

VEXBusters: Are High Traction Wheels Stronger than Omni Wheels?

Matadors VRC#2059A

Are the VEX High Traction wheels stronger than the VEX Omni Wheels? Name can sometimes be deceiving. The high traction wheels have a name that suggest more traction with the ground than other wheels. However, omni wheels are also commonly used in robot designs. To test this “myth”, the Matadors performed a test to determine whether the high traction wheels really live up to their name.

The basic structure of the test is a simple game of tug-o-war. Tug-o-war is fundamentally a game of friction. Although the pulling force does contribute to the result of the game, most of the forces involved in the game are exerted by the ground on the players’ feet. When applied to the robots, the frictional force between the players’ feet and the ground are translated into the frictional force between the robots’ wheels and the ground. Therefore, the stronger the wheels are, or the most traction a wheel has, the more force it exerts on the opposing robot. The winner, then, is the robot with the stronger wheels.

To set up the game, the team built two robots with identical chassis. Then, they attached the two different types of wheels to the chassis. After that, the two robots are connected together by a steel bar and programmed. Once a button on the robot is pressed, the the wheels move in opposite directions and attempt to pull the other across a red flag. The winner determines the result.

The result? The team discovered that the omni wheels easily overpowered the high traction wheels, which proved that the name certainly is deceiving. The omni wheels not only provide more fluid movement to the robot, but also provide more pulling or pushing force. New teams or even existing teams should now have substantial evidence to determine which wheels to use on their robots.

Myth: Busted