

Plan Of Approach

Introduction

This plan of approach was written immediately after we received the assignment. In this document, we clarify the assignment and we formulate the manner in which we will approach it. We set some goals for our SSV and think about the limitations of the project.

Assignment and approach

We are six students who chose the option electromechanical engineering at Group T University College in Leuven. Our goal during the project course EE4 is to design and build a small solar vehicle (SSV), over a timespan of one semester. At the end of the semester a race will be organized by the college, in which the different EE4 teams will compete against each other. The race consists of two parts. In the first part, each SSV will have to race over a straight distance of 10 meters. At the end of the 10 meter track, there is a boule de petanque. Each SSV has to crash into the ball and push it as high as possible on a curved ramp. The team that can push the ball the highest will be the winner of the race. The time the SSV took to race the 10 meter distance will also be taken into account.

In order to finish this project in the best possible manner, we will have to work well structured and coordinated as a team. We will use different methods to achieve our goal. First of all a work breakdown structure divides the project into a lot of different small parts. These parts will be divided over all the members of the team, considering everyone's qualities. Every team member does his part and at the end of the semester, if all goes well, the project as a whole will be finished successfully. Every member is responsible for his jobs and will brief the others if there are problems, delays or successes. These will then be handled during the next team meeting. Secondly in a Gantt Chart, every job gets a certain timespan in which it has to be finished. This way, everyone can stay on track and all the little jobs will come together at the right moment.

Goals

At the start of the project, 3 different main goals were imposed: to win the race, to build the most beautiful SSV or to build the most innovative SSV. As a team, we decided to go for the final goal, have the most innovative vehicle. We assumed that if we have the most innovative (best) vehicle this will give us a much better chance of winning the race. To us this means we will try to launch the ball as high as possible. This means we need to have a lot of potential energy after the first 10 meters of the race. This also means finding a balance between weight, speed and strength.

Building the most innovative car is a big challenge, because this will require a lot of creative thinking. Some innovative options are sunlight trackers, the use of sensors, the use of a gearbox or remote control, a lightweight chassis, etc... Each of these ideas will have to be judged on effectiveness and feasibility.

Limitations

During the design of the SSV we will have to take multiple limitations into account. These limitations are stated in the rules of the race. The most important limitations are summed up below in figure 1:

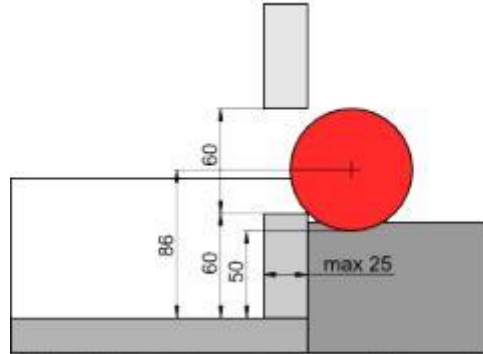


Figure 1: Limitations

The power of the car can only come from the energy supplied by the solar panel. No previously captured energy can be used, such as a pre-loaded battery. The SSV has maximum dimensions of 60 cm by 30 cm.

At the end of the 10 meter course, lies a 700 g (+of – 10 g) spherical ball. The dimensions of the launch panel of the ball are drawn in figure 1. Finally, the 10 meter course has to be run in less than 20 seconds, otherwise your car is excluded from the race.

Assumptions

Because we can't take every factor into account when we are building the car we will make some assumptions. For example, with our limited knowledge it would be pretty hard to start calculating the difference between different forms of body for our car. We also don't know how much sun there will be on the day of the race, and by consequence it is impossible to know how much power our solar panel is going to generate on the race day.