

# How to Build a Cubmobile

Detailed Instructions:

If you wish to build the cubmobile illustrated, these are step-by-step instructions. Have Fun!!!

- 1) Cut one 2 X 4 52" for main frame.
- 2) Cut two 2 X 4's 28" for axles.
- 3) Make an "X" on each end of each axle, and drill a hole at each "X" intersect, 6" deep using a hand electric drill (5/16" wood bit works well).
- 4) On front axle 2 X 4:
  - a. Drill a 5/16" hole on each end near the back for the rope.
  - b. Drill a 3/8" hole at center of 2 X 4.
  - c. Attach (2) 2 X 4 blocks to front axle, on either side, 2-1/8" from center hole, use glue and #6 X 2" screws. This will limit steering.
- 5) At front of main frame 2 X 4, drill a 3/8" hole (center 1-5/8" from front).
- 6) Attach front axle to frame using 3/8" X 4" hex bolt, 4 washers, and lock nut or 2 nuts. (Tighten enough to allow steering).
- 7) Align back axle 2 X 4 at right angle with back of main frame 2 X 4, clamp if possible. Drill (2) 5/16" holes through axle and main frame. Attach main frame to back axle using 2 carriage bolts, 2 washers, 2 lock washers, and 2 nuts. If this is to be a permanent attachment, glue also.
- 8) Cut out seat and backrest from plywood.
- 9) Cut one 2 X 4 12-14" in length for back rest support. (Bevel slightly about 5 degrees if possible).
- 10) Attach back rest support (bevel end down) to main frame using glue and 2 screws (#8...2-1/2") at an angle. Position of this support depends on size of boy, have your Royal Ranger boy sit on 2 X 4 frame to estimate position.
- 11) Cut out 2 triangular shaped pieces of plywood and attach to either side of backrest

support and main frame with glue and screws (#6 1-1/2"). Drilling small pilot holes helps.

12) Attach seat and back rest using glue and screws (#6...1-1/2").

13) Cut 2 X 2 surveyor's stake to 14-16" at an angle, cover end with rubber using nails, drill a 3/8" hole through stake at location it will meet main frame.

14) Drill hole 5/16" into main frame at point to attach brake. Mount brake using 3/8" X 4" lag screw and washer to side of main frame.

15) Drill and attach seat belt with fasteners of choice.

16) Attach 6-7' of 1/4" rope to front axle as shown.

17) Attach wheels using washers and 3/8" X 6" lag screws. (Socket wrench helps).

---

### **Supplies Needed:**

- 4 – 10" PNEUMATIC (Inflatable) wheels
- 1 – 2' x 4' x 3/8" or 1/2" Plywood
- 2 – 8' 2x4's
- 1 – 2" x 2" surveyor's stake
- 4 – 3/8" x 6" lag screws (for wheels)
- 1 – 3/8" x 4" hex bolt (for front axle)
- 1 – 3/8" x 4" lag screw (for brake)
- 2 – 5/16" x 4" carriage bolt (for rear axle)
- 13 – 3/8" washers
- 1 – 3/8" lock nut
- 2 – 5/16" washers
- 2 – 5/16" lock washers
- 2 – 5/16" nuts
- 32 – # 6 x 1 1/2 " wood screws
- 4 – # 6 x 2" wood screws
- 1 – 6' to 7' x 1/4" rope
- 1 – seat belt (from salvage yard)
- 1 – 2" x 6" piece of rubber (from an old tire)

### **Tools Needed:**

- Power Drill
- 3/8" and 5/16" wood bit

Wrenches or socket set  
Screwdriver  
Tape measure  
Wood glue  
Power or hand saw

---

## **Cubmobile Guidelines:**

- 1) Wheels must not exceed **10 inches** in diameter.
- 2) All wheels may be equipped with **PNEUMATIC (inflatable)** rubber tires.
- 3) Car frame is made from 2-by-4-inch construction lumber.
- 4) The overall length of the car is a maximum of 52"; the wheel base a maximum of 48".
- 5) Use roundhead 1/4-inch bolts to hold frame. Screws are a second choice. Nails are not suitable because they may work loose.
- 6) All cars must have a seat with braced backrest, so the driver can comfortably steer with his feet.
- 7) Steering is done with the feet, which are placed on the front axle, and by the hands holding a rope fastened to the front axle.
- 8) If threaded axles are used, the nuts must be secured with cotter pins or wire.
- 9) Cars must be equipped with an adequate safety belt securely fastened to the main frame of the car.
- 10) Cars must be equipped with a handbrake with its rubbing surface faced with a rubber material such as a strip of an old tire. This will stop the car when dragged on the ground.
- 11) During a race, the two 2-by-4-inch blocks fastened 1/4 to 1/2 inch from the centerboard will limit the turning radius. (Very important to test this before the race!)
- 12) No extra weights, etc. may be placed on the Cubmobile.
- 13) For the drivers' safety, they should wear long pants, a long sleeve shirt, and shoes that completely cover the feet, and a bike helmet.