



MAINTENANCE PROCEDURE FOR MK 2/ MK 2+ 1ST STAGES



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WARNING: This maintenance procedure is only for appointed Scubapro technicians that followed a complete 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. Seat extractor P/N 43.300.210
3. Socket P/N 43.191.107
4. Socket extension P/N 43.040.009
5. Field handle tool P/N 43.300.127
6. O ring extractor P/N 43.300.107
7. Filter retainer mounting tool P/N 43.026.101
8. Torque wrench
9. Interstage pressure gauge or 2nd stage adjustment tool P/N 41.043.000
10. Screwdriver

DISASSEMBLY

1. Unscrew all hoses from 1st stage with the universal tool being careful not to damage the chrome plating.
Remove all the plugs from the 1st stage with the 4 mm allen key of the universal tool.
Remove the o rings from the plugs with the o ring extractor and inspect.
2. Remove the inlet protector and the protector cap for the recent models.
3. Take the field handle tool and use preferably for strength the bigger thread 7/16" screw it in the HP port.
4. On the latest models, remove the plastic protection cap. Now unscrew the cap with the universal tool.
5. Carefully remove the piston, the spring and the nylon washers;
- 6a. For the INT version: Remove the yoke screw, then firmly hold the field handle tool attached to the body of the 1st stage and use the socket and socket extension to carefully remove the yoke retainer. Remove the filter retaining clip with the small screwdriver, the filter and the o ring with the o ring remover.
- 6b. For the DIN version: Remove with the o ring extractor the "tank" o ring, then with the 4 mm allen wrench unscrew the filter retainer. Remove the spring and the filter. Firmly hold the field handle tool in a vice and use the 6 mm socket extension to unscrew with care the DIN knob retainer. Put aside the o ring (P/N 01.050.158) for inspection.
7. Use the seat extractor to remove the HP seat.
8. With the o ring extractor remove the two o rings from the piston and the nylon washers.

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 replacement, prepare all the parts that need to be changed at every annual service.
 - a. 01.028.109 the filter
 - b. 01.073.101 the filter retaining clip (only for INT version)
 - c. 10.102.103 the HP seat



- d. 01.050.126 the piston stem o ring
- e. 01.050.177 the piston head o ring or the repair kit P/N 10.042.041

2a. For the INT version, place the filter in the yoke retaining screw, then the retaining clip with the filter retainer mounting tool. Assemble the o ring P/N 01.050.158 (black) or the polyurethane version P/N 01.050.427 (amber) on the yoke retaining screw. Slightly grease the threads and the o ring before assembling the parts on the 1st stage body. Firmly hold the field handle tool in a vice and use the bigger thread (7/16") screwed in the HP port of the 1st stage for optimal strength. Fix the socket on the yoke retaining screw, and the socket extension on the torque wrench and screw. **Adjust the torque wrench to 30 Newton / meter and tighten. Never use a torque exceeding 30 Newton / meter.**

2b. For the DIN version, assemble the o' ring P/N 01.050.158 (black) or the polyurethane version P/N 01.050.427 (amber) on the DIN retaining screw.

Slightly grease the threads and the o' ring before assembling the parts through the DIN knob and screw on the 1st stage body. Assemble the socket extension on the torque wrench. **Adjust the torque wrench to 30 Newton / meter and tighten. Never use a torque exceeding 30 Newton / meter.**

WARNING: The use of a torque wrench is highly recommended, if unavailable, For a torque of 30 Newton / meter, screw hand tight, then use a wrench and tighten 1/8 of a turn!!! An excess torque can lead to a permanent deformation or even a rupture of the parts.

Now place the conical filter upside down (the tip of the filter facing the tank valve), then the spring, and screw the filter retainer with a 4 mm allen key to 4 Newton/meter. Slightly grease the threads before inserting the " tank" o' ring (P/N 01.050.193 or 01.050.428)

- 3. Insert the new HP seat on the piston by placing the seat on a clean flat surface and pushing the piston on it.
- 4. Place the new o' rings on the piston and slightly grease.
- 5. Place the assembled piston inside the cap.
- 6. Slightly grease under the washers (to prevent the stagnation of water) and equally place each side of the spring.
- 7. Slightly grease the threads of the cap.
- 8. Place the spring on the piston.
- 9. Assemble the cap and body and lightly hand tighten. Remove the field vice tool and place back the all the plugs after light lubrication of the o ring and threads.
- 10. Remove the field handle tool from the body. Place back all the hoses and plugs after careful inspection of the o' rings and light lubrication of the threads and o' rings. Change them if necessary. Be careful to tighten with a torque not exceeding 4 to 5 Newton / meter.

THE 1ST STAGE IS NOW READY FOR ADJUSTMENT

IT IS VERY IMPORTANT TO USE A TANK FILLED TO THE NORMAL WORKING PRESSURE OF THE REGULATOR (200, 230 or 300 bars) TO CARRY OUT THE ADJUSTMENT OF THE INTERSTAGE PRESSURE.

ADJUSTMENT

- 1. Mount the 1st stage on a properly filled tank as mentioned above.
- 2. Place a precise interstage pressure gauge either on the 1st stage or at the end of one of the hoses. WARNING: The gauge used on the 2nd stage adjustment tool is not very precise



because of its small size. For a repair workshop, it is recommended to use a bigger and more precise gauge.

3. Open the tank valve slowly.
4. Carefully observe the needle of the gauge as the pressure rises. The needle should move regularly and stop dead without any creeping of the interstage pressure. The regulator should now be cycled about 10 times by pushing the purge of the 2nd stage so that all the parts take their permanent position. Take note of the interstage pressure. Three cases can happen: a) The interstage pressure is in between 9 and 10 bars. b) The interstage pressure is less than 9 bars. c) The interstage pressure is more than 10 bars.
5. If the pressure gauge indicates a pressure in between 9 and 10 bars with a good stability of the needle of the pressure gauge, a good adjustment has been reached.
6. If the interstage pressure is less than 9 bars, close the tank valve and purge the 2nd stage. The 1st stage can be left attached to the tank valve. Unscrew the cap with the multifunction tool and take a nylon washer (P/N 01.060.101) and place it between the spring and the body of the 1st stage. Assemble everything back and proceed as per paragraph 3, 4 and 5. It is possible to pile up a maximum of 3 washers each side of the spring to obtain a good adjustment of the interstage pressure. It is recommended to have an equal amount of washers each side of the spring.
7. If the interstage pressure is more than 10 bars, proceed as per paragraph 6 and **remove** the necessary washers to obtain the correct adjustment of the interstage pressure. It is recommended to have at least one washer each side of the spring for electrical insulation.