

Composite Panel Replacement Instructions (Riveted Joints)

April 2, 2019

Introduction:

This procedure addresses the replacement of a composite side panel on trailers manufactured by XPO Manufacturing. Our objective is to show a safe and efficient method for removing and replacing a side panel.

Labor Requirements:

Replacing a composite side panel requires three qualified mechanics using the proper tools and equipment, as outlined in this procedure. The standard repair time per panel is four hours. Changing adjacent panels in the same row takes less time per panel. This procedure is written based on a proven shop practice for replacing a single composite side panel. It identifies critical areas of concern. If read and followed, it will increase safety and efficiency and will prevent further damage to the trailer.

⚠ CAUTION: Individuals who work with composite side panels are advised to always use proper safety equipment, including: safety glasses, hearing protection, cut-resistant gloves, steel-toed shoes, knee pads, and face shields, etc.

List of Materials:

NOTE: Customers can order the correct replacement material to specification by trailer unit number from XPO Manufacturing.

Tools and Equipment Required:

- Two hand-held 3 /8" air drills with plenty of sharp F (.257) bits.
- Saber saw with a Fast Cut™ Bi-Metal blade
- Two pneumatic hammer guns, with proper rivet sets, plus flat chisel, and 1 /8"D tapered punch, tips
- Two quick release Vise-Grip® deep c-clamps (refer to Figure 2-14)
- Two Vise-Grip® quick release screw clamps
- Claw hammer and nail set
- Extendable load bar (i.e. of 9 ft. trailer width)
- Caulking gun, with Sika #227 or a urethane caulk
- Rivet sets and bucking tools

- 8 ft. ladder for inside and a 12 ft. ladder, manlift, or scaffold for outside
- 12-lb. sledge hammer
- Two wood or plastic wedges (a flat chisel tip works)
- Tape measure and grease pencil for marking
- Chalk line and or a long straight edge
- 36" crowbar and large plastic mallet for working on the scuff liner, when required
- Interior lighting for safe work inside the trailer, plus an electrical extension cord
- Two wood scrapers for removing self-sticking foam tape
- Safety equipment: safety glasses, hearing protection, cut-resistant gloves, steel-toed shoes, knee pads, and face shields, etc.
- Four suction cup handles for maneuvering panels
- Two jack stands for shoring the base rail, when required

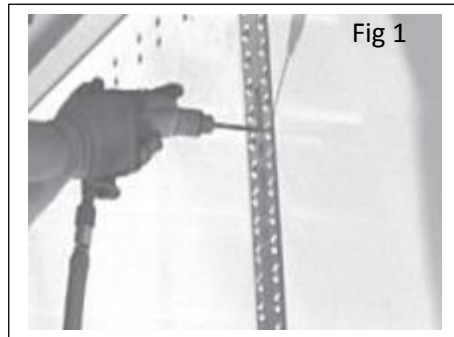
Trailer Setup:

Completely unload the trailer and park on a level shop floor. If more than two panels are removed at the same time, support the base rail with jack stands. String should be tightly stretched along the base rail for alignment, and as a reference point for ensuring the base rail remains level.

Removing the Damaged Composite Side Panel:

Composite side panels have two vertical columns of rivets that secure strips between the panels. To remove an adjacent panel, both inner composite steel strips must be completely removed and saved for reuse. Any remaining rivet portions attaching the outer strips to adjacent panels must be punched outward forcing the strips loose from the seams. On the inside logistic strips, only the clinched nub ends need to be removed to allow removal of the logistic strips for reuse.

1. Equipped with an air hammer/chisel tip, two mechanics can cut off the rivet button heads across the lower three rows of rivets that secure the panel to the base rail. Keep the chisel tip angled so as not to cut or gouge the aluminum rail surface.
2. If strips are in good condition then, switch to an air drill (with a sharp F bit) and remove the clinched rivet nubs which are recessed in the full length of both inner strips (Figure 1). Composite panel seam rivets swell in the holes of the inner strip. These will be saved for reuse.
3. If strips are damaged, use pneumatic chisel to shear rivet heads off.
4. Using an air hammer equipped with tapered punch 1/8" tip, punch out all rivet bodies from the vertical seams that secure the outer aluminum strips in place. This will force the outer strips away from the panels, allowing them to be removed by pulling them free from behind the top rail.



Reference Marks:

After the two outside strips have been removed, and before removing the old panel, use a grease pencil to mark exactly where the old panel is installed, marking both the base rail and top rail. These guide marks will ensure the placement of the new panel in its correct location and help align the holes of both inner and outer strips.

Breaking the Panel Sealant Bonds:

1. Complete work on both vertical seams first. Move down to the trailer floor and shear off the rivet button heads. Punch out the rivet stems securing the panel at the base rail. If both vertical seams are properly freed, the lower portion of the panel will break away from the base rail. If not, cut away the adhesive with a utility knife and carefully strike the lower portion of the panel with a hammer.

⚠ CAUTION: For safety, remove base rail rivets first and then install two quick release c-clamps. This secures the side panel at the base rail until the top rail connection is freed from its bonds.

2. Before cutting loose any other top rail rivets, have a person inside the trailer apply pressure against the panel. This keeps it in place behind the top rail. This safety practice will prevent the panel from falling and causing an injury
3. Remove the final top rail rivets from the outside by working on a ladder or scaffold stand. Have a mechanic, equipped with an air impact hammer and chisel tip, cut off the outer rivet clinched nubs across the full panel width on the outer rail face. Then, use the impact chisel between the aluminum rail and pane surface to force the two apart.

⚠ CAUTION: Before releasing the base rail clamps, have at least two extra people with gloves help to safely lower the panel down.

Cleaning and Preparing the Panel Opening:

1. Clean off all adhesive residue off the adjacent panel seams. Scrape any sealant behind the top rail and along the outside surface of the base rail. Wipe down all surfaces that will encounter the new panel. Sticky residue will attract and hold drill shavings, plus prevent maneuvering the new panel into place.
2. Apply Foam tape along the full length of both outside edges of the new panel and along the adjacent side panel outside the vertical edges of the opening. Add two rows of PVC tape across the horizontal width of the outer base rail open surface.

⚠ CAUTION: Always wear good ear protection (earmuffs/ear plugs) while working in and around riveting impact noise.

Installing the New Panel:

1. Use at least three people to lift and insert the new panel into the opening. Have one person inside the trailer with a step ladder and rivet bucking bar. The other two people must use quick release clamps outside to lift the panel into place and maneuver it along the base rail ledge.
2. Align the panel to the old marks so the strips cover both seams equally. Apply the modified quick release c-clamps to hold the panel tight against the base rail.
3. Position a ladder so a mechanic equipped with both an air drill and impact gun can quickly add temporary tacks to secure the panel at the top rail.
4. Before drilling or riveting, verify the new panel is properly aligned in relation to the opening and the holes align with adjacent panel seams. Refer to the old panel location marks.
5. Have available two outer strips with foam tape installed on the inner surface

Temporarily Tacking the New Panel:

1. Start at the top of one vertical seams, install an outer strip between the top rail and panels until the top set of holes aligns with the holes in the adjacent panel. Drop down 12" from the top rail and install two 1/4"-20 x 1"L bolts as temporary tacks to draw the three thicknesses together. Put one rivet in a hole from the outside to hold the panel snug while a person inside aligns the inner strip. It is easiest to use 1/4" bolts for temporary tacks when drawing the three layers together.

2. Move down the column 24" and install a second pair of bolts to hold the strips vertically in line with the holes in the adjacent panel.
3. Drill and install temporary tack bolts, evenly spaced in pairs at 12" intervals, down the seam to the base rail.
4. Moving back up to the top rail, transfer drill out the double row of holes across the top rail. Install 1/4" x 13/16" rivets in all holes within safe reach.
5. Move both inside and outside ladders to the next vertical seam. Install the second outer strip under the top rail until the first set of holes aligns with the hole in the adjacent panel. Insert a 1/4"-20 x 1"L bolt in the hole to hold the alignment. This gives the mechanic inside the opportunity to put the inner strip into place. Nut and secure the one bolt, drawing both strips tightly together in place.
6. Move down the column seam approximately 24" and install a second pair of bolts to hold the strips vertically in line with the holes in the adjacent panel.
7. Go back to the first bolt location, drill, and add a second 1/4"-20 x 1"L bolt and continue to install evenly spaced temporary tacks in pairs at 12" intervals down the vertical seam.
8. While working near the top rail, again drill out all holes across the top rail face. Then install rivets, including the four missing rivets from the adjacent panel.

Finish the Riveting Process:

1. Use two mechanics to drill holes and install rivets simultaneously from both inside and outside the trailer. Use an air drill/F bit, a bucking bar, and an impact gun.
2. Simultaneously, two mechanics can drill vertical seam holes in groups of 10 from the inside outward. Then, go back and install rivets from the outside inward. Working in intervals of 10 to 12 rivets between each set of tacks prevents puckering of the outer strip.
3. Work on one vertical seam, then move over to the other side. Work from the top to bottom.

⚠ WARNING: To prevent personal injury, use a wood block buffer when back-drilling the lower portion of each batten strip. The strip tends to bend away from the panel surface during the drilling. Refer to Figure 2.



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4. When the vertical seams are completed, proceed to inside the trailer and drill through the lower holes along the base rail. Change over to an air impact gun and install rivets.

⚠ CAUTION: To protect against injury from debris, wear knee pads when working on the base rail rivets on the floor.

Complete the Repair:

1. Sweep out the interior and clean up all debris.
2. Install conspicuity tape on lower rail if damage occurred during repair per DOT and new decals if needed.
3. Prevent moisture from entering, caulk the base rail ledge where the new panel rests.