

**DACOR REPAIR MANUAL
VOLUME THREE**



DACOR REPAIR MANUAL

VOLUME THREE

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GENERAL INFORMATION

HTM SPORT, based in Salita Bonsen, Rapallo, Italy, manufactures and markets a complete line of diving equipment under the **DACOR** brand.

The **DACOR** brand represents an assurance of exceptional quality, which diving enthusiasts have come to associate with this name.

DACOR TECHNICAL MANUAL

DACOR offers all its authorized dealers the opportunity of attending technical training courses at its factory. Dealers are strongly advised to obtain specific practical training in the servicing of **DACOR** diving equipment before undertaking the professional repair and servicing of diving equipment.

This manual is intended as a guide for experienced repair personnel, and not as a substitute for a **DACOR** Technical Training Course or as a comprehensive instruction book on all aspects of diving equipment for inexperienced repair personnel.

IMPORTANT !

Possession of this manual does not constitute an implicit concession or authorization, on the part of **DACOR**, for servicing its products. With the exception of **DACOR** Authorized Service Centers, any person attempting to service the equipment automatically takes on full responsibility for any damage or hazards which may result from a maintenance operation carried out incorrectly.

If the instructions provided in the manual are unclear or difficult to understand, please contact **DACOR** before attempting any maintenance action.

DACOR also recommends that even experienced technicians carefully read all parts of this manual before undertaking any repairs

IMPORTANT !

Carefully read all parts of this manual before carrying out any maintenance operations on diving equipment.

DACOR RESERVES THE RIGHT TO MODIFY THE PRODUCTS, PROCESSES AND TECHNICAL CHARACTERISTICS AT ANY TIME, AS THE NEED ARISES. IT IS THE TECHNICIAN'S RESPONSIBILITY TO OBTAIN UP-TO-DATE INFORMATION CONCERNING THE TECHNICAL CHARACTERISTICS AND THE REPAIR AND MAINTENANCE PROCEDURES FOR **DACOR** PRODUCTS.


SERIAL NUMBERS

All regulators are identified by a unique serial number, stamped on both the first and second stage. On the Viper tec first stage, the serial number is stamped on the 1st stage body.

WARRANTY

The warranty certificate is included in the regulator packaging, and must be signed, stamped and consigned to the customer at the time of the sale. As stated in the booklet included with the regulator, the warranty certificate is the definitive attestation.

Essentially, the warranty certificate states that **DACOR** regulators are guaranteed for a period of 2 years, provided that certain conditions are met: these include possession of a valid warranty certificate and the annual overhaul of the regulator by a **DACOR Service Center**.

REPAIR PROCEDURE	PAGE	INTRODUCTION		
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ROUTINE MAINTENANCE

Although all **DACOR** regulators are constructed from corrosion-proof materials, to ensure maximum performance and reliability the user is advised to scrupulously follow the instructions in the booklet which is included, together with the warranty certificate, inside the regulator packaging. The regulator should be rinsed in fresh water while it is still pressurized (connected to the tank). This makes it possible to wash the inside of the second stage without allowing contaminants to reach its critical sealing surfaces.

If the regulator is not pressurized, to prevent contamination of the filter and the first stage do not allow water to enter the air inlet of the first stage. **After drying the regulator**, place the first stage dust cap on the filter and secure it with the yoke knob.

Rinse the first stage, also flushing water through the second stage mouthpiece and the exhaust ports (tee) to eliminate any impurities. **Do not press the purge button during rinsing**. Pressing this button opens the second stage valve, permitting the entry of impurities which may cause the regulator to leak. Allow the regulator to dry thoroughly before putting it away. If the regulator is exposed for prolonged periods to direct sunlight, or left in greasy or dusty environments, some of its components may be damaged.

No lubricants are required, and in fact should not be used for the routine maintenance of the regulator.


SERVICE CENTER OVERHAUL

As required by the warranty, regulators must undergo an annual overhaul. This scheduled overhaul includes: disassembly, cleaning, inspection and reassembly with calibration and adjustments. In some cases it may be necessary to replace certain components. These operations should never be carried out by unauthorized personnel or by the user himself, but only by a **DACOR Service Center**.

GENERAL OVERHAUL

General Information

The Service Center overhaul essentially consists of cleaning, inspection, repairs and adjustments of the regulator. Regulators incorporate many O-rings, and cleaning is of the utmost importance to ensure perfect efficiency of the seals; consequently, the dealer is strongly advised to work in a clean and uncontaminated environment. Furthermore, experience has shown that, in the case of repetitive repairs, it is well worth taking the time to modify standard tools and devise custom measurement instruments. A description of some of these tools is provided in the section devoted to the overhaul procedure. The tools necessary for repairing and servicing the regulators are described in the appendix of this manual.

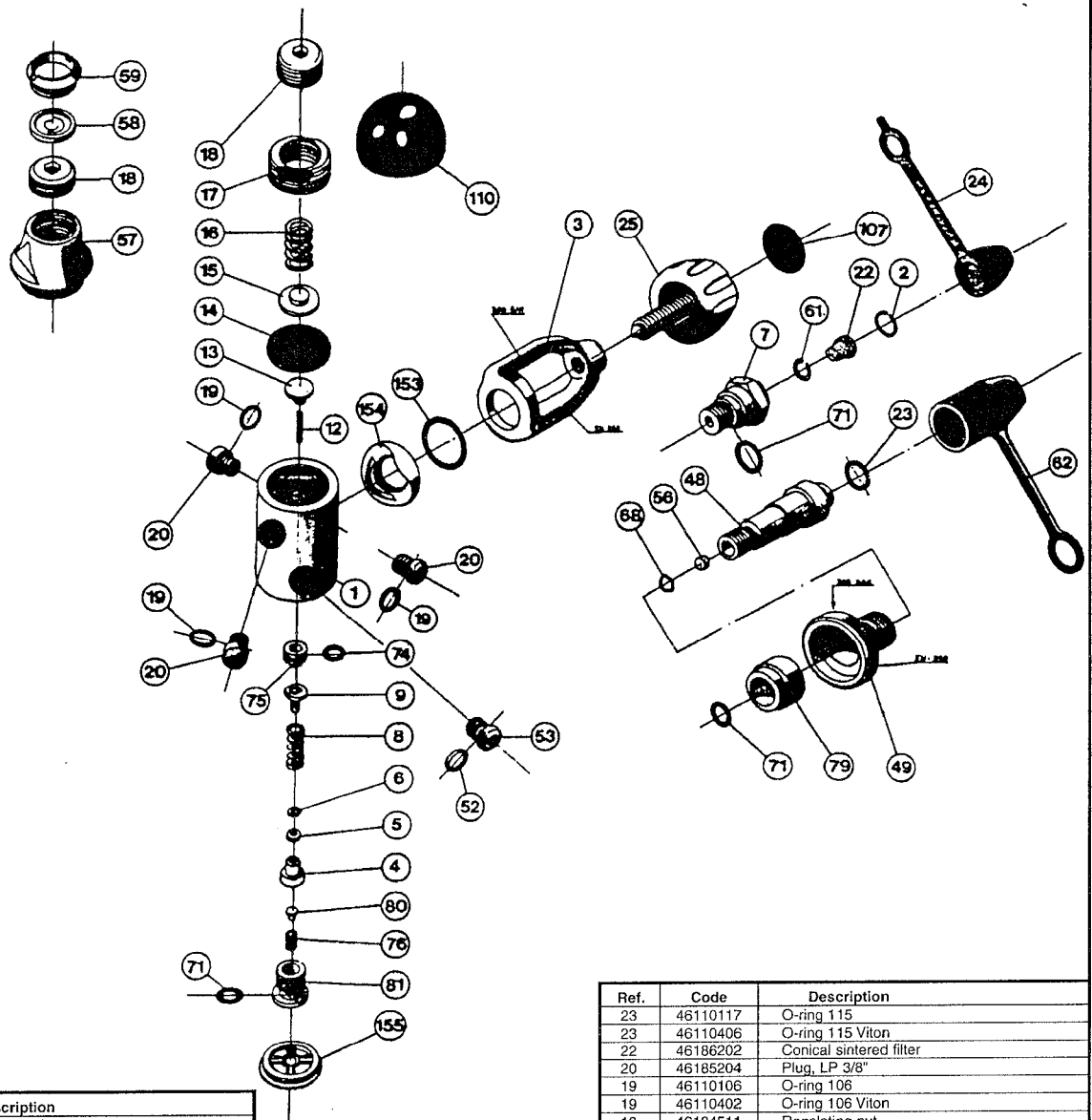
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**DACOR REPAIR MANUAL
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SECTION 1**

FIRST STAGE REGULATOR



**D 16
FIRST STAGE**



Ref.	Code	Description
155	46187015	Plastic protection
154	46187016	Plastic ring
153	46110229	O-ring 3118
110	46187012	Protection cap
107	46187013	Knob assembly label
81	46186208	Plug
80	46186206	HP housing button
79	46183034	Space ring, DIN connector
76	46186210	Spring, HP housing
75	46186216	Poppet seat
74	46110107	O-ring 2031
74	46110403	O-ring 2031 Viton
71	46110211	O-ring 2050
71	46110413	O-ring 2050 Viton
68	46183052	Spring, DIN connector
62	46183013	Dust cup, DIN connector
61	46185013	Spring filter
59	46185302	Bezel, A.E.R.
58	46185301	Diaphragm A.E.R.
57	46187042	Body A.E.R.
56	46183053	Filter for DIN Connector
53	46185205	Plug, HP 7/16"
52	46110108	O-ring 108
52	46110404	O-ring 108 Viton
49	46183001	DIN connector wheel
48	46183035	DIN connector body
25	46187007	Knob assembly
24	46187011	Dust cap (IN)

Ref.	Code	Description
23	46110117	O-ring 115
23	46110406	O-ring 115 Viton
22	46186202	Conical sintered filter
20	46185204	Plug, LP 3/8"
19	46110106	O-ring 106
19	46110402	O-ring 106 Viton
18	46184511	Regulating nut
17	46184510	Retaining nut
16	46185023	Spring diaphragm
15	46185034	Plate, spring base
14	46185022	Diaphragm
13	46186213	Button, poppet
12	46186214	Pin, poppet
9	46185002	Poppet
8	46185011	Spring, poppet
7	46186241	Nut, yoke retainer
6	46110101	O-ring 2012
6	46110401	O-ring 2012 Viton
5	46185038	Back-up ring
4	46185209	Poppet retainer
3	46187003	Yoke
2	46185015	Retaining ring
1	46187001	Body
ASSEMBLIES		
***	46187235	First stage assy, D16 INT
***	46187239	First stage assy, D16 DIN
***	46187224	First stage maintenance kit D 16 INT (2-5-6-19-22-52-71-74)
***	46187225	First stage maintenance kit D 16 DIN (5-6-19-23-52-56-68-71-74)
***	46187226	First stage maintenance kit D 16 INT Nitrox (2-5-6-19-22-52-71-74)
***	46187227	First stage maintenance kit D 16 DIN Nitrox (5-6-19-23-52-56-68-71-74)

D 16 FIRST STAGE

DISASSEMBLY

To facilitate the disassembly operations, the technician is advised to disassemble the hoses connected to the First Stage ports and replace them with the corresponding port plugs.

1. Unscrew the perforated cap (155) from the first stage.
2. Using the Allen wrench (B-8), unscrew the first stage plug assembly. (81-71-76-80).
3. Remove the O-ring (71), the anti-drag head (80) and the spring (76) from the first stage plug assembly.
4. Remove the HP chamber assembly (4-5-6), the spring (8), the first stage poppet (9) and the poppet pin (12) from the first stage body (1). (Fig. 1).

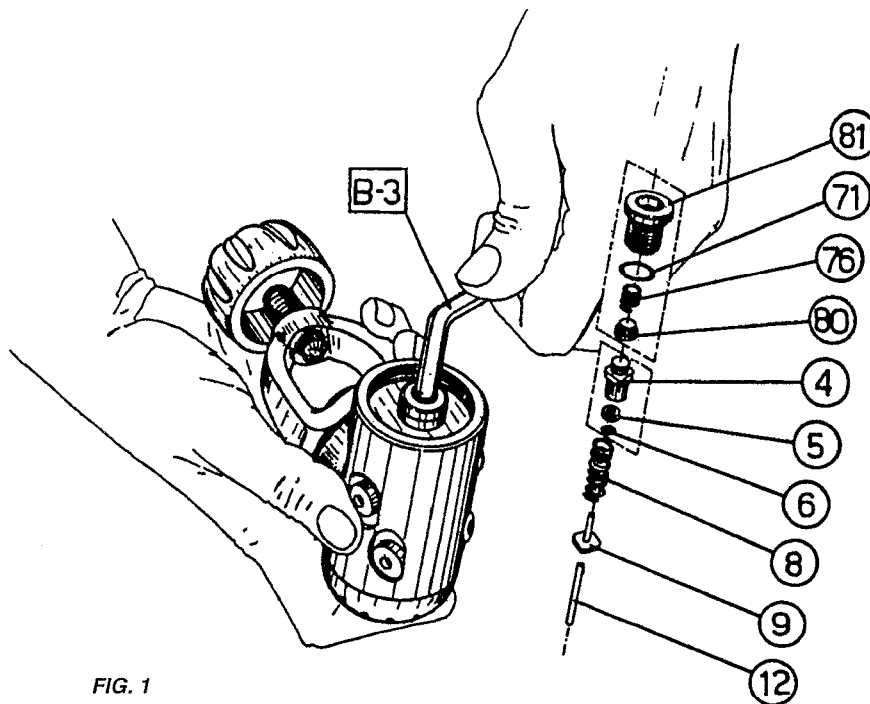


FIG. 1

5. Remove the O-ring (6) from the HP chamber.

WARNING

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


6. Position the special tool (B-21) on the first stage poppet seat (75), exerting a slight pressure; pressurize one of the low pressure ports with compressed air (below 7 bar). (Fig. 2)

NOTE

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

WARNING

DO NOT ATTEMPT TO REMOVE THE POPPET SEAT USING SHARP OR POINTED TOOLS; SCRATCHES ON THE SEATING SURFACE MAY CAUSE DEFECTIVE OPERATION.

D 16 FIRST STAGE	PAGE	D 16 FIRST STAGE		
	1-2	First Stage Regulators	05/99	

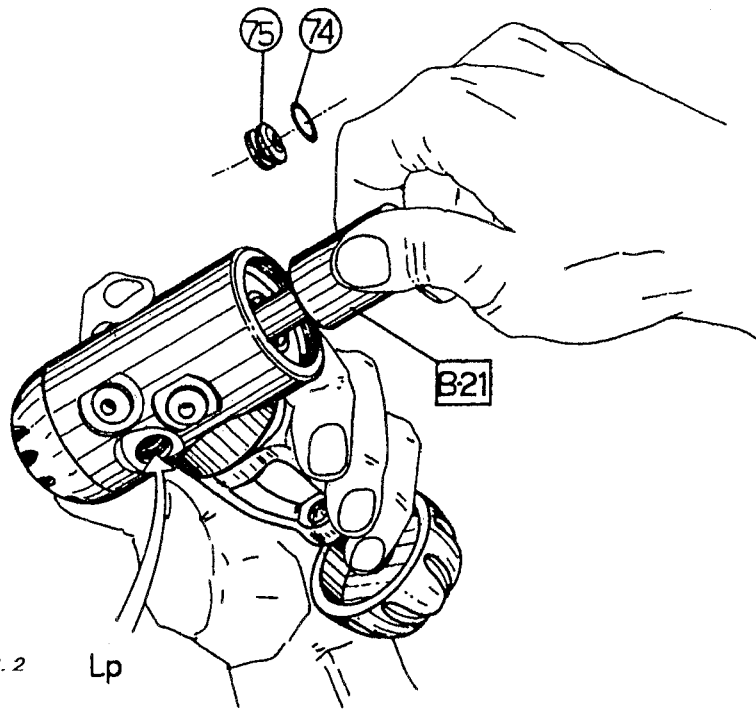


FIG. 2 Lp

7. Remove the poppet seat (75) from the first stage and remove the O-ring (74).
8. Screw the first stage disassembly tool (B-5) into a 3/8" low pressure port.
9. Remove the protection cap (110).
10. Using the Allen wrench (B-13), unscrew the adjusting nut (18) and pull out the spring (16). (Fig. 3)

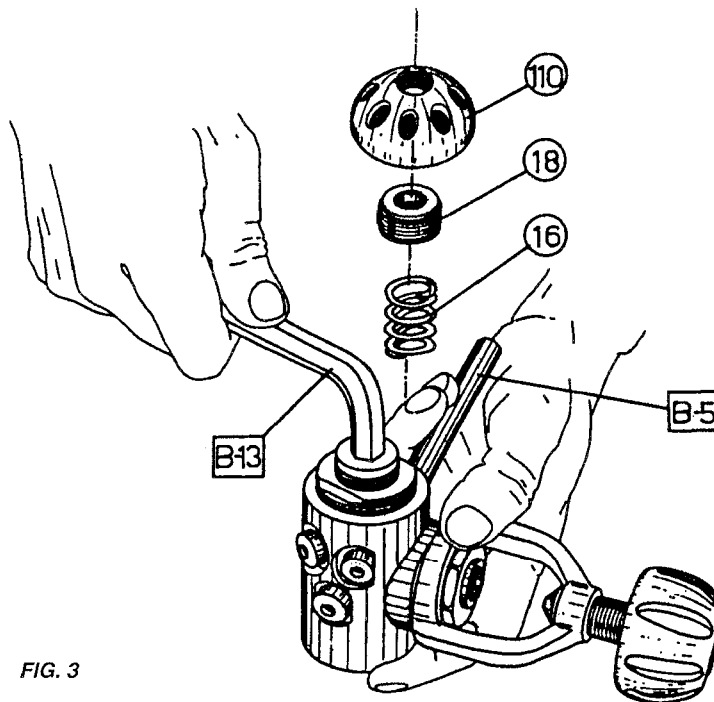



FIG. 3

	D 16 FIRST STAGE		PAGE	REPAIR PROCEDURE
	First Stage Regulators	05/99	1-3	

11. Unscrew the retaining nut (17) with the wrench (B-2), and remove the spring base plate (15). (Fig. 4)

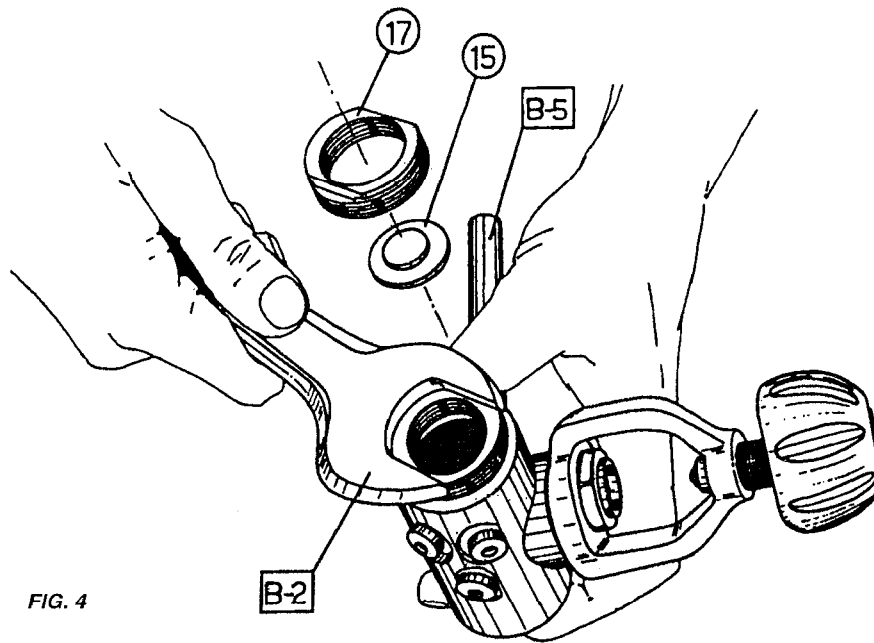


FIG. 4

12. Introduce low pressure air (below 100 PSI) and remove the diaphragm (14) and the poppet button (13). (Fig. 5)

WARNING ▲

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

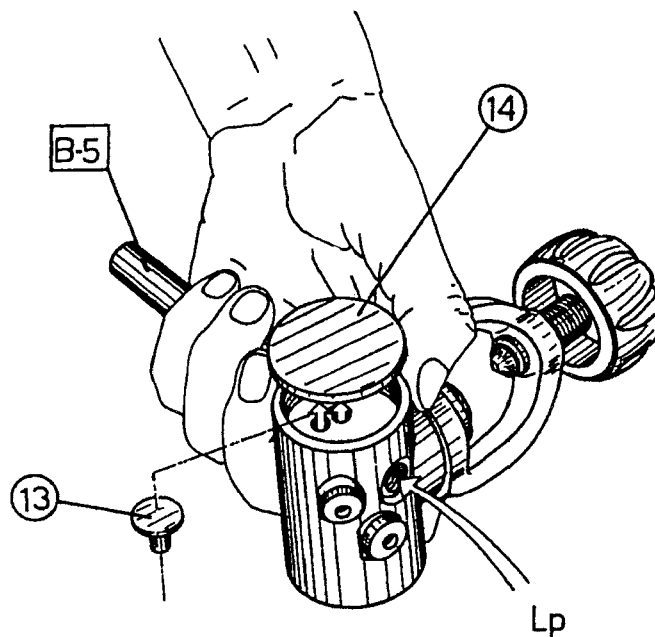



FIG. 5

REPAIR PROCEDURE	PAGE	D 16 FIRST STAGE		
	1-4	First Stage Regulators	05/99	

13. Unscrew the yoke retainer nut (7) using the special wrench (B-1); Remove the yoke (3) together with knob (25), and the connector (154) with O-ring (153). (Fig. 6).

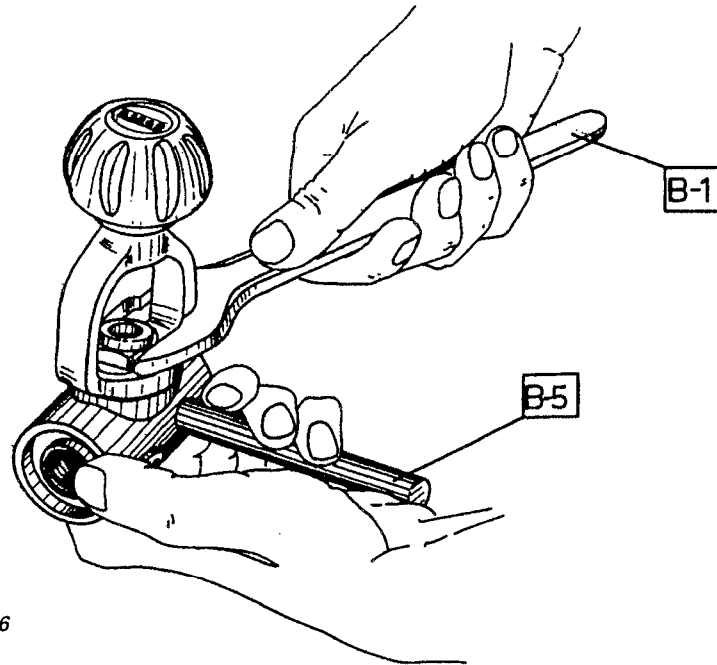


FIG. 6

14. Using the snap ring pliers (B-14), remove the snap ring (2), the tapered sintered filter (22) and the filter spring (61) from the yoke retainer nut (Fig. 7).

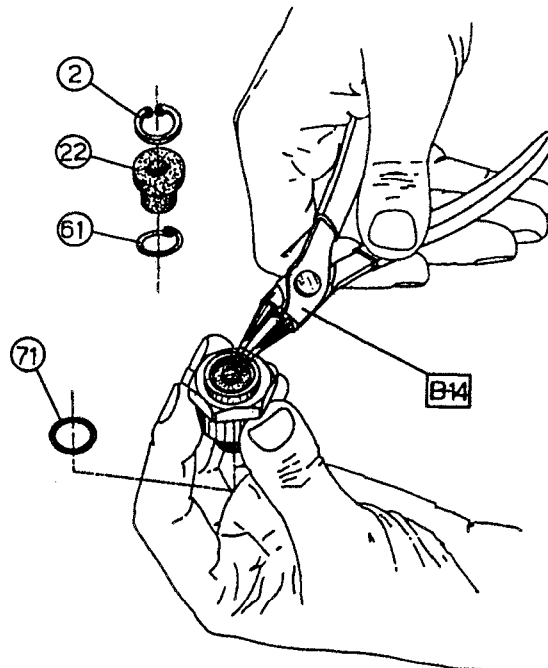



FIG. 7

15. Remove the O-ring (71) from the yoke retainer nut.

	D 16 FIRST STAGE		PAGE	REPAIR PROCEDURE
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DIN version

DISASSEMBLY:

(instead of steps 13 - 14 - 15)

- A. Using a 6-mm Allen wrench (B-8), unscrew the DIN connector body (48) from the first stage body (1).
 - B. Remove the O-ring (71).
 - C. Pull out the spacer bushing (79) and the threaded locking ring (49).
 - D. Remove the O-ring (23).
 - E. With the help of a small flat blade screwdriver, remove the pentagonal spring (68) and remove the sintered filter (56).
16. Unscrew the disassembly tool (B-5) and the high (53) and low (20) pressure port plugs from the first stage body. Remove the O-rings (52) and (19).

CLEANING

WARNING

WHEN WORKING WITH ANY KIND OF ACID, USE 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 SUBMERGE THE FIRST STAGE POPPET AND THE TAPERED SINTERED FILTER IN AN ACIDIC 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.

The components to replace are:

- Snap ring	(2)	- cod. 185015	
- Tapered sintered filter	(22)	- cod. 186202	
- LP O-rings	(19)	- cod. 110106	cod. Viton 110402
- HP O-rings	(52)	- cod. 110108	cod. Viton 110404
- HP chamber O-ring	(6)	- cod. 110101	cod. Viton 110401
- First stage plug assembly O-ring	(71)	- cod. 110211	cod. Viton 110413
- Poppet seat O-ring	(74)	- cod. 110107	cod. Viton 110403
- Yoke retainer nut O-ring	(71)	- cod. 110211	cod. Viton 110413
- DIN connector O-ring (DIN versions only)	(23)	- cod. 110117	cod. Viton 110406

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

REPAIR PROCEDURE	PAGE	D 16 FIRST STAGE		
	1-6	First Stage Regulators	05/99	

DO NOT USE PARTS WITH THE FOLLOWING DEFECTS:

- Snap rings:** Check for distortion, cracking or damaged edges. It is advisable to always replace them with new ones.
- First Stage poppet:** Check for cuts, burrs or abrasion of the rubber and separation of the rubber from the poppet body.
Make sure that the hole through the poppet stem is not obstructed by foreign bodies.
- Tapered sintered filter:** Inspect for sedimentation and rust. Rust deposits may indicate corrosion of the air tanks. Check for any cracks.
- HP chamber:** Inspect the interior for any foreign matter or particles.
- Backup ring:** Make sure that it is correctly positioned inside the HP chamber, and inspect its surface for deformations or foreign particles.

WARNING ▲

THE BACKUP RING SHOULD BE REPLACED EVERY TIME IT IS REMOVED FROM THE HP CHAMBER.

- O-Rings:** Check for cuts, deformation or foreign particles. The presence of any of these defects may result in leakage.
- First stage diaphragm:** Check for splitting, cuts, tears or major surface deformations.
- First stage body:** Check for scratches on the diaphragm sealing surfaces, the port plug seats and the poppet seat housing.
- Poppet seat:** Check for chipping, scratches and/or foreign particles on the sealing surface and in the O-ring seat.
- 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:** Check for any split, deformed or broken coils.
- Threaded components:** Check that all threads are clean and undamaged.

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 SECOND 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 LUBRICATED WITH SPECIAL OXYGEN-COMPATIBLE GREASE. **DO NOT USE SILICONE GREASE!**


1. Screw the disassembly tool (B-5) into a low pressure port (3/8") on the first stage body.
2. Reassemble the O-ring (71) on the yoke retainer nut (7).
3. Assemble the filter spring (61) and the tapered sintered filter (22) in the yoke retainer nut body.
4. Using the snap ring pliers (B-14), fit the snap ring (2) in its position above the filter.

NOTE
ROTATE THE SNAP RING TO CHECK ITS CORRECT POSITIONING.

5. Correctly position the yoke (3) with knob (25) and the connector (154) with O-ring (153) on the first stage body.
6. Using the wrench (B-1), fully lock down the yoke retainer nut assembly (7-71-61-22-2).

WARNING ▲

TO PREVENT THE YOKE RETAINER NUT (7) FROM ACCIDENTALLY WORKING LOOSE, APPLY TWO DROPS OF THREAD COMPOUND (TYPE LOCTITE 242E) ON THE THREAD ITSELF AND ON THE PART FURTHEST FROM THE O-RING. **DO NOT APPLY THE THREAD COMPOUND TO THE O-RINGS !**

	D 16 FIRST STAGE		PAGE	REPAIR PROCEDURE
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DIN Version

REASSEMBLY:

(Instead of steps 2-6)

- F. Place the sintered filter (56) into its housing on DIN connector (48) and fix it in place with spring (68).
 - G. Place O-Ring (23) into the housing of DIN connector (48).
 - H. Place the DIN connector wheel (49) and the spacer ring (79) on DIN connector (48).
 - I. Place the O-ring (71) into the housing of DIN connector (48).
 - J. Using the 6 mm. wrench (B-8), tighten the DIN connector (48) in the 1st stage body (1).
7. Unscrew the disassembly tool (B-5) from the first stage body.
 8. Reassemble the O-ring (74) on the poppet seat (75).
 9. Correctly position the poppet seat on the special tool (B-21).
 10. Exerting a slight pressure, push the poppet seat into position within the first stage body. (Fig. 8)

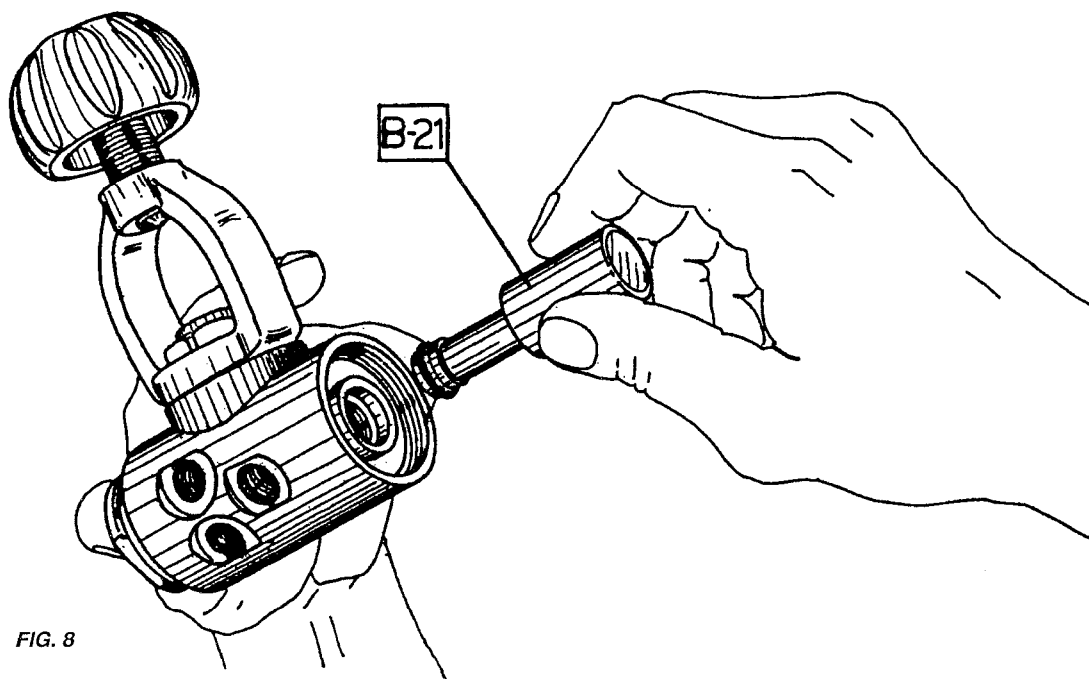


FIG. 8

11. Correctly position the first stage poppet (9) on the poppet seat.


WARNING ⚠

CHECK THAT THE POPPET IS CORRECTLY POSITIONED ON THE SEAT.

12. Place the spring (8) on top of the poppet.
13. Fit the backup ring (5) (if it was disassembled) and the O-ring (6) in the HP chamber.
14. Position the HP chamber assembly (4-5-6) on top of the spring.
15. Reassemble the O-ring (71) on the first stage plug assembly (81).
16. Correctly insert the anti-drag head (80) in the spring (76).
17. Press on the anti-drag head and snap components (76+80) into the plug assembly.

WARNING ⚠

IT IS RECOMMENDED TO REASSEMBLE COMPONENTS (76+80) WITH THE HELP OF A PLASTIC ROD, TO AVOID DAMAGING THEM. CHECK THAT THE POSITION IS CORRECT (FIG. 9)

REPAIR PROCEDURE	PAGE	D 16 FIRST STAGE		
	1-8	First Stage Regulators	05/99	

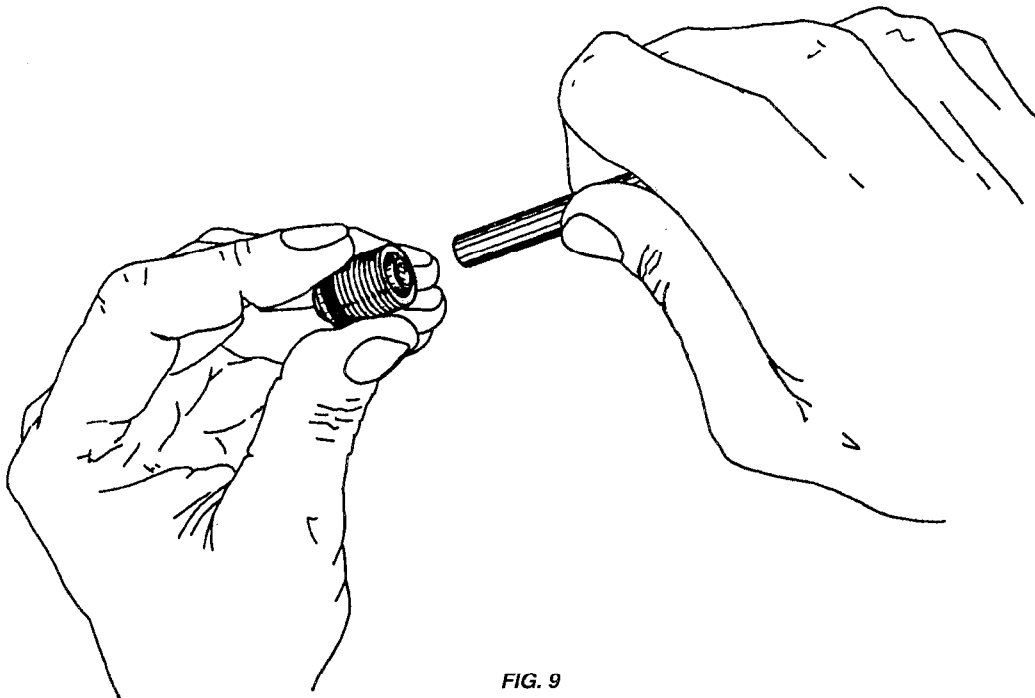


FIG. 9

18. Using the Allen wrench (B-8), lock down the plug assembly on the first stage body.
19. Screw the perforated cap (155) into the first stage body, without overtightening.
20. Insert the poppet pin (12) in the center hole of the first stage body.
21. Place the poppet button (13) on the pin and press a few times to check its movement and the correct positioning of the first stage poppet.
22. Install the first stage diaphragm (14), positioning it correctly in its seat.
23. Position the spring base plate (15) on the diaphragm.
24. Lightly lubricate the sealing edge of the retaining nut (17) and screw it into the first stage body, locking it down fully with the wrench (B-16).

NOTE


IF A TORQUE WRENCH IS USED, USE A TORQUE SETTING OF APPROXIMATELY 3 - 3.5 Kg/m - 260-304 in/lb (30 - 35 N/m 265-309 in/lb).

25. After having lightly lubricated the ends of the spring (16), center it on the base plate.
26. Using the Allen wrench (B-13), lock down the adjusting nut (18) through 2-3 turns in the retaining nut.

NOTE

DO NOT OVERTIGHTEN THE ADJUSTING NUT; THIS INCREASES THE INTERMEDIATE PRESSURE AND INTERFERES WITH THE SUBSEQUENT ADJUSTMENTS.

27. Fit the protection cap (110).
28. Fit the low (19) and high (52) pressure O-rings on the corresponding plugs (20) and (53) or on the hoses.
29. Lock down the plugs and/or hoses on their respective first stage ports.

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ADJUSTING THE INTERMEDIATE PRESSURE ON THE VIPER TEC FIRST STAGE (Fig. 10).

WARNING

DO NOT SUBMERGE THE INTERMEDIATE PRESSURE MEASURING GAUGE.

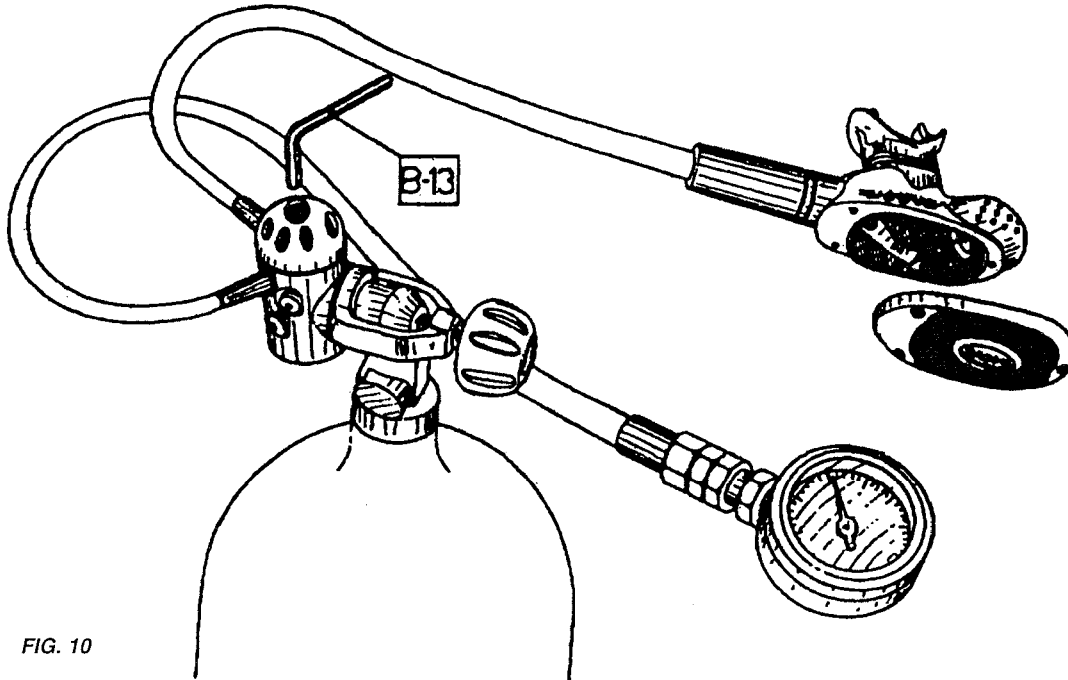


FIG. 10

TABLE OF FIRST STAGE INTERMEDIATE PRESSURES		
<i>MODEL</i>	<i>P.S.I.</i>	<i>BAR</i>
D 16	142 - 148	9,8 - 10,2
D 12	142 - 148	9,8 - 10,2

TABLE OF FIRST STAGE INTERMEDIATE PRESSURE WITH A.E.R. KIT		
<i>MODEL</i>	<i>P.S.I.</i>	<i>BAR</i>
D 16	130 - 136	9 - 9,4
D 12	130 - 136	9 - 9,4

PROCEDURE FOR ADJUSTING THE INTERMEDIATE PRESSURE


1. Screw the intermediate pressure measuring gauge (cod. 106252) into one of the 3/8" low pressure ports, using the special tool (B-18).
2. Using tool (B-18), apply the hose with the partially finished second stage to the D.F.C. port.
3. Mount the regulator group on the control valve (of a tank or Test Bench).
4. Holding down the second stage demand lever, slowly open the tank valve and, almost simultaneously, release the demand lever.
5. Read the value of the first stage adjustment on the pressure gauge, and proceed as follows (Fig. 12):
 - a) If the first stage adjustment is **higher** than the required value (see table), use the wrench (B-13) to slowly back off the adjusting nut (16) until the specified value is obtained.

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NOTE

WHENEVER THE INTERMEDIATE PRESSURE IS REDUCED, IT IS NECESSARY TO VENT THE EXCESS AIR IN ORDER TO OBTAIN A CORRECT READING OF THE ADJUSTMENT.

- b) If the first stage adjustment 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 adjustment remains constant.
- 7. After completing the second stage adjustments, remove the pressure gauge and screw on the corresponding port plug.

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A.E.R. COLD WATER DIVING KIT FOR DACOR DIAPHRAGM REGULATORS

WARNING 

THE INSTALLATION OF THE A.E.R. KIT MUST BE CARRIED OUT AT AN AUTHORIZED DACOR SERVICE CENTER BY A TECHNICIAN TRAINED IN THE SERVICING OF REGULATORS, IN ACCORDANCE WITH THE INSTRUCTIONS PROVIDED HERE. DACOR RECOMMENDS PERFORMING A COMPLETE REGULATOR OVERHAUL BEFORE INSTALLING THE A.E.R. KIT.

COLD WATER DIVING

According to the CEN EN 250 standard, water is considered to be cold at a temperature below 10°C (50°F).

WARNING 

ATTEMPTING TO DIVE IN COLD WATER CONDITIONS (10°C OR BELOW) WITHOUT ADEQUATE TRAINING MAY RESULT IN SERIOUS INJURY. BEFORE DIVING IN COLD WATER, IT IS ADVISABLE TO TAKE A SPECIAL TRAINING COURSE UNDER THE SUPERVISION OF A CERTIFIED DIVING INSTRUCTOR.


When diving in cold water conditions, parts of the regulator may be subject to “icing” phenomena. The factors affecting the likelihood of ice forming inside and on the regulator are: the external ambient temperature, the water temperature, the temperature of the air in the tanks (and hence the exposure time of the tanks to the cold before the dive), whether the dive is in fresh or seawater, the moisture content of the air in the tanks, the quantity of air delivered by the regulator during the dive and the breathing frequency.

WARNING 

BECAUSE NO REGULATOR CAN BE COMPLETELY GUARANTEED AGAINST FREEZING OF THE SECOND STAGE UNDER ALL THE AFORESAID CONDITIONS, EVEN DACOR REGULATORS FITTED WITH THE CWD KIT MAY BE SUBJECT TO “ICING” PHENOMENA WHICH CAN INTERFERE WITH THEIR CORRECT OPERATION. THIS MAY RESULT IN SERIOUS INJURY. THEREFORE, TO MINIMIZE THE POTENTIAL HAZARDS, IT IS ESSENTIAL TO BE ADEQUATELY TRAINED IN THE PREVENTION AND HANDLING OF THE PROBLEMS WHICH MAY ARISE FROM A REGULATOR SUBJECT TO “ICING” PHENOMENA.

In particular, for cold water conditions observe the following precautions:

1. Take a course to learn cold water diving techniques.
2. Refill the air tanks only at filling stations equipped with an efficient filtering and moisture removal system.
3. When preparing for a cold water dive, keep the tanks and regulator in a place that is sheltered from the cold until just before starting the dive.
4. Open the tank control valve for one or two seconds to make sure there are no water droplets or small ice crystals. Also check the inlet opening of the regulator.
5. In the event of repetitive dives, take particular care to ensure that the regulator is perfectly dry before starting the second dive.
6. Avoid breathing from the regulator outside the water.
7. As much as possible, try to prevent water from entering inside the second stage during the dive.
8. Never operate the purge button when not underwater.
9. Use the purge button as little as possible. In any case, never hold it down for more than 2 or 3 consecutive seconds; pressing it for longer may cause the formation of ice.
10. Try to breathe normally, to minimize the cooling effect produced by the higher air velocity during overbreathing.

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INSTRUCTION FOR INSTALLING THE A.E.R.KIT (CODICE: 187202)

To facilitate disassembly, remove all the hoses connected to the first stage and replace with port plugs.

1. Screw the first stage disassembly tool (B-5) into a low pressure port (3/8").
2. Using the Allen wrench (B-13), unscrew the adjusting nut (18) and pull out the spring (16).
3. Unscrew the retaining nut (17) using the wrench (B-2) and remove the spring base plate (15).

WARNING 

DACOR RECOMMENDS CLEANING THE DISASSEMBLED COMPONENTS TO REMOVE ANY TRACES OF RUST OR FOREIGN PARTICLES, ACCORDING TO THE INSTRUCTIONS DESCRIBED IN THE SERVICE MANUALS.

4. Position the spring base plate (15) on the diaphragm (14).
5. Lightly lubricate the sealing rim of the A.E.R. kit body (57) and screw it into the first stage body, locking it down fully with wrench (B-16).

NOTE

SIF USING A TORQUE WRENCH, SET THE TORQUE FOR APPROXIMATELY 3 - 3.5 Kg/m - 260-304 in/lb (30 - 35 N/m 265-309 in/lb).

6. After having lightly lubricated the ends of the spring (16), center it on the base plate (15).
7. Using the Allen wrench (B-13), lock down the adjusting nut (18) through 2-3 turns into the retaining nut.

NOTE


DO NOT OVERTIGHTEN THE ADJUSTING NUT; AS THIS CAUSES THE INTERMEDIATE PRESSURE TO INCREASE AND INTERFERES WITH THE SUBSEQUENT ADJUSTMENTS.

8. Unscrew the disassembly tool (B-5).
9. Screw the intermediate pressure measuring gauge (cod. 106252) into one of the 3/8" low pressure ports, using the special wrench (B-18).
10. Using wrench (B-18), apply the hose with the second stage to the port marked D.F.C..
11. Remove the cover (39) from the second stage case (follow the instructions provided in the manual for the regulator model in question).
12. Mount the regulator group on the control valve (of a tank or test bench).
13. Holding down the second stage demand lever, slowly open the tank valve, and almost at the same time release the demand lever.
14. Read the first stage adjustment on the pressure gauge, and proceed as follows:
 - a. If the adjustment is **higher** than the required value (see table in the "First Stage Adjustments" manual), slightly unscrew the adjusting nut (16) using wrench (B-13) until the specified adjustment is obtained.

NOTE

WHENEVER THE INTERMEDIATE PRESSURE IS REDUCED, IT IS NECESSARY TO VENT THE EXCESS AIR IN ORDER TO OBTAIN A CORRECT MEASURE OF THE ADJUSTMENT.

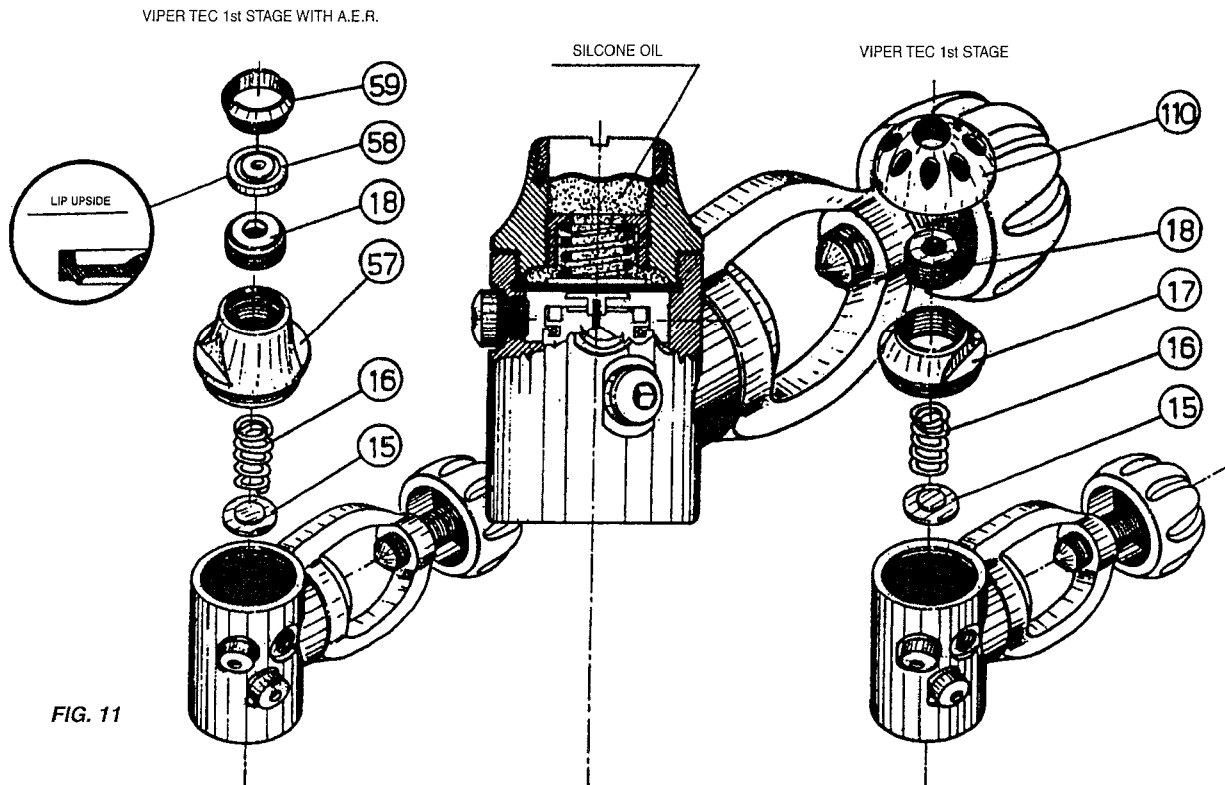
- b. If the adjustment is **lower** than the required value (see table in the "First Stage Adjustments" manual), slowly lock down the adjusting nut, until the specified adjustment is obtained.
15. Operate the second stage demand lever a few times, and check that the adjustment remains stable.
16. After having completed the second stage adjustments, (follow the instructions provided in the manual of the regulator in question), remove the pressure gauge and the second stage, replacing them with port plugs.
17. Remove the first stage from the control valve.
18. Close the first stage air inlet with the dust cap (24).
19. Slightly tilt the first stage (5° - 10°).

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20. Slowly fill the A.E.R. body (57) up to about 3 mm from the upper edge, using the silicone oil provided in the kit.
21. Hold the first stage vertically and turn it 2/3 times to eliminate any bubbles trapped in the threads or in the coils of the spring.
22. Fit the A.E.R.kit diaphragm (58) inside the A.E.R.body (57) orienting it correctly (with the edge facing upward) on the seat of the A.E.R. body (See Fig. 11).

NOTE

WHEN THE DIAPHRAGM IS CORRECTLY FITTED IN THE A.E.R.BODY, IT SHOULD BE COMPLETELY IMMERSED IN THE SILICONE OIL.



23. Press the center of the diaphragm (58) slightly to expel any air bubbles.

WARNING ⚠

DO NOT USE SHARP OBJECTS TO PRESS ON THE DIAPHRAGM.
 TO CHECK THAT THE DIAPHRAGM DOES NOT ADHERE BY SUCTION TO THE SIDES OF THE A.E.R. KIT BODY, SLIGHTLY LIFT THE EDGE OF THE A.E.R. DIAPHRAGM, TAKING CARE NOT TO ALLOW ANY AIR TO ENTER.

24. Correctly lock down the ring (59) against the body, using the special wrench provided in the kit.
25. Empty the excess oil.
26. Rinse the first stage in fresh water.

WARNING ⚠

DO NOT DIRECT STRONG JETS OF WATER (FOR EXAMPLE FROM A HOSE) ON THE A.E.R. DIAPHRAGM.


REPAIR PROCEDURE	PAGE	D 16 FIRST STAGE		
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27. Using the wrench (B-18), apply the hose with the second stage to the port marked D.F.C..
28. Screw the intermediate pressure measuring gauge (cod. 106252) into one of the 3/8" low pressure ports, using the special wrench (B-18).
29. Mount the regulator group on the control valve (of a tank or test bench).
30. Check that the previously adjusted intermediate pressure has not changed.

WARNING 


A VARIATION OF 0.1 - 0.2 BAR (1.4 PSI – 2.9 PSI) IN THE INTERMEDIATE PRESSURE IS ACCEPTABLE.
 IF THE VARIATION IS GREATER, IT IS NECESSARY TO REPEAT THE A.E.R. A.E.R.KIT INSTALLATION PROCEDURE.
 TO OBTAIN A CORRECT READING OF THE INTERMEDIATE PRESSURE, DO NOT PRESS ON THE A.E.R. A.E.R.DIAPHRAGM

31. Disassemble the group from the tank, replacing the LP pressure gauge (106252) and any port plugs with the corresponding hoses removed previously.

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FIRST STAGE D 16 TROUBLESHOOTING

PROBLEM	MODEL	PROBABLE CAUSE	SOLUTION
- 1 - AIR LEAKAGE FROM THE FIRST STAGE DIAPHRAGM RETAINING NUT	D 16	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 LEAKAGE FROM THE FIRST STAGE PORT PLUGS AND/OR HOSE PORTS	D 16	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 LEAKAGE BETWEEN THE FIRST STAGE BODY AND THE INT OR DIN CONNECTOR	Version INT - DIN D 16	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	1) Lock down
- 4 - AIR LEAKAGE BETWEEN THE FIRST STAGE INLET AND THE TANK VALVE	D 16	1) O-ring seal of tank valve dirty or damaged	1) Clean the seat in the tank valve and replace the O-ring
		2) O-ring sealing surface on the first stage damaged	1) (INT version) Replace the yoke retainer nut
			2) (DIN) Replace the connector body
- 5 - AIR LEAKAGE FROM THE HP CHAMBER PLUG	D 16	1) O-ring defective	1) Replace
- 6 - (A.E.R. VERSION) OIL LEAKAGE FROM THE DIAPHRAGM	D 16	1) A.E.R. diaphragm damaged	1) Replace the A.E.R. diaphragm
		2) C.W.D diaphragm retaining ring loose	1) Lock down correctly
- 7 - CONTINUOUS AIR DELIVERY FROM SECOND STAGE CHARACTERIZED BY AN INCREASE IN THE INTERMEDIATE PRESSURE	D 16	1) Intermediate pressure too high	1) Adjust the intermediate pressure
		2) First stage poppet damaged	1) Replace
		3) Defective poppet seat	1) Clean or replace the seat
			2) Replace the O-ring
		4) HP chamber defective	1) Replace the O-ring
2) Replace backup ring			
		3) Clean or replace the HP chamber	

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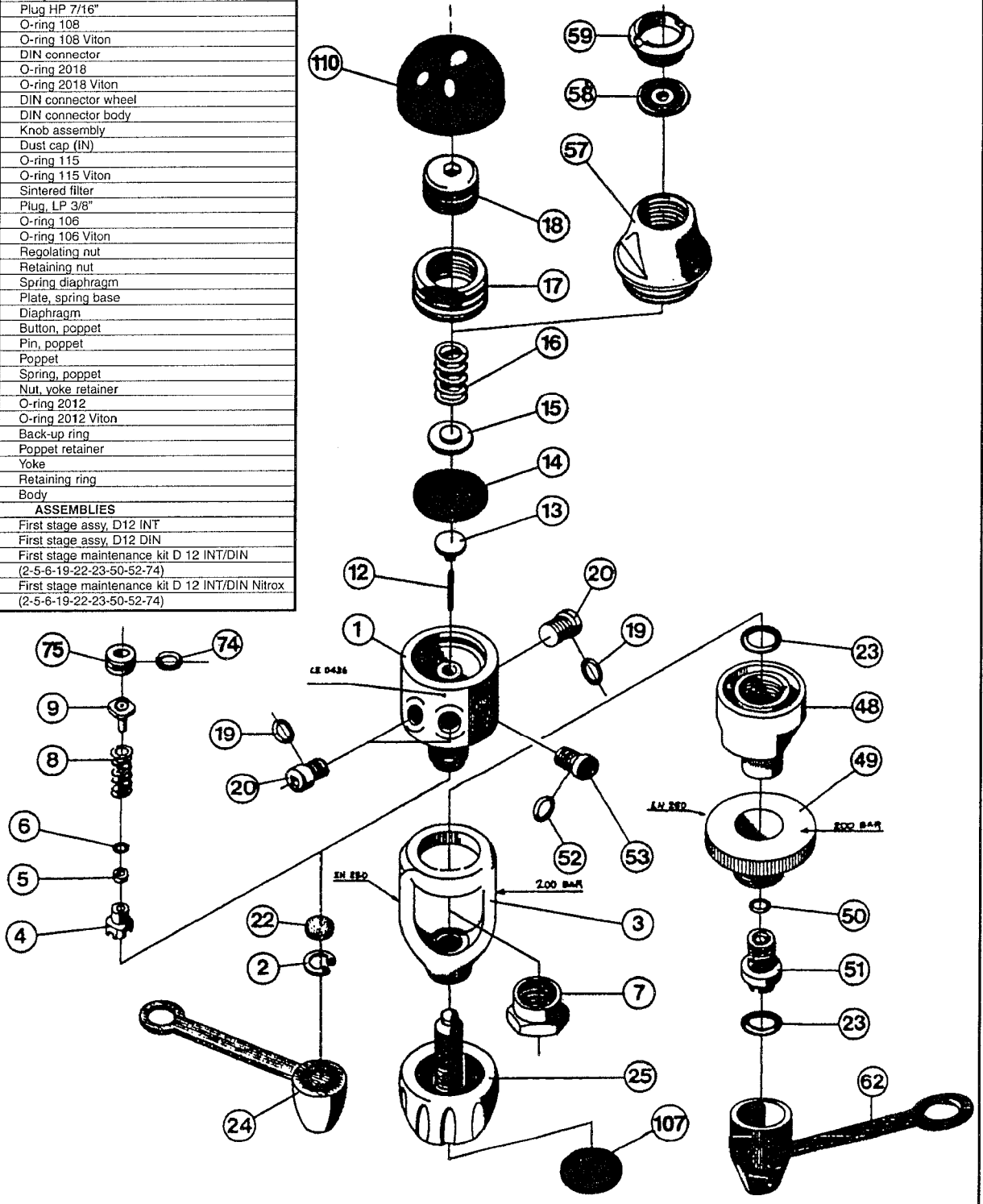
**DACOR REPAIR MANUAL
VOLUME THREE
05/99
SECTION 1**

FIRST STAGE REGULATOR



**D 12
FIRST STAGE**

Ref.	Code	Description
110	46187012	Protection cap
107	46187013	Knob assembly label
75	46186216	Poppet seat
74	46110107	O-ring 2031
74	46110403	O-ring 2031 Viton
62	46183013	Dust cap, DIN connector
59	46185302	Bezel A.E.R.
58	46185301	Diaphragm A.E.R.
57	46187042	Body A.E.R.
53	46185205	Plug HP 7/16"
52	46110108	O-ring 108
52	46110404	O-ring 108 Viton
51	46183003	DIN connector
50	46110203	O-ring 2018
50	46110409	O-ring 2018 Viton
49	46183001	DIN connector wheel
48	46183004	DIN connector body
25	46187007	Knob assembly
24	46187011	Dust cap (IN)
23	46110117	O-ring 115
23	46110406	O-ring 115 Viton
22	46185014	Sintered filter
20	46185204	Plug, LP 3/8"
19	46110106	O-ring 106
19	46110402	O-ring 106 Viton
18	46184511	Regulating nut
17	46184510	Retaining nut
16	46185023	Spring diaphragm
15	46185034	Plate, spring base
14	46185022	Diaphragm
13	46185032	Button, poppet
12	46185296	Pin, poppet
9	46185002	Poppet
8	46185011	Spring, poppet
7	46185212	Nut, yoke retainer
6	46110101	O-ring 2012
6	46110401	O-ring 2012 Viton
5	46185038	Back-up ring
4	46185209	Poppet retainer
3	46187003	Yoke
2	46185015	Retaining ring
1	46187000	Body
ASSEMBLIES		
***	46187236	First stage assy, D12 INT
***	46187240	First stage assy, D12 DIN
***	46187220	First stage maintenance kit D 12 INT/DIN (2-5-6-19-22-23-50-52-74)
***	46187221	First stage maintenance kit D 12 INT/DIN Nitrox (2-5-6-19-22-23-50-52-74)



D 12 - FIRST STAGE

DISASSEMBLY

To facilitate the disassembly operations, the technician is advised to disassemble the hoses connected to the First Stage ports and replace them with the corresponding port plugs.

1. Screw in the lever (B-5) to a low-pressure port (3/8") to disassemble the First Stage.
2. Remove the protection cap (110).
3. Unscrew the yoke fitting (7) using the special spanner (B-1) and remove the yoke (3) and its knob (25).
(FIG. 1)

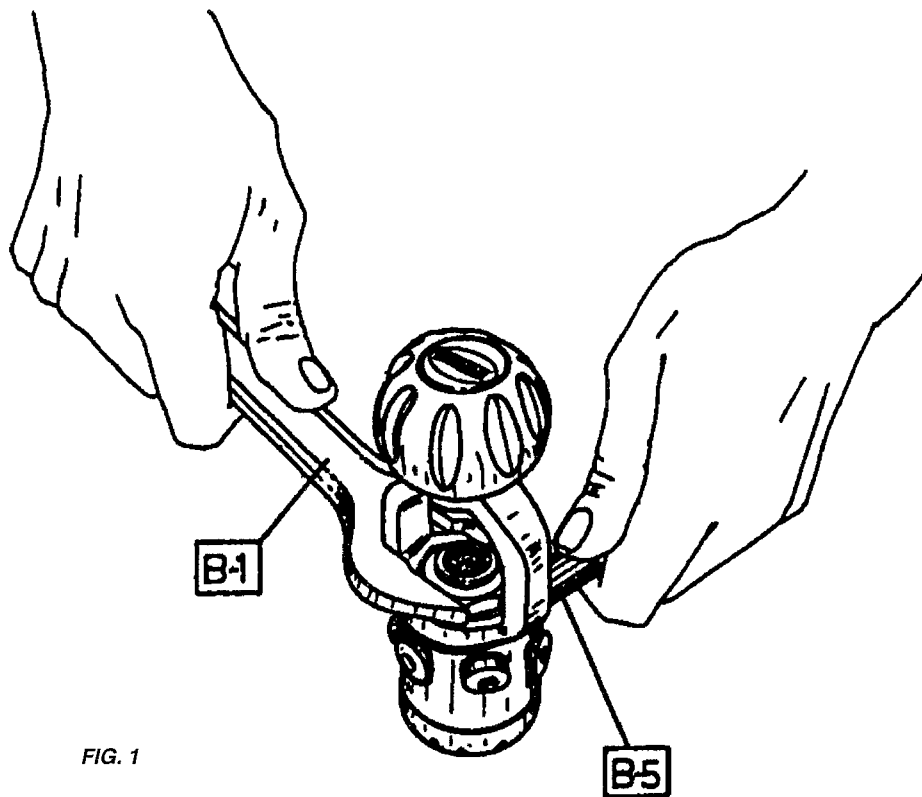



FIG. 1

REPAIR PROCEDURE	PAGE	D 12 FIRST STAGE		
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DIN VERSION

DISASSEMBLY:

(replacing phase 3 of the procedure)

- A. Using a 6 mm valve seat wrench (B-8), unscrew the DIN connector coupling (51) and remove the o-rings (23) and (50).
- B. Draw off the lock nut (49).
- C. Unscrew the DIN connector coupling (48) with the spanner (B-16) and remove the O-Ring (23).
- 4. Using the seeger pliers (B-14), remove from the First Stage body (1) the seeger (2), the sintered filter (22), the HP chamber (4+5+6), the spring (8), the valve (9) and the thrust pin (12). (Fig. 2).

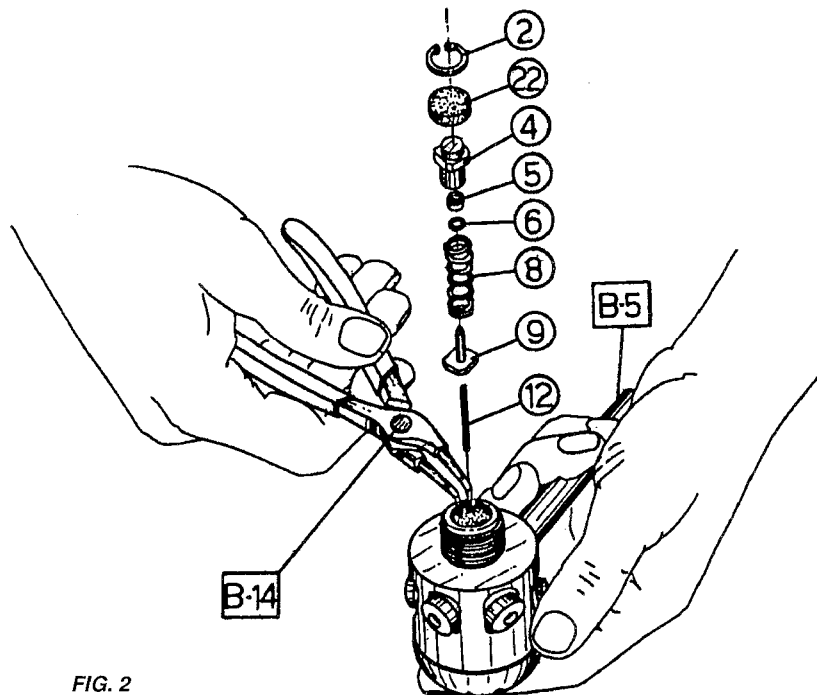


FIG. 2

- 5. Remove the O-Ring (6) from the HP chamber.

WARNING ▲

IT IS RECOMMENDED TO REMOVE THE ANTI-EXTRUSION RING (5) FROM THE HP CHAMBER (4) ONLY IF REPLACEMENT IS NECESSARY.


- 6. Place the special tool (B-21) onto the first stage valve seat (75) and press lightly; introduce compressed air (less than 7 bar (100 PSI)) through a low pressure port (3/8"). (Fig. 3).

NOTE

RELEASE THE PRESSURE ON THE SPECIAL (B-21) TOOL WHEN THE VALVE SEAT MOVES AFTER INTRODUCING AIR.

WARNING ▲

DO NOT TRY TO REMOVE THE VALVE SEAT WITH SHARP OR POINTED OBJECTS; SCRATCHING THE SEAT SURFACE MAY CAUSE OPERATIONAL DEFECTS.

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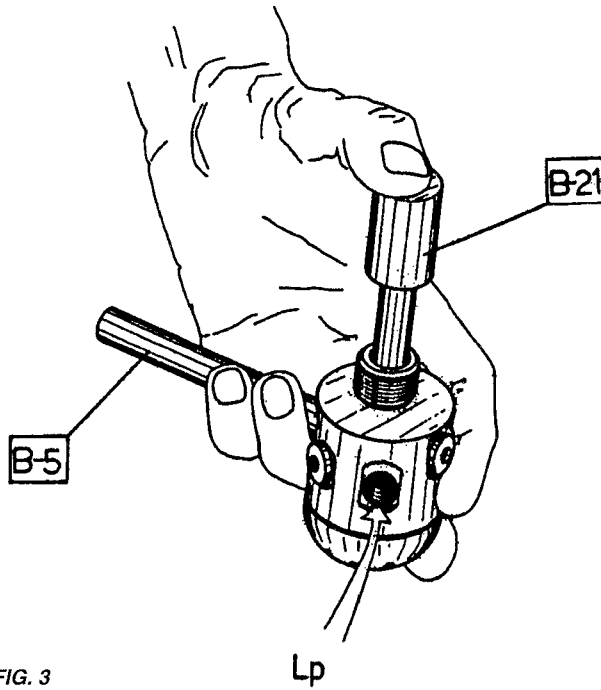


FIG. 3

7. Free the valve seat (75) from the first stage, and remove the O-Ring (74).
8. Using an Allen wrench (B-13), unscrew the adjusting nut (18) and draw out the spring (16). (Fig. 4)

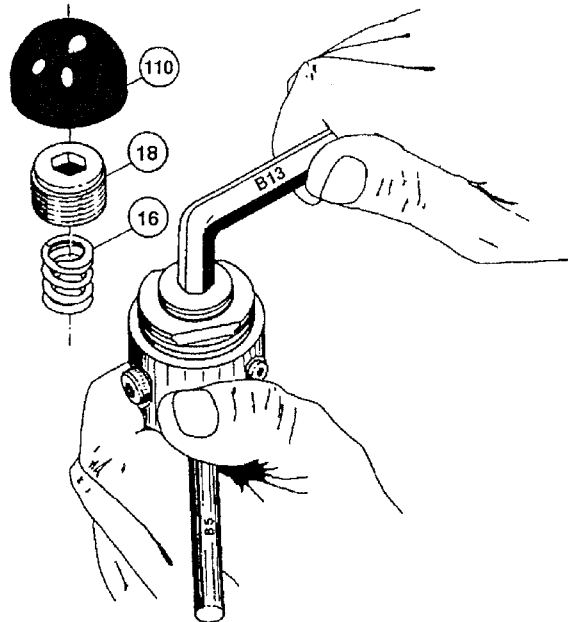



FIG. 4

REPAIR PROCEDURE	PAGE	D 12 FIRST STAGE		
	1-4	First Stage Regulators	05/99	

9. Unscrew the stop nut (17) using the spanner (B-2) and remove the spring seat (15). (Fig. 5).

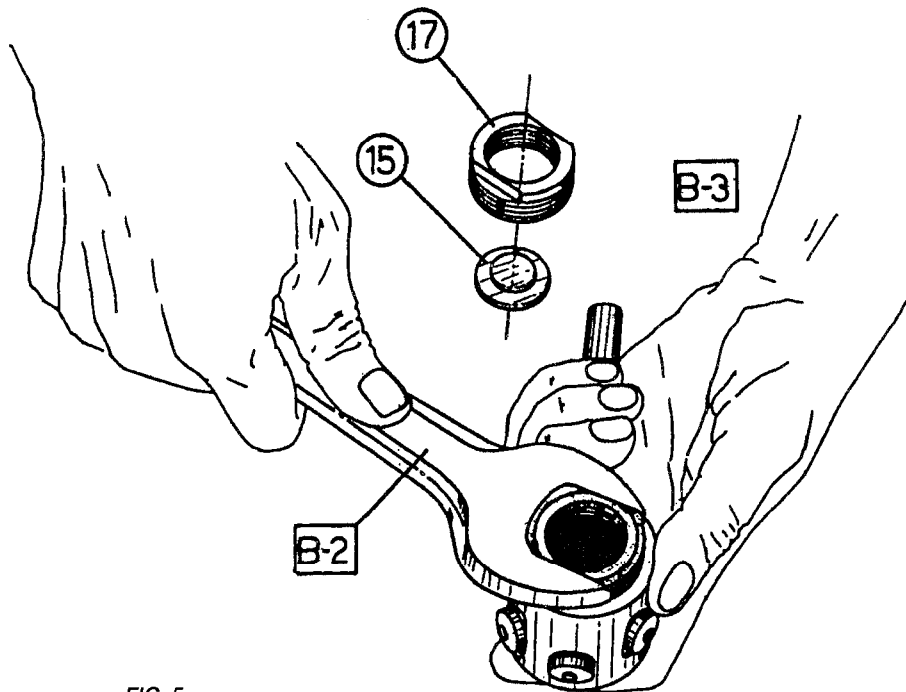



FIG. 5

10. Introduce compressed air (less than 7 bar (100 PSI)) through a low pressure port (3/8") and remove the diaphragm (14) and the poppet button (13).

NOTE
TO EASE OUT THE DIAPHRAGM, PLUG THE HIGH PRESSURE CHAMBER INLET (WITH A FINGERTIP, FOR EXAMPLE). (FIG. 6).

WARNING ⚠

DO NOT TRY TO REMOVE THE DIAPHRAGM WITH SHARP OR POINTED OBJECTS; SCRATCHING OF THE DIAPHRAGM SURFACE OR OF THE FIRST STAGE BODY MAY CAUSE AIR LEAKS.

	D 12 FIRST STAGE		PAGE	REPAIR PROCEDURE
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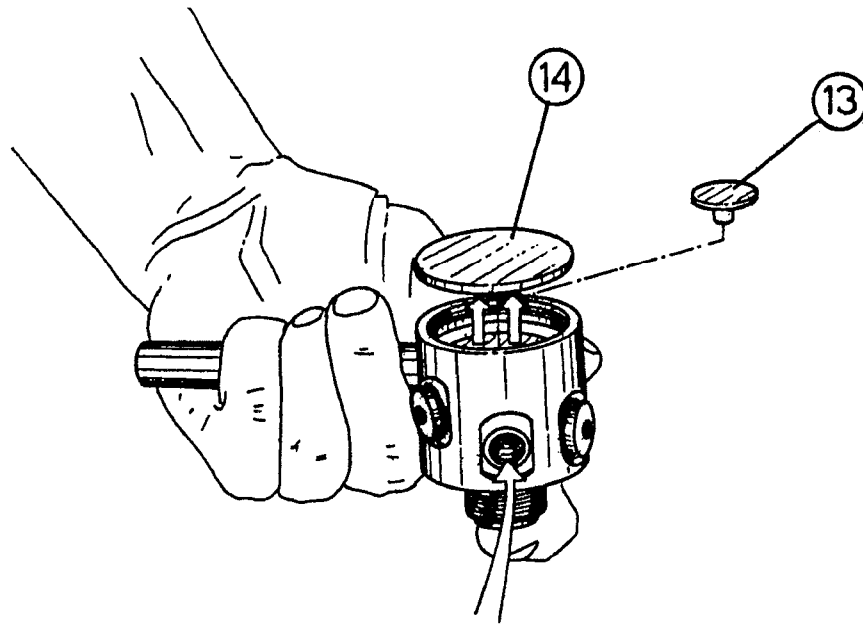


FIG. 6

Lp

- 11. Unscrew the high (53) and low (20) pressure plugs from the First Stage body; remove their O-Rings (52) and (19).
- 12. Unscrew the disassembly tool (B-5) from the First stage body.

CLEANING

WARNING ▲

WHEN WORKING WITH ANY KIND OF ACID, USE 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 AND OTHER SOLVENTS MAY DAMAGE RUBBER AND PLASTIC COMPONENTS. MAKE SURE ALL SEALS AND OTHER PARTS THAT MAY BE DAMAGED ARE REMOVED BEFORE CLEANING THE METAL COMPONENTS.

WARNING ▲

DO NOT IMMERSE THE SINTERED FILTER IN AN ACID SOLUTION.

REPAIR PROCEDURE	PAGE	D 12 FIRST STAGE		
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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.

The components to replace are:

- Seeger	(2)	- code 46185015	
- Sintered filter	(22)	- code 46185014	
- Low pressure O-Rings	(19)	- code 46110106	code Viton 46110402
- High pressure O-Rings	(52)	- code 46110108	code Viton 46110404
- HP chamber O-Ring	(6)	- code 46110101	code Viton 46110401
- Valve seat O-Ring	(74)	- code 46110107	code Viton 46110403
- DIN connector coupling O-Ring (DIN version)	(50)	- code 46110203	code Viton 46110409
- DIN coupling O-Ring (only DIN version)	(23)	- code 46110117	code Viton 46110406

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

DO NOT USE PARTS WITH THE FOLLOWING DEFECTS:

- Seegers:** Check for warping, cracking or damaged rims. Replacement is recommended.
- Sintered filter:** Check for settlings or rust; rust build-up may indicate deterioration of the tanks. Check for cracking
- First Stage poppet:** Check for cuts, chipping, scratches of the rubber part or if the rubber part has separated from the valve body.
Make sure that the valve stem port is free from foreign bodies.
- HP chamber:** Inspect the interior for any foreign matter or particles.
- Backup ring:** Make sure that it is correctly positioned inside the HP chamber, and inspect its surface for deformations or foreign particles.

WARNING
THE BACKUP RING SHOULD BE REPLACED EVERY TIME IT IS REMOVED FROM THE HP CHAMBER

- O-Rings:** Check for cuts, deformation or foreign particles. The presence of any of these defects may result in leakage.
- First stage diaphragm:** Check for splitting, cuts, tears or major surface deformations.
- First Stage Body:** Check for chipping and/or scratches on caps, on the diaphragm surface and on the valve seat.
- Valve seat:** Check for chipping, scratches and/or foreign bodies on the on the locking surface and on the O-Ring seat.

NOTE

A LIGHTLY ABRASIVE RUBBER MAY BE USED FOR OPTIMAL CLEANING OF THE FIRST STAGE VALVE SEAT. Fig 6

- O-Rings seats:** Check all metal surfaces that come into contact with O-Rings, or other seals, to make sure they do not present chipping, grazing, decayed chromium plating or foreign bodies embedded.
- Springs:** Check for split, deformed or broken coils.
- Threaded parts:** Make sure the threads are flawless and well cleaned.

	D 12 FIRST STAGE		PAGE	REPAIR PROCEDURE
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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 SECOND 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 LUBRICATED WITH SPECIAL OXYGEN-COMPATIBLE GREASE. **DO NOT USE SILICONE GREASE!**

1. Screw in the lever (B-5) through a low pressure port (3/8").
2. Reassemble the O-Ring (74) onto the valve seat (75).
3. Correctly place the valve seat on the special tool (B-21).
4. Push the valve seat into position in the First stage body pressing lightly. (Fig. 7).

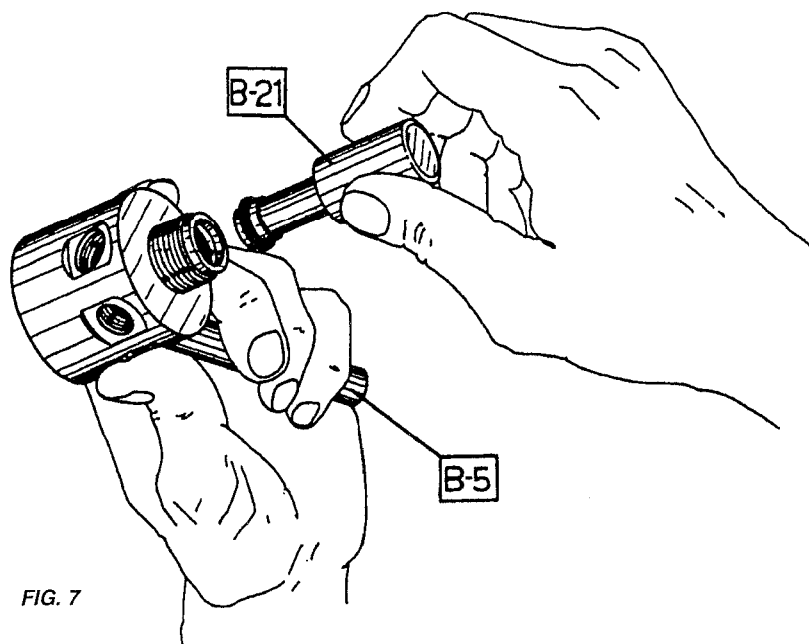


FIG. 7

5. Correctly place the valve (9) onto its seat.
6. Place the spring (8) on the valve.
7. Place the anti-extrusion ring (5) in the HP chamber (4) (if previously disassembled), and the O-Ring (6)
8. Place the HP chamber complete with all its components (4+5+6) in its position above the spring.
9. Place the sintered filter (22) onto the HP chamber.
10. Using the seeger pliers (B-14), tighten the seeger (2) and place it above the filter; press with a finger on the seeger and on the filter at the same time, to slot the seeger into place in the groove on the First stage body.


NOTE

TO CHECK THAT THE SEEGER IS CORRECTLY PLACED, ROTATE IT.

11. Place the yoke (3) and the knob (25) on the First stage body (if previously disassembled).
12. Using the spanner (B-1), tighten the yoke fitting (7).

WARNING

TO AVOID ACCIDENTAL UNSCREWING OF THE YOKE FITTING PUT ONE OR TWO DROPS OF THREAD COMPOUND (LOCTITE 242 E) ON THE FIRST STAGE BODY.

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DIN Version

REASSEMBLY

(substituting phases 11 and 12)

- D. Place the O-Ring (23) in the DIN connector coupling seat (48).
- E. Tighten the DIN connector coupling (48) with the spanner (B-16) onto the First stage body.
- F. Correctly place the locking ring (49) onto the First stage.
- G. Place the O-Rings (23) and (50) onto the DIN connector coupling (51).
- H. Using the 6 mm Allen wrench (B-8) tighten the DIN connector coupling onto the First stage body.

WARNING 

TO AVOID ACCIDENTAL UNSCREWING OF THE DIN CONNECTOR COUPLINGS (48) AND (51), PLACE ONE OR TWO DROPS OF THREAD COMPOUND ON THEM (USE LOCTITE 242 E). DO NOT PLACE THREAD COMPOUND ON THE O-RINGS (LOCTITE 242 E).

- 13. Put the valve pin (12) inside the center port of the First stage body.
- 14. Place the poppet button (13) on top of the pin, and press a few times to check the right movement and position of the valve in the First stage.
- 15. Install the First stage diaphragm (14), placing it correctly in its seat.
- 16. Place the spring base plate (15) onto the diaphragm.
- 17. Lightly lubricate the stop nut rim (17) and tighten it with the spanner (B-2) onto the First stage body.

NOTE


IF USING A TORQUE WRENCH SET A MAXIMUM TORQUE OF ABOUT 3 - 3.5 Kg/m - 260-304 in/lb (30 - 35 N/m 265-309 in/lb).

- 18. Center the spring onto the plate after lubricating lightly the bottom coils (16).
- 19. With the Allen wrench (B-13), tighten by 2-3 turns the adjusting nut (18) in the stop nut.

NOTE

DO NOT TIGHTEN THE ADJUSTING NUT TOO MUCH, AS IT WILL CAUSE AN INCREASE OF THE INTERMEDIATE PRESSURE AND WILL INTERFERE WITH SUCCESSIVE ADJUSTMENTS.

- 20. Place the protection cap back on (110).
- 21. Unscrew the lever (B-5).
- 22. Place the low (19) and high (52) pressure O-Rings on their caps (20) and (53), or onto the hoses.
- 23. Fasten the caps and/or the hoses to the First stage outlets.

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FIRST STAGE (D 12) VIPER INTERMEDIATE PRESSURE ADJUSTMENT (Fig. 8).

WARNING

DO NOT SUBMERGE THE INTERMEDIATE PRESSURE GAUGE.

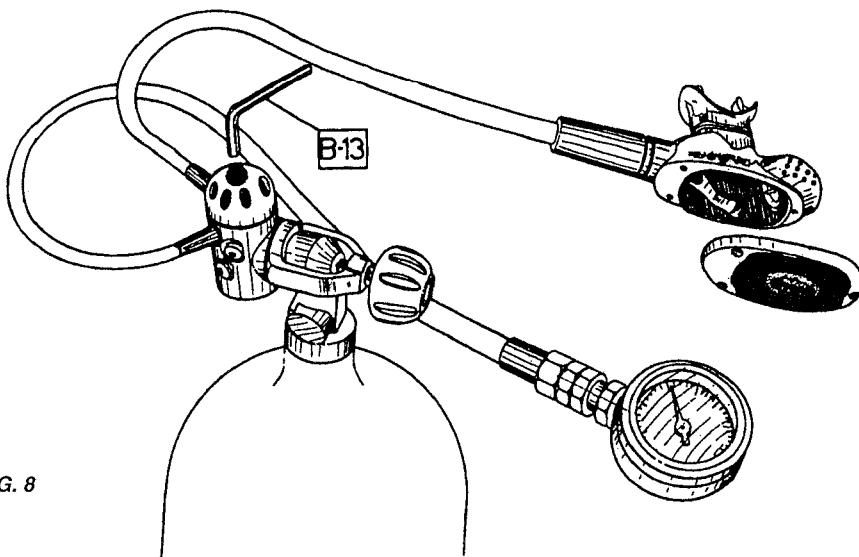


FIG. 8

FIRST STAGE INTERMEDIATE PRESSURE TABLE		
MODEL	P.S.I.	BAR
D 16	142 - 148	9,8 - 10,2
D 12	142 - 148	9,8 - 10,2

FIRST STAGE INTERMEDIATE PRESSURE TABLE WITH C.W.D. KIT		
MODEL	P.S.I.	BAR
D 16	130 - 136	9 - 9,4
D 12	130 - 136	9 - 9,4

PROCEDURE FOR ADJUSTING THE INTERMEDIATE PRESSURE

1. Screw the intermediate pressure measuring gauge (cod. 106252) into one of the 3/8" low pressure ports, using the special tool (B-18).
2. Using tool (B-18), apply the hose with the partially finished second stage to the D.F.C. port.
3. Mount the regulator group on the control valve (of a tank or Test Bench).
4. Holding down the second stage demand lever, slowly open the tank valve and, almost simultaneously, release the demand lever.
5. Read the value of the first stage adjustment on the pressure gauge, and proceed as follows (Fig. 8):
 - a) If the first stage adjustment is **higher** than the required value (see table), use the wrench (B-13) to slowly back off the adjusting nut (16) until the specified value is obtained.

NOTE

WHENEVER THE INTERMEDIATE PRESSURE IS REDUCED, IT IS NECESSARY TO VENT THE EXCESS AIR IN ORDER TO OBTAIN A CORRECT READING OF THE ADJUSTMENT.

- b) If the first stage adjustment 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 adjustment remains constant.
7. After completing the second stage adjustments, remove the pressure gauge and screw on the corresponding port plug.

REPAIR PROCEDURE	PAGE	D 12 FIRST STAGE		
	1-10	First Stage Regulators	05/99	

A.E.R. COLD WATER DIVING KIT FOR DACOR DIAPHRAGM REGULATORS

WARNING 

THE INSTALLATION OF THE A.E.R. KIT MUST BE CARRIED OUT AT AN AUTHORIZED DACOR SERVICE CENTER BY A TECHNICIAN TRAINED IN THE SERVICING OF REGULATORS, IN ACCORDANCE WITH THE INSTRUCTIONS PROVIDED HERE. DACOR RECOMMENDS PERFORMING A COMPLETE REGULATOR OVERHAUL BEFORE INSTALLING THE A.E.R. KIT.

COLD WATER DIVING

According to the CEN EN 250 standard, water is considered to be cold at a temperature below 10°C (50°F).

WARNING 

ATTEMPTING TO DIVE IN COLD WATER CONDITIONS (10°C OR BELOW) WITHOUT ADEQUATE TRAINING MAY RESULT IN SERIOUS INJURY. BEFORE DIVING IN COLD WATER, IT IS ADVISABLE TO TAKE A SPECIAL TRAINING COURSE UNDER THE SUPERVISION OF A CERTIFIED DIVING INSTRUCTOR.


When diving in cold water conditions, parts of the regulator may be subject to “icing” phenomena. The factors affecting the likelihood of ice forming inside and on the regulator are: the external ambient temperature, the water temperature, the temperature of the air in the tanks (and hence the exposure time of the tanks to the cold before the dive), whether the dive is in fresh or seawater, the moisture content of the air in the tanks, the quantity of air delivered by the regulator during the dive and the breathing frequency.

WARNING 

BECAUSE NO REGULATOR CAN BE COMPLETELY GUARANTEED AGAINST FREEZING OF THE SECOND STAGE UNDER ALL THE AFORESAID CONDITIONS, EVEN DACOR REGULATORS FITTED WITH THE CWD KIT MAY BE SUBJECT TO “ICING” PHENOMENA WHICH CAN INTERFERE WITH THEIR CORRECT OPERATION. THIS MAY RESULT IN SERIOUS INJURY. THEREFORE, TO MINIMIZE THE POTENTIAL HAZARDS, IT IS ESSENTIAL TO BE ADEQUATELY TRAINED IN THE PREVENTION AND HANDLING OF THE PROBLEMS WHICH MAY ARISE FROM A REGULATOR SUBJECT TO “ICING” PHENOMENA.

In particular, for cold water conditions observe the following precautions:

1. Take a course to learn cold water diving techniques.
2. Refill the air tanks only at filling stations equipped with an efficient filtering and moisture removal system.
3. When preparing for a cold water dive, keep the tanks and regulator in a place that is sheltered from the cold until just before starting the dive.
4. Open the tank control valve for one or two seconds to make sure there are no water droplets or small ice crystals. Also check the inlet opening of the regulator.
5. In the event of repetitive dives, take particular care to ensure that the regulator is perfectly dry before starting the second dive.
6. Avoid breathing from the regulator outside the water.
7. As much as possible, try to prevent water from entering inside the second stage during the dive.
8. Never operate the purge button when not underwater.
9. Use the purge button as little as possible. In any case, never hold it down for more than 2 or 3 consecutive seconds; pressing it for longer may cause the formation of ice.
10. Try to breathe normally, to minimize the cooling effect produced by the higher air velocity during overbreathing.

	D 12 FIRST STAGE		PAGE	REPAIR PROCEDURE
	First Stage Regulators	05/99	1-11	

INSTALLATION INSTRUCTIONS FOR THE A.F.K. KIT (CODE: 187203)

To facilitate disassembly, remove all the hoses connected to the first stage and replace with port plugs.

1. Screw the first stage disassembly tool (B-5) into a low pressure port (3/8").
2. Using the Allen wrench (B-13), unscrew the adjusting nut (18) and pull out the spring (16).
3. Unscrew the retaining nut (17) using the wrench (B-2) and remove the spring base plate (15).

WARNING 

DACOR RECOMMENDS CLEANING THE DISASSEMBLED COMPONENTS TO REMOVE ANY TRACES OF RUST OR FOREIGN PARTICLES, ACCORDING TO THE INSTRUCTIONS DESCRIBED IN THE SERVICE MANUALS.

4. Position the spring base plate (15) on the diaphragm (14).
5. Lightly lubricate the sealing rim of the A.E.R. kit body (57) and screw it into the first stage body, locking it down fully with wrench (B-16).

NOTE

IF USING A TORQUE WRENCH, SET THE TORQUE FOR APPROXIMATELY 3 - 3.5 Kg/m - 260-304 in/lb (30 - 35 N/m 265-309 in/lb).

6. After having lightly lubricated the ends of the spring (16), center it on the base plate (15).
7. Using the Allen wrench (B-13), lock down the adjusting nut (18) through 2-3 turns into the retaining nut.

NOTE


DO NOT OVERTIGHTEN THE ADJUSTING NUT; AS THIS CAUSES THE INTERMEDIATE PRESSURE TO INCREASE AND INTERFERES WITH THE SUBSEQUENT ADJUSTMENTS.

8. Unscrew the disassembly tool (B-5).
9. Screw the intermediate pressure measuring gauge (cod. 106252) into one of the 3/8" low pressure ports, using the special wrench (B-18).
10. Using wrench (B-18), apply the hose with the second stage to the port marked D.F.C..
11. Remove the cover (39) from the second stage case (follow the instructions provided in the manual for the regulator model in question).
12. Mount the regulator group on the control valve (of a tank or test bench).
13. Holding down the second stage demand lever, slowly open the tank valve, and almost at the same time release the demand lever.
14. Read the first stage adjustment on the pressure gauge, and proceed as follows:
 - a. If the adjustment is **higher** than the required value (see table in the "First Stage Adjustments" manual), slightly unscrew the adjusting nut (16) using wrench (B-13) until the specified adjustment is obtained.

NOTE

WHENEVER THE INTERMEDIATE PRESSURE IS REDUCED, IT IS NECESSARY TO VENT THE EXCESS AIR IN ORDER TO OBTAIN A CORRECT MEASURE OF THE ADJUSTMENT.

- b. If the adjustment is **lower** than the required value (see table in the "First Stage Adjustments" manual), slowly lock down the adjusting nut, until the specified adjustment is obtained.
15. Operate the second stage demand lever a few times, and check that the adjustment remains stable.
16. After having completed the second stage adjustments, (follow the instructions provided in the manual of the regulator in question), remove the pressure gauge and the second stage, replacing them with port plugs
17. Remove the first stage from the control valve.
18. Close the first stage air inlet with the dust cap (24).
19. Slightly tilt the first stage (5° - 10°).
20. Slowly fill the A.E.R. body (57) up to about 3 mm from the upper edge, using the silicone oil provided in the kit.
21. Hold the first stage vertically and turn it 2/3 times to eliminate any bubbles trapped in the threads or in the coils of the spring.

REPAIR PROCEDURE	PAGE	D 12 FIRST STAGE		
	1-12	First Stage Regulators	05/99	

22. Fit the A.E.R. A.E.R.kit diaphragm (58) inside the A.E.R. A.E.R.body (57) orienting it correctly (with the edge facing upward) on the seat of the A.E.R. A.E.R.body (See Fig. 9).

NOTE

WHEN THE DIAPHRAGM IS CORRECTLY FITTED IN THE A.E.R. A.E.R.BODY, IT SHOULD BE COMPLETELY IMMERSSED IN THE SILICONE OIL.

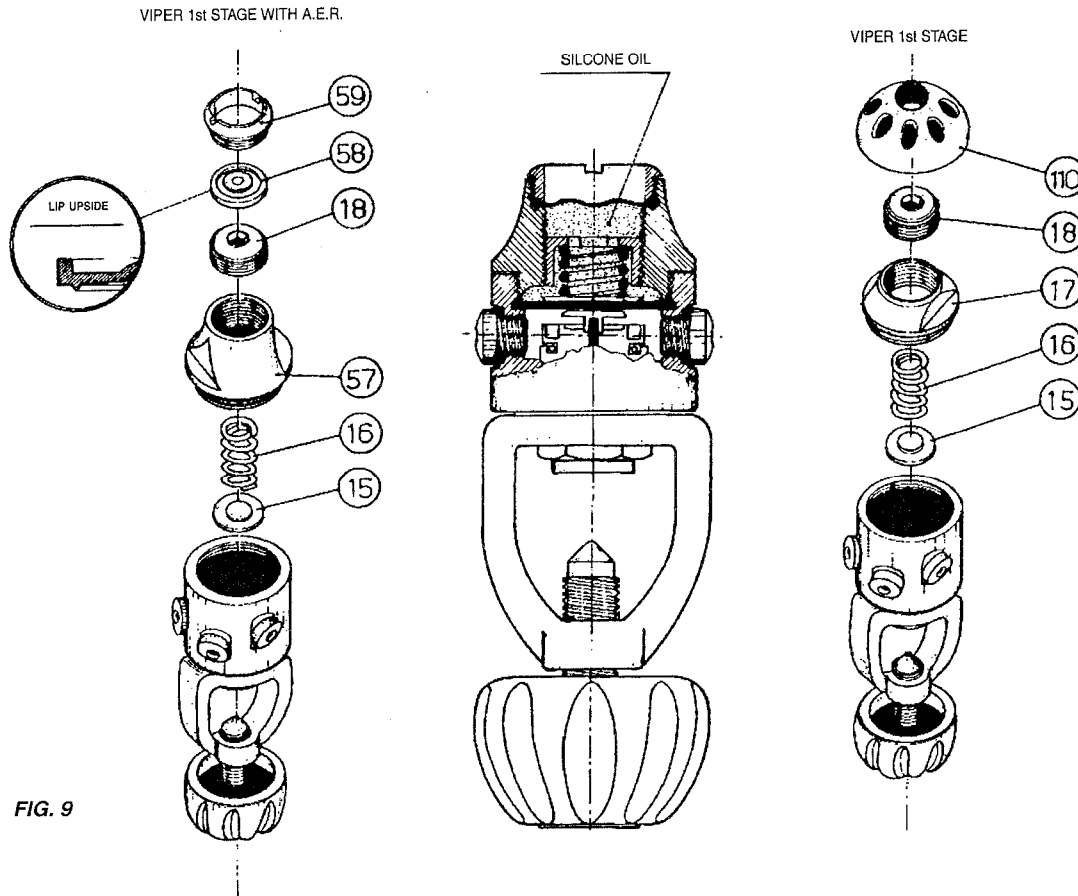


FIG. 9

23. Press the center of the diaphragm (58) slightly to expel any air bubbles.

WARNING ⚠

DO NOT USE SHARP OBJECTS TO PRESS ON THE DIAPHRAGM.
TO CHECK THAT THE DIAPHRAGM DOES NOT ADHERE BY SUCTION TO THE SIDES OF THE A.E.R. KIT BODY, SLIGHTLY LIFT THE EDGE OF THE A.E.R. DIAPHRAGM, TAKING CARE NOT TO ALLOW ANY AIR TO ENTER.

- 24. Correctly lock down the ring (59) against the body, using the special wrench provided in the kit.
- 25. Empty the excess oil.
- 26. Rinse the first stage in fresh water.

WARNING ⚠

DO NOT DIRECT STRONG JETS OF WATER (FOR EXAMPLE FROM A HOSE) ON THE A.E.R. DIAPHRAGM.


	D 12 FIRST STAGE		PAGE	REPAIR PROCEDURE
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- 27. Using the wrench (B-18), apply the hose with the second stage to the port marked D.F.C..
- 28. Screw the intermediate pressure measuring gauge (cod. 106252) into one of the 3/8" low pressure ports, using the special wrench (B-18).
- 29. Mount the regulator group on the control valve (of a tank or test bench).
- 30. Check that the previously adjusted intermediate pressure has not changed.

WARNING ▲


A VARIATION OF 0.1 - 0.2 BAR (1.4 PSI – 2.9 PSI) IN THE INTERMEDIATE PRESSURE IS ACCEPTABLE.
 IF THE VARIATION IS GREATER, IT IS NECESSARY TO REPEAT THE A.E.R. A.E.R.KIT INSTALLATION PROCEDURE.
 TO OBTAIN A CORRECT READING OF THE INTERMEDIATE PRESSURE, DO NOT PRESS ON THE A.E.R. A.E.R.DIAPHRAGM

- 31. Disassemble the group from the tank, replacing the LP pressure gauge (106252) and any port plugs with the corresponding hoses removed previously.

REPAIR PROCEDURE	PAGE	D 12 FIRST STAGE		
	1-14	First Stage Regulators	05/99	

FIRST STAGE D 12 TROUBLESHOOTING

PROBLEM	MODEL	PROBABLE CAUSE	SOLUTION
- 1 - AIR LEAKS FROM THE FIRST STAGE STOP NUT	D 12	1) Stop nut not tight enough	1) Tighten the nut
		2) Damaged first stage diaphragm	1) Replace the diaphragm
		3) Diaphragm seat surface damaged	1) Replace first stage body
- 2 - AIR LEAKS FROM THE FIRST STAGE HOSE UTLETS AND/OR CAPS	D 12	1) Dirty or damaged O-Ring	1) Clean the seat and replace the O-Ring
		2) Cap and/or hose not tight enough	1) Tighten
- 3 - AIR LEAKS BETWEEN THE FIRST STAGE BODY AND THE DIN CONNECTOR	DIN Version D 12	1) DIN connector O-Ring dirty or damaged	1) Clean the seat and replace the O-Ring
		2) DIN connector body not tight enough	1) Tighten
- 4 - AIR LEAKS BETWEEN THE FIRST STAGE CONNECTOR AND THE VALVE	D 12	1) First stage O-Ring seat damaged	1) (INT Version) Replace the first stage body
			1) (DIN Version) replace the connector coupling
- 5 - (A.E.R. VERSION) OILLEAKS FROM THE DIAPHRAGM	A.E.R. Version D 12	1) A.E.R. diaphragm damaged	1) Replace A.E.R. diaphragm
		2) A.E.R. diaphragm locking ring not tight enough	1) Tighten
- 6 - CONSTANT AIR FLOW FROM THE SECOND STAGE COUPLED WITH INCREASE OF THE INTERMEDIATE PRESSURE	D 12	1) Intermediate pressure too high	1) Adjust intermediate pressure
		2) First stage valve damaged	1) Replace
	D 12	3) First stage valve seat defective	1) Clean or replace first stage body
	D 12	4) Defective HP chamber	1) Replace the O-Ring
			2) Replace anti-extrusion ring
			3) Clean or replace HP chamber

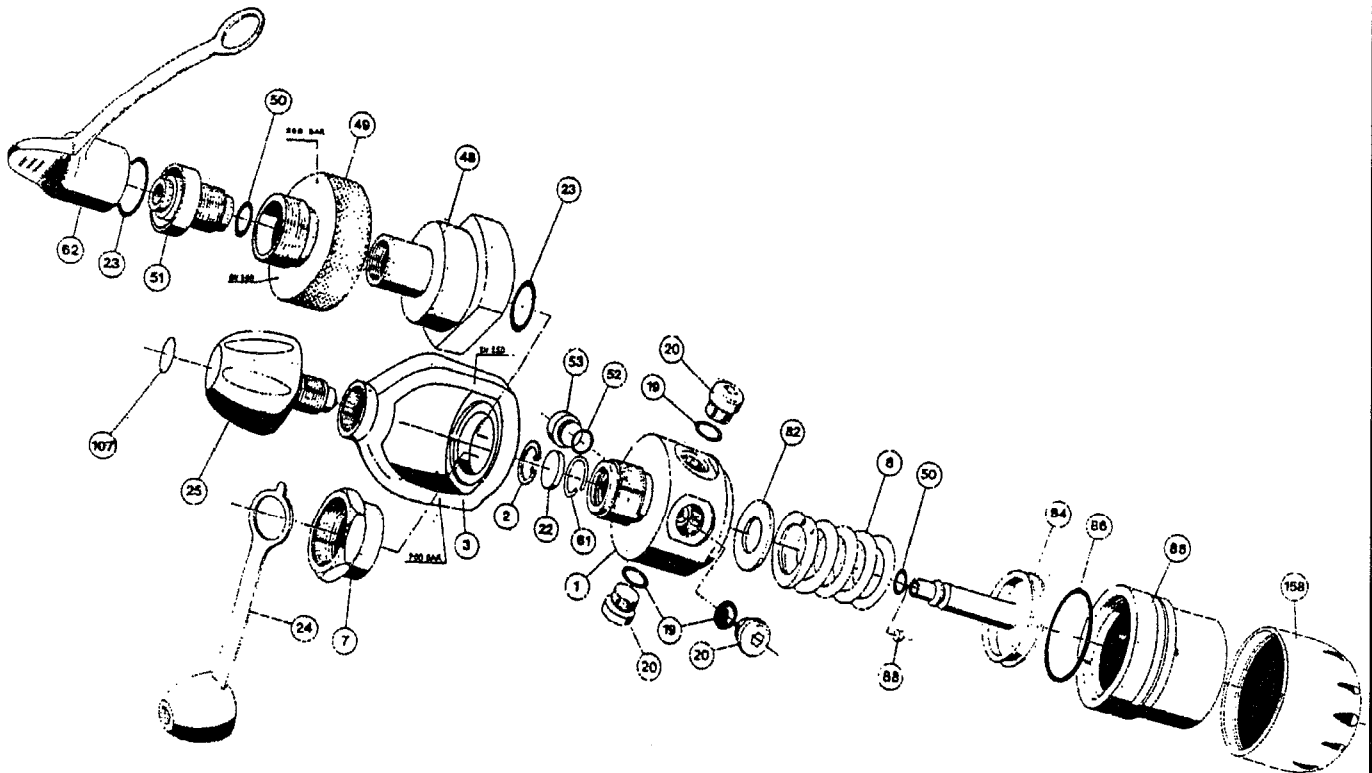
	D 12 FIRST STAGE		PAGE	REPAIR PROCEDURE
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**DACOR REPAIR MANUAL
VOLUME THREE
11/99
SECTION 1**

FIRST STAGE REGULATOR



**D 2
FIRST STAGE**



Ref.	Code	Description
1	46187056	Body, 1st stage
2	46185015	Retaining ring D. 13
3	46187003	Yoke
7	46185212	Retaining nut, yoke
8	46186220	Spring, piston
19	46110106	OR 106
19	46110402	OR 106 Viton 610-9707
20	46185204	Plug 3/8" UNF
22	46185014	Sintered filter
23	46110117	OR 115
23	46110406	OR 115 Viton 614-9707
24	46187011	Dust cap
25	46187007	Knob assembly
25		Knob assembly, Nitrox
48	46183008	Connector body (DIN) 200 BAR
49	46183006	Connector wheel (DIN) 200 BAR
50	46110203	OR 2018
50	46110409	OR 2018 Viton 008-9707
51	46179261	Connector (DIN) 200 BAR
52	46110108	OR 108
52	46110404	OR 108 Viton 611-9707
53	46185205	Plug HP 7/16" UNF
61	46185013	Spring, filter

Ref.	Code	Description
62	46183013	Cap, DIN connector
82	46186221	Washer, spring
84	46186228	Piston
85	46187057	Cover, 1st st. D2, send-blasted
86	46110224	OR 2100
86	46110419	OR 2100 Viton 022-9707
88	46186223	Plastic seat, piston
89	46184354	Label, 1st stage D2
107	46187013	Label, 1st stage knob
158		Cover
ASSEMBLIES		
A		1ST stage D2 assy
A		1ST stage D2 assy, Nitrox
A		1st stage DIN assy
F	436901	DIN connector 300 BAR assy (23-48-49-50-51-62)
F		DIN connector assy, Nitrox (23-48-49-50-51-62)
***		Maintenance kit 1st stage INT/DIN (2-19-22-23-50-52-86-88)
***		Maintenance kit 1st stage INT/DIN Nitrox (2-19-22-23-50-52-86-88)

D 2 - FIRST STAGE

DISASSEMBLY

1. Using wrench (B-18), remove hose from the First stage.
2. With a small screwdriver, remove the protection (158) (Fig. 1).

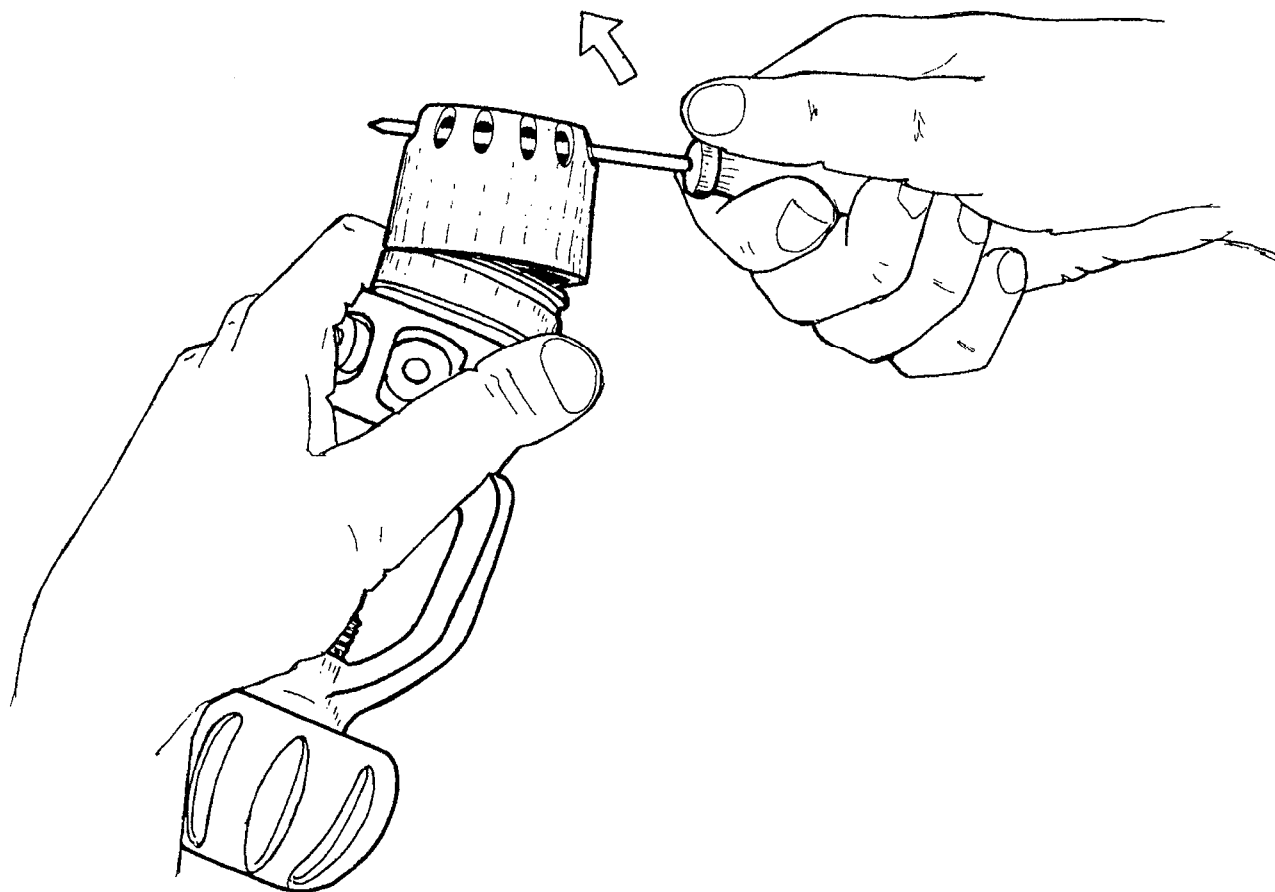



FIG. 1

REPAIR PROCEDURE	PAGE	D 2 FIRST STAGE		
	1-2	First Stage Regulators	11/99	

3. Insert the disassembling tool (B-5) into a LP port.
4. Using a pin wrench (B-23) unscrew cover (85), extract spring (8) and washer (82). (Fig. 2)

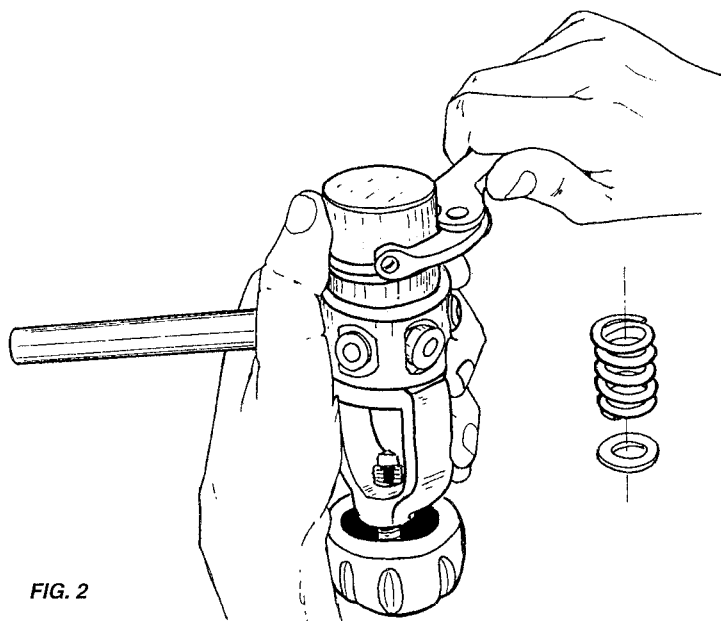


FIG. 2

IMPORTANT ⚠

TO MAKE DISASSEMBLY DESCRIBED IN No. 4 EASIER, CLAMP THE COVER IN A VICE WITH PLASTC JAWS AND LEVERING ON LEVER (B-5) UNSCREW THE FIRST STAGE BODY FROM THE COVER (FIG.3)

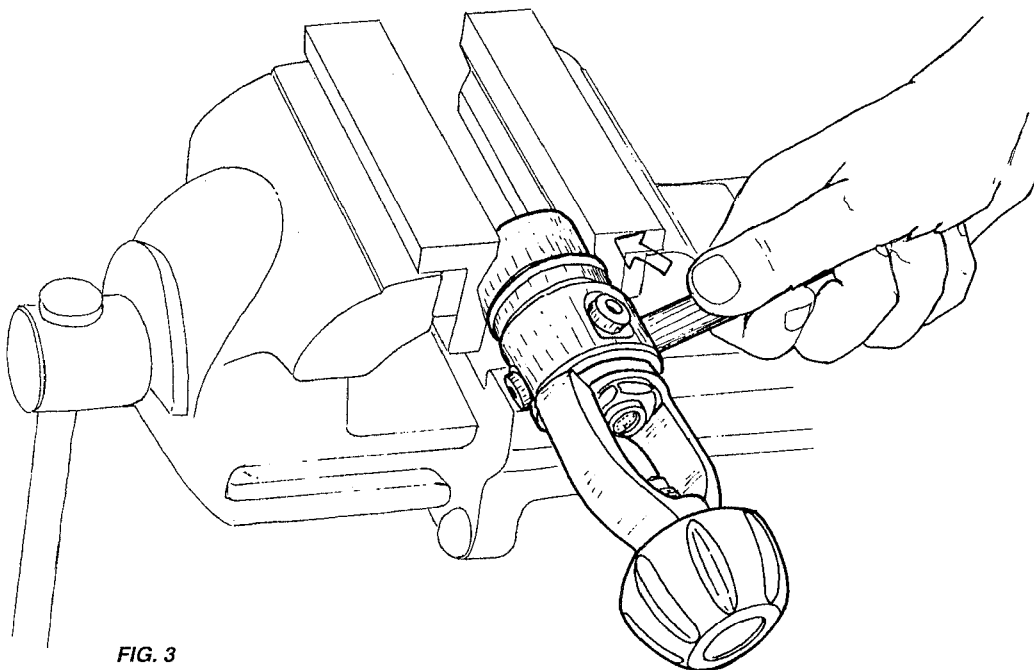



FIG. 3

5. Remove the complete piston (85-86-88-50) from the cover (85).
6. Remove O-rings (88) and (50) from piston.

	D 2 FIRST STAGE		PAGE	REPAIR PROCEDURE
	First Stage Regulators	11/99		

- 7. Remove the piston seat (88) from piston with tool (B-22). (Fig. 4).

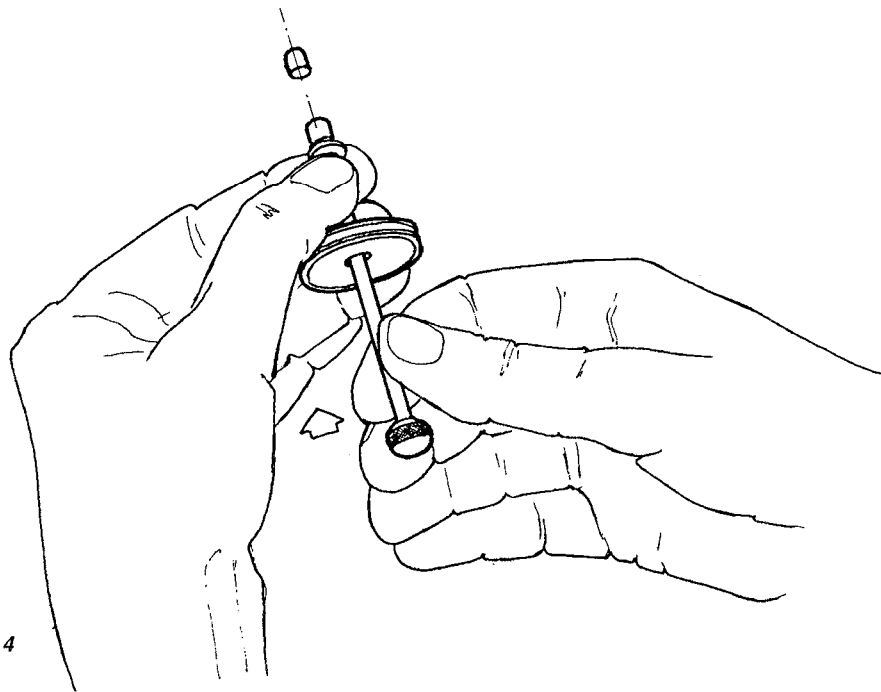


FIG. 4

- 8. Remove yoke retaining nut (7) with wrench (B-1) then remove yoke and knob assembly (25) (Fig.5).

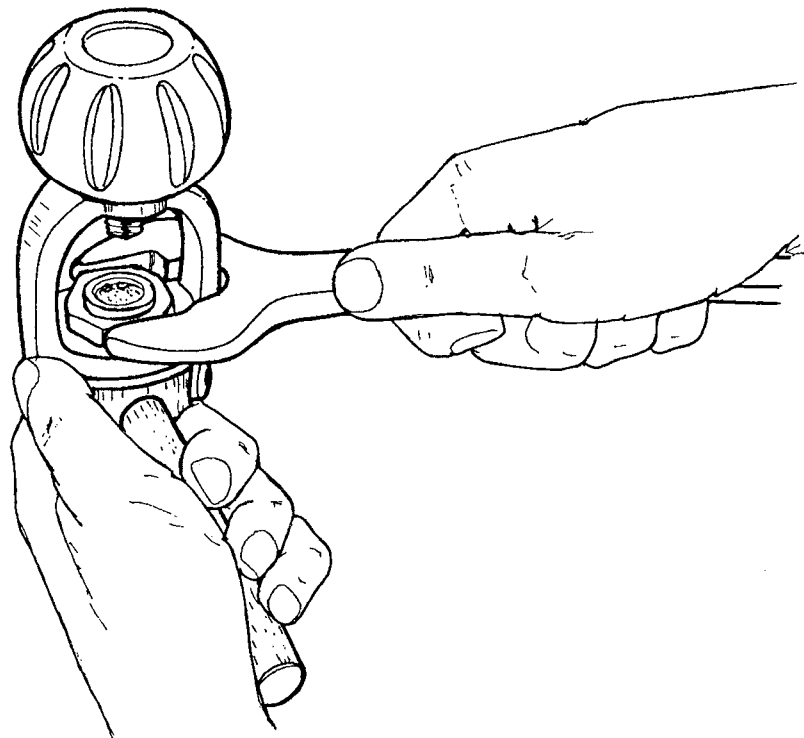



FIG. 5

REPAIR PROCEDURE	PAGE	D 2 FIRST STAGE		
	1-4	First Stage Regulators	11/99	

DIN VERSION

(instead of step 8)

- A. Using a 6 mm. wrench (B-8), unscrew the DIN connector coupling (51).
- B. Remove O-rings (23) and (50) from DIN connector (51).
- C. Extract the DIN connector wheel (49).
- D. Unscrew DIN connector body (48) and O-ring (23)

9. With snap ring pliers (B-14), extract retaining ring (2), filter (22) and filter spring (61) from 1st stage body (1) (Fig.6).

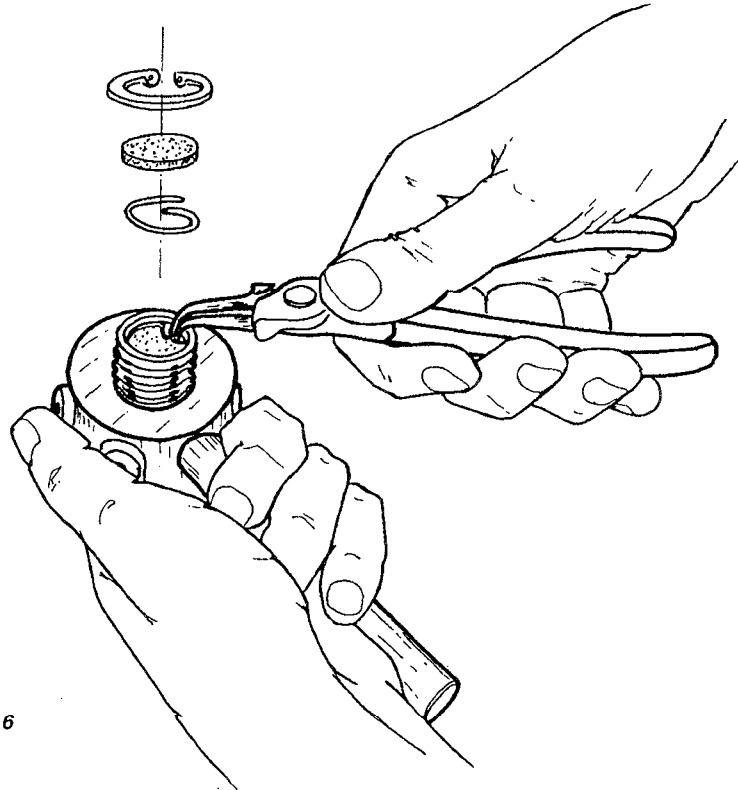



FIG. 6

10. Remove low (20) and high (53) pressure port plugs from 1st stage body and remove O-rings (19) and (52) with a 4 mm wrench.
11. Unscrew lever (B-5) from 1st stage body.

	D 2 FIRST STAGE		PAGE	REPAIR PROCEDURE
	First Stage Regulators	11/99	1-5	

CLEANING

WARNING 

WHEN WORKING WITH ANY KIND OF ACID, PROTECT EYES AND SKIN ADEQUATELY.

Cleaning requires all reusable parts to be carefully cleaned by scrubbing with a soft brush in a mild detergent and water solution. Before reassembly, make sure all parts have been carefully rinsed and dried. Metal parts should be cleaned in an ultrasonic cleaner with fresh water and a mild acid solution (white vinegar diluted with warm water is recommended).

WARNING 

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

WARNING 

DO NOT SUBMERGE THE 1st STAGE PISTON SEAT AND THE SINTERED FILTER IN ANY SOLUTION OF ACID.


INSPECTION

The following components of the 1st stage should be replaced during routine service. In view of their relatively low cost, O-rings should be all replaced at any service.

We recommend replacing the following components:

Description	Ref.	Quantity	Code	Viton Code
- Retaining ring	(2)	1	-code 185015	
- Sintered filter	(22)	1	-code 185014	
- Piston seat	(88)	1	-code 186223	
- O-Ring, piston (stem)	(50)	1	-code 110203	code Viton 110409
- O-Ring, piston (head)	(86)	1	-code 110224	code Viton 110419
- O-Ring LP	(19)	4	-code 110106	code Viton 110402
- O-Ring HP	(52)	1	-code 110108	code Viton 110404
- O-Ring, DIN connector coupling	(50)	1	-code 110203	code Viton 110409
- O-Ring, DIN connector	(23)	2	-code 110117	code Viton 110406

If the following parts are not replaced, they should be inspected with a jeweler's loop or similar magnifying device for the flaws listed below:

REPAIR PROCEDURE	PAGE	D 2 FIRST STAGE		
	1-6	First Stage Regulators	11/99	

DO NOT USE ANY PART WITH THESE FLAWS:

Description	Ref.	Inspection
Retaining rings	(2)	Inspect for distortion, chipping or damaged edges. We recommend to replace them at any revision.
Piston	(84)	Inspect for scratches and/or cuts on the O-rings seats. Make sure the hole through the stem is not obstructed.
Sintered filter	(22)	Inspect for sedimentation and rust. Rust deposits may indicate a deteriorated diving cylinder. Inspect for any chipping.
Piston seat	(88)	Inspect for any scratches, cuts or foreign matter

NOTE

THE PISTON HOUSING CAN BE REVERSED, IF NEEDED. CHECK THAT THE SURFACE IS NOT DAMAGED

O-Rings (19-23-50-52-86)		Inspect for cuts, tears or contamination. The presence of these defects may cause leakage.
Cover	(85)	Inspect the surface in contact with piston O-Rings for chipping or scratches.
1st stage body	(1)	Inspect for scratches, chipping, deteriorated plating on the tapered surface of the metal body, on the housing of plugs and of the piston seat. Make sure there is no foreign matter in the 1st stage body.

NOTE

A SLIGHTLY ABRASIVE RUBBER MAY BE USED TO CLEAN POPPET HOUSING.

O-Ring seals		Inspect all surfaces in contact with O-Rings and with other seals for scratches, chipping, deteriorated plating or contamination.
Springs	(8)	Inspect for cracking or broken coils.
Washers	(82)	Inspect for any sign of deformation, fraying or breaks

REASSEMBLY

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

WARNING 

IF THE SECOND STAGE IS USED FOR ENRICHED AIR DIVING, IT MUST BE PERFECTLY CLEANED AND FREE FROM RESIDUAL SILICONE OR FROM ANY FOREIGN MATTER. VITON O-RINGS CAN BE LUBRICATED WITH SPECIFIC OXYGEN COMPATIBLE GREASE. **DO NO USE SILICONE GREASE.**

- Place the filter spring (61) and the sintered filter (22) into the 1st stage body.
- Using snap ring pliers (B-14), tighten the retaining ring (2) and position it into the 1st stage body over the filter (22).


NOTE

USING SNAP RING PLIERS (B-14) ROTATE THE RETAINING RING TO MAKE SURE IT IS PROPERLY POSITIONED.

- Insert tool (B-5) in a LP port.
- Screw yoke knob (25) on the yoke (3).
- Place the yoke (3) with the knob (25) on the 1st stage body (1).
- Using wrench (B-1), tighten retaining nut (7).

IMPORTANT 

TO PREVENT THE YOKE RETAINER NUT FROM BECOMING LOOSE, PLACE TWO DROPS OF THREAD COMPOND (LOCTITE 242 E) ON THE THREADS OF THE RETAINING NUT.

	D 2 FIRST STAGE		PAGE	REPAIR PROCEDURE
	First Stage Regulators	11/99	1-7	

DIN VERSION

(instead of steps 5-6)

- A. Place O-Ring (23) into the housing of DIN connector (48).
- B. Screw the DIN connector (48) onto 1st stage body (1) using a spanner.
- C. Place the DIN connector wheel(49) on DIN connector (48).
- D. Mount O-Rings (23) and (50) on DIN connector coupling (51).
- E. Using the 6 mm. wrench (B-8), tighten the DIN connector coupling (51) in the 1st stage body.

WARNING 

TO PREVENT THE DIN CONNECTOR (48) AND THE DIN COUPLING (51) BECOMING ACCIDENTALLY LOOSE, PLACE ONE OR TWO DROPS OF THREAD COMPOUND (LOCTITE 242 E) ON THE THREADING.

7. Install the piston seat (88) and O-Rings (50) and (86) on the piston (84).
8. Slightly lubricate with silicone grease the surface of the cover that is in contact with head of the piston.
9. Insert the piston assembly into the cover (85)
10. Place washers (82) (if present) as follows:
 - a) If one washer is present, place it against the piston (Fig. 7A).
 - b) If two washers are present, place one against the piston and the second washer into the 1st stage body (Fig. 7B).

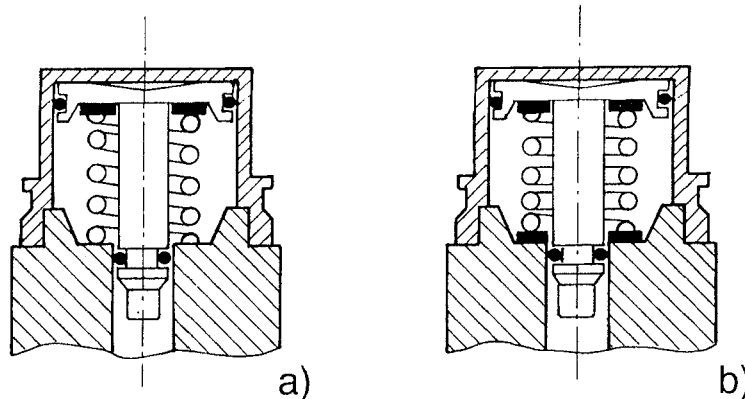



FIG. 7

11. Slightly lubricate the base of the spring (8) with silicone grease and insert on the piston body, in the cover (85).
12. Thread the cover (85) on the 1st stage body using tool (B-23).

WARNING 

TO MAKE STEP 12 OF REASSEMBLY EASIER, SCREW COVER TWO TURNS, THEN TIGHTEN THE COVER ON PLASTIC JAWS AND LEVERING ON (B-5) LEVER, FIX COVER (Fig. 8).

13. Insert protection (158) on the cover (85).
14. Unscrew tool (B-5) from the LP port.
15. Place O-Rings (52) and (19) on HP and LP pressure port plugs (53) and (20).
16. Using the 4 mm wrench, screw HP and LP port plugs (20) and (53) into their seat on the 1st stage body.
17. Using tool (B-18), install hose on 1st stage DFC port and tighten.

REPAIR PROCEDURE	PAGE	D 2 FIRST STAGE		
	1-8	First Stage Regulators	11/99	

ADJUSTING OF THE INTERMEDIATE PRESSURE

To obtain the correct intermediate pressure adjusting, proceed as follows:

- A. The system used must have low and high pressure air at disposal.
- B. A measuring gauge for intermediate pressure is needed (MAX 30 – 40 BAR scale).

TABLE OF FIRST STAGE INTERMEDIATE PRESSURE		
MODEL	P.S.I. PRESSURE	BAR PRESSURE
D 2	142 - 152	9,8 – 10,5

Tab. A

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

WARNING ▲
DO NOT SUBMERGE THE INTERMEDIATE PRESSURE MEASURING GAUGE.

2. Using tool (B-18), apply the hose with the partially finished second stage to the D.F.C. port.
3. Mount the regulator group on the control valve (of a Test Bench or a tank).
4. Holding down the 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:

- A. If the calibration value is higher than the required value (see Table A):
 - a) Close the tank valve and release air depressing the demand lever.
 - b) Disassemble the assembly from the tank and proceed as steps 1-2-3-4 of the disassembly section.
 - c) Remove washer (see Fig. 7A – 7B).
 - d) Reassemble components as indicated at steps 10-11-12-13-14-17 of the Reassembly section.
 - e) Operate as indicated at steps 3-4 of the present section, checking the intermediate pressure value on the gauge.

NOTE


IF THERE IS NO WASHER IN THE FIRST STAGE, THE SPRING MUST BE REPLACED.

- B. If the calibration value is lower than the required value (see Table A):
 - a) Close the tank valve and release air depressing the demand lever.
 - b) Disassemble the assembly from the tank and proceed as steps 1-2-3-4 of the disassembly section.
 - c) Add one or two washers as per step 10 in the Reassemble section (see Fig. 7A – 7B).
 - d) Reassemble components as indicated at steps 10-11-12-13-14-17 of the Reassemble section.
 - e) Operate as indicated at steps 3-4 of the present section, checking the intermediate pressure value on the gauge.

NOTE


IF THERE IS NO WASHER IN THE FIRST STAGE, THE SPRING MUST BE REPLACED.

6. Operate the second stage demand lever a few times and check that the First stage adjustment remains constant.
7. Go on with the Second stage adjustment, then close the tank valve and release air depressing the demand lever.
8. Dismount the assembly from the valve system and screw on the corresponding port plug.

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D 2 FIRST STAGE TROUBLESHOOTING

PROBLEM	MODEL	PROBABLE CAUSE	SOLUTION
- 1 - AIR LEAKAGE FROM THE FIRST STAGE PORT AND/OR 1ST STAGE HOSE PORTS	D 2	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
- 2 - AIR LEAKAGE FROM 1ST STAGE BODY AND DIN CONNECTOR	D 2	1) O-Ring seal dirty or damaged	1) Clean the seal and replace the O-Ring
		2) DIN connector body loose	1) Lock down
- 3 - AIR LEAKAGE FROM 1ST STAGE INLET AND THE TANK VALVE	D 2	1) O-Ring seal of the tank valve dirty or damaged	1) Clean the seat on the tank valve and replace the O-Ring
		2) O-Ring seal on 1st stage dirty or damaged	1) Replace 1st stage body
- 4 - AIR LEAKAGE FROM COVER HOLES ON 1ST STAGE	D 2	1) O-Rings of the piston defective	1) Replace O-Rings
		2) O-Rings seals surface of the piston dirty or damaged	1) Clean or replace
		3) Interior surface of the cover dirty or damaged	1) Clean or replace cover
		4) Interior surface of the 1st stage dirty or damaged	1) Clean or replace 1st stage body
- 5 - AIR LEAKAGE FROM 2nd STAGE CHARACTERIZED BY AN INCREASE IN THE INTERMEDIATE PRESSURE	D 2	1) Intermediate pressure too high	1) Adjust intermediate pressure
		2) 1st stage poppet damaged	1) Replace
		3) Piston seal damaged	1) Replace the piston seal

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