

# UrS6 Brake Servo Replacement

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This write-up covers the replacement of the brake servo on a 95.5 S6. The master cylinder remained intact and connected, so there was no need to bleed the brakes upon completion. This can be done by one person, but having an assistant at the point of mounting the new servo might save time. There is a technical bulletin available on Scott Mockery's site that discusses this and is viewable at:

[http://www.sjmautotechnik.com/trouble\\_shooting/brakeTSB47\\_92\\_2.html](http://www.sjmautotechnik.com/trouble_shooting/brakeTSB47_92_2.html)

## **Tools:**

The job requires no special tools, but having the following helps:

- 1 13mm swivel socket with a 1/4" drive
- 3 6" extensions, 1/4" drive
- 1 1/4" ratchet handle

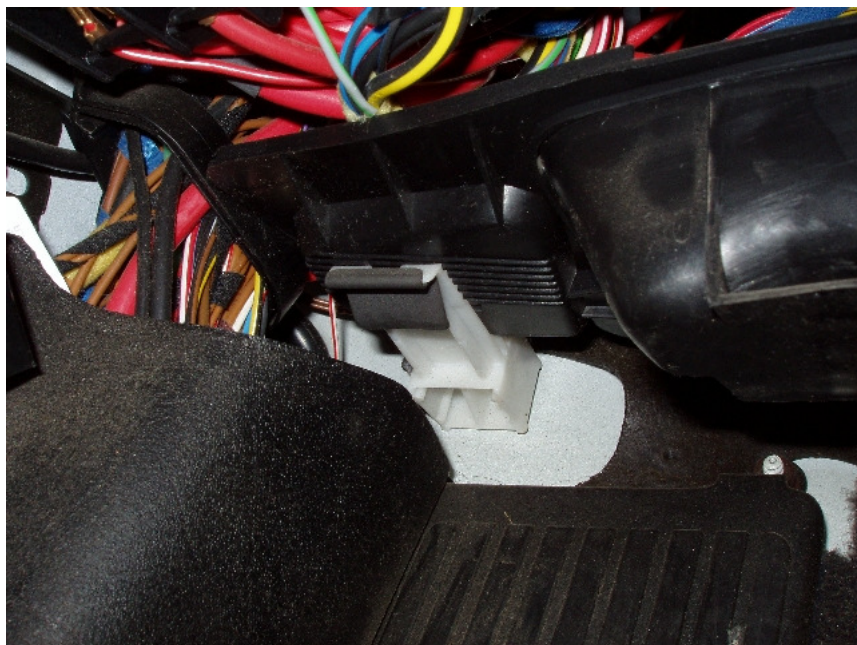
## **Parts:**

- |   |               |               |
|---|---------------|---------------|
| 1 | brake booster | 441 612 101 B |
| 1 | foam gasket   | 431 612 193   |
| 4 | M8 nyloc nuts | N 011 184 9   |

## **Steps:**

1. With the engine off, depressurize the bomb by pressing the brake pedal 20 to 30 times, or until it becomes rock hard.
2. The TSB on SJM's site says to remove the battery ground strap. I did not.
3. Move driver's seat as far back as it will go.
4. Remove the cover panel closest to the pedal cluster (2 screws, 10mm socket).
5. Remove the heavier knee bolster closer to the steering wheel (4 screws, 10mm socket).

6. Remove air duct closest to pedal cluster. Held by one screw on one end and

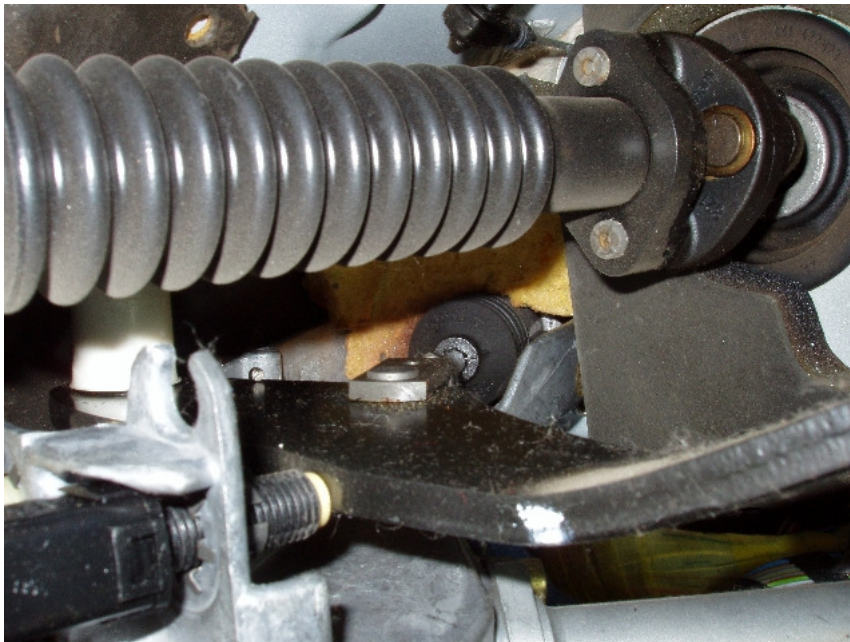


snaps into a clip on the other.

7. Disconnect leads to light mounted in the duct.



8. Looking up at the brake pedal from underneath, you can see the servo pushrod



- coming through the firewall and the clevis where it attaches to the brake pedal arm.
9. There is some yellow sound insulation surrounding the rubber bellows on the servo pushrod that will have to be moved out of the way to access the locknuts



that hold the servo in place.



10. Visible in the above picture, you can just see one of the nuts after the sound insulation was removed. Three of the four nuts can be seen and accessed relatively easily. The fourth nut is blind and must be accessed by feel. Give your back a rest and move around to the engine bay.

11. Note position of all the hard brake lines in the two multi-line clips that run along



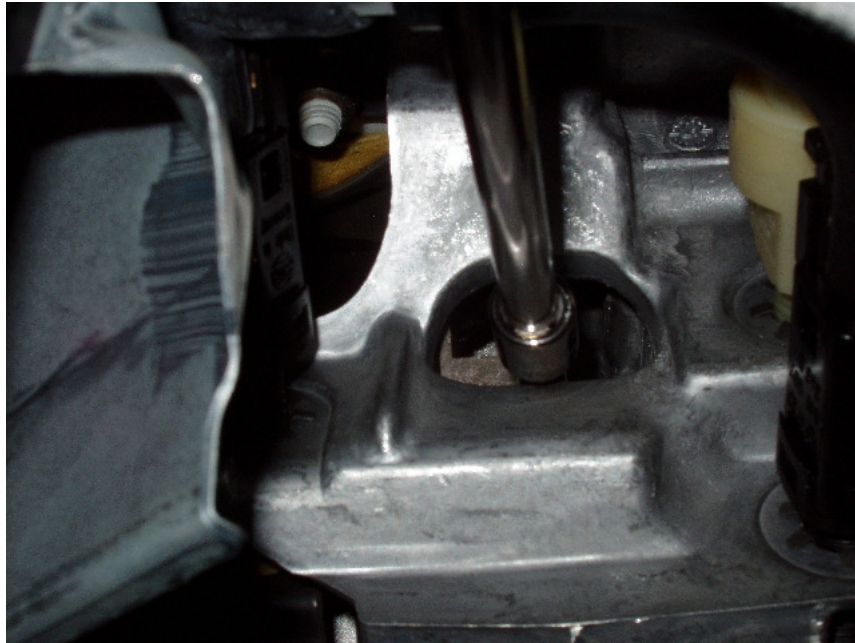
the fender wall. Pictures and sketches helped me get the lines back in place after they had been moved.

12. Unplug the electrical connection to the master cylinder and disconnect the two



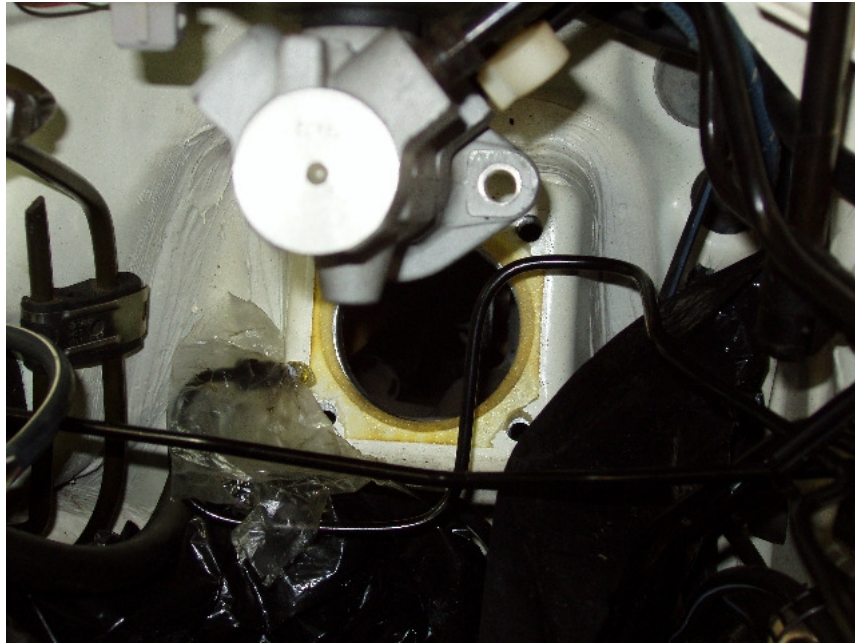
- electrical leads to the brake servo. The two hydraulic lines visible above are the pressure line (lower next to the electrical connection) and the return line (on the top of the servo). These need to be disconnected. They take an 11mm flare wrench. I covered the ends with plastic caps and wrapped them in plastic while they were disconnected. It should be noted that one should not move the brake pedal with the lines removed from the servo.
13. Remove the strut brace (6mm hex).
  14. Remove the two bolts that hold the master cylinder to the servo (13mm socket).
  15. Open the two multi-line clips holding the brake lines coming off the MC.  
(remember to note the position and routing first)
  16. Gently back the MC off the servo. The hard lines create quite a bit of resistance, so be careful. I suspended the MC using a bungee once it was free of the servo.
  17. Now, it's back under the dash. Disconnect the clevis from the brake pedal by first removing the circlip that holds the pin through the clevis. This is a safety clip that has to have the outside part of the clip levered out to clear the end of the pin. Simultaneously, push the clip up and off the pin. The pin can then be removed, freeing the clevis.

18. Now, the fun part. Using whatever combination of extensions you choose, get a 13mm socket on the three visible lock nuts and remove them. It is stating the obvious that care must be taken so that the loose nuts don't fall out of the socket



to rattle around the firewall for ever. For the blind nut, assemble the extensions one by one, feeding them through the small, rectangular hole in the brake support bracket as shown here. This is mostly a matter of feel. I could not see the nut no matter how I contorted, but others claim that they could – provided the extensions were  $\frac{1}{4}$ " sized. When you have it, back it out gently. I lost this nut somewhere.





19. Remove the servo. The removal must be done carefully as the pressure line coming into the servo is bent in such a way that it kind of captures the servo. Gentle persuasion will win out however. In this picture, you can see the remains of the foam gasket after the servo has been taken out. I chose to remove the old gasket and install a fresh one.
20. Before installing the new servo, the clevis and locknut must be removed from the



old servo and installed at the correct location on the new servo pushrod. I marked off the distance ( $230\text{mm} \pm 0.5\text{mm}$ ) on a piece of wood and placed it under the new servo with one end of the wood against the mating surface of the servo. After installing the locknut and the clevis on the new servo's pushrod, I

threaded the clevis down the pushrod until the 230mm mark was centered in the clevis hole. Care must be taken that the pushrod be fully extended and perpendicular to the mating surface of the servo flange when taking this reading. Tighten the locknut and prepare to mount the new servo.



21. Before I positioned the new servo, I put a plug in the blind hole (upper wheel side when viewed from the engine bay). The thought was that if there was something pointy poking through the hole, that maybe the locknut would center itself as I blindly fed it up and into position. I locked the yellow plug in the hole using a golf tee that had half the shaft cut off.
22. Prepare to position the blind locknut. I took some tinfoil and backed the new locknut with it before pushing the locknut into the socket. This was for two reasons. One was to make the fit tighter so the nut would not fall out of the socket as it made its way blindly up toward the hole in the firewall. The other reason was to improve the visual positioning feedback when viewed from the engine bay. When a flashlight was shown through the hole from the engine side, the hope was that the tinfoil would provide a reflective surface and signal success.
23. Thread the new locknut into position. I started with the blind nut and got it to a spot where I thought it felt in contact with something that might be the soft yellow plug. I taped the drive extensions in place with duct tape and went around to the engine bay.
24. I removed the yellow plug and thought I could see the reflection of tinfoil (could have been a wishful hallucination at that point. Did I mention that we were experiencing a heat wave during all of this and it was hot enough to bake a turkey in my garage. Come to think of it, I was feeling a little baked by then)
25. Position the new servo carefully, gently manipulating the pressure line. I got the pushrod through the hole in the firewall and the four studs of the servo lined up with the corresponding holes, then moved around to lie on my back under the dash. This is the part where an assistant might be helpful, but I was able to do it



myself by grasping the servo pushrod in one hand, moving the whole servo assembly gently closer to the firewall, while hopefully turning the 18 inches of extension in the correct direction to tighten the captured nut (at least I hoped it was still captured). I must say that there was a moment of mixed emotion when the freely turning extensions developed resistance. Was the nut feeding onto the threads? Was it feeding cleanly, or was it cross threading. It was one of those "damn the torpedoes and full speed ahead" decisions. I was verging on mania by then – all vision lost due to sweat rolling off my brow into my eyes and hence down my temples into my ears. I tossed a ratchet onto the extensions and tightened that sucker down. I still don't know if it was a clean thread and probably will not until I need to take it off again. Of course, I will be dead first, so it hardly mattered. After that, the other three nuts were a walk in the park.

26. Once the servo is bolted, refasten the clevis (grease the pin before reinserting) and attach the circlip.
27. Back around on the engine side, install pressure and return lines to the servo.
28. Reinsert the MC into the servo and bolt down.
29. Reattach all electrical connections and plugs.
30. At this point, I started the engine up to observe if the brake light went out, and whether the fluid level in the hydraulic reservoir dropped. All was well.
31. Reposition the hard lines in the multi-line clips (this proved to be somewhat of a challenge to me, but finally worked).
32. Reattach the strut brace.
33. Reattach the air duct and knee bolsters under the dash.
34. Enjoy a cold one.