



# The *asbe* Foundation

## 64<sup>th</sup> Annual

### High School Design Challenge, 2017-18

#### Rules and Guidelines for the *Engineering Design Category*

The *Engineering Design Category* challenges drafting students to develop a design solution to a given automotive-based problem. Consideration is given to the design's functionality, material, and manufacturability. The *Engineering Design Category* utilizes drafting/CAD skills and must be submitted on paper as a properly made engineering drawing using orthographic projection.

#### **Eligibility:**

The *Design Challenge* is open to all high school students, grades 9 through 12, who have a background in drafting and CAD. All student contestants are encouraged to research the project before beginning and may seek out advice during the early stage; however the design and submission must be the creation of the contestant. Only one entry per student is permitted. Each school may enter as many students as it wishes.

#### **The *Engineering Design Category* Problem:**

The task for the *Engineering Design Category* is to create a functional design of a step pocket and insert for the rear bumper of a mid-size pickup truck to assist entry into the truck bed when the tailgate is in the down position. A CAD model of a portion of a rear bumper will be provided in stp file format to work from along with a pdf image that shows the bumper in context. The student will begin with this CAD model to build your design with any CAD program your school is using.

**Register on the asbe website, [www.asbeFound.org/events](http://www.asbeFound.org/events)  
To Obtain the Rules, Guidelines, and CAD Files**

**\* Once Registered, you will be sent an email with a link to the downloads \***

#### **Specifications, Format, and Presentation Requirements:**

Design a step pocket for the rear bumper of a mid-size pickup truck to assist entry into the truck bed when the tailgate is in the down position.

- The step pocket must be accessible with the tailgate in the down position.
- The design is to include a step pocket insert which is to be made out of a non-slip, non-metallic material.
- The bumper can be modified as necessary without changing the overall dimensions.
- Only the left (driver's) side step pocket is to be designed.
- No part of the design can be lower than the lowest point on the bumper.
- All attaching methods and fasteners should be clearly shown.

- The design of the step pocket or insert must not include the name of the student, school, school logo, or otherwise identify the student, school, or the school district.
- Each part of the step pocket and pocket insert must be shown in orthographic projection using at least two views; section, auxiliary; iso views can be used as needed to fully describe the step pocket and insert to clearly show how they fit together and are assembled.
- Each component of the design must be labeled with part name and material.
- Fasteners and other such devices must also be shown in their proper assembled position.
- All views need to be carefully, correctly, and logically arranged and spaced on the sheet.
- No dimensions need to be shown on the drawing.
- An exploded pictorial assembly view may be used, but is not required.
- Best engineering practices should be considered in the design including; ease of assembly, cost, serviceability, manufacturability, and safety.
- Supporting written documentation describing the design, choice of materials, cost considerations, and any unique design features, etc. is encouraged but not required. Student name should appear on the upper right hand corner of the letter size page.
- The design must be on a single sheet or display board and be no larger than 24 x 36 inches (D size). Folding display boards must be no larger than 24 x 36 when open.
- A physical model of the step pocket may be submitted with the drawing and need not be full scale. Maximum of five pounds.
- The entry is to be identified with a title block that is included with the Contest materials under two file formats for your choosing. This “Student Information Block” is to be printed on, or attached to the lower right hand corner of the sheet, or printed and attached to physical models. Enter the information requested including the student *proper* first and last name. *Please do not change the scale of the Block; it should appear 3.5” x 3.5” on the drawing. No other title block or identifier should be used.* Student and school information will be masked during judging.

**Entries will be Judged On:**

- Creativity of the design
- Functionality of the design
- Ability to be manufactured
- Ability to be assembled
- Serviceability
- Structural integrity
- Fastening and joining methods
- Principles of proper engineering drawing; necessary views shown, overall drawing appearance etc.
- Materials selected
- Cost
- Safety
- Decision of the judges is final

**Teachers: To ensure you receive all the latest updates and reminders** for the 2017-18 Design Challenge, register now at [www.asbeFound.org/events](http://www.asbeFound.org/events) and download the *Design Challenge* materials.

**Students: Register Early** Inform us of your interest to enter the Design Challenge Competition by registering on our website today. *All registrations must be received no later than **Monday, April 2, 2018***; you must be registered to be eligible for the competition. Student registrations will be taken at [www.asbefound.org/events](http://www.asbefound.org/events) where Design Challenge materials can be downloaded as well.

**Due Date: Entries must be received by on or before 3 pm Monday, April 2, 2018. Submissions can be mailed or delivered to:**

*asbe Foundation* Design Challenge  
Heather Shellenbarger  
Macomb Intermediate School District  
44001 Garfield Rd.  
Clinton Twp, MI 48038  
eMail: [hshellenbarger@misd.net](mailto:hshellenbarger@misd.net)

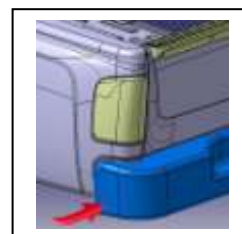
**Student Design Checklist:**

- Individual students must be Registered on the *asbe* website by April 2 to indicate their intent to enter the Design Challenge Competition: [www.asbeFound.org/events](http://www.asbeFound.org/events)
- Carefully read and understand the requirements and parameters of the part to be designed.
- Students are encouraged to research existing step pockets in order to obtain ideas for their design.
- Verify that you have the required number and types of views.
- Be aware of the requirements for sheet size of the drawing.
- Entry must have the *asbe* Student Information Block included digitally or attached to models, hand drawn renderings etc.
- Refer to the list of considerations of how your design will be judged.
- Drawings must be submitted for judging on or before 3 pm, Monday, April 2, 2018**

**Awards Dinner:** Winners of the Design Challenge and their teachers will be invited to attend the annual Awards Dinner celebration as our guests. This event will be held on Thursday April 19, 2018. Photos of past winners and Awards Dinner speakers are posted on our website.

**Awards Made for Each Category:**

1 <sup>st</sup> place	\$400 + “Jennings Award” Plaque
2 <sup>nd</sup> place	\$300 + Certificate of Honor
3 <sup>rd</sup> place	\$200 + Certificate of Honor
4 <sup>th</sup> up to 8 <sup>th</sup>	\$100 + Certificate of Honor
Best in School,	\$50 + Certificate of Merit



**Questions and Assistance:** [DesignChallenge@asbeFound.org](mailto:DesignChallenge@asbeFound.org)

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