MAINTENANCE PROCEDURE FOR MK25

MAINTENANCE PROCEDURE FOR MK 25 / MK 25 T/ TA 1ST STAGES

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 an appointed SCUBAPRO/ UWATEC appointed staff.

Tools needed :

1. **Universal tool P/N 43.040.000**
2. **Socket P/N 43.191.107**
3. **Socket extension P/N 43.300.009**
4. **Field handle tool P/N 43.300.127**
5. **O ring extractor P/N 43.300.107**
6. **Filter retainer mounting tool P/N 43.026.101**
7. **Bushing assembly tool P/N 43.300.226**
8. **Torque wrench**
9. **Adjustable spanner**
10. **Inter stage pressure gauge or 2nd stage adjustment tool P/N 41.043.000**
11. **Screwdriver**
12. **7/32" allen extension or 7/32 allen key**
13. **22 mm socket**

DISASSEMBLY

1. Unscrew all hoses from the 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 tool and inspect.

2. Remove the inlet protector.

3. Remove carefully the rubber bumper with the screwdriver.

4. Take the field handle tool and use preferably for strength the bigger thread 7/32” and screw it in the HP port.

5a. For the INT version: Remove the yoke screw, then firmly hold the field handle tool fixed 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 screwdriver, the filter and the o ring with the o ring remover.

5b. for the DIN version: Remove with the o ring extractor the "tank" o ring, then with the 4 mm Allen key unscrew the filter retainer. Remove the spring and the filter. Firmly hold the field handle tool and use the 6 mm socket extension to unscrew with care the DIN knob retainer. Put aside the o ring (P/N 01.050.138) for inspection.

6. With the multifunction tool unscrew the cap.

7. Carefully remove the piston, the spring and the nylon washers
8. Unscrew with the adjustable spanner the seat retainer and remove the friction disc, and with the 4 mm Allen key, remove by screwing the inter stage pressure adjustment screw.

9. Insert the screwdriver with care (in the cavity left by the removal of the piston) and push away the seat. Remove the spring

10. With the o ring extractor remove the o ring from the seat groove.

11. With the o ring extractor carefully remove the two super glide bushings and the H.P o ring.

12. Screw the field handle tool into one of the interstage outlets of the swivel.

13. With the 7/32” Allen key or the 7/32" Allen extension, unscrew the swivel retainer.

14. With the o ring extractor remove the o ring and the nylon washer.

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. P/N 01.028.109 the filter
b. P/N 01.073.101 the filter retaining clip (only for INT version)
c. P/N 10.101.161 the HP seat
d. P/N 01.050.161 The swivel o ring
e. P/N 01.050.136 the piston shaft HP o ring
f. P/N 01.050.177 the piston head o ring (in some cases there are 2 o rings)
g. P/N 01.050.138 the HP seat o ring
h. P/N 01.060.607 the anti friction o ring
i. P/N 10.700.105 the anti friction bushing
j. P/N 10.700.401 the silicone sleeve or the repair kit P/N 10.750.041

2a. For the INT version: insert the filter in the yoke retainer, then fit the retaining clip with the filter retainer tool. Fit the o ring P/N 01.050.138 in it's cavity.
Slightly grease the threads of the yoke retainer and the o ring before inserting in the yoke and the saddle. Firmly hold the 1st stage body with the field handle tool screwed in a HP port and fixed in a vice. Place the socket on the yoke retaining screw, and 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.**

2b. For the DIN version, assemble the o ring P/N 01.050.138 in it's cavity, slightly grease the threads and the o ring before inserting in the DIN wheel and the saddle. Only use the 6 mm socket extension. **Adjust the torque wrench to 30 Newton / meter and tighten. Never use a torque exceeding 30 Newton / meter.** 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).

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.

3. Piston preparation:
The piston is equipped with a T.I.S bushing (Thermal Insulating System) and it is recommended to grease the piston before inserting the bushing to prevent the stagnation of water between the parts although the latest version piston has a small static o ring to prevent water entry. Fit the T.I.S 1 silicone sleeve on the piston shaft first and slide the 2nd T.I.S 2 sleeve over it. Now fit the 2 o rings in the groves.
4. Assemble the swivel o ring on the cap and slightly grease.
5. Slightly grease the anti friction washer and place it in the groove inside the cap.
6. Fix the field handle tool in one of the interstage pressure outlets of the swivel and hold this assembly in a vice. Slightly grease the groove of the swivel and assemble. Fix the 7/32" Allen extension on the torque wrench and hand tighten the swivel retainer. **Adjust the torque wrench to 5 Newton / meter and tighten. Never use a torque exceeding 5 Newton / meter.**

If a torque wrench is not available, use a 7/32" Allen key and tighten slightly!!!

7. Unscrew the field handle tool from the swivel and fix it into one of the HP ports of the 1st stage.
8. Grease the o rings of the piston by filling the cavity between the 2 o rings. Carefully insert the piston in the assembled cap and swivel.
9. Place the spring on the piston.
10. Slightly grease the threads of the body of the 1st stage and the spring groove then place one nylon washer P/N 01.060.219. Place the spring and assemble the two parts with great care especially when the piston is inserted in the body of the 1st stage. Assemble the 2 parts and do not over tighten.
11. First slide on the piston shaft the cylindrical outer glide ring.

WARNING: It is important to follow the assembly procedure of this ring: Slide on the piston shaft the ring through the widest opening first and carefully push with the new plastic bushing assembly tool.

11. Now insert the slightly greased o ring P/N 01.050.136 on the piston shaft and push with the same tool (The o ring will now sit on the 1st inserted ring and will be in contact with the side opposite the 4 small holes).

11. Now insert on the piston shaft the other ring with the shoulder facing outside and carefully push it down with the tool.

WARNING: There are two generations of assembly tools: the older generation with the drilled side with no entry chamfer and the latest generation with an entry chamfer. A latest version is made of a special plastic that cannot damage the piston. If you are using the older generation tool, it is very important to take extreme care not to damage the piston "knife edge".

13. Next place the spring.

14. Assemble the o ring on the new HP seat.

15. Place the assembled HP seat in the body of the 1st stage.
    Warning: Take care to place the cavity of the HP seat facing the "knife edge" of the piston. The latest generation of HP seat has 2 opposite cavities, One with a smooth flat bottom, and the other with 4 little ribs. The smooth flat bottom cavity should face the piston.

16. Slightly grease the inter stage adjustment screw before inserting it from the internal side by **unscrewing** with the 4 mm Allen key until a resistance is felt, then, place the friction disc with the centring pin inside the HP seat cavity.

17. Grease slightly the threads of the assembled seat retainer and screw to 17 Newton/meter with a 22 mm socket and torque wrench.
17. Reassemble all the plugs and / or the hoses after having slightly greased the threads. Do not over torque (4 to 5 Newton / meter maximum).

THE 1ST STAGE IS NOW READY FOR THE ADJUSTMENT PHASE.

ADJUSTMENT

FOR THE ADJUSTMENT, IT IS VERY IMPORTANT TO HAVE A SUPPLY PRESSURE CURRENTLY USED FOR DIVING WITH THE REGULATOR CONCERNED (200, 230 or 300 bars).

1. Place the 1st stage on a full tank as previously indicated.

2. Place a precise interstage pressure gauge either at one of the interstage pressure ports or at the end of the regulator hose. WARNING: The gauge found on the adjustment tool is not precise enough because of it's small size and should not be used as a workshop gauge. A bigger size and more precise gauge should be used in a repair workshop.

3. Slowly open the tank valve.
4. Observe carefully the needle of the gauge that should move in a very smooth way before coming to a sharp stop. Cycle the regulator about 10 times by purging the 2nd stage. This is to allow all the moving internal parts to reach their definite position. Take note of the interstage pressure when the needle of the gauge comes to a stop.
   Three cases can occur: a) the interstage pressure is in between 9 and 10 bars. b) the interstage pressure is lower than 9 bars. c) the interstage pressure is higher than 10 bars.

5. If the gauge indicates an interstage pressure between 9 and 10 bars with a good stability of the needle of the gauge, a good adjustment has been reached.

7. 6. If the interstage pressure is lower than 9 bars. Close the tank valve and purge the 2nd stage. **Unscrew** with a 4 mm Allen key the adjustment screw inside the seat retainer. It is advised to proceed by ¼ turn as the total adjustment span is 1 to ¼ turn.
   Proceed as per paragraph 3, 4 and 5.

WARNING: Do not place any washer P/N 01.060.219 under the shoulder of the seat retainer to adjust inter stage pressure. If the adjustment screw if fully unscrewed and the inter stage pressure is still low, open the 1st stage and place one or more washers P/N 01.060.219 between the spring and the body. Do not pile up more than 3 washers.
(See assembly procedure paragraph 10)

8. If the inter stage pressure is higher than 10 bars, then proceed as per paragraph No 6 and **screw** the adjustment screw and proceed as per paragraph 5 or 6. It is advised to proceed by ¼ turn as the total adjustment span is 1 and 1/2 turn.

9. If after several unsuccessful attempts to reach the correct inter stage pressure, change the HP seat. If still unsuccessful, than change the piston after a careful check of it's knife edge.

10. After the adjustment of the inter stage pressure, place the cap over the seat retainer.