REV ROBOTICS

COMPATIBILITY GUIDE

This guide is intended as a reference on how to build with the new REV Robotics 15mm building system. We appreciate and understand that there are many other building systems that are used for building robots. While the REV system is different, this guide will show you the basics of how to interface REV parts with other systems

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1.1 Basic Adding Hex Shaft

Increase the reliability of any robot system by switching from set screws to hex shaft. Set screws can become loose and damage your shafts over time but using a hex shaft to transmit torque doesn't require any set screws or keys, it just simply works.

Converting part of an existing design, or using already purchased parts, with hex is easy. The simplest option is to change to the HD Hex Motor and directly drive either a REV Robotics Traction wheel, or use a HEX Hub with existing 4-hole pattern wheel. Use a shaft color to secure the wheel from sliding off the shaft. (Figure 1)

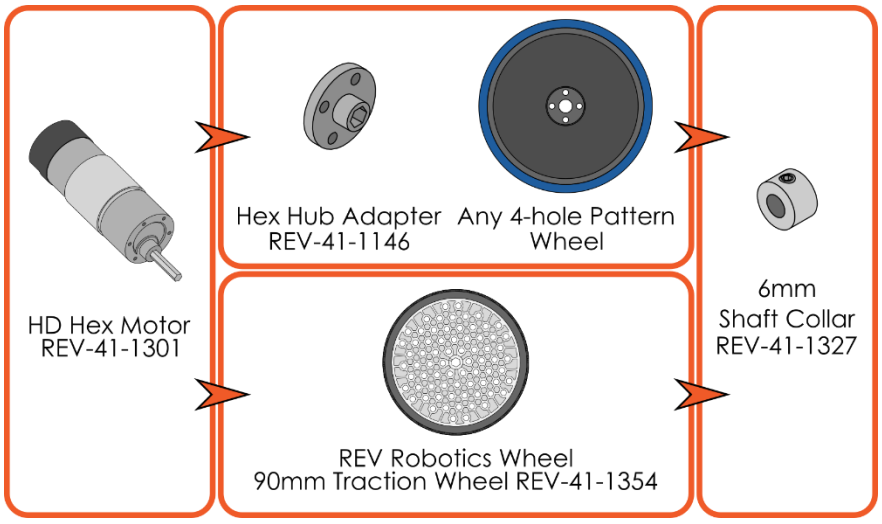

Figure 1: Direct Driven Wheel Using Hex

For a system with more shafts, the easiest way to couple between Hex and non-hex shafts is to use #25 pitch chain because it's common to all systems. In designs with multiple chain stages it's possible to change any number of the shafts over to hex. The more shafts converted, the less risk of a set-screw skipping and causing a failure. Starting from the motor and then changing subsequent shafts will provide the most benefit, but any shaft that's converted to hex will reduce a point of failure.

Figure 2 the HD Hex Motor is used with either a REV Robotics Sprocket or a Hex Hub with any 4-hole pattern sprocket. Connected by chain to the next shaft which can either be another REV Robotics based hex shaft or can connect to any existing #25 pitch chain solution a team already owns.

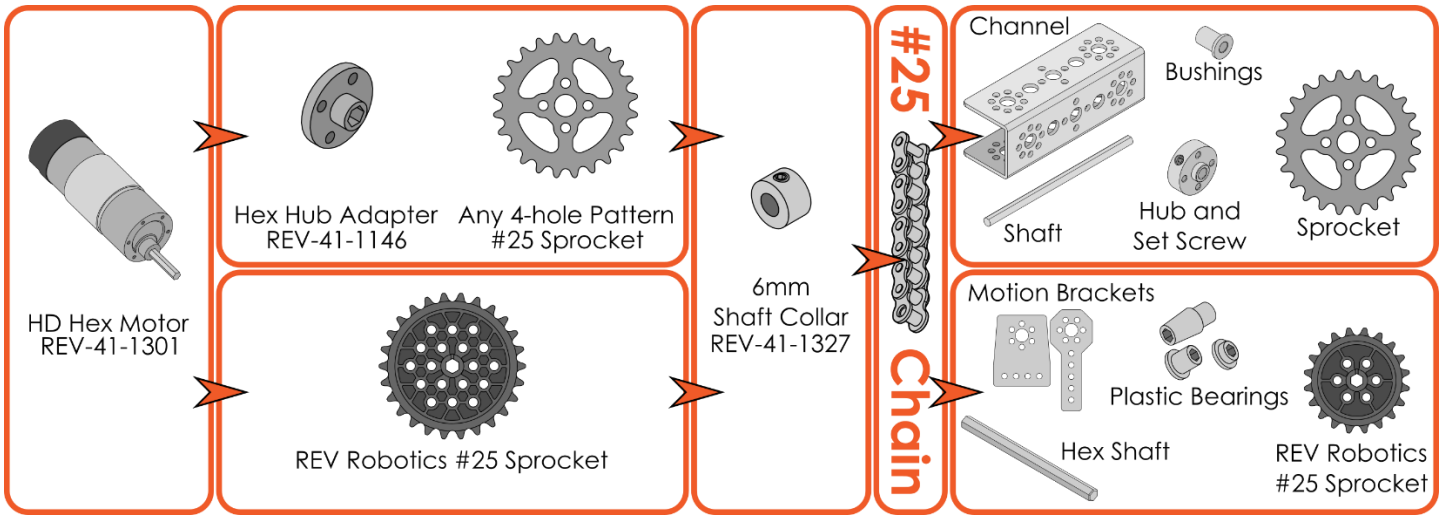

Figure 2: Sprocket and Chain Drive with Hex

1.2 Hex Hub Installation Instructions

Hex hub adaptors are specifically designed to help teams use the parts they already have with the reliability and convenience of a hex drive shaft. In Figure 3, a hex hub adaptor is mounted to an AndyMark Stealth Wheel using four M3x30mm bolts and nyloc nuts. The extended part of the hex hub adapter is sized to pilot the hub into the wheel keeping it centered.

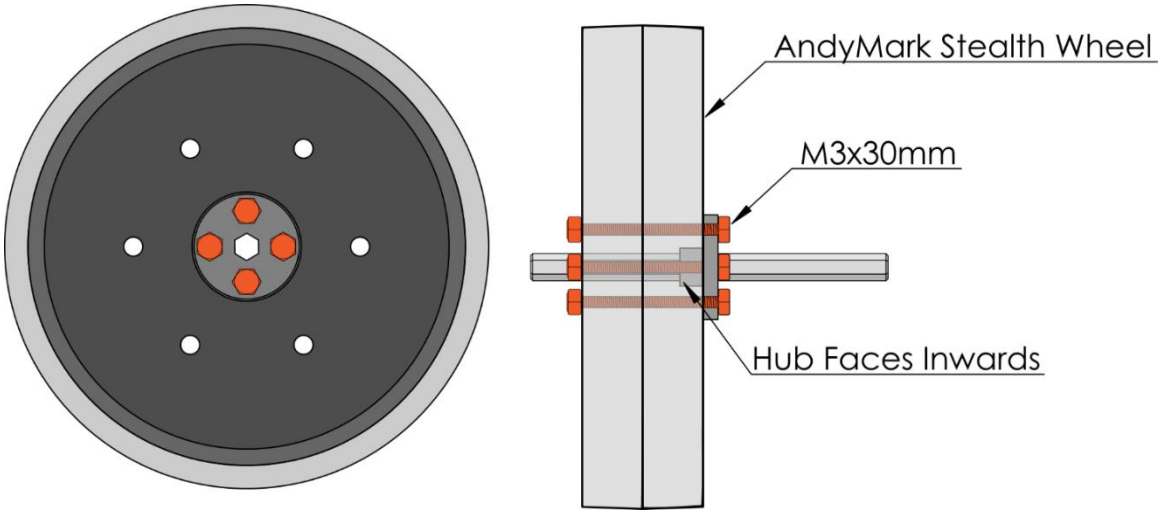

Figure 3: Hex Hub Adaptor used to convert an AndyMark Stealth Wheel to Hex Shaft

1.3 Using Brackets with Other Systems

The REV Robotics Plastic Brackets have mounting holes on an 8mm spacing which is compatible with other building systems commonly used by FTC teams. When mounting a REV Robotics Plastic Bracket to flat channels, turn the bracket so that the alignment ribs on the bracket face out from the channel as shone in Figure 4.

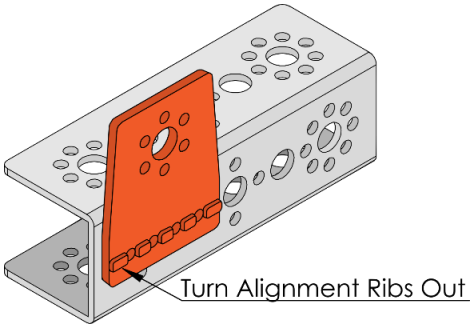

Figure 4: REV Robotics Plastic Bracket on Tetrix Channel with Alignment Ribs Facing Out

Tetrix channels also use an 8mm hole spacing so almost all REV Robotics brackets can mount directly to the channel. In Figure 5, there are several examples of how to mount motion brackets and a structural bracket to the Tetrix Channel. The motion brackets accept a REV Robotics 9mm bearing so they can be used to add hex shaft to a Tetrix robot.

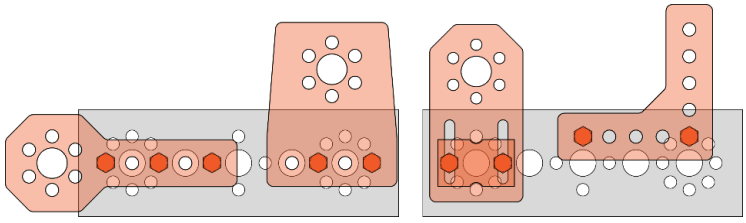

Figure 5: Mounting REV Robotics Brackets to Tetrix Channel

The 90 degree bracket in Figure 5 above is one way to mount extrusion to Tetrix channel. A stronger method would be to miter the end of the extrusion as needed and then bolt it directly to the Tetrix channel as shown in Figure 6. Install M3 hex cap bolts and nylocs in the Tetrix channel with the heads on the side the extrusion will be installed on. Slide the extrusion into place with the bolt heads in the extrusion channel and tighten. This method will also work with Actobotics channel.

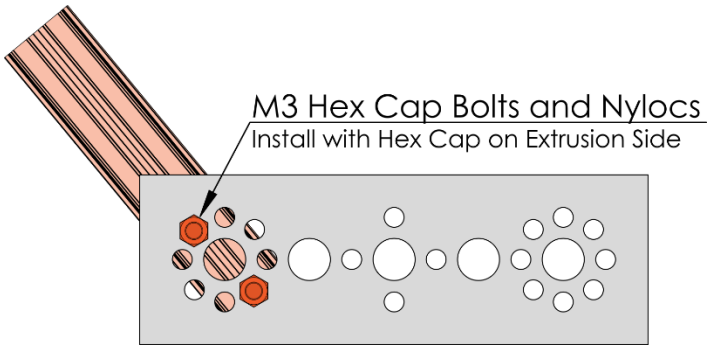

Figure 6: Mounting 15mm Extrusion to Tetrix Channel

To use the REV Robotics Plastic bearings directly in place of the Tetrix bushing, it's recommended to drill out one of the Tetrix pattern 8mm holes to 3/8" (larger than 9mm) and then install a motion bracket over the clearance hole (Figure 7). Depending on which 8mm hole in the Tetrix pattern is used it's possible to match drill and add more fasteners to secure the bracket. It is not recommended to use a plastic bearing directly in the metal channel because of durability concerns. The Delrin bearings a designed specifically to run in the nylon brackets for low friction and long wear.

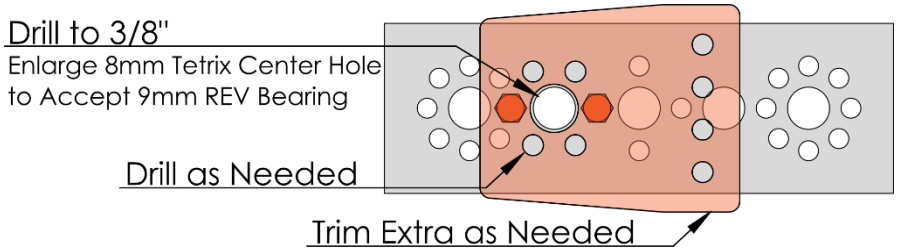

Figure 7: Using REV Robotics Bearings with the Tetrix Hole Pattern

Actobotics' channel is not on an 8mm pitch, but there are still several opportunities to mount REV robotics brackets to the channel. In Figure 8 a Motion Bracket is mounted to the Actobotics channel opening up the use of hex shafts for the Actobotics system with the addition of Motion Brackets and Plastic Bearings. When installing Plastic REV Robotics Brackets on metal channel, ensure the raised alignment ribs face outward so the back of the bracket sits flat in contact with the channel for strength.

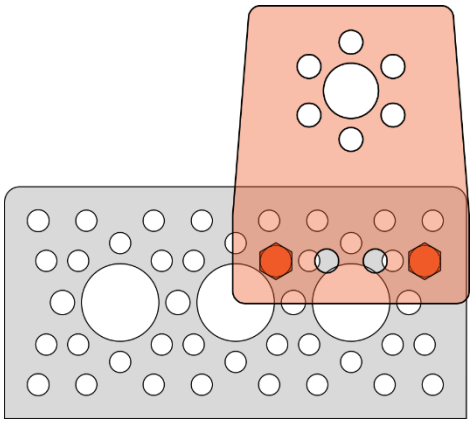

Figure 8: Motion Bracket Mounted to Actobotics Channel