



2016 Three Rivers Pinewood “CAR”nevale Car Construction and Race Rules




1 General Race Information, Inspection and Registration

- 1.1 Good sportsmanship is expected. Race officials may ask anyone not following this rule to leave.
- 1.2 No limit on the number of entries per builder.
- 1.3 The race will be run on an aluminum Best Track, using a Microwizard timing system, and running GrandPrix race management software.
- 1.4 There are two race classes with different specifications:
 - 1.4.1 STREET STOCK – This class of competition is what is traditionally found in Cub Scout Pinewood Derby races with more liberal definitions for added design flexibility.
 - 1.4.2 UNLIMITED – This class of competition has a very open design interpretation allowing builders to maximize performance. You will find the FASTEST cars in this class.
- 1.5 The Speed winners will be determined by the lowest combined time of all runs.
- 1.6 The People’s choice award will be determined by highest number of votes by the attendees.
- 1.7 Awards:

| |
|------------------------|
| Each Class: |
| People’s Choice Design |
| 1st Place Speed |
| 2nd Place Speed |
| 3rd Place Speed |

- 1.8 Each car must pass inspection by the Official Inspection Committee before it may compete. The inspectors will disqualify any car not meeting the rules. All appeals must be directed to the Race Committee Chairperson, whose decision is final.
- 1.9 Every effort will be made to conduct the inspection without altering the car.
- 1.10 After a car has passed inspection, only race officials may handle the car.
- 1.11 After check-in, car repairs are not allowed unless authorized by the race officials.
- 1.12 After each car has been inspected and weighed for compliance, a number will be assigned to the car and considered registered.
- 1.13 At the conclusion of the race, the top three finishers in each class will be subject to a post-race inspection and/or dis-assembly verification.
- 1.14 If you have any questions concerning these rules, please contact one of the following people:

| | | |
|---------------|--|--------------|
| Dan Inman | danielinman4@gmail.com | 410.474.1609 |
| Winslow Truax | truax.winslow@gmail.com | 703.362.4407 |



***** Look for this symbol for more speed tips and useful information *****



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2 Race Procedures

- 2.1 Each entry will race a MINIMUM of ONCE in each lane and an equal number of runs.
- 2.2 If a car departs its lane, only the affected car will be run again. If the car departs its lane a second time, it will automatically lose the heat. Before the car can race again, it must be test run to see if it can continue on to the next heat. If the car leaves the lane during the test run, the car will be disqualified.
- 2.3 If a car departs its lane and interferes with another car, only the affected cars will be run again. If the offending car departs its lane a second time, the car will automatically lose the heat. The interfering car must then be test run to see if it can continue on to the next heat. If the car leaves the lane during the test run, the car will be disqualified.
- 2.4 If a car suffers a mechanical problem, loses an axle, breaks a wheel, etc., and a repair can be made in a reasonable time, the heat will be run again. If not, the car will automatically lose the heat.



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.

- 2.5 If there is any malfunction with the race equipment, the heat will be rerun.
- 2.6 There will be three race officials monitoring the track.
- 2.7 Only race officials will be allowed in the track area.
- 2.8 Race officials have final authority over all race decisions.

3 Body Construction (All Classes)

- 3.1 The main body structure (chassis) which holds the weight, axles and other add-ons. The car design may be enhanced by the addition of other stable materials such as plastic or metal. Any additions must be firmly attached and meet the car specifications below.
- 3.2 The car must meet the following specifications:
 - 3.3.1 Length: maximum 7 inches
 - 3.3.2 Width: maximum 2-3/4 inches
 - 3.3.3 Height: maximum 4 inches
 - 3.3.4 Wheelbase: Any wheelbase as long as wheels do not exceed the 7 inch length requirement
 - 3.3.5 Track clearances: The wheels are the only part of the car allowed to touch the track.
 - 3.3.5.1 Width between wheels: minimum 1-3/4 inches (center guide strip clearance)
 - 3.2.5.2 Bottom Car: minimum 3/8 inch clearance between bottom of car and track (center guide strip clearance)



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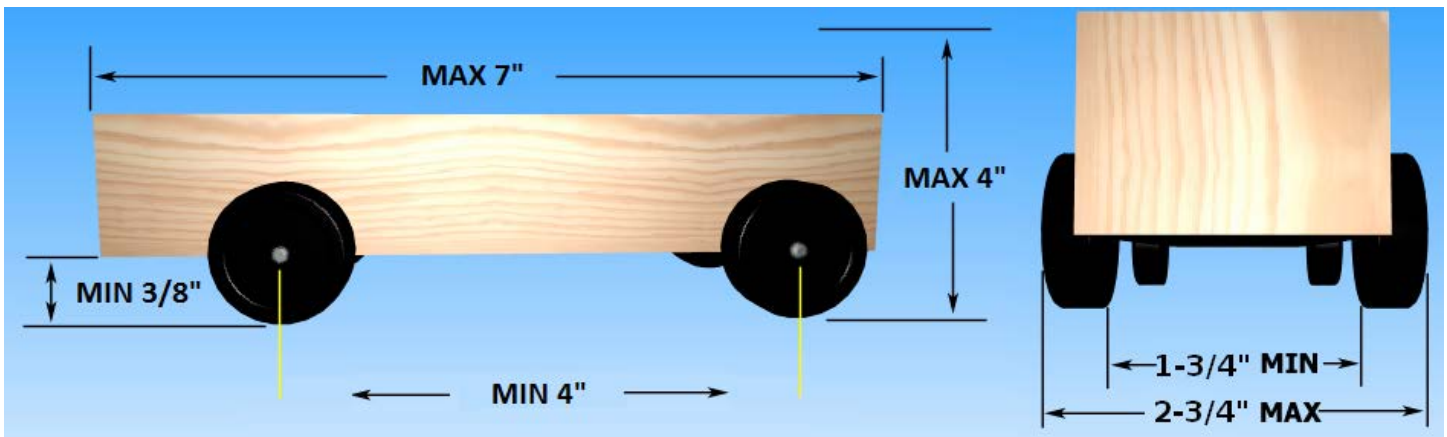


- 3.2.5.3 Fenders: Fenders or other body parts may extend below the bottom of the car as long as they are outside the 1-3/4 inch center guide strip.
- 3.2.5.4 Weights: To aid in a safe stop at the end of the track, we recommend that you insert weight inside the body or place it on the top of the car. Avoid placing thick (over 1/8") weight on the bottom of the car as that may destabilize the car on the stop section.
- 3.2.5.5 Front (nose): Minimum 1/2 inch. The car must be at least 1/2 inch wide at the center of the car. **NO NARROW POINTED FRONT ENDS.**

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



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. 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.





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4 Lubrication (All Classes)

- 4.1 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 100.

We encourage you to use oil based lubricants over graphite because it does not damage the car's paint and it promotes a safer and cleaner race environment.

The age old adage, "LESS is more" applies to the application of oil type lubricants.

5 Weight (All Classes)

- 5.1 ***See individual race class for weight specifications***
5.2 Lead (Pb) weight, if used, must be completely sealed (painted, covered, etc.) and safe from all possible contact.
5.3 Drilling, Sanding or Removal of lead weight is not allowed at the race or check-in venue.



Please avoid using Lead (Pb) weights.

There are many safe alternatives on the market such as Zinc, Tungsten, Tundra, FlexWeight, Steel and other composites.

Due to its very high density Tungsten is an excellent weighting material for pinewood derby cars. Tungsten is approximately 1.7 times denser than lead and 3.2 times denser than the zinc ("lead-free"). This allows a tremendous amount of freedom in the car design.

6 Prohibited Items (All Classes)

- 6.1 ***See individual race class for additional prohibitions***
6.2 Propellants or devices which mechanically alters rotation and spin of the wheels and/or axles
6.3 Starting or finish line devices
6.4 Electronic or lighting devices which interfere with the race electronics
6.5 Liquids, wet paint, oil, sticky substance, or powders of any kind (other than axle lubrication)
6.6 Loose/moving objects on/or in the car
6.7 Glass or excessively fragile parts
6.8 Sharp objects, sandpaper or abrasives on the bottom of car



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7 STREET STOCK Class

- 7.1 The car must be free-wheeling and gravity powered.
- 7.2 **Weight:** Maximum 5.0 ounces or 143.1 grams on a scale accurate to 1/10 ounce.
- 7.3 **Axles:**
 - 7.3.1 Minimum diameter: .084 inches
 - 7.3.2 Axles must have a nail head



You may use official BSA axles and many other after-market nail type axles sold 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.

- 7.4 **Wheels:**
 - 7.4.1 BSA, Maximum Velocity, Awana, Pinecar
 - 7.4.2 Wheel diameter: Maximum 1.2205 inches or 31 mm.
 - 7.4.3 Wheel tread surface width: Minimum .2950 inches or 7.5 mm.
 - 7.4.4 Wheel Weight: Minimum 2.4 grams
 - 7.4.5 The tread surface must be flat and parallel to the wheel bore.
 - 7.4.6 At least 4 wheels must be attached to the sides of the car body. Each wheel must be attached to the car 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 wheels 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.

- 7.4.7 The front most and rear most wheels must be positioned across the body from one another.
- 7.4.8 The following wheel modifications are prohibited:
 - 7.4.8.1 Angling, Canting, Round Crowning, Tapering, H-ing, V-ing, Dishing the tread surface
 - 7.4.8.2 Drilling holes in the sidewalls or tread area
- 7.5 The following items are prohibited:
 - 7.5.1 Springs
 - 7.5.2 Bearings and/or bushings



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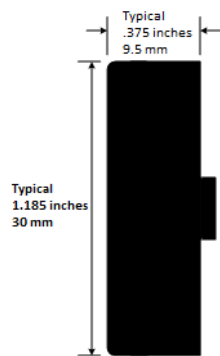
The rules permit many wheel modifications as long as you observe the dimension limits and restrictions listed above.

Common legal modifications include but are not limited to the following:

- CnCd, lathed, polished and/or sanded to true the edge of tread, surface and circumference
- 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 removing material or 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

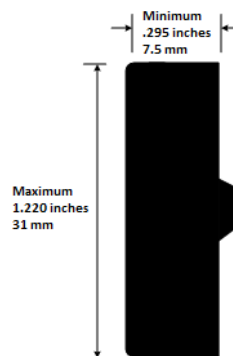


Kit Wheel*



*Kit wheels are typically 2.7g and are acceptable without modification. It is recommended to modify certain areas to maximize performance.

Acceptable Wheel



Rough edges trued and smoothed with a coned inner hub

Unacceptable Wheel Profiles



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



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8 UNLIMITED Class



The UNLIMITED class allows for maximum design flexibility and performance.

- 8.1 The car must be free-wheeling and gravity powered.
- 8.2 **Weight:** Maximum 16.0 ounces or 454.9 grams on a scale accurate to 1/10 ounce.
- 8.3 **Axles:** Any type
- 8.4 **Wheels:**
 - 8.4.1 Any type
 - 8.4.2 Maximum: 31 mm wheel diameter



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9 Pit Crew Positions

Each member of the Pit Crew will need to understand their job and be in position for the race to perform as a well-oiled machine. It will take a few heats to see the process in action. If possible practice as a complete team before the event. Here are the crew positions with descriptions:

| Position | Description | Pit Crew Member |
|------------------------|--|-----------------|
| Race Official (3) | Final authority on all racing issues. | |
| PWD experts | Provides 911 support to any and all areas. | |
| MC | Hype man and voice of the Pit Crew. | |
| Starting Gate Operator | Properly places cars in the correct lanes, verifies schedule, and operates starting gate. | |
| Heat Scheduler | Identifies and verifies which cars are racing and pre-staged. Communicates schedule to staging personnel. Signals Timer when ready. | |
| Staging Organizer(2) | Assists Heat Scheduler by organizing cars in staging area. Receives cars from Car Handlers. | |
| Timer | Operates computer timing software and signals Scheduler when ready. | |
| Car Handlers (3) | Receives cars at finish line and carefully delivers them to staging area. | |
| Registration team(3) | Pre-stages cars on numbered disposable plates with appropriate color and registration numbers, organizes cars by category and on display tables. | |
| Awards coordinator | Coordinates acquisition of trophies, works with registration to pre-stage cars for display and tallies votes for People's Choice Award. | |