

GreyT Shooter (7")- User Guide (Rev 1)

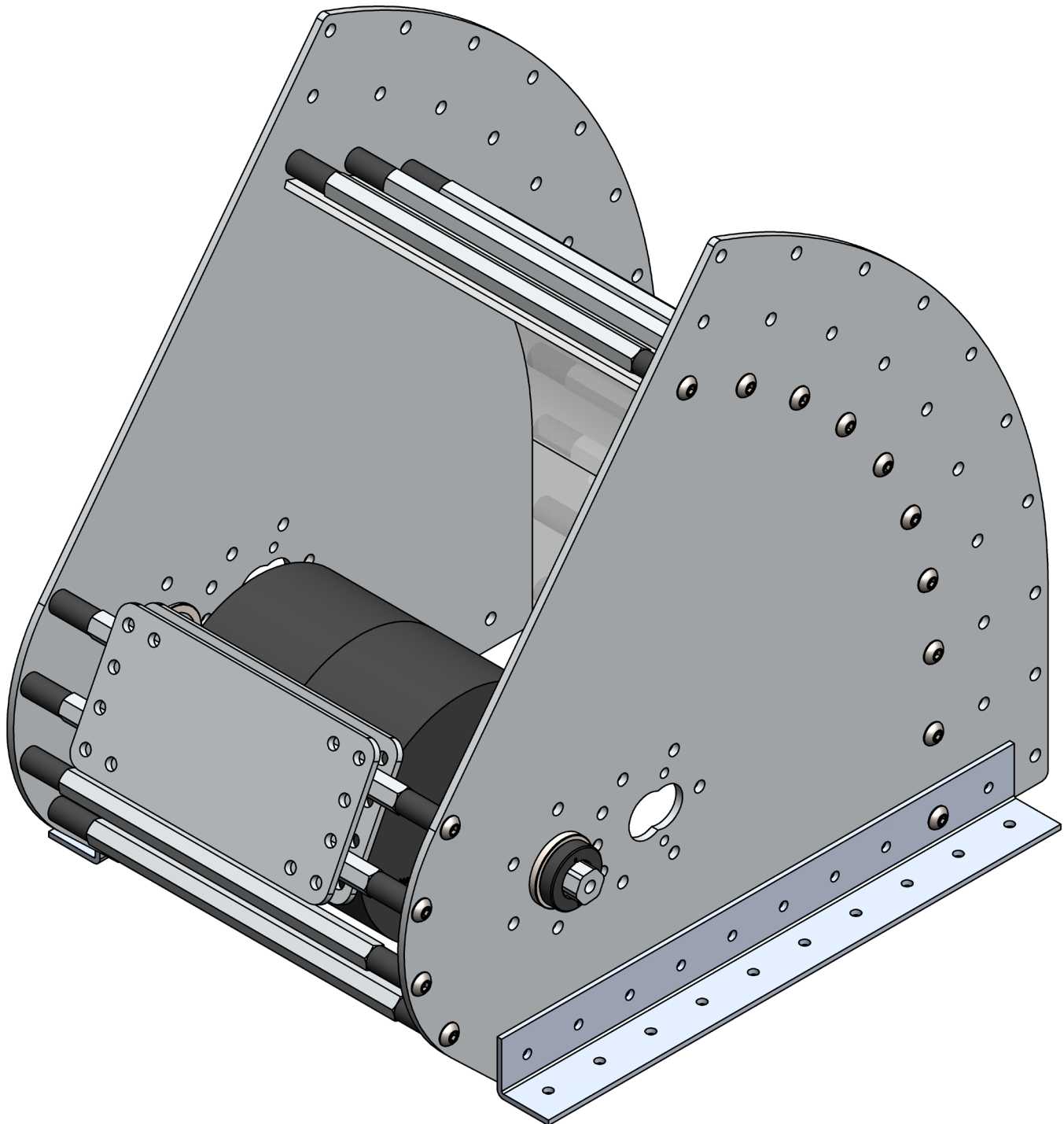




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What is the GreyT Shooter (7")?




The GreyT shooter builds on the elevator and roller claw released previously. This mechanism is designed to help teams create highly adjustable shooters easily. The Shooter was designed for the 2020 FRC Game: Infinite Recharge.

The main features of the Shooter are:

- Easy adjustability of compression
- Compatible with Falcon, 775pros, Versaplanetaries
- Option for Direct Drive or Belts
- Compatible with GreyT Turret

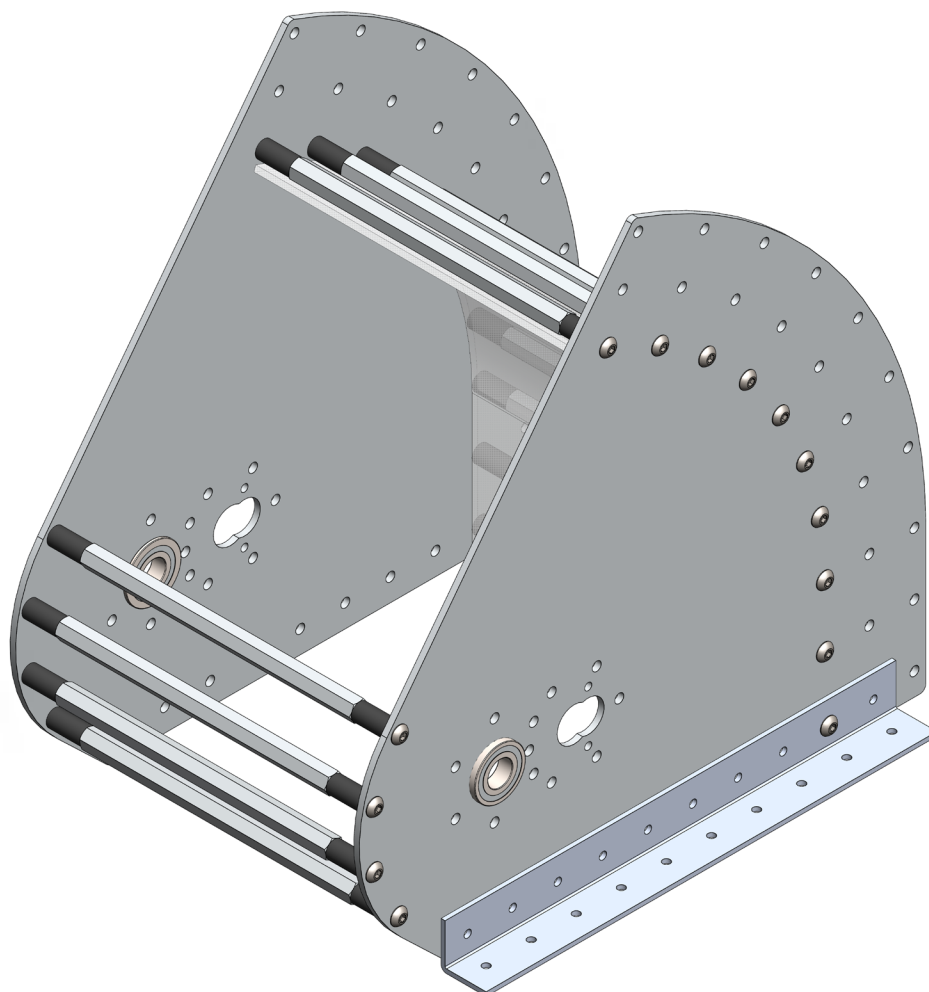


Recommended Tools

Picture	Name
	Allen Wrench Set
	3/8" Hex Wrench
	Drill w/ Drill Bit Set



GreyT Shooter Base Assembly Instructions

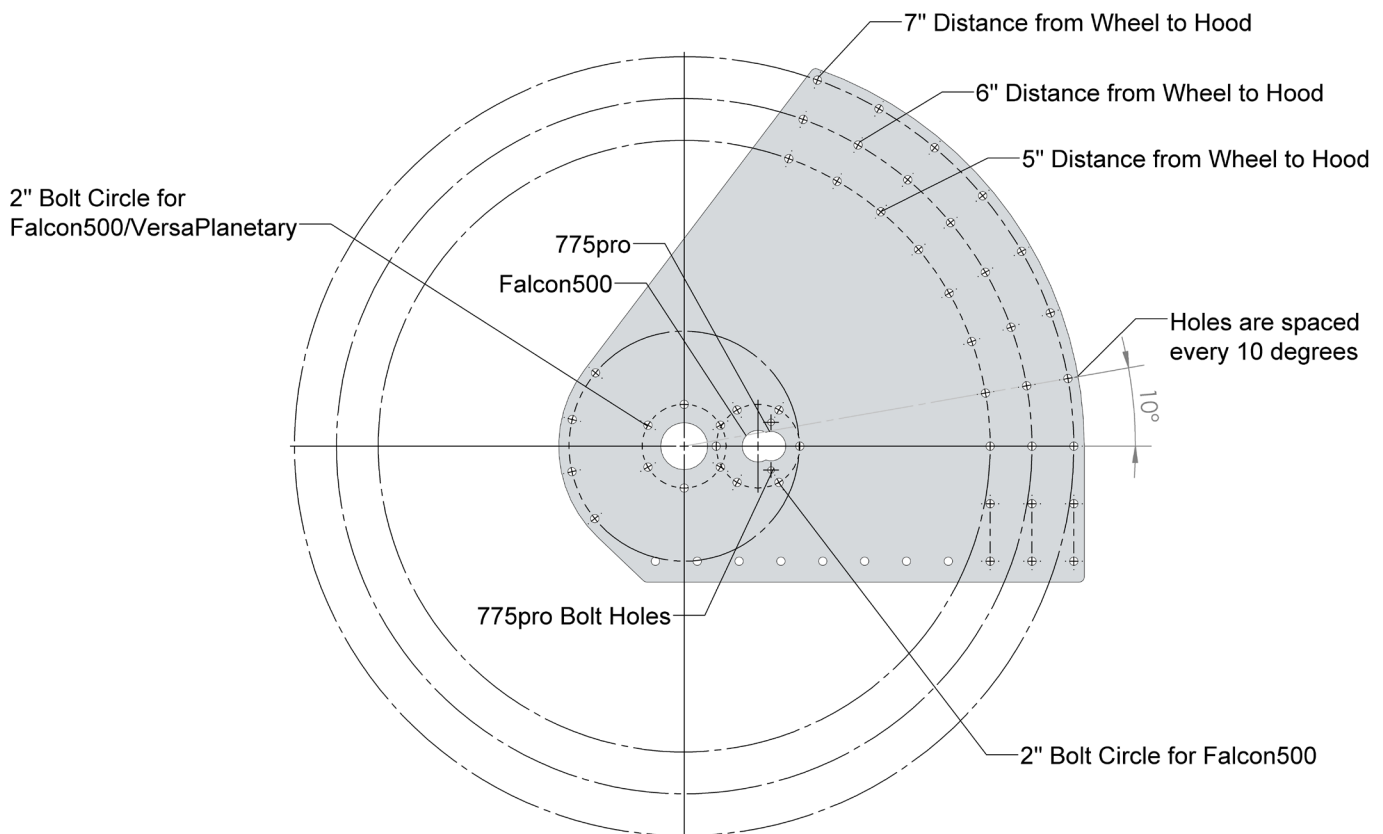




Greyt Shooter Side Plate Hole Explanations

The Greyt Shooter is designed to support multiple object sizes and multiple compression values for a certain diameter. The side plates have hole patterns for 5", 6", and 7" distances from a 4" wheel to the hood.

The Greyt Shooter also supports various motor and motor mounting options.

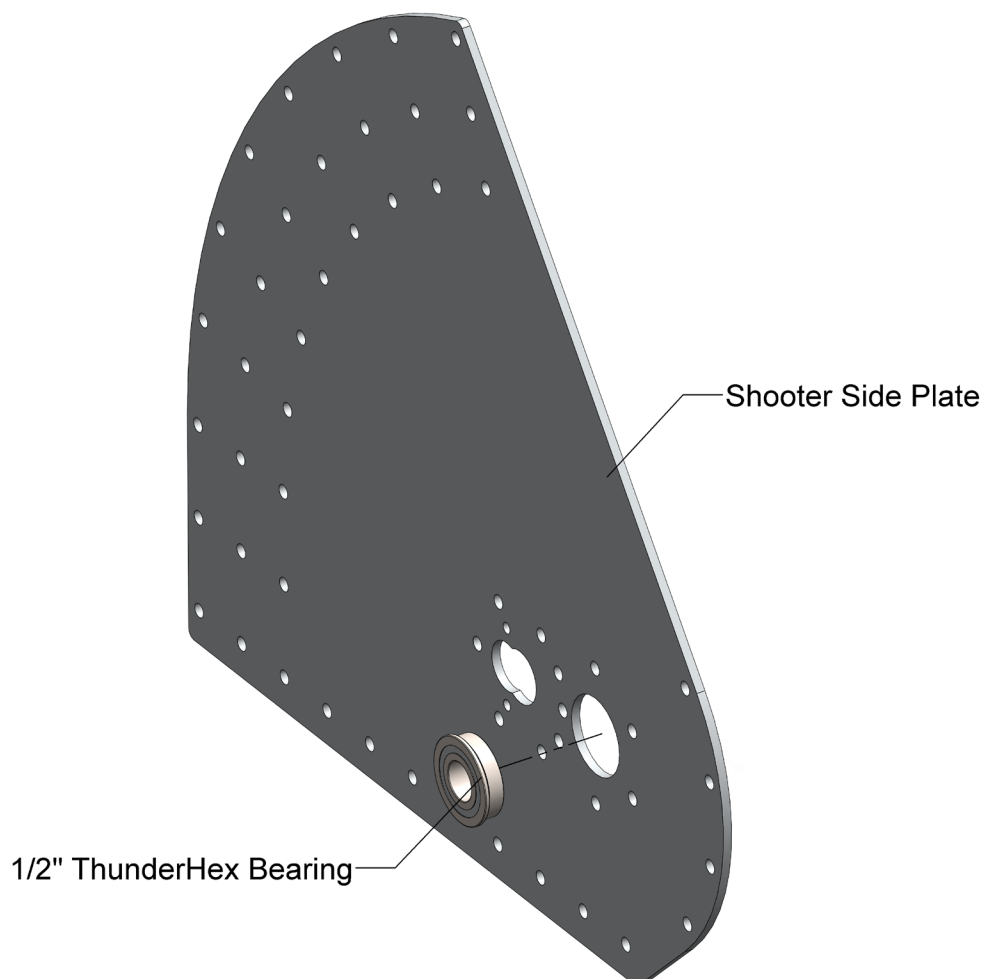




Step 1

Press ThunderHex Bearing into the shooter side plate. Repeat this step for the other side. Be sure to press the bearing in from the opposite side so that the bearing flanges are on opposite sides of the plates.

Note: The bearing is not needed for the direct drive or VersaPlanetary options.





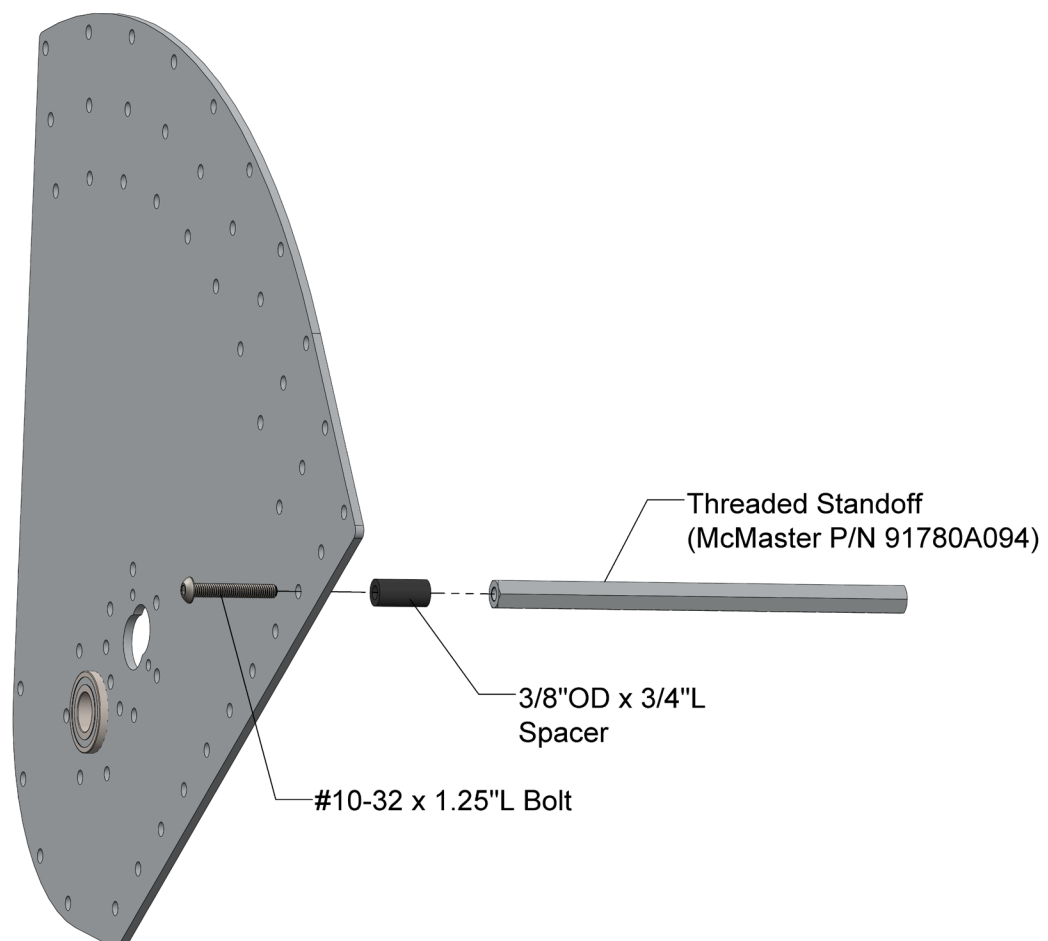
Step 2

Attach the spacer and standoff in the desired set of holes for the desired distance from the shooter wheel to where the hood will be. Reference the drawing on page 6 for more information on the sets of holes.

Repeat the step for the desired amount of holes to achieve the exit angle wanted.

It is recommended to not skip any holes between the first and last standoff used.

Note: This spacer and standoff may be replaced with 3/8" hex or similar material. The recommended replacement material is 3/8" ThunderHex stock.

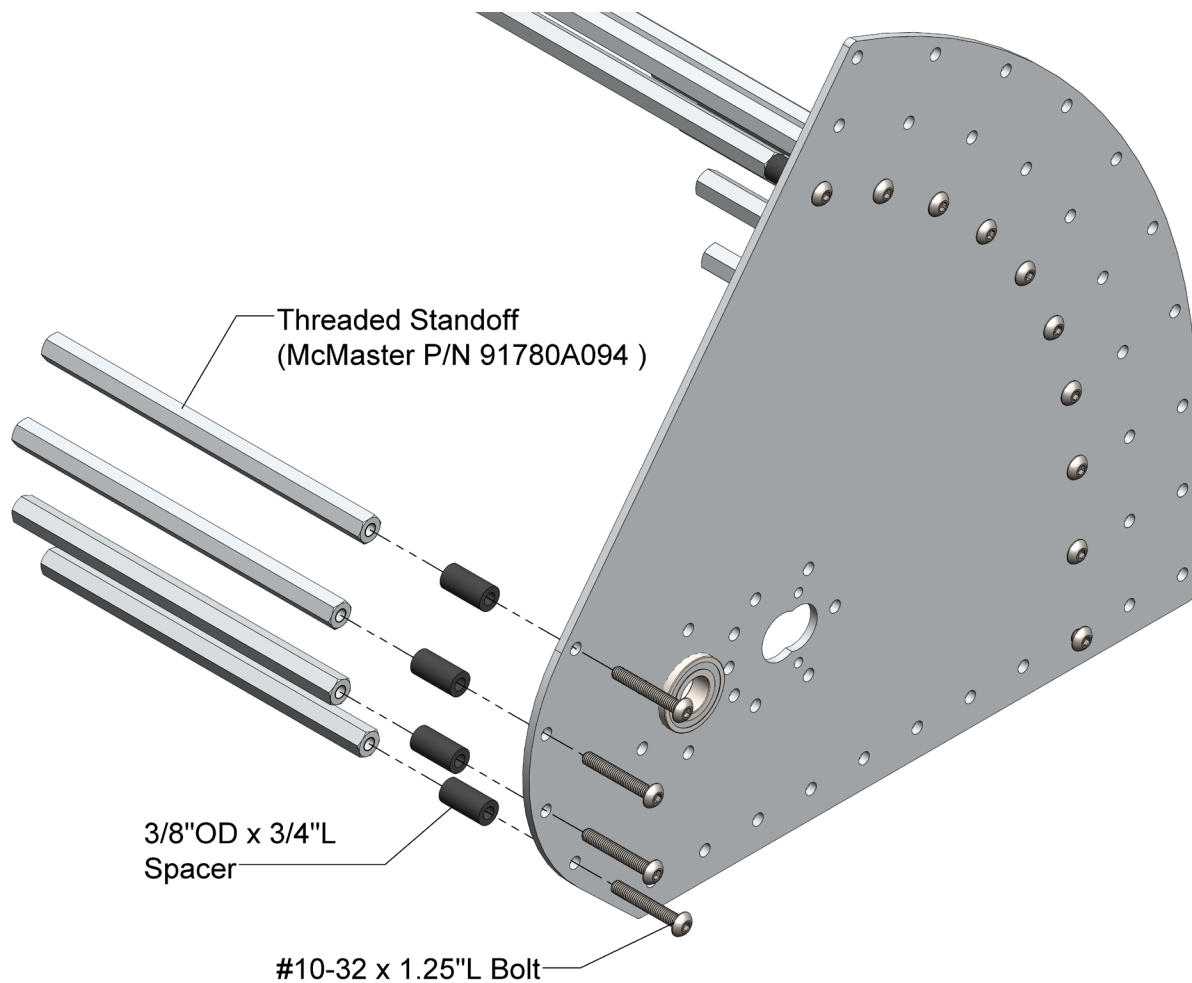




Step 3

Install the spacer and standoffs in the front guard set of holes.

Note: This spacer and standoff may be replaced with 3/8" hex or similar material. The recommended replacement material is 3/8" ThunderHex stock.

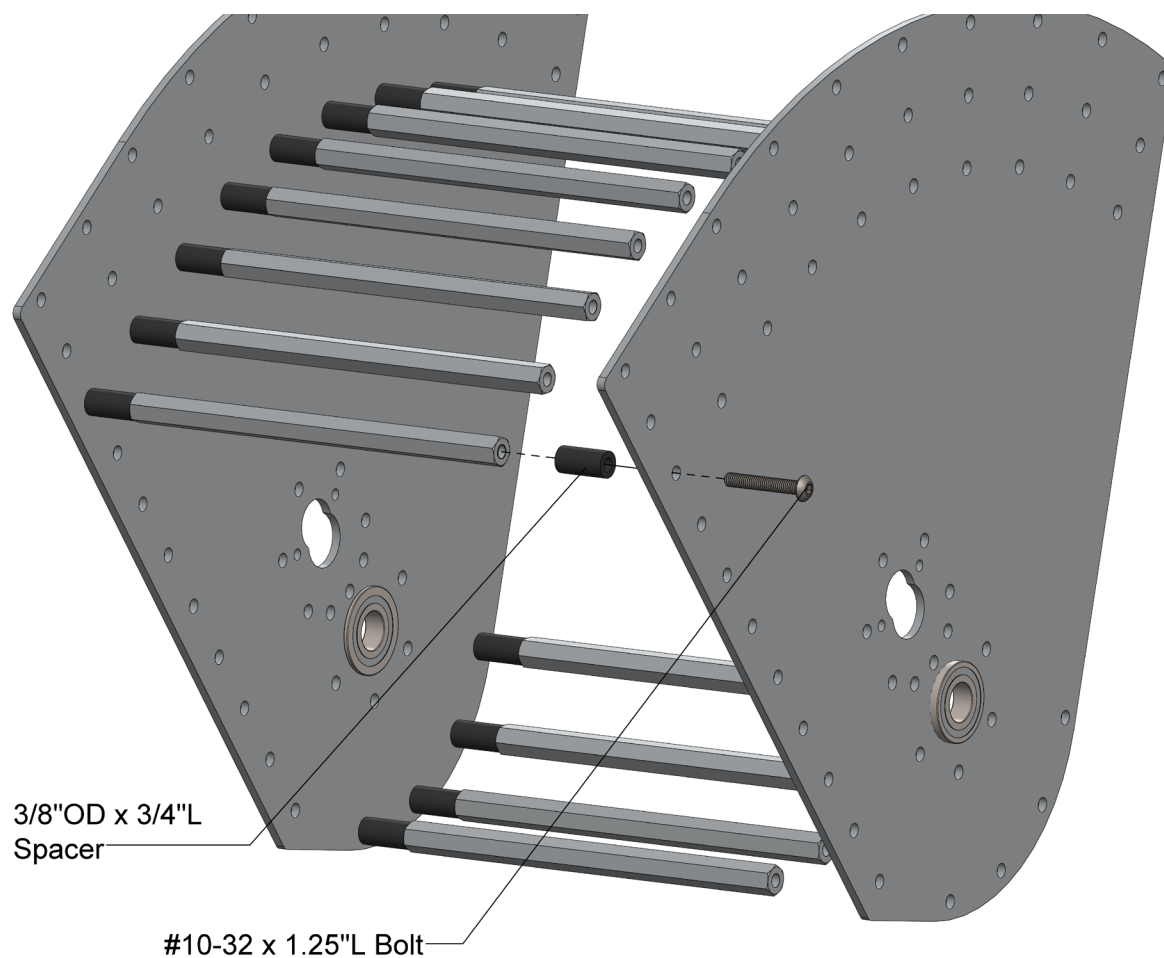




Step 4

Use the remaining spacers and bolts to attach the other side plate.

Note: If custom standoffs were made, the extra spacers are not needed.

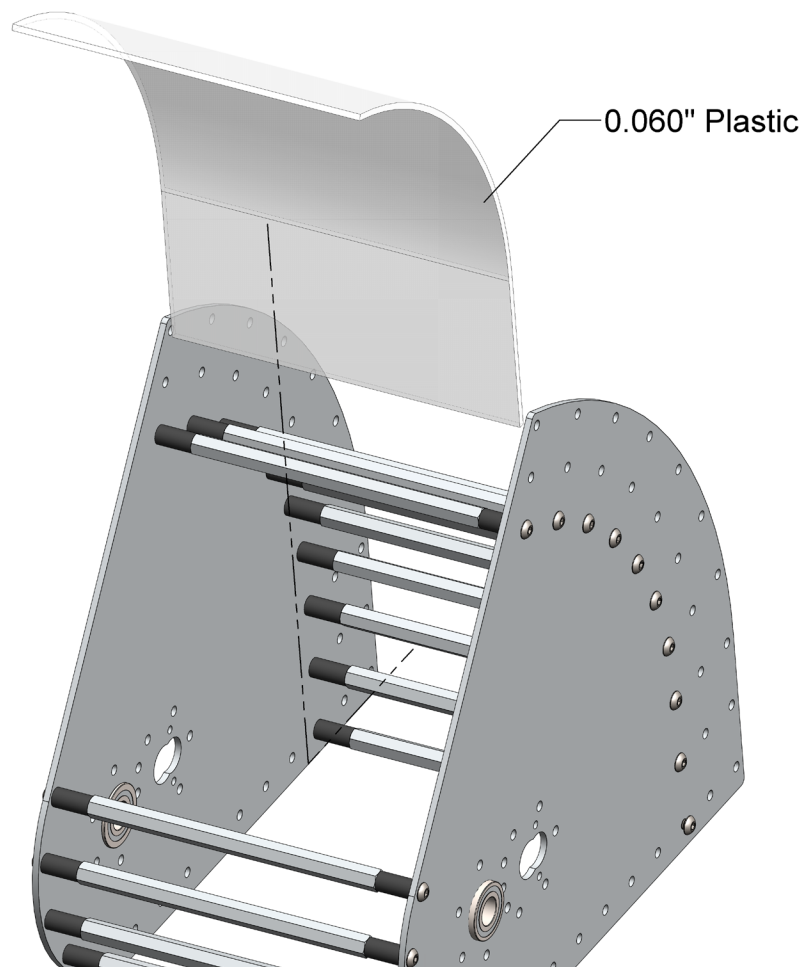




Step 5

Cut a piece of 1/16" polycarbonate for the backing of the shooter hood. It is recommended to cut the piece slightly longer, about 1", so that this extra length can be wrapped under the first standoff. This prevents the game object from being caught on the plastic as it feeds through the shooter.

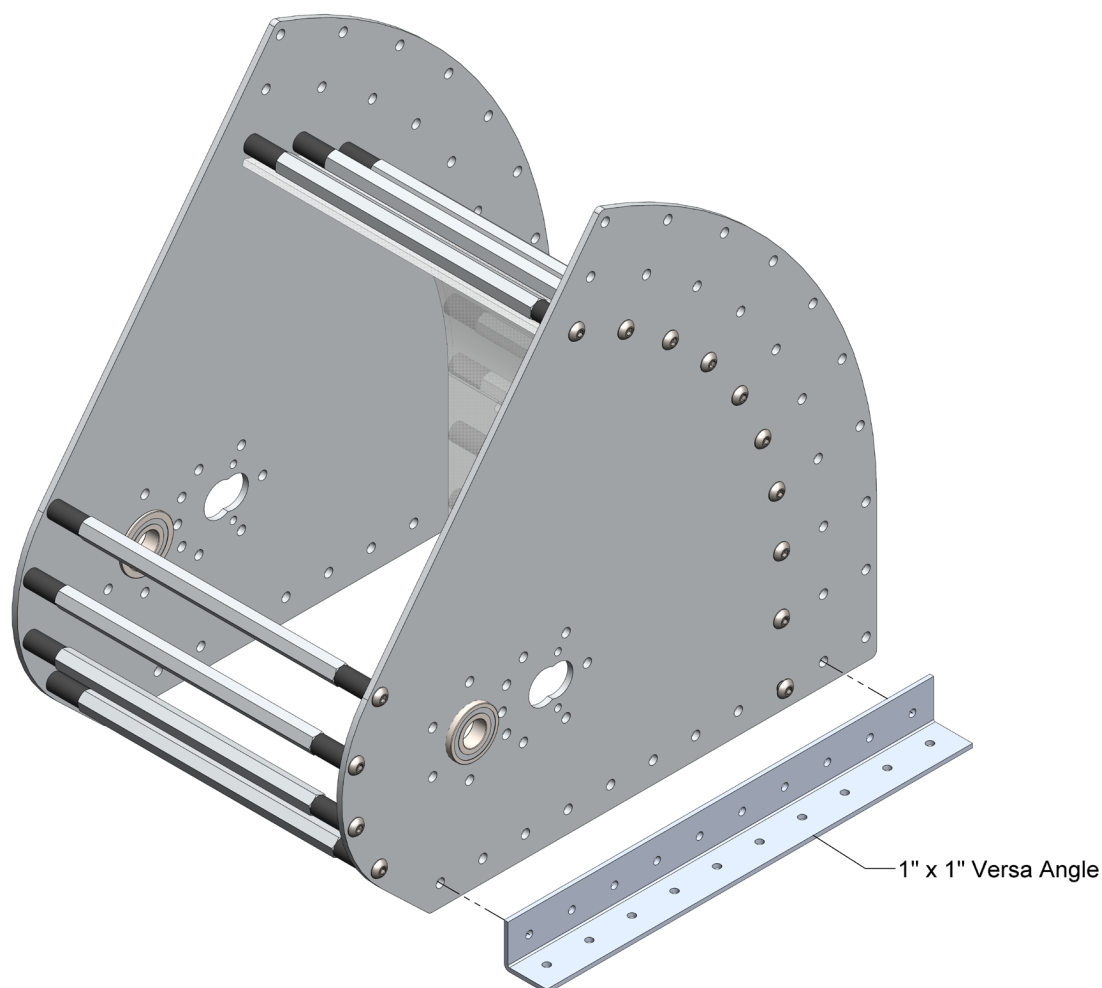
Zip ties are the recommended means of attaching the plastic backing. Start from the first standoff and work up. Drill one set of holes and then secure with the zip tie before moving on to the next standoff.





Step 6

Attach 1" x 1" VersaFrame Aluminum Angle to either side of the shooter with bolts or rivets.

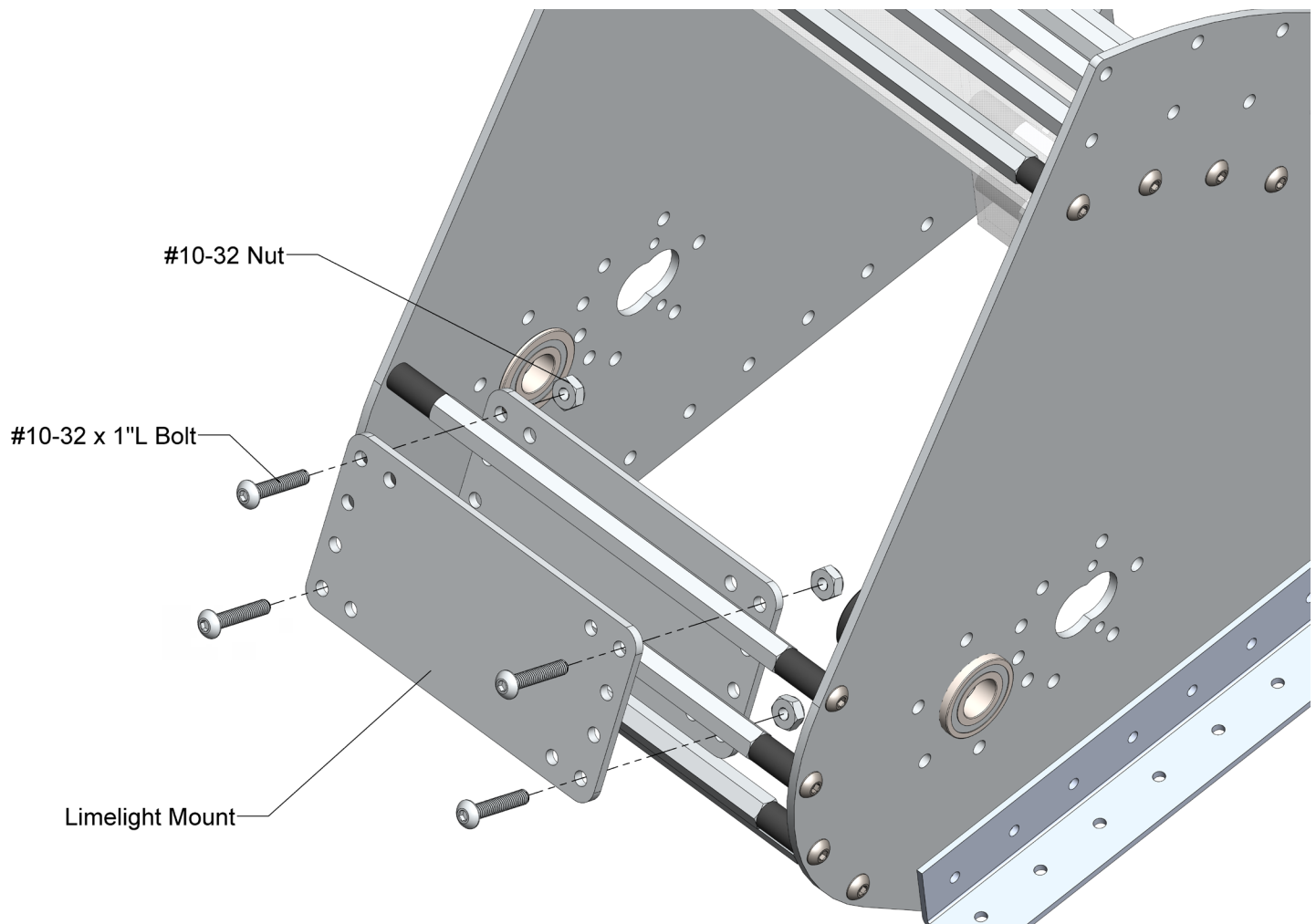




Step 7

Center the Limelight Mount between the Shooter Side Plates. Secure the Limelight Mount to the two top most standoffs using four #10-32 x 1"L bolts and nuts.

Note: Do not over tighten the bolts as this will cause the plates to bend.

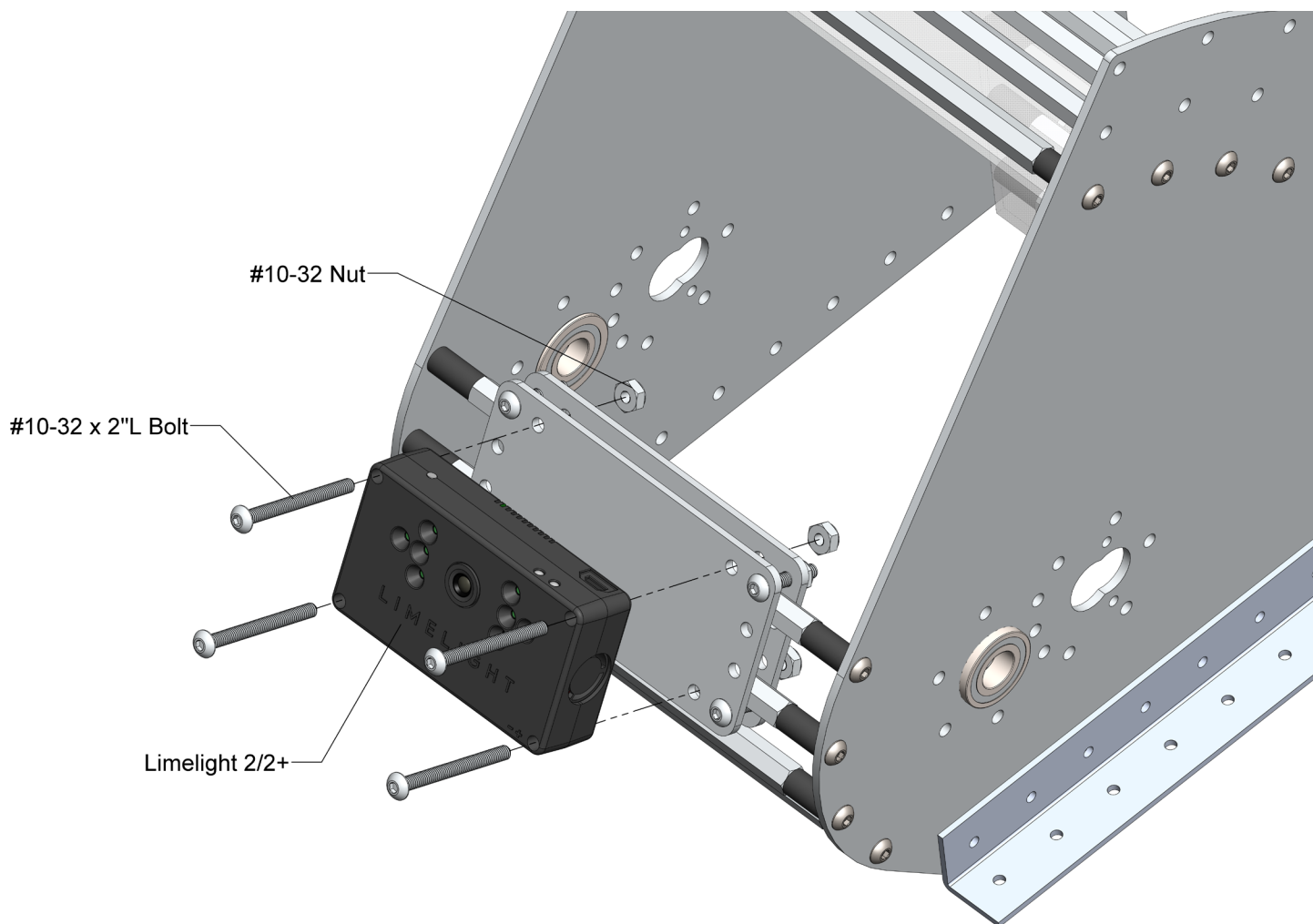




Step 8

Attach the Limelight to the Limelight mount using four #10-32 x 2"L bolts and nuts.

Warning: The bolts need only be tightened so that the Limelight is not loose on the plate. Over tightening the bolts may cause damage to the case or the electronics inside.





Motor Configurations Assembly Instructions

Motor configurations supported by the Greyt shooter:

- 775pro Belt
- 775pro VersaPlanetary
- Falcon500 Belt
- Falcon500 Direct Drive
- Falcon500 Versa

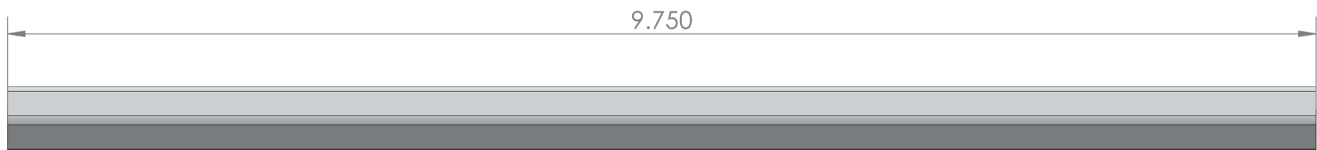


Hex Shaft Cut Lengths

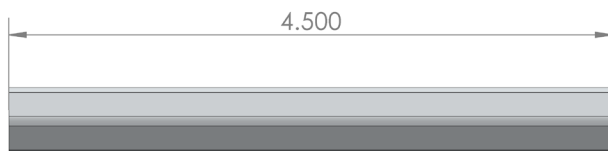
The overall length for the hex shafts does not need to be precise. Cutting to length with a hacksaw is acceptable if that is the only available option. Cutting to length and then using a lathe to clean up both ends is the recommended method though.

When cutting the slit on the "Falcon Direct Drive Shaft", the slit needs to be cut from one point of the hex to the point on the opposite side.

Belt Drive Shaft



VersaPlanetary Direct Drive Shaft

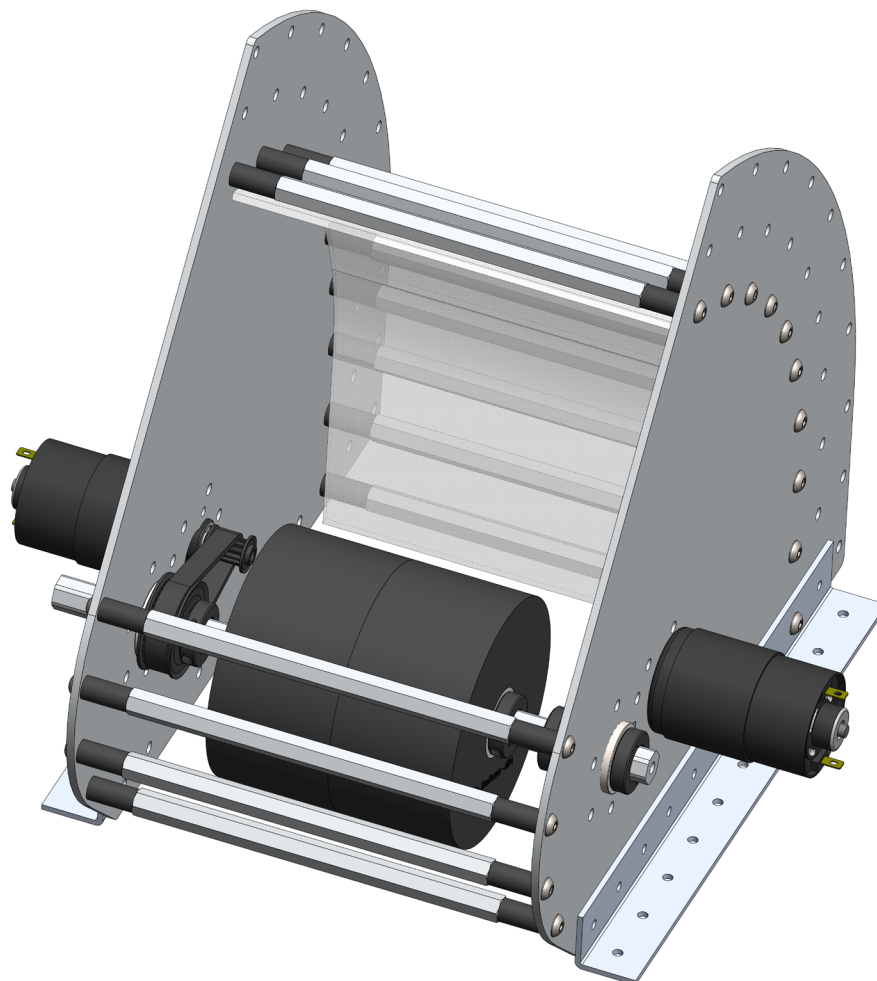


Falcon Direct Drive Shaft





775pro Belt Option

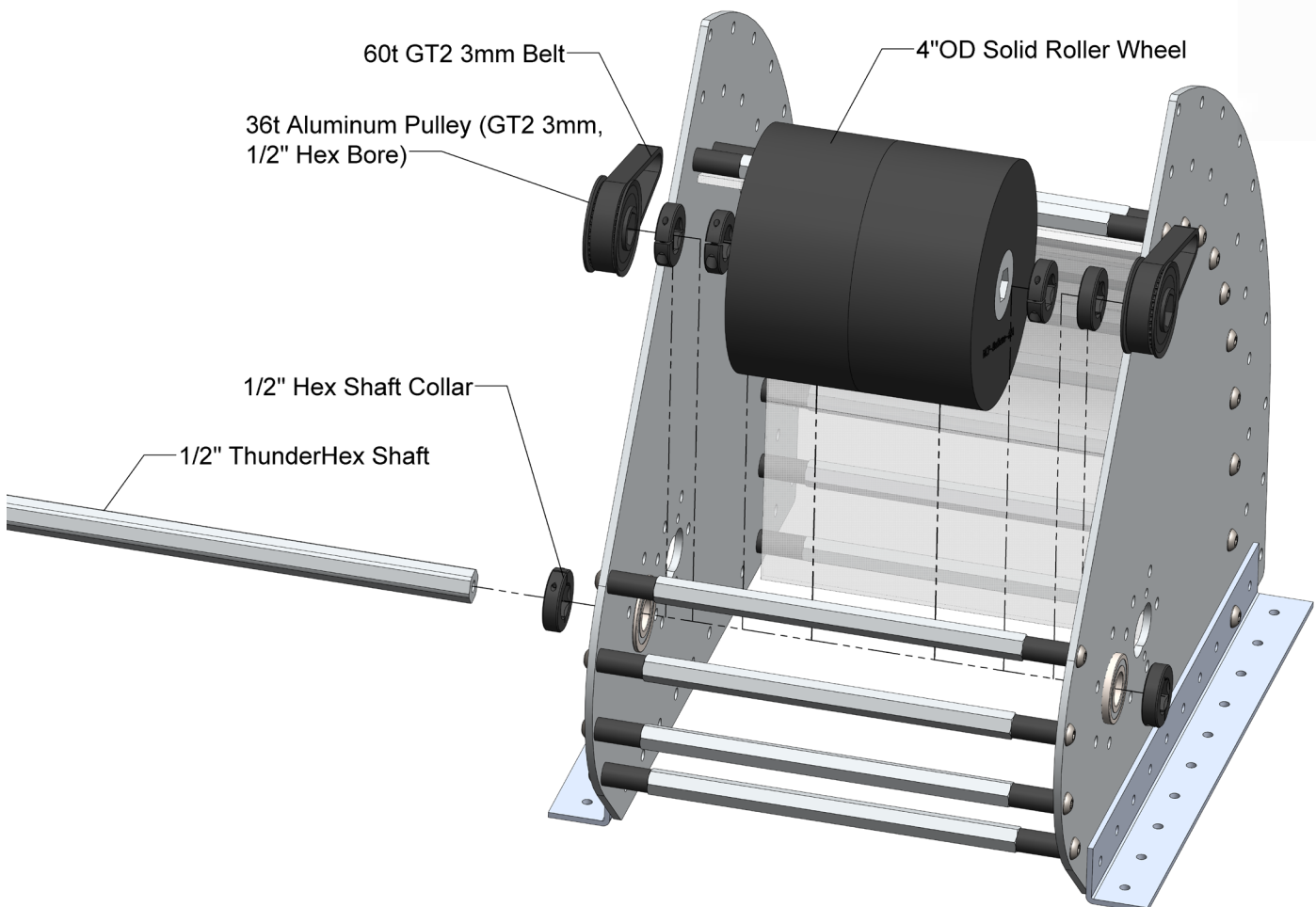




Step 1

Slide ThunderHex through bearing on one side of shooter assembly. Install remaining components as the shaft is slid through to the other side.

Note: Leave the collars loose until all components have been installed.





Step 2

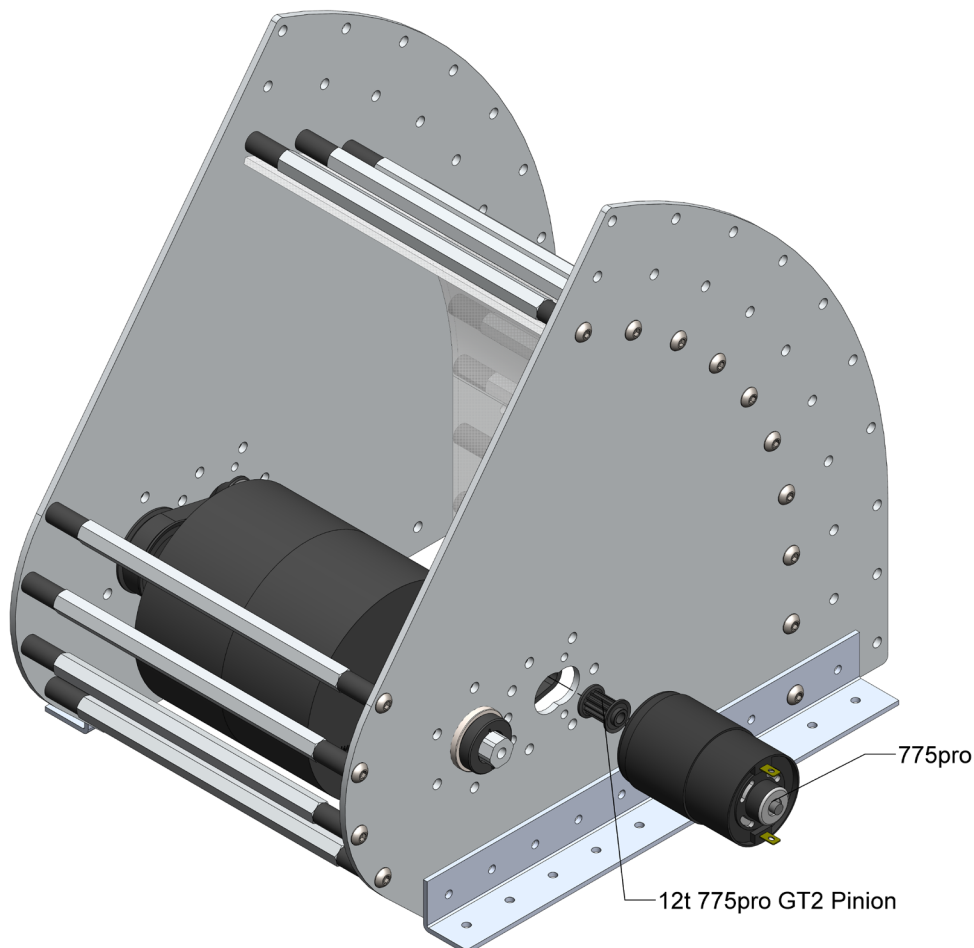
Press the 12t pinion onto the 775pro motor before installation.

The 775pro aligns with the hole further from the bearing hole. Use two M4 bolts to secure motor.

Install motor on opposite side as well.

Center the solid roller wheels and tighten all shaft collars.

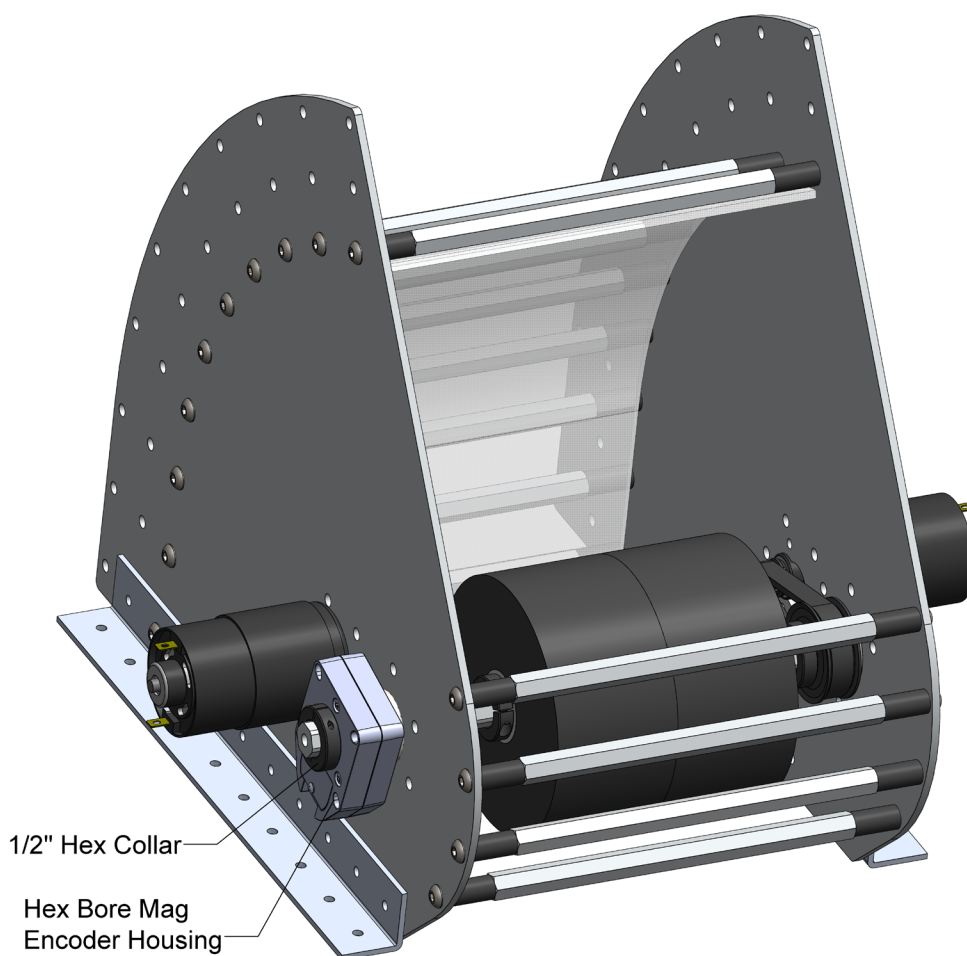
Note: Leave collars loose until the bolts for the motors are installed. Being able to slide the wheels will help with installing the motor bolts.



Step 3

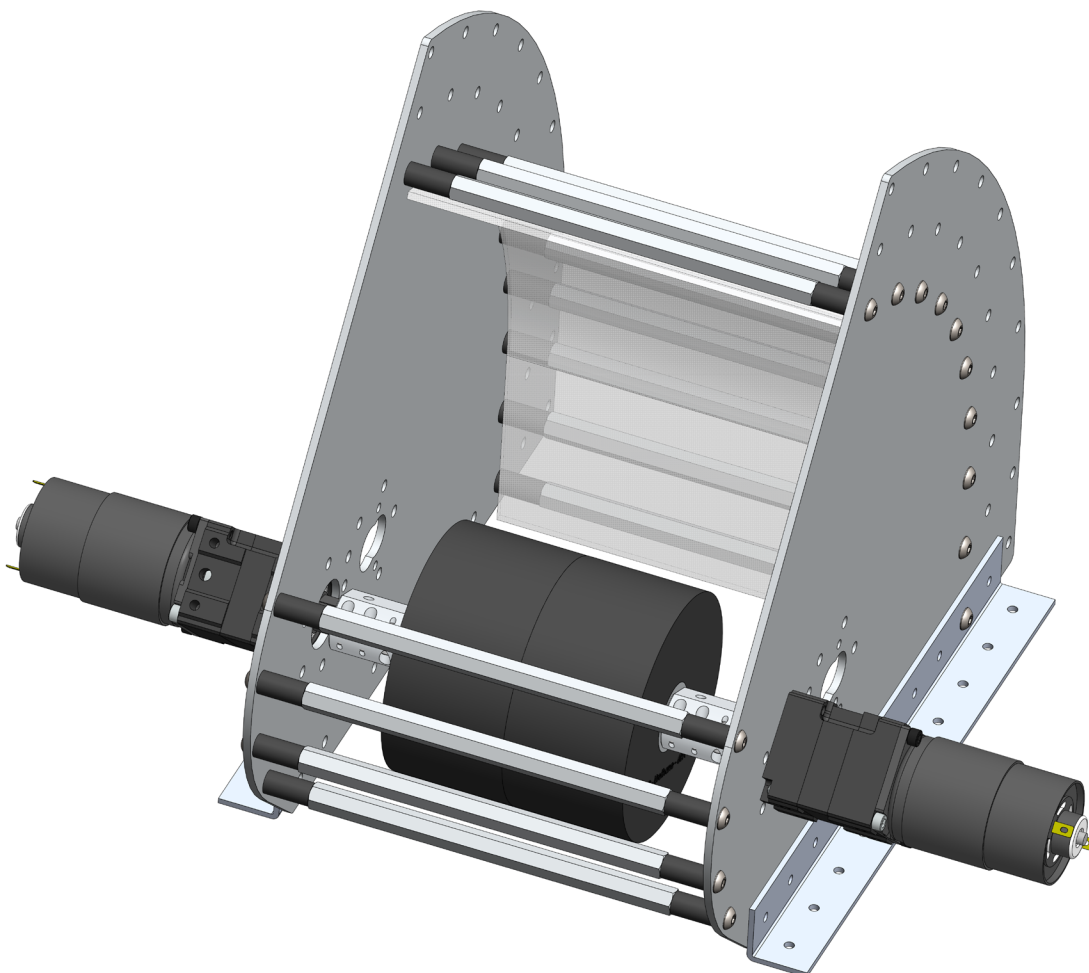
Install the Hex Bore Mag Encoder Housing on the ThunderHex shaft and secure with a 1/2" hex collar.

Note: Other encoders may be used. This is the simplest and easiest encoder mounting option.





775pro VersaPlanetary Option

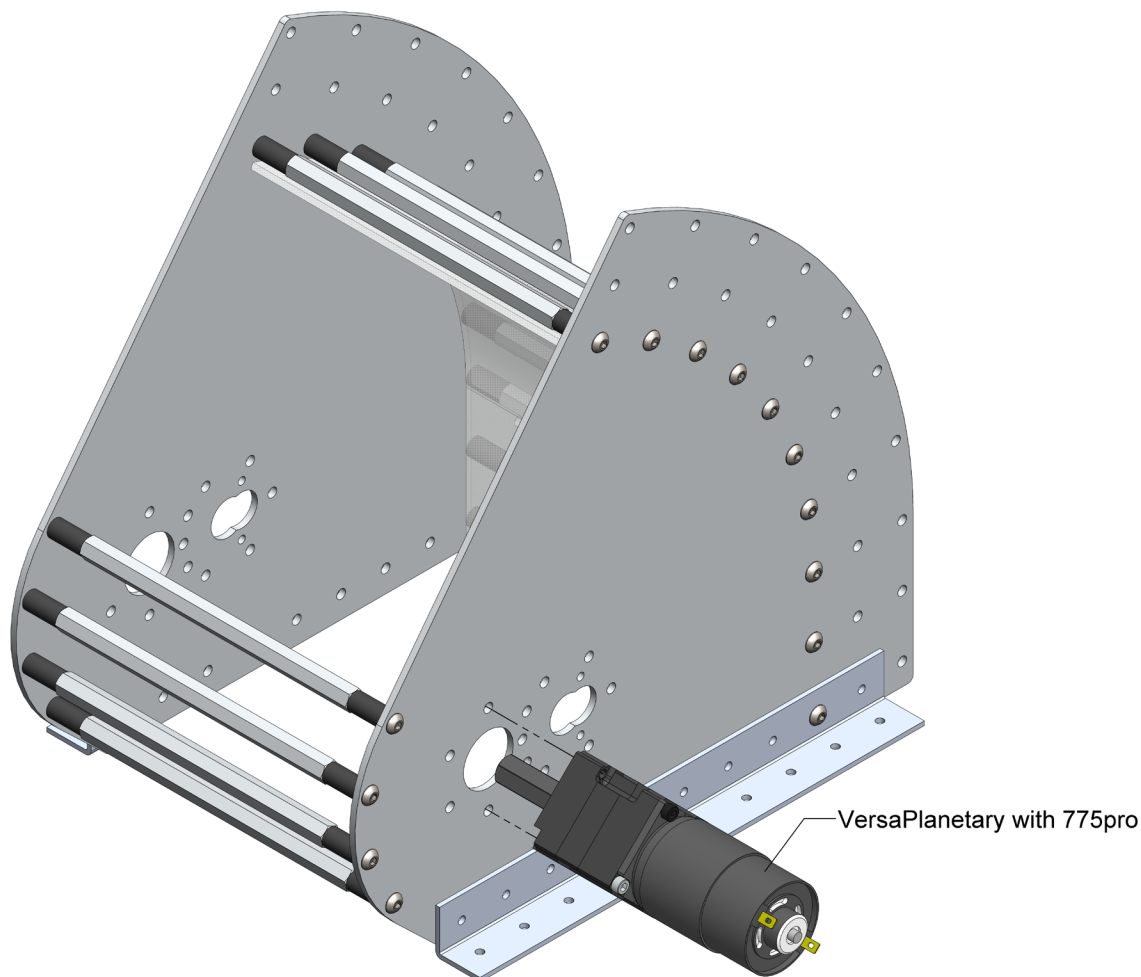


Step 1

Install VersaPlanetary with the desired gear ratio using two #10-32 x 1/2" L bolts.

Install motor and gearbox on the opposite side as well.

Note: Install the VersaPlanetary Integrated Encoder with the gearbox at this step. Only one encoder is needed.

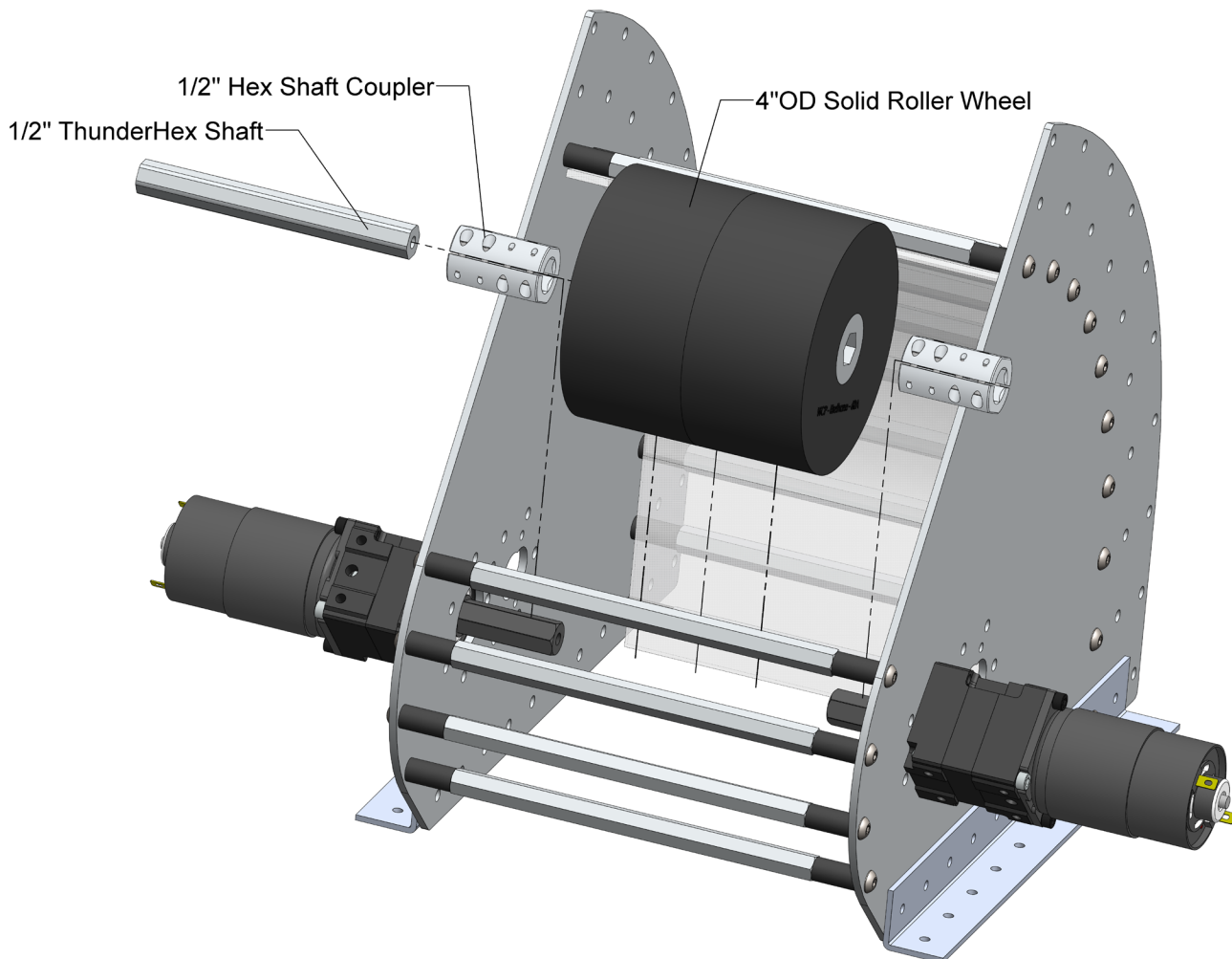




Step 2

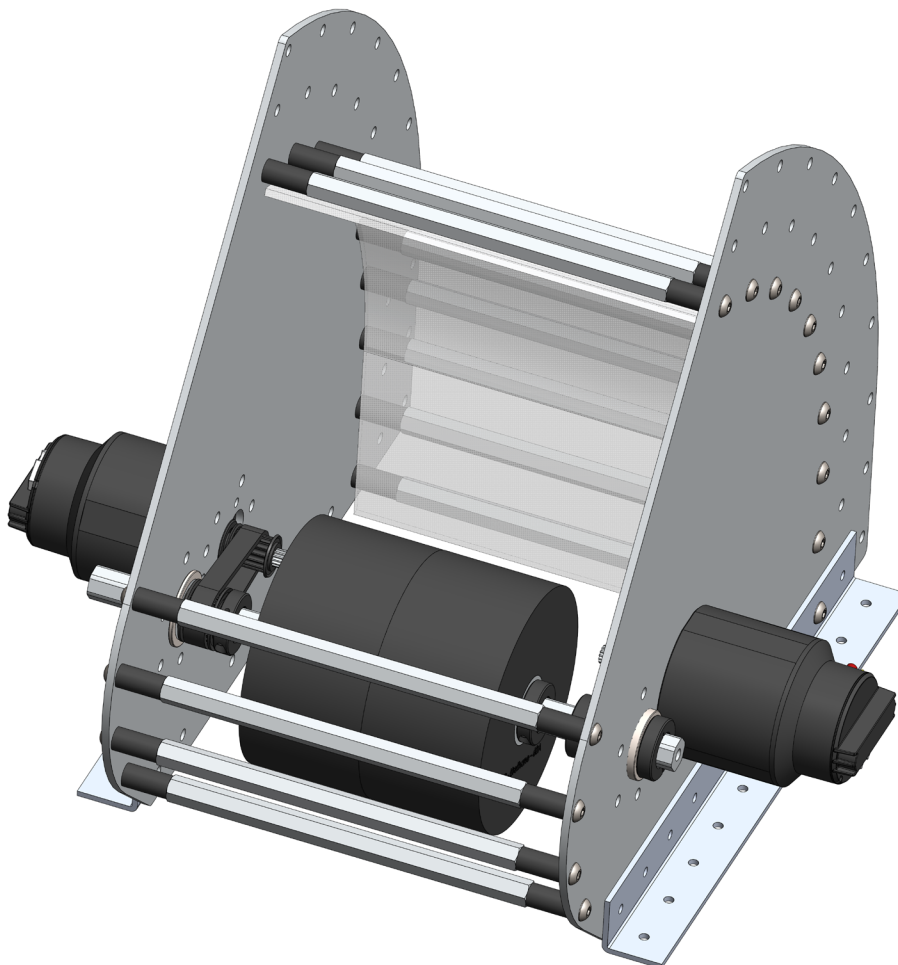
Slide the hex couplers onto the VersaPlanetary Output shafts before installing the ThunderHex shaft.

Install ThunderHex shaft and solid roller wheel. Center the solid roller wheel and tighten the shaft couplers.





Falcon500 Belt Option

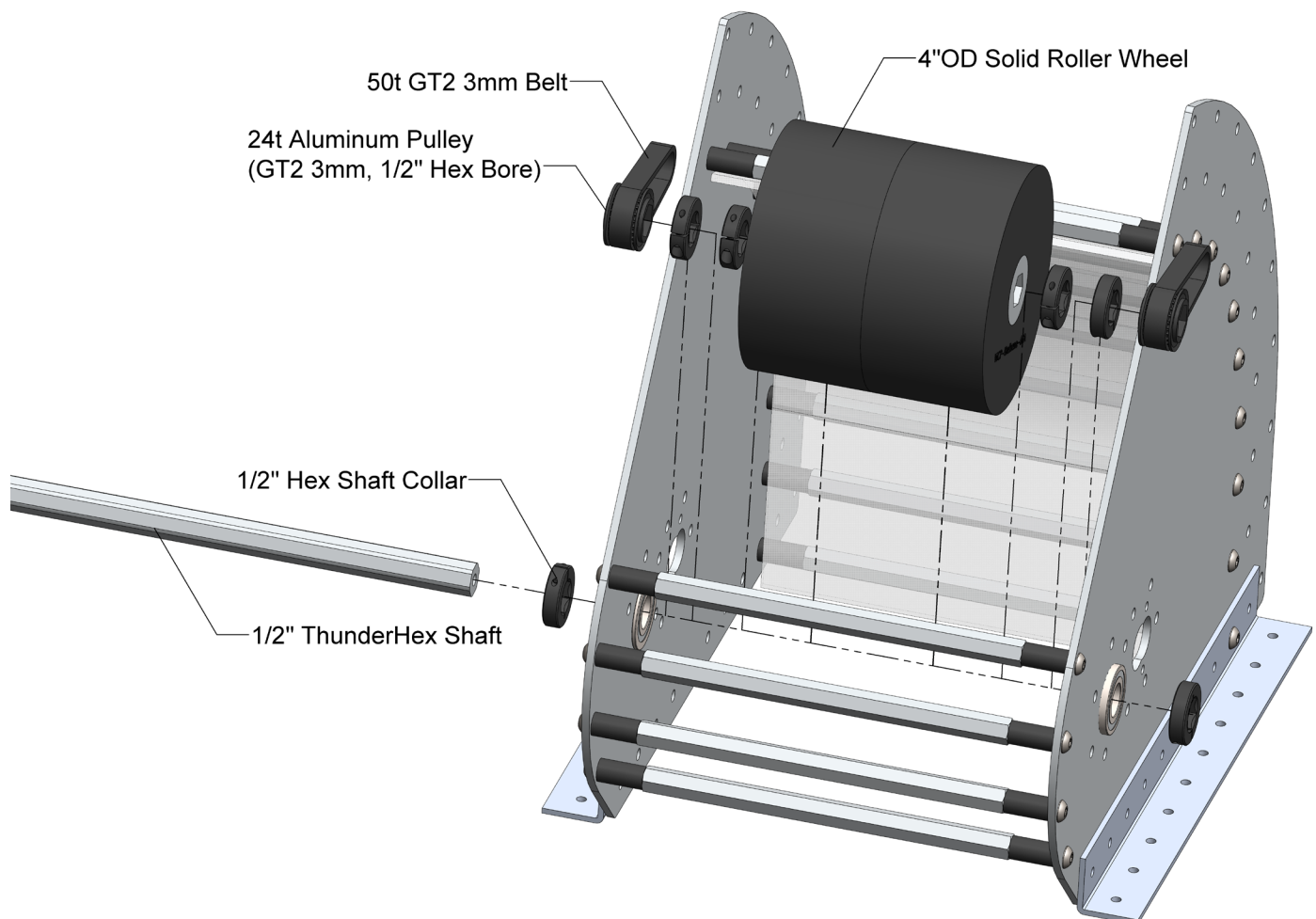




Step 1

Slide ThunderHex through bearing on one side of shooter assembly. Install remaining components as the shaft is slid through to the other side.

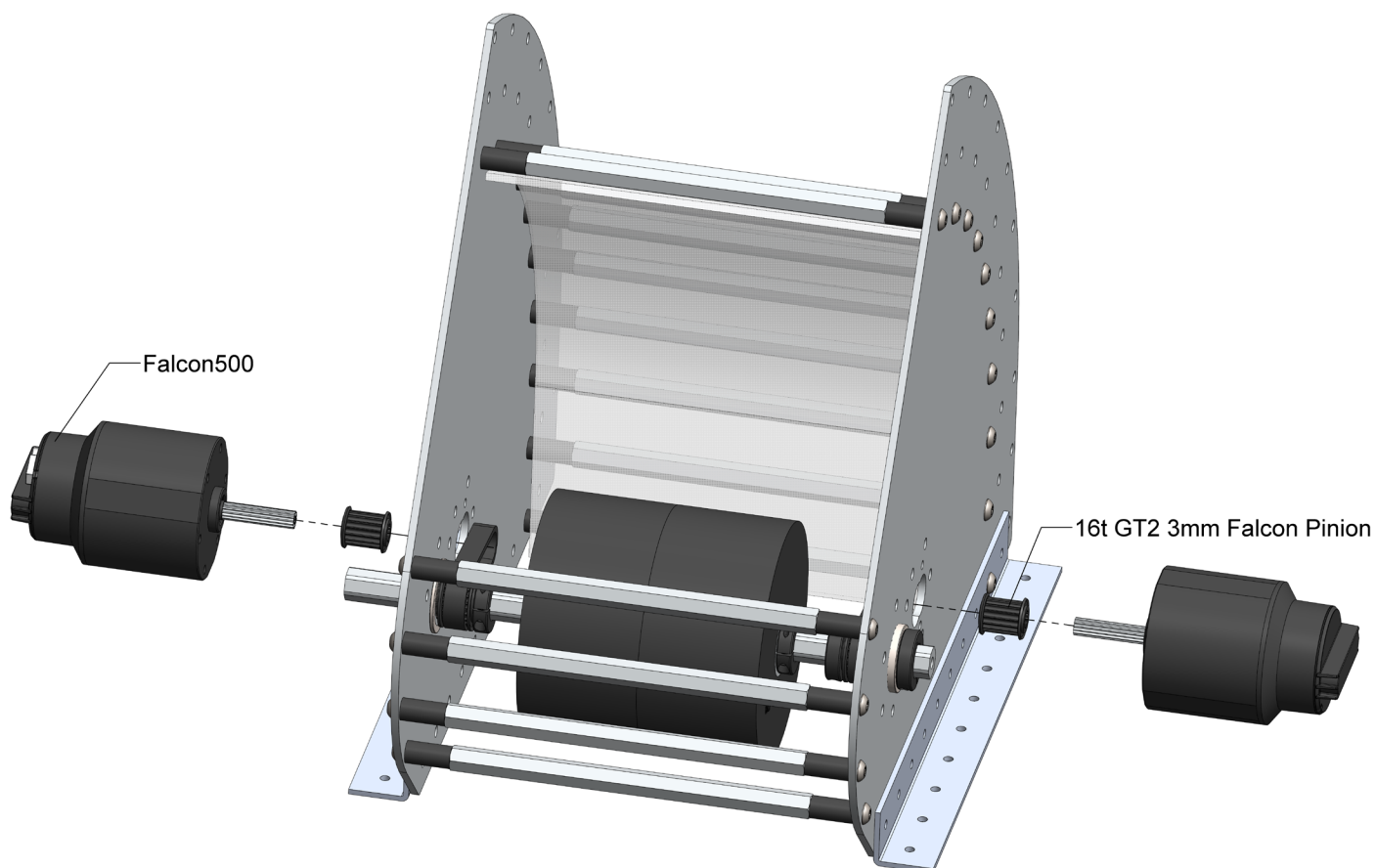
Note: Leave the collars loose until all components have been installed.



Step 2

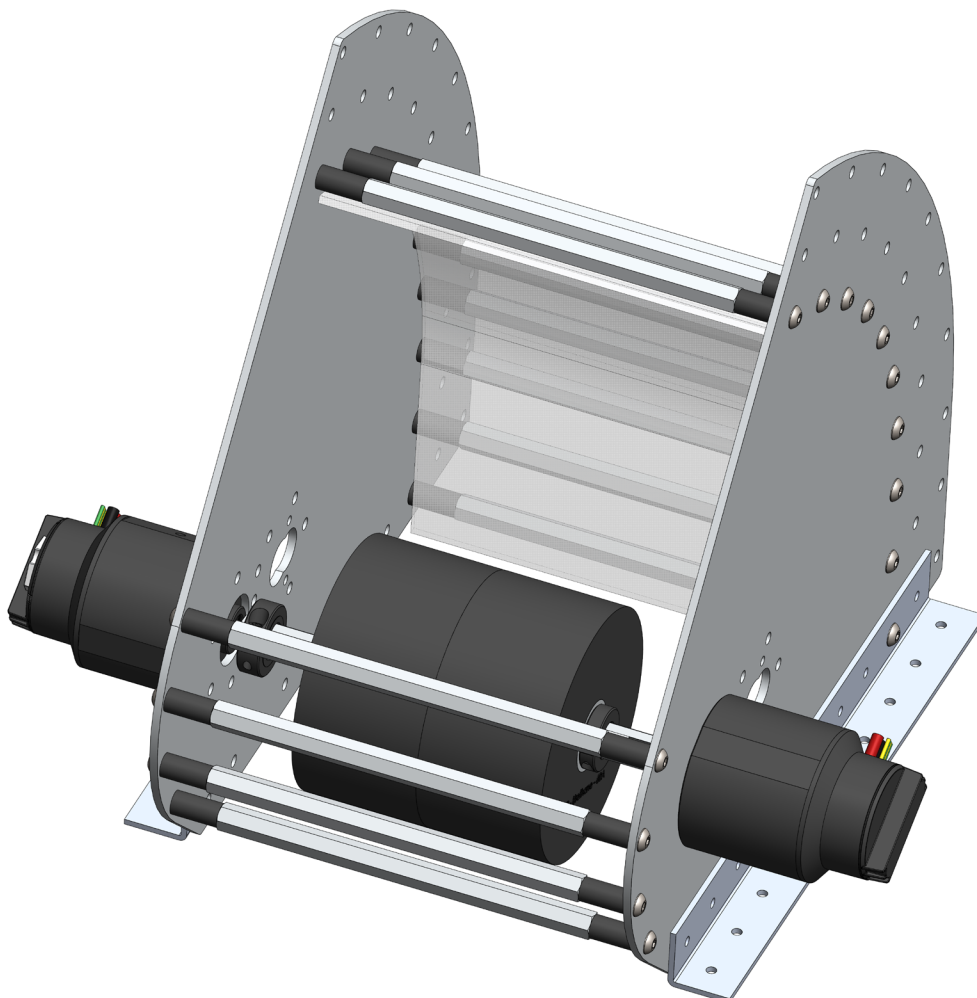
Install the Falcon500 and 16t GT2 pinion. Use a minimum of two #10-32 x 3/8"L bolts to attach each motor.

Use the appropriate Falcon Spacers and retaining bolt to hold the pinion in place.





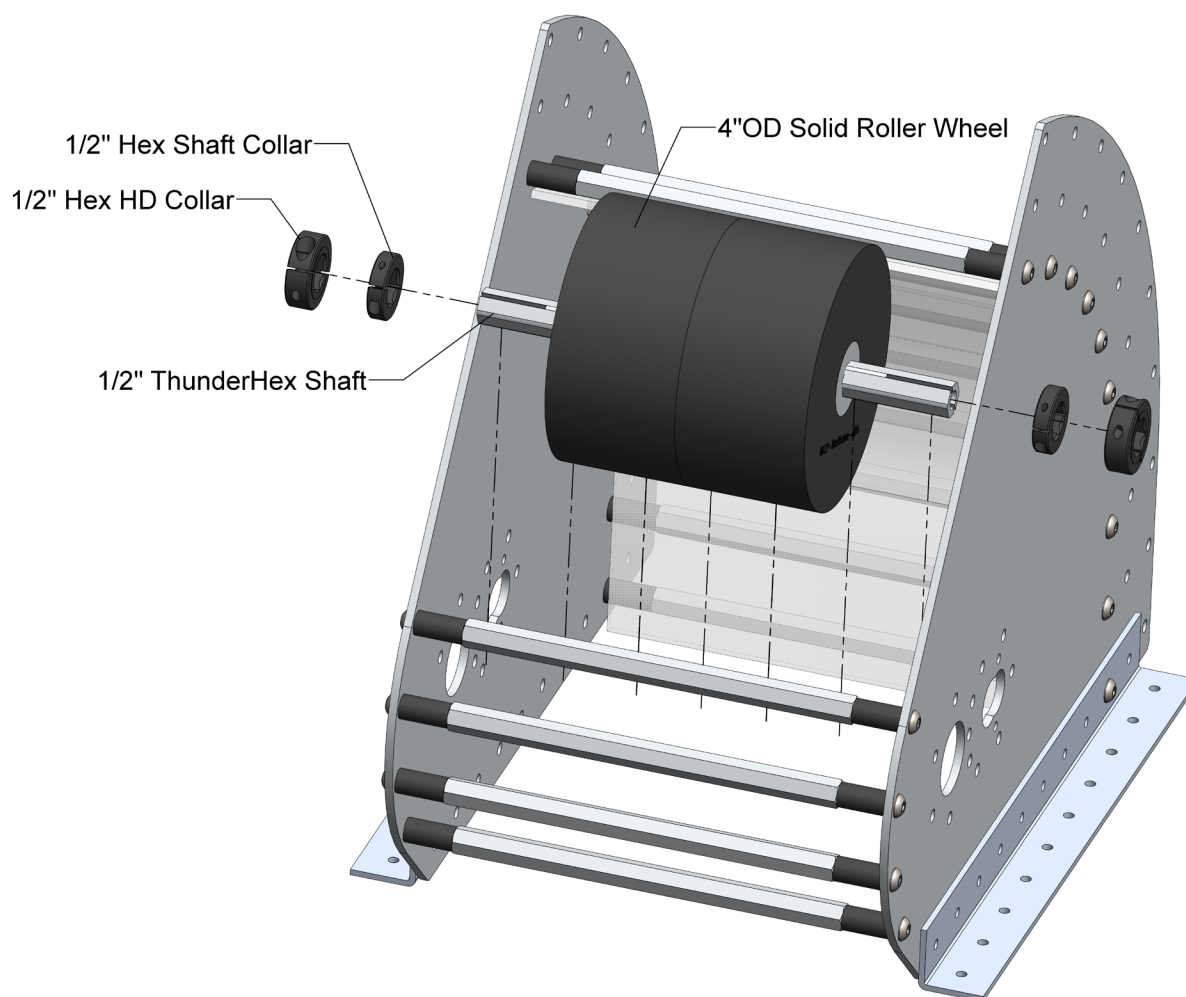
Falcon500 Direct Drive Option



Step 1

Install solid roller wheels and shaft collars onto the split ThunderHex Shaft.

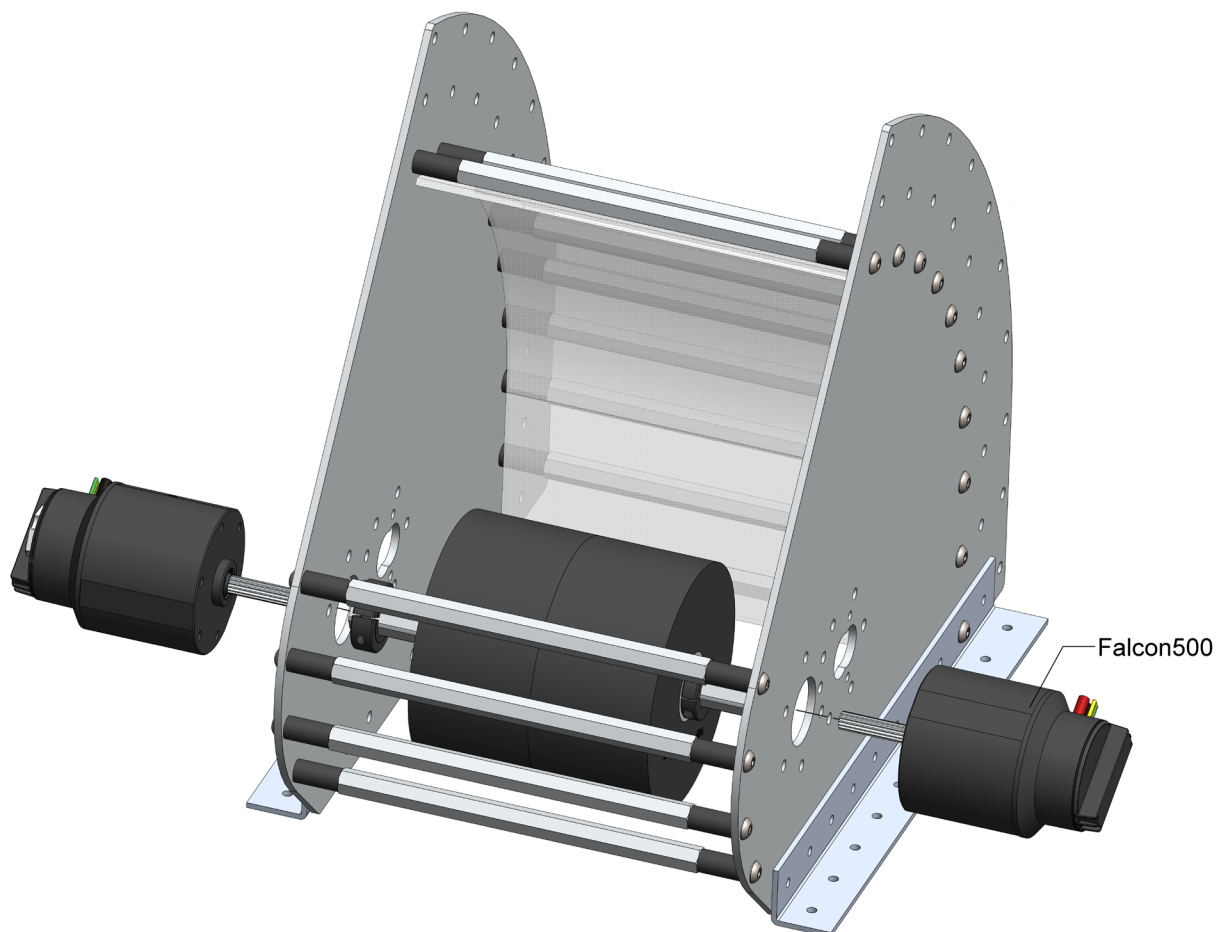
Note: Leave the collars loose until all components have been installed.



Step 2

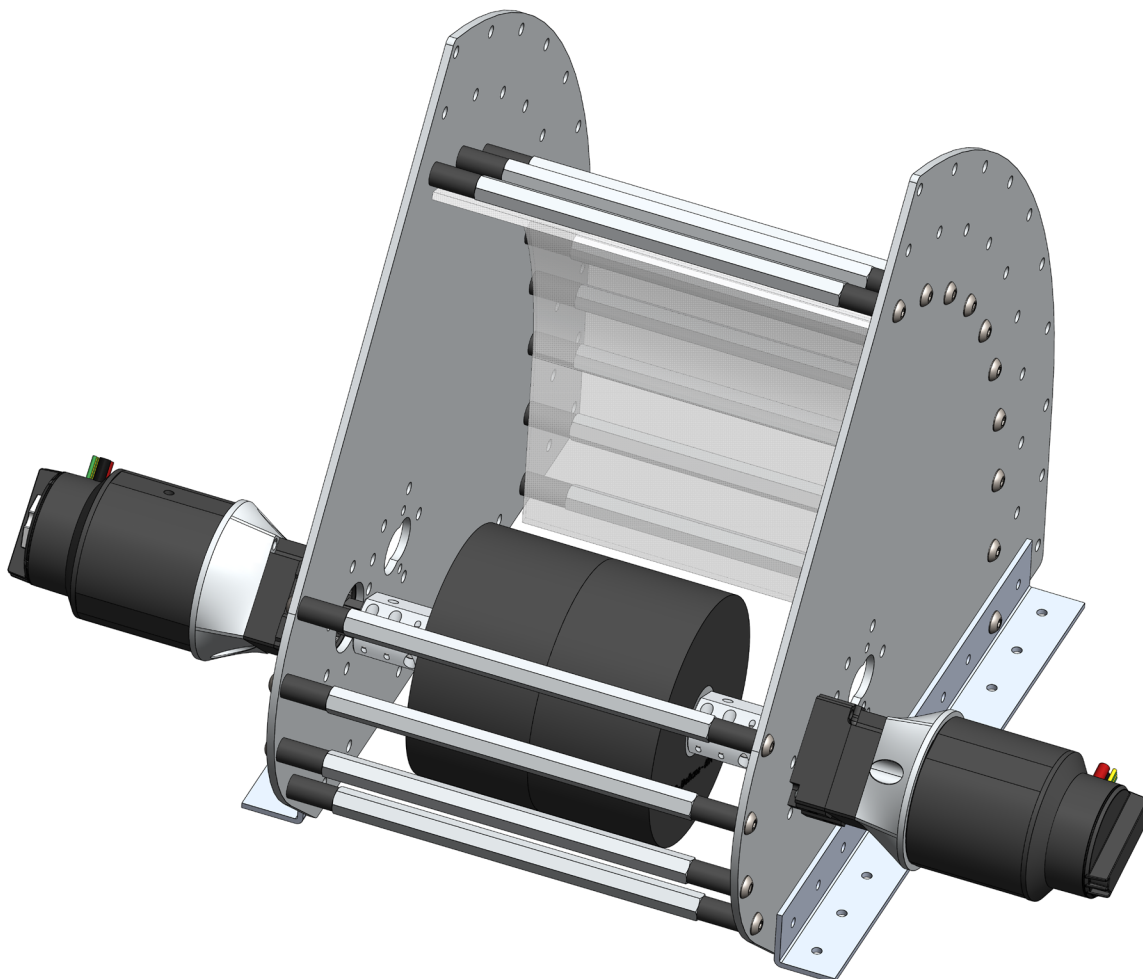
Install the Falcon500. Use a minimum of two #10-32 x 3/8"L bolts to attach each motor.

Tighten the HD shaft collars. Center the solid roller wheels and tight the shaft collars.





Falcon500 VersaPlanetary Option

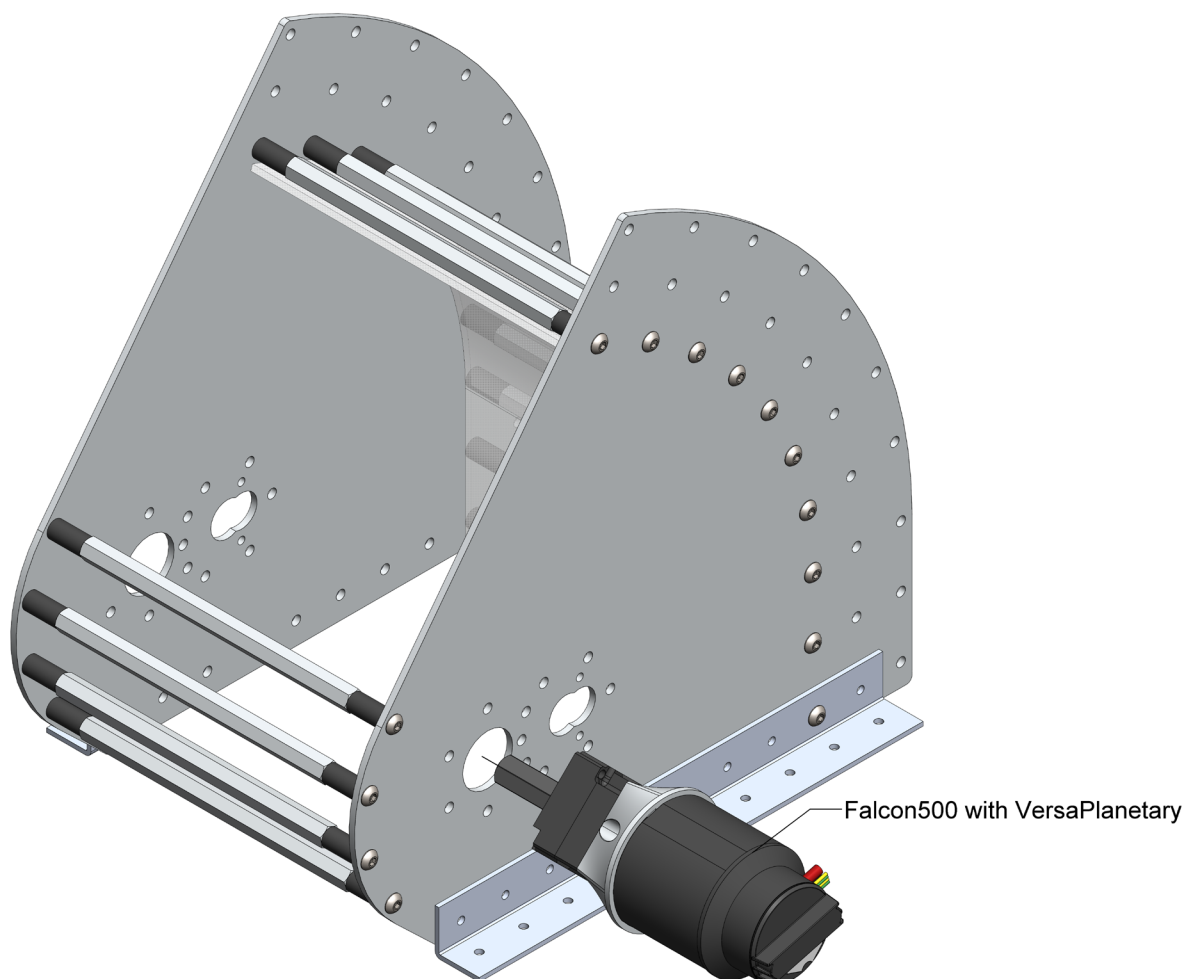




Step 1

Install VersaPlanetary with the desired gear ratio using two #10-32 x 1/2"L bolts.

Install motor and gearbox on the opposite side as well.

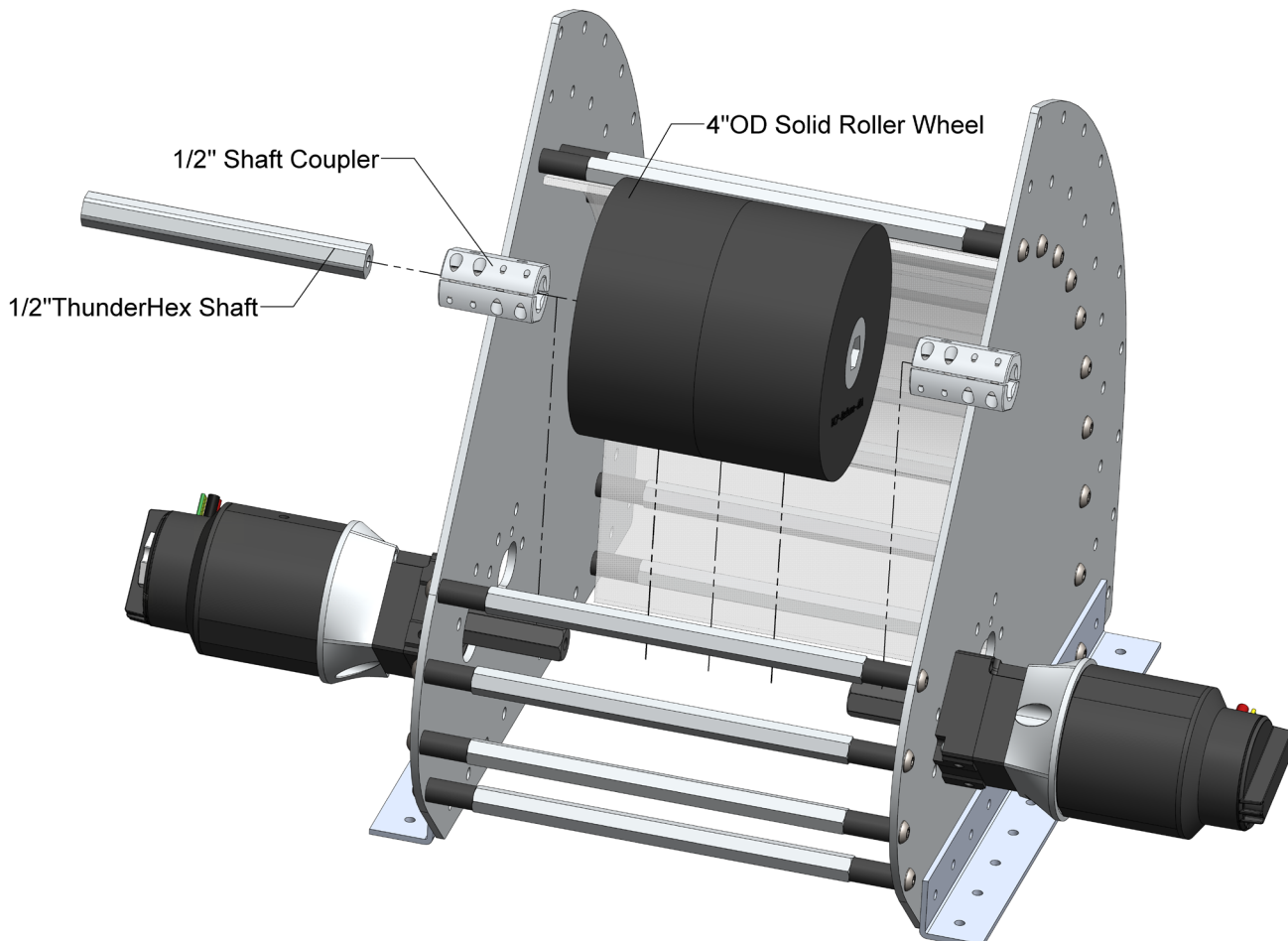




Step 2

Slide the hex couplers onto the VersaPlanetary Output shafts before installing the ThunderHex shaft.

Install ThunderHex shaft and solid roller wheel. Center the solid roller wheel and tighten the shaft couplers.





Recommended Wheels

The GreyT Shooter was designed to be paired with a 4" wheel.

Recommended wheels:

- WCP Solid Roller Wheels (https://www.wcproducts.com/wheels-hubs/roller-shooter/solid-roller-wheels/solidrollerwheels?__SID=U)
- 4" Flex Wheels (<https://www.wcproducts.com/flexwheels>)



Kit Contents

Picture	Name	QTY	Kit
	Shooter Side Plate	2	Base Kit
	Limelight Mount	2	Base Kit



Recommended Parts to Buy

Picture	Name	QTY
	1/2" ThunderHex (36")	1
	1" x 1" x 0.090" VersaFrame Aluminum Angle (59")	1
	*Aluminum Threaded Hex Standoff - 6" (McMaster P/N 91780A094)	14
	*Aluminum Spacers (.196" ID x 3/8" OD x 3/4" WD) (5-Pack)	6
	*3/8" ThunderHex (36")	4

* Aluminum Threaded Hex Standoff and Aluminum Spacers may be substituted with 3/8" ThunderHex

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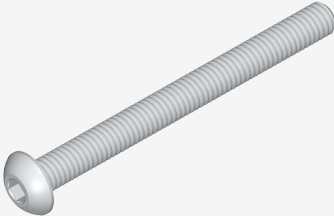
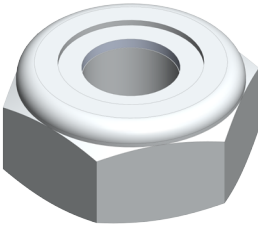


Picture	Name	QTY
	* #10-32 x 1.25"L Bolt	28
	* #10-32 x 1/2"L Bolt	28
	Solid Roller Wheel (4" OD x 2" WD, 1/2" Hex, Urethane, 60A)	2
	1/16" Gray Tinted Polycarbonate Sheet (36" x 72")	1
	#10-32 x 1"L Bolt	4

* The 1.25"L bolts are for the spacer and standoff combination. If using 3/8" ThunderHex buy 1/2"L bolts.

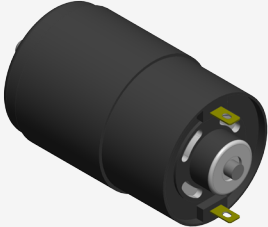
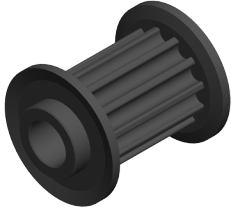


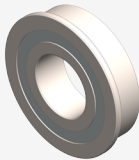
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Picture	Name	QTY
	#10-32 x 2"L Bolt	4
	#10-32 Nut	8


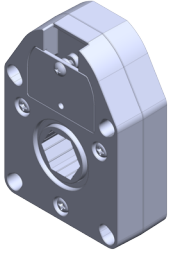


775pro Belt Option

Picture	Name	QTY
	775pro	2
	12t x 9mm Wide Double Flange Aluminum Pulley (GT2 3mm, RS775 Motor)	2
	36t x 9mm Wide Double Flange Aluminum Pulley (GT2 3mm, 1/2" Hex Bore)	2
	60t x 9mm Wide Timing Belt (GT2 3mm)	2
	1/2" ThunderHex Bearing	2

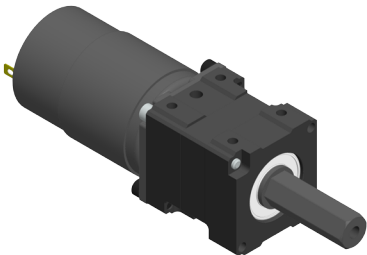
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Picture	Name	QTY
	1/2" Hex Shaft Collar	7
	Hex Bore Mag Encoder Housing	1




775pro VersaPlanetary Option

Picture	Name	QTY
	775pro	2
	VersaPlanetary w/ Ring Gear and Gear Kit	2
	VersaPlanetary Integrated Encoder	1
	1/2" Hex Coupler	2



Falcon500 Belt Option

Picture	Name	QTY
	Falcon 500	2
	16t GT2 Falcon Pinion	2
	24t x 9mm Wide Double Flange Aluminum Pulley (GT2 3mm, 1/2" Hex Bore)	2
	50t x 9mm Wide Timing Belt (GT2 3mm)	2
	1/2" Hex Collar	6

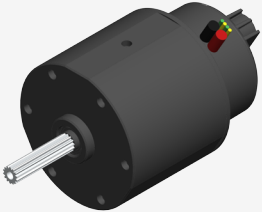
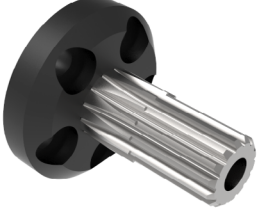

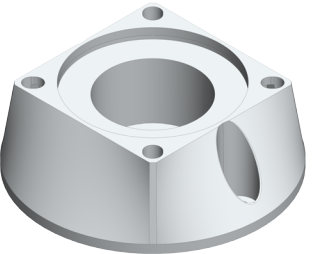
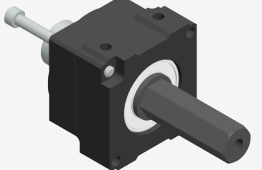


Falcon500 Direct Drive Option

Picture	Name	QTY
	Falcon500	2
	1/2" Hex Collar	2
	1/2" Hex HD Collar	2



Falcon500 VersaPlanetary Option

Picture	Name	QTY
	Falcon500	2
	Falcon Short Shaft	2
	Falcon Coupler	2
	VersaPlanetary CIM Adapter	2
	VersaPlanetary w/ Ring Gear and Gear Kit	2

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Picture	Name	QTY
	1/2" Hex Coupler	2
	1/2" Hex HD Collar	2
	1/2" Hex Collar	2

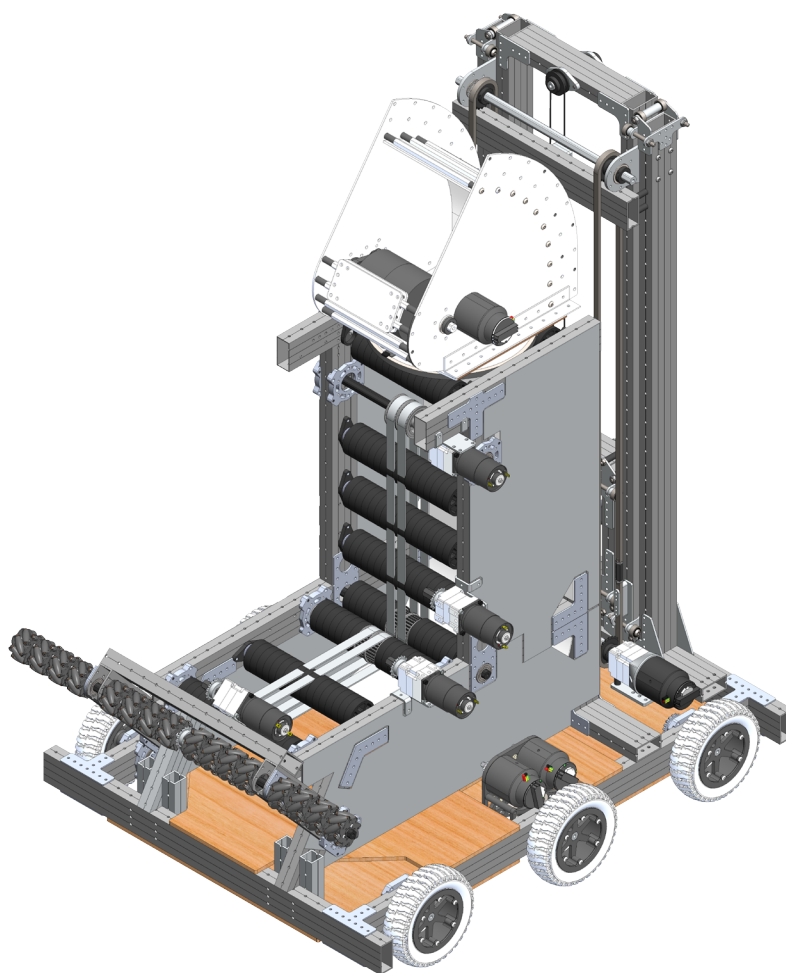


Application Example - 2020 WCP CC

The 2020 WCP CC utilized the Greyt shooter for scoring in the outer and inner ports the target in the 2020 FRC game Infinite Recharge. The shooter was used in combination with the Greyt Turret and the Limelight 2+. This combination is simple to use and combine for a robust scoring system. The shooter can also be used as a stand alone assembly.

CAD and video of the 2020 WCP CC can be found here:

<https://www.wcproducts.com/cc/>





FAQ

Q: What wheels are recommended?

A: The WCP Solid Roller Wheels or 4" Flex Wheels are the recommended wheel to use.

Q: What size game objects does the shooter support?

A: This GreyT Shooter was designed with a 7" game object in mind. Other sizes may be used but the performance may vary as smaller or larger game objects were not taken into consideration.

Trouble Shooting

Issue: Not shooting far enough.

Possible Solutions:

1. The RPM may not be high enough. Try increasing the RPM to gain for distance.
2. The compression on the game object is not enough. Try increasing the compression by moving the standoffs that support the plastic hood backing forward to the next set of holes.



Revision Table

Revision Date	Revision #	Description
8/26/2020	1.1	First revision created.