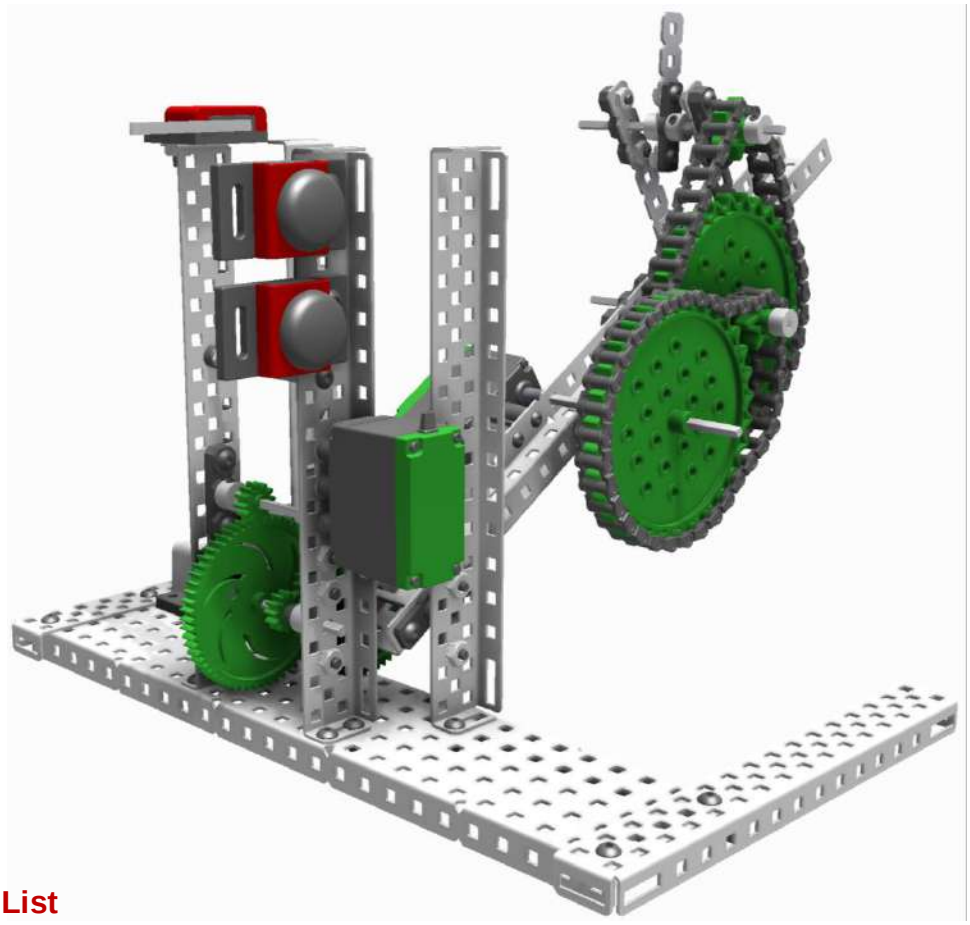
Ballistic Device Construction (VEX)

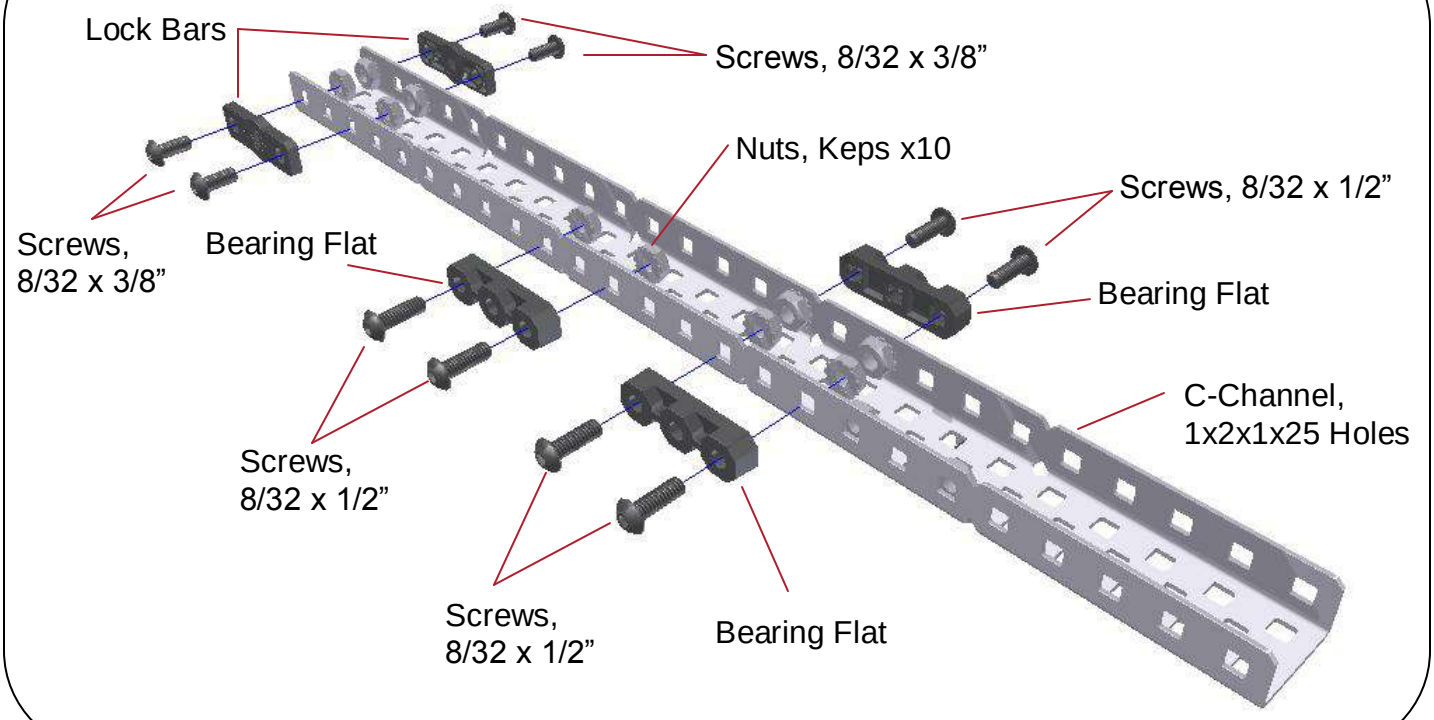


Parts List

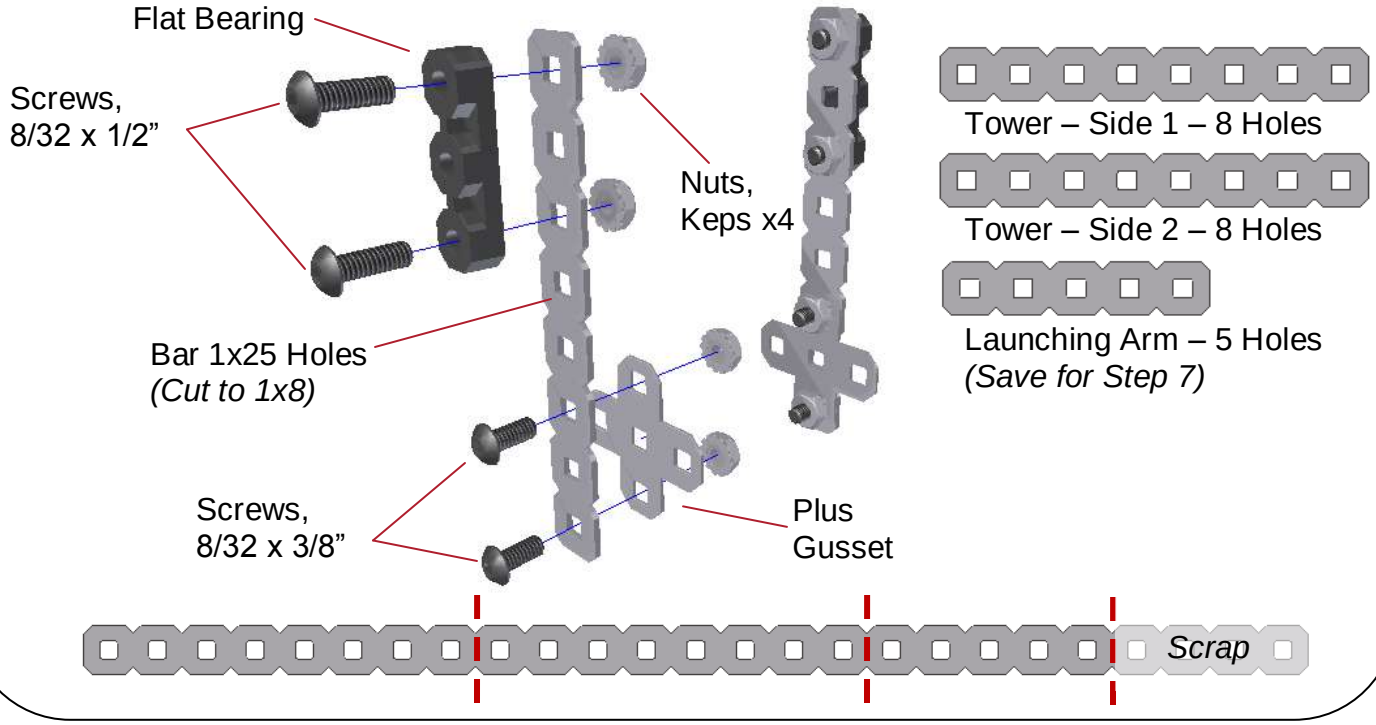
Materials	Quantity	Materials	Quantity
Screws 8/32 x 3/8	20	Drive Shaft 4"	3
Screws 8/32 x 1/2"	36	Drive Shaft 3"	3
Screws 8/32 x 3/4"	1	Drive Shaft 11mm (Motor Post)	2
Screws 6/32 x 1/4"	3	Motor Shaft Coupler	2
Screws 6/32 x 1/2"	1	2-Wire Motor 393 Module	2
Nuts, Keps	53	C-Channel 1x2x1x25 Holes	1
Standoffs, 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

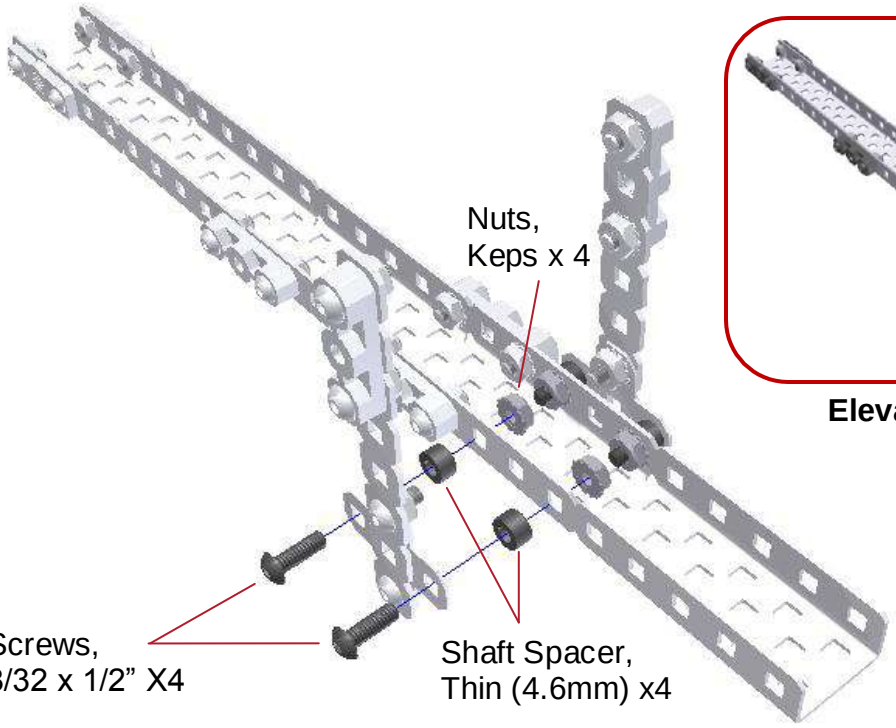


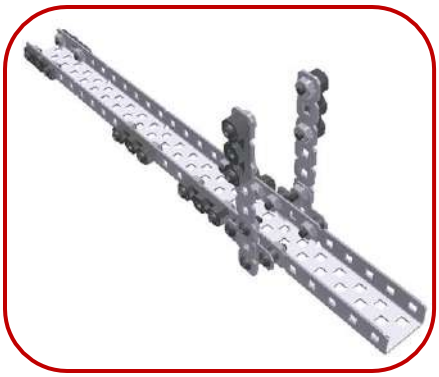
Step 2 – Elevation Arm Assembly Continued – Launcher Arm Towers x2



POE Ballistic Device Build Instructions

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

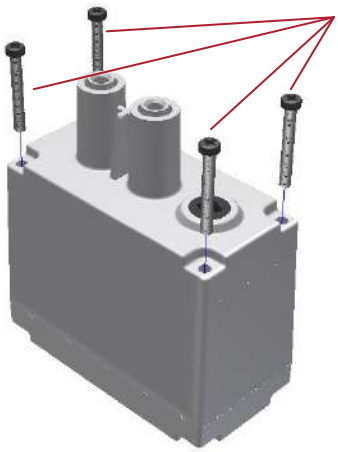




Elevation Arm

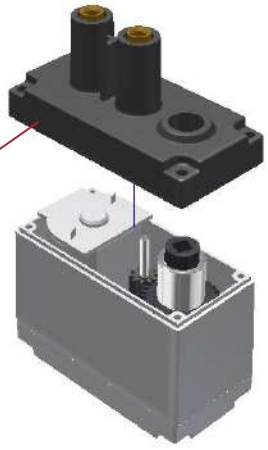
Step 4 - 2-Wire Motor 393 High Speed / Low Torque Gear Setup - *(If motor is already setup for high speed, skip to step 6)*

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



Carefully remove case screws with a small jeweler's phillips screwdriver

Lift off the top cover. Do not disturb the gears inside

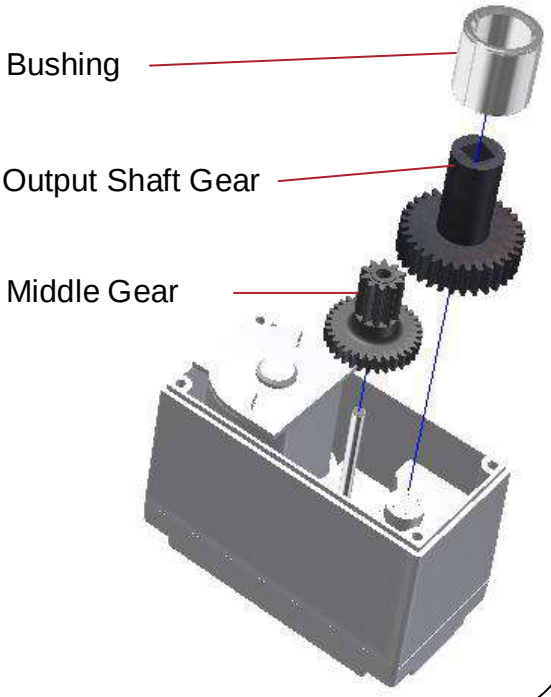


Description	As Shipped	High Speed Option
Stall Torque	13.5 in-lb	8.4 in-lb
Free Speed	100 RPM	160 RPM

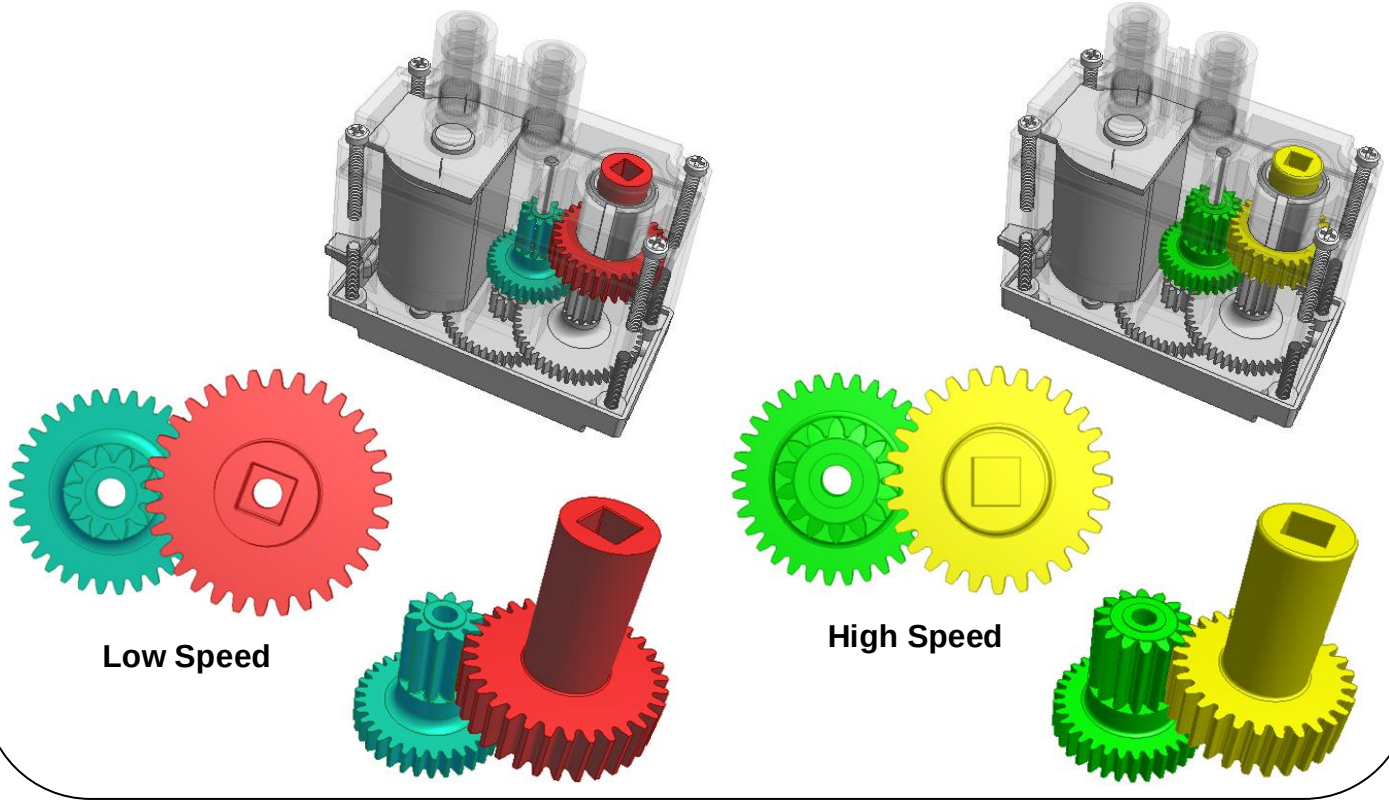
POE Ballistic Device Build Instructions

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

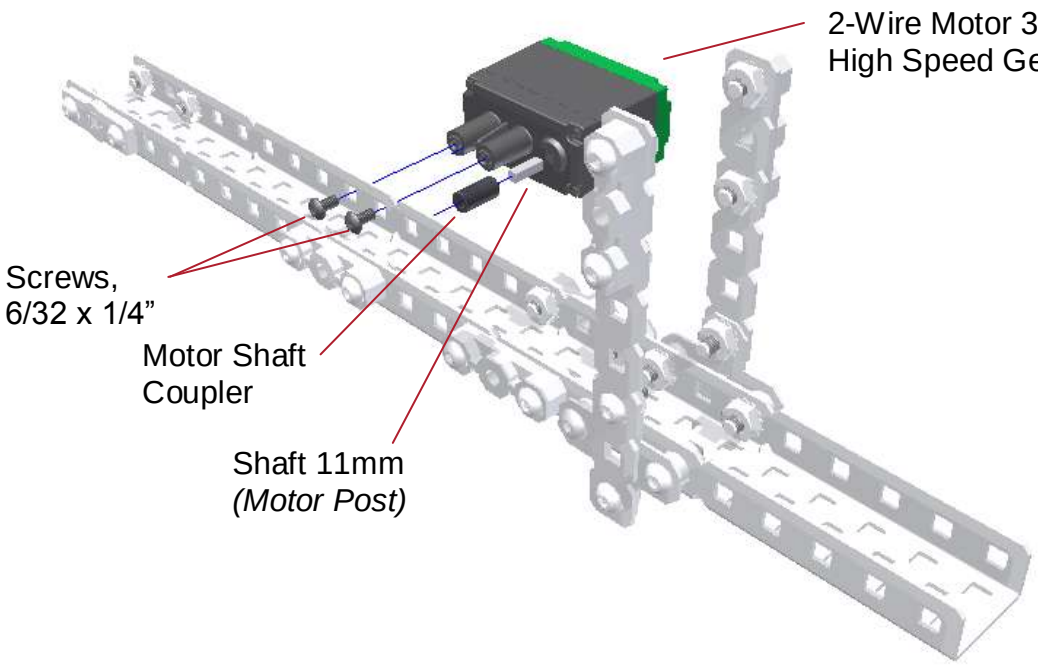
- Lift out the bushing and set aside for later. The bushing may stay linked inside the cover. If this is the case, leave the bushing as part of the cover
- Note the orientation and placement of the two visible gears. Remove the low speed middle and output shaft gears.
- Install the high speed middle 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 carful replacing the screws as you were removing them.**



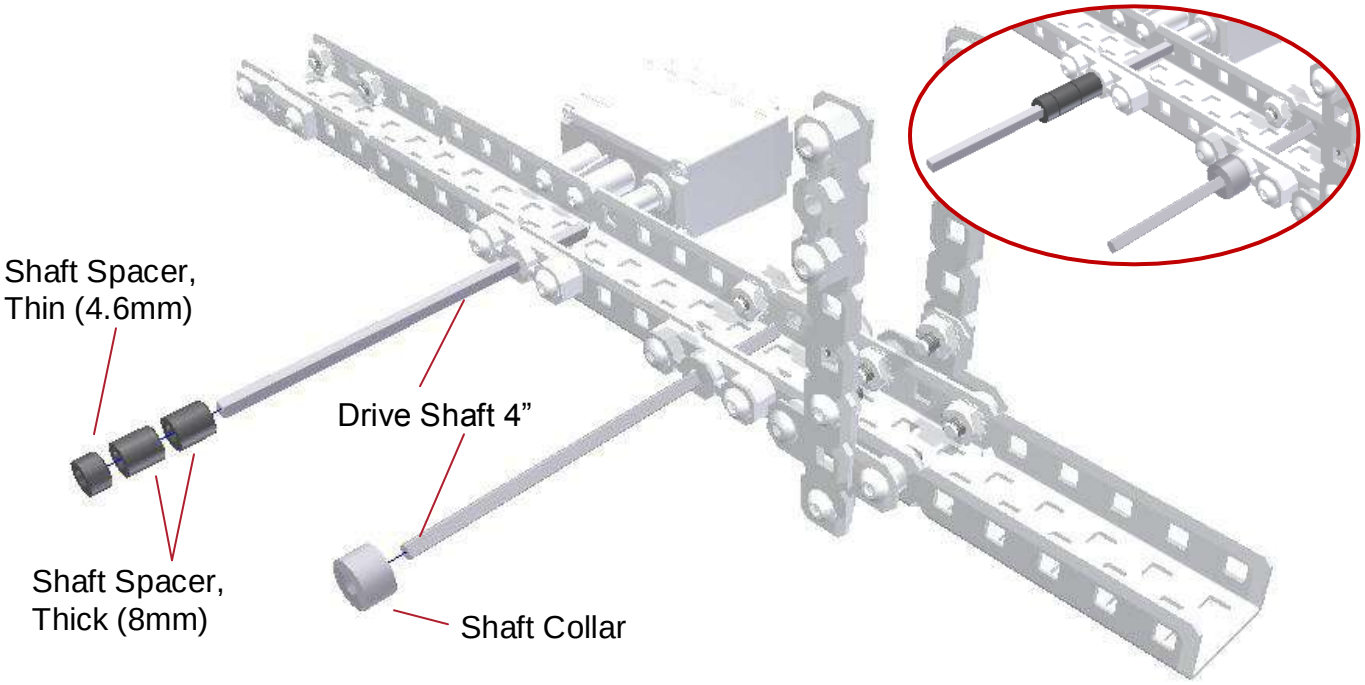
Information- 2-Wire Motor 393 High Speed and Low Speed Gear Setup Reference



Step 6 – Elevation Arm Assembly Continued – Launcher Gear System

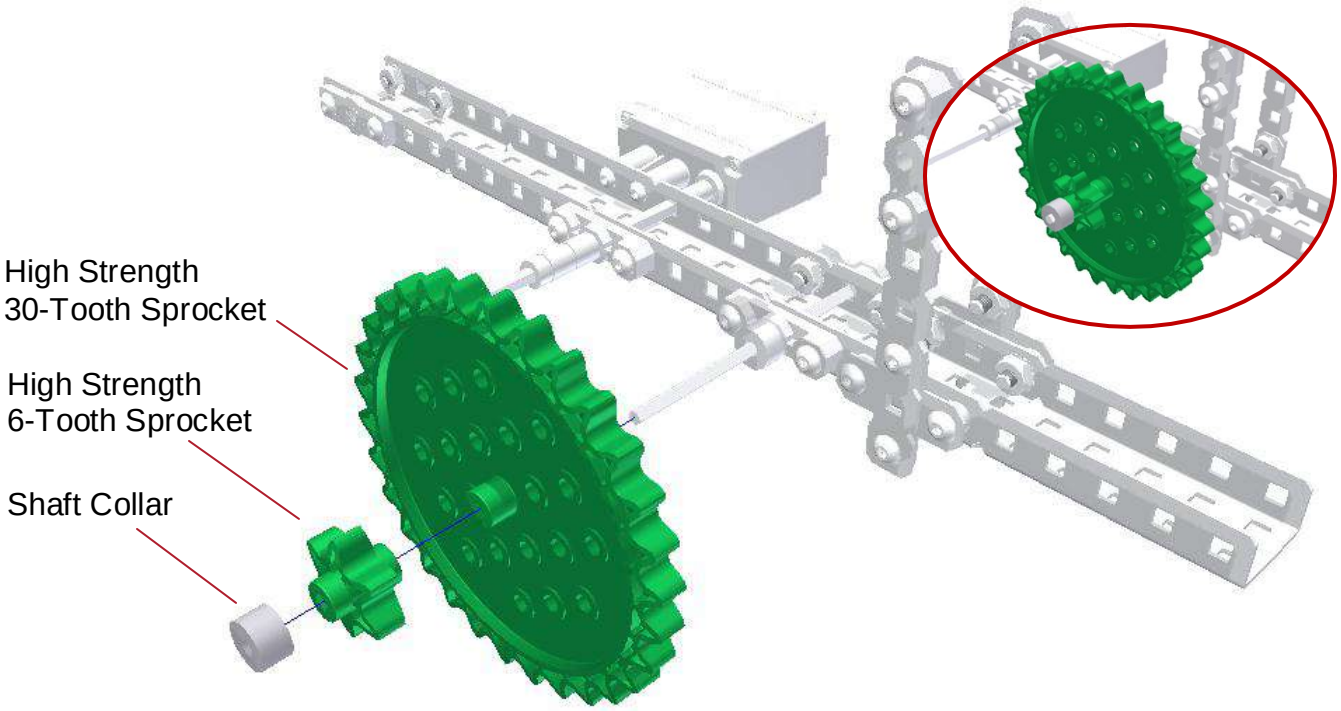


Step 7 – Elevation Arm Assembly Continued – Launcher Gear System Continued

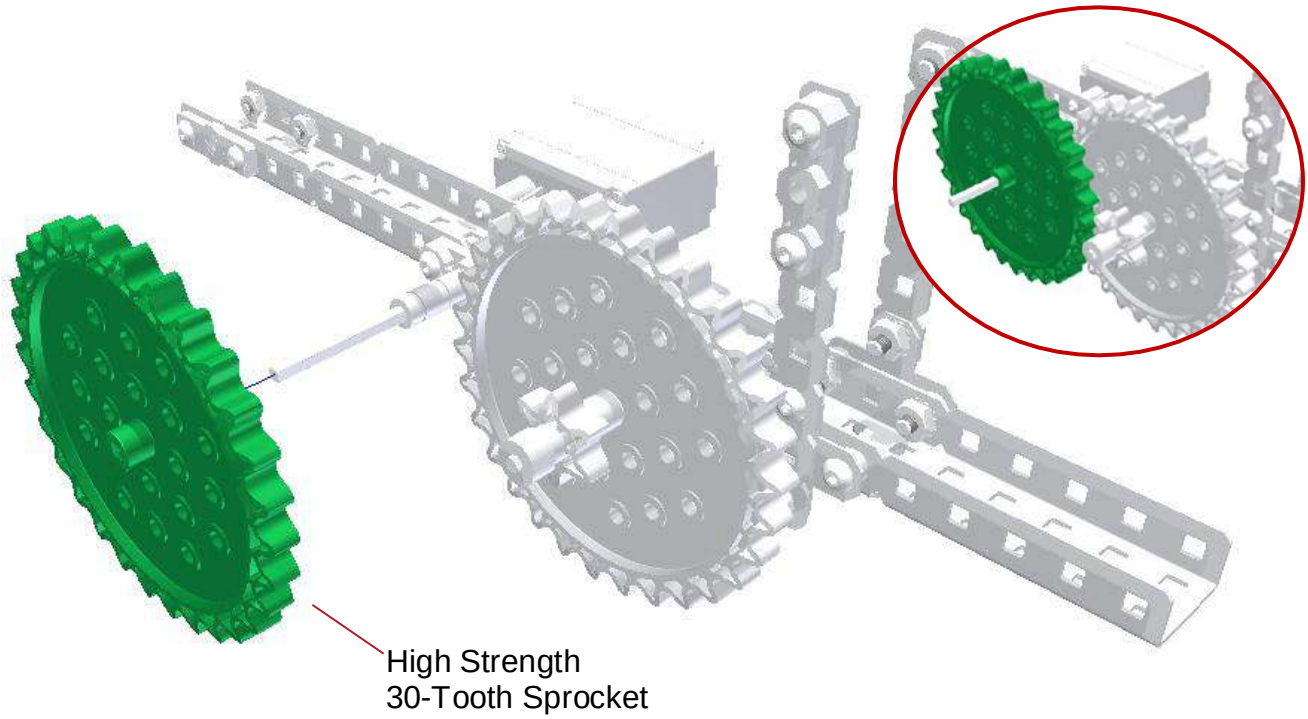


POE Ballistic Device Build Instructions

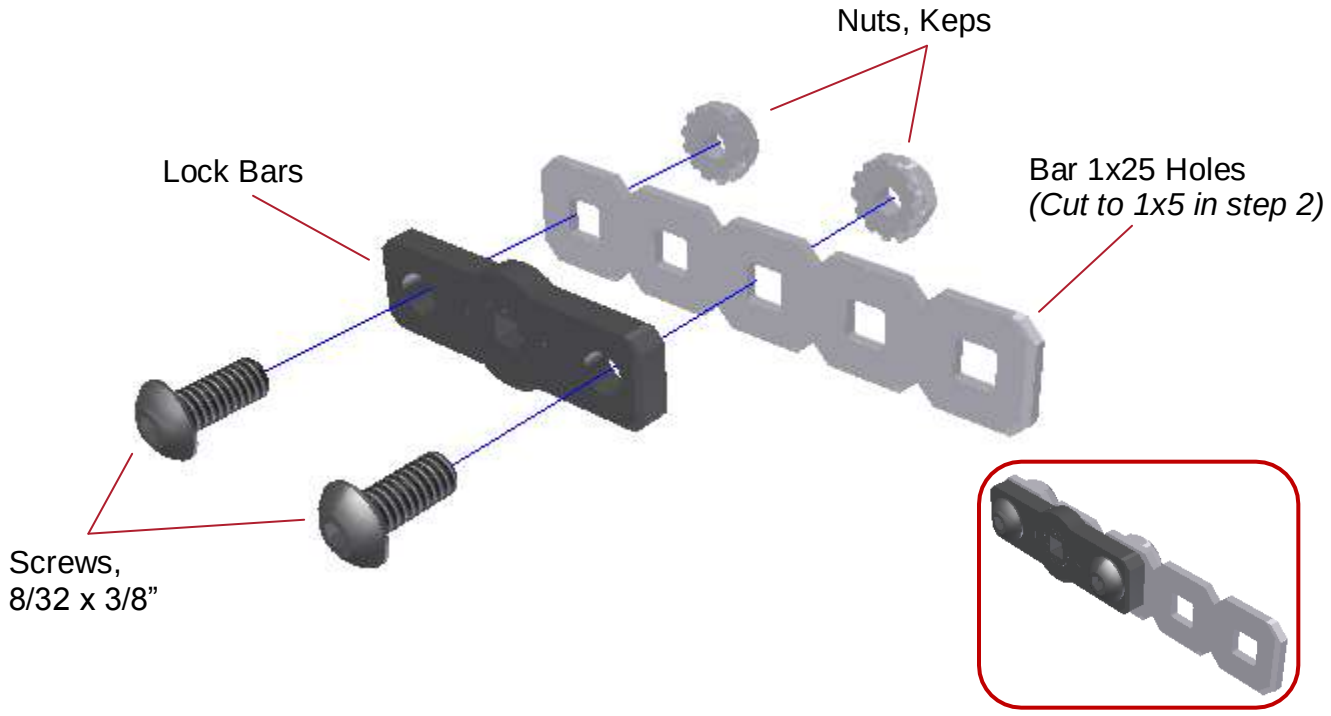
Step 8 – Elevation Arm Assembly Continued – Launcher Gear System Continued



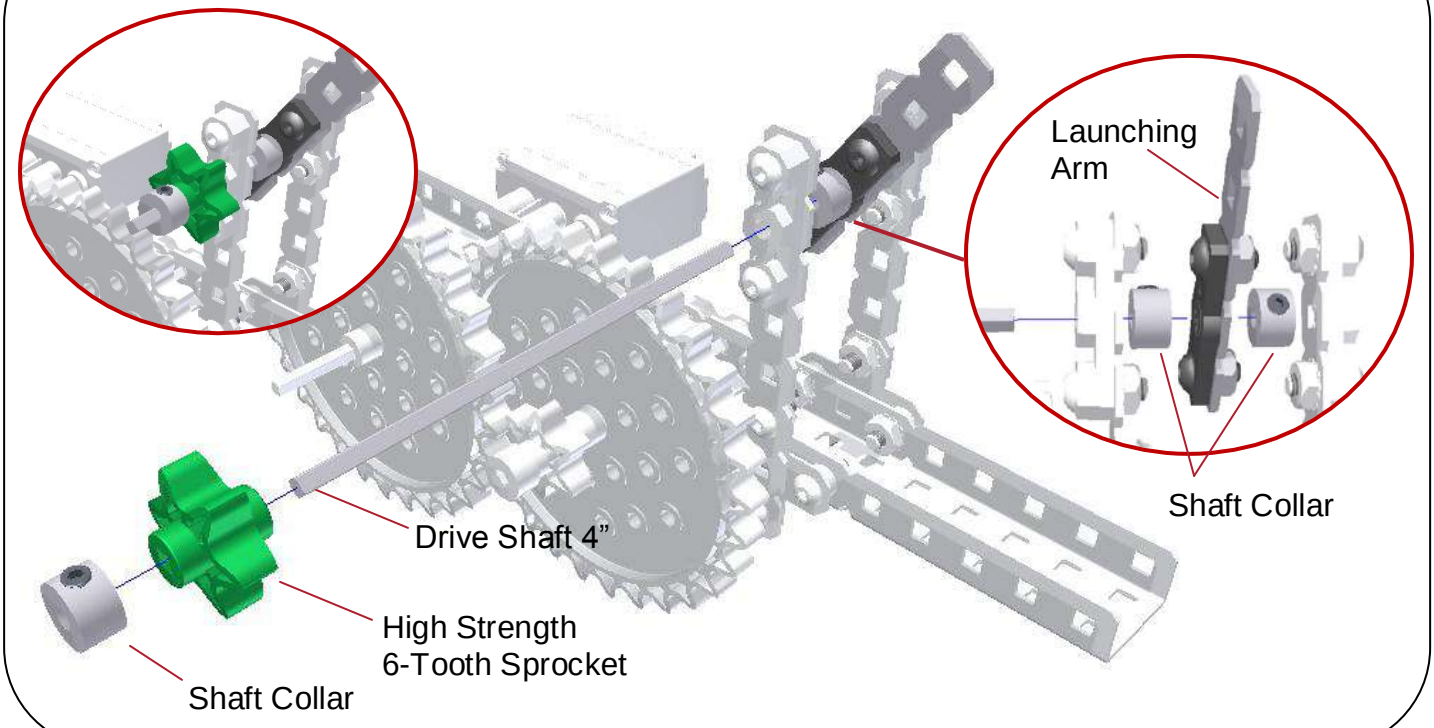
Step 9 – Elevation Arm Assembly Continued – Launcher Gear System Continued



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

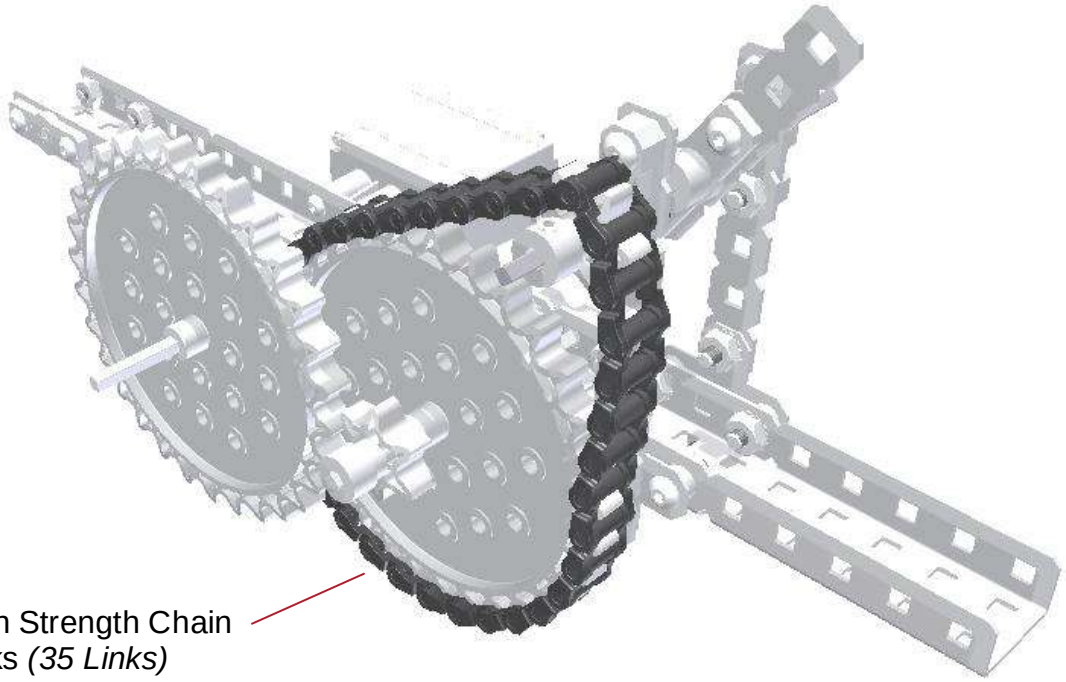


Step 11 – Elevation Arm Assembly Continued – Launcher Gear System Continued



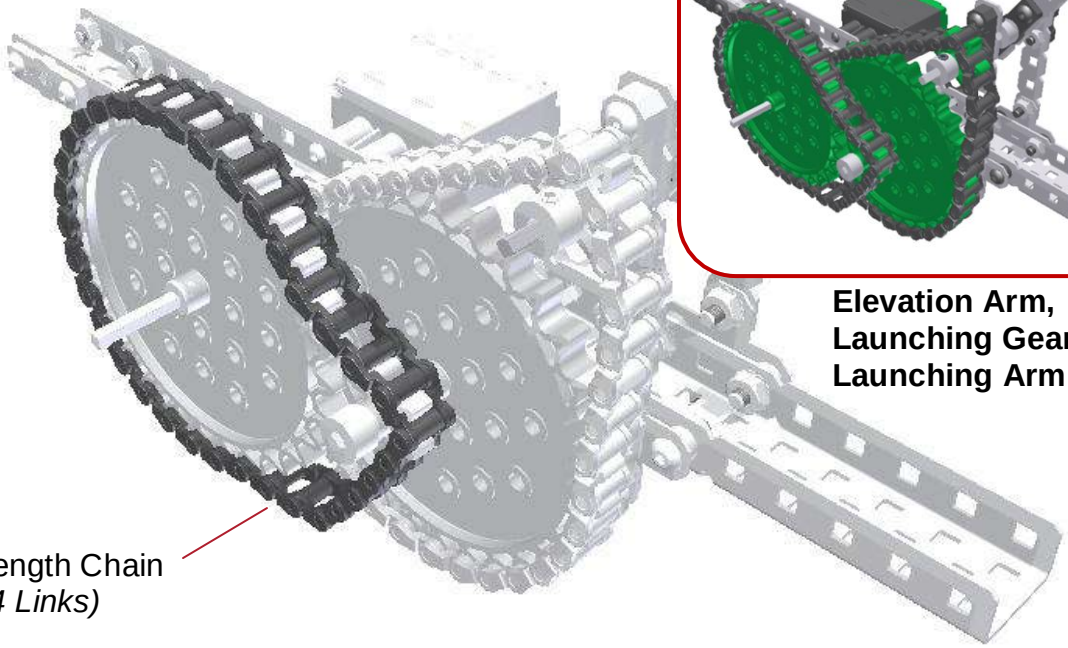
POE Ballistic Device Build Instructions

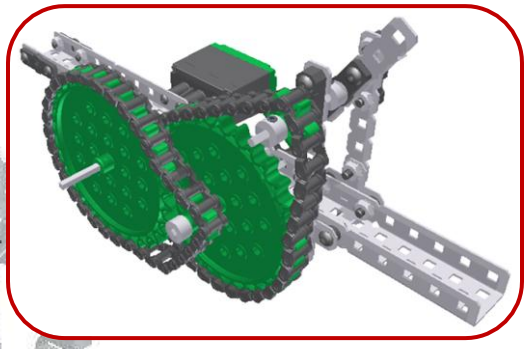
Step 12 – Elevation Arm Assembly Continued – Launcher Gear System Continued



High Strength Chain Links *(35 Links)*

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



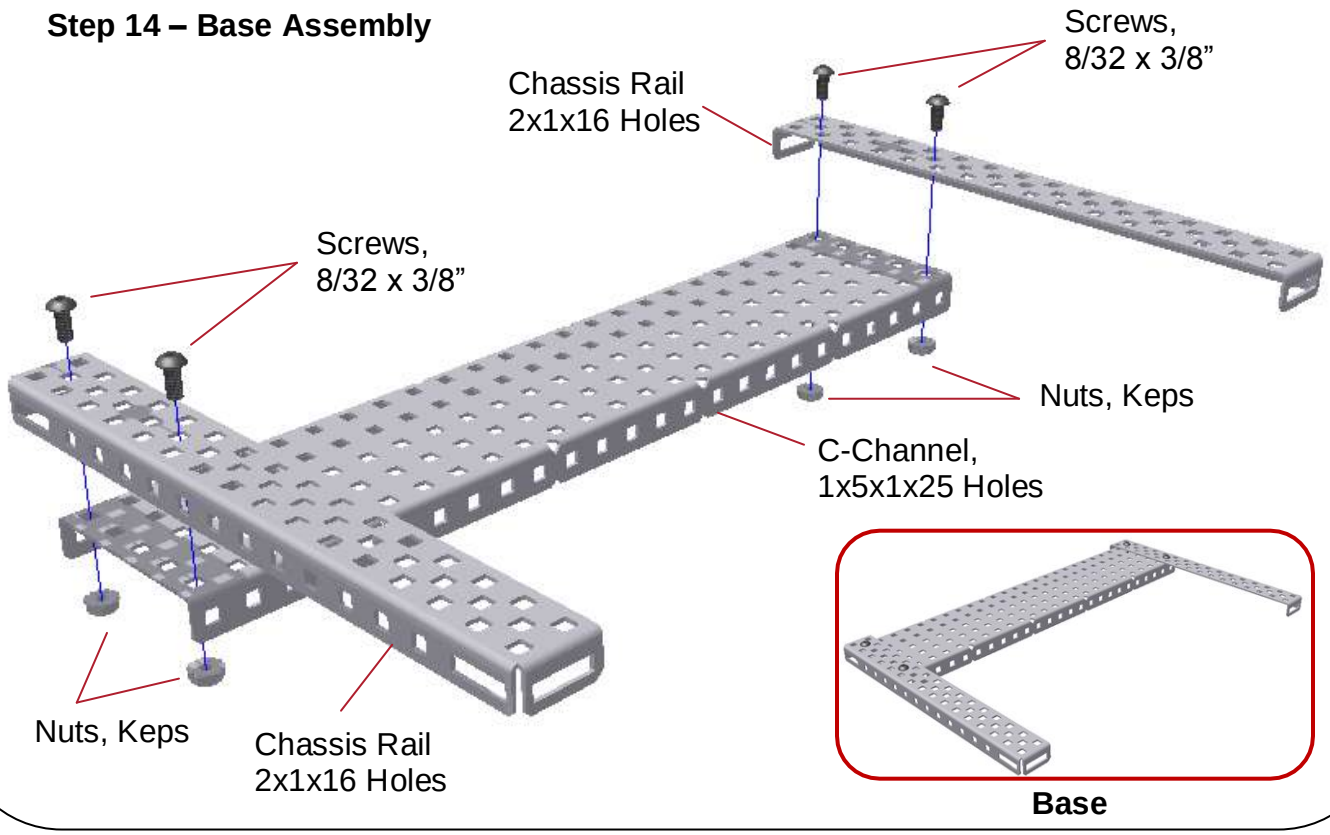


Elevation Arm, Launching Gears, & Launching Arm

High Strength Chain Links *(34 Links)*

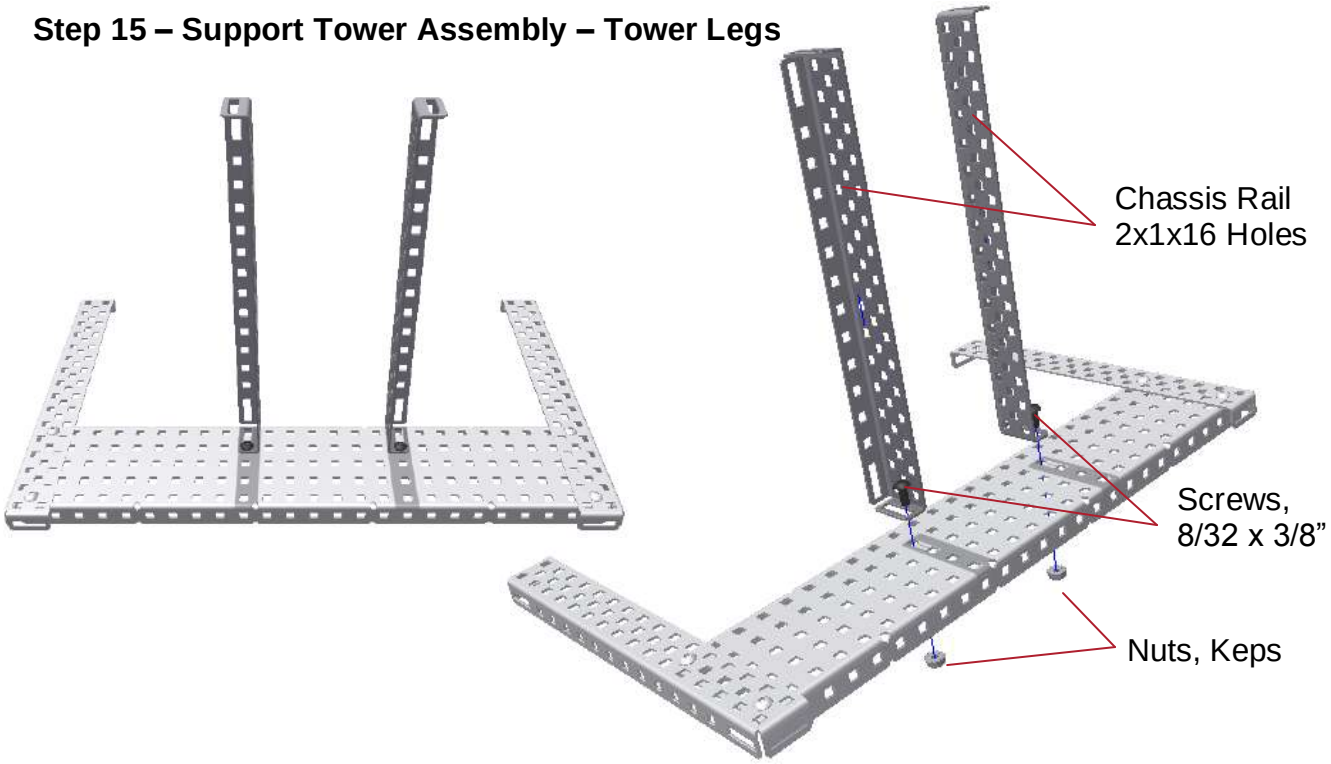
POE Ballistic Device Build Instructions

Step 14 – Base Assembly



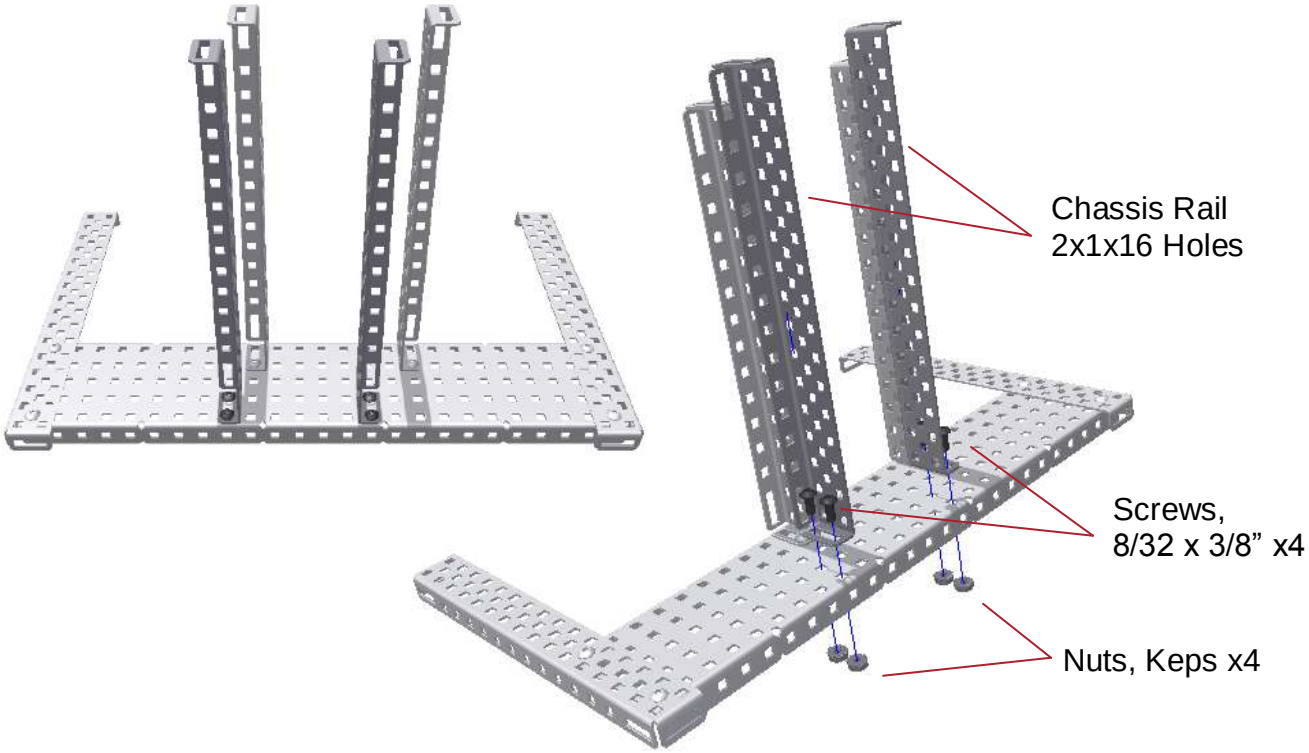
Base

Step 15 – Support Tower Assembly – Tower Legs

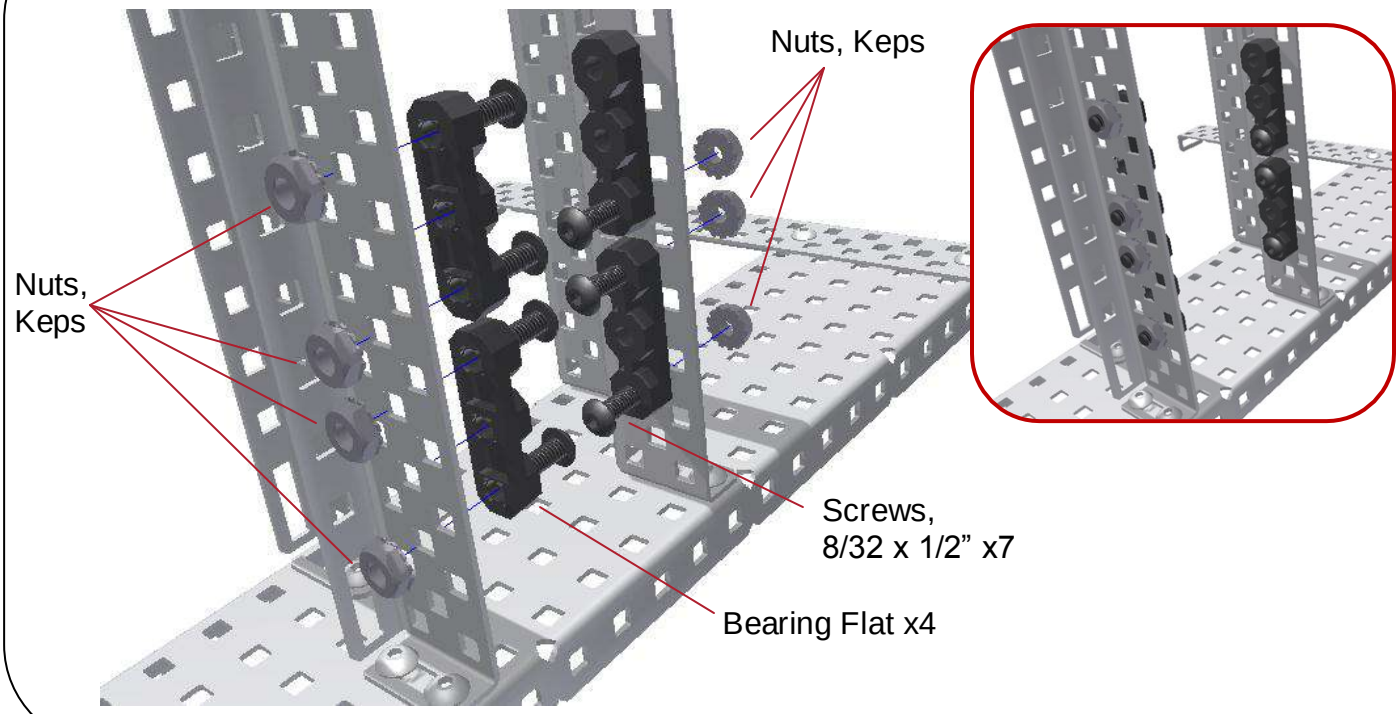


POE Ballistic Device Build Instructions

Step 16 – Support Tower Assembly – Tower Legs - Continued

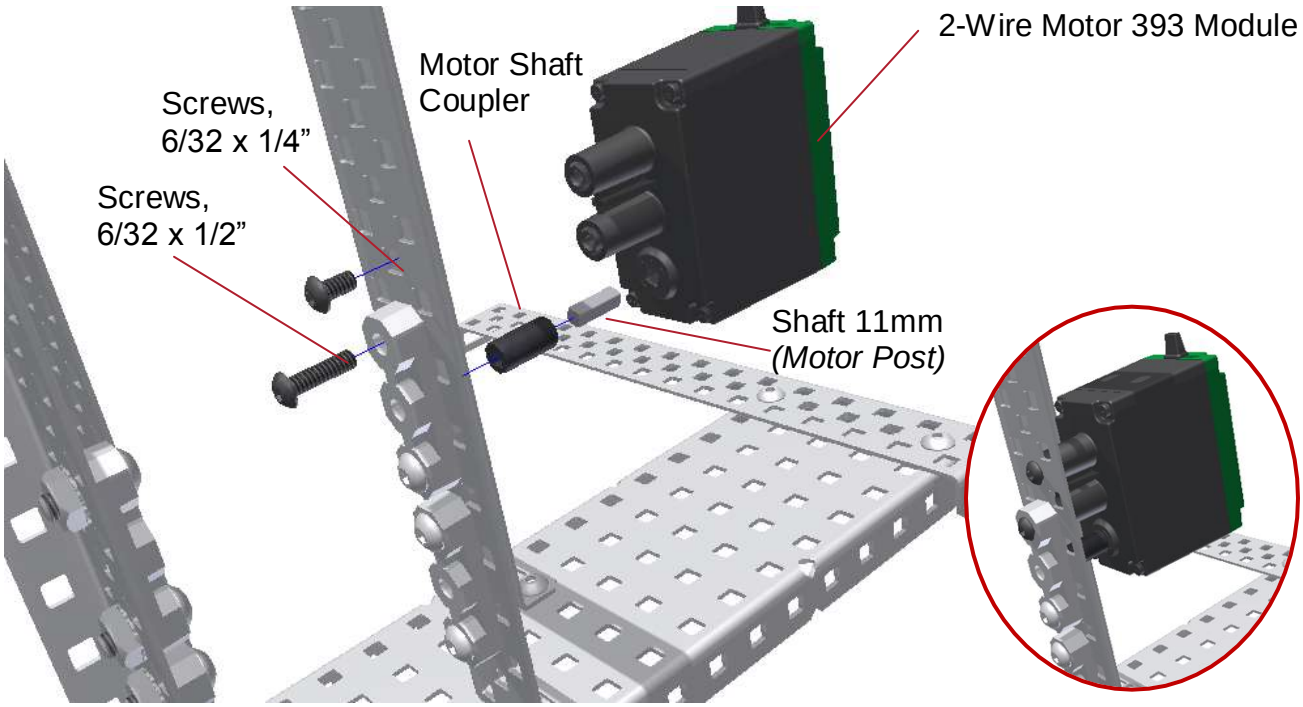


Step 17 – Support Tower Assembly – Rear Shaft Bearings

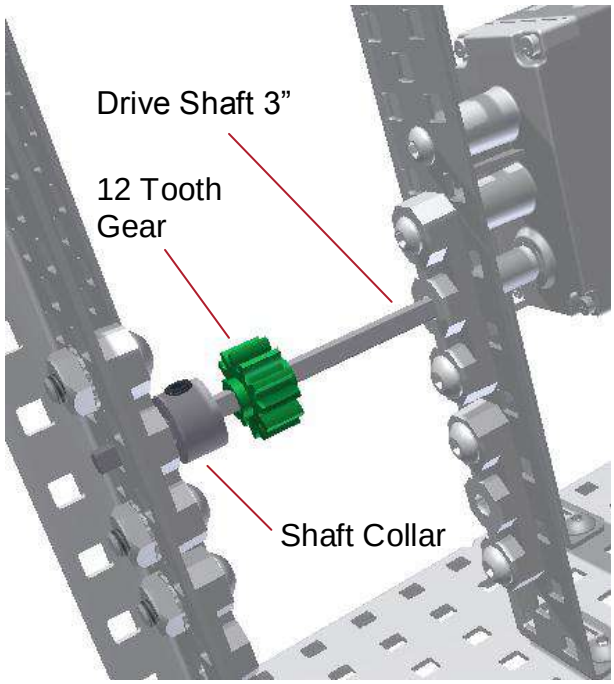


POE Ballistic Device Build Instructions

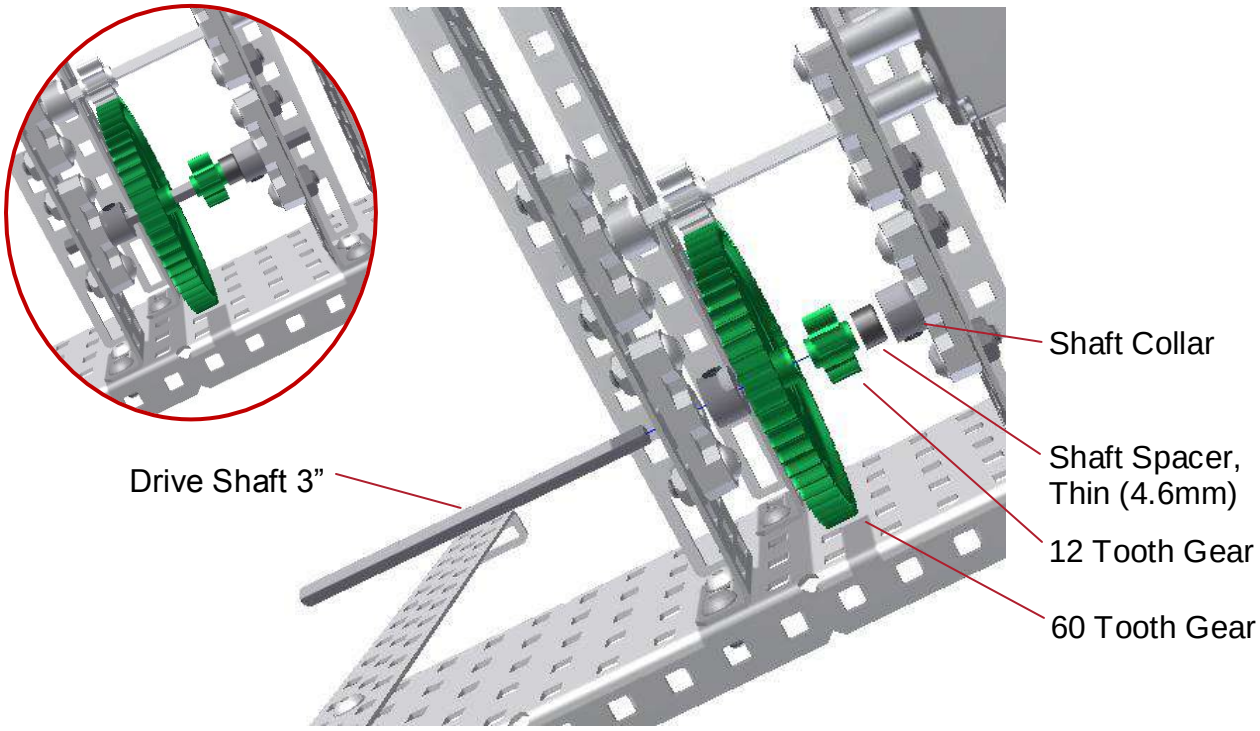
Step 18 – Support Tower Assembly – Elevation Motor



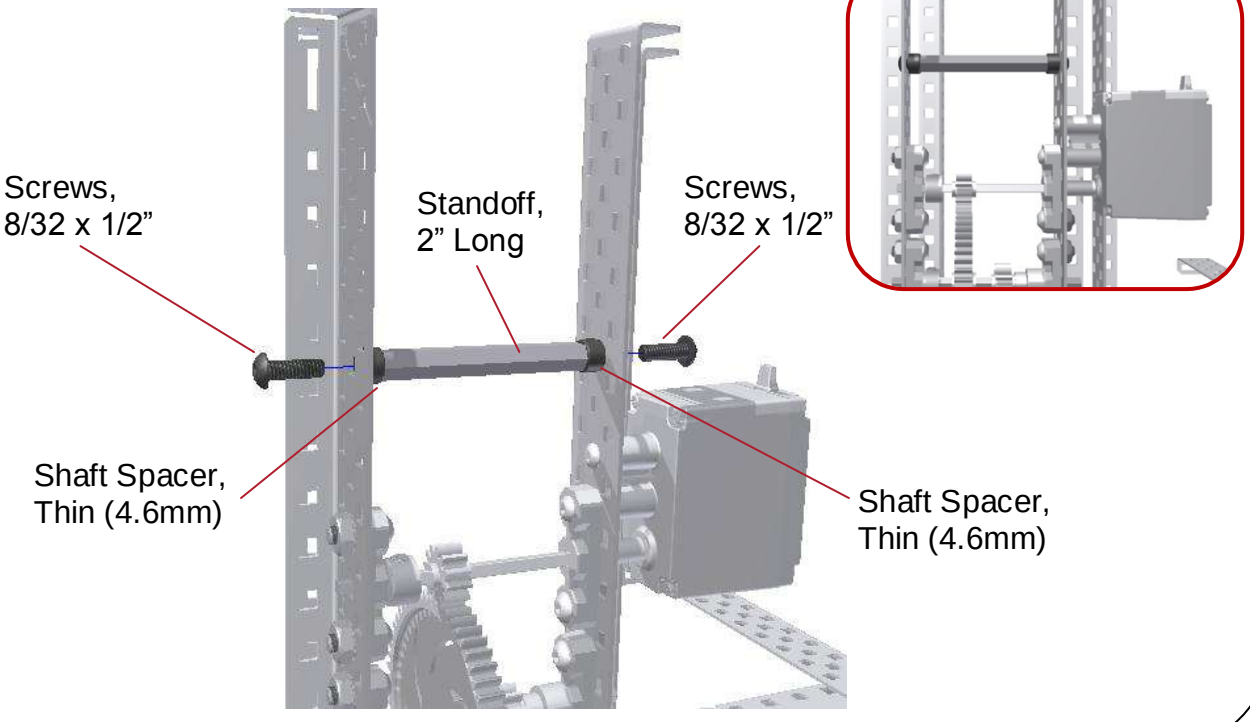
Step 19 – Support Tower Assembly – Elevation Gear System



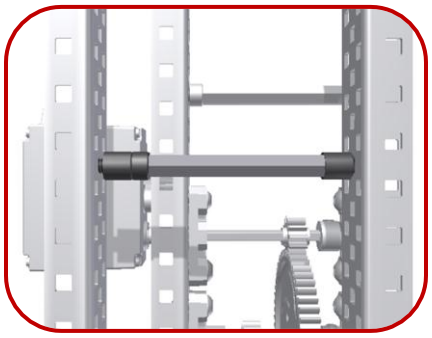
Step 20 – Support Tower Assembly – Elevation Gear System Continued

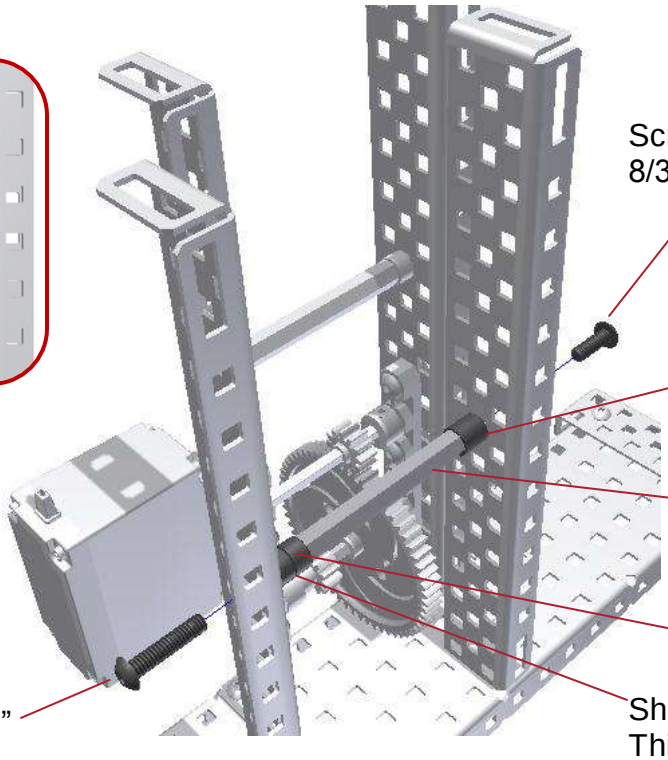


Step 21 – Support Tower Assembly – Bracing - Back

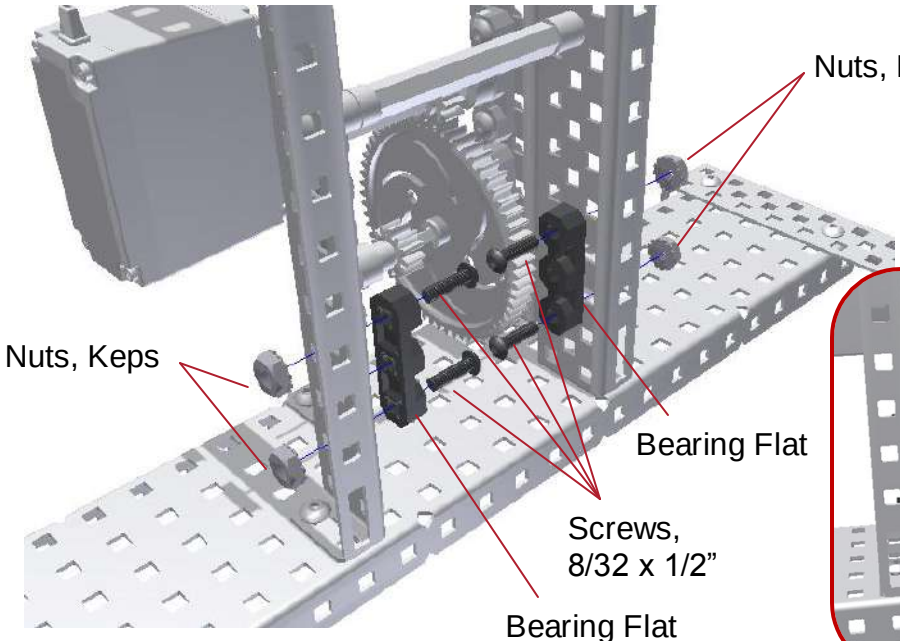


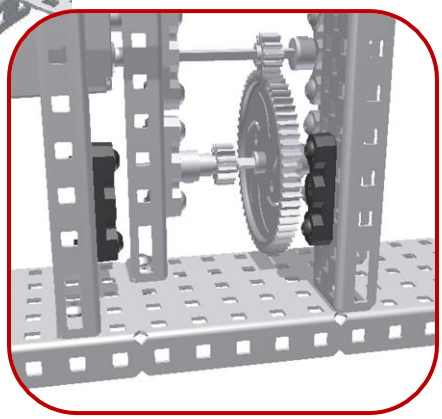
Step 22 – Support Tower Assembly – Bracing - Front





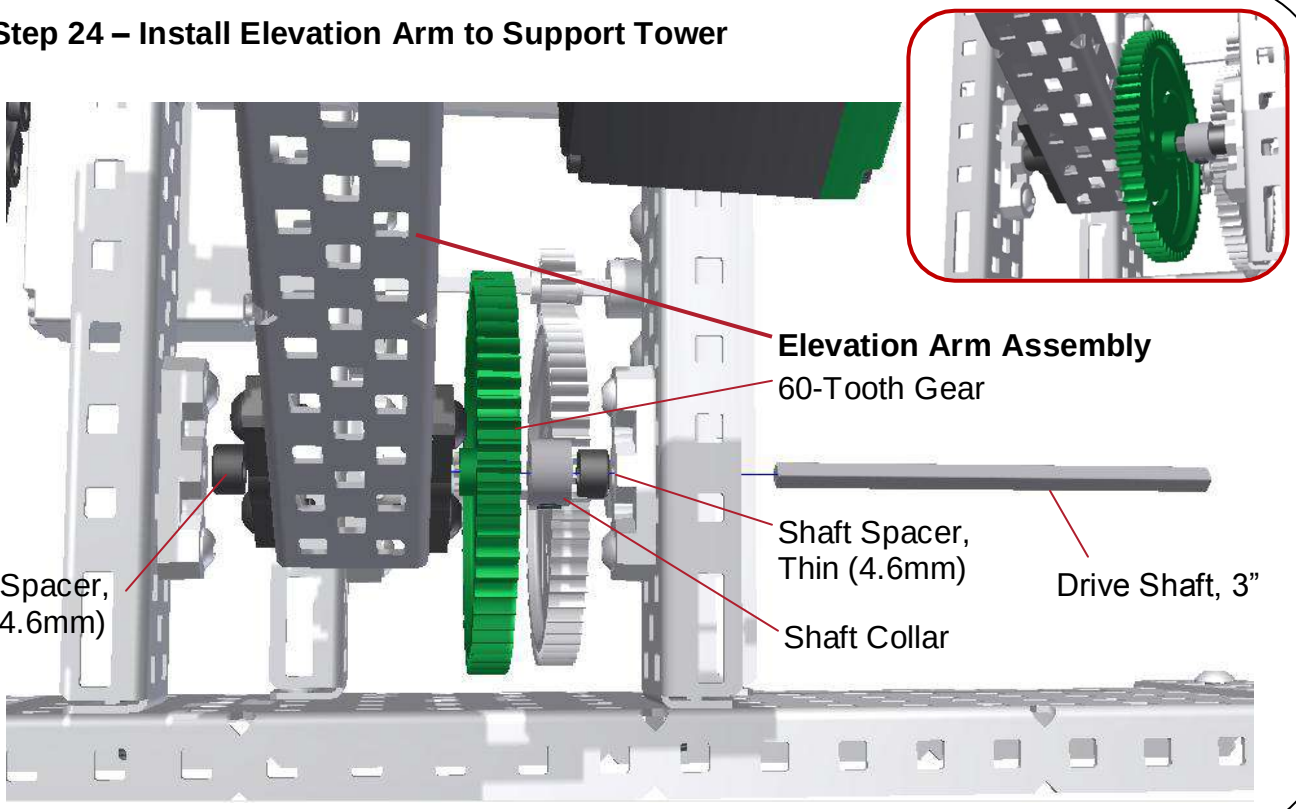
Step 23 – Support Tower Assembly – Front Shaft Bearings



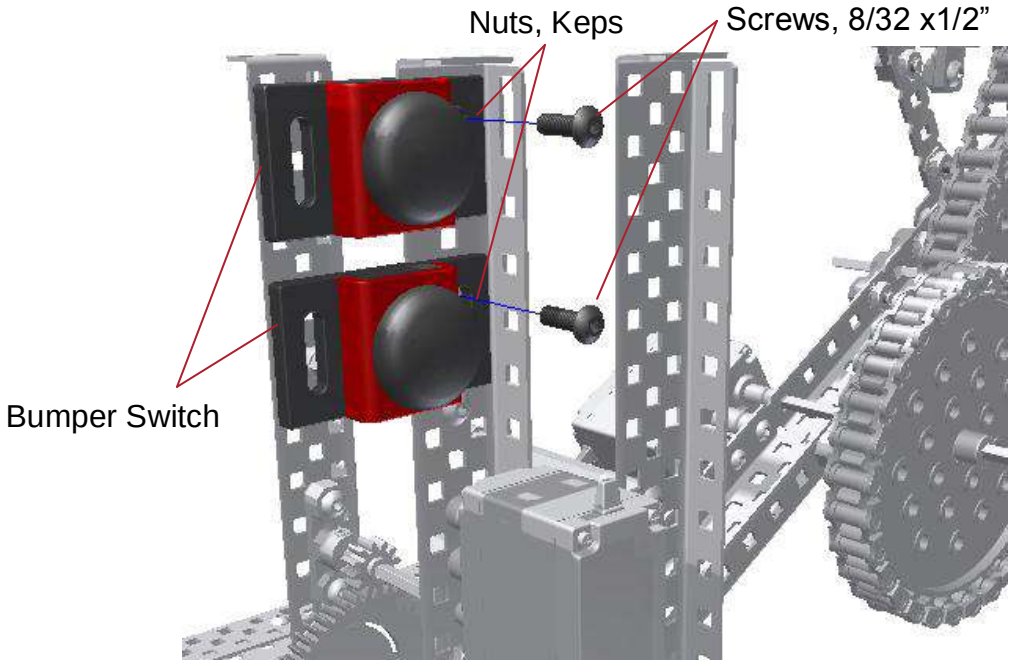


POE Ballistic Device Build Instructions

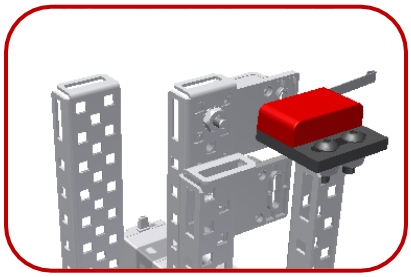
Step 24 – Install Elevation Arm to Support Tower

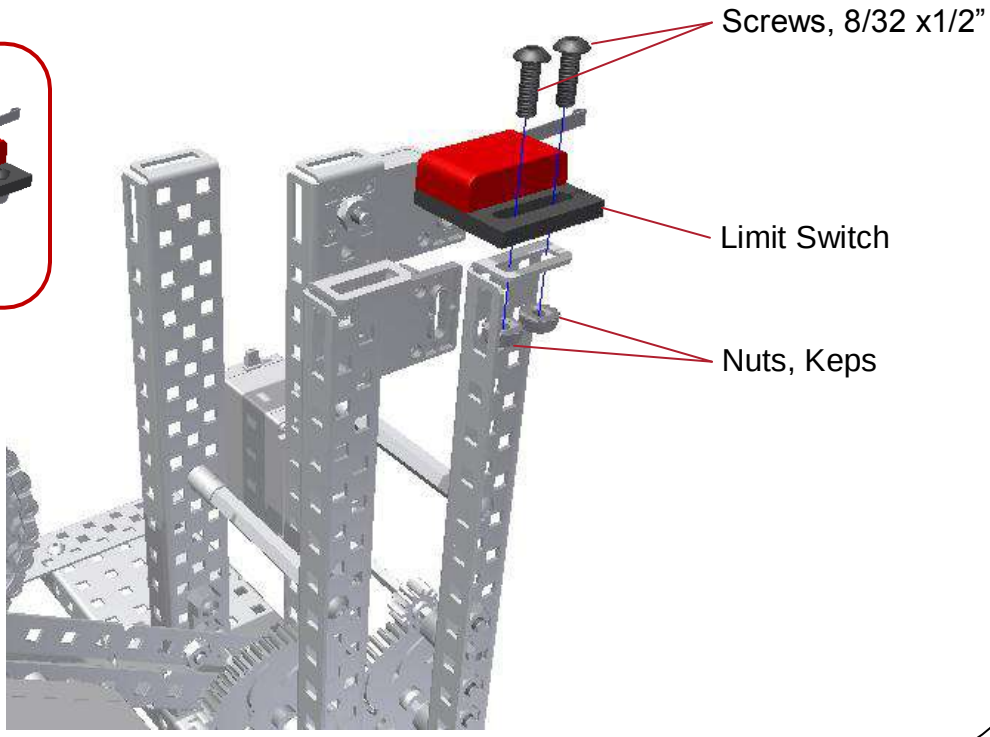


Step 25 – Install Bumper Switches on Rear Tower (Up and Down Elevation Inputs)

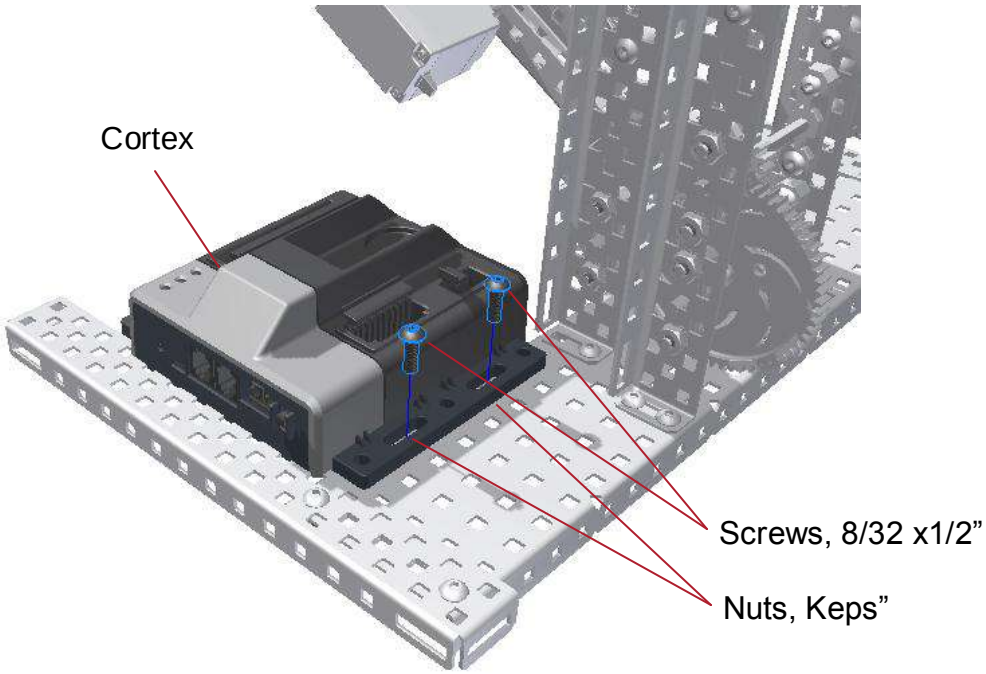


Step 26 – Install Limit Switch on Rear Tower (Ballistic Trigger)





Step 27 – Attach Cortex to Base



POE Ballistic Device Build Instructions

Step 28 – Attach Battery Strap and Battery