

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

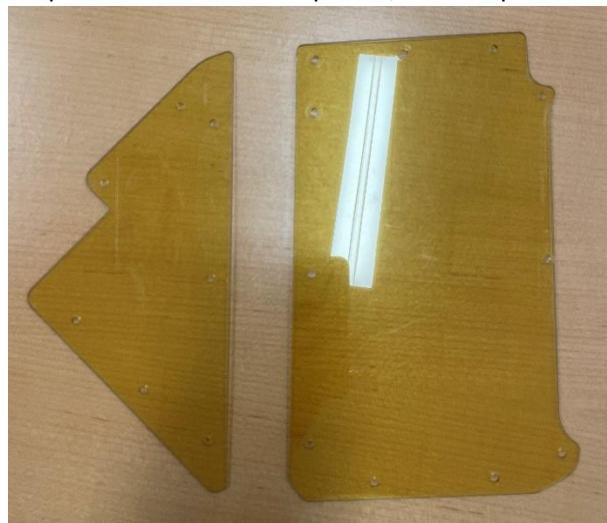


2. Assemble Flat Cover

Parts:

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

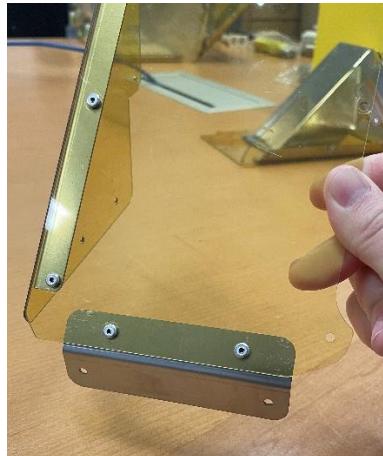
- a. Rivet front panel (J009859) and side panel (J009838) together using the long bracket (J009835) and six 97447A015 rivets
 - i. Proper orientation of the panels, with respect to each other:



- 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



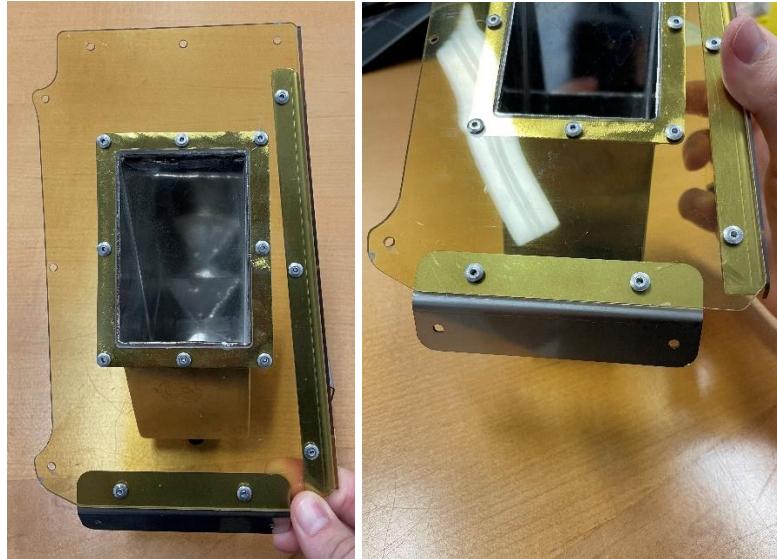
- b. Rivet front panel and side panel (J009838) together using the long bracket (J009835) and six 97447A015 rivets
 - i. Proper orientation of the panels, with respect to each other:



- 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



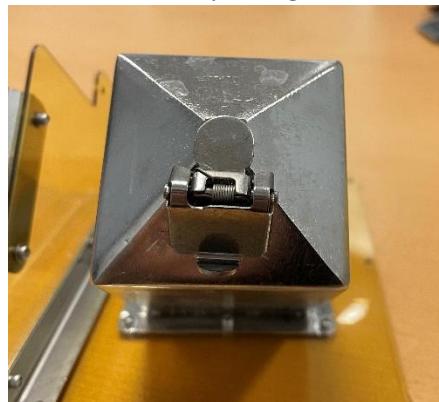
- d. Rivet side bracket (J009836) to the side panel with two 97447A015 rivets
- Bracket should be on the outside of the panel, with the short side of the “z” attached to the panel and the bracket jutting out away from the panel
 - Rivets will be attached through the bracket into the panel – use two washers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

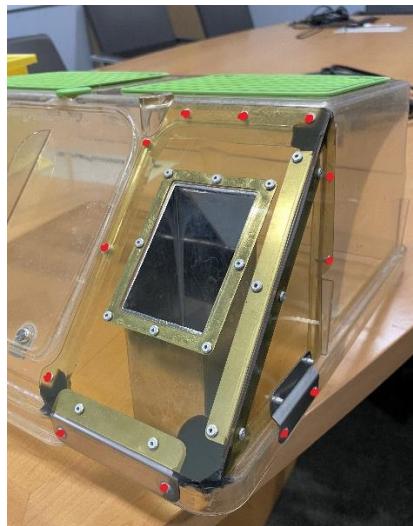


4. Attach Water Bottle Cover Assembly to Cage

Parts:

Part Number	Quantity
97447A020	12
90945A712	8

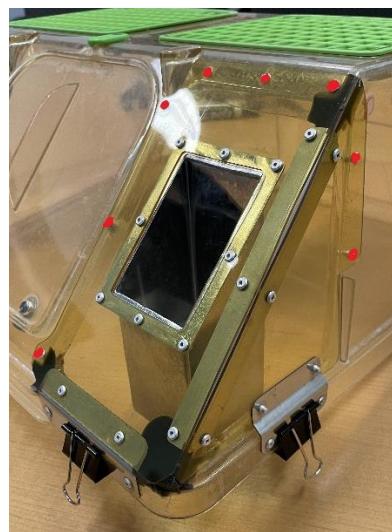
- a. Use cover assembly as guides to drill mounting holes through cage lid – hole locations marked in red
 - i. Water bottle holder assembly mounts on right side of lid when looking at the front
 - ii. Drill initial holes with 1/8" bit



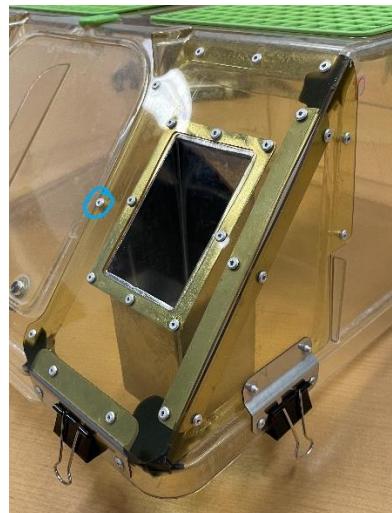
- iii. Can be helpful to hold the cover assembly in place with binder clips while drilling



- 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. 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.

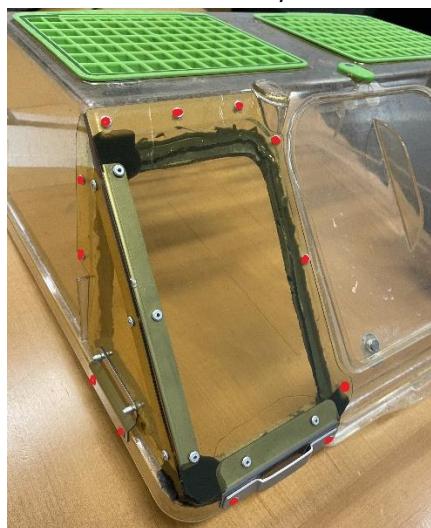


5. Attach Flat Cover Assembly to Cage

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

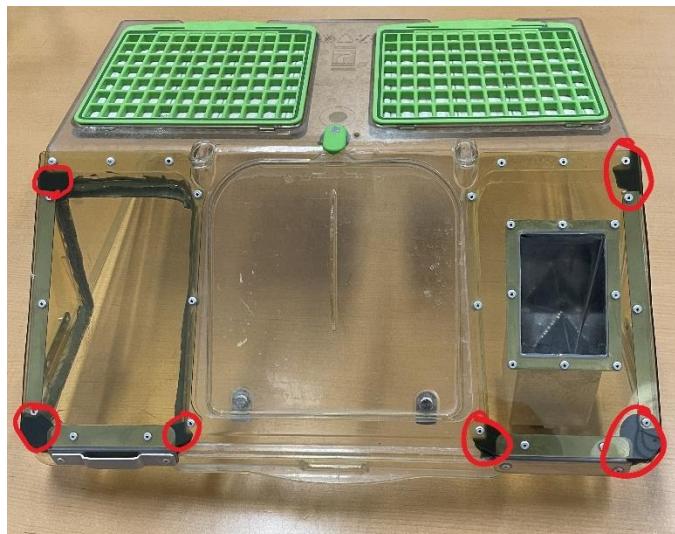
- v. The two rivets through the bottom lip on the left side of the lid need to be installed from the inside.



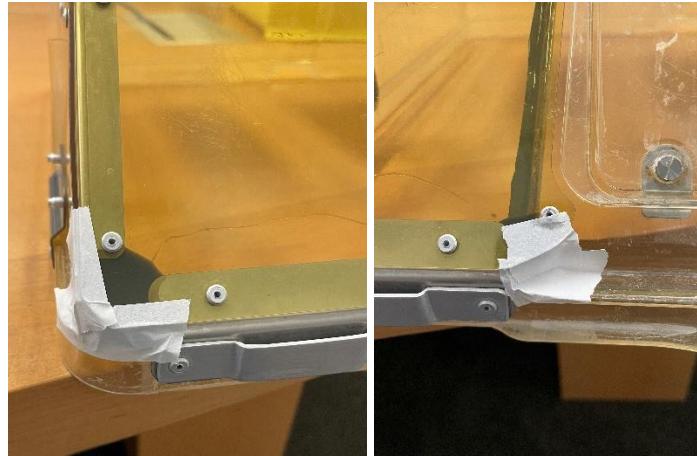
6. Epoxy

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

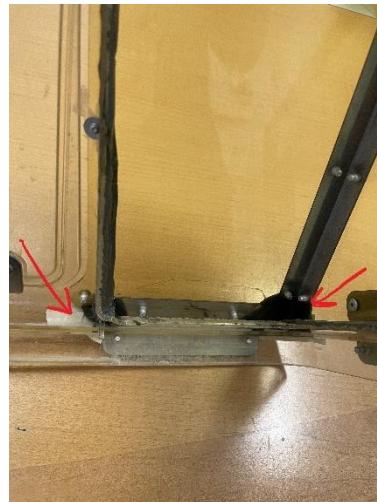
Note: There is epoxy all the way around the cut opening in the left side of the lid in these photos – that is leftover from a different modification. Do not replicate this



- 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.