

Gears and Gear Chain

Cooper Grund

PHS Robotics

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The uses and types of gear chains, in engineering and robotics, are immense in the sense of both purpose and variety of gear chains that can be used. Over the next couple paragraphs I'll talk about Driver and Driven gears, the components of gears, and the difference between rounded and straight edge gears. The history of gears goes as far back as the Industrial Revolution when they were used to power the basic machines like the Water Mill and Steam Engine to provide power to our basic machines to possibly produce gears and other important pieces of equipment. Over centuries, this led to gears becoming a more common thing from machines to cars and even watches. Gears have been studied and even have had formulas made to calculate their motion and interactions.

These gears can be either a Driver or Driven gear in the system. A Driver gear is rotated by the motor driving the Driven gear. The Driven gears are all after the first gear and they exert the force put out by the Driver gear. This gear interaction is a form of transfer of energy from one object to another by rotational force. There are different types of gears and these gears can also have a rounded or straight edge. The rounded edge has a greater surface for other gears to turn on. They also can be used with straight bevel gears to turn around corners when needed. A straight bevel gear is a straight sided gear with the teeth slanted inward. The straight edge gears are the best to use for vertical or horizontal gear chains which are extremely useful in many ways. These gears are used in everything that is mechanically or electrically driven in any way.

A gear is one or more toothed wheels that interact to move mechanized parts or wheels on an engineered device. The teeth of these gears can vary in number due to their size. The amount of movement input and output which is measured of the power exerted by the motor. These inputs and outputs can vary depending on the gear size since a small Driver gear makes a slow output and a larger gear makes a faster output. This is called a gear ratio and it is the ratio of Driver gear to Driven gear in the gears on the chain. A Driver gear is on a motor and a Driven gear is connected to the Driver gear. This function is a simple fraction that can be easily used.

$$\frac{Driver}{Driven} = Gear\ ratio$$

This function can easily be used to get the ratio of the gears used. This ratio can be used to improve accuracy and ease of use.

The most favorite gear of mine is the Differential gear. A Differential gear is a compact gear arrangement that reverses the input directional force to the other end of the gear system. This is beneficial when you want to turn an object in a simple way with one servo or motor. This can be important to use when you have a limited amount of pieces to use. This means that a Differential gear is an important piece of hardware to use in many instances. This important knowledge gained by my hands on experience with this type of gear during the Bot Ball 2017 competition, while experimenting with types of gears and gear systems to advance my knowledge of gears and gear systems for the better of my team knowledge and my own knowledge.

There is also the important distinction of tire or tyre. A Tyre is the rubber part around a wheel that a tire interacts with. The tire is the object that the motor interacts with and that causes

its motion. This motion is what drives the tire to move the tyre. This is a helpful distinction since the diameter of the tire and tyre differ.

$$\frac{MPH \times Gear \text{ ratio} \times 336}{RPM} = Tyre \text{ Diameter}$$

This shows that the Tyre diameter is a little bigger than the tire diameter which is logical since the tyre is around the tire.

As I have stated gears are the main movers in any machine that contains motors. There's also math involved in the interlocking and rotating gears that are used. This is also a tool that has made most of our modern technology possible through these little movers. The invention of gears created the ability for our machines and devices to be able to work like we intend without fault or error. In conclusion gears, tires and gear chains are all connected literally and figuratively.