

# Air Seat Construction Instructions for Reeder and GB Handles

Air seats are indisputably the most comfortable unicycle seats available. These instructions will teach the reader to construct a unicycle air seat using a Gemcrest carbon fiber base with either a Reeder or GB handle. The instructions are broken down into the following categories:

- Seat base preparation
- Component assembly
- Air pillow preparation
- Cover preparation
- Final assembly

It is recommended that the reader review the instructions in their entirety before beginning construction. Questions and comments are welcomed by email at [info@gb4mfg.com](mailto:info@gb4mfg.com).

## Materials required:

- 1 - Gemcrest carbon fiber saddle frame
- 1 - GB4 Reeder or GB Handle
- 1 - Miyata rear bumper (or alternatively a Kinport rear bumper)
- 2024 aluminum fasteners
  - 9 - 1/4" x 20 TPI x 0.750" hex head bolts
  - 9 - 1/4" x 20 TPI hex nuts
  - 15 - 1/4" flat washers
- 1 - Seat cover (choose from Roach nylon or Gemcrest leather covers)
- 1 - Dog bone air pillow
- 1 - 20" bicycle inner tube
- 1 - Seat post (or seat post rail adapter)
- 1 - old bicycle inner tube (or other source for thin rubber)
- 10 - 1/4" grommets (only required for Gemcrest leather cover)
- 1 - shoe string (or other similar string)
- 1 - tube of Loctite Blue (or similar medium strength thread locking compound)
- 1 - roll of duct tape

## NOTE:

- Unicycle related parts are available at Unicycle.com ([www.unicycle.com](http://www.unicycle.com)). All other materials can be found at most hardware stores or McMaster Carr ([www.mcmaster.com](http://www.mcmaster.com)).
- These instructions call for aluminum hardware. Steel hardware will work, but aluminum costs only a few dollars more, saves 82 grams, and will not rust.

## Tools required:

- 7/16" socket and ratchet
- 7/16" open end wrench
- 220 grit (or similar) sand paper
- Paint marker or other marking device
- Power drill or drill press with 9/32" and 11/32" drill bits
- Scissors
- Grommet installation kit
- Bicycle tire pump

## **WARNING:**

- The construction of an air seat requires the use of some common power tools. Power tools are dangerous pieces of machinery. If you are not experienced with them leave the drilling operations to an experienced machinist.
- The Gemcrest carbon fiber saddle frame does not have any holes drilled in it to begin with. Because drilling errors are not easily fixed in carbon fiber, great care should be used while locating and drilling holes for components
- Drilling carbon fiber produces very fine fiber dust. Avoid touching the dust with bare skin.

## **STEP 1: Seat base preparation**

1. Place the seat post on the underside of the carbon fiber frame and locate its desired mounting location. Ensure that the post is straight and centered on the frame. Holding the seat post in place, mark the locations of the four mounting holes with a paint marker. The holes should be similar in location to the four central holes pictured in Figure 1.
2. Use a 9/32" drill bit to drill four holes in the locations marked above. Sandpaper can be used to remove any sharp or rough edges.
3. At this time you can make a rubber cushion to go between the carbon fiber base and the seat post as shown in Figure 2. This will serve to reduce the stress placed on the carbon fiber seat base. Trace the outline of the seat plate and mounting holes onto a thin piece of rubber cut from an old bicycle inner tube. Cut out the outline and holes using a pair of sharp scissors. Repeat these steps to create a cushion for the handle as shown in Figure 3.



**Figure 1: Carbon fiber base with all holes drilled**



**Figure 2: Rubber seat post cushion**



**Figure 3: Rubber handle cushion**

4. Place the Miyata bumper on the rear of the saddle. Use a paint marker to mark the locations of the two mounting holes. With the bumper in place, mark a hole for the valve stem on the base. This will be on the centerline of the saddle, slightly ahead of the bumper. Figure 1 shows an appropriate location for this valve stem hole.

5. Remove the bumper and use a 9/32" drill bit to drill the two mounting holes. Use an 11/32" drill bit to drill the hole for the valve stem. Again, sandpaper can be used to remove any sharp or rough edges.

6. Place the handle on the front of the saddle. Refer to Figure 4 for an appropriate mounting location for Reeder handles. Refer to Figure 5 for an appropriate mounting location for GB handles. Be sure that there is enough clearance between the sides of the carbon fiber base and the handle for the seat cover to slide through. Using a paint marker mark the locations of the three mounting holes. Remove the handle.

7. Using a 9/32" drill bit, drill three holes in the locations marked above. If you wish, you may install the handle with a bolt and nut after the first hole is drilled to hold it in place and ensure that subsequent holes line up.

8. Once all necessary holes are drilled and sanded smooth you can begin mounting saddle components. Proceed to the component assembly portion of these instructions.



Figure 4: Reeder handle mounting location



Figure 5: GB handle mounting location

## STEP 2: Component Assembly

1. Place four hex head bolts with washers through the seat post mounting holes. These bolts will be installed from the top side of the seat base.
2. Install the rubber cushion and seat post over the bolts and place a flat washer on each bolt.
3. Place a small amount of Loctite Blue on these bolts and then install four hex nuts. It may work best to use a ratchet to tighten the nut on bottom while holding the bolt head with another wrench.
4. Place three bolts with washers through the handle mounting holes. Install the rubber cushion and handle.
5. Place one drop of Loctite Blue on the bolt threads and install three nuts. Flat washers are not required on these holes. At this point your seat should look similar to Figure 7.
6. Place two washers and bolts through the bumper mounting holes. Do not install the bumper yet.
7. Place a small square of duct tape over every bolt head on the top of the saddle frame as shown in Figure 8. This will prevent the edges of the bolts from puncturing the inner tube.
8. Set the saddle base assembly aside and proceed to the air pillow preparation instructions.



Figure 6: Tightening the handle bolts



Figure 7: Seatpost and handle installed



Figure 8: Tape over the bolt heads

### STEP 3: Air pillow preparation

1. Unfold the flaps on each end of the dog bone pillow.
2. Feed the deflated 20" bicycle inner tube through the air pillow as shown in Figure 9. Be sure that the valve stem is centered on one of the ends.
3. Adjust the tube until an equal amount shows out of each end of the pillow. Carefully fold the flaps on each end over the tube.
4. Position the valve stem so that it sticks out of the flap in pillow. Add a small amount of air to the tube, just enough to fill the tube.
5. Fold the air pillow in half.
6. Place duct tape straps around the now folded pillow as shown in Figure 10. This will prevent the tube from shifting once installed.
7. Set the air pillow aside and proceed to the cover preparation instructions.



Figure 9: Feeding the tube through the pillow

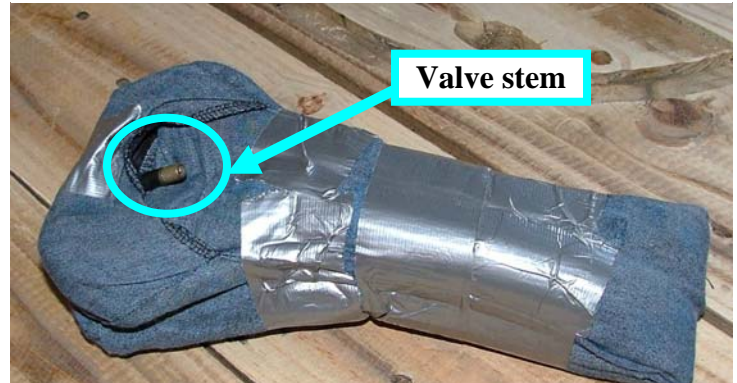


Figure 10: Finished air pillow



Figure 11: Leather cover with grommets

### STEP 4: Cover preparation

#### Leather saddle cover preparation

Install ten 1/4" grommets on the front portion of the air seat in locations similar to those in Figure 11. Follow the instructions that came with your grommet installation kit.

#### Nylon saddle cover preparation

Cut a circular hole in the front part of the thin lycra material on the underside of the cover, as pictured in Figure 12. The handle will later be fed through this hole. Both GB and Reeder handles will use the same size and location of hole.



Figure 12: Nylon cover with hole cut for handle

Proceed to the final assembly instructions.

## STEP 5: Final Assembly

1. Place the air pillow on top of the saddle frame as shown in Figure 13. Place the valve stem through the hole you drilled for it.
2. Assemble the saddle cover over the air pillow and frame. The nylon cover will pull on like a sock as pictured in Figure 14.
3. Fold about half an inch of cover material over the rear of the saddle and install the bumper as shown in Figure 15. Add two flat washers and hex nuts. Loctite Blue is not necessary on these nuts as the plastic will provide enough back pressure to keep the nuts from loosening.
4. Lace up the cover using the shoe lace as shown in Figure 16. If you have a leather cover, use the grommets you installed. If you have a nylon cover, use the nylon loops provided. When finished, securely knot the shoe lace and stuff the excess up under the cover.
5. To complete the installation, inflate the tube just enough to fill the entire volume under the cover without pressurizing the tube.

Congratulations, you have successfully assembled a unicycle air seat. Install the seat and go for a ride! The inner tube air pressure can be varied to suit your preferences. If the installation did not go as expected or you have any questions, please send an email to [info@gb4mfg.com](mailto:info@gb4mfg.com).



Figure 13: Air pillow on top of base



Figure 14: Assembling cover



Figure 15: Cover installed



Figure 16: Completed air seat