

DACOR REPAIR MANUAL
VOLUME TWO
9/93
9470-00

INTRODUCTION



© 1993 DACOR CORPORATION

INTRODUCTION

Congratulations on your purchase of the Dacor Repair Manual - Volume Two! This manual contains all regulators from the beginning of the PACER line to present. This manual also contains product or product components beginning with the 1992 product line to present. Also included are products produced before 1992, never published in the prior manual.

Regulators older than the PACER line (Double Hose, Olympics, etc.) are referenced in the Dacor Repair Manual - Volume One. Also referenced in Volume One are products or product components produced before 1992.

Both manuals, Volume One and Volume Two, contain over forty years of Dacor products. The manual has been divided into two volumes due to size and to keep future updates simple and organized. A convenient cross reference list has been compiled as an easy reference of product between the two volumes.

During Dacor's forty year history, a number of limited production products were produced and not published in the repair manual. If you need information on a product or product component not listed, please contact the Dacor Technical Support Department.

HOW TO USE THIS MANUAL

The Dacor Repair Manual - Volume Two has been divided into thirteen sections. Schematics and part listings are always on the left hand page. Repair procedures always begin on the opposing right page. This allows you, the reader, to view the schematic and read procedures with a minimum of page turning. You may encounter a number of intentional blank pages on the right side. This is required to keep the pagination consistent.

PAGE LAYOUT

The pages in this manual have been designed to provide a maximum amount of information in a consistent, organized form and to keep future updates simple.

A. The # column corresponds to the referenced part in the schematic. There are cases in which you may have a choice in which part to use, as in the case of different colors. Whenever you see a blank after a number in this column, this indicates a choice of parts for you to choose.

B. The **QTY** column refers to the quantity of a particular part used in a product or product component.

C. The **PART #** column lists the Dacor part number for the referenced part.

D. The **KEY** column contains icons for referencing notes on a particular part. The notes are found in the bottom right corner of the page.

E. The **DESCRIPTION** column contains the part description. In certain cases, a replacement part number may be listed after the description. You may use either the part number from the **PART #** column if available, or the replacement number.

F. This is the date that the information was compiled. All information is current as of this date. For future revisions, the revision date will be listed such as Rev. 1/94.

G. This is the product or product component description. This description is listed in the table of contents.

H. This is the section title, as listed on the dividers.

I. This is the section number and page number.

Sections are included for Technical Bulletins, that may be mailed out from time to time by Dacor as needed. Also there is a section for a Part Pricelist. The Part Pricelist is a sequential listing of part numbers, descriptions and dealer cost. The Part Pricelist is to be used in conjunction with the schematics in the repair manual.

If you have any questions or comments regarding this manual, please contact the **Dacor Technical Support Department** at:

DACOR CORPORATION
 161 NORTHFIELD ROAD
 NORTHFIELD, ILLINOIS 60093
 U.S.A.
 Tel. (847) 446-9555
 Fax. (847) 446-7547

Compiled, written, edited and produced by Craig H. Rogers, Technical Support Manager.

Special thanks to:
 The **Dacor Repair Department:** Elliott Castaneda, Cecil Cobb, Eric Ismond and Jerry Whitmire. (Continued ◀)

REPAIR PROCEDURE	PAGE	INTRODUCTION		
	2	Dacor Repair Manual Volume Two	9/93	

The **Dacor Engineering Department:** Tim Curameng, Bill Eungard, Jim Lutz, Rich Plegge, Mitch Pomerantz and Mark Walsh.

The **Dacor Customer Service Department:** Gary Davison and Kris Fronteras.

© DACOR CORPORATION 1993.

	INTRODUCTION		PAGE 3	REPAIR PROCEDURE
	9/93	Dacor Repair Manual Volume Two		

DACOR REPAIR MANUAL
VOLUME TWO
9/93
SECTION 1

FIRST STAGE REGULATORS



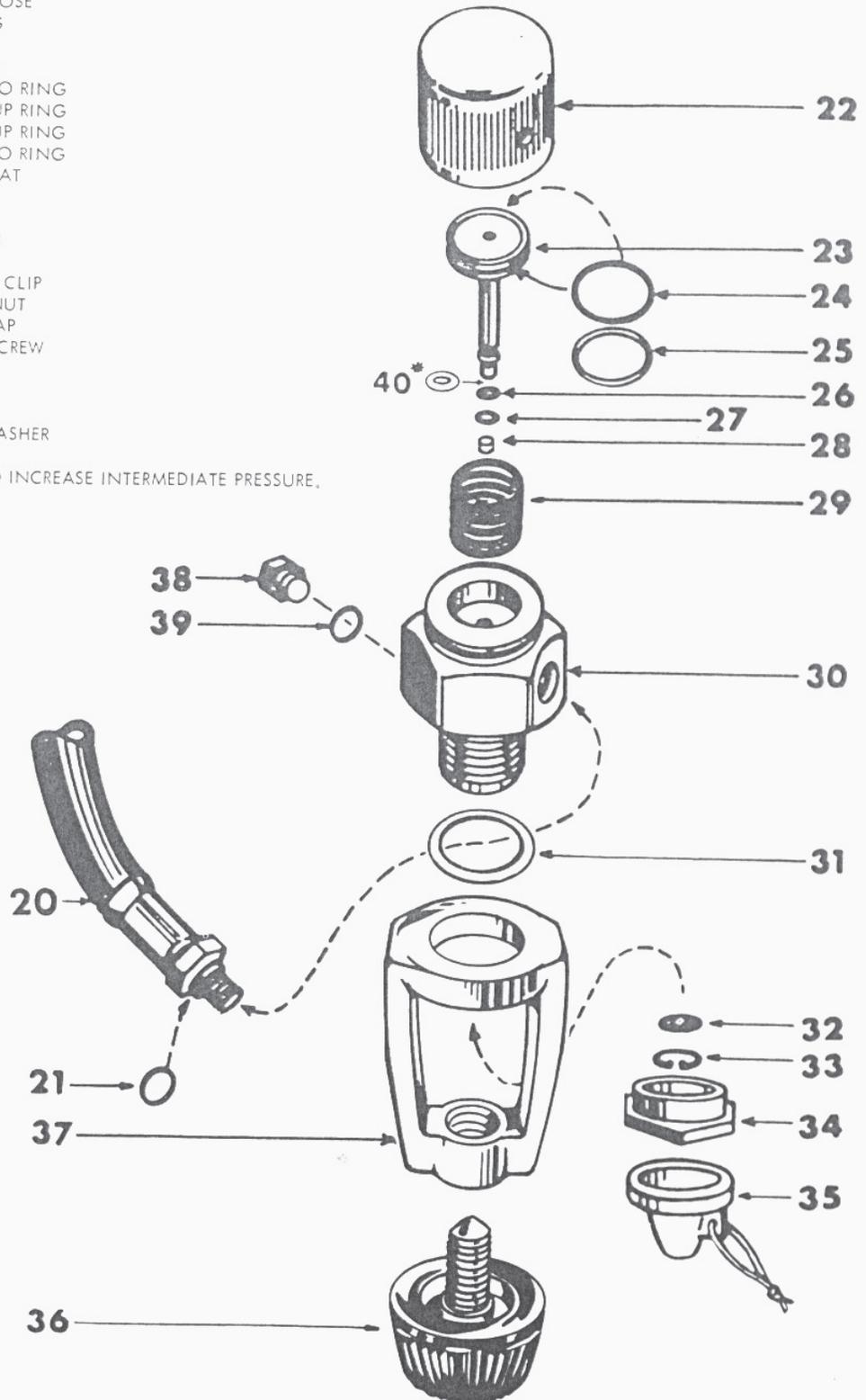
PACER 150 _____	added
PACER 300 & 350 _____	1-1
PACER 600 & 650 _____	1-4
PACER XL950, 950A, 950H & 900 _____	1-6
PACER 260 / FORMULA _____	1-10
PACER 360 (PRE 1991) _____	1-12
PACER 360 ICE _____	1-14
PACER 360 (1991 & AFTER) _____	1-17
PACER 360 DIN (PRE 1991) _____	1-20
PACER 460 _____	1-22
PACER 460 DIN _____	1-25
PACER 760 _____	1-28
PACER 960 (PRE 1991) _____	1-32
PACER 960 (1991 & AFTER) _____	1-35
REGULATOR MODULE _____	1-38
EXTREME PLUS / EXTREME ICE _____	1-41
EXTREME _____	1-44
QUANTUM _____	1-47
ENDURO _____	1-49
BOOST TESTING _____	1-52

PACER 150 1ST STAGE

Key Part No. Description

20	SS442	L. P. HOSE
21	D161	O RING
22	FPR431	CAP
23	FPR181	PISTON
24	FPR61	LARGE O RING
25	FPR91	BACK-UP RING
26	FPR92	BACK-UP RING
27	FPR62	SMALL O RING
28	FPR81	DISC SEAT
29	FPR41	SPRING
30	FPR31	BODY
31	R4121	WASHER
32	FS112	FILTER
33	FS251	SPRING CLIP
34	FS152	YOKE NUT
35	FS261	DUST CAP
36	1FS103	YOKE SCREW
37	FS391	YOKE
38	D1411	PLUG
39	D161	O RING
40*	MR129	SHIM WASHER

* USED ON SOME PISTONS TO INCREASE INTERMEDIATE PRESSURE.



SECTION 1U

To Disassemble 150 First Stage

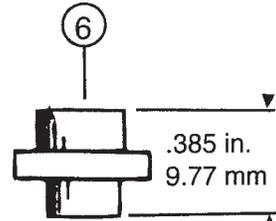
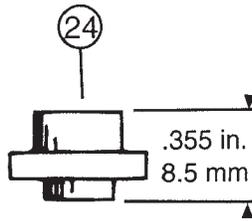
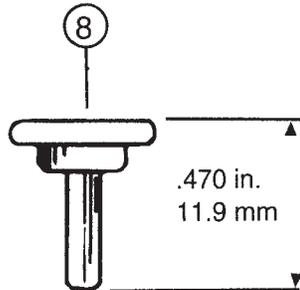
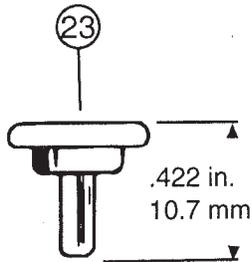
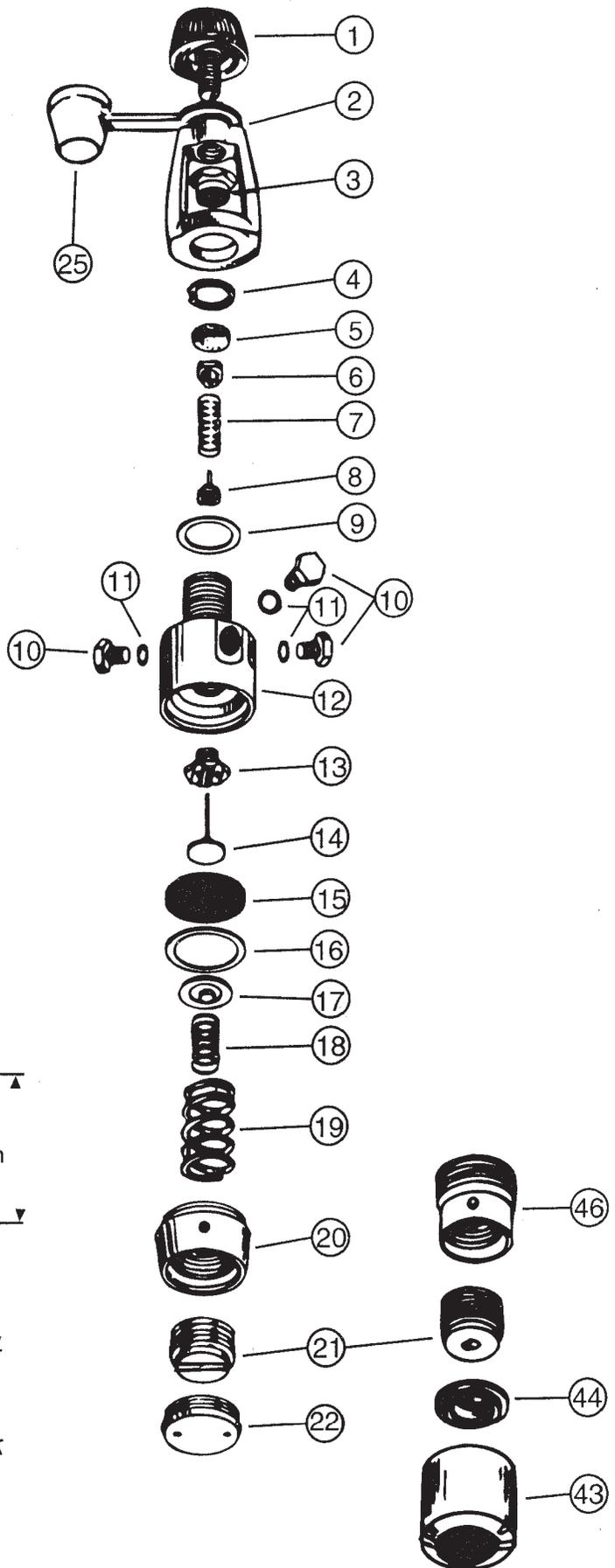
- U-1** Remove hose (20) from main body (30) using 9/16" wrench. "O" ring (39) will now be accessible.
- U-2** Remove cap (22) from main body by turning counter-clockwise.
- U-3** Remove piston (23) from cap by pulling gently on shaft of piston. "O" rings (24 and 27) and back-up rings (25 and 26) will now be accessible for lubricating and/or replacement, and disc seat (28) will be accessible for inspection and/or replacement. Cone seat in main body will also be accessible for inspection and/or polishing.
- U-4** Remove disc seat from piston by inserting wire through piston shaft and pushing seat disc from housing. A paper clip straightened out makes an excellent tool for this operation.
- U-5** Remove spring (29) from main body.
- U-6** Use circlip pliers to remove spring clip (33) from main body.
- U-7** Remove filter (32) from main body.
- U-8** To remove yoke (37) and washer (31), use wrench to loosen yoke nut (34) from main body, turning nut counter-clockwise.
- U-9** Remove plug (38) or TAG underwater pressure gauge by turning counter-clockwise with wrench. "O" ring (39) will not be accessible.

SECTION 1V

To Assemble 150 First Stage

- V-1** Install plug (or TAG underwater pressure gauge) after lightly lubricating "O" ring with silicone grease. Remember high pressure port has small orifice; low pressure port has large orifice.
- V-2** Install spring in main body.
- V-3** Install disc seat in piston by placing on clean flat surface, face down, beveled side up. Push piston down on seat until seat is firmly in place.
- V-4** Mount "O" rings and back-up rings on piston after lubricating them lightly. "O" rings must be mounted on the pressure side of the "O" ring groove, the back-up rings on the ambient side.
- V-5** Install piston assembly in cap.
- V-6** Install cap on main body, making it hand tight.
- V-7** Install filter with rough side out and spring clip with flat side up into body using circlip pliers. Be sure spring clip is seated in groove situated inside chamber.
- V-8** Install washer, yoke and yoke nut. Use wrench to tighten yoke nut. *Note:* Washer has a flat side and a round side. The flat side should go against the yoke.
- V-9** Install hose, after lightly lubricating "O" ring with silicone grease.
- V-10** To check intermediate pressure on the 150, mount unit on air source. (A diving cylinder is fine.) Install a Pacer pressure setting gauge (Model GPS) between hose and valve cone which is located on the second stage assembly. If air source is low (300 psi) gauge should read 120 psi (approximately). If air source is high (2500 psi), gauge should read 140 psi. The intermediate pressure on the 150 is controlled by the piston spring (29), and all units leaving DACOR are correct. Service personnel should have no problem in this area. However, in the event that the unforeseen should occur, intermediate pressure can be increased by using a stainless steel shim washer (40) on shaft of piston. If a unit is over correct pressure, a new spring must be installed.

#	QTY	PART #	KEY	DESCRIPTION
1	1	0100-51		YOKE SCREW
2	1	0390-02		YOKE
3	1	0150-16		YOKE NUT
4	1	0250-10		RETAINING RING
5	1	0110-00		FILTER
6	1	0101-16		BALANCE CHAMBER ASSM.
7	1	0040-07		SPRING
8	1	0100-15		H.P. SEAT
9	1	0120-13		WASHER
10	3	0410-05		PLUG
11	3	0060-01		O-RING
12	1	0030-50	①	MAIN BODY- EARLIER MODELS
12	1	0030-36	②	MAIN BODY- CURRENT
13	1	0180-30		BUSHING
14	1	0100-44		PUSH ROD
15	1	0050-12		DIAPHRAGM H.P.
15	1	0050-03		DIAPHRAGM H.P. EARLIER MOD
16	1	0120-65		WASHER
16	1	0120-18		WASHER- EARLIER MODELS
17	1	0160-00		SPRING PAD (SUB 0622-14)
18	1	0040-06		SPRING
19	1	0040-05		SPRING
20	1	0180-31		CUP
21	1	0200-03		ADJUSTMENT SCREW
22	1	0410-08		PLUG
23	1	0102-26		H.P. SEAT EARLIER MODELS
24	1	0100-21		BALANCE CHAMB ASSM EARLY
25	1	0510-42		DUST CAP
43	1	0180-04	③	AMBIENT CAP
44	1	0050-01	③	DIAPHRAGM
21	1	0200-02	③	ADJUSTING SCREW
46	1	0180-05	③	DIAPHRAGM RETAINER
		0860-01	③	1/2 OUNCE SILICONE



USED ON EARLIER 300'S

CURRENT



PACER 300 & 350
FIRST STAGE

9/93

First Stage
Regulators

PAGE

1-1

KEY

- ① Use 0100-21 with earlier model seat 0102-26
- ② Only to be used with H.P. seat 0100-15
- ③ All Environment Kit

PACER 300 & 350 FIRST STAGE

Disassembly:

Step 1: Remove hose from main body (12) using 9/16" wrench. O-ring will now be accessible.

Step 2: Using a 1/2" wrench or allen wrench, remove plugs (10) and/or accessories from main body (12). O-rings (11) will now be accessible.

Step 3: Remove plug (22) from the main assembly, using 5/8" cap wrench.

Step 4: Remove adjustment screw (21) using 1/8" allen wrench (RTK982), or wide blade screwdriver.

Step 5: Remove high pressure diaphragm springs (18 & 19).

Step 6: Remove cup (20) using spanner wrench.

Step 7: Remove spring pad (17), washer (16) and high pressure diaphragm (15) from main body (12).

Step 8: Remove push rod (14).

Step 9: Remove bushing (13) from main body using 1/2" socket wrench.

Step 10: Remove retaining ring (4) from main body using retaining ring pliers. Remove sintered filter (5). Caution: There is a spring tension under the filter; therefore, remove the retaining ring carefully to prevent loss of parts.

Step 11: Remove balance chamber assembly (6), high pressure seat spring (7) and high pressure seat assembly (8) from main body.

Step 12: Remove yoke screw (1) from yoke (2).

Step 13: Remove yoke nut (3) from main body. Washer (9) and yoke can now be removed. Note: These slightly different first stage main bodies are in the field. Early models (of which there are two versions) have two low pressure ports and one high pressure port. The earlier versions have, and can use, only the parts shown as items (23 & 24). The later version has, and can use, only the parts shown as items (6) and (8) in the same figure.

To accommodate the longer stack-up of parts in the later version, the location of the groove that retains the retaining ring (4), located in the high pressure chamber

of the first stage, was changed. Therefore, the earlier first stage will have a retaining ring groove fairly deep in the high pressure chamber (.115") compared to the later units which have a retaining ring groove closer to the outer edge of the high pressure chamber (.065"). The later model has three low pressure ports and one high pressure port. It has, and can only use the parts shown as items (6) and (8).

Assembly:

Step 1: Install high pressure seat (8) or (23), seat spring (7) and balance chamber assembly (6) or (24) (in that order) in main body.

Step 2: Install filter (5) and spring clip (4), using circlip pliers. Note: Rough side of the filter should face out. Be sure spring clip is firmly seated in groove situated inside high pressure chamber with sharp edge of clip facing out.

Step 3: Install the yoke (2), washer (9), yoke nut (3) and yoke screw (1).

Step 4: Install bushing (13) in main body (12).

Step 5: Install push rod (14) through center hole of bushing.

Step 6: Install diaphragm (15) in main body.

Step 7: Install diaphragm washer (16) in main body after lubricating lightly with silicone grease. The side with the rounded edge should be against the diaphragm,

Step 8: Install spring pad (17), smooth side against body.

Step 9: Install cup (20) into main body. Tighten snugly with spanner wrench. Do not over-tighten or diaphragm damage may occur.

Step 10: Install two high pressure diaphragm springs (18) and (19).

Step 11: Install adjusting screw (21).

Step 12: Install plugs and/or accessories in main body after inspecting and lubricating o-rings(11). Remember, the high pressure port has a restricted, small orifice; the low pressure port has a large orifice.

Step 13: Install hose on low pressure port of main body, after inspecting and lubricating o-ring (11).

REPAIR PROCEDURE	PAGE	PACER 300 & 350 FIRST STAGE		
	1-2	First Stage Regulators	9/93	

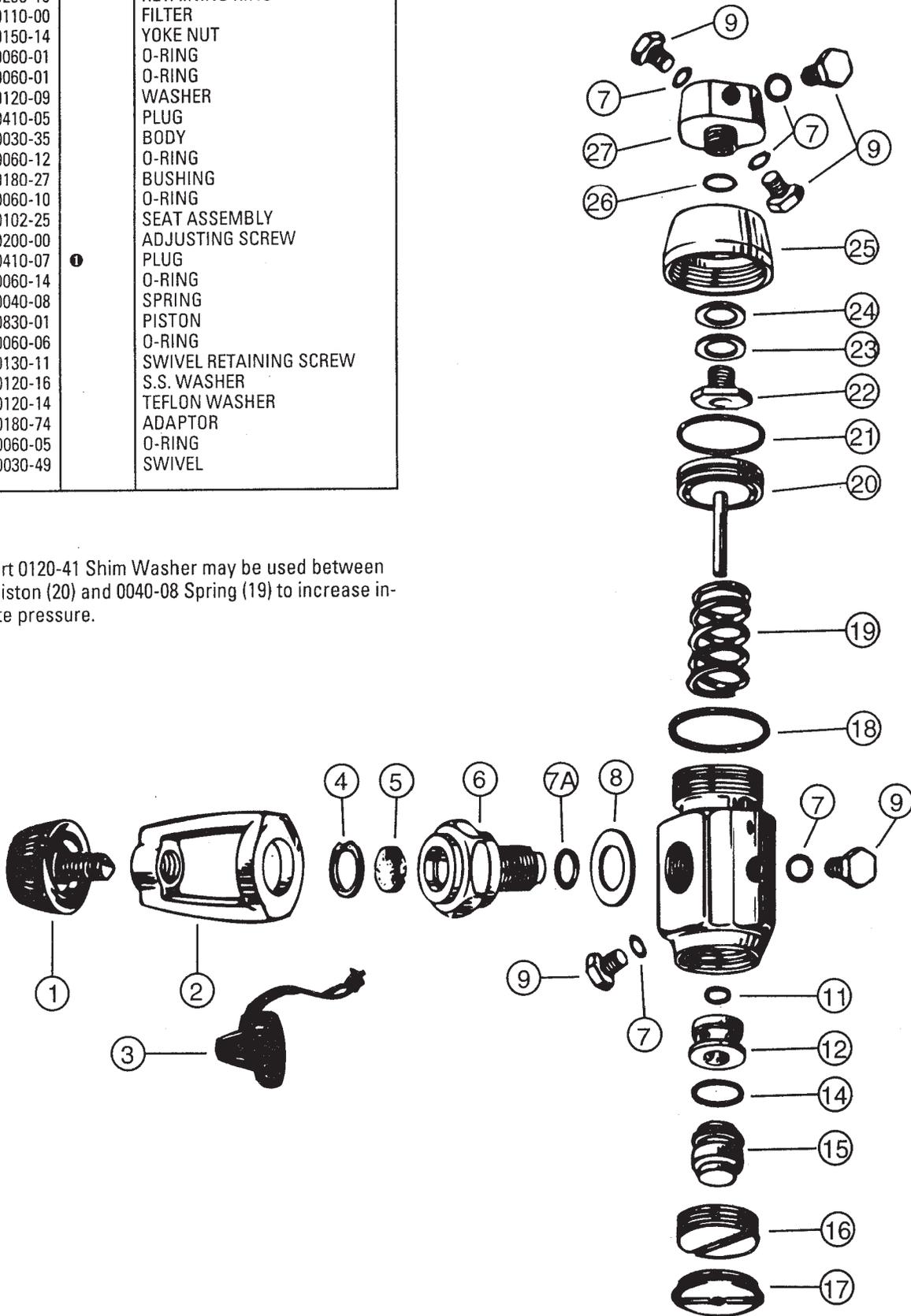
Step 14: To adjust intermediate pressure, mount regulator on air source (a diving cylinder can be used). Install a Dacor in-line pressure setting gauge between hose and valve seat which is located on the second stage assembly. Open cylinder tank. Optimum input testing pressure should be 3000 psig. Intermediate pressure, as indicated by the pressure setting gauge, should be 140 psig. A small drop in intermediate pressure (no more than 6 psig) is permissible at a low pressure of 300 psig. The pressure setting is made by turning adjusting screw in (clockwise) to increase intermediate pressure, or by turning adjusting screw out (counter-clockwise) to reduce intermediate pressure.

Step 15: Replace plug (22). Tighten snugly, do not over-tighten.

	PACER 300 & 350 FIRST STAGE		PAGE 1-3	REPAIR PROCEDURE
	9/93	First Stage Regulators		

#	QTY	PART #	KEY	DESCRIPTION
1	1	0101-22		YOKE SCREW (SUB 0104-33)
2	1	0390-08		YOKE
3	1	0510-42		DUST CAP
4	1	0250-10		RETAINING RING
5	1	0110-00		FILTER
6	1	0150-14		YOKE NUT
7	5	0060-01		O-RING
7A	1	0060-01		O-RING
8	1	0120-09		WASHER
9	5	0410-05		PLUG
10	1	0030-35		BODY
11	1	0060-12		O-RING
12	1	0180-27		BUSHING
14	1	0060-10		O-RING
15	1	0102-25		SEAT ASSEMBLY
16	1	0200-00		ADJUSTING SCREW
17	1	0410-07	❶	PLUG
18	1	0060-14		O-RING
19	1	0040-08		SPRING
20	1	0830-01		PISTON
21	1	0060-06		O-RING
22	1	0130-11		SWIVEL RETAINING SCREW
23	1	0120-16		S.S. WASHER
24	1	0120-14		TEFLON WASHER
25	1	0180-74		ADAPTOR
26	1	0060-05		O-RING
27	1	0030-49		SWIVEL

NOTE: Part 0120-41 Shim Washer may be used between 0830-01 Piston (20) and 0040-08 Spring (19) to increase intermediate pressure.



PACER 600 & 650
FIRST STAGE

9/93

First Stage
Regulators

PAGE

1-4

KEY

❶ Has been replaced by a new design under the same part number.

PACER 600 & 650 FIRST STAGE

Disassembly:

Step 1: Remove hoses and port plugs (9) from main body first stage assembly. O-rings (7) are now accessible.

Step 2: Remove yoke (2), yoke screw (1), Teflon washer (8) and yoke nut (6) from main body (10) using crescent wrench or vise to loosen yoke nut from body. O-ring (7A) is now accessible. Note: Jaws of wrench/vise should be placed on hex portion of yoke nut.

Step 3: Remove retaining ring (4) and filter (5) from yoke nut, using internal retaining ring pliers.

Step 4: Remove swivel assembly (27) as follows: Using the spanner wrench, turn adaptor (25) counter-clockwise. O-ring (18) will now be accessible.

Step 5: Remove swivel retaining screw (22) using a 9/16" socket wrench. Remove SS washer (23) and Teflon washer (24). Adaptor (25) and swivel (27) can now be separated by pulling the two pieces apart. O-ring (26) is now accessible.

Step 6: Remove piston (20). O-ring (21) is now accessible.

Step 7: Remove piston spring (19).

Step 8: Remove plug (17).

Step 9: Remove adjusting screw (16) using wide blade screwdriver.

Step 10: Remove seat assembly (15) as follows: Insert the long shaft of the 3/16" allen wrench into the high pressure port located in the inside of the center of the main body from the piston side. Gently push the seat assembly free. Bushing (12) can now be removed. O-ring (14) is now accessible.

Assembly:

Step 1: Replace piston spring (19).

Step 2: Replace piston (20), after inspecting, greasing and remounting o-ring (21).

Step 3: Reassemble swivel assembly as follows: Join swivel (27) and adaptor (25) together after inspecting, greasing and remounting o-ring (21). This can be done

by pressing the two parts together by hand. Replace the Teflon washer and SS washer. Replace the swivel retaining screw (22) using the socket wrench. Note: Place less than one drop of green Loctite® #290 on thread of screw before installing.

Step 4: Replace swivel assembly after inspecting, greasing and remounting o-ring (18). Turn assembly clockwise on main body using spanner wrench to tighten.

Step 5: Replace o-ring (11) and bushing (12) in main body (10) in high pressure seat side. To prevent possibility of cutting o-ring (11) with the sharp edge of the piston, use of the piston inserting tool (RTK986) is recommended. This is done by placing the o-ring (11) (after lubricating) over the tapered end of the tool, followed by the bushing. The machined end of the tool is then inserted into the shaft of the piston (already in place in the main body). By sliding the bushing down the tool into the main body, both o-ring (14) and bushing (12) will be properly in place, Inserting tool can now be removed.

Step 6: Replace seat assembly (15) after inspecting, greasing and remounting o-ring (14). Seat must be inserted completely into chamber.

Step 7: Replace adjusting screw (16), using screwdriver and turning clockwise until adjustment screw bottoms. Replace plug (17).

Step 8: Replace filter (5) with rough side out and the retaining ring (4) with the sharp side out into the yoke nut (6) using retaining ring pliers. Inspect, grease and replace o-ring (7A).

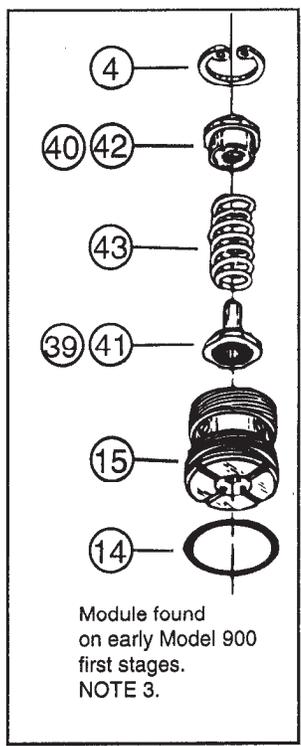
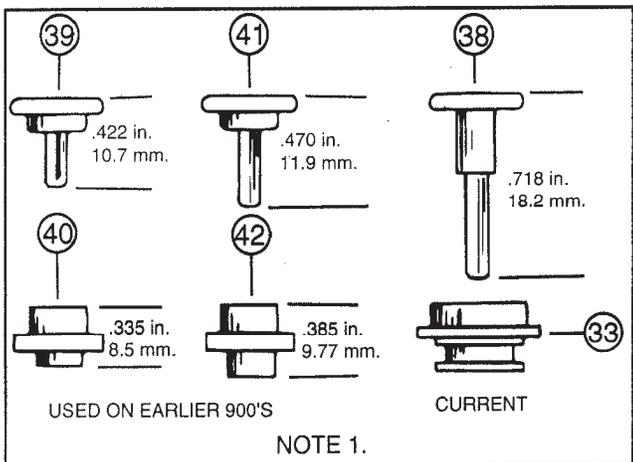
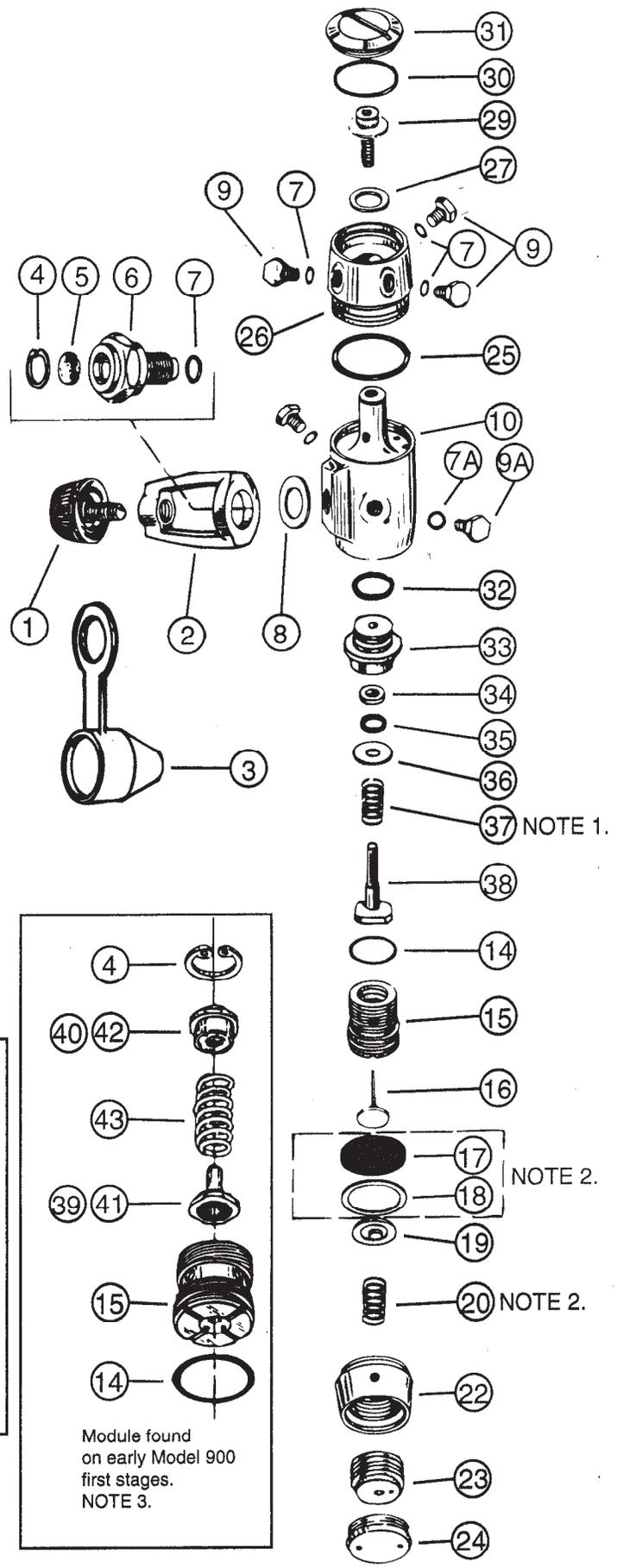
Step 9: Replace yoke assembly as follows: Insert threaded section of yoke nut (6) through opening at base of yoke (2). Place Teflon washer (8) on threaded section. Insert yoke nut into threaded opening on main body (10). Hold the yoke/module in your hand and turn main body (10) clockwise until snug. Using wrench or vise on hex portion of yoke nut, gently tighten. Note: Place less than one drop of green Loctite® #290 on threads of yoke nut (6) before installing. Replace yoke screw (1) into yoke.

Step 10: Replace second stage hose, plus accessories and plugs after inspecting, greasing and remounting all o-rings (7A).

Step 11: Proper intermediate pressure with 3000 PSI input is 140 PSI. If the pressure is high, the spring should be replaced. If pressure is too low, shim washer (0120-41) can be used to increase pressure.

REPAIR PROCEDURE	PAGE	PACER 600 & 650 FIRST STAGE		
	1-5	First Stage Regulators	9/93	

#	QTY	PART #	KEY	DESCRIPTION
1	1	0102-11		YOKE SCREW
1A	1	0103-77		YOKE SCREW
2	1	0390-08		YOKE
3	1	0510-42		DUST CAP
4	1	0250-10	①②	RETAINING RING
5	1	0110-00	①②	FILTER
6	1	0150-14		YOKE NUT
7	5	0060-01	①②	O-RING
7A	5	0060-43	①②	O-RING
8	1	0120-09	①	WASHER
9	4	0410-05		L.P. PLUG
9A	5	0410-20		H.P. PLUG
10	1	0030-38		BODY
14	1	0060-11	①②	O-RING
15	1	0180-26		H.P. MODULE
16	1	0100-46		SEAT & PUSH ROD ASSM.
17	1	0050-12	①	H.P. DIAPHRAGM
18	1	0120-65		WASHER
19	1	0160-00		SPRING PAD
20	1	0040-53	①	SPRING
22	1	0180-31		CUP
23	1	0200-03		ADJUSTMENT SCREW
24	1	0410-08		PLUG
25	1	0060-15	①②	O-RING
26	1	0030-29		SWIVEL
27	1	0120-12	①	WASHER
29	1	0101-67		WASHER/SCREW ASSM.
30	1	0060-13	①②	O-RING
31	1	0410-06		PLUG
32	1	0060-82	①②	O-RING
33	1	0180-29		BALANCE CHAMBER
34	1	0090-03	①②	BACKUP RING
35	1	0060-16	①②	O-RING
36	1	0120-19		WASHER
37	1	0040-24		SPRING
38	1	0100-12	①	H.P. SEAT (CURRENT)
39	1	0102-26		H.P. SEAT
40	1	0100-21		BALANCE CHAMBER ASSM.
41	1	0100-15		H.P. SEAT
42	1	0101-16		BALANCE CHAMBER ASSM.
43	1	0040-07		SPRING
		1186-00		AER KIT (OPTIONAL)



PACER XL950, 950A, 950H & 900
FIRST STAGE

9/93

First Stage
Regulators

PAGE
1-6

KEY
① Included in annual overhaul kit #9680-08
② Included in annual service kit #9680-15

PACER XL950, 950A, 950H & 900 FIRST STAGE

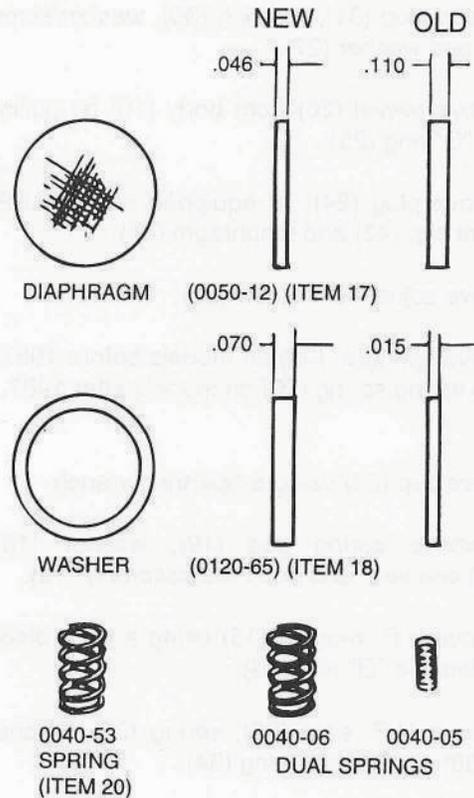
Important Notes

NOTE 1. Item (37) can only be used with current seat assembly (33) and (38). Spring (43) must be used with items (39, 40, 41, 42) and was part of Module found on earlier 900 First Stages. (See note 3).

NOTE 2. Items (17) and (18) must be used together as a unit. Furthermore, they can only be used with item (20) spring. NOTE: Early versions of 950 First Stages used dual springs as well as a thin washer. (Refer to view below). These dual springs cannot be used with the new thinner diaphragm (17) and washer (18) and must be changed to a single spring (20).

NOTE 3. Early 900 First Stages used module as shown. This concept utilized items (39, 40, or 41, 42) along with spring (43). Components where they are encapsulated in module (15) with the use of retaining ring (4).

Items (39, 40, or 41, 42 & 43) are not interchangeable with items (38, 33 & 37). As a rule replace all parts with parts identical to the original parts removed from the regulator being serviced.



REPAIR PROCEDURE	PAGE	PACER XL950, 950A, 950H & 900 FIRST STAGE		
	1-7	First Stage Regulators	9/93	

Disassembly:

Step 1: Remove hose and any accessory hose(s) and plug(s) (9) from first stage assembly. "O" rings (7) are now accessible.

Step 2: Remove yoke nut (6), yoke (2), washer (8), and yoke screw (1) from body (10). "O" ring (7A) is now accessible. NOTE: Place yoke nut (6) into vise. Hold across hex flats.

Step 3: Remove retaining ring (4) and filter (5) from yoke nut (6). Use internal retaining ring pliers.

Step 4: Remove plug (31), "O" ring (30), washer/screw assembly (29) and washer (27).

Step 5: Remove swivel (26) from body (10) by pulling free. Remove "O" ring (25).

Step 6: Remove plug (24). If equipped as an "AER" remove ambient cap (43) and diaphragm (44).

Step 7: Remove adjustment screw (23).

Step 8: Remove spring(s) (20) on models before 1987. Remove single spring spring (20) on models after 1987. See NOTE 2.

Step 9: Remove cup (22) using a Spanner wrench.

Step 10: Remove spring pad (19), washer (18), diaphragm (17) and seat and push rod assembly (16).

Step 11: Remove H.P. module (15) using a wide blade screwdriver. Remove "O" ring (14).

Step 12: Remove H.P. seat (38), spring (37), washer (36), "O" ring (35) and back-up ring (34).

Step 13: Remove bushing (33). NOTE: In earlier models, the H.P. seat (38 or 41), spring (37) and balance chamber (40 or 42) are contained in the H.P. module (15) by a retaining ring. Disassemble the earlier models as follows: (a) Remove the retaining ring. CAUTION: There will be spring pressure when the retaining ring is removed. Hold thumb over the retaining ring during this operation to avoid losing parts. (b) Remove balance chamber, spring, and H.P. seat from the H.P. module chamber.

Assembly:

Step 1: Replace "O" ring (32) on bushing (33) after

inspecting and lubricating.

Step 2: Put bushing (33) into body (10).

Step 3: Replace backup ring (34), "O" ring (35) and washer (36) in bushing (33).

Step 4: Replace spring (37) and H.P. seat (38). NOTE: In earlier models, the H.P. seat (39 or 41), spring (37) and balance chamber (40 or 42) are contained in the H.P. module (15) by a retaining ring. Assemble these as follows: (a) Place H.P. seat (39 or 41), spring (43) and balance chamber (40 or 42) in the H.P. module (15). (b) Lay retaining ring with sharp edge up on balance chamber. Using a pencil or dowel placed on the center of the balance chamber, push parts down into module. Using retaining ring pliers, install the retaining ring in groove inside of module. CAUTION: Be sure ring is securely in place.

Step 5: Inspect, lubricate and install "O" ring (14) on H.P. module. Replace H.P. module in body (10). Use a wide blade screwdriver to screw module into body until it bottoms out. Caution must be used to assure center alignment of H.P. seat and H.P. module.

Step 6: Replace seat and push rod assembly (16), diaphragm (17), washer (18) and spring pad (19) into body (10).

Step 7: Replace cup (22) using a Spanner wrench to tighten snugly. Do not over tighten.

Step 8: Replace springs (20 & 21).

Step 9: Replace adjustment screw (23). Tighten the adjustment screw only two full turns.

Step 10: Replace swivel (26) after inspecting, lubricating, and remounting "O" ring (25). Position swivel body (10) and push together until a distinct "snap" is heard.

Step 11: replace washer (27) and washer /screw assembly (29). Tighten with 3/16" Allen wrench. Place less than on drop of Blue Loc-Tite ® #242 on threads of washer/screw assembly before installing.

Step 12: Replace filter (5) rough side out and retaining ring (4) into yoke nut (6). Retaining ring's sharp edge must face out and ring must be firmly seated in groove.

Step 13: Inspect and lubricate "O" ring (7A) and place on yoke nut (6).

	PACER XL950, 950A, 950H & 900 FIRST STAGE		PAGE 1-8	REPAIR PROCEDURE
	9/93	First Stage Regulators		

Step 14: Replace yoke nut (6) into hole on yoke (2). Place washer (8) over threaded section. Insert yoke nut into body (10) and tighten with wrench snugly. Do not over tighten. NOTE: Place less than one drop of Blue Loc-Tite® #242 on threads before installing.

Step 15: Replace yoke screw (1).

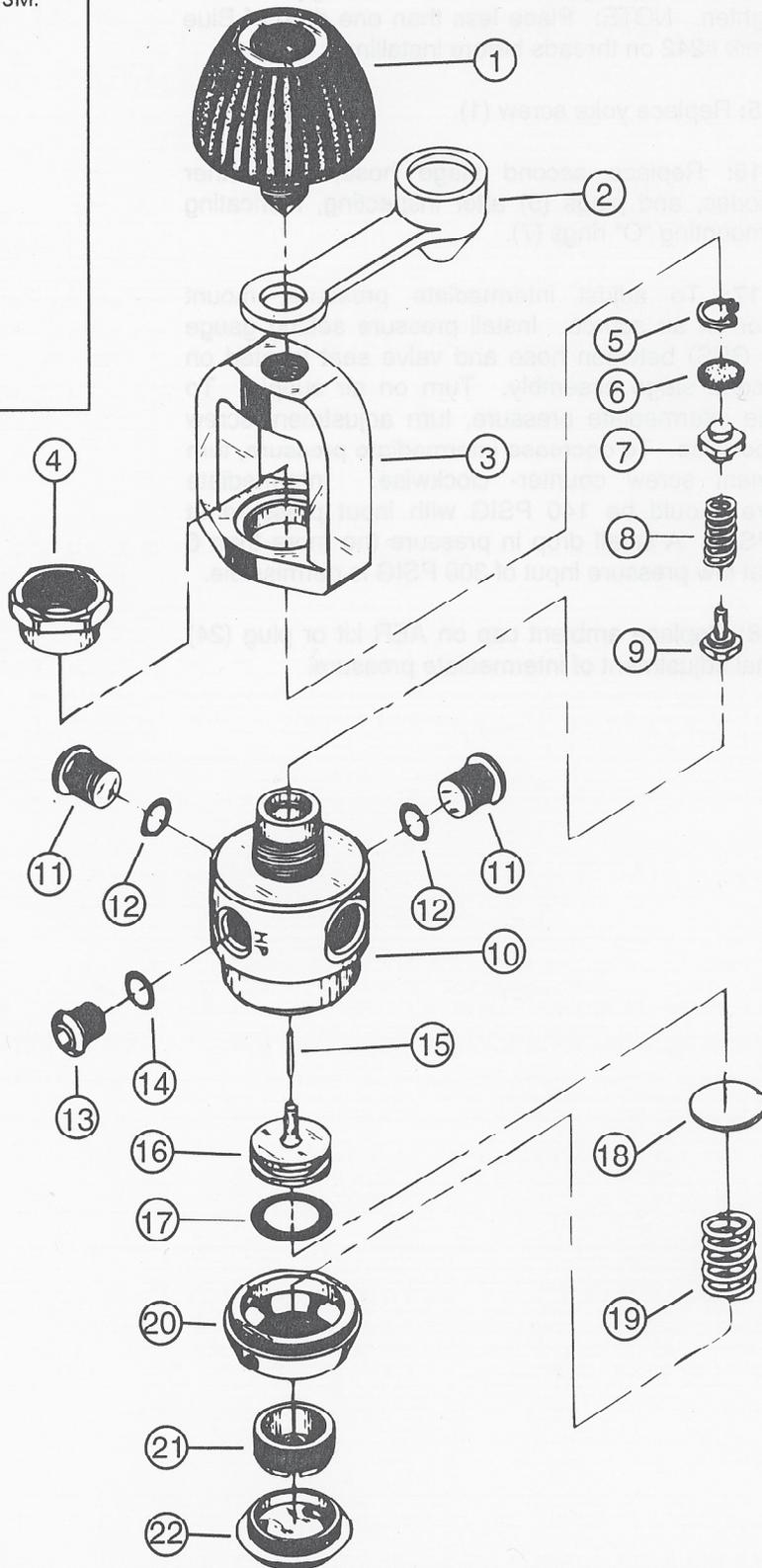
Step 16: Replace second stage hose, plus other accessories, and plugs (9) after inspecting, lubricating and remounting "O" rings (7).

Step 17: To adjust intermediate pressure, mount regulator on air source. Install pressure setting gauge (Model GPS) between hose and valve seat located on the second stage assembly. Turn on air supply. To increase intermediate pressure, turn adjustment screw (23) clockwise. To decrease intermediate pressure, turn adjustment screw counter-clockwise. Intermediate pressure should be 140 PSIG with input pressure at 3000 PSIG. A small drop in pressure (no more than 6 PSIG) at low pressure input of 300 PSIG is permissible.

Step 18: Replace ambient cap on AER kit or plug (24) after final adjustment of intermediate pressure.

REPAIR PROCEDURE	PAGE	PACER XL950, 950A, 950H & 900 FIRST STAGE		
	1-9	First Stage Regulators	9/93	

#	QTY	PART #	KEY	DESCRIPTION
1	1	0106-56		YOKE SCREW
1	1	0217-04		YOKE SCREW ASSM. FORMULA
2	1	0510-42		DUST CAP
3	1	0390-08		YOKE
4	1	0150-16		YOKE NUT
5	1	0250-10	①②	RETAINING RING
6	1	0110-00	①②	FILTER
7	1	0101-16	①	BALANCE CHAMBER ASSM.
8	1	0040-07		H.P. SPRING
9	1	0217-15	①	H.P. SEAT
10	1	0030-84		BODY
11	3	0410-24		L.P. PLUG
12	3	0060-51	①②	O-RING
13	1	0410-20		H.P. PLUG
14	1	0060-43	①②	O-RING
15	1	0350-17		PUSH ROD
16	1	0830-05		PISTON
17	1	0060-57	①②	O-RING
18	1	0120-74		SPRING PAD
19	1	0040-57		SPRING
20	1	0181-68		CUP
21	1	0200-03		ADJUSTING SCREW
22	1	0621-64		PLUG



PACER 260 & FORMULA
FIRST STAGE

9/93

First Stage
Regulators

PAGE

1-10

KEY

- ① Included in annual overhaul kit #9680-06
- ② Included in annual service kit #9680-13

PACER 260 & FORMULA FIRST STAGE**Tools Needed:**

1. 0980-15 Spanner Wrench
2. 0980-13 Cap Wrench
3. 0980-31 Hexagon Screwdriver
4. 0980-19 5/32" Allen Wrench
5. Retaining Ring Pliers (Internal)
6. Bench Vise
7. 9506-00 Silicone Grease
8. 9935-00 Intermediate Pressure Gauge
9. 0980-38 Regulator Tool Kit

Disassembly:

Step 1: Remove second stage regulator hose (not shown) from main body (10).

Step 2: Remove plugs (11 and 13) using 5/32" Allen wrench. "O" rings (12 and 14) are now accessible for inspection and/or replacement. Note: If low pressure ports have accessory hoses (octopus, power inflator, etc.) in place, remove those hoses from main body.

Step 3: Remove plug (22) using Cap wrench. Adjusting screw (21) is now accessible.

Step 4: Remove adjusting screw (21). Remove spring (19).

Step 5: Remove cup (20) using spanner wrench.

Step 6: Remove piston (16). This can be done by inserting a small rod, dental tool, etc. through one of the low pressure ports pushing the piston outward. "O" ring (17) is now accessible for removal, inspection, lubrication and/or replacement.

Step 7: Remove push rod (15).

Step 8: Remove yoke screw (1) and dust cap (2).

Step 9: Remove yoke nut (4) and yoke (3). Note: To perform this operation, place yoke nut in vise. Do not over-tighten vise jaws. Insert threaded rod (found in tool kit) fully into high or low pressure port. By turning main body counter-clockwise using tool for firm grip, main body can be removed from yoke nut. Caution: Never put main body (10) in vise. This can cause distortion of the inner concentricity and force replacement with a new main body.

Step 10: Remove retaining ring (5) using retaining ring

pliers. Remove filter (6), balance chamber (7), spring (8) and H.P. seat (9). Caution: care must be exercised when removing the retaining ring because of the spring load under the filter.

Assembly:

Step 1: Place H.P. seat (9), spring (8), balance chamber (7), filter (6), and retaining ring (5) into main body (10). Caution: Install filter rough side out. When checking to see if the retaining ring is properly fitted in the retaining ring groove, do not look directly into the chamber opening. If the retaining ring is not completely seated in the groove, it can allow the ring, filter and balance chamber to leave the chamber with enough force to cause injury. Always look into the high pressure chamber at an angle away from your face.

Step 2: Place yoke (3) and yoke nut (4) on main body (10). Tighten yoke nut hand tight. Put yoke nut in vise. Using the threaded rod inserted fully into a port on the body, tighten main body onto yoke nut (14). Do not over tighten.

Step 3: Place dust cap (2) on yoke screw (1). Install yoke screw into yoke (3).

Step 4: Inspect and lubricate "O" ring (17) and place on piston (16). Install push rod (15) on piston. Place piston inside main body.

Step 5: Install cup (20), spring (19), and adjusting screw (21) into main body (10). Tighten cup snugly with spanner wrench. Do not over tighten. Adjusting screw (21) should be threaded into cup (20) only two full turns.

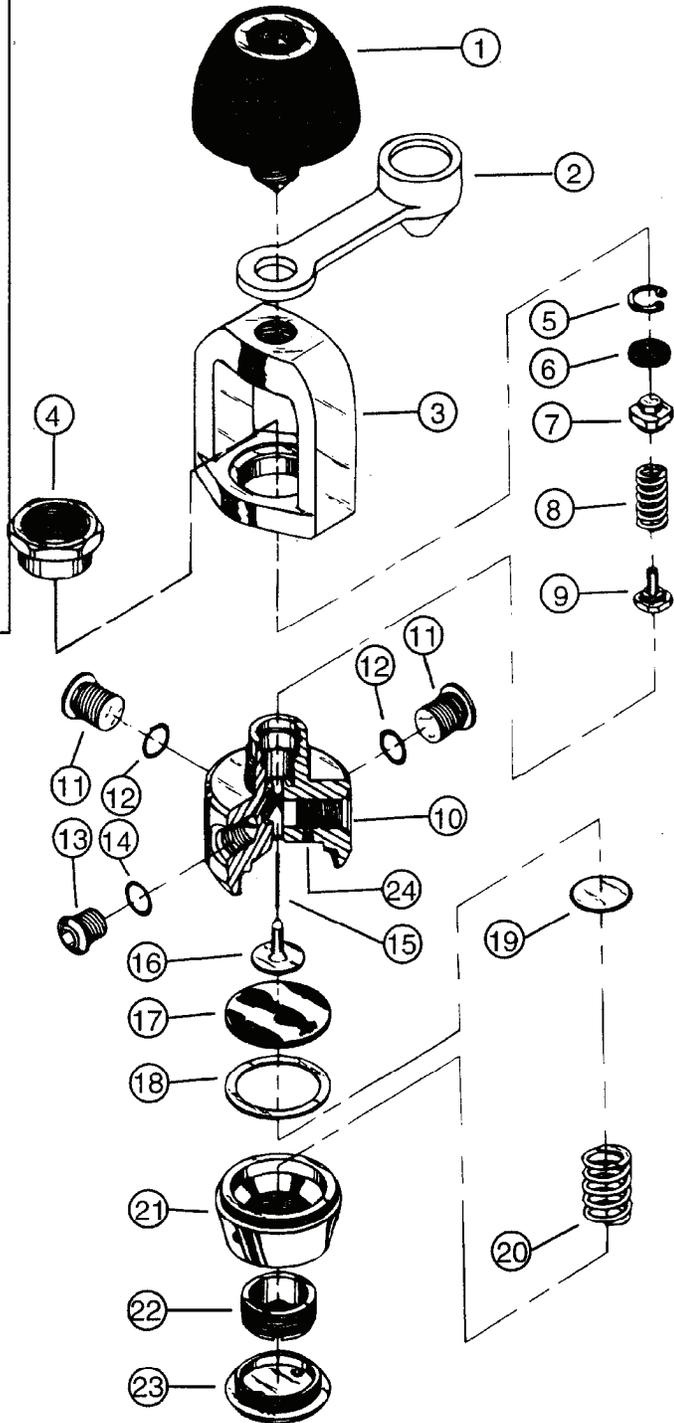
Step 6: Replace all plugs/hoses in proper ports after inspecting "O" rings (12 and 14).

Step 7: Place regulator on 3000 PSIG air source and adjust intermediate pressure to 140 PSIG using an intermediate pressure gauge. To increase intermediate pressure, turn adjusting screw (21) clockwise. To decrease pressure turn adjusting screw (21) counter clockwise.

Step 8: Replace plug (22).

REPAIR PROCEDURE	PAGE	PACER 260 & FORMULA FIRST STAGE		
	1-11	First Stage Regulators	9/93	

#	QTY	PART #	KEY	DESCRIPTION
1	1	0100-91		YOKE SCREW ASSMBLY
2	1	0510-42		DUST CAP
3	1	0390-08		YOKE
4	1	0150-16		YOKE NUT
5	1	0250-10	①②	RETAINING RING
6	1	0110-00	①②	FILTER
7	1	0101-16	①	BALANCE CHAMBER ASSMBLY
8	1	0040-07		SPRING
9	1	0217-15	①	H.P. SEAT
10	1	0030-73		BODY- 3 L.P. PORTS
10	1	0031-01	③	BODY- 4 L.P. PORTS
11	3	0410-24		L.P. PLUG
12	3	0060-51	①②	O-RING
13	1	0410-20		H.P. PLUG
14	1	0060-43	①②	O-RING
15	1	0350-17		PUSH ROD
16	1	0181-65		PIN SUPPORT
17	11	0050-12	①	H.P. DIAPHRAGM
18	1	0120-65		WASHER
19	1	0622-14		SPRING PAD
20	1	0040-57		SPRING
21	1	0180-31		CUP
22	1	0200-03		ADJUSTING SCREW
23	1	0621-64		PLUG
24	1	0580-71		ASPIRATOR TUBE
25	1	0410-05	③	3/8" L.P. PLUG (4 PORT BODY)
26	1	0060-01	①②③	O-RING (4 PORT BODY)



PACER 360 (PRE 1991)
FIRST STAGE

9/93

First Stage
Regulators

PAGE

1-12

KEY

- ① Included in annual overhaul kit #9680-06
- ② Included in annual service kit #9680-13
- ③ Not shown- Use w/4 L.P. port body 0031-01

PACER 360 (PRE 1991) FIRST STAGE

Tools Needed:

1. 11/16" Open End Wrench
2. 5/32" Allen Wrench
3. 5/8" Cap Wrench
4. Modified 3/4" Wood Chisel *
5. Spanner Wrench
6. Retaining Ring Pliers (internal).
7. Silicone Grease
8. Intermediate Pressure Gauge

* Modified 3/4 wood chisel. Grind the sharp edge from a common 3/4" wood chisel until you have a flat edge approximately .070 thick. This will give you a utility blade 3/4" by approximately 1/16".

Disassembly:

Step 1: Remove hose from main body (10) using 11/16" wrench. "O" ring (12) will now be accessible.

Step 2: Remove plugs (11, 13 & 25) from the main body using 5/32" Allen wrench. "O" rings (12, 14 & 26) will now be accessible.

Step 3: Remove accessory hoses, if present, from main body (10).

Step 4: Remove plug (23). Use 5/8" cap wrench.

Step 5: Remove adjustment screw (22) using modified wood chisel.

Step 6: Remove high pressure diaphragm spring (20).

Step 7: Remove cup (21) using spanner wrench.

Step 8: Remove spring pad (19) diaphragm washer (18) and diaphragm (17) from main body (10).

Step 9: Remove pin support (16) and push rod (15).

Step 10: Remove retaining ring (5) from main body (10) using internal retaining ring pliers. Remove sintered filter (6). CAUTION: There is a spring tension under the filter. Remove the retaining ring carefully to prevent loss of parts. Never look directly at the filter. The retaining ring and the filter can be expelled with considerable force and cause injury.

Step 11: Remove balance chamber assembly (7), high pressure seat spring (8) and high pressure seat (9) from main body.

Step 12: Remove yoke screw (1) from yoke (3). Dust cap (2) can now be removed from yoke screw.

Step 13: Remove yoke nut (4) from main body (10). Yoke (3) and can now be removed.

Assembly:

Step 1: Place high pressure seat (9), high pressure seat spring (8), and balance chamber assembly (7) into main body (10).

Step 2: Install filter (6), rough side out, and retaining ring (5) using retaining ring pliers. CAUTION: Be sure retaining ring is firmly in place in the retaining ring groove. Never look directly at the filter. If the retaining ring is not firmly seated in the retaining ring groove, both the retaining ring and filter can be expelled from the main body with enough force to cause injury. Always look into high pressure chamber at an angle away from your face.

Step 3: Replace yoke (3), and yoke nut (4). Yoke nut should be firmly tightened.

Step 4: Place dust cap (2) on shaft of yoke screw (1). Install yoke screw in yoke (3).

Step 5: Replace push rod (15) and pin support (16).

Step 6: Replace diaphragm (17), washer (18), and spring pad (19) inside main body (10). Replace spring (20).

Step 7: Install cup (21), spring (20), and adjusting screw (22) into main body (10). Tighten cup snugly with Spanner wrench. Do not over tighten. Adjusting screw (22) should be threaded into the cup (21) only two full turns.

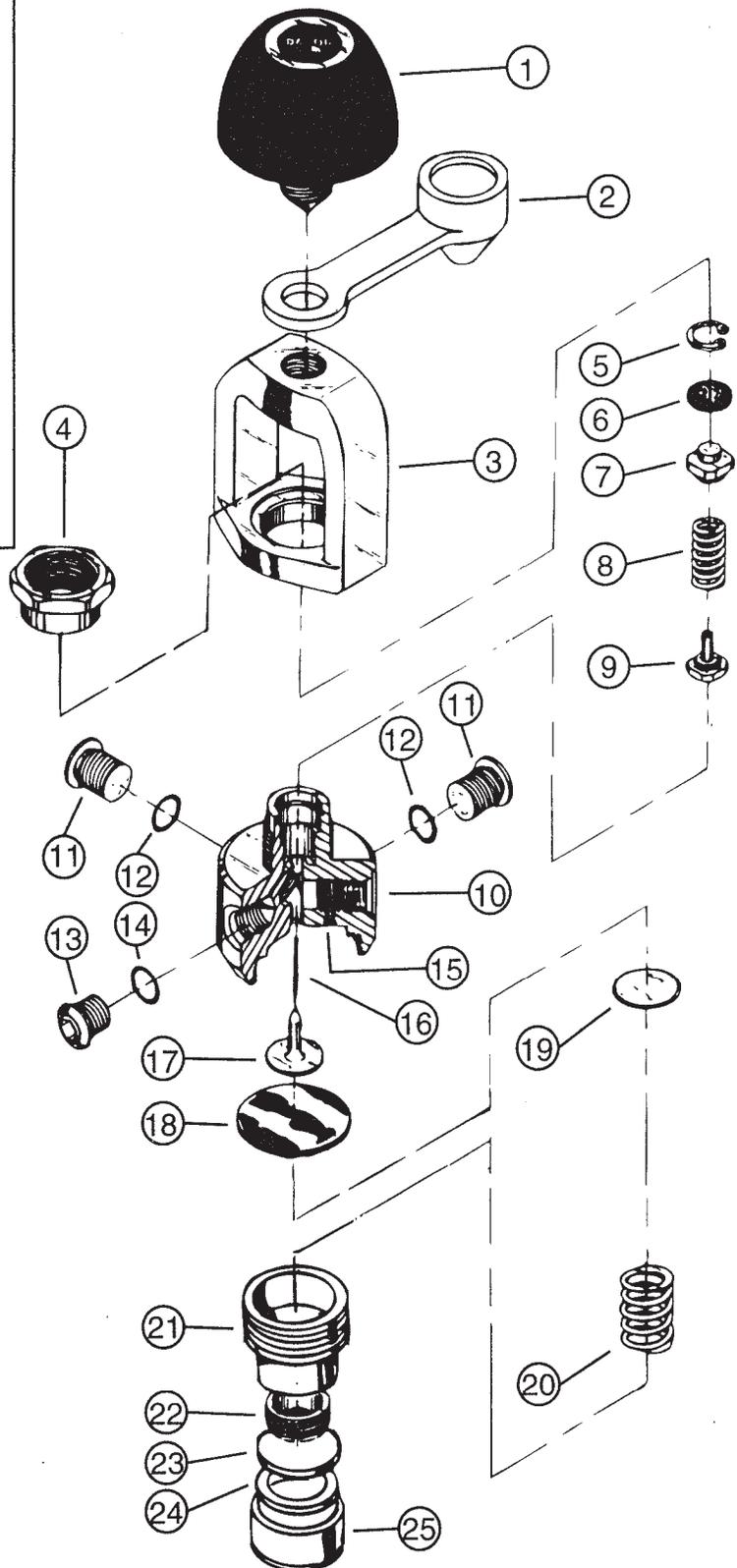
Step 8: Replace accessory hoses and/or plugs (11, 13 & 25) in proper low pressure ports. NOTE: Remove, inspect and lightly grease all "O" rings (12, 14 & 26) before installing hose or plugs. Use silicone grease only.

Step 9: Place regulator on 3000 PSIG air source and adjust intermediate pressure to 140 PSIG using an intermediate pressure gauge. To increase intermediate pressure, turn adjusting screw (22) clockwise. To decrease pressure, turn adjusting screw (22) counter clockwise.

Step 10: Replace plug (23).

REPAIR PROCEDURE	PAGE	PACER 360 (PRE 1991) FIRST STAGE		
	1-13	First Stage Regulators	9/93	

#	QTY	PART #	KEY	DESCRIPTION
1	1	0100-91		YOKE SCREW ASSEMBLY
2	1	0510-42		DUST CAP
3	1	0390-08		YOKE
4	1	0150-16		YOKE NUT
5	1	0250-10	①②	RETAINING RING
6	1	0110-00	①②	FILTER
7	1	0101-16	①	BALANCE CHAMBER ASSM.
8	1	0040-07		H.P. SPRING
9	1	0217-15	①	H.P. SEAT
10	1	0030-73		BODY- 3 L.P. PORTS
10	1	0031-01	③	BODY- 4 L.P. PORTS
11	3	0410-24		L.P. PLUG
12	3	0060-51	①②	O-RING
13	1	0410-20		H.P. PLUG
14	1	0060-43	①②	O-RING
15	1	0580-71		ASPIRATOR TUBE
16	1	0350-17		PUSH ROD
17	1	0181-66		PIN SUPPORT (SUB 0181-65)
18	1	0050-12	①②	DIAPHRAGM
19	1	0160-00		SPRING PAD (SUB 0622-14)
20	1	0040-53		SPRING (SUB 0040-57)
21	1	0180-05		RETAINER
22	1	0200-03		ADJUSTING SCREW
23	1	0050-01		DIAPHRAGM
24	1	0120-65		WASHER
25	1	0180-04		AMBIENT CUP
26	1	0410-05	③	3/8" L.P. PLUG (4 PORT BODY)
27	1	0060-01	①②③	O-RING (4 PORT BODY)



PACER 360 ICE
FIRST STAGE

9/93

First Stage
Regulators

PAGE

1-14

KEY

- ① Included in annual overhaul kit #9680-06
- ② Included in annual service kit #9680-13
- ③ Not shown- Use w/4 L.P. port body 0031-01

PACER 360 ICE FIRST STAGE

Tools Needed:

1. 11/16" Open End Wrench
 2. 5/32" Allen Wrench
 3. 5/8" Cap Wrench
 4. Modified 3/4" Wood Chisel *
 5. Spanner Wrench
 6. Retaining Ring Pliers (internal).
 7. Silicone Grease
 8. Intermediate Pressure Gauge
- * Modified 3/4" wood chisel. Grind the sharp edge from a common 3/4" wood chisel until you have a flat edge approximately .070 thick. This will give you a utility blade 3/4" by approximately 1/16".

Disassembly:

Step 1: Remove hose from main body (10) using 11/16" wrench.

Step 2: Remove plugs (11 & 13) from main body (10) using 5/32" Allen wrench.

Step 3: Remove ambient cup (25), washer (24) and diaphragm (23). Drain silicone fluid from chamber.

Step 4: Remove adjusting screw (22) from retainer (21) using a broad blade screwdriver or modified chisel. Turn counter-clockwise.

Step 5: Remove retainer (21).

Step 6: Remove spring (20).

Step 7: Remove spring pad (19) and diaphragm (18) from main body (10).

Step 8: Carefully remove pin support (17) and push rod (16) from main body.

Step 9: Remove retaining ring (5) using an internal retaining ring pliers. CAUTION: There is spring pressure against the retaining ring (5). Remove ring carefully to prevent loss of parts or injury. Never look directly at the retaining ring while removing it.

Step 10: After retaining ring (5) is removed, tilt the main body to allow filter (6), balance chamber assembly (7), spring (8), and H.P. seat (9) to fall from the main body (10) into your hand.

Step 11: Remove yoke screw (1) from yoke (3). Dust

cap (2) can now be removed from yoke screw (1).

Step 12: Remove yoke nut (4) from main body (10). Yoke (3) can now be removed.

Assembly:

Step 1: Place H.P. seat (9), spring (8), balance chamber assembly (7), filter (6), and internal retaining ring (5) into main body (10). CAUTION: Be certain to install filter rough side out. Be certain retaining ring (5) is firmly seated in the retaining ring groove. NEVER look directly at the retaining ring and filter while assembling because the spring (8) has enough energy to expel the filter and retaining ring with enough force to cause injury.

Step 2: Replace yoke (3) and yoke nut (4) on main body (10). Yoke nut must be firmly tightened.

Step 3: Place dust cap (2) on shaft of yoke screw (1). Install yoke screw (1) into yoke (3).

Step 4: Replace push rod (16) and pin support (17).

Step 5: Replace diaphragm (18) and spring pad (19) inside main body (10).

Step 6: Install retainer (21), spring (20), and adjusting screw (22) into main body (10). Tighten cup snugly with spanner wrench. Do not over tighten. Adjusting screw (22) should be threaded into the retainer (21) only 2 1/2 full turns.

Step 7: Place regulator on 3000 PSIG air source with retainer (21) in an upright position and adjust intermediate pressure to 140 PSIG, using an intermediate pressure gauge. To increase intermediate pressure, turn adjusting screw (21) clockwise. To decrease pressure, turn adjusting screw (21) counter-clockwise.

Step 8: Fill area above H.P. diaphragm (18) with silicone liquid. Fill through adjusting screw (22) up to rim of retainer (21). Wait a few seconds for air to be displaced and refill again. Fill convolution in the diaphragm (23) with silicone grease.

Step 9: Place washer (24) in ambient cap (25), sharp side down. Use a small drop of silicone liquid to lubricate between washer and retainer. Place diaphragm (23) in ambient cap (25).

Step 10: Install ambient cap (25) on retainer (21). Tighten ambient cap with a 1-1/4" wide blade

REPAIR PROCEDURE	PAGE	PACER 360 ICE FIRST STAGE		
	1-15	First Stage Regulators	9/93	

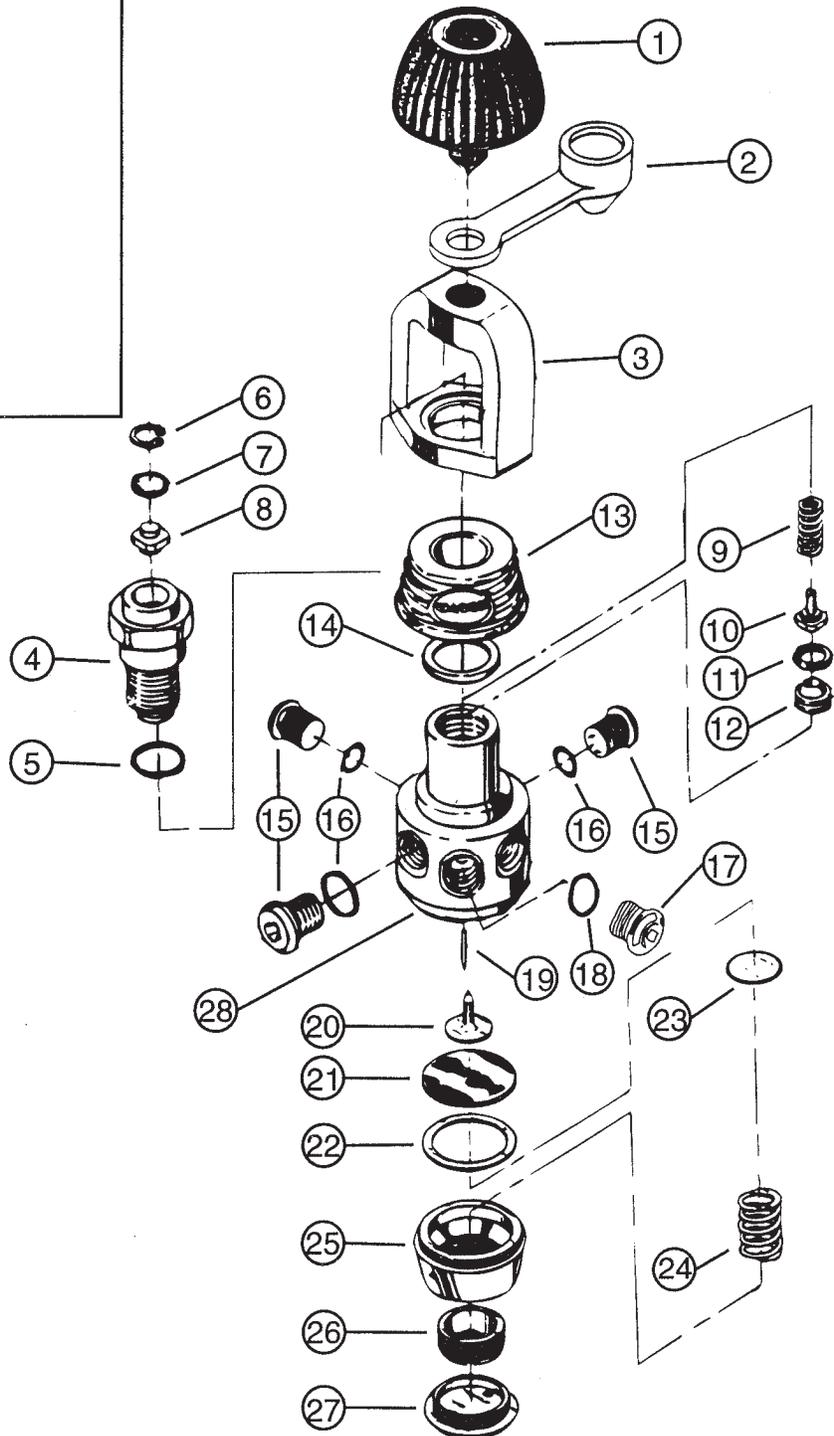
screwdriver.

Step 11: De-pressurize system by shutting off air supply and purging. If chamber has been properly filled, the diaphragm (23) will contract inward and expand outward once re-pressurized.

Step 12: Check for oil and air leaks.

	PACER 360 ICE FIRST STAGE		PAGE	REPAIR PROCEDURE
	9/93	First Stage Regulators	1-16	

#	QTY	PART #	KEY	DESCRIPTION
1	1	0100-91		YOKE SCREW ASSEMBLY
2	1	0510-42		DUST CAP
3	1	0390-08		YOKE
4	1	0182-04		YOKE SUPPORT
5	1	0060-83	①②	O-RING
6	1	0250-10	①②	RETAINING RING
7	1	0110-00	①②	FILTER
8	1	0101-16	①	BALANCE CHAMBER ASSM.
9	1	0040-24		SPRING
10	1	0217-64	①	SEAT RETAINER
11	1	0060-05	①②	O-RING
12	1	0182-05		CONE MODULE
13	1	0623-00		PLASTIC RING
14	1	0511-69		RUBBER WASHER
15	3	0410-24		L.P. PLUG
16	3	0060-51	①②	O-RING
17	1	0410-20		H.P. PLUG
18	1	0060-43	①②	O-RING
19	1	0350-12		PUSH ROD
20	1	0181-65		PIN SUPPORT
21	1	0050-12	①	H.P. DIAPHRAGM
22	1	0120-65		WASHER
23	1	0622-14		SPRING ROD
24	1	0040-57		SPRING
25	1	0180-31		CUP
26	1	0200-03		ADJUSTING SCREW
27	1	0621-64		PLUG
28	1	0031-12		MAIN BODY



PACER 360 (1991 & AFTER)
FIRST STAGE

9/93

First Stage
Regulators

PAGE

1-17

KEY

① Included in annual overhaul kit #9680-25

② Included in annual service kit #9680-24

PACER 360 (1991 & AFTER) FIRST STAGE

Tools Needed:

1. 0980-15 Spanner Wrench
2. 0980-13 Cap Wrench
3. 0980-31 Hexagon Screwdriver
4. 0980-19 5/32" Allen Wrench
5. 9506-00 Silicone grease
6. 9935-00 Intermediate Pressure Gauge
7. 0217-66 Cone Tool Assembly
8. 0980-61 "O" Ring Tool Kit
9. Adjustable Wrench
10. Retaining Ring Pliers (Internal)
11. Bench Vise

Disassembly:

Step 1: Remove all hoses and port plugs from first stage.

Step 2: Remove plug (27) using 5/8" cap wrench.

Step 3: Remove adjustment screw (26) using hex wrench #4 from tool kit. Remove ambient spring (24).

Step 4: Remove cup (25) using spanner wrench from tool kit.

Step 5: Remove spring pad (23), diaphragm washer (22) and diaphragm (21) from main body. Do not scratch hard sealing surface underneath diaphragm.

Step 6: Remove pin support (20) and push rod (19).

Step 7: Remove yoke screw (1) and dust cap (2) from yoke.

Step 8: Place threaded rod in a port. Mount treaded rod securely in a vise with yoke support (4) pointing upward. This will create a steady working platform. Remove yoke nut (4) using a 1" open end or adjustable wrench. Remove o-ring (5) from yoke nut.

Step 9: High pressure spring (9) and high pressure seat (10) can now be removed from regulator body.

Step 10: Remove retaining ring (6) from yoke support using internal retaining ring pliers. Filter (7) and balance chamber assembly (8) can now be removed.

Step 11: Remove cone module assembly (12) from regulator body using cone removal tool. Insert brass rod of tool into center hole of regulator which contained the

push rod. Apply pressure and push cone module assembly out of regulator body. Caution: Do not damage sharp sealing surface of cone module. Remove o-ring (11) from cone module.

Cleaning:

Step 1: The next phase is cleaning and inspection. All metal parts should be cleaned using a solution made from 1 gallon of white vinegar (with 5% acid content) and a quart of any general purpose household cleaner. If you need less solution, use a 4:1 ratio of vinegar to household cleaner. Soak the parts no longer that 15 minutes or 5 minutes if using an ultrasonic cleaner. All plastic and rubber items (including o-rings) should be cleaned with fresh water only. Then air dry all parts, preferably using an air gun.

Step 2: Discard old filter, and retaining clip. Replacements for these parts are included in the annual service kit. Replace all o-rings included in the annual overhaul kit if used.

Step 3: Clean and inspect all other o-rings and lubricate with a light silicone spray. Replace any questionable o-rings.

Assembly:

Step 1: Install o-ring (11) on cone module (12). Place cone module assembly, sharp side down, in groove on plastic handle end of cone insertion tool. Push cone module into high pressure chamber of regulator body (28) until properly seated.

Step 2: Place push rod (19) into pin support (20) and insert assembly into body from underneath. Keep assembly vertical to prevent pin from dropping out.

Step 3: Insert diaphragm (21) into body over pin support (20). This will hold pin support in position.

Step 4: Place finger in high pressure chamber of body to keep pin from falling out and turn body over so diaphragm (21) is facing upward. Place washer (22), spring pad (23), on diaphragm.

Step 5: Screw cup (25) in place hand tight. Insert ambient spring (24) into cup and install adjusting screw (26) but do not tighten yet.

Step 6: Turn regulator over so high pressure chamber is facing up. The push rod (19) should still be in position. Place high pressure seat (10) face down in chamber on

REPAIR PROCEDURE	PAGE	PACER 360 (1991 & AFTER) FIRST STAGE		
	1-18	First Stage Regulators	9/93	

push rod. This will hold the H.P. seat in proper position. Place H.P. spring (9) on seat stem and set body aside.

Step 7: Place o-ring (5) on yoke support (4). Install balance chamber assembly (8) open side down in top of yoke support (4). Install new filter (7) and secure with retaining ring (6) using retaining ring pliers.

Step 8: Place rubber washer (14) and plastic ring (13) on regulator body as shown. Place yoke support assembly through yoke and screw into regulator body (28) and tighten using 1" or adjustable wrench.

Step 9: Tighten cup (25) with spanner wrench. Replace all hoses and port plugs.

Adjustment:

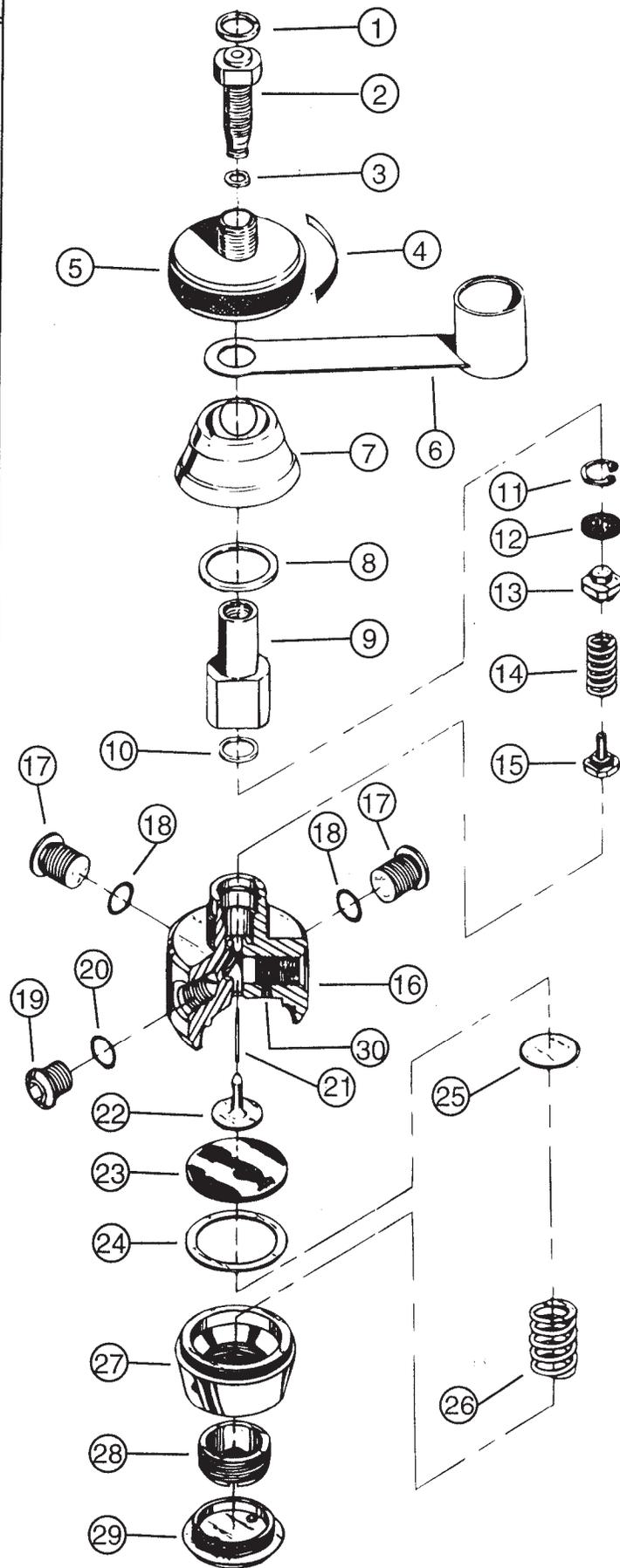
Step 1: Install intermediate pressure gauge in a low pressure port. Place regulator on a 3000 PSIG air source and slowly introduce air pressure. Intermediate pressure should be 140 PSIG when adjusted properly.

Step 2: To increase intermediate pressure turn adjusting screw clockwise. To decrease intermediate pressure turn adjusting screw counter-clockwise. Purge regulator during adjustment process to assure an accurate pressure reading.

Step 3: Turn off air supply and purge regulator. Remove intermediate pressure gauge and install plug (27) and tighten with cap wrench.

	PACER 360 (1991 & AFTER) FIRST STAGE		PAGE 1-19	REPAIR PROCEDURE
	9/93	First Stage Regulators		

#	QTY	PART #	KEY	DESCRIPTION
1	1	0060-21		O-RING
2	1	0182-30		RETAINER
3	1	0060-55		O-RING
4	1	0721-84		DECAL
5	1	0560-22		KNOB
6	1	0960-06		DUST CAP
7	1	0612-65		PLASTIC SPACER
8	1	0513-61		RUBBER SPACER
9	1	0182-32		ADAPTOR
10	1	0060-29		O-RING
11	1	0250-10	①②	RETAINING RING
12	1	0110-00	①②	FILTER
13	1	0101-16	①	BALANCE CHAMBER ASSM.
14	1	0040-07		SPRING
15	1	0217-15	①	H.P. SEAT
16	1	0030-73		MAIN BODY 3 L.P. PORTS
16	1	0031-01	③	MAIN BODY 4 L.P. PORTS
17	2	0410-24		L.P. PLUG
18	2	0060-51	①②	O-RING
19	1	0410-20		H.P. PLUG
20	1	0060-43	①②	O-RING
21	1	0350-17		PUSH ROD
22	1	0181-66		PIN SUPPORT (SUB 0181-65)
23	1	0050-12	①	H.P. DIAPHRAGM
24	1	0120-65		WASHER
25	1	0160-00		SPRING PAD (SUB 0622-14)
26	1	0040-57		SPRING
27	1	0180-31		CUP
28	1	0200-03		ADJUSTING SCREW
29	1	0621-64		END CAP
30	1	0580-71		ASPIRATOR TUBE
31	1	0410-05	③	3/8" L.P. PLUG (4 PORT BODY)
32	1	0060-01	①②③	O-RING (4 L.P. PORT BODY)



PACER 360 DIN (PRE 1991)
FIRST STAGE

9/93

First Stage
Regulators

PAGE

1-20

KEY

- ① Included in overhaul kit #9680-06
- ② Included in annual service kit #9680-13
- ③ Not shown

PACER 360 DIN (PRE 1991) FIRST STAGE

Disassembly:

- Step 1:** Remove hoses and plugs (17, 19, & 31) from main body (16).
- Step 2:** Remove retainer (2) and "O" rings (1 & 3). Use an adjustable wrench on retainer flats. Turn counter-clockwise.
- Step 3:** Remove knob (5), dust cap (6), plastic spacer (7) and rubber spacer (8) from adaptor (9).
- Step 4:** Remove adaptor (9) from main body (16). Use adjustable wrench on adaptor flats. Turn counter-clockwise. Remove "O" ring (10) from adaptor (9).
- Step 5:** Remove end cap (29) using 5/8" cap wrench. Turn counter-clockwise.
- Step 6:** Remove adjusting screw (28) using a broad bladed screwdriver. Turn counter-clockwise.
- Step 7:** Remove spring (26).
- Step 8:** Remove cup (27) using Spanner wrench.
- Step 9:** Remove spring pad (25), diaphragm washer (24) and diaphragm (23) from main body (16).
- Step 10:** Carefully remove pin support (22) and push rod (21) from main body (16).
- Step 11:** Remove retaining ring (11) using an internal retaining ring pliers. CAUTION: There is spring pressure against the retaining ring (11). Remove ring carefully to prevent loss of parts or injury. Never look directly at the retaining ring while removing it.
- Step 12:** After retaining ring (11) is removed, tilt the main body to allow filter (12), balance chamber assembly (13), spring (14) and H.P. seat (15) to fall from the main body (16) into your hand.

Assembly:

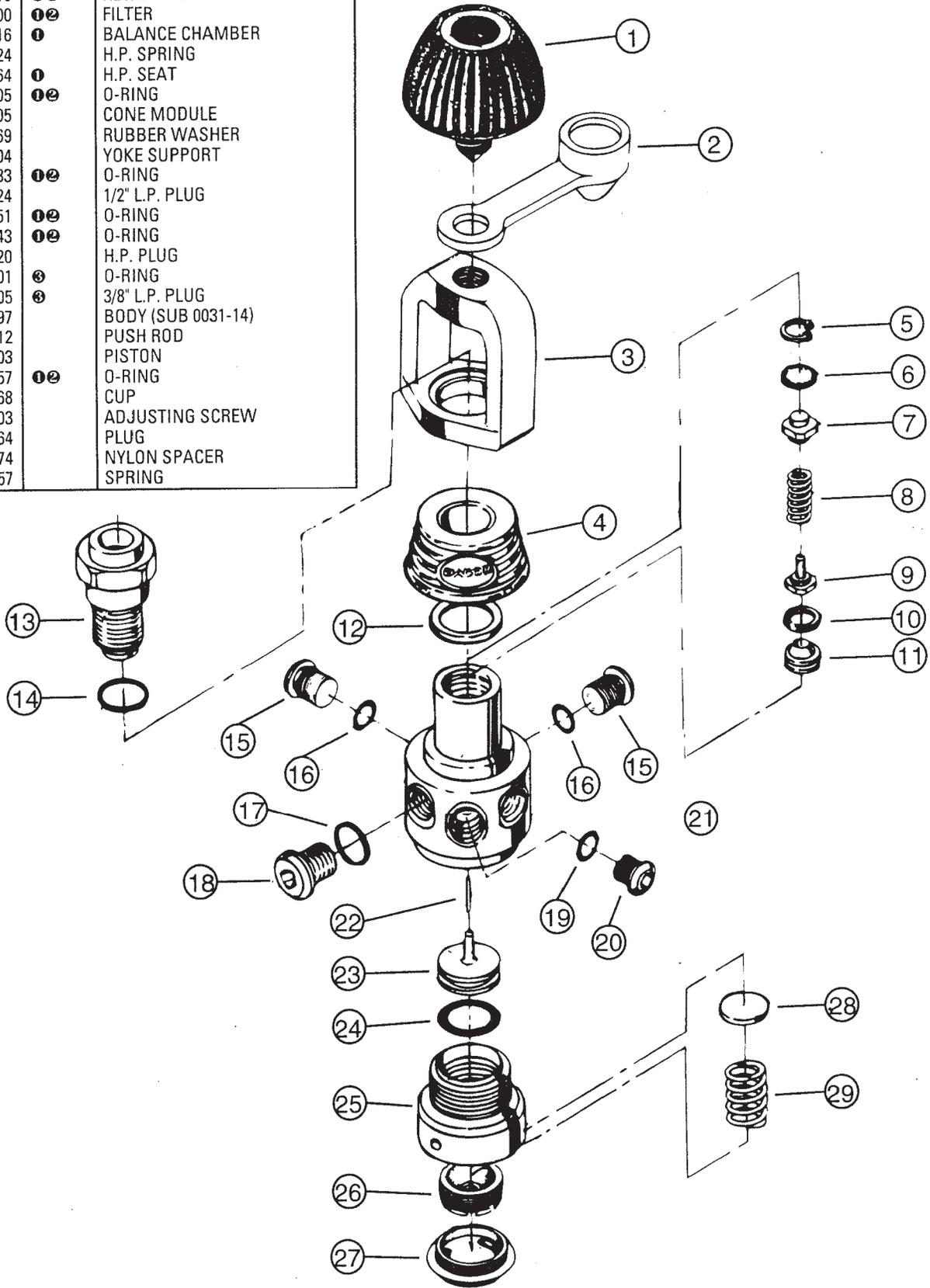
- Step 1:** Place seat retainer (15), spring (14), balance chamber assembly (13), filter (12) and internal retaining ring (11) into main body (16). CAUTION: Be certain to install filter (12) rough side out. Be certain retaining ring (11) is firmly seated in the retaining ring groove. NEVER look directly at the retaining ring and filter while assembling because the spring (14) has enough energy

to expel the filter and retaining ring with enough force to cause injury.

- Step 2:** Replace "O" ring (10) on adaptor (9).
- Step 3:** Install adaptor (9) onto main body (16). Use an adjustable wrench across the flats of the adaptor. Apply one drop of Green Loc-Tite® #290 to threads of body (16). Tighten in a clockwise direction. Approximately 10 ft./lbs. Do not over tighten.
- Step 4:** Install rubber spacer (8) and plastic spacer (7) onto the retainer (26).
- Step 5:** Replace "O" rings (1 & 3). Lubricate "O" rings slightly with silicone grease and place them on adaptor (9).
- Step 6:** Install dust cap (6), knob (5) and retainer (2). NOTE: Add one drop of Green Loc-Tite® #290 adhesive to the threads of the retainer (2). Use an adjustable wrench or a 3/4" open ended wrench to tighten the retainer (2). Approximately 25 in./lbs.
- Step 7:** Replace push rod (21) and pin support (22).
- Step 8:** Replace diaphragm (23), washer (24) and spring pad (25) inside main body (16).
- Step 9:** Install cup (27), spring (26), adjusting screw (28) into main body (16). Tighten cup snugly with spanner wrench. Do not over tighten. Adjusting screw (28) should be threaded into the cup (27) only two full turns. Replace accessory hoses and/or plugs (17, 19, & 31) in the proper ports. Replace "O" rings (18 & 19). Lubricate "O" rings lightly with silicone grease.
- Step 10:** Place regulator on 3000 PSIG air source and adjust intermediate pressure to 140 PSIG, using an intermediate pressure gauge. To increase intermediate pressure, turn adjusting screw clockwise. To decrease pressure, turn adjusting screw counter-clockwise.
- Step 11:** Replace end cap (29).

REPAIR PROCEDURE	PAGE	PACER 360 DIN (PRE 1991) FIRST STAGE		
	1-21	First Stage Regulators	9/93	

#	QTY	PART #	KEY	DESCRIPTION
1	1	0212-85		YOKE SCREW
2	1	0510-42		DUST CAP
3	1	0390-08		YOKE
4	1	0623-00		PLASTIC RING
5	1	0250-10	①②	RETAINING RING
6	1	0110-00	①②	FILTER
7	1	0101-16	①	BALANCE CHAMBER
8	1	0040-24		H.P. SPRING
9	1	0217-64	①	H.P. SEAT
10	1	0060-05	①②	O-RING
11	1	0182-05		CONE MODULE
12	1	0511-69		RUBBER WASHER
13	1	0182-04		YOKE SUPPORT
14	1	0060-83	①②	O-RING
15	2	0410-24		1/2" L.P. PLUG
16	2	0060-51	①②	O-RING
17	1	0060-43	①②	O-RING
18	1	0410-20		H.P. PLUG
19	1	0060-01	③	O-RING
20	1	0410-05	③	3/8" L.P. PLUG
21	1	0030-97		BODY (SUB 0031-14)
22	1	0350-12		PUSH ROD
23	1	0830-03		PISTON
24	1	0060-57	①②	O-RING
25	1	0181-68		CUP
26	1	0200-03		ADJUSTING SCREW
27	1	0621-64		PLUG
28	1	0120-74		NYLON SPACER
29	1	0040-57		SPRING



PACER 460
FIRST STAGE

9/93

First Stage
Regulators

PAGE

1-22

KEY

- ① Included in annual overhaul kit #9680-25
- ② Included in annual service kit #9680-24
- ③ Used on first production only.

PACER 460 FIRST STAGE

Tools Needed:

1. 0980-15 Spanner Wrench
2. 0980-13 Cap Wrench
3. 0980-31 Hexagon Screwdriver
4. 0980-19 5/32" Allen Wrench
5. 9506-00 Silicone grease
6. 9935-00 Intermediate Pressure Gauge
7. 0217-66 Cone Tool Assembly
8. 0980-61 "O" Ring Tool Kit
9. Adjustable Wrench
10. Retaining Ring Pliers (Internal)
11. Bench Vise

Disassembly:

Step 1: Remove second stage regulator hose (not shown) from main body.

Step 2: Remove plugs (15, 18 & 20) using 5/32" Allen wrench. "O" rings (16, 17 & 19) are now accessible for inspection, and/or replacement. NOTE: If low pressure ports have accessory hoses (Octopus, power inflator, etc.) in place, remove those hoses from regulator body.

Step 3: Remove plug (27) using cap wrench.

Step 4: Remove adjusting screw (26). Remove spring (29).

Step 5: Remove cup (25) using spanner wrench.

Step 6: Remove piston (23). Use a small rod, dental tool, etc., through one of the low pressure ports pushing the piston outward. "O" ring (24) is now accessible for removal, inspection, lubrication and /or replacement. Inspect nylon spacer (28) for damage and replace if necessary.

Step 7: Remove push rod (22) from piston and inspect for wear or damage.

Step 8: Remove yoke screw (1), dust cap (2).

Step 9: Remove yoke support (13) and yoke (3). NOTE: To perform this operation, insert threaded rod from tool kit fully into high pressure port or a low pressure port. Place the rod in a vise, (not the first stage). Do not over tighten the jaws. Insert large adjustable wrench or 1" open end wrench on the yoke support hex head. Turn wrench counter-clockwise to loosen. CAUTION: Never put body (21) in vise. This

can cause distortion of the inner concentricity and force replacement of body. Remove spacer ring (4) and rubber washer (12).

Step 10: Remove retaining ring (5) using retaining ring pliers. Remove filter (6), balance chamber (7), spring (8) and seat assembly (9).

Step 11: Remove "O" ring (14) using angled-point pick by stabbing "O" ring. If available, use brass "O" ring tool kit (0980-61). Do not reuse this "O" ring. CAUTION: Care should be taken when removing "O" ring not to scratch the surface of the body behind the "O" ring (sealing surface).

Step 12: Remove cone module (11) using cone removal tool (0217-66) To remove cone simply insert pin side of cone removal tool through piston guide hole in piston bore of body (21). Insert pin until contact is made with back of cone module. Now simply apply hand pressure until cone pops out of groove. NOTE: Place a towel between the body and your work bench. This will prevent impact damage to the cone module when it is popped out.

Step 13: Examine cone surface for cuts nicks. Clean up with polishing stick or replace if needed. Replace "O" ring (10). Do not reuse.

Assembly:

Step 1: Replace cone module (11) and a new "O" ring (10) into body. Using cone module insert tool (0217-66). (Use side opp. pin). Install a new "O" ring (14) into body.

Step 2: Inspect and lubricate a new "O" ring (24) and place on piston (23). Install push rod (22) into piston stem. Install nylon washer (28). Insert piston and push rod assembly into body. Place body piston side down on work bench.

Step 3: Place new or inspected H.P. seat (9) on exposed push rod (22). Place spring (8) on seat retainer (9).

Step 4: Place balance chamber (7), new filter (6) and retaining ring (5) into yoke support (13). CAUTION: Install filter (6) rough side out.

Step 5: Place rubber washer (12), spacer ring (4), yoke (3) and yoke support (13) on body. Tighten yoke support hand tight to avoid cross threading. Insert threaded rod from tool kit fully into high pressure port or

REPAIR PROCEDURE	PAGE	PACER 460 FIRST STAGE		
	1-23	First Stage Regulators	9/93	

a low pressure port. Place rod into vise, (not first stage). Do not over tighten vise jaws. Insert large adjustable wrench or 1" open end wrench on yoke support hex head. Turn wrench clockwise to tighten. Do not over tighten. (Torque maximum 20 Ft/Lbs).

Step 6: Check retaining ring for proper fit. **CAUTION:** Do not look directly into chamber opening. If the retaining ring is not completely seated in the groove, it can allow the ring, filter and spring to leave the chamber with enough force to cause injury. Always look into the high pressure chamber at an angle away from your face.

Step 7: Install cup (25), spring (29) and adjusting screw (26) into body. Tighten cup slightly with spanner wrench. Do not over tighten. Adjusting screw (26) should be threaded into the cup (25) only two full turns.

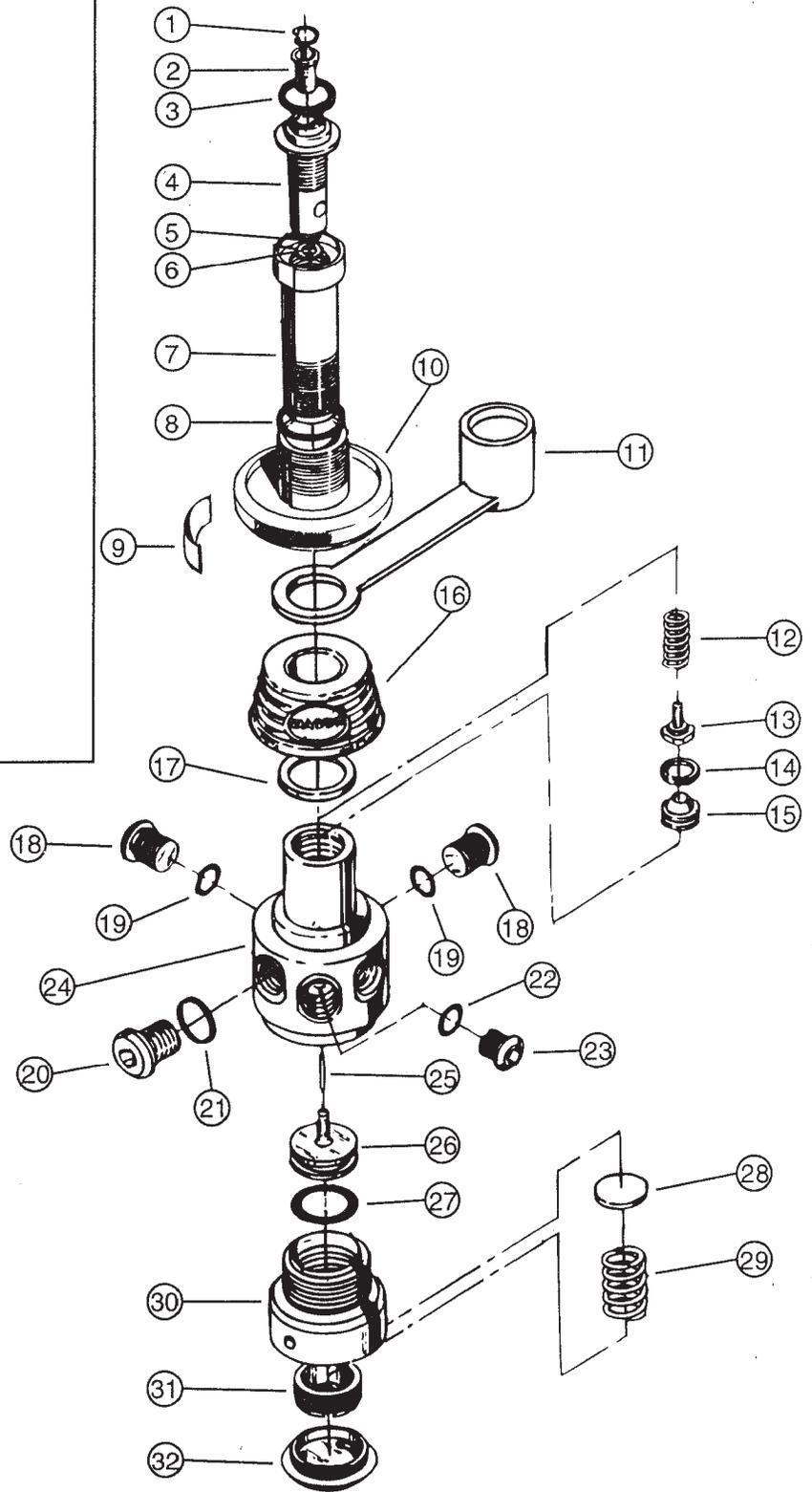
Step 8: Replace all plugs/hoses in proper ports after inspecting "O" rings.

Step 9: Install intermediate pressure gauge into primary low pressure port and plug remaining ports with plugs. Place regulator on 3000 PSIG air source and adjust intermediate pressure. To increase intermediate pressure, turn adjusting screw (26) clockwise. To reduce intermediate pressure turn adjusting screw (26) counter-clockwise. Simulate purging regulator by opening and closing bleeder knob on pressure gauge. Intermediate pressure should be 140 PSI. Turn off air and purge.

Step 10: Replace plug (15) and remove intermediate pressure gauge.

	PACER 460 FIRST STAGE		PAGE 1-24	REPAIR PROCEDURE
	9/93	First Stage Regulators		

#	QTY	PART #	KEY	DESCRIPTION
1	1	0250-19	①②	RETAINING RING
2	1	0110-08	①②	FILTER
3	1	0060-21		O-RING
4	1	0182-25		RETAINER 300 BAR
5	1	0060-85		O-RING
6	1	0120-10		WASHER
7	1	0182-24		ADAPTOR 300 BAR
8	1	0060-83	①②	O-RING
9	1	0721-84		DECAL DIN
10	1	0560-22		KNOB
11	1	0960-06		DUST CAP
12	1	0040-24		H.P. SPRING
13	1	0217-64		H.P. SEAT
14	1	0060-05	①②	O-RING
15	1	0182-05		CONE MODULE
16	1	0623-00		SPACER RING
17	1	0511-69		WASHER
18	2	0410-24		1/2" L.P. PLUG
19	2	0060-51	①②	O-RING
20	1	0410-20		H.P. PLUG
21	1	0060-43	①②	O-RING
22	1	0060-01	③	O-RING
23	1	0410-05	③	3/8" L.P. PLUG
24	1	0030-97		BODY (SUB 0031-14)
25	1	0350-12		PUSH ROD
26	1	0930-03		PISTON
27	1	0060-57	①②	O-RING
28	1	0120-74		TEFLON PAD
29	1	0040-57		SPRING
30	1	0181-68		CUP
31	1	0200-03		ADJUSTING SCREW
32	1	0621-64		PLUG



PACER 460 DIN
FIRST STAGE

9/93

First Stage
Regulators

PAGE

1-25

KEY

- ① Included in annual overhaul kit # 9680-25
- ② Included in annual service kit # 9680-24
- ③ Used on first production only.

PACER 460 DIN FIRST STAGE

Tools Needed:

1. 0980-15 Spanner Wrench
2. 0980-13 Cap Wrench
3. 0980-31 Hexagon Screwdriver
4. 0980-19 5/32" Allen Wrench
5. 9506-00 Silicone Grease
6. 9935-00 Intermediate Pressure Gauge
7. 0217-66 Cone Tool Assembly
8. 0980-61 O-Ring Tool Kit
9. Adjustable Wrench
10. Retaining Ring Pliers (Internal)
11. Bench Vise

Disassembly:

Step 1: Remove second stage regulator hose (not shown) from main body.

Step 2: Remove plugs (18, 20 & 23) using 5/32" Allen wrench. "O" rings (19, 21 & 22) are now accessible for inspection, and/or replacement. NOTE: If low pressure ports have accessory hoses (Octopus, power inflator, etc.) in place, remove those hoses from regulator body.

Step 3: Remove plug (32) using cap wrench.

Step 4: Remove adjusting screw (31). Remove spring (29).

Step 5: Remove cup (30) using spanner wrench.

Step 6: Remove piston (26). Use a small rod, dental tool, etc., through one of the low pressure ports pushing the piston outward. "O" ring (27) is now accessible for removal, inspection, lubrication and/or replacement. Inspect nylon spacer (28) for damage and replace if necessary.

Step 7: Remove push rod (25) from piston and inspect for wear or damage.

Step 8: Remove "O" ring (3), retaining clip (1), and filter (2).

Step 9: Remove adapter (7), knob (10), and dust cap (11). NOTE: To perform this operation, insert threaded rod from tool kit into high pressure port or a low pressure port. Place the rod in a vise, (not the first stage). Do not over tighten the jaws. Insert large adjustable wrench or 1" open end wrench on the yoke support hex head. Turn wrench counter-clockwise to loosen. CAUTION: Never

put body (24) in vise. This can cause distortion of the inner concentricity and force replacement of body. Remove spacer ring (16) and rubber washer (17).

Step 10: Remove retainer (4) from adapter (7). Remove "O" ring (5) and washer (6) from retainer (4). Remove spring (12) and H.P. seat (13), if they haven't already dropped out.

Step 11: Remove "O" ring (8) using angled-point pick by stabbing "O" ring. If available, use brass "O" ring tool kit (0980-16). Do not reuse this "O" ring. CAUTION: Care should be taken when removing "O" ring not to scratch the surface of the body behind the "O" ring (sealing surface).

Step 12: Remove cone module (15) using cone tool assembly (0217-66). To remove cone simply insert pin side of cone tool assembly through piston guide hole, in piston bore of body (24). Insert pin until contact is made with back of cone module. Now simply apply hand pressure until cone pops out of groove. NOTE: Place a towel between the body and your work bench. This will prevent impact damage to the cone module when it is popped out.

Step 13: Examine cone surface for cuts and nicks. Clean up with polishing stick or replace, if needed. Replace "O" ring (14). Do not re-use.

Assembly:

Step 1: Replace cone module (15) and a new "O" ring (14) into body (24). Using cone module insert tool (0217-66). (Use side OPP. pin). Install a new "O" ring (8) into body.

Step 2: Inspect and lubricate a new "O" ring (27) and place on piston (26). Install push rod (25) into piston stem. Install nylon washer (28). Insert piston and push rod assembly into body. Place body, piston side down, on work bench.

Step 3: Install rubber washer (17) and spacer ring (16) on body. Install knob (10) and dust cap (11) on adapter (7). Screw adapter into body. NOTE: Do not over tighten, maximum torque 20 Ft/Lbs. You can now look into adapter (7) and check to make sure that "O" ring (8) has not been pinched. If o-ring has been pinched, remove adapter (7) and replace "O" ring (8).

Step 4: Insert new or inspected H.P. seat (13) on exposed push rod (25). Place spring (12) on H.P. seat stem.

REPAIR PROCEDURE	PAGE	PACER 460 DIN FIRST STAGE		
	1-26	First Stage Regulators	9/93	

Step 5: Lubricate and install a new "O" ring (5) into retainer (4). Lubricate washer (6) with silicone grease and install into retainer (4). The silicone grease will hold retainer washer (6) during installation. Install "O" ring (3) on retainer (4).

Step 6: Install retainer (4) into adapter (7) using an allen wrench. Drop the filter (2) into retainer and install retaining ring (1). Check retaining ring for proper fit.

Step 7: Install cup (30), spring (29), and adjusting screw (31) into body (24). Tighten cup slightly with spanner wrench. Do not over tighten. Adjusting screw (31) should be threaded into cup (30) only two full turns.

Step 8: Replace all plugs/hoses in proper ports after inspecting "O" rings.

Step 9: Install intermediate pressure gauge into primary low pressure port and plug remaining ports with plugs. Place regulator on 3000 PSIG air source and adjust intermediate pressure to 140 PSIG. To increase intermediate pressure, turn adjusting screw (31) clockwise. To reduce intermediate pressure, turn adjusting screw (31) counter-clockwise. Simulate purging regulator by opening and closing bleeder knob on pressure gauge. Turn off air and purge gauge once intermediate pressure is set.

Step 10: Replace plug (32) and remove intermediate pressure gauge.

	PACER 460 DIN FIRST STAGE		PAGE	REPAIR PROCEDURE
	9/93	First Stage Regulators	1-27	