Power Window Cracked Door Repair

By Chuck Kinzer June 21, 2009

INTRODUCTION:

This paper describes a repair to interior door fiberglass that has been cracked from power window mechanism forces. The goal is a simple repair without fiberglass work, using basic tools, and without even taking any measurements. The repair is not fancy but it seems to work.

THE PROBLEM:

Apparently there is a tendency for the interior fiberglass door panel to crack due to sideways forces of power window operation where the regulator mechanism attaches with its three bolts. The sideways force gets very high when the window is against stops at either the up or down extreme with motor still shoving at full power. Perhaps different doors never crack alike so this repair, which happens to be for the passenger door, is just one possibility.

There is no "before" picture of just the cracks. But Photo 1 shows some of the cracking and has dotted lines showing where it continues under the plate. The fiberglass had become a loose flap. Note how the major crack runs all the way to the access opening and yet another crack starting to form a couple inches right.

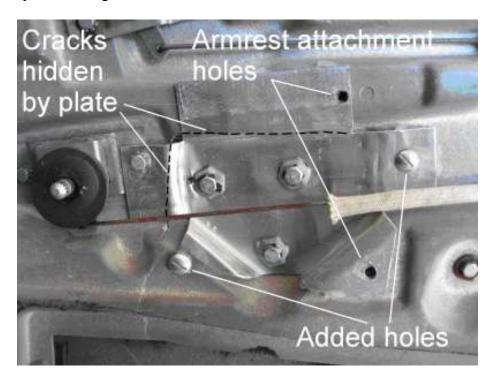


Photo 1

THE SOLUTION:

A strengthening plate is added on top of the fiberglass to provide the strength that the fiberglass no longer has. The plate uses as many existing mounting points as possible and is made from easily worked 1/8 inch aluminum plate.

This plate absorbs the forces previously applied only to the fiberglass and spreads those forces out over a larger area through the various attachment points and an adhesive. The plate also acts as a patch to the cracks themselves.

This can be done as a sort of blacksmithing project by eye and by trial and error. You can also certainly takes many measurements of the complex shapes involved and use any technique to make as accurate a part as you wish. But you don't need to.

MATERIALS:

1/8 inch aluminum sheet approximately 8 x 8 inches. 6061-T6 alloy is good. Softer varieties may also work well enough. (Try and get a scrap from a local machine or sheet metal shop.)

Clear lexan sheet such as Parma 8 x 9 inch .040 thick found in hobby shops catering to model planes.

Liquid Nails Multi Purpose construction adhesive (or equivalent).

Qty 2 of 1/4-20 x 1/2 inch long bolts with nuts with lowest profile head you can find. Or additional bolt hardware as needed for your particular repair.

PROCEDURE:

NOTE: This procedure is general in nature assuming you have what you need to drill holes and have a vise, files, and basic hand tools. A band saw makes for easy cutting of the aluminum, but a saber saw or even a hacksaw will also work.

- 1) Remove the decorative interior door panel.
- 2) Remove the various bolts that will be involved in holding the plate as shown in Photo 1. You now have clear access to the surfaces where the plate should mate.
- 3) Using scissors and bending by hand, fashion the lexan sheet to make a pattern with all the various cuts and bends to fit the recess in the fiberglass and with tabs to pick up the various holes. You can mark the hole locations on the lexan if you wish to use as future reference for the aluminum plate. The clear plastic will make it easy to see what you are doing and how it is fitting. Photo 2 shows the finished lexan plate.



Photo 2

4) Flatten the lexan plate to make a pattern for cutting the aluminum. Photo 3 shows the flattened lexan.

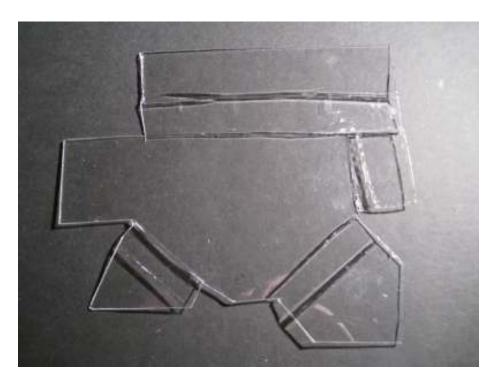


Photo 3

- 5) Place the flattened lexan pattern on the aluminum plate and trace around it with pencil or a scribe. Use existing edges as much as possible to minimize the cutting needed.
- 6) Saw the aluminum along the traced lines. Photo 4 shows the aluminum plate which is now ready for bending.



Photo 4

- 7) Put the bends back into the flattened lexan plate. It will be handy to refer to as a visual reference when bending the aluminum.
- 8) Now comes well let's call it the "hand craftsmanship" effort. Bend and fit and bend and fit the plate as needed. Use a vise, vise anvil surface, channel-locks, hammer, and brute force. Use the lexan part for reference and also keep test fitting the plate to the door panel. The plate needs to fit and mate fairly well, but not perfectly. You may find you can, or need to, saw some additional aluminum off here and there. Avoid re-bending because that weakens the aluminum. Also, your bend radii will likely be sharper than the fiberglass radii. And your radii will probably be no two alike. This doesn't seem important. (You may be tempted to add salty language in this step. Instead, just be thankful you're not wrestling stainless.)

As an example of how forgiving this scheme is, my bends were off enough that the center of the plate was about a 1/4 inch away from the fiberglass instead of abutting it. Enough pounding with a hammer to make that large flat area bowl shaped got the aluminum to touch the fiberglass as desired.

Photo 5 shows the plate with just one tab with its two bends.



Photo 5

- 9) Locate the various holes. I just made little marks on tape just outside the area to be covered by the plate in an X and Y coordinate fashion and then placed the plate and used the X and Y to roughly locate the hole.
- 10) Drill small holes such as 1/8 inch at first. Check to see how they line up. Drill to larger size and "move" holes as needed at that time. If you can't "move" a hole enough, use a round file and make it oval as needed.
- 11) Clean the aluminum plate and use coarse sandpaper to rough up its back side to provide "tooth" for the adhesive. Also clean the door panel.
- 12) Put a healthy amount of the construction adhesive on the back side of the plate. The goal is full contact at all points between the plate and fiberglass if possible.
- 13) Attach all of the existing mounting bolts and attach the armrest bracket.
- 14) Drill two 1/4 inch holes in the general location of the "added holes" as shown in Photo 1.
- 15) Install the added 1/4-20 bolts and nuts in the added holes.

16) Let the construction adhesive cure. Photo 6 shows the finished repair with arm rest bracket reattached and construction adhesive oozing out here and there



Photo 6

- 17) Inspect the window rollers for problems and make sure tracks are lubricated with white grease or whatever is your preferred lubricant.
- 18) Test the window. Pay special attention to what happens at the end of travel. You will probably notice the door panel being severely pushed in and out by the sideways forces of the window regulator. And you will see your strengthening plate doing its job nicely. The fiberglass door panel will still flex, but over a much larger area such that it can probably survive it.
- 19) Re-install the decorative inner door panel and you're done.

CONCLUSION:

The 1/8 inch thick aluminum and the repair in general seem strong enough. It is a small part with lots of bends so it is actually rather stout.

I considered putting a couple of splice plates on the exposed cracks in the area of the door access opening, but it didn't seem necessary. There don't seem to be forces wanting to act on or worsen those cracks anymore. But it's something to watch.

The cost was almost nothing: about \$4 for the lexan sheet, \$3 for a small tube of adhesive, and the aluminum was scrounged from work. It was perhaps at least a half day's work.

Also, any added thickness presented by the repair is of no consequence regarding reinstalling the inner door panel. No one will know the repair is there – so long as you don't write an article about it.

Finally, from now on, you will probably want to use extra finesse in power window usage. Especially if your other door isn't cracked yet!