



## Low Cost Development

There are a number of ways to improve the development and performance of your electric car here is one.

### Gear Ratios

The gear ratios between the pinion and the driven gear on the rear axle can be altered to change the characteristics of your vehicle, from high speed, low torque to low speed, high torque.

The ratios available for the *pinion* gears are: -

8 teeth to 20 teeth

and for the *driven* gear: -

44 teeth to 54 teeth

The two extremes of gearing therefore give ratios of

	8 – 54 =	6.75:1
or	20 – 44 =	2.2:1

For every 6.75 revolutions of the motor, the wheels will revolve once; and correspondingly for every 2.2 revolutions of the gear on the motor the wheels will again turn once.

If the motor turns 100 times per minute the wheels can either go at 14.8 times per minute for the low speed, or 45 times per minute, nearly 3 times the speed!

This difference in speed of the car will have draw backs. The higher speed ratios will suffer from low torque, power to push the car, and low acceleration; this will make it slow to get to the top speed down the straight. The low speed ratios will have bags of torque, loads of push for the car accelerate faster to it's top speed but of course the flat out speed will be significantly lower. The key becomes in balancing between fast acceleration and raw top end speed to achieve the fastest time possible.

If you do decide to “play around” with the gear ratios, the distance between the axle and the motor will change depending upon the two gears so making the motor mount adjustable in two directions, either away from the axle in height or length, is a must.

