**2. Motor characterisation**

The maximum voltage that will be provided to the motor will be approximately between 3 and 5 volts. The final circuit will send a signal to the motor within this range and the power supply need to send enough power to feed not only the 2 motors but also all the electronic elements of the buggy. In addition, the current must be enough to overcome the stall position of the buggy and go up through the ramp on the race day. However, it is necessary to find a balance between the current need it and the current that the batteries can supply.

To calculate the armature resistance, the motor was stalled, applying a start voltage of 1 volt and a protection current limit of 1.7 amps, measurements were taken increasing each time 0.25 V until the current limit was reached. Then, using the Emf equation:

Where , i.e. motor is stalled;

Stalled

**Fig. 2.1**

Armature Resistance=2.42Ω

Motor spinning

Motor stalled

**Fig. 2.2**

**Fig. 2.3**

**Relation between Emf and Speed with the maximum stalled torque**