DRAGSTER DESIGN

OVERVIEW

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

PURPOSE

The DragsterDesign event give LTSA members the opportunely to design and produce a fast CO2 powered dragster according to stated specifications and using only certain materials.

ELIGIBILITY

Entries are limited to one (1) individually-produced dragster per chapter and five (5) entries per chapter.

TIME LIMITS

A. The completed dragster and the required drawing are submitted at the assigned time and place designated in the official conference program.
B. The dragster and drawing must be produced during the school year immediately preceding the conference in which it is entered.
C. Drawings and cars must be picked up at the specified time upon the conclusion of the event.

PROCEDURE

A. Participants check in their entries at the time and place stated in the conference program.
B. Entries are reviewed by evaluators.
C. Dragsters that have been determined to be safe to be on the track 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. The top sixteen (16) cars race in a double-elimination format to earn points for the race portion of the event.
G. Drawing and design points are combined with race points to determine the final standings.

REGULATIONS

A. Each entry must be submitted with a full-size drawing of the completed vehicle. A two-view (top and side) drawing with 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 participant's "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 racetrack 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 will result in disqualification. 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 car body or wheels for any reason. Two (2) or more like or unlike pieces of wood glued together are not considered one-piece, all-wood construction.

	MINIMUM	MAXIMUM
DB2. Body length	200 mm	305 mm
DB3. Body height with wheels		75 mm
DB4. Body mass (completed car without CO_2) ...	55 g	
DB5. Body width at axles, front and back	35 mm	42 mm
DB6. Vehicle total width (including wheels)	90 mm	

Axles/axle holes/wheelbase

A1. Dragsters must have two (2) axles per car, no more.

A2. Bottom of axle hole above bottom of car.....	5 mm	1O mm
A3. Rear axle hole from rear of car	9 mm	100 mm
A4. Wheelbase (axle distance apart at farthest points)	105 mm	270 mm

A5. Bearings, bushings and lubricants may be used.

Spacer washers/clips

S1. Spacer washers	8 mm
S2. Axle clips	8 mm

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 (CO_2 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 CO_2cartridge. A minimum of 3 mm thickness around the entire power plant hole must be maintained on the dragster for safety.

P2. Hole depth	50 mm	52 mm
P3. Safety zone thickness.....	3 mm	
P4. Chamber diameter	19 mm	20 mm
P5. Lowest point of chamber diameter to race surface (with wheels)	26 mm	40 mm

Eye screws

ES1. Dragsters must have two screw eyes per car that meet tolerance, 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	3 mm	5 mm
ES3. Distance apart (at farthest points)	150 mm	270 mm

Wheels

W1. A dragster must have four (4) wheels, no more. Two (2) wheels must meet rules W2 and W3. The other two must meet rules W4 and W5. 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. Front diameter	32 mm	37 mm
W3. Front width (at surface contact point)	2 mm	5 mm
W4. Rear diameter	30 mm	40 mm
W5. Rear width (at surface contact point)	15 mm	18 mm

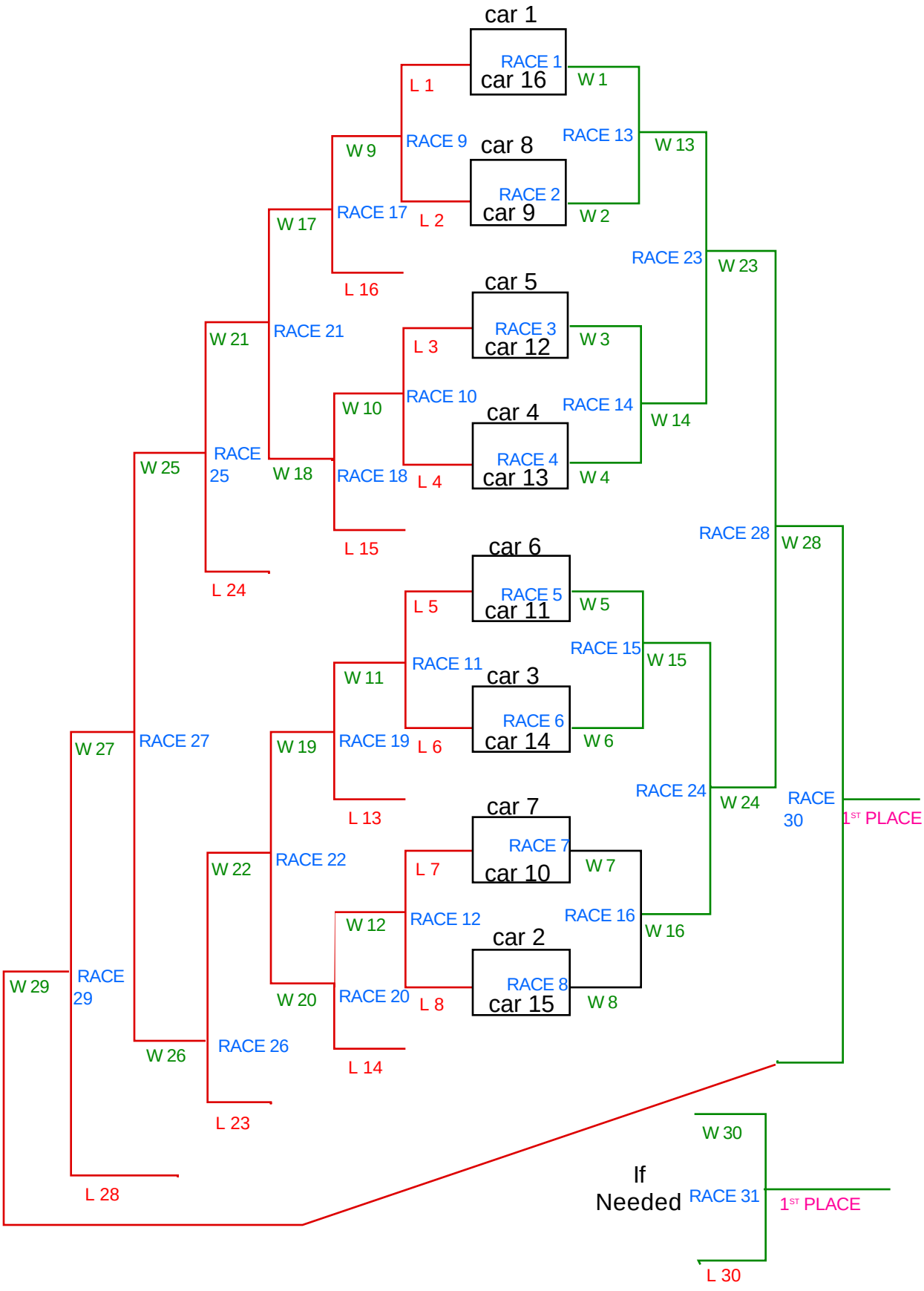
D. No repair or maintenance is allowed after the entries have been registered. Any entry damaged during the race is evaluated by the event coordinator to determine whether or not the vehicle is allowed to race again. In the event that the vehicle is damaged by the conference personnel, the event coordinator 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 Louisiana 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 wind tunnel test and placement in the double elimination on-site race.

Race Bracket for 16 - Car Double Elimination.



DRAGSTER DESIGN
EVENT COORDINATOR INSTRUCTIONS

P E R S O N N E L

A. Event coordinator
B. Event evaluators, four (4)
C. Recorder for double elimination chart
D. Assistants, two (2)

MATERIALS

A. Coordinators box, containing:
   1. Event guidelines, five (5) copies
   2. Official rating forms
   3. List of entries, with finalist report
   4. List of event evaluators/assistants;
   5. Official vehicle time sheet
   6. Double elimination bracket chart/overhead
   7. Summary sheets
   8. Results envelope

B. CO2 cartridges
C. Go/No-go gauges for all evaluators
D. Metric scientific scales (triple beam balance or digital)
E. Mono-filament fishing line for track (4 pre-tied, 2 on track and 2 reserve)
F. Race track set, including a starting gate and finish gate with digital timer and winning lane indicator
G. Padding for the finish gate
H. One or more test cars
I. Race brackets for placement of the finalists
J. Tables for the display of cars and for evaluation
K. Table at the starting line, for arranging and holding cars prior to the races
L. Table at the finish gate for the placement of cars after the races and to hold eliminated cars
M. Table for the official time keeper
N. When using a computer controlled track, provide the proper computer for the software being used, all necessary connections, and a printer. This equipment is placed on the official time keeper's table.
O. Provide for display of time trial and race brackets.

PROCEDURE

A. Upon arrival at the conference, report to the CRC room and check the contents of the coordinator's box. Review the event guidelines and check to see that enough evaluators/assistants have been scheduled.
B. Inspect area(s) in which the being held for appropriate set including room size, chairs, tables, outlets, etc. Notify the event manage any potential problems.

C. Check in the entries at the time stated in the conference program. Anyone reporting who is not on the entry list may check in only after official notification is received from the CRC chairman. Entries turned in late are NOT considered unless the lateness has been caused by the oversight or negligence of the conference coordinators. Secure the entries in the designated area.

D. One (1) hour before the event is scheduled to begin, meet with your evaluators/assistants to review time limits, procedures, regulations and all other details related to the event. If questions arise that cannot be answered, speak to the event manager before the event begins.

E. Begin the event at the scheduled time by closing the doors and checking the entry list. All participants and event evaluators should be in the room at this time. Any participant not present is disqualified. In order to compete, participants must be on the entry list or must have approval of the CRC chairman.

F. Position the drawings and cars for viewing by the event evaluators and assist the event evaluators during the evaluation of the design, drawing, and construction categories.

G. After testing all race-worthy cars in the time trials, event evaluators verify that the top sixteen finalists meet Section E specifications. Only raceable cars, as determined by the event evaluators, are allowed to compete in the finalist category. Cars that are damaged or broken during the qualifying rounds are deemed non-raceable and are not allowed to run in a finalist position. Eliminated entries not meeting specifications are removed. Lower qualifying cars are moved up until sixteen legal cars are determined.

H. Each car is timed in the same lane, one at a time. Cars are timed only once. It is very important that each car is positioned as well as possible in the starting gate. If, in the opinion of the event evaluators, a car misfires or a timing error occurs, the race may be rerun.

I. The operator's preliminary times are recorded on the official vehicle time sheet. Each vehicle is ranked according to fastest time first, second fastest time second, and so on. The top sixteen cars that meet specifications are run in the finals. Their times are not a factor in their final placement, with the exception of positioning them in the brackets of the double elimination bracket chart.

J. Position the top sixteen cars in the double elimination bracket by placing the fastest car in bracket 1, the second fastest car in bracket 2, and so on. Position one evaluator at the starting gate to check to see that all cars are positioned in the starting gate as well as possible. If the evaluator feels there is any sort of a misfire, a rerun can be ordered. Position one evaluator at the finish gate to rule on the finish of a race in case of failure of the finish lights or very close finish. If the evaluator feels there is any sort of timing error, a rerun may be ordered.

K. Secure the event evaluators' signatures on their discussion process, the event evaluators break any ties that affect the top three placements.

L. Submit the finalists report, including a ranking of the ten (10) finalists, and all related forms in the results envelope to the CRC room.

M. At the designated time and after the races have been concluded, the cars and drawings may be picked up by the student owners.

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OFFICIAL RATING FORM LEVEL 1 OR II

ENTRANT'S ID#														
EVALUATION CRITERIA														
Tolerance Violation/disqualification from race (Please note rule number.)														
Dragster appearance 15 pts.														
Drawing accuracy 15 pts.														
Drawing skills 10 pts. Neatness, dimensioning, lines, etc.														
Race (60 Pts) 1st place ..... 60 pts. 2nd place ..... 55 pts. 3rd place ..... 50 pts. 4th place ..... 45 pts. 5th & 6th place ..... 40 pts. 7th & 8th place .....35 pts. 9th& 10th place ..... 30 pts. 11th & 12th place ..... 25 pts. 13th & 14th place ..... 20 pts. 15th & 16th place ..... 15 pts.														
SUBTOTAL ..... 100 PTS.														
Rules Violation (if any) ..... minus 20 pts.														
TOTAL .....100 pts.														

I certify these results to be true and accurate to the best of my knowledge.

Evaluator's signature _____