

CHAPTER 16

HELICOPTER AIRCREW BREATHING DEVICE (HABD) SRU-40/P, SRU-40A/P, AND SRU-40B/P

Section 16-1. Description

16-1. GENERAL.

NOTE

For continuity throughout this chapter, the SRU-40/P, SRU-40A/P, and SRU-40B/P will be referred to as the HABD unless otherwise stated.

All three variations of the HABD are functionally and mechanically indential and differ only in improved components.

16-2. The SRU-40/P (P/N 1586AS301-1), SRU-40A/P (P/N 1586AS301-2), and SRU-40B/P (P/N 1586AS301-3) Helicopter Aircrew Breathing Devices (HABD) are compact, lightweight breathing assemblies with a rated cylinder pressure of 3000 psi (figure 16-1). They are intended for the emergency use of helicopter and E-2/C-2 aircrew personnel in the event of a ditching. The HABD provides emergency breathing air upon demand during egress from submerged aircraft. The device provides 1 to 3 minutes of breathing air depending upon the depth of water, water temperature, and the individual using the device.

16-3. The HABD is manufactured by U.S. Divers, INC. (CAGE 94120). The device is carried in a special pocket on the SV-2, AISAP, and AIRSAVE vests designed to accommodate the HABD. The Passenger Helicopter Aircrew Breathing Device System (PHABD) is only authorized for use by Marine Troop passengers utilizing the LPU-32/P, LPP-1/1A and Pouch Type Preserver (PTP). Refer to Chapter 9, Section 9-46 of this manual.

16-4. This manual does not apply to CNO approved Water Survival Sites. Training assets shall be maintained and inspected as outlined in a CNO approved HABD SOP manual, NAVOPMED P-1550-2, by approved water survival personnel.

16-5. CONFIGURATION.

16-6. The HABD is a two-stage device that comes in one size only. It is a compact, self-contained breathing device consisting of a First-Stage Regulator Assembly, a Second-Stage Regulator Assembly, and a hose assembly (figure 16-1).

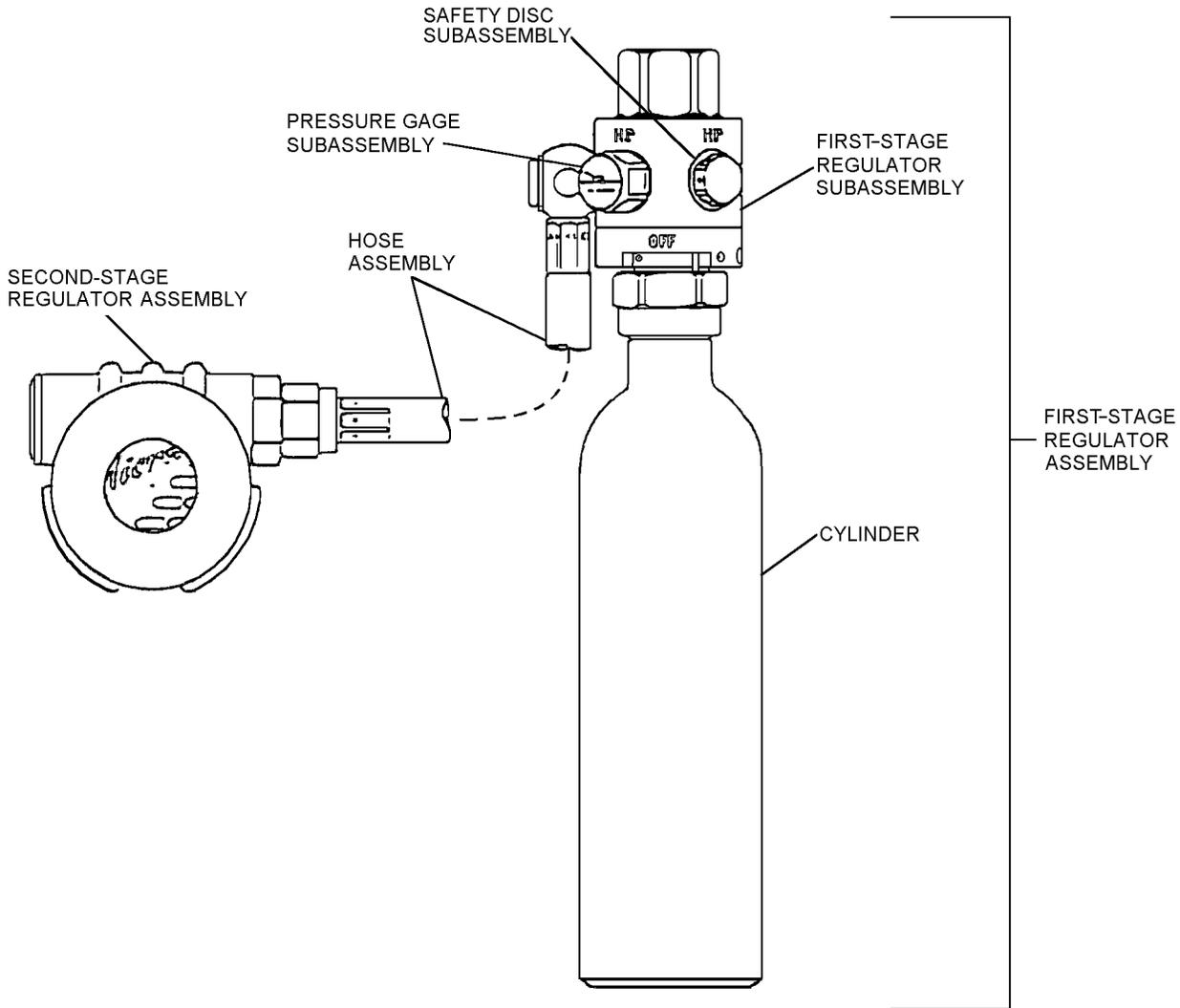
16-7. FIRST-STAGE REGULATOR ASSEMBLY.

The First-Stage Regulator Assembly consists of the First-Stage Regulator Subassembly, the pressure gage subassembly, and the cylinder. The First-Stage Regulator Subassembly reduces the cylinder pressure to 140 ± 5 psi after which it is routed to the Second-Stage Regulator Assembly through the connecting hose. An indicator ring on the First-Stage Regulator Assembly displays ON/OFF status and a burst disc in the safety disc subassembly prevents over pressurization. The pressure gage subassembly has a dial gage that indicates the fill level of the attached air cylinder. Air is contained in a 1.5 cu. ft. aluminum cylinder at 3000 psi. Hydrostatic testing of the cylinder is required by the manufacturer but does not need to be retested during use due to its small diameter of 2.0 inches. Specific information is printed on the side of the cylinder. The air cylinder comes as a component of the First-Stage Regulator Assembly and cannot be ordered separately.

16-8. SECOND-STAGE REGULATOR ASSEMBLY.

The Second-Stage Regulator Assembly consists of a mouthpiece, a mouthpiece cover, and a plastic chamber enclosing the breathing parts depicted in figure 6-8. It has two exhaust valves which are covered for protection and provide greater security from negative pressure in the demand chamber. Because of the constant pressure between the two stages, breathing is relatively easy and water does not enter the mouthpiece or chamber.

16-9. HOSE ASSEMBLY. The First-Stage and Second-Stage Regulators are connected by a 20-inch flexible, low pressure hose. The hose is attached to the First-Stage Regulator with a swivel fitting. The hose is long enough to provide freedom of movement for the wearer, but not so long as to encumber egress.



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Figure 16-1. HABD Major Components

16-10. SUPPORT EQUIPMENT.

16-11. The HABD is a 3000 psi unit which requires special support equipment to fill it. A Compressed Air Refill Assembly, CQU-10/U, P/N 1586AS401-1, also referred to as a Portable Refill System (PRS) is provided at both the O-Level and I-Level maintenance activities for use with the HABD. For maintenance and operating procedures on the CQU-10/U, refer to NAVAIR 16-45-716. Fleet Support Team (FST), formerly CFA, for Support Equipment is Lakehurst, NJ.

16-12. REFERENCE NUMBER, ITEMS, AND SUPPLY DATA.

16-13. [Section 16-3](#), [Illustrated Parts Breakdown](#), contains information on the HABD assembly. It contains figure and index numbers, reference or part numbers, description, quantity per assembly and Source, Maintenance, and Recoverability (SM&R) codes for all replaceable components of the HABD.

Section 16-2. Modifications

16-14. GENERAL.

16-15. The SRU-40/P shall be updated by comparing the configuration of the assembly with the directives listed in [Table 6-1](#).

Table 16-1. SRU-40/P HABD Directives

Description of Modification	Application	Modification Code
Installation of Cold Weather upgrade kit	All SRU-40/P (Note 1)	66-659
Notes: 1. After modification, the SRU-40/P shall be re-designated as SRU-40A/P.		

Section 16-3. Maintenance

16-16. GENERAL.

16-17. Maintenance of the HABD, shall consist of inspection, filling, cleaning, and replacing failed components. All maintenance shall be performed in accordance with OPNAVINST 4790.2. See Table 6-2 for the replaceable HABD assemblies and subassemblies. To obtain another cylinder, a First-Stage Regulator Assembly must be purchased.

16-18. All maintenance involving removal or replacement of components on the HABD, with the exception of the mouthpiece, will be performed at the Intermediate Level of maintenance. O-Level maintenance personnel are authorized to top-off the cylinder and to remove and replace the mouthpiece as well as perform Pre-Flight, Post-Flight, and 90-Day Inspections. Refer to figures 6-7 and 6-8 for the assembly and disassembly of HABD components. Refer to the IPB for component, individual parts and Service Kit ordering.

16-19. Two service kits are available. Service kit, P/N 1028-81, is for the First-Stage Regulator Assembly, and service kit, P/N 1028-82, is for the Second-Stage Regulator Assembly. These kits contain mandatory servicing parts such as O-rings, washers, etc., which will be replaced any time a regulator is fully or partially disassembled unless otherwise specified in this chapter. There is no Depot Level maintenance.

16-20. An exception for this maintenance concept is made for the Naval Aviation Water Survival Training Program (NAWSTP). Those activities use the HABD for training on a continual basis. Because of the constant use of these HABDs, the manufacturer recommends they be serviced two to three times per year instead of the normal once per year. Refer to NAVOPMED P-1550-2 for maintenance procedures, available at the local Aviation Survival Training Center (ASTC).

16-21. DEFINITIONS.

16-22. Purging. Purging has two meanings as follows:

1. Act of pressing the purge cover of the HABD while in the ON position to release pressurized air from the cylinder.

2. Process of filling and releasing pressure from the HABD to remove moisture and other debris that may have entered the unit.

16-23. Topping-off. Process of recharging the HABD when the pressure gage needle reads in the red zone (below 2700 psi).

16-24. Filling. Process of recharging the HABD after the unit's cylinder has been emptied.

Table 16-2. HABD Components

Component	Quantity Required	Part Number (SRU-40/P)	Part Number (SRU-40A/P)	Part Number (SRU-40B/P)
System	1	1586AS301-1	1586AS301-2	1586AS301-3
First-Stage Regulator Assembly (includes cylinder)	1	M1006-74	1006-74	1028-74
First-Stage Regulator Subassembly	1	M1006-71	1006-71	1028-71
Pressure Gage Subassembly	1	M1006-73	1028-73	1028-73
Safety Disc Subassembly	1	0502-41	0502-41	0502-41
Second-Stage Regulator Assembly	1	M1006-72	1028-72	1028-72
Mouthpiece	1	1058-31	1058-31	1058-31
Hose Assembly	1	M1006-75	1028-75	1028-75

16-25. INSPECTIONS.

NOTE

HABD units that have been completely depleted of air for more than two hours must be inspected for internal contamination. If contamination is found, clean unit in accordance with paragraph 16-46 and purge the unit in accordance with paragraph 16-43. If corrosion is found, replace unit.

16-26. With the exception of Pre-Flight and Post-Flight Inspections, inspections of the HABD shall be recorded on appropriate forms in accordance with OPNAVINST 4790.2 Series. The required inspections for the HABD are described in the following paragraphs:

NOTE

During any inspection, if the pressure gage is not in the green zone (2700 - 3000 psi) with the HABD in the ON position, it will be necessary to top-off or purge and refill the unit.

16-27. PLACE-IN-SERVICE INSPECTION. The HABD shall be given a Place-In-Service Inspection at I-Level. The Place-In-Service Inspection consists of the following:

NOTE

If existing labels show signs of wear, etch the serial number and configuration of bottle (i.e. SRU-40/P, SRU-40A/P, or SRU-40B/P) on the flat area of the cylinder bottom using an electric engraving tool.

Failure of the HABD during any portion of the Place-In-Service Inspection renders the unit non-RFI and must be reported in accordance with OPNAVINST 4790.2 series.

1. Inspect the device for external damage, dents, cracks, corrosion, and cylinder markings (figure 16-2).



Failure to check security of the ON/OFF indicator ring set screw may cause cylinder and first-stage regulator subassembly to separate resulting in the cylinder becoming a projectile, which could cause serious injury or death.

2. Inspect all components for security of attachment.

a. Inspect ON/OFF indicator ring for security of attachment. If found loose, re-tighten set screw in accordance with paragraph 16-63, steps 28 thru 30. Apply torque sealant (F-900) to set screw.

3. Visually inspect the condition of the hose assembly along its length for signs of deterioration or damage, such as cuts, cracks, blisters, abrasion, or corrosion of the fittings.

4. For record purposes, use S/N from the identification label. DO NOT use S/N from the cylinder neck or first stage regulator subassembly. If the identification label shows signs of becoming separated from the unit or is becoming illegible, the HABD serial number and the configuration of the bottle shall be engraved on the flat area of the cylinder bottom using an electric engraving tool.

5. Components that have been ordered individually from supply require different documentation procedures. First stage regulator assemblies P/N 1028-74 will not have a label on the cylinder. Upon receipt of first stage regulator assembly from supply, annotate the contract number and part number from packaging material onto the history card. For serial number identification, use serial number off the cylinder.

NOTE

All cylinders having a label shall be documented in accordance with step 4.

6. All data on label shall be recorded on appropriate forms in accordance with OPNAVINST 4790.2 series.

7. Inspect the chrome finish of the first-stage regulator to check for any flaking, chipping or other damage.

8. Remove Exhaust Cover (8, figure 16-8) from Second-Stage Regulator Assembly. Refer to paragraph 16-56, steps 20 and 21 for removal procedures.

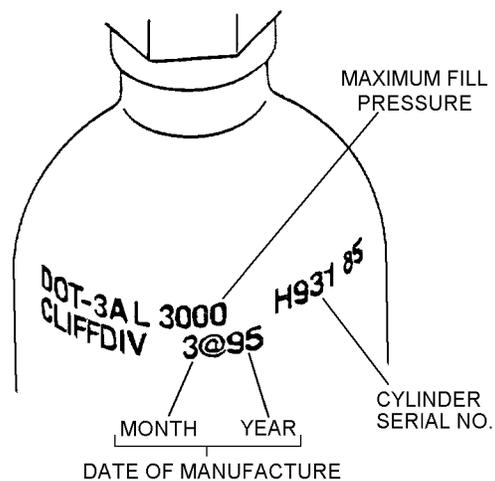


Figure 16-2. Cylinder Markings

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9. Inspect the exhaust valves (7, figure 6-8) for proper seating. To be properly seated, exhaust valves should be lying flat, completely covering entire exhaust ports. If found folded or tucked, lift folded or tucked edge of exhaust valve until it is lying flat and covering entire exhaust port.

10. If exhaust valves are found to be damaged, remove and replace with new exhaust valves from Service Kit. Refer to paragraph 6-56, step 22 for removal of exhaust valves and paragraph 6-64, step 7 for replacement procedures.

11. Install the exhaust cover (8, figure 6-8) to Second-Stage Regulator Assembly. Refer to paragraph 6-64, step 8 for replacement procedures.

NOTE

Torque sealant used on purge cover must be visible. Do not use black.

12. Inspect hard purge cover for tightness and apply torque sealant to purge cover in two locations opposite of each other.

WARNING

The HABD is designated compatible for use only with normal, atmospheric, compressed air. DO NOT attempt to fill with other gasses, including pure oxygen, or air which has been enriched with oxygen exceeding 22% in content. Failure to observe this WARNING may result in serious injury or death due to fire and explosion, or the serious deterioration and failure of the equipment.

13. Purge and fill the HABD in accordance with paragraph 6-43.

14. Perform Leak Test in accordance with paragraph 16-48. If leakage is detected, report discrepancy in accordance with OPNAVINST 4790.2 Series.

15. If no leaks are evident, the HABD is ready for issue (RFI).

16. Record inspection date and data on appropriate forms in accordance with OPNAVINST 4790.2 Series.

16-28. PRE-FLIGHT INSPECTION. The pre-flight inspection shall be performed on the HABD prior to each flight by the aircrewmember to whom the unit is assigned and shall consist of the following:

WARNING

Strict compliance of pre-flight inspections shall be adhered to by all aircrewmembers utilizing the HABD.

NOTE

Report any discrepancies to maintenance personnel immediately.

1. Visually inspect the device for evidence of malfunction or external damage.

2. Inspect mouthpiece for cuts, cracks, cleanliness, and overall integrity.

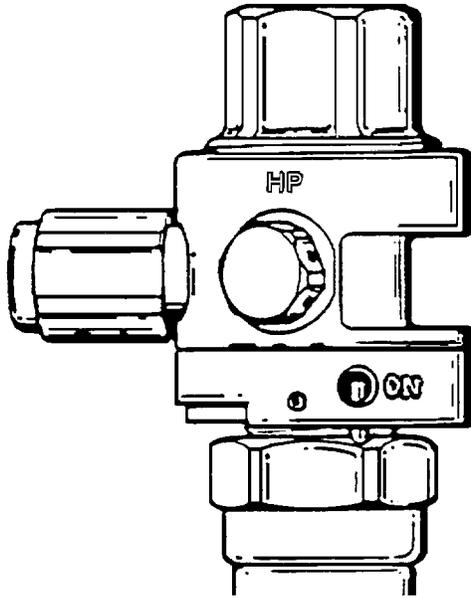
3. Carefully inspect the low pressure hose to ensure it is securely connected to both the First and Second-Stage Regulators. Inspect the hose for cuts, cracks, blisters, abrasions or other damage, and inspect the fittings for corrosion.

4. Prior to pressurizing unit, with the ON/OFF in the OFF position, place regulator mouthpiece in the mouth and proceed to inhale. No air should flow through the mouthpiece. If air flow is detected, report discrepancy to maintenance personnel immediately.

WARNING

If cylinder rotates more than one complete turn while turning to the ON position, STOP TURNING CYLINDER, and immediately report malfunction to maintenance personnel. Continuing to rotate cylinder may cause separation of the cylinder from the first-stage regulator subassembly resulting in the cylinder becoming a projectile, which could cause serious injury or death.

5. While holding the First-Stage Regulator securely, slowly turn the HABD cylinder counter-clockwise until the ON/OFF indicator pin can be sighted through the small aperture marked ON (figure 6-3).



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Figure 16-3. HABD Valve ON Position

NOTE

Step 6 may be omitted for units deployed to remote locations where no immediate Intermediate level maintenance support is available for refilling the CQU-10/U recharging unit.

6. Place regulator mouthpiece in mouth and inhale and exhale. Regulator should deliver air upon inhalation without excessive effort or fluttering of the second-stage diaphragm. There should be no fluttering or sticking of the second-stage exhaust valves when exhaling. If any of these problems occur report discrepancy to maintenance personnel immediately.

7. While the valve is in the ON position, examine the pressure gage (figure 16-4) to determine if the cylinder is ready for issue. The pressure gage should read in the green zone. After ensuring that the system is full, listen for any obvious signs of leakage from the system, including free flow from the Second-Stage Regulator. Report any HABD discrepancies to maintenance personnel immediately.



The pressure gage registers 3000 psi when the HABD is full. A reading in the green zone indicates above 2700 psi. The unit shall be topped-off if the pressure registers below 2700 psi (in the red zone). It may be topped-off if the pressure is higher. However, any time the pressure is low, depending upon its usage, a leak may be present. Check the HABD as indicated above and monitor it afterwards taking its usage into account.

8. Quickly press and release the purge button on the Second-Stage Regulator. A short burst of air should escape when the button is depressed and stop when it is released. Listen to ensure airflow has stopped.

9. Inspect purge cover to ensure that torque sealant is present. If not, have maintenance personnel check purge cover for tightness and re-apply torque sealant.

10. If no discrepancies have been noted, leave the HABD in the ON position for the flight.

16-29. POST-FLIGHT INSPECTION. The Post-Flight Inspection shall be performed after each flight by the aircrewmember to whom the unit was issued. The Post-Flight Inspection shall consist of the following:



Over-tightening of bottle may damage regulator or indicator pin. **DO NOT OVER TIGHTEN.** While turning off the bottle there will be a significant increase in torque pressure when the bottle reaches the off position. When the bottle is off the indicator pin should be positioned somewhere within the OFF position. Refer to figure 16-5.

1. Turn the HABD off by securely holding the First-Stage Regulator and slowly rotating the unit's cylinder clockwise until the indicator pin is in the OFF position (figure 16-5). Do not over-tighten. Depress the purge button on the Second-Stage Regulator to completely depressurize the hose and Second-Stage Regulator. Wait at least five minutes, and depress the Second-Stage Regulator Assembly purge button to determine whether any air pressure has built up inside the low pressure hose and second-stage valve.



If a build-up of air pressure occurs inside the low pressure hose and Second-Stage Regulator after the HABD valve has been turned to the OFF position and the system depressurized, the unit must be routed to the Intermediate Level maintenance for repair.

2. Inspect device for external damage.



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Figure 16-4. HABD Pressure Gage

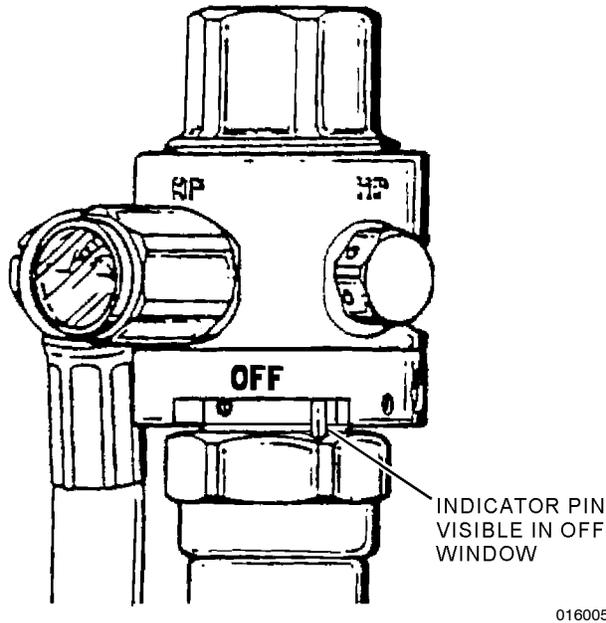


Figure 16-5. HABD Valve OFF Position

16-30. 90-DAY INSPECTION. The 90-Day Inspection shall be performed by a qualified Aircrew Survival Equipmentman at the O-Level as follows:

1. Visual Inspection.

- a. Remove HABD from survival vest pocket.

WARNING

Failure to check security of the ON/OFF indicator ring set screw may cause cylinder and First-Stage Regulator Subassembly to separate resulting in the cylinder becoming a projectile, which could cause serious injury or death.

- b. Inspect all hardware for security of attachment and/or damage.

(1) Inspect ON/OFF indicator ring for security of attachment. If found loose, re-tighten set screw in accordance with paragraph 6-63, steps 28 thru 30. Apply torque sealant (F-900) to set screw.

Check for any cable identification markings (figure 16-2).

d. Check mouthpiece for cleanliness, cracks, discoloration, and security. Clean mouthpiece, if needed, in accordance with paragraph 6-47, step 1, or replace mouthpiece as follows:

(1) Carefully snip the plastic mouthpiece cable tie and remove the mouthpiece (figure 6-8).

(2) Install the new mouthpiece onto the Second-Stage Regulator, in accordance with paragraph 16-64, step 9.

e. Inspect regulator for external damage, cracks, and dents. Inspect for signs of dirt or salt contamination. If necessary, clean, in accordance with paragraph 16-46.

NOTE

Torque sealant used on purge cover must be visible. Do not use black.

f. Inspect purge cover to ensure that torque sealant is present. If not, check purge cover for tightness and re-apply torque sealant to purge cover in two locations opposite of each other.

2. Functional Check.

a. Turn HABD on and check pressure gage for full charge. The pressure gage should read in the green zone at 2700 to 3000 psi (figure 16-4). Top-off, if required, in accordance with paragraph 6-41.

b. Quickly press and release the purge button to ensure proper operation of regulator components (i.e. the sound of vented air will be noticeable when pressed and the sound of vented air should immediately stop when released).

3. Perform Leak Test in accordance with paragraph 16-48.

4. If no leaks were detected, ensure HABD is turned off and return unit to survival vest pocket.

5. Record 90-day inspection date and data on appropriate form in accordance with OPNAVINST 4790.2 Series.

16-31. 360-DAY INSPECTION. The 360-Day Inspection shall be performed on the HABD by a qualified Aircrew Survival Equipmentman at I-Level maintenance as follows:

NAVAIR 13-1-6.5

Quantity	Description	Reference Number
1	First-Stage Regulator Service Kit	1028-81
2	Second-Stage Regulator Service Kit	1028-82

CAUTION

Discard all replaced parts. Do not reuse.

1. The HABD shall be thoroughly cleaned, inspected and overhauled. All cleaning shall be accomplished in accordance with [paragraph 6-46](#). Refer to the following paragraphs for overhaul instructions.

a. Disassemble the First-Stage Regulator Assembly in accordance with [paragraph 6-55](#).

b. Utilizing service kit, reassemble First-Stage Regulator Assembly in accordance with [paragraph 16-61](#).

c. Disassemble the Second-Stage Regulator Assembly in accordance with [paragraph 6-56](#).

d. Utilizing service kit, reassemble Second-Stage Regulator Assembly in accordance with [paragraph 16-64](#).

e. Perform final adjustment in accordance with [paragraph 6-65](#).

f. Perform Leak Test in accordance with [paragraph 6-49](#).

g. Refill or top-off HABD as necessary.

2. Record inspection date and data on appropriate forms in accordance with OPNAVINST 4790.2 Series.

16-32. BREATHING AIR SOURCES.

WARNING

Ensure compressors (Bristol and/or Bauer) have been modified in accordance with SEC 5440 or 5441 as applicable. Maintenance and Inspection criteria for air compressors used to fill the CQU-10/U Portable Refill Station (PRS) shall be strictly adhered to.

16-33. The source of breathing air for the SRU-40 Series is the Compressed Air Refill Assembly, CQU-10/U (also known as the Portable Refill System (PRS)). Refer to NAVAIR 16-47-716.

16-34. STANDARDS FOR AIR PURITY.

WARNING

Contamination of the HABD's breathing air can cause illness, unconsciousness or even death. CAUTION shall be observed when using a compressor to fill the CQU-10/U with air for breathing purposes. Ensure that the compressor is not using air filled with exhaust fumes from its own or any other motor or air filled with fumes from glue or any other toxic sources. Also, excess water vapor in the air can cause ice to form inside cylinder in cold weather and interfere with operation of the system.

The HABD is designated compatible for use only with normal, atmospheric, compressed air. DO NOT attempt to fill with other gasses, including pure oxygen, or air which has been enriched with oxygen exceeding 22% in content. Failure to observe this WARNING may result in serious injury or death due to fire and explosion or to the serious deterioration and failure of the equipment.

16-35. GENERAL SAFETY.

16-36. General safety regulations governing the handling and use of compressed gas cylinders are contained in both NAVSEA and NAVOSH instructions. Persons responsible for handling, storing, and charging refill cylinders must be familiar with these regulations. Safety rules applying particularly to refill cylinders are contained in [table 6-3](#). Because refill cylinders are subject to continuous handling, and because of the hazards posed by a damaged unit, close adherence to these rules is mandatory.

16-37. AIR COMPRESSORS. Safety considerations are of primary importance when working with or around high pressure air, such as that produced by an air compressor. The following warning describes the dangers involved when handling high pressure air or cylinders charged with high pressure air. If a question arises concerning the handling, connecting and operating of high pressure air devices, contact your supervisor, quality assurance personnel, or safety officer.

WARNING

When using high pressure air, the danger exists of cutting through a person's flesh or severely damaging an eye; of being hurt by a hose getting loose and flailing about and whipping someone or nearby equipment; or of a pressurized unit, such as a refill cylinder or HABD cylinder, getting loose and acting as a missile. There is also the danger of over-pressurizing a cylinder and causing it to explode. Refer to Table 16-3 for safety precautions and handling.

16-38. REPLENISHING HABD AIR CYLINDER.

16-39. The air supply in the HABD is replenished by either topping-off or purging and refilling the air cylinder. Topping-off or purging and refilling shall be accomplished only by the use of the CQU-10/U Compressed Air Refill Assembly.

16-40. TOPPING-OFF REQUIREMENT. There are four critical HABD readings of the pressure gage when determining the requirement for topping-off or purging

and refilling of the unit when the unit is turned on. These readings are described in the following subparagraphs:

1. 3000 psi – Pressure gage needle points to the 3 on the dial gage. This is the maximum operational HABD pressure. No action required.
2. 2700 psi – Pressure gage needle points to the low end of the green zone on the dial gage. This is the lower pressure limit allowable for flight. Cylinder may be topped-off (see paragraph 16-41).
3. Above 0 psi (needle moves when unit turned on) but below 2700 psi – Pressure gage needle is in the red zone. Cylinder must be topped-off (paragraph 16-41).
4. If no movement of the pressure gage needle is observed when the HABD is turned on, the cylinder may require purging and refilling. However, at lower pressures, there may not be enough pressure in the cylinder to register on the pressure gage, yet there may be enough air in the cylinder to avoid having to purge the cylinder. To test this, with the HABD on, press the purge cover quickly. If air can be heard escaping, there is sufficient air in the system to require that the unit only be topped-off (paragraph 16-41). If no air is heard escaping, and the HABD has remained empty for more than 2 hours, the HABD must be purged and refilled (paragraph 16-43).

Table 16-3. Safety Precautions for Charging and Handling Refill Cylinders

<ol style="list-style-type: none"> 1. Use only compressed air for filling conventional cylinders, never OXYGEN. (The color code for air is black and the color code for oxygen is green.) 2. Make sure all fittings are tight or torqued according to maintenance instructions before pressurizing any lines. 3. Avoid excessive heat when charging. 4. Store filled cylinders in a cool, shaded area. Never leave in direct sunlight. 5. Handle charged cylinders with care: if dropped or damaged, or if the cylinder valve is accidentally knocked loose, the cylinder can become a lethal missile. A cylinder charged to 3000 psi has enough energy to jet-propel itself through the air for some distance, tearing through any obstructions on the way. 6. Cylinders should always be properly secured aboard ship and not allowed to freely roll around. 7. Never work on a charged cylinder except to make final adjustments. 8. Always use gages to measure cylinder pressure. Never have your face near the dial of a gage to which pressure is being applied. 9. Do not attempt to fill any cylinder if the inspection date has expired or if it appears to be substandard in any way. Dents, severe rusting, bent valves, "frozen" reserve mechanisms, or evidence of internal contamination (water, scales of rust) are all signs of unsuitability. See NAVSEAINST 10560 Series. 10. Maximum cylinder charging rate shall not exceed 500 psi per minute, with a two minute cool down period before continuing refilling.

16-41. TOPPING-OFF PROCEDURE. The Top-Off procedure can be accomplished by either I-Level or O-Level maintenance personnel.

NOTE

If there is no movement of pressure gage needle when ON/OFF valve is turned to the ON position, the HABD device may need to be purged and refilled. If the unit becomes completely discharged (i.e. no air is heard escaping when the purge button is depressed), and the unit has been empty for more than 2 hours, the cylinder shall be inspected and the device purged. Refer to paragraph 6-43 for detailed purging instructions.

16-42. The 3500 psi high-pressure air cylinder of the CQU-10/U Compressed Air Refill Assembly is designed to be used to top-off the HABD system. The top-off procedures are as follows:

Materials Required

Quantity	Description	Reference Number
As Required	Christo-Lube (Noted)	MCG-111 (202 Tube)

Notes: 1. Christo-Lube may be open purchased from:

Lubrication Technology Inc.
310 Morton St.
Jackson, OH 45640
Phone - 740-286-2644

Support Equipment Required

Quantity	Description	Reference Number
	Compressed Air Refill Assembly, CQU-10/U	1586AS401-1
1	Torque Wrench (micrometer) 30 - 150 lbs-in	—
1	11/16-inch Hex Socket	—
1	O-ring	8203-19

WARNING

DO NOT attempt to top-off the HABD cylinder with more than 3000 psi. Doing so may seriously weaken and damage the cylinder, and may cause it to rupture and explode, possibly resulting in serious injury or death.

The HABD is designated compatible for use only with normal, atmospheric, compressed air. DO NOT attempt to fill with other gasses, including pure oxygen, or air which has been enriched with oxygen exceeding 22% in content. Failure to observe this WARNING may result in serious injury or death due to fire and explosion or to the serious deterioration and failure of the equipment.

CAUTION

Before topping-off the HABD, refer to safety precautions in table 16-3 and NAVAIR 16-45-716, CQU-10/U Refill Assembly System manual for operational instructions.

Top-off the HABD and, if a leak is suspected, perform a Leak Test in accordance with paragraph 6-49. If the HABD requires topping-off and there has been no use or repair on it, forward the unit to I-Level maintenance for more extensive leak testing.

Ensure all fittings and adapters are free of dirt and contaminants.

1. Open the CQU-10/U supply valve and check the pressure on the supply gage to ensure that it reads a minimum of 3000 psi (the maximum of 3500 psi is optimal). Before attempting to fill the HABD, ensure that the unit is completely dry, especially around the area of the First-Stage Regulator Subassembly.

CAUTION

When turning the HABD off, do not over-tighten. Overtightening may damage regulator or indicator pin.

2. Ensure the HABD is in the OFF position. If necessary, turn the system off by holding the First-Stage Regulator Assembly securely and turning the cylinder clockwise until it stops. The indicator pin should be positioned inside the aperture marked OFF (figure 16-5).

3. Depress the Second-Stage Regulator Assembly purge button to ensure that the hose and Second-Stage Regulator Assembly are completely depressurized.

4. Apply a 11/16-inch hex socket to the pressure gage subassembly located between the high pressure (HP) safety disc port and the low pressure (LP) swivel port (figure 16-6). Turn the pressure gage subassembly counter-clockwise and remove the gage.

5. Closely inspect the port opening to ensure that no debris, residue, or moisture is present.

CAUTION

If moisture is found inside port opening, it indicates that water may have entered the First-Stage Regulator and cylinder. DO NOT attempt to fill or use cylinder until system has been inspected and purged in accordance with paragraph 6-43.

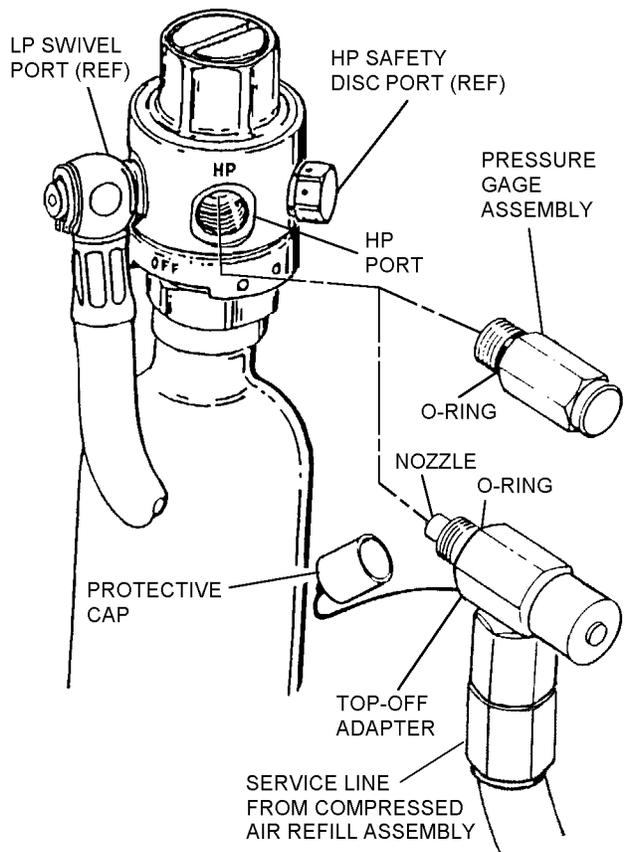


Figure 16-6. Pressure Gage Removal and Top-Off Adapter Installation

016006

6. Remove the protective cap from the refill nozzle of the top-off adapter. Inspect the nozzle to ensure the O-ring is present and seated evenly at the base of the threads (figure 16-6).

CAUTION

DO NOT apply a wrench or otherwise overtighten the top-off adapter into the First-Stage Regulator.

NOTE

If protective cap is not present, requisition from supply, P/N AN 929-4C, NIIN 00-720-1508.

7. Apply a light coating of Christo-lube to the O-ring and mate the threaded nozzle of the top-off adapter into the open HP port, and turn clockwise until hand tight.

8. While holding the First-Stage Regulator and top-off adapter securely, turn the HABD cylinder counter-clockwise until single click is felt and the ON/OFF indicator pin can be sighted through the small aperture marked ON (figure 16-3).

9. Place HABD in blast tube.

CAUTION

Always fill the HABD slowly. Rapid filling of the cylinder will generate heat and may result in an incomplete filling after the cylinder cools. Fill at a rate of 500 psi per minute, with a two minute cool down period to allow for cylinder cooling.

10. Begin filling the HABD by tilting the toggle valve lever slightly, ensuring the HABD cylinder is only filled in increments of 500 psi with 2 minutes intervals between fillings to allow for cylinder cooling.

11. Continue to fill the HABD cylinder until 3000 psi is achieved.

CAUTION

When turning the HABD off, do not overtighten. Overtightening may damage regulator or indicator pin.

12. Remove the HABD cylinder from blast tube. While holding the First-Stage Regulator Assembly and top-off adapter securely, turn the HABD cylinder clockwise until it stops and the indicator pin is positioned inside the aperture marked OFF (figure 16-5).

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13. Depressurize the hose and Second-Stage Regulator by pressing the Second-Stage Regulator purge button until no airflow can be heard.

14. While holding the HABD securely, turn the top-off adapter fitting counter-clockwise and remove it from the First-Stage Regulator. Ensure O-ring on top-off adapter refill nozzle is present.

15. Lubricate a new O-ring with Christo-lube and place O-ring evenly at the base of the threads on the pressure gage.

16. Screw the threaded end of the pressure gage sub-assembly into the HP port and turn clockwise until hand tight. Using a torque wrench with a 11/16-inch hex socket, tighten the pressure gage subassembly to a torque measurement of 40 ± 3 in-lb.

17. If no other HABD cylinders are to be filled, proceed to [step 18](#). If others are to be filled, return to [step 1](#).

18. To secure system, turn the CQU-10/U supply cylinder valve clockwise to close. Relieve pressure from the pressure regulator by holding the top-off adapter securely and tilting the toggle valve lever until all air bleeds out of system and the supply pressure gage reads zero.

19. Replace protective cap over refill nozzle of the top-off adapter.

16-43. PURGING AND FILLING THE HABD. Purging of the HABD will be performed at I-Level maintenance upon Place-In-Service, 360-Day Inspection and at any time contamination is suspected or the HABD has remained empty for more than 2 hours. When the cylinder has remained empty for more than two hours, or if contamination is suspected, the First-Stage Regulator and cylinder adapter must be removed and the cylinder inspected for contamination. If corrosion is found, replace First-Stage Regulator Assembly. However, note that at lower pressures the gage may not indicate that any air is in the cylinder, when, in fact, there is enough to avoid having to purge it. Therefore, as a secondary check with the HABD in the ON position, press the Second-Stage Regulator purge cover quickly. If air can be heard escaping, there is sufficient air in the system to require only that the HABD be immediately topped-off in accordance with [paragraph 16-41](#).

16-44. Purge the HABD in accordance with the following procedures.

16-12

Materials Required

Quantity	Description	Reference Number
As Required	Christo-Lube (Not E ₁)	MCG-111 (202 Tube)

Notes: 1. Christo-Lube may be open purchased from:

Lubrication Technology Inc.
310 Morton St.
Jackson, OH 45640
Phone - 740-286-2644

Support Equipment Required

Quantity	Description	Reference Number
1	Compressed Air Refill Assembly, CQU-10/U	1586AS401-1
1	Torque Wrench (micrometer), 30 - 150 in-lb	—
1	11/16-inch Hex Socket	—

WARNING

The HABD is designated compatible for use only with normal, atmospheric, compressed air. DO NOT attempt to fill with other gasses, including pure oxygen, or air which has been enriched with oxygen exceeding 22% in content. Failure to observe this WARNING may result in serious injury or death due to fire and explosion or in the serious deterioration and failure of the equipment.

CAUTION

Before purging the HABD, refer to safety precautions in [table 6-3](#) and the applicable CQU-10/U refill assembly system manual for operational instructions.

If a leak is suspected during purging and refilling, perform a Leak Test in accordance with [paragraph 16-48](#).

Ensure all fittings and adapters are free of dirt and contaminants.

1. Open the CQU-10/U supply valve and check the pressure on the supply gage to ensure that it reads a

minimum of 3000 psi (the maximum of 3500 psi is optimal). Before attempting to fill the HABD, ensure that the entire unit is completely dry, especially around the area of the First-Stage Regulator Subassembly.

CAUTION

When turning the HABD off, do not over-tighten. Overtightening may damage regulator or indicator pin.

2. Ensure that the HABD is in the OFF position. If necessary, turn the system off by holding the First-Stage Regulator securely and turning the cylinder clockwise until it stops. The indicator pin should be positioned inside the adapter mark OFF (figure 16-5).

3. Depress the Second-Stage Regulator Assembly purge button to ensure that the hose and Second-Stage Regulator Assembly are completely depressurized.

4. Apply an 11/16-inch open-end wrench to the pressure gage subassembly. Turn the pressure gage counter-clockwise and remove the gage.

5. Closely inspect the HP port opening to ensure that no debris, residue, or moisture is present.

CAUTION

If moisture is present inside port opening, it indicates that water may have entered the First-Stage Regulator and cylinder. Inspect cylinder thoroughly after purging to ensure all moisture has been removed. If necessary, repeat the purging process.

6. Remove the protective cap from the refill nozzle of the top-off adapter. Inspect the nozzle to ensure the O-ring is present and seated evenly at the base of the threads (figure 16-6).

CAUTION

DO NOT apply a wrench or otherwise over-tighten the top-off adapter into the first-stage regulator.

7. Apply a light coating of Christo-lube to the O-ring. Mate the threaded nozzle of the top-off adapter into the open HP port and turn clockwise by hand until hand tight.

WARNING

DO NOT attempt to fill the HABD Cylinder with more than 3000 psi. Doing so may seriously weaken and damage the cylinder, and may cause it to rupture and explode, possibly resulting in serious injury or death.

8. While holding the first-stage and top-off adapter securely, turn the HABD cylinder counter-clockwise until single click is felt and ON/OFF indicator pin can be sighted through the small aperture mark ON (figure 16-3).

9. Place HABD in blast tube.

10. Slowly tilt the toggle valve on the CQU-10/U and apply between 300 and 400 psi of pressure to the HABD.

11. Release pressure from the HABD by pressing the regulator purge button on the Second-Stage Regulator (an audible hiss should be heard) until the unit's pressure is depleted.

12. Repeat steps 10 and 11 two more times for a total of three times.

CAUTION

Always fill the HABD slowly. Rapid filling of the cylinder will generate heat and may result in an incomplete fill after it cools. Fill at a rate of 500 psi per minute, with a two minute cool down period to allow for cylinder cooling.

13. After cylinder has been purged, begin filling the HABD by tilting the toggle valve lever slightly ensuring the HABD cylinder is only filled in increments of 500 psi with 2 minutes intervals between fillings to allow for cylinder cooling.

14. Continue to fill the HABD cylinder until 3000 psi is achieved.

CAUTION

When turning the HABD off, do not over-tighten. Overtightening may damage regulator or indicator pin.

15. Remove the HABD cylinder from blast tube. While holding the First-Stage Regulator Assembly and top-off adapter securely, turn the HABD cylinder clockwise until it stops and the indicator pin is positioned inside the adapter mark OFF (figure 16-5).

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16. Depressurize the hose and Second-Stage Regulator by pressing the Second-Stage Regulator purge button until no airflow can be heard.

17. While holding the HABD securely, turn the top-off adapter counter-clockwise and remove it from the First-Stage Regulator. Ensure O-ring on top-off adapter refill nozzle is present.

18. Lubricate a new O-ring with Christo-lube and place O-ring evenly at the base of the threads on the pressure gage.

19. Screw the threaded end of the pressure gage sub-assembly into the HP port and turn clockwise until hand tight. Using a torque wrench with an 11/16-inch hex socket, tighten the pressure gage subassembly to a torque measurement of 40 ± 3 in-lb.

20. If no other HABD cylinders are to be purged and filled, proceed to step 21. If others are to be purged and filled, return to step 1.

21. To secure system, turn the CQU-10/U supply cylinder valve clockwise to close. Relieve pressure from the pressure regulator by holding the top-off adapter securely and tilting the toggle valve lever until all air bleeds out of system and the supply pressure gage reads zero.

22. Replace protective cap over refill nozzle of top-off adapter.

16-45. REFILLING THE COMPRESSED AIR RE-FILL ASSEMBLY CQU-10/U. Refilling the CQU-10/U must be performed at I-Level maintenance. Refer to the CQU-10/U Manual (NAVAIR 16-45-716) for approved refill procedures.

16-46. CLEANING.

16-47. Cleaning of parts shall be performed at O- or I-Level maintenance, as required. O-Level maintenance personnel shall clean and disinfect mouthpieces and mouthpiece covers only. I-Level maintenance personnel shall perform steps 1 thru 5. Cleaning is performed using the following procedures:

NOTE

Cleaning, disassembly, and assembly shall be performed in a clean, dust-free environment. Do not attempt to clean rubber components except for the mouthpiece and mouthpiece cover.

Materials Required

Quantity	Description	Reference Number
As Required	Gauze Pads, Absorbent	222066
As Required	Sodium Hypochlorite Solution	A-A-1427 NIIN 00-598-7316
As Required	Detergent, General Purpose, Type 1	MIL-D-16791 NIIN 00-282-9699
	-or-	
	Soap, Laundry, Low-filter	P-S-600
As Required	White Vinegar, Household Grade	—
As Required	Cloth, Lint-Free	—
1	Brush, Nylon Bristle	—

1. Mouthpiece and mouthpiece cover: Clean and sanitize the mouthpiece and mouthpiece cover as follows:

a. Remove mouthpiece by cutting cable tie and remove mouthpiece from box bottom. Remove mouthpiece cover by cutting the cable tie that attaches it to the survival vest.

b. Clean mouthpiece and mouthpiece cover as follows:

(1) (Preferred solution) Make a 1% by weight solution of cleaning compound (Detergent, General Purpose) by adding 1/4 to 1/2 ounce (liquid) of the compound to 1 gallon of fresh water. Wash mouthpiece and cover in soap and water and rinse thoroughly with fresh water. Let parts air dry completely.

(2) (Alternate solution) Make a suitable soap solution by adding approximately 4 tablespoons of soap powder to 1 gallon of fresh water. Hardness of water may require more soap, but the solution must be sufficiently strong to readily form lather when agitated. Make sure that all soap particles are dissolved. Wash mouthpiece and cover in suds only (to eliminate residue). Rinse thoroughly with fresh water and let mouthpiece and cover air dry completely.

c. To disinfect mouthpiece: Make disinfecting solution by mixing 1/3 cup of sodium hypochlorite solution with 1 gallon of fresh water.

(1) Moisten a gauze pad with solution and squeeze to prevent dripping. Wipe mouthpiece and ensure that sanitizing solution penetrates all crevices.

(2) Wipe mouthpiece with a clean, dry, lint-free cloth. Ensure that no lint remains.

d. Replace mouthpiece in accordance with paragraph 6-64, step 9.

e. Replace mouthpiece cover in accordance with NAVAIR 13-1-6.7-2.

2. Metal components: To clean metal components, proceed as follows:



Ultrasonic cleaning in excess of 15 minutes may damage chrome finish of certain parts. Be certain to use a timer, and do not leave parts unattended while cleaning. Do not clean parts which show damage to their chrome finish in an ultrasonic cleaner. Also, do not ultrasonically clean the anodized spring retainer on the SRU-40/P and SRU-40A/P (2, figure 6-8). Doing so will damage the anodized surface, and subsequently allow corrosion to occur. Allow parts to air dry when finished.

a. (Preferred method - Metal components, except the spring retainer on the SRU-40/P and SRU-40A/P): For ideal cleaning of metal components, use an ultrasonic cleaner with one-to-one solution of water and white vinegar. After soaking for 10 to 15 minutes, rinse with fresh water. Blow components clean with water pumped nitrogen or low pressure shop air through all regulator port holes (to clean particles that could have lodged in the internal passage). For heavily greased parts, degrease in a solution of warm water and liquid detergent prior to placing in ultrasonic cleaner. Allow parts to dry thoroughly when finished.

b. (Alternate method - Metal components, except the spring retainer on the SRU-40/P and SRU-40A/P): Make a one to one solution of white vinegar and water. Soak metal parts for 20 minutes. After soaking, rinse with fresh water. Blow components clean with water pumped nitrogen or low pressure shop air through all regulator port holes (to clean particles that could have lodged in the internal passage). Allow parts to dry thoroughly when finished.

c. Spring retainer on SRU-40/P and SRU-40A/P. Inspect spring retainer for any signs of oxidation or cor-

rosion, such as pitting, or other damage to the anodized surface. If found to be in reusable condition, clean it with warm soapy water and a nylon bristle brush. Rinse thoroughly with fresh water and set it aside to air dry.

3. Plastic components: Inspect plastic components for signs of grease, dirt or other containments.

a. Clean plastic components in a solution of 4 tablespoons of soap powder to 1 gallon of fresh water. Gently clean plastic components using a nylon bristle brush. Rinse thoroughly with fresh water and set aside to air dry.

4. Hoses: To clean hoses, proceed as follows:

NOTE

If build-up of corrosion on hose fittings is severe or cannot be removed, replace hose assembly.

a. For build-up of corrosion or dirt on hose fittings, soak them in vinegar but do not allow any of the solution to enter the hose. Gently remove corrosion and dirt using a nylon brush. If corrosion can not be removed, replace hose assembly.

b. Rinse hose fittings in fresh water and allow hose to dry with cleaned ends hanging down.

5. Cylinder: To clean the cylinder, proceed as follows:

a. Lightly agitate cylinder in a solution of soapy water.

b. Rinse thoroughly with fresh water and let it air dry completely.

16-48. TESTING.

16-49. HADB LEAK TEST. The Leak Test shall be performed by qualified Aircrew Survival Equipmentman (PR). Static Leak Testing is required during the Place-In-Service and 360-Day Inspections at I-Level maintenance. Both the Static Leak Test (paragraph 16-50) and the ON/OFF Valve Test (paragraph 16-51) shall be performed at O-Level maintenance during 90-Day Inspections or as required. If a leak is detected during either the Static or the ON/OFF Valve Test, a more extensive Leak Test shall be performed. Refer to paragraph 16-52.

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16-50. Static Leak Test (O-Level and I-Level Maintenance). The Static Leak Test is performed as follows:

1. Ensure HABD is fully charged (pressure gage is indicating 3000 psi).

2. Turn HABD to the ON position, record the time and set the unit aside in a secure area for a four hour static leak test.

3. At the end of the four hour period, check the pressure gage for indicated pressure. If the gage has remained at the same position (indicating 3000 psi) turn the HABD to the OFF position, and bleed the pressure from the hose utilizing the second-stage regulator purge button.

4. (O-Level) If the pressure gage has fallen below 3000 psi, the HABD shall be forwarded to Intermediate Level maintenance for more extensive leak testing (paragraph 16-52).

NOTE

Leaks detected during the Place-In-Service Static Leak Test shall be reported in accordance with OPNAVINST 4790 Series.

5. (I-Level) If the pressure gage has fallen below 3000 psi, perform a more extensive leak test. Refer to paragraph 16-52.

16-51. ON/OFF Valve Leak Test (O-Level Maintenance Only). To perform the ON/OFF Valve Leak Test, proceed as follows:

1. Turn HABD to the ON position. Ensure that the pressure gage indicates a full charge (3000 psi).

2. Depress and release the second-stage purge button. An audible hiss should be heard which should stop

immediately once the button is released. If the vented air does not stop immediately, depress the purge 2 or 3 more times. If the vented air stops, proceed with the test. If it does not stop, or if no audible hiss is heard when the purge button is depressed, forward the unit to the Intermediate Level maintenance for repair.

3. Turn HABD to the OFF position. Depress the purge button until all air flow stops and no audible hiss is heard.

4. Allow the HABD to sit for 15 minutes then depress the purge button. Any air escaping (an audible hiss is heard) indicates a leaking ON/OFF valve. Forward the unit to Intermediate Level maintenance for further testing and repair. If the HABD passes both the Static and the ON/OFF Valve Leak Tests, top-off the unit in accordance with paragraph 6-41.

16-52. HABD IMMERSION LEAK TEST. The Immersion Leak Test shall be performed on the HABD only if the source of the leak could not be found during the static or ON/OFF leak tests. The water immersion test shall only be performed at Intermediate Level maintenance.



Do not submerge unit without pressure on the entire system. Moisture may enter the valves and the cylinder, which will require the system to be disassembled and purged.

1. Turn the HABD ON/OFF valve to the ON position. After ensuring that the HABD is pressurized and the unit's pressure gage is in the green zone (2700 to 3000 psi), listen for any obvious signs of leakage from the system.

2. If leakage cannot be heard, or if the source of leakage detected is not obvious, immerse the entire system in fresh water. Examine closely to check for any signs of leakage from the second-stage regulator, hose, pressure gage, safety disc, first-stage regulator, or cylinder neck.

3. Note the source of any leakage found and refer to table 6-4 and 6-5 to determine the possible cause.

Table 16-4. Troubleshooting Guide, First-Stage Regulator (Figure 16-7)

Trouble	Possible Cause	Remedy
System will not remain depressurized after valve is shut and second-stage is purged.	<ol style="list-style-type: none"> Indicator ring (12) set incorrectly. Valve body (22) is damaged or worn. Crown sealing surface of cylinder adapter (26) orifice is damaged. 	<ol style="list-style-type: none"> Loosen set screw (11) and reset indicator ring. Replace First-Stage Regulator Subassembly. Replace First-Stage Regulator Subassembly.
High or unstable intermediate pressure.	<ol style="list-style-type: none"> First-stage improperly adjusted. HP seat (15) damaged or worn. Spring block O-ring (17) damaged or worn. Spring block (19) damaged. Crown sealing surface of first-stage body (10) damaged. Spring block springs (16 and 20) weakened or damaged. 	<ol style="list-style-type: none"> Readjust adjustment screw (1). Install service kit 1028-81. Install service kit 1028-81. Replace First-Stage Regulator Subassembly. Replace First-Stage Regulator Subassembly. Replace First-Stage Regulator Subassembly.
Low intermediate pressure.	<ol style="list-style-type: none"> Adjustment screw (1) incorrectly adjusted. Main spring (4) weakened or damaged. Spring retainer (2) loose. 	<ol style="list-style-type: none"> Readjust adjustment screw per final adjustment and testing instructions (paragraph 6-65). Replace First-Stage Regulator Subassembly. <u>Tighten to 25 ± 2 ft-lb.</u>
External air leakage (Immersion Test).	<ol style="list-style-type: none"> Spring retainer (2) loose. Diaphragm (7) worn or damaged. Diaphragm seating surface inside first-stage body (10) damaged. 	<ol style="list-style-type: none"> <u>Tighten to 25 ± 2 ft-lb.</u> Install service kit 1028-81. Replace First-Stage Regulator Subassembly.

Table 16-5. Troubleshooting Guide Second-Stage Regulator (Figure 16-8)

Trouble	Possible Cause	Remedy
Leakage or free flow from second-stage.	<ol style="list-style-type: none"> 1. High first-stage intermediate pressure. (Should be 140 ± 5 psi) 2. LP seat (15) damaged or worn. 3. Adjustment screw (11) incorrectly adjusted. 4. Lever (5) set too high. 5. Lever (5) bent. 6. Crown (25) sealing surface damaged or worn. 7. Poppet (14) damaged or worn. 8. Poppet spring (13) damaged. 	<ol style="list-style-type: none"> 1. Refer to first-stage Troubleshooting Guide (table 16-4). 2. Install service kit 1028-82. 3. Readjust adjustment screw per final adjustment and testing instructions (paragraph 6-65). 4. Readjust crown (25) per final adjustment and testing instructions (paragraph 16-65). 5. Replace Second-Stage Regulator Assembly. 6. Replace Second-Stage Regulator Assembly. 7. Replace Second-Stage Regulator Assembly. 8. Replace Second-Stage Regulator Assembly.
Low Purge or excessive work of breathing (full cylinder).	<ol style="list-style-type: none"> 1. Low intermediate pressure. (Should be 140 ± 5 psi) 2. Poppet spring adjustment screw (11) incorrectly adjusted. 3. Lever (5) set too low. 4. Lever (5) bent. 5. Poppet spring (13) incorrectly installed. 6. Cylinder valve not opening completely. 7. Intermediate pressure hose clogged or obstructed. 	<ol style="list-style-type: none"> 1. Refer to first-stage Troubleshooting Guide (table 16-4). 2. Readjust adjustment screw per final adjustment and testing instructions (paragraph 6-65). 3. Readjust crown (25) per final adjustment and testing instructions (paragraph 16-65). 4. Replace Second-Stage Regulator Assembly. 5. Disassemble second-stage and reinstall poppet spring. 6. Refer to first-stage Troubleshooting Guide (table 16-4). 7. Replace hose assembly.

Table 16-5. Troubleshooting Guide Second-Stage Regulator (Figure 16-8) (Cont)

Trouble	Possible Cause	Remedy
Water entering second stage.	<ol style="list-style-type: none"> 1. Hole in mouthpiece (19). 2. Demand diaphragm (4). 3. Exhaust valve (7) damaged. 4. Exhaust valve improperly seated. 5. Adjustment vane switch O-ring (21) dirty, damaged, or worn. 6. Diaphragm improperly seated between box bottom (22) and purge cover (3). 7. Box bottom (22) damaged. 8. Valve body O-ring (24) damaged. 9. End cap O-ring (10) damaged. 	<ol style="list-style-type: none"> 1. Replace mouthpiece. 2. Replace Second-Stage Regulator Assembly. 3. Install service kit 1028-82. 4. If exhaust valve is found folded or tucked, lift folded or tucked edge of exhaust valve until it is lying flat and covering entire exhaust port. 5. Install service kit 1028-82. 6. Disassemble and properly reassemble (check for distortion). 7. Replace Second-Stage Regulator Assembly. 8. Install service kit 1028-82. 9. Install service kit 1028-82.

16-53. DISASSEMBLY.

16-54. The following disassembly procedures shall be used for the complete disassembly of the HABD as authorized for Intermediate Level maintenance. For replacement of indicator pin only, refer to paragraph 16-57 and figure 6-7.

16-55. FIRST-STAGE REGULATOR DISASSEMBLY. The First-Stage Regulator disassembly procedure includes a complete breakdown of the First-Stage Regulator Assembly. DO NOT attempt to reuse mandatory replacement parts under any circumstances. Refer to figure 6-7 for disassembly and identification of parts.

Support Equipment Required

Quantity	Description	Reference Number
1	Brass O-ring Removal Tool	9440-22 NIIN 01-452-7267
1	Vise Mounting Tool	M1003-95 NIIN 01-452-7246
1	Compressed Air Refill Assembly, CQU-10/U	1586AS401-1
1	Cloth Strap Wrench	NIIN 00-242-3249
1	Magnifying Glass	—
1	Snap Ring Pliers	—

WARNING

Failure to completely empty the HABD of air prior to performing any disassembly may cause the sudden separation of components or ejection of parts, which may result in serious personal injury.

CAUTION

Use care when removing O-rings to prevent damage to the sealing surface. Even a small scratch across an O-ring sealing surface could result in leakage. Once an O-ring sealing surface has been damaged, that portion of the HABD is rendered unserviceable and

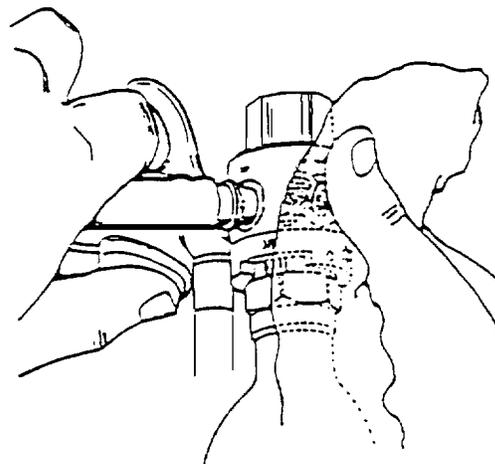
the part, subassembly or assembly must be replaced. Refer to Illustrated Parts Breakdown for requisitioning of parts, subassemblies, and assemblies. DO NOT use a dental pick or any other steel instrument.

NOTE

Use only a common plastic or brass O-ring removal tool when removing O-rings.

For all index numbers listed in the following text, refer to figure 6-7.

1. Turn HABD ON/OFF valve to ON. Depress second-stage regulator purge button until the unit is empty and there is no air flow.
2. Apply 11/16-inch open-end wrench to the dial gage (31). Turn the dial gage counter-clockwise and remove it from the First-Stage Regulator Assembly. Remove and discard the O-ring (32), and set the dial gage (31) aside.
3. Apply a 1/2-inch open-end wrench to the safety plug (30), and turn counter-clockwise two to three 360° turns to loosen but do not remove.
4. Close the HABD ON/OFF valve. Dislodge the burst disc by applying a short burst of air from the CQU-10/U or shop air into the pressure gage port. Remove the safety plug (30) to allow the burst disc (29) and gasket (28) to fall out of the First-Stage Regulator body. Discard these three items and do not reuse.



Step 4 - Para 16-55

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5. Apply external snap ring pliers to the hose snap ring (36) which holds the hose assembly in place. Spread the snap ring and remove from the swivel fitting. Discard the snap ring and do not attempt to reuse.

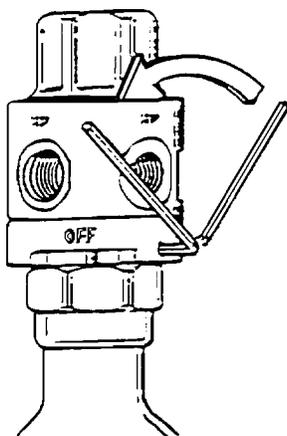
6. Firmly grasp the end of the hose assembly and pull straight off to remove from the swivel fitting (14).

7. Set the hose assembly and Second-Stage Regulator Assembly aside.

8. (SRU-40/P only) Apply a 5/16-inch blade screwdriver to the slot of the swivel fitting (14), and turn counter-clockwise and remove. Remove and discard the O-ring (13) from the threaded stem, and both O-rings (34) from the swivel fitting.

9. (SRU-40A/P and SRU-40B/P only) Apply a 5/16-inch hex key to the hex slot in the swivel fitting (14), and turn counter-clockwise to remove. Remove and discard the O-ring (13) from the threaded stem, and both O-rings (34) from the swivel fitting.

10. Apply a 1/16-inch hex key to the set screw (11) which holds the ON/OFF indicator ring (12) in place. Turn the set screw counter-clockwise and remove.



Step 10 - Para 16-55

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11. While holding the cylinder (33) securely, turn the First-Stage Regulator Assembly counter-clockwise by hand to loosen and remove the regulator from the cylinder adapter (26) and cylinder (33).

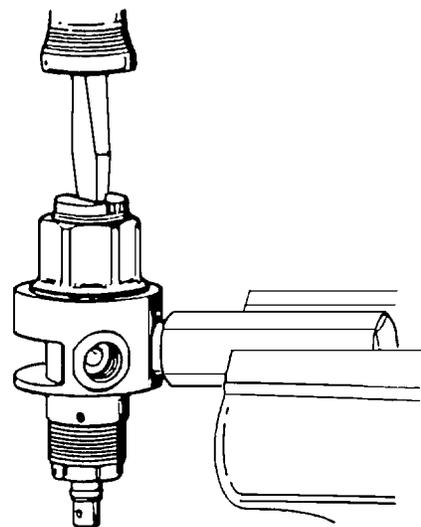
12. While holding cylinder (33) securely with a strap wrench or in a padded vise, apply a 1 1/8-inch open-end wrench to cylinder adapter (26) and turn counter-clockwise and remove cylinder adapter (26) from cylinder (33). Remove and discard the O-ring (27).

13. Gently pull the ON/OFF indicator ring (12) off the threaded stem of the valve assembly and set aside.

14. Install the vise mounting tool, hand tight, into the larger HP port of the first-stage regulator body.

15. Secure the vise mounting tool in a vise so that the low pressure side of the First-Stage Regulator Assembly faces straight up.

16. Apply a 5/16-inch blade screwdriver to the first-stage adjustment screw (1) and turn counterclockwise to remove it from the spring retainer (2) being careful to prevent the sudden ejection of internal parts beneath the adjustment screw. Set the first-stage adjustment screw aside.



Step 15 and 16 - Para 16-55

16055015

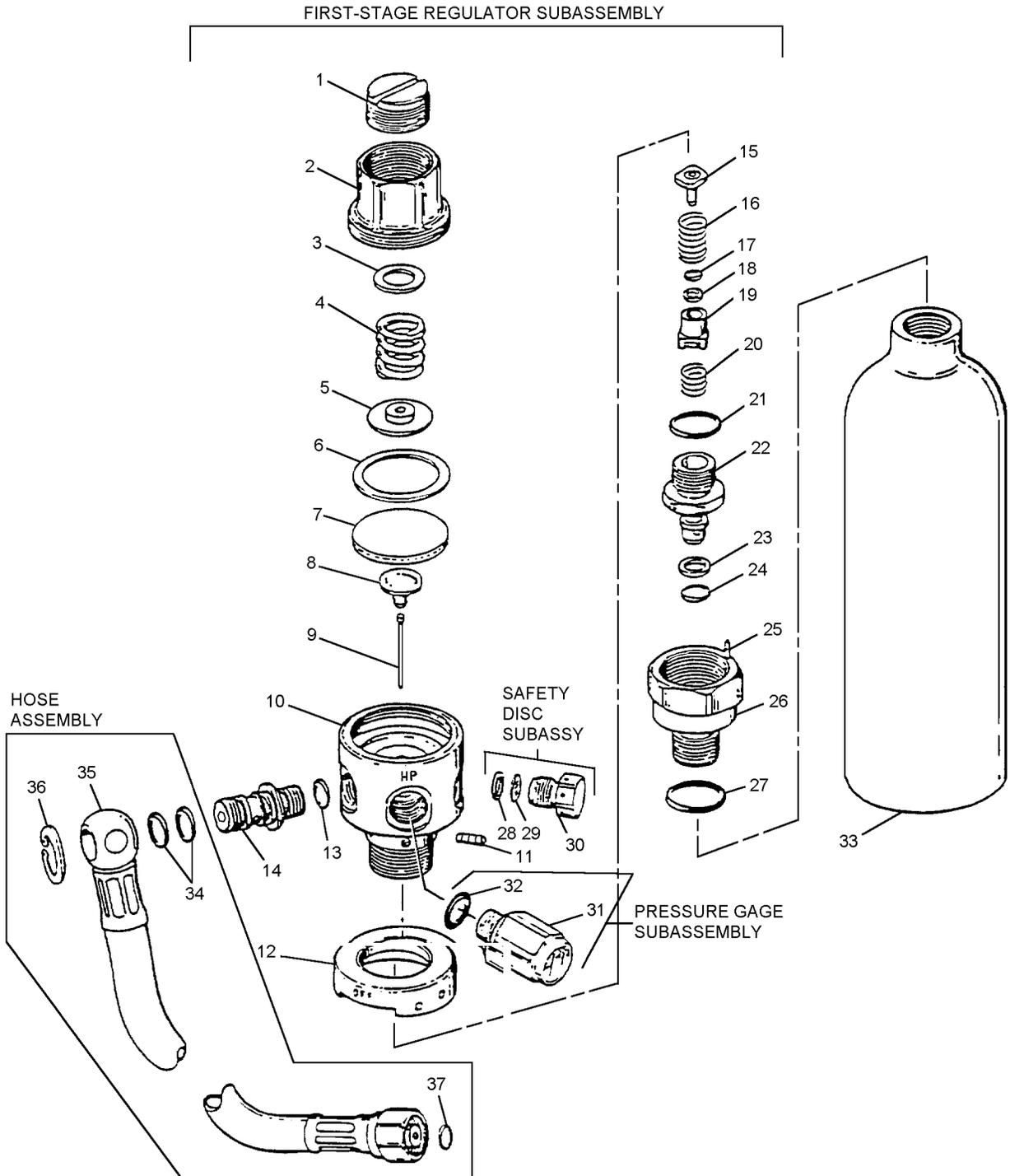


Figure 16-7. First-Stage Regulator Assembly and Hose Assembly (Sheet 1 of 2)

01600701

FIRST-STAGE REGULATOR SUBASSEMBLY

- 1 FIRST-STAGE ADJUSTMENT SCREW
- 2 SPRING RETAINER
- 3 WASHER, MAIN SPRING
- 4 MAIN SPRING
- 5 SPRING PAD
- 6 THRUST WASHER*
- 7 DIAPHRAGM*
- 8 PIN SUPPORT
- 9 PIN
- 10 REGULATOR BODY, FIRST-STAGE
- 11 SET SCREW
- 12 ON/OFF INDICATOR RING
- 13 O-RING*
- 14 SWIVEL FITTING
- 15 HP SEAT*
- 16 SPRING, SEAT
- 17 O-RING*
- 18 BACK-UP RING*
- 19 HP SPRING BLOCK
- 20 SPRING
- 21 O-RING*

- 22 VALVE BODY
- 23 BACK-UP RING*
- 24 O-RING*
- 25 INDICATOR PIN
- 26 CYLINDER ADAPTER
- 27 O-RING*

SAFETY DISC SUBASSEMBLY*

- 28 GASKET
- 29 BURST DISC
- 30 SAFETY PLUG

PRESSURE GAGE SUBASSEMBLY

- 31 DIAL GAGE
- 32 O-RING*

- 33 CYLINDER

HOSE ASSEMBLY

- 34 O-RING*
- 35 HOSE
- 36 HOSE SNAP RING*
- 37 O-RING

*SERVICING REPLACEMENT PARTS (KIT FOR FIRST-STAGE REGULATOR ASSEMBLY, P/N 1028-81)

Figure 16-7. First-Stage Regulator Assembly and Hose Assembly (Sheet 2)

17. Lift out the washer (3) and main spring (4). Examine the main spring with the use of a magnifier, checking closely for any signs of pitting, rusting, or other corrosion which permeates the surface of the metal. If this type of corrosion is found, replace First-Stage Regulator Subassembly.

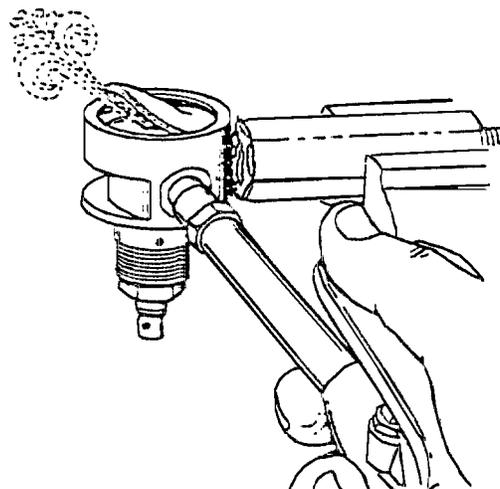
18. Apply a 1-inch open-end wrench to the spring retainer (2) and turn the spring retainer counter-clockwise and remove it from the first-stage body (10). Inspect the spring retainer for any signs of oxidation or corrosion, such as pitting, or other damage to the surface. If found to be in reusable condition, set the spring retainer aside to be cleaned in accordance with paragraph 6-46.

19. Lift the spring pad (5) and thrust washer (6) out of the First-Stage Regulator. Discard the thrust washer and set the spring pad aside.



DO NOT attempt to pry the diaphragm out of the First-Stage Regulator Subassembly with a metal instrument. Doing so will permanently damage the seating shoulder inside the First-Stage Regulator which will require the replacement of the First-Stage Regulator Subassembly.

20. Using the CQU-10/U or shop air, direct a short burst of low pressure air through the open IP port (where hose attaches) to dislodge the diaphragm (7) from the First-Stage Regulator body.



Step 20 - Para 16-55

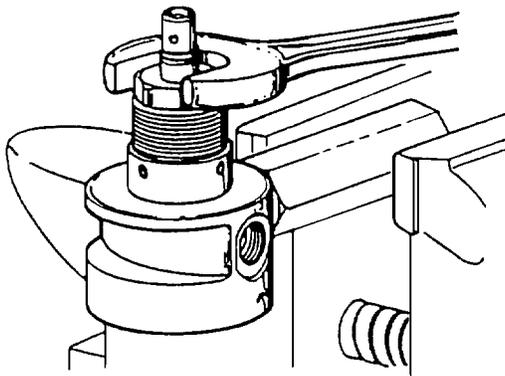
16055020

21. Loosen the vise to remove the vise-mounting tool and First-Stage Regulator Subassembly. Turn the First-Stage Regulator Subassembly over to allow the pin support (8) and pin (9) to drop out onto the bench, and set these items aside.

NAVAIR 13-1-6.5

22. Secure the vise-mounting tool in the vise once again, so that the high pressure valve body (22) faces straight up.

23. Apply a 3/4-inch open-end wrench over the flat hex surface of the valve body (22), just above the threaded portion of the First-Stage Regulator body (10). Slowly turn the wrench counter-clockwise and remove the valve body from the First-Stage Regulator body, being careful to prevent the sudden ejection of internal parts beneath the valve body which are under spring pressure.



Step 22 and 23 - Para 16-55

16055022

24. Using an O-ring tool, remove the O-ring (21) from the male threads, and the O-ring (24) and backup ring (23) from the stem of the valve body. Discard these items.

25. Closely examine the acrylic seat material inside the end of the valve body stem to check for any excessive wear or damage. If the seat material exhibits any signs of excessive wear or damage, or if the valve exhibited leakage during the initial inspection, replace the First-Stage Regulator Subassembly.

26. Loosen the vise to remove the vise-mounting tool and First-Stage Regulator. Turn the First-Stage Regulator Subassembly over to allow the spring (16), spring block (19), seat spring (20), and high pressure seat (15) to drop out. Discard the high pressure seat.

27. Closely examine both springs to check for any signs of corrosion that may have resulted from moisture entering the First-Stage Regulator Subassembly. If corrosion is found, replace the First-Stage Regulator Subassembly.

28. Carefully remove the O-ring (17) and backup ring (18) from inside the balancing chamber of the HP spring block (19), using an O-ring tool to prevent any damage to the internal sealing surface of the spring block.

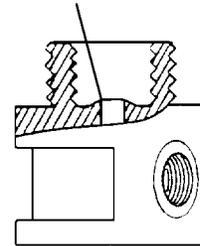


The slightest scratch or scar across the sealing surface inside the spring block will cause leakage, and prevent the regulator from achieving a stable lock-up of intermediate pressure.

29. With the use of a magnifier, closely examine the sealing surface inside the spring block to check for any signs of permanent corrosion, scoring, or other damage. If found, replace the First-Stage Regulator Subassembly.

30. With the use of a magnifier, closely inspect the sealing surface of the orifice crown inside the first-stage regulator body, checking to ensure that it is free of any signs of damage or corrosion. If any damage is found, replace First-Stage Regulator Subassembly.

ORIFICE CROWN
SEATING SURFACE



Step 30 - Para 16-55

16055030

16-56. SECOND-STAGE REGULATOR DISASSEMBLY. The Second-Stage Regulator disassembly procedure includes a complete breakdown of the Second-Stage Regulator Assembly. DO NOT attempt to reuse mandatory replacement parts under any circumstances. Refer to Figure 16-8 for disassembly and identification of parts.

Materials Required

Quantity	Description	Reference Number
1	Brass O-ring	9440-22
	Removal Tool	NIIN 01-452-7267
1	Retaining Ring	M1001-88
	Wrench	NIIN 01-452-7269
1	Magnifying Glass	—
1	Wooden Dowel	NIIN 00-240-0677
1	5/32-inch Hex Key	—
1	Wire Cutter	—

NOTE

Use only a common plastic or brass O-ring removal tool when removing O-rings.

Unless otherwise indicated, for all index numbers listed in the following text, refer to figure 16-8.

1. Using an 11/16-inch and an 13/16-inch open-end wrench, remove hose assembly (35, figure 16-7) from Second-Stage Regulator Assembly. Remove O-ring (37, figure 16-7) and discard. Set hose assembly and First Stage Regulator (if attached) aside.

2. Turn the hard purge cover (1) counter-clockwise by hand and remove it from the Second-Stage Regulator Assembly. Inspect threads for damage. If damaged threads are found, replace Second-Stage Regulator Assembly.

3. Insert both pins of the retaining ring wrench securely into any two opposite slots of the retaining ring (2). Turn the wrench counter-clockwise to remove the retaining ring.

4. Remove the retaining ring (2), purge cover (3) and demand diaphragm (4). Inspect these items closely to ensure that they are free of any tears, corrosion, or other damage. If damage or deterioration is found, replace Second-Stage Regulator Assembly.

5. Apply a 13/16-inch open-end wrench to the hex nut (27) and turn it counter-clockwise to remove.

6. Apply 5/32-inch hex key to the cap plug (9) and turn it counter-clockwise and remove. Remove O-ring (10) and discard.

7. Apply a 1/8-inch blade screwdriver to the slotted head of the plastic adjustment screw (11) and turn it counter-clockwise and remove. Remove the small washer (12) from the stem of the adjustment screw. Inspect these items for any signs of damage. If damage is found, replace Second-Stage Regulator Assembly.

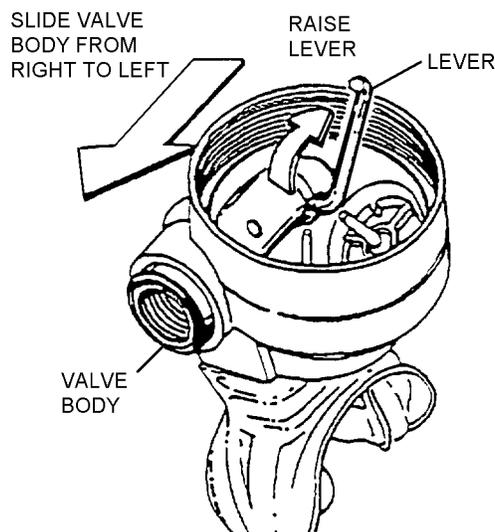
8. Remove the poppet spring (13), and examine it with the use of a magnifier. Check closely for any signs of pitting, rusting, or other corrosion which permeates the surface of the metal. If damage or corrosion is found, replace Second-Stage Regulator Assembly.

9. Before proceeding, stand the lever (5) up and out of the box bottom, and ensure that it is kept standing while performing the following step.



Failure to stand the lever up before attempting to move the valve body may result in permanent damage to the box bottom, the lever, or both.

10. While holding the box bottom secure, push the male threaded inlet side of the valve body (23) into the box bottom until the head of the lever retaining pin (6) is visible. Turn the box bottom over to drop out the pin, and then remove the lever. You may have to move the lever back and forth lightly for the pin to drop out. Inspect the lever to check for any signs of bending, distortion, or excessive wear of the plating. If any of these conditions are found, replace the Second-Stage Regulator Assembly.



Step 9 and 10 - Para 16-56

16056009

11. Press the valve body on the square end until it can be pulled out and removed from the opposite side of the box bottom. Tilt the female threaded end of the valve body down to drop out the poppet (14) that contains the LP seat (15). Remove and discard the valve body O-ring (24), and set the valve body aside.

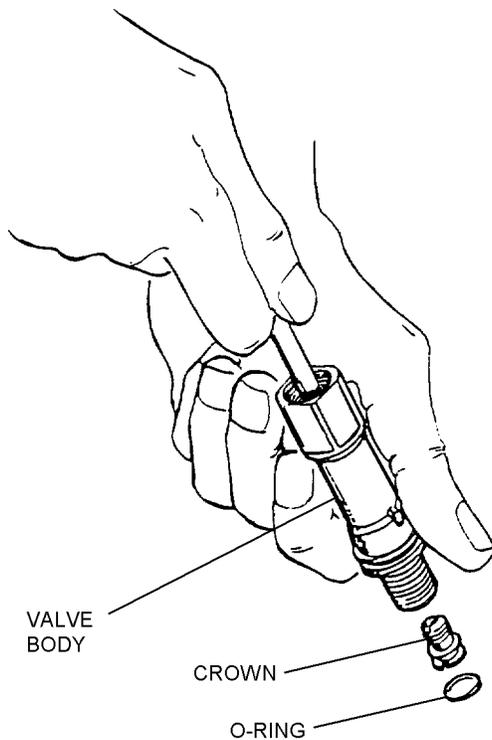
12. Lightly stick the center of the LP seat (15) with a plastic or brass O-ring removal tool and lift the seat out, being very careful to avoid damaging the poppet. Discard the seat, and inspect the poppet for any nicks, scratches, or wear of the lever groove. The hole beneath the LP seat cavity should be clear and free of any obstructions. If the poppet is damaged, replace the Second-Stage Regulator Assembly.

NOTE

Because the crown is O-ring sealed, it will not freely exit the valve body after it has been unscrewed. The following step must be performed correctly in order to remove the crown without damaging its delicate sealing surface.

13. While holding the valve body (23) secure, apply a medium blade screwdriver to the slotted head of the adjustable crown (25), and turn the crown counter-clockwise to unscrew until it stops backing out of the valve body.

14. When the crown has been unscrewed as far as it will go, carefully insert a non-metallic probe (a wooden dowel will suffice) through the opposite end of the valve body and gently press the crown out. Remove and discard the O-ring (26).



Step 14 - Para 16-56

16056014

15. Closely examine the crown with the use of a magnifier, checking for any scoring, nicks or other damage to the sealing surface. If damage is found, replace the Second-Stage Regulator Assembly. If crown is in

reusable condition, set it aside on a soft surface to prevent damage to the sealing surface.

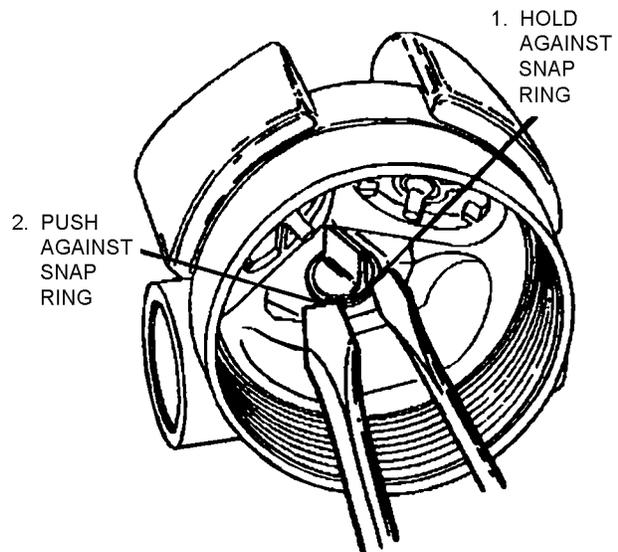
16. Using wire cutters, carefully snip the plastic mouthpiece cable tie (17) and remove the mouthpiece (19) from the box bottom. Inspect the mouthpiece to ensure it is free of any tears or cuts that may cause leakage of water into the second-stage regulator or other discomfort. Discard or set aside to be reused, depending on its condition.

17. Stand the box bottom (22) upside down on a padded surface, so that the vane adjustment switch (20) faces down, and the exhaust side of the box bottom face forward.

NOTE

To prevent the snap ring (16) from becoming lost in the process of removal, place a clean rag over the outlet boss of the box bottom before performing the following step.

18. Check to ensure that the ends of the snap ring (16) are facing straight towards the open side of the box bottom (22). (Rotate the snap ring, if necessary, to achieve this orientation.) While holding a 1/8-inch blade screwdriver stationary against one side to prevent the snap ring from rotating, apply a medium screwdriver against the other side to press the snap ring straight off the stem of the vane adjustment switch. Set snap ring aside.



Step 18 - Para 16-56

16056018

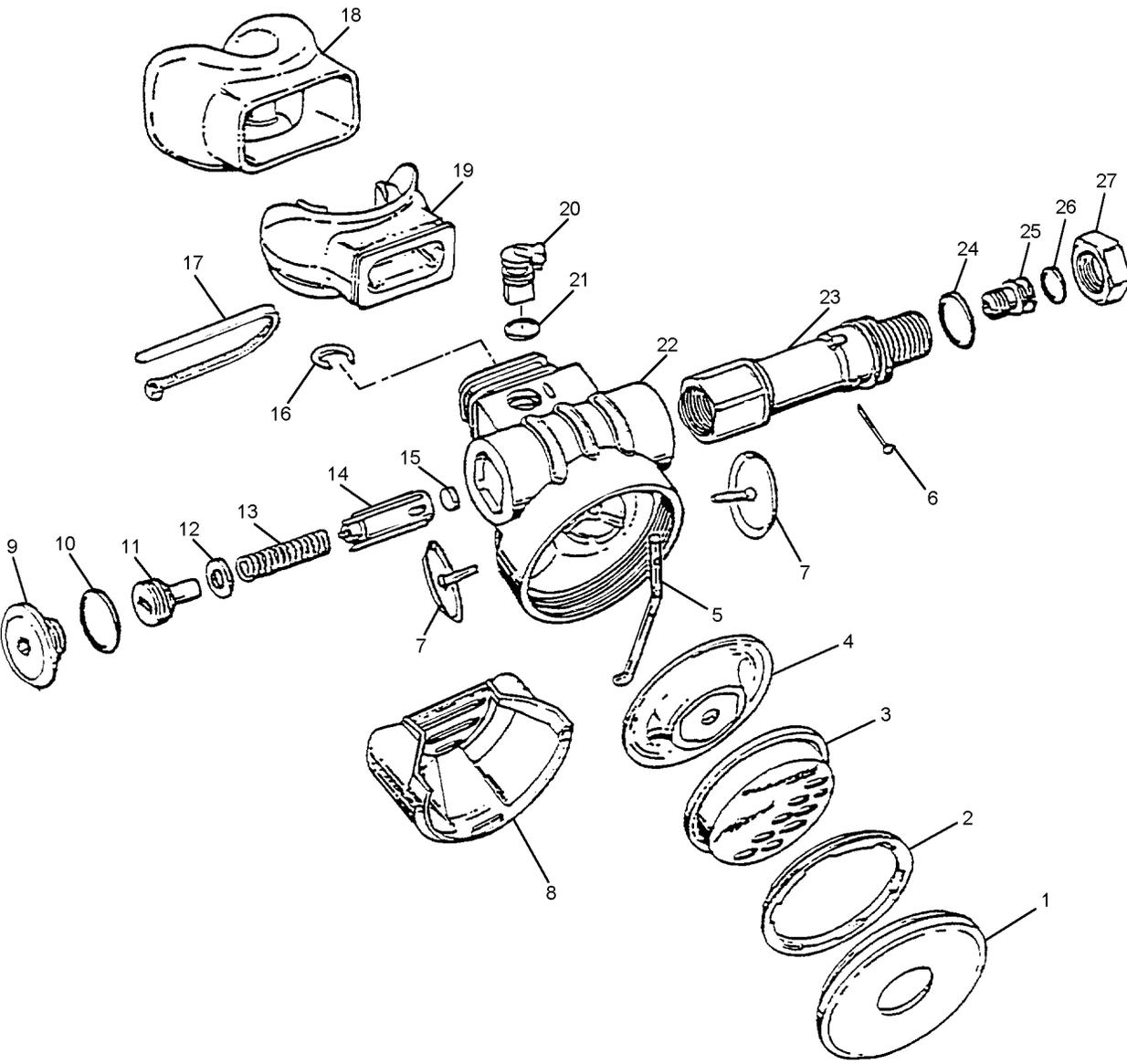


Figure 16-8. Second-Stage Regulator Assembly (Sheet 1 of 2)

01600801

NAVAIR 13-1-6.5

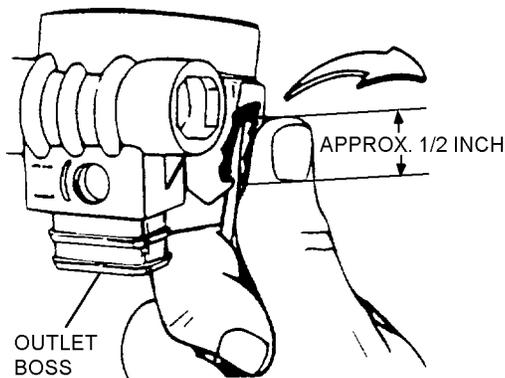
1	HARD PURGE COVER	15	LP SEAT*
2	RETAINING RING	16	SNAP RING
3	PURGE COVER	17	CABLE TIE, BLACK*
4	DEMAND DIAPHRAGM	18	MOUTHPIECE COVER
5	PURGE LEVER	19	MOUTHPIECE
6	LEVER PIN	20	VANE ADJUSTMENT SWITCH
7	EXHAUST VALVE*	21	O-RING*
8	EXHAUST COVER, BLACK	22	BOX BOTTOM
9	CAP PLUG,	23	VALVE BODY
10	O-RING*	24	O-RING*
11	ADJUSTMENT SCREW	25	CROWN
12	WASHER	26	O-RING*
13	SPRING	27	HEX NUT
14	POPPET		

*SERVICING REPLACEMENT PARTS (KIT FOR SECOND-STAGE REGULATOR ASSEMBLY, P/N 1028-82)

Figure 16-8. Second-Stage Regulator Assembly (Sheet 2)

19. Pull the vane adjustment switch straight up and out of the outlet boss of the box bottom. Remove and discard the O-ring (21), and set the vane adjustment switch aside.

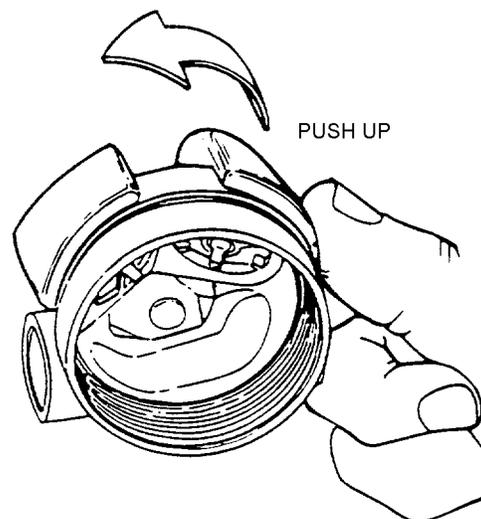
20. Place a medium blade screwdriver approximately 1/2 inch inside the opening of the exhaust cover and press the exhaust cover between thumb and screwdriver. Sharply pull the exhaust cover out and away from the box bottom until that corner of the exhaust cover is disengaged.



Step 20 - Para 16-56

16056020

21. Turn the box bottom and press the disengaged side of the exhaust cover up from below, rotating it over the box bottom until the opposite side disengages.



Step 21 - Para 16-56

16056021

22. Remove and discard the two exhaust valve diaphragms (7).

16-57. REPLACEMENT OF INDICATOR PIN. It is not necessary to completely disassemble the First-Stage Regulator in order to replace the indicator pin in the cylinder adapter.

Materials Required

Quantity	Description	Reference Number
As Required	Christo-Lube (Not E)	MCG-111 (202 Tube)
As Required	Anti-seize Lubricant, One Pound Can	MIL-A-907 NIIN 00-251-3980
As Required	Torque Seal (sealant)	F-900
1	Brass O-ring	9440-22
	Removal Tool	NIIN 01-452-7267
1	Indicator Pin	1006-09

Notes: 1. Christo-Lube may be open purchased from: Lubrication Technology Inc. 310 Morton St. Jackson, OH 45640 Phone - 740-286-2644

Support Equipment Required

Quantity	Description	Reference Number
1	Cloth Strap Wrench	NIIN 00-241-3249
1	1/16-in Hex Key	—
As Required	Cloth, Lint-Free	—
1	Wooden Mallet	—

16-58. Removal.



Failure to completely empty the HABD of air prior to any disassembly may cause the sudden separation of components or ejection of parts which may result in serious personal injury.

NOTE

Use only a common plastic or brass O-ring removal tool when removing O-rings.

Unless otherwise indicated, for all index numbers listed in the following text, refer to figure 6-7.

1. Apply a 1/16-inch hex key to the set screw (11) which holds the ON/OFF indicator ring (12) in place.

Turn the set screw counter-clockwise to loosen until the indicator ring can be turned independently of the First-Stage Regulator Subassembly. Remove set screw (11) and set aside.

2. While holding the cylinder (33) securely, turn the First-Stage Regulator Subassembly counter-clockwise by hand and remove First-Stage Regulator (10) from cylinder adapter (26) and cylinder (33).

3. Carefully remove indicator pin (25) from cylinder adapter (26) with the use of pliers.

16-59. Installation.

1. Install replacement indicator pin (25) into cylinder adapter (26) by inserting it into hole and gently tapping it in with a wooden mallet.

2. Remove old anti-seize lubricant from the male threads of the First-Stage Regulator and from the female threads of the cylinder adapter with a clean lint-free cloth.

3. Re-apply food grade anti-seize lubricant generously to the male threads of the First-Stage Regulator and to the female threads of the cylinder adapter.

4. Place the flat side of the ON/OFF indicator ring (12) over the male threads of First-Stage Regulator (10) so that the flat side of the indicator ring is flush against the First-Stage Regulator body and the OFF aperture is facing down.

5. While holding the First-Stage Regulator and indicator ring together, mate the First-Stage Regulator into the cylinder adapter. While holding the cylinder securely, turn the First-Stage Regulator clockwise by hand, and stop when resistance is felt.

6. Rotate the ON/OFF indicator ring to align the set screw hole with the female threaded hole in the First-Stage Regulator body that is to the immediate right of the indicator pin.



Failure to check security of the ON/OFF indicator ring set screw may cause cylinder and First-Stage Regulator Subassembly to separate resulting in the cylinder becoming a projectile, which could cause serious injury or death.

7. Mate the set screw (11) into the set screw hole of the indicator ring and into the hole of the regulator body using a 1/16-inch hex key. Tighten the set screw clockwise until snug. Indicator ring should not move. Apply torque sealant to set screw.

NAVAIR 13-1-6.5

8. If necessary, complete reassembly of First-Stage Regulator by proceeding to paragraph 6-63.

16-60. ASSEMBLY.

16-61. The HABD First-Stage and Second-Stage Regulator Assemblies are reassembled as described in the following paragraphs.



Discard all replaced parts. Do not reuse.

NOTE

For assembly of the HABD, utilize figures 16-7 and 6-8.

16-62. O-RING LUBRICATION AND DRESSING.

All O-rings shall be lubricated with a visible white coating of Christo-lube.



Do not apply any form of silicone lubricant to silicone rubber parts, as this will cause them to deteriorate prematurely.

16-63. FIRST-STAGE REGULATOR ASSEMBLY.

Before reassembling the HABD, it is important to inspect all parts both old and new, to ensure that every part is clean and free of any dust, corrosion or blemishes. Before dressing O-rings with Christo-lube, check each O-ring to ensure it is clean, supple, and free of any blemish. Lubricate all O-rings in accordance with paragraph 6-62.

Materials Required

Quantity	Description	Reference Number
As Required	Christo-Lube (Not)	MCG-111 (202 Tube)
As Required	Anti-seize Lubricant, One Pound Can	MIL-A-907 NIIN 00-251-3980
1	First-Stage Regulator Service Kit	1028-81

Materials Required (Cont)

Quantity	Description	Reference Number
As Required	Torque Seal (sealant)	F-900

Notes: 1. Christo-Lube may be open purchased from: Lubrication Technology Inc. 310 Morton St. Jackson, OH 45640 Phone - 740-286-2644

Support Equipment Required

Quantity	Description	Reference Number
1	Cloth Strap Wrench	—
1	3/4-in Hex Socket	—
1	1-in Hex Socket	—
1	Torque Wrench (micrometer) 20 - 100 ft-lb	—
1	Torque Wrench (micrometer) 30 - 150 in-lb	—
1	Vise Mounting Tool	M1003-95 NIIN 01-452-7246
1	Snap Ring Pliers	—
1	Wooden Dowel	NIIN 00-240-0677
1	1 1/8-in Hex Socket	—
1	1/2-in Hex Socket	—
1	5/32-in Allen Key Socket	—
1	1/16-in Hex Key	—
1	Inspection Light	—



Do not tighten parts beyond their torque specification when reassembling. Some parts are made of either marine brass or plastic and can be permanently damaged by undue stress.

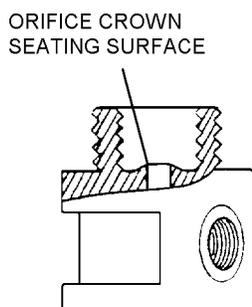
NOTE

Unless otherwise indicated, for all index numbers listed in the following text, refer to figure 6-7.

1. Install lubricated O-ring (32) onto the dial gage (31), at the base of the male threads. Set the pressure gage subassembly aside.

2. Install the backup ring (18), and then lubricated O-ring (17), into the chamber of the spring block (19). Set this assembly aside.

3. Apply a small amount of Christo-lube to the female threads of the high pressure side of the First-Stage Regulator body. While holding the high pressure seat (15) by its stem, gently lower it into the inlet cavity of the First-Stage Regulator body (10) until it rests flat on top of the orifice crown.



Step 3 - Para 16-63

16063003

4. Place the high pressure seat spring (16) directly over the stem of the high pressure seat.

5. Insert the open end of the spring block (19) into the center of the high pressure seat spring, and then place the smaller spring (20) directly over the large end of the spring block.

6. Place valve body (22) onto table with threaded position down. Install lubricated backup ring (23) (concave side facing up to face O-ring), followed by lubricated O-ring (24) onto the stem of the valve body. Install lubricated O-ring (21) onto the opposite side of the valve body, at the base of the male threads.

7. Apply a small amount of Christo-lube to the threads of the valve body. Mate the male threaded end of the valve body into the center of the regulator body (10) and press straight down while turning clockwise to engage the threads. Turn until hand-tight.

8. While holding the first-stage with the low pressure side facing up, carefully insert the small end of the pin (9) into the center hole of the body until only the large end protrudes out.

9. Install the pin support (8) over the large end of the pin. Gently push down to ensure a smooth, spring-loaded movement.

NOTE

Diaphragm (7) and thrust washer (6) are packaged together as a single unit.

It does not matter which direction the diaphragm is placed inside the body.

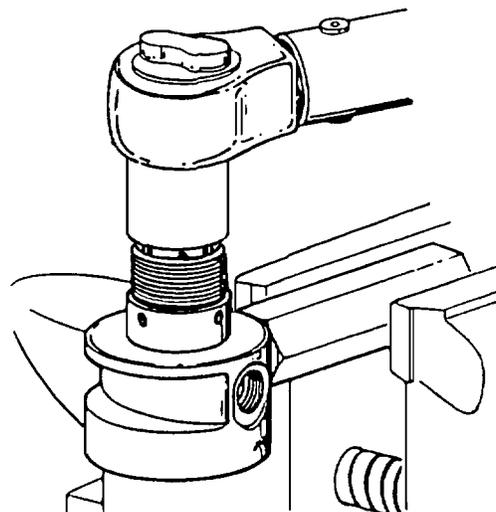
10. Lay the diaphragm (7) inside the body, and using the thumb, gently push and work it down into place until it is evenly seated at the base of the female threads.

11. Lay the thrust washer (6) over the diaphragm, and using the thumb, gently push and work it down into place until it is evenly seated.

12. Apply a small amount of Christo-lube to the threads of the spring retainer (2). Lay the spring pad (5) in the center of the diaphragm with the tab facing up, and thread the spring retainer (2) clockwise into the body until hand tight.

13. Install vise mounting tool into the larger HP port of the First-Stage Regulator body.

14. Secure the vise mounting tool in a vise, with the valve body (22) facing straight up. Apply a torque wrench with a 3/4-inch hex socket and tighten the valve body to a torque measurement of 60 ± 3 in-lb.



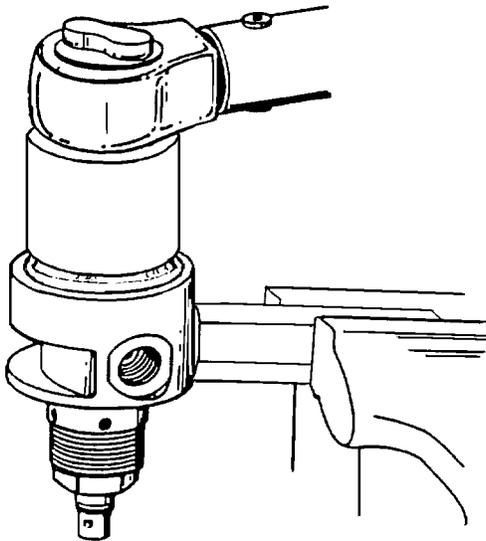
Step 14 - Para 16-63

16063014

NOTE

After completion of steps 5 through 7, the First-Stage Regulator Assembly must rest for a minimum of 8 hours and then be re-torqued. This will ensure proper seating of the burst disc and diaphragm.

15. Loosen the vise and turn the First-Stage Regulator over so that the spring retainer (2) is facing straight up. Refasten the vise. Apply a torque wrench with a 1-inch hex socket and tighten the spring retainer to a torque measurement of 25 ± 2 ft-lb.



Step 15 - Para 16-63

16063015



The hose assembly port is the same size as the safety disc port. The safety disc port has HP engraved above it.

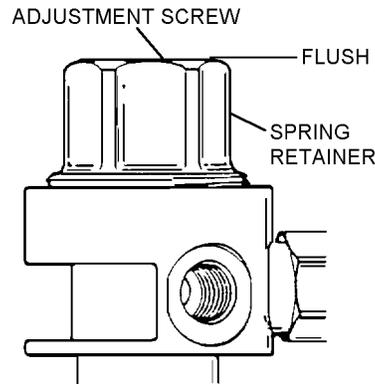
16. Loosen vise and rotate First-Stage Regulator so that the safety disc port is facing up. Retighten vise. Using a new safety disc subassembly, place the gasket (28) inside the smaller high pressure port. Press gasket in with a wooden dowel to ensure it is seated evenly at the base of the female threads. Place the new burst disc (29) inside the same port with red side facing out. Ensure it is seated evenly at the base of the female threads against the new gasket.

17. Mate the new safety plug (30) into the port, and thread clockwise until hand tight. Apply a torque wrench with a 1/2-inch hex socket to the safety plug, and tighten to a torque measurement of 90 ± 5 in-lb.

18. After a minimum of 8 hours, re-torque the spring retainer and the safety plug in accordance with steps 15 and 17.

19. Loosen vise and rotate the first-stage so that the spring retainer is facing up. Check to ensure that the spring pad is positioned in the center of the diaphragm. Install the main spring (4) into the spring retainer (2), ensure spring is centered over the spring pad. Place main spring washer (3) on top of the spring.

20. Mate the first-stage adjustment screw (1) over the spring and washer, and turn it clockwise to engage the threads. Apply a 5/16-inch blade screwdriver to turn it until it is flush with the top of the spring retainer.



Step 20 - Para 16-63

16063020

21. Loosen the vise, remove the First-Stage Regulator, and remove the vise mounting tool from the high pressure port. Set the First-Stage Regulator aside.



Before reassembling the cylinder adapter onto the cylinder, it is necessary to perform a thorough visual inspection of the cylinder with the use of a visual inspection light. If the cylinder is found to be in an unsuitable condition, it must either be cleaned in accordance with paragraph 16-47 or be replaced with a new First-Stage Regulator Assembly.

22. Place lubricated O-ring (27) onto the threaded male stem of the cylinder adapter (26).

23. Apply a small amount of Christo-lube to the male threads of the cylinder adapter (26). Thread the cylinder adapter clockwise into the cylinder (33) until hand-tight.

24. Secure cylinder (33) using a padded vise or a cloth strap wrench. Apply a torque wrench with a 1 1/8-inch hex socket to the cylinder adapter and tighten to a torque measurement of 25 ± 2 ft-lb.

25. Place the flat side of the indicator ring (12) over the male threads of the First-Stage Regulator body (10) so that the flat side of the indicator ring is flush against the regulator body, and the OFF aperture is facing down.

26. Apply food grade anti-seize lubricant generously to the male threads of the First-Stage Regulator and to the female threads of the cylinder adapter.

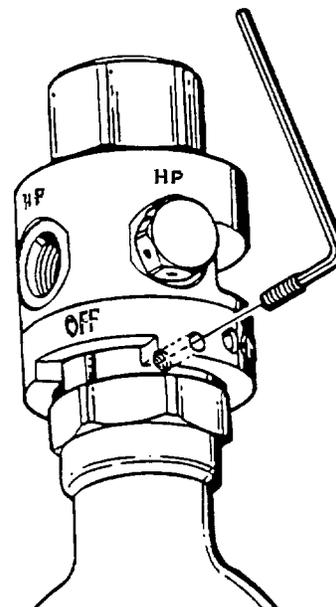
27. While holding the First-Stage Regulator and indicator ring together, mate them to the cylinder adapter (26). Firmly tighten and then loosen the First-Stage Regulator to the cylinder three times to ensure proper rotation and distribution of the anti-seize lubricant to all the threads. Turn the First-Stage Regulator clockwise by hand, and stop when resistance is felt.

28. While holding cylinder upright, rotate indicator ring to align the set screw hole with the threaded hole in the First-Stage Regulator body that is to the immediate right of the indicator pin.

WARNING

Failure to check security of the ON/OFF indicator ring set screw may cause cylinder and First-Stage Regulator Subassembly to separate resulting in the cylinder becoming a projectile, which could cause serious injury or death.

29. Mate the set screw (11) into the set screw hole of the indicator ring and into the hole of the First-Stage Regulator body using a 1/16-inch hex key. Tighten the set screw until snug. Indicator ring should not rotate. Apply torque sealant to set screw.



Step 28 and 29 - Para 16-63

16063028

30. While holding the cylinder securely, turn the First-Stage Regulator further clockwise until snug. The indicator pin should be visible inside the OFF aperture of the indicator ring. Resistance should be felt before the indicator pin reaches the far right side of the OFF aperture.

NOTE

If resistance is not felt before the indicator pin reaches the far right side of the OFF aperture, remove set screw and repeat steps 28 thru 30.

31. Install lubricated O-ring (13) onto the swivel fitting (14) at the base of the male threads. Install two lubricated O-rings (34) into the two grooves on opposite sides of the center orifice on the swivel fitting.

32. Mate the threaded stem of the swivel fitting (14) into the First-Stage Regulator swivel fitting port, and turn clockwise until hand tight. Apply a torque wrench with a 5/32-inch allen key socket to the swivel fitting and tighten it clockwise to a torque measurement of 60 ± 3 in-lb.

33. Place the banjo fitting of the hose assembly directly over the swivel fitting (14) and press straight down until it is seated at the base.

34. Closely examine the replacement hose snap ring (36) to identify that it is flat on one side and slightly rounded on the other. Apply external snap ring pliers to install the snap ring into the groove of the swivel fitting with its flat side facing outward, and ensure that it is securely fastened over the banjo fitting of the hose.

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35. Install lubricated O-ring (37) to the opposite end of the hose. Set First-Stage Regulator and hose assembly aside.

16-64. SECOND-STAGE REGULATOR ASSEMBLY.

Before performing any reassembly, it is important to inspect all parts both old and new to ensure every part is perfectly clean and free of any dust, corrosion or blemishes. Before dressing O-rings with Christo-lube, check each O-ring to ensure it is clean, supple, and free of any blemish. Lubricate all O-rings in accordance with paragraph 6-62.

Materials Required

Quantity	Description	Reference Number
As Required	Christo-Lube (Not E)	MCG-111 (202 Tube)
1	Second-Stage Regulator Service Kit	1028-82

Notes: 1. Christo-Lube may be open purchased from: Lubrication Technology Inc. 310 Morton St. Jackson, OH 45640 Phone - 740-286-2644

Support Equipment Required

Quantity	Description	Reference Number
1	Retaining Ring Wrench	M1001-88 NIIN 01-452-7269
1	13/16-in Hex Socket	—
1	Torque Wrench (micrometer) 30 - 150 in-lb	—
1	Wooden Dowel	NIIN 00-240-0677
1	Cable Tie Attachment Tool	—

CAUTION

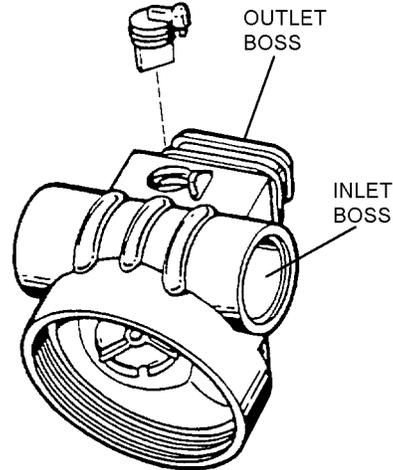
Do not tighten parts beyond their torque specification when reassembling. Some parts are made of either marine brass or plastic, and can be permanently damaged by undue stress.

NOTE

Unless otherwise indicated, for all index numbers listed in the following text, refer to figure 6-8.

1. Install lubricated O-ring (21) onto the vane switch (20).

2. Mate the vane switch into its respective hole in the box bottom (22) and press it down into place so that it is properly sealed inside the box bottom.

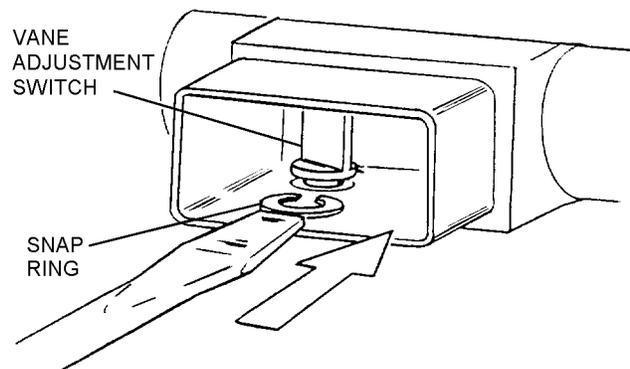


Step 2 - Para 16-64

16064002

3. While holding the switch in place, stand the box bottom on the flat surface of the outlet boss, with the open side of the box bottom facing forward. Lay the snap ring (16) inside the air outlet boss of the box bottom, with the its flat side of the snap ring facing up. Rotate the snap ring as needed to position the open end directly behind the stem of the vane.

4. Place a screwdriver squarely behind the snap ring, and press the snap ring evenly through the groove between the box bottom and the switch until it audibly snaps into place. Examine closely to ensure that the snap ring is seated evenly over the stem of the vane, inside the groove.



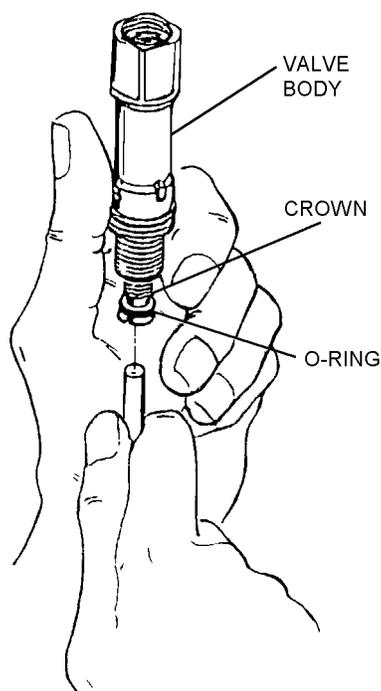
Step 3 and 4 - Para 16-64

16064003

NOTE

Closely examine the crown (25) for nicks, defective threads and plating before installing. If damage is found replace second-stage assembly.

5. Install lubricated O-ring (26) onto the crown (25), and carefully insert the threaded end of the crown into the inlet end (male threaded end) of the valve body (23). Gently press it in further with the end of a wooden dowel until it stops.



Step 5 - Para 16-64

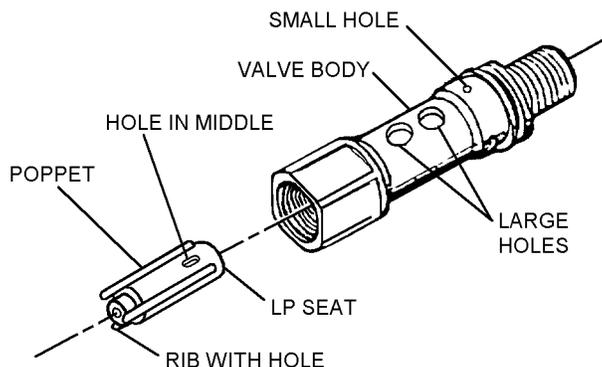
16064005

NOTE

Do not attempt to thread the adjustable crown into the valve body.

6. Firmly press the LP seat (15) into the cavity on the end of the poppet (14), checking first to ensure that the smooth side of the seat is facing out.

7. Hold the valve body positioned so the two large holes in its center are facing up. Examine the poppet (14) to identify the rib that has a hole through it. Place the poppet all the way inside the female open end of the valve body and ensure that the rib which contains the hole is aligned opposite of the large holes.



Step 7 - Para 16-64

16064007

NOTE

The valve body and box bottom are keyed to ensure the correct orientation between the two pieces.

8. Carefully rotate the valve body 180° so that the recessed retaining pin hole for the lever retaining pin is visible and facing straight up. While holding the valve body horizontal, mate the square end of the valve body through the round opening of the box bottom. Pass the valve body through until about 1/2 inch of the square end protrudes out from the side of the box bottom. Ensure that the retaining pin hole in valve body is visible from the top opening of the box bottom and the large holes in the middle of the valve body face toward the mouthpiece opening.

9. Insert the notched end of the lever (5) into the oval hole of the valve body that is just below the recessed retaining pin hole. Stand the lever up vertically, straight out of the box bottom. Insert the small end of the retaining pin (6) into the hole and through the notched section of the lever. If necessary, gently tug on the lever until the head of the pin is completely recessed into the valve body.

10. Push the square end of the valve body back into the box bottom until it is flush with the side of the box bottom.

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11. Insert the poppet spring (13) into the square end of the valve body, and check to ensure that it seats evenly over the end of the poppet.

12. Install the washer (12) onto the stem of the adjustment screw (11). Mate the adjustment screw through the square end of the valve body ensuring the stem is positioned into the center of the spring. Turn adjustment screw clockwise by hand to engage the threads.



Failure to stand the lever up before attempting to move the valve body may result in permanent damage to the box bottom, lever or both.

13. Push square end of valve body inward to reveal O-ring groove on male threaded end of valve body. Install lubricated O-ring (24) into the groove on the male threaded end. Carefully push the valve body back into the box bottom until the square end is flush with the box bottom.

NOTE

Putting O-ring on earlier may cut O-ring during assembly process and cause malfunction of the HABD.

14. Thread the hex nut (27) by hand onto the inlet of the valve body while holding the box bottom securely. Apply a torque wrench with a 13/16-inch hex socket and tighten the hex nut to a torque measurement of 45 ± 5 in-lb.

NOTE

If lever has been properly installed, it will rise slightly as the adjustment screw is turned into the valve body.

15. Using a 1/8-inch blade screwdriver, turn the adjustment screw (11) clockwise until approximately 10 - 12 threads are visible. Check that the lever springs up when pressed down.



Always depress the purge lever while adjusting the orifice. Failure to depress the purge lever while turning the orifice will cause damage to the low pressure seat, and possibly to the orifice crown, requiring replacement of the Second-Stage Regulator.

16. While pressing the purge lever down toward the exhaust valves, apply a medium blade screwdriver to turn the crown (25) clockwise six (6) 360° turns.

17. Install each exhaust valve diaphragm (7) into the box bottom by gently pulling the stem through the hole in the center of the support spokes until the barb has passed through and is securely seated. Carefully snip off the excess material of each stem with a small pair of scissors leaving approximately 1/4 inch of stem.

18. Examine the exhaust cover (8) and the box bottom to identify the locking tabs and grooves of each respective part. Press one corner of the exhaust cover onto the box bottom until the mating tab snaps into place. Press the center tab next, followed by the tab of the opposite corner, and check to ensure that all three tabs are securely locked into their respective grooves.

19. Install the mouthpiece (19) onto the Second-Stage Regulator, and lightly fasten the mouthpiece cable tie (17) onto the groove of the mouthpiece. Turn the cable tie so that the locking tab is aligned with either short side of the mouthpiece. Using a cable tie attachment tool at setting number 3, tighten cable tie around mouthpiece. Set Second-Stage Regulator aside.

16-65. FINAL ADJUSTMENT AND TESTING PROCEDURES. The HABD requires 3000 psi to perform the adjustment procedures.

16-66. First-Stage Regulator Adjustment.

Support Equipment Required

Quantity	Description	Reference Number
1	Intermediate Pressure Test Gage	M1116-10
1	Compressed Air Refill Assembly, CQU-10/U	1586AS401-1

NOTE

CQU-10/U must have a minimum of 3000 psi of supply pressure to perform the adjustment and testing procedures. (A maximum of 3500 psi is optimal)

1. Open supply valve to the CQU-10/U. Verify the supply gage reads between 3000 and 3500 psi.

NOTE

Intermediate test pressure gage (IP gage) requires yearly calibration.

2. Ensure HABD is empty and in the ON position. Connect the intermediate pressure (IP) test gage (P/N M1116-10) to the hose assembly of the HABD and hand tighten. Ensure bleeder valve on the IP test gage is closed.



Do not apply a wrench or otherwise overtighten the refill adapter of the CQU-10/U into the First-Stage Regulator Assembly.

3. Inspect the fill nozzle of the CQU-10/U refill adapter to ensure the O-ring is present and seated evenly at the base of the threads. Apply a light coating of Chris-to-lube to the O-ring. Thread the fill nozzle of the refill adapter into the pressure gage subassembly port of the HABD. Turn clockwise until hand tight.

4. Check to ensure that the first-stage adjustment screw is flush with the top of the spring retainer. If not, adjust with a 5/16-inch screwdriver.



After tilting the toggle valve of the CQU-10/U to apply pressure to the HABD, observe the intermediate pressure on the IP test gage. If the pressure reaches or exceeds 220 psi, let go of the toggle valve and immediately open the IP test gage bleed valve to release pressure from HABD. Failure to let

go of the CQU-10/U toggle valve before the intermediate pressure exceeds 220 psi will result in damage to the IP test gage or hose and may cause serious personal injury.



Always fill the HABD slowly by tilting the fill valve (toggle valve) of the CQU-10/U to control the rate of fill. Fill at a rate of 500 psi per minute with two minute intervals of cool down period. If the cylinder becomes warm to the touch during or after filling, the fill rate was too rapid.

Failure to cycle the IP test gage bleed valve, open and shut, during filling and adjustment, may cause a false reading of the intermediate pressure.

5. Place HABD in CQU-10/U blast tube. While holding the IP test gage, fill the HABD to 3000 psi by slowly tilting the toggle valve on the CQU-10/U. Continue to fill the HABD until the fill pressure gage on the CQU-10/U reads 3000 psi. Cycle the IP test gage bleed valve open and shut two to three times during filling. IP pressure gage should stabilize below 180 psi. Continue to closely monitor the IP test pressure gage to ensure the intermediate pressure does not rise above 220 psi while filling.

NOTE

Maintain 3000 psi of pressure on the HABD during adjustments.

6. When the intermediate pressure has stabilized, apply a 5/16-inch blade screwdriver to the First-Stage Regulator Adjustment Screw (1, figure 16-7) and turn either clockwise or counter-clockwise to adjust the IP pressure to read 140 ± 5 psi. While adjusting the IP pressure be sure to cycle the bleed valve, open and shut, to get an accurate reading.

7. Turn the HABD to the OFF position. Open the bleed valve of the IP test gage to depressurize the First-Stage Regulator and hose assembly. Check fill pressure on CQU-10/U to ensure that it is depressurized. Remove the IP test gage from the hose assembly.

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16-67. Second-Stage Regulator Adjustment.

Materials Required

Quantity	Description	Reference Number
As Required	Christo-Lube (Not EIT)	MCG-111 (202 Tube)
As Required	Torque Seal (Sealant)	F-900

Notes: 1. Christo-Lube may be open purchased from:
Lubrication Technology Inc.
310 Morton St.
Jackson, OH 45640
Phone - 740-286-2644

Support Equipment Required

Quantity	Description	Reference Number
1	In-line Adjustment Tool (Not EIT)	M1001-95
1	Compressed Air Refill Assembly CQU-10/U	1586AS401-1
1	Second-Stage Lever Gauge (Not EIT)	1028-68
1	Intermediate Pressure Test Gauge (Not EIT)	M1116-10
1	11/16-inch Crow's Foot Socket	—
1	Retaining Ring Wrench (Note EIT)	M1001-88
1	5/32-inch Allen Key Socket	—
1	11/16-inch Hex Socket	—

Notes: 1. Tools may be ordered open purchase from the following source:
U. S. Divers, Inc.
2340 Cousteau Court
Vista, CA 92083
760-597-5000 Ext. 5081, Military Sales

NOTE

Maintain 3000 psi of pressure to the HABD during adjustments.

Unless otherwise indicated, for all index numbers listed in the following text, refer to figure 16-8.

1. Attach the female fitting of the hose assembly to the male threads of the in-line adjustment tool. Pull back the knob of the in-line adjustment tool to retract the adjusting stem and mate the female threaded end of the tool to the male threads of the Second-Stage Regulator.

NOTE

If air flow can be heard from the Second-Stage Regulator after turning HABD on, turn HABD off and refer to figure 16-5, Troubleshooting Guide.

2. Slowly turn the HABD on, place in blast tube and top-off to 3000 psi if necessary.

WARNING

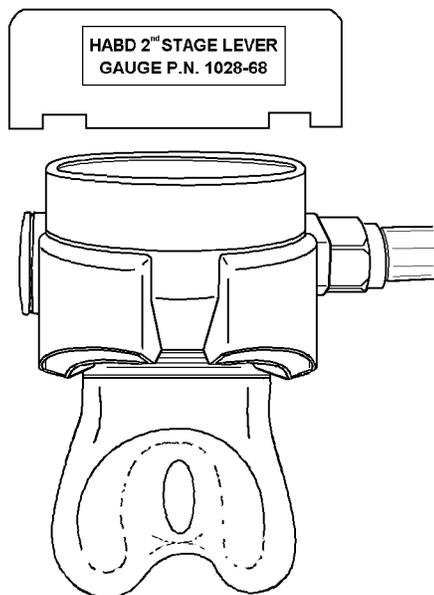
Over-adjustment of either the orifice (25) or the adjustment screw (11) will cause excessive spring load in the second-stage valve and will severely degrade the performance of the regulator.

3. Press the knob of the in-line adjustment tool inward, and gently turn the knob until it can be felt that the adjustment stem has mated into the slotted head of the orifice (25).

NOTE

While adjusting the orifice, periodically place the second-stage lever gauge on top of the box bottom and over the purge lever with the notched side facing the lever to inspect proper height of the lever.

4. While pressing inward on the knob of the in-line adjustment tool, turn the orifice (25) either clockwise or counter-clockwise a 1/4 turn at a time until the purge lever just makes contact with the bottom of the notched area of the second-stage lever gauge. Purge regulator a few times during adjustment by pressing on the purge lever (5). If properly adjusted, the lever will have slight free-play when gently pushing down or pulling up on the lever. After adjustment, release knob of the in-line adjustment tool.



Step 4 - Para 16-67

16067004

NOTE

While turning the adjustment screw (11) clockwise, it is required to turn the adjustment screw back counter-clockwise periodically to relieve tension on the spring.

5. Apply a 1/8-inch blade screwdriver to the adjustment screw (11). Turn the adjustment screw counter-clockwise to initiate a very slight leak. When leak is detected, turn the adjustment screw clockwise in very small increments just until the leak stops. When leak has stopped, turn the adjustment screw clockwise three complete 360-degree turns.

6. Re-verify that the purge lever is still correctly adjusted utilizing the second-stage lever gauge. If not, repeat steps 3 and 4.

7. Turn off the HABD and purge the Second-Stage Regulator and hose assembly. Check fill pressure gage on CQU-10/U to ensure that it is depressurized.

8. Remove in-line adjustment tool from hose and Second-Stage Regulator.

9. Connect the IP test gage to the hose assembly of the HABD and hand tighten. Ensure bleeder valve on the IP test gage is closed.

10. Slowly turn the HABD on and ensure CQU-10/U fill pressure gage reads 3000 psi, top-off if necessary. Ensure the IP pressure on IP test gage still reads 140 ± 5 psi. If not, re-adjust in accordance with paragraph 16-66.

WARNING

Movement of purge cover may cause diaphragm to unseat and become damaged causing a malfunction of the second stage regulator. Ensure purge cover does not move during the installation of the retaining ring.

11. Close HABD and open bleed valve of IP test gage to bleed pressure from hose and Second-Stage Regulator. Check fill pressure gage on CQU-10/U to ensure that it is depressurized. Remove the IP test gage from the hose assembly and disconnect the fill adapter from the pressure gage subassembly port of the HABD.

12. Install lubricated O-ring (10) onto cap plug (9) and install cap plug into end of valve body on the Second-Stage Regulator. Apply a torque wrench with a 5/32-inch allen key socket to the cap plug and tighten to a torque measurement of 30 ± 2 in-lb.

CAUTION

Place the 11/16-inch crow's foot socket on the torque wrench at a 90 degree angle to the handle. This will ensure a correct torque measurement.

13. Connect the female fitting of the hose assembly to the Second-Stage Regulator inlet. Hold the hex nut on the Second-Stage Regulator secure with a 13/16-inch open end wrench. Apply a torque wrench with a 11/16-inch crow's foot socket and tighten the hose assembly fitting to a torque measurement of 40 ± 3 in-lb.

14. Install diaphragm into the box bottom (22) with its raised center facing up, and check to ensure it is evenly seated onto the shoulder at the base of the threads.

15. Using a cotton swab, lubricate the entire side and lip of the purge cover (3) with soapy water solution (4 parts water to 1 part soap). Place the purge cover directly over the diaphragm so the U.S. Divers logo is parallel to the valve body.

WARNING

Movement of purge cover may cause diaphragm to unseat and become damaged causing a malfunction of the second stage regulator. Ensure purge cover does not move during the installation of the retaining ring.

16. Fit the retaining ring (2) down over the purge cover, slotted side facing up. While pressing down on purge cover with thumb to hold it in place, apply one pin of the retaining ring wrench to a slot in the retaining ring. Turn the retaining ring clockwise until it is snug. Apply both pins of the wrench to the retaining ring and tighten the retaining ring snug while continuing to press down on purge cover. Check to ensure that the purge cover has not rotated. Correct if necessary.

NOTE

Torque sealant used on purge cover must be visible. Do not use black.

17. Thread the hard purge cover (1) onto the box bottom and turn until hand tight. Apply torque sealant to the purge cover in two locations opposite of each other.

18. Ensure lubricated O-ring (32, Figure 6-7) is on the dial gage (31, Figure 6-7). Turn the dial gage clockwise to install into the First-Stage Regulator body. Apply a torque wrench with a 11/16-inch hex socket to tighten the dial gage to a torque measurement of 40 ± 3 in-lb.

19. Turn HABD on and check dial gage to ensure that the pressure reads in the green area of the gage. If not, top-off HABD in accordance with paragraph 6-41.

20. Close HABD and depressurize Second-Stage Regulator and hose assembly by pressing on the purge button of the Second-Stage Regulator.

21. Perform Leak Test in accordance with paragraph 16-48.

22. If no other bottles are to be tested secure CQU-10/U. Turn the supply cylinder valve clockwise to close. Relieve pressure from the pressure regulator by holding the top-off adapter and tilting the toggle lever until the pressure regulator gage reads zero and no airflow can be heard.

23. Place protective cap over refill nozzle of the top-off adapter.

16-68. MARKING INSTRUCTIONS FOR THE SRU-40A/P RETROFIT ONLY.

NOTE

If existing label show signs of wear, etch the serial number and new configuration of bottle (i.e. SRU-40A/P) on the flat area of the cylinder bottom using an electric engraving tool.

1. Clean the area directly below the existing label with isopropyl alcohol. Remove backing from new label and place directly below the existing label.

2. On the existing label, use a pen or etching tool and cross out the "/P" on the SRU-40/P and etch "A/P". On the part number, 1586AS301-1, cross out the "-1" and etch "-2".

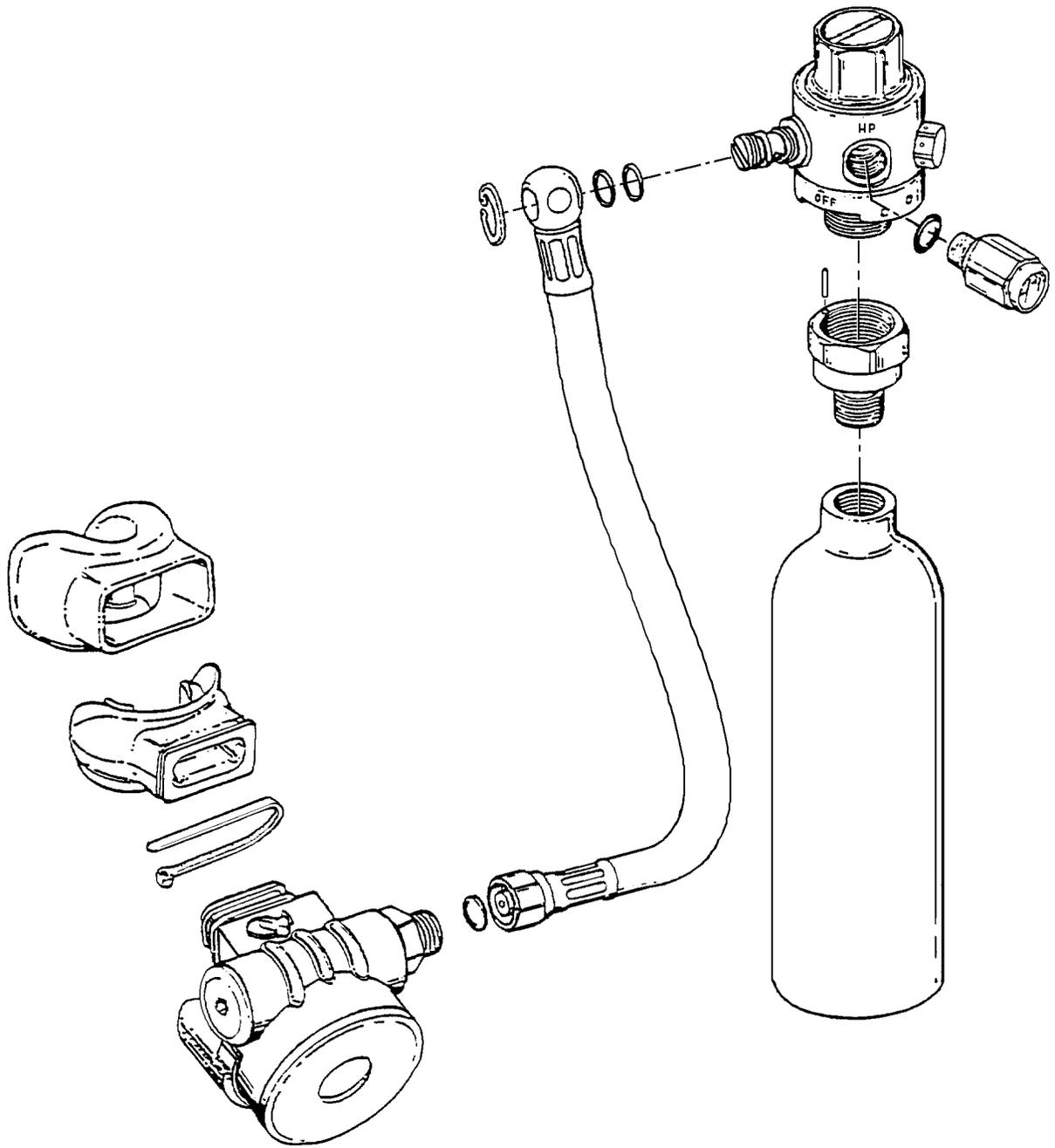
Section 16-3. Illustrated Parts Breakdown

16-69. GENERAL.

16-70. This section lists and illustrates the assemblies and subassemblies of the Helicopter Aircrew Breathing Device (HABD), Part Numbers 1586AS301-1,

1586AS301-2, and 1586AS301-3. The HABD is manufactured by U.S. Divers, Inc. (CAGE 94120).

16-71. The Illustrated Parts Breakdown (IPB) should be used when requisitioning parts.



NOTE: SRU-40/P, P/N 1586AS301-1, HAS BEEN SUPERSEDED BY SRU-40A/P AND SRU-40B/P. REFER TO FIGURE 16-10.

Figure 16-9. Helicopter Aircrew Breathing Device, SRU-40/P

016009

Figure and Index Number	Part Number	Description 1 2 3 4 5 6 7	Units Per Assembly	Usable On Code
	1586AS301-3	HELICOPTER AIRCREW BREATHING DEVICE, SRU-40B/P	REF	B
-1	1006-74	. □ First-Stage Regulator ASSEMBLY (Note 1) □	1	A
	1028-74	. □ First-Stage Regulator ASSEMBLY (Note 1) □	1	B
-2	1006-71	. . First-Stage Regulator SUBASSEMBLY (Note 1)	1	A
	1028-71	. . First-Stage Regulator SUBASSEMBLY (Note 1)	1	B
-3	1006-09	. □ . □ INDICATOR PIN (Note 2) □	1	
-4	1028-73	. □ . □ PRESSURE GAGE SUBASSEMBLY (Note 2) □ . □	1	
-5	8203-19	. □ . □ O-RING, Pressure Gage (Note 2)	1	
-6	1028-75	. HOSE ASSEMBLY	1	
-7	1028-72	. Second-Stage Regulator ASSEMBLY	1	
-8	1006-53	. □ . □ MOUTHPIECE COVER (Note 2) □	1	
-9	1058-31	. □ . □ MOUTHPIECE (Note 2) □	1	
-10	1049-13	. □ . □ CABLE TIE, Black (Note 2) □	1	
	1028-81	First-Stage Regulator SERVICE KIT (See Figure 6-11 for kit parts)	REF	
	1028-82	Second-Stage Regulator SERVICE KIT (See Figure 6-12 for kit parts)	REF	
<p>Notes: 1. First-Stage Regulator Assembly, P/N 1028-74, and First-Stage Regulator Subassembly, P/N 1028-71 are SRU-40B/P components and will replace First-Stage Regulator Assembly, P/N 1006-74, and First-Stage Regulator Subassembly, P/N 1006-71, respectively, on the SRU-40A/P by attrition. When replacing the First-Stage Regulator Assembly on the SRU-40A/P with P/N 1028-74, the bottle shall be re-designated as SRU-40B/P.</p> <p>2. Component may be open purchased from: U.S. Divers, Inc. 2340 Cousteau Court Vista, CA 92083 POC: Military Dept Phone: 760-597-5000 Ext. 5081 Toll Free: 877-252-3483 FAX: 760-597-4914</p>				

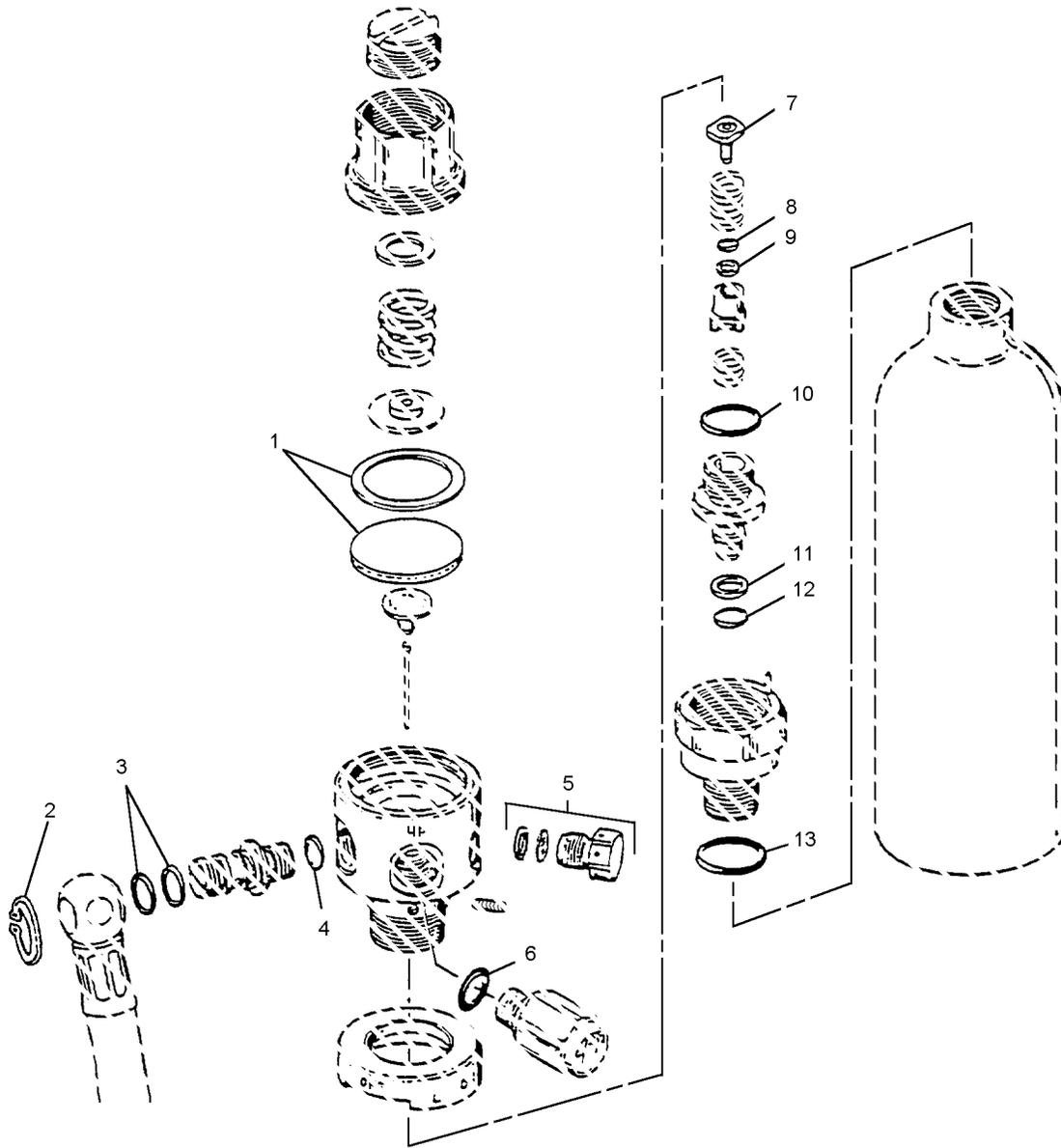
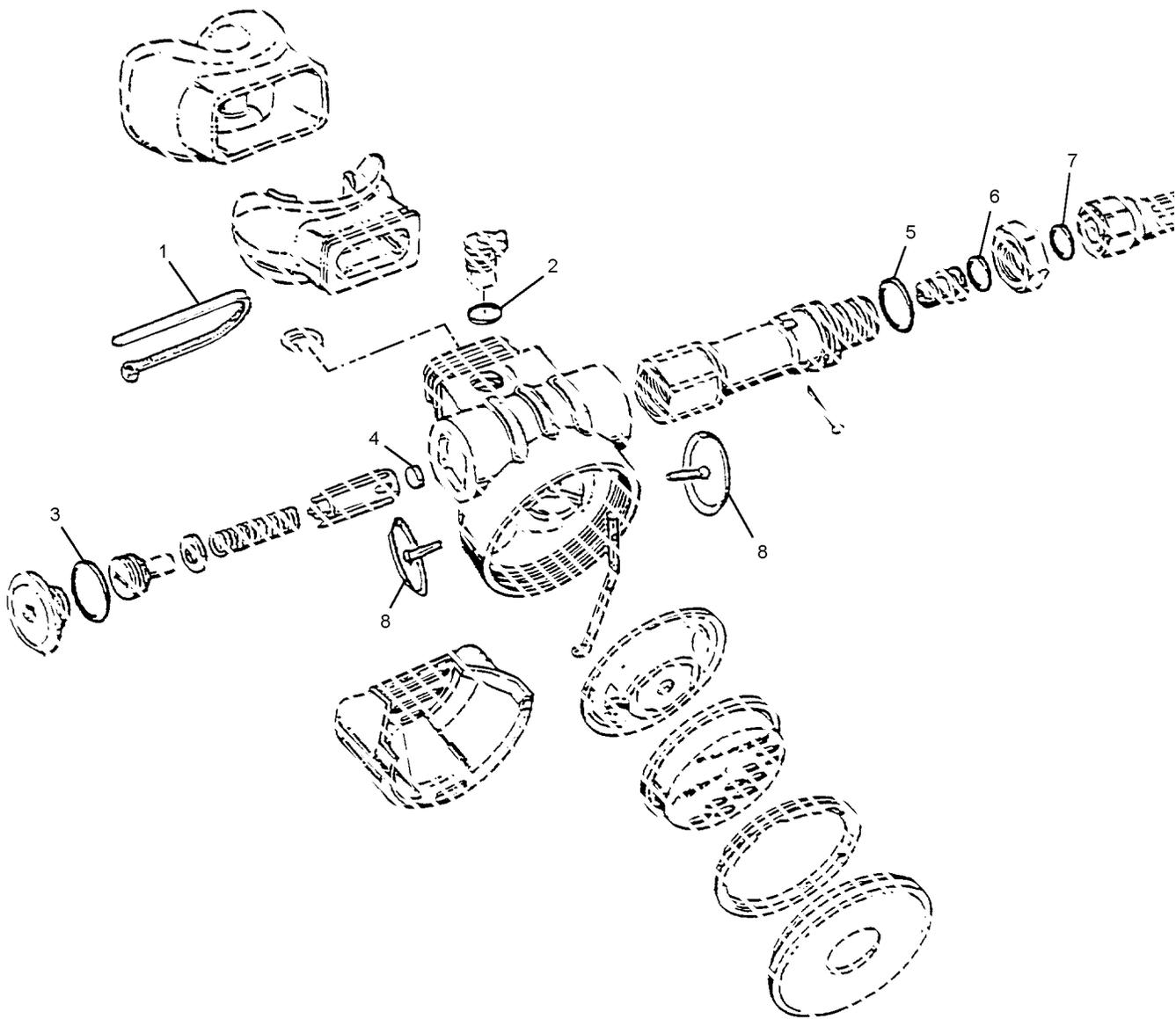


Figure 16-11. First Stage Regulator Service Kit

016011

Figure and Index Number	Part Number	Description 1 2 3 4 5 6 7	Units Per Assembly	Usable On Code
16-11	1028-81	First-Stage Regulator SERVICE KIT	REF	
-1	1034-25	. DIAPHRAGM KIT	1	
-2	8600-65	. HOSE SNAP RING	1	
-3	8203-12	. O-RING	2	
-4	8203-11	. O-RING	1	
-5	0502-41	. SAFETY DISC SUBASSEMBLY	1	
-6	8203-19	. O-RING	1	
-7	1053-21	. HP SEAT	1	
-8	8203-06	. O-RING	1	
-9	8280-05	. BACK-UP RING	1	
-10	8203-14	. O-RING	1	
-11	8285-10	. BACKUP RING	1	
-12	8203-10	. O-RING	1	
-13	8203-16	. O-RING	1	



016012

Figure 16-12. Second-Stage Regulator Service Kit

Figure and Index Number	Part Number	Description	Units Per	Usable
			Assembly	
16-12	1028-82	Second-Stage Regulator SERVICE KIT	REF	
-1	1049-13	. CABLE TIE	1	
-2	8203-10	. O-RING	1	
-3	8200-17	. O-RING	1	
-4	1067-38	. LP SEAT	1	
-5	8200-15	. O-RING	1	
-6	8203-10	. O-RING	1	
-7	8203-10	. O-RING	1	
-8	1001-22	. EXHAUST VALVE	2	

NUMERICAL INDEX

Part Number	Figure and Index Number	SM&R Code	Part Number	Figure and Index Number	SM&R Code
0502-41	16-11-5	KFGZZ	8600-65	16-11-2	KFGZZ
1001-22	16-12-8	KFGZZ	1067-38	16-12-4	KFGZZ
1006-09	16-10-3	PAGZZ	1586AS301-2	16-10	AGOGG
1006-53	16-10-8	PAOZZ	1586AS301-3	16-10	AGOGG
1006-71	16-10-2	PAGGG	8200-15	16-12-5	KFGZZ
1006-74	16-10-1	PAGGG	8200-17	16-12-3	KFGZZ
1028-71	16-10-2	PAGGG	8203-06	16-11-8	KFGZZ
1028-72	16-10-7	PAGGG	8203-10	16-11-12	KFGZZ
1028-73	16-10-4	PAGZZ		16-12-2	KFGZZ
1028-74	16-10-1	PAGGG		16-12-6	KFGZZ
1028-75	16-10-6	PAGGG		16-12-7	KFGZZ
1028-81	16-10-10	PAGZZ	8203-11	16-11-4	KFGZZ
	16-11	PAGZZ	8203-12	16-11-3	KFGZZ
1028-82	16-10-10	PAGZZ	8203-14	16-11-10	KFGZZ
	16-12	PAGZZ	8203-16	16-11-13	KFGZZ
1034-25	16-11-1	KFGZZ	8203-19	16-10-5	PAOZZ
1049-13	16-10-10	PAOZZ		16-11-6	PAOZZ
	16-12-1	KFOZZ	8280-05	16-11-9	KFGZZ
1053-21	16-11-7	KFGZZ	8285-10	16-11-11	KFGZZ
1058-31	16-10-9	PAOZZ			

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