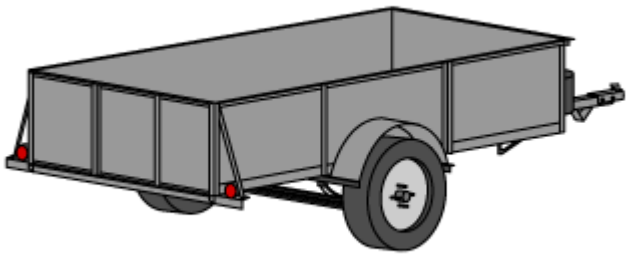
Utility Trailer

OVERVIEW



Introduction

You can build this handy trailer to haul lumber, topsoil, lawn equipment.just about anything within a 2,000-pound capacity. The lightweight, bolt-together design makes it easy to use and not too difficult to construct.

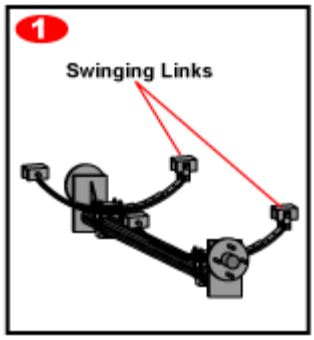
BEFORE YOU START...

SKILL LEVEL & TIME TO COMPLETE

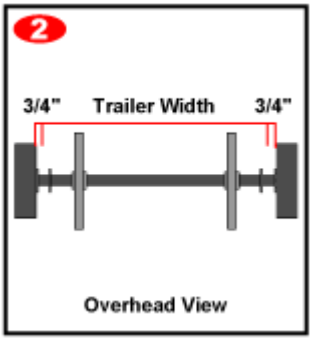
- Beginner - about a week
- Intermediate - about 4 to 5 days
- Advanced - about 2 to 3 days

STEPS

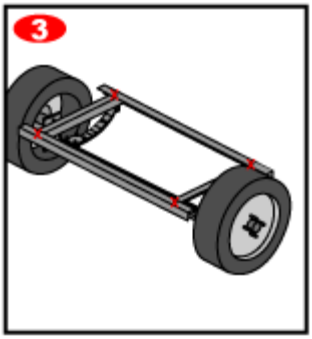
1. If you buy a complete axle assembly, you'll have no welding. It's also important that you use a very robust drill for the metal. A heavy-duty 3/8" variable speed drill is the minimum required.
Place the springs over the mounting pads on the axle and attach using the U-bolts and square plates. Using nuts with lock washers or compression nuts, tighten snugly for now. Over the ends of the springs, install the shackles. The swinging link, which allows the spring to distort under load, should be at the rear of the trailer.



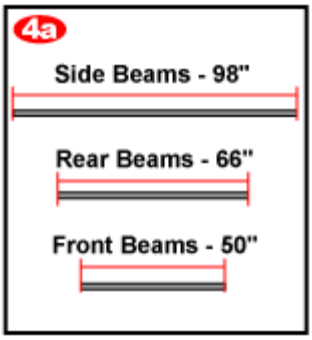
2. Install the back wheels to the wheel mounting studs, then measure the distance between the tires to determine trailer width. The space between the wheels must be large enough to allow at least 3/4" clearance between the tire and the finished side of the trailer.



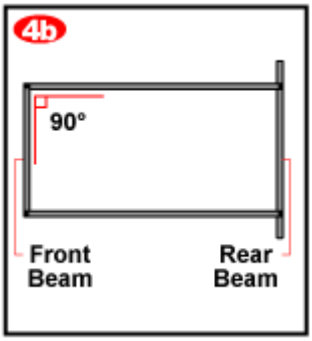
3. After cutting two crossbeams from the angle iron, center the crossbeams over the shackles and spring braces. Making sure that the springs are square to the axle, mark the location of the bolts on the crossbeams and drill 1/2" holes. With lock washers, bolt the crossbeams through the spring braces and into the shackles, pointing the bolts downward. Now tighten the U-bolt firmly.



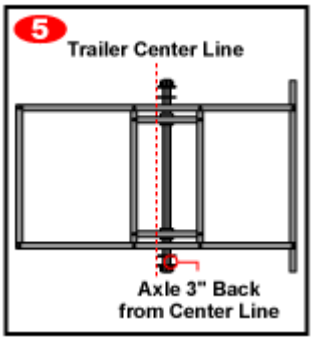
4. a From the 2" angle iron, you'll cut your two side beams, the rear beam and the front beam to these dimensions.



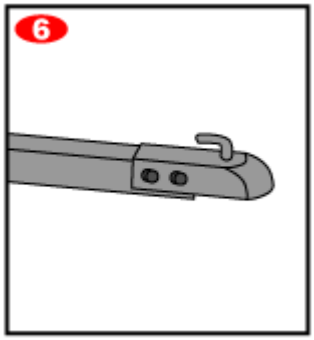
4. b Clamp the side beams, the rear beam and the front beam together at the corners using C-clamps or locking pliers and make sure the assembly is square.



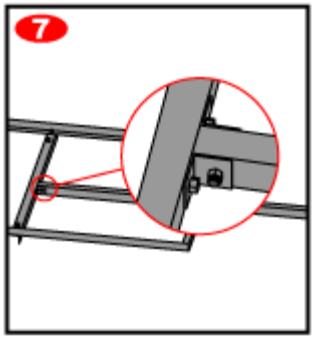
5. Now mark the center line of the trailer and place the frame over the wheel assembly with the center line of the wheels just behind the trailer center line. The width of the crossbeams should be the same as the width of the clamped-together frame. Clamp the frame to the crossbeams. Drill and bolt together the four corners of the frame with 1/2" bolts. Drill and bolt the crossbeam assembly to the side rails with the same size bolts. All must point downward and have lock washers.



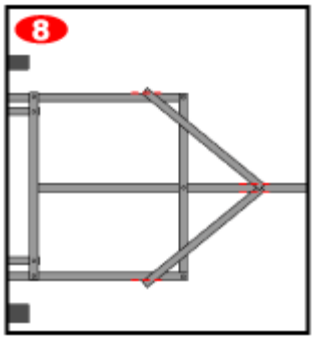
6. Clamp the coupler at the end of the tongue. Drill the tongue and bolt the coupler in place using bolts.



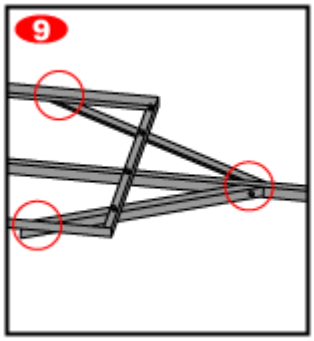
7. To install the tongue onto the front crossbeam, first cut two lengths of L-bracket and clamp the L-brackets to opposite sides of the tongue. Drill through them simultaneously, and bolt them together. Clamp the tongue into position at the front of the trailer and at the crossbeam. Then drill and bolt the tongue into the crossbeam using bolts, and onto the front beam with a 3" bolt.



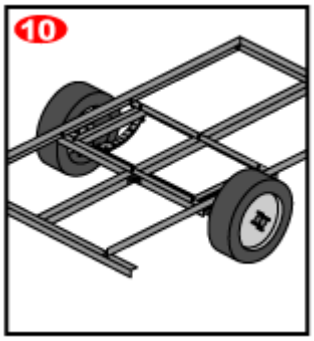
8. After cutting the two diagonals into 51" lengths of 2" angle iron, prop up the tongue of the trailer to a roughly horizontal position. Hold the diagonals into position and mark the angle on the ends. Cut the ends to the proper angle with a hacksaw or jigsaw. With a grinder, round over the protruding corners of the diagonals where they meet the side beams.



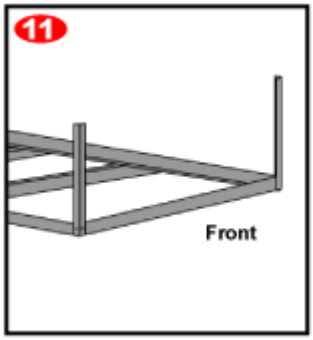
9. Clamp the diagonals into place and drill and bolt them at the tongue, and along the frame.



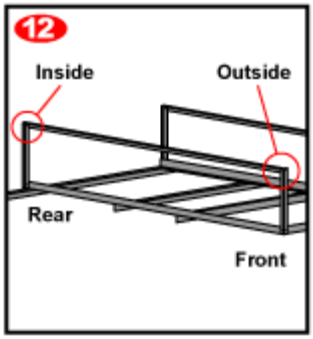
10. Cut the center deck support to length from the 2" angle iron, and cut the rear deck support from the same stock. These lengths will have to be modified if 22" springs aren't used. Cut the L-bracket from 2" angle iron. Drill and bolt the deck supports using 1/2" and 1" bolts with lock washers.



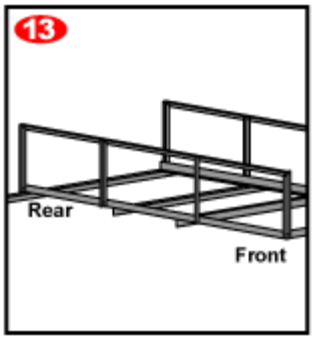
11. Cut the eight boxframe uprights to length from the 1-1/4" angle iron. Clamp the two corner uprights to the front of the trailer frame, positioned so they wrap around the corner, drill 5/16" holes and bolt each of them at both the front and the side with carriage bolts. Now install the two corner rear uprights the same way, with the angle facing outward.



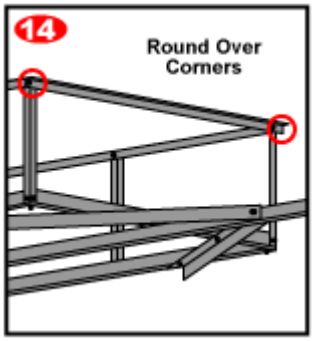
12. Cut the two box frame side rails to length from the 1 1/4" angle iron. Then install them at the top of the corner uprights. With flanges facing outward, mount the side rails on the outside of the front upright and on the inside of the rear upright. Clamp it into place and square it before attaching with your carriage bolts.



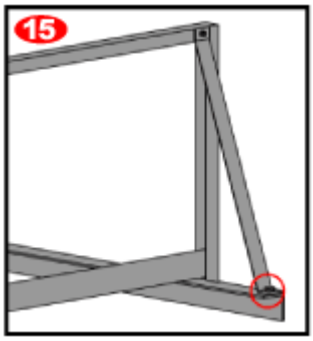
13. Now you can install the two inner uprights on the front frame and the two on the rear frame. Space and clamp them so that about 31" separates each upright. Drill and bolt the inner uprights into place with the carriage bolts.



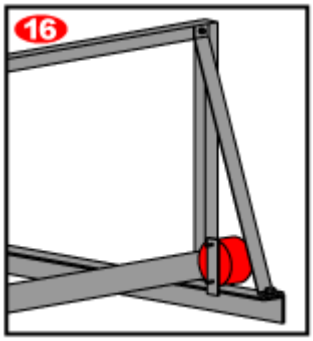
14. Cut the box frame front rail to length from the 1-1/4" angle iron. Round over the ends with your grinder, clamp it into place against the corner uprights and drill and bolt.



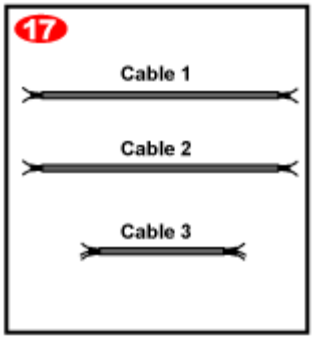
15. Cut two box frame braces to length from your 1" flat iron, and bend the ends 1" on each side so that the brace fits diagonally across the rear of the trailer sides. Drill and bolt the lower end into the frame with carriage bolts. Remove the top bolt of the box frame, drill the hole through the brace, and rebolt the three pieces of metal together with the same bolt.



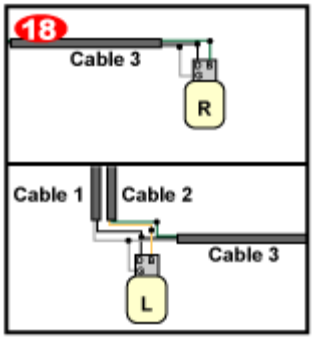
16. Install your taillights within the protective triangles formed by the braces, and with an L-bracket for mounting. Create the L-bracket out of the 1" flat iron, sizing and shaping it as required by the dimensions of the taillight.



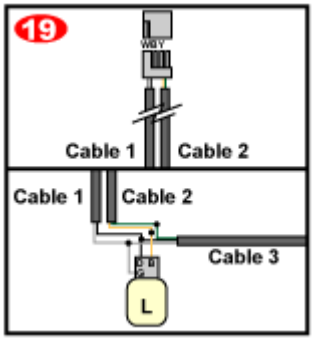
17. There are several ways to wire your utility trailer, but we'll show a standard 4-wire harness with an outdoor-rated extension cord, which is less expensive than automotive wiring. Since this cord isn't available with four wires, you must tie together two cables with two wires each. You'll also need a short piece of 3-wire cable that will cross over from one taillight to the other.



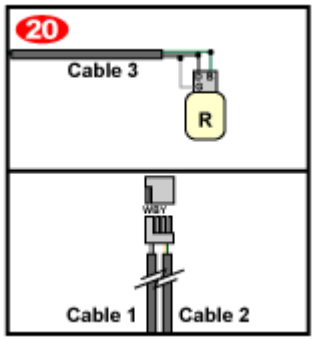
18. Start by connecting the three wires of the crossover cable to the three wires of the right taillight. The color-coding of these wires don't matter, but you'll have to know which operates the bright filament and which operates the dim one. At the left taillight, connect the ground wire from the right taillight to that of the left and to one of the wires in cable 1, which is one of your 2-wire cables. The ground wire is always the one that connects to the metal case of the light bulb.



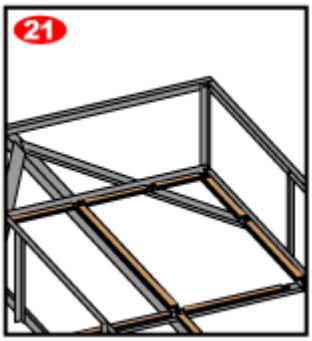
19. At the plug end, connect the ground wire to the white wire to complete the grounding circuit. At the left taillight, connect the dim light wire from the right taillight to that of the left and to the remaining wire in cable #1. At the plug end, connect that wire to the brown wire. The running lights circuit is now complete. At the left taillight, connect the bright light wire from the left taillight to one of the wires in cable #2.



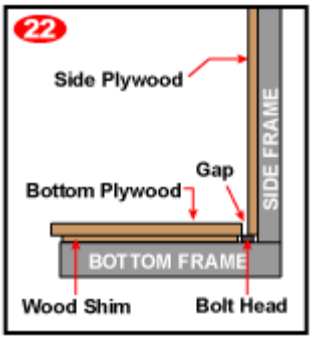
20. Connect the bright light wire from the right taillight to the other wire of cable #2. At the plug end, connect the bright light wire from the left taillight to the yellow wire of the plug. Connect the bright light wire from the right taillight to the green wire of the plug. Test the lights, then solder and tape all exposed joints.



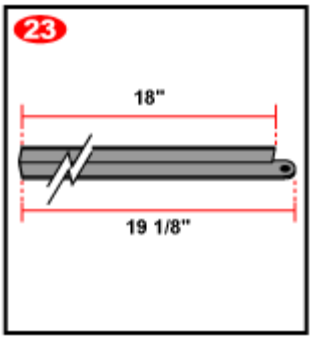
21. The bolt heads at the bottom of the trailer will prevent the bottom sheet of the trailer from seating properly against the frame, so for shims, cut some strips of rot-resistant wood from a 2x4 or 2X6 to form strips 3/8" thick and 1 1/2" wide. Cut the shims to lengths that fit between the bolts, and cement them in place with silicone sealant.



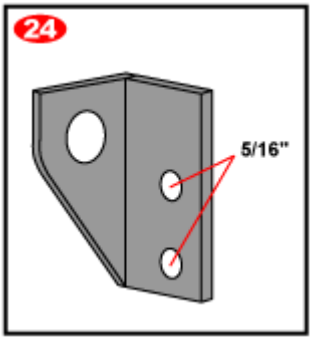
22. To make a plywood box liner, start by cutting your two side liners to shape from 3/4" plywood. Remove the bolts holding the box frame together and drill the holes through the plywood, facing out. Then squeeze a bead of silicone sealant along the wood shims and drop the plywood bottom into place. Drill 5/16" holes through the plywood and the frame in about ten places along the perimeter and two places in the center of the sheet. Bolt it into place using carriage bolts.



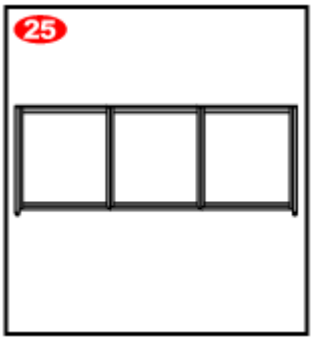
23. Cut two 19 1/8" sections of 1-1/4" angle iron for the tailgate ends, then further cut one end of each down to 18" lengths. Note that they should be mirror images of each other. In each, drill a 1/2" hole centered in the piece, 5/8" from either edge and 1/2" from the end. Then grind the ends round.



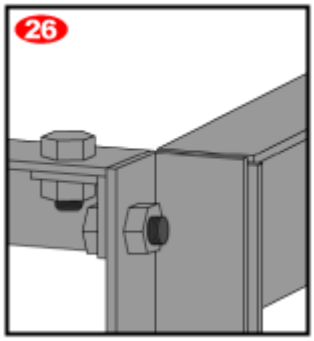
24. Cut the two hinges from 2" angle iron as shown. Make sure the hinges are mirror images of one another, and grind the sharp edges round. The 1/2" hole position should be centered, 1/2" from the edge. Drill the two 5/16" mounting holes below center.



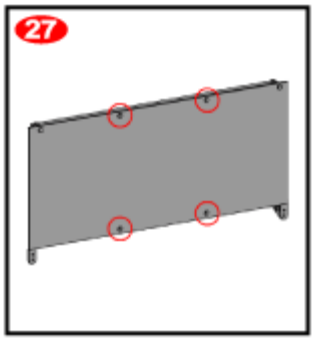
25. From the 1-1/4" angle iron, cut two lengths for the tailgate ends.two lengths for tailgate rails.and two lengths for tailgate braces. Arrange the parts in a horizontal frame with the rails on top and bottom, the braces in the middle, and the tailgate ends on either end. Form three roughly equal-sized boxes.



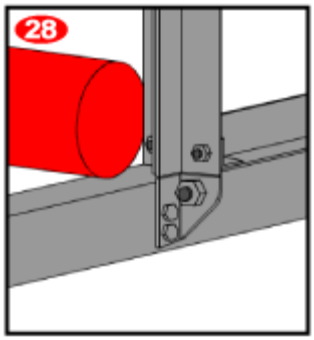
26. Next, cut four 1" long L-brackets from the 1-1/4" angle iron. Clamp the corners together and drill through both layers of metal together. Bolt them together with 5/16" bolts.



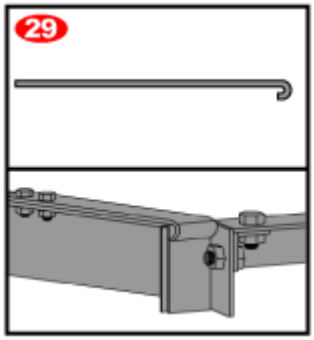
27. Cut your tailgate sheet to size to fit the tailgate. You may use either 18-gauge sheet metal or plywood of 3/8" to 3/4" thickness. Whichever you use, drill through at the locations of the four center bolts and bolt it through the framework using the existing bolts. The corner bolts are intended to also hold the drop chains, so they should be sized appropriately.



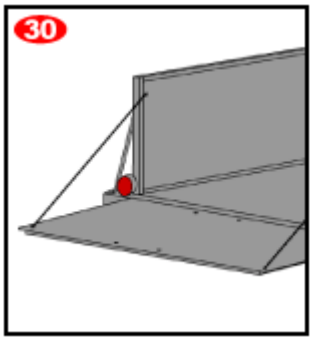
28. Clamp the tailgate hinges into place. The tailgate should be centered and the aligned with the top edges of the trailer sides.



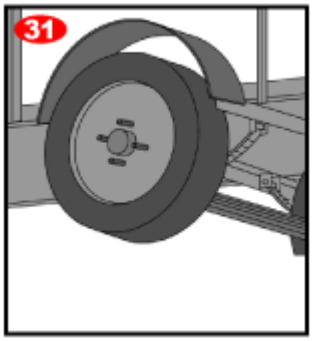
29. Using lengths of 1" flat iron, mount each of the two latches into a vice with about 3/4" protruding. With a torch, heat the bend line red hot and hammer the end to shape. Grind away all sharp edges, and clamp each latch into place on the side of the trailer at the location of the bolts. Test latches to ensure that the tailgate snaps shut with little effort. Drill through the two layers of metal at the same time and bolt them together with 5/16" x 1" bolts.



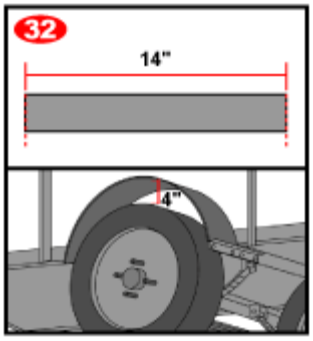
30. Using light chain rated at 200 to 300 pounds, bolt the ends of the tailgate with 1 1/4" x 1/4" bolts.



31. Make your fenders by cutting an 8" wide ring from an empty plastic barrel with a wood-cutting jig saw. Cut the ring in two and trim the length to fit your wheel. The barrel diameter is smaller than the wheel, so it will have to be flexed into position and bolted to the fender brackets.



32. For the fender brackets, cut two 14" lengths of 1-1/4" angle iron. Clamp them to the desired location and drill and bolt them into place using 5/16" bolts. Note that there should be a 4" gap between the top of the wheel and the fender.
Congratulations, you now have a utility trailer that will be one of the most useful pieces of equipment you own.



SHOP LIST

Materials List
Axle assembly (abut 62-1/2" between wheel flanges)
U-bolt kit (sized to fit the axle)
Shackle kit (sized to fit the springs)
(3) Wheels (12", 13" or 14", sized to fit axle hubs)
Coupler (sized to fit over 2" square tubing)
(2) Tail lights (sized to fit within triangle formed by boxframe brace)
(2) Tailgate chains (500 lbs. or greater capacity, trimmed to fit)
(2) Ramp hinges (6" gate hinges or 36" x 1" wide piano hinge)
(2) Fenders (cut from plastic barrel or buy to fit wheels)
(2) Spare tire mounting rods (10" x 3/8" dia. Threaded rod)
(2) Springs (22" measured between mounting bolt centers)
(2) Safety chains (18", 1,000-lb. rating, minimum)
Tailgate sheet (53" x 18" 18-gauge sheet metal or plywood)
Bottom liner (49" x 97" 18-gauge sheet metal or 4X8 3/4" plywood)
(2) Side liners (18" x 49" x 3/4" plywood
Front wall liner (18" x 49" x 3/4" plywood)
(25) Bolts (1/2" x 1" long)
(4) Bolts (1/2" x 3" long)
Bolt (1/2" x 4" long)
(64) Bolts (5/16" x 3/4" long)
(200) Pop rivets (1/8" x 1/2" long)
Tongue (78" x 2" x 3/16" square tubing)
Tongue support (12" x 2" x 1/8" flat iron)
Mild Steel:
- (52 ft.) 2" Angle iron (3/16" or 1/4" thick)
- (51 ft.) 1 1/4" Angle iron (1/8" thick)
- (6 ft.) 1" Flat iron (1/8" thick)

Tools List
Jigsaw
Hacksaw
Heavy duty drill
Wrenches
Angle grinder or bench grinder
Locking pliers
Basic hand tools