

## Rat Cage Lid Modification Procedure

**Parts List:**

| Name                      | Part Number | Vendor / Part Type                | Qty / Unit |
|---------------------------|-------------|-----------------------------------|------------|
| Rat Cage Lid              |             | Purchased-Techniplast             | 1          |
| RC Panel Front            | J009859     | Custom machined                   | 1          |
| RC Panel Front for Bottle | J009837     | Custom machined                   | 1          |
| RC Panel Side             | J009838     | Custom machined                   | 2          |
| RCBH4 Weldment            | J008644     | Custom weldment-GoProto           | 1          |
| RC Bracket Front          | J009600     | Custom sheetmetal-GoProto         | 2          |
| RC Bracket Long           | J009835     | Custom sheetmetal-GoProto         | 2          |
| RC Bracket Side           | J009836     | Custom sheetmetal-GoProto         | 2          |
| Card Holder Bracket       | J010308     | Custom sheetmetal-GoProto         | 1          |
| Rat Cage Flap Assembly    |             | Purchased-Part of Techniplast Lid | 1          |
| Rivets - .063" - .125"    | 97447A015   | McMaster                          | 28         |
| Rivets - .126" - .187"    | 97447A020   | McMaster                          | 22         |
| Rivets - .188" - .25"     | 97447A025   | McMaster                          | 2          |
| 18-8 SS No. 4 Washer      | 98019A309   | McMaster                          | 8          |
| 18-8 SS No. 5 Washer      | 90945A712   | McMaster                          | 20         |
| Epoxy, 3M DP125           | 7467A65     | McMaster                          | 1          |

**Tools List:**

| Name                    | Part Number | Vendor   | Quantity/Unit |
|-------------------------|-------------|----------|---------------|
| Angle Grinder/Dremel    |             |          |               |
| 1/8" Drill Bit          |             |          |               |
| #28 Drill Bit           |             |          |               |
| Power Drill             |             |          |               |
| Pliers                  |             |          |               |
| Epoxy Applicator Gun    | 74695A71    | McMaster | 1             |
| Masking Tape            |             |          | 1             |
| Binder Clips (optional) |             |          | 2             |

## Procedure

### 1. Cut Cage Lid

- Cut water bottle holder sections off the lid – cut lines shown in red on right picture



- Save metal flap assembly for reattachment to modified cage – there should be four components

- Axle, spring, axle-mounted flap, large rectangular cover



- Grind off both card holders on the front

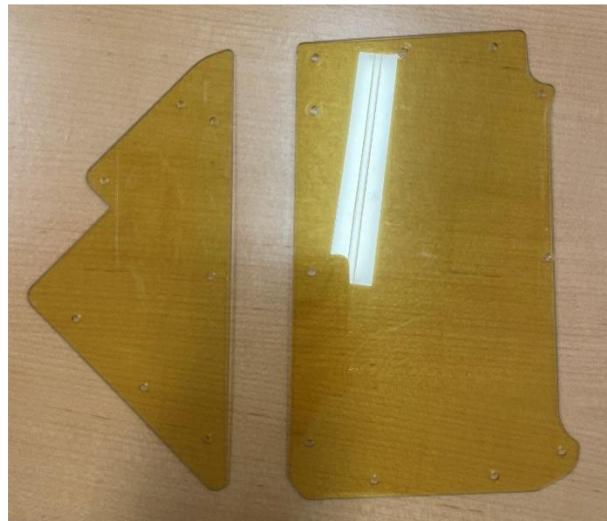


## 2. Assemble Flat Cover

Parts:

| Part Number | Quantity |
|-------------|----------|
| J009859     | 1        |
| J009838     | 1        |
| J009600     | 1        |
| J009835     | 1        |
| J009836     | 1        |
| 97447A015   | 10       |
| 90945A712   | 2        |

- a. Rivet front panel (J009859) and side panel (J009838) together using the long bracket (J009835) and six 97447A015 rivets
  - i. Proper orientation of the panels, with respect to each other:



- ii. The bracket is not symmetrical – the side with square corners should be attached to the front panel
- iii. Bracket should be attached on the inside of the panels, with rivets attached from the outside, so the flat head is on the outside of the plastic



- b. Rivet front bracket (J009600) to the front panel with two 97447A015 rivets
  - i. Bracket should be on the inside of the panel, with the bracket extending down below the panel
  - ii. Rivets attached from the outside, so the flat head is on the outside of the plastic



- c. Rivet side bracket (J009836) to the side panel with two 97447A015 rivets
  - i. Bracket should be on the outside of the panel, with the short side of the “z” attached to the panel and the bracket jutting out away from the panel
  - ii. Rivets will be attached through the bracket into the panel – use two washers (90945A712) behind the panel



### 3. Assemble Water Bottle Holder Cover

Parts:

| Part Number              | Quantity                        |
|--------------------------|---------------------------------|
| J009837                  | 1                               |
| J009838                  | 1                               |
| J008644                  | 1                               |
| J009600                  | 1                               |
| J009835                  | 1                               |
| J009836                  | 1                               |
| 97447A015                | 18                              |
| 90945A712                | 2                               |
| 98019A309                | 8                               |
| Cage Flap Assembly Parts | 1 ea. axle, spring, flap, cover |

- a. Attach RCBH4 Weldment (J008644) to the front panel (J009837) in the orientation shown here using eight 97447A015 rivets



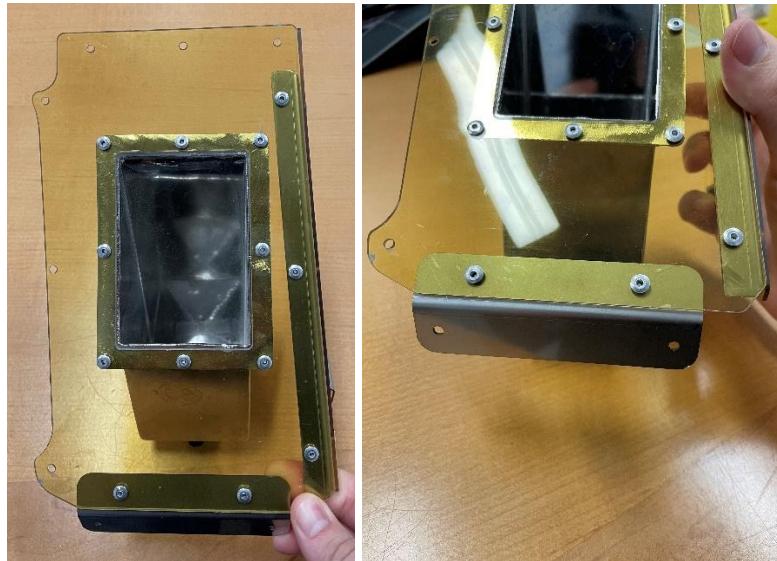
- b. Rivet front panel and side panel (J009838) together using the long bracket (J009835) and six 97447A015 rivets
  - i. Proper orientation of the panels, with respect to each other:



- ii. The bracket is not symmetrical – the side with square corners should be attached to the front panel
- iii. Bracket should be attached on the inside of the panels, with rivets attached from the outside, so the flat head is on the outside of the plastic



- c. Rivet front bracket (J009600) to the front panel with two 97447A015 rivets
  - i. Bracket should be on the inside of the panel, with the bracket extending down below the panel
  - ii. Rivets attached from the outside, so the flat head is on the outside of the plastic



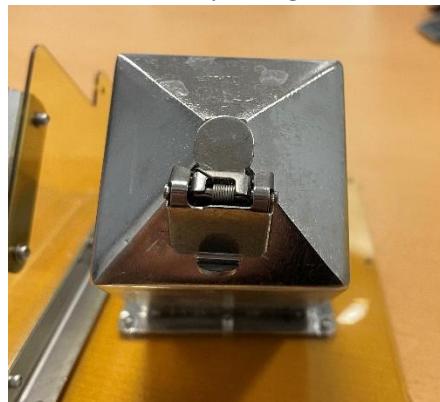
- d. Rivet side bracket (J009836) to the side panel with two 97447A015 rivets
- Bracket should be on the outside of the panel, with the short side of the “z” attached to the panel and the bracket jutting out away from the panel
  - Rivets will be attached through the bracket into the panel – use two washers (90945A712) behind the panel



- e. Attach cover flap assembly to weldment
- Axle spans the two tabs on the weldment, below the through hole for the water bottle tip
  - Eight 98019A309 washers should sandwich the flap and spring, four on either side, to keep the flap and spring centered over the through hole



- iii. Cover should snap into grooves in the axle and click into place



- iv. Bend tab over far enough to ensure cover will stay in place.

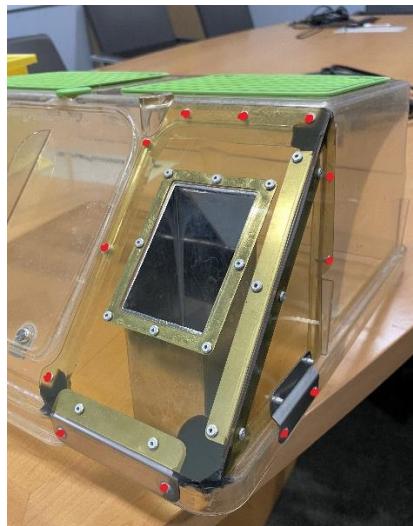


#### 4. Attach Water Bottle Cover Assembly to Cage

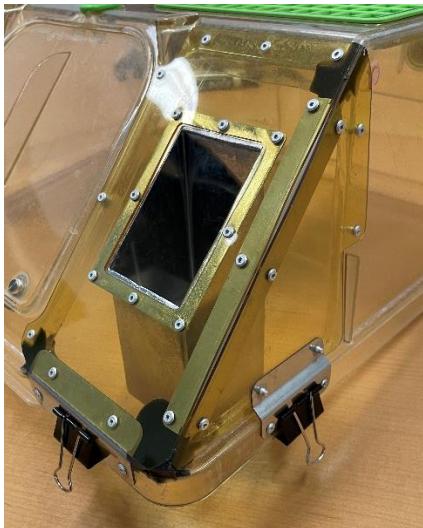
Parts:

| Part Number | Quantity |
|-------------|----------|
| 97447A020   | 12       |
| 90945A712   | 8        |

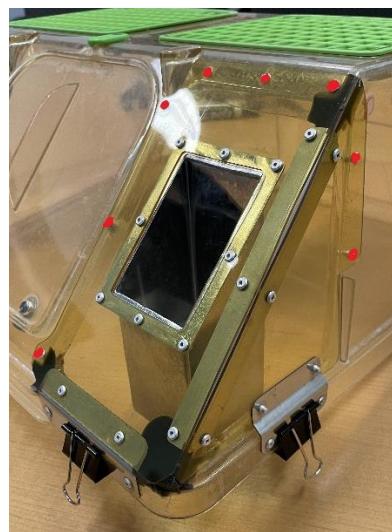
- a. Use cover assembly as guides to drill mounting holes through cage lid – hole locations marked in red
- Water bottle holder assembly mounts on right side of lid when looking at the front
  - Drill initial holes with 1/8" bit



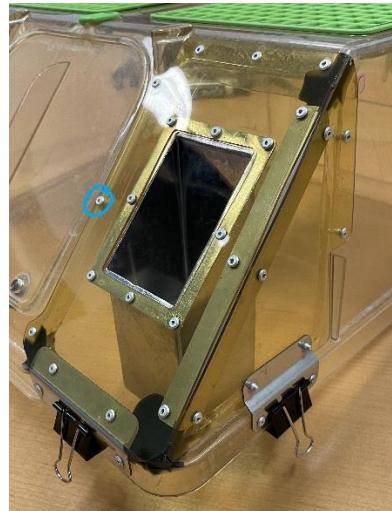
- iii. Can be helpful to hold the cover assembly in place with binder clips while drilling



- b. Remove cover assembly and enlarge holes with #28 drill bit
- c. Attach cover assembly to lid using twelve 97447A020 rivets
  - i. The eight rivets going through the front and side walls of the cage lid, as opposed to the bottom rim, should have backing washers (90945A712) behind the lid – locations shown in red. The rivets going through the bottom rim should be installed from the inside.



- ii. The washer for the hole circled in blue will need to be cut into a D-ring to fit in the compressed space along the thin wall



- iii. The two rivets through the bottom lip on the right side of the lid need to be installed from the **inside**. Grind the rivets down on the outside after riveting.



## 5. Attach Flat Cover Assembly to Cage

Parts:

| Part Number | Quantity |
|-------------|----------|
| 97447A020   | 10       |
| 90945A712   | 8        |
| J010308     | 1        |
| 97447A025   | 2        |

- a. Use cover assembly as guides to drill mounting holes through cage lid – hole locations marked in red
  - i. Flat panel assembly mounts on left side of lid when looking at the front
  - ii. Drill initial holes with 1/8" drill bit



- iii. Can be helpful to hold the cover assembly in place with binder clips while drilling
- b. Remove cover assembly and enlarge holes with #28 drill bit if needed to install rivets.
- c. Attach cover assembly to lid
  - i. The eight rivets going through the front and side walls, as opposed to the bottom rim, should have backing washers behind the lid plastic – locations shown in red. The rivets going through the bottom rim should be installed from the inside.



- ii. The washer for the hole circled in blue will need to be cut into a D-ring to fit in the compressed space along the thin wall



- iii. The card holder bracket (J010308) should be riveted to the front lip of the lid along with the cover using two 97447A025 rivets



- iv. At all ten other points of attachment, the 97447A020 rivets are sufficient

- v. The two rivets through the bottom lip on the left side of the lid need to be installed from the **inside**. Grind the rivets down on the outside of the cage after installation.



## 6. Epoxy

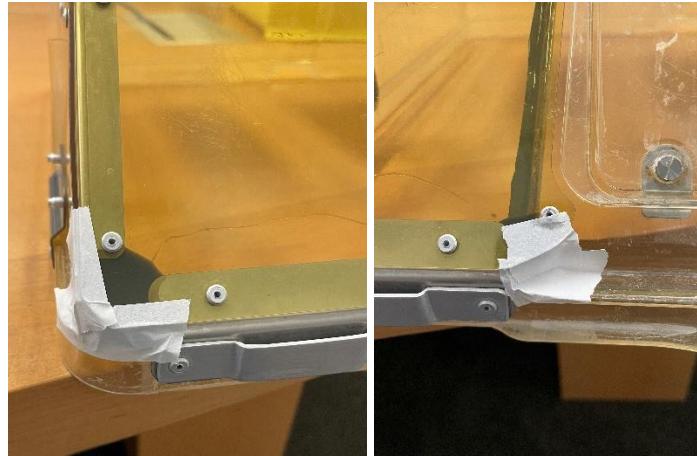
- a. Seal the corners of the covers with epoxy (7467A65)

- i. Circled corners need epoxy

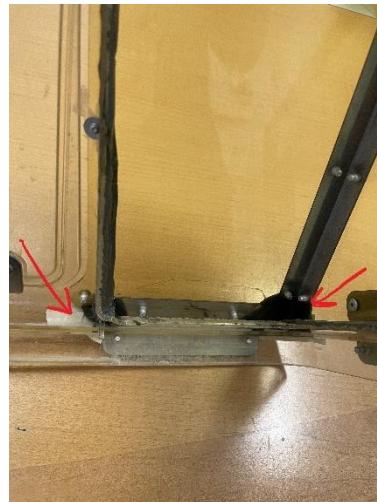
Note: There is epoxy all the way around the cut opening in the left side of the lid in these photos – that is leftover from a different modification. Do not replicate this



- ii. Tape over the openings



- iii. Inject epoxy with applicator gun from the inside of the lid



- iv. Stand on end to prevent epoxy from running and let dry 24 hours before removing tape
- v. After epoxy has dried remove tape and examine the outer surfaces of the cage for sharp edges created by sagging epoxy. **Sand any sharp edges that could cut skin or tear gloves.**

| Revision History |          |  |
|------------------|----------|--|
| DATE             | INITIALS | DESCRIPTION  |
| 8/4/2025         | JBA      | Added note about sanding sharp edges and pointed out flap spacer washers   |
| 9/23/2025        | JBA      | Add better images and descriptions re: washers and rivet install direction on lower lid flange, to be installed from inside.                               |
| 02/05/2026       | JBA      | Add notes regarding rivets installed from the inside of cage top lower lip. The rivets should be ground down on the outside to ensure cage rack clearance. |