

REVIEWS ON THE MANUSCRIPT [5]

Reviewer 1:

Comments:

The article focuses on the scientific analysis of a single, particularly chosen design approach for the car. The detailed analysis of the inflation/deflation process, together with the experimental estimation of the nozzle and the jet, is a very good approach to the task. However, the limitations of the approach should be discussed before the conclusions.

The strongest and the weakest aspect of the paper:

The strongest aspect of the paper is the detailed analysis of the inflation/deflation process with overpressure vs. volume/extension curves. Both experimental and theoretical parts are strong parts of this solution.

The weakest aspect of the paper is that only balloon parameter and a single nozzle optimization were considered; all other factors like construction of the model, aerodynamics, friction etc. were neglected.

Organization and Presentation:

The paper is rather easy to read. It has quite a clear structure.

Style:

The article is fairly understandable. There is a number of spelling errors (e.g. page 1 "gass" -> gas.) A spell check strongly suggested.

Equations inside the text are unclear and should be formatted and re-written (for example, the equation for the total work on Page 1 has the brackets misplaced).

Some phrases are unclear (see the additional questions).

Additional Questions:

- What pressure sensor did you use?
- Is there any hysteresis in inflation/deflation process? Did you calculate exactly what are the losses on the rubber deformation?
- What do you mean with the terms progression and regression?
- What do you mean with "basic working principle"?
- What are your assumptions and simplifications, which allow you to use Bernoulli principle and the presented equation for drag?
- The equation for the elastic energy U (page 2) should be described more (how the equation is derived or what is the literature source for this equation?)

References:

The number of used references is small (one). This reference lacks the volume, issue number, and page number of the journal.

Recommendation:

- Change "introduction" to "abstract"
- Improve the resolution of the formulas (see Style section.)
- The difference between the colors (grades of gray) on the figures (especially,

- Fig. 2, left) are hard to distinguish after printing
- Rename “basic working principle” section title
 - Provide a photo of your design of the car, if possible
 - Attach a chapter with a discussion of limitations of your solution (the description of limitations is scattered through the article)
 - Add your definition of the efficiency and comment on how the definition.

Summary:

The manuscript is recommended for publication after revision.

Reviewer 2:

Good structure.

Try and improve the resolution of the formulas.

However, note that Bernoulli's principle is **not** valid for turbulent flows. It is valid for laminar (non-turbulent) flows.

Recommended with some brushing up.

Editorial request:

10⁵ : consider using a more appropriate representation.

Concept: It appears clear that the author considers only the cars where the deflating balloon provides propulsion (a *rocket-type* car.)

Please report this in the introduction and justify shortly *why* this concept is considered and why any other possible approaches are not. This explanation would equally work as a necessary introduction for the readers into your approach.