

# Repair attempt of the hydraulic headlamp leveling

## **Attention:**

The repair of the LWR (actually it is not a repair, since no parts are exchanged and the actual reason for the malfunction can usually not be found) is literally a "mess", because the lines are provided with fresh liquid and there must be no air inside.

This repair is usually not long-lasting, depending on the defect (there must be a leak somewhere in the hydraulic system, otherwise the fluid would not have escaped), it can last from several hours to several days.

The amount of time that has to be invested here is disproportionate to success and only the better "electrification solution" remains. (During this time, you would have installed the electrical conversion kit at least twice.) But some people are not deterred.

### **Short description:**

The switch in the interior (slave cylinder) and the adjusters on the lamps (master cylinder) are removed.

The hydraulic hose is cut off at the connections, cylinders and lines are vented and refilled, the lines are put back on and then everything is assembled again. Time to spend: app. 3 - 4 hours!

### **Needed parts:**

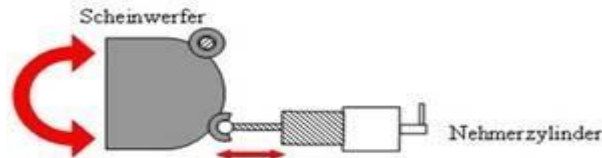
- 2 syringes for the master cylinder (approx. 20cm<sup>3</sup>)
- 1 syringe for the slave cylinder (approx. 20 cm<sup>3</sup>)
- 1 syringe with needle (nice and short) for filling the tube (approx. 20cm<sup>3</sup>)
- 1 liter of antifreeze (glycol)
- 1 sharp knife for clean, straight cuts
- 1 pair of pliers with sharp hollow pliers (to hold the hose well)
- 1 locking pliers (not possible without !!)
- 3 (empty) large jam / cucumber jars with lids
- 4 clothes pegs
- 1 larger Phillips screwdriver
- 1 hot glue gun
- Acetone
- clean rags
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## Manual:

First you remove the master cylinder (switch in the interior). You can get to the two Phillips screws if you carefully remove the display and cover from the front.

Now the slave cylinders (adjusters on the headlights) follow. These can be removed by turning the cylinders counterclockwise about 90 degrees (bayonet lock) until the cylinders are loose and fall out of the holder. The push rods of the slave cylinders are "clipped" into the headlights with a small ball head. With a careful but courageous jerk you can separate the headlights from the slave cylinders. The headlights remain swinging on the top of the vehicle.

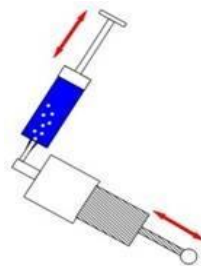


Use the knife to cut the two hoses on the master cylinder (switch in the interior) as close as possible (approx. 7 - 8 mm) before the connection. If possible at right angles to the hose core. Then the hose seals better later. The same applies to the slave cylinder.

Now it is vented! The worst thing that can happen to a hydraulic system is "air in the system". That is the reason why the LWR fails. The system loses somewhere (can be at the old filler neck or somewhere in the hose), hydraulic fluid or through the hose connections it draws air. However, the cylinder seals may also leak. Of course, they would have to be replaced (car recycling?).

Air can be compressed with little effort, but liquids cannot be compressed or only with great difficulty.

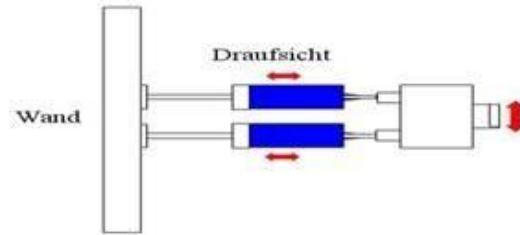
Now it is time to vent the slave cylinders (adjusters on the headlights). To do this, pull a syringe with antifreeze on, removes the hose from the cylinder, the syringe carefully on the hose connection of the cylinder and slowly push the antifreeze into the cylinder with the syringe. The push rod should now slowly move out of the cylinder. The syringe should be held in such a way that the hose connection of the cylinder is the topmost position of the entire cylinder.



When you let go of the plunger of the syringe, the spring in the cylinder pushes the rod and thus the plunger and the liquid back into the syringe. If there is air in the cylinder, it rises from the connection piece into the syringe and collects there. If you repeat this process a few times, the slave cylinder is empty.

It continues with the master cylinder (switch in the interior). Remove any remaining tubing, fill two syringes with anti-freeze and put them on the hose connections. If you have no help (2nd person), take the cylinder e.g. in the left hand and carefully press the plunger of the syringe against the wall. With the right hand you turn the regulator carefully (with simultaneous pressure from the syringes) again and again to the left and right. (The pistons of the syringes react accordingly to the rotational movement.) Turned back and forth a few times and this component is also empty.

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## Bleeding the hoses:

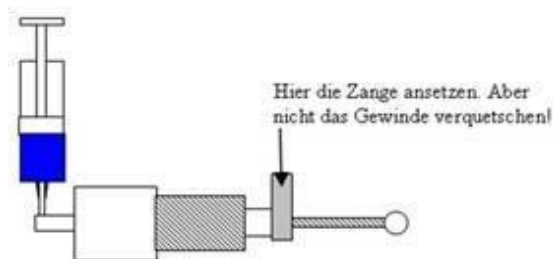
Take the lid of 3 clean jam jars and drill 1 hole each in the diameter of the hydraulic hose, fill some frost protection into the glass, screw the lid on and insert the hose so that it hangs a few centimeters in the frost protection. The hose must not slide out of the anti-freeze bath, possibly fix it with a clothespin! Drill two holes in a lid, which is later intended for the interior.

In the interior / footwell you then vent the hose by "pumping" frost protection into the hose with another syringe (possibly with a short, very thick needle). Here a relatively large amount of force / pressure has to be applied and the syringe has to be refilled several times until all air has escaped from the hose. When the hose is empty, its end is also placed in a jam jar (use the lid with 2 holes) with frost protection and secured with a clothes peg so that no air can penetrate here. The second line to the other headlight is also vented.

## Assembly:

Pull a syringe from the master cylinder (interior switch), take the hose out of the container and push it onto the connector on the master cylinder. That sounds simple, but it is not. On the one hand, glycol is very slippery and on the other hand, the hose is quite hard and unruly. With good / sharp combination pliers it should be possible to push the hose quickly onto the connection. If the antifreeze flows out of the hose, the venting action must start again! But as soon as the hose is a little bit on the connection and there is no more air in the system, it is done. Now push on the hose as far as it will go, done!

Now the slave cylinders (adjusters on the headlights) are still missing. It gets a little tricky here. Use the syringe to press the antifreeze against the spring pressure into the cylinder so that the push rod with the ball head comes out of the cylinder as far as possible. When the rod is almost fully extended, the thicker part of the push rod appears. The locking pliers are now fixed on the screw part of the push rod so that it cannot move back again through the spring. Do not place the locking pliers on the thick part of the push rod, there must be some play!



Now the hose is placed under the headlight under liquid on the connection of the cylinder. Push firmly until it stops and remove the locking pliers, done! The system pressure is then built up by the spring tension of the cylinder. The pressure could not have been greater when the system was manufactured, otherwise the push rod would have stuck out of the cylinder permanently. The whole thing is done again for the other side.

Then clean the components and rub the connections with acetone. The hot glue gun can then be used to generously seal the old filler neck and the hose ends at the connections.

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The headlights should now be perfectly adjustable again and still need to be adjusted (Basic setting).

The only question is how long the adjustment works! If there was a leak at one of the hose connections, it is now gone because the connections were replaced by cutting off the hose. However, if the leak is in the hose system or on the seal of a cylinder, the error has not been eliminated and will occur again more or less quickly. Unfortunately, it has happened several times that someone has successfully vented the hydraulic system, the adjustment worked again afterwards, but unfortunately not the next day at the MOT appointment ...

Tip for bleeding the cylinders: A “dry exercise” before the actual bleeding cannot hurt. Sometimes the syringes are quite tight / or too loose on the connections.

**Filling / venting is about speed and thus avoiding the pipes drawing air again!**