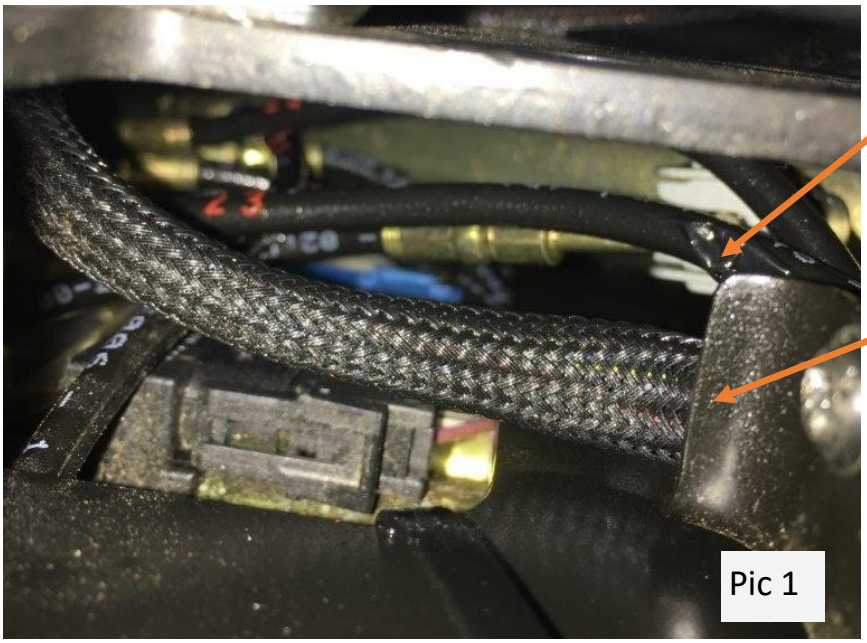
2000-2006 BMW 3-Series (E-46) Convertible Top Hydraulic Hose #23 or #24 Repair Info Using Cabriolet Hydraulics E46-HR

Disclaimer: This information is intended as a general guide for experienced technicians. Before you begin the repair, make sure that you have a clear plan from start to finish for your specific repair. If you are inexperienced, other reference aids may be necessary to successfully perform this repair. Common sense and experience must be applied. If after reading through this information you are unsure about your ability, seek experienced help.

This information refers to repairing hose #23. Hose #24 can be repaired in a similar manner. Cabriolet Hydraulics is not liable for damages or injury.



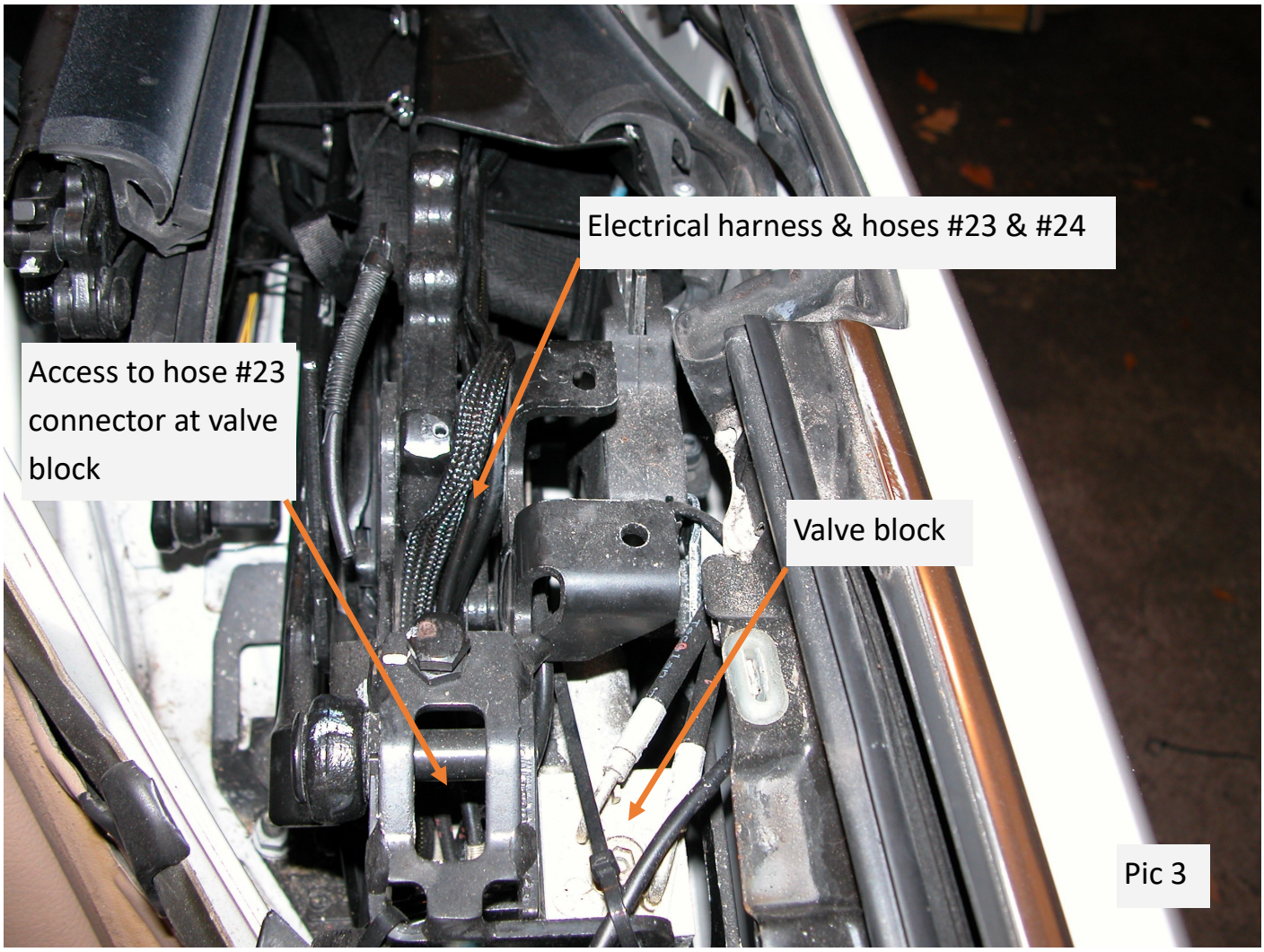
Pic 1

Pic 1 shows a punctured hose #23 and the front edge of the hose and electrical harness cover.

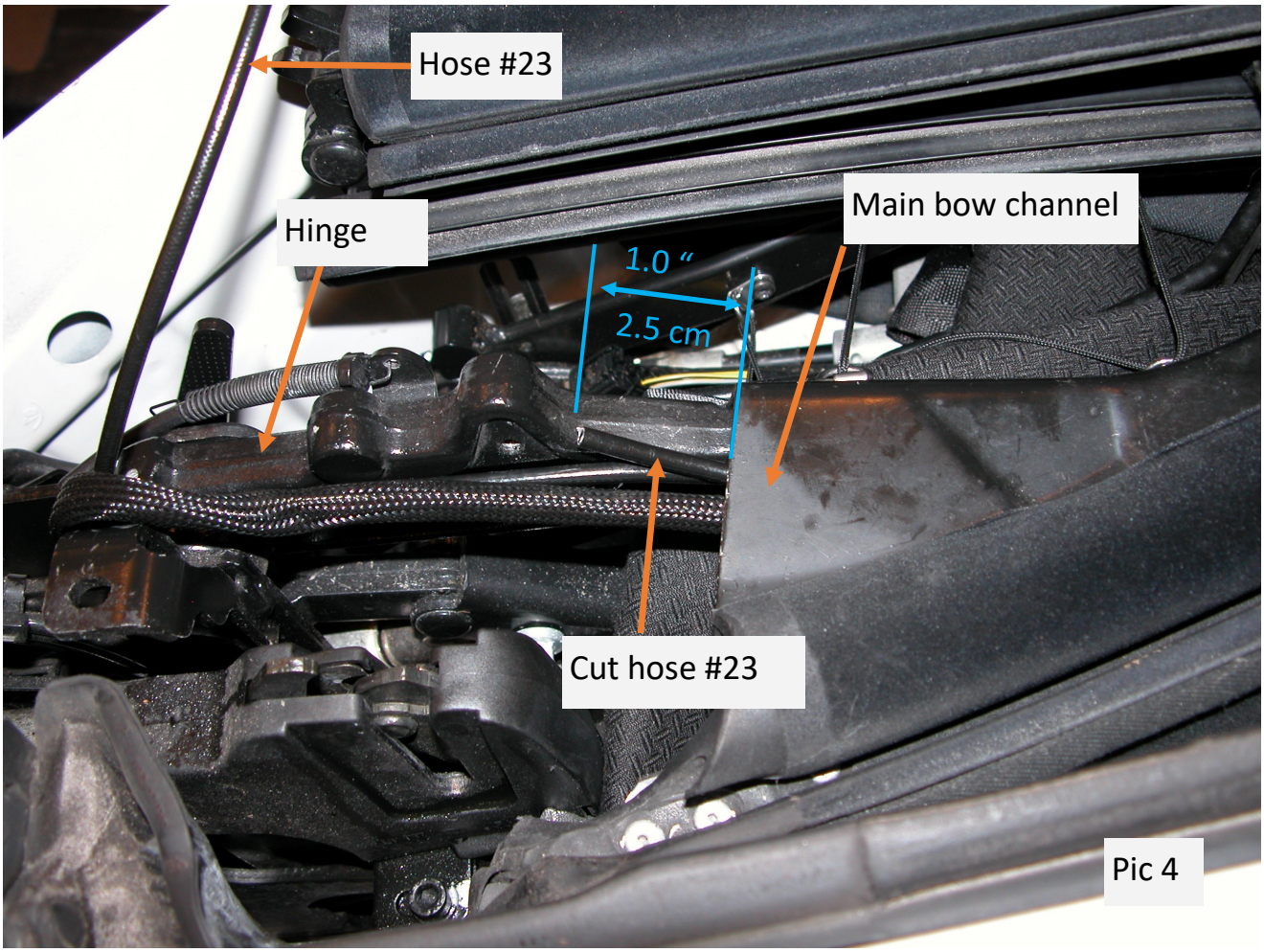
Step 1: With the top down and tonneau cover up, remove the interior left side upper panel next to the rear seat.

Pic 2

Step 2: Unscrew and remove the hose cover to expose the hoses and electrical harness. See Pic 2. Before continuing, take a clear photo of the exposed hose and the electrical wire routing. This is important! You will need the photo to reroute the hoses and electrical harness exactly to where they were originally.

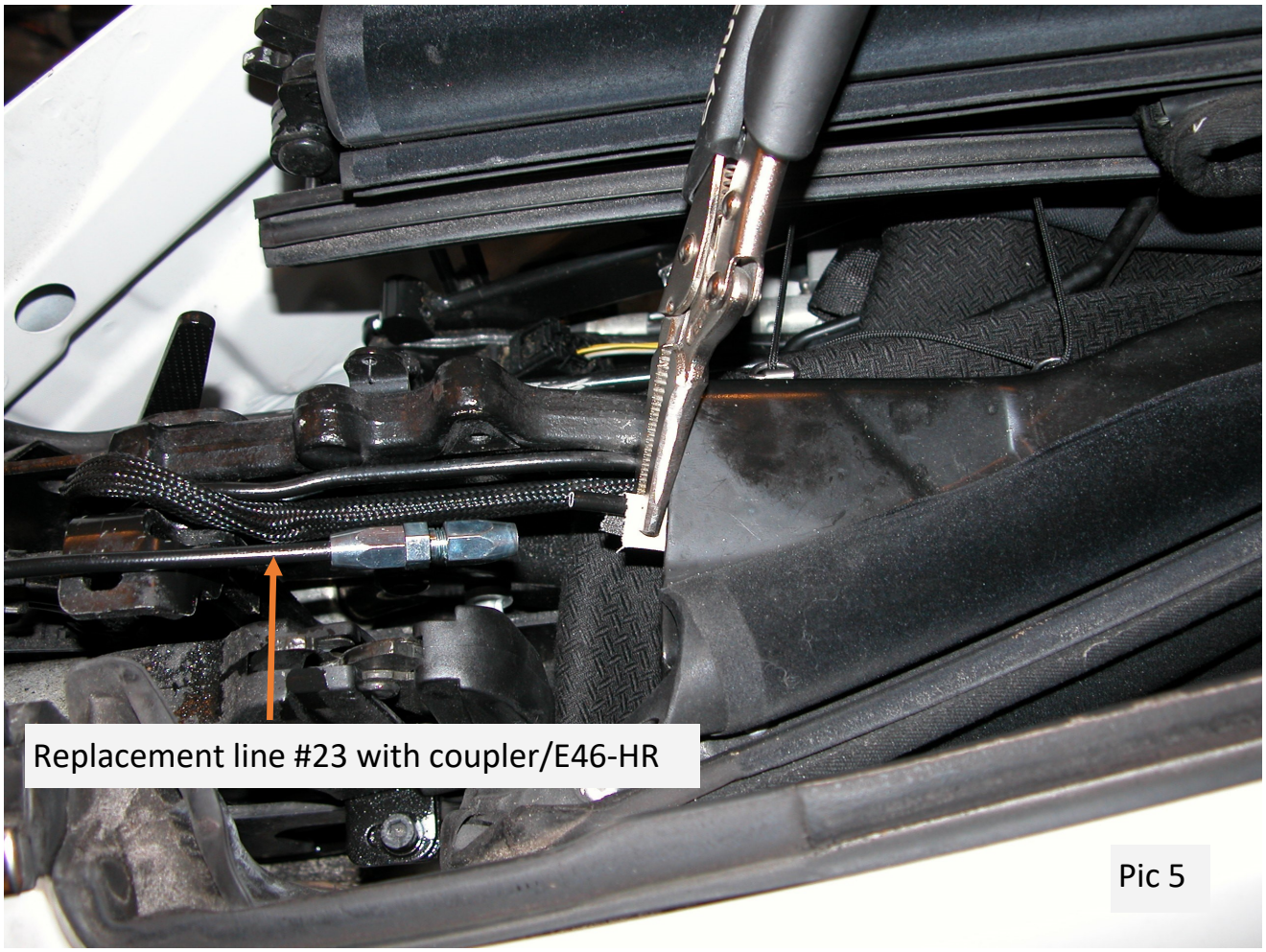


Pic 3 shows the hose and harness cover removed. Also shown are the valve block and rectangular opening to access the hose #23 connector at the valve block. Utilizing suitable tools such as long needle nosed plyers, hemostats, and a long thin flat screwdriver, it is possible to remove and replace #23 connector from the valve block without lifting the top frame. The top frame will have to be lifted out of the way to gain access to hose connector #24 if that hose is damaged.



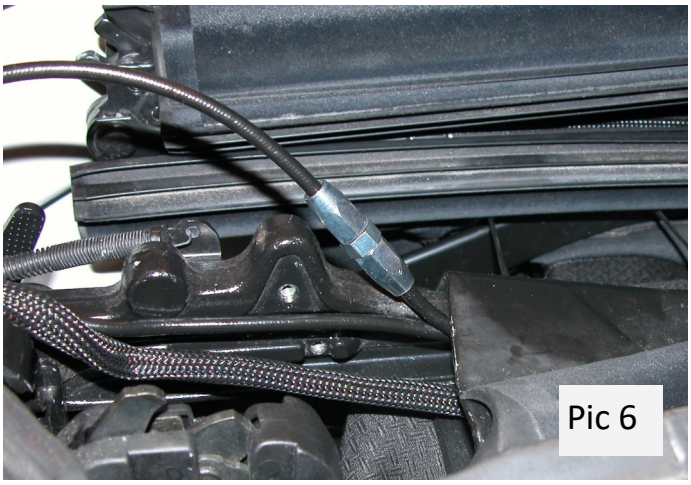
Step 3: Follow the damaged hose #23 along the hinge and cut the hose 1.0" or 2.5cm from the edge of the main bow channel as shown in Pic 4. Make sure that you are cutting the correct hose. Cut hose with a sharp utility knife and use a small wood block or equivalent as a cutting board. **Do not use wire/diagonal/side cutters, saws or cut-off wheels. Such tools distort the cut end of the hose and produce loose particles that can enter the hose and cause hydraulic system failure.**

Step 4: There is no photo provided for hose #23 connection at the valve block since this area is difficult to photograph. Refer back to Page 3 for more info. Note the position of hose connector #23 at the valve block. Rotate the clip/retainer to unlock the hoses from the valve block. Disconnect the original damaged hose #23 and connect the new hose (E46-HR) into that same position. Rotate the clip/retainer to the lock the hose connectors.

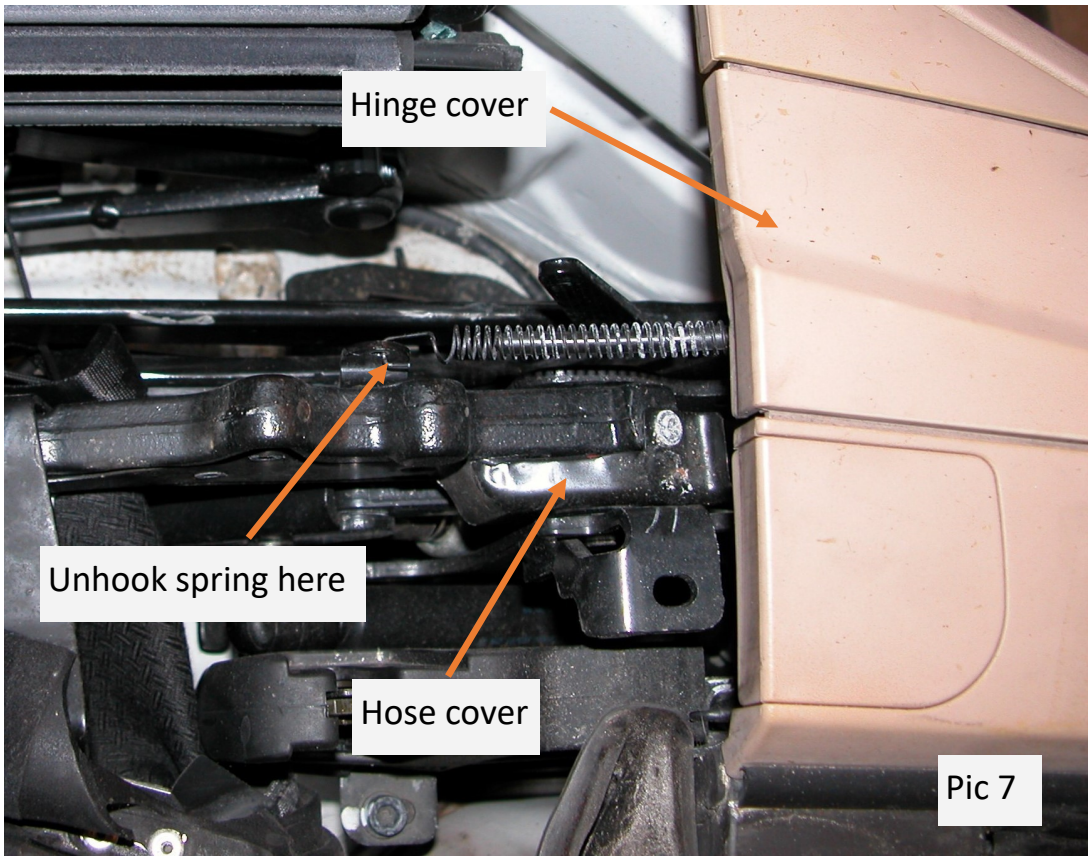


<u>Step 5</u>: Confirm that the new hose #23 section (E46-HR) is routed properly. **Once the coupler is installed, it cannot be removed.** After coupler is installed, hose routing can be corrected by disconnecting the hose from the valve block and rerouting the hose.

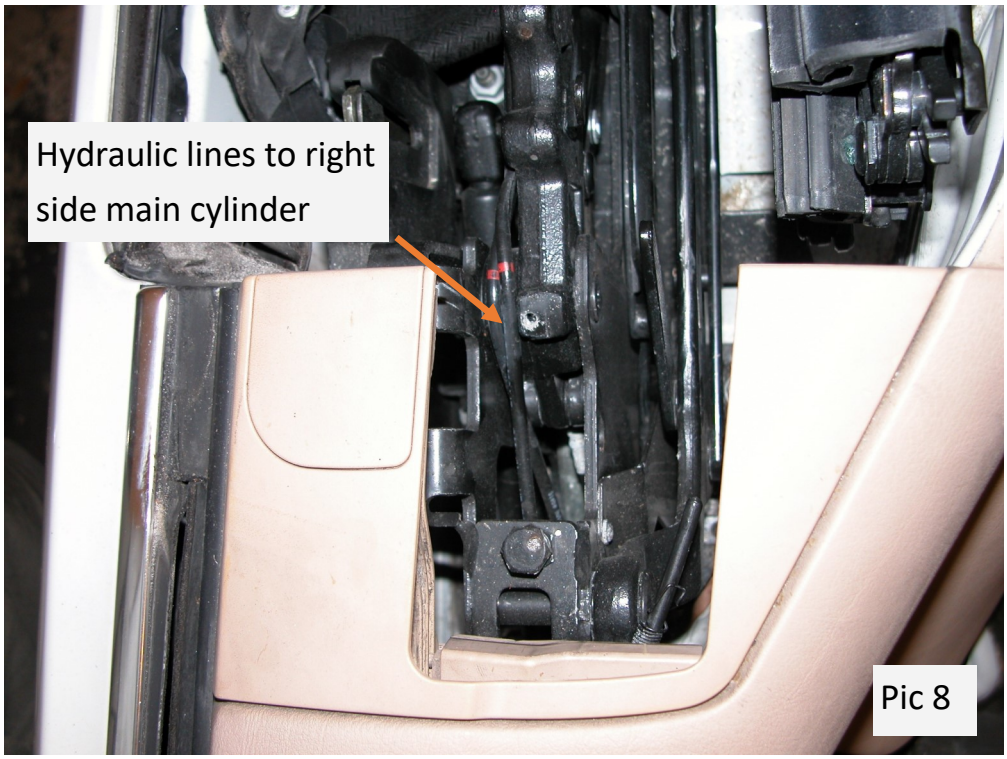
Wrap the cut hose using the supplied sandpaper patch and clamp lightly with narrow nosed vise grips as shown in Pic 5. **See Page 12 for Coupler Installation Instructions.**



Pic 6 shows the new hose section reattached with the coupler.

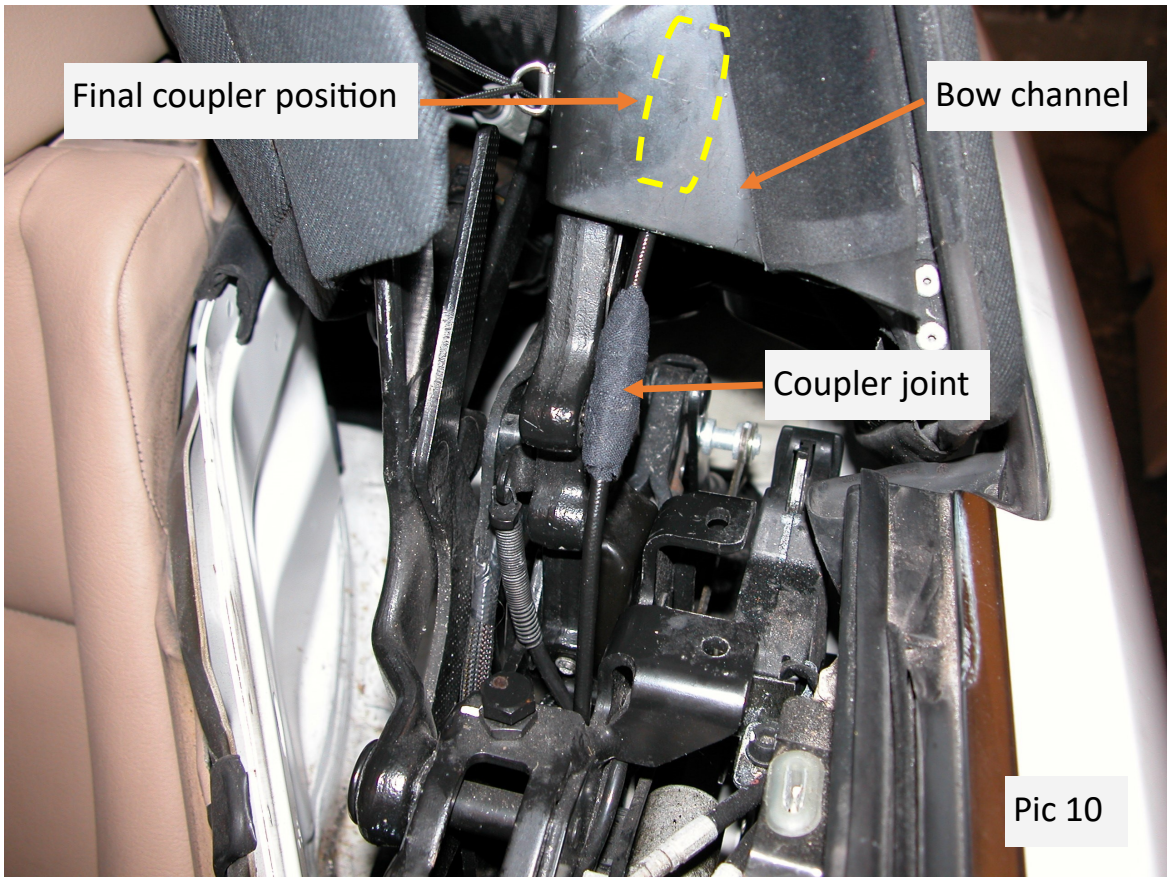


<u>Step 6</u>: Pic 7 shows the passenger (right) side main hinge area. Disconnect the tension spring and retract the hinge cover. Remove the hose cover as previously done on the left side. There is no need to remove the entire upper trim panel.



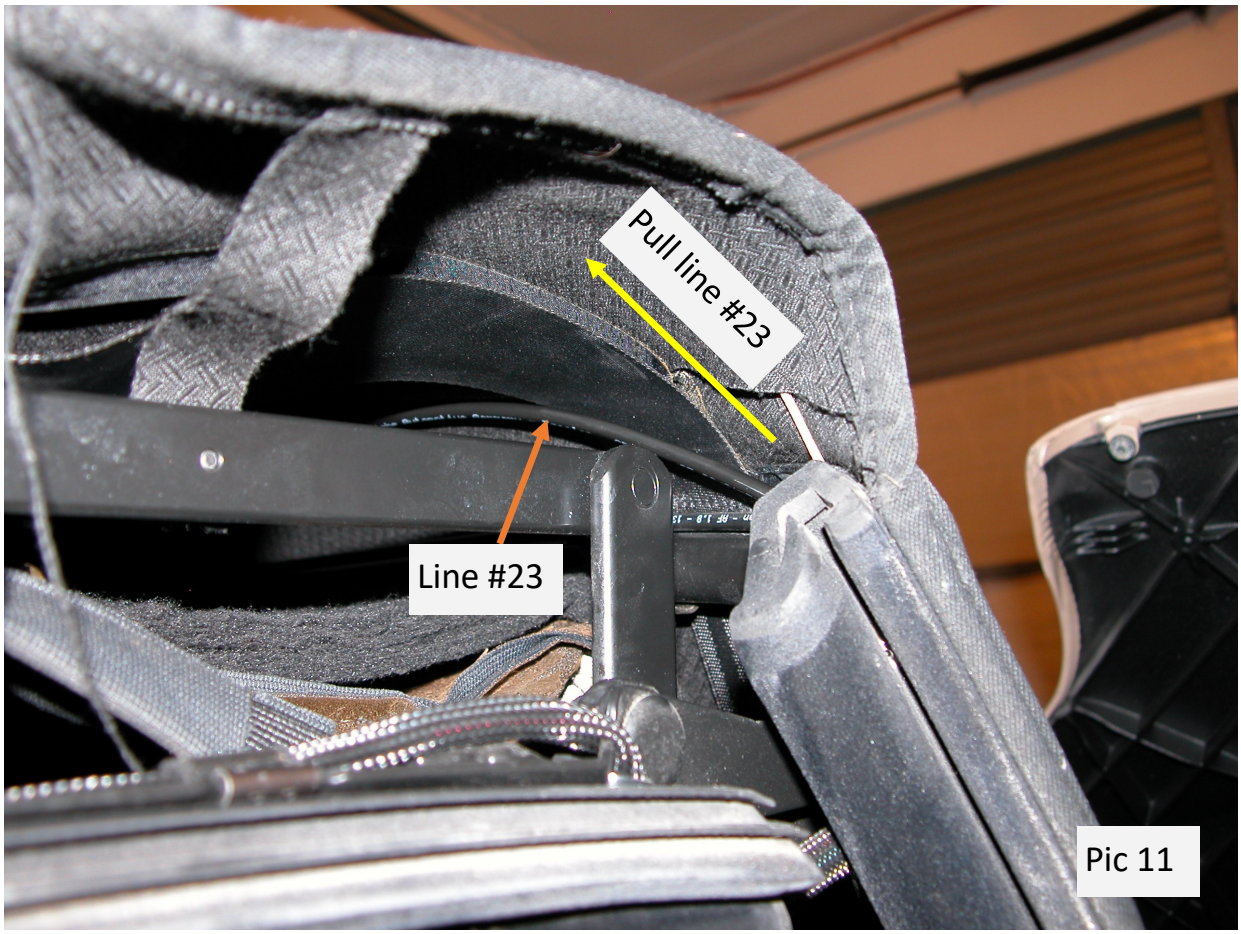
Pic 8 shows the right side hinge cover retracted and the hose cover removed. The two hoses shown are connected to the right main cylinder.

<u>Step 7</u>: Move the top so that the main bow is in a vertical position as shown in Pic 9.

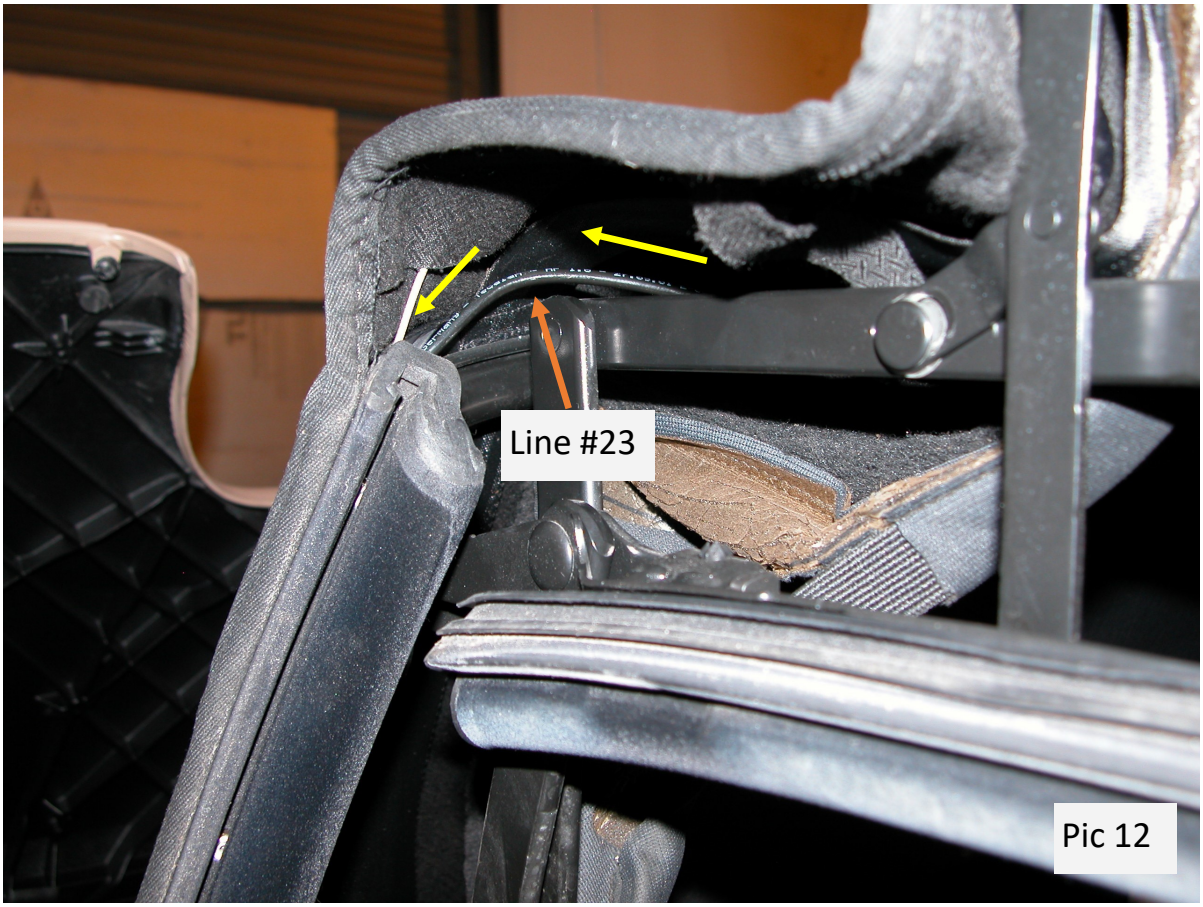


Step 8: To prevent any noise due to metal to metal contact, wrap the coupler with the padding included in the Kit. See Pic 10. The final position of the coupler joint will be behind the bow channel.

As mentioned earlier, hoses #23 and #24 run from the left side valve block and along the main bow to the right side main hydraulic cylinder. To remove extra slack from the repaired hose, simply pull the hose to the right side along the main bow all the way to the right main cylinder. When the hose is pulled, the coupler joint will move and become concealed inside of the bow channel. See Pic 10. The hose should slide without the need to cut the ties that secure the hoses to the main bow.

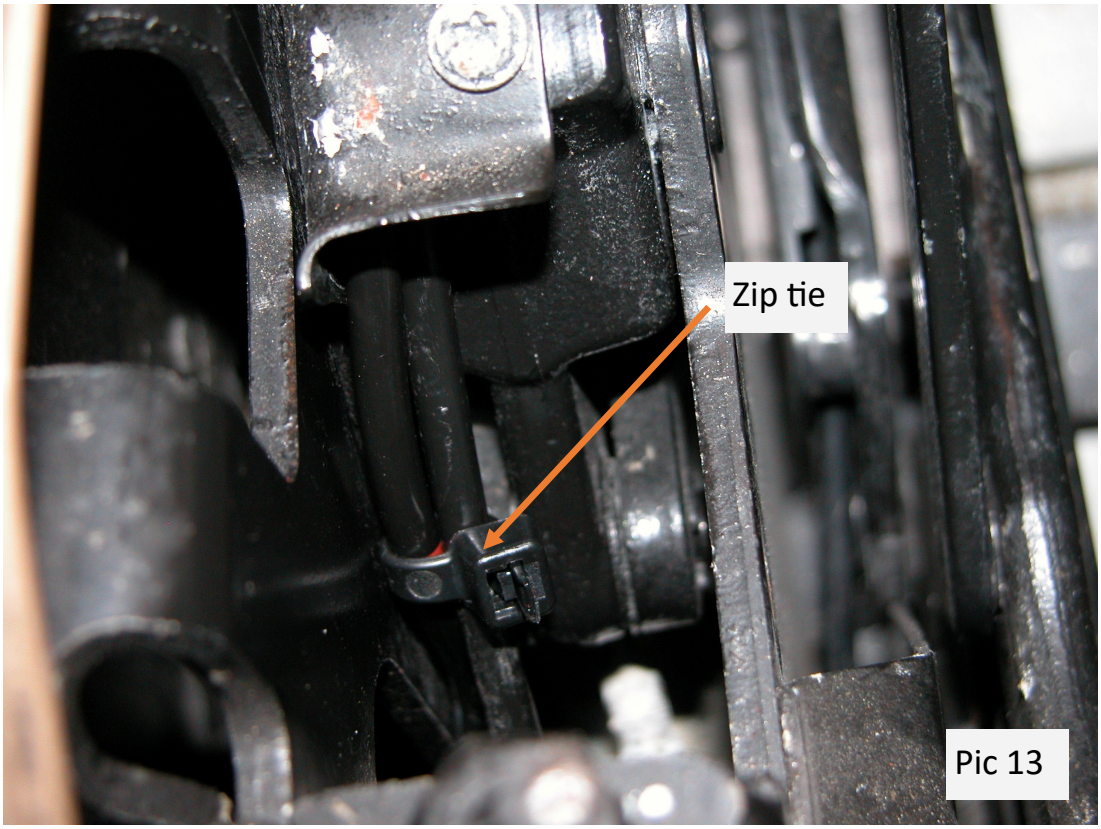


Step 9: Begin at the top left corner of the main bow and pull hose #23 as shown in Pic 11. The extra slack will build up at the top of the bow and the hose may become detached from the plastic clips located along the top of the bow frame. The hose can be clipped back into postition after the next step. To identify which hose to pull, simply choose one and pull on it. You've chosen the correct hose when the coupler joint moves.



Step 10: At the top right corner of the bow, Pic 12, pull the hose to take up the slack and insert the hose back into the plastic clips if they became detached.

Step 11: Pull the hose at the bottom of the right main bow channel opening along the main hinge and into the open space near the right main cylinder. There is no photo provided since the mechanism and hose arrangement is the same as the other side.



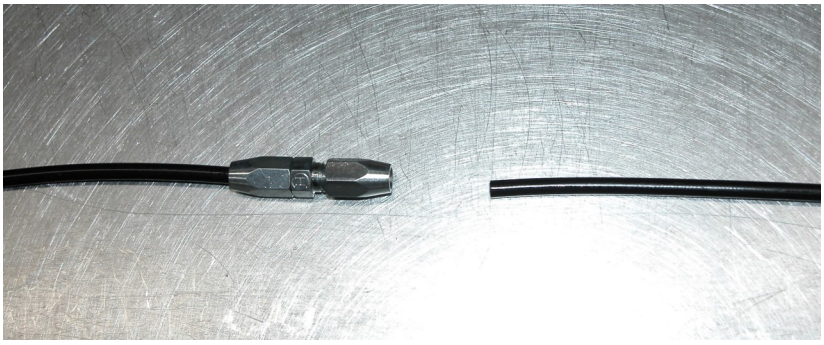
Step 12: After the proper slack adjustment has been made, install the hose covers. Double check the hose and electrical harness routing to ensure that the metal covers do not pinch the hoses.

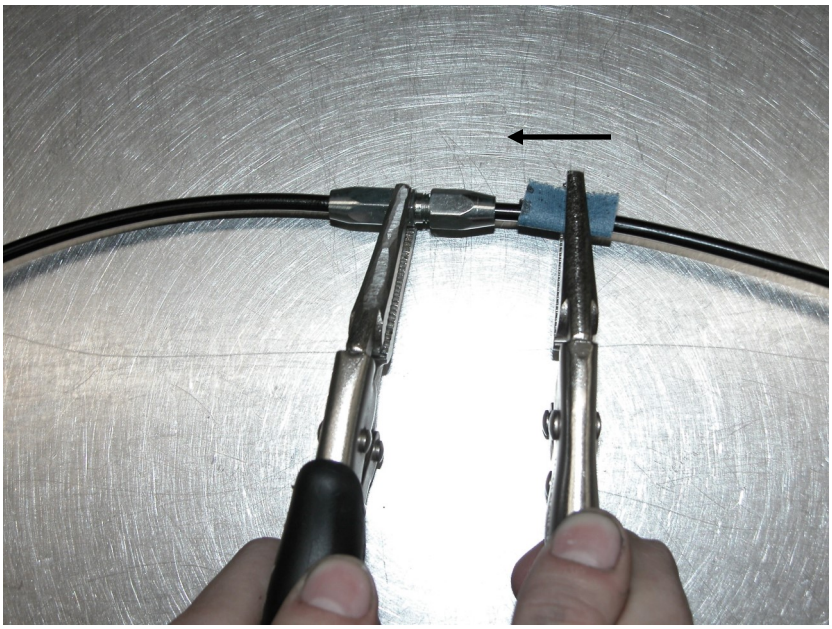
Step 13: At the right side hinge and in front of the hose cover, zip tie the two hoses together to keep them in place. See Pic 13.

Final Notes: **Do not power up the top until the repair has been double checked.** With the help of an assistant, open and close the top manually and check for any interference. Make final adjustments to the hoses as necessary and reinstall all parts that were removed. Fill the pump reservoir with the proper hydraulic fluid. We recommend Mercedes-Benz ZH-M hydraulic fluid.

Hose Coupler* Installation Instructions

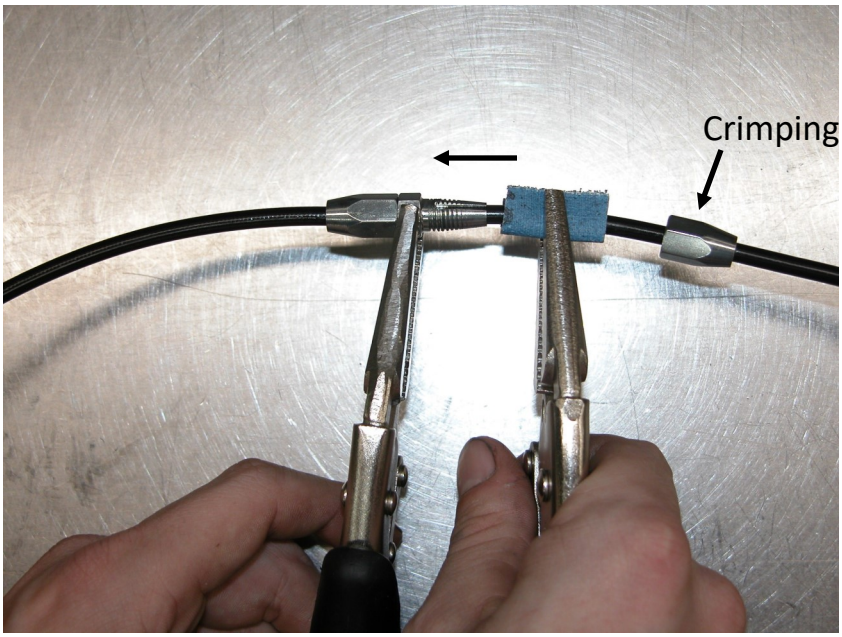
*U.S. Patent no. 9,482,375

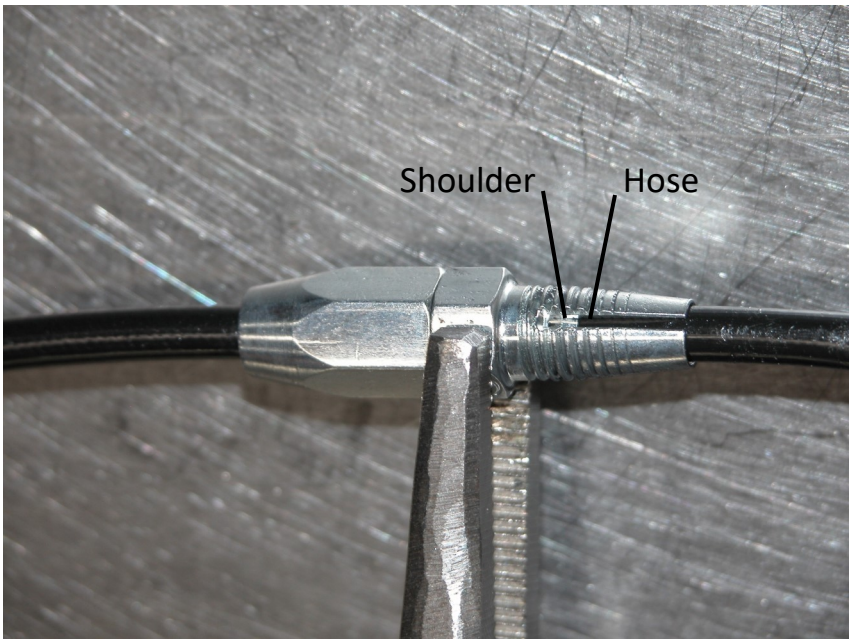




<u>Step 1</u>: Clamp coupler with locking pliers around the center hex of the coupler body .

<u>Step 2</u>: Fold the supplied patch of sandpaper with abrasive side against the hose and clamp slightly with a second pair of narrow nose pliers. The sandpaper will provide grip and protect the hose from the plier jaws. Push the hose into the coupler while twisting back and forth.

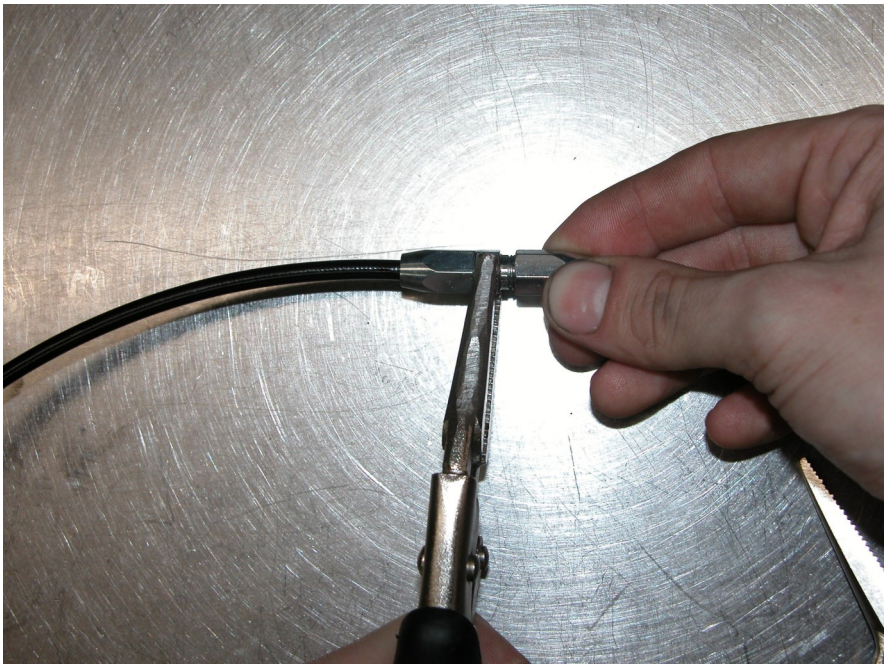




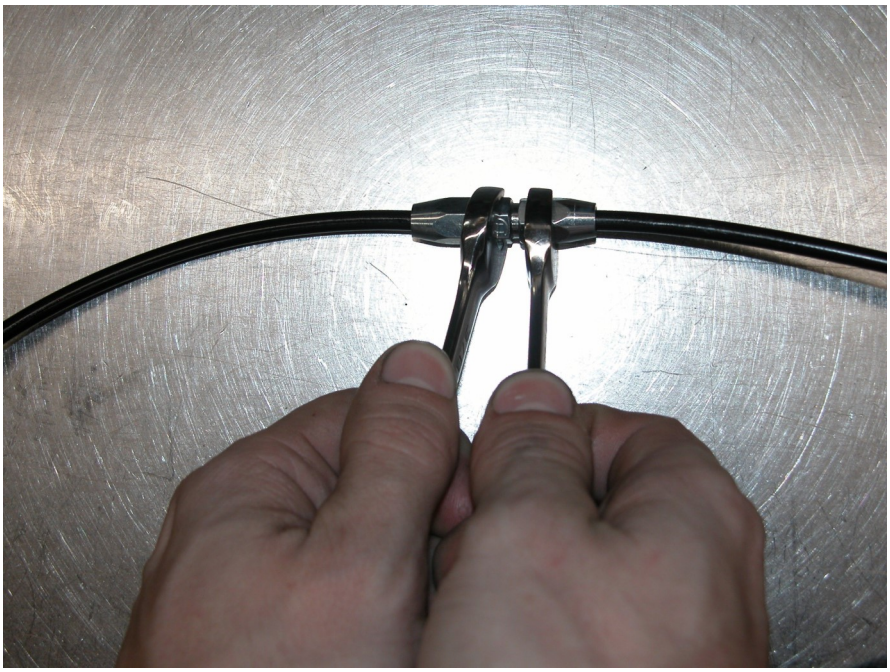
Step 3: Unscrew the crimping nut and slide away from the coupler .

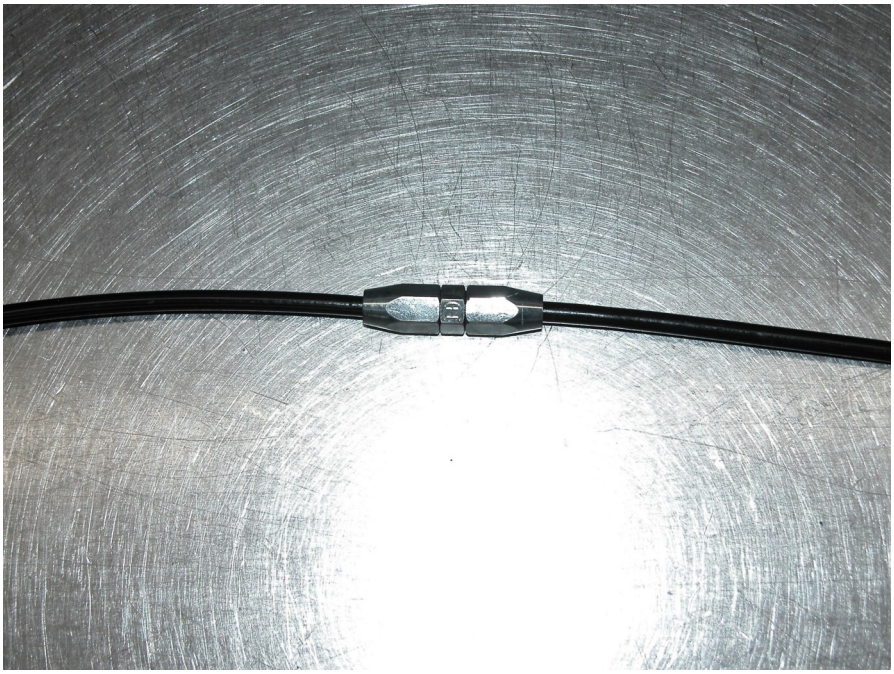
Step 4: As before, fold the sandpaper with abrasive side against the hose and clamp slightly with narrow nose pliers. Continue to push the hose into the coupler while twisting back and forth, until the hose end is in contact with the shoulder inside of the slotted relief as show above.

Important note: Once inserted, the tighter fitting hoses may be too difficult to remove from the coupler without damaging the hose end. If the hose is removed, inspect the end very carefully and trim off any damage. Do not attempt to cut and split the hose length wise inside of the coupler. Doing so will damage the barbed center and cause a leak. **Any tampering or damage to the coupler will void the warranty.**



Step 5: To prevent cross threading, thread the crimping nut onto the coupler by hand until resistance is felt. The nut should be 1/8" away from the center hex of the coupler





<u>Step 6</u>: Support the center hex with a 10mm open-ended wrench and with another 10mm open-ended wrench or adjustable wrench, turn the crimping nut until it bottoms against the center hex. Rotation will become more difficult as the nut begins to bottom. A defi-nite stop will be felt when the crimping nut bottoms. **Do not over tighten**. The hose re-pair is completed.