NFPA Fluid Power Vehicle Challenge

**SCORING RUBRIC**

Judge:

Team:

***For teams from returning universities, we expect new and innovative designs from you. You will need to describe changes from the previous year’s vehicle.***

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| **MIDWAY REVIEW** | **Poor** | **Moderate** | **Good** | **Very Good** | **Excellent** |
| **Designs from previous years** have been investigated, performance analyzed, and design objectives clearly state and reflect improvements over designs analyzed. | 1 | 2 | 3 | 4 | 5 |
| **Vehicle design** clearly supports the design objectives and is of obvious quality.\* | 1 | 2 | 3 | 4 | 5 |
| **Hydraulic and pneumatic circuit designs are** complete and reflect an understanding of fluid power components and systems.\* | 1 | 2 | 3 | 4 | 5 |
| **Calculations and analyses** have been performed on the presented design, and their results have been incorporated into the vehicle and/or circuit designs.\* | 1 | 2 | 3 | 4 | 5 |
| **Selection of hardware** is complete and is appropriate to the design objectives. | 1 | 2 | 3 | 4 | 5 |
| **Prototype** vehicle assembly has begun.\*\* | 1 | 2 | 3 | 4 | 5 |
| **Presentation** is completed on time and presented in a professional manner. | 1 | 2 | 3 | 4 | 5 |
| \*In addition to the above description, judges will be evaluating **returning teams** that are leveraging work products from previous years based on how they address these criteria in their Midway Review:  **Vehicle Design** – Returning team demonstrates original thought.  **Hydraulic and Pneumatic circuit designs** – Returning team made significant changes and includes a comparison of prior year schematics in the presentation.  **Analyses** – Returning team demonstrates an understanding of work completed and explains what changes were made to improve vehicle performance.  \*\*Criteria: **Prototype vehicle assembly has begun**  1= Significant progress has been made in sketches, schematics, and engineering design.  2= Vehicle frame assembly has begun  3= Vehicle frame has been assembled and ready for testing  4= Vehicle frame has been assembled, tested, and the pump, motor, accumulator, and mounting brackets have been made  5= Vehicle frame has been assembled and tested, and components are mounted | | | | | |

Judge’s Comments:

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| **FINAL PRESENTATION & DESIGN REVIEW** | **Poor** | **Moderate** | **Good** | **Very Good** | **Excellent** |
| **Vehicle construction** was completed on time, performed mostly by the team members. | 1 | 2 | 3 | 4 | 5 |
| **Vehicle testing** was performed, and improvements were made based on the results. | 1 | 2 | 3 | 4 | 5 |
| **Final vehicle** brought to competition appears reliable, safe, and of quality craftsmanship. | 1 | 2 | 3 | 4 | 5 |
| Presentation includes a **regenerative braking** **circuit** and demonstrates an understanding of **regenerative braking.** | 1 | 2 | 3 | 4 | 5 |
| **Lessons learned** are clearly stated and appropriate to the design/build experience described. | 1 | 2 | 3 | 4 | 5 |
| Presentation clearly demonstrates an **understanding of how design choices contribute** to vehicle performance. | 1 | 2 | 3 | 4 | 5 |
| Quality of vehicle design is associated with **operator safety and comfort.** The vehicle is ergonomic and easy to use. | 1 | 2 | 3 | 4 | 5 |
| Quality of vehicle design is associated with **innovative concepts** compared to previous entries and displays **uniqueness and original thought** | 1 | 2 | 3 | 4 | 5 |
| Returning teams must include prior year’s hydraulic and pneumatic circuit design schematic and show how the current year’s schematic is different.   Teams are given a maximum of 7 minutes to present on the first 6 criteria. 8 minutes will be allotted for judges to ask questions, assess the last two criteria, and perform the safety inspection. | | | | | |

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| --- | --- | --- |
| **FPVC Mentorship** | **Summary Submitted (Y/N)** | **Points** |
| Introduction and initial discussion about **vehicle** design. |  | 1 |
| Discussion about **component** design. |  | 1 |
| Discussion about **assembly** and **testing** |  | 1 |
| Final discussion on **adjustments** |  | 1 |
| **Total Points** | | 4 |

Comments: