

# Engineering Contest

## DRAGSTER DESIGN



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### OVERVIEW

Participants design, produce working drawings, and build a CO2 powered dragster. Dragster kits are \$5 – contact Jessika at #580-255-9675 to purchase.

### PURPOSE

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

### ELIGIBILITY

Entries are limited to ninth-twelfth graders within the Red River Technology Center district.

### TIME LIMITS

- A. Entries must be started and completed by March 22<sup>nd</sup>, 2010.
- B. **Each dragster is to be submitted between 2-5pm on March 22<sup>nd</sup>, 2010**  
**Location: Simmons Center, 800 Chisholm Trail Pkwy, Duncan**
- C. The dragsters will race between Noon-3pm on March 23<sup>rd</sup>, 2010
- D. Cars can be picked up at the conclusion of the event.

## PROCEDURE

- A. Participants or Teachers check in their entries at the time and place stated.
- 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 cars race in an elimination format to earn points for the race portion of the event.

## REGULATIONS

A. Each entry must be submitted with a full – size metric drawing of completed vehicle. A two (2) - view (top and side) drawing with metric dimensions is made on paper no larger than B- size drawing 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 participants “entry number” that 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/ tolerances are disqualified from the race.**

## DRAGSTER BODY

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

		<b>MINIMUM</b>	<b>MAXIMUM</b>
<b>DB2</b>	Body Length	200mm	305mm
<b>DB3</b>	Body Height with wheels		75mm
<b>DB4</b>	Body Mass (complete car without CO2)	40g	65g
<b>DB5</b>	Body width at axles, front & back	35mm	42mm
<b>DB6</b>	Vehicle total weight (including wheels)	40g	65g

### AXLES/AXLE HOLES/WHEELBASE

		MINIMUM	MAXIMUM
<b>A1</b>	Dragsters must have 2 axles per car		
<b>A2</b>	Bottom of axle bearing above bottom	5mm	10mm
<b>A3</b>	Rear axle hole rear of car	9mm	100mm
<b>A4</b>	Wheelbase (axle distance apart )	105mm	270mm
<b>A5</b>	Bearings, bushings, and lubrication are not allowed in this race.		
<b>A6</b>	Glue may be used		

### SPACER WASHERS/CLIPS

		MINIMUM	MAXIMUM
<b>S1</b>	Spacer washers		8
<b>S2</b>	Axle clips		8

**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 safety. The inside of the power plant hole must not be painted.

		MINIMUM	MAXIMUM
<b>P2</b>	Hole depth	48mm	54mm
<b>P3</b>	Safety Zone Thickness (no exposed cartridges)	3mm	
<b>P4</b>	Chamber Diameter	19mm	20mm
<b>P5</b>	Lowest point of chamber diameter to race surface (with wheels)	26mm	40mm

## EYE SCREWS

**ES1.** Dragsters must have two (2) 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.

		<b>MINIMUM</b>	<b>MAXIMUM</b>
<b>ES2</b>	Inside Diameter	3mm	5mm
<b>ES3</b>	Distance apart (at furthest point)	150mm	270mm

## WHEELS

**W1.** A dragster must have four (4) wheels, no more. Two (2) wheels must meet rules W2 and W3. The other two (2) must meet rules W4 and W5. All four (4) 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.

		<b>MINIMUM</b>	<b>MAXIMUM</b>
<b>W2</b>	Front diameter	32mm	37mm
<b>W3</b>	Front width (at surface contact point)	2mm	5mm
<b>W4</b>	Rear diameter	30mm	40mm
<b>W5</b>	Rear width (at surface contact point)	12mm	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 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.

## EVALUATION

Evaluation is based on points earned through car design and appearance, accuracy, and quality of the drawing, as well as points earned through placement in the double elimination on-site race. ***In addition, a People's Choice contest will take place with those in attendance voting on the car with the best design and appearance.***