

CHAPTER 12

PORTABLE OXYGEN SYSTEM P/N 6028

Section 12-1. Description

12-1. GENERAL.

12-2. The Portable Oxygen System is manufactured by Fluid Power Inc. (CAGE 99227) (figure 12-1). Table 12-1 contains the leading particulars for the Portable Oxygen System.

12-3. CONFIGURATION.

12-4. The Portable Oxygen System is supplied in one basic configuration that is composed of a 96 cubic inch high pressure oxygen cylinder, oxygen regulator, delivery hose, filler line and one way charging check valve assembly, with supporting unit frame and strap assembly.

12-5. FUNCTION.

12-6. Supply oxygen pressure of 2000 psig is stored in the 96 cubic inch oxygen cylinder. When the oxygen cylinder handwheel valve is turned off, "0" pressure

will be indicated on the oxygen regulator pressure gage. When the oxygen cylinder handwheel valve is turned counterclockwise to the open position, cylinder supply will be indicated on oxygen regulator pressure gage up to 2000 psig. Then the oxygen regulator on/off toggle (green) is turned to the on position, inlet oxygen pressure is reduced down to 32 to 35 psig. With the diluter toggle (white) in the normal position, air/oxygen dilution will occur on demand up to approximately 30,000 feet. With the diluter toggle in the 100% position, 100% oxygen will be supplied upon demand up to approximately 27,000 feet where the automatic positive pressure feature begins to function. The emergency toggle (red) has three positions: neutral, emergency, and test mask. When using the emergency toggle, the diluter toggle should be in the 100% oxygen position. When the emergency toggle is in the position, 2 to 4 inches of water pressure flow will be delivered to the aircrewmember. When moving the emergency toggle to the test mask position (aircrewmember must hold the emergency toggle in this position), 6 to 16 inches of water pressure flow will be delivered to the aircrewmember.

Table 12-1. Leading Particulars

Oxygen Regulator	Automatic Positive Pressure Diluter Demand Type
Operating Pressure	50 to 2000 psig
Operating Altitude	Sea level to 43,000 feet
Air/Oxygen Dilution	Up to approximately 30,000 feet
100 Percent Oxygen	Begins approximately 27,000 feet
Oxygen Cylinder	96 cubic inch, MS26545-A1X, MS26545-A2X
Overall Dimensions:	
Weight (Approximate)	11.3 pounds
Height (Overall)	16 3/4 inches
Width (Overall)	6 5/8 inches

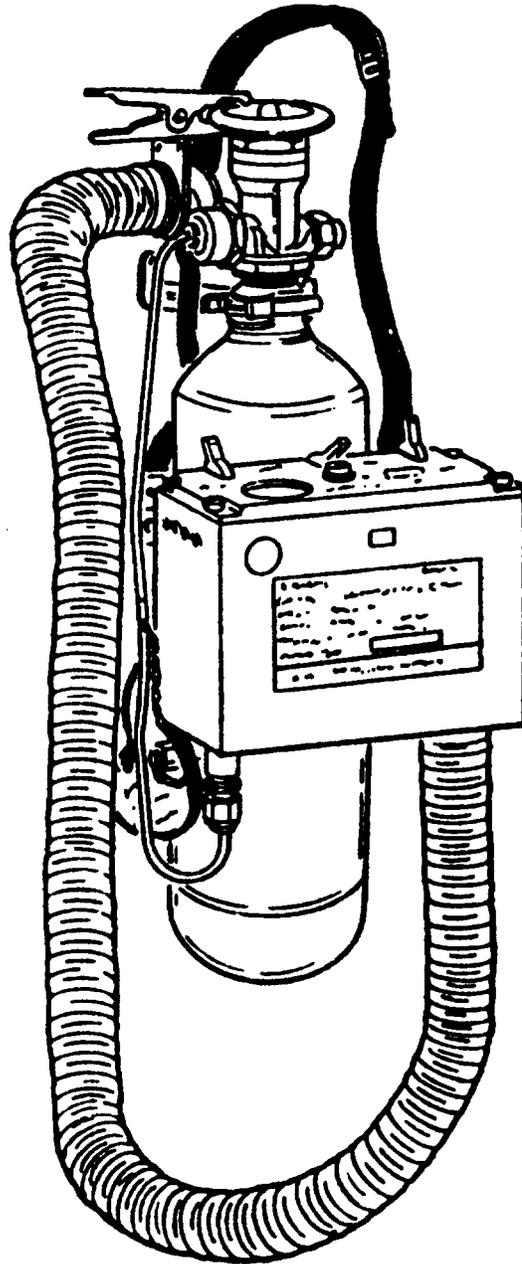


Figure 12-1. Portable Oxygen System

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12-7. SERVICE LIFE.

12-8. The Portable Oxygen System regulator shall remain in service as long as repair cost does not exceed 75% of the cost of the regulator. The 96 cubic inch oxygen cylinder falls under the Department of Transportation (D.O.T.) regulation and must be removed from service every 5 years for hydrostatic testing. The D.O.T. number (example: ICC 3AA) and the latest hydrostatic test date (example: 12/98) will be permanently stamped in the neck of the cylinder.

12-9. REFERENCE NUMBERS, ITEMS, AND SUPPLY DATA.

12-10. [Section 12-4](#), Illustrated Parts Breakdown, contains information on each assembly, subassembly and component part of the Portable Oxygen System. The figure and index number, reference or part number, description and units per assembly are provided with the breakdown.

Section 12-2. Modifications**12-11. GENERAL.**

12-12. No modifications to the Portable Oxygen System are required or authorized at this time.

Section 12-3. Maintenance**12-13. GENERAL.**

12-14. This section contains procedural steps for inspection, testing, disassembly, cleaning, repair and assembly of the Portable Oxygen System.

12-15. Procedural steps outlined in this section are listed as they are required, and in the sequence in which they occur.

NOTE

The Portable Oxygen System shall be considered beyond economical repair when cost of repair parts exceeds 75% of the cost of the Portable Oxygen System.

Upon completion of any maintenance action (e.g. inspection, repair, modification, etc.), be sure to make necessary entries on appropriate forms in accordance with OPNAV-INST 4790.2 Series.

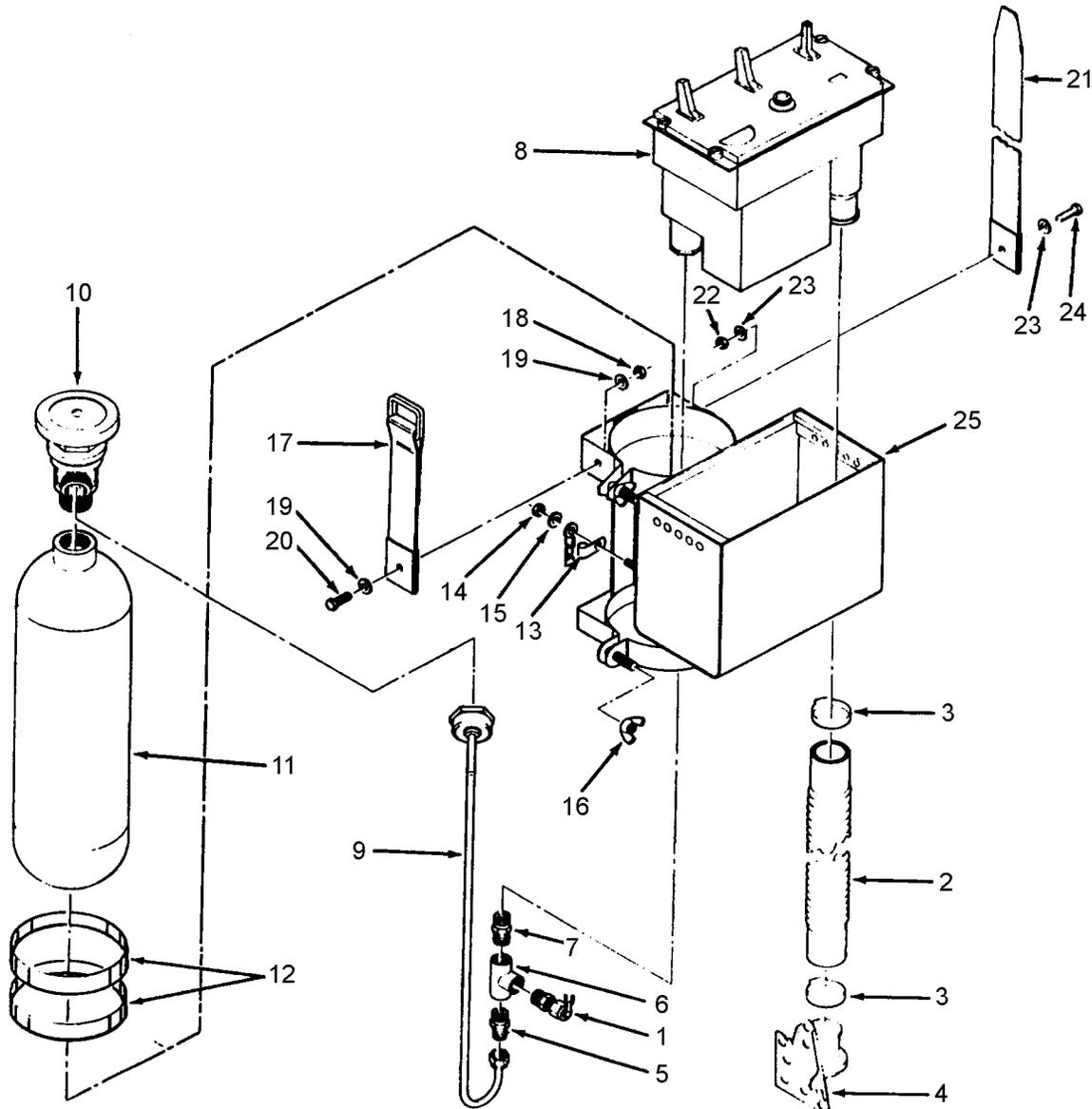
12-16. INSPECTION.

12-17. SPECIAL INSPECTION. The Special Inspection consists of a visual inspection and functional test

of the Portable Oxygen System. The Special Inspection is performed in conjunction with the aircraft inspection requirements for the aircraft in which the Portable Oxygen System is installed.

12-18. CALENDAR INSPECTION. The Calendar Inspection shall be conducted on the Portable Oxygen System every 448 days. The Calendar Inspection consists of the following:

1. Disassembly ([paragraph 12-27](#)).
2. Cleaning ([paragraph 12-29](#)).
3. Repair ([paragraph 12-31](#)).
4. Bench Test of Oxygen Regulator ([paragraph 12-22](#)).
5. Visual Inspection ([paragraph 12-19](#)).
6. Assembly ([paragraph 12-34](#)).
7. Charge of Oxygen Cylinder ([paragraph 12-25](#)).
8. Functional Test ([paragraph 12-21](#)).



- | | |
|----------------------------------|--------------------------|
| 1. CHARGING CHECK VALVE ASSEMBLY | 14. NUT |
| 2. HOSE ASSEMBLY | 15. FLAT WASHER |
| 3. STRAP, ELECTRICAL TIE-DOWN | 16. WING NUT |
| 4. CONNECTOR | 17. SHORT STRAP ASSEMBLY |
| 5. UNION NIPPLE | 18. NUT |
| 6. TEE | 19. FLAT WASHER |
| 7. NIPPLE | 20. MACHINE BOLT |
| 8. OXYGEN CYLINDER | 21. LONG STRAP ASSEMBLY |
| 9. LINE ASSEMBLY | 22. NUT |
| 10. CYLINDER VALVE ASSEMBLY | 23. FLAT WASHER |
| 11. OXYGEN CYLINDER | 24. MACHINE BOLT |
| 12. CYLINDER BAND | 25. SUPPORT WELDMENT |
| 13. LINE CLAMP | |

Figure 12-2. Portable Oxygen System, Exploded View

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12-19. VISUAL INSPECTION. To perform the Visual Inspection, proceed as follows:

NOTE

To assist in keeping track of the 96 cubic inch oxygen cylinders that are coming due for hydrostatic testing, it is highly recommended that local serial numbers be assigned and stenciled on the main body of the cylinder. Keep records of that cylinder using local assigned serial, aircraft BUNO installed on and hydrostatic test date due.

Index numbers refer to [figure 12-2](#) unless otherwise noted.

1. Inspect oxygen regulator (8) legibility of all markings, toggle for good condition and security of attachment.
2. Inspect support weldment (25) for cracks, dents, and security of attachment.
3. Inspect oxygen hose assembly (2) for cut, tears, fraying, dry rot of rubber and security of clamps (3) and oxygen connector (4).
4. Inspect short strap assembly (17) and long strap assembly (21) for cuts, tears, fraying, good condition and security of attachment machine bolts (20 and 24), washers (19 and 23) and nuts (18 and 22).
5. Inspect cylinder valve assembly (10) for good condition.
6. Inspect oxygen cylinder (11) condition and in-service hydrostatic test date stamped in neck of cylinder.
7. Inspect charging check valve assembly (1) for good condition and security of attachment.
8. Inspect tee (6) for cracks and good condition.
9. Inspect union nipple (5), nipple (7), and line (9) for good condition and security of attachment.
10. Replace all defective parts.

12-20. TESTING.

12-21. FUNCTIONAL TEST. To perform the Functional Test on the Portable Oxygen System, proceed as follows:

NOTE

Index numbers refer to [figure 12-2](#) unless otherwise noted.

1. Ensure oxygen regulator (8) supply toggle (green toggle) is in the off position, diluter toggle (white toggle) is in the 100% position, and emergency toggle (red toggle) is in the neutral position.

2. Turn oxygen cylinder valve assembly (10) to the full open position. Oxygen regulator (8) pressure gage should indicate between 1800 to 2000 psig. There should be no flow out of oxygen connector (4).

3. Move oxygen regulator (8) supply toggle (green toggle) to the on position. There should be no flow out of oxygen connector (4).

4. Move oxygen regulator (8) emergency toggle (red toggle) to the emergency position. There should be an audible flow out of oxygen connector (4).

5. Move oxygen regulator (8) emergency toggle (red toggle) to the neutral position. There should be no flow out of oxygen connector (4).

6. Move and hold in position oxygen regulator (8) emergency toggle (red toggle) to test mask position. There should be an audible flow out of oxygen connector (4).

7. Release oxygen regulator (8) emergency toggle (red toggle). It should automatically return to the neutral position and there should be no flow out of oxygen connector (4).

8. Turn oxygen cylinder valve assembly (10) to full off position.

9. Move oxygen regulator (8) emergency toggle (red toggle) to the emergency position to bleed pressure from oxygen regulator (8), then move emergency toggle back to the neutral position.

10. Move oxygen regulator (8) supply toggle (green toggle) to the off position.

11. If portable oxygen system fails functional test, replace with RFI unit.

12. Charge or top off Portable Oxygen System in accordance with [paragraph 12-25](#), as necessary.

12-22. BENCH TEST OXYGEN REGULATOR. Forward oxygen regulator to AIMD or MALS for bench test in accordance with NAVAIR 13-1-6.4-2.

12-23. STORAGE.

12-24. STORAGE OF PORTABLE OXYGEN SYSTEM ABOARD THE AIRCRAFT. [Figure 12-3](#) shows typical storage aboard the aircraft.

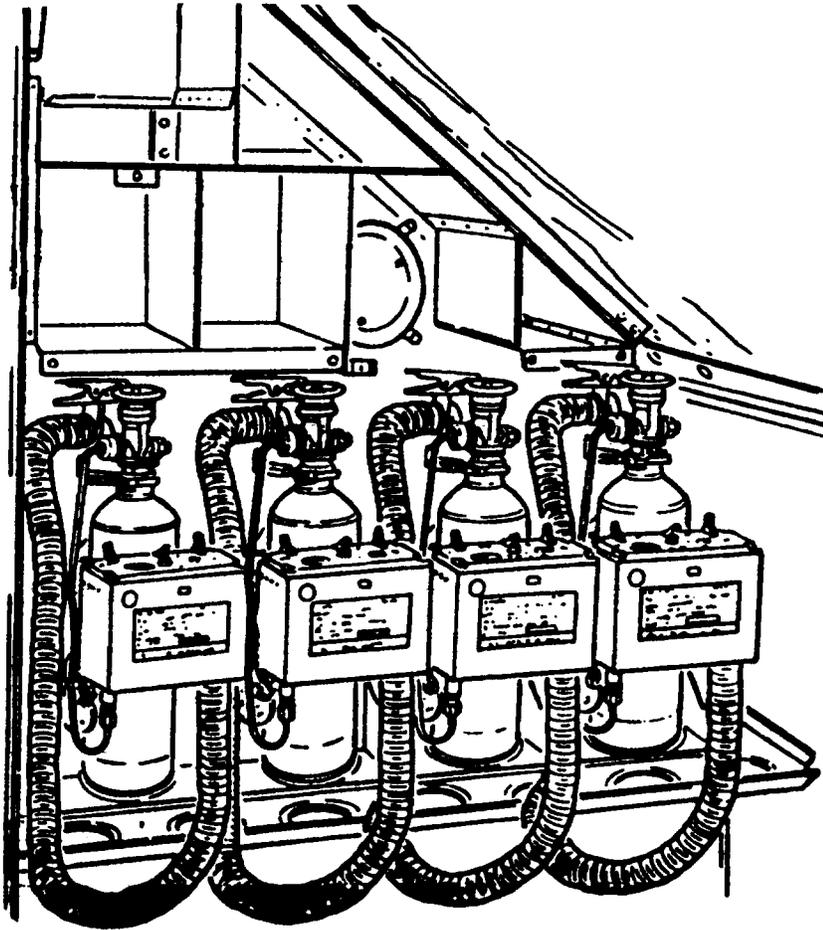


Figure 12-3. Typical Storage of Portable Oxygen System on Aircraft

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12-25. CHARGING.

12-26. To charge the Portable Oxygen System, proceed as follows:

Materials Required

Quantity	Description	Reference Number
As Required	Oxygen, Aviator's Breathing	MIL-O-27210, Type 1

NOTE

Personnel operating oxygen recharge spin cart should be thoroughly familiar with all valves and controls. Prior to operating, refer to appropriate ground support equipment

manual and servicing placard on spin cart for recharging operation procedures. Personnel operating oxygen spin cart shall be licensed in accordance with OPNAVINST 4790.2 Series.

Index numbers refer to [figure 12-2](#) unless otherwise noted.

1. Disconnect dust cap from charging check valve assembly (1).
2. Connect servicing line from oxygen spin cart.
3. Ensure oxygen regulator (8) supply toggle (green toggle) is in the off position.
4. Turn cylinder valve assembly (10) to full open position.

NOTE

During filling operation Portable Oxygen System servicing pressure will be indicated on oxygen regulator (8) pressure gage.

5. Using oxygen spin cart, fill the Portable Oxygen System to 1800 to 2000 psig in stages outlined in [table 12-2](#). Fill time for each stage is a minimum of 3 minutes with a 2 minute cool down period.
6. Shut down and secure oxygen spin cart.
7. Turn Portable Oxygen System cylinder valve assembly (10) to full off position.
8. Move oxygen regulator (8) supply toggle (green toggle) to on position.
9. Move oxygen regulator (8) emergency toggle (red toggle) to test mask position to bleed pressure from Portable Oxygen System, then release emergency toggle.
10. Move oxygen regulator (8) supply toggle to off position.
11. Disconnect oxygen spin cart servicing line from Portable Oxygen System charging check valve assembly (1).
12. Install dust cap on to Portable Oxygen System charging check valve assembly (1).

12-27. DISASSEMBLY.

12-28. To disassemble the Portable Oxygen System, proceed as follows:



Prior to disassembly, ensure oxygen cylinder valve (10) is in the fully closed position. Turn oxygen regulator (8) supply toggle to the on position and depress emergency toggle to test mask position to bleed pressure from system. Release emergency toggle and move supply toggle to the off position.

NOTE

Index numbers refer to [figure 12-5](#) unless otherwise noted.

Disassemble the Portable Oxygen System only as far as necessary to perform a repair action or specific maintenance function.

1. Remove cap and chain assembly from charging check valve assembly (1) and remove charging check valve assembly (1) from tee (6).
2. Remove nut (14), washer (15), and clamp (13).
3. Loosen and free line assembly (9) nuts from cylinder assembly (10) and union nipple (5). Remove line assembly (9).

Table 12-2. Cylinder Filling Stages

STAGE	PSIG
1	0-500
2	500-1000
3	1000-1500
4	1500-1800
5	1800-2000

AMBIENT AIR TEMPERATURE		CHARGING PRESSURE
°F	°C	PSIG
0	-18	1550-1750
10	-12	1600-1775
20	-7	1625-1800
30	-1	1675-1850
40	5	1700-1875
50	10	1725-1925
60	16	1775-1975
70	21	1800-2000
80	27	1825-2050
90	32	1875-2075
100	38	1900-2125
110	43	1925-2150
120	49	1975-2200
130	54	2000-2225

NAVAIR 13-1-6.4-1

4. Turn each of the four dzus fasteners on oxygen regulator (8) 1/4 turn counterclockwise. Slide oxygen regulator (8) from support weldment (25) far enough to access clamp (3).

5. Loosen hose clamp (3) and remove hose assembly (2) from oxygen regulator (8) outlet. Remove oxygen regulator (8) from support weldment (25).

6. Loosen clamp (3) and remove oxygen connector (4) from hose assembly (2).

7. Remove union nipple (5), tee (6), and nipple (7) from oxygen regulator (8) inlet assembly.

8. Remove two wing nuts (16) to loosen two support weldment (25) clamps and remove oxygen cylinder (11) from support weldment (25).

NOTE

Do not remove cylinder bands (12) from oxygen cylinder (11) unless replacement is necessary.

Intermediate level maintenance activities are not authorized to remove and replace cylinder valve assembly (10). Special vacuum heat drying equipment is required when removing and replacing cylinder valve assembly (10).

Removal of short strap assembly (17) and long strap assembly (21) is not required unless replacement is required.

9. Remove short strap assembly (17) from support weldment (25) by removing nut (18), washer (19), and bolt (20).

10. Remove long strap assembly (21) from support weldment (25) by removing nut (22), washer (23), and bolt (24).

11. Forward oxygen regulator assembly (8) to AIMD or MALS for bench test and repair.

12-29. CLEANING.

12-30. To clean the Portable Oxygen System parts, proceed as follows:

Materials Required

Quantity	Description	Reference Number
As Required	Dishwashing Liquid, Ivory Liquid or Equivalent	Local Purchase
As Required	Cloth, Lint-Free	MIL-C-85043

NOTE

Do not clean oxygen cylinder (11) using NOC process. Clean external body of oxygen cylinder (11) in accordance with the procedure outlined in [step 3](#) of this paragraph.

1. Clean oxygen line (9) in accordance with procedures outlined in NAVAIR 13-1-6.4-1.

2. Clean all metal parts (with exception of oxygen cylinder assembly (11)) in accordance with procedures outlined in NAVAIR 13-1-6.4-1.

3. Clean external body of oxygen cylinder assembly (11) by mixing 1 part Ivory liquid (or equivalent) to 5 parts water and wiping clean with a lint-free cloth. Wipe dry cylinder with a lint-free cloth.

12-31. REPAIR.

12-32. Repair of the Portable Oxygen System is limited to the fabrication of short strap (17) and long strap (21). All other defective components shall be replaced with new components. To fabricate new short strap (17) or long strap (21), proceed as follows:

Materials Required

Quantity	Description	Reference Number
As Required	Webbing, Nylon, 1 inch, Type XVII	MIL-W-4088 NIIN 00-260-6906
2	Ring, Metallic	MIL-R-3390 NIIN 00-202-0228
2	Grommet, Metallic Spur, Size O	NIIN 00-231-6582
As Required	Thread, Nylon, Size E	VT-295 NIIN 00-616-0079

1. Fabricate short strap assembly (17) as per figure 12-4, view B.

2. Fabricate long strap assembly (21) as per figure 12-4, view A.

12-33. VISUAL INSPECTION. Perform Visual Inspection of disassembled parts in accordance with paragraph 12-19.

12-34. ASSEMBLY.

12-35. To assemble the Portable Oxygen System, proceed as follows:

Materials Required

Quantity	Description	Reference Number
As Required	Tape, Anti-seize	MIL-T-27730A

NOTE

Index numbers refer to figure 12-5 unless otherwise noted.

1. Attach short strap (17) to support weldment (25) and secure with bolt (20), washers (19) and nut (18).

2. Attach long strap (21) to support weldment (25) and secure with bolt (24), washers (23) and nut (22).

3. Install cylinder bands (12) onto cylinder (11) and install cylinder (11) into support weldment (25) clamps, align cylinder bands (12) with support weldment (25) clamps and tighten two wing nuts (16) to hold cylinder until line assembly (9) is installed.

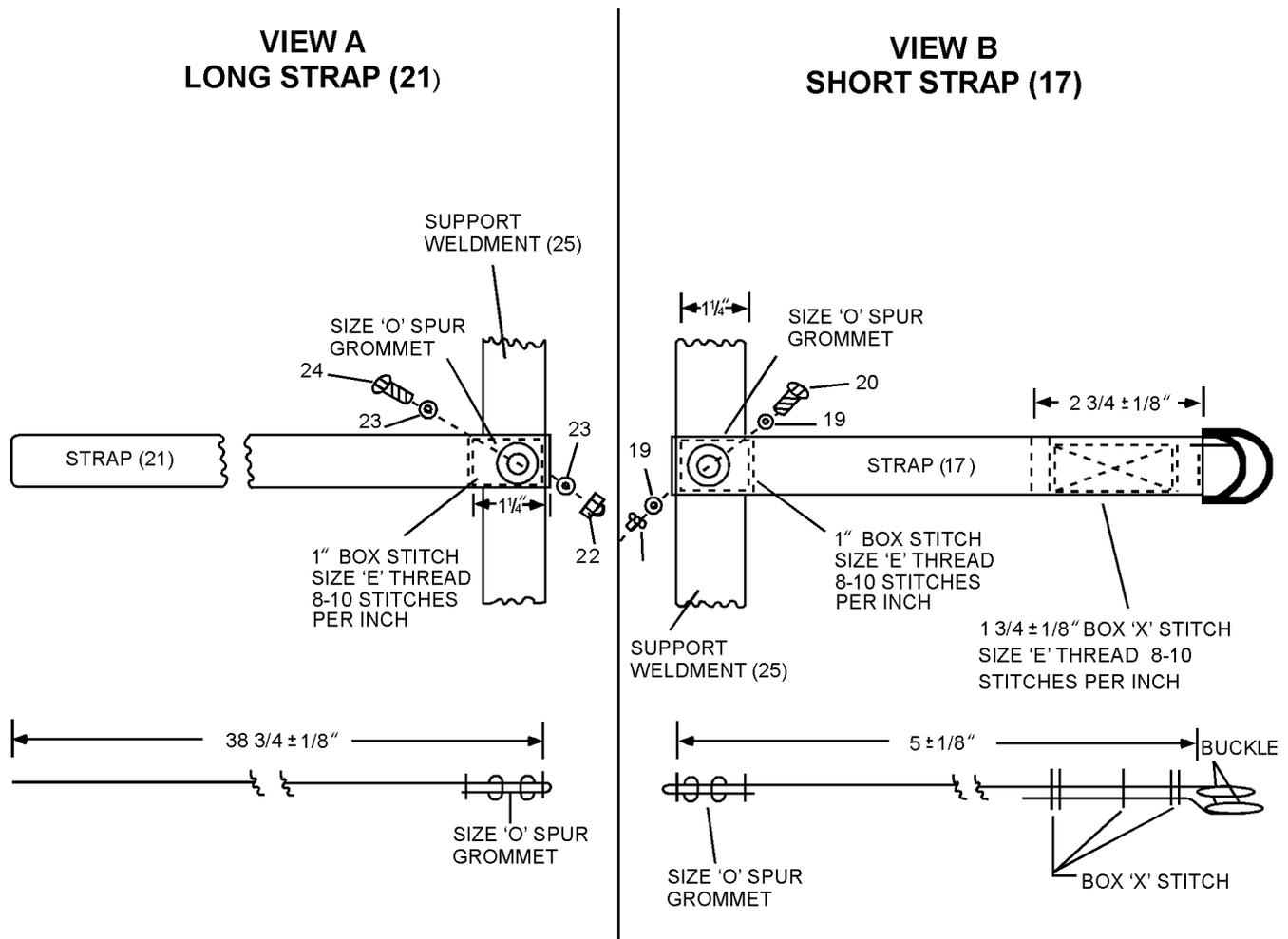


Figure 12-4. Short and Long Strap

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NAVAIR 13-1-6.4-1

4. Apply anti-seize tape to pipe threads of nipple (7) and union nipple (8) and screw nipple (7) and union nipple (8) into tee (6).

5. Attach union nipple (5), tee (6), and nipple (7) to oxygen regulator (8) by screwing nipple (7) into oxygen regulator (8) inlet.

6. Loosely install one clamp (3) onto one end of hose (2). Install oxygen connector (4) onto hose (2) and secure with clamp (3).

7. Slide hose (2) through large hole on bottom of support weldment (25) and loosely install remaining clamp (3) onto hose (2). Attach hose (2) to oxygen regulator (8) outlet and secure with clamp (3).

8. Slide oxygen regulator (8) into support weldment (25) and secure to support weldment (25) by turning 4 Dzus fasteners on oxygen regulator (8) clockwise 1/4 turn.



Do not bend line assembly (9) when assembling to union nipple (5) and cylinder valve (10). Adjust position of cylinder and valve (11) as described in [step 9](#) below to align connections.

9. Connect line assembly (9) to union nipple (5). Loosen two wing nuts (16) and adjust cylinder (11) and valve (10) assembly position in support weldment (25) to align valve assembly (10) with line assembly (9), screw line assembly (9) nut onto valve assembly (10). Tighten two wing nuts (16) to secure cylinder (11) and valve (10) assembly to support weldment (25). Position clamp (13) onto line assembly (9) and attach clamp (13) onto screw protruding out of support weldment (25) box. Attach charging valve (1) cap chain ring onto screw protruding out of support weldment (25) box, install washer (15) onto screw protruding out of support weldment (25) box and secure line assembly (9) and charging valve (1) cap and chain to support weldment (25) box with nut (14).

10. Apply anti-seize tape to pipe threads of charging check valve assembly (1) and screw charging check valve assembly (1) into tee (6).

11. Screw charging check valve assembly (1) dust cap onto charging check valve assembly (1).

12-36. POST ASSEMBLY TESTING. To perform post assembly testing, proceed as follows:

1. Charge Portable Oxygen System in accordance with [paragraph 12-25](#).

2. Perform Functional Test in accordance with [paragraph 12-21](#).

Section 12-4. Illustrated Parts Breakdown

12-37. GENERAL.

12-38. This section lists and illustrates the assemblies and detail parts of the Portable Oxygen System manufactured by Fluid Power Inc. (CAGE 99227) Part No. 6028.

12-39. The Illustrated Parts Breakdown should be used during maintenance when requisitioning and identifying parts.

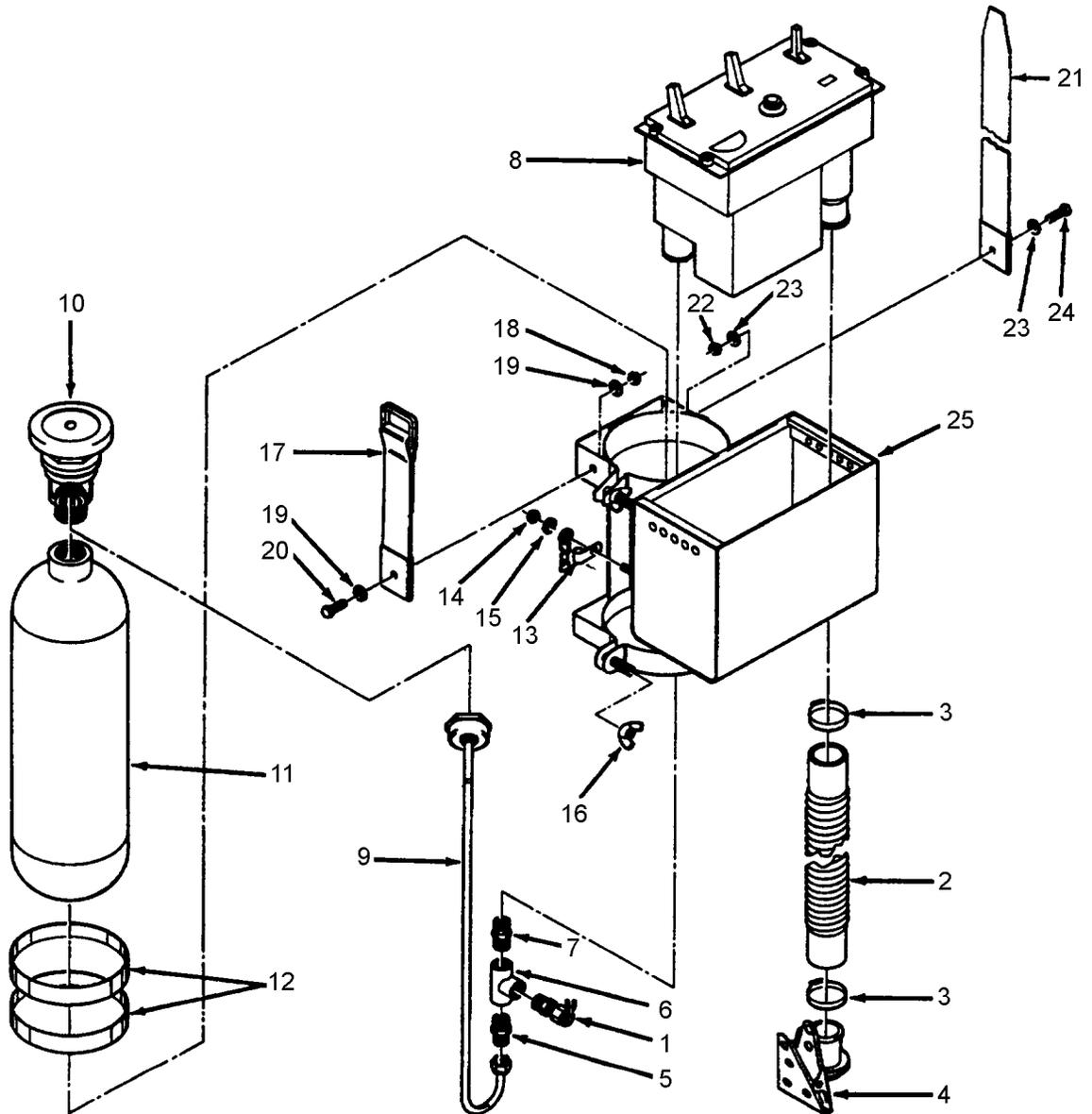


Figure 12-5. Portable Oxygen System

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NAVAIR 13-1-6.4-1

Figure and Index Number	Part Number	Description							Units Per Assembly	Usable On Code
		1	2	3	4	5	6	7		
12-5	6028	PORTABLE OXYGEN SYSTEM							1	
-1	4215	. CHECK VALVE ASSEMBLY,							1	
		Charging (NIIN 00-764-3294)								
-2	MS22055H36	. . HOSE ASSEMBLY (96906) (99227							1	
		Part number 1386)								
-3	MS22064-5	. . . CLAMP, Hose (AP) (96906) (99227							2	
		Part number 1382)								
-4	MS22058-1	. . . CONNECTOR, Oxygen hose to							1	
		regulator (96906)								
		(99227 Part number 4085)								
-5	AN780-3	. . NIPPLE, Union (88044)							1	
-6	AN917-1	. . TEE, Internal pipe thread (88044)							1	
-7	AN911-1	. . NIPPLE, Pipe thread (88044)							1	
-8	MS22062-1	. . REGULATOR, Oxygen (96906) (Note 2)							1	
	14800-8B	. . REGULATOR, Oxygen (96906) (Note 2)							1	
	14800-8C	. . REGULATOR, Oxygen (96906) (Note 2)							1	
	(CRU-72/A)									
	29255-6B-A1	. . REGULATOR, Oxygen (96906) (Note 2)							1	
	29255-6B-B1	. . REGULATOR, Oxygen (96906) (Note 2)							1	
-9	6045	. LINE ASSEMBLY (NIIN 00-106-7439)							1	
	5130	. CYLINDER AND VALVE ASSEMBLY							1	
		MS26545A1X0096								
-10	5500	. . VALVE, Cylinder (NIIN 00-794-5984)							1	
-11	6060	. . CYLINDER, Oxygen (NIIN 00-883-1844) ...							1	
-12	2733	. BAND, Cylinder							2	
	6032	. SUPPORT ASSEMBLY (NIIN 00-003-8894) ...							1	
-13	6034	. . CLAMP, Line (NIIN 01-280-0992)							1	
		(ATTACHING PARTS)								
-14	MS35650-302	. . NUT (96906)							1	
-15	AN960-10	. . WASHER, Flat (88044)							1	
		---*---								
-16	AN350-1032	. . NUT, Wing (88044)							2	
-17	6040	. . STRAP ASSEMBLY, Short							1	
		(ATTACHING PARTS)								
-18	MS20365-1032	. . NUT (96906)							1	
-19	AN960-10	. . WASHER, Flat (88044)							2	
-20	AN3-4	. . BOLT, Machine (88044)							1	
		---*---								

Figure and Index Number	Part Number	Description	Units Per Assembly	Usable On Code
		1 2 3 4 5 6 7		
-21	6039	. . STRAP ASSEMBLY, Long (ATTACHING PARTS)	1	
-22	MS20365-1032	. . NUT (96906)	1	
-23	AN960-10	. . WASHER, Flat (88044)	2	
-24	AN3-4	. . BOLT, Machine (88044)	1	
		---*---		
-25	6031	. . SUPPORT WELDMENT	1	

Notes: 1. Most parts listed in IPB may not be stocked in supply system. For these parts, activities must order the parts open purchase from the following company:
 Fluid Power Inc.
 1300 Hudson Gate Dr.
 P.O. Box 208
 Hudson, Ohio 44236
 TEL: (330) 653-5107

2. See NAVAIR 13-1-6.4-2 for IPB.

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NUMERICAL INDEX

Part Number	Figure and Index Number	SM&R Code
AN3-4	12-5-20	
AN3-4	12-5-24	
AN350-1032	12-5-16	
AN780-3	12-5-5	
AN911-1	12-5-7	
AN917-1	12-5-6	
AN960-10	12-5-15	
AN960-10	12-5-19	
AN960-10	12-5-23	
MS20365-1032	12-5-18	
MS20365-1032	12-5-22	
MS22055H36	12-5-2	
MS22058-1	12-5-4	
MS22062-1	12-5-8	
MS22064-5	12-5-3	
MS35650-302	12-5-14	
14800-8B	12-5-8	

Part Number	Figure and Index Number	SM&R Code
14800-8C	12-5-8	
(CRU-72/A)		
2733	12-5-12	
29255-6B-A1	12-5-8	
29255-6B-B1	12-5-8	
4215	12-5-1	
5130	12-5-9	
5500	12-5-10	
6028	12-5	
6031	12-5-25	
6032	12-5-12	
6034	12-5-13	
6039	12-5-21	
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6045	12-5-9	
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