CHAPTER 14

AIRCRAFT PANEL MOUNTED OXYGEN REGULATORS TYPES CRU-73/A, CRU-68A/A, AND CRU-92/A

Section 14-1. Description

14-1. GENERAL.

NOTE

For CRU-96/A, P/N 14800-11 and CRU-97/A, P/N 14950-46, refer to paragraph 14-59 for Bench Testing procedures and paragraph 14-116, step 22 for lamp installation procedures until formal maintenance chapters are incorporated in manual. Record bench test readings utilizing figure 14-3.

14-2. Aircraft Panel Mounted Oxygen Regulators, Types CRU-73/A, CRU-68A/A, and CRU-92/A (CAGE 03390) (figure 14-1) are manufactured by Carleton Technologies. They are designed to regulate breathing oxygen supplied to the aircrewmember during flight. Table 14-1 contains leading particulars for the regulators.

14-3. All controls and indicators necessary for indication of performance and operation of the regulator are located on an illuminated panel with the regulating components attached to the mounting plate and controls assembly.

NOTE

The equipment is identified by type, part number, and description. Type designation only will be used as reference in this chapter.

14-4. The regulators are panel-mounted, automatic positive pressure diluter demand type regulators and are used in conjunction with a pressure breathing type oxygen mask. The regulators provide 100 percent oxygen, or an air/oxygen mixture at the correct ratio depending on altitude, to the user on demand. The regulators incorporate an emergency pressure control lever. During normal operation, the lever is set in the NORMAL position. A TEST MASK position is provided to test the oxygen supply function of the regulator at low altitudes, and at ground level. When in the EMERGENCY position, the regulators deliver 100 percent oxygen to the user at a positive pressure. The EMERGENCY position is used when inadequate oxygen supply is suspected. The regulators are designed for Air Force aircraft and have been modified with test ports for in-place aircraft testing of the regulators. These test ports will not be used for testing in this chapter.

14-5. CONFIGURATION.

14-6. The regulators are supplied in one basic configuration: low pressure (50 to 500 psig operating range). Currently USAF rework facilities are modifying all regulators covered in this chapter to P/N B40550-1. Regulators in this chapter will be maintained at their current configuration and part number.

14-7. FUNCTION.

NOTE

When the supply lever (B) is placed in the OFF position, the diluter lever (N) will toggle to the 100 percent OXYGEN position. Diluter lever (N) can only be positioned to NORMAL OXYGEN when the SUPPLY lever (B) is in ON position.

14-8. Characteristics and performance for which the regulators are designed are described below. Letters in parentheses relate to letters circled in figure 14-2.

1. When supply lever (B) is placed in the ON position, and the diluter lever (N) is in the NORMAL OXYGEN position, oxygen enters at inlet (A) through the inlet supply assembly and flows to first stage reduction chamber (C). This chamber ensures a consistent and predictable outlet pressure and flow through the required wide range of inlet pressures. First stage relief valve (D) protects against over pressure conditions.

2. Demand valve (E) opens when the pressure differential across diaphragm (W) exceeds the force required to move the second stage demand valve lever (G) up. This differential is created at outlet (H) during inhalation. A reduction in pressure is sensed in the demand diaphragm chamber (J) through sensing port (K).

3. During periods of flow, oxygen from demand valve (E) flows through venturi (L) causing the flow indicator to show white. Oxygen from the venturi assembly is mixed with inlet air that is drawn in by the venturi assembly through diluter valve (M), (metered by the seat of the diluter aneroid (O)) and through diluter check valve (P). Diluter check valve (P) prevents the loss of oxygen outward through diluter valve (M) during the pressure (PB) mode at high altitudes, 100 percent oxygen at a safety pressure is supplied automatically.

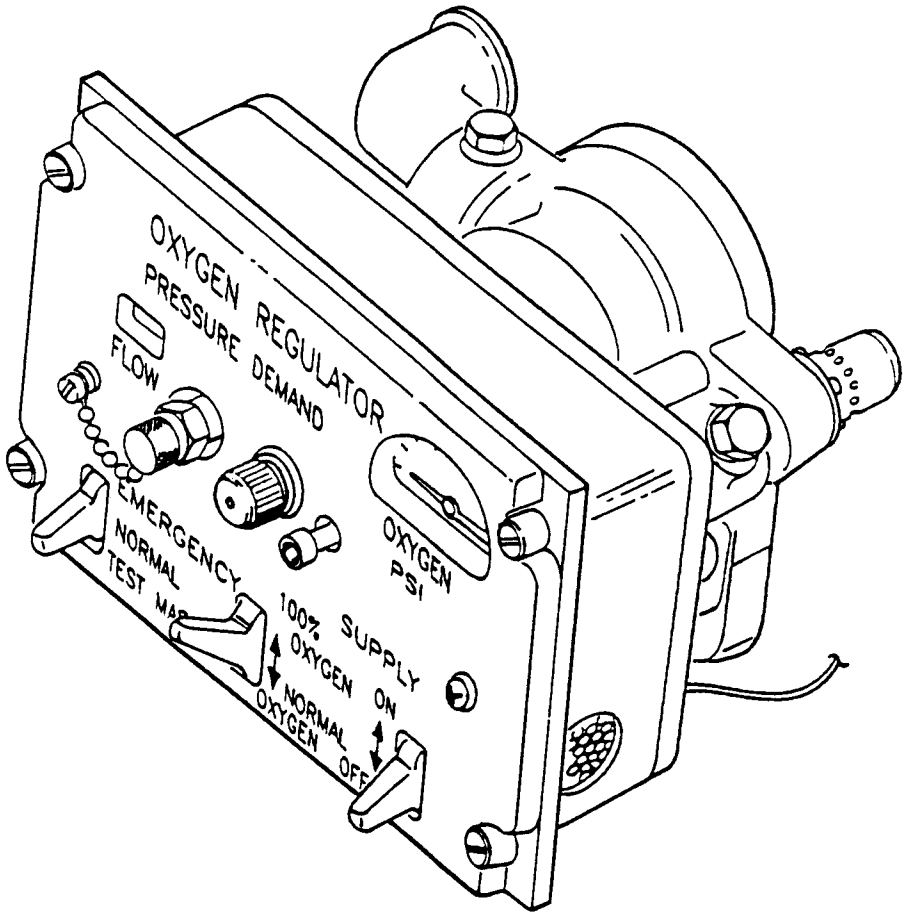

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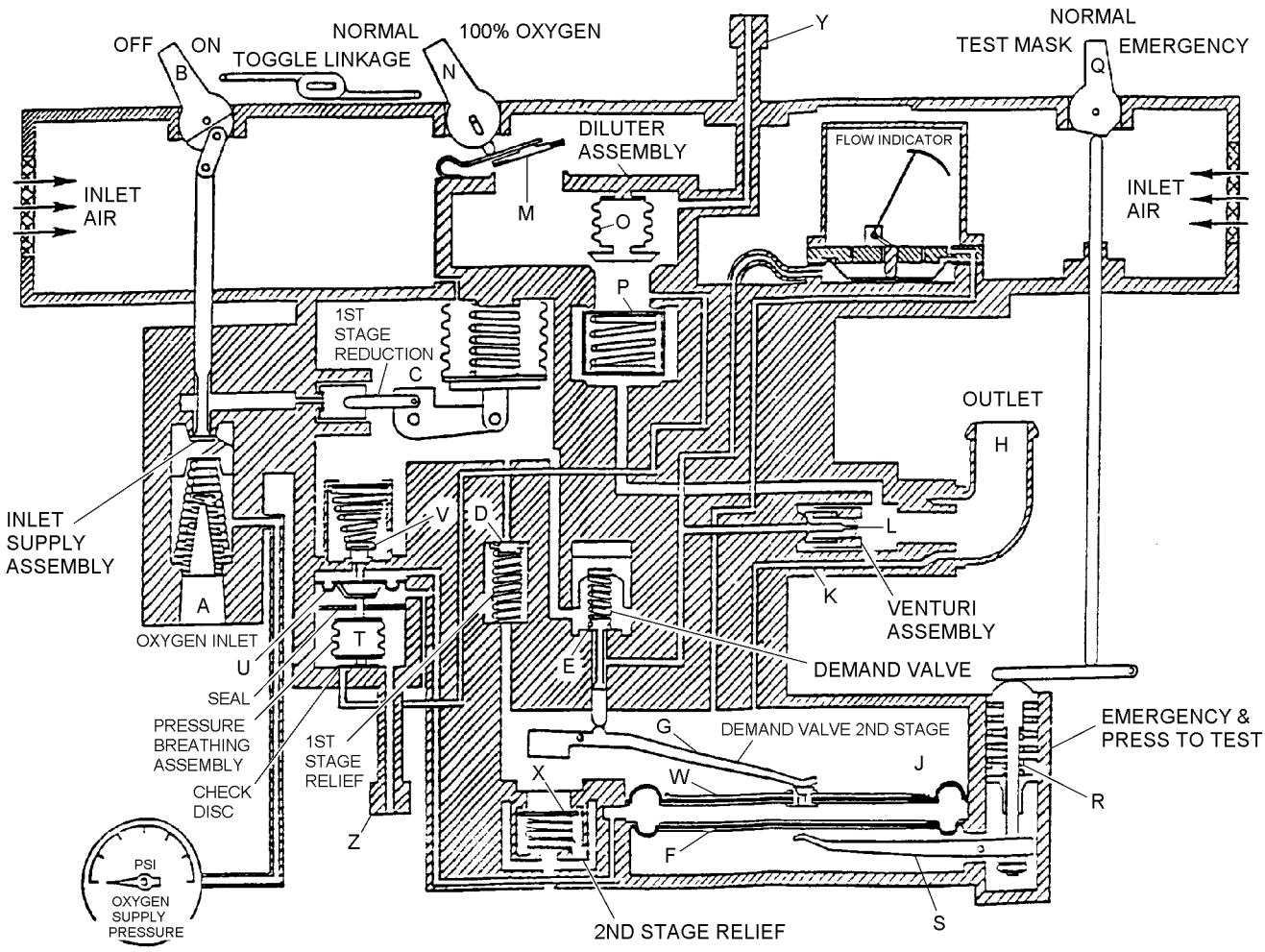
Figure 14-1. Aircraft Panel Mounted Oxygen Regulator, Types CRU-68A/A, CRU-73/A, and CRU-92/A



LEGEND

A. OXYGEN INLET
B. SUPPLY LEVER
C. 1ST STAGE REDUCTION CHAMBER
D. 1ST STAGE RELIEF VALVE
E. DEMAND VALVE
F. DEMAND DIAPHRAGM
G. 2ND STAGE DEMAND VALVE LEVER
H. OXYGEN OUTLET
J. DEMAND DIAPHRAGM CHAMBER
K. SENSING PORT
L. VENTURI ASSEMBLY
M. DILUTER VALVE
N. DILUTER LEVER
O. DILUTER ANEROID
P. DILUTER CHECK VALVE
Q. EMERGENCY LEVER
R. RELIEF VALVE SPRING
S. EMERGENCY AND PRESS TO TEST LEVER
T. ANEROID
U. ANEROID T DIAPHRAGM
V. BALL VALVE ASSEMBLY
W. PRESSURE BREATHING DIAPHRAGM
X. 2ND STAGE RELIEF VALVE
Y. AIR INLET TEST PORT
Z. PRESSURE BREATHING TEST PORT

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Figure 14-2. Regulator Operation

Table 14-1. Leading Particulars

CHARACTERISTICS		
CRU-73/A	B40550-1	50 to 500 psi
CRU-92/A	B40860-1	50 to 500 psi
CRU-73/A	14950-45	50 to 500 psi
CRU-73/A	14950-40	50 to 500 psi
CRU-68A/A	14950-34M	50 to 500 psi
Voltage		28 Vdc
Mounting		Panel
Dimensions:		
Width		5.750 in.
Height		3.000 in.
Depth		4.250 in.
Weight		2.769 lb.
Operating Altitude Ranges:		
Air-Oxygen Mixture		Up to 32,000 ft
100% Oxygen (Normal plus Pressure Breathing)		Up to 43,000 ft
100% Oxygen (Normal plus Pressure Breathing)		Up to 50,000 ft
Visual Indications		Oxygen PSI Gage and Flow Indicator
Regulator Controls:		
Diluter Lever		To select NORMAL or 100% OXYGEN
Supply Lever		To select ON or OFF
Emergency Lever		To select emergency or ground test of mask

4. At altitudes above 32,000 feet, in the normal supply mode with supply lever (B) in the ON position and diluter lever (N) in NORMAL OXYGEN position, aneroid (O) expands and closes diluter valve (M), preventing inlet air from diluting the oxygen. 100 percent oxygen is supplied from inlet (A), through the inlet supply assembly, into the first stage reduction chamber (C), through demand valve (E), venturi assembly (L), and outlet (H).

5. At altitudes above 30,000 feet, in the normal supply mode with supply lever (B) in the ON position and diluter lever (N) in the NORMAL OXYGEN position, the regulator automatically supplies pressure and pressure breathing by utilizing a pneumatic device actuated by aneroid (T) starting at approximately 27,000 feet. As altitude is increased, aneroid (T) forces diaphragm (U) to expand and actuate pressure breathing ball valve assembly (V) permitting oxygen to flow to pressure breathing diaphragm (W). As diaphragm (W) moves on second demand valve lever (G), positive pressure is increased at oxygen outlet (H). Second stage relief valve (X) prevents an over pressurization of demand diaphragm chamber (J).

6. At altitudes below 32,000 feet, with the supply lever (B) in the ON position, and diluter lever (N) in the 100% OXYGEN position, diluter valve (M) will close and 100 percent oxygen will be available. The 100 percent oxygen is supplied from inlet (A), through the inlet supply assembly, into first stage reduction chamber (C), through demand valve (E), then through venturi (L), and outlet (H).

7. When the emergency lever (Q) is placed in the EMERGENCY position, a force is applied to spring (R). Lever (S), attached to spring (R), mechanically loads the demand diaphragm (F). Pressure breathing diaphragm (W) is pressure loaded, acting on second stage demand valve lever (G). Demand valve (E) is opened when second stage demand valve lever (G) is forced up, providing positive pressure at outlet (H).

8. When the emergency lever (Q) is momentarily placed in the TEST MASK position, a force is applied to spring (R). Spring (R) loads pressure breathing diaphragm (W) through lever (S) moving diaphragm (F). Diaphragm (F) applies a pressure load to pressure breathing diaphragm (W) which acts on demand valve lever (G). Demand valve lever (G) provides positive pressure to the oxygen mask. The resulting outlet pressure will be higher than the emergency pressure. This feature allows the pilot to check the mask for leakage and proper fit before use.

9. The air inlet test port (Y) is used to check the altitude at which aneroid (O) stops the flow of added air. By pulling a vacuum at test port (Z) with diluter lever (N) in the 100% OXYGEN position, monitoring of test port (Y) with an altimeter will check operation of the diluter aneroid (O). Pressure breathing test port (Z) is also used to check the pressure at outlet (H) when aneroid (T) is subjected to various levels of vacuum to simulated altitude.

10. The regulator has two visual indicators. They are the flow indicator and the oxygen psi pressure gage. The pressure gage is calibrated to display supply pressure to the regulator in psig.

11. During periods of flow to outlet (H), oxygen also flows to the flow indicator. Pressure on the indicator diaphragm will rotate a white flag to show in a window indicating oxygen flow. Whenever an oxygen source is connected to inlet (A), regardless of the position of supply lever (B), pressure is indicated on the oxygen supply gage.

14-9. SERVICE LIFE.

14-10. Oxygen regulators shall remain in service for as long as they function correctly and do not require excessive repair (exceeds 75% of original cost of regulator). All affected silicone rubber parts shall be replaced whenever a regulator is disassembled for repair.

14-11. REFERENCE NUMBERS, ITEMS, AND SUPPLY DATA.

14-12. Section 14-5, Illustrated Parts Breakdown, contains information on each assembly, subassembly, and component part of the regulators. The figure and index number, reference or part number, description, and units per assembly are provided with the breakdown.

Section 14-2. Modifications

14-13. GENERAL.

14-14. There are currently no authorized modifications for the Aircraft Panel Mounted Oxygen Regulators.

Section 14-3. Performance Test Sheet Preparation

14-15. GENERAL.

14-16. Preparation of Oxygen Regulator Performance Test Sheets require that, through the various graphs, actual flows given in applicable directives and provided in this section be converted to indicated flows.

14-17. 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 flow must be converted to inches of water pressure (inH_2O), the form of measurement that can be read on the test stand manometers.

NOTE

The various graphs supplied with each Oxygen System Components Test Stand, Model 1172AS100 and 1316AS100, are used in converting flows. The graphs supplied are not interchangeable between test stands.

14-18. The information provided in the tables in this Section is to be recorded on the Performance Test Sheet (figure 14-3).

14-19. The Performance Test Sheet (figure 14-3) is a sample only, but may be reproduced for local use.

REGULATOR PERFORMANCE TEST SHEET

CARLETON TYPES CRU-73/A, CRU-92/A, AND
CRU-68A/A REGULATORS

DATE _____ TYPE _____ SERIAL NO. _____

TEST STAND SERIAL NO. _____ TESTED BY _____ CDI _____

1. INWARD LEAKAGE TEST _____ 2. OUTLET LEAKAGE TEST _____
3. OXYGEN SUPPLY VALVE LEAKAGE TEST _____ 4. OVERALL LEAKAGE TEST _____
5. PRESSURE GAGE TEST: NOTE: TESTED AT AMBIENT TEMPERATURE OF 70°F.

LOW PRESSURE REGULATOR ONLY

PRESSURE GAGE (PSIG)	TOLERANCE PSIG	BEFORE TAP	AFTER TAP
50	± 10		
100	± 25		
500	± 25		

6. OUTWARD LEAKAGE TEST _____
7. RELIEF VALVE TEST
   a. VENTS 45 LPM _____ AT 40.7 INH_2O (3 INHg)
   b. LEAKAGE AT 17 INH_2O _____
8. FLOW SUCTION TEST

ALTITUDE	INLET PRESSURE (PSIG)	ACTUAL OUTPUT (LPM)	NORMAL		100 PERCENT		MAXIMUM SUCTION (INH_2O)
			INDICATED OUTPUT	READING	INDICATED OUTPUT	READING	
SEA LEVEL	50	30					-0.50
SEA LEVEL	150	50					-0.70
SEA LEVEL	150	85					-1.0

9. OXYGEN RATIO TEST (INLET PRESSURE 50 PSIG FOR LOW PRESSURE REGULATORS)

ALTITUDE (1000 FT)	OXYGEN PERCENT		OUTPUT				INPUT				
	MIN	MAX	AVERAGE PERCENT	ACTUAL OUTPUT (LPM)	INDICATED OUTPUT (INH_2O)	CORRECTED INDICATED OUTPUT	ACT HI	ACT LOW	IND HI	IND LOW	READING
10	6	45	25.5	15			14.1	8.25			
10	6	60	33	85			79.9	34			
20	24	55	39.5	15			11.4	6.75			
20	24	80	52	85			64.6	17			
28	60	100	80	15			6	0		0	
28	60	100	80	85			34	0		0	
32	98	100	99	85			1.7	0		0	

10. ANEROID AIR VALVE CLOSURE TEST (28,000 TO 32,000 FEET) PERFORMED ONLY IF REGULATOR FAILS OXYGEN RATIO TEST _____

Figure 14-3. Performance Test Sheet (Sheet 1 of 2)

11. SAFETY PRESSURE/PRESSURE BREATHING TEST (INLET PRESSURE 50 PSIG FOR LOW PRESSURE REGULATORS)

ALTITUDE (1000 FT)	OUTPUT		PRESSURE (INH_2O)		
	ACTUAL (LPM)	INDICATED (INH_2O)	MINIMUM	READING	MAXIMUM
30	0	0	0.01		2.50
30	85		0.01		2.50
40	0	0	0.30		5.60
40	85		0.30		5.60
43	0	0	5.30		12.50
43	85		5.30		12.50
50	0	0	11.20		18.20
50	85		11.20		18.20

12. BLINKER (FLOW INDICATOR) TEST (INLET PRESSURE 50 PSIG FOR LOW PRESSURE REGULATORS)

ALTITUDE/ PRESSURE	DILUTER LEVER	OUTPUT		READING	BLINKER POSITION
		ACTUAL	INDICATED		
SEA LEVEL	NORMAL	20			FULLY OPEN
SEA LEVEL	100%	8			FULLY OPEN
SEA LEVEL	100%	0	0		CLOSE IMMED
17 INH_2O	100%	12			FULLY OPEN
17 INH_2O	100%	0	0		CLOSE IMMED

13. EMERGENCY PRESSURE TEST (INLET PRESSURE 50 PSIG FOR LOW PRESSURE REGULATORS)

OUTPUT		DILUTER LEVER	EMERGENCY LEVER	PRESSURE READING	TOLERANCE (INH_2O)
ACTUAL	INDICATED				
10 LPM		NORMAL	EMERGENCY		2.0 TO 4.0
80 LPM		100%	EMERGENCY		1.0 MIN.
10 LPM		100%	TEST MASK		6.0 TO 16.0

NOTES: WITH ZERO FLOW, OUTLET PRESSURE SHALL NOT EXCEED 17.5 INH_2O WITH EMERGENCY PRESSURE CONTROL LEVER IN TEST MASK POSITION. WITH EMERGENCY PRESSURE CONTROL LEVER IN EMERGENCY POSITION, OUTLET PRESSURE SHALL NOT EXCEED 5.5 INH_2O.

14. REGULATOR OXYGEN PURGE: APPLY 500 PSIG TO LOW PRESSURE REGULATORS WITH AVIATORS BREATHING OXYGEN AND FLOW 1 TO 3 MINUTES.

Figure 14-3. Performance Test Sheet (Sheet 2 of 2)

14-20. The following tests require conversion of flows from actual lpm to indicated inH_2O.

1. Relief Valve Test.
2. Flow Suction Test.
3. Oxygen Ratio Test.
4. Safety Pressure/Pressure Breathing Test.
5. Blinker (Flow Indicator) Test.
6. Emergency Pressure Test.

14-21. REGULATOR PERFORMANCE TESTS.

14-22. SECOND STAGE RELIEF VALVE TEST. The relief valve shall vent at least 45 lpm at a specified pressure. The actual 45 lpm flow must be converted to an indicated inH_2O flow by using the nitrogen (N_2) line of the Vent Flow Graph. Convert the actual flow as follows:

1. Locate the 45 lpm line on the bottom of the Vent Flow Graph, and trace the line up to where it intersects the N_2 line.

2. Trace the line on the graph where the lpm and N_2 lines intersect across the graph to the left hand column to determine indicated inH_2O.

3. Enter this information in the appropriate block on the Performance Test Sheet.

14-23. FLOW SUCTION TEST. The Flow Suction Test shall be performed at sea level with the diluter control lever in both the 100% OXYGEN and NORMAL OXYGEN position. Actual (lpm) flows are converted to indicated (inH_2O) flows by using the Sea Level Output Graph. The air line is used for NORMAL OXYGEN flows, and the N_2 line is used for 100% OXYGEN flows. Convert the actual flows as follows.

NOTE

Test Stand Input and 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 and input graph with various altitude lines, while others may have separate graphs for each altitude. Ensure the specified graph is used.

1. Locate the desired lpm line (figure 14-3) at the bottom of the Sea Level Output Graph.

2. Trace selected lpm line up to where it intersects the air line (NORMAL indicated output) or N_2 line (100% indicated output).

3. Trace the line from point of intersection across the graph to the left hand column to determine indicated 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 14-3.

14-24. OXYGEN RATIO TEST. Actual flows and oxygen percentages (figure 14-3) used for the Oxygen Ratio Test must be converted to indicated flows and oxygen averages. All actual flows must be converted to indicated flows. The results of these computations shall be entered in the appropriate columns within the Oxygen Ratio Test portion of the Performance Test Sheet. To find average oxygen, indicated output, corrected indicated output, actual and indicated input flows, proceed as follows:

NOTE

Test Stand Input and 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 and input graph with various altitude lines, while others may have separate graphs for each altitude. Ensure the specified graph is used.

14-25. AVERAGE OXYGEN. These figures are provided but are computed as follows. Average Oxygen is found by adding the minimum and maximum oxygen percentage (figure 14-3) then dividing the sum by 2 (e.g., 6% + 45% = 51% ÷ 2 = 25.5%).

1. Enter the resulting figure (25.5%) in the appropriate block on the Performance Test Sheet.

2. Repeat this procedure for all minimum and maximum oxygen percentages.

14-26. Indicated Output. To convert the actual output flows (lpm) given in figure 14-3 to Indicated Output flows (inH_2O), proceed as follows:

1. Locate the desired actual output at the bottom of the Output Graph (figure 14-3).

2. Trace the selected line up to the point of intersection with the appropriate altitude air line.

3. Trace the line on the graph from where the desired lpm and the altitude air lines intersect across the graph to the left hand column to determine indicated inH_2O.

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

NOTE

Flows at 28,000 and 32,000 feet are converted by using the next higher altitude air line or Output Graph (e.g. 30,000-foot Output Graph or 35,000-foot Output Graph).

5. Repeat steps 1 through 4 for all actual output flows given in figure 14-3.

14-27. Corrected Indicated Output. Corrected Indicated Output is indicated output with the required percentage of nitrogen added. To find Corrected Indicated Output, proceed as follows:

NOTE

Use Oxygen/Air/Nitrogen Conversion Graph provided in NAVAIR 17-15BC-21.

1. Locate the indicated output (inH_2O) at the bottom of the Oxygen/Air/Nitrogen Conversion Graph.

2. Find the average oxygen percentage on the Performance Test Sheet corresponding to the selected indicated output.

NOTE

Select percentage line on Oxygen/Air/Nitrogen Conversion Graph nearest to average oxygen figure selected from Average Oxygen column on Performance Test Sheet.

3. Follow the indicated output line selected on the Oxygen/Air/Nitrogen Conversion Graph up to the appropriate N_2 percentage line.

4. Trace the line on the graph where the selected indicated output and N_2 percentage lines intersect across the left hand column to determine inH_2O.

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

6. Repeat steps 1 through 5 for all required indicated output flows.

14-28. Actual High Air. These figures are provided, but are computed as follows. Find the Actual High Air by subtracting the minimum oxygen percentage (figure 14-3) from 100%; multiply the result by the corresponding actual output (e.g., 100% - 6% = 94% x 15 lpm = 14.10 lpm).

1. Enter 14.10 lpm in the Actual High Air column on the Performance Test Sheet.

2. Repeat the procedures for all minimum oxygen procedures given.

14-29. Actual Low Air. These figures are provided but are computed as follows. Find the Actual Low Air by subtracting the maximum oxygen percentage (figure 14-3) from 100%; multiply the result by the corresponding actual output (e.g., 100% - 45% = 55% x 15 lpm = 8.25 lpm).

1. Enter 8.25 lpm in the Actual Low Air column on the Performance Test Sheet.

2. Repeat the procedures for all maximum oxygen percentages given.

14-30. Indicated High Air (Input). To convert Actual High Air to Indicated High Air, proceed as follows:

1. Locate the actual input (lpm) at the bottom of the Test Stand Input Graph.

NOTE

Flows at 28,000 and 32,000 feet are converted by using the next higher altitude air line or Input Graph (e.g. 30,000-foot Input Graph or 35,000-foot Input Graph).

2. Trace the selected line up to where it intersects the appropriate altitude line.

3. Trace the line on the graph where the actual input and desired altitude lines intersect across the graph to the left hand column to determine indicated inH_2O.

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

5. Repeat steps 1 through 4 for all Actual High Air figures previously entered on Performance Test Sheet.

14-31. Indicated Low Air (Input). To convert Actual Low Air to indicated low air, proceed as follows:

1. Locate the actual input (lpm) at the bottom of the Test Stand Input Graph.

2. Trace the selected line up to where it intersects the appropriate altitude line.

3. Trace the line on the graph where the actual input and desired altitude lines intersect across the graph to the left hand column to determine indicated inH_2O.

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

5. Repeat steps 1 through 4 for all Actual Low Air figures previously entered on Performance Test Sheet.

14-32. SAFETY PRESSURE AND PRESSURE BREATHING TEST. Actual output flows (lpm) given in the Safety Pressure Breathing Test section of the Performance Test Sheet must be converted to indicated output flows (inH_2O). To convert the flows, proceed as follows:

NOTE

Test Stand Input and 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 and input graph with various altitude lines, while others may have separate graphs for each altitude. Ensure the specified graph is used.

1. Locate the desired actual output (figure 14-3) at the bottom of the test stand Output Graph.

2. Trace the selected line up to where it intersect the N_2 line, then across the graph to the left hand column to determine indicated inH_2O.

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

NOTE

Flows at 43,000 feet are converted using the 45,000-foot N_2 line on the Output Graph or the 45,000-Output Graph.

4. Repeat steps 1 through 4 for all actual flows given in the Safety Pressure and Pressure Breathing Test section on Performance Test Sheet.

14-33. BLINKER (FLOW INDICATOR) TEST. Actual output flows (lpm) for the Blinker Test section of the Performance Test Sheet must be converted to indicated output flows (inH_2O). To convert the flows refer to paragraphs 14-34 through 14-36.

14-34. Diluter Toggle Normal Oxygen Position. Use the air line of the Sea Level Output Graph.

1. Locate the actual output (figure 14-3) at the bottom of the graph and trace the selected line up to the air line.

2. Trace the line where the actual output and air lines intersect across the graph to the left hand column to determine indicated inH_2O.

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

14-35. Diluter Toggle 100 Percent Oxygen Position (Sea Level). Use the N_2 line on the Sea Level Output Graph.

1. Locate actual output (lpm) (figure 14-3) at the bottom of the graph and trace the selected line up to the N_2 line.

2. Trace the line where the actual output and N_2 lines intersect across the graph to the left hand column to determine indicated inH_2O.

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

14-36. Diluter Toggle 100 Percent Oxygen Position (17 inH_2O). Use the 50,000-foot N_2 line on the Output Graph.

1. Locate actual output (lpm) (figure 14-3) at the bottom of the Output Graph (or 50,000-foot Output Graph) and follow selected line up to the 50,000-foot N_2 line.

2. Trace the line where the actual output and N_2 lines intersect across the graph to the left hand column to determine indicated inH_2O.

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

14-37. EMERGENCY PRESSURE TEST. Actual output flows (lpm) specified for the Emergency Pressure Test can be found in the Emergency Pressure Test section of the Performance Test Sheet. Actual flows must be converted to indicated flows (inH_2O). To convert the flows, refer to paragraphs 14-38 through 14-39.

14-38. Diluter Toggle Normal Oxygen Position. Use air line of Sea Level Output Graph.

1. Locate the actual output (lpm) (figure 14-3) at the bottom of the Sea Level Output Graph and trace the selected line up to the air line.

2. Trace the line where the actual output and air lines intersect across the graph to the left hand column to determine indicated inH_2O.

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

14-39. Diluter Toggle 100 Percent Oxygen Position. Use the N_2 line on the Sea Level Output Graph.

1. Locate the actual output (lpm) (figure 14-3) at the bottom of the Sea Level Output Graph and trace the selected line up to the N_2 line.

2. Trace the line where the actual output and N_2 lines intersect across the graph to the left hand column to determine indicated inH_2O.

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

Section 14-4. Maintenance

14-40. GENERAL.

14-41. This section contains the procedural steps for inspecting, testing, troubleshooting, disassembly, cleaning, assembly, and adjusting of Aircraft Panel Mounted Oxygen Regulators.

NOTE

The regulators shall be considered beyond economical repair when the cost of repair parts exceeds 75% of original cost of regulator. Upon completion of any maintenance action (e.g., inspection, repair, modification, etc), be sure to complete the required Maintenance Data Collection System forms.

14-42. Procedural steps outlined in this section are listed under the aircraft inspection cycle in which they are required, and are in the sequence in which they normally occur.

14-43. Bench Tests shall be performed on aircraft panel mounted oxygen regulators prior to be 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. To ensure damage did not occur during extensive transportation and shipment (via commercial/U.S. Mail); all regulators shall be subjected to a Bench Test, when received from supply, and prior to being placed in service.

14-44. Bench Test shall be performed using Oxygen Systems Components Test Stand, Model 1172AS100 or 1316AS100. Refer to appropriate ground support equipment manual for identification of test stand controls and indicators referred to in Bench Test.

14-45. Due to the complexity of the Model 1172AS100 or 1316AS100 Test Stands, 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.

14-46. INSPECTION.

14-47. TURNAROUND/PREFLIGHT/POST FLIGHT/TRANSFER INSPECTION. The Turnaround/Preflight/Postflight/Transfer Inspection consists of a Visual Inspection performed in conjunction with the aircraft inspection requirements for the aircraft in which the regulators are installed. Refer to table 14-2 for assistance in troubleshooting. To perform the inspection, visually inspect the following:

1. Electrical performance of panel light.

2. Legibility of all markings.

3. Plastic lighting plate for cracks and discoloration.

4. Low or improper reading on pressure gage

5. Emergency pressure control toggle in NORMAL position.

6. Diluter control toggle in 100% OXYGEN position.

7. Supply control toggle in OFF position.

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

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

14-48. If discrepancies are found or suspected, Maintenance Control shall be notified.

14-49. Regulators that do not pass inspection and cannot be repaired in the aircraft shall be removed and replaced with Ready-For-Issue (RFI) regulators. Non-RFI regulators shall be forwarded to the nearest maintenance activity having repair capability.

14-50. ACCEPTANCE/SPECIAL/DAILY INSPECTION. The Acceptance/Special/Daily Inspection consists 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 14-2 for assistance in troubleshooting. To perform the inspection, proceed as follows:

WARNING

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

14-51. Visual Inspection. Visually inspect the regulators in accordance with paragraph 14-58.

14-52. Functional Test. To perform Functional Test, proceed as follows:

1. Place supply valve control toggle in ON position.

2. Place diluter control toggle in NORMAL OXYGEN position.

3. Connect oxygen hose quick disconnect. Place mask to face and inhale. Proper regulator operation will be indicated by flow indicator assembly showing white during inhalation and black during exhalation.

Table 14-2. Troubleshooting (Daily/Preflight/Special/Turnaround/Transfer and Acceptance Inspection)

Trouble	Probable Cause	Remedy
Oxygen cylinder pressure gage fails to indicate proper pressure.	Defective gage.	Replace regulator.
	Blocked or leaking supply line.	Replace or clean supply line to regulator.
	Low cylinder.	Refill.
	Defective inlet valve assembly.	Replace regulator.
Oxygen not available at mask with proper pressure source to regulator and other than emergency setting on regulator.	Regulator controls improperly position.	Correct position of controls.
	Hose to mask is kinked.	Straighten hose and reposition outlet.
	Regulator not functioning properly.	Replace regulator.
Oxygen not available at mask with proper pressure source to regulator and regulator set at EMERGENCY.	Kink or other malfunction between hose and mask.	Replace or readjust equipment as necessary.
	Faulty linkage from emergency pressure control lever.	Replace regulator.
Oxygen available at mask but flow is not indicated.	Defective blinker assembly.	Replace regulator.
Gage pressure drops when regulator is not in use.	Loose or leaking connections.	Tighten or replace connections as necessary.
	Defective manifold inlet assembly.	Replace regulator.
Panel lamp fails to light.	Burned out lamp.	Replace lamp.
	Faulty lamp assembly.	Replace regulator.
	Faulty electrical hookup to power source.	Repair electrical hookup.

NOTE

While at ground level, the regulator will not normally supply oxygen from the supply system to the mask. The emergency pressure control toggle must therefore be used in order to check out the oxygen supply function of the regulator at low altitudes. The emergency toggle is spring loaded at the TEST MASK position and will return to NORMAL when released.

4. Hold emergency pressure toggle in TEST MASK position and observe flow indicator. Flow indicator should be white, indicating a flow through regulator.

14-53. Upon completion of Functional Test, secure regulator as follows:

1. Disconnect mask from supply hose.

2. Ensure that emergency pressure control toggle returns to NORMAL position.

3. Place supply control toggle in the off position, the diluter control toggle should automatically be placed in the 100% OXYGEN position.

14-54. If discrepancies are found or suspected, Maintenance Control shall be notified.

14-55. 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.

14-56. CALENDAR/PHASED/SDLM INSPECTION. Calendar, Phased, or SDLM Inspection require removal of the regulators from the aircraft. See applicable Planned Maintenance System (PMS) publications for specific intervals. In no case shall the interval exceed 448 days. Upon removal from the aircraft, regulators shall be inspected and bench tested. All work shall be performed in a clean dust-free and oil-free area.

14-57. Aircraft Panel Mounted Oxygen Regulators failing Visual Inspection or Bench Test shall be repaired. SM&R codes define reparability of components and the lowest level of maintenance authorized. Instructions can be found in the current issue of Naval Aviation Maintenance Program, OPNAVINST 4790.2 (Series).

14-58. Visual Inspection. To visually inspect the regulator, proceed as follows:

Materials Required

Quantity	Description	Reference Number
As Required	Cloth, Lint-free, White	MIL-C-85043

1. Inspect regulator inlet and outlet for foreign objects, dirt, corrosion, bends, dents, cracks, damaged threads, and any other obvious damage.

2. Ensure that regulator inlet filter is properly installed.

3. Inspect regulator body for bends, dents, cracks, corrosion, condition and legibility of nameplate, security of screws and fittings, and any other obvious damage.

4. Inspect regulator for contamination in the form of a black/gray residue caused by wear/vibration as follows:

NOTE

It has been determined that this form of lead contamination poses no threat to aircrewmember's health.

Index numbers in parentheses refer to figure 14-11, unless otherwise noted.

a. Disassemble the emergency pressure control and diaphragm assembly of regulator in accordance with paragraph 14-95.

b. Using a clean lint-free piece of white cloth, swab area around emergency pressure control assembly (70). Examine cloth for traces of contamination.

c. Thoroughly inspect emergency pressure control lever and center assembly (79, figure 14-15) for wear at the attachment of the assembly to the control lever.

d. Inspect the outer diaphragm (75) and diaphragm and plate assembly (77) for evidence of wear/contamination.

e. Inspect the demand valve lever assembly (78) for wear.

f. If no wear/contamination is found, assemble the diaphragm and plate assembly (77) in accordance with paragraph 14-116 and perform Bench Test.

g. If wear/contamination is found proceed with steps h through k.

h. Disassemble regulator in accordance with paragraph 14-76.

i. Clean the disassembled parts in accordance with paragraph 14-98.

j. Replace worn or defective parts and assemble regulator in accordance with paragraph 14-104.

k. Bench Test assembled regulator.

14-59. BENCH TEST.

14-60. The Bench Test shall be performed using Oxygen Systems Components Test Stand, Model 1172AS100 or 1316AS100. Proceed as follows:

WARNING

Because of possible vacuum pump explosion, only water-pumped nitrogen, Type 1, Class 1, 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 cylinders. These cylinders can not be certified contaminant free.

NOTE

Nitrogen supply cylinders utilized in testing oxygen components contain a maximum pressure of 1800 psig. For tests requiring pressures of 1800 psig, utilize highest available pressure, but in no case shall this pressure be less than 500 psig.

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

14-61. Unless otherwise specified in specific tests, the pressure applied, control toggle settings, flows drawn, etc., shall be the same for all regulators.

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.

14-62. INWARD LEAKAGE TEST. To perform the Inward 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

Support Equipment Required

Quantity	Description	Reference Number
1	Adapter Assembly	NAVAIR Dwg No. 1172AS136
1	Oxygen Systems Components Test Stand	1172AS100 or 1316AS100

WARNING

Prior to use, inspect leak detection compound. Compound which is not clear and free from suspended material/sediment is considered contaminated and shall be disposed of. Compound exhibiting peculiar odors such as acetone or alcohol is considered contaminated and shall be disposed of.

NOTE

Regulators bench tested in this chapter have in plane test ports located on the face plate for Air Force specifications. The test ports will not be used during bench testing, however the test ports will be checked for leakage.

1. Ensure test stand valves are closed and then open N_2 supply cylinder valve.

2. Place regulator supply control valve lever in the OFF position, and the diluter control lever in the 100% OXYGEN position.

NOTE

Properly functioning levers/toggles can be determined when the ON/OFF toggle is placed in the OFF position, the NORMAL/100% OXYGEN toggle will automatically be toggled to the 100% OXYGEN mode. When the ON/OFF toggle is in the ON position, either NORMAL or 100% mode of operation can be selected.

3. Ensure regulator emergency pressure control lever is in NORMAL position. Cap regulator inlet.

NOTE

Regulator shall be mounted on a horizontal plane in the test chamber.

4. If using the Model 1316AS100 test stand proceed to step 5. If using the 1172AS100 test stand, perform the Leakage Test as follows:

a. Using an adapter (NAVAIR Drawing No. 1172AS136), connect the regulator outlet to N_2 INPUT connection (18) in the altitude chamber.

b. Connect a line from LOW PRESS. connection (19) to REF. TAP and connection (21) in altitude chamber. Plug the rubber hose attached to piezometer (26) using piezometer plug supplied with test stand.

WARNING

Ensure that no pressure is indicated on regulated high pressure gage (10), regulated low pressure gage (11), and N_2 input pressure gage (27).

Ensure LOW PRESS. REGULATOR. (N) is not loaded. This will prevent N_2 supply cylinder pressure from passing on to INLET PRESS. ON/OFF valve (L), which could damage the test item, or cause injury to the test stand operator.

c. Turn INLET PRESS. ON/OFF valve (L) to the ON position.

CAUTION

Vacuum pump vent (54) must be opened one to two turns when operating vacuum pump. Refer to appropriate ground support equipment manual.

d. Turn vacuum pump on.

e. Turn PRESS. SELECTOR valve (D) to the H_2O position. Fully open LEAKAGE CONTROL valve (E).

f. Ensure LEAKAGE SELECTOR valve (F) is in HIGH RANGE position.

NOTE

HIGH RANGE LEAKAGE rotameter (8) is calibrated with an applied pressure of 70 psig. The inward leakage test requires that a suction of 9.0 inH_2O be applied to the regulator outlet and the rotameter. This pressure difference (9.0 inH_2O vice 70 psig) creates a wide variance between actual leakage and indicated leakage. The maximum allowable leakage for the Inward Leakage Test is 200 ccm. An actual leakage of 200 ccm will be displayed on HIGH RANGE LEAKAGE rotameter (8) as an indicated 740 ccm.

g. Slowly open OUTPUT valve (C) until 9.0 inH_2O suction is indicated on PRESS./SUCTION manometer (4). Any leakage will be displayed on HIGH RANGE LEAKAGE rotameter (8). The maximum allowable indicated leakage is 740 ccm (actual 200). Record indicated leakage on the Performance Test Sheet

h. Close OUTPUT valve (C) and LEAKAGE CONTROL valve (E). Turn vacuum pump OFF. Turn INLET PRESS. ON/OFF valve (L) to the OFF position.

i. Disconnect line from LOW PRESS. connection (19) and REF. TAP and connection (21) in altitude chamber. Disconnect regulator outlet from N_2 INPUT connection (18). Remove piezometer plug from piezometer (26). Remove cap from regulator inlet.

j. If excessive leakage is indicated, locate probable cause, using troubleshooting table 14-3.

5. If using the Model 1316AS100 test stand, proceed as follows:

a. Connect piezometer (26) to regulator outlet. Connect a line from 20 to 200 ccm leakage connection (20) to REF. TAP and connection (21) in altitude chamber.

CAUTION

Vacuum pump vent (54) must be opened one to two turns when operating vacuum pump. Refer to appropriate ground support equipment manual.

b. Turn vacuum pump on.

c. Turn PRESS. SELECTOR valve (D) to the H_2O position.

d. Open OVERBOARD toggle (T).

e. Ensure LEAKAGE SELECTOR valve (F) is in HIGH RANGE position.

f. Open INWARD REF. TAP (P) until 9.0 inH_2O suction is indicated on PRESS./SUCTION manometer (4). Any leakage will be displayed on leakage rotameter (6). The maximum allowable indicated leakage is 200 ccm. Record indicated leakage on the Performance Test Sheet

g. Close INWARD REF. TAP (P) and OVERBOARD toggle (T). Disconnect line from 20 to 200 ccm leakage connection (20) and REF. TAP and connection (21) in altitude chamber. Turn vacuum pump OFF and disconnect piezometer (26) from regulator outlet.

h. If excessive leakage is indicated, locate probable cause, using troubleshooting table 14-3.

Table 14-3. Troubleshooting (Inward Leakage Test)

Trouble	Probable Cause	Remedy
Note: Unless otherwise noted, index numbers in parentheses refer to figure 14-16.		
Diluter plate control housing and check valve assembly leaking.	Damaged diluter valve assembly (23).	Replace diluter valve assembly (23).
	Diluter housing gasket (8) leaking.	Tighten screws (1) or replace diluter housing gasket (8).
	Preformed packing (9) leaking.	Replace preformed packing (9).
	Diluter plate (6) and seat assembly (23) damaged.	Replace diluter plate (6) and seat assembly (23).
	Manual diluter valve control lever (88, figure 14-11) bent or binding.	Replace manual diluter valve control lever (88, figure 14-11).
Diluter valve control lever leaking.	Diluter valve control lever (88, figure 14-11) not adjusted properly.	Adjust diluter valve control lever (paragraph 14-116).
Leakage from regulator outlet.	Preformed packing (136, figure 14-11) leaking.	Replace preformed packing (136, figure 14-11).
	Loose screws (134, 135, figure 14-11).	Tighten screws (134, 135, figure 14-11).
Leakage at relief valve.	Leakage past relief valve (8, figure 14-14), or relief valve seat (5) excessive.	Replace relief valve (8, figure 14-14) and seat (5).
Leakage at diluter test port.	Loose nut (13).	Tighten nut (13).
	Packings (14, 18) leaking.	Replace packing (14, 18).
	Tube and adapter assembly (19) leaking.	Replace tube and adapter assembly (19).
	Poppet valve (16) leaking.	Replace poppet valve (16).
	Fitting (15) leaking.	Replace fitting (15).
Notes: 1. Probable causes in table 14-9 Troubleshooting (Outward Leakage Test) could also cause excessive inward leakage.		

14-63. OUTLET LEAKAGE TEST. To perform Outlet Leakage Test, proceed as follows:

Materials Required

Quantity	Description	Reference Number
As Required	Compound, Leak Detection, Type 1	MIL-L-25567
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 regulator supply valve control toggle in ON position.

2. Place diluter control toggle in 100% OXYGEN position.

3. Ensure regulator emergency pressure control lever is in NORMAL position.

4. Connect regulator inlet to N_2 INPUT connection (18) in the altitude chamber.

5. Using LOW PRESSURE REGULATOR (N), apply 150 psig to the regulator inlet.

6. Slowly turn INLET PRESS. ON/OFF valve (L) to ON.

7. Activate emergency pressure control toggle to allow flow through the regulator. Return toggle to NORMAL position.

8. Draw a film of leak detection compound across the regulator outlet. Film shall not advance more than 1/2 inch in ten seconds. If film advance is more than allowable, repeat test three or four times (distention could be caused by difference in temperature between inside and outside of regulator). Record reading on Performance Test Sheet.

9. If film advance continues to be more than allowed, locate probable cause using troubleshooting table 14-4.

10. Relieve pressure on regulator to 50 psig by backing out on LOW PRESSURE REGULATOR (N) and using SYSTEM BLEED VALVE (S).

14-64. OXYGEN SUPPLY VALVE LEAKAGE TEST. To perform the Oxygen Supply Valve Leakage Test, proceed as follows:

Materials Required

Quantity	Description	Reference Number
As Required	Compound, Leak Detection, Type 1	MIL-L-25567
As Required	Nitrogen, Oil-free, Water Pumped, Type I, Class I, Grade B	Fed Spec BB-N-411 NIIN 00-985-7275

Table 14-4. Troubleshooting (Outlet Leakage Test)

Trouble	Probable Cause	Remedy
Note: Unless otherwise noted, index numbers in parentheses refer to figure 14-11.		
Demand valve assembly leaking.	Damaged demand valve seat (115).	Replace seat (115).
	Damaged demand valve assy (114).	Replace assy (114).
	Damaged preformed packings (112) or (116).	Replace packings (112) or (116).
Emergency pressure control assy Loading.	Emergency pressure lever stem out of adjustment (4, figure 14-15).	Readjust elastic nut (5, figure 14-15) so that emergency pressure control assy is not loading diaphragm.
Pressure breathing aneroid assy.	Expanded aneroid (48).	Replace aneroid (48).
First stage reduction pressure.	Pressure to high.	Adjust to 32 to 35 psi (paragraph 14-114).
First stage regulator valve and lever assy.	First stage regulator valve and lever assy (99) out of adjustment.	Readjust until approx. 2 or 3 threads show (paragraph 14-114).
First stage relief valve.	Damaged relief valve seat (129).	Replace seat (129).
	Pressure to low.	Adjust to 55 to 60 psig (paragraph 14-115).
	Weak relief valve spring (127).	Replace spring (127).
	Damaged preformed packing (130).	Replace packing (130).

Support Equipment Required

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

1. Place regulator supply valve control toggle in OFF position.

2. Place emergency control toggle in EMERGENCY position. Close altitude chamber door.

3. Ensure INLET PRESS. ON/OFF valve (L) is ON.

4. Using HIGH PRESS. REGULATOR (Q), apply 500 psig specified in table 14-5 to inlet of regulator.

5. Draw a film of leak detection compound across the regulator outlet. Record reading on Performance Test Sheet.

6. There is no allowable leakage. If leakage is noted locate probable cause using troubleshooting table 14-6.

Table 14-5. Inlet Pressure (Oxygen Supply Valve Leakage Test)

Type	Inlet Pressure (psig)
CRU-73/A	500
CRU-68A/A	500

14-65. OVERALL LEAKAGE TEST. To perform the Overall Leakage Test, proceed as follows:

NOTE

Perform this test with diluter toggle in 100% OXYGEN position, and then in the NORMAL OXYGEN position.

1. Place regulator oxygen inlet valve control toggle in ON position. Place emergency pressure control toggle in NORMAL position.

2. Ensure 500 psig pressure is still applied to regulator inlet in accordance with table 14-7.

3. Turn INLET PRESS. ON/OFF valve (L) to OFF. Leave regulator oxygen inlet valve toggle in ON position.

4. Leakage will be indicated on the regulator pressure gage. Allowable leakage shall not exceed 60 psig over a two minute period. Record reading on Performance Test Sheet.

5. If leakage is excessive, locate probable cause using troubleshooting table 14-8.

6. Turn HIGH PRESS. REGULATOR (Q) to VENT.

7. Bleed regulator by placing emergency pressure control toggle in EMERGENCY position, return toggle to NORMAL.

8. Bleed test stand to 50 psig using SYSTEM BLEED (S).

Table 14-6. Troubleshooting (Oxygen Supply Valve Leakage Test)

Trouble	Probable Cause	Remedy
Note: Unless otherwise noted, index numbers in parentheses refer to figure 14-17.		
Loading of manifold inlet assembly.	Supply valve control stem (index 3, figure 14-12 out of adjustment.	Readjust supply valve control stem (3, figure 14-12).
Leaking manifold inlet assy.	Damaged ball (8).	Replace ball (8).
	Damaged supply valve seat (10).	Replace seat (10).
	Damaged supply valve seat retainer (9).	Replace retainer (9).
	Damaged preformed packings (4, 5, 11, 13, 14, 15, 20).	Replace damaged packing(s) (4, 5, 11, 13, 14, 15, 20).

Table 14-7. Inlet Pressure (Overall Leakage Test)

Type	Inlet Pressure (psig)
CRU-73/A	500
CRU-68A/A	500

14-66. REGULATOR PRESSURE GAGE SCALE AND ERROR TEST. To perform the regulator 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 PRESS. ON/OFF valve (L) to ON.

Table 14-8. Troubleshooting (Overall Leakage Test)

Trouble	Probable Cause	Remedy
Note: Unless otherwise noted, index numbers in parentheses refer to figure 14-11.		
Manifold inlet assy leaking.	Loose manifold inlet adapter (3, figure 14-17).	Tighten or replace manifold inlet adapter (3, figure 14-17).
	Damaged preformed packings (4, 5, 11, 13, 14, 15, 20, figure 14-17).	Replace damaged packing(s) (4, 5, 11, 13, 14, 15, 20, figure 14-17).
	Loose manifold inlet assembly screws (105).	Tighten screws (105).
Pressure gage leaking.	Oxygen cylinder pressure gage (34).	Replace pressure gage (34).
	Damaged preformed packing (37).	Replace packing (37).
	Loose screws (35).	Tighten screws (35).
First stage reduction chamber leaking.	Loose screws (97) on first stage cover plate (96).	Tighten screws (97).
	Damaged first stage gasket (98).	Replace gasket (98).
	Damaged first stage bellows gasket (103).	Replace gasket (103).
Pressure breather assy leaking.	Loose screws (58).	Tighten screws (58).
	Damaged preformed packing (60).	Replace packing (60).
	Damaged pressure breather valve assy (57).	Replace assembly (57).
Emergency pressure control assembly leaking.	Emergency pressure control lever and center assembly (28) loading diaphragm and plate assy (77).	Adjust emergency pressure control stem by tightening or loosening elastic nut (27).
	Wrong size emergency pressure spring guide (12, figure 14-15).	Replace with shorter guide (12, figure 14-15).

CAUTION

LOW PRESS. REGULATOR (N) can only be used when applying pressures of below gage guard setting (165 to 175 psig) to an item under test. For pressures above gage guard setting, HIGH PRESS. REGULATOR (Q), must be used.

NOTE

Regulator pressure gage readings must be recorded twice, once before and once after tapping regulator pressure gage.

2. Using LOW PRESS. REGULATOR (N), slowly increase pressure to each test pressure 50 and 100 psig as specified in figure 14-3.

3. Check tolerance by comparing regulator pressure gage with test stand LOW/HIGH pressure gages. Record reading on Performance Test Sheet.

4. Back out on LOW PRESS. REGULATOR (N) until 70 psig is indicated on REGULATED LOW PRESSURE GAGE (11).

5. Using HIGH PRESS. REGULATOR (Q), apply 500 psig. Record reading on Performance Test Sheet.

6. Turn HIGH PRESS. REGULATOR (Q) to VENT.

7. Bleed test stand to 70 psig using SYSTEM BLEED (S). Bleed regulator by placing emergency pressure control toggle in EMERGENCY position, return toggle to NORMAL.

14-67. OUTWARD LEAKAGE TEST. To perform Outward 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

Support Equipment Required

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

NOTE

During this test the relief valve shall not be covered. The allowable leakage through this valve at 17 inH_2O is included in the maximum allowable leakage, 0.12 lpm (120 ccm).

1. Place regulator inlet valve control toggle in ON position, and diluter control toggle in NORMAL OXYGEN position. Cap the regulator inlet valve.

2. Connect regulator outlet to piezometer (26) in altitude chamber.

3. Connect a line from LOW PRESS. connection (19) to REF. TAP and connection (21) in altitude chamber.

4. Turn INLET PRESS. ON/OFF valve (L) to the OFF position.

5. Adjust LOW PRESS. REGULATOR (N), until 70 psig is indicated on REGULATED LOW PRESS. gage (11).

6. Turn PRESS. SELECTOR valve (D) to H_2O position, and slowly open LEAKAGE CONTROL valve (E) until 17 inH_2O is indicated on PRESS/SUCTION manometer (4).

NOTE

Maintain 17 inH_2O with LEAKAGE CONTROL valve (E) throughout the test.

7. If no leakage is indicated on HIGH RANGE LEAKAGE rotameter (8), turn LEAKAGE SELECTOR valve (F) to low range position, and check for indication of leakage on LOW RANGE LEAKAGE rotameter (7). Allowable leakage is 0.12 lpm (120 ccm). Record reading on Performance Test Sheet.

8. Switch LEAKAGE SELECTOR valve (F) to HIGH position, and close LEAKAGE CONTROL valve (E).

9. Repeat steps 6, 7, and 8 with diluter control lever 100% OXYGEN position and supply toggle on the regulator in the OFF position.

10. If leakage is excessive, locate probable cause using troubleshooting table 14-9.

Table 14-9. Troubleshooting (Outward Leakage Test)

Trouble	Probable Cause	Remedy
Note: Unless otherwise noted, index numbers in parentheses refer to figure 14-16.		
Diluter plate control housing and check valve assembly leaking.	Damaged diluter plate control housing and check valve preformed packings (9 and 14).	Replace packings (9 and 14).
	Damaged diluter valve seat (23).	Replace diluter control housing (24).
	Damaged check valve disc (12).	Replace disc (12).
	Improperly adjusted diluter plate control housing and check valve assy.	Adjust spring and screw adapter assembly (10).
	Loose screws (1).	Tighten screws (1).
Regulator outlet leaking.	Damaged preformed packings (136, 139, figure 14-11).	Replace packings (136 and 139, figure 14-11).
	Damaged or loose outlet (132, figure 14-11).	Tighten or replace outlet (132, figure 14-11).
Flow indicator leaking.	Damaged blinker diaphragm assembly (11, figure 14-13).	Replace blinker diaphragm assembly (11, figure 14-13).
	Damaged blinker tubing and base plate (12, figure 14-13).	Replace blinker tubing and base plate (12, figure 14-13).
Second stage relief valve leaking.	Out of adjustment.	Adjust spring retainer (3, figure 14-14).
	Weak second stage relief valve spring (4, figure 14-14).	Replace spring (4, figure 14-11).
	Loose housing screws (66, figure 14-11).	Tighten screws (66, figure 14-11).
	Damaged gasket (68, figure 14-11).	Replace gasket (68, figure 14-11).
	Damaged preformed packing (7, figure 14-14).	Replace packing (7, figure 14-14).
Outer diaphragm, diaphragm and plate assembly leaking.	Loose screws (73, figure 14-11).	Tighten screws (73, figure 14-11).
	Damaged outer diaphragm (75, figure 14-11).	Replace outer diaphragm (75, figure 14-11).
	Damaged diaphragm and plate assembly (77, figure 14-11).	Replace diaphragm and plate assembly (77, figure 14-11).
Leakage at diluter test port assembly.	Nut (13) loose.	Tighten nut (13).
	Damaged packings (9, 14, 18).	Replace packing(s) (9, 14, 18).
	Damaged tube and adapter assembly (19).	Replace tube and adapter assembly (19).
	Fitting (15) leaking.	Replace fitting (15).

14-68. SECOND STAGE RELIEF VALVE TEST. To perform the Second Stage Relief Valve 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 PRESS. SELECTOR valve (D) to Hg position, and place FLOW SELECTOR valve (M) SUIT SIMULATOR position.

2. Ensure diluter control lever is in 100% OXYGEN position.

3. Using VENT PRESS. valve (H), slowly apply 3 inches of mercury (inHg) to the regulator outlet. Regulator relief valve shall be venting at least 45 lpm as indicated on VENT FLOW manometer (3). Record reading on Performance Test Sheet.

4. Close VENT PRESS. valve (H), open VENT AMBIENT valve (I), place FLOW SELECTOR valve (M) in REGULATOR position, and Close valve (I).

5. Slowly move PRESS. SELECTOR valve (D) to H_2O position.

6. Turn LEAKAGE SELECTOR valve (F) to LOW range position.

7. Open LEAKAGE CONTROL valve (E) Apply and maintain 17 inH_2O to regulator outlet. Maximum allowable leakage is 0.12 lpm (120 ccm). Record reading on Performance Test Sheet.

8. Close LEAKAGE CONTROL valve (E).

9. Bleed pressure on test stand to 50 psig using LOW PRESS. REGULATOR (N) and SYSTEM BLEED valve (S)

10. Turn LEAKAGE SELECTOR valve (F) to HIGH range position

11. If excessive leakage is found or if relief valve fails to vent, locate probable cause using troubleshooting table 14-10.

14-69. 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

Table 14-10. Troubleshooting (Second Stage Relief Valve Test)

Trouble	Probable Cause	Remedy
Note: Unless otherwise noted, index numbers in parentheses refer to figure 14-14.		
Second stage relief valve does not vent 45 lpm.	Out of adjustment.	Adjust spring retainer (3) counterclockwise.
	Second stage relief valve spring (4) too strong.	Replace spring (4).
Second stage relief valve leaks excessively.	See Table 14-9 for probable cause and remedy.	

1. Disconnect hose from LOW PRESS. connection (19) to REF. TAP and connection (21) in altitude chamber.

2. Turn vacuum pump ON.

3. Ensure PRESS. SELECTOR valve (D) is in the H_2O position.

4. Ensure INLET PRESS. ON/OFF valve (L) is ON.

5. Place regulator inlet valve control toggle in ON position.

6. Using LOW PRESS. REGULATOR (N), set the inlet pressure at each inlet pressure specified on Performance Test Sheet.

NOTE

Readings must be recorded with the regulator diluter toggle in both NORMAL and 100% OXYGEN positions for each outlet flow specified on Performance Test Sheet.

Ensure inlet pressure is maintained when pulling outlet flows.

7. 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 readings on Performance Test Sheet.

NOTE

With no suction on regulator (OUTPUT valve (C) closed), maximum flow through regulator shall not exceed 0.01 lpm. This will cause a slight rise in PRESS./SUCTION manometer (4).

8. Close OUTPUT valve (C).

9. If regulator fails the Flow Suction Test, locate probable cause using troubleshooting table 14-11.

14-70. OXYGEN RATIO TEST. To perform the Oxygen Ratio 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. Ensure regulator inlet valve control toggle is in ON position, and diluter control toggle is in NORMAL OXYGEN position.

2. Using LOW PRESS. REGULATOR (N) apply 50 psig to regulator inlet. Close chamber door.

CAUTION

Maintain 3.0 inH_2O on OUTPUT FLOW manometer (1) with OUTPUT valve (C) while ascending to altitude.

Slowly open VACUUM CONTROL valve (B) and observe PRESS./ SUCTION manometer (4). If rapid increase in pressure is indicated, close down on VACUUM CONTROL valve (B) until pressure stabilizes. This rapid increase of pressure shown on PRESS./ SUCTION manometer (4) is caused by too fast a rate of climb in the altitude chamber.

3. Using VACUUM CONTROL valve (B), ascend to first test altitude shown on Performance Test Sheet.

4. Set output flows specified in Performance Test Sheet with OUTPUT valve (C) and stabilize altitude with INPUT valve (A).

5. Read INPUT FLOW manometer (2), and record readings on Performance Test Sheet.

6. Continue the test for each specified altitude and outlet flow shown on Performance Test Sheet.

7. Close OUTPUT valve (C) and INPUT valve (A). Descend to 30,000 feet using CHAMBER BLEED valve (K).

NOTE

If indicated input flows are not within limits, an Aneroid Closure Test must be performed.

8. If Oxygen Ratio Test was satisfactory, proceed to Safety Pressure and Pressure Breathing Test (paragraph 14-72).

Table 14-11. Troubleshooting (Flow Suction Test)

Trouble	Probable Cause	Remedy
Note: Unless otherwise noted, index numbers in parentheses refer to figure 14-14.		
First stage reduction chamber out of adjustment.	Low first stage pressure.	Reset to 32 to 35 psig (paragraph 14-114, 14-115 and figure 14-8).
Demand valve lever assembly.	Vane mounting pin (117, figure 14-11) sticking.	Replace mounting pin (117).
	Strong demand valve lever spring (113, figure 14-11).	Replace demand valve lever spring (113, figure 14-11).
	Demand valve lever (78, figure 14-11) bent or improperly adjusted.	Replace or adjust (paragraph 14-115).
Manifold inlet assembly.	Clogged inlet filter (1, figure 14-17).	Replace inlet filter (1, figure 14-17).
Venturi assembly.	Strong injector spring (3, figure 14-18).	Replace injector spring (3, figure 14-18).

14-71. ANEROID CLOSURE TEST. To perform the Aneroid Closure 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

NOTE

Aneroid Closure Test is performed only if regulator fails Oxygen Ratio Test.

1. Descend to 25,000 feet using CHAMBER BLEED valve (K).

2. Ensure inlet pressure is set at 50 psig.

3. Set up a flow of 3.0 inH_2O on OUTPUT FLOW manometer (1) with OUTPUT valve (C).

4. Aneroid shall close between 28,000 and 32,000 feet, as indicated by no further advance in altitude on LOW RANGE ALTM. (13).

5. Close OUTPUT valve (C) and descend to sea level using CHAMBER BLEED valve (K).

6. If regulator fails Aneroid Closure Test and or Oxygen Ratio Test, locate probable cause using trouble-shooting table 14-12.

14-72. SAFETY PRESSURE AND PRESSURE BREATHING TEST. To perform the Safety Pressure and 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. Ensure inlet pressure is set at 50 psig.

Table 14-12. Troubleshooting (Oxygen Ratio/Aneroid Closure Tests)

Trouble	Probable Cause	Remedy
Note: Unless otherwise noted, index numbers in parentheses refer to figure 14-16.		
Incorrect air/oxygen ratios for flows 40 lpm or less.	Low air.	Turn screw in spring and screw adapter assembly (10) counterclockwise.
	High air.	Turn screw in spring and screw adapter (10) clockwise.
Incorrect air/oxygen ratios for flows above 40 lpm.	Low air.	Adjust aneroid (5) clockwise.
	High air.	Adjust aneroid (5) counterclockwise.
Aneroid closes below 28,000 feet.	Aneroid assembly (5) out of adjustment.	Turn aneroid assembly (5) counterclockwise.
Aneroid closes above 32,000 feet.	Aneroid assembly (5) out of adjustment.	Turn aneroid assembly (5) clockwise.

NOTE

If chamber altitude is not at 30,000 feet adjust altitude. Use VACUUM CONTROL valve (B) to increase altitude or CHAMBER BLEED valve (K) to decrease altitude.

2. Using OUTPUT valve (C), draw flows of 0 and 85 lpm through the regulator. Delivery pressure must be within limits shown on Regulator Performance Test Sheet. Record reading on Performance Test Sheet.

CAUTION

Maintain 3.0 inH_2O on OUTPUT FLOW manometer (1) with OUTPUT valve (C) while ascending to altitude.

NOTE

Reading for 0 and 85 lpm must also be recorded at each test altitude.

3. Repeat step 2 for each altitude shown on Performance Test Sheet.

4. Close OUTPUT valve (C) and descend to sea level using CHAMBER BLEED valve (K).

5. If safety pressure/pressure breathing flows are not within limits, locate probable cause using troubleshooting table 14-13.

14-73. BLINKER ASSEMBLY TEST. To perform the Blinker Assembly 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. Ensure diluter control toggle is in NORMAL OXYGEN POSITION.

2. Using LOW PRESS. REGULATOR (N), apply 50 psig to regulator inlet.

3. Using OUTPUT valve (C), draw 20 lpm through regulator. Blinker must open fully. Record reading on Performance Test Sheet.

4. Reduce Output flow to 8 lpm and place diluter control toggle in 100% OXYGEN position. Blinker must remain fully open. Record reading on Performance Test Sheet.

5. Close OUTPUT valve (C). Blinker should close immediately. Record reading on Performance Test Sheet.

6. Close altitude chamber door.

CAUTION

Maintain 3.0 inH_2O on OUTPUT FLOW manometer (1) with OUTPUT valve (C) while ascending to altitude.

7. Using VACUUM CONTROL valve (B), ascend in altitude until 17.0 inH_2O is indicated on PRESS./SUCTION manometer (4).

8. Open OUTPUT valve (C) and draw a flow of 12 lpm through the regulator. The blinker should be fully open. Close OUTPUT valve (C). Blinker should close immediately. Record reading on Performance Test Sheet.

9. Descend to sea level using CHAMBER BLEED valve (K).

10. If malfunctions are noted, locate probable cause using troubleshooting table 14-13.

14-74. EMERGENCY PRESSURE TEST. To perform the Emergency Pressure 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. Ensure the diluter control toggle is in NORMAL OXYGEN position.

2. Using LOW PRESS. REGULATOR (N), apply 50 psig to regulator inlet.

3. Open OUTPUT valve (C) and draw a flow of 10 lpm through the regulator.

4. Place emergency control toggle in EMERGENCY position. Pressure indicated on PRESS./SUCTION manometer (4) shall read 2.0 to 4.0 inH_2O. Record reading on Performance Test Sheet.

Table 14-13. Troubleshooting (Safety Pressure/Pressure BreathingTest)

Trouble	Probable Cause	Remedy
Note: Unless otherwise noted, index numbers in parentheses refer to figure 14-16.		
Low safety pressure/pressure breathing 30,000 and 40,000 feet.	Damaged inner diaphragm (77).	Replace diaphragm (77).
	Diaphragm (75) blocking pressure breather port.	Install diaphragm (75) correctly.
	Spring (44) too weak.	Replace spring (44).
	Pressure breather valve (57) sticking or bent.	Replace pressure breather valve (57).
High safety pressure/pressure breathing 30,000 and 40,000 feet.	Index numbers 40 through 53 improperly assembled or aneroid assembly (48) not adjusted correctly.	Reassemble index numbers 40 through 53. Adjust IAW paragraph 14-116 steps 5 and 6.
Low safety pressure/pressure breathing 43,000 and 50,000 feet.	Index numbers 40 through 53 improperly assembled or aneroid assembly (48) not adjusted correctly.	Reassemble index numbers 40 through 53. Adjust IAW paragraph 14-116 steps 5 and 6.
High safety pressure/pressure breathing 40,000 and 50,000 feet.	Index numbers 40 through 53 improperly assembled or aneroid assembly (48) not adjusted correctly.	Reassemble index numbers 40 through 53. Adjust IAW paragraph 14-116 steps 5 and 6.

NOTE

Ensure inlet pressure is maintained when performing step 5.

5. Adjust OUTPUT valve (C) to draw 80 lpm flow through regulator.

6. Place diluter control toggle in 100% OXYGEN position. Pressure at outlet of regulator, as indicated on PRESS./SUCTION manometer (4), shall be no less than 1.0 inH_2O. Record reading on Performance Test Sheet.

7. Adjust output to 10 lpm flow. Hold emergency pressure control toggle in TEST MASK position. Output flow, as indicated PRESS./SUCTION manometer (4), shall be 6.0 to 16.0 inH_2O. Record reading on Performance Test Sheet.

8. If emergency pressure flows are not within tolerance, locate probable cause using troubleshooting table 14-14.

9. Close N_2 supply cylinder valve. Using LOW PRESS. REGULATOR (N) and SYSTEM BLEED valve (S), relieve all pressure in the test stand. Remove regulator from test stand.

14-75. REGULATOR OXYGEN PURGE. After completion of all tests, the regulator shall be purged with oxygen as follows:

Materials Required

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

WARNING

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

1. Connect regulator inlet to a regulated source of aviator's breathing oxygen.

2. Apply 500 psig to regulator inlet.

3. Position diluter control toggle in the 100% OXYGEN position, supply toggle in the ON position and emergency pressure control toggle in the EMERGENCY position, allow oxygen to flow 1 to 3 minutes.

4. Shut off oxygen source and disconnect regulator.

NOTE

All equipment forwarded from the Organizational Level maintenance to the Intermediate and/or Depot Level maintenance, shall be accompanied by an Aircrew Systems Record (OPNAV 4790/138). 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 and/or Calendar Inspection, the organizational custodian shall retain the Aircrew Systems Record, Performance Test Sheet, and VIDS/MAF.

14-76. DISASSEMBLY.

14-77. Disassemble the oxygen regulator using index numbers assigned to figure 14-11, unless otherwise noted. Disassemble the regulator only as far as required to correct any malfunctions. Disassemble the regulator as follows:

Table 14-14. Troubleshooting (Emergency Pressure Test)

Trouble	Probable Cause	Remedy
High emergency pressure at 10 lpm.	Emergency pressure control stem (26, figure 14-11) out of adjustment.	Turn emergency pressure control stem (25, figure 14-11) clockwise.
Low emergency pressure at 10 lpm.	Emergency pressure control stem (26, figure 14-11) out of adjustment.	Turn emergency pressure control stem (25, figure 14-11) counterclockwise.
Low emergency pressure at 80 lpm.	Elastic stop nut (5, figure 14-16) out of adjustment.	Adjust elastic stop nut (5, figure 14-16) counterclockwise.
	Faulty venturi assembly (figure 14-18).	Replace venturi assembly (figure 14-18).
Low test mask pressure.	Emergency pressure spring guide (12, figure 14-15) too short.	Install longer emergency pressure spring guide (12, figure 14-15).
High test mask pressure.	Emergency pressure spring guide (12, figure 14-15) too long.	Install shorter emergency pressure spring guide (12, figure 14-15).

CAUTION

All disassembly, inspection, repair and assembly must be done on benches having good lighting and in an area provided with air conditioning or air filtering. Walls, floor and ceiling should have a smooth finish, and be painted with a non-chalking paint which can be kept clean and dust free. It is desirable to keep all parts for each individual regulator separated. Make careful note of the location and quantity of all shims, spacers and packings. Plastic partitioned boxes with covers or similar storage facilities should be used to keep parts segregated and protected from dirt and moisture. Plastic bags are also useful for storing subassemblies and component parts after cleaning and inspection until ready for assembly.

14-78. PLASTIC LIGHTING PLATE. To remove the Plastic Lighting Plate, proceed as follows:

1. Remove cap, grommet and bulb from light assembly (18, figure 14-12). Remove screw (4), washer (6), dust cap assembly (1) and spacer (3).

2. Remove screw (5), washer (6) and plastic lighting plate (2).

14-79. MOUNTING PLATE AND CONTROLS ASSEMBLY. To remove Mounting Plate and Controls Assembly, proceed as follows:

NOTE

Do not remove panel light electrical cord bushing (125) and panel light cord plate (121) from electrical cable unless cable is damaged and must be replaced. If cable does not require removal, proceed to step 2.

1. Remove screws (122), washers (123), plate (121), and bushing (125).

2. Remove screw (9), screw (10), washers (11), screws (8), and mounting plate and controls assembly (7).

3. Remove emergency pressure control stem assembly (25). Remove screw (26) and locknut (27) from emergency pressure control stem assembly (25).

NOTE

Index number in steps 4 through 6 refer to figure 14-12 for disassemble of mounting plate and control assembly. Do not disassemble unless damaged.

Pin (4) in step 4 must be removed from right to left.

4. Remove control lever pins (2, 6, and 4) and levers (1, 5, and 3). Remove screw (8) and follower assembly (7) from lever (5).

5. Remove nut (13), washer (12), screw (10), toggle linkage (9) and washer (11).

6. Remove cord assembly (14), light assembly (18) and terminal lug (19) from mounting plate (21).

14-80. EMERGENCY PRESSURE CONTROL BEAM GUARD AND BEAM AND FULCRUM ASSEMBLY. To remove the Emergency Pressure Control Beam Guard and Beam and Fulcrum Assembly, proceed as follows:

1. Remove screws (14) washers (15) and emergency pressure control beam guard (13).

2. Remove screw (17), washer (18) and beam and fulcrum assembly (16).

14-81. RETAINER SCREEN AND SHROUD ASSEMBLY. To remove the Retainer Screen and Shroud Assembly, proceed as follows:

1. Remove screws (23), washers (24) and shroud and screen assembly. Remove demand valve feed port plug (118), gasket (119), and packing (120).

14-82. OXYGEN CYLINDER PRESSURE GAGE ASSEMBLY. To remove the Oxygen Cylinder Pressure Gage Assembly, proceed as follows:

1. Remove screws (35), washers (36), and gently work gage and bracket assembly (34) from regulator body (142).

2. Remove preformed packing (37).

14-83. BLINKER ASSEMBLY. To remove the Blinker Assembly, proceed as follows:

1. Remove screws (30). Using wrench, disconnect blinker tubing from regulator body and remove blinker. Remove packing (31) from regulator body (142).

NOTE

Index numbers in steps 2, 3, and 4 refer to figure 14-13.

2. Remove screws (2), plate retainer (1), cover (3) and gasket (9).

3. Remove blinker pin (5) blinker spring (6) and blinker flag and lever assembly (4) from actuator guide (8).

4. Remove screw (7) from actuator guide (8), blinker actuator (10), and blinker diaphragm assembly (11) from blinker tubing and base plate assembly (12).

14-84. EMERGENCY PRESSURE CONTROL STEM GUIDE. To remove Emergency Pressure Control Stem Guide, proceed as follows:

1. Remove screws (62) and remove emergency pressure control stem guide (61).

14-85. PRESSURE BREATHING VALVE CONTROL ASSEMBLY. To remove and disassemble the Pressure Breathing Valve Control Assembly, proceed as follows:

CAUTION

(Regulators part number 14950-45 only) use extreme care when removing unreinforced tubing (55) from barb on side of diluter plate control housing and check valve assembly (89).

1. Remove unreinforced tubing (55), screws (38), washers (39), and remove top housing assembly (53) from regulator.

NOTE

Due not remove test port assembly (52) and packing (51) unless damaged

2. If required, remove test port assembly (52), packing (51)

3. Remove nut (42), retainer (43), spring (44), seal (46), bottom housing (45), and gasket (47) from aneroid and pin assembly (48).

4. Remove nut (40) packing (41) aneroid and pin assembly (48), spring (49), and check disk (50) from top housing assembly (53 or 54).

14-86. PRESSURE BREATHER VALVE ASSEMBLY. To remove and disassemble the Pressure Breather Valve Assembly, proceed as follows:

1. Remove diaphragm assembly (56), screws (58) retaining plate (59), pressure breather valve assembly (57), and packing (60) from regulator body (142).

14-87. DILUTER PLATE CONTROL HOUSING AND CHECK VALVE ASSEMBLY. To remove and disassemble the Diluter Plate Control Housing and Check Valve Assembly, proceed as follows:

CAUTION

When removing diluter plate control housing and check valve, apply a firm pressure to the assembly to prevent stripping of screws (93), (91) and (90) or damage to the regulator housing. This is necessary because of spring tension applied by spring (95).

1. Remove screws (90 and 93) and washers (92 and 94). Remove diluter plate control housing and check valve assembly (89).

2. Remove screw (91) washer (94) and diluter lever (88). Remove screw (87) from diluter valve body (86) if damaged. Remove spring (95) from bellows assembly (102).

NOTE

Index numbers in steps 3 through 6 refer to figure 14-16.

3. Carefully distend legs of retainer assembly (10) and remove from diluter control housing (24). Remove check valve disk (12), spring (11), and packing (9).

4. Remove screws (1) washers (2), diluter valve plate assembly (6) and gasket (8) from housing assembly.

5. Remove aneroid assembly (5) from diluter valve plate assembly (6). Remove throttling plate screw (3), and throttling plate (4) from aneroid assembly (5). Remove diluter seal (7) from diluter valve plate assembly (6).

NOTE

Do not remove or disassemble tube and adapter assembly (19) from diluter control housing (24) unless damaged. If damaged, proceed to step 6.

6. If required, remove nut (13), packing (14), and tube and adapter assembly (19) from diluter control housing (24). Remove test port fitting (15), poppet valve (16), spring (17), and packing (18) from tube and adapter assembly (19).

14-88. DEMAND VALVE ASSEMBLY. To remove Demand Valve Assembly, proceed as follows:

1. Remove demand valve retaining screw (111), packing (112), demand valve spring (113), demand valve assembly (114), demand valve seat (115), demand valve pin (117) and packing (116) from regulator body (142).

14-89. MANIFOLD INLET ASSEMBLY. To remove and disassemble the Manifold Inlet Assembly, proceed as follows:

1. Remove screws (105) and washers (106). Using blunt instrument, depress supply valve stem and lift inlet manifold assembly (104) from regulator body (142). Remove performed packing (107).

NOTE

Index numbers steps 2 through 6 refer to figure 14-17.

2. Remove retaining ring (2), oxygen filter (1), manifold inlet adapter (3), spacer (6), backup ring (5), and packing (4).

3. Remove spring (7), and seat ball (8) from seat retainer (9).

4. Remove seat retainer (9), inlet seat assembly (10) and packing (11).

5. Remove manifold seal retainer (12), and packing (13) from supply inlet manifold (21).

6. Remove manifold valve stem seal retainer (16), inlet supply actuator stem (17), packing retainer (14) and packing (15) from manifold.

7. Remove inlet valve retainer (18), first stage inlet valve seat (19), and packing (20) from manifold.

NOTE

Do not remove plug (22) from the manifold body unless leakage has been detected. Removal of the plug is not necessary to clean, inspect, or test the inlet manifold assembly.

8. Remove plug (22) if required.

14-90. SUPPLY CONTROL STEM GUIDE. To remove the Supply Control Stem Guide, proceed as follows:

1. Remove screws (64) from supply control stem guide (63) and lift from regulator body (142).

14-91. FIRST STAGE BELLOWS ASSEMBLY. To remove first stage bellows assembly, proceed as follows:

1. Remove screws (97), first stage cover plate (96), and gasket (98).

2. Remove screw (100), washer (101) from valve lever assembly (99).

3. Lift first stage bellows assembly (102) and valve lever assembly (99) from regulator body (142).

4. Remove gasket (103), first stage seat valve assembly (109), and grommet (108).

5. Remove valve lever assembly (99) from first stage bellows assembly (102).

14-92. SECOND STAGE RELIEF VALVE ASSEMBLY. To remove and disassemble the Second Stage Relief Valve Assembly, proceed as follows:

1. Remove screws (66), washers (67) and lift second stage relief valve assembly (65) from regulator body (142). Remove gasket (68).

NOTE

Index numbers in steps 2 and 3 refer to figure 14-14.

2. Remove internal retaining ring (2), relief valve screen (1), spring retainer (3), and spring (4) from second stage relief valve housing (10).

3. Remove retaining ring (6), packing (7), relief valve seat (5), relief valve (8) and guide sleeve (9) from second stage relief valve housing (10).

14-93. REGULATOR OUTLET. To remove the Regulator Outlet, proceed as follows:

1. Remove nuts (133) and screws (134 and 135).

2. Remove regulator outlet (132), packing (136) and venturi screen (137) from regulator housing.

14-94. VENTURI ASSEMBLY. To remove and disassemble the venturi assembly, proceed as follows:

Support Equipment Required

Quantity	Description	Reference Number
1	Wrench, Spanner	QB70750-9 NIIN 00-302-6456

1. Using spanner wrench, remove venturi assembly (138) and gasket (139) from regulator body (142).

NOTE

Index numbers in step 2 refer to figure 14-18.

2. Remove venturi seat (1), injector nozzle (2), injector spring (3), and dampening spring (4) from venturi housing (5).

14-95. EMERGENCY PRESSURE CONTROL AND DIAPHRAGM ASSEMBLY. To remove and disassemble the Emergency Pressure Control and Diaphragm Assembly, proceed as follows:

1. Remove screws (73), washers (74), screw (71) and washer (72).

2. Remove emergency pressure control assembly (70), outer diaphragm (75), diaphragm spacer assembly (76) and diaphragm and plate assembly (77) from regulator body (142).

3. Remove identification plate (69) if damaged. If removed, retain with regulator for identification.

NOTE

Index numbers in steps 4 through 6 refer to figure 14-15.

4. Remove screws (2), washers (3) and cap (1) from emergency pressure control housing (16).

5. Remove nut (5), swivel (6), stem (4), emergency pressure control spring (7) and emergency pressure control test spring (8) from emergency pressure control housing (16).

6. Remove screws (14) washers (15) and pin (10). Remove second stage regulator cover (13) and control lever and center assembly (9) from emergency pressure control housing (16).

7. Remove spring (11) and select fit emergency pressure spring guide (12).

14-96. DEMAND VALVE LEVER ASSEMBLY. To remove the Demand Valve Lever Assembly, proceed as follows:

1. Remove palnut (80), screw (82) screw (84) and washer (85). Tilt demand valve lever assembly (78) and remove vane mounting pin (79), demand valve fulcrum (83), demand valve lever spring (81) and demand valve lever assembly (78) from regulator body (142).

2. Inspect pin dowel (140) and demand valve pin guide (141). The guides are installed during the manufacturing process and cannot be removed from the regulator body. If damaged replace regulator body (142).

14-97. FIRST STAGE RELIEF VALVE ASSEMBLY. To disassemble the First Stage Relief Valve Assembly, proceed as follows:

1. Remove relief valve spring retainer (126), relief valve spring (127), first stage relief valve assembly (128), relief valve seat (129) and packing (130) from regulator body (142).

14-98. CLEANING.

14-99. To clean the disassembled oxygen regulator body and components parts, proceed as follows:

Materials Required

Quantity	Description	Reference Number
As Required	Bag, Plastic	MIL-B-117 (CAGE 81349)
As Required	Bottle, Polyethylene Squeeze	—
As Required	Nitrogen, Oil-free, Water Pumped, Type I, Class I, Grade B	Fed Spec BB-N-411 NIIN 00-985-7275

WARNING

Do not use oil, or any material containing oil, in conjunction with oxygen equipment. Oil, even in a minute quantity, coming in contact with oxygen can cause explosion or fire. Dust, lint, and fine metal particles are also dangerous.

1. Clean all metallic parts using procedures outlined in NAVAIR 13-1-6.4-1. Blow dry with oil-free nitrogen.

CAUTION

Do not attempt to clean any elastomer parts that have become contaminated with oil or grease. All such parts shall be replaced.

2. Prior to installation, wash all silicone rubber parts in distilled water and blow dry with oil-free nitrogen.

3. After cleaning all internal surfaces, they shall be examined for cleanliness. Should further contamination be found, reclean the parts in accordance with step 1.

4. Cleaned parts shall be sealed in plastic bags for storage. Also, bag all complete assemblies that are not immediately returned to service.

14-100. INSPECTION OF DISASSEMBLED REGULATOR.

14-101. Inspect the disassembled regulator body and component parts in accordance with table 14-15.

1. Make certain lamp (18, figure 14-12) is wired in accordance with figure 14-4.

14-102. REPAIR.

14-103. Unless otherwise specified, all parts found to be damaged or defective shall be replaced. Defects on white painted surfaces may be touched-up using lacquer (MIL-L-6805).

14-104. ASSEMBLY

14-105. Assembly of Aircraft Panel Mounted Oxygen Regulators is essentially the reverse of disassembly. Tests are required on subassemblies as they are assembled into the regulator. Adjustment and calibration is also performed at time of assembly.

WARNING

Prior to use, inspect leak detection compound. Compound which is not clear and free from suspended material/sediment is considered contaminated and shall be disposed of. Compound exhibiting peculiar odors such as acetone or alcohol is considered contaminated and shall be disposed of.

CAUTION

Use extreme care in fitting precision parts to prevent damage. Ensure each component is dust and dirt free.

NOTE

All silicone-rubber parts shall be discarded, and replaced with new items at time of assembly. They shall be washed in accordance with paragraph 14-99, step 2 prior to installation.

14-106. Assembly is affected in two separate operations; assembly of components into subassemblies (mounting plate and controls assembly, injector assembly, etc), and assembly of subassemblies into regulator housing.

14-107. MOUNTING PLATE AND CONTROLS ASSEMBLY. To assemble the Mounting Plate and Controls Assembly (figure 14-12), proceed as follows:

Materials Required

Quantity	Description	Reference Number
As Required	Compound, Sealant	MIL-S-22473
As Required	Flux	—
As Required	Solder, Lead, Tin	QQ-S-571 (CAGE 81348)

Support Equipment Required

Quantity	Description	Reference Number
1	Tool, Fastener	PT-3-1/2
1	Wrench, Torque	—

1. If required, install fastener assembly (20) using fastener tool.

2. If removed, install bushing (15) by swaging over and staking in three places. Bushing must not turn when subjected to 1 ft-lb of torque.

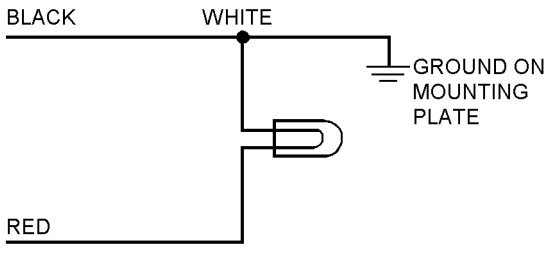

Figure 14-4. Wiring Diagram

Table 14-15. Inspection of Disassembled Regulator Components

Part Nomenclature	Figure and Index No.	Inspect for	Remedy
Follower.	14-12-7	Deformation, loose or missing ball.	Replace if defective.
Toggle Linkage.	14-12-9	Distortion, marred mating surfaces, and cracks.	Replace if defective.
Cord Assembly.	14-12-14	Condition of wiring.	Replace if defective.
Light Assembly.	14-12-18	Damaged lens, disfigured solder lead, or damaged threads.	Replace if defective.
Terminal Lug.	14-12-19	Distortion.	Replace if defective.
Mounting Plate.	14-12-21	Loose fasteners and bushings.	Replace if defective.
Regulator Shroud.	14-11-22	Cracks in casting, marred mating surfaces, or damaged threads in tapped holes.	Replace if defective.
Diluter Valve Body.	14-11-86	Marred or burred mating surface, or damage to internal threads.	Replace if defective.
Aneroid Assembly.	14-16-5	Dents, uneven spacing of convultions, or expanded.	Replace if defective.
Throttling Plate.	14-16-4	Seat surfaces free of nicks and scratches.	Replace if defective.
Test Port Fitting.	14-16-15	Damaged threads, or obvious external damage.	Replace if defective.
Poppet Valve.	14-16-16	Marred or burred surfaces.	Replace if defective.
Spring.	14-16-17	Uneven spacing of coils or distorted.	Replace if defective.
Tube and Adapter Assembly.	14-16-19	Damaged internal threads, fractured or obstructed tube.	Replace if defective.
Diluter Control Housing.	14-16-24	Seat surfaces free of nicks, scratches, or damaged threads.	Replace if defective.
Check Valve Disk.	14-16-12	Split or fractured edges.	Replace if defective.
Retainer Assembly.	14-16-10	Bent or uneven spacing between legs, or damaged threads.	Replace if defective.
Spring.	14-16-11	Damaged, distorted, or uneven spacing between coils.	Replace if defective.
Diluter Valve Plate Assembly.	14-16-6	Nicks or scratches.	Replace if defective.
Diluter Seal.	14-16-7	Nicks or scratches.	Replace if defective.
Stem.	14-11-28	Marred or burred exterior surfaces.	Replace if defective.
Bellows Assembly.	14-11-102	Dents or uneven spacing of convolutions.	Replace if defective.
Regulator Body.	14-11-142	Cracks in casting, marred mating surfaces, or damaged threads.	Replace if defective. Repair threads if possible.
Pressure Breather Valve Assembly.	14-11-57	Inspect externally for defects.	Replace assembly.
Retainer.	14-11-43	Distortion, marred, scratched or burred mating surfaces.	Replace if defective.
Regulator Outlet.	14-11-132	Cracks, marred mating surfaces at hose attachment, or damaged O-ring groove.	Replace if defective.

Table 14-15. Inspection of Disassembled Regulator Components (Cont)

Part Nomenclature	Figure and Index No.	Inspect for	Remedy
Control Housing Cap.	14-15-1	Obvious damage.	Replace if defective.
Emergency Pressure Lever Stem.	14-15-4	All outside diameters for nicks, scratches and burrs.	Replace if defective.
Emergency Pressure Swivel.	14-15-6	Marred mating surfaces.	Replace if defective.
Springs.	14-15-7, 8, and 11	Damaged, distorted, or uneven spacing between coils.	Replace if defective.
Control Lever and Center Assembly.	14-15-9	Free movement of disk, cracks, or damaged rivets.	Replace if defective.
Pin.	14-15-10	Bent or deformed.	Replace if defective.
Guide.	14-15-12	Large outer diameter and bore must be free of nicks, scratches and burrs.	Replace if defective.
Second Stage Regulator Cover.	14-15-13	Cracks in casting, burrs in bores, or marred mating surface.	Replace if defective.
Emergency Pressure Control Housing.	14-15-16	Cracks or damaged threads.	Replace if defective.
Demand Valve Lever Spring.	14-11-81	Damaged, distorted, or uneven spacing between coils.	Replace if defective.
Demand Valve Fulcrum.	14-11-83	Obvious damage.	Replace if defective.
Demand Valve Lever Assembly.	14-11-78	Marred or burred surfaces, and cracked or loose rivets.	Replace if defective.
Second Stage Relief Valve Assembly.	14-11-65	Obvious damage.	Replace if defective.
Relief Valve Screen.	14-14-1	Distortion or separation of wire ends.	Replace if defective.
Retaining Ring.	14-14-2	Obvious damage.	Replace if defective.
Spring Retainer.	14-14-3	Damage to threads.	Replace if defective.
Second Stage Relief Valve Spring.	14-14-4	Damaged, distorted, or uneven spacing between coils.	Replace if defective.
Second Stage Relief Valve Seat.	14-14-5	Mating surface of seat must be free of nicks, scratches and burrs.	Replace if defective.
Retaining Ring.	14-14-6	Deformation.	Replace if defective.
Second Stage Relief Valve.	14-14-8	Face free of nicks, scratches and burrs.	Replace if defective.
Guide Sleeve.	14-14-9	Marred mating surfaces.	Replace if defective.
Second Stage Relief Valve Housing.	14-14-10	Cracks in casting, or marred mating surfaces.	Replace if defective.
Relief Valve Spring Retainer.	14-11-126	Damaged threads, marred slot, or excessive sealant.	Replace if defective.
Relief Valve Spring.	14-11-127	Obvious damage, distortion, or uneven spacing between coils.	Replace if defective.
Relief Valve Seat.	14-11-129	Surface free of nicks, scratches, burrs, or damaged threads.	Replace if defective.

Table 14-15. Inspection of Disassembled Regulator Components (Cont)

Part Nomenclature	Figure and Index No.	Inspect for	Remedy
Spring.	14-11-44	Damage, distortion, or uneven spacing between coils.	Replace if defective.
Seal.	14-11-46	Dents, marred, scratches or burred mating surfaces.	Replace if defective.
Aneroid and Pin Assembly.	14-11-48	Dents and uneven spacing of convolutions, damage to pin.	Replace if defective.
Top Housing Assembly.	14-11-53	Cracks in housing or marred mating surfaces.	Replace if defective.
Valve Lever Assembly.	14-11-99	Bent pin, damaged threads, and large bore must be free of scratches or burrs.	Replace if defective.
Screw.	14-11-100	Outer diameter free from nicks, scratches or burrs.	Replace if defective.
Gage and Bracket Assembly.	14-11-34	Free passage of air through tubing.	Replace if defective.
Plate Retainer.	14-13-1	Cracks or deformation.	Replace if defective.
Cover.	14-13-3	Adhesion of decal and clarity of lens.	Replace if defective.
Flag and Lever Assembly.	14-13-4	Separation of plate and legs, or distortion of legs.	Replace if defective.
Blinker Pin.	14-13-5	Obvious deformation.	Replace if defective.
Blinker Spring.	14-13-6	Deformation of ends and coil.	Replace if defective.
Actuator Guide.	14-13-8	Cracks, marred mating surfaces. Damage to center hole.	Replace if defective.
Blinker Actuator.	14-13-10	Marred or burred outer diameters.	Replace if defective.
Blinker Tubing and Base Plate Assembly.	14-13-12	Damaged or obstructed tubing.	Replace if tubing is blocked or kinked
Demand Valve Assembly.	14-11-114	Voids in silicone surface of seat.	Replace if defective.
Demand Valve Seat.	14-11-115	Nicks,scratches, or burrs on seat.	Replace if defective.
Demand Valve Pin.	14-11-117	Must be free of nicks,scratches or burrs.	Replace if defective.
Venturi Seat.	14-18-1	Marred mating surfaces or damaged threads.	Replace if defective.
Injector Nozzle.	14-18-2	Outer diameter and bore must be free of nicks, scratches or burrs.	Replace if defective.
Spring Injector.	14-18-3	Obvious damage, distortion, and uneven spacing between coils.	Replace if defective.
Dampening Spring.	14-18-4	Distortion of ring or legs.	Replace if defective.
Venturi Housing.	14-18-5	Marred surfaces or damage to threads.	Replace if defective.
Venturi Screen.	14-11-137	Distortion or separation of wire ends.	Replace if defective.
Tubing Sleeve.	14-11-33	Over-compressed or distorted.	Replace if defective.
Tube Connector.	14-11-32	Damaged threads or sealing surface.	Replace if defective.
Manifold Inlet Adapter.	14-17-3	Damaged threads or obvious damage.	Replace if defective.

Table 14-15. Inspection of Disassembled Regulator Components (Cont)

Part Nomenclature	Figure and Index No.	Inspect for	Remedy
Inlet Supply Valve Seat Retainer.	14-17-9	Cracks in sleeve or marred surfaces.	Replace if defective.
Inlet Seat Assembly.	14-17-10	Raised edge of seat to be free of nicks scratches or burrs.	Replace if defective.
Inlet Supply Actuator Stem.	14-17-17	Obvious distortion, scratches or burrs.	Replace if defective.
Supply Inlet Manifold.	14-17-21	Cracks in casting, marred mating surfaces, or damaged threads.	Replace if defective.
First Stage Inlet Valve Seat.	14-17-19	Nicks, scratches or burrs on raised edge of seat.	Replace if defective.
Inlet Valve Retainer.	14-17-18	Cracks, marred mating surfaces, or damaged threads.	Replace if defective.
Manifold Valve Stem Seal Retainer.	14-17-16	Bore must be free of nicks, scratches, burrs, or damaged threads.	Replace if defective.
Manifold Seal Retainer.	14-17-12	Bore must be free of nicks, scratches, burrs, or damaged threads.	Replace if defective.
Panel Light Cord Plate.	14-11-121	Distortion, scratches, or burrs.	Replace if defective.
Demand Valve Pin Guide.	14-11-141	Marred or disfigured surfaces.	Replace if defective.
Demand Valve Feed Port Plug.	14-11-118	Marred or disfigured surface, or damaged threads.	Replace if defective.
Emergency Pressure Control Beam Guard.	14-11-13	Marred or disfigured surface.	Replace if defective.
Beam and Fulcrum Assembly.	14-11-16	Obvious damage.	Replace if defective.

3. Install bushing (16) with rivets (17).

4. Insert light assembly (18) through mounting plate (21). Install terminal lug (19) and washer (18). Ensure terminal lug is positioned down and between inlet valve and NORMAL/100% toggle.

5. If cord assembly (14) has been removed, solder new cord in place using solder and liquid flux to complete connections of cord assembly (14). Solder red wire to center of light assembly (18) and white wire with black trace to terminal lug (19). Apply sealing compound to solder connections.

6. Install emergency pressure control lever (1) in bushing and secure from left to right with control lever pin (2). Install follower assembly (7) in lever (5) aligning slot in follower and install control lever pin (6). Install screw (8) in lever (5). Adjustment will be made during final assembly.

7. Install lever and stem assembly (3) to bushing (16) and secure with control lever pin (4). Place toggle linkage (9) and washer (11) on screw (10) and install in mounting plate (21). Install washer (12) and nut (13) on screw (10) and tighten.

8. Attachment to regulating housing shall be covered later in this section.

14-108. BLINKER ASSEMBLY. To assemble the Blinker Assembly (figure 14-13), proceed as follows:

1. Turn screw (7) into guide (8), leaving three threads showing, as illustrated in figure 14-5.

2. Install the flag and lever assembly (4) and spring (6) onto guide (8) with blinker pin (5). End of blinker spring (6) must be positioned to rest in slotted head of screw (7), as illustrated in figure 14-5.

3. Crimp end of blinker pin (5) to retain assembled parts.

4. Stack blinker diaphragm assembly (11), actuator guide (8), and actuator guide on blinker tubing and base plate assembly (12). Ensure screw holes are aligned.

5. Adjust flag and lever assembly as shown in figure 14-5.

6. Install gasket (9) Ensure notch in gasket (9) is aligned with hole in blinker tubing and base plate assembly (12). Install cover (3), plate retainer (1) and secure with screws (2).

7. After assembly of blinker in regulator, should blinker fail to pass the test in paragraph 14-73, adjust as follows:

a. If flag did not completely open at flows of 8 lpm, remove plastic cover (3), and rotate adjustment screw one turn clockwise.

b. If flag does not completely close as flow is reduced to zero (17 inH_2O), rotate adjustment screw one turn counterclockwise.

c. Reinstall cover (3).

8. Installation into the regulator housing shall be covered later in this section.

14-109. SECOND STAGE RELIEF VALVE ASSEMBLY. To assemble the Second Stage Relief Valve Assembly (figure 14-14), proceed as follows:

Materials Required

Quantity	Description	Reference Number
As Required	Krytox 240AC Lubricant	(CAGE 73925) NIIN 00-961-8995

1. Apply a light film of lubricant to packing (7) and install into groove on valve seat (5).

2. Insert guide sleeve (9) into housing (10). Ensure sleeve is bottomed in housing.

NOTE

Ensure polished surface of valve (8) is against seat (5).

3. Insert seat (5) into housing (10). Do not bottom seat against sleeve (9). Insert valve (8) through top of housing (10).

4. Install spring (4) and retainer (3) into housing (10). Do not install screen (1) and retaining ring (2) until completion of post assembly bench testing.

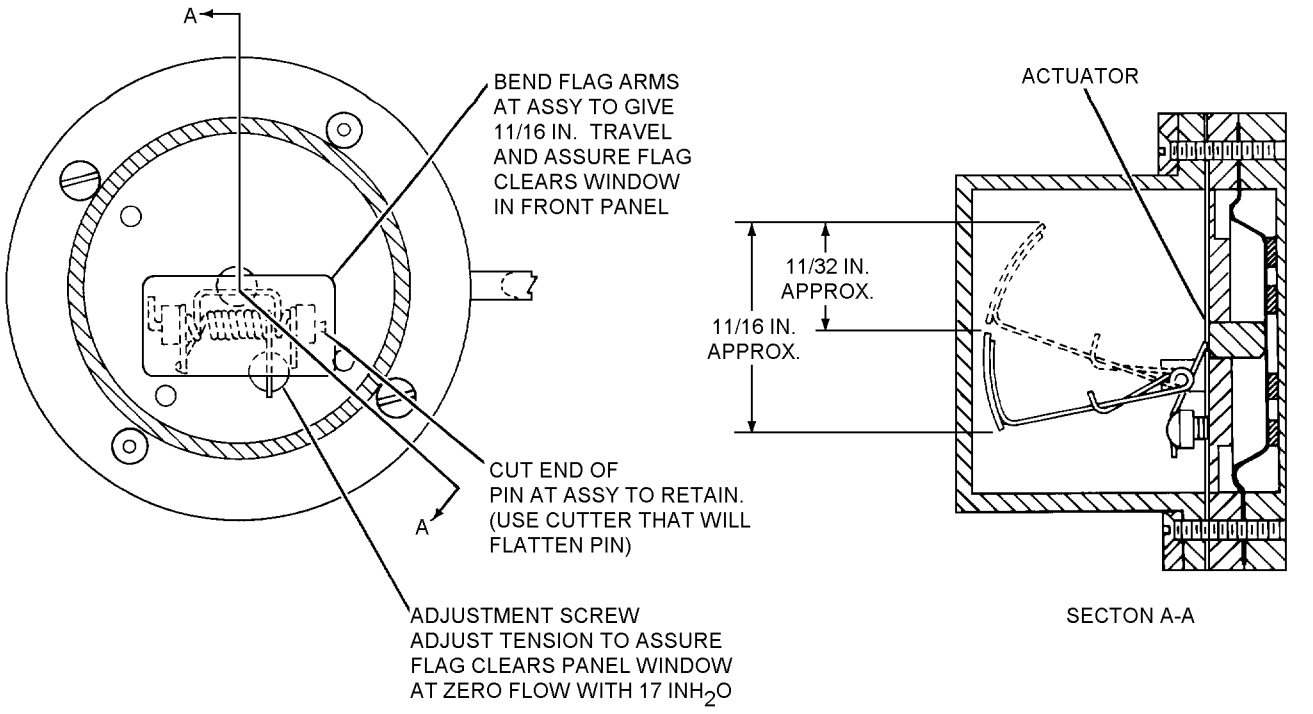

Figure 14-5. Blinker Assembly Adjustments

5. Press seat (5) into second stage relief valve housing (10) until bottomed. Install retaining ring (6) and ensure ring is seated in groove.

6. Attachment to the regulator housing shall be covered later in this section.

14-110. EMERGENCY PRESSURE CONTROL ASSEMBLY. To assemble the Emergency Pressure Control Assembly (figure 14-15), proceed as follows:

1. Insert emergency pressure spring guide (12) and spring (11) into emergency pressure control housing (16).

2. Insert and position control lever and center assembly (9) into second stage regulator cover (13).

3. Compress spring (11) to assemble second stage regulator cover (13) and control lever and center assembly (9) into emergency pressure control housing (16). Install pin (10), washer (15), and screw (14).

4. Slide emergency pressure control test spring (8) and emergency pressure control spring (7) onto stem (4).

5. Insert stem (4) into emergency pressure control housing (16). Install swivel (6) and nut (5). Do not install cap (1) and screw (2) and washer (3) until completion of post-assembly bench maintenance.

6. Attachment to the regulator housing shall be covered later in this section.

14-111. DILUTER PLATE CONTROL HOUSING AND CHECK VALVE ASSEMBLY. To assemble the Diluter Plate Control Housing and Check Valve Assembly (figure 14-16), proceed as follows:

Materials Required

Quantity	Description	Reference Number
As Required	Krytox 240AC Lubricant	(CAGE 73925) NIIN 00-961-8995

1. Install packing (18), spring (17), poppet valve (16), and test port fitting (15) into tube and adapter assembly (19).

2. Install tube and adapter assembly (19) and packing (14) in diluter control housing (24) with nut (13). Ensure that tube and adapter assembly (19) is correctly positioned.

3. Install diluter seal (7) by pressing into diluter valve plate assembly (6). Install throttling plate (4) and throttling plate screw (3) on aneroid assembly (5).

4. Install aneroid assembly (5) in diluter valve plate assembly (6).

5. Install gasket (8) and diluter valve plate assembly (6) on diluter control housing assembly, using washers (2) and screws (1).

6. Apply a light film of lubricant to packing (9) and install on diluter control housing (24).

NOTE

Ensure that spring (11) and check valve disk (12) are installed parallel to retainer assembly (10).

7. Carefully distend legs of retainer assembly (10) and install spring (11) and check valve disk (12).

8. Slightly distends legs of retainer assembly (10) and install on diluter control housing (24). Ensure that legs of retainer assembly (10) are properly installed in grooves on diluter control housing (24).

9. Attachment to the regulator housing shall be covered later in this section.

14-112. MANIFOLD INLET ASSEMBLY. To assemble the Manifold Inlet Assembly (figure 14-17), proceed as follows:

Materials Required

Quantity	Description	Reference Number
As Required	Krytox 240AC Lubricant	(CAGE 73925) NIIN 00-961-8995

1. Install packing retainer (14) into manifold seal retainer (12). Apply a light film of lubricant to packing (15). Install packing (15) followed by second packing retainer (14) into manifold seal retainer (12). Thread manifold valve stem seal retainer (16) into manifold seal retainer (12). Do not tighten manifold valve stem seal retainer (16).

2. Insert inlet supply actuator stem (17) through manifold valve stem seal retainer (16) and manifold seal retainer (12). Tighten manifold valve stem seal retainer (16) into manifold seal retainer (12).

3. Apply a light film of lubricant on packing (13) and install onto manifold seal retainer (12).

4. Install manifold seal retainer (12) into supply inlet manifold (21).

5. Apply a light film of lubricant on packing (11). Install packing (11) and inlet seat assembly (10) into supply inlet manifold (21).

6. Install seat retainer (9) into supply inlet manifold (21).

7. If removed during disassembly, install plug (22) to supply inlet manifold (21).

8. Apply a light film of lubricant on packing (20). Install packing (20) and first stage inlet valve seat (19) into supply inlet manifold (21). Install inlet valve retainer (18) into supply inlet manifold (21).

9. Press oxygen filter (1) into manifold inlet adapter (3) and secure with retaining ring (2).

10. Install spacer (6) and backup ring (5) on manifold inlet adapter (3).

11. Apply a light film of lubricant on packing (4) and install onto manifold inlet adapter (3).

12. Insert seat ball (8), spring (7) and assembled parts (1) thru (6) into supply inlet manifold (21).

13. Attachment to the regulator housing shall be covered later in this section.

14-113. VENTURI ASSEMBLY. To assemble the Venturi Assembly (figure 14-18), proceed as follows:

CAUTION

Exercise care in handling seat (1) and nozzle (2) to prevent mating surfaces from becoming nicked or scratched.

1. Install injector nozzle (2) into dampening spring (4) and check for slight amount of drag. Adjust dampening spring (4) as required. Remove dampening spring (4) from injector nozzle (2).

2. Install injector nozzle (2) into injector spring (3) and dampening spring (4) into injector spring (3). Install assembled parts (2, 3, and 4) into housing (5). Install venturi seat (1) into venturi housing (5).

3. Depress injector nozzle (2) away from venturi seat (1) and check for free movement with no drag.

4. Attachment to the regulator housing shall be covered later in this section.

14-114. ASSEMBLY OF INTERNAL PARTS INTO THE REGULATOR HOUSING. To assemble the internal parts into the regulator housing, attach the previously assembled components, and test or adjust assembly, proceed as follows:

Materials Required

Quantity	Description	Reference Number
As Required	Krytox 240AC Lubricant	(CAGE 73925) NIIN 00-961-8995

Support Equipment Required

Quantity	Description	Reference Number
1	Screwdriver	OT 234
1	Tool, Burnishing	85447-TEA
1	Wrench	OT 287

NOTE

Index numbers in the following paragraphs refer to figure 14-11 unless otherwise noted.

Apply a light film of lubricant to all packings before installation into regulator housing.

1. If required, use burnishing tool on demand valve pin guide (141) until demand valve pin (117) falls freely through guide without sticking or binding.

2. Install packing (130) on relief valve seat (129). Insert relief valve seat (129) into regulator body (142).

3. Place relief valve spring (127) over first stage relief valve assembly (129). Install relief valve spring retainer (126) into first stage cavity of regulator body (142) and tighten until flush with regulator body (142).

NOTE

First stage relief valve will be adjusted later in assembly.

4. Insert demand valve fulcrum (83) into regulator body (142) and position against pin dowel (140). Place demand valve lever spring (81) over demand valve pin guide (141).

5. Insert demand valve lever assembly (78) into regulator body (142) and hold against the compressed demand valve lever spring (81) by inserting a positioning pin through threaded hole of demand valve lever assembly (78) into demand valve lever spring (81). Secure demand valve lever assembly (78) to demand valve fulcrum (83) with vane mounting pin (79).

6. Remove positioning pin and secure demand valve fulcrum (83) to regulator body (142) with washer (85) and screw (84).

7. Thread screw (84) into palnut (80) approximately half way. Depress demand valve lever assembly (78) and center it. Demand valve fulcrum (83) should be positioned firmly against pin dowel (140). Thread screw (84) and palnut (80) into demand valve lever assembly (78).

CAUTION

Handle demand valve seat (115) with care to avoid nicks, scratches, etc. This damage can cause leaks in regulator.

8. Install packing (116) onto demand valve seat (115). Insert seat with packing side down into demand valve cavity of regulator body (142) and center in cavity.

9. Insert demand valve pin (117) with larger diameter first into regulator body (142). Inspect demand valve assembly (114) closely for defects and install valve assembly (silicone side down) on demand valve pin (117).

10. Install demand valve spring (113) (with small diameter down) onto demand valve assembly (114). Install packing (112) in groove of demand valve retaining screw (111). Thread demand valve retaining screw (111) into regulator body (142) until it bottoms out.

11. Verify operation of demand section by depressing demand valve lever assembly (78) and observe movement of demand valve pin (117) moving off demand valve seat (115) and then seating again through the first stage gage port.

12. If removed, install supply control stem guide (63) on regulator body (142) using screw (64).

13. If removed, install emergency pressure control stem guide (61) on regulator body (142) with screw (62).

14. Insert gasket (139) into venturi port of regulator body (142). Ensure gasket is lying flat. Using wrench, install venturi assembly (138) into regulator body (142).

15. Install setscrew (135) and nut (133) into first stage cavity side of injector port. Install setscrew (134) and nut (133) on opposite side. Both screws should be flush with inside of regulator port.

16. Install venturi screen (137) onto end of venturi assembly (138). Install packing (136) in first groove of regulator outlet (132).

17. Install regulator outlet (132) into regulator body (142). Using screwdriver and wrench, tighten setscrews (135, 134) and nuts (133).

18. Insert grommet (108) and press into first stage seat valve assembly (109). Ensure grommet is bottomed in valve assembly.

19. Press valve lever assembly (99) into first stage seat valve assembly (109) until bottomed.

CAUTION

Verify that cross pin on valve lever assembly (99) is engaged in slots in first stage seat valve assembly (109). Damage to assembly may result when mounting screw (100) is tightened.

20. Thread first stage bellows assembly (102) onto valve lever assembly (99). Ensure approximately 2 to 3 threads remain shown (figure 14-6). Install gasket (103) over valve lever assembly (99) onto first stage bellows assembly (102). Insert first stage bellows assembly (102) and assembled parts through opening in regulator body (142). Apply a light film of lubricant to screw (100). Secure first stage bellows assembly and assembled valve lever assembly with washer (101) and screw (100).

NOTE

Ensure valve lever assembly (99) is positioned in center of inlet assembly port located in regulator housing prior to installation of inlet manifold assembly (104).

21. Insert packing (107) into regulator body (142). Ensure valve lever assembly (99) and inlet manifold assembly (104) are aligned properly. Install inlet manifold assembly (104) to regulator body (142) using washers (106) and screws (105).

22. Align gasket (103) with hole pattern in regulator body (142). Position spring (95) in recess of first stage bellows assembly (102).

NOTE

The short screws (90) are used in flange holes on diluter plate control housing and check valve assembly (89).

23. Install diluter plate control housing and check valve assembly (89) to regulator body (142) using washers (92 and 94) and screws (90, 91, and 93). Ensure diluter valve body (86) is centered before tightening screws.

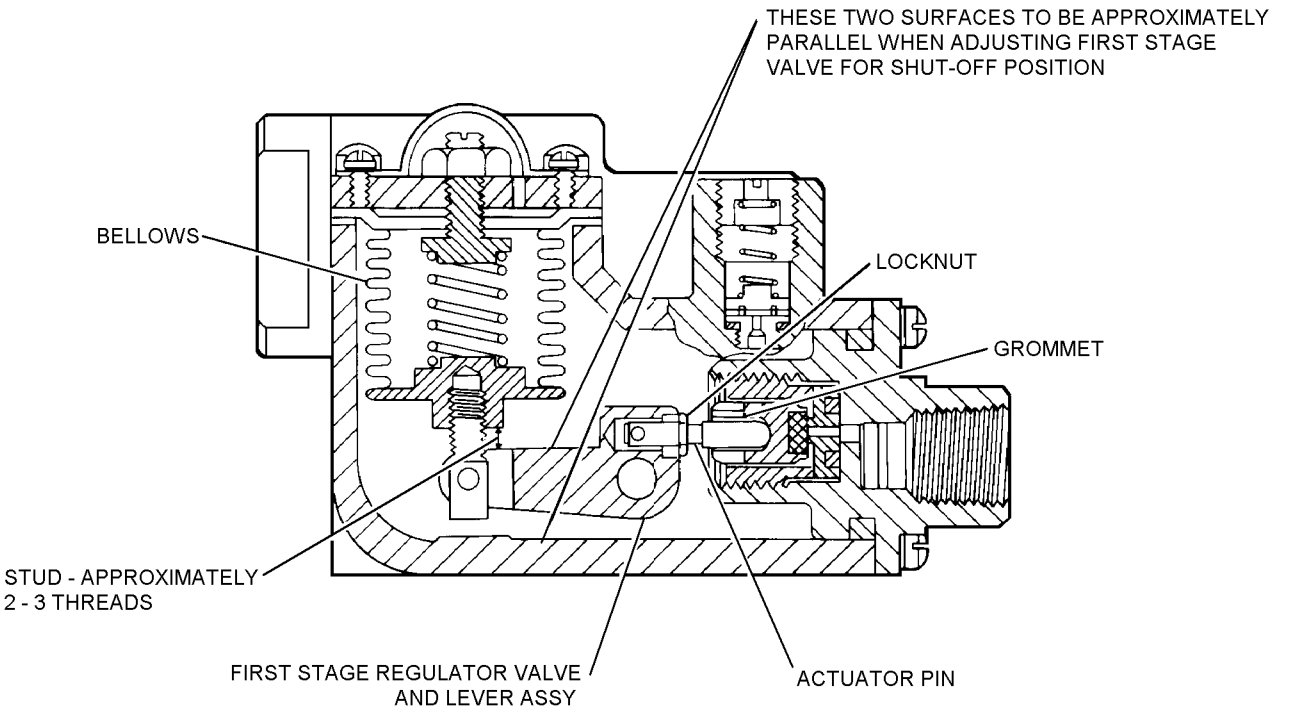

Figure 14-6. First Stage Relief Valve Adjustments

24. Install gasket (98) and cover plate (96) with screws (97).

25. Insert packing (31) into blinker port of regulator body (142). If removed during disassembly, reinstall tube connector (32) and tubing sleeve (33) onto blinker assembly (29). Install blinker assembly (29) to regulator body (142) with screws (30) and tighten tube connector (32).

26. Install packing (60) onto pressure breather valve assembly (57). Insert pressure breather valve assembly (57) into cavity of regulator housing (142). Ensuring holes are properly aligned, install retaining plate (59) and secure with screws (58).

14-115. LEAKAGE TEST AND ADJUSTMENTS. To test for leakage, and make adjustments to the partially assembled regulator, proceed as follows:

Materials Required

Quantity	Description	Reference Number
As Required	Compound, Leak Detection, Type 1	MIL-L-25567
As Required	Compound, Sealant	MIL-S-22473

Materials Required (Cont)

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	Brass Reducer Adapter	Local Manufacture, figure 14-7
1	Adapter Assembly	AN816-4-4
1	Adapter Assembly	AN816-4J
1	Oxygen Systems Components Test Stand	1172AS100 or 1316AS100

NOTE

Salvage the tubing from a discarded pressure gage, then pinch and silver solder the end of the tubing.

1. Install pressure gage tubing and preformed packing (37) into pressure gage port. Secure with washer (36) and screw (35).

CAUTION

Upon completion of tests and adjustments, remove metal strip from between regulator body (142) and inlet manifold assembly (104).

2. Install a thin strip of metal between the regulator body (142) and inlet manifold assembly (104) so that it depresses the inlet manifold stem.

3. Attach adapter fixture (figure 14-7) to the 0 to 160 psi pressure gage. Install gage, preformed packing (120) and gasket (119) into port normally occupied by demand valve feed port plug (118) (figure 14-8).

4. Install adapter (AN816-4J) into inlet manifold assembly (104) (figure 14-8).

5. Ensure all test stand valves are secured and turn on N_2 supply cylinder.

6. Connect regulator inlet to N_2 input connection (18) in the altitude chamber.

7. Using low pressure regulator (N) apply 150 psig.

8. Turn inlet ON/OFF valve (L) to ON position, 0 to 160 psi pressure gage should indicate 32 to 35 psig. If pressure is not within limits, adjust shutoff position of first stage regulator valve lever assembly (99) (figure 14-6).

9. Reduce supply pressure to 30 psig using system bleed (S) and apply leak detection compound to safety pressure/pressure breathing port (figure 14-9). Allowable leakage is 0.2 ccm (cubic centimeters) in 30 seconds. Any bubble distention at this port is excessive leakage and requires inspection/adjustment, or replacement of pressure breather valve assembly (57) (table 14-11).

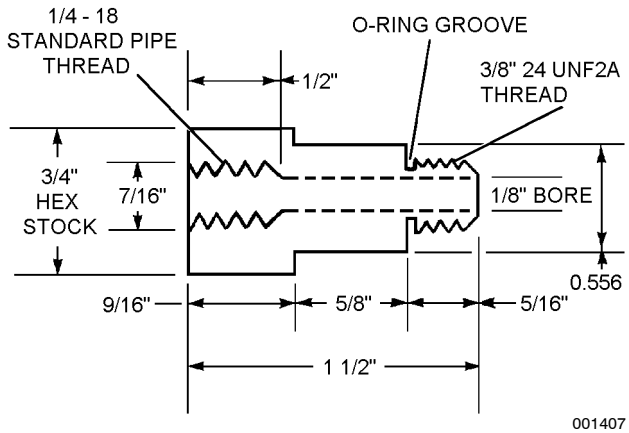

Figure 14-7. Brass Reducer Adapter

NOTE

Demand valve lever assembly (78) should protrude slightly above regulator body (142).

10. Using LOW PRESS. REGULATOR (N) increase inlet pressure to 150 psig and check demand valve lever assembly (78) adjustment by sliding a straight edge across regulator body (142). Straight edge should actuate demand valve, producing a slight flow.

11. Demand valve height adjustment is made by turning the adjustment screw (82) clockwise to raise lever, and counterclockwise to lower lever (figure 14-9).

12. Fully depress demand valve lever assembly (78). Pressure drop on 0 to 160 psi pressure gage shall not be more than 3 psig.

13. Depress demand valve lever assembly (78) and release while observing blinker assembly (29). Blinker assembly (29) should open when demand valve lever assembly (78) is depressed, and close immediately when released. Adjust in accordance with paragraph 14-108 and figure 14-5.

14. Depress demand valve lever assembly (78) to produce a flow, apply leak detection compound to blinker tubing nut and around base of blinker assembly (29), release demand valve lever assembly (78). If leakage is present, repair in accordance with paragraph 14-108 and figure 14-5.

15. Apply leak detection compound to base of diluter plate control housing and check valve assembly (89). If leakage is present, replace gasket (103).

16. Apply leak detection compound to first stage cover plate (96). If leakage is present, repair in accordance with table 14-8.

17. Apply leak detection compound to regulator outlet (132). If leakage is present, repair in accordance with table 14-3.

18. Remove metal strip from between regulator body (142) and inlet manifold assembly (104). Apply leak detection compound to the following areas (A, C, D, E and F, figure 14-10). If leakage is present, locate probable cause using table 14-5, and repair inlet manifold assembly (104).

19. Turn inlet pressure ON/OFF valve (L) to OFF, back out on low pressure regulator (N), open system bleed valve (S) and bleed pressure from regulated low pressure gage (11), and close system bleed (S).

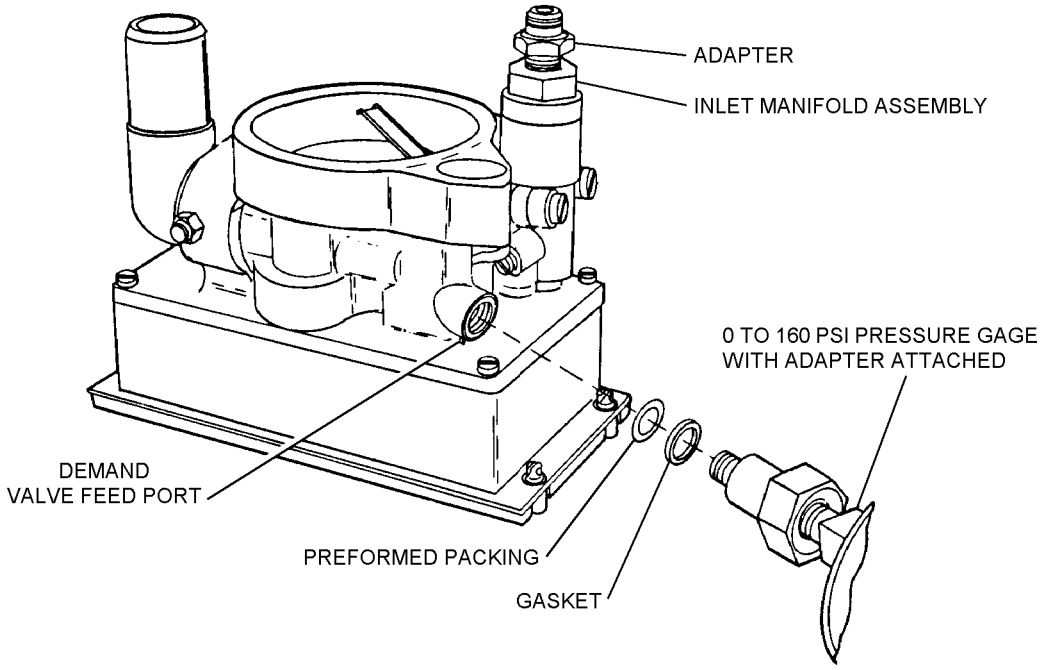

Figure 14-8. Attachment of 0 to 160 psi Pressure Gage to Demand Valve Feed Port for Leakage and Adjustment Test

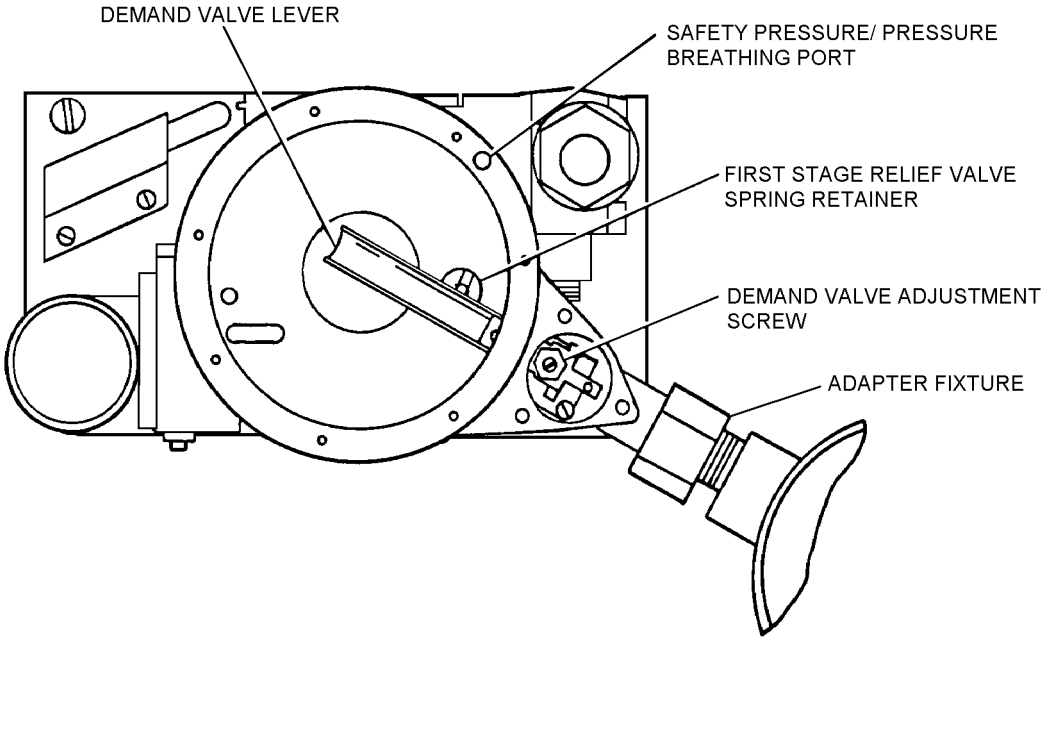

Figure 14-9. Attachment of Adapter Fixture to Regulator for Leakage and Adjustment Test

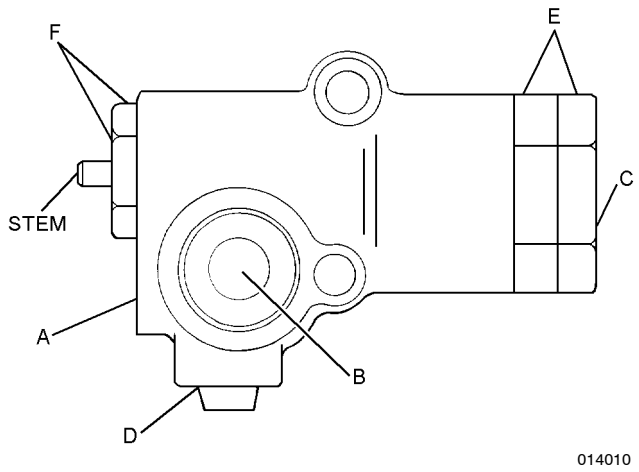

Figure 14-10. Test Areas, Manifold Inlet Assembly

20. Disconnect regulator from N_2 input connection (18), and remove 0 to 160 psi pressure gage from demand valve feed port.

21. Remove 0 to 160 psi pressure gage from adapter fixture.

22. Attach adapter (AN816-4-4) to adapter fixture and install adapter fixture, preformed packing (120), and gasket (119) into demand valve feed port (figure 14-8).

23. Connect regulator and adapter fixture to N_2 input connection (18), turn inlet pressure ON/OFF valve (L) to ON. Using LOW PRESS. REGULATOR (N), apply 60 psig to the regulator.

24. Adjust first stage relief valve spring retainer (126) so that first stage relief valve vents between 55 and 60 psig (figure 14-9). Clockwise to relieve later, counterclockwise to relieve earlier.

25. Reduce pressure to 50 psig using system bleed valve (S) and apply leak detection compound to area around first stage relief valve spring retainer (126). There shall be no leakage.

26. Turn inlet pressure ON/OFF valve (L) to OFF.

27. Turn N_2 supply cylinder off and bleed pressure from test stand using LOW PRESS. REGULATOR (N) and system bleed valve (S). Secure all test stand valves and disconnect regulator from N_2 input connection (18).

28. Remove adapter fixture, preformed packing (120) and gasket (119) from demand valve feed port.

29. Apply sealing compound (MIL-S-22347) or equivalent, to the first stage relief valve spring retainer (126).

30. Install new preformed packing (120), new gasket (119), and demand valve feed port plug (118) into demand valve feed port.

31. Remove screw (35), washer (36) and pinched and soldered pressure gage tubing from pressure gage port.

14-116. COMPLETION OF ASSEMBLY. To complete assembly of the regulator, proceed as follows:

Materials Required

Quantity	Description	Reference Number
As Required	Lamp, Incandescent	MS25237-327

NOTE

To aide in determining part placement and location, the plastic lighting panel shall be considered the front of the regulator.

1. Install washers (74) and screws (73) through holes on flat side of emergency pressure control assembly (70).

NOTE

Outer diaphragm (75) and diaphragm and plate assembly (77) must be installed with convoluted side down.

2. Stack outer diaphragm (75), diaphragm spacer assembly (76) and diaphragm and plate assembly (77) onto emergency pressure control assembly (70). Secure the assembled items to regulator body (142) with screws (73), washers (74), washer (72) and screw (71).

3. Install gasket (68) and second stage relief valve assembly (65) to cavity of regulator body (142) and secure with washers (67) and screws (66).

4. (Regulator part numbers 14950-45 only) install check disk (50) and spring (49).

5. Install aneroid and pin assembly (48) into top housing assembly (53 or 54) until aneroid is approximately 1/8 of a inch inside aneroid housing. Place packing (41) over stem of aneroid assembly and secure with nut (40).

6. Mate gasket (47) and bottom housing (45) with top housing assembly (53 or 54). Place seal (46), with large diameter of tapered hole adjacent to bottom housing (45), over pin of aneroid and pin assembly (48). Install spring (44) and retainer (43). Install and adjust nut (42) so that pin on aneroid and pin assembly (48) protrudes approximately two threads through nut (42).

NOTE

Ensure top housing assembly (53 or 54), when installed, is positioned with test port assembly (52) on outlet side of regulator.

7. Place diaphragm assembly (56) onto regulator body (142) with convolutions toward the front of regulator. Install top housing assembly (53 or 54) and secure with washers (39) and screws (38).

8. Attach unreinforced tubing (55) to top housing assembly (53). Attach free end of unreinforced tubing (55) to diluter plate control housing and check valve assembly (89).

9. If removed during disassembly, install packing (51) on test port assembly (52) and install test port assembly (52) into top housing assembly (53).

NOTE

Ensure that unreinforced tubing (55) is routed under bourbon tube of gage and bracket assembly (34).

10. Place packing (37) onto groove on gage and bracket assembly (34). Install gage and bracket assembly (34) to regulator body (142) with washers (36) and screws (35).

11. Install regulator shroud (22) to regulator body (142) with washers (24) and screws (23).

12. Install beam and fulcrum assembly (16) using washers (18) and screws (17) to regulator body (142).

13. Adjust locknut (27) and screw (26) to a dimension of 1.10 to 1.15 inches from end of emergency pressure control stem (28). Insert emergency pressure control stem assembly (28) into emergency pressure control stem guide (61).

14. If removed during disassembly, install diluter valve body (86) to diluter lever (88), using screw (87).

NOTE

Diluter valve body (86) should be centered over diluter port of diluter plate control housing and check valve assembly (89).

15. Remove two lower screws (90 and 92) with washers (93) from diluter plate control housing and check valve assembly (89). Install diluter lever (88) using washers (93) and screws (90 and 92) previously removed.

16. If removed during disassembly, insert cord assembly through counterbore of regulator body (142). Slide cord through bushing (125) and plate (121). Secure with washers (123) and screw (122).

17. Install mounting plate and control assembly (7) on regulator shroud (22) using screws (8). It may be necessary to align diluter test port with panel while installing.

18. Secure dilution test port located on diluter plate control housing and check valve assembly (89) and top housing assembly (53 or 54) test port with washers (11) and screws (9 and 10).

19. Install dust cap assembly (1) on test port located on diluter plate control housing and check valve assembly (89).

20. Perform complete Bench Test (paragraph 14-59).

21. Remove dust cap assembly (1). Install plastic lighting plate (2) onto mounting plate and controls assembly (7). Place washer (6), cap assembly (1), and bushing (3) onto screw (4). Install screw (4), washer (6), and screw (5) into mounting plate and controls assembly (7).

22. Install lamp, grommet, and cap to light assembly (18, figure 14-12), protruding through mounting plate and controls assembly (7) and plastic lighting plate (2).

23. If removed, install identification plate (69) onto emergency pressure control assembly (70).

24. Install screw (12) into dilution lever.

25. Install cap (1, figure 14-15), using washers and screws (3 and 2, figure 14-15).

26. Install oxygen filter (1, figure 14-17) and retaining ring (2, figure 14-17).

27. Install sealing cap (131) and protective plug (110).

28. Complete required Maintenance Data Collection System forms.

Section 14-5. Illustrated Parts Breakdown

14-117. GENERAL.

14-118. This section lists and illustrates the assemblies and detail parts of the regulators listed in table 14-16. This table also lists Usable On Codes used throughout this illustrated parts breakdown. These regulators are manufactured by Carleton Technologies, CAGE 03990.

14-119. The Illustrated Parts Breakdown should be used when requisitioning, storing, issuing, and identifying parts. It also illustrates disassembly and assembly relationships.

Table 14-16. Regulator Usable On Codes

Type	Part No.	Usable On Code
CRU-73/A	B40550-1	A
CRU-73/A	14950-45	B
CRU-73/A	14950-40	C
CRU-68A/A	14950-34M	D
CRU-92/A	B40860-1	E

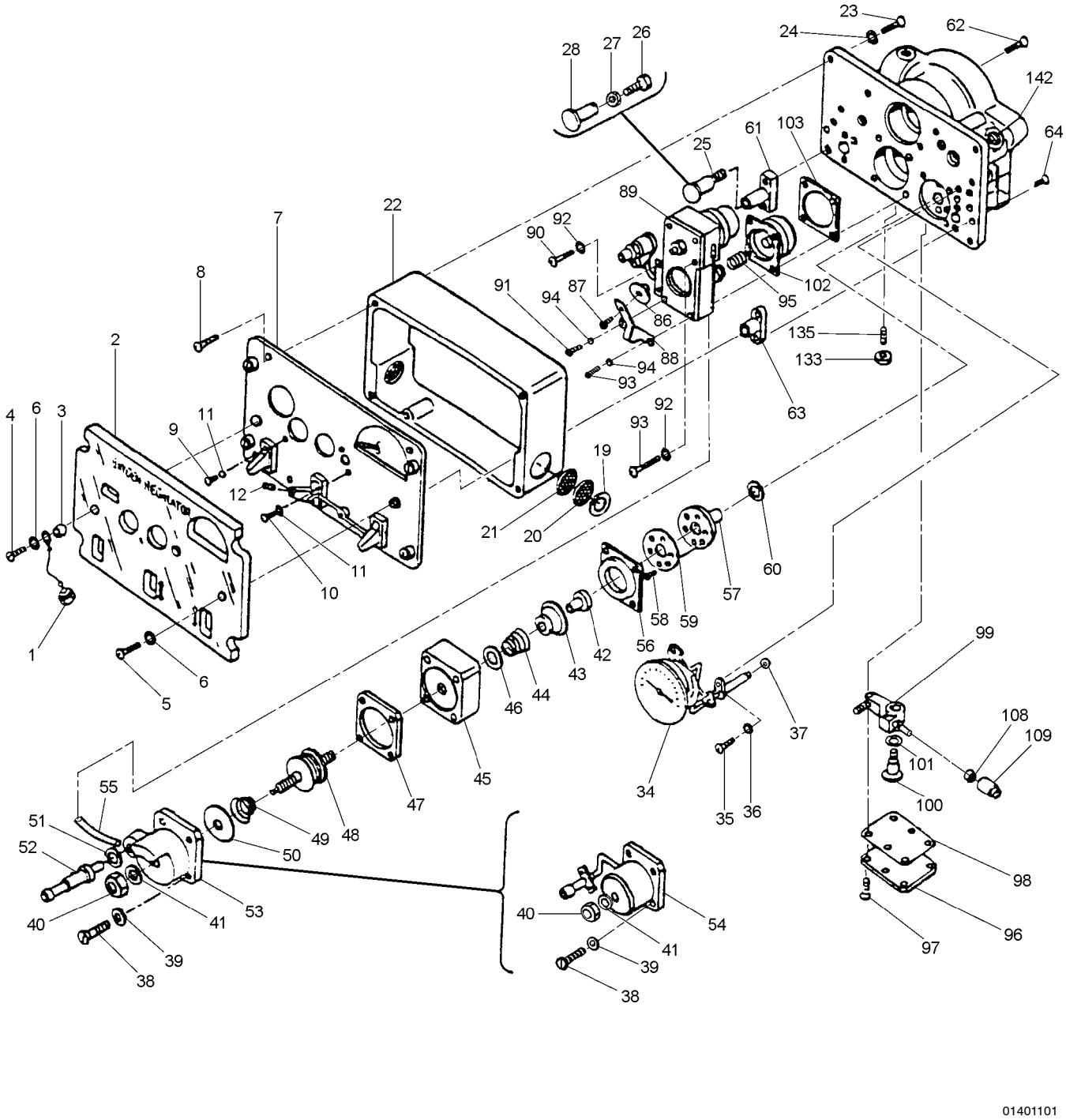

Figure 14-11. Aircraft Panel Mounted Oxygen Regulator, Types CRU-73/A, CRU-68A/A, and CRU-92/A (Sheet 1 of 2)

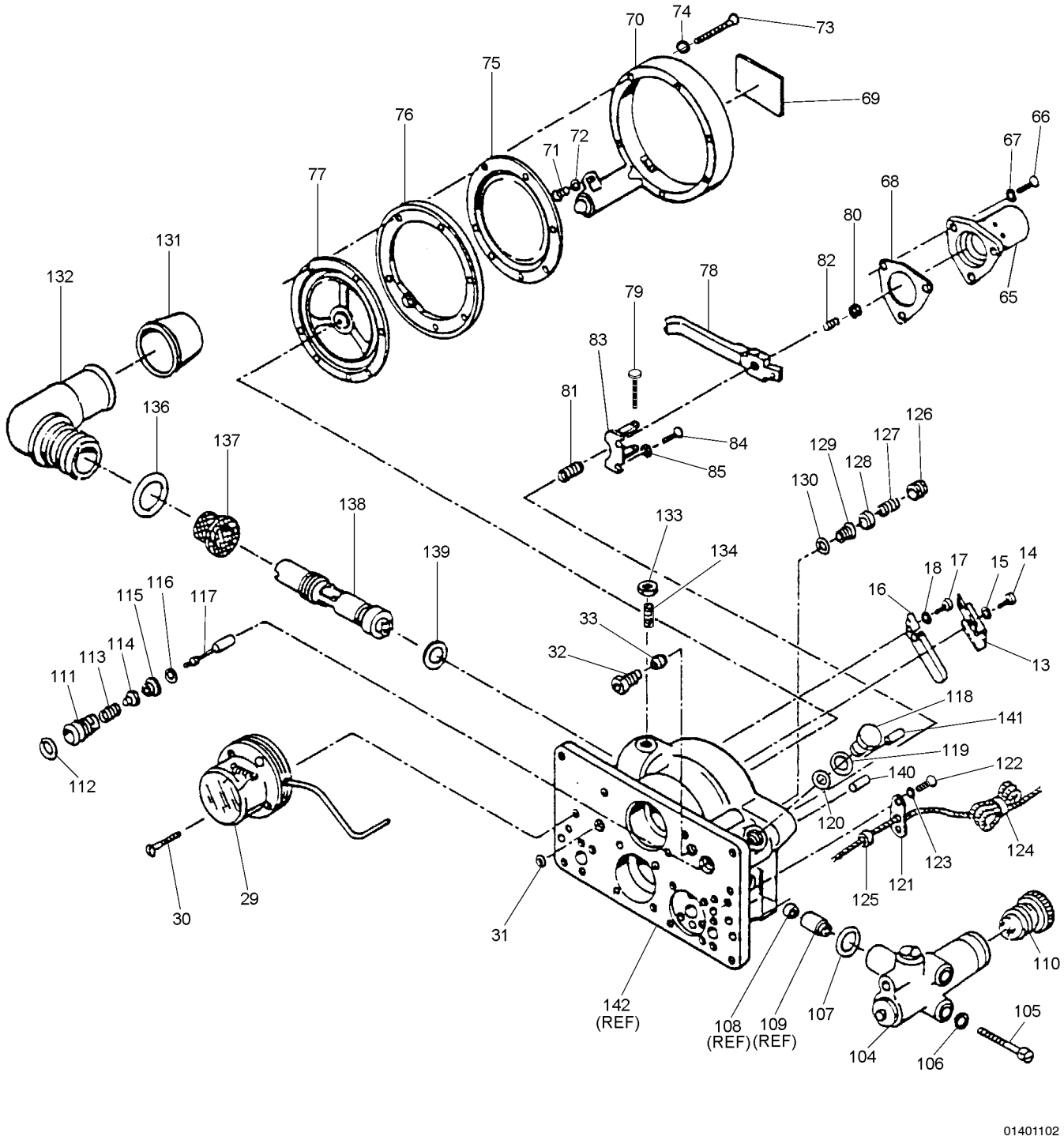

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Figure 14-11. Aircraft Panel Mounted Oxygen Regulator, Types CRU-73/A, CRU-68A/A, and CRU-92/A (Sheet 2 of 2)

Figure and Index Number	Part Number	Description 1 2 3 4 5 6 7	Units Per Assembly	Usable On Code
14-11	B40550-1	REGULATOR, Oxygen (Parts Kit Available)	1	A
	14950-45	REGULATOR, Oxygen (Parts Kit Available)	1	B
	14950-40	REGULATOR, Oxygen (Parts Kit Available)	1	C
	14950-34M	REGULATOR, Oxygen (Parts Kit Available)	1	D
	B40860-1	REGULATOR, Oxygen (Parts Kit Available)	1	E
	14951-45	REGULATOR, Automatic Pressure Breathing, Diluter Demand, Oxygen	REF	B
	14951-40	REGULATOR, Automatic Pressure Breathing, Diluter Demand, Oxygen	REF	C
	14951-34M	REGULATOR, Automatic Pressure Breathing, Diluter Demand, Oxygen	REF	D
-1	19726-3	. CAP ASSEMBLY, Dust	1	A
	19726-2	. CAP ASSEMBLY, Dust	1	B
	19726-1	. CAP ASSEMBLY, Dust	1	C
-2	19578	. PLATE, Plastic Lighting	1	A, B
	19578-1	. PLATE, Plastic Lighting	1	C
	19578-2	. PLATE, Plastic Lighting	1	E
-3	19498-1	. SPACER	1	
-4	MS35265-27	. SCREW (KF)	1	
-5	MS35265-25	. SCREW (KF)	1	
-6	MS35333-37	. WASHER (KF)	2	
-7	B40595-1	. MOUNTING PLATE AND CONTROLS ASSEMBLY (figure 14-12 for BKDN)	1	A
	19579	. MOUNTING PLATE AND CONTROLS ASSEMBLY (figure 14-12 for BKDN)	1	B, C
	19579-1	. MOUNTING PLATE AND CONTROLS ASSEMBLY (figure 14-12 for BKDN)	1	D
	B40863-1	. MOUNTING PLATE AND CONTROLS ASSEMBLY (NVIIS) (figure 14-12 for BKDN)	1	E
-8	MS24693S26	. SCREW (KF)	5	
-9	MS51957-13	. SCREW (KF)	1	C
	MS51957-17	. SCREW	1	D
-10	MS51957-12	. SCREW (KF)	2	C, D
-11	MS35338-40	. WASHER (KF)	3	C, D
-12	AS103CC832F2	. SCREW	1	B, C, D
-13	14986	. GUARD, Emergency Pressure Control Beam	1	
-14	MS35206-213	. SCREW (KF)	2	
-15	MS35338-40	. WASHER (KF)	2	
-16	14842	. BEAM AND FULCRUM ASSEMBLY	1	
-17	MS35265-16	. SCREW (KF)	1	
-18	MS35338-40	. WASHER (KF)	1	
	14804	. SHROUD AND SCREEN ASSEMBLY	1	
-19	14889	. RING, Screen Retaining	2	
-20	14887	. GUARD, Air Port Screen	2	
-21	14888	. SCREEN, Air Port	2	
-22	14974	. SHROUD, Regulator	1	
-23	MS35265-30	. SCREW (KF)	4	
-24	MS35338-41	. WASHER (KF)	4	
-25	14836-3	. STEM ASSEMBLY, Emergency Pressure Control	1	

Figure and Index Number	Part Number	Description 1 2 3 4 5 6 7	Units Per Assembly	Usable On Code
14-11-26	14839	. SCREW, Emergency Pressure Control Adjust	1	
-27	MS21043-04	. NUT	1	
-28	907713-1	. STEM, Emergency Pressure Control	1	
-29	19626	. BLINKER ASSEMBLY ..... (figure 14-13 for BKDN)	1	
-30	19543-2	. SCREW (KF)	2	
-31	14909-1	. PACKING, Preformed (KC)	1	
-32	14827	. CONNECTOR, Tube	1	
-33	14826	. SLEEVE, Tubing	1	
-34	17923	. GAGE AND BRACKET ASSEMBLY	1	
-35	MS35206-213	. SCREW (KF)	3	
-36	MS35338-40	. WASHER (KF)	3	
-37	14945	. PACKING, Preformed (KC)	1	
	B905739-2	. CONTROL ASSEMBLY, Pressure Breathing	1	A, E
	905739-1	. CONTROL ASSEMBLY, Pressure Breathing	1	B
	19727	. CONTROL ASSEMBLY, Pressure Breathing	1	C, D
-38	MS35265-18	. SCREW (KF)	4	
-39	AS142CC4	. WASHER (KF)	4	
-40	12249	. NUT	1	
-41	19846	. PACKING, Preformed (KC)	1	
-42	19573	. NUT (KF)	1	
-43	19666	. RETAINER	1	
-44	14959-1	. SPRING (KF)	1	
-45	19567	. HOUSING	1	A, B, E
-46	19568	. SEAL (KC)	1	
-47	19566	. GASKET (KC)	1	
-48	19855	. ANEROID AND PIN ASSEMBLY	1	
-49	905731-1	. SPRING	1	B
-50	905730-1	. DISK, Check	1	B
-51	14909-3	. PACKING, Preformed (KC)	1	B
-52	905733-1	. TEST PORT ASSEMBLY	1	B
-53	905736-1	. HOUSING ASSEMBLY	1	B
-54	19649	. HOUSING ASSEMBLY	1	C, D
-55	FS8650-020	. TUBING, Unreinforced	1	B
-56	14944	. DIAPHRAGM ASSEMBLY (KC)	1	
-57	14934	. VALVE ASSEMBLY, Pressure Breather	1	
-58	AS108CC348-5	. SCREW (KF)	3	
-59	16210	. PLATE, Retaining	1	
-60	15697	. PACKING, Preformed (KC)	1	
-61	14840-1	. GUIDE, Emergency Pressure Control Stem	1	
-62	AS108CC348-5	. SCREW (KF)	2	
-63	14851-1	. GUIDE, Supply Control Stem	1	
-64	AS108CC440-7	. SCREW (KF)	2	
-65	14880-3	. VALVE ASSEMBLY, Second Stage Relief ..... (figure 14-14 for BKDN)	1	
-66	MS35265-13	. SCREW (KF)	3	
-67	MS35338-40	. WASHER (KF)	3	
-68	14908	. GASKET, Preformed (KC)	1	

Figure and Index Number	Part Number	Description 1 2 3 4 5 6 7	Units Per Assembly	Usable On Code
14-11--69	B40593-1	. PLATE, Identification	1	A
	905748-1	. PLATE, Identification	1	B
	19665	. PLATE, Identification	1	C
	16579	. PLATE, Identification	1	D
	905746-1	. PLATE, Identification	1	E
-70	14866	. CONTROL ASSEMBLY, Emergency Pressure (figure 14-15 for BKDN)	1	
-71	MS35265-13	. SCREW (KF)	1	
-72	MS35333-36	. WASHER (KF)	1	
-73	MS35265-10	. SCREW (KF)	7	
-74	MS35338-39	. WASHER (KF)	7	
-75	14863	. DIAPHRAGM, Outer (KC)	1	
-76	14865	. SPACER ASSEMBLY, Diaphragm	1	
-77	19457	. DIAPHRAGM AND PLATE ASSEMBLY	1	A, B, E
	19813	. DIAPHRAGM AND PLATE ASSEMBLY	1	C, D
-78	19810	. LEVER ASSEMBLY, Demand Valve	1	
-79	19682	. PIN, Vane Mounting	1	
-80	14562	. PALNUT	1	
-81	19571	. SPRING, Demand Valve Lever	1	
-82	19683	. SCREW	1	
-83	19686	. FULCRUM, Demand Valve	1	
-84	MS35206-203	. SCREW (KF)	1	
-85	MS35333-35	. WASHER (KF)	1	
-86	19976	. BODY, Diluter Valve (KC)	1	
-87	19715	. SCREW, Shoulder (KF)	1	
-88	19646	. LEVER, Diluter (KF)	1	
-89	B40596-1	. DILUTER PLATE CONTROL HOUSING AND CHECK VALVE ASSEMBLY (figure 14-16 for BKDN)	1	A, E
	905740-1	. DILUTER PLATE CONTROL HOUSING AND CHECK VALVE ASSEMBLY (figure 14-16 for BKDN)	1	B
	19731-2	. DILUTER PLATE CONTROL HOUSING AND CHECK VALVE ASSEMBLY (figure 14-16 for BKDN)	1	C, D
-90	MS35206-215	. SCREW (KF)	2	
-91	MS35206-216	. SCREW (KF)	1	
-92	MS35338-40	. WASHER (KF)	3	
-93	MS35206-221	. SCREW (KF)	2	
-94	MS35333-36	. WASHER (KF)	2	
-95	14831-1	. SPRING, Helical, First Stage	1	
-96	14903-1	. PLATE, First Stage Cover	1	
-97	AS108CC440-4	. SCREW (KF)	6	
-98	14904-1	. GASKET, First Stage (KC)	1	
-99	14832	. VALVE LEVER ASSEMBLY, First Stage	1	
-100	14958	. SCREW	1	
-101	14957	. WASHER	1	
-102	14905	. BELLOWS ASSEMBLY, First Stage	1	
-103	14907	. GASKET, First Stage Bellows (KC)	1	

Figure and Index Number	Part Number	Description 1 2 3 4 5 6 7	Units Per Assembly	Usable On Code
14-11-104	14890-8	. MANIFOLD INLET ASSEMBLY (figure 14-17 for BKDN)	1	
-105	MS35266-67	. SCREW (KF)	2	
-106	MS35338-43	. WASHER (KF)	2	
-107	14909-11	. PACKING, Preformed (KC)	1	
-108	16695	. GROMMET (KC)	1	
-109	14966-2	. VALVE ASSEMBLY, First Stage Seat (KF)	1	
-110	13040-1	. PLUG, Protective (KF)	1	
-111	14972	. SCREW, Demand Valve Retaining	1	
-112	14909-9	. PACKING, Preformed (KC)	1	
-113	16212	. SPRING, Demand Valve (KF)	1	
-114	15882	. VALVE ASSEMBLY, Demand (KC)	1	
-115	14973	. SEAT, Demand Valve (KC)	1	
-116	14909-5	. PACKING, Preformed (KC)	1	
-117	14982	. PIN, Demand Valve (KF)	1	
-118	14879	. PLUG, Demand Valve Feed Port	1	
-119	16664	. GASKET, Plug (KC)	1	
-120	14909-5	. PACKING, Preformed (KC)	1	
-121	14824	. PLATE, Panel Light Cord	1	
-122	MS35206-213	. SCREW (KF)	2	
-123	MS35338-40	. WASHER (KF)	2	
-124	17436	. WIRE HOLDER	1	
-125	14823	. BUSHING, Panel Light Electrical Cord (KC)	1	
-126	9177	. RETAINER, Relief Valve Spring	1	
-127	16381	. SPRING, Relief Valve (KF)	1	
-128	16379	. VALVE ASSEMBLY, First Stage Relief	1	
-129	11221	. SEAT, Relief Valve (KC)	1	
-130	14909-2	. PACKING, Preformed (KC)	1	
-131	812097-1	. CAP, Sealing (KF)	1	
-132	14932	. OUTLET, Regulator	1	
-133	MS35649-282	. NUT (KF)	2	
-134	AS103CC832H6	. SETSCREW (KF)	1	
-135	AS103CC832H8	. SETSCREW (KF)	1	
-136	14825-19	. PACKING, Preformed (KC)	1	
-137	16480	. SCREEN, Venturi (KF)	1	
-138	19795	. VENTURI ASSEMBLY (figure 14-18 for BKDN)	1	
-139	11761	. GASKET, Venturi Nozzle (KC)	1	
	14803	. HOUSING AND DEMAND VALVE BUSHING ASSEMBLY	1	
-140	14998	. PIN DOWEL	1	
-141	14981-2	. GUIDE, Demand Valve Pin	1	
-142	14802	. BODY, Regulator	1	
	B43387-1	PARTS KIT (Cure Date) (Note 1)	1	
	B43388-1	PARTS KIT (Major Overhaul) (Note 1)	1	

Note: 1. These parts kits do not have stock numbers assigned. If they are needed for repair of the regulator, they must be open purchased via supply system from the manufacturer Carleton Technologies, Orange Park, NY CAGE 03390.

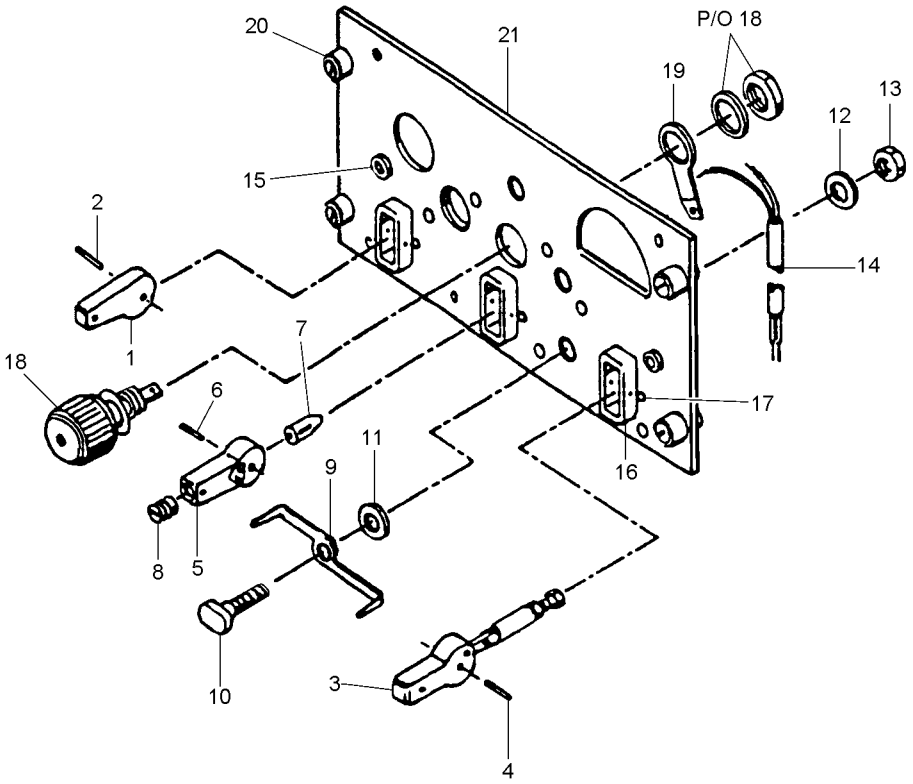

Figure 14-12. Mounting Plate and Controls Assembly

014012

Figure and Index Number	Part Number	Description 1 2 3 4 5 6 7	Units Per Assembly	Usable On Code
14-12	B40595-1	. MOUNTING PLATE AND CONTROLS ASSEMBLY (figure 14-11 for NHA)	REF	A
	19579	. MOUNTING PLATE AND CONTROLS ASSEMBLY (figure 14-11 for NHA)	REF	B, C
	19579-1	. MOUNTING PLATE AND CONTROLS ASSEMBLY (figure 14-11 for NHA)	REF	D
	B40863-1	. MOUNTING PLATE AND CONTROLS ASSEMBLY (NVIIS) (figure 14-11 for NHA)	REF	E
-1	905714-1	. LEVER, Emergency Pressure Control (KF)	1	
-2	14850	. PIN, Control Lever (KF)	1	B, C, D
-3	19658	. LEVER AND STEM ASSEMBLY, Supply Valve Control	1	A, B, E
	19658-1	. LEVER AND STEM ASSEMBLY, Supply Valve Control	1	C
-4	14850	. PIN, Control Lever (KF)	1	
-5	905715-1	. LEVER, Diluter Control Valve	1	A, B, E
	905715-2	. LEVER, Diluter Control Valve	1	C
-6	14850	. PIN, Control Lever (KF)	1	
-7	14848-4	. FOLLOWER ASSEMBLY, Diluter Lever (KF)	1	
-8	AS103CC832H10	. SCREW, Adjustment	1	
-9	19582	. LINKAGE, Toggle	1	
-10	19583	. SCREW, Shoulder	1	
-11	AN960C3	. WASHER	1	
-12	AS142CC3	. WASHER	1	

Figure and Index Number	Part Number	Description 1 2 3 4 5 6 7	Units Per Assembly	Usable On Code
14-12-13	AS115S356	. NUT	1	
	19581	. PLATE ASSEMBLY, Mounting	1	
-14	14809	. CORD ASSEMBLY, Panel Light (KF)	1	
-15	14828	. BUSHING	2	
-16	14846	. BUSHING	3	
-17	MS20426DD2-3	. RIVET	6	
-18	19179-4	. LIGHT ASSEMBLY	1	
-19	742555-1	. LUG, Terminal	1	
-20	19870	. FASTENER ASSEMBLY (KF)	4	
-21	19577	. PLATE, Mounting	1	

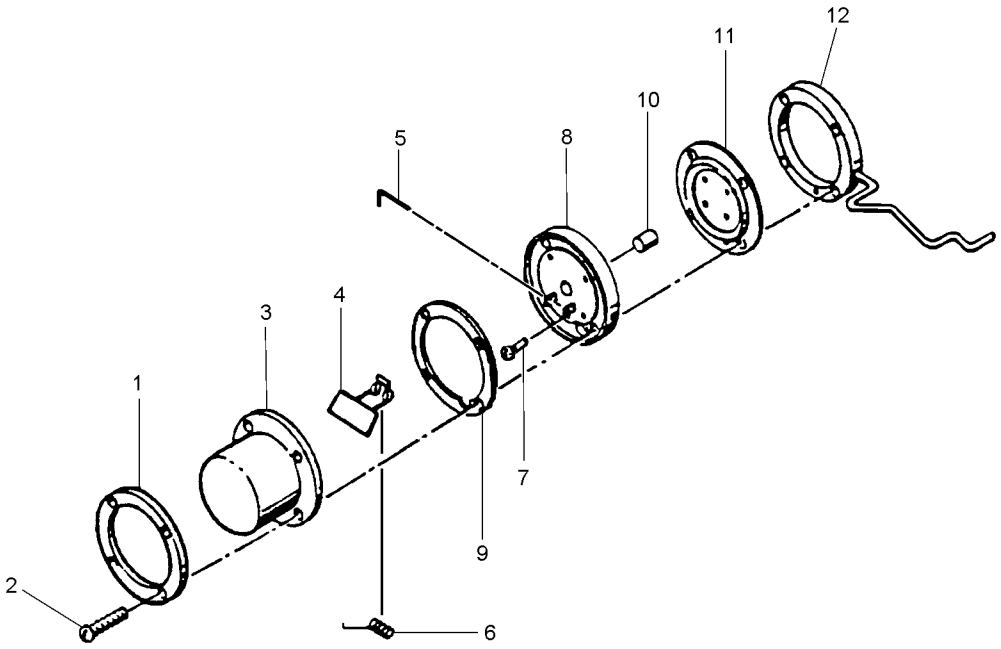

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Figure 14-13. Blinker Assembly

Figure and Index Number	Part Number	Description 1 2 3 4 5 6 7	Units Per Assembly	Usable On Code
14-13	19626	BLINKER ASSEMBLY (figure 14-11 for NHA)	REF	
-1	19546	. RETAINER, Plate	1	
-2	19543-1	. SCREW (KF)	2	
-3	19618	. COVER (KF)	1	
-4	14819	. FLAG AND LEVER ASSEMBLY	1	
-5	14983	. PIN, Blinker (KF)	1	
-6	14984	. SPRING, Blinker (KF)	1	
-7	MS35265-1	. SCREW (KF)	1	
-8	19616	. GUIDE, Actuator (KF)	1	
-9	19624	. GASKET (KC)	1	
-10	19623	. ACTUATOR, Blinker (KF)	1	
-11	14821	. DIAPHRAGM ASSEMBLY, Blinker (KC)	1	
-12	14987	. BLINKER TUBING AND BASE PLATE ASSEMBLY	1	

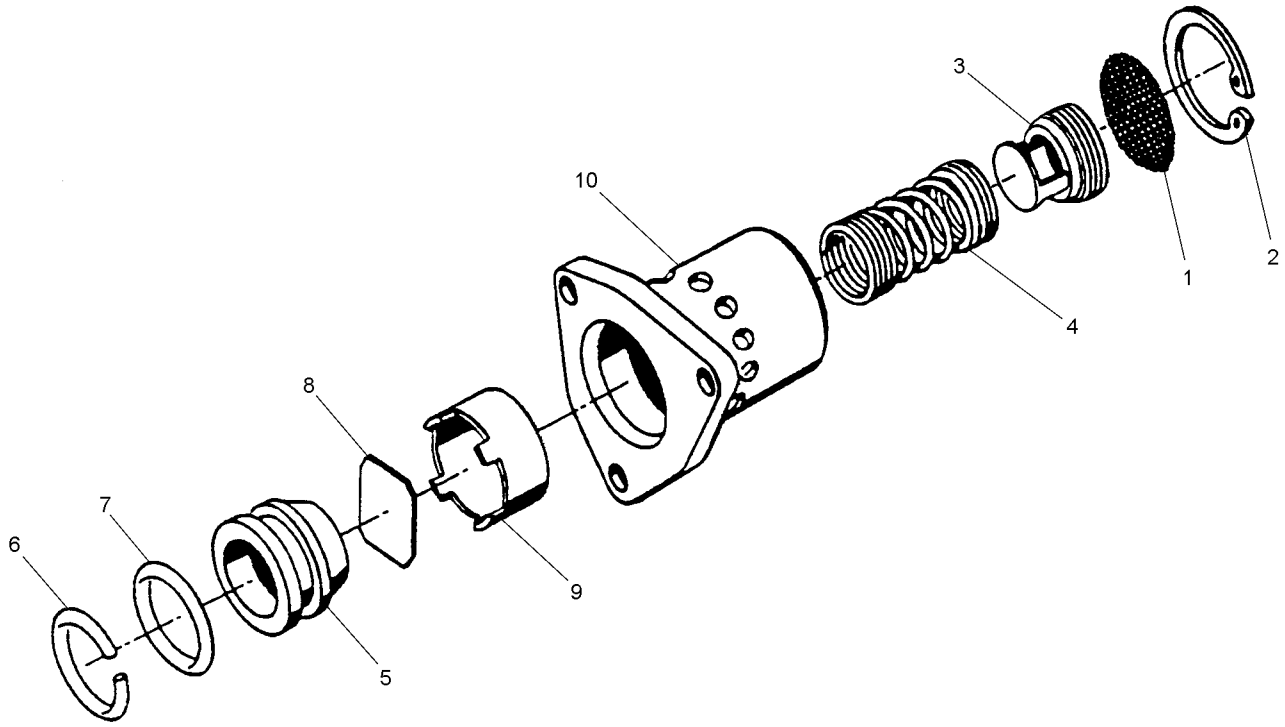

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Figure 14-14. Second Stage Relief Valve Assembly

Figure and Index Number	Part Number	Description 1 2 3 4 5 6 7	Units Per Assembly	Usable On Code
14-14	14880-3	VALVE ASSY, Second Stage Relief . . . . . (figure 14-11 for NHA)	REF	
-1	708760-1	. SCREEN, Relief Valve (KF)	1	
-2	92587-50	. RING, Retaining (KF)	1	
-3	708763-1	. RETAINER, Spring	1	
-4	14886	. SPRING, Second Stage Relief Valve (KF)	1	
-5	19332	. SEAT, Second Stage Relief Valve (KF)	1	
-6	14881	. RING, Retaining (KF)	1	
-7	14909-7	. PACKING, Preformed (KC)	1	
-8	14885	. VALVE, Second Stage Relief (KF)	1	
-9	19333	. SLEEVE, Guide (KF)	1	
-10	14882-1	. HOUSING, Second Stage Relief Valve	1	

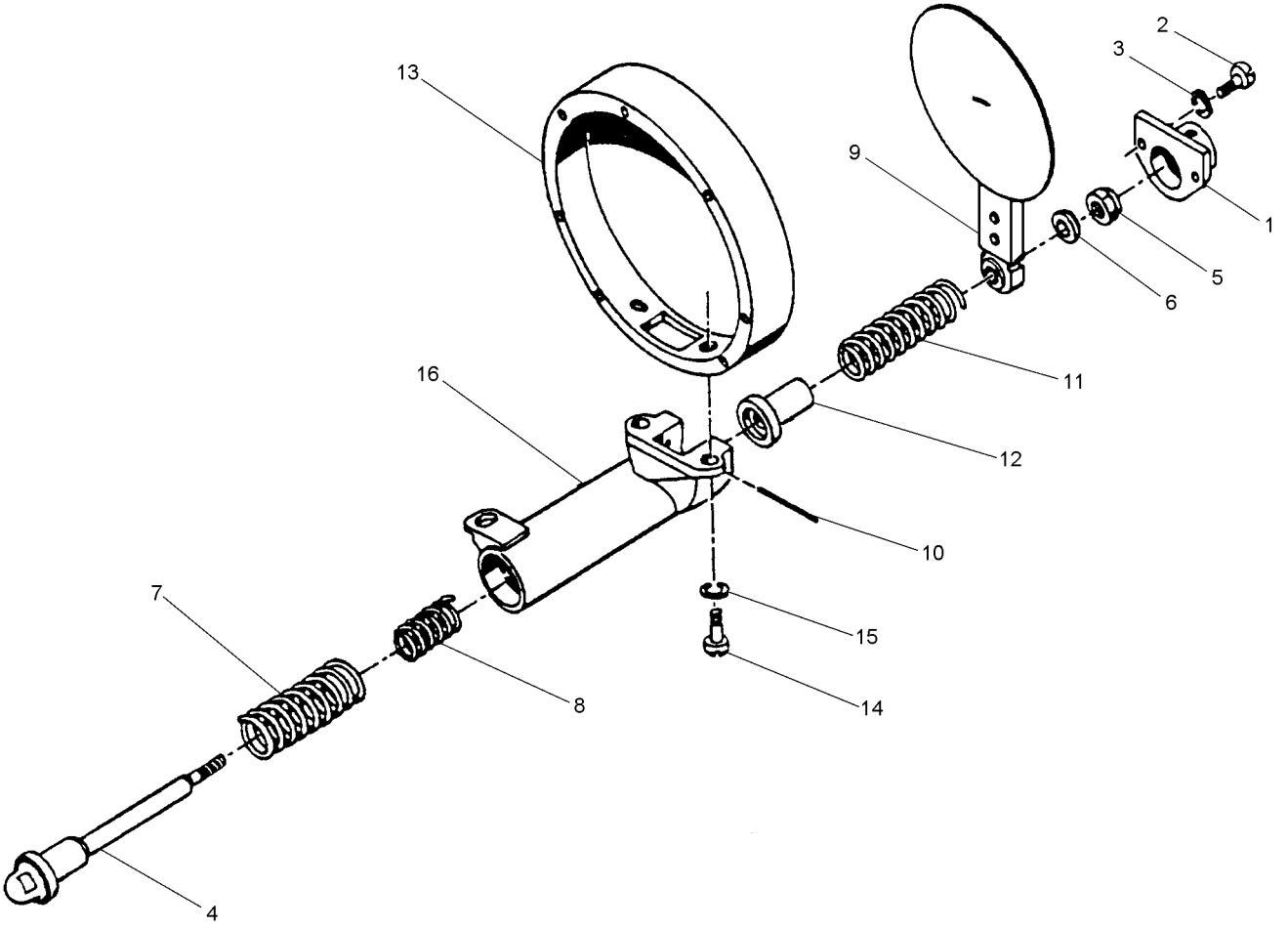


Figure 14-15. Emergency Pressure Control Assembly

Figure and Index Number	Part Number	Description 1 2 3 4 5 6 7	Units Per Assembly	Usable On Code
14-15	14866	CONTROL ASSEMBLY, Emergency Pressure . . . . . (figure 14-11 for NHA)	REF	
-1	14868	. CAP, Emergency Pressure Control . . . . . Housing	1	
-2	MS35265-2	. SCREW (KF)	2	
-3	MS35333-35	. WASHER (KF)	2	
-4	14875	. STEM, Emergency Pressure Lever	1	
-5	16557	. NUT, Self Locking Hex (KF)	1	
-6	16479	. SWIVEL, Emergency Pressure (KF)	1	
-7	14878-1	. SPRING, Emergency Pressure Control (KF)	1	
-8	14877	. SPRING, Emergency Pressure Control . . . . . Test (KF)	1	
-9	14870	. CONTROL LEVER AND CENTER . . . . . ASSEMBLY, Emergency Pressure	1	
-10	14961	. PIN (KF)	1	
-11	14876	. SPRING, Helical Compression Emergency . . . . . Pressure (KF)	1	
-12	14874-1	. GUIDE, Emergency Pressure Spring . . . . . 0.500-Inch Long (KF)	1	
	14874-2	. GUIDE, Emergency Pressure Spring . . . . . 0.531-Inch Long (KF)	1	
	14874-3	. GUIDE, Emergency Pressure Spring . . . . . 0.546-Inch Long (KF)	1	
	14874-4	. GUIDE, Emergency Pressure Spring . . . . . 0.562-Inch Long	1	
	14874-5	. GUIDE, Emergency Pressure Spring . . . . . 0.578-Inch Long (KF)	1	
	14874-6	. GUIDE, Emergency Pressure Spring . . . . . 0.593-Inch Long	1	
	14874-7	. GUIDE, Emergency Pressure Spring . . . . . 0.662-Inch Long (KF)	1	
	14874-8	. GUIDE, Emergency Pressure Spring . . . . . 0.682-Inch Long	1	
	14874-9	. GUIDE, Emergency Pressure Spring . . . . . 0.531-Inch Long (KF)	1	
	14874-10	. GUIDE, Emergency Pressure Spring . . . . . 0.375-Inch Long	1	
-13	14869	. COVER, Second Stage Regulator	1	
-14	MS35265-13	. SCREW (KF)	2	
-15	MS35333-36	. WASHER (KF)	2	
-16	14867	. HOUSING, Emergency Pressure Control (KF) . . .	1	

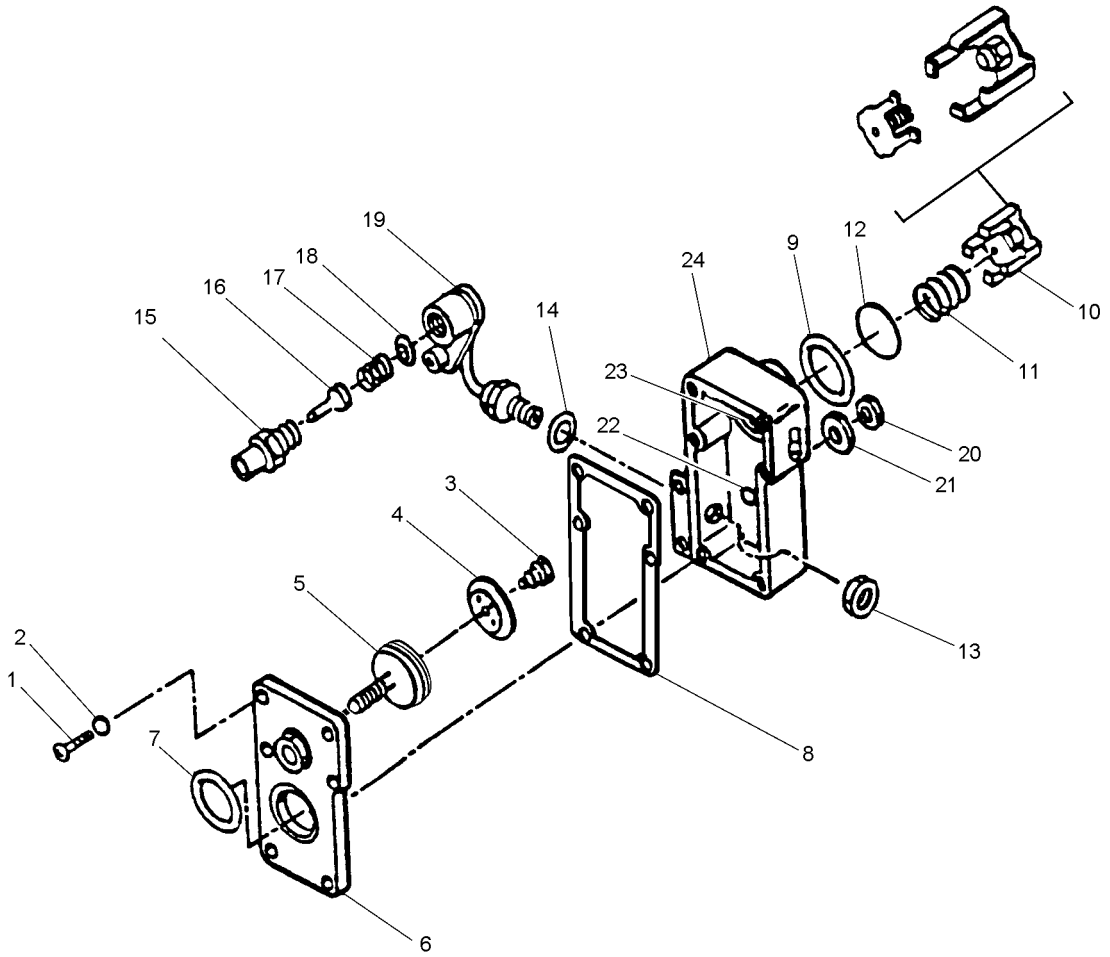


Figure 14-16. Diluter Plate Control Housing and Check Valve Assembly

Figure and Index Number	Part Number	Description 1 2 3 4 5 6 7	Units Per Assembly	Usable On Code
14-16	B40596-1	. DILUTER PLATE CONTROL HOUSING AND CHECK VALVE ASSEMBLY (figure 14-11 for NHA)	REF	A, E
	905740-1	. DILUTER PLATE CONTROL HOUSING AND CHECK VALVE ASSEMBLY (figure 14-11 for NHA)	REF	B
	19731-2	. DILUTER PLATE CONTROL HOUSING AND CHECK VALVE ASSEMBLY (figure 14-11 for NHA)	REF	C, D
	19648	. PLATE ASSEMBLY, Diluter	1	
-1	MS35206-216	. SCREW (KF)	3	
-2	MS35338-40	. WASHER (KF)	3	
-3	16284-1	. SCREW, Throttling Plate (KF)	1	
-4	19949	. PLATE, Throttling (KF)	1	C, D
-5	758632-2	. ANEROID ASSEMBLY	1	
-6	19809-2	. PLATE ASSEMBLY, Diluter Valve	1	B, C, D
-7	19977	. SEAL, Diluter (KC)	1	
-8	14921	. GASKET, Diluter Housing (KC)	1	
-9	14825-21	. PACKING, Preformed (KC)	1	
-10	11707	. RETAINER ASSEMBLY, Aneroid Check Valve (KF)	1	
-11	11706	. SPRING, Aneroid Check Valve (KF)	1	
-12	11705	. DISK, Check Valve (KC)	1	
	905741-1	. HOUSING ASSEMBLY, Diluter Control	1	A, E
	19732-1	. HOUSING ASSEMBLY, Diluter Control	1	B, C
-13	MS21044C08	. NUT	1	
-14	14909-3	. PACKING, Preformed (KC)	1	
-15	19718-2	. FITTING, Test Port	1	
-16	19704	. POPPET VALVE, Test Port	1	
-17	19703	. SPRING	1	
-18	14909-6	. PACKING, Preformed (KC)	1	
-19	19822-3	. TUBE AND ADAPTER ASSEMBLY	1	
-20	19014	. NUT, First Stage Adjusting Lock	1	B, C
-21	14830	. NUT, First Stage Adjusting	1	B, C
-22	14926	. SCREW, First Stage Adjusting	1	B, C
-23	14923	. SEAT, Diluter Valve	1	C, D
-24	19719	. HOUSING, Diluter Control	1	C, D
	905738-1	. HOUSING AND BARB ASSEMBLY, Diluter Control	1	A, B, E
	14937	ADAPTER SPRING AND SCREW ASSEMBLY (Note 1)	1	

Notes: 1. See index number 10.

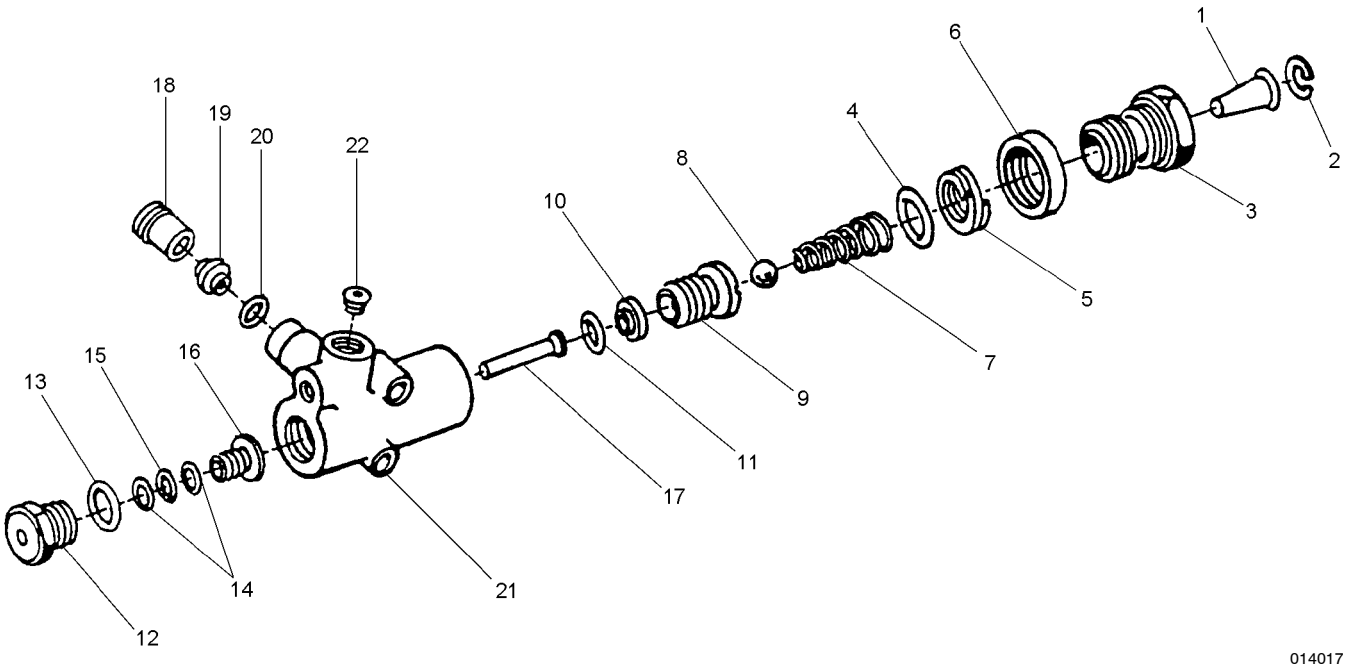
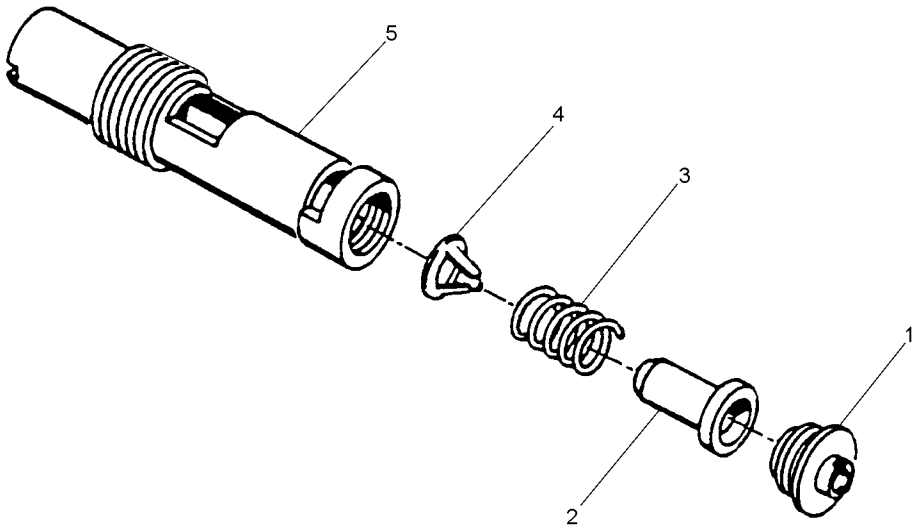


Figure 14-17. Manifold Inlet Assembly

Figure and Index Number	Part Number	Description 1 2 3 4 5 6 7	Units Per Assembly	Usable On Code
14-17	14890-8	MANIFOLD INLET ASSEMBLY . . . . . (figure 14-11 for NHA)	REF	
-1	14898	. FILTER, Oxygen (KF)	1	
-2	0-521-72A	. RING, Retaining (KF)	1	
-3	14947	. ADAPTER, Manifold Inlet	1	
-4	14909-11	. PACKING, Preformed (KC)	1	
-5	15746	. RING, Packing Backup (KC)	1	
-6	14948	. SPACER, Locking (KF)	1	
-7	14899	. SPRING, Supply Valve Conical Compression (KF)	1	
-8	19755	. BALL, Seat (KF)	1	
-9	14900-1	. RETAINER, Inlet Supply Valve Seat (KF)	1	
-10	19753	. INLET SEAT ASSEMBLY (KF)	1	
-11	14909-5	. PACKING, Preformed (KC)	1	
-12	16798	. RETAINER, Manifold Seal	1	
-13	14825-13	. PACKING, Preformed (KC)	1	
-14	16795	. RETAINER, Packing (KC)	2	
-15	19157	. PACKING, Preformed (KC)	1	
-16	16796	. RETAINER, Manifold Valve Stem Seal	1	
-17	19754	. STEM, Inlet Supply Actuator (KF)	1	
-18	15877	. RETAINER, Inlet Valve	1	
-19	16494	. SEAT, First Stage Inlet Valve (KF)	1	
-20	14909-4	. PACKING, Preformed (KC)	1	
-21	14893-2	. MANIFOLD, Supply Inlet	1	
-22	AS140CB1	. PLUG	1	



014018

Figure 14-18. Venturi Assembly

Figure and Index Number	Part Number	Description 1 2 3 4 5 6 7	Units Per Assembly	Usable On Code
14-18	19795	VENTURI ASSEMBLY . . . . . (figure 14-11 for NHA)	REF	
-1	19812	. SEAT, Venturi (KF)	1	
-2	19797	. NOZZLE, Injector (KF)	1	
-3	PB54188-3	. SPRING, Injector (KF)	1	
-4	PB53042-1	. SPRING, Damping (KF)	1	
-5	11794	. HOUSING, Venturi	1	

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