

## Step by Step Guide to building the BodyRail Ultra Edition - Risers Only

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Print these instructions

Read all of the instructions first before beginning - seeing the assembly pictures helps.

Tools Required (costs are approximate)

- Wire rope cutters \$20
- Cordless drill \$50
- Drill press \$100
- Drill press vise \$20
- Spade bits \$10
- Carbide or titanium drill bits \$20
- Chop saw or Radial Arm saw \$150
- Conduit cutter \$20
- 5/16" nut driver \$10
- Spray paint \$5 per can
- Sand paper

### CUTS

Make all of your cuts first as it speeds up the build process.

### **FOR ALL CUTS WEAR SAFETY GOGGLES**

Rear risers

1. Cut the two 1 x 8 boards 90" in length.
2. From the 65" 1 x 3 (leftover from rail spaces) cut two pieces 29 1/2" long for wall mounts
3. Rear riser upper support gets cut from the 83" 1 x 4 (left over from the foot-end wheel bracket). This piece is 27 3/4"
4. The front of the shelf can also be cut from the 1 x 4 and it too is 27 3/4" long
5. The base of the shelf is cut from the 1 x 6 and is 27 3/4" long
6. Rear riser upper connector plate is cut from the 1 x 6 and is 29 1/2" long
7. The rear riser pulley bracket is cut from the 2 x 4 and is 29 1/2" long
8. The rear riser top support pieces are cut from scap and are 7 1/4" inches long. These can be cut from leftover 1x stock or 2 x 2 stock
9. Cut the two 2 x 2 rear riser base plate supports 13 1/2" long
10. Cut the 2 x 4 rear riser base plate 29 1/2" long
11. Cut the 1 x 6 rear riser lower connector plate 29 1/2" long

Front risers

1. Cut the 5/4" x 8' boards 90" in length
2. Front riser upper connector plate is cut from the 1 x 6 and is 29 1/2" long
3. The front riser pulley bracket is cut from the 2 x 4 and is 29 1/2" long
4. Cut the 1 x 6 front riser lower connector plate 29 1/2" long

5. Drill the resistance holes in the front risers.. You'll need a  $\frac{7}{8}$ " spade bit and it is strongly recommended you use a drill press as the holes must be level.
  - a. Starting from the bottom (it doesn't matter which end of the board you select as the bottom) measure up 2  $\frac{3}{4}$ ". In the center of the wide side of the board, mark this spot with a pencil. This is the center of the lowest hole. FROM THE CENTER OF THE LOWEST HOLE, mark off every 4 inches for a total of twenty holes. The distance center to center from the lowest hole to the highest hole is 76"
  - b. Repeat this for the other riser
  - c. **BEFORE DRILLING**, line up the risers next to each other, bottom to bottom, and make sure all the marks are clearly visible in the center of the boards and line up with each other. These holes hold the rail-riser rod and MUST be aligned (Videos 9593 and 9594)

#### Riser Supports

1. From a 1 x 4 cut two pieces 12  $\frac{1}{4}$ " long
2. From a 2 x 4, cut two pieces  $\frac{3}{4}$ " long
3. Cut two pilot holes through the cut sides of the 2 x 4  $\frac{3}{4}$ " from each end
4. From a  $\frac{3}{4}$ " dowel cut two pieces 1  $\frac{5}{8}$ " long
5. Drill a  $\frac{3}{16}$ " hole through the side of the dowel  $\frac{1}{4}$ " from the end for the security pin
6. At the other end of the dowel (opposite the security pin hole) drill a pilot hole for a number 10 screw  $\frac{3}{4}$ " deep

#### Rods

1. [Watch the Conduit Cutter video on the website](#)
2. Rail-Riser rod sheath - using the  $\frac{3}{4}$ " conduit, measure 26" from one end and mark it with a sharpie. Using a conduit cutter, cut the piece at the mark. If you've never done this before, check out this video. With a metal file ensure the cut end of the conduit is smooth.
3. Rail-Riser rod - using the  $\frac{1}{2}$ " conduit, measure 36  $\frac{1}{4}$ " from one end and mark it with a sharpie. Using a conduit cutter, cut the piece at the mark. With a metal file ensure the cut end of the conduit is smooth.
4. Cable rod - using the  $\frac{1}{2}$ " conduit, measure 33" from one end and mark it with a sharpie. Using a conduit cutter, cut the piece at the mark. With a metal file ensure the cut end of the conduit is smooth.
5. Seat pulley rod - using the  $\frac{1}{2}$ " conduit, measure 17" from one end and mark it with a sharpie. Using a conduit cutter, cut the piece at the mark. With a metal file ensure the cut end of the conduit is smooth.

#### Drilling carabiner holes in the cable and seat pulley rods

1. [Watch the Conduit Drilling video on the website](#)
2. To cut the carabiner holes in the cable and seat pulley rods, measure  $\frac{1}{2}$ " from each end of the conduit and mark with a sharpie. Using a drill press and a drill press vise, position the conduit in the drill press vise and start with a small bit and step your way up to the largest bit. Make sure you use a drill bit that can cut through steel. Carbide or titanium should be just fine. **When drilling through metal, do not place your hands near the surface being drilled and it will become hot. Same thing with the drill bit. Before switching out bits, let them cool.**
  - a. I started with a  $\frac{3}{16}$ " bit and drilled through both sides of the conduit in one pass, then switched out ends and repeated
  - b. Next I stepped up to a  $\frac{9}{32}$ " bit and drilled through both sides of the conduit in one pass, then switched out ends and repeated
  - c. For the 3rd pass I used a  $\frac{3}{8}$ " bit. This time I drilled through one side of the conduit, flipped it over and drilled through the second side then switched ends and repeated. As the bit gets

larger, it's harder to penetrate the second side from inside the wall of the conduit due to it's concave shape.

- d. For the final pass I used a 1/2" bit and once again I drilled through one side of the conduit, flipped it over and drilled through the second side then switched ends and repeated.
- e. Once done, use a round metal file to smooth out the edges and remove any excess metal.



### Cables

1. 4 sets of 2 cables each are needed for a total of 8 cables
2. Direct resistance handle cables - cut 36" in length
3. Short cables - cut 20"
4. Pulley handle cables - cut 73"
5. Rowing cables - cut 146"
6. Each wire rope kit has 30' or 360" of cable. One complete set takes up 275". Cut one set from each kit.
7. I used a set of wire cutters but they make wire rope cutters
8. Mark the lengths as noted above and cut the cables. Make sure each pair of cables are the same length.

### **PAINTING or STAINING (optional)**

You don't have to apply a finish to your BodyRail Ultra. Sometimes just a natural wook looks pretty cool. But if you want to paint your BodyRail Ultra, now would be a good time to do that. Be sure to let the parts dry for at least 24 hours.

If you do want to paint it, here's what I did. I set up tarps in my garage and laid out the pieces in color sections so that overspray was not an issue. Here are the quantities of spray paint I used for my color scheme

- 5 cans of burgundy for the risers and rail supports.
- 4 cans of bronze for all of the cross members

## ASSEMBLY

Now that all the cuts are done you can begin the assembly process.

Build the rear risers [watch the Rear Riser Assembly video on the website](#)

1. You'll need a tape measure, pencil, drill, drill bits, countersink bit and a phillips head drill bit
2. Intro to building the rear risers
3. Start with the base plate for the lower pulleys for rowing. Drill pilot holes 3" in from the ends of the 29 1/2" 2 x 4 and 1/2" from the front. You'll be using #10 screws so make sure the bit is smaller than the threads.



4. Attach the pulleys to the base plate with a #10 2" sheet metal screw. Do not tighten. Allow enough room for the pulleys to swivel.



5. Place the rear risers (the 90" 1 x 8's) on their edges so they are spaced 28" apart. Place the 29 1/2" 1 x 6 connector plate on the risers with the top of the connector plate 22 1/2" from the bottom of the risers. Secure to the risers with four 1 1/2" screws drilling pilot holes 3/8" from the ends into the risers. Do this on both risers.
6. Place the rear lower pulley base plate across the risers 13 1/2" from the bottom, directly under the connector plate, with the pulleys at the top facing out. Once in place, drill 2 pilot holes to hold a #10 screw through the 2 x 4 and into the center of the rear riser (3/8" inches from the ends) Countersink the pilot hole to make sure the screw will be flush without splitting the wood. Use 3" phillips head wood screws to attach the base to the risers with your drill and phillips head bit. Make sure the two pieces are square. Repeat this for the other end of the base plate.



7. Beneath the base plate, position the  $1\frac{1}{2}$ "  $2 \times 2$  (which is actually  $1\frac{1}{2}$ "  $\times$   $1\frac{1}{2}$ ") vertically. Drill 2 pilot hole  $\frac{3}{8}$ " from each end, counter sink and then secure with 3" screws using your drill and phillips head bit



8. At the top of the risers, position the  $29\frac{1}{2}$ "  $1 \times 6$  connector plate 2" down from the top of the risers. This leaves  $3\frac{1}{2}$ " above the top of the risers. Drill two pilot holes through the connector plate into the center of the risers ( $\frac{3}{8}$ " from the ends). You'll be using a #8  $1\frac{1}{2}$ " wood screw to fasten so make sure the pilot hole is smaller than the thread. And then countersink the connector plate. Attach the connector plate to the risers with the screws using your drill and phillips head bit. Repeat for the other riser.



9. At the top of the rear riser attach a piece of scap  $1 \times 1$  or  $2 \times 2$  for additional support of the pulley cross member that will be installed. Cut the piece  $7\frac{1}{4}$ " long and secure with two  $1\frac{1}{4}$ " wood screws after drilling pilot holes. Be careful not to penetrate all the way through the riser. Repeat for the other riser.



10. Attached the  $\frac{3}{8}$ " 6" eye bolts through the pulley cross member. 3" from the end of the 29  $\frac{1}{2}$ " 2 x 4, drill  $\frac{3}{8}$ " holes all the way through. Slide the eye bolt through and secure on the other end with a washer and nut
11. From the connector plate side, secure the pulley cross member to the connector plate with four 1  $\frac{1}{2}$ " wood screws. You do not need to drill pilot holes. Just space out the screws evenly across. Once the pulley cross member is attached, add 3" corner brackets connecting the cross member to the risers. Here you will need to drill pilot holes in the top of the risers. Repeat for the other riser.



12. Mount the 29  $\frac{1}{2}$ " 1 x 3 wall mounts to the back of the rear risers. The top wall mount should be 12" from the top. The bottom wall mount should be 12" from the bottom. Drill pilot holes and through both the wall mount and the riser to hold a 2  $\frac{1}{2}$ " #8 wood screw. Countersink the pilot holes in the wall mounts and secure the wall mounts to the risers with your drill and phillips head drill bit
13. The top wall mount has additional support with a 27  $\frac{3}{4}$ " 1 x 4. Center this over the 1 x 3. Connect to the 1 x 3 and the risers with four 1  $\frac{1}{2}$ " corner brackets.



14. Also drill a pilot hole from the outside of the risers  $\frac{3}{8}$ " in and 13  $\frac{3}{8}$ " from the top of the riser. Countersink this hole. Use a 2  $\frac{1}{2}$ " screw to secure the 1 x 4 to the riser. Repeat this on the other side of the riser



Build the front risers [watch the Front Riser Assembly video on the website](#)

1. You'll need a tape measure, pencil, drill, drill bits, countersink bit, a phillips head drill bit and a one inch hole saw.
2. The lower front connector plate needs to be notched out to make room for where the pulleys are attached. Measure 3" from each end and mark it. With a 1" hole saw, line it up at the 3" mark and drill out a half circle. Do this on the other side of the plate.



3. For the front risers, place the 29 1/2" 1 x 6 connector plate on the risers with the top of the connector plate 22 1/2" from the bottom of the risers. Position the pilot holes so they are between the 7/8" holes in the front riser. Drill pilot holes through the connector plate and into the risers. Counter sink the pilot holes in the connector plate to ensure the screws will be flush. Secure to the risers with four 1 1/2" screws drilling pilot holes 5/8" from the ends into the risers. Do this on both risers



4. Just like the rear risers at the top of the front risers, position the 29 1/2" 1 x 6 connector plate 2" down from the top of the risers. This leaves 3 1/2" above the top of the risers. Drill two pilot holes through the connector plate into the center of the risers (5/8" from the ends as the front risers are 5/4" stock, not 3/4"

stock like the rear risers). You'll be using a #8 1 ½" wood screw to fasten so make sure the pilot hole is smaller than the thread. And then countersink the connector plate. Attach the connector plate to the risers with the screws using your drill and phillips head bit. Repeat for the other riser.

5. Just like the rear risers, from the connector plate side, secure the 2 x 4 cross member to the connector plate with four 1 ½" wood screws. You do not need to drill pilot holes. Just space out the screws evenly across. Once the 2 x 4 cross member is attached, add 1 ½" corner brackets connecting the cross member to the risers. Here you will need to drill pilot holes in the top of the risers. Repeat for the other riser. The front cross member does not need eye bolts.



Connect risers to the wall [Watch the Wall Mounting video on the website](#)

1. Position the rear risers against the wall where you will be planning to use the machine. Leave at least 3 feet on one side of the risers to remove the cable rod and the rail-riser rod when adjusting for exercises.
2. Since the risers are 29 ½" wide, they will span 2 studs in the wall.
3. Find the studs in the wall with either a stud finder or knocking on the wall and mark them accordingly.
4. It's ok if the risers are not perfectly centered across the two wall studs.
5. Make sure the risers are plumb by using a level.
6. Keeping the risers plumb and resting on the floor, drill 3/16" pilot holes through the mounting brackets and into the studs.
7. Secure the lower rear riser mounting bracket to the wall studs with four 3" ¼" lag screws. **THE RISER MUST REST ON THE FLOOR AND BE MOUNTED TO TWO WALL STUDS.**



8. Secure





9. Place the front risers in front of the rear risers.
10. Line up the lower connector plates so the ends and top are flush with each other and hold together with a C-Clamp.
11. Drill three  $\frac{1}{4}$ " holes in the connector plate  $1\frac{1}{2}$ " down from the top of the plate. The first hole should be in the center with the other two holes 7" on either side of the center. Attach a  $\frac{1}{4}$ " t-nut to the back of the rear connector plate. Tap in with a hammer if needed. Place a washer over the  $1\frac{1}{2}$ "  $\frac{1}{4}$ " hex bolts and slide through the holes in the connector plates. Tighten each bolt to the t-nut.



12. Line up the upper connector plates so the ends and bottom are flush with each other and hold together with a C-Clamp.
13. Drill three  $\frac{1}{4}$ " holes in the connector plate  $1\frac{1}{2}$ " up from the bottom of the plate. The first hole should be in the center with the other two holes 7" on either side of the center. Attach a  $\frac{1}{4}$ " t-nut to the back of the rear connector plate. Tap in with a hammer if needed. Place a washer over the  $1\frac{1}{2}$ "  $\frac{1}{4}$ " hex bolts and slide through the holes in the connector plates. Tighten each bolt to the t-nut.



Build the cables [Watch the Cable Assembly video on the website](#)

1. You'll need a tape measure, sharpie and a  $\frac{5}{16}$ " hex driver
2. From the end of each cable, mark off 7". This is the length needed to create the loop



3. To create the loop on each end, take two  $\frac{1}{8}$ " wire rope clips (the kit comes with two thimbles and 6 larger clips, you can set those aside as we won't be using them) and assemble them with the nuts just started on the threads.
4. Slide the clips over the end of the wire rope.



5. Loop the end of the wire rope back through the clip with the end piece of the rope on the nut side of the clip.



6. Adjust the loop so that the end of the wire rope lines up with the 7" mark you made. One clip should be just inside the mark, the second clip on the inside of the first making their loop slightly smaller



7. Tighten the nuts with either an adjustable wrench or ideally a 5/16" nut driver.



8. Repeat this process until you have completed loops at the end of all cables.

#### Build the riser supports

1. Riser supports are just that. Because there is a 65" span where the front and rear risers do not touch, this apparatus provides additional support anywhere up and down the riser if needed.
2. Take the 12 1/4" 1 x 4 and attach the dowel with a #10 1 1/4" round headed screw
3. Place the 2 x 4 3 1/2" from the same end as the down and connect to the 1 x 4 with 1 1/4" round head screws
4. On the outside of each end of the 1 x 4, attach 1 1/12" corner brackets so they wrap around the ends
5. Place a round headed sheet metal screw through the security hole in the dowel
6. Repeat for a second riser support



### Build and attach Shelf

1. The 27 ¾" long 1 x 6 base of the shelf can be mounted anywhere inside the risers. I recommend about 36" from the top as this will provide plenty of space to store the foot platform and other accessories. It is also a good height to hold an iPad.
2. Secure the 1 x 6 to the risers with four 1 ½" corner brackets, one in each corner, from underneath. Leave ¾" in the front to mount the face of the shelf.
3. The 1 x 6 leaves a gap of about 1 ½" between the machine and the wall. My thought here is that it allows you to mount a mirror if you would like.
4. The 27 ¾" long 1 x 4 front of the shelf can be attached to the base with four 1 ½" wood screws. Be sure to drill pilot holes and countersink.



### Thread through rowing pulleys by removing sheave.

1. To thread the 175" cables through the rowing pulleys, take the pulley that will hang from the top of the unit, pull out the pins that secure the axle for the sheave. Remove the axle, then remove the sheave. Place the cable in the pulley, replace the sheave, axle and pin.
2. Hang the pulley from the eye bolt with a locking carabiner
3. Repeat the process for the pulley that is attached in the base plate



#### Build seat pulley mechanism including rod

1. To thread the 73" cables through the handle pulleys, take two pulleys, pull out the pins that secure the axle for the sheave. Remove the axle, then remove the sheave. Place the cable in the pulley, replace the sheave, axle and pin. Then hang one of the pulleys from the 17" rod with a spring carabiner. Repeat this process for the other cable.



#### Attach storage hooks for handles and cables (optional)

1. I installed hooks on the inside of the rear risers to hold cables. Just be sure the threads on the hooks do not penetrate the outside of the riser.