Velocity 2013

INTRODUCTION

Ready for a race off?...Velocity will provide you the jumpstart you need to get the fuel pumping through your car's veins. Being the flagship event of Engineer, Velocity provides you an opportunity to showcase your racing talents amongst dedicated peers who have put in the elbow grease required in building these racing machines.

GENERAL RULES

- The students must carry valid student ID cards of their college which they should produce at the time of registration.
- A team may comprise a maximum of **FIVE** participants.
- The team is **not** permitted to compete with more than one car.
- Teams will not be allowed to modify their car during their trial.

EVENT FORMAT

The event will have 6 rounds:

- **Car Judging:** The car will be scrutinized by the organizers to make sure it conforms to the specified rules. There will be no points from this round. However, if the vehicle doesn't conform to all the rules, it will be immediately disqualified.
- **Maneuverability Test:** Each car will have to maneuver a set of obstacles and points will be awarded based on time taken to complete the course.
- **Acceleration Test:** Each car will have to accelerate a certain distance and points will be awarded based on the time taken to complete the stretch.
- **Quarter-Finals:** 8 quarter-Finalists will be decided based on their aggregate points obtained in the abstract submission, acceleration test and maneuverability test. 4 groups of 2 cars each will race and the first car proceeds to the next round.
- **Semi-Finals:** 4 semi-finalists will be divided into 2 groups and race-off for the 2 spots in the finals.
- **Final:** This round requires the final 2 cars to race through a track with acute curves and obstructions with the cars able pit stops for refueling and repairs. The endurance of the car will be tested.

EVENT RULES

- The final 3 rounds will have races with multiple cars racing at a time.
- The track will have check points at regular intervals. If a machine tumbles, or halts, or goes off the arena at any point on the track, one of the team members is allowed to lift it up and place it at the nearest checkpoint behind that point. The clock will keep running during this time Only **ONE** member of the team will be allowed to run along with the car throughout each race.

- Team members are not permitted to touch either their machines or those of their opponents once the race begins (unless there is a need to lift the machine as stated in second point). The penalty for doing so is disqualification.
- If any of the machines starts off before the flag is waved, the counter would be restarted and the machines will get a second chance. However, if any machine starts off before the waving of flag (or countdown) for a second time, it will be disqualified. No re-match will be offered for the second time.
- The machines are not allowed to leave any loose parts on any part of the arena. Any machine disintegrating during the race will be disqualified.
- Teams are not allowed to purposefully damage the machine of the opponent's team. If found doing so on track (while racing), the concerned team will be disqualified. Execution of last three rules will be subjective and relies completely on judges' discretion.

ARENA SPECIFICATIONS

- The design of the track will be updated periodically. (Make a note to check out the website periodically)
- The actual track during the time of race might not strictly follow the design shown above.
- The width of the track varies from 0.5 m to a maximum of 2mts.

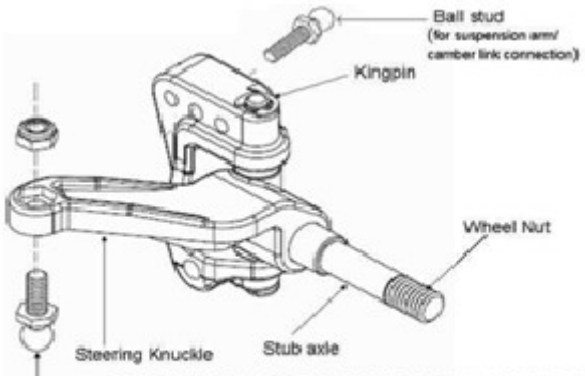
CAR SPECIFICATIONS

- Machine should fit in a box of dimensions 500 mm x 500 mm x 400 mm (L X B X H) at any moment of time during the race. The height will be measured excluding the antenna. The external device which is used to control the machine is not included in the size constraint.
- The machine should be controlled by a wireless remote control mechanism throughout the race.
- The machine must not be made from Lego parts, or any ready-made assembly kits other than the parts mentioned below. Readily available chassis layouts are not allowed. Any machine found having a readymade chassis will be immediately disqualified.
- The machine may be roughly classified into structural and functional parts:
- **Structural parts** - Chassis, shock mounting members and **have to be built by the participants themselves**.

- **Functional Parts – Stock Steering mechanism must not be used** and suspension (lower excluding suspension spring and shock absorbers) has to be **built by the participants themselves. Steering mechanisms have to be compulsorily built by the participants.**
- Judging for the same will be strict and the participant will be immediately disqualified if any of the above structural components are found to be ready made.
- The tires used must have a minimum diameter of 3 inches. You are advised to use tyres of good width for better performance on dirt tracks.

Please note: It is not compulsory to fabricate the brake mechanism.

- **Wheel Hub**: Any part rigidly attached to the wheel hub will be considered as a part of it and hence can be ready-made. An example here is that of the ball stud.



FRONT WHEEL HUB OF REAR WHEEL DRIVE CAR

- **Steering Mechanism:** Any part which is connected to steering rod rigidly i.e. has no degrees of freedom with respect to steering rod (example: heim joint http://en.wikipedia.org/wiki/Heim_joint) will be considered as part of steering rod and thus has to be fabricated by participants.

This is a typical RC Car suspension. Teams are free to innovate, as long as they are within the rules.

- **Suspension mechanism:** Any part rigidly connected to suspension arms or one with no degrees of freedom with respect to suspension arm will be considered as its part and has to be fabricated by the participants, except the upper suspension arm. For example both the heim joint (http://en.wikipedia.org/wiki/Rod_end_bearing -see this for more information) for the upper suspension arm and the stud rigidly connected to the wheel hub can be bought from the market.

- If there are parts used in the concerned joint which are neither rigidly connected with suspension or the hub, steering system or hub; they can be used readymade from the market.
- **If teams get any part specifically manufactured for them, they are required to present the CAD Drawings given to the manufacturer and the manufacturer's bill for the same.**
- **The Chassis has to be strictly built by the team and use of stock chassis will lead to immediate disqualification.**

The above pictures are just sample pictures for you to understand the rules easily.

PROPULSION AND STEERING

- The machine must use only mechanical power generated by an internal combustion (IC) engine for propulsion. Only one IC engine should be used in the machine. Use of any other sources such as chemicals, compressed gas, rockets etc. is not allowed.The maximum allowed capacity of IC engine to be used **is 5 cc.**

- Any machine which uses DC Motors for propulsion will be disqualified. However DC motors and servos can be used for steering mechanisms or any other control mechanisms apart from propulsion.
- The machine must have an on-board power supply to run any mechanism requiring electric power.
- The electric voltage anywhere in the machine should not exceed 15V at any point of time.
- There shall be a countdown preceding the start of the race. No participant is allowed to touch the machine during the countdown period.
- Providing a clutch mechanism between the engine and the wheel would prove useful, as it would prevent the engine from dying out at any stage of the race.
- Participants are advised to use a proper cooling mechanism to prevent overheating of the engine.
- Participants are advised to use sway bars for better control and stability.
- The participants are advised to use proper air filters as dirt might cause serious problems to the engine.
- Readymade wheels are allowed.
- The machine will be inspected and if found to be dangerous, the team will be disqualified. This decision rests solely with the judges and the organizers.

Contact Details

K.R.Akshay Karthik.N.S

9731937661 88614942478