MARES SERVICE MANUAL

2007

mares®

HOW TO CONSULT AND UPDATE THE MAINTENANCE MANUAL

IN THE UPDATED VERSIONS A COLUMN LABELED "NOTES" HAS BEEN ADDED TO THE INDEX.

THE NEW COLUMN ALLOWS NEW SECTIONS TO BE IDENTIFIED THAT ARE TO BE INCLUDED IN THE MANUAL FROM THOSE THAT HAVE BEEN MODIFIED OR WILL COMPLETELY OR PARTIALLY REPLACE CURRENT ONES.

HOW TO PROCEED:

IF, WHILE CONSULTING THE INDEX UNDER THE "NOTES" COLUMN, THE HEADING "NEW" IS FOUND, THE PAGE(S) IN THE UPDATED VERSION MUST BE ADDED IN THE ORDER SPECIFIED.

IF, WHILE CONSULTING THE INDEX UNDER THE "LAST REVISION" COLUMN, THE SPECIFIED YEAR (OR REVISION PERIOD) IS UPDATED WITH RESPECT TO THAT OF THE PREVIOUS VERSION, THE PAGES IT CONTAINS ARE TO REPLACE THOSE IN THE MANUAL, ACCORDING TO THE ORDER SPECIFIED UNDER THE PAGE NUMBER.

IMPORTANT!

HTM SPORT RECCOMMENDS THAT ALL THE INFORMATION CONTAINED IN THE "GENERAL INFORMATION" SECTION BE CONSULTED BEFORE MAINTENANCE OPERATIONS ARE IMPLEMENTED.

GENERAL INFORMATION

WARNING!

POSSESSION OF THIS MANUAL DOES NOT CONSTITUTE AN IMPLICIT CONCESSION OR AUTHORIZATION, ON THE PART OF MARES S.p.A, FOR SERVICING AND/OR REPAIRING ITS PRODUCTS.

WARNING!

BEFORE ATTEMPTING THE MAINTENANCE ACTIONS DESCRIBED IN THIS MANUAL, MARES S.p.A. RECOMMENDS CAREFULLY READING ALL THE TECHNICAL BULLETINS AND SECTIONS OF THIS MANUAL.

WARNING!

IF THE INSTRUCTIONS PROVIDED IN THE MANUAL ARE UNCLEAR OR DIFFICULT TO UNDERSTAND, PLEASE CONTACT MARES S.p.A BEFORE ATTEMPTING ANY MAINTENANCE ACTION.

WARNING!

WHERE NOT EXPRESSLY INDICATED (SEE TECHNICAL BULLETINS), THE REFERENCE NUMBERS OF THE COMPONENTS DESCRIBED IN THE MAINTENANCE PROCEDURES ARE GIVEN IN THE INITIAL DRAWING AND TABLE (SEE DATE).

WARNING!

IN ANY ORDERS FOR SPARE PARTS, ALWAYS REFER TO THE MOST RECENT TABLE (SEE DATE).

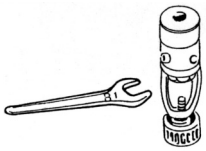
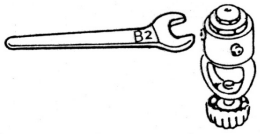
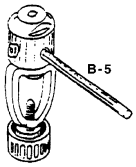
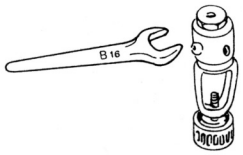
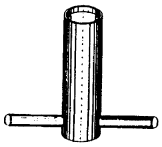
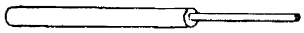
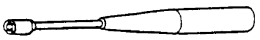
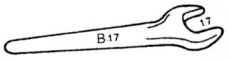
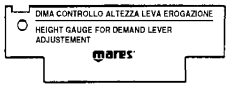
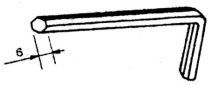
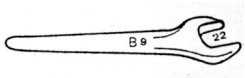
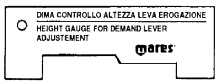
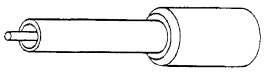
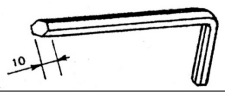
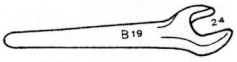
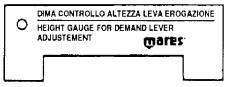
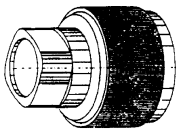
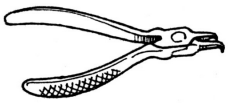
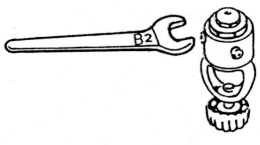
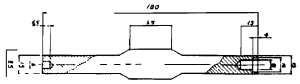
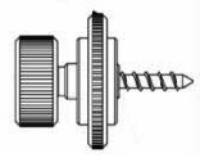
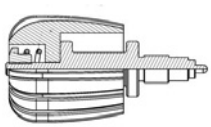
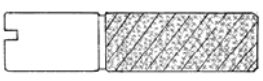
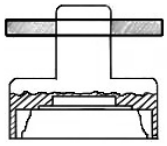
WARNING!

BEFORE ORDERING SPARE PARTS, PLEASE CAREFULLY READ ANY NOTES IN THE INDIVIDUAL TABLES.

NOTE FOR COMPONENTS WHOSE CODE NUMBER IN THE INDIVIDUAL TABLES HAS BEEN REPLACED WITH A LETTER OR SYMBOL, IT IS NECESSARY TO ORDER THE FINISHED PRODUCT IN THE ASSEMBLIES SECTION THAT IS LABELED WITH THE SAME SYMBOL OR LETTER.

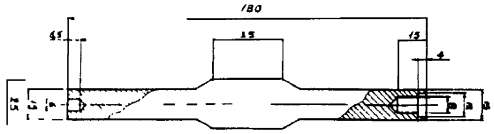
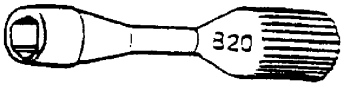
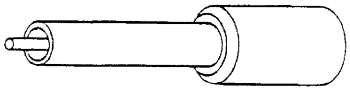
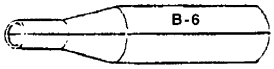
NOTE THE AVAILABILITY OF TITANIUM PLATED COMPONENTS IS LIMITED, BUT THEY CAN BE REPLACED WITH THE CORRESPONDING CHROME PLATED COMPONENTS.

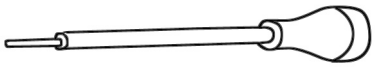
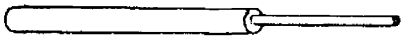
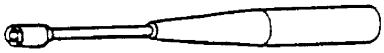
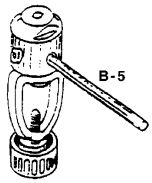
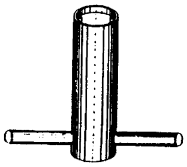
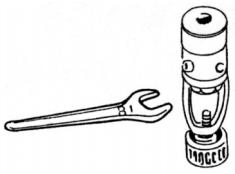
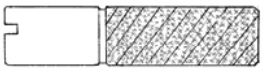
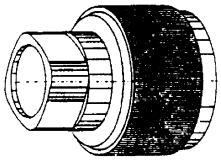
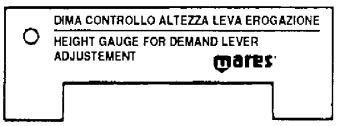
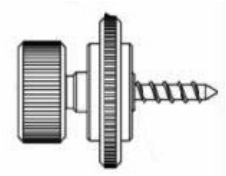
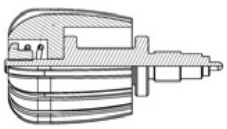
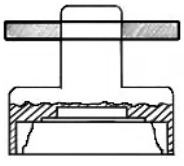
NOTE AVAILABILITY OF COMPONENTS WHOSE CODE NUMBER IS BETWEEN ANGLE BRACKETS "< >" IN THE INDIVIDUAL TABLES IS LIMITED, BUT THEY CAN BE REPLACED BY OTHER MORE CURRENT COMPONENTS.

TOOL KIT (REGULATORS - BCV)			CODE 416902
WRENCH FOR RETAINING NUT 1° STAGE (25 mm MODIFIED)	WRENCH FOR 1° STAGE DIAPHRAGM RETAINING NUT (28 mm)	1° STAGE TOOL RETAINING YOKE REGULATING NUT	WRENCH FOR 1° STAGE DIAPHRAGM RETAINING NUT (32 mm)
			
(B-1) Code 46106201	(B-2) Code 46106202	(B-5) Code 46106205	(B-16) Code 46106216
MR 02-1° STAGE SEAT CONNECTOR DISASSEMBLING TOOL	WRENCH FOR 1° STAGE HOSE CONNECTOR (14 mm)	SPECIAL TOOL FOR EXHAUST VALVE -AIR-LOCK	DEMAND LEVER ADJUSTMENT, (LONG)
			
(B-11) Code 46106211	(B-18) Code 46106218	(C2) Code 46200156	(B-12) Code 46106212
DEMAND LEVER ADJUSTMENT, (SHORT)	ADJUSTEMENT TOOL FOR 2° STAGE SEAT (HEX WRENCH 5 mm)	WRENCH FOR 2° STAGE CONNECTOR AND HOSE (2 X 17 mm)	GAUGE FOR 2° STAGE DEMAND LEVER (TECHNOPOLIMER VERSION)
			
(B-20) Code 46106220	(B-4) Code 46106204	(B-17) Code 46106217	Code 46106230
2° STAGE DEMAND LEVER ASSEMBLING TOOL / INSERTER OR	WRENCH 1° STAGE PLUG 16-22-32 VERSION (HEX WRENCH 6 mm)	WRENCH 2° STAGE HOSE CONNECTOR NIKOS (22 mm)	GAUGE FOR 2° STAGE DEMAND LEVER (METAL VERSION)
			
(B-6) Code 46106206	(B-8) Code 46106208	(B-9) Code 46106209	Code 46106231
POPPET SEAT 1° STAGE (DIAPHGRAM VERSION)	1° STAGE ADJUSTMENT TOOL (HEX WRENCH 10 mm)	WRENCH FOR 2° STAGE HOSE CONNECTOR BETA AND NAVY (24 mm)	GAUGE FOR 2° STAGE DEMAND LEVER (TURBO FLOW COVER)
			
(B-21) Code 46106221	(B-13) Code 46106213	(B-19) Code 46106219	Code 46200260
AKROS - NIKOS 2° STAGE COVER	R 2 PISTON SEAT-DISASSEMBLING TOOL	WRENCH FOR R 2 1° STAGE CAP (USAG 282 TSN/15-35)	SNAP RING LIER 1° STAGE (USAG 127 P/8-25)
			
(B-7) Code 46106207	(B-22) Code 46106222	(B-23) Code 46106223	(B-14) Code 46106214
2° STAGE POPPET (PROTON VERSION)	V42 WRENCH (30 mm) - DIAPHRAGM RETAINING NUT	V42 TOOL - HP/BALANCED CHAMBER PLUG	SPECIAL TOOL FOR EXHAUST BUTTON - ERGO INFLATOR
			
(B-36) Code 46200383	(B-40) Code 46200608	(B-25) Code 46106253	(C1) Code 47106190
V42 HP POPPET SEAT – DISASSEMBLING TOOL	V42 HP POPPET SEAT – ASSEMBLING TOOL	SPECIAL TOOL FOR AIRTRIM DUMP VALVE SEAT (2K3 VERSION)	SPECIAL TOOL FOR AIRTRIM DUMP VALVE
			
(B-38) Code 46200634	(B-39) Code 47200633	(C4) Code 47200756	(C3) Code 47200087

QUANTITY	TOOL NUMBER	CODE NUMBER	DESCRIPTION
1	B-1	46106201	WRENCH FOR RETAINING NUT 1° STAGE (25mm MODIFIED)
1	B-2	46106202	WRENCH FOR 1° STAGE DIAPHRAGM RETAINING NUT (28 mm)
1	B-4	46106204	ADJUSTEMENT TOOL FOR 2° STAGE SEAT (HEX WRENCH 5 mm)
1	B-5	46106205	1° STAGE TOOL: RETAINING YOKE / RETAINING DIAPHGRAM / REGULATING NUT
1	B-6	46106206	2° STAGE DEMAND LEVER ASSEMBLING TOOL / INSERTER OR
1	B-7	46106207	AKROS - NIKOS 2° STAGE COVER
1	B-8	46106208	WRENCH 1° STAGE PLUG 16-22-32 VERSION (HEX WRENCH 6 mm)
1	B-9	46106209	WRENCH 2° STAGE HOSE CONNECTOR NIKOS (22 mm)
1	B-11	46106211	MR 02-1° STAGE SEAT CONNECTOR DISASSEMBLING TOOL
1	B-12	46106212	DEMAND LEVER ADJUSTMENT, (LONG)
1	B-13	46106213	1° STAGE ADJUSTMENT TOOL (HEX WRENCH 10 mm)
1	B-14	46106214	SNAP RING LIER 1° STAGE (USAG 127 P/8-25)
1	B-16	46106216	WRENCH FOR 1° STAGE DIAPHRAGM RETAINING NUT (32 mm)
2	B-17	46106217	WRENCH FOR 2° STAGE CONNECTOR AND HOSE (2 X 17 mm)
1	B-18	46106218	WRENCH FOR 1° STAGE HOSE CONNECTOR (14 mm)
2	B-19	46106219	WRENCH FOR 2° STAGE HOSE CONNECTOR BETA AND NAVY (24 mm)
1	B-20	46106220	DEMAND LEVER ADJUSTMENT, (SHORT)
1	B-21	46106221	POPPET SEAT 1° STAGE (DIAPHGRAM VERSION)
1	B-22	46106222	R 2 PISTON SEAT-DISASSEMBLING TOOL
1	B-23	46106223	WRENCH FOR R 2 1° STAGE CAP (USAG 282 TSN/15-35)
1	B-25	46106253	V42 TOOL - HP/BALANCED CHAMBER PLUG
1	B-36	46200383	2° STAGE POPPET (PROTON VERSION)
1	B-38	46200634	V42 HP POPPET SEAT – DISASSEMBLING TOOL
1	B-39	46200633	V42 HP POPPET SEAT – ASSEMBLING TOOL
1	B-40	46200608	V42 WRENCH (30 mm) - DIAPHRAGM RETAINING NUT
1	- - -	46106230	GAUGE FOR 2° STAGE DEMAND LEVER (TECHNOPOLIMER VERSION)
1	- - -	46106231	GAUGE FOR 2° STAGE DEMAND LEVER (METAL VERSION)
1	- - -	46200260	GAUGE FOR 2° STAGE DEMAND LEVER (TURBO FLOW COVER)
1	C-1	47106190	SPECIAL TOOL FOR EXHAUST BUTTON - ERGO INFLATOR
1	C-2	46200156	SPECIAL TOOL FOR EXHAUST VALVE -AIR-LOCK
1	C-3	47200087	SPECIAL TOOL FOR AIRTRIM DUMP VALVE
1	C-4	47200756	SPECIAL TOOL FOR AIRTRIM DUMP VALVE SEAT (2K3 VERSION)

SPECIAL TOOL KIT (REGULATORS - BCV) COD. 416903

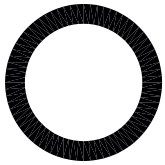
EXHAUST BUTTON FOR ERGO INFLATOR	DEMAND LEVER ADJUSTMENT, (SHORT)
	
(C1) Cod. 47106190	(B-20) Cod. 46106220
POPPET SEAT 1° STAGE (DIAPHGRAM VERSION)	1° STAGE POPPET SCS VERSION / 2° STAGE POPPET / INSERT BY PASS O-RING
	
(B-21) Cod. 46106221	(B-6) Cod. 46106206

POPPET PISTON (1° STAGE R2 VERSION)	EXHAUST VALVE AIR-LOCK	DEMAND LEVER ADJUSTMENT, (LONG)
		
(B 22) 46106222	(C2) Cod. 46200156	(B-12) Cod. 46106212
1° STAGE TOOL: RETAINING YOKE	POPPET SEAT 1° STAGE MR 02	WRENCH FOR RETAINING NUT 1° STAGE
		
(B-5) Cod. 46106205	(B-11) Cod. 46106211	(B-1) Cod. 46106201
2° STAGE POPPET (PROTON VERSION)	SPECIAL TOOL FOR AIRTRIM DUMP VALVE SEAT (2K3 VERSION)	AKROS - NIKOS 2° STAGE COVER
		
(B-36) Cod. 46200383	(C4) Cod. 47200756	(B-7) Cod. 46106207
GAUGE FOR DEMAND LEVER (TECNOPOLIMER 2° ST.	GAUGE FOR DEMAND LEVER (METAL VERSION)	GAUGE FOR DEMAND LEVER (TURBO FLOW COVER)
		
Cod. 46106230	Cod. 46106231	Cod. 46200260
V42 HP POPPET SEAT – DISASSEMBLING TOOL	V42 HP POPPET SEAT – ASSEMBLING TOOL	SPECIAL TOOL FOR AIRTRIM DUMP VALVE
		
(B-38) Cod. 46200634	(B-39) Cod. 47200633	(C3) Cod. 47200087

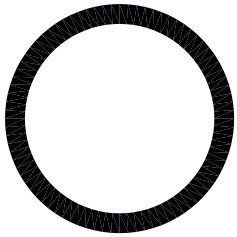
QUANTITY	TOOL NUMBER	CODE NUMBER	DESCRIPTION
1	B-1	46106201	WRENCH FOR RETAINING NUT 1° STAGE
1	B-5	46106205	1° STAGE TOOL: RETAINING YOKE / RETAINING DIAPHGRAM / REGULATING NUT
1	B-6	46106206	1° STAGE POPPET SCS VERSION / 2° STAGE POPPET / INSERT BY PASS O-RING
1	B-7	46106207	AKROS - NIKOS 2° STAGE COVER
1	B-11	46106211	POPPET SEAT 1° STAGE MR 02
1	B-12	46106212	DEMAND LEVER ADJUSTMENT, (LONG)
1	B-20	46106220	DEMAND LEVER ADJUSTMENT, (SHORT)
1	B-21	46106221	POPPET SEAT 1° STAGE (DIAPHGRAM VERSION)
1	B-22	46106222	POPPET PISTON (1° STAGE R2 VERSION)
1	B-36	46200383	2° STAGE POPPET (PROTON VERSION)
1	B-38	46200634	V42 HP POPPET SEAT – DISASSEMBLING TOOL
1	B-39	46200633	V42 HP POPPET SEAT – ASSEMBLING TOOL
1	- - -	46106230	GAUGE FOR DEMAND LEVER (TECNOPOLIMER 2° STAGE VERSION)
1	- - -	46106231	GAUGE FOR DEMAND LEVER (METAL VERSION)
1	- - -	46200260	GAUGE FOR DEMAND LEVER (TURBO FLOW COVER)
1	C-1	47106190	EXHAUST BUTTON FOR ERGO INFLATOR
1 C-2		46200156	EXHAUST VALVE AIR-LOCK
1	C-3	47200087	SPECIAL TOOL FOR AIRTRIM DUMP VALVE
1	C-4	47200756	SPECIAL TOOL FOR AIRTRIM DUMP VALVE SEAT (2K3 VERSION)

O-RING REFERENCE TABLE

3062 - 46110228



3100 - 47110271



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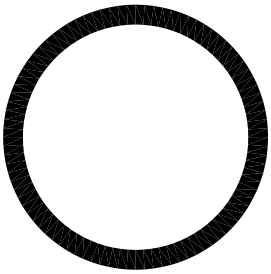

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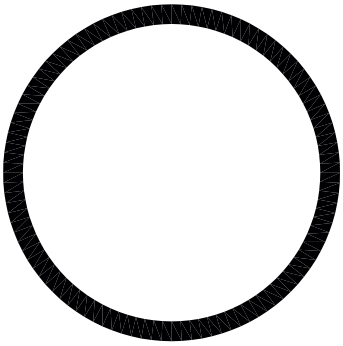

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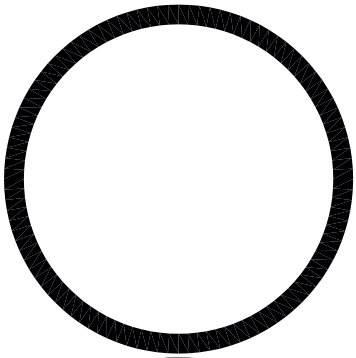
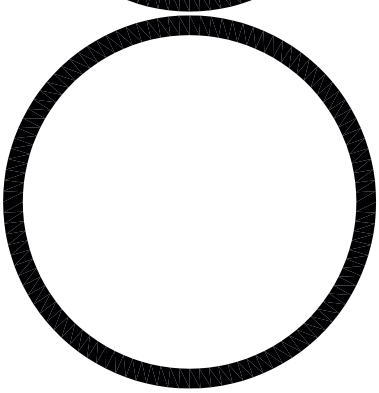


3175 - 47200723



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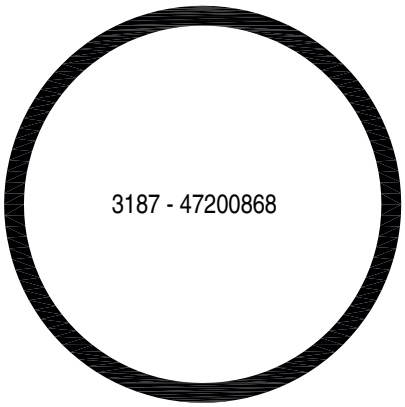

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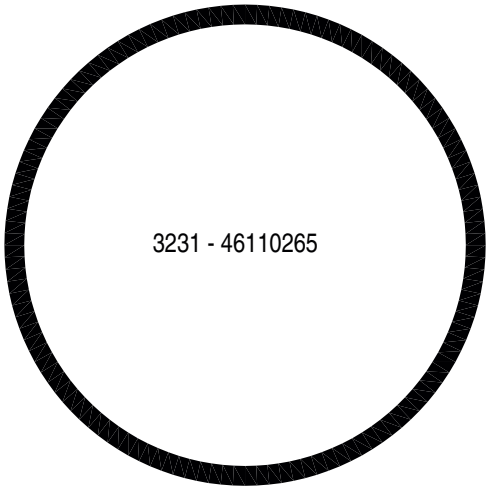
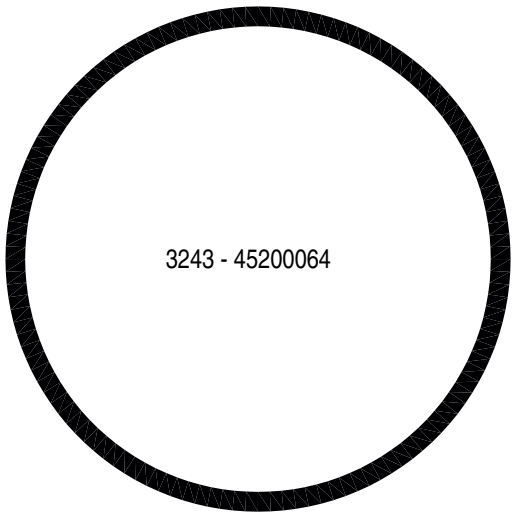


3243 - 45200064



MR42 FIRST STAGE

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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.

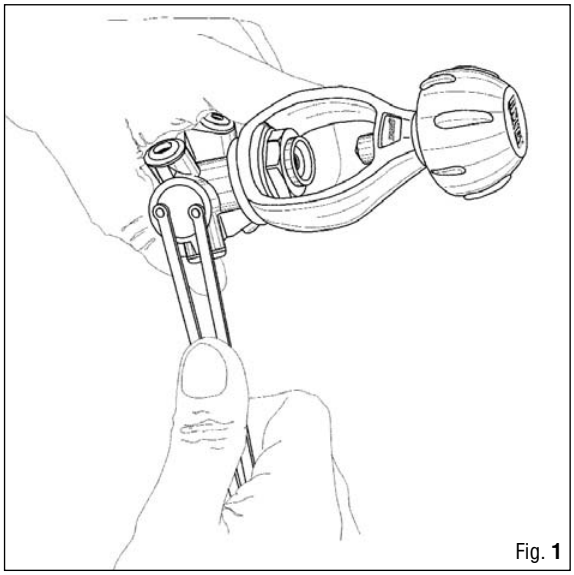
Fig. **1**

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. Position the special tool B-21 on the first stage poppet seat (75) (Fig. **2**), pressing on it gently. Introduce compressed air (about 10 bar) into a low-pressure port. When the compressed air causes the poppet seat to move, reduce the pressure exerted on the special tool (B-21).

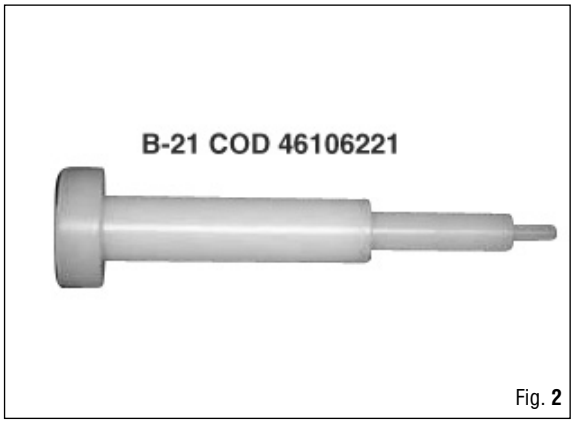

Fig. **2**

NOTE WHEN THE COMPRESSED AIR CAUSES THE POPPET SEAT TO MOVE, REDUCE THE PRESSURE EXER TED ON THE SPECIAL TOOL (B-21).

WARNING!

DO NOT A TTEMPT TO REMOVE THE POPPET SEA T USING SHARP OR POINTED TOOLS; SCRA TCHES ON THE SEA TING SURFACE MAY CAUSE DEFECTS IN OPERATION.

6. Remove the poppet seat (114) from the first stage and remove the O-ring (2012) (rif. 6).

WARNING!

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

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

WARNING!

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

8. Screw the first stage disassembly tool (B-5) into a low pressure port (3/8").
9. Using the Allen wrench (B-13), unscrew the adjusting nut (18) and pull out the spring (16).
10. 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) SIMPL Y APPL Y LIGHT PRESSURE.

11. Remove the plastic washer ring (195).

WARNING!

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

12. 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. SCRA TCHING THE SURF ACE OF THE DIAPHRAGM OR FIRST ST AGE BODY SEA T MA Y CAUSE AIR LEAKAGE.

13. Unscrew the yoke retainer nut (7) using the special tool (B-1) and remove the yoke (3) with the knob (25).
14. Remove the yoke connector (154).
15. 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.
16. Remove the O-Ring (71) from the yoke retainer nut (7).

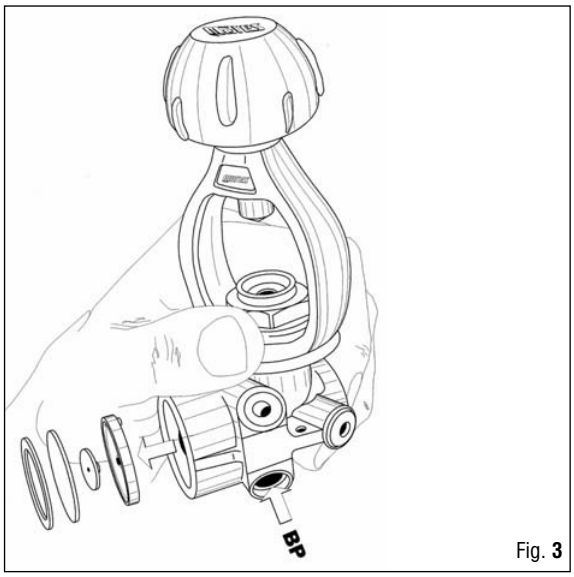

Fig. **3**

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).

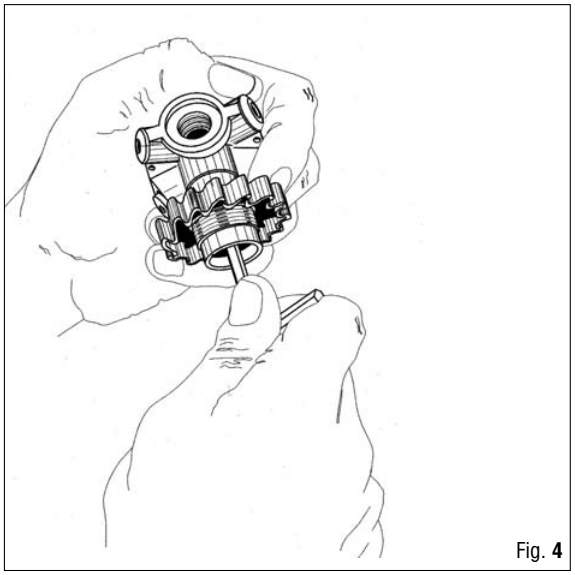
Fig. **4**

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

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

CLEANING

WARNING!

WHEN WORKING WITH ANY KIND OF ACID, WEAR ADEQUA TE 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 SOL VENTS MA Y DAMAGE PLASTIC AND RUBBER PARTS. BEFORE CLEANING METAL COMPONENTS, MAKE SURE THA T ALL SEALS AND OTHER P ARTS SUBJECT TO DETERIORATION HAVE BEEN REMOVED.

WARNING!

DO NOT IMMERSE THE SINTERED FIL TER 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. 46110211

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 sur faces, the port plug seats, and the poppet seat housing.
O-ring seats		Inspect all metal sur faces 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

WARNING!

THE BODY OF THE MR 42 FIRST ST AGE CANNOT BE INTERCHANGED WITH THAT FOR THE V42.

19. 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 A VOID DAMAGING THE SEA T. CHECK THA T IT IS POSITIONED CORRECTLY.

20. Place the O-Ring 2012 (ref. 6) on the poppet seat (ref. 114).

21. Correctly position the poppet seat on the special tool (B-21).

22. Pressing gently, press the poppet seat into position in the first stage body (Fig. **5**).

WARNING!

TAKE SPECIAL CARE WHEN INSER TING THE POPPET SEA T. MAKE SURE THA T IT IS POSITIONED CORRECTL Y ONCE IT IS INSERTED INTO THE HIGH-PRESSURE CHAMBER, WITH THE CONICAL SECTION FACING UPWARD.

23. Position the O-ring (74) in the external seat of the HP housing (4).

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

25. Insert the poppet (9), positioning the spherical part in contact with the seat connector.

26. Position the spring (8) on the first stage poppet (9).

27. 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.

28. Rotate the first stage and correctly position the DFC washer (189) in the groove of the first stage body (Fig. **7**).

29. Insert the pin (12) in the center hole in the DFC washer (1 89).

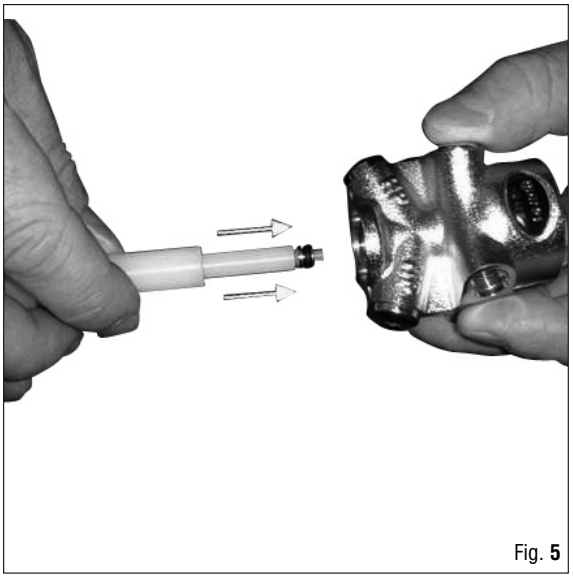

Fig. **5**

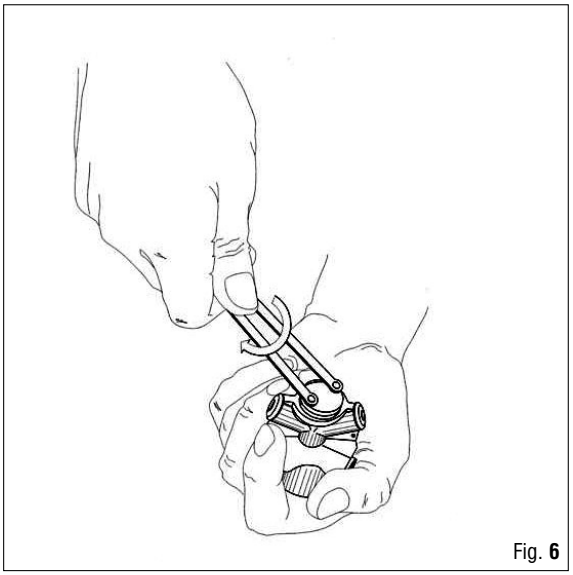

Fig. **6**

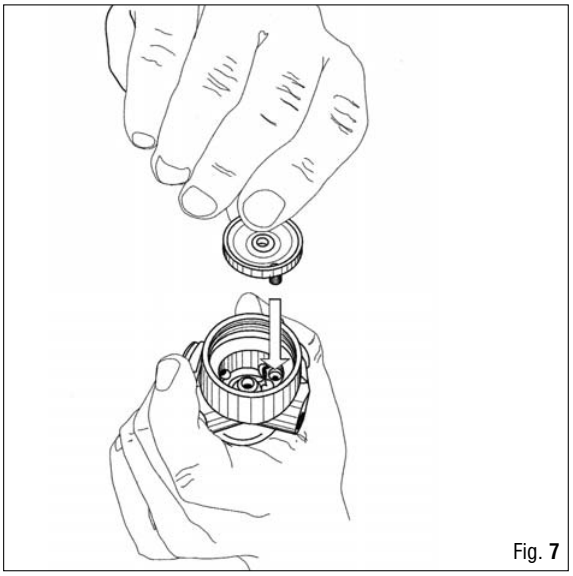

Fig. **7**

WARNING!

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

30. Position the poppet button (13) on the pin (12).

31. Position the diaphragm (14) in the seat of the first stage body (1).

32. Correctly position the plastic washer ring (195) above the diaphragm (14).

33. Arrange the spring base plate (15) on the diaphragm (14).

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

34. 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.

35. Position the spring (16) on the spring base plate (15).

36. 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 INTERMEDIA TE PRESSURE AND INTERFERES WITH THE SUBSEQUENT ADJUSTMENTS.

37. Insert the filter spring (61) and tapered filter (22) in the yoke retainer nut (7).

38. 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.

39. Arrange the yoke connector (154) on the first stage body (1).

40. Position the yoke (3) with the knob (25) on the first stage body (1).

41. 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.

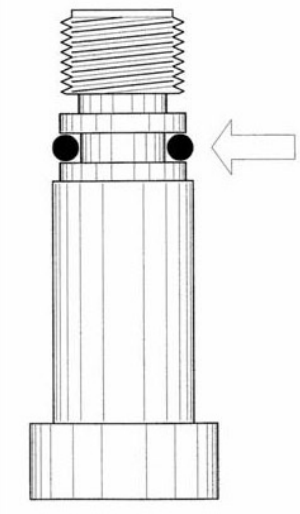

Fig. **8**

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 A T THE POINT F ARTHEST 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 HA VING 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.

PROCEDURE FOR ADJUSTING THE INTERMEDIATE PRESSURE IN DIAPHRAGM FIRST STAGES

1. Screw the intermediate pressure measuring gauge (cod. 106252) into one of the 3/8" low pressure ports, using the special wrench (B-18).
2. Using the wrench (B-18 or B-19), apply the hose with the partially assembled second stage to the port marked D.F.C.
3. Mount the regulator group on the control valve (of a tank or Test Bench).

(Only for MR 10 version)

It is important for the pressure (of the tank or Test Bench) to be approximately 200 bar.

4. Holding down the second stage demand lever, slowly open the tank valve and, almost simultaneously, release the demand lever.
5. Read the value of the first stage adjustment on the pressure gauge, and proceed as follows (Fig. 1):
   - **a.** If the first stage pressure is greater than the required value (see table), use the wrench (B-13) to slowly back off the adjusting nut (16) until the required value is obtained.

NOTE WHENEVER THE INTERMEDIATE PRESSURE IS REDUCED, IT IS NECESSARY TO VENT THE EXCESS AIR IN ORDER TO OBTAIN A CORRECT READOUT OF THE NEW VALUE.

   - **b**. If the first stage pressure is lower than the required value (see table), slowly lock down the adjusting nut until the specified value is obtained.
6. Operate the second stage demand lever a few times, and check that the first stage pressure remains constant.
7. After completing the second stage adjustments, remove the pressure gauge and screw on the corresponding port plug.

REBEL 2K6
SECOND STAGE

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DISASSEMBLY

1. Release the protective cap from the 1st stage.
2. Unscrew the hose from the first stage using the 14-mm open end wrench (B-18).
3. Remove the clamp (43) from the mouthpiece using cutting nippers or a similar tool.

NOTE ONLY REMOVE THE CLAMP FROM THE MOUTHPIECE IF A REPLACEMENT PART IS AVAILABLE.

4. Remove the mouthpiece (44).
5. Remove the exhaust tee (41).
6. Move the hose cover (46).
7. Using the two 17-mm open end wrenches (B-17), unscrew the hose from the 2nd stage connector.
8. Remove O-ring (27) from the seat of the swivel hose coupling.
9. Unscrew the case assembly connector (28) using a 17-mm open end wrench (B-17).
10. Remove the O-Ring (71) from the case assembly connector (28).
11. Unscrew the poppet seat (21) from the case assembly connector (28) using a 5-mm hex wrench (B-4).
12. Remove the O-Ring (27) from the poppet seat (21).
13. Pull out the metal retaining ring (96).
14. Remove the safety clip (63).
15. Unscrew the cover (101).

NOTE IN ORDER TO PROPERL Y CLEAN AND/OR REMOVE DEPOSITS THAT CAN HINDER THE PROPER MOTION OF THE PURGE BUTTON, IT IS NECESSAR Y TO REMOVE THE COVER ASSEMBL Y (PURGE BUTTON (103), SPRING (102), COVER (101)).

16. Remove the diaphragm retaining ring (32), the diaphragm (78), and the spacer ring (36) from the 2nd stage case (90).
17. Unscrew the case plug (64) using a 6-mm hex wrench (B-8).
18. Remove the O-ring (72) from the case plug.
19. Pressing gently, push the adjuster connector (87) inward and remove the O-ring (83) from its seat in the 2nd stage case (32).
20. Gently press the demand lever connector assembly into the case (Fig. **1**).
21. Remove the O-Ring (83) from its seat in the second stage case (32).

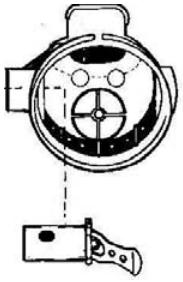

Fig. **1**

22. Position the demand lever connector assembly on the special tool (B-6) and use the screwdriver (B-12) to unscrew the retaining nut (33) from the demand lever (35). Then remove the washer (34), the poppet assembly (30+47+92) and the spring (31) (Fig. **2**).

23. Remove the poppet seat (47), pressing slightly on the poppet seat holder (92) in the direction of the threaded stem.

24. Remove the poppet seat holder (92) from the stem of the 2nd stage valve shaft (30).

25. Remove the exhaust valve (40).

NOTE ONLY REMOVE THE EXHAUST V ALVE IF A REPLACEMENT PART IS AVAILABLE.

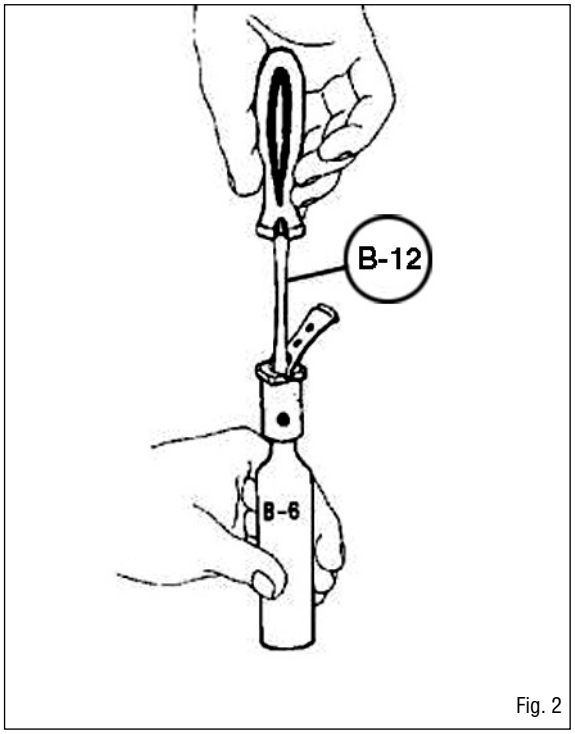

Fig. 2

CLEANING

WARNING!

WHEN WORKING WITH ANY KIND OF ACID, WEAR ADEQUA TE 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. Make sure all the components have been thoroughly rinsed in fresh water before reassembling them. Chrome-plated brass and stainless steel parts can be cleaned with an ultrasonic cleaner in fresh water, or in a mild acid solution (for example white vinegar , diluted as necessary).

WARNING!

ACIDS OR OTHER SOL VENTS MA Y DAMAGE PLASTIC AND RUBBER P ARTS. BEFORE CLEANING MET AL COMPONENTS, MAKE SURE THAT ALL SEALS AND OTHER P ARTS SUBJECT TO DETERIORATION HAVE BEEN REMOVED.

INSPECTION

Certain key components of the 2nd stage should be regularly replaced at each scheduled overhaul. In addition, considering their relatively low cost, it is recommended that all the O-rings be replaced each time.

Quantity	Ref. N.	Description	Code
2	(27)	O-Ring 2025	Cod.46110205 cod. Viton 46110411
1	(72)	O-Ring 2043	Cod.46110215 cod. Viton 46110415
1	(71)	O-Ring 2050	Cod. 46110211 cod. Viton 46110413
1	(83)	O-Ring 2068	Cod. 46110225 cod. Viton 46110420
1	(19)	O-Ring 106	Cod. 46110106 cod. Viton 46110402
1	(47)	2nd Stage poppet seat	Cod. 46184062
1	(33)	Demand lever adjusting	Cod. 46185051
1	(40)	Válvula de descarga	Cod. 46184006
1	(43)	Exhaust valve	Cod. 47157984
1	(63)	Safety pin	Cod. 46184289

If these components are not replaced, they should at least be carefully inspected with a jeweler's magnifying glass for the following defects.

DO NOT USE PARTS WITH THE FOLLOWING DEFECTS:

These components must be carefully checked using a jeweler's glass to look for any of the defects indicated below .

Description	Ref. N.	Inspection
2nd stage case	(32)	Inspect the sealing surfaces for scratches or cracks.
Seat connector	(21)	Check that the sealing surface and the O-ring seat are intact.
Diaphragm	(36)	Check for tears or pinholes around the metal disk, deformation of the outer rim or signs of separation of the diaphragm from the metal disk.
Poppet seat holder	(92)	Check for cracks, cuts or deformation.
Mouthpiece	(44)	Inspect for cuts, tears or signs of wear.
Exhaust tee	(41)	Check that it is intact.
Hose	(26)	Inspect for splits, blistering or any other signs of damage.
Spring	(31)	Check for any split or broken coils.

REASSEMBLY

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

WARNING!

IF THE 2 ND STAGE IS USED FOR DIVING WITH OXYGEN-RICH MIXTURES, IT MUST BE PERFECTLY CLEANED AND FREE OF ANY RESIDUAL SILICONE OR OTHER IMPURITIES. VITON O-RINGS MUST BE LUBRICA TED WITH SPECIAL OXYGEN-COMP ATIBLE GREASE. DO NOT USE SILICONE GREASE. YOU MUST CONSUL T THE NITROX SECTION OF THE MAINTENANCE MANUAL FOR THESE PROCEDURES.

1. Install a new exhaust valve (40), carefully pulling its silicone stem through the center hole of the 2 nd stage exhaust valve support.

WARNING!

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

2. Using cutting nippers, cut the silicone stem by about 7 mm.
3. Reassemble the poppet seat holder (92) on the 2 nd stage poppet stem (30).
4. Reassemble the poppet seat (47) in the poppet seat holder (92).These components must be carefully checked using a jeweler's glass to look for any of the defects indicated below.
5. Place the 2nd stage poppet assembly (30+47+92) together with its spring (31) on the special tool (B-6).
6. Pressing gently, correctly position the 2 nd stage valve and its spring into the demand lever connector (91) (Fig. **3**).

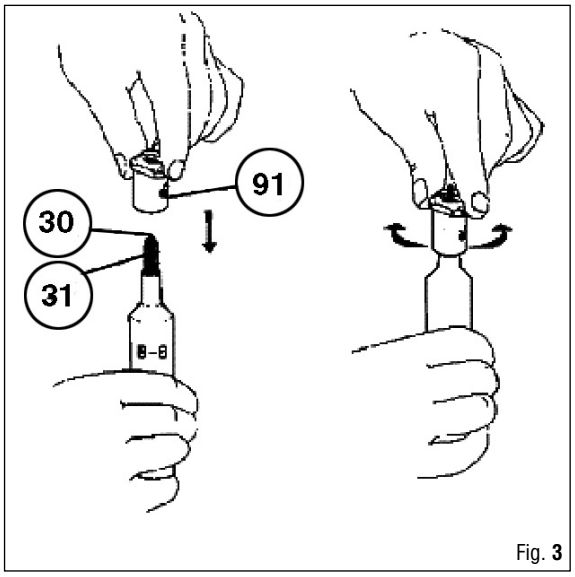

Fig. **3**

IMPORTANT

ROTATE THE SECOND ST AGE CASE SLIGHTL Y TO THE RIGHT AND LEFT TO OBT AIN CORRECT POSITIONING OF THE 2ND STAGE POPPET STEM (Fig. **3**).

7. Correctly position the demand lever (35) in the groove of the 2nd stage case (32).
8. Place the washer (34) on the valve stem, and tighten the adjusting nut (33) a few turns using the special wrench (B-20) (Fig.**4**).

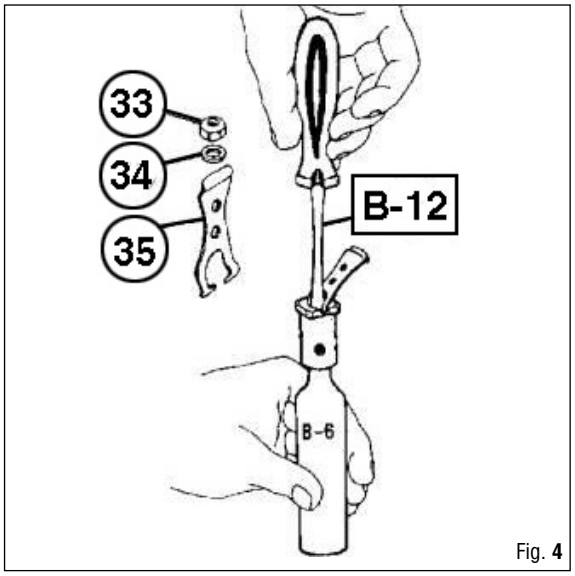

Fig. **4**

NOTE

PRESS THE DEMAND LEVER A FEW TIMES TO BE SURE IT IS ABLE TO MOVE FREEL Y. CORRECTL Y POSITION THE DEMAND LEVER CONNECTOR ASSEMBLY (91) IN THE 2ND STAGE CASE (Fig. **1**).

9. Place the O-Ring (83) in the seat between the 2 nd stage case and the demand lever connector using the special tool (B-6), (Fig. **5**).

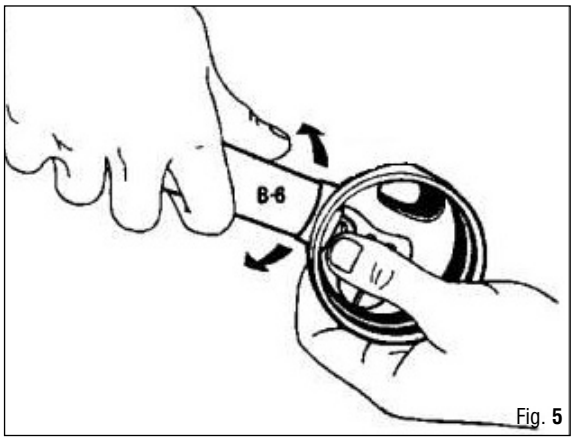

Fig. **5**

WARNING!

MAKE SURE THA T THE AIR HOLE IN THE DEMAND LEVER CONNECTOR (91) IS POSITIONED SO THAT IT IS ALIGNED WITH THE BY-PASS TUBE.

WARNING!

CHECK THAT THE DEMAND LEVER CONNECTOR HAS STAYED IN PLACE.

10. Place the O-Ring (27) in the housing in the poppet seat (21).

11. Insert and lock down the poppet seat (21) into the case assembly connector (28) using the 5-mm hex wrench (B-4), so that it protrudes from the connector by about 3 mm.

WARNING!

THE POPPET SEA T SHOULD NOT PROTRUDE BY MORE THAN 3.8 mm FROM THE CASE ASSEMBLY CONNECTOR.

12. Fit the O-Ring (71) in the seat of the case assembly connector (28).

13. Using a 17-mm open end wrench (B-17), fully lock down the case assembly connector on the 2 nd stage case.

NOTE

IF A TORQUE WRENCH IS USED, USE A TORQUE SETTING OF 8 - 8.5 N/M.

14. Correctly install the adjuster connector (87) in the hole of the 2nd stage case and, with the help of the special tool (B-6), fit the O-ring (83) in its seat.

15. Fit the O-ring (27) in the seat on the swivel connector of the hose (26).

16. Screw the hose (26) onto the case assembly connector (28) with the help of two 17-mm open end wrenches (B-17).

FINAL ADJUSTMENTS

In order to adjust the regulator correctly:

A. The repair shop should be equipped with a high- and low-pressure compressed air supply.

B. A pressure gauge is required for checking the intermediate pressure (the pressure gauge should have a full scale value MAX 30 - 40 BAR, for greater accuracy of adjustment).

1. Screw the intermediate pressure measuring gauge into one of the 3/8" low-pressure ports on the first stage, using the wrench (B-18).

2. Assemble the hose with the partially finished 2 nd stage on the port marked D.F.C., tightening it with the wrench (B-18).

3. Mount the regulator group on the control valve (of a tank or test bench).

4. Holding down the second stage demand lever, slowly open the tank valve and, almost simultaneously, release the demand lever.

5. Read the pressure gauge to check whether the 1 st stage pressure is correct.

WARNING!

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

PROCEDURE FOR ADJUSTING THE INTERMEDIATE PRESSURE

B.0 Correctly insert the spacer ring (90) in the second stage case.

B0.1 Place the 2nd stage diaphragm (36) in the 2nd stage case.

B0.2 Insert the diaphragm retaining ring (78).

B0.3 Screw on the cover.

IMPORTANT

CONTINUE TIGHTENING THE COVER UNTIL THE TWO SEA TS (ON THE CASE AND COVER) THAT ACCOMMODATE THE SAFETY CLIP ARE ALIGNED.

B.4 Insert the safety clip (63).

B.5 Working through the hole in the second stage case, use the wrench (B-12) to lock down or back off the demand lever nut (32) in order to adjust the demand lever (35).

WARNING!

CHECK THA T THE DEMAND LEVER (35) IS CORRECTL Y ADJUSTED. AIR DELIVER Y MUST BE TRIGGERED ABOUT MIDWAY ALONG THE PURGE BUTTON'S TRA VEL, AND THE SOUND OF THE DEMAND LEVER TOUCHING THE MET AL DISK OF THE SECOND STAGE DIAPHRAGM AS IT MOVES ("TAPPING") SHOULD BE AUDIBLE WHEN THE PRESSURIZED SECOND STAGE IS SHAKEN VIGOROUSLY UP AND DOWN.

B.6 Press the purge button a few times.

FINAL ASSEMBLY

6. Reassemble the O-ring (72) on the case plug (64).
7. Using the hex wrench (B-8), screw the case plug into the threaded bushing.

NOTE IF USING A TORQUE WRENCH, USE TIGHTENING TORQUE OF 90 N/cm.

8. Position the hose protector (46).
9. Disassemble the control valve unit.
10. Disassemble the intermediate pressure measuring gauge and screw the port plug with its O-ring seal back on.
11. Assemble the exhaust tee (41) on the support flange on the second stage case.

WARNING!

MAKE SURE THAT THE EDGE OF THE EXHAUST TEE IS CORRECTLY FITTED IN THE FLANGE LIGHT LUBRICA TION WITH LIQUID SOAP OR DETERGENT F ACILITATES INST ALLATION. DO NOT USE SILICONE LUBRICANTS, AS THEY MA Y DAMAGE CER TAIN COMPONENTS (DIAPHRAGMS) AND CAUSE THE EXHAUST TEE TO COME OUT OF ITS SEAT DURING USE MORE EASILY.

12. Assemble the mouthpiece (44), securing it with a new mouthpiece clamp (43).

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Drawing No. E33	**SECOND STAGE REBEL 2K6 - REBEL NX OCTOPUS REBEL**	Drawing update 7/3/2006

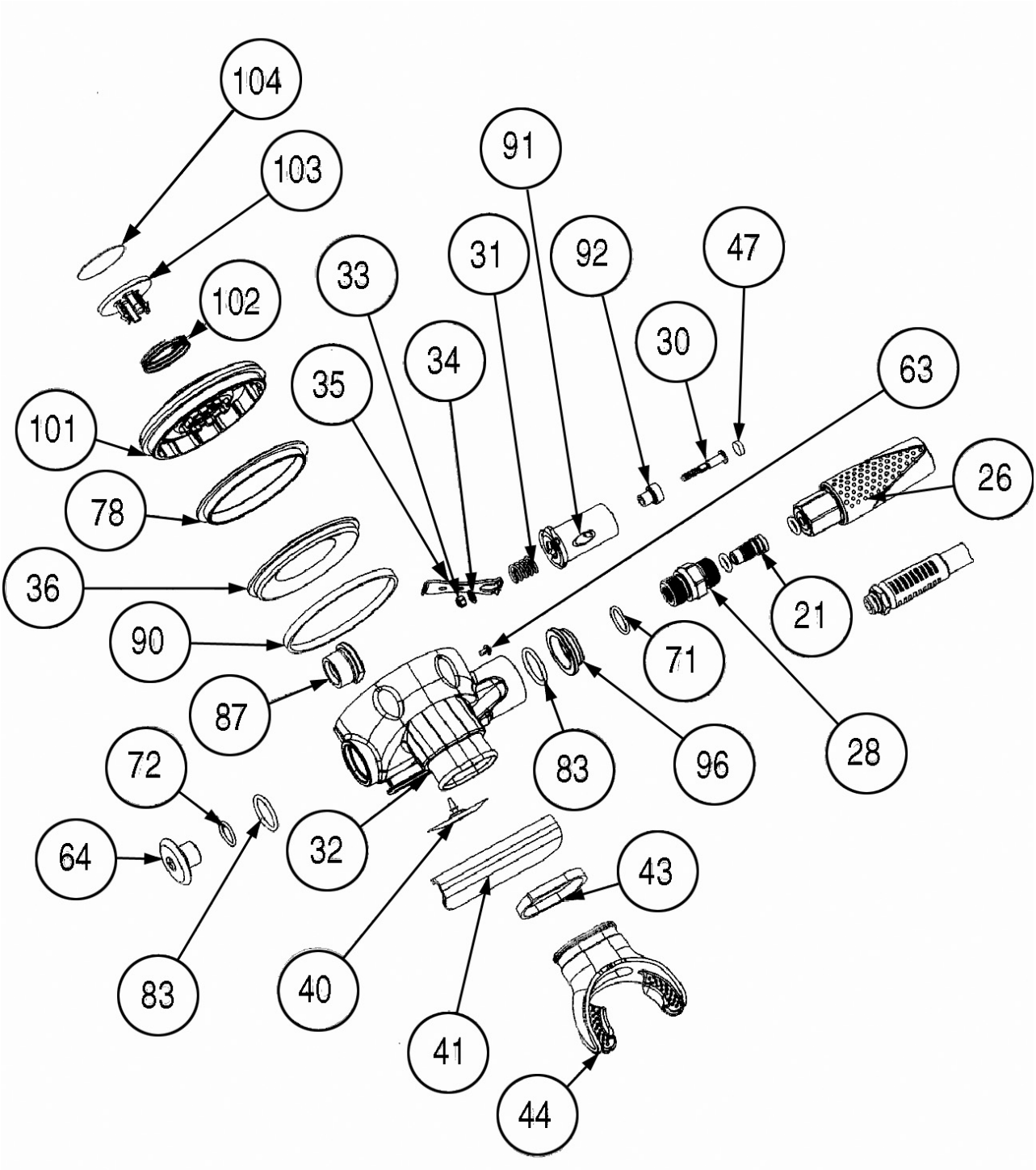

Table No. 123	SECOND STAGE REBEL 2K6 - REBEL NX OCTOPUS REBEL	Drawing reference No.: E 101 Table updated on: 01/22/2007

Ref. N.	Code	Description
19	46110106	OR 106
19	46110402	OR 106 Viton 610-97507
21	46200204	Poppet seat
26	46200452	Yellow 3/8” 1000 soft hose
26	46200451	Black 3/8” 800 soft hose
27	46110205	OR 2025
27	46110411	OR 2025 Viton 010-9707
28	46184282	Case assembly connector
30	46184219	Valve shaft
31	46185057	Poppet spring
32	46200703	Case
33	46185051	Demand lever nut
34	46185049	Lever washer
35	46185104	Demand lever
36	46184225	Diaphragm
40	46184006	Exhaust valve
41	46186266	Exhaust tee
43	47157984	Mouthpiece clamp
44	° ° °	Mouthpiece
45	46179902	First stage hose protector
46	46200323	Hose cover
47	46184062	Poppet seat
54	46186090	Mouthpiece plug Octopus
63	46184289	Cover safety catch
64	46186267	Adjustment port plug
71	46110211	OR 2050
71	46110413	OR 2050 Viton 014-9707
72	46110215	OR 2043
72	46110415	OR 2043 Viton 013-9707
78	46184224	Diaphragm holding ring

Ref. N.	Code	Description
83	46110225	OR 2068
83	46110420	OR 2068 Viton 017-9707
87	46184233	Adjuster connector
90	46184223	Spacer ring
91	46200693	Rebel 2K6 demand lever connector
92	46184221	Poppet seat holder
96	46200225	By-pass retainer ring
101	+++	Rebel 2nd st cover
101	+++	Rebel 2nd st cover yellow
102	+++	Spring button
103	+++	Button
104	46200539	Rebel button label
104	46200540	Rebel NX button label
		ASSEMBLIES
	46200292	2nd ST REBEL ASSEMBLY NX
	46200294	2nd ST REBEL ASSEMBLY
+ + +	46200601	Cover assembly Rebel
		(101-102-103-104)
+ + +	46200598	Cover assembly Rebel Nitrox
		(101-102-103-104)
+ + +	46200600	Cover assembly Rebel Octopus
		(101-102-103-104)
+ + +	46200599	Cover assembly Rebel Nitrox Octopus
		(101-102-103-104)
* * *	46200296	Service kit Axis/Rebel 2nd st series
		(19-27-33-40-43-47-71-72-83)
* * *	46200297	Service kit Axis Nx/Rebel Nx series 2nd st. (VITON O-Ring) (19-27-33-40-43-47-71-72-83)

OCTOPUS MV
SECOND STAGE

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DISASSEMBLY

1. Unscrew the hose (26) from the first stage using the open end wrench (B-18).
2. Using cutting nippers (or pliers), cut the mouthpiece clamp (43) and remove the mouthpiece (44).

NOTE

DO NOT REMOVE THE CLAMP UNLESS YOU HA VE THE REPLACEMENT PART.

3. Move the hose cover (44).
4. Using two wrenches (B-17), unscrew the hose (26) from the connection (28).
5. Remove the O-ring (27) in the swivel hose coupling and the O-Ring of the connection to the First stage (19) from the hose.
6. Unscrew the connection (28) using the open end wrench (B-17).
7. Use the hex wrench (B-4) to fully unscrew the poppet seat (21), removing the O-ring (27).
8. Remove the O-ring (71) from the connection (28).
9. Slide out the retaining ring (96).
10. Use a small Phillips head screwdriver ("USAG 326 PH 0" type) to unscrew the three screws (140) that fasten the lid (141).

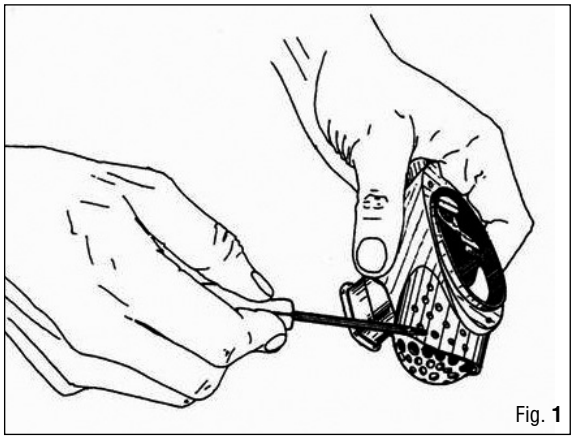


Fig. **1**

NOTE

WHEN REMOVING THE COVER, BE CAREFUL NOT TO MISPLACE THE SCREWS (140) AND WASHERS (151). WE SUGGEST THA T YOU DO NOT REMOVE THE SCREWS (140), MET AL W ASHERS (152), OR PLASTIC WASHERS (151) FROM THE COVER.

11. Remove the oval diaphragm (142).
12. Press on the pins in the exhaust grill (145) to remove it from the housing in the second stage case (32) (Fig. **1**).
13. Pressing from the inside of the second stage case (32), remove the exhaust valve holder (144) (Fig. **2**).

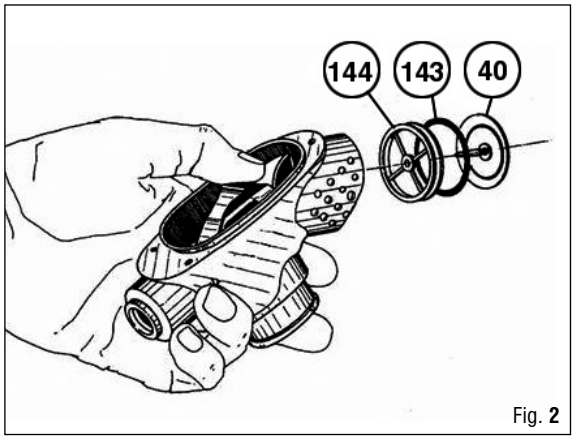


Fig. **2**

WARNING!

MARES RECOMMENDS THAT YOU NEVER EXER T ANY TYPE OF FORCE ON THE CENTER OR THE RAYS OF THE EXHAUST VALVE HOLDER. ONLY HANDLE THE CIRCUMFERENCE OF THE PIECE.

14. Remove the exhaust valve (40) and the O-ring (143) from the exhaust valve holder (144).
15. Use the special wrench (B-12) to unscrew the demand lever nut (33), removing the demand lever (35), the washer (34), the valve (30), and the spring (31) (Fig. **3**).

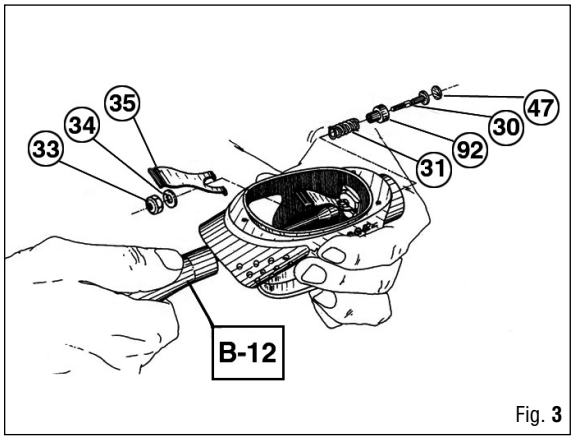


Fig. **3**

WARNING!

TO PREVENT THE V ALVE (30) FROM EJECTING VIOLENTL Y, MARES RECOMMENDS THA T YOU COVER THE EXIT OF THE CONNECTOR (91) WITH YOUR FINGER.

16. Remove the rubber seat (47) from the 2nd stage valve by pressing gently on the threaded stem.
17. Remove the seat holder (92) from the 2nd stage valve stem (30).
18. Push the demand lever connector (91) into the second stage case.
19. Remove the O-ring (83) from the seat in the second stage case (32).

CLEANING

WARNING!

WHEN WORKING WITH ANY KIND OF ACID, WEAR ADEQUA TE 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 plastic, silicone, or 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 SOL VENTS MA Y DAMAGE PLASTIC AND RUBBER P ARTS. BEFORE CLEANING MET AL COMPONENTS, MAKE SURE THAT ALL SEALS AND OTHER PARTS SUBJECT TO DETERIORATION HAVE BEEN REMOVED.

INSPECTION

Certain key components of the 2nd 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.
The components to replace are:

Quantity	N. Ref.	Description	Code
1	(71)	O-Ring 2050	Cod.46110211 cod. Viton 46110413
1	(83)	O-Ring 2068	Cod.46110225 cod. Viton 46110420
2	(27)	O-Ring 2025	Cod. 46110205 cod. Viton 46110411
1	(19)	O-Ring 106 Bp	Cod. 46110106 cod. Viton 46110402
1	(143)	O-Ring 2125	Cod. 46110175 cod. Viton 46110430
1	(47)	2nd stage poppet seat	Cod. 46184062
1	(33)	Demand lever adjusting nut	Cod. 46185051
1	(40)	Exhaust valve	Cod. 46184006
1	(43)	Mauthpiece clamp	Cod. 47157984

If these components are not replaced, they should at least be carefully inspected with a jeweler' s magnifying glass for the following defects.

DO NOT USE PARTS WITH THE FOLLOWING DEFECTS:

2nd stage case	**(32)**	Check that sealing surfaces are free of scratches, cracks, or deformations. Check that the threads in the seats for the cover screws are per fectly clean.
Cover	**(141)**	Check that sealing surfaces are free of scratches, cracks, deformations, or foreign particles. Make sure that sur faces under pressure (button) are not damaged or deformed.
Poppet seat	**(21)**	Check the integrity of the sealing sur face and the O-ring seat.
Diaphragm	**(142)**	Check for deformation, cuts, burrs or foreign particles. Any of these defects can cause leaks. It is recommended to replace it at each scheduled overhaul.
O-Rings	**(19-27-71-83-143)**	Check for cuts, burrs or foreign particles. The presence of any of these defects may result in leakage
Poppet seat holder	**(92)**	Check for cracks, cuts or deformation.
2nd stage poppet seat	**(47)**	Check for cuts, burrs or abrasion of the rubber
Demand lever adjusting nut	**(33)**	Verify its self-locking capacity and inspect for rust. It is recommended to replace it at each scheduled overhaul
Mouthpiece	**(44)**	Inspect for cuts, tears or signs of wear
Exhaust valve holder	**(144)**	Check that the surface that seals against the exhaust valve and the O-Ring seat are free of scratches or foreign particles, and that the rays are perfectly free of damage or wear.
Exhaust valve	**(40)**	Inspect for cuts, small holes, tears, or deterioration. It is recommended to replace it at each scheduled overhaul.
Soft hose	**(26**	Inspect for splits, blistering or any other signs of damage. Check that the O-ring seat are intact
Spring	**(31)**	Check for any split or broken coils
Threaded components	()	Check that all threads are clean and undamaged.

REASSEMBLY

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

20. Correctly reassemble the seat holder (92) snugly on the 2nd stage valve shaft (30) and position the rubber seat (47).

21. Place the 2nd stage poppet assembly and its spring (31) on the special tool (B-6).

22. Pressing gently, correctly insert the 2nd stage valve and its spring into the demand lever connector (91) (Fig. **4**).

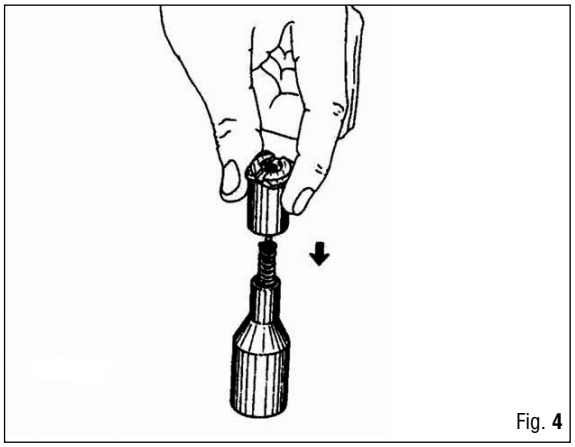


Fig. **4**

WARNING!

ROTATE THE DEMAND LEVER CONNECTOR (91) LEFT AND RIGHT IN ORDER TO CORRECTLY POSITION THE 2nd STAGE VALVE. (Fig. **4**)

23. Position the demand lever correctly in the groove on the demand lever connector (91), place the washer (34) on the valve stem, and tighten the adjusting nut (33) a few turns using the special wrench (B-12) (Fig. **5**).

NOTE MAKE SURE THAT THE DEMAND LEVER IS POSITIONED CORRECTLY WITH RESPECT TO THE DEMAND LEVER CONNECTOR (Fig. **5**).

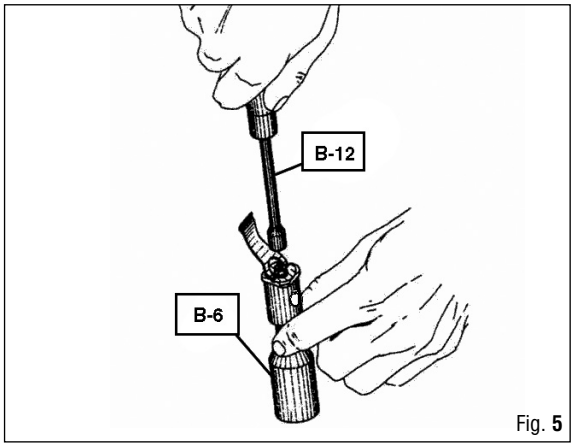


Fig. **5**

NOTE PRESS THE DEMAND LEVER A FEW TIMES TO CHECK THAT IT CAN MOVE FREELY.

24. Correctly insert the demand lever connector (91) into the seat in the second stage case (32) (Fig. **6**).

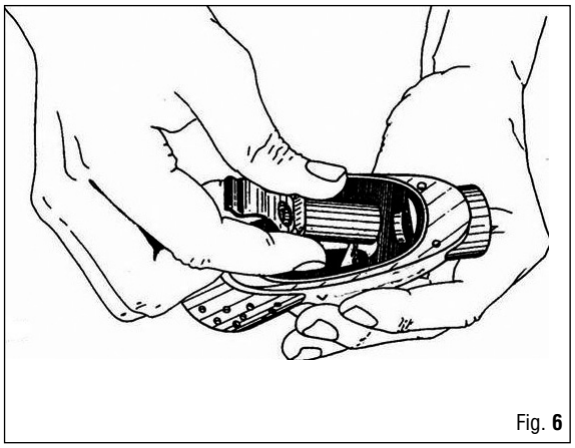


Fig. **6**

WARNING!

MAKE SURE THAT THE LEVER CONNECTOR IS POSITIONED AND ORIENTED CORRECTLY IN ITS HOUSING IN THE 2nd STAGE CASE (Fig. **6**).

25. Position the O-ring (83) in the corresponding seat using the special tool (B-6) (Fig. **7**).

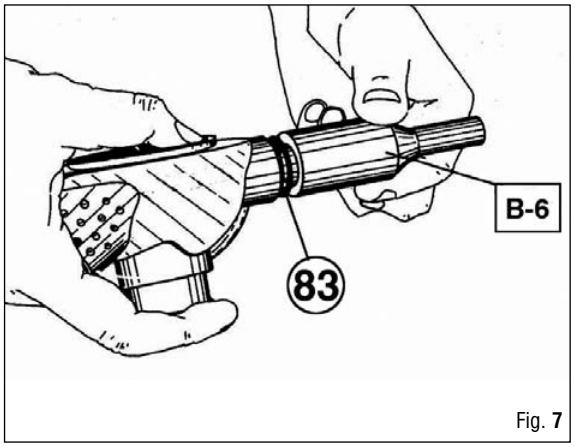


Fig. **7**

WARNING!

MAKE SURE THAT THE LEVER CONNECTOR HAS NOT SHIFTED INWARD INSIDE THE CASE DURING THIS OPERA TION. MARES SUGGESTS THAT YOU REST A FINGER ON THE BASE OF THE LEVER CONNECTOR TO PREVENT IT FROM MOVING INW ARD. **DO NOT EXERT PRESSURE ON THE LEVER!**

26. Arrange the O-ring (71) on the case assembly connector (28). Install the O-ring (27) on the poppet seat (21).

27. Use the hex wrench (B-4) to properly screw the poppet seat into the case assembly connector until it protrudes about 3 mm.

WARNING!

THE POPPET SEAT (31) MUST NOT EXTEND MORE THAN 3.8 mm OUT OF THE CONNECTOR (28). YOU CAN USE THE GAUGE (CODE:46106230) TO CHECK THE MAXIMUM PROTRUSION FROM THE CONNECTOR.

28. Place the retaining ring (96) correctly.

29. Correctly screw the case assembly connector into the demand lever connector. Tighten, but do not force, using the open end wrench (B-17).

30. Place the O-Rings (27) and (19) in the swivel hose coupling seat and the seat of the first stage coupling for the hose (26) respectively.

31. Using the two open end wrenches (B-17), tighten the swivel hose coupling (26) in the seat (28).

NOTE IF USING A TORQUE WRENCH, USE TIGHTENING TORQUE OF 8 - 8.5 N/m (70.8-75.2 in/lb).

ADJUSTMENTS

WARNING!

IN ORDER TO MAKE REASONABL Y ACCURATE ADJUSTMENTS TO THE REGULA TOR, REP AIR F ACILITIES MUST HA VE BOTH HIGH- AND LOW-PRESSURE AIR AVAILABLE. A SUBMERSIBLE PRESSURE GAUGE IS ALSO NEEDED TO CHECK THE INTERMEDIATE PRESSURE.
(N.B: A SUBMERSIBLE PRESSURE GAUGE WITH A FULL SCALE OF MAX. 30-40 BAR IS NEEDED TO ENSURE THA T ADJUSTMENTS WILL BE AS PRECISE AS POSSIBLE.)

I. Screw the intermediate pressure measuring gauge (cod. 46106252) into one of the 3/8" low-pressure ports, using the special wrench (B-18).

II. Using the wrench (B-18), screw the low-pressure hose with the partially-finished second stage to the D.F.C. port.

III. Position the unit on the valves (of the test bench or a tank) (Fig. **8**).

IV. Holding down the second stage demand button, slowly open the tank valve, releasing the demand button almost simultaneously.

V. Check the pressure gauge to see that the calibration value of the first stage is correct.

WARNING!

THE INTERMEDIATE PRESSURE READING OF THE FIRST ST AGE MUST BE TAKEN WHEN THERE ARE NO AIR LEAKS.
CONSULT THE MANUAL FOR ANY CALIBRA TIONS AND ADJUSTMENTS TO THE FIRST STAGE.

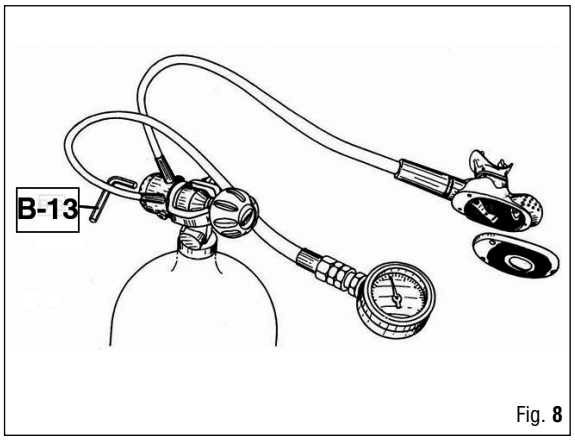


Fig. **8**

PROCEDURE FOR ADJUSTING THE INTERMEDIATE PRESSURE

A3. Place the oval diaphragm (142) into the seat in the cover (141).

WARNING!

CHECK THAT THE COVER AND THE SURFACE OF THE SECOND STAGE CASE WHERE THE DIAPHRAGM SEAL SITS ARE PERFECTLY CLEAN AND UNDAMAGED.
CHECK THE PROPER POSITION OF THE DIAPHRAGM INSIDE THE COVER, AND CHECK FOR THE THREE PLASTIC WASHERS (151).

A3. Correctly position the cover (141) with the oval diaphragm (142) on the second stage case (32).

WARNING!

YOU SHOULD GREASE THE THREE COVER SCREWS WITH SILICONE GREASE.

WARNING!

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

B4. Use the special tool (B-12) to tighten or loosen the adjusting nut (33) to adjust the height of the demand lever (35) (Fig. **9**).

WARNING!

THE DEMAND LEVER IS ADJUSTED CORRECTLY WHEN YOU CAN PRESS THE PURGE BUTTON ON THE COVER DOWN ABOUT 1 mm BEFORE AIR BEGINS TO RELEASE.

32. Press the purge button a few times.

33. Place the O-Ring (143) in the seat of the exhaust valve holder (144).

34. Carefully install a new discharge valve (40), pulling the silicone stem through the central hole of the exhaust valve holder (144) (Fig.**10**).

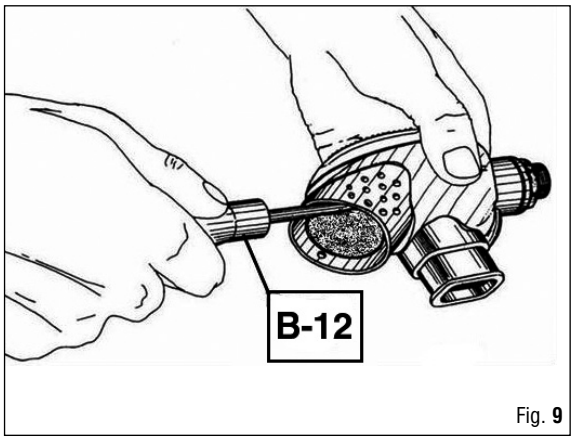


Fig. **9**

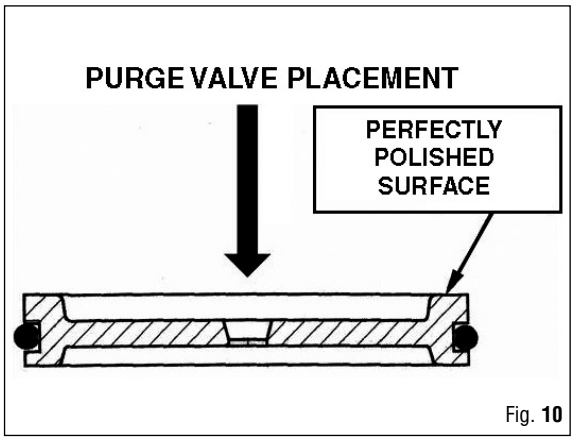


Fig. **10**

WARNING!

IN ORDER TO AVOID DAMAGING THE EXHAUST VALVE, DO NOT PULL TOO HARD ON THE STEM.

35. Set the exhaust valve holder (144) over the seat in the second stage (32) with the exhaust valve side facing outward.

36. Touching the edges of the valve holder (144) in the seat inside the second stage case (32)

WARNING!

IN ORDER TO AVOID DAMAGING THE EXHAUST VALVE, DO NOT PULL TOO HARD ON THE STEM.

37. Position the exhaust grill (145) by inserting the tabs into the corresponding seats in the second stage case (32).

38. Carefully install the mouthpiece (44), fastening it with a new clamp (43).

WARNING!

FOR CHECKS AND ADJUSTMENTS ON THE SECOND ST AGE, CONSULT THE CORRESPONDING SECTION OF THE MAINTENANCE MANUAL.

WARNING!

WHEN ADDITIONAL ADJUSTMENTS ARE NEEDED, REMOVE THE COVER AND THE EXHAUST V ALVE HOLDER AS DESCRIBED IN THE “DISASSEMBLY” SECTION UNDER STEPS 10, 11, AND 14. WHEN YOU HA VE FINISHED ALL THE REQUIRED ADJUSTMENTS, REASSEMBLE THE PARTS BY FOLLOWING THE INSTRUCTIONS CONCERNING ADJUSTMENT OF THE DEMAND LEVER AND THEN STEPS 32 - 38.

SUBJECT: IDENTIFING THE NEW 2° STAGE REBEL 2K6

ITM14

PLEASE BE INFORMED THAT MARES HAS DESIGNED A NEW METAL INSERT ON THE 2ND STAGE REBEL. THE NEW METAL INSERT PROVIDES INCREASED RESISTANCE TO WEAR AND IMPROVES PERFORMANCE IN COLD W ATER CONDITIONS. INITIALLY THE NEW REGULA TORS CAN BE IDENTIFIED BY THE SERIAL NUMBERS PRECEDED BY THE LETTER "R" AS INDICATED IN CHAR T N° 1. SUBSEQUENTL Y THE NEW REGULA TORS CAN BE IDENTIFIED BY THE SERIAL NUMBERS PRECEDED BY THE LETTERS INDICATED IN CHART N°2.
THE NEW REGULA TOR REBEL CAN ALSO BE IDENTIFIED BY A VISIBLE DIFFERENCE OF THE SP ACER RING ON THE CONNECTOR, AS YOU CAN SEE IN THE PHOTO N°4, P AGE 2.
THE NEW REBEL SECOND ST AGE CASE IS NOT INTERCHANGEABLE WITH THE PREVIOUS VERSIONS OF THE REBEL SECOND STAGE CASES. THEREFORE, IF IS IT NECESSAR Y TO REPLACE THE CASE OF THE PREVIOUS SECOND ST AGE REBEL (46200287) IT IS NECESSAR Y TO REQUEST TO MARES THE COMPONENTS WITH THE RELA TIVE QUANTITIES INDICATED IN THE CHART N°3.

CHART N°1

CODE	DESCRIPTION	SERIAL NUMBERS
416201	MR 12 REBEL 2K6	R RB 23263
416201	MR 12 REBEL 2K6	R MJ 10003
416202	R 2 REBEL 2k6	R RL 14199

CHART N°2

CODE	DESCRIPTION	SERIAL NUMBERS
416201	MR 12 REBEL 2K6	ER 10001
416202	R 2 REBEL 2k6	RI 10001
416534	OCTOPUS REBEL 2k6	OO 10001

REQUIRED COMPONENTS FOR THE SUBSTITUTION OF THE 2° STAGE REBEL CASE OLD (46200287)

CHART N°3

CODE	DESCRIPTION	QUANTITY
46200703	CASE OF 2° STAGE	1
46200693	METAL INSERT	1
46200225	BY-PASS RETENTION RING	1
46110225	OR 2068	1

PHOTO 4

ATTENTION!

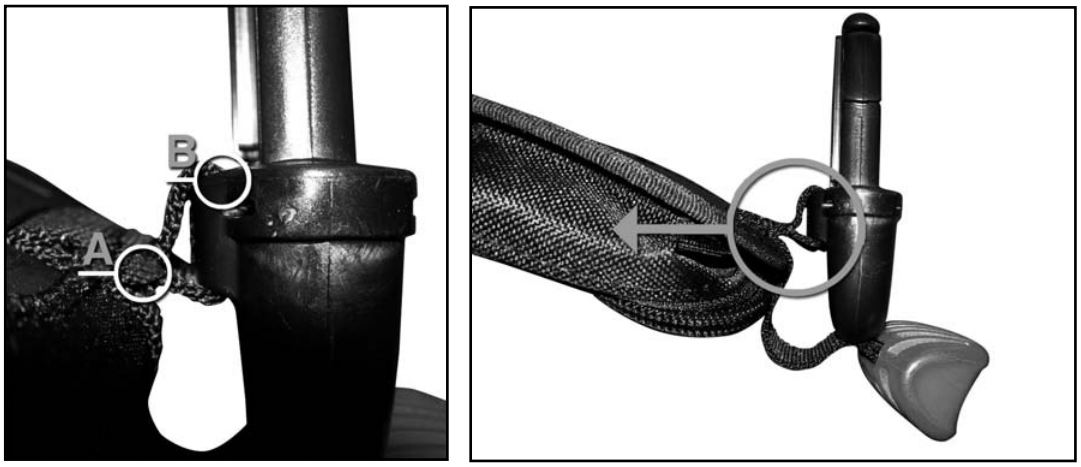
MAINTENANCE AND/OR UPDA TE PROCEDURES MUST BE PERFORMED ON THE REBEL REGULA TOR BY QUALIFIED PERSONAL AT A MARES TECHNICAL CENTER AND/OR AUTHORIZED MARES DISTRIBUTOR.
FOR THE DISASSEMBLY, REASSEMBLY, ADJUSTMENTS AND CHECKS PLEASE CONSULT THE PROCEDURES DESCRIBED IN THE MAINTENANCE MANUAL.
SHOULD THE UPDA TED MANUALS CONT AINING MAINTENANCE INSTRUCTIONS BE ABSENT OR IF INSTRUCTIONS ARE UNCLEAR OR NOT ENTIREL Y UNDERST ANDABLE PLEASE CONT ACT MARES BEFORE PERFORMING ANY MAINTENANCE ADJUSTMENT OR CHECKS.

SUBJECT: MRS PLUS

ITM15

MARES WISHES TO INFORM YOU THAT DUE TO INCORRECT USAGE PROCEDURES, CERTAIN CASES HAVE OCCURRED IN WHICH THE MRS SYSTEM PLUS DOES NOT OPERA TE PROPERLY, WITH A CONSEQUENT DIFFICUL TY AND/OR FAILURE TO RELEASE THE WEIGHT POCKET BUCKLE FROM ITS HOUSING IN THE BC.
THIS DIFFICULTY CAN BE ATTRIBUTED TO AN INCORRECT POSITION OF THE BUCKLE WITH RESPECT TO THE STITCHING ON THE STRAP; AS CLEARLY ILLUSTRATED IN FIGURE 1, BETWEEN POINT A (STITCHING A T THE EDGE OF THE STRAP), AND POINT B (ON THE PLASTIC BUCKLE F ASTENER), THE BUCKLE HAS MOVED (APPROXIMA TELY 8 mm). WHEN RELEASING, THIS SHIFT MEANS THAT ALL FORCE APPLIED MUST BE SUSTAINED BY THE INTERNAL MECHANISM, WITH THE POSSIBILITY OF DAMAGE TO IT IN FEW CASES.

FIG. 1



IN ORDER TO AVOID THIS PROBLEM, BEFORE INSERTING THE BUCKLE, CAREFULLY CHECK THE CORRECT POSITION OF THE BUCKLE. THE CORRECT POSITION IS ILLUSTRA TED IN FIGURE 2, WHERE THE MAXIMUM DISTANCE BETWEEN POINT A AND POINT B IS 3 mm.

FIG. 2