



**THE OFFICIAL
CUB SCOUT PACK 371
PINWOOD DERBY
DESIGN & BUILD RULE BOOK**

revised 02.06.2011

The purpose of this rule book.

The purpose of this rule book is to give Scout parents within Pack 371 an understanding of how to build a legal, and compliant pinewood derby car for racing at the Pack 371 Pinewood Derby.

Over the years, the Pinewood Derby has become a very important part of Cub Scouting. Along with that, there have been numerous techniques developed through the years to increase the speed of these cars... some are legal, some are not. This rule book will help you to understand what you can and cannot do in order to make your car as fast as possible.

These rules, not ***those*** rules.

There are numerous books in print, and web sites dedicated to providing information and materials for sale in order to increase performance. While we don't discourage you from exploring ways to better your car's performance, do not assume that anything you read, hear, or gather from anywhere other than this rule book is legal within Pack 371. In other words, when your car is rejected at inspection because you spent your time reading a pinewood derby secrets book you bought off the Internet instead of reading these rules, don't tell the inspector "I read it in a book, so it should be OK". That won't fly.

The Pack 371 rules may differ from the BSA rules that came with your car. Our rules may also differ with rules from other Cub Scout Packs. The official Pack 371 rule book is a result of decades of racing and fine tuning. Our rules are designed specifically to meet the dimensions of our track and have been established to make the race day as fair as possible to all racers. When considering a modification or enhancement to your car, refer to this rule book and no other source. These rules are final and we will not consider "acceptable alterations" from other rule sources.

Who Can Race

All Cub Scouts who are currently chartered with Pack 371, may race a car in our Pinewood Derby. Special races for "Tags" (older or younger siblings) and parents of currently chartered Cub Scouts with Pack 371 are normally held on Race Day too.

Materials

Your car must be made from the materials within the Official BSA Pinewood Derby Kit including the wood block, wheels and axles. No exceptions.

Lubricants

Absolutely no wet lubricants are allowed. Dry lubricants only. Graphite is the standard and is recommended. No washers may be used between the wheels and the car body.

No propellants

Absolutely no sort of artificial or mechanical propellant may be used on any car. Cars are to descend the track by gravity only. No stored energy, springs or movable weight of any sort is allowed.

No previously raced cars

Cars that have been raced in **any** previous Pinewood Derby, may NOT be raced in the Pack 371 Pinewood derby. This includes tag races. Scouts (or tags) and their parent(s) must make a new car together every year.

Dimensions

The following section defines the legal dimensions for Pinewood Derby cars. Cars that don't meet these standards will be rejected at inspection.

Width

The car width at the wheels may not be modified - it must be the same as the original kit and not exceed 2-3/4 inches. Other areas of the car may be reduced in width as long as the width between the wheels is unchanged. Weights or decoration such as fenders or faux exhaust pipes may be mounted to the side of the car as long as they do not protrude past the outermost edge of the wheel.

Length

The overall length of your car may not exceed 7 inches. This length includes any additional weights or add-ons to your car. If you need to add weight to the front or rear of your car, you must reduce the length of the car first. Cars with a total length over 7 inches will be rejected.

Height

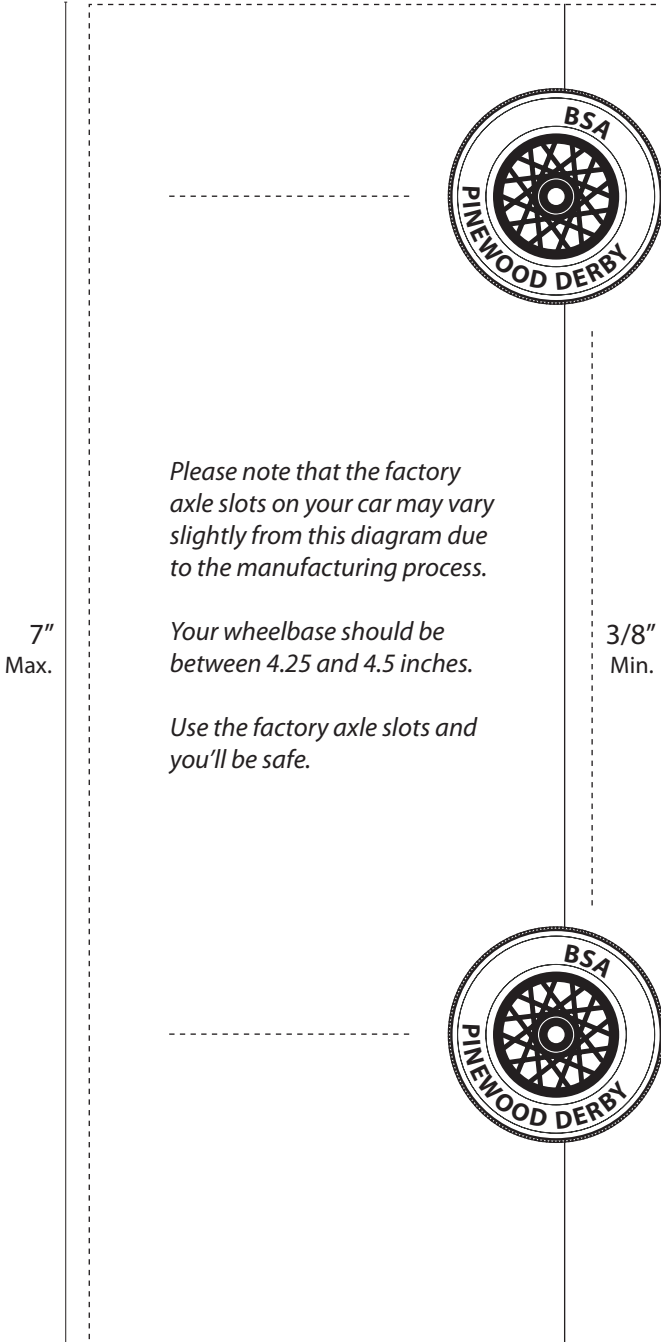
The overall height of your car may not exceed 3 inches. This height has to be adhered to in order for your car to pass beneath the scoring mechanism at the end of the track.

Wheelbase

The wheelbase may not be modified - it must remain the same as the official kit. You may, however, use either end of your block for the front of the car (one end is longer).

Ground Clearance

Your car must have 3/8" ground clearance. Cars run on a track straddling a raised ridge. Without the proper clearance your car will not roll down the track. If you add weight to your car on the bottom, it is advised to remove a section of wood and recess the weight inside the car so that the ground clearance is unchanged.



Please note that the factory axle slots on your car may vary slightly from this diagram due to the manufacturing process.

Your wheelbase should be between 4.25 and 4.5 inches.

Use the factory axle slots and you'll be safe.

Use this profile diagram to make sure that your car's dimensions are in check.

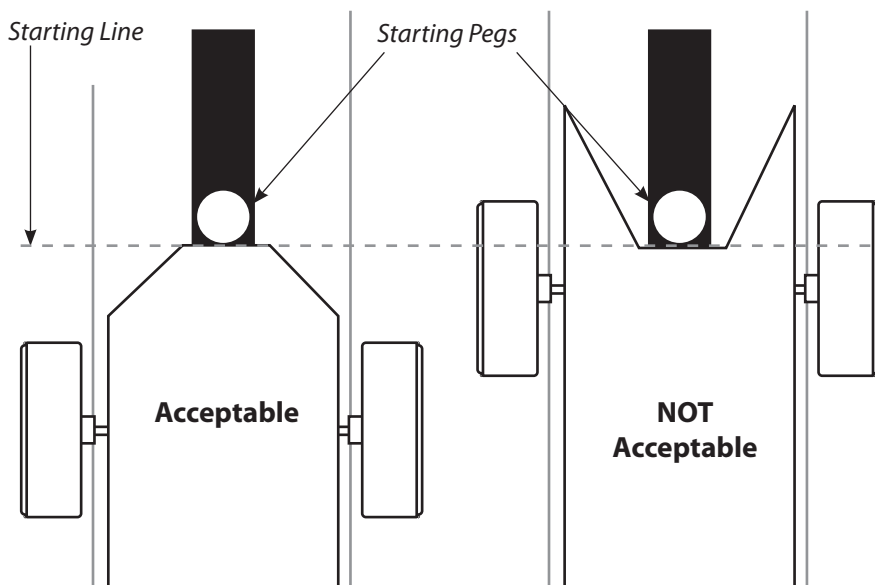
Weight

The overall weight of the finished car may not exceed 5 ounces measured on the official Pack 371 scale. Pack 371 offers a *Test and Tune* night prior to race day, where the scale is made available and modifications to your car may be done on site to ensure proper weight.

The addition of weight is normally required to get a car to the 5 oz. maximum weight. It is recommended that your car be at or as close as possible to 5 ounces. The heavier, the faster. All additional weight must be attached securely and may not move freely. All additional weight must also comply with the aforementioned dimension specifications. Weights of various size and shape can be purchased from most area hobby shops.

Front End

When placed on the track, the front of the car rests on a 1/4" peg which serves as the starting gate. No part of the car may sit forward of the rear of the peg. Cars with heavily recessed front ends that straddle the starting peg will be rejected. Any car that does not rest solid on the starting peg may be rejected. Avoid designs with pin point front ends that may not rest on the peg correctly.



Axles

The following section describes allowable axle placement and procedures for improving axle quality. Any procedures not listed below are illegal by Pack 371 standards.

Placement

Axles must be positioned in the axle slots of your car. You may not drill new axle holes or drive your axles into the wood above the slots or anywhere else in the car block for that matter. Axles may be glued into place after positioning, but it is recommended that you do this only after your car has passed the first inspection phase at *Test and Tune* (**all four wheels must make contact with the racing surface when the car is set down on the wheels**).

De burring

If you look closely under the head of your axles you will notice two burs opposite each other. These are a result of the manufacturing process. You may de bur the under side of the axle head with a metal file as long as you do not reshape the barrel of the axle.

Head Rounding

You may spin your axle in a drill and apply a fine metal file to the edge of the head of your axle in order to obtain a "truer" round head. Only remove enough of the head to obtain a true round. Cars with axles that have had more than necessary removed from the axle head will be rejected.

Polishing

Axles may be polished to increase speed. The recommended method is to spin the axle in a drill or drill press and apply a high grit (400-600) sandpaper or emery cloth. You can then use a cloth and some chrome polish for a final polishing. Some hobby shops sell a polish specifically for Pinewood Derby car axles.

You may not make grooves in your axles or reduce the diameter of your axle anywhere along its length. Modifying the axle may prevent it from fitting securely in the axle slot, and could result in a wheel falling off during a race.

Wheels

Of all the pieces of the Pinewood Derby car, the wheels are most often the reason a car is rejected at inspection. The following section describes allowable wheel placement and procedures for improving wheel quality. Any procedures not listed below are illegal by Pack 371 standards.

Placement

Wheels must be placed on the axles in the axle slots (see previous section "Axles"). When placed on a flat service, all four wheels must make contact and roll together without pause when the car is pushed forward and backward.

Polishing/Sanding

Light polishing of the wheel tread area (the area of the wheel that is in contact with the track) is allowed, as long as it is done only enough to remove the flashing tab left by the moulding process. The recommended method is to spin the wheel in a drill or drill press and apply a high grit (400-600) sand paper or emery cloth to the tread surface for a few seconds.

THIS FLAT AREA OF THE WHEEL IS THE ONLY AREA OF THE WHEEL THAT MAY BE POLISHED / SANDED. If your wheels appear to have been polished or sanded anywhere else your car will be rejected.

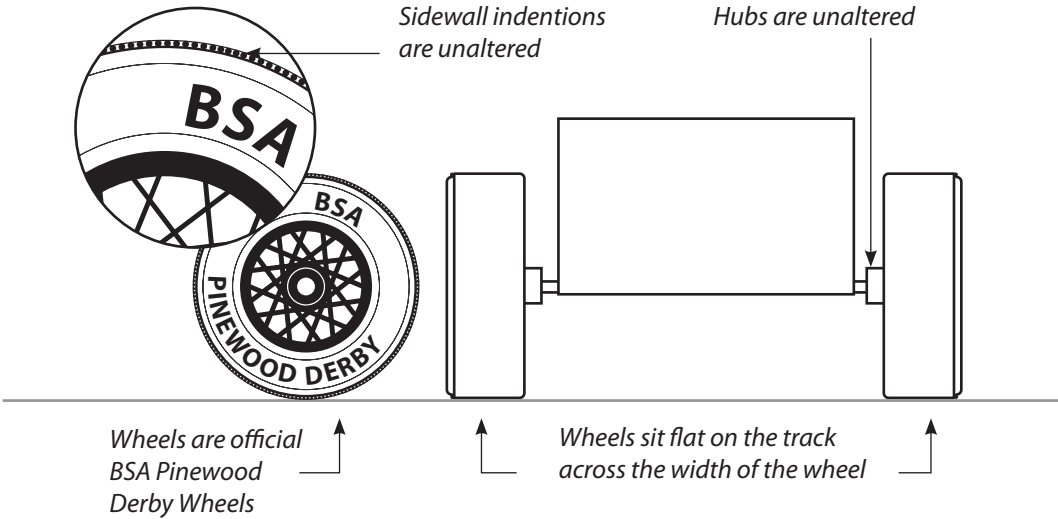
If the sidewalls, or corners of your tires have been polished, rounded, sanded radiused, crowned or otherwise altered your car will be rejected.

If the hubs of your wheels have been polished, rounded, sanded radiused, crowned or otherwise altered your car will be rejected.

If the small indentions on the outside corner of the tire appear to have been sanded or otherwise altered, your car will be rejected.

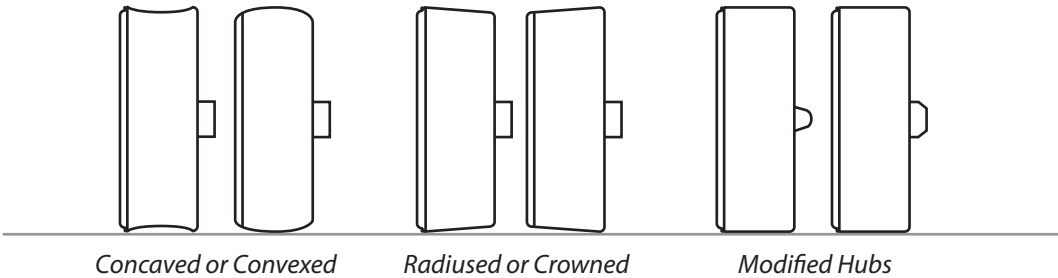
If the tread surface of your tire has been convexed, concaved, or coned in either direction, your car will be rejected. YOUR WHEELS MUST SIT FLAT ON THE TRACK ACROSS THE ENTIRE WIDTH OF THE WHEEL.

Characteristics of Acceptable Wheels



Characteristics of Unacceptable Wheels

The following wheel alterations are unacceptable and will result in rejection of your car from racing.



Test and Tune Night

Test and Tune Night will be from 4:00 - 8:00 PM the night before Race Day. The purpose of this night, is to test your car, pass inspection, and register for the race. The official pack scale will be made available as well as a variety of tools for adjusting and weighting your car. You should bring your own weight and lubricant. The Pack 371 Practice Track will also be made available on *Test and Tune Night*. **All cars planning on racing, including tag races, must come to Test and Tune to have your car inspected and registered. There will be NO registration or inspection on Race Day.**

Inspection

Prior to registration your car will be inspected by a team of volunteers to ensure that it was designed and built in accordance to the guidelines set forth in this booklet. If your car fails inspection you will be given the reason, and if you have time and depending upon ability to correct the failure, you may attempt to correct it, and re enter the inspection line at the rear. It is highly recommended that you arrive early at *Test and Tune*, so if you should fail inspection you will have time to make corrections.

Once your car passes inspection, it will go to registration and impound. If you do not take your car directly to registration and impound after it passes inspection, you will be required to have your car pass the inspection process again. **Inspection will be made available on Test and Tune Night only. There will be NO inspection on Race Day.**

Registration and Impound

After inspection your car will be registered for the race, and then will be impounded until race day. Impounding cars in a secure area ensures that the cars are not altered or modified after passing inspection. **Registration will be made available at Test and Tune Night only. There will be no registration on Race Day.**

Race Day

Racing is done normally in a "Perfect N" scenario which provides fair lane access and competition to each racer.

Handling of cars during racing

Cars may not be altered between heats. You may not adjust wheels, re-lubricate or otherwise modify your car at any point after passing your inspection. If your car suffers a mechanical failure during the race such as a wheel falling off, that causes it to jump the track, your car will place 6th (last) for that heat as long as it did not effect another car on the way down the track. If a car interferes with another car, both cars will be inspected, sent to On-site Repair (see below), and the heat will be re-raced.

On-site Repair

A crew of volunteers will be stationed to make any minor repairs to cars that suffer from mechanical failures such as a weight or wheels falling off. If a car is determined unrepairable (such as an axle groove splitting to the point the axle won't stay in the car) it will be disqualified. Any car that cannot be repaired in 5 minutes will be considered unrepairable and will be disqualified. Only members of the On-site Repair crew may handle a car sent to this repair station. The owners of the car are welcome to witness the repair and converse with the crew, but cannot touch the car while being repaired.

The last and most important

When building your pinewood derby car with your son, please keep in mind the values that we teach our Scouts... honesty, integrity, hard work, and fair play to name a few. All too often the goal of winning the race overshadows the experience of spending time with our sons building something unique, and teaching lessons about craftsmanship and good sportsmanship. Make sure that your son is involved in the entire process from design to final paint. Please take this opportunity to ensure that the lessons he learns from this experience are good ones, and will pave the way for good judgement in his future.