



DRAGSTER DESIGN CHALLENGE

OVERVIEW

Participants design, produce working drawings for and build a CO₂-powered dragster.

CHALLENGE

Design and produce a fast CO₂-powered dragster according to stated specifications and using only certain specified materials.



The middle event is almost the same as the high school version, with just a few different specifications.

ELIGIBILITY

Entries are limited to two (2) individually-produced dragsters per chapter [one (1) entry per participant].

TIME LIMITS

- A. Entries must be started and completed during the current school year.
- B. The dragster and drawing are submitted at the assigned time and place stated in the conference program.
- C. Drawings and cars must be picked up at the specified time upon the conclusion of the event.

ATTIRE

Casual TSA attire as described in Competitive Events Attire is the minimum requirement.

PROCEDURE

- A. Participants check in their entries at the time and place stated in the conference program.
- B. Entries are reviewed by evaluators to determine, among other things, safety on the track.
- C. Safe dragsters race for qualifying time on the same lane of the raceway.
- D. The top sixteen (16) qualifying cars based on the time trials are evaluated against the criteria for this event.



- E. Dragsters that do not meet event regulations are disqualified and lower qualifying cars are moved up until sixteen (16) dragsters that meet specifications are determined.
- F. A wind tunnel test is performed to determine relative wind resistance.
- G. The top sixteen (16) cars race in a double-elimination format to earn points for the race portion of the event.
- H. Drawing and design points are combined with race points to determine the final standings.
- I. Following the race, participants pick up their entries from the display area at the time and place stated in the conference program.

REGULATIONS

- A. Each entry must be submitted with a full-size metric drawing of the completed vehicle. A two-view (top and side) working drawing with metric dimensions is made on 11"x 17" (tabloid) paper. Drawings are developed using standard engineering practices and procedures. The drawing may be produced using traditional drafting methods or CAD. The title block includes only the participant's entry number, which is assigned at registration time and is placed on the entry and drawing during check-in.
- B. The official distance between the start line and the finish line on the race track is twenty (20) meters.
- C. ***Dragsters that do not meet the following specifications and tolerances are disqualified from the race.***

Dragster body

DB1. One-piece, all-wood construction. Any type of lamination will result in disqualification. Two (2) or more like or unlike pieces of wood glued together are not considered one-piece, all-wood construction. No add-ons such as body strengtheners, fenders, plastic canopy, exhausts, or air foils may be attached to or enclosed within the vehicle. Fiberglass or shrink wrap are considered body strengtheners and cannot be used on the car body for any reason. Decals may be used for decoration only. They may not be used to gain an aerodynamic advantage, i.e., decals can not cover the exterior axle holes or be used to cover open areas of the body.

	MINIMUM	MAXIMUM
DB2. Body length.....	200mm	305mm
DB3. Body height with wheels.....		75mm
DB4. Body mass (completed car without CO ₂)	*(2005-2006) ? 60g	
.....	*(2006-2007) – 40g.....	
* determines specific school year requirement		
DB5. Body width at axles, front and back.....	35mm	42mm
DB6. Vehicle total width (including wheels).....		90mm

Axles/axle holes/wheelbase

- A1. Dragsters must have two (2) axles per car, no more.
- A2. Bottom of axle hole above bottom of car..... 5mm..... 10mm
- A3. Rear axle hole from rear of car 9mm..... 100mm
- A4. Wheelbase (axle distance apart at farthest points) 105mm..... 270mm
- A5. Bearings, bushings and lubricants may be used.

Spacer washers/clips

- S1. Spacer washers 10
- S2. Axle clips..... 4
- S3. Silicone or any other type of glue/adhesive may not be used in place of wheel clips to hold wheels or axles in place.

Power plant (CO₂ cartridge hole)

- P1. The power plant hole must be at the farthest point at the rear of the car and must be drilled parallel to the racing surface to assure proper puncture of the CO₂ cartridge. A minimum of 3mm thickness around the entire power plant hole must be maintained on the dragster for safety. Do not paint inside the CO₂ cartridge hole.
- P2. Hole depth..... 50mm..... 52mm
- P3. Safety zone thickness 3mm
- P4. Chamber diameter 19mm..... 20mm
- P5. Lowest point of chamber diameter to race surface (with wheels)..... 26mm..... 40mm

Eye screws

- ES1. Dragsters must have two screw eyes per car that meet tolerances, no more. Screw eyes must not make contact with the racing surface. The track string must pass through both screw eyelets, which are located on the center line of the bottom of the car. Glue may be used to reinforce the screw eyes. It is the responsibility of the car designer/engineer to see that the eye screw holes are tightly closed to prevent the track string from slipping out. As with all adjustments, this must be done prior to event check-in.
- ES2. Inside diameter..... 3mm..... 5mm
- ES3. Distance apart (at farthest points) 150mm..... 270mm

Wheels

- W1. A dragster must have exactly four (4) wheels, each of which separately must meet the regulations in W2 and W3 below. All four wheels must touch the racing surface at the same time. All wheels must roll. Wheels must be made entirely from plastic. Dimensions must be consistent for the full circumference of the wheel.
- W2. Wheel diameter 30mm..... 40mm
- W3. Wheel width..... 2mm..... 18mm



- D. No repair or maintenance is allowed after the entries have been registered. Any entry damaged during the race is evaluated by the event coordinator to determine whether or not the vehicle is allowed to race again. In the event that the vehicle is damaged by the conference personnel, the event coordinator rules as to whether the vehicle may be repaired by the student entering the vehicle. This is the only reason a student is allowed to touch his/her vehicle after registration. Undamaged wheels that come off during the event may be replaced as determined by the event coordinator. Damaged wheels may not be replaced.
- E. All CO₂ cartridges for the race are provided by national TSA.

EVALUATION

Evaluation is based on points earned through car design and appearance, accuracy and quality of the drawing, in addition to points earned through the wind tunnel test and placement in the double elimination on-site race.