AndyMark®

User Guide

AM14U3 - 6” SR Mecanum Upgrade Kit

(am-14u3-mk6sr)

AndyMark – Your Robot Parts Experts

AndyMark wishes the best of luck to all *FIRST®* Teams in the upcoming *FIRST® Robotics Competition* season!

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 with *FIRST®* Robotics Competition events they identified a niche market and began designing and selling robotics components for *FIRST®* teams. At that time, many designs were being shared and re-created, but finding the correct fabrication resources for these parts was difficult for some *FIRST® Robotics Competition* teams. AndyMark has been a proud supplier to the *FIRST® Robotics Competition* since 2005.

System Overview

The AM14U3 Drive Chassis Base Kit (am-14u3) is designed to help teams accomplish the basics in *FIRST® Robotics Competition*. The AM14U3 Base Kit includes standard AndyMark products and is designed to also work with additional AndyMark products.

Additional Instructions Available

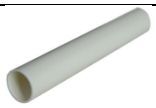
We encourage customers to seek product information at **AndyMark.com**, contact us via e-mail at **support@andymark.com**, or call Toll-Free **877-868-4770** with questions about any of our products.

Detailed assembly tips and instructional videos can be found at AndyMark.com/FRCVideos. Additional resources, drawings, and CAD are available on the AndyMark.com/ web page.

AM14U3 Recommended Hand Tool List (not included)

Component	Part No.	QTY	Part Photo
Hammer	Available at your local hardware store.	1	
Drill or Drive	Available at your local hardware store.	1	
Hacksaw	Available at your local hardware store.	1	
3/8” Magnetic Nut Setter	am-2755	1	
5/16” Magnetic Nut Setter	am-2754	1	
9/16” Socket, 3/8” Drive	am-2743	1	
3/8” Socket, 3/8” Drive	am-2740	1	
5/32” Ball End Hex Drive	am-2751	1	
3/8” Drive Quick Release Ratchet	am-2753	1	
1/2”-9/16” Open-End Wrench	am-2746	1	

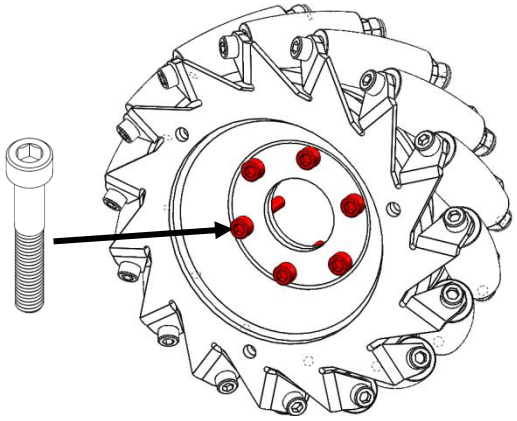
6” SR Mecanum Upgrade Kit Bill of Materials

Component	Part No.	QTY	Part Photo
6” SR Mecanum Wheel Set	am-	1	
500EX Hex Hub	am-2568	4	
FR8ZZ Hex Bearing	am-2986	4	
.125” x .629”ID Nylon Washer	am-1358	8	
550 Sprocket Spacer	am-0651	4	
#10-32 Nylock Nut	am-1042	24	
#10-32 x 1.25” SHCS	am-1041	24	
2.425” PVC Spacer	am-3544	4	
AM14U3 2x6 Bracket	am-3299	4	
3.875” Churro	am-3087	4	
10.71:1 Ratio Toughbox Micro	am-3549_107	4	

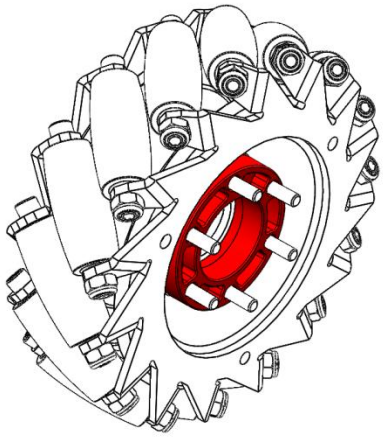
6” SR Mecanum Wheel and Hub Assembly Instructions

Mecanum Wheel (QTY 4)

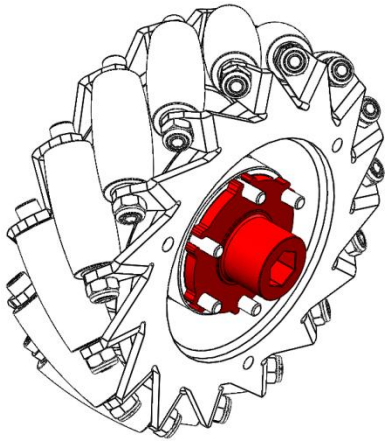
Step 1: Insert (6) 10-32 x 1.250” SHCS (am-1041) into the bolt holes of the mecanum wheel hub.



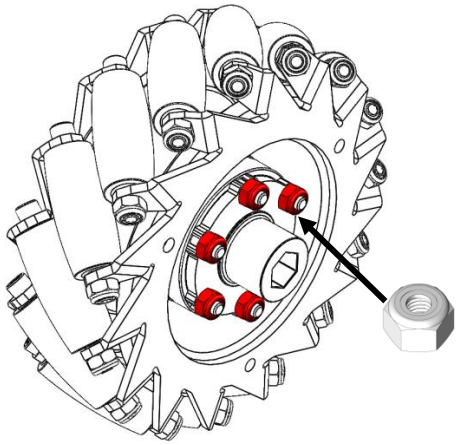
Step 2: Add a 550 Sprocket Spacer (am-0651) to the mecanum wheel.



Step 3: Add the 500Ex Hex Hub (am-2568).



Step 4: Tighten down (6) 10-32 Nylock Nuts (am-1042).

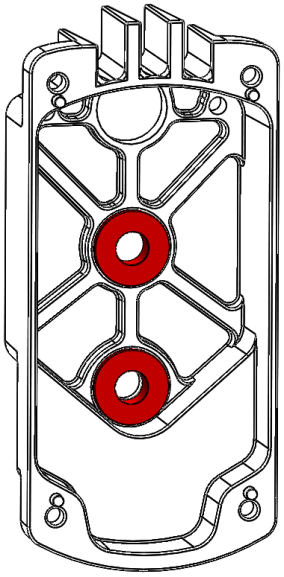


NOTE: Tighten the screws in a star pattern to ensure the hub aligns evenly on the wheel.

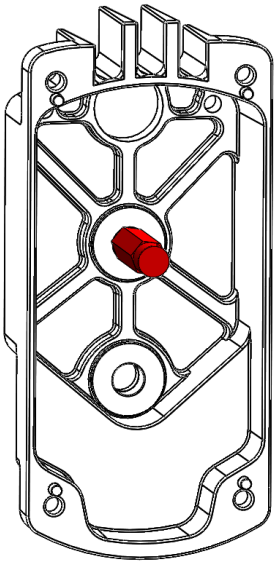
4X

Toughbox Micro (QTY 4)

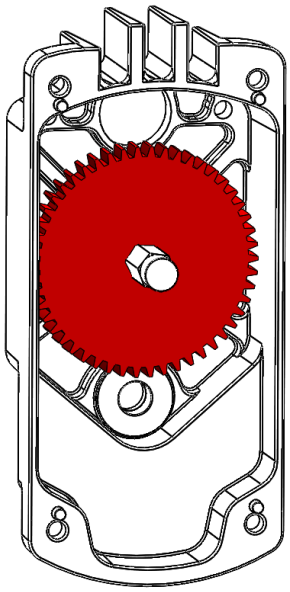
Step 1: Press an R6ZZ bearing (am-0516) into the two center holes of the Toughbox Micro housing (am-3157).



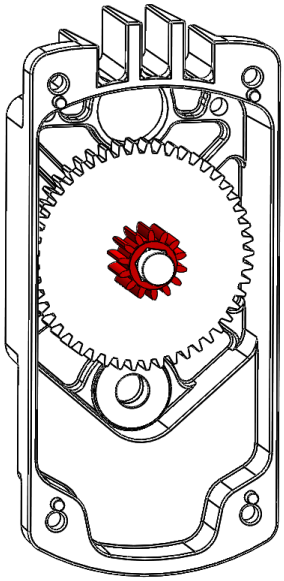
Step 2: Insert the Toughbox small hex shaft (am-0152) in the top bearing.



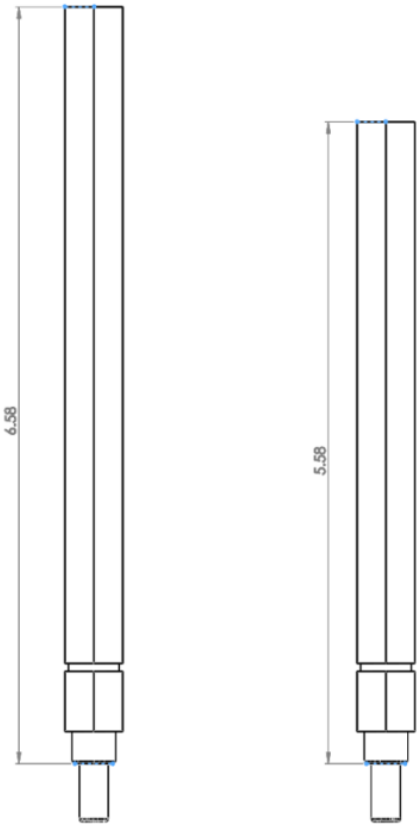
Step 3: Insert the 50T 3/8" Hex Gear (am-0149) onto the small hex shaft with the flat side up.



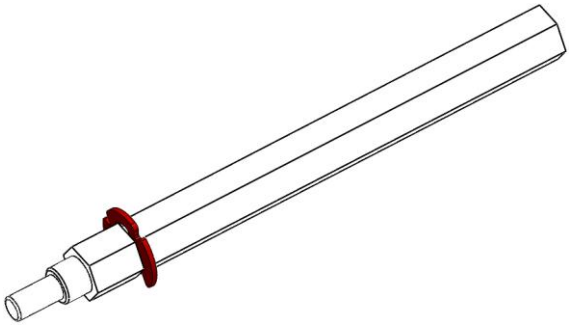
Step 4: Insert the 16T 3/8" Hex Gear (am-0747) over the small hex shaft with the flat side down.



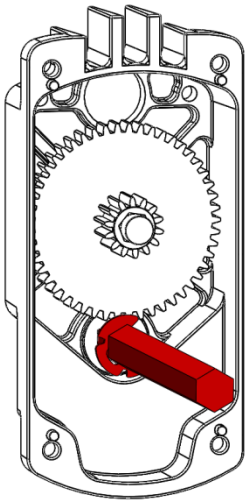
Step 5: Cut 1” off the end of the Long 1/2” Hex Shaft for Toughbox series (am-0801a).



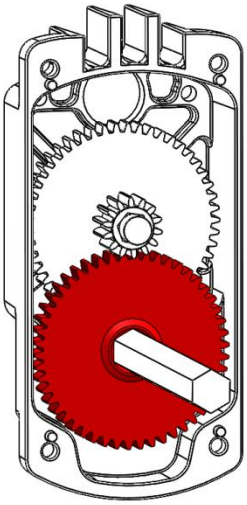
Step 6: Tap the 1/2” eClip Ring (am-0206) into the grooved slot of the Toughbox output shaft (am-0801a).



Step 7: Insert the small end of the output shaft into the bottom R6ZZ bearing.



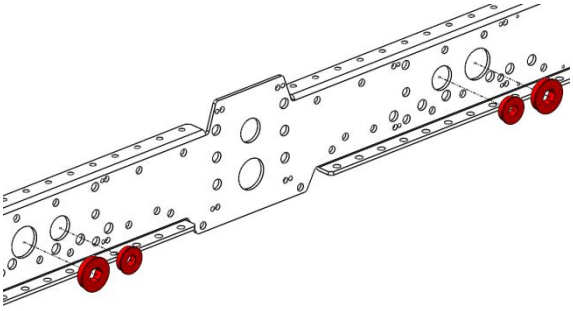
Step 8: Place the 48T ½” Hex Gear (am-0855) onto the output shaft, flat side down. Use grease packet (am-2768) and apply grease to all of the gear teeth.



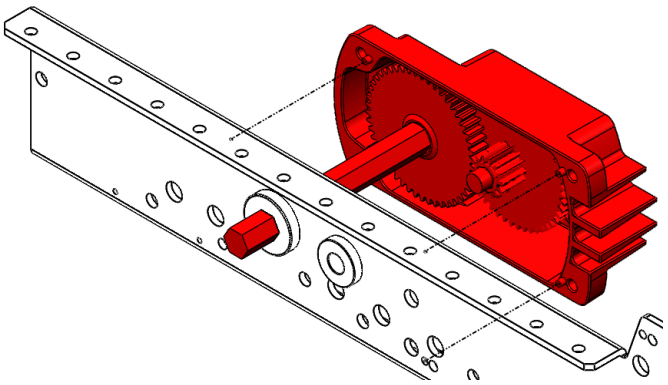
4X

Mecanum Drive Module (QTY 2)

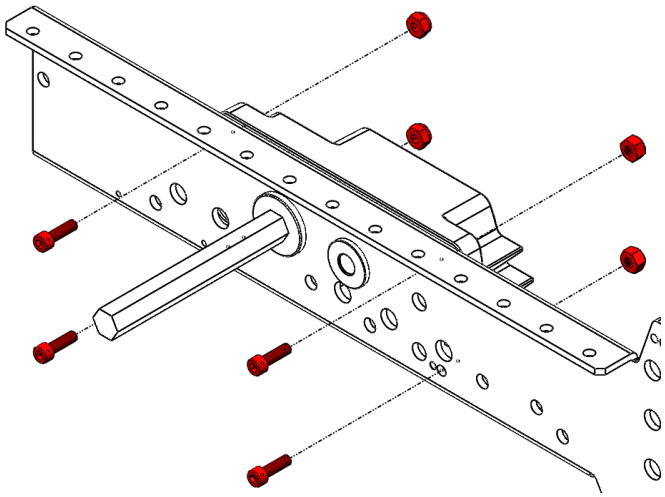
Step 1: Press the FR6ZZ (am-0028) and FR8ZZ Hex HD bearings (am-2986) into the center holes on the Inner Plate (am-2952a) with the **bearing flanges on the same side** as the bottom flange. This will keep the bearings from falling out during operation.



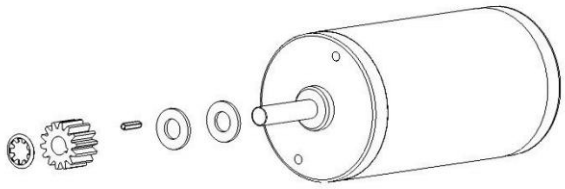
Step 2: Place the TB Micro (am-3549_107) onto the Inner Plate using the plastic studs to align the housing. The bottom flanged edge of the Inner Plate will be facing towards the gearbox housing.



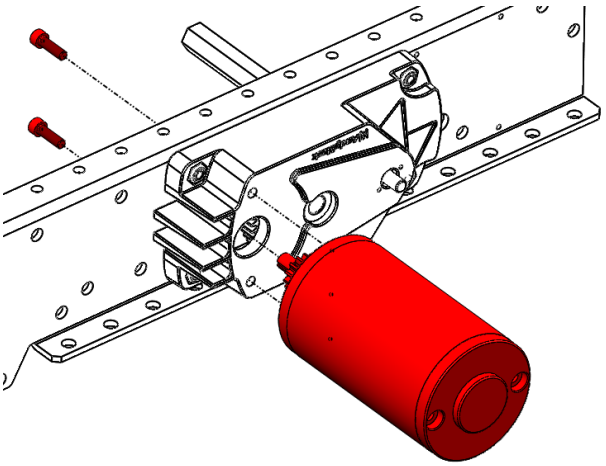
Step 3: Attach the TB Micro to the Inner Plate with (4) 10-32 x 0.750” SHCS (am-1047) and (4) Nylock nuts (am-1042). The nuts will fit into the hex pockets on the TB Micro housing and will hold the nut while tightening.



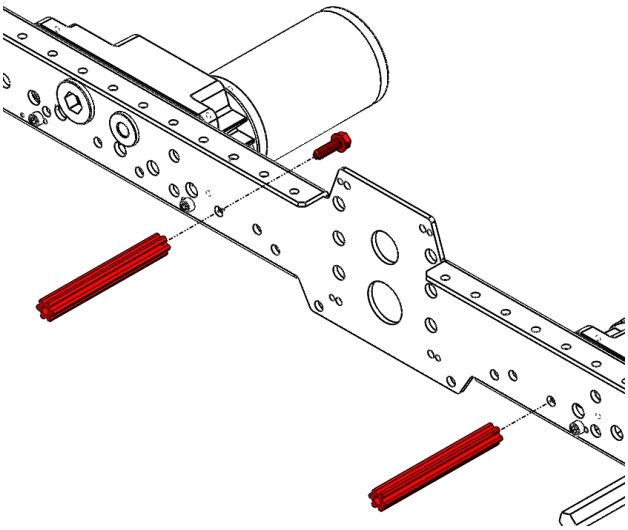
Step 4: Place (2) 5/16” Washers (am-1009) onto the CIM Motor shaft. Place the 2 x 2 x 10mm Machine Key (am-1121) into the keyway of the motor shaft. Push the 14T, 8mm Key gear (am-0034) onto the shaft, to the face of the washers, while aligning the keyway with the machine key. Use a 7/16” socket to press the 8mm Retaining Clip (am-0033) onto the face of the gear.



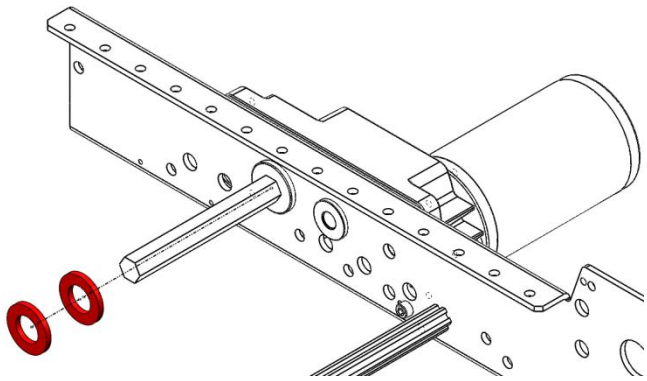
Step 5: Line up the CIM motor with the mounting holes in the TB Micro. The housing can be used to align the motor. Secure the CIM motors (am-0255) to the TB Micro housing with (2) 10-32 x 0.625" SHCS w/ Nylon Patch (am-1120).



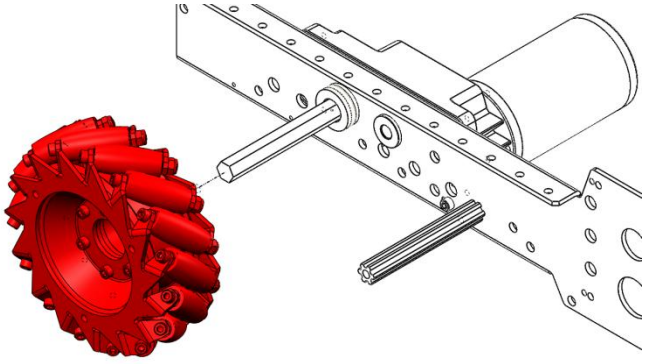
Step 6: Attach (2) 3.875" Churro Standoffs (am-3087) with (2) ¼-20 x 0.750" Thread Forming Screws (am-1310) onto the Inside Plate. A ½" wrench can be used to hold the churro while tightening.



Step 7: Add (2) .125" Thick Nylon Spacer (am-1358) onto the hex output shaft.

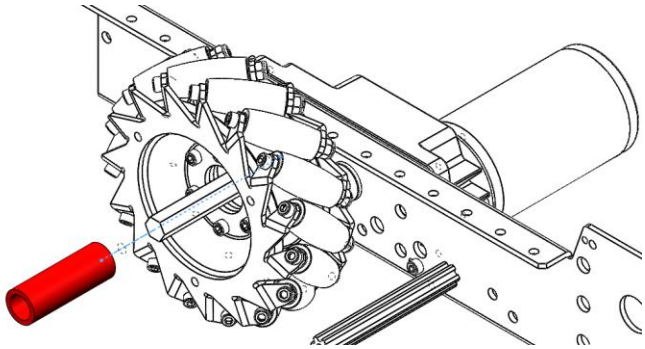


Step 8: Add the assembled **Left** 6" SR Mecanum wheel (am-3479L) onto the hex output shaft.

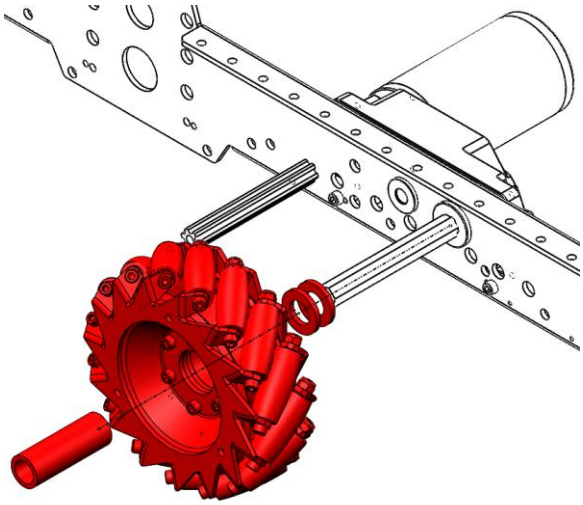


NOTE: The churro standoffs are intended to help with the structure of the chassis. Be sure to install (2) on each Inner Plate.

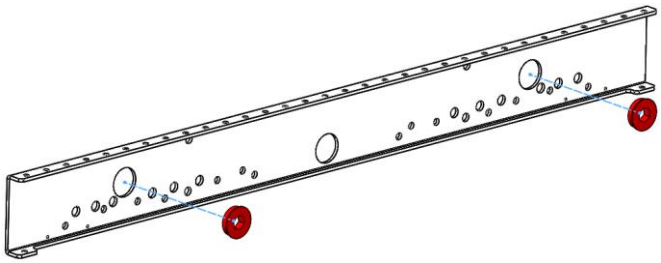
Step 9: Next add the 2.425” PVC Spacer (am-3544) onto the hex output shaft.



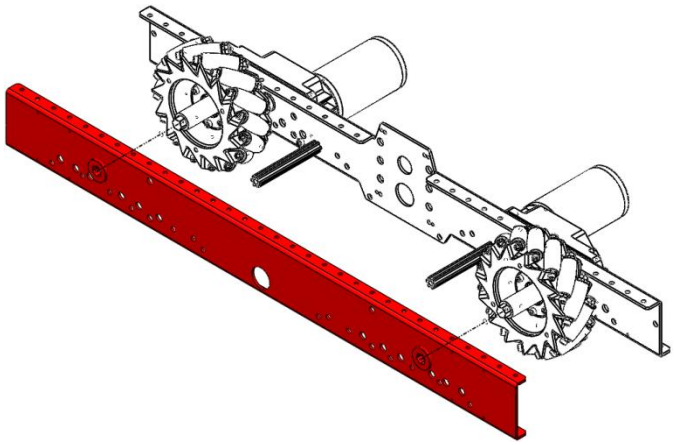
Step 10: Repeat steps 8-9 for the **Right** assembled 6” SR Mecanum Wheel (am-3479R).



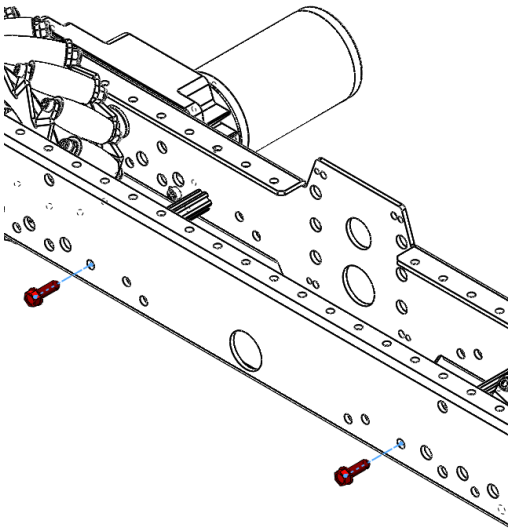
Step 11: Press (2) FR8ZZ Hex HD Bearing (am-2986) into the outer large holes of the Outer Plate (am-2951a).



Step 12: Add the Outer Plate so that the output shaft are inserted through the hex bearings.



Step 13: Secure the Outer Plate to the churros with (2) ¼-20 x0.750” Thread Forming Screws (am-1310).



2X