

## Pack 152

# Pinewood Derby Rules

## Key Rules to Keep In Mind

- Cars must be built new for this season and cannot have been raced in previous years (see *section 1.1*)
- Use an official BSA Pinewood Derby kit, not a PineCar or other kit (see *section 2.1 and 2.2*)
- Car must weigh no more than 5.0 ounces (141.7 grams) as weighed on the official scale (see *section 3.1*)
- The original axle grooves must be used (see *section 3.8*)
- Wheel treads must NOT be modified in any way (see *section 4.9*)
- Only dry graphite lubricant can be used (see *section 5.1*)

## Car Specifications

### 1. General

- 1.1. Each car entered in the race must be newly built for the current Cub Scouting year. Cars from previous scouting years are not permitted.
- 1.2. The car should be substantially built by the Cub Scout. Adult supervision and guidance in the construction of the car is encouraged, but the adult partner **SHOULD NOT BUILD THE CAR FOR THE CUB SCOUT**. Fully or partially finished cars purchased from a third party are not allowed.
- 1.3. Cars must be powered by gravity only. No engines, rubber bands, wind up motors, springs as used for propulsion, rocket motors, CO2 cartridges, thermo-nuclear reactors, plasma boosters, or any other thrust generation or enhancement devices.
- 1.4. Projectiles are not allowed. No part of the car may intentionally detach from the car during the race, come into contact with any other car, or extend outside the allowed dimensions.
- 1.5. Movable or liquid weights that shift the center of gravity of the car when the car is tipped or rolled are prohibited.
- 1.6. Electronics are allowed as long as they do not provide any propulsion. Examples of acceptable electronics include LEDs, phototransistors, microprocessors, batteries, electromagnetic coils, transistors, relays, transmitters to cause lights or effects, etc. However, you may not use the electronics to create any kind of propulsion or inertial force.
- 1.7. The car must be free of any wet or sticky substances to race on the track.

## 2. Only Official BSA Pinewood Derby Kits Permitted

- 2.1. The body of the car must use the block of wood provided in an official BSA Pinewood Derby Grand Prix kit (BSA item #17006).
- 2.2. The axles must be attached directly to the original block of wood (see below for axle slot rules).

## 3. Dimensions and Weight

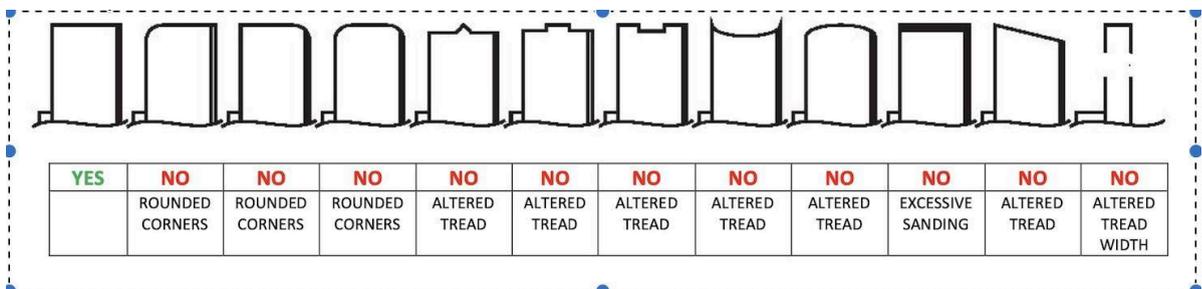
- 3.1. The total weight of the car may not exceed 5 ounces (141.7 grams). Be careful about using scales at the store or Post Office, as they are notoriously inaccurate. Most digital scales are fairly accurate, but only the official scale will be used for the official weigh-in.
- 3.2. The maximum width of the car, including wheels, may not exceed 2-3/4 inches.
- 3.3. The maximum length of the car may not exceed 7 inches, but there is no minimum except that the wheelbase must be at least 4-1/2".
- 3.4. The minimum ground clearance from the bottom of the wheels to the bottom of the lowest part of the car other than the wheels must be at least 3/8 of an inch. **No weights or accessories can protrude from the bottom of the car, they must be counter sunk.**
- 3.5. Minimum width between wheels is 1-3/4 inches.
- 3.6. The maximum height of the car is 3 inches including accessories.
- 3.7. Other materials such as wood, plastic or metal may be added to the original block of wood from the official kit as long as the car is within the allowed dimensions.
- 3.8. The original axle grooves must be used. If an axle slot is not straight, the groove may only be trued to ensure a 90° angle. If, at the beginning of the building phase, an axle groove is broken, defective, or otherwise not usable as determined by the car builder, contact the race committee. If it is determined by the race committee that a new slot must be cut, the new slots must be spaced apart (or have a wheelbase of) exactly 4-5/16" (4.3125"), but may be between 4" and 4-1/2". Too long or too short of a wheelbase will result in disqualification.
- 3.9. If lead weights are used, they must be fully encased (e.g., in wood plugs, epoxy, or putty, etc.) so they cannot be touched or fall out, preventing exposure. Other weights such as tungsten, steel, or zinc are strongly recommended.

## 4. Wheels and Axles

- 4.1. The original wheel axles (nails) must be placed in the original slots provided in the block of wood in the official kit, exception see axle slot rules above under 3.8.
- 4.2. The car may not be designed so that the wheels ride upon the center guide strip of the track.
- 4.3. If the front of the car is designed to gain an unfair advantage by shortening the distance between the start pin and the finish line sensor, or the car design otherwise

interferes with a fair start, race officials reserve the right to require the racer to modify the front of the car to eliminate the advantage, or the car will be disqualified.

- 4.4. The axles of the car must be from an official BSA Pinewood Derby kit or an official Pinewood Derby wheel replacement kit.
- 4.5. Axles must be firmly attached to the car and may not pivot in the body.
- 4.6. Axles may be polished, but may not be machined, reduced in diameter more than 1% of their original diameter, or plated or permanently coated with any finish. The heads on the axles may not be modified or reduced except to remove flashing or to polish. Reshaping, tapering, grooving, or otherwise modifying the axles will disqualify the car.
- 4.7. The use of a flexible or sprung suspension system of any type is prohibited.
- 4.8. The wheels must be from the official B.S.A. Pinewood Derby kit or official Pinewood Derby wheel replacement kit. All wheels must be marked with "BSA PINEWOOD DERBY" on the front and "OFFICIAL BSA MADE IN USA" on the back.
- 4.9. Wheel treads **may not be shaped or rounded off in any way** (see illustration below). Light sanding is allowed to eliminate any defects however sanding may not reduce the diameter more than 1% of their original diameter. If excessive sanding is detected by **removal of the tiny bumps at the outside corner of the tread** or any other alteration from the appearance of the stock official BSA wheels, the car will be disqualified. This is the largest cause of car disqualification, even when caused by a so-called over-eager Scout who just wanted to sand the wheels and there is no intent to reshape the wheels. **DO NOT RESHAPE THE TREAD OF THE WHEELS IN ANY WAY OR YOUR CAR WILL BE DISQUALIFIED REGARDLESS OF INTENT.** Below are acceptable and unacceptable wheel profiles:



- 4.10. If commercial aftermarket wheels or axles that have been professionally polished, rounded, grooved, lightened, lathed, machined, trimmed, or shaved are detected, the car will be disqualified. You are expected to prepare the wheels and axles yourself.
- 1.1. The bore of the wheels may be polished but not altered (i.e., coned).
- 1.2. No cars will be accepted into the race where bearings, washers, spacers, or any materials other than dry lubricant or paint are placed between the axle/body assembly and the wheel or are used as part of the wheel assembly.
- 1.3. Hubcaps or coverings that conceal the axle end and/or contain a reservoir of lubricant are prohibited.
- 1.4. All four wheels must be in contact with the track at the same time.

## 2. Lubrication

- 2.1. **The only dry lubricant allowed is graphite powder.** Non-dry lubricants including those with a petroleum, solvent, or non-dry base may attack the plastic wheels and keep them from turning freely, or can damage or contaminate the track, and are not permitted under any circumstances. **Do not use oil or grease as a lubricant.**
- 2.2. Wheels and axles should be lubricated, if desired, before being inspected and checked in. District race organizers may or may not provide graphite powder lubricant at the race or at check-in.
- 2.3. Once the car is impounded after the inspection and weigh-in, it may NOT be re-lubricated except when the wheel is damaged or becomes dislodged during a race.
- 2.4. Dry lubricant must be applied over a trashcan or rag, and spills must be completely cleaned up. Lubricant reservoirs that are built into the car are prohibited.

## 3. Build Techniques Not Specified

- 3.1. Other than the prohibitions and limitations described in this document, it is acceptable for the car to employ any other methods such as favoring front, mid or rear weighting, streamlining, or any other techniques that the builder feels will make the car faster.
- 3.2. The race officials may disqualify any car that in their determination is not in compliance with the spirit of these race rules. You are a Cub Scout, so Honesty is up to you.
- 3.3. In rare circumstances, race officials reserve the right to perform a destructive teardown inspection of wheels, axles, or other systems on any car entered in the race. Any such inspections will be performed after all races have been completed, and should a car fail the inspection, the final race results will be adjusted. Race officials will return all parts to the participant, but will not be responsible for restoring the car.

## 1. Race Procedures

- 1.1. Only currently registered Cub Scouts may enter cars in the official race.
- 1.2. Cub Scouts should be dressed in a neat, clean, Class A uniform at the race event. However, a Cub Scout will not be disqualified from racing if they do not wear their uniform.
- 1.3. A “VIP” area will be marked off trackside for the current Race Group of Cub Scouts to sit in. This is only for the Cub Scouts and not adult partners and/or siblings.
- 1.4. All spectators must stay behind the marked off area.
- 1.5. Cub Scouts/Spectators must NEVER STEP OVER THE TRACK for any reason. WALK AROUND THE TRACK. No food or beverages allowed in the race area except for Race Staff however, they must keep them far away from the track.
- 1.6. No additional lubrication may be applied to the car after passing inspection or during the race. No additional weight may be added to or removed from the car after passing inspection or during the race.

- 1.7. After the Scout has registered and paid any applicable registration or outstanding fees, their car will be weighed, measured, and inspected to ensure compliance with the official rules.
- 1.8. Only an officially designated scale will be used to weigh cars. Cars will not be accepted if their weight exceeds five (5) ounces by even the smallest resolution of the balance. Scales vary widely, so be prepared to adjust the weight of your car up or down at the time of inspection. Race officials will have a reference weight on hand to calibrate and verify the official scale.
- 1.9. A wood, plastic, or metal jig will be used to determine if the car complies with the dimension limitations (length, width, height, wheelbase, and ground clearance).
- 1.10. After the car has passed inspection, it will be impounded and taken by a race official to the staging area to await the race. Cars may not be handled by the owner after inspection and until after all racing has been completed.
- 1.11. Cars will be handled only by the race officials (and the car owner only if the owner is making an emergency repair).
- 1.12. A Cub Scout whose car fails any part of the inspection will be given the opportunity to make adjustments to the car. Cars will be re-weighed, measured, and inspected until they comply or until the scheduled race starting time. If you are unable to make your car comply with the inspection requirements before the start of the race, your car will not be allowed to run.
- 1.13. Each heat will begin with a race official positioning the cars on the track.
- 1.14. Each car will run in multiple heats on different lanes on the track. The lanes will be randomly assigned by computer. All of the lanes may or may not be used.
- 1.15. Race officials will return the cars from the finish line to the staging area between races. Spectators should not touch the cars at any time during the race.
- 1.16. In the event of a breakdown of a car during the race, the participant will be allowed to repair the car. Only the damaged portion of the car may be modified. The Scout must do the work with assistance from their adult partner. Race officials shall re-inspect any car that is serviced during the race. The Race officials may choose to continue with other race heats in order to avoid long delays in the race. The damaged car must be raced before the race proceeds to the next level of elimination.
- 1.17. In the event of a breakdown of the track, electronic finishing or ordering system, or race management software, or in the event of an error in set up of the cars (car jumps from the lane, car positioned in wrong lane, car positioned backwards in the lane, etc.), the heat affected by the breakdown may be re-run and the original result, if any, will not be factored into the final results.
- 1.18. If a participant needs to leave the race before all heats have been completed, the participant must leave the car in the care of the race officials. The car will be returned to the participant after the race or to their Den Leader.
- 1.19. The results, as called by the judges, are final. Races will not be rerun due to parental interference.

- 1.20. Unsportsmanlike conduct (by Adult or Cub Scout) will result in immediate disqualification.

## **1. Race Schedule and Awards**

- 1.1. Check-in begins at 2:15 pm and ends at 2:45pm. Cars will be weighed, inspected, and assigned a number for the race. If your car is over/under the weight limit, you will have until the end of the check-in time to make adjustments. Additional weights may or may not be provided. No cars will be accepted after this time to ensure adequate time to input racer data into the computer system.
- 1.2. The race starts at 3:15pm.
- 1.3. The top three racers overall will be recognized,
- 1.4. Additional awards, as voted on by the Scouts, will be presented for: Most Scout-like, Best Car-That's-Not-A-Car, Best Build, and Most Realistic Car. Voting for awards will take place after the Opening Ceremony. Awards will be presented after the race.
- 1.5. No Scout may receive more than one award in the additional award categories, In the event that a Scout receives the most votes in more than one category, a decision will be made among the race committee as to how to proceed.