2019 Pinewood Derby Rules

NORTHERN STAR SCOUTING

Again there are no major rule changes this year. There are WARNING boxes and boxes with useful INFO.

Remember that with the OPEN Divisions, EVERY ONE can race!

1 GENERAL

1.1 In order to race at the **Northern Star Scouting Cub Scout Championship**, the participant must satisfy one of the two membership requirements.

- Registered as a Cub Scout at some point since January 1st, 2019
- 5th Grade Cub Scout who bridged (joined) Scouts BSA since September 1st, 2018.

1.2 For the **Northern Star Scouting OPEN Championship**, the participants will be divided by age groups.

- Youth under the age of 12 for the Open Youngster Division
- Between 12 and 18 for the Open Youth Division
- Over the age of 18 for the Open Adult Division

Traditionally we ask that each District send the top 3 racers from each rank. This year we are going to open up the participation to allow any who believe they have a competitive car to register and race at the Council race. **We encourage 5th graders who have not had a chance to race at either their Pack or District level to come and join the fun!**

While we encourage all racers to be present and wearing their uniforms, we understand that things can be very busy and that the racer may not be in their scout uniform. They may have hurried over from some other event. Some may not even get to see the race live. If needed please have someone bring your car to race and video it if possible! ☺

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1.3 The Cub Scout cars must be built for the current Pinewood Derby Racing Season. NO REPEATS or REPAINTS. (OPEN Championships may be repeats)

1.4 A completed car purchased from a third party is not allowed.

1.5 The car may not be **sent** to third party facilities for tuning or other performance enhancements.

1.6 **The youth advances, not a specific car.** Feel free to retune your car or even build a whole new one! Many build a car for DESIGN at the Pack or District level and then build a new car for SPEED at the Council level.

If you lack the tools or resources to cut out a car from a stock block of wood, then we encourage you to attend a workshop hosted by your den, pack, district, or council. Alternately, **you may purchase a pre-shaped block** and assemble it with approved wheels and axles.

The youth advances and not the specific car. This is since all the cars cannot be impounded to prevent any changes after the pack or district races. Remember, building and tuning a car WITH the adult is a major part of the Pinewood Derby.

2 BODY

2.1 **The main body structure(chassis) 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 The car must meet the following specifications:

- 2.2.1 Width: not to exceed 2 3/4 inches
- 2.2.2 Length: not to exceed 7 inches
- 2.2.3 Weight: not to exceed 5.0 ounces on a scale accurate to 1/10 ounce. For scales that have more than a single digit beyond the decimal point, the maximum weight is 5.0500
- 2.2.4 Height: not to exceed 3 inches
- 2.2.5 Clearance: **The wheels are the only part of the car allowed to touch the track.**
- 2.2.6 Center rail width: **Wheels must clear center guide rails**, no less than 1 ¾ inches minimum.

The following **guidelines** are intended to help you construct a car with the necessary clearance for most tracks. If any question arises about a car's clearance during check in, race inspectors should place the car on the track to verify that only the wheels can touch the track.

- Car bottom: to clear a filled center rail, the bottom of the car should be no less than 3/8 inch from the surface.
- Fenders: Fenders or other body parts may extend below 3/8 inch from the track surface. Remember the guide rail width so the fenders do not rub.
- Weights: To aid in a safe stop at the end of the track, we recommend that you insert weight inside the body or place it on the top of the car. Avoid placing thick (over 1/8") weight on the bottom of the car as that may destabilize the car on the stop section.

2.3 Wheelbase: the distance between the center of the front and rear wheel must be no less than 4 inches.

2.4 Front: the front/leading edge of the car must be no more than 1 inch above the wheel lane of the track and be **at least ½ inch wide at the center of the car**. NO NARROW POINTED FRONT ENDS.

This rule ensures the car rests securely against the starting pin when placed in the starting position and is wide enough to trigger electronic finish lines. Another way to say this is no needle nose cars and no cars with a high front end. The needle nose makes it hard to align for a straight start and often does not trip the electronic sensor until enough of the car has passed to cover the hole. The raised front end or raised wire is only effective on tracks where the starting pins are released by hand and not spring driven. The tracks used for the council race are spring driven and the pins drop faster than a car can start.

2.5 When placed in the starting position, no part of the car may protrude beyond the starting pin.

2.6 At least 4 wheels must be attached to the **sides** of the car body. **Each wheel must be attached to the car's wood chassis with a legal axle.**

Although at least 4 wheels are required, **it is not required that all 4 wheels touch the track surface**. It can actually be difficult to get all 4 of the wheel s to touch. Most of the fastest cars have one front wheel raised slightly and not touching.

The rationale for 4 wheels is that it ensures the car will stay on the track and not slide off the center rail and collide with another car.

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2.7 Each attached wheel must not be angled(canted) more than 20 degrees from vertical.

2.8 The front most and rear most wheels must be positioned across the body from one another.

2.9 The complete inside and outside lettering of each wheel must be visible when the wheel is attached to the body.

NEW STUFF ➔Wheel "Air Dams" and Interior Wheel weights:

Any covering of the interior of the wheel must be transparent(clear) and if using interior wheel weights there must be a slot that allows for rotating the wheel for interior inspection.

2.10 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 substance, or powders of any kind (other than axle lubrication)
5. Glass or excessively fragile parts
6. Bearings and or bushings
7. Hubcaps covering the nail head
8. Loose/moving objects on or in the car

Washers/body treatments to help reduce friction ARE ALLOWED. Washers may be between the body and the wheel, and the wheel and the axle head.

Body treatments(between wood chassis and wheel) may be things like sprayed on graphite paint, Teflon tape, other slippery materials/waxes applied to the body.

The cost of small washers is very low and the experience of working with them can be educational and fun. The washers may be glued to the car body.

3 WHEELS

3.1 Only official BSA wheels are allowed.

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, spokes and other markings on the outside wheel area must remain visible.

"Fluting" refers to the small bumps on the outside edge of the tread.

3.4 The wheel diameter must be no less than **1.16 inches**.

3.5 The tread surface width must be no less than **7.5 mm**.

3.6 The tread surface must be flat and parallel to the wheel bore. Therefore, the following modifications are prohibited:

1. Rounding of the tread surface
2. Grooving, H cutting, or V cutting the tread surface

3.7 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

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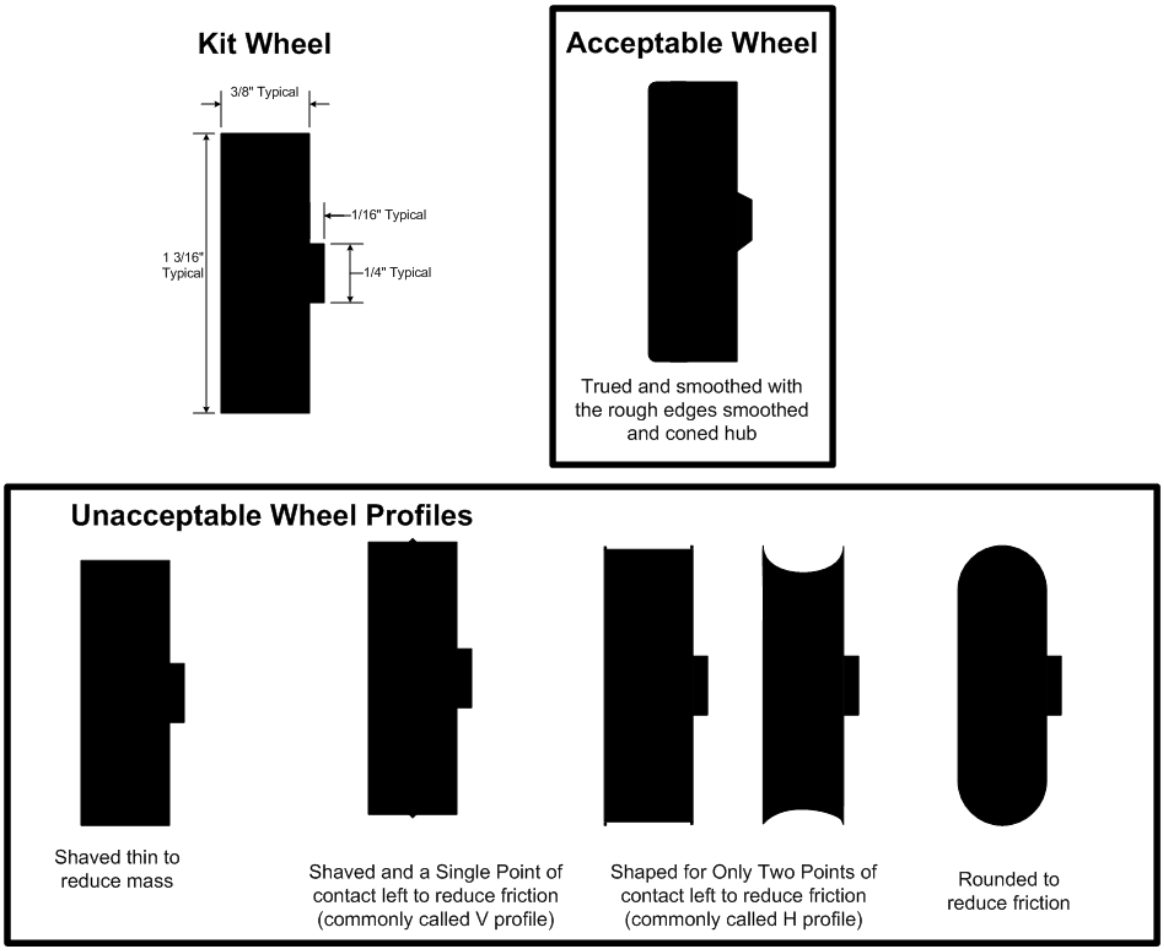

The rules permit many wheel modification so long as you observe the dimension limits and restrictions listed above. Common legal modifications include but are not limited to:

- Truing the tread surface with sandpaper, straight edge, or lathe to correct “out of round” wheels.
- Truing and shaping the inner edge of the thread surface
- Narrowing the tread surface to 7.5mm to get straight edges
- Applying wheel bore treatments such as polish and wax to smooth the bore.
- Tapping the wheel bore
- Truing and re-coning the tip of the inner hub
- Removing the double step from the outer hub
- Balancing the wheel by **adding** material such as glue or fingernail polish to the inside of the wheel
- Adding a **transparent** cover to the inside of the wheel to reduce air drag

Some online vendors sell aftermarket BSA wheels that have been lightened by removing material from inside the wheel surfaces. Per rule 3.7, these wheels are NOT allowed and are easily recognized at inspection. Cars with these wheels will NOT be permitted to race. If you plan to use aftermarket wheels, confirm with the vendor that no weight is removed from inside the wheel.

4 AXLES

4.1 Metal Axles with a nail head are required with an overall diameter of no less than .084 inches.

4.2 One-piece axles that extend through the width of the car to support both wheels are not allowed.

You may use official BSA axles or after-market nail type axles from various vendors.

You may also polish and groove the axle provided that the journal portion of the axle (the part the wheel rides on) is no less than .084 inches, roughly the same diameter as the original BSA nails.

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5 LUBRICATION

5.1 Over application of lubricant, which results in excessive shedding onto the track is not allowed.

Lubricants you may use include but are not limited to: Graphite, Teflon, Nyoil, and Krytox.

We encourage you to use VERY SMALL AMOUNTS of oil based lubricants such as Krytox 100 instead of graphite because it does not damage the car's paint and generally promotes a cleaner and safer work and race area. You can find information regarding the most effective use of Krytox 100 online and through workshop participation.

6 WEIGHTS

6.1 Lead (Pb) weight, if used, must be completely sealed and safe from all possible contact with youth.

6.2 Drilling/Removal of lead weight is not allowed at the race or check-in venue.

6.3 Interior wheel weights are allowed as long as they allow for inspection of the interior of the wheels.

Please avoid Lead (Pb) in cars this year! The 2008 Consumer Product Safety Improvement Act restricts the amount of lead that may be contained in children's toys (ages 12 and under). For a 5-ounce toy, the lead limit would be 3/1000 of an ounce!

Therefore, we strongly encourage you to use other material for weight. Common alternatives include zinc, copper, and tungsten.

For more information see
http://www.cpsc.gov/CPSCPUB/PREREL/prhtml09/09120.html

7 RACE DAY

7.1 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, whose decision is final.

7.2 Every effort will be made to do the inspection without any altering of the car. **If we can't verify that the wheels have not been lightened due to interior wheel weights, air dams, fenders, or other reasons, we will ask YOU to take the wheels off for inspection.**

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

7.4 After check-in, adjustments are not allowed. Car repairs during the race are not allowed unless authorized by the race officials.

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

7.6 Good sportsmanship and behavior is expected. Race officials may ask anyone not following this rule to leave.

Typically, race officials will authorize a car repair if it was involved in a collision with another car or object. However, the decision to allow a repair is left entirely to the discretion of the race officials. Depending on the race officials, they may offer to assist with the repairs if needed.

8 QUESTIONS

Questions may be addressed to the Race Officials. The Council Race Officials may be contacted at PWDRacing@Yahoo.com.