

## MAINTENANCE PROCEDURE FOR X 650



## MAINTENANCE PROCEDURE FOR X 650 2<sup>ND</sup> STAGE

**WARNING: This maintenance procedure is only for appointed Scubapro technicians that completed a course on equipment repair and in no case can replace a technical repair course delivered by a SCUBAPRO/ UWATEC appointed staff.**

### **Tools needed:**

1. Universal tool P/N 43.040.000
2. Adjustment tool P/N 41.043.000
3. O-ring extractor P/N 43.300.107
4. Lever assembly tool P/N 43.650.220
5. Small flat blade screwdriver
6. Philips screwdriver
7. Small tweezers

### **DISASSEMBLY**

1. Unscrew the interstage pressure hose with the universal tool. Remove the safety O-ring from the inlet tube.
2. Remove the O-rings from the hose with the O-ring extractor tool.
3. Remove the mouthpiece strap or quick release clip and mouthpiece.
4. With the small Philips screwdriver, unscrew the 2 Philips screws from the top case plug. Remove the plug and the O-ring with the extractor.
5. Remove the front cover and unscrew the ring. Remove also the washer and the diaphragm.
6. With the small screwdriver using it as a lever, remove the sleeve safety clip. To access that clip, the housing has to be turned upside down.
7. Pull the complete adjustment knob and dive switch assembly out of the housing. Remove the 2 O-rings P/N 01.050.160 from the dive switch with the O-ring extractor.
8. Remove the decal from the adjustment knob with the O-ring extractor.
9. Unscrew the Philips screw and remove the O-ring P/N 01.050.126 from the screw.
10. Pull the adjustment knob to remove it from the adjustment shaft of the stem knob. Note: the metal ring is fixed in the adjustment knob and can't be removed.
11. Push the adjustment assembly from the switch with the back of the O-ring extractor.
12. Remove the O-ring P/N 01.050.351 from the sleeve with the O-ring extractor.
13. Hold the sleeve with one hand and screw clockwise the knob stem (containing the fine adjustment screw) to remove it from the sleeve.
14. Remove the P/N 01.050.293 O-ring from this fine adjustment screw with the O-ring extractor.
15. Hold the knob stem with one hand and screw clockwise with the small screwdriver the fine adjustment screw to remove it.
16. Remove the O-ring P/N 01.050.126 from this internal fine adjustment screw.
17. Remove the balance chamber and the spring.
18. Carefully remove the lever.
19. Pull out the poppet.



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## **PARTS CLEANING**

**WARNING: Refer to parts cleaning procedure.**

## **ASSEMBLY**

1. After careful inspection of the cleaned parts and the static O-rings that do not need to be changed, prepare all the parts that need to be changed at every annual service.
  1. P/N 11.250.221 the seat
  2. P/N 01.050.363 the 2 poppet O-rings
  3. P/N 01.050.132 the interstage pressure hose O-ring Or P/N 11.650.041 the annual repair kit.

**If the exhaust valve has been removed, it is strongly recommended to replace with a new valve P/N 11.650.109.**

2. Insert the new exhaust valve and use the pliers to pull it from the inside of the case. Make sure that the valve is correctly fitted, the shoulder on the nipple should stick out of the retainer and the lip of the valve should rest properly on the regulator case. Check the valve by pulling slightly on the lip at several places and make sure the outer part of the valve rests on the regulator case.
3. Refit the exhaust cover and insert the stainless pin making sure it is correctly centred.
4. Place the O-ring on the adjustable orifice, slightly lubricate the threads and the O-ring.
5. Using the universal tool to screw the orifice about 3 or 4 turns in the inlet tube.
6. Place the O-ring P/N 01.050.160 on the inlet tube, it does not require lubrication. Insert the inlet tube assembly inside the housing placing the injection holes facing the mouthpiece tube and push firmly into position.
7. Slightly lubricate the inlet tube threads before fitting the O-ring P/N 01.050.347. Screw the jam nut with the flange towards the O-ring. Tighten moderately with the universal tool. Place the other O-ring behind the jam nut.
8. Place the 2 O-rings P/N 01.050.363 on the balanced poppet. Place a new seat on a flat and clean surface. Hold the poppet vertically to insert the seat into it. Push firmly into place. Lubricate the 2 O-rings, taking care to place some grease in between the O-rings.
9. Hold the tip of the poppet shaft and guide the poppet wings into the grooves of the inlet barrel by positioning the lever tab towards the mouthpiece tube. If the poppet is wrongly inserted, assembly of the lever will not be possible.
10. Place the spring and the balance chamber.
11. Place the O-ring P/N 01.050.126 on the fine adjustment screw.
12. Assemble the fine adjustment screw inside the stem knob by unscrewing with the small screwdriver until a resistance is felt, do not insist. **The inner thread and O-ring should not be lubricated.**
13. Place the O-ring P/N 01.050.293 on the adjustment shaft and lubricate both the threads and O-ring. Assemble this into the guide sleeve by unscrewing until the 2 grooves appear on the other side (to take the adjustment knob). Unscrew until a resistance is felt, do not insist.
14. Fit the O-rings P/N 01.050.351 on the sleeve, and push this assembly into the dive switch.
15. Fit the O-rings on the dive switch.
16. Fit the dive switch in the housing with a rotation movement to engage the inlet barrel slots with the tabs of the sleeve and position the dive switch lever in it's groove. The safety clip groove now appears.
17. Fit the clip in the groove of the dive switch from under and position the clip nipple in the dive switch cavity.
18. Insert with care the lever assembly tool through the adjustable orifice. Push the poppet back a few millimetres and then insert the lever. Make sure that the lever does not stick out too much on the other



side of the inlet tube. Remove the tool and pull gently on the lever to check if properly inserted. The lever should not come out. Cycle a few times the lever to check the proper assembly.

19. Place back the top case plug with the O-ring. Lubricate the threads of the 2 screws and do not over tighten.
20. Check the diaphragm, there should be neither punctures nor distortion after cleaning.
21. Position the diaphragm on the housing making sure that there it is not distorted.
22. Place the washer and screw the cover snug.
23. Hook the soft purge cover on the nipple on top and place it in position.
24. Assemble the mouthpiece.
25. Place the O-ring P/N 01.050.132 in the groove of the inter stage pressure hose, slightly lubricate the O-ring and threads.

### **THE 2<sup>ND</sup> STAGE IS NOW READY FOR ADJUSTMENT**

## **ADJUSTMENT**

**WARNING: DO NOT ATTEMPT TO ADJUST A 2<sup>ND</sup> STAGE IF THE INTERSTAGE PRESSURE IS NOT CORRECTLY ADJUSTED.**

1. Before connecting the adjustment tool to the 2nd stage, and without pushing on the purge, slowly blow through the inlet tube to detect a leak. This information will indicate if the orifice is in contact (no leak) or not (leak) with the seat. If a leak is detected, screw the 2nd stage adjustment tool to the 2nd stage and slowly screw the orifice about one or two turns to stop any leak.
2. Place the adjustment knob on the adjustment shaft by aligning the tabs on the grooves and by firmly pushing. No need to place the O-ring and screw in place yet. Unscrew the adjustment to the maximum until a resistance is felt, do not insist.
3. With the small screwdriver, unscrew the internal fine adjustment screw until a resistance is felt. Do not go beyond that point.
4. Connect an appropriate and well adjusted 1st stage to a full tank, connect the 1st stage to the adjustment tool with the inter stage pressure hose and slowly open the tank valve.
5. Push slowly on the tool adjustment knob to counteract the thrust of the inter stage pressure. Turn slowly the knob to look for the groove of the adjustable orifice. As soon as the groove is found, slowly unscrew the adjustable orifice until a small leak is detected, then turn the orifice clockwise to just stop the leak without having to turn more than 1/8 of a turn on the orifice.

**Note: 1/16 of a clockwise turn of the adjustment tool acting on the orifice should stop the leak. If more than 1/4 of a turn is required to stop the leak, it means that the spring compression is too light and the fine adjustment internal screw has to be screwed as follows: (This procedure must only be applied to stop the leak described above)**

With the small screwdriver, (proceed by steps of 1/4 of a turn at a time) screw the internal fine spring tension adjustment in order to obtain a sharp stop of the leak (1/16 of a turn) when adjusting the orifice with the tool. Do not exceed more than 3 turns of clockwise adjustment on the fine adjustment screw. Proceed as in paragraph 5.

6. Cycle the 2nd stage about 10 to 15 times by pushing on the purge, then finalise the adjustment as indicated in paragraph 5.
7. Close the tank valve and purge the 2nd stage. Remove the adjustment tool from the 2<sup>nd</sup> stage and assemble the hose with the universal tool with moderate tightening torque, do not over tighten.
8. Assemble the adjustment knob on the adjustment shaft by aligning the tabs on the grooves and by firmly pushing. Place the O-ring P/N 01.050.126 on the Philips screw and tighten moderately. Apply the decal to the Philips screw head.
9. Place back the hose and tighten moderately with the universal tool.