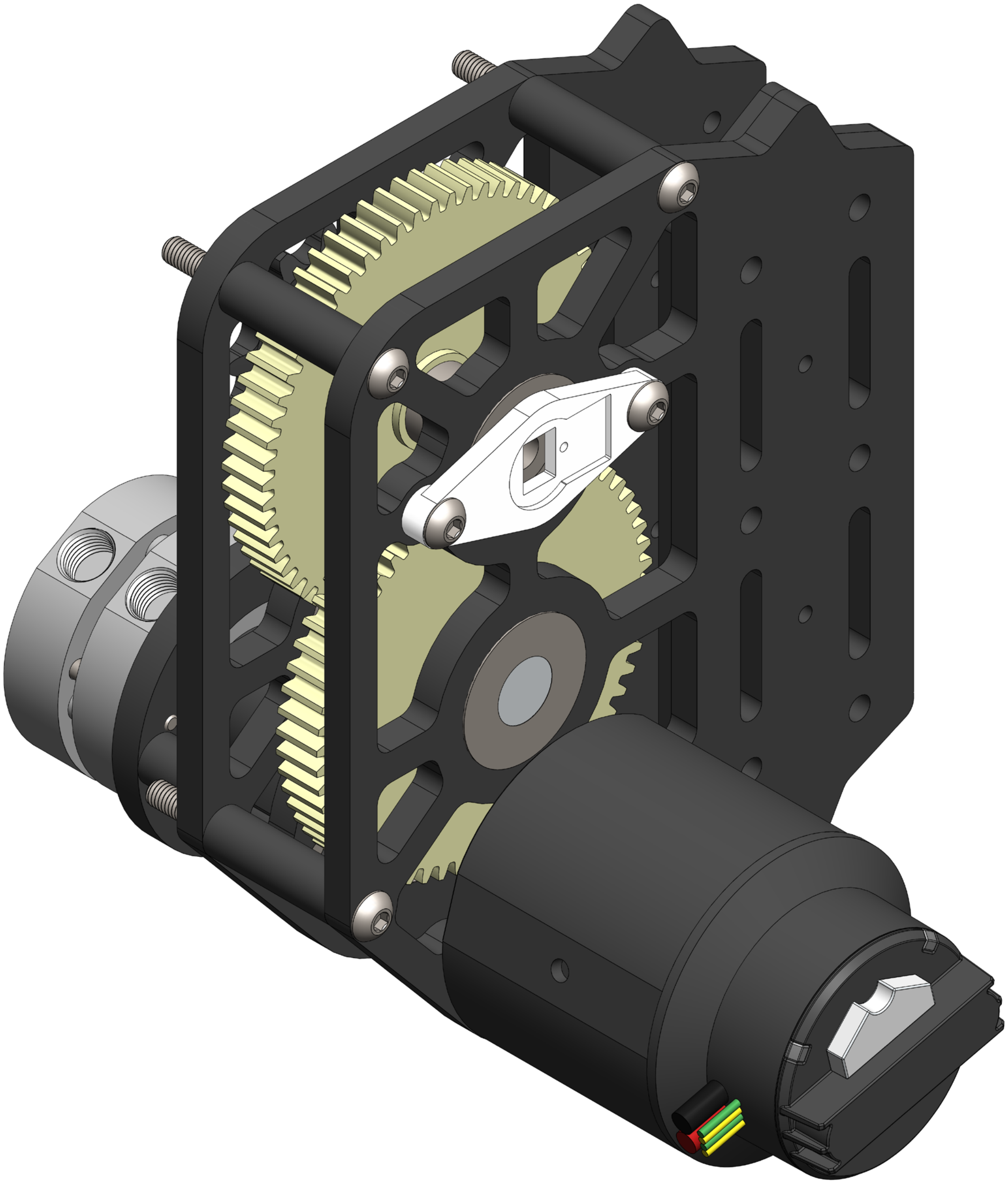
WCP Rotation SS Gearbox (2 Stages)- User Guide
(Rev 1)



WCP Rotation SS Gearbox (2 Stages)- User Guide

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Recommended Tools

Picture	Name
	Allen Wrench Set
	1/2” Snapring Pliers

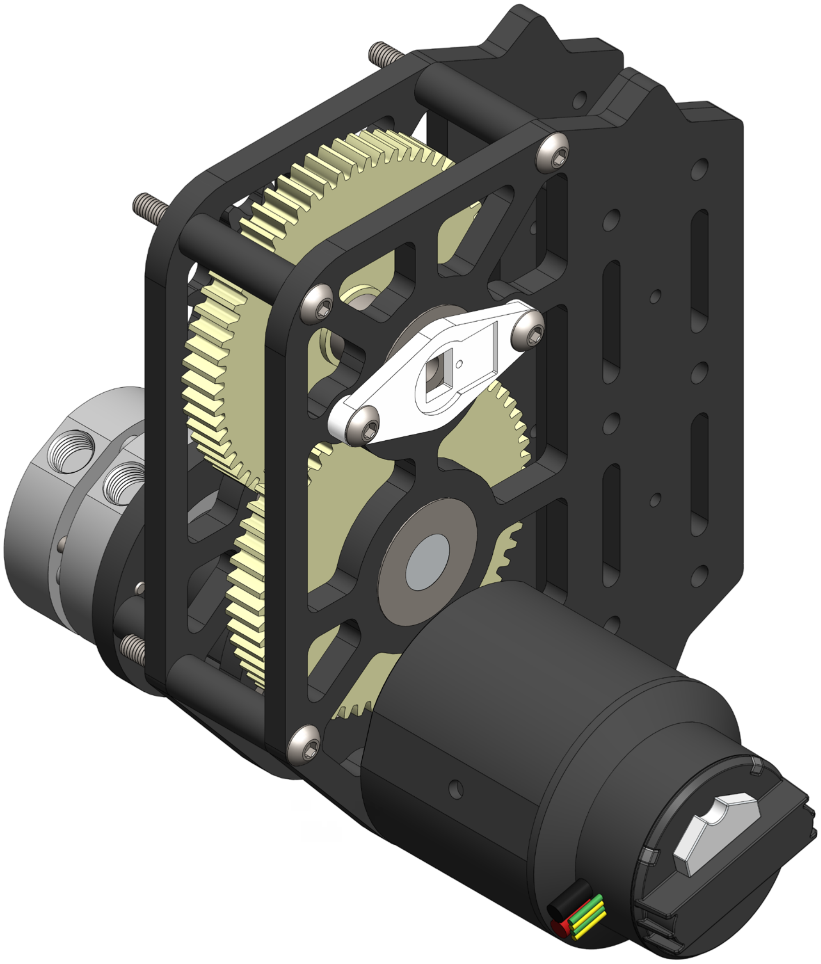
What is the WCP Rotation SS Gearbox (2 Stages)?

This gearbox is designed to assist teams in creating rotational arm joints. This was modeled after the 973/1323 arm gearbox from 2011. 1323 used a similar gearbox in 2019 and realized how much work went into creating rotational/arm gearboxes.

The main features of this gearbox are:
- Native Falcon support
- Compact, 2 stages
- Ability to add a 3rd stage via VersaPlanetary (Can be 1 or more stages)
- Ability to add a 4th stage via Chain Reduction
- Friction Brake Integration
- Clamp to a 1x2” piece of tubing or VersaFrame
- CAM Tensioning
- Built in external Encoder Mount

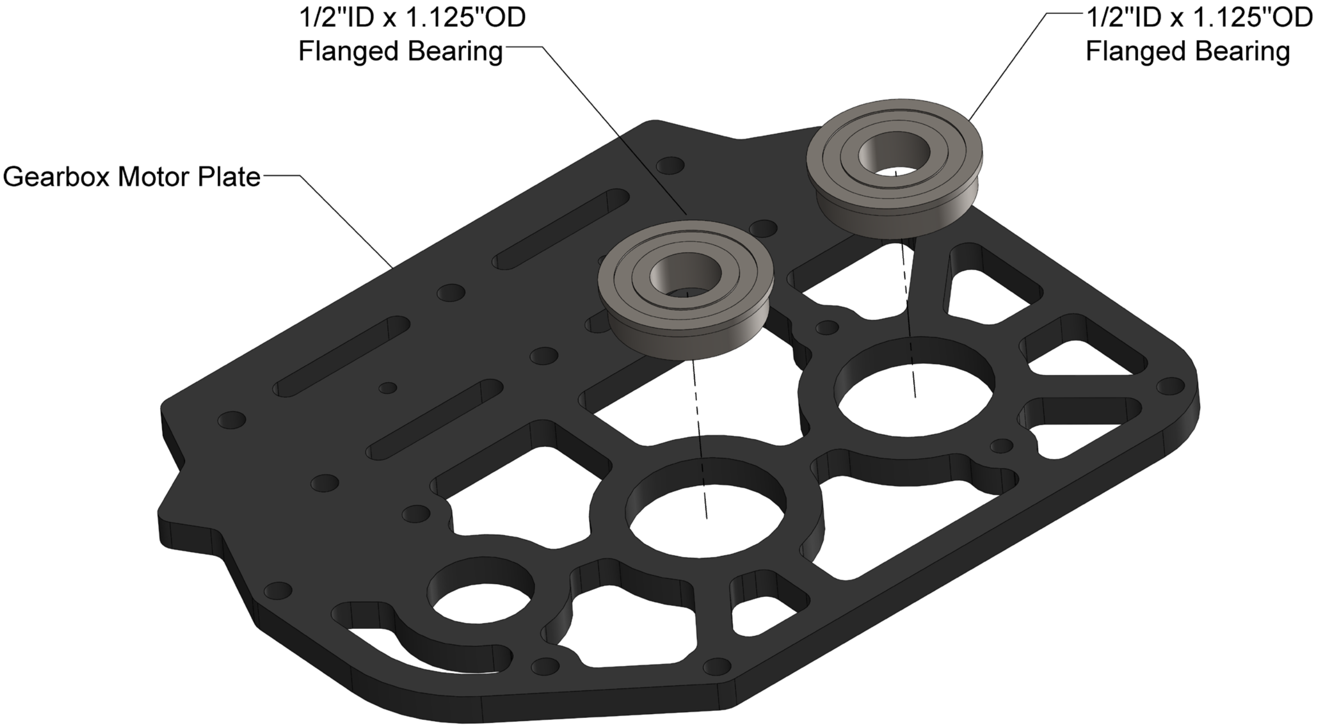
An application of creating an arm with this gearbox is shown at the end of this manual.

Assembly Instructions



Step 1

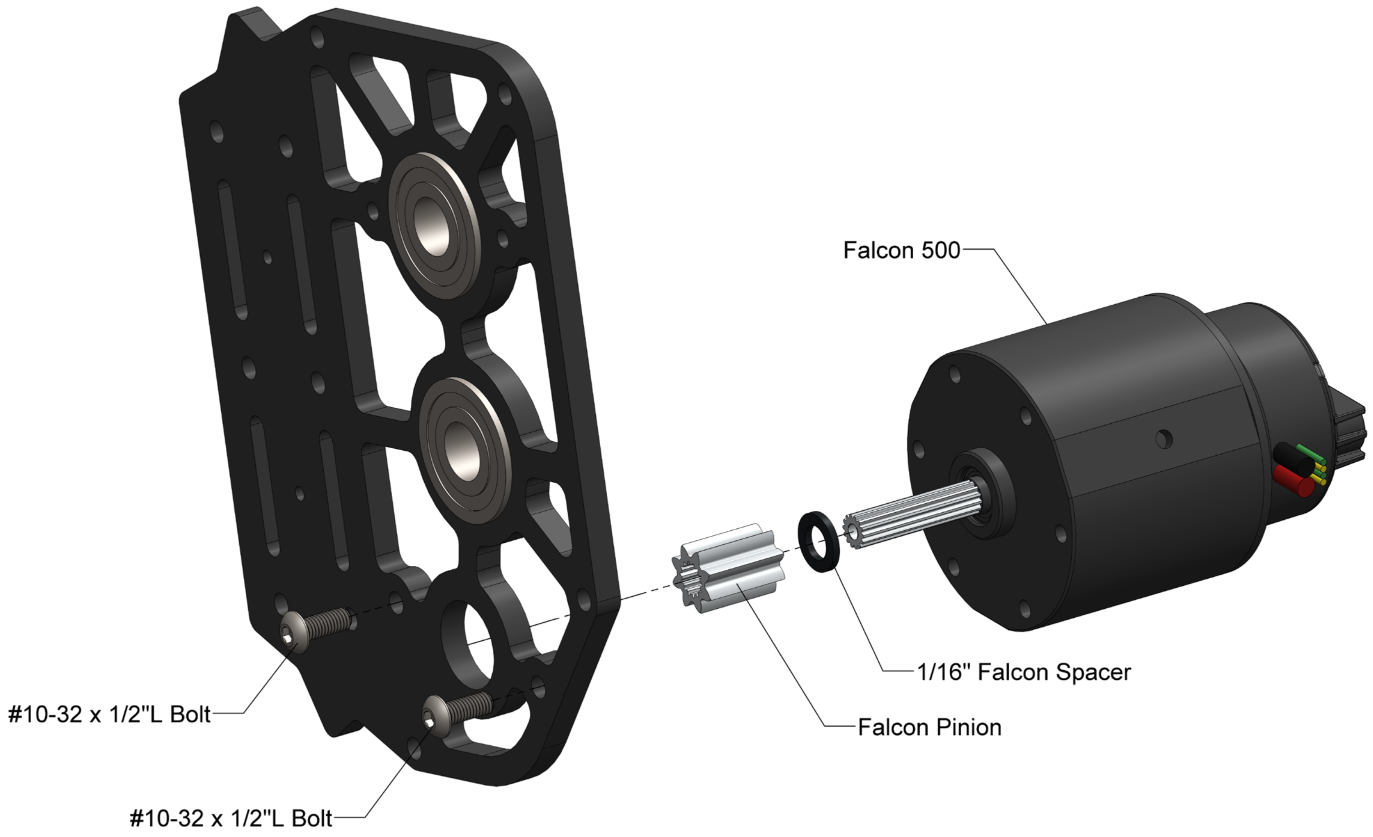
Press both bearings into the moto plate. This should be a light press it. The bearing flages should both be on the same side.


1/2"ID x 1.125"OD
Flanged Bearing
1/2"ID x 1.125"OD
Flanged Bearing
Gearbox Motor Plate

Step 2

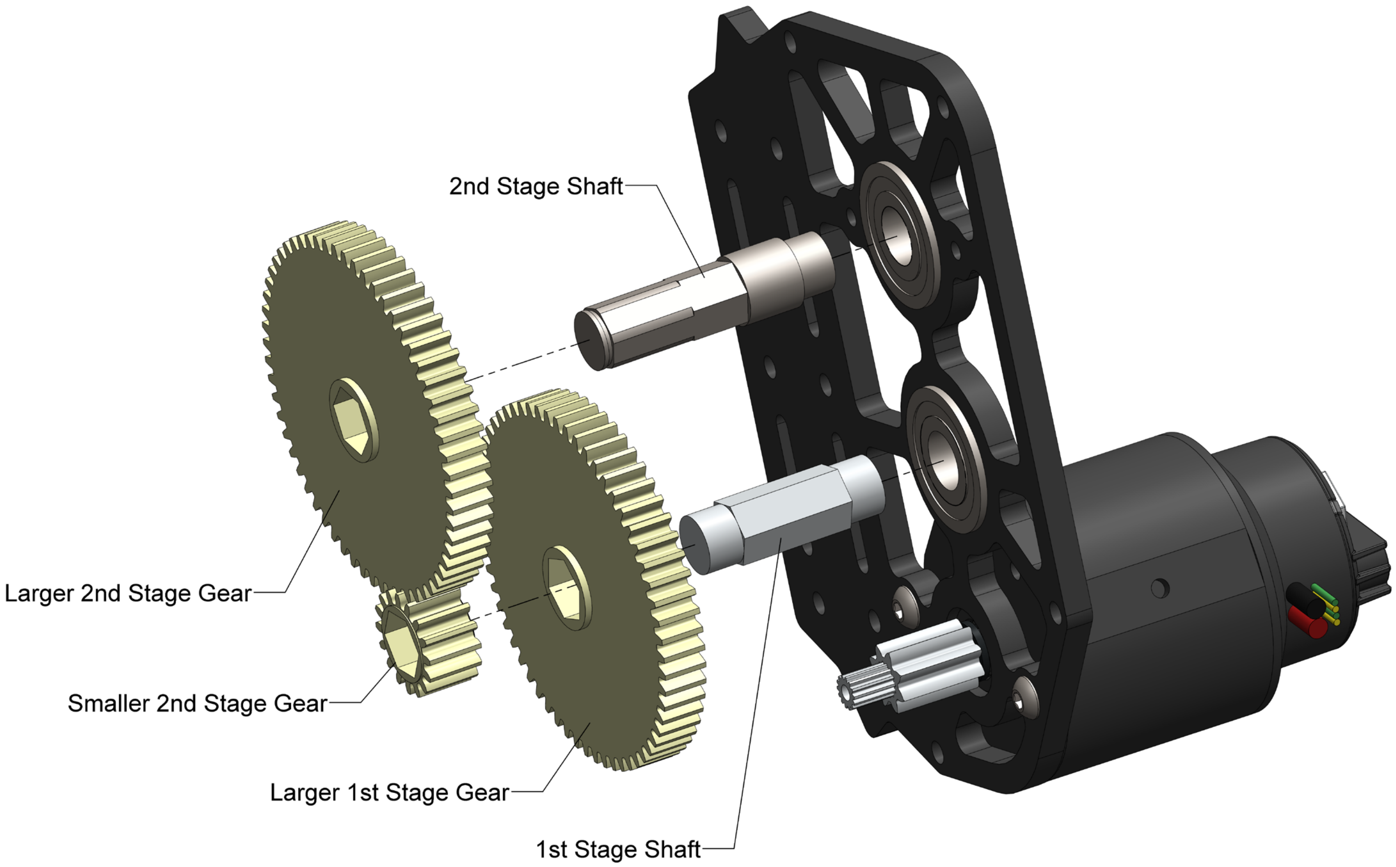
Install the Falcon motor with 2 #10-32 x 1/2”L bolts.

Install the desired pinion and 1/16” Falcon Spacer.


Falcon 500
1/16" Falcon Spacer
Falcon Pinion
#10-32 x 1/2"L Bolt
#10-32 x 1/2"L Bolt

Step 3

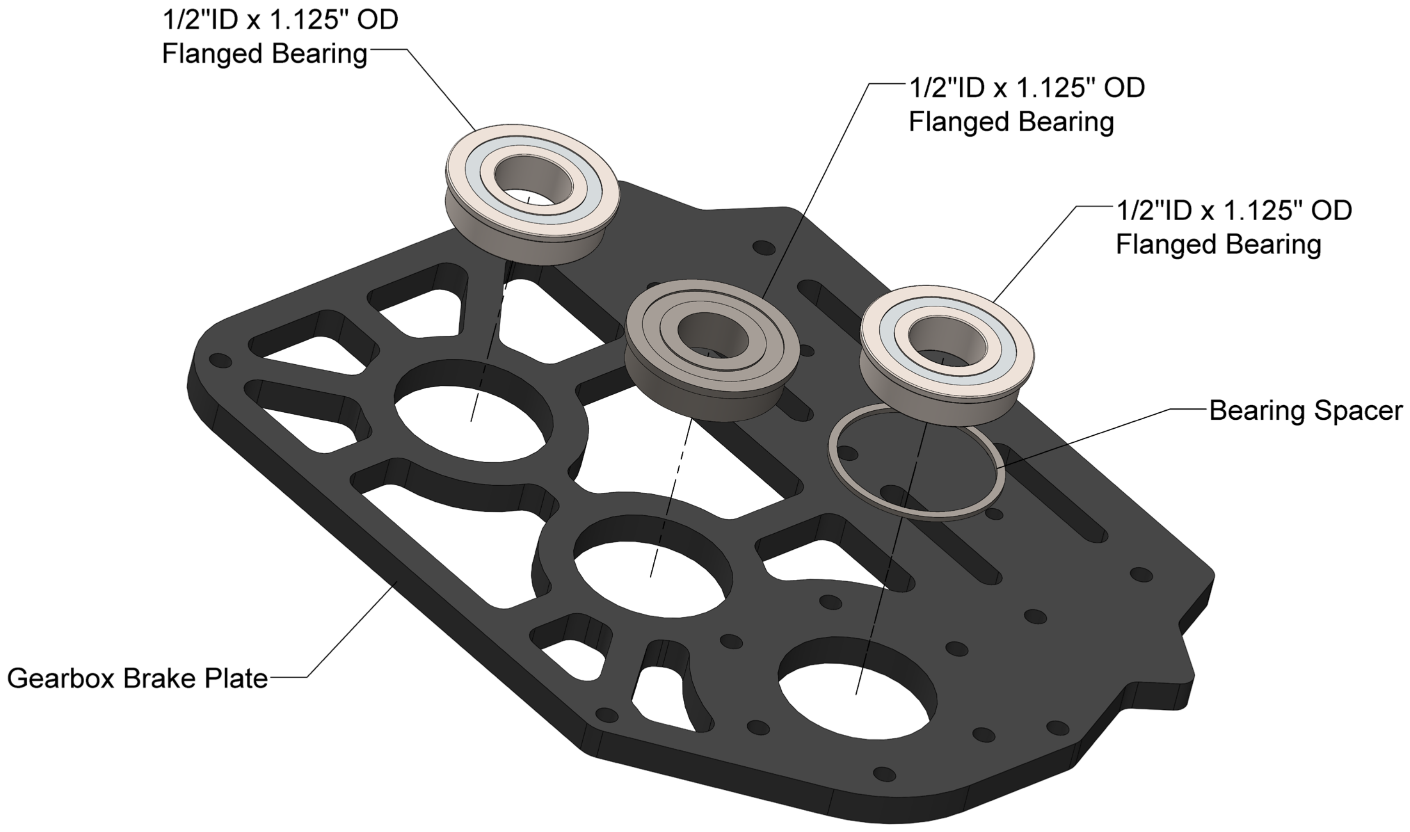
Slide all desired gears and shaft into place.


2nd Stage Shaft
Larger 2nd Stage Gear
Smaller 2nd Stage Gear
Larger 1st Stage Gear
1st Stage Shaft

Step 4

Press both bearings into the moto plate. This should be a light press it. The bearing flages should both be on the same side.

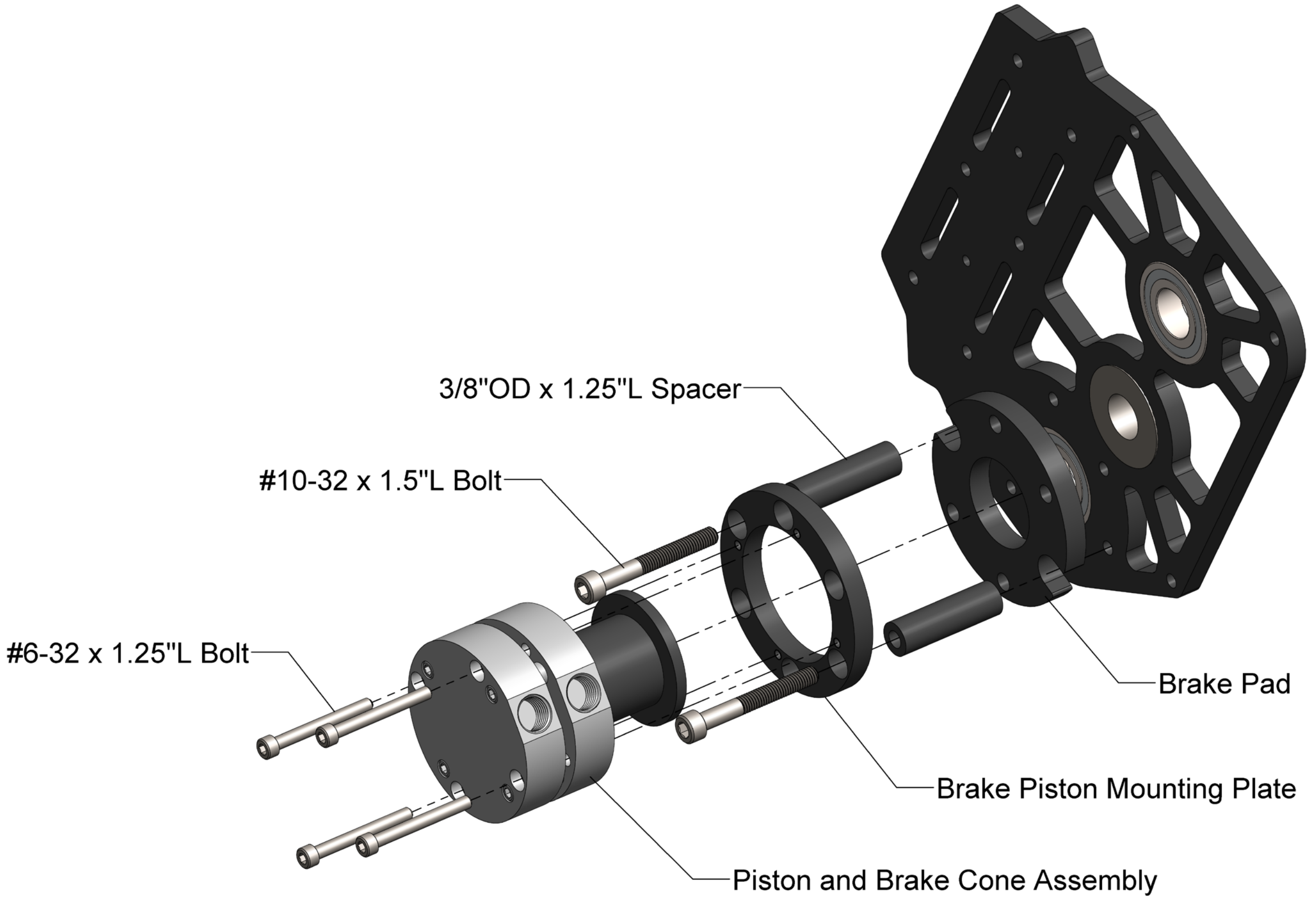
The 1/2” bearing that alligns with the brake requires a spacer to be intalled between the plate and flange.


1/2"ID x 1.125" OD
Flanged Bearing
1/2"ID x 1.125" OD
Flanged Bearing
1/2"ID x 1.125" OD
Flanged Bearing
Bearing Spacer
Gearbox Brake Plate

Step 5

Note: This step can be ommitted if the brake was not purchased.

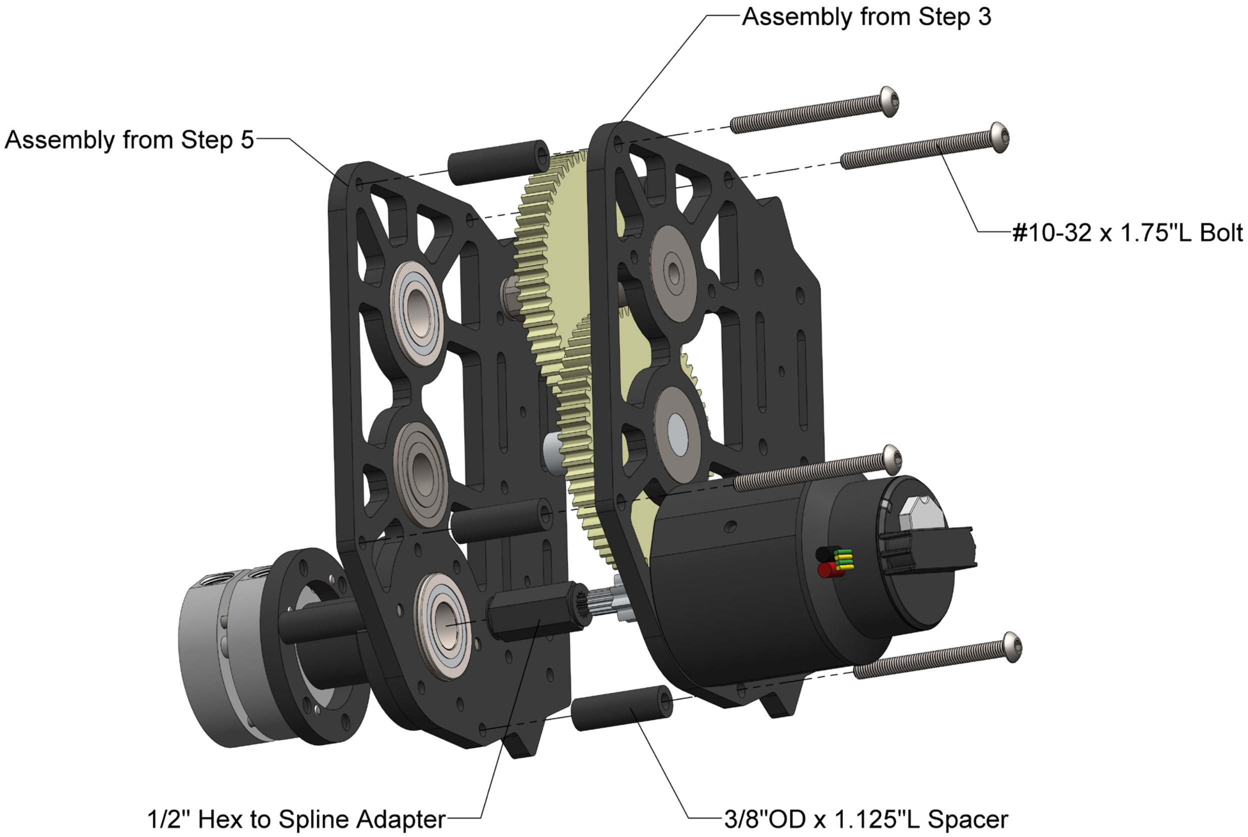
The brake must be assembled in place. For more detailed brake assembly steps, refer the the WCP Friction Brake Manual.


3/8"OD x 1.25"L Spacer
#10-32 x 1.5"L Bolt
#6-32 x 1.25"L Bolt
Brake Pad
Brake Piston Mounting Plate
Piston and Brake Cone Assembly

Step 6

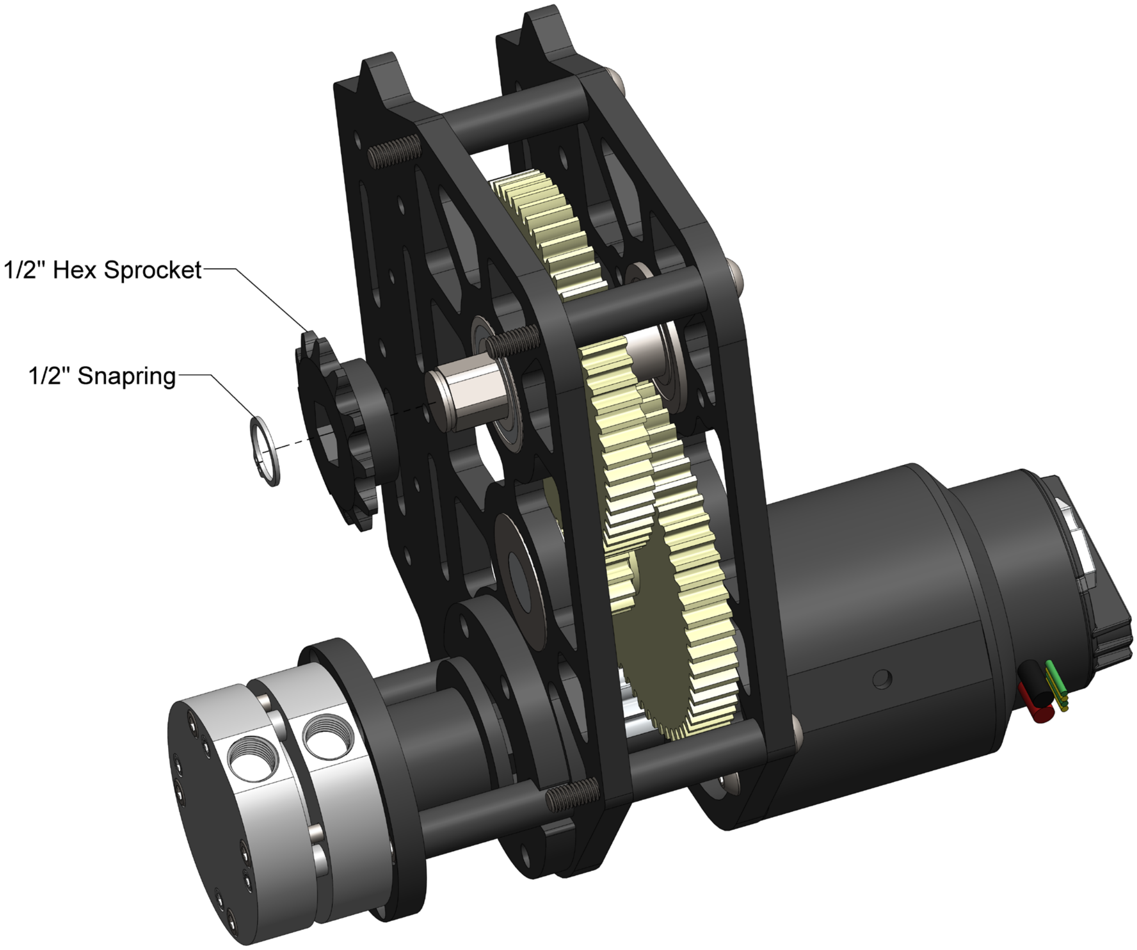
Attach the two halves of the gearbox using 4 #10-32 x 1.75"L bolts and 4 1.125"L spacers.

Note: If the brake was not installed in Step 5, the 1/2" Hex to Spline Adapet can be ommitted.


Assembly from Step 3
Assembly from Step 5
#10-32 x 1.75"L Bolt
1/2" Hex to Spline Adapter
3/8"OD x 1.125"L Spacer

Step 7

Attached desired output sprocket and retain with 1/2” snapring.

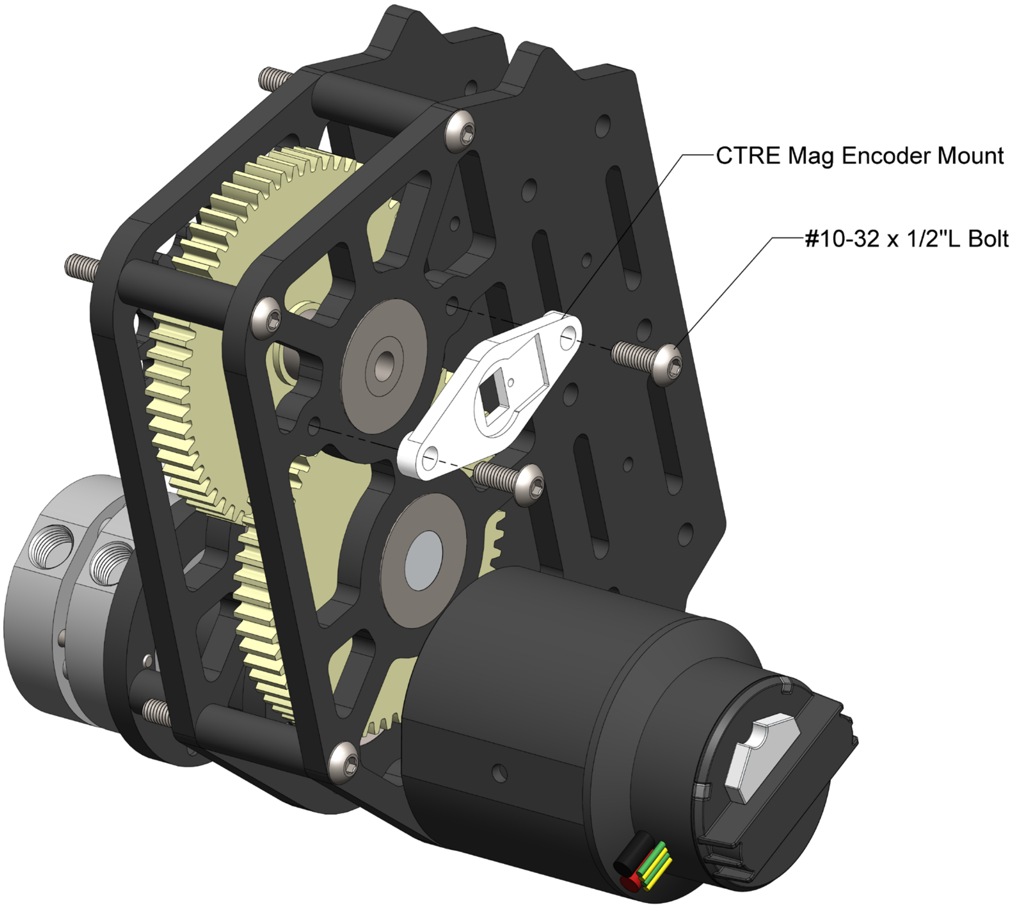

1/2" Hex Sprocket
1/2" Snapring

Step 8

Use 2 #10-32 x 1/2”L bolts to attached the Mag Encoder mount.

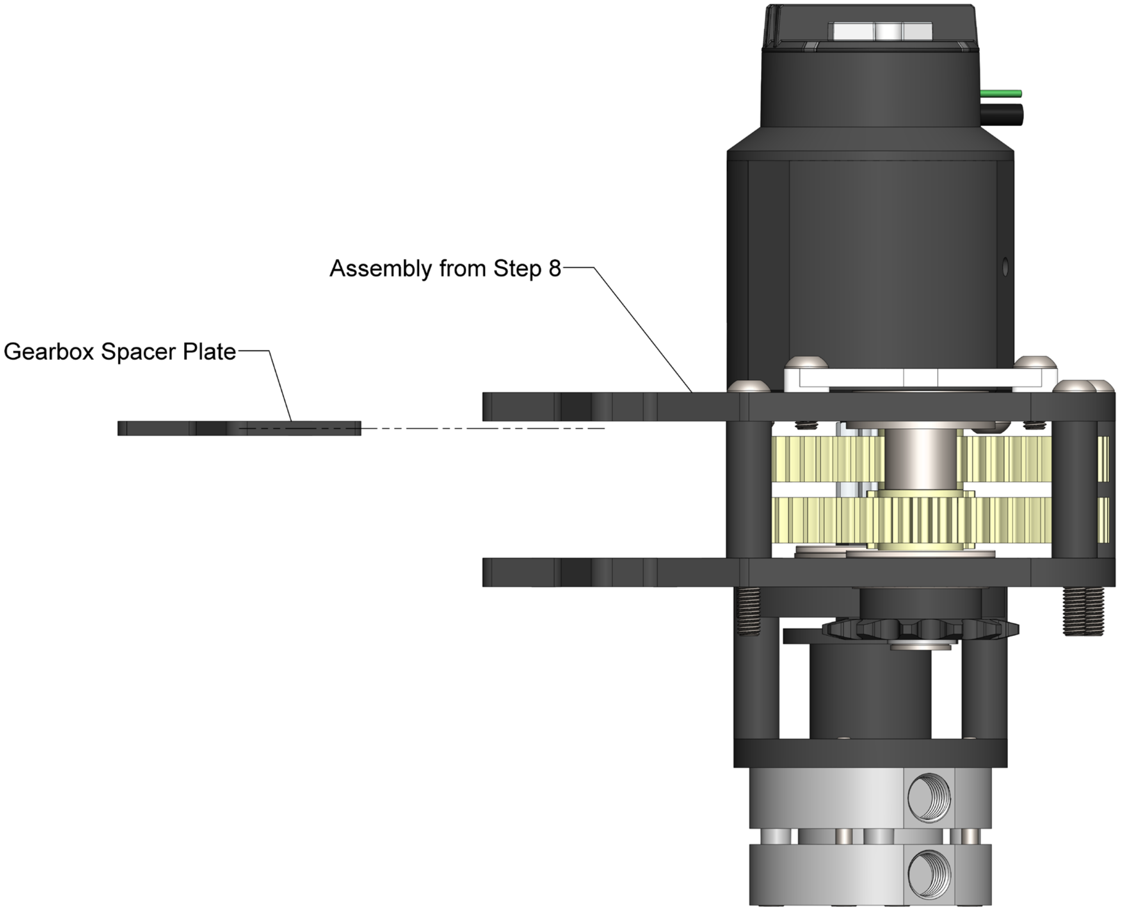
Note: The CTRE Mag Encoder Mount is not included and may be printed. Teams may choose to design their own mount or use the one in the CAD model. Magnet will come pre-installed in the shaft.

Warning: DO NOT ever tighten bolts and crush 3D printed mount.

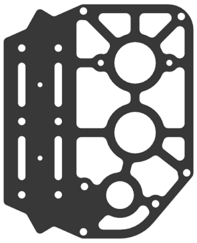
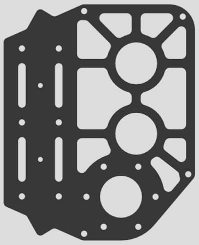
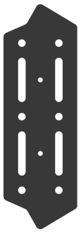
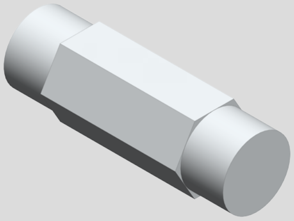
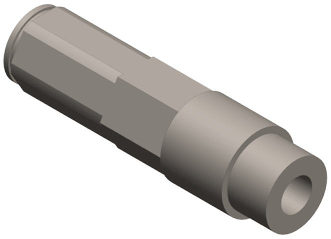


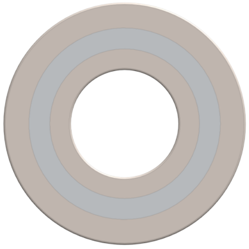
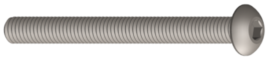
Step 9

The gearbox spacer is required for the proper spacing to mount to a 1”x2” tube. Allign the spacer plate with the gearbox plate and use the mounting holes.

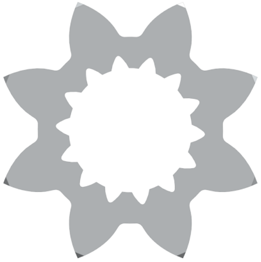
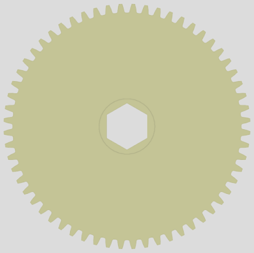
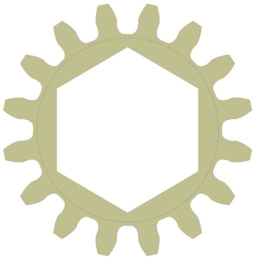
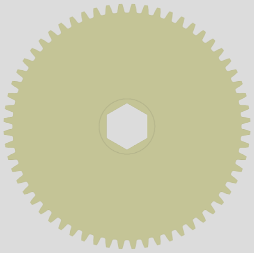
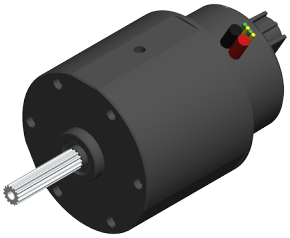

Assembly from Step 8
Gearbox Spacer Plate

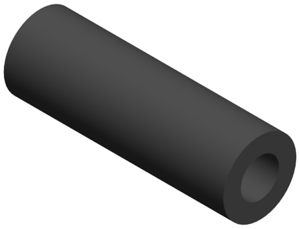
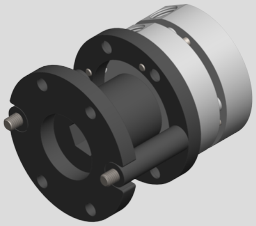
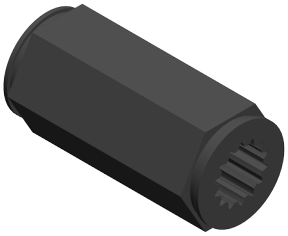
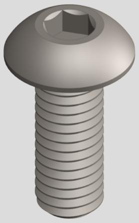
Kit Contents

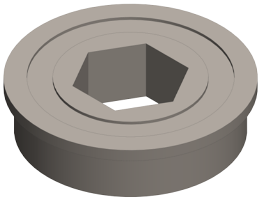
Picture	Name	QTY	Kit
	Gearbox Motor Plate	1	Base Kit
	Gearbox Brake Plate	1	Base Kit
	Spacer Plate	1	Base Kit
	1st Stage Shaft	1	Base Kit
	2nd Stage Shaft	1	Base Kit

Picture	Name	QTY	Kit
	1/2” Thunder Hex ID x 1.125”OD Flanged Bearing	1	Base Kit
	1/2”ID x 1.125”OD Flanged Bearing	3	Base Kit
	#10-32 x 1.5”L Bolt	4	Base Kit

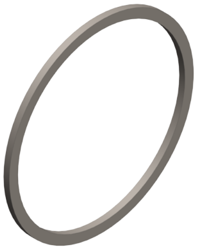
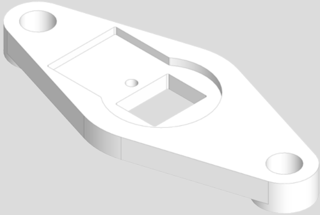
Recommended Parts to Buy

Picture	Name	QTY
	Falcon Pinion	1
	Larger 1st Stage Gear	1
	Smaller 2nd Stage Gear	1
	Larger 2nd Stage Gear	1
	Motor	1

Picture	Name	QTY
	3/8"OD x 1.125"L Spacer	4
	Friction Brake (1/2" Hex)	1
	1/2" Hex to Spline Adapter	1
	#10-32 x 1/2"L Bolt	2
	1/2" Snapring (WCP-0229)	1

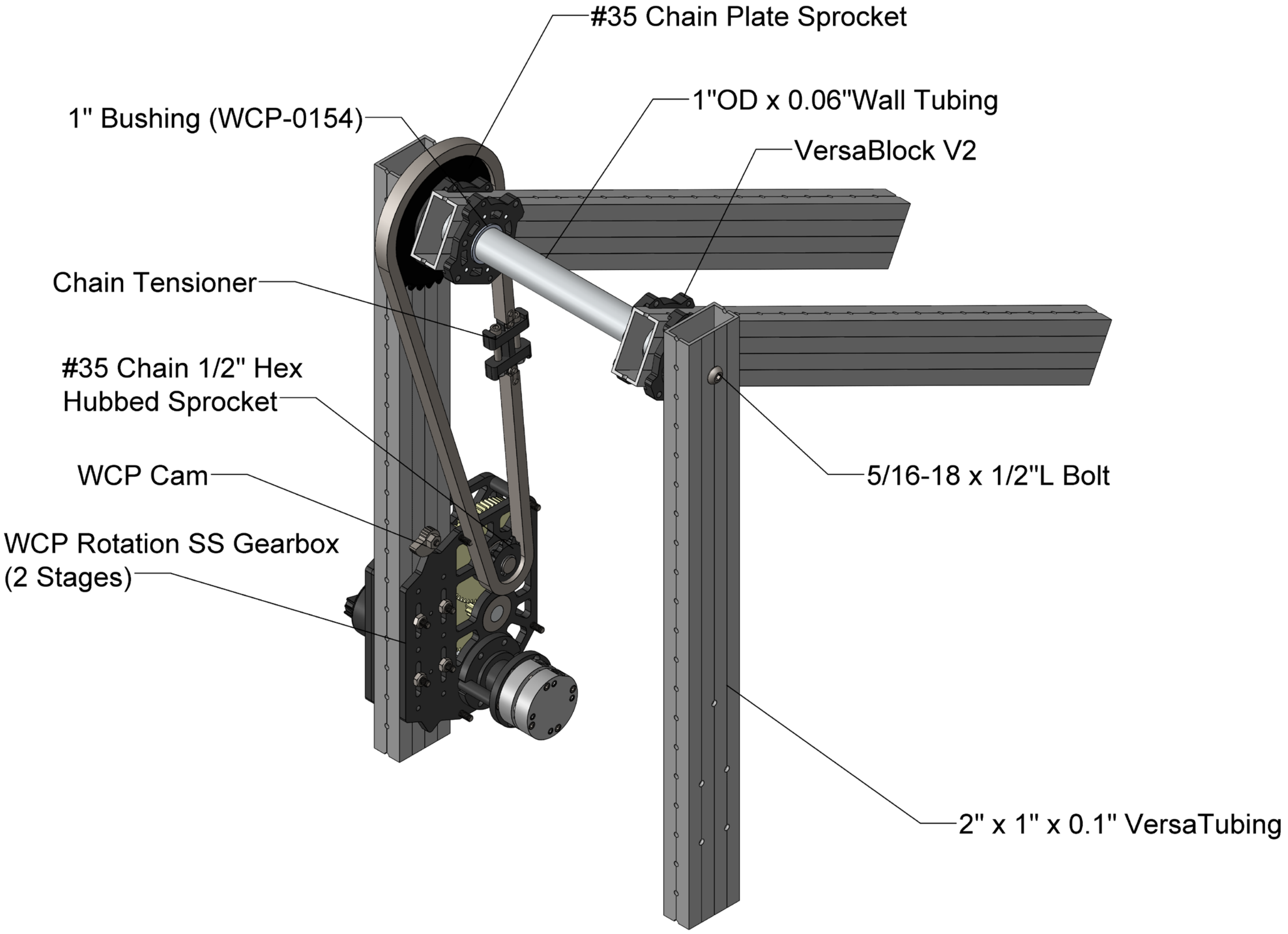
Picture	Name	QTY
	1/2” Hex Bearing	1

Printable Components

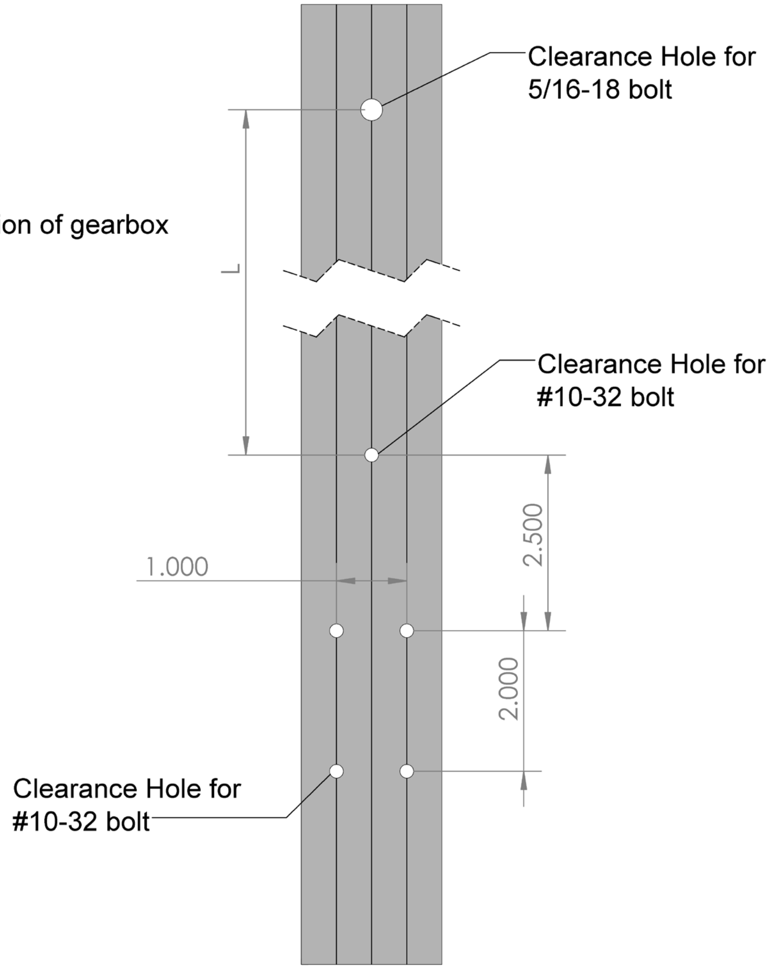
Picture	Name	QTY
	Bearing Spacer	1
	CTRE Mag Encoder Mount	1

Application Example - Basic Arm

This example utilizes the WCP Rotation SS Gearbox and Versa Blocks for a simple and easy to fabricate arm that teams with limited manufacturing resources can make with basic hand tools.


#35 Chain Plate Sprocket
1" Bushing (WCP-0154)
1"OD x 0.06"Wall Tubing
VersaBlock V2
Chain Tensioner
#35 Chain 1/2" Hex Hubbed Sprocket
WCP Cam
WCP Rotation SS Gearbox (2 Stages)
5/16-18 x 1/2"L Bolt
2" x 1" x 0.1" VersaTubing

Mounting Holes


Clearance Hole for
5/16-18 bolt
L
Clearance Hole for
#10-32 bolt
2.500
1.000
2.000
Clearance Hole for
#10-32 bolt

Note: L is dependent on location of gearbox
relative to arm pivot point.

Revision Table

Revision Date	Revision #	Description
1/10/2020	1.1	First revision created.