

## 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

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



- b. Save metal flap assembly for reattachment to modified cage – there should be four components
  - i. Axle, spring, axle-mounted flap, large rectangular cover



- c. Grind off both card holders on the front



## 2. Assemble Flat Cover

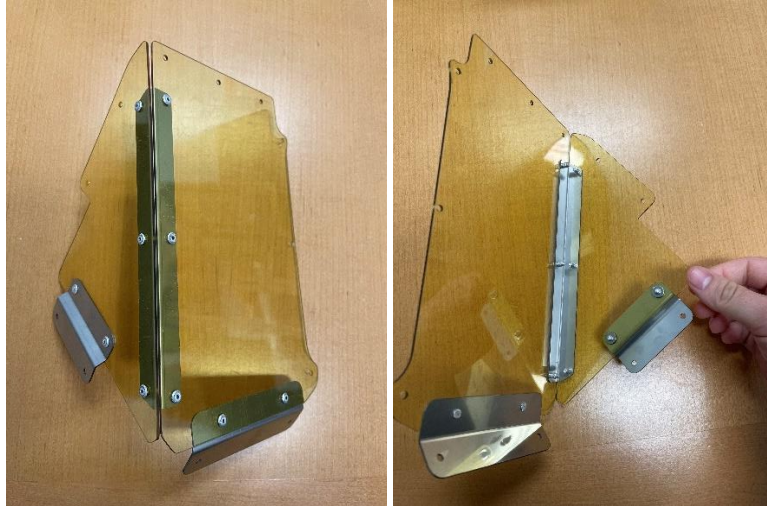
Parts:

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

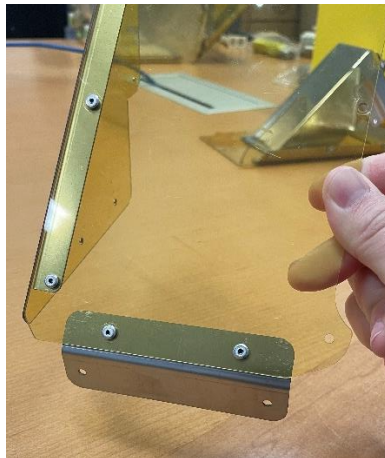
- a. Rivet front panel (J009859) and side panel (J009838) together using the long bracket (J009835) and six 97447A015 rivets
  - i. Proper orientation of the panels, with respect to each other:



- 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

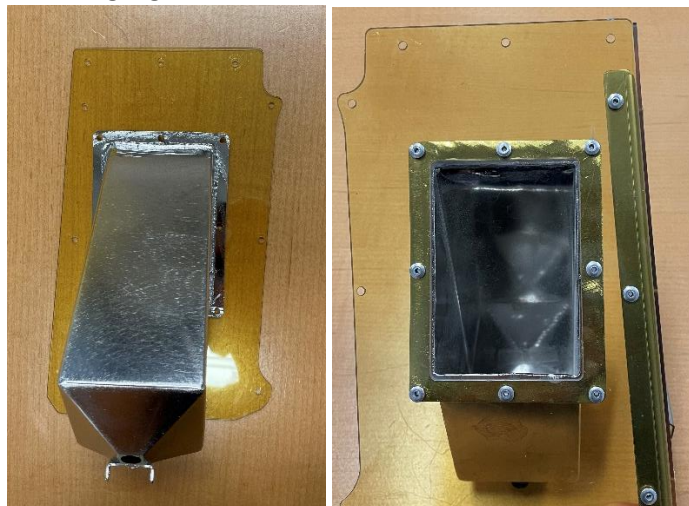


### 3. Assemble Water Bottle Holder Cover

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

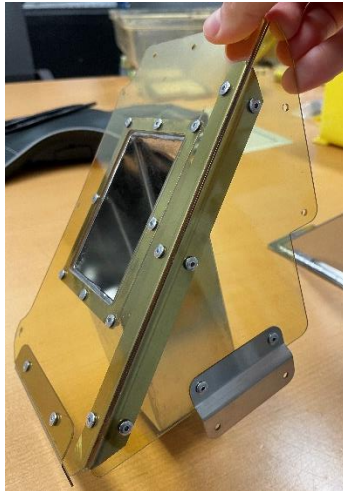


- b. Rivet front panel and side panel (J009838) together using the long bracket (J009835) and six 97447A015 rivets
  - i. Proper orientation of the panels, with respect to each other:

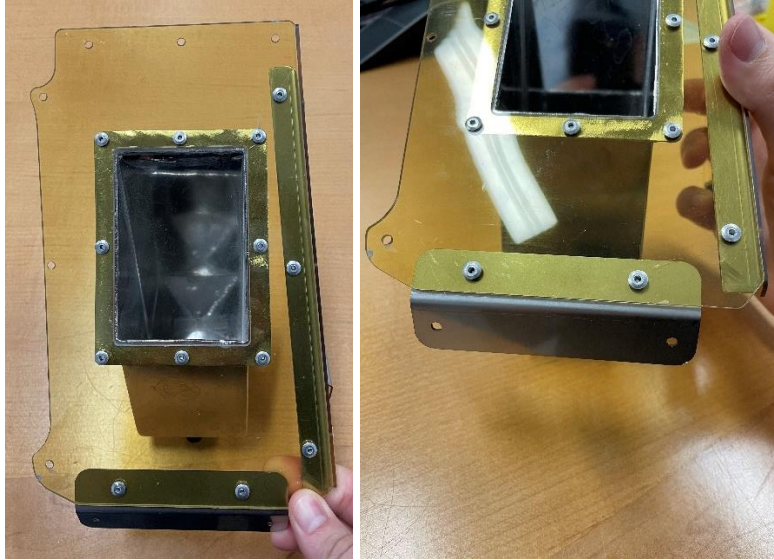




- ii. The bracket is not symmetrical – the side with square corners should be attached to the front panel
- iii. Bracket should be attached on the inside of the panels, with rivets attached from the outside, so the flat head is on the outside of the plastic



- 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



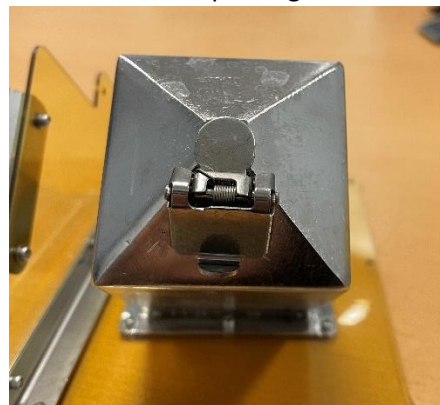
- d. Rivet side bracket (J009836) to the side panel with two 97447A015 rivets
  - i. Bracket should be on the outside of the panel, with the short side of the “z” attached to the panel and the bracket jutting out away from the panel
  - ii. Rivets will be attached through the bracket into the panel –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



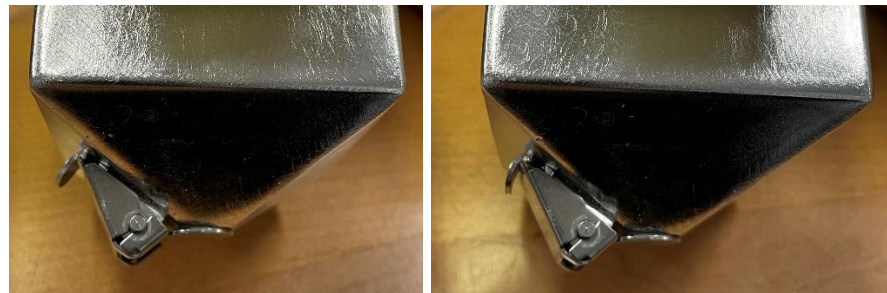
- e. Attach cover flap assembly to weldment
  - i. Axle spans the two tabs on the weldment, below the through hole for the water bottle tip
  - ii. Eight 98019A309 washers should sandwich the flap and spring, four on either side, to keep the flap and spring centered over the through hole



- 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.



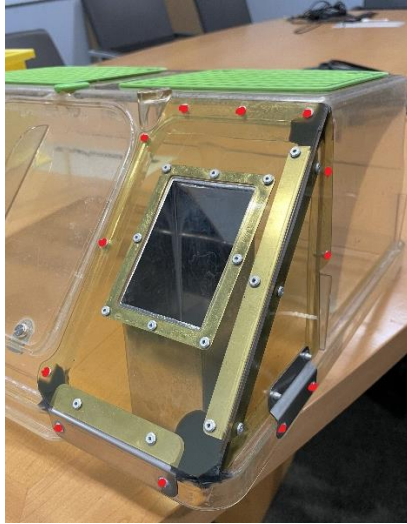
#### 4. Attach Water Bottle Cover Assembly to Cage

Parts:

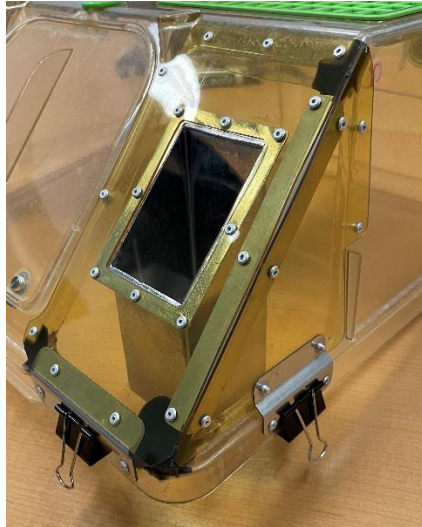
Part Number	Quantity
97447A020	12
90945A712	8

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

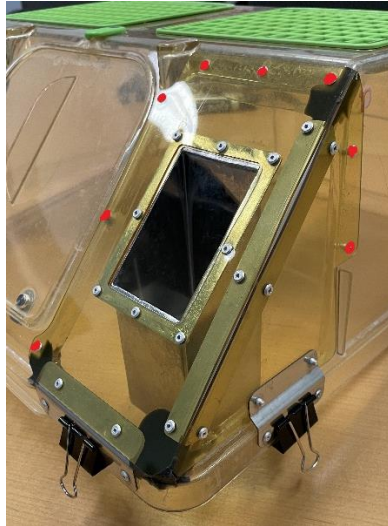




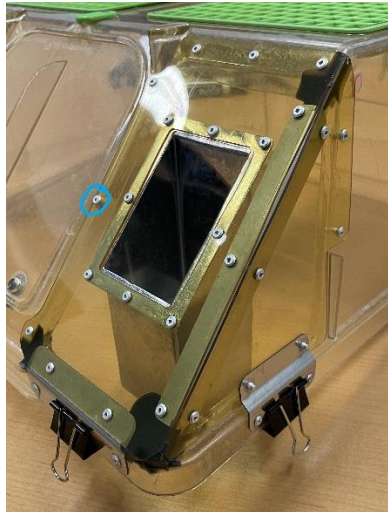
- iii. Can be helpful to hold the cover assembly in place with binder clips while drilling



- 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



- 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 ground flush to the plastic on the inside of the lid

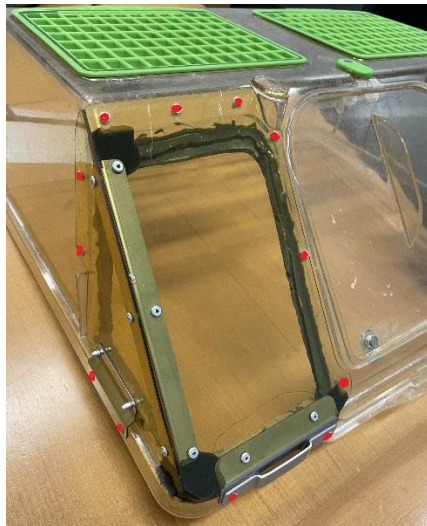


5. Attach Flat Cover Assembly to Cage

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
- 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



- 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



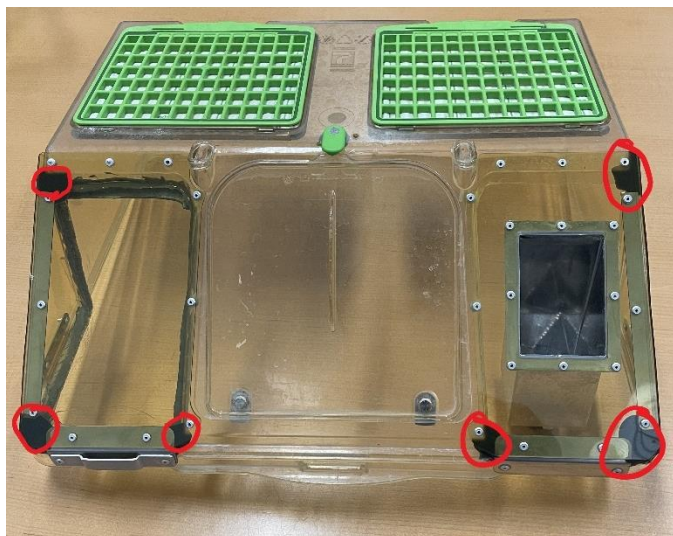
- v. The two rivets through the bottom lip on the left side of the lid need to be ground flush to the plastic on the inside of the lid



#### 6. Epoxy

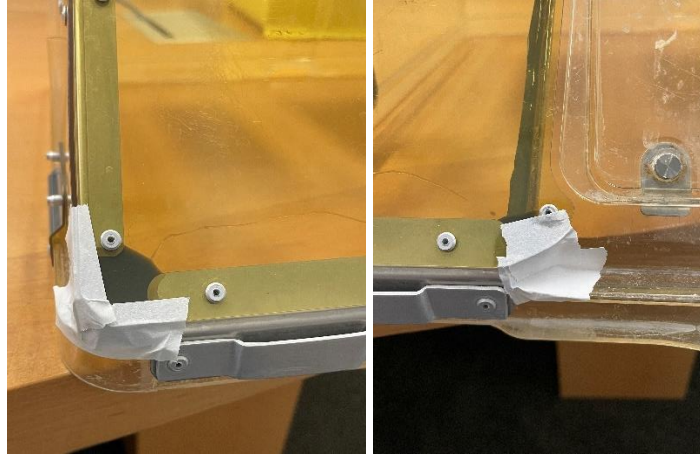
- a. Seal the corners of the covers with epoxy (7467A65)
  - i. Circled corners need epoxy

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

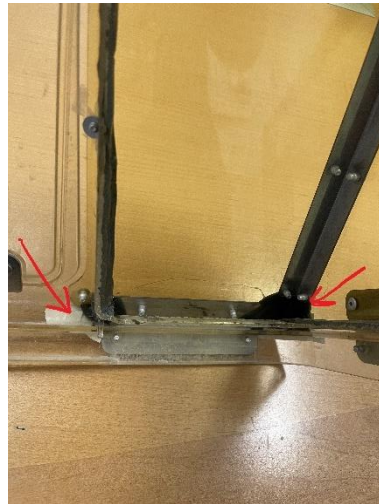


- ii. Tape over the openings





- 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.**

**Revised 8/4/2025 JBA: Added note about sanding sharp edges and pointed out flap spacer washers**