



BMW E46 Convertible Bow Cylinder replacement guide



TopHydraulics
Making the best better



There is nothing better than a BMW convertible, until uh oh... what's *that*? You find a wet spot on the cover or rear deck. You clean it and it comes back. You clean it... and what the! It's back again!



Look for stains as well, for they can be an example of a small leak or of past history if you are a new owner of a used car.

Bad news

The reality is that your bow cylinders in your convertible top are leaking, and they need to be repaired. If you don't, the top will fail and the leak will ruin the rear deck along the way, both very expensive propositions.

Good news

Taking them out and off for repair isn't hard at all and is relatively inexpensive!

This is intended as a DIY guide for the average Joe, if you can follow directions and save yourself a ton of time and money in the repair. When I found this problem, I was given estimates of 7+ hours of shop time and \$1,000 for two new cylinders for the repair. The work would include the complete removal of the top leaving your car out of commission until repairs were done.

I found a way to take out the cylinders without removing the top, with roughly 45 minutes to remove and roughly an hour to reinstall after a lot of research, phone calls, investigation and help from key individuals.

This guide is intended as best effort and there are very likely better ways of doing what I did, better pointers, or improvements others can add. If you can do better, faster, easier, absolutely do it! This is a combination of the owner's manual, e46Fanatics.com forum and huge thanks to [Klaus Witte](#) of [Top Hydraulics](#)! The goal was to write up what is a simple guide for what I was told can't be done: Removing both cylinders without removing the top.

If you need to remove the all of the other cylinders, there is an excellent source DIY advice on the e46fanatics forums, created by Chris Taylor. Please refer to that info here: [DIY: Convertible hydraulic cylinders removal](#)

Disclaimer: This process worked for me beautifully but that doesn't mean it will automatically for you. Work slowly and carefully, don't force anything and don't rush. For roughly two hours total of time, you can save upwards of \$2,000 in parts and labor. I have used terms and descriptions that make sense to me that may have nothing to do with the real names of the pieces involved.

Goals:

Remove both rear bow cylinders without removing the top and not damaging the car.

Return top to working up position to allow use while cylinders are being repaired by [Top Hydraulics](#).

Reinstall bow cylinders and return car to full working order with minimum effort.

Tools:

Must have:

Torx T20 screw driver

Razor blade or utility knife

Small flat screwdriver

Long prop used to hold up the rear section of the top.

Zip ties (2)

Shop towels

Simple Green or similar cleaner

Double sided carpet tape

Convertible hydraulic oil, use listed or use similar - [54340394395](#)

Nice to have:

Pliers

Shop work gloves

Magnetic screw bowl

Lots of light and space

Forum information – [E46 Fanatics Convertibles Forum](#)

Music (I recommend BB King, nothing like the blues while doing car work)

Contacts:

[E46 Fanatics Forum](#)

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Bow Cylinder Removal

*Assumptions: Top is still working and can be operated if briefly with power controls. If you cannot use the top in power mode, refer to the BMW convertible guide for manual emergency operation.

1. With the ignition on and the top up and locked, use the top down button to unlock the roof from the windshield and release tension in the top.



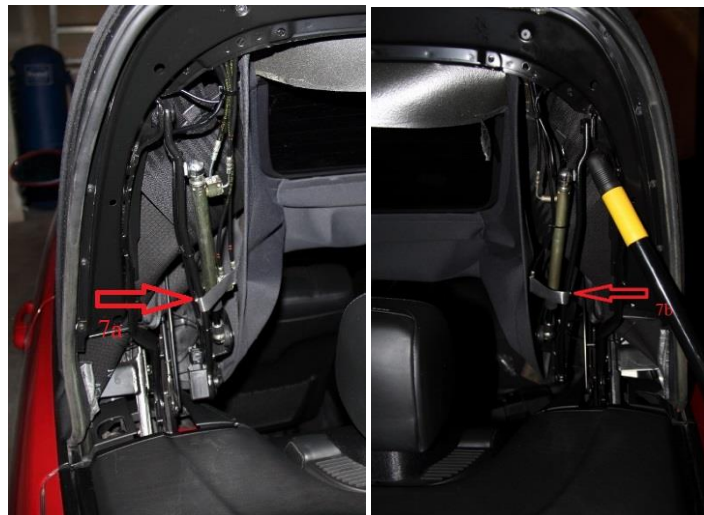
2. Turn off the ignition which will release pressure on the hydraulics system and allow manual operation within 30 seconds.
3. Remove the rear center bolster in the back seat to access manual roof controls. Pull on the black tab down and out to pull out and set aside. Lift along the black trim to peel back the cover from the tool and controls.



4. Remove the hand crank style tool from the clips. The tool goes into the small hole marked by the lowest arrow. Depress the button marked by the top arrow, and turn the hand crank until the button stays down. This disengages the motor drive from the top allowing manual operations as per the operations guide. *not certain this step is required, did it anyway*



5. Pull and prop up the rear top assembly manually, marked 5a. *note also used same point drivers side as well alternatingly. I used a shop broom as it was long enough, had a solid base and a foam covered handle for no damage to the quarter panel.*
6. Cut two zip ties marked 6a and 6b freeing the hydraulic hoses *note cloth cover (step 8) is already cut in this picture*
7. Remove two t20 Torx screws holding inner cover retaining straps. (7a, 7b)

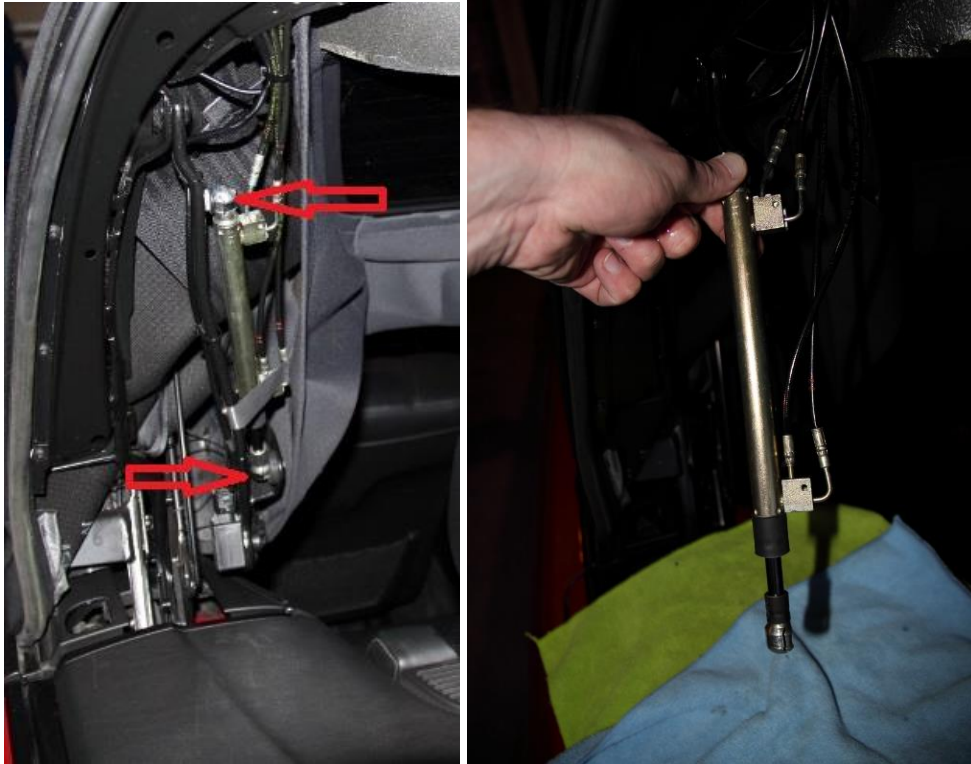


8. Cut cloth retaining material with a utility knife or razor blade, cutting as close as possible to the black retaining lip. The material has double sided tape but also is held at least partially by the top assembly itself. You can cut it quickly and repair with carpet tape, or take out 25+ t20 Torx screws separating the outer shell from the deck piece and possibly creating other issues. I cut it.



Cutting the cloth also kept the material from tearing as it appears to be a combination of tape and pressure to hold in place. Good carpet tape will fix this easily and look OEM when done.

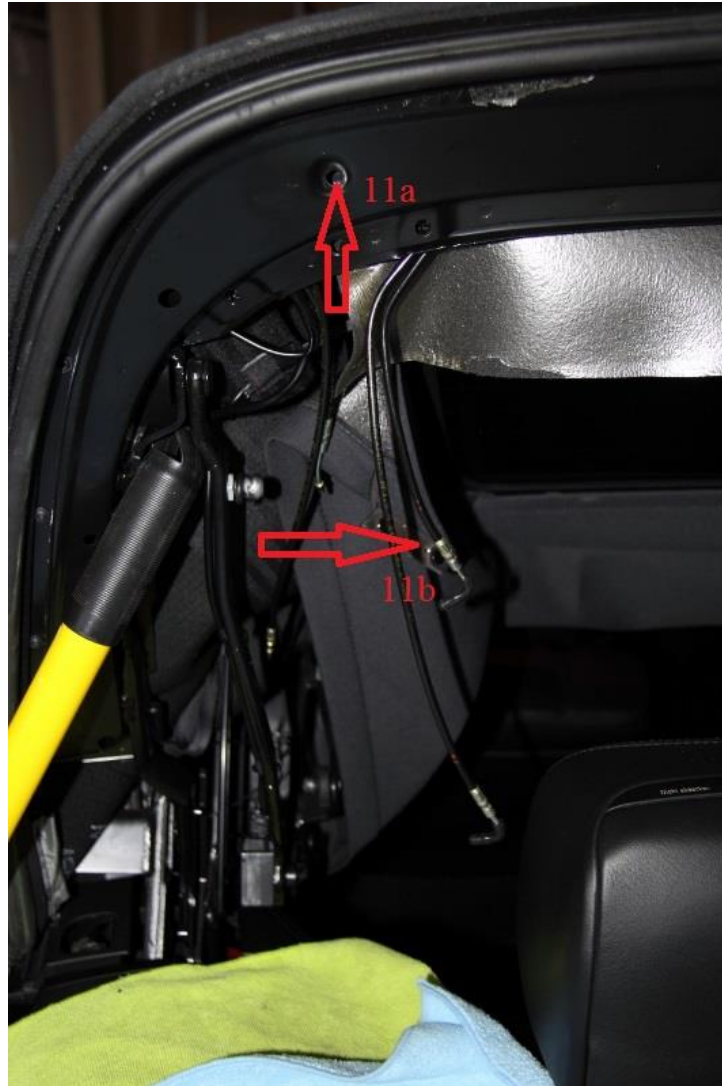
9. Pull top and bottom retaining clips from driver's side hydraulic cylinder. Insert a small flat bladed screwdriver between the center bow of the clip and the flat spot at the top and gently pry free. Pull the cylinder from the frame, while laying down shop towels in case of leaks.



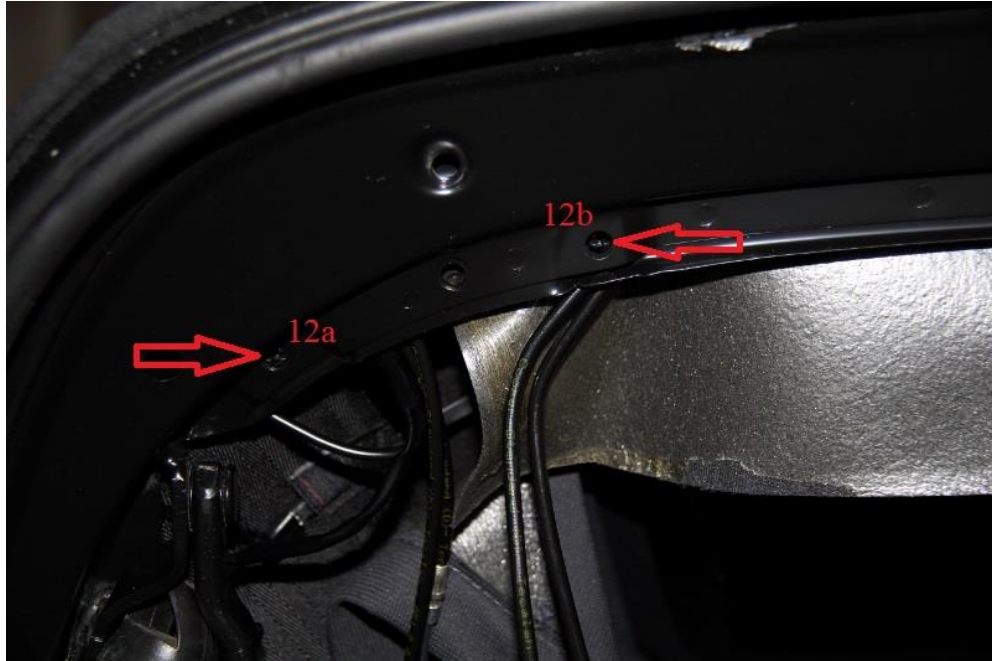
10. Rotate the cylinder to access the upper and lower locking plates. Remove the t20 torx screws and pull the plates. Both upper and lower hydraulic connections will then pull free from the cylinder. Keep shop towels down to catch any hydraulic fluid leaks. Set cylinder in a safe place.



11. Pull the hoses from the passenger side, working across the frame at each connection. Pull the t20 torx screw from the upper frame first (11a) as this will allow the interior liner connector to be loose hanging behind the hoses in this pic. (11b) Repeat on driver's side.



12. Carefully push back expansion pins in routing plate with a flat bladed screwdriver and work the hoses free. Don't push the pins out the back and lose them. (12a) (12b) Note that the cloth wrap can have some adhesive connected to the plate, so may have to work it free with your fingers and pull the plate free and lower to access the hoses.



Pull only the right side hoses for the pasenger side free, and secure the plate back in place.



13. Work your way across the upper frame, carefully pushing the locking pins back in the pressure fittings and freeing the hoses from the passenger side. Wrap the two free hose ends in a shop towel and tape in place to keep from leaking on the cover or seats.



14. Repeat step 12 on the passenger side, freeing the routing plate and hoses. Free only the left hoses, and secure the routing plate back in place.



15. Repeat step nine on the passenger side, removing upper and lower clips on the hydraulic cylinder. The hydraulic hoses are permanently attached at this end, but should now be free of the upper frame. Put clips in a safe place and remove the cylinder from the mounts.



I removed the securing brackets so the pins wouldn't be lost in shipping. I marked where the clips were with blue painters tape to make reinstallation easier. Clean up, drain oil and box up to [Top Hydraulics!](#)



If you compress the cylinders, remember they are full of oil and ***will*** squirt all over like a super soaker.

Securing the top to drive

No reason to not have your daily driver while the cylinders are being repaired.

1. Wrap the two hydraulic hoses on the driver's side to avoid leaks. Wrap a towel around the loose ends and put in a baggy, tape in place.
2. Lower the back section down onto the rear cover in normal closed position. Remove the cover from the manual lock on the inside front lip of the top. Use fingers or cloth covered screwdriver.

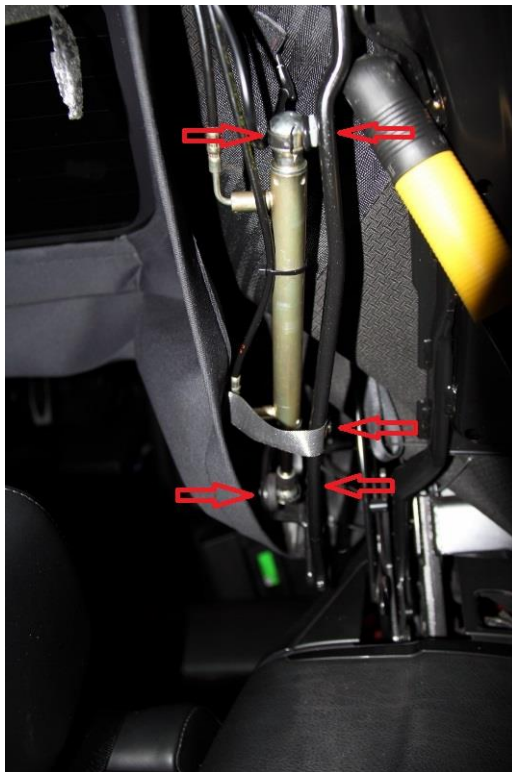


3. Insert the hand crank into the hole and turn clockwise to lock the top down and into place. It may take two hands or extra help to hold the top in place as the latches are tightened. Turn until secure and your top is sealed and ready to go even if it rains. Reinstall the center manual lock cover you pulled off to secure the top.
4. Leave the motor disengaged, put the hand crank back into the clips, put the leather cover and seat bolster back into place (removal step 4) and enjoy the shade until your parts return from repair.

Bow Cylinder Installation

Welcome back! Your cylinders will be back from Klaus by now, shiny, repaired and better than new! The short version of the installation? Reverse the removal steps, start backwards and work back to the beginning.

1. Remove the rear center bolster and cover again, to get the hand crank.
2. Remove the cover from the manual lock in the upper center of your roof and unlatch the roof. Turn the crank as indicated, counter clockwise (anti-clockwise) until it stops. This will loosen all the tension and allow you to raise the roof partially, and then prop the rear section up again. Replace manual lock cover.
3. Reinstall the passenger side cylinder first. Socket the cylinder onto the two ball joints and then install the retaining clips. If a clip wont seat quite properly, *gently* apply pressure with a pair of pliers (at the red arrows) until it clicks into the grooves securely. (don't do anything stupid here) Install the inner cover retaining straps with t20 torx screw.



4. Route the hydraulic cables back up through the routing plate and reinstall the plate. Push the pressure fittings back into the holes, and guide the pins back in from behind to secure. Reinstall the interior liner connector, shown hanging here (4a) back into the orientation shown in with the red box (4b) with the saved long torx screw. Check for twists in the material, the liner should be straight.

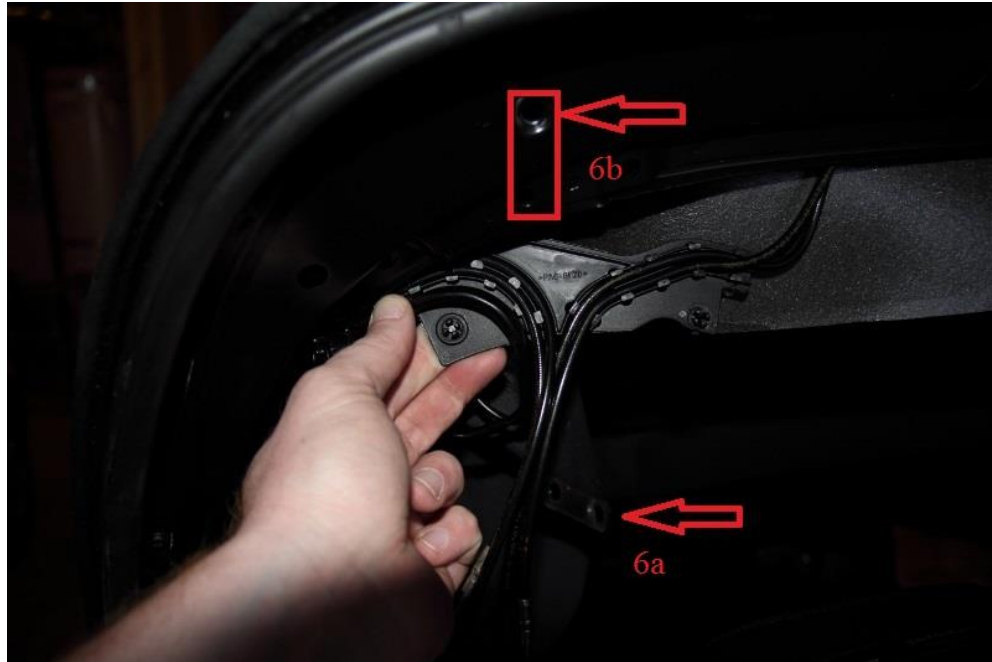
5. Reinstall locking clips at the painter tape reminders while removing the tape, and route along the upper tray. Be careful to not lose any of the tiny pressure pins along the way.

Route and install all of them until you get to the corner and the reinstallation of the routing plate. Check for any slack and that the connectors look about in the right place for the cylinder.



Pull the routing plate again, making sure none of the other hoses have come loose, and route the right hand hoses through the proper groves.

6. Route the hoses, and reinstall the routing plate, and reinstall the inner liner connector (6a) in the orientation shown in the picture. (6b) Again, twists are bad.



7. Insert the upper and lower hydraulic hoses back into the cylinder connectors, reinstall the locking cover plates using the t20 torx screws. Rotate the cylinder back into normal orientation and install back onto the ball joints. Use pliers if needed to secure the locking clips and check they are on securely. Restore the zip ties on either side securing the hydraulic hoses, check all clips for proper installation and reinstall the inner cover strap with t20 torx screw.



8. Use the double sided carpet tape along the upper tray edge to secure the cloth wrap and apply carefully to restore the pre-cut look. Get good tape, and this will look good.



9. Check the clips, connectors, locking plates and anything else you have touched, moved or taken off to make sure everything is right. Remove your support and lower the rear section.
10. In the back seat, remove the bolster and cover and use the hand crank to reengage the motor, indicated by the button popping back up. Replace the hand crank, install the cover and bolster.



11. Turn the ignition to the second position, and power the top down.
12. Assuming that works: Power the top up to full up and locked position.
13. Assuming that works: Power the top partially down just far enough to lift the back section and with the key still on to maintain pressure, check all connections and hoses for leaks.
14. Assuming no leaks... **CONGRATULATIONS! ****
15. Take this opportunity to clean the rear deck *thoroughly*. The hydraulic oil is difficult to clean off and the deck itself gets filthy just from normal top down operation. With really good cleaning with a rag and Simple Green (or similar) you can even reduce the visibility of the oil stains.

Well done! Give yourself a massive pat on the back for saving a huge amount of money and fixing something they said couldn't be done this way! Wasn't that bad, was it?



** There is always a "but", right? But, depending on how much hydraulic fluid you may or may not have lost, you should check the pump reservoir in the trunk. This requires taking off the left hand carpet pieces and other work. That process isn't documented here, but is strongly recommended.

Do it. Check it. If needed, buy more hydraulic oil and don't waste all of your hard work on something so simple.

Again well done! When in doubt, refer to listed resources for help as everyone has been amazing!

Written by Stefan Yotz 3/2013

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There is no warrantee or guarantee to this guide and is provided in all good faith and best effort.

Huge thanks to:

Klaus Witte – [Top Hydraulics](#)

Les and Kim - [Convertibles Only Seattle](#)

Chris Taylor – e46fanatics.com forum contributor and author of the [DIY: Convertible hydraulic cylinders removal](#)

Gbakerkingston – e46fanatics.com contributor