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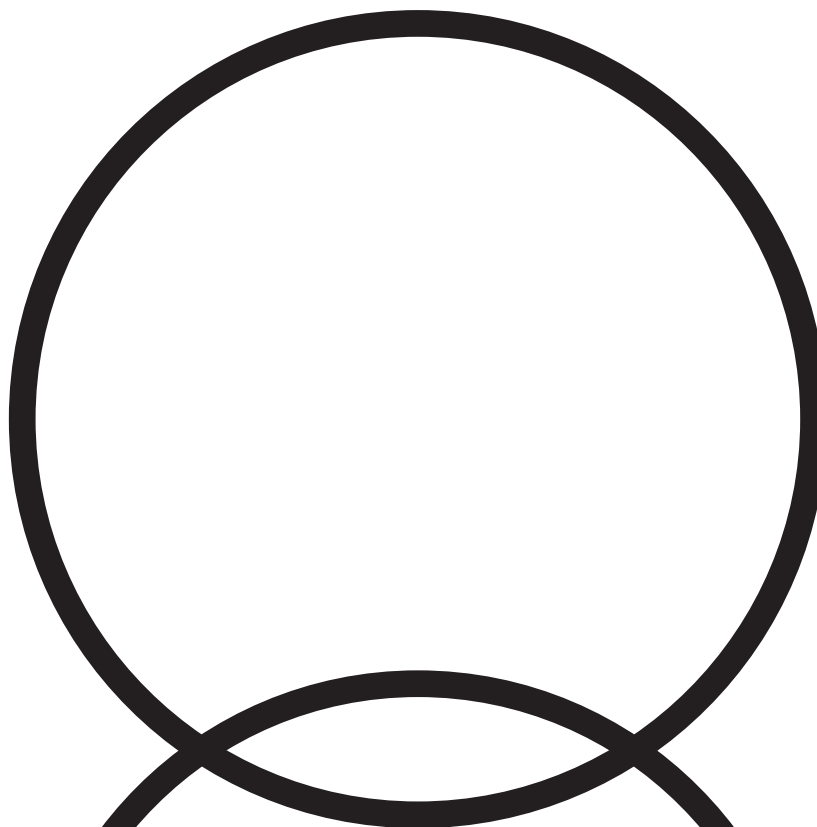
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REASSEMBLY OF PNEUMATIC CONTROL	H 1-16	2000	CHECKS AND INSPECTIONS	I 1-10	2002
REASSEMBLY OF BAG	H 1-16	2000	AIRLOCK DRAWING	I 1-12	2002
REASSEMBLY OF INFLATION PIPE	H 1-16	2000	AIRLOCK TABLE	I 1-13	2002
REASSEMBLY OF MECHANIC OVERPRESSURE VALVES	H 1-17	2000	TECHNICAL INFORMATION		
REASSEMBLY OF TANK PLATE SUPPORT	H 1-18	2000	ITM1 REPLACING A.T. PNEUMATIC INFLATOR	IT 1-1	2004
REASSEMBLY OF 7-WAY MANIFOLD SYSTEM	H 1-19	2000	ITM2 TECHNICAL UPDATE FOR PHOS TRONIC LIGHT SWITCH	IT 2-1	2004
REASSEMBLY OF TANK PLATE SUPPORT + 7-WAY MANIFOLD ON INTEGRATED SYSTEM	H 1-20	2000	ITM3 REPLACEMENT OF TECHNOMAD SERIES BAG WHEELS	IT 3-1	2004
REASSEMBLY OF BACK PACK	H 1-20	2000	ITM4 REPLACING X-VISION MASK LENSES	IT 4-1	2004
REASSEMBLY 4-WAY MANIFOLD AND SECONDS STAGES	H 1-21	2000	ITM5 PHOS 20/35	IT 5-1	2004
REASSEMBLY OF 1 ST STAGE	H 1-22	2000	ITM6 PHOS TRONIC	IT 6-1	2004
TESTS	H 1-22	2000	ITM7 REPLACING BUTTONS FOR M1 - M1 RGBM COMPUTER	IT 7-1	2004
TEST OF PNEUMATIC SYSTEM	H 1-22	2000	ITM8 REPLACEMENT OF OR 2012 AND VITON 75 AIRLAB QUICK-COUPLER GASKET	IT 8-1	2004
A) PNEUMATIC CONTROL BODY	H 1-22	2000	ITM9 REPLACEMENT NEMO BATTERY	IT 9-1	2004
B) PNEUMATIC DUMP VALVES	H 1-23	2000	ITM10 ACTIVATING NEMO AFTER IMMERSION IN OFF MODE	IT 10-1	2004
TEST OF BAG	H 1-23	2000	ITM11 NEW SCS VALVE SEAT	IT 11-1	2005
C) MECHANICAL OVERPRESSURE VALVES	H 1-23	2000	ITM12 V42 SPECIAL TOOLS	IT 12-1	2006
D) BAG	H 1-24	2000	ITM13 NEW SCS VALVE SEAT	IT 13-1	2006
TEST OF INTEGRATED SYSTEM ASSEMBLY	H 1-24	2000			
TEST OF DISTRIBUTORS / HOSES	H 1-25	2000			
F) DISASSEMBLY	H 1-25	2000			
G) REASSEMBLY	H 1-26	2000			
H.U.B. MARES DRAWING AND PARTS LIST	H 1-27	2000			
H.U.B. MARES TABLE	H 1-28	2002			
H.U.B. MARES TABLE	H 1-29	2002			
PNEUMATIC DISCHARGE VALVE H.U.B. DRAWING AND PARTS LIST	H 1-30	2004			
PNEUMATIC DISCHARGE VALVE H.U.B. TABLE	H 1-31	2004			
PNEUMATIC CONTROL H.U.B. DRAWING AND PARTS LIST	H 1-32	2002			
PNEUMATIC CONTROL H.U.B. TABLE	H 1-33	2003			
H.U.B. CENTURY DRAWING	H 1-34	2002			
H.U.B. CENTURY TABLE	H 1-35	2003			
H.U.B. AVANTGARDE DRAWING	H 1-36	2002			
H.U.B. AVANTGARDE TABLE	H 1-37	2004			
H.U.B AVANTGARDE PNEUMATIC CONTROL DRAWING	H 1-38	2002			
H.U.B AVANTGARDE PNEUMATIC CONTROL TABLE	H 1-39	2003			

NEW
NEW
NEW

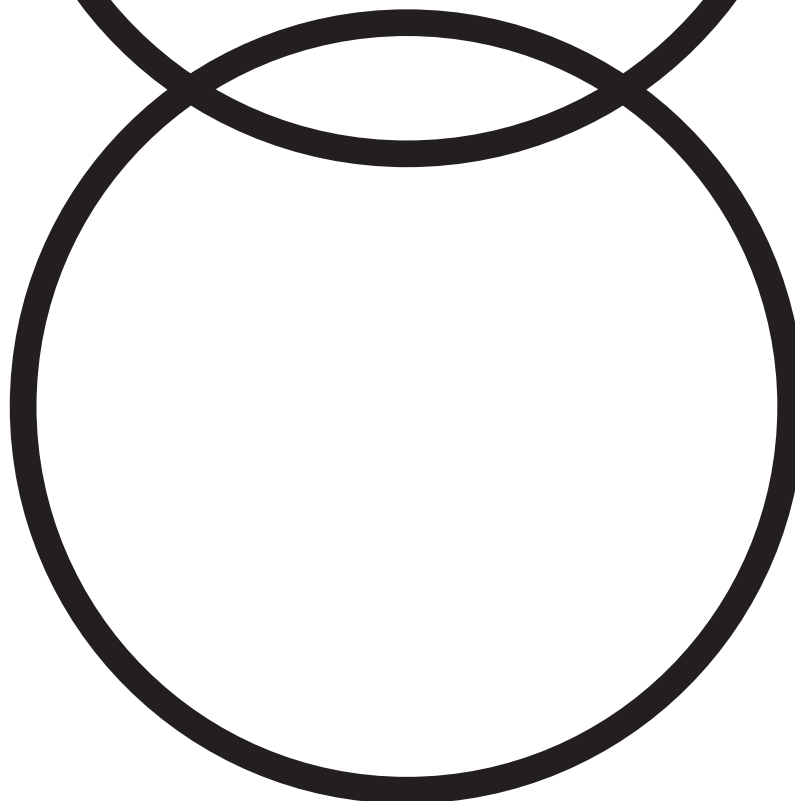
O-RING REFERENCE TABLE

O-RING TYPE - REFERENCE

4400 46110171



4387 46110170



O-RING REFERENCE TABLE

2007 - 46110213



2010 - 46110201



2012 - 46110101



2015 - 46110102



2018 - 46110203



2021 - 46110204



2025 - 46110205



2031 - 46110107



2037 - 46110110



2043 - 46110215



2050 - 46110211



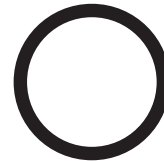
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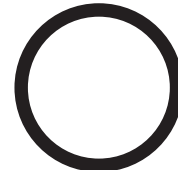
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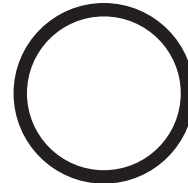
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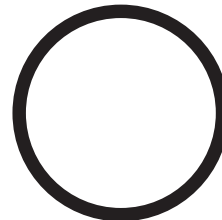
2075 - 46110243



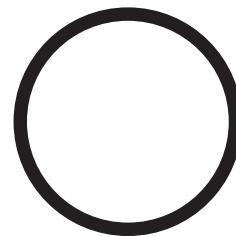
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2100 - 46110224



2106 - 46110245



3043 - 46110247



3050 - 46110119

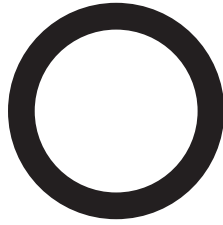


3056 - 46110227

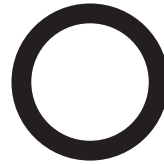


O-RING REFERENCE TABLE

200-212-8854 46110173



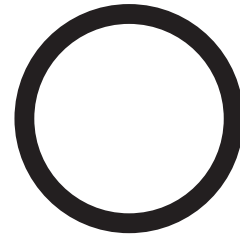
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106 - 46110106



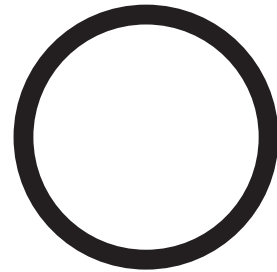
3100 - 47110271



108 - 46110108



3118 - 46110176



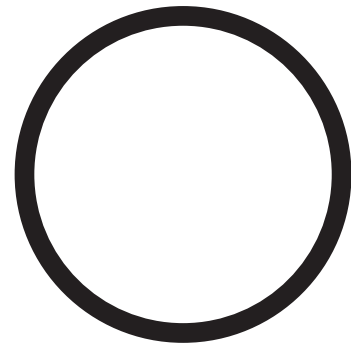
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115 - 46110117



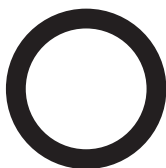
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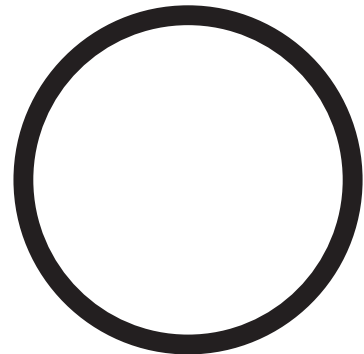
117 - 46110300




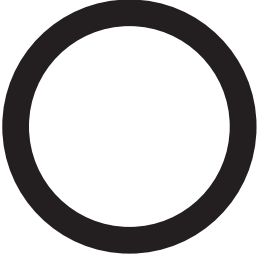
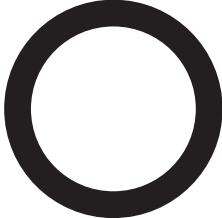
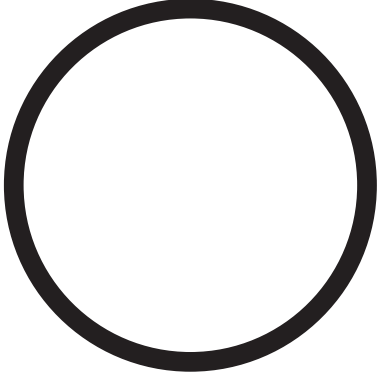
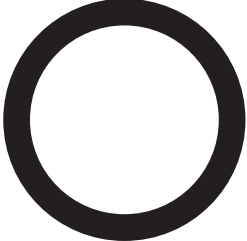
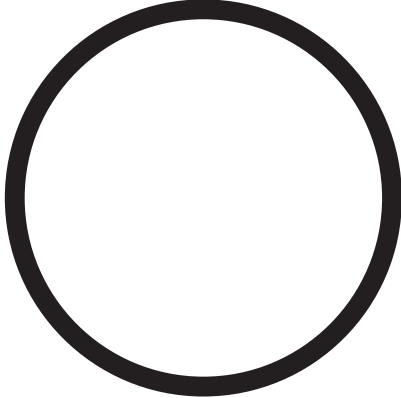

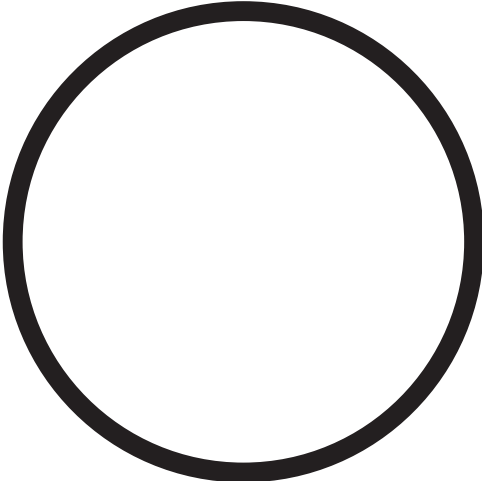




122 BIS - 45110206



3162 - 46110219

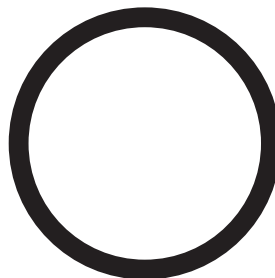


O-RING REFERENCE TABLE

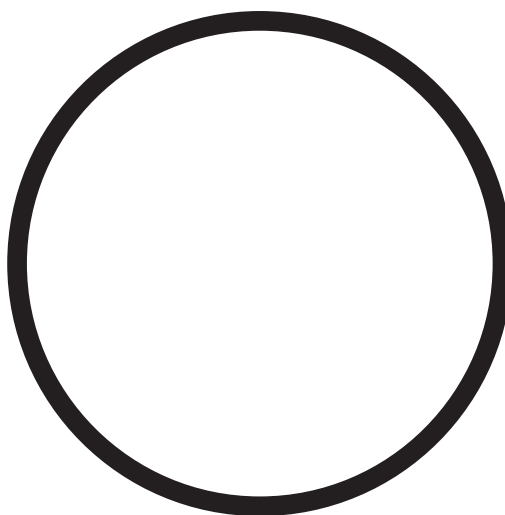
2-109 - 46110241		4106 - 46110217	
4087 - 46110172			
3175 - 47200723		4100 - 46110216	
3187 - 47200868		7X2 - 46200154	
3231 - 46110265		4X1 - 46110405	
		3X1 - 47110272	
		R/1 - 46110201	
		2-003 - 46110242	

O-RING REFERENCE TABLE

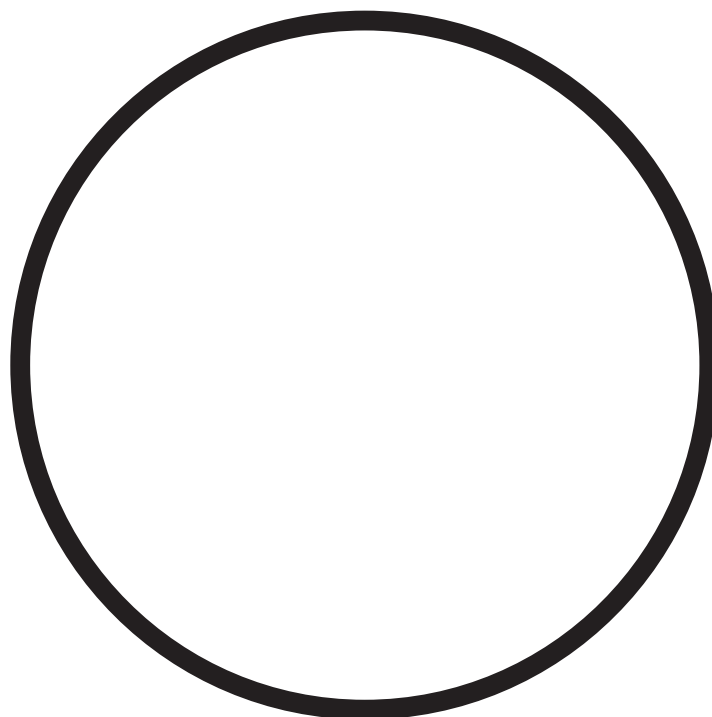
SPECIAL - 46110208



3243 - 45200064



2-153 - 46110240



MAINTENANCE PROCEDURES FOR MARES NITROX EN-13949 CERTIFIED REGULATORS: 2003



WARNING!

THE GENERAL MAINTENANCE PROCEDURES DESCRIBED IN THIS SECTION ARE INTENDED SOLELY AND EXCLUSIVELY FOR NITROX REGULATORS CERTIFIED AND PRODUCED BY MARES IN ACCORDANCE WITH THE EN 13949:2003 STANDARD AND NOT AS CONVERSION PROCEDURES FOR ANY OTHER REGULATOR AND/OR PIECE OF EQUIPMENT. REGULATORS CERTIFIED AND PRODUCED BY MARES IN ACCORDANCE WITH THE EN 13949:2003 STANDARD ARE EASILY IDENTIFIED BY THE FIRST STAGE CONNECTION, WHICH IN COMPLIANCE WITH EUROPEAN STANDARD EN 144-3, HAS AN M 26X2 THREADED RING NUT (SEE TABLE "A"). IT IS RECOMMENDED THAT YOU CONTACT MARES IF YOU ARE UNABLE TO CLEARLY IDENTIFY WHETHER THE REGULATOR SUBMITTED FOR MAINTENANCE WAS PRODUCED AND CERTIFIED IN ACCORDANCE WITH STANDARD EN 13949:2003.

TABLE "A"

DESCRIPTION	SERIAL NUMBER	1 ST STAGE CONNECTION	COLLECTION
(MR22) ABYSS NITROX	AYX 10262	EN 144-3 (M26x2)	2006
MR12 REBEL NITROX	XR 10197	EN 144-3 (M26x2)	2006
REBEL NITROX Octopus	NR 10579	EN 144-3 (M26x2)	2006

► MARES NITROX REGULATORS

MARES Nitrox regulators and Nitrox octopus are designed and built for use SOLELY AND EXCLUSIVELY with Nitrogen and Oxygen gas mixtures containing a percentage of oxygen greater than 22%. Do not use this equipment with any other gas. Failure to observe this warning may result in premature wear of the equipment, defective operation or risk of explosion, resulting in potentially serious damage.



DANGER!

DO NOT USE ANY MARES REGULATOR OR EQUIPMENT CERTIFIED UNDER STANDARD EN 13949:2003 WITHOUT ADEQUATE INFORMATION REGARDING ITS USE. FAILURE TO OBSERVE THIS WARNING COULD RESULT IN SERIOUS INJURY.

MAINTENANCE PROCEDURES



WARNING!

DO NOT ATTEMPT TO PERFORM MAINTENANCE PROCEDURES ON A MARES REGULATOR OR ANY OTHER DIVING EQUIPMENT INTENDED FOR USE WITH OXYGEN-ENRICHED GAS MIXTURES WITHOUT BEING PROPERLY TRAINED AND FULLY AWARE OF ALL THE PREPARATION AND ASSEMBLY PROCEDURES FOR HIGH-PRESSURE OXYGEN SYSTEMS.



WARNING!

MAINTENANCE PROCEDURES MAY ONLY BE PERFORMED BY QUALIFIED AND AUTHORIZED MARES TECHNICIANS, PREVIOUSLY TRAINED TO PROPERLY PERFORM MAINTENANCE PROCEDURES ON REGULATORS AND OTHER HIGH-PRESSURES SYSTEMS INTENDED FOR USE WITH OXYGEN-ENRICHED GAS MIXTURES.



WARNING!

WHEN MAINTENANCE IS COMPLETE, NOTIFY THE OWNER OR USER OF THE EQUIPMENT THAT IT MAY ONLY BE USED WITH MIXTURES OF GAS AND OXYGEN GREATER THAN 22%. IN THE EVENT THAT THE EQUIPMENT IS USED WITH NORMAL COMPRESSED AIR AND/OR AIR THAT DOES NOT COMPLY WITH THE REQUIREMENTS CALLED FOR BY STANDARD EN 13949:2003, BEFORE USING THE EQUIPMENT AGAIN THE ENTIRE MAINTENANCE AND CLEANING OPERATION MUST BE REPEATED, BECAUSE THE EQUIPMENT MAY SHOW SIGNS OF CONTAMINATION DUE TO THE PRESENCE OF HYDROCARBONS OR OTHER IMPURITIES THAT COULD TRIGGER COMBUSTION.



WARNING!

MARES RECOMMENDS USING A SET OF TOOLS DEDICATED EXCLUSIVELY TO OVERHAUL PROCEDURES FOR REGULATORS USED WITH GAS AND OXYGEN MIXTURES. BEFORE PROCEEDING WITH ANY MAINTENANCE OPERATION, IT IS RECOMMENDED THAT YOU CAREFULLY CHECK THAT THE NECESSARY EQUIPMENT AND CONTROL INSTRUMENTS ARE PERFECTLY CLEAN.

REMARKS!

IN ORDER TO AVOID CONTAMINATION OF THE COMPONENTS RESULTING FROM RESIDUES OF SILICONE GREASE AND/OR OILS DEPOSITED ON THE SKIN OF THE HANDS, IT IS CRUCIAL TO WORK WITH PERFECTLY CLEAN HANDS AND WEAR PERFECTLY CLEAN PROTECTIVE LATEX GLOVES.

DISASSEMBLY, CONTROL, REASSEMBLY, AND CALIBRATION PROCEDURES FOR REGULATORS PRODUCED AND CERTIFIED ACCORDING TO STANDARD EN 13949:2003 ARE PROVIDED IN THE RESPECTIVE SECTIONS OF THE MAINTENANCE MANUAL.

DISASSEMBLY

In order to avoid any contamination of the disassembled components, it is recommended that you work in a clean and sufficiently ventilated area (or one with an adequate ventilation system).

To overhaul a regulator intended for use with gas and oxygen mixtures (according to standard EN 13949:2003) it is necessary to carefully clean all components, removing any trace of silicone components or other impurities, and replacing the O-rings with those suitable for such a use (Viton O-rings). It is therefore necessary to completely disassemble the regulator as described in the respective maintenance models of the various regulator models.

▶ CLEANING THE COMPONENTS

Before proceeding with cleaning operations, put on adequate protection for the eyes and hands, and work in a clean and adequately ventilated location.

Before cleaning the components with the solutions indicated, it is recommended that you use absorbent cloth or a nylon brush to remove any excessive amounts of grease and/or lubricants.

► 1 - METAL COMPONENTS AND HOSES

Brass and stainless steel parts can be cleaned in an ultrasound cleaner in a specific degreasing solution (such as "DEOX ND-165") and in a limescale removal solution (such as "DEOX EXTRA"). If ultrasound equipment is not available, it is possible to clean the components after disassembly by following the procedures provided below:

- a. Immerse the components repeatedly in a container full of degreasing solution (we suggest warm/hot fresh water containing a degreasing solution such as "DEOX ND-165" in a ratio ranging from 1:1 to 1:5) for approximately 10-15 minutes.
- b. Rinse with warm/hot fresh water.
- c. Dry with low-pressure compressed air (max 7 bar).
- d. If a visual inspection finds traces of contaminants, repeat the procedures described in steps **A**, **B**, and **C**.
- e. Immerse the components in a container full of limescale removal solution (we suggest fresh water containing a solution such as "DEOX EXTRA" in a 1:1 ratio) for about 10 minutes.
- f. Then rinse all parts using hot water. (We suggest that you use distilled water to remove any mineral residues).
- g. Dry with low-pressure compressed air (max 7 bar).

► 2 - RUBBER, SILICONE, AND TECHNOPOLYMER COMPONENTS

The rubber, plastic, and technopolymer components can be cleaned using the procedures described below:

- h. Immerse the components repeatedly in a container full of degreasing solution (we suggest warm/hot fresh water containing a degreasing solution such as "DEOX ND-165" in a ratio ranging from 1:5 to 1:8) for approximately 10-15 minutes.
- i. Rinse with warm/hot fresh water.
- j. Dry with low-pressure compressed air (max 7 bar).
- k. If a visual inspection finds traces of contaminants, repeat the procedures described in steps **H**, **I**, and **J**.
- l. Immerse the components in a container full of a solution of hot water and mild detergent for approximately 10 minutes.
- m. Then rinse all parts using warm water. (We suggest that you use distilled water to remove any mineral residues).

DRYING THE COMPONENTS

Dry all components using a perfectly clean cloth or fabric. Make especially sure that the equipment and the low-pressure air used (max 7 bar) complies with the requirements of standard EN 13949:2003, in order to avoid exposing the components to risks of contamination.

CHECKING THE COMPONENTS

Inspect all the components, using a magnifying glass if necessary, to make sure that all the parts are perfectly clean and free of lubricants, oils, silicone grease residues, nicks, or shavings. Repeat the cleaning operations and/or replace the damaged components if necessary. It is recommended that you reassemble the regulator as soon as the components have been cleaned and checked in order to avoid leaving them exposed to risks of contamination for prolonged periods. Make sure that the Viton O-rings necessary for the conversion are those indicated in the spare parts list for the regulator model in question. Mares provides O-ring kits that contain all the components needed for maintenance of MARES Nitrox regulators currently on the market and produced in accordance with the standard EN 13949:2003.

LUBRICATION



DANGER!

DO NOT USE SILICONE LUBRICANT!

Before reassembling the regulator you must lubricate all the O-rings and certain components as described in the maintenance manuals. Lubrication before installation will minimize the risk of damage during reassembly and will facilitate the proper operation of the regulator.

It is vital that you only use oxygen-compatible lubricating grease (Such as "Christo-Lube MCG 111").

It is recommended that you lubricate the O-rings with a minimal quantity of oxygen-compatible grease in order to prevent excess grease from attracting particles of contaminants, causing malfunctions in the regulator.

REASSEMBLY

Before proceeding with reassembly procedures you must make sure that all tools and equipment needed for reassembly are perfectly clean. Clean the equipment using trichloroethylene or as indicated in the cleaning procedures for metallic components. Then rinse in distilled water and dry using low-pressure air compliant with the requirements of the EN 13949:2003 standard.

ADJUSTMENTS

Adjustment operations are those described in the respective maintenance manuals of the various regulator models.



WARNING!

MARES RECOMMENDS THAT YOU EXCLUSIVELY USE GAS COMPLIANT WITH THE EN 13949:2003 STANDARD. DURING CALIBRATION AND REGULATOR ADJUSTMENT OPERATIONS REFER TO THE SECTION OF THE MANUAL ABOUT CALIBRATION AND ADJUSTMENT OPERATIONS.

SUBJECT: DIN CONNECTOR 2K5

BTM11

**FOR COMPONENTS, PLEASE REFER TO 2005 SPARE PART LIST: TAB. N. 23 DRAWINGS E 14
PLEASE REFER TO DEALER MANUAL FOR FINAL TESTS AND ADJUSTMENTS: SECTION F-7 AND S-9**

STARTING FROM 2005 SEASON, MARES S.P.A. HAS DEVELOPED A NEW DIN CONNECTOR (PART N. 416805) FOR THE FOLLOWING FIRST STAGES: 32 - 22 - 16 AND H.U.B. IT WILL BE AVAILABLE ONLY IN 300 BAR. IT CAN BE ASSEMBLED ALSO ON 200 BAR TANKS (AS FORESEEN BY THE EUROPEAN NORM UNI EN 144-2:2000). THE NEW DIN CONNECTORS **ARE EASILY IDENTIFIABLE BY THE CONNECTOR WHEEL MADE OF TECHNOPOLYMER (REF. 49). THE NEW DIN CONNECTOR IS ASSEMBLED WITH A NEW THREADED DUST CAP TO PROTECT THE THREAD AGAINST POSSIBLE DAMAGES AND OFFER A GOOD SEAL WHEN RINSING THE REGULATOR.**



ATTENTION!

THE ASSEMBLING OPERATION OF THE NEW DIN CONNECTOR MUST BE PERFORMED BY ONLY QUALIFIED PERSONNEL AT A TECHNICAL ASSISTANCE CENTRE AND/OR BY AN AUTHORIZED MARES DISTRIBUTOR.

FOR THE ASSEMBLY PLEASE FOLLOW THE PROCEDURES DESCRIBED IN THIS TECHNICAL BULLETIN.

FOR POSSIBLE ADJUSTMENT PROCEDURE, CHECKS OR COMPONENTS REFERENCE NUMBERS PLEASE CONSULT THE PROCEDURES AND THE DRAWINGS DESCRIBED IN THE MAINTENANCE MANUAL.

SHOULD THE UPDATED MANUALS CONTAINING THE SECTIONS INDICATED BE ABSENT, OR IF THE INSTRUCTIONS ARE UNCLEAR OR NOT ENTIRELY UNDERSTANDABLE, PLEASE CONTACT MARES BEFORE PERFORMING ANY MAINTENANCE, ADJUSTMENT OR CHECK.

TOOLS	KIT COMPONENTS (PART N. 416805)
- 1 4 mm HEX WRENCH - 1 5 mm HEX WRENCH (B-4 PART N: 46106204)	- CHECK TABLE N. 23 - DRAWING E 14 - SPARE PART LIST 2005



ATTENTION!

MARES RECOMMENDS, WHEN ASSEMBLING THE DIN CONNECTOR, TO PAY PARTICULAR ATTENTION TO THE MAINTENANCE AND/OR ADJUSTMENT OPERATIONS LISTED HERE BELOW.

DISASSEMBLY:

ASSEMBLE THE DIN CONNECTOR AFTER HAVING DISASSEMBLED, FROM THE FIRST STAGE, THE YOKE RETAINING NUT (7), THE YOKE (3) AND THE YOKE KNOB (25), FOLLOWING THE INSTRUCTIONS IN THE MANUAL RELATED TO YOUR FIRST STAGE.



ATTENTION!

BEFORE ASSEMBLING THE DIN CONNECTOR CHECK TABLE "A" TO VERIFY THE CORRECT POSITIONING OF THE O-RING (71) AND (194) ACCORDING TO THE FIRST STAGE MODEL THAT YOU ARE DISASSEMBLING.

1. PLACE THE O-RING (71) IN THE SEAT ON THE DIN CONNECTOR BODY (48) AS PER TAB. A (PAGE 11/2 OF THIS BULLETIN).
2. INSERT THE DIN CONNECTOR BODY (48) INTO THE DIN WHEEL (49).
3. PLACE, IF NECESSARY, THE O-RING (194) ON THE DIN CONNECTOR BODY DIN (48) AS PER TAB. B.
4. WITH A 5 mm HEX WRENCH (B4) TIGHTEN THE DIN CONNECTOR BODY (48) INTO THE FIRST STAGE.



TO PREVENT THE DIN CONNECTOR BODY (48) FROM BECOMING LOOSE, APPLY TWO DROPS OF THREAD COMPOUND, MEDIUM STRENGTH, (LOCTITE 242E) ON THE BODY THREAD, FURTHEST FROM THE O-RING. DO NOT APPLY THREAD COMPOUND (LOCTITE 242 E TYPE) ON THE O-RING!



IF A DYNAMOMETRIC KEY IS USED, SET IT ON 17-20 N/m (151-178 LB.IN).



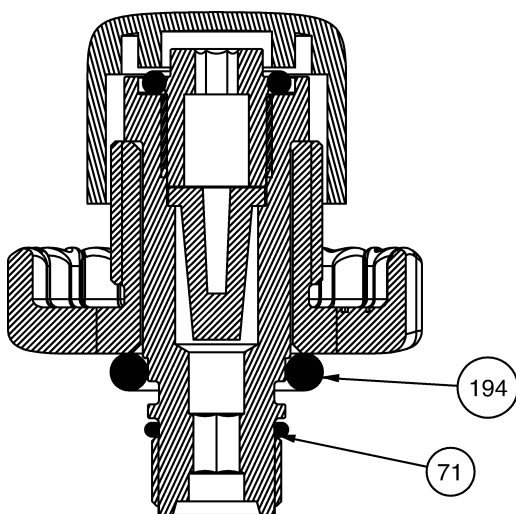
ATTENTION!

AFTER ASSEMBLING THE DIN CONNECTOR BODY (48) INSERT LOW PRESSURE AIR (MAX 7 BAR - 100 PSI) INTO THE LOW PRESSURE PORT TO REMOVE POSSIBLE TRACES OF METAL DUST.

5. INSERT THE CONIC FILTER IN THE DIN CONNECTOR BODY (48).
6. PLACE THE O-RING (188) ON THE O-RING SEAT (187).
7. SCREW THE O-RING SEAT (187) ON THE DIN CONNECTOR BODY (48).



IF A DYNAMOMETRIC KEY IS USED, SET IT ON 1,5-2 N/m (13-17 LB.IN).



TAB. A	O-Ring Ref. No. 71
MR22	A
V32	A
RUBY	A
LE	A
V16	B
MR16	B
D16	B
HUB	B

TAB. B	O-Ring Ref. No. 194
MR22	NO
V32	NO
RUBY	NO
LE	NO
V16	YES
MR16	YES
D16	YES
HUB	YES

SUBJECT: DIN CONNECTOR 2K5

BTM11

**FOR COMPONENTS, PLEASE REFER TO 2005 SPARE PART LIST: TAB. N. 23 DRAWINGS E 14
PLEASE REFER TO DEALER MANUAL FOR FINAL TESTS AND ADJUSTMENTS: SECTION F-7 AND S-9**

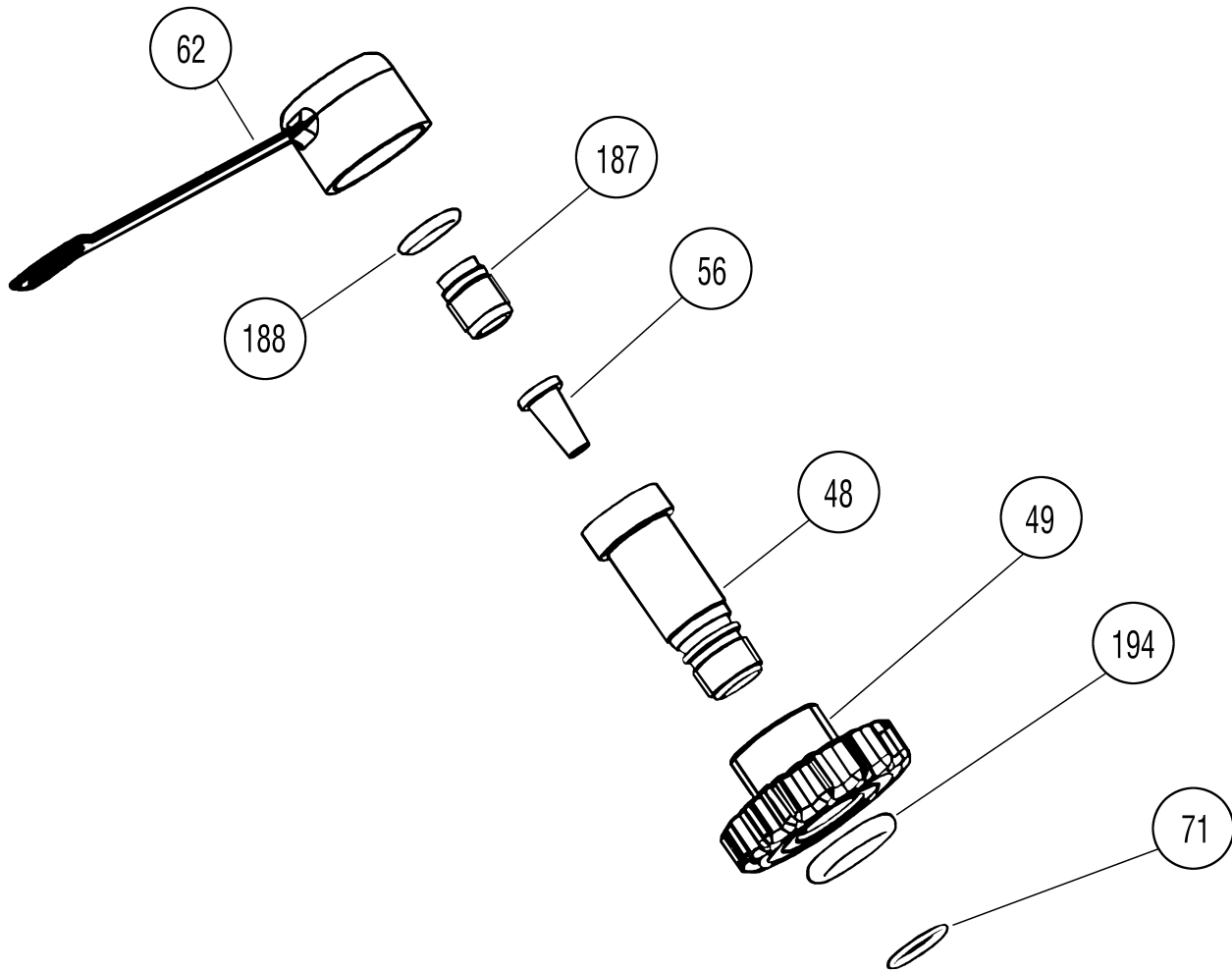


Table No. 23 **DIN CONNECTOR 300 BAR** (version 32 - 22 - 16) Drawing reference No.: E 14
Table updated on: 01/10/2005

Ref. No.	Part. No.	Description	Ref. No.	Part. No.	Description
48	46200548	Body din connector 300 bar	187	46200547	O-ring seat
49	46200546	Din wheel	188	46110247	O-ring 3043
56	46200561	Conic filter	188	46200620	O-ring 3043 viton
62	46200562	Dust cap	194	46200559	O-ring 15 x 4
71	46110211	O-ring 2050			ASSEMBLY
71	46110413	O-ring 2050 viton	F	416805	Din connector 300 bar

**SUBJECT: FIRST STAGE
MR22 NITROX CONNECTOR (EN 144-3) - MAINTENANCE INSTRUCTION**

BTM16

PLEASE REFER TO 2006 SPARE PART LIST - Table 30 drawing 107
FOR FINAL ADJUSTMENT PLEASE CHECK THE MAINTENANCE MANUAL - EN 13949 NITROX SECTION

STARTING FROM 2006, MARES MANUFACTURES NITROX REGULATORS TESTED AND APPROVED ACCORDING TO EN 13949:2003 NORM. THE NITROX FIRST STAGE ASSEMBLY THE NEW NITROX 200 BAR TYPE CONNECTION IN ACCORDANCE TO THE EN 144-3 NORM. THE NEW NITROX CONNECTOR MUST BE ASSEMBLED ONLY ON VALVES WITH FEMALE CONNECTION M 26X2 IN COMPLIANCE WITH THE EN 144-3 NORM.



WARNING!

THESE PROCEDURES APPLY **ONLY** ON MARES NITROX REGULATORS CERTIFIED ACCORDING TO EN 13949:2003 NORM. THEY SHOULD **NOT** BE USED AS STANDARD PROCEDURE TO MODIFY OTHER REGULATORS
THE MAINTENANCE OPERATION ON THE NEW NITROX CONNECTOR MUST BE PERFORMED BY ONLY AUTHORIZED QUALIFIED PERSONNEL AT A TECHNICAL ASSISTANCE CENTER AND/OR BY AN AUTHORIZED MARES DISTRIBUTOR.
FOR ADJUSTMENT AND INSPECTIONS PLEASE CHECK THE PROCEDURES DESCRIBED IN THE MAINTENANCE MANUAL -NITROX SECTION EN 13949:2003.
SHOULD THE UPDATED MANUALS CONTAINING THE SECTIONS INDICATED BE ABSENT, OR IF THE INSTRUCTIONS ARE UNCLEAR OR NOT ENTIRELY UNDERSTANDABLE, PLEASE CONTACT MARES BEFORE PERFORMING ANY MAINTENANCE, ADJUSTMENT OR CHECK.

TOOLS

- 1 HEX WRENCH 5 mm (B-4 Part # 46106204)
- 1 HEX WRENCH 4 mm

! WARNING!

MARES RECOMMENDS CAREFULLY READING ALL INSTRUCTIONS AND PROCEDURES DURING THE ASSEMBLING, MAINTENANCE AND/OR ADJUSTMENT OPERATIONS LISTED BELOW.

DISASSEMBLY:

1. WITH A 4 mm HEX WRENCH UNSCREW THE O-RING SEAT (51) FROM THE CONNECTOR BODY (48).
2. REMOVE THE O-RING (198) FROM THE O-RING SEAT (51).
3. TURNING UPSIDE DOWN THE FIRST STAGE, REMOVE THE CONICAL FILTER (56) FROM THE CONNECTOR BODY.
4. INSERT A 5 mm HEX WRENCH (B4) INSIDE THE CONNECTOR BODY (48) AND UNSCREW IT COMPLETELY (Fig. 1).
5. REMOVE THE CONNECTOR BODY (48) AND THE WHEEL (49).
6. REMOVE THE O-RING (71) FROM THE CONNECTOR BODY (48).

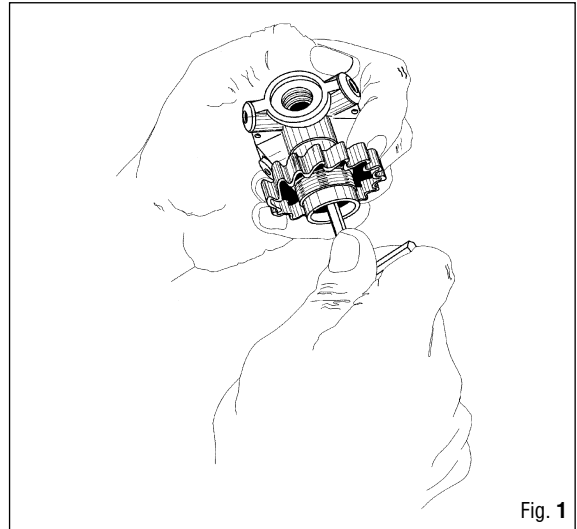


Fig. 1

RIASSEMBLY:

7. PLACE THE O-RING (71) ON THE CONNECTOR BODY (48) (Fig. 2).
8. INSERT THE CONNECTOR BODY (48) IN THE WHEEL (49).
9. WITH A 5 mm HEX WRENCH (B-4) SCREW THE CONNECTOR BODY (48) TO THE FIRST STAGE BODY.

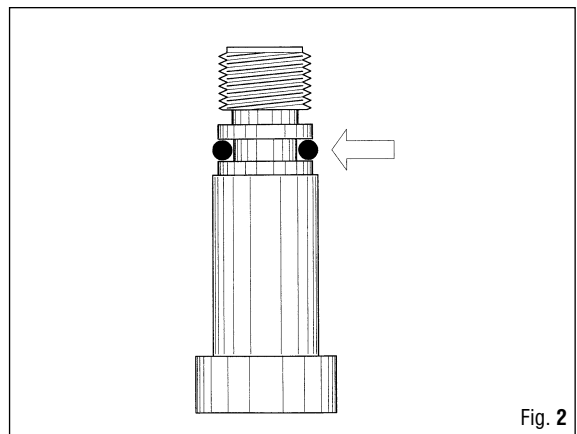


Fig. 2



TO AVOID ACCIDENTAL LOOSENING OF THE NITROX CONNECTOR BODY (48) POUR, AWAY FROM THE O-RING, ONE OR TWO DROPS OF SEALING COMPOUND (LOCTITE TYPE 242 E) ON ITS THREAD. DO NOT APPLY LOCTITE ON THE O-RINGS.



IF A TORQUE WRENCH IS USED, SET IT ON 17 - 20 N.m.

! WARNING!

AFTER ASSEMBLING THE NITROX CONNECTOR BODY (48), INTRODUCE LOW PRESSURE AIR (MAX 7 BAR) IN ONE LP PORT TO EXPEL POSSIBLE METAL BURRS. TO AVOID POSSIBLE RISK OF CONTAMINATION PAY ATTENTION TO THE PURITY OF THE AIR AS FORESEEN IN THE EN 13949:2003 NORM.

10. INSERT THE CONICAL FILTER (56) IN THE CONNECTOR BODY.
11. WITH A 4 mm HEX WRENCH SCREW THE O-RING SEAT (51) ON THE CONNECTOR BODY (48).



IF A TORQUE WRENCH IS USED, SET IT ON 1.5 - 2. N.m.

12. PLACE THE O-RING (198).

Drawing No. E 107

MR22 NITROX CONNECTOR

Drawing updated: 12/12/05

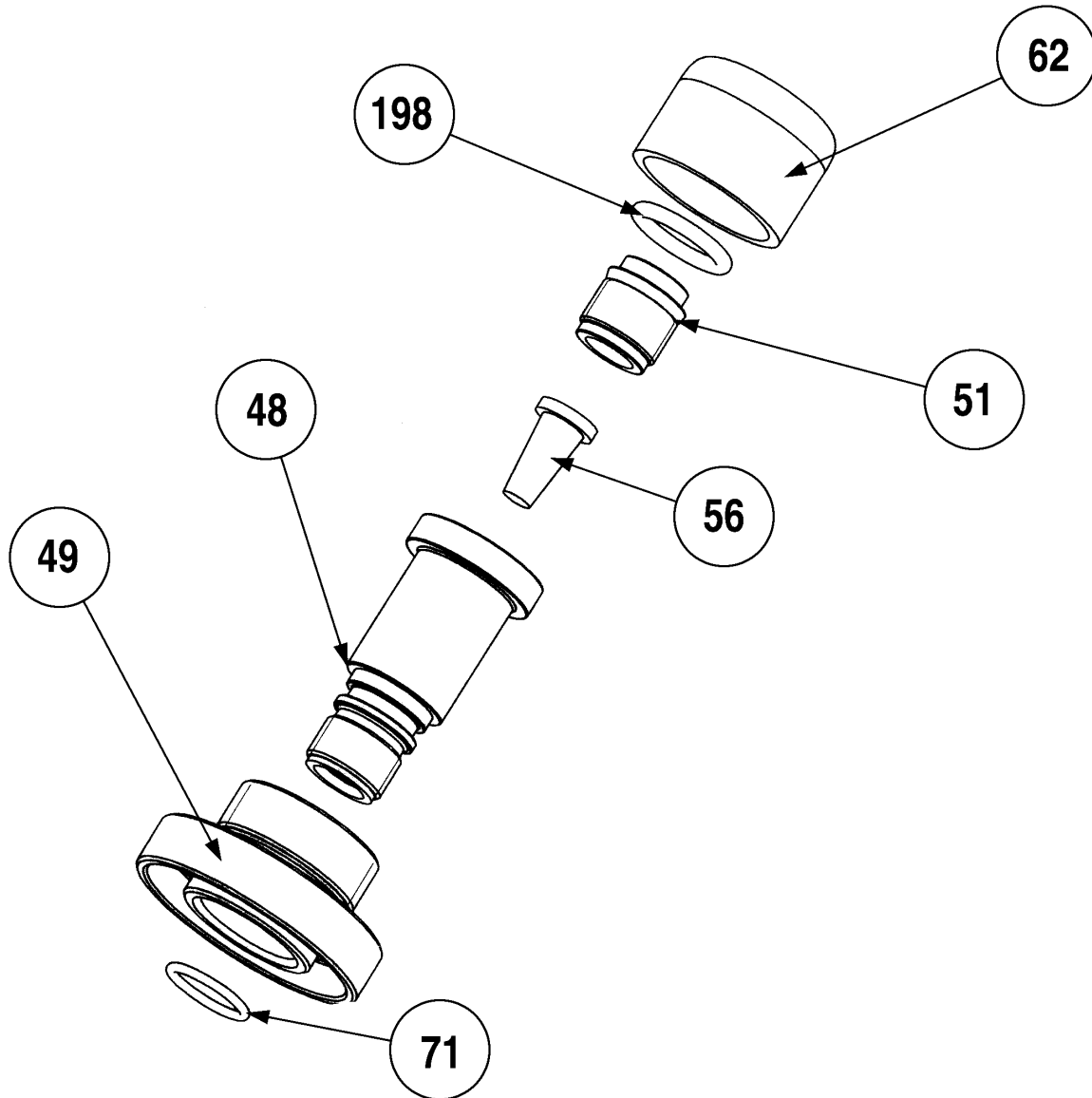


Table No. 30

MR22 NITROX CONNECTOR

Drawing reference No.: E 107
 Table updated on: 05/25/2005

Ref. No.	Part n.	Description	Ref. No.	Part n.	Description
48	46200594	Connector body NX 200 BAR	198	46200655	OR 3056 Viton
49	46200592	Wheel 200 BAR m26x2			
51	46200593	OR seat			
56	46200561	Conical filter			
62	46200658	Protection cap (yellow)			
71	46110413	OR 2050 Viton			
					ASSEMBLY
			F	46200663	NITROX connector 200 BAR

Table No. 19	ABYSS FIRST STAGE	Drawing reference No.: E 2 Table updated on: 01/10/2005
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Ref.No.	Code	Description	Ref.No.	Code	Description
1		1 ST Stage body with DFC port	71	46110211	OR 2050
2	46185015	Snap ring Int. D. 13	71	46110413	OR 2050 Viton 014-9707
3	46185211	Yoke	74	46110107	OR 2031
4	D	HP chamber	74	46110403	OR 2031 Viton 011-9707
5	46185038	Backup ring	75	46186216	1 ST Stage poppet seat
6	46110101	OR 2012	76	46186210	HP chamber spring
6	46110401	OR 2012 Viton 006-9707	79	° ° °	DIN connector spacer bushing
7	46186205	Yoke retainer nut	80	46186206	Anti-drag head
8	46185011	Poppet spring	81	46186208	1 ST Stage port plug
9	46200175	Pebax 1 ST Stage poppet (***)	89	46184324	ABYSS Sticker
12	46186214	Poppet pin	148	46184315	"EN 250 - 200 bar" Sticker
13	46186213	Poppet button	149	46184316	"MARES" Sticker
14	46185022	Diaphragm			ASSEMBLIES
15	46185034	Spring base plate	G	46200106	MR 22 1 ST ST. assembly INT
16	46185023	Diaphragm spring	g***	46200652	MR 2K5 assembly 1 ST stage valve
17	46186219	Retaining nut	D	46185210	HP Chamber assembly (4-5-6)
18	46185028	Spring adjusting nut	D	46186259	HP Chamber assembly (4-5-6) Nitrox
19	46110106	OR 106	F	416805	Connector assembly DIN 300 BAR (Tab. #23 drg E14)
19	46110402	OR 106 Viton 610-9707	I	416851	ABYSS CWD KIT
20	46185204	3/8" UNF Port plug		46186152	Service kit INT STAGE 32/22/16/TP/D16/S40 (2-5-6-19-22-52-71-74)
22	46186202	Tapered sintered filter		46200606	Service kit DIN 2005 1 ST ST. 32/22/16/TP/D16 (5-6-19-52-74-(56-71-188-194 tab 7))
23	° ° °	OR 115		46185167	Service kit Ruby INT VITON 1 ST Stage/32/22/16/D16 (2-5-6-19-22-52-71-74)
23	° ° °	OR 115 Viton 614-9707			ACCESSORIES
24	46185010	Dust cap	98	46186207	1/2 UNF Port plug
25	46184079	Yoke knob	97	46110215	OR 2043
48	° ° °	300 BAR DIN connector body			NOTE
49	° ° °	DIN 300 BAR threaded locking ring			PREVIOUS DIN FITTING VERSION 416800 FOR REFERENCES 23-48-49-56-62-68-71-79 CONSULT THE 2004 SPARE PARTS LIST. THESE COMPONENTS WILL BE AVAILABLE AS LONG AS SUPPLIES LAST. WHEN THEY ARE NOT AVAILABLE THE INTERIOR MUST BE REPLACED DIN CONNECTOR WITH THE NEW VERSION CODE 416805 Tab. #23 Drg E14 (***)
52	46110108	OR 108			FOR 1 ST ST POPPET (9) REPLACEMENT
52	46110404	OR 108 Viton 611-9754			USE EXCLUSIVELY the code 46200652
53	46185205	7/16" HP port plug			
56	° ° °	DIN connector filter D. 9			
57	I	CWD body			
58	46185301	CWD Diaphragm			
59	I	CWD Locking ring			
61	46185013	Filter spring			
62	° ° °	DIN connector dust cap			
68	° ° °	Pentagonal spring for DIN connector D. 12			
69	46186218	Shock ring			

Table No. 21	V 32 FIRST STAGE	Drawing reference No.: E 12 Table updated on: 01/10/2005
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Ref.No.	Code	Description	Ref.No.	Code	Description
1		1 ST st body V32 w/DFC port	71	46110211	OR 2050
2	46185015	Snap ring Int. D. 13	71	46110413	OR 2050 Viton 014-9707
3	46186270	Sandblasted yoke	74	46110107	OR 2031
4	D	HP chamber	74	46110403	OR 2031 Viton 011-9707
5	46185038	Backup ring	75	46186249	SCS poppet seat
6	46110101	OR 2012	76	46186210	HP chamber spring
6	46110401	OR 2012 Viton 006-9707	79	°°°	DIN connector spacer bushing
7	46186205	Yoke retainer nut	80	46186206	Anti-drag head
8	46186306	Poppet spring	81	46186208	1 ST Stage port plug
9	46200175	SCS 1 ST Stage poppet	148	46184315	" EN 250 " Yoke sticker
12	46186214	Poppet pin	176	46200351	Oval Sticker
13	46186213	Poppet button	177	46200368	V 32 bottom casing
14	46185022	Diaphragm	178	46200367	V 32 top casing
15	46185034	Spring base plate			
16	46185023	Diaphragm spring			ASSEMBLIES
17	46186268	Sandblasted retaining nut	G	46200405	V32 1 ST ST. assembly INT
18	46185028	Spring adjusting nut	D	46185210	HP Chamber assembly (4-5-6)
19	46110106	OR 106	F	416805	Connector assembly DIN 300 BAR (Tab. #23 drg E14)
19	46110402	OR 106 Viton 610-9707	I	416851	CWD KIT
20	46185204	3/8" UNF Port plug	***	46186152	Service kit INT 1 ST STAGE 32/22/16/TP/D16/S40 (2-5-6-19-22-52-71-74)
22	46186202	Tapered sintered filter	***	46200606	Service kit DIN 1 ST Stage 32/22/16/TP/D16 2K5 (5-6-19-52-74-(56-71-188-194 tab 7))
23	°°°	OR 115	***	46185167	Service kit Ruby INT VITON 1 ST Stage/32/22/16/D16 (2-5-6-19-22-52-71-74)
23	°°°	OR 115 Viton 614-9707			
24	46185010	Dust cap			ACCESSORIES
25	46184079	Yoke knob	98	46186207	1/2 UNF Port plug
48	°°°	300 BAR DIN connector body			
49	°°°	DIN 300 BAR threaded locking ring			
52	46110108	OR 108			
52	46110404	OR 108 Viton 611-9754			
53	46185205	7/16" HP port plug			
56	°°°	DIN connector filter D. 9			
57	I	CWD body			
58	46185301	CWD Diaphragm			
59	I	CWD Locking ring			
61	46185013	Filter spring			
62	°°°	DIN connector dust cap			
68	°°°	Pentagonal spring for DIN connector D. 12			

NOTE

FOR REFERENCES 23-48-49-56-62-68-71-79 CONSULT THE PREVIOUS SPARE PARTS LIST. THESE COMPONENTS WILL BE AVAILABLE AS LONG AS SUPPLIES LAST. WHEN THEY ARE NOT AVAILABLE THE INTERIOR MUST BE REPLACED DIN CONNECTOR WITH THE NEW VERSION CODE 416805 Tab. #23 Drg E14

Drawing No. E 103	V32 EXTREME FIRST STAGE	Drawing updated: 03/03/2005
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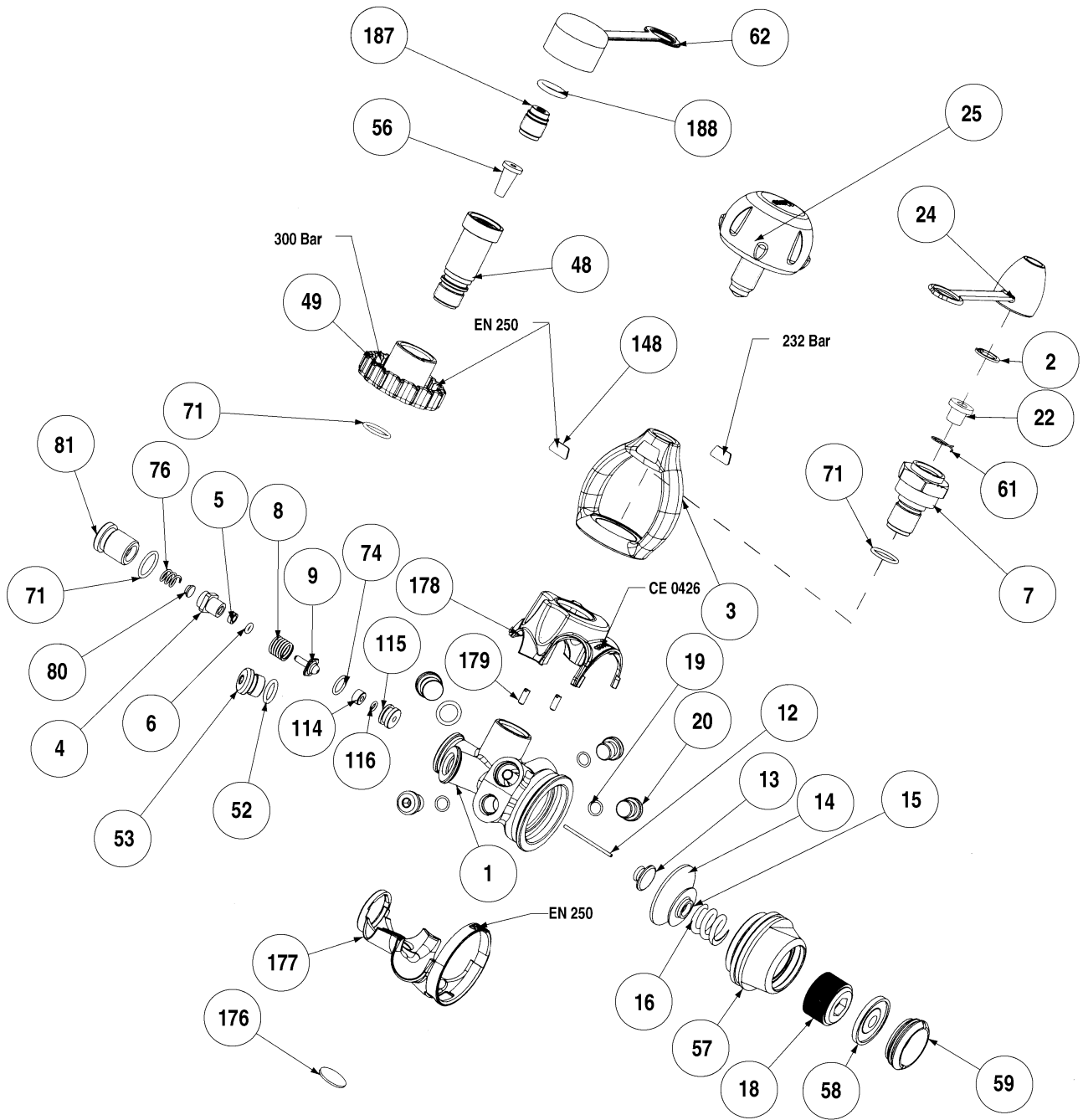


Table No. 26	V32 EXTREME FIRST STAGE	Drawing reference No.: E 103 Table updated on: 12/12/2005
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Ref.No.	Code	Description	Ref.No.	Code	Description
1		1 ST body V32 w/DFC port	71	46110413	OR 2050 Viton 014-9707
2	46185015	Snap ring Int. D. 13	74	46110107	OR 2031
3	46186270	Sandblasted yoke	74	46110403	OR 2031 Viton 011-9707
4	D	HP chamber	76	46186210	HP chamber spring
5	46185038	Backup ring	80	46186206	Anti-drag head
6	46110101	OR 2012	81	46186208	1 ST Stage port plug
6	46110401	OR 2012 Viton 006-9707	148	46184315	" EN 250 " Yoke sticker
7	46186205	Yoke retainer nut	176	46200351	Oval Sticker
8	46186306	Poppet spring	177	46200368	V 32 bottom casing
9	46200175	SCS 1 ST Stage poppet	178	46200367	V 32 top casing
12	46186214	Poppet pin	187	46200547	DIN OR seat
13	46186213	Poppet button	188	46110247	OR 3043
14	46185022	Diaphragm			
15	46185034	Spring base plate			
16	46185023	Diaphragm spring			ASSEMBLIES
18	46185028	Spring adjusting nut			
19	46110106	OR 106	D	46185210	HP Chamber assembly (4-5-6)
19	46110402	OR 106 Viton 610-9707	F	416805	Connector assembly DIN 300 BAR (Tab. #23 drg E14)
20	46185204	3/8" UNF Port plug			
22	46186202	Tapered sintered filter	I	416851	AER KIT
24	46185010	Dust cap	115	46186249	SCS poppet seat assembly (114-115-116)
25	46184079	Yoke knob			
48	46200548	300 bar DIN connector body	***	46186152	Service kit INT STAGE 32/22/16/TP/D16/S40 (2-5-6-19-22-52-71-74)
49	46200546	DIN 300 BAR ring nut			
52	46110108	OR 108	***	46200606	Service kit DIN 1 ST Stage 32/22/16/TP/D16 2K5 (5-6-19-52-74-(56-71-188-194 tab 7))
52	46110404	OR 108 Viton 611-9754			
53	46185205	7/16" HP port plug	***	46185167	Service kit Ruby INT VITON 1ST Stage/32/22/16/D16 (2-5-6-19-22-52-71-74)
56	46200561	DIN conical filter			
57	I	CWD body			
58	46185301	CWD Diaphragm			ACCESSORIES
59	I	CWD Locking ring			
61	46185013	Filter spring		46185340	CWD Öl-Fläschchen
62	46200562	DIN connector dust cap	98	46186207	1/2 UNF Port plug
71	46110211	OR 2050	97	46110215	OR 2043

Drawing No. E 104	MR 22 NITROX FIRST STAGE (EN 13949)	Drawing updated: 07/26/2005
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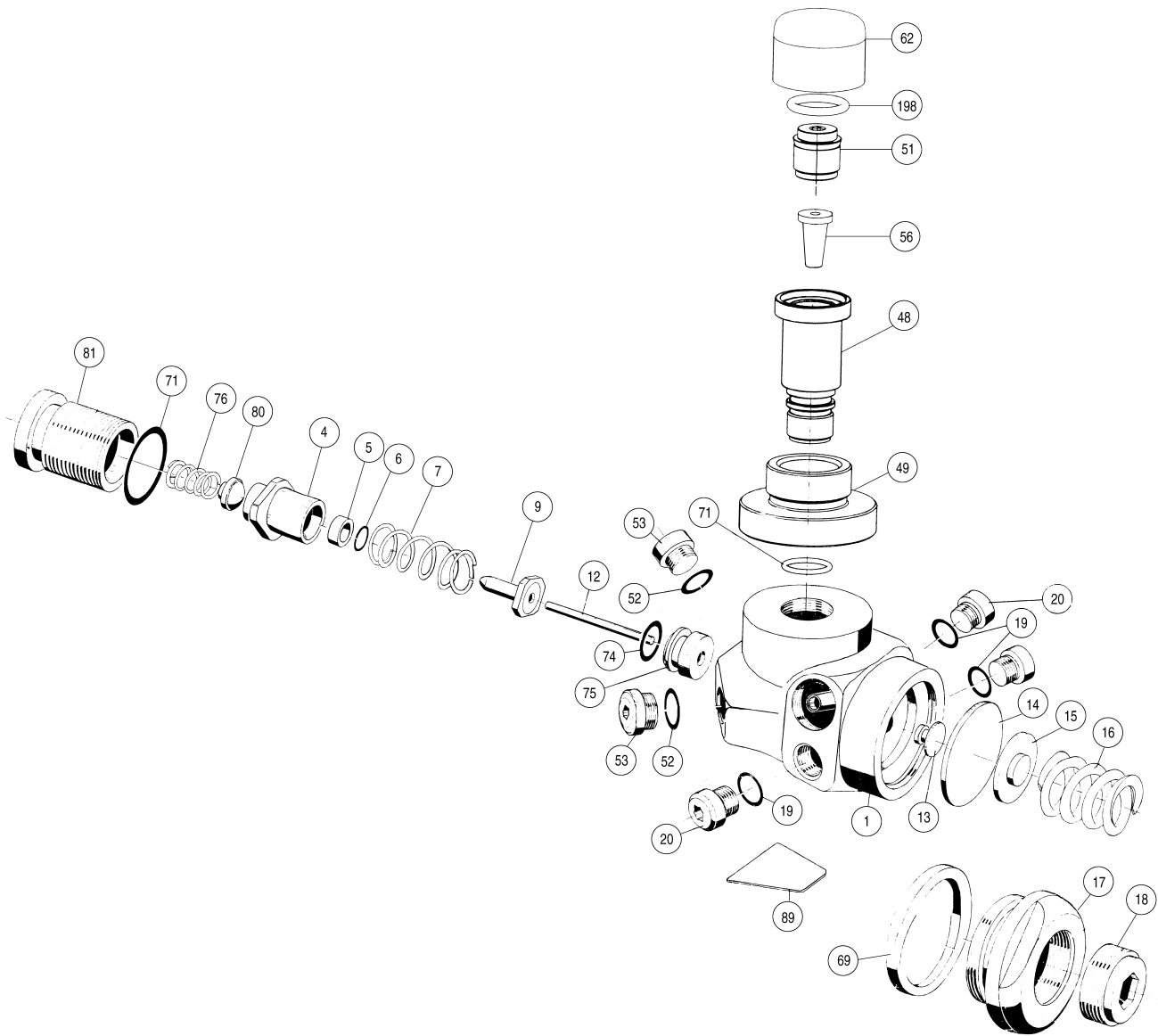


Table No. 27	MR 22 NITROX FIRST STAGE (EN 13949)	Drawing reference No.: E 104 Table updated on: 07/26/2005
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Ref.No.	Code	Description	Ref.No.	Code	Description
1		1 ST Stage body with DFC port	74	46110403	OR 2031 Viton 011-9707
4	D	HP chamber	75	46186216	1 ST Stage poppet seat
5	46185038	Backup ring	76	46186210	HP chamber spring
6	46110401	OR 2012 Viton 006-9707	80	46186206	Anti-drag head
8	46185011	Poppet spring	81	46186208	1 ST Stage port plug
9	46200276	Pebax Stage poppet	89	46184324	ABYSS Sticker
12	46186214	Poppet pin	198	46200655	OR 3056
13	46186213	Poppet button			
14	46185022	Diaphragm			ASSEMBLIES
15	46185034	Spring base plate			
16	46185023	Diaphragm spring	9***	46200652	MR 2K5 assembly 1 ST stage valve
17	46186219	Retaining nut	D	46186259	HP Chamber assembly (4-5-6) Nitrox
18	46185028	Spring adjusting nut	F	*	Connector assembly Nitrox 200 BAR
19	46110402	OR 106 Viton 610-9707			(Ref. Table 30 Drg. 107)
20	46185204	3/8" UNF Port plug	###	46200692	Service kit MR22 Nitox 1 ST stage (EN 13949)
48	46200594	Nitrox 200 BAR body fitting			(5-6-19-52-56-71-74-198)
49	46200592	Nitrox 200 BAR ring nut fitting			
51	46200593	OR seat			ACCESSORIES
52	46110404	OR 108 Viton 611-9754	98	46186207	1/2 UNF Port plug
53	46185205	7/16" HP port plug	97	46110215	OR 2043
56	46200561	DIN conical filter			
62	46200658	Nitrox 2k5 cap			NOTE
69	46186218	Shock ring			FOR 1 ST ST POPPET (9) REPLACEMENT USE EXCLUSIVELY
71	46110413	OR 2050 Viton 014-9707			THE CODE 46200652

SUBJECT: DIN CONNECTOR 2K5

BTM11

**FOR COMPONENTS, PLEASE REFER TO 2005 SPARE PART LIST: TAB. N. 23 DRAWINGS E 14
PLEASE REFER TO DEALER MANUAL FOR FINAL TESTS AND ADJUSTMENTS: SECTION F-7 AND S-9**

STARTING FROM 2005 SEASON, MARES S.P.A. HAS DEVELOPED A NEW DIN CONNECTOR (PART N. 416805) FOR THE FOLLOWING FIRST STAGES: 32 - 22 - 16 AND H.U.B. IT WILL BE AVAILABLE ONLY IN 300 BAR. IT CAN BE ASSEMBLED ALSO ON 200 BAR TANKS (AS FORESEEN BY THE EUROPEAN NORM UNI EN 144-2:2000). THE NEW DIN CONNECTORS **ARE EASILY IDENTIFIABLE BY THE CONNECTOR WHEEL MADE OF TECHNOPOLYMER (REF. 49). THE NEW DIN CONNECTOR IS ASSEMBLED WITH A NEW THREADED DUST CAP TO PROTECT THE THREAD AGAINST POSSIBLE DAMAGES AND OFFER A GOOD SEAL WHEN RINSING THE REGULATOR.**



ATTENTION!

THE ASSEMBLING OPERATION OF THE NEW DIN CONNECTOR MUST BE PERFORMED BY ONLY QUALIFIED PERSONNEL AT A TECHNICAL ASSISTANCE CENTRE AND/OR BY AN AUTHORIZED MARES DISTRIBUTOR.

FOR THE ASSEMBLY PLEASE FOLLOW THE PROCEDURES DESCRIBED IN THIS TECHNICAL BULLETIN.

FOR POSSIBLE ADJUSTMENT PROCEDURE, CHECKS OR COMPONENTS REFERENCE NUMBERS PLEASE CONSULT THE PROCEDURES AND THE DRAWINGS DESCRIBED IN THE MAINTENANCE MANUAL.

SHOULD THE UPDATED MANUALS CONTAINING THE SECTIONS INDICATED BE ABSENT, OR IF THE INSTRUCTIONS ARE UNCLEAR OR NOT ENTIRELY UNDERSTANDABLE, PLEASE CONTACT MARES BEFORE PERFORMING ANY MAINTENANCE, ADJUSTMENT OR CHECK.

TOOLS	KIT COMPONENTS (PART N. 416805)
- 1 4 mm HEX WRENCH - 1 5 mm HEX WRENCH (B-4 PART N: 46106204)	- CHECK TABLE N. 23 - DRAWING E 14 - SPARE PART LIST 2005



ATTENTION!

MARES RECOMMENDS, WHEN ASSEMBLING THE DIN CONNECTOR, TO PAY PARTICULAR ATTENTION TO THE MAINTENANCE AND/OR ADJUSTMENT OPERATIONS LISTED HERE BELOW.

DISASSEMBLY:

ASSEMBLE THE DIN CONNECTOR AFTER HAVING DISASSEMBLED, FROM THE FIRST STAGE, THE YOKE RETAINING NUT (7), THE YOKE (3) AND THE YOKE KNOB (25), FOLLOWING THE INSTRUCTIONS IN THE MANUAL RELATED TO YOUR FIRST STAGE.



ATTENTION!

BEFORE ASSEMBLING THE DIN CONNECTOR CHECK TABLE "A" TO VERIFY THE CORRECT POSITIONING OF THE O-RING (71) AND (194) ACCORDING TO THE FIRST STAGE MODEL THAT YOU ARE DISASSEMBLING.

1. PLACE THE O-RING (71) IN THE SEAT ON THE DIN CONNECTOR BODY (48) AS PER TAB. A (PAGE 11/2 OF THIS BULLETIN).
2. INSERT THE DIN CONNECTOR BODY (48) INTO THE DIN WHEEL (49).
3. PLACE, IF NECESSARY, THE O-RING (194) ON THE DIN CONNECTOR BODY DIN (48) AS PER TAB. B.
4. WITH A 5 mm HEX WRENCH (B4) TIGHTEN THE DIN CONNECTOR BODY (48) INTO THE FIRST STAGE.



TO PREVENT THE DIN CONNECTOR BODY (48) FROM BECOMING LOOSE, APPLY TWO DROPS OF THREAD COMPOUND, MEDIUM STRENGTH, (LOCTITE 242E) ON THE BODY THREAD, FURTHEST FROM THE O-RING. DO NOT APPLY THREAD COMPOUND (LOCTITE 242 E TYPE) ON THE O-RING!

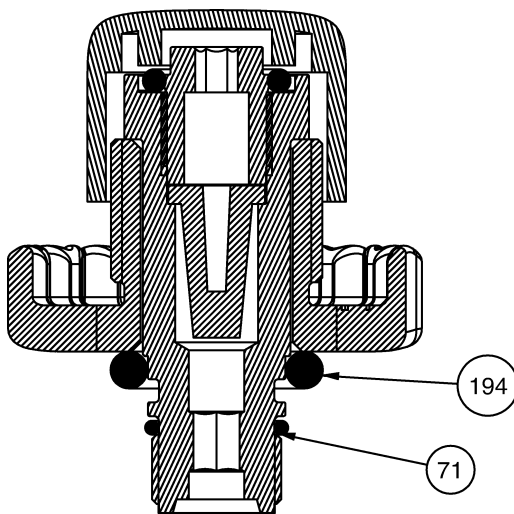
NOTE IF A DYNAMOMETRIC KEY IS USED, SET IT ON 17-20 N/m (151-178 LB.IN).

! ATTENTION!

AFTER ASSEMBLING THE DIN CONNECTOR BODY (48) INSERT LOW PRESSURE AIR (MAX 7 BAR - 100 PSI) INTO THE LOW PRESSURE PORT TO REMOVE POSSIBLE TRACES OF METAL DUST.

5. INSERT THE CONIC FILTER IN THE DIN CONNECTOR BODY (48).
6. PLACE THE O-RING (188) ON THE O-RING SEAT (187).
7. SCREW THE O-RING SEAT (187) ON THE DIN CONNECTOR BODY (48).

NOTE IF A DYNAMOMETRIC KEY IS USED, SET IT ON 1,5-2 N/m (13-17 LB.IN).



TAB. A	O-Ring Ref. No. 71
MR22	A
V32	A
RUBY	A
LE	A
V16	B
MR16	B
D16	B
HUB	B

TAB. B	O-Ring Ref. No. 194
MR22	NO
V32	NO
RUBY	NO
LE	NO
V16	YES
MR16	YES
D16	YES
HUB	YES

SUBJECT: DIN CONNECTOR 2K5

BTM11

**FOR COMPONENTS, PLEASE REFER TO 2005 SPARE PART LIST: TAB. N. 23 DRAWINGS E 14
PLEASE REFER TO DEALER MANUAL FOR FINAL TESTS AND ADJUSTMENTS: SECTION F-7 AND S-9**

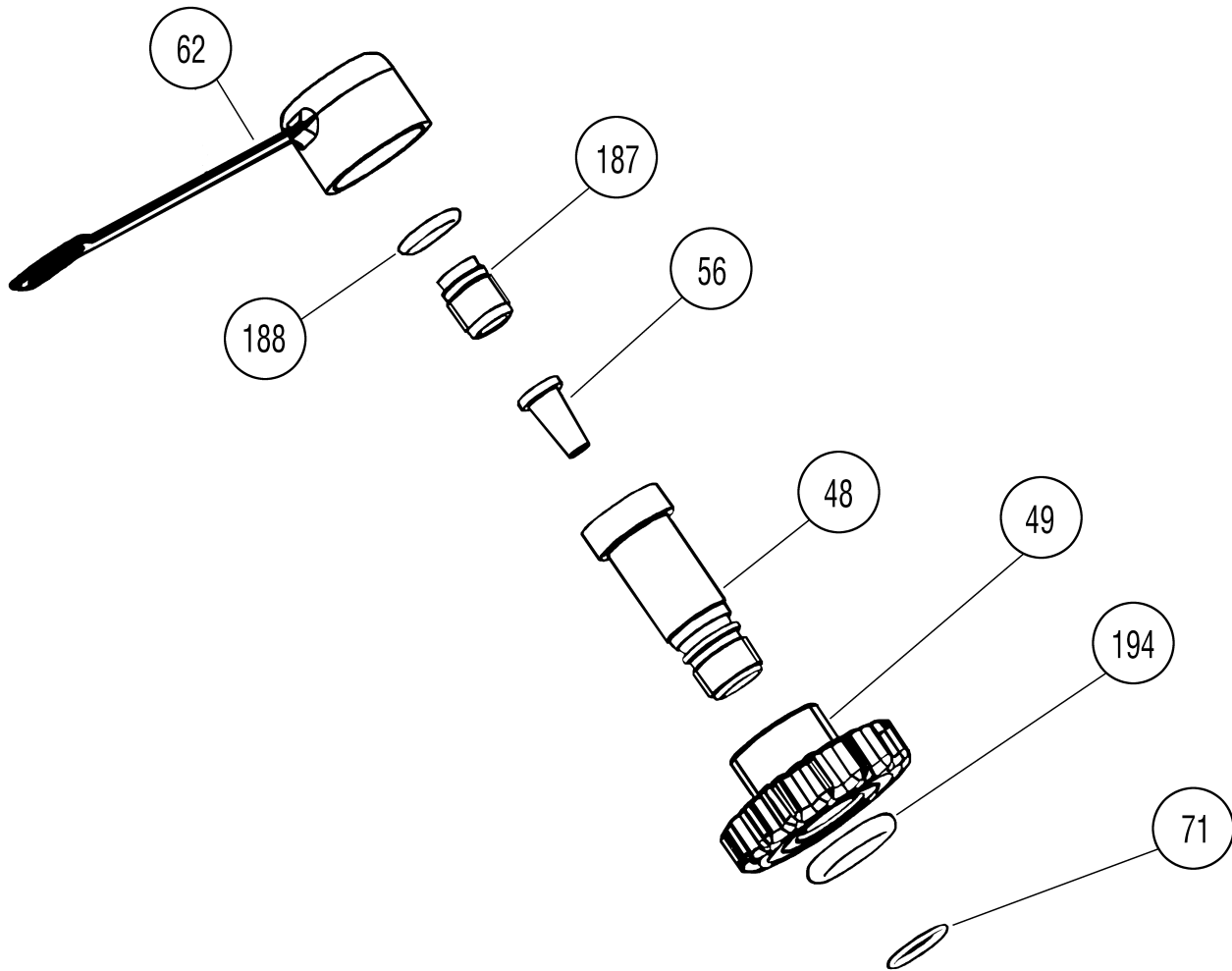


Table No. 23 **DIN CONNECTOR 300 BAR** (version 32 - 22 - 16) Drawing reference No.: E 14
Table updated on: 01/10/2005

Ref. No.	Part. No.	Description	Ref. No.	Part. No.	Description
48	46200548	Body din connector 300 bar	187	46200547	O-ring seat
49	46200546	Din wheel	188	46110247	O-ring 3043
56	46200561	Conic filter	188	46200620	O-ring 3043 viton
62	46200562	Dust cap	194	46200559	O-ring 15 x 4
71	46110211	O-ring 2050			ASSEMBLY
71	46110413	O-ring 2050 viton	F	416805	Din connector 300 bar

Table No. 8	V 16 FIRST STAGE	Drawing reference No.: E 6 Table updated on 01/10/2005
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Ref.No.	Code	Description	Ref.No.	Code	Description
1		1 st st body DFC V 16	68	°°°	Pentagonal spring for DIN connector D. 9
2	46185015	Snap ring Int. D. 13	71	46110211	OR 2050
3	46185211	V 16 Yoke	71	46110413	OR 2050 Viton 014-9707
4	D	H.P. chamber	74	46110107	OR 2031
5	46185038	Backup ring	74	46110403	OR 2031 Viton 011-9707
6	46110101	OR 2012	76	46186210	HP chamber spring
6	46110401	OR 2012 Viton 006-9707	79	° ° °	DIN connector spacer bushing
7	46186241	Yoke retainer nut	80	46186206	Anti-drag head
8	46186306	V 16 Poppet spring	81	46186208	Port plug
9	46200175	SCS 1 st Stage poppet	108	46185266	C.W.D. Protection cap
12	46186214	Poppet pin	109	46186239	Tampographed V 16 SCS unit protection
13	46185032	Poppet button	110	46186245	Tampographed protection cap
14	46185022	Diaphragm	115	46186249	SCS poppet seat (V 16)
15	46185034	Spring base plate	148	46184315	"EN 250 - 200 bar" Sticker
16	46185023	Diaphragm spring	149	46184316	"MARES" Sticker
17	46186219	Retaining nut			
18	46185028	Spring adjuster nut			ASSEMBLIES
19	46110106	OR 106	G	46200109	V16 1 st ST. assembly INT
19	46110402	OR 106 Viton 610-9707	D	46185210	H.P. chamber assembly (4-5-6)
20	46185204	3/8" UNF Port plug	F	416805	Connector assembly DIN 300 BAR
22	46186202	Tapered sintered filter			(Tab. #23 drg E14)
23	°°°	OR 115	I	416851	AER KIT
23	°°°	OR 115 Viton 614-9707	***	46186152	Service kit INT 1 st STAGE
24	46185010	V 16 Dust cap			32/22/16/TP/D16/S40
25	46184079	V 16 Yoke knob			(2-5-6-19-22-52-71-74)
48	°°°	300 BAR DIN connector body	***	46200606	Service kit DIN 1 st Stage 32/22/16/TP/D16 2K5
49	°°°	Threaded locking ring (DIN) 300 BAR			(5-6-19-52-74-(56-71-188-194 tab 7))
52	46110108	OR 108	***	46185167	Service kit Ruby INT VITON
52	46110404	OR 108 Viton 611-9707			1 st Stage/32/22/16/D16
53	46185205	H.P. 7/16" UNF Port plug			(2-5-6-19-22-23-52-56-68-71-74)
56	°°°	DIN connector filter D.9			
57	I	C.W.D. body			NOTE
58	46185301	C.W.D. diaphragm			DIN fitting previous version cod. 416803 FOR REFERENCES 23-48-49-
59	I	C.W.D. ring nut			56-62-68-71-79 CONSULT THE 2004 SPARE PARTS List. THESE
61	46185013	Filter spring			COMPONENTS WILL BE AVAILABLE AS LONG AS SUPPLIES LAST.
62	°°°	DIN connector dust cap			WHEN THEY ARE NOT AVAILABLE THE INTERIOR MUST BE
					REPLACED DIN CONNECTOR WITH THE NEW VERSION CODE
					416805 Tab. #23 Drg E14

SUBJECT: FIRST STAGE
MR12 NITROX CONNECTOR (EN 144-3) - MAINTENANCE INSTRUCTION

BTM15

FOR COMPONENTS PLEASE REFER TO 2006 SPARE PART LIST - Tab 29 drawing 106
FOR FINAL ADJUSTMENT AND CHECKS REFER TO MAINTENANCE MANUAL - EN 13949 NITROX SECTION

STARTING FROM 2006, MARES MANUFACTURES NITROX REGULATORS TESTED AND APPROVED ACCORDING TO EN 13949:2003 NORM. THE NITROX FIRST STAGES ASSEMBLE THE NEW NITROX 200 BAR TYPE CONNECTION IN ACCORDANCE TO THE EN 144-3 NORM. THE NEW NITROX CONNECTOR MUST BE ASSEMBLED ONLY ON VALVES WITH FEMALE CONNECTION M 26X2 IN COMPLIANCE WITH THE EN 144-3 NORM.



WARNING!

THESE PROCEDURES MUST BE APPLIED **ONLY** ON MARES NITROX REGULATORS CERTIFIED ACCORDING TO EN 13949:2003 NORM. THEY SHOULD **NOT** BE USED AS STANDARD PROCEDURE TO MODIFY OTHER REGULATORS THE MAINTENANCE OPERATION ON THE NEW NITROX CONNECTOR MUST BE PERFORMED BY QUALIFIED PERSONNEL AT A TECHNICAL ASSISTANCE CENTER AND/OR BY AUTHORIZED MARES DISTRIBUTOR. FOR ADJUSTMENT AND INSPECTIONS PLEASE CHECK THE PROCEDURES DESCRIBED IN THE MAINTENANCE MANUAL -NITROX SECTION EN 13949:2003. SHOULD THE UPDATED MANUALS CONTAINING THE SECTIONS INDICATED BE LACKING, OR IF THE INSTRUCTIONS ARE UNCLEAR OR NOT ENTIRELY UNDERSTANDABLE, PLEASE CONTACT MARES BEFORE PERFORMING ANY MAINTENANCE, ADJUSTMENT OR CHECK.

TOOLS

- 1 HEX WRENCH 6 mm (B-8 Cod. 46106208)
- 1 WRENCH 32 mm (B-16 Cod. 46106216)

- FIRST STAGE TOOL (B-5 Cod. 46106205)

⚠ WARNING!

MARES RECOMMENDS TO PAY MAXIMUM ATTENTION DURING THE ASSEMBLING, MAINTENANCE AND/OR ADJUSTMENT OPERATIONS LISTED BELOW.

DISASSEMBLY:

1. SCREW THE TOOL (B-5) IN A 3/8" LP PORT (Fig. 1).
2. WITH THE 6 MM HEX WRENCH (B-8), UNSCREW THE CONNECTOR FRONT (51) AND REMOVE O-RINGS (50) AND (198) .
3. REMOVE THE CONNECTOR WHEEL (49).
4. WITH THE WRENCH (B-16), UNSCREW THE CONNECTOR BASE (48) AND REMOVE THE O-RING (23).

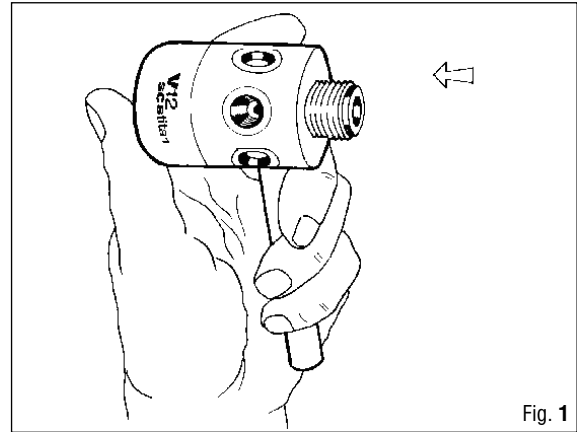


Fig. 1

RIASSEMBLY:

5. PLACE THE O-RING (23) ON THE CONNECTOR BASE (48).

NOTE TO AVOID ACCIDENTAL LOOSENING OF THE NITROX CONNECTOR BASE (48) AND THE CONNECTOR FRONT (51), POUR, AWAY FROM THE O-RING, ONE OR TWO DROPS OF SEALING COMPOUND (LOCTITE TYPE 242 E) ON THE THREAD. DO NOT POUR LOCTITE ON THE O-RINGS.

6. TIGHTENING WITH THE 32 MM WRENCH (B-16), SCREW THE NITROX CONNECTOR BASE (48) ON THE FIRST STAGE BODY.

NOTE IF A TORQUE WRENCH IS USED, SET IT ON 17 - 20 N.m.

7. PLACE CORRECTLY THE WHEEL (49) ON THE CONNECTOR BASE (48).
8. PLACE THE O-RINGS (50) AND (198) ON THE CONNECTOR SEAT (51).
9. USING THE 6 MM HEX WRENCH TIGHTEN THE CONNECTOR SEAT (51) ON THE FIRST STAGE.

Drawing No. E 106

MR12 NITROX CONNECTOR

Drawing updated: 05/25/2005

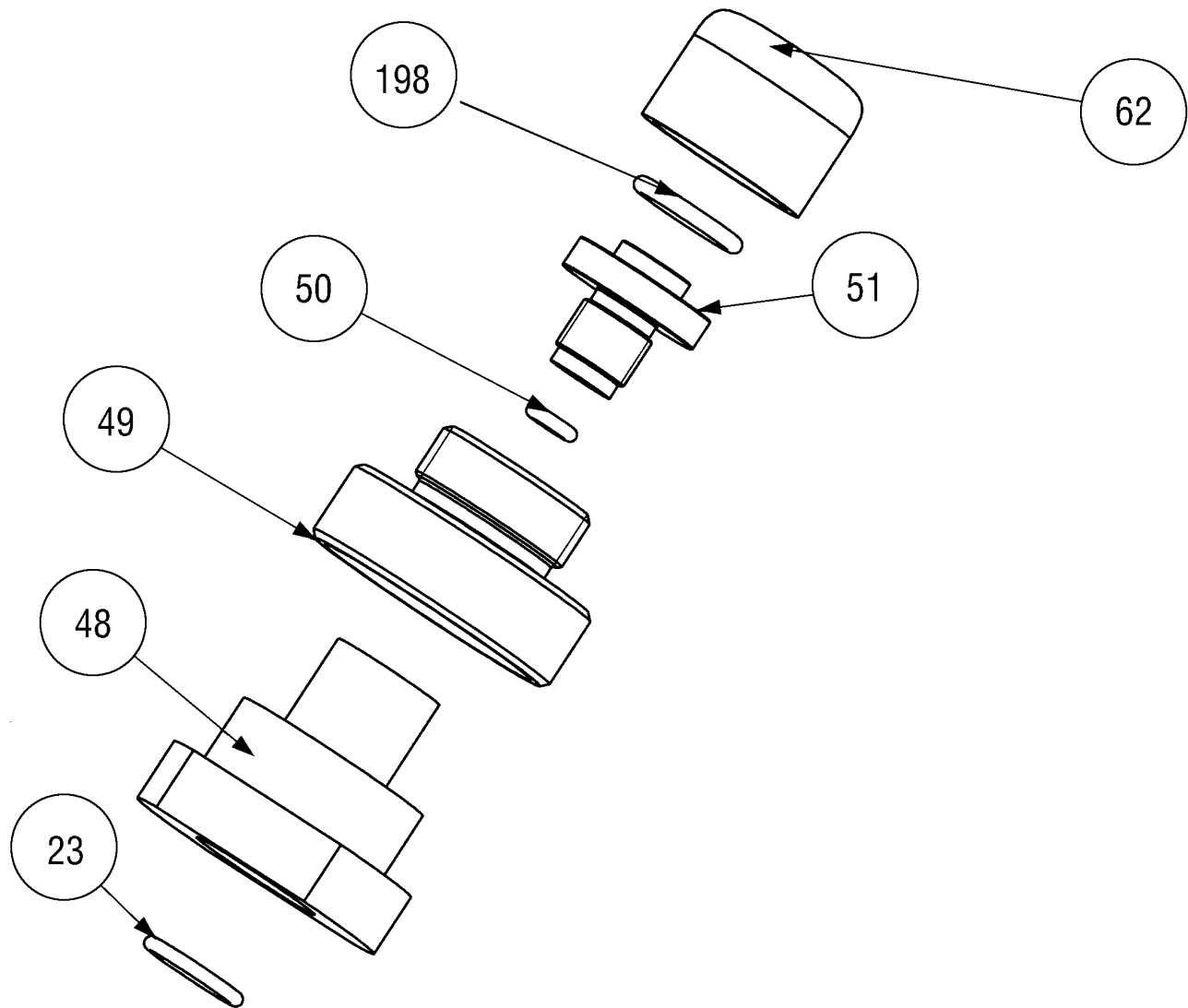


Table No. 29

MR12 NITROX CONNECTOR

Drawing reference No.: E 106
Table updated on 05/25/2005

Ref. No.	Part n.	Description	Ref. No.	Part n.	Description
23	46110406	O-Ring 115 Viton	198	46200655	O-Ring 3056 Viton
48	46200657	Connector - base Nitrox 200			
49	46200654	Wheel 200 Bar M26X2			
50	46110409	O-Ring 2018 Viton			
51	46200656	Connector - front Nitrox			ASSEMBLY
62	46200658	Protection cap 2K5 (yellow)	F	46200664	Connector Nitrox 200 BAR

Table No. 22	MR 12 LONG FIRST STAGE	Drawing reference No.: E 13 Table updated on: 01/10/2005
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Ref.No.	Code	Description	Ref.No.	Code	Description
1		1 ST Stage MR 12 Body	58	46185301	CWD Diaphragm
2	46185015	Snap ring INT.D. 13	59	I	CWD Locking ring
3	46185211	MR 12 Yoke	62	46183014	DIN connector dust cap
4	D	H.P. chamber	70	46200325	Proton 1 ST Stage cap
5	46185038	Backup ring	74	46110107	OR 2031
6	46110101	OR 2012	74	46110403	OR 2031 Viton 011-9707
6	46110401	OR 2012 Viton 006-9707	75	46186216	1 ST stage poppet seat
7	46185212	Yoke retainer nut	148	46184315	"EN 250 - 200 bar" Sticker
8	46185011	MR 12 valve spring	149	46184316	"MARES" Sticker
9	<46200276>	Pebax 1 ST Stage poppet (***)			
12	46186303	V 12 poppet pin			ASSEMBLIES
13	46185032	Poppet button	G	46200406	MR12 1 ST ST. assembly INT
14	46185022	Diaphragm	9***	46200652	MR 2K5 assembly 1 ST stage valve
15	46185034	Spring base plate	D	46185210	H.P. chamber assembly (4-5-6)
16	46185023	Diaphragm spring	D	46186259	H.P. chamber assembly (4-5-6) Nitrox
17	46184510	Retaining nut	F	416804 300 NX	300 BAR DIN Nitrox connector assembly
18	46184511	Spring adjuster nut			(23-48-49-50-51-62)
18	46185028	Spring adjuster nut (C.W.D.)	I	416851	CWD Kit
19	46110106	OR 106		46186150	Service kit INT/DIN 1 ST ST. 12/LONG/D12/S30
19	46110402	OR 106 Viton 610-9707			(2-5-6-19-22-23-50-52-74)
20	46185204	3/8" UNF Port plug		46186154	Service kit INT/DIN VITON 1 ST ST. 12/LONG
22	46185014	Sintered filter			(2-5-6-19-22-23-50-52-74)
23	46110117	OR 115			SAFE FIRST ACCESSORIES
23	46110406	OR 115 Viton 614-9707	----	46200180	Extra 1 ST stage hose (Safe first)
24	46185010	MR 12 Dust cap	----	46200241	Tamp. 1 ST stage cap. Yellow
25	46184079	MR 12 yoke nut	----	46200177	Fixed part of swivel connector
48	F	Connector body (DIN) 300 BAR	----	46110215	OR 2043
49	F	DIN 300 BAR threaded locking ring	----	46110205	OR 105
50	46110203	OR 2018	----	46200178	Mobile part of swivel connector
50	46110409	OR 2018 Viton 008-9707	----	46200176	Swivel connector cap
51	46183003	Connector coupling (DIN) 300 BAR			
52	46110108	OR 108			
52	46110404	OR 108 Viton 611-9707			
53	46185205	7/16" HP port plug			
57	I	CWD body			
NOTE					
(***) FOR 1 ST ST POPPET (9) REPLACEMENT USE EXCLUSIVELY the code 46200652					

Drawing No. E 105	MR 12 NITROX FIRST STAGE (EN 13949)	Drawing updated: 07/26/2005
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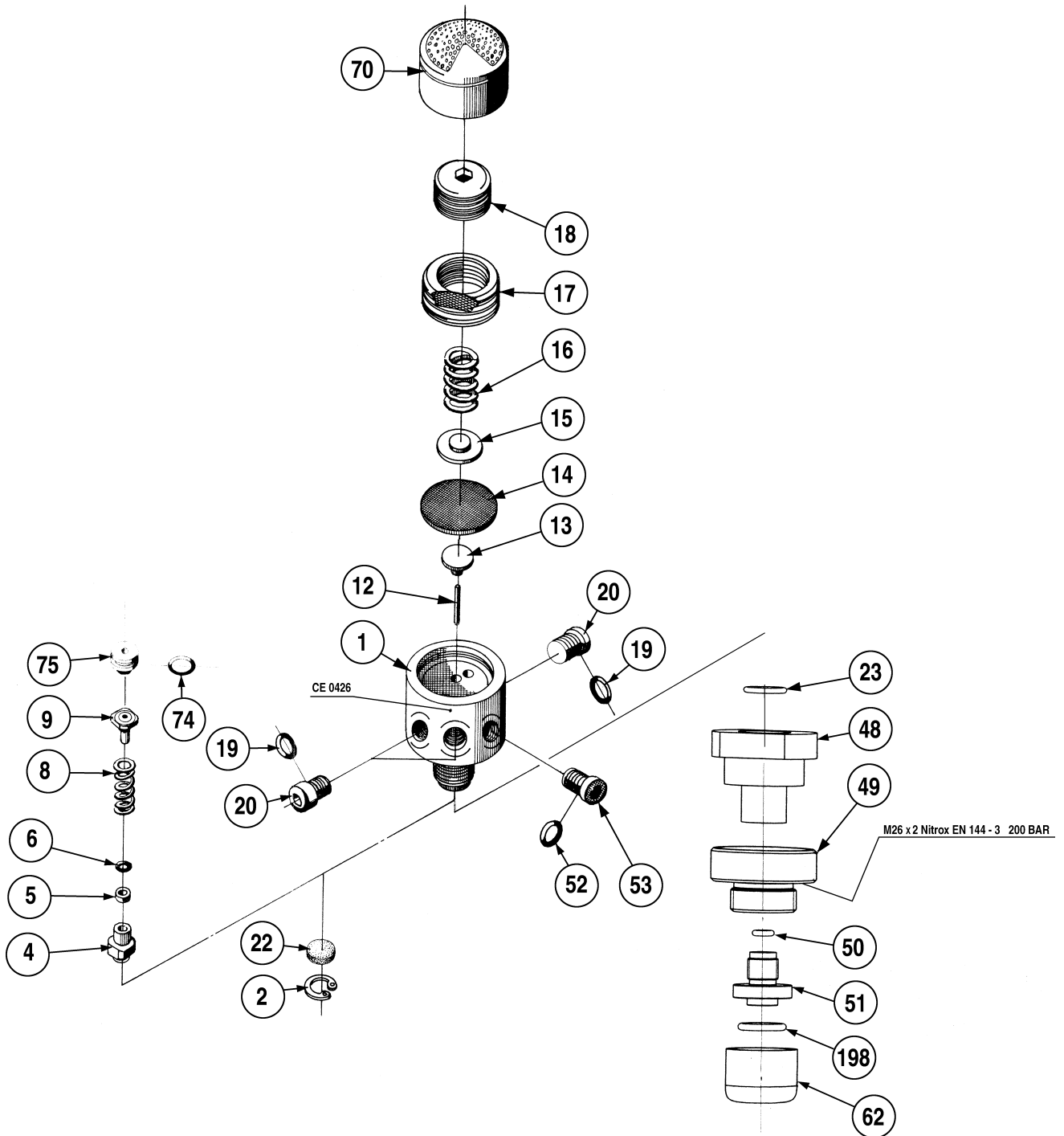


Table No. 28	MR 12 LONG NITROX FIRST STAGE (EN 13949)	Drawing reference No.: E 105 Table updated on: 07/26/2005
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Ref. No.	Code	Description	Ref. No.	Code	Description
1		Body	49	46200654	Nitrox 200 BAR ring nut fitting
2	46185015	Snap ring INT.D. 13	50	46110409	OR 2018 Viton 008-9707
4	D	H.P. chamber	51	46183003	Nitrox 200 BAR connector coupling
5	46185038	Backup ring	52	46110404	OR 108 Viton 611-9707
6	46110401	OR 2012 Viton 006-9707	62	46200658	Dust cap (yellow)
8	46185011	MR 12 valve spring	70	46200325	Proton 1st Stage cap
9	46200276	Pebax 1st Stage poppet	74	46110403	OR 2031 Viton 011-9707
12	46186303	V 12 poppet pin	75	46186216	1st stage poppet seat
13	46185032	Poppet button	198	46200655	OR 3056
14	46185022	Diaphragm			
15	46185034	Spring base plate			ASSEMBLIES
16	46185023	Diaphragm spring	D	46186259	H.P. chamber assembly (4-5-6) Nitrox
17	46184510	Retaining nut	F	*	Connector assembly Nitrox 200 BAR
18	46184511	Spring adjuster nut			(Ref. Table 29 Drg. 106)
19	46110402	OR 106 Viton 610-9707	* * *	46200678	Service kit MR 12 Nitrox (EN 13949)
20	46185204	3/8" UNF Port plug			(2-5-6-19-22-23-50-52-74-198)
22	46185014	Sintered filter			NOTE
23	46110406	OR 115 Viton 614-9707			(***) FOR 1 ST ST POPPET (9) REPLACEMENT USE EXCLUSIVELY
48	46200657	Nitrox 200 BAR body fitting			the code 46200652

V42 FIRST STAGE



DISASSEMBLY

In order to facilitate disassembly operations, it is advisable to remove the flexible hoses connected to the First Stage, with the exception of the one connected to the D.F.C. port, and replace them with the corresponding plugs.

1. Move the 1ST stage hose protection, and unscrew the hose (26) using a 14-mm open end wrench (B -18).
2. Using a caliper tool (B 25), unscrew and remove the HP housing assembly (4) and remove the spring (8), poppet (9), and pin (12) from the first stage body (1) (Fig. 1).
3. Remove the O-Ring (74) from the HP housing (4).
4. Extract the O-Ring (6) from the HP housing (4).

WARNING!

REMOVE THE BACKUP RING (5) FROM THE HP HOUSING (4) ONLY IF IT IS TO BE REPLACED.

5. Using the 1ST stage poppet seat extractor (B-38), remove the 1ST stage poppet seat (Fig. 2).

WARNING!


DO NOT ATTEMPT TO REMOVE THE POPPET SEAT USING SHARP OR POINTED TOOLS; SCRATCHES ON THE SURFACE OF THE FIRST STAGE BODY CAN CAUSE OPERATIONAL DEFECTS.

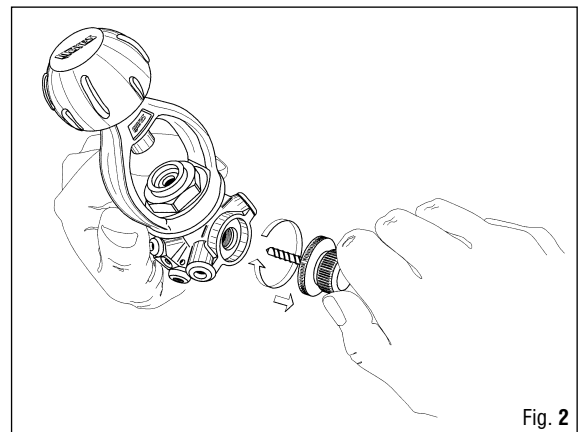
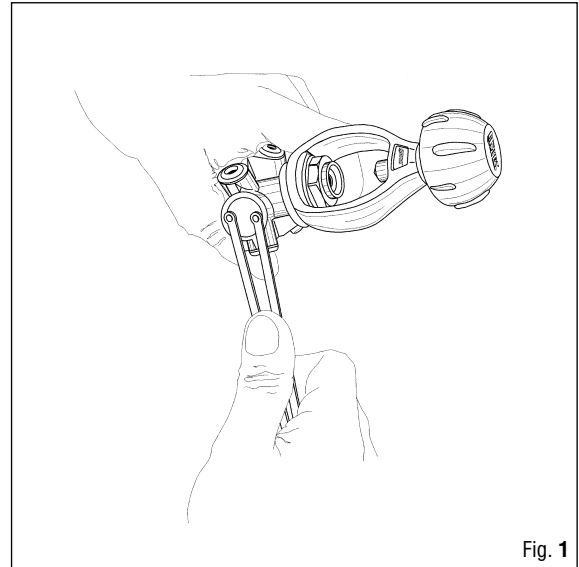
6. Remove the O-Ring 4 x 1 (116) by introducing low-pressure air (below 7 bar).

WARNING!

DO NOT ATTEMPT TO REMOVE THE O-RING (116) USING SHARP OR POINTED TOOLS; SCRATCHES IN THE O-RING SEAT CAN CAUSE OPERATIONAL DEFECTS.

7. Screw the first stage disassembly tool (B-5) into a low pressure port (3/8").
8. Using the Allen wrench (B-13), unscrew the adjusting nut (18) and pull out the spring (16).
9. Back off the retaining nut (17) using the 30-mm open end wrench (B-40) and remove the spring base plate (15).

 **NOTE** TO DISASSEMBLE THE RING (157) FROM THE RETAINING NUT (17) SIMPLY APPLY LIGHT PRESSURE.



10. Remove the plastic washer ring (195).

! WARNING!

DO NOT USE POINTED TOOLS TO REMOVE THE PLASTIC WASHER RING (195) IN ORDER TO AVOID DAMAGING THE DIAPHRAGM (14).

11. Introducing low pressure air (below 7 bar) through a 3/8" LP port, remove the diaphragm (14), the poppet button (13), and the DFC washer (189) (Fig. 3).

! WARNING!

DO NOT ATTEMPT TO REMOVE THE DIAPHRAGM WITH SHARP OR POINTED TOOLS. SCRATCHING THE SURFACE OF THE DIAPHRAGM OR FIRST STAGE BODY SEAT MAY CAUSE AIR LEAKAGE.

12. Unscrew the yoke retainer nut (7) using the special tool (B-1) and remove the yoke (3) with the knob (25).
13. Remove the yoke connector (154).
14. Using the snap ring pliers (B-14), extract the snap ring (2), the tapered sintered filter (22), and the filter spring (61) from the yoke retainer nut.
15. Remove the O-Ring (71) from the yoke retainer nut (7).

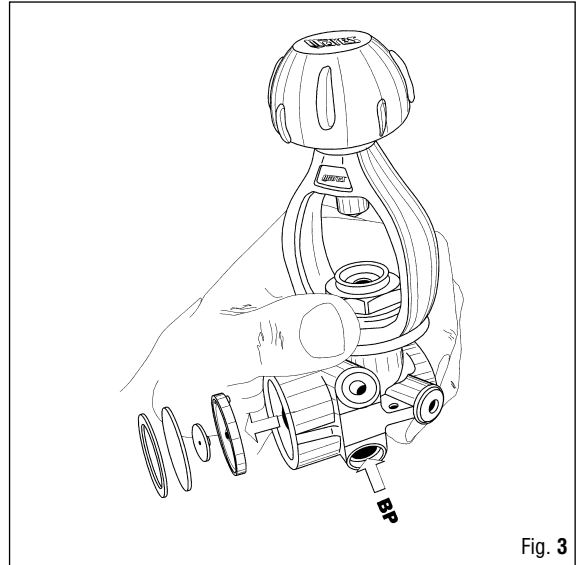


Fig. 3

► DIN VERSION

► DISASSEMBLY

(FROM STEP 12 TO STEP 15)

Unscrew the DIN OR seat (187) from the DIN fitting (48) with a 4-mm Allen wrench.

Remove the O-Ring (188) from the DIN OR seat (187).

Remove the sintered filter (56) from the DIN connector body (48), turning the first stage over.

Insert an 5-mm Allen wrench (B4) inside the DIN fitting (48) and unscrew it completely (Fig. 4).

Remove the DIN fitting (48) and the DIN ring nut (49).

Remove the O-Ring (71) from the DIN fitting (48).

16. Unscrew the lever (B5) from the first stage body.

17. Unscrew the caps (20 - 53) and remove the O-Rings (19 - 52) from them.

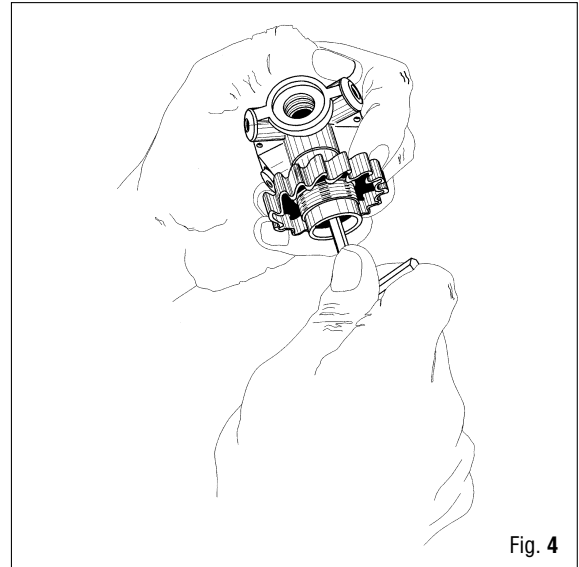


Fig. 4

CLEANING



WARNING!

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

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. Chrome plated brass and stainless steel parts can be cleaned with an ultrasonic cleaner in fresh water 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 that all components have been rinsed and dried before proceeding with reassembly.



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.

**WARNING!**

DO NOT IMMERSE THE SINTERED FILTER IN AN ACID SOLUTION.

INSPECTION

Certain key components of the first stage should be regularly replaced at each scheduled overhaul. Moreover, in view of their relatively low cost, all the O-rings should also be replaced.

- Snap ring	(2)	- cod. 46185015
- Tapered sintered filter	(22)	- cod. 46186202
- DIN tapered sintered filter	(56)	- cod. 46200561
- LP O-rings	(19)	- cod. 46110106
- HP O-rings	(52)	- cod. 46110108
- HP chamber O-ring	(6)	- cod. 46110101
- HP chamber O-ring	(74)	- cod. 46110107
- Poppet seat O-ring	(116)	- cod. 46110405
- DIN O-Ring housing O-Ring	(188)	- cod. 46110247
- Yoke retainer nut O-ring	(71)	- cod. 46110211
- DIN connector O-ring (DIN versions only)	(71)	- cod.

DO NOT USE PARTS WITH THE FOLLOWING DEFECTS

Description	Ref.	Inspection
Snap rings (circlips)	(2)	Check for distortion, cracking or damaged edges. It is advisable to always replace them with new ones.
Tapered sintered filter	(22)	Inspect for sedimentation and rust. Rust deposits may indicate deterioration of the air tanks. Inspect for any cracks.
HP chamber	(4)	Inspect the interior for any foreign matter or particles.
O-Rings	(6 - 19 - 52 - 71 - 74 - 116 - 188)	Check for cuts, deformation or foreign particles. Any of these defects can cause leaks.
First stage diaphragm	(14)	Inspect for cracks, cuts, and tears.
First stage body	(1)	Check for scratches on the diaphragm sealing surfaces, the port plug seats, and the poppet seat housing.
O-ring seats		Inspect all metal surfaces in contact with the O-rings or other seals, and check for scratches, chipping, deteriorated plating, or foreign particles.
Springs	(16 - 8)	Check for any split, deformed or broken coils.
Plastic washer ring	(195)	Check for cracks or damaged edges.

REASSEMBLY

18. Position the O-Ring (116) in the seat inside the First Stage body (1).

WARNING!

IT IS ADVISABLE TO REPLACE THE O-RING (116) USING A PLASTIC ROD (MAX 6 mm DIAMETER) IN ORDER TO AVOID DAMAGING THE SEAT. CHECK THAT IT IS POSITIONED CORRECTLY.

19. Use the First Stage seat assembly tool (B39) to insert the seat connector (114) (Fig. 5).

WARNING!

CHECK THE PROPER POSITION OF THE SEAT CONNECTOR.

20. Position the O-ring (74) in the external seat of the HP housing (4).
21. Insert the backup ring (5) and the O-Ring (6) into the HP housing (4).
22. Insert the poppet (9), positioning the spherical part in contact with the seat connector.
23. Position the spring (8) on the first stage poppet (9).
24. Screw the HP housing (4) into the first stage body (1) (Fig. 6).

WARNING!

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

25. Rotate the first stage and correctly position the DFC washer (189) in the groove of the first stage body (Fig. 7).
26. Insert the pin (12) in the center hole in the DFC washer (189).

WARNING!

CHECK THE CORRECT POSITIONING OF THE D.F.C. WASHER.

27. Position the poppet button (13) on the pin (12).
28. Position the diaphragm (14) in the seat of the first stage body (1).
29. Correctly position the plastic washer ring (195) above the diaphragm (14).
30. Arrange the spring base plate (15) on the diaphragm (14).

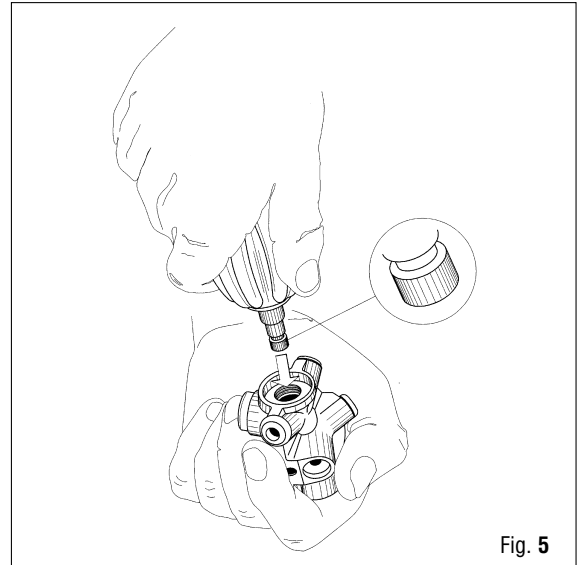


Fig. 5

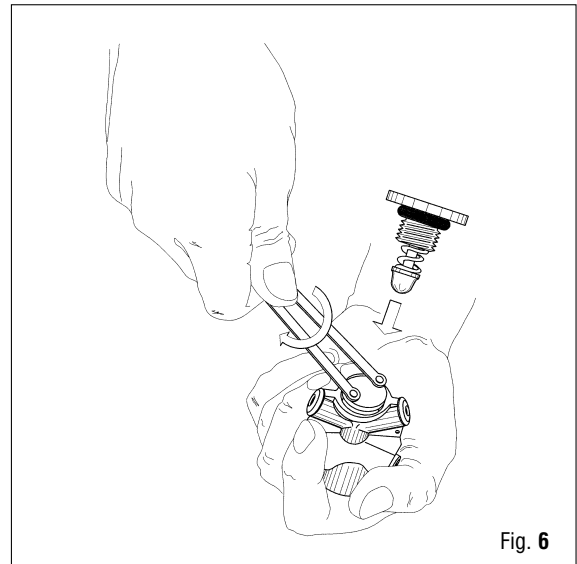


Fig. 6

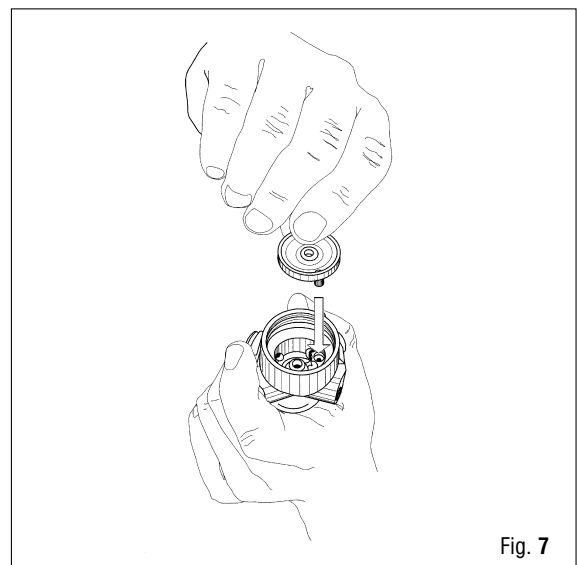


Fig. 7

NOTE POSITION THE SHOCK RING (157) ON THE RETAINING NUT (17), APPLYING LIGHT PRESSURE.

31. Use a 30-mm open end wrench (B 40) to screw down the retaining nut (17).

NOTE IF USING A TORQUE WRENCH, USE TIGHTENING TORQUE OF APPROXIMATELY 20 - 25 N/m.

32. Position the spring (16) on the spring base plate (15).
33. Screw the adjusting nut (18) 3 - 4 turns on the retaining nut (17) using a 10-mm Allen wrench (B13).

NOTE DO NOT OVER-TIGHTEN THE ADJUSTING NUT; THIS INCREASES THE INTERMEDIATE PRESSURE AND INTERFERES WITH THE SUBSEQUENT ADJUSTMENTS.

34. Insert the filter spring (61) and tapered filter (22) in the yoke retainer nut (7).
35. Using snap ring pliers (B14) position the snap ring (12) in the yoke retainer nut (7).

NOTE ROTATE THE SNAP RING TO CHECK ITS CORRECT POSITIONING.

36. Arrange the yoke connector (154) on the first stage body (1).
37. Position the yoke (3) with the knob (25) on the first stage body (1).
38. Fully screw down the yoke retainer nut (7) to the first stage body (1) using a 25-mm open-end wrench (B1).

NOTE IN ORDER TO PREVENT THE YOKE RETAINER NUT (7) FROM WORKING LOOSE ACCIDENTALLY, PUT A FEW DROPS OF THREAD GLUE (SUCH AS LOCTITE 242 E) ON THE THREADS AT THE POINT FARTHEST FROM THE O-RING. DO NOT PUT THREAD GLUE ON THE O-RING.

▶ DIN VERSION

▶ REASSEMBLY

(from step 33 to step 37)

Position the O-Ring (71) on the DIN fitting (48) (Fig. 8)
Insert the DIN fitting (48) in the DIN ring nut (49).

NOTE IN ORDER TO PREVENT THE DIN FITTING (48) FROM WORKING LOOSE ACCIDENTALLY, PUT A FEW DROPS OF THREAD GLUE (SUCH AS LOCTITE 242 E) ON THE THREADS AT THE POINT FARTHEST FROM THE O-RING. DO NOT PUT THREAD GLUE ON THE O-RING.

Using a 5-mm Allen wrench (B 4), tighten the DIN fitting (48) to the first stage body (1) (Fig. 4).

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

! WARNING!

AFTER HAVING SCREWED ON THE DIN FITTING (48), INTRODUCE LOW PRESSURE AIR (max 7 BAR) IN A LOW PRESSURE PORT TO REMOVE ANY METALLIC RESIDUES.

Insert the tapered filter (56) in the DIN fitting.
Position the O-Ring (188) on the DIN OR seat (187).
Screw the O-Ring housing (187) to the DIN fitting (48) with a 4-mm Allen wrench.

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

39. Position the O-Rings (19 - 52) on the caps (20 - 53).
40. Screw the caps (20 - 53) to the first stage body (1) using a 4-mm Allen wrench.

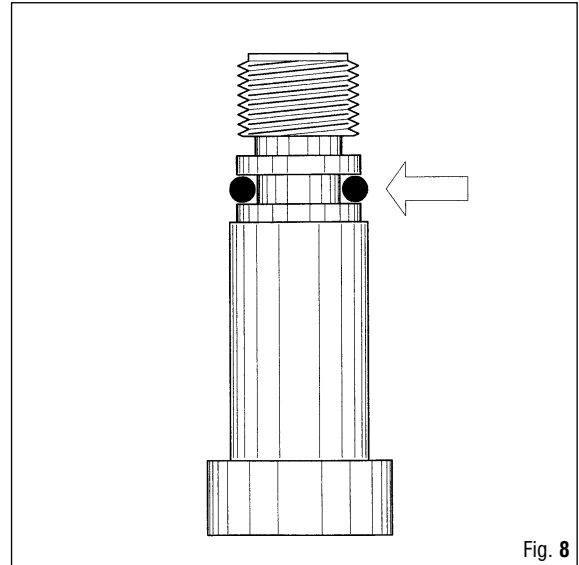


Fig. 8

Drawing No. E 101	V 42 FIRST STAGE	Drawing updated: 07/13/2005
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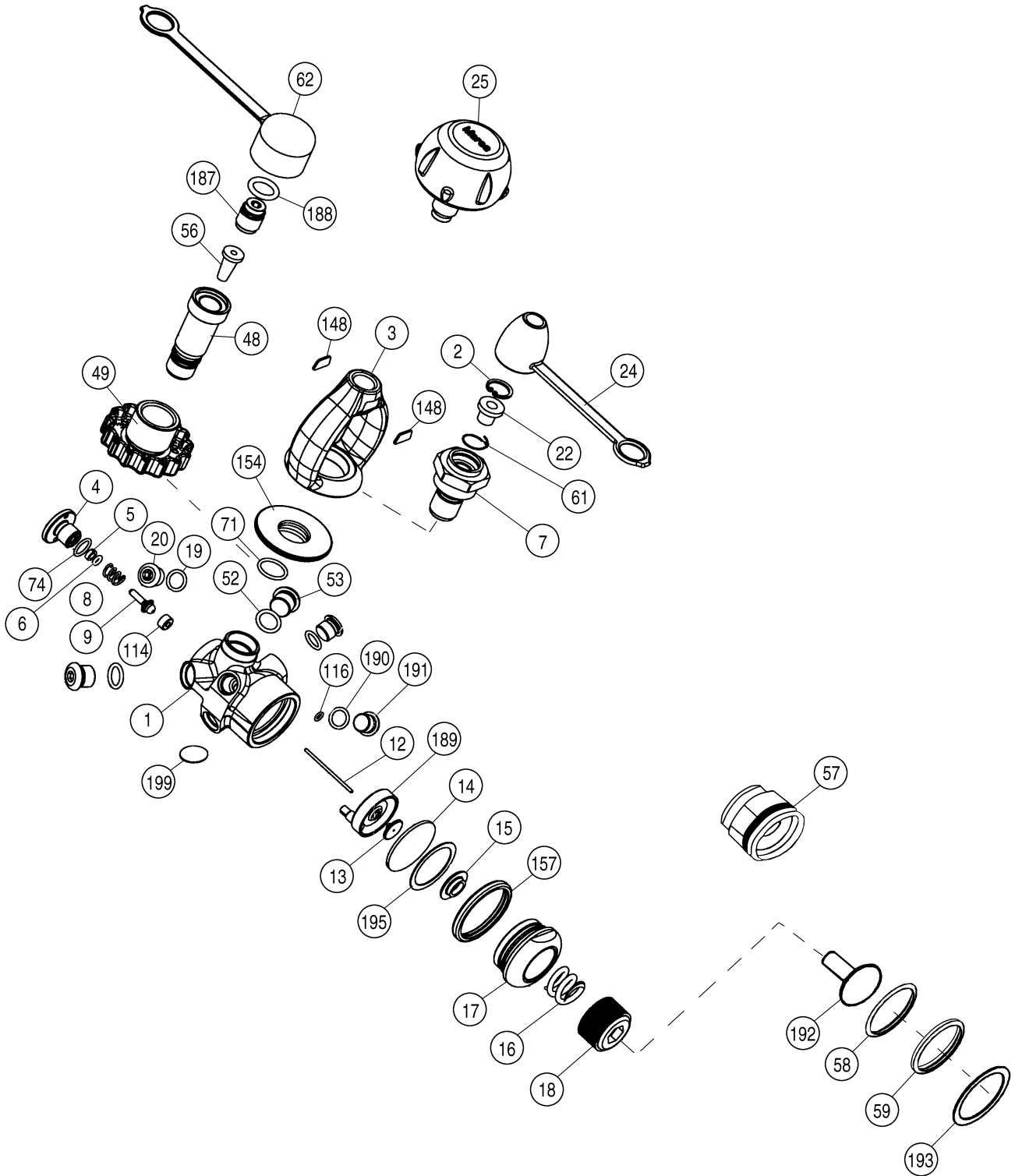


Table No. 24	V 42 FIRST STAGE	Drawing reference No.: E 101 Table updated on: 08/01/2005
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Ref.No.	Code	Description	Ref.No.	Code	Description
1		1 ST st body .	62	46200562	DIN 2k4 connector dust cap
2	46185015	Snap ring Int. D. 13	71	46200211	OR 2050
3	46185211	Yoke	74	46110107	OR 2031
4	D	HP chamber	114	46200683	Seat connector
5	46185038	Backup ring	116	46110405	OR 4 X 1
6	46110101	OR 2012	148	46184315	"EN 250"; "232 bar" yoke label
7	46186205	Yoke retainer nut	148	46184316	MARES yoke lable
8	46200673	1 ST stage poppet spring	154	46200553	1 ST stage yoke connector
9	46200670	1 ST stage poppet	157	46200554	1 ST stage shock ring
12	46200672	Poppet pin	187	46200547	DIN OR seat
13	46200545	Poppet button	188	46110247	OR 3043
14	46200674	Diaphragm	189	46200671	DFC 1 ST stage washer
15	46200582	Spring base plate	195	46200581	Plastic washer ring
16	46185023	Diaphragm spring	199	46200665	V 42 1 ST stage oval sticker
17	46200544	Retaining nut			
18	46185028	Spring adjusting nut			
19	46110106	OR 106			ASSEMBLIES
20	46185204	3/8" UNF Port plug			
22	46186202	Tapered sintered filter	G	46200706	V42 1 ST ST assembly INT
24	46185010	Dust cap	D	46200597	HP Chamber assembly (4-5-6)
25	46184079	Yoke knob	F	416805	Connector assembly DIN 300 BAR (71-48-49-56-187-188)
48	46200548	300 BAR DIN connector body			
49	46200546	DIN 300 BAR threaded locking ring	I		CWD KIT
52	46110108	OR 108	***	46200596	Service kit INT METAL TECH 1 ST st. INT /V 42 (2-5-6-19-22-52-61-71-74-116)
53	46185205	7/16" HP port plug			
56	46200561	DIN fitting filter	***	46200603	Service kit Metal Tech 1 ST st DIN/ V 42 (2-5-6-19-52-56-71-74-116-188)
61	46185013	Filter spring			

► **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	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	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	INT - DIN Version OF RUBY - MR22 - MR 16 - V16 - MR10 - TI PLANET - V32 - V42	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	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	1) O-ring seal of tank valve dirty or damaged	1) Clean the seat of the tank valve and replace the O-ring
	RUBY - MR22 - MR16 - V16 - MR10 - V32 - TI PLANET	2) O-ring sealing surface on the first stage damaged	1) (INT version) Replace the first stage body
			2) (DIN version) replace the connector body
	MR12 - V12 - R2	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	
- 5 - AIR LEAK FROM THE HP CHAMBER PLUG	RUBY - MR22 - MR16 - V16 - V32 - TI PLANET - V42	1) O-ring defective	1) Replace
- 6 - AIR LEAK FROM HOLES IN THE FIRST STAGE CAP	R2	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 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	1) Intermediate pressure too high	1) Clean the seat of the tank valve and replace the O-ring
	MR22 - MR16 - MR12 - MR12 II° - MR10	2) First stage poppet damaged	1) Replace
	R 2	3) Piston friction lining damaged	1) Replace friction lining
	MR12 - R2	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	6) Defective HP chamber	1) Replace the O-rings	
		2) Replace the backup ring	
		3) Clean or replace the HP chamber	

Drawing No. E 30	ABYSS 2005 SECOND STAGE	Drawing updated 01/15/2004
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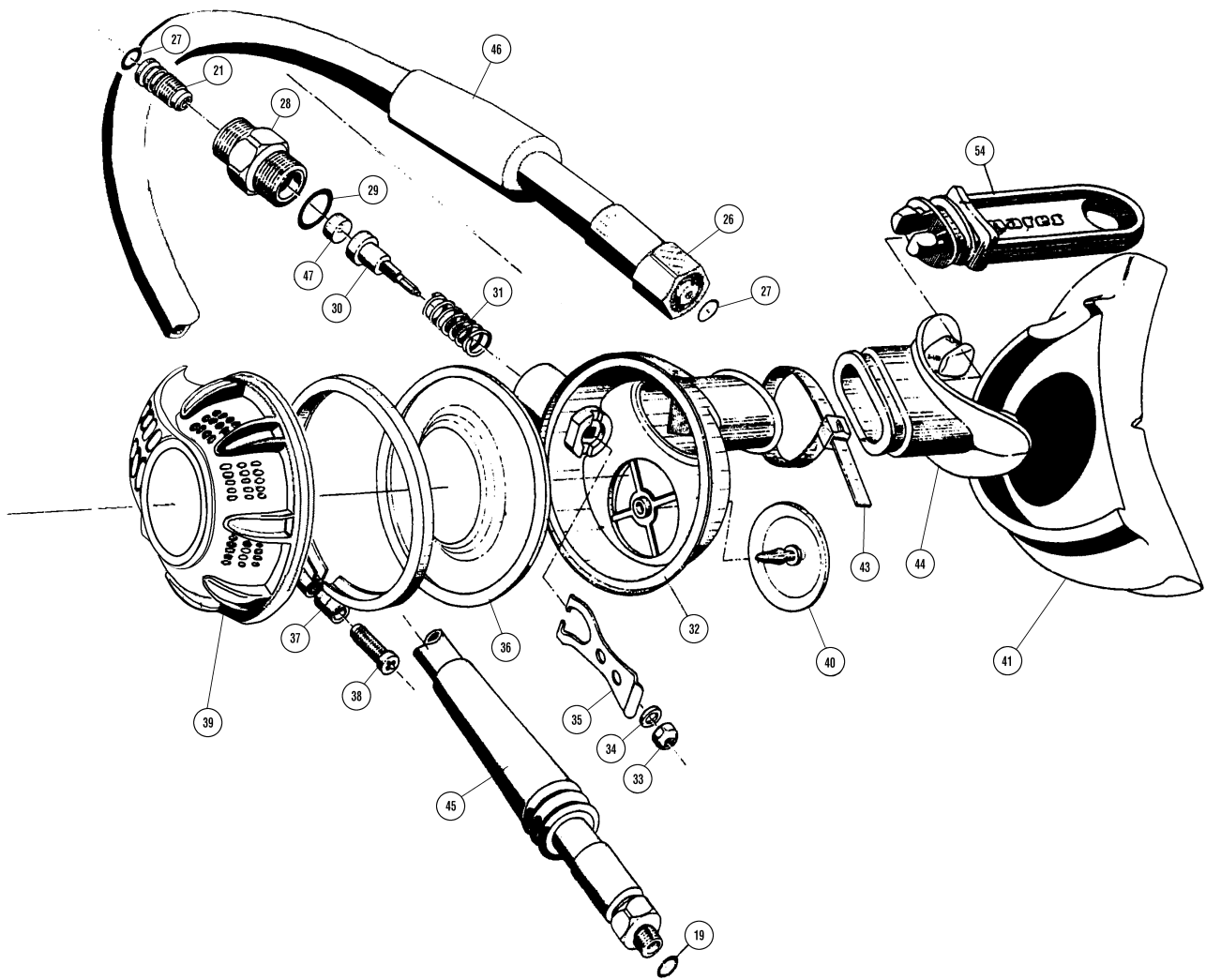


Table No. 120	ABYSS 2005 SECOND STAGE	Drawing reference No.: E 30 Table updated on: 12/12/2005
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Ref.No.	Code	Description	Ref.No.	Code	Description
19	46110215	OR 2043	41	46186310	Exhaust tee
19	46110415	OR 2043 Viton 013-9754	43	47157984	Mouthpiece clamp
21	46200204	Seat connector	44	° ° °	Black mouthpiece
26	46184449	Black 1/2" Abyss super/flow hose	45	46179902	Black 1 ST stage hose protector
27	46110205	OR 2025	46	46187036	Black 2 ND Stage hose protector
27	46110411	OR 2025 Viton 010-9754	47	46184062	Poppet seat
28	46184282	Case assembly connector	54	46186090	Mouthpiece plug Octopus
29	46110211	OR 2050	°°°	46200541	Abyss 2K5 Button sticker
29	46110413	OR 2050 Viton		46200542	Abyss Nitrox Button sticker
30	46186024	Second stage poppet			ASSEMBLIES
31	46185057	Poppet spring			
32	46186025	2 ND stage case	G	46200121	ABYSS 05 Second stage
33	46185051	Demand lever nut	39	46200595	Cover assembly ABYSS 05
34	46185049	Washer	39	46200602	Cover assembly ABYSS 05 NX
35	46185104	Demand lever (CWD)	** *	46186160	2 ND St service kit AVO/Classic Pro/Tech
36	46186029	Black diaphragm			(19-27-29-33-40-43-47)
37	46185073	Ring clamp	** *	46185166	2 ND st service kit ABYSS Nitrox (VITON O-Ring)
38	46185075	Ring clamp screw 3 x 16 stainless			(19-27-29-33-40-43-47)
40	46184006	Exhaust valve			

**AXIS - REBEL SERIES -
SECOND STAGES**

mares[®]

Drawing No. E 29	REBEL SECOND STAGE OCTOPUS REBEL	Drawing updated: 06/16/2004
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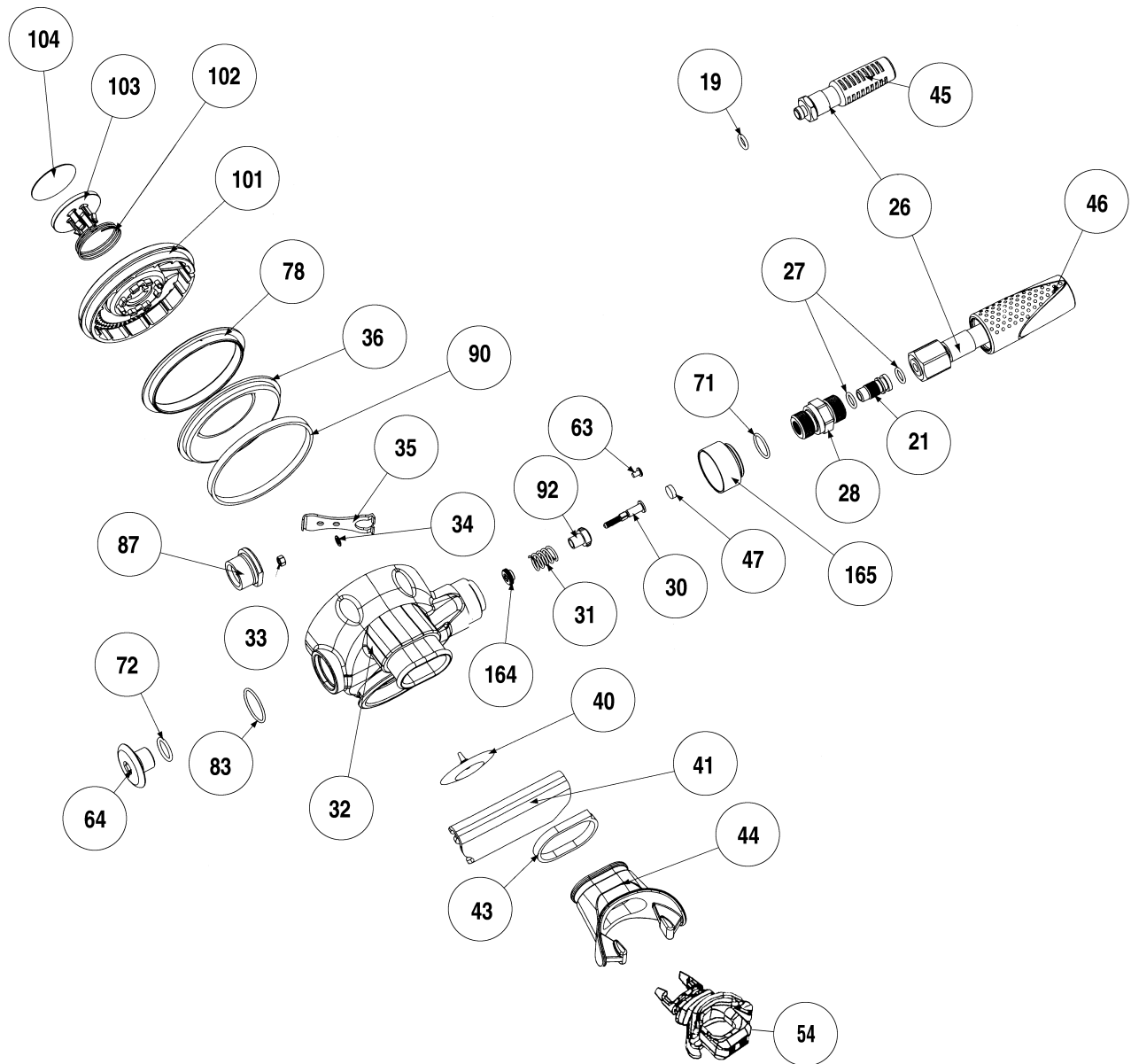


Table No. 119	REBEL SECOND STAGE OCTOPUS REBEL	Drawing reference No.: E 29 Table updated on 01/10/2005
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Ref.No.	Code	Description	Ref.No.	Code	Description
19	46110106	OR 106	83	46110420	OR 2068 Viton 017-9707
19	46110402	OR 106 Viton 610-97507	87	46184233	Adjuster connector
21	46200204	Seat connector	90	46184223	Spacer ring
26	46200451	Black 3/8" 800 soft hose	92	46184221	Valve body
26	46200452	Yellow 3/8" 1000 soft hose	101	+++	Rebel 2 ND st cover
27	46110205	OR 2025	101	+++	Rebel 2 ND st cover yellow
27	46110411	OR 2025 Viton 010-9707	102	+++	Spring button
28	46184282	Case assembly connector	103	+++	Button
30	46184219	Valve shaft	104	46200539	Rebel button label
31	46185057	Poppet spring	104	46200540	Rebel NX button label
32	---	Case	164	---	Rotation stop washer
33	46185051	Demand lever nut	165	46200213	Case assembly bushing
34	46185049	Lever washer			
35	46185104	Demand lever			ASSEMBLIES
36	46184225	Diaphragm			
40	46184006	Exhaust valve	G	46200294	Rebel 2 ND ST. assembly
41	46186266	Exhaust tee	G	46200292	Rebel 2 ND ST. assembly Nitrox
43	47157984	Mouthpiece clamp	---	46200287	Rebel P/F Case (32 - 164 - 165)
44	° ° °	Mouthpiece	+++	46200601	Cover assembly Rebel
45	46179902	First stage hose protector			(101-102-103-104)
46	46200323	Hose cover	+++	46200598	Cover assembly Rebel Nitrox
47	46184062	Poppet seat			(101-102-103-104)
54	46186090	Mouthpiece plug Octopus	+++	46200600	Cover assembly Rebel Octopus
63	46184289	Cover safety catch			(101-102-103-104)
64	46184234	Adjustment port plug	+++	46200599	Cover assembly Rebel Nitrox Octopus
71	46110211	OR 2050			(101-102-103-104)
71	46110413	OR 2050 Viton 014-9707	***	46200296	Service kit Axis/Rebel 2 ND st series
72	46110215	OR 2043			(19-27-33-40-43-47-71-72-83)
72	46110415	OR 2043 Viton 013-9707	***	46200297	Service kit Axis Nx/Rebel NX 2 ND st. series
78	46184224	Diaphragm holding ring			(VITON O-Ring)
83	46110225	OR 2068			(19-27-33-40-43-47-71-72-83)

Table No. 114	PROTON SECOND STAGE OCTOPUS PROTON	Drawing reference No.: E 24 Table updated on: 01/10/2005
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Ref.No.	Code	Description	Ref.No.	Code	Description
19	46110106	OR 106	92	46184221	Valve body
19	46110402	OR 106 Viton 610-97507	101	+++	Proton cover nut
21	46200204	Seat connector	102	+++	Spring button
26	46200451	Soft 3/8" hose 800	103	+++	Proton cover button
26	46200452	Yellow 3/8" 1000 soft hose	104	46200339	Button sticker
26	46200269	3/8" soft hose 600 (Proton junior)	164	---	Rotation stop washer
26	46200348	3/8" yellow soft hose 900 (Proton junior)	165	46200334	Case assembly bushing
27	46110205	OR 2025	171	46110110	OR 2037
27	46110411	OR 2025 Viton 010-9707	171	46200298	OR 2037 Viton
28	46184282	Case assembly connector	172	+++	Proton octopus 2 nd st. rubber cover
30	46184219	Valve shaft	172	+++	Proton octopus 2 nd st. rubber cover
31	46185059	Poppet spring	173	46200340	Proton case sticker
32	---	2 nd stage case	174	46200361	Exhaust tee cap fastening pin
33	46185051	Demand lever nut			
34	46185049	Lever washer			ASSEMBLIES
35	46187027	Demand lever			
36	46200311	2 nd stage diaphragm	G	46200411	Proton Second Stage assembly
40	46184006	Exhaust valve	G	46200412	Proton NX 2 nd stage assembly
41	46200315	Proton inspection cap	---	46200527	P.F. Proton/XL Case (32 - 164 - 165)
43	47157984	Mouthpiece clamp	---	46200526	P.F. Octopus Proton Case (32 - 164 - 165)
44	° ° °	2k2 Mouthpiece	+++	46200416	Proton assembly cover
44	° ° °	Small mouthpiece (Proton Junior)			(101 - 103 - 104 - 172)
46	46200323	Proton hose protector	+++	46200415	Proton NK assembly cover
47	46184062	Poppet seat			(101 - 103 - 104 - 172)
54	46186090	Mouthpiece plug Octopus	+++	46200413	Proton octopus assembly cover
63	46184289	Cover safety catch			(101 - 103 - 104 - 172)
64	46200322	2 nd St. adjustment plug	***	46200409	Service kit Proton series 2 nd St
71	46110211	OR 2050			(19 - 27 - 33 - 40 - 43 - 47 - 71 - 171)
71	46110413	OR 2050 Viton 014-9707	***	46200408	Service kit Proton Nx series 2 nd st.
78	46200321	Diaphragm holding ring			(19 - 27 - 33 - 40 - 43 - 47 - 71 - 171)

Table No. 115	PROTON XL SECOND STAGE	Drawing reference No. : E 25 Table updated on 01/10/2005
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Ref.No.	Code	Description	Ref.No.	Code	Description
19	46110106	OR 106	78	46200321	Diaphragm holding ring
19	46110402	OR 106 Viton 610-97507	92	46184221	Valve body
21	46200204	Seat connector	101	+++	Proton cover nut
26	46200451	Soft 3/8" hose 800	102	+++	Spring button
27	46110205	OR 2025	103	+++	Proton cover button
27	46110411	OR 2025 Viton 010-9707	104	46200374	Button sticker
28	46184282	Case assembly connector	164	---	Rotation stop washer
30	46184219	Valve shaft	165	46200334	Case assembly bushing
31	46185059	Poppet spring	171	46110110	OR 2037
32	---	2 ND stage case	171	46200298	OR 2037 Viton
33	46185051	Demand lever nut	172	+++	Rubber cover
34	46185049	Lever washer	173	46200341	Proton case sticker
35	46187027	Demand lever	174	46200361	Exhaust tee cap fastening pin
36	46200311	2 ND stage diaphragm	175	46200320	Cabochoon
40	46184006	Exhaust valve			
41	46200315	Proton inspection cap			ASSEMBLIES
43	47157984	Mouthpiece clamp			
44	° ° °	Black mouthpiece	G	46200410	Proton XL 2 ND stage assembly
46	46200323	Proton hose protector	---	46200527	P.F. Proton/XL Case (32 - 164 - 165)
47	46184062	Poppet seat	+++	46200414	Proton XL assembly cover (101 - 103 - 104 - 172 - 175)
54	46186090	Mouthpiece plug Octopus			
63	46184289	Cover safety catch	***	46200409	Service kit Proton series 2 ND St (19 - 27 - 33 - 40 - 43 - 47 - 71 - 171)
64	46200379	2 ND St. adjustment plug			
71	46110211	OR 2050	***	46200408	Service kit Proton Nx series 2 ND st. (19 - 27 - 33 - 40 - 43 - 47 - 71 - 171)
71	46110413	OR 2050 Viton 014-9707			

Table No. 118	PROTON METAL SECOND STAGE	Drawing reference No.: E 28 Table updated on: 01/10/2005
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Ref.No.	Code	Description	Ref.No.	Code	Description
19	46110106	OR 106	71	46110211	OR 2050
19	46110402	OR 106 Viton 610-97507	71	46110413	OR 2050 Viton 014-9707
21	46200204	Seat connector	78	46200321	Diaphragm holding ring
26	46200451	Soft 3/8" hose 800	92	46184221	Valve body
27	46110205	OR 2025	101	+++	Proton Metal 2 ND Stage Cover
27	46110411	OR 2025 Viton 010-9707	102	+++	Spring
28	46184282	Case assembly connector	103	+++	Proton Ice cover button
30	46184219	Valve shaft	104	46200519	Proton Metal cover sticker
31	46185059	Poppet spring	171	46110110	OR 2037
32	46200524	2 ND stage case	171	46200298	OR 2037 Viton
33	46185051	Demand lever nut	172	+++	Proton Ice front
34	46185049	Lever washer			
35	46187027	Demand lever			ASSEMBLIES
36	46200311	2 ND stage diaphragm			
40	46184006	Exhaust valve	G	46200531	Proton Metal second stage assembly
41	46200521	Exhaust tee	+++	46200525	Proton Metal Cover assembly
43	47157984	Mouthpiece clamp			(101 - 102 - 103 - 104 - 172)
44	° ° °	Mouthpiece	***	46200409	Service kit Proton series 2 ND St
46	46200323	Proton hose protector			(19 - 27 - 33 - 40 - 43 - 47 - 71 - 171)
47	46184062	Poppet seat	***	46200408	Service kit Proton Nx series 2 ND st.
63	46184289	Cover safety catch			(19 - 27 - 33 - 40 - 43 - 47 - 71 - 171)
64	46200322	2 ND St. adjustment plug			

Drawing No. E 32	PROTON ICE EXTREME SECOND STAGE	Drawing updated: 03/03/2005
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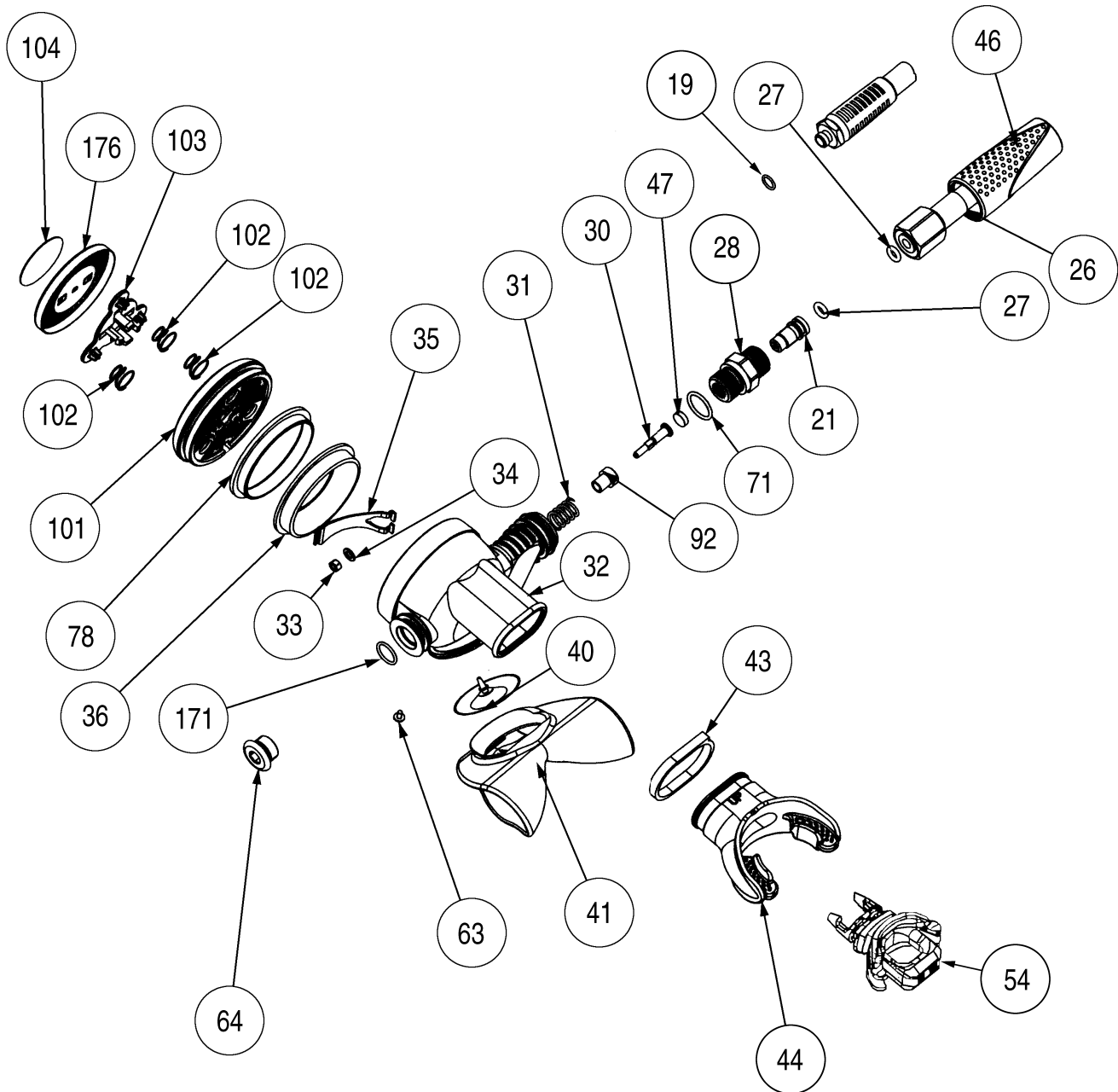


Table No. 122	PROTON ICE EXTREME SECOND STAGE	Drawing reference No.: E 32 Table updated on: 12/12/2005
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Ref.No.	Code	Description	Ref.No.	Code	Description
21	46200204	Seat connector	64	46200460	2 ND St. adjustment plug
26	46200346	Soft 1"/2 hose 800	71	46110211	OR 2050
26	46200452	3/8" 1000 soft yellow hose	71	46110413	OR 2050 Viton 014-9707
27	46110205	OR 2025	78	46200321	Diaphragm holding ring
27	46110411	OR 2025 Viton 010-9707	92	46184221	Valve body
28	46184282	Case assembly connector	101	+++	Proton Metal 2 ND Stage Cover
30	46200626	Valve shaft	102	+++	Spring
31	46200625	Poppet spring	103	+++	Proton Ice cover button
32	46200624	2 ND stage case	104	46200653	Proton Extreme cover sticker
33	46200623	Demand lever nut	171	46110110	OR 2037
34	46200622	Lever washer	171	46200298	OR 2037 Viton
35	46187027	Demand lever	172	+++	Proton Ice Extreme Front
36	46200311	2 ND stage diaphragm			
40	46184006	Exhaust valve			ASSEMBLIES
41	46200521	Exhaust tee			
43	47157984	Mouthpiece clamp	+++	46200632	Proton Ice Extreme assembly cover
44	46200366	Mouthpiece			(101 - 102 - 103 - 104 - 172)
46	46200323	Proton hose protector	***	46200704	Service kit Proton Extreme 2 ND Stage
47	46184062	Poppet seat	***	46200408	Service kit Proton Nitrox series 2 ND stage
63	46184289	Cover safety catch			(19 - 27 - 33 - 40 - 43 - 47 - 71 - 171)

**SUBJECT:
IDENTIFY THE NEW ERGO 2005 INFLATOR**

BTM10

MARES HAS DEVELOPED A NEW ERGO INFLATOR THAT, EVEN IF MAINTAINING UNCHANGED THE TECHNICAL CHARACTERISTICS OF THE PREVIOUS MODEL, PROVIDES INCREASED SAFETY AND PERFORMANCES DURING INFLATION.

THE TWO NEW COMPONENTS ARE A NEW INFLATION VALVE (REF. 57) AND A NEW RED INFLATING BUTTON (REF.54). THESE TWO NEW COMPONENTS ARE INTERCHANGEABLE WITH THE PREVIOUS MODEL, BUT IT IS NECESSARY TO FOLLOW THESE INSTRUCTIONS WHEN REPLACING EITHER THE INFLATION VALVE OR INFLATION BUTTON ON A MODEL PRIOR TO FEBRUARY 17, 2005. BOTH THE NEW INFLATION VALVE AND RED INFLATING BUTTON MUST BE REPLACED AT THE SAME TIME. IT IS NOT POSSIBLE TO REPLACE THEM INDIVIDUALLY.

STARTING FROM SERIAL NUMBER ES 21273 - FEBRUARY 17, 2005, ALL BC VESTS WILL BE ASSEMBLED WITH THESE NEW COMPONENTS.

THE BC VESTS ASSEMBLED WITH THE NEW COMPONENTS CAN ALSO BE IDENTIFIED BY THE RED INFLATING BUTTON.



WARNING!

MAINTENANCE AND/OR UPDATE PROCEDURE MUST BE PERFORMED ON THE ERGO INFLATOR BY QUALIFIED PERSONNEL AT A TECHNICAL ASSISTANCE CENTER AND/OR BY AUTHORIZED MARES DISTRIBUTOR. FOR THE DISASSEMBLY, REASSEMBLY, ADJUSTMENT AND CHECKS PLEASE CONSULT THE PROCEDURES DESCRIBED IN THE MAINTENANCE MANUAL.

SHOULD THE UPDATED MANUALS CONTAINING THE SECTIONS INDICATED BE ABSENT, OR IF THE INSTRUCTIONS ARE UNCLEAR OR NOT ENTIRELY UNDERSTANDABLE, PLEASE CONTACT MARES BEFORE PERFORMING ANY MAINTENANCE, ADJUSTMENT OR CHECK.

MARES RECOMMENDS, REPLACING THE COMPLETE INFLATION VALVE ASSEMBLY (PART N. 47200807) DURING THE STANDARD MAINTENANCE PROCEDURE.

NECESSARY TOOLS

- 1 FLAT SCREW DRIVER (TYPE USED 323 1 X 5.5 100)



ATTENTION!

IF IT IS NECESSARY TO DISASSEMBLE THE INFLATION VALVE ASSEMBLY, PROCEED AS FOLLOWS:

Disassembly:

1. Using a screw driver, rotate 90° the O-Ring seat (163) and remove it.
2. Remove from the O-Ring seat (163) the O-Ring (164) and the spring (165).
3. Take out the steel ball (166) and the O-Ring (167) from the valve.
4. Remove the O-Rings (58) from the valve.

Reassembly:

1. Place the two O-Rings on the valve.
2. Position the O-Ring (167) inside the valve.
3. Position the steel ball (166) on the O-Ring (167).
4. Place the O-Ring (164) on the O-Ring seat (163).
5. Position the spring (165) inside the O-Ring seat (163).
6. Insert into the valve the O-Ring seat (163) with the O-Ring and the spring (165) and lock it by rotating 90°, with the help of a screw driver.

Drawing
No. J 107

CORRUGATED ASSEMBLY WITH R.E. VALVE 2K5

Drawing updated:
12/06/2004

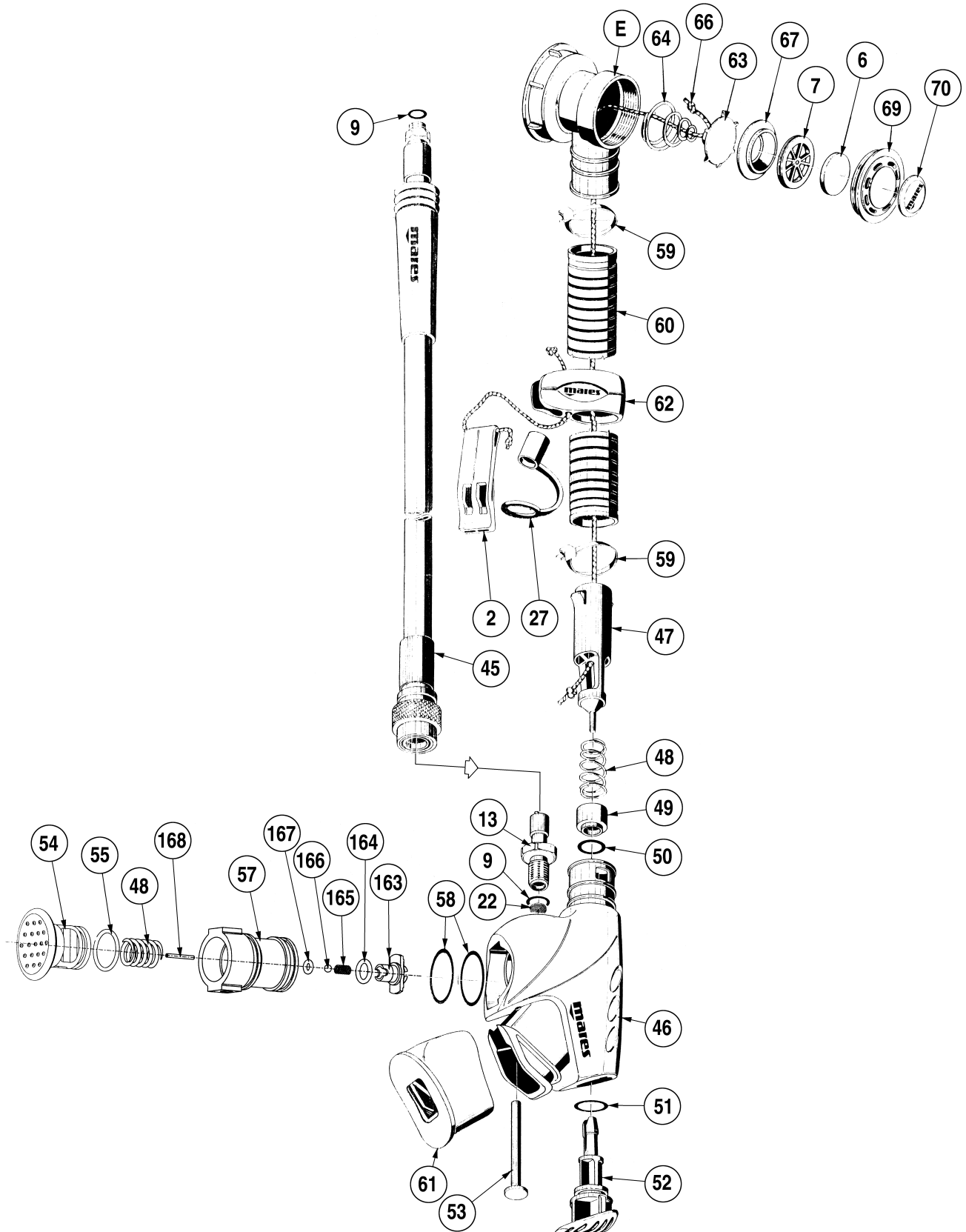


Table No. 255	CORRUGATED ASSEMBLY WITH R.E. VALVE 2K5	Drawing reference No.: J 107 Table updated on: 12/12/2005
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Rif. N.	Codice	Denominazione	Rif. N.	Codice	Denominazione
2	47159020	Fischietto bitonale	67	47159133	Guarnizione R.E. Valve
6	47159070	Membrana scarico Lp Inflator	69	F	Coperchio R.E. Valve
7	F	Porta membrana Lp Inflator	70	46184322	Etich. stereoscopic x JKT 99
9	46110106	OR 106	163	° ° °	Premi OR Ergo 2K5
13	47159659	Innesto maschio rapido Lp	164	46110204	OR 2021
22	47159146	Filtro Lp	165	° ° °	Molla valvola di ricarica
27	47159712	Tappo protezione innesto maschio Ergo	166	° ° °	Sfera inox 3/16"
45	47159681	Manichetta Lp Int. completa	167	46110101	OR 2012
46	47159700	Corpo Lp Ergo	168	D	Spillo Ergo 2K5
47	47159702	Boccola aggancio sagola ERGO			COMPLETI
48	46185011	Molla 1° stadio MR 12	A	47158504	Comando Lp cpl. ERGO s/manichetta 99
49	47159701	Boccola OR scarico ERGO	C	47159729	Corrugato ERGO cpl. s/manichetta 99 (A - F -2-27-59-60-62)
50	46110241	OR 2-109	C	47158507	Corrugato ERGO cpl. Crt s/man 99 (A - F -2-27-59-60-62)
51	46110115	OR 115	D	47200808	Pulsante di carico Ergo 2K5 cpl ((54 - 55 - 168)
52	47159717	Pulsante di scarico ERGO 99 ARG	F	47159725	Corpo R.E. Valve cpl. (E-6-7-63-64-66-67-69-70)
53	47159707	Spina pulsante di carico ERGO	G	47200807	Boccola con valvola Ergo cpl (57-58-163-164-165-166-167)
54	D	Pulsante di carico ERGO 2K5 rosso	H	47200806	Kit manutenzione Ergo 2K5 (9-22-50-51-55-58-59-164-167-OR 2031)
55	46110210	OR 2056	###	47200829	Kit Upgrade ergo 2k5 (D-G-OR 2031-9-22-50-51-59)
57	47200807	Boccola porta valvola ERGO CPL			NOTE
58	46110221	OR 2081		46110107	O-Ring 2031 per innesto rapido manichetta jacket INT
59	45179863	Fascetta per corrugato D. 23			
60	47159709	Tubo corrugato D. 23			
61	47159705	Boccaglio Lp ERGO			
62	47159711	Reggifrusta gruppo comando ERGO			
63	F	Valvola chiusura R.E. Valve			
64	F	Molla bottone spurgo			
66	F	Sagola nera s/anima D. 1,75			

Drawing No. J78	PNEUMATIC DISCHARGE VALVE	Drawing updated: 02/04/2004
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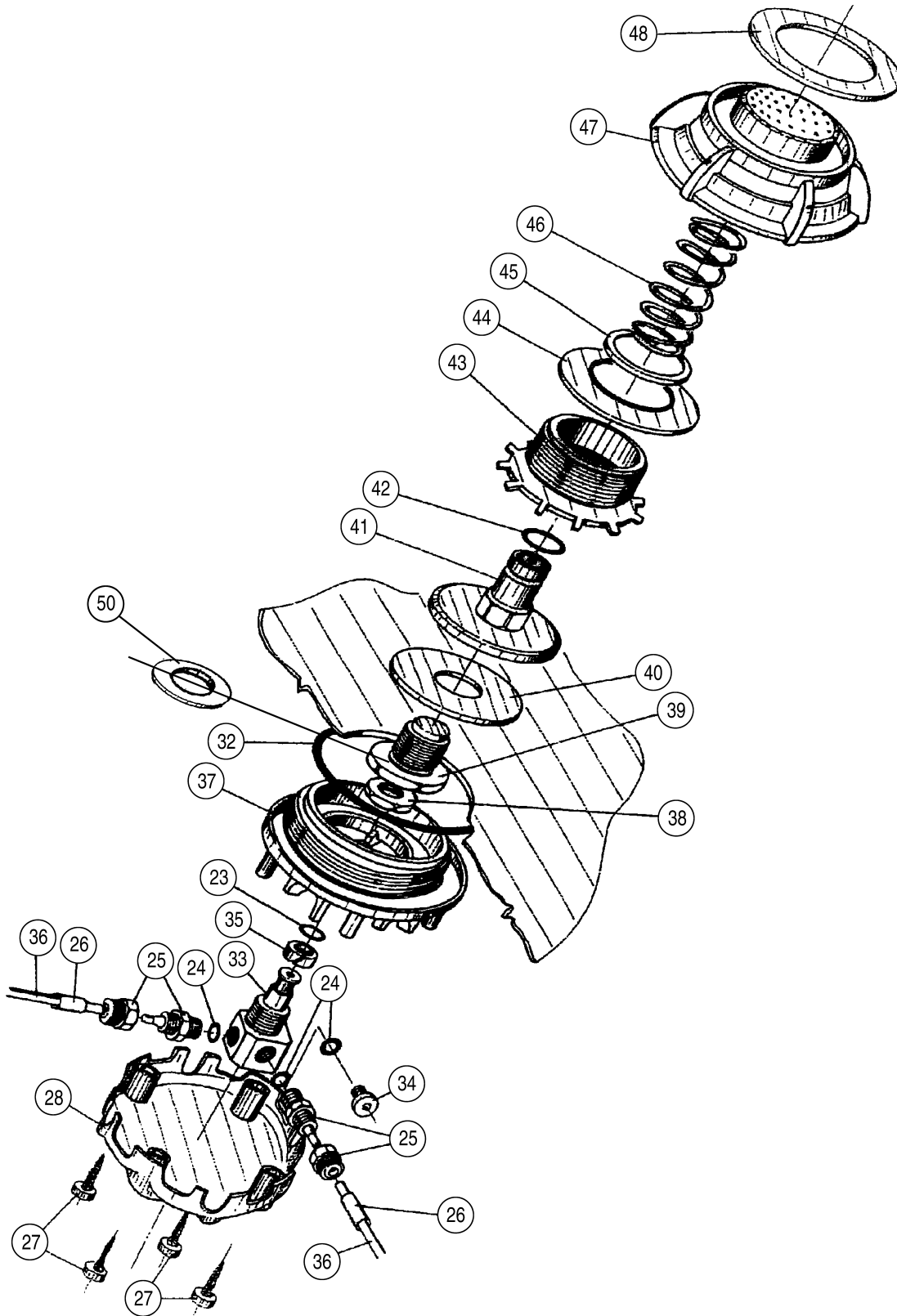


Table No. 277	PNEUMATIC DISCHARGE VALVE	Drawing reference No.: J78 Table updated on: 01/09/2003
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Ref. No.	Code	Description	Ref. No.	Code	Description
23	46110102	O-Ring 2015	48	47158703	Sticker
24	47110272	O-Ring 3 x 1	50	47200706	Distance washer
25	= = =	Air connector			
27	45111003	Screws 2.9 x 9,5			ASSEMBLIES
28	46200025	Protection cap	H	46200128	H.U.B. discharge valve assembly
32	46110265	O-Ring 3231			(23-27-28-33-35-37-39-40-41-44-45-46-47-48)
33	47158721	2 way valve shaft	= = =	47200605	45-cm LP Tube assembly
34	47158720	Plug for valve			(24-25-26-36)
35	47158716	Dash backup ring	= = =	46200125	60-cm LP Tube assembly
37	46200012	Pneumatic valve flange			(24-25-26-36)
38	47158725	Valve shaft nut	= = =	47200606	65-cm LP Tube assembly
39	46200010	Sealing disk nut			(24-25-26-36)
40	47158727	Sealing disk	= = =	46200126	72-cm LP Tube assembly
41	46200011	Sealing disk support			(24-25-26-36)
42	46110110	O-Ring 2037	= = =	47200607	75-cm LP Tube assembly
43	46200026	Diaphragm nut			(24-25-26-36)
44	47158728	Diaphragm	= = =	47200608	120-cm LP Tube assembly
45	47158737	Friction washer			(24-25-26-36)
46	47158701	Pneumatic valve spring	* * *	46200145	Service kit A.T. Pneumatic valves
47	46200023	Valve ring			(23-24-32 - OR 3100 -35-OR 2056 -42)

Drawing No. J84	PNEUMATIC INFLATOR AIR TRIM	Drawing updated: 02/04/2004
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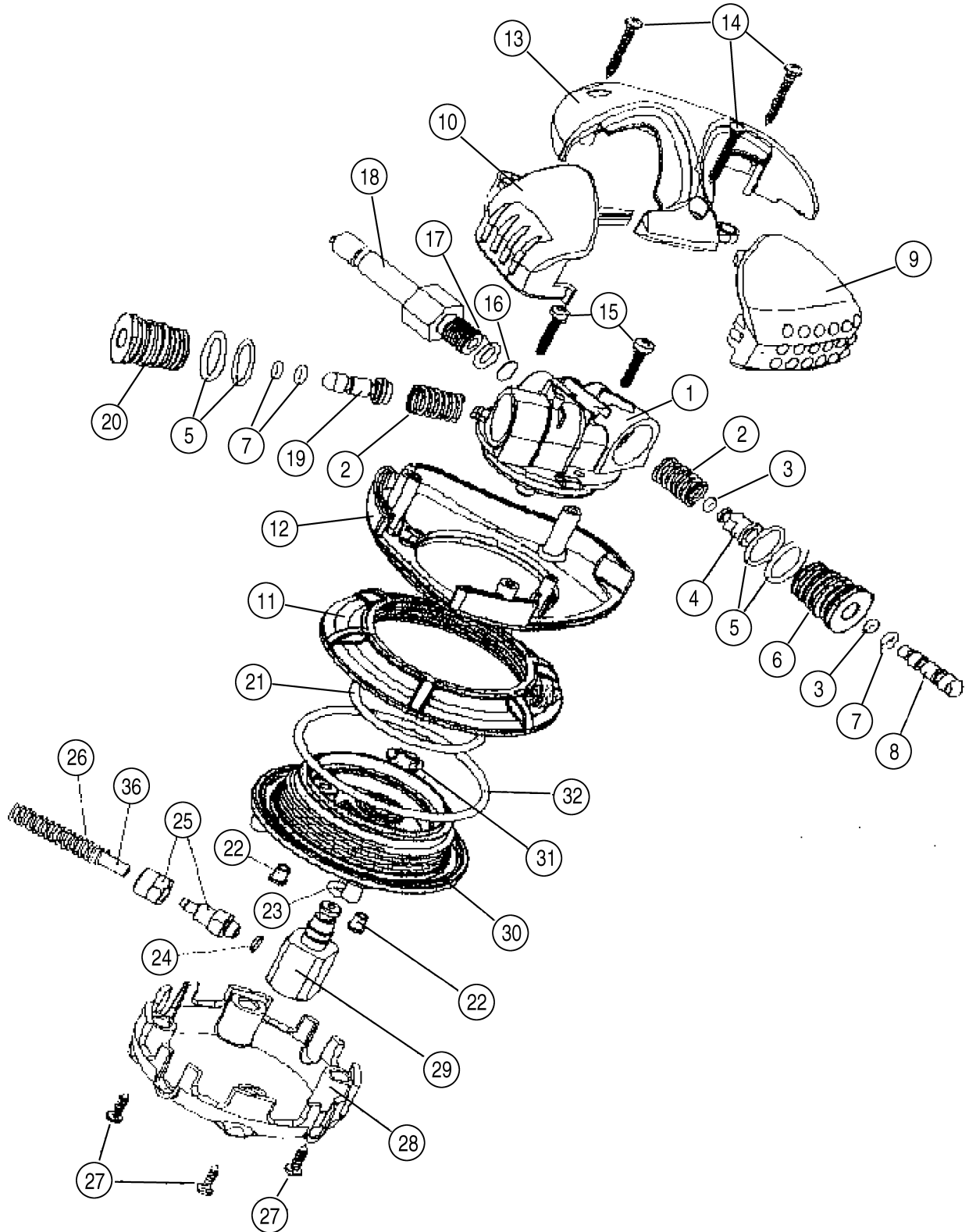


Table No. 233	PNEUMATIC INFLATOR AIR TRIM	Drawing reference No.: J84 Table updated on: 01/09/2003
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Ref. No.	Code	Description	Ref. No.	Code	Description
1	46200013	Inflator body	28	46200025	Protection cap
2	47158717	Spring for pistons	29	47158722	Valve shaft
3	46110213	O-Ring 2007	30	46200014	Inflator flange
4	47158740	Deflation button bushing	31	47158707	Radial snap ring diam. 6
5	46110211	O-Ring 2050	32	46110265	O-Ring 3231
6	47158745	Deflation piston seat			
7	46110101	O-Ring 2012			ASSEMBLIES
8	47158742	Deflation piston			
9	47200298	Deflation button (yellow)	\$ \$ \$	46200127	H.U.B. pneumatic inflator assembly
10	47200299	Inflation button (gray)	# # #	46200141	Internal mechanism assembly for pneum. inflator (1-2-3-4-5-6-7-8-15-16-17-18-19-20)
11	46200022	Inflator ring	= = =	47200605	45-cm LP Tube assembly (24-25-26-36)
12	47200297	Lower covering	= = =	46200125	60-cm LP Tube assembly (24-25-26-36)
13	47200296	Upper covering	= = =	47200606	65-cm LP Tube assembly (24-25-26-36)
14	45111004	Screws 2.9 x 19	= = =	46200126	72-cm LP Tube assembly (24-25-26-36)
15	46185075	Screws M 3 x 16	= = =	47200607	75-cm LP Tube assembly (24-25-26-36)
16	47159146	Filter	= = =	47200608	120-cm LP Tube assembly (24-25-26-36)
17	46110106	O-Ring 106	** *	46200145	Service kit A.T. pneumatic inflator. (3-5-7-17-21-23-24-32)
18	47158718	Male quick coupling			
19	47158741	Inflation piston			
20	47158746	Inflation piston seat			
21	47110270	O-Ring 3156			
22	41138960	Inflator flange connector			
23	46110102	O-Ring 2015			
24	47110272	O-Ring 3 x 1			
25	= = =	Air connector			
27	45111003	Screws 2.9 x 9,5			

SUBJECT:
A.T. 2003 PNEUMATIC INFLATOR BUTTON O-RING

BTM13

SPARE PARTS LIST REFERENCE:
TABLE #253 - DRAWING #J-105

AIRTRIM 2003 (AT 2) SERVICE MANUAL REFERENCES:

STEP 12 OF SECTION A-1 (DISASSEMBLY OF DISCHARGE BUSHING)
STEP 15 OF SECTION A-2 (DISASSEMBLY OF INFLATION SOCKET)
STEP 23 OF SECTION A-2 (ASSEMBLY OF INFLATION SOCKET)
STEP 28 OF SECTION A-1 (ASSEMBLY OF DISCHARGE BUSHING)

THE MARES DIVISION WISHES TO INFORM YOU THAT IT HAS UPDATED THE EXPLODED DIAGRAM (J-105 VERS. 04 FEB 2004) AND THE CORRESPONDING CODES TABLE (#253 - VERS. 10 JAN 2005) BECAUSE ITS COMPONENTS (20 AND 52) LISTED O-RINGS OTHER THAN THOSE USED.

FROM THE NEW EXPLODED DIAGRAM (J-105 VERS. 02 AUG 2005) AND THE NEW UPDATED CODES TABLE (#253 VERS. 09 AUG 2005), THE CHANGE REFERS TO COMPONENTS (50) AND (170) MOUNTED INFLATION SOCKET (20) AND THE DISCHARGE BUSHING (52).

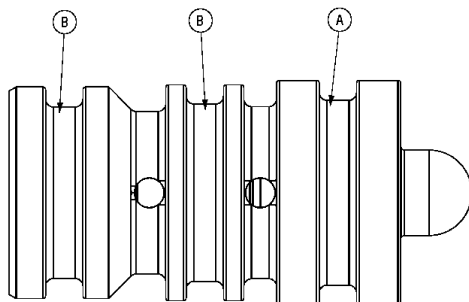
FIGURE 1 SHOWS THE PROPER POSITION OF THE O-RINGS IN THE CORRESPONDING SEATS.
THE MAINTENANCE PROCEDURES ARE DESCRIBED BELOW.

⚠ WARNING!

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

IT IS NECESSARY TO CONSULT THE PROCEDURES DESCRIBED IN THE MAINTENANCE MANUAL FOR THE DISASSEMBLY, REASSEMBLY, ADJUSTMENT, AND CONTROL PROCEDURES.

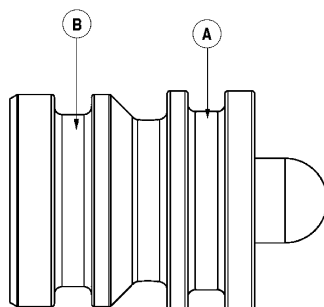
IF AN UPDATED MANUAL IS UNAVAILABLE AND/OR IF THE INSTRUCTIONS ARE UNCLEAR OR NOT FULLY COMPREHENSIBLE, PLEASE CONTACT MARES BEFORE PERFORMING ANY MAINTENANCE, ADJUSTMENT, OR CONTROL OPERATION.



A - DISCHARGE BUSHING (52)

POSITION A: O-RING 2050 (170)

POSITION B: O-RING 114 (50)



B - INFLATION SOCKET (20)

POSITION A: O-RING 2050 (170)

POSITION B: O-RING 114 (50)

SUBJECT:
A.T. 2003 PNEUMATIC INFLATOR BUTTON O-RING**BTM13**

SPARE PARTS LIST REFERENCE:
TABLE #253 - DRAWING #J-105

AIRTRIM 2003 (AT 2) SERVICE MANUAL REFERENCES:

STEP 12 OF SECTION A-1 (DISASSEMBLY OF DISCHARGE BUSHING)
STEP 15 OF SECTION A-2 (DISASSEMBLY OF INFLATION SOCKET)
STEP 23 OF SECTION A-2 (ASSEMBLY OF INFLATION SOCKET)
STEP 28 OF SECTION A-1 (ASSEMBLY OF DISCHARGE BUSHING)

IN AIRTRIM 2003 SYSTEM MAINTENANCE PROCEED AS FOLLOWS:

DISASSEMBLY**WARNING!**

PAY CLOSE ATTENTION WHEN REMOVING THE O-RING IN THE INFLATION BUSHING IN ORDER TO AVOID DAMAGING THE SEATS.

DO NOT USE METAL OR POINTED TOOLS.

(INSTEAD OF STEP 12 DESCRIBED IN SECTION A-1 "DISASSEMBLY OF INFLATION SOCKET")

- 12.a** REMOVE THE O-RING (170) FROM THE SEAT IN THE DISCHARGE BUSHING.
12.b REMOVE THE O-RINGS (50) FROM THE OTHER TWO SEATS IN THE DISCHARGE BUSHING.

(INSTEAD OF STEP 15 DESCRIBED IN SECTION A-2 "DISASSEMBLY OF INFLATION SOCKET")

- 15.a** REMOVE THE O-RING (170) FROM THE SEAT OF THE INFLATION SOCKET.
15.b REMOVE THE O-RING (50) FROM THE OTHER SEAT IN THE INFLATION SOCKET.

ASSEMBLY**(INSTEAD OF STEP 23 DESCRIBED IN SECTION A-2 "ASSEMBLY OF INFLATION SOCKET")**

- 23.a** POSITION THE O-RING (170) IN THE SEAT OF THE INFLATION SOCKET (20) (Fig. **2-B**).
23.b POSITION THE O-RING (50) IN THE SEAT OF THE INFLATION SOCKET (20) (Fig. **2-B**).

(INSTEAD OF STEP 28 DESCRIBED IN SECTION A-1 "ASSEMBLY OF DISCHARGE BUSHING")

- 28.a** POSITION THE O-RING (170) IN THE SEAT OF THE DISCHARGE BUSHING (52) (Fig. **2-A**).
28.b POSITION THE O-RING (50) IN THE SEATS OF THE DISCHARGE BUSHING (52) (Fig. **2-A**).

**WARNING!**

CHECK VERY CAREFULLY THAT THE O-RINGS ARE POSITIONED CORRECTLY IN THE CORRESPONDING SEATS AS SHOWN IN FIGURE 1.

SUBJECT:
AIR TRIM PNEUMATIC SYSTEM - O-RING INFLATOR BODY

BTM14

**PLEASE REFER TO SPARE PART LIST:
TABLE # 253 - DRAWING J-105 - REF. No. 32**

**PLEASE REFER TO AIR TRIM 2003 (AT2) MAINTENANCE MANUAL:
PHASE A - PART (PNEUMATIC INFLATOR DISASSEMBLY)
PHASE A-1 - PART 33 (ASSEMBLY - DISCHARGE SOCKET)**

**MARES S.p.A. HAS RECEIVED NOTICE ABOUT A SLIGHT AIR LEAKAGE BETWEEN THE HEAT-SEALED FLANGE IN BUOYANCY BAG (30) AND THE INFLATOR BODY (1).
THE O-RING 3175 - PART # 47200723 (REF. 32) - HAS THEREFORE BEEN REPLACED WITH THE O-RING 3187 PART # 47200868.**

**PLEASE NOTE THAT THIS DOES NOT AFFECT THE SAFETY DURING THE DIVE AND THE WORKING OF THE AIR TRIM.
THE O-RING MUST BE REPLACED ONLY IN CASE OF LEAKAGE, FOLLOWING THE INSTRUCTIONS OF THE MAINTENANCE MANUAL.**



WARNING!

**MAINTENANCE PROCEDURE MUST BE PERFORMED ONLY BY QUALIFIED PERSONNEL AT A TECHNICAL ASSISTANCE CENTER AND/OR BY AUTHORIZED MARES DISTRIBUTOR.
FOR DISASSEMBLY, REASSEMBLY, ADJUSTMENT AND CHECKS PLEASE CONSULT THE PROCEDURES DESCRIBED IN THE MAINTENANCE MANUAL.
SHOULD THE UPDATED MANUALS CONTAINING THE SECTIONS INDICATED BE ABSENT, OR IF THE INSTRUCTIONS ARE UNCLEAR OR NOT ENTIRELY UNDERSTANDABLE, PLEASE CONTACT MARES BEFORE PERFORMING ANY MAINTENANCE, ADJUSTMENT OR CHECK.**

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 AVANTGARDE
45	47200734	1	1				
			2				
60	47200735	2		1(XS) 2	1(XS-S-M)	2	1
75	47200736			1(S-M-L-XL)	1(L-XL)	1 (XS-S-M-L)	2
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.

Drawing No. J105	PNEUMATIC INFLATOR AIR TRIM 2003	Drawing updated: 08/02/2005
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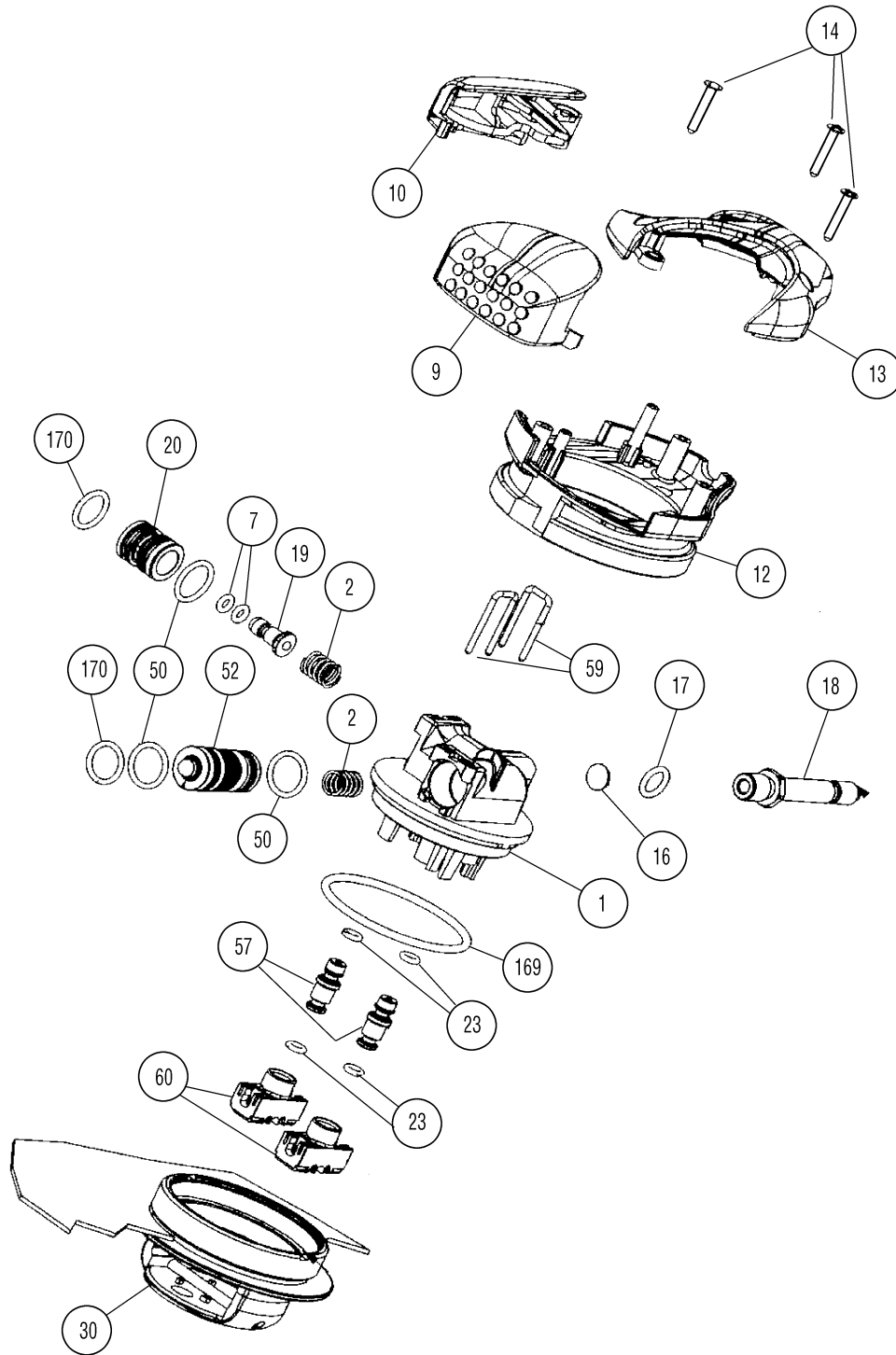


Table No. 253	PNEUMATIC INFLATOR AIR TRIM 2003	Drawing reference No.: J105 Table updated on: 08/09/2005
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Ref. No.	Code	Description	Ref. No.	Code	Description
1	47200731	A.T. 2003 Inflator body	169	47200868	OR 3187
2	47200744	A.T. 2003 Spring button	170	46110211	OR 2050
7	46110101	O-Ring 2012			
9	47200729	A.T. 2003 discharge button			ASSEMBLIES
10	47200728	A.T. 2003 inflation button		47200738	A.T. 2003 Discharge bushing assembly
12	47200726	A.T. 2003 Lower casing	# # #	47200733	Internal mechanism assembly for pneum. inflator 2003
13	47200296	Upper covering			(1-2-3-7-16-17-18-19-20-23-169-50-52-57-170)
14	45111004	Screws 2.9 x 19	= = =	47200734	45-cm LP Tube assembly
16	47159146	Filter			(24-25-26-36)
17	46110106	O-Ring 106	= = =	47200735	60-cm LP Tube assembly
18	47200724	A.T. 2003 Male quick coupling			(24-25-26-36)
19	47200713	A.T. 2003 Inflation button	= = =	47200736	75-cm LP Tube assembly
20	47200716	A.T. 2003 Inflation socket			(24-25-26-36)
23	46110102	O-Ring 2015	= = =	47200737	120-cm LP Tube assembly
50	46110114	O-Ring 114			(24-25-26-36)
52	47200738	Bushing	* * *	47200760	Service kit A.T. 2003 pneumatic inflator
57	47200718	Perforated OR housing spindle assembly			(7-16-17-23-50-52-169-170)
59	47200720	Fastening fork			
60	47200710	LP 1-way insert			

Tabella No. 254	PNEUMATIC DISCHARGE VALVE AIR TRIM 2003	Drawing reference No. : J106 Table updated on 01/10/2005
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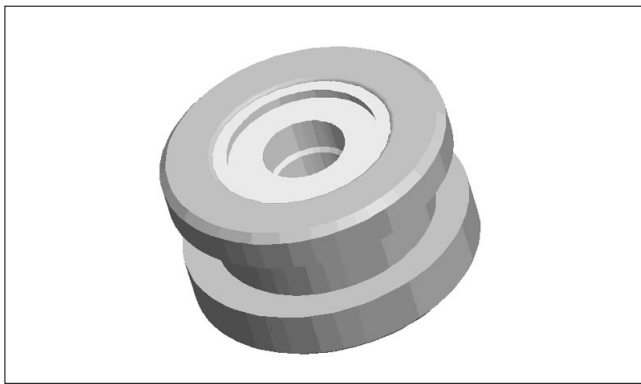
Ref. No.	Code	Description	Ref. No.	Code	Description
23	46110102	O-Ring 2015	66	47200711	Seat connector 2003
30		Buoyancy bag			
32	47200723	O-Ring 3175			ASSEMBLIES
40	47158727	Rubber sealing disk			
41	47200725	A.T. 2003 Piston valve	* * *	47200759	Service kit A.T. 2003 Pneumatic valves
42	46110110	O-Ring 2037			(23 - 32 - 42 - OR 2012 - OR 2056 - 3100)
43	46200026	Diaphragm nut	= = =	47200734	45-cm LP Tube assembly
44	47158728	Diaphragm			(24-25-26-36)
45	47158737	Friction washer	= = =	47200735	60-cm LP Tube assembly
46	47158701	Pneumatic valve spring			(24-25-26-36)
47	47200727	Pneum. Valve ring 2003	= = =	47200736	75-cm LP Tube assembly
48	47200564	Sticker			(24-25-26-36)
55	47200717	Blind OR housing spindle assembly		47200904	80-cm LP Tube assembly
60	47200710	LP 1-way insert	= = =	47200737	120-cm LP Tube assembly
61	47200709	LP 2-way insert			(24-25-26-36)

SUBJECT:
NEW SCS VALVE SEAT (# 46186249)

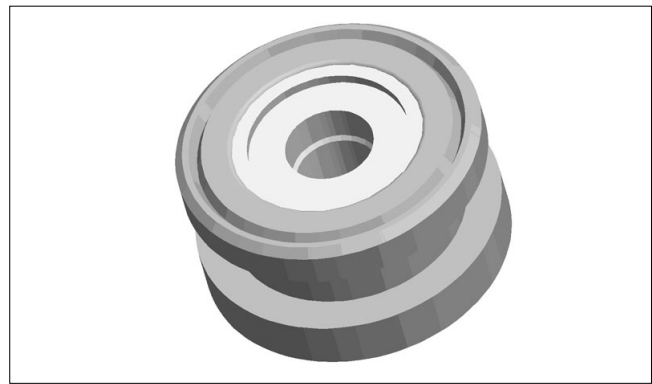
ITM11

PLEASE BE INFORMED THAT MARES, AFTER HAVING PERFORMED MANY TESTS, HAS REPLACED THE MATERIAL OF THE SCS VALVE SEAT. THIS MATERIAL GUARANTEES A BETTER WEARING RESISTANCE. THE NEW SCS VALVE SEAT WILL BE IDENTIFIED, AT THE BEGINNING, WITH AN INDELIBLE MARK AND THEN WITH A CONCENTRIC MARK (SEE DRAWING 1-B). FOR YOUR INFORMATION, WE LIST HERE BELOW THE MODEL AND THE SERIAL NUMBER OF THE FIRST REGULATOR ON WHICH THIS VALVE SEAT HAS BEEN ASSEMBLED.

PART NUMBER	DESCRIPTION	SERIAL NUMBER
416116	V32 PROTON ICE	PI 23846
416149	V16 PROTON XL - (D)	PVD 10477
416124	V16 PROTON METAL - (D)	DP 10197
416118	V16 PROTON METAL	VM 17804
416148	V16 PROTON XL	PV 13918
416151	V16 PROTON XL - (J)	VPJ 10455



A - SCS VALVE SEAT



B - NEW SCS VALVE SEAT

DRAWING 1



THE NEW SCS VALVE SEAT CAN BE USED IN PLACE OF THE PREVIOUS ONE.



ATTENTION!

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

FOR THE DISASSEMBLY AND REASSEMBLY THE SCS VALVE SEAT, PLEASE CHECK THE PROCEDURES DESCRIBED IN THE MAINTENANCE MANUAL.

SHOULD THE UPDATED MANUALS CONTAINING THE SECTIONS INDICATED BE LACKING, OR IF THE INSTRUCTIONS ARE UNCLEAR OR NOT ENTIRELY UNDERSTANDABLE, PLEASE CONTACT MARES BEFORE PERFORMING ANY MAINTENANCE, ADJUSTMENT OR CHECK.

**SUBJECT :
V42 FIRT STAGE - HP POPPET SEAT REPLACEMENT**

ITM12

MARES HAS DEVELOPED 2 NEW SPECIAL TOOLS: ASSEMBLING TOOL FOR V42 FIRST STAGE HP POPPET SEAT (PART # 46200633) AND DISASSEMBLING TOOL FOR V42 FIRST STAGE HP POPPET SEAT (PART # 4620063) - DRAWING A.

THE PURPOSE OF THESE TOOLS IS TO HELP ASSEMBLING AND DISASSEMBLING THE HP POPPET SEAT FROM V42 FIRST STAGE AND INCREASE SAFETY DURING THIS OPERATION.

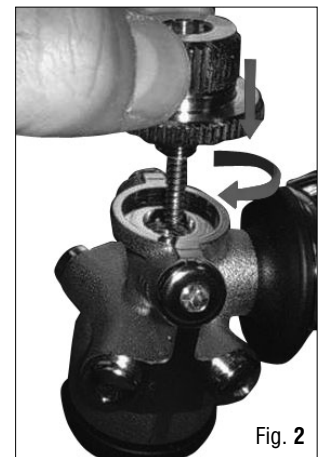
⚠ ATTENTION!

MAINTENANCE PROCEDURE MUST BE PERFORMED BY QUALIFIED PERSONNEL AT A TECHNICAL ASSISTANCE CENTER AND/OR BY AN AUTHORIZED MARES DISTRIBUTOR. FOR DISASSEMBLY AND REASSEMBLY FIRST STAGE COMPONENTS IT IS NECESSARY TO CHECK THE PROCEDURES DESCRIBED IN THE MAINTENANCE MANUAL. SHOULD THE UPDATED MANUALS CONTAINING THE SECTIONS INDICATED BE LACKING, OR IF THE INSTRUCTIONS ARE UNCLEAR OR NOT ENTIRELY UNDERSTANDABLE, PLEASE CONTACT MARES BEFORE PERFORMING ANY MAINTENANCE, ADJUSTMENT OR CHECK.



▶ **V42 FIRST STAGE HP POPPET SEAT DISASSEMBLY**

1. Remove from the first stage the balancing chamber, the spring, the poppet and the pin, following the instruction on the maintenance manual.
2. Screw, without forcing, the wheel (1 - drawing a) of the disassembling tool until it touches the counter wheel (2 - drawing a).
3. Screw, without forcing, the tool assembly in the hp seat, till it touches the first stage body (Fig. 2 and 3).



⚠ ATTENTION!

OPERATE AS DESCRIBED AT POINT 3, WITHOUT FORCING.

4. While firmly keeping the counter wheel of the disassembling tool (2), screw the wheel (1) till the poppet seat comes out.
5. Remove, with care, from the first stage body, the disassembling tool (Fig. 4).
6. Remove the o-ring 4x1 from the v42 first stage body.



▶ V42 FIRST STAGE HP POPPET SEAT REASSEMBLY

7. Insert the O-Ring 4x1 inside the V42 first stage body.
8. Place properly the poppet seat on the V42 assembling tool (Fig 5).



ATTENTION!

THE HP SEAT IS CORRECTLY POSITIONED ON THE ASSEMBLING TOOL WHEN THE FULL FLAT SIDE OF THE POPPET SEAT IS FACING UP.

9. Insert inside the first stage body the V42 assembling tool and the poppet seat and screw till it touches the first stage body, without forcing (Fig. 6 - 7).
10. Unscrew the assembling tool and remove it from the first stage body.
11. Reassemble the regulator components following the manual instructions.



Fig. 4



Fig. 5



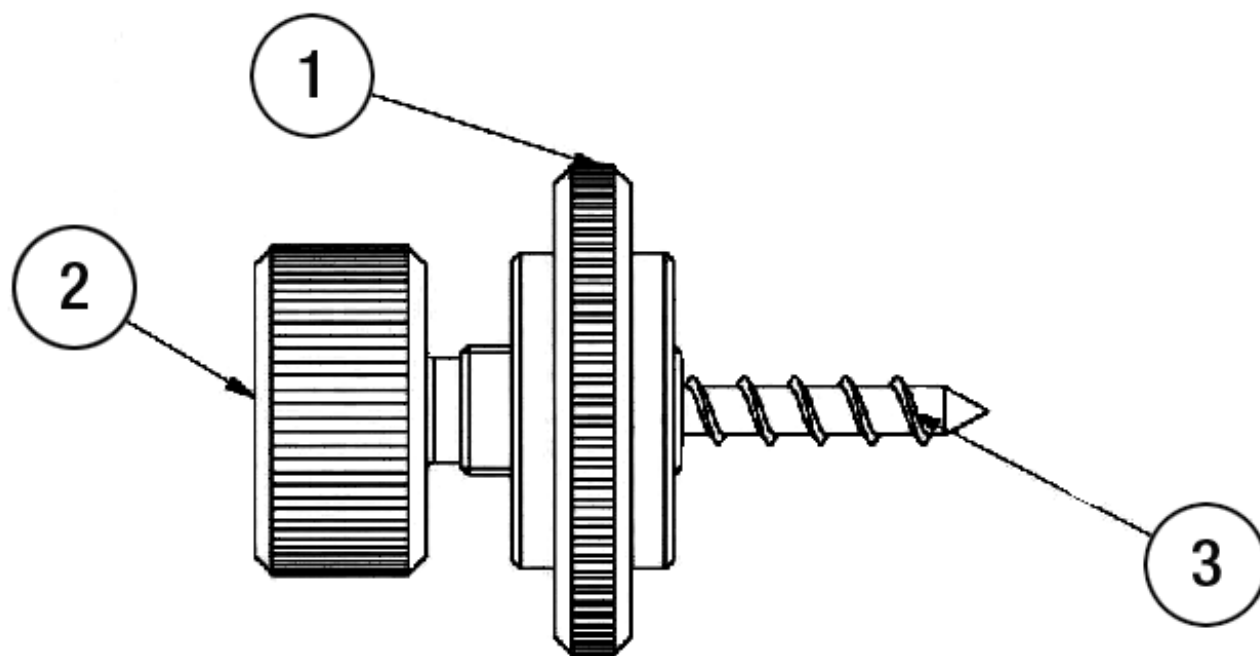
Fig. 6



Fig. 7

**SUBJECT :
V42 FIRT STAGE - HP POPPET SEAT REPLACEMENT**

ITM12



DRAWING A

DISASSEMBLING TOOL FOR V42 FIRST STAGE HP POPPET SEAT

Ref.	Description
1	V42 first stage wheel
2	V42 first stage counter wheel
3	Screw AB 4.2 X 38

SUBJECT:
NEW SCS VALVE SEAT (# 46186249)

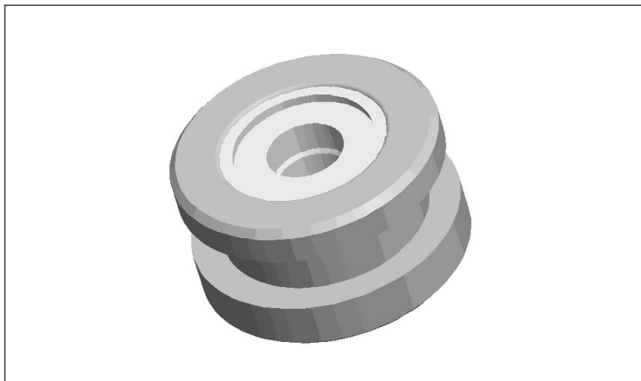
ITM13

PLEASE BE INFORMED THAT MARES HAS DEVELOPED AND TESTED A NEW MATERIAL TO BE USED ON THE "V" FIRST STAGE SCS VALVE SEATS. THIS NEW MATERIAL GUARANTEES A BETTER WEARING RESISTANCE AND, ABOVE ALL, A SUPERIOR SEALING, ESPECIALLY WHEN USING PRESSURES HIGHER THAN 230 BAR.

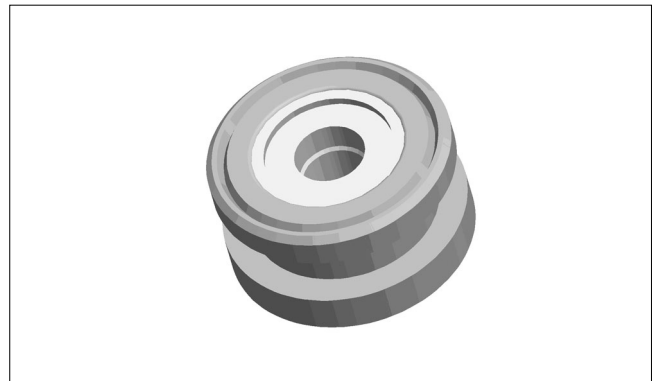
INITIALLY YOU CAN IDENTIFY THE NEW SCS VALVE SEATS THROUGH TWO INDELIBLE MARKS ON THE METAL BACK PART OF THE VALVE (THE PREVIOUS VERSION HAD ONE MARK ONLY - CHECK ITM 11). IN THE FUTURE THEY CAN BE IDENTIFIED THROUGH A CONCENTRIC MARK ON THE METAL FRONT PART OF THE VALVE (SEE DRAWING 1-B).

THE NEW VALVE SEAT WILL BE ASSEMBLED ON THE FOLLOWING REGULATORS, STARTING FROM THE SERIAL NUMBER LISTED BELOW:

PART NUMBER	DESCRIPTION	SERIAL NUMBER
416116	V32 PROTON ICE	PI 25541
416127	V32 PROTON ICE EXTREME	IE 10301
416109	V32 PROTON METAL	PL 10312
416118	V16 PROTON METAL	VM 19963
416148	V16 PROTON XL	PV 14964



A - SCS VALVE SEAT



B - NEW SCS VALVE SEAT 300 BAR

DRAWING 1



THE NEW SCS VALVE SEAT CAN BE USED IN PLACE OF THE PREVIOUS ONE.



ATTENTION!

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

FOR THE DISASSEMBLY AND REASSEMBLY THE SCS VALVE SEAT, PLEASE CHECK THE PROCEDURES DESCRIBED IN THE MAINTENANCE MANUAL.

SHOULD THE UPDATED MANUALS CONTAINING THE SECTIONS INDICATED BE LACKING, OR IF THE INSTRUCTIONS ARE UNCLEAR OR NOT ENTIRELY UNDERSTANDABLE, PLEASE CONTACT MARES BEFORE PERFORMING ANY MAINTENANCE, ADJUSTMENT OR CHECK.