

# APACHE HINGE REPLACEMENT PROJECT

## **MATERIALS:**

Aluminum Extrusion, custom lengths  
Setscrew, stainless steel, 7mm x 10mm hex socket \*(optional)  
Pop Rivets, 3/16", long, aluminum  
Back Up Spacers, 3/16" (Pop Rivet)  
Silicone Adhesive, GE Silicone II CLEAR, 1 to 2 10 oz. tubes  
Teflon Lubricant, LPS Magnum, 11 oz. aerosol can  
White Lube  
Mineral Spirits, or Paint Thinner  
Soft Scrub Cleaner (mild abrasive)  
Sandpaper, 3M Auto-Pak(tm), Wetordry(tm) Assortment Pack, No. 03021NA  
Abrasive Pads, 4" x 9", Rhodes American Synthetic STEEL WOOL 2 (#00)  
Shop Towels, disposable  
Rags, non-linting

## **TOOLS:**

Drill Bit, 3/16" high-speed steel  
Drill Bit, 5/16" Black & Decker Pilot Point Bullet, No.14320  
Power Drill (battery powered, preferred)  
Rotary Tool (Dremel type)  
Cut-off Wheels (Disc), 1-1/4" and spindle (for rotary tool)  
Wood Chisel, 1/2" (sharp, or new)  
Wood Chisel, 1-1/2" (sharp, or new)  
Cutter, small blade, (snap-off style)  
Cutter, large blade, or box (snap-off style)  
Metal Files, assorted, fine  
Rubber Mallet  
Pop Rivet Tool  
Caulking Tool  
Paintbrush, 1-1/2", soft bristle  
Spring Clamps, large  
\*3mm, or 1/8" hex socket bit and handle (for setscrews)

## **OVERVIEW:**

This is a professional restoration project to replace the ABS Hinge, part number 4200036 and 4200037, which are no longer available. The replacement part is constructed of an aluminum extrusion and supplied by Associated Medical Electronics (amej@ix.netcom.com). The business WEB site contains Apache images and useful project information at:

<http://home.ix.netcom.com/~amej/apache.html>

Hinges are in various lengths due to the Apache Model and location. Therefore, the extrusion must be cut to size and notched to fit. A 1972 Apache Ramada is the model used to provide the information for this project. A 7mm stainless setscrew is mentioned in the materials list. The original setscrew used to hold the hinge in place and act, as a pivot point was custom made. It was made from an alloy stock,

which had a screwdriver slot on one end (Figure 1 shows the hex socket setscrew, original setscrew & alloy bolt).

A source for this product could not be found. A custom-made hex socket, setscrew was procured from a manufacturer in England. The hex socket size is 3mm. I found; some 3mm bits would fit and others would have a loose fit and could not take any torque. Some 1/8" bits fit; others would be too large. Limited supplies of screws are available from Associated Medical Electronics. Otherwise, a substitute screw can be made from a 1/2" to 1" 7mm alloy bolt, supplied by any True Value Hardware store. The bolt will have to be cut to length and a slot cut in the end. All other supplies can be purchased from a Wal-Mart, Home Depot, or Pep Boy store.

The difficulty factor is: Medium. Skills are required in metalworking and the use of hand tools, solvents and lubricants.

Cleanliness and the proper preparation of the ABS plastic walls and aluminum parts are the utmost of importance. Reminds me of "spit-polishing" shoes in my military service.

Take your time; your Apache is worth it!

## **DISASSEMBLY INSTRUCTIONS:**

**NOTE:** Long lengths will be listed in Feet & Inches. Short lengths will be listed in Metric, mm. (Due to the size of the set screws.) Also, one end of the Aluminum Hinge Extrusion will have a smooth end; the other will show cut marks. Always shorten the Hinge from the cut end. This will make the preparation easier.

### **A. Aluminum Hinge Extrusion (AHE) (Figure 2)**

1. The length of the (Double J) Lower Aluminum Hinge (DJH) (Figure 3) determines the length of the hinge. Both are the same length. When ordering the hinge, measure the length and then "round-up" to the next foot. If this length is greater than seven (7) feet, the material will have to be supplied in two pieces. Please identify these pieces in your order.
2. Cut each piece of Hinge (AHE) to the length of the Hinge (DJH) that will be mated. File the end smooth (allow for the loss of this material). Any burrs and slivers can be removed with a small cutter (knife).
3. Place a mark 10mm from each end of the Hinge (AHE), except for a two-piece length. In this case, mark the cut-end of the Hinge (AHE). (The smooth ends will butt up to each other during the assembly.) Cut the round rod off, at the marks (Figure 4). Use a rotary tool and cut-off disc. File the cuts smooth and remove any slivers with the cutter (Figure 5). Repeat for each Hinge; both ends, for full-length hinges, and only one end, for two-piece installations. Set each hinge aside until needed in the final assembly. Refer to step E.4. for making one more cut on any hinges that will be in contact with the doorframe.

### **B. Walls (Assuming all hinges will be replaced. Otherwise, just apply portions of the steps that would be needed.)**

1. The walls in one step. Extend the cover and leave the bed sides down. Move the beds out, as needed, for access to the hinges. It is easier to prepare the walls for removal of the ABS Replace the hinge only on one wall at a time. All hinge spot-welds can be drilled out on all of Hinges, with the cover fully extended. Get help from a second person when ready to disconnect the hinges from the walls and reinstalling the walls into the hinges. Begin with the shortest wall, as it will be easier to learn how to complete the job for the longer walls.

2. Take the large blade cutter and score the exterior walls at the point where the bead of adhesive joins the ABS Hinge. This may have to be repeated as the hinge is separated from the wall.
3. Use a 5/16" pilot-point bullet drill to remove the spot-welds along the ABS Hinges. The pilot point will fit into the center of each weld so the drill will not "walk" away from the hinge. The welds are not even, so use care in holding the drill. Drill to a depth penetrating the wall. (Figure 6 will show the ABS Hinge being separated from the wall and show the drilled out area.) Save the shavings to mix with MEK and make your own filler/adhesive. (Glass baby food jars are the best style.) It will not be a disaster should you drill through the wall. The new hinge will cover the hole on the interior wall. The hole can be filled on the exterior wall later.
4. Use a 3/16" high-speed steel drill to remove the pop-rivets on the vertical wall struts. Only remove the rivets in contact with the ABS Hinges.
5. Use a 1-1/2" wood chisel and rubber mallet to release the ABS Hinges from each wall. If a vertical wall strut is in the way, use the chisel to release the strut from the hinge and wall. Take care and use small strokes on all of the areas. The material is brittle enough and the adhesive is not that strong. This is a point where the second person is needed. As hinge material is being pulled away from the wall, it can be broken into smaller pieces. A wedge, or chisel, can be used to force (not too much) the wall up and away from the hinges. Once the wall is separated from the hinge, the lower portion can be moved to the inside of the trailer. Move it just enough to expose the hinges.

**NOTE:** There are ABS cover protectors on each side of the door. These may, or may not, be released when the ABS hinge is removed. Avoid breaking these; it is easier to let them drop off and reinstall them later. If they are removed, clean them up and set them aside. If they remain, use the 1/2" wood chisel to clean up any adhesive or weld material. This will allow the new Hinge (AHE) to fit.

6. Remove the setscrews attached to the Hinge (DJH). Then remove (slide-out) the remainder of the ABS Hinge. Next, carefully, slide the Hinge (DJH) out and away from the trailer.
7. Bring the wall back toward the outside of the trailer and let it hang. Clean up the residue adhesive and material from the welds using the 1/2" wood chisel. Clean up the contact areas with abrasive pads (cut to fit your hand) saturated with Soft Scrub Cleaner and wet/dry sandpaper, as needed. Finish with a lint-free towel saturated with mineral spirits (or paint thinner).

### **C. (Double J) Hinges**

1. Clean and polish the Hinge (DJH) with abrasive pads (cut to fit your hand) saturated with Soft Scrub Cleaner and wet/dry sandpaper. Finish with a lint-free towel saturated with mineral spirits (or paint thinner), as needed. Allow the material to dry.
2. Spray a coating of Teflon lubricant inside the two tracks of the hinge. Use a lint-free towel to spread the lube around the tracks. Let the excess lube remain in the tracks and set the hinge aside.

### **D. Wall Hinge and Aluminum Molding**

1. Clean and polish this material as you have with the (Double J) Hinge. Make sure the inside rod of the lower hinge is cleaned. If left, old lubricant and oxide can cause problems later.
2. Lightly coat the rod portion of the lower hinge with the Teflon lubricant and the lint-free towel used on the (Double J) Hinge.

## **REASSEMBLY INSTRUCTIONS:**

### **E. Aluminum Hinge Extrusion (AHE) and (Double J) Hinge (DJH)**

1. Fit the Hinge (AHE) onto the wall, without adhesives. If all goes well, continue with the installation. Otherwise, remove the obstructions with the tools on hand.
2. Remove any excess lubricant and reinstall the Hinge (DJH) on the lower hinge of the trailer. Make sure it is installed with the central lip of the hinge pointed downwards.
3. Reinstall or replace the lower setscrews on each end of the Hinge (DJH). Do not tighten, as they will be removed to apply white lubricant to the pivot points during the clean up.
4. Slide the Hinge (AHE) onto the Hinge (DJH) with the higher side toward the inside of the trailer. If this hinge is in contact with the doorframe, another cut will be necessary.
5. If the hinge is on the electrical and water side of the trailer, go to step 7. Otherwise, continue with step 6.
6. While the Hinge (AHE) is in place, drop the wall onto the hinge. Measure and mark the Hinge (AHE) for a cutout to allow the doorframe to fit (Figure 7). Remove the Hinge (AHE) to make the cut. Use a rotary tool and cutoff disc to remove the material. Use a file to eliminate the rough edges (Figure 8). Reinstall the hinge and check for a proper fit.
7. Install the upper set screws on each end of the Hinge (DJH). Do not tighten and keep them very loose so the Hinge (AHE) can be easily moved during the installation. Clean the inside portion of the track with mineral spirits (or paint thinner).
8. Cut the tip of a tube of silicone adhesive (3/16") and attach to a caulking tool. Firmly, run a bead of adhesive into the channel of the Hinge (AHE) (Figure 9).

**CHANGE:** I found that the bead placed too much material in the channel. The wall did not fit into the channel properly and the adhesive did not cure. I would suggest placing a 1/16" bead of adhesive in the channel and use a flat tool, or brush, to spread the adhesive along the walls and the bottom of the channel. Remove any excess material. Next, apply a small amount of adhesive along each side of the wall, which will be in contact with the channel. Use your fingers, a small towel, or rag to spread the material. Do not allow the adhesive to stand too long as it will begin to air cure. If the wall does not fit completely into the channel, as it did in step E.1., then separate the wall from the channel and remove any excess adhesive that might be preventing the wall to fit. It is not too critical to fit the pieces, however, if there is too much adhesive, the wall will be too high and the top will not drop into place. The rule should be: "It is better to use too little adhesive, then too much." (7/27/01)

9. Place the hinge with the adhesive side up toward the inside of the trailer. Take each end of the wall and set on top of the adhesive, resting on the channel of the hinge. While keeping the wall straight, rotate the hinge up and allow the wall to drop down, inside the channel of the hinge. Place pressure on the wall so the adhesive has a chance to flow around the channel and wall. Lower the trailer cover onto the wall and make a tight fit; causing a slight bow on the wall. Remain in this position for at least twelve (12) hours. Allow a full cure of 24 hours, before the wall is laid down and the cover cranked down.

**NOTE:** It may take more than 24 hours for a full cure. Moisture causes the curing action and it may take longer for moisture to penetrate the wall and the track.

10. As the cover is placed on the wall, check for the proper horizontal alignment of the wall to the trailer and Hinge (AHE). The edge of the hinge should be directly below the bend in the wall

molding (Figure 10). The wall can be moved to correct for the alignment. It should not move further with the pressure from the cover.

11. Take the shop towels and remove all of the adhesive that has worked its way to the surface. Wipe the wall and aluminum moldings with vigorous pressure before the adhesive is allowed to cure. After all of the material is cleaned, let any further adhesive remain until the final cleaning.
12. Repeat these steps for the remainder of the hinges to be replaced.

#### **F. Final Clean up (After all of the hinges have been replaced)**

1. While the Cover is pressing against the last wall, proceed to replace the pop rivets that were removed from the vertical struts.
2. Clean out the silicone adhesive from the holes that contained the pop rivets. If the holes are not visible past the hinge, drill through the material with a 3/16" high-speed drill.
3. Insert the 3/16" pop rivet from the outside with the pop rivet tool. Place a 3/16" back up spacer on the inside part of the rivet. Compress the rivet with the tool and check your work.
4. Repeat these steps for each location.
5. Lower the walls and cover until the walls are nearly flat and the cover is high enough for access to the hinges and the walls.
6. Clean the silicone adhesive from each hole that is exposed to the outside of the wall. Take a paste mixture of ABS plastic and MEK and fill each hole. Allow the material to dry and, either repeat the procedure, if necessary, to completely fill each hole. Otherwise, take a fine grade of the wet/dry sandpaper and sand each of the areas smooth.
7. Inspect the ABS cover protectors that are on each side of the door. Re-install, or repair, any of the protectors that were removed, or loosened, during the hinge installation. The easiest method is to clean the contact areas and apply a small amount of silicone adhesive to these areas. The protectors can be "wedged" back into place.
8. Remove all of the excess silicone adhesive that is visible. Check for silicone adhesive around the setscrews and inside the hinge tracks. Use a paintbrush to clean the area between the hinges. Do a final cleaning with lint-free towels saturated with mineral spirits (or paint thinner). Wipe dry and polish with a dry lint-free towel. An automotive cleaner/polish can be used at this time.
9. Go around the trailer and lightly tighten all of the setscrews that were loose. Check the hinge alignment, so each end is at an equal distance from the hinge combination.
10. Remove each setscrew, one at a time, and place a dab of white lube on the end of the screw. Do not apply any lubricant to the screw threads! Re-install the setscrew until snug. Loosen the setscrew by 1/2 of a turn. Repeat this procedure for each setscrew.
11. Spray a small amount of the Teflon lubricant along each hinge track.

Now, it is time to prepare your Apache for the next trip. Stand back and admire your work.

You deserve it!

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