

Repairing the Front Undertray

Background

Perhaps due to sagging front springs, the front of my car rides low. Once or twice I had pulled too far into a parking place causing spoiler under tray to slide up over the parking curb. Then, upon backing out, the undertray ripped from the screws that attach it to the car body. Subsequently, the back edge began to droop, making it susceptible to even more damage. The drooping may have been due to the lip, which provides stiffness, having also been broken. Or perhaps it was due to oil damage from a leaking front crankshaft seal. At some point my mechanic put in some cable ties to support it a bit. When I had to remove the undertray to replace the front crankshaft seal, I thought about replacing it. However, the cost of a new one inspired me to try to repair it instead.

Lateral Reinforcement

The first thing I tried after cleaning it up was to attach a 3/8" aluminum alloy angle extrusion along the back edge. This is to improve lateral stiffness, formerly provided by the broken lip. I attached it with 3/16" x 1/4" aluminum pop rivets. Figure 1 shows the tray after attaching the angle extrusion.

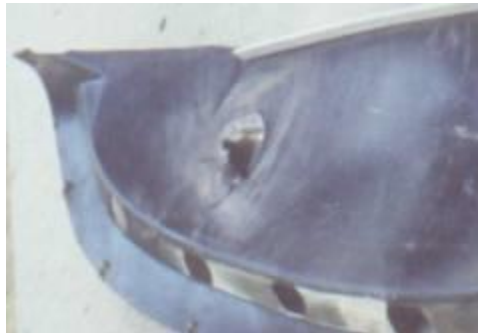


Figure 1. Undertray with lateral reinforcement

Note that if the angle is left perfectly straight (as it is in the picture) it will make the back edge of the tray straight also, whereas it originally has a slight downward curvature. That downward curvature is necessary for clearance of other hardware such as the oil cooler hose and sway bar. To give a little curvature I later cut slots every 8" or so in the vertical side of the angle. Also note that the reinforcement bar is on the upper side of the tray. If it's put it on the bottom it will reduce ground clearance.

The one problem with this repair is that it makes the rear edge of the tray very stiff so it can't be bowed downward for installation like the original. As a result of these repairs, one must now undo a couple of the air dam mounting screws to get the tray in place and even then, it's difficult.

Repairing the Mounting Pads

The tray has “mounting pads” molded into the plastic. From the upper side of the tray, Figure 1, they protrude from the surface, shaped like the frustum of a cone. From below the car, they appear as recesses around the mounting screws. When the tray catches on a parking curb or something, these pads get ripped open, so you no longer have solid material under the mounting screws. This was the second thing that had to be repaired on my undertray.

I considered two approaches for repairing the pads. The first idea was to form metal brackets that fit over the pads and riveted to the upper side of the tray. I was able to make such brackets using 1/16” x 1 ¼” aluminum alloy flat stock. Although it might have worked it looked clumsy so I abandoned that approach in favor of a fiberglass repair.

In preparation for patching, I used sandpaper to rough up the area around the pads on the upper side of the tray. Then I cut eight, 1-inch strips of fiberglass matt about 8 inches long. One at a time, I painted the strips with the activated resin, and laid them across the pad in a wagon-wheel pattern. After the resin set, I sanded it a bit then put on a second layer in the same manner. The upper side of the tray after this patching (and painting) is shown in *Figure 2*. (Black is a bit hard to photograph. I have gamma brightened the photo so you can see at least some of the detail of the patching.)



Figure 2. Upper side of undertray after fiberglass patching and painting.

The tearing around the pads on my undertray was so bad that pieces were missing around the screw holes. To fix this and give a proper base of the mounting screws and washers, I also did some patching on the lower side. For this repair, I shredded some matting material and mixed it with a small batch of resin. This was poured into the gaps where pieces of plastic were missing. After drying, I smoothed it a bit with a routing bit.

I have to say that the patching the mounting holes helped, but was not totally satisfactory. I recently had to remove the tray for some radiator hose work and discovered that the fiberglass was breaking loose from the plastic. Nonetheless, it is far better than it was before and has not broken loose from the mounting screws yet.

Painting

My tray had been covered with undercoating at some point. Part of this had peeled off, but I could not get the rest of it off without a lot of effort and scratching the plastic. Because of this I decided to repaint the whole thing with the undercoating spray available in auto parts stores. It looks pretty good, but I'm sure it will eventually peel off.