MARES SERVICE MANUAL

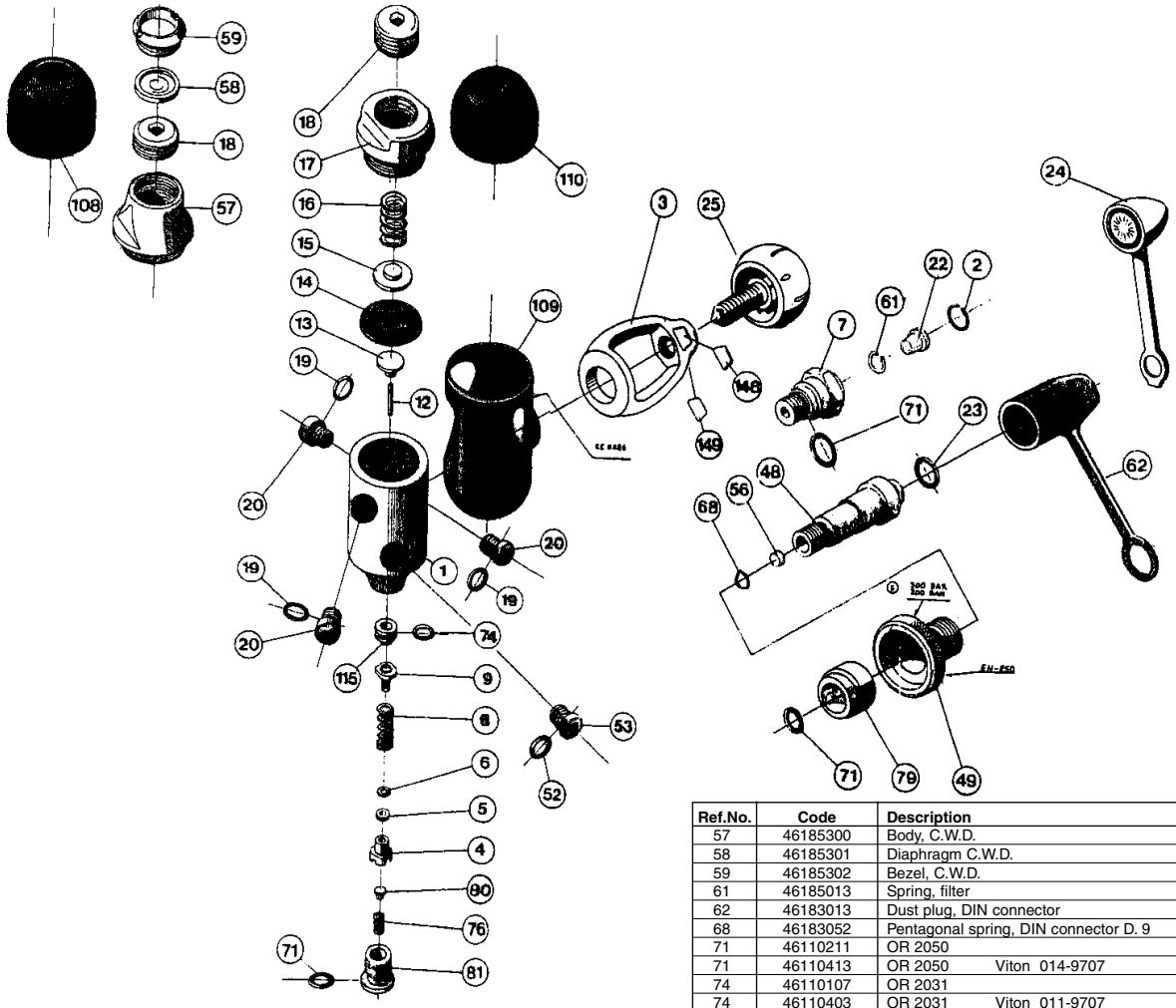
2000

2001

mares®

FIRST STAGE V 16 2000 - V 16 2000 NITROX - VX 16

Reference drawing No. : E 6 - Table No. 8-9
Update to: 01-04-1998



Ref.No.	Code	Description
1	46186240	1st stage body DFC V 16
2	46185015	Retaining ring D. int. 13
3	46185211	Yoke V 16
4	46185209	H.P. housing
5	46185038	Back up ring
6	46110101	OR 2012
6	46110401	OR 2012 Viton 006-9707
7	46186241	Nut, yoke retainer
8	46186306	Spring, poppet V 16
9	46186304	Poppet, 1st stage Titanium V16
12	46186214	Pin, poppet
13	46185032	Button, poppet
14	46185022	Diaphragm
15	46185034	Plate, spring base
16	46185023	Spring, diaphragm
17	46186219	Retaining ring
18	46185028	Regulating nut, spring
19	46110106	OR 106
19	46110402	OR 106 Viton 610-9707
20	46185204	Plug 3/8" UNF
22	46186202	Sintered conical filter
23	46110117	OR 115
23	46110406	OR 115 Viton 614-9707
24	46185010	Dust plug V 16
25	46184079	Knob assembly V 16
48	46183036	DIN connector body 200 BAR
48	46183035	DIN connector body 300 BAR
49	46183006	DIN connector wheel 200 BAR
49	46183001	DIN connector wheel 300 BAR
52	46110108	OR 108
52	46110404	OR 108 Viton 611-9707
53	46185205	Plug, H.P. 7/16" UNF
56	46183053	Filter, DIN connector D.9

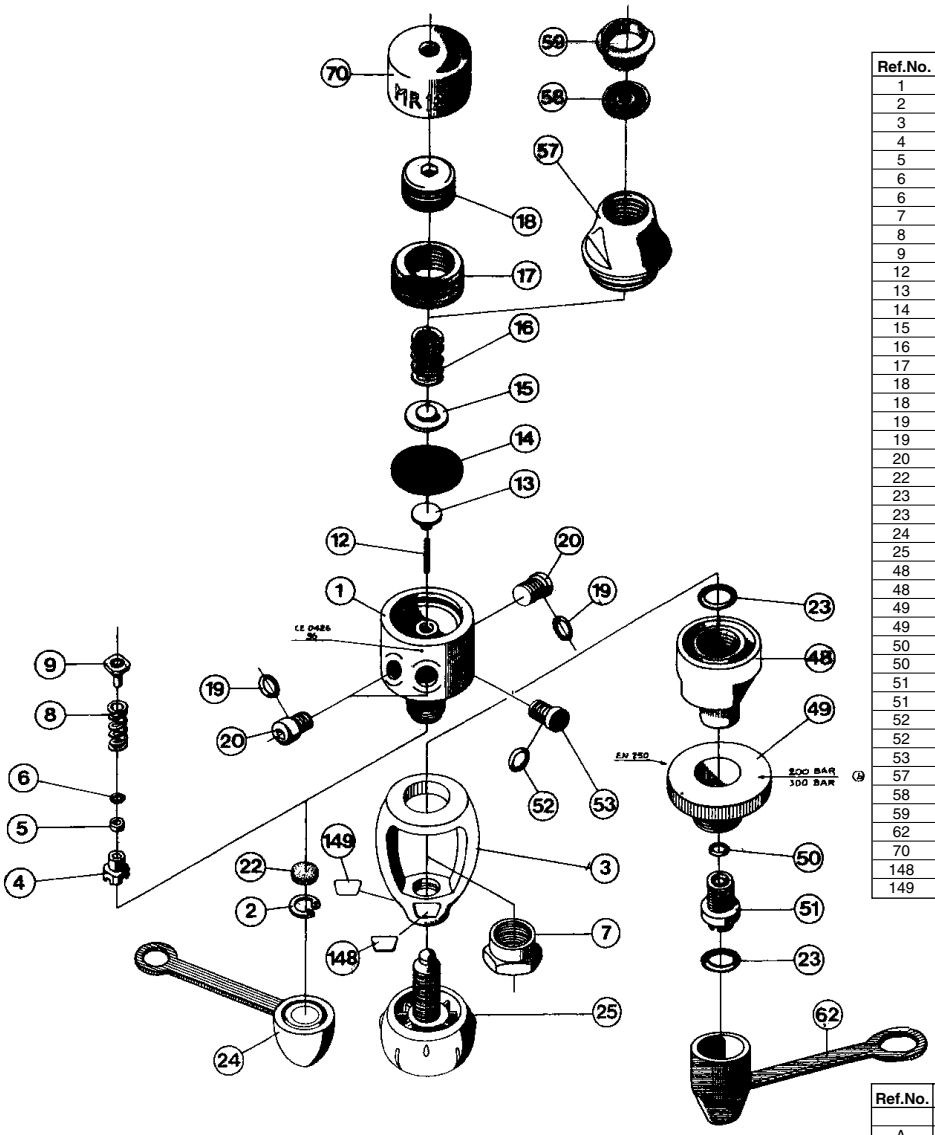
Ref.No.	Code	Description
57	46185300	Body, C.W.D.
58	46185301	Diaphragm C.W.D.
59	46185302	Bezel, C.W.D.
61	46185013	Spring, filter
62	46183013	Dust plug, DIN connector
68	46183052	Pentagonal spring, DIN connector D. 9
71	46110211	OR 2050
71	46110413	OR 2050 Viton 014-9707
74	46110107	OR 2031
74	46110403	OR 2031 Viton 011-9707
75	46186249	Poppet seat SCS (V 16)
76	46186210	Spring, H.P. housing
79	46183034	Spacer ring, DIN connector
80	46186206	Anti-trial head
81	46186208	Plug
108	46185266	Protection plug C.W.D.
109	46186239	Body protection V 16 SCS tamp.
110	46186245	Protection cap, tamp.
148	46184315	Label "EN 250 - 200 bar"
149	46184316	Label "MARES"
		ASSEMBLIES
A	46200109	1st stage assy V 16 2000
A	46200110	1st stage assy V 16 2000 J
A	46200111	1st stage assy V 16 DIN 2000
D	46185210	HP housing assy (4-5-6)
D	46186259	HP housing (4-5-6) Nitrox
F	416803 200 NR	Connector assy, DIN 200 BAR
		(23-48-49-56-62-68-71-79)
F	416803 300 NR	Connector assy, DIN 300 BAR
		(23-48-49-56-62-68-71-79)
F	416803 200 NX	Connector assy, DIN 200 BAR Nitrox
		(23-48-49-56-62-68-71-79)
F	416803 300 NX	Connector assy, DIN 300 BAR Nitrox
		(23-48-49-56-62-68-71-79)
I	416851	CWD Kit V 16
***	46186152	Maintenance kit, 1st stage V 16 INT.
		(2-5-6-19-22-52-71-74)
***	46186151	Maintenance kit, 1st stage V 16 - V 16 DIN
		(5-6-19-23-52-56-68-71-74)
***	46185167	Maintenance kit, 1st stage V 16 INT. Viton
		(2-5-6-19-22-23-52-56-68-71-74)
***	46185168	Maintenance kit, 1st stage V 16 - V 16 DIN Viton
		(5-6-19-23-52-56-68-71-74)

NOTE

Poppet seat OR included in in the kit (code 186151 and 186152) can also be in Viton

FIRST STAGE MR12 DFC 2000
FIRST STAGE MR12 NITROX
FIRST STAGE MRX12 DFC

Reference drawing No. : E8 - Table No. 12-13
Updated to 03-04-2000

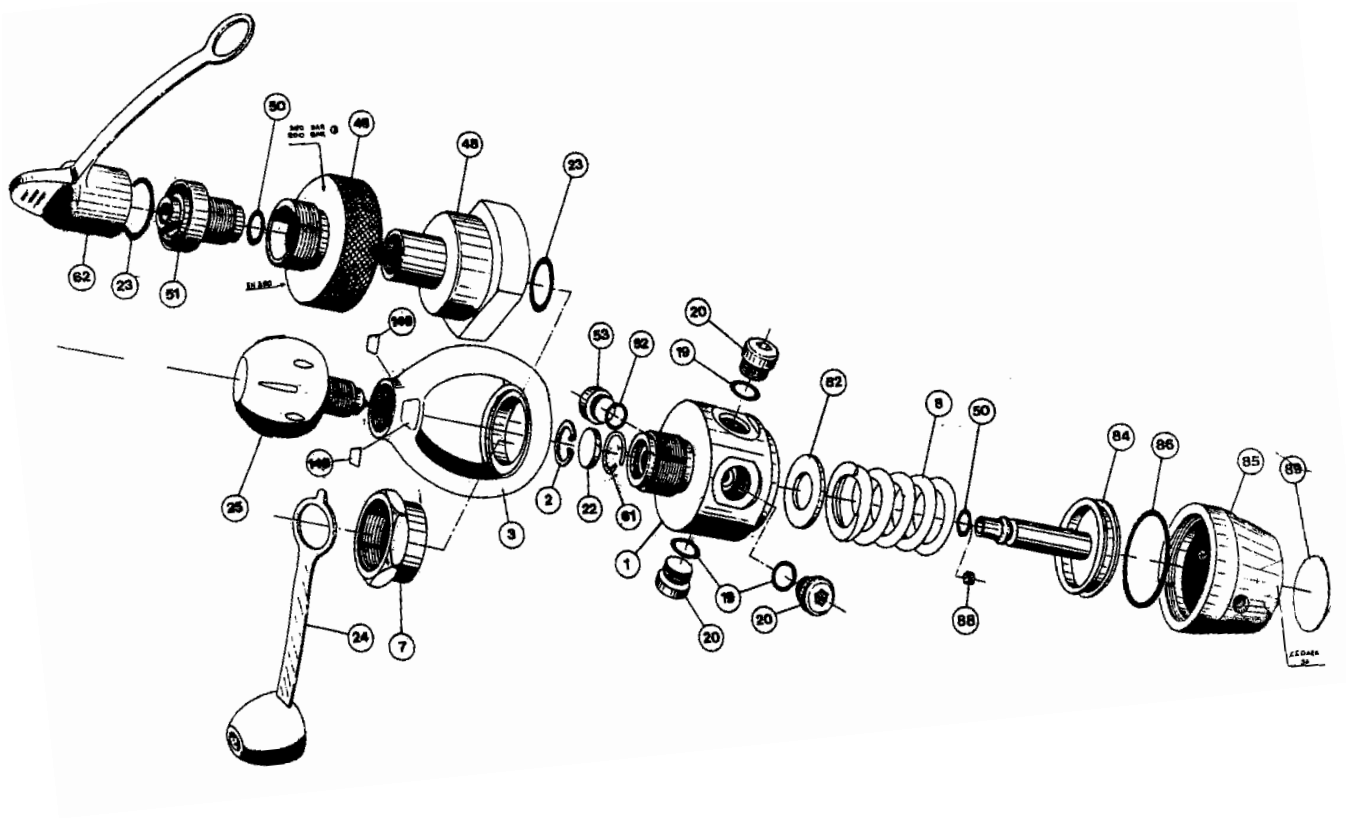


Ref.No.	Code	Description
1	46186021	Body, MR 12 DFC
2	46185015	Retaining ring D. INT. 13
3	46185211	Yoke MR 12
4	46185209	H.P. housing
5	46185038	Back up ring
6	46110101	OR 2012
6	46110401	OR 2012 Viton 006-9707
7	46185212	Nut, yoke retainer
8	46185011	Spring, poppet MR 12
9	46185002	Poppet, 1st stage MR 12
12	46185206	Pin, poppet MR 12
13	46185032	Button, poppet
14	46185022	Diaphragm
15	46185034	Plate, spring base
16	46185023	Spring, diaphragm
17	46184510	Retaining ring
18	46184511	Regulating nut, spring
18	46185028	Regulating nut, spring (C.W.D.)
19	46110106	OR 106
19	46110402	OR 106 Viton 610-9707
20	46185204	Plug 3/8" UNF
22	46185014	Sintered filter
23	46110117	OR 115
23	46110406	OR 115 Viton 614-9707
24	46185010	Dust cap MR 12
25	46184079	Knob assembly MR 12
48	46183008	DIN connector body 200 BAR
48	46183004	DIN connector body 300 BAR
49	46183006	DIN connector wheel 200 BAR
49	46183001	DIN connector wheel 300 BAR
50	46110203	OR 2018
50	46110409	OR 2018 Viton 008-9707
51	46179261	DIN connector 200 BAR
51	46183003	DIN connector 300 BAR
52	46110108	OR 108
52	46110404	OR 108 Viton 611-9707
53	46185205	Plug HP 7/16"
57	46185300	Body (CWD)
58	46185301	Diaphragm (CWD)
59	46185302	Bezel (CWD)
62	46183013	Dust cap, DIN connector
70	46184452	Cap MR 12
148	46184315	Label "EN 250 - 200 bar"
149	46184316	Label "MARES"

Ref.No.	Code	Description
		ASSEMBLIES
A	46186286	1st stage assy MR 12 2000
A	46186287	1st stage assy MR 12 DIN 2000
A	46185990	1st stage assy MR 12 CWD 2000
A	46185995	1st stage assy MR 12 DIN/CWD
A	46185963	1st stage assy MR 12 Nitrox 2000
D	46185210	H.P. housing assy (4-5-6)
D	46186259	H.P. housing assy (4-5-6) Nitrox
F	416804 200 NR	DIN connector assy 200 BAR
		(23-48-49-50-51-62)
F	416804 300 NR	DIN connector assy 300 BAR
		(23-48-49-50-51-62)
F	416804 200 NX	DIN connector assy 200 BAR Nitrox
		(23-48-49-50-51-62)
F	416804 300 NX	DIN connector assy 300 BAR Nitrox
		(23-48-49-50-51-62)
I	416852	Kit CWD, MR 12 2000
***	46186150	1st stage maintenance kit MR 12 INT/DIN
		(2-5-6-19-22-23-50-52-74)
***	46186154	1st stage maintenance kit MR 12 INT/DIN Nitrox
		(2-5-6-19-22-23-50-52-74)
		ACCESSORIES
***	46179257	Yoke connector INT/DIN assy
***	46179258	Nut connector INT/DIN assy
***	46179260	Plug, DIN external threading

FIRST STAGE R2 2000 DFC
FIRST STAGE R2 NITROX

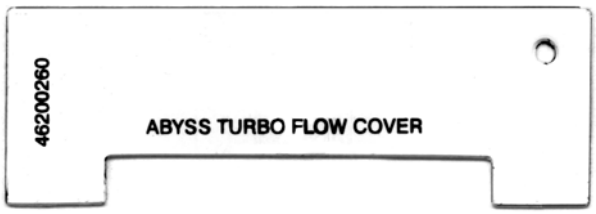
Reference drawing No. : E7 - Table No. 16
Updated to 03-04-2000



REFERENCE: ADJUSTING OF 2nd STAGE LEVER HEIGHT (2nd STAGE TURBO FLOW COVER)

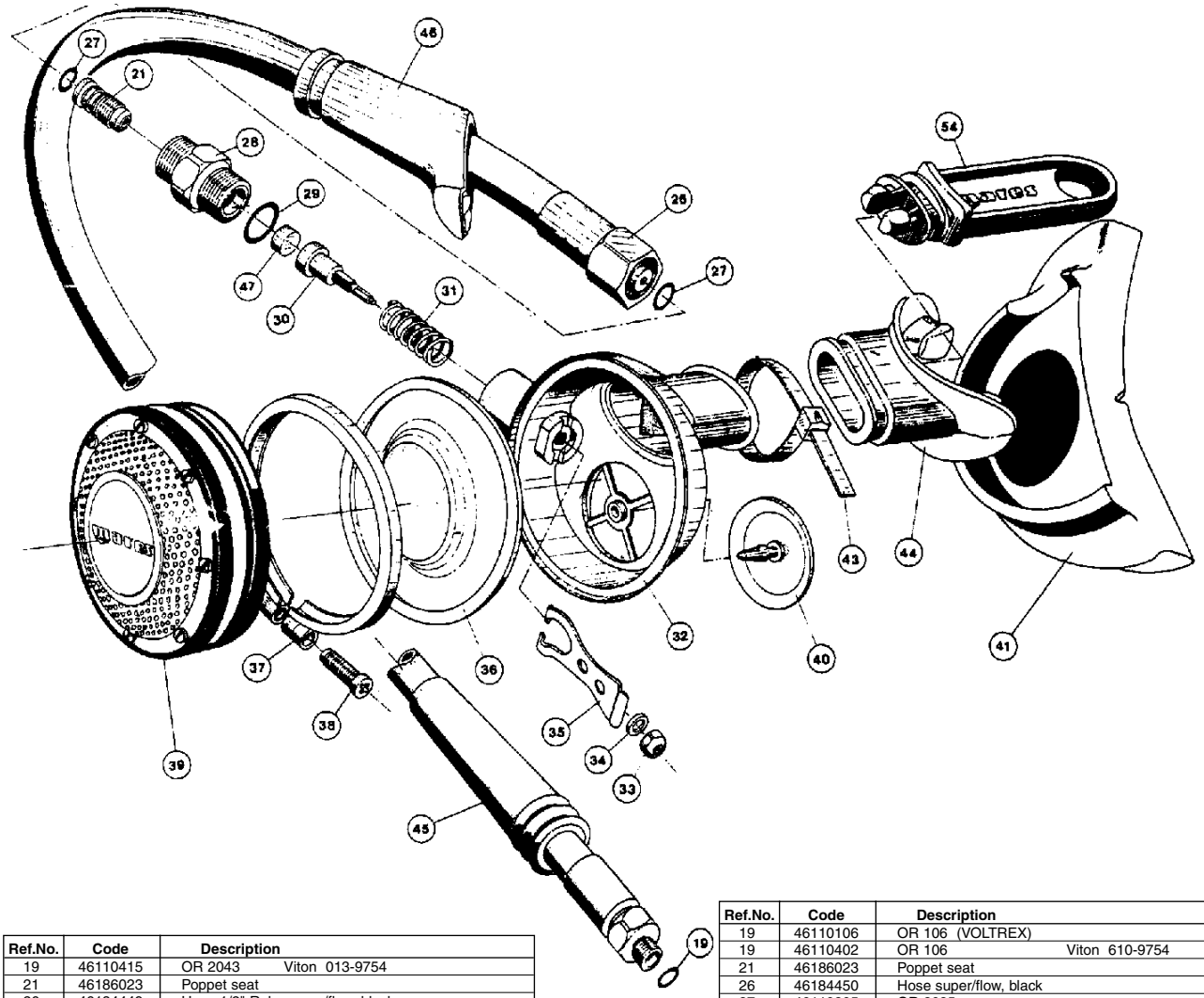
TBM3

TO ADJUST LEVER HEIGHT IN 2nd STAGES FEATURING TURBO FLOW COVER (46186049 AND 46186043), A NEW GAUGE MUST BE USED (CODE 46200260), FOLLOWING THE PROCEDURES OF THE SERVICE MANUAL.



RUBY 2000 - RUBY SECOND STAGE
RUBY TITANIUM SECOND STAGE
ORBITER SECOND STAGE

Reference drawing No. : E16 - Table No. 101 - 103
Updated to 03-04-2000



Ref.No.	Code	Description
19	46110415	OR 2043 Viton 013-9754
21	46186023	Poppet seat
26	46184449	Hose 1/2" Ruby super/flow, black
27	46110411	OR 2025 Viton 010-9754
28	46184282	Hose connector
29	46110408	OR Parker 3-906 Viton 906-9754
30	46186024	Poppet
31	46185057	Spring, poppet
32	46186025	2nd stage case
33	46185051	Retaining nut, lever
34	46185049	Washer
35	46185104	Lever (CWD)
36	46186029	Diaphragm, black
37	46185073	Clamp
38	46185075	Screw, clamp 3 x 16 inox
39	46186256	Cover assy, RUBY
40	46184006	Exhaust valve
41	46186028	Exhaust tee 99
41	46186310	Exhaust tee 2000
43	46157984	Clamp, mouthpiece
44	46185086	Mouthpiece, black
45	46179904	Hose protector, 1st stage, black
46	46186094	Hose protector, 2nd stage, black
47	46184062	Plastic poppet seat
		ASSEMBLIES
G	46186145	Second stage assy RUBY
G	46186146	Second stage assy RUBY J.
***	46185166	Maintenance kit, 2nd stage RUBY Viton
		(19-27-29-33-40-43-47)

Ref.No.	Code	Description
19	46110106	OR 106 (VOLTREX)
19	46110402	OR 106 Viton 610-9754
21	46186023	Poppet seat
26	46184450	Hose super/flow, black
27	46110205	OR 2025
27	46110411	OR 2025 Viton 010-9754
28	46184282	Hose connector
29	46110191	OR Parker 3-906
29	46110408	OR Parker 3-906 Viton 906-9754
30	46186024	Poppet
31	46185057	Spring, poppet
32	46186025	2nd stage case
33	46185051	Retaining nut, lever
34	46185049	Washer
35	46185104	Lever (CWD)
36	46186029	Diaphragm, black
37	46185073	Clamp
38	46185075	Screw, clamp 3 x 16 inox
39	46184279	Cover assy ORBITER
40	46184006	Exhaust valve
41	46186028	Exhaust tee 99
41	46186266	Exhaust tee 2000
43	47157984	Clamp, mouthpiece
44	46185086	Mouthpiece, black
45	46179904	Hose protector, 1st stage, black
46	46186094	Hose protector, 2nd stage, black
47	46184062	Plastic seat, poppet
		ASSEMBLIES
G	46186149	Second stage assy ORBITER
G	46200123	Second stage assy ORBITER J
***	46186160	Maintenance kit, 2nd stage ORBITER
		(19-27-29-33-40-43-47)

REFERENCE: DEFECTIVENESS OF RETAINING NUT LEVER IN 2nd STAGE REGULATORS

TBM1

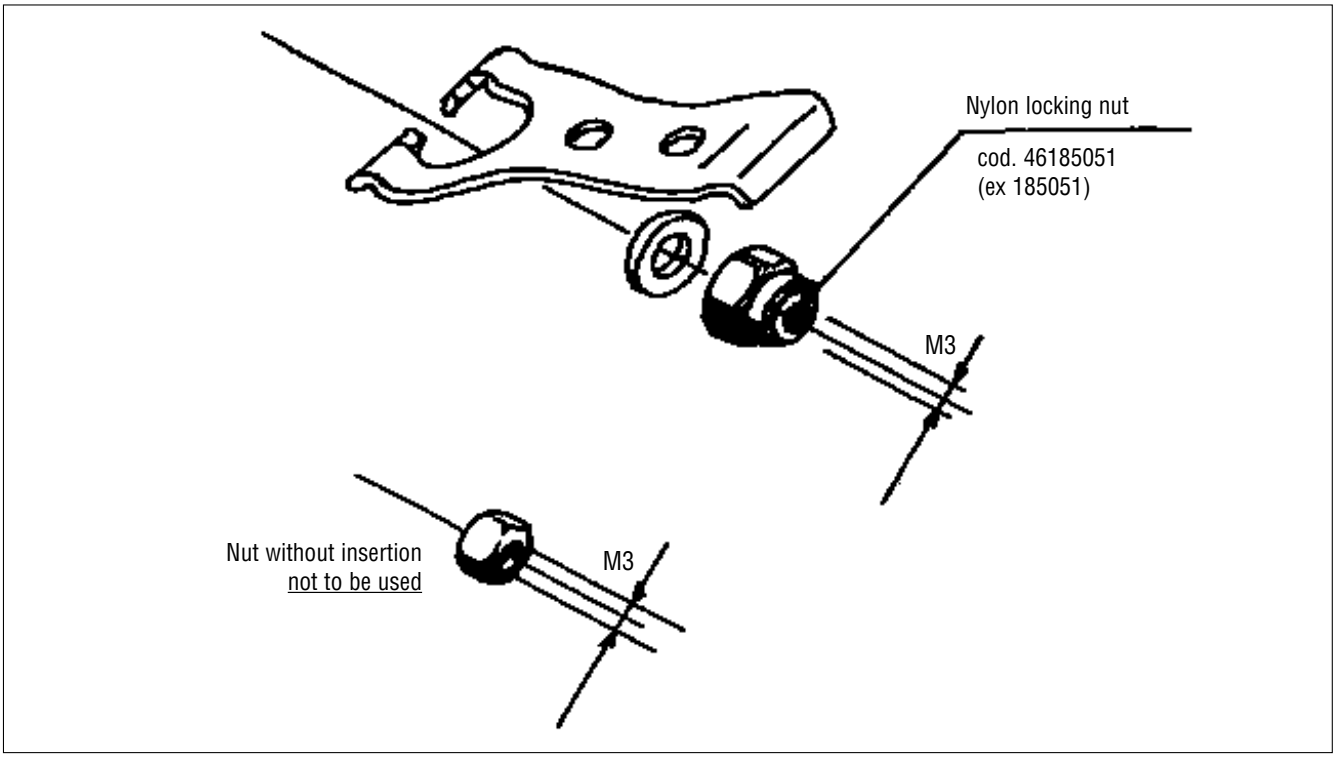
WARNING – DANGER !

WE NOTICED THAT IN SOME SECOND STAGE SERVICE KITS (CODE No. 46186164 -EX 186164), LEVER RETAINING RINGS WITHOUT THE NYLON UNSCREWING PART HAVE BEEN INSERTED BY MISTAKE (SEE FIGURE).

WARNING !

DO NOT USE RETAINING RINGS IF THEY DO NOT FEATURE THE NYLON UNSCREWING PART.

IN FACT, THIS KIND OF NUT CAN UNCREW WHEN USED AND CAUSE THE LEVER DETACHMENT, WHICH WOULD RESULT IN AIRFLOW CUT.
WE THEREFORE RECOMMEND TO CHECK ALL LEVER RETAINING RINGS AND TO REPLACE THOSE THAT DO NOT INCLUDE THE NYLON PART BY NO. 46185051 (EX 185051) CODE RINGS.



REFERENCE: INLET FITTING-2nd STAGE HOSE NIKOS - NIKOS ESCORT - OCTOPUS NIKOS

TBM2

(SEE MANUAL, PAGES: S 3-4 / S 3-5 / S 3-9)

FROM SERIAL NUMBER TO 54689 OF 27/03/00 (OCTOPUS NIKOS), INLET FITTING (REF. 94 CODE 46184216) AND HOSE CONNECTOR (REF. 28 CODE 46184282) WILL BE REPLACED BY HOSE CONNECTOR (CODE 46200006).
FOR PRE-REGULATING PROCEDURE OF THE SEAT CONNECTOR (REF. 21 CODE 46186023) AND REASSEMBLY, DO AS FOLLOWS:

1. CAREFULLY INSTALL A NEW EXHAUST VALVE (40) PULLING THE STEM THROUGH THE 2nd STAGE CASE CROSS OPENING

WARNING !
DO NOT PULL THE STEM TOO MUCH, IN ORDER TO AVOID DAMAGING EXHAUST VALVE.

2. USING A CUTTER (OR SCISSORS), REMOVE ABOUT 7 mm OF EXHAUST VALVE STEM (40)

3. CORRECTLY REASSEMBLE PLASTIC POPPET BODY (92) ON 2nd STAGE METAL POPPET BODY (30) AND POSITION RUBBER POPPET SEAT (47)

4. POSITION THE 2nd STAGE POPPET WITH ITS SPRING IN THE POPPET HOUSING (91) AND PLACE THE ASSEMBLY ONTO TOOL (B-6) (SEE FIG. **2** OF THE SERVICE MANUAL)

WARNING !
TO OBTAIN A CORRECT POSITION OF THE 2nd STAGE POPPET, WE RECOMMEND TO ROTATE POPPET HOUSING (91) RIGHT AND LEFT. (SEE FIG. **2** OF THE SERVICE MANUAL)

5. CORRECTLY POSITION LEVER (35) IN THE POPPET HOUSING GROOVE (91), POSITION WASHER (34) ON POPPET STEM AND THREAD REGULATING NUT (33) SOME TURNS, USING THE SPECIAL TOOL (B-20 OR B-12) (SEE FIG. **3** OF THE SERVICE MANUAL)

NOTE DEPRESS THE LEVER A FEW TIMES, TO ENSURE FREEDOM OF MOVEMENT.

6. CORRECTLY POSITION POPPET HOUSING ASSEMBLY (LEVER INCLUDED) IN THE 2nd STAGE CASE. (SEE FIG.**4** OF THE SERVICE MANUAL)

WARNING !
CHECK THAT POPPET HOUSING IS CORRECTLY POSITIONED IN ITS SEAT IN 2nd STAGE CASE. (SEE FIG. **4** OF THE SERVICE MANUAL)

7. POSITION O-RING (83) IN ITS SEAT USING SPECIAL TOOL (B-6). (SEE FIG. **5** OF THE SERVICE MANUAL)

8. PLACE O-RING (66) IN POPPET HOUSING SEAT (91)

WARNING !
CHECK POPPET HOUSING STILL IS IN POSITION.

9. INSTALL O-RING (27) ON POPPET SEAT (21).

10. USING SPECIAL TOOL (B-4), SLOWLY SCREW SEAT CONNECTOR (21) IN HOSE CONNECTOR UNTIL IT ROTATES.

WARNING !
AT THE END OF STROKE, DO NOT FORCE VALVE SEAT IN THE CONNECTOR.

11. USING SPECIAL TOOL (B-4), ROTATE SEAT CONNECTOR (21) COUNTER-CLOCKWISE FOUR FULL TURNS.

12. SCREW HOSE CONNECTOR IN POPPET HOUSING ASSEMBLY USING WRENCH (B-9), WITHOUT FORCING.

WARNING !
IF USING A TORQUE WRENCH, SET THE TORQUE FOR 8-8.5 Nm.

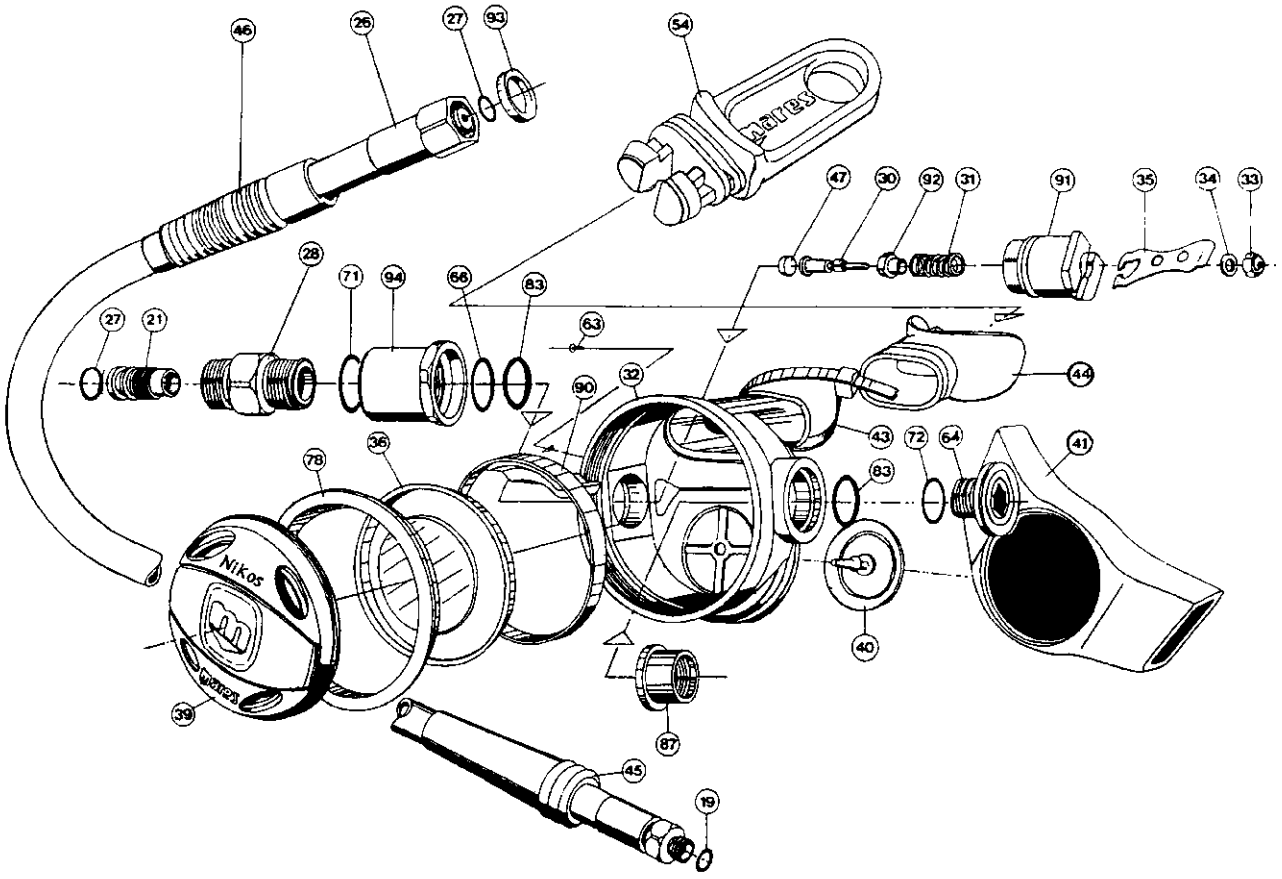
13. REASSEMBLE O-RING (27) IN THE HOSE SWIVEL CONNECTION.

14. USING TOOL (B-9 AND B-17), TIGHTEN THE HOSE ONTO INLET FITTING.

PROCEED TO THE NEXT ADJUSTMENTS AND CONTROLS AS PER THE SERVICE MANUAL.

NIKOS 2000 SECOND STAGE
OCTOPUS NIKOS - OCTOPUS NIKOS NITROX

Reference drawing No.: E21 - Table No. 112
Updated to 03-04-2000



INTEGRATED SYSTEM H.U.B.

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INTEGRATED SYSTEM H.U.B. - DISASSEMBLIES

DISASSEMBLY OF THE 1ST STAGE FROM INTEGRATED SYSTEM

1. Deflate integrated system bag, pressing the pneumatic control purge button.

2. Turn tank valve off.

3. Unlock positioning strap buckle.

4. Pressing 2nd stage purge button (or octopus purge button), exhaust regulator assembly.

5. Unscrew yoke knob and remove 1st stage from tank valve.

6. Release single tank waistband, releasing the integrated system from tank.

7. Using a 17-mm wrench (B-17), unscrew hose from DFC port.

8. Using a 14 mm wrench (B-18), unscrew 1st stage from HP hose and remove 1st stage cap (24).

NOTE FOR THE COMPLETE SERVICE PROCEDURE OF FIRST STAGE H.U.B, SEE THE SPECIAL PROVIDED MANUAL (MR 16 MARES VERSION – D 16 MARES VERSION).

DISASSEMBLY OF H.U.B. BAG

DISASSEMBLY OF 4-WAY MANIFOLD

9. Extract Second stages from the pockets of integrated system, then using a small screw-driver (USAG 322 PH 1) unscrew screw (26) and washer (25) that are located in the right pocket of the integrated system.

10. Extract the support of the 4-way manifold (48).

11. Using a 14-mm wrench (B-18), remove hose and 2nd stage.

12. Using the same 14-mm wrench (B-18), disassemble Octopus.

NOTE FOR THE COMPLETE SERVICE PROCEDURE OF MAIN SECOND STAGE AND OF OCTOPUS, SEE THE SPECIAL PROVIDED MANUALS.

13. Using two 17-mm wrenches (B-17), disassemble the 4 way manifold from the 1/2” LP hose (29).

14. Using a 4-mm wrench, unscrew 3/8” LP plug (20) and remove O-Ring (19).

15. Remove connector (50), using a 17-mm wrench (B-17), and O-Ring (97).

DISASSEMBLY OF BACKPACK

16. After removing rubber protection (96), extract tank waistband from backpack (43).

NOTE HTM RECOMMENDS PUTTING THE BAG ON A CLEAN AND FLAT SURFACE. COMPLETELY OPEN THE INTEGRATED SYSTEM BAG AND PLACE IT WITH BACKPACK INTERNAL PART FACING UP, SO THAT THE TECHNICIAN CAN UNDERTAKE THE FOLLOWING SERVICE PROCEDURE VERY EASY.

17. Extract central waistband (45) from H.U.B. bag loops.

18. Using a small screwdriver (USAG 322 PH 1 type), disassemble the five screws (3) and separate backpack (43) from tank support plate (15).

NOTE TO MAKE SUCH AN OPERATION EASIER, KEEP KNOB HALF-CLOSED.

19. Extract right tank adjusting strap from its buckle.

20. Separate right waistband Velcro and extract it from backpack corresponding buttonhole.

NOTE REPETE OPERATIONS FROM 19 TO 20 FOR LEFT WAISTBAND DISASSEMBLY.

21. Extract HP and LP hoses from tank support plate grooves (15) that are located under the bag.

22. Remove 1/2" hose and pneumatic control hose from openings under bag buttonholes.

23. Using a screwdriver (USAG 322 PH 1 type), unscrew central screw (3) and remove 7-way manifold.

24. Extract tank valve plate from its position under the bag.

DISASSEMBLY OF 7-WAY MANIFOLD

25. Using a 4 mm Allen wrench, unscrew 7/16" HP plug (53) and 3/8" LP plug (20) with O-Rings (52 - 19).

26. Using two wrenches (B-17) and (B-18), remove hose (7) (up right, with quick connector for pneumatic control) and remove O-Rings from hose.

27. Using a 17-mm wrench (B-17), unscrew connector (8) and remove O-Ring (97).

28. Using a 17-mm wrench (B-17), unscrew hose (29) (up left) and remove the two O-Rings.

29. Using a 14-mm wrench (B-18) and a 15-mm wrench, remove HP hose placed down right.

30. Using snap ring pliers (USAG 133 type), extract swivel (5) from connector (2).

WARNING

HTM RECOMMENDS TO PUT LINEN ADHESIVE TAPE ON PLIER ENDS TO AVOID SWIVEL DAMAGING.

31. Remove O-Rings (4) from swivel (5).

32. Using a 14-mm wrench (B-18), disassemble connector (2) and remove O-Ring (52).

33. Using a 17-mm wrench (B-17), disassemble hose (9) and remove the two O-Rings.

DISASSEMBLY OF TANK SUPPORT PLATE

NOTE HTM RECOMMENDS TO DISASSEMBLE THE TANK SUPPORT PLATE ONLY IF IT IS NECESSARY.

34. Place tank support plate with grip plate (13) face up.

35. Extract left shorter strap with female buckle, from plate slot.

36. Extract longer, right strap, with male buckle, from plate slot.

37. Remove grip plate (13) from tank support plate (15).

38. Using a metal rod (MAX Ø 4.5 mm), extract shaft (17) fixing the knob (16) and remove it.(FIG. **1**)

39. Using a screwdriver (USAG 322 PH 1 type), unscrew screws (27) and remove the two rollers (10).

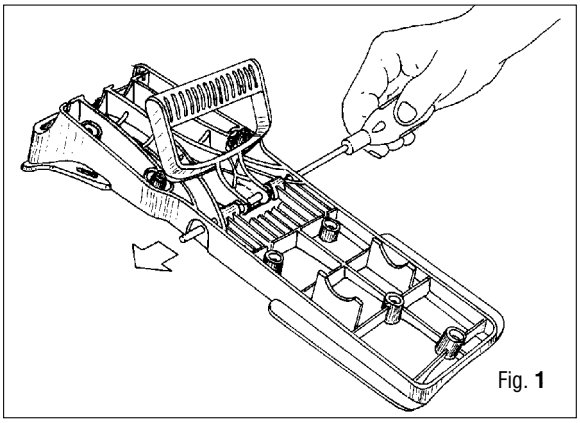


Fig. **1**

DISASSEMBLY OF MECHANICAL OVERPRESSURE VALVES

NOTE HTM RECOMMENDS PUTTING THE BAG ON A CLEAN AND FLAT SURFACE. COMPLETELY OPEN THE INTEGRATED SYSTEM BAG AND PLACE IT WITH OVERPRESSURE VALVES FACING UP, SO THAT THE TECHNICIAN CAN UNDERTAKE THE FOLLOWING SERVICE PROCEDURE VERY EASY.

40. Untie knot and remove knob (44).

41. Split line (66) off from their seat.

42. Using wrench (USAG 282/58-62-65 type), unscrew overpressure valve assembly.

40. Remove line (66), overpressure cap (37) and spring (36).

44. Remove overpressure valve seal (34).

45. Split spring base plate off (35) from line (66).

DISASSEMBLY OF INFLATING ORAL PIPE

46. Extract inflating pipe assembly (21) from integrated system pocket.

47. Using wrench (USAG 282/58-62-65 type), unscrew flange for swivel elbow (38).

48. Remove retaining ring (31) using snap ring pliers (HI TECH 1221-S type).

49. Remove flange for swivel elbow (38) from swivel elbow (40).

50. Remove O-Ring (33) from flange (38) and O-Ring (39) from swivel elbow (40).

51. Cut off pipe clamp off (22) and remove swivel elbow (40) from pipe (21).

52. Cut the pipe clamp (22) placed on the other end of pipe (21).

53. Extract air poppet (23) from pipe (21).

54. Extract poppet cover (24) from pipe (21).

DISASSEMBLY OF H.U.B. PNEUMATIC SYSTEM

DISASSEMBLY OF PNEUMATIC CONTROL

55. Using a screwdriver (USAG 322 PH 1 type), unscrew screws (14) and remove top cover (13).

56. Extract inflator button (10) and purge button (9).

57. Using a screwdriver (USAG 322 PH 1 type), unscrew screws (15) and remove control body assembly, bottom cover (12) and O-Ring (21).

58. Remove O-Ring (23) from valve shaft (29).

59. Using a special wrench (USAG 282/58-62-65 type), unscrew bezel (11) and remove O-Ring (21).

WARNING

TO AVOID ANY DAMAGE TO THE INTERNAL PIPE, DUE TO ROTATION OF INTERNAL SUPPORT DURING BEZEL UNSCREWING, BLOCKING INTERNAL PART OF PNEUMATIC CONTROL IS NECESSARY. (FIG. **2**)

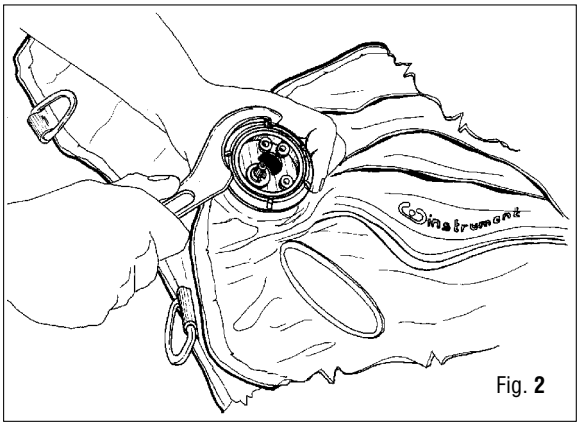


Fig. **2**

60. Using a 17-mm wrench (B-17), unscrew purge piston seat (6).

61. Remove spring (2) and O-Ring (3) from purge button bushing.

62. Clamp the plane surfaces of the piston (8) that protrude from purge piston seat (6), in a vice.

63. Using a 6-mm wrench, disassemble purge button bushing (4). (FIG. **3**)

64. Extract piston (8) and remove O-Rings (7) and (3).

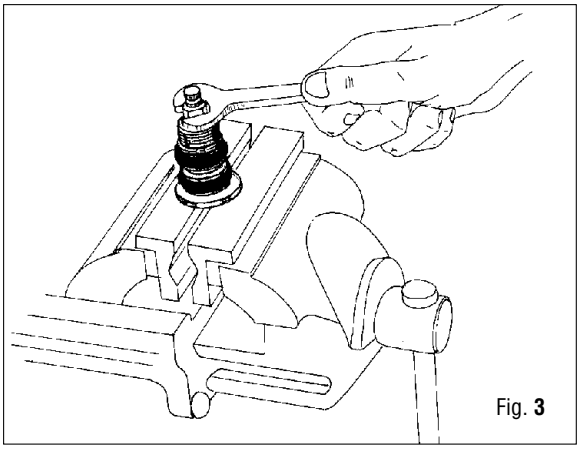


Fig. **3**

NOTE TO REMOVE PISTON, A PLASTIC ROD CAN BE USED (MAX. DIAMETER 4 mm) PUSHING SEAT OUTWARDS FROM INSIDE.

65. Remove O-Rings (5) from purge piston seat (6).

66. Using a 17-mm wrench (B-17), unscrew loading piston seat control (20).

67. Remove spring (2).

68. Extract loading piston control (19) pushing outwards from loading piston seat (20) and remove the two O-Rings (7).

69. Remove O-Rings (5) from loading piston seat (20).

70. Using a 14-mm wrench (B-18), unscrew male quick connector (18) and extract filter (16).

71. Remove O-Ring (17) from its seat on male quick connector (18).

▸ DISASSEMBLY OF PNEUMATIC DUMP VALVES EXTERNAL BEZEL

NOTE THE FOLLOWING OPERATIONS MUST BE CARRIED ON FOR DISASSEMBLY OF BOTH (BOTTOM AND TOP) EXTERNAL BEZELS OF PNEUMATIC DUMP VALVES.

72. Using wrench (C-3), unscrew valve bezel (47).

73. Extract spring (46).

74. Remove O-Rings (23) and back-up ring (35) from the 2-way valve shaft (33).

NOTE DISASSEMBLE VALVE BEZEL ONLY IF NECESSARY.

75. Extract sealing plate support assembly (41) from 2-way valve shaft.

76. Unscrew diaphragm nut (43) from valve bezel (47).

77. Extract washer (45) and diaphragm (44) from diaphragm nut (43).

78. Using the 22-mm wrench (B-9), unscrew valve nut (39) from sealing plate support (41).

79. Remove sealing plate (40) and O-Ring (42) from sealing plate support (41).

DISASSEMBLY OF PNEUMATIC SYSTEM INTERNAL SUPPORTS FROM BAG

NOTE START DISASSEMBLY BY THE INTERNAL SUPPORT OF BOTTOM PNEUMATIC VALVE AND THEN REMOVE OTHER INTERNAL SUPPORTS (OF VALVE AND PNEUMATIC CONTROL) FROM BAG.

NOTE TO MAKE EXTRACTION OF INTERNAL SUPPORTS FROM BAG EASIER, WE RECOMMENDS TO PUT SUPPORTS IN VERTICAL POSITION (PERPENDICULAR TO NORMAL OPERATING POSITION). (FIG. **4**)

NOTE REMOVE O-RINGS (32) FROM THE SEAT OF THE 3 FLANGES (37) AND (30).

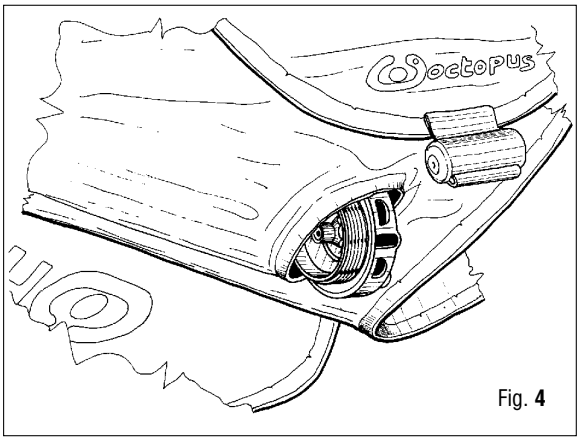


Fig. **4**

DISASSEMBLY OF BOTTOM PNEUMATIC DUMP VALVE INTERNAL SUPPORT

80. Unscrew screws (27) using a screwdriver (USAG 322 PH 1 type) and remove protection cap (28).

81. Using a 14-mm wrench (B-18) (or a 14-mm “pipe-wrench”) unscrew nut valve shaft (38) and remove flange for pneumatic valve flange (37) from 2-way valve shaft (33).

82. Using an 8-mm wrench, unscrew air connector (25).

WARNING

TO AVOID ANY DAMAGE TO SHEATHING DURING PHASE 80, ROTATE SIMULTANEOUSLY PNEUMATIC CONTROL INTERNAL SUPPORT AND SHEATHING. (FIG. **5**)

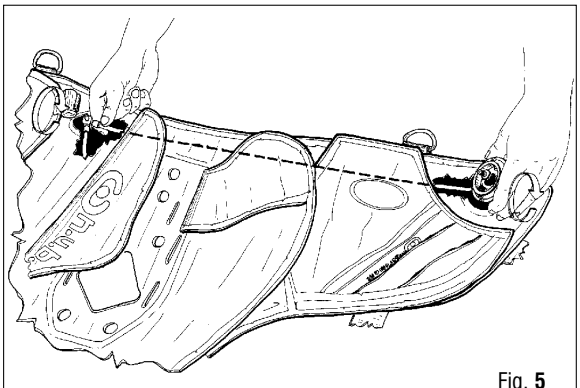


Fig. **5**

83. Using an 8-mm wrench, unscrew air connector (25) of top pneumatic valve from 2-way valve shaft (33).

DISASSEMBLY OF TOP PNEUMATIC DUMP VALVE INTERNAL SUPPORT

84. Using a screwdriver (USAG 322 PH 1 type), unscrew screws (27) and remove protection cap (28).).

85. Using a 14-mm wrench (B-18) (or a 14-mm “pipe-wrench”) unscrew nut valve shaft (38) and remove flange for pneumatic valve (37) from 2-way valve shaft (33).

86. Using an 8-mm wrench, unscrew air connector (25).

87. Using a 2.5 mm Allen wrench, unscrew plug (34) and remove O-Ring (24).

88. Remove O-Ring (24) from air connector (25).

DISASSEMBLY OF PNEUMATIC CONTROL INTERNAL SUPPORT

89. Using a screwdriver (USAG 322 PH 1 type), unscrew screws (27) and remove protection cap (28).

90. Using a small screwdriver (USAG 322 type), remove back-up ring (31) and valve shaft (29).

91. Using an 8-mm wrench, unscrew air connector (25).

92. Remove O-Ring (24) from air connector (25).

DISASSEMBLY OF PNEUMATIC SYSTEM INTERNAL SHEATHING

CAUTION

HTM RECOMMENDS PROCEEDING WITH THE FOLLOWING PROCEDURE ONLY IF EXTREMELY NEEDED.
TO MAKE SERVICE EASIER AND GUARANTEE SUCCESSFUL OPERATION, WE RECOMMENDS TO ALWAYS REPLACE INTERNAL SHEATHING (CODE: 46200125 - CM 60 - CODE: 46200126 - CM 72) WHEN DEFORMATION OR BREAKING OCCURS.

93. Using two wrenches (8 mm and 9 mm), unscrew air connector (25).

94. Remove knurled part of air connector (25) from sheathing (26).

95. Repeat points 93 and 94 for the air connector located on the other ends of sheathing (26).

CLEANING

WARNING

USE APPROPRIATE EYE AND SKIN PROTECTION WHEN HANDLING ANY TYPE OF ACIDS.

Ordinary cleaning of any rubber parts to be reused should be performed by washing all parts with a mixture of warm water and mild detergent. 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).
Make sure all parts have been carefully rinsed and dried before reassembly.

WARNING

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

INSPECTION

Some components of integrated system must be regularly replaced at each revision.

Components we recommend to replace are the following:

PNEUMATIC CONTROL

Quantity	Reference number	Description	Code
2	3	O-Ring 2007	46110213
4	5	O-Ring 2050	46110211
3	7	O-Ring 2012	46110101
1	16	Filter	47159146
1	17	O-Ring 106	46110106
1	21	O-Ring 3156	47110270
1	23	O-Ring 2015	46110102
1	24	O-Ring 3 x 1	47110172
1	32	O-Ring 3231	46110265

If the above-mentioned parts are not replaced, they should be inspected with a jeweler's loop for the flaws listed below.

Description	Ref. number	Inspection
Quick connector	18	Inspect for scratches, corrosion or deteriorated chrome plating.
O-Rings	3-5-7-17 21-23-24-32	Inspect for cuts, tears or contamination. The presence of any of these flaws may cause leakage.
Filter	16	Inspect for no deposit on filter surface.
O-Ring seats		Inspect for all metal surfaces or other seals and check the presence of scratches, chipping, deteriorated chrome-plating or foreign particles.
Sheathing assembly	36	Check that spiral and sheathing do not show any deformation or break.
Spring	2	Inspect for cracking, deformed or broken coils.
Threaded parts		Inspect threading and carefully clean with low-pressure air and/or soft brush.

PNEUMATIC VALVES

Quantity	Reference number	Description	Code
2	23	O-Ring 2015	46110102
4	24	O-Ring 3 x 1	47110272
2	32	O-Ring 3231	46110265
2	33	O-Ring 3100	47110271
1	35	Back-up ring	47158716
1	39	O-Ring 2056	46110210
2	40	Sealing plate	47158727
2	42	O-Ring 2037	46110110

If the above-mentioned parts are not replaced, they should be inspected with a jeweler's loop for the flaws listed below.

Description	Ref. number	Inspection
O-Rings	23-24-32-33-39-42	Inspect for cuts, tears or contamination. The presence of any of these flaws may cause leakage.
Sealing plate	40	Inspect for cuts, cracks or foreign particles.
Back-up ring	35	Inspect for distortion or foreign particles.
O-Ring seats		Inspect for all metal surfaces or other seals and check the presence of scratches, chipping, deteriorated chrome-plating or foreign particles.
Diaphragm	44	Inspect for distortion, cuts, cracks or foreign particles.
Washer	45	Inspect for distortion or foreign particles.
Spring	46	Inspect for cracking, deformed or broken coils.
Threaded parts		Inspect threading and carefully clean with low-pressure air and/or soft brush.

7-WAY MANIFOLD/HOSES

Quantity	Reference number	Description	Code
2	4	O-Ring 2-003	46110242
2	19	O-Ring 106	46110106
1	28	O-Ring 2025	46110205
3	52	O-Ring 108	46110108
2	97	O-Ring 2043	46110215
2		O-Ring 114	46110114
1		O-Ring 2031	46110107

If the above-mentioned parts are not replaced, they should be inspected with a jeweler's loop for the flaws listed below.

Description	Ref. number	Inspection
O-Rings	4-19-28-52-97-(114-2031)	Inspect for cuts, tears or contamination. The presence of any of these flaws may cause leakage.
Hoses	6-7-9-29	Inspect for cuts, bubbles or any other sign of damage.
O-Ring seats		Inspect for all metal surfaces or other seals and check the presence of scratches, chipping, deteriorated chrome-plating or foreign particles.
Manifold body	1	Inspect for scratches, chipping or foreign particles in hose seats and plugs.
Threaded parts		Inspect threading and carefully clean with low-pressure air and/or soft brush.

4-WAY MANIFOLD

Quantity	Reference number	Description	Code
1	19	O-Ring 106	46110106
1	97	O-Ring 2043	46110215

If the above-mentioned parts are not replaced, they should be inspected with a jeweler's loop for the flaws listed below.

Description	Ref. number	Inspection
O-Rings	19-97	Inspect for cuts, tears or contamination. The presence of any of these flaws may cause leakage.
O-Ring seats		Inspect for all metal surfaces or other seals and check the presence of scratches, chipping, deteriorated chrome-plating or foreign particles.
Manifold body	51	Inspect for scratches, chipping or foreign particles in hose seats and plugs.
Threaded parts		Inspect threading and carefully clean with low-pressure air and/or soft brush.

ORAL PIPE

Quantity	Reference number	Description	Code
2	22	Pipe clamp	47179863
1	33	O-Ring 3100	47110271
1	39	O-Ring 2056	46110210

If the above-mentioned parts are not replaced, they should be inspected with a jeweler's loop for the flaws listed below.

Description	Ref. number	Inspection
O-Rings	33-39	Inspect for cuts, tears or contamination. The presence of any of these flaws may cause leakage.
Pipe	21	Inspect for distortion, cuts, chipping or any other sign of damage.
Swivel elbow	40	Inspect for foreign particles on pipe and flange seat.
Oral inflator valve	23	Inspect for breaks or foreign particles inside the poppet.

OVERPRESSURE VALVE

Description	Ref. number	Inspection
Overpressure valve seal	34	Inspect for distortion, chipping, cuts or foreign particles.
Spring plate	35	Inspect for distortion, chipping, cuts or foreign particles.
Quick purge spring	36	Inspect for cracking, deformed or broken coils.

For First stage, Second stage and Second stage Octopus inspection, refer to the relevant manual.

REASSEMBLY

CAUTION

BEFORE STARTING THE REASSEMBLY, LIGHTLY LUBRICATE ALL O-RINGS WITH CON SILICONE GREASE (GENERAL ELECTRIC VERSALUBE G-322 TYPE OR EQUIVALENT). LUBRICATION WILL REDUCE THE RISK OF DAMAGING DURING REASSEMBLY.

PNEUMATIC SYSTEM REASSEMBLY

REASSEMBLY OF INTERNAL SHEATHING OF INTEGRATED SYSTEM

NOTE PROCEED TO THE FOLLOWING OPERATIONS ONLY IF INTEGRATED SYSTEM HAS BEEN PREVIOUSLY DISASSEMBLED.

1. Insert pipe (36) in the knurled part of connector (25) (knurled part facing pipe).

2. Insert pipe (36) in the connector (25).

3. Using two wrenches (8 mm and 9 mm), screw the two parts.

4. Repeat air connector reassembly steps, (connector is located at the other end of sheathing).

5. Position O-Rings (24) in air connector seats (25).

REASSEMBLY OF INTERNAL SUPPORT OF PNEUMATIC CONTROL

6. Position O-Ring (23) in valve shaft seat (29).

7. Screw air connector (25) in valve shaft hole (29), tightening with a 9-mm wrench.

8. Place valve shaft (29) in control flange hole (30). (FIG. **6**)

9. Lock valve shaft (29) with back-up ring (31).

NOTE POSITION SHEATHING AS SHOWN IN FIG. **6**.

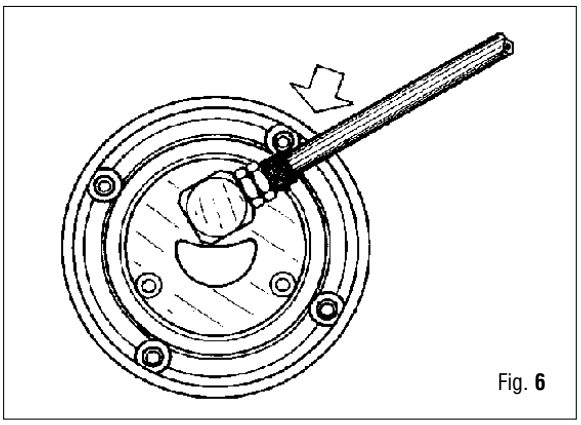


Fig. **6**

10. Insert protection cap (28) and tighten screws (27), using a screwdriver (USAG 322 PH 1 type).

11. Insert internal support of pneumatic control in the bottom, left hole, removing pipe from bottom right hole.

REASSEMBLY OF INTERNAL SUPPORT OF TOP PNEUMATIC DUMP VALVE

12. Position back-up ring (35) and O-Ring (23) in the seat of 2-way valve shaft. (33).

NOTE BACK-UP RING FEATURES A CUT TO MAKE REASSEMBLY EASIER. IT MUST BE LUBRICATED AS O-RING.

13. Place O-Ring (24) on valve plug (34).

14. Screw plug (34) in the 2-way valve shaft hole, using a 2.5-mm Allen wrench.

15. Position O-Ring (24) on air connector seat (25).

16. Screw air connector (25) in valve shaft hole (33), tightening with an 8-mm wrench.

17. Insert 2-way valve shaft (33) in the flange (37), and place sheathing in its seat.

18. Position protection cap (28) and tighten screws (27), using a screwdriver (USAG 322 PH 1 type).

CAUTION

INSERT SHEATHING IN THE SMALLER HOLE OF PROTECTION CAP.

19. Lock 2-way valve shaft (33) with nut (38), using a 14-mm wrench (B-18).

20. Insert internal support of top dump valve in the top, left hole, and remove pipe from bottom, left hole.

REASSEMBLY OF INTERNAL SUPPORT OF BOTTOM PNEUMATIC DUMP VALVE

21. Tighten both sheathings previously removed from bottom, right hole and screw them to 2-way valve shaft (33), using a 9 mm wrench (FIG. **7**)

NOTE TO MAKE SUCH AN OPERATION EASIER, SCREW SHEATHING OF TOP PNEUMATIC DUMP VALVE SUPPORT FIRST.

CAUTION

TO AVOID DAMAGING SHEATHING DURING STEP 22, SIMULTANEOUSLY TURN INTERNAL SUPPORT OF PNEUMATIC CONTROL.

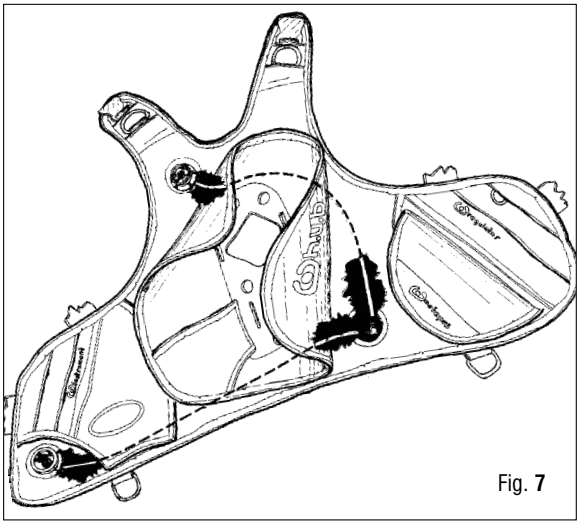


Fig. **7**

22. Insert pneumatic valve flange (37) in 2-way valve shaft (33) and sheathing into its seat. Tighten nut (38) using a 14-mm wrench (B-18).

NOTE IF USING A TORQUE WRENCH, SET THE TORQUE TO 4 - 4,5 Nm

23. Tighten protection cap (28) with screws (27), using a screwdriver (USAG 322 PH 1 type).

CAUTION

SLIP SHEATHING INTO PROTECTION CAP SMALL HOLES.

24. Position O-Ring (32) on internal supports.

25. Insert internal supports into the bag (O-Ring (32) must be inside).

NOTE O-RING (32) MUST BE PLACED INSIDE THE BAG.

NOTE TO MAKE SUCH AN OPERATION EASIER, PLACE INTERNAL SUPPORTS IN VERTICAL POSITION (PERPENDICULAR TO NORMAL OPERATING POSITION). (FIG. **4**)

REASSEMBLY OF PNEUMATIC DUMP VALVES EXTERNAL BEZEL

26. Position sealing plate (40) on sealing plate support (41).

27. Using a 22-mm wrench (B-9), lock down sealing plate nut (39) on support (41).

28. Place O-Ring (42) in its seat on sealing plate support (41).

29. Insert sealing plate (41) in 2-way valve shaft (33).

30. Position spring (46) on sealing plate support (41).

NOTE PROCEED TO THE FOLLOWING PROCEDURE ONLY IF PREVIOUSLY DISASSEMBLED.

31. Place diaphragm (44) on diaphragm nut (43).

32. Install washer (45) on diaphragm (44).

33. Lock down diaphragm nut (43), by hand, to valve bezel. (47).

34. Using special wrench (C-3), screw valve bezel (47) to pneumatic valve flange (37).

CAUTION

FOR SUCCESSIVE OPERATION AND SEALING CHECK, REFER TO SPECIAL PROVIDED INSTRUCTIONS AT "TESTS" SECTION.

REASSEMBLY OF PNEUMATIC CONTROL BODY

35. Position O-Ring (17) in its seat, on male quick connector (18).

36. Place filter (16) on male quick connector hole (18) and lock it down in the central hole of control body (1), using a 14-mm wrench (B-18).

NOTE IF USING A TORQUE WRENCH, SET THE TORQUE TO 4 - 4,5 Nm

37. Position the two O-Rings (7) in the seats of control loading piston (19) and lightly lubricate it with special grease (Varisil 500.000 type).

38. Place two O-Rings (5) in the seat of loading piston (20).

39. Insert control loading piston (19) in the seat of loading piston (20) and make round end of piston go out from top hole of loading piston seat (20).

40. Position spring (2) on piston.

41. Screw piston seat (20) into top hole of control body (1), using a 17-mm wrench (B-17), and lock it down.

NOTE IF USING A TORQUE WRENCH, SET THE TORQUE TO 4 - 4,5 Nm

42. Position (7) and (3) in the seats of control purge piston (8).

43. Place two O-Rings (5) in purge piston seat (6).

44. Slip purge piston (8) in its seat (6), entering from top hole. The round end of piston will protrude.

45. Lock down the flat part of piston (8) that protrudes in a vice (Fig. **3**)

46. Position O-Ring (3) in bushing seat (4).

CAUTION

PUT A DROP OF SPECIAL PRODUCT (LOCTITE 415) ON THREADED END OF PURGE PISTON.

47. Screw purge button bushing (4) on purge piston, using a 6 mm wrench.

48. Position spring (2) on bushing (4) and lock down purge piston seat (6) into bottom hole of control body (1), using a 17-mm wrench (B-17).

CAUTION

FOR SUCCESSIVE OPERATION AND SEALING CHECK, REFER TO SPECIAL PROVIDED INSTRUCTIONS AT "TESTS" SECTION.

REASSEMBLY OF PNEUMATIC CONTROL

49. Screw bezel (11) to flange (30) but do not tighten.

50. Place (but do not screw it) and correctly position control body assembly on flange (30).

CAUTION

CONTROL BODY ASSEMBLY MUST BE POSITIONED BEING QUICK CONNECTOR ON THE RIGHT, WITH A 45° ANGLE, TO GET THE BEST POSITION FOR USE. (FIG. **8**)

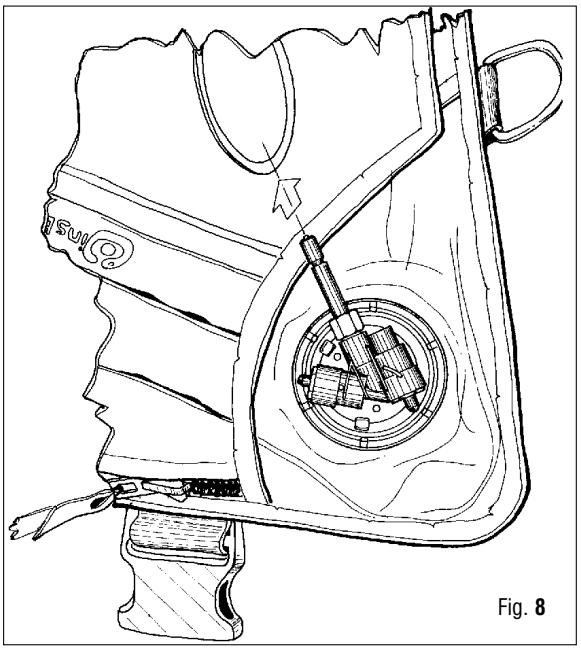


Fig. **8**

51. Keep control body in this position and lock bezel down (11) using wrench (USAG 282/58-62-65 type).

52. Remove control body.

53. Insert O-Ring (21) in flange seat (30).

54. Place bottom cover (12) on bezel (11) and screw control body assembly on flange (30) with two screws (15) using a screwdriver USAG 322 PH 1 type.

55. Place inflator button (10) on top and purge button (9) on bottom and screw top cover (13) with screws (14), using a screwdriver USAG 322 PH 1 type.

REASSEMBLY OF BAG

REASSEMBLY OF INFLATION PIPE

56. Insert pipe (21) on longer part of swivel elbow (40) top end (near the elbow) using a clamp (22).

57. Cut the clamp (22) at base, using a cutter.

58. Lightly lubricate swivel elbow O-Ring seat (40) with special poppet grease (General Electric Versalube G-322 type or equivalent) and position O-Ring (39) on it.

59. Place swivel elbow flange (38) on elbow and place O-Ring (33) on flange.

60. Using snap ring pliers (HI-TECH 1221-S type), lock the assembly down with a back-up ring located in swivel elbow.

61. Place poppet cap (24) at the end of pipe (21).

62. Completely insert Halkey Roberts poppet in pipe (21) and position it aligned with the edge of the pipe, the red part facing outward.

63. Clamp pipe with a clamp (22), which is positioned on external part of poppet.

64. Cut clamp at base, using a cutter.

65. Mount oral inflation pipe on bezel, near left pocket, using a wrench (USAG 282/58-62-65 type).

66. Put inflation pipe in the pocket, through internal hole, and lock it with Velcro that is in the pocket.

CAUTION

FOR SUCCESSIVE OPERATION AND SEALING CHECK, REFER TO SPECIAL PROVIDED INSTRUCTIONS AT "TESTS" SECTION.

REASSEMBLY OF MECHANIC OVERPRESSURE VALVES

67. Put line (66) through base plate spring hole (35) and make two knots locating them in its seat, under sealing.

68. Lubricate base plate spring (35) surface with special poppet grease (General Electric Versalube G-322 type or equivalent) and insert overpressure valve seal (34).

69. Opposite, position spring (36) on the special base plate spring seat and put line (66) through it.

70. Put line (66) through overpressure cover hole (37).

71. Lay bag with external part facing up.

72. Lock the two overpressure valve assemblies down, using the special wrench (USAG 282/58-62-65 type) (position long line on the top and short line on the bottom).

CAUTION

TO MAKE LINE INSERTION EASIER, USE A HOOK-SHAPED PIN.

73. Insert line in ball grip hole and fix it with two knots.

CAUTION

FOR SUCCESSIVE OPERATION AND SEALING CHECK, REFER TO SPECIAL PROVIDED INSTRUCTIONS AT "TESTS" SECTION.

REASSEMBLY OF TANK PLATE SUPPORT

74. Put plate (15) on a surface with hose housing (grooves) facing up. (Fig. **9**)

75. Insert the two rolls in plate pin located on top half , over knob seat (fig. 9).

76. Lock rolls down with screws (27) and washers (11), using a screwdriver (USAG 322 PH 1 type).

77. Position knob (16) in its seat, and align knob hole with plate holes.

78. Insert rod (17) and lock knob down (16).

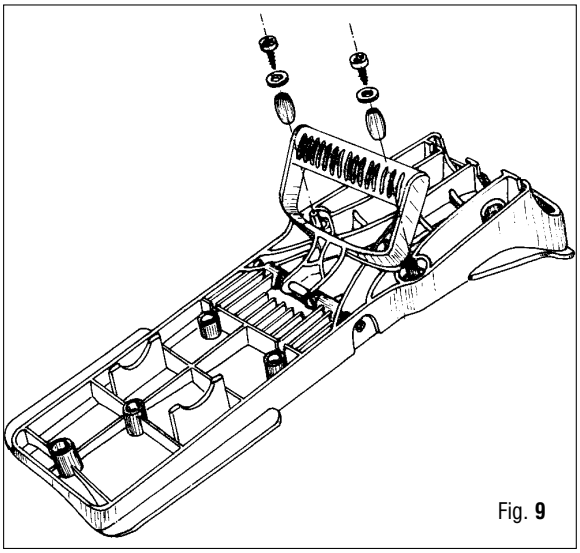


Fig. **9**

CAUTION

ROD MUST COMPLETELY ENTER THE PLATE. (FIG.**10**)

79. Turn plate and position grip plate (13) in its seat.

80. Insert shorter tape (female buckle) in plate slot, up left.

81. Insert longer tape (male buckle) in plate buttonhole, up right.

NOTE

GREY STITCHING ON MALE BUCKLE TAPE SHOWS MINIMUM AND MAXIMUM ADJUSTING LEVEL OF TAPE, TO USE WHEN INSTALLING INTEGRATED SYSTEM ON TANK.

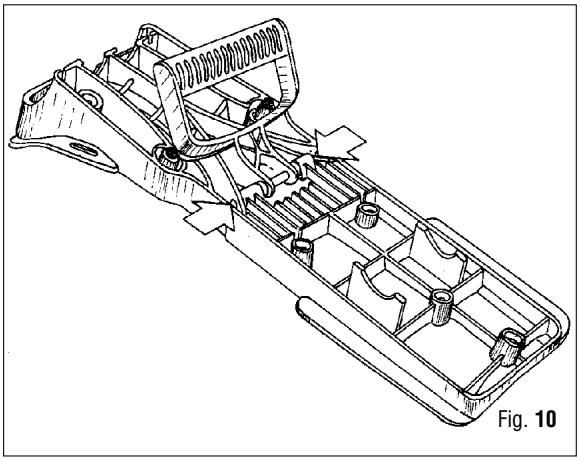


Fig. **10**

REASSEMBLY OF 7-WAY MANIFOLD SYSTEM

82. Position 7-way manifold system on a surface, being HP writing visible (the two HP ports diagonally marked must be on the bottom). (Fig. **11**)

83. Put two O-Rings (52) on plugs (53).

84. Screw plugs (53) to HP2 and HP3 ports on the bottom, using a 4-mm Allen wrench.

85. Position O-Ring (19) on plug (20).

86. Screw plug (20) in LP3 threaded port, using a 4-mm Allen wrench.

87. Place O-Ring (97) in connector seat (8), and screw connector in LP4 threaded port, using a 17-mm wrench (B-17).

88. Position O-Ring (52) on connector (2), and screw connector (2) in HP1 threaded port, using a 14-mm wrench (B-18).

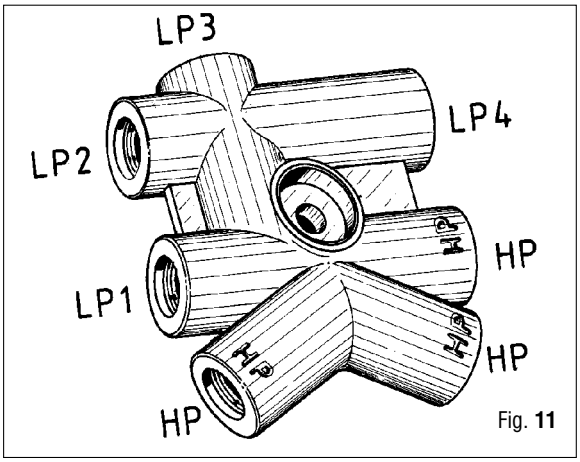


Fig. **11**

89. Position O-Rings (4) on swivel (5).

90. Using a 14-mm wrench (B-18), screw quick connector hose in LP4 port of distributive system.

91. Using a 17-mm wrench (B-17), screw 1/2" LP hose (29) in LP2 port

92. Insert swivel (5) in connector (2), using snap ring pliers (USAG 133 type).

WARNING

HTM RECOMMENDS TO PUT LINEN ADHESIVE TAPE ON PLIER ENDS TO AVOID SWIVEL DAMAGING.

93. Using a 15-mm wrench, install HP hose (55 cm) (6) on connector (2).

94. Using a 17-mm wrench (B-17), install LP 1/2" hose (9) in LP1 threaded port.

WARNING

FOR SUCCESSIVE OPERATION AND SEALING CHECK, REFER TO SPECIAL PROVIDED INSTRUCTIONS AT "TESTS" SECTION.

REASSEMBLY OF TANK PLATE SUPPORT + 7-WAY MANIFOLD ON INTEGRATED SYSTEM

95. Position integrated system open and completely deflated on a surface facing up.

96. Insert tank plate support assembly (15) under integrated system, and make knob protrude from central opening of bag. (Fig. **12**)

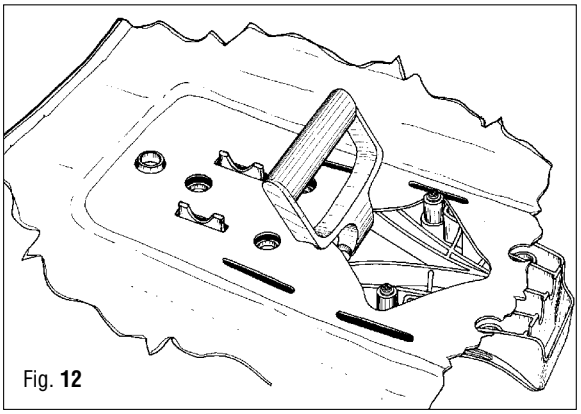


Fig. **12**

WARNING

CHECK THAT BAG ROUND OPENINGS ARE ALIGNED WITH THREADED SEATS OF PLATE AND THAT THE 7-WAY MANIFOLD SUPPORTS PROTRUDE FROM THEIR SLOTS. (FIG. **12**)

97. Position the 7-way manifold system assembly in tank plate support seat, outside the bag. (Fig. **13**)

98. Lock the manifold with screw (3), using a screwdriver (USAG 322 PH1 type).

99. Put hose (7) in bag top opening, under inner right buttonhole, then connect it to pneumatic control (Fig. **14**)

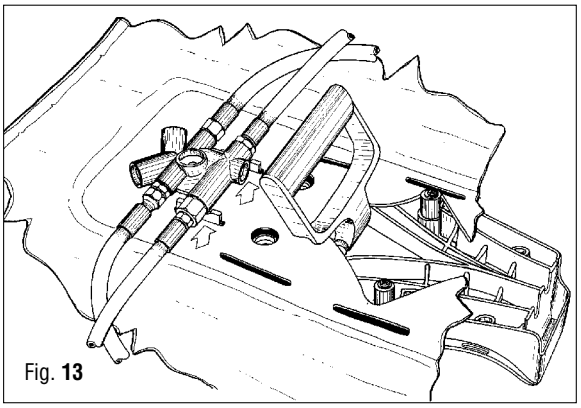


Fig. **13**

100. Put the 1/2" LP hose (29) in bag top opening under inner left buttonhole and put it through pocket. (Fig. **14**)

101. Pass the two hoses around knob (9) and (6), and make them go through tank plate support grooves (15), under bag and make them go out from plate top, between plate and bag. (Fig. **14**)

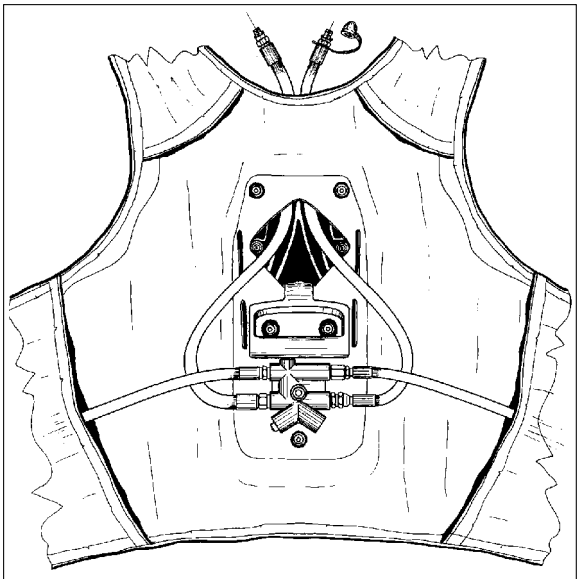


Fig. **14**

REASSEMBLY OF BACK PACK

102. Position backpack (45) on a surface with showing label part facing up.

NOTE

LEFT WAISTBAND IS THE ONE THAT HAS MALE VELCRO (ROUGH) IN THE EXTERIOR PART, IN CORRISPONDENCE WITH PART MARKED H.U.B.
RIGHT WAISTBAND IS THE ONE THAT HAS FEMALE VELCRO (SOFT) IN THE INNER PART, IN CORRISPONDENCE WITH PART MARKED H.U.B.

103. Insert waistbands (45) in backpack slots (43).

104. Insert tape in waistband buckle.

105. Position backpack (43) assembly in correspondence with plate assembly, making knob go out from plate, through backpack central hole.

NOTE

TO MAKE SUCH AN OPERATION EASIER, KEEP KNOB INCLINED

106. Using a screwdriver (USAG 322 PH1 type), screw backpack to plate with 5 screws (3).

WARNING

CHECK THAT HOSES POSITIONED IN PLATE GROOVES, UNDER THE BAG, ARE FREE OF MOVEMENT.

107. Insert waistband in the two loops and make the end protrude.

108. Turn integrated system and insert MB belt (B) in the seat of tank plate support (15).

109. Position rubber protection on MB belt (B).

110. Insert MB belt (B) in knob hauling.

REASSEMBLY 4-WAY MANIFOLD AND SECONDS STAGES

111. Position O-Ring (19) on plug (20).

112. Completely screw plug (20) in LP8 port, using a 4-mm Allen wrench.

113. Position O-Ring (97) in connector seat (50).

114. Screw connector (50) in LP6 port, using a 17-mm wrench (B-17).

115. Insert octopus hose in corresponding pocket LP5 port and screw it to 4-way manifold, using a 14-mm (B-18).

116. Insert mouthpiece in corresponding port of Octopus pocket.

117. Screw 2nd stage hose to 4-way manifold, using a 14 mm (B-18).

118. Using two 17 mm wrenches (B-17), screw 2nd stage hose to connector (50). Position manifold support (48) on the outside of pocket, in correspondence with bag ports. (Fig.**16**)

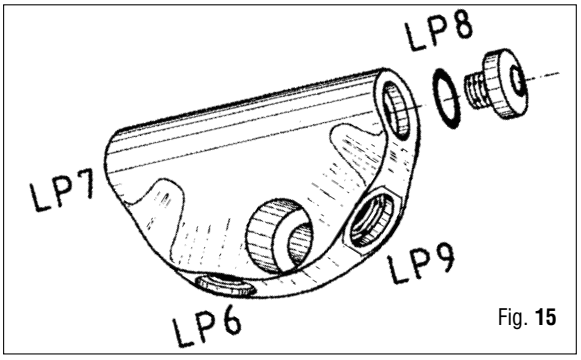


Fig. **15**

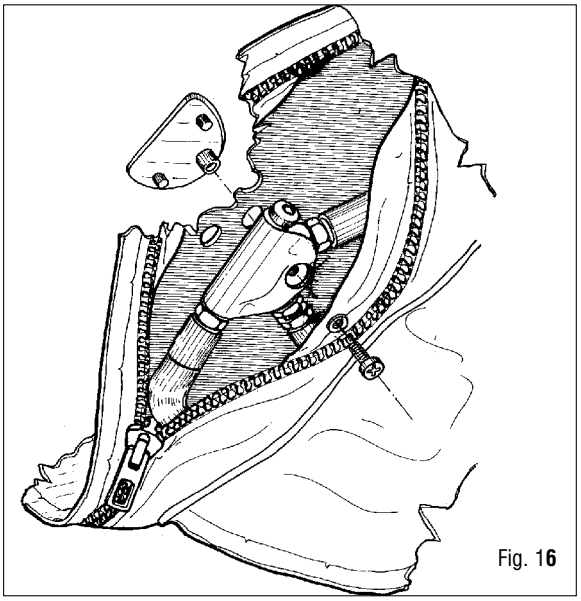


Fig. 1**6**

WARNING

MAKE SURE THREE SUPPORT PINS ARE CORRECTLY POSITIONED.

119. Install 4-way manifold on support pins and screw it using screw (26) with corresponding washer (25) in the central hole of distributor, using a screwdriver (USAG 322 PH 1 type). (Fig. **16**)

WARNING

FOR SUCCESSIVE OPERATION AND SEALING CHECK, REFER TO SPECIAL PROVIDED INSTRUCTIONS AT "TESTS" SECTION.

REASSEMBLY OF 1ST STAGE

120. Position 1st stage dust cap (24) on H.P. hose (6).

121. Using a 14 mm wrench (B-18), install 1st stage assembly on HP hose.

122. Using a 17-mm wrench (B-17), position second hose in D.F.C. port.

123. Position integrated system on tank and lock it with tank belt (B).

124. Connect 1st stage to tank valve.

WARNING

FOR SUCCESSIVE OPERATION AND SEALING CHECK, REFER TO SPECIAL PROVIDED INSTRUCTIONS AT "TESTS" SECTION.

TESTS

TEST OF PNEUMATIC SYSTEM

A) PNEUMATIC CONTROL BODY

A.1) Connect male quick connector (18) to a jacket hose (INT) mounted on a 1st stage (adjusted at around 10 ATM.).

A.2) Open tank valve wheel.

A.3) Press pistons (loading and purge pistons) to check that air comes out.

A.4) Submerge control body in water to check possible air leakage.

NOTE IF OPERATIONAL ANOMALIES, AND/OR AIR LEAKAGE ARE NOTICED, REFER TO THE “INSPECTION” SECTION OF MANUAL.

B) PNEUMATIC DUMP VALVES

B.1) Open tank valve wheel, pressing purge button of 2nd stage.

B.2) Inflate integrated system pressing inflation button (10) of pneumatic control.

B.3) Deflate integrated system activating purge button (9).

WARNING

CHECK THAT PNEUMATIC DUMP VALVES OPEN, ALLOWING AIR TO COME OUT DURING DEFLATION.

NOTE IF OPERATIONAL ANOMALIES, AND/OR AIR LEAKAGE ARE NOTICED, REFER TO THE “INSPECTION” SECTION OF MANUAL.

TEST OF BAG

C) MECHANICAL OVERPRESSURE VALVES

C.1) Open tank valve wheel, pressing purge button of 2nd stage.

C.2) Inflate integrated system pressing inflation button (10) of pneumatic control to check correct operation of mechanical overpressure valves.

WARNING

MECHANICAL OVERPRESSURE VALVES MUST ALLOW EXCESS AIR COMES OUT DURING INFLATION.

C.3) Deflate integrate system acting on mechanical overpressure valves that must allow air discharge.

NOTE

IF OPERATIONAL ANOMALIES, AND/OR AIR LEAKAGE ARE NOTICED, REFER TO THE “INSPECTION” SECTION OF MANUAL.

D) BAG

D.1) Open tank valve wheel, pressing purge button of 2nd stage.

D.2) Inflate integrated system.

WARNING

AFTER 4 HOURS, INSPECT FOR AIR LEAKAGE (OF BAG OR VALVES) AND CHECK BAG INFLATION.

TEST OF INTEGRATED SYSTEM ASSEMBLY

E.1) Install a gauge (code 46106152) in a HP port of 1st stage.

E.2) Open tank valve wheel, pressing purge button of 2nd main stage or of octopus.

E.3) Check correct operation of 2nd stage and Octopus acting as follow:

I) Press purge button for a few seconds and inspect for any dust particles in the hose and in the 2nd stage.

II) Rinse purge button and submerge 2nd stage and then Octopus in water to check possible leakage.

E.4) Operate loading button of pneumatic control and inflate integrated system.

E.5) Verify mechanical overpressure valves operation, as previously explained in “Tests” section, Item C.

E.6) Test oral inflation valve operating a few times, lightly pressing, and inspect for air leakage.

NOTE LIGHT PRESSURE WILL CAUSE AIR LEAKAGE.

E.7) Now submerge oral inflation pipe in water to check there are no air bubbles.

WARNING

AIR LEAKAGE MEANS FAULTY OPERATION OF AIR INLET VALVES. WE RECOMMEND IT

E.8) Activate pneumatic control purge button and deflate integrated system.

E.9) Verify pneumatic valves operation, as previously explained in “Tests” section, Item B.

E.10) Inflate integrated system, close tank valve and check pressure value on the gauge. Pressure value must be constant.

WARNING

NO PRESSURE DECREASE MUST OCCUR FOR AT LEAST 2 MINUTES.

TEST OF DISTRIBUTORS / HOSES

F) DISASSEMBLY

WARNING

IF PRESSURE DECREASE OCCURS INSIDE THE SYSTEM DURING TEST (“E” SECTION), PROCEED AS EXPLAINED HERE UNDER.

F.1) Close tank valve wheel.

F.2) Completely deflate integrated system, acting on pneumatic control purge button (9).

F.3) Deflate regulator assembly, pressing purge button of one of the two 2nd stages.

F.4) Open single tank belt buckle and extract rubber protection (96) and belt.

NOTE WE RECOMMEND TO KEEP THE SYSTEM CONNECTED TO TAPE AND 1ST STAGE CONNECTED TO TANK VALVE.

F.5) Using a screwdriver (USAG 322 PH 1 type), unscrew the 5-backpack screws (3) and remove inner part.

F.6) Press purge button of one of 2nd stages and slowly open tank valve .

F.7) Using soap foam check all sealing parts (hoses and manifolds).

WARNING

FOR POSSIBLE SERVICE OPERATIONS, ACT AS INDICATED IN RELEVANT SECTION OF THE MANUAL, AND PROCEED TO SUCCESSIVE INSPECTION AS SAID IN INTEGRATED SYSTEM TEST (“E” SECTION).

G) REASSEMBLY

G.1) Open tank valve, pressing purge button of 2nd stage and purge regulators assembly.

G.2) Position backpack and lock it down with 5 screws (3) using a screwdriver (USAG 322 PH 1 type).

WARNING

INSPECT FOR CORRECT POSITION AND MOVEMENT OF HOSES CONNECTED TO 1ST STAGE.

G.3) Insert the two waistbands in loops located under pockets.

G.4) Reassembly single tank belt with its rubber protection.

G.5) Disassemble the gauge and screw plug in 1st stage HP, using a 4-mm Allen wrench.

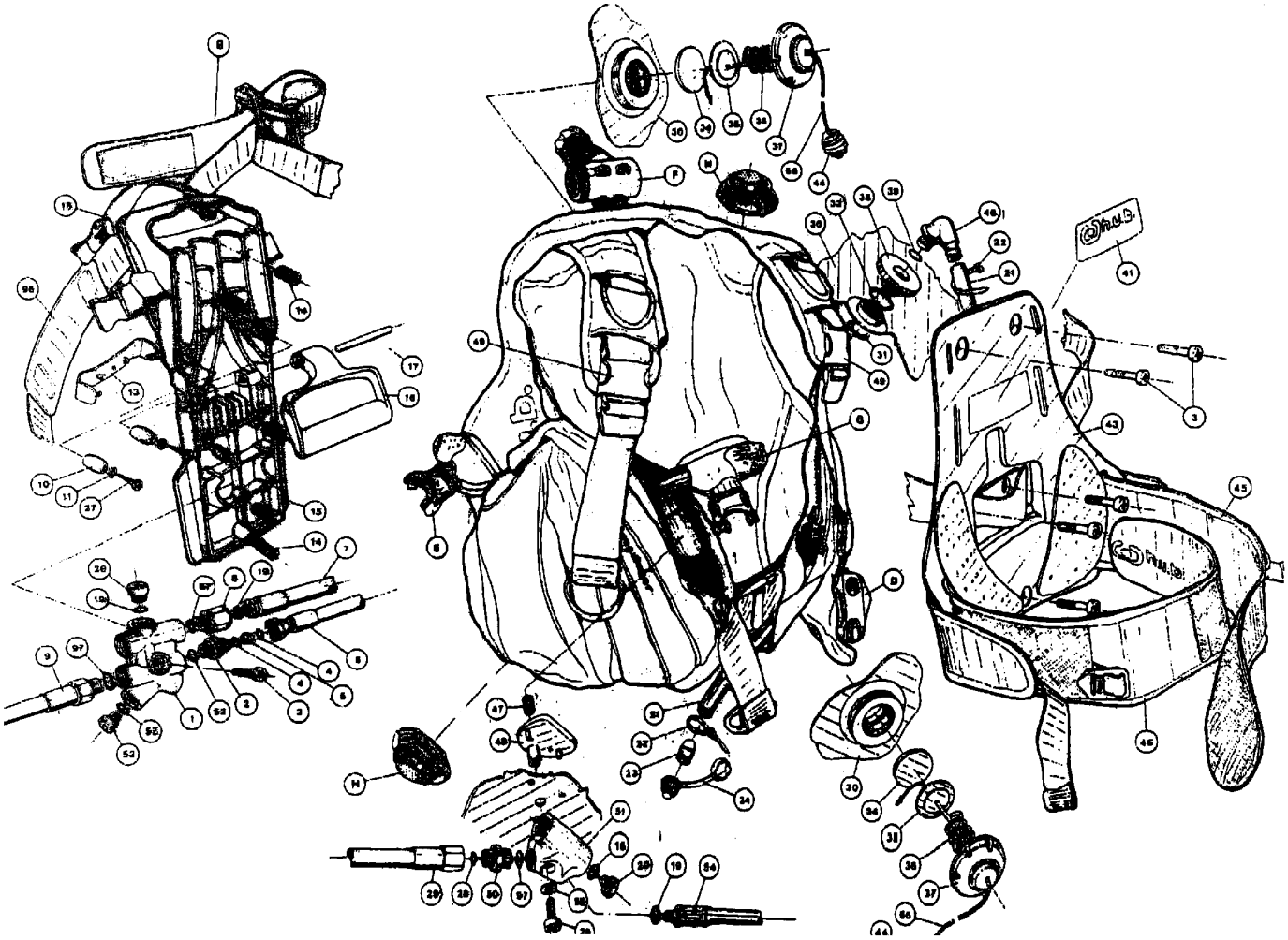
G.6) Disassemble 1st stage from tank valve and insert in tank support plate housing.

G.7) Roll up Second Stages inside bag pockets.

G.8) Remove integrated system from tank.

H.U.B. MARES

Drawing ref. No. J76
Updated to 03-04-2000



Ref. No.	Code	Description
1	47158706	7-way manifold
2	47158724	Connector 7/16" UNF
3	41111016	Screw M 5 x 20
4	46110242	O-Ring 2-003
5	44172073	Swivel assy
6	47158736	Hose H.P. cm 55
7	47158735	Hose L.P. 3/8" – quick connector, jacket cm 50
7	47158734	Hose L.P. 3/8" – quick connector, jacket cm 45
8	47158726	Connector 1/2 UNF 3/8"
9	47158729	Hose L.P. 1/2" – 1/2" (swivel)
10	46200007	Roller
11	41111017	Washer Ø 4.3 UNI-6593 DIN-126
13	46200015	Grip insert
14	47158714	Metal insert 018M5
15	46200009	Plate, tank support
16	46200008	Knob
17	47158715	Rod Ø 5 x 80 mm
18	47200203	Strap
19	46110106	O-Ring 106
20	46185204	Plug 3/8" UNF
21	47158700	Small pipe
22	47179863	Clamp, pipe
23	46200016	Poppet Halkey Roberts 730 ROA
24	46200017	Cover, valve 736 ACU4
25	45111018	Washer, Ø 5,3 UNI 6592 DIN 125/A
27	41111003	Screw 2,9 x 9,5 UNI 6954 71
28	46110205	O-Ring 2025
29	47158731	Hose L.P. 1/2" - 9/16" L-XL (cm 50)
29	47158730	Hose L.P. 1/2" - 9/16" S-M (cm 43)
30	47200021	Inflatable bag
31	47158708	Retaining ring Ø 18
33	46110271	O-Ring 3100
34	47159125	Seal, overpressure poppet
35	47159054	Base plate, spring

Ref. No.	Code	Description
36	46159150	Spring, quick purge
37	47159056	Overpressure cap
38	46200001	Bezel for swivel elbow
39	46110210	O-Ring 2056
40	46200002	Swivel elbow
41	47158743	Label
43	46200024	Backpack
44	47159136	Knob, black
45	***	Waistband
47	47158713	Tapex 073M4 insert
48	46200000	Support for 4 way manifold
49	47158562	Adjusting buckle Mares logo 50 M (1065)
49	47158563	Buckle Reg. 50 F (6483)
50	47158723	Connector 1/2" UNF 9/16"
51	47158705	4-way manifold
52	46110108	O-Ring 108
53	46185205	Plug 7/16" UNF
54	47158732	Hose L.P. 3/8" - 9/16" (cm 70 soft)
66	43169822	Line
96	47159311	Tank protection
97	46110215	O-Ring 2043
		ASSEMBLIES
B	47159295	Tank band assy, single tank
***	47200021	Bag assy Size S (18-30- 45)
***	47200022	Bag assy Size M (18-30- 45)
***	47200023	Bag assy Size L (18-30- 45)
***	47200024	Bag assy Size XL (18-30- 45)
***	46200148	Maintenance kit, hose/manifold H.U.B. Mares
		(4-19-28-52-97-OR 114-OR 2031)
D	***	Pneumatic control H.U.B. (table No. 205 plan J77)
E	***	Octopus VIPER (table No.102 plan E 18)
F	***	1st stage H.U.B. (table No.18 plan E 9)
G	***	2nd stage VIPER TEC (table No. 103 plan E 19)
H	***	Pneumatic purge valve H.U.B. (table No.206 plan J78)