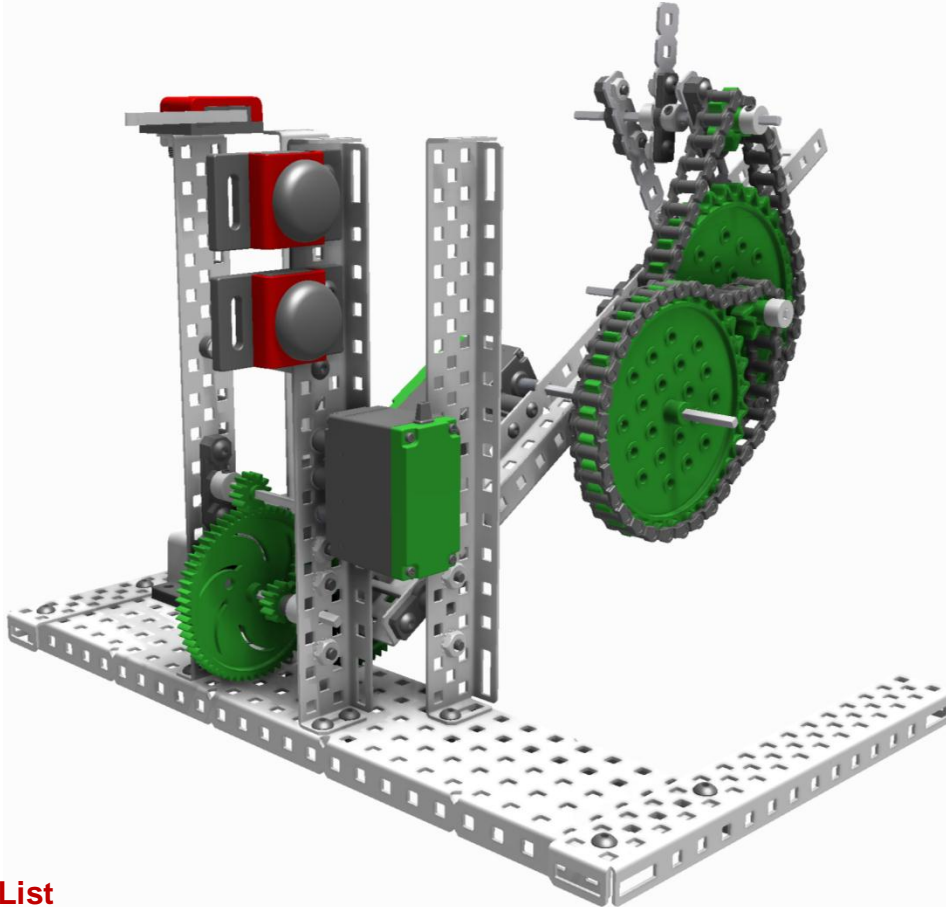


## Ballistic Device Construction (VEX)

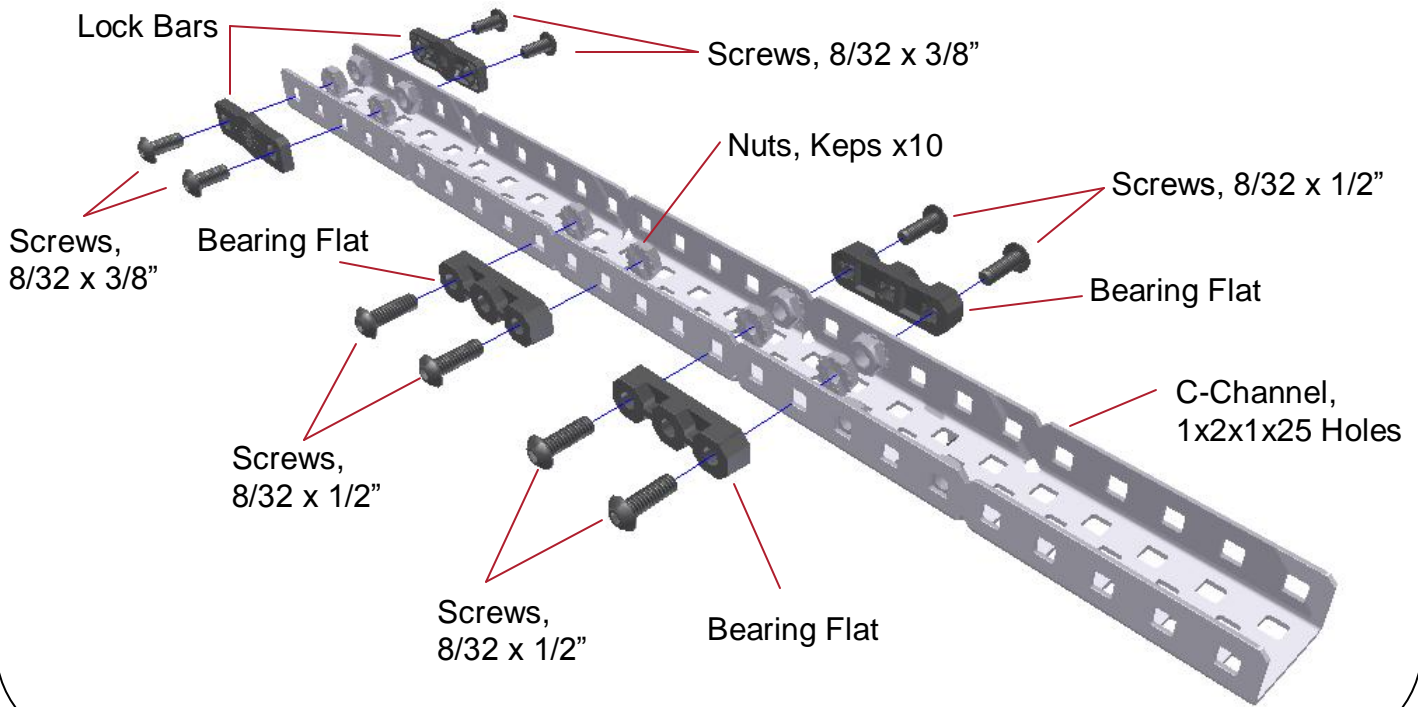


### Parts List

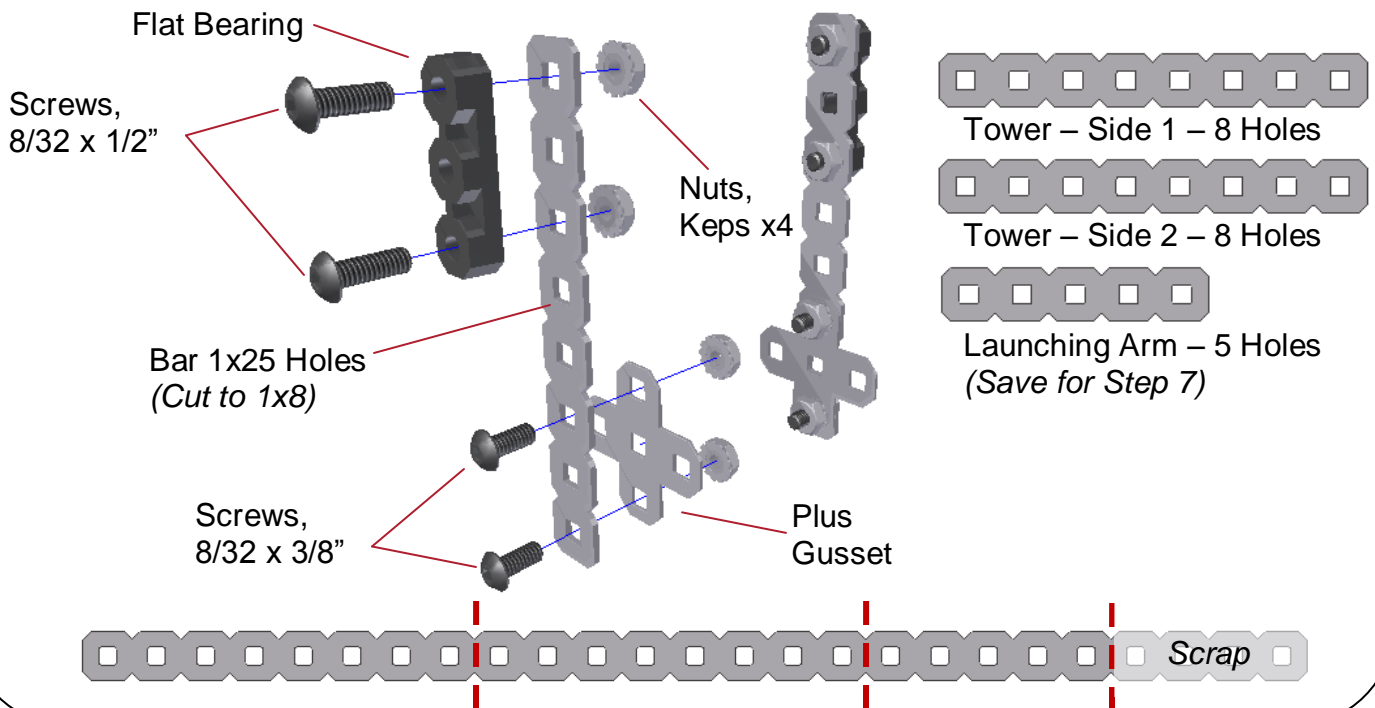
Materials	Quantity	Materials	Quantity
Screws 8/32 x 3/8	20	Drive Shaft 4"	3
Screws 8/32 x 1/2"	36	Drive Shaft 3"	3
Screws 8/32 x 3/4"	1	Drive Shaft 11mm (Motor Post)	2
Screws 6/32 x 1/4"	3	Motor Shaft Coupler	2
Screws 6/32 x 1/2"	1	2-Wire Motor 393 Module	2
Nuts, Keps	53	C-Channel 1x2x1x25 Holes	1
Standoffs, 2" Long	2	C-Channel 1x5x1x25 Holes	1
Bearing Flat	11	Bar 1x25 Holes	1
Lock Bars	3	Chassis Rail 2x1x16 Holes	6
60 Tooth Gear	2	Plus Gusset	2
12 Tooth Gear	2	Bumper Switch	2
High Strength 30-Tooth Sprocket	2	Limit Switch	2
High Strength 6-Tooth Sprocket	2	Battery Strap	1
High Strength Chain Links	69	7.2V Robot Battery NiMH 2000mAh	1
Shaft Spacer, Thin	12	VEX Cortex Microcontroller	1
Shaft Spacer, Thick	3	Small Jeweler's Phillips Screw Driver	1
Shaft Collar	8		

# POE Ballistic Device Build Instructions

## Step 1 – Elevation Arm Assembly

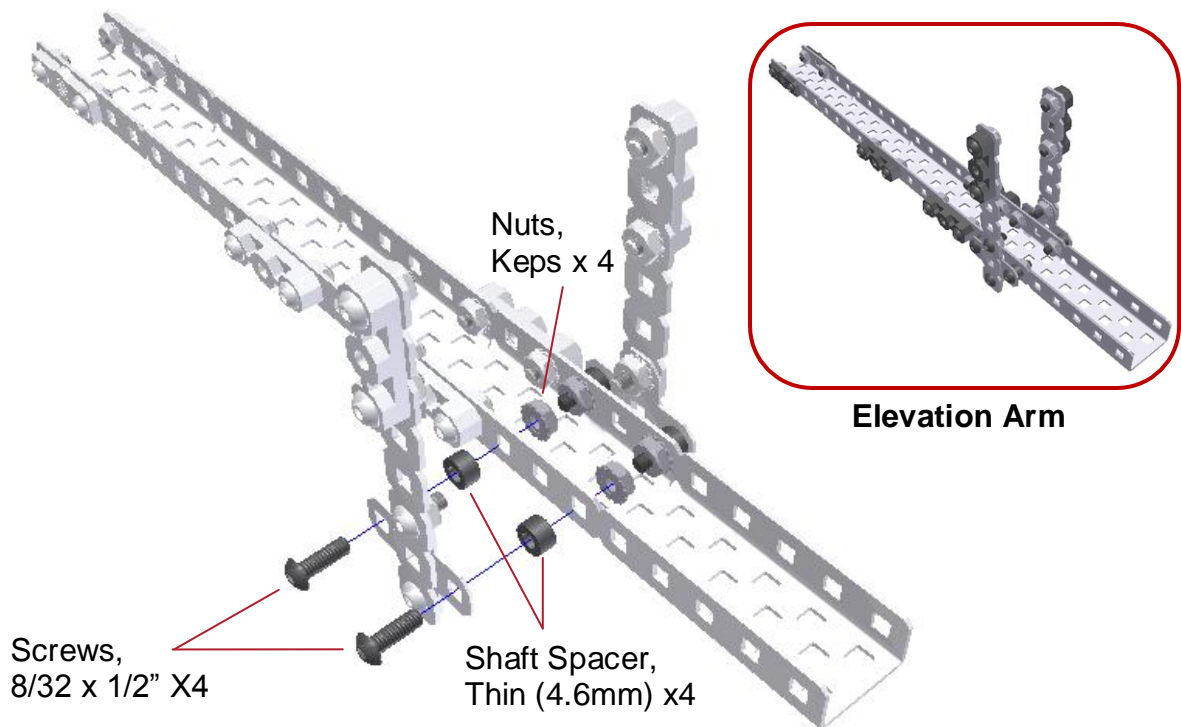


## Step 2 – Elevation Arm Assembly Continued – Launcher Arm Towers x2



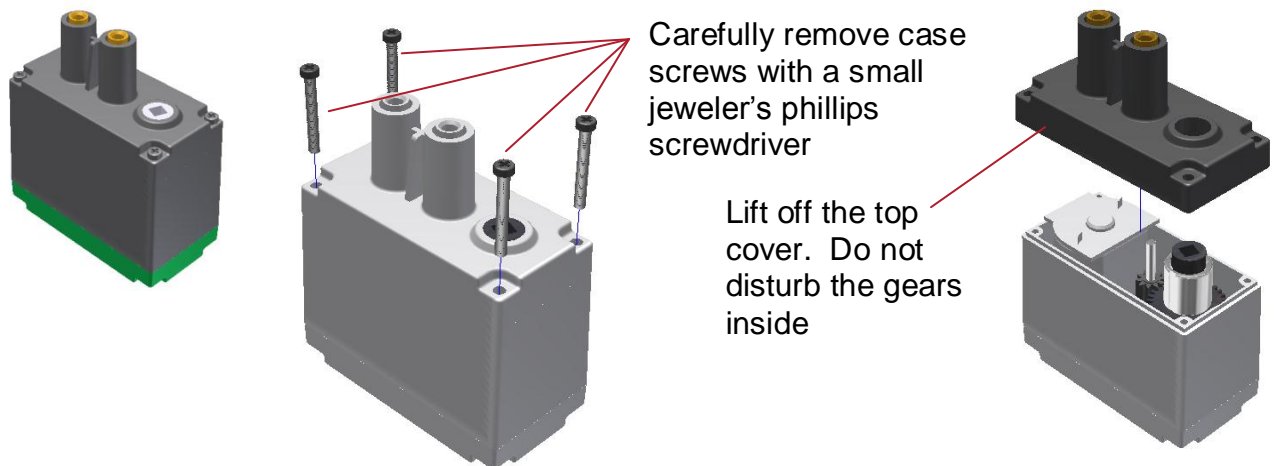
# POE Ballistic Device Build Instructions

## Step 3 – Elevation Arm Assembly Continued – Launcher Arm Towers x2 Cont.




## Step 4 - 2-Wire Motor 393 High Speed / Low Torque Gear Setup - (If motor is already setup for high speed, skip to step 6)

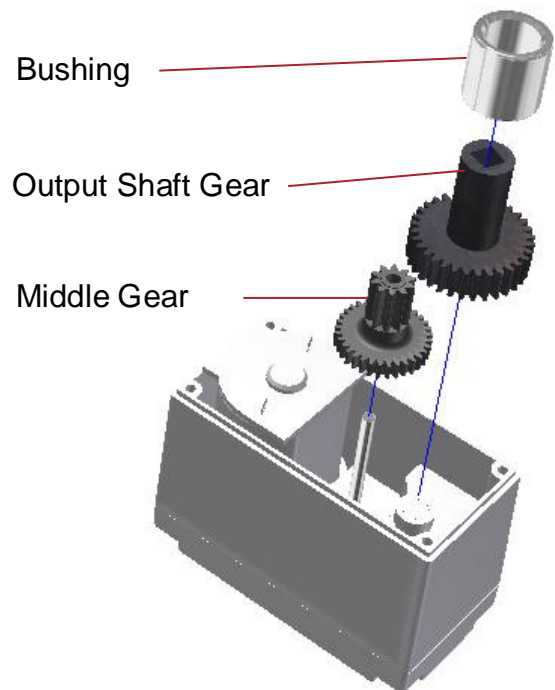
**!** *Caution: Be careful when removing the case screws. The heads of the screws can easily be stripped during this process.*



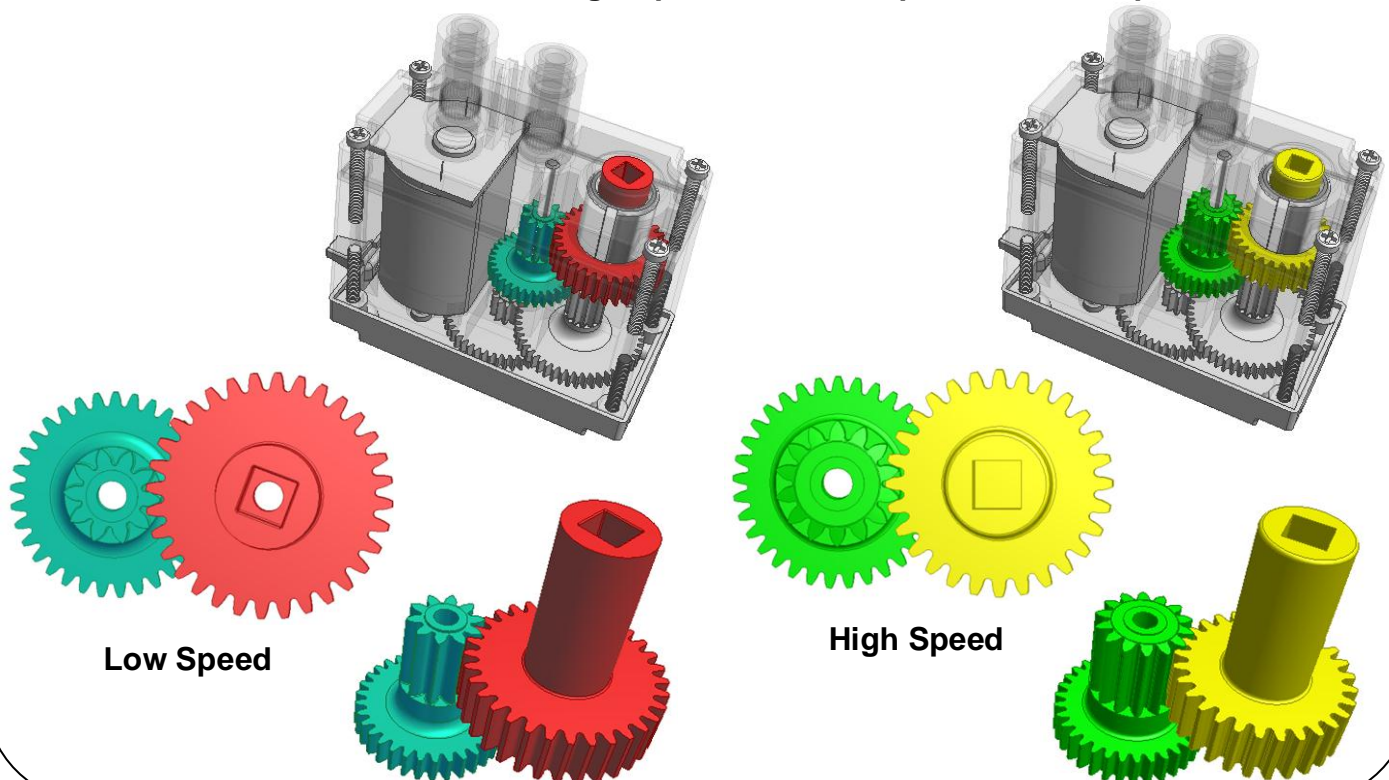
Description	As Shipped	High Speed Option
Stall Torque	13.5 in-lb	8.4 in-lb
Free Speed	100 RPM	160 RPM

## Step 5 - 2-Wire Motor 393 High Speed Low / Torque Gear Setup - Continued

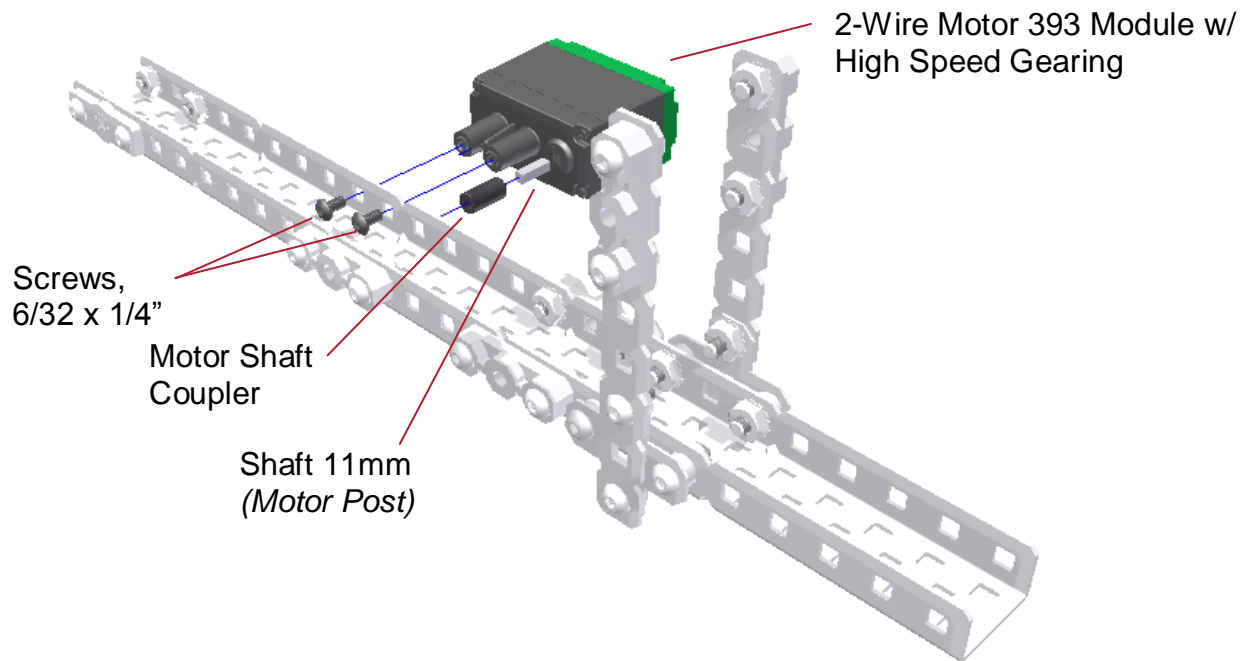
- Lift out the bushing and set aside for later. The bushing may stay linked inside the cover. If this is the case, leave the bushing as part of the cover
- Note the orientation and placement of the two visible gears. Remove the low speed middle and output shaft gears.
- Install the high speed middle gear first.
- Install the high speed output shaft gear. Make sure the gears line up and are engaged to each other
- If the bushing **is not** stuck inside the cover, install it over the output shaft gear.
- Replace the cover and four screws.  **Caution: Be just as careful replacing the screws as you were removing them.**



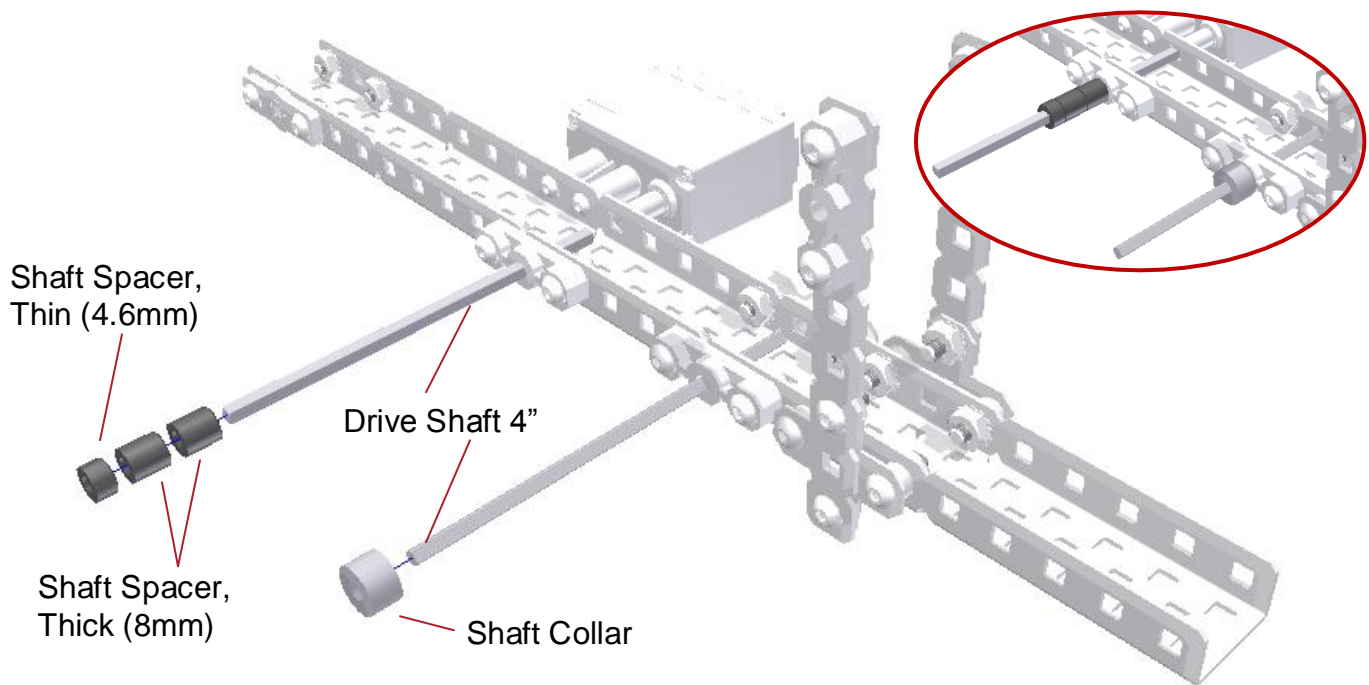
## Information- 2-Wire Motor 393 High Speed and Low Speed Gear Setup Reference



## Step 6 – Elevation Arm Assembly Continued – Launcher Gear System

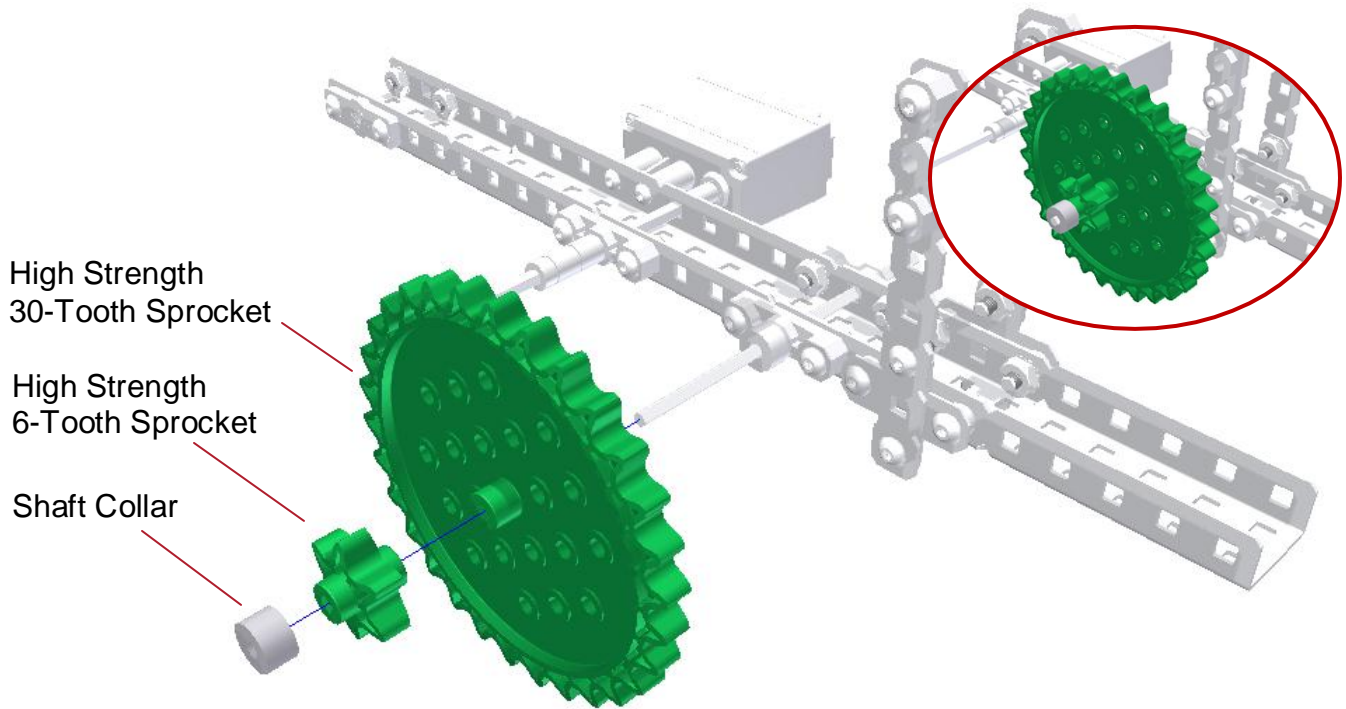


## Step 7 – Elevation Arm Assembly Continued – Launcher Gear System Continued

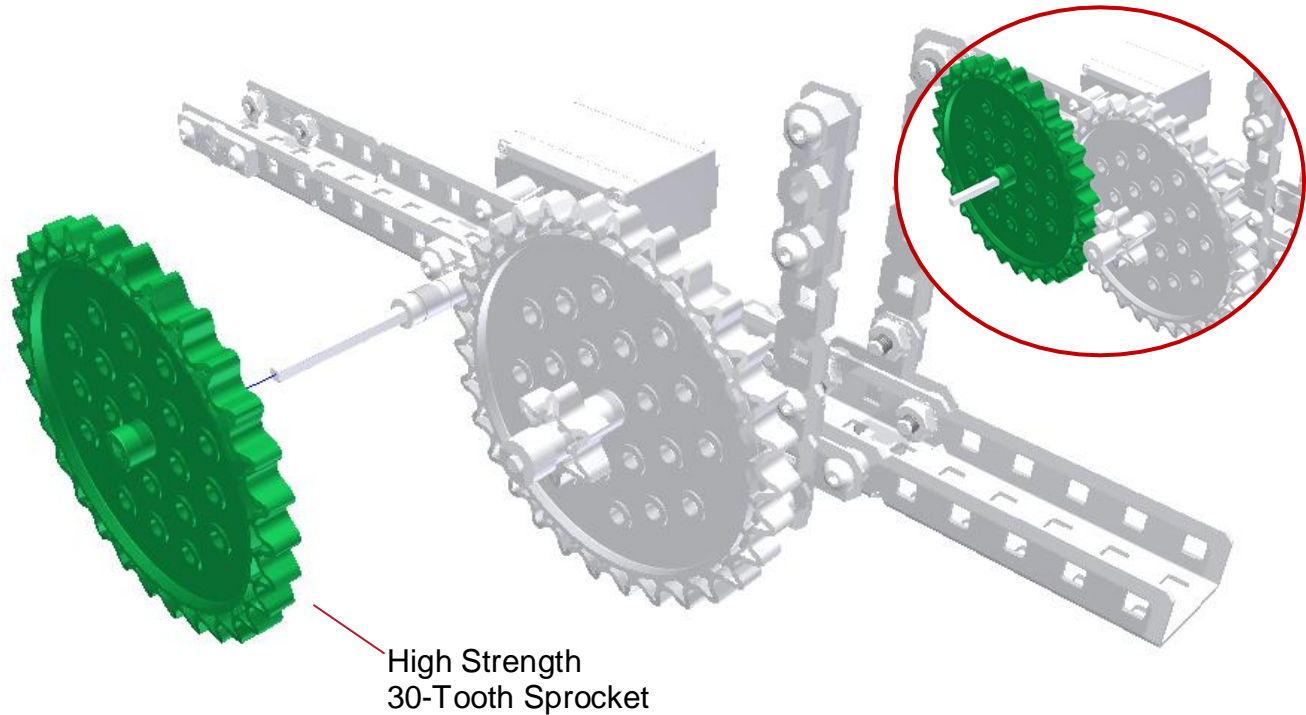


# POE Ballistic Device Build Instructions

## Step 8 – Elevation Arm Assembly Continued – Launcher Gear System Continued

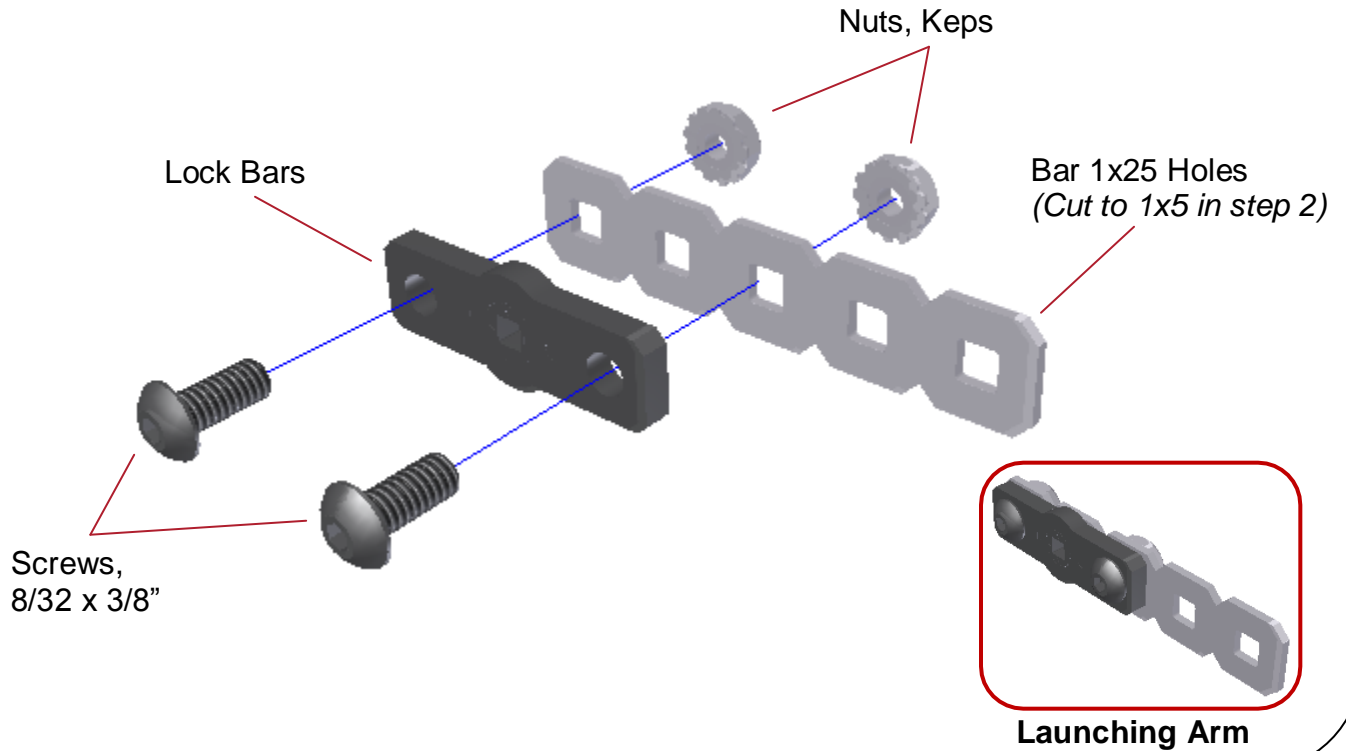


## Step 9 – Elevation Arm Assembly Continued – Launcher Gear System Continued

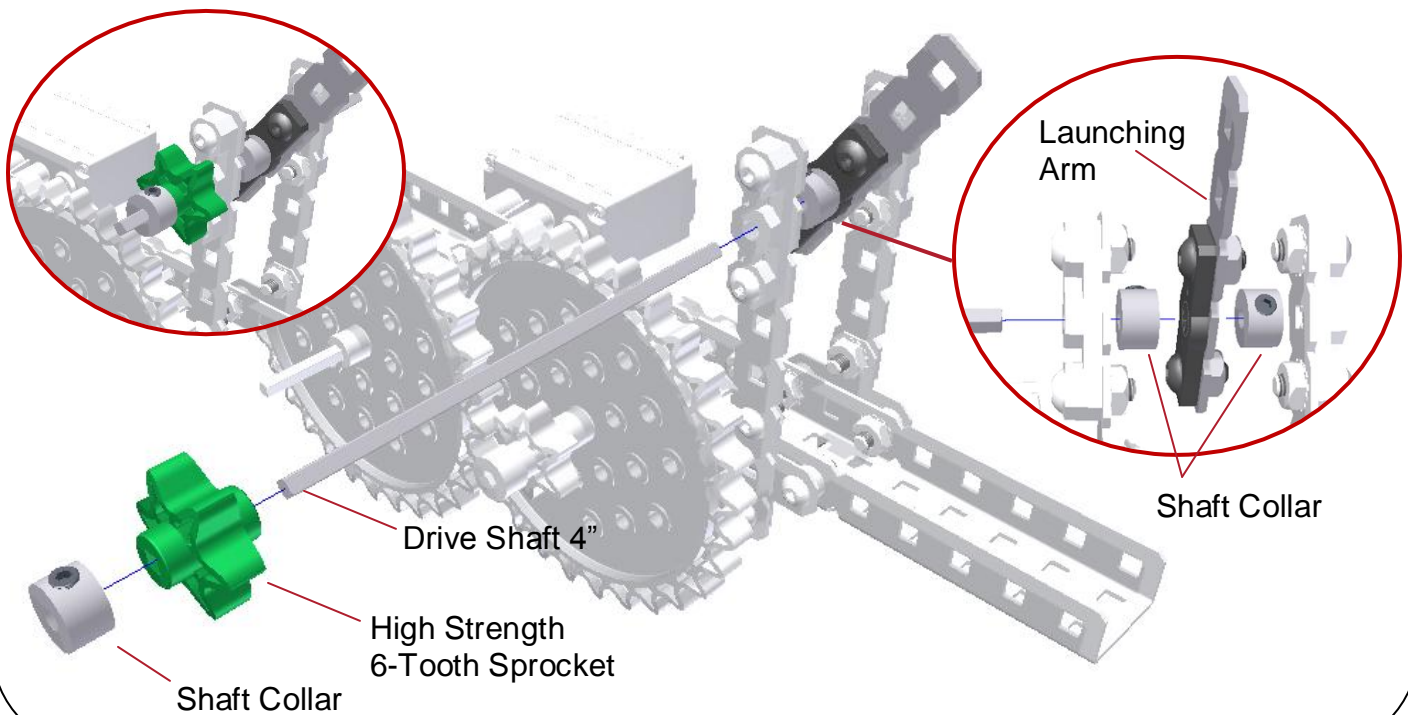


# POE Ballistic Device Build Instructions

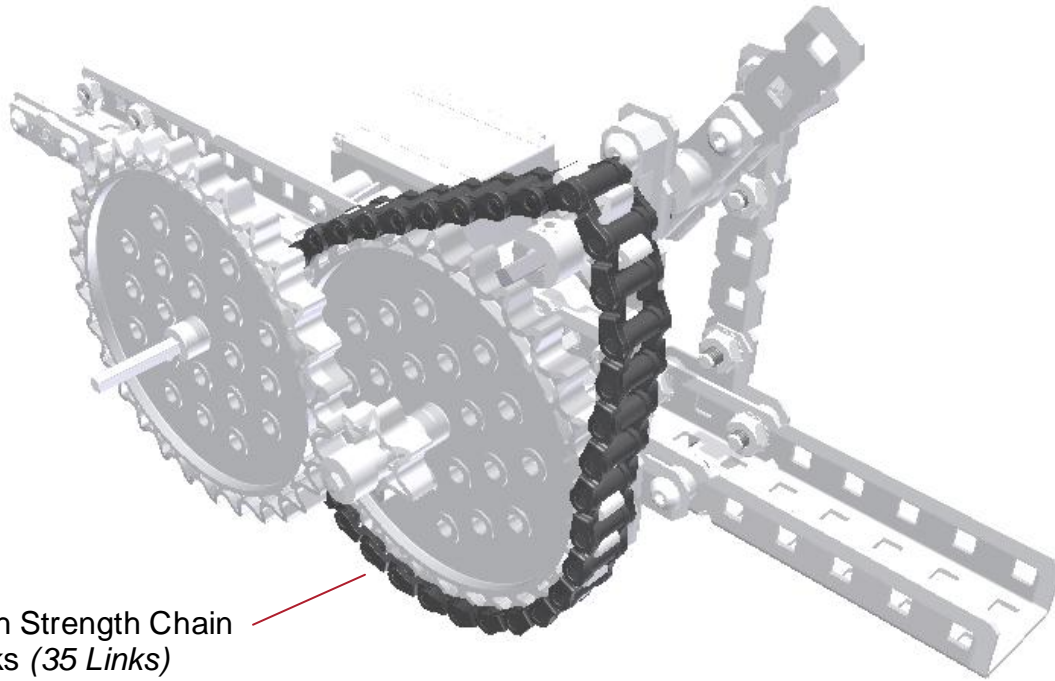
## Step 10 – Elevation Arm Assembly Continued – Launcher Gear System Continued



## Step 11 – Elevation Arm Assembly Continued – Launcher Gear System Continued

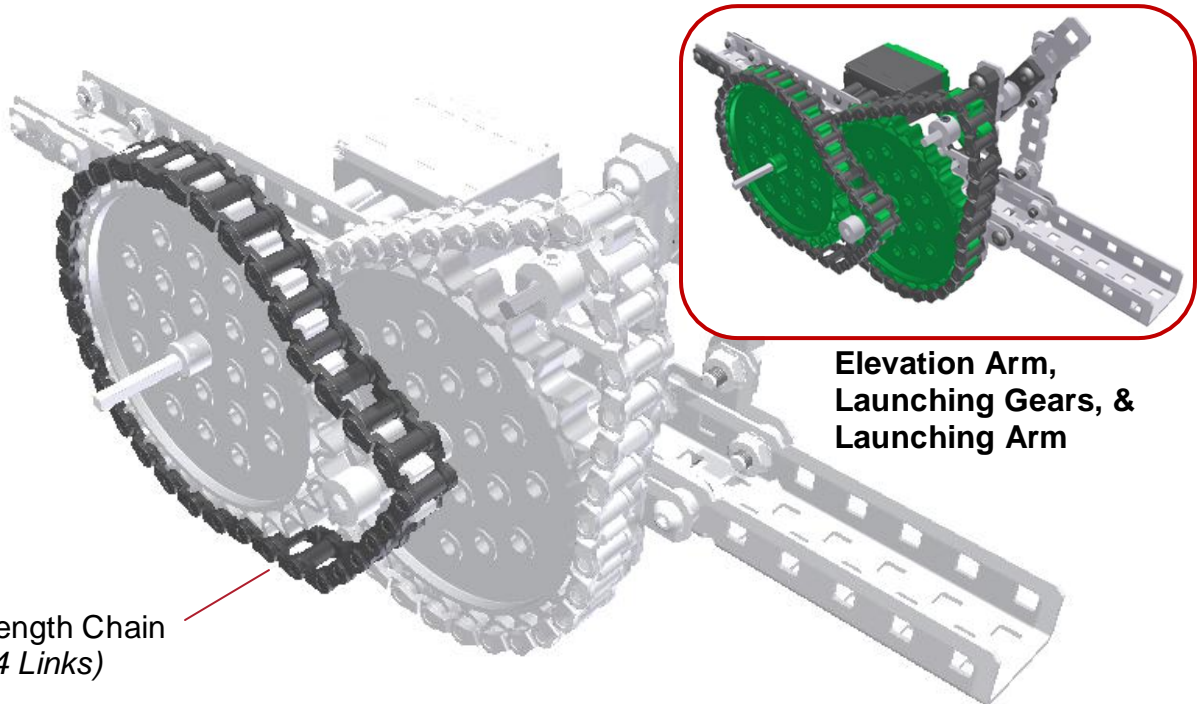


## Step 12 – Elevation Arm Assembly Continued – Launcher Gear System Continued



High Strength Chain  
Links (35 Links)

## Step 13 – Elevation Arm Assembly Continued – Launcher Gear System Continued



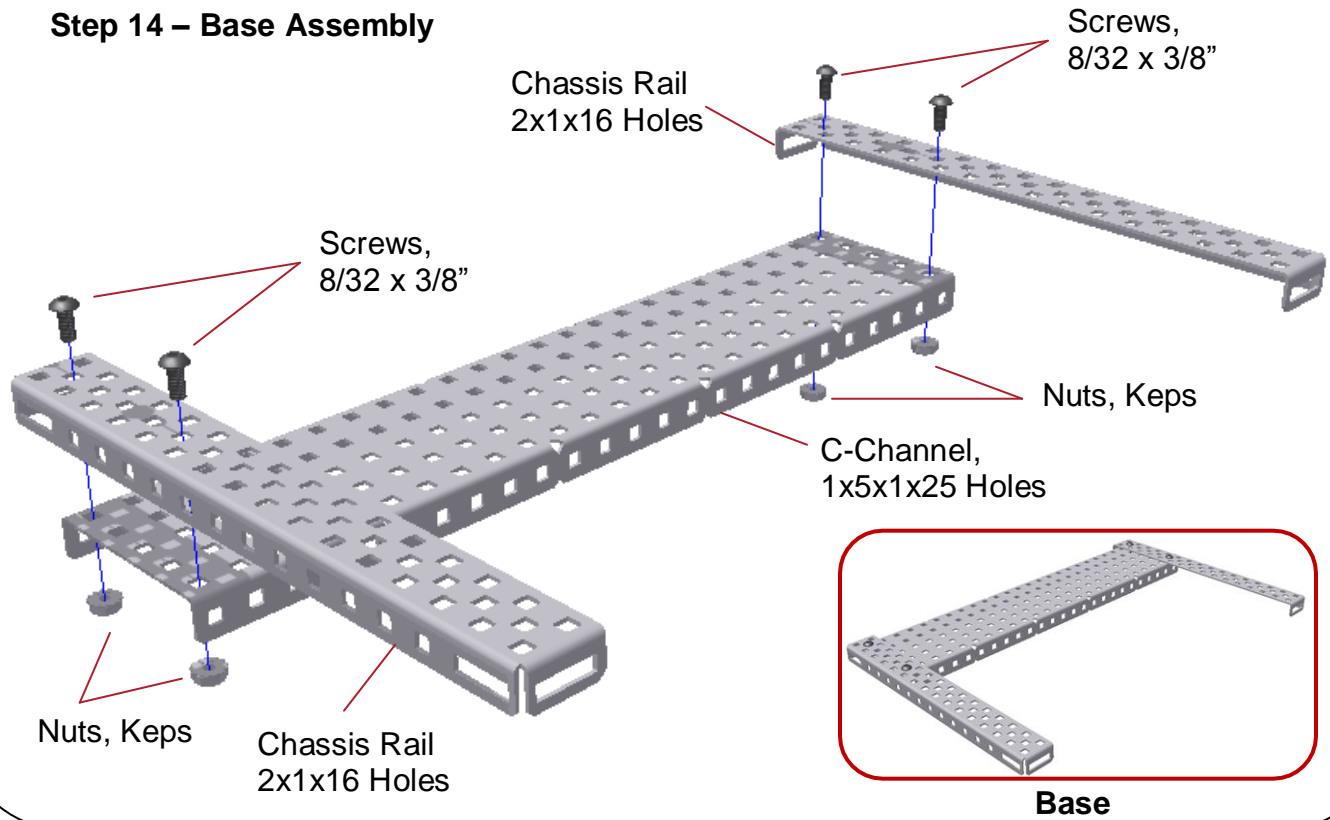
Elevation Arm,  
Launching Gears, &  
Launching Arm

High Strength Chain  
Links (34 Links)

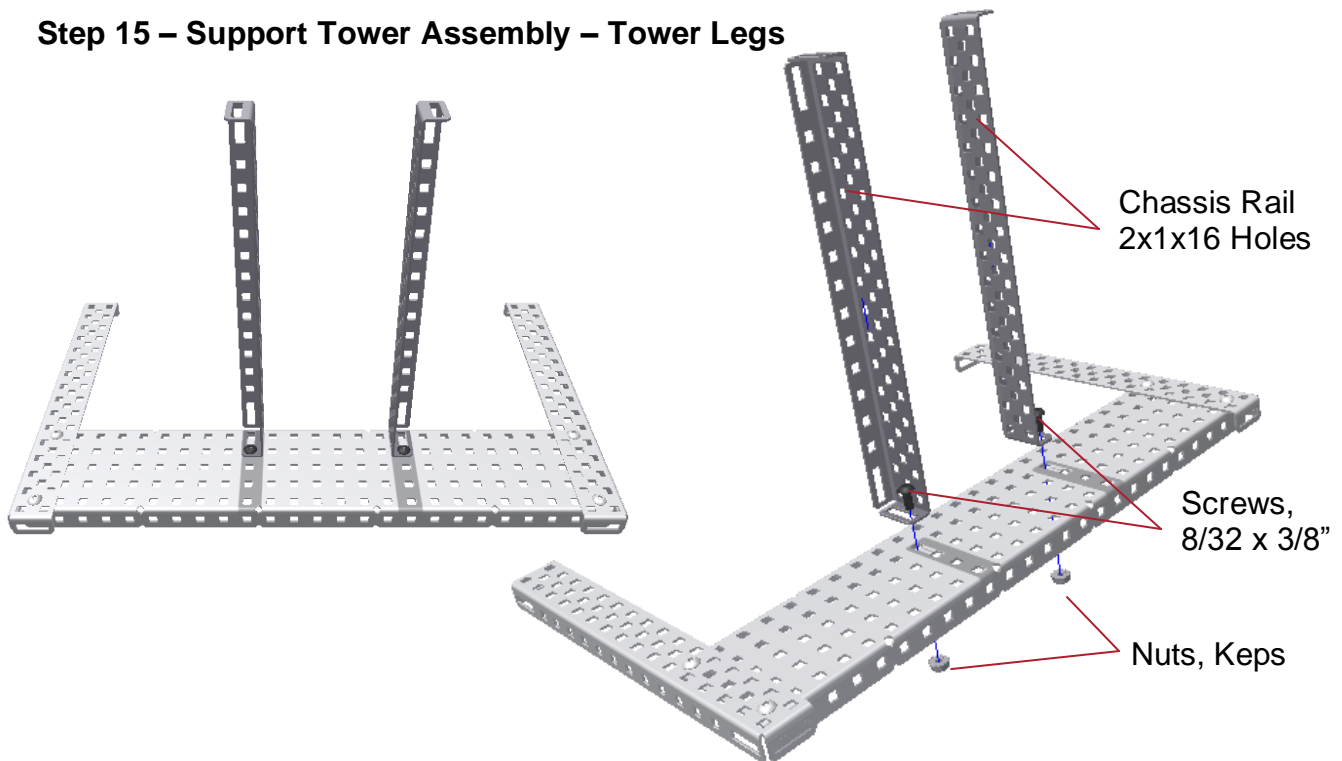


# POE Ballistic Device Build Instructions

## Step 14 – Base Assembly

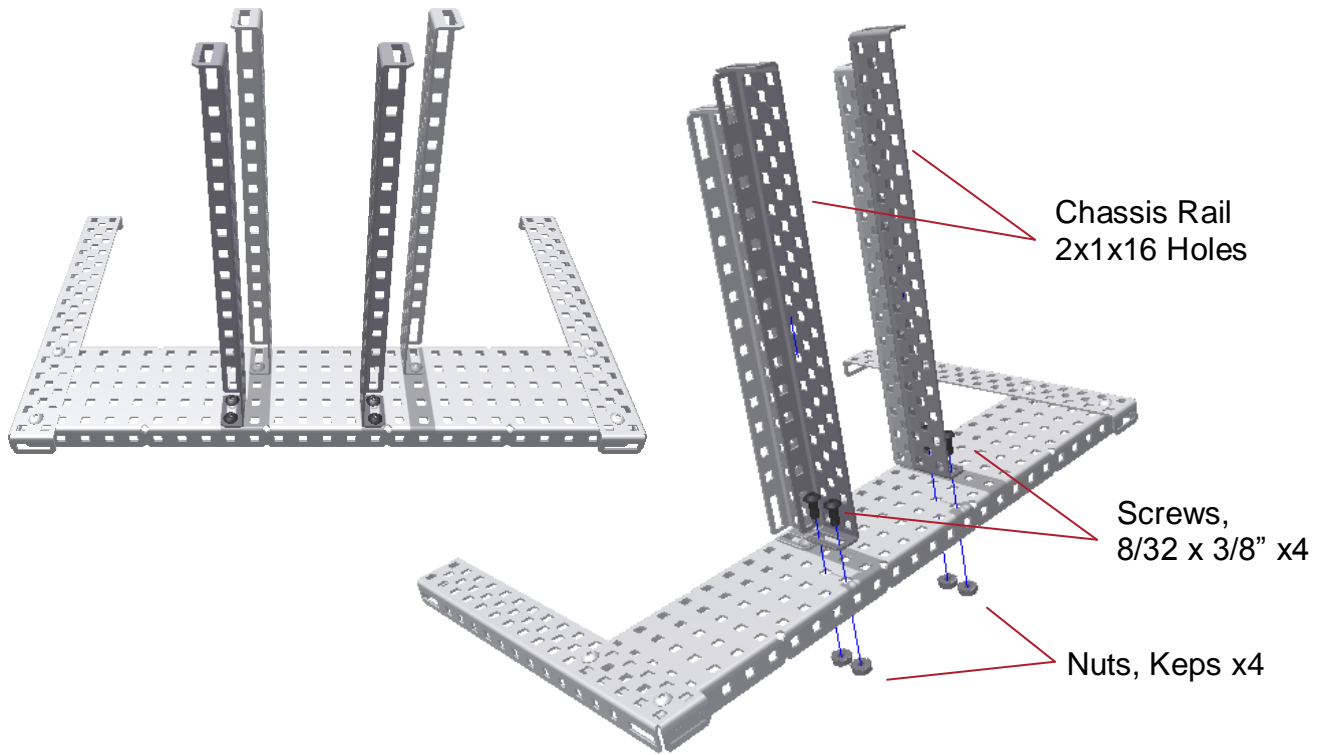


## Step 15 – Support Tower Assembly – Tower Legs

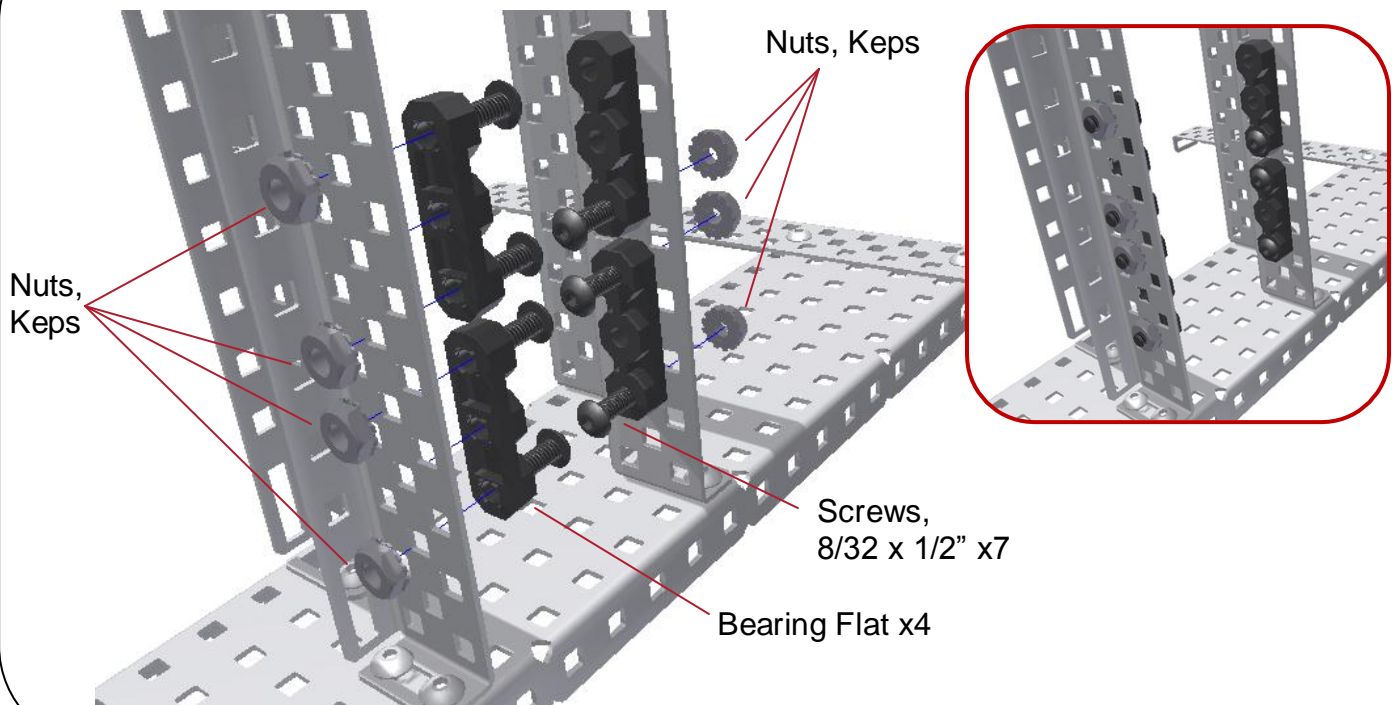


# POE Ballistic Device Build Instructions

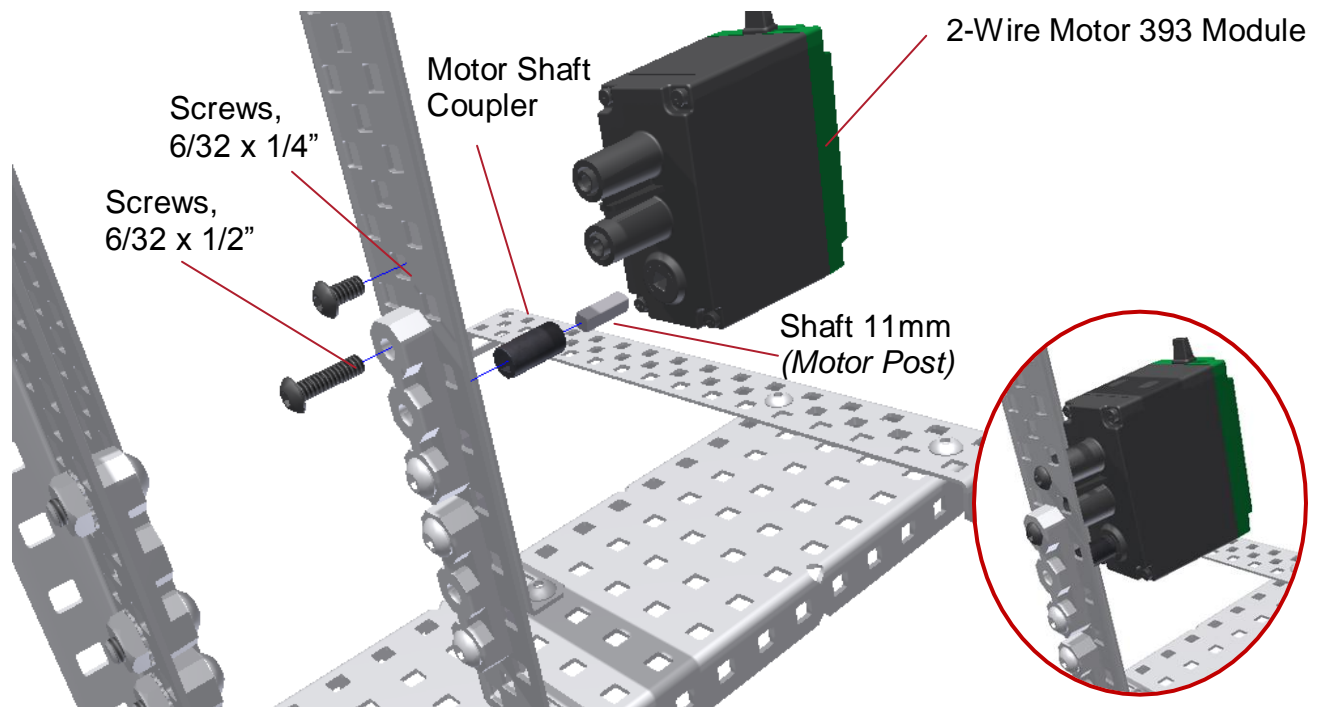
## Step 16 – Support Tower Assembly – Tower Legs - Continued



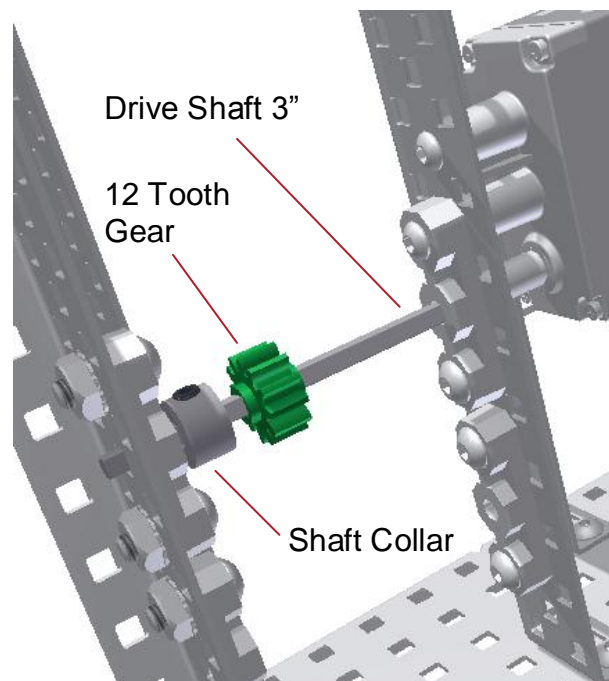
## Step 17 – Support Tower Assembly – Rear Shaft Bearings



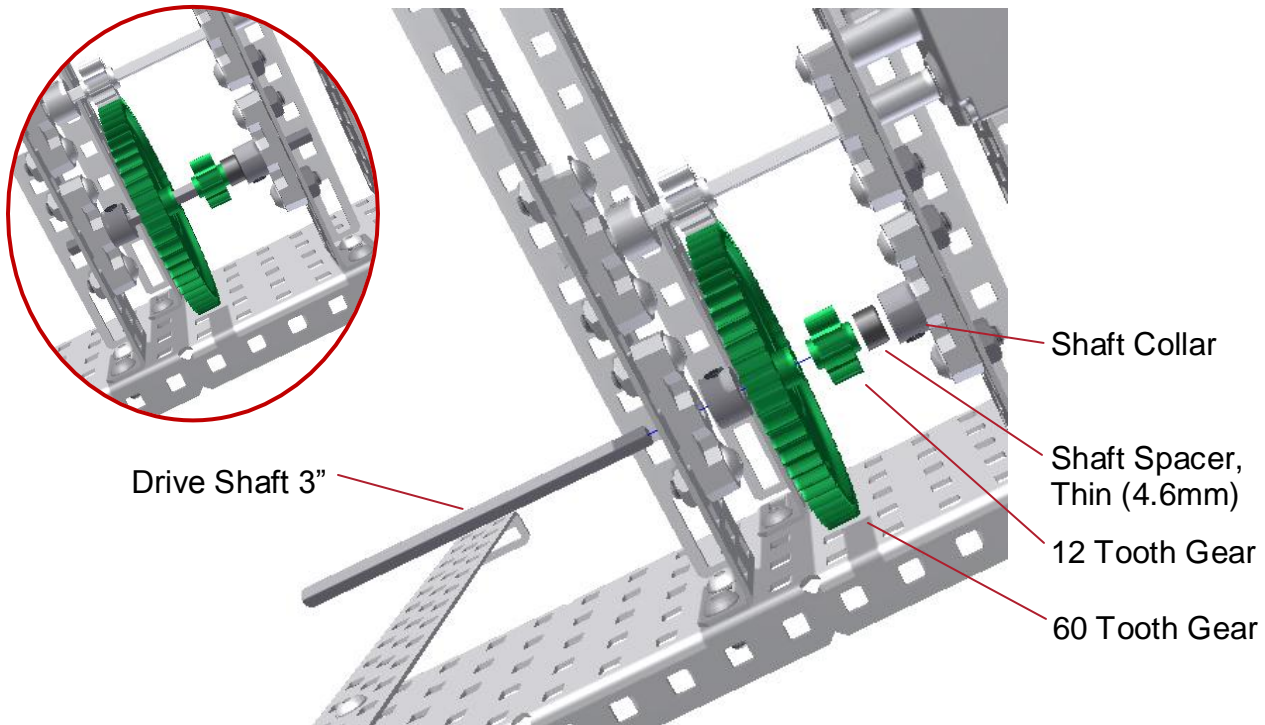
## Step 18 – Support Tower Assembly – Elevation Motor



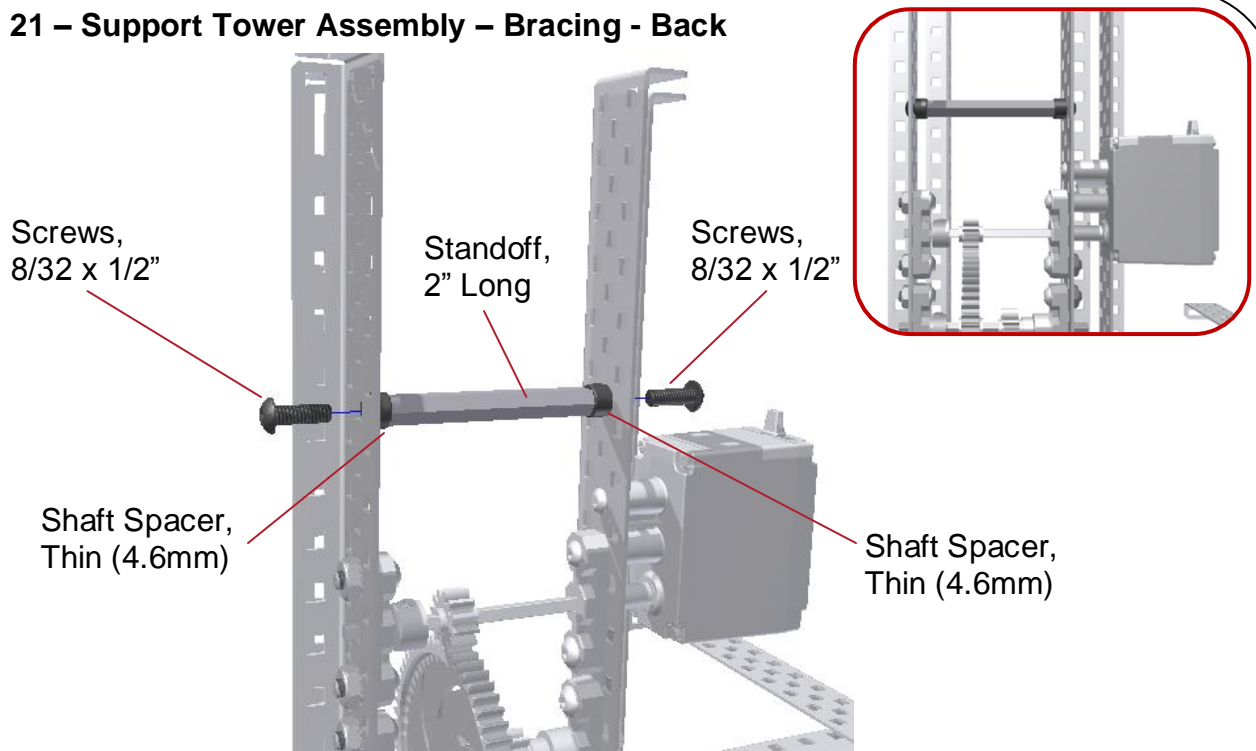
## Step 19 – Support Tower Assembly – Elevation Gear System



## Step 20 – Support Tower Assembly – Elevation Gear System Continued

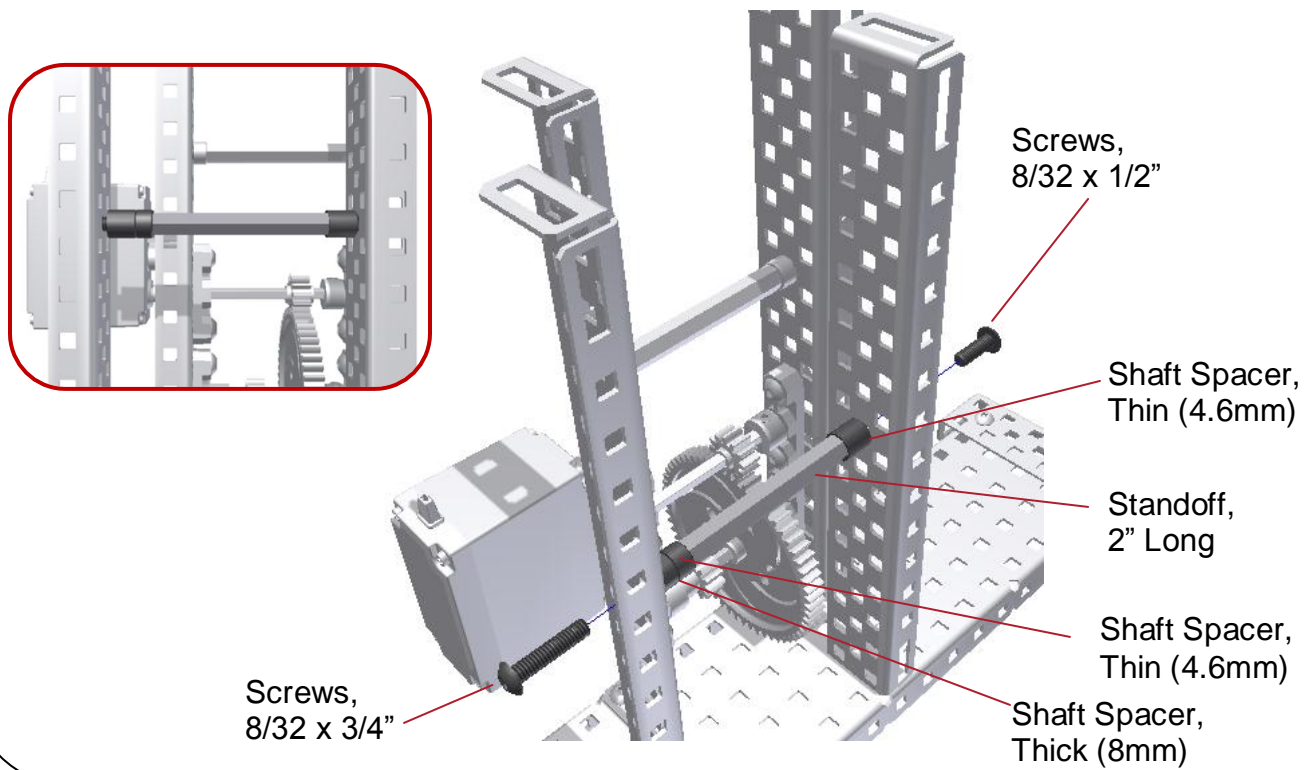


## Step 21 – Support Tower Assembly – Bracing - Back

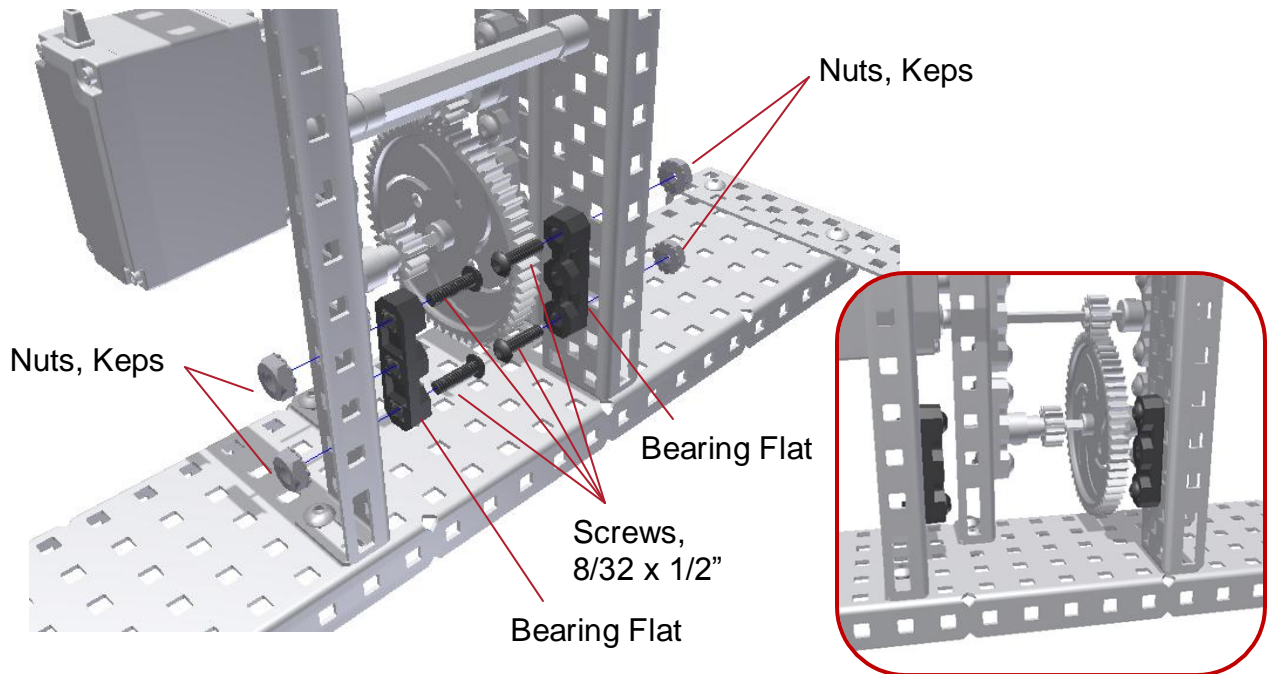


# POE Ballistic Device Build Instructions

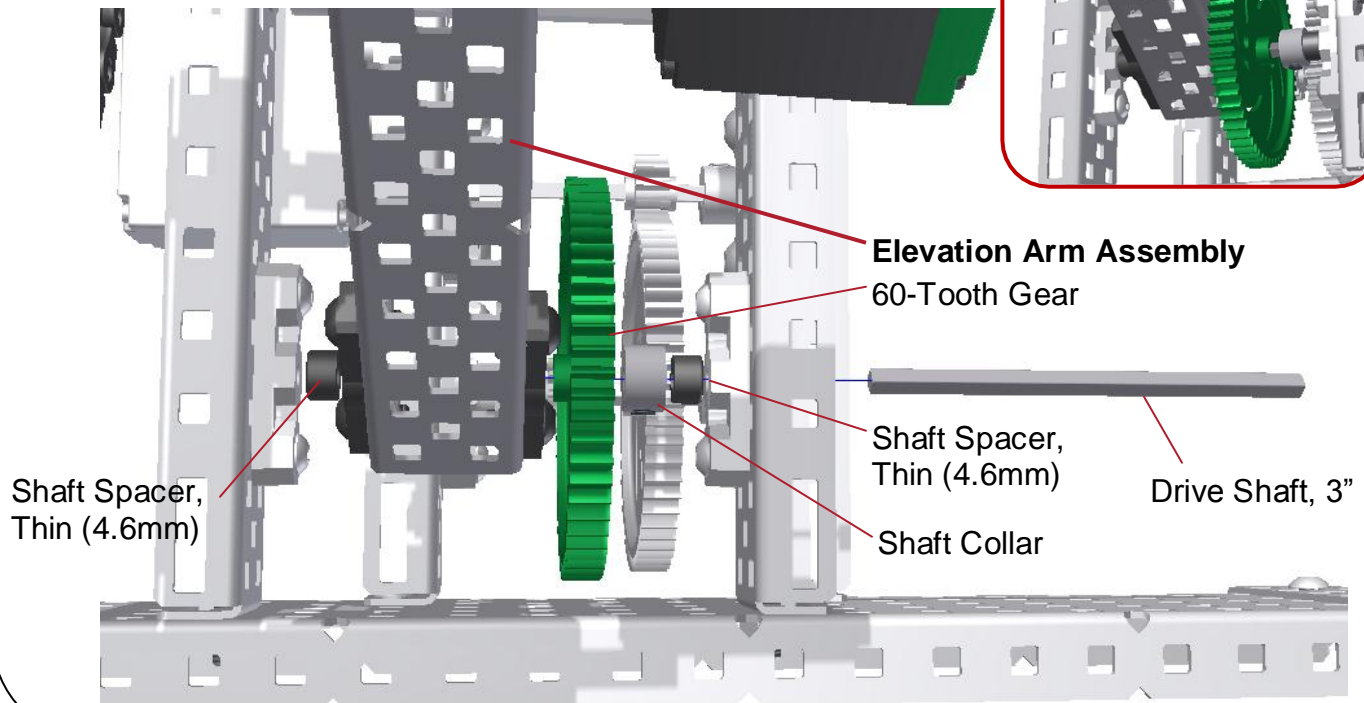
## Step 22 – Support Tower Assembly – Bracing - Front



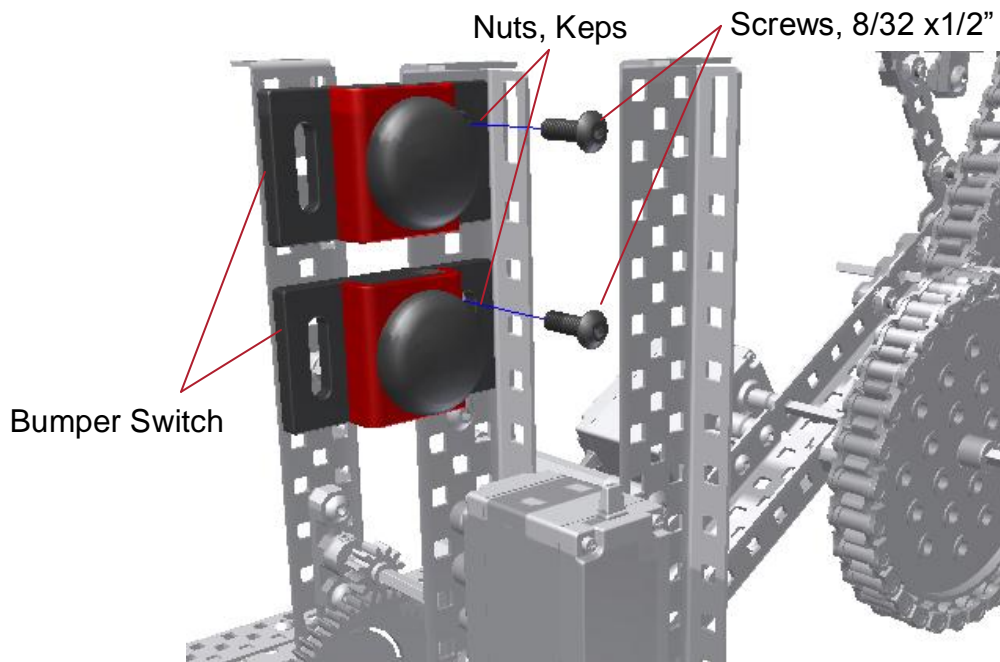
## Step 23 – Support Tower Assembly – Front Shaft Bearings



## Step 24 – Install Elevation Arm to Support Tower

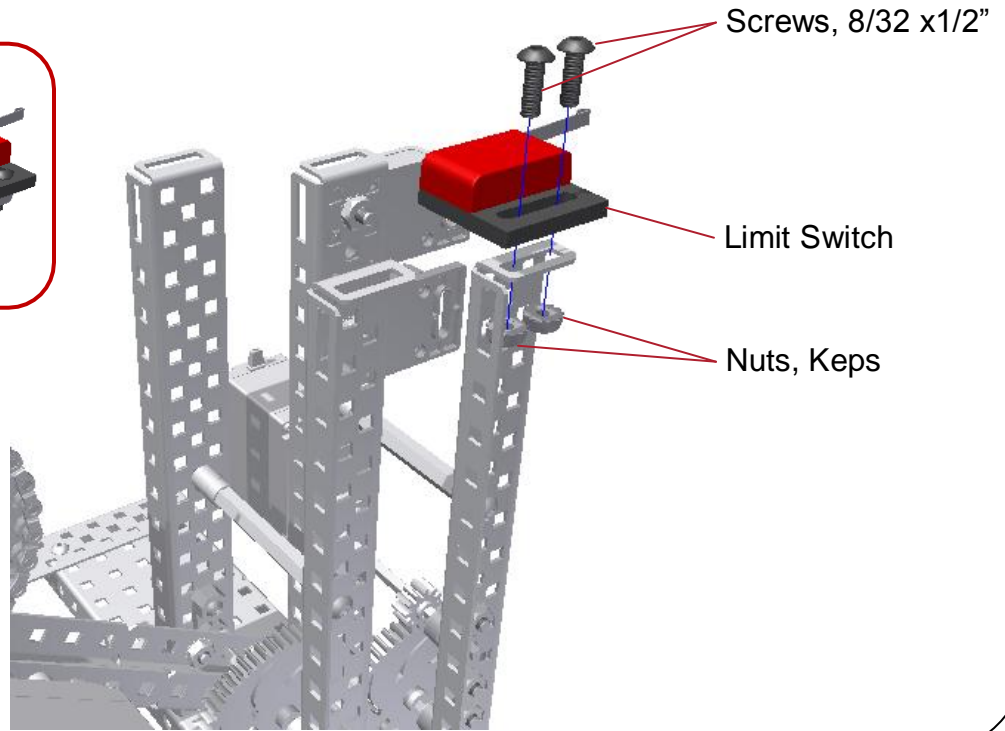
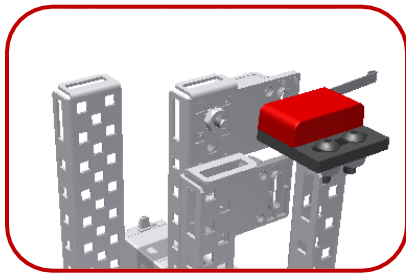


## Step 25 – Install Bumper Switches on Rear Tower (Up and Down Elevation Inputs)

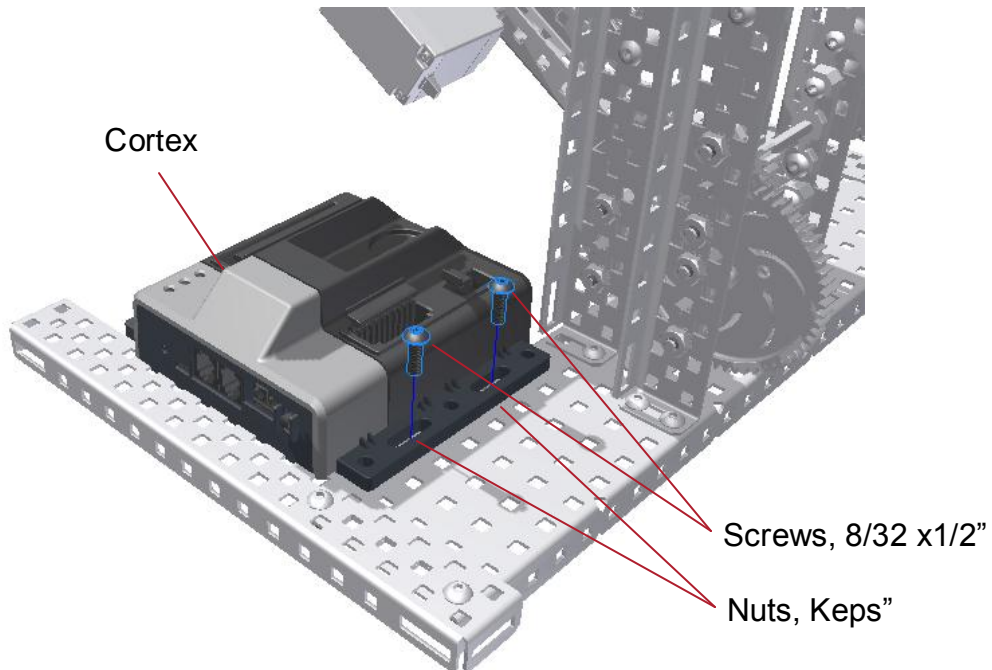


# POE Ballistic Device Build Instructions

## Step 26 – Install Limit Switch on Rear Tower (Ballistic Trigger)



## Step 27 – Attach Cortex to Base



# POE Ballistic Device Build Instructions

## Step 28 – Attach Battery Strap and Battery

