

Official Pinewood Derby Racing Rules

Scouting participants allowed to race in championship race:

1. Lions, Tigers, Wolves, Bears, Webelos, and AOL.
 - a. AOL Scouts (5th Grade) can race as Webelos even if they have graduated to Boy Scouts.
2. The top four finishers from each pack are eligible to race in the District Derby and will have their entrance fee waived. Individual packs are responsible for deciding how the top four finishers are determined.
3. Any Cub Scout that is not one of the top four finishers in their pack may still race in the championship race but will need to pay the entrance fee.
4. New cars can be built before the district race, or the current car can be raced. Again, **all** rules must still be followed.

Open class race:

1. Open to anyone who wishes to build a car and race.
2. Participants will need to follow all the same rules listed.
3. Cub Scouts are allowed to race in this event BUT are not allowed to race the same car in both the open and the championship race. Scouts will need to register and race a different car that has not been registered for the championship race.

Sportsmanship:

1. Scouting encourages good sportsmanship.
2. Scouts should wear full 'Class A' uniform when possible.
3. Cars will be disqualified if the Scout or his parents display unsportsmanlike/un-scout-like conduct/behavior.
4. **Remember:** it is only a race, and the object is for all Scouts to have a great time!

***Tip/Hint:** Scouts and parents are strongly encouraged to offer/share ideas, building tips and thoughts to other scouts and their parents. The race is not only about building cars but also about building relationships!*

Car Specifications:

1. Scouts may **ONLY** use **official BSA Pinewood Derby Kits**. Additional official kits are available for purchase at the Scout Office along with additional wheels and axles. All cars must be built after the previous year's District Derby race.
2. Bodies of other materials and/or from outside vendors are not allowed and will be disqualified.
3. The body may be shaped, hollowed out, or built up from the original block.
4. No part of the car, including the wheels, may touch the fit box wall behind the pin.
5. Paints, decals, accessory trim pieces, and weights are allowed.
6. Any additions to the original body (drivers, decals, paint, weights, etc.) must be firmly attached.
7. Weights or other accessories attached to the bottom of the car **must** be covered using tape or similar material to prevent sharp edges from damaging/tearing the stop strip.
8. The entire car must fit inside of the official measurement box and the door must be completely closed. (See Dimensions section)
9. There is no designated front or back to the supplied body - either end may be the front.
10. Axle slots do not need to be used; holes in any position may be used instead. Overall dimensions and clearance rules still apply.

Tip/Hint: *Placing weight toward the rear of the car allows for more potential energy and likely a faster car. Approximately 1.8 ounces (+/-) of weight behind the rear axle is a good starting point (dependent upon car design). Use caution/experience/judgment when placing the weight. Too much weight behind the rear axle will cause the car to be unstable. Building multiple cars (either over several years or in a single year) helps you to better understand what works best. It also refines the tactile skills needed/used while building a car.*

Wheels & Axles:

1. **Only** official BSA wheels and axles are allowed.
2. Colored official BSA wheels are allowed. These can be purchased through the Scout Store.
3. Outer wheel surface (tread area) may be lightly sanded, shaved, or polished to remove surface imperfections and mold casting burs, but must not be reshaped in any attempt to lighten the wheel, minimize tread contact and/or alter aerodynamics. (See picture below.)
4. No material may be removed from inside of the wheel in an attempt to lighten the wheel. All original markings must remain on the wheel. **Note:** *Truing the wheel hub (interior and exterior) is allowed.*
5. Wheel surface must remain flat with full tread width. The raised “dots” located around the outer portion of the wheel must remain visible. (see the picture below for reference)
6. Wheel bore and hubs may be polished. Bore polish is available at the Scout Store.
7. Wheel bores may not be filled and re-machined. The original bore must be retained.
8. No coverings are allowed over the wheel hubs.
9. No bushings, bearings, rubber tubing, or springs are allowed.
10. Axles may be polished if desired.
11. Cars must have a minimum of 4 (four) wheels. A truck, bus, or other larger vehicle may use more wheels. Wheels must be placed directly across from each other. No guide pins are allowed.

Tip/Hint: *Polishing the axles helps to increase speed. When polishing there is a fine line where too much material can be removed. This causes slop between the wheel bore and the axle. Remove only as much material needed to create a smoother surface for the wheel to ride upon. Trial and error may be needed to determine what works best. Extra wheels and axles can be purchased at the Scout Store. Doing this allows you to select the best running wheels and the straightest axles. Also polishing the side of the car where the wheel/hub rubs against it will reduce friction and increase speed. A small washer, select tapes and/or vinyl may also work well.*

Dimensions:

1. The car width at the wheel locations must be the same as the original kit (1 3/4”). This is to ensure that the car will travel down the track without binding on the center guide rails.
2. Other portions of the car body width may be changed if desired.
3. Overall width (measured from the outside of the wheels) may not exceed 2 3/4”.
4. Overall length may not exceed 7”. (This includes any weights, decorative tailpipes, etc.)
5. Overall height may not exceed 3" (Point of wheels contacting track up to highest point of car).
6. Minimum clearance below the body must be at least 3/8” to prevent dragging on the guide strip.

Tip/Hint: *Consideration must be given while designing the car to the shape of the nose. A very narrow nose can be difficult to correctly place against the starting pin. This shape also may record a slightly slower time when breaking the light beam at the finish.*

A lower profile car will be more aerodynamic as it has a smaller frontal cross section. Yes, aerodynamics do make a difference at this level. It is not much, but there is a small difference.

Weight:

1. The weight of the race-ready car must not exceed five (5) ounces.
2. Weight will be measured using the official scale when the car is inspected/checked in. Food scales and/or the Post Office scales could be used to check a car while building. Just remember that the “official scale” is the one used during check-in/inspection. (It is easier to add a few grams of weight than remove some weight on race day. Plan accordingly.)
3. After the official weigh-in and the car is impounded, no adjustments may be made to the car.
4. Anything can be used for weight. Steel, Zinc, Lead, and Tungsten are a few examples. If lead is used, it must be completely covered or encapsulated for safety reasons.
5. Cars may not have any mechanical or stored energy of any type. Weights must be fixed and not movable.

Tip/Hint: *Because Tungsten is one of the densest materials and it is a good choice for adding weight. It is more expensive than the other options but allows for more weight placement options. Lead is another good choice for adding weight because it is also very dense. However, caution should be exercised if using lead because of its toxicity, especially to kids. Placing tape around the lead before allowing Scouts to handle it is a good option. Also good hygiene (hand washing) is strongly recommended for both adults and Scouts after **any** contact with lead weight.*

Lubricant:

1. Oil is the only approved lubricant! (This is due to the additional track maintenance created when graphite is used along with the pushback from many venues about using graphite.) *Entities using/allowing graphite may be imposed a track cleaning fee of up to \$300.*
2. **NO** lubricant tubes/containers of any type are allowed in the building where the race is held. Apply lubricant to car axles before racing, outside of the building or at home.
3. No stored or excessive lubricant is allowed in the hub area. Excess oil fouls the track.
4. Once a car is inspected/impounded, no additional oil may be applied.

Tip/Hint: *Krytox oil (available at the scout store) is strongly encouraged! This is for several reasons. One bottle of Krytox can lube 20 cars or more. Oil lubricant is a little faster than a very good graphite lubricant. Krytox oil allows a car to make 40-70 runs before needing any attention. It also will last 6 months or longer before any drop in speed is noticed. Polishing the bores works well and increases speed. This works especially well with oil lubricants. Use **small** amounts of oil! Too much oil will slow the car! 2-3 medium drops of Krytox are more than enough per axle. Beware of the specialty oils that are available online. Some of them need to be applied within a few hours of the race and may only last for a few hours. These also have very specific instructions of how much oil to use.*

Inspection process:

1. Cars will be inspected and weighed by the racing staff during registration at the scheduled times.
2. Cars that fail to meet specifications will not be permitted to race.
3. After final approval, cars will be placed into the impound area until they are needed for a race.
4. A car can be disqualified at any time during the event for not meeting rule specifications, even if it has already passed an inspection.
5. Racing Staff/Inspectors can at any time ask the scout to remove an axle/wheel for closer inspection to ensure the usage of proper wheels and axles.

Impound process:

1. Cars must stay in the impound area until time for racing. Once a car is placed into the impound area, **no** adjustments may be made.
2. Once placed into the impound area, racers are **NOT** allowed to touch/access their car until their scheduled race time.
3. If a racer retrieves their car before their scheduled race time, the car will have to be inspected again before being placed back into impound.
4. Cars proceeding to the finals will be impounded until the final race.
5. Cars that are not proceeding to the finals will be given back to the Scouts.

Have fun and Good Luck!