

SPEED RACER KIT

PINECAR RACING SPECIFICATIONS

1. Maximum racer size, including wheels, is 7" long, 2 3/4" wide.
2. Minimum racer width between wheels is 1 3/4".
3. Minimum clearance between racer and track is 3/8".
4. Maximum racer weight is 5 oz. (142 g.). Metal, wood or plastic may be added.
5. No wheel bearings, bushings, springs, starting devices, loose or moving weights or parts are allowed.

Racers that do not meet specifications may be disqualified. Local rules may vary. Wheels and axles should be the same on all racers in a race. **OFFICIAL BSA WHEELS AND AXLES WILL FIT ON ALL PINECAR RACERS.**

General Information

The Speed Racer Kit is based on solid, proven race and track-tested designs and principles. It was designed for speed, which should be the focus of every step of assembly. Appearance is secondary: decals can easily be added. Other accessories may cause drag. The center of gravity for the assembled racer varies depending on track type. Fine tuning the center of gravity helps maximize the car's speed potential.

The Shape: The racer body is a low profile design with a flat, tapered front edge. This creates little wind drag, resulting in the most efficient use of the racer's potential stored energy. Low drag = more speed. The recessed weight slot enables the Cavity Weight to be completely hidden and causes no additional drag, as opposed to conventional exposed weights.

Top Weight: Borrowing from the same design principles, the Top Weight features the same low profile, tapered design, with the addition of air fins that smoothly channel air flow over the racer's body, minimizing wind drag.

Cavity Weight: The Cavity Weight is incremental, as well as adjustable. This design allows you to adjust and fine tune your weight system according to the type of track you will be racing on, utilizing the maximum racer weight. You are actually customizing your racer to the track type.

Instructions

• Weigh racer parts

Weigh all racer parts before assembling. Make the racer slightly overweight. The heavier your racer, the faster it will go. Break off Cavity Weight increments with pliers. To remove the Cavity Weight, slide it out of the slot at the back of the racer body (Fig. 1).

• Test-fit wheel and axle assemblies (Figs. 2 and 3)

Put two wheels on one axle. Be sure outside of wheels face correct direction and install hubcaps (Fig. 2). Repeat with other axle. Center axle assemblies over axle slots on racer bottom. Make slots the correct size by gently tapping axles into slots with a hammer (Fig. 3). All wheels should clear racer body enough to spin freely (if not, remove the axle assemblies and sand sides of racer body until they do).

• Prepare racer body

Remove axle assemblies. Sand the entire racer with medium sandpaper, then sand with fine sandpaper, removing all sanding marks. Wipe sanding dust off.

Length, Width: Measure length and width of racer before painting to make sure your racer meets local race specifications.

TIP: Use **PineCar Body Putty (P3928)** to fill any gaps, cuts, or scratches. Putty can also be used as a smoothing compound. If needed, sand racer to remove putty residue.

• Paint

Paint at least two coats in the color of your choice. Sand between coats with a fine grit sandpaper for best results. Add several coats of gloss finish for a smooth, slick surface. A smooth finish means less wind drag. We recommend using the **PineCar Paint Systems (P3955-P3959)**. They include everything needed to paint your racer.

• Polish all axles and de-burr nail-type axles (Fig. 4)

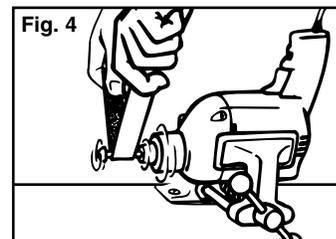
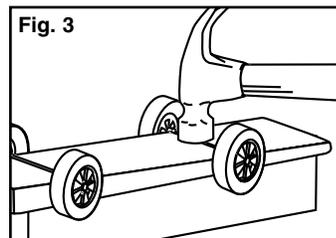
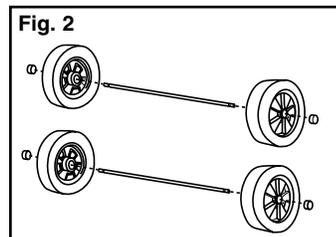
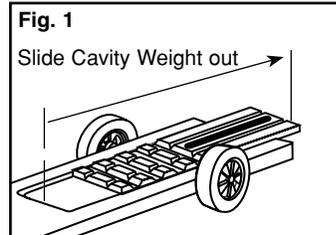
This kit contains one-piece axles, but if you are installing nail-type axles, use the **PineCar Axles & Polishing Kit (P359)** to remove burrs from the nail heads and polish all types of axles. It includes everything needed to prepare axles for racing. One-piece axles do not have burrs, but should be polished for ultimate speed (don't neglect this very important step).

To de-burr nail-type axles:

1. Secure drill in vice.
2. Set pointed end of axle into drill chuck and tighten.
3. Start drill and file off burrs.

To polish all axles:

1. Set axle into drill chuck and tighten.
2. Polish with sandpaper and pumice mixture.

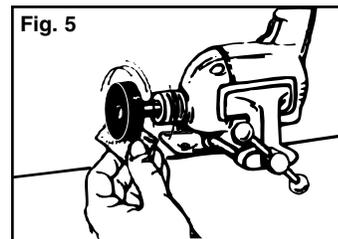


• Tune wheels (Fig. 5)

Use the **Wheel Turning Mandrel (P357)** to turn and fine tune wheels for optimum performance. For fast-spinning wheels, remove the parting seam from the tread of wheels.

To turn wheels:

1. Secure drill in vice.
2. Insert screw through center hole of wheel and into mandrel shaft. Tighten screw.
3. Mount large end of mandrel shaft into drill chuck and tighten.
4. Turn on drill and sand to remove seams.



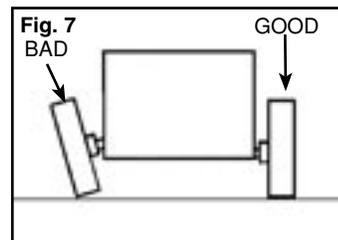
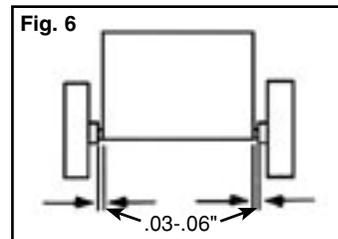
• Install Axles and Wheels

Use a small hammer to tap wheel and axle assemblies into slots on racer body. It is very important to check clearance between wheels and racer body, camber and toe in and out on your racer. We recommend you use the **Wheel Alignment Tool (P456)** as it simplifies the process.

Check clearance between wheels and racer body (Fig. 6): It should have a clearance of approximately .03" to .06".

Check Camber (Fig. 7): Axles should be parallel to a flat surface and wheels are 90° to the flat surface and axles.

Check toe in and out (Fig. 8): All wheels should be parallel to racer body.



• Maximize Racer's Weight (Fig. 9)

1. Install Cavity Weight by sliding it into slot at back of racer.
2. Push forward in slot until flush with back of racer. Do not install set screw at this time.
3. Place Top Weight on top of racer, centered over cavity, with back of weight flush with back of racer. Do not install screws at this time.
4. Weigh racer parts including screws.
5. If racer is too heavy, remove the Cavity Weight and break off increments as needed with pliers (Fig. 10).

• Fine Tune Your Weight System

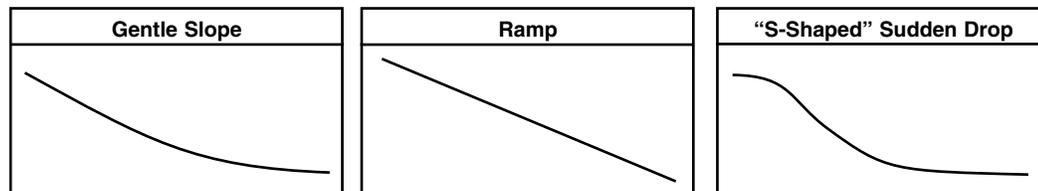
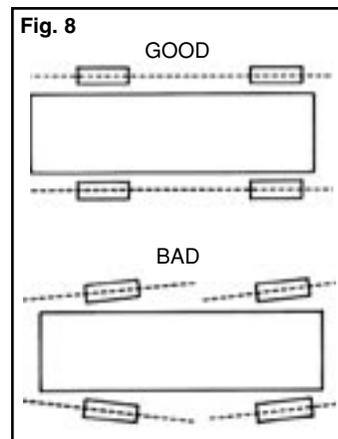
After your optimum weight has been achieved, place your Cavity Weight in the slot. Install the set screw through the center slot in the weight, 1 1/2" from the rear of the racer, but do not tighten at this time. Place Top Weight on racer, do not attach.

• Check Center of Gravity and Position Weight

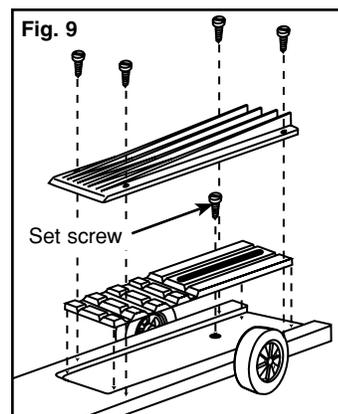
Locate the center of gravity (COG) by balancing your racer on the edge of a pencil. When it is balanced it will not rock back and forth. Set COG based on track types. Move Cavity Weight to different positions to achieve maximum performance.

If possible, find out what type of track you will be racing prior to race day. If you are unable to find out prior to race day, final adjustments can easily be made on race day. There are three basic types of tracks:

1. **Gentle Slope Track:** Place Cavity Weight as far back as possible in weight slot. The COG should be approximately 1" forward of rear axle.
2. **Ramp Track:** Place Cavity Weight in center of weight slot. The COG should be approximately 1 1/8" forward of rear axle.
3. **"S-Shaped" Sudden Drop Track:** Place Cavity Weight as forward as possible in weight slot. The COG should be approximately 1 1/4" forward of rear axle.



After Cavity Weight has been properly tuned, tighten set screw to secure weight. Now install Top Weight flush with the back of the racer. Secure in place with four screws.



• Final Step

Lubricate the wheels and axles to help maximize your racer's speed potential by reducing friction between contact points. Lubricate axles with a dry powdered graphite such as **PineCar Dry Graphite (P358)**. Place the lubricant where the wheels rotate, on the wheel hub. Spin the wheels several times, adding more lubricant if needed, until the wheels rotate freely.

