Effect of Anti-Torque on Tire Grip

Kim, Jun Oh

The main purpose of this project is to see which direction of motor spinning takes better tire grip. When the motor spins, according to the newton's third law, it always has the opposite force of the motion. In the motor, when the motor spins, it has the main torque in ninety degrees from the center, and it also has the opposite torque, which is the Anti-Torque. In this mechanism, the position of the motor is same as the direction of tire spinning. This makes the Anti-Torque goes down, and it presses the chassis of the car. This would affect the tire grip of the car; if the tire grip increases, those three variables, handling, accelerating, and weight shifting will increase respectively. To find out which motor position is the best, used Slalom for handling, Straight 10 meter for accelerating, and 5meter diameter of half circle for the weight shifting. Also, the motor location on the chassis will differ the result of Anti Torque motor and Torque motor. So I customized car into Front motor version and the Rear motor version. According to the experiment, Anti Torque motor increases the tire grip because the spinning of the motor is same with the wheels spin. This motor position makes more pressure down to the chassis. In addition, the rear motor version showed better tire grip in most of the experiments because the motor was closer to the wheels that takes the kinetic energy of the motor. Also, the closer motor position with the wheels in motion takes more pressure caused by Anti-Torque. It is not depends on weight, because the both front and rear motor version of car has the same weight ratio: 40% in front and 60% in rear. So the Rear motor with the Anti Torque motor position made the best tire grip. Because it gives more tire grip, it use lesser energy than other motor

Awards Won: