



# IGOR II

## 14 DoF Wheeled R/C Robot

### Assembly Instructions

Updated Oct 7, 2021

# General Warnings and Cautions

## **Danger (May cause serious injury or death)**

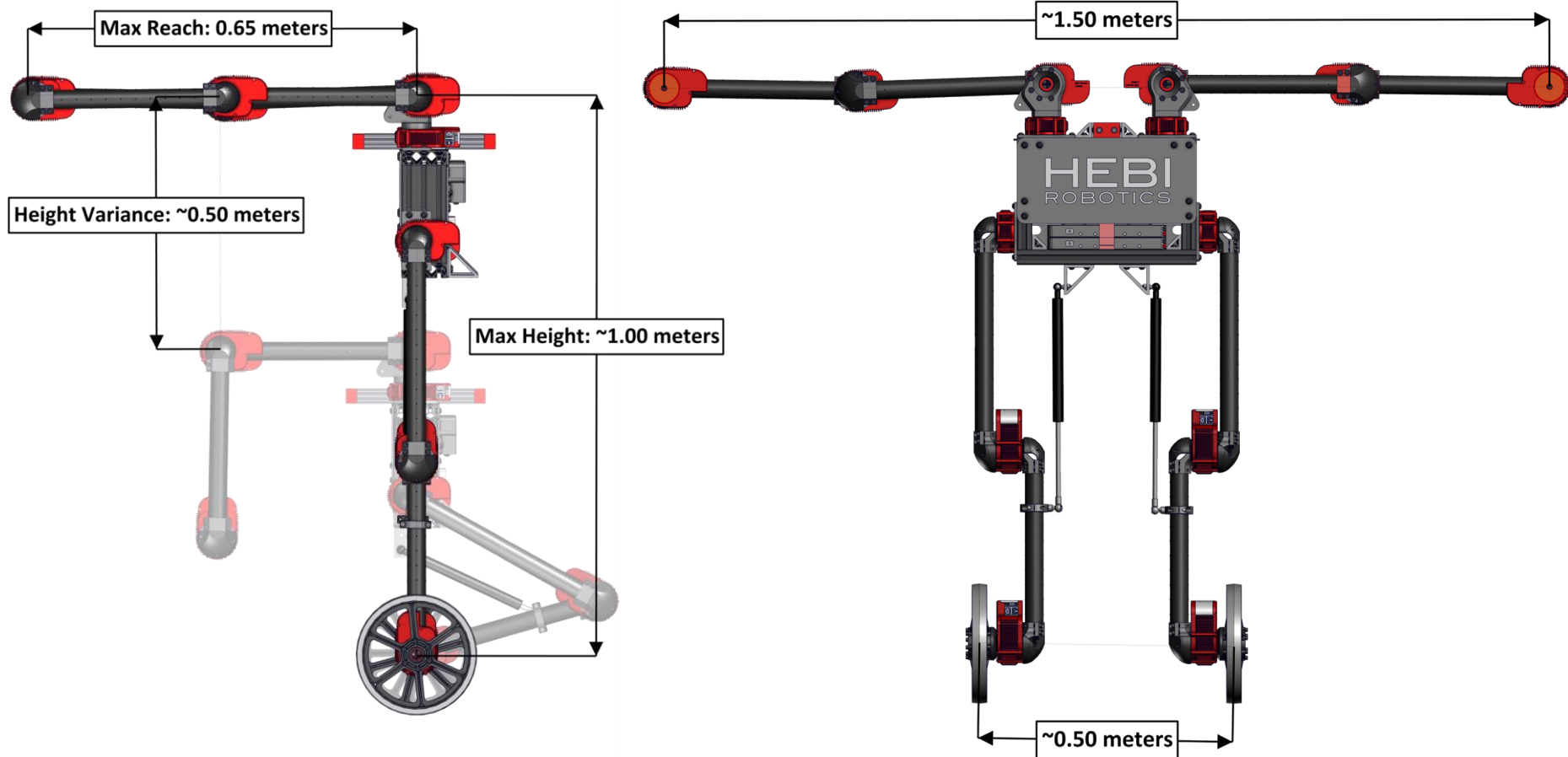
- Keep water, flammables, solvents and other liquids clear from actuator.
- Never place fingers, arms, toes and other body parts near actuator during operation.
- Cut power if actuator emits strange odors or smoke.
- Keep actuator out of reach of children.

## **Warning (May cause injury or damage to actuator)**

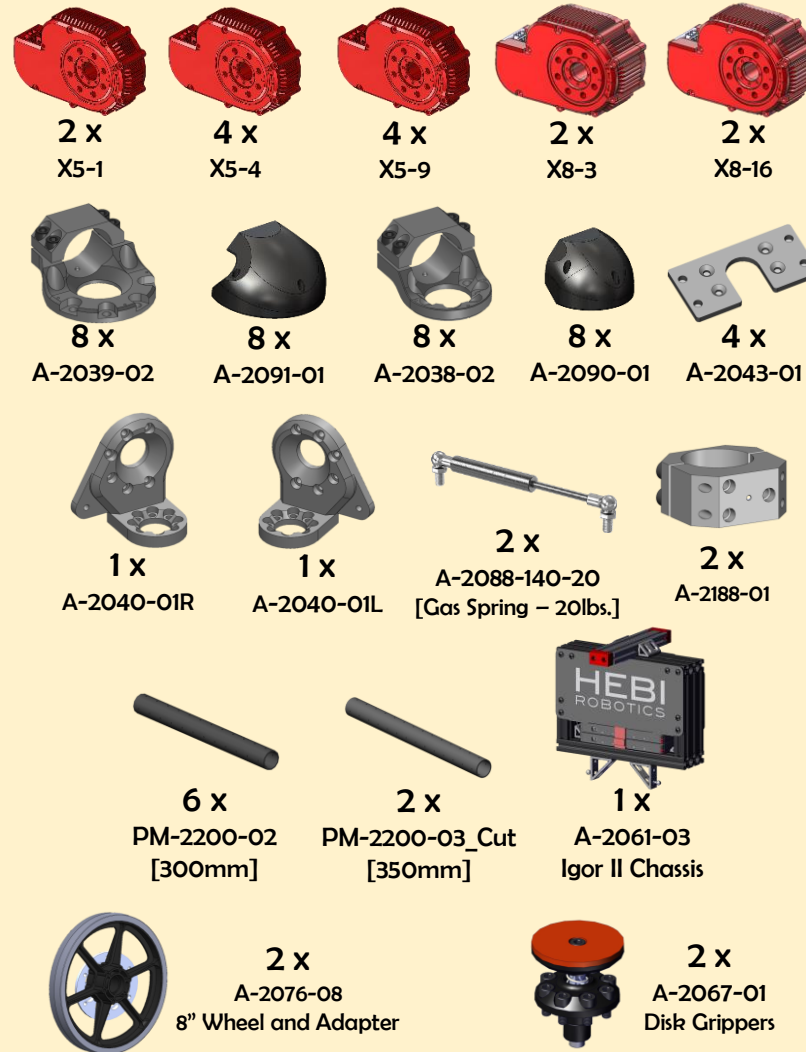
- Before operating, read all applicable instructions and notices found here:  
<http://docs.hebi.us/#quickstart-guide-x-series-actuator>
- Comply with the operating temperature (-10°C to 50°C)
- Turn off power source before connecting or disconnecting actuator power.
- Do not expose the actuator to permanent 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***

## Robot Workspace



# Bill of Materials - Mechanical\*



\*fasteners included, not shown\*

## Bill of Materials - Electrical



**8 x**  
**A-2128-01**  
Power Distribution Board



**3 x**  
**PP-2058-01**  
Ethernet Coupler



**2 x**  
**PP-2084-01**  
LiGo Battery



**7 x**  
**A-2046-12**  
Power Cable, 12" Length



**7 x**  
**A-2046-18**  
Power Cable, 18" Length



**6 x**  
**A-2046-24**  
Power Cable, 24" Length



**7 x**  
**PP-2059-01**  
Ethernet Cable, 12" Length



**8 x**  
**PP-2060-01**  
Ethernet Cable, 24" Length



**4 x**  
**PP-2062-01**  
Ethernet Cable, 48" Length

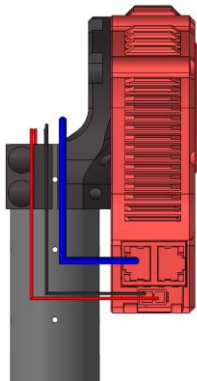
## Wiring Notes

- It is best to wire each limb before moving onto the Final Assembly.
- 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 one at a time.

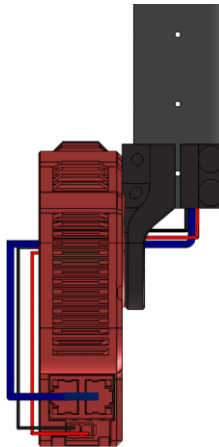


For more information visit: [docs.hebi.us](https://docs.hebi.us)

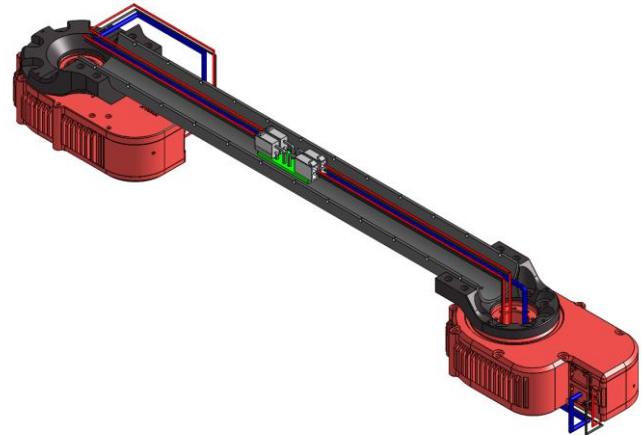
Wires that come from the previous joint should be inserted directly to actuator ports.



Wires that connect to the next joint should be threaded through the actuator's bore hole.

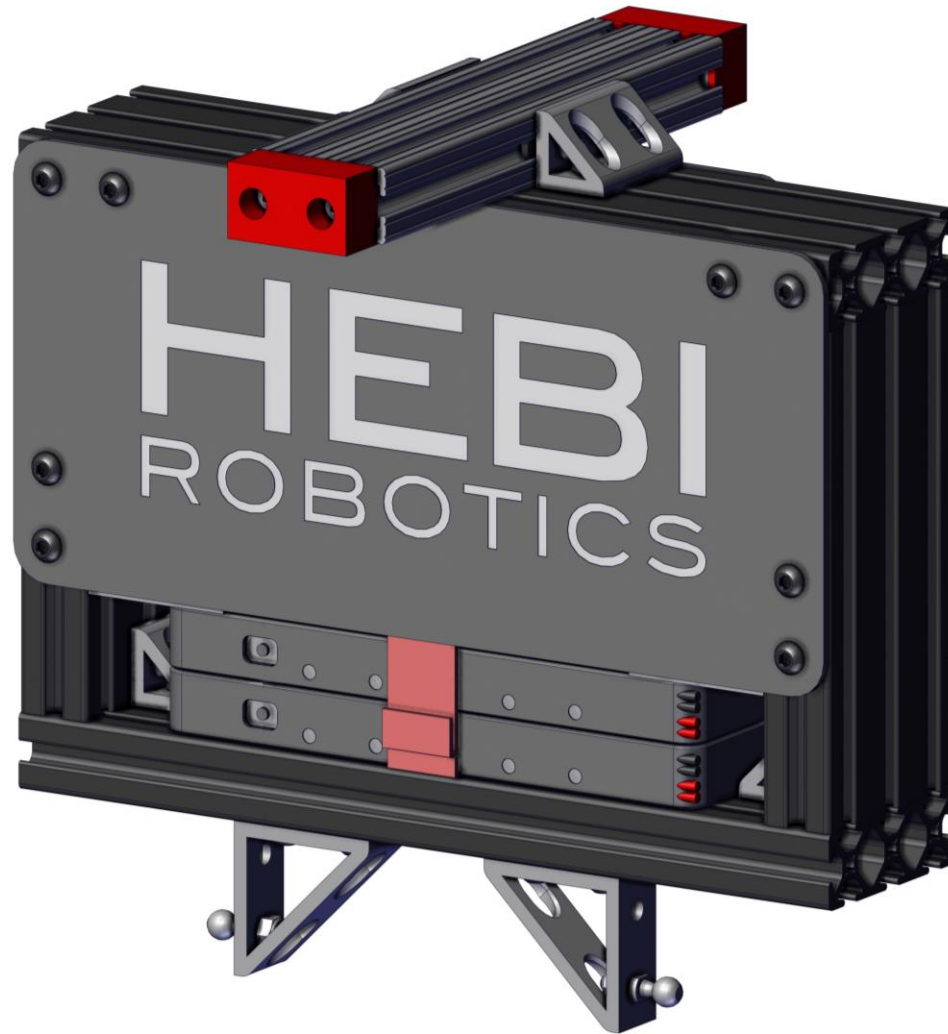


Power distribution boards are included to help daisy-chain power connections. These fit well within the tubes between actuators.



# Table of Contents

| <b><u>Assembly</u></b>     | <b><u>Quantity</u></b> | <b><u>Image</u></b>                                                                 | <b><u>Pages</u></b> |
|----------------------------|------------------------|-------------------------------------------------------------------------------------|---------------------|
| Chassis                    | 1x                     |  | [8-10]              |
| Arms                       | 1x Left<br>1x Right    |  | [11-20]             |
| Legs                       | 2x Mirrored            |  | [21-29]             |
| Final<br>(includes wiring) | 1x                     |  | [30-33]             |

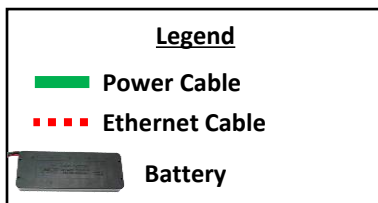
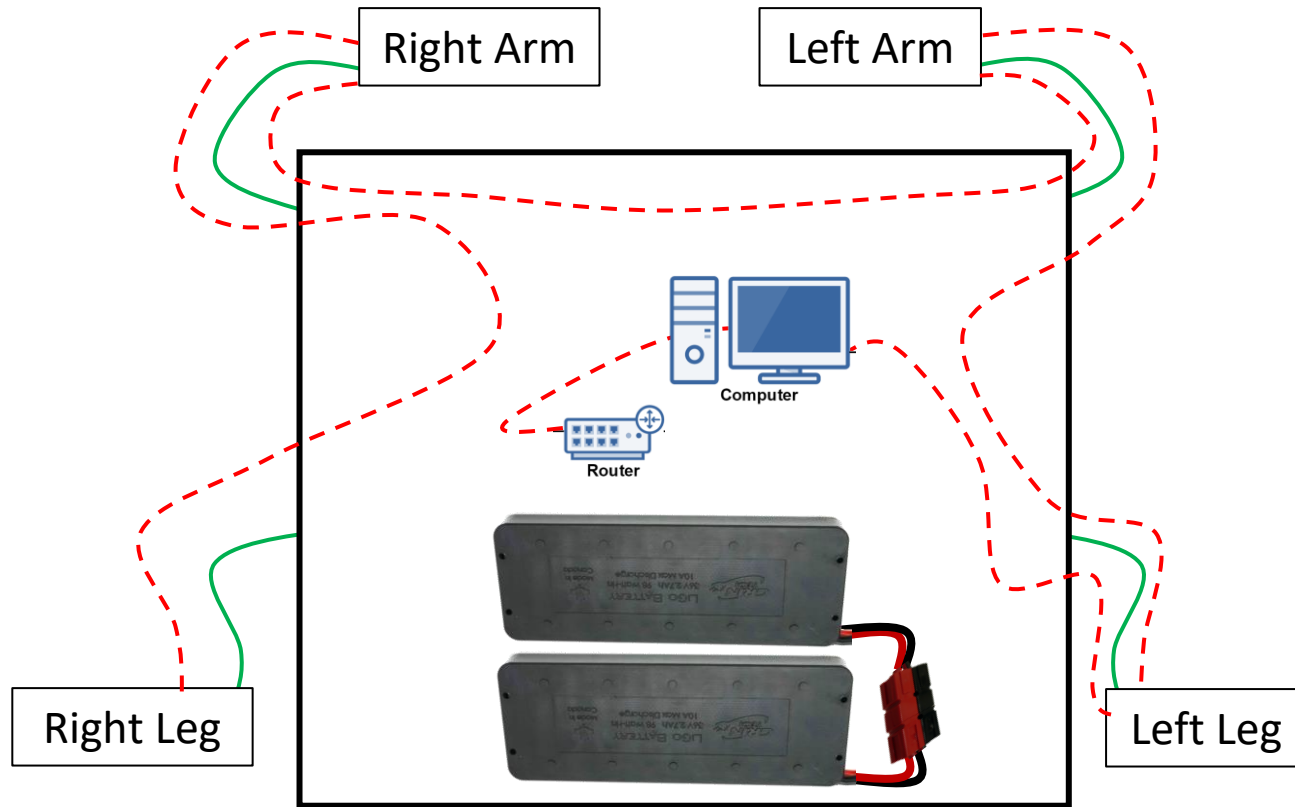


# Chassis

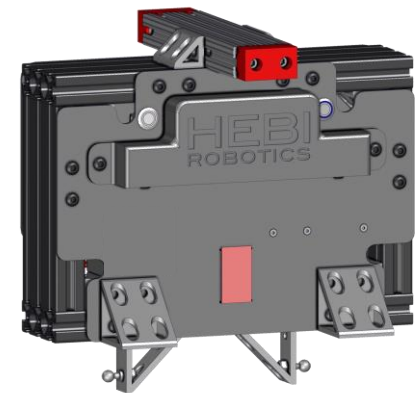
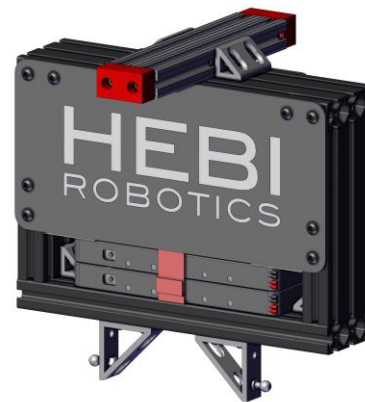
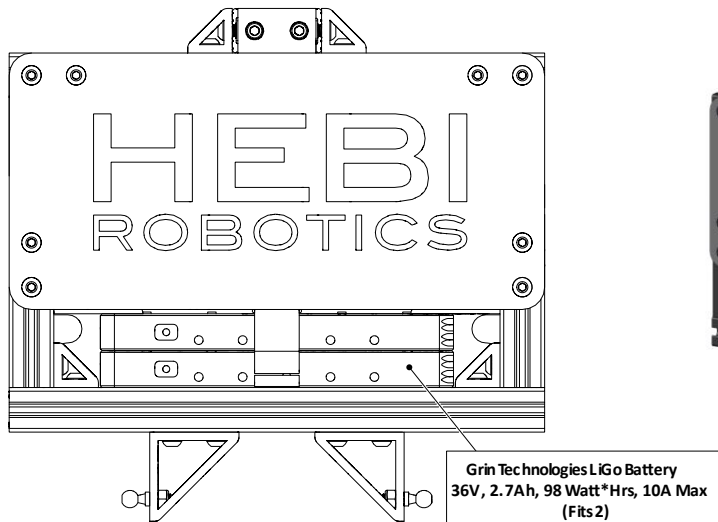
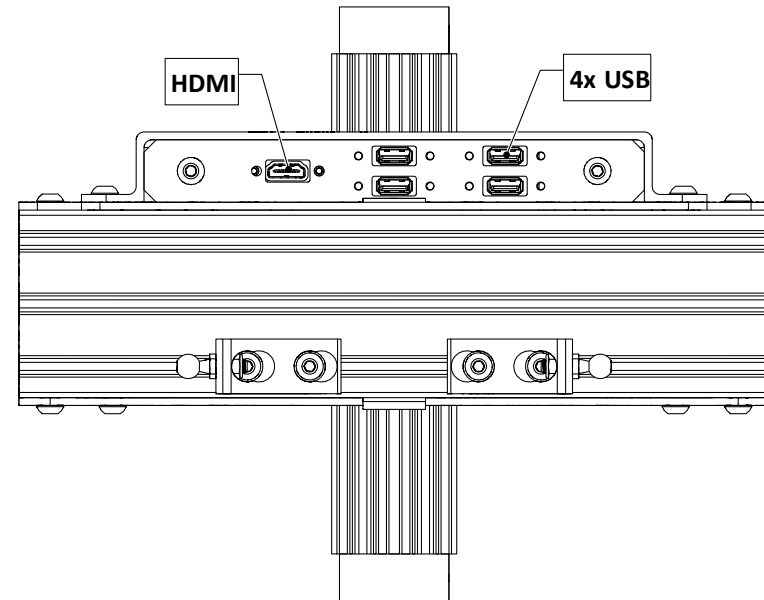
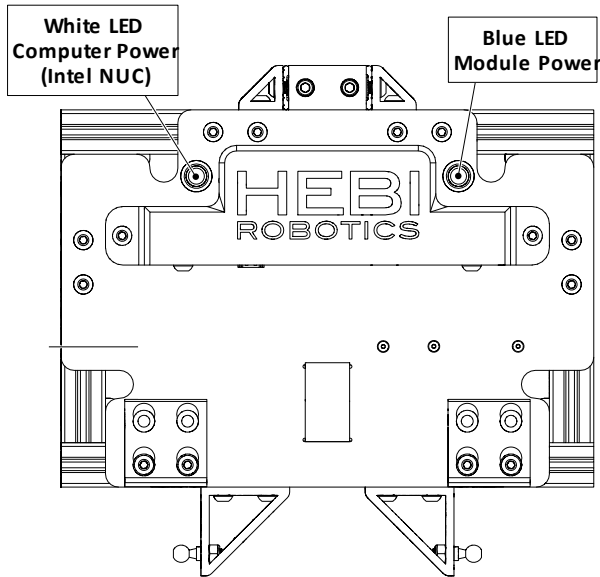


## Chassis Wiring

\*Cabling will be provided with assembled chassis



## Chassis Bulkhead Layout



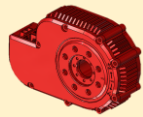


# Arms (1x Left & 1x Right)



Flat face towards inside

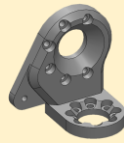
1x L  
1x R



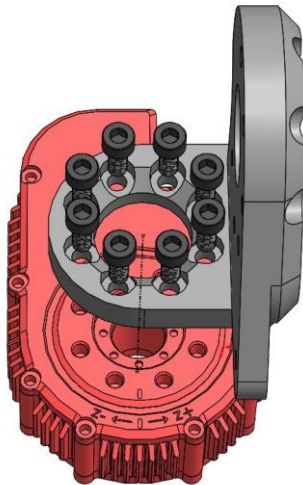
1 x  
X5-4



1 x  
A-2040-01L



1 x  
A-2040-01R

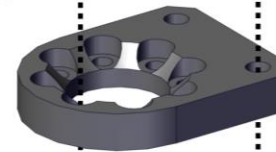


Align with actuator  
output hub tick mark

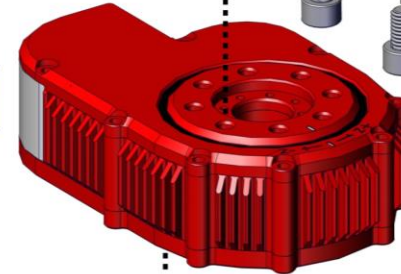
(face parallel with tick mark and  
mounting hole pointed on same side)

M5 x 12mm

Step 2 of 2

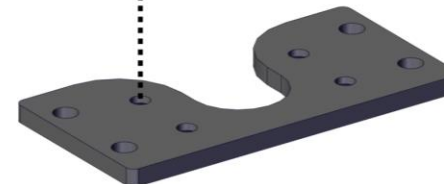


Base (X5-4)



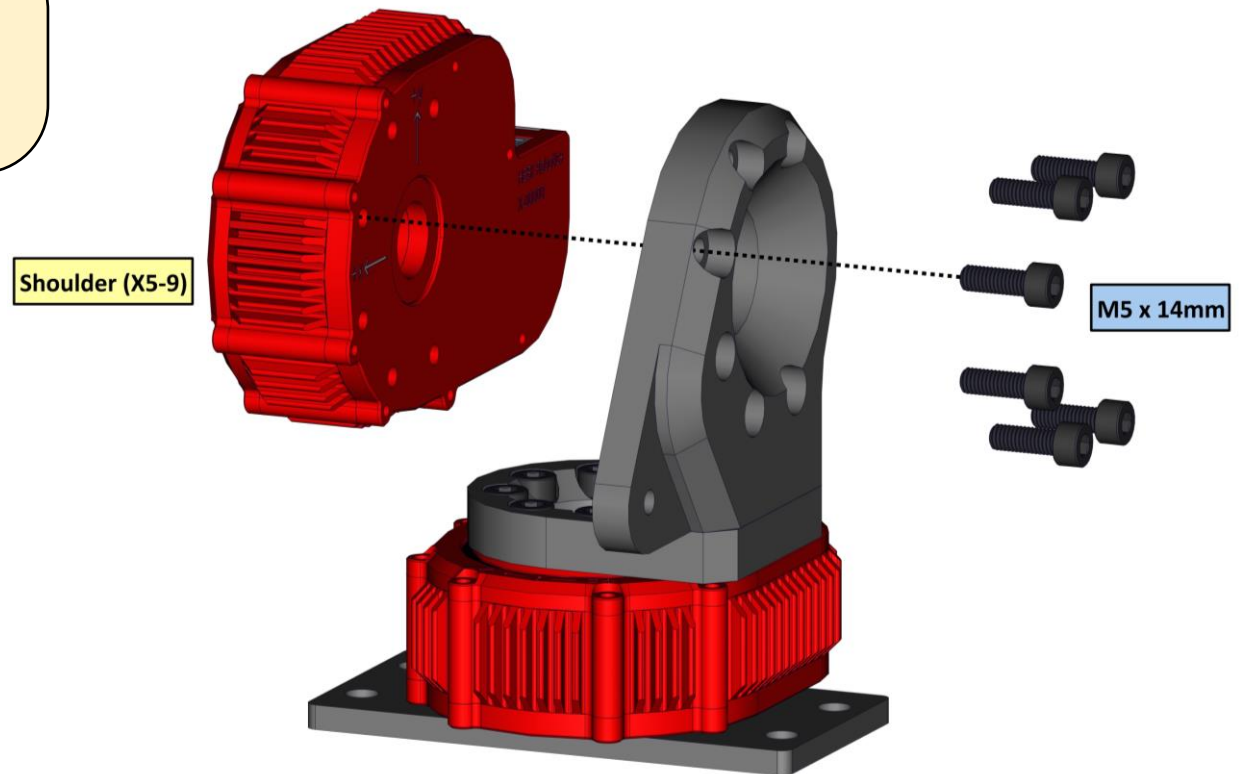
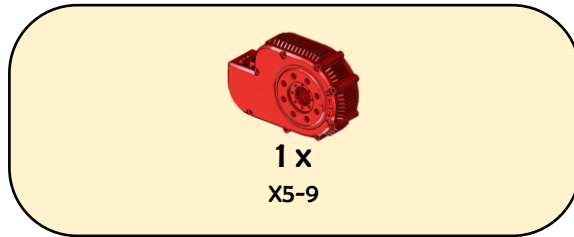
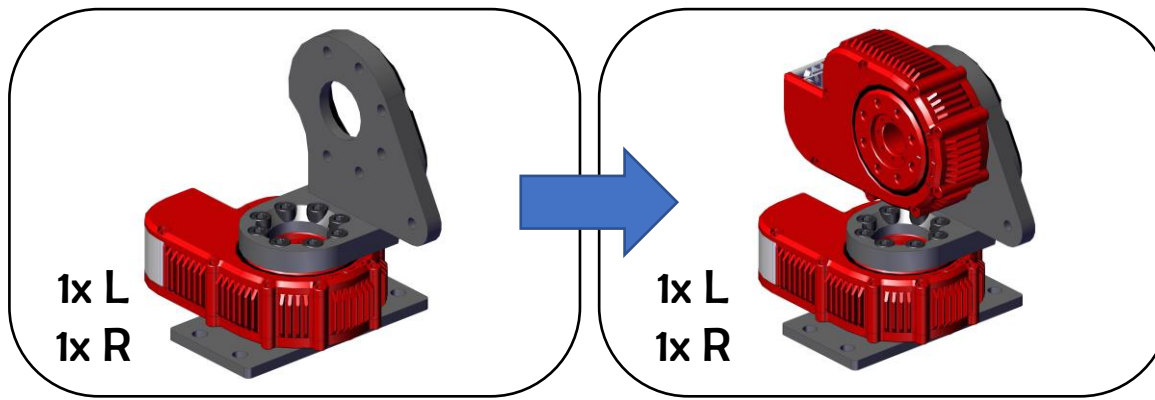
M6 x 10mm

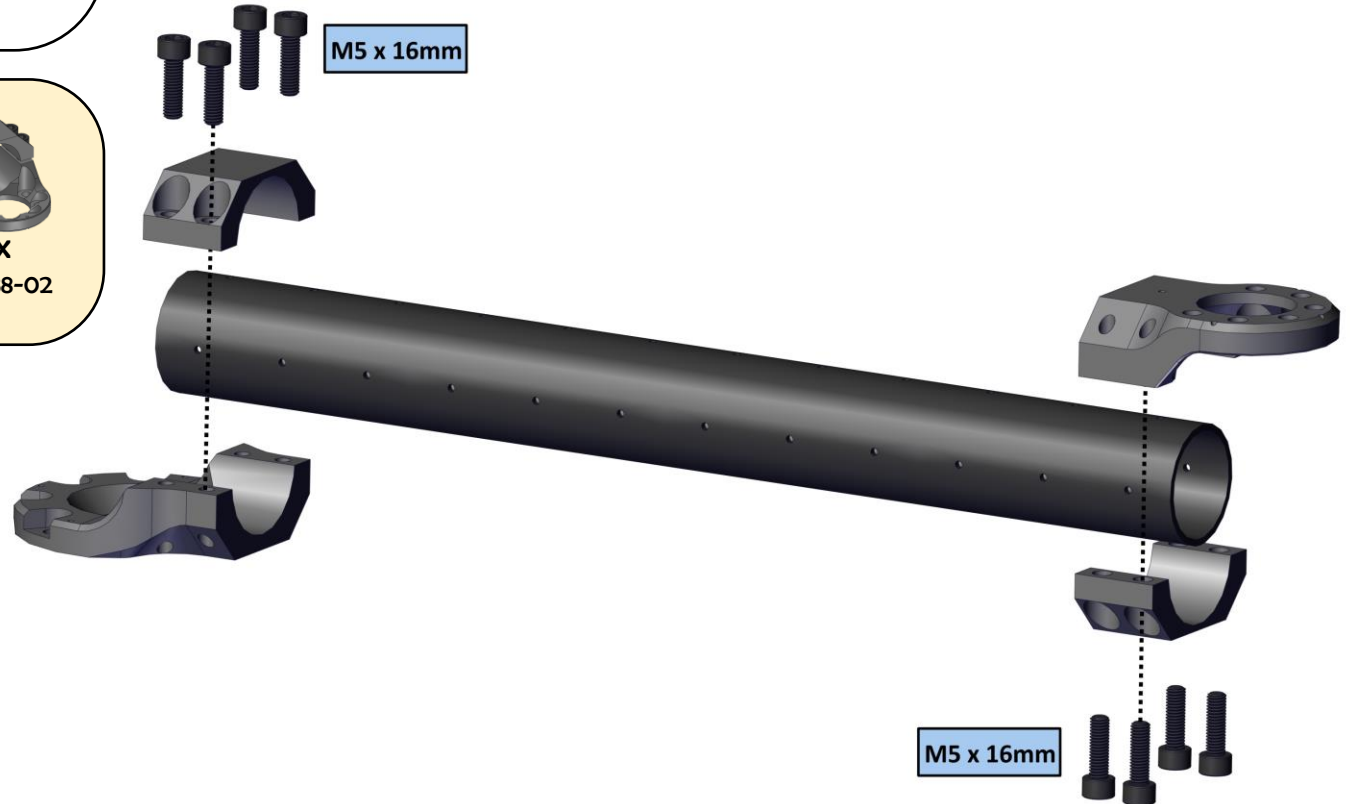
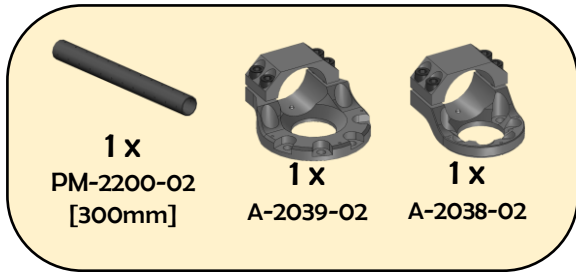
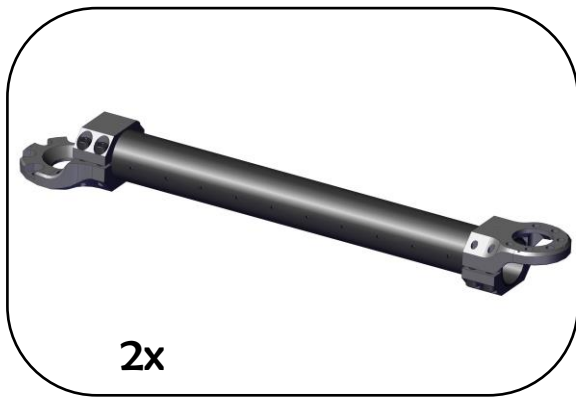
Step 1 of 2

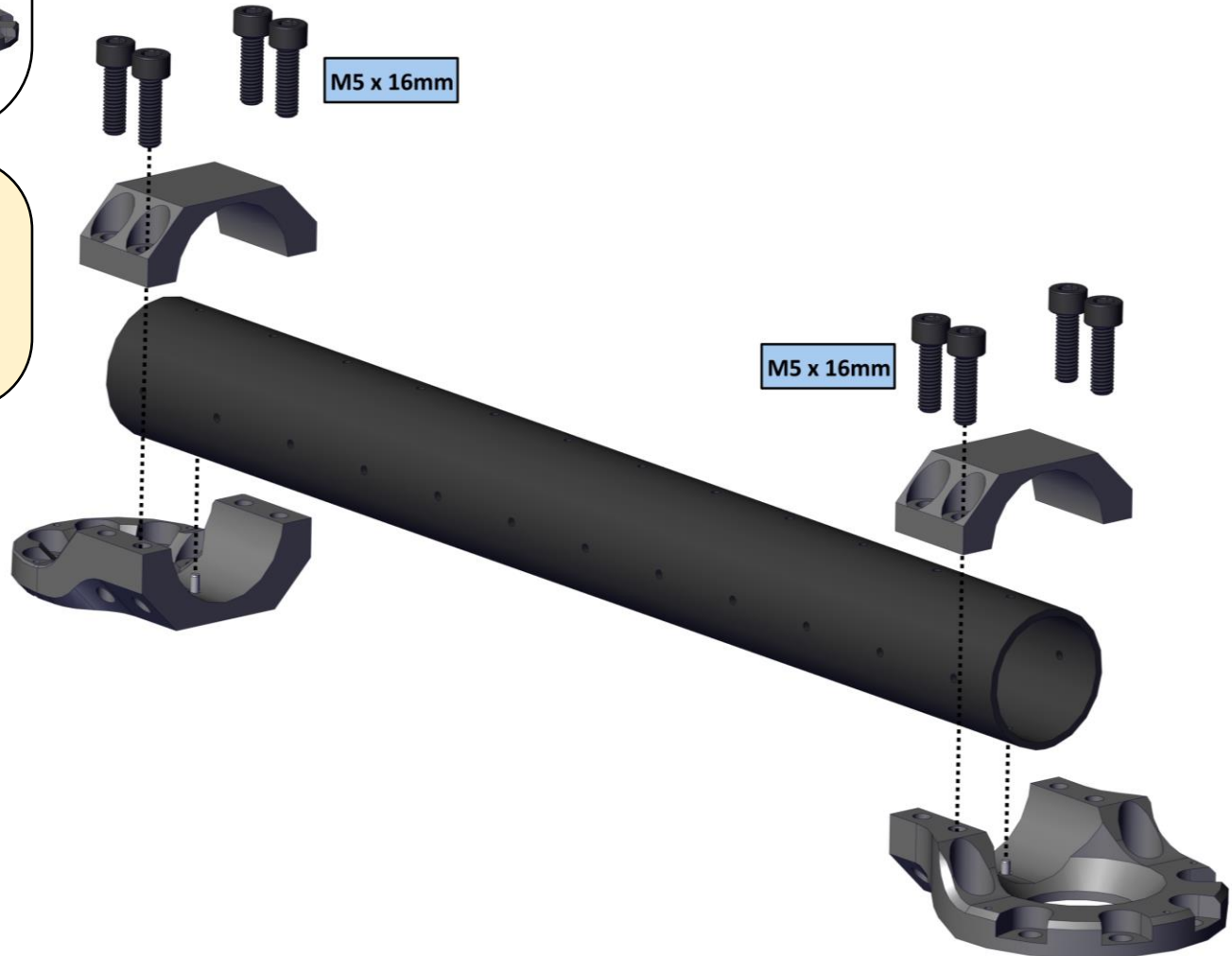
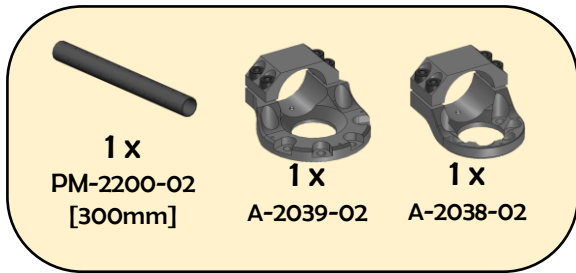
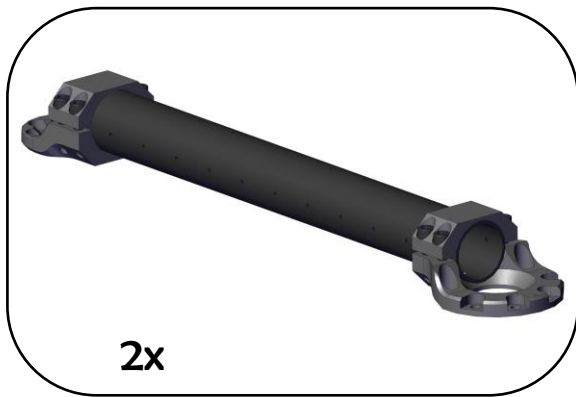


M5 x 10mm FHCS











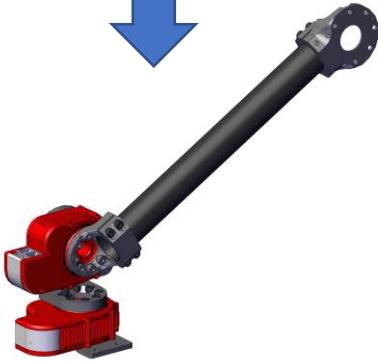
1x L  
1x R



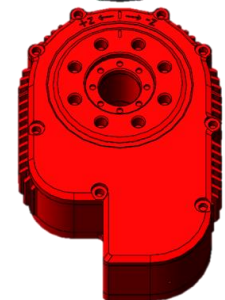
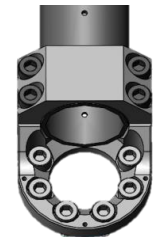
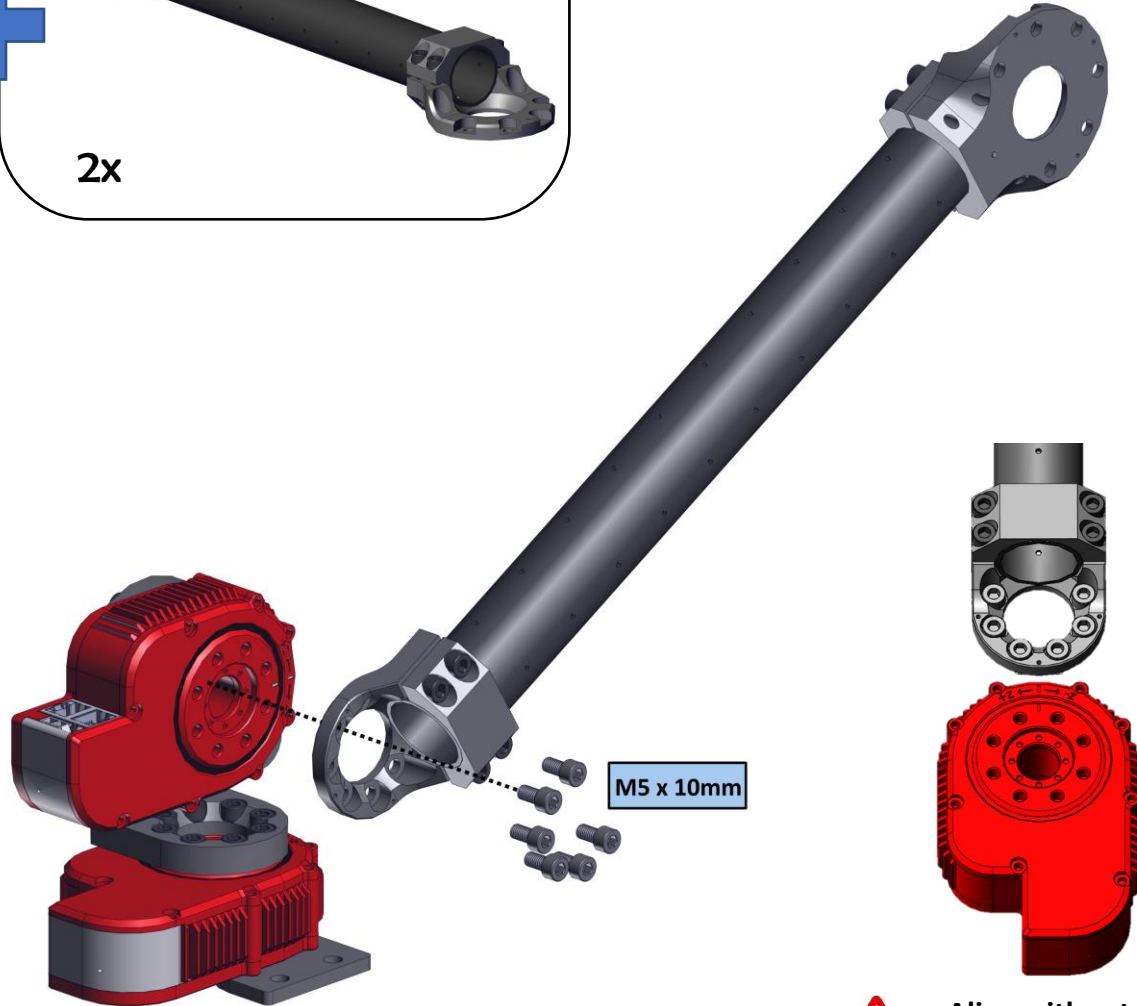
2x



1x L  
1x R

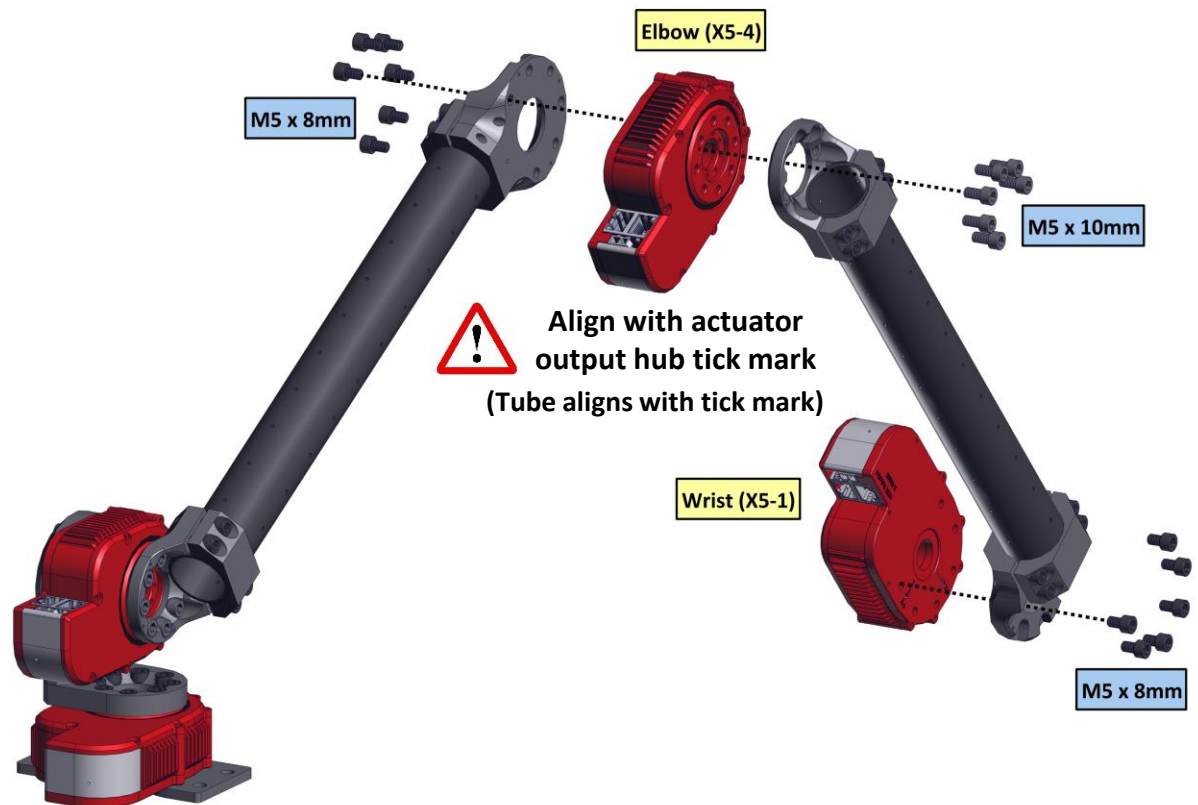
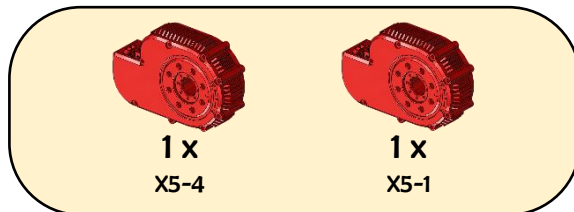
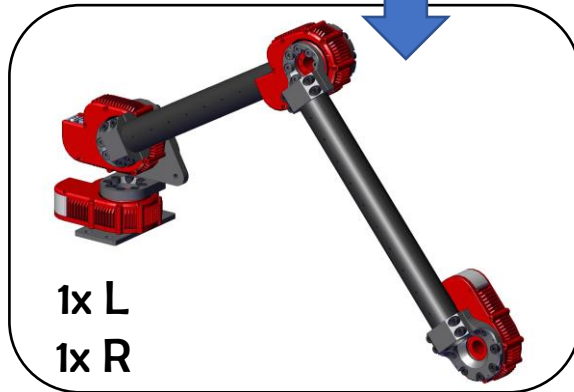
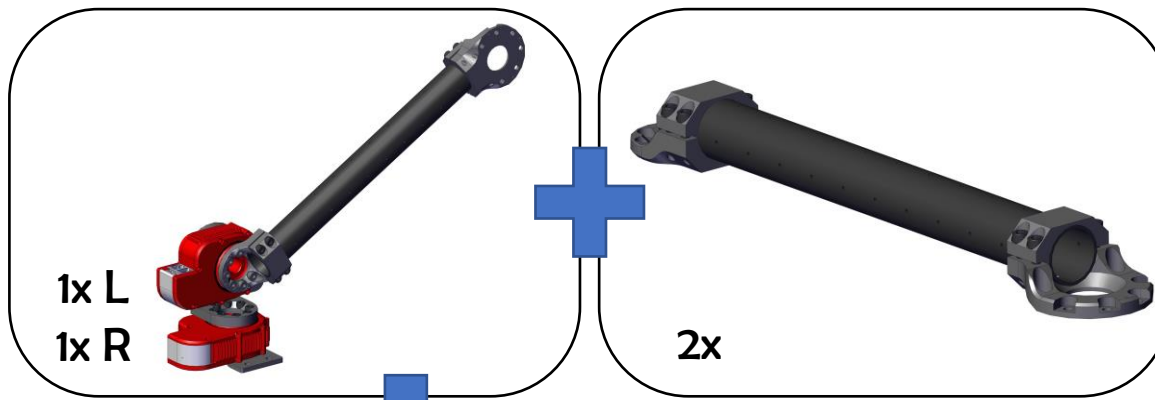


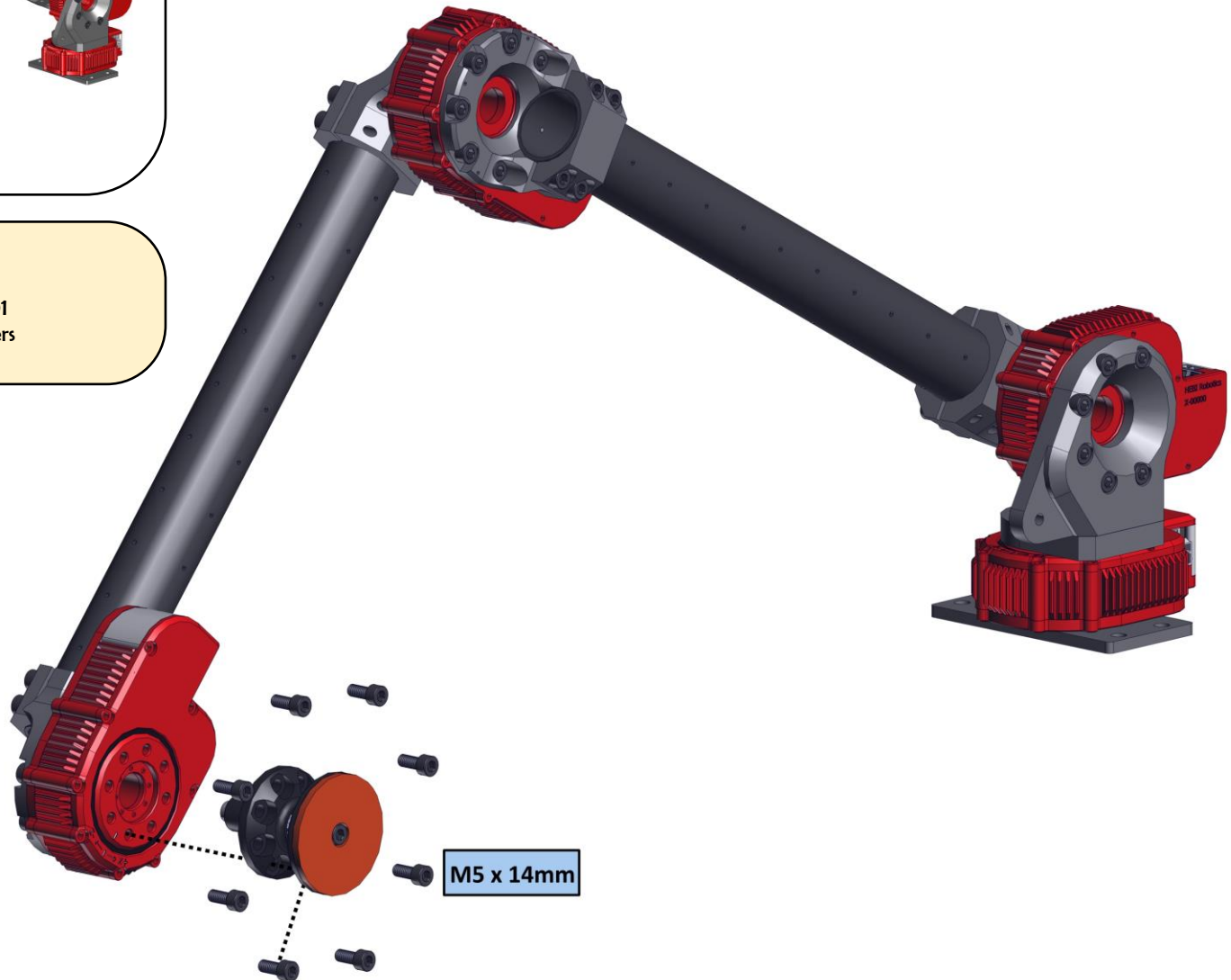
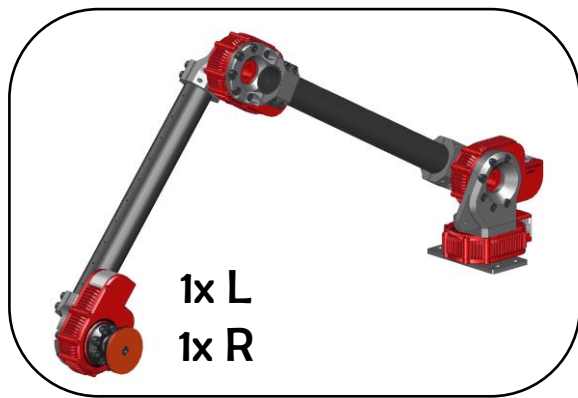
1 x  
A-2090-01

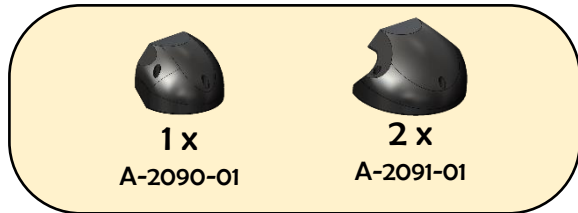
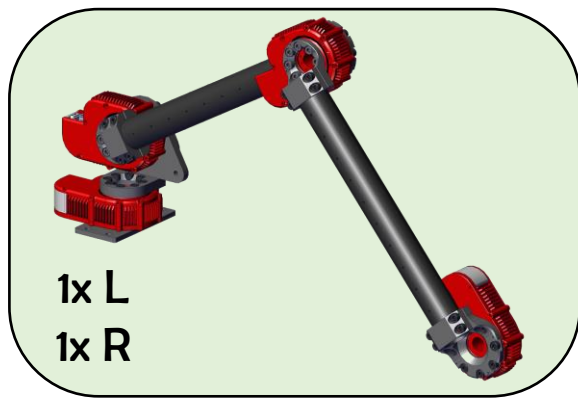


Align with actuator  
output hub tick mark  
(Tube aligns with tick mark)

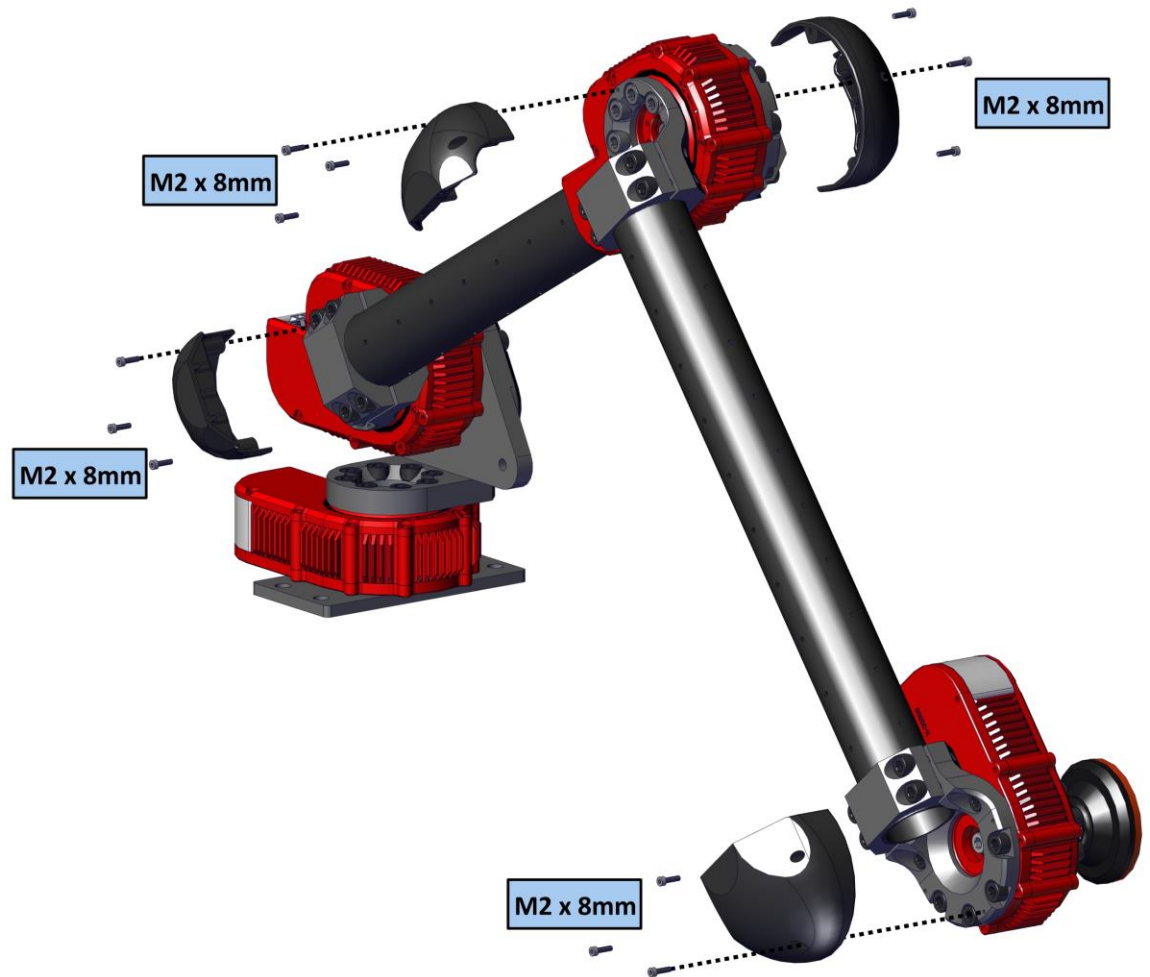






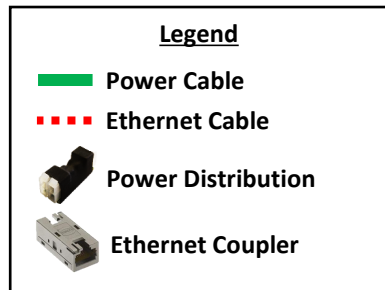
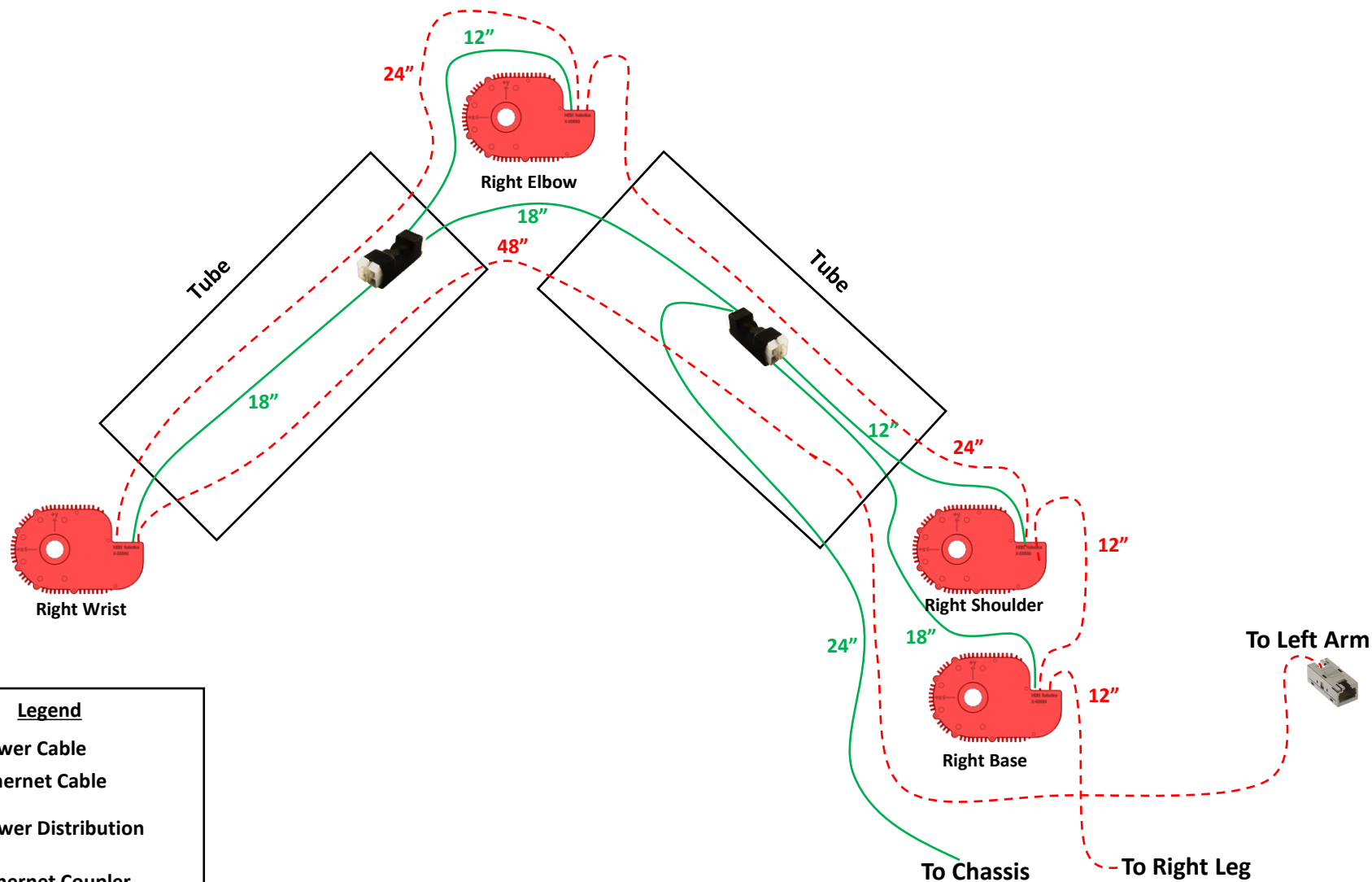


Install cables before  
adding covers



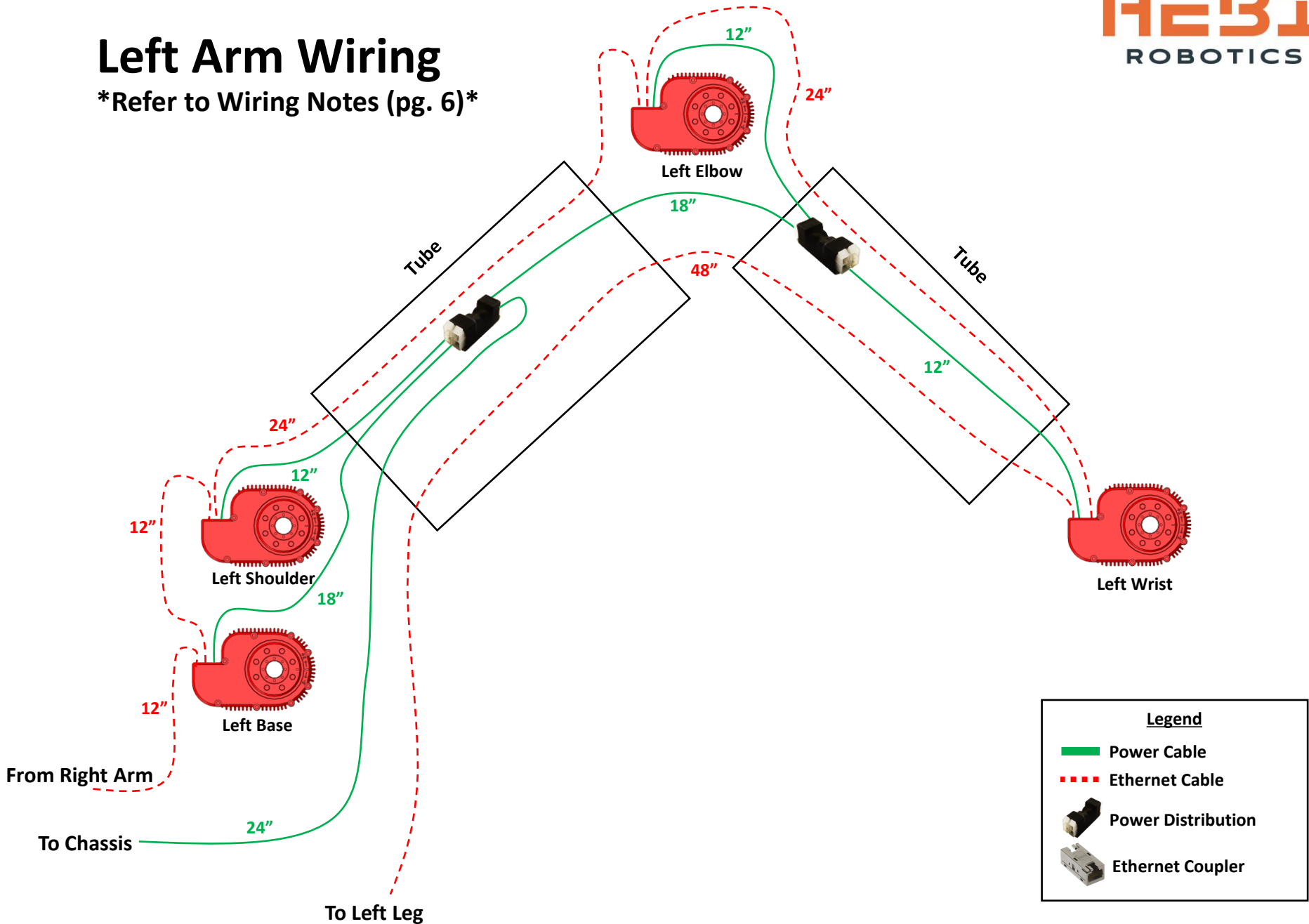
## Right Arm Wiring

\*Refer to Wiring Notes (pg. 6)\*



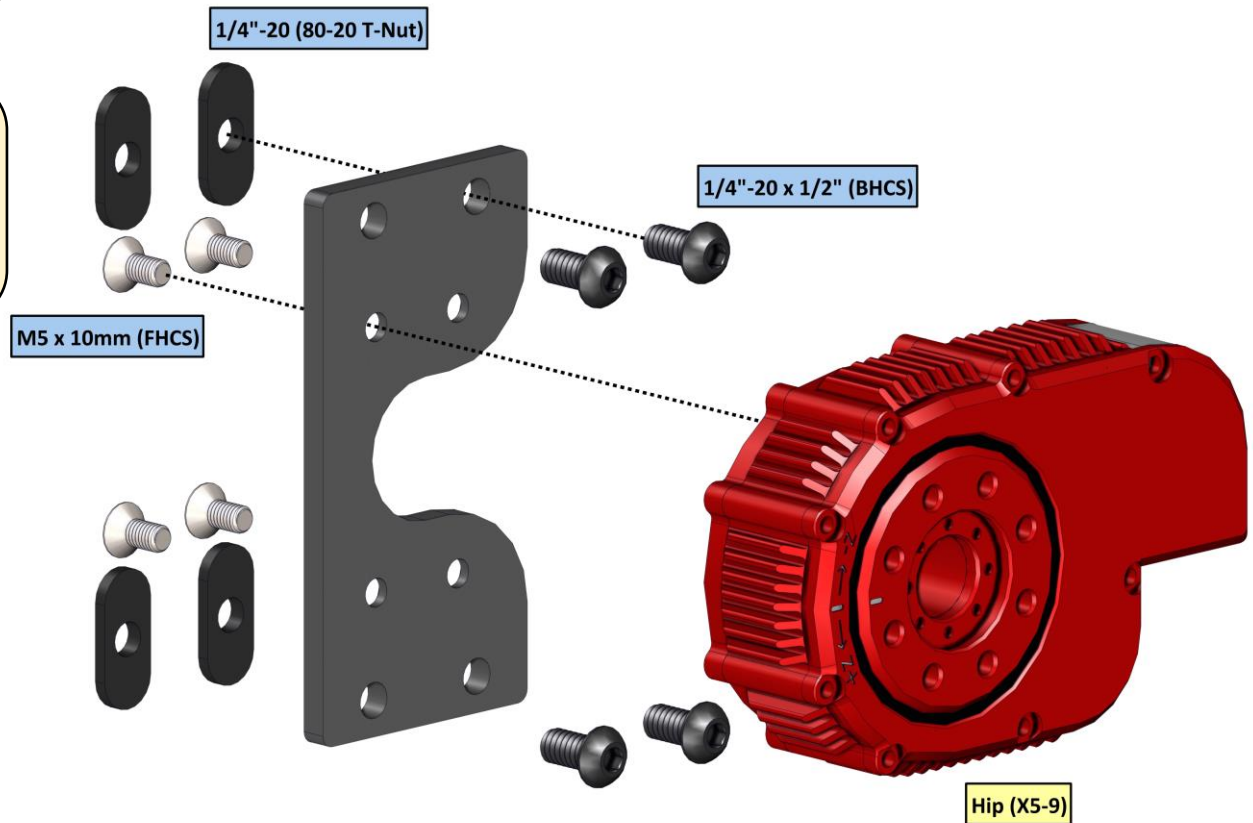
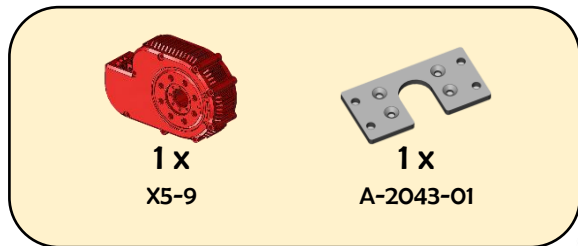
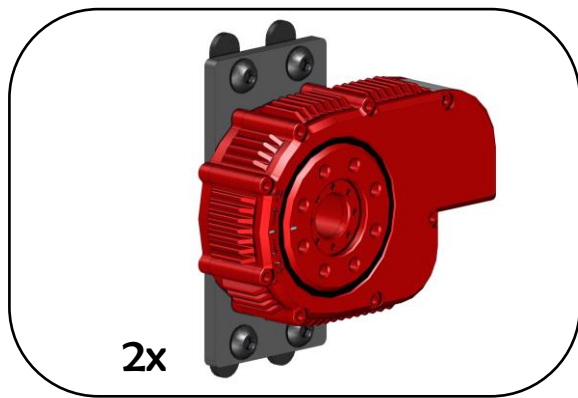
## Left Arm Wiring

\*Refer to Wiring Notes (pg. 6)\*





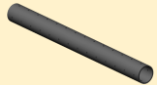
# Legs



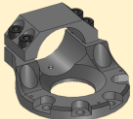




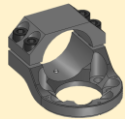
2x 350mm



1 x  
PM-2200-03\_Cut  
[350mm]

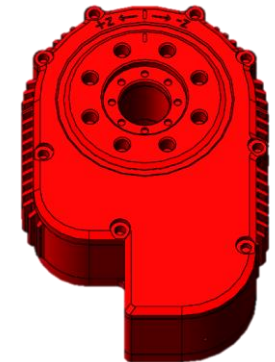
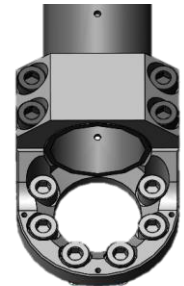
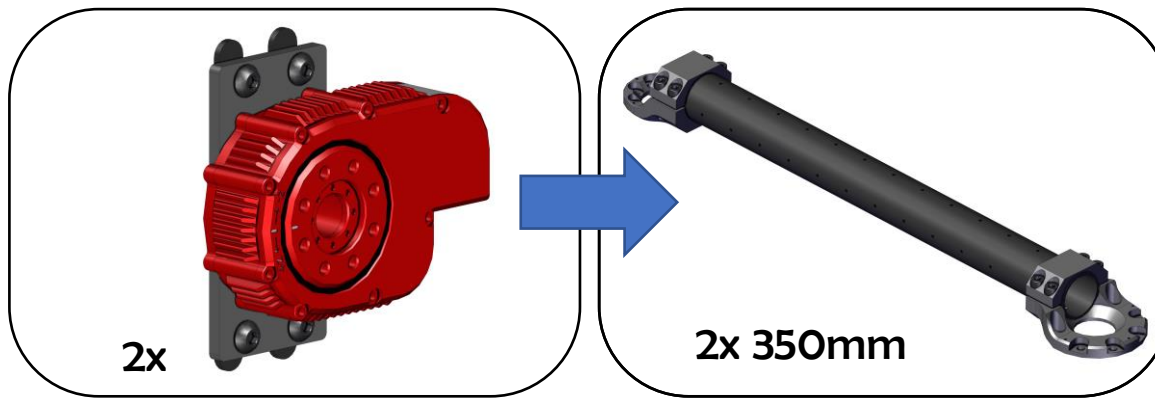


1 x  
A-2039-02



1 x  
A-2038-02

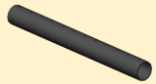




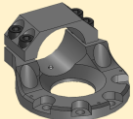
 **Align with actuator  
output hub tick mark**  
(Tube aligns with tick mark)



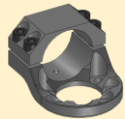
2x 300mm



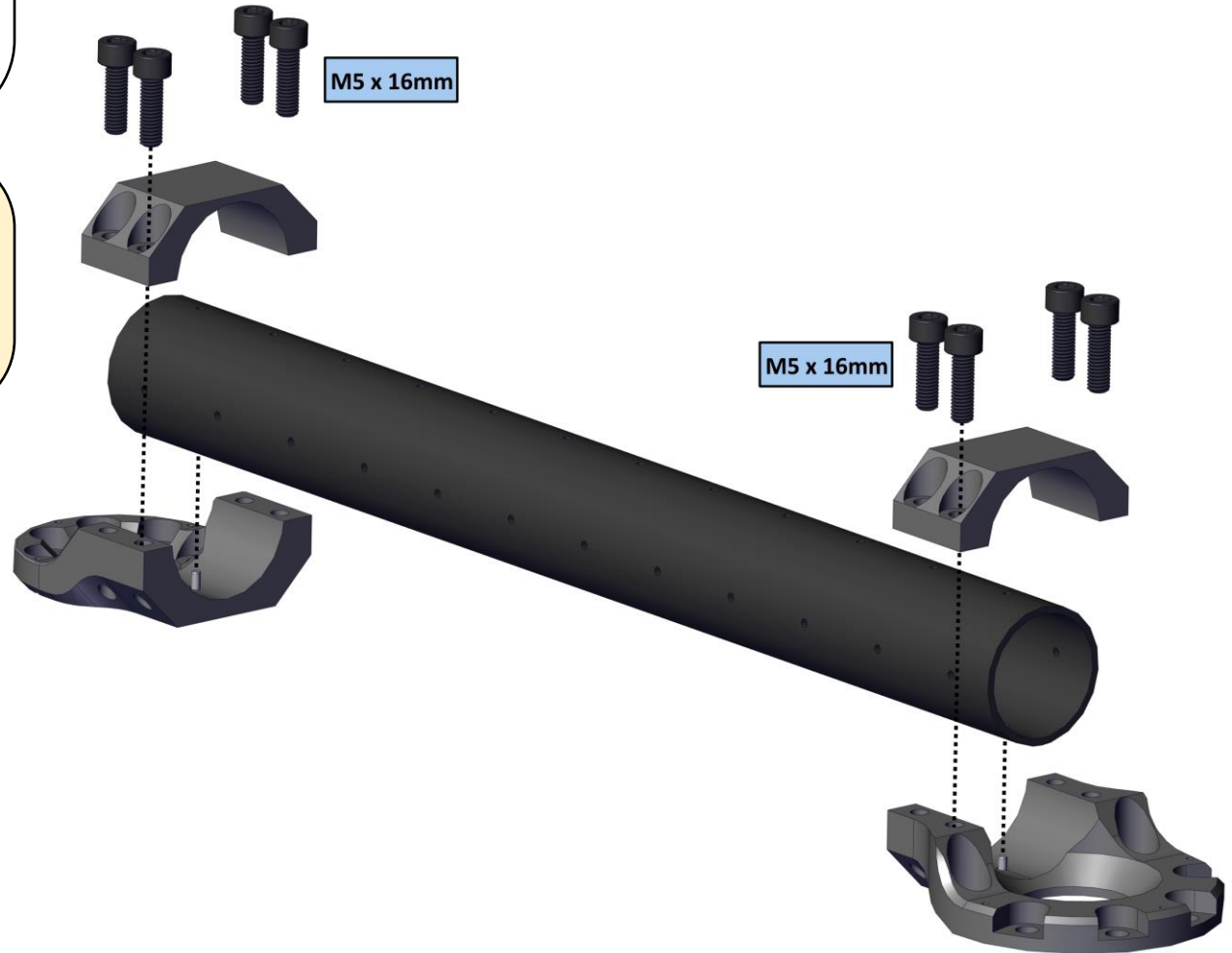
1 x  
PM-2200-02  
[300mm]

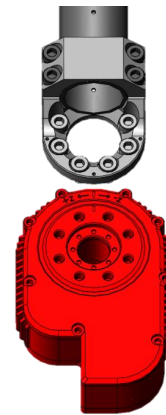
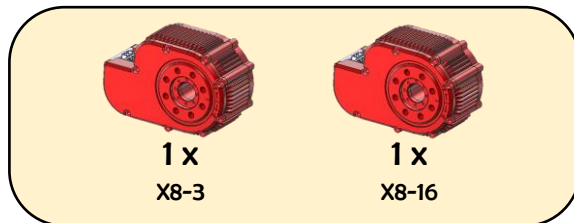
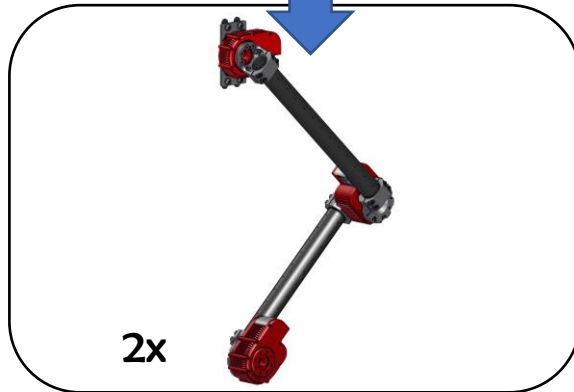
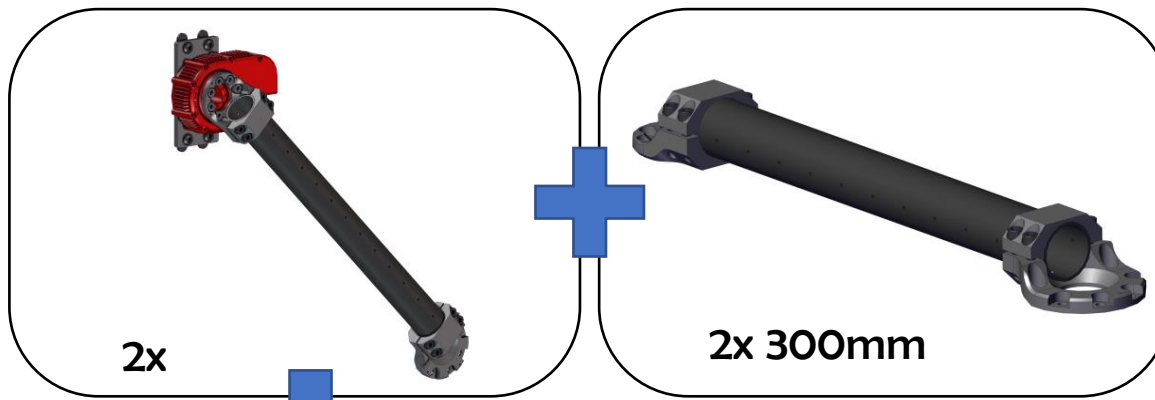


1 x  
A-2039-02



1 x  
A-2038-02





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

M5 x 10mm



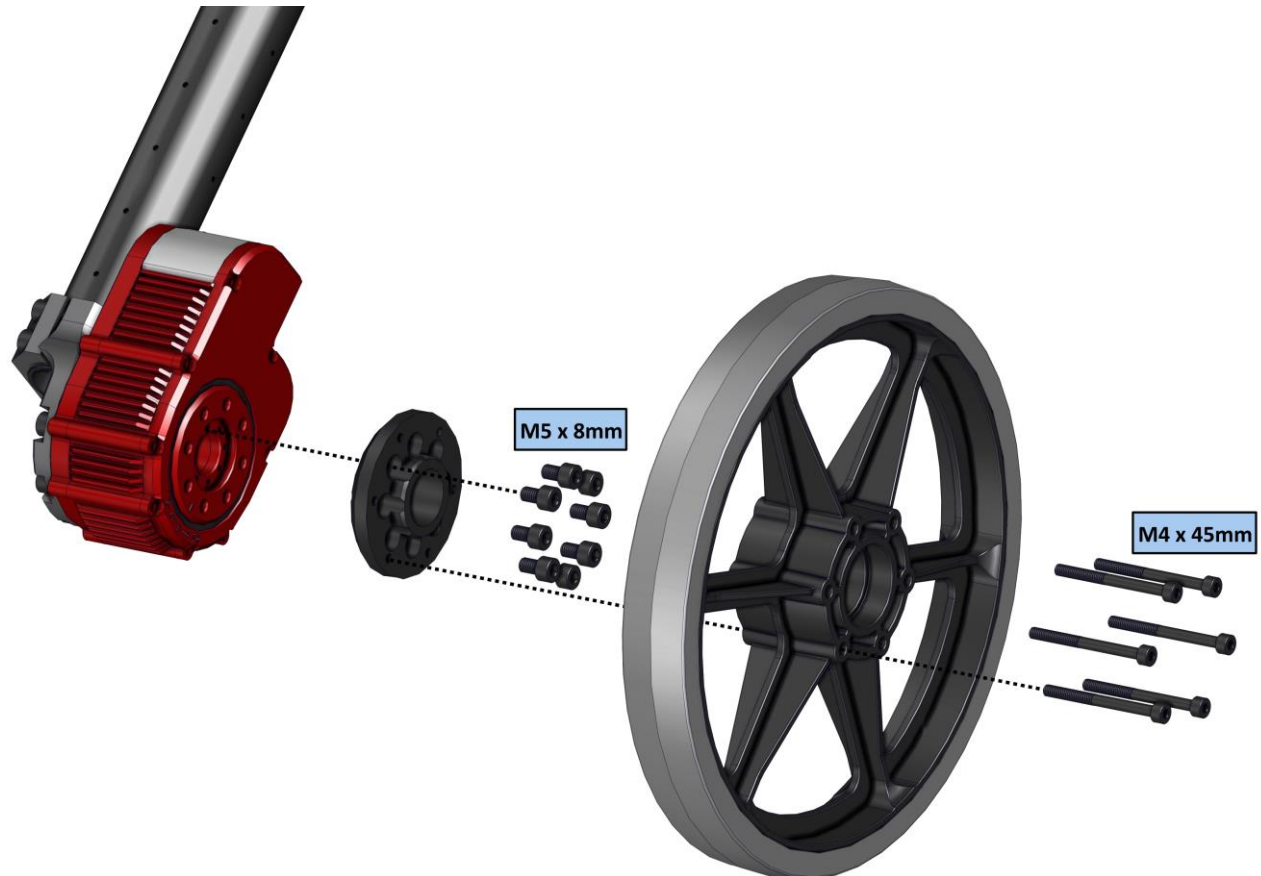
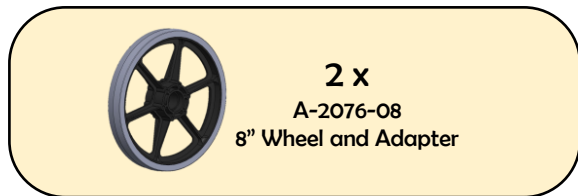
Knee (X8-16)

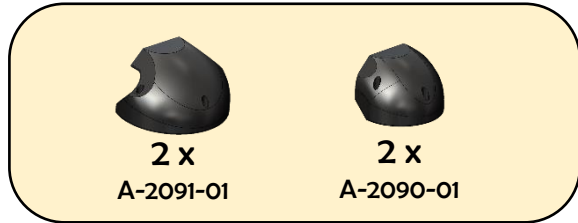
M5 x 8mm

M5 x 8mm



Wheel (X8-3)



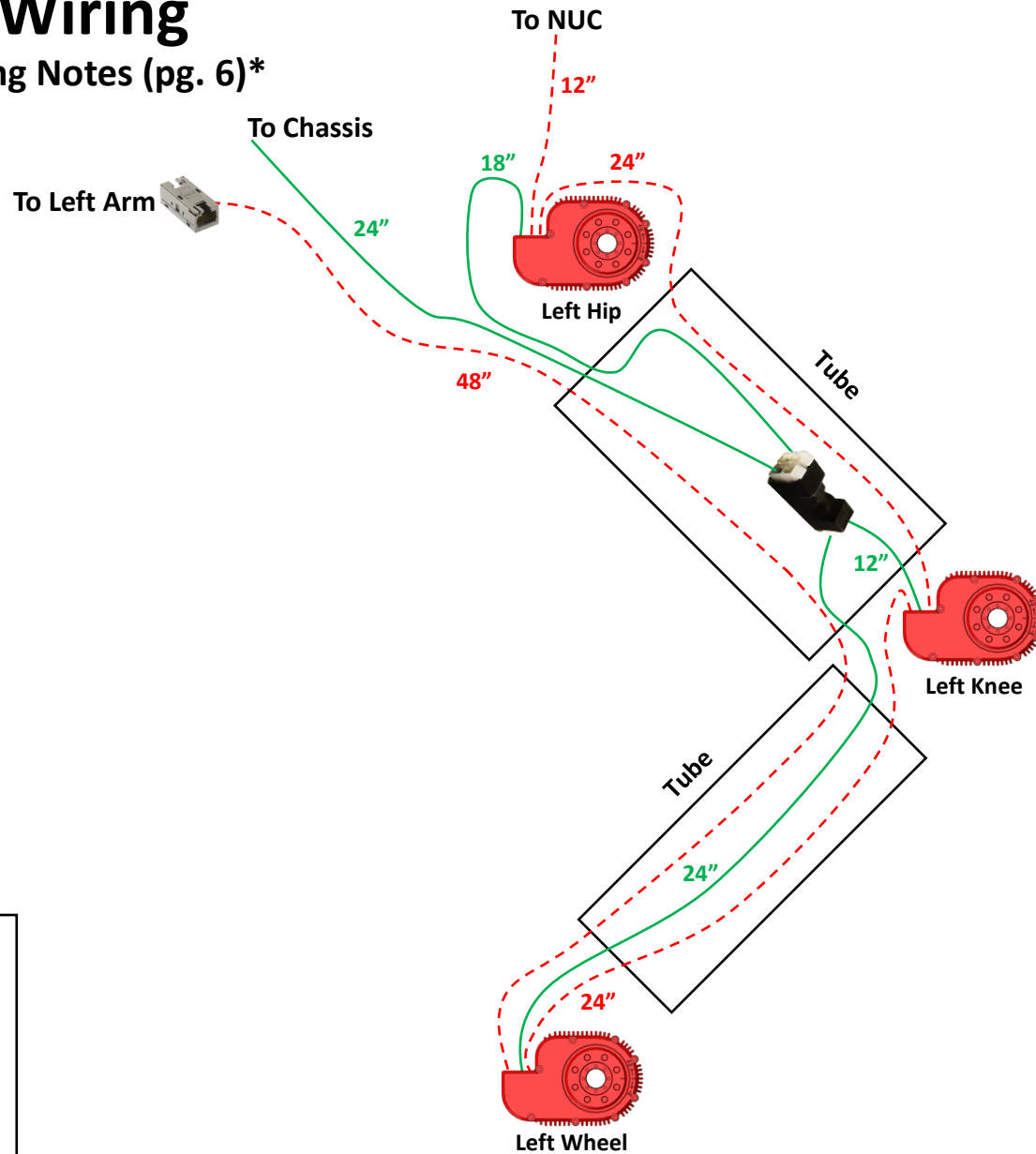


Install cables before  
adding covers



## Left Leg Wiring

\*Refer to Wiring Notes (pg. 6)\*



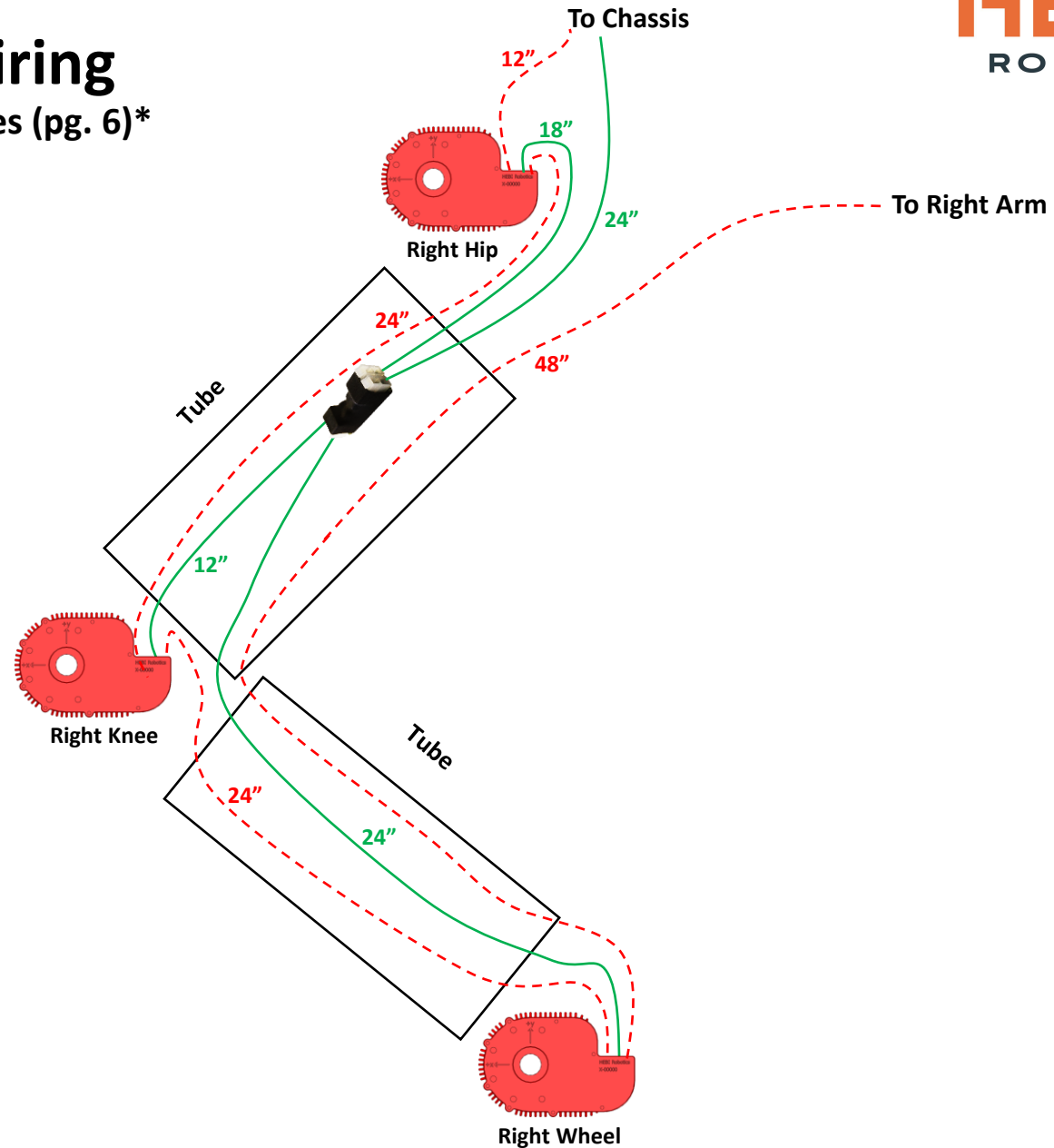
### Legend

- Power Cable
- Ethernet Cable
-  Power Distribution
-  Ethernet Coupler



## Right Leg Wiring

\*Refer to Wiring Notes (pg. 6)\*

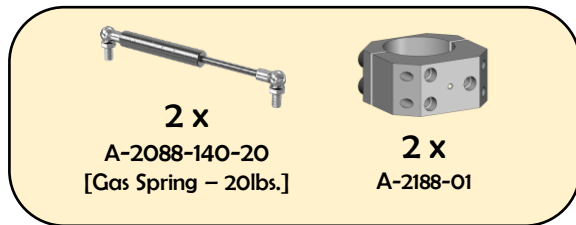
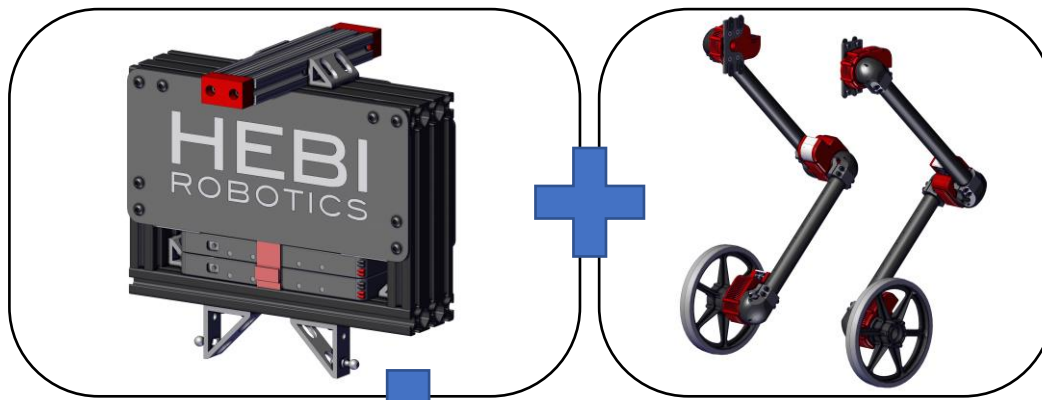


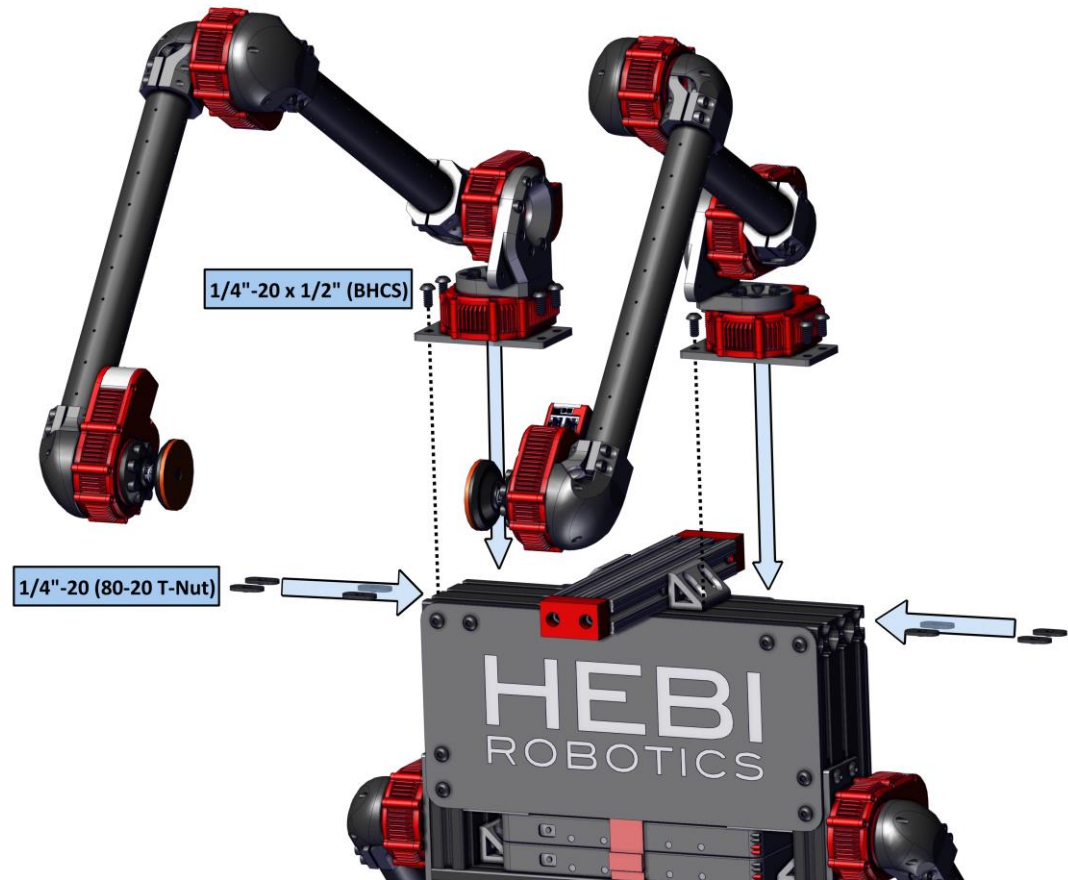
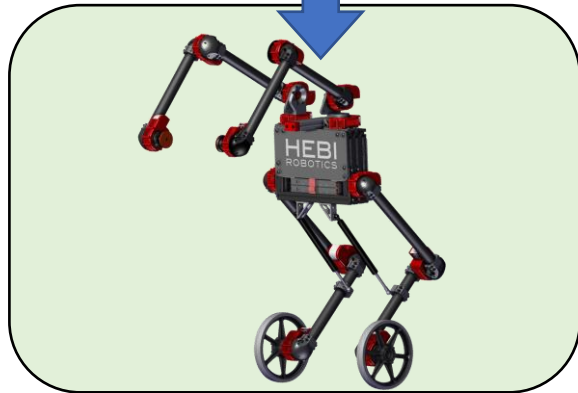
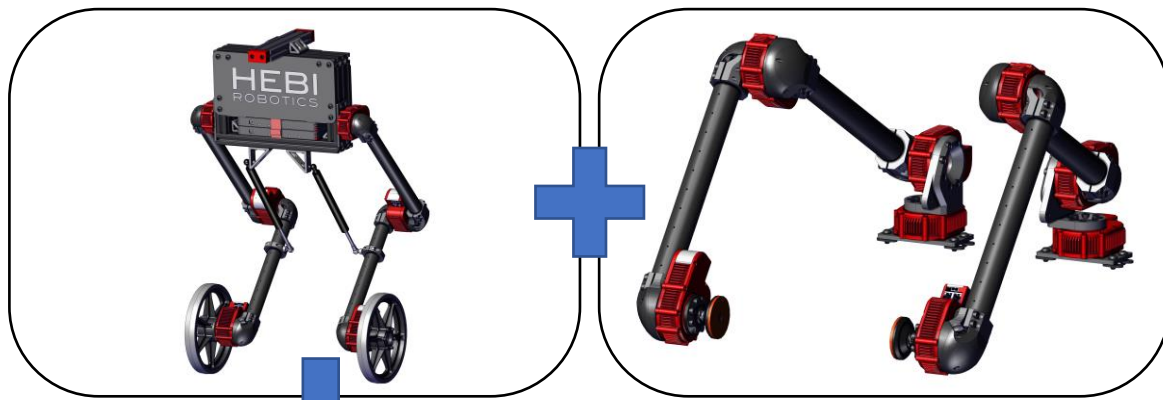
### Legend

- Power Cable
- - - Ethernet Cable
-  Power Distribution
-  Ethernet Coupler



# Final Assembly





## Wiring through Chassis (Robot facing you)

