

# Onshape Design Competition 2023



**Competition Starts**  
January 12

**Competition Ends**  
February 12

**Winner(s) Announced**  
March 1

## Design a vertical spinner & wedge system for Switchback the BattleBot!

Go head-to-head with top CAD designers in the third annual Onshape Design Competition! We've partnered with the Battlebots team Midnight Invention to bring you a contest that is equal parts exciting and challenging: designing a new weapon system for Switchback.

It's up to you to design a new vertical spinner and wedge system for the robot. Since Switchback was modeled in Onshape for the 2023 BattleBots season, you'll get access to a modified version of the original Onshape document that you can use to design your own weapon system.

Your design must meet the criteria of the BattleBots competition, and all submissions will be judged based on use of modeling best practices, functionality, manufacturability, and of course, AWESOMENESS.

Midnight Invention will prototype the winning design and share a video of the prototype on the robot following Onshape Live.\* And of course, it wouldn't be the Onshape Design Competition without the coveted Onshape Championship Belt and Onshape swag!

**SUBMIT YOUR DESIGN**

General Rules	Submission Guidelines
<ul style="list-style-type: none"> <li>Any Onshape user is eligible to participate, including professionals, hobbyist, students, and educators. <b>You must register for Onshape Live '23 to participate</b></li> <li>Entry must be created and produced solely by the individual(s) listed on the submission</li> <li>Participants can submit as individuals or as a team of no more than 3 people</li> <li>All custom parts must be modeled in Onshape by the user(s) submitting to the competition</li> <li>Individuals/teams can submit multiple entries</li> <li>Design must fit within the BattleBots Design Rules for 2022. We recommend looking closely at Section 8 in parts e, f, g, and h</li> <li>Tips from the Switchback team: <ul style="list-style-type: none"> <li>Maximum linear speed allowed at tip of weapon is 250 MPH per the BattleBots rulebook. As currently configured, the max RPM of the weapon shaft is 22,000 RPM. Gearing can be adjusted, but keep max speed in mind when designing!</li> <li>The robot has a max weight of 250lbs. Switchback has allotted 40lbs for the vertical spinner and wedges/forks that you will be designing</li> </ul> </li> <li>Submissions will be judged and scored based on use of modeling best practices, functionality, manufacturability, and awesomeness. See criteria below for details!</li> </ul>	<ul style="list-style-type: none"> <li>During your submission process you will provide a link to one Onshape document with your main design</li> <li>If your submission links to other documents and you want them to be considered as part of your submission, you will be able to provide the links to those documents.</li> <li>All submitted documents must be made public</li> <li><b>You will also be asked to provide short answers to the following:</b> <ul style="list-style-type: none"> <li>How would your system work? <ul style="list-style-type: none"> <li>For example, does it improve on the existing system or another design?</li> </ul> </li> <li>How would you manufacture this system? <ul style="list-style-type: none"> <li>For example, what materials would be used? What equipment would be needed?</li> </ul> </li> </ul> </li> <li>Please describe your design process <ul style="list-style-type: none"> <li>For example, how did you exhibit best practices in your modeling?</li> <li>What Onshape capabilities contributed to your design?</li> <li>Were there any interesting design iterations along the way?</li> </ul> </li> </ul>

If you have questions or comments,  
email [competitions@ptc.com](mailto:competitions@ptc.com)  
or post on the [Onshape Forum](#)

## Judging Criteria\*\*

Criteria	Considerations
<b>Modeling Best Practices</b>	<ul style="list-style-type: none"> <li>• Are features clearly organized and labeled in the Feature List?</li> <li>• Are Onshape/CAD best practices followed?</li> <li>• Can the design process be followed through versions and branches?</li> <li>• Were any custom features used in the creation of your design?</li> </ul>
<b>Functionality</b>	<ul style="list-style-type: none"> <li>• Could the design function as described in the submission?</li> <li>• Does the design fit effectively into Switchback's existing form factor?</li> <li>• What is the moment of inertia of the spinning weapon, and how does it compare to the existing Switchback weapons? (Beater Bar: 501.2 in<sup>2</sup> lb, Disks: 223.6 in<sup>2</sup> lb)</li> <li>• Were any extras such as PDFs, Videos, or Images included to show functionality?</li> </ul>
<b>Manufacturability</b>	<ul style="list-style-type: none"> <li>• Could it be manufactured?</li> <li>• How complex/expensive is the tooling required to manufacture the design?</li> </ul>
<b>Awesomeness</b>	<ul style="list-style-type: none"> <li>• Is this design a novel and creative concept?</li> <li>• Does it function in a unique way?</li> <li>• Does it match the aesthetic of Switchback?</li> <li>• Does it look intimidating to the competition?</li> </ul>

\* The Switchback team reserves the right to choose whether or not they utilize this weapon in the actual competition.

\*\* Winners will be chosen at the sole discretion of PTC judges.