W123 Transmission Vacuum Modulator Adjustment DIY - measure it the 'right' way

Why do you need to do this?: You need to do this to properly check the internal hydraulic pressure of the transmission, either during a debug OR you must do this after installing a new modulator (my case).

This only applies to automatics. You manual tranny people have it too easy anyways...

Overview: You are going to connect a psi gauge to a test port on your transmission's underside near your vacuum modulator. Then, turn the car on and make some adjustments, and then remove the gauge and you're done.

Theres a lot of talk about this on the forum - you NEED to set the pressure correctly. There's a right answer - it's not a rule of thumb or by feel measurement.

Time once you're ready to go: 60-90 minutes

Materials required:

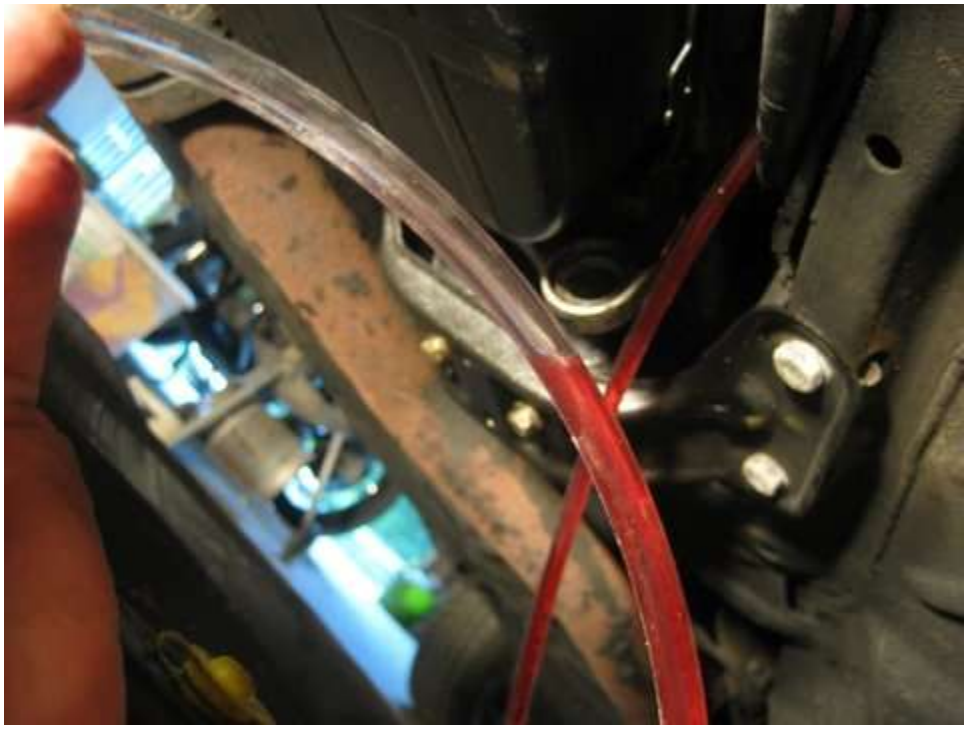
- 12mm socket and socket wrench (I used 1/4" drive)
- 1 banjo bolt scrounged off of an ALDA on a yard car. I grabbed mine off of a later turbo model. The ALDA is the square unit on top of the injection pump on a turbo model. There is a banjo fitting leading into the ALDA from some clear tubing. Thats the one you want. Take the hollow bolt, two washers and banjo fitting
- a few feet of 3/16" ID vinyl tubing rated for 60 psi or more. I got mine at my local hardware store.
- a 0-100 psi gauge. I also got mine at a hardware store for $10. It had a 1/4" NPT fitting.
- 1/4 NPT to hose fitting adapter.
-some brake cleaner and paper towels for locating your transmission ID #
-teflon tape for NPT fitting
-ramps for front wheels. Jackstands can work too.
-chocks for rear wheels
-TDM printouts that are attached to the next post.

Gauge assembly:

-take your scrounged ALDA banjo bolt and hollow screw and clean it really thoroughly with brake cleaner. Clean it some more. Transmission fluid is going to go into this fitting, and then get sucked back into the transmission. You want this thing clean! Let it dry for a little while.
-attach your gauge to the hose fitting using some teflon tape.
- push the the ends of the vinyl hose onto the hose fittings on the gauge and the banjo bolt.
-make sure everything looks nice and tight. This stuff will be under 50-80 psi.
-wrap a plastic bag around the banjo bolt (keep it clean!) end of your gauge assembly and bring it to the car

The Main Event:
- make sure you have the right fluid level in your transmission.
- put front wheels on ramps. Jackstands can also work, but get them up high! Im a thin guy and I really appreciate the extra height the ramps give me.
-put e-brake on and chock the rear wheels. Safety first...
-turn car off and put in P.
-first you need to identify what exact model transmission you have. You can find the transmission ID on the passenger side of the tranny. It is located on a flat right above the front of the pan. You probably will ned a paper towel with a little brake cleaner to clean the area off. It may be obstructed a little bit by your exhaust pipe, but its there I promise. You are looking for a number that begins with 722.xxx
-before you get too dirty consult the TDM printout for your proper reading. I have a 722.315 and my number was 2.9 bar. Write down this number and concert it to psi. 1 bar = 14.5 psi.
- get under the car on the drivers side. You are looking for your vacuum modulator. Mine is green. Yours may be red or black. It's above the pan - you have to get right up under the transmission to see it.
- a little below and to the rear of the modulator is a 12mm bolt. This is your test port. Unscrew the bolt and put it to the side somewhere...you guessed it..Clean!.
-screw in your banjo bolt. Point the hose up and to the rear of the car. BE VERY CAREFUL to seat the bolt correctly. Check again. If you dont, fluid will spew everywhere when you do the test. Dont ask me how I know!!!!
-snug it down, but do not overtighten.
-look at figure 2 - this is how it looks, but you wont have red fluid in the line yet.

-check everything again, and crawl out from underneath the car.
-plug the vacuum line that dives down to the transmission from the engine compartment.
-start the car. Quickly look down and check for leaks. I bet all is well.
-look at figure 3. This is what you will see. Fluid will be running down the tube, but wont make it to the gauge.



-A pressure reading will be registering on the gauge - figure 1. This is normal - I thought it wasn't at first and got concerned.

-what you need to do next is make the adjustment. This is done on the modulator itself. There is a little black plastic cap that hides a t handle. To make the adjustment youll need to pull the cap off, pop the T handle out a little bit and screw IN to RAISE pressure, and screw OUT to LOWER pressure. Adjustment is a little bit at a time. I turned my t handle half a turn to lower is 2 bar. I did this with the car on above me - it was easy this way.
-NOTE: the TDM says to do this test at 50kmh while driving. BUT, every reptuable Benz mechanic I have talked to says the same reading can be obtained in park. Thats how they all do it. It sure is easier. I dont wat to think about trying to rig up a drivable version of this.
-the adjustment doesn't take long if you do it with the car running.
-once the correct reading is achieved, let the car idle for a bit and make sure the reading is nice and stable after the transmission is at operating temperature.
-turn the car off.
- take off the banjo bolt, reinstall the 12mm plug bolt. re install the modulator rubber cap. reconnect the vacuum line.
- remove chocks, take car off ramps. test drive the beast.

Getriebe	Modulierdruck in bar Überdruck Stellung „D"		Arbeitsdruck in bar Überdruck		
			Stellung „D"		Stellung „R"
	65 km/h	im Stand	65 km/h	im Stand	im Stand
Lieferausführung (J) (S)					
(J) 1961/1962					
722.117	2,8	4,4±0,2	5,2±0,2	–	18 und darüber
722.118		4,6±0,2	5,7±0,2	–	
722.122	3,8	6,3±0,2	5,2±0,2	9,0±0,4	
(S) 1961/1962					
722.112	3,8	6,3±0,2	6,0±0,2	10,3±0,4	18 und darüber
722.116	2,8	4,6±0,2	4,9±0,2	–	
722.117			5,2±0,2	–	
722.118			5,7±0,2	–	
722.122	3,8	6,3±0,2	5,6±0,2	9,5±0,4	
(USA) 1961/1962					
722.112	3,8	6,3±0,2	6,4±0,2	10,7±0,4	18 und darüber
722.117	3,0[1]	4,4±0,2	5,2±0,2	–	
722.118	3,0	4,3±0,2	5,8±0,2	–	
(ZR) 1961/1962					
722.117	3,0	4,4±0,2	5,2±0,2	–	18 und darüber
722.118	3,0	4,3±0,2	5,8±0,2		

Achtung! Während der Prüfung im Stand wird die gesamte Leistung des Motors im Drehmomentwandler in Wärme umgewandelt, deshalb darf diese Prüfung *nicht länger als 5 Sekunden dauern.* Dabei muß das Fahrzeug mit der Feststellbremse und der Betriebsbremse gut abgebremst werden.

[1] Modulierdruck ab Modelljahr 1962 3,1 bar.

27 — Modulier- und Arbeitsdruck 722.3

Getriebe	Moduliердruck in bar Überdruck	Arbeitsdruck in bar Überdruck
	Stellung „D" 50 km/h	Stellung „D" im Stand
Standard-Ausführung		
722.300	2,8	9,7±1,0
722.301	3,6	12,2±1,0
722.302	3,8	12,7±1,0
722.304	3,5	12,2±1,0
722.305	3,8	13,7±1,0
722.306	2,8	9,7±1,0
722.307	2,8	9,7±1,0
722.308	3,6	12,9±1,0
722.309	2,8	9,7±1,0
722.310	4,0	12,2±1,0
722.311		13,7±1,0
722.312		13,2±1,0
722.313		13,7±1,0
722.315	2,9	12,5±1,0
Landes-Ausführung (AUS) (S)		
(AUS) (S) **1981**		
722.300	2,4	8,5±1,0
722.301	3,0	10,7±1,0
722.304	3,0	10,7±1,0

Achtung! Messung bei betriebswarmem Getriebe und abgeschlossener Unterdruckleitung durchführen.

Getriebe	Modulierdruck in bar Überdruck Stellung „D" 50 km/h	Arbeitsdruck in bar Überdruck Stellung „D" im Stand
Landes-Ausführung (AUS) (J) (S) (USA)		
(J) (USA) **1981**		
722.300	2,4	8,5±1,0
722.301	3,5	12,2±1,0
722.303	2,9	12,5±1,0
722.304	3,5	12,2±1,0
(AUS) (S) **1982**		
722.300 722.309	2,6	10,2±1,0
722.310 722.312	3,9	12,2±1,0
722.315	2,9	12,5±1,0
(J) (USA) **1982**		
722.300	2,6	10,1±1,0
722.303	2,9	12,5±1,0
722.309	2,6	10,1±1,0
722.310 722.312	3,7	12,0±1,0
722.315	2,9	12,5±1,0

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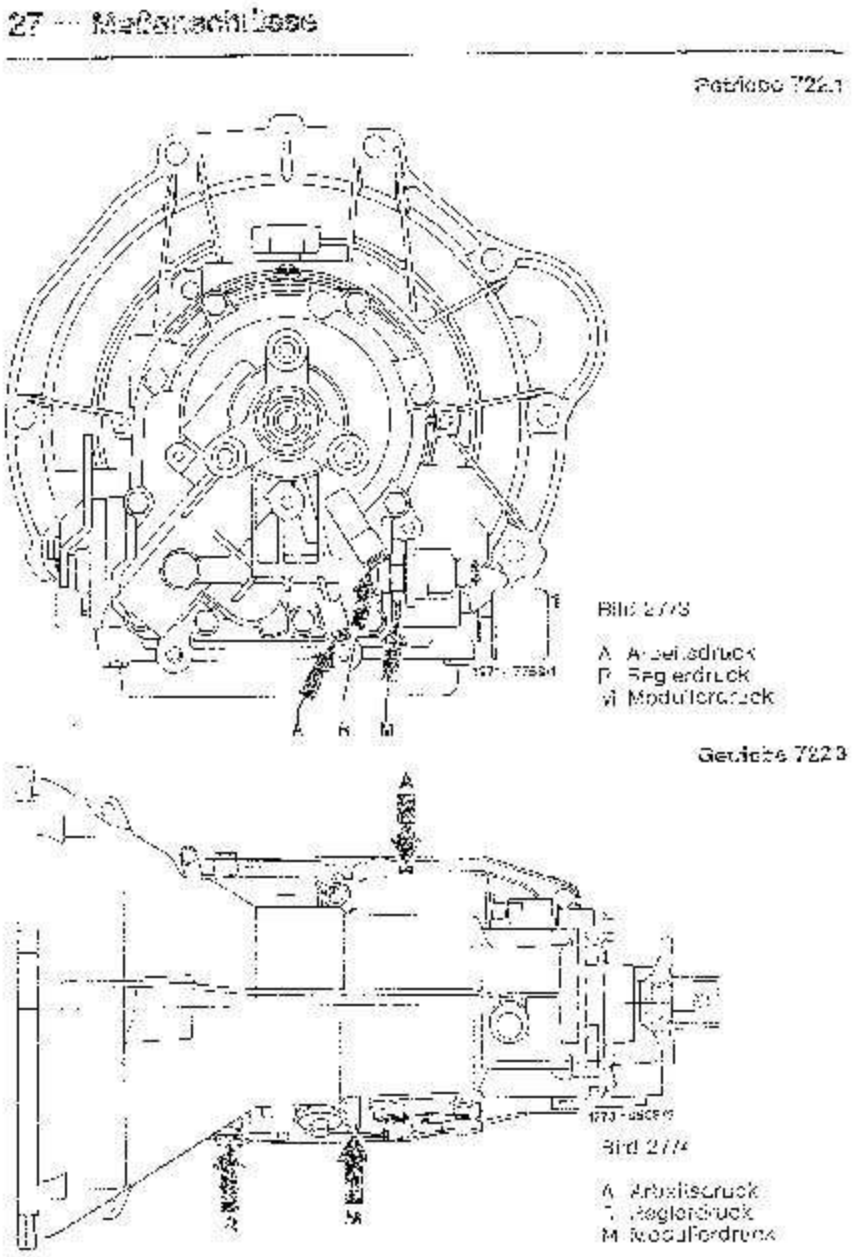

Enjoy!! You can now continue your transmission debug. Make adjustments by other means (VCV, orifices etc.), NOT by the modulator any more - your work here is done. Hopefully this is the end of your debug journey.

Good luck,
-dieseldan44

Special thanks to forum member tomnik for walking me through this measurement and providing the TDM scans.