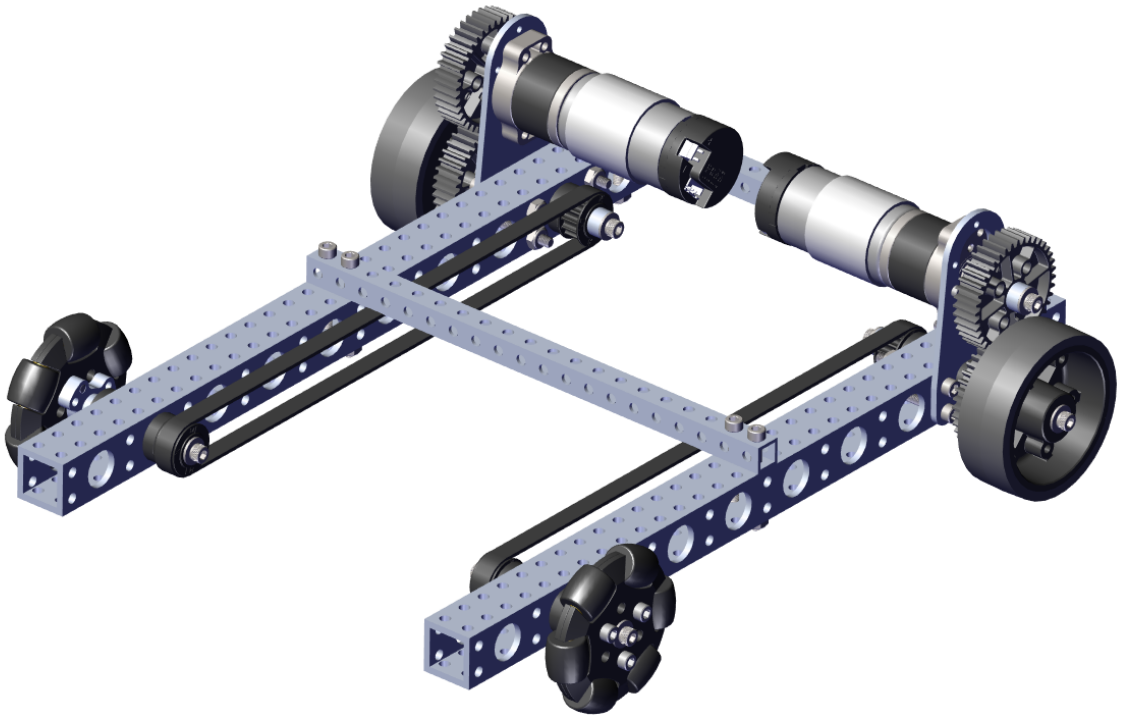
AndyMark®

Assembly Guide

ROBITS

Starter Drive Base



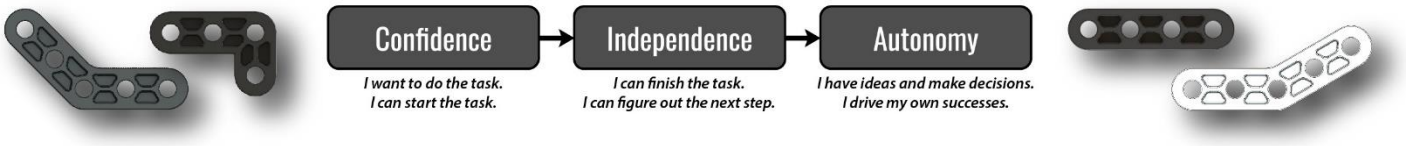
June 2025

***AndyMark* – Your Robot Parts Experts**

AndyMark, Inc. was founded in 2004 by Andy Baker and Mark Koors to design and sell unique mechanical parts for competition and educational robotics. Through their volunteer work at FIRST® events they identified a niche market and began designing and selling robotics components for FIRST ® teams. AndyMark's staff has over 200 years of FIRST team experience, and provides staffing services to many robot competition events throughout the year. Our Kokomo, Indiana home provides a central location for quick distribution across North America, as well as international shipping to over 70 countries.

Welcome to ROBITS!

Robits is a building system for FIRST Tech Challenge teams, designed with accessibility in mind. Robits encourages rapid iteration and promotes development of critical thinking and problem solving.



The Robits system is designed to reduce complexity and enable robust builds. Parts align to a common 1/2" grid simplifying construction and allowing alignment of both structure and motion components. Optimized resolution of components simplifies the system while allowing teams to always have the parts they need to complete a build.

Additional Instructions Available

For more product information, examples and guides check out **AndyMark.com**. For additional questions about any of our products contact us via e-mail at **support@andymark.com**, or call **765-868-4779**.

Required Tool List	
AM Part Name	**AM Part #**
Hex Driver, Ball End 2.5mm with Handle	am-3724
Hex Driver, Ball End 5/32" with Handle	am-2751
3/8 Combination Wrench	am-4961

Starter Drive Base		
AM Part Name	**AM Part #**	**Quantity**
Robits 1.0 x 1.0 x 15.5 Tube	am-5002-1550	2
Robits Bushing for 375 Hex	am-5021	8
#10 Steel Washer	am-1026	10
Screw, SHCS, 10-32 x 0500	am-1002	10
Screw, SHCS, 10-32 x 1500	am-1014	8
10-32 Nylock Jam Nut	am-1063	16
M3-0.5 x 8 mm Socket Head Cap Screw with Thread Patch	am-1500	6
40 Tooth 20DP 0.375 in. Hex Bore Plastic Gear	am-5020_40	4
Robits 0.375 in. Hex Shaft 3 in. Long	am-5003-0300	2
3 in. Stealth Wheel (Gray)	am-4718_gray	2
Robits 0.375 in. Hex Shaft 4 in. Long	am-5003-0400	2
14 Tooth 0.375 in. Hex Bore HTD Pulley Half	am-4960_half	8
121 Tooth Belt	am-5209_121T	2
Spacer, 0.430 ID x 0.500 OD x 0.250 Long Aluminum	am-1698	10
3" Omni Wheel (Single)	am-4967a	2
NeveRest Hex - 19.2:1, 1 Inch Shaft	am-5442	2
JST Motor Cable 12IN	am-5198-1200	2
Robits 80-100T Motor Mount	am-5017	2
Robits 0.5 x 0.5 x 10.0 Tube	am-5001-1000	2
Screw, SHCS, 10-32 x 1750	am-1048	8

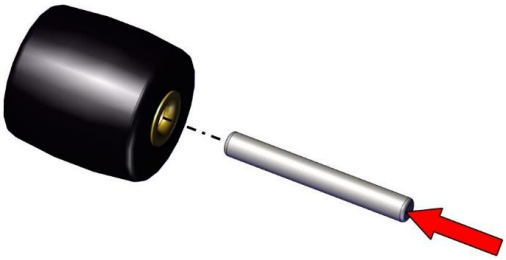
Omni Wheel Assembly (am-4967a)			
AM Part Name	**AM Part #**	**Quantity per Wheel**	**Quantity per Drive Base**
Omni Roller	am-5464	6	12
Bushing	am-0050	12	24
Dowel	am-1019	6	12
Screw, SHCS, 10-32 x 0750	am-1047	3	6
Omni Wheel Half	am-5463_half	2	4
Hub	am-4967_hub	1	2

Assemble Omni Wheels

1. Place two bushings (am-0050) into each roller (am-5464). Each wheel will use 6 rollers.

6x

2. Place one dowel (am-1019) into each roller. Repeat for each of the 6 rollers per wheel.

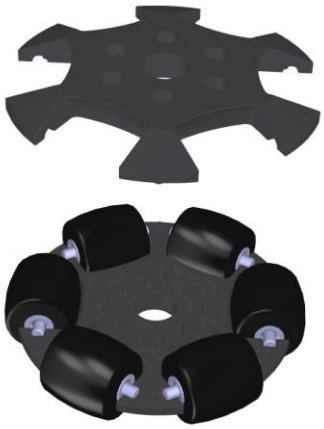


6x

3. Place a roller assembly in between each spoke of the omni wheel half (am-5463_half).

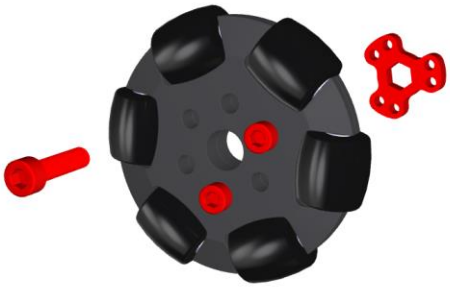
Note: The hub can be used as support under the wheel halves to make it easier to place each of the rollers.

4. Cover the roller dowels with a second outer plate.



Note: Be sure to align the pegs on the first half to match the hole in the second half.

5. Fasten the stack to a hub (am-4967_hub) with three 10-32 x 0750 inch screws (am-1047) in alternating holes.



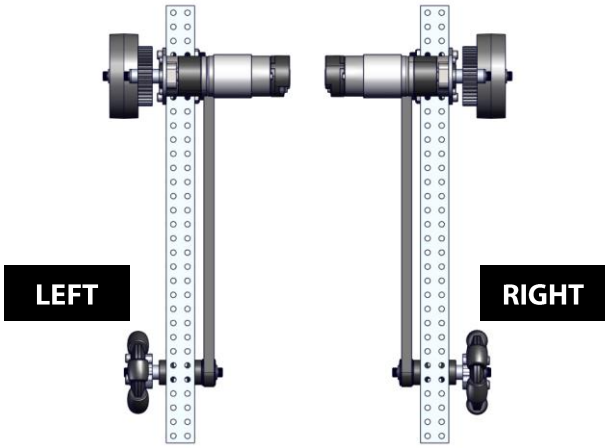
Note: A 3/8 shaft can be used to help align the center hole while tightening screws

6. Repeat steps 1-5 to build two wheels for the starter chassis.

2x

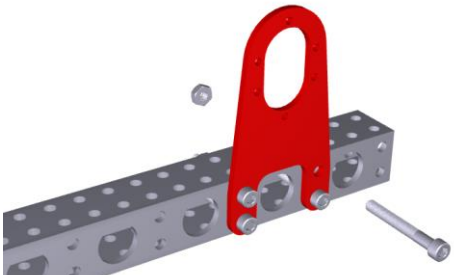
Assemble Drive Modules

*The Robits drive base has a module for each side. Ensure both a **left** and **right** version are built.*

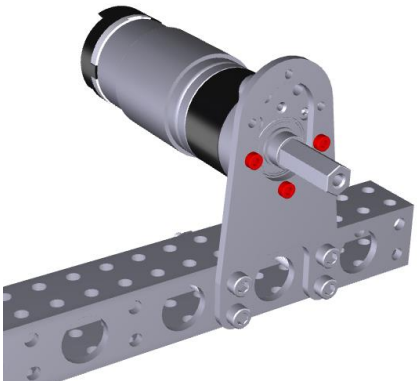


1. Install one 80-100T Motor Mount (am-5017) to the outside of the Robits 1.0 x 1.0 x 15.5 Tube (am-5002-1550) using four 10-32 x 1500 inch screws (am-1014) and four 10-32 nylock nuts (am-1063).

Note: RIGHT Version Shown

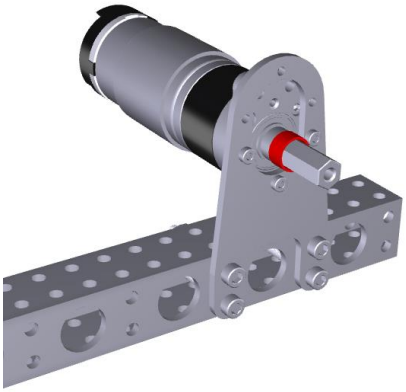


2. Install one NeveRest Orbital 19.2 gearmotor (am-5442) to the Motor Mount plate using three M3-0.5 8mm patched screws (am-1500) in the lower three mounting holes.

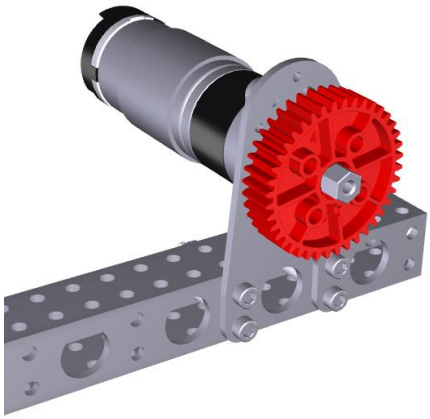


Note: We recommend the motor flanges be vertical, with the motor connectors facing inward.

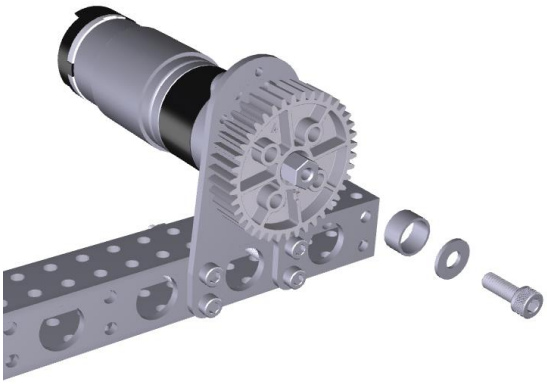
3. Place a ¼ inch shaft spacer (am-1698) on the motor shaft.



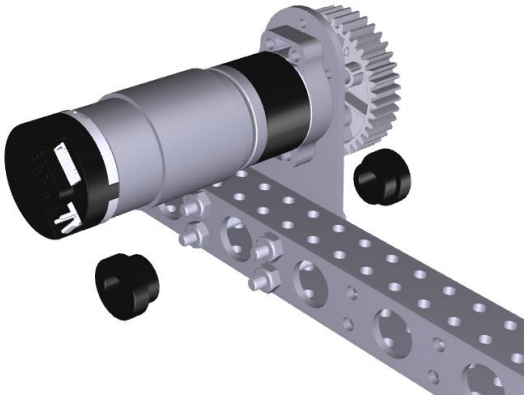
4. Place one 40T gear (am-5020_40) on the motor shaft.



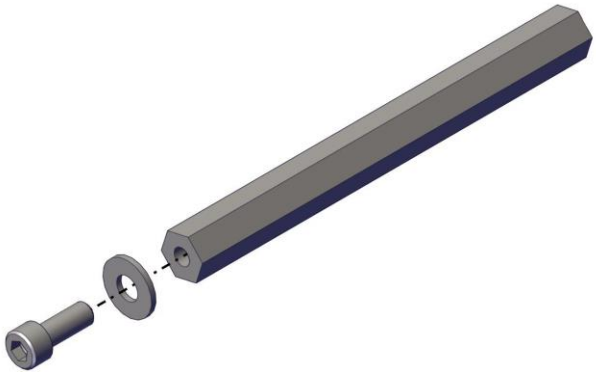
5. Place a ¼ inch shaft spacer (am-1698) on the shaft and retain with one 10-32 x 0500 inch screw (am-1002) with one #10 washer (am-1026).



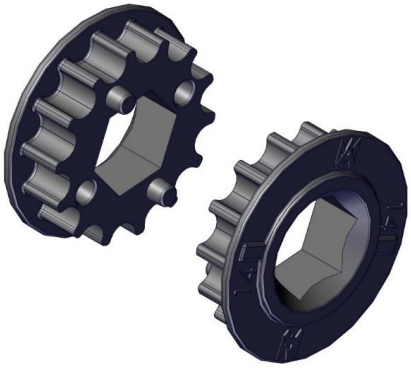
6. Insert two bushings (am-5021) into the tube under the motor mount.



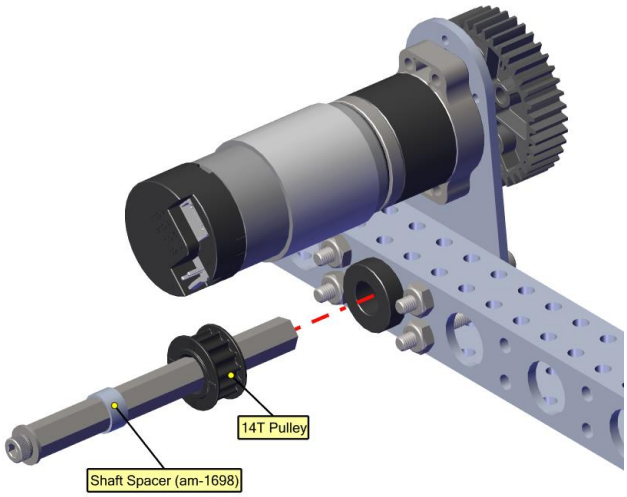
7. Install one 10-32 x 0500 inch screw (am-1002) with one #10 washer (am-1026) into the end of one 4 inch shaft (am-5003-0400).



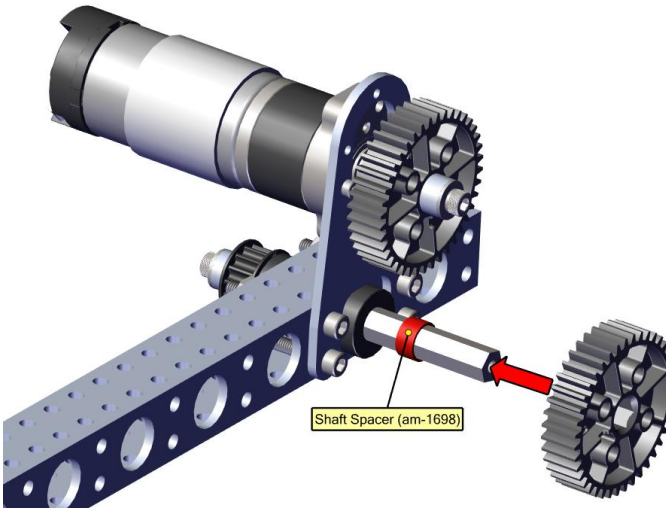
8. Put together two pulley halves (am-4960_half) to create a pulley.



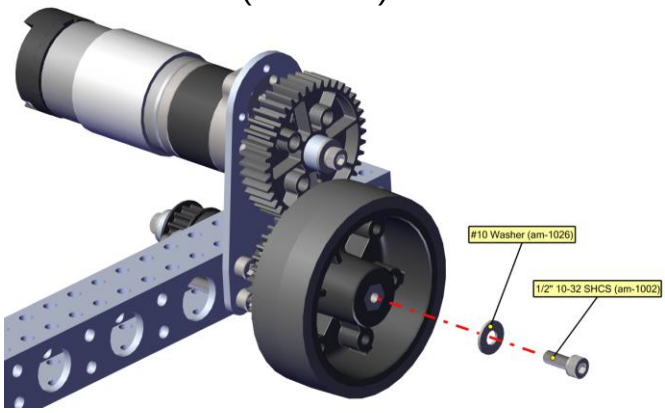
9. Add a ¼ inch shaft spacer (am-1698) and insert shaft assembly through the two 14T pulley halves and through the previously installed bushings in the tube.



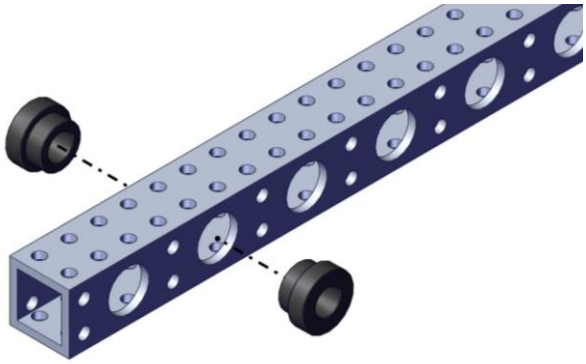
10. Slide one ¼ inch shaft spacer (am-1698) on the shaft from the outside and follow it with one 40T gear (am-5020_40).



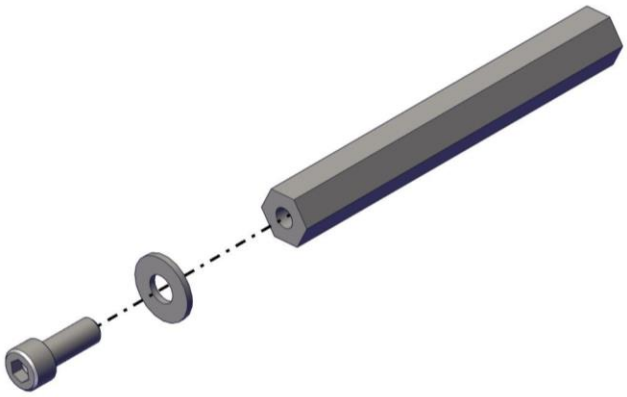
11. Add a 3 inch stealth wheel (am-4718_gray) to the shaft. Retain the wheel with one 10-32 x 0500 inch screw (am-1002) with one #10 washer (am-1026).



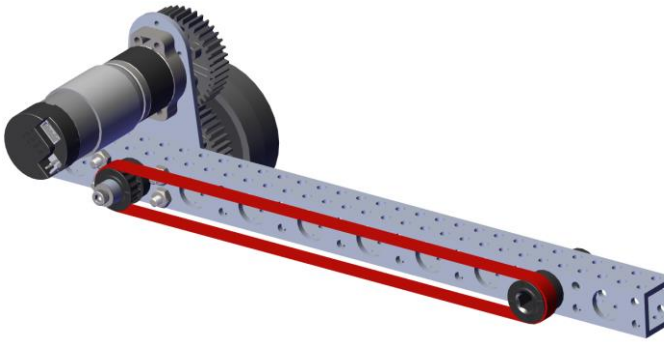
12. Insert two bushings (am-5021) into the tube in the 2nd hole from the end opposite the motor.



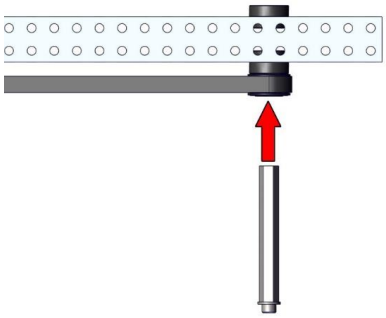
13. Install one 10-32 x 0500 inch screw (am-1002) with one #10 washer (am-1026) into the end of one 3 inch shaft (am-5003-0300).



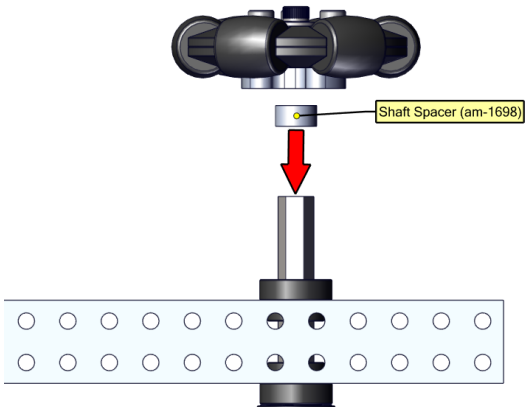
14. Place one 121T belt (am-5209_121) on to the motor side pulley and position two 14T pulley halves (am-4960_half) on the opposite side.



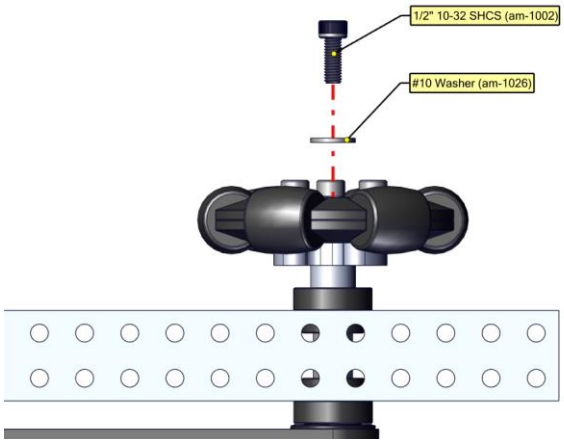
15. Insert the 3 inch shaft assembly through the 14T pulley and previously installed bushings.



16. Slide one ¼ inch shaft spacer (am-1698) on the shaft from the outside and follow it with one 3 inch omni wheel (am-4967a).



17. Retain wheel with one 10-32 x 0500 inch screw (am-1002) with one #10 washer (am-1026).

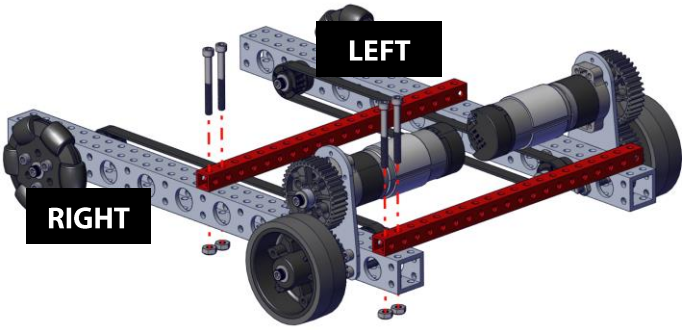


18. Repeat steps 1-17 in a mirror image to create a “left-handed” drive module.

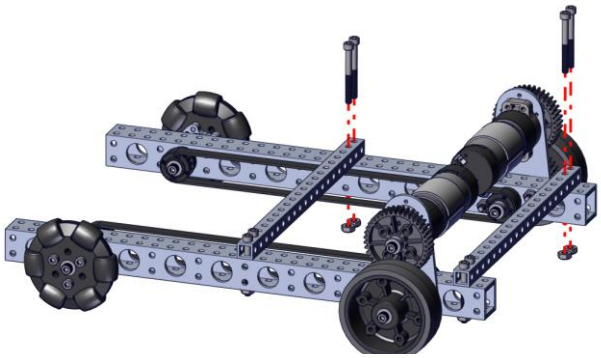
Note: Attach the tubes to the center hole pair and the second hole pair on the motor side.

Assemble Drive Base

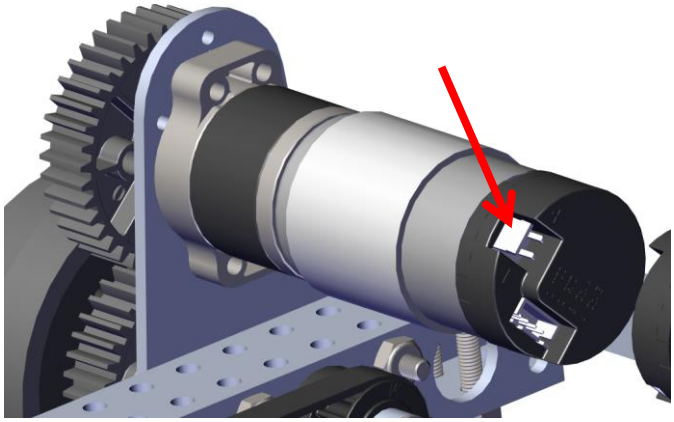
Place two 0.5 x 0.5 x 10.0 tubes (am-5001-1000) on top of one of the drive modules and fasten with four 10-32 x 1750 inch screws (am-1048) and four 10-32 Nylock nuts (am-1063).



Align the other drive module with the existing inch 0.5 x 0.5 x 10.0 tubes and fasten with 10-32 x 1750 inch screws (am-1048) and 10-32 Nylock nuts (am-1063).



Connect one 12” JST Motor cable to each NeveRest motor at the location shown.



The starter drive base is complete! Use this as a starting point and add on other parts, mechanisms, and electronics to create a complete robot.