

# 2025 Mattaponi District Pinewood Derby Grand Prix Rules



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

## **1. General – Entry is Limited to one car per participant**

### **1.1. Membership Requirements for the Cub Scout Championship Race (Speed Divisions)**

1.1.1. Registered as a Cub Scout at some point since January 1st, 2025

1.1.2. 5th Grade Cub Scout who bridged (joined) Scouts BSA since September 1st, 2024

1.2. **Open Divisions:** these participants do not need to be registered with the BSA in any way but are included for fun and to exemplify life-long learning. Depending on the number of entries, this may be combined into a single division. The number of entries for the open division is not limited. One may concurrently enter in the open and either the show or speed divisions.

1.2.1. Open Youth will include youth under the age of 18.

1.2.2. Open Adult will include anyone over the age of 18.

### **1.3. Show Divisions**

1.3.1. Registered as a Cub Scout at some point since January 1st, 2025

1.3.2. 5th Grade Cub Scout who bridged (joined) Scouts BSA since September 1st, 2024

### **1.4. Eligibility**

1.4.1. To register for a spot in the Cub Scout Championship Race, you must have finished 1st at the Pack level in your division (e.g. 1st place Wolf), or in the Top 3 overall in your Pack (e.g. 3rd Overall despite 2nd place Bears). If any of the qualifiers are not available, the runner up may be entered instead.

1.4.2. Anyone under 18 may race in the Open Youth category, regardless of pack or district finishing.

1.4.3. Anyone may race in the Open Adult category, regardless of age.

1.4.4. Each Pack may send up to 5 cars for the Show Division. These should be the winners of their Pack Best in Show Competitions. Each Pack's show competition is different, so the cars sent are at the unit leaders' discretion. A Pack may send less than five cars if you only have 3 best in show winners.

1.5. Main Division and Show Division cars must be built for the current season, NO REPEATS or REPAINTS. Open Divisions may be repeats.

1.6. Cars may not be sent to a third-party facility for tuning or other performance enhancements.

1.7. A youth advances, NOT the specific car. Cars built for the year may be returned, or even

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whole new cars built to take advantage of different rules.

## 1.8. Proxy Racing

1.8.1. Participants need not be present to compete in any division

1.8.2. Unclaimed cars will be discarded 30 days after the race

1.9. Each Pack needs a designee responsible for the cars registered from their unit. This individual must be present for the entirety of the race.

1.10. By registering, you acknowledge that the car is in compliance with these rules to the best of your knowledge.

1.11. Everyone is encouraged to wear their scout uniform! This is NOT a requirement, as we recognize participants may have come from or be headed to other events. A Scout is Trustworthy. We expect everyone to abide by the rules in letter and spirit.

## 2. Body

2.1. The main body must be made of wood. The car design may be enhanced by the addition of other stable materials such as plastic or metal. Any additions must be firmly attached, non-moving, and meet car size specifications.

2.2. Cars must meet the following specifications using on-site tools and jigs:

2.2.1. 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 5.0500 oz.

2.2.2. Total width: not to exceed 2.75 inch.

2.2.3. Total length: not to exceed 7.0 inch. This includes wheels and any decorations.

2.2.4. Total height: not to exceed 6.0 inch.

2.2.5. Clearance: only the wheels may touch the track.

2.2.6. Center rail: wheels must clear the center guide rails, at least 1.75 inch. The car bottom should be at least 3/8 (0.375) inch from the surface to avoid the center rail.

2.2.7. Wheelbase: the distance between the centers of the front and rear wheel must be at least 4 inches. Cars must use the existing axel slots.

2.2.8. 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.

2.2.9. No part of the car may protrude beyond the starting pin.

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- 2.2.10. At least four (4) wheels must be attached to the sides of the car body.
  - 2.2.10.1. Each wheel must be attached to the car's body with a legal axle.
  - 2.2.10.2. Only three (3) wheels need to touch the track.
- 2.2.11. The complete inside and outside lettering of each wheel must be visible when the wheel is attached to the body.
- 2.2.12. Washers (e.g. delrin) and/or body treatment (e.g. teflon tape, graphite) between the car body and wheel are permitted. These must be affixed to the car body and not be in violation of other rules (i.e. wheel-cover).
- 2.2.13. Fenders and fairings are permitted, but must not cover the inside or outside of the wheel nor interfere with the center rail.
- 2.2.14. Each attached wheel must not be angled more than 20 degrees from horizontal.
- 2.2.15. Front-most and rear-most wheels must be positioned across the body from each other.
- 2.2.16. Air Dams covering the inside or outside of the wheel are not permitted. This allows for inspection.
- 2.2.17. 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 used for axle lubrication)
  - 5. Glass or excessively fragile parts
  - 6. Bearings and/or bushings
  - 7. "Hubcaps" covering the nail head
  - 8. Loose/moving objects in/on the car.

## 3. Wheels

- 3.1. Only official BSA wheels are allowed.
  - 3.1.1. Wheels from the box kits (black), or various colors from the 4-packs are acceptable.
  - 3.1.2. Aftermarket BSA wheels may be used but must meet all rules.

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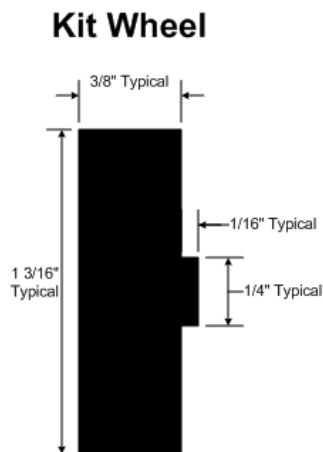
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- 3.2. All lettering and numbering, both inside and outside of the wheel, must remain complete and be visible with the wheel on the car.
- 3.3. The fluting (small bumps on the outside edge of the tread), spokes and other markings on the outside wheel area must remain visible.
- 3.4. The minimum wheel diameter is 1.16 inch.
- 3.5. The tread surface must be at least 0.295 inch (7.5 mm).
- 3.6. All surfaces of the wheel may be polished.
- 3.7. The tread surface must be flat and parallel to the wheel bore. Therefore, the following modifications are prohibited (see Figure):
  1. Rounding of the tread surface
  2. Grooving, H-cutting, or V-cutting the tread surface
- 3.8. The following wheel modifications are prohibited:
  1. Removing material from the inside tread surface or the inside sidewall surface
  2. Drilling holes in the tread, sidewalls, or spoke area.
  3. Removing material from the sidewalls or Spoke
  4. Filling wheel tread with any type of material
  5. Filling the wheel bores and re-drilling the bore
  6. Removing the double step from the outer hub
  7. Adding wheel covers inside or outside

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**Acceptable Wheel**



Trued and smoothed with  
the rough edges smoothed  
and coned hub

**Unacceptable Wheel Profiles**



Shaved thin to  
reduce mass



Shaved and a Single Point of  
contact left to reduce friction  
(commonly called V profile)



Shaped for Only Two Points of  
contact left to reduce friction  
(commonly called H profile)



Rounded to  
reduce friction

## 4. Axels

4.1. 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)

4.1.1. Axles may be polished and grooved, provided the part the wheel rides on meets the above diameter requirement.

4.1.2. After-market nail-type axles may be purchased and used if they meet the specifications.

4.2. Axels must be secured in the pre-cut groove of the pinewood derby kit.

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- 4.3. One-piece metal axles extending through the width of the car to support both wheels are not permitted.
- 4.4. Axles may be bent, as long as the wheel angle remains not more than 20 deg from horizontal (see 2. Body).
- 4.5. Grooves cut into the outside nail head to tune the wheel tracking are permitted.

## **5. Lubrication**

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

## **6. Weights**

- 6.1. Only non-toxic materials are allowed.
  - 6.1.1. Good choices include tungsten, steel, zinc, copper, nickel
  - 6.1.2. Weighted (tungsten) putty is allowed, and even encouraged, as it can be quickly added/removed to fine-tune the final weight at check-in.
- 6.2. Prohibited: 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.
  - 6.2.1. Safe "Pb-free" alternatives can be found at all scout and hobby shops.
  - 6.2.2. Specific to lead – if a lead weight was used as part of a build workshop, you must ensure the weight is completely sealed and safe from any possible contact and notify the staff for inspection.

## **7. Best In Show**

- 7.1. Latitude within the Show categories allows for variation of design which may depart from the Speed Rules, however, in the spirit of competition, cars should be designed for the show completion with the intent of the car meeting the rules for speed and the cars should be qualified to compete as a race and a show competitor.
  - 7.1.1. Weight: Each car should participate in their Pack's race as both a racer and a show competitor. To meet that spirit, each car should be no greater than 5.0

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ounces. However, to account for differences in Pack scales, any car that is over 5.5 ounces or less will be allowed to enter without removing weight. (The spirit of this provision is to prevent entrants from having to damage their cars on the day of registration, not to give them an extra 0.3 ounces to work with.) Any car that is over 5.5 ounces will be required to have weight removed until it is 5.5 ounces or less before it will be placed on the judging table.

7.1.2. Dimensions – the car must conform to the same standards of length, width, wheelbase, and height as the speed car entrants. Again, the judges can allow some latitude in this regard.

7.1.3. Wheels: Wheels should meet the intent of the Speed Registration Rules. The Race Director reserves the right to interpret the rules differently for show check-in than for speed check-in. One specific example: if a car is disqualified from the speed category because the wheels have been over-sanded, it will be allowed to enter the show category.

7.1.4. No model stands are allowed. The car will be judged on its own merit. It must hold itself together without props or external aides.

7.2. The winners of each category will be decided by a ballot of all Packs present at the pinewood derby.

7.2.1. The ballot will be cast by the Pack designee in consultation with the members of the Pack at the direction of the Race Director.

## 8. Race Day

8.1. Race Officials are the adults and youth involved in putting on the race. There shall be a Race Director (RD), who may designate other roles to ensure smooth race operations. Other roles may include:

8.1.1. Track master – typically responsible for handling track operation and software. They should ensure the racetrack is in good working order and notify the RD of any problems.

8.1.2. Commentator(s) – entertain the crowd, generally inform the race status, etc.

8.1.3. Official Inspection judges – perform inspections of cars during check-in.

8.1.4. 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.

8.1.5. Track Crew – they ferry cars from the finish to the staging area during heats.

8.1.6. 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

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questions during the race. This person may alert the RD to potential issues and expedite a resolution.

## 8.2. Inspection

8.2.1. 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.

8.2.2. Every effort will be made to do the inspection without any altering of the car.

8.2.2.1. 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.

8.2.2.2. 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.

8.2.3. Scouts must identify the front of their car.

8.2.4. After a car has passed inspection, only race officials may handle the car.

8.2.4.1. Racers may withdraw their car at any time.

8.2.4.2. After check-in, adjustments are not allowed.

8.2.4.3. Car repairs during the race are allowed only when authorized by the race officials (such as wheel failure, or impact from another car).

8.2.4.4. 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.

8.2.4.5. Once Inspection is PASSED before the race, the car will not be re-inspected after the race.

## 8.3. Racing

8.3.1. Each car will participate in at least 4 heats, running once on each of the 4 track lanes. The average time to complete the four heats will determine the fastest car in each den level and for the overall district categories.

8.3.2. The track may be wiped down as needed to keep it clean.

8.3.3. 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.

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- 8.3.4. 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.
- 8.3.5. 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.
- 8.3.6. If two cars tie with identical average times, then the car with the fastest run wins the tiebreaker.
- 8.3.7. If the RD determines that track malfunction/inconsistency renders differences between top overall performers nearly equal after the Den 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.
- 8.3.8. Race officials have final discretion on whether to allow a car repair, and for how long.
- 8.3.9. 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.
- 8.3.10. If time allows, the RD may permit unofficial heats between Open-Division and Main-Division racers for fun. However, these do not affect the official times and standings.

## 9. Awards

- 9.1.1. All scouts will receive a participation patch.
- 9.1.2. Den-level awards/trophies for 1<sup>st</sup> place will be presented to the scouts with the fastest average times for their den.
- 9.1.3. Overall awards/trophies for 1st, 2nd, and 3rd places will be presented to the scouts with the fastest average times overall.
- 9.1.4. Open Youth and Open Adult awards/trophies may be awarded for 1st, 2nd, and 3rd places depending on number of entries.
- 9.1.5. Best In Show Awards will be presented in the following categories:
- Most Creative Design
  - Best Scout Design
  - Most Patriotic Design

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- Best Racecar Design
- Best Craftsmanship

9.1.6. No one will receive more than one award.

9.2. The unit with the most winners and best Scout spirit will receive the Mattaponi Cup which they will retain until the another recipient is determined at next years Pinewood Derby Grand Prix.

## 10. Questions/Disputes

- 10.1. 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.
- 10.2. The Scout owner of a non-compliant or disqualified car will receive a participation patch. Their car may still race in the "Open" section and will not qualify for a speed award.

## 11. Notes

- 11.1. These rules were adapted from the rule sets of the NCAC, as well as the [Northern Star Scouting Pinewood Derby Rules](#). We acknowledge the thought behind this particular rule set as a means to balance competition and innovation with practicality and accessibility for all scouts.
- 11.2. These rules may be updated for clarification at any time.