

## Bow Extension Cylinders

Level of difficulty: Fairly easy to intermediate – very rewarding! Requires some patience.

Tools needed:

- 5-mm Allen wrench or socket (only for '90-'95 models)
- Needle nose pliers (for '96-'02 models)
- Flat screwdriver
- Phillips screwdriver
- Rag or paper towels
- Wire or match, cut to 1-1/4" length
- (recommended: magnetic parts tray to hold screws and clips, and magnetic retrieval tool for dropped parts)
- (luxury: E-clip removal tool)



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*For inspection only:*

- No tools required, and only a few minutes to open the tonneau cover and look at the cylinders...

1. Open the tonneau cover.  
(If your tonneau cover should not open or unlock automatically, you can unlock it with the MB supplied tool with the 6-mm Allen wrench at one end. The tonneau cover unlocking bolt is hiding between the roll bar and the rear seat side panel...)



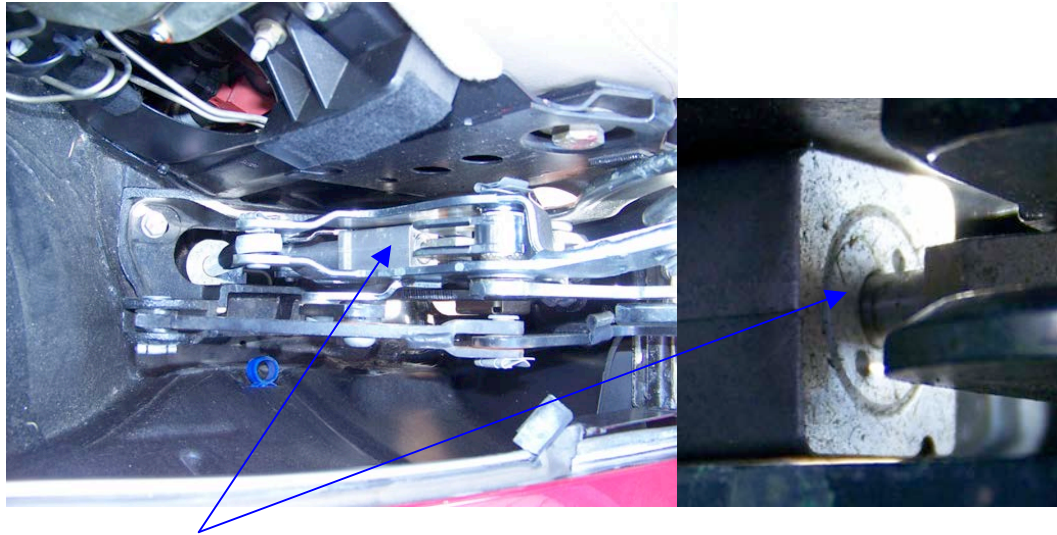
2. Raise the soft top, and keep the rear of the soft top raised. Do not latch the front of the soft top – keep a soft spacer between it and the windshield header.

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### 3. Inspection for leaks:



The bow extension cylinders are located inside the soft top frame, several inches above the main lift cylinders.

The position of these cylinders changes as the top moves. That makes it possible not to see oil on top of the cylinder, even when the cylinder is leaking. The cylinder shown has, if any, only a minor leak: there are no signs of running or accumulated oil, and the only sign of minor leakage is how the dust is sticking flatly to the surface and looking somewhat darker than other dust in the area. This particular cylinder may be a candidate for 'rebuilding while the other ones are getting done, anyway'. Remember, you have the tools ready, and you will have to remove the same trim panels to remove these cylinders as for the removal of the main lift cylinders, anyway. Also, having these cylinders rebuilt together with other ones will not significantly extend the period of time that your car is out of commission.

When these cylinders leak, the oil will drain in front of your rear tires.

*Your hydraulic system may eventually not work properly when the hydraulic fluid level gets too low, and the cylinders cannot develop enough pressure. Your hydraulic pump may suffer damage.*

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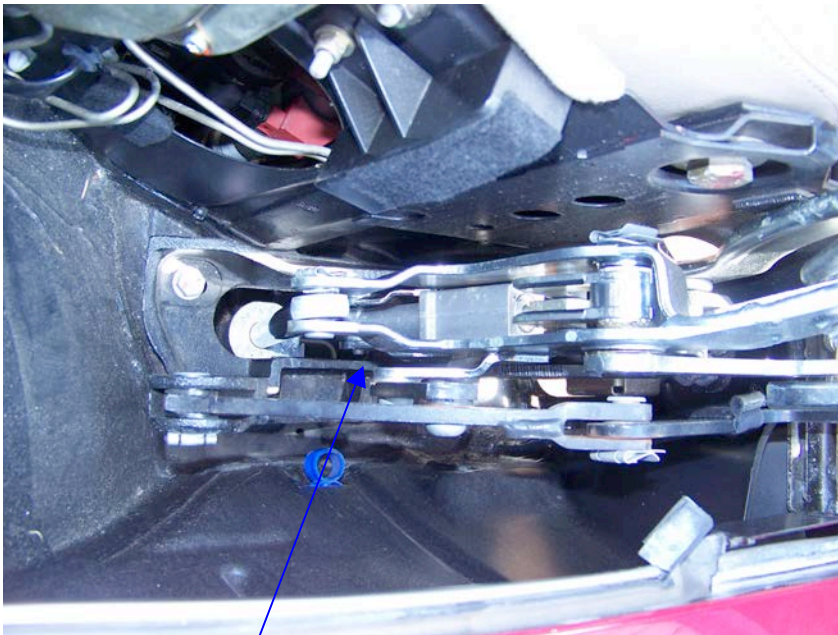
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*The seal material used in the OEM cylinders is usually rated for a shelf lifetime of 10 years (replacement cylinders at your dealer may have been on the shelf for awhile already...), and has been designed into the system at the latest in the 1980s. Top Hydraulics, Inc. uses enhanced, more modern seals that provide for extended use, while making an excellent seal.*

4. To remove the bow extension cylinder, you will need to remove the spring loaded, metal trim panel on top ("top case plate"), the welting inside the door jamb, and the trim panels around the rear compartment area. You do not have to remove the carpeted trim panels all the way if you are working on the bow extension cylinders only. We will show both options below.

For '90-'95 models, the front pin holding the bow extension is a bolt with a 5-mm Allen head. For '96-'02 models, it is a pin with E-clips (aka C-clips) on both ends.

On '96-'02 models, remove the inner E-clip while the rear of the soft top and the tonneau cover are up at the same time. At this point, the "front" pin of the bow extension cylinder appears to be in the bottom position – see next photo. It is easy to drop the E-clip during this procedure; that is where an E-clip removal tool comes in handy. Second best is a magnetic retrieval tool...



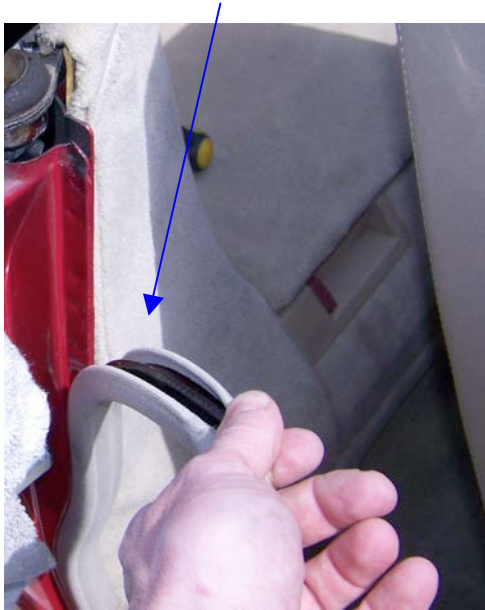
(Remove outer E-clip on '96-'02 models)

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5. Remove the welting inside the door jamb. (This may be glued in newer models)



Release the rubber molding from the top case plate with a flat screwdriver. (This may not be necessary on newer models)



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Remove three Phillips screws to lift out the spring loaded top case plate assembly – use a stubby screwdriver, or a ratchet. There is one screw towards the inside, and two screws towards the outside (quarter panel). Theoretically, the outer screws only need to be loosened to lift out the plate assembly. The rubber drain hose pulls out easily.



Remove the Phillips screw holding the rear compartment trim panel.



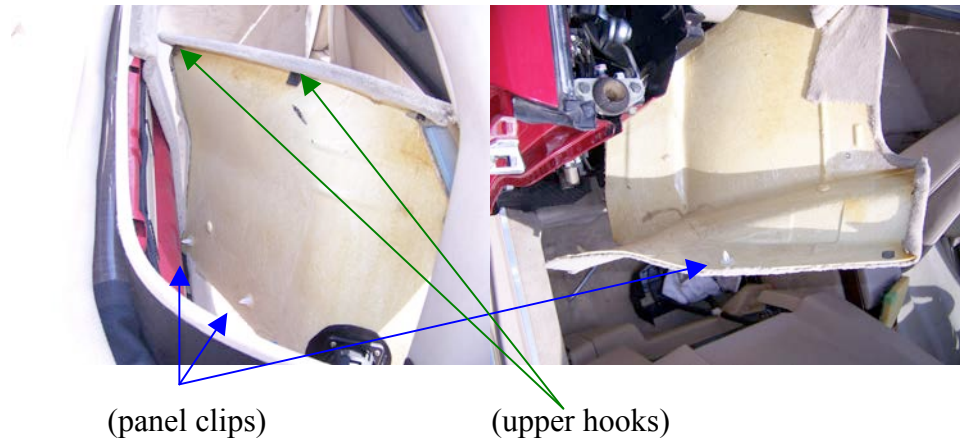
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Remove the rear compartment side trim panel – take a look at the photo below first, showing how the panel is fastened. Full removal of the panel is not required if you are only removing the bow extension cylinder, albeit advisable. We are showing it here, anyway. Farther below, we'll show you how far the panel has to be pushed back in order to access the Allen screw hiding behind the panel.

Start pulling from the upper outer corner, locate all the fasteners and pull in their position, then lift up the panel out of the hook in the rear top. It is best to have the roll bar in the raised position for this; removal of the windscreen is optional.



Unplug the rear speaker, if equipped.

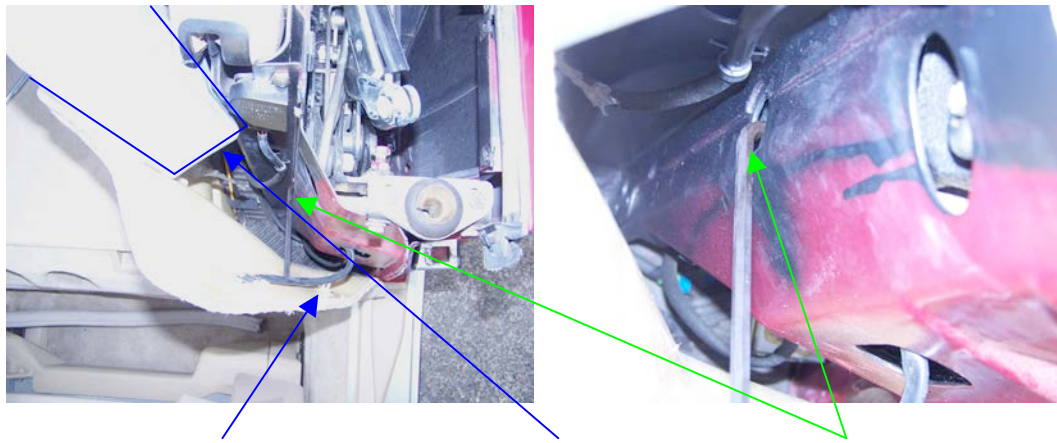


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Let the soft top drop into its storage well, but keep the tonneau cover open. Locate the access hole for the front bow extension cylinder bolt or pin on the inside of the door jamb. On '90-'95 models, remove with a 5-mm Allen wrench or socket – start on the passenger side! **On '96-'02 models, push the pin out with a small screwdriver (you have previously removed the E-clip).** For re-installation on '96-'02 models, push the pin back in from the inside with needle nose pliers.



Driver side door jamb shown, with oil bottle as a spacer, and Allen wrench inserted



(Front pin/bolt with Allen head for '90-'95 models)

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To remove the rear pivot pin of the bow extension cylinder, prepare the soft top position as follows: While raising the soft top to about its highest position, rest the rear just above the tonneau cover hinges, and buffer with a rag so that the rear does not get damaged.



Remove the c-clip as shown below, and pull out the pivot pin. Be careful not to loose the c-clip, or the pin. Hold on to the soft top.

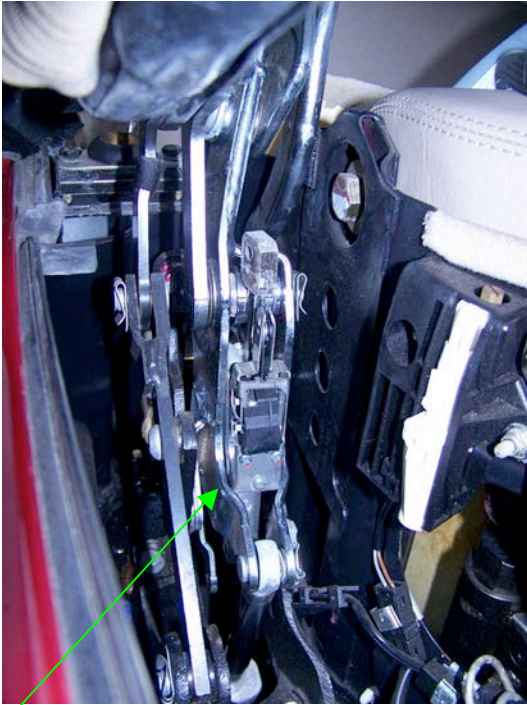


Move the soft top forward; try not to latch it. The driver side cylinder must be removed with the top in this position, otherwise the micro switch on that cylinder cannot clear the soft top frame and will be damaged.

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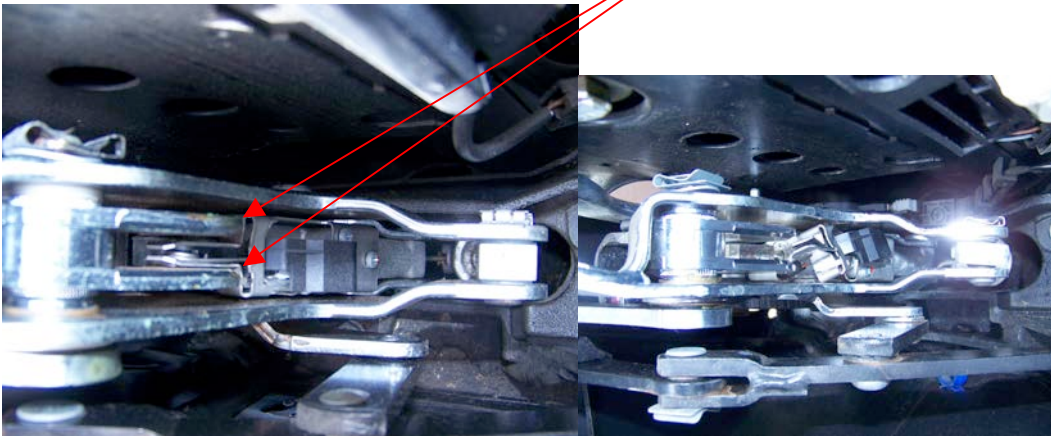
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(You can “cheat” a little and lift the rear of the soft top a few inches, as done in this photo. The arrow shows where the micro switch needs to clear the soft top frame...)

If you want to remove the cylinder from the outside, as shown above, be careful not to lift the rear of the soft top too high, or the frame will crush the switch as seen in the photo below:



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It is safer to remove the cylinder from the inside, with the top closed, but you can do it from outside once you understand how the switch could get crushed...

Remember to push in the cylinder rod as soon as possible, so that it will not get scratched.

Pull out the cylinder and remove the hydraulic line clips with a flat screwdriver, or an angled tool. Make sure you can identify the respective positions of the hydraulic lines once they have been removed! The lines have numbers stamped on them, which correspond to markings on the cylinders. However, in some cases the numbers might be hard to read. Wrap the cylinder in a rag, and carefully twist it off the hydraulic lines. Wrap the hydraulic lines in a rag, as well.

Empty the cylinder of hydraulic oil by cycling it with the oil discharging into the rag. Be careful, the oil could squirt all over you if you don't cover the exit holes!

**Replace in reverse order, and use the 'match trick' as shown on the following pages.** Remember all electrical connections and the clips on the hydraulic lines... Also, remember that the rounded part of the clips points towards the outside of the car, and that the thicker side of the block attached to the left side bow extension cylinder is oriented towards the switch (see notes below).

After re-installation, the air will eventually be vented from the system, after you have cycled it a number of times.

Remember to wrap the assemblies carefully when shipping to us, so that the pistons do not get scratched during transport.

For repair and/or seal replacement, ship cylinders to:

Top Hydraulics, Inc.  
3235 Pacific View Drive  
Florence, OR 97439  
USA

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The "Match Trick" for re-installation:

A common difficulty is that the micro switch assembly could get crushed by the soft top frame, when moving the top around to install the two pins anchoring the cylinder. To avoid this, we recommend the following procedure for re-installation. Before we get into the detail of this procedure, please remember that the thicker part of the rectangular block attached to the cylinder must be oriented towards the switch assembly, so that it will engage the switch's lever when the cylinder is retracted.



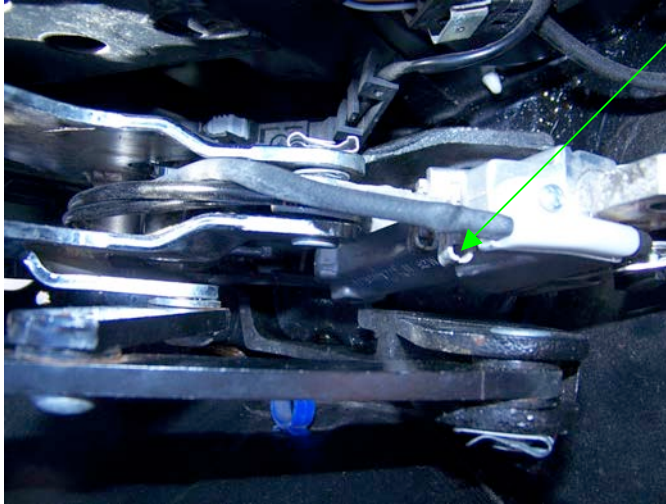
As the cylinder rod retracts, the top piece moves a lever that releases the micro switch.

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- 1) With the rear of the soft top raised, install lines and micro switch as shown. Make sure that the lines are in the original order, and that the clips are fastened with the rounded side pointing towards the outside of the car.



- 2) With the rear of the soft top raised only a few inches, slide the cylinder back into its original position. The cylinder needs to be almost upright now. Watch out not to crush the switch by excessive movement of the soft top – see removal instructions above.
- 3) Cut a match or a piece of wire to about 1-1/4" length (30-35mm), which is about the length of the anchoring pin.



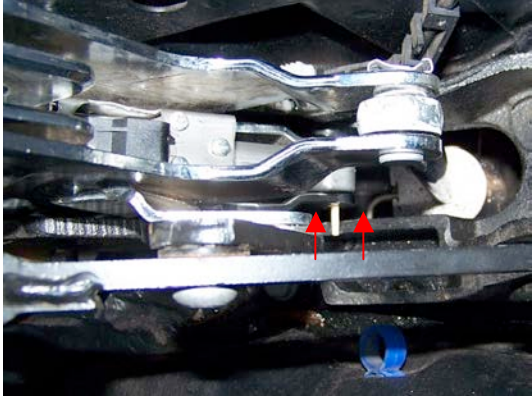
(30-35mm long piece of wood or wire or plastic tubing)

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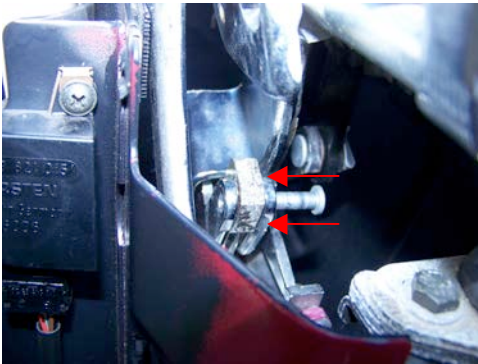
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- 4) Line up the bow extension cylinder's bottom hole with the matching hole in the frame, and insert the piece of wood or wire all the way.



- 5) Lower the rear of the soft top, pull out the cylinder rod to match up with the frame, and re-install the upper anchoring pin with spring and e-clip.



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- 6) Lower the soft top into the storage well, and remove the piece of match or wire through the hole in the door jamb.



- 7) Re-install the lower anchoring pin.

Test the micro-switch: when the top is up, you should hear the switch clicking as you move the rear of the top almost all the way up. Electrically, the switch is now closed.

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