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DIY MINI BIKE PLANS



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MATERIAL LIST FOR MINI-BIKE

1. Steel

- (a) 20' of 7/8" OD x .085 wall welded 1025 grade tubing for frame and fork.
- (b) 7" of 5/8" ID approx. .085 wall seamless 1025 tubing for axle and fork support.
- (c) 2 pieces of 1/8" plate 3" x 7-1/4" for front fork support plates.
- (d) 2 pieces of 3/16" plate 2-1/2" x 3-1/4" for rear axle support brackets.
- (e) 1 piece of 1/8" plate 5-1/2" x 5-1/2" for seat plate.
- (f) 1 piece of 1/8" plate 8-1/8" x 6-1/2" for motor mount.
- (g) 2 pieces of 5/8" steel shaft 7-1/2" long for front and rear axles.

2. Engine

Should be of 4 cycle design with approximately 4 to 6 horsepower and a 3/4" shaft.

3. Wheels

You should have a 4.10 x 3.50 - 4 wheel assembly for the front and a 4.10 x 3.50 - 5 for the rear with demountable hub design. Hub should be 1-1/2" in diameter with 5/8" ball bearings.

4. Brake

An internal expansion brake or brake drum and brake band should be used.

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INTRODUCTION

Before starting to build your Mini-Bike, be sure that you have all the parts shown on the material list. You will note that tubing has been used in the construction. The advantages of using tubing far out-weigh the additional time for building. You will need all the common household tools, plus a 2" radius conduit bender (available at almost any electrical shop) and a welder. You are now ready to start to build.

1. Lay out 2 pieces of 7/8" tubing and mark for bending as shown. Remember that the bend is in the shaded area as shown below in Figure 1.

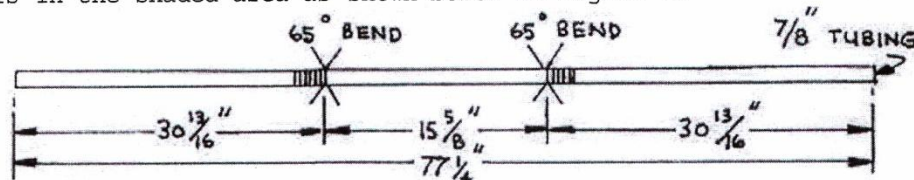


FIGURE 1

2. After you have your first 2 bends, mark for the next 2 bends as shown. Be sure that you bend in the shaded area only. See Figure 2 below.

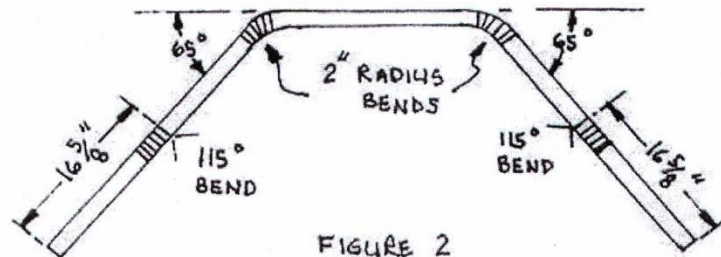


FIGURE 2

3. Now you have all four bends completed, weld each side member together as shown. Your main side members are now complete. (Figure 3 below)

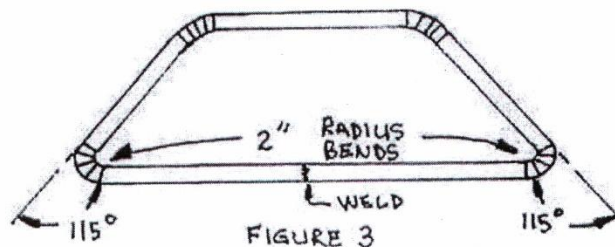


FIGURE 3

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MINI BIKE PLANS



Page 2

4. Lay out 2 pieces of $\frac{7}{8}$ " tubing each 31" long. Mark and bend in shaded area as shown below.

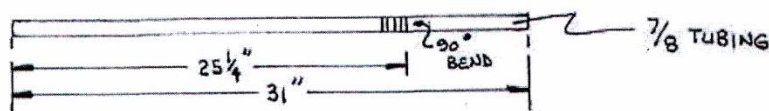
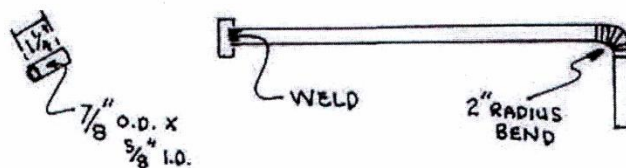


FIGURE 4

5. Cut 2 pieces of $\frac{7}{8}$ " tubing, with a $\frac{5}{8}$ " inside diameter, as shown in Figure 5. Weld to the 2 pieces of tubing you have just bent as shown in Figure 6.



6. Make 2 pieces as shown in Figure 7 out of $\frac{1}{8}$ " plate steel. There is a full size pattern on the back of this sheet. Using $\frac{5}{8}$ " bolts to line up the plates and the axle, weld the front fork assembly as shown in Figure 8.

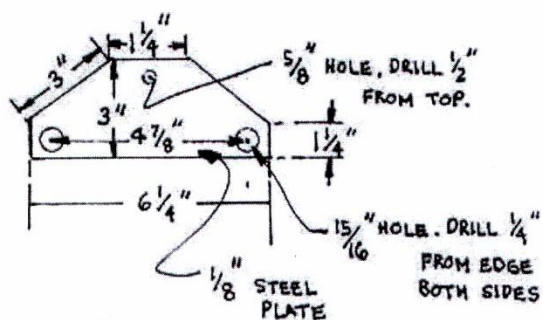
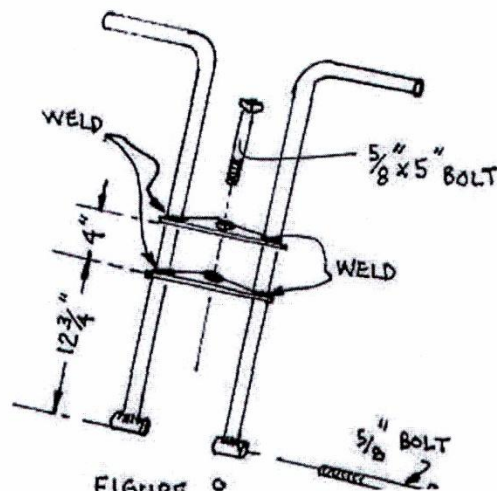
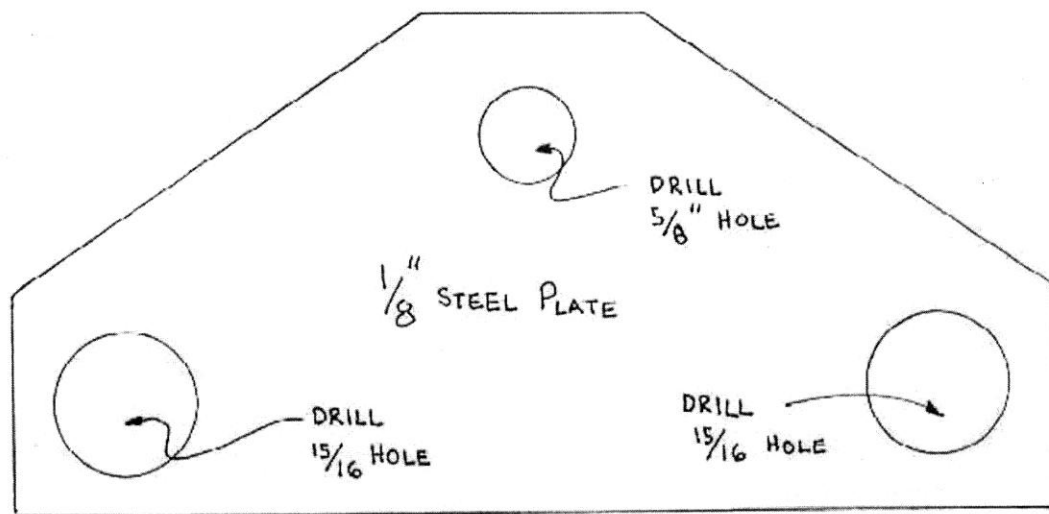


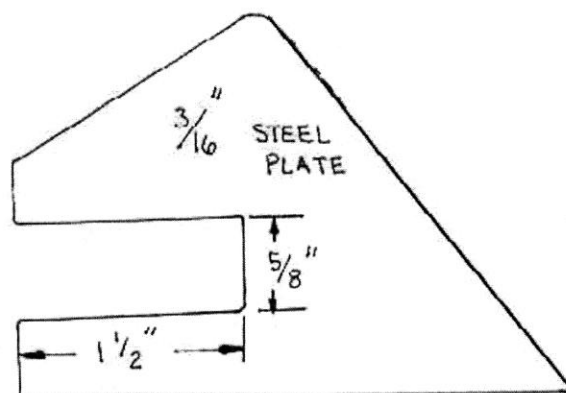
FIGURE 7

Note: Be sure that you insert the $\frac{5}{8}$ " guide bolts as shown in Figure 8. If you don't, the fork assembly will be out of line.





Full size front fork plate pattern to be made out of $\frac{1}{8}$ " steel plate. 2 required.



Full size rear axle support to be made out of $\frac{3}{16}$ " plate. 2 required.

7. Make 2 rear axle supports out of $\frac{3}{16}$ " plate as shown in Figure 9. See back of page 2 for full size pattern. Cut off a piece of $\frac{5}{8}$ " ID tubing for the front fork support as shown in Figure 10. Make the motor mount and seat plate out of $\frac{1}{8}$ " plate as shown in Figure 11 and 12. Do not drill holes for the engine yet.

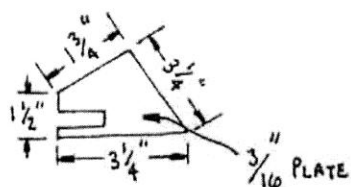


FIGURE 9



FIGURE 10

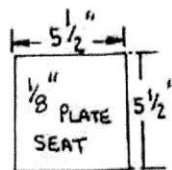


FIGURE 11

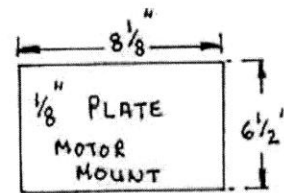
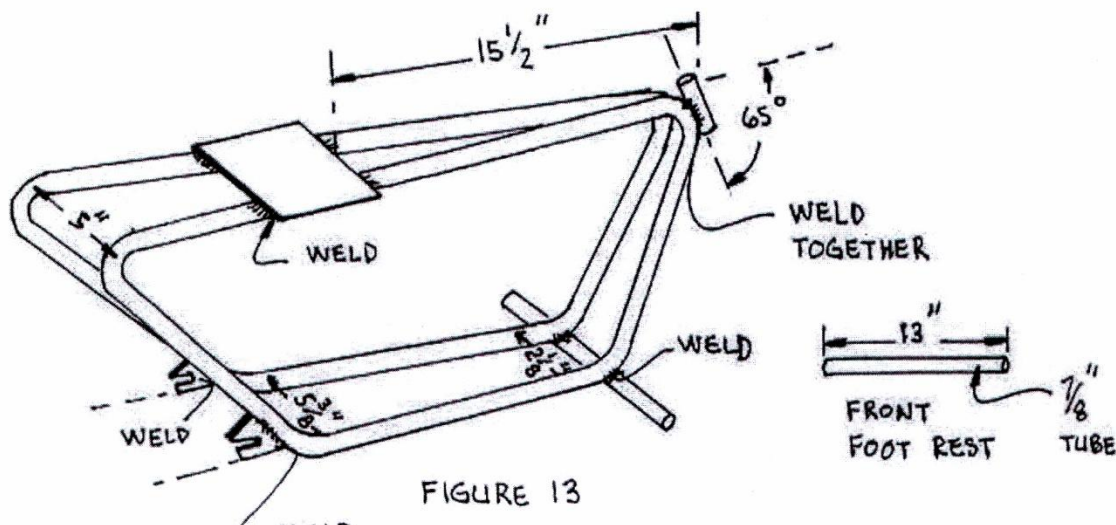


FIGURE 12

Weld the 2 main side members you have made as shown in Figure 13 below. To hold the proper distance between each side member, we would suggest that you make wood blocks the proper length to use as spacers between the side members and clamp together before welding. Weld the seat plate as indicated. Next weld the front foot rest as shown. Weld the front fork tube at the proper angle as indicated. Weld on the 2 rear axle supports so that the bottom of each support is flush with the top of the frame tube. Better use 5/8" axle bolt to make sure you have lined them up correctly. Be sure to weld to the inside of the frame as shown. Note that you are not to weld the engine mount on yet.



9. Bolt on the front fork assembly, using 5/8" x 5" bolt and self-locking nut. Spray paint the entire frame your favorite color.
10. Make 2 axles as shown in Figure 14 below using an SAE thread 1 1/2" each end.

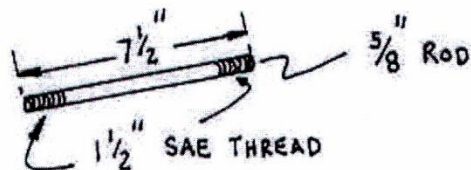


FIGURE 14

11. Install the front wheel assembly as shown in Figure 15, using a self-locking nut at each end of the axle.

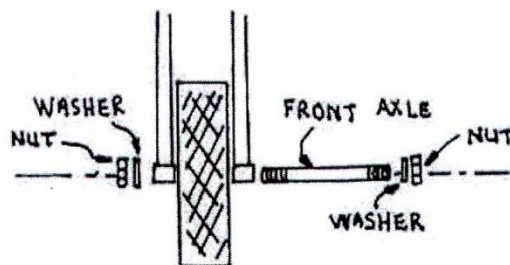


FIGURE 15

12. Weld the brake drum and sprocket assembly to the hub of the rear wheel as shown in Figure 16 below. Before welding check to make sure that you have $\frac{3}{8}$ " clearance between the sprocket and the tire. Bolt the hub to the rear wheel.

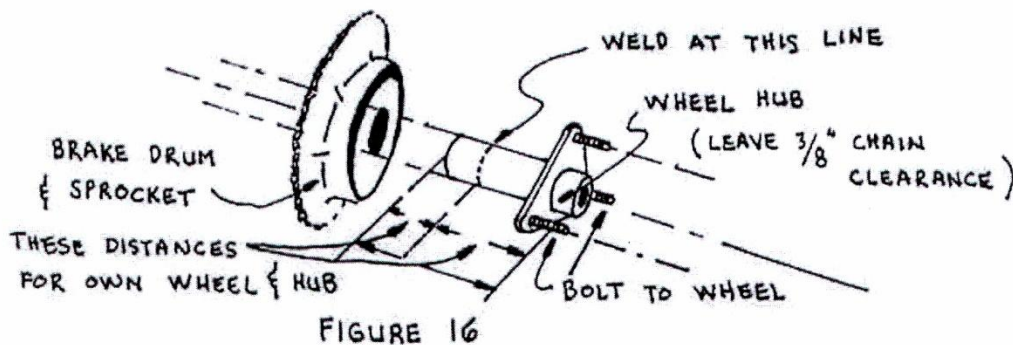


FIGURE 16

13. Install the rear wheel assembly to the frame as shown in Figure 17 below. (Insert the axle through the hub of the wheel, put on $\frac{5}{8}$ " jam nuts. Then put on a washer on each side and slide onto the frame. Install another washer and $\frac{5}{8}$ " nut and tighten.)

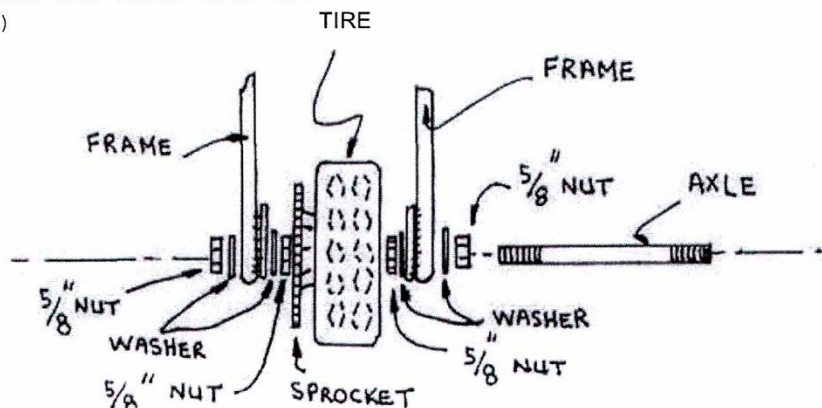


FIGURE 17

14. Install your clutch to the engine shaft, keeping the sprocket of the clutch as close to the engine as possible. Now, place the engine mount on the frame and weld in the proper position. Next, place your engine on the mount, using a chain to line the clutch and rear sprocket. Mark and drill holes and bolt your engine to the mount. Install chain. Connect the twist grip throttle control on the right handle bar to the engine, and brake handle on the left to the brake drum.
15. Cut a piece of $\frac{3}{8}$ " plywood as shown in Figure 18. Cut a piece of 2" or 3" foam the same size as the plywood. Cover with water resistant fabric, using tacks to fasten the fabric to the plywood. Drill two holes in the seat plate on the frame, and using wood screws, screw the seat to the frame. You are now ready to ride your Mini Bike. Drive carefully.

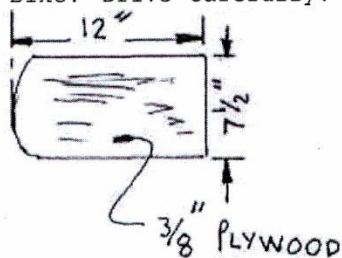


FIGURE 18

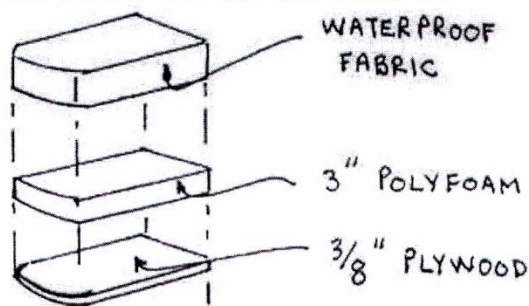


FIGURE 19

5. **Clutch**

An automatic clutch with a 12 tooth sprocket for #35 chain is needed. The 12 tooth sprocket and the 60 tooth rear sprocket give you an ideal gear ratio of 5:1. Be sure you order the correct bore for your engine shaft.

6. **Chain**

Any good #35 roller chain will work. You will need approximately 4 feet.

7. **Throttle Control**

A twist grip throttle control with a 7/8" inside diameter for the front handle bar is needed. You will need about a 34" cable to your engine.

8. **Brake Lever**

A brake lever for 7/8" tube and 66" cable are needed for your brake control.

9. **Bolts and Nuts**

- (a) 1 only 5/8" x 5" bolt and self-locking nut to hold front fork to main frame.
- (b) 4 only 5/8" nuts (not self-locking) for rear axle.
- (c) 2 only 5/8" self-locking nuts for front axle.
- (d) 6 only 5/8" washers for front and rear axles.
- (e) 4 only 1/4" x 1" engine mounting bolts and self-locking nuts.
- (f) 2 only wood screws 1/2" roundhead to hold seat to seat plate.

10. **Seat**

The seat fabric should be of a waterproof type. You will need a piece of 3/8" plywood 7 1/2" wide by 12" long for the bottom board. You will also need a piece of 2 or 3" foam the same size.

11. **Handle Grips**

You will need 3 only 7/8" handle grips for the handle bars and foot rest.

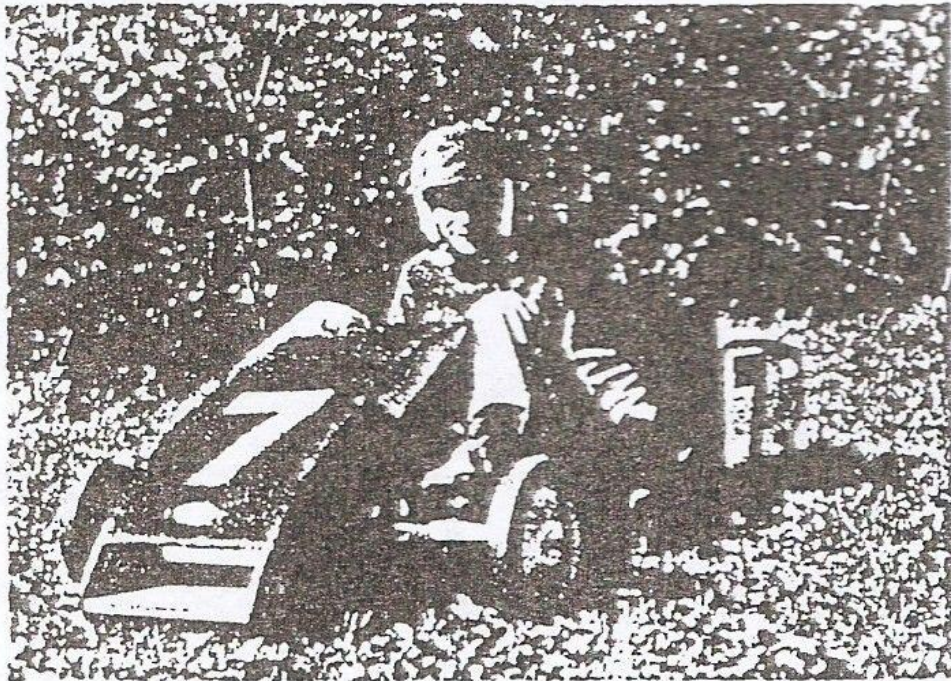
12. **Paint**

Paint should be a spray on type enamel, quick drying. One small can will do.

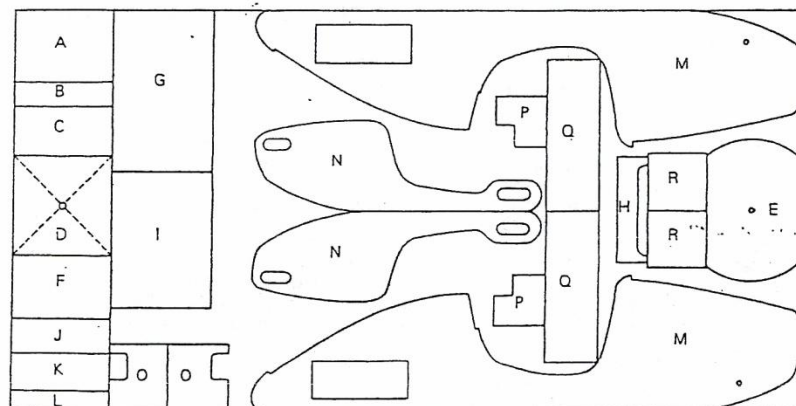
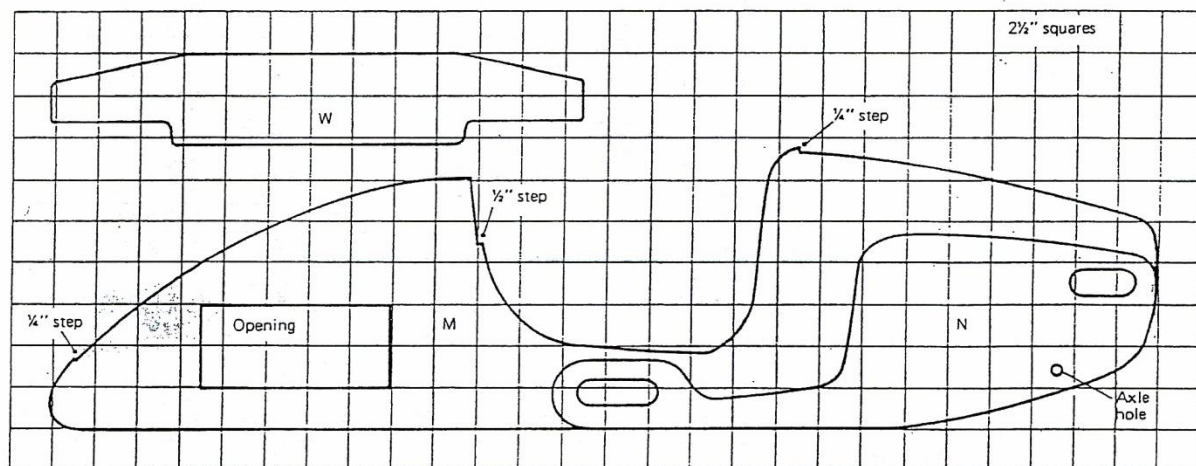
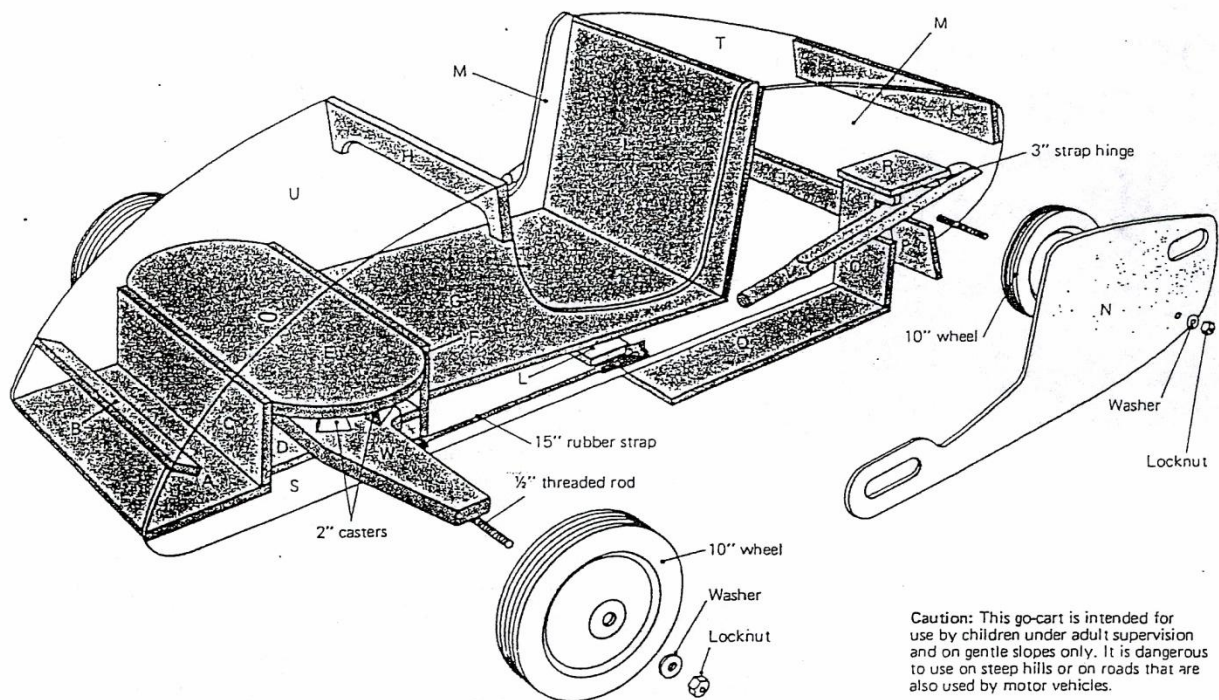
Down Hill Racer

FREE PLANS

DOWNHILL RACER

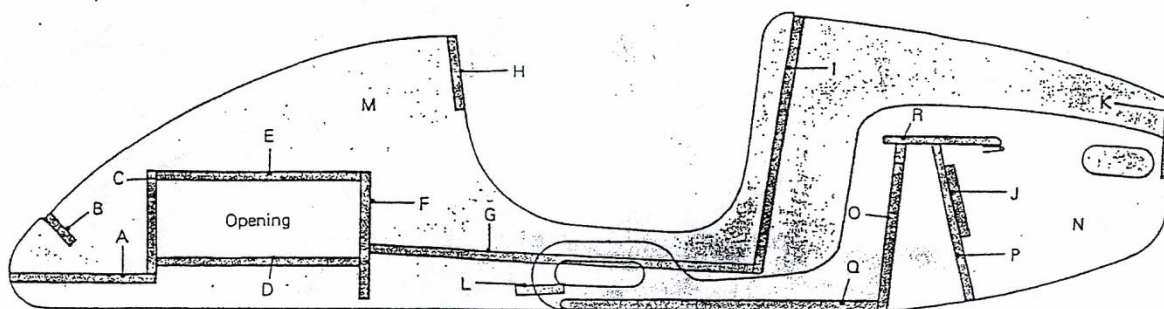


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Enlarge pattern, above (see p.48), using 2 1/2-in. squares. Make separate patterns for the outer hulls and pontoons (M and N). Position the pattern for M, as shown at left, on a 4- x 8-ft. panel of plywood. Then reverse the pattern and trace its opposite side onto the panel. Do the same with N. Exact dimensions for the notches in the brake towers O and P are given on page 348, Step 10. Lay out an 11 1/2- x 13-in. rectangle for the steering platform (E); then draw diagonal lines from corner to corner to locate its center. Use a compass or a length of string to draw the two curved sides of E, swinging arcs from corner to corner on the 11 1/2-in. sides of the rectangle. The back edge of the steering arm (W) should be straight for shorter drivers so that their legs can reach it. For taller drivers indent the back edge as shown on the grid.

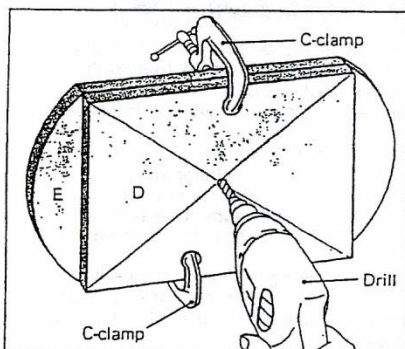
Cross-section view



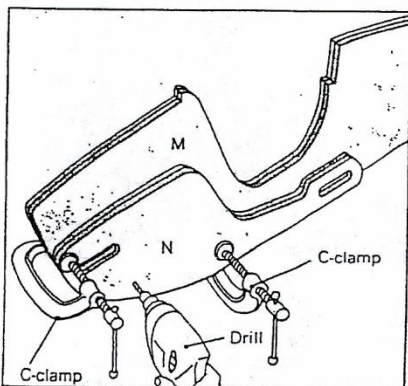
Use this view to position parts A through L and O through R (see Steps 4–6, 11, and 13–16).

Construction

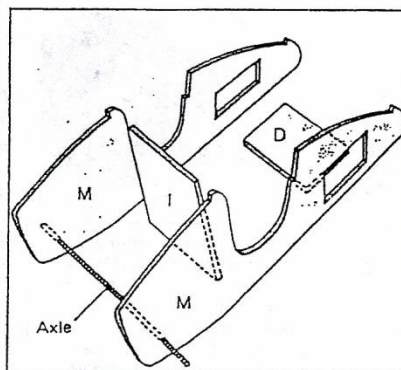
1. Cut all wood and hardboard to the sizes given in the chart and diagrams on pages 346 and 347. The height of the rectangular openings in the outer hulls (M) must equal the combined heights of the steering arm (1 1/4 in.), steering platform (1/2 in.), axle (1/2 in.), and casters (2 1/2 in.), plus 1/4 in. for clearance. Adjust this dimension to suit height of casters you purchased.



2. Center crossmember D over steering platform (E) and clamp the two parts together. Draw diagonal lines from corner to corner on D to locate its center, then drill a 1/2-in. hole for the carriage bolt through the centers of both parts at the same time.



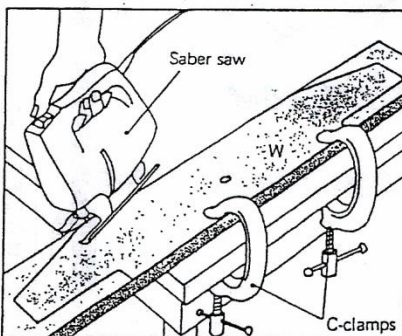
3. Clamp outer hulls (M) and pontoons (N) together so that curved bottom and rear portions of all four parts are aligned. Use pattern on preceding page to mark position of rear axle, then drill a 1/2-in. clearance hole for axle through all four pieces.



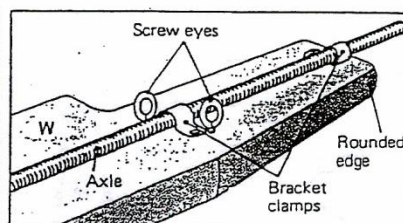
4. Unclamp parts M and N. Temporarily insert an axle through parts M in order to keep them in alignment, and attach crossmembers I and D between parts M, using glue and 1 1/2-in. No. 6 screws.

5. Use a rotary rasp or file to round off the sharp corners on the bottom edge of crossmember B. Use a saber saw to cut the curve into the bottom of the dashboard (H). Then glue and screw parts A, B, C, F, G, H, J, and K between parts M, using 1 1/2-in. screws.

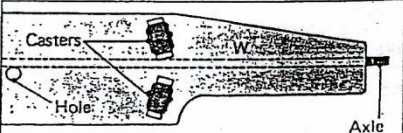
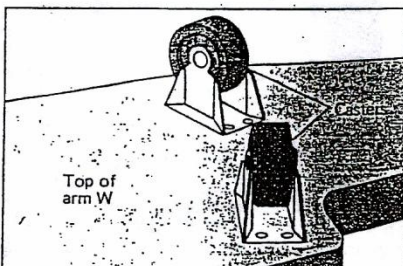
6. Turn the hull upside down and center the steering platform (E) in the hull. Temporarily insert bolt through parts D and E to align them. Then glue and nail E into the hull. Remove bolt.



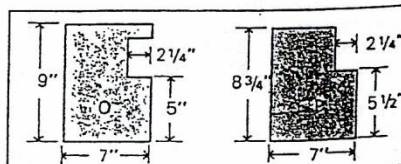
7. Cut the steering arm (W) from a 3-ft. length of 1/4 x 6 pine board, using the pattern on page 347 and a saber saw. Use the rotary rasp to round the front edge of the arm for about 7 in. from each end. Drill a 1/2-in. hole for the carriage bolt in the exact center of the arm. Paint the arm.



8. When the paint has dried, attach the front axle under the steering arm, just in front of the center hole, using screws and clamps from four brass handrail brackets. (Discard the brackets themselves.) Attach four screw eyes to the bottom of the steering arm in approximately the positions shown. Make sure that all clamps and screws are mounted on the narrow outer sections of the arm, leaving the center 18 in. clear.

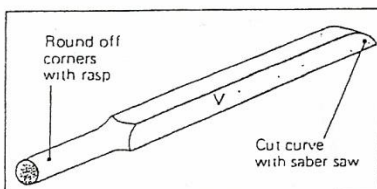


9. Turn steering arm right side up and attach four casters to the top of the arm with 1-in. No. 10 wood screws. Position casters as shown, two on each side of the arm.

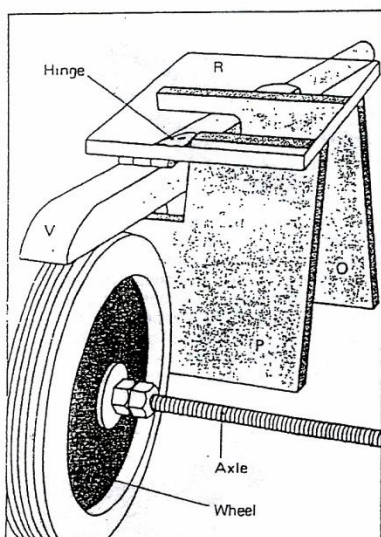


10. Use the saber saw to cut notches in the brake tower parts O and P to the dimensions shown above.

11. Attach parts O, P, and bottom pontoons (O) to the outsides of the hull in the positions shown using 1½-in No 6 wood screws and glue



12. Shape brake handles (V) from two 20½-in lengths of 2 x 2 pine or fir. Use the saber saw to round off the top of the end that will contact the wheel. Use the rotary rasp to round off the sharp edges at the end that the driver will pull on.

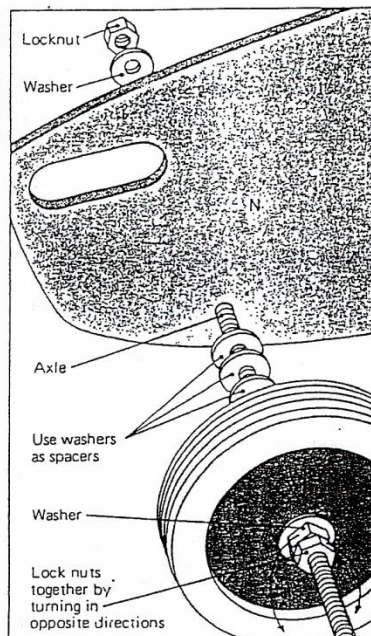


13. Temporarily tape a brake tower R in position on top of parts O and P. Position a brake handle so that its back end can touch the wheel and its front end extends forward through the hole in O. Mark the position of the hinge that will join parts R and V. Attach the hinge to the brake handle.

14. Untape part R from the brake tower and attach brake handle hinge to R. Position R on brake tower so handle will rub against the wheel when it is pulled up and fall away from the wheel when it is released. Reattach R with glue and 1½-in screws. Repeat Steps 13 and 14 on opposite side.

15. Attach crossmember L to the hull with 1½-in screws and glue. This part serves as a support for the belly pan (S) and should be positioned about halfway between parts F and I and 1 in above the lower edge of parts M. Its forward edge should be about ½ in lower than its rear edge.

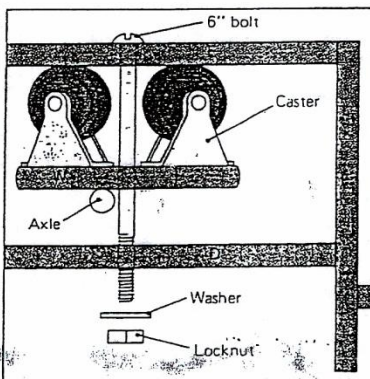
16. Cut tempered hardboard to size for the belly pan (S), trunk (T), and hood (U). Cut a 4-in square opening in the center of the pan about 12 in back from its front edge (for access to the carriage bolt and nut). Attach the pan to crossmembers A, F, I, J, K, and L with nails and glue. Attach the trunk to parts I, K, and M with nails and glue. Temporarily attach hood with ¾-in screws but no glue.



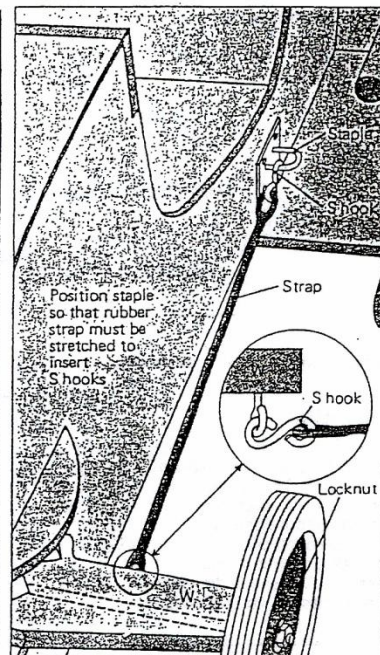
17. Position two nuts and one washer on each end of the rear axle to hold each rear wheel even with its brake handle. Turn the nuts in opposite directions to lock them together firmly. Slide each wheel onto the axle, then add enough flat washers to take up the space between each wheel and its outer pontoon (N).

18. Use the rotary rasp to round off all exposed corners on the car, then paint car to match our green and buff color scheme—or any colors you prefer.

19. Attach outer pontoons (N) to parts O, P, Q, and R with glue and 1½-in screws making sure that the space between the pontoons and the rear wheels is filled with flat washers. Place a washer and a locknut on each end of the axle and tighten them down onto the pontoons.

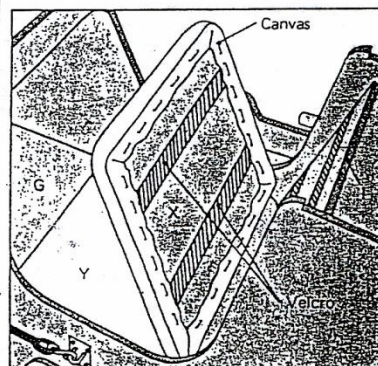


20. Remove the hood and insert the front axle assembly through the hull with the axle under the arm. Secure the axle assembly with the 6-in carriage bolt, a washer, and a locknut. Insert the bolt downward so that its head remains on top of the steering platform. Do not overtighten the nut or you will warp the plywood.



21. Hook one end of each rubber tie-down strap to the inner screw eyes behind the front axle. Hook the other end of each strap to the staple portions of two lock hasp sets. Position the staples on the hull so that they will exert moderate tension on the straps when the axle is in the straight-ahead position; then attach the staples with screws. Discard the hasps. Use pliers to crimp shut the S hooks on the tie-down straps.

22. Reinstall the hood. Attach the front wheels to the axle, using a washer on each side of the wheels and a locknut at the ends of the axle.



23. Cut foam rubber ¼ in. oversize and glue it to the seat (Y) and seat back (X). Wrap canvas upholstery tightly around the foam and staple it to the backs of X and Y. Staple matching Velcro strips to the hull and to the backs of X and Y, and press the seat and seat back into place.

24. Attach snap rings to the ends of nylon rope. Clip rope to the outer screw eyes on the steering arm in order to pull the racer uphill. Unclip the rope and store it under the dashboard before coasting downhill.