



NFPA  
Education and  
Technology  
Foundation

# Project Proposal

National Fluid Power Association

PROGRAM YEAR 2024-25



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# Program Year 2024–25



## Objectives

1. Stimulate education in fluid power components, circuits, and systems, incorporating them into a systems engineering experience.
2. Provide students with real-world engineering experience under a strict timeline of designing, simulating, ordering, building, testing, and demonstrating their designs.
3. Stimulate innovative thinking for designing and testing potential new fluid power technologies or concepts integrated into a vehicle platform.
4. Provide an industry recruitment opportunity for high-potential engineering students by engaging directly with practitioners in the fluid power industry.

## Overview & Background

The NFPA Fluid Power Vehicle Challenge is based on the Chainless Challenge program, which Parker Hannifin pioneered and managed from 2004 through 2016. Since 2017, the National Fluid Power Association has run the program under the Fluid Power Vehicle Challenge name. The Fluid Power Vehicle Challenge encourages universities to participate in the context of their senior capstone design courses, but student teams in other configurations are welcome.

Either way, students are required to design and build the drive system for their vehicles and participate in the Final Competition Event. They can utilize either industry-grade components provided by the program's official parts and fluids suppliers, off-the-shelf parts from other reputable suppliers and resources, or design their own. The Final Competition Event includes a sprint race, an efficiency race, a regenerative braking demonstration, and an endurance race. In addition, teams will present their design process and decisions and demonstrate the safe function of their vehicles. The Event will be conducted over three days at a location hosted by donors to the NFPA Education and Technology Foundation. Danfoss Power Solutions will host one in Ames, Iowa; IFP Motion Solutions Inc. will host one in Cedar Rapids, Iowa; and Norgren, a part of IMI plc, will host one Event in Rockford, Illinois. NFPA provides travel funds to offset the transportation and lodging costs of the participants. Cash awards are given to the winning teams in several specified categories.



[Watch an Overview Video of the Final Competition!](#)

## Design Team

One team per university may compete in the program and receive funding Team.

Team members may have participated in previous years.

- One faculty advisor and up to seven students will be eligible to travel to the Final Competition Event.



## Resources

### PERSONNEL

Two NFPA program staff, one Technical Liaison, and at least one industry mentor will be assigned to each team and a panel of judges from NFPA member companies will be available to guide teams. Last year, representatives from thirty companies participated in the mentoring program or served as competition judges.

In support of the Design Team activities, three separate stipends of \$1,000 each will be disbursed upon completion of the following:

1. Kick-Off Webinar & Registration
2. Design and Specification Midway Review
3. Final Presentation & Design Review

Teams that participate for the first time receive a \$1,500 stipend for the Kick-off Webinar, only. These stipends are restricted for use by current and future team participants for supplies and activities directly related to the NFPA Fluid Power Vehicle Challenge.

### TRAVEL & OTHER EXPENSE REIMBURSEMENT

For travel and qualifying expenses related to the final competition event, NFPA will reimburse universities directly up to \$5,000 for one faculty advisor and up to seven students, participating in the Final Competition Event. Reimbursements are not made to individuals. Qualifying reimbursable expenses include airfare, rental car, hotel, vehicle shipment, and certain meals.

