

Soapbox Derby

The following section is intended to provide assistance to builders with regard to construction of steering components on their cars. Builders are not limited to these designs, they are only offered as examples.

Recommendations: use 1/8" (minimum) diameter cable and closed style eye bolts

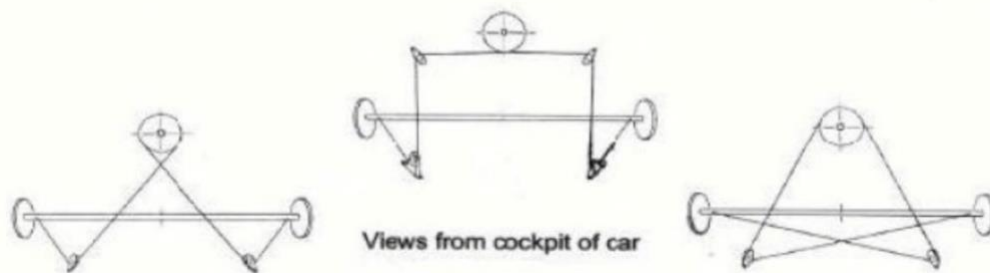
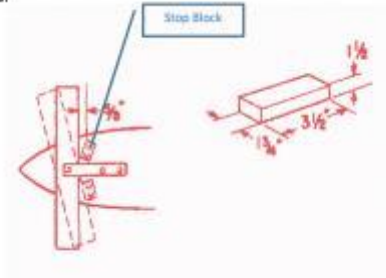
The simplest steering system consists of a cable that is wrapped around a steering column. The cable passes through closed pulleys and is attached near the ends of the front axle. The steering column may be vertical, horizontal, or for that matter at any angle. The cable is securely attached to the steering column to prevent

slippage and is tightened with turnbuckles.

Make sure the cable passes through and is wrapped around the steering column in the proper direction to prevent backward steering. (See diagrams below for some examples.)

The steering wheel should be large enough to allow a secure grip and have no sharp points or edges in any position. The sensitivity of the steering should be neither "too quick", nor "too slow". There should be minimal "play". The turning radius of the car can be relatively large since the racecourse does not have any curves. Should the car get off course, however, it is important that corrections can be made. A minimum turning radius of 30 feet (10m) is adequate. Stop locks to limit steering should be used and must be secured extremely well. The stop blocks prevent the axle from turning the steering wheel excessively, if one wheel hits an object.

Steering Stop Blocks:



Braking:

- Cost
- Ease of Construction
- Choice of Mounting Location Options

Hockey Stick Brake

- Braking Effectiveness • Skid Control
- Tire Wear

The following section is intended to provide assistance to builders with regard to construction of brake components on their cars. Builders are not limited to these designs, they are only offered as examples.

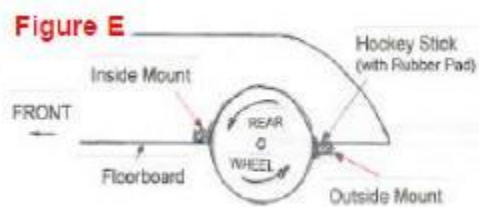
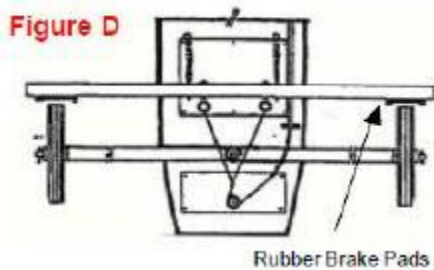
There are several kinds of safe and reliable brakes. Some design features to consider are:

The hockey stick brake uses a piece of strong hardwood with rubber pads (see diagram) parallel to the rear axle that is pulled up against both rear wheels by a cable. A spring pulls the bar off the wheels when the cable is released. It is quite simple and inexpensive to build. Make sure that the stick is mounted under the floorboard if it is behind the axle, and above the floorboard if it is in front of the axle.

(Figure E) In these positions, the rotation of the wheels will force the stick against the floorboard, providing support. Tires wear somewhat as the brake is applied and flat spotting can occur if the brake is applied too hard. The maximum braking power available from this brake is dependent on the weight of the car on the rear axle.

Drop Arm Brake

The drop arm brake incorporates a hinged arm with a brake pad on one end that drags on the road surface. The main hardware items needed to make the scissor brake are four large butt hinges. This brake does not wear-on or flat spot the tires. Positioning it as far as possible ahead of the rear axle is best.



Drop Arm Drag Brake

Similar to the brake described above but does not incorporate any scissor hinges. The concept is to use steel tubing cut and shaped to create a "T" that mounts to the wooden arm with the brake pad and is pulled down by a cable attached to a foot pedal. A spring is utilized to keep the brake in place and to retract the brake pedal when the pedal is released.

Bicycle or Hand Brakes

Hand brakes are limited in effectiveness and require the driver to take their hands off of the steering wheel in order to apply the brake which can lead to a loss of control situation

Hand-Held Drag Break

A piece of wood with rubber on one end that usually fits through a slot in the floorboard and is pulled upward by the driver to slow the car. Again, the driver has to remove their hands from the steering wheel and the mount location of this type of brake will determine if the car will veer from one side or the other when applied. The closer to the center of the vehicle as possible will avoid veering action.

Brake Pads:

Automobile Tire Tread: This is by far the best material recommended for ground contact brake pads.