

Torsion Bar Roof Support Panel Repair

A note of caution. This article is offered to document a procedure I used to successfully repair a separated roof panel. If you wish to repeat this procedure, you will be doing it at your own risk. Since this work involves removing tension from your torsion bars, you should enlist the help of someone who has performed this job before. As with any car repair, this should be done by a knowledgeable person with a good degree of mechanical ability. This procedure worked for me, but it is offered without any promises. Use good judgment and you are responsible for your own work.

The torsion bars are installed in the front hinge of each door. The other end of each torsion bar goes through a hole in the black fiberglass body and is held in place by brackets bolted into a steel panel. This torsion bar roof support panel is glued (epoxied) to the car's fiberglass body.

On many cars, this glue has deteriorated over the years. This allows the panel to separate from the body due to the load from the torsion bars. In my particular case, the torsion bars were overtorqued and surely helped accelerate the panel's separation from the car's fiberglass body.

The tension was so great on my torsion bars that my doors literally flew up when opened and they were very difficult to close. Not being around many DeLoreans, I originally thought this was normal. But, a previous owner had overtensioned the torsion bars to compensate for weak door struts. Never do this!

The panel becoming unglued causes several problems. The picture at right shows the original condition of my support panel. It lifted about 1/4" in the center. Note the position of the torsion bar retaining plates. The inside corner of each retaining plate is lifted up and each end of the panel itself is sliding toward the center of the car.



The lift in the center makes the panel contact the T-roof. This in turn makes the T-roof sit higher than normal. When the louver is raised it hits the T-roof. I had marks on my louver and bends in my T-roof from where the louver had been hitting.

A second problem is when the panel lifts, the torsion bars actually move toward the center of the car a small amount. This can allow the torsion bars to rub the rear hinges of each door if the panel is lifted enough.

It is relatively easy to check and see if your torsion bar support panel has become unglued. Take off the plastic finishing piece under the T-roof. This is located above the rear window and is held in place by three (3) screws. These screws may or may not still have the factory covers on them. If the covers are missing, one can find new ones at a well-stocked Lowes Home Improvement Center. They will be in the section where specialty fasteners are found.

The T-roof has four (4) tabs that press against the plastic finishing piece. This is how the rear of the T-roof is held down. In order to remove the plastic finishing piece, you must carefully bend these tabs outward. Note I said carefully. As with most stainless panels on the car, this one also contains sharp edges and it is very easy to cut your fingers!



After the plastic finishing piece is removed, one can readily see the torsion bar support panel and the torsion bar retaining brackets. The torsion bar retaining brackets should be relatively horizontal. Also, the gap between the torsion bar retaining plate and the window should be small.

If your panel looks like this, it has become unglued! There should be little space between the bottom of the roof support panel and the top of the rear window (highlighted in red).

A quicker (but less certain) method to see if your panel has become unglued is to examine the area where your torsion bar passes by each rear door hinge. The reason I say less certain is because the torsion bar retaining bracket's bolt holes have a generous amount of clearance for the mounting bolts. This allows one to adjust the location of the bracket a little (limited amount of side-to-side and up-and-down movement). It could be possible your torsion bar support panel is perfectly glued down, but your torsion bars could be very close to the door's rear hinge just due to the way the torsion bar brackets were installed. Also, your torsion bar support panel may not have moved enough yet to make the torsion bars rub the door hinges.

When my torsion bars were retensioned, we placed some pressure on each retaining bracket to try and move it toward the outside of the car as much as possible. This allowed the maximum clearance possible between the torsion bar and each rear door hinge.

To check how close your torsion bars are to your door hinges, open your door fully and get a piece of paper. Try to place the paper in between the torsion bar and the rear door hinge. If it will not go, it may be the torsion bar support panel has lifted and moved the torsion bar too close to the hinge. Both my torsion bars were rubbing the door hinges and a piece of paper would not slide between the torsion bars and the rear door hinges. With the rarity of driver's side torsion bars, there is no need to tempt fate by rubbing the torsion bars every time the door is opened and closed!

If you determine your torsion bar support panel is unglued and wish to repair it, here is the procedure I used to perform the work. Again, a word of caution. This worked for me, but any work you do on your car is at your own risk. I highly recommend the workshop manual for reference. I studied the appropriate sections before I started work on the car and referenced the manual during the work.

Things you will need:

- Two (2) low profile carriage bolts. 1/4-20 thread, 4 inches long.
- Two (2) 1/4-20 Nyloc nuts.
- Four (4) 1-1/2" outside diameter fender washers with a 1/4" or 3/8" center hole.
- Torsion bar jig and associated tools to perform the job.
- Small hammer and a rubber mallet.
- Drill with 1/4" bit.
- Dremel or similar tool for cutting the excess length off the carriage bolts.
- RTV sealant
- Black paint.

Step 1: Remove the louver

- Raise the louver and have an assistant(s) hold it while you disconnect the gas struts on the louver side.
- Next remove the four (4) bolts that hold the louver to the hinges (2 bolts per hinge).
- Now remove the louver from the car and store it in a safe place.

Step 2: Remove the lower engine cover

- Raise the lower engine cover and have an assistant(s) hold it while you unbolt the cover from its hinges. There are two (2) nuts to remove on each hinge.
- Remove the engine cover stay from the car's body by unbolting the two (2) bolts holding it in place. Be careful as the engine cover stay is spring loaded and there are two (2) pieces to the mount. Store the pieces and the lower engine cover in a safe place.

Step 3: Remove the plastic finishing piece

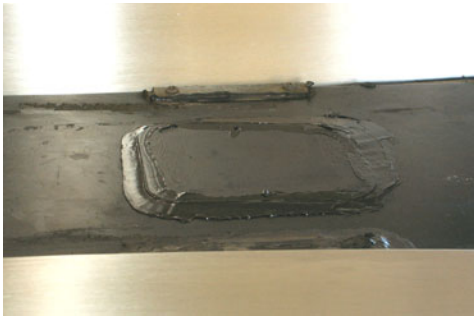
- The plastic finishing piece is held in place by three (3) screws. These screws may or may not still have the factory covers on them. If they do, remove the covers and then remove the screws.
- There are four (4) tabs on the T-roof that press against the plastic finishing piece. These tabs need to be **carefully** bent outwards just enough to allow the plastic finishing piece to be removed. Store it in a safe place.

Step 4: Remove the T-roof

- Open both doors.
- Carefully pull back the weather-strip from the T-roof edge to expose the mounting screws (The picture at right shows the driver's weather-strip removed and the T-roof cleaned of adhesive). There are three (3) screws on each side. Remove these screws and put in a safe place. Close both doors.
- Carefully pull up on the rear of the T-roof. It is likely the T-roof is stuck to the car's fiberglass body—mine was. To unstick it, I carefully took a sturdy yardstick and inserted it between the T-roof and the fiberglass body. By carefully working the yardstick back and forth while slightly lifting the T-roof, I was able to get the T-roof unstuck without damaging its attached insulation. After the T-roof is loose, it simply slides backward to remove (there is a lip on the front of the T-roof that slides under the windshield's upper finishing piece). The key here is to be patient and not force anything. One could easily bend the T-roof if too much pressure is applied. Place the T-roof in a safe place.

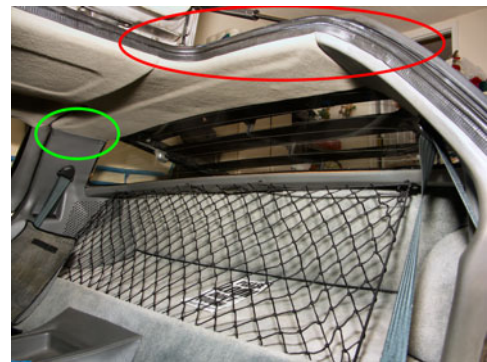


While the T-roof is off, it would be a good time to service the electrical connectors to the doors. There is an access panel on top of the roof. I opened the panel and took the opportunity to clean the contacts to all the electrical connectors (disconnect the battery before doing any electrical work). The pictures below show the plate resealed with RTV and then covered with duct tape.



Step 5: Remove the rear headliner

- The rear headliner is held in place by a hidden rear bracket and by glued fabric underneath each door's weather-strip. First step is to remove enough of the weather-strip to get to the glued fabric. Refer to the driver's side area circled in red to the right. The picture at top of the page shows the driver's side weather-strip already removed and gives a good idea of how the fabric from the headliner glues to the car's fiberglass body.
- After enough of the weather-strip is removed from both passenger and driver's side (pulls straight up), carefully separate the fabric on both sides from the car's fiberglass body. Locate the screws holding the headliner to the side upholstery (green circle area in picture at right) and remove them (one per side). The rear headliner can now be carefully slid toward the front of the car to disengage it from the rear bracket.
- After the back is loose, the ends of the headliner (circled in green above) must be released. By moving the headliner to one side and bending the headliner a little, the end will come out. Repeat for the other side.
- Now the entire rear headliner can be slid back toward the rear of the car and downward to remove it. Store it in a safe place for now.



Step 6: Remove tension from the torsion bars

- It is beyond the scope of this article to detail this step. I read the workshop manual on this procedure and it is a good reference. There are also several articles available online on how to do this and how to build the torsion bar jig required for this step. Get someone who has performed this type work before to help if possible.

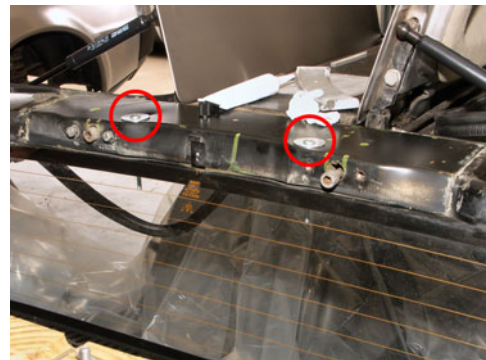
If all is going well to this point, your car should look like the picture on the right. Note I did not remove the torsion bars completely. This is contrary to other posts detailing this procedure. I imagine their idea is torsion bar removal minimizes the risk of damaging them while doing work to secure the support panel. I think if you are careful, this should not be an issue.

My passenger's side torsion bar was loose and could have been removed easily. However, the driver's side torsion bar was stuck tight in the door's front hinge. In helping others with torsion bar work, I have found that unsticking the torsion bar is a rather unnerving task as it tends to pop rather loudly when it releases. Rather than risk fracturing the driver's side bar, I simply left it in. YMMV.



Step 7: Securing the torsion bar support panel

- After the tension was off the panel, I took a rubber mallet and knocked the panel back down as close as possible to its original position. Be careful when using the rubber mallet as the rear window is close by. It is not necessary to hit the panel very hard because it is thin metal and moves quite easily.
- Refer to the picture at the right. You will notice the carriage bolts with fender washers installed (circled in red). I just used two bolts between the torsion bars because the outside portions of the panel are normally under tension. I suppose one could place another set of bolts on the other side of the torsion bars also, but I did not see a need to do that.
- In the next picture you will see that I located the carriage bolts so that the fender washers are very near the back edge of the panel. They are also located very near to where the panel starts curving inward. This was the point where the panel kinked and looked as if it was the greatest point of stress.
- The bottom picture shows the view from inside the car. The carriage bolts have already been trimmed to fit. Notice the bracket between the carriage bolts. This is what the rear headliner engages to hold it in place. Be careful not to hit the wiring when drilling holes for the carriage bolts!
- After locating and drilling the 1/4" holes through the support panel and the car's fiberglass body, I seated the fender washer onto the bolt. As is, the square portion of the bolt just under the head would not go into the 1/4" round hole of the fender washer. I suppose it would have been easier to buy fender washers with a 3/8" center hole, but I made do with what was on hand.
- Install a carriage bolt with fender washer on top, then install a fender washer on bottom. Tighten with nyloc nuts. I did not get a torque reading on the nuts, but they were tightened down hard using a hand wrench. There was very little deflection in the fiberglass roof inside the car. This area is stronger than one may think.
- After the bolts were in place, I sealed around all edges of the panel with RTV. I also painted the fender washers and bolt heads black to prevent corrosion. There were no signs of water damage or rust in this area, but better safe than sorry.



Step 8: Retensioning the torsion bars

- Again, this step is beyond the scope of this article. As mentioned earlier, my torsion bars were overtorqued. The driver's side was relaxed by two splines and the passenger's side by one spline.
- It was found that when the doors were properly tensioned, the gas door strut could be removed and the torsion bars would lightly hold the door just off the door strikers. I have heard that others recommend the torsion bars hold the doors up by themselves several inches off the strikers. I personally feel this is too much. YMMV.

Step 9: Reassembly

- Reinstall the lower engine cover. Be especially careful tightening up the bolts on the hinges. Replacement hinges are no longer available (as of the time of this article) and the studs can be easily snapped off.
- Reinstall the louver and align it.
- If everything is going well to this point, your car should look like the picture to the right. Note the bottom of the plate now follows the curvature of the rear window and the torsion bar brackets are more horizontal than before. In looking through the window, one can see the weather-strip hanging down as the rear headliner hasn't been installed yet.
- Reinstall the T-roof. The T-roof slides first into the windshield top finishing piece. Once the T-roof is in place, take a look at its position from the back of the car. Make sure the T-roof is centered between the doors.
- Next reinstall the three (3) screws on each side that fasten the T-roof (reference first picture on page 3). The holes in the T-roof for these fasteners are purposely larger than necessary. This is so one can adjust the height and location of the T-roof in relation to the doors. It took me several iterations of adjusting, tightening screws, then closing the doors to check alignment.



After getting the alignment correct, reattach the weather-strip using black super weather-strip adhesive.

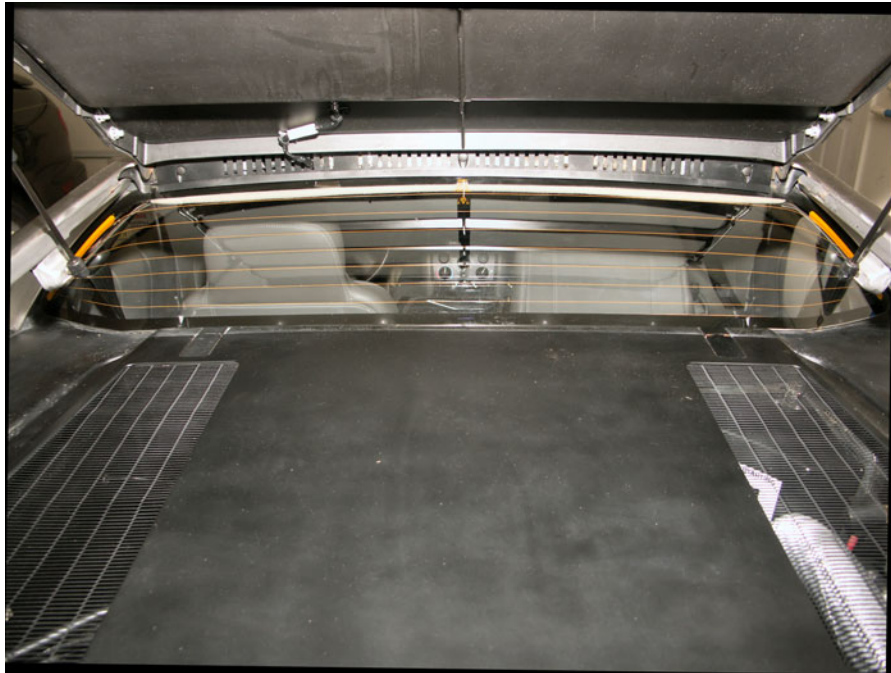
- The plastic retaining piece now needs to be reinstalled. After getting it installed, carefully bend the tabs of the T-roof against the plastic piece. The rear of the T-roof now should be low enough to allow the louver to open without hitting. At no time did the T-roof contact the heads of the carriage bolts.
- Finally comes the rear headliner. My rear headliner was sagging (look at the pictures on the bottom of page 1 and the top of page 4), so while it was out I decided to fix it. Home Depot sells a 3/4" wide X 1/8" thick X 3 foot length piece of aluminum bar that is perfect for the job. This piece was secured to the backside of the headliner using common 2-part epoxy. Please note all those clamps aren't necessary for this job! I got carried away!



After the epoxy sets, slide the front of the headliner under the headliner between the doors. It will take a little fidgeting to get the outer edges of the rear headliner back under the side upholstery pieces. Slide the rear headliner back toward the rear of the car until the rear mounting bracket is engaged. Slight pressure was placed on the aluminum bar to form it against the curvature of the roof. Replace the screws securing the rear headliner to the car's upholstery pieces.

The fabric from the rear headliner was then reglued to the car's fiberglass body using contact cement. The weather-stripping was pushed back down over the fabric and the job was done.

Below is a picture of the finished project. Note the headliner follows the curvature of the roof nicely. Now it doesn't take Superman to close the doors, one doesn't have to quickly get out of the way of the doors as they open, the creaking noises when the doors open or close are gone, the louver clears the T-roof, and I rest a bit easier with the knowledge the torsion bars are no longer rubbing the door hinges.



Brian
VIN# 4494