

Getting Ready to Race & Driving Tips

By Steve Yonker

1. Well before the first race:

Proper weights are essential. We can help you with this, either at the construction clinics, or individually, but we will not have time to do this the morning of the race. Weights can be cut from steel plates, or molded from lead. If you use steel plate, you generally must purchase the material from a store like "Metal by the Foot." Lead can be obtained from tire stores (used lead weights), or other sources. KCSBD often has some lead which you can have. Generally, the following steps will get you where you need to be with weights:

Estimate the total weight needed. For stock car drivers, figure 200 lb weight limit, minus 63 lb for weight of car including wheels, minus the driver's weight with racing helmet on. For super stock car drivers, the weight limit is 230 lb. With the total weight, figure all but about 10 lb being located in the middle area of the car in one or two large pieces of weight or stacks of weight. The large weights cannot stack thicker than 1-1/2" in the middle area of the car, and must fit properly into the middle area of the car. Their length cannot exceed 12", and they cannot touch the sides (body) of the car. We have patterns for steel weights and molds for lead weights which you can borrow to make these. The remaining 10 lb should be made up into several small weights, like two 1/2 lb, five 1 lb, and two 2 lb weights. These adjustable weights should be thin enough so several can be stacked onto a weight bolt and not create a mountain. We have molds for these weights as well. They should be able to fit into the front, middle, and rear areas of the car. This is because some of these weights will be used to balance the weight distribution between the front and rear axles while the driver is in his/her racing position in the car. About the only way to do this balancing adjustment accurately is to use the derby scales at the construction clinic or at the track (scales will generally be available at the track on practice dates). Try to put some of the adjustable weight in the middle area of the car, since weight can be added or removed from this area without affecting the weight balance of the car. Finally, have about 5 lb additional adjustable weights since kids' weight will change from day to day, and even during the course of a race.

2. After your last practice run before a race: It is best to get these things done before the morning of the race because of the limited time on race day. KCSBD officials are often busy with race day preparations, and we will not have time to help everyone with these things the morning of the race.

- Check the rear axle alignment, or “triangulation” as it is sometimes called. You want the measurement from both ends of the rear axle square stock to the front kingpin to be equal. You don’t need a special “gauge” to do this. I turn my car upside-down on blocks and measure with a tape measure. A “gauge” makes this easier since you don’t have to turn the car upside-down and adjustments are therefore much easier. This measurement should not change much, if any, from race to race, but it’s a good idea to check it. Adjust the radius rod turnbuckles as necessary. If turnbuckle adjustments are made, make sure the locknuts are tightened securely, and you don’t change the turnbuckle adjustment while you are tightening the locknuts. I don’t check alignment between heats unless I suspect there is something wrong with the car. One time a radius rod turnbuckle eyebolt broke and, needless to say, caused the rear axle to be out of alignment.
- Align all four axle spindles (the round end portions of the axles). This is done using special tools you have probably seen at the construction clinics. We can help you make your own tools, or you can borrow them from a KCSBD official. The spindles are “bent” so the wheels will be square to the track surface. A “squatting” wheel will cause more wheel bearing friction and slow the car down, so this alignment is important. Remember to have the driver in the car, in racing position, with the proper weight and weight balance in the car, whenever measuring the vertical spindle position. None of this is necessary when measuring the horizontal spindle position. Feeler gauges are used to measure the spindle position. Most derby experts set their spindles to be anywhere from dead-on flat to as much as 0.002 in. down at the end of the spindle in the vertical direction, and dead-on flat to as much as 0.002 in. forward at the end of the spindle in the horizontal direction. The slight forward position in the horizontal direction provides some wheel “toe-in,” which some feel helps the driver maintain a straight line down the hill. For what it’s worth, we set all four spindles at 0.002 down vertical and forward horizontal. The choice is yours.
- Check out the steering cables. They should be snug, not loose or tight. Adjust steering cable turnbuckles as necessary, and be sure to retighten the turnbuckle locknuts. You may get by with using the two 3/16” nuts that hold the turnbuckle eyes to the front axle to adjust the cable tension. This is easier than using the turnbuckles, since they require you to unwrap and rewrap the safety wire. While you’re checking this, also measure the aim of the front axle when the steering wheel is in a straight driving position. Using a tape measure, the measurement from the rear axle to the front axle (taken at the ends of the square stock) should be equal on both sides of the car. Again, adjust steering turnbuckles as necessary.
- Check the brake cable, cable clamps, and the brake mechanism for proper function. Check and replace the brake pad if necessary.
- Check bolts, nuts, etc. for tightness. Make sure the screws holding the body to the floorboard are tight. If the “threads” in the floorboard become stripped and screws can no longer be tightened, you may insert a toothpick cut to proper length to fill the hole which will allow you to get the screws in tight.
- Most derby enthusiasts will experiment with the tightness of the front and rear axle kingpins to try to make their cars go faster. I like to have the rear axle kingpin as tight as possible (avoiding “squashing” the washers into the floorboard, or worse, stripping the

threads on the nut or bolt). I also like to have the front axle kingpin looser. Some use a torque wrench that measures torque in inch-pounds (not foot-pounds) to be able to consistently tighten the kingpins to a desired torque. I will not make any recommendations for what torque setting to use. My experience with three different stock cars suggests to me that different cars go faster at different torque settings or bolt tightness, and I believe you have to experiment with each car to find out what works best for each.

3. Morning of the race, at the track:

- Arrive early. There are several things to do and you don't want to be hurried.
- Arrive no later than 7:30 am – 7:15 is better. Bring “blocks” or some other means to park your racer off its wheels. Choose a “pit” location and bring tools, etc.
- You will want to check the total weight and “tail weight” of the car plus driver after arriving, but before the first heats are called. This will give you time to make any necessary adjustments to your total weight and weight balance or “tail weight.” Generally there is a line of cars at the scales waiting to take their turn at this. Someone will be at the scales to help out. First, check total weight (with your racer plus helmet and whatever he/she plans to wear while racing). Add or remove adjustable weights as needed. Next, have the driver get into his/her racing position in the car so the “tail weight” (the weight on the rear axle only) can be checked. The idea is to split the total weight properly between the front and rear axles. Although you are permitted to race up to 15 lb heavier (“tail weight”) on the rear axle, I recommend you race with the weight balanced which is 100 lb on the rear axle for stock cars, and 115 lb for super stocks. The maximum tail weight for the stocks is 107.5 lb and the maximum for super stocks is 122.5 lb. The desired balance is achieved by moving adjustable weight as necessary. Once this is done, only minor adjustments should be needed throughout the rest of the day when you weigh the car and driver again before each heat.
- It's not a bad idea to check each wheel. Remove any crud that may be stuck to the rubber “tire.” Spin the wheel bearing while holding the wheel in your hand and listen for noises which indicate there may be dirt in the bearings. Clean bearings with lighter fluid or other light solvent as necessary to get them spinning smoothly.
- Clean and polish the spindles. This is usually done with some WD-40 and fine (like 600 grit) wet/dry sandpaper. After cleaning, put some lubricant on the spindles.
- Register for the race (the paperwork!) and pay your registration fee at the table near the starting line.
- Sometime around 8:30, racers will be called by division to draw their car number for the day. For the rest of the day, you will be called by your car number, so remember it. You will be given a decal which is stuck to the left front of your car.

4. Before each heat:

- Your car number will be called along with your opponent's number. Pair up and get in line to be weighed.
- After weighing, you and your opponent's car will be placed on a tire to raise the car off its wheels. You will swap two wheels (left front/right rear, or right front/left rear, determined by coin flip) with your opponent. Next, move off the tire and get in line. The low numbered car lines up in Lane 1, while the high numbered car lines up in Lane 2 for the first "phase" of your two "phase" heat. If second phase cars return to the starting line, they have priority over first phase racers and you must let them go first.
- The car handler should move the car onto the starting ramps immediately after the cars in front of you begin their race.

5. The all-important start:

- Aim the car in the starting ramps in the direction you want the car to go at the start. I center the front wheels in the ramps, and move the rear wheels to the left or right depending on which way we want the car to go. I recommend inexperienced drivers head straight down the middle of their lane. Many experienced drivers go to the outside half of both lanes at our track because it may be a little more "downhill" in that direction. Inexperienced drivers, however, may not feel comfortable with driving closer to the guardrail, so they are better off going down the middle. That is much better than going to the outside half of the lane and hitting the guardrail, which will certainly slow down the car, and may put spindles out of adjustment or other undesirable side effects. It can also cause inexperienced drivers to drive "nervously," making unnecessary steering adjustments which will also slow the car.
- After the car is aimed, the driver gets into the car. After the driver is in his/her racing position, make sure the steering wheel is aimed straight. Look over the wheels and ramps to make sure there are no small objects to interfere with the start, like pebbles, etc.
- Have your driver positioned low – head low, shoulders "tucked in" below the car body line if possible.
- The car handler's job is now done. The rest is up to your driver.

6. The drive:

- On the count of three, the starter will send the cars on their way. Hopefully the car and steering are aimed properly. If you're going straight down the middle of the lane, your driver should steer only as necessary to maintain a straight path down the middle. Less is

better when it comes to steering. Frequent corrections, and especially over steering, will significantly slow the car down. If the car is heading to the outside half of the lane, the driver should make just one steering adjustment to straighten the car down the hill after it reaches the outer part of the lane.

- No U-Turns, please!
- Your driver should stay low in the car all the way down the hill, across the finish line.
- Stay away from the white (center) line dividing the two lanes. There is a timing device right on the white line at the finish line which will be run over if you drive on the white line. It is designed to be run over, but we prefer it not be run over!
- After crossing the finish line, pump the brake to slow down the car and bring it to a stop near the end of the track. This will make it easier for the workers at the bottom of the track to move the cars off the track.
- The car handler should assist with unloading his and his opponent's car off the return trailer, and onto the tires where all four wheels will be swapped. The wheels should be in the same position (right front to right front, etc.). After the wheels are swapped, move your car back to the starting line for the second phase of the heat.

7. Between heats:

It's a good idea to look over the car during the day to make sure everything stays o.k. Check your brake pad and replace if necessary. Do anything else you think is necessary to relieve nervousness, etc. Watch what other racers are doing, especially those cars that are doing well. Ask experienced people for advice – most are willing to tell you what they know if you ask them. Remember, it's only a race, and the point of it all is to have fun.