CHAPTER 12

PORTABLE BREATHING OXYGEN REGULATOR AND CYLINDER

TYPE MA-1 (SCOTT AVIATION TYPE)

Section 12-1. Description

12-1. GENERAL.

12-2. The Portable Breathing Oxygen Regulator and Cylinder Type MA-1, P/N 9000A-1 thru 9010A-2, is manufactured by Scott Aviation (CAGE 53655) (figure 12-1). The Portable Breathing Oxygen Regulator and Cylinder Type MA-1, is a self-contained portable breathing device capable of supplying breathing oxygen to flight personnel for normal or emergency use. The regulator type A-21 P/Ns 9000A, 9000A-1, 9010A, 9010A-1, and 9010A-2, hereafter referred to as the A-21 which forms part of the unit, is a demand/pressure breathing type regulator which will deliver oxygen to the user upon demand or provide a positive pressure to the mask depending upon the positioning of the selector knob. The unit is intended for use with the full face smoke mask (P/N 651-280) or the MBU-12 oxygen mask configuration. During normal operation the selector knob is positioned in the norm position and will deliver 100% oxygen upon demand. When the selector knob is placed in the 30M, 42M, or EMER position, the unit will deliver 100% oxygen at a positive pressure of 1.6 to 14.0 inH_2O depending upon the positioning of the selector knob from sea level to the service ceiling of the aircraft. See Table 12-1 for leading particulars.

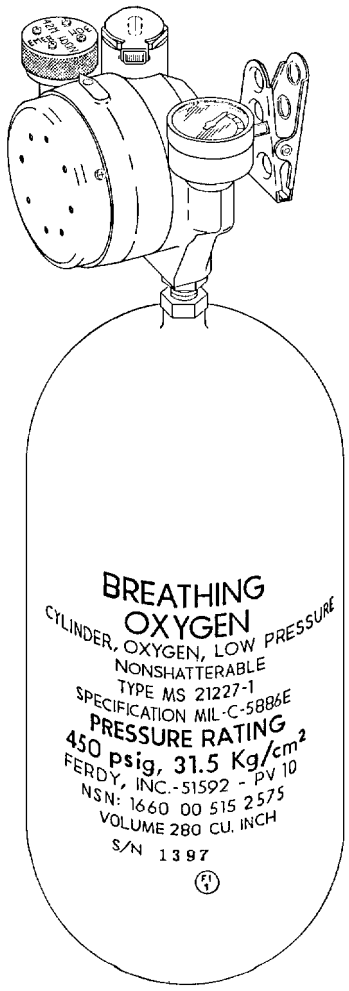

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Figure 12-1. Portable Breathing Oxygen Regulator and Cylinder, Type MA-1

12-3. CONFIGURATION.

12-4. The regulators are supplied in one basic configuration: low pressure (50 to 500 psig operating pressure range).

Table 12-1. Leading Particulars

CHARACTERISTICS	
A-21	9000A ..... 50 to 500 psig
A-21	9000A-1 ..... 50 to 500 psig
A-21	9010A ..... 50 to 500 psig
A-21	9010A-1 ..... 50 to 500 psig
A-21	9010A-2 ..... 50 to 500 psig
Mounting	MA-1 portable walk around cylinder
Operating Altitude Range	Sea Level to 43,000 ft
Visual Indicator	Pressure gage
Selector knob:	
NORM	100% Oxygen on demand
30M	Provides 100% Oxygen at a positive pressure of 1.6 to 2.4 inH_2O
42M	Provides 100% Oxygen at a positive pressure of 5.5 to 6.5 inH_2O
EMER	Provides 100% Oxygen at a positive pressure of 12.0 to 14.0 inH_2O
Overall Dimensions:	
Length	5 9/16 in.
Width	5 1/2 in.
Height	4 9/16 in.
Weight	2.1 lb.

12-5. SERVICE LIFE.

NOTE

Low Pressure Oxygen Cylinders, Type MS21227-1 used on MA-1 Portable Emergency Oxygen System, do not have a Department of Transportation (D.O.T.) ICC number permanently stamped in the neck of the cylinder and therefore do not require hydrostatic testing. These cylinders are painted yellow in accordance with MIL-STD-101.

12-6. The regulator shall remain in service as long as it continues to function correctly and does not require other than authorized adjustment or repair.

Section 12-2. Modifications

12-7. GENERAL.

12-8. There are no authorized modifications to the Type A-21 regulator.

Section 12-3. Performance Test Sheet Preparation

12-9. GENERAL.

12-10. Preparation of oxygen regulator Performance Test Sheet require that, through the use of various graphs, actual flows given in applicable directives and provided in this section be converted to indicated flows.

12-11. Flows provided in applicable directives are stated in liters per minute (lpm) and are not measurable by the manometers used in oxygen regulator test stands. The flows must be converted to inches of water pressure (inH_2O), the form of measurement which can be read on the test stand manometers.

NOTE

The various graphs supplied with each oxygen system components test stand, models 1172AS100 and 1316AS100 are used in converting flows. The graphs supplied are not interchangeable between test stands.

12-12. The information provided in the tables in this section are to be recorded on the Performance Test Sheet (figure 12-2).

12-13. The Performance Test Sheet (figure 12-2) is a sample only, but may be reproduced for local use.

12-14. The following tests require conversion of flows from actual lpm to indicated inH_2O.

1. Flow Suction Test.

2. Pressure Breathing Test.

12-15. REGULATOR PERFORMANCE TESTS.

12-16. FLOW SUCTION TEST. The Flow Suction Test shall be performed at sea level with the selector knob in the NORM position. Actual (lpm) flows are converted to indicated (inH_2O) output flows by using the sea level output graph N_2 line. Convert the actual flows as follows:

NOTE

Test stand output flow graphs may vary in makeup, according to the activity performing the test stand calibration. Some test stands may have a single output graph with various altitude lines, while others may have separate graphs for each altitude. Ensure specified graph is used.

1. Locate the desired lpm line (figure 12-2) at the bottom of the sea level output graph.

2. Trace selected lpm line up to where it intersects the N_2 line.

3. Trace the line from point of intersection across the graph to the left-hand column to determine indicated output inH_2O.

4. Enter this figure in the appropriate block on the Performance Test Sheet.

5. Repeat steps 1 through 4 for all output flows (lpm) given in figure 12-2.

12-17. PRESSURE BREATHING TEST. The Pressure Breathing Test shall be performed at sea level with the selector knob in the 30M, 42M, and EMER positions. Actual (lpm) flows are converted to indicated (inH_2O) output flows by using the sea level output graph N_2 line. Convert the actual flows as follows:

NOTE

Test stand output flow graphs may vary in makeup, according to the activity performing the test calibration. Some test stands may have a single output graph with various altitude lines, while others may have separate graphs for each altitude. Ensure specified graph is used.

1. Locate the desired lpm line (figure 12-2) at the bottom of the sea level output graph.

REGULATOR PERFORMANCE TEST SHEET

SCOTT TYPES A-21
9000A, 9000A-1, 9010A-1, AND 9010A-2

DATE: _____ TYPE: _____ SERIAL NUMBER: _____

TEST STAND SERIAL NUMBER: _____ TESTED BY: _____ CDI: _____

1. OVERALL LEAKAGE TEST: _____

2. PRESSURE GAGE SCALE AND ERROR TEST:

INLET PRESSURE	TOLERANCE	PRESSURE GAGE READING
200 PSIG	± 25 PSIG	
300 PSIG	± 25 PSIG	
400 PSIG	± 25 PSIG	

3. FLOW SUCTION TEST:

SELECTOR KNOB SETTING	INLET PRESSURE	LPM	INDICATED OUTPUT	READING	MAXIMUM SUCTION
NORM	50	10			-.4
NORM	50	50			-1.4
NORM	150	10			-.4
NORM	150	50			-1.4
NORM	150	100			-1.4
NORM	500	10			-.4
NORM	500	50			-1.4
NORM	500	100			-1.4

Figure 12-2. Performance Test Sheet Preparation (Sheet 1 of 2)

4. PRESSURE BREATHING TEST:

SELECTOR KNOB SETTING	INLET PRESSURE (PSIG)	ACTUAL OUTPUT LPM	INDICATED OUTPUT INH_2O	READING	MAXIMUM ALLOWABLE SUCTION
30M	50	10			+1.6 TO +2.4
30M	50	50			-1.0 NOTE 1
30M	50	0	0		+1.0 NOTE 2
30M	500	10			+1.6 TO +2.4
30M	500	50			-1.0 NOTE 1
30M	500	90			-1.0 NOTE 1
30M	500	0	0		+1.0 NOTE 2
42M	50	10			+5.5 TO +6.5
42M	50	50			-1.5 NOTE 1
42M	50	0	0		+1.5 NOTE 2
42M	500	10			+5.5 TO +6.5
42M	500	50			-1.5 NOTE 1
42M	500	90			-1.5 NOTE 1
42M	500	0	0		+1.5 NOTE 2
EMER	50	10			+12.0 TO +14.0
EMER	50	50			-2.0 NOTE 1
EMER	50	0	0		+2.0 NOTE 2
EMER	500	10			+12.0 TO +14.0
EMER	500	50			-2.0 NOTE 1
EMER	500	90			-2.0 NOTE 1
EMER	500	0	0		+2.0 NOTE 2

5. OXYGEN CYLINDER AND REGULATOR PURGE _____

NOTES:

1. MAXIMUM ALLOWABLE PRESSURE DECREASE FROM 10 LPM READING.
2. MAXIMUM ALLOWABLE PRESSURE INCREASE ADDED TO 10 LPM READING.

Figure 12-2. Performance Test Sheet Preparation (Sheet 2 of 2)

2. Trace selected lpm line up to where it intersects the N_2 line.

3. Trace the line from point of intersection across the graph to the left-hand column to determine indicated output inH_2O.

4. Enter this figure in the appropriate block on the Performance Test Sheet.

5. Repeat steps 1 through 4 for all output flows (lpm) given in figure 12-2.

Section 12-4. Maintenance

12-18. GENERAL.

12-19. Maintenance of the Scott Aviation Portable Breathing Oxygen Regulator and Cylinder Type MA-1, is limited to inspection testing, adjustment of the pressure breathing assembly, and tightening of loose screws and fittings. Ensure that anti-seize tape is used on pipe threads. This section contains only the procedural steps necessary to meet these requirements.

NOTE

Upon completion of any maintenance action (e.g., inspection, adjustment, repair, etc), be sure to complete the required maintenance data collection system form.

12-20. INSPECTIONS.

12-21. If the regulator fails any inspection or testing requirements and cannot be adjusted within limits which are authorized, it shall be removed from service and sent to Air Force Depot Level Maintenance for repair and replaced with a Ready-For-Issue (RFI) component.

12-22. Procedural steps outlined in this section are listed under the inspection cycle in which they are required, and in the sequence in which they normally occur.

12-23. TURNAROUND/PREFLIGHT/POSTFLIGHT/TRANSFER INSPECTIONS. The Turnaround/Preflight/Postflight/Transfer Inspections consist of a Visual Inspection performed in conjunction with the aircraft inspection requirements for the aircraft in which the regulators are installed. See table 12-2 for assistance in troubleshooting. To perform the inspection, visually inspect the following:

1. Legibility of all markings.

2. Low or improper reading on regulator pressure gage.

3. Selector knob in NORM position.

4. Regulator and surrounding area for freedom from dirt and hydrocarbons.

5. Delivery hose and connector for cuts, fraying, kinking, hydrocarbons and general condition.

12-24. If discrepancies are found or suspected, Maintenance Control shall be notified.

12-25. Regulators which do not pass inspection and cannot be repaired in the aircraft, shall be removed and replaced by Ready-For-Issue (RFI) regulators. Non-RFI regulators shall be forwarded to the nearest maintenance activity having repair capability.

12-26. ACCEPTANCE/SPECIAL/DAILY INSPECTIONS. The Acceptance/Special/Daily Inspections consist of a Visual Inspection followed by a Functional Test. These inspections and tests shall be performed in conjunction with the aircraft inspection requirements for the aircraft in which the regulators are installed. Refer to table 12-2 for assistance in troubleshooting. To perform the inspection, proceed as follows:

Table 12-2. Troubleshooting (Daily, Preflight, Special, Turnaround Transfer, and Acceptance Inspections)

Trouble	Probable Cause	Remedy
Oxygen cylinder pressure gage fails to indicate proper pressure.	Defective gage.	Replace regulator.
	Low cylinder pressure.	Refill.
	Defective inlet assembly.	Replace regulator.
Oxygen not available at mask with selector knob in NORM position with proper pressure source to regulator.	Hose to mask is kinked.	Straighten hose and reposition outlet.
	Regulator not functioning properly.	Replace regulator.
Oxygen not available at mask with proper source to regulator with selector knob in 30M, 42M, and EMER positions.	Kinked or other malfunction between hose and mask.	Replace or readjust equipment as necessary.
	Regulator malfunctioning or out of adjustment.	Replace regulator.
Gage pressure drops when regulator is not in use.	Loose or leaking connections.	Tighten or replace connections as necessary.
	Defective regulator.	Replace regulator.

WARNING

When working with oxygen, make certain that clothing, tubing fittings, and equipment are free of oil, grease, fuel, hydraulic fluid, or any combustible liquid. Fire or explosion may result when even slight traces of combustible material come in contact with oxygen under pressure.

12-27. Visually inspect the regulators in accordance with paragraph 12-23.

12-28. FUNCTIONAL TEST. To perform the Functional Test, proceed as follows:

1. Place selector knob in NORM position.

2. Connect oxygen hose to quick-disconnect, place mask to face and inhale, there should be no restriction inhaling or exhaling.

3. Turn selector knob to 30M, 42M, and EMER positions. There should be a progressively higher flow rate when moving selector knob from 30M to 42M and from 42M to EMER positions.

12-29. Upon completion of Functional Test, secure regulator as follows:

1. Place selector knob in NORM position.

2. Disconnect mask hose from regulator.

12-30. If discrepancies are found or suspected maintenance control shall be notified.

12-31. Regulators which do not pass inspection and cannot be repaired in the aircraft, shall be removed and replaced by RFI regulators. Non-RFI regulators shall be forwarded to the nearest maintenance activity having repair capability.

12-32. CALENDAR/PHASED/SDLM INSPECTIONS. Calendar, Phased or SDLM Inspections require removal of the regulators from the aircraft. See applicable planned maintenance system (PMS) publications for specified intervals. In no case shall the interval exceed 448 days. Upon removal from the aircraft, regulators shall be visually inspected (paragraph 12-23) and Bench Tested (paragraph 12-34).

12-33. Aircraft type A-21 regulators failing the Bench Test and cannot be adjusted within limits shall be shipped to Depot Level repair.

12-34. BENCH TEST.

WARNING

Because of possible vacuum pump explosion, only water-pumped nitrogen, Type I, Class I, Grade B (Fed Spec BB-N-411) shall be used in testing oxygen regulators.

For oxygen test stands and purging equipment, use only nitrogen from gray cylinders marked NITROGEN OIL FREE in white letters. Two 3-inch wide black bands mark the tops of these cylinders. Do not use 3500 psig cylinder. These cylinders cannot be certified contaminant free.

NOTE

Tests are arranged so they proceed from one test to the next with a minimum of flow changes. Troubleshooting tables are provided following each test.

12-35. Bench Test shall be performed on aircraft oxygen regulators prior to being placed in service, and during the Phase/Calendar or SDLM (Standard Depot Level Maintenance) Inspection cycle of the aircraft in which installed. See applicable planned maintenance system (PMS) publications for specific intervals. In no case shall the interval exceed 448 days. The regulators shall also be subjected to a Bench Test if malfunction is suspected, and after repair or replacement of damaged parts.

12-36. Bench Test shall be performed using Oxygen System Components Test Stand, Model 1172AS100 or 1316AS100. Refer to the appropriate ground support equipment manual for identification of test stand controls and indicators referred to in Bench Test.

12-37. Due to the complexity of the 1172AS100 and 1316AS100 test stand, it is essential that the operator become thoroughly familiar with the test stand prior to performing Bench Test. Refer to appropriate ground support equipment manual.

12-38. DEPLETION OF OXYGEN CYLINDER AND REMOVAL OF OXYGEN REGULATOR FROM CYLINDER. To deplete oxygen and remove regulator from cylinder, proceed as follows:

WARNING

When working with oxygen, make certain that clothing, tubing fittings, and equipment are free of oil, grease, fuel, hydraulic fluid, or any combustible liquid. Fire or explosion may result when even slight traces of combustible material come in contact with oxygen under pressure.

Deplete oxygen from the oxygen cylinder in an area free from dirt, grease, oil or other hydrocarbons.

1. Turn selector knob to the EMER position and completely deplete oxygen from oxygen cylinder.

CAUTION

Use care not to damage regulator or cylinder during regulator removal from cylinder. Make certain wrench is firmly on hexagon flats at base of regulator.

NOTE

For index numbers in the following step, refer to figure 12-3.

2. Remove regulator (1) from cylinder (4) by firmly grasping adapters (2) at base of regulator and hexagon boss (3) at cylinder neck with two 3/4-inch wrenches.

3. Cap open port of cylinder with plug and stow cylinder in bin free from dirt, grease, oil, and other hydrocarbons.

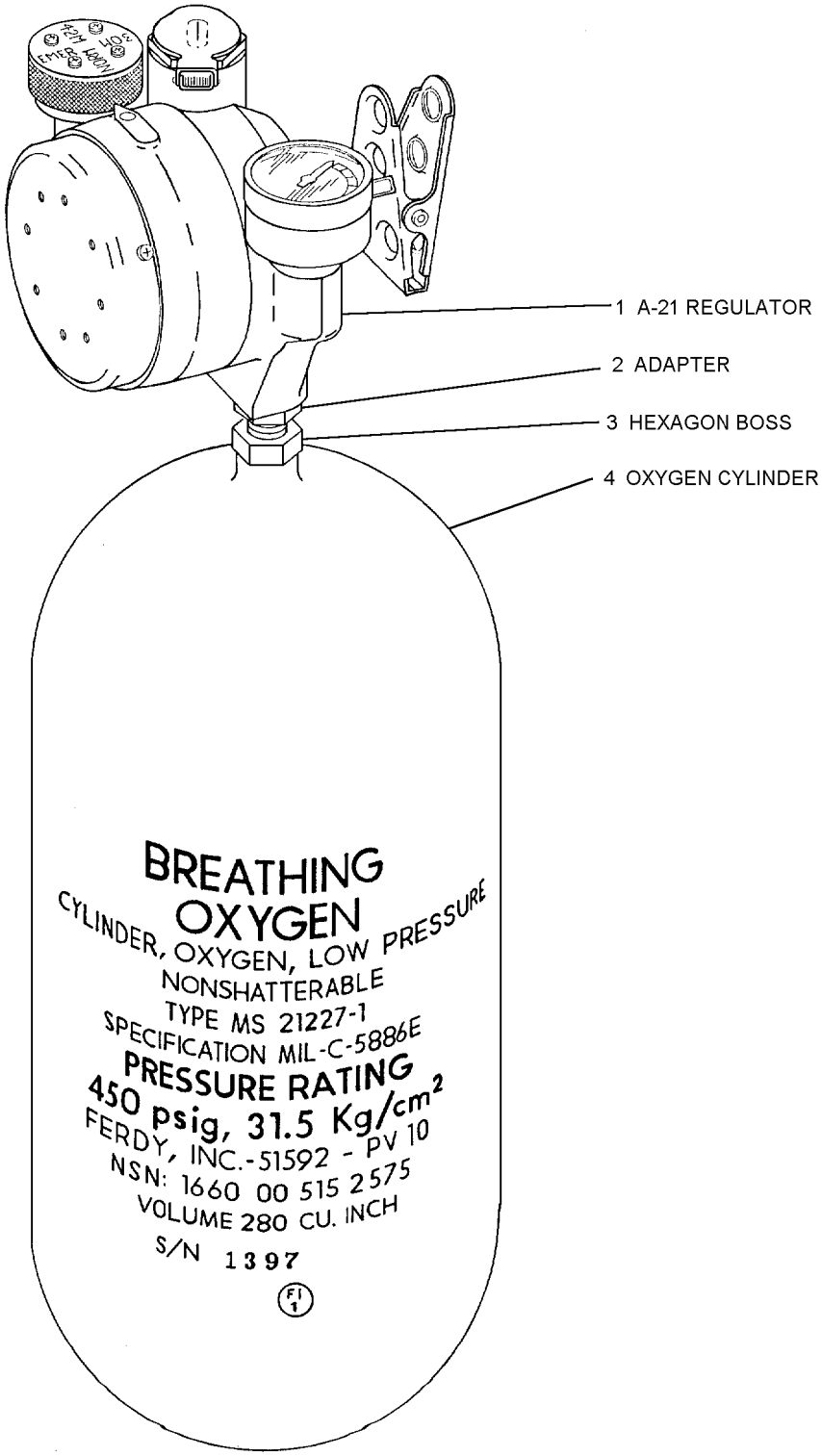

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Figure 12-3. Type MA-1 Portable Breathing Oxygen Cylinder and Regulator

12-39. MODIFICATION OF OXYGEN HOSE COUPLING ASSEMBLY. To modify the Oxygen Hose Coupling Assembly (MS22016), proceed as follows:

1. Modify oxygen hose coupling assembly by removing spring and valve assembly and cross bar support from inside of oxygen hose coupling assembly; to provide a clear passage with no restrictions for flows being drawn.

2. Attach modified oxygen hose coupling to piezometer (26) using a short hose maintaining one inch between the oxygen hose coupling and piezometer (26).

WARNING

Ensure altitude chamber is configured in accordance with NAVAIR 17-15BC-21, WP003 00, Figure 3, sheets 2 thru 4 as applicable. Ensure High Pressure or Low Pressure Hose Assembly listed in NAVAIR 17-15BC-21, WP031 00, Figure 1 or Figure 2 is attached to N_2 Input Connection (18) or Tee Connection (28) in altitude chamber as applicable for the oxygen regulator being tested. Remove hose assembly not being used and cap connection (18) or (28) when not in use. For regulators requiring inlet pressures greater than 175 psig, the High Pressure Hose Assembly in NAVAIR 17-15BC-21, WP031 00, Figure 1 shall be used.

12-40. OVERALL LEAKAGE TEST. To perform the Overall Leakage Test, proceed as follows:

Materials Required

Quantity	Description	Reference Number
As Required	Nitrogen, Oil-free, Water Pumped, Type I, Class I, Grade B	Fed Spec BB-N-411 NIIN 00-985-7275
As Required	Tape, Anti-seize	MIL-T-27730A, NIIN 00-889-3535 (CAGE 81349)
As Required	Compound, Leak Detection, Type I	MIL-L-25567

Support Equipment Required

Quantity	Description	Reference Number
1	Adapter, Straight	MS24398D8-4 (CAGE 96906) NIIN 00-684-7292
1	Oxygen Systems Components Test Stand	1172AS100 or 1316AS100

1. Apply anti-seize tape to inlet fitting of the regulator.

2. Attach adapter to inlet fitting of the regulator.

3. Ensure all test stand valves are secure and open N_2 supply cylinder.

4. Attach inlet of regulator to N_2 input connection (18) in the altitude chamber.

5. Turn inlet pressure ON/OFF valve (L) ON.

6. Place selector knob of regulator in NORM position.

7. Using high pressure regulator (Q), slowly apply 500 psig to regulator.

8. Using leak detection compound, check for leaks at the outlet of the regulator, filler valve, pressure gage, relief valve, and threaded areas. No leakage allowed.

9. If leakage occurs, locate probable cause using troubleshooting chart (table 12-3).

10. Turn INLET PRESSURE ON/OFF valve (L) to OFF.

11. Turn high pressure regulator (Q) to vent.

12. Bleed pressure from regulator by placing selector knob in 30M position. Bleed pressure from test stand with system bleed valve (S).

13. Turn system bleed valve (S) OFF and place regulator selector knob in NORM position.

Table 12-3. Troubleshooting (Overall Leakage Test)

Trouble	Probable Cause	Remedy
Inlet fitting leaking.	Loose inlet fitting.	Tighten inlet fitting.
	Damaged threads on inlet fitting.	BCM regulator.
Pressure gage leaking.	Loose pressure gage.	Tighten pressure gage.
	Damage pressure gage.	BCM regulator.
Oxygen filler valve leaking.	Defective filler valve.	BCM regulator.
Relief valve leaking.	Defective relief valve.	BCM regulator.
Leaking first stage bellows assembly.	Defective first stage bellows or gasket.	BCM regulator.
Leakage at demand valve port.	Damaged tilt valve.	BCM regulator.

12-41. PRESSURE GAGE SCALE AND ERROR TEST. To perform the Pressure Gage Scale and Error Test, proceed as follows:

Materials Required

Quantity	Description	Reference Number
As Required	Nitrogen, Oil-free, Water Pumped, Type I, Class I, Grade B	Fed Spec BB-N-411 NIIN 00-985-7275

Support Equipment Required

Quantity	Description	Reference Number
1	Oxygen Systems Components Test Stand	1172AS100 or 1316AS100

1. Turn inlet pressure ON/OFF valve (L) ON.

WARNING

When applying inlet pressure using high pressure regulator (Q), apply pressures slowly.

2. Using high pressure regulator (Q), slowly increase pressure to each test pressure specified on Performance Test Sheet (figure 12-2).

3. Check tolerance by comparing regulator pressure gage reading with test stand regulated high pressure gage (10).

4. Regulators failing the pressure gage scale and error test shall be BCM to Air Force Depot Level maintenance for repair.

5. Turn high pressure regulator (Q) to vent position.

6. Bleed test stand using system bleed valve (S). Bleed pressure from regulator by placing selector knob in 30M position. Close system bleed valve (S).

12-42. FLOW SUCTION TEST. To perform the Flow Suction Test, proceed as follows:

Materials Required

Quantity	Description	Reference Number
As Required	Nitrogen, Oil-free, Water Pumped, Type I, Class I, Grade B	Fed Spec BB-N-411 NIIN 00-985-7275

Support Equipment Required

Quantity	Description	Reference Number
1	Oxygen Systems Components Test Stand	1172AS100 or 1316AS100

CAUTION

Low pressure regulator (N) can only be used when applying pressures below gage guard setting (165 to 175 psig) to an item under test. For pressure above gage guard setting, high pressure regulator (Q) must be used.

1. Place selector knob in NORM position.

2. Attach regulator outlet to piezometer (26).

3. Turn on vacuum pump.

4. Using low press. regulator (N) set inlet pressures of 50 and 150 psig as specified on Performance Test Sheet (figure 12-2).

NOTE

When drawing flows with output valve (C), ensure inlet pressure is maintained.

5. Place pressure selector valve (D) inH_2O position.

6. Using output valve (C), set flows specified on Performance Test Sheet on output manometer (1). Suction values will be displayed on PRESS./SUCTION manometer (4). Record suction readings on Performance Test Sheet.

7. Close output valve (C) and back out on low press. regulator (N).

8. Using high pressure regulator (Q) slowly set inlet pressure of 500 psig as specified on Performance Test Sheet.

9. Using output valve (C), set flows specified in Performance Test Sheet on output manometer (1). Suction values will be displayed on press./suction manometer (4). Record suction readings on Performance Test Sheet.

10. Regulators failing Flow Suction Test shall be BCM to Air Force Depot Level maintenance for repair.

11. Close output valve (C).

12. Turn high pressure regulator (Q) to vent.

13. Bleed pressure from test stand by opening system bleed valve (S). Bleed pressure from regulator by turning selector knob to 30M position. Close system bleed valve (S).

12-43. PRESSURE BREATHING TEST. To perform Pressure Breathing Test, proceed as follows:

Materials Required

Quantity	Description	Reference Number
As Required	Nitrogen, Oil-free, Water Pumped, Type I, Class I, Grade B	Fed Spec BB-N-411 NIIN 00-985-7275

Support Equipment Required

Quantity	Description	Reference Number
1	Oxygen Systems Components Test Stand	1172AS100 or 1316AS100

1. Place selector knob in 30M position.

2. Using low press. regulator (N) set inlet pressure of 50 psig as specified on Performance Test Sheet.

NOTE

When drawing flows with output valve (C) ensure inlet pressure is maintained.

3. Using output valve (C) draw a 10 lpm flow as indicated on output manometer (1).

4. Reading on PRESS./SUCTION manometer (4) shall be within minimum and maximum allowable inH_2O specified on Performance Test Sheet. Record reading on Performance Test Sheet.

NOTE

The initial value obtained at a 10 lpm flow at 30M, 42M, and EMER selector knob settings establishes the base line for determining minimum allowable reading for 50 and 90 lpm flows and maximum allowable reading for 0 lpm flow.

Example: Computing minimum allowable reading for 50 lpm at 50 psig, 30M selector knob setting.

A. 10 lpm reading at 50 psig = 1.8 inH_2O.

B. Minus maximum allowable pressure drop = 1.0 inH_2O.

C. Minimum allowable reading for 50 lpm flow at 50 psig = 0.8 inH_2O.

Example: Computing maximum allowable reading for 0 lpm flow at 50 psig, 30M selector knob setting.

A. 10 lpm reading at 50 psig = 1.8 inH_2O.

B. Plus maximum allowable pressure increase = 1.0 inH_2O.

C. Maximum allowable reading for 0 lpm flow at 50 psig = 2.8 inH_2O.

5. Using output valve (C) draw a 50 lpm flow as indicated on output manometer (1).

6. Reading on PRESS./SUCTION manometer (4) shall not decrease more than the specified inH_2O allowable decrease on the Performance Test Sheet. Record reading on Performance Test Sheet.

7. Close output valve (C).

8. Reading on PRESS./SUCTION manometer (4) shall not increase more than the specified inH_2O allowable increase on the Performance Test Sheet. Record reading on Performance Test Sheet.

9. Place selector knob in NORM position.

10. Back out on low PRESS. regulator (N).

11. Place selector knob in 30M position.

12. Using high pressure regulator (Q) slowly set inlet pressure of 500 psig as specified on Performance Test Sheet.

13. Using output valve (C) draw a 10 lpm flow as indicated on output manometer (1).

14. Reading on PRESS./SUCTION manometer (4) shall be within minimum and maximum allowable inH_2O specified on Performance Test Sheet. Record reading on Performance Test Sheet.

15. Using output valve (C) draw a 50 lpm flow as indicated on output manometer (1).

16. Reading on pressure suction manometer (4) shall not decrease more than the specified inH_2O allowable decrease on the Performance Test Sheet. Record reading on Performance Test Sheet.

17. Using output valve (C) draw a 90 lpm flow as indicated on output manometer (1).

18. Reading on PRESS./SUCTION manometer (4) shall not decrease more than the specified inH_2O allowable decrease on the Performance Test Sheet. Record reading on Performance Test Sheet.

19. Close output valve (C).

20. Reading on PRESS./SUCTION manometer (4) shall not increase more than the specified inH_2O allowable increase on the Performance Test Sheet. Record reading on Performance Test Sheet.

21. Place selector knob in NORM position.

22. Turn high pressure regulator (Q) to vent position.

23. Bleed pressure from test stand using system bleed valve (S).

24. Bleed pressure from regulator by turning selector knob to 30M position, then close system bleed valve (S).

25. Repeat steps 2 thru 24 with selector knob in the 42M and EMER position.

26. If the regulator fails the Pressure Breathing Test, refer to paragraph 12-44.

27. Turn off vacuum pump. Close N_2 supply cylinder valve. Using low PRESS. regulator (N) and system bleed valve (S), relieve all pressure in the test stand. Secure all test stand valves. Disconnect A-21 regulator from test stand.

12-44. ADJUSTMENT PROCEDURES FOR 30M, 42M, AND EMER. SPRING GUIDE SCREWS. To adjust 30M, 42M, and EMER. spring guide screws, proceed as follows:

Materials Required

Quantity	Description	Reference Number
As Required	Nitrogen, Oil-free, Water Pumped, Type I, Class I, Grade B	Fed Spec BB-N-411 NIIN 00-985-7275

Support Equipment Required

Quantity	Description	Reference Number
1	Oxygen Systems Components Test Stand	1172AS100 or 1316AS100

NOTE

To adjust spring guide screws, refer to figure 12-4 for steps 1 through 21.

1. Remove cover (9) from regulator by removing three screws (1).

2. Using a 0.0312-inch allen wrench, loosen 3 setscrews (2).

3. Ensure all test stand valves are secure, then open N_2 supply cylinder.

4. Connect inlet of regulator to N_2 input connection (18).

5. Connect outlet of regulator to piezometer (26).

6. Turn on vacuum pump.

7. Turn inlet pressure ON/OFF valve (L) ON.

8. Using low press. regulator (N), apply 150 psig to regulator as indicated on N_2 input PRESS. gage (27).

9. Open output valve (C) and draw a 10 lpm flow as indicated on output manometer (1).

10. Turn PRESS. selector valve (D) to H_2O position.

11. Turn selector knob to 30M position.

NOTE

When performing steps 13, 16, and 19 to increase outlet pressure, turn adjusting screws clockwise. To decrease outlet pressure, turn adjusting screws counterclockwise.

12. Using 3/16-inch wrench, hold spring adapter (3) in place.

13. With 10 lpm flow indicated on output manometer (1) adjust spring guide screw (4) to obtain a reading of 1.6 to 2.4 inH_2O as indicated on PRESS./SUCTION manometer (4).

14. Turn regulator selector knob clockwise to 42M position.

15. Using 3/16-inch wrench, hold spring adapter (5) in place.

16. With 10 lpm flow indicated on output manometer (1) adjust spring guide screw (6) to obtain a reading of 5.5 to 6.5 inH_2O as indicated on PRESS./SUCTION manometer (4).

17. Turn regulator selector knob clockwise to EMER position.

18. Using 3/16-inch wrench, hold spring adapter (7) in place.

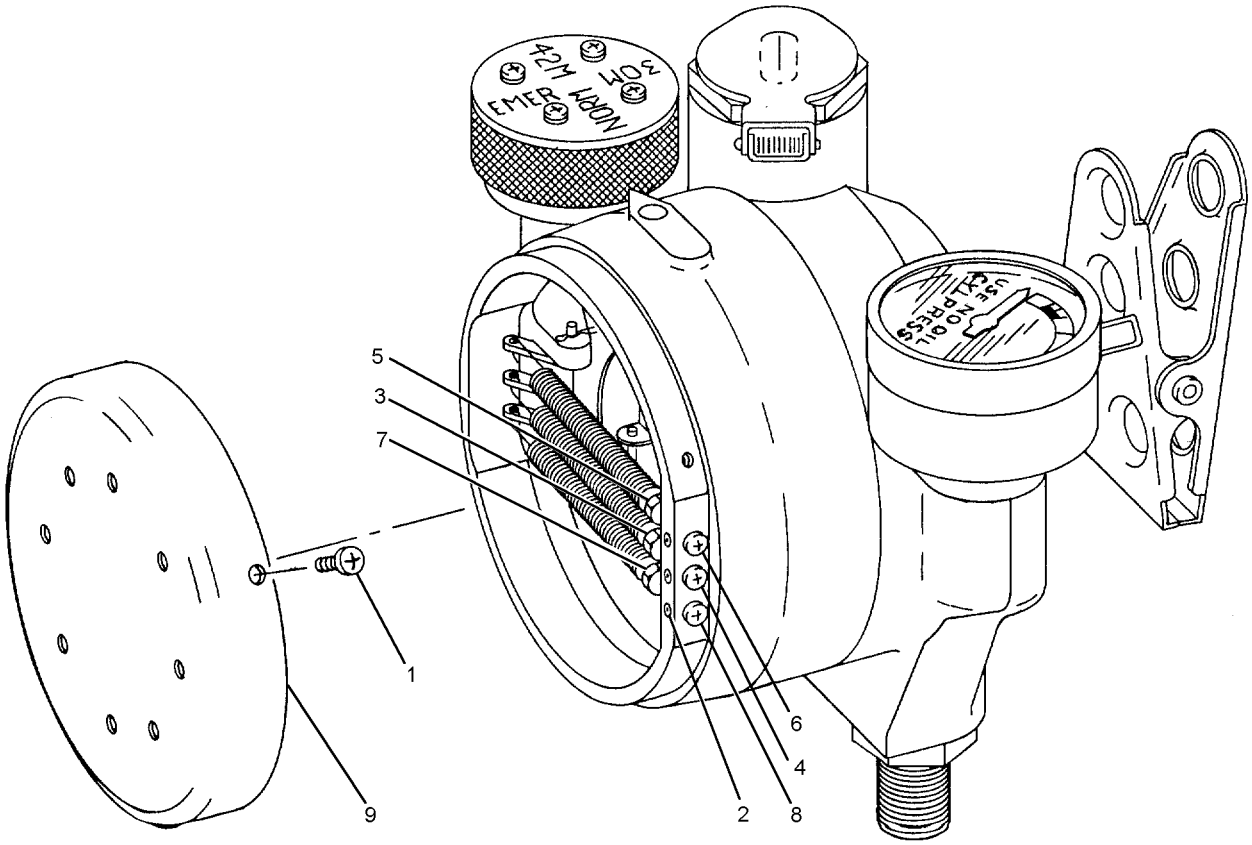

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Figure 12-4. Adjustment of 30M, 42M, and EMER Springs

19. With 10 lpm flow indicated on output manometer (1) adjust spring guide screw (8) to obtain a reading of 12.0 to 14.0 inH_2O as indicated on PRESS./SUCTION manometer (4). Close output valve (C). Place selector knob in NORM position.

20. Tighten 3 setscrews (2) and install cover (9) on regulator and secure in place with three screws (1).

NOTE

At this time it is necessary to perform the Pressure Breathing Test (paragraph 12-43) in its entirety.

12-45. OXYGEN CYLINDER AND REGULATOR PURGE. To perform the Oxygen Cylinder and Regulator Purge, proceed as follows:

Materials Required

Quantity	Description	Reference Number
As Required	Tape, Anti-seize	MIL-T-27730A, NIIN 00-889-3535 (CAGE 81349)
As Required	Aviator's Breathing Oxygen, Type I	MIL-O-27210

WARNING

Do not use oxygen system components test stand to regulate the oxygen purge pressure.

1. Using anti-seize tape, tape the pipe threads of the inlet adapter.

WARNING

Use extreme care not to damage cylinder and regulator to oxygen cylinder.

2. Install oxygen regulator on oxygen cylinder.

3. Connect regulator filler adapter to a regulated source of aviator's breathing oxygen.

4. Slowly charge the oxygen cylinder to 450 psig.

5. Shut off oxygen source and disconnect regulator and oxygen cylinder from regulated source of aviator's breathing oxygen.

6. Turn selector knob to 30M position and deplete oxygen from oxygen cylinder through regulator.

7. Turn selector knob to NORM position and repeat steps 3 through 6, twice.

NOTE

After purging is completed, fill MA-1 portable walk around unit to 450 psig.

All equipment forwarded from the Organizational Level maintenance to the AIMD shall be accompanied by the appropriate forms in accordance with OPNAVINST 4790.2 Series. The test stand operator and CDI shall sign the Performance Test Sheet, and the original or a copy shall be forwarded to the organizational custodian. Upon completion of the Bench Test/or Calendar Inspection, the organizational custodian shall retain the appropriate forms in accordance with OPNAVINST 4790.2 Series.