Replacement of Soft Top Lift Cylinders on BMW E85 Z4

This DIY was performed on my 2006 3.0si (May 2006 Build Date), but this same procedure should work on any Z4 E85 Roadster.

History of the Top Motor on this Car:

The original pump motor failed in 2010 and was replaced at a BMW dealer service department using the factory procedure. It failed again (failed to run) due to the expected corrosion issue in March of 2014 and I replaced it myself and sealed the housing using an RTV compound. In December 2015 the unit failed again however this time the pump motor was running but not building any pressure. I initially suspected a failed hydraulic lift cylinder, but after removal of the top and disassembly of the pump motor the root cause turned out to be a fractured relief valve body. It broke at the center point and left the pump permanently in the bypass mode. (Side Note: The interior of the motor housing was clean and dry proving that Shipkiller's sealing procedure works.)

Since I had already ordered the rebuilt lift cylinders from Top Hydraulics (http://www.tophydraulicsinc.com/en/55-bmw-z4) and my goal was to not have to remove the top assembly again for a long time, I went ahead and installed the rebuilt units.

Obligatory Disclaimer: The information herein is provided for reference only and I make no guarantees that this will work on your car. This presents my actions in doing this for my first time. There may be other approaches that will achieve the same result, this approach worked for me.

Shipkiller has already created an excellent DIY for removing the Z4 soft top assembly and I'm not going to duplicate those instructions here. This instruction assumes you already have the top removed from the car. For those that may wonder if you could do this without removing the top, by the time you get far enough into the removal process to lift the top frame up sufficiently to access the lift cylinders, you almost have it ready to lift out and my opinion is that you might as well go ahead and do that so you have easy access to effect the replacement.

You'll want to test the top and run the top up and down multiple times to bleed the hydraulic system before you reinstall the top assembly into the car so you'll want to build a stand to support the top. You'll find this convenient for doing the lift cylinders replacement as it will stabilize the top assembly while you work on it. The 2 photos below show the stands that I fabricated. I used some erector set style slotted steel angle available from Home Depot (also available from Lowes or Ace Hardware) as I found that the hole pattern lined up well with the hole spacing for the mounting points for the top.

http://www.homedepot.com/p/Everbilt-1-1-2-in-x-14-Gauge-x-48-in-Zinc-Plated-Slotted-Angle-802417/204225778

http://www.homedepot.com/p/Everbilt-2-1-4-in-x-1-1-2-in-x-48-in-Zinc-Plated-Offset-Slotted-Angle-801327/204225770?MERCH=RV-_-OD_NavPLP_rr-_-204225778-_-204225770-_-N

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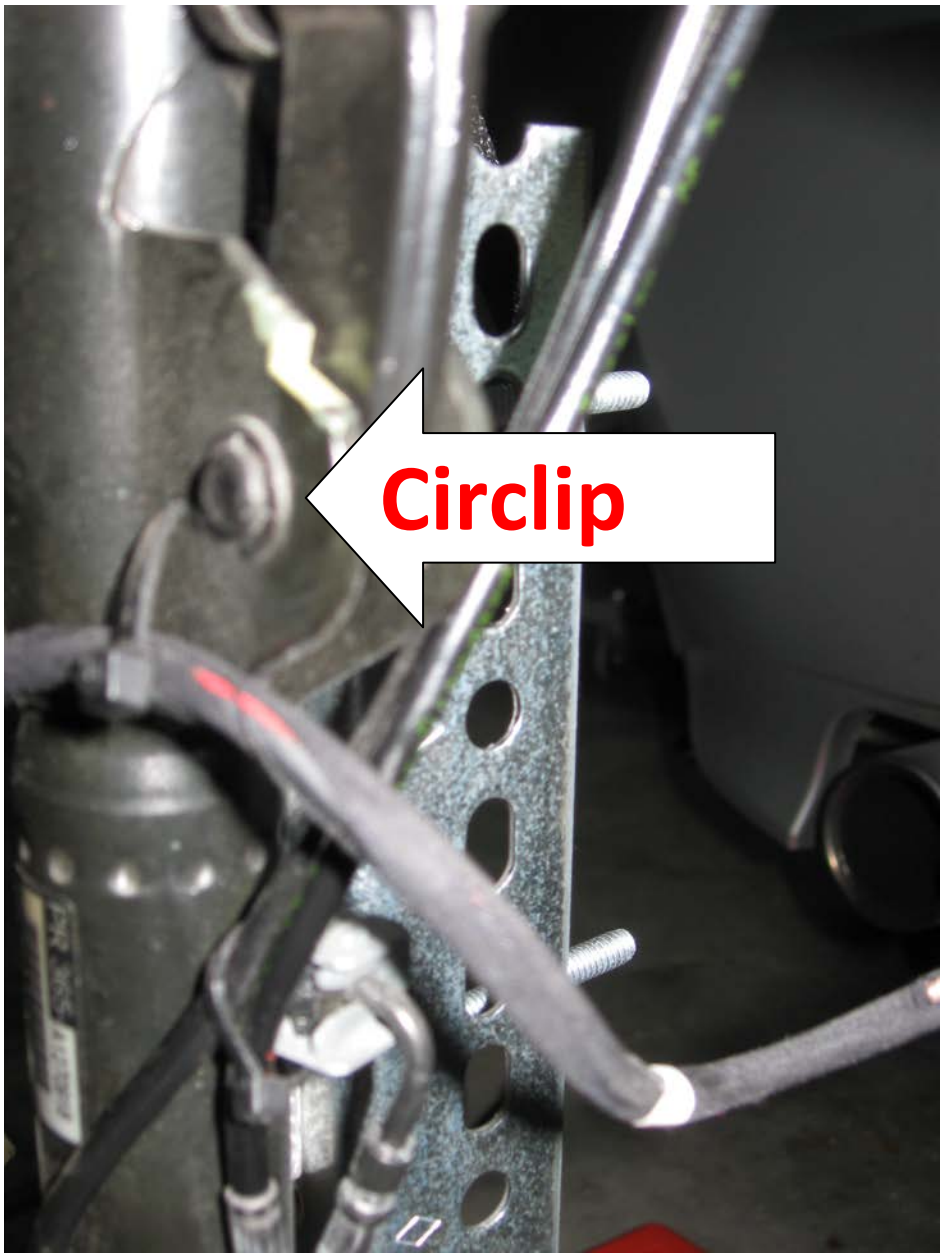
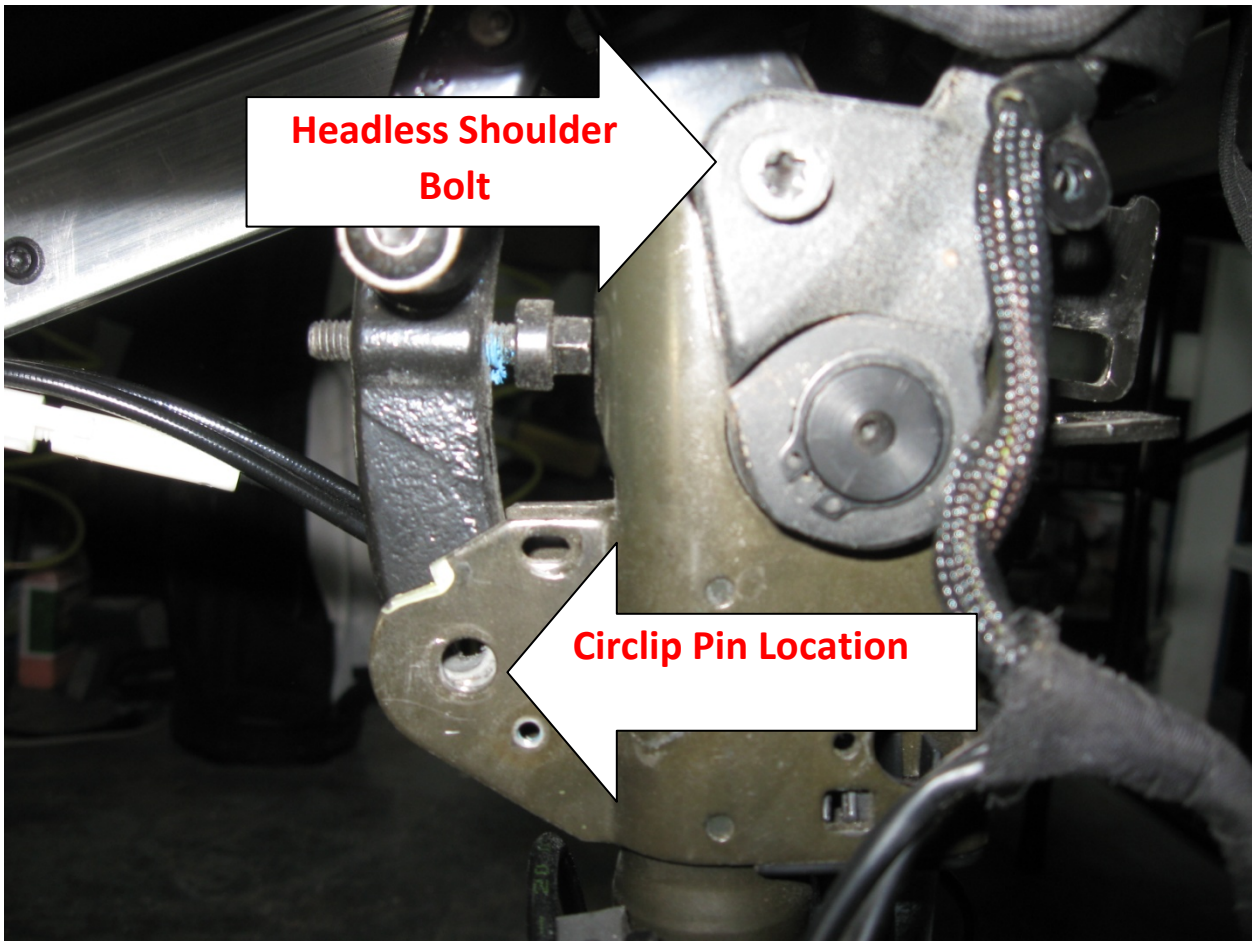
Replacement Procedure

1. There is a plastic trim cap near the base of each of the "B Pillars" of the top. Using a small flat blade screw driver, carefully pry it off.
2. There are 4 fasteners that hold the top assembly to the lift cylinder. Two of them connect the B Pillar of the top frame to the hinge arm, and two of them connect the base of the bow assembly. Loosen the two torx bolts that were under the trim cover removed in step 1, but don't remove them at this point.
3. Take photos of how the hydraulic lines are secured to the lift cylinder and how they are routed so that you can duplicate it during reassembly.

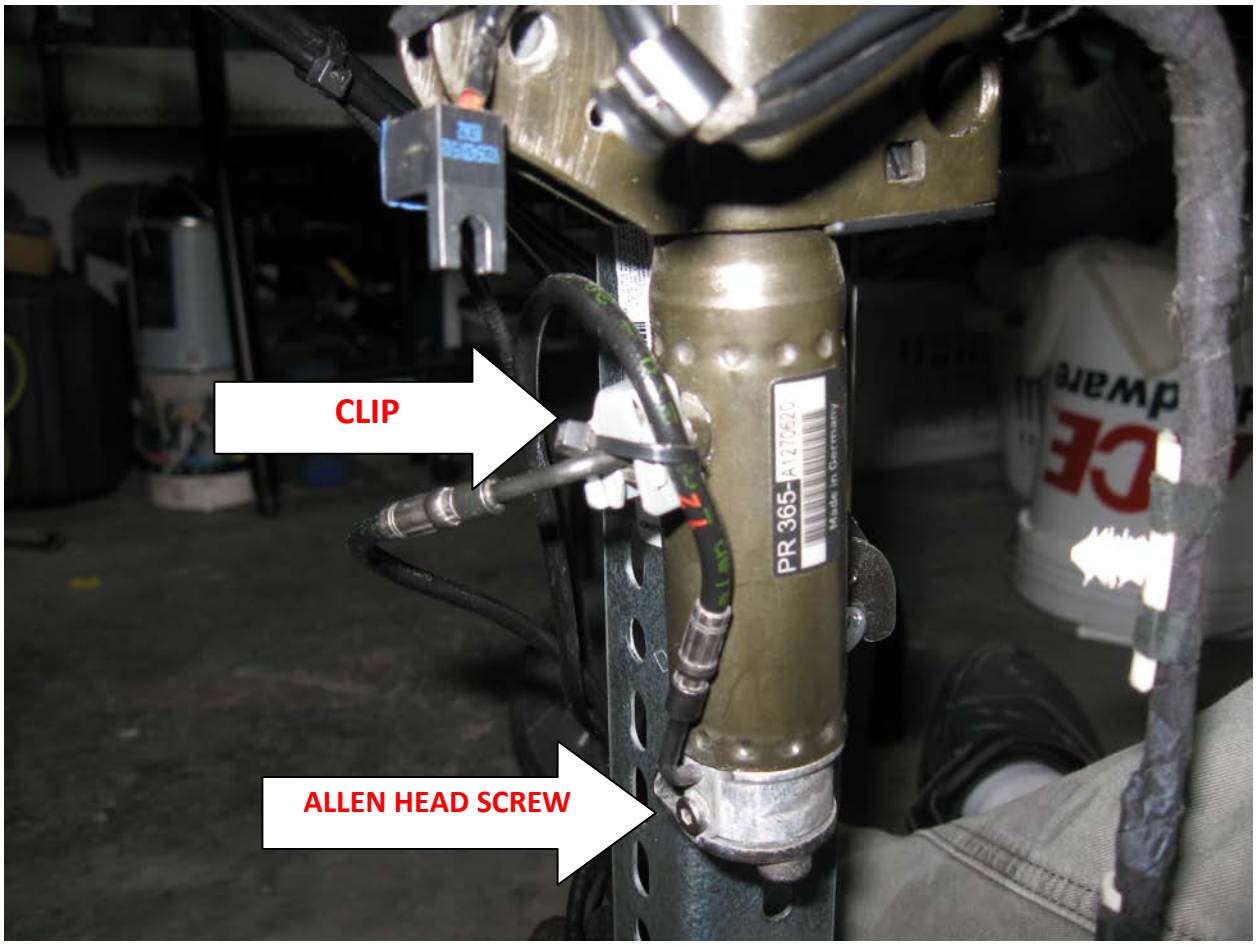
4. One of the fasteners of the frame base is a pin with a circlip to hold it in place. Carefully remove the circlip and tap the pin out of the hole. Be careful that you don't mushroom, nick, flatten or otherwise damage the area the circlip sits in or you won't get the circlip back in place later.



5. Remove the 2nd fastener (a headless shoulder bolt shown in the photo below) holding the frame bows to the base.



6. Remove the hydraulic lines from the cylinder. The upper line is held in place by a clip that slides off. The lower line is secured by a small plate held in place by an Allen head screw. Once the fasteners are removed the line you can pull the line directly out. The seals for the hydraulic lines are built into the cylinder body (small o-rings) so you don't have to worry about the seals falling out.



7. At this point for the passenger side cylinder you can remove the two large torx bolts in the B Pillar and remove the lift cylinder from the top assembly. On the driver side you'll need to remove the two sensors prior to removing the lift cylinder.

Note: When you remove the two torx bolts from the B Pillar and lift the top away from the lift cylinder, an aluminum shim will fall out. Keep track of this shim as you'll need to replace it when you reassembly the lift cylinder to the top frame.

8. There is a plastic cap on the top of the lift cylinder. Pry this cap off the old cylinder and install it on the new lift cylinder.
9. The aluminum shim that fell out in step 7 goes in between the lift cylinder hinge arm and the B Pillar on the top frame. I found it almost impossible to hold it in place, juggle the top frame, the lift cylinder and the torx bolts with it loose so I used just a small bit of Permatex to hold it in place during assembly. See photo below.

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10. Reassembly is the reverse of the disassembly steps just completed.
11. When you have the new lift cylinder reinstalled, you'll want to run the pump motor and raise and lower the top several times to verify operation, and bleed any air out of the lines. Running the top up and down does the bleeding by moving any air in the cylinders and lines into the pump reservoir. Since you replaced a cylinder you may find you need to add some fluid to the system to complete the bleeding and before you reinstall the top assembly into the car. There is a large plus sign on the side of the pump reservoir. When the reservoir is level and the fluid level is at the top of the plus sign, it's at the correct level.