

MARES SERVICE MANUAL

2012

mares


RE:
MR22-42 300 BAR DIN CONNECTOR BODY

BTM21

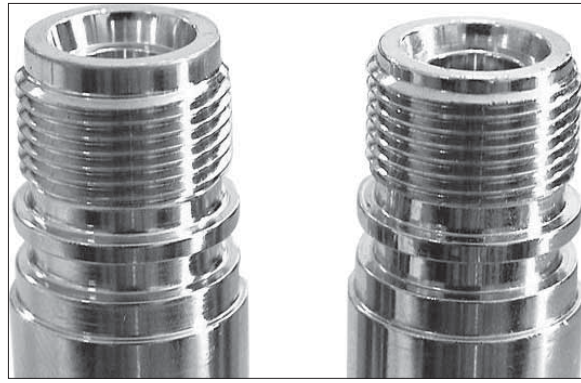
MARES S.p.A. ANNOUNCES THAT IT HAS ALTERED THE 300 BAR DIN CONNECTOR BODY (#46201134), DEVELOPED ONLY AND EXCLUSIVELY FOR 22-42 VERSION FIRST STAGES, AS ILLUSTRATED IN PHOTO 3. THE NEW DIN BODY CAN BE DISTINGUISHED FROM THE PREVIOUS VERSION (#46200548) BY A RADIAL GROOVE AT THE TOP OF THE BODY, AS SHOWN IN FIGURE 3. REGULATORS AND/OR FIRST STAGES THAT MOUNT THE NEW DIN BODY AS STANDARD CAN ALSO BE RECOGNIZED BY THE SERIAL NUMBER, AS INDICATED IN THE FOLLOWING TABLE.

PRODUCT CODE	DESCRIPTION	SERIAL NUMBER
416134	ABYSS 22 DIN	EA 28218
416155	PRESTIGE 22 DIN	GM 12308
416222	SET ABYSS 22 DIN	STA 11099
416216	1ST STAGE 22 DIN SMU	UM 11039

⚠ WARNING!

MARES RECOMMENDS NOT USING THE NEW 300 BAR DIN BODIES IN 16-HUB VERSION FIRST STAGES BECAUSE THE SHAPE OF THE NEW DIN BODY IS DIFFERENT FROM THE PREVIOUS ONE (PHOTO 1-2). HOWEVER, FOR MR-V16 FIRST STAGES, HUB, THE DIN CONNECTOR #416805 CAN BE USED, OR ALTERNATIVELY THE DIN #416803 OR THE #46200548 CONNECTOR BODY AS THE REPLACEMENT PART, FOLLOWING THE BTM 11 INSTRUCTIONS.

- DIN BODY -



#46201134

#46200548



IDENTIFYING CONCENTRIC GROOVE

RE:

MR22-42 300 BAR DIN CONNECTOR BODY

BTM21

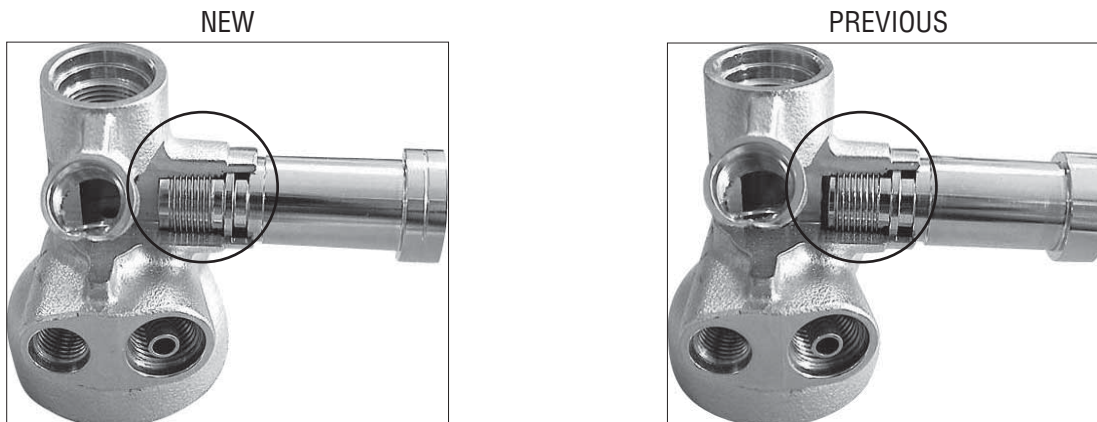


FIG.1

IN LIGHT OF THE ABOVE, THE NEW 300 BAR DIN BODY AND/OR DIN KIT CAN BE INSTALLED ON THE FOLLOWING MODELS OF MARES FIRST STAGES:

1° STADIO	KIT DIN 416805	KIT DIN 416810	DIN KIT 416803	SPARE PARTS 46200548	SPARE PARTS 46201134
MR 22	YES	YES	NO	YES	YES
MR/V 32	YES	YES	NO	YES	YES
RUBY	YES	YES	NO	YES	YES
MR/V 42	YES	YES	NO	YES	YES
MR/V 16	YES	NO	YES	YES	NO
HUB	YES	NO	YES	YES	NO
T-PLANET	YES	NO	YES	YES	NO

⚠ WARNING!

MAINTENANCE OPERATIONS MUST BE PERFORMED BY QUALIFIED PERSONNEL AT A MARES TECHNICAL ASSISTANCE CENTER AND/OR AUTHORIZED MARES DISTRIBUTOR.

IF THE UPDATED MANUAL CONTAINING THE REQUIRED SECTIONS IS NOT AVAILABLE AND/OR IF THE INSTRUCTIONS ARE NOT ENTIRELY CLEAR OR NOT FULLY COMPREHENSIBLE, PLEASE CONTACT THE MARES S.P.A. TECHNICAL SUPPORT SERVICE BEFORE CONDUCTING ANY MAINTENANCE, ADJUSTMENT, OR CONTROL OPERATIONS.

Drawing No: E 113	1st STAGE MR 22 "2008"	DRAWING UPDATED: 20/01/2012
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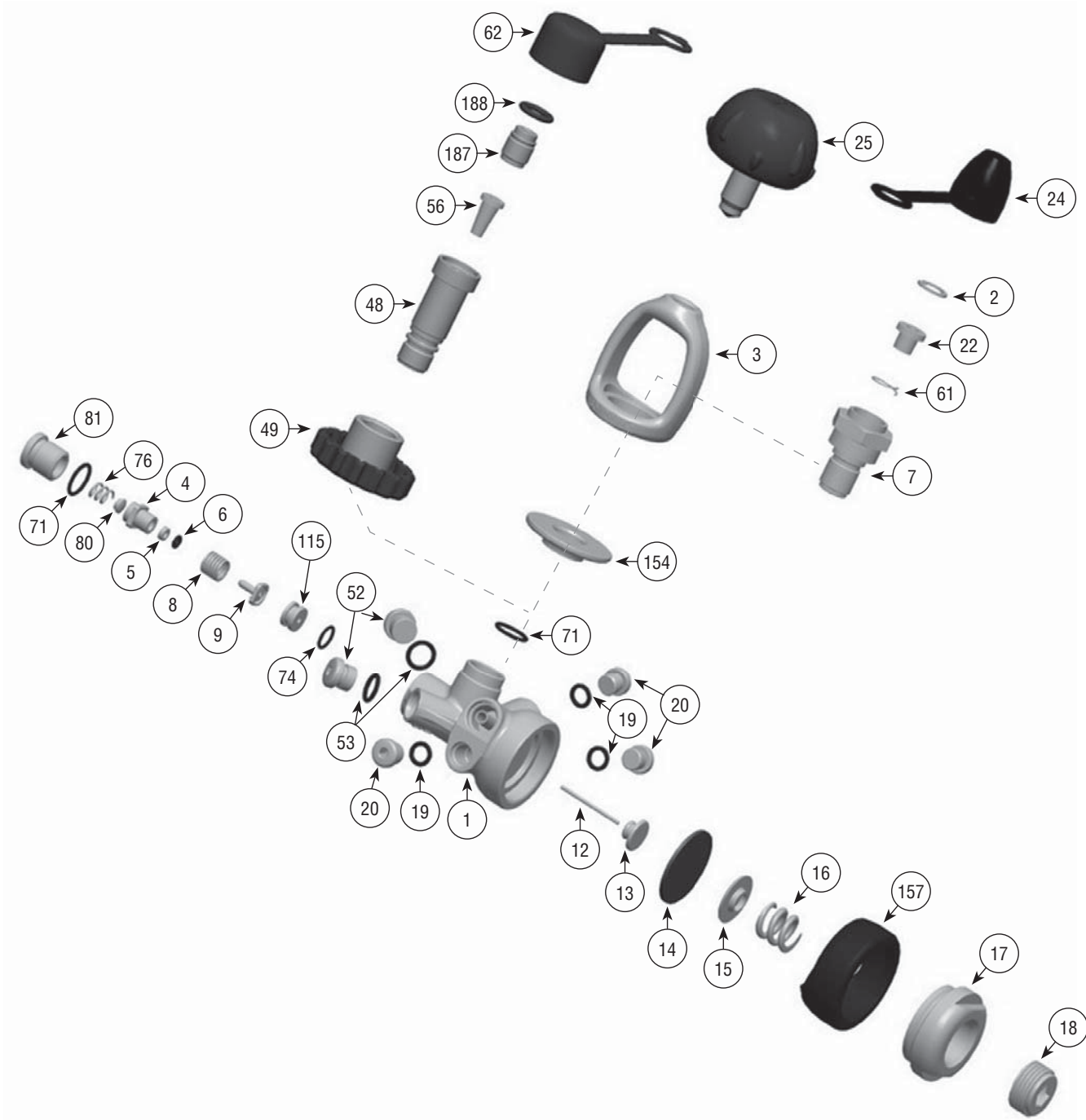
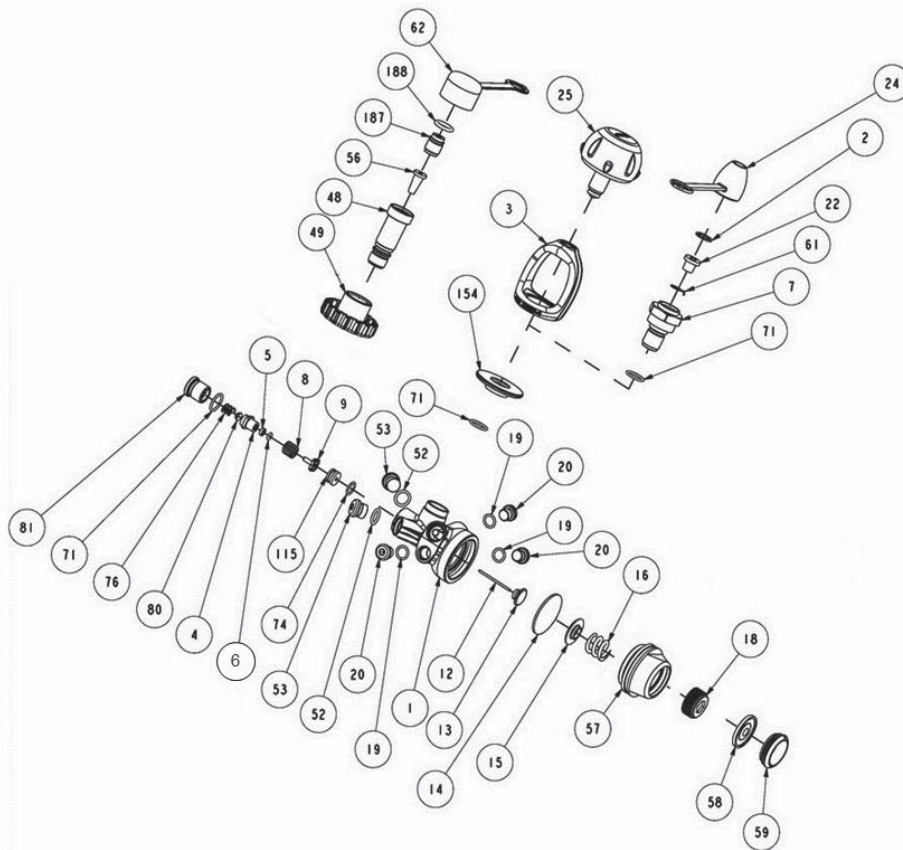


Table No: 36	1st STAGE MR 22 "2008"	TABLE UPDATED ON: 14/03/2012
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REF	CODE	DESCRIPTION
1	46200959	FIRST STAGE BODY DFC
2	46185015	RETAINING RING, 1ST STAGE FILTER
3	46201074	YOKE K11
4	D	HP CHAMBER
5	46110506	BACKUP RING 1ST STAGE REGULATOR
6	46110101	OR 2012
6	46110401	OR 2012 VITON 006-9707
7	46186205	NUT,YOKE RETAINER 1ST STAGE MR22
8	46185011	SPRING, 1ST STAGE VALVE
9	46201132	POPPET 1° STG TRI-MATERIAL 10 PCS
12	46186214	PIN, 1ST STAGE, 32,5 MM
13	46186213	BUTTON POPPET, 1ST STAGE MR22
14	46201111	DIAPHRAGM, 1ST STAGE REGULATORS
15	46185034	PLATE SPRING BASE, 1ST STAGE REGS
16	46185023	SPRING DIAPHRAGM 1ST STAGE REG.
17	46200859	LOCKING NUT
18	46185028	REGULATING NUT, 1ST STAGE REGS
19	46110106	OR 106
19	46110402	OR 106 VITON 610-9707
20	46185204	LP PLUG 3/8", 1ST STAGE, REGS.
22	46186202	CON.SINTERED FILTER. 1ST STAGE
24	46185010	DUST CAP
25	46184079	YOKE KNOB
48	46201134	BODY, DIN CONNECTOR 300 BAR
49	46200546	DIN 300 BAR THREADED LOCKING RING
52	46110108	OR 108
52	46110404	OR 108 VITON 611-9754
53	46185205	HP PLUG 7/16", 1ST STAGE
56	46200561	FILTER, DIN CONNECTOR, MR22
57	I	CWD BODY
58	46185301	DIAPHRAGM, CWD KIT
59	46185302	CWD LOCKING RING
61	46185013	SPRING, FILTER 1ST STAGE
62	46200562	DIN CONNECTOR DUST CAP
71	46110211	OR 2050
71	46110413	OR 2050 Viton 014-9707

REF	CODE	DESCRIPTION
74	46110107	OR 2031
74	46110403	OR 2031 VITON 011-9707
76	46186210	SPRING,HP HOUSING,1ST STAGE MR22
80	46186206	HP HOUSING BUTTON 1ST STAGE MR22
81	46200860	PLUG, 1ST STAGE, MR22
115	46186216	POPPET SEAT, 1ST STAGE, MR22
148	46184315	LABEL "EN 250"
149	46184316	LABEL MARES
154	46200553	YOKE CONNECTOR 1ST STAGE
157	46200861	PROTECTION CAP 1STG
187	46200547	O-RING SEAT DIN
188	46110247	OR 3043
189	K	CWD DRY 12S PISTON
190	46200923	PLASTIC RING CWD DRY 12S
191	46200922	HOCK CUP CWD DRY 12S
192	K	CWD DRY BODY
193	46200926	CWD DRY DIAPHRAGM
194	46200950	PLATE SPRING BASE CWD DRY
ASSEMBLIES		
A	416216	1ST STAGE MR22 ASSEMBLED (DIN-INT)
D	46185210	HP HOUSING ASSEMBLY, 1ST STAGE (4-5-6)
D	46186259	HP HOUSING ASSEMBLY, 1ST STAGE (VITON O-RINGS)
F	416810	DIN CONNECTOR 300 BAR
I	416851	KIT CWD SILICONE OIL
K	416855	KIT CWD DRY 22
###	46186152	SERVICE KIT INT 1°ST STAGE 32/22/16 (2-5-6-19-22-52-71-74)
###	46185167	SERVICE KIT INT 1°ST STAGE VITON 32/22/16 (2-5-6-19-22-52-71-74)
###	46200606	SERVICE KIT DIN 1 ST° STAGE 32/22/16/TP/D16 2K5 (5-6-19-52-74-56-71-188-194)
###	46200906	SERVICE KIT.DIN 1°STD. 16/22/32 VITON 2K5 (5-6-19-52-74-56-71-188-194)
ACCESSORIES		
98	46186207	PLUG 1/2 UNF 1ST STAGE MR22
97	46110215	OR 2043

Table No.: 39 DRAWING NO: E 116	1st STAGE MR 22 NAVY	DRAWING UPDATED: 13/03/2012 TABLE UPDATED ON: 28/01/2011
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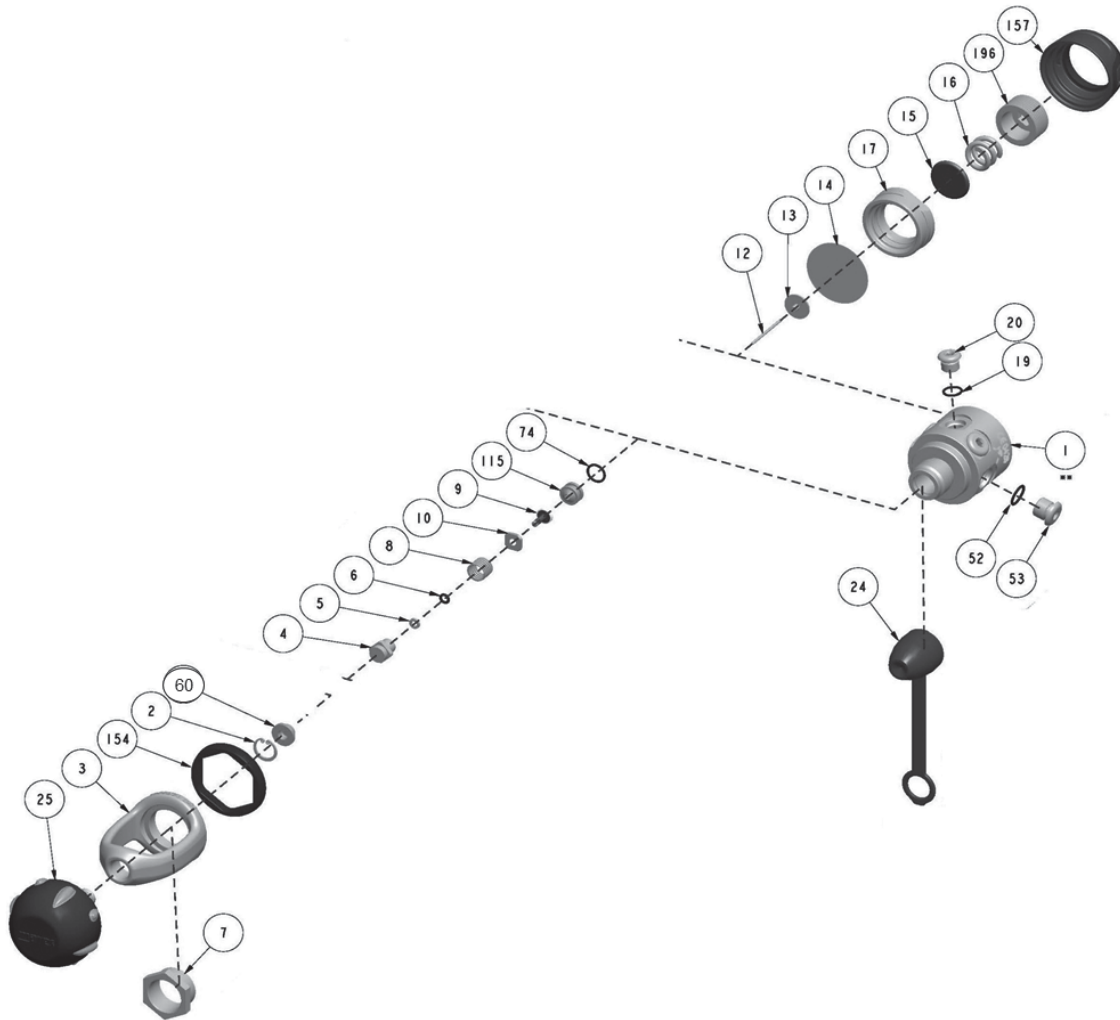
RIF.N.	CODE	DESCRIPTION
1	46201083	FIRST STAGE BODY
2	46185015	RETAINING RING, 1ST STAGE FILTER
3	46201074	YOKE
4	D	HP CHAMBER
5	46110506	BACKUP RING 1ST STAGE REGULATOR
6	46110101	OR 2012
6	46110401	OR 2012 VITON 006-9707
7	46186205	NUT YOKE RETAINER
8	46185011	SPRING
9	46201132	POPPET 1° STG TRI-MATERIAL 10 PCS
12	46186214	PIN POPPET 32,5MM
13	46186213	BUTTON FIRST STAGE POPPET
14	46201111	DIAPHRAGM
15	46200950	PLATE SPRING BASE
16	46185023	SPRING DIAPHRAGM
18	46185028	REGULATING NUT
19	46110106	OR 106
19	46110402	OR 106 VITON 610-9707
20	46185204	LP PLUG 3/8"
22	46186202	FILTER
24	46185010	DUST CAP
25	46184079	YOKE KNOB
48	46201134	CONNECTOR BODY DIN 300 BAR
49	46200546	WHEEL DIN 300 BAR
52	46110108	OR 108
52	46110404	OR 108 VITON 611-9754
53	46185205	HP PLUG 7/16"
56	46200561	FILTER DIN CONNECTOR
57	I	CWD BODY
58	46185301	DIAPHRAGM, CWD KIT

RIF.N.	CODE	DESCRIPTION
59	I	CWD LOCKING RING
61	46185013	SPRING, FILTER 1ST. STAGE
62	46200562	PROTECTION CAP - DIN CONNECTOR
71	46110211	OR 2050
71	46110413	OR 2050 VITON 014-9707
74	46110107	OR 2031
74	46110403	OR 2031 VITON 011-9707
76	46186210	SPRING, HP HOUSING, 1ST STAGE
80	46186206	HP HOUSING BUTTON 1ST STAGE
81	46186208	PLUG
115	46186216	POPPET SEAT MR
154	46200553	YOKE CONNECTOR 1ST STAGE
187	46200547	O-RING SEAT DIN
188	46110247	OR 3043

ASSEMBLIES		
D	46185210	HP HOUSING ASSEMBLY, (4-5-6)
F	416805	DIN CONNECTOR 300 BAR (TAB. N. 23 DIS E14)
I	416851	KIT CWD
***	46186152	SERVICE KIT, 1ST STAGE INT (2-5-6-19-22-52-71-74)
***	46200606	SERVICE KIT, 1ST STAGE DIN (5-6-19-52-74- 56-71-188)
***	46185167	SERVICE KIT INT VITON 1° STG 32/22 (2-5-6-19-22-52-71-74)

ACCESSORIES		
	46185340	OIL X CWD
98	46186207	PLUG 1/2 UNF 1ST STAGE
97	46110215	OR 2043

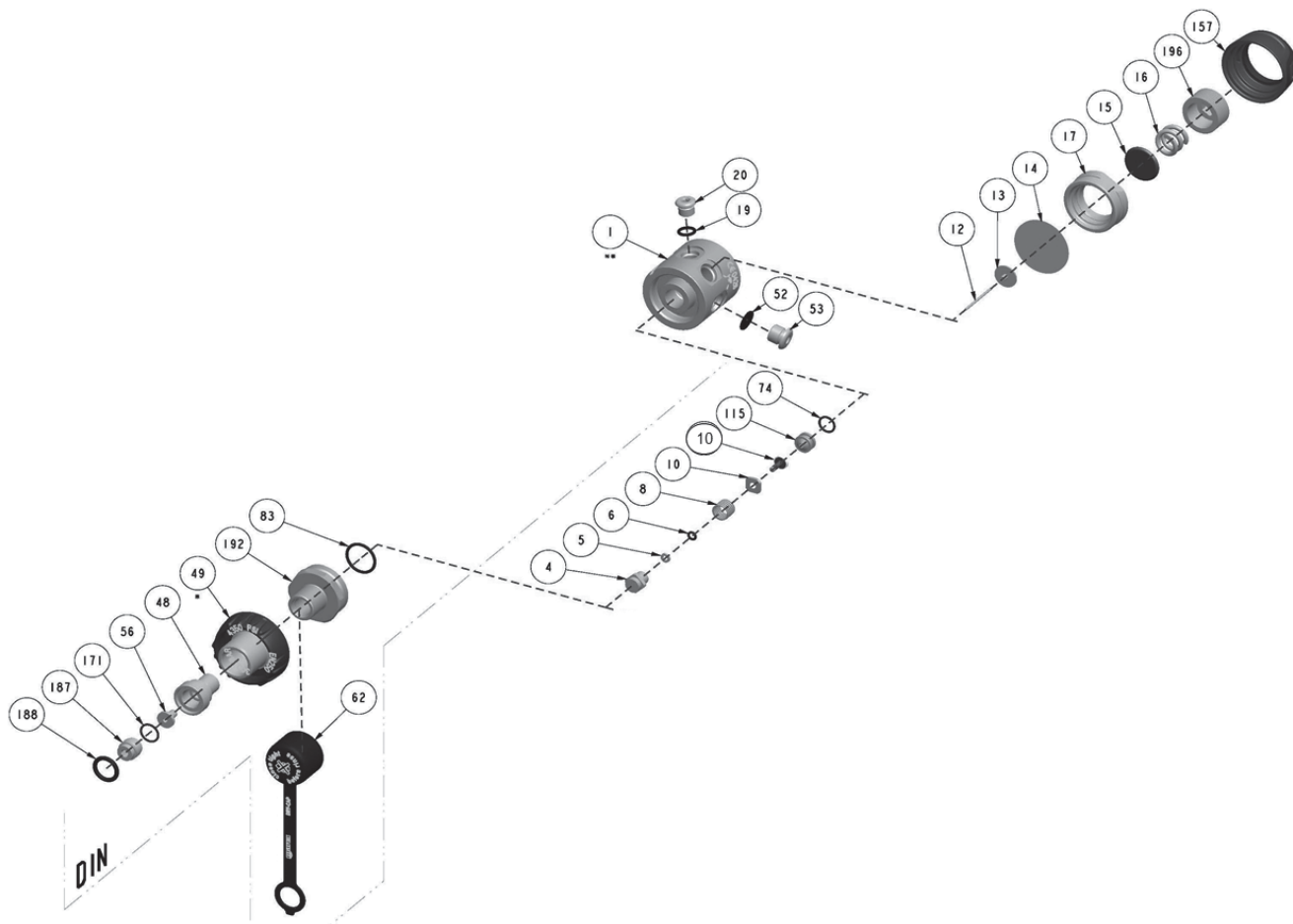
Table No.: 41 Drawing No.: E 11	MR 12 S "2011" INT	DRAWING UPDATED: 27/01/2012 TABLE UPDATED ON: 14/12/2012
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REF	CODE	DESCRIPTION
1	46201144	FIRST STAGE BODY 12S INT
2	46185015	SEEGER D. INT. 13
3	46201074	YOKE K9
4	D	HP CHAMBER
5	46110506	BACKUP RING PK
6	46110101	OR 2012
6	46110401	OR 2012 VITON 006-9707
7	46185212	NUT YOKE RETAINER 1ST STAGE MR12
8	46185011	SPRING, 1ST STAGE VALVE, MR12
10	46201132	POPPET 1° STG TRI-MATERIAL 10 PCS
12	46201142	PIN POPPET 29,3 MM
13	46185032	BUTTON, 1ST ST. POPPET
14	46185022	DIAPHRAGM, 1ST STAGE REGULATORS
15	46185034	PLATE SPRING BASE
16	46185023	SPRING DIAPHRAGM 1ST STAGE REG.
17	46201228	RETAINING NUT K11
19	46110106	OR 106
19	46110402	OR 106 VITON 610-9707
20	46185204	LP PLUG 3/8", 1ST STAGE, REGS.
24	46185010	DUST CAP INT

REF	CODE	DESCRIPTION
25	46184079	YOKE KNOB
52	46110108	OR 108
52	46110404	OR 108 VITON 611-9707
53	46185205	HP PLUG 7/16", 1ST STAGE
60	46201150	FILTER, INT CONNECTOR, 12S
74	46110107	OR 2031
74	46110403	OR 2031 VITON 011-9707
83	46110225	OR 2068
83	46110420	OR 2068 VITON
115	46186216	HP SEAT "MR"
154	46200930	PLASTIC RING INT 12S
157	46200929	HOCK CAP, 1ST STAGE 12S
196	46201230	REGULATING NUT, 1ST STAGE
ASSEMBLIES		
D	46185210	HP HOUSING ASSY, 1ST STAGE (4-5-6)
D	46186259	HP HOUSING ASSY, 1ST STD (VITON O-RINGS)
I	416855	KIT CWD DRY
###	46201184	SERVICE KIT 1ST STG12S INT(2-5-6-19-52-74-83)
	416804	DIN CONNECTOR 300 12S *ITM25

Table No.: 41 Drawing No.: 118	MR 12 S "2011" DIN	DRAWING UPDATED: 27/01/2012 TABLE UPDATED ON: 14/12/2012
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REF	CODE	DESCRIPTION
1	46201146	FIRST STAGE BODY 12S DIN
4	D	HP CHAMBER
5	46110506	BACKUP RING PK
6	46110101	OR 2012
6	46110401	OR 2012 VITON 006-9707
8	46185011	SPRING, 1ST STAGE VALVE, MR12
10	46201132	POPPET 1° STG TRI-MATERIAL 10 PCS
12	46201142	PIN POPPET 29,3 MM
13	46185032	BUTTON, 1ST ST. POPPET
14	46185022	DIAPHRAGM, 1ST STAGE REGULATORS
15	46185034	PLATE SPRING BASE
16	46185023	SPRING DIAPHRAGM 1ST STAGE REG.
17	46201228	RETAINING NUT K11
19	46110106	OR 106
19	46110402	OR 106 VITON 610-9707
20	46185204	LP PLUG 3/8", 1ST STAGE, REGS.
25	46184079	YOKE KNOB
48	46200934	CONNECTING PLUG, DIN 300 BAR 12S
49	46200932	DIN 300 BAR THREADED LOCKING RING
52	46110108	OR 108
52	46110404	OR 108 VITON 611-9707
53	46185205	HP PLUG 7/16", 1ST STAGE

REF	CODE	DESCRIPTION
56	46200948	FILTER, DIN CONNECTOR, 12S
62	46183014	DUST CAP DIN
74	46110107	OR 2031
74	46110403	OR 2031 VITON 011-9707
83	46110225	OR 2068
83	46110420	OR 2068 VITON
115	46186216	HP SEAT "MR"
157	46200929	HOCK CAP, 1ST STAGE 12S
171	46110110	OR 2037
171	46200298	OR 2037 VITON
187	46200946	O-RING SEAT DIN 12S
188	46110247	OR 3043
188	46200620	OR 3043 VITON
192	46200942	CONN. BODY HP DIN 12S
196	46201230	REGULATING NUT, 1ST STAGE
ASSEMBLIES		
D	46185210	HP HOUSING ASSY, 1ST STAGE (4-5-6)
D	46186259	HP HOUSING ASSY, 1ST STD (VITON O-RINGS)
I	416855	KIT CWD DRY
°°°	46200964	SERVICE KIT 1ST STG 12S DIN
°°°	46200966	SERVICE KIT 1ST STG 12S DIN (VITON O-RINGS)
		(5-6-19-52-56-74-83-171-188)

MR52
1ST STAGE

mares[®]

MAINTENANCE PROCEDURES

► TOOLS NEEDED



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.



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.

OTHERS TOOLS

- 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)
- MR52 1st stage service kit (code INT – DIN 46201164, VITON 46201166)

(B-4) 5MM
46106204



(B-21)
#46106221



(B-6)
46106206



(B-5)
46106205



(B-14)
#46106214



(B-1) 25 mm
46106201



HEX WRENCH 4 mm



(B-13) 10 mm
#46106213



(B-18) 14 mm
#46106218



(B-42)
46201042



B-8) 6mm
46106208



DISASSEMBLY

1. Loosen the dust cap (10) from the 1st stage, fully unscrewing the yoke knob (22).
2. Remove the hose protection from the body of the 1st stage.
3. Unscrew the hose using a 14-mm open end wrench (B18). Photo 1



Photo 1

4. Remove the cap 1st stage (44), using a flat head screwdriver (type USAG No. 322). Insert the screwdriver in correspondence with "M", (as shown in the picture 2) and penetrate between the plastic parts 44 and 38 with the screwdriver for at least 1 cm, then lever the screwdriver with caution until the release. Photos 2-3



Photo 2



Photo 3

5. Take both shells out (38-39). Photo 4



Photo4

6. Using tool (B-8), unscrew the HP chamber plug (34), take off the HP Spring (36), the trimaterial valve (19), and the 28.3-mm Pin (1) from the first stage body.

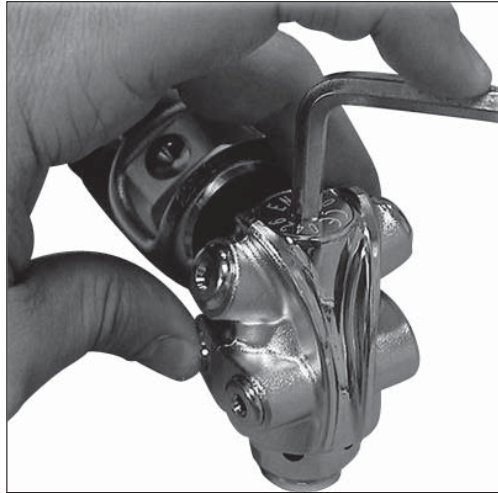


Photo 5

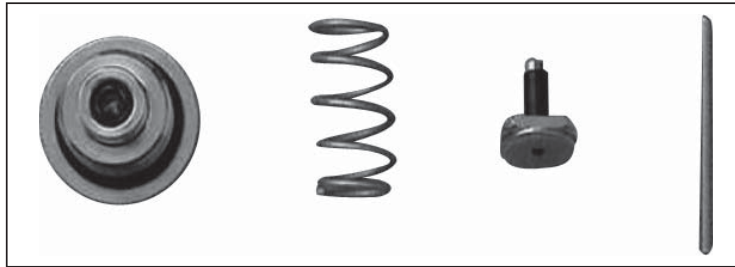


Photo 6

7. Extract the O-Ring (20) from the HP housing (34) and the back up ring (3) using a plastic or brass OR removal tool.
Photos 7-8

⚠ WARNING!

DO NOT USE BLADES OR POINTED TOOLS MADE OF STEEL OR OTHER MATERIALS, WHICH CAN SCRATCH THE SURFACES.



Photo 7



Photo 8

8. Screw in the threaded bar tool (B5) to a 3/8" LP port to make it easier to remove the adjusting nut (18) and retaining nut (17) from the 1st stage. Photo 9

NOTE TO MAKE DISASSEMBLY EASIER, WE RECOMMEND THAT YOU PLACE THE FIRST STAGE IN A BENCH VISE (PHOTO 9).

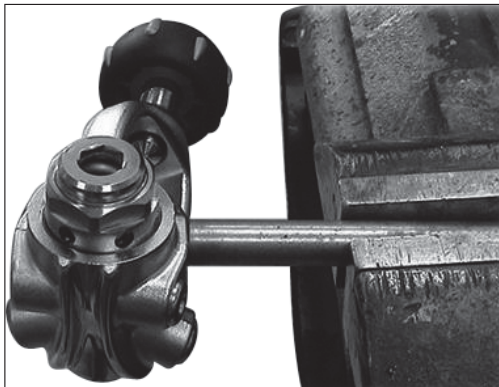


Photo 9

9. Using the Allen wrench (B-13), unscrew the adjusting nut (18) and pull out the spring (16). Photo 10

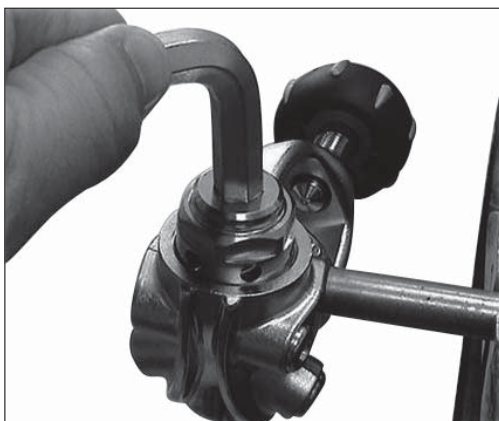


Photo 10

10. Unscrew the retainer nut (17) using the special 25-mm wrench (B1) and remove the Plate Spring Base (31). Photo 11

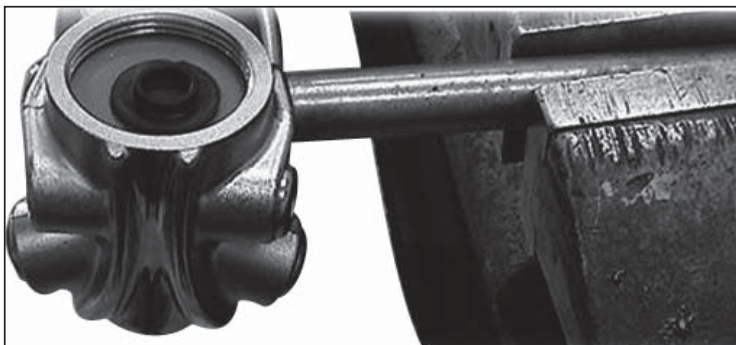


Photo 11

11. Remove the plastic washer ring (32).

⚠ WARNING!

DO NOT USE POINTED TOOLS TO REMOVE THE PLASTIC WASHER RING (32) IN ORDER TO AVOID DAMAGING THE DIAPHRAGM (30).



Photo 12

12. Turn upside down the 1st stage, Insert poppet pin (1) into poppet seat (33) using the special tool (B6) tool in chamber. Gently Press on the Pin with a plastic tool, to avoid damage to the profile of the HP seat (33), until complete removal of the components (28-30-35).



Photo 13

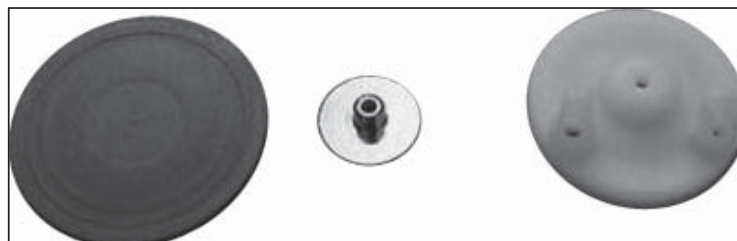


Photo 14

13. Use the special utensil special (B-41), inserting it in a hole of Diaphragm side and doing with it push on HP seat (33).
14. After removing the seat connector (33) from the 1st stage body, remove the O-Ring (27).
15. Unscrew the yoke retainer nut (23) using the special wrench (B1) and remove also the Spacer (37).

NOTE TO MAKE DISASSEMBLY EASIER, WE RECOMMEND THAT YOU PLACE THE FIRST STAGE IN A BENCH VISE (PHOTO 17).

16. Using the snap ring pliers (B14), pull out the snap ring (2), INT Filter (8) and the filter spring (12).

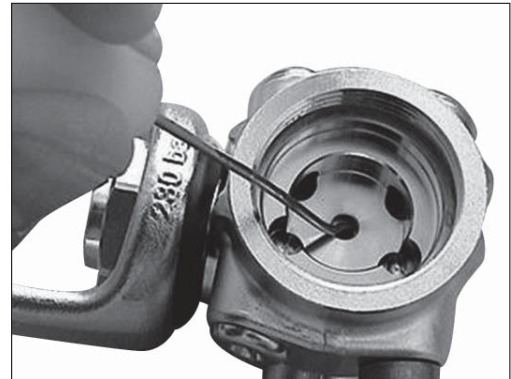


Photo 15



Photo 16



Photo 17



Photo 18

- I. Unscrew the DIN OR seat (15) with a 4-mm Allen wrench.
- II. Remove the O-Ring (25) from the OR seat (15).
- III. Remove the sintered filter (7) from the DIN connector body (48), turning the first stage over.
- IV. Insert an 5-mm Allen wrench (B4) inside the DIN fitting (24) and unscrew it completely. If necessary use also the wrench B1 for raise it easier.
- V. Remove the DIN Body (24) and the DIN ring nut (11).
- VI. Remove the O-Ring (26) from the DIN fitting body (24).

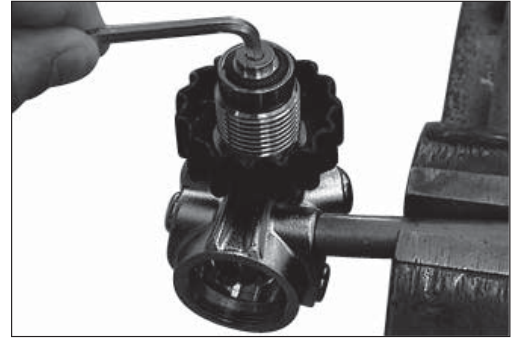


Photo 19



Photo 20



Photo 21



Photo 22

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.



WARNING!

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.

ROUTINE MAINTENANCE



WARNING!

CERTAIN KEY COMPONENTS OF THE FIRST STAGE SHOULD BE REGULARLY REPLACED AT EACH SCHEDULED OVERHAUL. LISTED BELOW ARE THE COMPONENTS INCLUDED IN THE MR52 1ST STAGE SERVICE KIT (CODE 46201164 INT- DIN):

MR52 SERVICE KIT (INT-DIN: 46201164)

- ANTI-FRICTION RING
- SNAP RING (only INT conn.)
- SINTERED FILTERS (INT & DIN)
- BACKUP RING Parbak
- O-RINGS :
 - 3 106 O-RINGS
 - 2 108 O-RINGS
 - 1 2012 O-RING
 - 1 2031 O-RING
 - 1 3043 O-RING (for DIN only)
 - 1 2050 O-RING

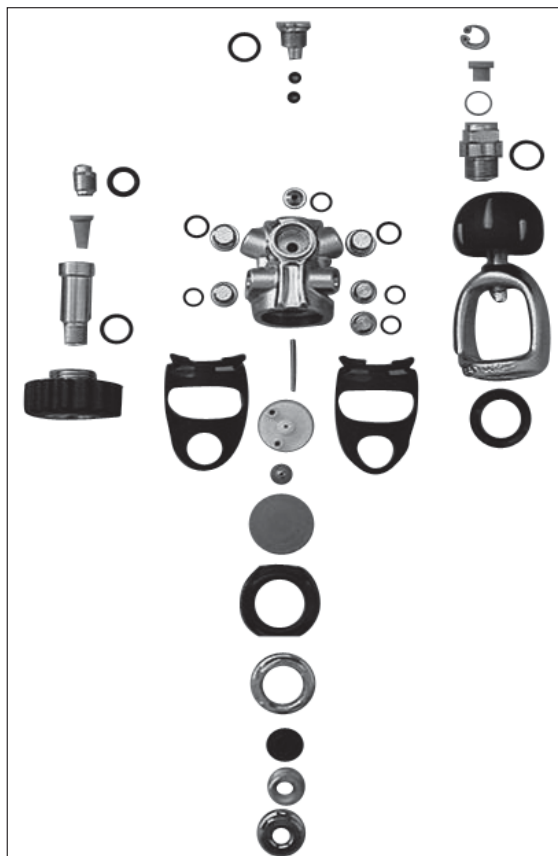


WARNING!

IF THE 1ST 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

17. Place the O-Ring (27) in the HP seat (33) and then correctly position the HP seat on the special tool (B21).
18. Pressing gently, insert the poppet seat (33) into position in the first stage body.

WARNING!

TAKE SPECIAL CARE WHEN INSERTING THE POPPET SEAT. MAKE SURE THAT IT IS POSITIONED CORRECTLY. ONCE IT IS INSERTED CORRECTLY INTO THE FIRST STAGE, THE CONICAL SECTION WILL BE VISIBLE WHEN LOOKING FROM THE HIGH PRESSURE END.

19. Insert the backup ring (3) , the O-Rings (20) into the HP CHAMBER Plug (34) and the O-Ring (26).
20. Properly position poppet (19). Photo 25.
21. Place spring (36) over the poppet (19).
Using the hex. tool (B8), tighten into the First Stage Hp chamber plug assembly (34).

 **NOTE** MAKE SURE THAT ONCE INSERTED INTO THE BALANCING CHAMBER (34) THE BACKUP RING (3) HAS SIDE "A" FACING THE O-RING (20).

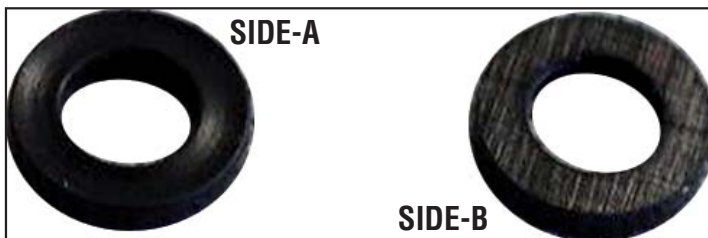


Photo 23



Photo 24

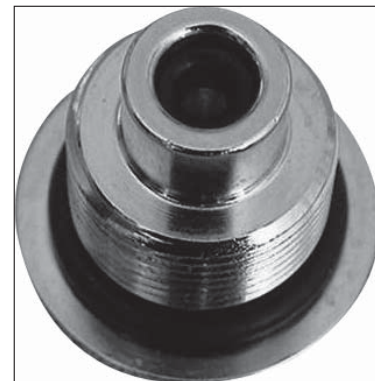


Photo 25



Photo 26

22. Rotate the first stage and correctly position the DFC washer (35) in the groove of the first stage body . Insert the pin (1) in the center hole in the DFC washer.
23. Position the poppet button (28) on the pin (1), and press on it to feel the "response" of the HP spring (36).
24. Place the diaphragm (30) in the retaining nut seat (17), making it adhere perfectly to the edges.

NOTE REINSTALL THE DIAPHRAGM (30) IN THE SAME POSITION FROM WHICH IT WAS REMOVED. NOTE THE IMPRESSION OF THE POPPET BUTTON (28) ON IT.

25. Correctly position the plastic washer ring (32) above the diaphragm (30).
26. Place the spring base plate (31) in the middle of the diaphragm (30).
27. Use a 25-mm wrench (B1) to fully tighten the retaining nut to the 1st stage body.

NOTE IF USING A TORQUE WRENCH, USE TIGHTENING TORQUE OF APPROXIMATELY 25N/M.



Photo 27



Photo 28

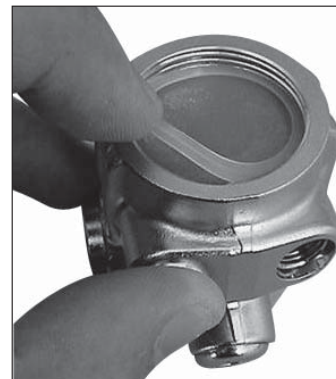


Photo 29



Photo 30

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

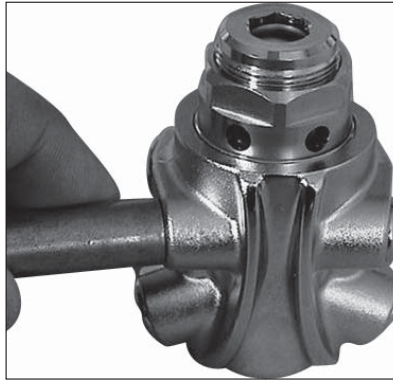


Photo 31

29. Screw the adjusting nut (18) 3 – 4 turns on the retaining nut (17) using a 10-mm Allen wrench (B13).



ATTENZIONE!

DO NOT OVER-TIGHTEN THE ADJUSTING NUT; THIS WILL CAUSE AN INCREASE IN INTERMEDIATE PRESSURE, INTERFERING WITH SUBSEQUENT ADJUSTMENTS AND MAY ALSO DAMAGE THE LP GAUGE.

30. Rotate the 1st stage body and insert the Spacer (37).

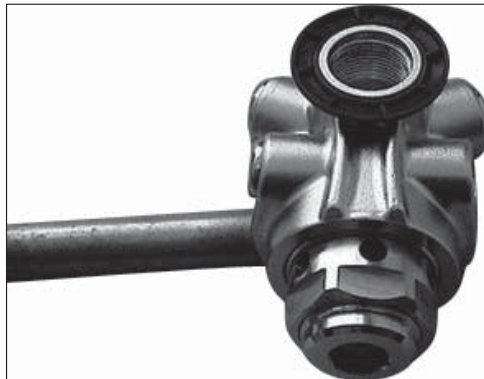


Photo 32

31. Assemble the filter spring (12) and the sintered filter (8) in the yoke retainer nut body (23).



Photo 33

32. 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. IT IS NECESSARY THAT THERE ARE NOT RESIDUALS OF OLD LOCTITE ON THE THREADS .

TO MAKE ASSEMBLY EASIER, WE RECOMMEND THAT YOU PLACE THE FIRST STAGE IN A BENCH VISE (PHOTO 32).

33. Position the yoke (21) with the knob (22) on the first stage body.

34. Using the wrench (B1), fully tighten the complete yoke retainer nut (23).

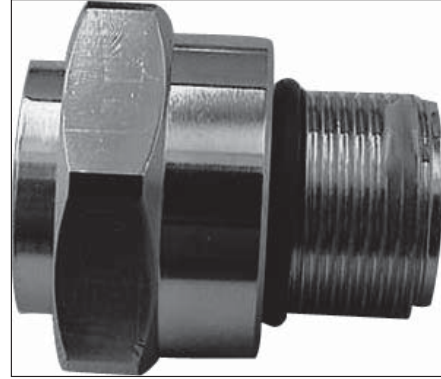


Photo 34

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

35. Insert the DIN body (24) in the Threaded Locking ring (11).

36. Position the O-Ring (26) on the DIN body (24).

NOTE TO PREVENT THE DIN BODY (24) FROM WORKING LOOSE ACCIDENTALLY, APPLY ONE OR TWO DROPS OF THREAD COMPOUND (TYPE LOCTITE 415) ON THE FITTING THREAD ON THE PART FURTHEST FROM THE O-RING (26). DO NOT PUT THREAD COMPOUND ON THE O-RING. IT IS NECESSARY THAT THERE ARE NOT RESIDUALS OF OLD LOCTITE ON THE THREADS.



Photo 35

37. Insert the Spacer (37) in the 1st stage body as shown.

38. Using a 5-mm Allen wrench (B 4), tighten the DIN body (24) to the first stage body.



Photo 36

IF USING A TORQUE WRENCH, USE TIGHTENING TORQUE OF APPROXIMATELY 17 - 20 N/M.

39. Insert the conical filter (7) in the DIN body (24).

40. Position the O-Ring (25) on the DIN OR seat (15).

41. Screw the O-Ring housing (15) to the DIN body (24) with a 4-mm Allen wrench.

IF USING A TORQUE WRENCH, USE TIGHTENING TORQUE OF APPROXIMATELY 1.5-2 N/M.



Photo 37

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.

42. Remove the Tool B-5. Position the O-Rings (5 - 13) on the plugs (6 - 14).
43. Tighten the plugs (6-14) to the first stage body using a 4-mm Allen wrench and fit 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.

44. Properly position body protections (39-38) on the first stage body and the 1° stage Cap (44) as shown.



Photo 38



Photo 39



Photo 40

Drawing No: E 117	1st STAGE MR 52 T	DRAWING UPDATED: 23/01/2012
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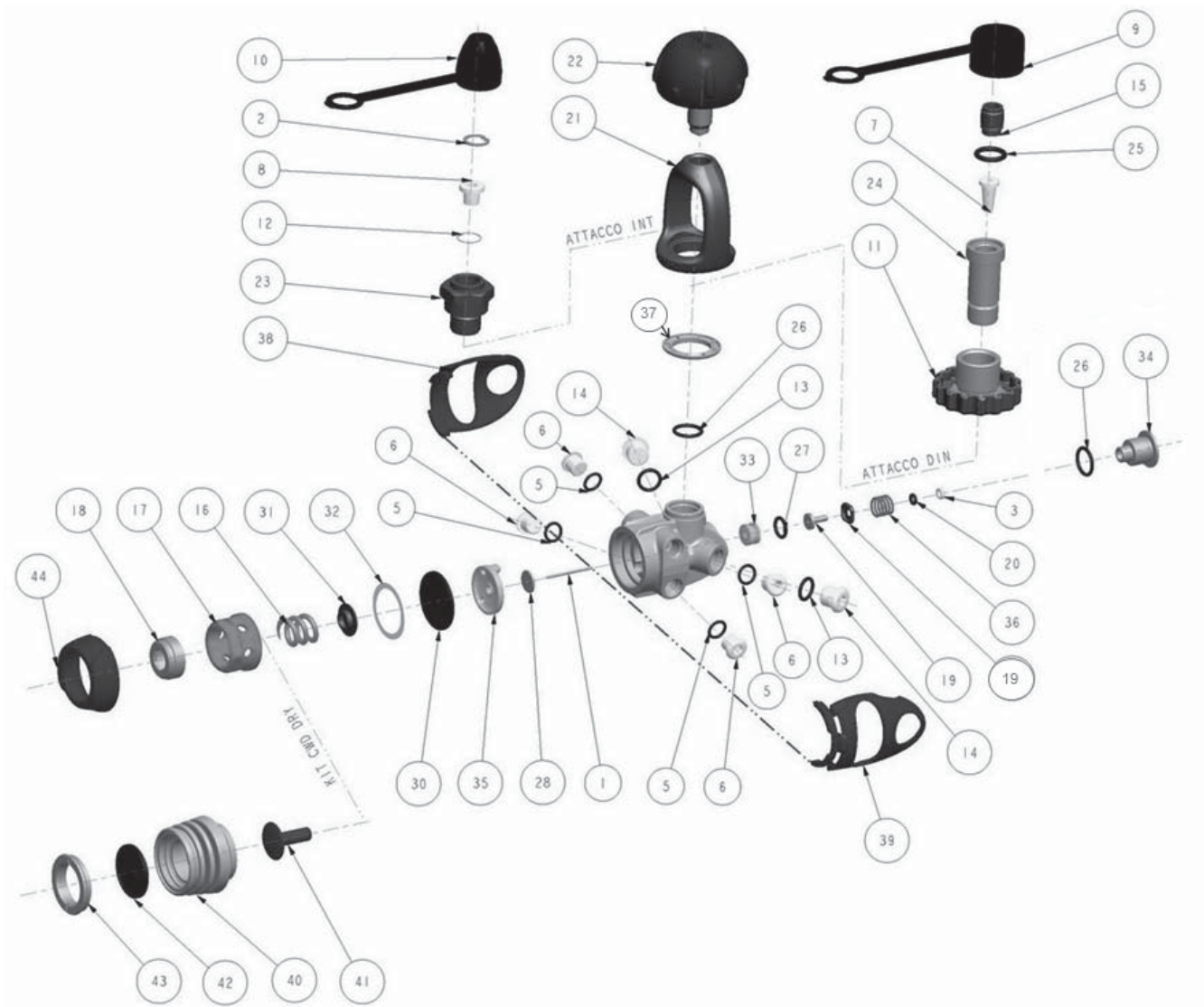


Table No: 40	1st STAGE MR 52 T	TABLE UPDATED ON: 14/03/2012
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REF	CODE	DESCRIPTION
1	46201124	PIN POPPET 28,3 MM
2	46185015	RETAINING RING, 1ST STG FILTER
3	46110506	BACKUP RING PK
4	46201107	FIRST STAGE 52
5	46110106	OR 106
5	46110402	OR 106 VITON
6	46184204	LP PLUG 3/8"
7	46200561	CONICAL FILTER, DIN
8	46186202	CONICAL FILTER INT
9	46200562	DUST CAP 300 BAR DIN
10	46185010	DUST CAP INT
11	46200546	THREADED LOCKING RING (300 BAR)
12	46185013	SPRING, FILTER 1ST. STAGE
13	46110108	OR 108
13	46110404	OR 108 VITON
14	46185205	HP PLUG 7/16"
15	46200547	O-RING SEAT DIN
16	46185023	SPRING DIAPHRAGM
17	46201118	RETAINING NUT
18	46201120	REGULATING NUT
19	46201132	POPPET 1° STG TRI-MATERIAL 10 PCS
20	46110101	OR 2012
20	46110401	OR 2012 VITON
21	46201074	YOKE K11
22	46184079	YOKE KNOB
23	46201100	NUT YOKE RETAINER
24	46201102	BODY, DIN CONNECTOR 300 BAR
25	46110247	OR 3043

REF	CODE	DESCRIPTION
25	46200620	OR 3043 VITON
26	46110211	OR 2050
26	46110413	OR 2050 VITON
27	46110107	OR 2031
27	46110403	OR 2031 VITON
28	46200545	BUTTON FIRST STAGE POPPET
30	46201112	DIAPHRAGM
31	46200582	PLATE SPRING BASE
32	46200581	ANTI-FRICTION RING
33	46186216	HP SEAT "MR"
34	46201116	HP CHAMBER PLUG
35	46201114	DFC WASHER 52
36	46185011	HP SPRING 1° STG
37	46201135	YOKE SPACER 1° STG
38	46201126	LEFT SHELL 52
39	46201128	RIGHT SHELL 52
40	C	CWD DRY BODY, 52
41	C	CWD DRY PISTON
42	46200558	CWD DRY DIAPHRAGM
43	46200566	HOCK CUP CWD DRY
44	46201127	1ST STG CAP 52
ASSEMBLIES		
F	416809	DIN CONNECTOR 300 BAR (9-7-11-15-24-25)
C	416857	KIT CWD DRY
S	46201164	SERVICE KIT MR52 INT/DIN (2-3-5-7-8-13-20-25-26-27-32)
V	46201166	SERVICE KIT MR52 INT/DIN (VITON) (2-3-5-7-8-13-20-25-26-27-32)

ADJUSTING AND CHECKING THE INTERMEDIATE PRESSURE



ATTENTION!

DO NOT SUBMERGE THE INTERMEDIATE PRESSURE MEASURING GAUGE.

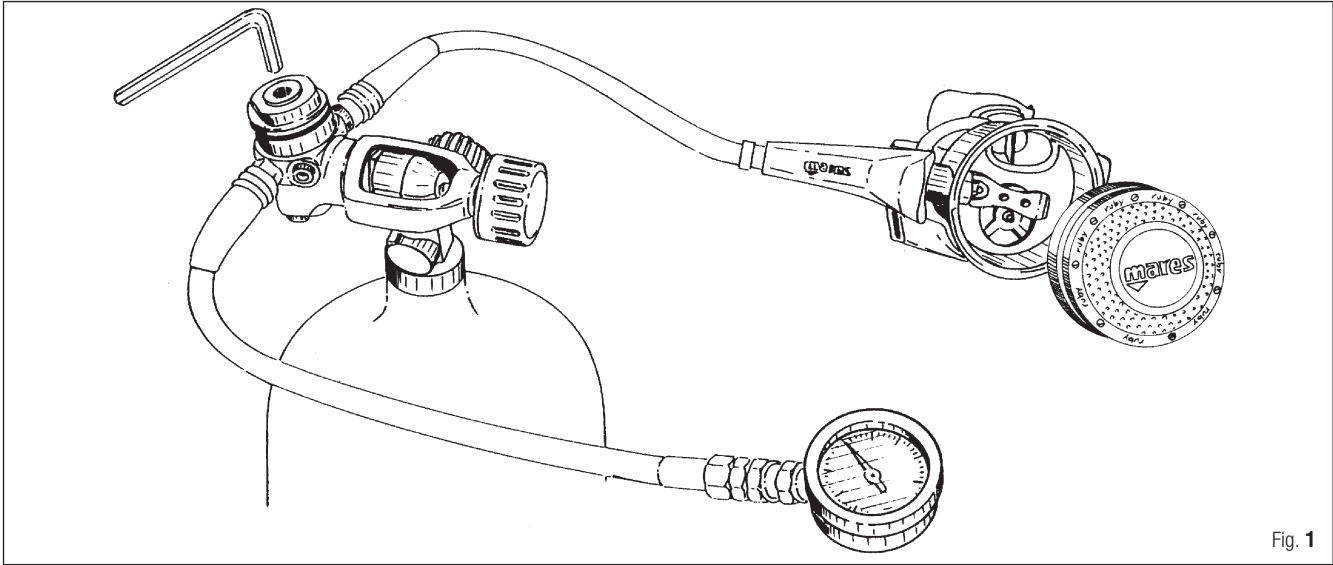


Fig. 1

TABLE OF FIRST STAGE INTERMEDIATE PRESSURES		
MODEL	P.S.I.	BAR
RUBY	142 - 148	9.8 - 10.2
V32 - V16 - V12 - V42	142 - 148	9.8 - 10.2
MR22 - MR16 - MR12 - MR32 - MR42 - 12S	142 - 148	9.8 - 10.2
TI PLANET	142 - 148	9.8 - 10.2
MR12 2nd	145	10
R2 - R2S (with tank 2900 p.s.i. / 200 bar)	142 - 152	9.8 - 10.5
MR10 (with tank 2900 p.s.i. / 200 bar)	123 - 130	8.5 - 9.0

INTERMEDIATE PRESSURE WITH CWD. KIT		
ALL BALANCED DIAPHRAGM MODELS	P.S.I.	BAR
MR 22 NAVY	127 - 136	8.8 - 9.4

► PROCEDURE FOR ADJUSTING THE INTERMEDIATE PRESSURE IN PISTON FIRST STAGES (R1 - R2 - R2S)

1. Screw the intermediate pressure measuring gauge (cod. 106252) into one of the 3/8" low pressure ports, using the special wrench (B-18).
2. Using the wrench (B-18), apply the hose with the partially assembled second stage to the port marked D.F.C.
3. Mount the regulator group on the control valve (of a tank or Test Bench).
4. Holding down the second stage demand lever, slowly open the tank valve and, almost simultaneously, release the demand lever.
5. Read the value of the first stage adjustment on the pressure gauge, and proceed as follows (Fig. 1):
 - A. If the pressure setting is greater than the required value (see table):
 - A.1. Disassemble the regulator from the tank and proceed as described in points 1 and 2 of the disassembly operations.
 - A.2. Remove one distance washer.
 - A.3. Reassemble the components as described in steps 8.1 - 9 - 10 - 11 - 12 of the reassembly instructions.
 - A.4. Proceed as described in steps 3 and 4 of the procedure for checking the intermediate pressure, reading out the value of the intermediate pressure on the gauge.

NOTE IF THERE ARE NO DISTANCE WASHERS IN THE FIRST STAGE, IT IS NECESSARY TO REPLACE THE SPRING.

- B. If the first stage pressure is lower than the required value (see table):
 - B.1. Disassemble the regulator from the tank and proceed as described in points 1 and 2 of the disassembly operations.
 - B.2. Add one distance washer (up to a maximum of two) positioning it/them as described in step 8 of the reassembly operations.
 - B.3. Reassemble the components as described in steps 9 - 10 - 11 - 12 of the reassembly instructions.
 - B.4. Proceed as described in steps 3 and 4 of the procedure for checking the intermediate pressure, reading out the value of the intermediate pressure on the gauge.

NOTE IF THERE ARE NO DISTANCE WASHERS IN THE FIRST STAGE, IT IS NECESSARY TO REPLACE THE SPRING.

6. Operate the second stage demand lever a few times, and check that the first stage adjustment remains constant.
7. After completing the second stage adjustments, remove the pressure gauge and screw on the corresponding port plug.

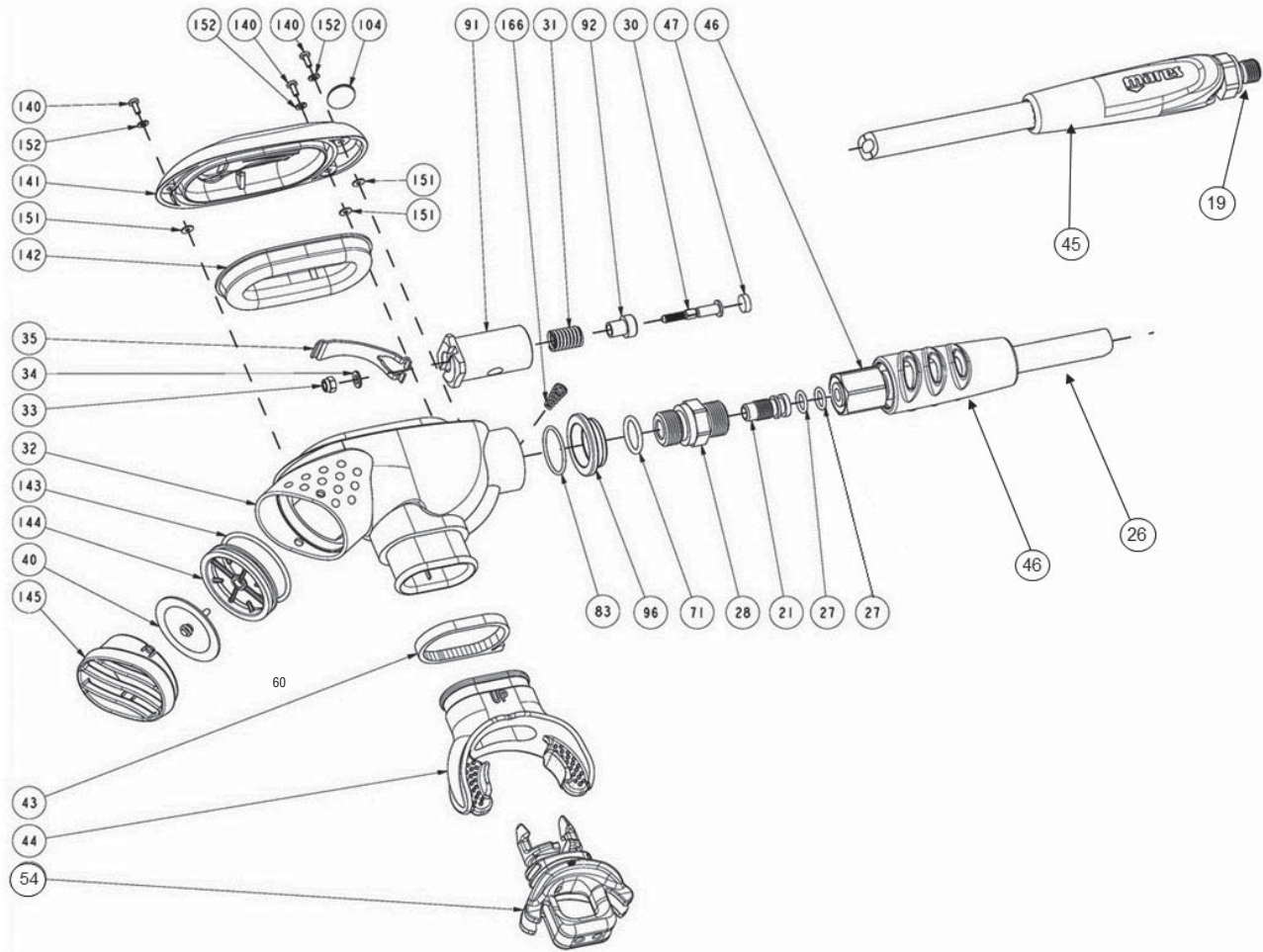
► FIRST STAGE TROUBLESHOOTING

PROBLEM	MODEL	PROBABLE CAUSE	SOLUTION
- 1 - AIR LEAK FROM FIRST STAGE DIAPHRAGM RETAINING NUT	RUBY - MR22 - MR16 - V16 - MR12 - V12 - MR12 II° - MR10 - TI PLANET - V32 - V42 - MR32 - MR42	1) Retaining nut loose	1) Lock down the nut
		2) First stage diaphragm damaged	1) Replace the diaphragm
		3) First stage diaphragm seating surface damaged	1) Replace the first stage body
- 2 - AIR LEAK FROM THE FIRST STAGE PORT PLUGS AND/OR HOSE PORTS	RUBY - MR22 - MR16 - V16 - MR12 - V12 - MR12 II° - MR10 - R2 - TI PLANET - V32 - V42 - MR32 - MR42	1) O-ring dirty or damaged	1) Clean the seat and replace the O-ring
		2) Hose and/or port plug loose	1) Lock down
- 3 - AIR LEAK BETWEEN THE FIRST STAGE BODY AND THE INT OR DIN CONNECTOR	Version INT-DIN of RUBY - MR22 - MR16 V16 - MR10 - TI PLANET - V32 V42 - MR32 - MR42 - MR52	1) O-ring seal dirty or damaged	1) Clean the seat and replace the O-ring
		2) INT yoke fitting or DIN connector body loose	2) Lock down
	DIN version of MR12 - V12 - R2 - R2S	3) DIN connector O-ring seal dirty or damaged	1) Clean the seat and replace the O-ring
		4) DIN connector body loose	1) Lock down
- 4 - AIR LEAK BETWEEN FIRST STAGE INLET AND TANK VALVE	RUBY - MR22 - MR16 - V16 - MR12 - V12 - MR12 II° - MR10 - R2 - TI PLANET - V32 - V42 - MR32 - MR42	1) O-ring seal of tank valve dirty or damaged	1) Clean the seat of the tank valve and replace the O-ring
		2) O-ring sealing surface on the first stage damaged	1) (INT version) Replace the first stage body
	MR12 - V12 - R2 - R2S		3) O-ring sealing surface on the first stage damaged
		1) (INT version) Replace the first stage body	
2) (DIN version) replace the connector coupling			
MR12 II°	4) O-ring sealing surface on the first stage damaged	2) Replace the first stage body	
- 5 - AIR LEAK FROM THE HP CHAMBER PLUG	RUBY - MR22 - MR16 - V16 - V32 - TI PLANET - V42 - MR32 - MR42 - MR52	1) O-ring defective	1) Replace
- 6 - AIR LEAK FROM HOLES IN THE FIRST STAGE CAP	R2 - R2S	1) Piston O-rings defective	1) Replace the O-rings
		2) Piston O-ring sealing surfaces dirty or damaged	1) Clean or replace
		3) Inner surface of cap dirty or damaged	1) Clean or replace the cap
		4) Inner surface of first stage dirty or damaged	1) Clean or replace the first stage body

► FIRST STAGE TROUBLESHOOTING

PROBLEM	MODEL	PROBABLE CAUSE	SOLUTION
- 7 - (C.W.D. VERSION) OIL LEAK FROM THE DIAPHRAGM	RUBY - MR22 - MR16 - V16 - MR12 - V12 - MR12 II° - MR10 - V32 - MR32 - TI PLANET	1) C.W.D. diaphragm damaged	1) Replace the A.E.R. diaphragm.
		2) C.W.D. diaphragm retaining ring loose	1) Lock down correctly
- 8 - CONTINUOUS AIR DELIVERY FROM SECOND STAGE CHARACTERIZED BY AN INCREASE IN THE INTERMEDIATE PRESSURE	RUBY - MR22 - MR16 - V16 - MR12 - V12 - MR12 II° - MR10 R2 - V32 - TI PLANET - V42 - MR32 - MR42 - MR52	1) Intermediate pressure too high	1) Clean the seat of the tank valve and replace the O-ring
	MR22 - MR16 - MR12 - MR12 II° - MR10 - MR32 - MR42 - MR52	2) First stage poppet damaged	1) Replace
	R2 - R2S	3) Piston friction lining damaged	1) Replace friction lining
	MR12 - R2 - R2S	4) Seat connector in first stage defective	1) Clean or replace first stage body
	RUBY - V16 - V32 - TI PLANET - V42	5) Seat connector defective	1) Clean or replace the seat
			2) Replace the O-ring
RUBY - MR22 - MR16 - V16 - MR12 - V12 - MR12 II° - V32 - TI PLANET - V42 - MR32 - MR42 - MR52	6) Defective HP chamber	1) Replace the O-rings	
		2) Replace the backup ring	
		3) Clean or replace the HP chamber	

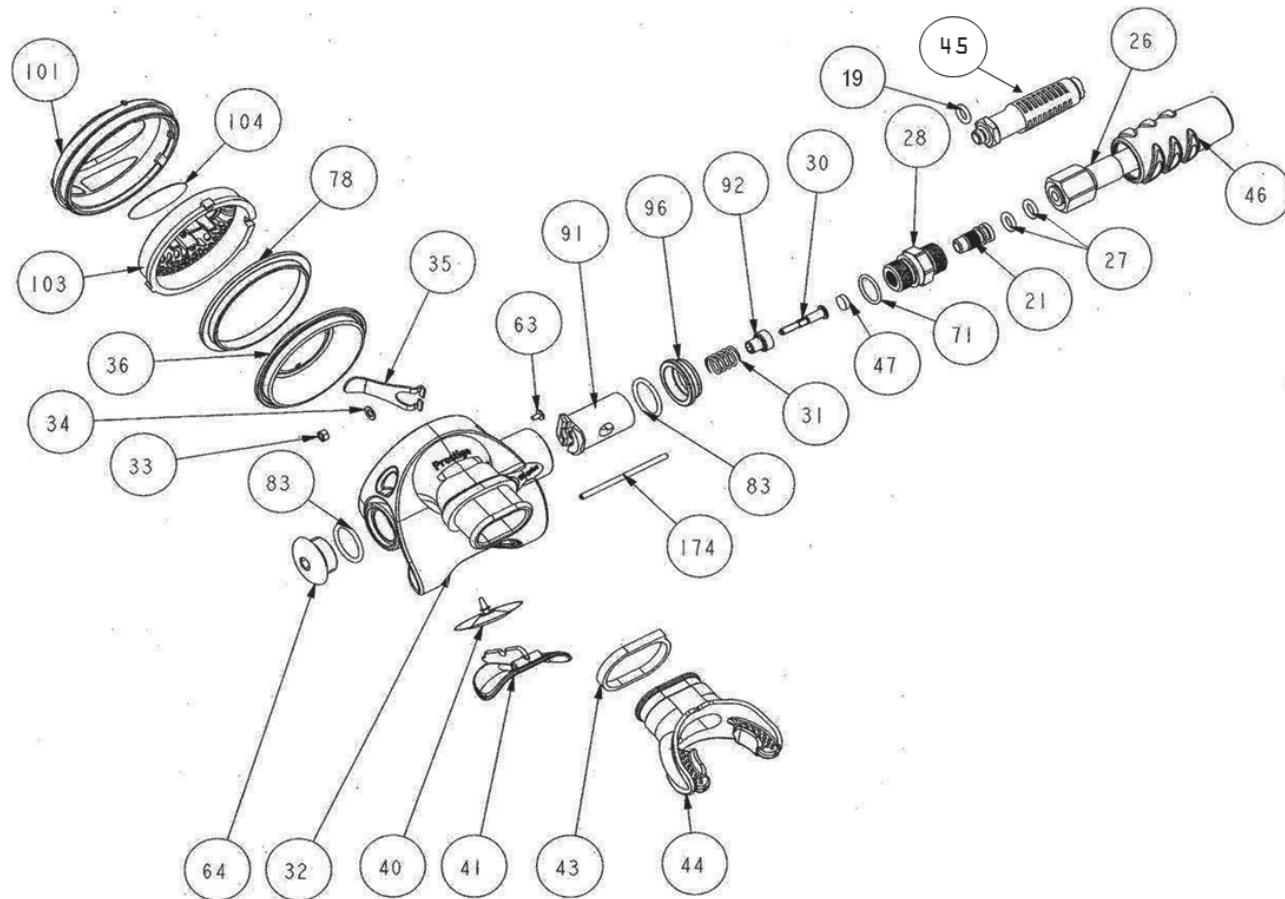
Table No.: 124 Drawing No.: E 34	Octopus MV	DRAWING UPDATED: 22/11/2012 TABLE UPDATED ON: 27/11/2012
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REF	CODE	DESCRIPTION
19	46110106	O RING 106
19	46110402	O RING 106 VITON
21	46200204	POPPET SEAT 2ND STAGE
26	46200790	SOFT HOSE YELLOW 3/8" L1000
27	46110205	O RING 2025
27	46110411	OR 2025 VITON
28	46184282	HOSE CONNECTOR
30	46184219	POPPET METAL BODY REGS
31	46185059	SPRING REGULATOR 2ND STAGE
32	°°°	2° STAGE CASE OCTOPUS MV
33	46185051	LOCKNUT DEMAND LEVER
34	46185049	WASHER DEMAND LEVER
35	46187027	DEMAND LEVER
40	46201219	EXHAUST VALVE
43	47157984	MOUTHPIECE CLAMP
44	46200855	MOUTHPIECE BK (10 PICS)
45	46201077	HOSE PROTECTOR
46	46200768	HOSE PROTECTOR 2ND STG
47	46184062	RUBBER SEAT
54	46186090	OCTOPUS PLUG
71	46110211	O RING 2050
71	46110413	O RING 2050 VITON

REF	CODE	DESCRIPTION
83	46110225	O RING 2068
83	46110420	OR 2068 VITON
91	46187033	POPPET HOUSING
92	46184221	VALVE BODY 2ND STAGE
96	46187038	LOCK RING
104	46200687	MARES OVAL LABEL - 17,5 MM
140	46187004	SCREW M 2X5 DIN 7985-A4
141	46187028	COVER MV YELLOW
142	46187009	OVAL DIAPHRAGM
143	46110175	O RING 2125
143	46110430	OR 2125 VITON
144	46187025	EXHAUST VALVE SEAT
145	46201220	EXHAUST VALVE GRID BK
151	46187008	WHITE WASHER 1,8X5X0,5
152	46187005	FLAT WASHER UNI 6592 D 4,5
166	46200179	CONICAL SPRING, REG.
ASSEMBLED		
°°°	46200780	2° STAGE CASE MV (32-166)
***	46187222	SERVICE KIT 2ND STAGE MV (19-27-33-40-43-47-71-83-143)
***	46187223	SERVICE KIT VITON O-RING MV
	46200510	KIT RETROFIT (21-27-47)

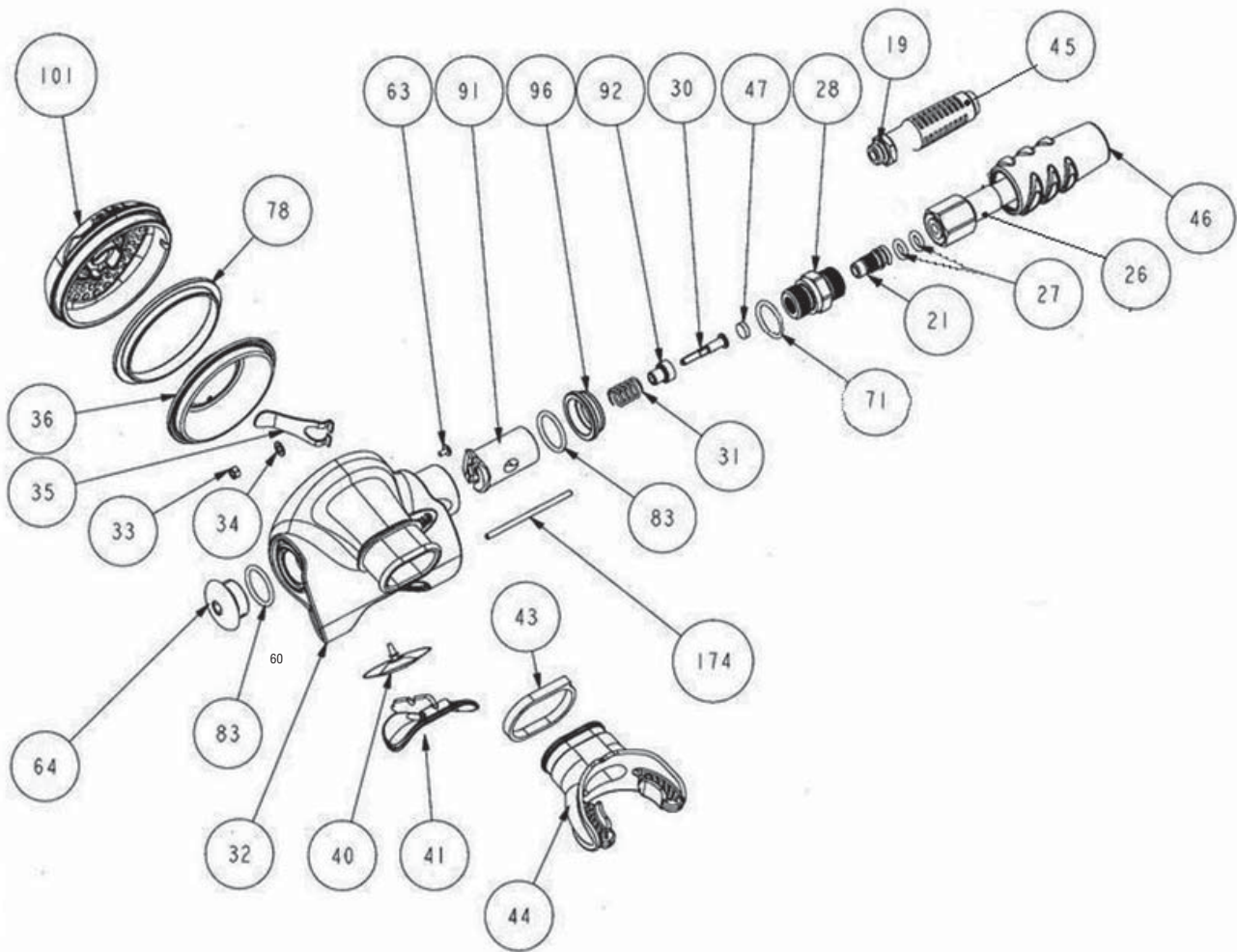
Table No.: 126 Drawing No.: E36	2nd Stage - Octopus PRESTIGE/PRESTIGE SHE DIVES	DRAWING UPDATED: 18/01/2012 TABLE UPDATED ON: 20/12/2012
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REF	CODE	DESCRIPTION
19	46110106	OR 106
19	46110402	OR 106 VITON 610-97507
21	46200204	POPPET SEAT
26	46200998	LP HOSE PRESTIGE 3/8 L 800 SFX
26	46200790	LP HOSE PRESTIGE 3/8 L1000 YL
27	46110205	OR 2025
27	46110411	OR 2025 VITON
28	46184282	HOSE CONNECTOR
30	46184219	POPPET METAL BODY REGS
31	46185057	POPPET SPRING 2ND STAGE
32	46200770	CASE 2ND STG PRESTIGE
32	46201045	CASE 2ND STG SHE DIVES
33	46185051	LOCKNUT, DEMAND LEVER
34	46185049	WASHER, DEMAND LEVER
35	46201240	DEMAND LEVER PRESTIGE
36	46200771	DIAPHRAGM PRESTIGE
40	46184006	EXHAUST VALVE, 2ND STAGE
41	46200769	INSPECTION PLUG
43	47157984	CLAMP
44	46200855	MOUTHPIECE BK (10 PICS)
45	46201077	HOSE PROTECTOR 2K9
46	46200768	HOSE PROTECTOR 2ND STG
47	46184062	RUBBER SEAT 2ND STAGE

REF	CODE	DESCRIPTION
63	46184289	PIN-COVER
64	46200772	2ND ST. ADJUSTMENT PLUG
71	46110211	OR 2050
71	46110413	OR 2050 VITON
78	46200773	DIAPHRAGM RING PRESTIGE
83	46110225	OR 2068
83	46110420	OR 2068 VITON
91	46200992	INSERT FOR DEMAND LEVER
92	46184221	VALVE BODY, 2ND STAGE
96	46200779	SPACER RING BY-PASS BK
96	46200782	SPACER RING BY-PASS YL
101	46200775	COVER 2ND STG PRESTIGE
101	46200781	OCTOPUS COVER PRESTIGE
101	46201057	COVER SHE DIVES
103	46200776	BUTTON 2ND STAGE
104	46200794	STICKER
174	46200361	EXHAUST PLUG PIN
ASSEMBLED		
***	46200296	MAINTENANCE KIT REBEL/PRESTIGE (19- 27- 33 - 40- 43- 47 - 63 - 71-72 - 83)
***	46200297	MAINTENANCE KIT PRESTIGE(VITON O-RINGS) (19 -27- 33 -40 - 43 - 47 -63-71- 72- 83)
	46200510	KIT RETROFIT (21-27-47)

Table No.: 128 Drawing No.: E 38	2nd Stage - Octopus ROVER	DRAWING UPDATED: 12/12/2008 TABLE UPDATED ON: 20/12/2012
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REF	CODE	DESCRIPTION
19	46110106	OR 106
19	46110402	OR 106 VITON 610-97507
21	46200204	POPPET SEAT
26	46200789	LP HOSE PRESTIGE 3/8 L 800
26	46200790	LP HOSE PRESTIGE 3/8 L1000 YL
27	46110205	OR 2025
27	46110411	OR 2025 VITON
28	46184282	HOSE CONNECTOR
30	46184219	POPPET METAL BODY REGS
31	46185057	POPPET SPRING 2ND STAGE
32	46200858	CASE 2ND STG ROVER
33	46185051	LOCKNUT, DEMAND LEVER
34	46185049	WASHER, DEMAND LEVER
35	46201240	DEMAND LEVER PRESTIGE
36	46200771	DIAPHRAGM PRESTIGE
40	46184006	EXHAUST VALVE, 2ND STAGE
41	46200769	INSPECTION PLUG
43	47157984	CLAMP
44	46200855	MOUTHPIECE BK (10 PICS)
45	46201077	HOSE PROTECTOR
46	46200768	HOSE PROTECTOR 2ND STG

REF	CODE	DESCRIPTION
47	46184062	RUBBER SEAT 2ND STAGE
63	46184289	PIN-COVER
64	46200772	2ND ST. ADJUSTMENT PLUG
71	46110211	OR 2050
71	46110413	OR 2050 VITON
78	46200773	DIAPHRAGM RING PRESTIGE
83	46110225	OR 2068
83	46110420	OR 2068 VITON
91	46200992	INSERT FOR DEMAND LEVER
92	46184221	VALVE BODY, 2ND STAGE
96	46200779	SPACER RING BY-PASS BK
96	46200782	SPACER RING BY-PASS YL
101	46200871	COVER 2°ND STAGE ROVER BLACK
101	46200872	COVER OCTOPUS ROVER
101	46200968	COVER NITROX ROVER
174	46200361	EXHAUST PLUG PIN
ASSEMBLED		
***	46200296	MAINTENANCE KIT REBEL/PRESTIGE (19- 27- 33 - 40- 43- 47 - 63 - 71-72 - 83)
***	46200297	MAINTENANCE KIT PRESTIGE(VITON O-RINGS)
	46200510	KIT RETROFIT (21-27-47)

Drawing No: E 37	2nd Stage - Octopus PRESTIGE DPD	DRAWING UPDATED: 20/01/2012
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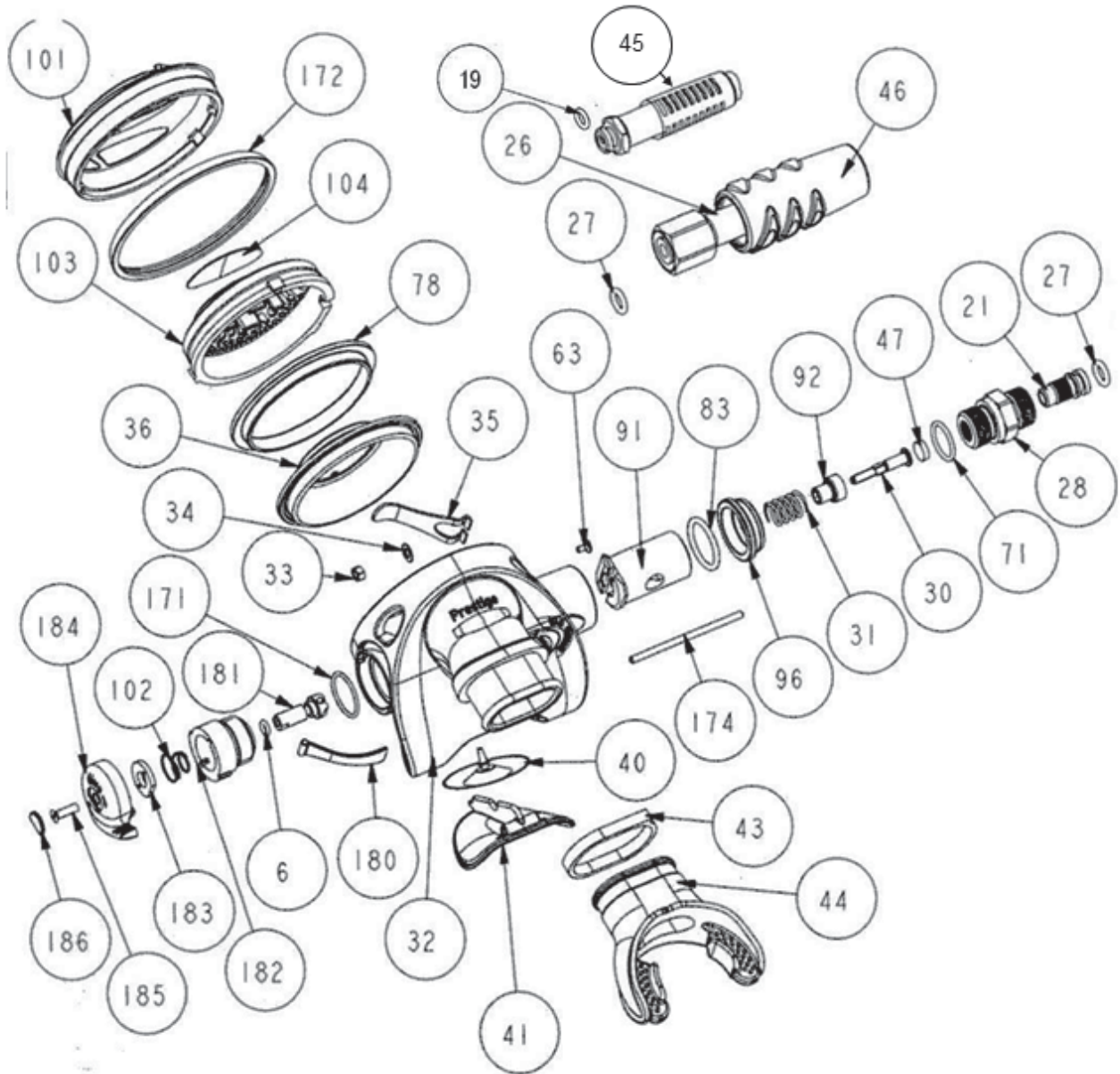
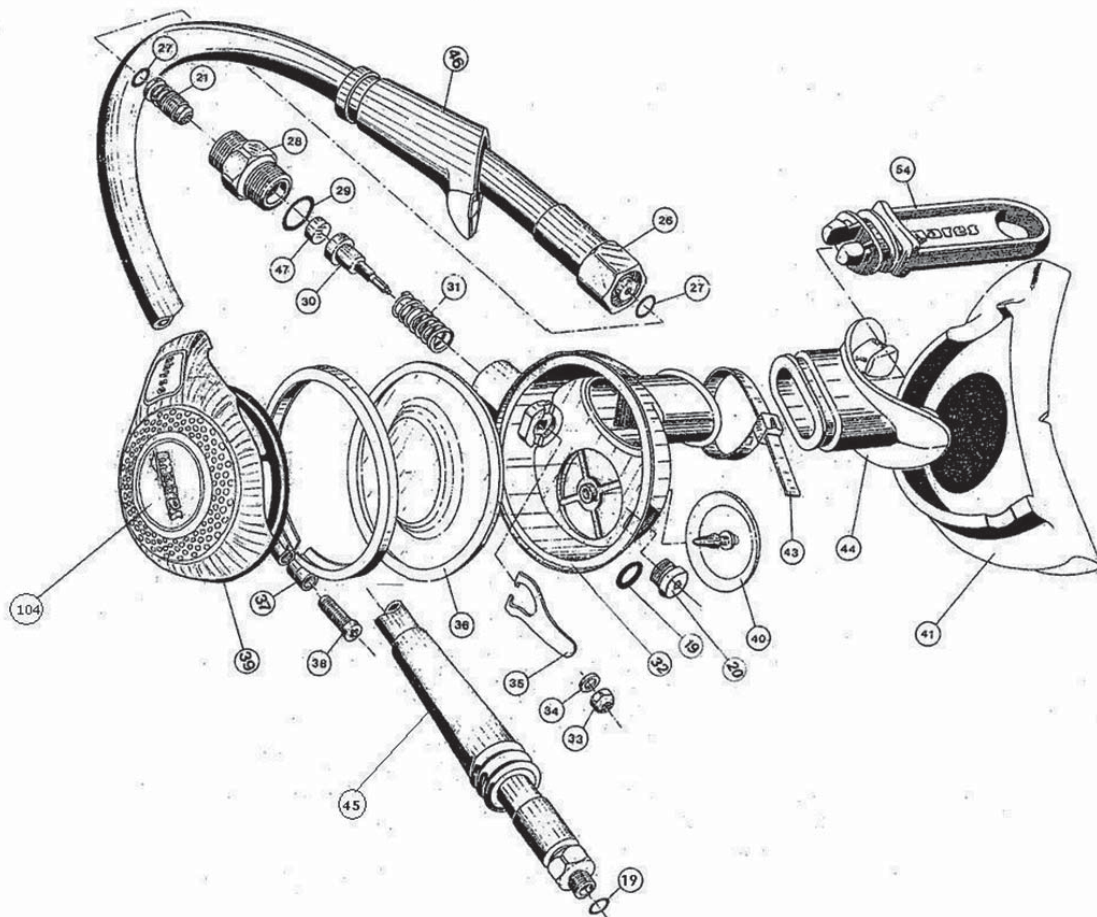


Table No: 127	2nd Stage - Octopus PRESTIGE DPD	TABLE UPDATED ON: 20/12/2012
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REF	CODE	DESCRIPTION
6	46110101	OR 2012
6	46110401	OR 2012 VITON 006-9707
19	46110215	OR-2043
19	46110415	OR-2043 VITON
21	46200204	POPPET SEAT
26	46200883	LP HOSE SFX 1/2" DPD
26	46200886	LP HOSE SFX 3/8" OCTOPUS DPD
27	46110205	OR 2025
27	46110411	OR 2025 VITON
28	46184282	HOSE CONNECTOR
30	46184219	POPPET METAL BODY REGS
31	46185057	POPPET SPRING 2ND STAGE
32	46201048	CASE 2ND STG DPD
33	46185051	LOCKNUT, DEMAND LEVER
34	46185049	WASHER, DEMAND LEVER
35	46201240	DEMAND LEVER PRESTIGE
36	46200771	DIAPHRAGM PRESTIGE
40	46184006	EXHAUST VALVE, 2ND STAGE
41	46200769	INSPECTION PLUG
43	47157984	CLAMP
44	46200855	MOUTHPIECE BK (10 PICS)
45	46201077	HOSE PROTECTOR 2K9
46	46200768	HOSE PROTECTOR 2ND STG
47	46184062	RUBBER SEAT 2ND STAGE
63	46184289	PIN-COVER
71	46110211	OR 2050
71	46110413	OR 2050 VITON 014-9707
78	46200773	DIAPHRAGM RING PRESTIGE
83	46110225	OR 2068

REF	CODE	DESCRIPTION
83	46110420	OR 2068 VITON
91	46200992	INSERT FOR DEMAND LEVER
92	46184221	VALVE BODY, 2ND STAGE
96	46200818	SPACER RING BY-PASS
101	---	COVER
102	47159075	SPRING DPD
103	46200776	BUTTON 2ND STG PRESTIGE
104	46200825	LABEL DPD
171	46110220	OR 2062
171	46110417	OR 2062 VITON
172	---	RING ANODIZED ALUMINIUM
174	46200361	EXHAUST PLUG PIN
180	46200814	LEVER DPD
181	46200391	ADJ STEM DPD
182	46200813	BODY DPD
183	46200390	ADJ LOCK
184	46200812	KNOB DPD
185	46200395	INOX SCREW M 2X10
186	46200802	STICKER D.9 DPD
ASSEMBLED		
---	46200835	COVER ASSEMBLY DPD(101-172)
---	46200952	COVER ASSEMBLY OCTOPUS DPD (101-172)
* * *	46200822	MAINTENANCE KIT PRESTIGE DPD (6-19-27-33-40-43-47-63-71-83-171-186)
* * *	46200823	MAINTENANCE KIT DPD (VITON O-RING)
	46200510	KIT RETROFIT (21-27-47)
ACCESSORIES		
	46201046	ADJ. PLUG FOR DPD CASE

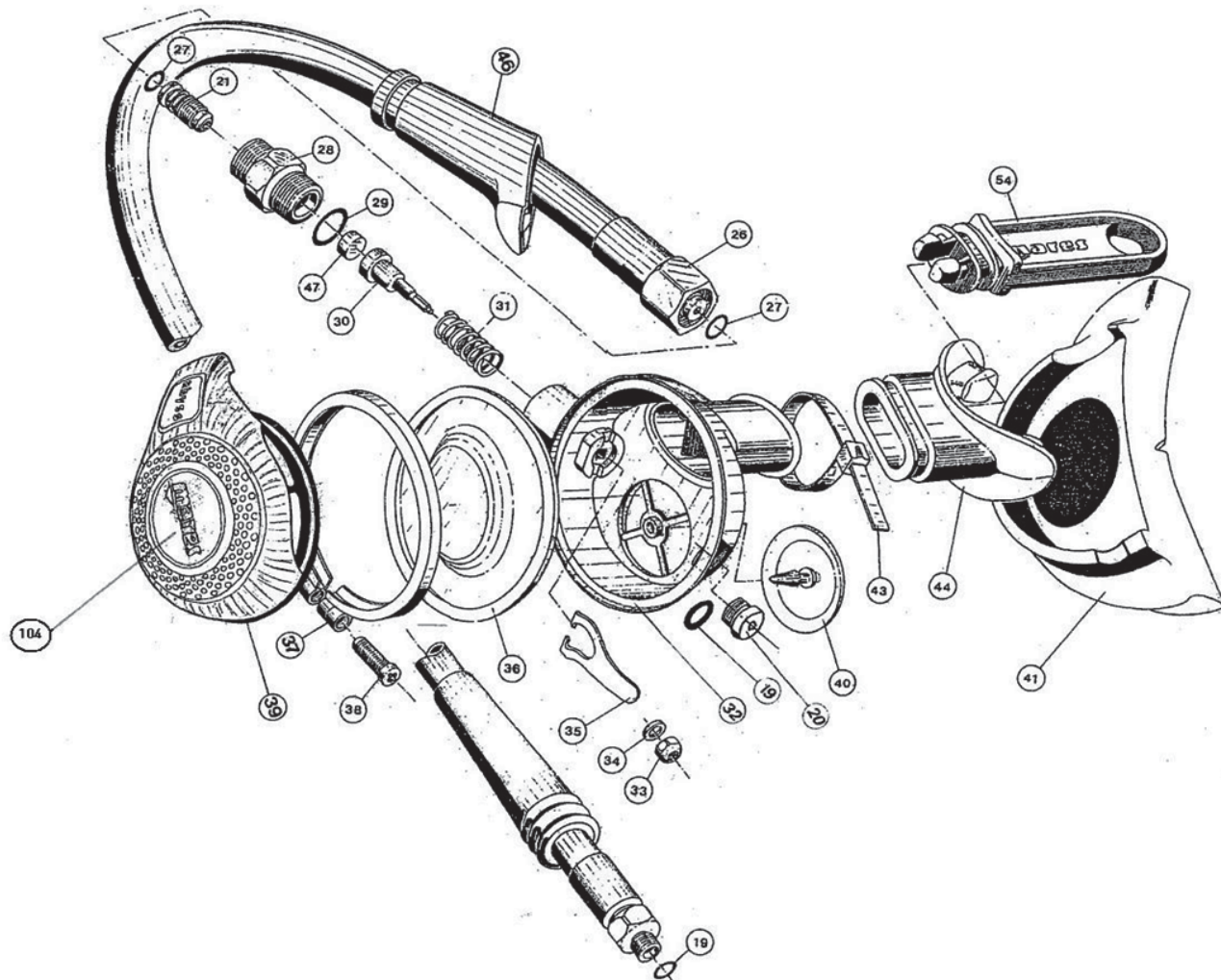
Table No.: 129 Drawing No.: E 39	2nd Stage - Octopus ABYSS/ABYSS NX	DRAWING UPDATED: 22/01/2013 TABLE UPDATED ON: 20/11/2012
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REF	CODE	DESCRIPTION
19	46110106	OR 106 (FOR HOSE 3/8")
19	46110402	OR 106 VITON
19	46110215	OR 2043 (FOR HOSE 1/2")
19	46110415	OR 2043 VITON
20	46185204	LP PLUG 3/8"
21	46200204	POPPET SEAT
26	46200882	LP HOSE SFX 1/2" (MR 22)
26	46201175	LP HOSE SFX 1/2" 100CM
26	46200881	LP HOSE SFX 3/8" (MR 52)
26	46186180	LP HOSE SFX 3/8" 100 CM
26	46200885	LP HOSE SFX 3/8" OCTOPUS
27	46110205	OR 2025
27	46110411	OR 2025 VITON 010-9754
28	46184282	HOSE CONNECTOR
29	46110211	OR 2050
29	46110413	OR 2050 VITON
30	46186024	POPPET BODY, 2ND STAGE
31	46185057	POPPET SPRING 2ND STAGE
32	46201190	2ND STAGE HOUSING
33	46185051	LOCKNUT, DEMAND LEVER
34	46185049	WASHER, DEMAND LEVER
35	46201240	DEMAND LEVER
36	46186029	DIAPHRAGM, 2ND STAGE REG.

REF	CODE	DESCRIPTION
37	46185073	RING CLAMP, 2ND STAGE
38	46185075	CLAMP SCREW, II STAGE
40	46184006	EXHAUST VALVE, 2ND STAGE
41	46186310	EXHAUST TEE
43	47157984	CLAMP
44	46200855	MOUTHPIECE BK (10 PICS)
45	46201077	HOSE PROTECTOR I ST. 3/8 2K9
45	46201078	HOSE PROTECTOR I ST. 1/2 2K9
46	46200846	HOSE PROTECTOR 2ND STG
47	46184062	RUBBER SEAT 2ND STAGE
54	46186090	OCTOPUS PLUG
104A	46200803	STICKER D. 28 ABYSS
104B	46200805	STICKER D. 28 NITROX ABYSS
104C	46200804	STICKER D. 28 OCTOPUS ABYSS
ASSEMBLIES		
39	46200849	COVER ASSY ABYSS 08
39	46200851	COVER ASSY ABYSS NX 08
39	46200850	COVER ASSY ABYSS OCTOPUS 08
* * *	46186160	SERVICE KIT 2ND STAGE ABYSS (19-27-29-33-40-43-47)
* * *	46185166	SERVICE KIT 2ND STAGE ABYSS VITON
	46200510	KIT RETROFIT (21-27-47)

Table No.: 131 Drawing No.: E 41	2nd STAGE NAVY / EXTREME	DRAWING UPDATED: 22/12/2008 TABLE UPDATED ON: 20/11/2012
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REF	CODE	DESCRIPTION
19	46110106	OR 106 (FOR HOSE 3/8")
19	46110402	OR 106 VITON 610-97507
19	46110215	OR 2043 (FOR HOSE 1/2")
19	46110415	OR 2043 VITON 013-9754
20	46200898	LP PLUG* TFL
21	46200204	POPPET SEAT
26	46201109	LP HOSE 1/2" NAVY
26	46200885	LP HOSE SFX 3/8" OCTOPUS
27	46110205	OR 2025
27	46110411	OR 2025 VITON 010-9754
28	46200627	HOSE CONNECTOR TFL
29	46110211	OR 2050
29	46110413	OR 2050 VITON
30	46200894	STEM POPPET ABYSS TFL
31	46200893	POPPET SPRING 2ND STAGE
32	46201191	2STG CASE ABYSS EXTREME TFL
33	46200623	LOCKNUT, DEMAND LEVER
34	46200622	WASHER, DEMAND LEVER
35	46201240	DEMAND LEVER

REF	CODE	DESCRIPTION
36	46186029	DIAPHRAGM
37	46200896	RING CLAMP, 2ND STAGE
38	46200897	CLAMP SCREW, II STAGE
40	46184006	EXHAUST VALVE, 2ND STAGE
41	46186310	EXHAUST TEE
43	47157984	CLAMP
44	46200855	MOUTHPIECE BK (10 PICS)
45	46201078	HOSE PROTECTOR I ST. 1/2 2K9
46	46200846	HOSE PROTECTOR 2ND STG
47	46184062	RUBBER SEAT 2ND STAGE
104A	46200803	STICKER ABYSS
104B	46200804	STICKER ABYSS OCTOPUS
ASSEMBLED		
39	46201018	COVER ASSEMBL. ABYSS EXTREME
***	46200912	SERVICE KIT. 2ND STAGE ABYSS EXTREME (19-27-29-33-40-43-47)
***	46185166	SERVICE KIT. 2ND STAGE. ABYSS (VITON)
	46200510	KIT RETROFIT (21-27-47)

Table No: 130	2nd Stage -Octopus CARBON	TABLE UPDATED ON: 20/12/2012
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REF	CODE	DESCRIPTION
19	46110106	OR 106
19	46110402	OR 106 VITON
21	46200204	POPPET SEAT 2ND STAGE
26	46200880	LP HOSE SFX 3/8"
26	46200884	LP HOSE SFX 3/8" OCTOPUS
27	46110205	OR 2025
27	46110411	OR 2025 VITON
28	46184282	HOSE CONNECTOR
30	46184219	POPPET METAL BODY
31	46185057	POPPET SPRING
32	B	2ND STAGE HOUSING
33	46185051	LOCKNUT, DEMAND LEVER
34	46185049	WASHER
35	46201240	DEMAND LEVER
36	46186029	DIAPHRAGM, 2ND STAGE REG.
37	46201063	RING CLAMP, 2ND STAGE
38	46185075	CLAMP SCREW, II STAGE
40	46184006	EXHAUST VALVE, 2ND STAGE
41	46200521	EXHAUST TEE
43	47157984	CLAMP
44	46200855	MOUTHPIECE BK (10 PICS)
45	46201077	HOSE PROTECTOR 2K9
46	46200768	HOSE PROTECTOR 2ND STG
47	46184062	RUBBER SEAT 2ND STAGE
64	46200772	2ND ST. ADJUSTMENT PLUG

REF	CODE	DESCRIPTION
71	46110211	OR 2050
71	46110413	OR 2050 VITON
72	46110215	OR 2043
72	46110415	OR 2043 VITON
83	46110225	OR 2068
83	46110420	OR 2068 VITON
87	46201125	PLUG SEAT
91	46200992	INSERT DEMAND LEVER CARBON
92	46184221	VALVE BODY, 2ND STAGE
96	46200779	SPACER RING BY-PASS BK
100	46201163	CARBON STICKER
104A	46200988	BUTTON 2ND STG CARBON
104B	46200989	BUTTON OCT. CARBON
ASSEMBLED		
C	46201003	COVER 2ND ST CARBON ASSEMBLY (C+104)
C	46201004	COVER CARBON OCTOPUS (C+104)
+++	46200296	MAINTENANCE KIT CARBON/PRESTIGE/REBEL (19- 27- 33 - 40- 43- 47 -71 -83)
+++	46200297	MAINTENANCE KIT CARBON (VITON O-RING)
B	46201185	2ND STAGE CASE (40-32-64-72-83-87-100)
NOTE		
*** :STARTING FROM SERIAL NO. CA 15169 & CO 12338 , MARES WILL BE ASSEMBLING ALL 2ND STG CARBON/OCTOPUS WITH A DIFFERENT HOUSING (32) #46201185 & ADJ PLUG (64) AS SHOWN IN THIS TABLE.		

OGGETTO:
EXHAUST GASKET AIRCONTROL (#46201212)

BTM22

THE TECHNICAL SERVICE HQ INFORM ALL MARES LAB PARTNERS OF A CHANGE MADE TO THE UNIT 'AIRCONTROL (416893), DESIGNED TO INCREASE THE EFFICIENCY DURING ORAL INFLATION. AS SHOWN IN THE PICTURE, MARES ASSEMBLE INSIDE A GASKET (223) INTERPOSED BETWEEN THE SPACER RING (222) AND THE EXHAUST VALVE SEAT (220).



BELOW ARE PROCEDURES FOR UPDATING THE AIRCONTROL

NECESSARY TOOLS	PARTS
<ul style="list-style-type: none">- SPECIAL TOOL A-1 #46201039- PLASTIC TOOL S-1 , #41106000	EXHAUST GASKET AIRCONTROL # 46201212

DISASSEMBLE

1. USING THE SPECIAL A-1 WRENCH, UNSCREW THE EXHAUST VALVE CAP (211).
2. USING TOOL S-1, CAREFULLY REMOVE THE EXHAUST VALVE SEAT ASSEMBLED (220+221+193) FROM THE OUTSIDE BY GENTLY PULLING IT UP AND OUT. DON'T REMOVE THE SPACER RING (222).

REASSEMBLE

3. SET UP OVER THE SPACER RING (222) THE GASKET (223).
4. REASSEMBLE EXHAUST VALVE SEAT ASSEMBLED (220+221+193). SCREW THE EXHAUST VALVE CAP (211) ONTO THE AIR CONTROL BODY , TIGHTENING GENTLY WITH THE A-1 TOOL.



WARNING!

MAINTENANCE PROCEDURE MUST BE PERFORMED ONLY BY QUALIFIED PERSONNEL AT A TECHNICAL ASSISTANCE CENTER AND/OR BY AUTHORIZED MARES DISTRIBUTOR.
IF THE INSTRUCTIONS ARE UNCLEAR OR NOT ENTIRELY UNDERSTANDABLE, PLEASE CONTACT MARES TECHNICAL ASSISTANCE BEFORE PERFORMING ANY MAINTENANCE OR CHECK.

Table No: 132	AIR-CONTROL	TABLE UPDATED ON: 25/01/2012
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REF	CODE	DESCRIPTION
1	46185011	SPRING DEFLATE BUTTONAIR 2K9
2	46201113	SPRING INFLATE BUTTONAIR 2K9
3	46201040	SNAP RING
6	46110101	OR 2012
19	46110106	OR 106
27	46110205	OR 2025
33	46185051	LOCKNUT, DEMAND LEVER
34	46185049	WASHER
36	46200311	DIAPHRAGM, 2ND STAGE REG.
42	45179863	CLAMP 3,6X200
43	47157984	MOUTHPIECE CLAMP
44	46200855	MOUTHPIECE BK (10 PICS)
45	46186090	OCTOPUS PLUG
46	46179902	HOSE PROTECTOR
47	46185060	RUBBER SEAT III
47	46184062	RUBBER SEAT 2ND STAGE ***
53	46110204	OR 2021
54	46110221	OR 2081
55	46200998	HOSE SFX 3/8"
63	46184289	PIN-COVER
71	46110211	OR 2050
72	46110215	OR 2043
74	46110107	OR 2031
78	46200321	DIAPHRAGM PLASTIC RING
165	43163807	SPRING INFLATING VALVE
166	43163808	STEEL BALL 3/16"
168	D	PIN ERGO 2K5
171	46110110	OR 2037
187	A1	INFLATOR ADAPTOR 20MM
188	A2	INFLATOR ADAPTOR 25MM
189	46201036	INFLATOR ADAPTOR 21MM
190	A1	METAL PIN 3X20
191	A2	METAL PIN 3X25
192	C	QUICK CONNECTOR BODY
193	46110175	OR 2125
194	46201033	EXHAUST DIAPHRAGM LP INFLATOR

REF	CODE	DESCRIPTION
195	C	STEEL BALL D3,2
196	46201009	CONICAL SPRING
197	46201008	QUICK CONNECTOR SPRING
198	46201007	RETAINING RING
199	46201031	METAL WASHER
201	46201044	DEMAND LEVER AIRCONTROL
202	C	QUICK CONNECTOR SLIDER
203	46201019	PURGE BUTTON SILVER
204	46201029	COVER AIR CONTROL
205	46201028	POPPET HOUSING
206	46201027	POPPET METAL BODY REGS
207	46185059	SPRING REGULATOR
208	46201026	PLASTIC SEGEER
209	46201012	POPPET SEAT
210	46201015	MALE CONNECTOR
211	46201025	EXHAUST VALVE CAP
214	46201024	O-RING SEAT
215	46201023	INFLATING PLUG
216	D	INFLATING BUTTON RED
217	46201016	QUICK CONNECTOR SHUTTER
218	46201021	CORPO AIRCONTROL
220	46187025	EXHAUST VALVE SEAT
221	46184006	EXHAUST VALVE
222	46201020	SPACER RING
223	46201212	EXHAUST VALVE GASKET
ASSEMBLED		
A	46201065	SERVICE KIT OCTOPUS (19-33-43-47-63-171-193-198-221)
B	46201064	SERVICE KIT INFLATOR (3-6-19-27-33-42-53-54-71-72-74-216)
C	46201066	QUICK CONNECTOR ASSEMBLED FEMALE (3-27-74-192-195-196-197-202-217)
D	46201067	INFLATING BUTTON RED ASSEMBLED (72-168-216)
A1	46201068	ADAPTOR D20 AIR CONTROL (42-54-187-190-208)
A2	46201069	ADAPTOR D25 AIR CONTROL (42-54-188-191-208)
NOTE		
*** :STARTING FROM SERIAL NO. EC11923, MARES ASSEMBLE IN ALL AIR-CONTROL UNITS THE RUBBER SEAT # 46184062		

**INSTINCT
2ND STAGE**

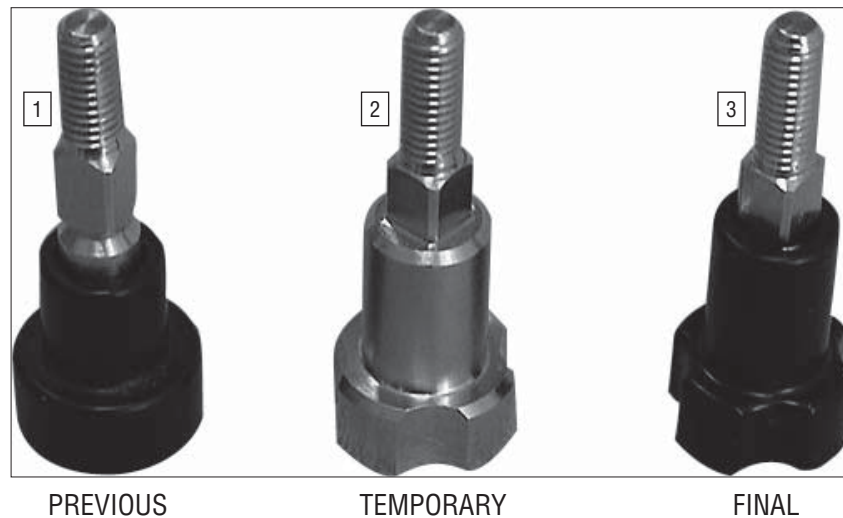
mares[®]

RE:
INSTINCT 2ND STAGE POPPET

BTM23

TECHNICAL ASSISTANCE DEPT. OF MARES S.p.A. INFORMS ALL MARES LAB PARTNERS ABOUT AN IMPROVEMENT MADE TO THE INSTINCT SECOND STAGE: A NEW POPPET 2nd STAGE (#46201234 VERS.2) INITIALLY MADE COMPLETELY OF METAL BUT THE FINAL PART WILL BE MADE IN DUAL COMPONENTS (VERS. 3) AS THE PICTURE SHOWN. THE FEATURE OF NEW POPPET ARE 4 GROOVES ON THE HEAD THAT ALLOW FOR A MORE FLOW OF AIR, AND THEREFORE MORE COMFORTABLE BREATHING AT ALL DEPTHS AND DIVING CONDITIONS. IN VARIOUS CASES, THE NEW 2ND STAGE POPPET ALSO SOLVES POSSIBLE CASES OF VIBRATION THAT CAN OCCUR IN CERTAIN INSTINCT SECOND STAGES WITH A PREVIOUS VALVE (VERS. 1).

- PHOTO 1 -



*INITIALLY THE NEW SECOND STAGE POPPET (VERS. 2) WILL BE ASSEMBLED ON THE FOLLOWING MODELS, BEGINNING WITH THE SERIAL NUMBERS (S/N) LISTED BELOW:

CODICE	DESCRIZIONE	S/N
416164	INSTINCT 12S INT	IS 13367
416134	INSTICT 52 SHE DIVES INT (JP)	JS 10289

*FOR FURTHER INFORMATION ABOUT VERSION 3, PLEASE CONTACT TECHNICAL ASSISTANCE ANYTIME.



ATTENZIONE!

PER LE PROCEDURE DI SMONTAGGIO, RIMONTAGGIO, REGOLAZIONE E CONTROLLO DELLA SCATOLA SECONDO STADIO, E' NECESSARIO CONSULTARE LA PROCEDURA DI MANUTENZIONE DEL SUDDETTO. IN MANCANZA DEL MANUALE SI' PREGA DI CONTATTARE LA MARES PRIMA D'EFFETTUARE QUALSIASI INTERVENTO DI MANUTENZIONE, REGOLAZIONE E CONTROLLO.

MAINTENANCE PROCEDURE

► TOOLS NEEDED



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.



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.

- Phillips head screwdriver
- Compressed air supply circuit or tank (180-200 bar)
- Cutting nippers
- 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
- Carbon/Prestige/Rebel 2nd stage maintenance kit (code 46200296 – 46200297 VITON O-RING)



(B-6)
46106206



(B-17) 17mm (2)
46106217



(B-18) 14mm
#46106218



Pliers
(type Usag 133)



(B-12) 5.5mm
#46106212



(B-4) 5mm
#46106204



(S-1)
#41106000



Hex wrench 4mm

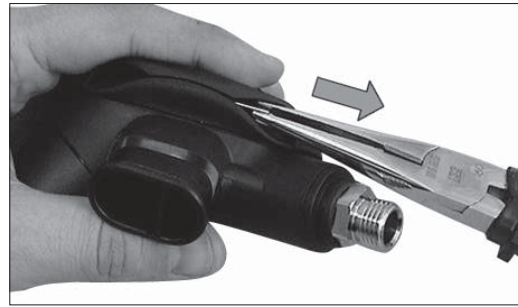
DISASSEMBLY

We recommend having the schematic to hand, to make the procedure easier.

1. Remove the dust cap and move the hose cover from the 1st stage. Photo 1.
2. Unscrew the hose (26) using a 14-mm open end wrench (B18).
3. Move the 2nd stage side hose protector (46).
4. Remove the mouthpiece (44) using with care cutting nippers.



5. Remove the Pin Cover (38) using tool B-22.
6. Take the Pin off with a pliers.



NOTE MAKE SURE TO REMOVE THE TOP PIN COVER (174) FROM THE HOSE CONNECTOR SIDE (28).

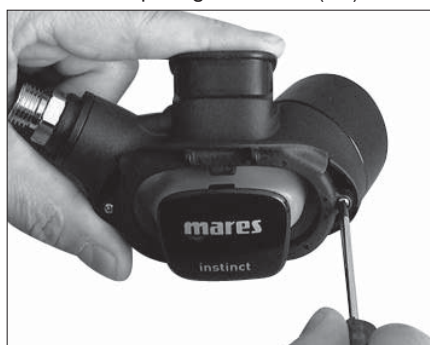
7. Push down the button (104) and slightly raise the cover (39).



8. Using tool S-1, release definitively the cover (39) over the 2nd stage case (32).



9. Unscrew both screws (140) and remove the diaphragm Holder (78) and the diaphragm (142) too.



10. Remove the bottom Pin button (174) using tool B-22. Take the Pin off with a pliers.

Make sure to remove the bottom Pin Button (174) as pictured.

11. Unscrew the hose connector (28) using a 17-mm open end wrench (B-17), and then pull out the by-pass retainer ring (96).

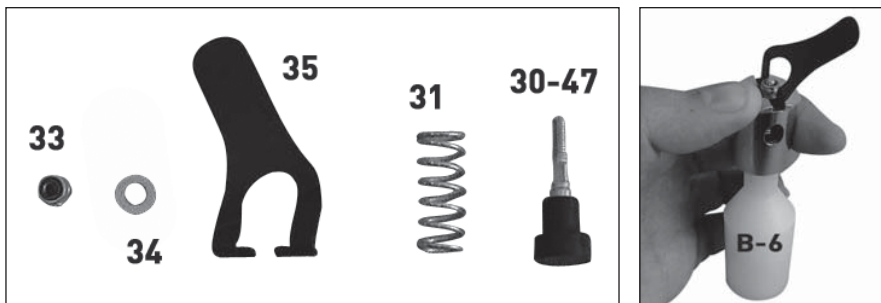


12. Gently press out the demand lever connector assembly into the case and remove the O-Ring (83) from its seat in the second stage case (32).

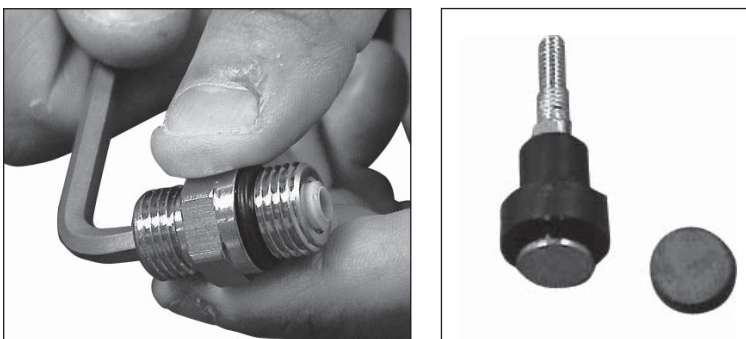
NOTE IT IS NOT ADVISABLE TO PULL IT OUT BY DEMAND LEVER (35).



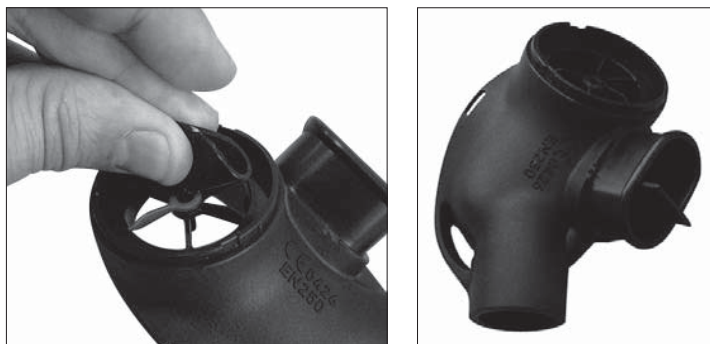
- 13.** Position the demand lever connector assembly on the special tool (B-6) and use the screwdriver (B-12) to unscrew the retaining nut (33) from the demand lever (35). Then remove the washer (34), the poppet assembly (30+47+92), and the spring (31).



- 14.** Remove the poppet seat (47), pressing slightly on the poppet seat holder (92) in the direction of the threaded stem. Remove the poppet seat holder (92) from the stem of the 2nd stage valve shaft (30).
- 15.** Unscrew the seat connector (21) from the case assembly connector (28) using a 5-mm hex wrench (B-4).



- 16.** Remove the O-Ring (71) from the hose connector (28) and the O-Ring (27) from the seat connector (21).
- 17.** Remove the exhaust tee (41) from the second stage case (32) and the exhaust valve (40) as well.
- 18.** Remove the deflector (50).



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.



WARNING!

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 thoroughly rinse all parts in fresh water and dry with a jet of low pressure air at 8-10 bar before proceeding with reassembly.

INSTINCT - ROUTINE MAINTENANCE



WARNING!

CERTAIN KEY COMPONENTS OF THE 2ND STAGE SHOULD BE REGULARLY REPLACED AT EACH SCHEDULED OVERHAUL. BELOW ARE LISTED THE COMPONENTS INCLUDED IN THE INSTINCT 2ND STAGE SERVICE KIT (#46201165 - #46201171 VITON O-RINGS):

▶ INSTINCT- INSTINCT OCTOPUS 2ND STAGE SERVICE KIT

- DEMAND LEVER LOCK NUT (33)
- 2ND STAGE RUBBER PAD (47)
- EXHAUST VALVE (40)
- MOUTHPIECE CLAMP (43)
- O-RINGS :

- I. 1 O-RING 106 (19)**
- II. 2 O-RINGS 2025 (27)**
- III. 2 O-RINGS 2068 (83)**
- IV. 1 O-RING 2050 (71)**

REASSEMBLY

⚠ WARNING!

IF THE FIRST 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.

19. Place the Deflector (50) in the centre of the beathing tube as shown in the picture .
20. Install on exhaust valve (40) the Spoke (144), carefully pulling its silicone stem through the center hole of the second stage exhaust valve support. make sure that the Spoke (144).

⚠ WARNING!

DO NOT PULL TOO HARD ON SILICONE STEM AS THIS MAY DAMAGE THE EXHAUST VALVE.

21. Use cutting nippers to cut the silicone stem at approximately half its length.

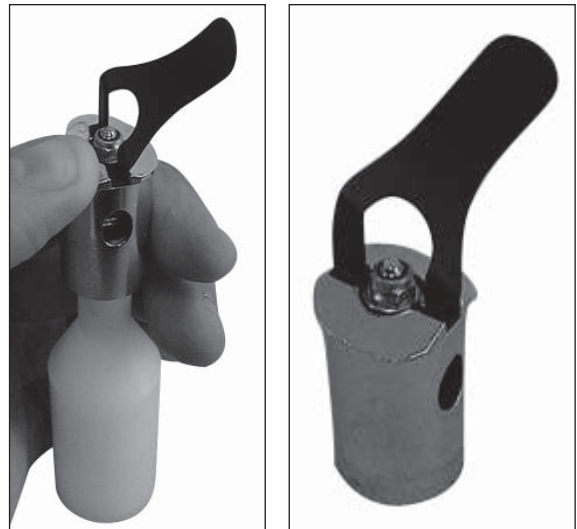
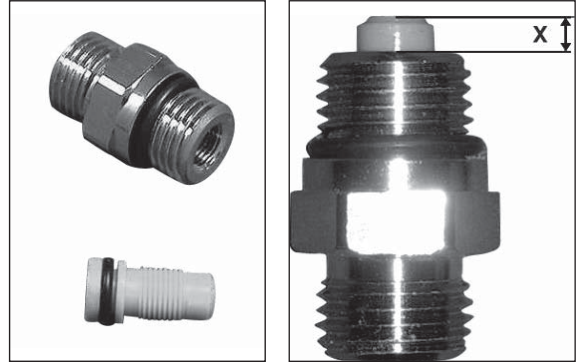


22. Fit the O-Ring (71) in the seat of the case assembly connector (28) and fit the O-ring (27) in its place in the seat connector (21).
23. Insert and screw the seat connector (21) into the case assembly connector (28) using the 5-mm hex wrench (B-4) until it protrudes about 3 mm.
24. Reassemble the poppet seat holder (92) on the 2nd stage poppet stem (30).
25. Reassemble the poppet seat (47) in the poppet seat holder (92).
26. Place the 2nd stage poppet assembly (30-47-92) together with its spring (31) on the special tool (B-6).
27. Pressing gently, correctly position the 2nd stage valve and its spring into the demand lever connector (91) and hold it in place.

NOTE TO ENSURE THAT THE 2ND STAGE POPPET STEM IS POSITIONED CORRECTLY IN THE DEMAND LEVER CONNECTOR HOLE, GENTLY ROTATE THE CONNECTOR LEFT AND RIGHT ON THE B-6 TOOL.

28. Properly position the demand lever (35) with respect to the by-pass hole in the metal insert (91) channel.
29. Fit the washer (34) on the poppet stem and tighten the demand lever adjusting nut (33) 7 or 8 full turns using the special wrench (B-20).

NOTE PRESS THE DEMAND LEVER A FEW TIMES TO BE SURE IT IS ABLE TO MOVE FREELY.



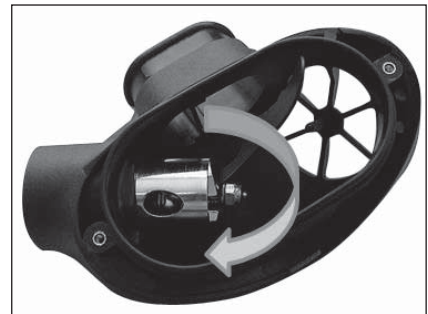
- 30.** Correctly position the demand lever connector assembly (91) in the 2nd stage case (32).
- I. Move in the opposite position the demand lever (35) on the Insert (91).
 - II. Set up it as shown and rotate it (91) in the case (32).
- 31.** Hold the demand lever connector in place in the second stage case by hand, insert the O-Ring (83) into the seat between the 2nd stage case and the demand lever connector using the special wrench (B-6).
- 32.** Hold the demand lever connector in place in the second stage case by hand, insert the O-Ring (83) into the seat between the 2nd stage case and the demand lever connector using the special wrench (B-6).

NOTE IF USING A TORQUE WRENCH, USE TIGHTENING TORQUE OF 8 - 8.5 N/M.

- 33.** Put the spacer ring (96) in place, and then use the 17-mm open-end wrench (B-17) to fully lock down the case assembly connector (28) in the 2nd stage case. Press the demand lever a few times.
- 34.** Fit the O-Ring (27) in the seat on the swivel connector of the hose (26) and the O-Ring (19) in the seat of the metal coupler that screws into the to first stage.
- 35.** Screw the hose (26) into the case assembly connector (28) using a 17-mm open end wrench (B-17).



I



II



FINAL ADJUSTMENTS

To correctly adjust the regulator:

- a. The repair shop should be equipped with a high- and low-pressure compressed air supply.
- b. A pressure gauge is required for checking the intermediate pressure (the pressure gauge should have a full scale value MAX 30-40 BAR, for greater adjustment accuracy).
- I. Screw the intermediate pressure measuring gauge into one of the 3/8" low-pressure ports on the 1st stage, using the wrench (B-18).
- II. Mount the regulator group on the control valve (of the tank or test bench).
- III. Holding down the second stage demand lever, slowly open the tank valve and, almost simultaneously, release the demand lever.
- IV. Read the pressure gauge to check whether the 1st stage pressure is correct.



WARNING!

THE FIRST STAGE INTERMEDIATE PRESSURE MUST BE MEASURED WHEN THERE IS NO AIR COMING OUT OF THE 2ND STAGE. FOR ANY NECESSARY 1ST STAGE ADJUSTMENTS, REFER TO THE CORRESPONDING MANUAL.



WARNING!

ALL THE ADJUSTMENTS BELOW MUST BE MADE WITH THE SECOND STAGE CONSISTENTLY SUPPLIED WITH THE CORRECT INTERMEDIATE PRESSURE.

36. Assemble the button Spring (102) on the Ring Diaphragm (78) and over it place the button (104). Using the Pin (102) Fixed the Button (104) through right side.



37. Place the 2nd stage diaphragm (142) in the Ring Diaphragm (78).

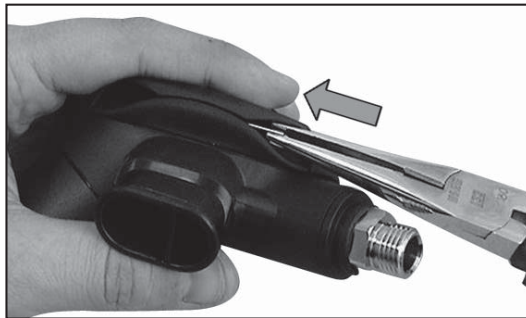
38. Fit both screws (140) on the Housing (32).



- 39.** Pushing down the button (104), insert Cover (39). Fix first its teeth (bottom), release the Button (104) set up the cover in the proper position.



- 40.** Assemble the Pin (102) Fixed the Cover (39) through right (hose connector) side.



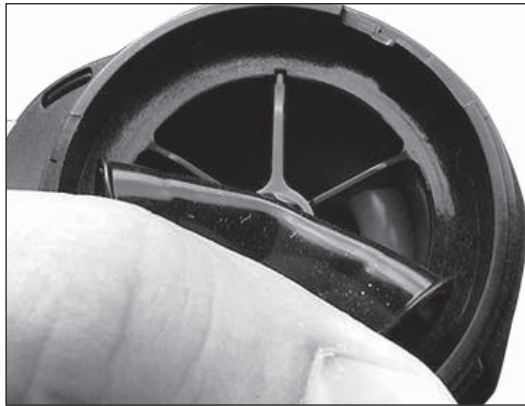
- 41.** Gently move exhaust valve (40) and the Spoke (144). Working through the hole in the second stage case, use the wrench (B-12) to lock down or back off the demand lever nut (32) in order to adjust the demand lever (35).



! WARNING!

THE DEMAND LEVER IS ADJUSTED CORRECTLY WHEN YOU CAN PRESS THE PURGE BUTTON ON THE COVER DOWN ABOUT 3MM BEFORE AIR BEGINS TO RELEASE. IN ADDITION, THE SOUND OF THE DEMAND LEVER TOUCHING THE METAL DISK OF THE SECOND STAGE DIAPHRAGM AS IT MOVES ("TAPPING") SHOULD BE AUDIBLE WHEN THE PRESSURIZED SECOND STAGE IS SHAKEN VIGOROUSLY UP AND DOWN.

42. Make sure the Spoke (144) is returned to its proper position after lever height adjustment.

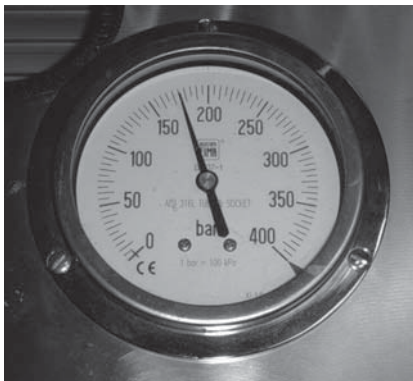


**OBJECT:
REGULATORS TEST BENCH****INFORMAZIONI IMPORTANTI**

TO CHECK THE HIGH PRESSURE (2) MARES RECOMMEND HP AIR BETWEEN 150 TO 200 BAR!

CHECK THE INTERMEDIATE PRESSURE (IP), ON THE LP GAUGE AND ADJUST IT IF NECESSARY. TO DOWNLOAD THE AIR FROM REGULATOR THE "DISCHARGE LEVER" (5) CAN BE USED.

TANK PRESSURE



IP PRESSURE



DISCHARGE LEVER



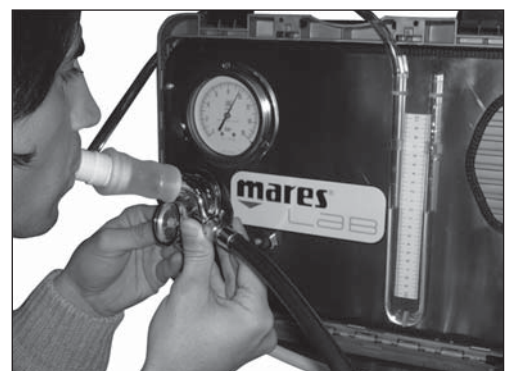
- INSTALL THE INHALING MOUTHPIECE (8) ON THE SECOND STAGE MOUTHPIECE TUBE.



- TO CHECK THE CRACKING EFFORT USING COLUMN WATER (SEE INFO TABLE).



...THE CRACKING EFFORT MUST BE READ IN THE MOMENT THAT THE VALUE OF INTERMEDIATE PRESSURE STARTS TO DECREASE...



2° STAGES CRACKING EFFORT

2° STADIO	cm of H ₂ O	inch of H ₂ O
PRIMARY	2.8- 3.2 ~	1,1-1.3
OCTOPUS	3.3-3.5	1,2-1,4

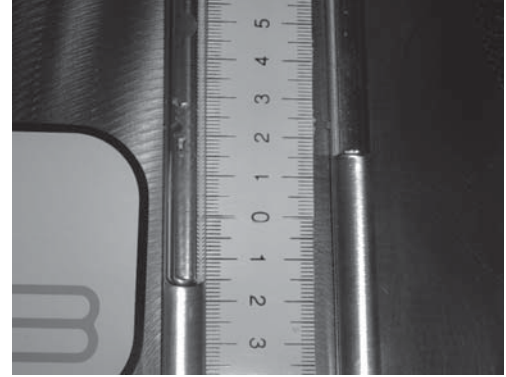


TO OBTAIN THE CRACKING EFFORT IT IS NECESSARY TO ADD THE VALUE OF COLUMN WATER THAT GOES UP WITH THE VALUE OF COLUMN WATER THAT GOES DOWN (OR REDOUBLE ONE OF THEM).



SOMETIMES THE GRADUATION OF COLUMN WATER IS ALREADY REDOUBLED (1 REAL CM = 2 ON GRADUATION OF COLUMN WATER).

- CLOSE THE TANK VALVE (3) AND DISCHARGE THE RESIDUAL AIR, PUSHING ON THE SECOND STAGE BUTTON COVER OR THE DISCHARGE LEVER (5).
- CLOSE THE TEST BENCH VALVE (3) AND TRY TO INHALE DIRECTLY FROM THE SECOND STAGE (W/O INHALING MOUTHPIECE (8), IN ORDER TO DETECT LEAKAGE INSIDE OF THE CASE.



FINAL ASSEMBLY



WARNING!

FOR CHECKS AND ADJUSTMENTS ON THE SECOND STAGE, CONSULT THE CORRESPONDING SECTION OF THE MAINTENANCE MANUAL (S 9-1).

43. Assemble the exhaust tee (41) on the support flange on the second stage.
44. Carefully assemble the mouthpiece (44), securing it with a new mouthpiece clamp (43).



Table No: 132	2nd STAGE INSTINCT	TABLE UPDATED ON: 18/12/2012
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REF	CODE	DESCRIPTION
19	46110106	OR 106
19	46110402	OR 106 VITON 610-97507
21	46200204	POPPET SEAT
26	46201200	LP HOSE SFX BLACK 3/8" , 65 CM (26-45-46)
26	46200886	LP HOSE SFX YELLOW
27	46110205	OR 2025
27	46110411	OR 2025 VITON 010-9707
28	46184282	HOSE CONNECTOR
30	46201234	POPPET METAL BODY, INSTINCT
31	46185059	POPPET SPRING
32	46201204	2ND STAGE CASE, INSTINCT
33	46185051	LOCKNUT, DEMAND LEVER 2ND STAGE
34	46185049	WASHER, DEMAND LEVER
35	46201241	DEMAND LEVER, INSTINCT
39	46201203	COVER FOR 2° STG P. METAL
40	46201194	EXHAUST VALVE,D. 33
41	46201201	EXHAUST TEE INSTINCT
43	47157984	CLAMP BK
44	46200855	MOUTHPIECE BK (10 PICS)
45	46201077	HOSE PROTECTOR 1ST STG 2K9
46	46200768	HOSE PROTECTOR 2ND STG
47	46184062	RUBBER SEAT
50	46201199	DEFLECTOR

REF	CODE	DESCRIPTION
71	46110211	OR 2050
71	46110413	OR 2050 VITON 014-9707
78	46201198	RING-DIAPHRAGM
83	46110225	OR 2068
83	46110420	OR 2068 VITON
91	46201181	INSERT FOR DEMAND LEVER
96	46184280	SPACER RING BY-PASS BK
96	46187038	SPACER RING BY-PASS YL
102	46201138	BUTTON SPRING
104	46201197	BUTTON BLACK
104	46201208	BUTTON YELLOW
140	46187004	SCREW M2X5
142	46187009	OVAL DIAPHRAGM
144	46201196	EXHAUST VALVE SPOKE
172	46201195	COVER FRAME, CHROME
174	46201188	PIN BUTTON/COVER
		ASSEMBLED
S	46201165	SERVICE KIT 2ND STG INSTINCT
	46201171	SERVICE KIT INSTINCT VITON (19 - 27 - 33 - 40 - 43 - 47 - 71 - 83)
R	46200510	KIT RETROFIT (21-27-47)

FINAL CHECKS AND ADJUSTMENTS

The checks described below are designed to verify the perfect operation of the regulator. The specified values are applicable to regulators subject to annual service (Tab. 1).

CRACKING PRESSURE VALUES FOR SECOND STAGES		
MODEL	Inch. of H ₂ O	cm of H ₂ O
PRIMARY SECOND STAGE	1 - 1,3	2,8 - 3,2
OCTOPUS SECOND STAGE	1,2 - 1,4	3,2 - 3,5

Table 1

1. Position the regulator on the air valve (of a test bench or tank).
2. Using the laboratory Test Bench (cod. 416921) or the portable Test Bench (cod. 416922), after calibrating the first stage, breath in through the mouthpiece and read the "cracking" pressure (value required to trigger air delivery) on the U gauge, at the instant when the gauge detects a drop in the intermediate pressure.



WARNING !

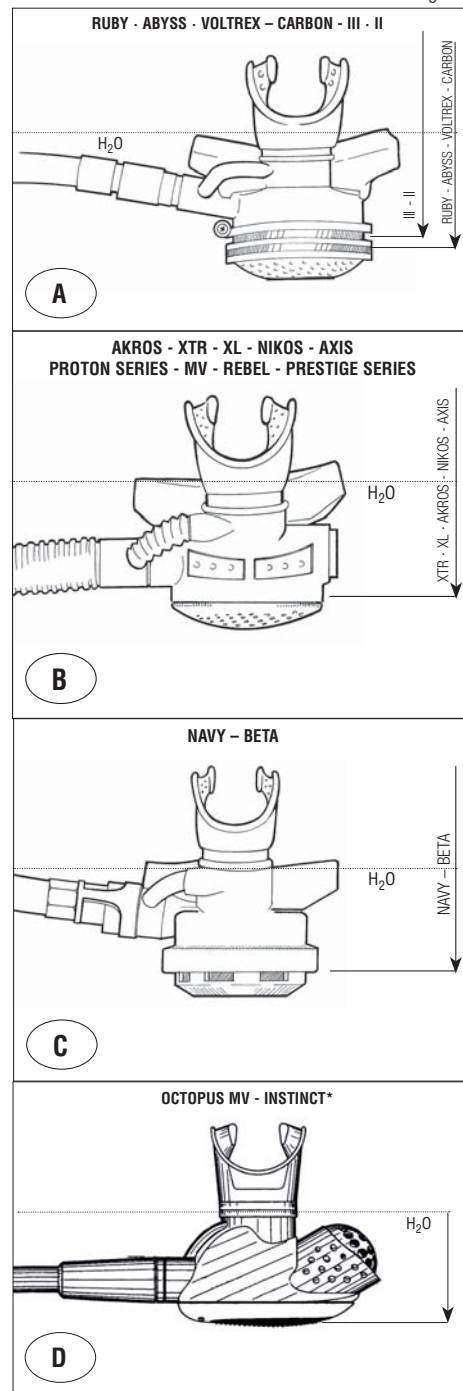
IN THE ABSENCE OF A TEST BENCH IT IS POSSIBLE TO RUN AN APPROXIMATE CHECK ON THE CRACKING PRESSURE USING A BASIN OF WATER AND FOLLOWING THE PROCEDURE BELOW:

- a. Slowly submerge the second stage in the water with the mouthpiece facing up, without allowing water to go inside.
- b. When the water level, measured on the mouthpiece connector with reference to the point indicated in the diagram, falls between the cracking values indicated in the table (Tab. 1), the air must start to flow (Fig. 1).

SECONDO STAGE MODEL	POINT OF REFERENCE
RUBY - ABYSS - VOLTREX - CARBON	STARTING FROM AND INCLUDING THE RING CLAMP (37)(A)
AKROS - XTR - XL - NIKOS - MV - AXIS - PROTON SERIES - REBEL - PRESTIGE SERIES - INSTINCT*	STARTING FROM THE SECOND STAGE CASE (32)(B)
III° - II°	STARTING FROM AND EXCLUDING THE RING CLAMP (37)(A)
NAVY - BETA	STARTING FROM AND INCLUDING THE COVER RING (60)(C)

Table 2

Fig. 1



*you must install the Octopus Cap (46186090 - photo 1) during the test in order to prevent the second stage from filling with water.

► **SECOND STAGE TROUBLESHOOTING**

PROBLEM	MODEL	PROBABLE CAUSE	SOLUTION
- 1 - CONTINUOUS OR INTERMITTENT AIR LEAKS FROM THE SECOND STAGE	RUBY - ABYSS VOLTREX AKROS - XTR - XL NIKOS	1) Second stage poppet seat dirty or damaged	1) Clean, invert or replace
	NAVY - BETA III° - II°	2) Sealing surface of seat connector dirty or damaged	1) Clean or replace
	AXIS - PROTON PROTON SERIES - REBEL - MV	3) Intermediate pressure too high	1) Adjust the intermediate pressure
	PRESTIGE SERIES CARBON - INSTINCT	4) Demand lever set too high	1) Adjust correctly
		5) Poppet spring incorrectly positioned or damaged	1) Position correctly or replace
	RUBY - ABYSS VOLTREX - AKROS XTR - XL NIKOS - AXIS PROTON SERIES REBEL - MV PRESTIGE SERIES - INSTINCT	6) Adjustable seat O-ring in connector dirty or damaged	1) Clean or replace
		7) Adjustable connector seat too low	1) Adjust correctly
	NAVY - BETA	8) Seat connector O-ring dirty or damaged	1) Clean or replace
		9) Spacer ring missing or damaged	1) Position correctly or replace
- 2 - CRACKING PRESSURE TOO HIGH	RUBY - ABYSS VOLTREX - AKROS - XTR - XL NIKOS - NAVY - BETA III° - II° AXIS - PROTON SERIES - REBEL - MV PRESTIGE SERIES CARBON - INSTINCT	1) Demand lever set too low	1) Adjust correctly
		2) Intermediate pressure too low	1) Adjust correctly
		3) Hole for 2nd stage poppet in the 2nd stage case obstructed	1) Clean carefully
		4) Tank control valve not fully opened	1) Open the tank valve completely
		5) Second stage spring deformed and/or damaged	1) Replace
		6) First stage filter clogged	1) Overhaul first stage and replace the filter
	AKROS - XTR - XL	7) Pivoting flow vane dirty and/or damaged	1) Clean and/or replace the damaged components
	RUBY - ABYSS VOLTREX - AKROS AXIS - PROTON SERIES - REBEL - MV PRESTIGE SERIES - INSTINCT	8) Poppet spring loading too high	1) Adjust correctly and if necessary replace the spring
	NAVY - BETA - III° - II°	9) Poppet spring loading too high	1) Replace the spring or remove the washer if present
- 3 - CRACKING PRESSURE TOO LOW	RUBY - ABYSS VOLTREX AKROS - XTR - XL NIKOS - NAVY III° - II° - BETA AXIS PROTON SERIES REBEL - MV CARBON - INSTINCT	1) Intermediate pressure too high	1) Adjust correctly
		2) Second stage spring deformed and/or damaged	1) Replace
		3) Poppet spring loading too low	1) Adjust correctly and if necessary replace the spring
	NAVY - BETA	4) Poppet spring loading too low	1) Add a distance washer (max one) or replace the spring
	III° - II°	5) Poppet spring loading too low	1) Replace the spring

► SECOND STAGE TROUBLESHOOTING

PROBLEM	MODEL	PROBABLE CAUSE	SOLUTION
- 4 - AIR LEAK BETWEEN SWIVEL HOSE COUPLING AND SECOND STAGE CONNECTOR	RUBY - ABYSS VOLTREX AKROS - XTR - XL NIKOS - NAVY III° - II° - BETA - AXIS PROTON SERIES REBEL - MV - INSTINCT	1) Swivel hose coupling O-Ring defective	1) Replace the O-Rings
		2) Sealing surface of hose connector O-Ring dirty or damaged	1) Clean or replace the hose connector
	NAVY - BETA	3) Seat connector O-Ring dirty or damaged	1) Clean or replace
		4) Seat connector dirty or damaged	1) Clean or replace
- 5 - TRACES OF WATER INSIDE THE SECOND STAGE	RUBY - ABYSS VOLTREX AKROS - XTR - XL NIKOS - NAVY - BETA - III° - II° AXIS - PROTON SERIES REBEL - MV	1) Exhaust valve dirty, incorrectly positioned or damaged	1) Clean, position correctly or replace
		2) Exhaust valve support dirty or damaged	1) Clean or replace the second stage case
		3) Diaphragm dirty, incorrectly positioned or damaged	1) Clean, position correctly or replace
		4) Mouthpiece loose or damaged	1) Replace the clamp and tighten or replace the mouthpiece
	RUBY - ABYSS VOLTREX AKROS - XTR - XL NIKOS - NAVY - BETA - III° - II° - AXIS PROTON SERIES REBEL - MV - INSTINCT	5) Seat connector O-Ring defective	1) Replace
	RUBY - ABYSS VOLTREX - III° - II°	6) Cover ring clamp loose or damaged	1) Tighten or replace
	AKROS - XTR - XL - NIKOS - AXIS	7) Spacer ring incorrectly positioned or damaged	1) Correctly position or replace the spacer ring
		8) Spacer ring incorrectly positioned or damaged	1) Correctly position or replace the spacer ring
		9) Cover incorrectly clamped	1) Correctly lock down the cover and secure with the pin
		10) Sealing surfaces and O-rings of the plug, between the threaded connector and the second stage case and between the case assembly connector and the second stage case	1) Inspect and clean the sealing surfaces, replacing the O-Rings and the defective components
	AKROS - XTR - XL	11) Defective O-Ring seals or seats between the by-pass and the second stage case assembly connector	1) Inspect and clean the sealing surfaces, replacing the O-Rings and the defective components
	NAVY	12) Defective seal between the by-pass and the second stage case	1) Replace with second stage case already complete with by-pass
		13) O-Ring seal between by-pass and case assembly connector dirty or damaged	1) Clean and replace the O-Ring
	NAVY - BETA	14) Cover ring clamp loose	1) Tighten the ring clamp
		15) Seat connector O-Ring defective	1) Replace the O-Ring
	BETA	16) O-Rings in case assembly connector and plug dirty or damaged	1) Clean the seats and replace the O-Rings
	INSTINCT	17) Exhaust Valve SPOKE placed in wrong position	1) Position correctly

► **SECOND STAGE TROUBLESHOOTING**

PROBLEM	MODEL	PROBABLE CAUSE	SOLUTION
- 6 - COVER PURGE BUTTON JAMMED	RUBY - ABYSS - VOLTREX - AKROS - XTR - XL - NIKOS - NAVY - BETA - III° - II° - AXIS - REBEL PRESTIGE SERIES CARBON	1) Purge button seat dirty	1) Clean
		2) Defective spring	1) Replace the spring
- 7 - VIBRATIONS DURING THE INHALATION PHASE	RUBY - ABYSS - VOLTREX - AKROS - XTR - XL - NIKOS - NAVY - BETA - III° - II° - AXIS - REBEL PROTON SERIES - MV PRESTIGE SERIES CARBON - INSTINCT	1) Diaphragm incorrectly positioned	1) Position correctly
		2) Demand lever incorrectly adjusted	1) Adjust correctly
		3) Poppet spring incorrectly positioned or damaged	1) Position correctly or replace

18. Remove anchoring bushing (47) from actuating cable (66).
19. With suitable pliers, cut clamp (59) and remove the corrugated hose (60) from the RE valve (F).
20. Unscrew the RE cap (69) and remove (Fig. 7).
21. Remove the exhaust diaphragm (6) and housing (7) from RE cap (69).

NOTE IT IS NOT NECESSARY TO REMOVE THE EXHAUST DIAPHRAGM (6) FROM THE HOUSING (7), UNLESS THE EXHAUST DIAPHRAGM OR HOUSING ARE TO BE REPLACED.

22. Remove gasket (67) from RE housing.
23. Remove the RE valve plate (63) from the RE housing and unthread the actuating cable (66), detaching it from RE valve plate (63).
24. Remove spring (64) from RE housing.

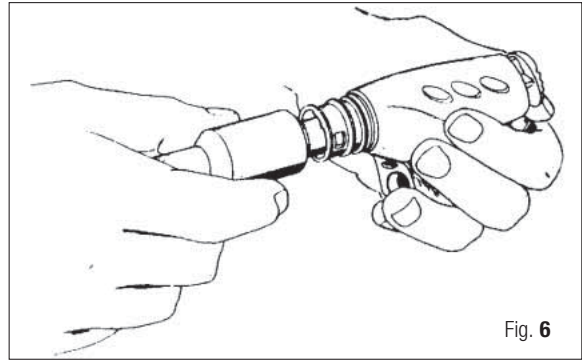


Fig. 6

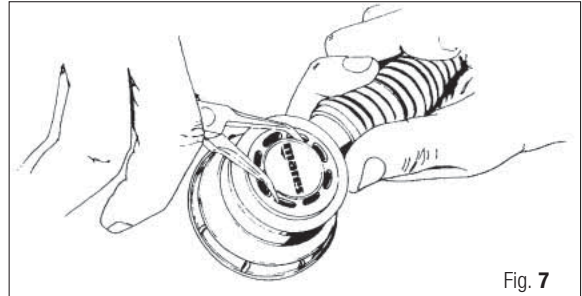


Fig. 7

DISASSEMBLY RE VALVE 2K12

- I. With suitable pliers, cut clamps (59) and remove the corrugated hose (60) from the RE valve (32).
- II. Remove Spring Bearing(38) from RE valve body (32), using a small screwdriver.
- III. Take the Gasket (34) out.
- IV. Untie rope only in case Line(66) and/or Bushing (47) must be replace/s.



Photo 1

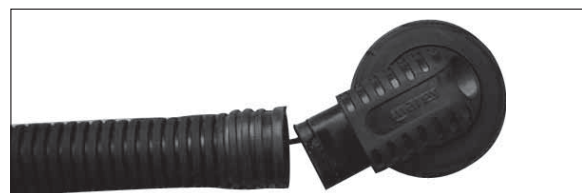


Photo 2

CLEANING

Cleaning requires all reusable rubber and plastic parts to be carefully cleaned by scrubbing with a soft brush in a mild detergent and water solution. Do not use solvents or acids on rubber or plastic parts. Metal parts should be cleaned in an ultrasonic cleaner with fresh water or a mild acid solution. (White vinegar diluted with warm water is recommended). Before reassembly make sure all parts have been carefully rinsed and dried.



WARNING!

ACIDS MAY CAUSE BURNS, OR SKIN, EYE OR RESPIRATORY IRRITATION. WHEN WORKING WITH ANY KIND OF ACID PROTECT EYES AND SKIN ADEQUATELY AND WORK IN A WELL VENTILATED AREA. ACIDS MAY DAMAGE RUBBER AND PLASTIC PARTS. BEFORE CLEANING METAL PARTS, MAKE SURE THAT ALL RUBBER AND PLASTIC PARTS HAVE BEEN REMOVED.

INSPECTION

The following components should be replaced during routine service.

Description	Part Number
Filter (22)	159146
O-ring, male QD (9)	110106
O-ring, bushing (50)	110241
O-ring, deflate button (51)	110117
O-ring, inflate button (55)	110210
O-ring, valve holder (58)	110221

If the following parts are not replaced, they should be inspected with a jeweler's loop or similar magnifying device, for the defects listed below. Replace any part with these defects.

Male OD fitting (13):	Inspect for wear, corrosion or loose plating.
Filter (22):	Inspect the filter surface for any foreign matter or deposits.
Inflator body (46):	Inspect the body for any signs of cracks and check all surfaces in contact with O-rings. Inspect the QD threads for any signs of damage.
Inflate button (54):	Inspect for wear or cracking.
Pin (53):	Inspect for wear or distortion.
Valve holder (57):	Inspect the valve for any signs of contamination or corrosion. Inspect the holder for any signs of scratches on O-ring surfaces or cracking. The valve and holder are replaced as an assembly.
Deflate button (52):	Inspect the deflate button retaining tabs for any signs of distortion or breakage.
Bushing (49):	Inspect for wear or cracking.

Anchoring bushing (49):	Inspect the locking tabs and actuating cable attaching hole for wear or cracking.
Actuating cable (66):	Inspect the knots for tightness and any signs of frayed cable.
Corrugated hose (60):	Inspect for wear or cracking.
RE housing (E):	Inspect the housing for cracks and all thread surfaces for damage.
RE valve plate (63):	Inspect for wear or scratches on the gasket sealing surface.
Gasket (67):	Inspect for cracking, brittleness and splits.
Exhaust diaphragm seat (7):	Inspect for wear or cracking.
Exhaust diaphragm (6):	Inspect for wear or cracking.
Cap (69):	Inspect threads for damage.
Springs:	Inspect for cracking or broken coils.
O-rings:	Inspect for cuts, tears, flat spots or contamination. The presence of any of these defects may cause leakage.
O-ring seats:	Inspect all surfaces in contact with O-rings and other seals for chipping, scratches or contamination.

**WARNING!**

ACIDS MAY CAUSE BURNS, OR SKIN, EYE OR RESPIRATORY IRRITATION. WHEN WORKING WITH ANY KIND OF ACID PROTECT EYES AND SKIN ADEQUATELY AND WORK IN A WELL VENTILATED AREA. ACIDS MAY DAMAGE RUBBER AND PLASTIC PARTS. BEFORE CLEANING METAL PARTS, MAKE SURE THAT ALL RUBBER AND PLASTIC PARTS HAVE BEEN REMOVED.

REASSEMBLY

Before reassembly, slightly lubricate all O-rings with silicone grease (General Electric, Versalukie G-322 or equivalent). Lubricating the O-rings before reassembly will minimize the risk of damage during reassembly.

1. If the actuating cable (66) is to be replaced. cut the replacement cable to a length of 51 cm. (20 in.) and tie a knot at one end.
2. Thread the actuating cable (66) through the RE valve plate (63) so that the end of the actuating cable without the knot is protruding from the center hole of the RE valve plate. Pull the actuating cable through the center hole of the RE valve plate until the knot is fed into the seat of the RE valve plate.
3. Thread the actuating cable through the spring (64) so the smaller diameter of the spring faces the RE valve plate (63).

4. Thread the actuating cable through the RE housing (F), over the internal pin and out through the hose connector opening. Pull the loose end of the actuating cable until the Spring (64) and RE valve plate (63) are positioned inside the RE Valve body (E).
5. Install the exhaust diaphragm (6) onto the housing (7) and trim the exhaust diaphragm stem.

NOTE THE EXHAUST DIAPHRAGM (6) MUST BE AGAINST THE FLAT SMOOTH SIDE OF THE SEAT (7).

6. Insert the exhaust diaphragm (6) and housing (7) into the RE Valve cap (69) with the diaphragm facing the cap.
7. Position the gasket (67) onto the cap (69), with the stepped side of the gasket facing the cap.
8. Thread the cap (69) with the exhaust diaphragm (6), housing (7) and gasket (67) into the RE housing (F) and tighten.
- V. Fit the Line (66) in the RE Valve Piston (35) only whether previously you untie that.
- VI. Position the gasket (34) onto the Spring Bearing (35) as shown.

IF NECESSARY CLEAN THE GASKET WITH MILD DETERGENT AND WATER SOLUTION.

- VII. Fix Spring Bearing + Gasket into the RE Valve Body. Slide the corrugated hose (60) onto the RE housing (32) and secure with clamps.
9. If the male QD cap (27) or LP hose clip (62) were removed from the corrugated hose (60) or if the corrugated hose was replaced, install the male QD cap and LP hose clip on the corrugated hose.
10. Thread the actuating cable through the corrugated hose (60).
11. Slide the corrugated hose (60) onto the RE housing (F) and secure with clamp (59).
12. Thread the actuating cable (66) through the anchoring bushing (47) and tie a knot in the actuating cable in a location that will allow the base of the anchoring bushing to just protrude from the corrugated hose.
13. Place o-ring (51) into the o-ring groove of the deflate button (52).
14. Insert the deflate button (52) with o-ring (51) into the inflator body (46).
15. Place O-ring (50) on bushing (49).
16. With special tool (P/N 106190 Fig. 5) or needle nose pliers, insert bushing (49) with O-ring (50), facing the deflate button, into the inflator body until the deflate button retaining tabs engage the bushing (Fig. 8-9).
17. Place the spring (48) on the anchoring bushing (47) and insert the anchoring bushing with spring into the inflator body until the locking tabs engage the inflator body. Depress the deflate button and release. The deflate button should return to its original position. If it does not return to its original position repeat steps 12-16 making sure all parts are in the correct location.



Photo 3



Photo 4

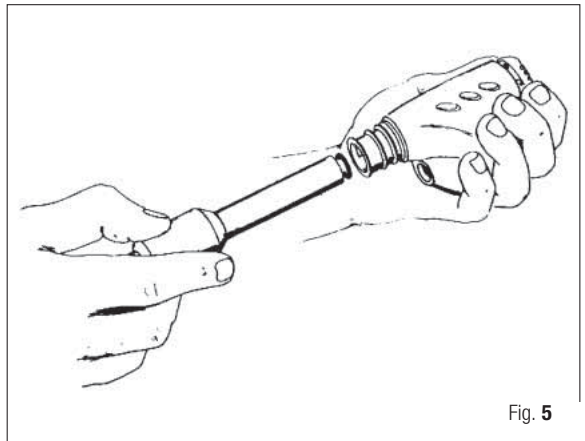


Fig. 5

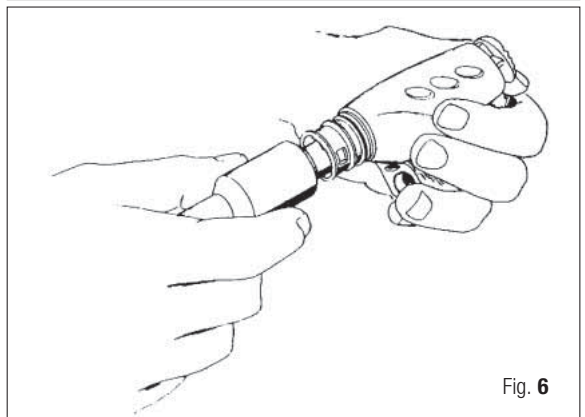


Fig. 6

Table No: 255	ERGO INFLATOR ASSEMBLY 2k5 & 2k12	TABLE UPDATED ON: 10/12/2012
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REF	CODE	DESCRIPTION
2	47159020	WHISTLE, B.C. VESTS
6	47159070	EXHAUST DIAPHRAGM, LP INFLAT.
7	F	DIAPHRAGM CASE LP INFLATOR
9	46110106	OR 106
13	47159659	QUICK-CONNECTOR MALE
22	47159146	FILTER, LP INFLATOR
27	47159712	DUST CAP, ERGO INFLATOR
31	L	RING NUT RE VALVE 2K10
32	L	BODY RE VALVE 2K10
33	L	SPRING BEARING
34	47201064	RE VALVE GASKET
35	L	PISTON RE VALVE
38	L	SPRING, RE VALVE
45	47159681	HOSE, ERGO LP INFLATOR
46	47159700	INFLATOR BODY
47	47159702	BUSHING, INFL.LINE RETAINER
48	46185011	SPRING
49	47159701	EXHAUST BUSHING, ERGO INFLATOR
50	46110241	OR 2-109
51	46110115	OR 115
52	47159717	PURGE BUTTON ERGO 99 SILVER
53	47159707	BUTTON PIN, ERGO INFLATOR
54	D	INFLATOR BUTTON - RED
55	46110210	OR 2056
57	G	INFLATION VALVE
58	46110221	OR 2081
59	45179863	CLAMP CORRUGATED HOSE
60	47159709	CORRUGATED HOSE, ERGO INFLATOR

REF	CODE	DESCRIPTION
61	47159705	MOUTHPIECE, ERGO INFLATOR
62	47159711	HOSE RETAINER
63	F	RUBBER DISK
64	F	SPRING, PURGE BUTTON
66	F	LINE DIAM. 1,75 BLACK
67	47159133	R.E. VALVE SEAL, B.C. VEST
69	F	R.E. VALVE COVER
70	46184322	LABEL
163	G	O-RING SEAT
164	46110204	O-RING 2021
165	G	SPRING INFLATING VALVE
166	G	STEEL BALL 3/16"
167	46110101	OR 2012
168	D	PIN ERGO 2K5
169	46201002	VALVE ERGO 30 BAR PACK.10 PC
ASSEMBLIES		
A	47158504	ERGO LP INFLATOR WITHOUT HOSE
C	47201121	ERGO INFLATOR W/O HOSE 2K5 (A-F-2-27-59-60-62)
C	47201122	ERGO INFLATOR W/O HOSE 2K12 (A-F-2-27-59-60-62)
D	47200808	INFLATING BUTTON ASSY (54 - 55 - 168)
F	47158503	R.EXHAUST VALVE ASSEMBLY DIA 23 (E-6-7-63-64-66-67-69-70)
G	47200807	INFLATION VALVE (57-58-163-164-165-166-167)
°°°	47200806	SERVICE KIT ERGO 2K5 (9-22-50-51-55-58-59-164-167-OR 2031)
###	47200829	UPDATING KIT ERGO 2K5 (D-G-OR 2031-9-22-50-51-59)
	46110107	O RING OR 2031 FOR HOSE QUICK CONNECTOR
B	47201070	ERGO INFLATOR 2K10 W/OUT LP HOSE
L	47201118	RE VALVE + CORRUGATED 2K10

TABLE "A"**TABLE "A" - MEASUREMENTS AND USE OF INTERIOR TUBES.**

THE NUMBER CORRESPONDS TO THE POSITION OF THE TUBE INSIDE THE BUOYANCY BAG.
THE SIZES IN WHICH THEY ARE USED ARE INDICATED IN PARENTHESES TO THE SIDE.

POSITION 1: FROM INFLATOR TO 1ST DISCHARGE VALVE.

POSITION 2: FROM 1ST DISCHARGE VALVE TO 2ND DISCHARGE VALVE.

POSITION 3: CONNECTED ONLY TO INFLATOR.

LENGHT (cm)	CODE	MORPHOS TWIN	MORPHOS PRO	VECTOR 1000	VECTOR CHROME	DRAGON AT	HUB	ORIGIN SPORT AT	KAILA AT	HYBRID AT	PRESTIGE AT
45	47200734	1	1					1(XS-S-M)	1(XS-S-M)	1 (XS-S-M-L)	1
			2								
60	47200735	2		1(XS)	1(XS-S-M)	2	1	1(L-XL)	1(L-XL)	1 (XL)	
				2				2	2		
75	47200736			1 (S-M-L-XL)	1(L-XL)	1 (XS-S-M-L)	2			2 (XS-S-M- L-XL)	
80	47200904					1(XL)					
120	47200737	3	3								

CLEANING**WARNING!**

WHEN WORKING WITH ANY KIND OF ACID, WEAR ADEQUATE PROTECTIVE GEAR FOR EYES AND SKIN.

NORMAL CLEANING OF THE RUBBER COMPONENTS MUST BE PERFORMED BY WASHING ALL PARTS IN A MIXTURE OF HOT WATER AND DELICATE DETERGENT, SCRUBBING THEM, IF NECESSARY, WITH A SOFT BRUSH. DO NOT USE ACIDS AND/OR SOLVENTS ON PLASTIC AND/OR RUBBER COMPONENTS. CHROME-PLATED BRASS AND STAINLESS STEEL PARTS CAN BE CLEANED WITH AN ULTRASONIC CLEANER IN FRESH WATER (OR SPECIAL SOLUTION) OR, IF THE NECESSARY EQUIPMENT IS NOT AVAILABLE, IN A MILD ACID SOLUTION (FOR EXAMPLE WHITE VINEGAR, DILUTED WITH HOT WATER AS NECESSARY). MAKE SURE TO RINSE ALL PARTS WITH FRESH WATER AND DRY THEM BEFORE REASSEMBLING

**WARNING!**

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.

PRESSURIZING

Cyrano pneumatic spearguns can be pressurized using the Mares gun charging yoke (part # 413807) or a Mares hand pump (part # 413806).

POWER LOADER FOR MARES PNEUMATIC GUNS

1. Screw the open end of the high pressure hose into the high pressure port of a first stage regulator (Fig 1).
2. Mount the first stage regulator onto a scuba tank (Fig 2). The tank should be filled to a pressure of at least 30bar/425psi in order to reach the same pressure in the pneumatic gun. A lower tank pressure will result in a lower pressure in the pneumatic gun.



WARNING!

USE ONLY SCUBA TANKS FILLED WITH AIR.

3. Screw the threaded end of the main body of the power loader all the way (finger tight) onto the back of the pneumatic gun (Fig 3A).
4. If a power adjusting system is present, ensure that it is set to maximum power (Fig.3B).



WARNING!

WHEN LOADING THE PNEUMATIC GUN, IT IS VERY IMPORTANT THAT THE POWER ADJUSTING SYSTEM IS SET TO MAXIMUM POWER. NEVER EXCEED THE MAXIMUM PRESSURE OF 30BAR. A PRESSURE IN EXCESS OF 30BAR CAN LEAD TO SERIOUS INJURY OR DEATH AND/OR IT CAN LEAD TO DAMAGE TO THE EQUIPMENT.

5. Keep the power loader turned in such a way that the pressure gauge points away from you, then slowly open the valve on the scuba tank.



WARNING!

PNEUMATIC GUNS ARE PRESSURIZED SYSTEMS. NEVER POINT A PNEUMATIC GUN AT YOURSELF OR AT ANYONE ELSE. FAILURE TO DO SO MAY LEAD TO SERIOUS INJURY OR DEATH.

6. If you want to charge a gun to less than 30bar, close the tank valve when the pressure gauge reaches the desired pressure.
7. You will hear the air hissing as it is gradually charging the gun until the relief valve pops. Charging a 100cm gun takes approximately 30s, different lengths will take proportionally more (longer guns) or less (shorter guns).
8. When you have finished charging the gun, close the tank valve and unscrew the power loader from the back of the gun.



WARNING!

USE WITH MARES PNEUMATIC GUNS ONLY.

PRESSURIZING USING MARES HAND PUMP (PART # 413806)**WARNING!**

ALWAYS PRESSURIZE THE SPEARGUN WITH THE POWER ADJUSTMENT LEVER IN THE MAXIMUM "HIGH" POWER POSITION (FIG. 1). NEVER EXCEED THE MAXIMUM 30 BAR PRESSURE. FAILURE TO PRESSURIZE THE SPEARGUN IN THE MAXIMUM "HIGH" POWER POSITION OR OVER-PRESSURIZATION MAY CAUSE THE SPEARGUN TO RUPTURE WHICH MAY CAUSE SERIOUS INJURY OR DEATH.

1. Set the power adjustment lever (38) to maximum "high" power position (Fig. 2).
2. By hand, thread the hand pump into the inlet valve of the speargun, until the hand pump o-ring seals against the inlet valve body.
3. The following pressure table shows the approximate number of pump strokes required to obtain the pressure values listed.

CYRANO VERSION

DESCRIPTION	PRESSURE IN BAR				
	10	15	20	25	30
	NUMBER OF PUMP STROKES (APPROX.)				
CYRANO 550	125	185	250	330	410
CYRANO 700	150	230	310	390	480
CYRANO 850	210	330	450	580	710
CYRANO 970	260	395	575	755	925
CYRANO 1100	320	510	700	870	1055

SPARK VERSION

DESCRIPTION	PRESSURE IN BAR				
	10	15	20	25	30
	NUMBER OF PUMP STROKES (APPROX.)				
SPARK 550	181	268	363	479	595
SPARK 700	218	334	450	566	696
SPARK 850	305	479	653	841	1030
SPARK 970	377	573	834	1095	1341
SPARK 1100 Pipin	464	740	1015	1262	1530

STEN 2001 VERSION

DESCRIPTION	PRESSURE IN BAR					
	LENGTH (cm)	10	15	20	25	30
	NUMBER OF PUMP STROKES (APPROX.)					
STEN MINIMINI	42	60	130	170	210	240
STEN MINIMINI	58	140	220	340	450	550
STEN MEDI	70	200	280	440	560	700
STEN	84	270	430	580	750	1000
SUPER STEN	100	370	550	750	980	1300

**WARNING!**

THE NUMBER OF PUMP STROKES LISTED IN THE PRESSURE TABLE REFER TO A COMPLETELY EMPTY SPEARGUN TANK. IF IT IS NOT POSSIBLE TO DETERMINE THE EXISTING PRESSURE IN THE SPEARGUN, ALL PRESSURE MUST BE RELEASED FROM THE SPEARGUN PRIOR TO PRESSURIZING IT. IF THE EXISTING PRESSURE IN THE SPEARGUN IS KNOWN AND IT BECOMES NECESSARY TO ADD PRESSURE, ONLY INCREASE IT THE AMOUNT OF THE DIFFERENCE. FOR EXAMPLE, TO INCREASE THE PRESSURE OF A CYRANO 700 FROM 20 BAR TO 30 BAR, 170 PUMP STROKES ARE REQUIRED. NOT THE FULL 480 PUMP STROKES SHOWN IN THE TABLE. NEVER EXCEED THE MAXIMUM 30 BAR PRESSURE. OVER-PRESSURIZATION MAY CAUSE THE SPEARGUN TO RUPTURE WHICH MAY CAUSE SERIOUS INJURY OR DEATH. PNEUMATIC SPEARGUNS ARE HIGHLY PRESSURIZED. NEVER POINT THE SPEARGUN AT YOURSELF OR ANYONE ELSE. VIOLATION OF THIS WARNING COULD RESULT IN SERIOUS INJURY OR DEATH.

4. Remove the hand pump from the inlet valve.

**COMPETITION PNEUMAT
IC SPEARGUN**

mares®

▶ DISASSEMBLY:

1. Remove protective cover (6) (if any) from head (1-2-3-5) (see numbered Competition schematic).
2. Unscrew inlet cap (33) using a 6 mm. Allen wrench.

WARNING!

ALWAYS EXHAUST ALL AIR FROM THE SPEARGUN WITH THE POWER ADJUSTMENT LEVER IN THE MAXIMUM "HIGH" POWER POSITION BEFORE PERFORMING ANY MAINTENANCE OR REPAIRS REQUIRING DISASSEMBLY (FIG. 1). FAILURE TO EXHAUST ALL AIR FROM THE SPEARGUN IN THE MAXIMUM "HIGH" POWER POSITION CAN CAUSE PARTS TO BE EXPELLED FROM THE SPEARGUN AT HIGH VELOCITY WHICH MAY CAUSE SERIOUS INJURY OR DEATH.

3. Set the power adjustment lever (38) to maximum "high" power position (Fig. 1).
4. With a metal rod (approximately 1.5 mm. diameter), depress the inlet valve ball, until all the air is fully released from the speargun (Fig. 2).

NOTE

IT IS NORMAL FOR A SMALL AMOUNT OF OIL TO BE PRESENT AS THE AIR IS RELEASED FROM THE SPEARGUN. BEFORE RELEASING THE AIR, POSITION THE SPEARGUN IN A MUZZLE DOWN POSITION FOR SEVERAL MINUTES. THIS WILL MINIMIZE THE AMOUNT OF OIL RELEASED WHEN THE INLET VALVE BALL IS DEPRESSED. A SHOP RAG POSITIONED OVER THE INLET VALVE MAY BE USEFUL IN CAPTURING ANY OIL WHICH MAY BE RELEASED DURING THIS PROCEDURE

5. Using a vise, clamp the head (1-2-3-5) in the 24 mm. jaws (A-1) (Fig. 3). Remove the head by holding the handle and the nose cone and simultaneously turning them counter-clockwise using equal effort (Fig. 4).

CAUTION!

THE HANDLE AND NOSE CONE MUST BE TURNED SIMULTANEOUSLY USING EQUAL EFFORT OR INTERNAL DAMAGE TO THE GUN WILL RESULT FIG. 4.

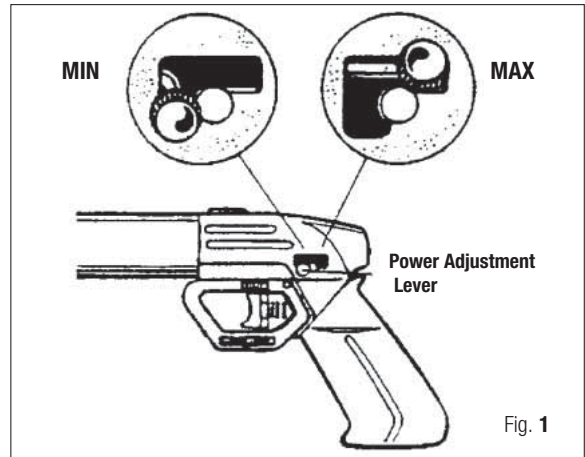


Fig. 1

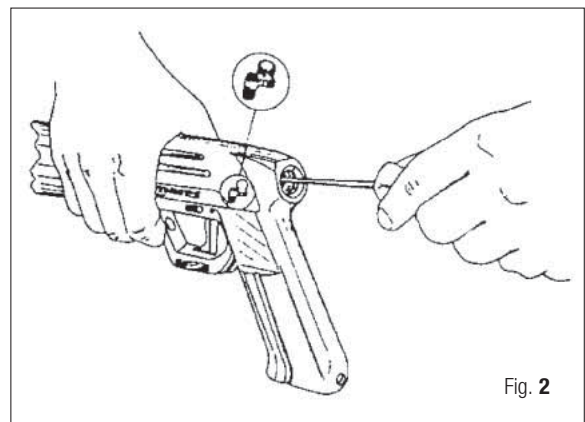


Fig. 2

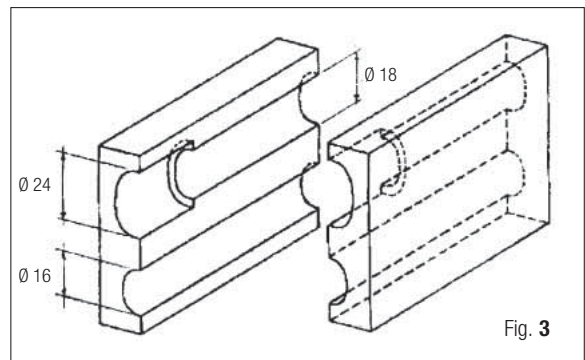


Fig. 3

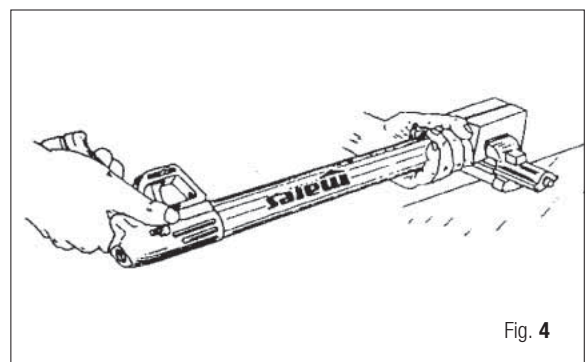


Fig. 4

6. Clamp the head in the 24 mm. jaws (A-1) (Fig. 3) and remove head tip (5) from head body (1) with a 19 mm. wrench (Fig. 5).
7. Remove shock absorber (2) and insert (3) from head body.
8. Remove shock absorber (2) from shock absorber insert (3).
9. Remove piston (17-18-19) from the barrel. If necessary a shaft may be used to aid in the removal of the piston (Fig.6).
10. Remove oil wiper (19) and O-ring (18) from piston (Fig. 6).
11. Using a rotating motion, remove the nose cone (4) and O-ring (20).
12. Drain the oil contained in the speargun into a suitable container. Dispose of waste oil properly by taking it to a waste oil recycling facility.
13. Using a rotating motion remove the tank (25), using clamping jaws (A-3) if needed.
14. Place the barrel in the 18 mm. jaws (A-1) (Fig. 3) and clamp into vise.
15. Remove barrel O-ring (22) with tool A-7.
16. Using snap ring pliers remove the barrel bushing (21).
17. If necessary remove the grip by gently sliding it off the handle.
18. Remove trigger pin (53) using a pin punch, then remove trigger (48-52-75).
19. Remove the trigger adjustment screw (48) from trigger body (52) with a 6 mm. wrench.
20. Remove the trigger insert (75) by depressing the locking tab and sliding it out of the trigger body (52).

NOTE IT IS NOT NECESSARY TO REMOVE THE TRIGGER ADJUSTMENT (48) OR THE TRIGGER INSERT (75) FROM THE TRIGGER BODY (52) DURING ROUTINE SERVICING, UNLESS THEY ARE TO BE REPLACED.

21. Remove the safety (49) by sliding it out of the handle (41).
22. Remove connecting plunger (45) with special tool A-13 (Ø 3 mm) or needle nose pliers.
23. For Competition Line Spearguns starting from serial number 92296000 forward, remove connecting plunger bushing (47) using tool A22 (Fig. 7).
24. For Competition Line Spearguns with serial numbers 92289000 and prior, remove snap fork (74) by inserting, simultaneously, 2 small screwdrivers or punches through the holes on either side of the handle. Slightly depress snap fork with screwdrivers or punches and lift upward (Fig. 8).
25. Remove connecting plunger O-ring (77).

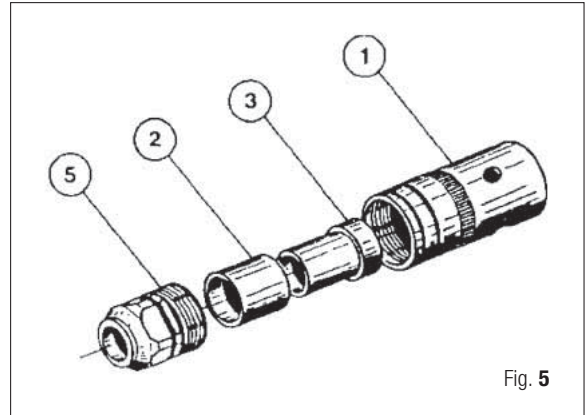


Fig. 5

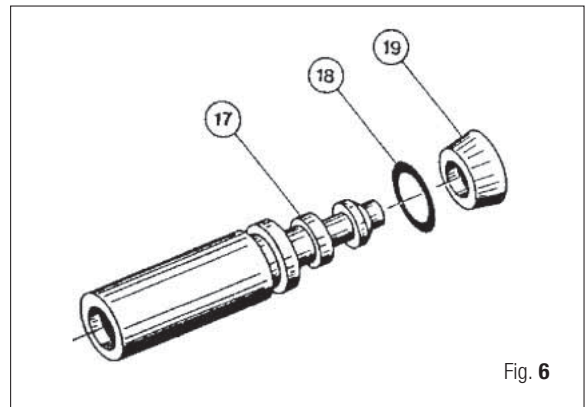


Fig. 6

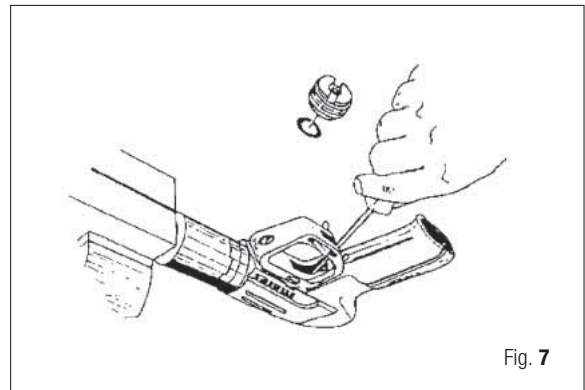


Fig. 7

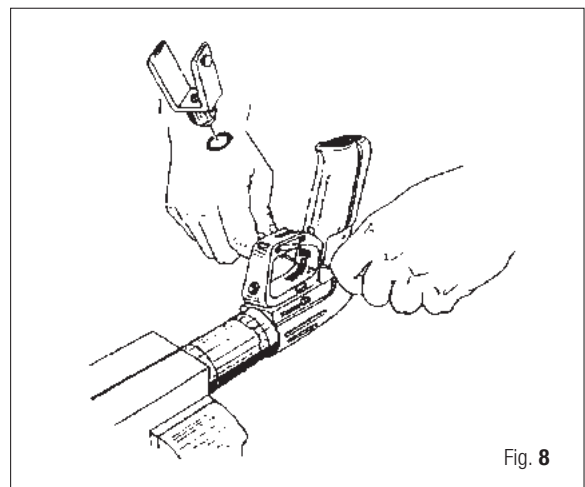


Fig. 8

26. Remove line retainer pin (43) with a pin punch, then remove line retainer (42).

NOTE IT IS NOT NECESSARY TO REMOVE THE LINE RELEASE DURING ROUTINE SERVICE UNLESS THE LINE RELEASE IS WORN, DAMAGED OR DOES NOT SWIVEL FREELY ON THE LINE RELEASE PIN.

27. Remove inlet valve (32-46-65-66-67) with inlet valve wrench (A 4).
28. With a Philips screwdriver, remove the inlet bushing (67) and spring (66) (Fig. 9).
29. Remove ball (65) from the inlet valve body (32).
30. Remove O-ring (46) from the inlet valve body.
31. Slide handle (41) rearward off of the barrel (26).
32. Remove O-ring (37) from O-ring seat (39) of the power adjustment rod.
33. With a 7 mm wrench, unscrew power adjustment rod (34-35-37-39) from power adjustment lever (38).

NOTE IF THE O-RING SEAT (39) UNSCREWS FROM POWER ADJUSTMENT ROD (35), THE ROD MUST BE COMPLETELY REMOVED FROM POWER ADJUSTMENT LEVER (38) BY CLAMPING THE ROD WITH PLASTIC JAWS AND ROTATING THE HANDLE COUNTER-CLOCKWISE TO UNSCREW THE POWER ADJUSTMENT ROD. AFTER REMOVING THE POWER ADJUSTMENT ROD PUT A DROP OF O-RING COMPOUND (LOCTITE 270) IN THE THREADED HOLE OF O-RING SEAT (39) AND TIGHTEN IT SECURELY ON THE POWER ADJUSTMENT ROD (35).

34. Remove power adjustment rod (35-39) and spring (34) from handle (41).
35. Remove spring (34) from power adjustment rod.
36. Remove power adjustment lever (38) from handle (41).
37. Remove the power adjustment rod bushing (36) and O-ring (37) from handle.
38. Remove O-ring (20) from handle.
39. With a pin punch, remove catch hook pin (53), catch hook (50) and spring (44) from the barrel (26).
40. Slide the power regulating block (20-68-69-70) off of the barrel.
41. Remove one-way housing (69) and one-way seat (68) from power regulating block (Fig. 10).
42. Remove O-ring (20) from power regulating block.
43. Remove O-ring (71) from barrel with tool A-7.
44. Remove snap ring (72).

NOTE IT IS NOT NECESSARY TO REMOVE THE SNAP RING (72) DURING ROUTINE SERVICE, UNLESS IT OR THE BARREL IS TO BE REPLACED.

45. Remove barrel (26) from the jaws.

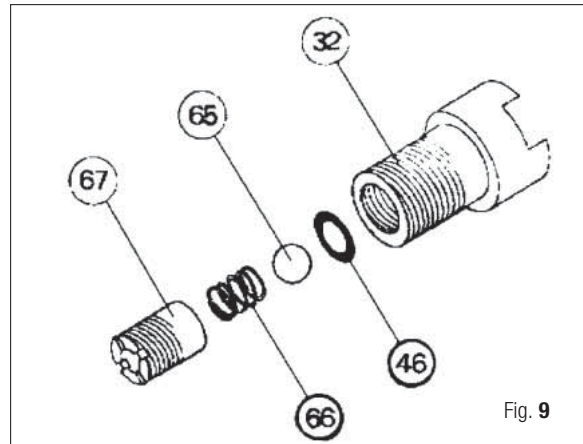


Fig. 9

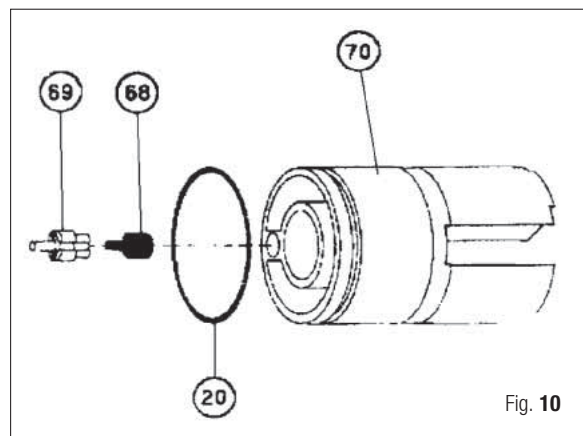


Fig. 10

► CLEANING

The parts used to manufacture MARES spearguns do not require special cleaning. Acids or solvents should not be used to clean any speargun parts. A clean shop rag can be used to remove any oil or grease that remains on the parts prior to inspection.

► INSPECTION

All O-rings should be replaced during routine servicing (maintenance kit part # 163979). If the following parts are not replaced, they should be inspected with a jeweler's loop or similar magnifying device, for the flaws listed below. Replace any part with these flaws.

Barrel (26) (part # depending on the model)	Inspect for any scratches or foreign material inside the barrel. Then check the outer surface for scratches and or chips around the o-ring sealing areas.
Barrel bushing (21) (part # 163665)	Inspect for any signs of cracks, distortion or brittleness.
Snap ring (72) (part #163518)	Inspect for any signs of cracks, distortion or brittleness.
Oil wiper (19) (part # 163866)	Inspect for any cuts, distortion or foreign material. Any of these flaws may cause leakage.
Shock absorber (2) (part # 163856)	Inspect for any signs or cuts or distortion.
Shock absorber insert (3) (part # 163409)	Inspect for any cracks or distortion.
Piston (17) (part # 163608)	Inspect for any cracks or distortion.
Power regulating block (70) (part # 163637)	Inspect for any cracks or distortion.
One-way seat (68) (part # 163635)	Inspect for any signs of cracks or distortion.
Power adjustment rod (35) (part # 163328)	Inspect the surface of the rod for scratches, distortion or cracks. Also make sure that the o-ring seat (39) is securely tightened on the power adjustment rod.
Handle (41) (part # 163657 w/power adjustment) (part # 163658 w/power adjustment)	Inspect for any cracks or distortion. Check all o-ring seating surfaces for any signs of scratches, distortion or cracks.
Connecting plunger (45) (part # 163674, 2 mm.) (part # 163344, 3 mm.)	Inspect the surface for distortion or scratches.
Catch hook (50) (part # 163377)	Inspect the surface of the catch hook that engages the piston for any signs of wear. Replace the catch hook if any signs of wear are present.
Inlet valve (32) (part # 163429)	Inspect the seating and sealing surfaces for cracks, scratches, distortion or foreign material.
Springs	Inspect for any signs of distortion.
O-rings (maintenance kit part # 163979)	Inspect for any cuts, distortion or foreign material. Any of these flaws may cause leakage.
Shaft (part depending on the model)	Inspect the shaft for straightness and corrosion. Check the tapered shaft sleeve, washer and line retainer for wear and replace with original Mares parts if necessary.

CAUTION!

REPLACE ANY PARTS WITH DAMAGED THREADS. ALL THREADED PARTS MUST BE CLEAN AND IN GOOD CONDITION. INSTALLING ANY PART WITH DAMAGED THREADS MAY CAUSE IT TO CROSS THREAD RESULTING IN DAMAGE TO THE SPEARGUN.

REASSEMBLY

NOTE BEFORE REASSEMBLY, LIGHTLY LUBRICATE ALL O-RINGS WITH MARES GREASE (MOBIL PLEX 47 OR EQUIVALENT). LUBRICATING O-RINGS BEFORE INSTALLATION WILL MINIMIZE THE RISK OF DAMAGE TO THE O-RINGS DURING REASSEMBLY.

1. Place the barrel in the 16 mm. jaws (A-1) (Fig. 3) and clamp into vise (Fig. 11).
2. Install the barrel bushing (21) in the groove of the barrel with tool A-9, being sure that the side of the bushing with the smaller diameter is towards the handle of the gun. (Fig. 11-A).
3. Place O-ring (22) against the barrel bushing (21) with tool A-9 (Fig. 11-A).
4. Using tool A-7, install the snap ring (72) into the groove of the barrel, with the square tab facing the front (muzzle end) of the barrel (Fig. 11-B).

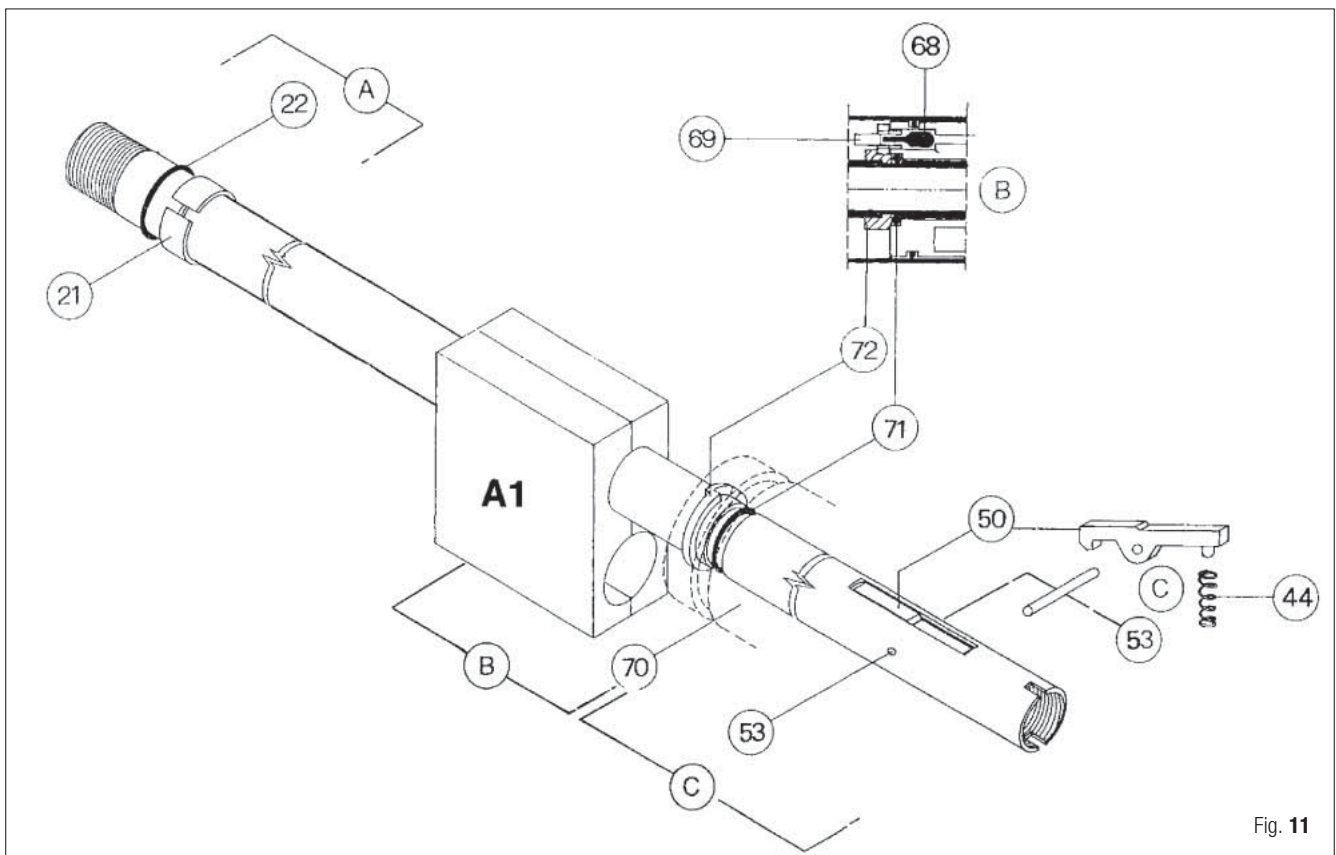


Fig. 11

5. Place o-ring (71) in the groove of the barrel next to the snap ring (72) with tool A-7 (Fig. 11-B).
6. Insert the one-way seat (68) into the power regulating block (70) (Fig. 10).
7. Position the one-way housing (69) over the one-way seat (68) and press into place (Fig. 12).
8. Place O-ring (20) into the groove of the power regulating block (70) (Fig. 12).
9. Slide the power regulating block into position over O-ring (71). Rotate the snap ring and/or power regulating block as needed to align the one-way housing (69) with the snap ring seat. (Fig 11-B).
10. Install spring (44) onto catch hook (50) (Fig. 11-C).
11. Install catch hook (50) with spring (44) attached, into the barrel and align the hole in the catch hook with the holes in the barrel and install the catch hook pin (53) (Fig. 11-C).
12. Using an appropriate length shaft with piston (A-16, part # 163608) attached, slide the piston and shaft into the barrel until it engages the catch hook. Make sure that the catch hook spring is positioned into its seat.
13. Place O-ring (20) into the groove of the handle (41).

NOTE IF THE O-RING SEAT (39) WAS REMOVED FROM THE POWER ADJUSTMENT ROD (35), PUT A DROP OF THREAD COMPOUND (LOCTITE 270) IN THE THREADED HOLE OF O-RING SEAT (39) AND TIGHTEN IT SECURELY ON THE POWER ADJUSTMENT ROD (35).

14. Slide spring (24) onto power adjustment rod.
15. Slide power adjustment rod bushing (36) onto the power adjustment rod, with the smaller diameter facing away from the O-ring seat (39).
16. Place O-ring (37) onto power adjustment rod against the power adjustment rod bushing (36).

NOTE PLACE A DROP OF THREAD COMPOUND (LOCTITE 242) ON THE THREADS OF THE POWER ADJUSTMENT ROD.

17. Insert the power adjustment rod into its hole in the handle (41), press O-ring (37) and power adjustment rod bushing (36) into handle.
18. Insert the power adjustment lever (38) into its housing in the handle, then with a 7 mm wrench, gently tighten the power adjustment rod onto the power adjustment lever.
19. Place O-ring (37) into the groove of the O-ring seat (39) using tool (A-12).
20. Slide handle (41) onto barrel (26).

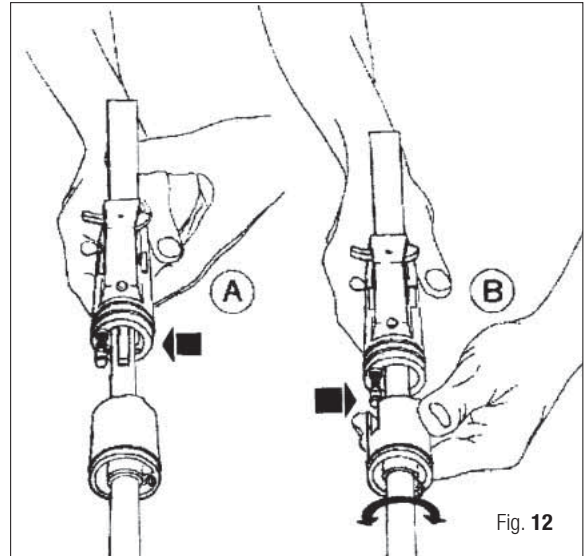


Fig. 12

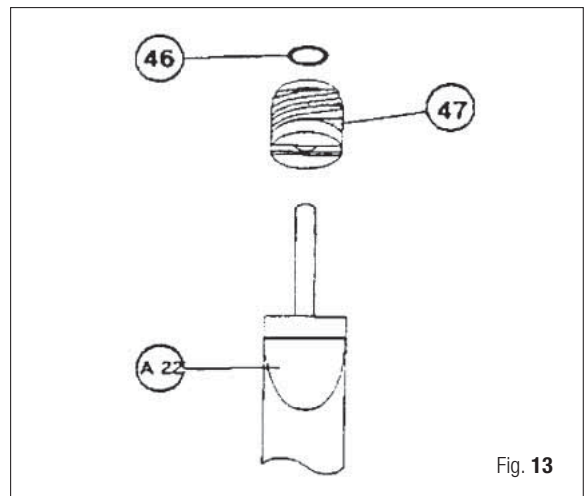


Fig. 13

NOTE POSITION THE HANDLE (41) WITH THE TRIGGER SEAT ABOVE THE CATCH HOOK (50) (FIG. 12-A). ALIGN THE POWER ADJUSTMENT ROD WITH THE CORRESPONDING HOLE IN THE POWER REGULATING BLOCK. IF NECESSARY, ROTATE THE POWER REGULATING BLOCK, MAKING SURE THE ONE-WAY HOUSING REMAINS IN THE SNAP RING SEAT (FIG. 14-B). PUSH THE HANDLE AGAINST THE POWER REGULATING BLOCK AND MAKE SURE THAT THE POWER REGULATING BLOCK TABS ARE POSITIONED IN THEIR SEATS IN THE HANDLE.

21. Position o-ring (46) in inlet valve body (32) seat, with tool (A-13) (Fig. 9).
22. Center the inlet ball (65) on o-ring (46).
23. Place spring (66) inside of the inlet bushing (67).

NOTE APPLYING A SMALL AMOUNT OF GREASE ON THE SPRING (66) WILL RETAIN THE SPRING IN THE INLET BUSHING (67) DURING ASSEMBLY.

24. Tighten inlet bushing (67) into valve body (32) using a Philips screwdriver.

NOTE APPLY TWO OR THREE DROPS OF THREAD COMPOUND (LOCTITE 242) TO THE THREADS OF THE INLET VALVE.

25. Insert the inlet valve into handle using the inlet valve wrench (A4) and tighten securely.

! WARNING!

FAILURE TO SECURELY TIGHTEN THE INLET VALVE MAY CAUSE PARTS TO BE EXPELLED FROM THE SPEARGUN AT HIGH VELOCITY WHEN THE GUN IS PRESSURIZED, WHICH MAY CAUSE SERIOUS INJURY OR DEATH.

26. Insert the line release (42) into the handle with the line release lever oriented towards the same side as the power adjustment lever. Align the hole in the line release (42) with the hole in the handle and install line release pin
27. On Competition Line guns starting from serial number 92296000 forward, place bushing (47) and o-ring (46) on tool A-22 (Fig. 15).
28. Insert bushing (47) and o-ring (46) into the handle (41). Gently tighten the bushing (47) into its housing in the handle with tool A-22.

△ CAUTION!

TORQUE BUSHING (47) TO 80 N/CM. (7 lbs.in. approx.) OVER TIGHTENING THE BUSHING MAY RESULT IN DAMAGE TO THE HANDLE CAUSING LEAKAGE.

29. On guns prior to serial number 92289000, place the o-ring (46) into the handle insuring that it is positioned in its seat then install the snap fork (74). Be sure that the snap fork locks into place.
30. Insert the rounded end of the connecting plunger (45) into the bushing (47) or snap fork (74) using special tool A-13 (Ø 3mm) or needle nose pliers.
31. Insert the safety with the fluorescent tab oriented towards the same side as the power adjustment lever, making sure that the notch in the safety faces the trigger.
32. Install trigger adjustment screw (48) and trigger insert (75) into trigger body (52) (Fig. 14). With a 6 mm wrench, tighten trigger adjustment screw (48) into trigger body (52), until the 6 mm. hex protrudes approximately 4 mm.
33. Align the hole in the trigger with the holes in the handle (41) and install trigger pin (53).
34. If the grip was removed gently slide it onto the handle.
35. Pull trigger and remove shaft with piston (A-16) attached.
36. Remove piston (A-16, part # 163608) from the shaft.
37. Open the jaws and remove barrel (26).
38. With a rotating motion, install tank (25) using jaws (A-3) if necessary.
39. Fill the barrel (26) with oil, according to the quantities shown in the table below.

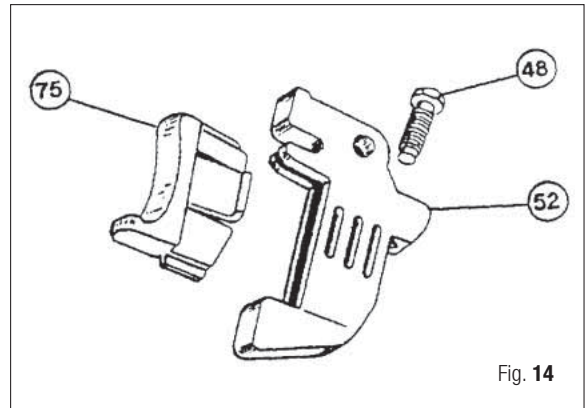


Fig. 14

⚠ CAUTION!

USE ONLY CORROSION AND RUST PREVENTING OILS, SUCH AS MOBIL DTE OIL LIGHT OR SAE 10 W OILS SUITABLE FOR USE IN HYDROPNEUMATIC SYSTEMS. DO NOT USE GRAPHITE BASE OILS! THE USE OF OILS NOT SPECIFIED FOR USE IN HYDROPNEUMATIC SYSTEMS MAY LEAD TO PREMATURE GUN DAMAGE DUE TO INTERNAL CORROSION.

SPEARGUN	OIL QUANTITY IN CC
STEN-MINIMINI	15
STEN-MINI	20
STEN-MEDI	20
OTHER MODELS	30

40. Install the oil wiper (19) on piston making sure that the lip of the oil wiper faces the metal post of the piston.
41. Insert piston into barrel using caution not to damage oil wiper.
42. Install o-ring (20) onto the nose cone (4).
43. Using a rotating motion insert the nose cone (4) into tank (25) and align the nose cone sight with the sight on the handle.

44. Insert the shock absorber insert (3) into the shock absorber (2) (Fig. 5).
45. Install shock absorber (2) and shock absorber insert (3) into the head body (1) with the shock absorber facing the head tip (5) (Fig. 5).
46. Clamp the head body in the 24 mm. jaws (A-1) (Fig. 3)
47. Apply anti-corrosion grease to the threads of the head tip (5). Tighten the head tip into head body (1) with a 19 mm. wrench (Fig. 5).
48. Apply anti-corrosion grease to the threads of the head body (1) and install head.
49. Clamp the head (1-2-3-5) in the 24 mm. jaws (A-1) (Fig. 3). Tighten the head by holding the handle and the nose cone and simultaneously turning them clockwise using equal effort (Fig. 4).



CAUTION!

THE HANDLE AND NOSE CONE MUST BE TURNED SIMULTANEOUSLY USING EQUAL EFFORT OR INTERNAL DAMAGE TO THE GUN WILL RESULT (FIG. 4).

50. Remove speargun from jaws .
51. The speargun is now ready to be pressurized. Follow the instructions in the Pressurizing section of this manual.



PERFORM STEPS 53 AND 54 BELOW, AFTER PRESSURIZING, TESTING AND TRIGGER ADJUSTMENT (IF ANY), AS DESCRIBED IN THE FOLLOWING SECTIONS OF THIS MANUAL.

52. Install inlet valve cap (33) using a 6 mm Allen wrench.
53. Install protective cover (6) (if any) on head (1-2-3-5).

PRESSURIZING

Competition pneumatic spearguns can be pressurized using the Mares gun charging yoke (part #413807) or a Mares hand pump (part #423901).

1. Screw the open end of the high pressure hose into the high pressure port of a first stage regulator (Fig 1).
2. Mount the first stage regulator onto a scuba tank (Fig 2). The tank should be filled to a pressure of at least 30bar/425psi in order to reach the same pressure in the pneumatic gun. A lower tank pressure will result in a lower pressure in the pneumatic gun.

PNEUMATIC GUN LOADER



WARNING!

USE ONLY SCUBA TANKS FILLED WITH AIR.

3. Screw the threaded end of the main body of the power loader all the way (finger tight) onto the back of the pneumatic gun (Fig 3A).
4. If a power adjusting system is present, ensure that it is set to maximum power (Fig.3B)

**WARNING!**

WHEN LOADING THE PNEUMATIC GUN, IT IS VERY IMPORTANT THAT THE POWER ADJUSTING SYSTEM IS SET TO MAXIMUM POWER. NEVER EXCEED THE MAXIMUM PRESSURE OF 30BAR. A PRESSURE IN EXCESS OF 30BAR CAN LEAD TO SERIOUS INJURY OR DEATH AND/OR IT CAN LEAD TO DAMAGE TO THE EQUIPMENT.

5. Keep the power loader turned in such a way that the pressure gauge points away from you, then slowly open the valve on the scuba tank.

**WARNING!**

PNEUMATIC GUNS ARE PRESSURIZED SYSTEMS. NEVER POINT A PNEUMATIC GUN AT YOURSELF OR AT ANYONE ELSE. FAILURE TO DO SO MAY LEAD TO SERIOUS INJURY OR DEATH.

6. If you want to charge a gun to less than 30bar, close the tank valve when the pressure gauge reaches the desired pressure.
7. You will hear the air hissing as it is gradually charging the gun until the relief valve pops. Charging a 100cm gun takes approximately 30s, different lengths will take proportionally more (longer guns) or less (shorter guns).
8. When you have finished charging the gun, close the tank valve and unscrew the power loader from the back of the gun.

**WARNING!**

USE WITH MARES PNEUMATIC GUNS ONLY.

► PRESSURIZING USING MARES HAND PUMP (PART #691101)

**WARNING!**

ALWAYS PRESSURIZE THE SPEARGUN WITH THE POWER ADJUSTMENT LEVER IN THE MAXIMUM "HIGH" POWER POSITION (FIG. 1). NEVER EXCEED THE MAXIMUM 30 BAR PRESSURE. FAILURE TO PRESSURIZE THE SPEARGUN IN THE MAXIMUM "HIGH" POWER POSITION OR OVER-PRESSURIZATION MAY CAUSE THE SPEARGUN TO RUPTURE WHICH MAY CAUSE SERIOUS INJURY OR DEATH.

1. Set the power adjustment lever (38) to maximum "high" power position (Fig. 1).
2. By hand, thread the hand pump into the inlet valve of the speargun, until the hand pump o-ring seals against the inlet valve body.

MODEL	LENGTH CM	PRESSURE TANK (bar)				
		10	15	20	25	30
		NUMBER OF PUMP (Approx.)				
STEN-MINIMINI	42	50	75	100	130	170
STEN-MINI	58	100	150	200	250	310
STEN-MEDI	71,5	100	150	250	350	470
STEN LONG	84	150	200	275	375	520
STEN	92	200	250	300	400	570
SUPERSTEN	100	300	350	400	500	660
STEN L	119	345	400	460	575	715
STEN 133	126	300	400	500	600	810

! WARNING!

THE NUMBER OF PUMP STROKES LISTED IN THE PRESSURE TABLE REFER TO A COMPLETELY EMPTY SPEARGUN TANK. IF IT IS NOT POSSIBLE TO DETERMINE THE EXISTING PRESSURE IN THE SPEARGUN, ALL PRESSURE MUST BE RELEASED FROM THE SPEARGUN PRIOR TO PRESSURIZING IT. IF THE EXISTING PRESSURE IN THE SPEARGUN IS KNOWN AND IT BECOMES NECESSARY TO ADD PRESSURE, ONLY INCREASE IT THE AMOUNT OF THE DIFFERENCE. FOR EXAMPLE, TO INCREASE THE PRESSURE OF A FRONTIERSMAN FROM 20 BAR TO 30 BAR, 200 PUMP STROKES ARE REQUIRED NOT THE FULL 470 PUMP STROKES SHOWN IN THE TABLE. NEVER EXCEED THE MAXIMUM 30 BAR PRESSURE. OVER-PRESSURIZATION MAY CAUSE THE SPEARGUN TO RUPTURE WHICH MAY CAUSE SERIOUS INJURY OR DEATH. PNEUMATIC SPEARGUNS ARE HIGHLY PRESSURIZED. NEVER POINT THE SPEARGUN AT YOURSELF OR ANYONE ELSE. VIOLATION OF THIS WARNING COULD RESULT IN SERIOUS INJURY OR DEATH.

3. The following pressure table shows the approximate number of pump strokes required to obtain the pressure values listed.
4. Remove the hand pump from the inlet valve.

SPEARGUN INSPECTION AND ADJUSTMENT

To insure the gun is functioning correctly, inspection and adjustment may be needed. The following inspection and adjustment procedures must be performed with the greatest care and attention.

! WARNING!

FOR THE NECESSARY INSPECTION TO BE PERFORMED, THE SHAFT MUST BE INSERTED INTO THE SPEARGUN. FOR YOUR SAFETY, FASTEN THE SHAFT INTO A FLOOR BASE. WHEN THE SHAFT IS INSERTED, ALWAYS MAINTAIN PRESSURE ON THE SPEARGUN WITH BOTH HANDS AND KEEP THE HANDLE UNDER YOUR SHOULDER (FIG. 15-A), NEVER UNDER YOUR FACE (FIG. 15-B). DO NOT PERFORM ANY ADJUSTMENT OR LEAVE THE GUN UNATTENDED WHEN THE SHAFT IS INSERTED. FAILURE TO FASTEN THE SHAFT INTO A FLOOR BASE OR MAINTAIN PRESSURE ON THE SPEARGUN WITH BOTH HANDS AND KEEP THE HANDLE UNDER YOUR SHOULDER (FIG. 15-A) WHEN THE SHAFT IS INSERTED, COULD RESULT IN THE SPEAR SHAFT AND/OR SPEARGUN BEING PROPELLED UNCONTROLLABLY, IF THE TRIGGER IS PULLED OR THE SPEARGUN FIRES UNEXPECTEDLY AND COULD RESULT IN SERIOUS INJURY OR DEATH.

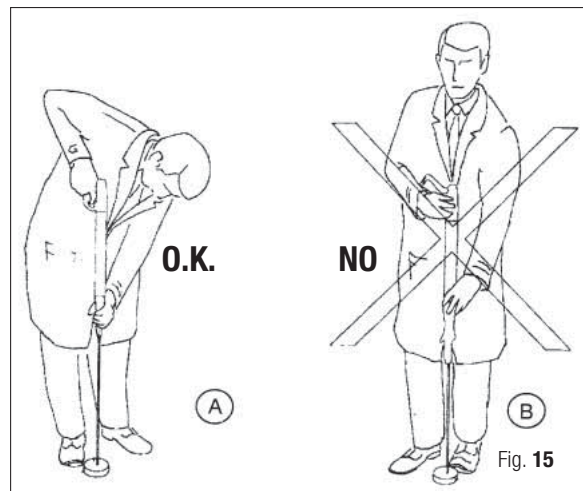


Fig. 15

A floor base can be made from a piece of metal that is 120 mm. (4.75 in.) in diameter and 30 mm. (1.25 in.) thick. Locate the center point of the floor base and drill a hole 16 mm. (5/8 in.) in depth with a 6.20 mm. bit. Thread the hole using a M 7 x 1 tap (Fig. 16).

NOTE THE VARIOUS INSPECTION STEPS MAY BE PERFORMED CONSECUTIVELY.

▶ O-RING INSPECTION

1. Immerse the speargun in water and watch for signs of air leakage from o-rings and sealing items.

▶ TRIGGER STROKE INSPECTION

1. Using a floor base, insert the shaft until the piston engages the catch hook (Fig. 15-A).
2. Pull the trigger until the piston disengages. Measure the trigger stroke. The trigger stroke should be a minimum of 3 mm. to a maximum of 7 mm. If the trigger stroke does not fall within 3 mm. minimum to 7 mm. maximum, the trigger sensitivity will need to be adjusted.
3. Remove shaft from speargun.

▶ TRIGGER SENSITIVITY ADJUSTMENT

! WARNING!

FOR CORRECT TRIGGER RELEASE SENSITIVITY, THE TRIGGER STROKE SHOULD BE SET FROM 3 MM MINIMUM TO 7 MM MAXIMUM. WHENEVER TRIGGER SENSITIVITY IS ADJUSTED, MAKE SURE THAT THE PISTON FULLY ENGAGES THE CATCH HOOK. OVER-ADJUSTMENT MAY CAUSE THE PISTON NOT TO ENGAGE OR TO PARTIALLY ENGAGE THE CATCH HOOK AND MAY CAUSE THE SPEARGUN TO DISCHARGE UNEXPECTEDLY WHICH MAY CAUSE SERIOUS INJURY OR DEATH.

1. Move the safety to the "safe" position.
2. Insert a small screwdriver into the trigger adjustment screw (48).
 - a. Turn the trigger adjustment screw counterclockwise to decrease sensitivity.
 - b. Turn the trigger adjustment screw clockwise to increase sensitivity.
3. Measure trigger stroke and repeat steps as needed to obtain the correct adjustment.

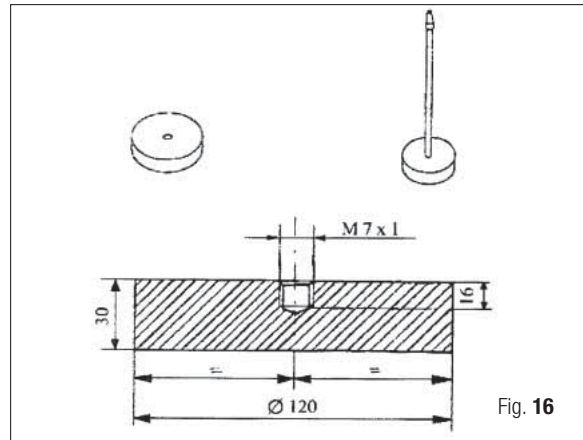


Fig. 16

▶ **SAFETY INSPECTION**

1. Using a floor base, insert the shaft until the piston engages the catch hook (Fig. 15-A).
2. Move the safety to the “safe” position.
3. Pull the trigger. The trigger should be locked in position and the speargun should not fire.
4. Move the safety to the “fire” position.
5. Pull the trigger and remove the shaft from the speargun.

▶ **POWER REGULATOR INSPECTION**

1. Set the power adjustment lever (38) to minimum “low” power position (Fig. 1).
2. Using a floor base, insert the shaft until the piston engages the catch hook (Fig. 15-A).
3. Pull the trigger, take note of the effort exerted by the speargun and remove the shaft from the speargun.
4. Leave the power adjustment lever (38) in minimum “low” power position (Fig. 1), for approximately 2 hours.
5. Using a floor base, insert the shaft until the piston engages the catch hook (Fig. 15-A). The effort exerted by the speargun should be the same as it was 2 hours previous. A decrease in the effort would indicate a leak in the speargun. An increase in effort would indicate an internal leak past the power regulating block.
6. Pull the trigger and remove the shaft from the speargun.
7. Set the power adjustment lever (38) to maximum “high” power position (Fig. 1).

RE:
INSERT DEMAND LEVER #46200992

ITM23

MARES S.P.A TECHNICAL SUPPORT WISHES TO NOTIFY MARES LAB CENTERS AND TECHNICIANS OF A CHANGE MADE TO THE METAL INSERT DEMAND LEVER (# 46200774) USED IN PRESTIGE, PRESTIGE DPD, ROVER, AND CARBON SECOND STAGES.

THE NEW VERSION MAKES THE SECOND STAGE LIGHTER WEIGHT AND DELIVERS IMPROVED BREATHING COMFORT. THE CHANGE MADE WAS TO THE OVERMOULDING OF THE NYLON INSERT, AND CAN BE IDENTIFIED BY THE BLACK COLOR AS SHOWN IN THE PHOTO FOUND IN THE TECHNICAL INFORMATION. THE NEW OVERMOULDED DEMAND LEVER WILL REPLACE THE PREVIOUS VERSION, WHICH WILL BE AVAILABLE WHILE SUPPLIES LAST AND CAN BE REQUESTED AS A SPARE PART USING CODE: #46200992.

INITIALLY THE REGULATORS ON WHICH THE NEW INSERT DEMAND LEVER WILL BE ASSEMBLED CAN BE RECOGNIZED BY A SERIAL NUMBER AS SHOWN IN THE FOLLOWING TABLE:

PRODUCT CODE	DESCRIPTION	SERIAL NUMBER
416182	PRESTIGE 12S DIN	SM17670
416223	OCTOPUS PRESTIGE „SMU“	STE 10419
416223	PRESTIGE 12S INT „SMU“	STD 10419
416526	OCTOPUS PRESTIGE	PO 34301
416220	ROVER 2S INT	RS 12344
416505	OCTOPUS ROVER	RH 35320

2ND STAGE INSERT DEMAND LEVER



#46200774

#46200992

! WARNING!

MAINTENANCE OPERATIONS MUST BE PERFORMED BY QUALIFIED PERSONNEL AT A MARES TECHNICAL ASSISTANCE CENTER AND/OR AUTHORIZED MARES DISTRIBUTOR.

IN ORDER TO DISASSEMBLE AND REASSEMBLE THE SEAT FROM THE FIRST STAGE, IT IS NECESSARY TO CONSULT THE PROCEDURES DESCRIBED IN THE CORRESPONDING SECTION OF THE MAINTENANCE MANUAL (S-11).

IF THE UPDATED MANUAL CONTAINING THESE SECTIONS IS NOT AVAILABLE AND/OR IF THE INSTRUCTIONS ARE NOT CLEAR OR FULLY UNDERSTANDABLE, PLEASE CONTACT MARES S.P.A. TECHNICAL SUPPORT BEFORE PERFORMING ANY MAINTENANCE, ADJUSTMENT, OR INSPECTION OPERATIONS.

RE:
PARBAK BACKUP RING

ITM24

MARES TECHNICAL SUPPORT ANNOUNCES THAT FOLLOWING NUMEROUS TESTS, IT HAS ALTERED THE MATERIAL AND SHAPE OF THE BACKUP RING INITIALLY USED ON THE NAVY 22 REGULATORS.

THE NEW PARBAK BACKUP RING ENSURES EXCELLENT PERFORMANCE FOR FIRST STAGES, ESPECIALLY FOR DIVES IN EXTREMELY COLD WATERS ($\leq 0\text{ }^{\circ}\text{C}$).

AS SHOWN IN FIG. 1, THE NEW PARBAK BACKUP RING IS EASILY DISTINGUISHABLE FROM THE PREVIOUS TEFLON VERSION, THANKS TO THE BLACK COLOR OF THE NEW MATERIAL USED.

BOTH BACKUP RINGS WILL SOON BE INCLUDED IN ALL 1ST STAGE MAINTENANCE KITS, CURRENTLY IN USE, WHICH WILL BE IDENTIFIED BY "V.11" IN THEIR DESCRIPTION:

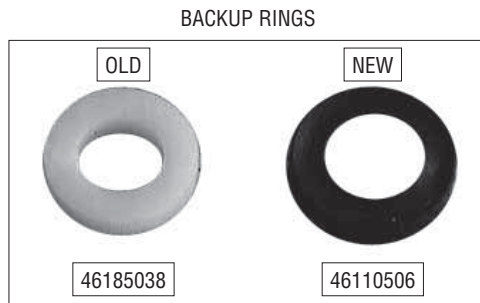


FIG.1

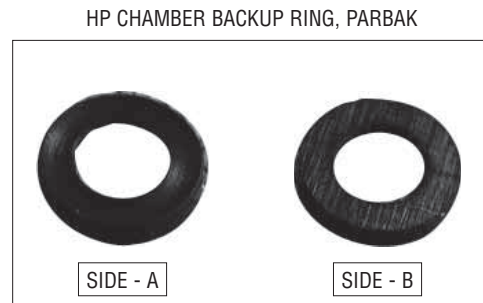
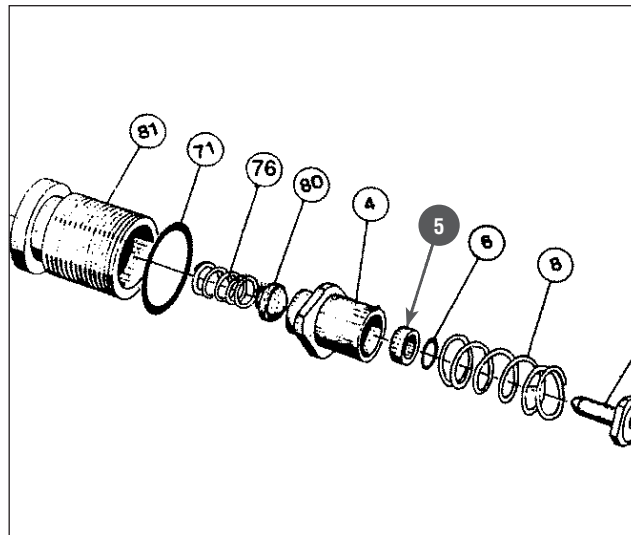


FIG.2



⚠ WARNING!

ITM 24 STATED THAT THE BACKUP RING 46110506 WHICH WENT TO SUBSTITUTE 46185038 WAS NOT RECCOMENDED FOR USE WITH NITROX. RECENTLY WE HAVE TESTED THE PARBAK BACKUP RING FOR COMPATIBILITY WITH 100% OXYGEN AT PRESSURE UP TO 200 BAR. HENCE WE ARE REVISING THE STATEMENT ON NITROX COMPATIBILITY OF THIS COMPONENT.

FOR EUROPEAN COUNTRIES NOTHING CHANGES, SINCE NON-NITROX REGULATORS ARE NOT TO BE USED WITH MIXES OTHER THAN AIR.

FOR NON-EUROPEAN COUNTRIES , THE USUAL RULE OF COMPATIBILITY UP TO 40% NITROX APPLIES NOW.

RE:
PARBAK BACKUP RING

ITM24

ASSEMBLY INSTRUCTIONS

MAKE SURE THAT ONCE INSERTED INTO THE BALANCING CHAMBER (4) THE BACKUP RING (5) HAS SIDE "A" (FIG. 2) FACING THE O-RING (6).

THE REGULATORS ON WHICH THE BACKUP RING (# 46110506) WILL BE INSTALLED CAN BE IDENTIFIED BY A SERIAL NUMBER, AS SHOWN IN THE TABLE BELOW:

PRODUCT CODE	DESCRIPTION	SERIAL NUMBER
416134	ABYSS 22 DIN	EA 29556
416134	ABYSS 22 INT	EA 29180
416182	PRESTIGE 12S DIN	SM 18279
416216	1° ST. MR22 DIN SMU	UM 11462
416158	ABYSS 22 NAVY DIN	NV 10196
416222	ABYSS 22 INT X SET 2	STA 11291
416209	1ST MR 12S DIN	SS 13965
416155	PRESTIGE 22 DPD DIN	GM 12500
416223	PRESTIGE 12S INT X SET D	STE 10419
416222	ABYSS 12S INT X SET 2	STB 11291
416182	PRESTIGE 12S INT	SM 18921

**WARNING!**

MAINTENANCE OPERATIONS MUST BE PERFORMED BY QUALIFIED PERSONNEL AT A MARES TECHNICAL ASSISTANCE CENTER AND/OR AUTHORIZED MARES DISTRIBUTOR.

IN ORDER TO DISASSEMBLE AND REASSEMBLE THE SEAT FROM THE FIRST STAGE, IT IS NECESSARY TO CONSULT THE PROCEDURES DESCRIBED IN THE CORRESPONDING SECTION OF THE MAINTENANCE MANUAL.

IN THE EVENT THAT THE UPDATED MANUAL CONTAINING THE SECTIONS INDICATED IS UNAVAILABLE, OR IF THE INSTRUCTIONS ARE UNCLEAR OR NOT ENTIRELY UNDERSTANDABLE, PLEASE CONTACT MARES BEFORE PERFORMING ANY MAINTENANCE, ADJUSTMENT, OR CHECK.

RE:
MR12S FIRST STAGE MODIFICATION

ITM25

MARES S.P.A. TECHNICAL SUPPORT WISHES TO NOTIFY ALL TECHNICIANS WORKING IN MARES LAB SERVICE CENTERS THAT, BEGINNING WITH THE 2012 COLLECTION, A NEW VERSION OF THE MR 12S FIRST STAGE WILL BE AVAILABLE.

WHILE PERFORMANCE AND RELIABILITY REMAIN UNCHANGED, THE NEW VERSION OF THE MR12S FIRST STAGE WILL BE EASIER TO MAINTAIN AND WILL DECREASE REPAIR TIME, ESPECIALLY IN THE "INT" VERSION.

THIS TECHNICAL SHEET PROVIDES ALL THE INSTRUCTIONS AND PROCEDURES NEEDED TO EASILY IDENTIFY THE FIRST STAGE VERSIONS SO THAT ORDERS CAN BE MADE CORRECTLY FOR INDIVIDUAL COMPONENTS AND THE VARIOUS KITS (MAINTENANCE AND DIN).



THE NEW FIRST STAGE WILL BE ASSEMBLED ON ALL ROVER 12S AND INSTINCT 12S REGULATORS. ON ALL PRESTIGE 12S THERE WILL BE A RUNNING CHANGE.



THE TWO VERSIONS WILL BE EASILY IDENTIFIABLE, BECAUSE THE PREVIOUS VERSION (2008) USES A DIFFERENT DIAPHRAGM RETAINING NUT, WHICH CREATES A GROOVE WITH THE BODY OF THE 1ST STAGE, AS SHOWN BY THE ARROW (PHOTO 1 AND PHOTO 5).



FOR MORE INFORMATION ABOUT REFERENCES AND/OR CODES, PLEASE CONSULT THE APPROPRIATE EXPLODED DIAGRAMS FOUND ON THE 2011 SPARE PARTS LIST (VERSION 2011: DIAGRAM #40 - TABLE E 117; VERS 2008 : DIAGRAM #35 - TABLE E 112).



ATTENTION!

MAINTENANCE OPERATIONS MUST BE PERFORMED BY AUTHORIZED PERSONNEL AT A MARES LAB TECHNICAL ASSISTANCE CENTER AND/OR AUTHORIZED MARES DISTRIBUTOR.

FOR DISASSEMBLY AND REASSEMBLY PROCEDURES, CONSULT THE PROCEDURES DESCRIBED IN THE CORRESPONDING SECTION OF THE MAINTENANCE MANUAL.

IF THE UPDATED MANUAL CONTAINING THESE SECTIONS IS NOT AVAILABLE AND/OR IF THE INSTRUCTIONS ARE NOT CLEAR OR FULLY UNDERSTANDABLE, PLEASE CONTACT MARES S.P.A. TECHNICAL SUPPORT BEFORE PERFORMING ANY MAINTENANCE, ADJUSTMENT, OR INSPECTION OPERATIONS.

RE:
MR12S FIRST STAGE MODIFICATION

ITM25


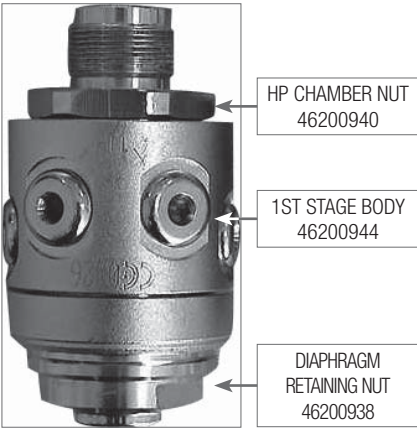

INTERNATIONAL VERSIONS		
2008 VERSION	PARTS AND VARIOUS COMPONENT CODES	KIT CODES
		 <p>DIN 300 CONNECTOR KIT #416807</p>
		<p>SERVICE KIT #46200963</p>

FIG.1

FIG.2


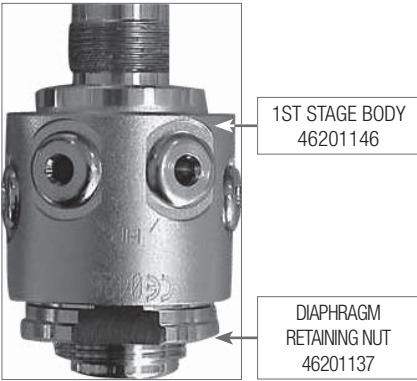

2011 VERSION	PARTS AND VARIOUS COMPONENT CODES	KIT CODES
		 <p>DIN 300 CONNECTOR KIT #416804 DIN 200 CONNECTOR KIT #416808</p>
		<p>SERVICE KIT #46201184</p>

FIG.3

FIG.4

RE:
MR12S FIRST STAGE MODIFICATION

ITM25



DIN VERSIONS		
2008 VERSION	PARTS AND VARIOUS COMPONENT CODES	NECESSARY KIT CODES
	 <p>1ST STAGE BODY 46200944</p> <p>DIAPHRAGM RETAINING NUT 46200938</p>	<p>SERVICE KIT #46200964</p>

FIG.5

FIG.6



2011 VERSION	PARTS AND VARIOUS COMPONENT CODES	NECESSARY KIT CODES
	 <p>1ST STAGE BODY 46201144</p> <p>DIAPHRAGM RETAINING NUT 46201137</p>	<p>SERVICE KIT #46200964</p>

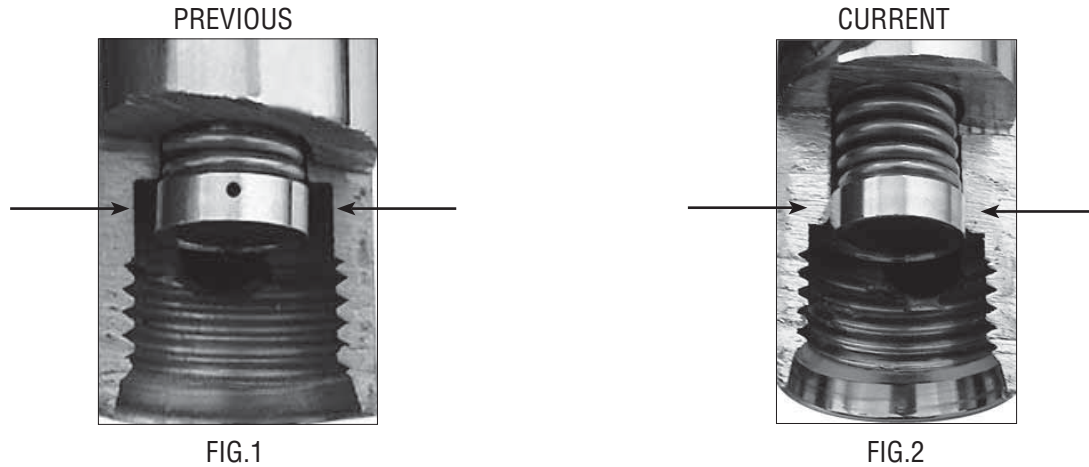
FIG.7

FIG.8

RE:
ABYSS SECOND STAGE CASE - ABYSS EXTREME/NAVY (CODE: 46201190-46201191)

ITM26

MARES S.P.A. TECHNICAL SUPPORT ANNOUNCES THAT IT HAS FURTHER IMPROVED THE PERFORMANCE OF ABYSS, ABYSS EXTREME/NAVY SECOND STAGES. THE NEW SECOND STAGE CASE HAS A MODIFIED CASE INLET FITTING CONNECTOR THAT ALLOWS THE SECOND STAGE VALVE TO BE MORE "GUIDED" INSIDE THE INLET FITTING DURING USE (PHOTOS 1 & 2), MINIMIZING THE RISK OF FREEFLOW. THIS INNOVATION GUARANTEES GREATER RELIABILITY FOR THE REGULATOR, ESPECIALLY IN EXTREME CONDITIONS.



THE NEW SECOND STAGE CASES CAN BE RECOGNIZED BY AN IDENTIFYING GROOVE AS SHOWN IN THE PHOTO.



RE:
ABYSS SECOND STAGE CASE - ABYSS EXTREME/NAVY (CODE: 46201190-46201191)**ITM26**

INITIALLY THE NEW SECOND STAGE CASE WILL BE ASSEMBLED ON THE FOLLOWING MODELS, BEGINNING WITH THE CONSECUTIVE SERIAL NUMBERS:

CODICE	DESCRIZIONE	S/N
416227	SET ABYSS 22 DIN	STF 11893
416134	ABYSS 22 DIN	EA 32826
416163	ABYSS 52 INT	AQ 12046
416504	OCTOPUS ABYSS	OY 19953
416536	OCT ABYSS EXTREME	XA 11727
416158	ABYSS 22 NAVY	NV 11506

*FOR ADDITIONAL INFORMATION PLEASE CONTACT TECHNICAL SUPPORT.

SPARE PARTS INFORMATION!

THE NEW SECOND STAGE CASES CAN BE USED AS REPLACEMENTS IN PREVIOUS 46200811 & 46200895 MODELS, WHICH WILL BE SOLD WHILE SUPPLIES LAST.

**ATTENTION!**

TO DISASSEMBLE, REASSEMBLE, ADJUST, OR CHECK THE SECOND STAGE CASE, CONSULT THE CORRESPONDING MAINTENANCE MANUAL UNDER SECTION S 12-1 / S 12-7

IF THE MANUAL IS UNAVAILABLE, PLEASE CONTACT MARES BEFORE PERFORMING ANY MAINTENANCE, ADJUSTMENT, OR TESTING PROCEDURE.

RE:
MV EXHAUST VALVE # 46201219

ITM27

MARES S.p.A. TECHNICAL SUPPORT WISHES TO INFORM ALL MARES LAB CENTERS AND TECHNICIANS THAT THE FOLLOWING CHANGES WILL BE MADE TO THE MV SECOND STAGE/OCTOPUS CODE (416523):

- 1) NEW EXHAUST VALVE (# **46201219**) (PHOTO 1 REF. A)
- 2) NEW EXHAUST TEE (# **46201220**) (PHOTO 2 REF. B)

THE NEW EXHAUST VALVE IS SLIGHTLY HARDER THAN THE PREVIOUS VERSION (#46184006), THEREBY ENSURING A PERFECT SEAL EVEN WHEN THERE IS A CURRENT. IT WILL BE ASSEMBLED BEGINNING WITH THE SERIAL NUMBERS INDICATED BELOW, AND WILL BE EASILY DISTINGUISHABLE FROM THE PREVIOUS VERSION BY THE NEW COLOR (GREY) (PHOTO 1, REF. A).

THANKS TO ITS NEW STREAMLINED SHAPE, THE NEW EXHAUST TEE AND THE INTERNAL BAFFLES (PHOTO 2 REF. B) IMPROVE BOTH APPEARANCE AND PERFORMANCE DURING THE EXHALE (AIR RELEASE). THE NEW TEE WILL BE ASSEMBLED WITH THE IN-LINE EXCHANGE SYSTEM AS SOON AS STOCK OF THE PREVIOUS VERSION IS EXHAUSTED (PHOTO 2 REF. A).



FIG.1

FIG.2

THE REGULATORS ON WHICH THE NEW EXHAUST VALVE AND NEW TEE ARE ASSEMBLED CAN BE RECOGNIZED BY SERIAL NUMBER, AS SHOWN IN THE TABLE BELOW:

PRODUCT CODE	DESCRIPTION	SERIAL NUMBER
416523	OCTOPUS MV	BMD10001

⚠ ATTENTION!

MAINTENANCE OPERATIONS MUST BE PERFORMED BY QUALIFIED PERSONNEL AT A MARES TECHNICAL ASSISTANCE CENTER AND/OR AUTHORIZED MARES DISTRIBUTOR.

IN ORDER TO DISASSEMBLE AND REASSEMBLE THE SEAT FROM THE FIRST STAGE, IT IS NECESSARY TO CONSULT THE PROCEDURES DESCRIBED IN THE CORRESPONDING SECTION OF THE MAINTENANCE MANUAL (S-11).

IF THE UPDATED MANUAL CONTAINING THE REQUIRED SECTIONS IS NOT AVAILABLE AND/OR IF THE INSTRUCTIONS ARE NOT ENTIRELY CLEAR OR NOT FULLY COMPREHENSIBLE, PLEASE CONTACT THE MARES S.p.A. TECHNICAL SUPPORT SERVICE BEFORE CONDUCTING ANY MAINTENANCE, ADJUSTMENT, OR CONTROL OPERATIONS.

RE:
NEW ERGO LOW PROFILE & OVER PRESSURE FLAT VALVES

ITM28

MARES S.p.A. TECHNICAL SUPPORT WISHES TO INFORM ALL MARES LAB PARTNERS THAT THE NEW OVER-PRESSURE "FLAT" VALVES AND THE NEW ERGO "LOW-PROFILE" HOSE WILL BE ASSEMBLED BEGINNING WITH THE NEW 2013 BC MODELS LISTED IN THE TABLE BELOW:

PRODUCT CODE	PRODUCT DESCRIPTION	SERIAL NUMBER
417345	BCD HYBRID MRS+ MAN	FROM SERIAL N° 491226853
417346	BCD HYBRID MRS+ SHE DIVES	
415347	BCD JOURNEY ELITE (SMU USA)	
415348	BCD HYBRID PRO-TEC	
417350	BCD ROVER PRO DC	
417351	BCD HYBRID MRS+ MAN D	
417352	BCD HYBRID PURE	
417309	BCD PRIME	
417353	BCD PRIME (SMU USA)	

AFTER THAT, THE OVER-PRESSURE VALVE, THE NEW HOSE, AND THE INTERNAL FLANGES (WELDED IN THE BAG) WILL BE ASSEMBLED ON ALL BCS MANUFACTURED BY MARES S.p.A., WITH IN-LINE CHANGE PROCEDURE, AS SOON AS STOCK OF THE PREVIOUS COMPONENTS ARE EXHAUSTED.

THE PURPOSE OF THIS TECHNICAL BULLETIN IS TO PROVIDE ALL THE INFORMATION NECESSARY TO IDENTIFY THE NEW COMPONENTS AND THUS BE ABLE TO CORRECTLY MANAGE ASSEMBLY, MAINTENANCE, AND SPARE-PART-REQUEST PROCEDURES BOTH FOR THE NEW BCS AND PREVIOUS VERSIONS OF THE BCS, HOSES, AND VALVES.



WARNING!

MAINTENANCE OPERATIONS MUST BE PERFORMED BY QUALIFIED PERSONNEL AT A MARES LAB TECHNICAL ASSISTANCE CENTER AND/OR AUTHORIZED MARES DISTRIBUTOR.

MARES S.P.A. RECOMMENDS THAT YOU CAREFULLY READ THIS ENTIRE NOTICE BEFORE PERFORMING ANY MAINTENANCE AND/OR OVERHAUL PROCEDURES; IF THE INFORMATION/INSTRUCTIONS ARE UNCLEAR OR NOT FULLY UNDERSTANDABLE, PLEASE CONTACT MARES TECHNICAL SUPPORT BEFORE PERFORMING ANY MAINTENANCE, ADJUSTMENT, OR CONTROL PROCEDURES.

IF A CURRENT MAINTENANCE MANUAL CONTAINING THE DISASSEMBLY, CONTROL, REASSEMBLY, AND ADJUSTMENT PROCEDURES IS NOT AVAILABLE AND/OR IF THE INSTRUCTIONS ARE UNCLEAR OR NOT FULLY UNDERSTANDABLE, PLEASE CONTACT MARES TECHNICAL SUPPORT BEFORE PERFORMING ANY MAINTENANCE, ADJUSTMENT, OR CONTROL PROCEDURES.

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OVER PRESSURE VALVES (OPV)

1. YOU CAN IDENTIFY THE NEW OVER-PRESSURE "FLAT" VALVE VISUALLY BECAUSE IT IS NOW THINNER; IN FACT, THE NEW OVER-PRESSURE FLAT VALVE (FIG. 2) IS APPROXIMATELY 7 mm SHORTER THAN THE PREVIOUS ONE (FIG. 1).



FIG. 1



FIG. 2



WARNING!

IN ORDER TO AVOID ANY RISK OF SERIOUS INJURY TO THE USERS, MARES S.P.A. STRONGLY RECOMMEND THAT THE PREVIOUS VERSION OF THE OVER PRESSURE VALVE (FIG. 1) MUSTN'T BE ASSEMBLED WITH NEW WELDED FLANGE (FIG. 4) EVEN IF IT SEEMS TO WORK; CONSEQUENTLY, THE NEW FLAT OVERPRESSURE VALVE (FIG. 2) MUSTN'T BE ASSEMBLED WITH PREVIOUS WELDED FLANGE (FIG. 3)

HI-FREQUENCY WELDED "FLANGE"

2. AS INDICATED EARLIER, THE WELDED FLANGES OF THE NEW BCS HAVE UNDERGONE IMPORTANT CHANGES THAT YOU MUST UNDERSTAND IN ORDER TO IDENTIFY THEM.

THE NEW FLANGE HAS A GASKET HOUSING (FIG. 4) THAT IS ABOUT 7 mm DEEPER THAN THE PREVIOUS VERSION (FIG. 3); IT IS EASILY IDENTIFIABLE IN A SIMPLE VISUAL INSPECTION, BUT THE PHOTOS BELOW PROVIDE THE INFORMATION YOU NEED TO BE ABLE TO CHECK AND IDENTIFY THE TWO DIFFERENT VERSIONS WITH CERTAINTY.



FIG. 3



FIG. 4

RE:
NEW ERGO LOW PROFILE & OVER PRESSURE FLAT VALVES

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NEW FLAT RAPID EXHAUST VALVE (REV)

3. IN ADDITION TO THE OVER-PRESSURE VALVE, THE RAPID EXHAUST VALVE HAS ALSO BEEN MODIFIED; THE SHAPE OF THE NEW VALVE (FIG. 6) IS APPROXIMATELY 20 mm SHORTER THAN THE PREVIOUS VERSION (FIG. 5); THANKS TO THE NOTICEABLE DIFFERENCE, IT IS EASILY IDENTIFIABLE EVEN IN A SIMPLE VISUAL INSPECTION.



FIG. 5



FIG. 6

GASKET FOR RE VALVE

4. WITH NEW FLAT RE VALVE IS NECESSARY TO USE A DIFFERENT THICKNESS OF GASKET (FIG. 8), DUE TO THE DIFFERENT INTERNAL PROFILE WE HAVE IN THE NEW WELDED FLANGES, AS SHOWN AT THE STEP 3; WITH THE NEW ONE CAN BE REPLACED ALSO THE PREVIOUS VERSION (FIG.7).



PREVIOUS GASKET
CODE: 47159124

FIG. 7



NEW GASKET
CODE: 47201155

FIG. 8

IN THE FOLLOWING TABLE (TABLE 9) YOU CAN CHECK HOW MANY PCS OF NEW GASKETS (CODE: 47201155) HAVE TO BE USED RELATED TO THE RE VALVE AND OTHER VERSION OF WELDED FLANGE IT HAS TO BE INSTALLED.

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⚠ WARNING!

THE NEW FLAT RE VALVE (FIG. 6) MUSTN'T BE INSTALLED ON THE OLD WELDED FLANGE (FIG. 3) WHILE WILL BE POSSIBLE TO INSTALL THE OLD RE VALVE (FIG.5) ON THE NEW WELDED FLANGE (FIG. 4) USING 3 GASKETS AS SHOWN IN THE TABLE 9.

GASKET 47201155 QTY TABLE	WELDED FLANGE VERSION	
	OLD (FIG. 3)	NEW (FIG.4)
RE VALVE VERSION	OLD (FIG. 3)	NEW (FIG.4)
OLD BIG (FIG. 5)	1	3
FLAT (FIG.6)	DO NOT ASSEMBLE!!!	1

TABLE 9

NEW INFLATOR BODY

5. THE INFLATOR BODY (FIG. 11). ALL COMPONENTS AND SPARE PARTS INSIDE CAN BE USED WITH THE PREVIOUS VERSION OF ERGO INFLATOR (FIG. 10). AS YOU CAN SEE IN THE PICTURES BELOW WILL BE VERY EASY TO IDENTIFY THE NEW INFLATOR BODY FROM THE PREVIOUS VERSION THANK TO DIFFERENT LOOK.



CODE: 47159700

FIG. 10



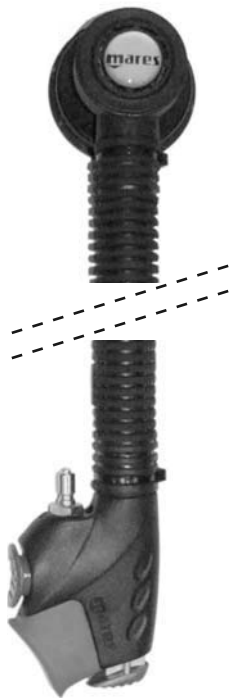
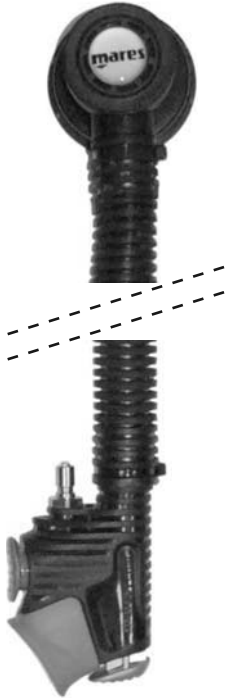
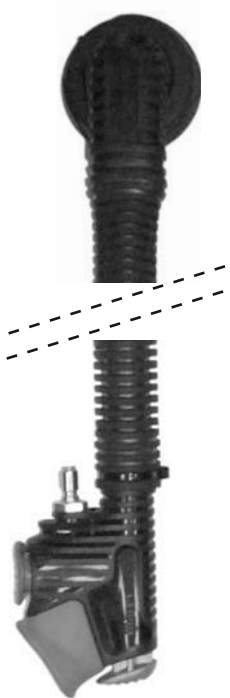
CODE: 47201119

FIG. 11

**RE:
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AS MENTIONED, BE INFORMED THAT THE CHANGE WITH NEW RE VALVE AND INFLATOR BODY WILL BE NOT DONE IN THE SAME MOMENT BUT AS RUNNING CHANGE, AS SOON AS THE STOCK OF PREVIOUS COMPONENTS WILL BE FINISHED. FOR THIS REASON, PLEASE HAVE A LOOK INTO THE TABLE BELOW IN ORDER TO UNDERSTAND WHICH VERSION OF INFLATORS YOU COULD FIND IN THE MARKET AND ON WHICH VERSION OF WELDED FLANGE CAN BE INSTALLED AND HOW MANY GASKETS TO BE NECESSARY TO USE.

HOW TO INSTALL THE INFLATOR OPTIONS		
PREVIOUS	TEMPORARY	NEW
 <p>(47159729)</p>	 <p>(47201121)</p>	 <p>(47201122)</p>
POSSIBLE OPTIONS		POSSIBLE OPTION
