



*****Decisions of the Judges during the heats and races are final*****

1. General – Entry is limited to one car per participant per Division

a. Scout Divisions (Lions through AOL)

i. Pack Winner Division

1. This class is open to all 1st place winners at the Den/Rank level for each Pack. This includes the 1st place car from each of the Lion, Tiger, Wolf, Bear, Webelos, and AOL ranks.
 - a. This allows each Pack to enter up to 6 cars (1 car per rank)
 - b. If a rank has multiple Dens, the car with the fastest average time within the rank as a whole moves forward to compete in this Division.
 - c. If the 1st place winner cannot attend and the car cannot be sent via proxy, the 2nd place winner may race in their stead.
2. All participants must be registered as a Cub Scout at some point since September 1st, 2025
3. 5th Grade Cub Scouts who bridged to Scouts BSA since September 1st, 2025 are permitted to race

ii. Open Cub Scout Division

1. Any registered Cub Scout may register to race in the Open Cub Scout Division
2. The car does not have to have finished 1st at the Den/Rank level.
3. All participants must be registered as a Cub Scout at some point since September 1st, 2025
4. 5th Grade Cub Scouts who bridged to Scouts BSA since September 1st, 2025 are permitted to race

b. Outlaw Divisions

i. Open Outlaw Youth

1. All youth under the age of 18
2. Participants do not need to be registered with Scouting America

3. This class may be included at the discretion of the race director for fun and to exemplify life-long learning
4. This may be combined into a single division with the Open Adult

ii. Open Outlaw Adult

1. Anyone over the age of 18
2. Participants do not need to be registered with Scouting America
3. This class may be included at the discretion of the race director for fun and to exemplify life-long learning
4. This may be combined into a single division with the Open Youth

2. Car Eligibility

a. Scout Divisions

- i. Cars must meet the specifications in Section 4
- ii. Cars must be built for the current season, NO REPEATS or REPAINTS.
- iii. Cars may not be sent to a third-party facility for tuning or for other performance enhancements
- iv. Cars may be re-tuned following the Pack race

b. Outlaw Divisions

- i. Cars must meet the specification in Section 5
- ii. Cars may be repeated and raced from season to season

3. Proxy Racers

- a. Proxy Racers are permitted.
- b. Cars may be registered by a designated Pack representative in the case a Scout cannot attend in person.
- c. Contact the race director with specific questions on arrangements for getting the car to the race.

4. Cub Scout Car Specifications

a. Body

- i. The main body must be constructed from an official BSA Pinewood Derby block
 1. The car design may be enhanced by the addition of other stable materials such as 3D-printed materials, plastic, or metal.
 2. Any additions must be firmly attached, non-moving, and still meet car size specifications.
- ii. Cars must meet the following specifications:
 1. Weight: not to exceed 5.0 oz on scales accurate to 0.1 oz. For scales that have more than a single digit beyond the decimal point, the maximum weight is 5.01 oz.
 - a. The District will provide tools to help reduce weight.
 - b. Consider using some easily-removable weight to fine-tune at the race site if needed (see 4.e. Weights)

2. Total width: not to exceed 2.75 inch
 3. Total length: not to exceed 7.0 inch (inc. wheels and any decorations)
 4. Total height: not to exceed 6.0 inch
 5. Clearance: only the wheels may touch the track.
 6. Center rail: wheels must clear the center guide rails, about 1.75 inch. The car bottom should be at least 3/8 (0.375) inch from the surface to avoid the center rail.
 7. Wheelbase: the distance between the centers of the front and rear wheel must be at least 4 inch. Cars may use the axle slots or drill new axle holes.
 - a. At least 4 wheels must be attached to the sides of the car body.
 - b. Each wheel must be attached to the car's body with a legal axle.
 - c. Only 3 wheels need to touch the track.
 - d. The complete inside and outside lettering of each wheel must be visible when the wheel is attached to the body.
 - e. Washers (e.g. delrin) and/or body treatment (e.g. teflon tape, graphite) between the car body and wheel are not permitted.
 - f. Each attached wheel must not be angled more than 20 degrees from vertical
 - g. Front-most and rear-most wheels must be positioned across the body from each other.
 8. Front: the front/leading edge of the car must be **at least ½ inch wide** at the center of the car, and no more than 1 inch above the wheel lane of the track. No pointed-front cars.
 - a. No part of the car may protrude beyond the starting pin.
 9. Fenders and fairings are permitted, but must not cover the inside or outside of the wheel nor interfere with the center rail.
 - a. Air Dams covering the inside or outside of the wheel are not permitted.
- iii.** The following items are prohibited:
1. Springs
 2. Starting devices or propellants
 3. Electronic or lighting devices that interfere with the race electronics
 4. Liquids, wet paint, oil, sticky substances, or powders of any kind (other than powdered graphite used for axle lubrication)
 - a. Liquid lubricants are prohibited (e.g. Krytox 100, oil, silicone).
 5. Washers (e.g. delrin) and/or body treatment (e.g. teflon tape, graphite) between the car body and wheel are not permitted.
 6. Glass or excessively fragile parts
 7. Bearings and/or bushings
 8. "Hubcaps" covering the nail head
 9. Loose/moving objects in/on the car (this includes moving weights)

b. Wheels

- i. Only official BSA wheels are allowed.
 1. Wheels from the box kits (black), or various colors from the 4-packs are acceptable.
 2. Aftermarket BSA wheels may be used but must meet all rules. Please check what you purchase!
- ii. All lettering and numbering, both inside and outside of the wheel, must remain complete and be visible with the wheel on the car.

- iii. The fluting (small bumps on the outside edge of the tread), spokes and other markings on the outside wheel area must remain visible.
- iv. Official BSA wheel dimensions
 1. The minimum wheel diameter is 1.16 inch
 2. The tread surface must be at least 0.295 inch (7.5 mm).
- v. All surfaces of the wheel may be polished.
- vi. The tread surface must be flat and parallel to the wheel bore.
- vii. The following wheel modifications are prohibited:
 1. Rounding of the tread surface (see Figure 1)
 2. Grooving, H-cutting, or V-cutting the tread surface (see Figure 1)
 3. Removing material from the inside tread surface or the inside sidewall surface
 4. Drilling holes in the tread, sidewalls, or spoke area.
 5. Removing material from the sidewalls or Spoke
 6. Filling wheel tread with any type of material
 7. Filling the wheel bores and re-drilling the bore
 8. Adding wheel covers inside or outside

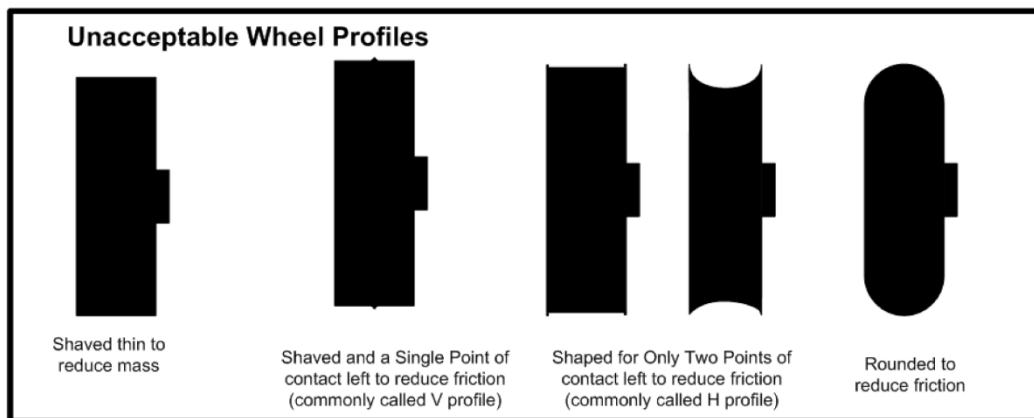


Figure 1: Examples of unacceptable wheel modifications. Changes to the wheels should be minimal and only remove small imperfections (if any).

c. Axles

- i. Metal axles with a nail head are required and must have a diameter of at least 0.084 inch. (typical nails are 0.088-0.092 inch diameter)
 1. Axles may be polished and grooved, provided the part the wheel rides on meets the above diameter requirement.
 2. After-market nail-type axles may be purchased and used if they meet the specifications.
- ii. One-piece metal axles extending through the width of the car to support both wheels are not permitted.
- iii. Axles may be bent, as long as the wheel angle remains not more than 20 deg from vertical (see 4.a.ii.7.f Body).
- iv. Grooves cut into the outside nail head to tune the wheel tracking are permitted.

d. Lubrication

- i. Dry lubricants only (e.g. graphite, molybdenum, tungsten disulfide, powdered teflon, wax).
- ii. Liquid lubricants are prohibited (e.g. Krytox 100, oil, silicone).
- iii. Cars must be clean of excess lubricant
 - 1. Excessive lubricant which results in shedding onto the track is not allowed.
 - 2. Normal handling of a car should not make the hand dirty.

e. Weights

- i. Only non-toxic materials are allowed.
 - 1. Good choices include tungsten, steel, zinc, copper, nickel
 - 2. Weighted (tungsten) putty is allowed, and even encouraged, as it can be quickly added/removed to fine-tune the final weight at check-in.
- ii. Prohibited weights: lead, mercury, cadmium, etc. These are a serious health hazards not permitted in childrens' toys, and present a danger to the health and safety of everyone under the Federal Hazardous Substances Act.
- iii. Safe "Pb-free" alternatives can be found at all scout and hobby shops.

5. Outlaw Rules

- a. The restrictions for outlaw division are minimal
 - i. Length: the car must be no more than 7" long
 - ii. Weight: not substantially more than 9.00 oz. This is at the discretion of the head judge, but cars that clearly exceed the weight will not be allowed to race.
 - iii. Only use gravity for propulsion (no springs, engines, etc.)
 - iv. May not contain projectiles or unsafe materials of any kind
 - v. Dry lubricants only (e.g. graphite, molybdenum, tungsten disulfide, powdered teflon, wax).
 - vi. Liquid lubricants are prohibited (e.g. Krytox 100, oil, silicone).
- b. Razor wheels, wheel bearings, solid-piece axles, fairings, etc. are permitted

6. Race Day

a. Roles and Responsibilities:

- i. Race Officials - the adults and youth involved in putting on the race
- ii. Race Director (RD) - who may designate other roles to ensure smooth race operation
- iii. Track master – typically responsible for handling track operation and software. They should ensure the track is in good working order and notify the RD of any problems.
- iv. Commentator(s) – entertain the crowd, generally inform the race status, etc.
- v. Official Inspection judges – perform inspections of cars during check-in.
- vi. Repair judge – may assist with car repairs. Often useful during check-in to remove car weight. Should come prepared with a variety of hand tools to assist.
- vii. Scout runners – they ferry cars from the finish to the staging area during heats.

- viii. Parent liaison – this person may be an expert racer or someone who is well-versed in the rules that acts as an observer. The scouts/parents may also come to them with questions during the race. This person may alert the RD to potential issues and expedite a resolution.

b. Inspection

- i. Each car must pass inspection by the Official Inspection Committee before it may compete. The inspectors will disqualify any car not meeting these rules. Any adult or scout may appeal the findings of the Inspectors to the Race Committee Chairperson (often the RD), whose decision is final.
- ii. Every effort will be made to do the inspection without any altering of the car.
 - 1. If race officials cannot verify that the wheels have not been lightened due to interior wheel weights, fenders, or other reasons, we will ask YOU (or the proxy) to take the wheels off for inspection.
 - 2. If the race officials cannot confirm only dry lubricant was used, we may ask YOU (or the proxy) to add your dry lubricant to the wheels.
- iii. After a car has passed inspection, only race officials may handle the car.
- iv. Racers may withdraw their car at any time.
- v. After check-in, adjustments are not allowed without re-inspection.
- vi. Car repairs during the race are allowed only when authorized by the race officials (such as wheel failure, or impact from another car).
- vii. If a car is damaged from an official mishandling, the owner may be asked to reinspect their car and confirm it is in working order. A reasonable time may be allowed for repair at the discretion of the race officials.
- viii. Once Inspection is PASSED before the race, the car will not be re-inspected after the race.

c. Racing

- i. Each car will participate in the number of heats as lanes on the track. E.g. 4 heats, running once on each of the 4 track lanes (most likely configuration).
- ii. The average time to complete the four heats will determine the fastest car in each division and for the overall categories.
- iii. The track may be wiped down as needed to keep it clean.
- iv. Additional rules
 - 1. If a car comes off the track during a heat, a “No Race” will be declared and the heat will be run again. If the same car jumps off the track a second time, that car’s time for that heat will default to 9.9999 seconds.
 - 2. If a car suffers a major mechanical problem, a “No Race” will be declared and race officials may allow car repair (typically 5 minutes). If the car is still unable to compete, the damaged car will be assigned a time of 9.9999 seconds for the heat and any remaining heats.
 - 3. If a car or cars do not make it to the Finish Line, the car(s) will be assigned a time of 9.9999 seconds for the heat.
 - 4. If two cars tie with identical average times, then the car with the fastest run wins the tie-breaker.
 - 5. If the RD determines that track malfunction/inconsistency renders differences between top overall performers nearly equal after the division heats, a Grand Final

set of heats may be raced to determine the overall placements. The number to include is at the discretion of the Race Officials, but will likely be less than 5.

6. **Good sportsmanship and behavior is expected. Race officials understand that emotions may run high, as a great deal of time and effort goes into these cars. However, race officials may ask anyone not following this rule to leave the race area.**

d. Awards

- i. 1st, 2nd, and 3rd place will be presented awards/trophies for the cars with the fastest average times overall per division.
- ii. The Pack Winner Division will be awarded 1st and 2nd place awards/trophies for design as determined by a panel of judges.
- iii. A Best in Show award may be given to the most outstanding design in the Pack Winner Division as determined by a panel of judges.
- iv. (Optional) Youth/Adult Outlaw awards/trophies may be awarded for 1st, 2nd, and 3rd places per division.

7. Questions/Disputes

- a. Questions may be addressed to the Race Officials. Please be specific, noting the race heat and/or cars involved, rules broken, and/or mistakes needing correction.
- b. The Scout owner of a non-compliant car may still race in the "Youth Outlaw" Division.

Decisions of the Judges during the heats and races are final.

By registering, you acknowledge that the car meets the rules to the best of your knowledge.

Everyone is encouraged to wear their scout uniform.

A Scout is Trustworthy. We expect everyone to abide by the rules in letter and spirit.

Note: just because your car has passed every previous inspection does not ensure it will pass here! While we hate to inconvenience you to change your car last-minute, we also strive for the fairest race when the margins for winning are so thin.

Rules may be updated as needed to fix typos or to clarify a rule.

Brief Rationale

These build rules are less restrictive, in some cases substantially, than many PWD rule sets for the Pack races. The reasons for this are as follows:

1. Encourage experimentation and innovation, core concepts of STEM

2. Impossible/ineffective enforcement of some existing rules
3. Discrepancies between Pack rule sets

There should be a balance between allowing cub scouts and parents to run wild with exotic designs and being mindful that this should not become a cost-prohibitive endeavor. Generally, a car design element/modification that does not make cost a factor is acceptable.

Some rules are also not practical to enforceable. We do not ban after-market parts because they are (a) relatively moderately priced, (b) often use existing PWD parts (blocks, wheels, & axles), or are not substantially different materials, and (c) can be a substantial time and cost savings to families without tool shops and experience while still allowing families to design, build, and tune a car themselves. Also, detection of these parts, especially axles, can be very difficult (esp. trying to register dozens of scouts while everyone waits for things to get started), as they are often designed to look identical to stock parts when assembled.

What about fully pre-built cars? We **strongly** discourage purchasing these, as we think scouts will get much more out of working on their own cars. However, we would have a very hard time proving a scout/parent broke this rule. If you must race one of these cars, be honest about it, and we encourage you to enter it into an Open Outlaw division. A Scout is Trustworthy.

We attempted to lay out rules that target potential safety, handling, and cost concerns without discouraging cub scouts and their families from exploring the boundaries of their imaginations. We welcome feedback and constructive criticism, and may update the rules each year to better meet the goals of Scouting.

Do Your Best, and Happy Racing!