12S 1st Stage

-Maintenance Procedure-

Warning!

All maintenance and repair procedures MUST be performed by a Mares authorized Service Center and/or Distributor. Therefore, the information provided below is intended strictly for technicians at such centers.

Note!

All operations must be conducted strictly in the order described.

IN ORDER TO ENSURE ADVANCED PERFORMANCE AND SAFETY DURING USE, AFTER 100 HOURS OF DIVING OR 1 YEAR THE REGULATOR MUST BE CHECKED, AND ITS CRITICAL PARTS MUST BE INSPECTED AND REPLACED IF NECESSARY.

Tools needed


(B-21)
#46106221


(B-6)
46106206


(B-5)
46106205


(B-14)
#46106214
INT


(B-1) 25mm
46106201
INT


(B-16) 32mm
46106216


(B-2) 28mm
46106202


(B-18) 14mm
#46106218


(B-13) 10mm
#46106213


Hex wrench 4mm

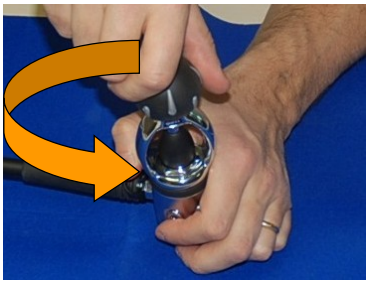

B-40 30mm
46200608
CWD Dry


(B-8) 6mm
46106208
DIN

- Flathead screwdriver
- Compressed air supply circuit or tank (180-200 bar)
- nylon brush
- O-Ring removal tool
- Silicone grease (General Electric Versalube G-322 type)
- Compressed air gun (8-10 Bar)
- Descaling solution (Deox Extra type) or ultrasound tank
- Test Bench or LP pressure gauge to calibrate the intermediate pressure
- Thread compound (Loctite 422 INT connection type - Loctite 415 type for DIN connection)
- 12S 1st stage service kit (code 46200963 INT – 46200964 DIN)

DISASSEMBLY

1. Loosen the dust cap (24) from the 1st stage, fully unscrewing the yoke knob (25).



2. Remove the hose protection from the body of the 1st stage.

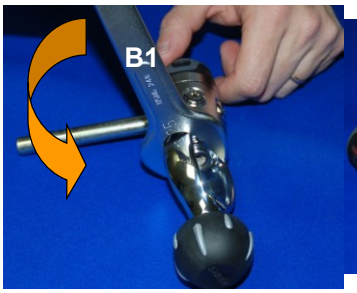
DISASSEMBLY

3. Unscrew the hose (26) using a 14-mm open end wrench (B18).

4. Screw on the disassembly tool (B5) to make it easier to remove the 1st stage from the 3/8” LP port

DISASSEMBLY

5. Unscrew the yoke retainer nut (7) using the special 25-mm wrench (B1).



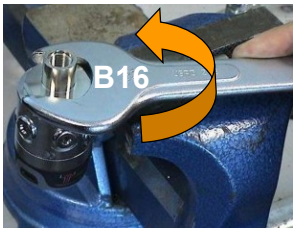
To make disassembly easier, we recommend that you place the first stage in a bench vise.

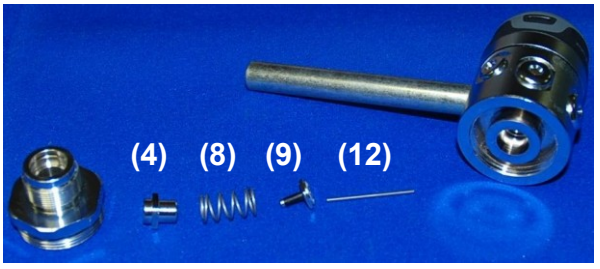
6. Using the snap ring pliers (B14), pull out the INT HP chamber nut (10), the snap ring (2), the tapered sintered filter, and the filter spring (61).

DIN version

DISASSEMBLY

Using a 32-mm open end wrench (B16), unscrew the INT HP chamber nut (10) and then remove the HP assembly (4), the poppet spring (8), the trimaterial valve (9), and the 32-mm pin (12) from the first stage.





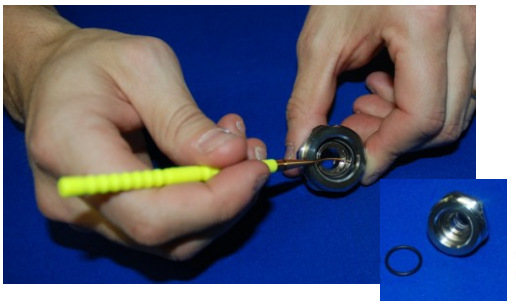
DISASSEMBLY

8. Extract the O-Ring (6) from the HP housing (4) using a plastic or brass OR removal tool.

REMOVE THE
BACKUP RING (5) FROM THE HP CHAMBER ONLY IF IT IS TO BE REPLACED.

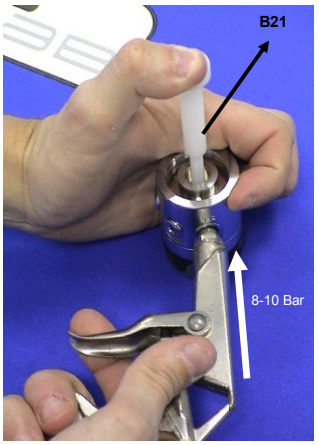
Do not use blades or pointed tools made of steel or other materials, which can scratch the surfaces.

9. Remove the 2068 O-Ring (83) from the HP chamber nut (10).



DISASSEMBLY

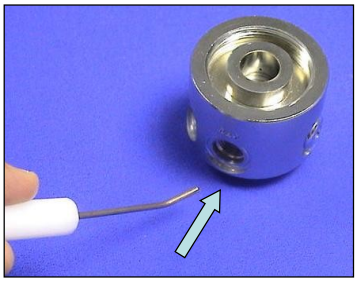
10. Position the special tool (B21) on the 1st stage poppet seat (115) and press lightly; then inject compressed air (8-10 bar) through a 3/8” low pressure port.

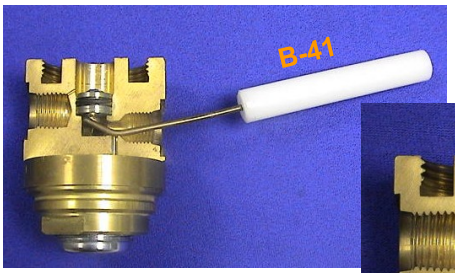


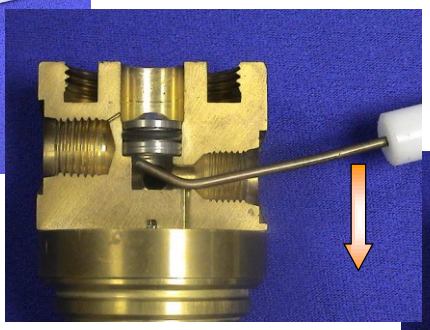
BTM 17

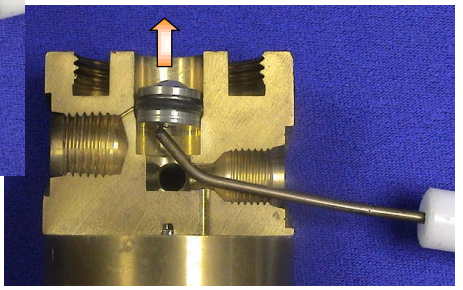
When the compressed air causes the poppet seat to move, reduce the pressure exerted on the special tool (B21).

If it was not possible to extract the Seat (115) in the illustrated way previously it is necessary to use the special utensil special Dismantlement Center 12S (B-41), inserting him/it in a hole of low pressure and doing with it raises on the Center Valve (115).









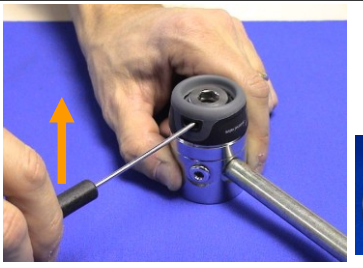
46201041 Attrezzo smontaggio sede 12 S (B-41)

DISASSEMBLY

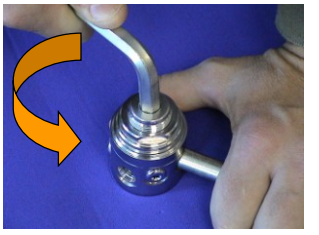
11. After removing the seat connector (115) from the 1st stage body (1), remove the O-Ring (74).

12. Rotate the first stage body to remove the cap (157) from it, prying with a flathead screwdriver.

Be careful to avoid damaging the chrome plating on the retaining nut (17).

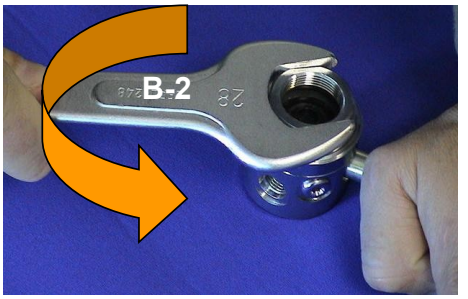


13. Using the Allen wrench (B-13), unscrew the adjusting nut (196) and pull out the spring (16).



DISASSEMBLY

14. Unscrew the retaining nut (17) using the 28-mm open end wrench (B2).



15. Use a 4-mm Allen wrench to remove all the low- and high-pressure port caps and then remove their O-Rings.

Cleaning and Checks

For routine cleaning of reusable rubber components, wash all parts in a mixture of hot water and mild detergent, scrubbing if necessary with a soft brush. Do not use solvents or acids on rubber components.

ACIDS OR OTHER SOLVENTS MAY DAMAGE PLASTIC AND RUBBER PARTS.
. BEFORE CLEANING METAL COMPONENTS, MAKE SURE THAT ALL SEALS AND OTHER PARTS SUBJECT TO DETERIORATION HAVE BEEN REMOVED.

Chrome-plated brass and stainless steel components can be cleaned using a nylon brush to remove any deposits, by immersing them in a fresh water ultrasound bath, or,
if suitable equipment is not available, in a gentle acid solution (Deox Extra type) or white vinegar diluted with hot water.
Be sure to rinse all parts in fresh water and dry with a jet of low pressure air at 8-10 bar before proceeding with reassembly.

12S - ROUTINE MAINTENANCE

Certain key components of the first stage should be regularly replaced at each scheduled overhaul.
Listed below are the components included in the 12S 1st stage service kit (code 46200963 INT – 46200964 DIN) :

12S SERVICE KIT (INT: 46200963 – DIN: 46200964)

- ✓ **SNAP RING (only INT conn.)**
- ✓ **SINTERED FILTER**
- ✓ **BACKUP RING**
- ✓ **O-RINGS**
  - **3 106 O-RINGS (LP Cap)**
  - **2 108 O-RINGS (HP Cap)**
  - **1 2012 O-RING (HP housing)**
  - **1 2031 O-RING (HP seat connector)**
  - **1 2068 O-RING (HP chamber nut)**
  - **1 3043 O-RING (for DIN connection only)**
  - **1 2037 O-RING (for DIN connection only)**

REASSEMBLY

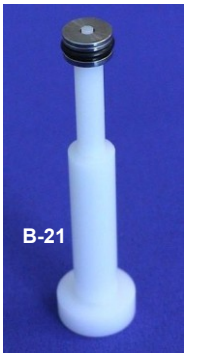
WARNING !

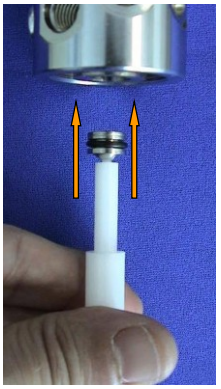
IF THE SECOND STAGE IS USED FOR DIVES WITH OXYGEN-ENRICHED MIXTURES, STRICTLY FOLLOW ALL THE INSTRUCTIONS PROVIDED IN THIS MAINTENANCE MANUAL IN THE NITROX CHAPTER (EN 13949)BEFORE BEGINNING REASSEMBLY!

Before reassembling, lightly lubricate all the O-rings with silicone grease (type General Electric Versalube G-322). Lubrication reduces the likelihood of damage during reassembly.

REASSEMBLY

16. Place the O-Ring (74) in the MR poppet seat (115) and then correctly position the poppet seat on the special tool (B21).





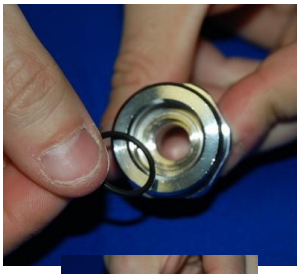
17. Pressing gently, push the poppet seat (115) into position in the first stage body (1).

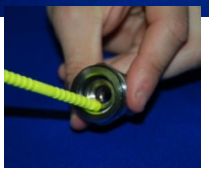
WARNING !

TAKE SPECIAL CARE WHEN INSERTING THE POPPET SEAT. MAKE SURE THAT IT IS POSITIONED CORRECTLY ONCE IT IS INSERTED INTO THE HIGH-PRESSURE CHAMBER, WITH THE CONICAL SECTION FACING UPWARD.

REASSEMBLY

18. Insert the O-Ring (83) into the HP chamber nut (10 INT - 192 DIN)





Note!
WE RECOMMEND THAT YOU PLACE THE O-RING (83) IN ITS SEAT USING A PLASTIC ROD. CHECK THAT IT SITS PROPERLY IN PLACE.

19. Insert the backup ring (5) and the O-Ring (6) into the HP housing (4).

REASSEMBLY

20. Place the complete HP housing (4) inside the HP Chamber Nut (10 INT - 192 DIN). Then position the MR spring (8) and the trimaterial valve (9) over the HP housing.

21. Turn the first stage (1) over and screw the HP chamber nut into it.

REASSEMBLY

22. Use a 32-mm wrench (B16) to fully tighten the HP nut (10 INT – 192 DIN).

Note:
IF USING A TORQUE WRENCH, USE TIGHTENING TORQUE OF APPROXIMATELY 32-35 N/m.

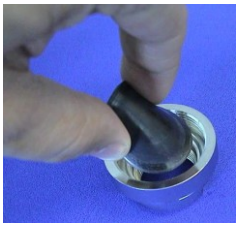
23. Rotate the 1st stage body and insert the 32.5-mm steel pin (12) into the center hole in the 1st stage body (1).

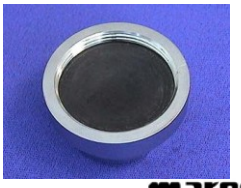
REASSEMBLY

24. Position the poppet button (13) on the pin (12), and press on it to feel the "response" of the poppet spring.

CWD
Dry Kit

25. Place the diaphragm (14) in the retaining nut seat (17), making it adhere perfectly to the edges.





Note:

Reinstall the diaphragm (14) in the same position from which it was removed. Note the impression of the poppet button (13) on it.

REASSEMBLY

26. Tighten the retaining nut (17) including the diaphragm (14) to the 1st stage body (1).

27. Use a 28-mm wrench (B2) to fully tighten the retaining nut to the 1st stage body.

Note:
IF USING A TORQUE WRENCH, USE TIGHTENING TORQUE OF APPROXIMATELY 32-35 N/m.

REASSEMBLY

28. Place the spring base plate (15) in the middle of the diaphragm (14).

29. Position the spring (16) over the spring base plate (15).

REASSEMBLY

30. Screw the adjusting nut (196) 3 – 4 turns on the retaining nut (17) using a 10-mm Allen wrench (B13).

WARNING
DO NOT OVER-TIGHTEN THE ADJUSTING NUT;
THIS WILL CAUSE AN INCREASE IN INTERMEDIATE PRESSURE,
INTERFERING WITH SUBSEQUENT ADJUSTMENTS.

---

31. Place the cap (157) on the first stage.

32. Rotate the 1st stage body and insert the yoke spacer (154).

33. Assemble the filter spring (61) and the sintered filter (22) in the yoke retainer nut body.

34. Using the snap ring pliers (B14), fit the snap ring (2) in its position above the sintered filter (22).

Rotate the snap ring to check its correct positioning.

TO PREVENT THE YOKE RETAINER NUT FROM WORKING LOOSE ACCIDENTALLY, POUR ONE OR TWO DROPS OF THREAD COMPOUND (LOCTITE 422 TYPE) ONTO ITS THREADING.

35. Position the yoke (3) with the knob (25) on the first stage body.
36. Using the wrench (B1), fully tighten the complete yoke retainer nut (7).

NOTE
IF USING A TORQUE WRENCH,
USE TIGHTENING TORQUE OF APPROXIMATELY
18-20 N/m.

DIN version

REASSEMBLY

Connect the first stage to a full tank (at least 180 bar) or test bench, and
open the air valve slowly to expel any foreign matter from the first stage.

37. Position the O-Rings (19 - 52) on the caps (20 - 53).

38. Tighten the caps (20 - 53) to the first stage body (1) using a 4-mm Allen wrench and the flexible hoses in the corresponding ports on the first stage.

WARNING !
FOR CHECKS AND ADJUSTMENTS ON THE FIRST STAGE, CONSULT THE CORRESPONDING SECTION OF THE MAINTENANCE MANUAL : F 7-1 (2008)

Kit CWD Dry