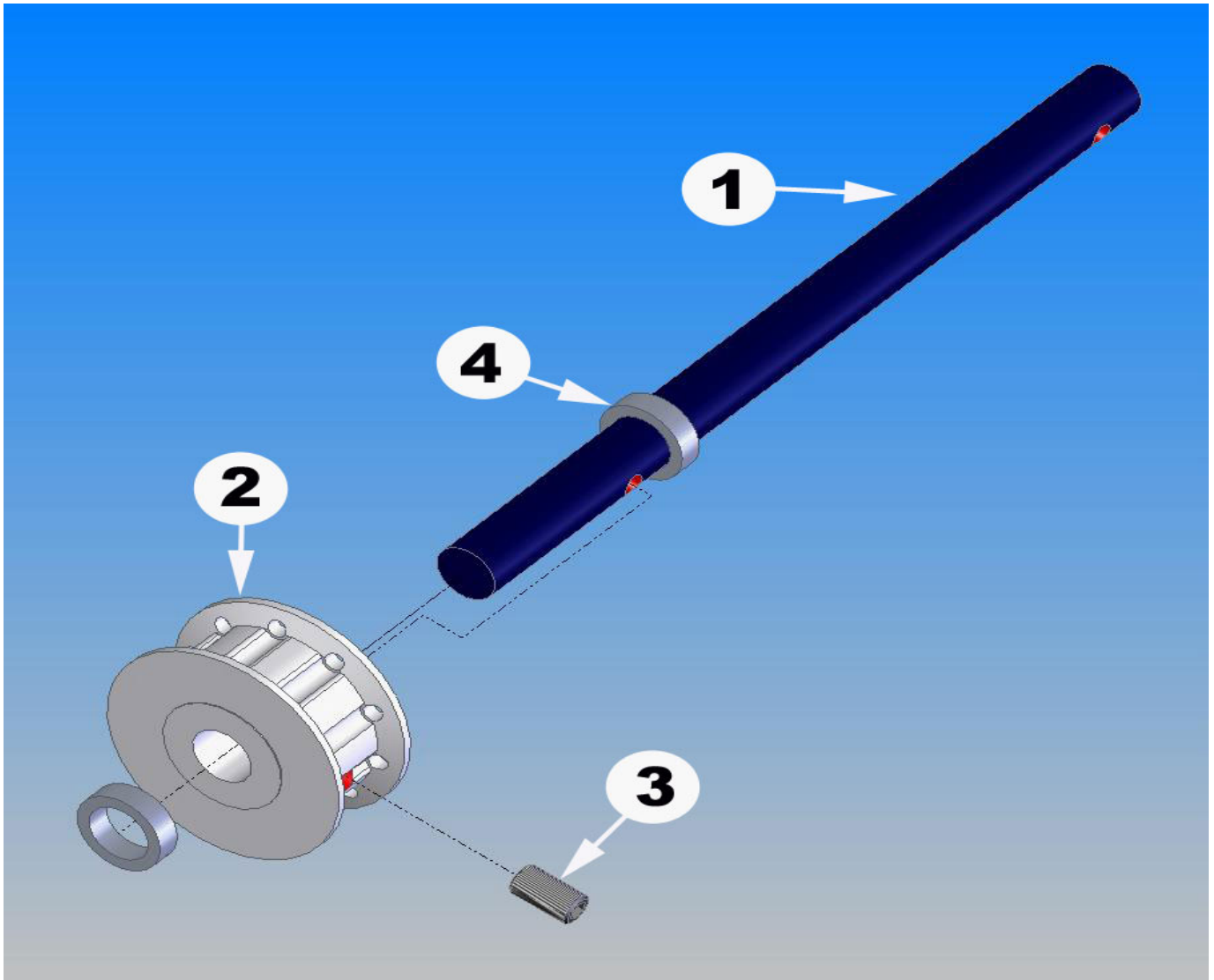


- Adjust the Tail Transmission and Start Shaft Bearing Block to get proper gear matches. Trick: fold a piece of tablet paper of 20x100mm (1x4 inch) along a long side and then insert it between the gears. Bring the gears together. Tighten the screws on the Tail Transmission/Start Shaft Bearing Block up and take the piece of paper off.



5-1 TAIL PULLEY GEAR ASSEMBLY

No.	Bag#	Description	Qty
1	5	Tail Output Shaft	1
2	5	Tail Pulley Gear	1
3	HB	M3x5 Set Screw	1
4	5	M5x7x2 Spacer	2

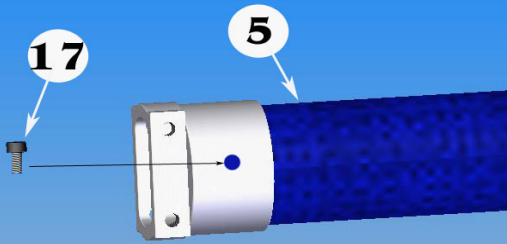
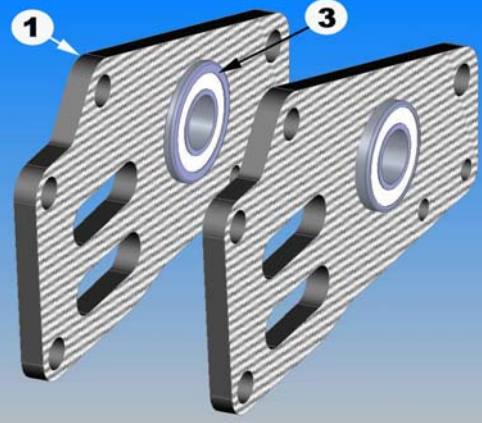


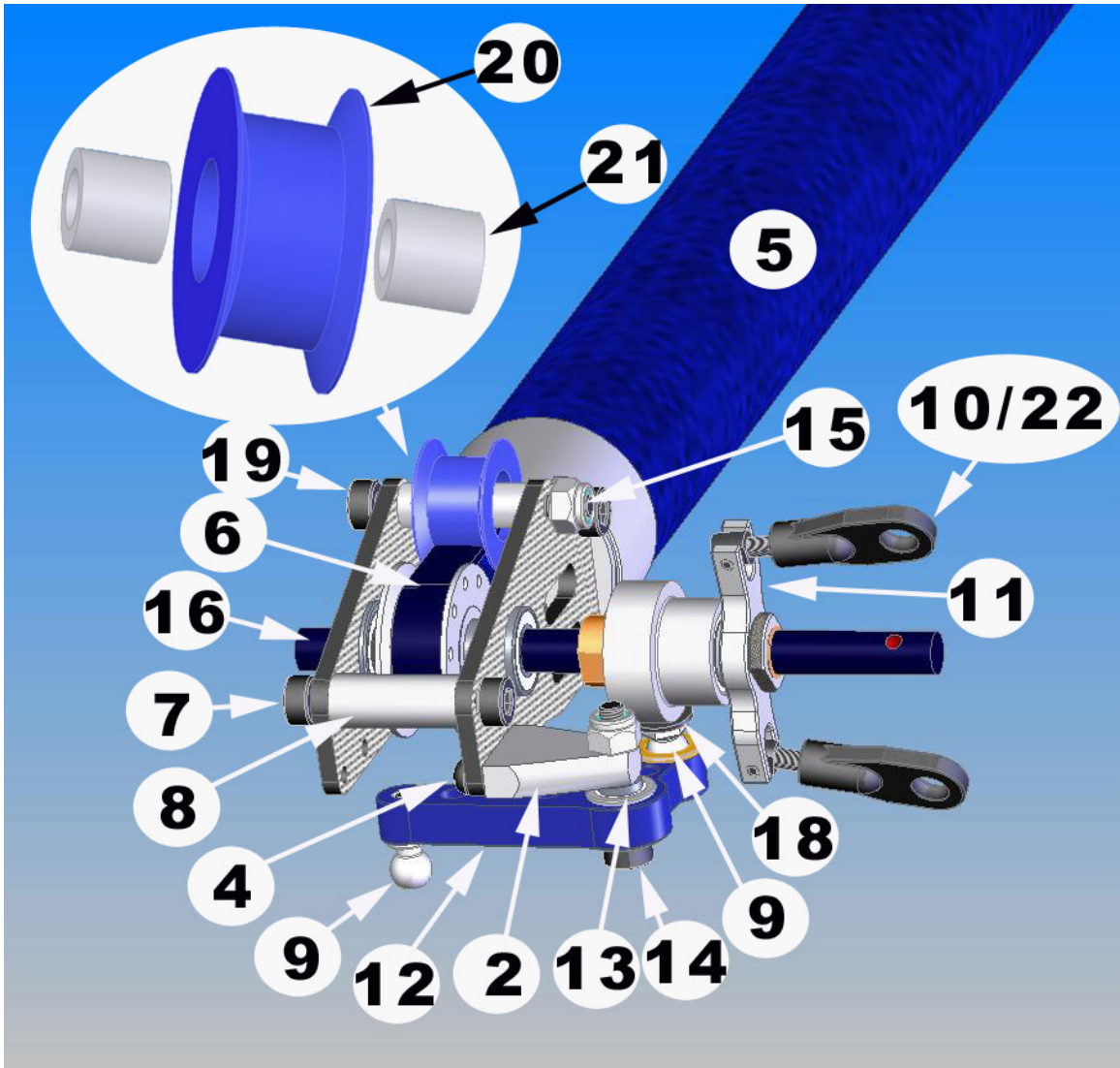
5-2 TAIL ROTOR ASSEMBLY

No	Bag#	Description	Qty	No.	Bag#	Description	Qty
1	Frame	Tail Case Side Plate	2	12	5	Tail Pitch Control Lever	1
2	5	Tail Pitch Lever Mount	1	13	HB	M3x5x1 Spacer	1
3	5	5X10X4 Flange Bearing	2	14	HB	M3x16 Cap Head Bolt	1
4	HB	M2x6 Phillips Screw	2	15	HB	M3 Locknut	2
5	In box	Tail Boom (in Box)	1	16	Step 5-1	Tail Pulley Gear Subassy	1
6	In box	Timing Belt (in Box)	1	17	HB	M2.5x6 Cap Head Bolt	1
7	HB	M3x6 Cap Head Bolt	6	18	HB	M3x7 Flat Washer	1
8	5	Tail Case Cross Member	1	19	HB	M3x25 Cap Head Bolt	1
9	HB	M3x4 Pivot Ball Stud	2	20	5	Tail Idler	1
10	5	M2.3 Long Ball Link*	2	21	5	3x6x5.5 Spacer	2
11	5	Tail Pitch Slider	1	22	5	2mm Spherical Link Metal**	2

*Sport Version only

**Pro Version only

<p>First, to prevent the Boom End from rotating, drill a 2.5mm hole in the side of the Boom End, then secure with an M2.5x6 Cap Head Bolt.</p>	
<p>Install the Bearings into the Tail Case Side Plates. The flanges should be inside. Sometimes, the holes are too tight; you have to sand them a little bit.</p>	



Note: Normally you just need one M3x5x1 Spacer between the Tail Pitch Control Lever and Tail Pitch Lever Mount but you may need two of them in some cases (if you do not have enough clearance for the lever.)

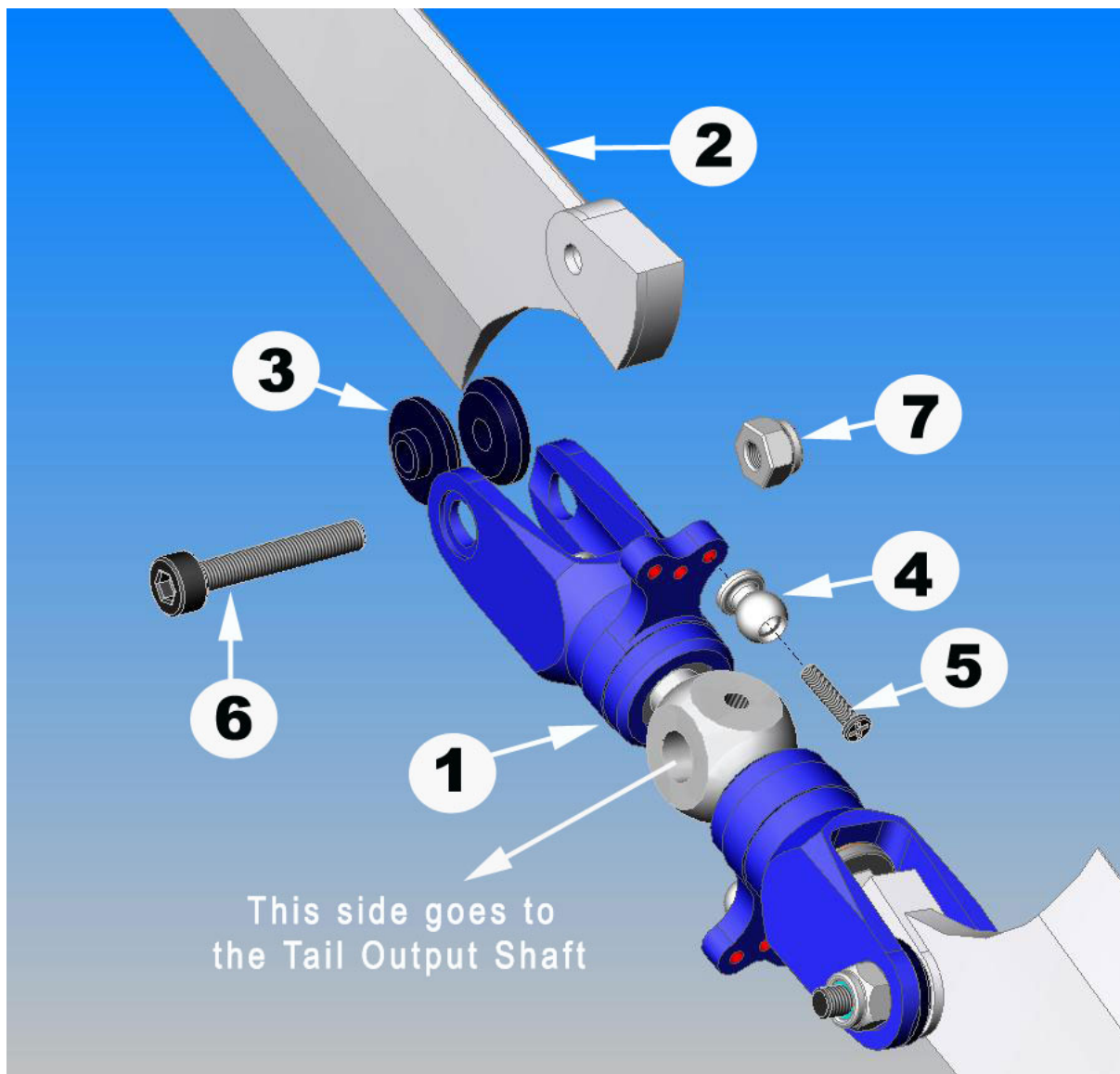
5-3 TAIL BLADE ASSEMBLY

No	Bag#	Description	Qty	No.	Bag#	Description	Qty
1	5	Tail Rotor	1	6	HB	M3x22 Cap Head Bolt	2
2	5	Tail Blade	2	7	HB	M3 Locknut	2
3	5	Tail Blade Spacer	4	8	HB	M3x5 Set Screw	2
4	HB	Shim Ball*	2	9	5	Spherical Link Spacer**	2
5	HB	M2x8 Phillips Screw*	2	10	HB	M2x12 Cap Head Bolt**	2

*Sport version only

**Pro version only

The Tail Rotor shown may look lightly differently from the one in the kit. Pro version comes with the metal blade grips; Sport version comes with the plastic blade grips.



Slide the Tail Blade Assembly into the Tail Output Shaft then secure it with two M3x5 Set Screws. Connect the Ball Links to the Shim Balls.

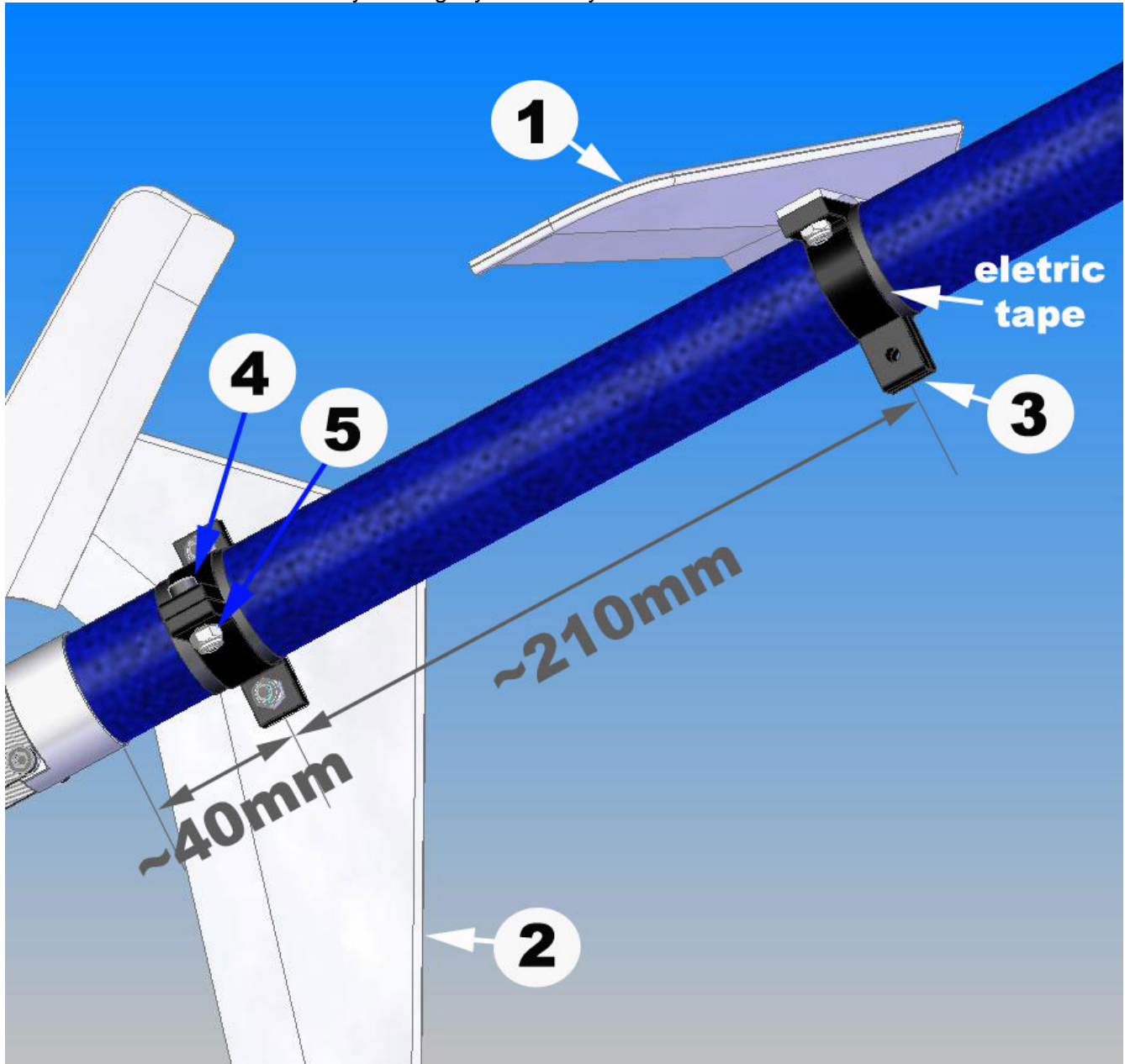


5-4 FIN INSTALLATION

No.	Bag#	Description	Qt.
1	5	Horizontal Fin*	1
2	5	Vertical Fin*	1
3	5	Fin Mount	2
4	HB	M3x12 Cap Head Bolt	5
5	HB	M3 Locknut	5
6****		Electric Tape	1

*Carbon Fin Set is also available for option.

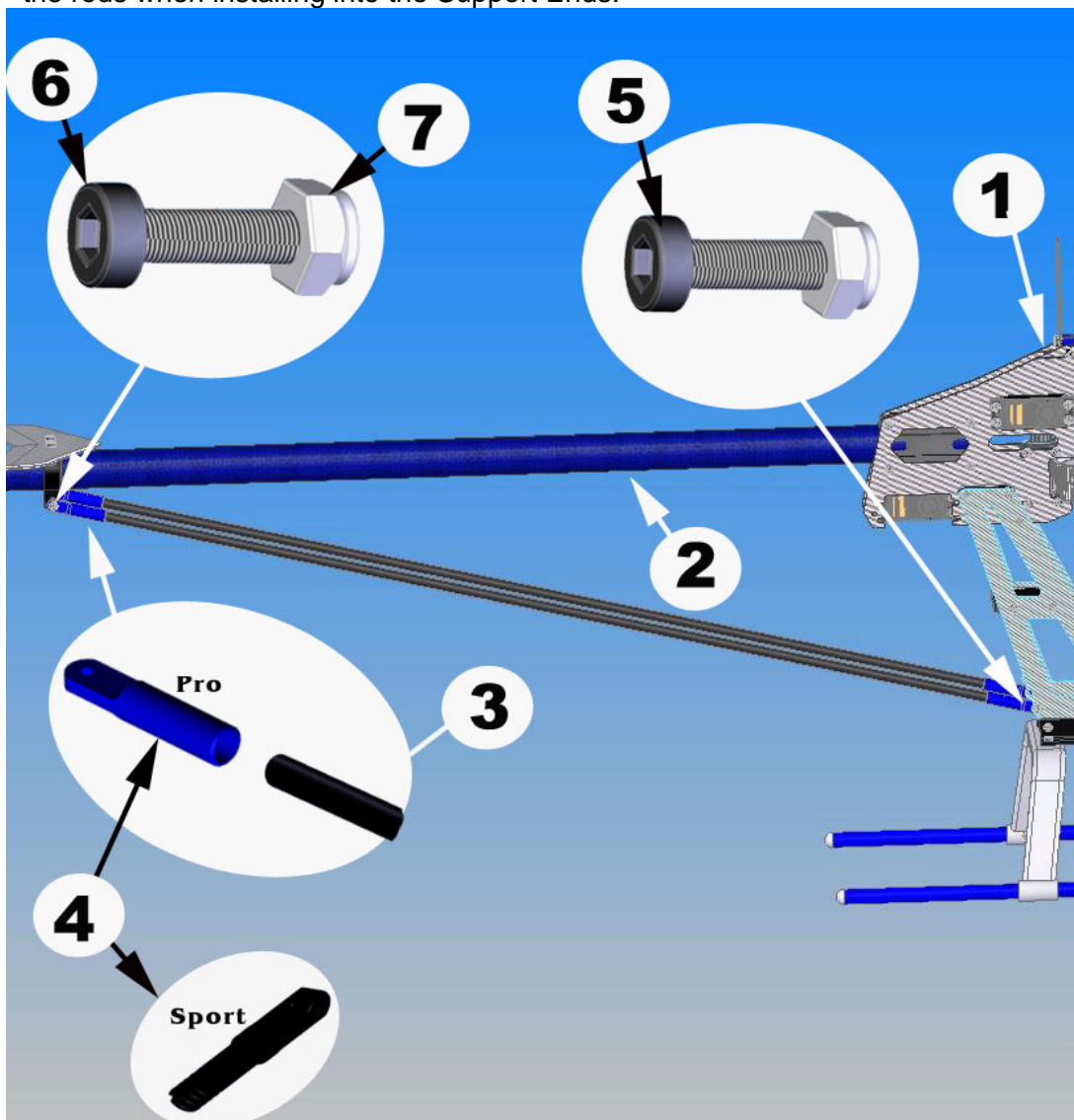
Wrap electric tape around the boom couple times where you are going to install the fin mounts. Note: Fin set may look lightly differently from the one in the kit.

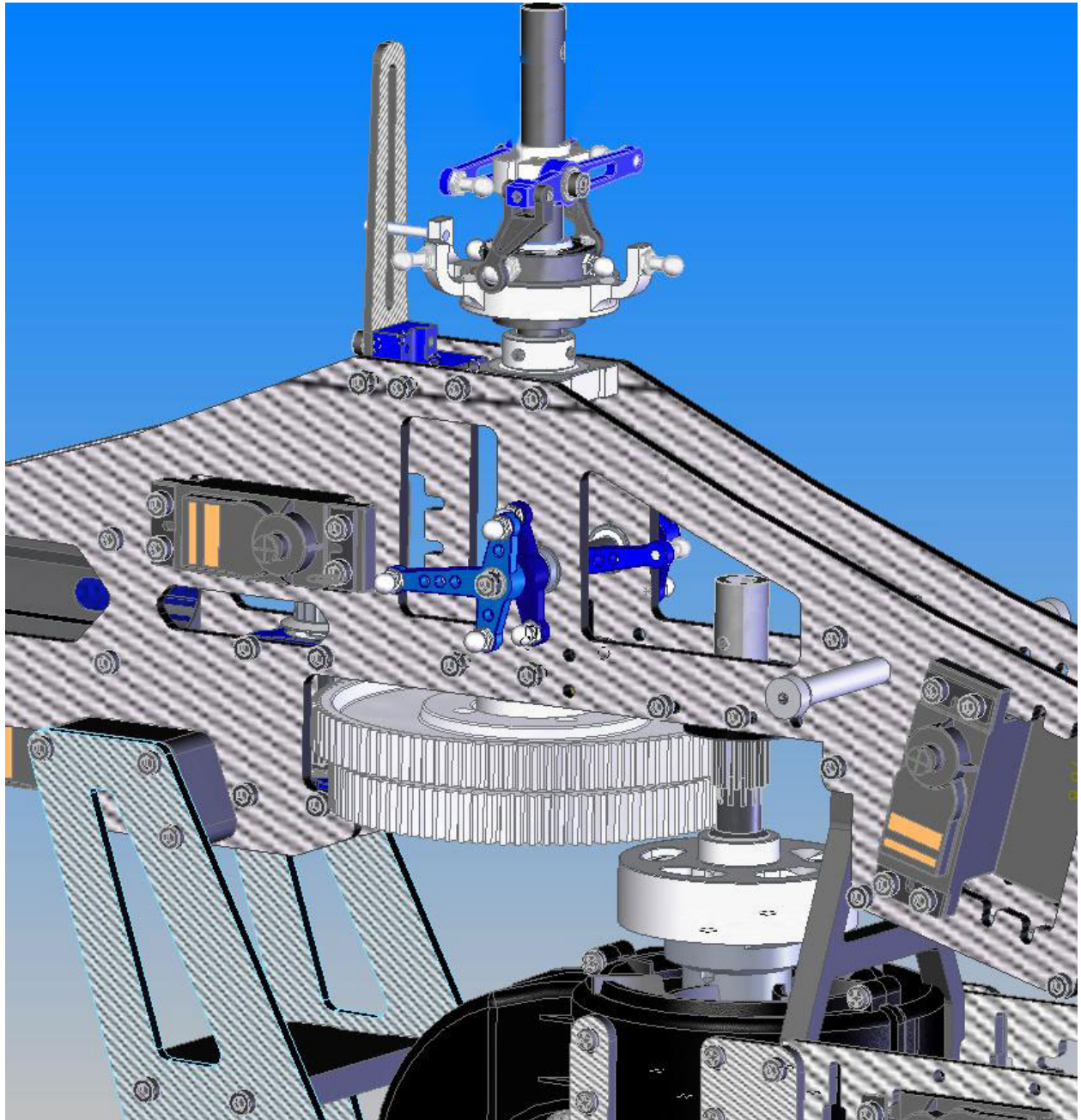


5-5 TAIL INSTALLATION

No.	Bag#	Description	Qt.
1		Assembly up to step 4	1
2	Step 5-4	Tail Assembly	1
3	In box	Boom Support	2
4	5	Boom Support End	4
5	HB	M3x12 Cap Head Bolt	2
6	HB	M3x16 Cap Head Bolt	1
7	HB	M3 Locknut	3
8****		CA Glue	1

- Wrap three or four rounds of electric tape around the end of Boom where the Boom Holders are going to touch it.
- Note for installing the timing belt: Turn the Tail assembly so that the Tail Output Shaft pointing upward put the belt onto the Transmission, then twist the Tail Assembly 90° to the right. Make sure the belt not too tight or loose. Tighten the four screws on the boom holders.
- Measure the Boom Support carefully before cutting. It is a good idea if you install one end of the rod first, then make the measure then cut it. Remember apply CA Glue for the rods when installing into the Support Ends.

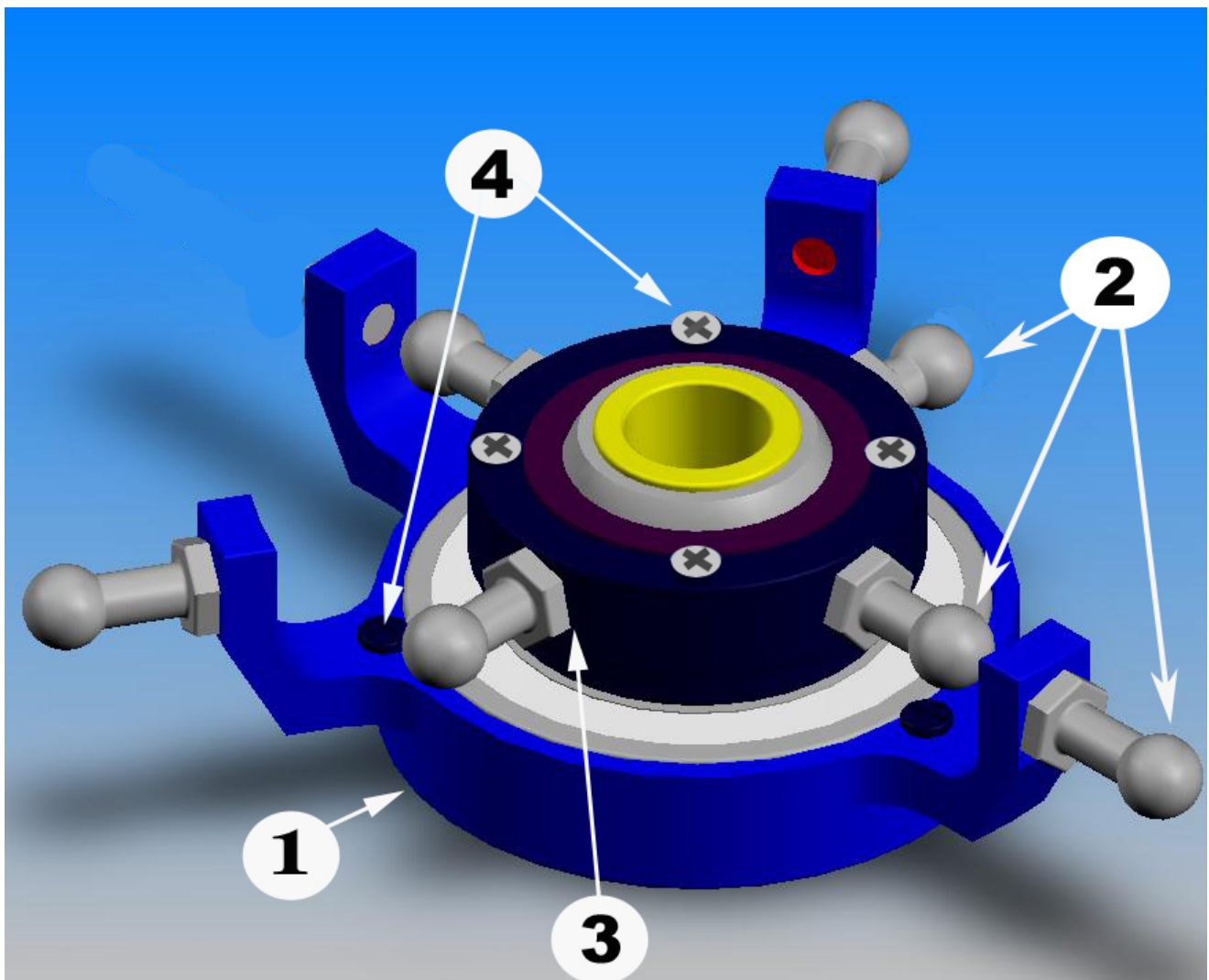


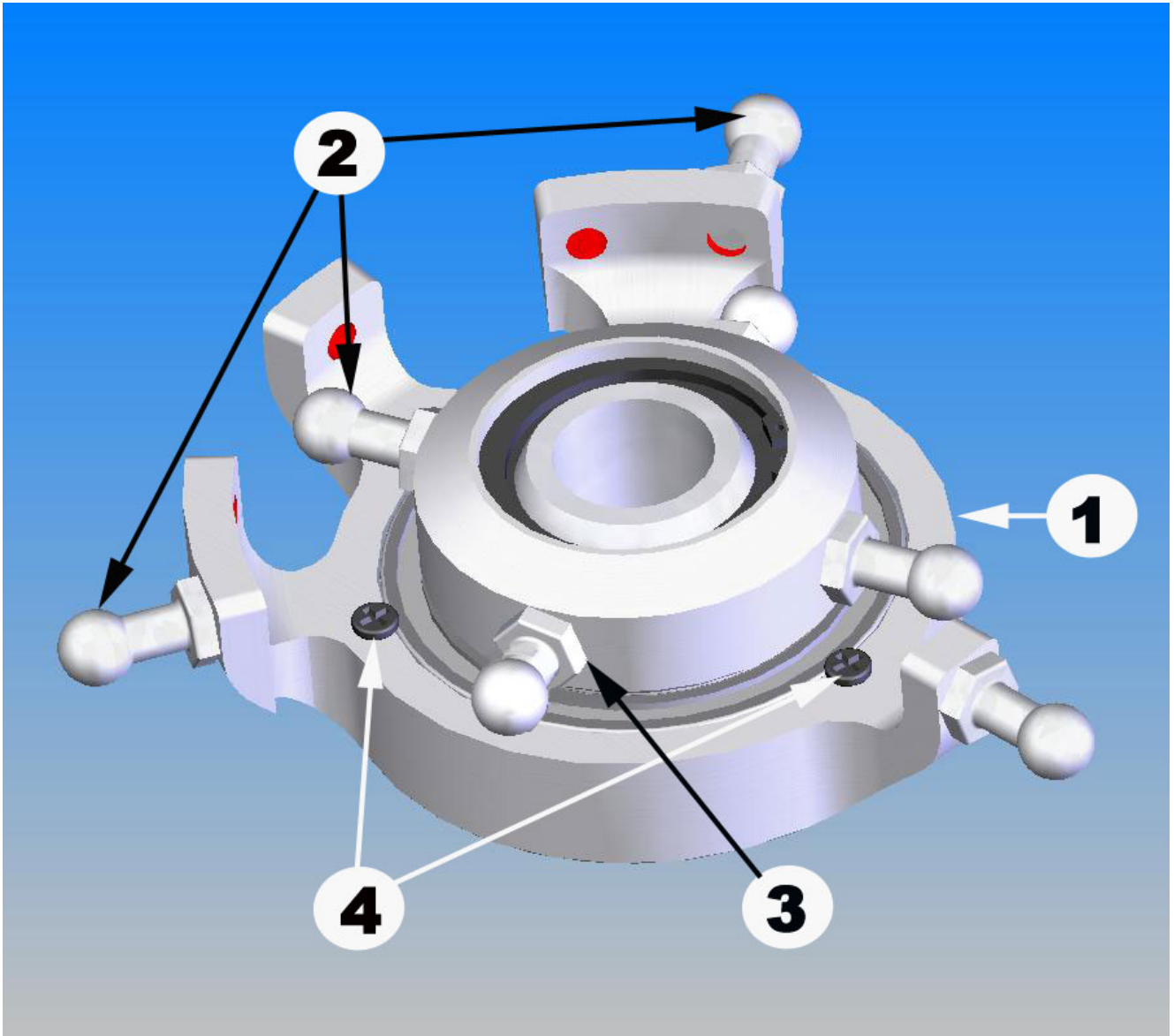


6-1 SWASHPLATE ASSEMBLY

No.	Bag#	Description	Qty
1	6	Swashplate Complete	1
2	HB	M3x7Pivot Ball Stud	7
3	HB	M3 x7 Flat Washer	4
4	HB	M2X4 Phillips Screws	7

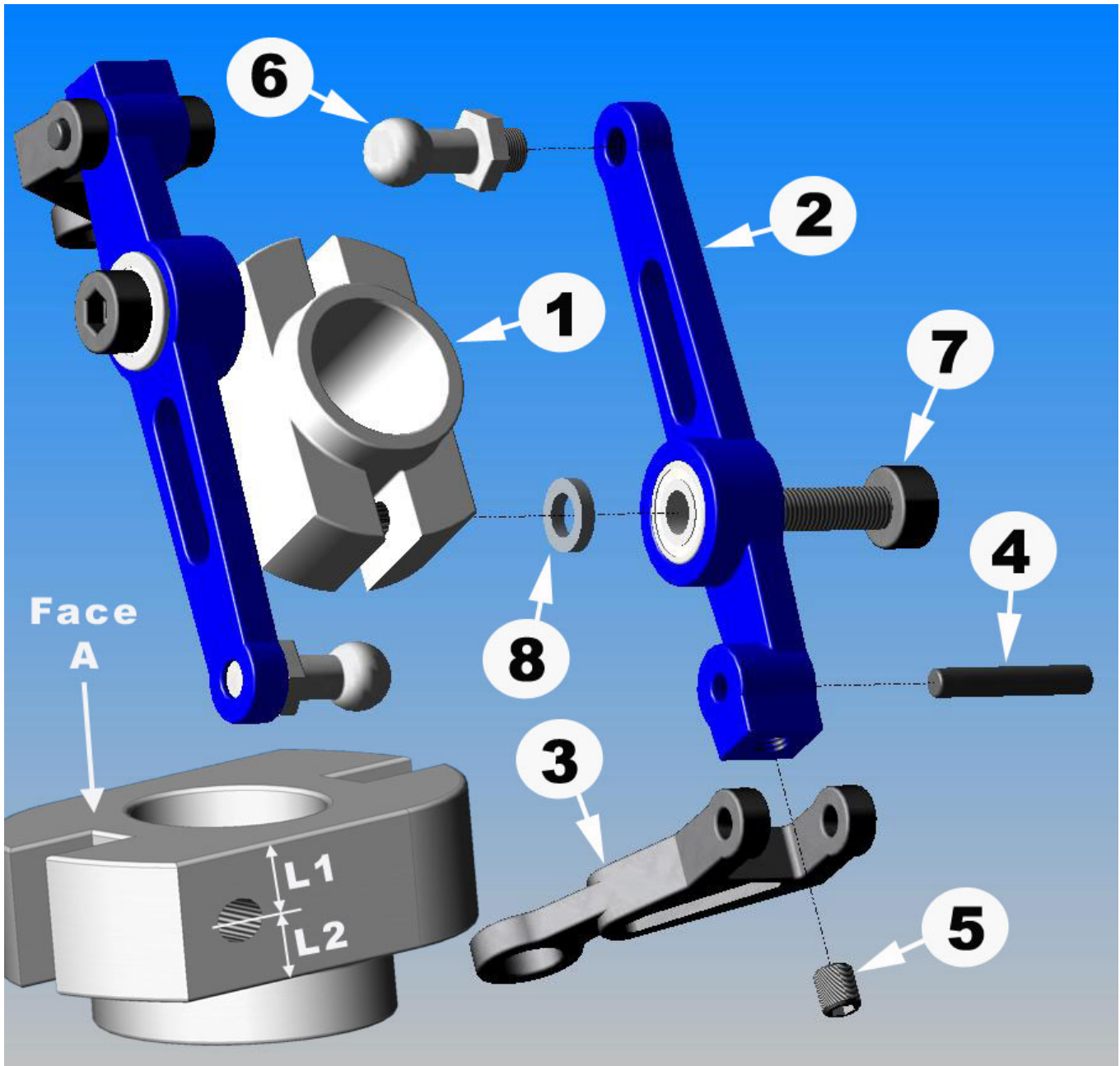
Note: There are some kinds of the Swashplate. One has little holes (maybe 7, 4, or 3 of them.) The others have no hole on it. Both work the same. If you got the one with holes, just fill them in with Phillips Screws. If you got the one with no hole, do not worry about Phillips Screws; the Swashplate still works well.





6-2 WASHOUT ASSEMBLY

No.	Bag#	Description	Qty	No.	Bag#	Description	Qty
1	6	Washout Base	1	5	HB	M3x5 Set Screw	2
2	6	Washout Arm	2	6	HB	M3x7Pivot Ball Stud	2
3	6	Washout Link	2	7	HB	M3x12 Cap Head Bolt	2
4	6	Washout Link Pin	2	8	HB	M3X5X1 Spacer	2

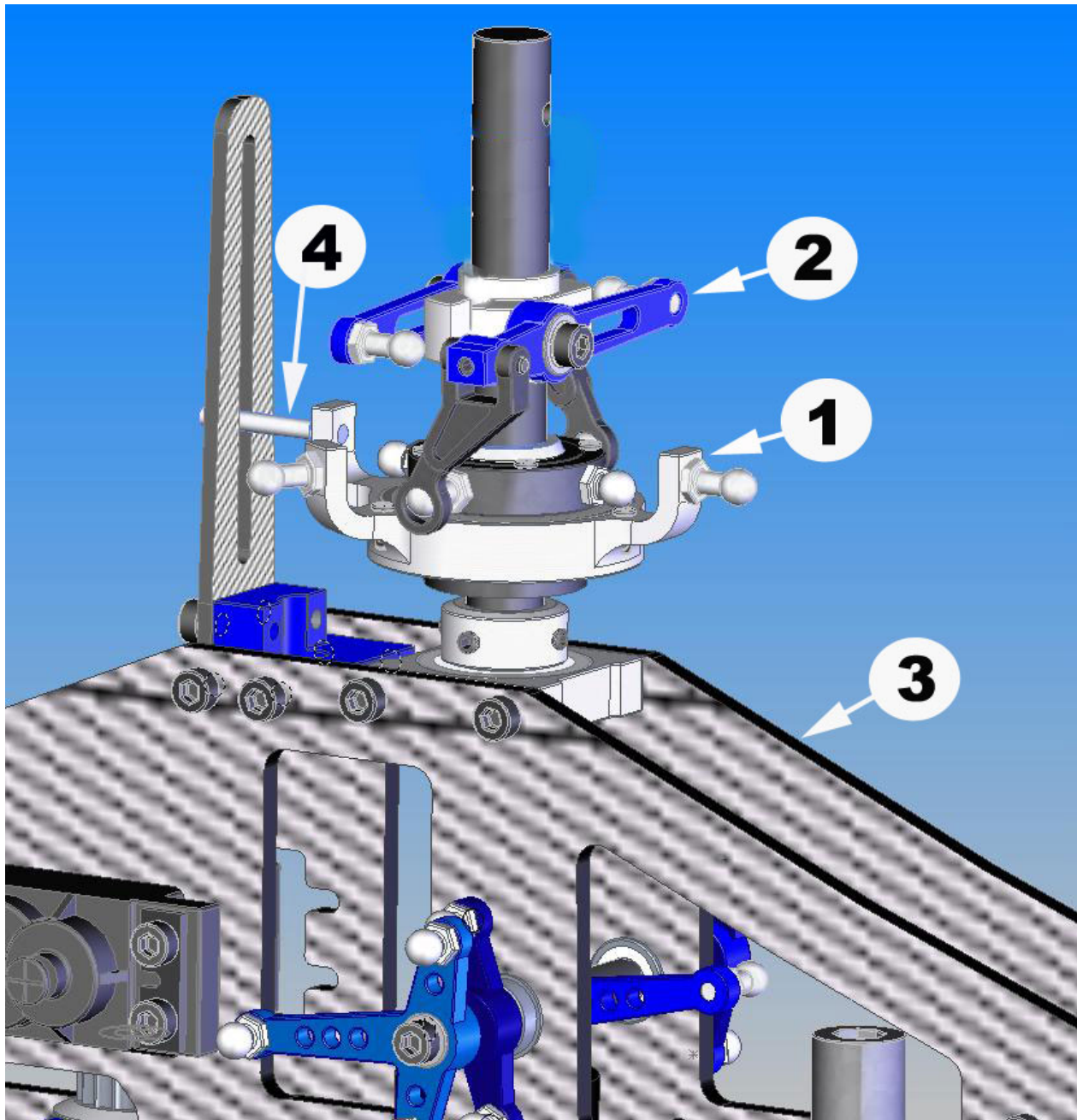


Note: There are some versions of the Washout Base (Item No. 1). All of them work the same but they should be installed appropriately:

- If L1 is shorter or equal to L2, face A should go up.
- If L1 is longer than L2, face A should go down.

6-3 CONTROL SYSTEM INSTALLATION

No.	Bag#	Description	Qty
1	Sep 6-1	Swashplate Assembly	1
2	Step 6-2	Washout Assembly	1
3	Step 5	Assembly up to step 5	1
4	6	Swash Anti-rotation Pin	1



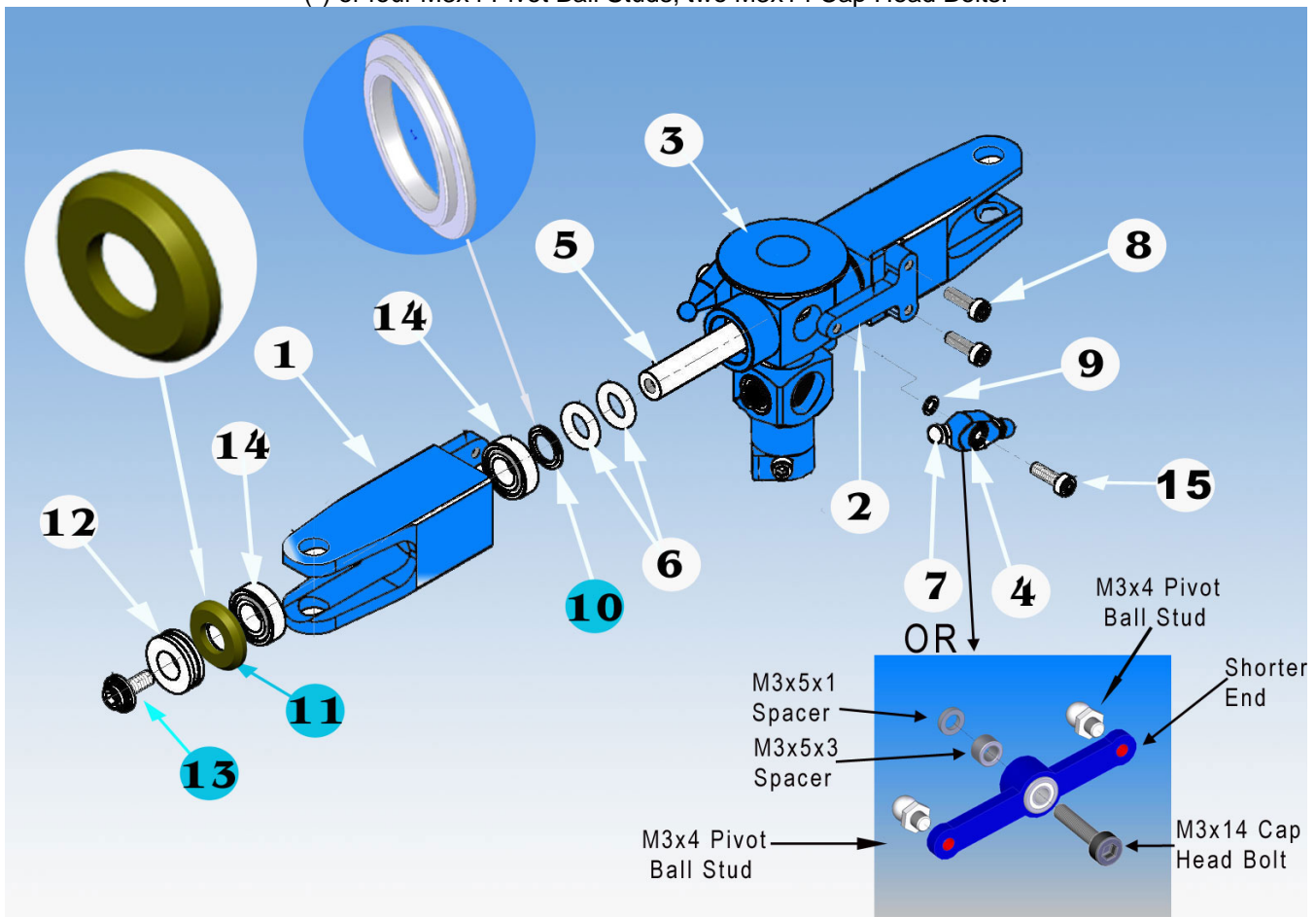
Connect the Washout Links to the 3x7 Pivot Studs on the Washplate.

SECTION 7A: ROTOR HEAD SPORT VERSION Bag 7

7A-1 MAIN ROTOR HUB ASSEMBLY

No.	Bag#	Description	Qty	No.	Bag#	Description	Qty
1	7	Main Blade Grip	2	9	HB	M3X5X3 Spacer	2
2	7	Pitch Arm	2	10	7	Head Spindle Spacer	2
3	7	Center Hub	1	11	7	Thrust Bearing Spacer	2
4	7	Hiller Arm	2	12	7	8x16x5 Thrust Bearing	2
5	7	Head Spindle	1	13	7	M4 Flange Cap Head Bolt	2
6	7	Dampener O-Ring	4	14	7	8x16x5 Regular Bearing	4
7	HB	M3x7 Pivot Ball Stud(*)	2	15	HB	M3x12 Cap Head Bolt(*)	2
8	HB	M3x10 Cap Head Bolt	4				

(*) or four M3x4 Pivot Ball Studs; two M3x14 Cap Head Bolts.

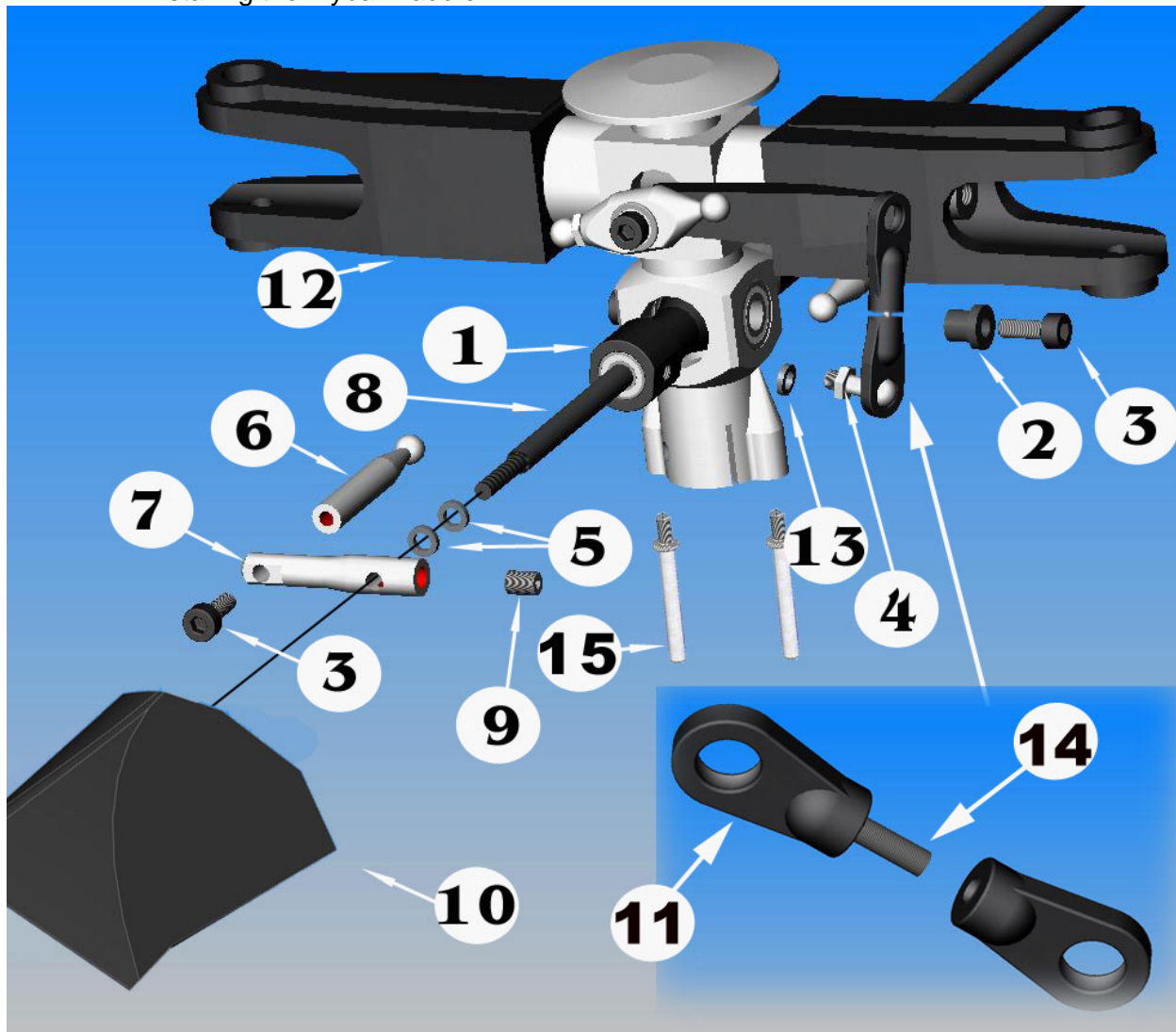


Note: Some Center Hubs are designed for one O-ring each side. If this is your case, use one O-ring each side. The beveled edge of the Thrust Bearing Spacer (No. 11) should face away from the Center Hub. The flanges of the bearings of the Hiller Arms should face outside. Usually the Thrust Bearing has three parts: two race washers and caged ball bearings. The caged ball bearings will be between two race washers. In some cases, you may get a different version of the Thrust Bearing: one race washer, one flat washer, and caged ball bearings in your kit. That is fine; it still works the same. In this case, you need to install the flat washer first (next to Thrust Bearing Spacer-No. 11), then the caged ball bearings, the race washer goes last.

7A-2 FLYBAR & SEESAW ASSEMBLY

No.	Bag#	Description	Qty	No.	Bag#	Description	Qty
1	7	Seesaw	1	9	HB	M3x5 Set Screw	2
2	7	Seesaw Collar	2	10	7	4mm Fly-Bar Paddle	2
3	HB	M3x8 Cap Head Bolt	4	11	7	Double Link	2
4	HB	M3x7 Pivot Ball Stud	2	12	Step 7A-1	Main Rotor Hub Assembly	1
5	7	M4x6x1 Spacer	4	13	HB	M3x7 Flat Washer	2
6	7	Fly-Bar Control Arm	2	14	7	2.3x10mm Linkage Rod	2
7	7	Fly-Bar Control Arm	2	15	7	Washout Anti-rotation Pin	2
8	In	4mm Flybar	1	16****		Epoxy Glue/JP Weld	1

- There are two holes in the paddles. For regular setup, use the hole that is further from the letter “Quick” on the paddles.
- Although the drawing does not show the other side of the head, you should repeat the same assembly for that side.
- Fly-bar should be balanced on the Seesaw.
- Make sure to apply Epoxy Glue or JP Weld to the thread on Flybar when installing the Flybar Paddle.

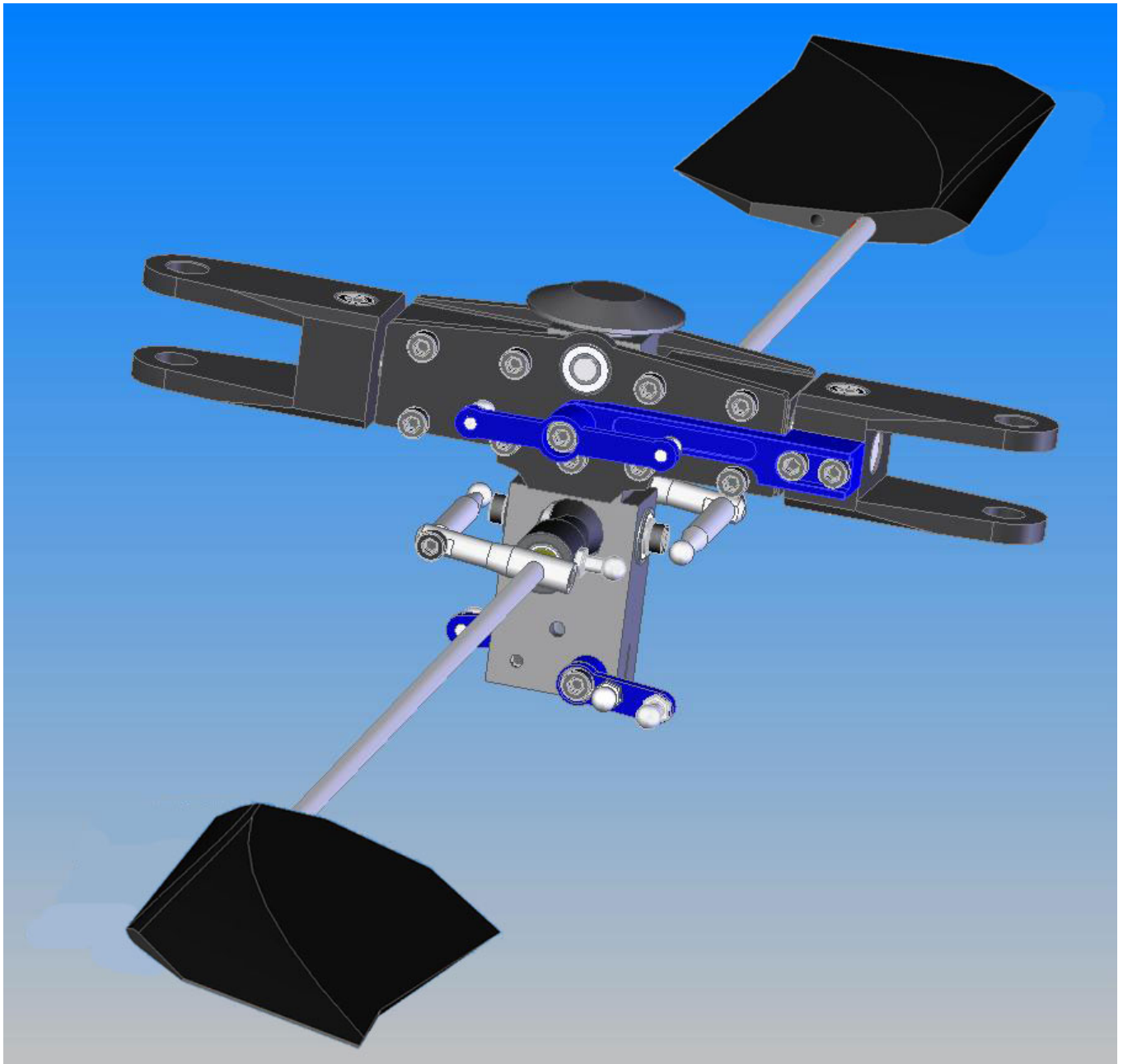


Note: The Center Hub, Main Blade Grips, and Flybar Control Arm shown may look differently from the ones in the kit. Attach the Double Link to the built-in ball of the Hiller Arm and the Pivot Ball installed on the Seesaw (see drawing).

7A-3 ROTOR HEAD INSTALLATION

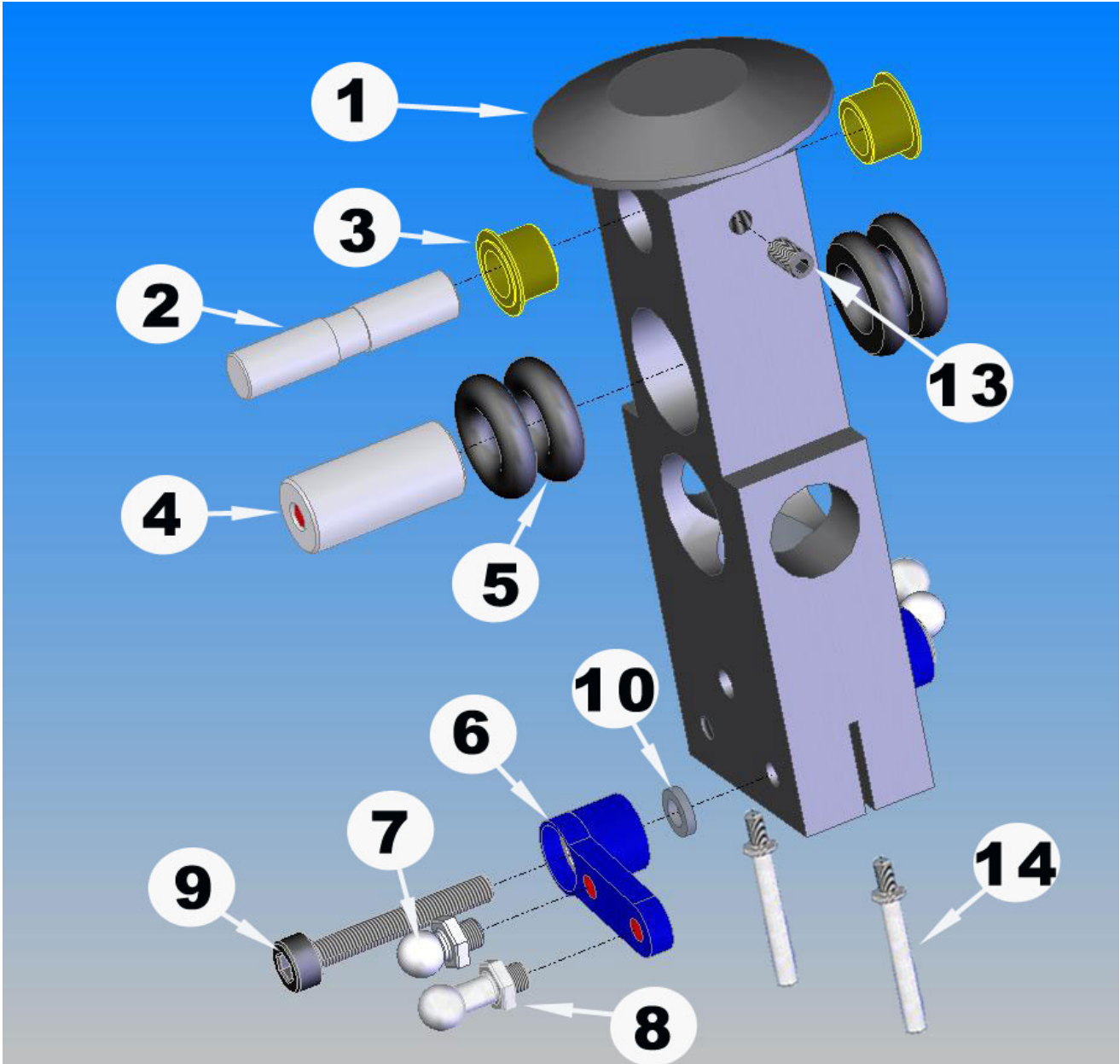
No.	Bag#	Description	Qty
1	Step 7A-2	Completed Rotor Head (step 7A-2)	1
2	Step 6	Assembly up to step 6	1
3	HB	M3x20 Cap Head Bolt	1
4	HB	M3 Locknut	1

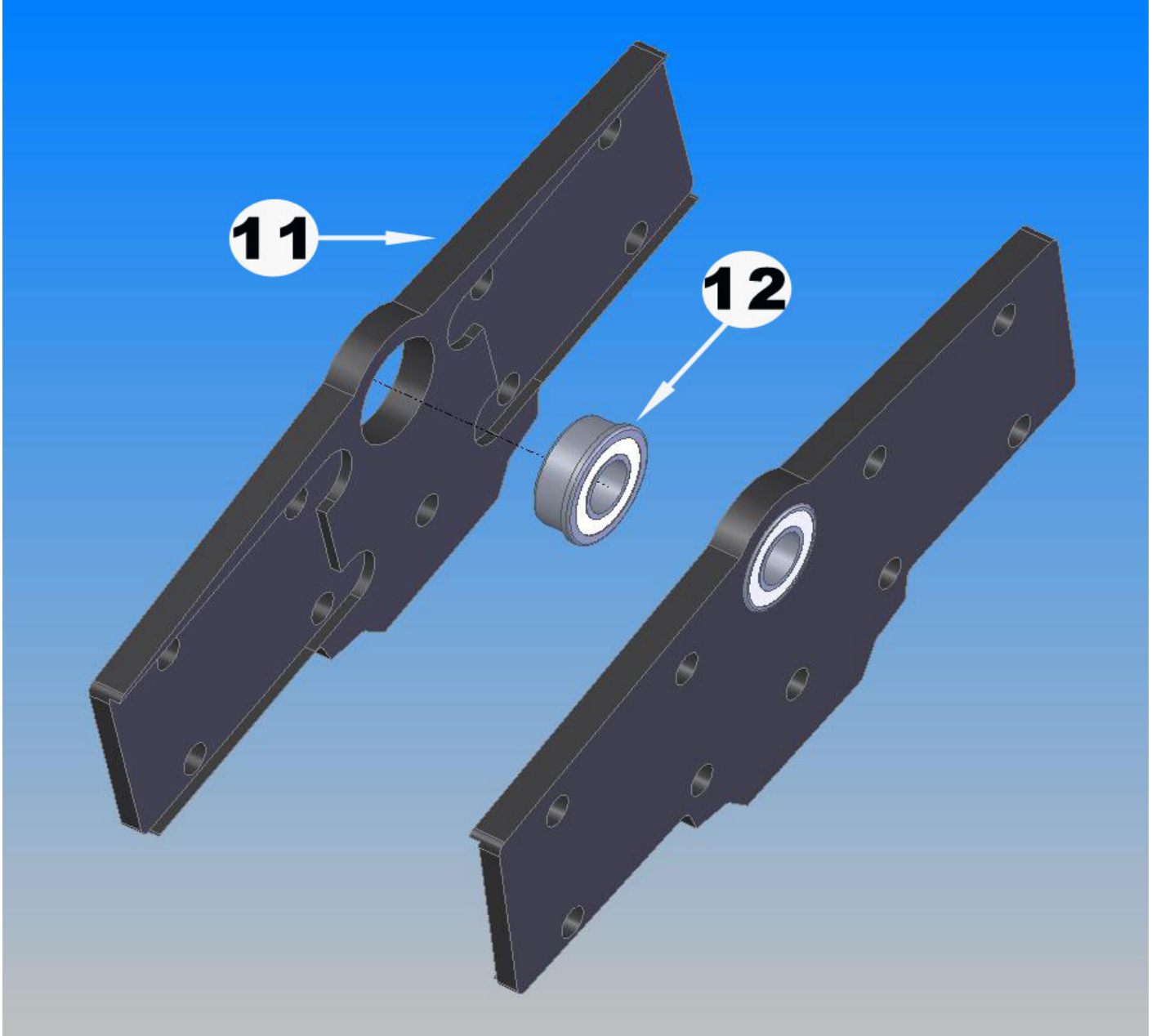
Install the Head Assembly into the Main Shaft, and then secure it by one M3x20 Cap Head Bolt and one M3 Locknut.



7B-1 CENTER HUB ASSEMBLY

No.	Bag#	Description	Qty	No.	Bag#	Description	Qty
1	7	Center Hub	1	8	HB	M3x7 Pivot Ball Stud	2
2	7	Center Hub Shaft	1	9	HB	M3x20 Cap Head Bolt	2
3	7	Center Hub Shaft Spacer	2	10	HB	M3x5x1 Spacer	2
4	7	Dampener Shaft	1	11	7	Center Hub Side Plate	2
5	7	Head Dampener O-ring	4	12	7	5x10x4 Flange Bearing	2
6	7	Multiply Arm	2	13	HB	M3x5 Set Screw	1
7	HB	M3x4 Pivot Ball Stud	2	14	7	Washout Anti-rotation Pin	2

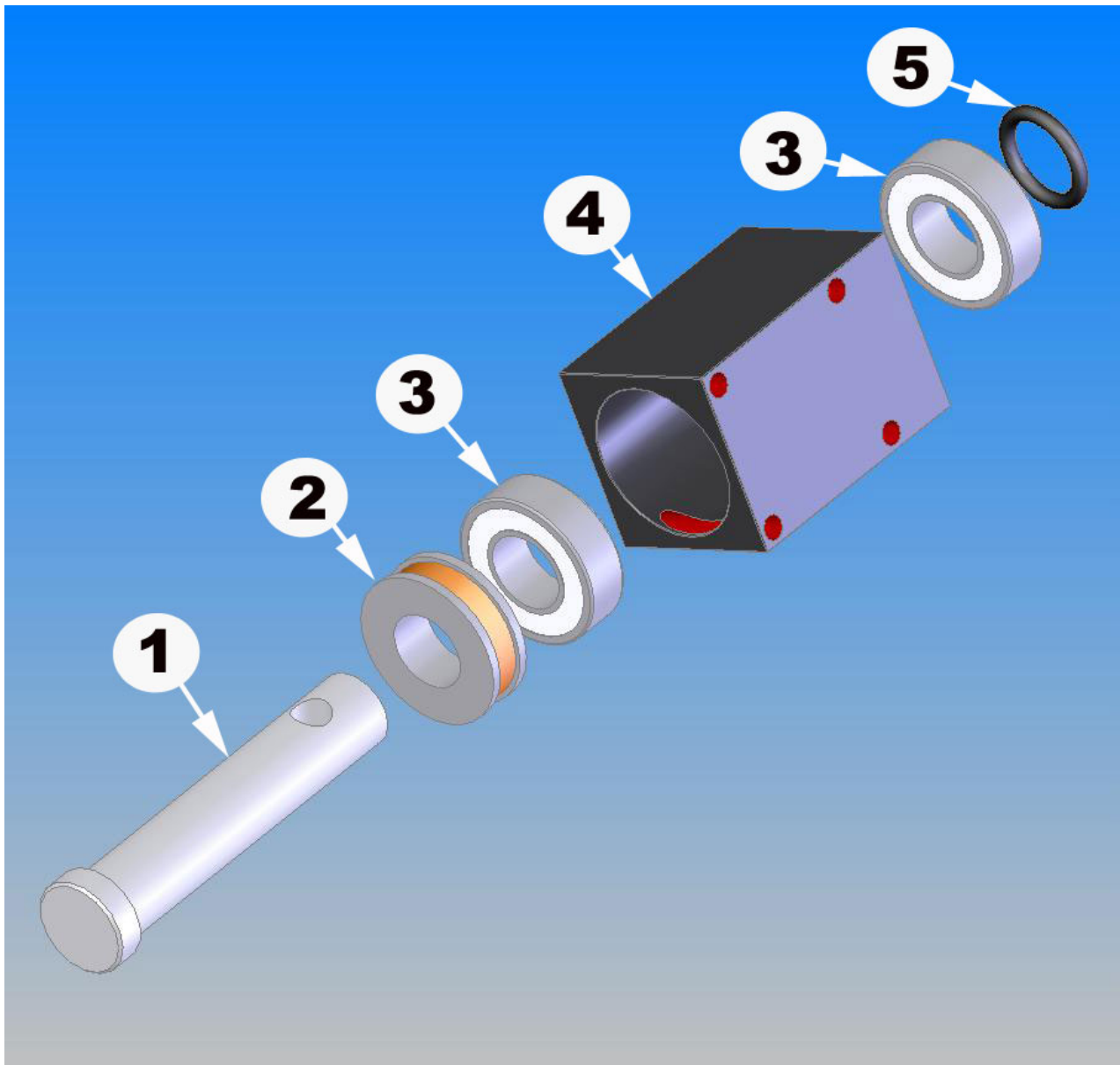




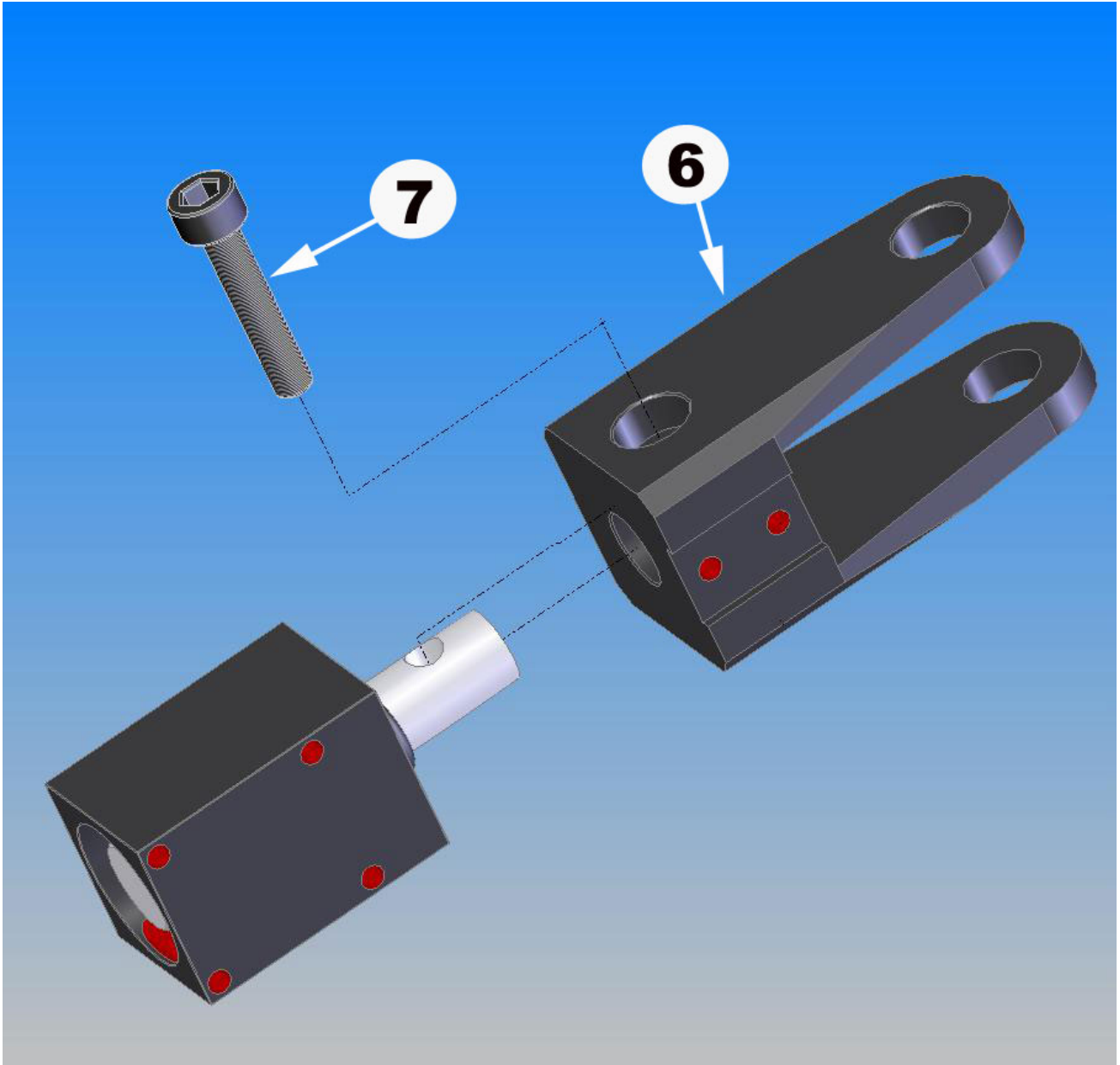
7B-2 MAIN GRIP ASSEMBLY

No.	Bag#	Description	Qty
1	7	Head Spindle	2
2	7	8X16X5 Thrust Bearing	2
3	7	8X16X5 Regular Bearing	4
4	7	Blade Grip Bearing Block	2
5	7	Spindle O-ring	2
6	7	Blade Holder	2
7	HB	M4x18 Cap Head Bolt	2

In some cases, you may get different version of the Thrust Bearing: one race washer, one flat washer, and caged ball bearings in your kit. That is fine; it still works the same. In this case, you need to install the flat washer first (next to Regular Bearing-No. 3), then the caged ball bearings, the race washer goes last.

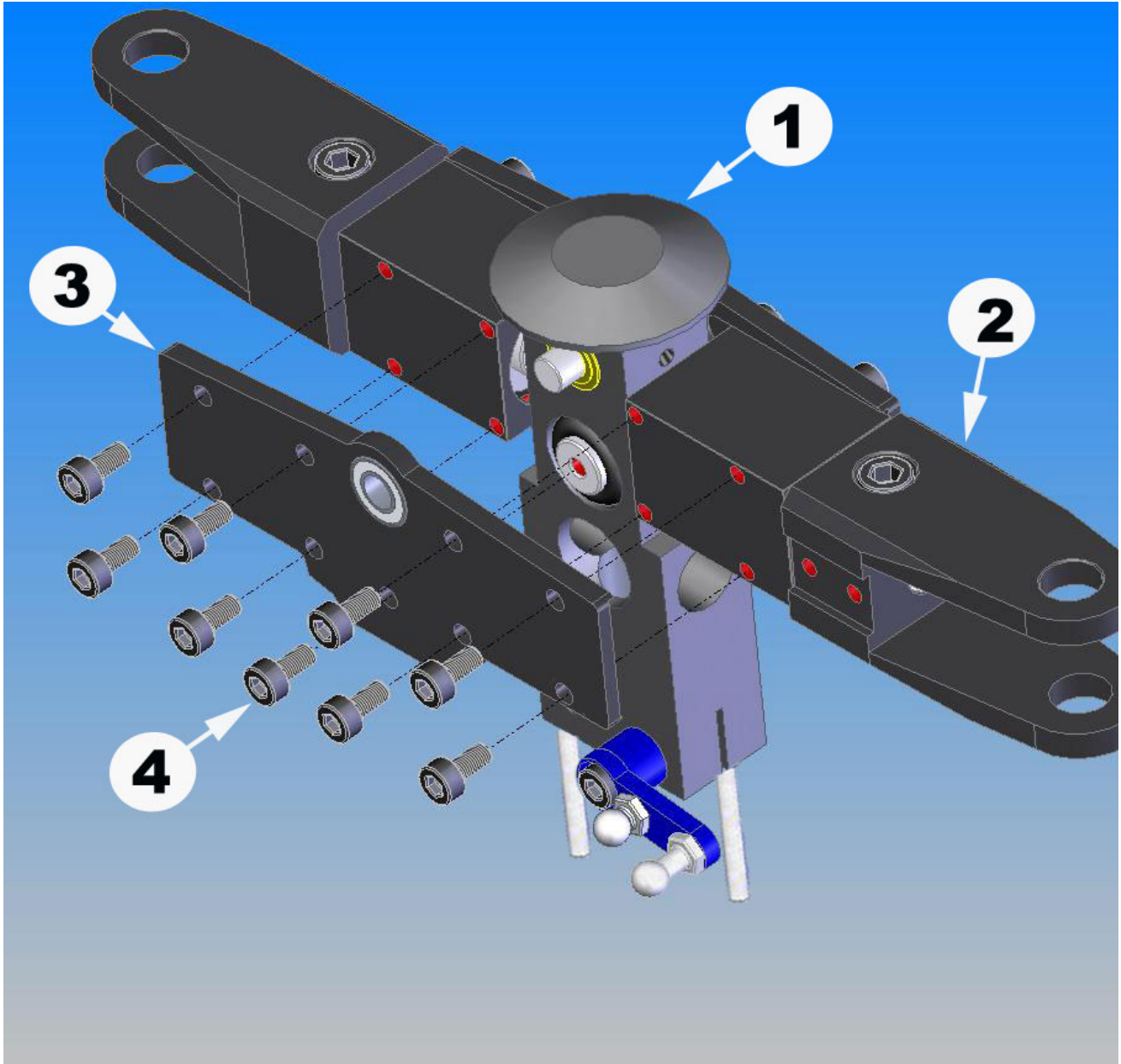


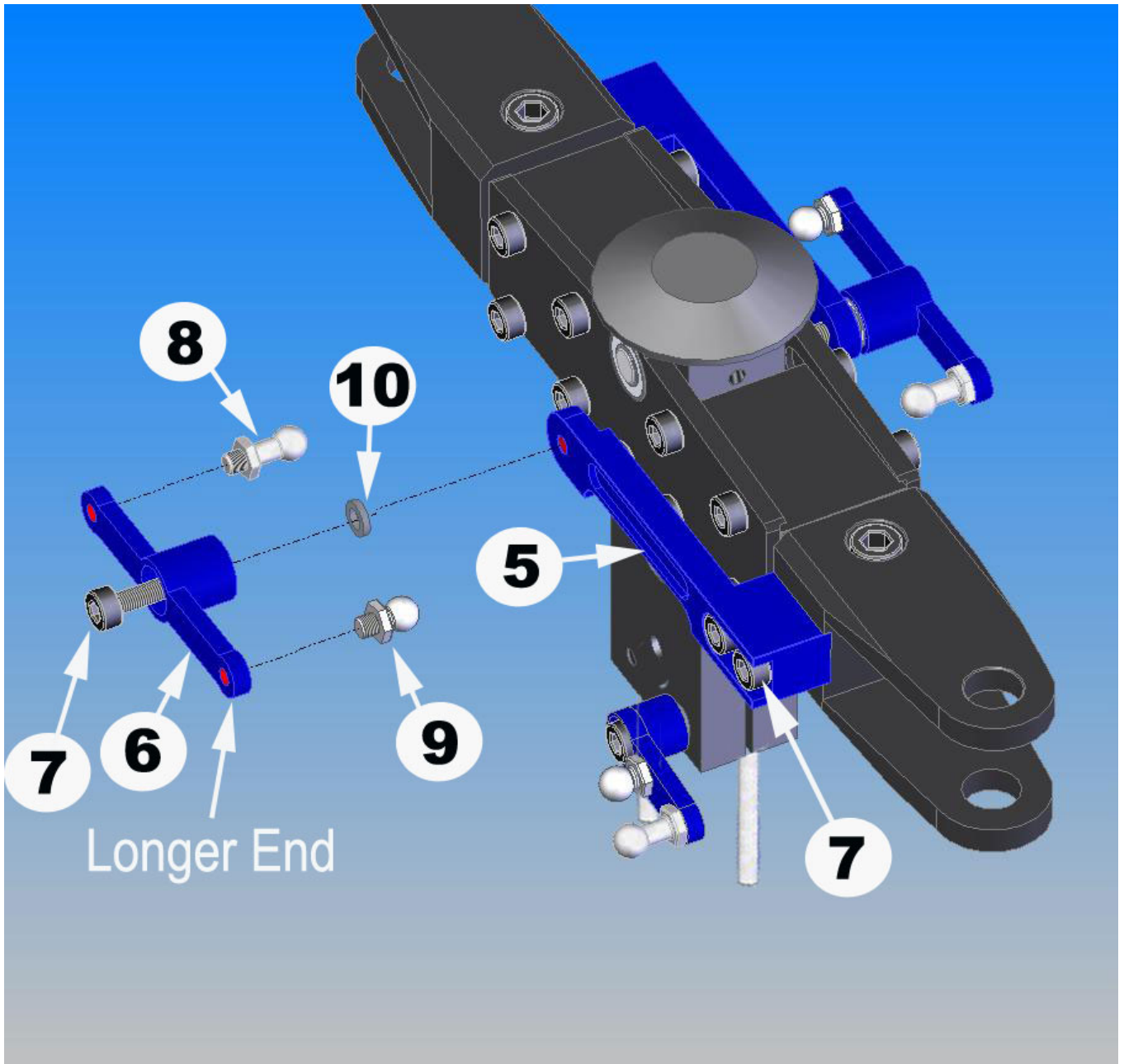
Note: No. 5 Spindle O-ring shown in the drawing is stretched out to fit in the model in the software program when making the drawing (the actual size is much smaller.)



7B-3 MAIN ROTOR ASSEMBLY

No.	Bag#	Description	Qty	No.	Bag#	Description	Qty
1	Step 7B-1	Center Hub Assembly	1	6	7	Hiller Arm	2
2	Step 7B-2	Main Grip Assembly	2	7	HB	M3x12 Cap Head Bolt	6
3	Step 7B-1	Center Hub Side Plate	2	8	HB	M3x7 Pivot Ball Stud	2
4	HB	M3x6 Cap Head Bolt	18	9	HB	M3x4 Pivot Ball Stud	2
5	7	Pitch Arm	2	10	HB	M3x5x1 Spacer	2

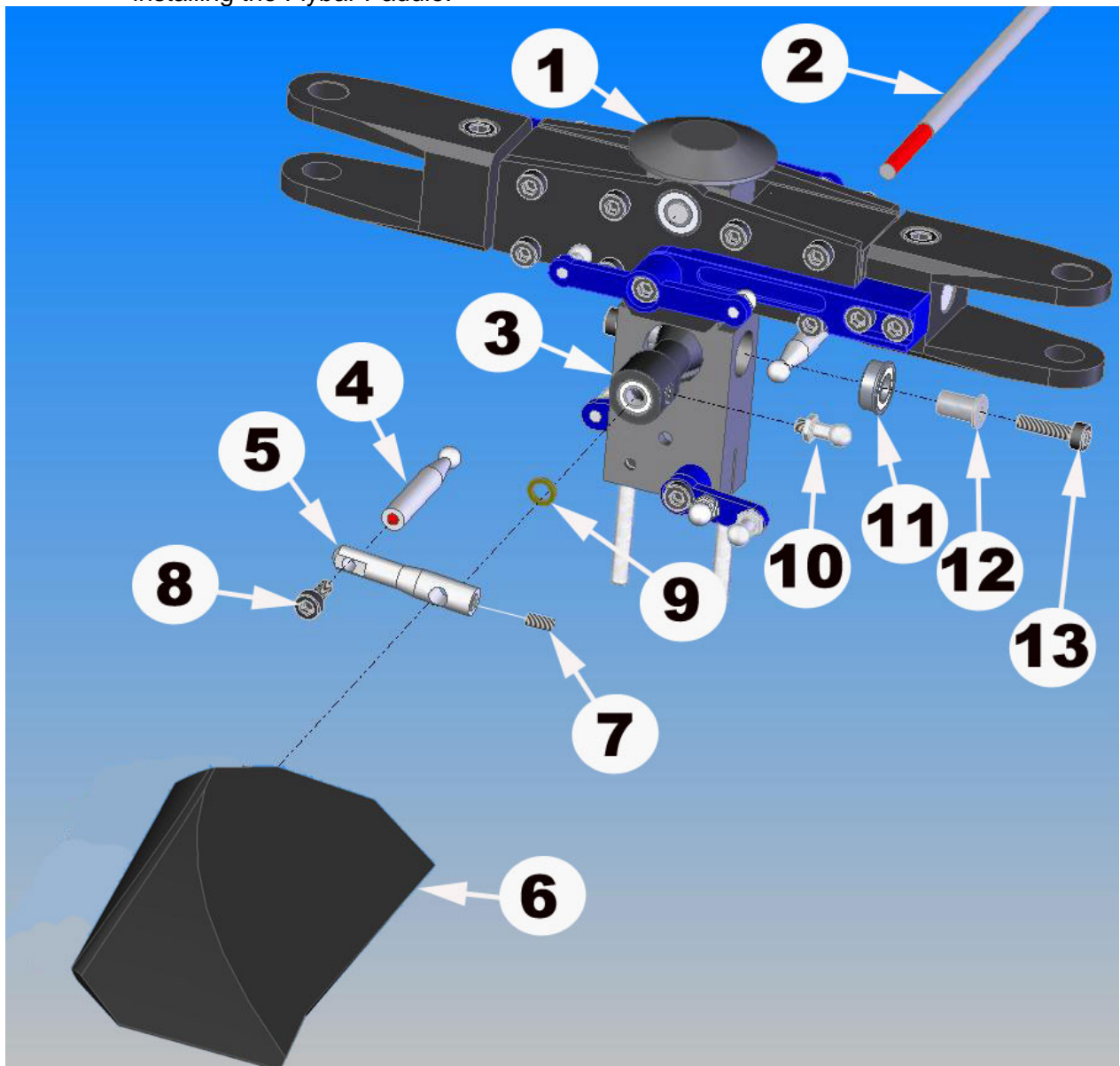




7B-4 FLYBAR & SEESAW ASSEMBLY

No.	Bag#	Description	Qty	No.	Bag#	Description	Qty
1	Step 7B-	Main Rotor Assembly	1	8	HB	M3x8 Cap Head Bolt	2
2	In box	4mm Flybar	1	9	7	M4x6x1 Spacer	2
3	7	Seesaw	1	10	HB	M3x7 Pivot Ball Stud	2
4	7	Flybar Control Arm A	2	11	7	5x10x4 Flange Bearing	2
5	7	Flybar Control Arm B	2	12	7	Seesaw Collar	2
6	7	4mm Flybar Paddle	2	13	HB	M3x12 Cap Head Bolt	2
7	HB	M3x5 Set Screw	2	14****		Epoxy Glue/JP Weld	1

- There are two holes in the paddles. For regular setup, use the hole that is further from the letter “Quick” on the paddles.
- Although the drawing does not show the other side of the head, you should repeat the same assembly for that side.
- Fly-bar should be balanced on the Seesaw.
- Make sure to apply Epoxy Glue or JP Weld to the thread on Flybar when installing the Flybar Paddle.

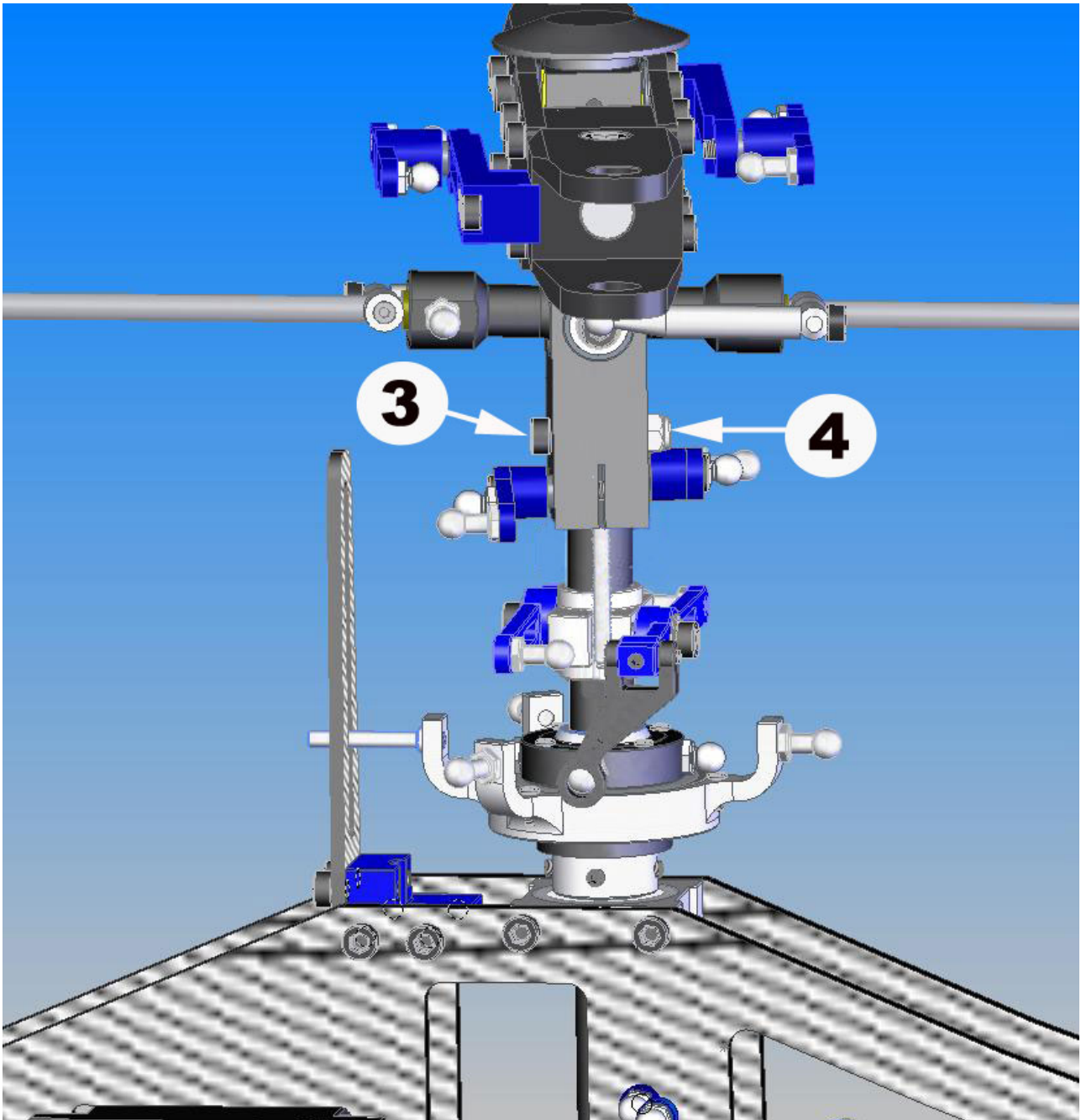


Note: Flybar Control Arm shown may look differently from the ones in the kit.

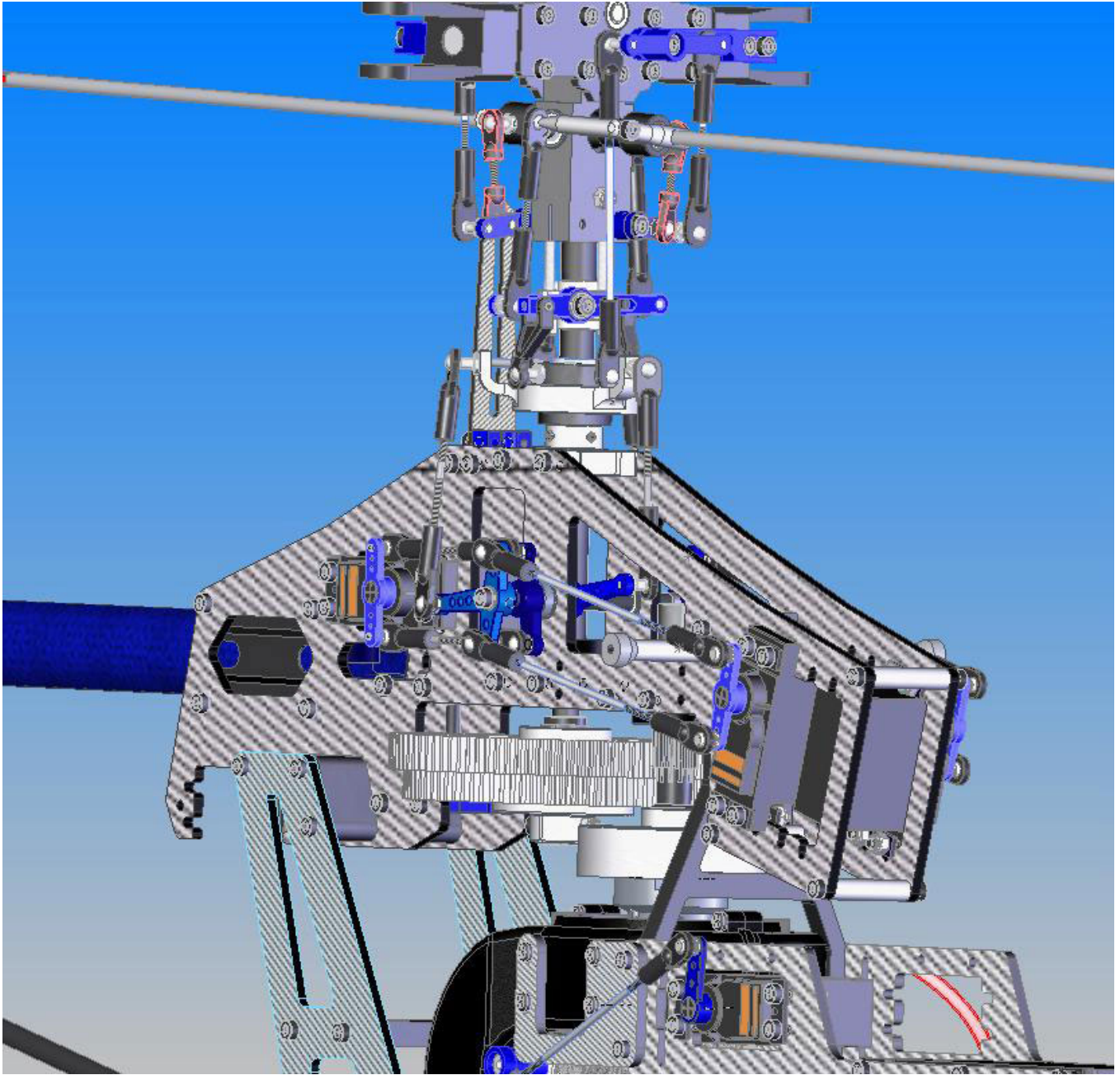
7B-5 ROTOR HEAD INSTALLATION

No.	Bag#	Description	Qty
1	Step 7B-2	Completed Rotor Head (step 7B-2)	1
2	Step 6	Assembly up to step 6	1
3	HB	M3x20 Cap Head Bolt	1
4	HB	M3 Locknut	1

Install the Head Assembly into the Main Shaft, and then secure it by one M3x20 Cap Head Bolt and one M3 Locknut.



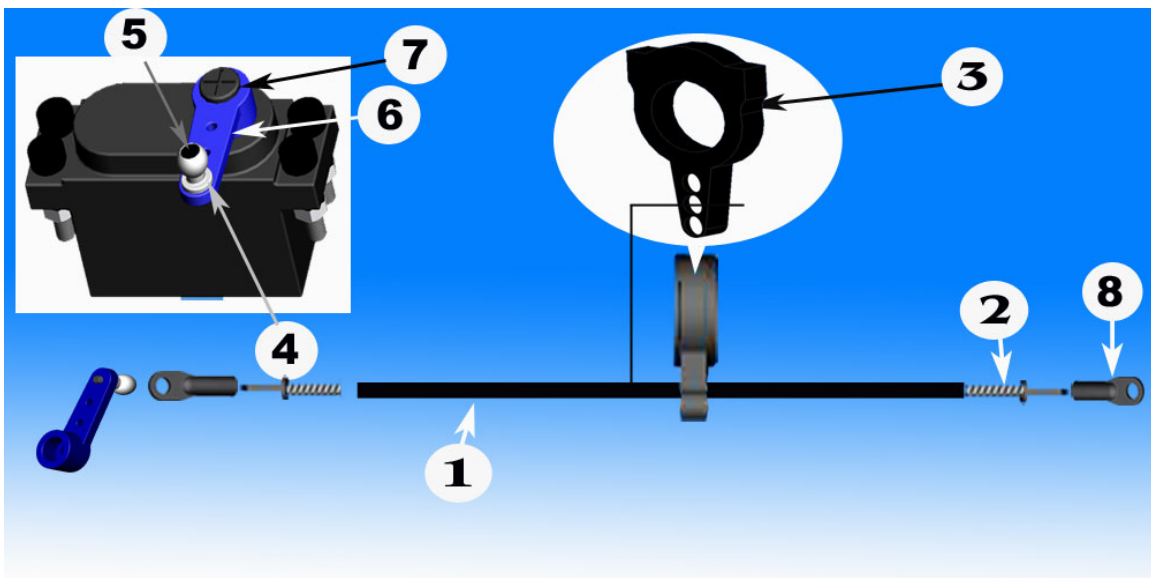
SECTION 8: LINKAGE RODS AND SETTINGS Bag 8



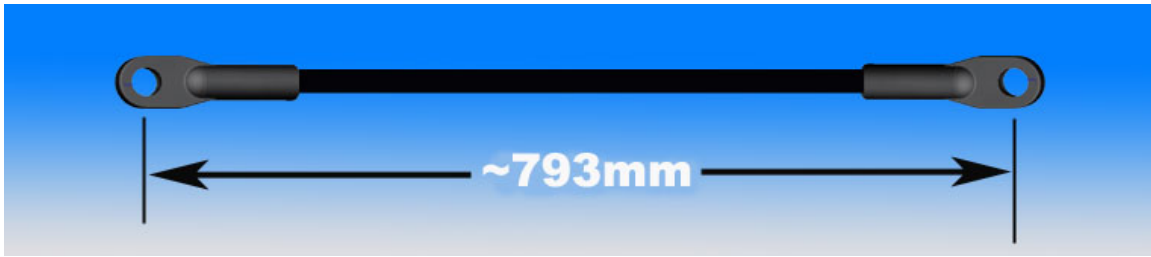
8-1 RUDDER PUSH ROD INSTALLATION

No.	Bag#	Description	Qty
1	In box	Rudder Push Rod	1
2	8	Rudder Push Rod End	2
3	8	Pushrod Guide Clamp-on	1
4	HB	Shim Ball	1
5	HB	M2x8 Phillips Screw	1
6****		Servo Arm	1
7****		M3 Servo Phillips Screw	1
8	8	2.3mm Long Ball End	2
9****		CA Glue	1
10****		Electric Tape	1

The diameter of the Pushrod Guide Clamp-on is a little bit bigger than the diameter of the boom. Cut off 2-3 teeth of the clamp and wrap the Boom with a couple of wraps of electrical tape to keep it from slipping.

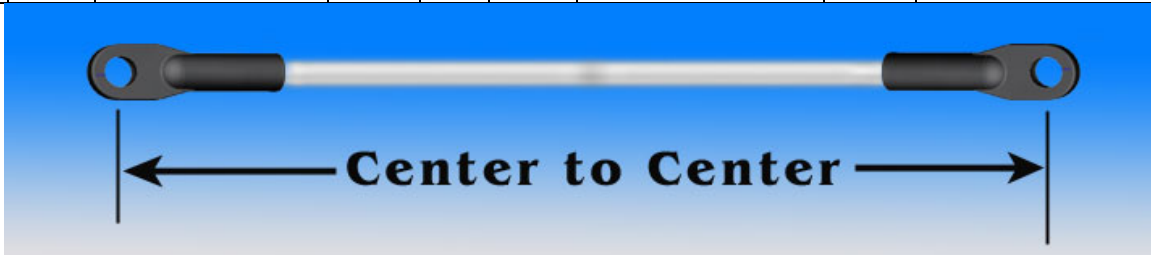


The length of the Rudder Rod measured from center to center should be around 793 mm.



8-2A LINKAGE ASSEMBLY SPORT VERSION

No.	Bag#	Description	Qt.	No.	Bag#	Description	Qt.	The lengths of linkages are used for reference only. Final adjustments might need to be made after setup.
1	8	2.3 Long Ball End	28	5	8	2.3x70mm Rod	2	
2	8	2.3x25mm Rod	2	6	8	2.3x80mm Rod	1	
3	8	2.3x35mm Rod	2	7	8	2.3x85mm Rod	2	
4	8	2.3x45mm Rod	3	8	8	2.3x110mm Rod	2	

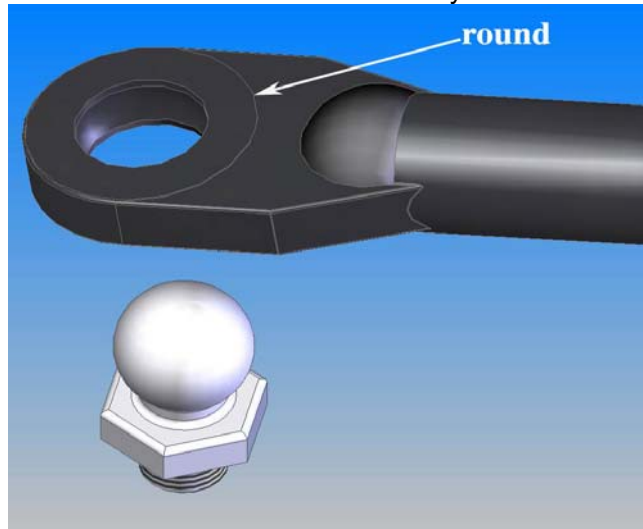


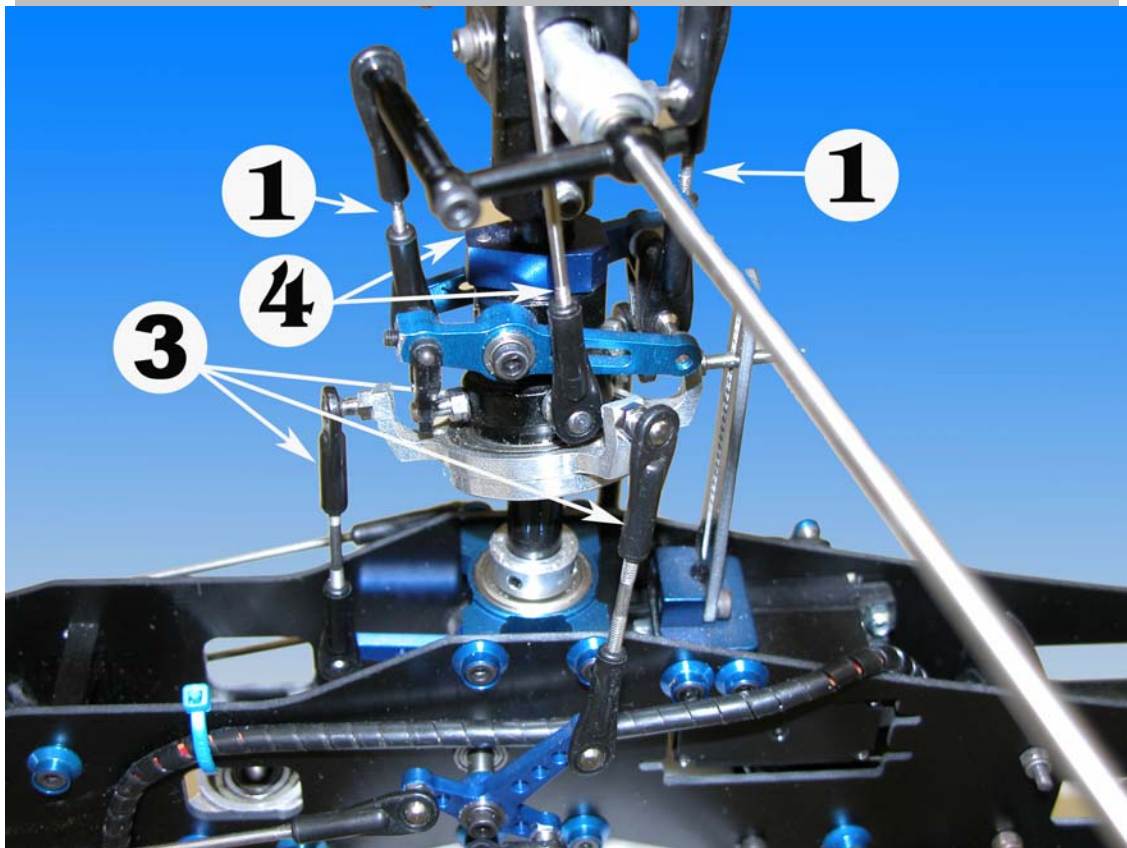
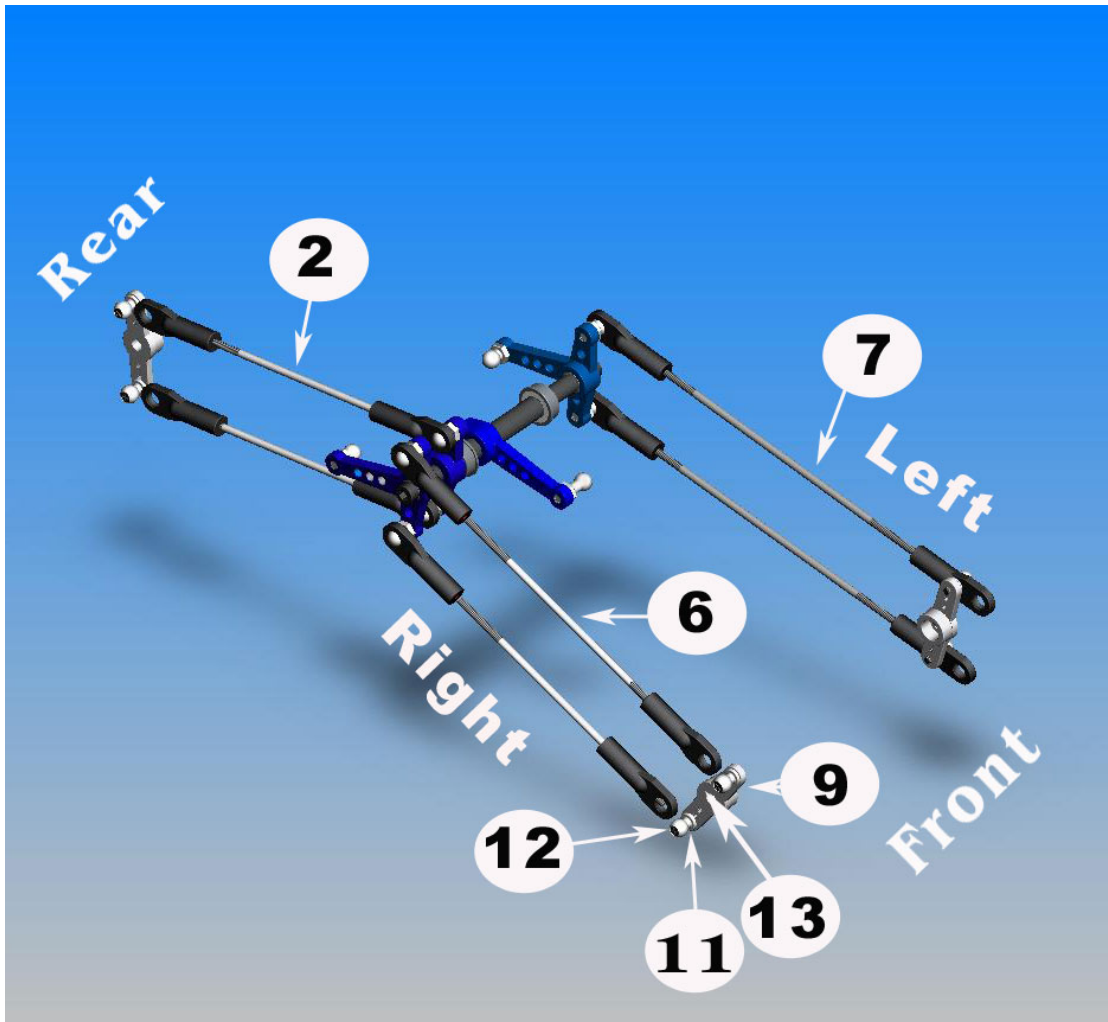
Rod Assembly:

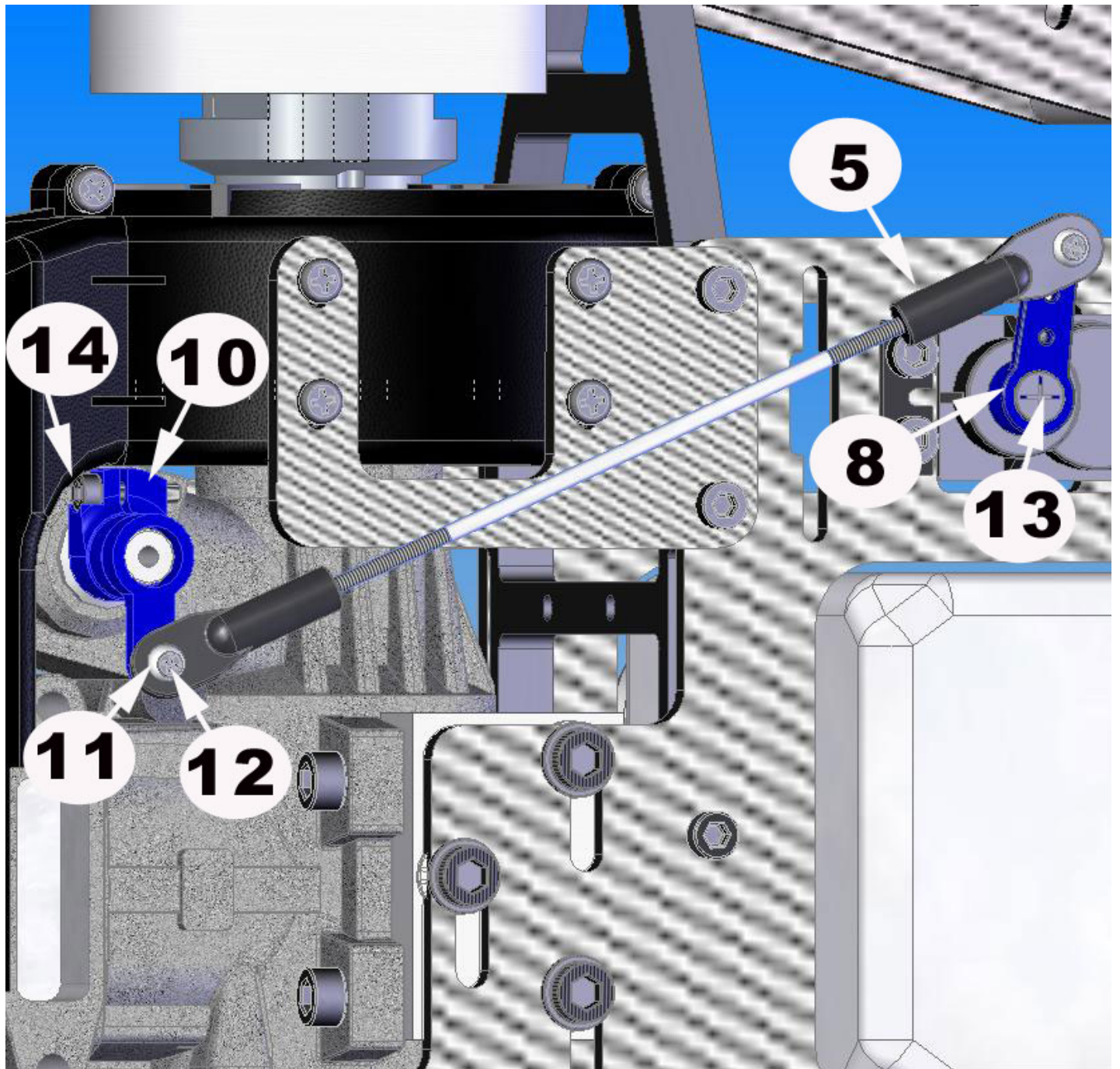
All the Linkages should be assembled with dimensions measured center to center as following:

No.	Bag #	Rod Description	Center to	Qty	No.	Bag	Rod Description	Qty
1		2.3x25mm Rod	51.5 mm	2	8*****		Single Servo Arm	1
2		2.3x35mm Rod	61 mm	2	9*****		Double Servo Arm	3
3		2.3x45mm Rod	75 mm	3	10*****		Throttle Extension	1
4		2.3x70mm Rod	94.5 mm	2	11	HB	Shim Ball	8
5		2.3x80mm Rod	110 mm	1	12	HB	M2x8 Phillips Screw	8
6		2.3x85mm Rod	113 mm	2	13*****		M3 Servo Phillips Screw	4
7		2.3x110mm Rod	136 mm	2	14*****		M2.5x10 Cap Head Bolt	1

Note: Look close to a ball end; you will see one side is different from the other. One has a round marked on it. The other is just plain. When installing a ball link into a pivot ball stud (or a shim ball) the side with a round should face away from a ball stud (or shim ball.)





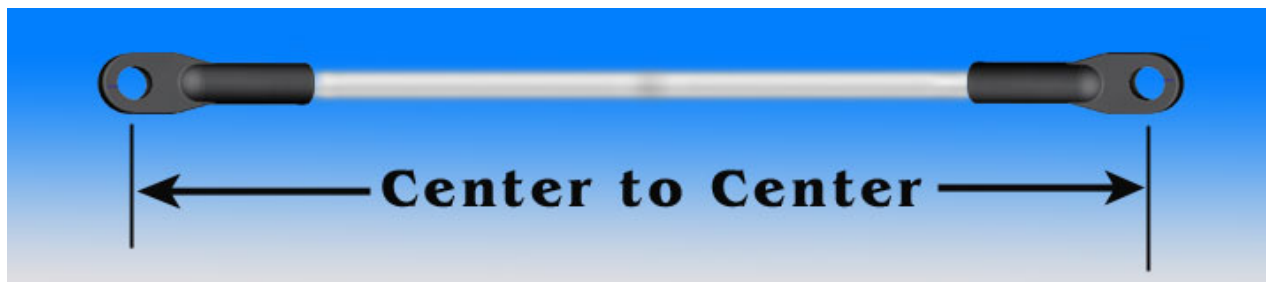


8-2B LINKAGE ASSEMBLY PRO VERSION

There are two types of linkage rods you will construct:

- Regular linkage rod: constructed by two ball ends and one metal rod.
- Carbon linkage rod: constructed by two ball ends, two rod ends, one carbon rod, and CA glue. This carbon rod should be cut in specific length. We will tell you how to cut it and how long you need.

No.	Bag#	Description	Qt.
1	8	2.3 Long Ball End	28
2	8	2.3 Medium Ball End	6
3	8	2.3 Short Ball End	2
4	8	2.5mm Rod End	16
5	8	2.3x10mm Rod	2
6	8	2.3x20mm Rod	4
7	8	2.3x35mm Rod	2
8	8	2.3x70mm Rod	2
9	In box	2.5mm Carbon Linkage Rod	1
10****		CA Glue	1

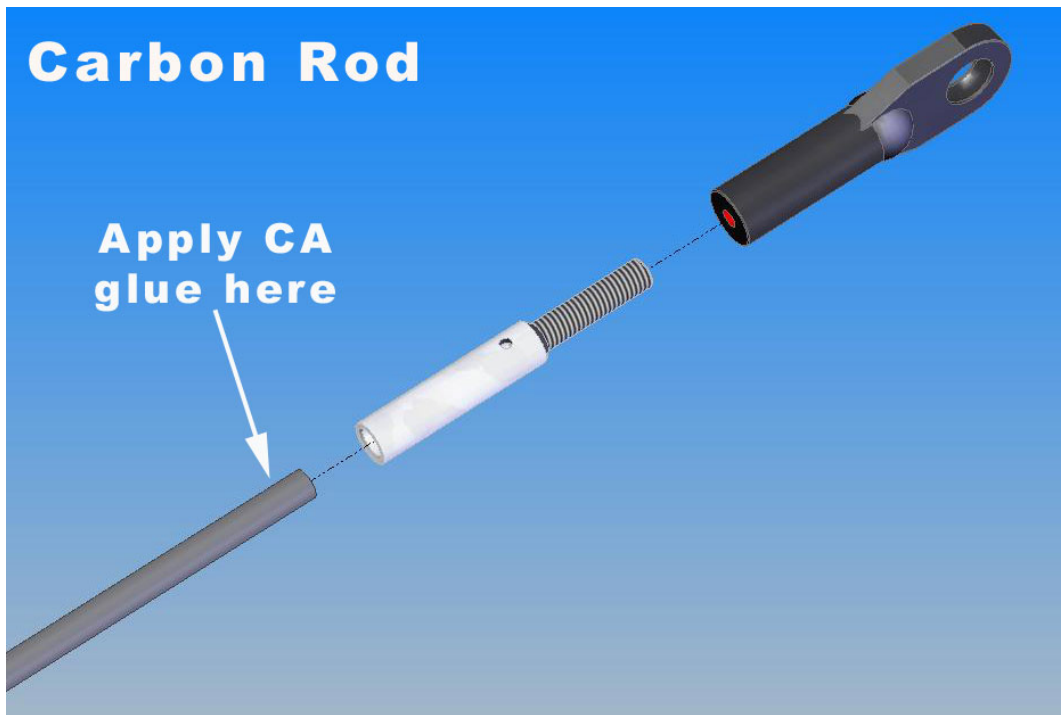


Rod Assembly:

All the Linkages should be assembled with dimensions measured center to center as following:

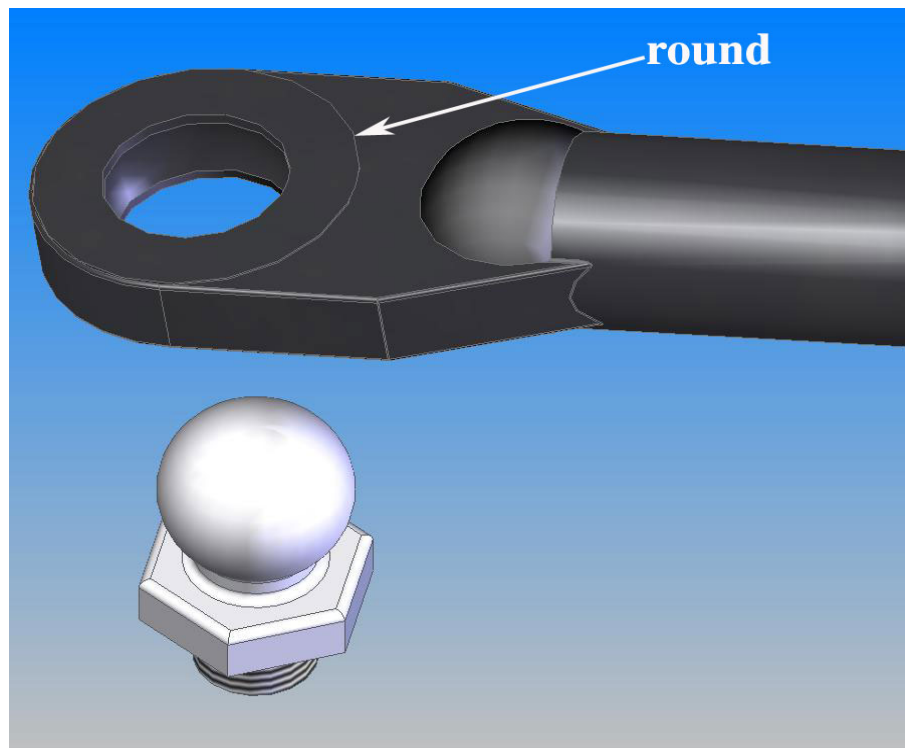
No.	Bag #	Rod Description	Ball Ends Used	Center to Center	Qty
1		2.3x10mm Rod	Short Ball End	25.6 mm	2
2		2.3x20mm Rod	Long Ball End	49 mm	2
3		2.3x20mm Rod	Long Ball End	50 mm	2
4		2.3x35mm Rod	Long Ball End	61 mm	2
5		2.3x70mm Rod	Long Ball End	96 mm	2
6		2.3x34mm Carbon Rod	Medium Ball End	74 mm	3
7		2.3x59mm Carbon Rod	Long Ball End	113 mm	2
8		2.3x66mm Carbon Rod	Long Ball End	120 mm	1
9		2.3x82mm Carbon Rod	Long Ball End	136 mm	2
10****		Single Servo Arm			1
11****		Double Servo Arm			3
12****		Throttle Extension			1
13	HB	Shim Ball			8
14	HB	M2x8 Phillips Screw			8
15****		M3 Servo Phillips Screw			4
16****		M2.5x10 Cap Head Bolt			1

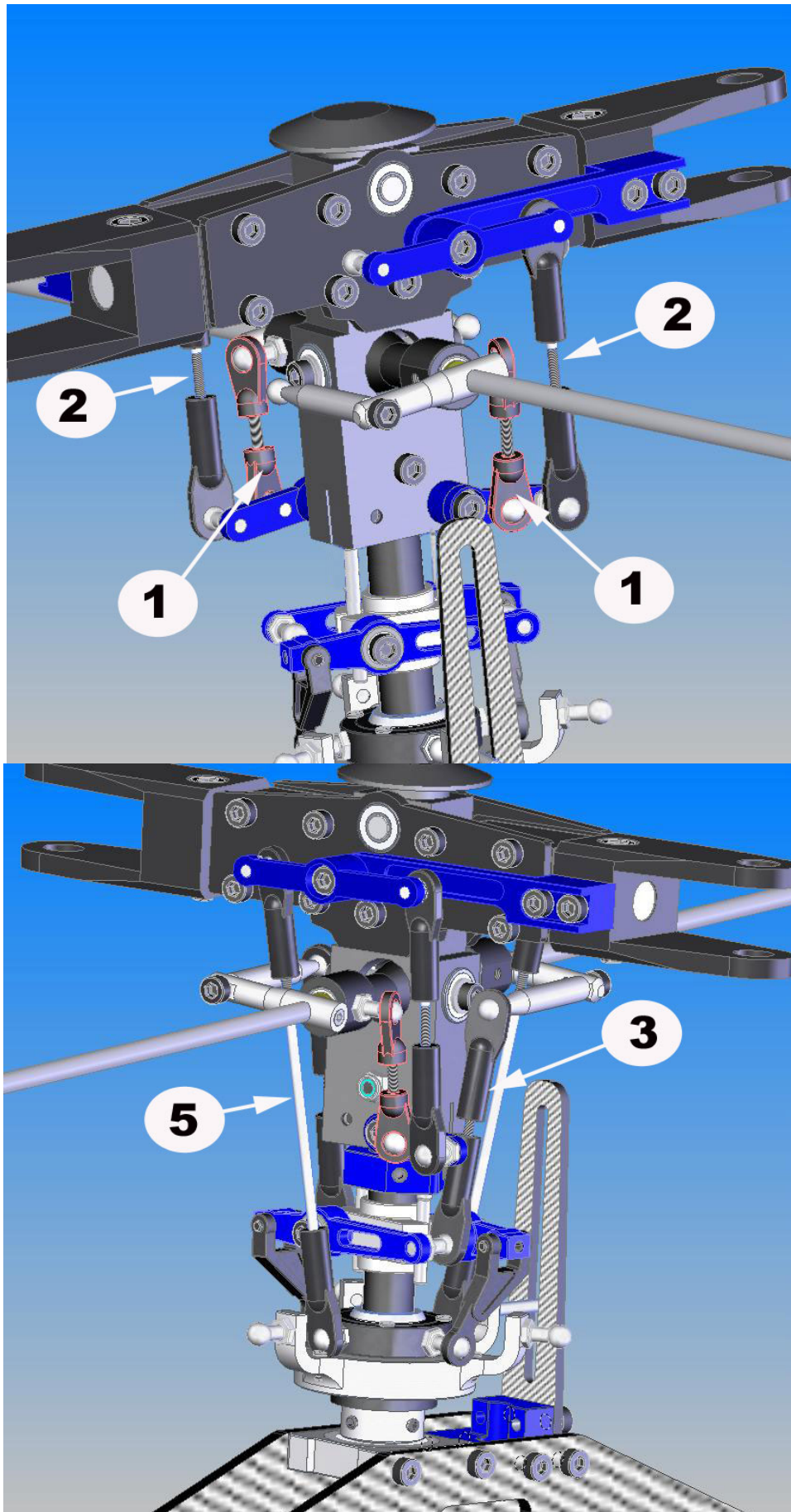
It is recommended to cut a carbon rod by electronic cutter like Dremel® with thin carbide cut-off wheel but the others may work too. Do not cut it by a scissors, pliers, or wire cutter.

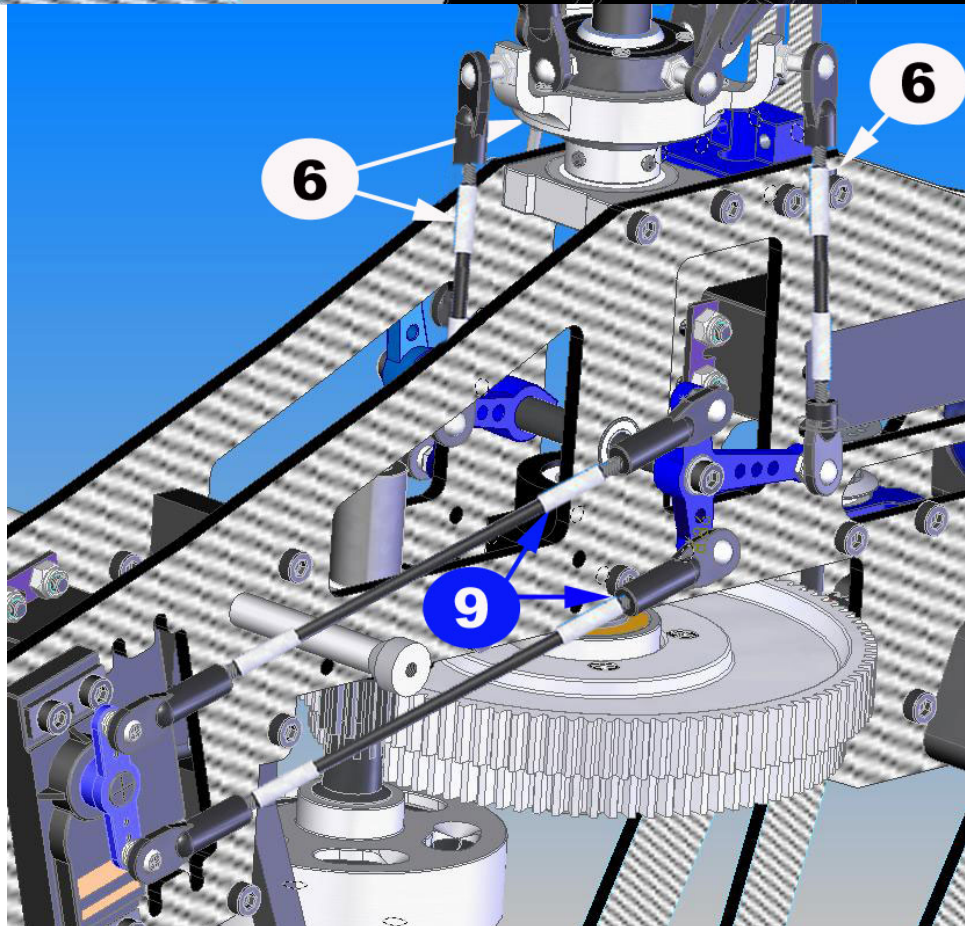
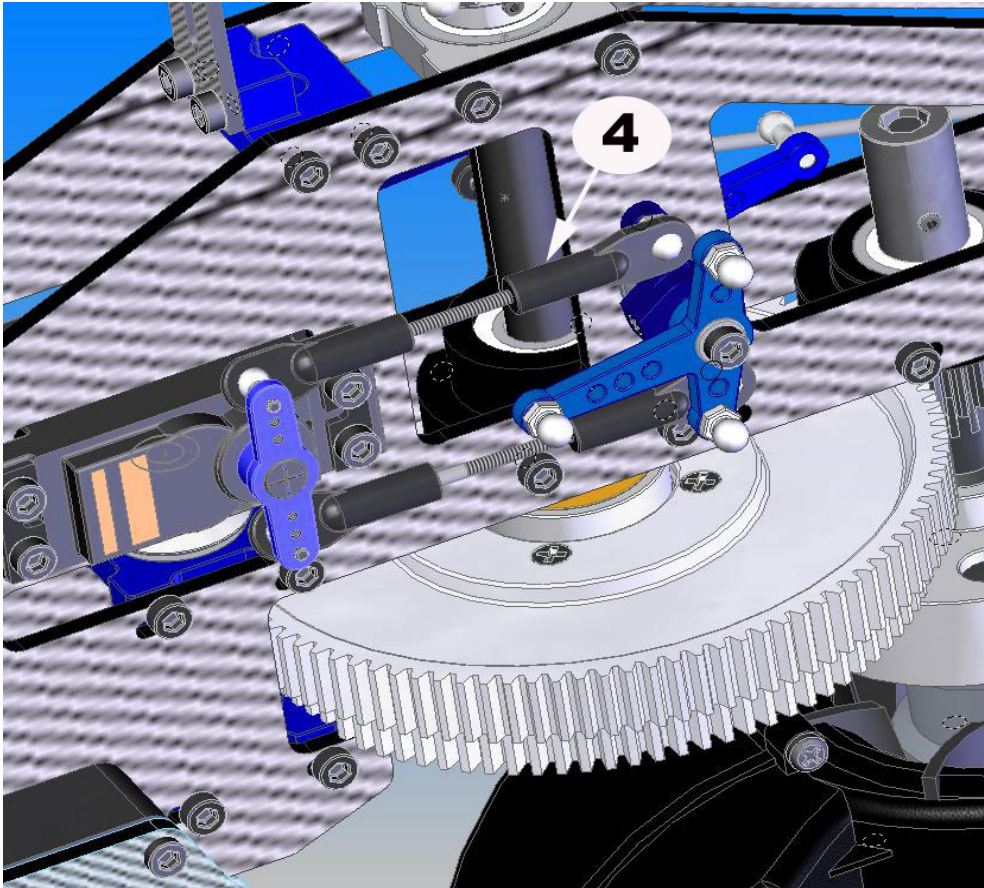


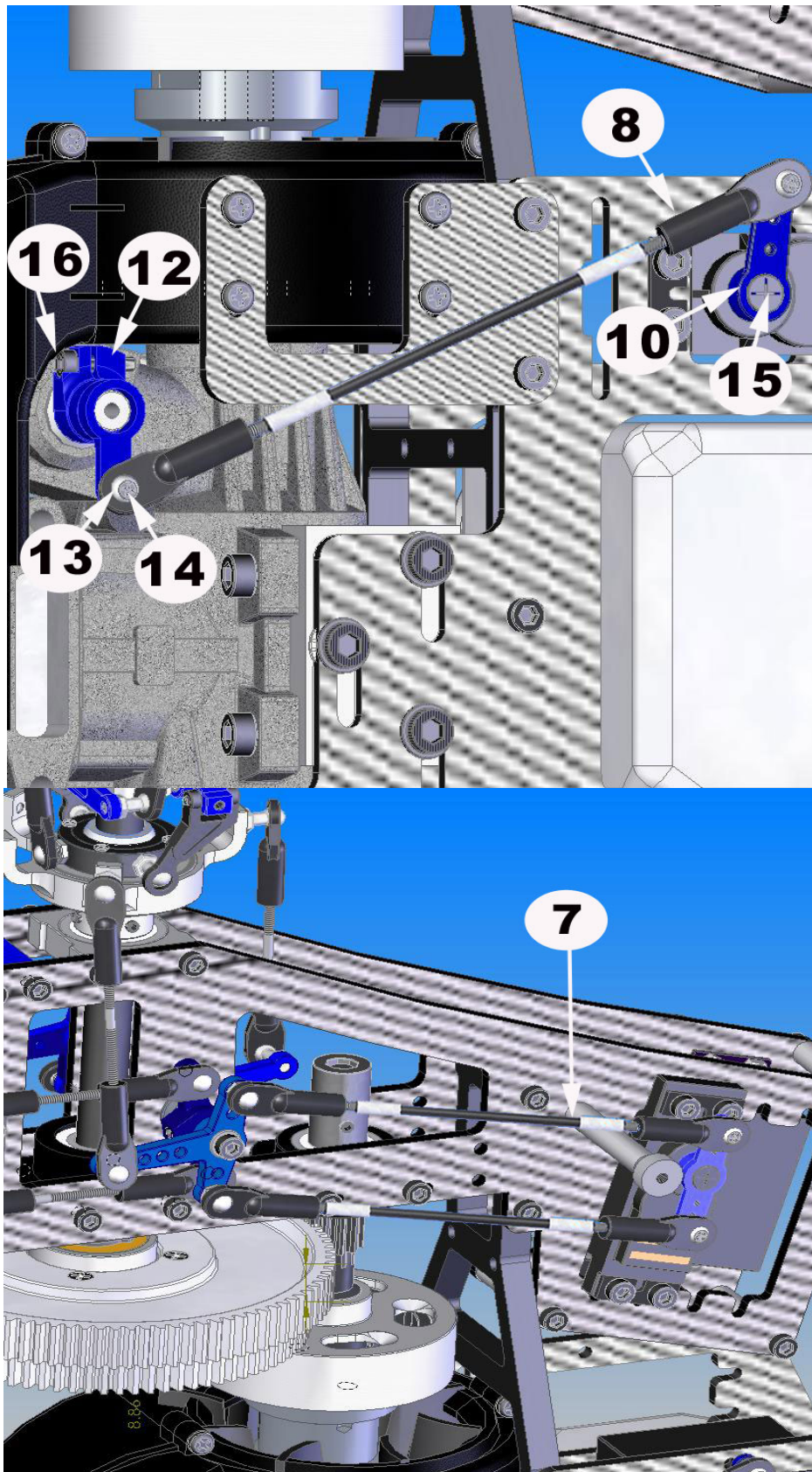
How to assemble a carbon linkage rod: First screw Ball End into the Rod End about 7mm. Apply CA glue at the ends of the rod. Insert the rod all the way in the Rod End. Use a piece of cloth to wipe off any excess glue. See instruction on the glue bottle for recommended drying time. If you need to remove the Rod End, heat it gradually then take it out.

Note: Look close to a ball end; you will see one side is different from the other. One has a round marked on it. The other is just plain. When installing a ball link into a pivot ball stud (or a shim ball) the side with a round should face away from a ball stud (or shim ball.)





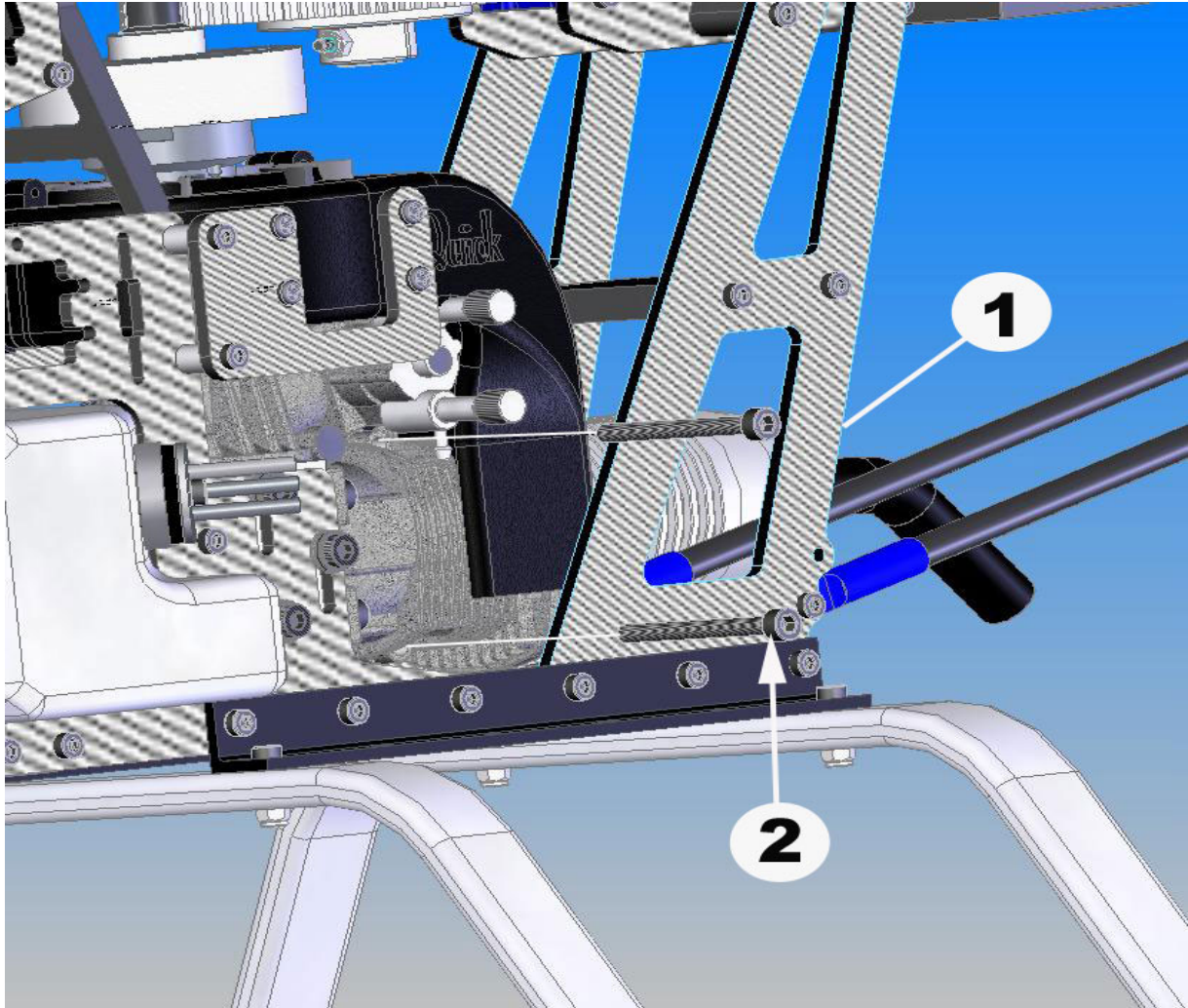


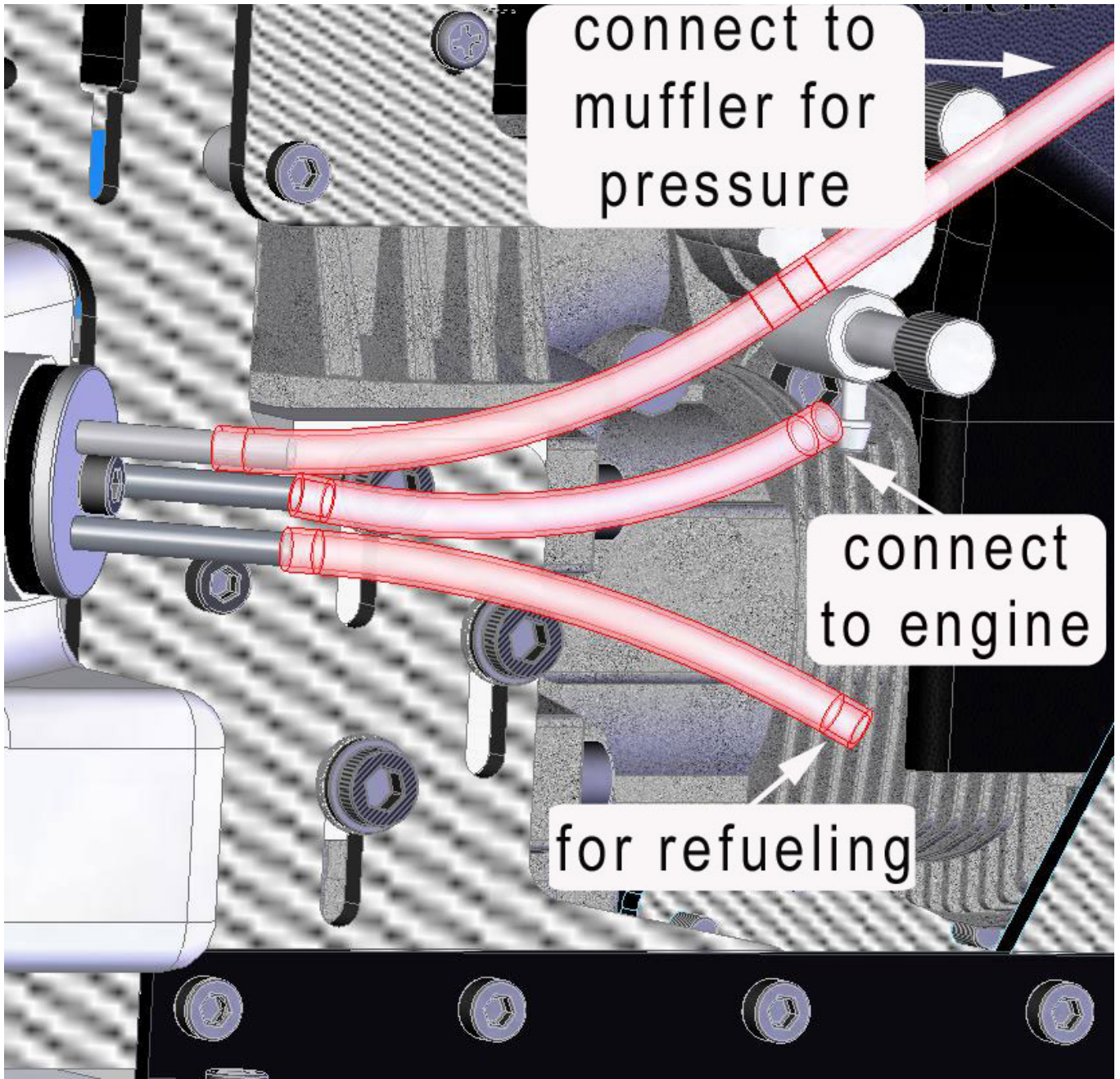


8-3 MUFFLER & HOSES INSTALLATION

No.	Bag#	Description	Qty.
1****		Muffler	1
2****		M4x40 Cap Head Bolt	2
3****		Hose	3

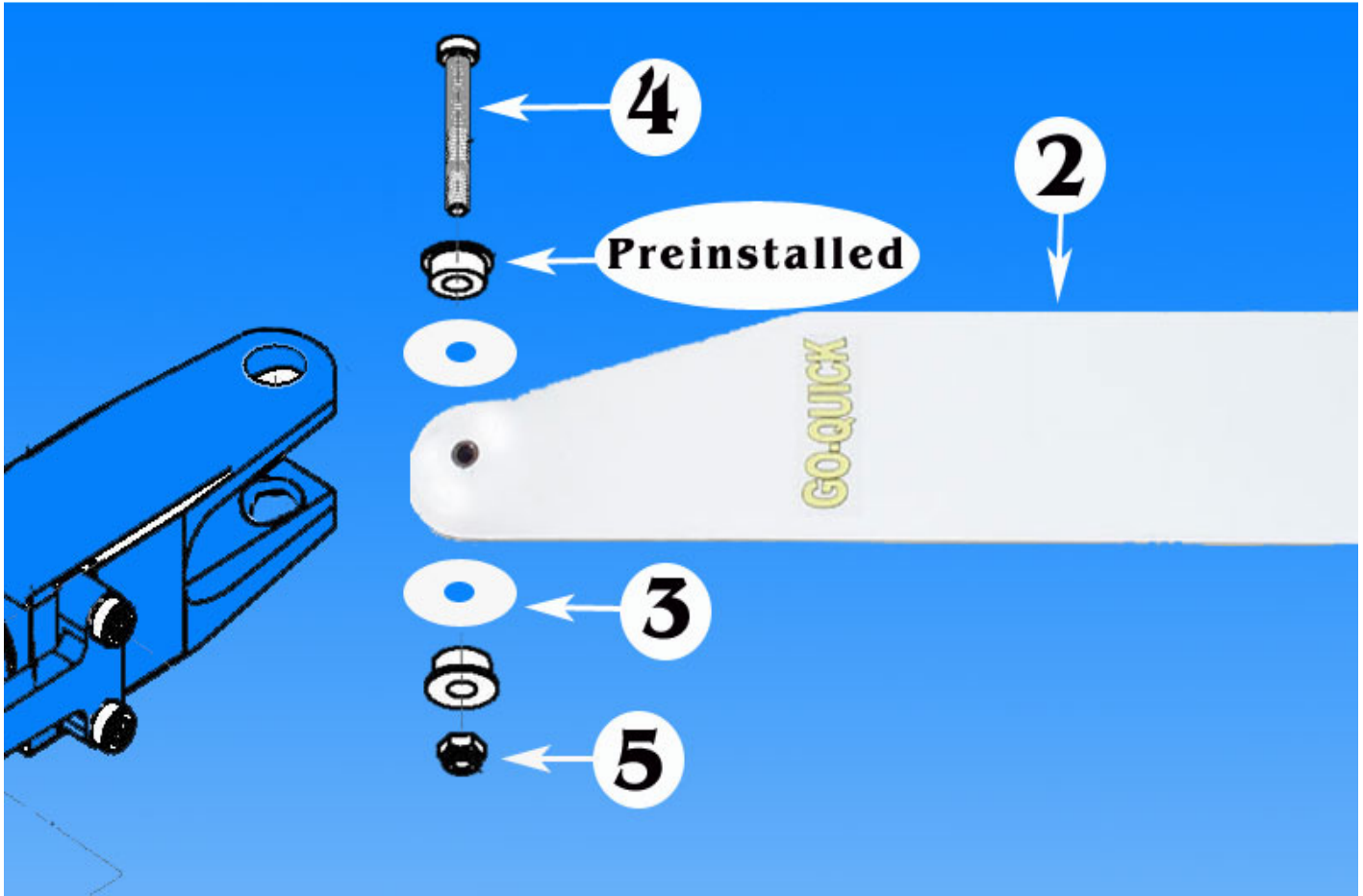
Note: For some kinds of engines and mufflers, you may have to cut the frame angle to make room for screws to fit. Although the drawings do not show the valves for hoses, you need to put one somewhere between the fuel tank and the engine; the other for refueling hose.





8-4 MAIN BLADE INSTALLATION

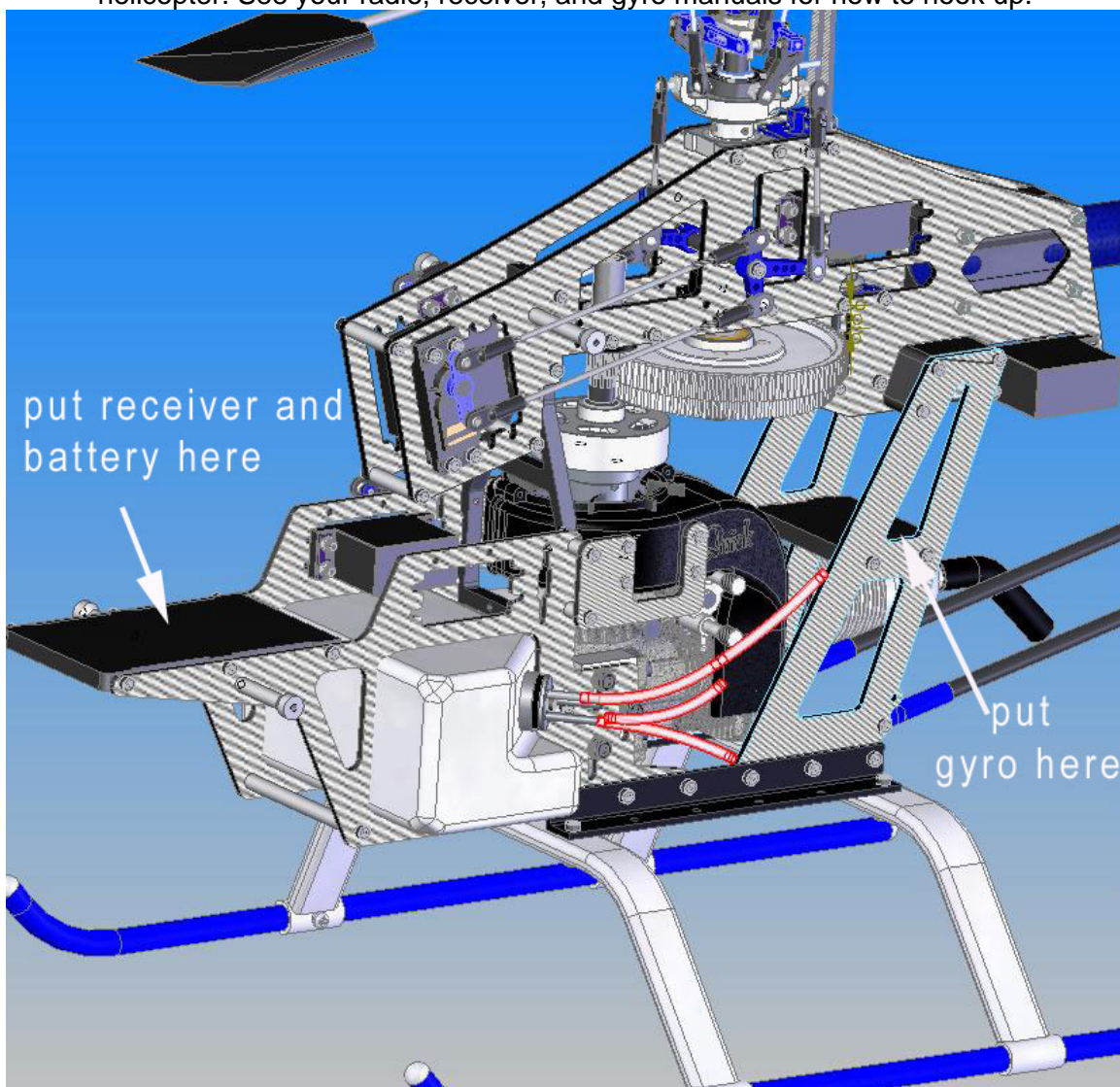
No.	Bag#	Description	Qty
1	Step 8-3	Helicopter (up to step 8-3)	1
2****		Main Blade	2
3****		Main Blade Spacer	4
4	HB	M4x30 Cap Head Bolt	2
5	HB	M4 Locknut	2



8-5 RADIO SETUP

No.	Bag#	Description	Qty
1	Step 8-4	Helicopter (up to step 8-4)	1
2	*****	Radio	1
3	*****	Receiver	1
4	*****	Gyro	1
5	*****	Battery for Receiver	1

Before setting up the radio, you have to install the receiver, gyro, and batteries for your helicopter. See your radio, receiver, and gyro manuals for how to hook up.



CCPM Helicopter Setup (for all Quick Helicopters)

General

Instead of giving you the exact length of each linkage rod we will explain to you what you are trying to achieve. This is the same for all Quick helicopters. Another thing worth mentioning is that all controls on our helicopters are leading edge controlled. We have three such controls on our helicopter and they are Main blades, Tail blade and flybar control arms. For example the main blade pitch arms should be mounted so they are in

front of the blades in the direction of travel, clockwise if you look at the helicopter from above, see picture 4. Your radio manual will be needed during this set up.

Swashplate

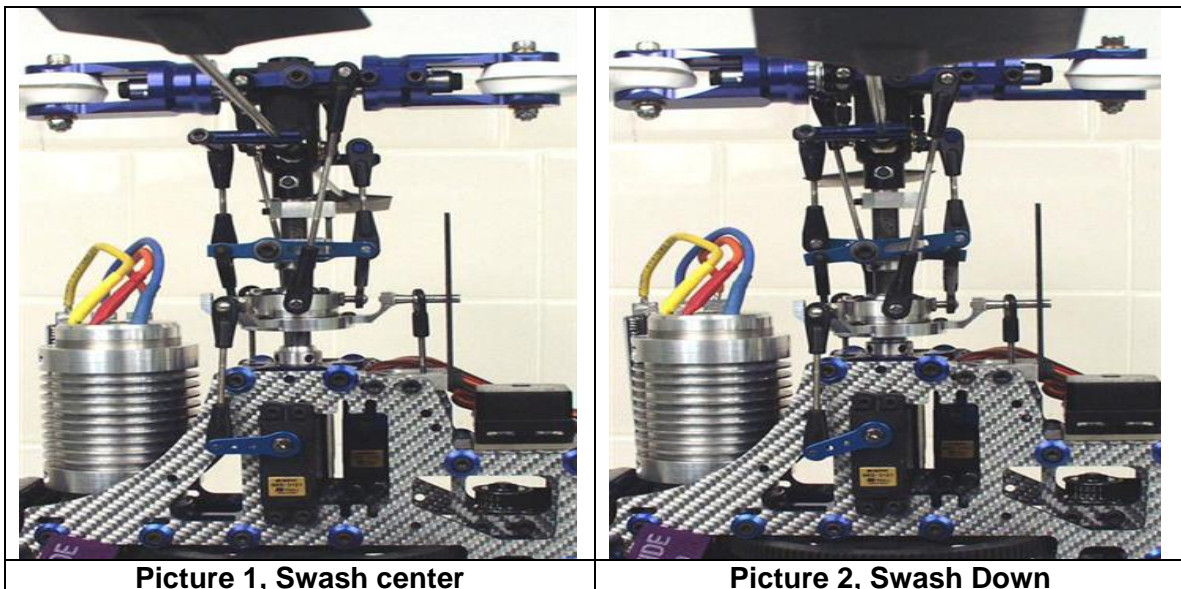
First, set your radio so that all travel values are at 100%. If you have a radio with Swash Mixing set, set those values to 50% (Aileron, Elevator, and Pitch.) Then use servo reversing so that all servos are moving in the right direction. If Pitch operates reversed, change the value in the Swash Mixing from + to -.

Step 1: First set your radio up so that all servos are moving in the right direction and adjust all travel values to 100%. If you have a radio with Swash mixing values set those to 50% (Pitch, Aileron and Elevator).

Now center both radio sticks (including “throttle”) and center all trim and sub-trim values. When this is done turn your receiver pack on. Now mount the servo arms at a 90° angle towards the linkage rod. In our non push pull helis this will be horizontal. Use the mounting position on the servo arm that will be closest to 90°, not all servos will line up 100% correct. If they are visible off from the 90° position the use the sub-trim function in your radio for fine tuning, do not use regular trim for this, see picture 1.

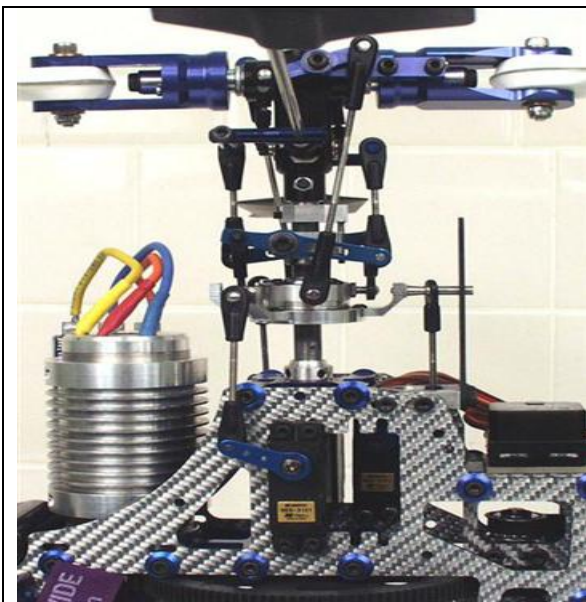
Now you have a good start and the rest of the setup will become easier.

Step 2: Connecting the Swashplate at the right distance. This is done by moving your Pitch (throttle) stick all the way down, see picture 2. When the servos are in this position adjust the length of the linkage rods so the Swashplate is located towards the bottom, but still leaves enough room for left/right (aileron) and front/back (elevator) travel. During such travel, portions of the Swashplate will move below the Swashplate position archived during Pitch full down radio stick position. So make sure you leave enough room for this extra travel, see picture 2 for recommended height. Also make sure that all 3 linkage rods between the servo arms and the Swashplate are the same, so the Swashplate is level. It should not tilt in any direction; unless your right radio stick is moved. If it tilts, and all linkage rods are the same length, then go back to step one and make sure your three servo arms have the same neutral position (horizontal on non push pull helis).

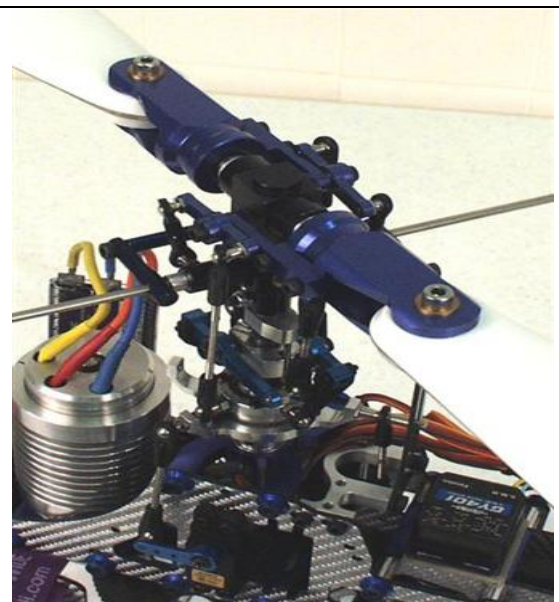


Step 3: Connecting the Washout assembly. Connect the fixed length plastic “A” arms to the Swashplate, connect to the two longer pivot studs, if all four are the same length then any two will do. The next step is to adjust the length of the linkage rod between the Washout Arm and the Flybar connection point. Turn your radio and receiver back on and center both sticks. Now adjust the length of the flybar linkage so the washout arms are level (horizontal), see picture 1. Also make sure your flybar arms and flybar-paddles are level (horizontal), when adjusting the linkage. After the length is adjusted make sure that you have free travel in all directions and stick positions. When the Pitch stick is all the way up it should look like picture 3. As you can see there is still plenty of room for aileron and elevator travel. Now adjust the Washout Anti-rotation pin height so the pin is still in the guide slot of the washout base during all travel positions. For the Left/Right Washout Anti-rotation position, line the attachment point of the plastic washout “A” arm on the Swashplate up with flybar linkage connection point. The imaginary line between these points should be vertical.

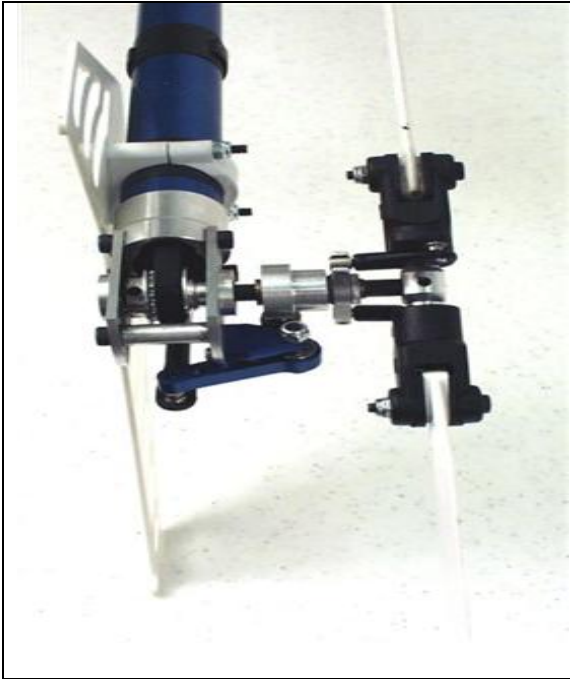
Now you are almost done, only one set of links left, and the length of those links will be depending on your desired setup whether it's Aerobatic or normal flying. Please refer to the Pith travel setup table for this final link length.



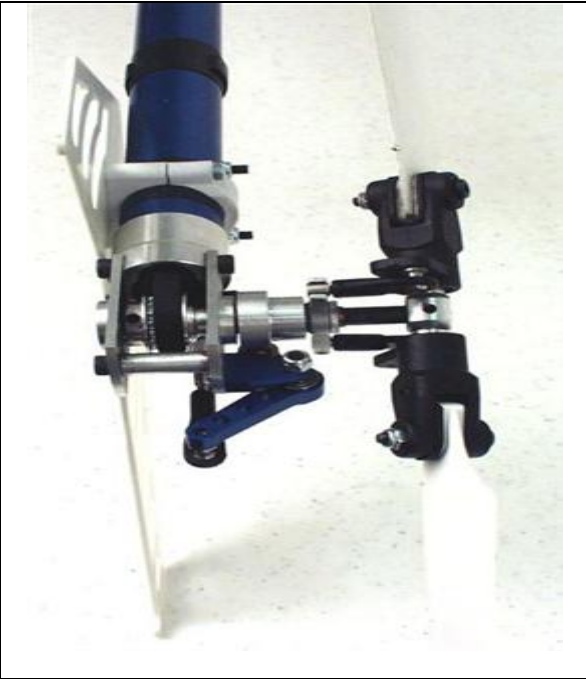
Picture 3, Swash Up



Picture 4, Head



Picture 5, Tail Center



Picture 6, Tail Positive Thrust



Picture 7, Tail Negative Thrust



Picture 8, Tail

Pitch Travel Setup		
Collective Position	Normal Flying	Aerobic
Up (100%)	+10°	+10°
Center (50%)	+5°	+0°
Down (0%)	-3°	-10°

Throttle Curve Setup				
Collective Position	Fuel		Electric (non governor mode)	
	Normal Flying	Aerobic	Normal Flying	Aerobic
Up (100%)	100%	100%	85%	85%
Center (50%)	70%	60%	75%	75%
Down (0%)	10%	100%	0%	85%

Tail

First adjust the servo arm position like you did with the swash, make sure your trim and sub-trim values are centered. Attach the servo arm so it's 90° to the tail pushrod (vertical). Now adjust your two plastic ball ends, for the push rod, so they are screwed on about half way onto the threaded pushrod guide end piece. This will allow you have maximum amount of adjustment available in both directions. Use the outer holes on the tail blade grips for the ball link attachments. When this is done cut the carbon pushrod to a length that will achieve about 3° of positive pitch on your tail blades, when the servo is in its neutral (vertical) position. Then glue the two end pieces on to the pushrod with CA glue, don't forget to insert the pushrod guides first.

When this is done you should have 3° of positive tail blade pitch. The tail should spin counter clockwise looking at the right side of the helicopter with the nose to your right and tail to your left. See pictures 5-8.

Note: Please consult the instruction for your Gyro for setting the overall travel and limits to ensure proper operation and travel of Tail Pitch Slider.

Throttle

The throttle curve will be affected by several conditions; some of them are, motor choice, blades choice, elevation, temperature, helicopter weight and type of helicopter. So in order to explain this I will explain what you are looking for. Your goal is to achieve a constant head speed once the helicopter is airborne. If you add pitch (climb) you need to add power (throttle) to compensate for the added resistance a higher blade pitch creates. If during climb your head speed drops, then you need to add throttle to that particular stick position, and reversed if you have an increase in rpm. If during max climb out you experience an increase in head speed then you need to give the blades a higher pitch, do not try to adjust the max climb rpm by reducing throttle. There are other ways of achieving this by using cyclic mixing, however we will stay away from this for now. Follow the pitch guidelines in the table above, and if you need more pitch at max power because the rpm is increasing, then add pitch. 10° is just a guideline and will work in

most setups, but a powerful motor or a light helicopter might need more. For rpm adjustment during anything other than full stick deflection you should use the throttle.

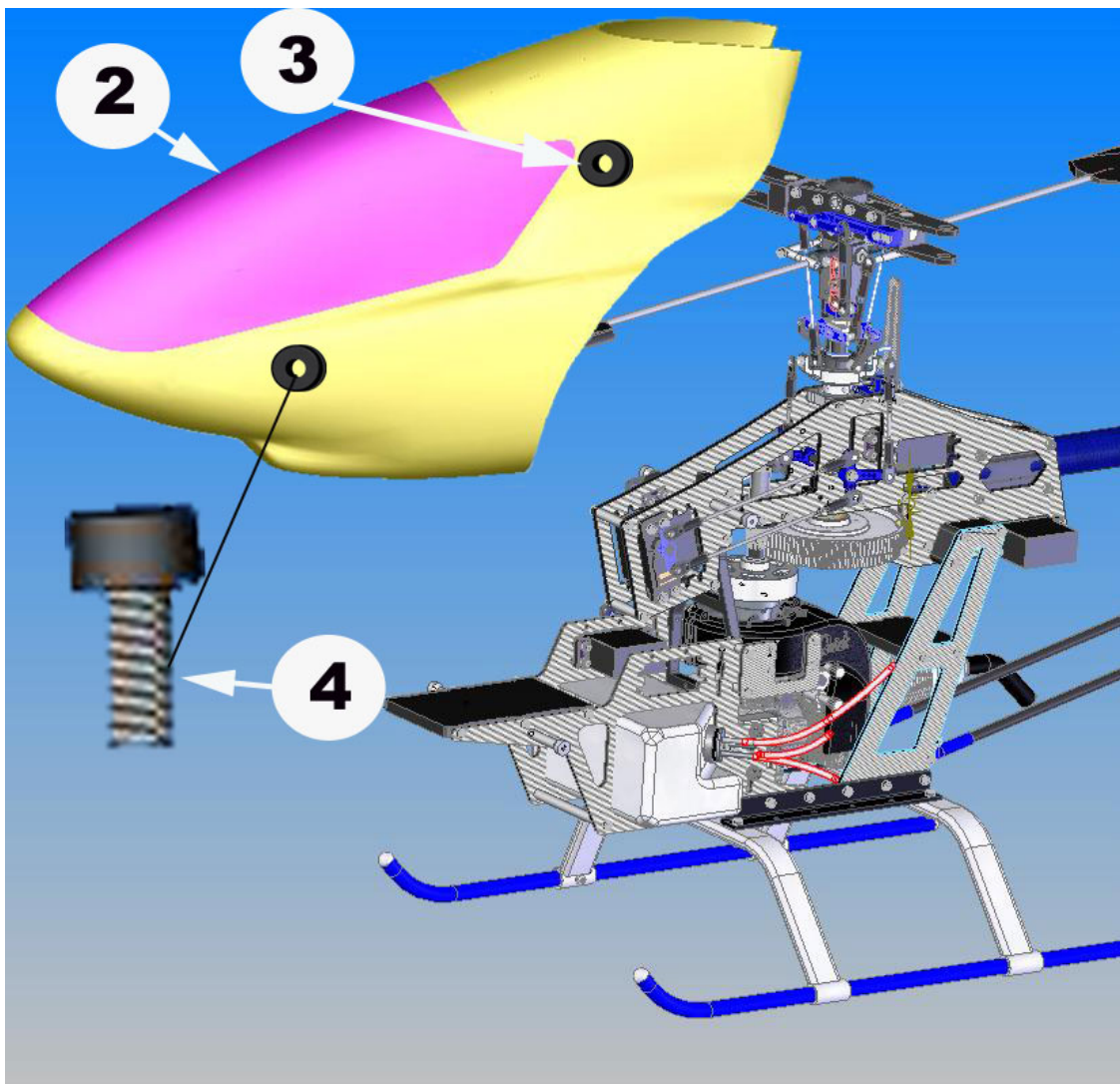
A short recap, adjust throttle to adjust rpm during anything other than full collective. At full collective adjust the pitch. See the Throttle table for general setup.

Final Words

These are guidelines and will get you going but might not be 100% accurate in regards to all helicopters. Especially the throttle curve table should be considered as initial guidelines. As mentioned before it's greatly affected by your equipment. As you become more familiar and proficient with your helicopter you can change the pitch and throttle curves to your flying style.

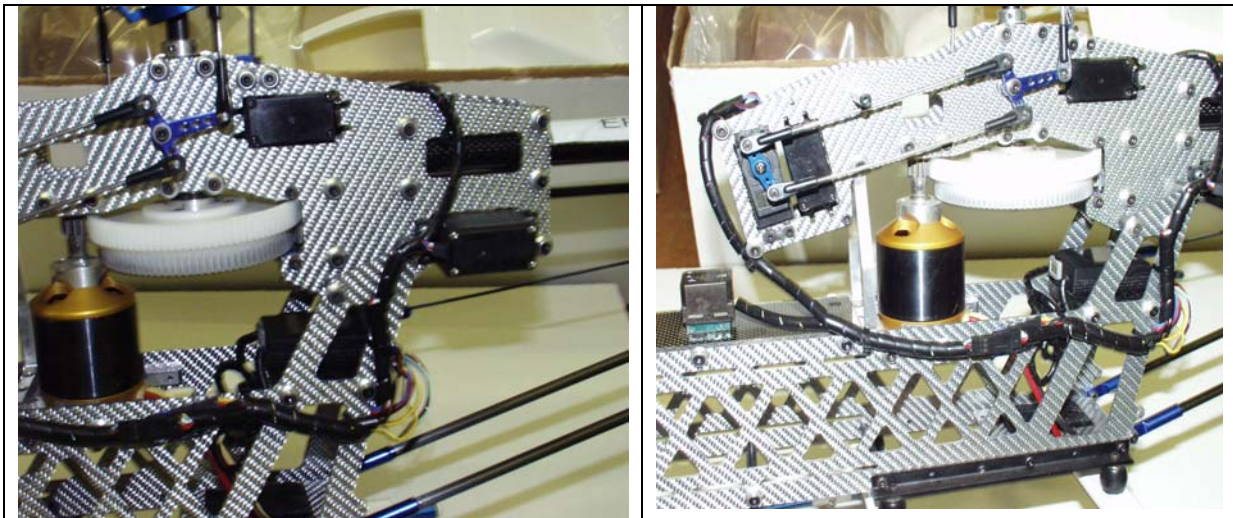
8-6 MOUNTING CANOPY

No.	Bag#	Description	Qty	
1		Helicopter	1	<ul style="list-style-type: none">• Put the Canopy on the helicopter, mark the right positions for 4 holes, and then drill four 5.5mm holes.• Install the Canopy Grommets on the Canopy.• Secure the Canopy by 4 M3x16 Cap Head Bolts.
2	In box	Canopy	1	
3	8	Canopy Grommet	4	
4	HB	M3x16 Cap Head Bolt	4	



PRE-FLIGHT CHECKS

- The rotor flybar and shaft must be straight.
- The flybar and control paddles must tilt in the proper direction and operates smoothly throughout the whole range.
- Check the swashplate to make sure it move smoothly and clean.
- When control input are given to tilt the swashplate, make sure no control arms or pushrods are binding.
- Check the two control paddles for level, parallel, and proper direction.
- Make sure the batteries are fully charged and the fuel tank is full.
- Make sure the radio and receiver are on and all controls operate properly before flight.
- There should be no interference of radio signal in your flying zone. Range check the radio.
- Always grab onto the helicopter main rotor head when turning on the helicopter.



These pictures illustrate how everything should be neatly wired up and strapped down before your helicopters first flights.

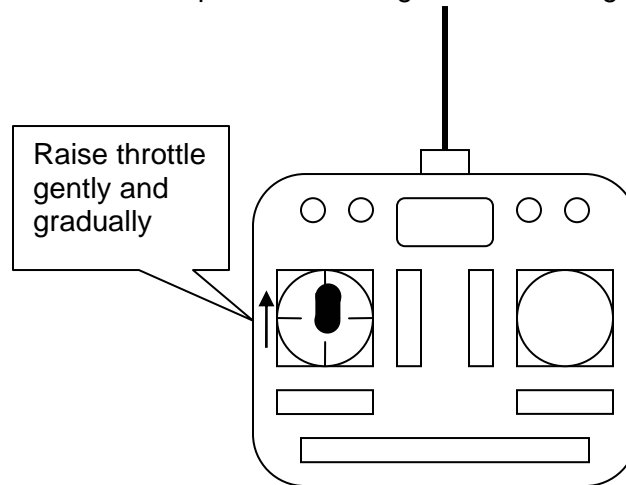
WARNINGS

- Do not operate helicopters in rainy, windy, or snowy condition.
- Operate helicopter in a safe zone away from crowds, traffic, or distractions.
- Use the proper batteries to prevent damage to the motor and equipment.
- Make sure all the batteries are fully and properly charged and the fuel tank is full.
- Make sure all the controls operate properly before flight.
- The main and tail rotors blades operate at very high speed (rpm); therefore, make sure nothing can come into contact with them while they are spinning.
- Perform a range check on the radio before flying.
- Make sure the transmitter and receiver are turned on before start the engine
- Keep a safe distance when operating a helicopter.
- Do not fly for a long period of time. Take some rests during flights.
- Motors are often very hot after operation. So be careful when handling or touching them immediately after flying.

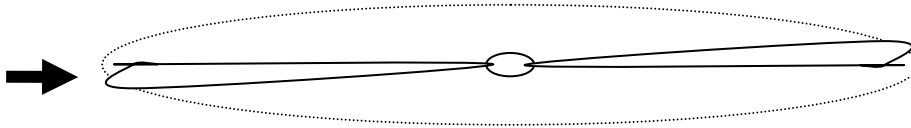
ADJUSTMENTS

Tracking Adjustment: The tips of the main rotor blades should follow the same path when they rotate. We call the main rotor blades are in track.

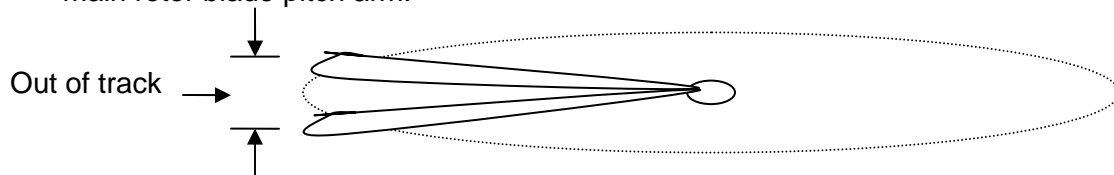
(a) Rev up the motor until the helicopter becomes light on its landing gear.



(b) If the main rotor blades are in track, it's good.



(c) If the blades are out of track, then adjust one of the pushrods that connect to the main rotor blade pitch arm.

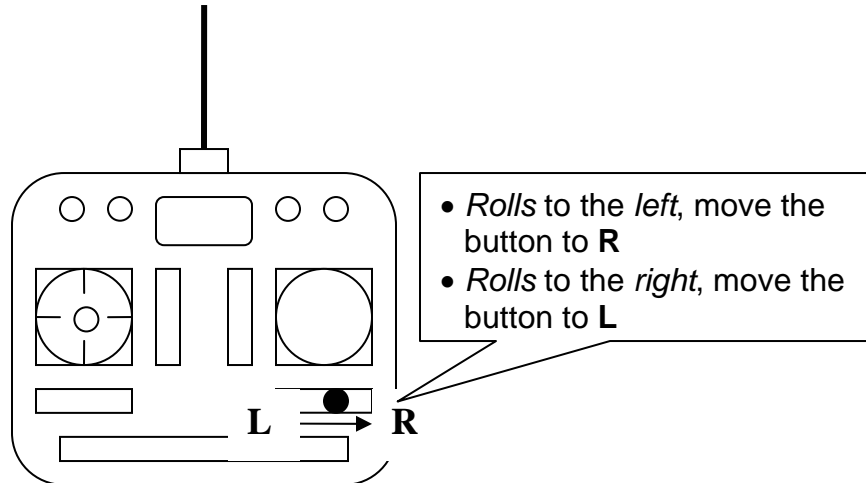


Repeat steps (a) to (c) until the blades are in track.

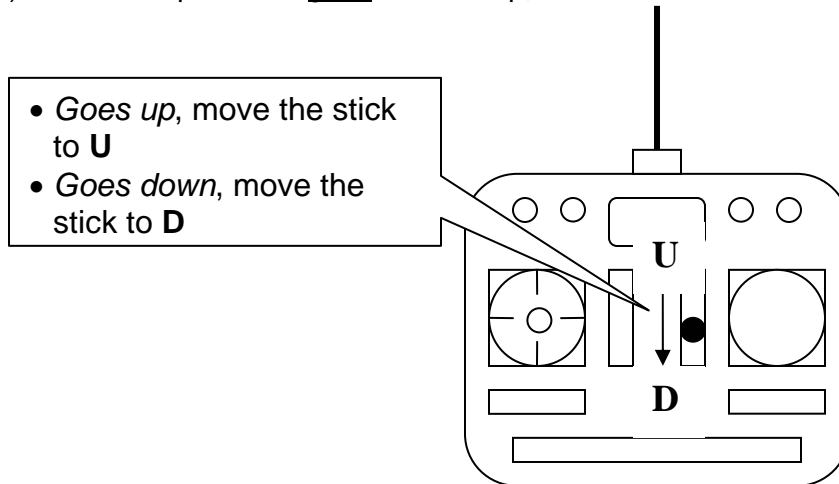
Trimming: Most of new built helicopters are unstable. But if you trim your helicopter properly, you will stop it from drifting away or yawing by itself quickly. Followings are instructions for trimming your helicopter.

(a) If the helicopter nose starts to yaw left or right, adjust the tail rotor push rod to compensate. If using a Heading Hold Gyro, do not adjust the trim lever on the radio.

(b) If the helicopter rolls to left or right, then:



(c) If the helicopter nose goes down or up, then:



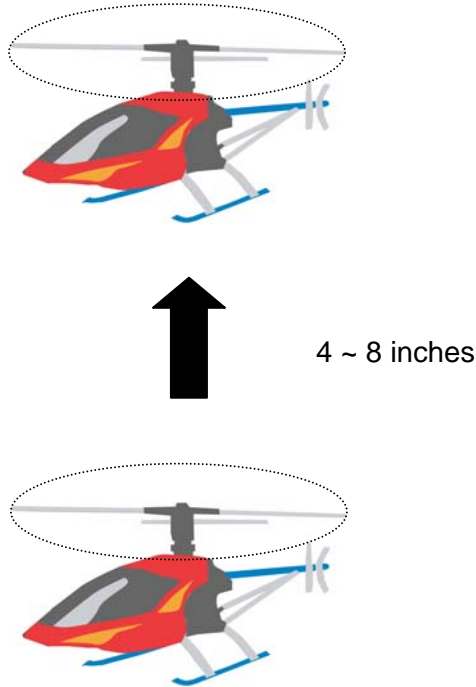
HOW TO HOVER

Basic maneuver for a pilot is learn how to hover a helicopter. When the helicopter is floating in a stationary position in the air, we call that hovering. Use the following procedure to practice your hovering:

- (a) Make sure everything is clear in the flying zone. Stand at least 30 feet (10 meters) behind the helicopter.
- (b) Check the main rotor fore/aft and left/right cyclic to make sure the main rotor is following to your cyclic command before taking off. Make sure the helicopter nose will swing in your desired directions by moving the tail rotor control stick.
- (c) Now, increase the throttle/collective gently to lift the helicopter landing gear off the ground to no more than 4 inches (10 cm). At the beginning, it is very difficult for the

pilot to keep the helicopter from moving. It will also be difficult to know if the helicopter is in trim or not for a beginner. Keep going on the practice close to ground you will develop your skills.

- (d) Keep practicing lifting your helicopter no more than 8 inches (20cm) from the ground until you feel comfortable with control commands. Once you can keep it at one place, then it is time to slowly increase the height a few inches in each flight. Soon, you will be able to hover the helicopter confidently at a few feet high. Beginners should always practice hovering close to ground since in an emergency situation; you can drop the throttle and collective quickly without making any big damage.

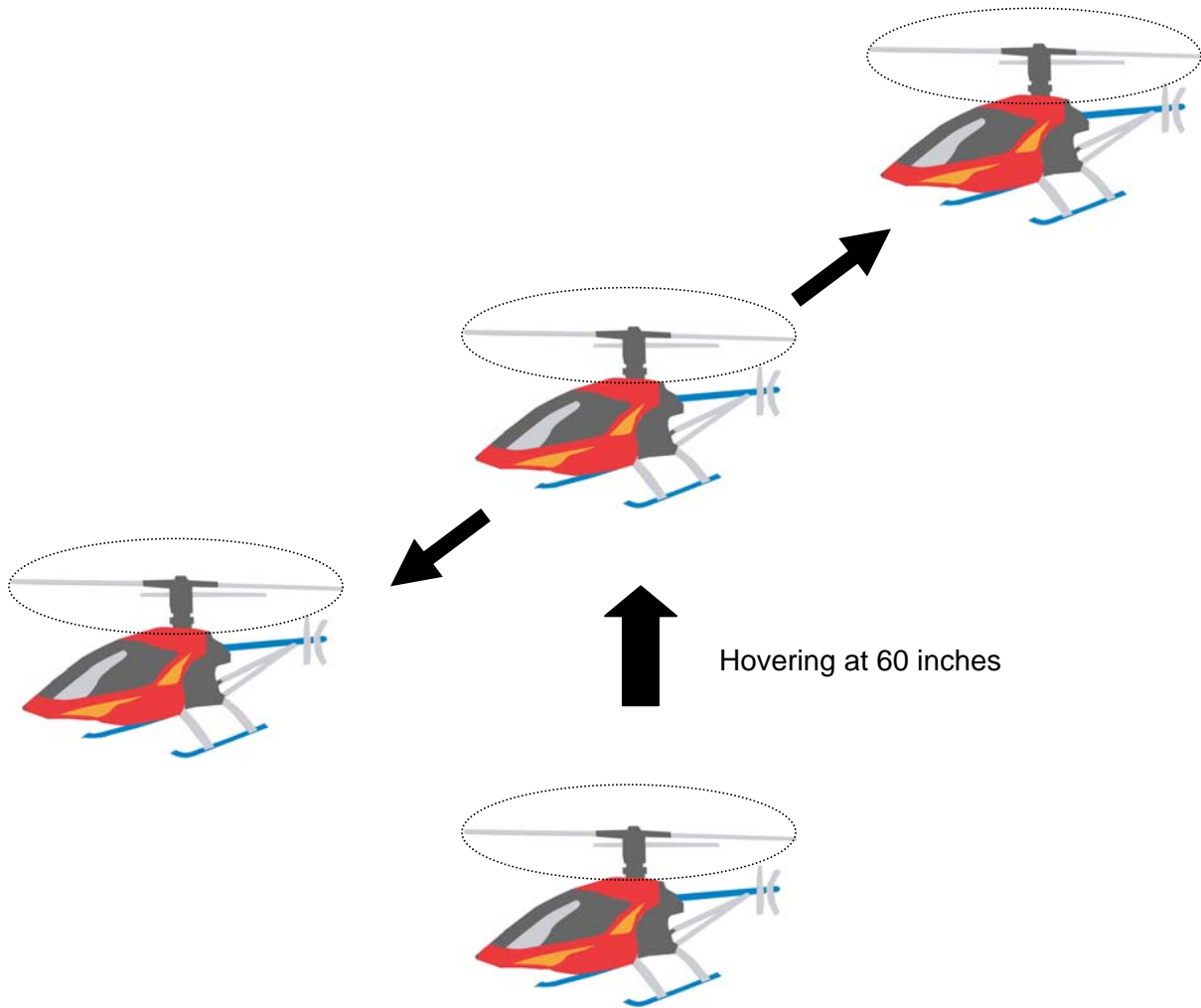


- (e) Stand behind the helicopter so you can watch the nose of the helicopter. A left tail rotor command will yaw the helicopter nose to the left, and a right command will yaw to the right. Also, a left cyclic command will cause the helicopter to translate left., Start practice hovering while standing to either side of the model after you can comfortably hover the helicopter at 3 feet (1m) high without drifting. Finally, you need to learn hovering the model from any positions. When you can confidently hover a helicopter at any altitude and at any position, you have mastered most of the fundamental control movements of a helicopter.

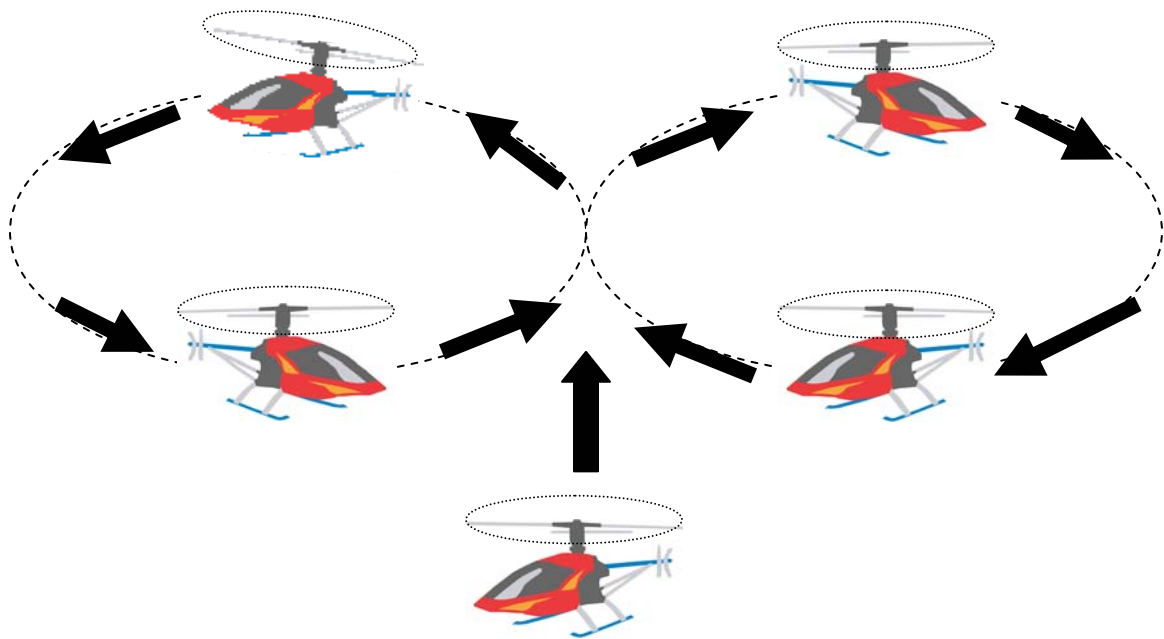
HOW TO FLY FORWARD

Once you have mastered hovering flight:

- (a) Let's begin the exercise of changing positions by practice moving the helicopter to the left or right slowly from 60 inches (1.5 m) above the ground.



(b) Once you have been comfortable with all the movements and controls in the previous step, start using some tail rotor control to make the helicopter point slightly to the left or right as you fly it to the left or right. Keep practicing the figure-eight path as shown below, you will master all basic control movements of a helicopter.



AFTER FLIGHT CHECKS

After each flight, the helicopter should be thoroughly inspected:

- (a) Unplug the batteries.
- (b) Check every bolt, nut, and screw to make sure none has loosened due to vibration.
- (c) Check every rotating and movable part like head rotor, swashplate, tail rotor, to ensure they still move smoothly and properly.
- (d) Check all movable parts, such as gears, ball links, belt, etc. for unusual wear.
- (e) Clean up the helicopter then lubricate every moving part with oil to ensure a smooth operation in the future.
- (f) Keep the helicopter in a cool and dry place. Avoid storage under direct sun light or near heat.
- (g) Please replace any damaged parts if they are discovered during maintenance.

WHAT IF THE HELICOPTER CRASHED

Turn off everything and check the helicopter immediately. If any item is damaged, replace the damaged parts to ensure safe operation. Do not try to glue any broken or damaged plastic or carbon parts specially broken rotor blades. The followings are parts that should be inspected right away:

- Main and tail rotor blades.
- Flybar, main shaft, head spindle, and tail output shaft.
- All the gears.
- Tail boom and supports for cracks.
- Vertical and horizontal fins.
- Frames.
- All pushrods.
- Servos, motor, and batteries

SPECIFICATIONS

Specification	Big Bertha 69
Blades	Quick 680-710 mm
Length	1245 mm
Height	470 mm
Fully Equipped Weight	~10.5lbs (4.77kg)
Engine	70-90
Frame Thickness	2.9-3.15 mm
Spindle	8 mm
Main Shaft	10 mm
Canopy	Fiberglass
Flying	Aerobatic / 3D