

HEBI
ROBOTICS



4-DoF SCARA Style Arm Kit

Assembly Instructions

General Warnings and Cautions

Danger (May cause serious injury or death)

- Keep water, flammables, solvents and other liquids clear from actuator.
- Never place fingers, arms, toes and other body parts near actuator during operation.
- Cut power if actuator emits strange odors or smoke.
- Keep actuator out of reach of children.

Warning (May cause injury or damage to actuator)

- Before operating, read all applicable instructions and notices found here:
<http://docs.hebi.us/#quickstart-guide-x-series-actuator>
- Comply with the operating temperature (-10°C to 50°C)
- Turn off power source before connecting or disconnecting actuator power.
- Do not expose the actuator to permanent and strong magnetic fields.
- The actuator must not be exposed to dusty or wet environments.
- If actuator is under load, abruptly removing the power connection can cause permanent damage.
- Do not force screws into the bottom of the actuator.
 - **X5**: 5mm tap depth
 - **X8**: 7mm tap depth
- Use provided hardware with accessories and hand tighten as needed.
- Do not attempt to disassemble actuator, this will void the warranty and can cause permanent damage.

For more information please visit: ***docs.hebi.us***

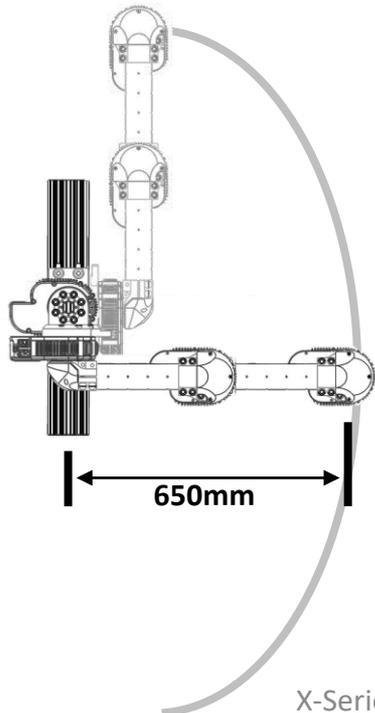
Technical Specifications

<u>Specifications</u>	<u>Value</u>
Weight (Excludes T-Slot Frame)	2.5 kg
Reach	650 mm
Max Continuous Payload*	1.00 kg
Max Peak Payload*	1.50 kg

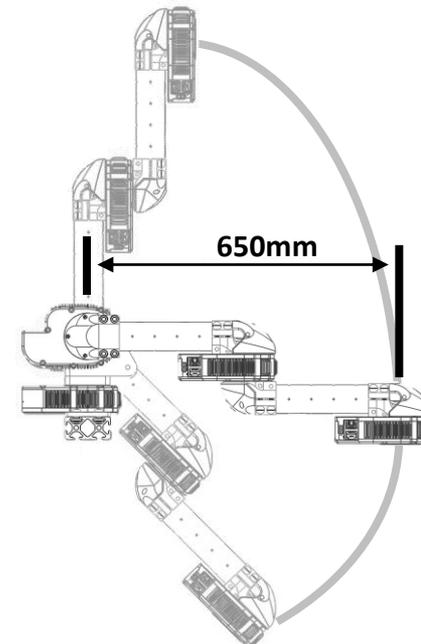
Calculated using Default Configuration.
Using a different configuration of X-Series Actuators will provide different payload capacities.

<u>Movement</u>	<u>Working Range</u>	<u>Max Speed</u>
Axis 1 – Base [Default: X5-4]	-50° to +80° (limited by wiring)	192°/s
Axis 2 – Shoulder [Default: X5-9]	-30° to +90°	84°/s
Axis 3 – Elbow [Default: X5-4]	-155° to +155° (avoid end effector collisions)	192°/s
Axis 4 – Wrist 1 [Default: X5-1]	Continuous (avoid end effector collisions)	540°/s

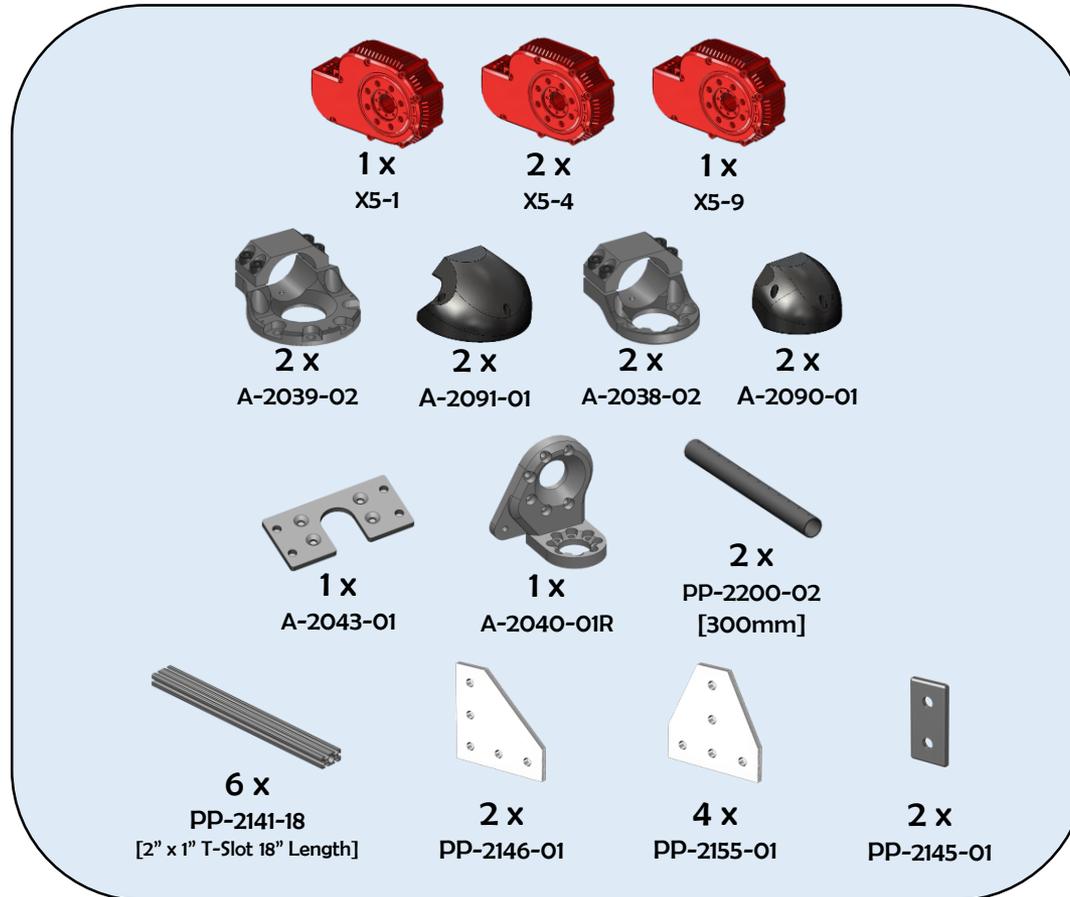
Top View



Side View



Bill of Materials - Mechanical*



fasteners included, not shown

Additional T-Slot components available from McMaster-Carr or 80/20 Inc.

Bill of Materials - Electrical



2 x
A-2128-01
Power Distribution Board



1 x
A-2048-02
Power Jumper



2 x
A-2046-12
Power Cable, 12" Length



3 x
A-2046-18
Power Cable, 18" Length



1 x
A-2046-24
Power Cable, 24" Length

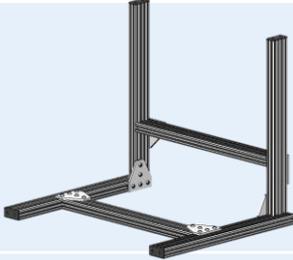
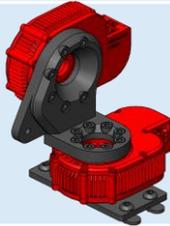
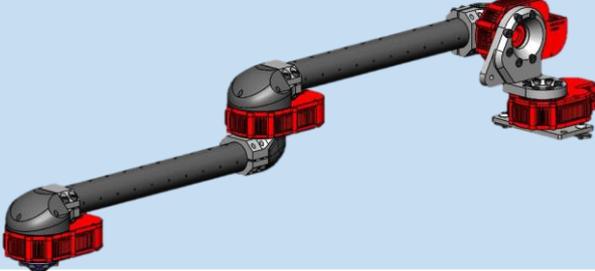


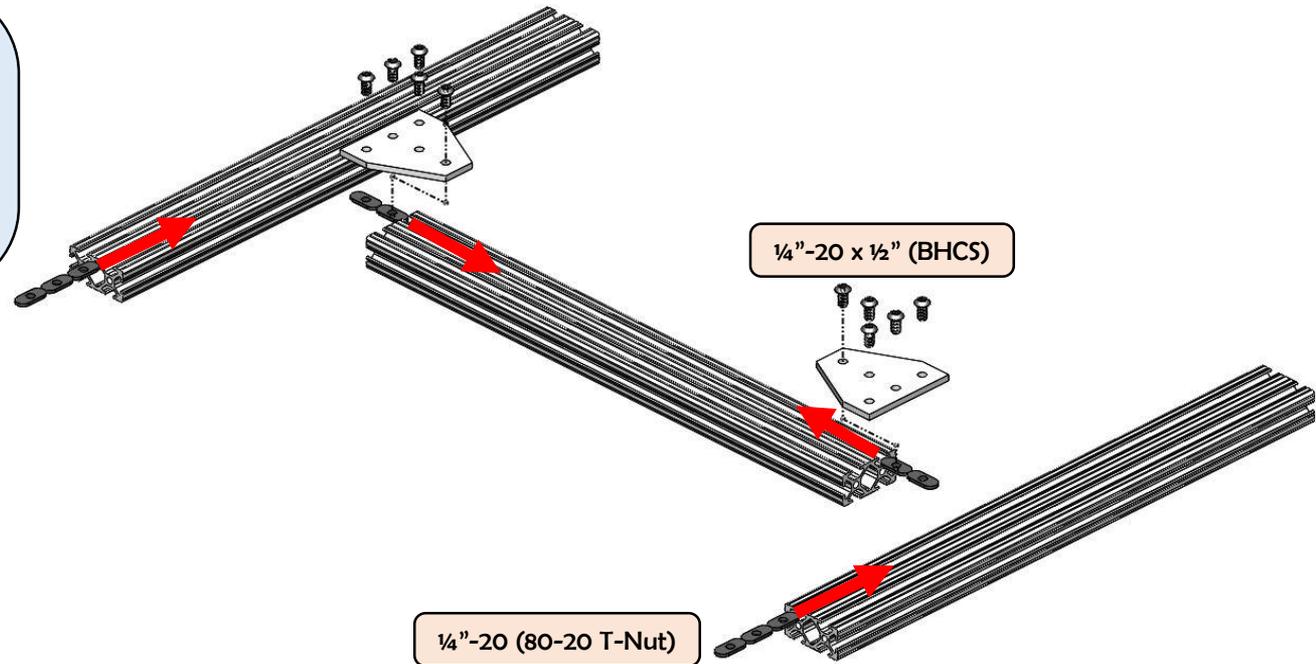
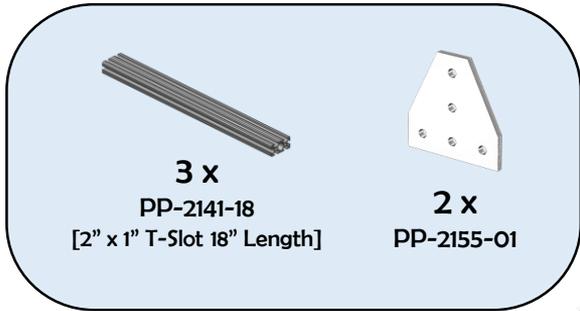
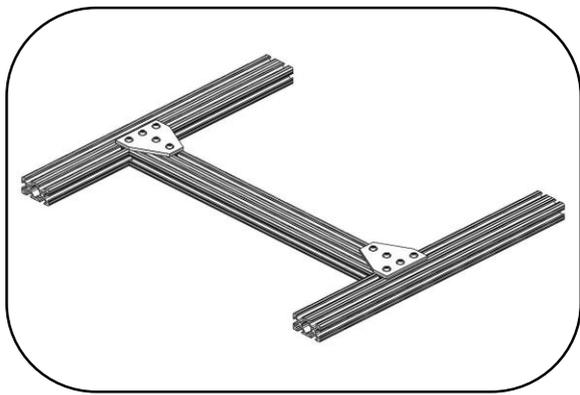
1 x
PP-2059-01
Ethernet Cable, 12" Length

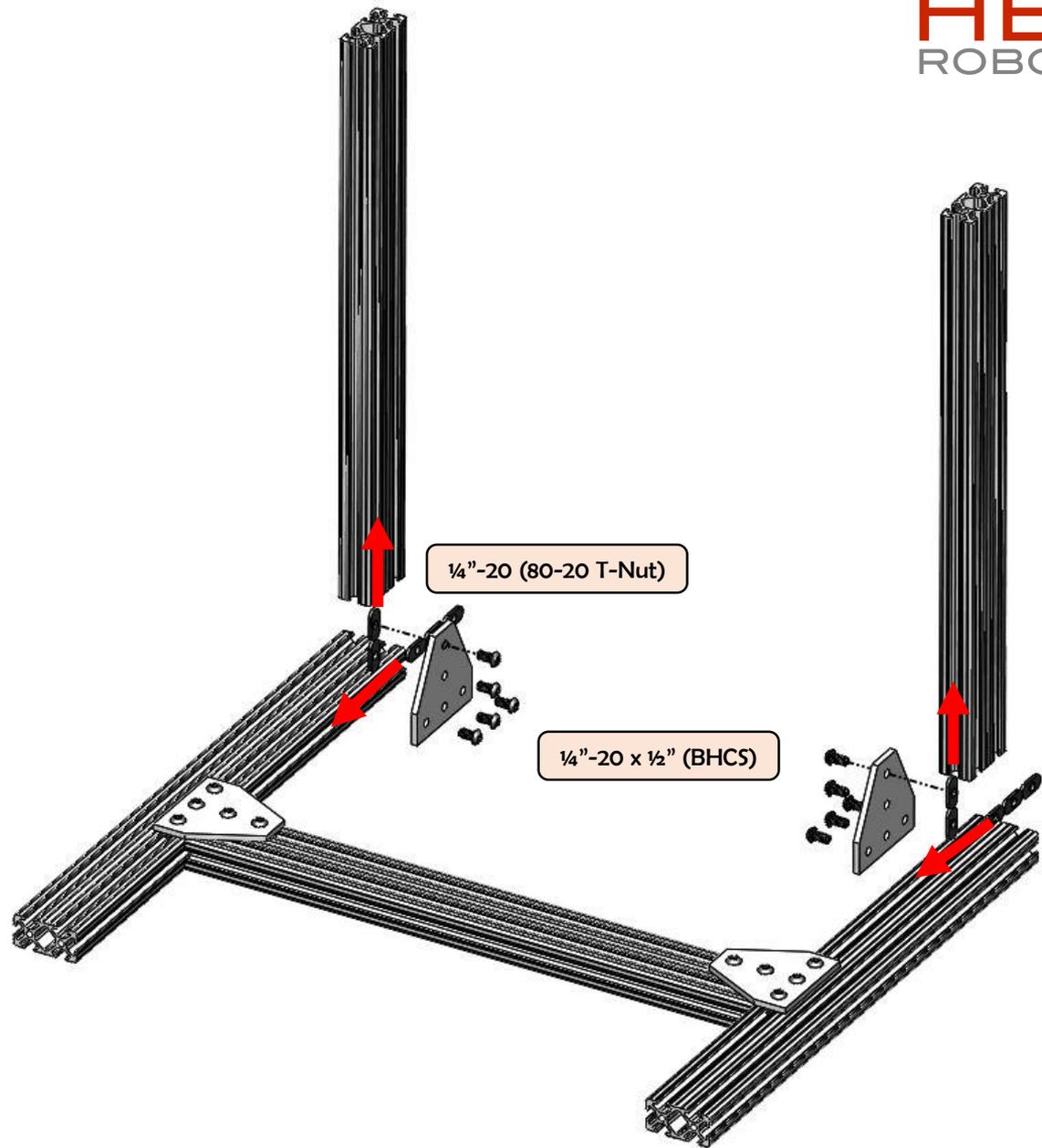
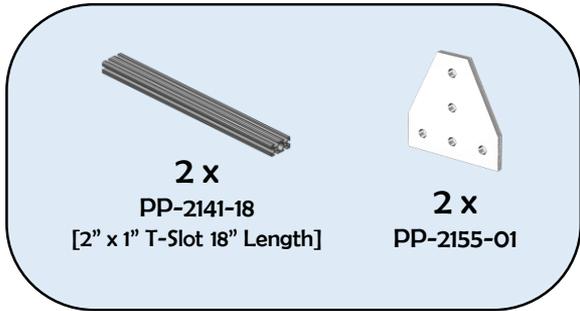
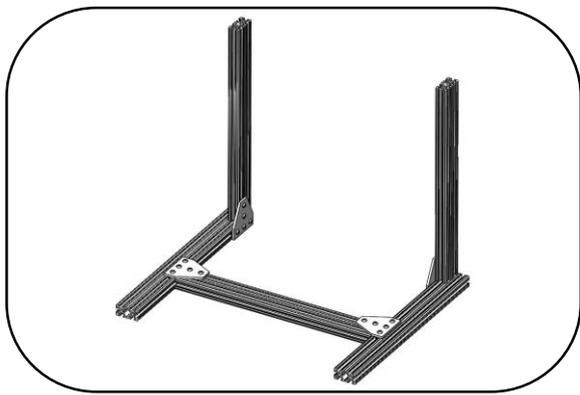


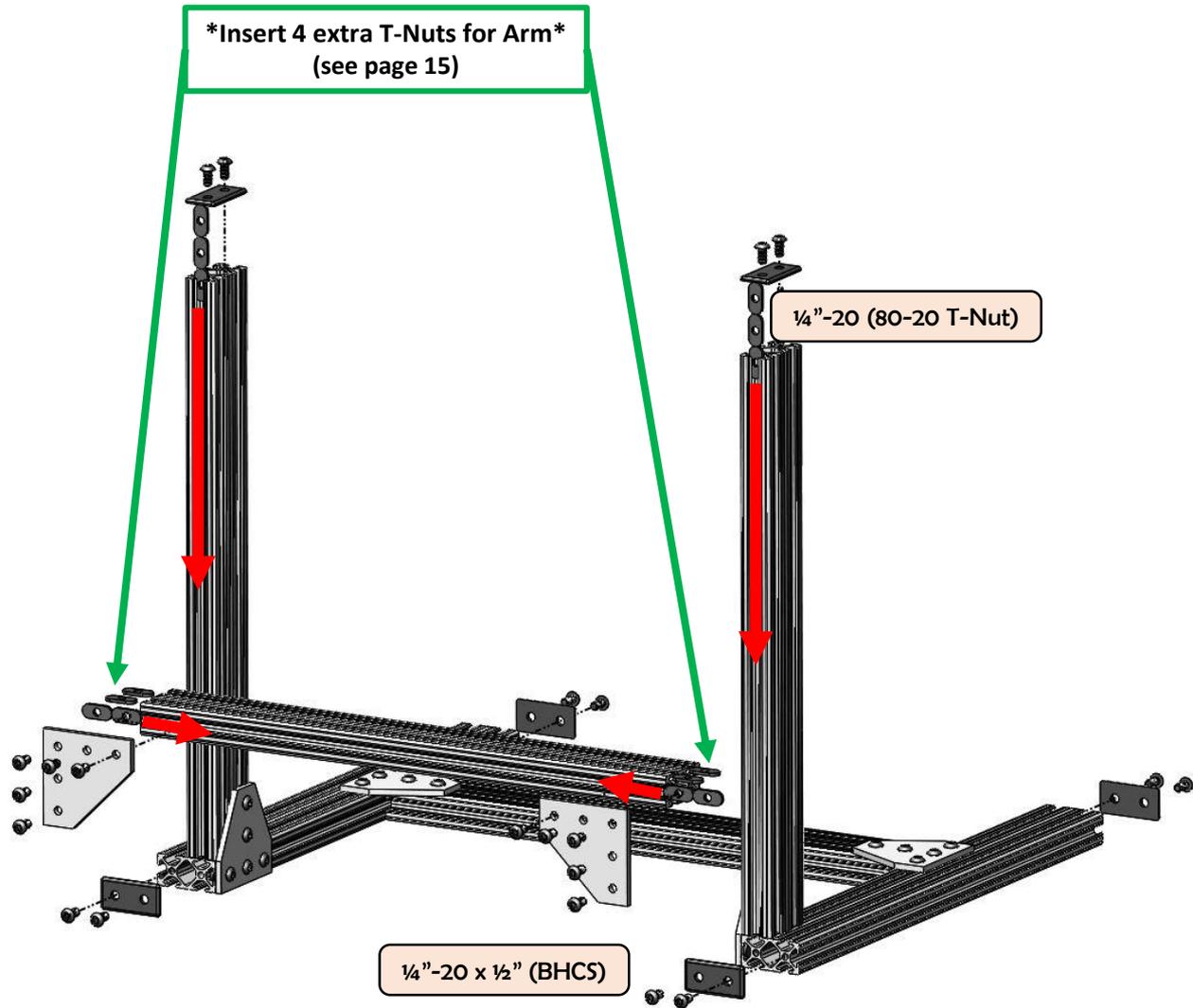
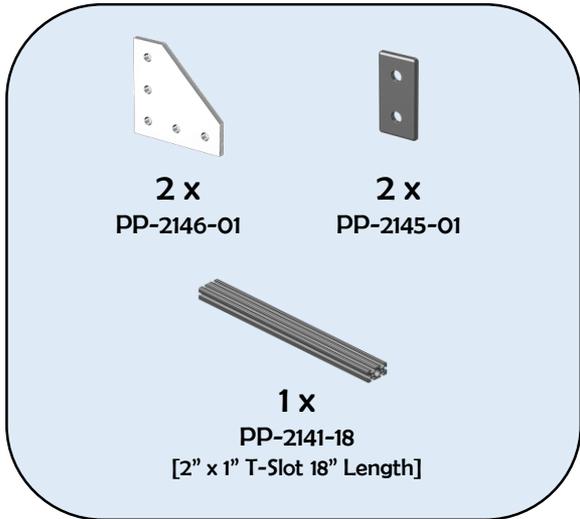
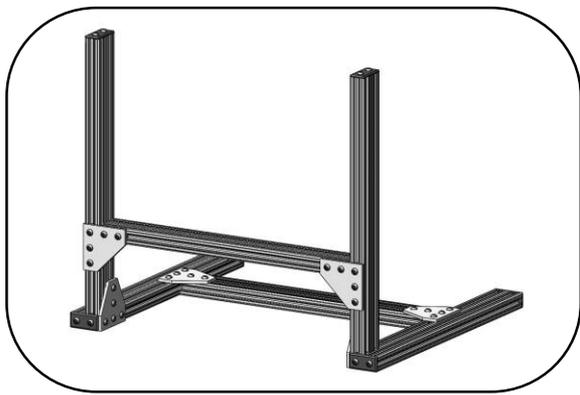
3 x
PP-2061-01
Ethernet Cable, 36" Length

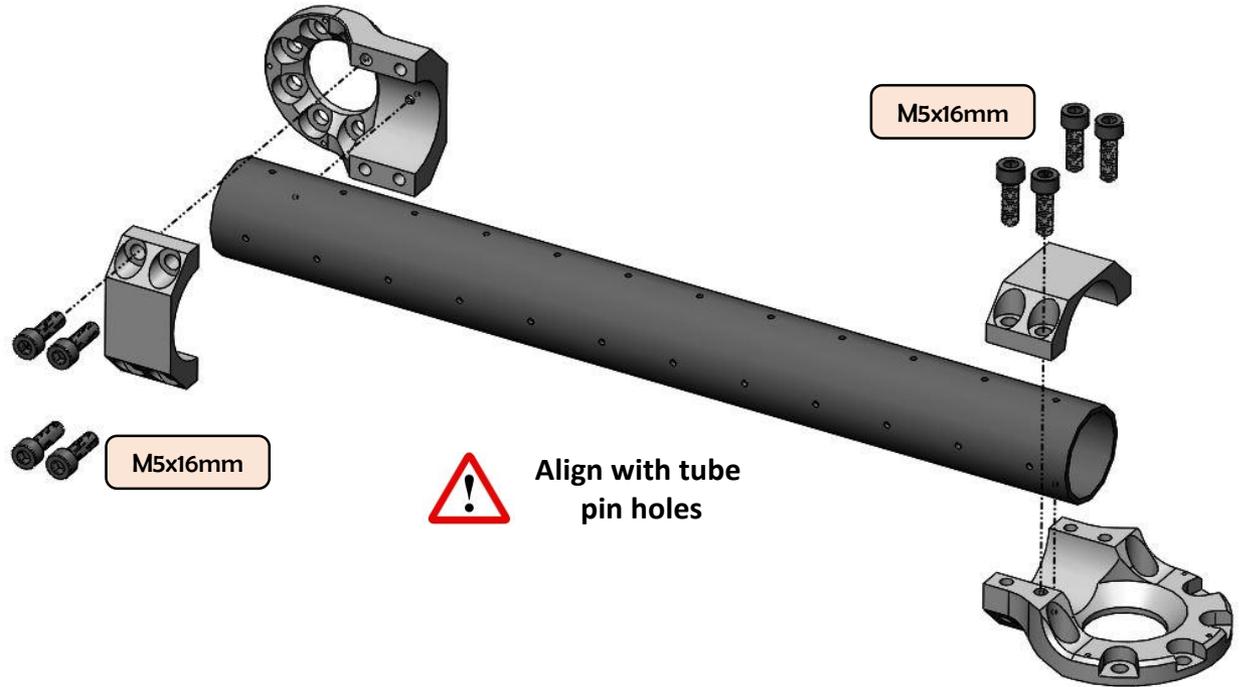
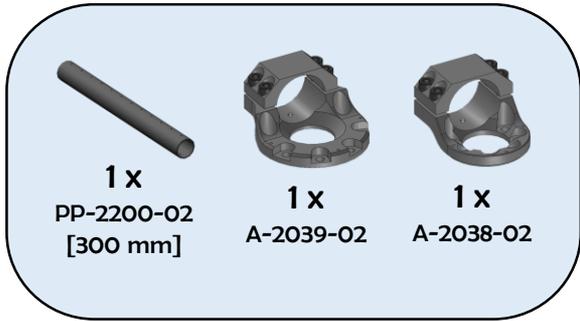
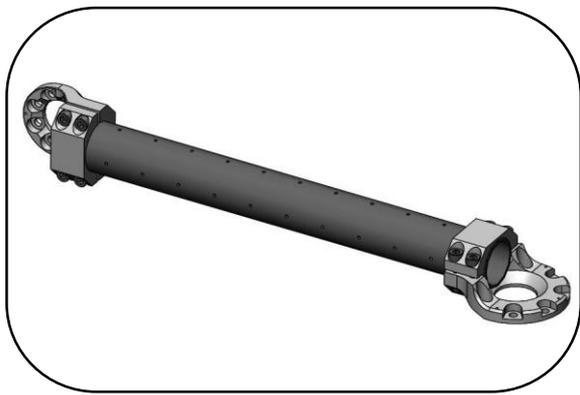
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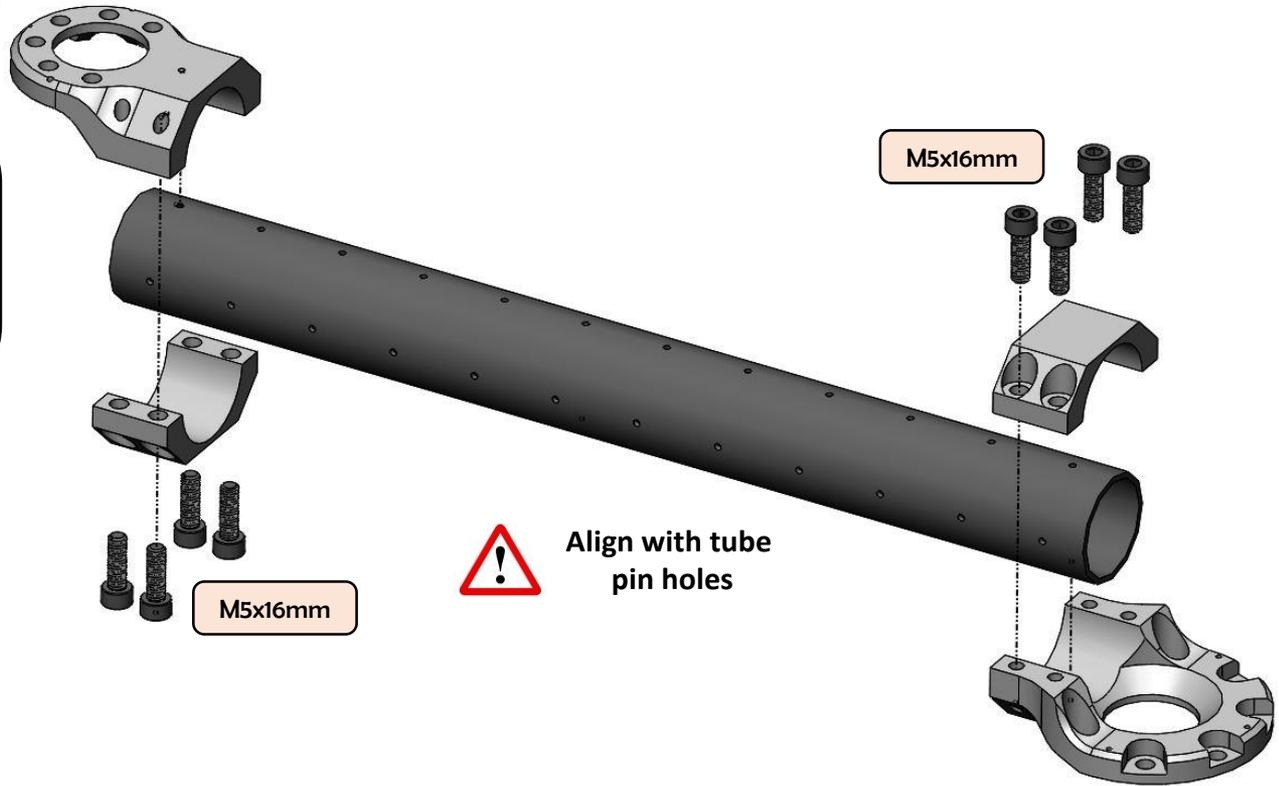
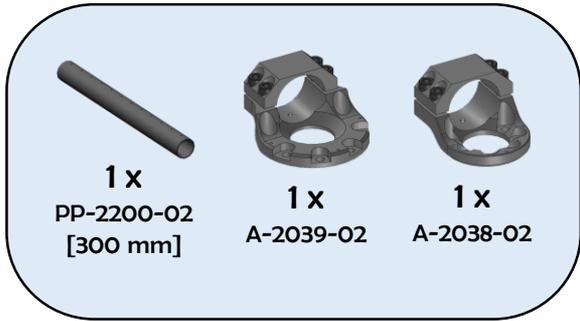
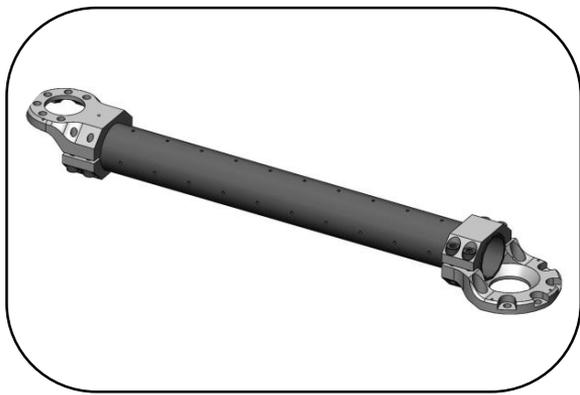
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Tubes		[9-10]
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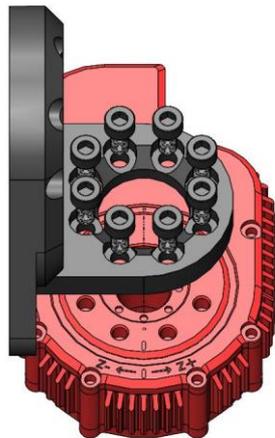
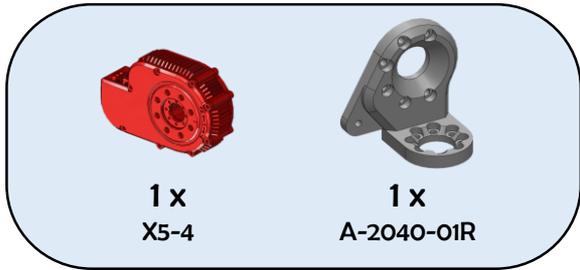




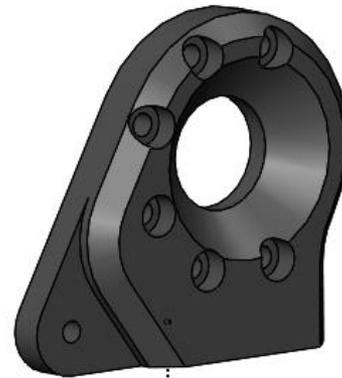








 **Align with actuator output hub tick mark (face parallel with tick mark and mounting hole pointed on same side)**



Flat face towards outside



M5x12mm

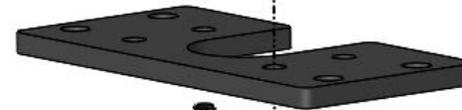
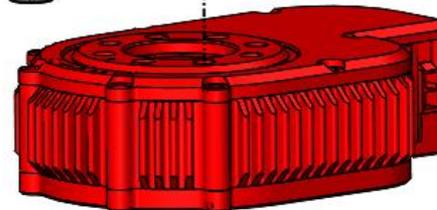
Step 2 of 2



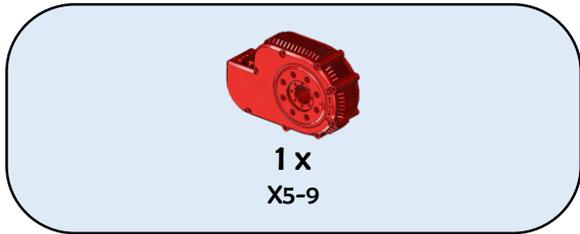
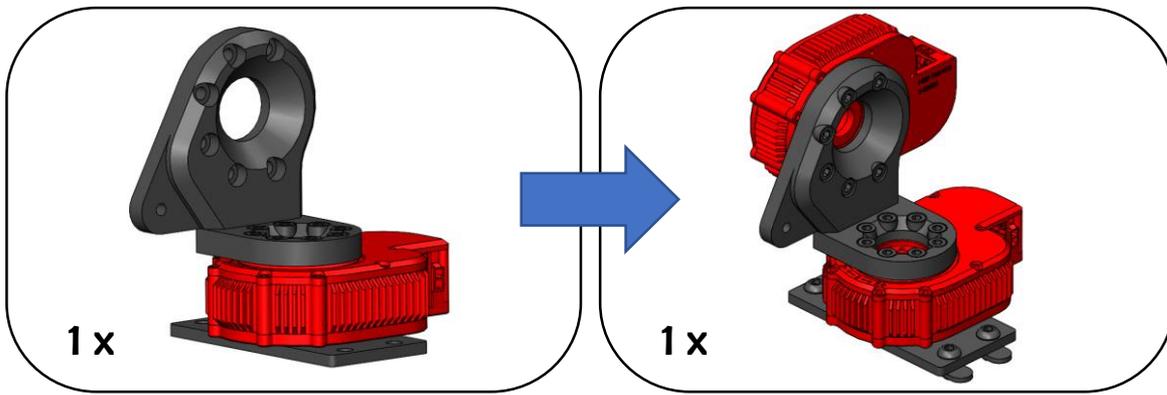
M6x12mm

Step 1 of 2

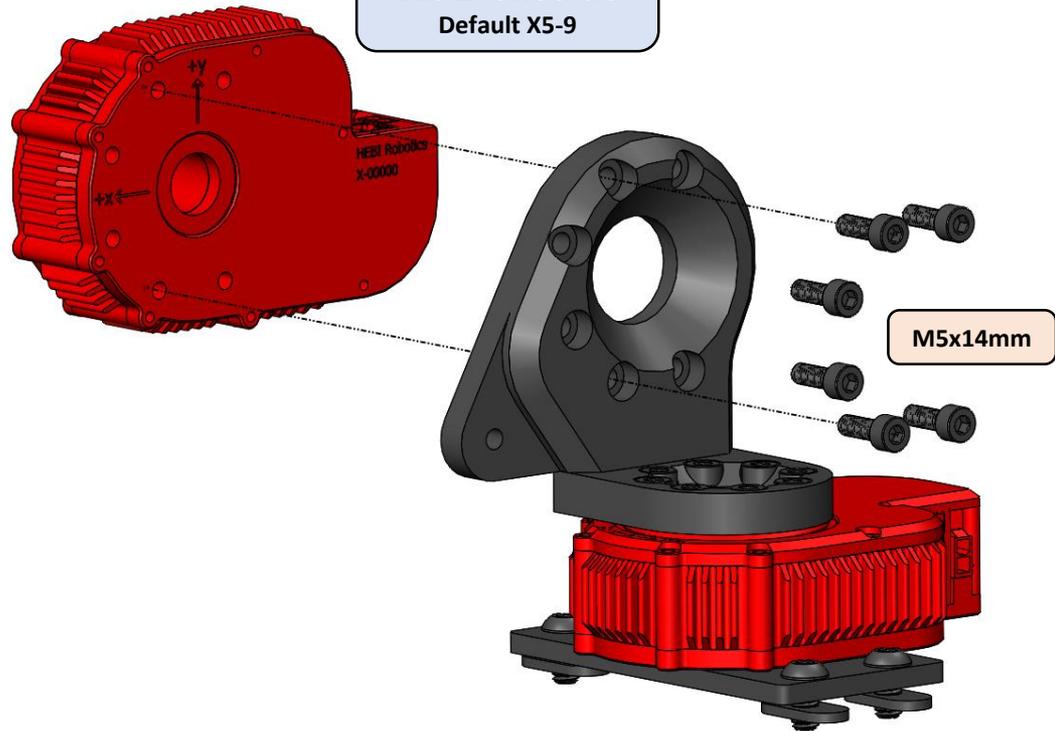
Axis 1: Base
Default X5-4

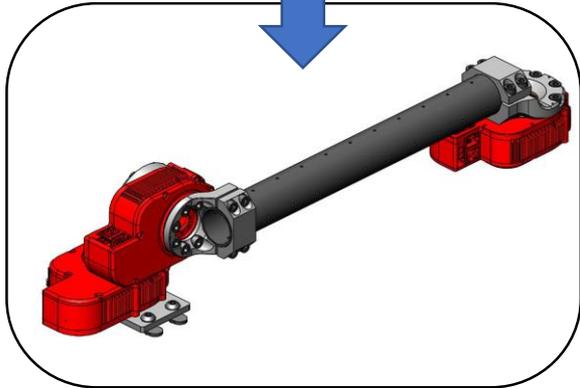
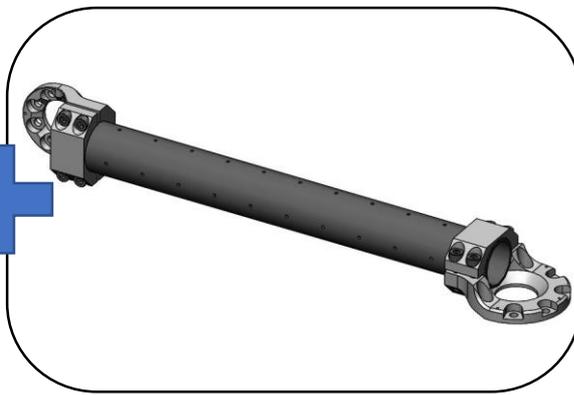
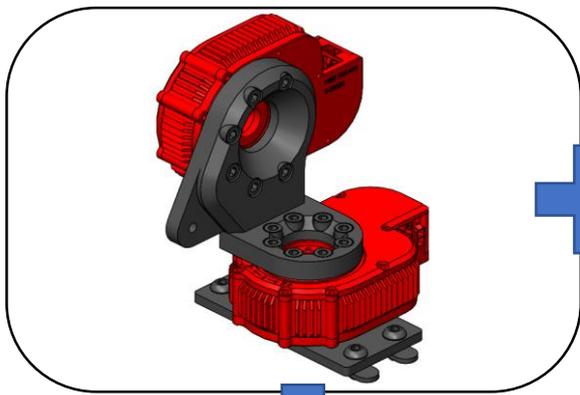


M5x10mm FHCS

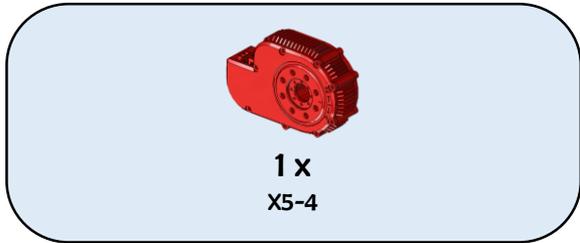


Axis 2: Shoulder
Default X5-9

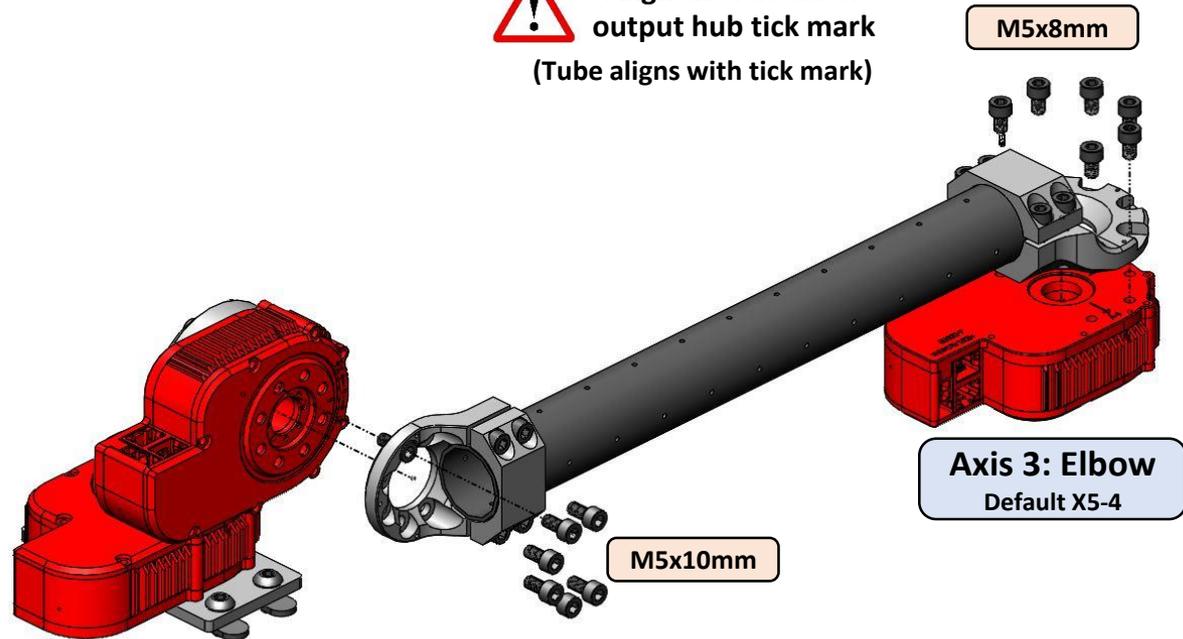


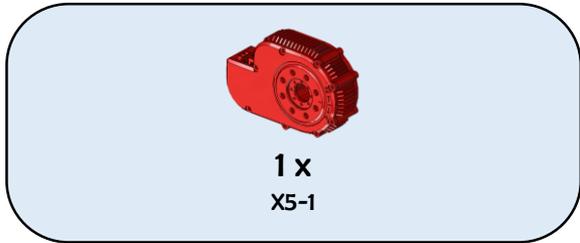
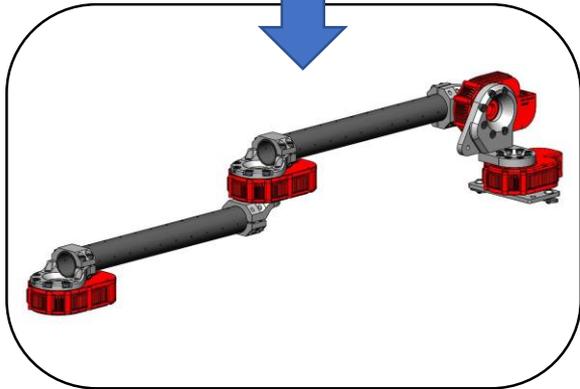
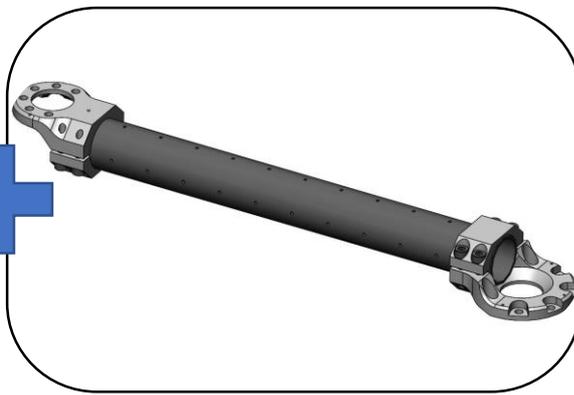
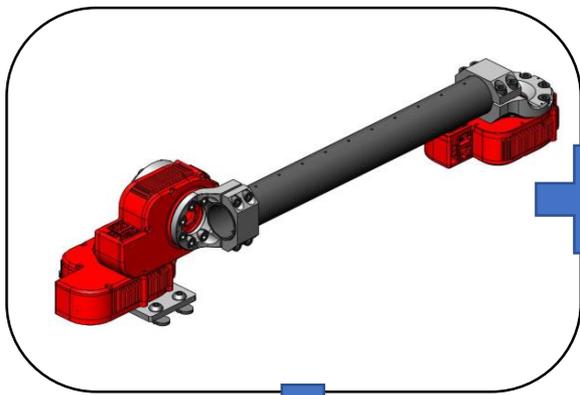


 **Align with actuator
output hub tick mark**
(Tube aligns with tick mark)

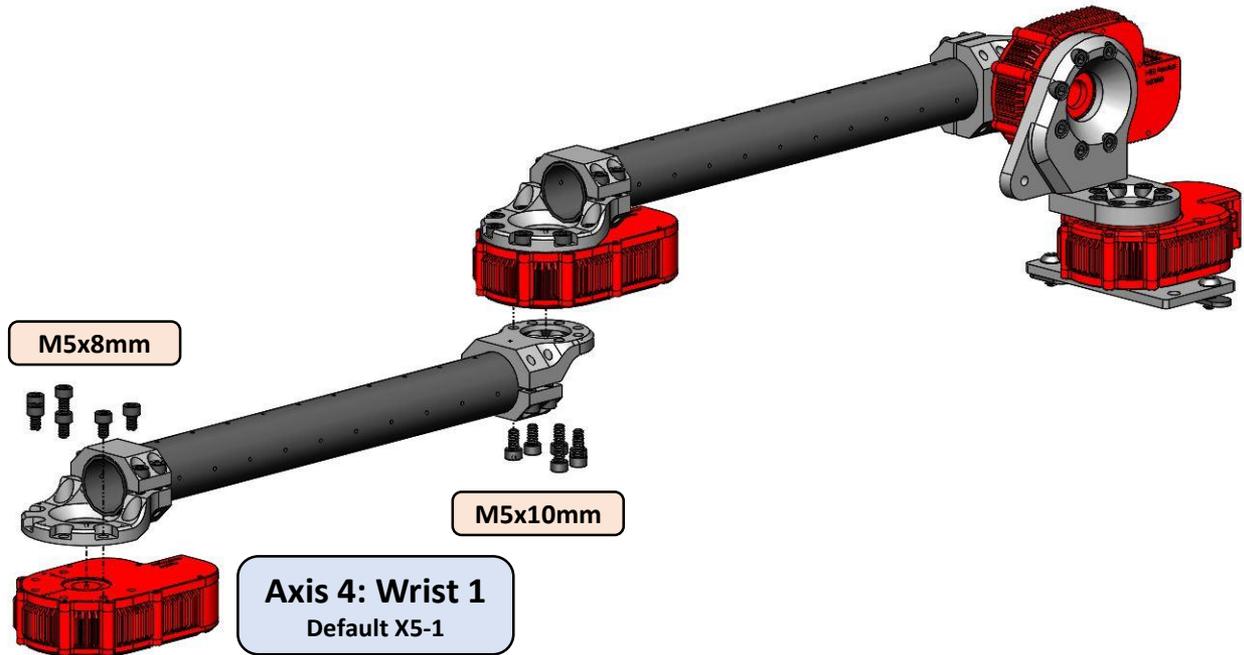
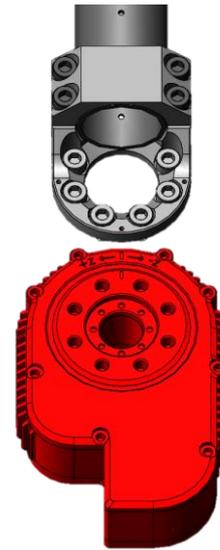


M5x8mm





 Align with actuator
output hub tick mark
(Tube aligns with tick mark)



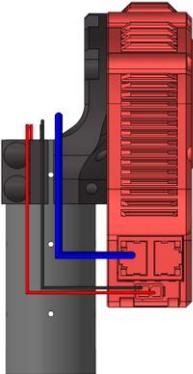
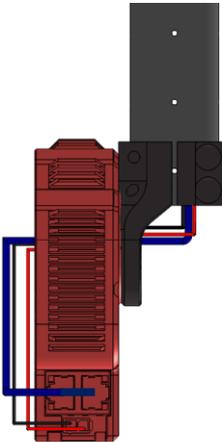
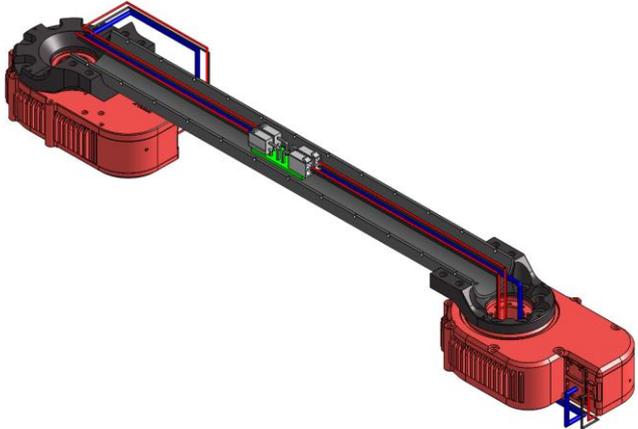
Wiring Notes

- Keeping wires organized will help prevent tangling and add a nice aesthetic.
 - Spiral sleeving is a good accessory for organizing loose wires
- HEBI X-Series actuators have a thru bore specifically designed to fit ethernet and power connectors.
 - Please pass connectors thru bore hole 1 at a time.

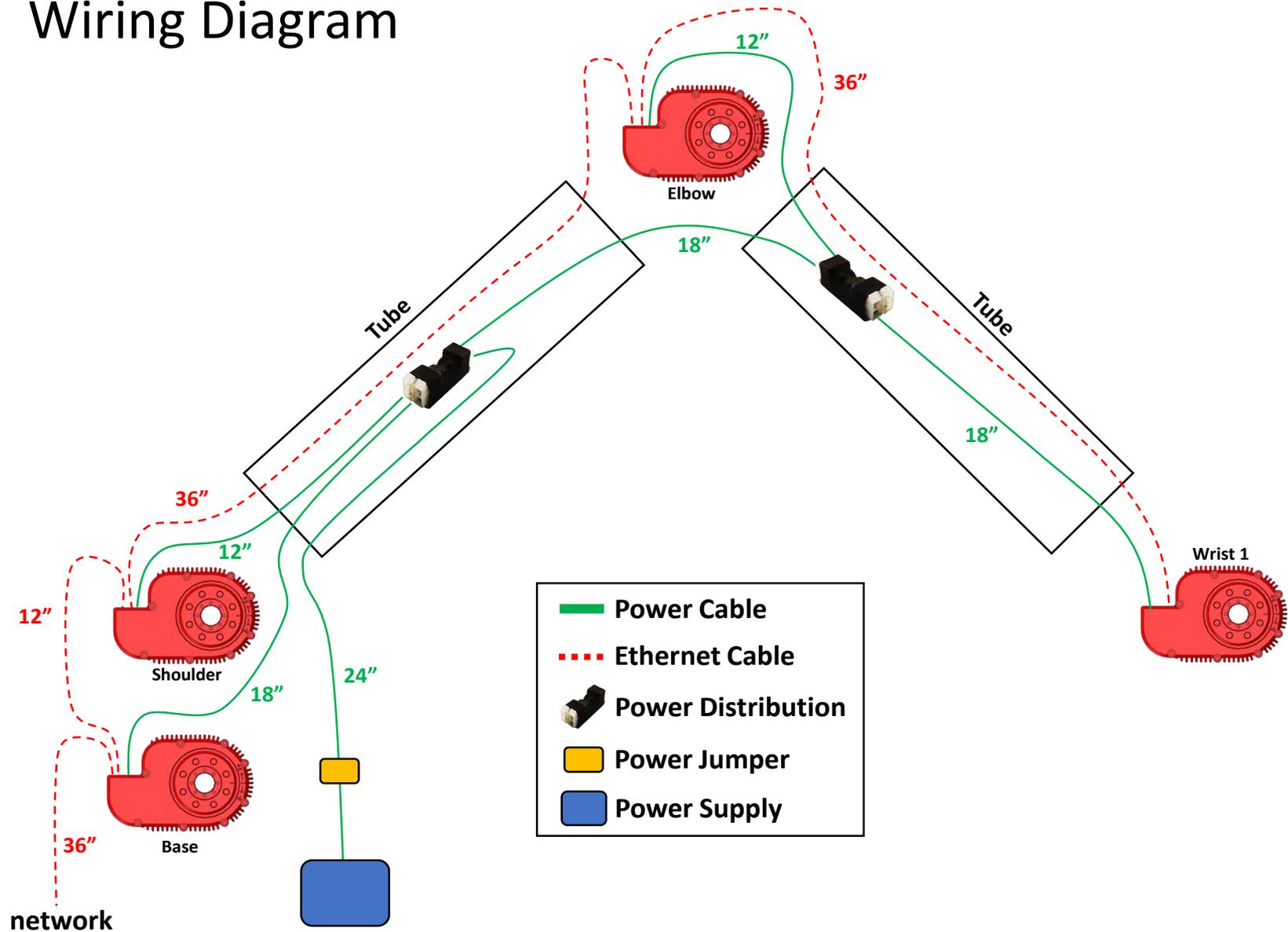
For more information visit: docs.hebi.us

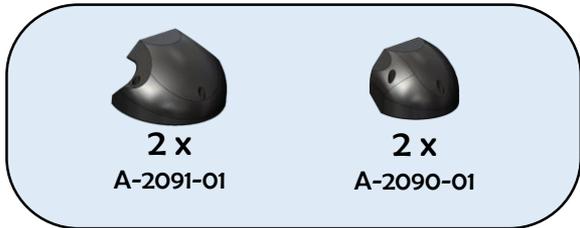
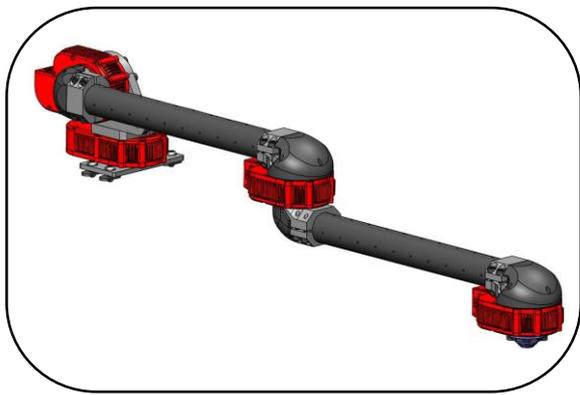


[Spiral sleeving]

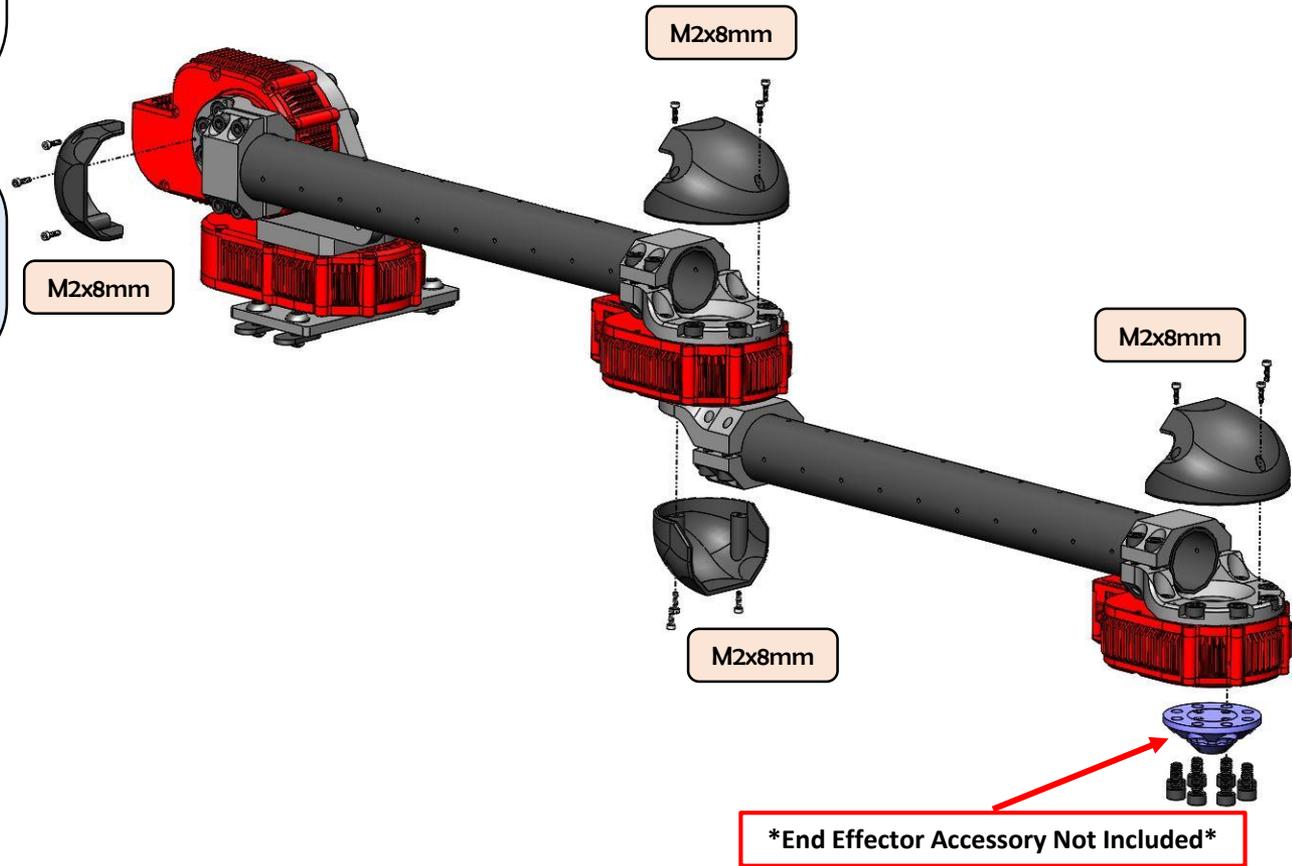
<p>Wires that come from the previous joint should be inserted directly to actuator ports.</p> 	 <p>Wires that connect to the next joint should be threaded through the actuator's bore hole.</p>	<p>Power distribution boards are included to help daisy-chain power connections. These fit well within the tubes between actuators.</p> 
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Wiring Diagram



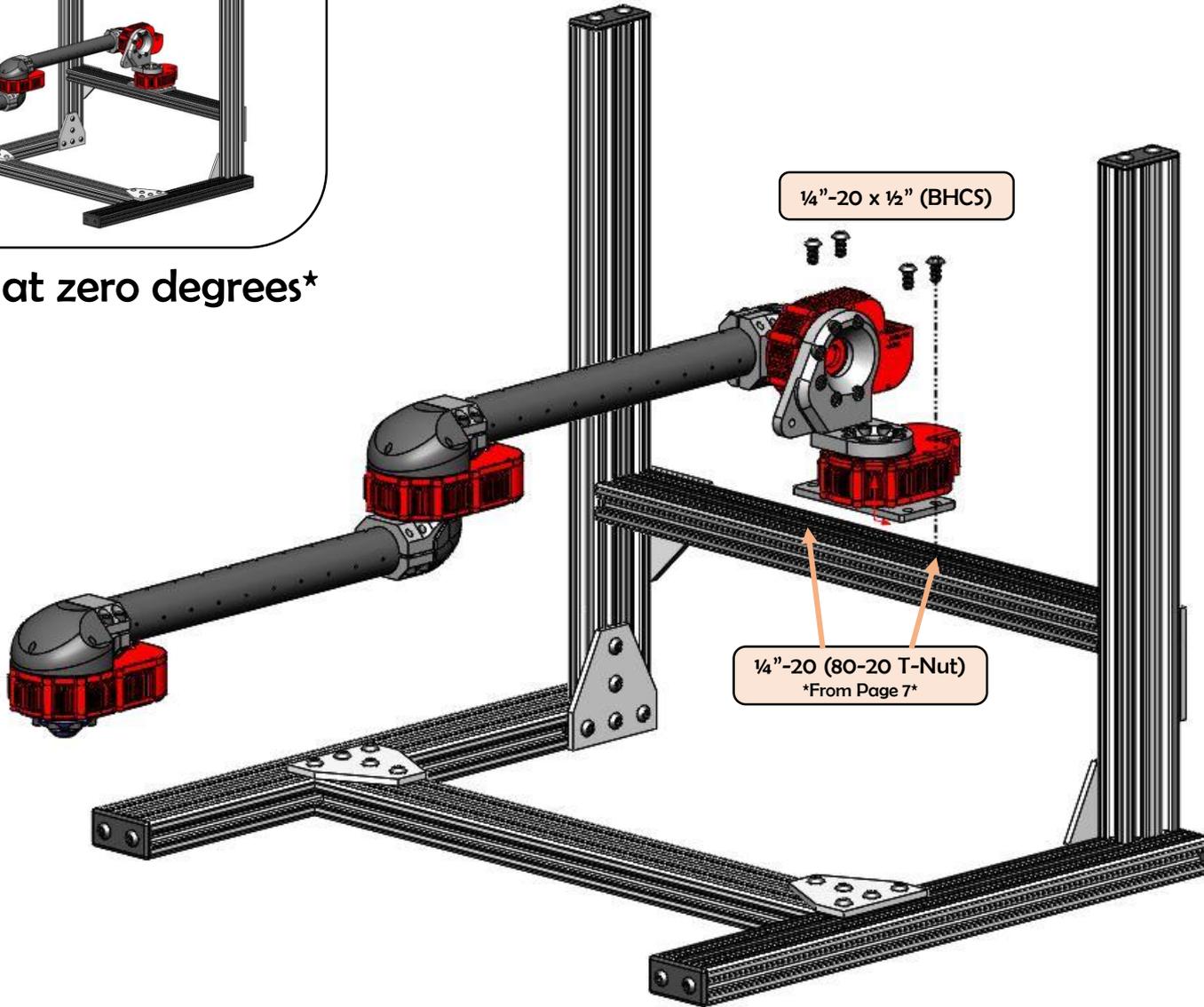


Route wires before installing caps





All axes at zero degrees



Additional Accessories

- Power Supply, 24V 220W (A-2098-24)
 - Comes with correct Molex Minifit Jr 2 connector
- Magnet embedded end effector (A-2081-01)
 - Interfaces with hex shaft driver bits for screwing/bolting tasks
 - Screwdriver bits not included
- HEBI I/O Board (A-2116-01)
 - Integrate with 3rd party end effectors or tools using HEBI APIs
- HEBI Gripper
 - Cable driven gripper keeps weight away from end of arm
 - *Modules sold separately*



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