# Chevy Bolt Trunk Floor Transition Plate, Version 1.1

## By R. G. Sparber



## Background

The Chevy Bolt engineers did an excellent job designing my 2023 electric car. Although I've found no design errors so far, I have found one design choice I felt I could improve: the trunk floor.

With the seats folded down, there are two problems:

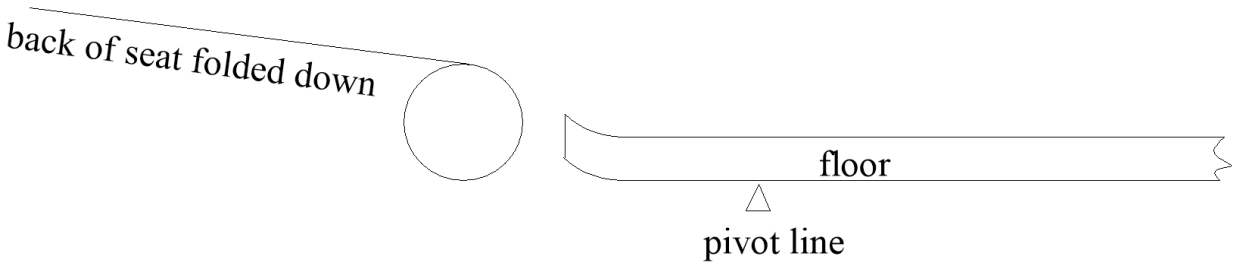
1. I have a one-inch rise from the trunk floor to the back of the seat. As I slide cargo forward, it usually hangs up on this rise.
2. There is the dreaded "floor trap." Anyone with a large dog knows about it. All is fine until Fido ventures forward of the "pivot line." Then, the floor flips up, permanently traumatizing the dog, who will not trust the floor again.

I aimed to create an easily fabricated attachment that does not modify the car yet addresses these shortcomings.

## Chevy Design Tradeoffs

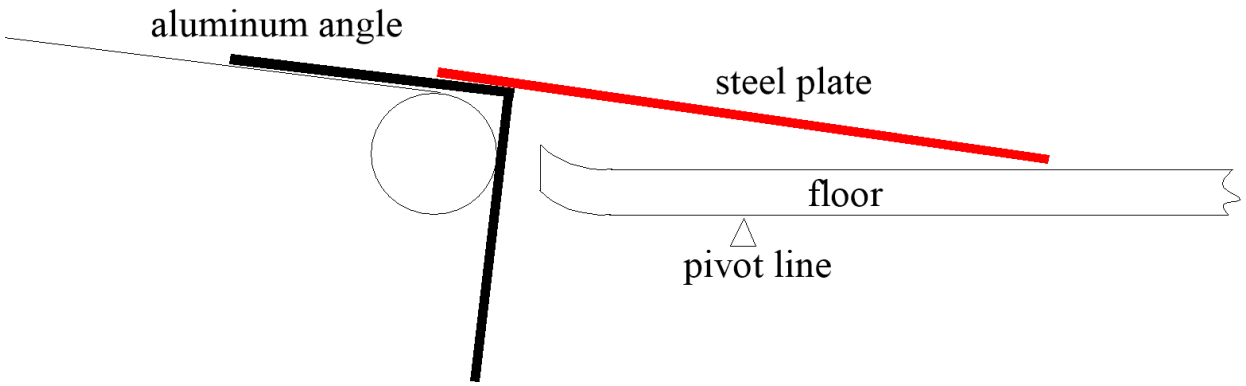
1. With the seat backs raised, the rear passenger seats are at a comfortable height. Batteries are under the seat, and I want as many as possible. So, if the lowered seat backs were at a lower altitude, I'd have to give up rear seat comfort and battery capacity.
2. The trunk floor is excellent when I need to access items under it. I lift the floor, which pivots before locking into a raised position. Very handy. If nothing is under the floor, I can store the floor in this space. This enables me to handle taller cargo.
3. The bottom of the rear hatch opening is at a reasonable altitude and level with the floor. I would not want to raise the floor so it was even with the seat backs when folded down.

## A closer Look




This rough sketch shows the major players. The folded-down seatback is angled about 6.5 degrees relative to the trunk floor. About a ½ inch gap exists between the seat back hinge and the floor. The floor has a slight upturn on the end nearest the seats. The pivot line is back about 6 inches from this edge.

## My Solution: A Transition Plate




The transition plate addresses all of the problems. It provides a smooth transition from trunk floor to folded down seat back with only a 0.05-inch rise between floor and plate. Weight is not placed on the floor forward of the pivot line, so the floor does not pivot.

Drop the plate in place for use and remove it when not needed. No modification of the car is required. This plate can be left on the trunk floor up-side-down or stored under the floor.

### *Fabrication Details*

I fabricated the transition plate using a 2-foot long piece of 1/8$^{th}$ inch thick 2-inch by 2-inch extruded aluminum angle and an 8½-inch by 24-inch piece of 18-gage mild steel[2]. I chose the aluminum angle because it is light.

I rounded all corners and filed smooth all edges. I plan to paint the assembly once I'm satisfied it solves my problems.

I chose the steel plate because it is thin yet relatively rigid. This minimal thickness makes the step from floor to plate tolerable as I slide objects from the floor up onto the back of the seat.

The two pieces are secured together using three aluminum Pop Rivets, which I chose for their extremely low height above the steel plate. They require a 1/8$^{th}$-inch hole and can grip through the 1/8$^{th}$-inch plus 0.05-inch stock.

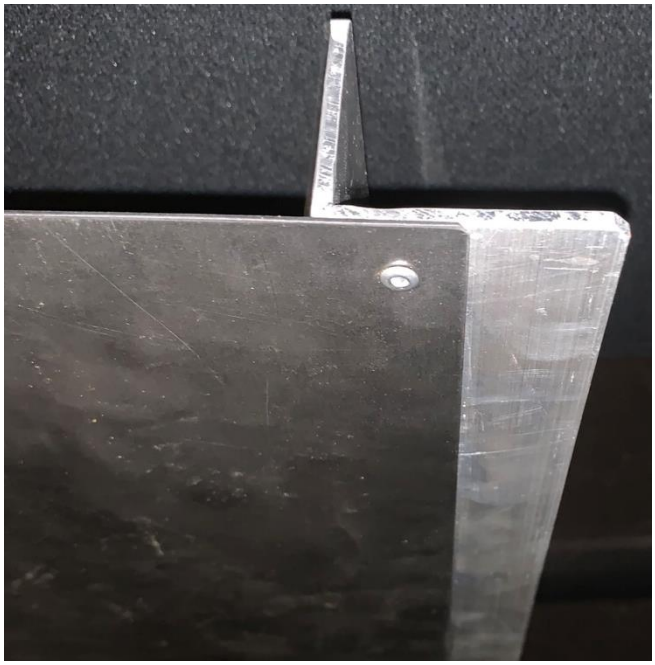
[2] Although I bought these materials at a metal materials supply house, you may find them at Ace Hardware or a "big box" home improvement store. If you are in Phoenix, I recommend Industrial Metal Supply. They will even cut the steel to size for a small charge.

Most force on these rivets should be sheer as cargo slides on the plate, so I expect it to hold. If I'm wrong, I can replace them with 6-32 screws with flat or pan heads.

As shown here, the aluminum angle drops into the slot between the floor and the seat, preventing the attachment from sliding off of the seat and onto the trunk floor. It is easily removed by lifting.

Note that the plate is 24-inches wide, but the floor is 39-inches wide. I chose to go narrower to reduce the weight of the transition plate and make storage under the floor easier.

If only the wider seat is down, the plate spans the entire opening. With both seats down, there is a gap of 7½-inches on each side. Time will tell if this is a problem.



The rivet holes are ½-inch back from the edge for both the plate and aluminum. The end holes are ½-inch back from the side edges.

I deburred each hole after drilling.

I first drilled a hole in the aluminum for the leftmost rivet. I then marked a line on the steel ½-inch from its long edge. I aligned the two pieces and verified I had a 1-inch overlap. I could see the marked line in the center of the hole.

I then used this first hole as a guide and drilled through the steel. After inserting an unset rivet, I checked my alignment and drilled the hole at the other end through both aluminum and steel. Then I dropped in a second unset-rivet.

And finally, I drilled my middle hole. With this procedure, all holes must line up, and I didn’t need to make any careful measurements.

Shawn Greenberg pointed out that storing the ramp under the floor is best since it could be a projectile if loose during a collision.

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