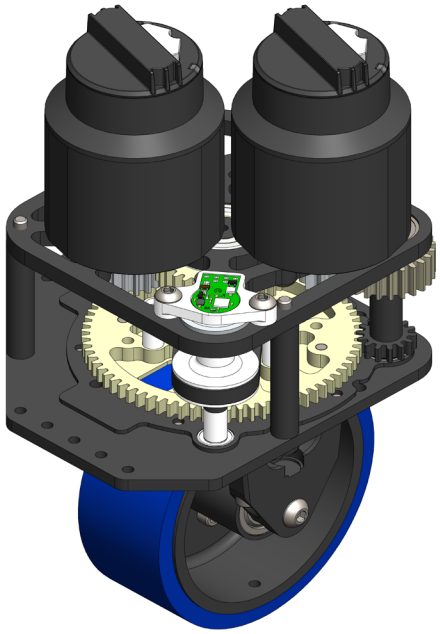
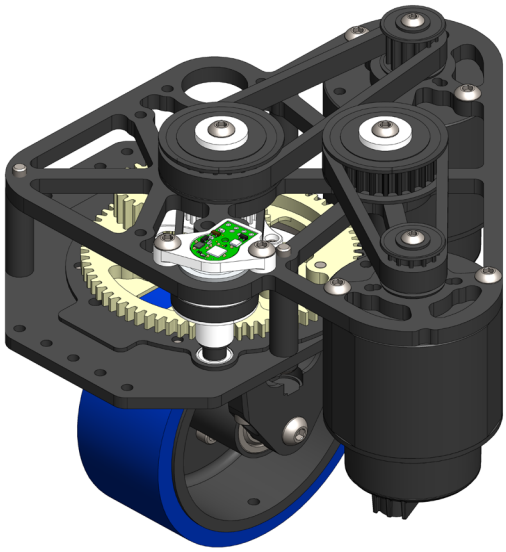
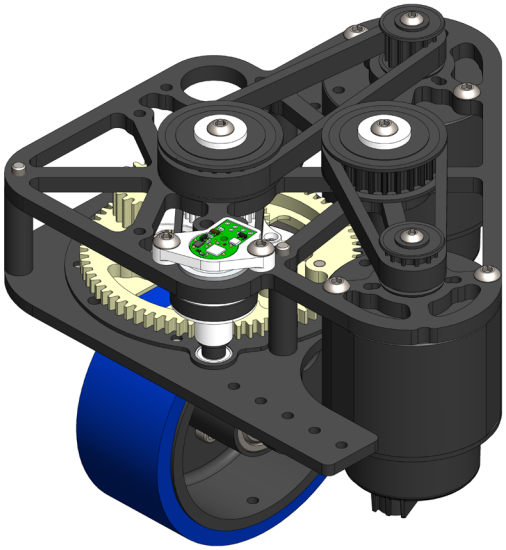
Swerve X - User Guide
(Rev 1)







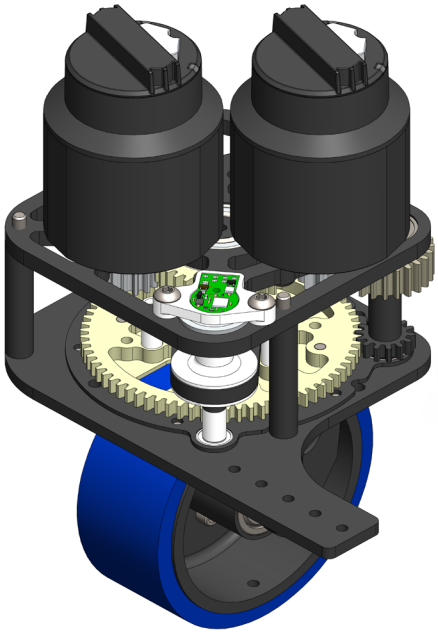


Table of Contents

What is the Swerve X?

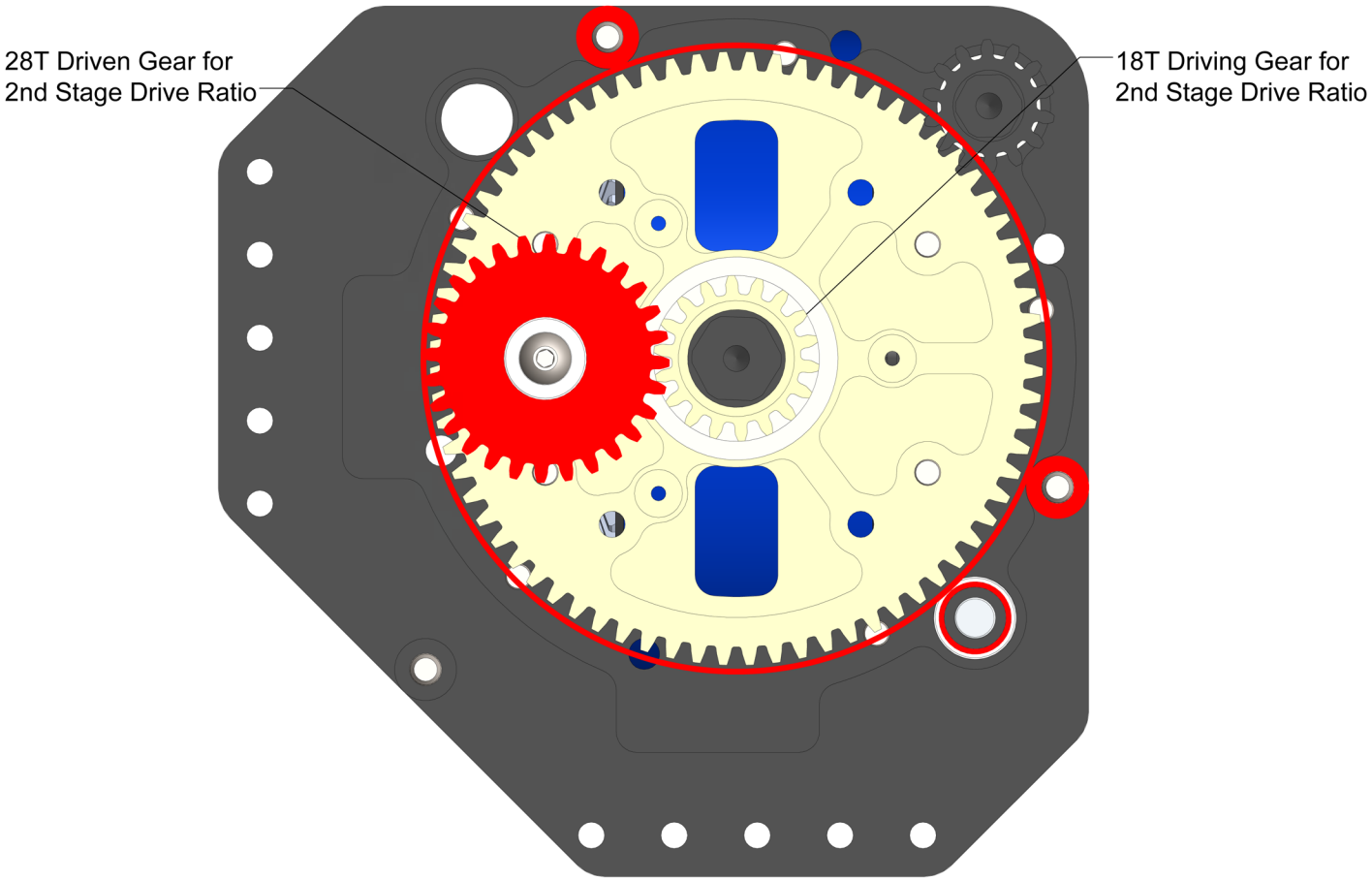
WCP's newest generation of the swerve drive module, designed from the ground up to utilize the powerful Falcon 500 brushless motor to improve performance and remove complexity. This new design is smaller, lighter, and more versatile than our previous module, and truly makes omnidirectional driving as simple as plug and play.

Notable features:

- All 4 configurations of the module use the same shafts. What this means is users can swap from Tube Mount to Flipped Tube Mount to Corner Mount to Flipped Corner Mount by simply using different plates.
- Less hardware required for assembly.
- Encoder can be placed in two different spots.
- Modules accept multiple motors: Falcon 500 - 775pro - 550 motors.
- The bottom mounting plate is made of 7075-T6 to help with bending.
- Wheel height is the same regardless of configuration, so it is possible to mix and match modules on robot.
- New optional aluminum bevel gear is available to shave off weight.
- Alignment holes to zero module.
- Clearance holes so motors can be removed without disassembling gearbox.
- Smaller and lighter 3" ID X-contact bearing.

Choosing Ratios - Possible Issues

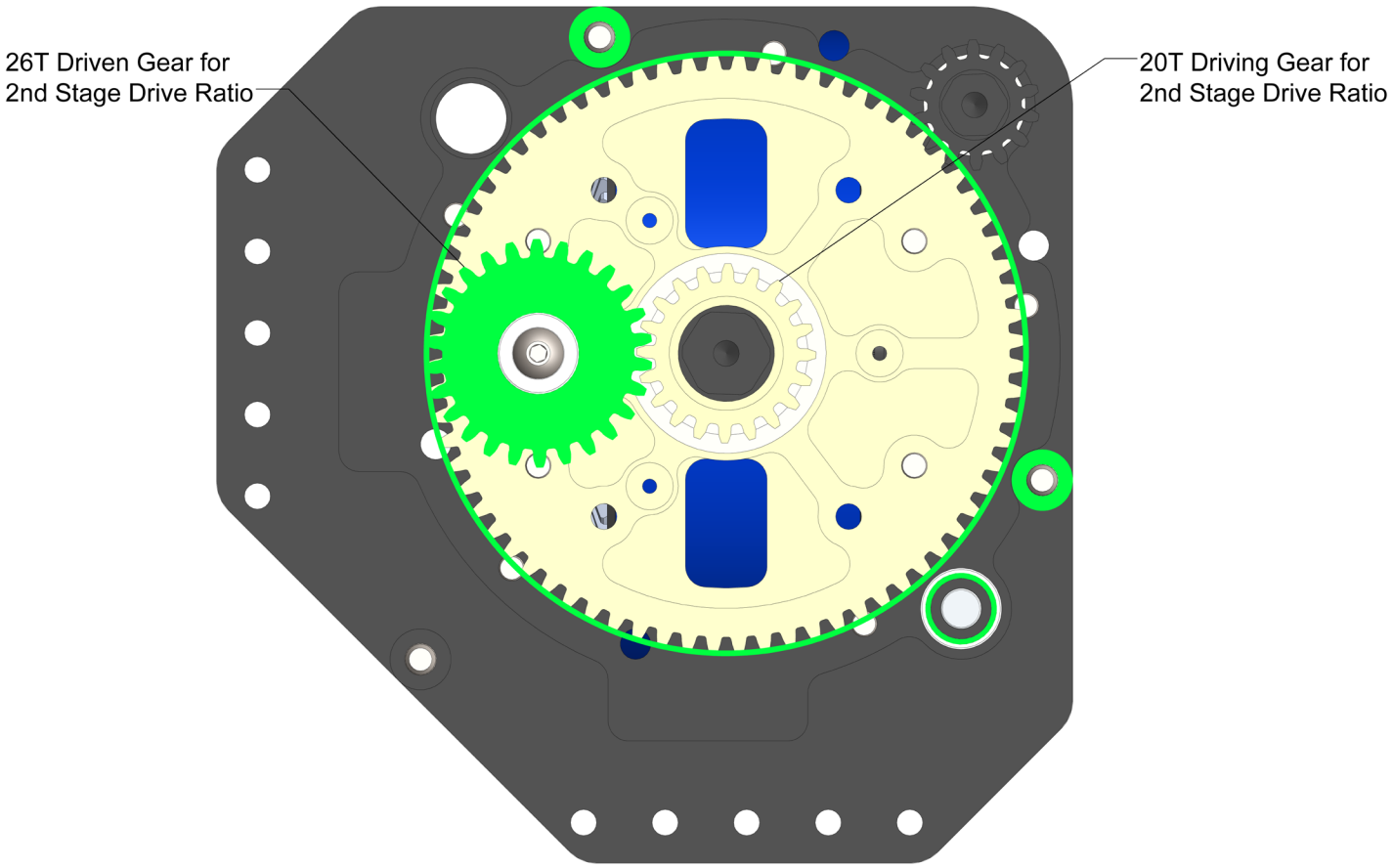
When creating custom overall drive ratios, the gear set for the 2nd stage must be carefully selected. The driven gear for this stage cannot exceed a 26T tooth count, otherwise the gear will collide with the module spacers and sensor shaft as the wheel module rotates.



Choosing Ratios - Recommended

For the 2nd stage of the drive ratio, a 26T or smaller driven gear provides the required clearance for the module as it rotates. Listed in the table below are some recommended gear sets.

Driving Gear Tooth Count	Driven Gear Tooth Count
20	26
22	24
24	22

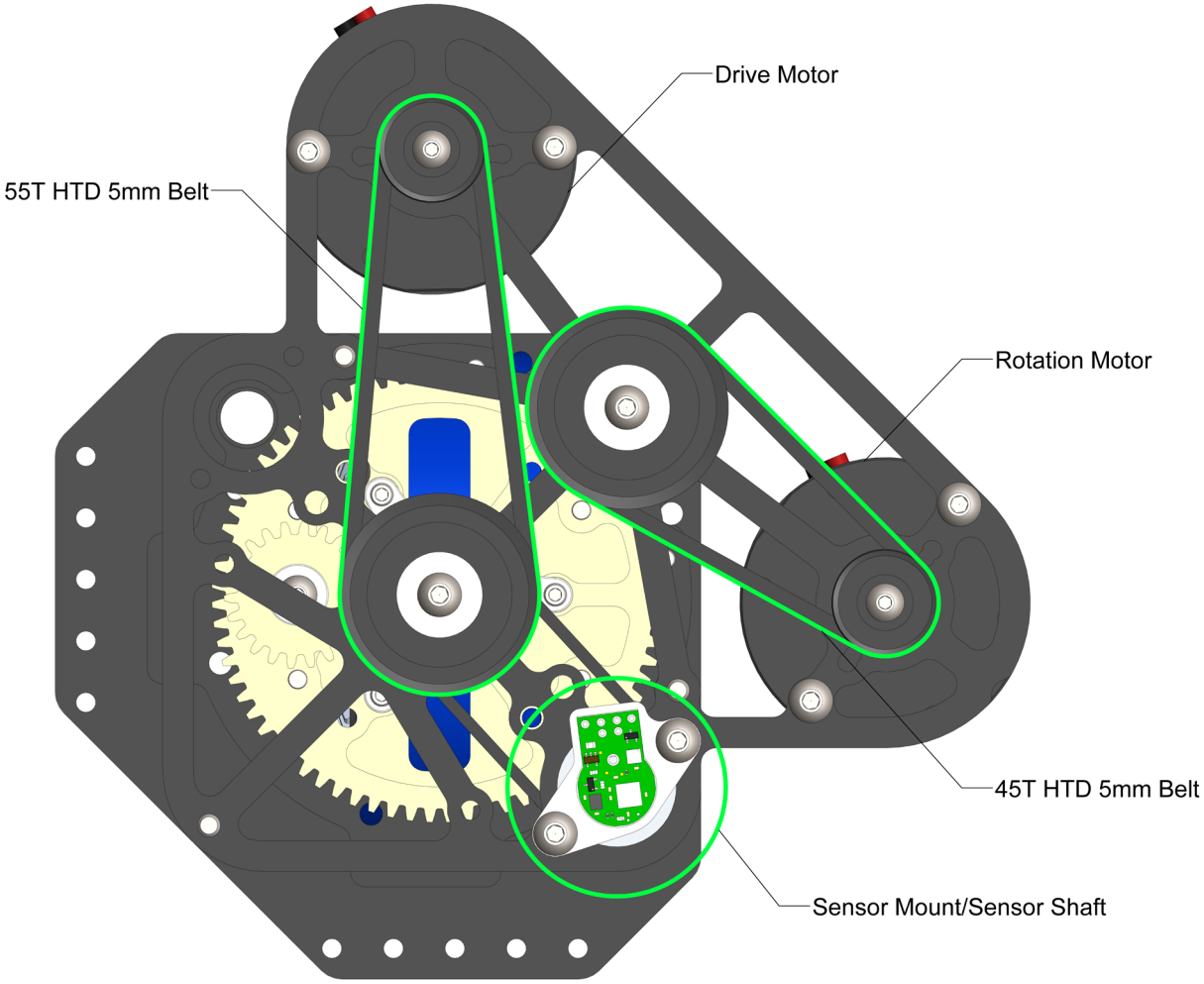


Sensor Installation - Possible Issues

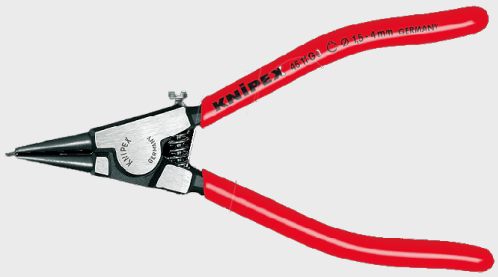
The position of the Sensor Shaft determines the correct orientation for the belt installation in Step 11. The Drive Motor will be the motor farthest from the Sensor Shaft, while the Rotation Motor will be the motor closest to the Sensor Shaft.

The image below shows one of the two correct possible belt/sensor configurations. If the Sensor Shaft is in the other corner, you will swap which motor is belted to which shaft.

Warning: If assembled incorrectly, the 55T HTD 5mm Belt for the drive may collide with the sensor mount.



Recommended Tools

Picture	Name
	Snapring Pliers for 1/2” and 3/8” Snaprings
	SAE/Inch Allen Set

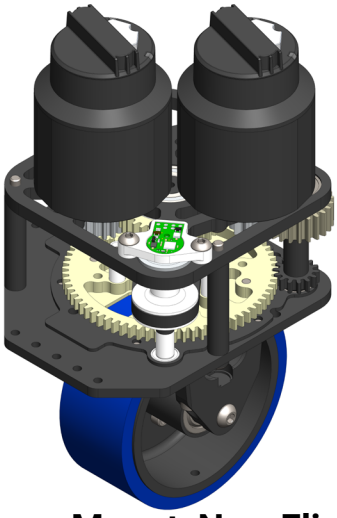
Swerve X Assembly Instructions

Assembly instructions are interchangeable between the Corner and Tube Mount versions of the Swerve. Unless otherwise specified, this also goes for the Flipped and Non-Flipped versions of the Swerve.

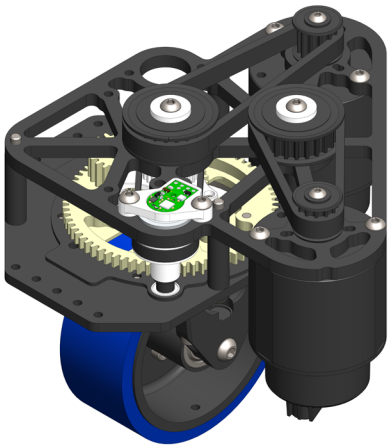
Note: Blue Loctite (McMaster P/N 1004A12) is recommended on all bolts that thread into a tapped hole.

Note: Check for any remaining support material on all 3D printed parts before assembly.

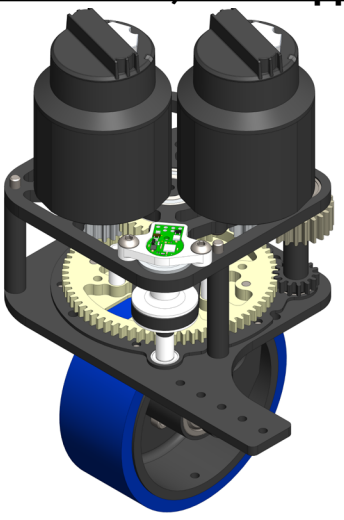
Tube Mount, Non-Flipped



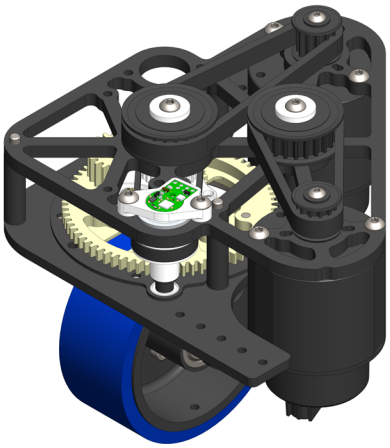
Tube Mount, Flipped



Corner Mount, Non-Flipped



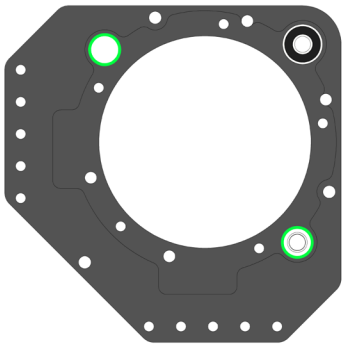
Corner Mount, Flipped



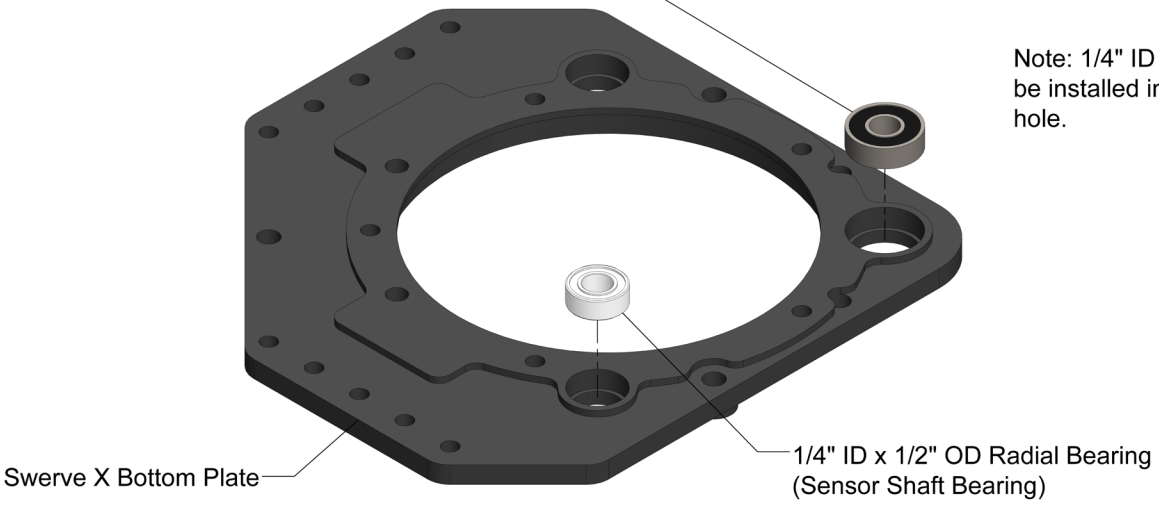
Step 1

The 1/4” ID bearings are installed from the top side of the Bottom Plate. They are a light press fit and may be pressed in by hand or with an arbor press.

Note: The 1/4” ID x 1/2” OD Bearing can be installed in either available bearing hole. The placement of this bearing will determine the location of the CTRE Mag Encoder Mount on the top plate for all configurations, along with the belt configuration for the Flipped configurations.



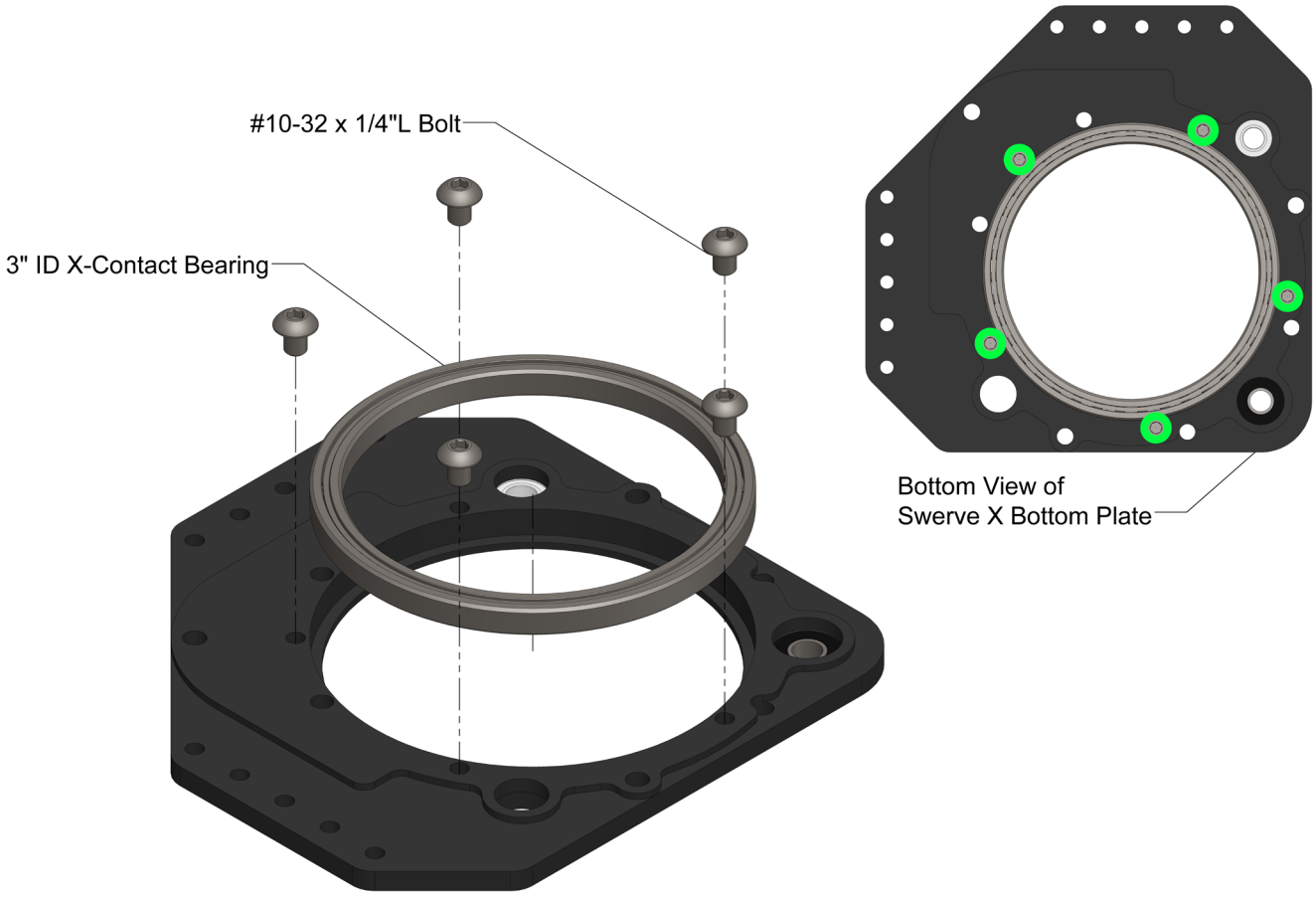
Note: 1/4" ID x 1/2" OD Bearing can be installed in either available bearing hole.



Step 2

The 3” ID X-Contact Bearing will be installed from the bottom side of the Swerve X Bottom Plate. It is a tight slip fit and can be installed by hand or with an arbor press, if necessary. The bearing should sit flush with the bottom side of the plate.

Once the bearing is fully seated, use the five #10-32 x 1/4”L bolts to retain it. The bolts should be tightened until flush with the bottom side of the Bottom Plate. The image below indicates the location of the bolts in green.

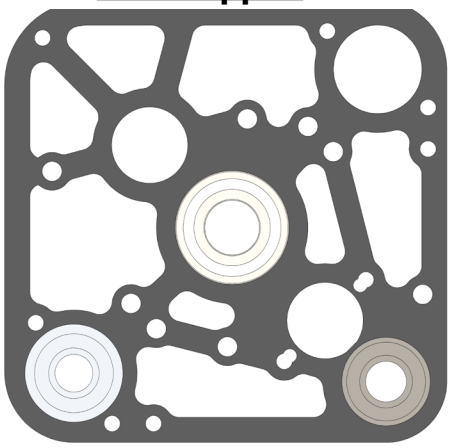


Step 3

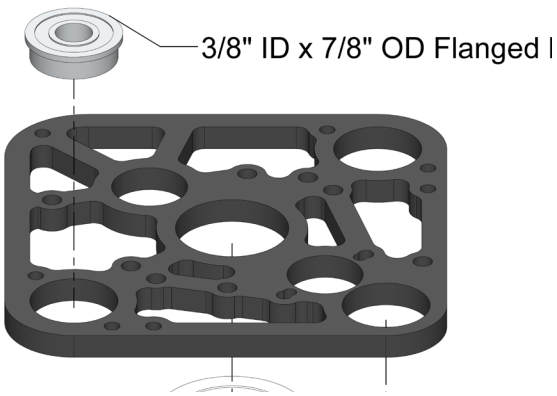
These bearings are a light press fit and may be pressed in by hand or with an arbor press. The images below show the side the bearings must be installed from for both the Non-Flipped and Flipped configurations. It is critical that the flanges are on the correct side so that the motors will sit flat.

Note: The position of the 3/8” ID x 7/8” OD flanged bearing must align with the 1/4” ID x 1/2” OD radial bearing installed in step 1.

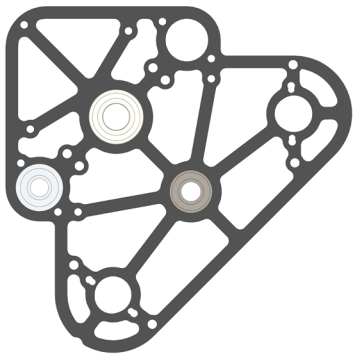
Non-Flipped



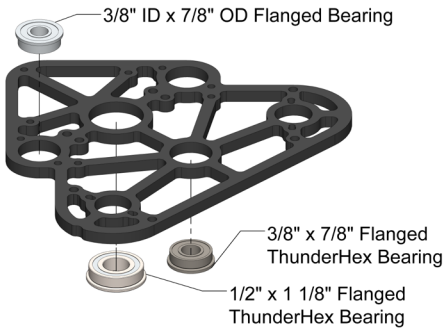
Note: 3/8" ID x 7/8" OD flanged bearing must align with the 1/4" ID x 1/2" OD radial bearing from step 1.



Flipped

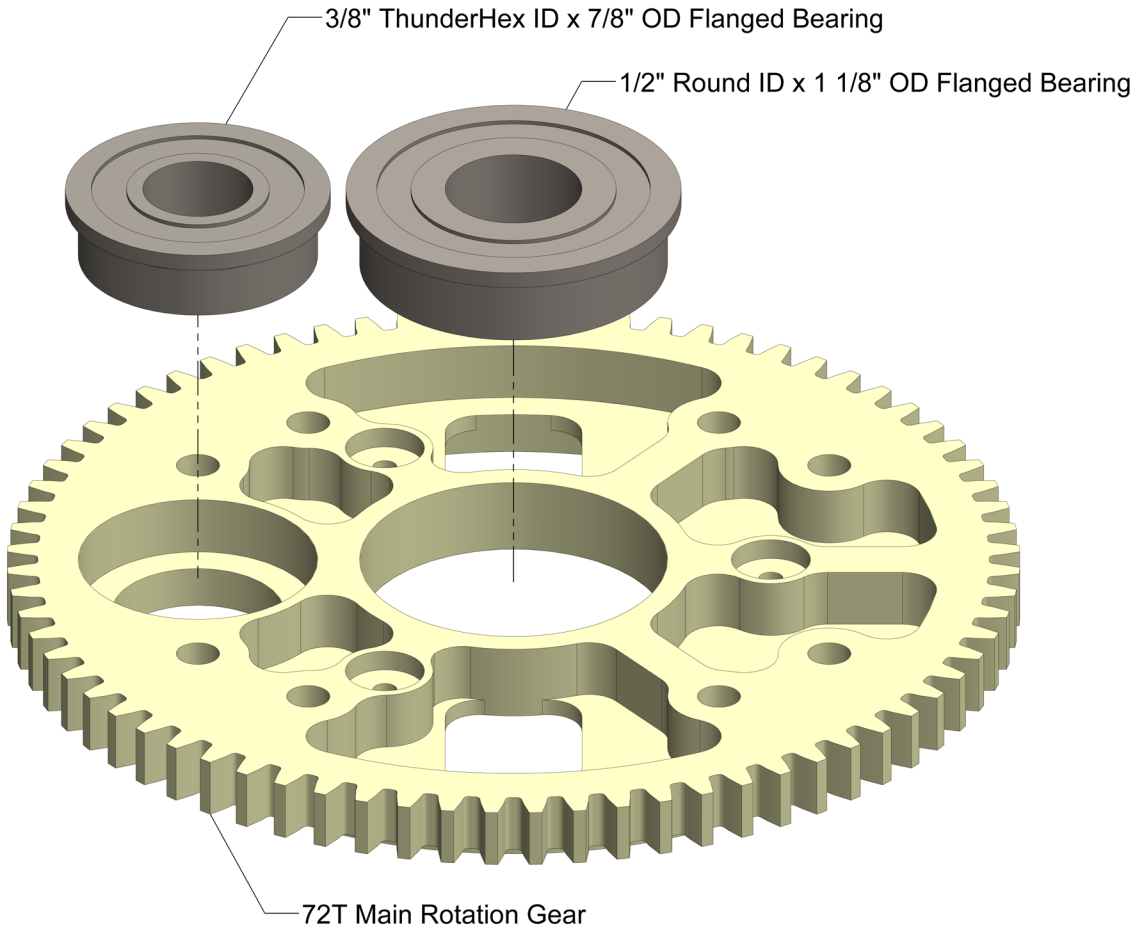


Note: 3/8" ID x 7/8" OD flanged bearing must align with the 1/4" ID x 1/2" OD radial bearing from step 1.



Step 4

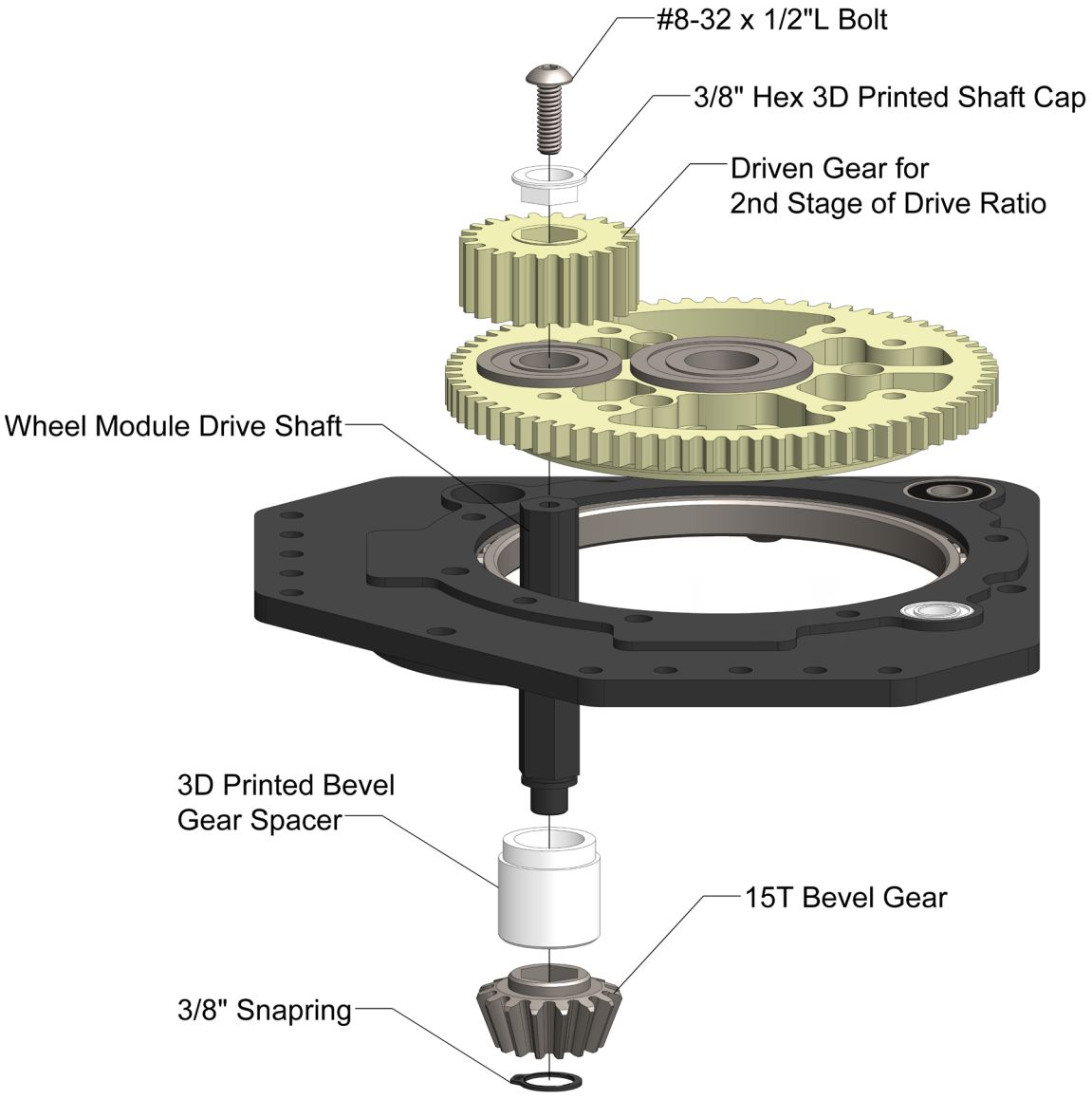
The bearings will come installed in the 72T Main Rotation Gear. If removal is required, the bearings will be a light press fit.



Step 5

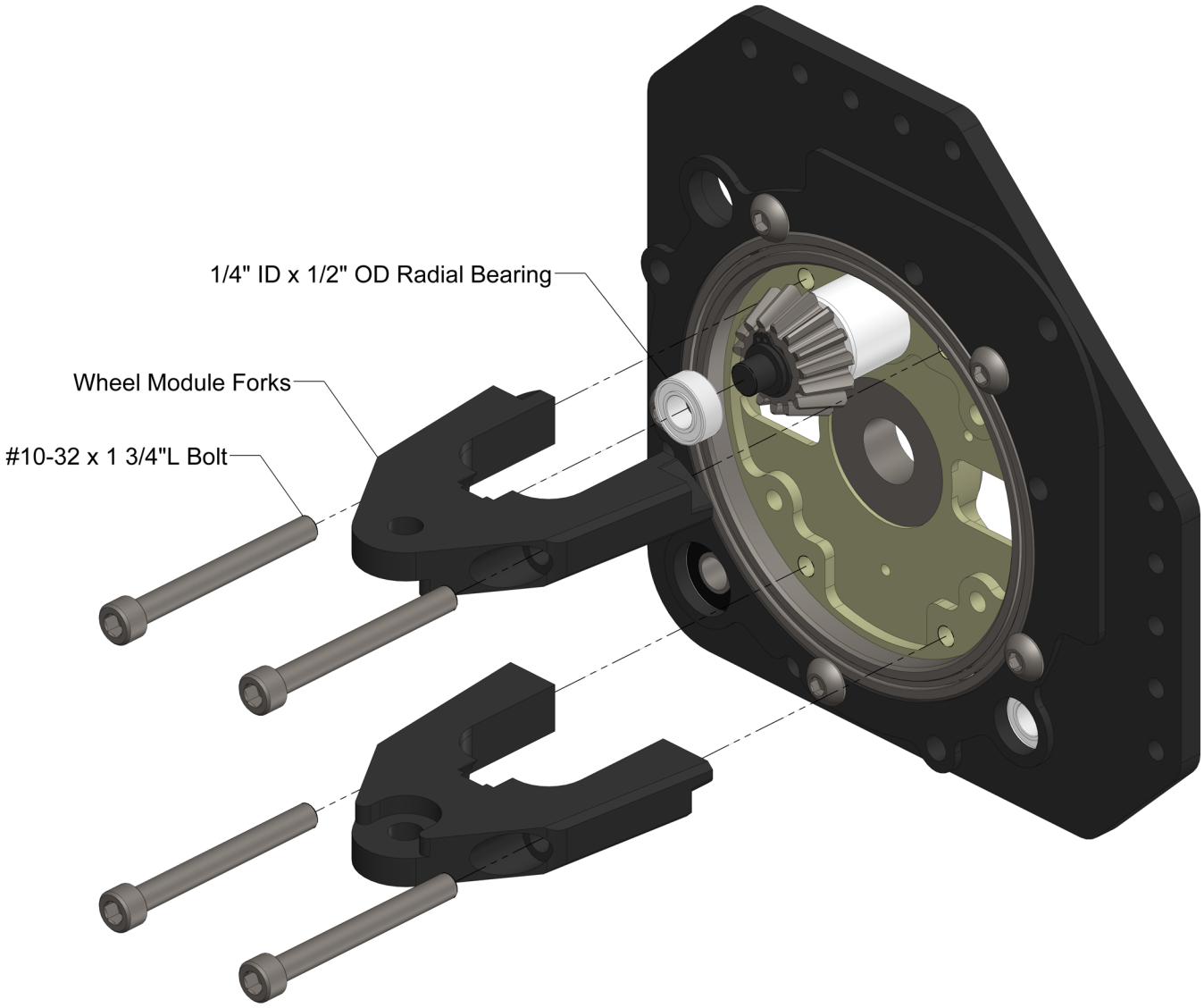
Press the 72T Rotation Gear in by hand. If necessary, use a dead blow hammer to lightly tap it in.

The Drive Shaft must be installed through the bottom side of the 3/8” ThunderHex bearing.



Step 6

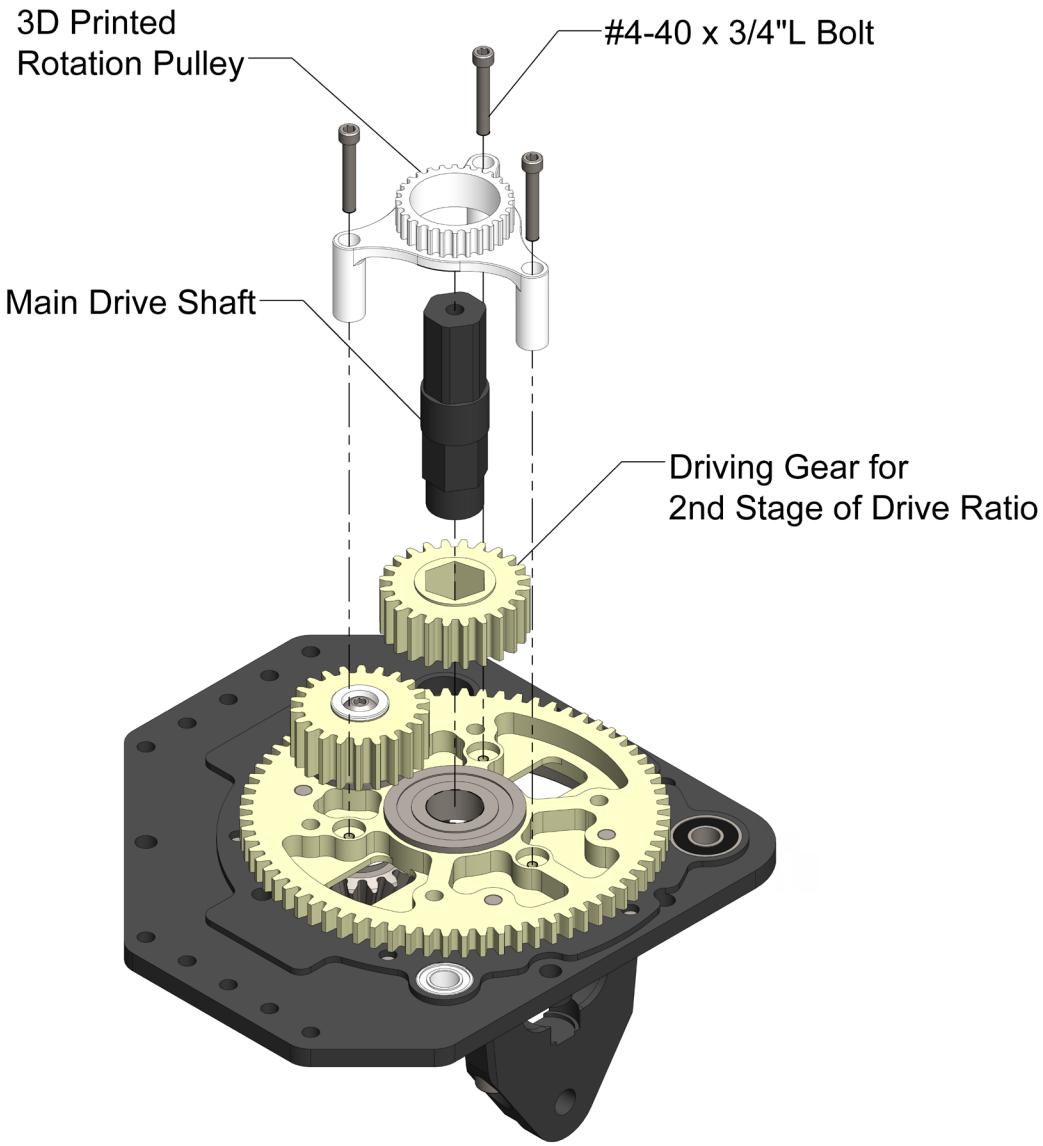
The 1/4” ID x 1/2” OD bearing can be presed into the Wheel Module Fork by hand. Only the Fork that aligns with the Wheel Module Drive Shaft needs a bearing. Once the bearing is in place, use the #10-32 x 1 3/4”L bolts to install both forks into the module.



Step 7

The Main Drive Shaft and corresponding gear should be installed before the 3D Printed Rotation Pulley. Use the #4-40 x 3/4”L bolts to install the 3D Printed Rotation Pulley.

Warning: Do NOT overtighten the #4-40 bolts, as this will crush the 3d printed part.



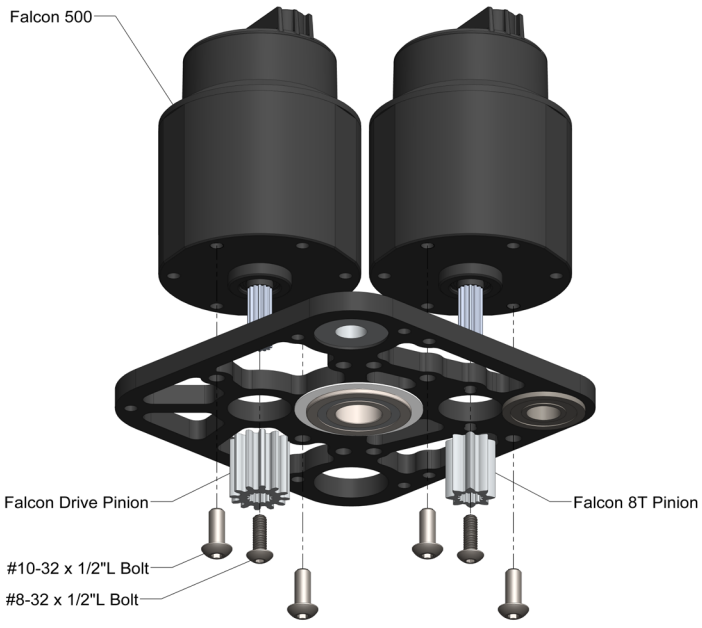
Step 8

For the Non-Flipped configuration, the output shafts for the motors must be shortened for clearance. If you do not want to cut the shafts, we recommend installing Motor Spacers (WCP-0339).

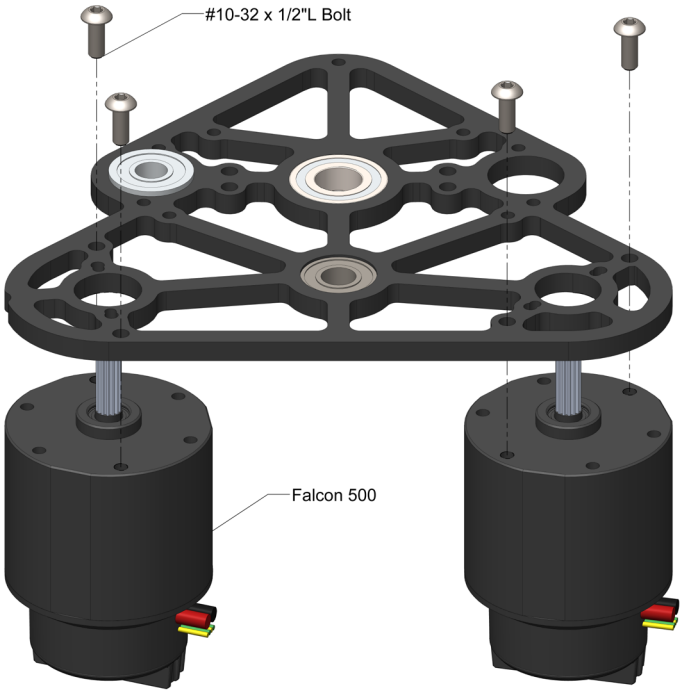
For all configurations, the motors are installed using #10-32 x 1/2”L bolts. For the Non-Flipped configuration, the pinions are bolted in using #8-32 x 1/2”L bolts.

Note: The motor shaft length does not matter in the assembly of the Flipped Swerve.

Non-Flipped



Flipped



Step 9

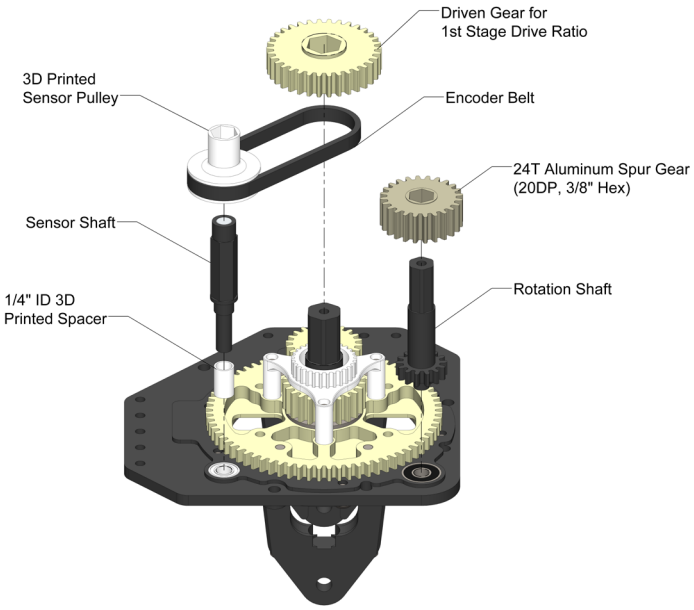
The magnet will come installed in the Sensor Shaft.

Slide all gears and shafts into position. For the Non-Flipped configurations, the 1/4” ID 3D Printed Spacer is required on the Sensor Shaft.

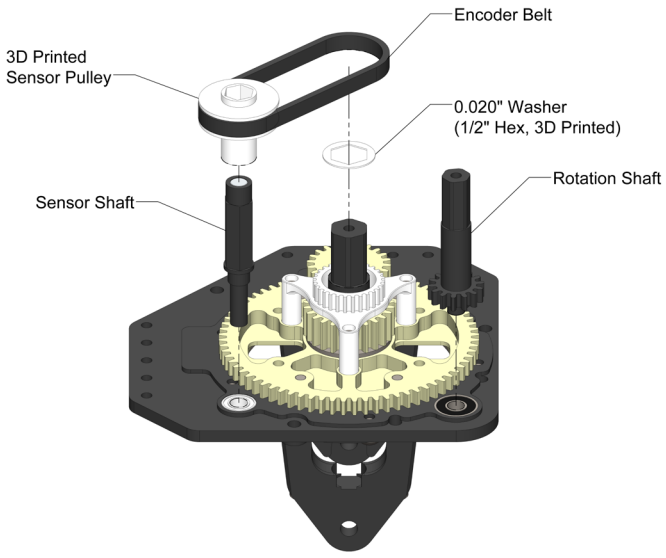
The Encoder Belt will be installed during this step. This can be done by placing it on the 3D Printed Sensor Pulley, and then sliding it onto the 3D Printed Rotation Pulley installed in Step 7.

Note: For the Flipped configurations, the excess 1/4” shoulder on the Sensor Shaft that extends past the Swerve X Bottom Plate can be cut off. However, doing so will prevent the Sensor Shaft from being reused in Non-Flipped configurations.

Non-Flipped



Flipped

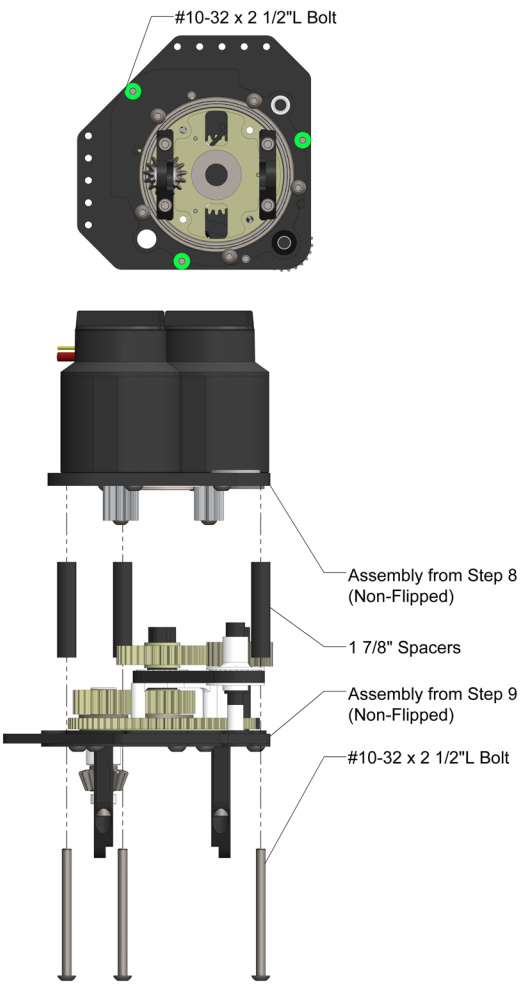


Step 10

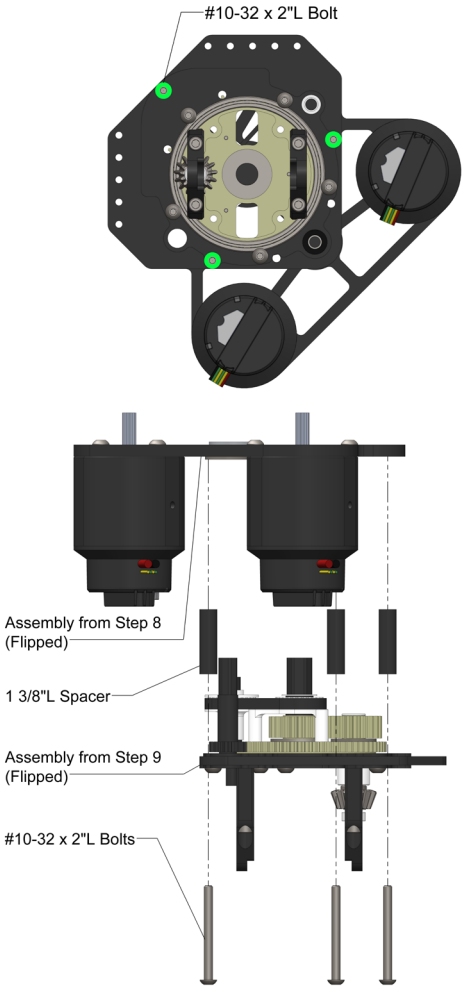
For the Non-Flipped configurations, use the three #10-32 x 2 1/2”L bolts and the three 1 7/8” spacers to assemble the bottom and top subassemblies. For the Flipped configurations, in place of the 2 1/2” bolts and 1 7/8” spacers, use the 2” bolts and 1 3/8” spacers.

For all configurations, the bolt locations are marked in green in the images below.

Non-Flipped



Flipped

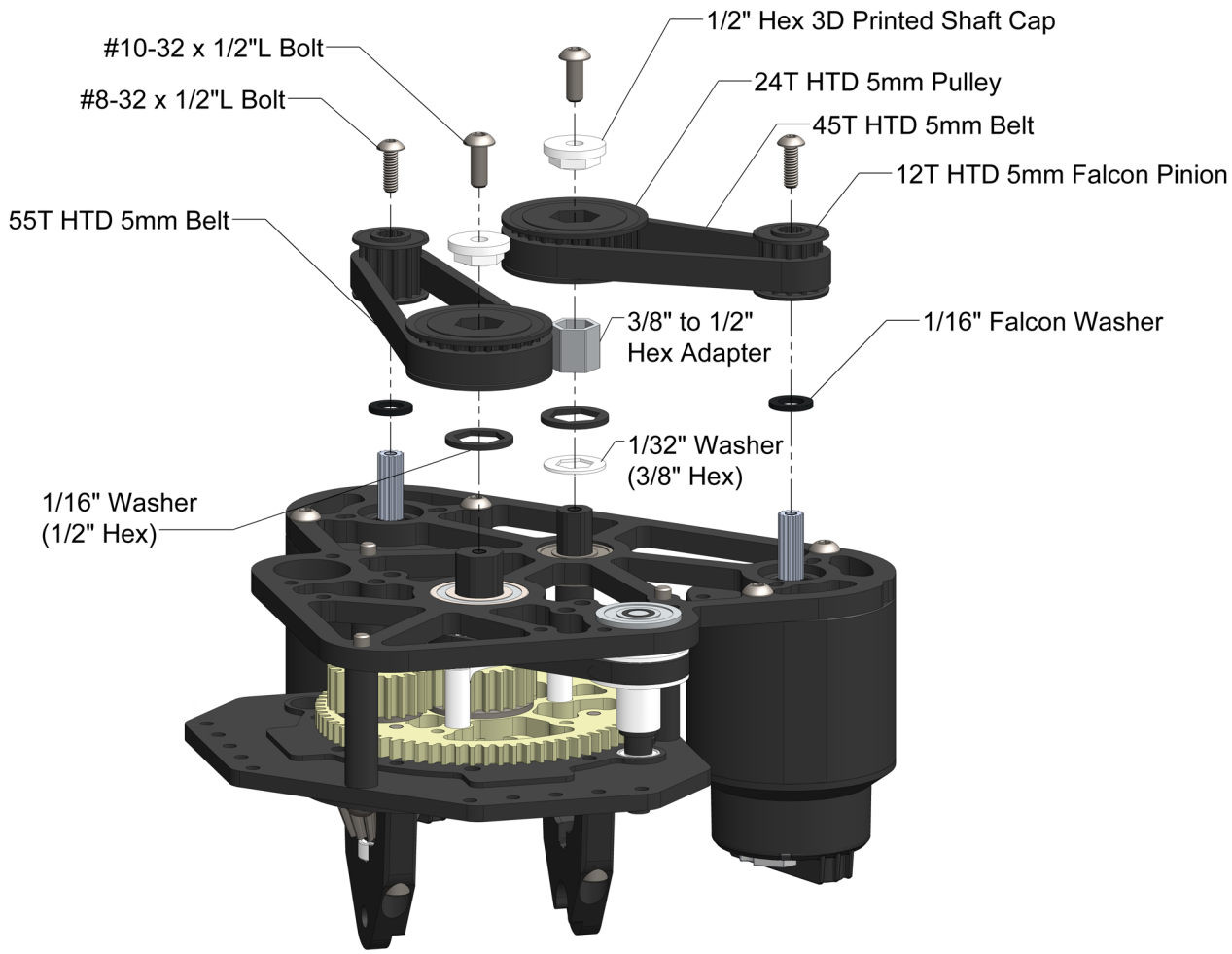


Step 11

This step is for the Flipped configurations only. Skip this step if you are assembling a Non-Flipped Module.

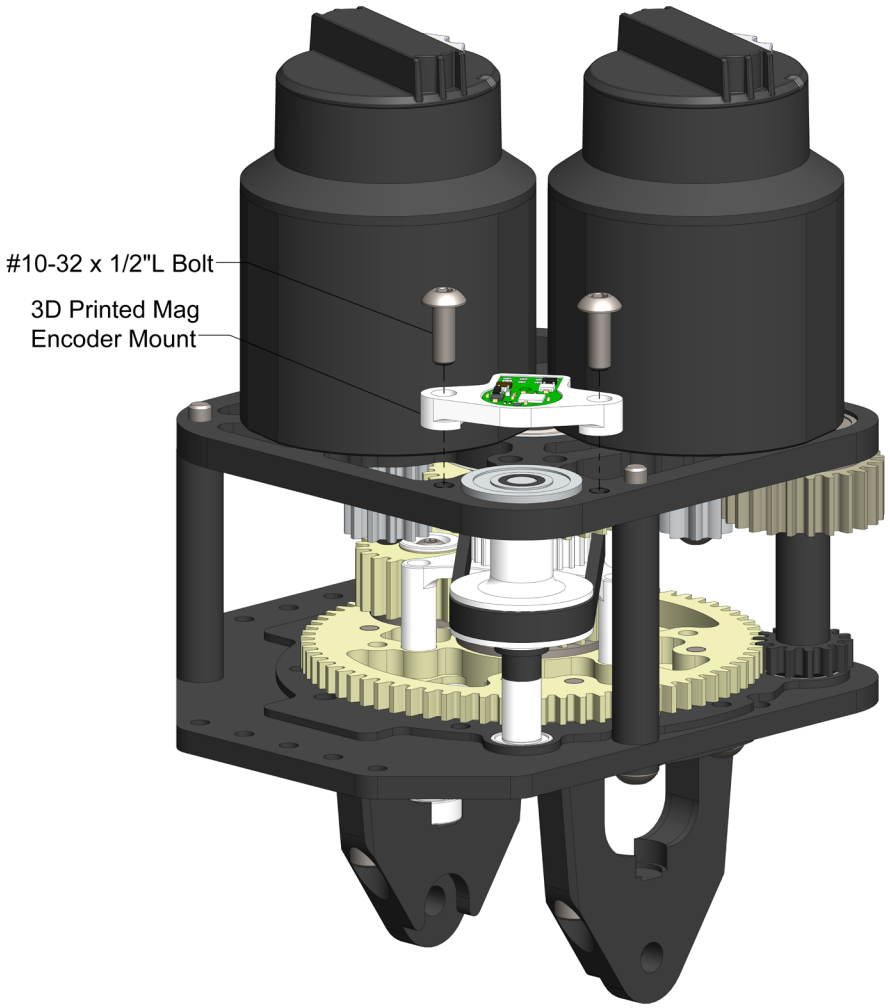
When installing the belts, the 55T HTD 5mm Belt goes with the motor farthest from the Sensor Shaft and the 45T HTD 5mm Belt goes with the motor closest to the Sensor Shaft.

Note: For more information regarding belt installation, see Sensor Installation - Possible Issues.



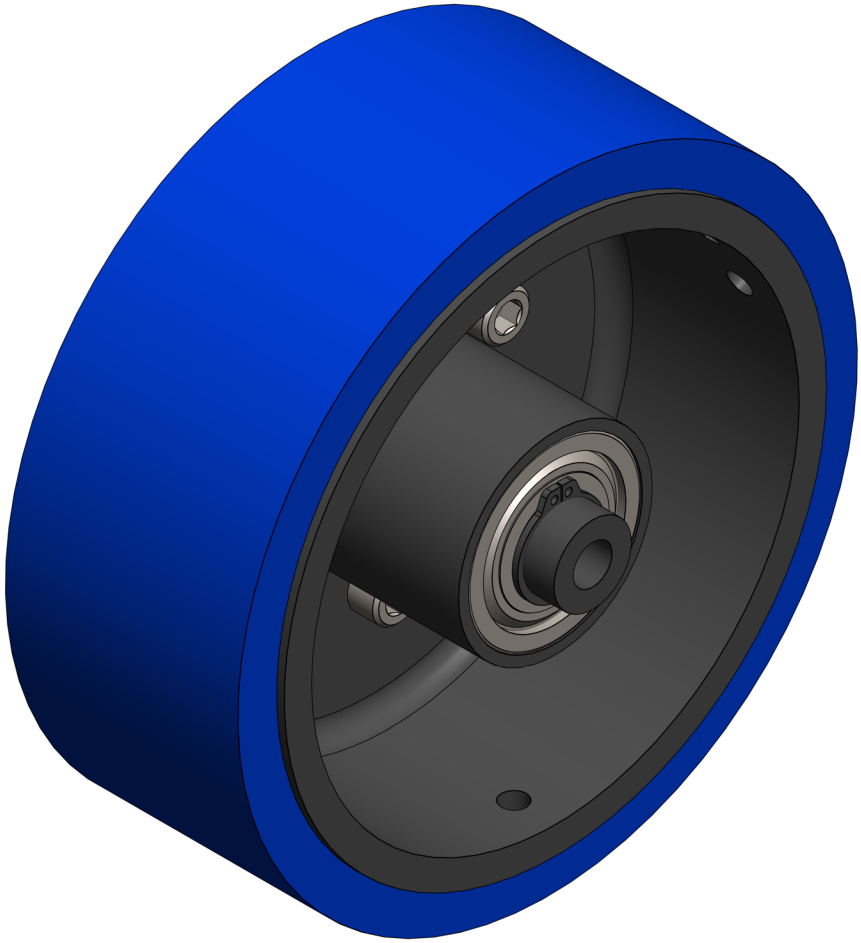
Step 12

Install the CTRE Mag Encoder Mount using two #10-32 x 1/2”L bolts. To install the Mag Encoder, remove the board from the case and fit it into the cutout on the 3D Printed Mag Mount. Use the mounting bolts from the Mag Encoder to attach the sensor. The CANcoder can be used as a drop in replacement.



Wheel Assembly and Installation Instructions

Wheel assembly and installation can be done at any point after step 6. These instructions are the same across all configurations.



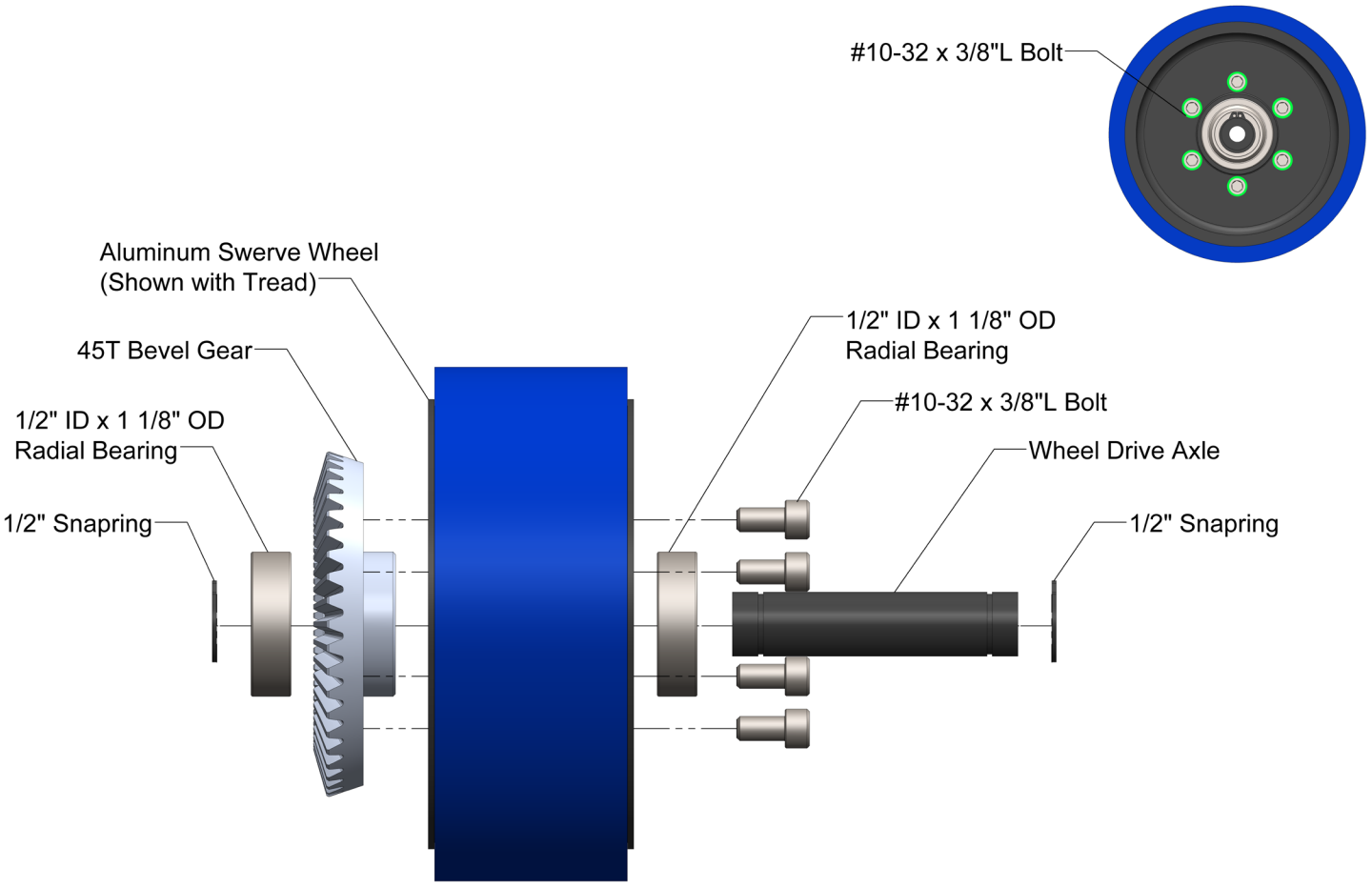
Wheel Assembly and Installation - Step 1

Insert the 45T Bevel Gear by either tapping it in with a dead blow hammer or using an arbor press.

Warning: Be sure to align the bolt holes in the Aluminum Swerve Wheel with the tapped holes in the 45T Bevel Gear.

The Wheel Drive Axle is symmetric. The orientation it is assembled in does not matter.

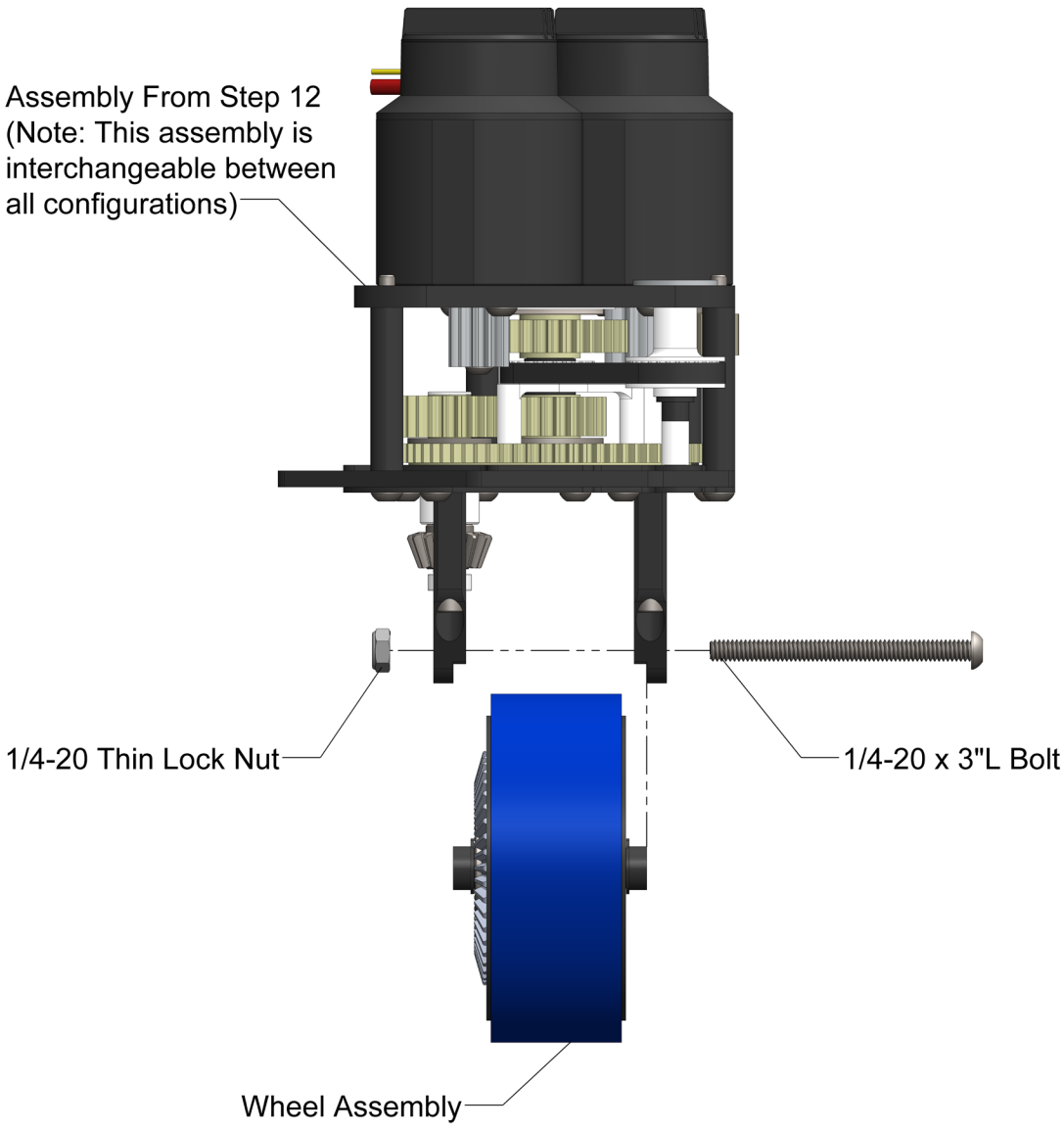
Note: The locations of the bolts are marked out in green in the image below.



Wheel Assembly and Installation - Step 2

When installing the Wheel Assembly, be sure the 45T Bevel Gear and 15T Bevel Gear are on the same side.

Note: It is easier to install the tread on the wheel before installing the wheel in the module.



Available Kits

Kit Number	Name
KIT-0002	WCP Swerve X (Tube Mount)
KIT-0003	WCP Swerve X (Tube Mount, Flipped)
KIT-0004	WCP Swerve X (Corner Mount)
KIT-0005	WCP Swerve X (Corner Mount, Flipped)
KIT-0006	6.54:1 Gear Ratio (Swerve X, Falcon)
KIT-0007	7.13:1 Gear Ratio (Swerve X, Falcon)
KIT-0008	7.85:1 Gear Ratio (Swerve X, Falcon)
KIT-0009	5.50:1 Pulley Ratio (Swerve X, Falcon)
KIT-0010	6.55:1 Pulley Ratio (Swerve X, Falcon)
KIT-0011	7.80:1 Pulley Ratio (Swerve X, Falcon)
KIT-0012	6.54:1 Gear Ratio (Swerve X, Cim)
KIT-0013	7.13:1 Gear Ratio (Swerve X, Cim)
KIT-0014	7.85:1 Gear Ratio (Swerve X, Cim)
KIT-0015	5.50:1 Pulley Ratio (Swerve X, Cim)
KIT-0016	6.55:1 Pulley Ratio (Swerve X, Cim)
KIT-0017	7.80:1 Pulley Ratio (Swerve X, Cim)

KIT-0002: WCP Swerve X (Tube Mount)

Part Number	Name	QTY
WCP-0360	WCP Swerve X (Tube Mount)	1
WCP-0364	WCP Swerve X (Hardware Kit)	1
WCP-0365	WCP Swerve X (4” Wheel, 1.125” Bearing Bore)	1
WCP-0366	WCP Swerve X (Wheel Fork, 2-Pack)	1
WCP-0367	WCP Swerve X (3D Printed Components)	1
WCP-0233	45T Steel Bevel Gear (1.5 Module, Round Bore)	1
WCP-0276	15T Steel Bevel Gear (1.5 Module, 3/8” Hex Bore)	1
WCP-0357	3” ID x 3.5” OD x .25” WD (X-Contact Bearing)	1

KIT-0003: WCP Swerve X (Tube Mount, Flipped)

Part Number	Name	QTY
WCP-0361	WCP Swerve X (Tube Mount, Flipped)	1
WCP-0364	WCP Swerve X (Hardware Kit)	1
WCP-0365	WCP Swerve X (4” Wheel, 1.125” Bearing Bore)	1
WCP-0366	WCP Swerve X (Wheel Fork, 2-Pack)	1
WCP-0367	WCP Swerve X (3D Printed Components)	1
WCP-0233	45T Steel Bevel Gear (1.5 Module, Round Bore)	1
WCP-0276	15T Steel Bevel Gear (1.5 Module, 3/8” Hex Bore)	1
WCP-0357	3” ID x 3.5” OD x .25” WD (X-Contact Bearing)	1

KIT-0004: WCP Swerve X (Corner Mount)

Part Number	Name	QTY
WCP-0362	WCP Swerve X (Corner Mount)	1
WCP-0364	WCP Swerve X (Hardware Kit)	1
WCP-0365	WCP Swerve X (4” Wheel, 1.125” Bearing Bore)	1
WCP-0366	WCP Swerve X (Wheel Fork, 2-Pack)	1
WCP-0367	WCP Swerve X (3D Printed Components)	1
WCP-0233	45T Steel Bevel Gear (1.5 Module, Round Bore)	1
WCP-0276	15T Steel Bevel Gear (1.5 Module, 3/8” Hex Bore)	1
WCP-0357	3” ID x 3.5” OD x .25” WD (X-Contact Bearing)	1

KIT-0005: WCP Swerve X (Corner Mount, Flipped)

Part Number	Name	QTY
WCP-0363	WCP Swerve X (Corner Mount, Flipped)	1
WCP-0364	WCP Swerve X (Hardware Kit)	1
WCP-0365	WCP Swerve X (4” Wheel, 1.125” Bearing Bore)	1
WCP-0366	WCP Swerve X (Wheel Fork, 2-Pack)	1
WCP-0367	WCP Swerve X (3D Printed Components)	1
WCP-0233	45T Steel Bevel Gear (1.5 Module, Round Bore)	1
WCP-0276	15T Steel Bevel Gear (1.5 Module, 3/8” Hex Bore)	1
WCP-0357	3” ID x 3.5” OD x .25” WD (X-Contact Bearing)	1

KIT-0006: 6.54:1 Gear Ratio (Swerve X, Falcon)

Part Number	Name	QTY
217-6919	12T Steel Spur Gear (20 DP, Falcon Motor)	1
217-2706	34T Aluminum Spur Gear (20 DP 1/2" Hex Bore)	1
217-5465	26T Aluminum Spur Gear (20 DP 1/2" Hex Bore)	1
217-2701	20T Aluminum Spur Gear (20 DP 3/8" Hex Bore)	1
217-6915	8T Steel Spur Gear (20 DP, 10T CD, Falcon Motor)	1
217-2703	24T Aluminum Spur Gear (20 DP 3/8" Hex Bore)	1

KIT-0007: 7.13:1 Gear Ratio (Swerve X, Falcon)

Part Number	Name	QTY
217-6918	11T Steel Spur Gear (20 DP, 12T CD, Falcon Motor)	1
217-2706	34T Aluminum Spur Gear (20 DP 1/2" Hex Bore)	1
217-5465	26T Aluminum Spur Gear (20 DP 1/2" Hex Bore)	1
217-2701	20T Aluminum Spur Gear (20 DP 3/8" Hex Bore)	1
217-6915	8T Steel Spur Gear (20 DP, 10T CD, Falcon Motor)	1
217-2703	24T Aluminum Spur Gear (20 DP 3/8" Hex Bore)	1

KIT-0008: 7.85:1 Gear Ratio (Swerve X, Falcon)

Part Number	Name	QTY
217-6917	10T Steel Spur Gear (20 DP, 12T CD, Falcon Motor)	1
217-2706	34T Aluminum Spur Gear (20 DP 1/2" Hex Bore)	1
217-5465	26T Aluminum Spur Gear (20 DP 1/2" Hex Bore)	1
217-2701	20T Aluminum Spur Gear (20 DP 3/8" Hex Bore)	1
217-6915	8T Steel Spur Gear (20 DP, 10T CD, Falcon Motor)	1
217-2703	24T Aluminum Spur Gear (20 DP 3/8" Hex Bore)	1

KIT-0009: 5.50:1 Pulley Ratio (Swerve X, Falcon)

Part Number	Name	QTY
WCP-0454	12T x 9mm Wide Aluminum Pulley (HTD 5mm, Falcon Motor)	2
217-3227	24T x 9mm Wide Aluminum Pulley (HTD 5mm, 1/2" Hex Bore)	2
WCP-0162	45T x 9mm Wide Timing Belt (HTD 5mm)	1
WCP-0164	55T x 9mm Wide Timing Belt (HTD 5mm)	1
WCP-0063	3/8" Hex to 1/2" Hex Adapter	1
217-2704	24T Aluminum Spur Gear (20 DP, 1/2" Hex Bore)	1
217-5452	22T Aluminum Spur Gear (20 DP, 3/8" Hex Bore)	1

KIT-0010: 6.55:1 Pulley Ratio (Swerve X, Falcon)

Part Number	Name	QTY
WCP-0454	12T x 9mm Wide Aluminum Pulley (HTD 5mm, Falcon Motor)	2
217-3227	24T x 9mm Wide Aluminum Pulley (HTD 5mm, 1/2" Hex Bore)	2
WCP-0162	45T x 9mm Wide Timing Belt (HTD 5mm)	1
WCP-0164	55T x 9mm Wide Timing Belt (HTD 5mm)	1
WCP-0063	3/8" Hex to 1/2" Hex Adapter	1
217-5462	22T Aluminum Spur Gear (20 DP, 1/2" Hex Bore)	1
217-2703	24T Aluminum Spur Gear (20 DP, 3/8" Hex Bore)	1

KIT-0011: 7.80:1 Pulley Ratio (Swerve X, Falcon)

Part Number	Name	QTY
WCP-0454	12T x 9mm Wide Aluminum Pulley (HTD 5mm, Falcon Motor)	2
217-3227	24T x 9mm Wide Aluminum Pulley (HTD 5mm, 1/2" Hex Bore)	2
WCP-0162	45T x 9mm Wide Timing Belt (HTD 5mm)	1
WCP-0164	55T x 9mm Wide Timing Belt (HTD 5mm)	1
WCP-0063	3/8" Hex to 1/2" Hex Adapter	1
217-2702	20T Aluminum Spur Gear (20 DP, 1/2" Hex Bore)	1
217-5453	26T Aluminum Spur Gear (20 DP, 3/8" Hex Bore)	1

KIT-0012: 6.54:1 Gear Ratio (Swerve X, Cim)

Part Number	Name	QTY
217-3099	12T Steel Spur Gear (20 DP, Cim Motor)	1
217-2706	34T Aluminum Spur Gear (20 DP 1/2" Hex Bore)	1
217-5465	26T Aluminum Spur Gear (20 DP 1/2" Hex Bore)	1
217-2701	20T Aluminum Spur Gear (20 DP 3/8" Hex Bore)	1
217-6335	8T Steel Spur Gear (20 DP, 10T CD, Cim Motor)	1
217-2703	24T Aluminum Spur Gear (20 DP 3/8" Hex Bore)	1

KIT-0013: 7.13:1 Gear Ratio (Swerve X, Cim)

Part Number	Name	QTY
217-3107	11T Steel Spur Gear (20 DP, 12T CD, Cim Motor)	1
217-2706	34T Aluminum Spur Gear (20 DP 1/2" Hex Bore)	1
217-5465	26T Aluminum Spur Gear (20 DP 1/2" Hex Bore)	1
217-2701	20T Aluminum Spur Gear (20 DP 3/8" Hex Bore)	1
217-6335	8T Steel Spur Gear (20 DP, 10T CD, Cim Motor)	1
217-2703	24T Aluminum Spur Gear (20 DP 3/8" Hex Bore)	1

KIT-0014: 7.85:1 Gear Ratio (Swerve X, Cim)

Part Number	Name	QTY
217-6334	10T Steel Spur Gear (20 DP, 12T CD, Cim Motor)	1
217-2706	34T Aluminum Spur Gear (20 DP 1/2" Hex Bore)	1
217-5465	26T Aluminum Spur Gear (20 DP 1/2" Hex Bore)	1
217-2701	20T Aluminum Spur Gear (20 DP 3/8" Hex Bore)	1
217-6335	8T Steel Spur Gear (20 DP, 10T CD, Cim Motor)	1
217-2703	24T Aluminum Spur Gear (20 DP 3/8" Hex Bore)	1

KIT-0015: 5.50:1 Pulley Ratio (Swerve X, Cim)

Part Number	Name	QTY
WCP-0076	12T x 9mm Wide Aluminum Pulley (HTD 5mm, Cim Motor)	2
217-3227	24T x 9mm Wide Aluminum Pulley (HTD 5mm, 1/2" Hex Bore)	2
WCP-0162	45T x 9mm Wide Timing Belt (HTD 5mm)	1
WCP-0164	55T x 9mm Wide Timing Belt (HTD 5mm)	1
WCP-0063	3/8" Hex to 1/2" Hex Adapter	1
217-2704	24T Aluminum Spur Gear (20 DP, 1/2" Hex Bore)	1
217-5452	22T Aluminum Spur Gear (20 DP, 3/8" Hex Bore)	1

KIT-0016: 6.55:1 Pulley Ratio (Swerve X, Cim)

Part Number	Name	QTY
WCP-0076	12T x 9mm Wide Aluminum Pulley (HTD 5mm, Cim Motor)	2
217-3227	24T x 9mm Wide Aluminum Pulley (HTD 5mm, 1/2" Hex Bore)	2
WCP-0162	45T x 9mm Wide Timing Belt (HTD 5mm)	1
WCP-0164	55T x 9mm Wide Timing Belt (HTD 5mm)	1
WCP-0063	3/8" Hex to 1/2" Hex Adapter	1
217-5462	22T Aluminum Spur Gear (20 DP, 1/2" Hex Bore)	1
217-2703	24T Aluminum Spur Gear (20 DP, 3/8" Hex Bore)	1

KIT-0017: 7.80:1 Pulley Ratio (Swerve X, Cim)

Part Number	Name	QTY
WCP-0076	12T x 9mm Wide Aluminum Pulley (HTD 5mm, Cim Motor)	2
217-3227	24T x 9mm Wide Aluminum Pulley (HTD 5mm, 1/2" Hex Bore)	2
WCP-0162	45T x 9mm Wide Timing Belt (HTD 5mm)	1
WCP-0164	55T x 9mm Wide Timing Belt (HTD 5mm)	1
WCP-0063	3/8" Hex to 1/2" Hex Adapter	1
217-2702	20T Aluminum Spur Gear (20 DP, 1/2" Hex Bore)	1
217-5453	26T Aluminum Spur Gear (20 DP, 3/8" Hex Bore)	1

WCP-0360: WCP Swerve X (Tube Mount) Base Kit

Part Number	Name	QTY
WCP-0360-002	Swerve X Top Plate (Non-Flipped)	1
WCP-0360-001	Swerve X Bottom Plate (Tube Mount)	1
WCP-0261	#10-32 x 2.5” L BHCS (Steel, Black Oxide)	3
WCP-0387	Aluminum Spacers (.196”ID x 3/8” OD x 1 7/8”WD)	3

WCP-0361: WCP Swerve X (Tube Mount, Flipped) Base Kit

Part Number	Name	QTY
WCP-0361-001	Swerve X Top Plate (Flipped)	1
WCP-0360-001	Swerve X Bottom Plate (Tube Mount)	1
WCP-0259	#10-32 x 2” L BHCS (Steel, Black Oxide)	3
WCP-0253	#10-32 x 1/2” L BHCS (Steel, Black Oxide)	2
WCP-0388	Aluminum Spacers (.196”ID x 3/8” OD x 1 3/8”WD)	3
217-3257	1/16" Acetal Spacer - 1/2" Hex	2

WCP-0362: WCP Swerve X (Corner Mount) Base Kit

Part Number	Name	QTY
WCP-0360-002	Swerve X Top Plate (Non-Flipped)	1
WCP-0362-001	Swerve X Bottom Plate (Corner Mount)	1
WCP-0261	#10-32 x 2.5” L BHCS (Steel, Black Oxide)	3
WCP-0387	Aluminum Spacers (.196”ID x 3/8” OD x 1 7/8”WD)	3

WCP-0363: WCP Swerve X (Corner Mount, Flipped) Base Kit

Part Number	Name	QTY
WCP-0361-001	Swerve X Top Plate (Flipped)	1
WCP-0362-001	Swerve X Bottom Plate (Corner Mount)	1
WCP-0259	#10-32 x 2” L BHCS (Steel, Black Oxide)	3
WCP-0253	#10-32 x 1/2” L BHCS (Steel, Black Oxide)	2
WCP-0388	Aluminum Spacers (.196”ID x 3/8” OD x 1 3/8”WD)	3
217-3257	1/16" Acetal Spacer - 1/2" Hex	2

WCP-0364: WCP Swerve X (Hardware Kit)

Part Number	Name	QTY
WCP-0364-001	72T Rotation Gear	1
217-3489	0.250" ID x 0.500" OD x 0.188" WD (Radial Bearing)	2
WCP-0041	0.250" ID x 0.625" OD x 0.196" WD (Radial Bearing)	1
217-3109	0.500" ID x 1.125" OD x 0.313" WD (Radial Bearing)	2
217-5829	3/8" ThunderHex x 0.875" OD x 0.280" WD (Flanged Bearing)	2
217-2733	0.375" ID x 0.875" OD x 0.280" WD (Flanged Bearing)	1
217-2731	0.500" ID x 1.125" OD x 0.313" WD (Flanged Bearing)	1
217-4006	1/2" ThunderHex x 1.125" OD x 0.313" WD (Flanged Bearing)	1
WCP-0364-004	Sensor Shaft with Magnet	1
WCP-0364-003	Rotation Shaft	1
WCP-0364-002	1st Stage Drive Shaft	1
WCP-0364-005	2nd Stage Drive Shaft	1
WCP-0364-006	Drive Axle	1
WCP-0229	1/2" Snap Ring	2
WCP-0228	3/8" Snap Ring	1
WCP-0251	#10-32 x 1/4"L BHCS (Steel, Black Oxide)	5
WCP-0253	#10-32 x 1/2"L BHCS (Steel, Black Oxide)	2
WCP-0265	#10-32 x 3/8"L SHCS (Steel, Black Oxide)	6
WCP-0250	#8-32 x 1/2"L BHCS (Steel, Black Oxide)	1
~	#10-32 x 1.75"L SHCS (Steel, Black Oxide)	4
~	#4-40 x 3/4"L SHCS (Steel, Black Oxide)	3
~	1/4"-20 x 3"L BHCS (Steel, Black Oxide)	1
~	1/4"-20 Nut	1
~	64T Encoder Belt	1

WCP-0367: WCP Swerve X (3D Printed Components)

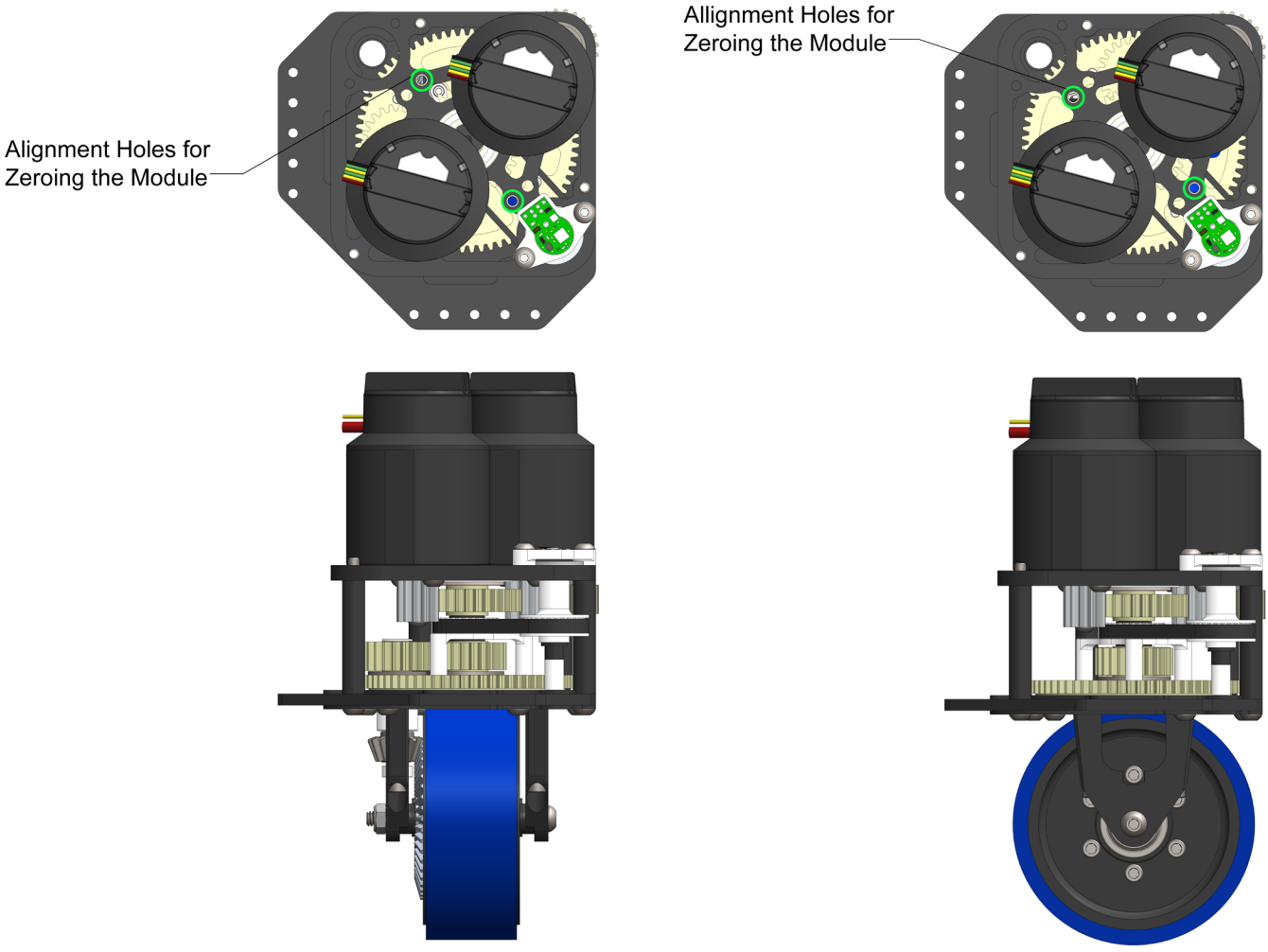
Part Number	Name	QTY
WCP-0367-001	.02" Hex Spacer	1
WCP-0367-002	Pulley Plate	1
WCP-0367-003	Shaft Pulley	1
WCP-0367-004	Sensor Shaft Spacer	1
WCP-0367-012	Sensor Mount	1
WCP-0367-006	Bevel Gear Spacer	1
WCP-0367-007	Flipped Shaft Pulley Top Cap	2
WCP-0367-008	Fliped Shaft Hex Washer	1
WCP-0367-009	Bearing Washer	1
WCP-0367-010	Drive Shaft Top Cap	1

Zeroing the Module

Depending on the location that the module is mounted, one of two sets of tapped holes in the 72T Main Rotation Gear will align with a set of holes in the Swerve X Top Plate. These sets of holes align the wheel to the module so that a zero can be set in code.

To align the wheel, determine the correct set of hole to use for the desired direction. Manually align the wheel and then use a #10-32 x 2.25”L bolt in each of the two holes for the final alignment. Lightly tighten the bolt while gently turning the module to get the perfect alignment. Once the position is calibrated, remove the bolts.

Note: For the Flipped configurations all steps are the same, except for the bolts used. Substitute #10-32 x 1.75”L bolts for the 2.25”L bolts.



FAQ

Q: What tread is recommended?
A: Any 1.5” Tread will work, the recommended options are the roughtop or wedgetop sold by WCP or McMaster.

Q: Can I use other motors besides the Falcon 500?
A: Yes you can.

Revision Table

Revision Date	Revision #	Description
11/17/2021	1.0	First revision created.