S9592-B1-MMO-010

REVISION 2

TECHNICAL MANUAL

OPERATION AND MAINTENANCE MANUAL

ORGANIZATIONAL LEVEL

FLY AWAY DIVE SYSTEM (FADS) III
AIR SYSTEM

0910-LP-102-8288

N61331-01-D-0018

THIS PUBLICATION SUPERSEDES REVISION 1 OF
NAVSEA S9592-B1-MMO-010, DATED 25 SEPTEMBER 1998.

PUBLISHED BY DIRECTION OF COMMANDER, NAVAL SEA SYSTEMS COMMAND

0910-LP-102-8288

S9592-B1-MMO-010

REVISION 2

TECHNICAL MANUAL

OPERATION AND MAINTENANCE MANUAL

ORGANIZATIONAL LEVEL

FLY AWAY DIVE SYSTEM (FADS) III
AIR SYSTEM

0910-LP-102-8288

N61331-01-D-0018

THIS PUBLICATION SUPERSEDES REVISION 1 OF
NAVSEA S9592-B1-MMO-010, DATED 25 SEPTEMBER 1998.

PUBLISHED BY DIRECTION OF COMMANDER, NAVAL SEA SYSTEMS COMMAND

14 MARCH 2008

LIST OF EFFECTIVE PAGES

INSERT LATEST CHANGED PAGES. DESTROY SUPERSEDED PAGES.

Date of issue for original pages is:

Revision 2 . . 0 . . 14 March 2008

TOTAL NUMBER OF PAGES IN THIS PUBLICATION IS 594, CONSISTING OF THE FOLLOWING:

Page No.	*Change No.
Title	0
A thru B	0
C Blank	0
(Change Record)	0
Blank	0
i thru xx	0
1-1 thru 1-17	0
1-18 Blank	0
2-1 thru 2-13	0
2-14 Blank	0
2-15 thru 2-16	0
3-1 thru 3-23	0
3-24 Blank	0
3-25 (Foldout)	0
3-26 Blank (Foldout)	0
3-27 (Foldout)	0
3-28 Blank (Foldout)	0
3-29 (Foldout)	0
3-30 Blank (Foldout)	0
3-31 (Foldout)	0
3-32 Blank (Foldout)	0
4-1 thru 4-7	0
4-8 Blank	0
5-1 thru 5-10	0
6-1 thru 6-169	0
6-170 Blank	0
6-171 thru 6-177	0
6-178 Blank	0
6-179 thru 6-188	0
7-1	0
7-2 Blank	0
7-3 (Foldout)	0
7-4 Blank (Foldout)	0
7-5 (Foldout)	0
7-6 Blank (Foldout)	0
7-7 (Foldout)	0
7-8 Blank (Foldout)	0
7-9 (Foldout)	0
7-10 Blank (Foldout)	0
7-11	0
7-12 Blank	0
8-1 thru 8-9	0
8-10 Blank	0
Appendix A Title Page	0
A-0 thru A-5	0
A-6 Blank	0
A-7 thru A-17	0
A-18 Blank	0
A-19 thru A-37	0
A-38 Blank	0
A-39 thru A-50	0
Appendix B Title Page	0
B-0 thru B-12	0
B-13 (Foldout)	0
B-14 Blank (Foldout)	0
B-15 thru B-16	0
B-17 (Foldout)	0
B-18 Blank (Foldout)	0
B-19 thru B-23	0
B-24 Blank	0
B-25 thru B-53	0
B-54 Blank	0
B-55 thru B-63	0
B-64 Blank	0
B-65 thru B-69	0
B-70 Blank	0
B-71 thru B-77	0
B-78 Blank	0
B-79 thru B-81	0
B-82 Blank	0
B-83 thru B-91	0
B-92 Blank	0
Appendix C Title Page	0
C-0 thru C-8	0
C-9 (Foldout)	0
C-10 Blank (Foldout)	0
C-11 thru C-25	0
C-26 Blank	0
C-27 thru C-35	0
C-36 Blank	0
C-37 thru C-38	0
Appendix D Title Page	0
D-0 thru D-12	0
D-13 (Foldout)	0

* Zero in this column indicates an original page.

LIST OF EFFECTIVE PAGES
(Continued)

INSERT LATEST CHANGED PAGES. DESTROY SUPERSEDED PAGES.

Page No.	*Change No.
D-14 Blank (Foldout)	0
D-15 (Foldout)	0
D-16 Blank (Foldout)	0
D-17 thru D-21	0
D-22 Blank	0
D-23 thru D-35	0
D-36 Blank	0
D-37 thru D-57	0
D-58 Blank	0
D-59 thru D-67	0
D-68 Blank	0
Appendix E Title Page	0
Blank	0
E-1 thru E-2	0
Appendix F Title Page	0
Blank	0
F-1 thru F-8	0
Appendix G Title Page	0
Blank	0
G-1 thru G-2	0

* Zero in this column indicates an original page.

NAVSEA TECHNICAL MANUAL CERTIFICATION SHEET

Certification Applies to: New Manual ☐ Revision ☒ Change ☐

Applicable TMINS/Pub. No. S9592-B1-MMO-010/0910-LP-102-8288

Publication Date (Da, Mo, Yr) 14 March 2008

Title: Fly-Away Dive System (FADS III) Air System, Revision 2

TMCR/TMSR/Specification No.:

CHANGES AND REVISIONS:

Purpose: Update repair procedures in chapter 6. Modify and update operational and emergency procedures in appendixes A, B, C, and D. Correct discrepancies throughout the manual.

Equipment Alteration Numbers Incorporated:

TMDER/ACN Numbers Incorporated:

Continue on reverse side or add pages as needed.

CERTIFICATION STATEMENT

This is to certify that responsible NAVSEA activities have reviewed the above identified document for acquisition compliance, technical coverage, and printing quality. This form is for internal NAVSEA management use only, and does not imply contractual approval or acceptance of the technical manual by the Government, nor relieve the contractor of any responsibility for delivering the technical manual in accordance with the contract requirement.

Authority	Name	Signature	Organization	Code	Date
Acquisition	R. Whaley	Robert Whaley	NAVSEA	00C3	1 Apr 08
Technical	R. Webb	R. Webb	NAVSEA	00C35	4/1/08
Printing Release					

DERIVED FROM NAVSEA 4160/8 (5 - 89)

THIS PAGE INTENTIONALLY LEFT BLANK

RECORD OF CHANGES

Change No.	Date	Title and/or Brief Description	Signature of Validating Officer

THIS PAGE INTENTIONALLY LEFT BLANK

TABLE OF CONTENTS

Chapter/Paragraph Page

List of Illustrations x
List of Tables xiii
Foreword xv
List of Acronyms and Abbreviations xvii
Safety Summary xix

1 GENERAL INFORMATION AND SAFETY PRECAUTIONS

1.1 Safety Precautions 1-1
1.2 Introduction 1-2
1.2.1 Purpose 1-2
1.2.2 Scope 1-2
1.2.3 Applicability 1-4
1.2.4 Supersedure Data 1-4
1.2.5 Equipment Configuration 1-4
1.3 System Equipment 1-5
1.3.1 Air Supply Rack Assembly (ASRA) 1-5
1.3.2 Control Console Assembly (CCA) 1-10
1.3.3 Volume Tank Assembly (VTA) – Optional 1-10
1.3.4 5,000 psi Compressor System 1-10
1.3.5 Interconnecting Hose Assemblies 1-11
1.4 Physical Arrangement 1-12
1.4.1 Configuration 1: Diving the FADS III Air System in the Stand-Alone Diving Setup 1-12
1.4.2 Configuration 2: Diving the FADS III Air System with TRCS Support . 1-12
1.4.3 Configuration 3: Diving the FADS III CCA/VTA with the LWDS MK 3 Mod 0 Flask Rack Assemblies 1-13
1.4.4 Configuration 4: Diving the FADS III Air System with SNDLRCS Support 1-13
1.5 Reference Data 1-14

2 OPERATION

2.1 Introduction 2-1
2.2 Preoperational Conditions and Setup 2-1
2.2.1 Equipment Checklist 2-1
2.2.2 Control and Indicator Settings 2-2
2.3 Operating and Emergency Procedures 2-11
2.4 Failure Analysis Reporting 2-13
2.5 Accident/Incident Equipment Status Reporting 2-13

TABLE OF CONTENTS—Continued

Chapter/Paragraph Page

3 FUNCTIONAL DESCRIPTION

3.1 Introduction ... 3-1
3.2 General System Description ... 3-1
3.3 Equipment Functional Descriptions ... 3-1
3.3.1 Air Supply Rack Assembly (ASRA) ... 3-1
3.3.1.1 Rack Enclosure Assembly ... 3-2
3.3.1.2 Air Flask Rack Assembly (AFRA) ... 3-2
3.3.1.2.1 Flask Rack Weldment ... 3-2
3.3.1.2.2 AFRA Control Panel Assembly ... 3-2
3.3.1.2.3 Composite HP Air Flasks ... 3-3
3.3.1.3 HP Air Hose Assemblies ... 3-8
3.3.1.4 SCUBA Charge Hose Assembly ... 3-9
3.3.2 Control Console Assembly (CCA) ... 3-9
3.3.2.1 CCA Rear Panel Assembly ... 3-9
3.3.2.2 CCA Front Panel Assembly ... 3-10
3.3.2.3 CCA Interior Components ... 3-14
3.3.3 Volume Tank Assembly (VTA) ... 3-14
3.3.4 5,000 psi Compressor System ... 3-16
3.4 Primary and Secondary Air Flow in Configuration 1 ... 3-17
3.4.1 Scenario for Configuration 1 Stand-Alone Diving Setup ... 3-17
3.4.2 Primary Air Flow for Configuration 1 Stand-Alone Diving Setup ... 3-18
3.4.3 Secondary Air Flow for Configuration 1 Stand-Alone Diving Setup ... 3-19
3.5 Charging Air Flow in Configuration 1 ... 3-20
3.5.1 Charging Composite HP Air Flasks ... 3-20
3.5.2 Charging SCUBA Cylinders or the TRCS Air Supply Rack Assembly ... 3-21

4 SCHEDULED MAINTENANCE

4.1 Introduction ... 4-1
4.1.1 Purpose ... 4-1
4.1.2 Scope ... 4-1
4.2 System Certification and Re-Entry Control (REC) ... 4-1
4.3 Recordkeeping and Reporting Procedures ... 4-2
4.4 General Safety Requirements ... 4-2
4.5 Maintenance Concept ... 4-3
4.5.1 Scheduled Maintenance ... 4-3
4.5.2 Unscheduled Maintenance ... 4-3

TABLE OF CONTENTS—Continued

Chapter/Paragraph Page

4.6 Planned Maintenance System (PMS) ... 4-3
4.7 General Maintenance Instructions ... 4-4
4.7.1 Tools, Supplies, and Test Equipment ... 4-4
4.7.2 Disassembly and Replacement of Parts ... 4-4
4.7.3 Cleaning Breathing Air System Components ... 4-5
4.7.3.1 Cleaning Standards and Procedures ... 4-5
4.7.3.2 Cleaning Solutions ... 4-5
4.7.3.2.1 NID Solution ... 4-5
4.7.3.2.2 NOC Solution ... 4-6
4.7.3.2.3 TSP Solution ... 4-6
4.7.4 Teflon® Tape ... 4-6
4.7.5 Lubricants ... 4-6
4.7.6 O-rings and Packings ... 4-6
4.7.6.1 Removal ... 4-6
4.7.6.2 Inspection ... 4-6
4.7.6.3 Cleaning ... 4-7
4.7.6.4 Lubrication ... 4-7
4.7.6.5 Installation ... 4-7

5 TROUBLESHOOTING

5.1 Introduction ... 5-1
5.2 Troubleshooting Analysis ... 5-1

6 CORRECTIVE MAINTENANCE

6.1 Introduction ... 6-1
6.2 Safety Requirements ... 6-1
6.3 Adjustments and Alignments ... 6-2
6.4 General Repair Information ... 6-2
6.4.1 Maintenance Parts ... 6-2
6.4.2 Related Maintenance ... 6-2
6.5 Tools and Support Equipment ... 6-3
6.5.1 Tools ... 6-3
6.5.2 Special Tools ... 6-4
6.5.3 Support Equipment ... 6-4
6.6 Consumable Supplies ... 6-4
6.7 Torque Values ... 6-4
6.8 Corrective Maintenance Procedures ... 6-7
6.8.1 Air Supply Rack Assembly (ASRA) ... 6-10
6.8.1.1 Air Flask Rack Assembly (AFRA) Removal and Installation ... 6-15
6.8.1.2 Composite HP Air Flasks ... 6-19

TABLE OF CONTENTS—Continued

Chapter/Paragraph Page

6.8.1.3 Flask Isolation Triport Shutoff Valves (AHP-V401, -V402, -V403, -V404, -V405, -V406, -V407, -V408, -V409) 6-30
6.8.1.4 Flask Drain Triport Shutoff Valves (AHP-V410, -V411, -V412, -V413, -V414, -V415, -V416, -V417, -V418) 6-44
6.8.1.5 Angle Shutoff Valves (AHP-V419, -V425, -V429, -V431, -V443) 6-58
6.8.1.6 Triport Shutoff Valves (AHP-V420, -V421, -V422, -V423, -V424, -V434) 6-69
6.8.1.7 Gauge Stop Valves (AHP-V426, -V427, -V428, -V435) 6-82
6.8.1.8 HP Relief Valve (AHP-V430) 6-85
6.8.1.9 Regulator Valve (AHP-V432) 6-88
6.8.1.10 HP Relief Valve (AHP-V433) 6-95
6.8.1.11 Vent (Bleed) Valves (AHP-V440, -V441, -V442) 6-98
6.8.1.12 Shutoff Valve (AHP-V444) 6-102
6.8.1.13 Check Valve (AHP-V445) 6-107
6.8.1.14 In-line Filters (F-040) 6-110
6.8.1.15 Pressure Gauge, 0-5,000 psi (AHP-G436) 6-113
6.8.1.16 Pressure Gauges, 0-8,000 psi (AHP-G437, -G438, -G439) 6-115
6.8.2 Control Console Assembly (CCA) 6-117
6.8.2.1 Control Console Panel Assembly 6-120
6.8.2.2 Angle Shutoff Valves (AHP-V301, -V302) 6-125
6.8.2.3 Regulator Valves (AHP-V303, -V304) 6-135
6.8.2.4 Gauge Stop Valves (AHP-V305, -V306; ALP-V307, -V308) 6-149
6.8.2.5 LP Relief Valves (ALP-V309, -V310) 6-152
6.8.2.6 Angle Ball Valves (ALP-V311, -V312, -V314, -V315, -V316) 6-154
6.8.2.7 Ball Valve (ALP-V313) 6-156
6.8.2.8 Angle Ball Valves (ALP-V317, -V318, -V319) 6-158
6.8.2.9 In-line Filters (F-020) 6-160
6.8.2.10 Diver Depth Gauges (ALP-G320, -G321, -G322) 6-163
6.8.2.11 Pressure Gauges, 0-500 psi (ALP-G323, -G324) 6-166
6.8.2.12 Pressure Gauges, 0-6,000 psi (AHP-G325, -G326) 6-168
6.8.3 Volume Tank Assembly (VTA) 6-171
6.8.3.1 VTA Frame Assembly 6-172
6.8.3.2 Plug Valve (ALP-V201) 6-173
6.8.3.3 LP Relief Valve (ALP-V202) 6-176
6.8.4 Air Hose Assemblies 6-179
6.8.4.1 Strain Relief Lashing Procedure 6-180
6.8.4.2 LP Air Hose Assembly (H-203) 6-181
6.8.4.3 SCUBA Charge Hose Assembly (H-406) 6-183

TABLE OF CONTENTS—Continued

Chapter/Paragraph Page

6.8.4.4 HP Air Hose Assemblies (H-436) 6-185
6.8.4.5 HP Air Hose Assembly (H-444) 6-187

7 PARTS LISTS

7.1 Introduction 7-1
7.2 Index of Replacement Parts 7-1
7.3 List of Manufacturers and Suppliers 7-1

8 INSTALLATION, DEPLOYMENT, AND STORAGE

8.1 Introduction 8-1
8.2 Installation 8-1
8.2.1 Inventory 8-1
8.2.2 Inspection 8-3
8.2.2.1 Air Supply Rack Assembly (ASRA) 8-3
8.2.2.2 Control Console Assembly (CCA) 8-3
8.2.2.3 Volume Tank Assembly (VTA) 8-4
8.2.2.4 5,000 psi Compressor System 8-4
8.2.2.5 Interconnecting Hoses 8-4
8.2.3 System Certification 8-4
8.3 Deployment 8-4
8.3.1 Start-Up Maintenance (Depreservation) 8-4
8.3.2 Pre-Deployment Procedures 8-5
8.3.3 Handling 8-7
8.3.4 Transportation Documentation 8-8
8.4 Storage 8-8
8.4.1 Short-Term Storage 8-8
8.4.2 Long-Term Storage and Periodic Maintenance 8-8
8.4.3 Long-Term Storage Precautions 8-9

TABLE OF CONTENTS—Continued

Appendix/Paragraph | Page

APPENDIX A FADS III AIR SYSTEM OPERATING AND EMERGENCY PROCEDURES FOR CONFIGURATION 1: DIVING THE FADS III AIR SYSTEM IN THE STAND-ALONE DIVING SETUP

USING THE CHECKLISTS AND RELATED DOCUMENTS A-2

OP-1 Premission Procedures A-7
OP-2 Predive Start-Up Procedures A-13
OP-2M Modified Predive Start-Up Procedures A-19
OP-3 Shutdown Procedures A-23
OP-3M Modified Shutdown Procedures A-27
OP-4 Postmission Procedures....................A-29
OP-5 HP Air Flask Charging Procedures for Banks 1, 2, or 3 with ASRA On-Line A-33
OP-6 HP Air Flask Charging Procedures with ASRA Off-Line....................A-39
OP-7 SCUBA Cylinder Charging Procedures A-45
EP-1 Emergency Procedure: Loss of Primary Air to Divers A-49

APPENDIX B FADS III AIR SYSTEM OPERATING AND MAINTENANCE SUPPLEMENT FOR CONFIGURATION 2: DIVING THE FADS III AIR SYSTEM WITH TRCS SUPPORT

B.1 Introduction B-1
B.2 Safety Precautions B-3
B.3 General Description B-3
B.3.1 FADS III Air System B-3
B.3.2 TRCS MK 6 Mod 0 / Mod 1 ....B-3
B.4 Reference Data B-4
B.5 Controls and Indicators....................B-4
B.6 Operation....................B-8
B.7 Functional Description B-8
B.7.1 Primary and Secondary Air Flow – Diving with TRCS Support B-9
B.7.1.1 Predive Planning Procedure B-9
B.7.1.2 Sample Scenario for Configuration 2 Operations....................B-10
B.7.1.3 Primary Air Flow for Diving with TRCS Support....................B-11
B.7.1.4 Secondary Air Flow for Diving with TRCS Support....................B-12
B.8 Scheduled Maintenance B-16
B.9 Troubleshooting....................B-16
B.10 Corrective Maintenance....................B-16
B.11 Parts Lists....................B-16
B.12 Installation, Deployment, and Storage....................B-16

TABLE OF CONTENTS—Continued

Appendix/Paragraph Page

B.13 Operating and Emergency Procedures B-19
B.13.1 Introduction B-19
B.13.2 Using the Checklists and Related Documents B-20
B.13.2.1 Status Sheet B-20
B.13.2.2 Flow Chart of Operations B-20
B.13.2.3 OP Checklists B-20
B.13.3 Configuration 2 Operating Procedures B-23
OP-1 Premission Procedures B-25
OP-2 FADS III Predive Start-Up Procedures B-33
OP-2M FADS III Modified Predive Start-Up Procedures B-39
OP-3A TRC Predive Start-Up Procedures B-43
OP-3B TL Predive Start-Up Procedures B-55
OP-3M TRC & TL Modified Predive Start-Up Procedures B-65
OP-4 Shutdown Procedures B-71
OP-4M Modified Shutdown Procedures B-79
OP-8 Postmission Procedures B-83

APPENDIX C FADS III AIR SYSTEM OPERATING AND MAINTENANCE SUPPLEMENT FOR CONFIGURATION 3: DIVING THE FADS III CCA/VTA WITH THE LWDS MK 3 MOD 0 FLASK RACK ASSEMBLIES

C.1 Introduction C-1
C.2 Safety Precautions C-3
C.3 General Description C-3
C.3.1 FADS III Air System C-3
C.3.2 LWDS MK 3 Mod 0 ..... C-3
C.4 Reference Data C-3
C.5 Controls and Indicators C-3
C.6 Operation C-4
C.7 Functional Description C-4
C.7.1 Configuration 3A C-4
C.7.2 Configuration 3B C-4
C.7.3 Configuration 3C C-4
C.7.4 Configuration 3D C-4
C.7.5 Interconnecting Hose Assemblies C-5
C.7.6 Primary and Secondary Air Flow C-5
C.7.6.1 Sample Scenario for Configuration 3 Operations C-5
C.7.6.2 Primary Air Flow for Configuration 3 ..... C-6
C.7.6.3 Secondary Air Flow for Configuration 3 ..... C-7
C.8 Scheduled Maintenance C-8
C.9 Troubleshooting C-8

TABLE OF CONTENTS—Continued

Appendix/Paragraph Page

C.10 Corrective Maintenance C-8
C.11 Parts Lists C-8
C.12 Installation, Deployment, and Storage C-8
C.13 Operating and Emergency Procedures C-11
C.13.1 Introduction C-11
C.13.2 Using the Checklists and Related Documents C-11
C.13.2.1 Status Sheet C-11
C.13.2.2 Flow Chart of Operations C-12
C.13.2.3 OP Checklists C-12
OP-1 Premission Procedures C-15
OP-2 Predive Start-Up Procedures C-21
OP-2M Modified Predive Start-Up Procedures C-27
OP-3 Postdive Shutdown Procedures C-31
OP-3M Modified Postdive Shutdown Procedures C-37

APPENDIX D FADS III AIR SYSTEM OPERATING AND MAINTENANCE SUPPLEMENT FOR CONFIGURATION 4: DIVING THE FADS III AIR SYSTEM WITH SNDLRCS SUPPORT

D.1 Introduction D-1
D.2 Safety Precautions D-2
D.3 General Description D-3
D.3.1 FADS III Air System D-3
D.3.2 SNDLRCS D-3
D.4 Reference Data D-3
D.5 Controls and Indicators D-3
D.6 Operation D-8
D.7 Functional Description D-8
D.7.1 Equipment Functional Descriptions D-8
D.7.2 Primary and Secondary Air Flow – Diving with SNDLRCS Support D-8
D.7.2.1 Sample Scenario for Configuration 4 Operations D-9
D.7.2.2 Primary Air Flow for Diving with SNDLRCS Support D-10
D.7.2.3 Secondary Air Flow for Diving with SNDLRCS Support D-11
D.8 Scheduled Maintenance D-12
D.9 Troubleshooting D-12
D.10 Corrective Maintenance D-12
D.11 Parts Lists D-12
D.12 Installation, Deployment, and Storage D-17
D.13 Operating and Emergency Procedures D-17
D.13.1 Introduction D-17
D.13.2 Using the Checklists and Related Documents D-18
D.13.2.1 Status Sheet D-18

TABLE OF CONTENTS—Continued

Appendix/Paragraph — Page

D.13.2.2 Flow Chart of Operations D-18
D.13.2.3 OP Checklists D-18
D.13.3 Configuration 4 Operating Procedures D-21
OP-1 Premission Procedures D-23
OP-2A Predive Start-Up Procedures for the FADS III Air System D-31
OP-2B Predive Start-Up Procedures for the SNDLRCS D-37
OP-2M Modified Predive Start-Up Procedures for the FADS III and SNDLRCS D-45
OP-3 Shutdown Procedures D-51
OP-3M Modified Shutdown Procedures D-59
OP-4 Postmission Procedures D-63

APPENDIX E INTERNAL INSPECTION PROCEDURES FOR KEVLAR® AND CARBON FIBER HP COMPOSITE FLASKS

E.1 Introduction E-1
E.2 Internal Inspection of HP Composite Flasks E-1
E.3 Condemnation and Disposal of Flasks E-2

APPENDIX F EXTERNAL INSPECTION PROCEDURES FOR KEVLAR® AND CARBON FIBER HP COMPOSITE FLASKS

F.1 Introduction F-1
F.2 External Inspection of HP Composite Flasks F-1
F.2.1 Types of External Damage F-2
F.2.2 Levels of External Damage F-2
F.2.3 External Inspection Criteria F-3
F.2.4 Hydrostatic Testing F-8
F.2.5 Manufacturer's Label F-8

APPENDIX G U.S. DEPARTMENT OF TRANSPORTATION (DOT) COMPOSITE FLASK SPECIAL PERMITS AND ASSOCIATED DOCUMENTS

G.1 Introduction G-1
G.2 Composite Flask Special Permits G-2
G.3 Associated Documents G-2

LIST OF ILLUSTRATIONS

Figure	Title	Page
1-1	Overview of the Fly Away Dive System (FADS) III Air System	1-3
1-2	Configuration 1: Diving the FADS III Air System in the Stand-Alone Diving Setup	1-6
1-3	Configuration 2: Diving the FADS III Air System with TRCS Support	1-7
1-4	Configuration 3: Diving the FADS III CCA/VTA with the LWDS MK 3 Mod 0 Flask Rack Assemblies	1-8
1-5	Configuration 4: Diving the FADS III Air System with SNDLRCS Support	1-9
2-1	Control Console Assembly (CCA) Controls and Indicators	2-4
2-2	Control Console Assembly (CCA) Interface Ports	2-6
2-3	Volume Tank Assembly (VTA) Control and Interface Port	2-7
2-4	Air Supply Rack Assembly (ASRA) Controls and Indicators	2-9
2-5	Air Supply Rack Assembly (ASRA) Interface Ports	2-12
2-6	Failure Analysis Report (FAR) Form	2-15
3-1	AFRA Control Panel Assembly, Front View	3-5
3-2	AFRA Control Panel Assembly, Rear View	3-6
3-3	AFRA Flask Connections, Top and Bottom Views	3-7
3-4	Control Console Assembly (CCA) Interface Ports and Blow-Out Plug	3-10
3-5	CCA Front Panel Assembly, Front View	3-11
3-6	CCA Front Panel Assembly, Rear View	3-12
3-7	Volume Tank Assembly (VTA)	3-15
3-8	Charging the TRCS Air Supply Rack Assembly Using the FADS III ASRA	3-22
FO-1	Primary Air Flow Path for Configuration 1: Diving the FADS III Air System In the Stand-Alone Diving Setup	3-25
FO-2	Secondary Air Flow Path for Configuration 1: Diving the FADS III Air System in the Stand-Alone Diving Setup	3-27
FO-3	Air Flow Paths for Composite HP Air Flask Charging	3-29
FO-4	Air Flow Paths for SCUBA Cylinder or TRCS Air Supply Rack Assembly Charging	3-31
6-1	Air Flask Rack Assembly (AFRA), Side View	6-11
6-2	AFRA Flask Connections, Top and Bottom Views	6-12
6-3	AFRA Control Panel Assembly, Front View	6-13
6-4	AFRA Control Panel Assembly, Rear View	6-14
6-5	Air Flask Rack Assembly (AFRA) Removal and Installation	6-16
6-6	Composite HP Air Flask Removal and Installation	6-20
6-7	Flask Removal Planning Diagram	6-23
6-8	Circle Seal Flask Isolation Triport Shutoff Valves (AHP-V401, -V402, -V403, -V404, -V405, -V406, -V407, -V408, -V409)	6-31
6-9	CPV Flask Isolation Triport Shutoff Valves (AHP-V401, -V402, -V403, -V404, -V405, -V406, -V407, -V408, -V409)	6-38
6-10	Circle Seal Flask Drain Triport Shutoff Valves (AHP-V410, -V411, -V412, -V413, -V414, -V415, -V416, -V417, -V418)	6-45

LIST OF ILLUSTRATIONS—Continued

Figure	Title	Page
6-11	CPV Flask Drain Triport Shutoff Valves (AHP-V410, -V411, -V412, -V413, -V414, -V415, -V416, -V417, -V418)	6-53
6-12	Circle Seal Angle Shutoff Valves (AHP-V419, -V425, -V429, -V431, -V443)	6-59
6-13	CPV Angle Shutoff Valves (AHP-V419, -V425, -V429, -V431, -V443)	6-65
6-14	Circle Seal Triport Shutoff Valves (AHP-V420, -V421, -V422, -V423, -V424, -V434)	6-70
6-15	CPV Triport Shutoff Valves (AHP-V420, -V421, -V422, -V423, -V424, -V434)	6-77
6-16	Gauge Stop Valves (AHP-V426, -V427, -V428, -V435)	6-83
6-17	HP Relief Valve (AHP-V430)	6-86
6-18	Regulator Valve (AHP-V432)	6-89
6-19	HP Relief Valve (AHP-V433)	6-96
6-20	Vent (Bleed) Valves (AHP-V440, -V441, -V442)	6-99
6-21	Shutoff Valve (AHP-V444)	6-103
6-22	Check Valve (AHP-V445)	6-108
6-23	In-line Filters (F-040)	6-111
6-24	Pressure Gauge, 0-5,000 psi (AHP-G436)	6-114
6-25	Pressure Gauges, 0-8,000 psi (AHP-G437, -G438, -G439)	6-116
6-26	Control Console Assembly, Front View of Front Panel Assembly	6-118
6-27	Control Console Assembly, Rear View of Front Panel Assembly	6-119
6-28	Removing/Reinstalling Control Console Panel Assembly	6-121
6-29	Circle Seal Angle Shutoff Valves (AHP-V301, -V302)	6-126
6-30	CPV Angle Shutoff Valves (AHP-V301, -V302)	6-131
6-31	Circle Seal Regulator Valves (AHP-V303, -V304)	6-136
6-32	Tescom Regulator Valves (AHP-V303, -V304)	6-143
6-33	Gauge Stop Valves (AHP-V305, -V306; ALP-V307, -V308)	6-150
6-34	LP Relief Valves (ALP-V309, -V310)	6-153
6-35	Angle Ball Valves (ALP-V311, -V312, -V314, -V315, -V316)	6-155
6-36	Ball Valve (ALP-V313)	6-157
6-37	Angle Ball Valves (ALP-V317, -V318, -V319)	6-159
6-38	In-line Filters (F-020)	6-161
6-39	Diver Depth Gauges (ALP-G320, -G321, -G322)	6-164
6-40	Pressure Gauges, 0-500 psi (ALP-G323, -G324)	6-167
6-41	Pressure Gauges, 0-6,000 psi (AHP-G325, -G326)	6-169
6-42	Volume Tank Assembly (VTA)	6-171
6-43	VTA Frame Assembly	6-172
6-44	Plug Valve (ALP-V201)	6-174
6-45	LP Relief Valve (ALP-V202)	6-177
6-46	Strain Relief Lashing	6-180
6-47	LP Air Hose Assembly (H-203)	6-182
6-48	SCUBA Charge Hose Assembly (H-406)	6-184

LIST OF ILLUSTRATIONS—Continued

Figure	Title	Page
6-49	HP Air Hose Assembly (H-436)	6-186
6-50	HP Air Hose Assembly (H-444)	6-188
A-1	Configuration 1: Diving the FADS III Air System in the Stand-Alone Diving Setup	A-0
A-2	Configuration 1 Status Sheet	A-3
A-3	Flow Chart of Operations for Configuration 1: Diving the FADS III Air System in the Stand-Alone Diving Setup	A-4
B-1	Configuration 2: Diving the FADS III Air System with TRCS Support	B-0
B-2	ASRA Controls and Indicators in Configuration 2	B-6
B-3	ASRA Interface Ports	B-9
B-4	Primary Air Flow Paths for Configuration 2: Diving the FADS III Air System with TRCS Support	B-13
B-5	Secondary Air Flow Paths for Configuration 2: Diving the FADS III Air System with TRCS Support	B-17
B-6	Configuration 2 Status Sheet	B-21
B-7	Flow Chart of Operations for Configuration 2: Diving the FADS III Air System with TRCS Support	B-22
C-1	Configuration 3: Diving the FADS III CCA/VTA with the LWDS MK 3 Mod 0 Flask Rack Assemblies	C-0
C-2	Primary and Secondary Air Flow Paths for Configuration 3	C-9
C-3	Configuration 3 Status Sheet	C-13
C-4	Flow Chart of Operations for Configuration 3: Diving the FADS III CCA/VTA with the LWDS MK 3 Mod 0 Flask Rack Assemblies	C-14
D-1	Configuration 4: Diving the FADS III Air System with SNDLRCS Support	D-0
D-2	ASRA Controls and Indicators in Configuration 4	D-5
D-3	ASRA Interface Ports	D-8
D-4	Primary Air Flow Paths for Configuration 4: Diving the FADS III Air System with SNDLRCS Support	D-13
D-5	Secondary Air Flow Paths for Configuration 4: Diving the FADS III Air System with SNDLRCS Support	D-15
D-6	Configuration 4 Status Sheet	D-19
D-7	Flow Chart of Operations for Configuration 4: Diving the FADS III Air System with SNDLRCS Support	D-20

LIST OF TABLES

Table	Title	Page
1-1	FADS III Air System Physical Characteristics	1-11
1-2	FADS III Air System Interconnecting Hose Assemblies	1-11
1-3	Equipment, Accessories, and Documents Supplied	1-14
1-4	Referenced Documents	1-15
2-1	FADS III Air System Configuration 1 Equipment List	2-2
2-2	Control Console Assembly (CCA) Controls and Indicators	2-3
2-3	Control Console Assembly (CCA) Interface Ports	2-6
2-4	Volume Tank Assembly (VTA) Control and Interface Port	2-7
2-5	Air Supply Rack Assembly (ASRA) Controls and Indicators	2-8
2-6	Air Supply Rack Assembly (ASRA) Interface Ports	2-11
3-1	AFRA Control Panel Assembly Components and Functions	3-4
4-1	Typical Periodicity Codes	4-4
5-1	Fault Isolation Index	5-2
5-2	Air Supply Rack Assembly (ASRA) Fault Directory	5-3
5-3	Control Console Assembly (CCA) Fault Directory	5-6
5-4	Volume Tank Assembly (VTA) Fault Directory	5-9
5-5	Air Hose Assemblies Fault Directory	5-10
6-1	List of Recommended Tools	6-3
6-2	Special Tools	6-4
6-3	Consumable Supplies	6-5
6-4	Torque Values	6-5
6-5	FADS III Air System Maintenance Reference Chart	6-7
7-1	FADS III Air System Replacement Parts Index	7-3
7-2	List of Manufacturers and Suppliers	7-11
8-1	FADS III Air System Initial Inventory	8-1
8-2	FADS III Air System Pre-Deployment Procedures	8-5
8-3	Minimum Shipping Documents Required	8-8
A-1	Index of Configuration 1 Procedures	A-1
B-1	Configuration 2 Equipment List	B-1
B-2	ASRA Controls and Indicators in Configuration 2	B-5
B-3	Index of Configuration 2 Procedures	B-19
C-1	Configuration 3 Equipment List	C-1
C-2	Index of Configuration 3 Procedures	C-11
D-1	Configuration 4 Equipment List	D-1
D-2	ASRA Controls and Indicators in Configuration 4	D-4
D-3	ASRA Interface Ports to CCA/VTA and SNDLRCS in Configuration 4	D-7
D-4	Index of Configuration 4 Procedures	D-17
F-1	Summary of External Inspection Criteria for Fully-Wound Composite Flasks	F-6

THIS PAGE INTENTIONALLY LEFT BLANK

FOREWORD

This technical manual contains operation and maintenance information and procedures for the Fly Away Dive System (FADS) III Air System. The information in this manual is presented in eight chapters and seven appendices as follows:

- Chapter 1 — General Information and Safety Precautions
- Chapter 2 — Operation
- Chapter 3 — Functional Description
- Chapter 4 — Scheduled Maintenance
- Chapter 5 — Troubleshooting
- Chapter 6 — Corrective Maintenance
- Chapter 7 — Parts Lists
- Chapter 8 — Installation, Deployment, and Storage
- Appendix A — Operating and Emergency Procedures for Configuration 1: Diving the FADS III Air System in the Stand-Alone Diving Setup
- Appendix B — Operating and Maintenance Supplement for Configuration 2: Diving the FADS III Air System with TRCS Support
- Appendix C — Operating and Maintenance Supplement for Configuration 3: Diving the FADS III CCA/VTA with the LWDS MK 3 Mod 0 Flask Rack Assemblies
- Appendix D — Operating and Maintenance Supplement for Configuration 4: Diving the FADS III Air System with SNDLRCS Support
- Appendix E — Internal Inspection Procedures for Kevlar® and Carbon Fiber HP Composite Flasks
- Appendix F — External Inspection Procedures for Kevlar® and Carbon Fiber HP Composite Flasks
- Appendix G — U.S. Department of Transportation (DOT) Composite Flask Special Permits and Associated Documents

Ships, training activities, supply points, depots, Naval Shipyards, and Supervisors of Shipbuilding are requested to arrange for the maximum practical use and evaluation of Naval Sea Systems Command (NAVSEA) technical manuals. All errors, omissions, discrepancies, and suggestions for improvement to NAVSEA technical manuals shall be forwarded to:

COMMANDER
NAVAL SURFACE WARFARE CENTER DIVISION
NAVAL SYSTEMS DATA SUPPORT ACTIVITY
4363 MISSILE WAY
PORT HUENEME CA 93043-4307

on NAVSEA/SPAWAR Technical Manual Deficiency/Evaluation Report (TMDER), form NAVSEA 4160/1. All feedback comments shall be thoroughly investigated and originators will be advised of action resulting therefrom. Three copies of form NAVSEA 4160/1 are included at the end of each separately bound technical manual 8-1/2 x 11 inches or larger; however, users are encouraged to transmit deficiency submittals via the Naval Systems Data Support Activity Web page located at https://nsdsa2.phdnswc.navy.mil/tmder/tmder-generate.asp?lvl=1. Click on the website address, follow the procedure for entry to the site (see note below), enter the publication number (S9592-B1-MMO-010), and select Continue.

NOTE

The user is required to have a Public Key Infrastructure (PKI) Certificate or a Department of Defense (DoD) Common Access Card (CAC) to access the above site.

Individual electronic technical manuals do not contain form NAVSEA 4160/1 but are linked to an electronic version on the resident CD-ROM. Therefore, we encourage the user to transmit submittals via the Naval Systems Data Support Activity Web page located above.

LIST OF ACRONYMS AND ABBREVIATIONS

Symbols and Numbers

~ .... Approximate
± .... Plus or Minus
º................. Degree
ºC .... Degrees Celsius
ºF .... Degrees Fahrenheit
3-M............ Maintenance Material Management

AC .... Air Conditioner
AFRA .... Air Flask Rack Assembly
AHP........... Air High Pressure
ALP .... Air Low Pressure
ANU .... Authorized for (U.S.) Navy Use
APL .... Allowance Parts List
APPX .... Appendix
AR .... As Required
ASME........ American Society of Mechanical Engineers
ASRA .... Air Supply Rack Assembly
Assy .... Assembly

BIBS......... Built-In Breathing System
BKHD........ Bulkhead
BPR........... Bypass Regulator

C1............. Configuration 1
C2 .... Configuration 2
C3 .... Configuration 3
C4 .... Configuration 4
CAC .... Computer Access Card
CAGE........ Commercial and Government Entity (Code)
CAOS........ Chamber Air and Oxygen Supply
CCA .... Control Console Assembly
CCW .... Counterclockwise
CD-ROM ... Compact Disc – Read Only Memory
cfm .... Cubic Feet (per) Minute
CGA .... Compressed Gas Association
CO............. Carbon Monoxide
CO2........... Carbon Dioxide
Comms...... Communications
CPS........... Collective Protection System
CPV........... Combination Pump Valve
CW .... Clockwise

Dia. .... Diameter
DLSS......... Divers Life Support System
DoD .... Department of Defense
DOT........... Department of Transportation
DSPS .... Diver Support Platform System
Dwg .... Drawing

ECS .... Environmental Control System
e.g. .... *for example*
EP .... Emergency Procedure
EQ .... Equalization
etc. .... *et cetera (and so forth)*
EXH........... Exhaust Hull

FADS .... Fly Away Dive System
FAR .... Failure Analysis Report
Fig. .... Figure
FME........... Foreign Material Exclusion
FMGS........ FADS III Mixed-Gas System
FRP .... Fiber Reinforced Plastic
fsw............. Feet of Seawater
ft. .... Foot/Feet
ft-lb .... Foot Pounds

HOSRA..... Helium-Oxygen Supply Rack Assembly
HP .... High Pressure
HPAC .... High Pressure Air Compressor

ID .... Inside Diameter
i.e. .... *that is*
IL .... Inner Lock
IMA............ Intermediate Maintenance Activity
In. .... Inch/Inches
in-lb .... Inch Pounds
ISO .... International Organization for Standards

JID .... Joint Identification Drawing

LG............. Long
LP.............. Low Pressure
LWDS........ Lightweight Dive System

MEK.......... Methyl Ethyl Ketone
METCAL.... Metrology and Calibration
Mfr. .... Manufacturer
Min. .... Minimum

LIST OF ACRONYMS AND ABBREVIATIONS—Continued

MIP .... Maintenance Index Page
MLP .... Mixed-Gas Low Pressure
mm .... Millimeters
MPT .... Male Pipe Thread
MRC.......... Maintenance Requirement Card
MS .... Military Standard/Service/ Specification
MSDS........ Material Safety Data Sheet

N/A .... Not Applicable
NATO .... North Atlantic Treaty Organization
NAVOSH... Navy Occupational Safety and Health
NAVSEA ... Naval Sea Systems Command
NID........... Nonionic Detergent
No. .... Number
NOC .... Navy Oxygen Cleaner
Nom. .... Nominal
NPTM........ National Pipe Thread Male
NSN .... National Stock Number

O2 .... Oxygen
OHP .... Oxygen High Pressure
OL .... Outer Lock
OLP........... Oxygen Low Pressure
OP............. Operating Procedure
OSRA........ Oxygen Supply Rack Assembly

Para.......... Paragraph
Pg .... Page
PKI .... Public Key Infrastructure
PMS .... Planned Maintenance System
PN .... Part Number
PNEUMO .. Pneumofathometer
Press......... Pressure
Proc. .... Procedure
psi .... Pounds per Square Inch
psig .... Pounds per Square Inch Gauge

QDR .... Quality Deficiency Report
Qty .... Quantity

REC ....Re-Entry/Reentry Control
REE ....Rejection Elastic Expansion
Ref ....Reference

SAE...........Society of Automotive Engineers
SCA ....System Certification Authority
scf ....Standard Cubic Feet
scfm ....Standard Cubic Feet per Minute
SCI.............Structural Composite Industries
SCUBA ......Self-Contained Underwater Breathing Apparatus
SN..............Serial Number
SNDL ....Standard Navy Double-Lock
SNDLRCS .Standard Navy Double-Lock Recompression Chamber System
SPAWAR ...Space and Naval Warfare Systems Command

TL..............Transfer Lock
TM ....Technical Manual
TMDER......Technical Manual Deficiency/Evaluation Report
TMO...........Transportation Management Office
TP ....Test Pressure
TRC ....Transportable Recompression Chamber
TRCS.........Transportable Recompression Chamber System
TSP............Tri-Sodium Phosphate

UBA ....Underwater Breathing Apparatus
UIC ....Unit Identification Code
U.S.............United States
UWSH........Underwater Ships Husbandry

V................Volts
VTA............Volume Tank Assembly

w/ ....With
WP.............Working Pressure

SAFETY SUMMARY

S.1 GENERAL SAFETY GUIDELINES

Personnel using the Fly Away Dive System (FADS) III Air System shall observe the safety precautions and procedures specified in this technical manual. Personnel must be thoroughly familiar with all safety practices and understand the potential hazards associated with the FADS III Air System before using the system or performing maintenance on the equipment.

S.1.1 STANDARD SAFETY PRECAUTIONS. Personnel using this equipment shall comply with the Diving Safety and Planning Checklist and with the U.S. Navy standard diving safety procedures, as stated in the *U.S. Navy Diving Manual*, NAVSEA SS521-AG-PRO-010. Use only the approved replacement parts, lubricants, cleaning solutions, and sealants specified in this technical manual or in the Planned Maintenance System (PMS) for the FADS III Air System. Practices such as substitution of parts or materials and omission or alteration of procedures stated herein are not authorized.

S.1.2 FORCES AFLOAT. Forces afloat must also comply with the *Navy Occupational Safety and Health (NAVOSH) Program Manual for Forces Afloat*, OPNAVINST 5100.19 series.

S.1.3 SHORE ACTIVITIES. Shore activities must also comply with the *Navy Occupational Safety and Health Program Manual*, OPNAVINST 5100.23 series.

S.2 GENERAL SAFETY PRECAUTIONS

The following safety guidelines apply to operation and maintenance procedures in general and do not appear elsewhere in this publication, except by reference. Personnel must understand and comply with these guidelines during operation and maintenance of the system.

- **COMPRESSED AIR:** Compressed air may be used for cleaning of electric motors but may not be used for general cleaning as compressed air can create an environment of propelled particles. If used on electric motors, reduce pressure to less than 30 pounds per square inch gauge (psig) and use personal protective equipment. Never direct the air stream toward self or other personnel.

- **CLEANING SOLVENTS:** Ensure that area is well ventilated when using cleaning solvents. Avoid breathing of fumes and solvent contact with skin or eyes. Keep flame and other sources of ignition away from solvent and solvent vapors. Toxic solvents are not to be used within Collective Protection System (CPS) spaces.

- **FIRST AID:** An injury, no matter how slight, shall never go unattended. Always obtain first aid or medical attention immediately.

- **TRAINING:** Established operating and maintenance procedures, as well as basic safety precautions contained in this manual, must be reviewed with operating and maintenance personnel. Newly assigned operators and/or maintenance personnel must be trained in safe operation of the equipment before they are permitted to operate or work on the FADS III Air System.

- **DO NOT EXCEED RATED CONDITIONS:** Do not operate the FADS III Air System in excess of its rated conditions. Do not exceed design parameters listed in this manual.

- **DO NOT SERVICE OR ADJUST ALONE:** Under no circumstances should any person reach into the equipment to make a repair or adjustment except in the presence of another person who is capable of rendering aid.

- **PRESSURE RELIEF VALVES AND VENTS:** Pressure relieving devices and other controls that are vented to atmosphere must have their exhaust connections directed away from possible operator positions.

- **HIGH PRESSURE:** Do not tighten or adjust fittings or connections under pressure.

- **LIFTING EQUIPMENT:** Lifting hoists and similar equipment must be regularly tested and have a sufficient safety factor for the weight to be lifted. Also, ensure that lifting devices are properly secured before any lifting is attempted.

- **SLIPPERY AREAS AND OBSTRUCTIONS:** The area around the equipment must be kept clear and free of oil, grease, and obstructions that could cause personnel to slip or trip.

- **SAFETY EQUIPMENT:** Ensure all required safety equipment (e.g., hearing protection, safety glasses, hard hats, safety shoes, and fire extinguishers) is available as appropriate.

- **LOCKOUT/TAG-OUT:** Lock out or tag out the equipment prior to performing maintenance, adjustments, or other procedures that would bypass safety guards or barriers, or otherwise expose personnel to hazardous conditions. Lockout/tag-out procedures shall be conducted in accordance with current ship/shore instructions.

- **HAZARDOUS MATERIALS WARNINGS:** Warnings for hazardous materials in this manual are designed to warn personnel of hazards associated with such items when they come in contact with them during actual use. For each hazardous material used, a Material Safety Data Sheet (MSDS) is required to be provided and available for review by users. Contact your local safety and health staff concerning any questions on hazardous chemicals, MSDS, personal protective equipment requirements, and appropriate handling and emergency procedures.

- **LOOSE CLOTHING:** Do not wear loose clothing, neckties, jewelry, watches, hand rags, etc. around machinery.

CHAPTER 1

GENERAL INFORMATION AND SAFETY PRECAUTIONS

1.1 SAFETY PRECAUTIONS

Personnel using the Fly Away Dive System (FADS) III Air System shall observe the safety precautions and procedures specified in this technical manual. Personnel must be thoroughly familiar with all safety practices and understand the potential hazards associated with the FADS III Air System before using the system or performing maintenance on the equipment. Personnel must also understand and comply with the standard safety precautions and guidelines provided in the Safety Summary immediately preceding this chapter.

Warnings and cautions are included in this manual when it is necessary to highlight critical operations or procedures that may present potential hazards to personnel or result in damage to the equipment. Warnings and cautions immediately precede the step or procedure to which they apply. Notes are used to highlight or stress essential information and may precede or follow the associated text.

A warning header is used only once for each set of multiple warnings that apply to the same portion of text, except when the warnings are interrupted by a page break; the same applies for each set of multiple cautions and multiple notes. If any combination of warnings, cautions, and notes applies to the same portion of text, warnings are presented first, cautions second, and notes last. The following notations define warnings, cautions, and notes as used in the text of this manual:

WARNING

Identifies a location, equipment, or system where a potential hazard exists that is capable of producing injury to personnel if approved procedures are not followed.

CAUTION

Identifies a location, equipment, or system where a potential hazard exists that is capable of producing severe damage to the equipment, system, or ship, and loss of mission capability if approved procedures are not followed.

NOTE

Indicates an essential operating or maintenance procedure, practice, condition, or statement that must be highlighted.

1.2 INTRODUCTION

The FADS III Air System (Figure 1-1) is a portable diving system authorized by the U.S. Navy for surface-supported air diving operations to a maximum depth of 190 feet of seawater (fsw). In addition, it can be interfaced to support the Transportable Recompression Chamber System (TRCS), Standard Navy Double-Lock Recompression Chamber System (SNDLRCS), Lightweight Dive System (LWDS) MK 3 Mod 0 Flask Rack Assemblies, or the Underwater Ships Husbandry (UWSH) Diver Support Platform System (DSPS), also known as the *Drive and Dive*. The following paragraphs describe the purpose, scope, and applicability of this operation and maintenance manual, along with pertinent supersedure and equipment layout data.

1.2.1 PURPOSE. The purpose of this manual is to provide technical information that will enable personnel to transport, operate, maintain, repair, and stow the FADS III Air System equipment safely and efficiently.

1.2.2 SCOPE. The information in this manual is broken down into the eight chapters and seven appendices listed below. Brief descriptions of the material contained within each chapter or appendix are also provided.

- Chapter 1 – General information and safety precautions
- Chapter 2 – Controls and indicators
- Chapter 3 – Detailed physical and functional descriptions of the equipment
- Chapter 4 – Scheduled maintenance information
- Chapter 5 – Troubleshooting instructions
- Chapter 6 – Corrective maintenance procedures
- Chapter 7 – Parts lists
- Chapter 8 – Installation, deployment, and storage information
- Appendix A – Configuration 1: reproducible operating and emergency procedure checklists for Diving the FADS III Air System in the Stand-Alone Diving Setup
- Appendix B – Configuration 2: supplemental operation and maintenance information and reproducible operating procedure checklists for Diving the FADS III Air System with TRCS Support
- Appendix C – Configuration 3: supplemental operation and maintenance information and reproducible operating procedure checklists for Diving the FADS III CCA/VTA with the LWDS MK 3 Mod 0 Flask Rack Assemblies
- Appendix D – Configuration 4: supplemental operation and maintenance information and reproducible operating procedure checklists for Diving the FADS III Air System with SNDLRCS Support
- Appendix E – Internal inspection procedures for Kevlar® and carbon fiber high-pressure (HP) air flasks
- Appendix F – External inspection procedures for Kevlar® and carbon fiber HP air flasks
- Appendix G – U.S. Department of Transportation (DOT) composite flask special permits and associated documents

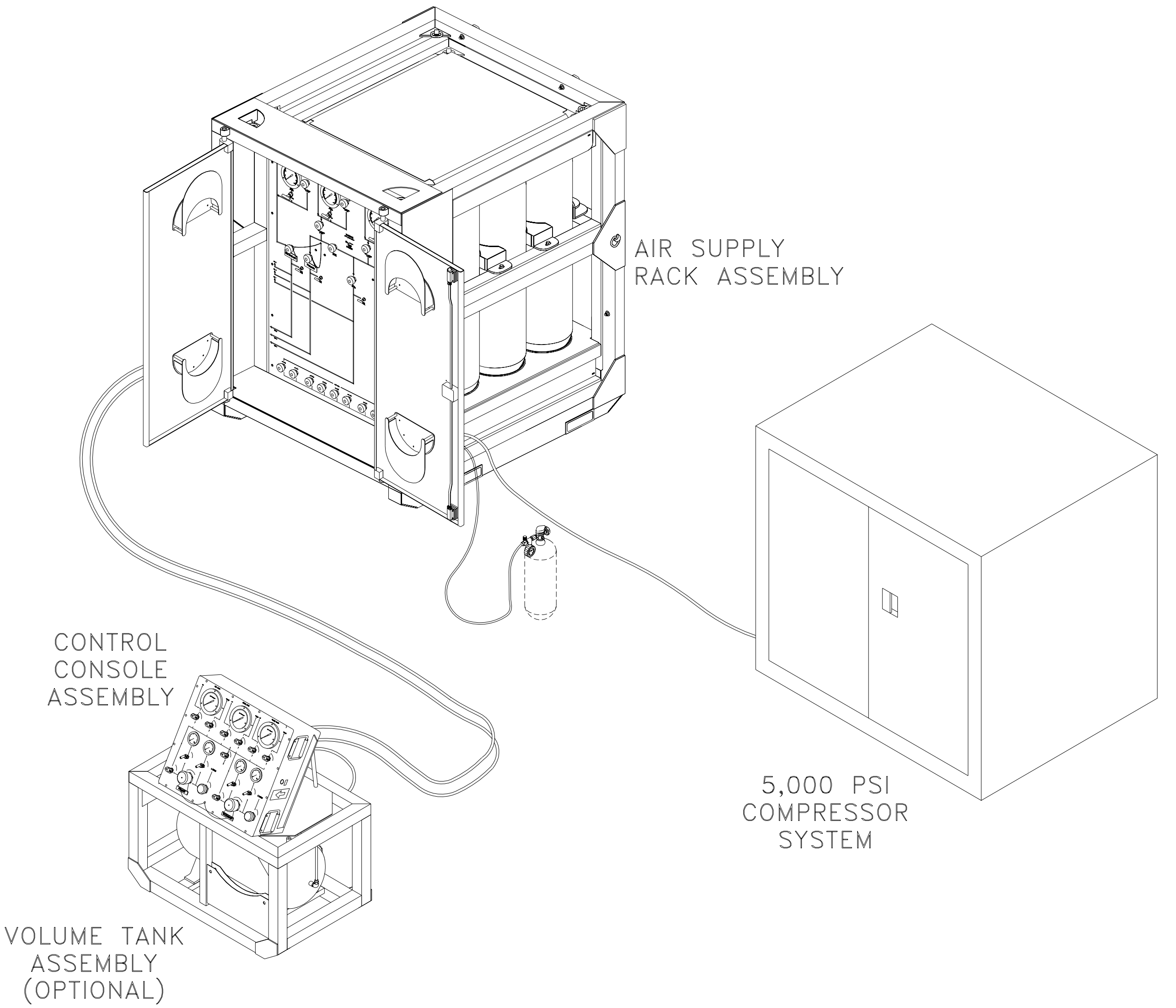


Figure 1-1. Overview of the Fly Away Dive System (FADS) III Air System

This manual is dedicated to the four configurations using the FADS III Control Console Assembly (CCA) and optional Volume Tank Assembly (VTA) as outlined in paragraph 1.2.5. The main body of the manual provides technical information for the basic equipment configuration (Configuration 1), which is the Stand-Alone Diving Setup, whereas technical information for the other three configurations is contained in Appendices B, C, and D, respectively.

NOTE

Information regarding the air system components that are common to both the FADS III Air System and the FADS III Mixed-Gas System is contained in this manual only and will not be duplicated in the FADS III Mixed-Gas System technical manual (NAVSEA S9592-B2-OMI-010). Reference sources for other systems and equipment mentioned in this manual are provided in Table 1-4, which is located at the end of this chapter.

The setup that uses the modified LWDS control console and volume tank assemblies with the FADS III Air Supply Rack Assembly (ASRA) is officially classified as the LWDS MK 3 Mod 1. As a result, the operating and emergency procedures that were formerly located in Appendix B of this manual are now located in Revision 2 of the LWDS MK 3 Mod 0 technical manual (NAVSEA SS500-HK-MMO-010), dated 07 May 2003.

Although the UWSH DSPS (*Drive and Dive*) uses major components of the FADS III Air System as basic components of its customized operating system, it will not be covered in any detail in this manual due to its uniqueness. Users of the certified *Drive and Dive* are encouraged to use this manual for informational and maintenance purposes and should continue to refer to the FADS III Air System drawing package for shared components and those components that are unique to the UWSH DSPS. Operating and emergency procedures will continue to be supplied and updated by the local Command.

1.2.3 APPLICABILITY. The FADS III Air System can be used from a variety of platforms in both ship and shore applications. See Chapter 3 for more information.

1.2.4 SUPERSEDURE DATA. This manual supersedes Revision 1 of NAVSEA S9592-B1-MMO-010, *Technical Manual, Operation and Maintenance, Organizational, Fly Away Dive System (FADS) III Air System*, dated 25 September 1998.

1.2.5 EQUIPMENT CONFIGURATION. The FADS III Air System can be set up to support Navy diving operations utilizing four different configurations.

- Configuration 1 (Figure 1-2) incorporates the use of the ASRA, CCA, and optional VTA, and supports stand-alone dive missions limited to a maximum depth of 190 fsw.

- Configuration 2 (Figure 1-3) incorporates the use of the ASRA, CCA, and optional VTA, and encompasses the use of a TRCS for chamber support. Dive missions are limited to a maximum depth of 190 fsw.

- Configuration 3 (Figure 1-4) incorporates the FADS III Air System CCA and optional VTA, which are supported by LWDS MK 3 Mod 0 Flask Rack Assemblies. Dive missions are limited to a depth of 60 fsw, or 190 fsw, depending on the configuration of the air racks. See Appendix C for more information.

- Configuration 4 (Figure 1-5) incorporates the use of the ASRA, CCA, and optional VTA, and encompasses the use of an SNDLRCS for chamber support. Dive missions are limited to a maximum depth of 190 fsw.

1.3 SYSTEM EQUIPMENT

The FADS III Air System is a portable diving support system designed to provide sufficient air for two working divers (and one standby diver) operating at a moderately heavy work rate to a maximum depth of 190 fsw. The FADS III Air System, which is also capable of supporting the TRCS and the SNDLRCS, is a lightweight, highly mobile configuration that facilitates rapid deployment for use in a wide range of diving scenarios from salvage to underwater ships husbandry, construction, and repair. The system contains the four major hardware assemblies that are listed below and briefly described in the paragraphs that follow. A section on interconnecting hose assemblies is also included for an overall view of the hoses used throughout the system. Chapter 3 provides detailed physical and functional descriptions of the assemblies and their components, as well as a functional flow diagram showing the interrelationship of the major assemblies and interconnecting hoses.

FADS III Air System Major Assemblies and Interconnecting Hoses

- Air Supply Rack Assembly (ASRA)
- Control Console Assembly (CCA)
- Volume Tank Assembly (VTA) – OPTIONAL
- 5,000 pounds per square inch (psi) Compressor System
- Interconnecting Hose Assemblies

1.3.1 AIR SUPPLY RACK ASSEMBLY (ASRA). The ASRA is an integrated HP storage bank system consisting of an Air Flask Rack Assembly (AFRA) housed inside a rack enclosure assembly. The AFRA, which may be used without the rack enclosure assembly in certain setups, contains nine identical composite HP air flasks that are housed in an aluminum frame weldment and feature an isolation valve at the top and a drain valve at the bottom of each flask. Flask whips are used to interconnect the isolation valves within designated banks and to interconnect the drain valves with each other and the system drain valve. The flask valves are also connected to the controls and indicators on the front panel assembly using flex shaft assemblies. Each flask has a floodable volume of 3.15 cubic feet, and when pressurized to its working pressure of 5,000 pounds per square inch gauge (psig), contains 1,075 standard cubic feet (scf) of air. The nine flasks can be configured to supply the primary and secondary air necessary for the divers and/or the equipment supported by the FADS III Air System.

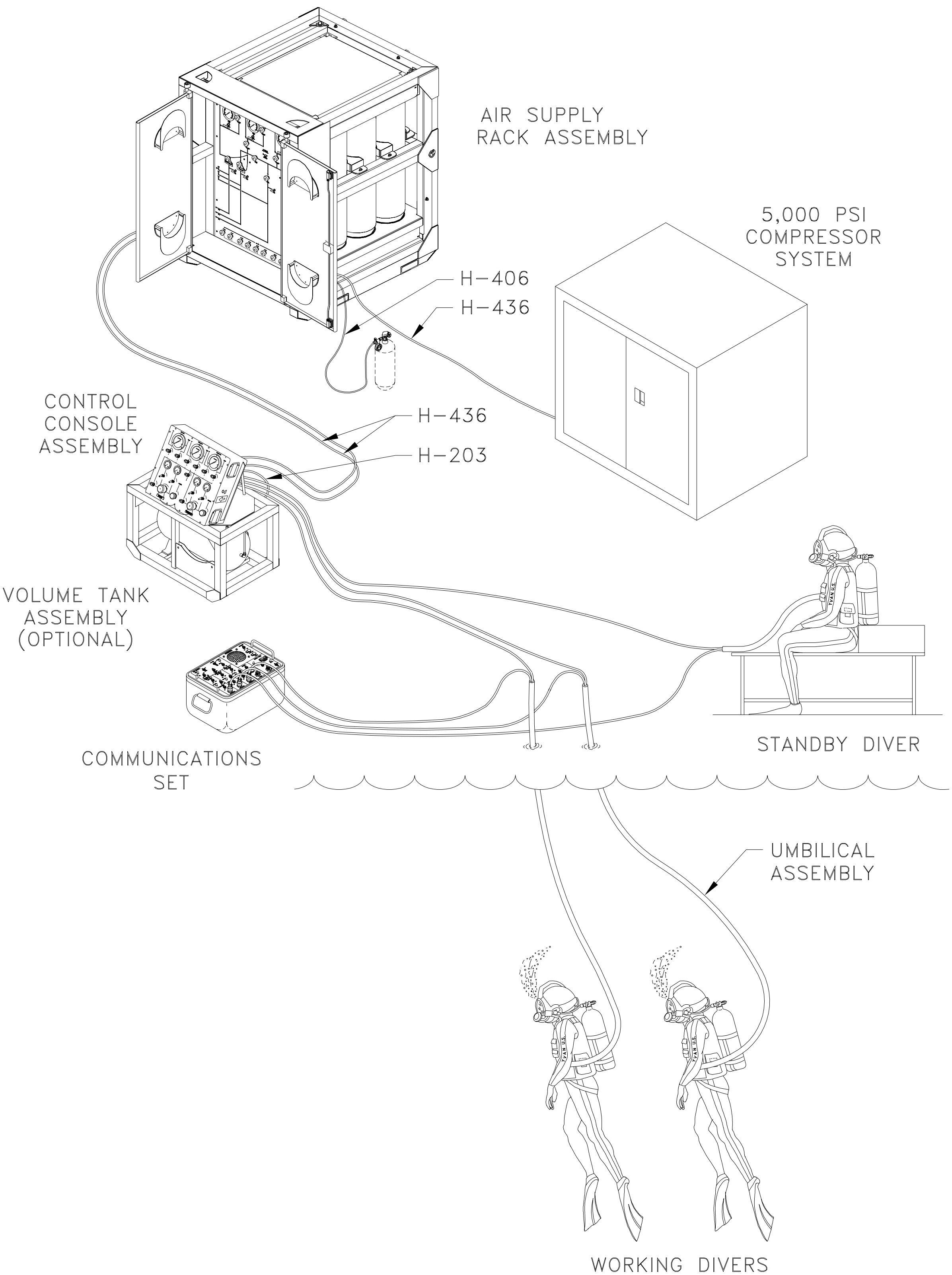


Figure 1-2. Configuration 1: Diving the FADS III Air System in the Stand-Alone Diving Setup

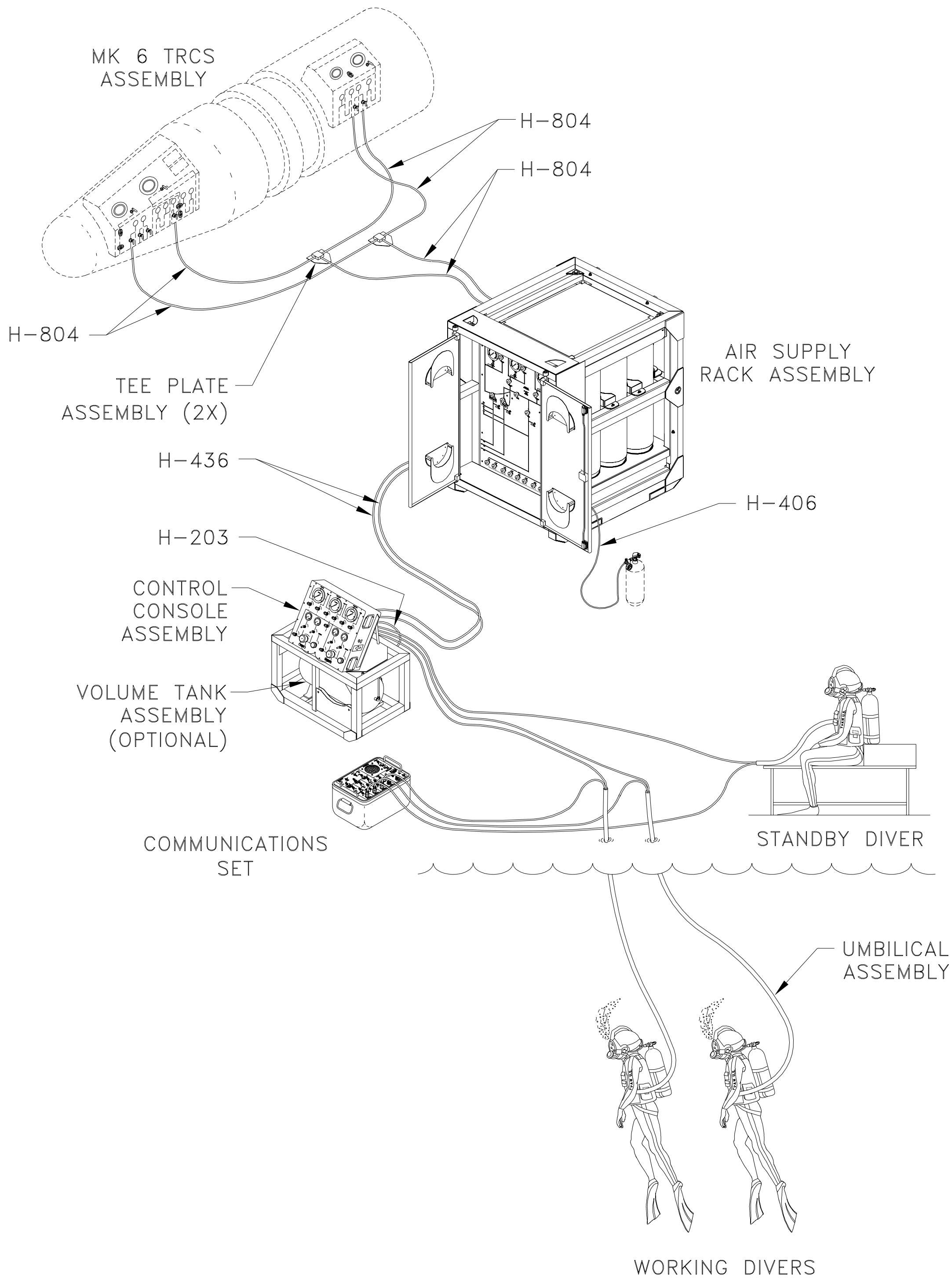
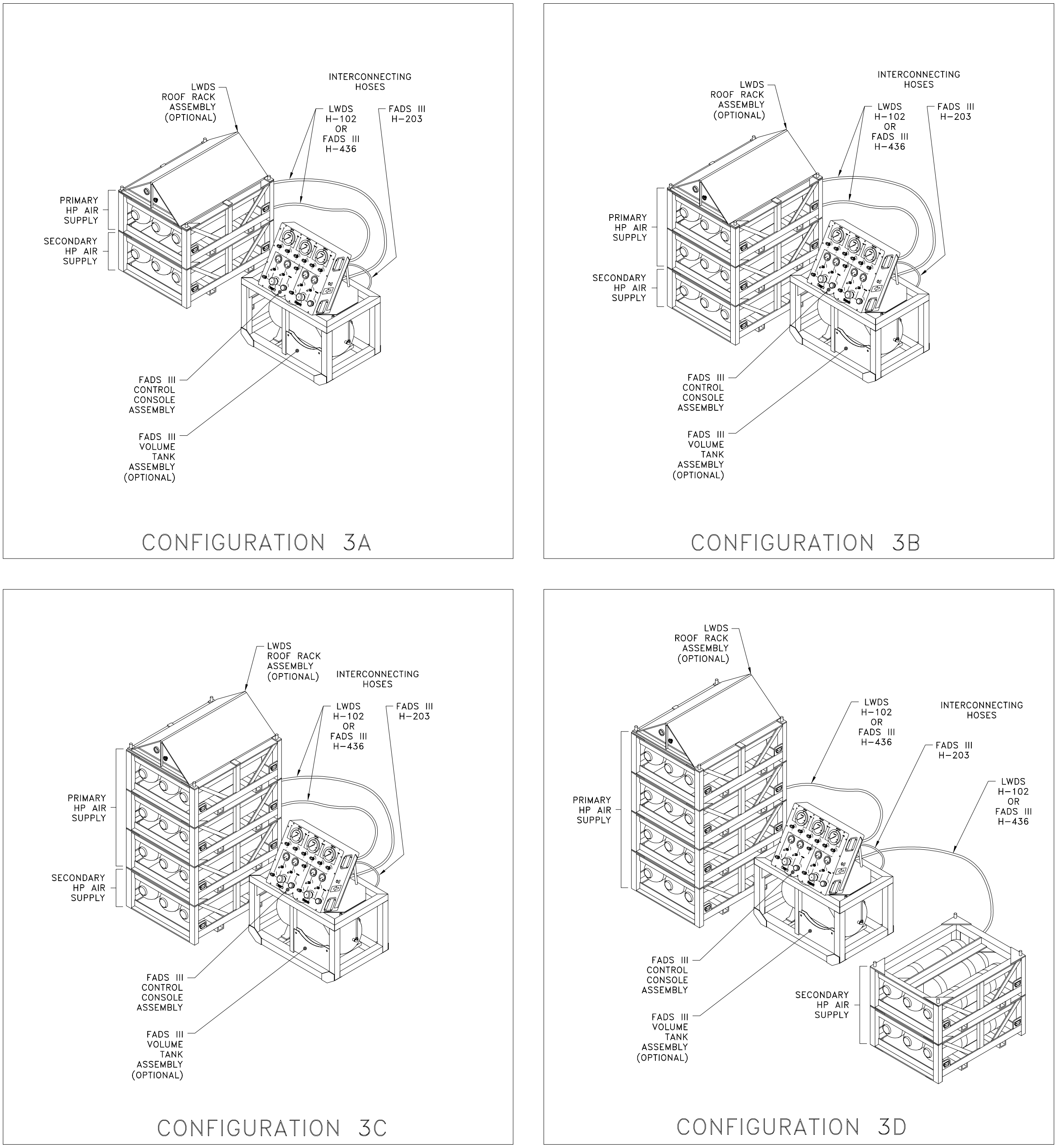


Figure 1-3. Configuration 2: Diving the FADS III Air System with TRCS Support



(MINIMUM REQUIREMENTS)

Figure 1-4. Configuration 3: Diving the FADS III CCA/VTA with the LWDS MK 3 Mod 0 Flask Rack Assemblies

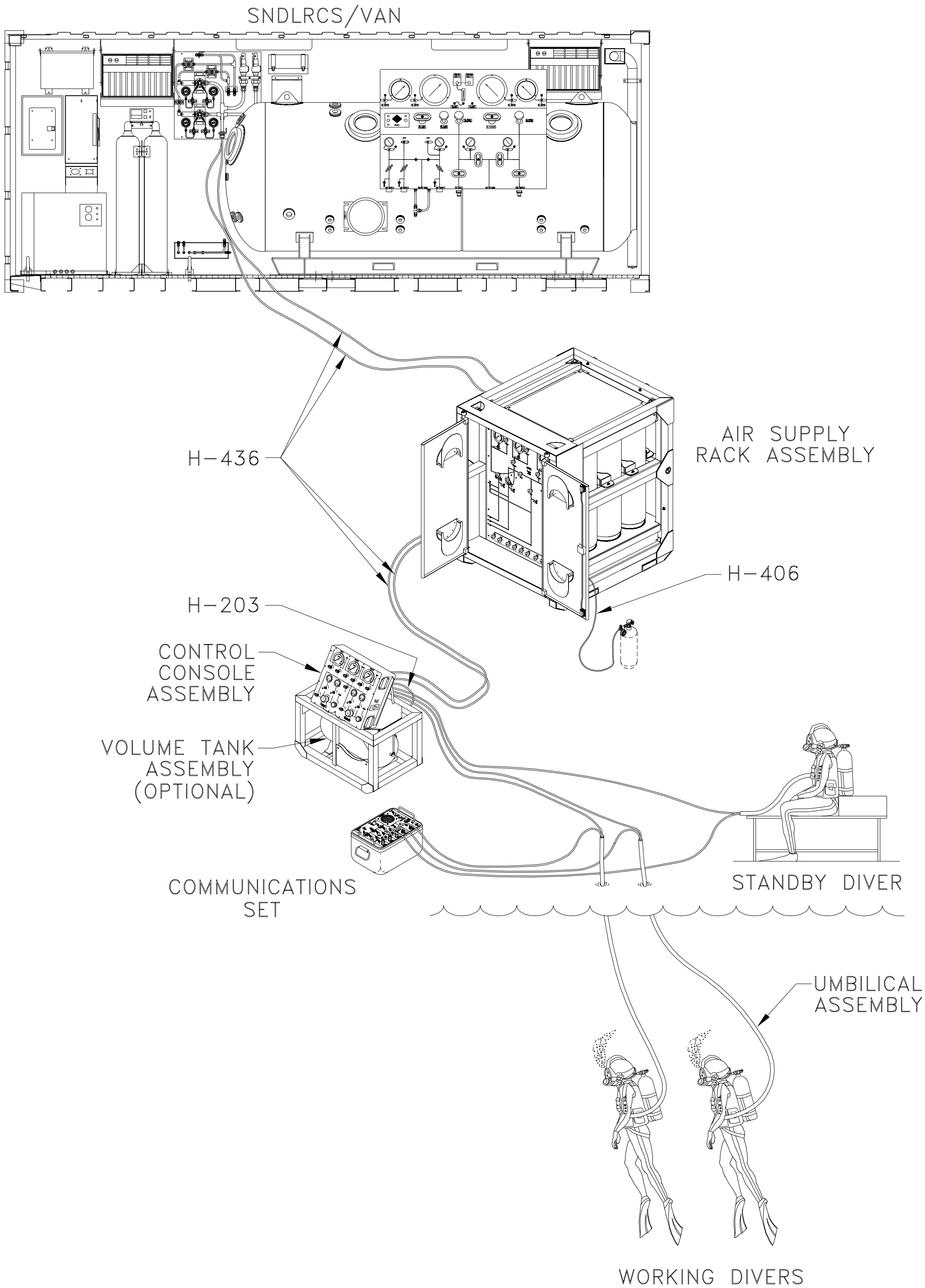


Figure 1-5. Configuration 4: Diving the FADS III Air System with SNDLRCS Support

The ASRA weighs 2,800 pounds empty and 3,440 pounds fully charged, and has a structural volume of 210 cubic feet. Two HP air hose assemblies connect the two ASRA outlet ports to the two CCA inlet ports. Also used with the ASRA are the Self-Contained Underwater Breathing Apparatus (SCUBA) charge hose assembly that is used to charge individual SCUBA cylinders, the HP air hose assembly that is used with the SCUBA charge hose assembly to charge the TRCS Air Supply Rack Assembly, and the six HP air hose assemblies and two tee plate assemblies that are used to interface the ASRA with the TRCS. The SCUBA charge hose assembly is not an integral part of the ASRA prior to initial installation, but thereafter remains attached to the ASRA except when maintenance is required. The TRCS interface hoses and tee plate assemblies are contained in the FADS III TRCS Air Supply Hose Kit, which is part of the Air System Maintenance Kit.

1.3.2 CONTROL CONSOLE ASSEMBLY (CCA). The CCA is a portable control console that reduces air at high pressure (5,000 psig) to the required over-bottom pressure of the divers. The HP air is supplied from the ASRA to the CCA via two 42-foot interconnecting hoses to two inlet ports located on the console's rear panel. Each port supplies air to one of the two regulators that control the delivery pressure of the primary and secondary air supplied to the three divers. In the event of a primary regulator malfunction, the malfunctioning regulator can be secured and the secondary regulator brought into service. Additional major CCA components include two automatic overpressure relief valves set to relieve at 300 psig, A and B SUPPLY HP inlet supply valves and gauges, A and B SUPPLY manifold supply and pressure valves and gauges, a valve that controls the flow of air between the CCA and the VTA, three diver air supply valves, three pneumofathometer gauges, and three pneumofathometer valves. In addition to the two inlet ports mentioned previously, the rear panel of the console houses the three diver air supply and three pneumofathometer ports for umbilical attachment, the port that allows connection of the low-pressure (LP) supply hose from the optional VTA, and a blow-out plug (which is removed before pressurization of the CCA). The CCA weighs 148 pounds and has a structural volume of 6 cubic feet.

1.3.3 VOLUME TANK ASSEMBLY (VTA) – OPTIONAL. In the past when compressors were used to supply air directly to the divers, the VTA served two vital purposes: one was to cool the air coming from the compressor and the other was to keep the air stored at an equalized pressure as the compressor tended to kick on and off when the diver inhaled. However, now that the air from the compressor is being stored in the ASRA's HP air flasks and supplied when needed, those issues are no longer viable and the VTA is considered optional equipment to be used at the diving supervisor's discretion. The VTA consists of a frame-mounted 4-cubic-foot floodable volume tank that is fabricated of 316 stainless steel and has a system working pressure of 275 psig. The tank frame (skid weldment) also serves as the mounting base for the CCA, which houses the valve that controls the flow of air between the VTA and CCA. Air from the CCA enters and exits the VTA through a short LP hose that acts as both the supply and return line to the VTA. The VTA features a condensate drain valve that can be manually operated to remove moisture that accumulates in the volume tank, and an automatic pressure relief valve that is set to relieve at 300 psig to provide overpressure protection. The VTA weighs 305 pounds and has a structural volume of 25 cubic feet.

1.3.4 5,000 PSI COMPRESSOR SYSTEM. The 5,000 psi compressor system, which consists of a Bauer diesel or electric compressor or a Mako diesel or electric compressor, is designed to charge the ASRA HP air flasks at a minimum rate of 25 standard cubic feet per minute (scfm) via an interconnecting HP hose assembly. Each compressor system has a purification system installed within the framework of the compressor. The system is designed to remove carbon monoxide (CO), particulates, water and oil vapors, and odors and taste from the discharged air. Weights and volumes for the authorized compressor systems are shown in Table 1-1, which summarizes the physical characteristics of all the major assemblies of the FADS III Air System.

1.3.5 <u>INTERCONNECTING HOSE ASSEMBLIES</u>. Table 1-2 contains an overview of the interconnecting hose assemblies that are used with the FADS III Air System.

Table 1-1. FADS III Air System Physical Characteristics

Assembly	Dimensions (Shipping) W×H×D (in.)	Weight (pounds)	Structural Volume (cubic feet)	Capacity
Air Supply Rack Assembly	63 × 80 × 74	3,440 charged 2,800 empty	210	1,075 scf @ 5,000 psig
Control Console Assembly	34 × 30 × 17	148	6	HP- 5,000 psig
Volume Tank Assembly	48 × 30 × 31	305	25	275 psig system working pressure
5,000 psi Compressor System				Charges at rate of 25 scfm
Diesel – Bauer (Model 74628BD)	75 × 52 × 55	2,530	125	
Diesel – Mako (Model 74628MD)	75 × 53 × 55	2,140	125	
Electric – Bauer (Model 74628BE)	72 × 52 × 40	1,720	88	
Electric – Mako (Model 74628ME)	72 × 53 × 40	1,340	88	

Table 1-2. FADS III Air System Interconnecting Hose Assemblies

Designation	Qty.	Connection	HP/LP	Comments
H-203	1	VTA to CCA	LP	Interconnects VTA with CCA; not required if VTA not used
H-401	9	ASRA Flask Drain Valves	HP	Interconnects flask drain valves and condensate drain valve (AHP-V419)
H-402	6	ASRA Flask Isolation Valves	HP	Interconnects flask isolation valves within each bank
H-403	1	ASRA BANK 1 Supply Hose	HP	Interconnects BANK 1 MANIFOLD valve (AHP-V420) with flasks in Bank 1
H-404	1	ASRA BANK 2 Supply Hose	HP	Interconnects BANK 2 MANIFOLD valve (AHP-V421) with flasks in Bank 2
H-405	1	ASRA BANK 3 Supply Hose	HP	Interconnects PORT C valve (AHP-V422) with flasks in Bank 3

Table 1-2. FADS III Air System Interconnecting Hose Assemblies—Continued

Designation	Qty.	Connection	HP/LP	Comments
H-406	1	ASRA to SCUBA Cylinder	HP	Used to charge SCUBA cylinders
H-436	2	ASRA to CCA	HP	One hose interconnects ASRA's PORT A or B to CCA's A SUPPLY or B SUPPLY; the other interconnects ASRA's PORT C to CCA's remaining SUPPLY port
H-436	1	ASRA to Compressor	HP	Interconnects ASRA to HP compressor for flask charging purposes
H-444	1	SCUBA Charge Hose to TRCS Air Supply Rack Assembly	HP	Used to charge TRCS flask racks
H-804	6	ASRA to Tee Plate to TRCS	HP	Used in Configuration 2 (Diving with TRCS Support)

1.4 PHYSICAL ARRANGEMENT

The FADS III Air System is set up using one of the four configurations described in paragraphs 1.4.1 thru 1.4.4.

1.4.1 CONFIGURATION 1: DIVING THE FADS III AIR SYSTEM IN THE STAND-ALONE DIVING SETUP. Configuration 1 (Figure 1-2) uses the basic components of the FADS III Air System, including the CCA, the optional VTA, one of the 5,000 psi compressor systems, and the ASRA. Using interconnecting hoses, the following connections are made:

- 5,000 psi compressor system to ASRA (for charging)
- ASRA to SCUBA cylinders (for charging)
- ASRA to CCA (primary and secondary air)
- CCA to and from optional VTA
- CCA to standby diver and two working divers (air and pneumofathometer hoses)

Additional information on Configuration 1 is contained in the main body of this manual and in the operating and emergency procedure checklists in Appendix A.

1.4.2 CONFIGURATION 2: DIVING THE FADS III AIR SYSTEM WITH TRCS SUPPORT. Configuration 2 (Figure 1-3) uses the same basic components and connections identified in paragraph 1.4.1. However, since Configuration 2 also has to support the TRCS MK 6 Mod 0 or Mod 1, the following additional connections are required:

- ASRA to primary and secondary tee plate assemblies
- Primary tee plate assembly to Transportable Recompression Chamber (TRC) and Transfer Lock (TL)
- Secondary tee plate assembly to TRC and TL

Additional information on Configuration 2 is contained in Appendix B of this manual.

1.4.3 CONFIGURATION 3: DIVING THE FADS III CCA/VTA WITH THE LWDS MK 3 MOD 0 FLASK RACK ASSEMBLIES. Configuration 3 (Figure 1-4) uses the LWDS MK 3 Mod 0 flask rack assemblies to support the CCA and the optional VTA from the FADS III Air System. This configuration has been broken down into four subconfigurations that are identified as Configurations 3A, 3B, 3C, and 3D. The LWDS equipment that comprises each configuration (in addition to the optional roof rack assembly) is outlined below.

- Configuration 3A: 1 primary rack 1 secondary rack
- Configuration 3B: 2 primary racks 1 secondary rack
- Configuration 3C: 3 primary racks 1 secondary rack
- Configuration 3D: 4 primary racks (minimum) 2 secondary racks

Using interconnecting hoses, connections are made as follows:

- HP air compressor to optional LWDS roof rack assembly (for charging)
- Optional LWDS roof rack assembly to topmost in-line LWDS primary rack
- LWDS primary rack(s) and secondary rack(s) to FADS III CCA
- FADS III CCA to and from optional FADS III VTA
- FADS III CCA to standby diver and two working divers (air and pneumofathometer hoses)

Additional information on Configuration 3 is contained in Appendix C of this manual.

1.4.4 CONFIGURATION 4: DIVING THE FADS III AIR SYSTEM WITH SNDLRCS SUPPORT. Configuration 4 (Figure 1-5) uses the SNDLRCS ASRA to support the FADS III Air System CCA and optional VTA. Please note that although equipment from two different systems is involved, this configuration falls within the FADS III Air System classification (based on the type of control console being used) and therefore will be addressed only in this technical manual and not in the SNDLRCS technical manual.

Hose connections for Configuration 4 are made in accordance with one of the following two options:

a. If the SNDLRCS ASRA is located inside the SNDLRCS van:

   - 5,000 psi compressor system to ASRA (for charging)
   - ASRA to SNDLRCS Air Control Panel (primary and secondary air)
   - ASRA to CCA (primary and secondary air)
   - CCA to and from optional VTA
   - CCA to two working divers and one standby diver (air and pneumofathometer)

b. If the SNDLRCS ASRA is located outside the SNDLRCS van:

   - 5,000 psi compressor system to ASRA (for charging)
   - ASRA to SNDLRCS outside BKHD panel and then to SNDLRCS Air Control Panel (primary and secondary air)

- ASRA to CCA (primary and secondary air)
- CCA to and from optional VTA
- CCA to two working divers and one standby diver (air and pneumofathometer)

Additional information on Configuration 4 is contained in Appendix D of this manual.

1.5 REFERENCE DATA

Table 1-3 provides a list of the equipment, accessories, and documents supplied with the FADS III Air System. Documents that are referenced in this manual but not supplied with the system are listed in Table 1-4.

Table 1-3. Equipment, Accessories, and Documents Supplied

Qty	Nomenclature	Part/Dwg Number
1	**AIR SUPPLY RACK ASSEMBLY (ASRA)**, consisting of:	53711-6961893
1	– Rack Enclosure Assembly	53711-6961897
1	– Air Flask Rack Assembly (AFRA), consisting of:	53711-6961898
9	• Flasks, HP Composite, Carbon Fiber –OR–	53711-6961914
	Flasks, HP Composite, Kevlar®	53711-6961959
1	• HP Air Hose Assembly H-406 – SCUBA Charge Hose Assembly	53711-6962020
18	• Flask Whips/Hoses H-401 (9), H-402 (6), H-403, H-404, H-405 (1 ea)	53711-6962071
18	• Flex Shaft Adapters	53711-6961958
6	• Flex Shaft Assemblies, 17 in.	FAUSG14AZ1
6	• Flex Shaft Assemblies, 32.375 in.	FAUSG14AZ2
6	• Flex Shaft Assemblies, 48.25 in.	FAUSG14AZ3
1	– Cover, Vinyl-Nylon, Blue	53711-6962031
3	– HP Air Hose Assemblies H-436, designated as:	53711-6962000
2	• ASRA to CCA	53711-6962000
1	• ASRA to Compressor	53711-6962000
1	**AIR SYSTEM MAINTENANCE KIT**, consisting of:	53711-6962034
1	– FADS III TRCS Air Supply Hose Kit	53711-6961909
2	• HP Air Hose Assemblies H-804 – ASRA to Tee Plate Assembly	53711-6962000
4	• HP Air Hose Assemblies H-804 – Tee Plate Assembly to TRCS	53711-6962000
1	• HP Air Hose Assembly H-444 – SCUBA Charge Hose to TRCS Rack	53711-6962070-6
2	• Tee Plate Assemblies	53711-6962055-1
1	– Storage Container	PC422928
1	– Storage Container Lid	LS422904
2	– Air Hose Connectors	53711-6962056-1
1	**CONTROL CONSOLE ASSEMBLY (CCA)**	53711-6961896
	DOCUMENTATION, consisting of:	
1	– Fly Away Dive System (FADS) III Air System Technical Manual	S9592-B1-MMO-010
1	**VOLUME TANK ASSEMBLY (VTA)**; includes the following:	53711-6961895
1	– LP Air Hose Assembly H-203 – VTA to CCA	53711-6962010
1	– Cover, Vinyl-Nylon, Blue	53711-6962030

Table 1-3. Equipment, Accessories, and Documents Supplied—Continued

Qty	Nomenclature	Part/Dwg Number
1	**5,000 PSI COMPRESSOR SYSTEM**, consisting of one of the following: – Bauer Diesel (Model 74628BD) – Bauer Electric (Model 74628BE) – Mako Diesel (Model 74628MD) – Mako Electric (Model 74628ME)	 53711-6961899-1 53711-6961899-2 53711-6961899-3 53711-6961899-4

Table 1-4. Referenced Documents

Document Name	Identifying Number or Web Address
Allowance Parts List (APL) for: – FADS III Air Supply Rack Assembly – FADS III Air Systems Maintenance Kit	 990010167 990010179
Appendix A, Basic Requirements for Fully Wrapped Carbon-Fiber Reinforced Aluminum Lined Cylinders	DOT-CFFC; http://hazmat.dot.gov / Library / OHM Guidance Documents
Basic Requirements for Fiber Reinforced Plastic (FRP) Type 3FC Composite Cylinders	DOT FRP-1 Standard; http://hazmat.dot.gov / Library / OHM Guidance Documents
Cleaning and Gas Analysis for Diving Applications Handbook	NAVSEA SS521-AK-HBK-010 *http://www.supsalv.org/*
Cleaning Compound - Aqueous - Oxygen Systems Components	MIL-DTL-24800
Cleaning Diving System Air Components with NOC	NAVSEA-00C4-PI-002 *http://www.supsalv.org/*
Cleaning of Shipboard Compressed Air Systems	MIL-STD-1622 Series *http://www.supsalv.org/*
Composite Flask Special Permits from U.S. Department of Transportation (DOT)	See Appendix G of this manual for detailed list
Compressor Documentation: – Operation and Maintenance Instructions for High Pressure Air Compressor System (Diesel Engine Driven) 24.0 cfm @ 5000 psig – Operation and Maintenance Instructions for High Pressure Air Compressor System (Diesel Engine Driven) 29.0 cfm @ 5000 psig – Workshop Manual, Isuzu Motors Limited, Industrial Diesel Engine – Care and Operation of Twin Disc Power Take-offs, Twin Disc, Incorporated, Models C-110-HP, C-111-HP – Instruction Manual and Replacement Parts, Bauer Compressors, Inc., IK 22.0 High Pressure Air-Compressor Block	 Highstar Model 74628MD Highstar Model 74628BD C240 Manual #101548 Model IK22-BH
Detergent, General Purpose (Liquid, Nonionic)	MIL-D-16791G, Type I, NSN 7930-00-282-9699

Table 1-4. Referenced Documents—Continued

Document Name	Identifying Number or Web Address
Diver Life Support System Cleaning	Volume VI of Topside Tech Notes http://www.supsalv.org/
Diving Equipment Authorized for U.S. Navy Use (ANU)	http://www.supsalv.org/
FADS III Air System Joint Identification Drawing	6961894
Failure Analysis Report (FAR), Naval Sea Systems Command Diving Life Support Equipment	NAVSEA Form 10560/4 (see Figure 2-6) Also available on-line at http://www.supsalv.org/
Filters	Volume IX of Topside Tech Notes http://www.supsalv.org/
Flexible Hoses and Umbilicals for DLSS	Volume III of Topside Tech Notes http://www.supsalv.org/
Fly Away Dive System (FADS) III Mixed-Gas System Operation and Maintenance Manual	NAVSEA S9592-B2-OMI-010
Guidelines for Visual Inspection and Requalification of Fiber Reinforced High Pressure Cylinders [External]	Compressed Gas Association publication, CGA C-6.2
Hydrostatic Testing Facilities (by identification number or state listing)	http://hazmat.dot.gov/sp_app/approvals/hydro/hydro_retesters.htm
Lightweight Dive System (LWDS) MK 3 Mod 0 Operation and Maintenance Manual	NAVSEA SS500-HK-MMO-010 http://www.supsalv.org/
Maintenance Requirements and Inspection Criteria for Diver Life Support System (DLSS), Moisture Separators, Filter Housings, Receivers, Volume Tanks, and Purification Systems	NAVSEA-00C3-PI-005 http://www.supsalv.org/
Methods for Hydrostatic Testing of Compressed Gas Cylinders	Compressed Gas Association publication, CGA C-1
Naval Ships' Technical Manual, Chapter 262, Lubricating Oils, Greases, Specialty Lubricants, and Lubrication Systems	S9086-H7-STM-010/CH-262, Section 8
NAVSEA/SPAWAR Technical Manual Deficiency/ Evaluation Report (TMDER)	Form NAVSEA 4160/1; submit electronically via https://nsdsa2.phdnswc.navy.mil/tmder/tmder-generate.asp?lvl=1
Navy Occupational Safety and Health (NAVOSH) Program Manual for Forces Afloat	OPNAVINST 5100.19 Series
Navy Occupational Safety and Health Program Manual	OPNAVINST 5100.23 Series
Planned Maintenance System (PMS) for: – Fly Away Dive System (FADS) III – FADS III Mako 5409 HP Compressor & assoc. MIPs: • Divers Life Support System (DLSS) • Divers Compressed Air • Isuzu Diesel Engine Models C240PW/3KA1/3KB1/3KC1 • Miscellaneous AC/DC Motors • Diving Equipment Flexible Hose(s) – Divers Compressor, Bauer/Mako	 MIP 5921/181 MIP 5921/036 MIP 5921/034 MIP 5921/101 MIP 5921/009 MIP 3002/001 MIP 5921/033 MIP 5921/063

Table 1-4. Referenced Documents—Continued

Document Name	Identifying Number or Web Address
PMS Feedback Report	OPNAV 4790/7B
Precision Cleaning and Testing of Shipboard Oxygen, Helium, Helium-Oxygen, and Nitrogen Systems, Standard Practice for	MIL-STD-1330 Series http://www.supsalv.org/
Relief Valves	Volume I of Topside Tech Notes http://www.supsalv.org/
Ships' Maintenance Material Management (3-M) Manual	OPNAVINST 4790.4 Series
Standard Navy Double-Lock Recompression Chamber System Operation and Maintenance Manual	NAVSEA SS500-B1-MMM-010
Standards for Visual Inspection of High Pressure Aluminum Compressed Gas Cylinders [Internal]	Compressed Gas Association publication, CGA C-6.1
Survey System Certification Requirements/Guidelines for Afloat and Portable Recompression Chambers and Surface Supported Diving Systems	http://www.supsalv.org/
Transportable Recompression Chamber System (TRCS) MK 6 Mod 0/Mod 1 Operation and Maintenance Manual	NAVY SS500-AW-MMM-010 / MARINE CORPS TM 10114A-14&P/1-1 http://www.supsalv.org/
U.S. Navy Diving and Manned Hyperbaric Systems Safety Certification Manual	NAVSEA SS521-AA-MAN-010 http://www.supsalv.org/
U.S. Navy Diving Manual	NAVSEA SS521-AG-PRO-010 http://www.supsalv.org/

THIS PAGE INTENTIONALLY LEFT BLANK

CHAPTER 2

OPERATION

WARNING

Divers and support personnel shall adhere to the operating procedures presented in this manual when using the FADS III Air System. Failure to perform prescribed procedures may result in equipment failure and personnel injury or death.

2.1 INTRODUCTION

The information in this chapter is intended to familiarize the equipment operator with the controls, indicators, and interface ports associated with the Fly Away Dive System (FADS) III Air System. Information covered in this chapter is presented as follows:

a. Para. 2.2—Preoperational Conditions and Setup .... Page 2-1
b. Para. 2.3—Operating and Emergency Procedures .... Page 2-11
c. Para. 2.4—Failure Analysis Reporting... Page 2-13
d. Para. 2.5—Accident/Incident Equipment Status Reporting .... Page 2-13

2.2 PREOPERATIONAL CONDITIONS AND SETUP

Prior to deploying the FADS III Air System, divers and support personnel must be thoroughly familiar with the system's operational capabilities and procedures. Table 2-1 has been provided to assist personnel in choosing the assemblies and hoses that are required to successfully set up and operate the FADS III Air System in Configuration 1, and Tables 2-2 through 2-6 have been provided to help identify the controls, indicators, and interface ports for each major assembly. Before operating the FADS III Air System, personnel should perform the required maintenance in the Planned Maintenance System (PMS) for the FADS III Air System (refer to Chapter 4 for more information).

2.2.1 EQUIPMENT CHECKLIST. Table 2-1 contains a list of the assemblies and hoses that are required to perform operations using the FADS III Air System in Configuration 1. Please note that charging of the Transportable Recompression Chamber System (TRCS) Air Supply Rack Assembly has been included here and not in Appendix B since Configuration 2 uses the FADS III Air Supply Rack Assembly (ASRA) to support the TRCS. Prior to deployment, ensure the applicable items listed in Table 2-1 are serviced and available for use.

Table 2-1. FADS III Air System Configuration 1 Equipment List

Item	Component/Description	Qty.
STAND-ALONE DIVING		
1	Control Console Assembly (CCA)	1
2	Volume Tank Assembly (VTA) – Optional This setup uses the following hose assembly: • H-203 – LP Air Hose Assembly – VTA to CCA (6 ft. 1 in. ± 1 in. length; 1/2 in. dia.)	AR* 1
3	Air Supply Rack Assembly (ASRA) This setup uses the following hose assembly: • H-436 – HP Air Hose Assembly – ASRA to CCA (42 ft. ± 6 in. length; 3/8 in. dia.)	1 2
ASRA HP COMPOSITE AIR FLASK CHARGING		
1	5,000 psi Compressor System (selected from authorized systems shown below): • Bauer Diesel Compressor System • Mako Diesel Compressor System • Bauer Electric Compressor System • Mako Electric Compressor System	1
2	ASRA HP Composite Air Flasks This setup uses the following hose assembly: • H-436 – HP Air Hose Assy – ASRA to Compressor (42 ft. ± 6 in. length; 3/8 in. dia.)	AR* 1
SELF-CONTAINED UNDERWATER BREATHING APPARATUS (SCUBA) CYLINDER CHARGING		
1	Air Supply Rack Assembly (ASRA) This setup uses the following hose assembly: • H-406 – SCUBA Charge Hose Assembly (6 ft. 5.5 in. ± 1 in. length; 1/4 in. dia.)	1 1
2	SCUBA Cylinders	AR*
TRCS AIR SUPPLY RACK ASSEMBLY CHARGING		
1	FADS III Air Supply Rack Assembly (ASRA) This setup uses the following hose assembly: • H-406 – SCUBA Charge Hose Assembly (6 ft. 5.5 in. ± 1 in. length; 1/4 in. dia.)	1 1
2	FADS III Air System Maintenance Kit This setup uses the following item from the FADS III TRCS Air Supply Hose Kit, which is included in the maintenance kit: • H-444 – HP Air Hose Assembly – ASRA H-406 to TRCS Air Supply Rack Assy (42 ft. ± 6 in. length; 3/8 in. dia.)	1 1
3	TRCS Air Supply Rack Assembly	1

* AR = As Required

2.2.2 <u>CONTROL AND INDICATOR SETTINGS</u>. Tables 2-2 through 2-6 identify the controls, indicators, and interface ports for the FADS III Air System. The first column of each table contains index numbers that correspond to the callouts shown in the applicable illustration in Figures 2-1 through 2-5. Additional columns may contain information for one or more of the following: the panel label as shown on the equipment, component type (valve, gauge, tag, etc.), the component's assigned designator number (if any), and a brief description of the component's function and normal operating condition.

NOTE

Component identification consists of alpha-numeric values or designators that identify a particular fitting, hose, gauge, or valve in a system. The following is a key to the designations used in this manual:

Designators Preceding Dash	Designators Following Dash
AHP = Air High Pressure	G = Gauge
ALP = Air Low Pressure	V = Valve
F = Fitting	200's = Volume Tank Assembly
H = Hose	300's = Control Console Assembly
	400's = Air Supply Rack Assembly

Table 2-2. Control Console Assembly (CCA) Controls and Indicators
(Refer to Figure 2-1)

Index No.	Panel Label	Component	Designator	Function	Normal Operating Condition
1	**MANIFOLD PRESSURE**	Gauge	ALP-G323	Indicates regulated pressure to **A SUPPLY** manifold	VARIABLE
2	**RED SUPPLY**	Valve	ALP-V316	Controls flow of LP air to red diver	OPEN (when diver is breathing umbilical air)
3	**A SUPPLY**	Gauge	AHP-G325	Indicates pressure of air flowing to **A REGULATOR** (AHP-V303)	VARIABLE
4	**RED DIVER**	Gauge	ALP-G322	Indicates red diver's depth	VARIABLE
5	**PNEUMO** (red)	Valve	ALP-V319	Controls flow of purge air to red diver's pneumo hose	CLOSED (open briefly to read depth)
6	**GREEN SUPPLY**	Valve	ALP-V315	Controls flow of LP air to green diver	OPEN (when diver is breathing umbilical air)
7	**GREEN DIVER**	Gauge	ALP-G321	Indicates green diver's depth	VARIABLE
8	**VOLUME TANK**	Valve	ALP-V313	Controls flow of air between CCA and VTA	OPEN (only if VTA is being used)
9	**PNEUMO** (green)	Valve	ALP-V318	Controls flow of purge air to green diver's pneumo hose	CLOSED (open briefly to read depth)
10	**YELLOW SUPPLY**	Valve	ALP-V314	Controls flow of LP air to yellow diver	OPEN (when diver is breathing umbilical air)
11	**YELLOW DIVER**	Gauge	ALP-G320	Indicates yellow diver's depth	VARIABLE
12	**PNEUMO** (yellow)	Valve	ALP-V317	Controls flow of purge air to yellow diver's pneumo hose	CLOSED (open briefly to read depth)

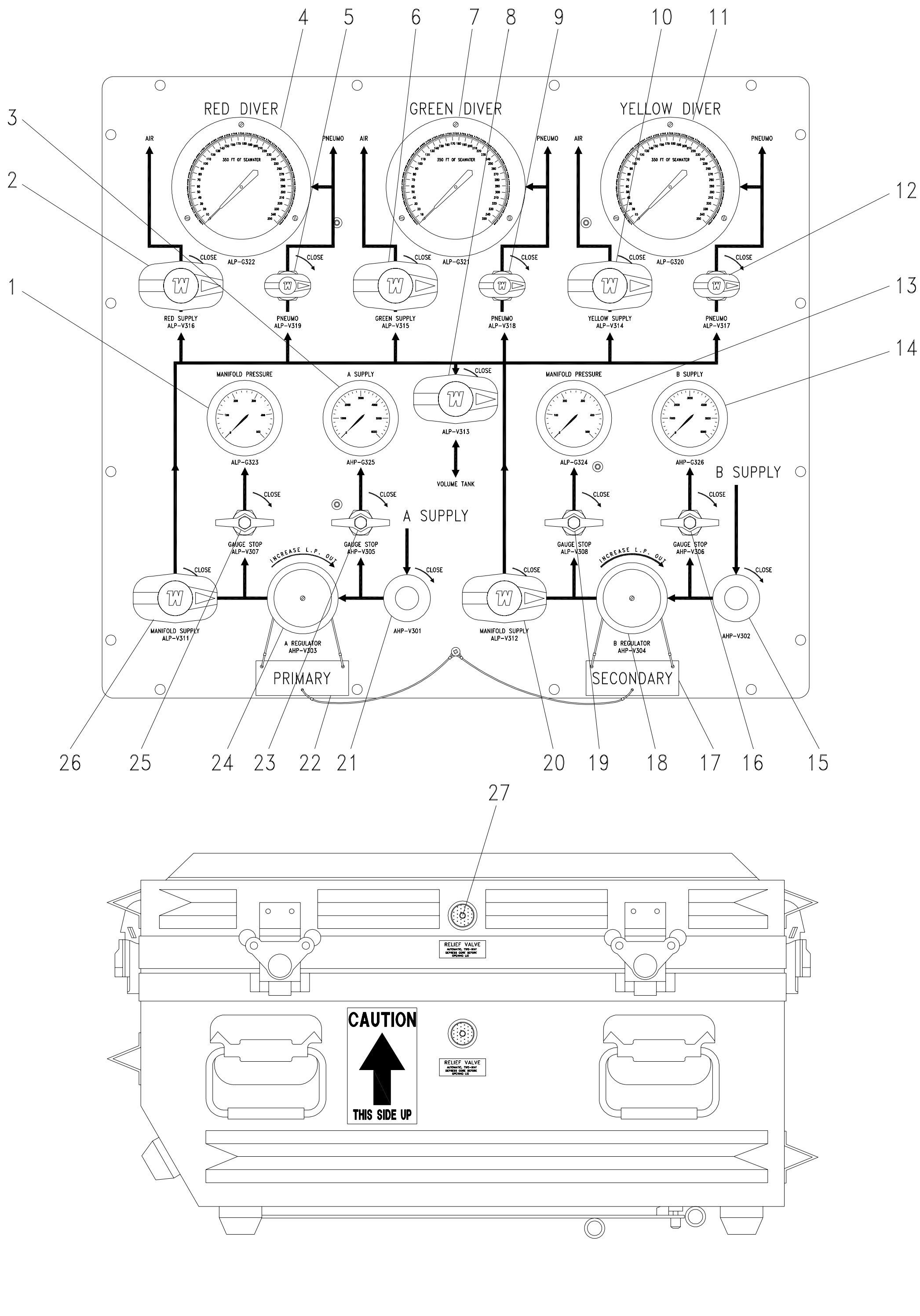


Figure 2-1. Control Console Assembly (CCA) Controls and Indicators

Table 2-2. Control Console Assembly (CCA) Controls and Indicators—Continued
(Refer to Figure 2-1)

Index No.	Panel Label	Component	Designator	Function	Normal Operating Condition
13	**MANIFOLD PRESSURE**	Gauge	ALP-G324	Indicates regulated pressure to **B SUPPLY** manifold	VARIABLE
14	**B SUPPLY**	Gauge	AHP-G326	Indicates pressure of air flowing to **B REGULATOR** (AHP-V304)	VARIABLE
15	**B SUPPLY**	Valve	AHP-V302	Controls **B SUPPLY** HP air supply entering CCA	OPEN
16	**GAUGE STOP** (B SUPPLY)	Valve	AHP-V306	Controls flow of HP air to **B SUPPLY** gauge (AHP-G326)	OPEN
17	**SECONDARY**	Tag	N/A	Identifies circuit chosen to supply secondary air	N/A
18	**B REGULATOR**	Valve	AHP-V304	Reduces air from 5,000 psig to manifold pressure set by operator	VARIABLE
19	**GAUGE STOP** (B SUPPLY)	Valve	ALP-V308	Controls flow of LP air to **MANIFOLD PRESSURE** gauge (ALP-G324)	OPEN
20	**MANIFOLD SUPPLY** (B SUPPLY)	Valve	ALP-V312	Controls flow of LP air to manifold	If Primary: OPEN If Secondary: CLOSED
21	**A SUPPLY**	Valve	AHP-V301	Controls **A SUPPLY** HP air supply entering CCA	OPEN
22	**PRIMARY**	Tag	N/A	Identifies circuit chosen to supply primary air	N/A
23	**GAUGE STOP** (A SUPPLY)	Valve	AHP-V305	Controls flow of HP air to **A SUPPLY** gauge (AHP-G325)	OPEN
24	**A REGULATOR**	Valve	AHP-V303	Reduces air from 5,000 psig to manifold pressure set by operator	VARIABLE
25	**GAUGE STOP** (A SUPPLY)	Valve	ALP-V307	Controls flow of LP air to **MANIFOLD PRESSURE** gauge (ALP-G323)	OPEN
26	**MANIFOLD SUPPLY** (A SUPPLY)	Valve	ALP-V311	Controls flow of LP air to manifold	If Primary: OPEN If Secondary: CLOSED
27	**RELIEF VALVE**	Valve	N/A	Located on outside of CCA case; both valves must be pressed before opening case to vent pressure that may have built up inside case	OPEN only when pressed; otherwise, CLOSED

Table 2-3. Control Console Assembly (CCA) Interface Ports
(Refer to Figure 2-2)

Index No.	Panel Label	Function
1	**YELLOW DIVER**	Connection for yellow diver air supply hose
2	**VOLUME TANK**	Connection for LP supply hose from VTA (optional)
3	**GREEN DIVER**	Connection for green diver air supply hose
4	**RED DIVER**	Connection for red diver air supply hose
5	**RED PNEUMO**	Connection for red diver pneumofathometer hose
6	**GREEN PNEUMO**	Connection for green diver pneumofathometer hose
7	**A SUPPLY**	Connection for HP supply hose to ASRA port A, B, or C
8	**B SUPPLY**	Connection for HP supply hose to ASRA port A, B, or C
9	**YELLOW PNEUMO**	Connection for yellow diver pneumofathometer hose

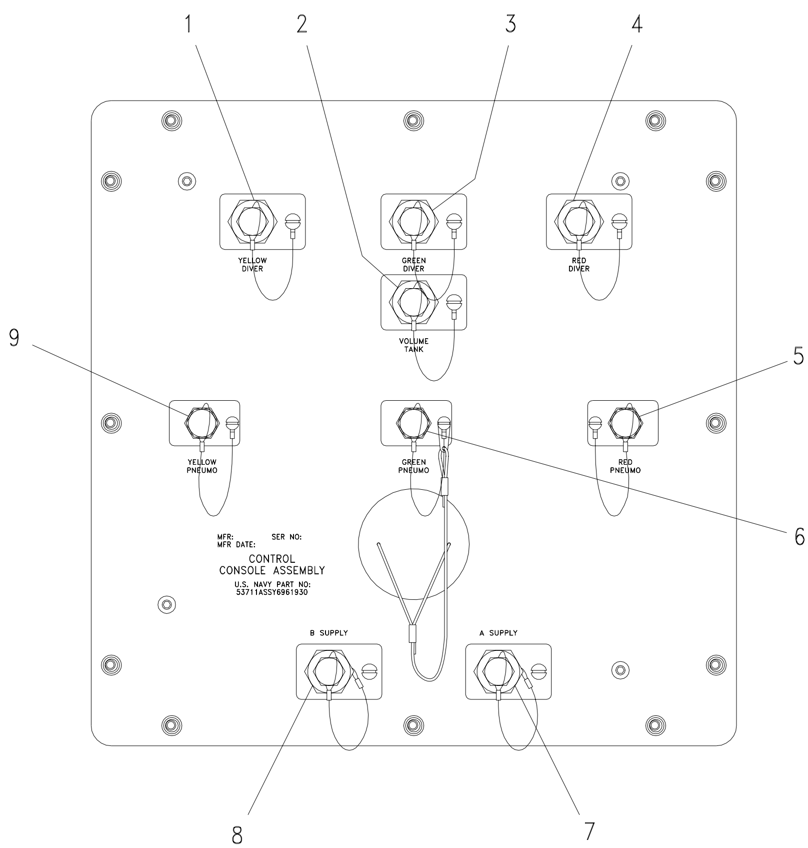


Figure 2-2. Control Console Assembly (CCA) Interface Ports

Table 2-4. Volume Tank Assembly (VTA) Control and Interface Port
(Refer to Figure 2-3)

Index No.	Panel Label	Component	Designator	Function	Normal Operating Condition
1	**CONTROL CONSOLE**	Port	N/A	Connection for LP supply hose to CCA	N/A
2	**ALP-V201**	Valve	ALP-V201	Allows condensate (moisture) to be manually drained	CLOSED

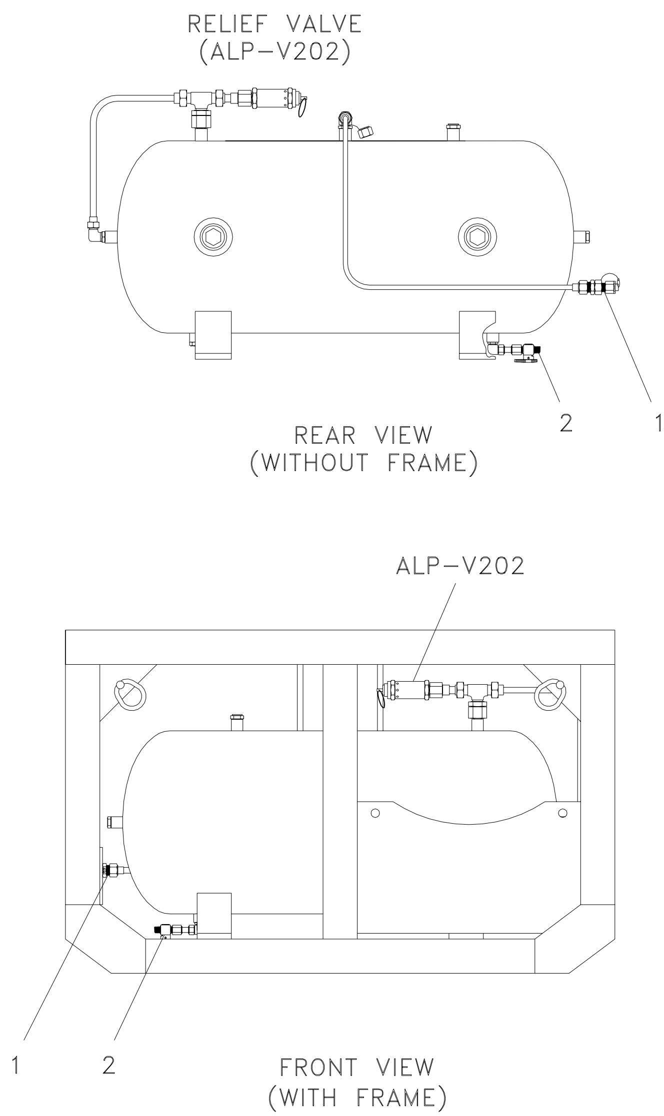


Figure 2-3. Volume Tank Assembly (VTA) Control and Interface Port

Table 2-5. Air Supply Rack Assembly (ASRA) Controls and Indicators
(Refer to Figure 2-4)

Index No.	Panel Label	Component	Designator	Function	Normal Operating Condition
1	**PRIMARY**	Tag	N/A	Identifies circuit chosen to supply primary air	Hung on **PORT A** Valve (5) or **PORT B** Valve (3)
2	**SECONDARY**	Tag	N/A	Identifies circuit chosen to supply secondary air	Hung on **PORT C** Valve (4)
3	**PORT B**	Valve	AHP-V429	Controls output flow of HP air through **PORT B**	OPEN (only if chosen for primary supply)
4	**PORT C**	Valve	AHP-V422	Controls output flow of HP air through **PORT C**	OPEN
5	**PORT A**	Valve	AHP-V443	Controls output flow of HP air through **PORT A**	OPEN (only if chosen for primary supply)
6	**BANK 2 MANIFOLD**	Valve	AHP-V421	Controls air flow from Bank 2 flasks to the manifold(s) delivering air to CCA	OPEN if Bank 2 is delivering air CLOSED if off-line
7	**GAUGE STOP** (BANK 3)	Valve	AHP-V428	Controls flow of HP air to **BANK 3** gauge (AHP-G439)	OPEN
8	**BANK 3**	Gauge	AHP-G439	Indicates pressure of air in Bank 3 flasks	VARIABLE
9	**FLASK ISOLATION** (BANK 3)	Valve	AHP-V409	Controls flow of air from corresponding flask in Bank 3 to **PORT C** valve (AHP-V422)	OPEN if flask is delivering air CLOSED if off-line
10	**FLASK ISOLATION** (BANK 3)	Valve	AHP-V408	Controls flow of air from corresponding flask in Bank 3 to **PORT C** valve (AHP-V422)	OPEN if flask is delivering air CLOSED if off-line
11	**BANK 3 CHARGE**	Valve	AHP-V425	Controls flow of charging air to Bank 3 flasks	CLOSED
12	**FLASK ISOLATION** (BANK 2)	Valve	AHP-V407	Controls flow of air from corresponding flask in Bank 2 to **BANK 2 MANIFOLD** valve (AHP-V421)	OPEN if flask is delivering air CLOSED if off-line
13	**FLASK ISOLATION** (BANK 2)	Valve	AHP-V406	Controls flow of air from corresponding flask in Bank 2 to **BANK 2 MANIFOLD** valve (AHP-V421)	OPEN if flask is delivering air CLOSED if off-line
14	**BANK 2**	Gauge	AHP-G438	Indicates pressure of air in Bank 2 flasks	VARIABLE
15	**FLASK ISOLATION** (BANK 2)	Valve	AHP-V405	Controls flow of air from corresponding flask in Bank 2 to **BANK 2 MANIFOLD** valve (AHP-V421)	OPEN if flask is delivering air CLOSED if off-line
16	**GAUGE STOP** (BANK 2)	Valve	AHP-V427	Controls flow of HP air to **BANK 2** gauge (AHP-G438)	OPEN if Bank 2 is primary

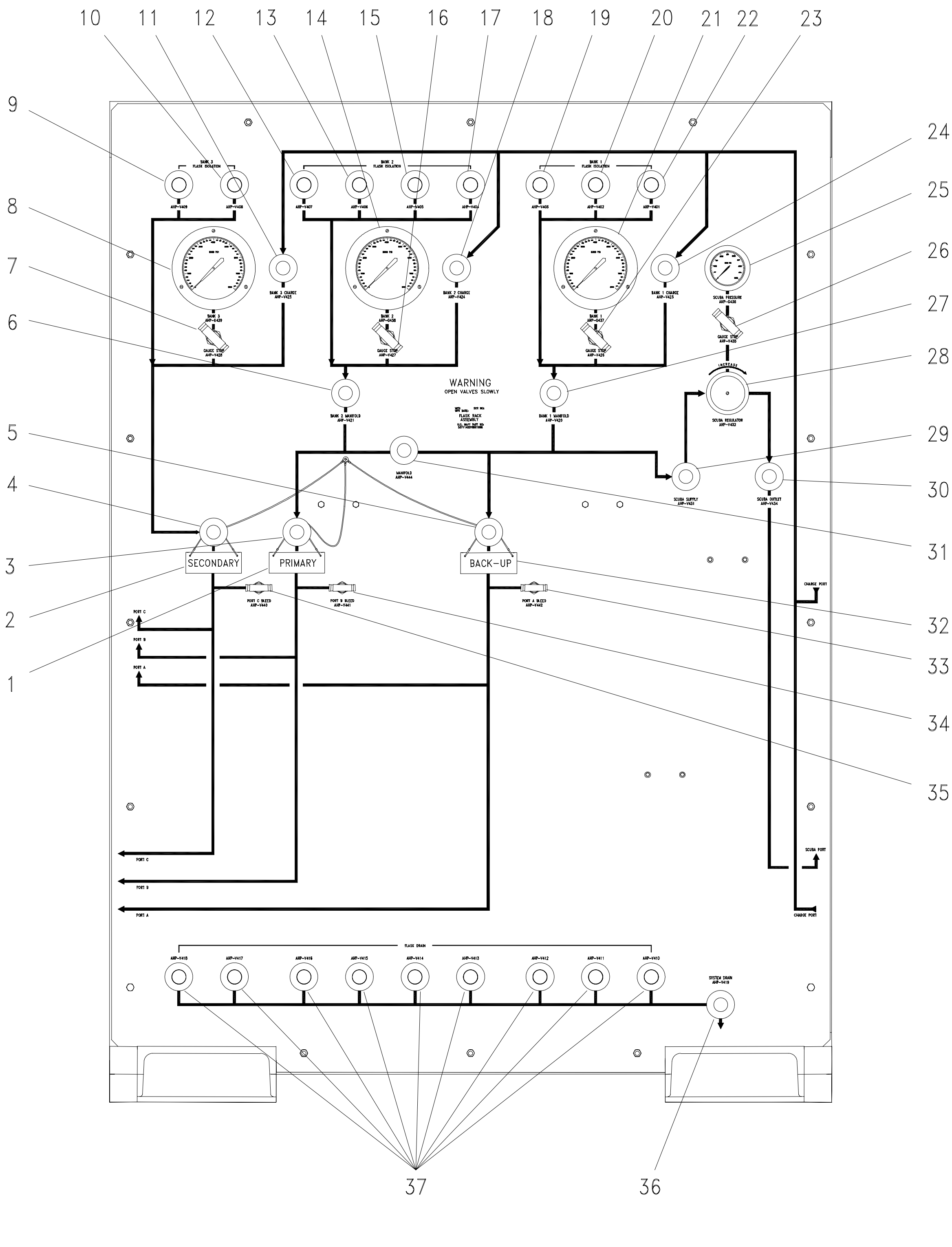


Figure 2-4. Air Supply Rack Assembly (ASRA) Controls and Indicators

Table 2-5. Air Supply Rack Assembly (ASRA) Controls and Indicators—Continued
(Refer to Figure 2-4)

Index No.	Panel Label	Component	Designator	Function	Normal Operating Condition
17	**FLASK ISOLATION** (BANK 2)	Valve	AHP-V404	Controls flow of air from corresponding flask in Bank 2 to **BANK 2 MANIFOLD** valve (AHP-V421)	OPEN if flask is delivering air CLOSED if off-line
18	**BANK 2 CHARGE**	Valve	AHP-V424	Controls flow of charging air to Bank 2 flasks	CLOSED; OPEN if charging Bank 2
19	**FLASK ISOLATION** (BANK 1)	Valve	AHP-V403	Controls flow of air from corresponding flask in Bank 1 to **BANK 1 MANIFOLD** valve (AHP-V420)	OPEN if flask is delivering air CLOSED if off-line
20	**FLASK ISOLATION** (BANK 1)	Valve	AHP-V402	Controls flow of air from corresponding flask in Bank 1 to **BANK 1 MANIFOLD** valve (AHP-V420)	OPEN if flask is delivering air CLOSED if off-line
21	**BANK 1**	Gauge	AHP-G437	Indicates pressure of air in Bank 1 flasks	VARIABLE
22	**FLASK ISOLATION** (BANK 1)	Valve	AHP-V401	Controls flow of air from corresponding flask in Bank 1 to **BANK 1 MANIFOLD** valve (AHP-V420)	OPEN if flask is delivering air CLOSED if off-line
23	**GAUGE STOP** (BANK 1)	Valve	AHP-V426	Controls flow of HP air to **BANK 1** gauge (AHP-G437)	OPEN if Bank 1 is primary
24	**BANK 1 CHARGE**	Valve	AHP-V423	Controls flow of charging air to Bank 1 flasks	CLOSED; OPEN if charging Bank 1
25	**SCUBA PRESSURE**	Gauge	AHP-G436	Indicates pressure of air flowing to **SCUBA PORT**	VARIABLE when charging SCUBA cylinders
26	**GAUGE STOP** (SCUBA)	Valve	AHP-V435	Controls flow of HP air to **SCUBA PRESSURE** gauge (AHP-G436)	CLOSED; OPEN when charging SCUBA cylinders
27	**BANK 1 MANIFOLD**	Valve	AHP-V420	Controls air flow from Bank 1 flasks to the manifold(s) delivering air to CCA	OPEN if Bank 1 is delivering air CLOSED if off-line
28	**SCUBA REGULATOR**	Valve	AHP-V432	Reduces 5,000 psi air to SCUBA charge pressure	CLOSED; VARIABLE when charging SCUBA cylinders
29	**SCUBA SUPPLY**	Valve	AHP-V431	Controls flow of HP air to **SCUBA REGULATOR** valve (AHP-V432)	CLOSED; OPEN when charging SCUBA cylinders
30	**SCUBA OUTLET**	Valve	AHP-V434	Controls flow of HP air to **SCUBA PORT**	CLOSED; OPEN when charging SCUBA cylinders

Table 2-5. Air Supply Rack Assembly (ASRA) Controls and Indicators—Continued
(Refer to Figure 2-4)

Index No.	Panel Label	Component	Designator	Function	Normal Operating Condition
31	**MANIFOLD** (BANKS 1&2)	Valve	AHP-V444	If open, allows air from both Banks 1 and 2 to flow to manifold(s) delivering air to the CCA	CLOSED
32	**BACK-UP**	Tag	N/A	Identifies circuit chosen to supply back-up air.	Hung on **PORT A** Valve (5) or **PORT B** Valve (3)
33	**PORT A BLEED**	Valve	AHP-V442	Controls depressurization of **PORT A**	CLOSED
34	**PORT B BLEED**	Valve	AHP-V441	Controls depressurization of **PORT B**	CLOSED
35	**PORT C BLEED**	Valve	AHP-V440	Controls depressurization of **PORT C**	CLOSED
36	**SYSTEM DRAIN**	Valve	AHP-V419	Back-up valve for **FLASK DRAIN** valves	CLOSED
37	**FLASK DRAIN**	Valve	AHP-V410 thru AHP-V418	Flask condensate drain valve	CLOSED

Table 2-6. Air Supply Rack Assembly (ASRA) Interface Ports
(Refer to Figure 2-5)

Index No.	Panel Label	Function
1	**PORT A – HP**	Upper/lower connections for CCA's A or B SUPPLY hoses
2	**PORT B – HP**	Upper/lower connections for CCA's A or B SUPPLY hoses
3	**PORT C – HP**	Upper/lower connections for CCA's A or B SUPPLY hoses
4	**CHARGE PORT – HP**	Lower connection point for compressor hose; used in charging flasks
5	**SCUBA PORT**	Connection point for SCUBA charge whip used to charge SCUBA cylinders or TRCS Air Supply Rack Assembly
6	**CHARGE PORT – HP**	Upper connection point for compressor hose; used in charging flasks

2.3 OPERATING AND EMERGENCY PROCEDURES

Refer to Appendices A, B, C, and D of this manual for the operating and emergency procedures that shall be used for Configurations 1, 2, 3, and 4, respectively. The procedures are presented in reproducible checklist form, along with a system illustration, a status sheet, and a flow chart showing the general sequence of operations.

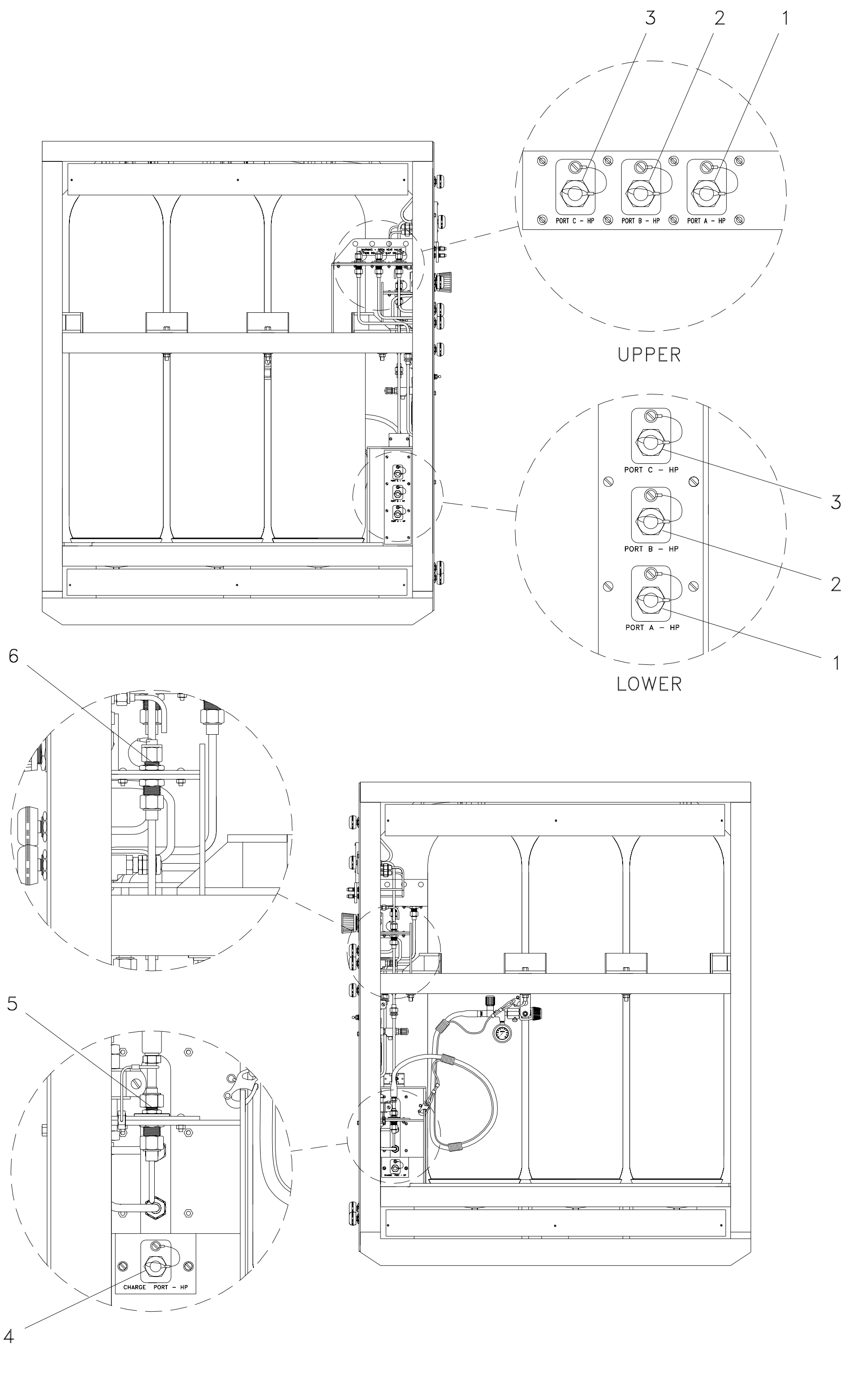


Figure 2-5. Air Supply Rack Assembly (ASRA) Interface Ports

2.4 FAILURE ANALYSIS REPORTING

In order to maintain system certification and standardize reporting, tracking, and resolving of material failures or deficiencies in the FADS III Air System, a Failure Analysis Report (FAR), NAVSEA Form 10560/4, should be submitted as soon as possible when any of the following conditions are met:

a. An equipment or component malfunction occurs
b. Unscheduled repairs are performed
c. An unscheduled adjustment is required
d. An equipment deficiency is noted
e. A defective component or spare part is detected

A copy of the FAR form is provided in Figure 2-6 with contact information provided on the reverse side of the form. An electronic version of the FAR form is also available on-line at http://www.supsalv.org.

NOTE

If the failure also meets the criteria in paragraph 2.5, the equipment shall be immediately secured and handled accordingly.

2.5 ACCIDENT/INCIDENT EQUIPMENT STATUS REPORTING

The following definition of accidents and incidents is taken from Volume 1, paragraph 5-10 of the *U.S. Navy Diving Manual,* NAVSEA SS521-AG-PRO-010:

*"An **accident** is an unexpected event that culminates in loss of or serious damage to equipment or injury to personnel. An **incident** is an unexpected event that degrades safety and increases the probability of an accident.*

The number of diving accidents/incidents involving U.S. Navy divers is small when compared to the total number of dives conducted each year. The mishaps that do occur, however, must receive a thorough review to identify the cause and determine corrective measures to prevent further diving mishaps."

Accident/incident equipment status reporting is mandatory for all diving units in each of the following cases:

a. Whenever an accident/incident results in a fatality or serious injury
b. Whenever an equipment malfunction or inadequate performance may have contributed to an accident/incident

Detailed reporting procedures are provided in Volume 1, Chapter 5 of the *U.S. Navy Diving Manual.* Personnel should be familiar with the reporting process before a mishap occurs to ensure expeditious reporting and proper care and handling of the affected equipment.

THIS PAGE INTENTIONALLY LEFT BLANK

NAVAL SEA SYSTEMS COMMAND
DIVING LIFE SUPPORT EQUIPMENT FAILURE ANALYSIS REPORT (FAR)
(Read Instructions on Reverse)

1. REPORTING ACTIVITY NAME	2. UNIT IDENTIFICATION CODE________________ FAR SERIAL NO.________________	3. DATE PROBLEM DETECTED (MO/DAY/YR) __________
4. POINT OF CONTACT NAME:________________ TELEPHONE:________________	5. CLASSIFICATION (CSS Use Only) 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐	
6. EQUIPMENT NAME	EQUIPMENT SERIAL NUMBER	
7. ITEM NAME	PART NUMBER OR NATIONAL STOCK NUMBER	

8. FAILURE

A. HOW DISCOVERED: ☐ PREDIVE ☐ OPERATING ☐ POSTDIVE ☐ PMS ☐ OTHER (Block 11)

B. TYPE: ☐ MALFUNCTION ☐ BROKEN OR DAMAGED ☐ TECH DOCUMENTATION ☐ OTHER (Block 11)

C. CAUSE: ☐ NORMAL WEAR ☐ HUMAN ERROR ☐ DESIGN FLAW ☐ PMS ☐ WRONG PARTS ☐ OTHER (Block 11)

9. SPARE PARTS PART CONTRACT NUMBER (XXXXXX-YY-X-XXXX)

☐ NOT AVAILABLE FROM STOCK ☐ IMPROPERLY PACKAGED ☐ DEFECTIVE ON RECEIPT

☐ DEFECTIVE ON TRIAL ☐ QUALITY DEFICIENCY REPORT (QDR) SUBMITTED ☐ OTHER (Block 11)

10. CORRECTION ☐ REPAIRED PARTS ☐ REPLACED PARTS ☐ OTHER (Block 11)

DATE COMPLETED: MAN HOURS: EST. COST OF PART:

11. COMMENTS (Reference Block Numbers)

NAVSEA 10560/4 (10/86) (Front) S/N 0116-LF-106-6020

Figure 2-6. Failure Analysis Report (FAR) Form (Sheet 1 of 2)

INSTRUCTIONS

Legible, handwritten copies (black ballpoint pen preferred) are acceptable. Blocks 1, 2, 3, 4, 6, and 7 must be filled in completely; all other blocks should be filled in as required. When information is not available, write NONE. When more space is required, use Block 11 and blank paper as needed; **identify each added page with the information provided in Blocks 2 and 3 and number pages** (example: "page 2 of 3").

BLOCK

2. Enter your command Unit Identification Code (UIC) and FAR Serial Number from command FAR log (sequential numbering as issued).

6. Enter the exact name of the system in which the failure was experienced (ex: Lightweight Dive System (LWDS) MK 3 Mod 0). Enter the serial number of the pertinent assembly (ex: Control Console Assembly SN 12345).

7. Enter the lowest item (may be assembly or part) in which the failure was located by name and by part number **as identified by the system technical manual** (ex: HP Regulator Assembly, PR50-6). Use MS, SAE, National Stock Number, etc., only if a system part number is not available, and describe the application in Block 11.

8. Check the appropriate box(es) as required. Note that "Technical Documentation" should be checked if the technical manual, Planned Maintenance System (PMS), Allowance Parts List (APL), or other documentation inadequately supports operation or maintenance; identify the inadequate document and page number(s) in Block 11. Block 11 must be used if "OTHER" is checked.

9. Copy contract number from spare part tag and check appropriate boxes.

11. Complete this block to further explain any items from Blocks 1 through 10 as required; identify each item by Block Number. Suggestions on failure corrections and system improvements are encouraged. Attach pages (descriptions, sketches, etc.) as required and identify each page with the information provided in Blocks 2 and 3.

DISTRIBUTION

ORIGINAL FAR TO: **COMMAND FAR LOG**

COPIES TO:

**(1) COMMANDER, NAVAL SEA SYSTEMS COMMAND
ATTN 00C33
1333 ISAAC HULL AVENUE SE STOP 1073
WASHINGTON NAVY YARD DC 20376-1073**

**(2) COMMANDING OFFICER
NAVAL SURFACE WARFARE CENTER PANAMA CITY
ATTN: CODE S13, BLDG 49
110 VERNON AVENUE
PANAMA CITY FL 32407-7001**

**(3) NAVY EXPERIMENTAL DIVING UNIT
IN-SERVICE ENGINEERING
321 BULLFINCH ROAD
PANAMA CITY FL 32407-7015**

NAVSEA 10560/4 (10/86)(Back)

Figure 2-6. Failure Analysis Report (FAR) Form (Sheet 2 of 2)

CHAPTER 3

FUNCTIONAL DESCRIPTION

3.1 INTRODUCTION

This chapter presents a detailed functional description of the major assemblies and components that comprise the Fly Away Dive System (FADS) III Air System. Information in this chapter is presented as follows:

a. Para. 3.2—General System Description ..... Page 3-1
b. Para. 3.3—Equipment Functional Descriptions ..... Page 3-1
c. Para. 3.4—Primary and Secondary Air Flow in Configuration 1 ..... Page 3-17
d. Para. 3.5—Charging Air Flow in Configuration 1 ..... Page 3-20
e. Foldouts Depicting Breathing and Charging Air Flow Paths ..... Page 3-25

3.2 GENERAL SYSTEM DESCRIPTION

The FADS III Air System is a flexible, lightweight, portable, and highly mobile diving support system that can be rapidly deployed for use in a wide range of diving scenarios from salvage to underwater ships husbandry, construction, and repair. In the Configuration 1 Stand-Alone Diving Setup, the system's main function is to provide breathing quality air to two working divers (and one standby diver) operating at a moderately heavy work rate to a maximum dive depth of 190 feet of seawater (fsw). To accomplish this function, the FADS III Air System uses some or all of the major assemblies that are listed below and illustrated in Figure 1-1:

- Air Supply Rack Assembly (ASRA)
- Control Console Assembly (CCA)
- Volume Tank Assembly (VTA) — OPTIONAL
- 5,000 pounds per square inch (psi) Compressor System
- Interconnecting Hose Assemblies

3.3 EQUIPMENT FUNCTIONAL DESCRIPTIONS

3.3.1 AIR SUPPLY RACK ASSEMBLY (ASRA). The ASRA is a portable high-pressure (HP) air storage bank system that is used to supply primary or secondary breathing air to two working divers and one standby diver in the Diving Setup. The ASRA may also be used to charge Self-Contained Underwater Breathing Apparatus (SCUBA) cylinders and the Transportable Recompression Chamber System (TRCS) Air Supply Rack Assembly. When not in use, the ASRA should be covered with the blue vinyl-nylon storage cover that is supplied with the system. The following paragraphs contain functional descriptions of the two major assemblies that comprise the ASRA—the Rack Enclosure Assembly and the Air Flask Rack Assembly (AFRA)—and their respective components. Descriptions of the hose assemblies used with the ASRA are provided separately in paragraphs 3.3.1.3 and 3.3.1.4.

3.3.1.1 Rack Enclosure Assembly. The Rack Enclosure Assembly consists of a rack enclosure weldment and two hinged door assemblies. The rack enclosure weldment is a welded metal frame that is designed to house the AFRA and provide added stability and protection to the nine composite HP air flasks that are contained in the AFRA. The two hinged door assemblies provide protection to the control panel assembly, which is part of the AFRA, and two brackets on the inside of each door are used as storage racks for the three 42-foot hose assemblies (see paragraph 3.3.1.3 for more information). The right door assembly also features a locking mechanism that helps limit access to the control panel and keeps the doors secured during transport. When authorized, the AFRA may be used without the Rack Enclosure Assembly, such as in the Standard Navy Double-Lock Recompression Chamber System (SNDLRCS) and the Underwater Ships Husbandry (UWSH) Diver Support Platform System (DSPS), or the *Drive and Dive* as it is commonly known.

3.3.1.2 Air Flask Rack Assembly (AFRA). The major components of the AFRA include the Flask Rack Weldment, the Control Panel Assembly, and the nine composite HP air flasks. Physical and functional descriptions of the major components and primary subcomponents of the AFRA are provided in the following paragraphs:

3.3.1.2.1 Flask Rack Weldment. The framework for the AFRA consists of a flask rack weldment that features a full top shield and partial upper and lower side shields to help protect the flask isolation and drain valves, flask whips, and flex shaft assemblies. The rest of the weldment is essentially open to the atmosphere except for the front, which is covered by the control panel assembly (paragraph 3.3.1.2.2). The bottom of the weldment holds a crate assembly that acts as a support structure for the nine composite HP air flasks that are vertically mounted and secured in the weldment with front, inner, and rear flask bracket assemblies and two threaded rods. The nine holes in the crate assembly allow access to the drain valves at the bottom of the flasks for interconnecting the valves. Five bulkhead connector plates, which are mounted on either side of the weldment, provide nine hose connection points. Two of the plates—one upper (horizontal) and one lower (vertical)—are located on the left side of the weldment; each plate contains three hose connection ports labeled ***PORT A-HP***, ***PORT B-HP***, and ***PORT C-HP***. This configuration allows flexibility in the placement of hoses when only one set of ports is required, such as in the Stand-Alone Diving Setup. The three bulkhead connector plates on the right side of the weldment (from top to bottom) contain an upper port for charging the flasks, a lower port that is used for SCUBA cylinder charging, and another lower port for charging the flasks. SCUBA Charge Hose Assembly (H-406) is semi-permanently attached to the SCUBA charging port upon installation and is stored with the ASRA from that point on using the yoke bracket and SCUBA block, which are also mounted on the right side of the flask rack weldment (see paragraph 3.3.1.4 for more information). If the AFRA is used without the Rack Enclosure Assembly (such as in the UWSH DSPS), the corner guards that are supplied with the system should be installed on the right and left front corners of the flask rack weldment.

3.3.1.2.2 AFRA Control Panel Assembly. The AFRA control panel assembly, which is attached to the front of the flask rack weldment, provides a central location for controlling and monitoring the various components of the AFRA. Most of the components on the panel are accessible from the front for control and monitoring purposes and from the back for maintenance purposes; however, there are some components (like the relief valves, filters, tubing, and fittings) that are only accessible from the back of the panel. Additionally, the flask isolation valves and flask drain valves are controlled from the front panel using flex shaft assemblies and control knobs that have been removed from the valve bodies, which are located on the flasks within the AFRA (see paragraph 3.3.1.2.3 for more information). Also included on the front of the control panel assembly are the ***PRIMARY, BACK-UP,*** and ***SECONDARY*** tags, which are attached to lanyards. The tags are used to identify the ports that have been selected to deliver the respective air supplies. Table 3-1 contains functional descriptions of the valves and gauges that are located on the front of the control panel assembly, with a final section containing those components located behind the panel. The components in Table 3-1 are listed as found on the face of the panel from top to bottom and left to right (with allowances made for grouping of similar components to avoid unnecessary duplication of text). Figures 3-1, 3-2, and 3-3 provide additional assistance in component location.

3.3.1.2.3 Composite HP Air Flasks. The nine composite HP air storage flasks that are supplied with the FADS III Air System are vertically mounted in the AFRA to provide storage for the compressed air used for the primary and secondary breathing air supplies. Each flask has a floodable volume of 3.15 cubic feet, thereby enabling the AFRA to store in excess of 9,000 cubic feet of breathing air at a pressure of 5,000 psi. The flasks are double ported and fitted at the top and bottom with manually operated triport shutoff valves, which are interconnected with flask whips as shown in Figure 3-3. The top shutoff valves function as flask isolation valves and the bottom valves function as flask drain valves. Two versions of the shutoff valves (one made by Circle Seal and the other by CPV) are approved for use with the FADS III Air System. Functional descriptions of the valves are presented as follows:

- Flask Isolation Valves: The valve in the top port functions as a flask isolation valve and is fitted with a pressure rupture disk designed to blow out when pressure in the flask exceeds 8,000 psi. The flask isolation valves (numbered AHP-V401 thru AHP-V409) are interconnected with flask whips in such a way that the flasks are separated into three banks (as shown in Figure 3-3), with three flasks in Bank 1 (AHP-V401, -V402, and -V403), four in Bank 2 (AHP-V404, -V405, -V406, and -V407), and two in Bank 3 (AHP-V408 and AHP-V409). Each bank is supported by its own pressure gauge and charging valve.

- Flask Drain Valves: The valve in the bottom port functions as a condensate drain valve and is fitted with a thermal fuse designed to open and relieve system pressure as the ambient temperature reaches or exceeds 217 degrees Fahrenheit (°F). Condensate drain valves ALP-V410 thru AHP-V418 are connected in series by HP hoses and tee fittings creating a common drain assembly with the final stop valve being AHP-V419. Because the drain valves share a common drain assembly, it is possible to cascade air from flask to flask or bank to bank if opened at the same time. Normal operation is to open the common drain stop valve (AHP-V419) and then open the individual flask drain valves one at a time to drain the condensate.

- Valve Control: The nine flask isolation valves and nine flask drain valves are remotely controlled using control knobs that have been removed from the valve bodies. The control knobs are located on the control panel assembly and are connected to the corresponding valve bodies using flex shaft assemblies and adapters. The flex shaft assemblies used in the AFRA come in three lengths: 17 inches, 32.375 inches, and

48.25 inches, with the length depending on the distance of the valve from its corresponding control knob. The assemblies are fitted to the valve bodies using 18 identical flex shaft adapters. When a control knob is turned, a mechanism in the flex shaft assembly transmits the rotation to the valve body and opens or closes the valve as required.

Table 3-1. AFRA Control Panel Assembly Components and Functions
(Refer to Figures 3-1, 3-2, and 3-3 for component location)

Component	Designation	Function
Bank 3 Flask Isolation Valves Bank 2 Flask Isolation Valves Bank 1 Flask Isolation Valves	AHP-V409, -V408 AHP-V407, -V406, -V405, -V404 AHP-V403, -V402, -V401	Remotely control air flow from the respective shutoff valves located on top of the nine HP air flasks that are allocated into three banks; control is accomplished via flex shaft assemblies (paragraph 3.3.1.2.3)
Bank 3 Gauge Bank 2 Gauge Bank 1 Gauge	AHP-G439 AHP-G438 AHP-G437	Indicate the pressure of air in the respective banks; 0-8,000 psi
Bank 3 Charge Valve Bank 2 Charge Valve Bank 1 Charge Valve	AHP-V425 AHP-V424 AHP-V423	Control the flow of charging air to the flasks located in the corresponding bank
SCUBA Pressure Gauge	AHP-G436	Indicates pressure of charging air to SCUBA charging port when charging SCUBA cylinders or TRCS flask racks; 0-5,000 psi range
Gauge Stop Valves	AHP-V428, -V427, -V426, -V435	Isolate Bank 3, Bank 2, Bank 1, and SCUBA pressure gauges, respectively
Bank 2 Manifold Valve Bank 1 Manifold Valve	AHP-V421 AHP-V420	Control flow of air from respective banks to manifold(s) delivering air to CCA
SCUBA Regulator Valve	AHP-V432	Reduces 5,000 psi air to pressure required for charging SCUBA cylinders
Manifold Valve	AHP-V444	If open, allows air from both Banks 1 and 2 to flow to manifold(s) delivering air to CCA
SCUBA Supply Valve	AHP-V431	Controls flow of HP air to SCUBA regulator
SCUBA Outlet Valve	AHP-V434	Controls flow of HP air to SCUBA charging port
Port C Valve Port B Valve Port A Valve	AHP-V422 AHP-V429 AHP-V443	Control outflow of air through the respective ports to the CCA

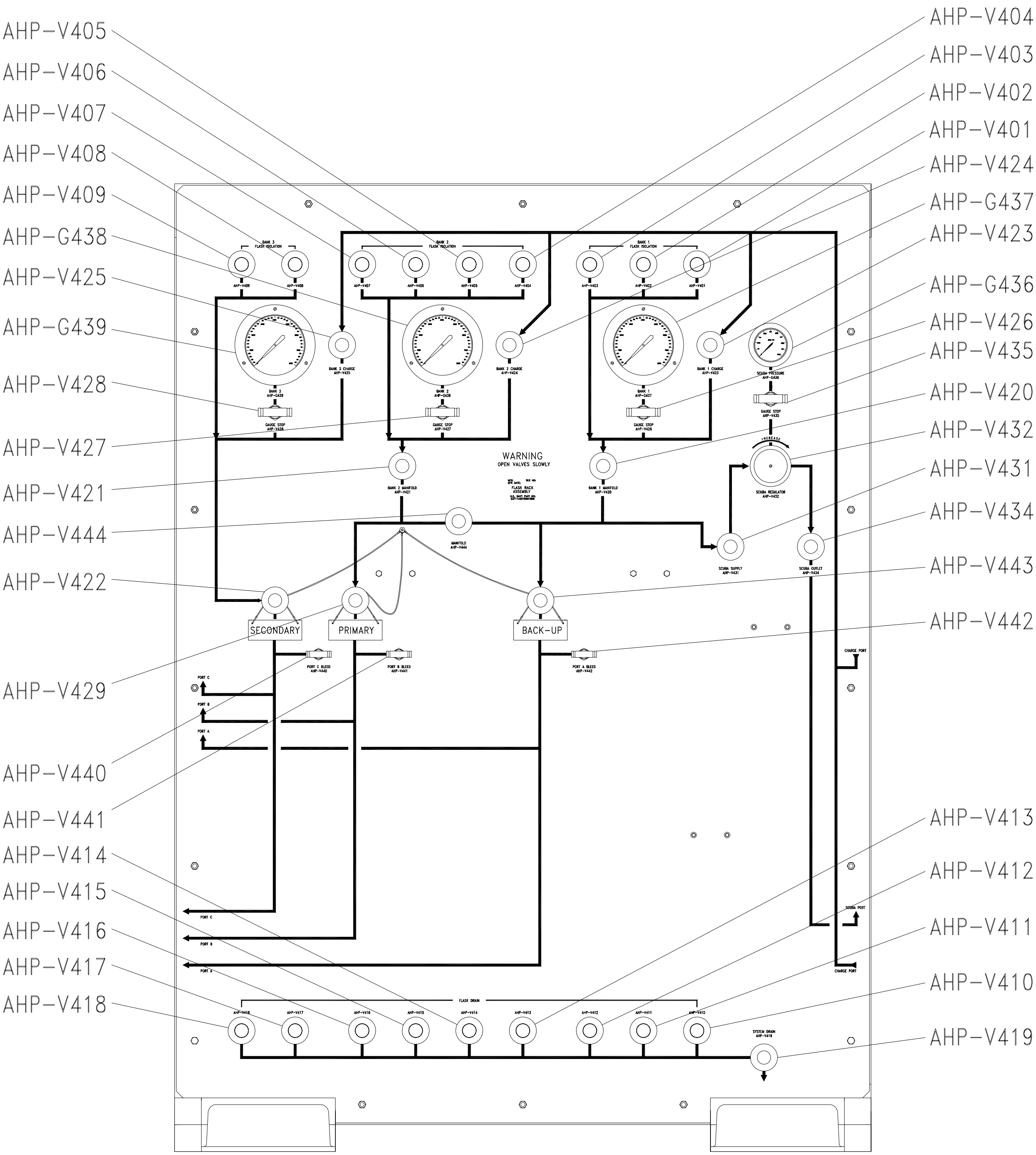


Figure 3-1. AFRA Control Panel Assembly, Front View

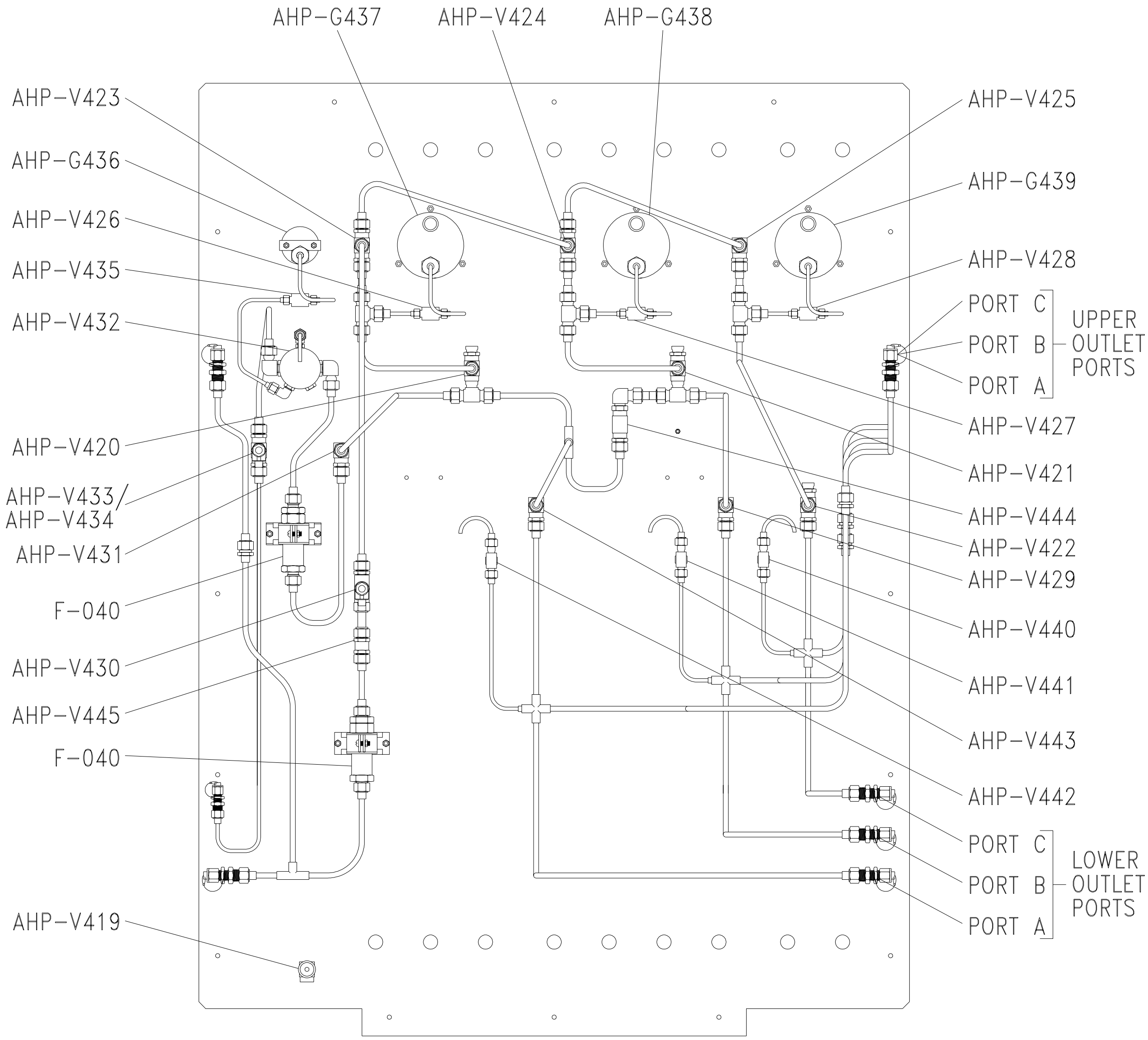


Figure 3-2. AFRA Control Panel Assembly, Rear View

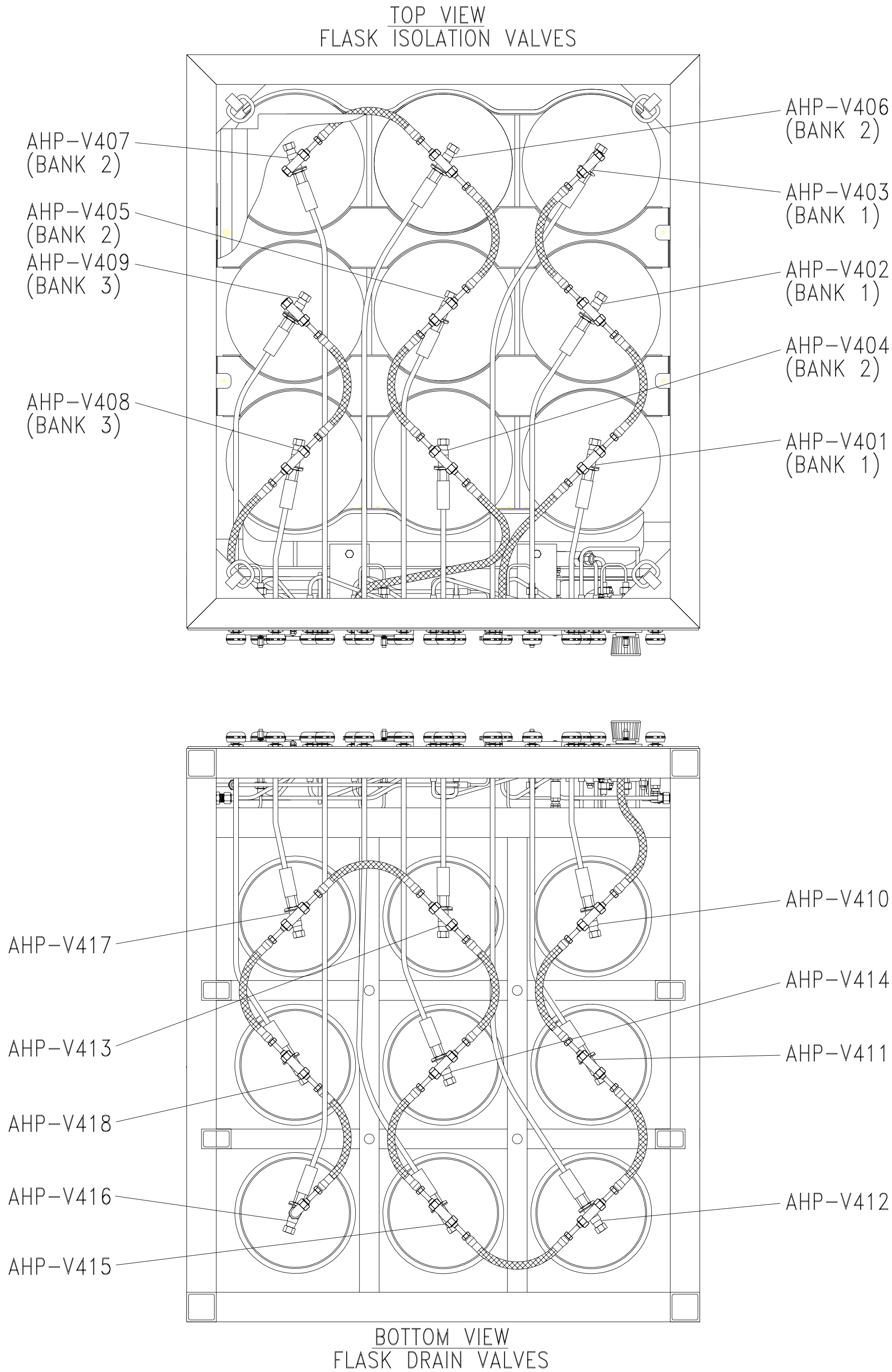


Figure 3-3. AFRA Flask Connections, Top and Bottom Views

Table 3-1. AFRA Control Panel Assembly Components and Functions—Continued
(Refer to Figures 3-1, 3-2, and 3-3 for component location)

Component	Designation	Function
Port C Bleed Valve Port B Bleed Valve Port A Bleed Valve	AHP-V440 AHP-V441 AHP-V442	Control depressurization of the respective ports to allow for hose attachment or removal
Flask Drain Valves	AHP-V418, -V417, -V416, -V415 AHP-V414, -V413, -V412, -V411 AHP-V410	Remotely control draining of condensate from the respective shutoff valves located at the bottom of the nine HP air flasks; control is accomplished using flex shaft assemblies (paragraph 3.3.1.2.3)
System Drain Valve	AHP-V419	Must be opened prior to opening individual flask drain valves
PRIMARY SUBCOMPONENTS LOCATED BEHIND CONTROL PANEL		
Check Valve	AHP-V445	Located between in-line filter (F-040) and relief valve (AHP-V430); prevents incoming charging air from flowing back to compressor
In-line Filters	F-040, F-040	One filters contaminants from air coming into AFRA from compressor and the other filters contaminants from air going to SCUBA cylinders
Relief Valve (charge port)	AHP-V430	Set to automatically relieve If pressure of charging air from compressor reaches 5,500 psi
Relief Valve (SCUBA port)	AHP-V433	Set to automatically relieve if pressure of charging air going to SCUBA port reaches 3,300 psi

3.3.1.3 **<u>HP Air Hose Assemblies</u>.** Three 42-foot long HP air hose assemblies (designated H-436) are provided with the ASRA and are normally stored on racks inside the ASRA doors; the hose assemblies are identical to each other and totally interchangeable in the applications described in this section. Two of the hose assemblies provide primary and secondary air interfaces between the ASRA HP ports and the CCA. The third assembly is provided as a charging interface between the HP compressor discharge and the ASRA HP charging inlet. Each assembly contains a stainless steel wire strength member with snap shackles at each end that allow the strength member to be attached to the two assemblies where the hose connections are made; this prevents the hose from whipping around uncontrollably and causing injury should the hose be cut or should separation between the hose and an end fitting occur.

3.3.1.4 <u>SCUBA Charge Hose Assembly</u>. The SCUBA Charge Hose Assembly (designated as H-406) is used alone when charging SCUBA cylinders or is used in conjunction with HP air hose assembly (H-444) when charging the TRCS Air Supply Rack Assembly. H-406 is initially supplied separately but becomes a semi-permanent part of the ASRA when connected to the ***SCUBA PORT*** on the right side of the ASRA. For storage purposes, a dummy SCUBA valve attachment point is provided on the ASRA frame allowing the yoke of the SCUBA hose to be attached. The hose assembly, which is approximately 6 feet in length, has a stainless steel wire rope lashed to the hose to restrain the assembly should the hose be cut or should separation between the hose and end fitting occur. Snap shackles are affixed to the ends of the wire rope to provide a means of attaching the strain relief to the ASRA and to the valve of the SCUBA cylinder being charged. SCUBA Charge Hose Assembly (H-406) features a line valve that controls the flow of air through the hose assembly and a 5,000 psi gauge that indicates the pressure of the air flowing through the hose to the SCUBA cylinder or hose assembly (H-444). The hose assembly also features a bleeder valve that is used to bleed down the pressure in the hose before disconnecting the hose.

3.3.2 <u>CONTROL CONSOLE ASSEMBLY (CCA)</u>. The CCA, which is the flow control and pressure reduction station for the FADS III Air System, is built into a rugged case assembly capable of withstanding rigorous transportation conditions. The lid of the CCA case is removable to allow access to the various controls and indicators, and a door assembly on the back of the CCA case opens to allow access to the blow-out plug and the nine interface ports that serve as connection points for the ASRA, optional VTA, and diver air and pneumofathometer hoses. Two metal legs that are normally stowed inside the CCA case lid allow the CCA to be mounted on top of the optional VTA during equipment setup. If the VTA is not being used, the CCA should be set up and secured using the most appropriate method available that will allow access to the front and rear panel assemblies. Functional descriptions of the CCA rear panel assembly, front panel assembly, and interior components are provided in the following paragraphs:

3.3.2.1 <u>CCA Rear Panel Assembly</u>. The CCA rear panel assembly contains a blow-out plug and nine hose interface ports, which are each protected by a cap when not in use. Lanyards are attached to the panel and each of the nine port caps and the blow-out plug to prevent misplacing the caps and plug when not in use. The following list outlines the components found on the rear panel of the CCA and briefly describes their functions (components are listed as they appear in Figure 3-4 from left to right and top to bottom):

a. <u>***YELLOW DIVER, GREEN DIVER, RED DIVER*** ports</u>: Serve as the attachment points for the diver air hoses providing breathing air to the yellow diver, green diver, and red diver, respectively. The diver air hoses are included in the umbilicals going to each diver and deliver breathing quality air on demand to the masks or helmets worn by the divers.

b. <u>***VOLUME TANK*** port</u>: Serves as the attachment point for low-pressure (LP) air hose assembly (H-203), which interfaces the CCA with the optional VTA; if the VTA is not used, the port remains capped. If the VTA is used, air flows in and out of the ***VOLUME TANK*** port and H-203 as needed.

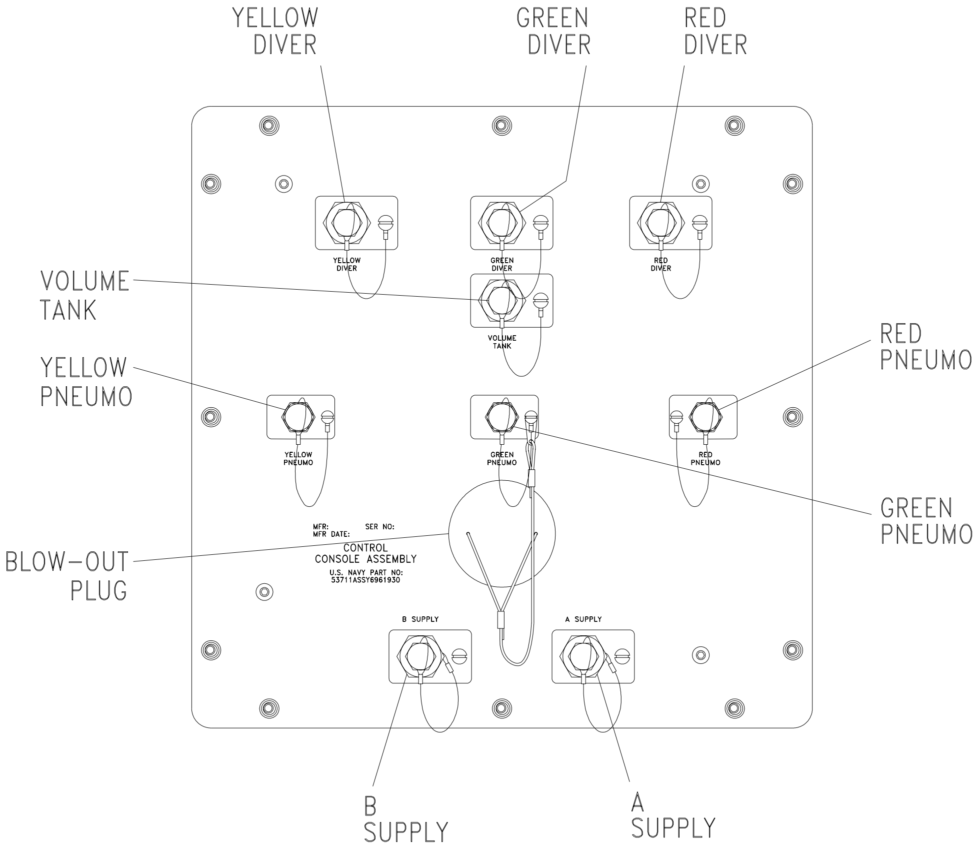


Figure 3-4. Control Console Assembly (CCA) Interface Ports and Blow-Out Plug

c. ***YELLOW PNEUMO***, ***GREEN PNEUMO***, ***RED PNEUMO*** ports: Serve as the connection points for the pneumofathometer hoses that are attached to harnesses worn by the yellow diver, green diver, and red diver, respectively.

d. Blow-out plug: This plug must be removed before pressurizing the CCA to prevent overpressurization of the control console box in the event one or both relief valves were to lift. The plug should be installed before stowing the CCA to help prevent contamination of the interior components.

e. ***B SUPPLY, A SUPPLY*** ports: These two ports can be used interchangeably as the hose connection points for the two HP air hose assemblies (H-436) that provide primary and secondary breathing air from the ASRA. During premission setup, the hose that will be considered primary H-436 will be connected to the ASRA port that was chosen to supply primary air (***PORT A*** or ***PORT B***) and will also be connected to the CCA port (***A SUPPLY*** or ***B SUPPLY***) that has been chosen to supply primary air. Secondary H-436 will be connected to ASRA ***PORT C*** and to the remaining CCA port.

3.3.2.2 CCA Front Panel Assembly. The CCA front panel assembly contains three depth gauges, four pressure gauges, the controls for 17 valves, and two tags as shown in Figure 3-5. The panel itself is etched with colored lines that point out the path the active air supply takes while inside the CCA. The control knobs for the valves are accessible from the front of the panel as shown in Figure 3-5, but the actual valve bodies are located behind the panel as illustrated in Figure 3-6. The following list outlines the components indicated on the front panel of the CCA and briefly describes their functions (components are listed as they appear in Figure 3-5 from top to bottom with similar components grouped to avoid repetition):

a. ***RED DIVER, GREEN DIVER, YELLOW DIVER*** depth gauges: Designated as ALP-G322, ALP-G321, and ALP-G320, respectively, these three gauges indicate the depth of the respective divers when the corresponding ***PNEUMO*** valves are operated (see item c). Air is supplied to the ***PNEUMO*** valves and depth gauges from the supply manifold located inside the CCA. The depth gauges indicate depths up to 350 fsw in increments of 2 fsw.

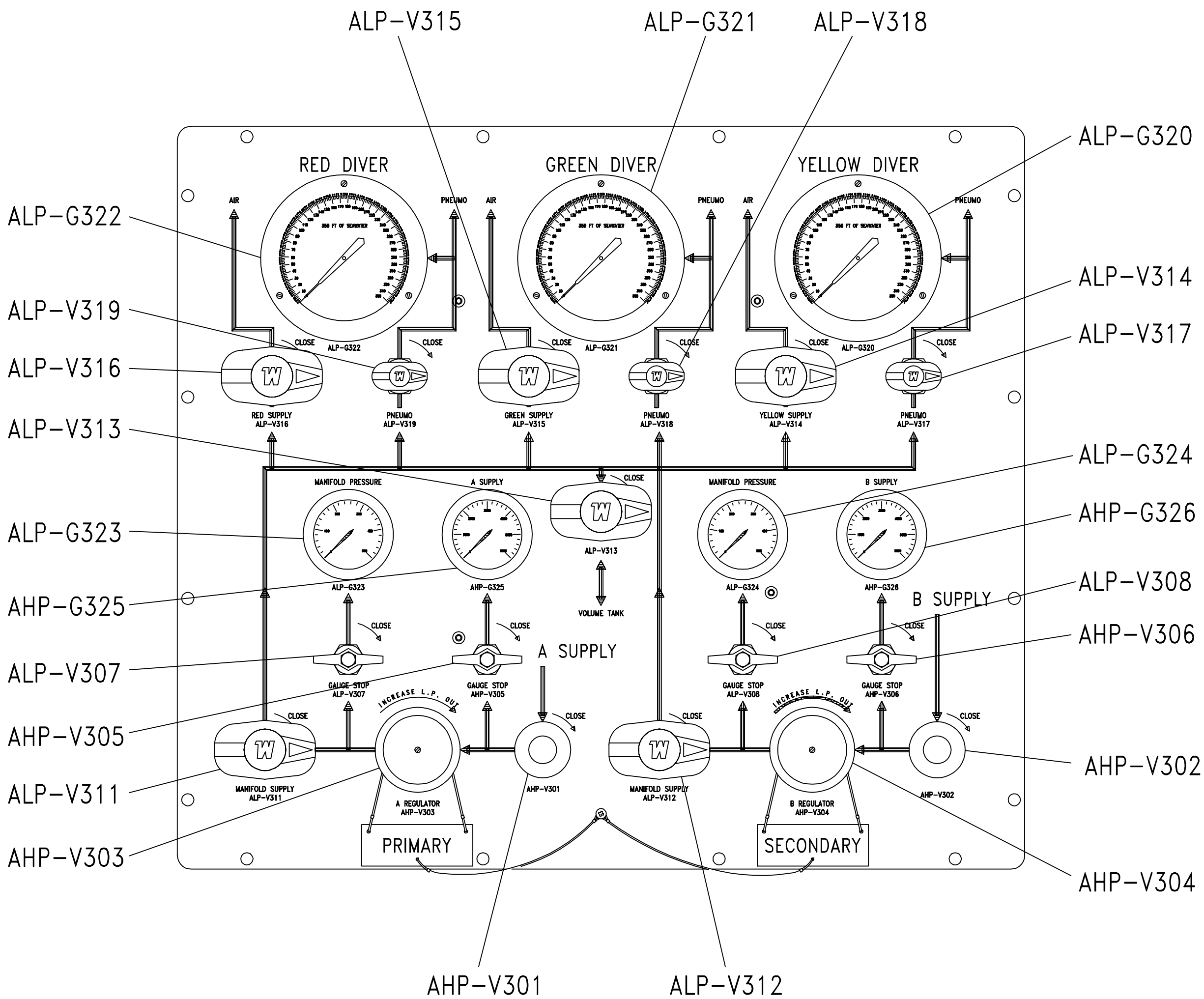


Figure 3-5. CCA Front Panel Assembly, Front View

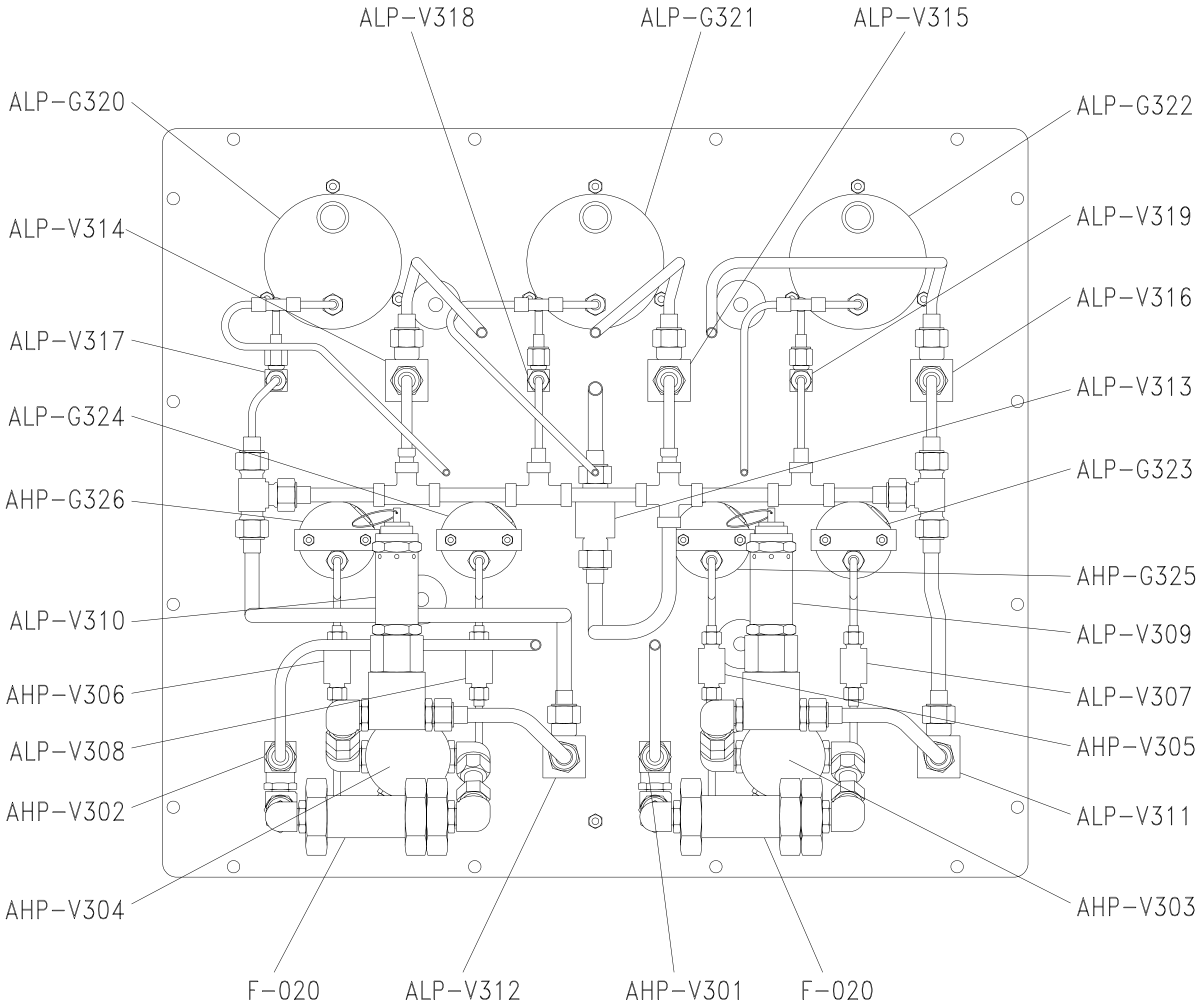


Figure 3-6. CCA Front Panel Assembly, Rear View

b. ***RED SUPPLY, GREEN SUPPLY, YELLOW SUPPLY*** valves: Designated as ALP-V316, ALP-V315, and ALP-V314, respectively, these three valves control the flow of breathing air to the respective divers. Air is supplied to the valves from the supply manifold located inside the CCA and is delivered to the divers on demand.

c. ***PNEUMO*** valves: The three ***PNEUMO*** valves (ALP-V319, ALP-V318, and ALP-V317) control the flow of air to the pneumofathometer hoses attached to each diver's harness. The resistance of the water pressure against the air in the hose registers on the corresponding depth gauge to show the diver's depth. Air is supplied to the ***PNEUMO*** valves and depth gauges from the supply manifold located inside the CCA.

d. ***MANIFOLD PRESSURE*** gauges: The 0-500 psi ***MANIFOLD PRESSURE*** gauges (ALP-G323 and ALP-G324) indicate the pressure of the air leaving the regulator and entering the supply manifold from the ***A SUPPLY*** or ***B SUPPLY*** side, respectively.

e. ***A SUPPLY, B SUPPLY*** gauges: The 0-6,000 psi supply gauges (AHP-G325 and AHP-G326) indicate the pressure of the air entering the regulator on the ***A SUPPLY*** or ***B SUPPLY*** side, respectively.

f. ***VOLUME TANK*** valve: Designated as ALP-V313, this ball valve must be open for air to flow freely between the supply manifold and the VTA. The valve will remain closed if the Diving Supervisor chooses not to use the VTA.

g. ***GAUGE STOP*** valves: When open, the ***GAUGE STOP*** valves allow air to flow to the corresponding pressure gauges (see previous items d and e) where the pressure of the air going into and leaving the regulator can be measured. When closed, the valves allow in-place calibration of the gauges.

(1) ALP-V307 controls the flow of air entering ***MANIFOLD PRESSURE*** gauge (ALP-G323) on the LP side of ***A REGULATOR*** (AHP-V303).

(2) AHP-V305 controls the flow of air entering ***A SUPPLY*** gauge (AHP-G325) on the HP side of ***A REGULATOR*** (AHP-V303).

(3) ALP-V308 controls the flow of air entering ***MANIFOLD PRESSURE*** gauge (ALP-G324) on the LP side of ***B REGULATOR*** (AHP-V304).

(4) AHP-V306 controls the flow of air entering ***B SUPPLY*** gauge (AHP-G326) on the HP side of ***B REGULATOR*** (AHP-V304).

h. ***MANIFOLD SUPPLY*** valves: These angled ball valves (designated as ALP-V311 for the A Supply side and ALP-V312 for the B Supply side) are opened only for the side that is currently active. If the A Supply side is designated to supply primary air, ALP-V311 is opened and ALP-V312 remains closed until secondary air is required, at which time ALP-V311 will be closed and ALP-V312 will be opened. If the B Supply side is designated to supply primary air, all actions will be reversed.

i. ***A REGULATOR, B REGULATOR*** valves: Regulator valves AHP-V303 and AHP-V304 regulate the A and B air supplies in the CCA and have a range of 40-400 psi but must be adjusted to the pressure determined by the Diving Supervisor, with the maximum working pressure being 275 psi. If the pressure exceeds 300 psi, a relief valve downstream of the regulator will vent the extra pressure. ***A REGULATOR*** valve (AHP-V303) controls the pressure for the A Supply, and ***B REGULATOR*** valve (AHP-V304) controls the pressure for the B Supply. A 0-6,000 psi gauge (AHP-G325 or AHP-G326) reads the supply pressure entering the regulator, and a 0-500 psi gauge (ALP-G323 or ALP-G324) reads the pressure that has been reduced by the regulator before it enters the supply manifold. Clockwise rotation of the regulator control knob increases the air pressure passing through the regulator, while counterclockwise rotation decreases the air pressure. The ***PRIMARY*** and ***SECONDARY*** tags (see next item) are hung on the appropriate regulator control knobs during the premission setup procedures.

j. ***PRIMARY, SECONDARY*** tags: These black plastic tags are permanently attached via lanyards to the CCA front panel assembly. One tag is etched in white letters with the word ***PRIMARY*** and the other with the word ***SECONDARY***. The tags are hung on the appropriate regulator control knobs as reminders of which air supply is primary and which is secondary. The tags should never be switched after operations have begun.

k. ***A SUPPLY, B SUPPLY*** valves: These angled shutoff valves (AHP-V301 and AHP-V302) control the flow of air into the CCA from the supply ports on the rear panel assembly. The two valves are never open at the same time as one services the primary air supply and the other the secondary air supply. AHP-V301 controls the flow of air for the A Supply and AHP-V302 controls the flow of air for the B Supply.

3.3.2.3 CCA Interior Components. The interior of the CCA contains the valve bodies of those components described in paragraph 3.3.2.2, along with the in-line filters, relief valves, and supply manifold described below. The components are interconnected with each other and the interface ports using tubing and fittings as shown in Figure 3-6.

a. In-line Filters: There are two 10 micron in-line filters (both designated F-020) located inside the CCA; one is on the A Supply side and the other is on the B Supply side. High-pressure air from the ASRA must enter the A Supply or B Supply port and pass through the corresponding supply valve (AHP-V301 or AHP-V302) and an in-line filter before reaching the corresponding regulator (AHP-V303 or AHP-V304). The in-line filters remove particulates larger than 10 microns from the air.

b. Relief Valves: Two LP relief valves (ALP-V309 and ALP-V310) are located inside the CCA. One valve is situated between ***A REGULATOR*** (AHP-V303) and ***MANIFOLD SUPPLY*** valve (ALP-V311), and the other is situated between ***B REGULATOR*** (AHP-V304) and ***MANIFOLD SUPPLY*** valve (ALP-V312). The relief valves prevent overpressurization by venting pressure in excess of 300 psi on the LP side.

c. Supply Manifold: This manifold distributes breathing air to the diver supply valves, the pneumofathometer valves and gauges, and the ***VOLUME TANK*** valve. The diver supply valves remain open while the divers are on-line to ensure an uninterrupted supply of air, and the ***VOLUME TANK*** valve also remains open but only if the volume tank is used. The pneumofathometer valves are briefly cracked open only when diver depth data is required. Air to the supply manifold is controlled by the ***MANIFOLD SUPPLY*** valve that services whichever air supply is currently being used (either ALP-V311 or ALP-V312).

3.3.3 VOLUME TANK ASSEMBLY (VTA). In the past when LP compressors were used as the only air source for diver air supply systems, the VTA served two vital purposes—one was to cool the air coming from the compressor and the other was to keep the air stored at an equalized pressure as the compressor tended to cycle on and off due to the diver’s air demand. However, now that the air is being stored and supplied by the composite HP air flasks in the ASRA, those problems are no longer an issue and the VTA is considered optional equipment to be used at the Diving Supervisor’s discretion. Figure 3-7 and the paragraphs that follow illustrate and describe the major components of the VTA.

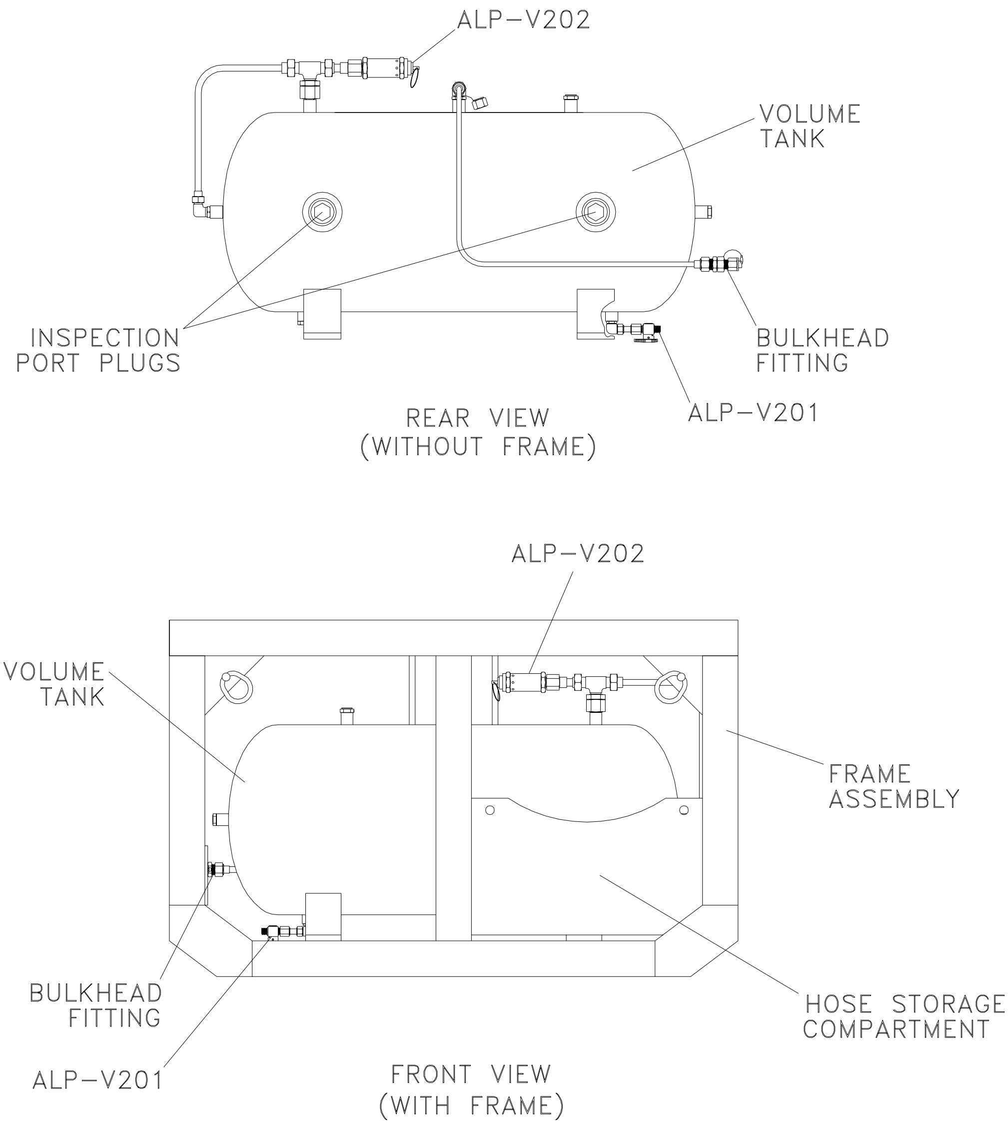


Figure 3-7. Volume Tank Assembly (VTA)

a. Frame Assembly: The frame assembly is a durable aluminum structure that provides moderate protection to the volume tank, valves, and piping. The frame assembly also serves as a stable base for mounting the CCA and contains an open storage compartment for stowing LP air hose assembly (H-203), which is used to connect the CCA to the VTA. The frame assembly is not used in the UWSH DSPS (*Drive and Dive*).

b. LP Air Hose Assembly (H-203): The requirements for this LP hose assembly include having a working pressure of 275 pounds per square inch gauge (psig) and passing hydrostatic testing at 550 psig for five minutes without leakage or permanent deformation. The hose is approximately 6 feet in length and has a 1/2-inch diameter. A stainless steel wire rope assembly is lashed to the hose and attached to the CCA and VTA connection points to restrain the assembly should the hose be cut or should the end fitting separate from the hose. The hose assembly is stowed in the VTA's storage compartment when not in use.

c. Volume Tank: The 30-gallon volume tank stores a volume of air at the same pressure setting as the CCA manifold; for example, at a 275 psi manifold pressure, the VTA contains approximately 80 cubic feet of air. The volume tank is fitted with nine ports that are plugged if unused or are fitted with one of the following components:

(1) Condensate Drain Valve (ALP-V201): As moisture from incoming air condenses in the volume tank through natural cooling, it collects at the bottom of the tank and is removed through the manually operated condensate drain valve (ALP-V201), which is located beneath the volume tank. ALP-V201 is a plug valve that connects to the volume tank using an elbow and a close coupling.

(2) Relief Valve (ALP-V202): Air from the volume tank exits through two ports to reach ALP-V202, which is located above the volume tank and is set to relieve at 300 psi in order to maintain the same pressure setting as the CCA manifold and prevent overpressurization of the volume tank. ALP-V202 connects to the two volume tank ports using tubing and an elbow, tee, and various other fittings.

(3) Bulkhead Fitting: The bulkhead fitting provides a connection point for LP air hose assembly (H-203), which connects the VTA to the CCA. The bulkhead fitting is connected to the volume tank using tubing, an elbow, and various other fittings.

(4) Inspection Port Plugs: Two inspection ports are provided in the rear wall of the volume tank. The inspection port plugs should only be removed when maintenance procedures call for inspection of the interior of the volume tank.

d. Storage Cover: A blue storage cover made of vinyl-nylon is provided with the VTA to provide protection during storage and shipping, and to guard against prolonged periods of exposure during deployment.

3.3.4 5,000 PSI COMPRESSOR SYSTEM. No specific functional description is provided in this manual for the 5,000 psi Compressor System since four compressor systems have been approved for use with the FADS III Air System and not every Command will use the same compressor system. Instead, the documentation that is supplied with each system should be used to familiarize the operator with the equipment. The four compressor systems that have been approved for use with the FADS III Air System are the Bauer electric and diesel engine-driven compressors and the Mako electric and diesel engine-driven compressors shown in Table 1-3. Although a diesel engine-driven compressor system is normally used to support the FADS III Air System charging requirements, the electric motor-driven compressors may be more appropriate for special applications. All configurations are complete, self-contained with drying and purification systems, and mounted on a heavy-duty aluminum frame that is designed to minimize vibration. A blue storage cover made of vinyl-nylon is provided with the compressor system to provide protection during storage and shipping, and to guard against prolonged periods of exposure during deployment.

3.4 PRIMARY AND SECONDARY AIR FLOW IN CONFIGURATION 1

As stated earlier, the FADS III Air System's main function in Configuration 1 is to provide breathing quality air to U.S. Navy diving personnel who are in an underwater environment. The air that is supplied during normal operations is designated as the primary air supply, and the air that is supplied when failure of the primary air supply occurs is designated as the secondary air supply. Both primary and secondary air is supplied from the nine composite HP air flasks located in the ASRA. The flasks are divided into three banks using interconnecting hose assemblies. Bank 1 contains three flasks, Bank 2 contains four flasks, and Bank 3 (which is always reserved for the secondary air supply) contains two flasks. In the Configuration 1 Stand-Alone Diving Setup, Banks 1 and 2 can be selected together to serve as the primary air supply or they can be selected separately with one serving as the primary supply and the other serving as the back-up supply. The following shows the different selections that can be made:

a.	Bank 1 (PRIMARY)	Bank 2 (BACK-UP)	Bank 3 (SECONDARY)
b.	Bank 1 (BACK-UP)	Bank 2 (PRIMARY)	Bank 3 (SECONDARY)
c.	Bank 1 (PRIMARY)	Bank 2 (PRIMARY)	Bank 3 (SECONDARY)

If Banks 1 and 2 are selected together, ***MANIFOLD*** valve (AHP-V444) must be open to allow air from both banks to flow to the selected port. ***MANIFOLD*** valve (AHP-V444) must also be open if using Bank 2 to supply air to Port A, or if using Bank 1 to supply air to Port B. Paragraphs 3.4.1, 3.4.2, and 3.4.3 present a typical scenario of equipment settings that can be used in Configuration 1 and trace the primary and secondary air paths, respectively.

3.4.1 SCENARIO FOR CONFIGURATION 1 STAND-ALONE DIVING SETUP. This paragraph presents a typical scenario for the FADS III Air System in Configuration 1. (See Figures FO-1 and FO-2 for component location. Note that all foldouts for Chapter 3 are located at the end of the chapter.)

a. ASRA - Primary Supply Selections: Bank 1 has been selected to supply primary air, the lower set of ports has been selected for hose connections, and ***PORT A*** and ***PORT A*** valve (AHP-V443) have been chosen for the primary supply.

b. ASRA - Back-Up Bank Selection: Bank 2 has been chosen to supply back-up air through ***PORT A***. In the event that back-up air is required, ***BANK 1 MANIFOLD*** valve (AHP-V420) would be shut and ***BANK 2 MANIFOLD*** valve (AHP-V421) would be opened, allowing back-up air to flow through ***MANIFOLD*** valve (AHP-V444) to ***PORT A***.

c. ASRA - Secondary Supply Selections: Bank 3, ***PORT C*** (both upper and lower sets of ports), and ***PORT C*** valve (AHP-V422) are always reserved for the secondary supply. In this scenario, the lower ***PORT C*** has been chosen for the secondary supply.

d. <u>CCA - Primary Supply Selections</u>: ***A REGULATOR*** (AHP-V303) and ***A SUPPLY*** port have been chosen as primary.

e. <u>CCA - Secondary Supply Selections</u>: ***B REGULATOR*** (AHP-V304) and ***B SUPPLY*** port have been chosen as secondary.

f. <u>VTA</u>: The Diving Supervisor has opted to use the VTA.

g. Hose connections have been made as follows:
   - Primary H-436 from ASRA's lower ***PORT A*** to CCA's ***A SUPPLY*** port
   - Secondary H-436 from ASRA's lower ***PORT C*** to CCA's ***B SUPPLY*** port
   - H-203 from VTA to CCA
   - Umbilical hoses from CCA to divers

3.4.2 <u>PRIMARY AIR FLOW FOR CONFIGURATION 1 STAND-ALONE DIVING SETUP</u>. The following steps describe the flow of primary breathing air in Configuration 1 from source to end user, and Figure FO-1 illustrates the flow of air.

a. High-pressure air flows from the three flasks in Bank 1 through ***FLASK ISOLATION*** valves (AHP-V401, -V402, -V403) and interconnecting hose assemblies to ***BANK 1 MANIFOLD*** valve (AHP-V420).

b. The HP air from AHP-V420 then flows through ***PORT A*** valve (AHP-V443) to lower ***PORT A***, where it enters primary air hose assembly (H-436).

NOTE

If back-up air is required, HP air flows from the four flasks in Bank 2 through ***FLASK ISOLATION*** valves (AHP-V404, -V405, -V406, -V407) and their interconnecting hose assemblies to ***BANK 2 MANIFOLD*** valve (AHP-V421), and then through ***MANIFOLD*** valve (AHP-V444) and ***PORT A*** valve (AHP-V443) to ***PORT A*** and primary hose assembly (H-436).

c. Air flows through H-436 to the rear panel of the CCA, enters the ***A SUPPLY*** port, and flows through ***A SUPPLY*** valve (AHP-V301) and in-line filter (F-020) to ***A REGULATOR*** valve (AHP-V303) where it is regulated to a lower pressure determined by the Diving Supervisor. The pressure of air entering AHP-V303 is measured by ***A SUPPLY*** gauge (AHP-G325), which may be isolated using ***GAUGE STOP*** valve (AHP-V305).

d. The LP air leaving AHP-V303 flows to ***MANIFOLD SUPPLY*** valve (ALP-V311). The pressure of the air is measured by ***MANIFOLD PRESSURE*** gauge (ALP-G323), which may be isolated using ***GAUGE STOP*** valve (ALP-V307). Relief valve (ALP-V309) protects the ***A SUPPLY*** manifold from overpressurization and is set to relieve pressure at 300 psig.

e. The LP air from ALP-V311 flows to a manifold for use by the ***RED SUPPLY, GREEN SUPPLY,*** and ***YELLOW SUPPLY*** valves (ALP-V316, -V315, -V314), the three ***PNEU-***

MO valves (ALP-V319, -V318, -V317), and ***VOLUME TANK*** valve (ALP-V313). The air is then distributed as follows:

(1) Air from the supply valves is delivered to the divers' Underwater Breathing Apparatuses (UBAs) through their respective umbilical assemblies.

(2) Air is used by the pneumofathometer valves and hoses to check the depth of the divers. The depth of each diver is indicated on the corresponding ***RED DIVER***, ***GREEN DIVER***, or ***YELLOW DIVER*** depth gauge (ALP-G322, -G321, or -G320, respectively).

(3) With ALP-V313 open, air is sent via LP hose assembly (H-203) to the VTA, where it is stored and maintained at a constant pressure until needed; a relief valve on the VTA (ALP-V202) protects the volume tank from overpressurization and is set to relieve pressure at 300 psig. Returning air flows through the same LP hose assembly (H-203) and is delivered to the divers through the supply valves or is available for use by the pneumofathometer valves and hoses.

3.4.3 <u>SECONDARY AIR FLOW FOR CONFIGURATION 1 STAND-ALONE DIVING SETUP</u>. The secondary air flow for the Stand-Alone Diving Setup is described below and illustrated in Figure FO-2.

a. Immediately upon notification that secondary air is required, ***MANIFOLD SUPPLY*** valve (ALP-V311) is closed and ***MANIFOLD SUPPLY*** valve (ALP-V312) is opened.

b. High-pressure air flows from the two flasks in Bank 3 through ***FLASK ISOLATION*** valves (AHP-V408, -V409) and ***PORT C*** valve (AHP-V422).

c. From AHP-V422, air flows to the lower ***PORT C***, where it enters secondary air hose assembly (H-436).

d. Air flows through H-436 to the rear panel of the CCA, enters the ***B SUPPLY*** port, and flows through ***B SUPPLY*** valve (AHP-V302) and in-line filter (F-020) to ***B REGULATOR*** valve (AHP-V304) where it is regulated to a lower pressure determined by the Diving Supervisor. The pressure of the air entering AHP-V304 is measured by ***B SUPPLY*** gauge (AHP-G326), which may be isolated using ***GAUGE STOP*** valve (AHP-V306).

e. The pressure of the air leaving ***B REGULATOR*** (AHP-V304) is measured by ***MANIFOLD PRESSURE*** gauge (ALP-G324), which may be isolated using ***GAUGE STOP*** valve (ALP-V308). Relief valve (ALP-V310) protects the ***B SUPPLY*** manifold from overpressurization and is set to relieve pressure at 300 psig.

f. The LP air leaving ***B REGULATOR*** valve (AHP-V304) flows through ***MANIFOLD SUPPLY*** valve (ALP-V312) to a manifold for use by the ***RED SUPPLY, GREEN SUPPLY***, and ***YELLOW SUPPLY*** valves (ALP-V316, -V315, -V314), the three ***PNEUMO*** valves (ALP-V319, -V318, -V317), and ***VOLUME TANK*** valve (ALP-V313).

3.5 CHARGING AIR FLOW IN CONFIGURATION 1

There are two basic types of charging functions that can be accomplished using the components of the FADS III Air System. One involves using the 5,000 psi compressor system to charge the composite HP air flasks in the AFRA and the other involves using the composite HP air flasks in the AFRA to charge SCUBA cylinders or the TRCS Air Supply Rack Assembly. The following paragraphs discuss the air flow for both functions:

3.5.1 CHARGING COMPOSITE HP AIR FLASKS. Two charging ports (labeled ***CHARGE PORT***) are located on the right-hand side of the ASRA to provide a choice of connection points for HP air hose assembly (H-436), which is connected at the other end to the 5,000 psi compressor system when charging of the composite HP air flasks in the AFRA is required. The flow of charging air is described and illustrated in the following text and Figure FO-3:

a. After compressor start-up, air from the compressor system flows through HP air hose assembly (H-436) and enters the selected ***CHARGE PORT*** at a maximum pressure of 5,000 psi.

b. From the charging port, air flows through a 10-micron filter (F-040), check valve (AHP-V445), and relief valve (AHP-V430) prior to reaching ***BANK 1 CHARGE*** valve (AHP-V423). The filter removes particulates larger than 10 microns and helps ensure purity of the air system, and the check valve prevents the air from flowing back toward the charging port. The relief valve is set to relieve at 5,500 psi to prevent overpressurization of the flasks.

NOTE

BANK 1 CHARGE valve (AHP-V423) and ***BANK 2 CHARGE*** valve (AHP-V424) are triport valves with an input port, a common passage, and an output port. Air entering AHP-V423 passes through the common passage to AHP-V424 but cannot enter the Bank 1 circuit through the output port until AHP-V423 is opened. Similarly, air entering AHP-V424 passes through the common passage to ***BANK 3 CHARGE*** valve (AHP-V425) but cannot enter the Bank 2 circuit through the output port until AHP-V424 is opened. To charge a single bank or combination of banks, the corresponding charge valve(s) must be open.

A single bank or any combination of banks may be charged while the system is off-line by following the procedure presented in FADS III Air OP-6. However, restrictions apply when charging Bank 1, 2, or 3 with the system on-line to avoid injury or death of personnel (see FADS III Air OP-5 for more information).

c. If Bank 1 is to be charged, AHP-V423 is opened and air flows through a common passage in ***BANK 1 MANIFOLD*** valve (AHP-V420) and into the flask whips that interconnect ***FLASK ISOLATION*** valves (AHP-V401, -V402, and -V403), which are also open. The air then enters each of the open flask isolation valves and fills the flasks. The flow of charging air is stopped by closing ***BANK 1 CHARGE*** valve (AHP-V423) when ***BANK 1*** gauge (AHP-G437) indicates the desired pressure has been reached. AHP-G437 can be isolated using ***GAUGE STOP*** valve (AHP-V426).

d. If Bank 2 is to be charged, AHP-V424 is opened and air flows through a common passage in ***BANK 2 MANIFOLD*** valve (AHP-V421) and into the flask whips that interconnect ***FLASK ISOLATION*** valves (AHP-V404, -V405, -V406, and -V407), which are also open. The air then enters each of the open flask isolation valves and fills the flasks. The flow of charging air is stopped by closing ***BANK 2 CHARGE*** valve (AHP-V424) when ***BANK 2*** gauge (AHP-G438) indicates the desired pressure has been reached. AHP-G438 can be isolated using ***GAUGE STOP*** valve (AHP-V427).

e. If Bank 3 is to be charged, AHP-V425 is opened and air flows through a common passage in ***PORT C*** valve (AHP-V422) and into the flask whips that interconnect ***FLASK ISOLATION*** valves (AHP-V408 and AHP-V409), which are also open. The air then enters each of the open flask isolation valves and fills the flasks. The flow of charging air is stopped by closing ***BANK 3 CHARGE*** valve (AHP-V425) when ***BANK 3*** gauge (AHP-G439) indicates the desired pressure has been reached. AHP-G439 can be isolated using ***GAUGE STOP*** valve (AHP-V428).

3.5.2 CHARGING SCUBA CYLINDERS OR THE TRCS AIR SUPPLY RACK ASSEMBLY. Also located on the right-hand side of the ASRA is the ***SCUBA PORT***, which serves as a connection point for SCUBA Charge Hose Assembly (H-406). With this charging setup, HP air from one or more of the composite HP air flasks in Banks 1 and 2 is used to charge SCUBA cylinders or the TRCS Air Supply Rack Assembly prior to operations. If SCUBA cylinders are being charged, H-406 will be attached to a SCUBA cylinder, and if the TRCS Air Supply Rack Assembly is being charged, H-406 will be attached to HP air hose assembly (H-444). The other end of H-444 will be connected to the primary or secondary supply charge port on the TRCS Air Supply Rack Assembly, as shown in Figure 3-8. The flow of air for charging functions using H-406 is outlined as follows and as shown in Figure FO-4 (all the valves mentioned have been opened unless otherwise indicated):

a. If one or more of the Bank 1 ***FLASK ISOLATION*** valves (AHP-V401, -V402, -V403) have been opened, air flows through the interconnecting flask whips and ***BANK 1 MANIFOLD*** valve (AHP-V420) to ***SCUBA SUPPLY*** valve (AHP-V431). Air also flows through the common passage in AHP-V420 to ***GAUGE STOP*** valve (AHP-V426) and ***BANK 1*** gauge (AHP-G437), which indicates the pressure of air in Bank 1.

NOTE

Air from AHP-V420 also flows via a tee connection to ***PORT A*** valve (AHP-V443) and ***MANIFOLD*** valve (AHP-V444), both of which will not be open if no air is being supplied from Bank 2.

b. If one or more of the Bank 2 ***FLASK ISOLATION*** valves (AHP-V404, -V405, -V406, -V407) have been opened, air flows through the interconnecting flask whips and ***BANK 2 MANIFOLD*** valve (AHP-V421) to ***MANIFOLD*** valve (AHP-V444), both of which must be open for air to pass through to ***SCUBA SUPPLY*** valve (AHP-V431). Air also flows through the common passage in AHP-V421 to ***GAUGE STOP*** valve (AHP-V427) and ***BANK 2*** gauge (AHP-G438), which indicates the pressure of air in Bank 2.

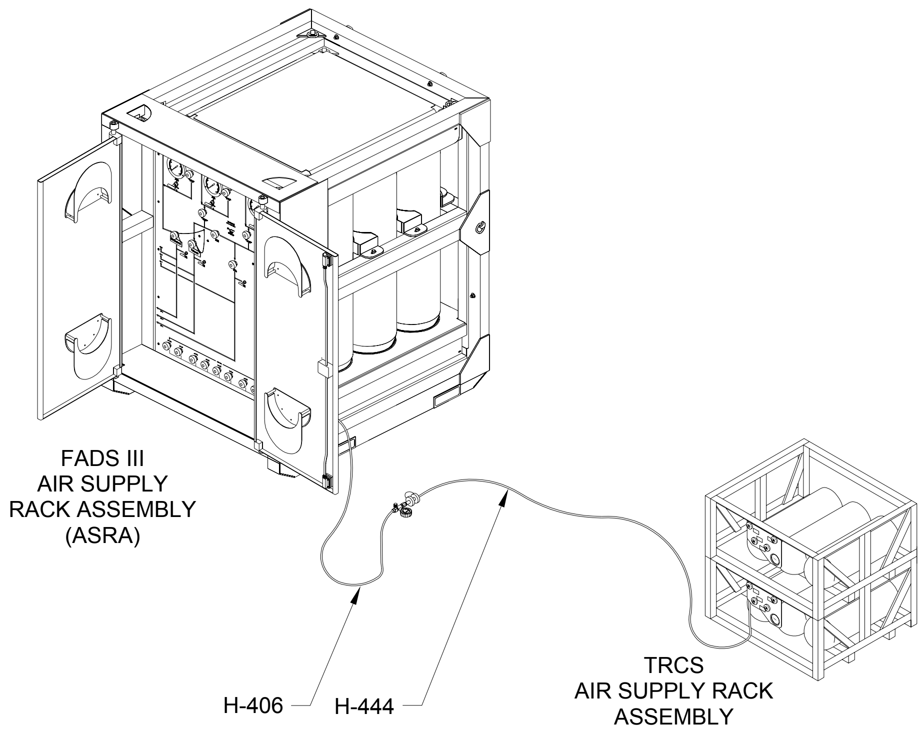


Figure 3-8. Charging the TRCS Air Supply Rack Assembly Using the FADS III ASRA

NOTE

Air from AHP-V421 also flows via a tee connection to ***PORT B*** valve (AHP-V429) but the flow of air along that path is blocked as the valve is closed.

Air from ***MANIFOLD*** valve (AHP-V444) also flows via a tee connection to ***PORT A*** valve (AHP-V443) but the flow of air along that path is blocked as the valve is closed.

c. With AHP-V431 open, HP air flows through in-line filter (F-040) and ***SCUBA REGULATOR*** (AHP-V432) to ***SCUBA OUTLET*** valve (AHP-V434), which remains closed until charging operations are ready to begin. The filter removes particulates larger than 10 microns and helps ensure purity of the air system, and the regulator lowers the pressure to meet the maximum SCUBA charge limit of 3,000 psi. The pressure of the regulated air is indicated on ***SCUBA PRESSURE*** gauge (AHP-G436), which can be isolated using ***GAUGE STOP*** valve (AHP-V435).

d. When ***SCUBA OUTLET*** valve (AHP-V434) is opened, air flows to the ***SCUBA PORT*** but is vented by relief valve (AHP-V433) should the pressure reach or exceed 3,300 psi. The relief valve is attached to a port on AHP-V434.

e. If a SCUBA cylinder is being charged, the SCUBA cylinder valve and the line valve on the yoke of SCUBA Charge Hose Assembly (H-406) should be open in accordance with the procedures in FADS III Air OP-7. This allows charging air to flow through H-406 and fill the attached SCUBA cylinder. Closing ***SCUBA OUTLET*** valve (AHP-V434) when the desired pressure is reached stops the flow of charging air.

f. If the TRCS Air Supply Rack Assembly is being charged, the primary or secondary air rack valves will be set as indicated in TRCS OP-8. When ready for charging, the line valve on the yoke of SCUBA Charge Hose Assembly (H-406) is opened and air flows through H-406 into HP air hose assembly (H-444) and the charging port on the TRCS Air Supply Rack Assembly. From there it flows through charge isolation valve (AHP-V-501), bank isolation valve (AHP-V-504), and the three flask isolation valves (AHP-V-505, -506, -507) to fill the three flasks in the bank. Air also flows from AHP-V-501 to gauge isolation valve (AHP-V-503) and bank pressure gauge (AHP-G-508), which indicates the pressure of air in the bank. Closing ASRA ***SCUBA OUTLET*** valve (AHP-V434) when the desired pressure is reached stops the flow of charging air.

THIS PAGE INTENTIONALLY LEFT BLANK

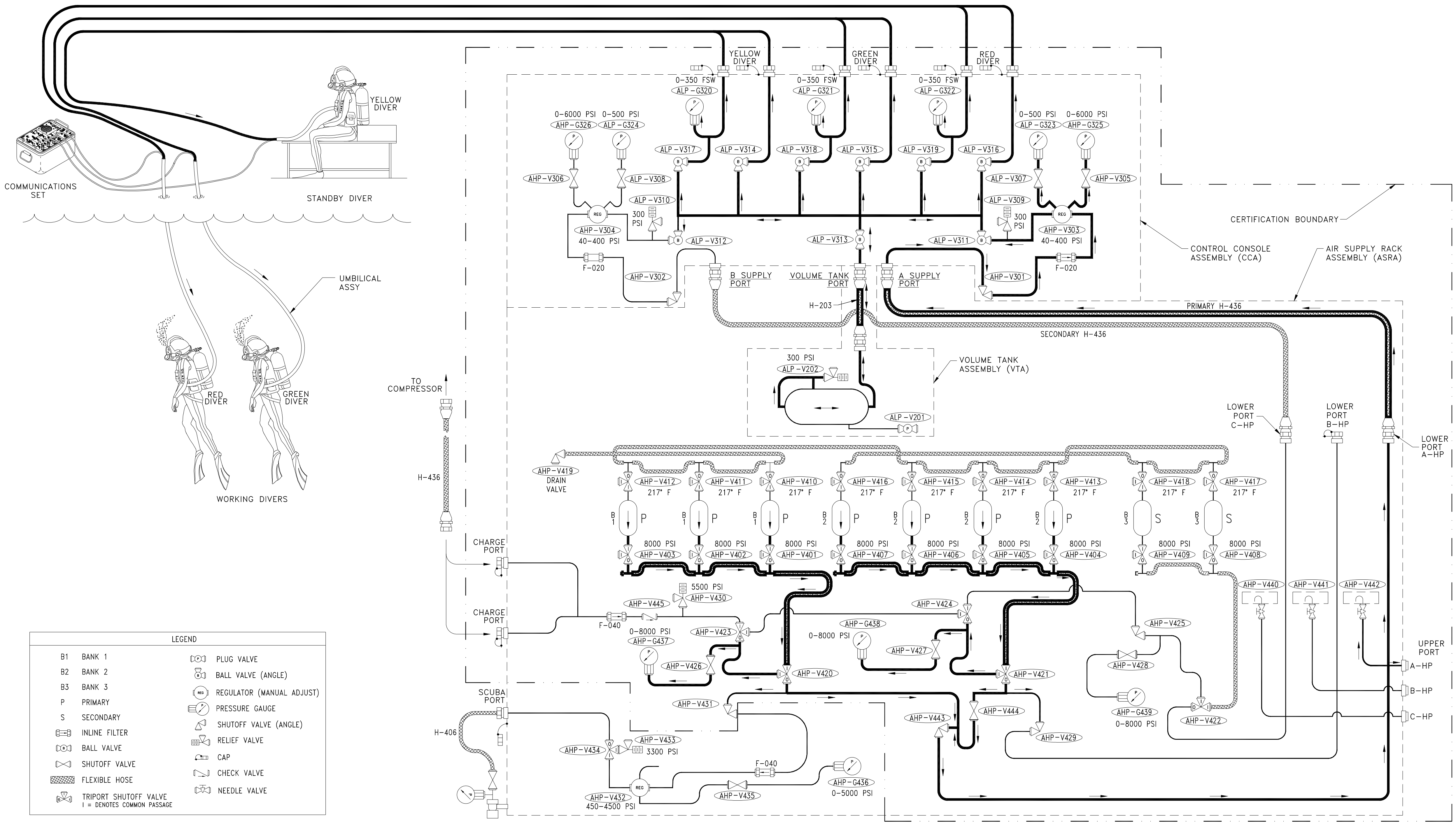


Figure FO-1. Primary Air Flow Path for Configuration 1: Diving the FADS III Air System in the Stand-Alone Diving Setup

THIS PAGE INTENTIONALLY LEFT BLANK

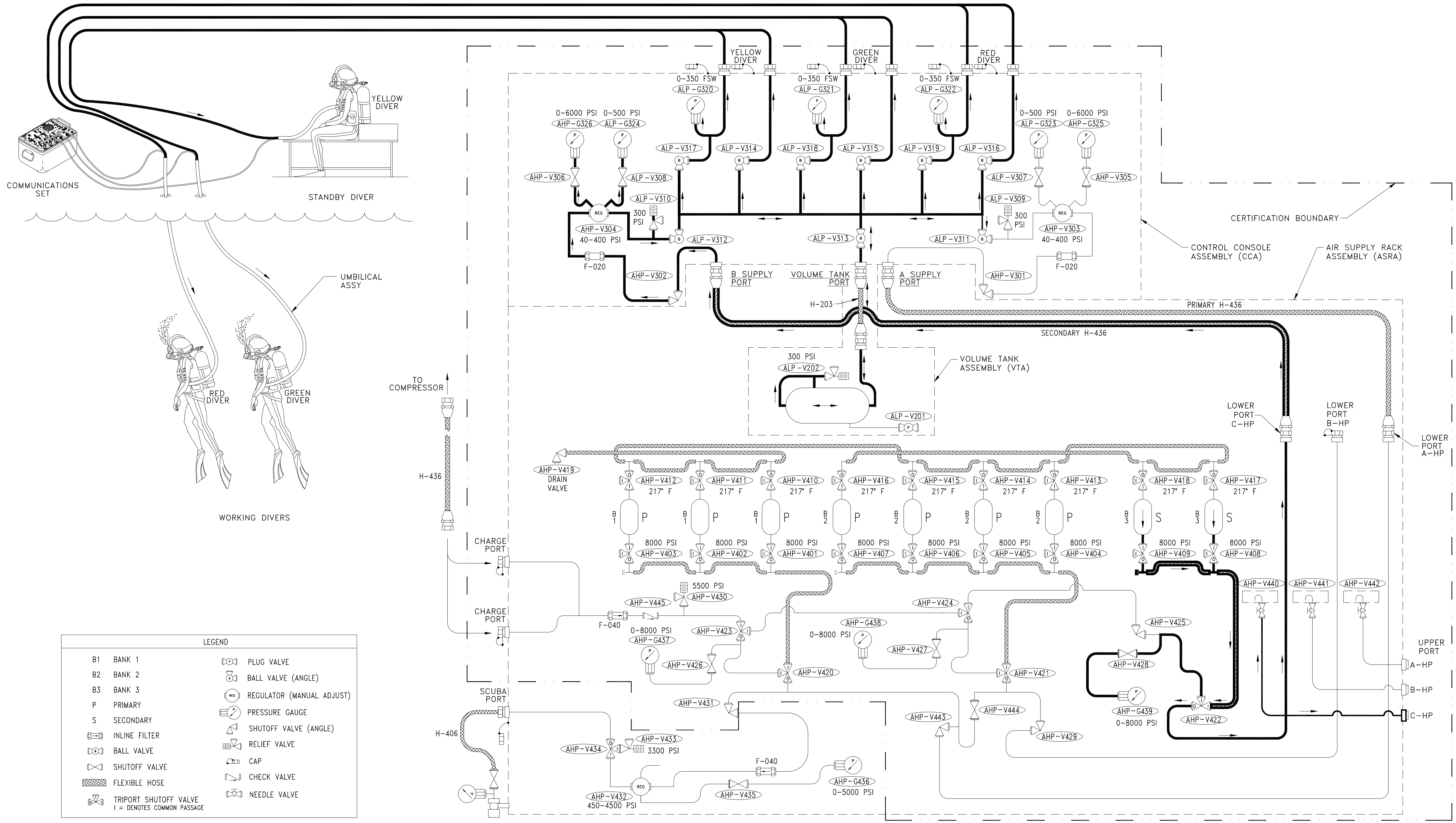
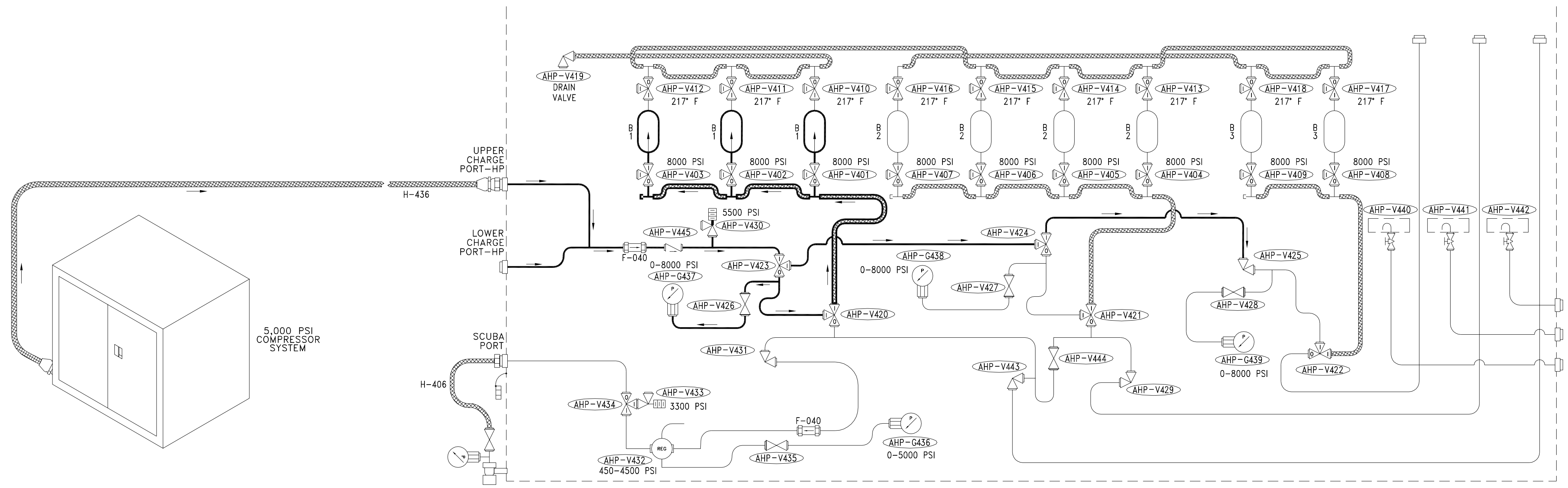
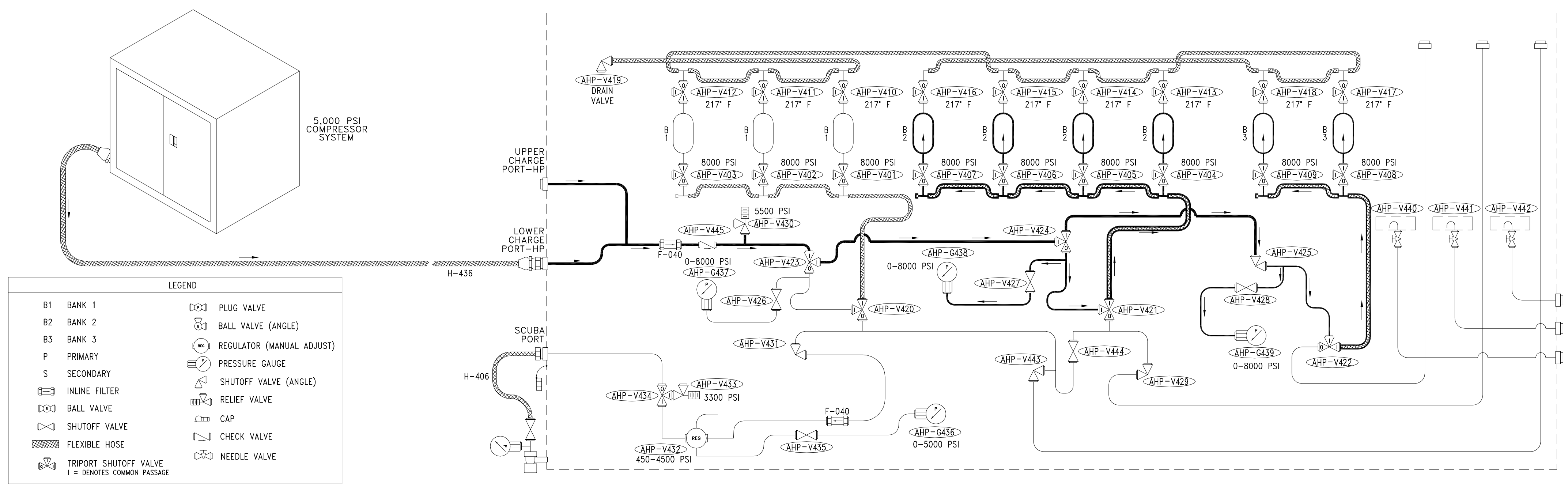


Figure FO-2. Secondary Air Flow Path for Configuration 1: Diving the FADS III Air System in the Stand-Alone Diving Setup

THIS PAGE INTENTIONALLY LEFT BLANK

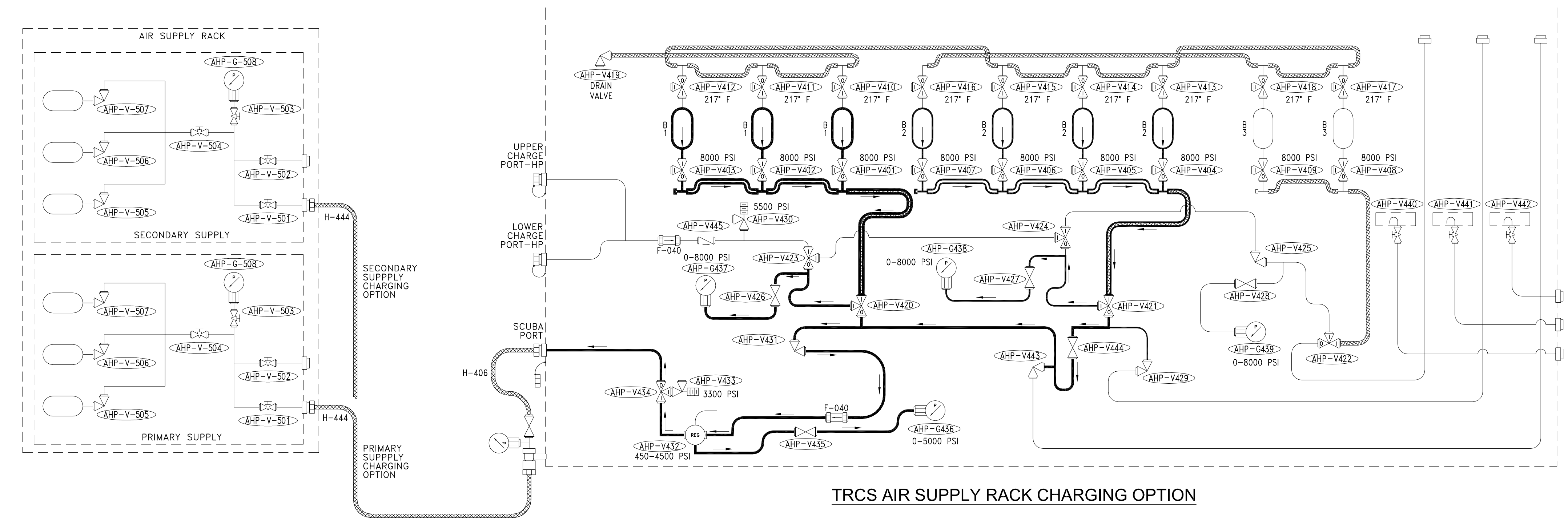


CHARGING BANK 1 FLASKS

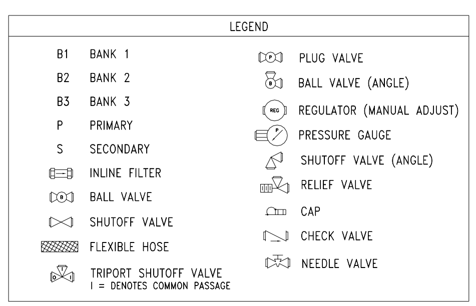


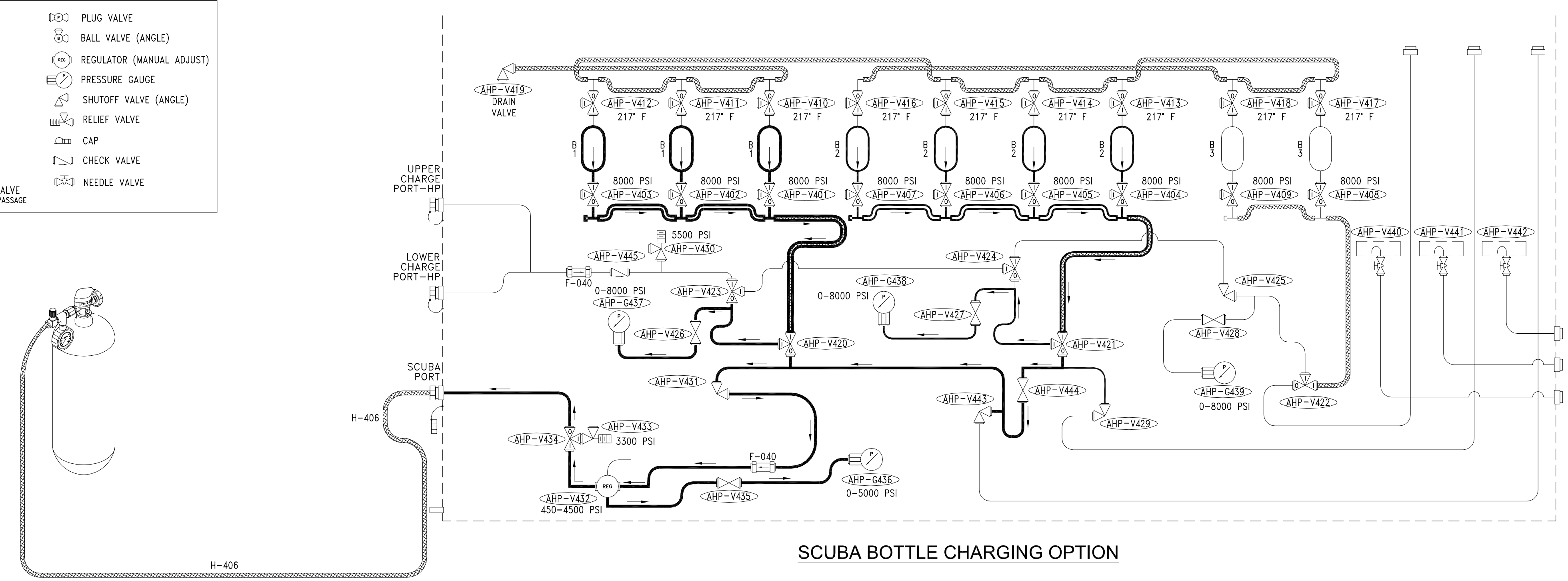
CHARGING BANK 2 AND/OR BANK 3 FLASKS

Figure FO-3. Air Flow Paths for Composite HP Air Flask Charging



TRCS AIR SUPPLY RACK CHARGING OPTION





SCUBA BOTTLE CHARGING OPTION

Figure FO-4. Air Flow Paths for SCUBA Cylinder or TRCS Air Supply Rack Assembly Charging

THIS PAGE INTENTIONALLY LEFT BLANK

CHAPTER 4

SCHEDULED MAINTENANCE

WARNING

Properly performed scheduled maintenance is essential to safe, dependable diving operations using components of the Fly Away Dive System (FADS) III Air System. Omission or negligent performance of prescribed maintenance procedures could result in equipment failure and injury or death to personnel.

4.1 INTRODUCTION

4.1.1 PURPOSE. This chapter provides diving supervisors and qualified maintenance personnel with the information necessary to efficiently plan, schedule, and document maintenance for the Fly Away Dive System (FADS) III Air System.

4.1.2 SCOPE. The information in this chapter is intended to supplement the FADS III Air System Planned Maintenance System (PMS) and assist maintenance personnel in using the PMS to safely and effectively perform scheduled maintenance on the FADS III Air System. If conflicts occur between the information in this chapter and that found in the PMS, the PMS takes precedence. Refer to paragraph 4.6 for more information on the PMS for this system.

The information in this chapter is arranged as follows:

- Para. 4.2—System Certification and Re-Entry Control (REC) .... Page 4-1
- Para. 4.3—Recordkeeping and Reporting Procedures .... Page 4-2
- Para. 4.4—General Safety Requirements .... Page 4-2
- Para. 4.5—Maintenance Concept .... Page 4-3
- Para. 4.6—Planned Maintenance System (PMS) .... Page 4-3
- Para. 4.7—General Maintenance Instructions .... Page 4-4

4.2 SYSTEM CERTIFICATION AND RE-ENTRY CONTROL (REC)

The FADS III Air System is a Naval Sea Systems Command (NAVSEA) certified diving life support system and must be maintained in accordance with certification requirements. Any maintenance involving entry into the FADS III Air System certification boundaries (shown in Figures FO-1 and FO-2 in Chapter 3 and in Joint Identification Drawing 6961894) shall be performed in accordance with the following:

> Maintenance of certified equipment requires strict adherence to the controls and procedures outlined in the *U.S. Navy Diving and Manned Hyperbaric Systems Safety Certification Manual*, NAVSEA SS521-AA-MAN-010. Scheduled maintenance or

repair actions within the system certification boundaries shall be conducted in accordance with the REC procedures located in Appendix A of NAVSEA SS521-AA-MAN-010, which can be accessed on-line at http://www.supsalv.org. The following guidelines apply when performing scheduled maintenance or repairs on components within the certification boundaries:

a. This maintenance involves certified equipment, and therefore applicable certification procedures, including re-entry control, must be followed. Re-entry control is a formal process that consists of implementing procedures and instructions that define access into a certified system, and the precautions that must be taken to maintain the system in an "as certified" condition. Whenever a pressure boundary is opened or breached, a REC form is required to verify that the work was done completely and correctly. Detailed information about REC and certification procedures, including electronic copies of REC logs and forms, may be accessed on-line at http://www.supsalv.org.

b. For the purpose of sustaining system certification, use only the renewable parts listed in the "Tools, Parts, Materials, Test Equipment" block on the Maintenance Requirement Cards (MRCs) associated with the PMS for this system (see paragraph 4.6).

4.3 RECORDKEEPING AND REPORTING PROCEDURES

The recordkeeping and reporting procedures presented in this section are to be performed in addition to the REC procedures referenced in paragraph 4.2. Information regarding PMS recordkeeping and reporting can be found in the *Ships' Maintenance Material Management (3-M) Manual*, OPNAVINST 4790.4 series, which describes the general PMS provisions that cover departmental and user unit recordkeeping as well as Maintenance Index Pages (MIPs) and MRCs. The maintenance information in this manual is intended to supplement the procedures furnished in the PMS for the FADS III Air System (see paragraph 4.6). In case of conflicts, the PMS takes precedence. Discrepancies associated with the PMS shall be reported immediately on a PMS Feedback Report, OPNAV 4790/7B. Maintenance discrepancies found in this manual shall be reported in accordance with the guidelines provided in the Foreword to this manual. Failure analysis reporting is covered in Chapter 2.

A logbook is used to record equipment use and maintenance performed on all major assemblies of the FADS III Air System. Usage and maintenance data shall be recorded in the logbook to ensure continuance of certification.

4.4 GENERAL SAFETY REQUIREMENTS

In addition to the safety precautions prescribed in this manual, maintenance shall be performed in accordance with the following instructions, as appropriate. Forces afloat must comply with the *Navy Occupational Safety and Health (NAVOSH) Program Manual for Forces Afloat*, OPNAVINST 5100.19 series. Shore activities must comply with the *Navy Occupational Safety and Health Program Manual*, OPNAVINST 5100.23 series.

4.5 MAINTENANCE CONCEPT

The FADS III Air System maintenance concept is based on the U.S. Navy PMS, which classifies maintenance into two categories—scheduled and unscheduled.

4.5.1 SCHEDULED MAINTENANCE. Scheduled maintenance includes primarily preventive or replenishment actions to ensure reliable system operation. Scheduled maintenance requirements that are part of operational procedures, such as mission equipment preparation, are also described in the Operating and Emergency Procedure Checklists in Appendix A. All scheduled maintenance (such as inspection, cleaning, lubrication, parts replacement, and calibration) shall be performed by qualified FADS III Air System personnel.

4.5.2 UNSCHEDULED MAINTENANCE. Unscheduled (corrective) maintenance includes the actions required to locate equipment faults and correct failures or performance degradations. Unscheduled maintenance (such as troubleshooting, repair, and certain replacement procedures) is normally performed by maintenance technicians trained in FADS III Air System service requirements. Unscheduled maintenance actions are included in Chapter 5, *Troubleshooting*, and Chapter 6, *Corrective Maintenance*.

4.6 PLANNED MAINTENANCE SYSTEM (PMS)

Preventive maintenance actions and performance tests are accomplished on a scheduled or situation-related basis. Maintenance procedures not performed during premission or postmission procedures are contained in the FADS III Air System PMS, which consists of Maintenance Index Pages (MIPs) and Maintenance Requirement Cards (MRCs). All scheduled maintenance for the FADS III Air System is to be conducted in accordance with the following MIPs:

- MIP 5921/181 – Fly Away Dive System (FADS) III (for Air and Mixed-Gas Systems)
- MIP 5921/036 – FADS III MAKO 5409 HP Compressor
- MIP 5921/034 – Divers Life Support System (DLSS)
- MIP 5921/101 – Divers Compressed Air
- MIP 5921/063 – Divers Compressor, Bauer / Mako
- MIP 5921/009 – ISUZU Diesel Engine Models C240PW/3KA1/3KB1/3KC1

The MIPs provide a summary of the maintenance actions found on each of the MRCs and include the periodicity codes that indicate the frequency of the required maintenance (see Table 4-1 for typical periodicity codes). All FADS III Air System MRCs are within the scope of certification and are periodically updated via regular U.S. Navy PMS channels. Premission and postmission maintenance procedures are included in the procedural checklists found in Appendix A.

NOTE

Periodicities relating to gauge calibration and air sampling are based on actual calibration and test dates. Gauge calibration must be completed by a U.S. Navy Metrology and Calibration (METCAL) facility or a METCAL-certified contractor.

Table 4-1. Typical Periodicity Codes

Code	Periodicity
CALENDAR	
M	Monthly
Q	Quarterly
S	Semiannually
A	Annually
36M	Each 36 months
72M	Each 72 months
NON-CALENDAR	
R	Situation requirement
INACTIVE EQUIPMENT MAINTENANCE	
LU	Lay-up maintenance
PM	Periodic maintenance
SU	Start-up maintenance

4.7 GENERAL MAINTENANCE INSTRUCTIONS

4.7.1 TOOLS, SUPPLIES, AND TEST EQUIPMENT. The tools, supplies, and test equipment required for each scheduled maintenance action in the PMS are listed on the individual MRCs. The tools and consumable supplies required to perform corrective maintenance on the FADS III Air System are listed in Chapter 6.

WARNING

Repair or replace worn or damaged parts immediately with authorized replacement parts. Failure of a system component during a dive may result in injury or death to the diver.

DO NOT DISASSEMBLE COMPONENTS NOR LOOSEN OR TIGHTEN FITTINGS WHILE THE SYSTEM IS UNDER PRESSURE. Prior to performing maintenance, ensure high-pressure (HP) air supply has been shut down and all pressure has been vented from the system. Exposure to escaping HP air may result in serious injury or death to personnel.

4.7.2 DISASSEMBLY AND REPLACEMENT OF PARTS. Disassemble equipment only to the level necessary to complete the scheduled maintenance action (e.g., cleaning, inspection, repair). Procedures authorized at the user unit organizational level are specified in the MRCs.

To maintain system certification, ensure all replacement parts used are approved for use with the FADS III Air System. Authorized replacement parts are listed in Chapter 7 and in the Allowance Parts Lists (APLs) for the FADS III Air System (990010167 for the Air Supply Rack Assembly and 990010179 for the Maintenance Kit). Ensure proper tag-out procedures are conducted prior to performing maintenance.

4.7.3 CLEANING BREATHING AIR SYSTEM COMPONENTS.

WARNING

Cleanliness is imperative in maintaining and handling the FADS III Air System. All tools and parts must be kept free of oil, grease, rust, or other contamination. Foreign substances within an assembly may result in equipment failure and possible injury or death to the diver.

4.7.3.1 Cleaning Standards and Procedures. Cleaning of breathing air systems shall be conducted in accordance with the following documents, which are all available on-line at http://www.supsalv.org:

- *Cleaning of Shipboard Compressed Air Systems*, MIL-STD-1622 Series
- *Diver Life Support System Cleaning*, Topside Tech Notes, Volume VI, Issue 2, March 2005
- *Cleaning Diving System Air Components with NOC*, NAVSEA-00C4-PI-002, October 1995
- *Cleaning and Gas Analysis for Diving Applications Handbook,* SS521-AK-HBK-010

Technicians shall be thoroughly familiar with each of the above documents before conducting maintenance, precleaning, and final cleaning of breathing air system components.

4.7.3.2 Cleaning Solutions. Precleaning and final cleaning of the FADS III Air System components can be accomplished using Nonionic Detergent (NID), Navy Oxygen Cleaner (NOC), or Tri-Sodium Phosphate (TSP) solutions in accordance with the standards and procedures identified in paragraph 4.7.3.1.

4.7.3.2.1 NID Solution. NID is a concentrated nonionic hydrocarbon surfactant that can be mixed with water to create a cleaning solution that is approved for use as a precleaner for breathing air systems and a final cleaner for air system O-rings, valve seats, and captured gaskets. The cleaning solution is prepared by mixing 1 teaspoon of general-purpose NID (MIL-D-16791G, Type I, NSN 7930-00-282-9699) with 1 gallon of warm fresh water. After reassembly of the components, an NID solution can be used as a leak detection solution to ensure system tightness.

CAUTION

Components cleaned with NOC or TSP shall be rinsed off immediately after pre-cleaning. Deposits resulting from the drying NOC and TSP are very difficult to remove.

4.7.3.2.2 NOC Solution. NOC, which is the preferred precleaner and final cleaner for breathing air systems, is an aqueous alkaline cleaning solution that has been approved for use for all compatible piping and components. NOC is incompatible with potted epoxy.

4.7.3.2.3 TSP Solution. TSP, which is approved as a precleaner for compatible piping and components, is a highly water-soluble ionic salt that must be used at temperatures between 160 and 180 ºF. TSP is incompatible with aluminum, copper, and potted epoxy.

4.7.4 TEFLON® TAPE. During disassembly of taped fittings, use care to keep parts clean and avoid introducing contaminants, foreign matter, or tape particles into lines or valves. When applying Teflon® tape to male fittings, use two turns of the tape and leave three threads free to allow engagement when mating parts.

4.7.5 LUBRICANTS. Use only those lubricants authorized by the MRCs or by the *Naval Ships' Technical Manual, Chapter 262, Lubricating Oils, Greases, Specialty Lubricants, and Lubrication Systems*, S9086-H7-STM-010/CH-262, Section 8, which covers lubricants for diving systems. Apply lubricants sparingly to avoid clogging or the accumulation of foreign substances.

4.7.6 O-RINGS AND PACKINGS. If possible, visually inspect existing O-rings and packings to avoid unnecessary disassembly that might result in damage or undue wear. Unless otherwise directed, cut and discard used O-rings. Damaged O-rings should always be cut and discarded. When a maintenance procedure requires that an O-ring be removed and permits its re-use, comply with the removal, inspection, cleaning, lubrication, and installation procedures presented below. Installation of new O-rings is covered in paragraph 4.7.6.5.

CAUTION

Do not use metal screwdrivers or metal picks to remove O-rings. To avoid damage to the O-ring groove, remove O-rings using fingers only whenever possible.

4.7.6.1 Removal. The recommended method for removing O-rings is to use your fingers. However, when an O-ring is seated so tightly in its groove that it cannot be removed in this manner, the use of a nonmetallic O-ring removal tool is recommended. This method prevents scratching the O-ring groove, which may cause leakage or premature seal failure.

4.7.6.2 Inspection. Inspect all O-rings for deformities or compression set, hardening or brittleness, nicks or cuts, pits or blisters, or any other sign of damage. Cut and discard damaged O-rings.

4.7.6.3 Cleaning. Ensure O-rings are cleaned to the latest revision of MIL-STD-1622 or with NID solution prepared in accordance with paragraph 4.7.3.2.1.

4.7.6.4 Lubrication. Lightly lubricate O-rings to prevent extrusion of lubricant into the system where it can trap particulates and plug small ports, thereby blocking air flow.

WARNING

Ensure O-rings are in good condition before installation. Failure of an O-ring in any component may result in equipment damage, mission abort, or diver injury or death.

4.7.6.5 Installation. Comply with the following procedure to ensure proper installation of new O-rings (or reinstallation of previously used O-rings if re-use is permitted).

a. Ensure that O-rings are of proper size and material and have been lightly lubricated.

b. Do not overstretch O-rings during assembly. Stretch O-rings only as much as necessary for installation. Diameter stretch during installation should not exceed 5 percent as overstretching may damage O-ring.

c. Ensure O-ring is not twisted in its groove. Twisting occurs easily during installation of large O-rings with a relatively small cross-sectional diameter.

d. Do not force O-ring over corners, threads, keyways, slots, splines, ports, or other sharp edges. Use thimbles, supports, cones, or similar devices to prevent O-ring from coming in contact with sharp edges.

e. Ensure O-ring is not pinched at groove corners while closing or assembling components sealed by O-rings.

f. When assembling components, avoid any rotating or twisting movements that may bunch, cut, or tear O-ring material.

THIS PAGE INTENTIONALLY LEFT BLANK

CHAPTER 5

TROUBLESHOOTING

5.1 INTRODUCTION

This chapter provides troubleshooting procedures for locating and correcting equipment faults that may cause a malfunction of the Fly Away Dive System (FADS) III Air System during diving operations. The troubleshooting procedures are intended primarily for use at the work site or in the diving unit's shop or dive locker.

NOTE

> This manual, written for user organizational-level maintenance, cannot possibly list all malfunctions that may occur, nor all tests, inspections, and corrective actions that may be needed. If a specific malfunction is not listed or cannot be corrected by the listed maintenance actions, notify the immediate supervisor.

5.2 TROUBLESHOOTING ANALYSIS

Troubleshooting involves a step-by-step fault isolation process. Ordinarily an equipment fault is indicated by an observed symptom or malfunction, and the objective is to locate the cause and take corrective action. Since the most common, easily corrected causes of the fault are normally investigated first, a fault directory can assist in this process. The fault isolation index in Table 5-1 provides a listing of the major assemblies of the FADS III Air System and their corresponding fault directories in Tables 5-2 thru 5-5, with references to related top-level maintenance procedures in Chapter 6 of this manual. Each fault directory lists possible symptoms, probable causes, suggested remedies, and specific references to associated maintenance procedures to correct the malfunction.

Maintenance remedies listed as Depot/Intermediate Maintenance Activity (IMA) indicate a repair condition that may be beyond the unit's repair capability. Maintenance repairs beyond the capability of the unit should be accomplished by a qualified IMA, manufacturer, or distributor. A list of equipment manufacturers and suppliers for the FADS III Air System is provided in Table 7-2.

Table 5-1. Fault Isolation Index

Major Assembly	Fault Directory (Chapter 5)	Test/Maintenance Procedures (Chapter 6)
Air Supply Rack Assembly (ASRA)	Table 5-2 / page 5-3	Paragraph 6.8.1 / page 6-10
Control Console Assembly (CCA)	Table 5-3 / page 5-6	Paragraph 6.8.2 / page 6-117
Volume Tank Assembly (VTA)	Table 5-4 / page 5-9	Paragraph 6.8.3 / page 6-171
5,000 psi Compressor System[1] (HPAC)	N/A	N/A
Air Hose Assemblies	Table 5-5 / page 5-10	Paragraph 6.8.4 / page 6-179

[1]Compressor system troubleshooting and maintenance procedures are conducted in accordance with the vendor's operation and maintenance manual supplied with the equipment.

Table 5-2. Air Supply Rack Assembly (ASRA) Fault Directory

Symptom	Probable Cause	Remedy	Corrective Action Para./ Page (PN) Mfr.
VALVES			
1. All Malfunctions of ***Shutoff Valve (Triport)***	a. Valve leaking at gland nut due to defective stem or stem seal	a. Remove and repair or replace valve.	6.8.1.3A / 6-30 (HV09-13-2) Circle Seal
AHP-V401 AHP-V402 AHP-V403 AHP-V404 AHP-V405 AHP-V406 AHP-V407 AHP-V408 AHP-V409	b. Valve leaking when closed due to defective O-ring or valve seat	b. Remove and repair or replace valve.	6.8.1.3B / 6-37 (PLB-12760-2) CPV
2. All Malfunctions of ***Shutoff Valve (Triport)***	a. Valve leaking at gland nut due to defective stem or stem seal	a. Remove and repair or replace valve.	6.8.1.4A / 6-44 (HV09-14-2) Circle Seal
AHP-V410 AHP-V411 AHP-V412 AHP-V413 AHP-V414 AHP-V415 AHP-V416 AHP-V417 AHP-V418	b. Valve leaking when closed due to defective O-ring or valve seat	b. Remove and repair or replace valve.	6.8.1.4B / 6-51 (PLB-12765-2) CPV
3. All Malfunctions of ***Shutoff Valve (Angle)***	a. Valve leaking at gland nut due to defective stem or stem seal	a. Remove and repair or replace valve.	6.8.1.5A / 6-58 (HV09-15-2) Circle Seal
AHP-V419 AHP-V425 AHP-V429 AHP-V431 AHP-V443	b. Valve leaking when closed due to defective O-ring or valve seat	b. Remove and repair or replace valve.	6.8.1.5B / 6-63 (PLB-12764-2) CPV
4. All Malfunctions of ***Shutoff Valve (Triport)***	a. Valve leaking at gland nut due to defective stem or stem seal	a. Remove and repair or replace valve.	6.8.1.6A / 6-69 (HV09-16-2) Circle Seal
AHP-V420 AHP-V421 AHP-V422 AHP-V423 AHP-V424 AHP-V434	b. Valve leaking when closed due to defective O-ring or valve seat	b. Remove and repair or replace valve.	6.8.1.6B / 6-76 (PLB-12763-2) CPV

Table 5-2. Air Supply Rack Assembly (ASRA) Fault Directory—Continued

Symptom	Probable Cause	Remedy	Corrective Action Para./ Page (PN) Mfr.
VALVES—*Continued*			
5. All Malfunctions of ***Gauge Stop Valve*** ***AHP-V426 AHP-V427 AHP-V428 AHP-V435***	a. Valve leaking at bonnet due to defective stem or stem seal b. Valve leaking when closed due to defective valve seat	a. Remove and repair or replace valve. b. Remove and repair or replace valve.	6.8.1.7 / 6-82 (PLC-10669) CPV
6. ***HP Relief Valve*** leaks or prematurely opens below set pressure ***AHP-V430 AHP-V433***	Defective O-ring, valve seat, or spring	Remove and repair or replace relief valve.	***AHP-V430*** 6.8.1.8 / 6-85 (SS-4R3A-1509-H) Swagelok ***AHP-V433*** 6.8.1.10 / 6-95 (SS-4R3A-1509-F) Swagelok
7. All Malfunctions of ***Regulator Valve*** ***AHP-V432***	a. Handle hard to operate due to defective bearing, or dirty or galled threads of spring guide or shaft b. Regulator leaking through handle due to defective piston O-ring c. Regulator leaking through vent due to defective O-ring, vent seat, or piston d. Regulator creeping when set due to defective O-ring, main seat, or main poppet	a. Remove and repair or replace regulator. b. Remove and repair or replace regulator. c. Remove and repair or replace regulator. d. Remove and repair or replace regulator.	6.8.1.9 / 6-88 (PR50-18-2) Circle Seal
8. All Malfunctions of ***Vent (Bleed) Valve*** ***AHP-V440 AHP-V441 AHP-V442***	a. Valve leaking at bonnet due to defective stem or stem seal b. Valve leaking when closed due to defective valve seat	a. Remove and repair or replace valve. b. Remove and repair or replace valve.	6.8.1.11 / 6-98 (SS-3NBVCO4) Swagelok
9. All Malfunctions of ***Shutoff Valve*** ***AHP-V444***	a. Valve leaking at gland nut due to defective stem or stem seal b. Valve leaking when closed due to defective O-ring or valve seat	a. Remove and repair or replace valve. b. Remove and repair or replace valve.	6.8.1.12 / 6-102 (HV09-17-2) Circle Seal

Table 5-2. Air Supply Rack Assembly (ASRA) Fault Directory—Continued

Symptom	Probable Cause	Remedy	Corrective Action Para./ Page (PN) Mfr.
VALVES—*Continued*			
10. ***Check Valve*** allows air to backflow to charge ports ***AHP-V445***	Defective O-ring, valve seat, or spring	Remove and repair or replace valve.	6.8.1.13 / 6-107 (SS-CHVCO8-50) Swagelok
FILTERS			
11. ***In-line Filter (F-040)*** • Decreased air flow through filter • Slow charging rate of ASRA or SCUBA cylinder • Excessive differential pressure between HPAC outlet gauge and gauge of bank being charged	Clogged or dirty filter	Remove and clean or replace filter cartridge.	6.8.1.14 / 6-110 (U-10002) Norman Filter
GAUGES			
12. ***Pressure Gauge (HP)*** indicates improper air supply pressure ***AHP-G436*** ***AHP-G437*** ***AHP-G438*** ***AHP-G439***	Bourdon tube or dial components failed	Verify valve line-up per procedure. Cross-check with other gauges. Remove and replace gauge if defective.	***AHP-G436*** 6.8.1.15 / 6-113 (25502-35B21-MCF) 3D Instruments ***AHP-G437*** ***AHP-G438*** ***AHP-G439*** 6.8.1.16 / 6-115 (25544-37B21-MCD) 3D Instruments

Table 5-3. Control Console Assembly (CCA) Fault Directory

Symptom	Probable Cause	Remedy	Corrective Action Para./ Page (PN) Mfr.
VALVES			
1. All malfunctions of ***Shutoff Valve (Angle)*** ***AHP-V301*** ***AHP-V302***	a. Valve leaking at gland nut due to defective stem or stem seal b. Valve leaking when closed due to defective O-ring or valve seat	a. Remove and repair or replace valve. b. Remove and repair or replace valve.	6.8.2.2A / 6-125 (HV09-15-1) (HV09-15-3) Circle Seal 6.8.2.2B / 6-130 (PLB-12764-1) (PLB-12764-3) CPV
2. All malfunctions of ***Regulator Valve*** ***AHP-V303*** ***AHP-V304***	a. Handle hard to operate due to defective bearing, or dirty or galled threads of spring guide or shaft b. Regulator leaking through handle due to defective piston O-ring c. Regulator leaking through vent due to defective O-ring, vent seat, or poppet d. Regulator creeping when set due to defective O-ring, main seat assembly, or poppet	a. Remove and repair or replace regulator. b. Remove and repair or replace regulator. c. Remove and repair or replace regulator. d. Remove and repair or replace regulator.	6.8.2.3A / 6-135 (PR-50-6-1) (PR-50-6-3) Circle Seal 6.8.2.3B / 6-142 (44F5417T308) Tescom
3. All malfunctions of ***Gauge Stop Valve*** ***AHP-V305*** ***AHP-V306*** ***ALP-V307*** ***ALP-V308***	a. Valve leaking at bonnet due to defective stem or stem seal b. Valve leaking when closed due to defective valve seat	a. Remove and repair or replace valve. b. Remove and repair or replace valve.	6.8.2.4 / 6-149 (PLC-10669) CPV
4. ***LP Relief Valve l****eaks or prematurely opens below set pressure* ***ALP-V309*** ***ALP-V310***	Defective O-ring, valve seat, or spring	Remove and replace relief valve.	6.8.2.5 / 6-152 (M5132-N-6M(L)-300 ASME) Circle Seal

Table 5-3. Control Console Assembly (CCA) Fault Directory—Continued

Symptom	Probable Cause	Remedy	Corrective Action Para./ Page (PN) Mfr.
VALVES—*Continued*			
5. All malfunctions of ***Ball Valve (Angle)*** ***ALP-V311 ALP-V312 ALP-V314 ALP-V315 ALP-V316*** and ***Ball Valve*** ***ALP-V313***	a. Valve leaking at bonnet due to defective stem, stem seal, or loose packing bolt b. Valve hard to operate due to corroded slide rings and discs c. Valve leaking when closed due to defective slide rings, discs, or ball stem	a. Tighten packing bolt. Remove and replace valve if still leaking. b. Remove and replace valve. c. Remove and replace valve.	***ALP-V311 ALP-V312 ALP-V314 ALP-V315 ALP-V316*** 6.8.2.6 / 6-154 (SS-45TVCO8-A-K) Swagelok ***ALP-V313*** 6.8.2.7 / 6-156 (SS-45TVCO8-K) Swagelok
6. All malfunctions of ***Ball Valve (Angle)*** ***ALP-V317 ALP-V318 ALP-V319***	a. Valve leaking at bonnet due to defective stem, stem seal, or loose packing bolt b. Valve hard to operate due to corroded slide rings and discs c. Valve leaking when closed due to defective slide rings, discs, or ball stem	a. Remove and replace valve. b. Remove and replace valve. c. Remove and replace valve.	6.8.2.8 / 6-158 (SS-43TVCO4-A-K) Swagelok
FILTERS			
7. ***In-line Filter (F-020)*** • Decreased air flow through filter • Excessive differential pressure between upstream on-line bank gauges and down-stream *AHP-G325 or AHP-G326*	Clogged or dirty filter	Remove and clean or replace filter cartridge.	6.8.2.9 / 6-160 (U-10003) Norman Filter

Table 5-3. Control Console Assembly (CCA) Fault Directory—Continued

Symptom	Probable Cause	Remedy	Corrective Action Para./ Page (PN) Mfr.
GAUGES			
8. ***Diver Depth Gauges*** indicate improper depth of seawater ***ALP-G320*** ***ALP-G321*** ***ALP-G322***	Bourdon tube or dial components failed	Verify valve line-up per procedure. Cross-check with other gauges. Remove and replace gauge if defective.	6.8.2.10 / 6-163 (25544-24B24-MCE) (25544-24B22-MCE) (25544-24B23-MCE) 3D Instruments
9. Defective or damaged ***Pressure Gauges (LP)*** ***ALP-G323*** ***ALP-G324***	Bourdon tube or dial components failed	Verify valve line-up per procedure. Cross-check with other gauges. Remove and replace gauge if defective.	6.8.2.11 / 6-166 (25502-27B21-MCF) 3D Instruments
10. Defective or damaged ***Pressure Gauges (HP)*** ***AHP-G325*** ***AHP-G326***	Bourdon tube or dial components failed	Verify valve line-up per procedure. Cross-check with other gauges. Remove and replace gauge if defective.	6.8.2.12 / 6-168 (25502-36B21-MCF) 3D Instruments

Table 5-4. Volume Tank Assembly (VTA) Fault Directory

Symptom	Probable Cause	Remedy	Corrective Action Para./ Page (PN) Mfr.
VALVES			
1. All malfunctions of ***Plug Valve*** ***ALP-V201***	a. Valve leaking at top or bottom of plug b. Valve leaking when closed due to defective O-rings	a. Remove and repair or replace valve. b. Remove and repair or replace valve.	6.8.3.2 / 6-173 (SS-4P4T2-VCO) Swagelok
2. ***LP Relief Valve*** leaks or prematurely opens below set pressure ***ALP-V202***	Defective O-ring, valve seat, or spring	Remove and replace relief valve.	6.8.3.3 / 6-176 (M5132-N-6M(L)-300 ASME) Circle Seal

Table 5-5. Air Hose Assemblies Fault Directory

Symptom	Probable Cause	Remedy	Corrective Action Para./ Page Ref.
ALL LP AND HP AIR HOSE ASSEMBLIES (H-203, H-406, H-436, and H-444)			
1. Strain relief lashing loose, damaged, or missing	Normal wear, or lashing improperly installed	Install new lashing.	6.8.4.1 / 6-180
2. Plug assembly or snap shackles damaged or missing	Rough handling, stress, or strain	Install new plug assembly or snap shackle as required.	6.8.4.2 / 6-181 6.8.4.3 / 6-183 6.8.4.4 / 6-185 6.8.4.5 / 6-187
3. Audible air leak	a. Puncture, cut, or abrasion in hose material	a. Leak-test hose to determine area of leakage. Repair or replace hose as required.	6.8.4.2 / 6-181 6.8.4.3 / 6-183 6.8.4.4 / 6-185 6.8.4.5 / 6-187
	b. Fitting partially separated from hose	b. Leak-test connections to determine area of leakage. Repair area of separation.	
	c. O-ring damaged or missing	c. Replace O-ring.	
4. Bulge or worn area in hose	Rough handling, stress, or strain	Repair or replace hose as required.	6.8.4.2 / 6-181 6.8.4.3 / 6-183 6.8.4.4 / 6-185 6.8.4.5 / 6-187
5. Fitting partially or fully separated from hose	Rough handling, stress, or strain	Repair area of separation.	6.8.4.2 / 6-181 6.8.4.3 / 6-183 6.8.4.4 / 6-185 6.8.4.5 / 6-187
SCUBA CHARGE HOSE ASSEMBLY (H-406)			
6. 5,000 psi gauge defective or malfunctioning	Bourdon tube or dial components failed	Remove and replace gauge.	6.8.4.3 / 6-183
7. Bleeder valve defective or malfunctioning	Defective valve seat	Remove and replace bleeder valve.	6.8.4.3 / 6-183
8. Line valve defective or malfunctioning	Defective valve seat	Remove and replace line valve.	6.8.4.3 / 6-183

CHAPTER 6

CORRECTIVE MAINTENANCE

WARNING

Properly performed corrective maintenance is essential to safe, dependable diving operations using components of the Fly Away Dive System (FADS) III Air System. Omission or negligent performance of prescribed maintenance procedures could result in equipment failure and injury or death to personnel.

6.1 INTRODUCTION

This chapter provides general repair information and specific corrective maintenance procedures for organizational level personnel performing maintenance actions on the Fly Away Dive System (FADS) III Air System equipment in a "home" and "deployed or away" environment. The maintenance concept for the FADS III Air System is to perform all the maintenance necessary to maintain the system in an operable status while deployed, and to complete any other necessary repairs at the home station.

Information in this chapter is arranged in the following sequence:

- Para. 6.2—Safety Requirements .... Page 6-1
- Para. 6.3—Adjustments and Alignments .... Page 6-2
- Para. 6.4—General Repair Information .... Page 6-2
- Para. 6.5—Tools and Support Equipment .... Page 6-3
- Para. 6.6—Consumable Supplies .... Page 6-4
- Para. 6.7—Torque Values .... Page 6-4
- Para. 6.8—Corrective Maintenance Procedures .... Page 6-7

6.2 SAFETY REQUIREMENTS

Prior to conducting any corrective maintenance on the FADS III Air System, maintenance personnel shall review and become thoroughly familiar with the general safety notices and precautions listed in the Safety Summary located at the front of this manual and with the specific warnings and cautions associated with the maintenance actions in this chapter. Also ensure that tag-out procedures, if applicable, are performed before conducting maintenance. The following warnings apply to all maintenance procedures presented in this chapter and shall be strictly observed to ensure the safety of all maintenance and diving personnel.

WARNING

Before performing corrective maintenance on the FADS III Air System, ensure that all pressure has been vented from the system. Accidental exposure to escaping high pressure air may result in injury or death to personnel.

Accomplish procedures in a clean environment. Contamination of the breathing air system may result in diver injury or death.

Discard and replace all O-rings as standard procedure while performing maintenance. Failure of an O-ring in any component may cause further damage to equipment, mission abort, or diver injury or death.

6.3 ADJUSTMENTS AND ALIGNMENTS

No special adjustment or alignment procedures are required for the FADS III Air System.

6.4 GENERAL REPAIR INFORMATION

The scope of repairs covered in this chapter includes procedures for removal and replacement of parts repairable at the organizational level. Cleaning and inspection procedures are included if required for the procedure described. Operator/organizational maintenance repair limits are prescribed in the interest of diving safety and optimum service life of the equipment. Components beyond these limits should be sent to a depot facility for repair or replacement.

WARNING

If in doubt about the serviceability of a part, repair or replace it immediately. Use only approved replacement parts. Failure of a component during a dive may result in diver injury or death.

6.4.1 MAINTENANCE PARTS. Illustrated parts lists for FADS III Air System components are provided in this chapter. Only approved replacement parts shall be used to repair FADS III Air System equipment.

6.4.2 RELATED MAINTENANCE. Related corrective maintenance actions include inspection, cleaning, and replacement of parts. Chapter 4 contains a definition of cleanliness as it pertains to a certified system and provides procedures for precleaning, leak detection, and final cleaning; applying Teflon® tape and lubricants; and inspecting, cleaning, removing, and installing O-rings and packings. The procedures outlined in Chapter 4 should be reviewed before attempting the corrective maintenance procedures in this chapter.

The FADS III Air System is a Naval Sea Systems Command (NAVSEA) certified diving life support system and must be maintained in accordance with certification. Any maintenance involving entry into the FADS III Air System certification boundaries shown in Joint Identification Drawing (JID) 6961894 shall be performed in accordance with the requirements shown in Chapter 4, paragraph 4.2.

Because the FADS III Air System is a certified system, providing protection to clean components (i.e., capping or plugging open ports and bagging exposed areas or components) is vital to the maintenance process. Although every effort has been made to identify when protection of a part is necessary, it is the ultimate responsibility of the maintenance technician to maintain cleanliness whether or not the protective action is called out. If in doubt, cap it, plug it, or bag it.

6.5 TOOLS AND SUPPORT EQUIPMENT

The FADS III Air System is initially furnished with a maintenance kit that contains the necessary technical manuals, tools, consumables, spare parts, and other materials to support the system up to 180 days. General and specialty tools that are used in the corrective maintenance procedures found in this chapter are identified whenever possible within each procedure and are included in the lists of tools in the following paragraphs. A list of consumables is provided in paragraph 6.6, and spare or replacement parts are included in the parts lists in Chapter 7.

6.5.1 TOOLS. Table 6-1 lists the commonly available tools that may be required to perform corrective maintenance on the FADS III Air System. Since the list is all-inclusive, be sure to check the individual maintenance procedure for the required tools.

Table 6-1. List of Recommended Tools

Item	Tool Name	Description
1	Crowfoot attachment, socket wrench	Open end, 3/8-inch female drive for use with male socket wrench, assorted sizes
2	Extension bar, solid, socket wrench	1/4 and 3/8 drives, length as required
3	Hammer, hand-held	As required
4	Handle, hinged	1/4 and 3/8 drives, length as required
5	Handle, ratchet, reversible	1/4 and 3/8 drives, length as required
6	Handle, speeder	3/8 drive, 16-inch length
7	Joint, universal	3/8 drive
8	Screwdriver set, flat tip	Assorted sizes
9	Screwdriver set, Phillips head	Assorted sizes
10	Socket set	1/4 and 3/8 drive, assorted sizes, U.S. and metric

Table 6-1. List of Recommended Tools—Continued

Item	Tool Name	Description
11	Toolbox, portable	As required
12	Wrench, adjustable	As required
13	Wrench set, Allen head	Assorted sizes
14	Wrench set, combination, thin	U.S. and metric, assorted sizes
15	Wrench, torque	See Table 6-4 for required torque ranges

6.5.2 SPECIAL TOOLS. Table 6-2 lists the special tools required to perform corrective maintenance on the FADS III Air System.

Table 6-2. Special Tools

Description	Part Number / Manufacturer	Use
Tool, O-ring removal	PN 887-200, Parker-Hannifin	Removing/installing O-rings
Tool, special	PN 16268, Circle Seal	Rebuilding valves HV09-13-2 thru HV09-18-2
Tool, special	PN 16715, Circle Seal	Rebuilding valves HV09-13-2 thru HV09-18-2
Tool, special	PN 16717, Circle Seal	Rebuilding valves HV09-13-2 thru HV09-18-2

6.5.3 SUPPORT EQUIPMENT. Repositioning of the ASRA will require the use of a forklift or lifting equipment capable of handling approximately 3,440 pounds. Removal and installation of the composite HP air flasks will also require the use of support blocks capable of supporting approximately 3,440 pounds and a ladder or secure platform that will allow access to the top of the Air Flask Rack Assembly (AFRA), which is approximately 6 feet, 8 inches high.

6.6 CONSUMABLE SUPPLIES

Table 6-3 lists the consumable supplies needed to perform repair procedures in this chapter. The table provides a description of the product or material and its use. Consumable repair parts (such as O-rings) are listed in the maintenance repair instructions for each component.

6.7 TORQUE VALUES

The FADS III Air System torque values are listed in Table 6-4 and are specified individually in the assembly procedures in this chapter. Fasteners should be clean and undamaged prior to use.

Table 6-3. Consumable Supplies

Description	Use
Bags, plastic, assorted sizes	Component protection; storage or shipping containers
Brush, soft bristle	Cleaning components
Cleaning fluid	Cleaning filter elements
Enamel, polyurethane	Flask repair
Gel Coat®, commercial (high grade) or two-part, non water-soluble epoxy	Flask repair
Lubricant, MIL-G-27617, Type III grease, NSN 9150-01-364-0218, or DOD-L-24574	Lubrication of O-rings, O-ring grooves, pipe threads, and other components
Rags, lint-free, clean	Cleaning and drying components
Sandpaper, 120 and fine grit	Flask repair
Solution, cleaning, nonionic detergent (NID) general purpose, MIL-D-16791, Type I, NSN 7930-00-282-9699	General cleaning of component parts
Solution, leak check, NID (see above); (LEAK-TEK or SNOOP may also be used)	Checking for high and low pressure leaks
Solvent, Methyl Ethyl Ketone (MEK)	Flask repair
Tape, Teflon®, 0.25-in. wide, MIL-T-27730A, size 1, NSN 8030-00-889-3535	Sealing pipe threads
Tape, white, No. 827, 1-inch wide	Sealing polyethylene bags and binding hoses
Tape, white, No. 827, 2-inch wide	Binding hoses
Water, fresh, warm	Cleaning components

Table 6-4. Torque Values

Primary Component	Assy	Type	Mfr.	PN	Ref.	Torqued Component	Torque Value
AHP-V301 AHP-V302	CCA	Shutoff Valve (Angle)	Circle Seal	HV09-15-1 HV09-15-3	6.8.2.2 Proc. A	Gland Nut	55-65 in-lb
			CPV	PLB-12764-1 PLB-12764-3	6.8.2.2 Proc. B	Gland Nut	75-100 in-lb
AHP-V303 AHP-V304	CCA	Regulator Valve	Circle Seal	PR50-6-1 PR50-6-3	6.8.2.3 Proc. A	Seat Retainer Housing	38-43 in-lb 65-70 ft-lb
			Tescom	44F5417T308	6.8.2.3 Proc. B	Seat Retainer Vent Bonnet Set Screw	100 in-lb 50-60 in-lb 50 ft-lb 20-25 in-lb

Table 6-4. Torque Values—Continued

Primary Component	Assy	Type	Mfr.	PN	Ref.	Torqued Component	Torque Value
AHP-V401 thru AHP-V409 (Flask Isolation Valves)	ASRA	Shutoff Valve (Triport)	Circle Seal	HV09-13-2	6.8.1.3 Proc. A	Gland Nut Safety Device (Pressure)	55-65 in-lb 190-210 in-lb
			CPV	PLB-12760-2	6.8.1.3 Proc. B	Gland Nut Safety Device (Pressure)	75-100 in-lb 190-210 in-lb
AHP-V410 thru AHP-V418 (Flask Drain Valves)	ASRA	Shutoff Valve (Triport)	Circle Seal	HV09-14-2	6.8.1.4 Proc. A	Gland Nut Safety Device (Thermal)	55-65 in-lb 38-42 ft-lb
			CPV	PLB-12765-2	6.8.1.4 Proc. B	Gland Nut Safety Device (Thermal)	75-100 in-lb 456-504 in-lb
AHP-V419 AHP-V425 AHP-V429 AHP-V431 AHP-V443	ASRA	Shutoff Valve (Angle)	Circle Seal	HV09-15-2	6.8.1.5 Proc. A	Gland Nut	55-65 in-lb
			CPV	PLB-12764-2	6.8.1.5 Proc. B	Gland Nut	75-100 in-lb
AHP-V420 AHP-V421 AHP-V422 AHP-V423 AHP-V424 AHP-V434	ASRA	Shutoff Valve (Triport)	Circle Seal	HV09-16-2	6.8.1.6 Proc. A	Gland Nut	55-65 in-lb
			CPV	PLB-12763-2	6.8.1.6 Proc. B	Gland Nut	75-100 in-lb
AHP-V432	ASRA	Regulator Valve	Circle Seal	PR50-18-2	6.8.1.9	Housing Retaining Nut Handle Nut	65-70 ft-lb 15-20 ft-lb 8-10 ft-lb
AHP-V444	ASRA	Shutoff Valve (Straight)	Circle Seal	HV09-17-2	6.8.1.12	Gland Nut	55-65 in-lb
AHP-V445	ASRA	Check Valve	Swagelok	SS-CHVCO8-50	6.8.1.13	Body Halves	200 in-lb
F-020	CCA	Filter	Norman	U-10003	6.8.2.9	Filter Element Filter Plug	5 ft-lb 30-45 ft-lb
F-040	ASRA	Filter	Norman	U-10002	6.8.1.14	Filter Element Filter Plug	5 ft-lb 30-45 ft-lb
Fittings and Joints	ASRA CCA VTA	Fittings and Joints	N/A	N/A	N/A	CGA-346 Fittings Pipe Threads	Tighten until no leakage is observed.
O-ring Seals	ASRA CCA VTA	O-ring Seals	N/A	N/A	N/A	Straight Thread VCO Face Seal	3/8 to 1/2 turn after O-ring engagement
						CPV MK VIII 1/4 3/8 1/2	18-36 in-lb 24-48 in-lb 36-72 in-lb

6.8 CORRECTIVE MAINTENANCE PROCEDURES

WARNING

Accomplish procedures in a clean environment as contamination of the breathing air system may result in diver injury or death.

If in doubt about the serviceability of a part, repair or replace it immediately. Use only approved replacement parts. Failure of a component during a dive may result in diver injury or death.

This section contains the necessary procedures to perform corrective maintenance on the FADS III Air System. To find a specific procedure, refer to the maintenance reference chart in Table 6-5, which lists major components according to their designators, or to the directory found at the beginning of each major assembly listed below. Additional information about component designators is located in the note on page 2-3.

- Para. 6.8.1—Air Supply Rack Assembly (ASRA) .... Pg 6-10
- Para. 6.8.2—Control Console Assembly (CCA) .... Pg 6-117
- Para. 6.8.3—Volume Tank Assembly (VTA) .... Pg 6-171
- Para. 6.8.4—Air Hose Assemblies .... Pg 6-179

Table 6-5. FADS III Air System Maintenance Reference Chart

Component	Designator	Used On	Part Number	Para. / Page Reference
Air Flask Rack Assembly	N/A	ASRA	53711-6961898-1	6.8.1.1 / 6-15
Control Console Panel Assy	N/A	CCA	53711-6961930	6.8.2.1 / 6-120
Filter, In-line (2)	F-020	CCA	U-10003	6.8.2.9 / 6-160
Filter, In-line (2)	F-040	ASRA	U-10002	6.8.1.14 / 6-110
Flask, HP Air, Carbon Fiber Flask, HP Air, Kevlar® (Note 1)	F-022	ASRA	53711-6961914-1 53711-6961959	6.8.1.2 / 6-19
Gauge, 0-350 fsw, Diver Depth: Gauge, 0-350 fsw, yellow Gauge, 0-350 fsw, green Gauge, 0-350 fsw, red	 ALP-G320 ALP-G321 ALP-G322	CCA	 25544-24B24-MCE 25544-24B22-MCE 25544-24B23-MCE	6.8.2.10 / 6-163
Gauge, 0-500 psi	ALP-G323 ALP-G324	CCA	25502-27B21-MCF	6.8.2.11 / 6-166
Gauge, 0-5,000 psi	AHP-G436	ASRA	25502-35B21-MCF	6.8.1.15 / 6-113

Note 1: There are nine composite HP air flasks located in the AFRA. Any combination of the two types of flasks (carbon fiber or Kevlar®) may be used.

Table 6-5. FADS III Air System Maintenance Reference Chart—Continued

Component	Designator	Used On	Part Number	Para. / Page Reference
Gauge, 0-6,000 psi	AHP-G325 AHP-G326	CCA	25502-36B21-MCF	6.8.2.12 / 6-168
Gauge, 0-8,000 psi	AHP-G437 AHP-G438 AHP-G439	ASRA	25544-37B21-MCD	6.8.1.16 / 6-115
Hose Assembly, HP Air (3) Hose Assembly, HP Air (6)	H-436 H-804	ASRA TRCS	53711-6962000	6.8.4.4 / 6-185
Hose Assembly, HP Air	H-444	ASRA	53711-6962070-6	6.8.4.5 / 6-187
Hose Assembly, LP Air	H-203	VTA	53711-6962010	6.8.4.2 / 6-181
Hose Assembly, SCUBA Charge	H-406	ASRA	53711-6962020	6.8.4.3 / 6-183
Strain Relief Lashing	N/A	ASRA CCA VTA	N/A	6.8.4.1 / 6-180
Valve, Ball	ALP-V313	CCA	SS-45TVCO8-K	6.8.2.7 / 6-156
Valve, Ball, Angle	ALP-V311 ALP-V312 ALP-V314 ALP-V315 ALP-V316	CCA	SS-45TVCO8-A-K	6.8.2.6 / 6-154
Valve, Ball, Angle	ALP-V317 ALP-V318 ALP-V319	CCA	SS-43TVCO4-A-K	6.8.2.8 / 6-158
Valve, Check	AHP-V445	ASRA	SS-CHVCO8-50	6.8.1.13 / 6-107
Valve, Gauge Stop	AHP-V305 AHP-V306 ALP-V307 ALP-V308	CCA	PLC-10669	6.8.2.4 / 6-149
Valve, Gauge Stop	AHP-V426 AHP-V427 AHP-V428 AHP-V435	ASRA	PLC-10669	6.8.1.7 / 6-82
Valve, Plug	ALP-V201	VTA	SS-4P4T2-VCO	6.8.3.2 / 6-173
Valve, Regulator	AHP-V303 AHP-V304	CCA	PR50-6-1 (Circle Seal) PR50-6-3 (Circle Seal)	6.8.2.3 A / 6-135
	AHP-V303 AHP-V304	CCA	44F5417T308 (Tescom)	6.8.2.3 B / 6-142
Valve, Regulator	AHP-V432	ASRA	PR50-18-2	6.8.1.9 / 6-88
Valve, Relief, HP	AHP-V430	ASRA	SS-4R3A-1509-H	6.8.1.8 / 6-85
Valve, Relief, HP	AHP-V433	ASRA	SS-4R3A-1509-F	6.8.1.10 / 6-95

Table 6-5. FADS III Air System Maintenance Reference Chart—Continued

Component	Designator	Used On	Part Number	Para. / Page Reference
Valve, Relief, LP	ALP-V202	VTA	M5132-N-6M(L)-300 ASME	6.8.3.3 / 6-176
Valve, Relief, LP	ALP-V309 ALP-V310	CCA	M5132-N-6M(L)-300 ASME	6.8.2.5 / 6-152
Valve, Shutoff	AHP-V444	ASRA	HV09-17-2	6.8.1.12 / 6-102
Valve, Shutoff, Angle	AHP-V301 AHP-V302	CCA	HV09-15-1 (Circle Seal) HV09-15-3 (Circle Seal)	6.8.2.2 A / 6-125
	AHP-V301 AHP-V302	CCA	PLB-12764-1 (CPV) PLB-12764-3 (CPV)	6.8.2.2 B / 6-130
Valve, Shutoff, Angle	AHP-V419 AHP-V425 AHP-V429 AHP-V431 AHP-V443	ASRA	HV09-15-2 (Circle Seal) PLB-12764-2 (CPV)	6.8.1.5 A / 6-58 6.8.1.5 B / 6-63
Valve, Shutoff, Triport (Flask Drain)	AHP-V410 AHP-V411 AHP-V412 AHP-V413 AHP-V414 AHP-V415 AHP-V416 AHP-V417 AHP-V418	ASRA	HV09-14-2 (Circle Seal) PLB-12765-2 (CPV)	6.8.1.4 A / 6-44 6.8.1.4 B / 6-51
Valve, Shutoff, Triport (Flask Isolation)	AHP-V401 AHP-V402 AHP-V403 AHP-V404 AHP-V405 AHP-V406 AHP-V407 AHP-V408 AHP-V409	ASRA	HV09-13-2 (Circle Seal) PLB-12760-2 (CPV)	6.8.1.3 A / 6-30 6.8.1.3 B / 6-37
Valve, Shutoff, Triport	AHP-V420 AHP-V421 AHP-V422 AHP-V423 AHP-V424 AHP-V434	ASRA	HV09-16-2 (Circle Seal) PLB-12763-2 (CPV)	6.8.1.6 A / 6-69 6.8.1.6 B / 6-76
Valve, Vent (Bleed)	AHP-V440 AHP-V441 AHP-V442	ASRA	SS-3NBVCO4	6.8.1.11 / 6-98
VTA Frame Assembly	N/A	VTA	N/A	6.8.3.1 / 6-172

6.8.1 AIR SUPPLY RACK ASSEMBLY (ASRA). The ASRA is a portable high-pressure (HP) storage bank system consisting of an Air Flask Rack Assembly (AFRA) housed inside a Rack Enclosure Assembly. In order to perform corrective maintenance on some of the components in the AFRA, it will be necessary to first remove the AFRA from the Rack Enclosure Assembly as outlined in step a of paragraph 6.8.1.1. Upon completion of the necessary corrective maintenance, the AFRA should be reinstalled in the Rack Enclosure Assembly in accordance with step b of paragraph 6.8.1.1. Corrective maintenance for the ASRA consists of repair or replacement of the flasks, valves, filters, and gauges that are listed below and called out in Figures 6-1 thru 6-4. Please note that Figures 6-1 thru 6-4 show different views of the AFRA, which is a subassembly of the ASRA and is highlighted here because it contains the majority of the parts that will require corrective maintenance. Illustrations of the ASRA and the Rack Enclosure Assembly are provided in Figure 6-5, which appears in conjunction with the AFRA removal and installation procedures in paragraph 6.8.1.1.

- Para. 6.8.1.1—Air Flask Rack Assembly (AFRA) Removal and Installation .... Pg 6-15
- Para. 6.8.1.2—Composite HP Air Flasks .... Pg 6-19
- Para. 6.8.1.3—Flask Isolation Triport Shutoff Valves (AHP-V401, -V402, -V403, -V404, -V405, -V406, -V407, -V408, -V409) .... Pg 6-30
- Para. 6.8.1.4—Flask Drain Triport Shutoff Valves (AHP-V410, -V411, -V412, -V413, -V414, -V415, -V416, -V417, -V418) .... Pg 6-44
- Para. 6.8.1.5—Angle Shutoff Valves (AHP-V419, -V425, -V429, -V431, -V443) .... Pg 6-58
- Para. 6.8.1.6—Triport Shutoff Valves (AHP-V420, -V421, -V422, -V423, -V424, -V434) .... Pg 6-69
- Para. 6.8.1.7—Gauge Stop Valves (AHP-V426, -V427, -V428, -V435) .... Pg 6-82
- Para. 6.8.1.8—HP Relief Valve (AHP-V430) .... Pg 6-85
- Para. 6.8.1.9—Regulator Valve (AHP-V432) .... Pg 6-88
- Para. 6.8.1.10—HP Relief Valve (AHP-V433) .... Pg 6-95
- Para. 6.8.1.11—Vent Valves (AHP-V440, -V441, -V442) .... Pg 6-98
- Para. 6.8.1.12—Shutoff Valve (AHP-V444) .... Pg 6-102
- Para. 6.8.1.13—Check Valve (AHP-V445) .... Pg 6-107
- Para. 6.8.1.14—In-line Filters (F-040) .... Pg 6-110
- Para. 6.8.1.15—Pressure Gauge, 0-5,000 psi (AHP-G436) .... Pg 6-113
- Para. 6.8.1.16—Pressure Gauges, 0-8,000 psi (AHP-G437, -G438, -G439) .... Pg 6-115

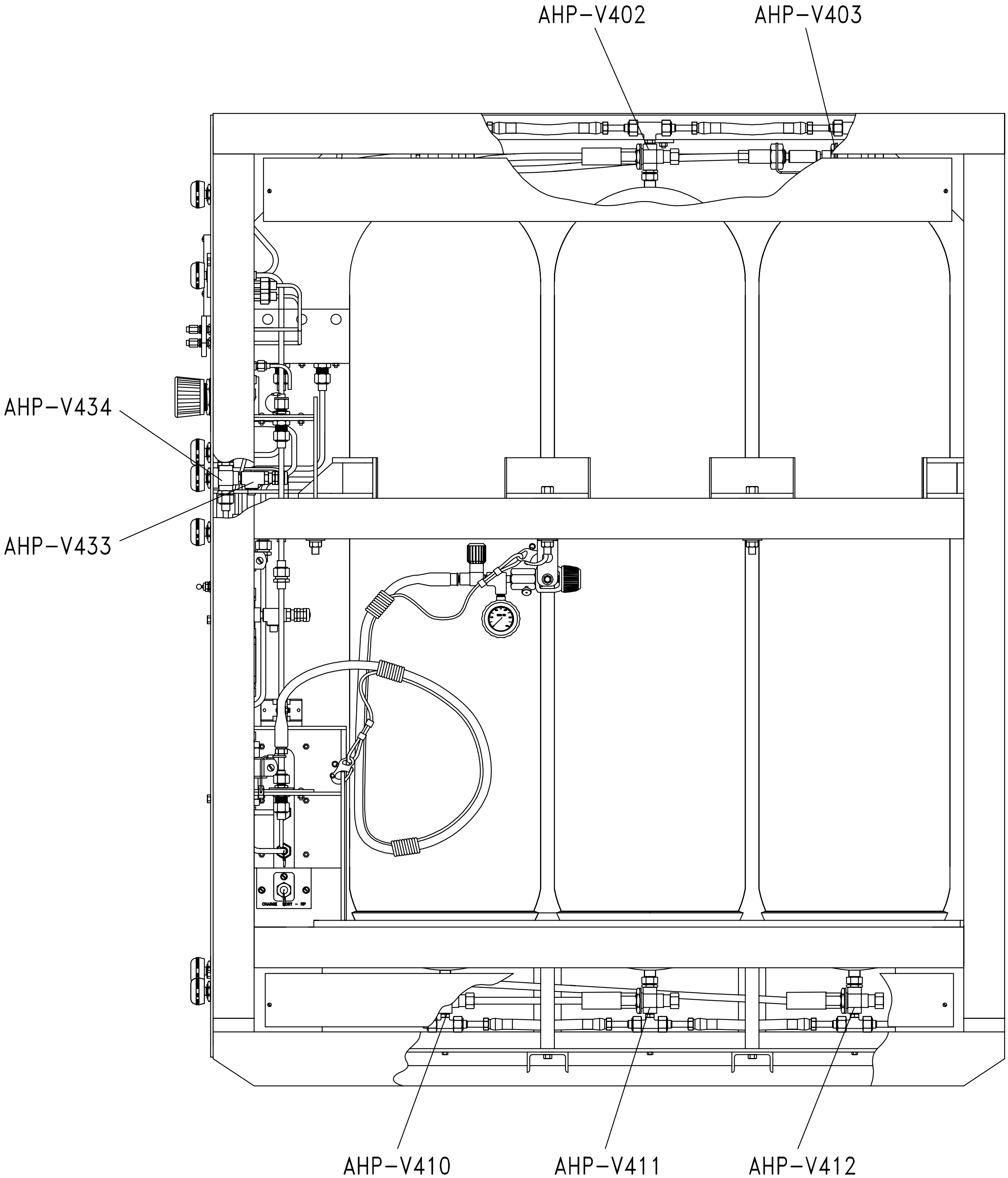


Figure 6-1. Air Flask Rack Assembly (AFRA), Side View

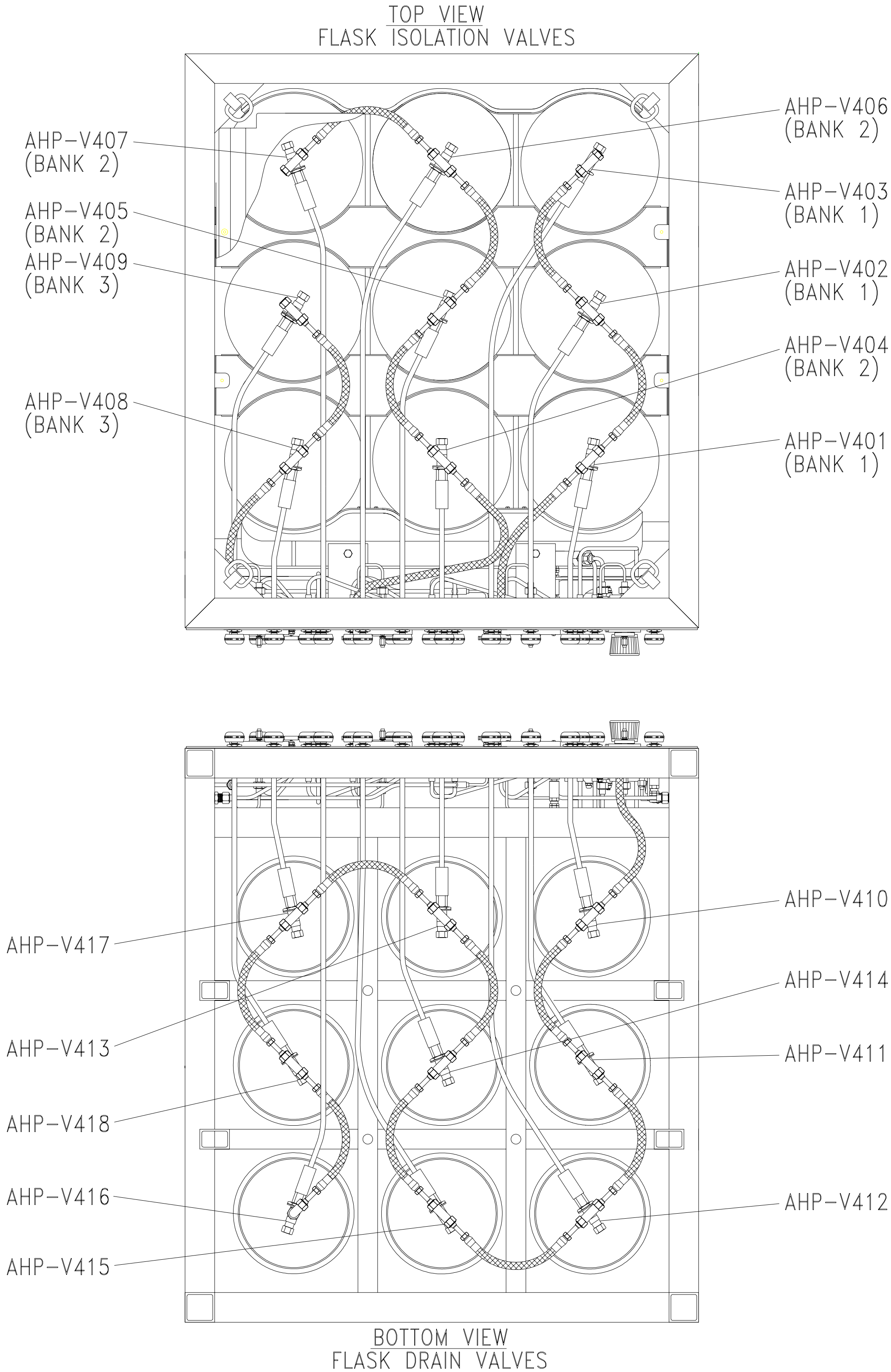


Figure 6-2. AFRA Flask Connections, Top and Bottom Views

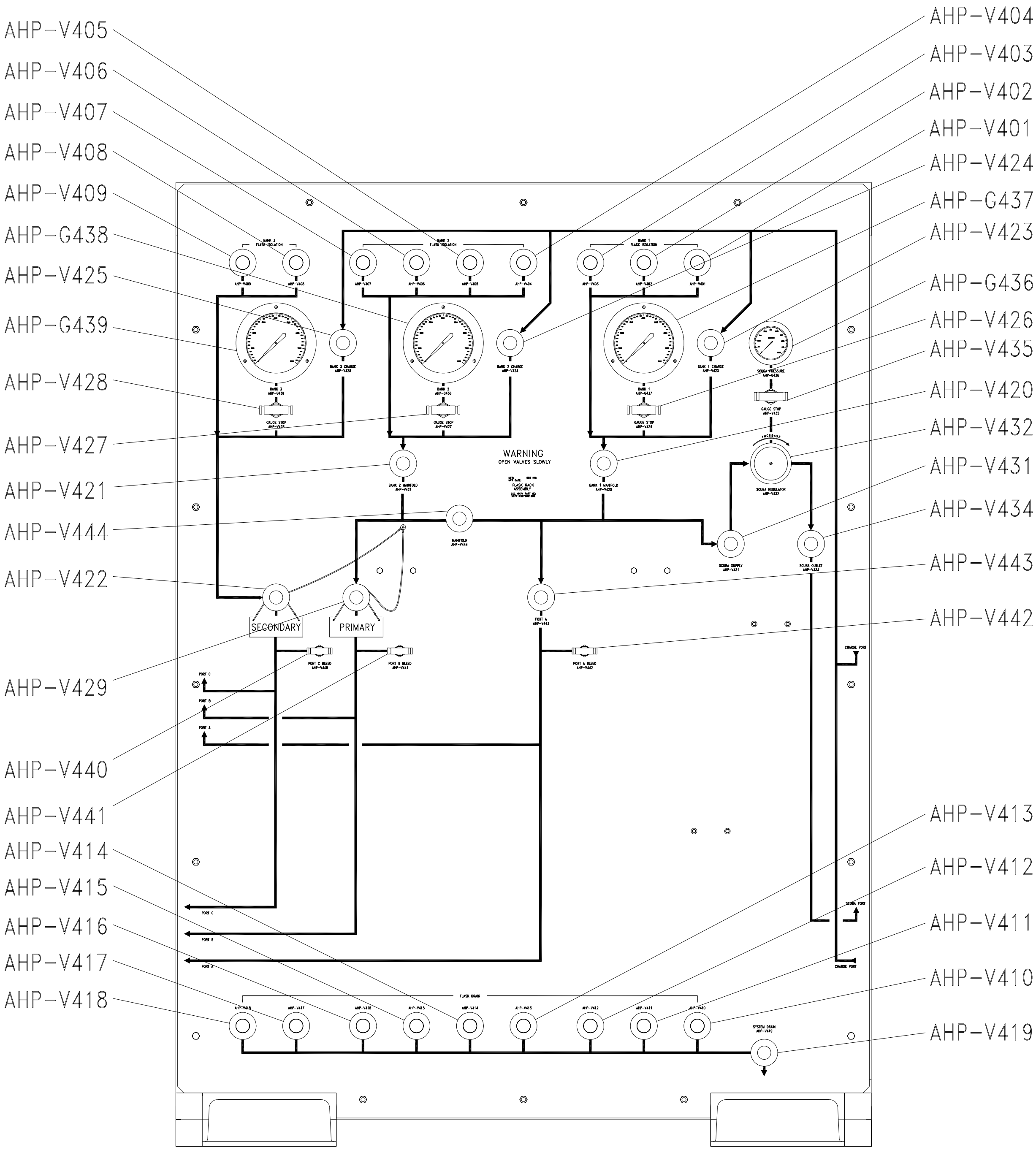


Figure 6-3. AFRA Control Panel Assembly, Front View

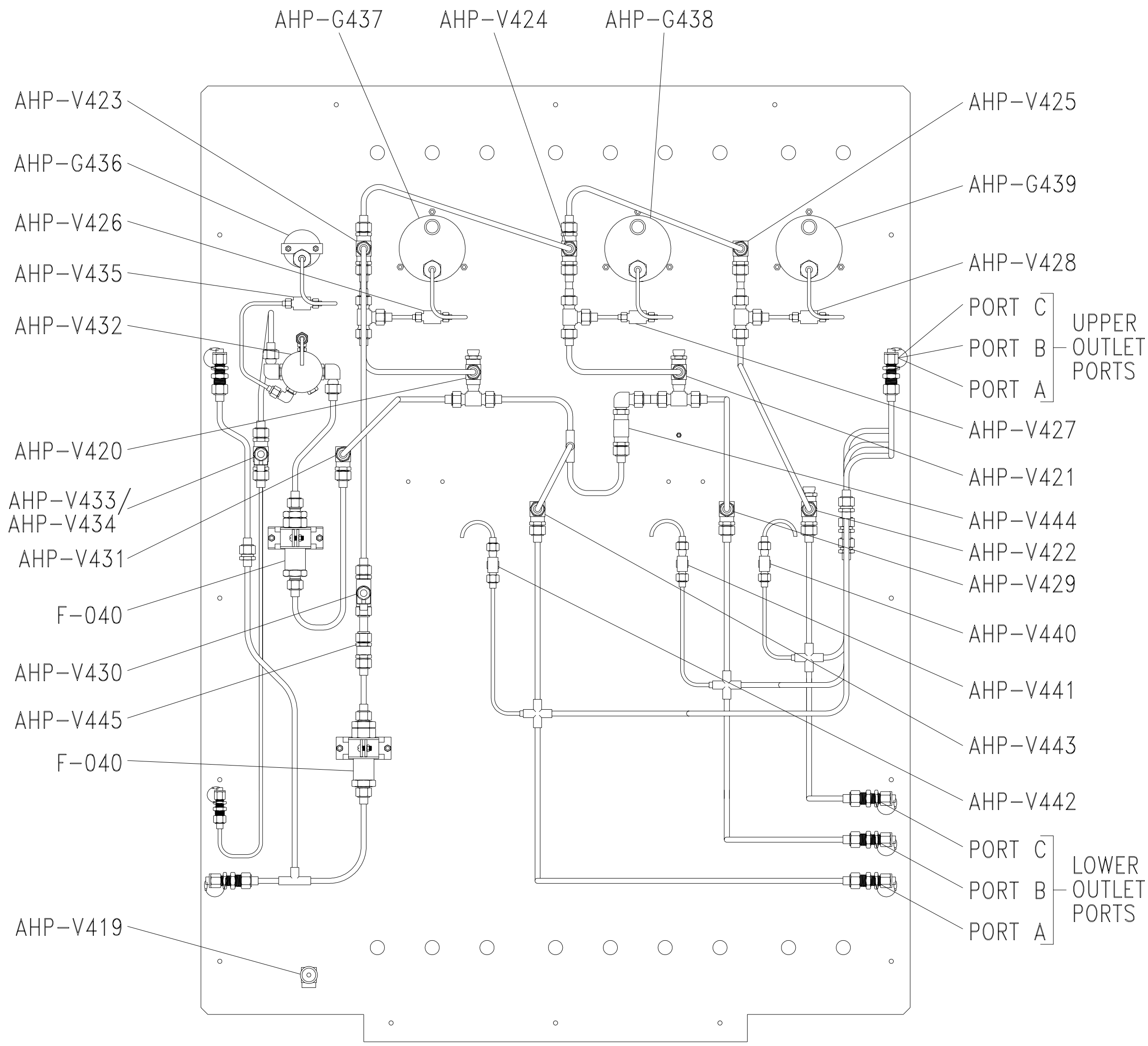


Figure 6-4. AFRA Control Panel Assembly, Rear View

6.8.1.1 Air Flask Rack Assembly (AFRA) Removal and Installation. The following procedures present the recommended steps for removing the AFRA from the Rack Enclosure Assembly and for reinstalling it following completion of corrective maintenance. The removal procedure in step a and the installation procedure in step b are referenced at the beginning and end, respectively, of each corrective maintenance procedure in this section. It should be noted that differences in equipment placement and space restrictions may make it necessary to modify the procedures to fit each particular situation. Deviations are allowed as long as all necessary precautions are taken to protect the health and safety of nearby personnel and the integrity of the equipment. Figure 6-5 contains an illustrated parts list of the components that are called out in the AFRA removal and installation procedures. Some of the components in the list are provided for reference purposes only and may not require replacement.

NOTE

All view references and callouts in the following procedures refer to Figure 6-5 unless otherwise noted. If there is only one view reference in a step, all callouts refer to that view.

a. Removal of AFRA (View B, 6) from Rack Enclosure Assembly (7):

(1) If necessary, reposition ASRA (View A, 1) in accordance with the following procedure:

(a) If attached, remove the four tiedown cables (such as those shown in View A) from the deck fittings and the two ring swivel bolts (2) located on each side of ASRA (1).

NOTE

There are four lifting ring assemblies and four tiedown assemblies located on the ASRA. The lifting ring assemblies are located on each top corner and the tiedown ring assemblies are located on the left and right sides (two per side). Each assembly consists of a ring swivel bolt (2), flat washer (3), and self-locking nut (4). Remove and replace assemblies only if damaged or corroded.

(b) The ASRA (View A, 1) may be moved using a forklift or lifting equipment capable of handling approximately 3,440 pounds. If using lifting equipment, attach lift cables to the four upper ring swivel bolts (2). If using a forklift, carefully insert forks into the two forklift channels (5) that run side-to-side at the bottom of ASRA (1).

(c) Move ASRA (View A, 1) to an area that will allow access to AFRA (View B, 6) when it is removed for maintenance.

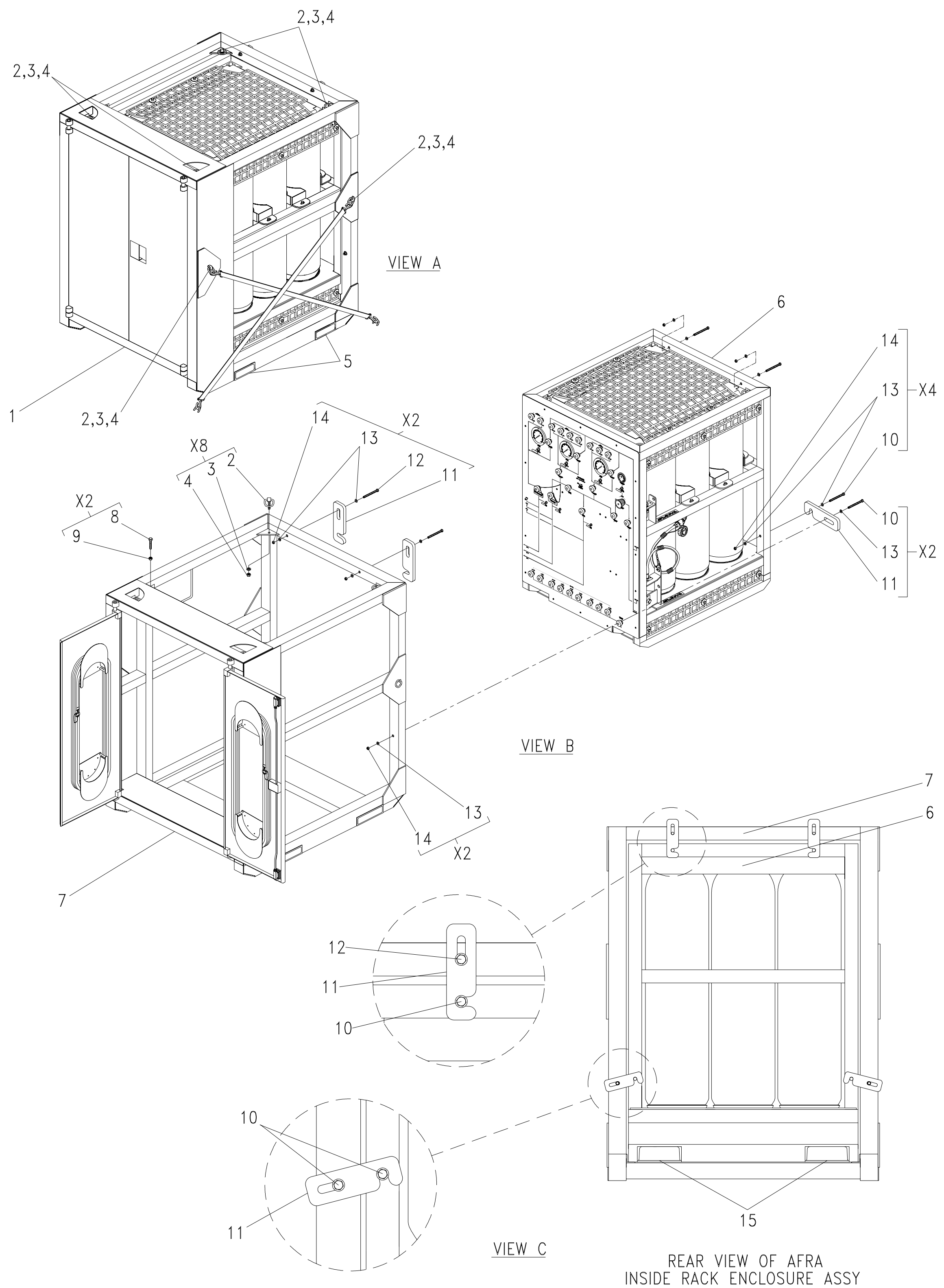


Figure 6-5. Air Flask Rack Assembly (AFRA) Removal and Installation (Sheet 1 of 2)

Item	Description	CAGE Code	Part Number	Qty
1	Air Supply Rack Assembly (ASRA)	53711	53711-6961893	1
2	Bolt, ring swivel	80205	NAS1251-A10-8	8
3	Washer, flat, 0.562 nom	96906	MS15795-843	8
4	Nut, self-locking, 0.5625-18UNJF-3B	96906	MS21044-C9	8
5	Forklift channels	53711	53711-6961940-13	2
6	Air Flask Rack Assembly (AFRA)	53711	53711-6961898-1	1
7	Rack Enclosure Assembly	53711	53711-6961897	1
8	Bolt, hex hd, 0.500-13UNC-2A X 3.00 LG	7R019	35307-419	2
9	Nut, jam, 0.500-13UNC-2B	96906	MS35691-35	2
10	Bolt, hex hd, 0.500-13UNC-2A X 4.50 LG	7R019	35307-425	6
11	Bracket	53711	53711-6961943	4
12	Bolt, hex hd, 0.500-13UNC-2A X 6.00 LG	7R019	35307-429	2
13	Washer, flat, 0.500 nom	96906	MS15795-818	16
14	Nut, self-locking, 0.500-13UNC-2B	96906	MS17830-8C	8
15	Forklift tubes	53711	53711-6961950-31	2

Figure 6-5. Air Flask Rack Assembly (AFRA) Removal and Installation (Sheet 2 of 2)

(2) Remove AFRA (View B, 6) from Rack Enclosure Assembly (7) in accordance with the following procedure:

(a) Remove the two sets of 3-inch hex head bolts (View B, 8) and jam nuts (9) that secure the two bolt plates on Rack Enclosure Assembly (7) to AFRA (6).

(b) Loosen the six 4.5-inch hex head bolts (View C, 10) and the two 6-inch hex head bolts (12) that secure the four brackets (11) to AFRA (6) and Rack Enclosure Assembly (7), and rotate brackets out of the way.

NOTE

It is not necessary to remove upper bracket assemblies (10, 11, 12, 13, 14) or lower bracket assemblies (10, 11, 13, 14) unless damage or corrosion is evident and replacement is required.

(c) Using a forklift, insert forks into forklift tubes (View C, 15) running from front-to-back at bottom of AFRA (6), and slide AFRA out through rear of Rack Enclosure Assembly (7).

b. Reinstallation of AFRA (View B, 6) into Rack Enclosure Assembly (7):

(1) Using a forklift, insert forks into forklift tubes (View C, 15) at bottom rear of AFRA (6) and slide AFRA into rear opening of Rack Enclosure Assembly (7).

(2) Secure the two bolt plates on Rack Enclosure Assembly (View B, 7) to AFRA (6) using the two sets of 3-inch hex head bolts (8) and jam nuts (9).

(3) Rotate the four brackets (View C, 11) on Rack Enclosure Assembly (7) and position hooked ends over the four 4.5-inch hex head bolts (10) on AFRA (6). Tighten bolts (10, 12).

(4) Using lifting equipment or forklift, return ASRA to operating position and secure with tiedowns as required.

6.8.1.2 Composite HP Air Flasks. The following procedure presents the steps required to remove the composite HP air flasks from the AFRA, and also presents the steps required for repair and reinstallation or replacement. There are two types of flasks that may be used in the FADS III Air System: one is the carbon fiber flask (PN 53711-6961914-1) and the other is the Kevlar® flask (PN 53711-6961959). Although the Kevlar® flasks were procured prior to September 1998 and the carbon fiber flasks were procured after September 1998 and each are coated with different materials, any combination of the two types of flasks may be used in the AFRA. The nine flasks in the AFRA are designated as F-022 in JID 6961894 but may be differentiated by the valve numbers assigned to the flask isolation valves (located at the top of the flasks) and to the flask drain valves (located at the bottom of the flasks). Refer to Figure 6-6 for an index of replacement parts and to Appendices E, F, and G for detailed inspection and handling procedures for the composite HP air flasks. Unless otherwise noted, the callouts in the procedure below refer to Figure 6-6.

WARNING

Do not disassemble components while the FADS III Air System is under pressure. Failure to observe this warning may result in injury or death to personnel.

This maintenance action involves entry into a certified boundary and approved re-entry control procedures must be followed.

a. Flask Removal Procedure.

(1) Bleed system pressure to 0 psi.

(2) Remove AFRA from Rack Enclosure Assembly in accordance with paragraph 6.8.1.1, step a.

(3) Conduct external cleaning of AFRA (1).

(4) From top shield plate (2), remove the four sets of panhead screws (3), flat washers (4, 5), and self-locking nuts (6). Remove top shield plate (2).

(5) If required, from the two upper side shields (7), remove the six sets of hex-head cap screws (8), flat washers (4, 5), and self-locking nuts (6). Remove the two upper side shields (7).

(6) If required, from the two lower side shields (9), remove the six sets of panhead screws (3) and flat washers (4). Remove the two lower side shields (9).

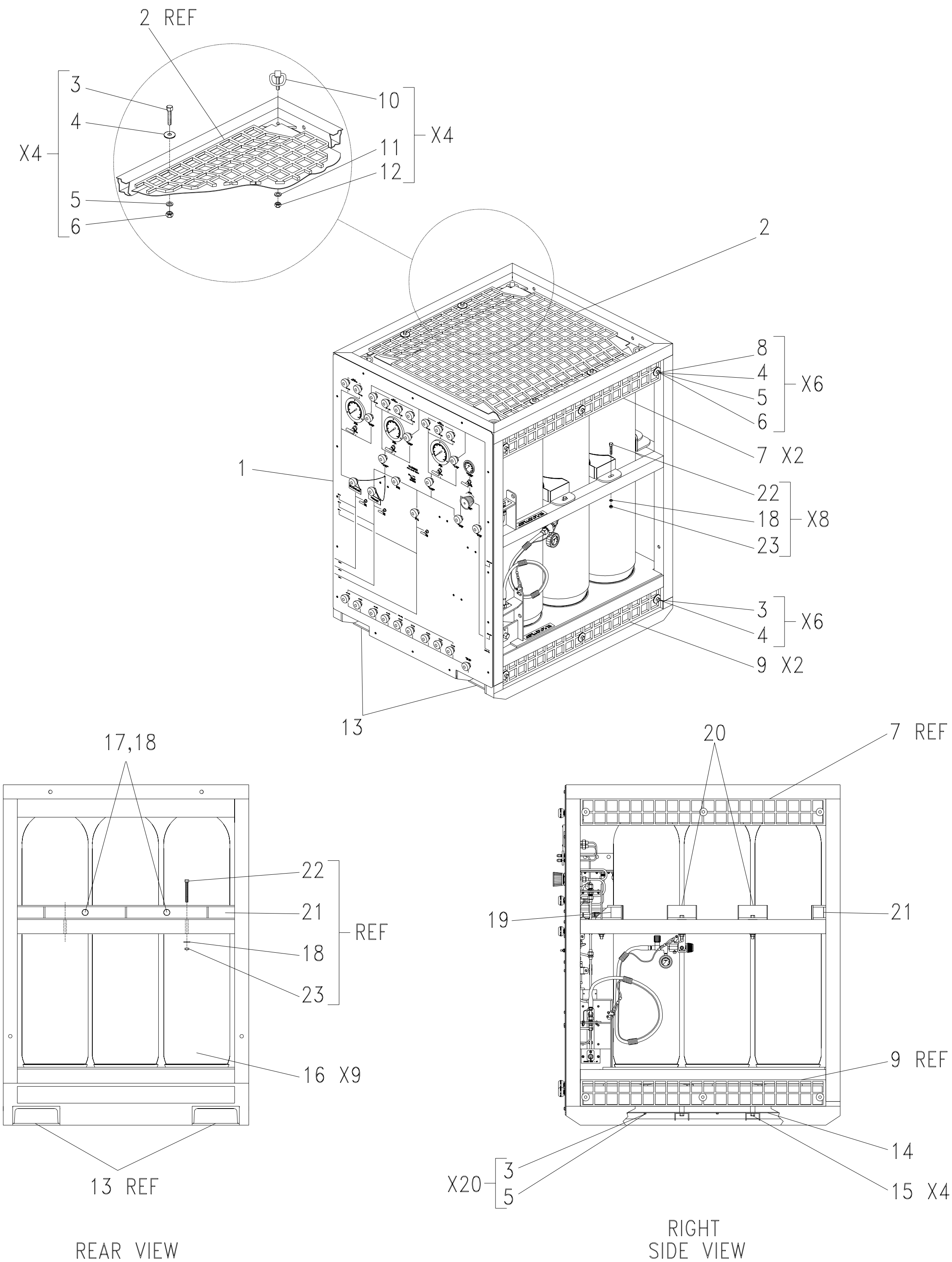


Figure 6-6. Composite HP Air Flask Removal and Installation (Sheet 1 of 2)

Item	Description	CAGE Code	Part Number	Qty
1	Air Flask Rack Assembly (AFRA)	53711	53711-6961898-1	1
2	Shield plate, top	53711	53711-6961898-3	1
3	Screw, panhead, 0.250-20UNC-2A X 0.75 LG	96906	MS51957-81	30
4	Washer, flat	85446	1.250 X .250 X .062 X 301SS	16
5	Washer, flat, 0.25 nom	96906	MS15795-810	30
6	Nut, self-locking, 0.250-20UNC-3B	96906	MS17828-4C	10
7	Side shield, upper	53711	53711-6961898-6	2
8	Screw, cap, hex hd, 0.250-20UNC-2A X 1.00 LG	96906	MS35307-308	6
9	Side shield, lower	53711	53711-6961898-7	2
10	Bolt, ring swivel	80205	NAS1251-A10-8	4
11	Washer, flat, 0.562 nom	96906	MS15795-843	4
12	Nut, self-locking, 0.5625-18UNJF-3B	96906	MS21044-C9	4
13	Forklift tubes	53711	53711-6961950-31	2
14	Shield plate weldment, bottom	53711	53711-6961898-2	1
15	Screw, cap, hex hd, 0.375-16UNC-2A X 1.00 LG	96906	MS35307-360	4
16	Flask, HP Composite, Carbon Fiber Flask, HP Composite, Kevlar®	53711 53711	53711-6961914-1 53711-6961959	9*
17	Rod, threaded (with welded hex nut)	53711	53711-6961954	2
18	Washer, flat, 0.50 nom	96906	MS15795-818	10
19	Flask bracket assembly, front	53711	53711-6961951	1
20	Flask bracket assembly, inner	53711	53711-6961953	2
21	Flask bracket assembly, rear	53711	53711-6961952	1
22	Bolt, hex hd, 0.500-13UNC-2A X 4.50 LG	7R019	35307-425	8
23	Nut, self-locking, 0.500-13UNC-3B	96906	MS16228-8C	8

* Any combination of the two types of flasks may be used to obtain a total quantity of 9.

Figure 6-6. Composite HP Air Flask Removal and Installation (Sheet 2 of 2)

WARNING

Ensure support blocks are stable and capable of supporting the weight of the AFRA. Using inadequate support could result in injury or death to personnel and damage to the equipment.

(7) Using lifting equipment and the four ring swivel bolts (10) or the two forklift tubes (13), lift AFRA (1) and place it on support blocks that are high enough to allow a technician to work underneath.

(8) From bottom shield plate weldment (14), remove the twenty sets of panhead screws (3) and flat washers (5). Remove bottom shield plate weldment (14).

NOTE

There are two channels on the bottom shield plate weldment that are attached using two hex head cap screws (15) per channel. These components do not need to be removed unless damage or corrosion is evident and replacement is required.

(9) Photocopy Figure 6-7 and use it to plan removal of targeted flask(s) (1 thru 9), flex shaft assemblies (10, 11, 12), hose assemblies (13 thru 17), flask drain and flask isolation valves, and other attaching hardware.

(10) Using removal diagram in Figure 6-7, label all flask drain valve flex shaft assemblies (10, 11, 12) that are targeted for removal. Disconnect labeled flex shaft assemblies from valves and AFRA control panel (if necessary, see Figure 6-10 or 6-11 for visual guidance).

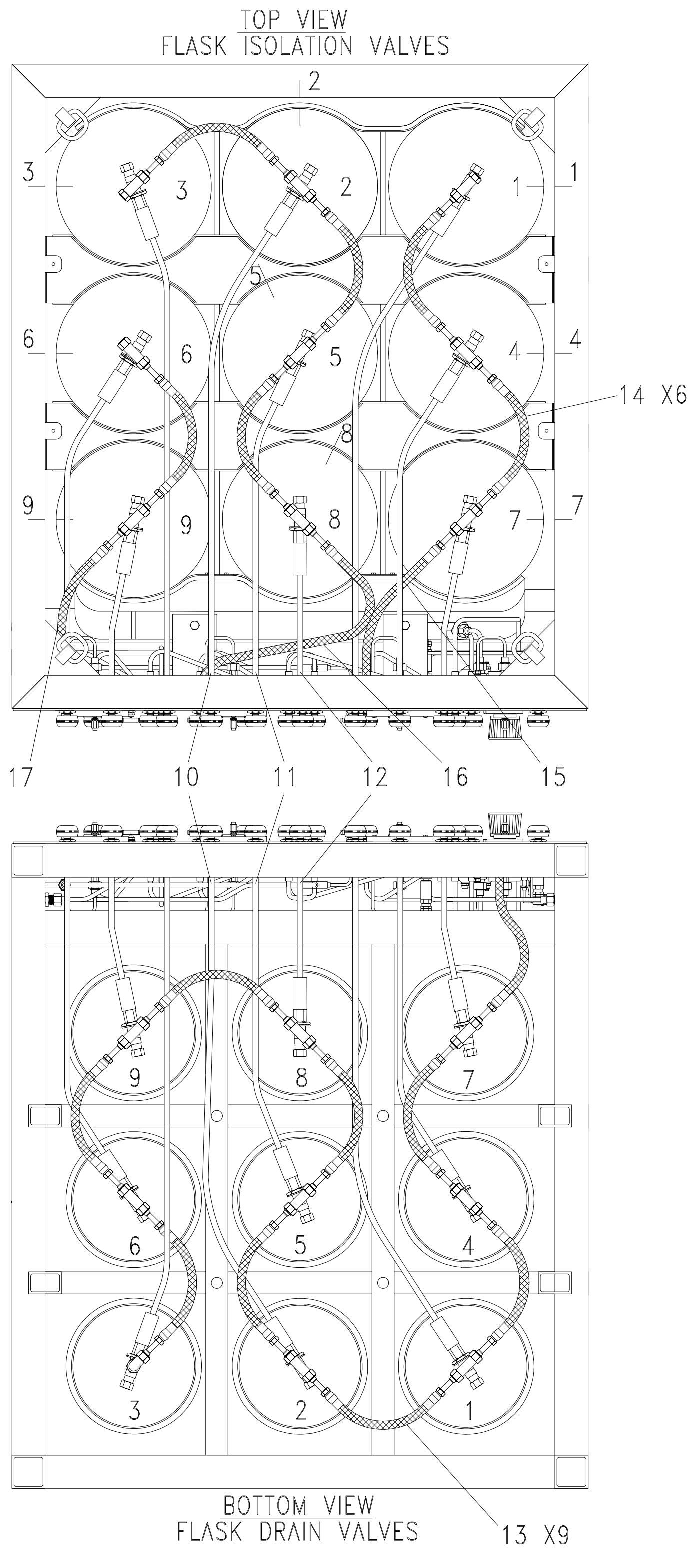
(11) Conduct cleaning of all targeted flask drain valve joints and hose assemblies (13, Figure 6-7) with NID and water.

(12) Label all hose assemblies (13, Figure 6-7) that are targeted for removal, and disconnect hoses. Remove, cut, and discard old O-rings. Bag, plug, or cap hose assemblies and open ports.

(13) If flask drain valve assembly is to be removed, label and remove (as a unit) the reducer union, flask drain valve, and tee (or elbow) from each flask targeted for removal (see paragraph 6.8.1.4 for removal procedures). Install Foreign Material Exclusion (FME) threaded plug in open port of each flask. Remove, cut, and discard O-rings. Bag, plug, or cap open ports of valve assembly.

(14) Ensure area underneath AFRA has been cleared of all tools, supplies, and removed components before exiting.

(15) Using lifting equipment and the four ring swivel bolts (10, Figure 6-6) or the two forklift tubes (13), carefully lift AFRA (1), remove support blocks, and lower AFRA to surface.



INSTRUCTIONS FOR USE

Using four different-colored highlighters and working in both views:

1. Highlight flask(s) targeted for repair or replacement.
2. Highlight flask(s) that must be removed to reach target flask(s).
3. Highlight flex shaft assemblies that must be removed or disconnected.
4. Highlight hose assemblies that must be removed or disconnected.

ABBREVIATED COMPONENT INDEX

Reference the associated figures or drawings in the following list for more information:

1-9	HP Composite Air Flasks	Fig. 6-6
10	Flex Shaft Assembly, 48.25"	Fig. 6-8
11	Flex Shaft Assembly, 32.375"	Fig. 6-8
12	Flex Shaft Assembly, 17"	Fig. 6-8
13	Hose Assembly	6962071-1
14	Hose Assembly	6962071-2
15	Hose Assembly	6962071-3
16	Hose Assembly	6962071-5
17	Hose Assembly	6962071-4

Figure 6-7. Flask Removal Planning Diagram

(16) Using a ladder, climb to top of AFRA (1); if unable to access all the flasks targeted for removal using only a ladder, use a secure platform to provide a stable work surface.

(17) Using a felt-tip pen or other marking device, bench-mark flasks and framework in such a way that the flasks can be placed in the exact same position during reinstallation (see Figure 6-7 for suggested markings). This will help ensure the correct alignment of the hose and flex shaft assemblies during installation.

(18) Using removal diagram in Figure 6-7, label all flask isolation valve flex shaft assemblies (10, 11, 12) that are targeted for removal. Disconnect labeled flex shaft assemblies from valves and AFRA control panel (if necessary, see Figure 6-8 or 6-9 for visual guidance).

(19) Conduct cleaning of all targeted flask isolation valve joints and hose assemblies (14-17, Figure 6-7) with NID and water.

(20) Label all hose assemblies (14-17, Figure 6-7) that are targeted for removal or disconnection, and disconnect hoses. Cut and discard old O-rings. Bag, plug, or cap hose assemblies and open ports.

(21) If flask isolation valve assembly is to be removed, label and remove (as a unit) the reducer union, flask isolation valve, and tee from each flask targeted for removal (see paragraph 6.8.1.3 for removal procedures). Install FME threaded plug in open port of each flask. Remove, cut, and discard O-rings. Bag, plug, or cap open ports of valve assembly.

(22) Remove targeted flasks using the following procedure and Figures 6-6 and 6-7. Follow the procedure only to the extent necessary to remove the required flasks.

(a) Referring to rear and right side views of AFRA (1) in Figure 6-6, use a 3/4-inch socket with extension bar to remove the two threaded rods with welded hex nuts (17) and flat washers (18) that tension front flask bracket assembly (19), the two inner flask bracket assemblies (20), and rear flask bracket assembly (21) together.

(b) From rear flask bracket assembly (21, Figure 6-6), remove the two sets of hex head bolts (22), flat washers (18), and self-locking nuts (23), and remove rear flask bracket assembly.

(c) If any flask in the rear row (1, 2, 3, Figure 6-7) is targeted for removal, carefully remove the required flask(s). If no other flask is targeted, proceed to step (23).

(d) From the first inner flask bracket assembly (20, Figure 6-6), remove the two sets of hex head bolts (22), flat washers (18), and self-locking nuts (23), and remove inner flask bracket assembly.

(e) If any flask in the middle row (4, 5, 6, Figure 6-7) is targeted for removal, carefully remove the required flask(s). If no other flask is targeted, proceed to step (23).

(f) From the second inner flask bracket assembly (20, Figure 6-6), remove the two sets of hex head bolts (22), flat washers (18), and self-locking nuts (23), and remove inner flask bracket assembly.

(g) If any flask in the front row (7, 8, 9, Figure 6-7) is targeted for removal, carefully remove the required flask(s) and continue with step (23).

(23) Ensure the FME threaded plugs, caps, or bagging are securely in place on each end of the removed flask(s).

(24) If hydrostatic testing is required, send flask(s) to authorized testing facility. If making repairs to flask(s), proceed to step b. If making repairs to flask isolation or flask drain valves, refer to the appropriate procedure in paragraphs 6.8.1.3 and 6.8.1.4, respectively.

CAUTION

Do not repair flasks that have been damaged beyond inspection criteria stated in Appendix F, Table F-1.

b. Repair Procedure for Kevlar® and Carbon Fiber Flasks. Repair cuts or abrasions less than 0.010 inch in depth and 1.00 inch in length, parallel to flask centerline, as follows:

(1) Sand damaged area with 120-grit sandpaper.

(2) Clean cut area with fine sandpaper.

(3) Clean cut area with Methyl Ethyl Ketone (MEK) solvent; dry thoroughly.

(4) Cut loose fibers or ends.

(5) While carefully following manufacturer's directions on package for use and drying time, repair cut using any of the following commercial two-part epoxy systems: Devcon®, Master Mend®, Duro®, or Loctite®.

(6) Using available polyurethane enamel (in original color if possible), repaint repaired area and allow to dry overnight. Do not paint over Department of Transportation (DOT) label.

c. Flask Installation Procedure.

(1) Install flask(s) in accordance with the following procedure. Follow the procedure only to the extent necessary to complete installation of the flask(s).

(a) If any flasks in the front row (7, 8, 9, Figure 6-7) were removed, lower them into place and match benchmarks on flasks to marks on frame as shown in Figure 6-7.

(b) Install inner flask bracket assembly (20, Figure 6-6) using the two sets of hex head bolts (22), flat washers (18), and self-locking nuts (23).

(c) If any flasks in the middle row (4, 5, 6, Figure 6-7) were removed, lower them into place and match benchmarks on flasks to marks on frame as shown in Figure 6-7.

(d) Install inner flask bracket assembly (20, Figure 6-6) using the two sets of hex head bolts (22), flat washers (18), and self-locking nuts (23).

(e) If any flasks in the rear row (1, 2, 3, Figure 6-7) were removed, lower them into place and match benchmarks on flasks to marks on frame as shown in Figure 6-7.

(f) Install rear flask bracket assembly (21, Figure 6-6) using the two sets of hex head bolts (22), flat washers (18), and self-locking nuts (23). Do not tighten fasteners at this time.

(g) Install the two threaded rods with welded hex nuts (17, Figure 6-6) and flat washers (18). Torque threaded rods to 30 ft-lb and tighten fasteners on rear flask bracket assembly (21).

(2) Using a ladder, climb to top of AFRA; if unable to access all newly installed flasks from a ladder, use a secure platform to provide a stable work surface.

NOTE

If flask isolation valve assemblies (reducer, valve, and tee) were removed from flasks, complete steps (3) thru (7).

(3) Verify flask isolation valve assembly to be installed is the correct one for the corresponding flask. Apply a light coat of lubricant to one M83248/2-910 O-ring (5, Figure 6-8/6-9) and install O-ring onto reducer union (3, Figure 6-8/6-9).

(4) Remove FME threaded plug or cap-plug from top of flask.

(5) Install reducer union/flask isolation valve/tee unit in top of flask. Torque reducer union 3/8 to 1/2 turn past O-ring engagement.

(6) Install flex shaft assembly (11, Figure 6-8/6-9) on AFRA control panel.

(7) Ensure valve assembly lines up with hose and flex shaft assemblies. If necessary, loosen adjustable nuts on reducer union (3, Figure 6-8/6-9) and tee (2, Figure 6-8/6-9) and reposition valve assembly as required. Torque adjustable nuts 3/8 to 1/2 turn past O-ring engagement.

(8) Repeat steps (3) thru (7) for all other newly installed flasks.

(9) Apply a light coat of lubricant to M83248/2-111 O-rings (4, Figure 6-8/6-9) and install an O-ring onto face of each open port of all tees. AHP-V403, -V407, and -V409 should have only one open port; the other port should be covered by a blind nut (6, Figure 6-8/6-9).

(10) Check hose labels and install hoses (14-17, Figure 6-7) to tees as required. Torque hose fittings to 3/8 to 1/2 turn past O-ring engagement.

(11) Check labels on flex shaft assemblies (10, 11, 12, Figure 6-7) and install to valves as indicated. Ensure that valve end is securely seated on flex shaft adapter (12, Figure 6-8/6-9).

WARNING

Ensure support blocks are stable and capable of supporting the weight of the AFRA. Using inadequate support could result in injury or death to personnel and damage to the equipment.

(12) Using lifting equipment and the four ring swivel bolts (10, Figure 6-6) or the two forklift tubes (13), lift AFRA (1) and place it on the support blocks that were used during flask removal.

NOTE

If flask drain valve assemblies (reducer, valve, and tee) were removed from flasks, complete steps (13) thru (17).

(13) Verify flask drain valve assembly to be installed is the correct one for the corresponding flask. Apply a light coat of lubricant to one M83248/2-910 O-ring (6, Figure 6-10/6-11) and install O-ring onto reducer union (4, Figure 6-10/6-11).

NOTE

Ensure that valve assembly AHP-V416 is installed in the correct flask (flask 3 in Figure 6-7) as it requires a positionable elbow instead of a tee.

(14) Remove FME threaded plug or cap-plug from bottom of flask.

(15) Install reducer union/flask drain valve/tee unit in flask opening. Torque to 3/8 to 1/2 turn past O-ring engagement.

(16) Install flex shaft assembly (12, Figure 6-10/6-11) on AFRA control panel.

(17) Ensure valve assembly lines up with hose and flex shaft assemblies. If necessary, loosen adjustable nuts on reducer union (4, Figure 6-10/6-11) and tee (2, Figure 6-10/6-11) and reposition valve assembly as required. Torque adjustable nuts 3/8 to 1/2 turn past O-ring engagement.

(18) Repeat steps (13) thru (17) for all other newly installed flasks.

(19) Apply a light coat of lubricant to M83248/2-010 O-rings (5, Figure 6-10/6-11), and install onto face of each open port of all tees. The unit containing AHP-V416 requires only one O-ring; install O-ring onto face of open port of elbow (3, Figure 6-10/6-11).

(20) Check hose labels and install hoses (13, Figure 6-7) to tees (and elbow) as required. Torque hose fittings 3/8 to 1/2 turn past O-ring engagement.

(21) Check labels on flex shaft assemblies (10, 11, 12, Figure 6-7) and install to valves and AFRA control panel as indicated. Ensure that valve end is securely seated on flex shaft adapter (13, Figure 6-10/6-11).

(22) Conduct joint tightness test of all joints to 5,000 ± 100 psi for not less than 15 minutes. Document results on a test and inspection report.

(23) Conduct a 24-hour drop test to 5,000 ± 100 psi. Document all required information on a test and inspection report.

(24) Reinstall bottom shield plate weldment (14, Figure 6-6) using the twenty sets of panhead screws (3) and flat washers (5).

(25) Using lifting equipment and the four ring swivel bolts (10, Figure 6-6) or the two forklift tubes (13), carefully lift AFRA (1), remove support blocks, and lower AFRA to surface.

(26) If removed, reinstall the two lower side shields (9, Figure 6-6) using the six sets of panhead screws (3) and flat washers (4).

(27) If removed, reinstall the two upper side shields (7, Figure 6-6) using the six sets of hex-head cap screws (8), flat washers (4, 5), and self-locking nuts (6).

(28) Reinstall the top shield plate (2, Figure 6-6) using the four sets of panhead screws (3), flat washers (4, 5), and self-locking nuts (6).

(29) Reinstall AFRA into Rack Enclosure Assembly in accordance with paragraph 6.8.1.1, step b.

(30) Complete re-entry control forms.

6.8.1.3 Flask Isolation Triport Shutoff Valves (AHP-V401, -V402, -V403, -V404, -V405, -V406, -V407, -V408, -V409). The nine composite HP air flasks housed in the AFRA are equipped with a manually operated triport shutoff valve at the top and bottom of each flask. The top valve functions as a flask isolation valve and the bottom valve functions as a flask drain valve. The main difference between the two types of valves is that the flask isolation valves are equipped with rupture discs (safety assemblies) and the flask drain valves are equipped with thermal safety devices. The nine flask isolation valves covered here and the nine flask drain valves covered in paragraph 6.8.1.4 are assigned individual valve numbers to help identify their locations within the AFRA (see Figure 6-2).

Each flask isolation valve is installed in the top port of an HP air flask using a reducer union and two straight thread O-rings as shown in Figure 6-8. A male tee is installed in the top port of each valve using one straight thread O-ring. For AHP-V401, -V402, -V404, -V405, -V406, and -V408, two interconnecting hose assemblies are attached to the ports of the tee using one face seal O-ring per port. For AHP-V403, -V407, and -V409, one connecting hose assembly and a blind nut are attached to the ports of the tee using one face seal O-ring per port as shown in the inset in Figure 6-8.

The flask isolation valves are remotely controlled from the AFRA control panel assembly using flex shaft assemblies in three lengths as shown in the parts index in Figure 6-8; the length used will depend on the valve body's distance from the control panel. The flex shaft assembly, which is equivalent to an extension of the valve stem, is connected to the valve stem on one end using an adapter, and the other end is inserted through the panel and held in place with a panel nut on either side of the panel. The valve handle, which is supplied with the valve, is attached to the stem of the flex shaft assembly to allow remote manual operation.

Two versions of the flask isolation valve—one made by Circle Seal (PN HV09-13-2) and the other by CPV (PN PLB-12760-2)—are approved for use with the FADS III Air System. To allow for differences in design, corrective maintenance for the flask isolation valves has been divided into two procedures: Procedure A below covers the Circle Seal valves and Procedure B on page 6-37 covers the CPV valves.

PROCEDURE A: CIRCLE SEAL TRIPORT SHUTOFF VALVES (PN HV09-13-2)

All callouts in the following procedure refer to the illustrated parts list in Figure 6-8. See Chapter 7 for additional ordering information.

WARNING

Do not disassemble components while the FADS III Air System is under pressure. Failure to observe this warning may result in injury or death to personnel.

This maintenance action involves entry into a certified boundary and approved re-entry control procedures must be followed.

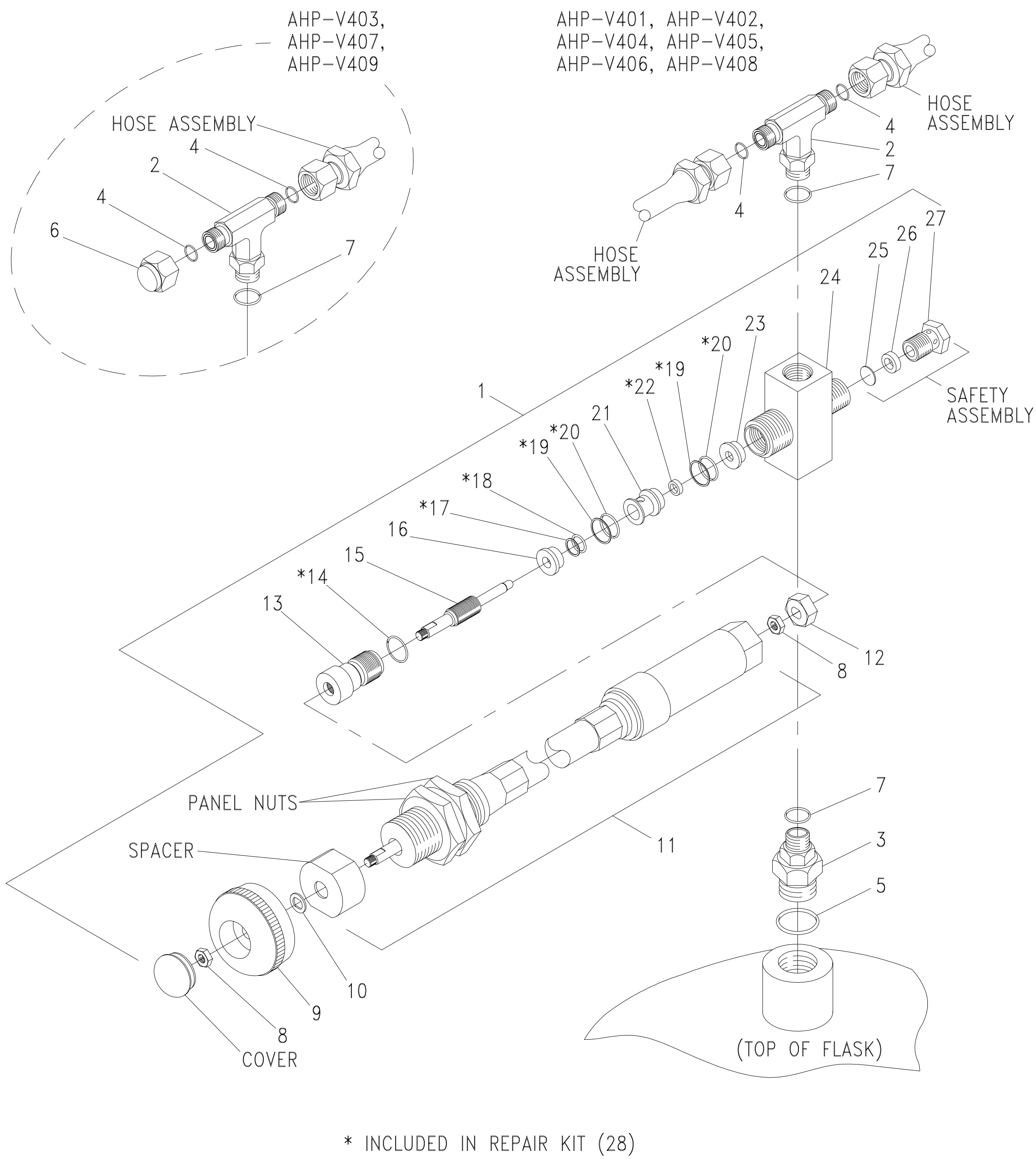


Figure 6-8. Circle Seal Flask Isolation Triport Shutoff Valves (AHP-V401, -V402, -V403, -V404, -V405, -V406, -V407, -V408, -V409) (Sheet 1 of 2)

Item	Description	CAGE Code	Part Number	Qty
1	Shutoff valve, triport	91816	HV09-13-2	1
2	Tee, male	02570	SS-8-VCO-TP-8VCO-6ST	1
3	Reducer union	02570	SS-10-SAE-6P-6ST-05055	1
4	O-ring, face seal (tee)	81349	M83248/2-111	2
5	O-ring, straight thread (reducer union)	81349	M83248/2-910	1
6*	Blind nut*	02570	SS-8-VCO-4-BL*	1
7	O-ring, straight thread (reducer union and tee)	81349	M83248/2-906	2
8	Nut (flex shaft adapter and handle)	91816	-6521SC	2
9	Handle, black	91816	-26689-2	1
10	Washer	91816	1940SL	1
11	Flex shaft assembly, 17 in. Flex shaft assembly, 32.375 in. Flex shaft assembly, 48.25 in.	0KZS2	FAUSG14AZ1 (401, 404, 408) FAUSG14AZ2 (402, 405, 409) FAUSG14AZ3 (403, 406, 407)	1 ea. 1 ea. 1 ea.
12	Flex shaft adapter	53711	6961958	1
13	Gland nut	91816	A12914B	1
14	Snap ring	91816	9045-700	1
15	Valve stem	91816	12956M	1
16	Spacer	91816	12912B	1
17	Back-up ring, small	91816	A1939L	1
18	O-ring, small	91816	4010-32 (size AS568-010)	1
19	Back-up ring, large	91816	1958L	2
20	O-ring, large	91816	4013-32 (size AS568-013)	2
21	Sleeve	91816	12910B	1
22	Seal	91816	12941L1	1
23	Insert	91816	12940B	1
24	Body	91816	38643	1
25	Rupture disc	91816	-6255-8000	1
26	Follower disc	91816	A100913T	1
27	Disc nut	91816	-36447	1
28	Repair kit (contains 14, 17-20, and 22)	91816	17314	AR

* Used on tees connected to AHP-V403, -V407, and -V409 only.

Figure 6-8. Circle Seal Flask Isolation Triport Shutoff Valves (AHP-V401, -V402, -V403, -V404, -V405, -V406, -V407, -V408, -V409) (Sheet 2 of 2)

a. Remove:

(1) Bleed system pressure to 0 psi.

(2) If necessary, remove AFRA from Rack Enclosure Assembly in accordance with paragraph 6.8.1.1, step a.

(3) If required, conduct external cleaning of AFRA (1, Figure 6-6).

(4) From top shield plate (2, Figure 6-6), remove the four sets of panhead screws (3), flat washers (4, 5), and self-locking nuts (6). Remove top shield plate (2).

(5) Disconnect flex shaft assembly (11, Figure 6-8) from targeted valve and from AFRA control panel. If more than one valve is targeted for removal, label the flex shaft assemblies prior to removal.

(6) Using NID and water, clean targeted valve(s), attaching parts, and all joints to be opened.

NOTE

The callouts in the remainder of this procedure refer to Figure 6-8, unless otherwise noted.

(7) Disconnect all hose assemblies from tee located above valve targeted for removal. Remove, cut, and discard O-rings (4). Bag, plug, or cap all open ports.

(8) At reducer union (3), unscrew union/valve/tee as a unit from top of flask. Install FME threaded plug or cap-plug in open port of each flask.

(9) Remove, cut, and discard reducer union O-ring (5).

NOTE

AHP-V403, -V407, and -V409 will have only one visible face seal O-ring (4). Remove and replace blind nut (6) and other face seal O-ring (4) only if damage is noted or otherwise instructed to do so.

(10) Remove reducer union (3) from valve body (24).

(11) Remove O-ring (7) from reducer union (3); cut and discard O-ring.

(12) Remove male tee (2) from valve body (24).

(13) Remove O-ring (7) from male tee (2); cut and discard O-ring.

(14) Remove nut (8) and flex shaft adapter (12) from valve stem (15).

(15) If valve is to be repaired, proceed to repair procedure in step b. If valve is to be replaced, install new valve in accordance with step c.

b. Repair:

(1) Using the following procedure and Figure 6-8 as a guide, disassemble valve components as follows:

(a) Secure valve body (24) in vise with protective material against valve inlet/outlet faces to prevent scratching or other damage.

(b) Insert small flat-head screwdriver into slot of valve body (24) below snap ring (14), and remove ring from groove.

(c) Unscrew gland nut (13) in clockwise direction (left-hand threads) and remove gland nut (13), valve stem (15), and snap ring (14) from valve body (24).

(d) Carefully remove spacer (16), sleeve (21), and insert (23) assemblies from valve body (24), taking care not to scratch the inner bore sealing surface of valve body (24).

(e) Remove large back-up ring (19) and large O-ring (20) from spacer (16), along with small O-ring (18) and small back-up ring (17) from inside of spacer (16); cut and discard removed components.

(f) Remove seal (22), large back-up ring (19), and large O-ring (20) from sleeve (21); cut and discard removed components.

(g) Remove valve stem (15) and snap ring (14) from gland nut (13); discard snap ring.

(h) If safety assembly is to be replaced, remove disc nut (27), follower disc (26), and rupture disc (25). Discard rupture disc (25).

NOTE

It is recommended that Circle Seal assembly tools 16268, 16715, and 16717 be utilized during assembly of the Circle Seal flask isolation triport shutoff valves.

(2) Using parts from repair kit (28) or from parts list in Figure 6-8, replace defective component(s) and reassemble shutoff valve (1) in accordance with the following procedure:

WARNING

Different brands of MIL-G-27617 Type III greases should never be mixed. Ensure all old grease is removed prior to applying new grease.

(a) Apply a light coat of MIL-G-27617 Type III lubricant to new O-rings (18, 20), back-up rings (17, 19), threads of valve stem (15), and inner bore of valve body (24).

(b) Screw valve stem (15) into gland nut (13) until valve stem stops against shoulder of gland nut. Using tool 16717, install snap ring (14) onto gland nut (13).

(c) Install small back-up ring (17) and small O-ring (18) inside of spacer (16), and install large back-up ring (19) and large O-ring (20) onto spacer (16).

(d) Using tools 16268 and 16715, slip spacer (16) onto valve stem (15).

(e) Apply a light coat of MIL-G-27617 Type III lubricant to new seal (22), large back-up ring (19), and large O-ring (20), and install components on sleeve (21).

(f) Install insert (23) into valve body (24) and ensure firmly seated.

(g) Slide sleeve assembly (19-22) onto valve stem (15) until it stops against spacer (16).

(h) Insert valve stem assembly (13-22) into valve body (24) and screw gland nut (13) counterclockwise, being careful not to pinch large O-ring (20) against thread bore transition of valve body (24), until gland nut (13) bottoms out.

WARNING

Torque gland nut to limits described below, not as marked on valve body. Torque values stamped into valve body are double actual limits and create a safety hazard to personnel and equipment.

(i) Torque gland nut (13) to 55-65 in-lb, and set snap ring (14) into groove.

(j) If applicable, install new rupture disc (25), follower disc (26), and disc nut (27) into valve body (24). Torque disc nut to 190-210 in-lb.

c. Install:

(1) Install flex shaft adapter (12) and nut (8) onto valve stem (15).

(2) Apply a light coat of MIL-G-27617 Type III lubricant to new O-ring (7), install O-ring on straight threads of male tee (2), and install tee into valve body (24). Do not tighten adjustable nut at this time.

(3) Apply a light coat of MIL-G-27617 Type III lubricant to new O-ring (7), install O-ring on straight threads of reducer union (3), and install reducer union into valve body (24). Do not tighten adjustable nut at this time.

(4) Apply a light coat of MIL-G-27617 Type III lubricant to new O-ring (5), and install O-ring on reducer union (3).

(5) Remove FME threaded plug or cap-plug from top of flask.

(6) Install reducer union/valve/tee unit in flask opening. Torque reducer union 3/8 to 1/2 turn past O-ring engagement.

(7) Install flex shaft assembly (11) on AFRA control panel.

(8) Ensure tee (2) and flask isolation valve (1) line up with hoses and flex shaft assembly (11). If necessary, loosen adjustable nuts on reducer union (3) and tee (2), align tee and valve, and torque adjustable nuts 3/8 to 1/2 turn past O-ring engagement.

(9) Apply a light coat of MIL-G-27617 Type III lubricant to new O-rings (4) and install O-rings on face of each open port of tee (2). AHP-V403, -V407, and -V409 should have only one open port; the other port should be covered by blind nut (6).

(10) Install hose assemblies to tee (2) as required. Torque hose fittings 3/8 to 1/2 turn past O-ring engagement.

(11) Install flex shaft assembly (11) on flex shaft adapter (12) and ensure securely seated.

(12) Conduct joint tightness test of all joints to 5,000 ± 100 psi for not less than 15 minutes. Document results on a test and inspection report.

(13) Conduct a 24-hour drop test to 5,000 ± 100 psi. Document all required information on a test and inspection report.

(14) Reinstall top shield plate (2, Figure 6-6) using the four sets of panhead screws (3), flat washers (4, 5), and self-locking nuts (6).

(15) If removed, reinstall AFRA into Rack Enclosure Assembly in accordance with paragraph 6.8.1.1, step b.

(16) Complete re-entry control forms.

PROCEDURE B: CPV TRIPORT SHUTOFF VALVES (PN PLB-12760-2)

All callouts in the following procedure refer to the illustrated parts list in Figure 6-9. See Chapter 7 for additional ordering information.

WARNING

Do not disassemble components while the FADS III Air System is under pressure. Failure to observe this warning may result in injury or death to personnel.

This maintenance action involves entry into a certified boundary and approved re-entry control procedures must be followed.

a. Remove:

(1) Bleed system pressure to 0 psi.

(2) If necessary, remove AFRA from Rack Enclosure Assembly in accordance with paragraph 6.8.1.1, step a.

(3) If required, conduct external cleaning of AFRA (1, Figure 6-6).

(4) From top shield plate (2, Figure 6-6), remove the four sets of panhead screws (3), flat washers (4, 5), and self-locking nuts (6). Remove top shield plate (2).

(5) Disconnect flex shaft assembly (11, Figure 6-9) from targeted valve and from AFRA control panel. If more than one valve is targeted for removal, label the flex shaft assemblies prior to removal.

(6) Using NID and water, clean targeted valve(s), attaching parts, and all joints to be opened.

NOTE

The callouts in the remainder of this procedure refer to Figure 6-9, unless otherwise noted.

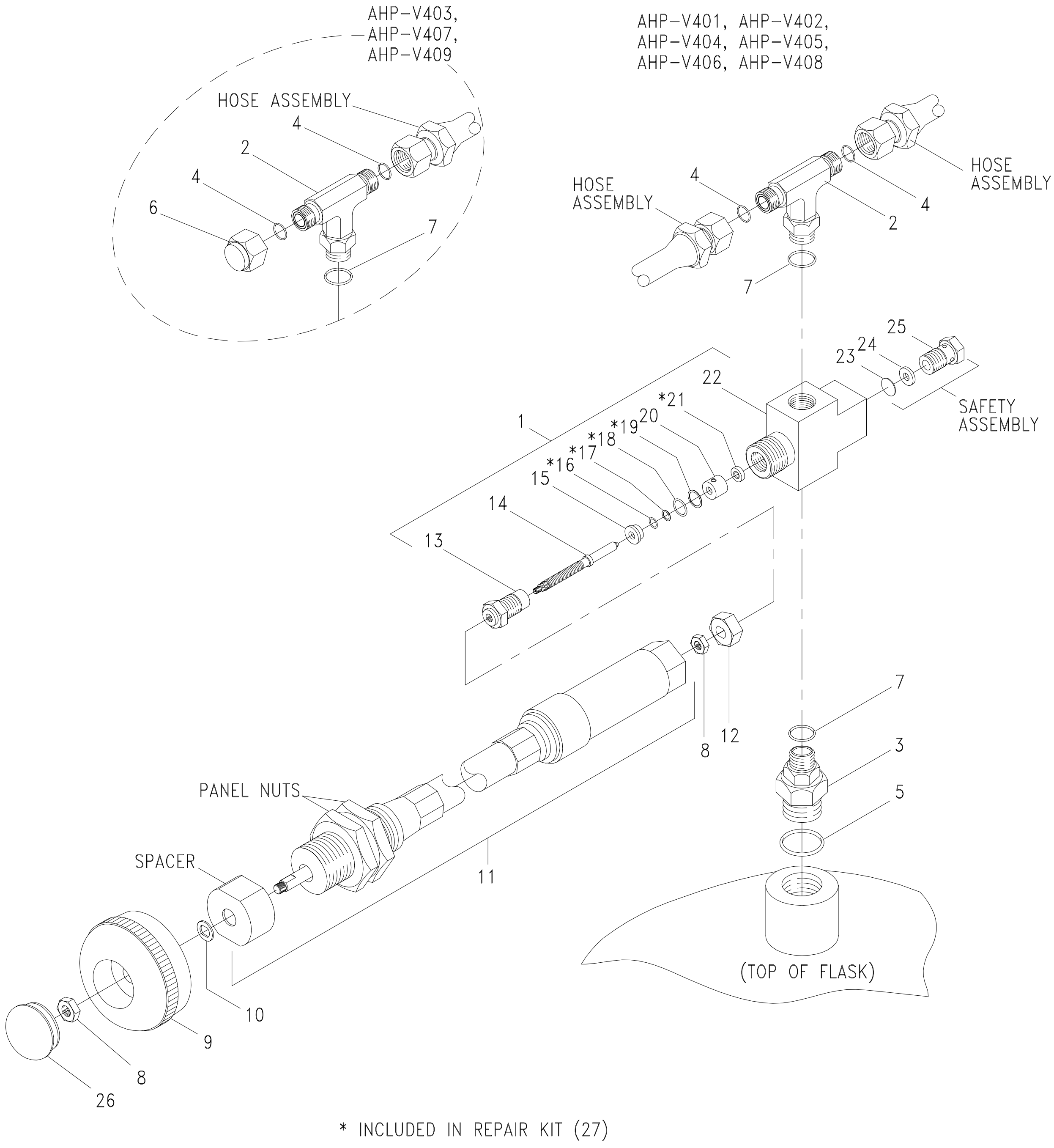


Figure 6-9. CPV Flask Isolation Triport Shutoff Valves (AHP-V401, -V402, -V403, -V404, -V405, -V406, -V407, -V408, -V409) (Sheet 1 of 2)

Item	Description	CAGE Code	Part Number	Qty
1	Shutoff valve, triport	99565	PLB-12760-2	1
2	Tee, male	02570	SS-8-VCO-TP-8VCO-6ST	1
3	Reducer union	02570	SS-10-SAE-6P-6ST-05055	1
4	O-ring, face seal (tee)	81349	M83248/2-111	2
5	O-ring, straight thread (reducer union)	81349	M83248/2-910	1
6*	Blind nut*	02570	SS-8-VCO-4-BL*	1
7	O-ring, straight thread (reducer union and tee)	81349	M83248/2-906	2
8	Nut (flex shaft adapter and handle)	99565	10-32	2
9	Handle, black	99565	130110DL-2	1
10	Retaining ring	99565	005506XX	1
11	Flex shaft assembly, 17 in. Flex shaft assembly, 32.375 in. Flex shaft assembly, 48.25 in.	0KZS2	FAUSG14AZ1 (401, 404, 408) FAUSG14AZ2 (402, 405, 409) FAUSG14AZ3 (403, 406, 407)	1 ea. 1 ea. 1 ea.
12	Flex shaft adapter	53711	6961958	1
13	Gland nut	99565	127940AC	1
14	Valve stem	99565	127930DC	1
15	Spacer	99565	127960AG	1
16	Back-up ring, small	99565	011010EL	1
17	O-ring, small	99565	000010EE	1
18	Back-up ring, large	99565	011013EL	1
19	O-ring, large	99565	000013EE	1
20	Sleeve	99565	127950AG	1
21	Disc	99565	127970EW	1
22	Valve body	99565	127920CF	1
23	Rupture disc	99565	128450XX	1
24	Follower disc	99565	128040CC	1
25	Disc nut	99565	128030DC	1
26	Cover	99565	130387BA	1
27	Repair kit (16-19, 21)	99565	PLB-1276SK	AR

* Used on tees connected to AHP-V403, -V407, and -V409 only.

Figure 6-9. CPV Flask Isolation Triport Shutoff Valves (AHP-V401, -V402, -V403, -V404, -V405, -V406, -V407, -V408, -V409) (Sheet 2 of 2)

(7) Disconnect all hose assemblies from tee located above valve targeted for removal. Remove, cut, and discard O-rings (4). Bag, plug, or cap all open ports.

(8) At reducer union (3), unscrew union/valve/tee as a unit from top of flask. Install FME threaded plug or cap-plug in open port of each flask.

(9) Remove, cut, and discard O-ring (5).

NOTE

AHP-V403, -V407, and -V409 will have only one visible face seal O-ring (4). Remove and replace blind nut (6) and other face seal O-ring (4) only if damage is noted or otherwise instructed to do so.

(10) Remove reducer union (3) from valve body (22).

(11) Remove O-ring (7) from reducer union (3); cut and discard O-ring.

(12) Remove male tee (2) from valve body (22).

(13) Remove O-ring (7) from male tee (2); cut and discard O-ring.

(14) Remove nut (8) and flex shaft adapter (12) from valve stem (14).

(15) If valve is to be repaired, continue with step b. If entire valve is to be replaced, skip to step c.

b. Repair:

(1) Using the following procedure and Figure 6-9 as a guide, disassemble valve components as follows:

(a) Secure valve body (22) in vise with protective material against valve inlet/outlet faces to prevent scratching or other damage.

(b) Unscrew gland nut (13) (in clockwise direction) and remove valve stem and sleeve assembly (13-21) from valve body (22).

(c) From valve stem (14), remove sleeve (20) and spacer (15) assemblies.

(d) From sleeve (20) assembly, remove large back-up ring (18), large O-ring (19), and sleeve disc (21). Cut and discard O-ring.

(e) From spacer (15) assembly, remove small O-ring (17) and small back-up ring (16). Cut and discard O-ring.

(f) Unscrew valve stem (14) from gland nut (13).

(g) If safety assembly is to be replaced, remove disc nut (25), follower disc (24), and rupture disc (23) from valve body (22).

(2) Using parts from repair kit (26) or from parts list in Figure 6-9, replace defective component(s) and reassemble shutoff valve (1) as follows:

(a) Ensure valve body (22) is secured in vise with protective material against valve inlet/outlet faces to prevent scratching or other damage.

(b) If applicable, install new rupture disc (23), follower disc (24), and disc nut (25) into valve body (22). Torque disc nut to 190-210 in-lb.

WARNING

Different brands of MIL-G-27617 Type III greases should never be mixed. Ensure all old grease is removed prior to applying new grease.

CAUTION

If steps (c) thru (g) are not followed in the exact order shown, damage to the O-rings and back-up rings may occur.

(c) Apply a light coat of MIL-G-27617 Type III lubricant to threads of valve stem (14), and screw valve stem into gland nut (13) until valve stem stops against shoulder of gland nut.

(d) Apply a light coat of MIL-G-27617 Type III lubricant to new O-rings (17, 19), back-up rings (16, 18), and inner bore of valve body (22).

(e) Slide spacer (15), small back-up ring (16), and small O-ring (17) onto valve stem (14) until spacer stops against gland nut (13). Ensure O-ring (17) is securely seated into spacer (15).

(f) Install sleeve disc (21), large O-ring (19), and large back-up ring (18) on sleeve (20). Slide sleeve assembly onto valve stem (14) until it stops against spacer (15).

(g) Insert valve stem assembly (13-21) into valve body (22) and screw gland nut (13) counterclockwise, being careful not to pinch large O-ring (19) against thread bore transition until cartridge bottoms out.

(h) Torque gland nut (13) to 75-100 in-lb.

c. Install:

(1) Install flex shaft adapter (12) and nut (8) onto valve stem (14).

(2) Apply a light coat of MIL-G-27617 Type III lubricant to new O-ring (7), install O-ring on straight threads of male tee (2), and install tee into valve body (22). Do not tighten adjustable nut at this time.

(3) Apply a light coat of MIL-G-27617 Type III lubricant to new O-ring (7), install O-ring on straight threads of reducer union (3), and install reducer union into valve body (22). Do not tighten adjustable nut at this time.

(4) Apply a light coat of MIL-G-27617 Type III lubricant to new O-ring (5), and install O-ring on reducer union (3).

(5) Remove FME threaded plug or cap-plug from top of flask.

(6) Install reducer union/valve/tee unit in flask opening. Torque reducer union 3/8 to 1/2 turn past O-ring engagement.

(7) Install flex shaft assembly (11) on AFRA control panel.

(8) Ensure tee (2) and flask isolation valve (1) line up with hoses and flex shaft assembly (11). If necessary, loosen adjustable nuts on reducer union (3) and tee (2), align tee and valve, and torque adjustable nuts 3/8 to 1/2 turn past O-ring engagement.

(9) Apply a light coat of MIL-G-27617 Type III lubricant to new O-rings (4) and install O-rings on face of each open port of tee (2). AHP-V403, -V407, and -V409 should have only one open port; the other port should be covered by blind nut (6).

(10) Install hose assemblies to tee (2) as required. Torque hose fittings 3/8 to 1/2 turn past O-ring engagement.

(11) Install flex shaft assembly (11) on flex shaft adapter (12) and ensure securely seated.

(12) Conduct joint tightness test of all joints to 5,000 ± 100 psi for not less than 15 minutes. Document results on a test and inspection report.

(13) Conduct a 24-hour drop test to 5,000 ± 100 psi. Document all required information on a test and inspection report.

(14) Reinstall top shield plate (2, Figure 6-6) using the four sets of panhead screws (3), flat washers (4, 5), and self-locking nuts (6).

(15) If removed, reinstall AFRA into Rack Enclosure Assembly in accordance with paragraph 6.8.1.1, step b.

(16) Complete re-entry control forms.

6.8.1.4 Flask Drain Triport Shutoff Valves (AHP-V410, -V411, -V412, -V413, -V414, -V415, -V416, -V417, -V418). The nine composite HP air flasks housed in the AFRA are equipped with a manually operated triport shutoff valve at the top and bottom of each flask. The top valve functions as a flask isolation valve and the bottom valve functions as a flask drain valve. The main difference between the two types of valves is that the flask isolation valves are equipped with rupture discs (safety assemblies) and the flask drain valves are equipped with thermal safety devices. The nine flask drain valves covered here and the nine flask isolation valves covered in paragraph 6.8.1.3 are assigned individual valve numbers to help identify their locations within the AFRA (see Figure 6-2).

Each flask drain valve is installed in the bottom port of an HP air flask using a reducer union and two straight thread O-rings as shown in Figure 6-10. A male tee is installed in the bottom port of each valve (except for AHP-V416) using one straight thread O-ring. Two interconnecting hose assemblies are attached to the ports of the tee using one face seal O-ring per port. A positionable elbow is installed in the bottom port of AHP-V416 using one straight thread O-ring, and a single hose assembly is attached to the elbow port using one face seal O-ring as shown in the inset in Figure 6-10.

The flask drain valves are remotely controlled from the AFRA control panel assembly using flex shaft assemblies in three lengths as shown in the parts index in Figure 6-10; the length used will depend on the valve body's distance from the control panel. The flex shaft assembly, which is equivalent to an extension of the valve stem, is connected to the valve stem on one end using an adapter, and the other end is inserted through the panel and held in place with a panel nut on either side of the panel. The valve handle, which is supplied with the valve, is attached to the stem of the flex shaft assembly to allow remote manual operation.

Two versions of the flask drain valve—one made by Circle Seal (PN HV09-14-2) and the other by CPV (PN PLB-12765-2)—are approved for use with the FADS III Air System. To allow for differences in design, corrective maintenance for the flask drain valves has been divided into two procedures: Procedure A below covers the Circle Seal valves and Procedure B on page 6-51 covers the CPV valves.

PROCEDURE A: CIRCLE SEAL TRIPORT SHUTOFF VALVES (PN HV09-14-2)

All callouts in the following procedure refer to the illustrated parts list in Figure 6-10. See Chapter 7 for additional ordering information.

WARNING

Do not disassemble components while the FADS III Air System is under pressure. Failure to observe this warning may result in injury or death to personnel.

This maintenance action involves entry into a certified boundary and approved re-entry control procedures must be followed.

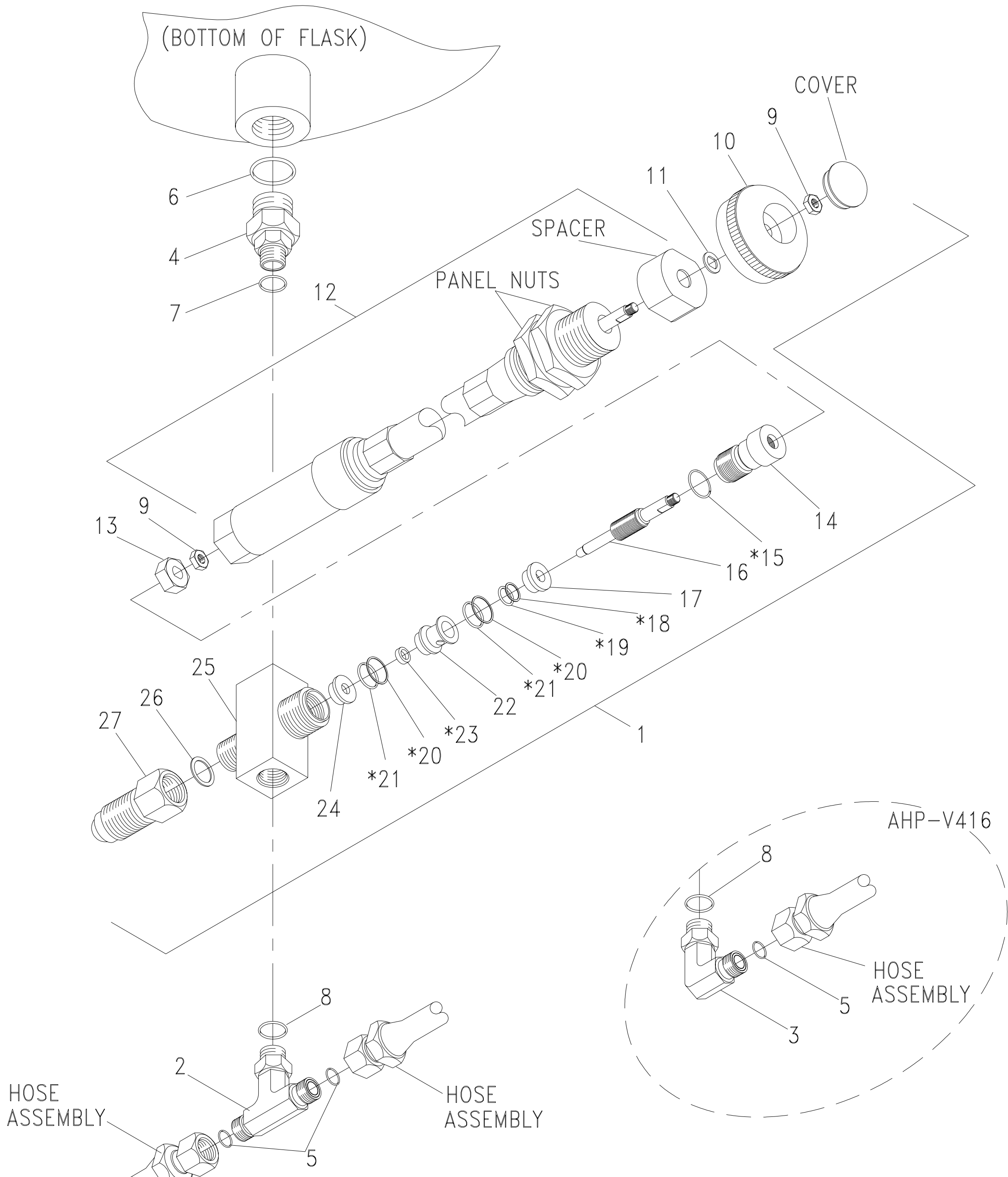


Figure 6-10. Circle Seal Flask Drain Triport Shutoff Valves (AHP-V410, -V411, -V412, -V413, -V414, -V415, -V416, -V417, -V418) (Sheet 1 of 2)

Item	Description	CAGE Code	Part Number	Qty
1	Shutoff valve, triport	91816	HV09-14-2	1
2	Tee, male (for all but AHP-V416)	02570	SS-8-VCO-TP-4VCO-4ST	1
3	Elbow, positionable (for AHP-V416 only)	02570	SS-4-VCO-9P-4ST	1
4	Reducer union	02570	SS-10-SAE-6P-6ST-05055	1
5	O-ring, face seal (tee and elbow)	81349	M83248/2-010	2 / 1
6	O-ring, straight thread (reducer union)	81349	M83248/2-910	1
7	O-ring, straight thread (reducer union)	81349	M83248/2-906	1
8	O-ring, straight thread (tee or elbow)	81349	M83248/2-904	1
9	Nut (flex shaft adapter and handle)	91816	-6521SC	2
10	Handle, black	91816	-26689-2	1
11	Washer	91816	1940SL	1
12	Flex shaft assembly, 17 in. Flex shaft assembly, 32.375 in. Flex shaft assembly, 48.25 in.	0KZS2	FAUSG14AZ1 (410, 413, 417) FAUSG14AZ2 (411, 414, 418) FAUSG14AZ3 (412, 415, 416)	1 ea. 1 ea. 1 ea.
13	Flex shaft adapter	53711	6961958	1
14	Gland nut	91816	A12914B	1
15	Snap ring	91816	9045-700	1
16	Valve stem	91816	12956M	1
17	Spacer	91816	12912B	1
18	Back-up ring, small	91816	A1939L	1
19	O-ring, small	91816	4010-32 (size AS568-010)	1
20	Back-up ring, large	91816	1958L	2
21	O-ring, large	91816	4013-32 (size AS568-013)	2
22	Sleeve	91816	12910B	1
23	Seal	91816	12941L1	1
24	Insert	91816	12940B	1
25	Body	91816	38643	1
26	Washer (thermal safety device)	91816	-2237-0419C	1
27	Thermal safety device	91816	-7770	1
28	Repair kit (15,18-21,23)	91816	17314	AR

Figure 6-10. Circle Seal Flask Drain Triport Shutoff Valves (AHP-V410, -V411, -V412, -V413, -V414, -V415, -V416, -V417, -V418) (Sheet 2 of 2)

a. Remove:

(1) Bleed system pressure to 0 psi.

(2) If necessary, remove AFRA from Rack Enclosure Assembly in accordance with paragraph 6.8.1.1, step a.

(3) If required, conduct external cleaning of AFRA (1, Figure 6-6).

WARNING

Ensure support blocks are stable and capable of supporting the weight of the AFRA. Using inadequate support could result in injury or death to personnel and damage to the equipment.

(4) Using lifting equipment and the four ring swivel bolts (10, Figure 6-6) or the two forklift tubes (13), lift AFRA (1) and place it on support blocks that are high enough to allow a technician to work underneath.

(5) From bottom shield plate weldment (14, Figure 6-6), remove the twenty sets of panhead screws (3), flat washers (5), and bottom shield plate weldment (14).

NOTE

There are two channels on the bottom shield plate weldment that are attached using two hex head cap screws (15) per channel. These components do not need to be removed unless damage or corrosion is evident and replacement is required.

(6) Disconnect flex shaft assembly (12, Figure 6-10) from targeted valve and from AFRA control panel. If more than one valve is targeted for removal, label the flex shaft assemblies prior to removal.

(7) Using NID and water, clean targeted valve(s), attaching parts, and all joints to be opened.

NOTE

The callouts in the remainder of this procedure refer to Figure 6-10, unless otherwise noted.

(8) Disconnect all hose assemblies from tee (or elbow) located below valve targeted for removal. Remove, cut, and discard O-ring(s) (5). Bag, plug, or cap all open ports.

(9) At reducer union (4), unscrew union/valve/tee as a unit from bottom of flask. Install FME threaded plug or cap-plug in open port of each flask.

(10) Remove, cut, and discard reducer union O-ring (6).

(11) Remove reducer union (4) from valve body (25).

(12) Remove O-ring (7) from reducer union (4); cut and discard O-ring.

(13) Remove male tee (2) or positionable elbow (3) from valve body (25).

(14) Remove O-ring (8) from male tee (2) or positionable elbow (3); cut and discard O-ring.

(15) Remove nut (9) and flex shaft adapter (13) from valve stem (16).

(16) If valve is to be repaired, proceed to repair procedure in step b. If valve is to be replaced, install new valve in accordance with step c.

b. Repair:

(1) Using the following procedure and Figure 6-10 as a guide, disassemble valve components as follows:

(a) Secure valve body (25) in vise with protective material against valve inlet/outlet faces to prevent scratching or other damage.

(b) Insert small flat-head screwdriver into slot of valve body (25) below snap ring (15), and remove ring from groove.

(c) Unscrew gland nut (14) in clockwise direction (left-hand threads) and remove gland nut (14), valve stem (16), and snap ring (15) from valve body (25).

(d) Carefully remove spacer (17), sleeve (22), and insert (24) assemblies from valve body (25), taking care not to scratch the inner bore sealing surface of valve body (25).

(e) Remove large back-up ring (20) and large O-ring (21) from spacer (17), along with small O-ring (19) and small back-up ring (18) from inside of spacer (17); cut and discard removed components.

(f) Remove seal (23), large back-up ring (20), and large O-ring (21) from sleeve (21); cut and discard removed components.

(g) Remove valve stem (16) and snap ring (15) from gland nut (14); discard snap ring.

(h) If safety assembly is to be replaced, remove thermal safety device (27) and washer (26) from valve body (25). Discard washer (26).

NOTE

It is recommended that Circle Seal assembly tools 16268, 16715, and 16717 be utilized during assembly of the Circle Seal flask drain triport shutoff valves.

(2) Using parts from repair kit (28) or from parts list in Figure 6-10, replace defective component(s) and reassemble shutoff valve (1) in accordance with the following procedure:

WARNING

Different brands of MIL-G-27617 Type III greases should never be mixed. Ensure all old grease is removed prior to applying new grease.

(a) Apply a light coat of MIL-G-27617 Type III lubricant to new O-rings (19, 21), back-up rings (18, 20), threads of valve stem (16), and inner bore of valve body (25).

(b) Screw valve stem (16) into gland nut (14) until valve stem stops against shoulder of gland nut. Using tool 16717, install snap ring (15) onto gland nut (14).

(c) Install small back-up ring (18) and small O-ring (19) inside of spacer (17), and install large back-up ring (20) and large O-ring (21) onto spacer (17).

(d) Using tools 16268 and 16715, slip spacer (17) onto valve stem (16).

(e) Apply a light coat of MIL-G-27617 Type III lubricant to new seal (23), large back-up ring (20), and large O-ring (21), and install components on sleeve (22).

(f) Install insert (24) into valve body (25) and ensure firmly seated.

(g) Slide sleeve assembly (20-23) onto valve stem (16) until it stops against spacer (17).

(h) Insert valve stem assembly (14-23) into valve body (25) and screw gland nut (14) counterclockwise, being careful not to pinch large O-ring (21) against thread bore transition of valve body (25), until gland nut (14) bottoms out.

WARNING

Torque gland nut to limits described below, not as marked on valve body. Torque values stamped into valve body are double actual limits and create a safety hazard to personnel and equipment.

(i) Torque gland nut (14) to 55-65 in-lb, and set snap ring (15) into groove.

(j) If applicable, install new washer (26) and thermal device (27) into valve body (25). Torque thermal device (27) to 38-42 ft-lb.

c. Install:

(1) Install flex shaft adapter (13) and nut (9) onto valve stem (16).

(2) Apply a light coat of MIL-G-27617 Type III lubricant to new O-ring (8), install O-ring on straight threads of male tee (2) or positionable elbow (3), and install tee or elbow into valve body (25). Do not tighten adjustable nut at this time.

(3) Apply a light coat of MIL-G-27617 Type III lubricant to new O-ring (7), install O-ring on straight threads of reducer union (4), and install reducer union into valve body (25). Do not tighten adjustable nut at this time.

(4) Apply a light coat of MIL-G-27617 Type III lubricant to new O-ring (6), and install O-ring on reducer union (4).

(5) Remove FME threaded plug or cap-plug from bottom of flask.

(6) Install reducer union/valve/tee (or elbow) unit in flask opening. Torque reducer union 3/8 to 1/2 turn past O-ring engagement.

(7) Install flex shaft assembly (12) on AFRA control panel.

(8) Ensure tee (2) or elbow (3) and flask drain valve (1) line up with hoses and flex shaft assembly (12). If necessary, loosen adjustable nuts on reducer union (4) and tee (2) or elbow (3), align tee/elbow and valve, and torque adjustable nuts 3/8 to 1/2 turn past O-ring engagement.

(9) Apply a light coat of MIL-G-27617 Type III lubricant to new O-ring(s) (5) and install O-ring(s) on face of each open port of tee (2) or elbow (3).

(10) Install hose assemblies to tee (2) or elbow (3) as required. Torque hose fittings 3/8 to 1/2 turn past O-ring engagement.

(11) Install flex shaft assembly (12) on flex shaft adapter (13) and ensure securely seated.

(12) Conduct joint tightness test of all joints to 5,000 ± 100 psi for not less than 15 minutes. Document results on a test and inspection report.

(13) Conduct a 24-hour drop test to 5,000 ± 100 psi. Document all required information on a test and inspection report.

(14) Reinstall bottom shield plate weldment (14, Figure 6-6) using the twenty sets of panhead screws (3) and flat washers (5).

(15) Using lifting equipment and the four ring swivel bolts (10, Figure 6-6) or the two forklift tubes (13), carefully lift AFRA (1), remove support blocks, and lower AFRA to surface.

(16) If removed, reinstall AFRA into Rack Enclosure Assembly in accordance with paragraph 6.8.1.1, step b.

(17) Complete re-entry control forms.

PROCEDURE B: CPV TRIPORT SHUTOFF VALVES (PN PLB-12765-2)

All callouts in the following procedure refer to the illustrated parts list in Figure 6-11. See Chapter 7 for additional ordering information.

WARNING

Do not disassemble components while the FADS III Air System is under pressure. Failure to observe this warning may result in injury or death to personnel.

This maintenance action involves entry into a certified boundary and approved re-entry control procedures must be followed.

a. Remove:

(1) Bleed system pressure to 0 psi.

(2) If necessary, remove AFRA from Rack Enclosure Assembly in accordance with paragraph 6.8.1.1, step a.

(3) If required, conduct external cleaning of AFRA (1, Figure 6-6).

WARNING

Ensure support blocks are stable and capable of supporting the weight of the AFRA. Using inadequate support could result in injury or death to personnel and damage to the equipment.

(4) Using lifting equipment and the four ring swivel bolts (10, Figure 6-6) or the two forklift tubes (13), lift AFRA (1) and place it on support blocks that are high enough to allow a technician to work underneath.

(5) From bottom shield plate weldment (14, Figure 6-6), remove the twenty sets of panhead screws (3), flat washers (5), and bottom shield plate weldment (14).

NOTE

There are two channels on the bottom shield plate weldment that are attached using two hex head cap screws (15) per channel. These components do not need to be removed unless damage or corrosion is evident and replacement is required.

(6) Disconnect flex shaft assembly (12, Figure 6-11) from targeted valve and from AFRA control panel. If more than one valve is targeted for removal, label the flex shaft assemblies prior to removal.

(7) Using NID and water, clean targeted valve(s), attaching parts, and all joints to be opened.

NOTE

The callouts in the remainder of this procedure refer to Figure 6-11, unless otherwise noted.

(8) Disconnect all hose assemblies from tee (or elbow) located below valve targeted for removal. Remove, cut, and discard O-ring(s) (5). Bag, plug, or cap all open ports.

(9) At reducer union (4), unscrew union/valve/tee as a unit from bottom of flask. Install FME threaded plug or cap-plug in open port of each flask.

(10) Remove, cut, and discard reducer union O-ring (6).

(11) Remove reducer union (4) from valve body (23).

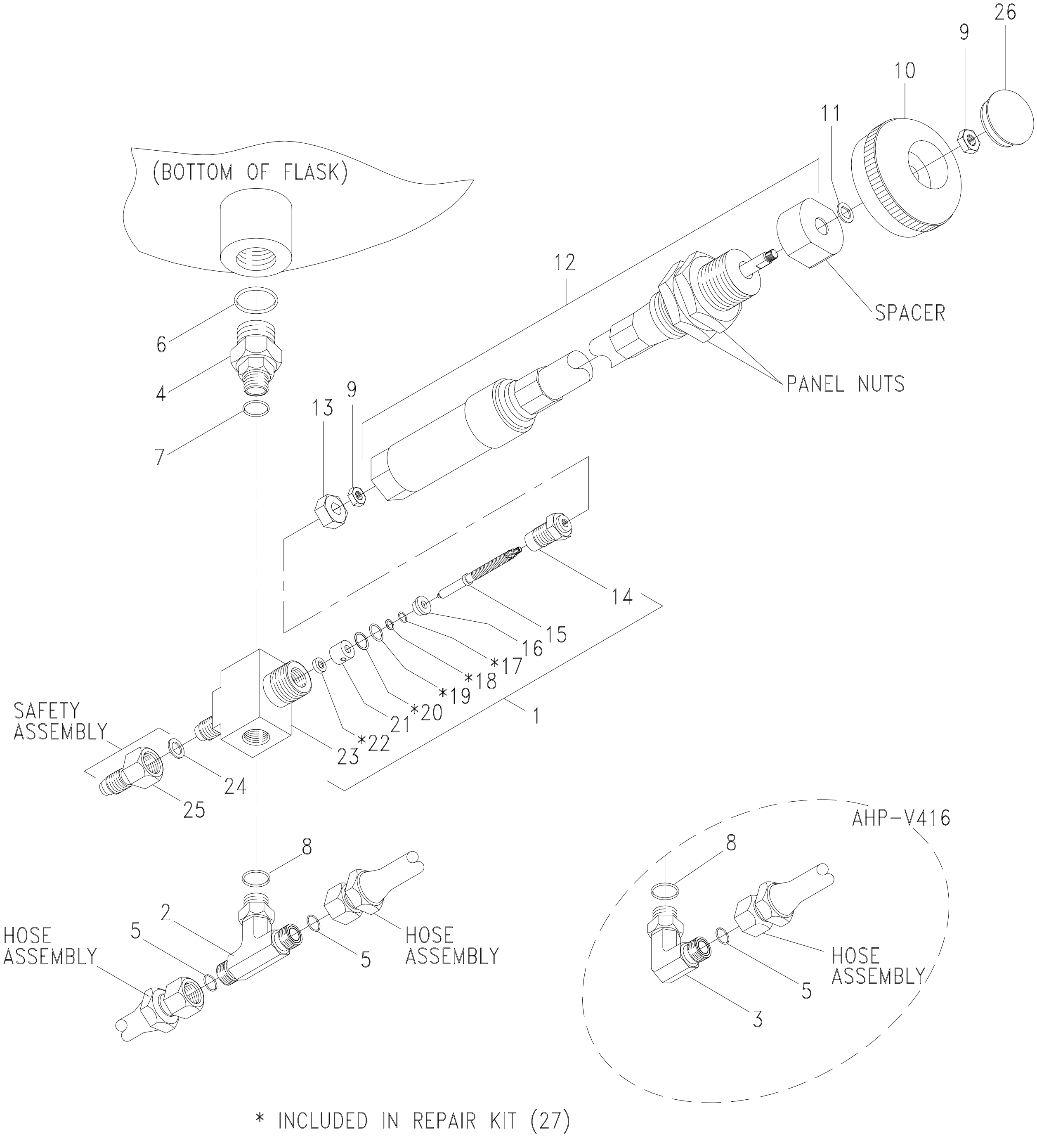


Figure 6-11. CPV Flask Drain Triport Shutoff Valves (AHP-V410, -V411, -V412, -V413, -V414, -V415, -V416, -V417, -V418) (Sheet 1 of 2)

Item	Description	CAGE Code	Part Number	Qty
1	Shutoff valve, triport	99565	PLB-12765-2	1
2	Tee, male (for all but AHP-V416)	02570	SS-8-VCO-TP-8VCO-6ST	1
3	Elbow, positionable (for AHP-V416 only)	02570	SS-4-VCO-9P-4ST	1
4	Reducer union	02570	SS-10-SAE-6P-6ST-05055	1
5	O-ring, face seal (tee and elbow)	81349	M83248/2-010	2 / 1
6	O-ring, straight thread (reducer union)	81349	M83248/2-910	1
7	O-ring, straight thread (reducer union)	81349	M83248/2-906	1
8	O-ring, straight thread (tee or elbow)	81349	M83248/2-904	1
9	Nut (flex shaft adapter and handle)	99565	10-32	2
10	Handle, black	99565	130110DL-2	1
11	Ring, retaining	99565	005506XX	1
12	Flex shaft assembly, 17 in. Flex shaft assembly, 32.375 in. Flex shaft assembly, 48.25 in.	0KZS2	FAUSG14AZ1 (401, 404, 408) FAUSG14AZ2 (402, 405, 409) FAUSG14AZ3 (403, 406, 407)	1 ea. 1 ea. 1 ea.
13	Flex shaft adapter	53711	6961958	1
14	Gland nut	99565	127940AC	1
15	Valve stem	99565	127930DC	1
16	Spacer	99565	127960AG	1
17	Back-up ring, small	99565	011010EL	1
18	O-ring, small	99565	000010EE	1
19	Back-up ring, large	99565	011013EL	1
20	O-ring, large	99565	000013EE	1
21	Sleeve	99565	127950AG	1
22	Disc, sleeve	99565	127970ER	1
23	Valve body	99565	127920CF	1
24	Thermal safety device	99565	130400AG	1
25	Washer (thermal safety device)	99565	130410AN	1
26	Cover	99565	130387BA	1
27	Repair kit (contains 17-20, 22)	99565	PLB-1276SK	AR

Figure 6-11. CPV Flask Drain Triport Shutoff Valves (AHP-V410, -V411, -V412, -V413, -V414, -V415, -V416, -V417, -V418) (Sheet 2 of 2)

(12) Remove O-ring (7) from reducer union (4); cut and discard O-ring.

(13) Remove male tee (2) or positionable elbow (3) from valve body (23).

(14) Remove O-ring (8) from male tee (2) or positionable elbow (3); cut and discard O-ring.

(15) Remove nut (9) and flex shaft adapter (13) from valve stem (15).

(16) If valve is to be repaired, proceed to repair procedure in step b. If valve is to be replaced, install new valve in accordance with step c.

b. Repair:

(1) Using the following procedure and Figure 6-11 as a guide, disassemble valve components as follows:

(a) Secure valve body (23) in vise with protective material against valve inlet/outlet faces to prevent scratching or other damage.

(b) Unscrew gland nut (14) (in clockwise direction) and remove valve stem and sleeve assembly (14-22) from valve body (23).

(c) From valve stem (15), remove sleeve (21) and spacer (16) assemblies.

(d) From sleeve (21) assembly, remove large back-up ring (19), large O-ring (20), and sleeve disc (22). Cut and discard O-ring.

(e) From spacer (16) assembly, remove small O-ring (18) and small back-up ring (17). Cut and discard O-ring.

(f) Unscrew valve stem (15) from gland nut (14).

(g) If thermal safety device is to be replaced, remove thermal safety device (25) and washer (24) from valve body (23).

(2) Using parts from repair kit (26) or from parts list in Figure 6-11, replace defective component(s) and reassemble shutoff valve (1) as follows:

(a) Ensure valve body (23) is secured in vise with protective material against valve inlet/outlet faces to prevent scratching or other damage.

(b) If applicable, install new washer (24) and thermal safety device (25) into valve body (23). Torque to 456-504 in-lb.

WARNING

Different brands of MIL-G-27617 Type III greases should never be mixed. Ensure all old grease is removed prior to applying new grease.

CAUTION

If steps (c) thru (g) are not followed in the exact order shown, damage to the O-rings and back-up rings may occur.

(c) Apply a light coat of MIL-G-27617 Type III lubricant to threads of valve stem (15), and screw valve stem into gland nut (14) until valve stem stops against shoulder of gland nut.

(d) Apply a light coat of MIL-G-27617 Type III lubricant to new O-rings (18, 20), back-up rings (17, 19), and inner bore of valve body (23).

(e) Slide spacer (16), small back-up ring (17), and small O-ring (18) onto valve stem (15) until spacer (16) stops against gland nut (14). Ensure O-ring (18) is securely seated into spacer (16).

(f) Install sleeve disc (22), large O-ring (20), and large back-up ring (19) on sleeve (21). Slide sleeve assembly onto valve stem (15) until it stops against spacer (16).

(g) Insert valve stem assembly (14-22) into valve body (23) and screw gland nut (14) counterclockwise, being careful not to pinch large O-ring (20) against thread bore transition until assembly bottoms out.

(h) Torque gland nut (14) to 75-100 in-lb.

c. Install:

(1) Install flex shaft adapter (13) and nut (9) onto valve stem (15).

(2) Apply a light coat of MIL-G-27617 Type III lubricant to new O-ring (8), install O-ring on straight threads of male tee (2) or positionable elbow (3), and install tee or elbow into valve body (23). Do not tighten adjustable nut at this time.

(3) Apply a light coat of MIL-G-27617 Type III lubricant to new O-ring (7), install O-ring on straight threads of reducer union (4), and install reducer union into valve body (23). Do not tighten adjustable nut at this time.

(4) Apply a light coat of MIL-G-27617 Type III lubricant to new O-ring (6), and install O-ring on reducer union (4).

(5) Remove FME threaded plug or cap-plug from bottom of flask.

(6) Install reducer union/valve/tee (or elbow) unit in flask opening. Torque reducer union 3/8 to 1/2 turn past O-ring engagement.

(7) Install flex shaft assembly (12) on AFRA control panel.

(8) Ensure tee (2) or elbow (3) and flask drain valve (1) line up with hoses and flex shaft assembly (12). If necessary, loosen adjustable nuts on reducer union (4) and tee (2) or elbow (3), align tee/elbow and valve, and torque adjustable nuts 3/8 to 1/2 turn past O-ring engagement.

(9) Apply a light coat of MIL-G-27617 Type III lubricant to new O-ring(s) (5) and install O-ring(s) on face of each open port of tee (2) or elbow (3).

(10) Install hose assemblies to tee (2) or elbow (3) as required. Torque hose fittings 3/8 to 1/2 turn past O-ring engagement.

(11) Install flex shaft assembly (12) on flex shaft adapter (13) and ensure securely seated.

(12) Conduct joint tightness test of all joints to 5,000 ± 100 psi for not less than 15 minutes. Document results on a test and inspection report.

(13) Conduct a 24-hour drop test to 5,000 ± 100 psi. Document all required information on a test and inspection report.

(14) Reinstall bottom shield plate weldment (14, Figure 6-6) using the twenty sets of panhead screws (3) and flat washers (5).

(15) Using lifting equipment and the four ring swivel bolts (10, Figure 6-6) or the two forklift tubes (13), carefully lift AFRA (1), remove support blocks, and lower AFRA to surface.

(16) If removed, reinstall AFRA into Rack Enclosure Assembly in accordance with paragraph 6.8.1.1, step b.

(17) Complete re-entry control forms.

6.8.1.5 Angle Shutoff Valves (AHP-V419, -V425, -V429, -V431, -V443). The five angle shutoff valves covered in this section are mounted directly to the AFRA control panel with the valve body behind the panel and the control handle on the panel front. The valves are identical but have different functions as outlined in the following:

a. AHP-V419 functions as the system drain valve and is the last in-line drain valve for the nine composite HP air flasks in the AFRA. The hook-up for AHP-V419 differs from that for the flask drain valves; it does not require a flex shaft assembly as it mounts directly on the AFRA control panel.

b. AHP-V425 functions as the Bank 3 Charge control valve in the AFRA.

c. AHP-V429, AHP-V431, and AHP-V443 serve as the control valves for Port B, the SCUBA Supply port, and Port A, respectively.

Two versions of the angle shutoff valves—one made by Circle Seal (PN HV09-15-2) and the other by CPV (PN PLB-12764-2)—are approved for use with the FADS III Air System. To allow for differences in design, corrective maintenance for the angle shutoff valves has been divided into two procedures: Procedure A below covers the Circle Seal valves and Procedure B on page 6-63 covers the CPV valves.

PROCEDURE A: CIRCLE SEAL ANGLE SHUTOFF VALVES (PN HV09-15-2)

All callouts in the following procedure refer to the illustrated parts list in Figure 6-12. See Chapter 7 for additional ordering information.

WARNING

Do not disassemble components while the FADS III Air System is under pressure. Failure to observe this warning may result in injury or death to personnel.

This maintenance action involves entry into a certified boundary and approved re-entry control procedures must be followed.

a. Remove:

   (1) If necessary, remove AFRA from Rack Enclosure Assembly in accordance with paragraph 6.8.1.1, step a.

   (2) Ensure system is depressurized and all valves on AFRA control panel assembly are closed.

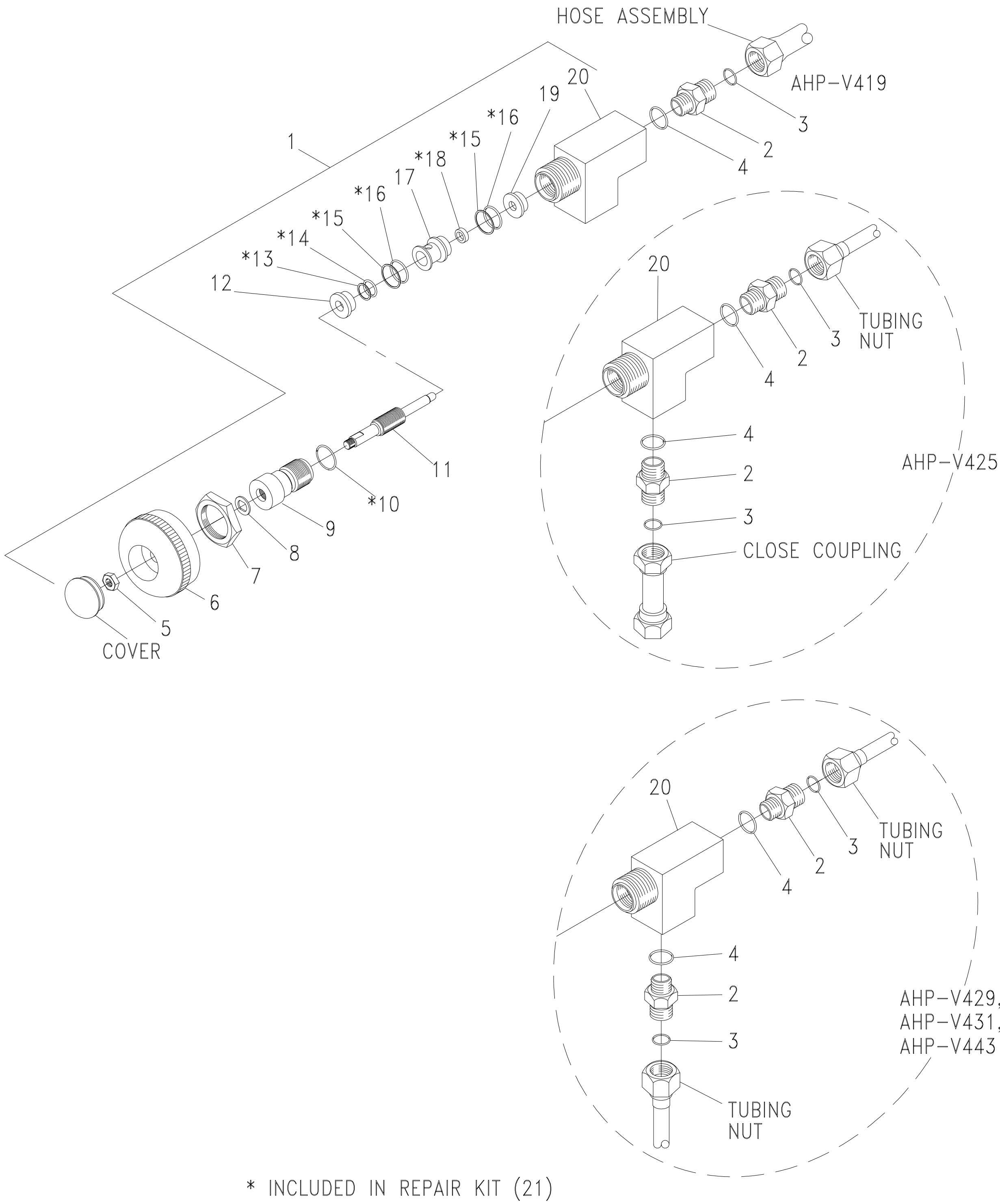


Figure 6-12. Circle Seal Angle Shutoff Valves
(AHP-V419, -V425, -V429, -V431, -V443) (Sheet 1 of 2)

Item	Description	CAGE Code	Part Number	Qty
1	Shutoff valve, angle	91816	HV09-15-2	1
2	Connector (AHP-V419) Connector (AHP-V425, -V429, -V431, -V443)	02570 02570	SS-4-VCO-1-6ST SS-8-VCO-1-6ST	1 2 ea.
3	O-ring, face seal (AHP-V419) O-ring, face seal (AHP-V425, -V429, -V431, -V443)	81349 81349	M83248/2-010 M83248/2-111	1 2 ea.
4	O-ring, straight thread (AHP-V419) O-ring, straight thread (AHP-V425, -V429, -V431, -V443)	81349	M83248/2-906	1 2 ea.
5	Nut, handle	91816	-6521SC	1
6	Handle, black	91816	-26689-2	1
7	Nut, panel	91816	-6524SC	1
8	Washer	91816	1940SC	1
9	Gland nut	91816	A12914B	1
10	Snap ring	91816	9045-700	1
11	Valve stem	91816	12956M	1
12	Spacer	91816	12912B	1
13	Back-up ring, small	91816	A1939L	1
14	O-ring, small	91816	4010-32 (size AS568-010)	1
15	Back-up ring, large	91816	1958L	2
16	O-ring, large	91816	4013-32 (size AS568-013)	2
17	Sleeve	91816	12910B	1
18	Seal	91816	12941L1	1
19	Insert	91816	12940B	1
20	Body	91816	38908	1
21	Repair kit (10,13-16, 18)	91816	17314	AR

Figure 6-12. Circle Seal Angle Shutoff Valves (AHP-V419, -V425, -V429, -V431, -V443) (Sheet 2 of 2)

(3) Locate valve body (20), which is mounted behind AFRA control panel, and remove hose assembly from AHP-V419, tubing nut and close coupling from AHP-V425, or the two tubing nuts from AHP-V429, -V431, -V443.

(4) Remove, cut, and discard face seal O-ring(s) (3). Bag or cap open ends of hose assembly, tubing, and close coupling, whichever is applicable.

(5) Remove cover from handle (6).

(6) Remove handle nut (5), handle (6), and washer (8) from valve stem (11).

(7) While supporting valve body (20), remove panel nut (7) and body from panel.

(8) Remove connector(s) (2) from valve body.

(9) Remove, cut, and discard O-ring(s) (4).

(10) If valve is to be repaired, proceed with repair procedure in step b. If valve is to be replaced, install new valve in accordance with step c.

b. Repair:

(1) Using the following procedure and Figure 6-12 as a guide, disassemble valve components as follows:

(a) Secure valve body (20) in vise with protective material against valve inlet/outlet faces to prevent scratching or other damage.

(b) Insert small flat-head screwdriver into slot of valve body (20) below snap ring (10) and remove ring from groove.

(c) Unscrew gland nut (9) in clockwise direction (left-hand threads) and remove gland nut (9), valve stem (11), and snap ring (10) from valve body (20).

(d) Carefully remove spacer (12), sleeve (17), and insert (19) assemblies from valve body (20) taking care not to scratch the inner bore sealing surface of valve body (20).

(e) Remove large back-up rings (15) and large O-rings (16) from spacer (12) and sleeve (17), along with small O-ring (14) and small back-up ring (13) from inside of spacer (12); cut and discard removed components.

(f) Remove valve stem (11) and snap ring (10) from gland nut (9); discard snap ring.

NOTE

It is recommended that Circle Seal assembly tools 16268, 16715, and 16717 be utilized during valve assembly.

(2) Using parts from repair kit (21) or from parts list in Figure 6-12, replace defective component(s) and reassemble shutoff valve (1) as follows:

WARNING

Different brands of MIL-G-27617 Type III greases should never be mixed. Ensure all old grease is removed prior to applying new grease.

(a) Apply a light coat of MIL-G-27617 Type III lubricant to new O-rings (14, 16), back-up rings (13, 15), threads of valve stem (11), and inner bore of valve body (20).

(b) Screw valve stem (11) into gland nut (9) until valve stem stops against shoulder of gland nut. Using tool 16717, install snap ring (10) onto gland nut (9).

(c) Install small back-up ring (13) and small O-ring (14) inside of spacer (12), and install large back-up ring (15) and large O-ring (16) onto spacer (12).

(d) Using tools 16268 and 16715, slip spacer (12) onto valve stem (11).

(e) Apply a light coat of MIL-G-27617 Type III lubricant to new seal (18), large back-up ring (15), and large O-ring (16), and install components on sleeve (17).

(f) Install insert (19) into valve body (20) and ensure firmly seated.

(g) Slide sleeve assembly (15-18) onto valve stem (11) until it stops against spacer (12).

(h) Insert valve stem assembly (9-18) into valve body (20) and screw gland nut (9) counterclockwise, being careful not to pinch large O-ring (16) against thread bore transition of valve body (20), until gland nut (9) bottoms out.

WARNING

Torque gland nut to limits described below, not as marked on valve body. Torque values stamped into valve body are double actual limits and create a safety hazard to personnel and equipment.

(i) Torque gland nut (9) to 55-65 in-lb, and set snap ring (10) into groove.

c. Install:

(1) Apply a light coat of MIL-G-27617 Type III lubricant to new O-ring(s) (4) and install O-ring(s) on straight threads of connector(s) (2). Install connector(s) in body of new or repaired shutoff valve (1).

(2) Insert valve stem (11) through back of panel, and secure valve to panel front using panel nut (7).

(3) Place washer (8) and handle (6) on valve stem (11) and secure with handle nut (5).

(4) Install cover on handle (6).

(5) Apply a light coat of MIL-G-27617 Type III lubricant to new face seal O-ring(s) (3) and install O-ring(s) on connector(s) (2). Attach hose assembly, tubing, and close coupling (whichever is applicable) to respective connector(s).

(6) Pressurize system. Conduct joint tightness test. Using NID solution prepared in accordance with paragraph 4.7.3.2, leak test valve connections and correct as necessary.

(7) If AFRA was removed from Rack Enclosure Assembly for this procedure, reinstall in accordance with paragraph 6.8.1.1, step b.

(8) Complete re-entry control forms.

PROCEDURE B: CPV ANGLE SHUTOFF VALVES (PN PLB-12764-2)

All callouts in the following procedure refer to the illustrated parts list in Figure 6-13. See Chapter 7 for additional ordering information.

WARNING

Do not disassemble components while the FADS III Air System is under pressure. Failure to observe this warning may result in injury or death to personnel.

This maintenance action involves entry into a certified boundary and approved re-entry control procedures must be followed.

a. Remove:

(1) If necessary, remove AFRA from Rack Enclosure Assembly in accordance with paragraph 6.8.1.1, step a.

(2) Ensure system is depressurized and all valves on AFRA control panel assembly are closed.

(3) Locate valve body (18), which is mounted behind AFRA control panel, and remove hose assembly from AHP-V419, tubing nut and close coupling from AHP-V425, or the two tubing nuts from AHP-V429, -V431, -V443.

(4) Remove, cut, and discard face seal O-ring(s) (3). Bag or cap open ends of hose assembly, tubing, and close coupling, whichever is applicable.

(5) Remove cover (19) from handle (6).

(6) Remove handle nut (5), handle (6), and retaining ring (8) from valve stem (10).

(7) While supporting valve body (18), remove panel nut (7) and body from panel.

(8) Remove connector(s) (2) from valve body (18).

(9) Remove, cut, and discard straight thread O-ring(s) (4).

(10) If valve is to be repaired, proceed with repair procedure in step b. If valve is to be replaced, install new valve in accordance with step c.

b. Repair:

(1) Using the following procedure and Figure 6-13 as a guide, disassemble valve components as follows:

(a) Secure valve body (18) in vise with protective material against valve inlet/outlet faces to prevent scratching or other damage.

(b) Unscrew gland nut (9) (in clockwise direction) and remove valve stem assembly (9-17) from valve body (18).

(c) From valve stem (10), remove sleeve (16) and spacer (11) assemblies.

(d) From sleeve (16) assembly, remove large back-up ring (14), large O-ring (15), and sleeve disc (17). Cut and discard O-ring.

(e) From spacer (11) assembly, remove small O-ring (13) and small back-up ring (12). Cut and discard O-ring.

(f) Unscrew valve stem (10) from gland nut (9).

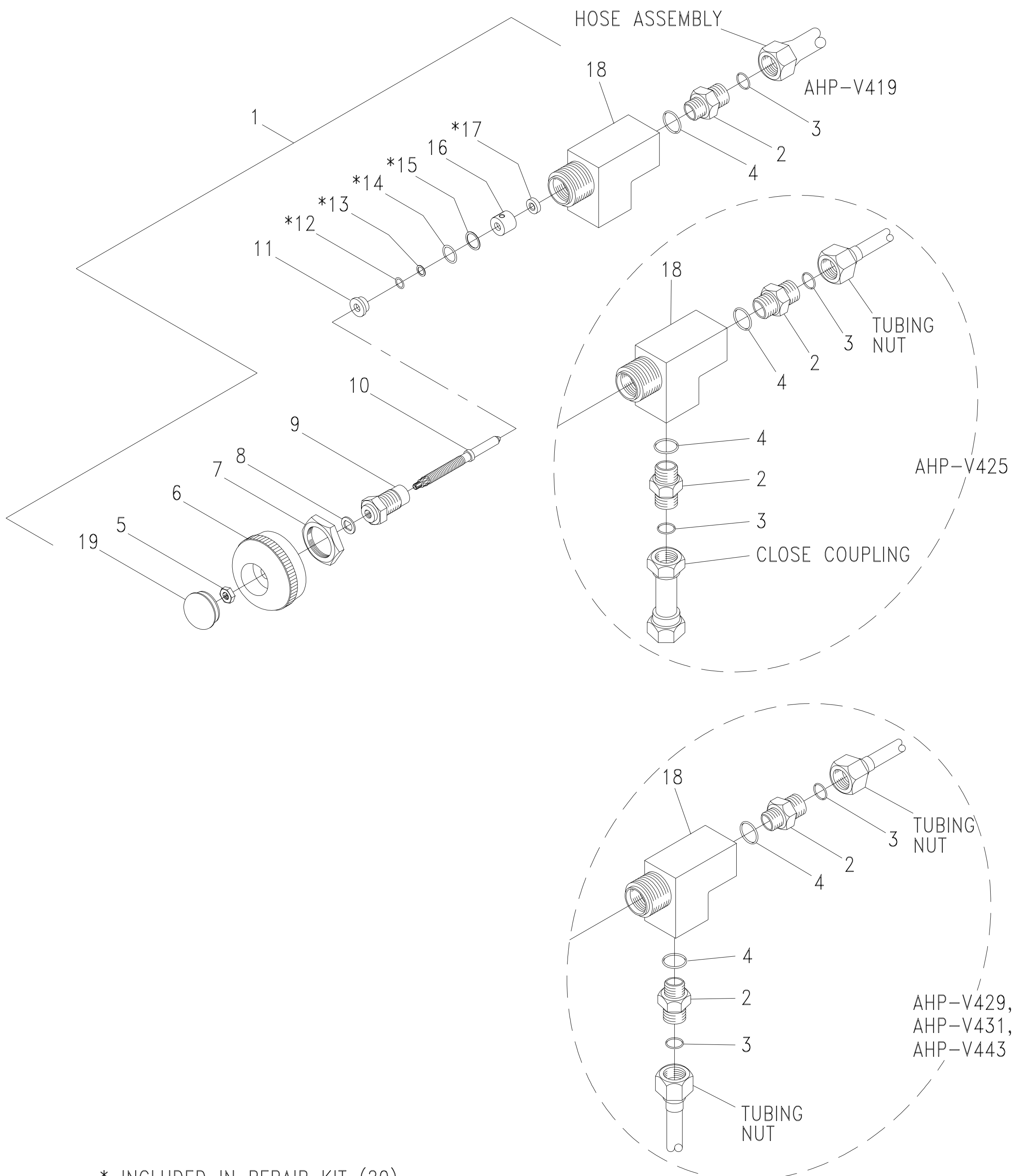


Figure 6-13. CPV Angle Shutoff Valves (AHP-V419, -V425, -V429, -V431, -V443) (Sheet 1 of 2)

Item	Description	CAGE Code	Part Number	Qty
1	Shutoff valve, angle	99565	PLB-12764-2	1
2	Connector (AHP-V419) Connector (AHP-V425, -V429, -V431, -V443)	02570 02570	SS-4-VCO-1-6ST SS-8-VCO-1-6ST	1 2 ea.
3	O-ring, face seal (AHP-V419) O-ring, face seal (AHP-V425, -V429, -V431, -V443)	81349 81349	M83248/2-010 M83248/2-111	1 2 ea.
4	O-ring, straight thread (AHP-V419) O-ring, straight thread (AHP-V425, -V429, -V431, -V443)	81349	M83248/2-906	1 2 ea.
5	Nut, handle	99565	10-32	1
6	Handle, black	99565	130110DL-2	1
7	Nut, panel	99565	127980AG	1
8	Ring, retaining	99565	005506XX	1
9	Nut, gland	99565	127940AC	1
10	Stem, valve	99565	127930DC	1
11	Spacer	99565	127960AG	1
12	Back-up ring, small	99565	011010EL	1
13	O-ring, small	99565	000010EE	1
14	Back-up ring, large	99565	011013EL	1
15	O-ring, large	99565	000013EE	1
16	Sleeve	99565	127950AG	1
17	Disc	99565	127970EW	1
18	Body, valve	99565	129380CF	1
19	Cover	99565	130387BA	1
20	Repair kit (contains 12-15, 17)	99565	PLB-1276SK	AR

Figure 6-13. CPV Angle Shutoff Valves (AHP-V419, -V425, -V429, -V431, -V443) (Sheet 2 of 2)

(2) Using parts from repair kit (20) or from parts list in Figure 6-13, replace defective component(s) and reassemble shutoff valve (1) as follows:

(a) Ensure valve body (18) is secured in vise with protective material against valve inlet/outlet faces to prevent scratching or other damage.

WARNING

Different brands of MIL-G-27617 Type III greases should never be mixed. Ensure all old grease is removed prior to applying new grease.

CAUTION

If steps (b) thru (f) are not followed in the exact order shown, damage to the O-rings and back-up rings may occur.

(b) Apply a light coat of MIL-G-27617 Type III lubricant to threads of valve stem (10), and screw valve stem into gland nut (9) until valve stem stops against shoulder of gland nut.

(c) Apply a light coat of MIL-G-27617 Type III lubricant to new O-rings (13, 15), back-up rings (12, 14), and inner bore of valve body (18).

(d) Slide spacer (11), small back-up ring (12), and small O-ring (13) onto valve stem (10) until spacer (11) stops against gland nut (9). Ensure O-ring (13) is securely seated in spacer (11).

(e) Install sleeve disc (17), large O-ring (15), and large back-up ring (14) onto sleeve (16). Slide sleeve assembly (14-17) onto valve stem (10) until it stops against spacer (11).

(f) Insert valve stem assembly (9-17) into valve body (18) and screw gland nut (9) counterclockwise, being careful not to pinch O-ring (15) against thread bore transition until assembly bottoms out.

(g) Torque gland nut (11) to 75-100 in-lb.

c. Install new or repaired shutoff valve (1) as follows:

(1) Apply a light coat of MIL-G-27617 Type III lubricant to new O-ring(s) (4), install O-ring(s) on connector(s) (2), and install connector(s) in valve body (18).

(2) Insert valve stem (10) through back of panel, and secure valve to panel using panel nut (7).

(3) Place retaining ring (8) and handle (6) on valve stem (10), and secure with nut (5). Install cover (19) on handle (6).

(4) Apply a light coat of MIL-G-27617 Type III lubricant to new face seal O-ring(s) (3) and install O-ring(s) on connector(s) (2). Attach hose assembly, tubing nut, and close coupling (whichever is applicable) to respective connector(s).

(5) Pressurize system. Conduct joint tightness test. Using NID solution prepared in accordance with paragraph 4.7.3.2, leak test valve connections and correct as necessary.

(6) If AFRA was removed from Rack Enclosure Assembly for this procedure, reinstall in accordance with paragraph 6.8.1.1, step b.

(7) Complete re-entry control forms.

6.8.1.6 Triport Shutoff Valves (AHP-V420, -V421, -V422, -V423, -V424, -V434). The six triport shutoff valves covered in this section are mounted directly to the AFRA control panel with the valve body behind the panel and the control handle on the panel front. The valves each feature three ports and are identical in design but have different functions as outlined in the following:

a. AHP-V420 and AHP-V421 serve as the ***Bank 1 Manifold*** valve and ***Bank 2 Manifold*** valve, respectively.

b. AHP-V422 functions as the AFRA ***Port C*** control valve.

c. AHP-V423 and AHP-V424 serve as the ***Bank 1 Charge*** and ***Bank 2 Charge*** valves.

d. AHP-V434 functions as the ***SCUBA OUTLET*** valve, which controls the flow of HP air to the SCUBA charging port.

Two versions of the above triport shutoff valves—one made by Circle Seal (PN HV09-16-2) and the other by CPV (PN PLB-12763-2)—are approved for use with the FADS III Air System. To allow for differences in design, corrective maintenance for the triport shutoff valves has been divided into two procedures: Procedure A below covers the Circle Seal valves and Procedure B on page 6-76 covers the CPV valves.

PROCEDURE A: CIRCLE SEAL TRIPORT SHUTOFF VALVES (PN HV09-16-2)

All callouts in the following procedure refer to the illustrated parts list in Figure 6-14. See Chapter 7 for additional ordering information.

WARNING

Do not disassemble components while the FADS III Air System is under pressure. Failure to observe this warning may result in injury or death to personnel.

This maintenance action involves entry into a certified boundary (except as noted below) and approved re-entry control procedures must be followed.

NOTE

Re-entry control procedures do not apply to AHP-V434 as it is outside the certification boundaries for this system, but controlled work procedures should be developed in support of valve maintenance or repair.

a. Remove:

(1) If necessary, remove AFRA from Rack Enclosure Assembly in accordance with paragraph 6.8.1.1, step a.

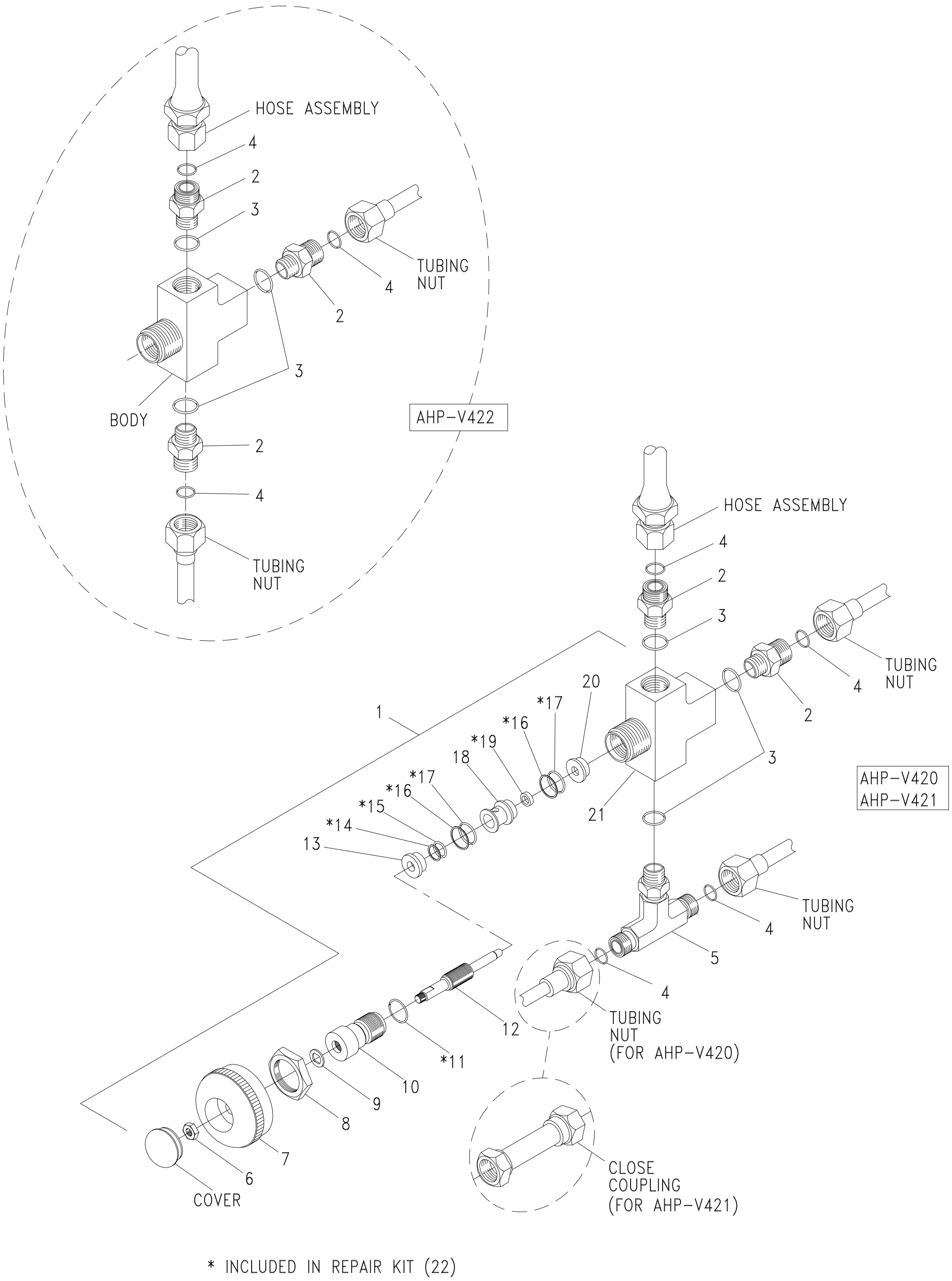


Figure 6-14. Circle Seal Triport Shutoff Valves (AHP-V420, -V421, -V422, -V423, -V424, -V434) (Sheet 1 of 3)

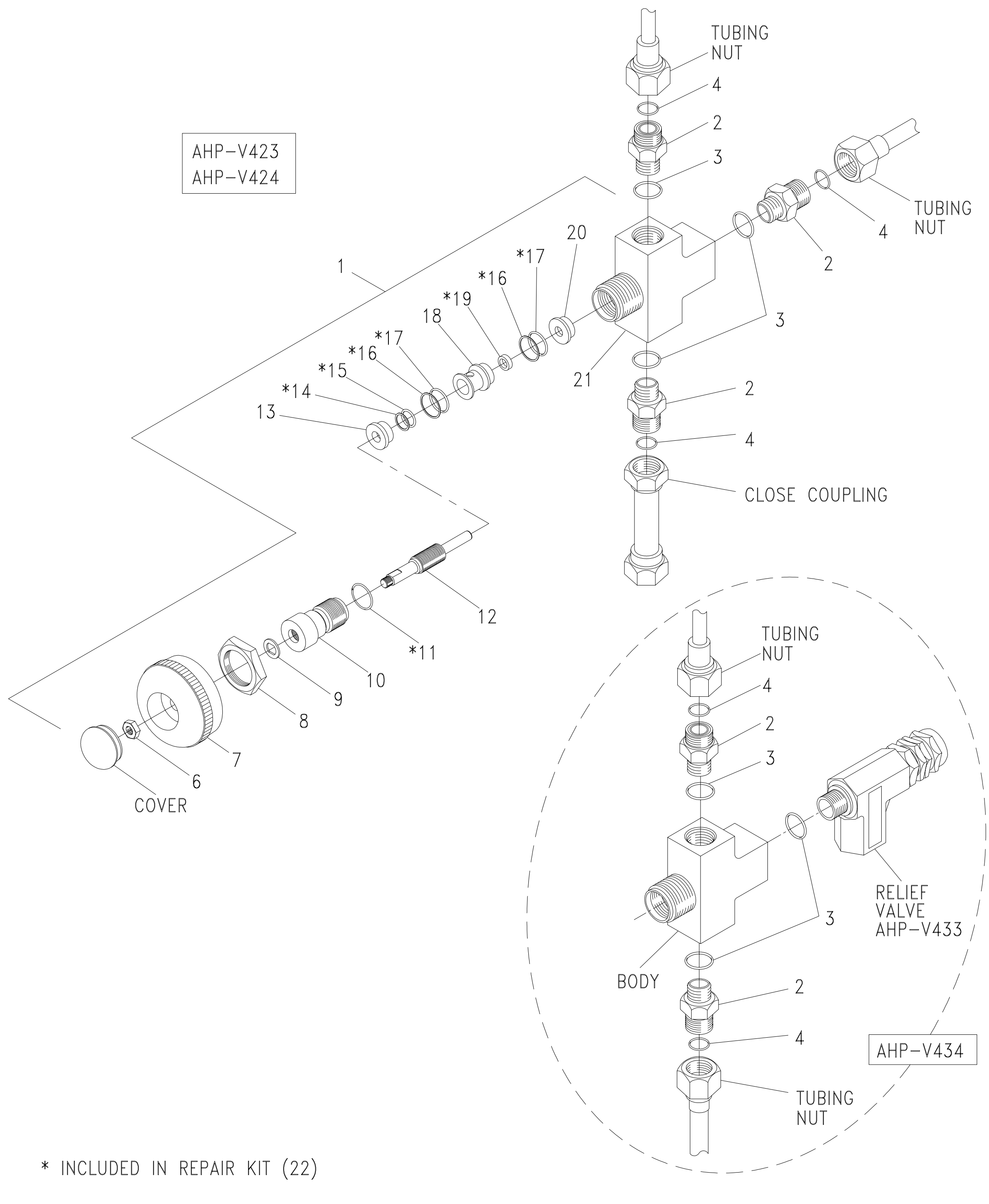


Figure 6-14. Circle Seal Triport Shutoff Valves (AHP-V420, -V421, -V422, -V423, -V424, -V434) (Sheet 2 of 3)

Item	Description	CAGE Code	Part Number	Qty
1	Shutoff valve, triport	91816	HV09-16-2	1
2	Connector (AHP-V420, -V421, -V434) Connector (AHP-V422, -V423, -V424)	02570	SS-8-VCO-1-6ST	2 ea. 3 ea.
3	O-ring, straight thread (all valves)	81349	M83248/2-906	3 ea.
4	O-ring, face seal (AHP-V420, -V421) O-ring, face seal (AHP-V422, -V423, -V424) O-ring, face seal (AHP-V434)	81349	M83248/2-111	4 ea. 3 ea. 2 ea.
5	Tee, male (AHP-V420, -V421)	02570	SS-8-VCO-TP-8VCO-6ST	1 ea.
6	Nut, handle	91816	-6521SC	1
7	Handle, black	91816	-26689-2	1
8	Nut, panel	91816	-6524SC	1
9	Washer	91816	1940SC	1
10	Gland nut	91816	A12914B	1
11	Snap ring	91816	9045-700	1
12	Valve stem	91816	12956M	1
13	Spacer	91816	12912B	1
14	Back-up ring, small	91816	A1939L	1
15	O-ring, small	91816	4010-32 (size AS568-010)	1
16	Back-up ring, large	91816	1958L	2
17	O-ring, large	91816	4013-32 (size AS568-013)	2
18	Sleeve	91816	12910B	1
19	Seal	91816	12941L1	1
20	Insert	91816	12940B	1
21	Body	91816	38643	1
22	Repair kit (11, 14-17, 19)	91816	17314	AR

Figure 6-14. Circle Seal Triport Shutoff Valves (AHP-V420, -V421, -V422, -V423, -V424, -V434) (Sheet 3 of 3)

(2) Ensure system is depressurized and all valves on AFRA control panel assembly are closed.

(3) Locate valve body (21), which is mounted behind the control panel, and remove attaching parts in accordance with Figure 6-14.

(4) Remove face seal O-rings (4) from connectors (2) (and tee (5) for AHP-V420 and AHP-V421); cut and discard O-rings. Bag or cap open ends of hose assembly, tubing, and fittings, as applicable.

(5) Remove cover from handle (7).

(6) Remove handle nut (6), handle (7), and washer (9) from valve stem (12).

(7) While supporting valve body (21), remove panel nut (8) and body from panel.

(8) Remove connectors (2) (and male tee (5), if applicable) from valve body (21).

(9) Remove straight thread O-rings (3) from connectors (2) and from male tee (5), if applicable; cut and discard O-rings.

(10) If valve is to be repaired, proceed with repair procedure in step b. If valve is to be replaced, install new valve in accordance with step c.

b. Repair:

(1) Using the following procedure and Figure 6-14 as a guide, disassemble valve components as follows:

(a) Secure valve body (21) in vise with protective material against valve inlet/outlet faces to prevent scratching or other damage.

(b) Insert small flat-head screwdriver into slot of valve body (21) below snap ring (11) and remove ring from groove.

(c) Unscrew gland nut (10) in clockwise direction (left-hand threads) and remove gland nut (10), valve stem (12), and snap ring (11) from valve body (21).

(d) Carefully remove spacer (13), sleeve (18), and insert (20) assemblies from valve body (21) taking care not to scratch the inner bore sealing surface of valve body (21).

(e) Remove large back-up rings (16) and large O-rings (17) from spacer (13) and sleeve (18), along with small O-ring (15) and small back-up ring (14) from inside of spacer (13); cut and discard removed components.

(f) Remove valve stem (12) and snap ring (11) from gland nut (10); discard snap ring.

NOTE

It is recommended that Circle Seal assembly tools 16268, 16715, and 16717 be utilized during valve assembly.

(2) Using parts from repair kit (22) or from parts list in Figure 6-14, replace defective component(s) and reassemble shutoff valve (1) as follows:

WARNING

Different brands of MIL-G-27617 Type III greases should never be mixed. Ensure all old grease is removed prior to applying new grease.

(a) Apply a light coat of MIL-G-27617 Type III lubricant to new O-rings (15, 17), back-up rings (14, 16), threads of valve stem (12), and inner bore of valve body (21).

(b) Screw valve stem (12) into gland nut (10) until valve stem stops against shoulder of gland nut. Using tool 16717, install snap ring (11) onto gland nut (10).

(c) Install small back-up ring (14) and small O-ring (15) inside of spacer (13), and install large back-up ring (16) and large O-ring (17) onto spacer (13).

(d) Using tools 16268 and 16715, slip spacer (13) onto valve stem (12).

(e) Apply a light coat of MIL-G-27617 Type III lubricant to new seal (19), back-up ring (16), and O-ring (17), and install on sleeve (18).

(f) Install insert (20) into valve body (21) and ensure firmly seated.

(g) Slide sleeve assembly (16-19) onto valve stem (12) until it stops against spacer (13).

(h) Insert valve stem assembly (10-19) into valve body (21) and screw gland nut (10) counterclockwise, being careful not to pinch large O-ring (17) against thread bore transition of valve body (21), until gland nut (10) bottoms out.

WARNING

Torque gland nut to limits described below, not as marked on valve body. Torque values stamped into valve body are double actual limits and create a safety hazard to personnel and equipment.

(i) Torque gland nut (10) to 55-65 in-lb, and set snap ring (11) into groove.

c. Install:

(1) Apply a light coat of MIL-G-27617 Type III lubricant to appropriate number of new O-rings (3) and install one O-ring on straight threads of each connector (2). Install connectors in appropriate ports of new or repaired shutoff valve (1).

(2) For AHP-V420 and AHP-V421, apply a light coat of MIL-G-27617 Type III lubricant to new O-ring (3) and install O-ring on straight threads of male tee (5). Install tee in appropriate port of shutoff valve (1).

(3) Insert valve stem (12) through back of panel, and secure with panel nut (8) on front side of panel.

(4) Place washer (9) and handle (7) on valve stem (12) and secure with handle nut (6).

(5) Install cover on handle (7).

(6) Apply a light coat of MIL-G-27617 Type III lubricant to appropriate number of new O-rings (4) and install one O-ring on face of each connector (2). Attach tubing nut(s), hose assembly, and close coupling (as applicable) to connectors (2).

(7) For AHP-V434, apply a light coat of MIL-G-27617 Type III lubricant to one new O-ring (3) and install O-ring on straight threads of relief valve (AHP-V433). Install AHP-V433 on shutoff valve (1).

(8) Pressurize system. Conduct joint tightness test. Using NID solution prepared in accordance with paragraph 4.7.3.2, leak test valve connections and correct as necessary.

(9) If AFRA was removed from Rack Enclosure Assembly for this procedure, reinstall in accordance with paragraph 6.8.1.1, step b.

(10) Complete re-entry control forms for AHP-V420, -V421, -V422, -V423, and -V424. Note that AHP-V434 is exempt from this requirement.

PROCEDURE B: CPV TRIPORT SHUTOFF VALVES (PN PLB-12763-2)

All callouts in the following procedure refer to the illustrated parts list in Figure 6-15. See Chapter 7 for additional ordering information.

WARNING

Do not disassemble components while the FADS III Air System is under pressure. Failure to observe this warning may result in injury or death to personnel.

This maintenance action involves entry into a certified boundary (except as noted below) and approved re-entry control procedures must be followed.

NOTE

Re-entry control procedures do not apply to AHP-V434 as it is outside the certification boundaries for this system, but controlled work procedures should be developed in support of valve maintenance or repair.

a. Remove:

(1) If necessary, remove AFRA from Rack Enclosure Assembly in accordance with paragraph 6.8.1.1, step a.

(2) Ensure system is depressurized and all valves on AFRA control panel assembly are closed.

(3) Locate valve body (19), which is mounted behind the control panel, and remove attaching parts in accordance with Figure 6-15.

(4) Remove face seal O-rings (4) from connectors (2); cut and discard O-rings. Bag or cap open ends of hose assembly, tubing, and close coupling, as applicable.

(5) Remove cover (20), nut (6), handle (7), and retaining ring (9) from valve stem (11).

(6) While supporting valve body (19), remove panel nut (8) and body from panel.

(7) Remove connectors (2) (and male tee (5), if applicable) from valve body (19).

(8) Remove straight thread O-rings (3) from connectors (2) and from male tee (5), if applicable; cut and discard O-rings.

(9) If valve is to be repaired, proceed with repair procedure in step b. If valve is to be replaced, install new valve in accordance with step c.

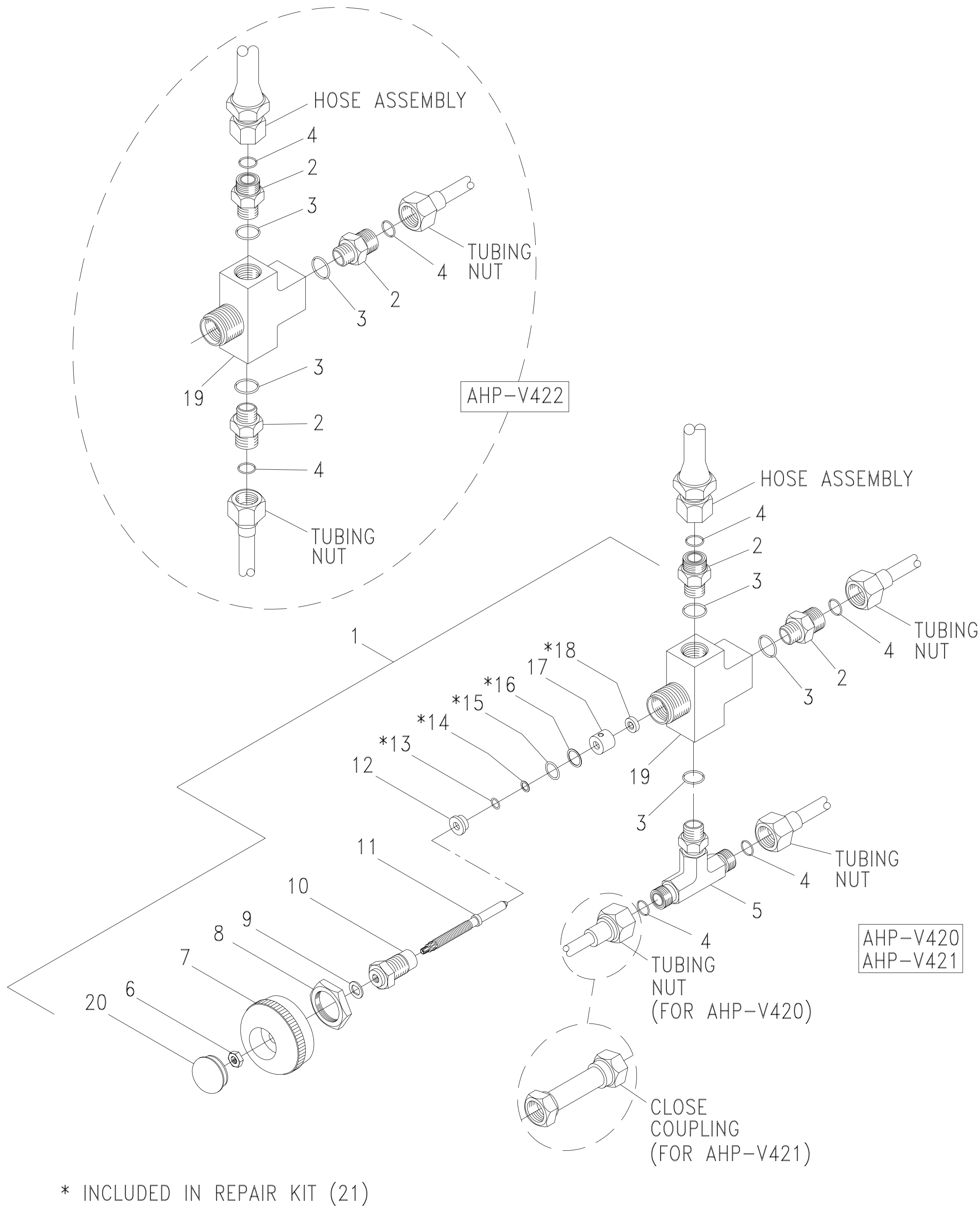


Figure 6-15. CPV Triport Shutoff Valves (AHP-V420, -V421, -V422, -V423, -V424, -V434) (Sheet 1 of 3)

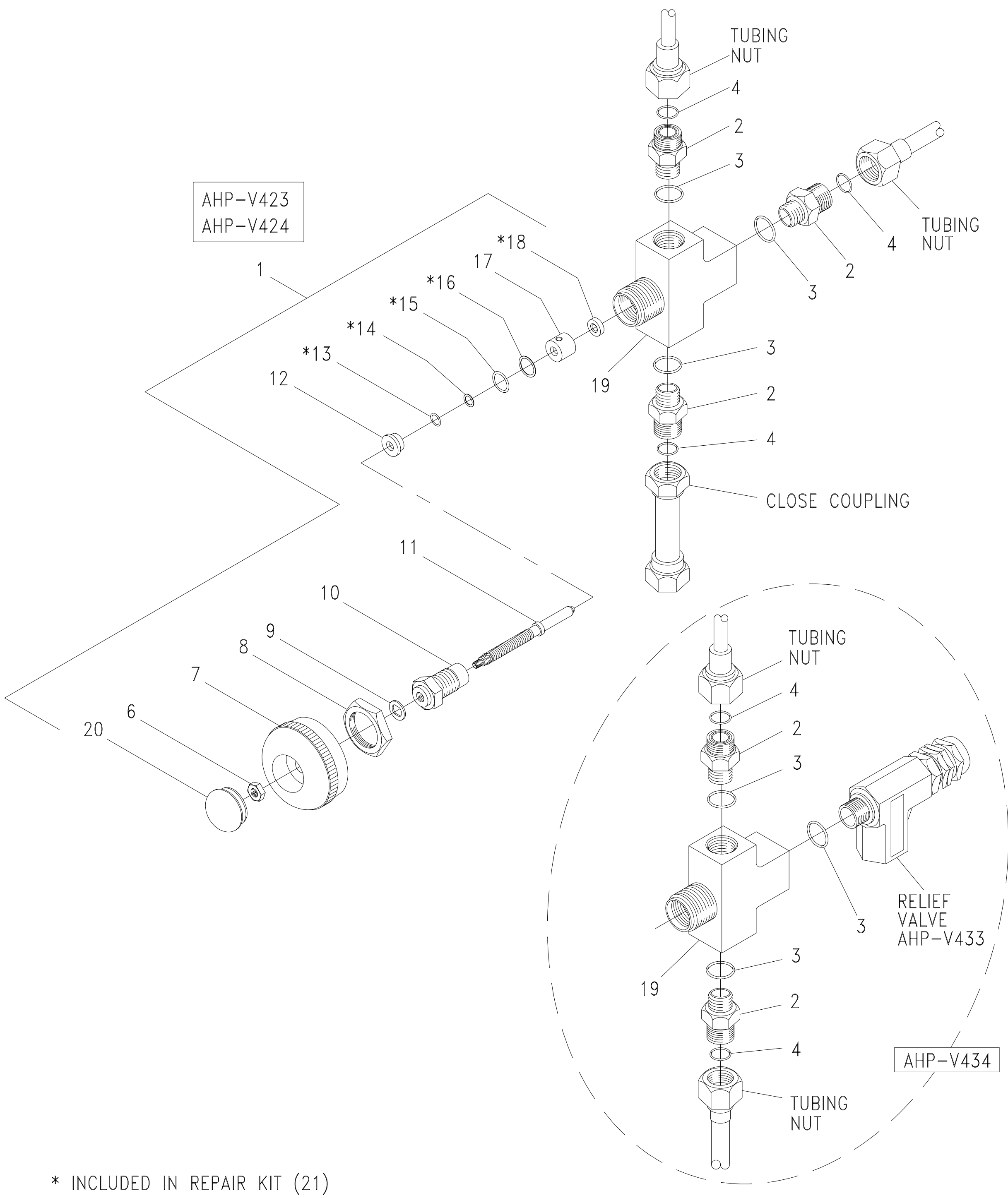


Figure 6-15. CPV Triport Shutoff Valves (AHP-V420, -V421, -V422, -V423, -V424, -V434) (Sheet 2 of 3)

Item	Description	CAGE Code	Part Number	Qty
1	Shutoff valve, triport	99565	PLB-12763-2	1
2	Connector (AHP-V420, -V421, -V434) Connector (AHP-V422, -V423, -V424)	02570	SS-8-VCO-1-6ST	2 ea. 3 ea.
3	O-ring, straight thread (all valves)	81349	M83248/2-906	3 ea.
4	O-ring, face seal (AHP-V420, -V421) O-ring, face seal (AHP-V422, -V423, -V424) O-ring, face seal (AHP-V434)	81349	M83248/2-111	4 ea. 3 ea. 2 ea.
5	Tee, male (AHP-V420, -V421)	02570	SS-8-VCO-TP-8VCO-6ST	1 ea.
6	Nut	99565	10-32	1
7	Handle, black	99565	130110DL-2	1
8	Nut, panel	99565	127980AG	1
9	Ring, retaining	99565	005506XX	1
10	Nut, gland	99565	127940AC	1
11	Stem, valve	99565	127930DC	1
12	Spacer	99565	127960AG	1
13	Back-up ring, small	99565	011010EL	1
14	O-ring, small	99565	000010EE	1
15	Back-up ring, large	99565	011013EL	1
16	O-ring, large	99565	000013EE	1
17	Sleeve	99565	127950AG	1
18	Disc	99565	127970EW	1
19	Body, valve	99565	129380CF	1
20	Cover	99565	130387BA	1
21	Repair kit (contains 13-16, 18)	99565	PLB-1276SK	AR

Figure 6-15. CPV Triport Shutoff Valves (AHP-V420, -V421, -V422, -V423, -V424, -V434) (Sheet 3 of 3)

b. Repair:

(1) Using the following procedure and Figure 6-15 as a guide, disassemble valve components as follows:

(a) Secure valve body (19) in vise with protective material against valve inlet and outlet faces to prevent scratching or other damage.

(b) Unscrew gland nut (10) (in clockwise direction) and remove valve stem assembly (10-18) from valve body (19).

(c) From valve stem (11), remove sleeve (17) and spacer (12) assemblies.

(d) From sleeve (17) assembly, remove large back-up ring (15), large O-ring (16), and sleeve disc (18). Cut and discard O-ring.

(e) From spacer (12) assembly, remove small O-ring (14) and small back-up ring (13). Cut and discard O-ring.

(f) Unscrew valve stem (11) from gland nut (10).

(2) Using parts from repair kit (20) or from parts list in Figure 6-15, replace defective component(s) and reassemble shutoff valve (1) as follows:

(a) Ensure valve body (19) is secured in vise with protective material against valve inlet/outlet faces to prevent scratching or other damage.

WARNING

Different brands of MIL-G-27617 Type III greases should never be mixed. Ensure all old grease is removed prior to applying new grease.

CAUTION

If steps (b) thru (f) are not followed in the exact order shown, damage to the O-rings and back-up rings may occur.

(b) Apply a light coat of MIL-G-27617 Type III lubricant to threads of valve stem (11), and screw valve stem into gland nut (16) until valve stem stops against shoulder of gland nut.

(c) Apply a light coat of MIL-G-27617 Type III lubricant to new O-rings (14, 16), back-up rings (13, 15), and inner bore of valve body (19).

(d) Slide spacer (12), small back-up ring (13), and small O-ring (14) onto valve stem (11) until spacer (12) stops against gland nut (10). Ensure O-ring (14) is securely seated into spacer (12).

(e) Install sleeve disc (18), large O-ring (16), and large back-up ring (15) onto sleeve (17). Slide sleeve assembly onto valve stem (11) until it stops against spacer (12).

(f) Insert valve stem assembly (10-18) into valve body (19) and screw gland nut (10) counterclockwise, being careful not to pinch large O-ring (16) against thread bore transition until assembly bottoms out.

(g) Torque gland nut (12) to 75-100 in-lb.

c. Install:

(1) Apply a light coat of MIL-G-27617 Type III lubricant to appropriate number of new O-rings (3) and install one O-ring on straight threads of each connector (2) and male tee (5), as appropriate. Install fittings in appropriate ports of new or repaired shutoff valve (1).

(2) Insert valve stem (11) through back of panel, and secure with panel nut (8) on front side of panel.

(3) Place retaining ring (9) and handle (7) on valve stem (11), and secure with nut (6). Install cover (20) on handle (7).

(4) Apply a light coat of MIL-G-27617 Type III lubricant to appropriate number of new O-rings (4) and install one O-ring on face of each connector (2). Attach tubing nut(s), hose assembly, and close coupling (as applicable) to connectors (2).

(5) For AHP-V434, apply a light coat of MIL-G-27617 Type III lubricant to one new O-ring (3) and install O-ring on straight threads of relief valve (AHP-V433). Install AHP-V433 on shutoff valve (1).

(6) Pressurize system. Conduct joint tightness test. Using NID solution prepared in accordance with paragraph 4.7.3.2, leak test valve connection and correct as necessary.

(7) If AFRA was removed from Rack Enclosure Assembly for this procedure, reinstall in accordance with paragraph 6.8.1.1, step b.

(8) Complete re-entry control forms for AHP-V420, -V421, -V422, -V423, and -V424. Note that AHP-V434 is exempt from this requirement.

6.8.1.7 Gauge Stop Valves (AHP-V426, -V427, -V428, -V435). The valves covered in this paragraph serve as HP gauge isolation valves in the AFRA. AHP-V426 isolates AHP-G437 (***BANK 1*** pressure gauge); AHP-V427 isolates AHP-G438 (***BANK 2*** pressure gauge); AHP-V428 isolates AHP-G439 (***BANK 3*** pressure gauge); and AHP-V435 isolates AHP-G436 (***SCUBA PRESSURE*** gauge). The valves are mounted directly to the AFRA's control panel with the valve bodies behind the panel and the control handles on the panel front.

All callouts in the following procedure refer to the illustrated parts list in Figure 6-16. See Chapter 7 for additional ordering information.

WARNING

Do not disassemble components while the FADS III Air System is under pressure. Failure to observe this warning may result in injury or death to personnel.

This maintenance action involves entry into a certified boundary and approved re-entry control procedures must be followed.

NOTE

Re-entry control procedures do not apply to AHP-V435 as it is outside the certification boundaries for this system, but controlled work procedures should be developed in support of valve maintenance or repair.

a. Remove:

(1) If necessary, remove AFRA from Rack Enclosure Assembly in accordance with paragraph 6.8.1.1, step a.

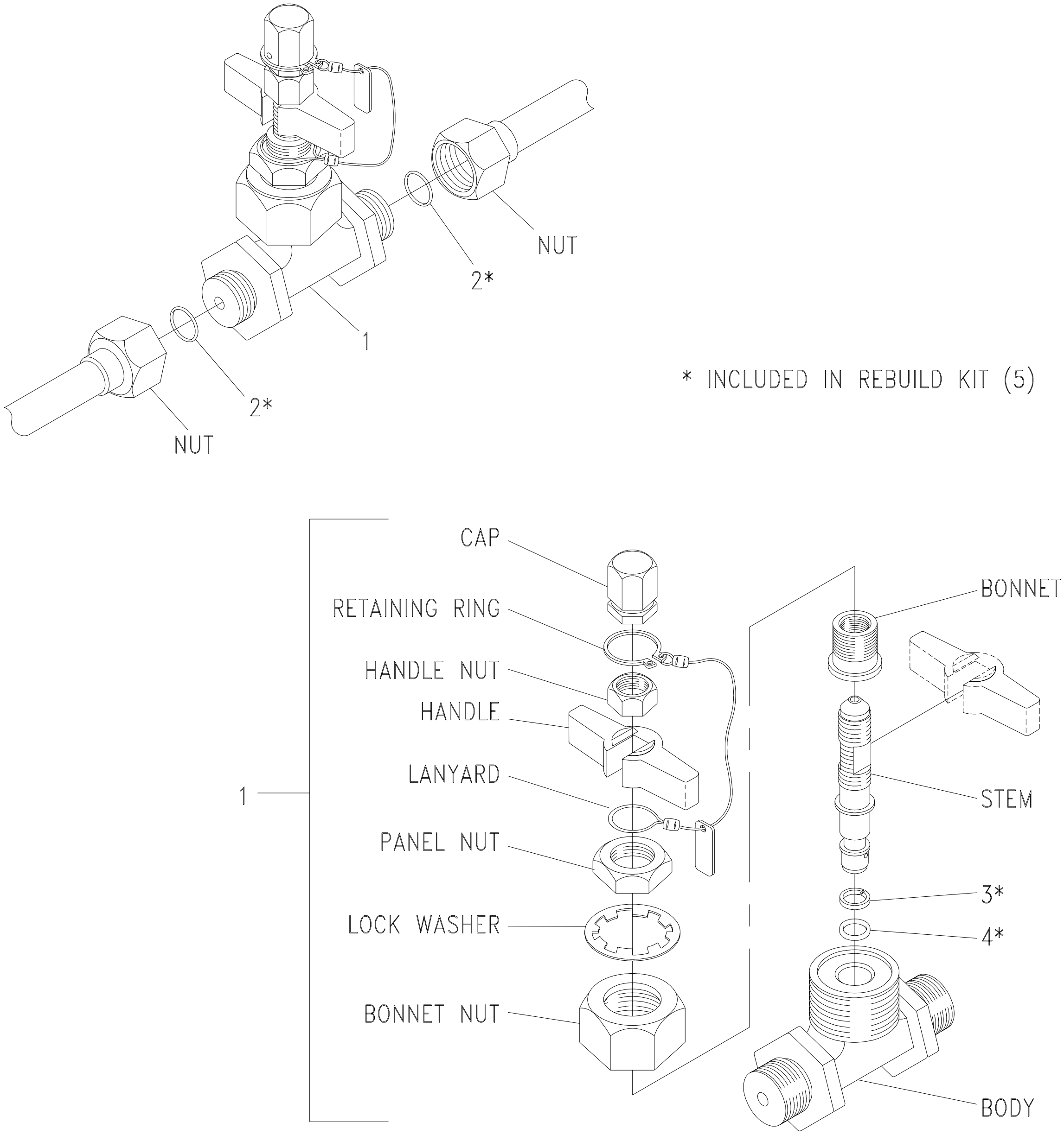
(2) Ensure system is depressurized and all valves on AFRA control panel assembly are closed.

(3) Locate body of gauge stop valve (1), which is mounted behind the control panel, and back off tubing nuts from both sides of valve body.

(4) Remove, cut, and discard the two face seal O-rings (2). Bag or cap open ends of tubing.

(5) Free valve (1) from control panel by removing the following components in the order shown here and in Figure 6-16: cap, retaining ring, handle nut, handle, lanyard, panel nut, and lock washer. Remove valve body from panel.

(6) If valve is to be repaired, proceed with repair procedure in step b. If valve is to be replaced, install new valve in accordance with step c.



Item	Description	CAGE Code	Part Number	Qty
1	Gauge stop valve	99565	PLC-10669	1
2	O-ring (face seal)	81349	M83248/2-008	2
3	Back-up ring	99565	011009-EL	1
4	O-ring, stem	99565	000009-EE	1
5	Rebuild kit (contains 2-4)	99565	PLC-10669SK	AR

Figure 6-16. Gauge Stop Valves (AHP-V426, -V427, -V428, -V435)

b. Repair is limited to replacement of back-up ring (3) and stem O-ring (4). If any other component is defective or damaged, replace entire valve in accordance with step c.

(1) Remove bonnet nut, bonnet, valve stem, back-up ring (3), and stem O-ring (4) from valve body. Cut and discard back-up ring and O-ring.

(2) Inspect valve stem for damage; if damaged, omit remainder of repair procedure and replace entire valve in accordance with step c. If valve stem passes inspection, continue with repair procedure.

WARNING

Different brands of MIL-G-27617 Type III greases should never be mixed. Ensure all old grease is removed prior to applying new grease.

(3) Apply a light coat of MIL-G-27617 Type III lubricant to new back-up ring (3) and new stem O-ring (4) and install in valve body.

(4) Install valve stem, bonnet, and bonnet nut on valve body as shown in Figure 6-16.

c. Install:

(1) Position valve body in control panel opening, and secure with lock washer and panel nut.

(2) Install remaining components on valve stem in the following order: lanyard, handle, handle nut, retaining ring, and cap (refer to Figure 6-16 for correct positioning of handle on valve stem).

(3) Apply a light coat of MIL-G-27617 Type III lubricant to two new face seal O-rings (2). Install one O-ring in each port of valve (1) and attach tubing nuts.

(4) Pressurize system. Conduct joint tightness test. Using NID solution prepared in accordance with paragraph 4.7.3.2, leak test valve connections, and correct as necessary.

(5) If AFRA was removed from Rack Enclosure Assembly for this procedure, reinstall in accordance with paragraph 6.8.1.1, step b.

(6) Complete re-entry control forms for AHP-V426, -V427, and -V428. Note that AHP-V435 is exempt from this requirement.

6.8.1.8 HP Relief Valve (AHP-V430). AHP-V430, which is located between check valve (AHP-V445) and Bank 1 charge valve (AHP-V423) in the AFRA, is an automatic HP relief valve that has been set to relieve at 5,500 psi. The valve is mounted behind the control panel with no manual control on the panel front. All callouts in the following procedure refer to the illustrated parts list in Figure 6-17. See Chapter 7 for additional ordering information.

WARNING

Do not disassemble components while the FADS III Air System is under pressure. Failure to observe this warning may result in injury or death to personnel.

This maintenance action involves entry into a certified boundary and approved re-entry control procedures must be followed.

a. Remove:

(1) If necessary, remove AFRA from Rack Enclosure Assembly in accordance with paragraph 6.8.1.1, step a.

(2) Ensure system is depressurized and all valves on AFRA control panel assembly are closed.

(3) Locate relief valve (1), which is mounted behind the control panel, and remove valve from female tee (2).

(4) Remove, cut, and discard O-ring (3). Bag or plug open port of tee (2).

(5) If valve is to be repaired, proceed with repair procedure in step b. If valve is to be replaced, install new valve in accordance with step c.

b. Repair:

(1) Using Figure 6-17 as a guide, disassemble valve components as shown.

WARNING

Different brands of MIL-G-27617 Type III greases should never be mixed. Ensure all old grease is removed prior to applying new grease.

(2) Using appropriate parts from repair kit (4) or from parts list shown in Figure 6-17, replace defective component(s) and reassemble valve in order shown in Figure 6-17. Ensure that a light coat of MIL-G-27617 Type III lubricant is applied to new parts prior to installation.

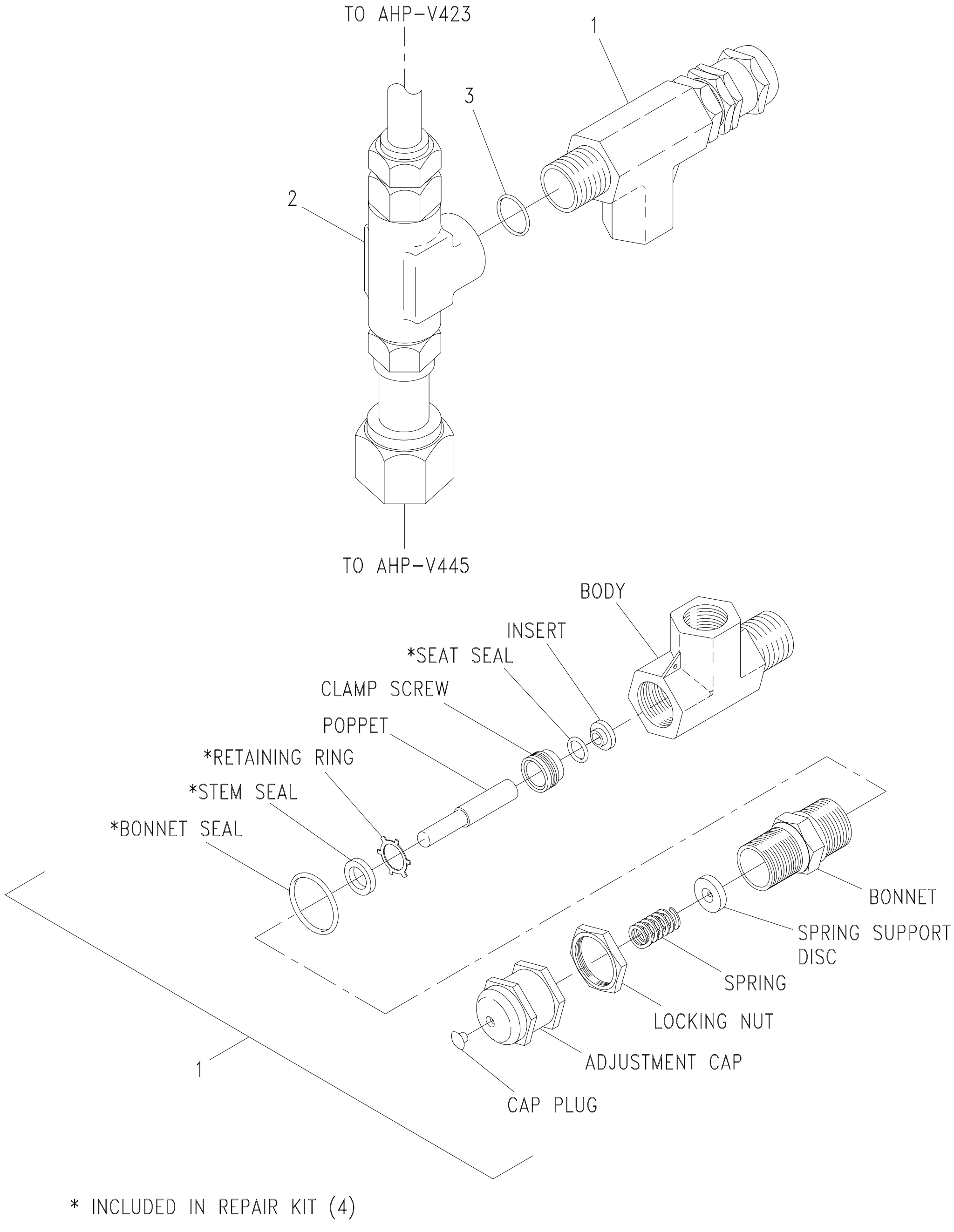


Figure 6-17. HP Relief Valve (AHP-V430) (Sheet 1 of 2)

Item	Description	CAGE Code	Part Number	Qty
1	Relief valve (set to 5,500 psi)	02570	SS-4R3A-1509-H	1
2	Female tee	99237	AN938K6	1
3	O-ring (straight thread)	81349	M83248/2-906	1
4	Repair kit (bonnet seal, stem seal, retaining ring, and seat seal)	02570	VI-R3A-K2	AR

Figure 6-17. HP Relief Valve (AHP-V430) (Sheet 2 of 2)

c. Install:

CAUTION

Ensure new or rebuilt relief valve is tagged showing 5,500 psi relief pressure.

(1) Ensure replacement valve (1) has been cleaned to MIL-STD-1330 or other approved NAVSEA cleaning procedure for life support systems.

(2) Apply a light coat of MIL-G-27617 Type III lubricant to new O-ring (3) and install on straight threads of relief valve (1). Install relief valve in female tee (2).

(3) Pressurize system. Using NID solution prepared in accordance with paragraph 4.7.3.2, leak test valve connections and correct as necessary.

(4) If AFRA was removed from Rack Enclosure Assembly for this procedure, re-install in accordance with paragraph 6.8.1.1, step b.

(5) Complete re-entry control forms.

6.8.1.9 Regulator Valve (AHP-V432). AHP-V432, also known as the ***SCUBA REGULATOR*** valve, reduces 5,000 psi air from the Bank 1 air flasks to a maximum of 3,000 psi air for use in charging SCUBA cylinders. If defective or damaged, the regulator valve should be repaired or replaced in accordance with the following procedure.

All callouts in the following procedure refer to the illustrated parts list in Figure 6-18. See Chapter 7 for additional ordering information.

WARNING

Do not disassemble components while the FADS III Air System is under pressure. Failure to observe this warning may result in injury or death to personnel.

NOTE

Re-entry control procedures do not apply to AHP-V432 as it is outside the certification boundaries for this system, but controlled work procedures should be developed in support of valve maintenance or repair.

a. Remove:

(1) If necessary, remove AFRA from Rack Enclosure Assembly in accordance with paragraph 6.8.1.1, step a.

(2) Ensure system is depressurized and all valves on AFRA control panel assembly are closed.

(3) Back off tubing nuts from the two smaller positionable elbows (1) and the two larger positionable elbows (2) that are installed in regulator valve (3).

(4) Remove, cut, and discard face seal O-rings (4, 5). Bag open ends of tubing.

(5) Remove dome plug (6) and nut (7) from handle (8). Remove handle from shaft (9).

(6) While supporting body of regulator valve (3), remove panel nut (10) and insulator (11) from front of panel. Remove valve (with fittings still attached) and insulator (12) from panel.

(7) Remove the two smaller positionable elbows (1), the two larger positionable elbows (2), and bleeder plug (13) from valve (3).

(8) Remove, cut, and discard O-rings (14, 15) from elbows and bleeder plug.

(9) If valve is to be repaired, proceed with repair procedure in step b. If valve is to be replaced, install new valve in accordance with step c.

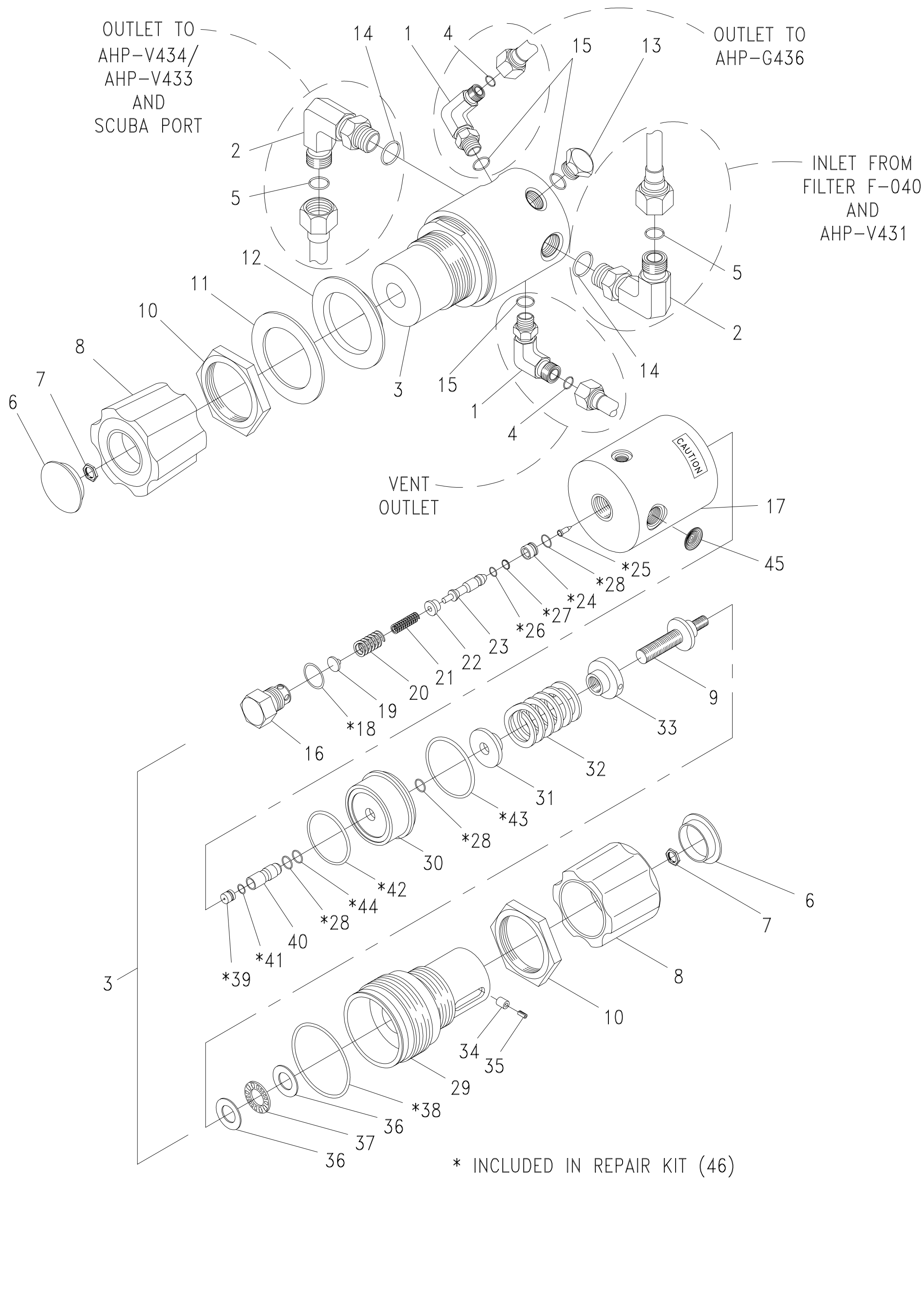


Figure 6-18. Regulator Valve (AHP-V432) (Sheet 1 of 3)

Item	Description	CAGE Code	Part Number	Qty
1	Positionable elbow (F-010)	02570	S-4-VCO-9P-4ST	2
2	Positionable elbow (F-012)	02570	SS-8-VCO-9P-8ST	2
3	Regulator valve	91816	PR50-18-2	1
4	O-ring (face seal)	81349	M83248/2-010	2
5	O-ring (face seal)	81349	M83248/2-111	2
6	Dome plug	91816	-7703	1
7	Nut	91816	-2303-0305T	1
8	Handle, black	91816	-2235-0109	1
9	Shaft	91816	-2105-0089	1
10	Panel mounting nut	91816	-2303-0928	1
11	Insulator	53711	6961935-3	1
12	Insulator	53711	6961935-1	1
13	Plug, bleeder (F-050)	99237	AN814-4K	1
14	O-ring (straight thread)	81349	M83248/2-908	2
15	O-ring (straight thread)	81349	M83248/2-904	3
16	Retaining nut	91816	-38995	1
17	Body	91816	-38902B	1
18*	O-ring	91816	-4908-32 (size AS569-908)	1
19	Spring button	91816	-38996	1
20	Spring	91816	A38911	1
21	Spring	91816	B38919	1
22	Spring seat	91816	-38994	1
23	Poppet, main	91816	-38909	1
24*	Seat, main	91816	-38154	1
25*	Poppet, vent	91816	A37361	1
26*	O-ring	91816	-4006-32 (size AS568-006)	1
27*	Back-up ring	91816	-8006	1
28*	O-ring	91816	-4013-32 (size AS568-013)	3
29	Housing	91816	A2221-0482B	1
30	Adapter	91816	A2243-9033B	1
31	Spring button	91816	-2209-0197	1
32	Spring	91816	-2207-0172	1

Figure 6-18. Regulator Valve (AHP-V432) (Sheet 2 of 3)

Item	Description	CAGE Code	Part Number	Qty
33	Spring guide	91816	-2227-0196	1
34	Bearing	91816	-2274-0031	1
35	Spiral head pin	91816	-2246-0318	1
36	Thrust washer	91816	-2274-0021	2
37	Thrust bearing	91816	-2274-0020	1
38*	O-ring	91816	-4036-32 (size AS568-036)	1
39*	Seat, vent	91816	A2202-1888	1
40	Piston	91816	-2231-0194	1
41*	O-ring	91816	-4007-32 (size AS568-007)	1
42*	O-ring	91816	-4128-32 (size AS568-128)	1
43*	O-ring	91816	-4136-32 (size AS568-136)	1
44*	Back-up ring	91816	-8013	1
45	Filter	91816	-38913	1
46	Repair kit (includes items 18, 24, 25, 26, 27, 28, 38, 39, 41, 42, 43, and 44)	91816	K/PR50-18	AR

Figure 6-18. Regulator Valve (AHP-V432) (Sheet 3 of 3)

b. Repair:

(1) Disassemble regulator in accordance with the following procedure. Disassembly should be performed only to the level necessary to make the needed repair.

(a) Remove retaining nut (16) from body (17).

(b) Remove O-ring (18) from retaining nut (16). Cut and discard O-ring.

(c) Remove spring button (19) and springs (20, 21) from retaining nut (16).

(d) Remove spring seat (22), main poppet (23), main seat (24), and vent poppet (25) from body (17).

(e) Remove O-ring (26) and back-up ring (27) from main poppet (23). Cut and discard O-ring and back-up ring.

(f) Remove O-ring (28) from main seat (24). Cut and discard O-ring.

(g) Remove housing (29) from body (17).

(h) Remove spring button (31), spring (32), shaft assembly (33, 9, 34, 35), thrust washers (36), and thrust bearing (37) from housing (29).

(i) Remove O-ring (38) from housing (29). Cut and discard O-ring.

(j) Remove adapter (30) with piston (40) from body (17).

(k) Remove piston (40) from adapter (30). Remove O-ring (28) and back-up ring (44) from inside adapter (30). Cut and discard O-ring and back-up ring.

(l) Remove O-ring (41) and vent seat (39) from piston (40). Cut and discard O-ring.

(m) Remove O-rings (42, 43) from adapter (30). Cut and discard O-rings.

(n) Remove filter (45) from body (17).

(2) Reassemble regulator in accordance with the following procedure. Perform only those steps that pertain to the components removed during disassembly.

WARNING

Different brands of MIL-G-27617 Type III greases should never be mixed. Ensure all old grease is removed prior to applying new grease.

(a) Apply a light coat of MIL-G-27617 Type III lubricant on new O-ring (41), and place O-ring on vent seat (39). Position vent seat with small hole toward piston, and insert into piston (40).

(b) Apply a light coat of MIL-G-27617 Type III lubricant on two new O-rings (28) and back-up ring (44). Install back-up ring (44), O-rings (28), and piston (40) inside adapter (30) as shown in Figure 6-18. Ensure back-up ring (44) is on top of O-ring (28).

(c) Apply a light coat of MIL-G-27617 Type III lubricant on new O-rings (42, 43), and place O-rings on adapter (30) as shown in Figure 6-18.

(d) Insert adapter (30) into valve body (17).

(e) Apply a light coat of MIL-G-27617 Type III lubricant on thrust washer (36) and thrust bearing (37). Place thrust washer and thrust bearing on top of shaft assembly (9, 33) and insert assembly in housing (29).

(f) Place spring (32) and spring button (31) on shaft (9) and insert bearing (34) and pin (35) into spring guide (33).

(g) Apply a light coat of MIL-G-27617 Type III lubricant on new O-ring (38), and install O-ring on housing (29).

(h) Screw housing (29) into body (17) and torque to 65-70 ft-lb.

(i) Place vent poppet (25) in body (17).

(j) Apply a light coat of MIL-G-27617 Type III lubricant on new O-ring (28), and install O-ring on main seat (24).

(k) Apply a light coat of MIL-G-27617 Type III lubricant on new O-ring (26) and back-up ring (27), and install O-ring and back-up ring on main poppet (23). Ensure back-up ring (27) is on top of O-ring (26).

(l) Place main poppet (23) in main seat (24), then place main seat in body (17).

(m) Place spring seat (22) on main poppet (23).

(n) Place spring button (19) in retaining nut (16).

(o) Nest smaller spring (21) inside larger spring (20), and place in retaining nut (16).

(p) Apply a light coat of MIL-G-27617 Type III lubricant to new O-ring (18), and install O-ring on retaining nut (16).

(q) Screw retaining nut (16) into body (17), and torque to 15-20 ft-lb.

(r) Install filter (45) in body (17).

c. Install:

(1) If replacing with new regulator valve, ensure replacement regulator has been cleaned in accordance with MIL-STD-1330 or other approved NAVSEA cleaning procedure for life support systems.

(2) Apply a light coat of MIL-G-27617 Type III lubricant to new O-ring (15), and install O-ring on bleeder plug (13). Install bleeder plug in body (17).

(3) Apply a light coat of MIL-G-27617 Type III lubricant to two new O-rings (15), and install one O-ring on straight threads of each of the smaller positionable elbows (1). Install positionable elbows in body (17), but do not tighten nuts at this time.

(4) Apply a light coat of MIL-G-27617 Type III lubricant to two new O-rings (14), and install one O-ring on straight threads of each of the larger positionable elbows (2). Install positionable elbows in body (17), but do not tighten nuts at this time.

(5) Install regulator valve (3) with insulators (11, 12) on control panel, verify alignment, and secure with panel mounting nut (10).

(6) Place handle (8) on shaft (9) and secure with nut (7); torque nut to 8-10 ft-lb.

(7) Install dome plug (6).

(8) Apply a light coat of MIL-G-27617 Type III lubricant to two new face seal O-rings (4) and install one O-ring in each of the smaller positionable elbows (1). Attach tubing to elbows.

(9) Apply a light coat of MIL-G-27617 Type III lubricant to two new face seal O-rings (5) and install one O-ring in each of the larger positionable elbows (2). Attach tubing to elbows.

(10) Tighten elbow nuts on positionable elbows (1, 2).

(11) Pressurize AFRA. Load regulator to maximum operating pressure, and look for regulator creep. Leak test regulator valve connections using NID solution prepared in accordance with paragraph 4.7.3.2. Correct leaks as necessary.

(12) If AFRA was removed from Rack Enclosure Assembly for this procedure, reinstall in accordance with paragraph 6.8.1.1, step b.

6.8.1.10 HP Relief Valve (AHP-V433). AHP-V433, which is attached to ***SCUBA OUTLET*** valve (AHP-V434) in the AFRA, is an automatic HP relief valve that has been set to relieve at 3,300 psi. The valve is mounted behind the control panel with no manual control on the panel front.

All callouts in the following procedure refer to the illustrated parts list in Figure 6-19. See Chapter 7 for additional ordering information.

WARNING

Do not disassemble components while the FADS III Air System is under pressure. Failure to observe this warning may result in injury or death to personnel.

NOTE

Re-entry control procedures do not apply to AHP-V433 as it is outside the certification boundaries for this system, but controlled work procedures should be developed in support of valve maintenance or repair.

a. Remove:

(1) If necessary, remove AFRA from Rack Enclosure Assembly in accordance with paragraph 6.8.1.1, step a.

(2) Ensure system is depressurized and all valves on AFRA control panel assembly are closed.

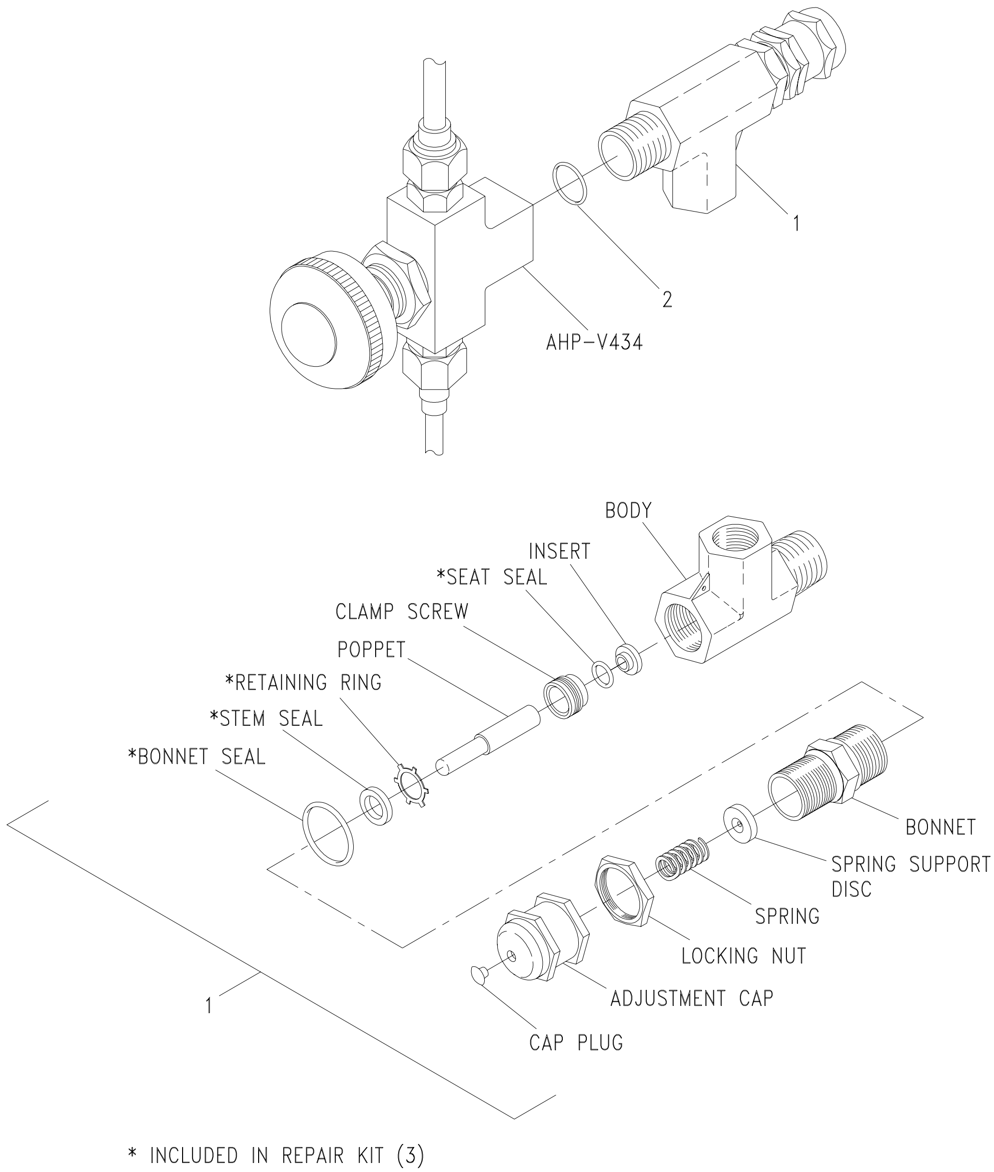
(3) Locate relief valve (1), which is mounted behind the control panel, and remove valve from ***SCUBA OUTLET*** valve (AHP-V434), which is a triport shutoff valve.

(4) Remove, cut, and discard O-ring (2). Bag or plug open port of AHP-V434.

(5) If valve is to be repaired, proceed with repair procedure in step b. If valve is to be replaced, install new valve in accordance with step c.

b. Repair:

(1) Using Figure 6-19 as a guide, disassemble relief valve components only to the extent necessary to make the needed repair.



Item	Description	CAGE Code	Part Number	Qty
1	Relief valve (set to relieve at 3,300 psi)	02570	SS-4R3A-1509-F	1
2	O-ring, straight thread	81349	M83248/2-906	1
3	Repair kit (bonnet seal, stem seal, retaining ring, and seat seal)	02570	VI-R3A-K2	AR

Figure 6-19. HP Relief Valve (AHP-V433) (Sheet 1 of 1)

WARNING

Different brands of MIL-G-27617 Type III greases should never be mixed. Ensure all old grease is removed prior to applying new grease.

(2) Using appropriate parts from repair kit (3) or from parts list shown in Figure 6-19, replace defective component(s) and reassemble valve in order shown in Figure 6-19. Ensure that a light coat of MIL-G-27617 Type III lubricant is applied to new parts prior to installation.

c. Install:

CAUTION

Ensure new or rebuilt relief valve is pop tested and tagged showing 3,300 psi relief pressure.

(1) Ensure replacement valve (1) has been cleaned to MIL-STD-1330 or other approved NAVSEA cleaning procedure for life support systems.

(2) Apply a light coat of MIL-G-27617 Type III lubricant to new O-ring (2) and install on straight threads of relief valve (1). Install relief valve in triport shutoff valve (AHP-V434).

(3) Pressurize system. Using NID solution prepared in accordance with paragraph 4.7.3.2, leak test valve connections, and correct as necessary.

(4) If AFRA was removed from Rack Enclosure Assembly for this procedure, re-install in accordance with paragraph 6.8.1.1, step b.

6.8.1.11 Vent (Bleed) Valves (AHP-V440, -V441, -V442). Vent valves (AHP-V440, -V441, and -V442) are the ***PORT C BLEED***, ***PORT B BLEED***, and ***PORT A BLEED*** valves, respectively. Each valve controls depressurization of their respective ports. The valves are mounted directly to the AFRA's control panel with the valve bodies behind the panel and the control handles on the panel front.

All callouts in the following procedure refer to the illustrated parts list in Figure 6-20. See Chapter 7 for additional ordering information.

WARNING

Do not disassemble components while the FADS III Air System is under pressure. Failure to observe this warning may result in injury or death to personnel.

This maintenance action involves entry into a certified boundary and approved re-entry control procedures must be followed.

a. Remove:

(1) If necessary, remove AFRA from Rack Enclosure Assembly in accordance with paragraph 6.8.1.1, step a.

(2) Ensure system is depressurized and all valves on AFRA control panel assembly are closed.

(3) Locate body of vent valve (1), which is mounted behind the control panel, and back off tubing nuts from both sides of valve body.

(4) Remove, cut, and discard the two face seal O-rings (2). Bag or cap open ends of tubing.

(5) Remove set screw, handle pin, and handle from valve stem.

(6) Remove locknut and panel nut from valve threads, and remove vent valve (1) from panel.

(7) If valve is to be repaired, proceed with repair procedure in step b. If valve is to be replaced, install new valve in accordance with step c.

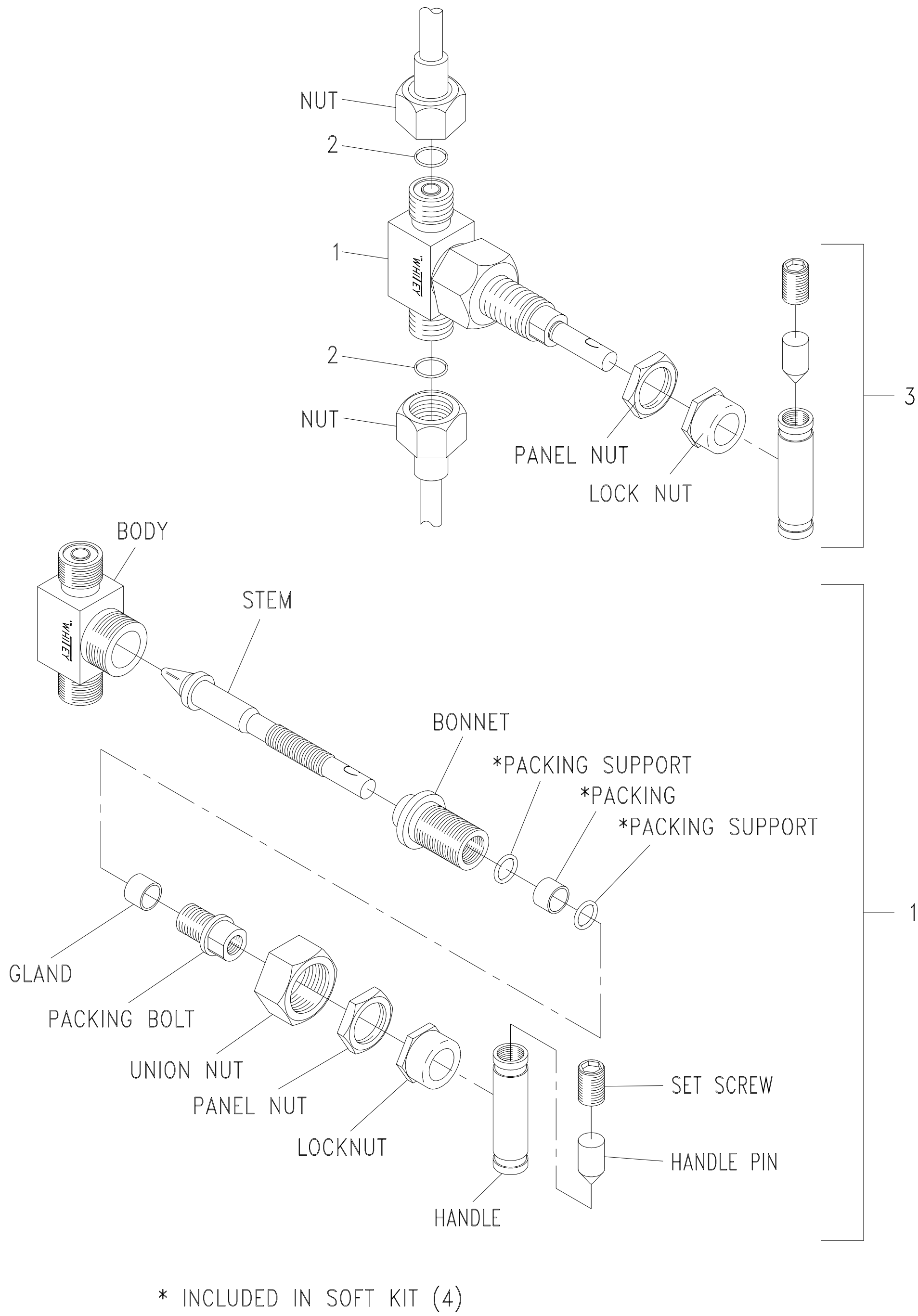


Figure 6-20. Vent (Bleed) Valves (AHP-V440, -V441, -V442) (Sheet 1 of 2)

Item	Description	CAGE Code	Part Number	Qty
1	Vent valve	02570	SS-3NBVCO4	1
2	O-ring, face seal	81349	M83248/2-010	2
3	Handle kit	02570	SS-5K-14B	1
4	Soft kit (packing (2) and packing support)	02570	T-9K-3N	AR

Figure 6-20. Vent (Bleed) Valves (AHP-V440, -V441, -V442) (Sheet 2 of 2)

b. Repair is limited to replacement of handle components using handle kit (3) and replacement of packing and packing supports using soft kit (4). If any other component is defective or damaged, replace entire valve in accordance with step c.

(1) Disassemble vent valve components as shown in Figure 6-20. Discard packing and packing supports.

(2) Inspect valve stem for damage. If valve stem is damaged, omit remainder of repair procedure and replace entire valve in accordance with step c. If valve stem passes inspection, continue with repair procedure.

(3) Begin reassembly of valve by installing valve stem and bonnet into valve body.

WARNING

Different brands of MIL-G-27617 Type III greases should never be mixed. Ensure all old grease is removed prior to applying new grease.

Do not use nickel anti-seize lubricant contained in soft kit. Failure to observe this warning may result in injury or death to the diver.

(4) Apply a light coat of MIL-G-27617 Type III lubricant to new packing and packing supports and install in bonnet.

(5) Install remainder of components (gland, packing bolt, and union nut) as shown in Figure 6-20.

c. Install:

(1) Position valve body in control panel and secure with panel nut and locknut.

(2) Install handle on valve stem. Insert handle pin and secure with set screw.

(3) Apply a light coat of MIL-G-27617 Type III lubricant to two new face seal O-rings (2), install one O-ring in each port of vent valve (1), and attach tubing.

(4) Pressurize system. Using NID solution prepared in accordance with paragraph 4.7.3.2, leak test valve connections, and correct as necessary.

(5) If AFRA was removed from Rack Enclosure Assembly for this procedure, re-install in accordance with paragraph 6.8.1.1, step b.

(6) Complete re-entry control forms.

6.8.1.12 Shutoff Valve (AHP-V444). AHP-V444, also known as the ***MANIFOLD*** valve, controls the flow of air between the Bank 1 and Bank 2 manifolds. The valve is mounted directly to the AFRA's control panel with the valve body behind the panel and the control handle on the panel front.

All callouts in the following procedure refer to the illustrated parts list in Figure 6-21. See Chapter 7 for additional ordering information.

WARNING

Do not disassemble components while the FADS III Air System is under pressure. Failure to observe this warning may result in injury or death to personnel.

This maintenance action involves entry into a certified boundary and approved re-entry control procedures must be followed.

a. Remove:

(1) If necessary, remove AFRA from Rack Enclosure Assembly in accordance with paragraph 6.8.1.1, step a.

(2) Ensure system is depressurized and all valves on AFRA control panel assembly are closed.

(3) Locate valve body (21), which is mounted behind the control panel, and back off tubing nuts from connector (2) and elbow (4).

(4) Remove, cut, and discard face seal O-rings (3). Bag or cap open ends of tubing.

(5) Remove cover from handle (7).

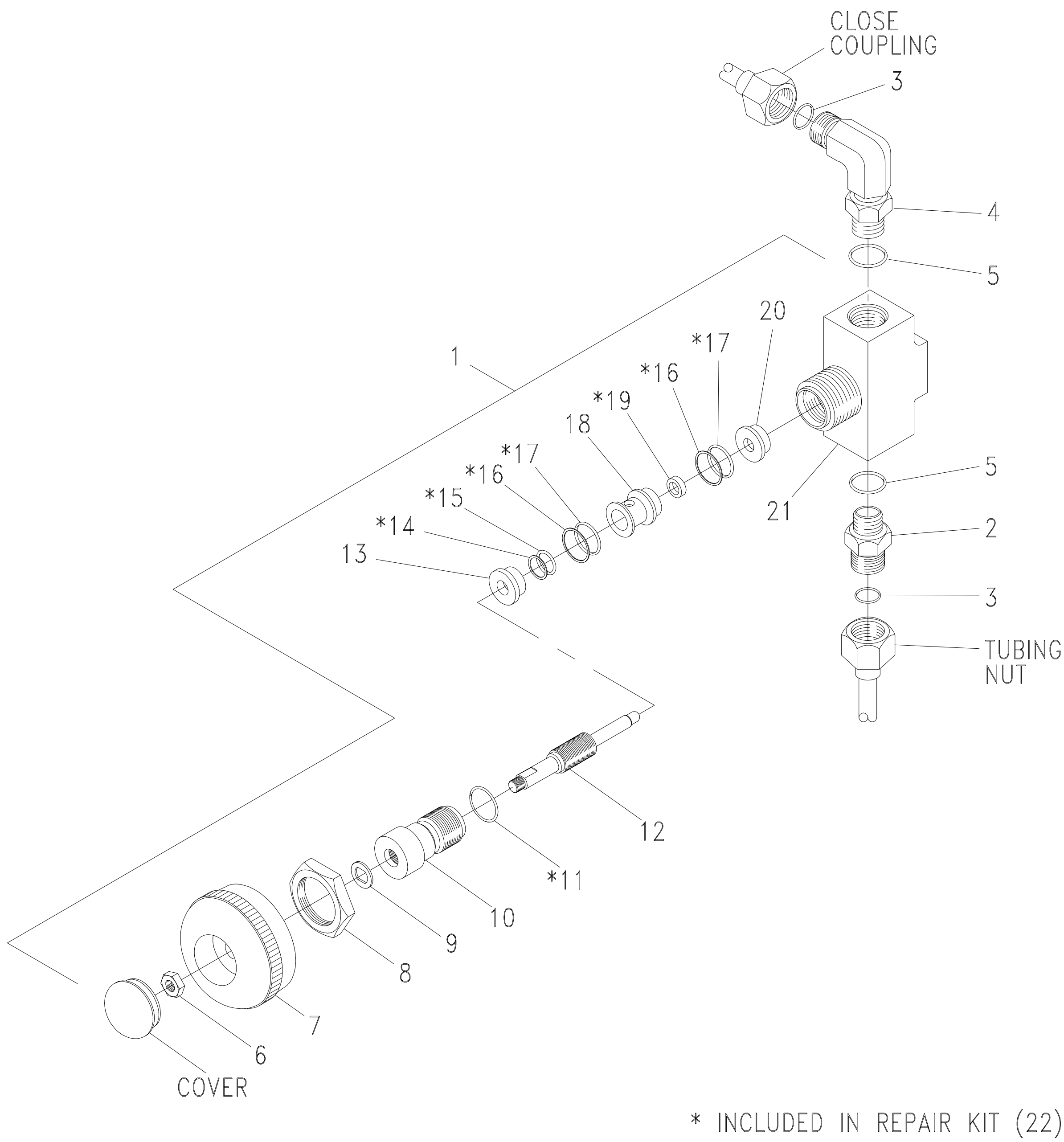
(6) Remove handle nut (6), handle (7), and washer (9) from valve stem (12).

(7) While supporting valve body (21), remove panel nut (8) and body from panel.

(8) Remove connector (2) and elbow (4) from valve body (21).

(9) Remove O-rings (5) from connector (2) and elbow (4); cut and discard O-rings.

(10) If valve is to be repaired, proceed with repair procedure in step b. If valve is to be replaced, install new valve in accordance with step c.



Item	Description	CAGE Code	Part Number	Qty
1	Shutoff valve	91816	HV09-17-2	1
2	Connector	02570	SS-8-VCO-1-6ST	1
3	O-ring, face seal	81349	M83248/2-111	2

Figure 6-21. Shutoff Valve (AHP-V444) (Sheet 1 of 2)

Item	Description	CAGE Code	Part Number	Qty
4	Positionable elbow	02570	SS-8-VCO-9P-6ST	1
5	O-ring, face seal and straight thread	81349	M83248/2-906	2
6	Nut, handle	91816	-6521SC	1
7	Handle, black	91816	-26689-2	1
8	Nut, panel	91816	-6524SC	1
9	Washer	91816	1940SC	1
10	Gland nut	91816	A12914B	1
11	Snap ring	91816	9045-700	1
12	Valve stem	91816	12956M	1
13	Spacer	91816	12912B	1
14	Back-up ring, small	91816	A1939L	1
15	O-ring, small	91816	4010-32 (size AS568-010)	1
16	Back-up ring, large	91816	1958L	2
17	O-ring, large	91816	4013-32 (size AS568-013)	2
18	Sleeve	91816	12910B	1
19	Seal	91816	12941L1	1
20	Insert	91816	12940B	1
21	Body	91816	38929	1
22	Repair kit (contains 11,14-17, 19)	91816	17314	AR

Figure 6-21. Shutoff Valve (AHP-V444) (Sheet 2 of 2)

b. Repair:

(1) Using the following procedure and Figure 6-21 as a guide, disassemble valve components as follows:

(a) Secure valve body (21) in vise with protective material against valve inlet/outlet faces to prevent scratching or other damage.

(b) Insert small flat-head screwdriver into slot of valve body (21) below snap ring (11) and remove ring from groove.

(c) Unscrew gland nut (10) in clockwise direction (left-hand threads) and remove gland nut (10), valve stem (12), and snap ring (11) from valve body (21).

(d) Carefully remove spacer (13), sleeve (18), and insert (20) assemblies from valve body (21) taking care not to scratch the inner bore sealing surface of valve body (21).

(e) Remove back-up rings (16) and O-rings (17) from spacer (13) and sleeve (18), along with O-ring (15) and back-up ring (14) from inside of spacer (13); cut and discard removed components.

(f) Remove valve stem (12) and snap ring (11) from gland nut (10); discard snap ring.

NOTE

It is recommended that Circle Seal assembly tools 16268, 16715, and 16717 be utilized during valve assembly.

(2) Using parts from repair kit (22) or from parts list in Figure 6-21, replace defective component(s) and reassemble shutoff valve (1) as follows:

WARNING

Different brands of MIL-G-27617 Type III greases should never be mixed. Ensure all old grease is removed prior to applying new grease.

(a) Apply a light coat of MIL-G-27617 Type III lubricant to new O-rings (15, 17), back-up rings (14, 16), threads of valve stem (12), and inner bore of valve body (21).

(b) Screw valve stem (12) into gland nut (10) until valve stem stops against shoulder of gland nut. Using tool 16717, install snap ring (11) onto gland nut (10).

(c) Install back-up ring (14) and O-ring (15) inside of spacer (13), and install O-ring (17) and back-up ring (16) onto spacer (13).

(d) Using tools 16268 and 16715, slip spacer (13) onto valve stem (12).

(e) Apply a light coat of MIL-G-27617 Type III lubricant to new seal (19), back-up ring (16), and O-ring (17), and install on sleeve (18).

(f) Install insert (20) into valve body (21) and ensure firmly seated.

(g) Slide sleeve assembly (16-19) onto valve stem (12) until it stops against spacer (13).

(h) Insert valve stem assembly (10-19) into valve body (21) and screw gland nut (10) counterclockwise, being careful not to pinch large O-ring (17) against thread bore transition of valve body (21) until gland nut (10) bottoms out.

WARNING

Torque gland nut to limits described below, not as marked on valve body. Torque values stamped into valve body are double actual limits and create a safety hazard to personnel and equipment.

(i) Torque gland nut (10) to 55-65 in-lb, and set snap ring (11) into groove.

c. Install:

(1) Apply a light coat of MIL-G-27617 Type III lubricant to new O-ring (5) and install O-ring on straight threads of connector (2). Install connector in new or repaired shutoff valve (1).

(2) Apply a light coat of MIL-G-27617 Type III lubricant to new O-ring (5) and install on straight threads of positionable elbow (4). Install positionable elbow in shutoff valve (1). Do not tighten nut at this time.

(3) Install body of shutoff valve (1) in control panel, and secure with panel nut (8).

(4) Place washer (9) and handle (7) on valve stem (12) and secure with handle nut (6).

(5) Install cover on handle (7).

(6) Apply a light coat of MIL-G-27617 Type III lubricant to two new face seal O-rings (3) and install O-rings in open ports of positionable elbow (4) and connector (2).

(7) Connect close coupling to positionable elbow (4) and tubing to connector (2).

(8) Tighten adjustable nut on positionable elbow (4).

(9) Pressurize system. Using NID solution prepared in accordance with paragraph 4.7.3.2, leak test valve connections, and correct as necessary.

(10) If AFRA was removed from Rack Enclosure Assembly for this procedure, reinstall in accordance with paragraph 6.8.1.1, step b.

(11) Complete re-entry control forms.

6.8.1.13 Check Valve (AHP-V445). AHP-V445 is a check valve that prevents air from back flowing from the ASRA to the charging ports. The valve is automatic and therefore has no control handle on the AFRA control panel.

All callouts in the following procedure refer to the illustrated parts list in Figure 6-22. See Chapter 7 for additional ordering information.

WARNING

Do not disassemble components while the FADS III Air System is under pressure. Failure to observe this warning may result in injury or death to personnel.

This maintenance action involves entry into a certified boundary and approved re-entry control procedures must be followed.

a. Remove:

(1) If necessary, remove AFRA from Rack Enclosure Assembly in accordance with paragraph 6.8.1.1, step a.

(2) Ensure system is depressurized and all valves on AFRA control panel assembly are closed.

(3) Locate check valve (1), which is mounted behind the control panel, and back off tubing and connector nut (2) from valve. Remove valve.

(4) Remove, cut, and discard the two face seal O-rings (3). Bag or cap open ends of tubing and connector.

(5) If valve is to be repaired, proceed with repair procedure in step b. If valve is to be replaced, install new valve in accordance with step c.

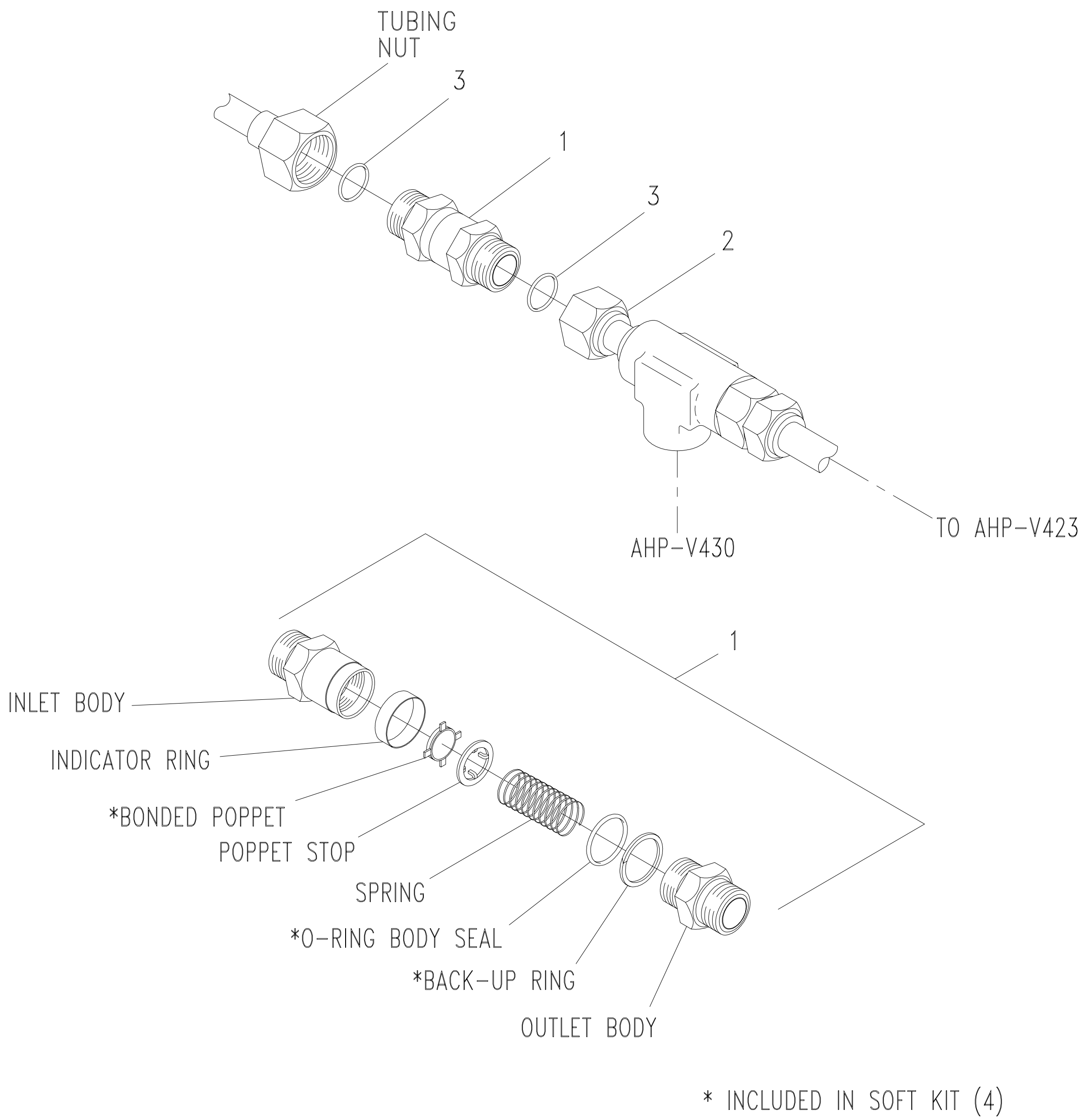
b. Repair:

(1) Using Figure 6-22 as a guide, disassemble check valve components.

(2) Using parts from soft kit (4), replace defective component(s) as required.

(3) Reassemble components in order shown in Figure 6-22.

(4) Torque inlet and outlet body halves to 200 in-lb.



Item	Description	CAGE Code	Part Number	Qty
1	Check valve	02570	SS-CHVCO8-50	1
2	Connector	02570	SS-8-WVCO-1-6ST	1
3	O-ring, face seal	81349	M83248/2-111	2
4	Soft kit (bonded poppet, O-ring body seal, and back-up ring)	02570	SS-3K-CH8-VI	AR

Figure 6-22. Check Valve (AHP-V445)

c. Install:

WARNING

Different brands of MIL-G-27617 Type III greases should never be mixed. Ensure all old grease is removed prior to applying new grease.

(1) Apply a light coat of MIL-G-27617 Type III lubricant to new face seal O-rings (3) and install one O-ring in each port of new or repaired check valve (1).

(2) Attach inlet of check valve (1) to tubing and outlet of check valve to connector (2). Tighten nuts securely.

(3) Pressurize system. Using NID solution prepared in accordance with paragraph 4.7.3.2, leak test valve connections for leaks, and correct as necessary.

(4) If AFRA was removed from Rack Enclosure Assembly for this procedure, re-install in accordance with paragraph 6.8.1.1, step b.

(5) Complete re-entry control forms.

6.8.1.14 In-line Filters (F-040). The AFRA contains two in-line filters designated as F-040. One filter is located between the charging ports and check valve (AHP-V445) and is designated as the air charge filter; the other is located between the ***SCUBA SUPPLY*** valve (AHP-V431) and regulator valve (AHP-V432) and is designated as the SCUBA charge filter. The major difference between the two filters is that the air charge filter is subject to re-entry control procedures whereas the SCUBA charge filter is not (see warning and note below). Both filters have removable elements that can be cleaned and reused, or replaced if desired. Identical tubing attachments are made to the ends of each filter.

All callouts in the following procedure refer to the illustrated parts list in Figure 6-23. See Chapter 7 for additional ordering information.

WARNING

Do not disassemble components while the FADS III Air System is under pressure. Failure to observe this warning may result in injury or death to personnel.

Maintenance for the air charge filter involves entry into a certified boundary and approved re-entry control procedures must be followed.

NOTE

Re-entry control procedures do not apply to the SCUBA charge filter as it is outside the certification boundaries for this system, but controlled work procedures should be developed in support of filter maintenance or replacement.

a. Remove:

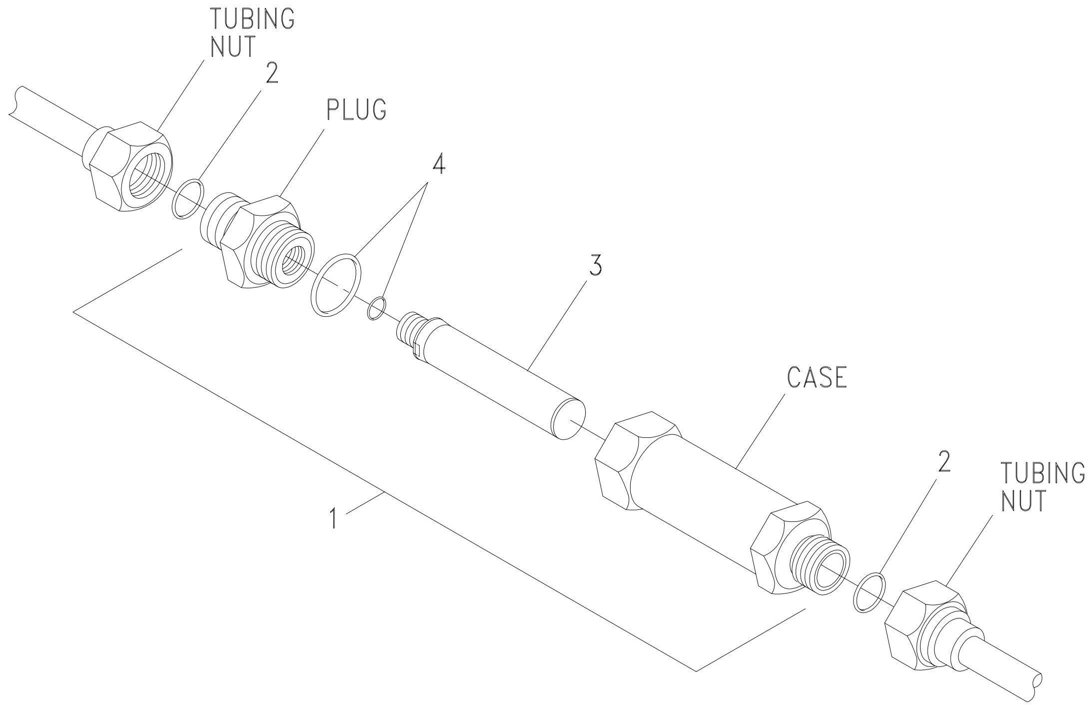
(1) If necessary, remove AFRA from Rack Enclosure Assembly in accordance with paragraph 6.8.1.1, step a.

(2) Ensure system is depressurized and all valves on AFRA control panel assembly are closed.

(3) Locate in-line filter (1) behind the AFRA control panel, back off tubing nuts from each end of filter, and remove filter.

(4) Remove, cut, and discard the two face seal O-rings (2). Bag or cap open ends of tubing.

(5) If filter element (3) is to be cleaned or replaced, proceed with element replacement procedure in step b. If entire filter (1) is to be replaced, install new filter in accordance with step c.



Item	Description	CAGE Code	Part Number	Qty
1	Filter	59165	U-10002	1
2	O-ring, face seal	81349	M83248/2-012	2
3	Element	59165	U-10007	1
4	Seal kit (large and small O-rings)	59165	U-10009	AR

Figure 6-23. In-line Filters (F-040)

b. Filter element cleaning or replacement:

(1) Remove plug from filter case as shown in Figure 6-23.

(2) Remove filter element (3) from plug.

(3) Remove, cut, and discard O-rings (4).

(4) Inspect filter element (3). If cleaning is indicated, send to NAVSEA authorized cleaning facility to be cleaned to MIL-STD-1330 or other approved NAVSEA cleaning procedure for diver life support systems. If replacement is required, proceed to step (5).

(5) Reassemble filter (1) using cleaned filter element (3) or new replacement element cleaned to MIL-STD-1330, or other NAVSEA authorized cleaning procedure for life support system as follows:

WARNING

Different brands of MIL-G-27617 Type III greases should never be mixed. Ensure all old grease is removed prior to applying new grease.

(a) Apply a light coat of MIL-G-27617 Type III lubricant to new O-ring (small) from seal kit (4), and install O-ring on filter element (3).

(b) Install filter element (3) in plug, and torque to 5 ft-lb.

(c) Apply a light coat of MIL-G-27617 Type III lubricant to new O-ring (large) from seal kit (4), and install O-ring on plug.

(d) Install plug in filter case, and torque to 30-45 ft-lb.

c. Install cleaned or replacement filter:

(1) Apply a light coat of MIL-G-27617 Type III lubricant to two new face seal O-rings (2) and install one O-ring in each port of cleaned or replacement filter (1).

(2) Verify direction of filter air flow is correct, then attach tubing nuts to each end of filter (1). Tighten nuts securely.

(3) Pressurize system. Using NID solution prepared in accordance with paragraph 4.7.3.2, leak test filter connections, and correct as necessary.

(4) If AFRA was removed from Rack Enclosure Assembly for this procedure, reinstall in accordance with paragraph 6.8.1.1, step b.

(5) Complete re-entry control forms for air charge filter only.

6.8.1.15 <u>Pressure Gauge, 0-5,000 psi (AHP-G436)</u>. AHP-G436, also known as the ***SCUBA PRESSURE*** gauge, indicates the pressure of air being delivered from ***SCUBA REGULATOR*** valve (AHP-V432) to the SCUBA charging port.

All callouts in the following procedure refer to the illustrated parts list in Figure 6-24. See Chapter 7 for additional ordering information.

WARNING

Do not disassemble components while the FADS III Air System is under pressure. Failure to observe this warning may result in injury or death to personnel.

NOTE

Re-entry control procedures do not apply to AHP-G436 as it is outside the certification boundaries for this system, but controlled work procedures should be developed in support of gauge maintenance or repair.

a. Remove:

(1) If necessary, remove AFRA from Rack Enclosure Assembly in accordance with paragraph 6.8.1.1, step a.

(2) Ensure system is depressurized and all valves on AFRA control panel assembly are closed.

(3) Back off tubing nut, remove gauge mounting kit from rear of gauge (1), and remove gauge from front of control panel. Bag or cap open end of tubing.

(4) Remove, cut, and discard face seal O-ring (2).

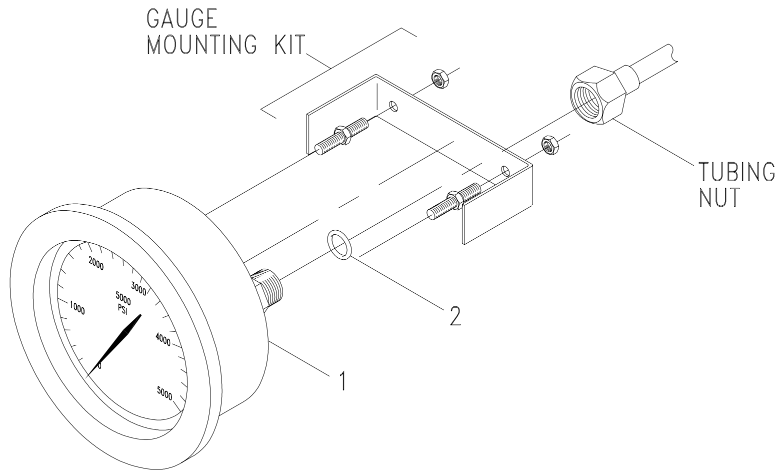
(5) If gauge is to be recalibrated, tag and bag in accordance with approved procedures and send to NAVSEA-approved calibration facility.

b. Replace:

WARNING

Different brands of MIL-G-27617 Type III greases should never be mixed. Ensure all old grease is removed prior to applying new grease.

(1) Apply a light coat of MIL-G-27617 Type III lubricant to new face seal O-ring (2) and install O-ring in port of replacement gauge (1).



Item	Description	CAGE Code	Part Number	Qty
1	Gauge, 0-5,000 psi	52159	25502-35B21-MCF	1
2	O-ring, face seal	81349	M83248/2-010	1
3	Kit, gauge mounting	52159	RS-426-1	1

Figure 6-24. Pressure Gauge, 0-5,000 psi (AHP-G436)

(2) Insert replacement gauge (1) in control panel, and install tubing to gauge.

(3) Install gauge mounting kit (3).

(4) Pressurize system. Using NID solution prepared in accordance with paragraph 4.7.3.2, leak test gauge connections, and correct as necessary.

(5) If AFRA was removed from Rack Enclosure Assembly for this procedure, re-install in accordance with paragraph 6.8.1.1, step b.

6.8.1.16 Pressure Gauges, 0-8,000 psi (AHP-G437, -G438, -G439). AHP-G437, -G438, and -G439 are designated as the ***BANK 1***, ***BANK 2***, and ***BANK 3*** pressure gauges, respectively. Corrective maintenance is limited to removal and replacement.

All callouts in the following procedure refer to the illustrated parts list in Figure 6-25. See Chapter 7 for additional ordering information.

WARNING

Do not disassemble components while the FADS III Air System is under pressure. Failure to observe this warning may result in injury or death to personnel.

This maintenance action involves entry into a certified boundary and approved re-entry control procedures must be followed.

a. Remove:

(1) If necessary, remove AFRA from Rack Enclosure Assembly in accordance with paragraph 6.8.1.1, step a.

(2) Ensure system is depressurized and all valves on AFRA control panel assembly are closed.

(3) Back off tubing nut from rear port of gauge (1). Bag or cap open end of tubing.

(4) Remove the three sets of panhead screws (2), flat washers (3), and self-locking nuts (4) that secure gauge (1) to AFRA control panel; remove gauge from panel.

(5) Remove, cut, and discard face seal O-ring (5).

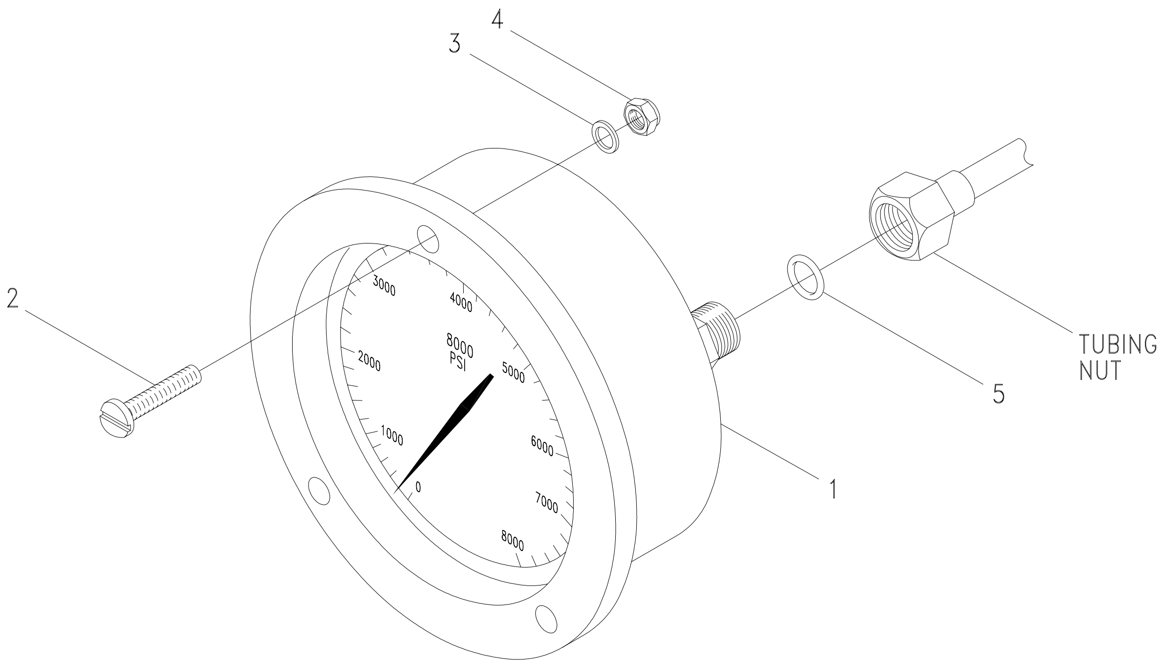
(6) If gauge is to be recalibrated, tag and bag in accordance with approved procedures and send to NAVSEA-approved calibration facility.

b. Replace:

WARNING

Different brands of MIL-G-27617 Type III greases should never be mixed. Ensure all old grease is removed prior to applying new grease.

(1) Apply a light coat of MIL-G-27617 Type III lubricant to new face seal O-ring (5) and install O-ring in port of replacement gauge (1).



Item	Description	CAGE Code	Part Number	Qty
1	Gauge, 0-8,000 psi	52159	25544-37B21-MCD	1
2	Screw, panhead, 0.190-24UNC-2A X 1.00 LG	96906	MS51957-67	3
3	Washer, flat, 0.19 nom	96906	MS15795-808	3
4	Nut, self-locking, 0.190-24UNC-3B	96906	MS17830-3C	3
5	O-ring, face seal	81349	M83248/2-010	1

Figure 6-25. Pressure Gauges, 0-8,000 psi (AHP-G437, -G438, -G439)

(2) Insert replacement gauge (1) in control panel and secure with the three sets of panhead screws (2), flat washers (3), and self-locking nuts (4).

(3) Install tubing to gauge (1), and tighten tubing nut securely.

(4) Pressurize system. Using NID solution prepared in accordance with paragraph 4.7.3.2, leak test gauge connections, and correct as necessary.

(5) If AFRA was removed from Rack Enclosure Assembly for this procedure, re-install in accordance with paragraph 6.8.1.1, step b.

(6) Complete re-entry control forms.

6.8.2 <u>Control Console Assembly (CCA)</u>. Corrective maintenance for the CCA consists of repair or replacement of the following components. See Figures 6-26 and 6-27 for component locations.

- Para. 6.8.2.1—Control Console Panel Assembly .... Pg 6-120
- Para. 6.8.2.2—Angle Shutoff Valves (AHP-V301, -V302) .... Pg 6-125
- Para. 6.8.2.3—Regulator Valves (AHP-V303, -V304) .... Pg 6-135
- Para. 6.8.2.4—Gauge Stop Valves (AHP-V305, -V306; ALP-V307, -V308) .... Pg 6-149
- Para. 6.8.2.5—LP Relief Valves (ALP-V309, -V310) .... Pg 6-152
- Para. 6.8.2.6—Angle Ball Valves (ALP-V311, -V312, -V314, -V315, -V316) .... Pg 6-154
- Para. 6.8.2.7—Ball Valve (ALP-V313) .... Pg 6-156
- Para. 6.8.2.8—Angle Ball Valves (ALP-V317, -V318, -V319) .... Pg 6-158
- Para. 6.8.2.9—In-line Filters (F-020) .... Pg 6-160
- Para. 6.8.2.10—Diver Depth Gauges (ALP-G320, -G321, -G322) .... Pg 6-163
- Para. 6.8.2.11—Pressure Gauges, 0-500 psi (ALP-G323, -G324) .... Pg 6-166
- Para. 6.8.2.12—Pressure Gauges, 0-6,000 psi (AHP-G325, -G326) .... Pg 6-168

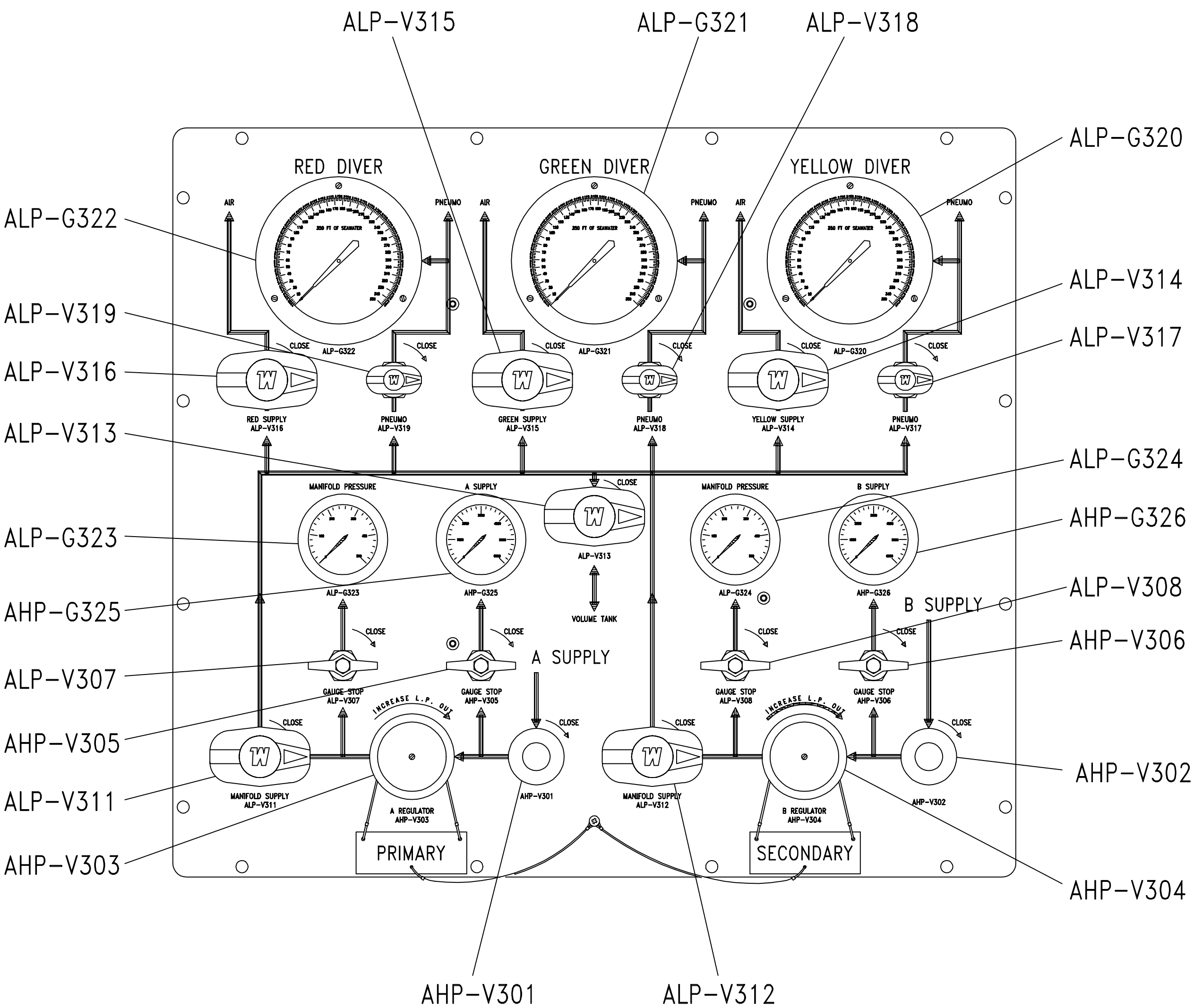


Figure 6-26. Control Console Assembly, Front View of Front Panel Assembly

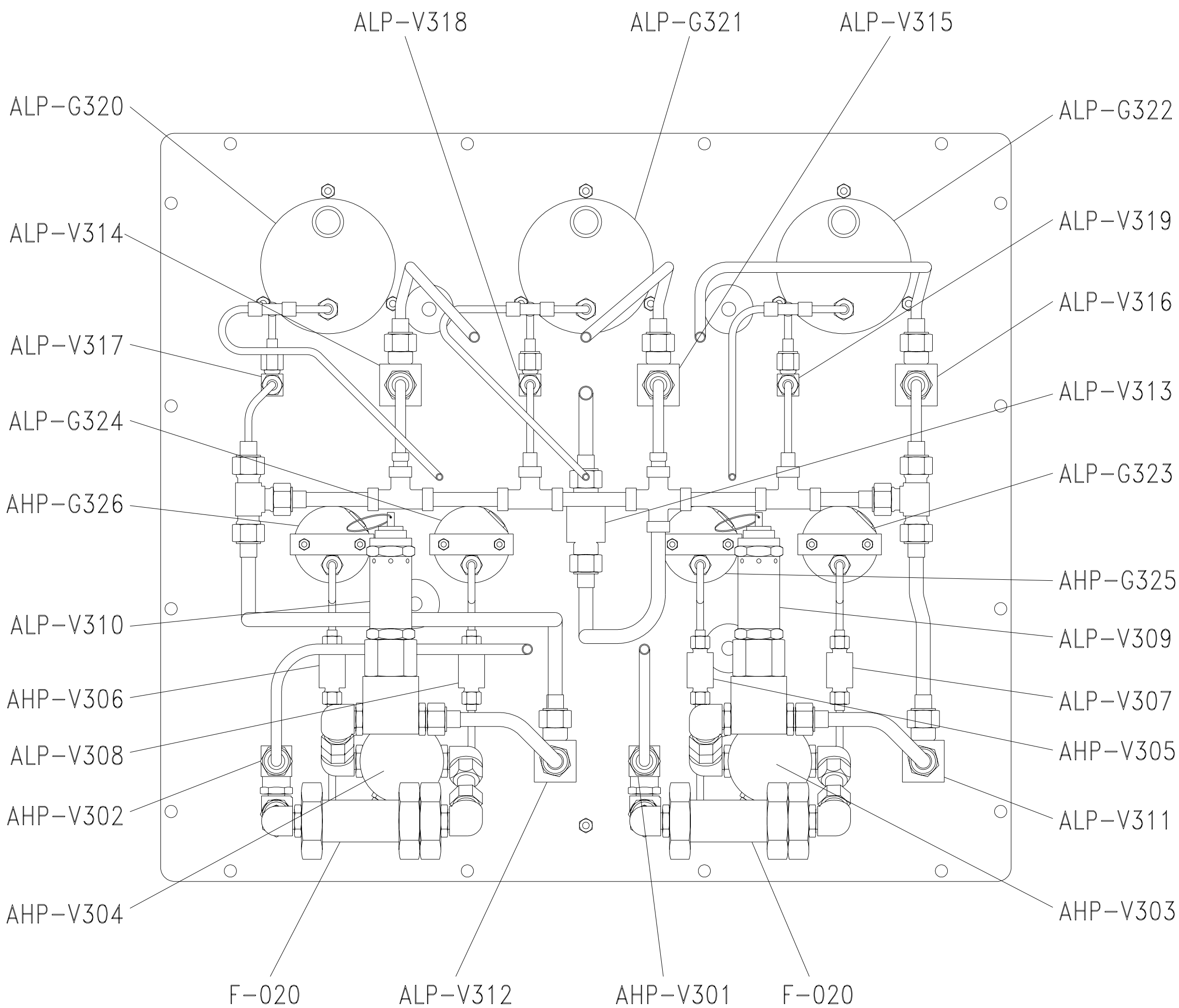


Figure 6-27. Control Console Assembly, Rear View of Front Panel Assembly

6.8.2.1 Control Console Panel Assembly. The control console panel assembly consists of valves, filters, gauges, and interconnecting tubing interfaced with and sandwiched between a front and rear panel. Before corrective maintenance can be accomplished on these components, the control console panel assembly must be removed from its protective case. Removal and reinstallation procedures are provided below and correspond with the indicated sheet in Figure 6-28:

a. Remove:

(1) If CCA has been in use, bleed down system to relieve pressure from CCA, diver umbilicals, and supply hoses from VTA and ASRA. Disconnect all hoses from rear panel, cap CCA ports, and cap or bag open ends of umbilical and supply hoses.

(2) Refer to Figure 6-28, Sheet 1: If CCA lid is installed, depress breather valves (1) on lid (2) and case (3) to relieve residual pressure. Release latches (4) and remove lid.

(3) If rear door on CCA is closed, loosen the five captive screws (5) and open rear door (6) to expose the rear panel.

(4) Refer to Figure 6-28, Sheet 2, Bottom/Rear View: Loosen the 12 captive screws (7) holding rear panel (8) to case (3).

(5) Refer to Figure 6-28, Sheet 2, Top/Front View, and Sheet 3: Loosen the 16 captive screws (9) and remove retainer assembly (10) from control console panel assembly (11).

(6) Refer to Figure 6-28, Sheet 3: With retainer assembly (10) removed, carefully remove control console panel assembly (11) (with internal components and rear panel (8) attached) through opening in case (3).

NOTE

Disassemble control console panel assembly (11) only to the extent necessary to perform the required maintenance.

b. Reinstall:

(1) Refer to Figure 6-28, Sheet 3: If control console panel assembly (11) was disassembled for maintenance, reassemble as necessary.

(2) On CCA case (3), ensure gaskets surrounding panel openings are in place and serviceable. Replace as necessary.

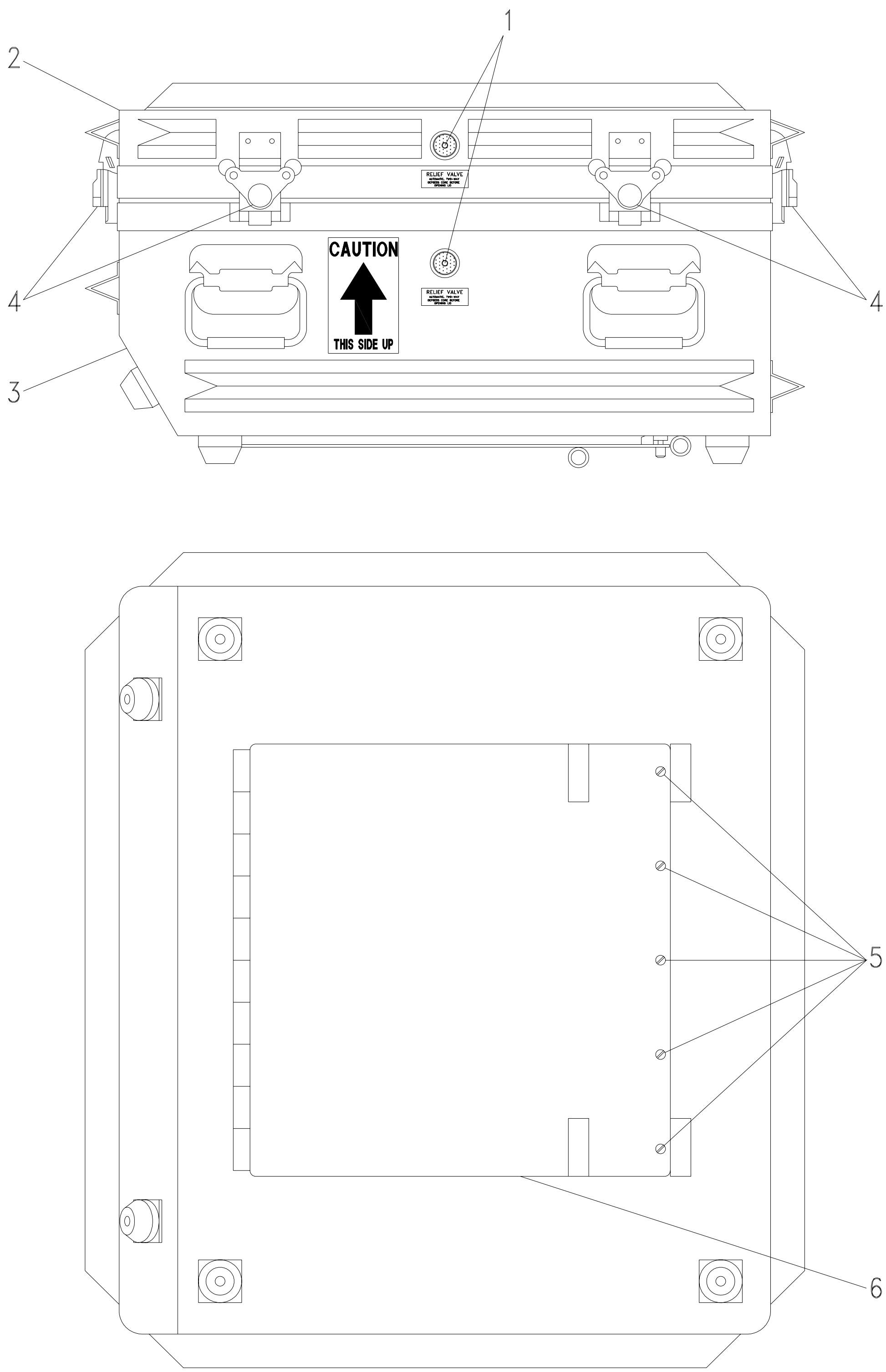


Figure 6-28. Removing/Reinstalling Control Console Panel Assembly (Sheet 1 of 3)

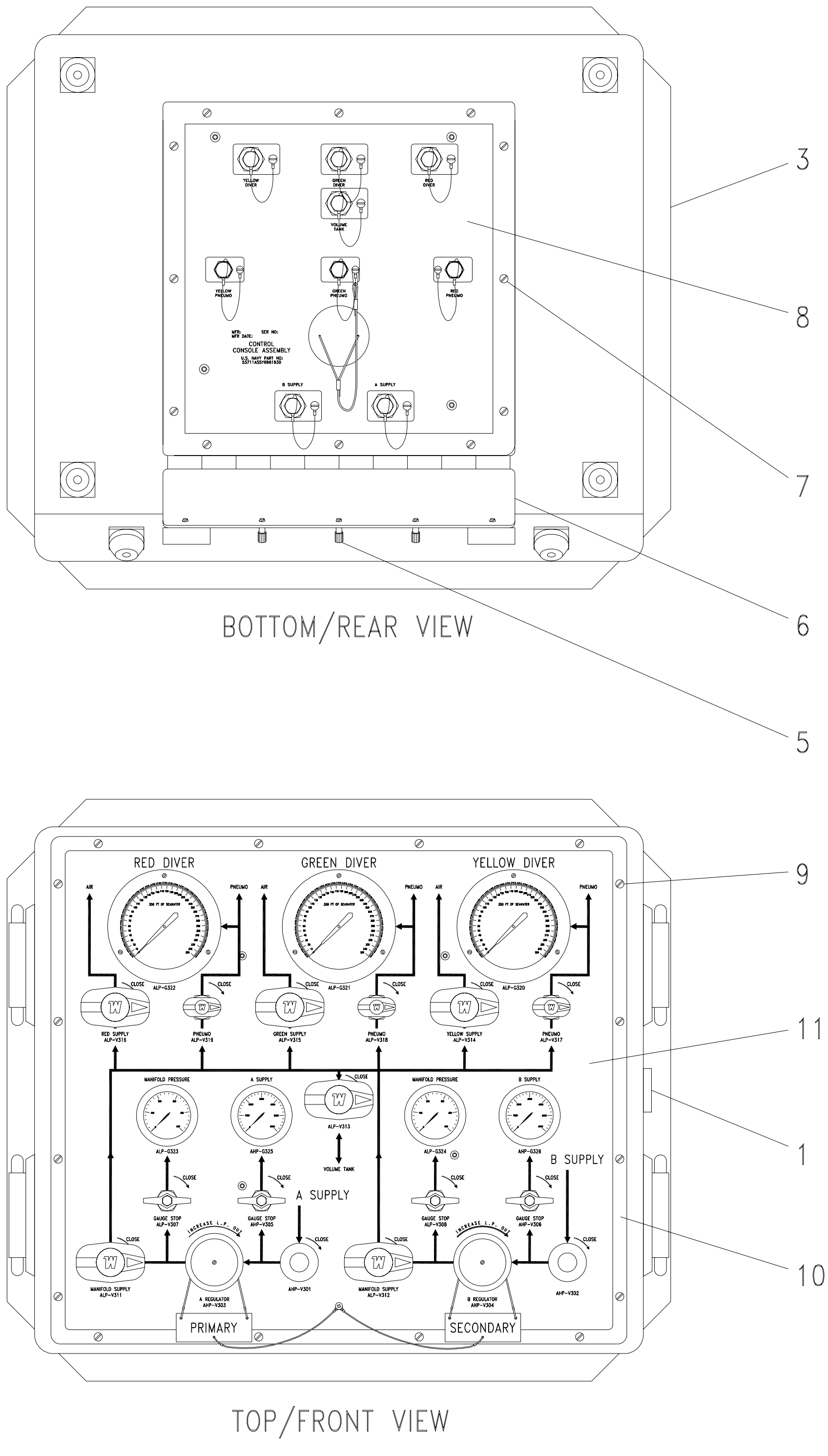


Figure 6-28. Removing/Reinstalling Control Console Panel Assembly (Sheet 2 of 3)

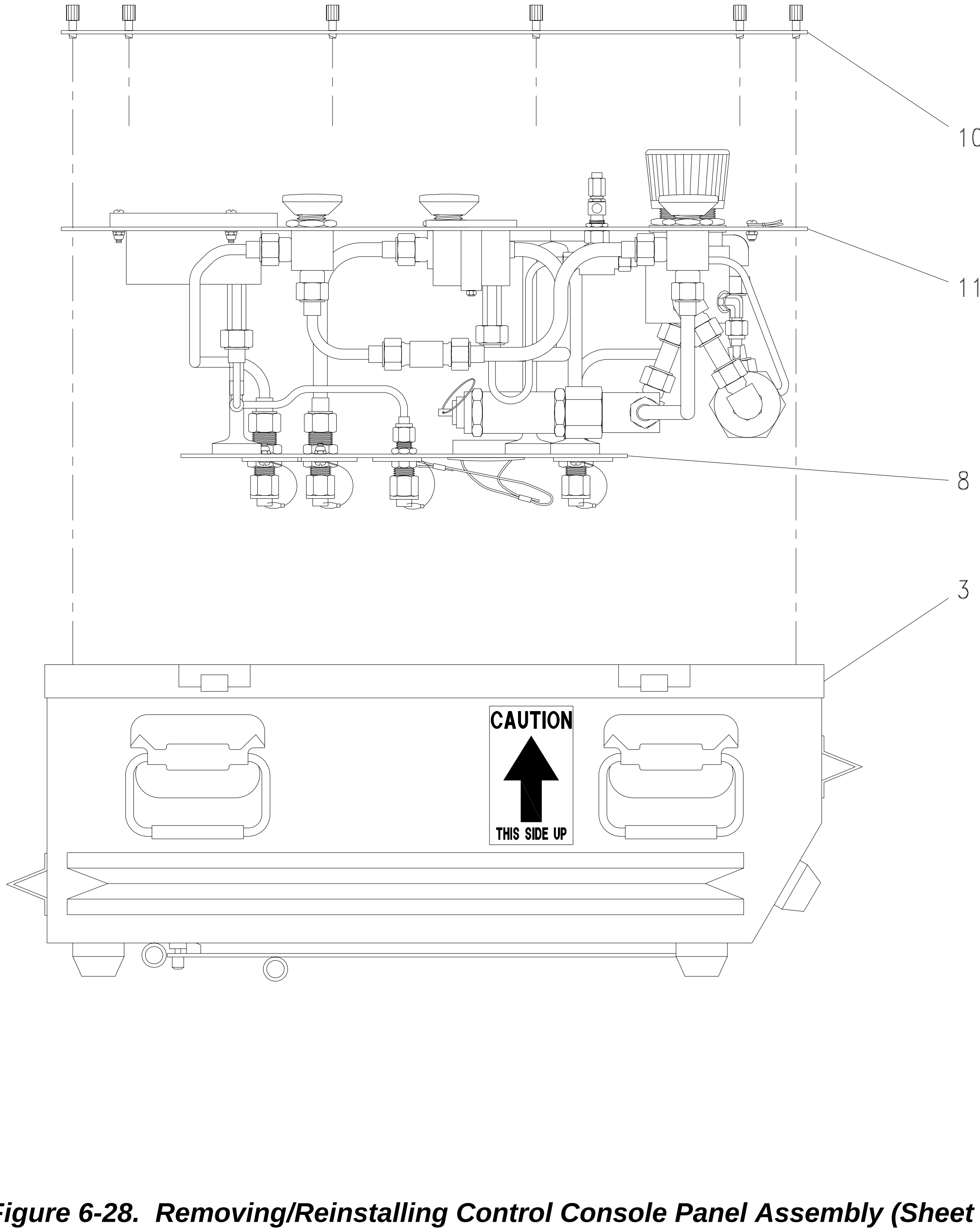


Figure 6-28. Removing/Reinstalling Control Console Panel Assembly (Sheet 3 of 3)

(3) Carefully insert control console panel assembly (11) (with internal components and rear panel (8) attached) through front opening in case (3).

(4) Refer to Figure 6-28, Sheet 3 and Sheet 2, Top/Front View: Install front panel retainer assembly (10) and secure with the 16 captive screws (9).

(5) Refer to Figure 6-28, Sheet 2, Bottom/Rear View: Secure rear panel (8) with the 12 captive screws (7).

(6) Refer to Figure 6-28, Sheet 1: If placing CCA in temporary storage, secure case (3) in accordance with the following:

(a) Close rear door (6) and secure with the five captive screws (5).

(b) Install lid (2) and secure with latches (4).

(7) If placing CCA back in service, set up equipment in accordance with premission procedures in OP-1 of Appendix A.

6.8.2.2 Angle Shutoff Valves (AHP-V301, -V302). AHP-V301 and AHP-V302 control the HP air supply entering the CCA through the ***A SUPPLY*** and ***B SUPPLY*** ports, respectively. When open, air passes through the valve to an in-line filter (F-020) and a regulator valve (AHP-V303 or AHP-V304). The angle shutoff valves are mounted directly to the CCA's front panel with the valve body behind the panel and the control handle on the panel front.

Two versions of the angle shutoff valves—one made by Circle Seal and the other by CPV—are approved for use with the FADS III Air System. To allow for differences in design, corrective maintenance for the angle shutoff valves has been divided into two procedures: Procedure A below covers the Circle Seal valves and Procedure B on page 6-130 covers the CPV valves.

PROCEDURE A: CIRCLE SEAL ANGLE SHUTOFF VALVES (PN HV09-15-1 and PN HV09-15-3)

All callouts in the following procedure refer to the illustrated parts list in Figure 6-29. See Chapter 7 for additional ordering information.

WARNING

Do not disassemble components while the FADS III Air System is under pressure. Failure to observe this warning may result in injury or death to personnel.

This maintenance action involves entry into a certified boundary and approved re-entry control procedures must be followed.

a. Remove:

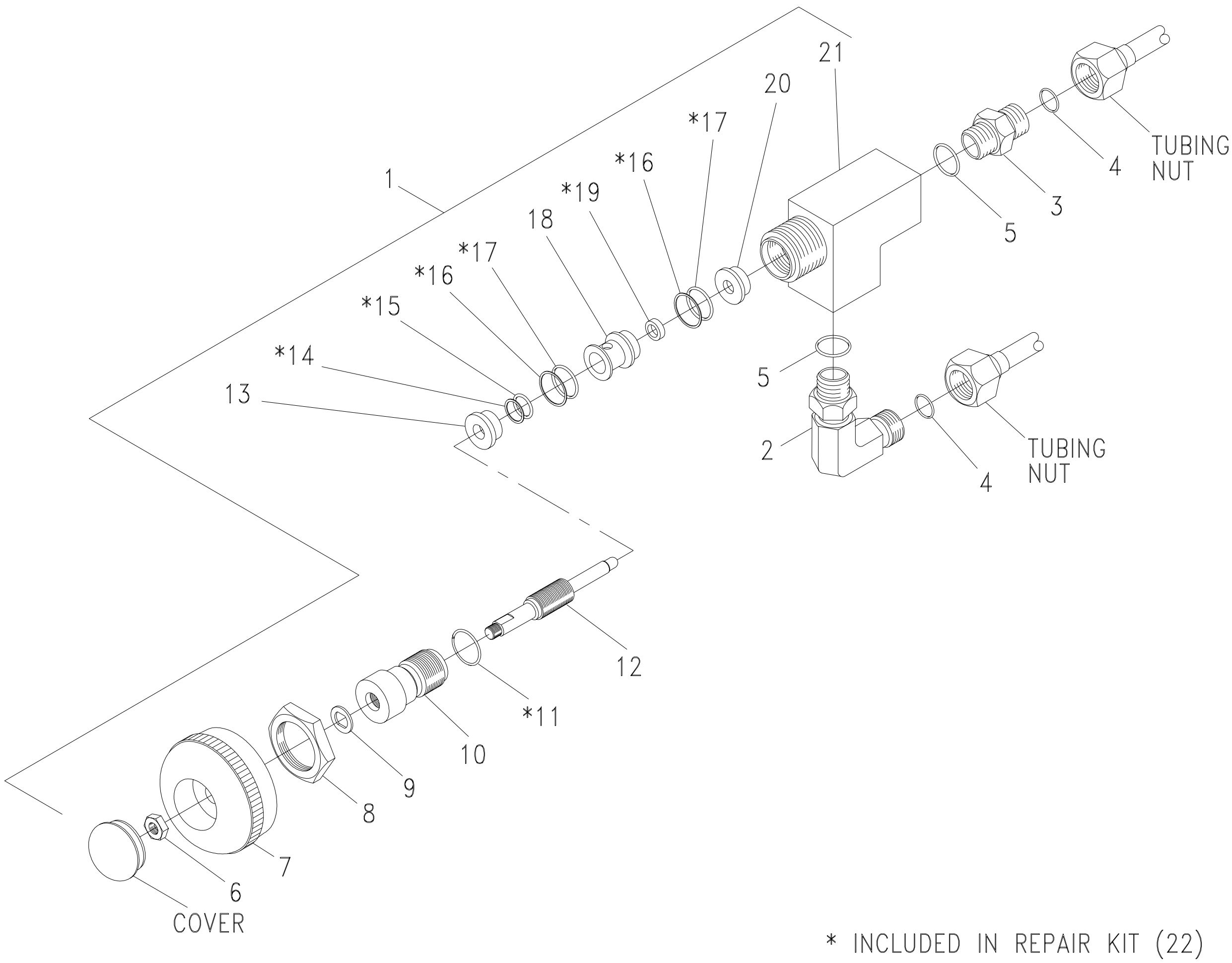
(1) Depressurize system and remove CCA control console panel assembly from its case in accordance with paragraph 6.8.2.1, step a.

(2) Locate body of angle shutoff valve (1), which is mounted behind the front panel, and back off tubing nuts from positionable elbow (2) and connector (3).

(3) Remove, cut, and discard the two face seal O-rings (4). Bag or cap open ends of tubing.

(4) Remove cover and handle nut (6) from handle (7). Remove handle (7) and washer (9) from valve stem.

(5) Remove panel nut (8) from valve stem, and remove valve body from rear of front panel.



Item	Description	CAGE Code	Part Number	Qty
1	Shutoff valve, angle (blue handle – V301) Shutoff valve, angle (orange handle – V302)	91816 91816	HV09-15-1 HV09-15-3	1 1
2	Elbow, positionable	02570	SS-8-VCO-9P-6ST	1
3	Connector	02570	SS-8-VCO-1-6ST	1
4	O-ring, face seal	81349	M83248/2-111	2
5	O-ring, straight thread	81349	M83248/2-906	2
6	Nut, handle	91816	-6521SC	1
7	Handle, blue (for AHP-V301) Handle, orange (for AHP-V302)	91816 91816	-26689-1 -26689-3	1 1

Figure 6-29. Circle Seal Angle Shutoff Valves (AHP-V301, -V302) (Sheet 1 of 2)

Item	Description	CAGE Code	Part Number	Qty
8	Nut, panel	91816	-6524SC	1
9	Washer	91816	1940SC	1
10	Gland nut	91816	A12914B	1
*11	Snap ring	91816	9045-700	1
12	Stem	91816	12956M	1
13	Spacer	91816	12912B	1
*14	Back-up ring, small	91816	A1939L	1
*15	O-ring, small	91816	4010-32 (size AS568-010)	1
*16	Back-up ring, large	91816	1958L	2
*17	O-ring, large	91816	4013-32 (size AS568-013)	2
18	Sleeve	91816	12910B	1
*19	Seal	91816	12941L1	1
20	Insert	91816	12940B	1
21	Body	91816	38908	1
22	Repair kit (contains 11, 14-17, 19)	91816	17314	AR

Figure 6-29. Circle Seal Angle Shutoff Valves (AHP-V301, -V302) (Sheet 2 of 2)

(6) Remove positionable elbow (2) and connector (3) from valve body.

(7) Remove, cut, and discard the two straight thread O-rings (5).

(8) If valve is to be repaired, proceed with repair procedure in step b. If valve is to be replaced, install new valve in accordance with step c.

b. Repair:

(1) Using the following procedure and Figure 6-29 as a guide, disassemble valve components as follows:

(a) Secure valve body (21) in vise with protective material against valve inlet/outlet faces to prevent scratching or other damage.

(b) Insert small flat-head screwdriver into slot of valve body (21) below snap ring (11) and remove ring from groove.

(c) Unscrew gland nut (10) in clockwise direction (left-hand threads) and remove gland nut (10), valve stem (12), and snap ring (11) from valve body (21).

(d) Carefully remove spacer (13), sleeve (18), and insert (20) assemblies from valve body (21) taking care not to scratch the inner bore sealing surface of valve body (21).

(e) Remove back-up rings (16) and O-rings (17) from spacer (13) and sleeve (18), along with O-ring (15) and back-up ring (14) from inside of spacer (13); cut and discard removed components.

(f) Remove valve stem (12) and snap ring (11) from gland nut (10); discard snap ring.

NOTE

It is recommended that Circle Seal assembly tools 16268, 16715, and 16717 be utilized during valve assembly.

(2) Using repair parts from repair kit (22) or from parts list shown in Figure 6-29, replace defective component(s) and reassemble valve (1) as follows:

WARNING

Different brands of MIL-G-27617 Type III greases should never be mixed. Ensure all old grease is removed prior to applying new grease.

(a) Apply a light coat of MIL-G-27617 Type III lubricant to new O-rings (15, 17), back-up rings (14, 16), valve stem threads (12), and inner bore of valve body (21).

(b) Screw valve stem (12) into gland nut (10) until valve stem stops against shoulder of gland nut. Using tool 16717, install snap ring (11) onto gland nut (10).

(c) Install back-up ring (14) and O-ring (15) inside of spacer (13), and install back-up ring (16) and O-ring (17) onto spacer (13).

(d) Using tools 16268 and 16715, slip spacer (13) onto valve stem (12).

(e) Apply a light coat of MIL-G-27617 Type III lubricant to new seal (19), back-up ring (16), and O-ring (17), and install components on sleeve (18).

(f) Install insert (20) into valve body (21) and ensure firmly seated.

(g) Slide sleeve assembly (16-19) onto valve stem (12) until it stops against spacer (13).

(h) Insert valve stem assembly (10-19) into valve body (21) and screw gland nut (10) counterclockwise, being careful not to pinch large O-ring (17) against thread bore transition of valve body (21) until gland nut (10) bottoms out.

WARNING

Torque gland nut to limits described below, not as marked on valve body. Torque values stamped into valve body are double actual limits and create a safety hazard to personnel and equipment.

(i) Torque gland nut (10) to 55-65 in-lb, and set snap ring (11) into groove.

c. Install:

(1) Apply a light coat of MIL-G-27617 Type III lubricant to two new O-rings (5) and install O-rings on straight threads of positionable elbow (2) and connector (3). Install elbow and connector in new or repaired angle shutoff valve (1). Tighten connector, but do not tighten adjustable elbow nuts at this time.

(2) Install angle shutoff valve (1) in front panel, and secure with panel nut (8).

(3) Apply a light coat of MIL-G-27617 Type III lubricant to two new face seal O-rings (4) and install one O-ring in each open port of positionable elbow (2) and connector (3). Attach tubing to elbow and connector and tighten tubing nuts.

(4) Tighten adjustable nut on positionable elbow (2).

(5) Place washer (9) and handle (7) on valve stem and secure with handle nut (6).

(6) Install cover on handle (7).

(7) Pressurize system. Using NID solution prepared in accordance with paragraph 4.7.3.2, leak test valve connections, and correct as necessary.

(8) Reinstall CCA control console panel assembly in accordance with paragraph 6.8.2.1, step b.

(9) Complete re-entry control forms.

PROCEDURE B: CPV ANGLE SHUTOFF VALVES (PN PLB-12764-1 and PN PLB-12764-3)

All callouts in the following procedure refer to the illustrated parts list in Figure 6-30 unless otherwise directed. See Chapter 7 for additional ordering information.

WARNING

Do not disassemble components while the FADS III Air System is under pressure. Failure to observe this warning may result in injury or death to personnel.

This maintenance action involves entry into a certified boundary and approved re-entry control procedures must be followed.

a. Remove:

(1) Depressurize system and remove CCA control console panel assembly from its case in accordance with paragraph 6.8.2.1, step a.

(2) Locate body of angle shutoff valve (1), which is mounted behind the front panel, and back off tubing nuts from positionable elbow (2) and connector (3).

(3) Remove, cut, and discard the two face seal O-rings (4). Bag or cap open ends of tubing.

(4) Remove cover (20), handle nut (6), handle (7), and retaining ring (9) from valve stem (11).

(5) While supporting valve body (19), remove panel nut (8) from valve body (19), and remove valve body from rear of front panel.

(6) Remove positionable elbow (2) and connector (3) from valve body (19).

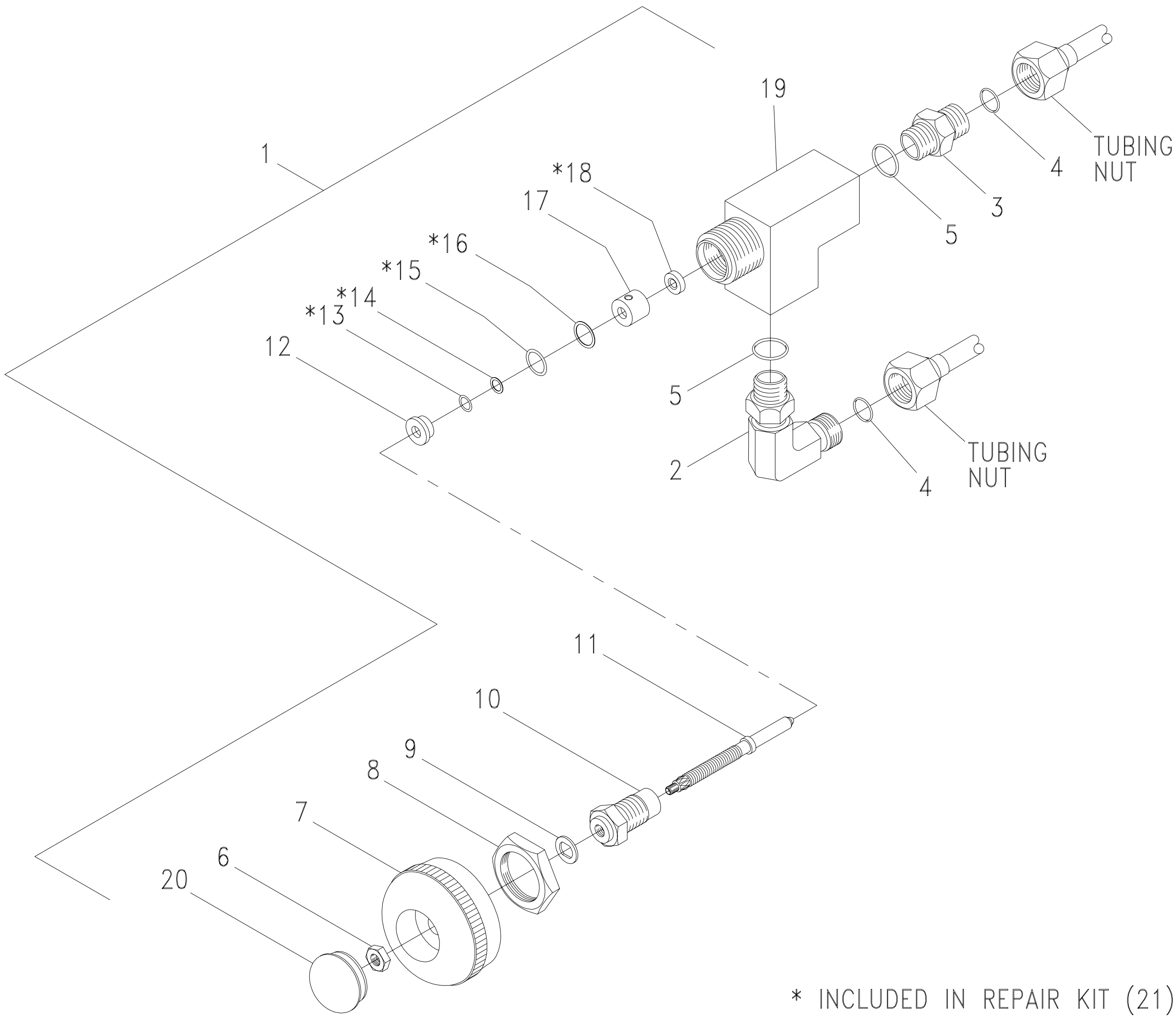
(7) Remove, cut, and discard the two straight thread O-rings (5).

(8) If valve is to be repaired, proceed with repair procedure in step b. If valve is to be replaced, install new valve in accordance with step c.

b. Repair:

(1) Using the following procedure and Figure 6-30 as a guide, disassemble valve components as follows:

(a) Secure valve body (19) in vise with protective material against valve inlet/outlet faces to prevent scratching or other damage.



Item	Description	CAGE Code	Part Number	Qty
1	Shutoff valve, angle (blue handle – V301) Shutoff valve, angle (orange handle – V302)	99565 99565	PLB-12764-1 PLB-12764-3	1 1
2	Elbow, positionable	02570	SS-8-VCO-9P-6ST	1
3	Connector	02570	SS-8-VCO-1-6ST	1
4	O-ring, face seal	81349	M83248/2-111	2
5	O-ring, straight thread	81349	M83248/2-906	2
6	Nut, handle	99565	SS #10-32	1

Figure 6-30. CPV Angle Shutoff Valves (AHP-V301, -V302) (Sheet 1 of 2)

Item	Description	CAGE Code	Part Number	Qty
7	Handle, blue (for AHP-V301) Handle, orange (for AHP-V302)	99565 99565	130110DL-1 130110DL-3	1 1
8	Nut, panel	99565	127980AG	1
9	Ring, retaining	99565	005506XX	1
10	Nut, gland	99565	127940AC	1
11	Stem	99565	127930DC	1
12	Spacer	99565	127960AG	1
*13	O-ring, small	99565	000010EE	1
*14	Ring, back-up, small	99565	011010EL	1
*15	O-ring, large	99565	000013EE	1
*16	Ring, back-up, large	99565	011013EL	1
17	Sleeve	99565	127950AG	1
*18	Disc	99565	127970EW	1
19	Body, valve	99565	129380CF	1
20	Cover	99565	130387BA	1
21	Repair kit (contains 14-17, 19)	99565	PLB-12764SK	AR

Figure 6-30. CPV Angle Shutoff Valves (AHP-V301, -V302) (Sheet 2 of 2)

(b) Unscrew gland nut (10) in clockwise direction (left-hand threads) and remove valve stem assembly (10-18) from valve body (19).

(c) From valve stem (11) remove sleeve (17) and spacer (12) assemblies.

(d) From sleeve (17) assembly, remove large back-up ring (15), large O-ring (16) and sleeve disc (18). Cut and discard O-ring.

(e) From spacer (12) assembly, remove small O-ring (14) and small back-up ring (13). Cut and discard O-ring.

(f) Unscrew valve stem (11) from gland nut (10).

(2) Using parts from repair kit (20) or from parts list in Figure 6-30, replace defective component(s) and reassemble shutoff valve (1) as follows:

(a) Ensure valve body (19) is secured in vise with protective material against valve inlet/outlet faces to prevent scratching or other damage.

WARNING

Different brands of MIL-G-27617 Type III greases should never be mixed. Ensure all old grease is removed prior to applying new grease.

CAUTION

If steps (b) thru (f) are not followed in the exact order shown, damage to the O-rings and back-up rings may occur.

(b) Apply a light coat of MIL-G-27617 Type III lubricant to threads of valve stem (11), and screw valve stem into gland nut (10) until valve stem stops against shoulder of gland nut.

(c) Apply a light coat of MIL-G-27617 Type III lubricant to new O-rings (14, 16), back-up rings (13, 15), and inner bore of valve body (19).

(d) Slide spacer (12), small back-up ring (13), and small O-ring (14) onto valve stem (11) until spacer (12) stops against gland nut (10). Ensure O-ring (14) is securely seated into spacer (12).

(e) Install sleeve disc (18), large O-ring (16), and large back-up ring (17) on sleeve (17). Slide sleeve assembly onto valve stem (11) until it stops against spacer (12).

(f) Insert valve stem assembly (10-18) into valve body (19) and screw gland nut (10) counterclockwise, being careful not to pinch large O-ring (16) against thread bore transition until assembly bottoms out.

(g) Torque gland nut (12) to 75-100 in-lb.

c. Install:

(1) Apply a light coat of MIL-G-27617 Type III lubricant to two new O-rings (5) and install O-rings on straight threads of positionable elbow (2) and connector (3). Install elbow and connector in new or repaired angle shutoff valve (1). Tighten connector, but do not tighten elbow adjustable nut at this time.

(2) Install angle shutoff valve (1) in front panel, and secure with panel nut (8).

(3) Apply a light coat of MIL-G-27617 Type III lubricant to two new face seal O-rings (4) and install one O-ring in each open port of positionable elbow (2) and connector (3). Attach tubing to elbow and connector and tighten tubing nuts.

(4) Tighten adjustable nut on positionable elbow (2).

(5) Place washer (9) and handle (7) on valve stem and secure with handle nut (6).

(6) Install cover on handle (7).

(7) Pressurize system. Using NID solution prepared in accordance with paragraph 4.7.3.2, leak test valve connections, and correct as necessary.

(8) Reinstall CCA panel in accordance with paragraph 6.8.2.1, step b.

(9) Complete re-entry control forms.

6.8.2.3 Regulator Valves (AHP-V303, -V304). The FADS III Air System CCA contains two HP regulators that are identical except for the handles—AHP-V303 features a blue handle and AHP-V304 features an orange handle. AHP-V303 reduces the 5,000 psi air from the incoming ***A SUPPLY*** to the manifold pressure set by the operator, and AHP-V304 performs the same function for the incoming ***B SUPPLY***. If defective or damaged, the regulator should be repaired or replaced in accordance with the following procedure.

Two versions of the regulator valves—one made by Circle Seal (PN PR50-6) and the other by Tescom (PN 44F5417T308)—are approved for use with the FADS III Air System. To allow for differences in design, corrective maintenance for the regulators has been divided into two procedures: Procedure A below covers the Circle Seal regulator and Procedure B on page 6-142 covers the Tescom regulator.

PROCEDURE A: CIRCLE SEAL REGULATOR (PN PR50-6-1/PR50-6-3)

All callouts in the following procedure refer to the illustrated parts list in Figure 6-31. See Chapter 7 for additional ordering information.

WARNING

Do not disassemble components while the FADS III Air System is under pressure. Failure to observe this warning may result in injury or death to personnel.

This maintenance action involves entry into a certified boundary and approved re-entry control procedures must be followed.

a. Remove:

(1) Depressurize system and remove CCA control console panel assembly from its case in accordance with paragraph 6.8.2.1, step a.

(2) Locate body of regulator valve (4) behind front panel, and back off tubing and close coupling nuts from positionable elbows (1, 2).

(3) Remove, cut, and discard face seal O-rings (5, 7). Bag open ends of tubing and close couplings (3).

(4) Remove screw (9), spacer (10), three screws (11), handle (12), sleeve (17), panel nut (13), and insulator (14). Remove regulator valve (4) and insulator (15) from panel. Ensure bearing (18) and pin (19) do not drop out of housing.

(5) Remove the positionable elbows (1, 2) from valve body.

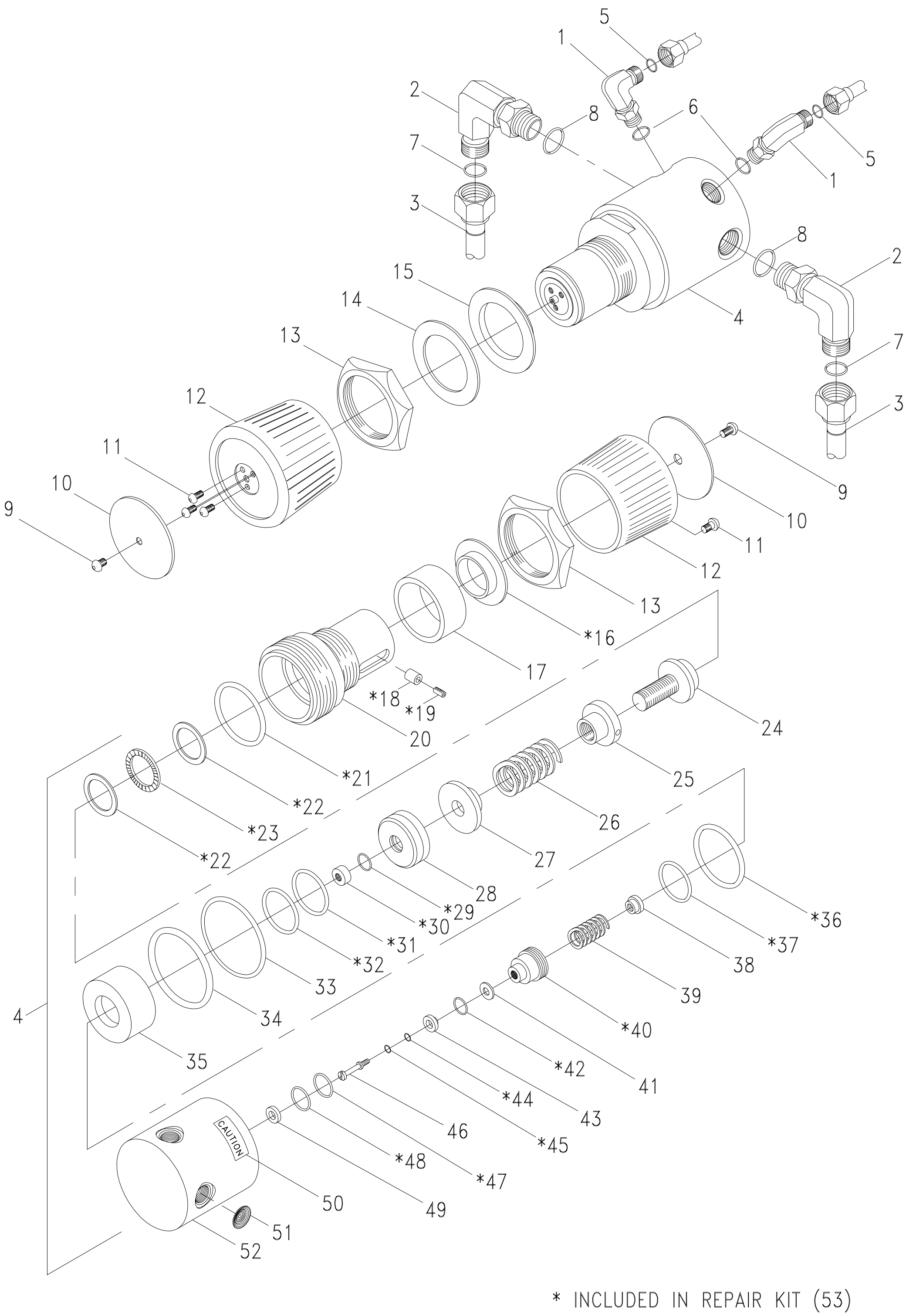


Figure 6-31. Circle Seal Regulator Valves (AHP-V303, -V304) (Sheet 1 of 3)

Item	Description	CAGE Code	Part Number	Qty
1	Positionable elbow (smaller)	02570	SS-4-VCO-9P-4ST	2
2	Positionable elbow (larger)	02570	SS-8-VCO-9P-8ST	2
3	Close coupling	02570	SS-8-WVCO-6-DF	2
4	Regulator valve (blue handle AHP-V303) Regulator valve (orange handle AHP-V304)	91816 91816	PR50-6-1 PR50-6-3	1 1
5	O-ring, face seal	81349	M83248/2-010	2
6	O-ring, straight thread	81349	M83248/2-904	2
7	O-ring, face seal	81349	M83248/2-111	2
8	O-ring, straight thread	81349	M83248/2-908	2
9	Screw	91816	-2300-0260	1
10	Spacer	91816	-2245-0145	1
11	Screw	91816	-2300-0259	3
12	Handle, blue (AHP-V303) Handle, orange (AHP-V304)	91816 91816	-2235-0075 -38962-2	1 1
13	Panel nut	91816	-2303-0237	1
14	Insulator	53711	6961935-2	1
15	Insulator	53711	6961935-1	1
*16	Bushing	91816	-2228-0138	1
17	Sleeve	91816	-2238-0093	1
*18	Bearing	91816	-2274-0018	1
*19	Pin	91816	-2246-0047	1
20	Housing	91816	-2221-0344B	1
*21	O-ring	91816	-4142-32 (size AS568-034)	1
*22	Bearing race	91816	-2274-0014	2
*23	Needle roller bearing	91816	-2274-0013	1
24	Shaft	91816	A2105-0075	1
25	Spring guide	91816	-2227-0125	1
26	Spring	91816	-2207-0172	1
27	Pad	91816	-2209-0129	1
28	Piston	91816	A2231-0112	1
*29	O-ring	91816	-4013-32 (size AS568-013)	1

* Included in repair kit (53)

Figure 6-31. Circle Seal Regulator Valves (AHP-V303, -V304) (Sheet 2 of 3)

Item	Description	CAGE Code	Part Number	Qty
30	Seat, vent	91816	-2202-1844	1
*31	O-ring	91816	-4126-32 (size AS568-126)	1
*32	O-ring	91816	-4028-32 (size AS568-028)	1
33	Ring	91816	-2228-0209	1
34	Retaining ring	91816	-2201-0412B	1
35	Adapter	91816	-2243-9029B	1
*36	O-ring	91816	-4034-32 (size AS568-142)	1
*37	O-ring	91816	-4024-32 (size AS568-024)	1
38	Retainer	91816	A2201-0283	1
39	Spring	91816	-38930	1
*40	Seat assembly, main	91816	A2203-0621	1
41	Spacer	91816	-2245-0177T1	1
*42	O-ring	91816	-4012-32 (size AS568-012)	1
43	Retainer	91816	B2201-0282B	1
*44	Back-up ring	91816	-8006	1
*45	O-ring	91816	-4006-32 (size AS568-006)	1
46	Poppet	91816	-38918	1
*47	Back-up ring	91816	-8019	1
*48	O-ring	91816	-4019-32 (size AS568-019)	1
49	Ring	91816	-2228-0208T1	1
50	"Caution" label	91816	-2271-0179	1
51	Filter	91816	-38913	1
52	Body	91816	-2166-1288	1
53	Repair kit (includes items 16, 18, 19, 21, 22, 23, 29, 30, 31, 32, 36, 37, 40, 42, 44, 45, 47, and 48)	91816	K/PR50-6	AR

* Included in repair kit (53)

Figure 6-31. Circle Seal Regulator Valves (AHP-V303, -V304) (Sheet 3 of 3)

(6) Remove, cut, and discard straight thread O-rings (6, 8).

(7) If valve is to be repaired, proceed with repair procedure in step b. If valve is to be replaced, install new valve in accordance with step c.

b. Repair:

(1) Disassembly:

(a) Remove housing (20) from body (52).

(b) Remove adapter (35), pad (27), spring (26), and shaft assembly (24, 25, 18, and 19) from housing (20).

(c) Remove O-ring (21) from housing (20). Cut and discard O-ring.

(d) Remove bearing races (22), needle roller bearing (23), and bushing (16) from housing (20).

(e) Remove piston (28) from adapter (35).

(f) Remove O-rings (31, 32) from adapter (35). Cut and discard O-rings.

(g) Remove vent seat (30) from piston (28).

(h) Remove O-ring (29) from piston (28). Cut and discard O-ring.

(i) Remove ring (33), O-rings (36, 37), and retaining ring (34) from body (52). Cut and discard O-rings.

(j) Remove seat assembly (40) from body (52).

(k) Unscrew retainer (38) and remove retainer (38) and spring (39) from seat assembly (40).

(l) Push poppet (46) through seat assembly (40), and remove back-up ring (44), O-ring (45), spacer (41), O-ring (42), and retainer (43) from poppet (46). Cut and discard O-rings.

(m) Remove spacer (41), O-ring (42), and retainer (43) from poppet (46). Cut and discard O-ring.

(n) Remove ring (49), back-up ring (47), and O-ring (48) from body (52). Cut and discard O-ring and back-up ring.

(o) Remove filter (51) from body (52).

(2) Reassembly:

WARNING

Different brands of MIL-G-27617 Type III greases should never be mixed. Ensure all old grease is removed prior to applying new grease.

(a) Apply a light coat of MIL-G-27617 Type III lubricant on new O-rings (42, 44), and install retainer (43), O-ring (42), spacer (41), O-ring (45), and back-up ring (44) onto poppet (46).

(b) Insert poppet (46) through small hole in end of seat assembly (40). Install spring (39) in opposite end of seat assembly. Install retainer (38) in seat assembly, and tighten poppet to retainer until poppet seals tightly, then back off 2 to 2-1/4 turns.

(c) Install ring (49), with chamfer facing up, in body (52).

(d) Apply a light coat of MIL-G-27617 Type III lubricant on new O-ring (48) and new back-up ring (47), and install components in body (52) in order shown in Figure 6-31.

(e) Screw seat assembly (40) in body (52) and torque to 38-43 in-lb.

(f) Apply a light coat of MIL-G-27617 Type III lubricant on new O-rings (36, 37). Install ring (33) (with chamfer facing up), O-ring (36), ring (33), and O-ring (37) into body (52).

(g) Apply a light coat of MIL-G-27617 Type III lubricant on new O-ring (29) and install O-ring into piston (28).

(h) Install vent seat (30) with chamfer facing out (toward poppet when assembled) in piston (28).

(i) Apply a light coat of MIL-G-27617 Type III lubricant on new O-rings (31, 32), and install O-rings in adapter (35).

(j) Install piston (28) in adapter (35).

(k) Apply a light coat of MIL-G-27617 Type III lubricant to new O-ring (21), and install O-ring in housing (20).

(l) Apply a light coat of MIL-G-27617 Type III lubricant on roller bearing (23). Install bearing races (22) and needle roller bearing (23) on shaft assembly (24, 25).

(m) Stack adapter (35), spring pad (27), spring (26), and shaft assembly (25, 24, 22, and 23) into body (52).

(n) Screw housing (20) into body (52) hand-tight.

(o) Install bushing (16) in housing (20).

(p) Torque housing (20) into body (52) to 65-70 ft-lb.

(q) Install bearing (18) and pin (19) into spring guide (25) of shaft assembly. Temporarily install sleeve (17) onto housing (20) to prevent bearing and pin from falling out.

(r) Install filter (51) in body (52).

c. Install:

(1) If replacing with new regulator valve, ensure replacement regulator has been cleaned in accordance with MIL-STD-1330 or other approved NAVSEA cleaning procedure for life support systems.

(2) Apply a light coat of MIL-G-27617 Type III lubricant to two new O-rings (8), and install O-rings on straight threads of each of the two larger positionable elbows (2). Install positionable elbows in body (4), but do not tighten nuts at this time.

(3) Apply a light coat of MIL-G-27617 Type III lubricant to two new O-rings (6), and install O-rings on straight threads of each of the smaller positionable elbows (1). Install positionable elbows in body (4), but do not tighten nuts at this time.

(4) Install body of regulator valve (4) and insulators (14, 15) on control panel, and secure with panel mounting nut (13).

(5) Place sleeve (17) on housing (20).

(6) Place handle (12) on shaft (24), and secure handle with the three screws (11). Install spacer (10) and secure with screw (9).

(7) Apply a light coat of MIL-G-27617 Type III lubricant to two new face seal O-rings (5) and install one O-ring in each of the smaller positionable elbows (1). Attach tubing to elbows.

(8) Apply a light coat of MIL-G-27617 Type III lubricant to two new face seal O-rings (7) and install one O-ring in each of the larger positionable elbows (2). Attach close couplings (3) to elbows.

(9) Tighten nuts on positionable elbows (1, 2).

(10) Pressurize system, operate regulator through turning arc, and leak test regulator and valve connections using NID solution prepared in accordance with paragraph 4.7.3.2. Correct leaks as necessary.

(11) Reinstall CCA control console panel assembly in accordance with paragraph 6.8.2.1, step b.

(12) Complete re-entry control forms.

PROCEDURE B: TESCOM REGULATOR (PN 44F5417T308)

All callouts in the following procedure refer to the illustrated parts list in Figure 6-32. See Chapter 7 for additional ordering information.

WARNING

Do not disassemble components while the FADS III Air System is under pressure. Failure to observe this warning may result in injury or death to personnel.

This maintenance action involves entry into a certified boundary and approved re-entry control procedures must be followed.

a. Remove:

(1) Depressurize system and remove CCA control console panel assembly from its case in accordance with paragraph 6.8.2.1, step a.

(2) Locate body of regulator valve (4) behind front panel, and back off tubing and close coupling nuts from positionable elbows (1, 2).

(3) Remove, cut, and discard face seal O-rings (5, 7). Bag open ends of tubing and close couplings (3).

(4) Remove plug (9) with flat-head screwdriver.

(5) Using external snap-ring pliers, remove retaining ring (11) and handle (12) from regulator (4).

(6) Support regulator and remove panel nut (13) and regulator (4) from panel.

(7) Remove positionable elbows (1, 2) from valve body.

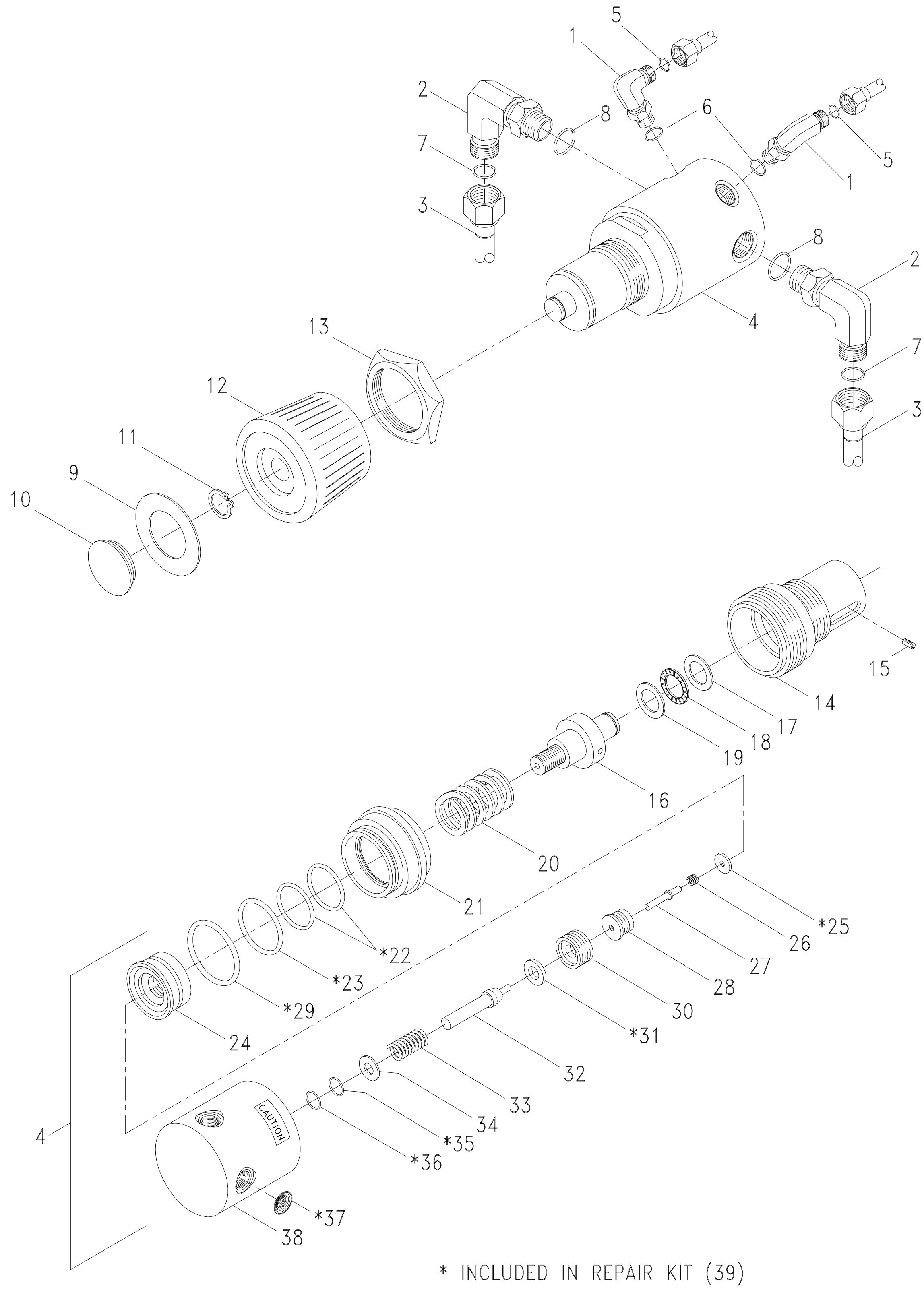


Figure 6-32. Tescom Regulator Valves (AHP-V303, -V304) (Sheet 1 of 3)

Item	Description	CAGE Code	Part Number	Qty
1	Positionable elbow (smaller)	02570	SS-4-VCO-9P-4ST	2
2	Positionable elbow (larger)	02570	SS-8-VCO-9P-8ST	2
3	Close coupling	02570	SS-8-WVCO-6-DF	2
4	Regulator valve	13669	44F5417T308	1
5	O-ring, face seal	81349	M83248/2-010	2
6	O-ring, straight thread	81349	M83248/2-904	2
7	O-ring, face seal	81349	M83248/2-111	2
8	O-ring, straight thread	81349	M83248/2-908	2
9	Hole plug	13669	5432	1
10	Label (blue handle AHP-V303) Label (orange handle AHP-V304)	13669	6320A 6320B	1
11	Retaining ring	13669	5427	1
12	Handle	13669	5397-6	1
13	Panel nut	13669	62634	1
14	Bonnet	13669	62616-1	1
15	Limit screw	13669	5405-211686	1
16	Washer	13669	5426	1
17	Thrust bearing	13669	5424	1
18	Washer	13669	5425	1
19	Adjusting screw assembly	13669	40942	1
20	Spring	13669	1051	1
21	Sensor back-up	13669	62618	1
*22	O-ring	13669	5200-020307	2
*23	O-ring	13669	5200-020327	1
24	Sensor	13669	62735	1
*25	Seat, valve	13669	6490	1
26	Spring	13669	62954	1
27	Vent valve	13669	62733-9	1
28	Retainer, vent seat	13669	62734-9	1
*29	O-ring	13669	5200-021437	1
30	Retainer, seat	13669	62757-9	

* Included in repair kit (39)

Figure 6-32. Tescom Regulator Valves (AHP-V303, -V304) (Sheet 2 of 3)

Item	Description	CAGE Code	Part Number	Qty
*31	Seat	13669	62756-7	1
32	Valve	13669	62758-9	1
33	Spring	13669	3624	1
34	Washer	13669	7421	1
*35	O-ring	13669	5200-020087	1
*36	Back-up ring	13669	5476-10080	1
*37	Filter	13669	66248-24-250	1
38	Body	13669	62615-1	1
39	Repair kit (includes items 22, 23, 25, 29, 31, 35, 36, 37)	13669	389F7023	AR

* Included in repair kit (39)

Figure 6-32. Tescom Regulator Valves (AHP-V303, -V304) (Sheet 3 of 3)

(8) Remove, cut, and discard straight thread O-rings.

(9) If regulator is to be repaired, proceed with repair procedure in step b. If regulator is to be replaced, install new regulator in accordance with step c.

b. Repair:

(1) Disassembly:

(a) Using 1-5/8” open-end wrench, remove bonnet (14) by turning counter-clockwise. Note that spring (20) is free and may fall if care is not taken.

(b) Using 1/8” Allen wrench, remove limit screw (15) from adjusting screw assembly (19).

(c) Slide adjusting screw assembly (19) out of bonnet (14). Thrust washers (16, 18) and bearing (17) may be removed for service or replacement as required.

(d) Remove sensor assembly (21-28) from regulator body (38).

(e) Push sensor (24) out of sensor back-up (21), and remove, cut, and discard O-rings (22, 23).

(f) Secure sensor (24) in vise with protective material by flats and unscrew vent seat retainer (28) with 7/16” socket.

(g) Remove vent seat retainer (24), vent valve (27), spring (26), and vent seat (25) from sensor (24).

(h) Remove O-ring (23) from regulator body (38); cut and discard O-ring.

(i) Remove seat retainer (30) from regulator body (38).

(j) Remove seat (31) with a sharp-pointed tool and then remove main valve (32) and spring (33) from regulator body (38).

(k) Inspect main valve (32) for wear on cone and tail. Replace if worn or damaged.

(l) Remove washer (34), O-ring (35), and back-up ring (36) from regulator body (38). Cut and discard O-ring.

(m) Remove filter (37) from regulator body (38).

(2) Reassembly:

(a) Install filter (37) into regulator body (38).

WARNING

Different brands of MIL-G-27617 Type III greases should never be mixed. Ensure all old grease is removed prior to applying new grease.

(b) Apply a light coat of MIL-G-27617 Type III lubricant on new back-up ring (36), O-ring (35), and seat (31).

(c) Install back-up ring (36), O-ring (35), washer (34), spring (33), valve (32), and seat (31) (with chamfer facing up or towards vent valve (27) connector) into regulator body (38).

(d) Install seat retainer (30) and torque to 100 in-lb.

(e) Apply a light coat of MIL-G-27617 Type III lubricant to new valve seat (25) and install into sensor (24) with chamber facing up or towards vent valve (27) connector.

(f) Install vent valve (27) and spring (26) into vent seat retainer (28) and thread into sensor (24). Torque to 50-60 in-lb.

(g) Apply a light coat of MIL-G-27617 Type III lubricant to new O-ring (29) and install into regulator body (38).

(h) Apply a light coat of MIL-G-27617 Type III lubricant to new O-rings (22, 23) and install on sensor back-up (21).

(i) Slide sensor (24) into sensor back-up (21) and install assembly into regulator body (38).

(j) Apply a light coat of MIL-G-27617 Type III lubricant to thrust washers (16, 18) and bearing (17) and install onto adjusting screw (19).

(k) Slide adjusting screw assembly (16-19) into bonnet (14) and install limit screw (15). Torque to 20-25 in-lb.

(l) Screw bonnet (14) into regulator body (38) and torque to 50 ft-lb.

c. Install:

(1) If replacing with new regulator valve, ensure replacement regulator has been cleaned in accordance with MIL-STD-1330 or other approved NAVSEA cleaning procedure for life support systems.

(2) Apply a light coat of MIL-G-27617 Type III lubricant to two new O-rings (8), and install O-rings on straight threads of each of the two larger positionable elbows (2). Install positionable elbows in body (4), but do not tighten nuts at this time.

(3) Apply a light coat of MIL-G-27617 Type III lubricant to two new O-rings (6), and install O-rings on straight threads of each of the smaller positionable elbows (1). Install positionable elbows in body (4), but do not tighten nuts at this time.

(4) Install body of regulator valve (4) on control panel, and secure with panel mounting nut (13).

(5) Place handle (12) on regulator body (4), and secure with retaining ring (11) using external snap-ring pliers. Install plug (9).

(6) Apply a light coat of MIL-G-27617 Type III lubricant to two new face seal O-rings (5) and install one O-ring in each of the smaller positionable elbows (1). Attach tubing to elbows.

(7) Apply a light coat of MIL-G-27617 Type III lubricant to two new face seal O-rings (7) and install one O-ring in each of the larger positionable elbows (2). Attach close couplings (3) to elbows.

(8) Tighten nuts on positionable elbows (1, 2).

(9) Pressurize system, operate regulator through turning arc, and leak test regulator and valve connections using NID solution prepared in accordance with paragraph 4.7.3.2. Correct leaks as necessary.

(10) Reinstall CCA panel in accordance with paragraph 6.8.2.1, step b.

(11) Complete re-entry control forms.

6.8.2.4 <u>Gauge Stop Valves (AHP-V305, -V306; ALP-V307, -V308)</u>. The two HP gauge stop valves used in the CCA (AHP-V305 and AHP-V306) can be used to isolate the ***A SUPPLY*** and ***B SUPPLY*** HP air gauges (AHP-G325 and AHP-G326), respectively. The two LP gauge stop valves (ALP-V307 and ALP-V308) can be used to isolate the two ***MANIFOLD PRESSURE*** LP air gauges (ALP-G323 and ALP-G324), respectively. The valves are mounted directly to the CCA panel with the valve bodies behind the panel and the control handles on the panel front.

All callouts in the following procedure refer to the illustrated parts list in Figure 6-33. See Chapter 7 for additional ordering information.

WARNING

Do not disassemble components while the FADS III Air System is under pressure. Failure to observe this warning may result in injury or death to personnel.

This maintenance action involves entry into a certified boundary and approved re-entry control procedures must be followed.

a. Remove:

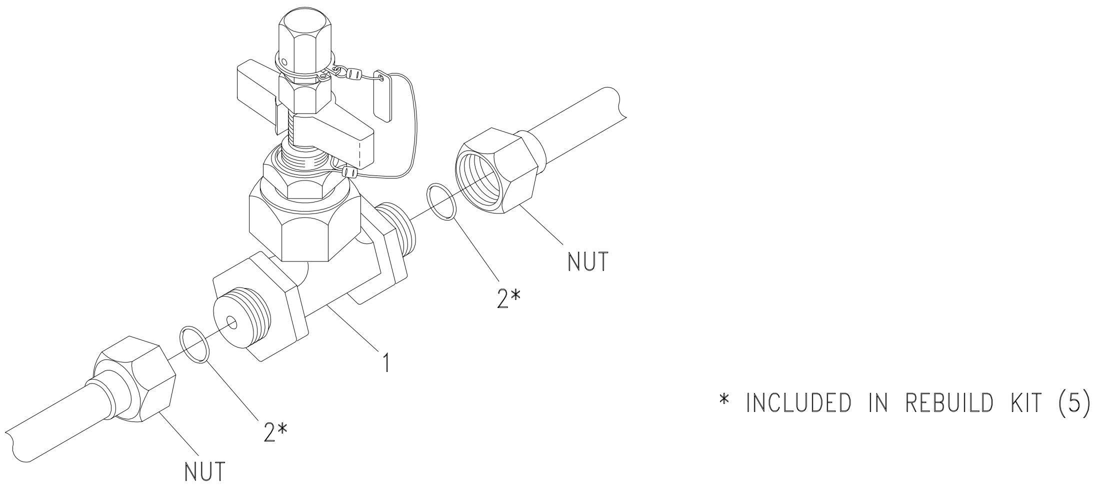
(1) Depressurize system and remove CCA control console panel assembly from its case in accordance with paragraph 6.8.2.1, step a.

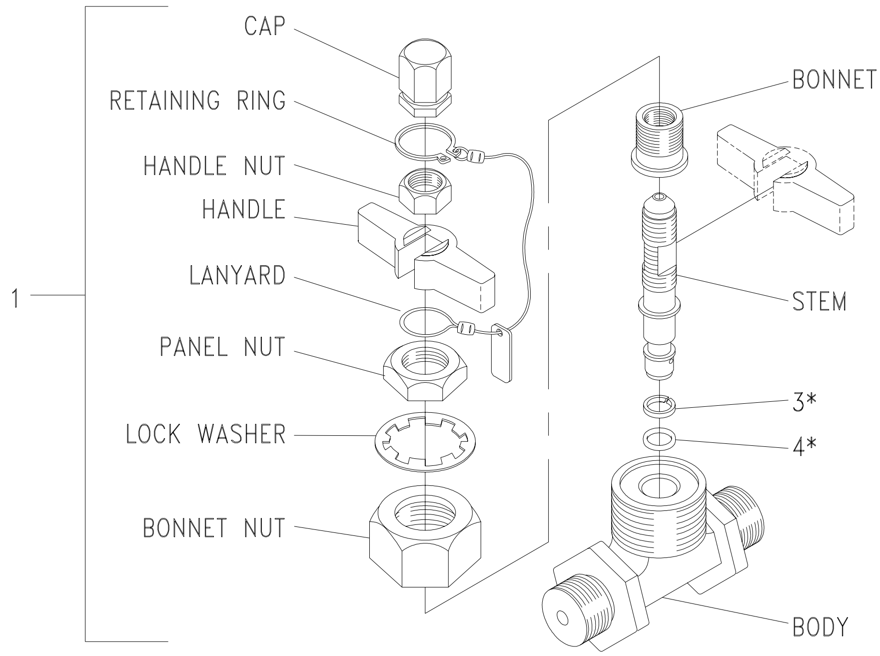
(2) Locate body of gauge stop valve (1), which is mounted behind the control panel. Remove the following components from valve stem in order shown here and in Figure 6-41: cap, retaining ring, handle nut, handle, lanyard. Remove tubing from both sides of valve body.

(3) Remove, cut, and discard the two face seal O-rings (2). Bag or cap open ends of tubing.

(4) While supporting valve body, remove panel nut and lock washer. Remove valve body from panel.

(5) If valve is to be repaired, proceed with repair procedure in step b. If valve is to be replaced, discard valve and install new valve in accordance with step c.





Item	Description	CAGE Code	Part Number	Qty
1	Gauge stop valve	99565	PLC-10669	1
2	O-ring	81349	M83248/2-008	2
3	Back-up ring	99565	011009-EL	1
4	O-ring, stem	99565	000009-EE	1
5	Rebuild kit (contains 2-4)	99565	PLC-10669SK	AR

Figure 6-33. Gauge Stop Valves (AHP-V305, -V306; ALP-V307, -V308)

b. Repair is limited to replacement of back-up ring (3) and stem O-ring (4). If any other component is defective or damaged, replace entire valve in accordance with step c.

(1) Remove bonnet nut, bonnet, valve stem, back-up ring (3), and O-ring (4).

(2) Inspect valve stem for damage. If valve stem is damaged, omit remainder of repair procedure and replace entire valve in accordance with step c. If valve stem passes inspection, continue with repair procedure.

WARNING

Different brands of MIL-G-27617 Type III greases should never be mixed. Ensure all old grease is removed prior to applying new grease.

(3) Apply a light coat of MIL-G-27617 Type III lubricant to new back-up ring (3) and new stem O-ring (4) and install components in valve body.

CAUTION

Verify that the valve stem is fully retracted into the bonnet prior to tightening the bonnet nut. Failure to do so may cause damage to the valve stem or seat.

(4) Reassemble valve stem, bonnet, and bonnet nut in order shown in Figure 6-41.

c. Install:

(1) Position valve body in control panel. While supporting valve body, secure valve with lock washer and panel nut.

(2) Install remaining components on valve stem in order shown here and in Figure 6-33: lanyard, handle, handle nut, retaining ring, and cap (refer to Figure 6-33 for correct positioning of handle on valve stem).

(3) Apply a light coat of MIL-G-27617 Type III lubricant to two new face seal O-rings (2), install one O-ring in each port of gauge stop valve (1), and attach tubing.

(4) Pressurize system. Using NID solution prepared in accordance with paragraph 4.7.3.2, leak test valve connections and correct as necessary.

(5) Reinstall CCA panel in accordance with paragraph 6.8.2.1, step b.

(6) Complete re-entry control forms.

6.8.2.5 **LP Relief Valves (ALP-V309, -V310).** ALP-V309 and ALP-V310 are automatic relief valves that have been set to vent if the air pressure coming from regulator valves AHP-V303 and AHP-V304 exceeds 300 psi. The valves are mounted behind the CCA panel with no manual controls on the panel front. ALP-V309 is located in-line between regulator valve AHP-V303 and ***MANIFOLD SUPPLY*** valve ALP-V311, and ALP-V310 is located in-line between regulator valve AHP-V304 and ***MANIFOLD SUPPLY*** valve ALP-V312. Each of the relief valves is installed into a tee using an adapter. Corrective maintenance for the relief valves is limited to removal and replacement of the defective valve.

All callouts in the following procedure refer to the illustrated parts list in Figure 6-34. See Chapter 7 for additional ordering information.

WARNING

Do not disassemble components while the FADS III Air System is under pressure. Failure to observe this warning may result in injury or death to personnel.

This maintenance action involves entry into a certified boundary and approved re-entry control procedures must be followed.

a. Remove:

(1) Depressurize system and remove CCA control console panel assembly from its case in accordance with paragraph 6.8.2.1, step a.

(2) Remove relief valve (1) and adapter (2) (as a unit) from tee (F-013).

(3) Remove, cut, and discard O-ring. Plug or bag open port of tee.

(4) Remove adapter (2) from relief valve (1). Remove Teflon® tape from threads of adapter and relief valve, and bag components.

b. Install:

WARNING

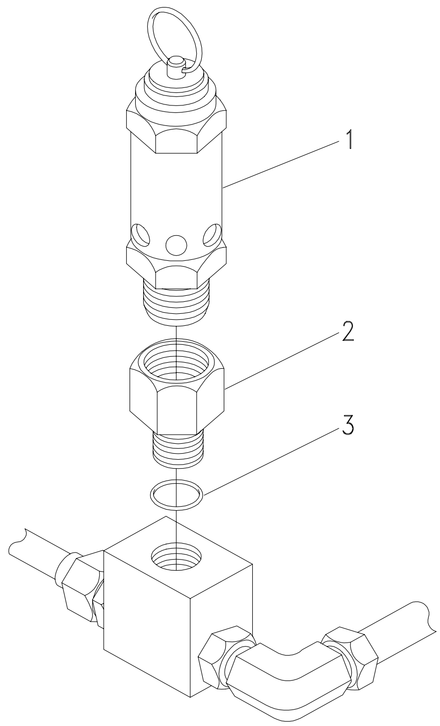
Different brands of MIL-G-27617 Type III greases should never be mixed. Ensure all old grease is removed prior to applying new grease.

CAUTION

Ensure new relief valve is tagged showing 300 ± 5 psi relief pressure.

(1) Beginning at second thread from end, wrap Teflon® tape 1-1/4 turns onto threaded portion of new relief valve in clockwise direction. Apply a light coat of MIL-G-27617 Type III lubricant to Teflon® tape.

(2) Install relief valve (1) in adapter (2) and tighten wrench-tight.



Item	Description	CAGE Code	Part Number	Qty
1	Relief valve	91816	M5132-N-6M(L)-300 ASME	1
2	Adapter	02570	SS-12-SAE-7-12	1
3	O-ring	81349	M83248/2-912	1

Figure 6-34. LP Relief Valves (ALP-V309, -V310)

(3) Apply a light coat of MIL-G-27617 Type III lubricant to new O-ring (3), and install O-ring on straight threads of adapter (2). Install adapter in tee.

(4) Pressurize CCA, and leak test valve using NID solution prepared in accordance with paragraph 4.7.3.2. Correct leaks as necessary.

(5) Reinstall CCA panel into its case in accordance with paragraph 6.8.2.1, step b.

(6) Complete re-entry control forms.

6.8.2.6 Angle Ball Valves (ALP-V311, -V312, -V314, -V315, -V316). ALP-V311 and ALP-V312 are ***MANIFOLD SUPPLY*** valves that control the flow of LP air to the diver's air supply manifold. ALP-V314, ALP-V315, and ALP-V316 control the supply of air to the yellow, green, and red divers, respectively. The valves are mounted directly to the CCA panel with the valve bodies behind the panel and the control handles on the panel front. Corrective maintenance for the valves covered in this paragraph is limited to removal and replacement of the defective valve.

All callouts in the following procedure refer to the illustrated parts list in Figure 6-35. See Chapter 7 for additional ordering information.

WARNING

Do not disassemble components while the FADS III Air System is under pressure. Failure to observe this warning may result in injury or death to personnel.

This maintenance action involves entry into a certified boundary and approved re-entry control procedures must be followed.

a. Remove:

(1) Depressurize system and remove CCA control console panel assembly from its case in accordance with paragraph 6.8.2.1, step a.

(2) Locate body of defective valve (1) behind panel and remove tubing from both ports in valve body.

(3) Remove, cut, and discard the two face seal O-rings (2). Bag or cap open ends of tubing.

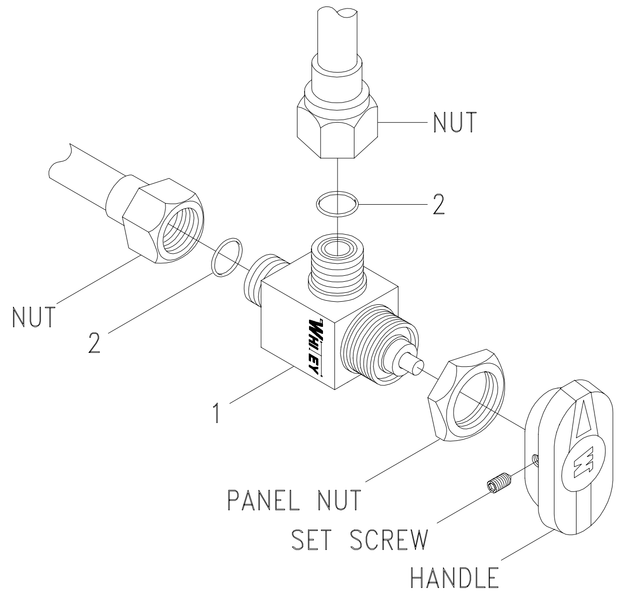
(4) Remove set screw and handle from valve stem.

(5) Holding valve body securely, remove panel nut and valve body from panel.

b. Install:

(1) Position body of replacement valve (1) in control panel and secure with panel nut.

(2) Install handle and secure with set screw.



Item	Description	CAGE Code	Part Number	Qty
1	Ball valve	02570	SS-45TVCO8-A-K	1
2	O-ring (face seal)	81349	M83248/2-111	2

Figure 6-35. Angle Ball Valves (ALP-V311, -V312, -V314, -V315, -V316)

WARNING

Different brands of MIL-G-27617 Type III greases should never be mixed. Ensure all old grease is removed prior to applying new grease.

(3) Apply a light coat of MIL-G-27617 Type III lubricant to two new face seal O-rings (2), install one O-ring in each port of ball valve (1), and attach tubing.

(4) Pressurize system. Using NID solution prepared in accordance with paragraph 4.7.3.2, leak test valve connections and correct as necessary.

(5) Reinstall CCA panel in accordance with paragraph 6.8.2.1, step b.

(6) Complete re-entry control forms.

6.8.2.7 Ball Valve (ALP-V313). ALP-V313, which is designated as the ***VOLUME TANK*** valve, controls the flow of LP air between the CCA and the VTA. The valve is mounted directly to the CCA panel with the valve body behind the panel and the control handle on the panel front. Corrective maintenance for ALP-V313 is limited to removal and replacement of the defective valve.

All callouts in the following procedure refer to the illustrated parts list in Figure 6-36. See Chapter 7 for additional ordering information.

WARNING

Do not disassemble components while the FADS III Air System is under pressure. Failure to observe this warning may result in injury or death to personnel.

This maintenance action involves entry into a certified boundary and approved re-entry control procedures must be followed.

a. Remove:

(1) Depressurize system and remove CCA control console panel assembly from its case in accordance with paragraph 6.8.2.1, step a.

(2) Locate body of defective valve (1) behind panel and remove tubing from both ports in valve body.

(3) Remove, cut, and discard the two face seal O-rings (2). Bag or cap open ends of tubing.

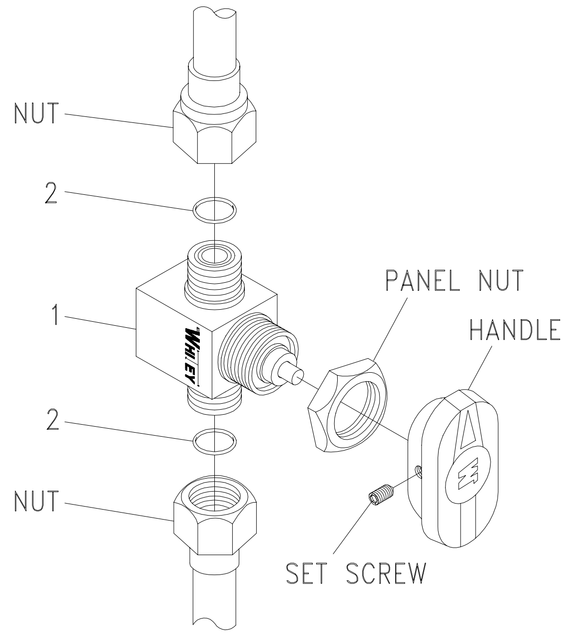
(4) Remove set screw and handle from valve stem.

(5) Holding valve body securely, remove panel nut and valve body from panel.

b. Install:

(1) Position body of replacement valve (1) in control panel and secure with panel nut.

(2) Install handle and secure with set screw.



Item	Description	CAGE Code	Part Number	Qty
1	Ball valve	02570	SS-45TVCO8-K	1
2	O-ring (face seal)	81349	M83248/2-111	2

Figure 6-36. Ball Valve (ALP-V313)

WARNING

Different brands of MIL-G-27617 Type III greases should never be mixed. Ensure all old grease is removed prior to applying new grease.

(3) Apply a light coat of MIL-G-27617 Type III lubricant to two new face seal O-rings (2), install one O-ring in each port of ball valve (1), and attach tubing.

(4) Pressurize system. Using NID solution prepared in accordance with paragraph 4.7.3.2, leak test valve connections and correct as necessary.

(5) Reinstall CCA panel in accordance with paragraph 6.8.2.1, step b.

(6) Complete re-entry control forms.

6.8.2.8 Angle Ball Valves (ALP-V317, -V318, -V319). ALP-V317, -V318, and -V319, also known as the ***PNEUMO*** valves, control the flow of LP air to the pneumofathometers for the yellow, green, and red divers, respectively. The valves are mounted directly to the CCA panel with the valve bodies behind the panel and the control handles on the panel front. Corrective maintenance for the valves covered in this paragraph is limited to removal and replacement of the defective valve.

All callouts in the following procedure refer to the illustrated parts list in Figure 6-37. See Chapter 7 for additional ordering information.

WARNING

Do not disassemble components while the FADS III Air System is under pressure. Failure to observe this warning may result in injury or death to personnel.

This maintenance action involves entry into a certified boundary and approved re-entry control procedures must be followed.

a. Remove:

(1) Depressurize system and remove CCA control console panel assembly from its case in accordance with paragraph 6.8.2.1, step a.

(2) Locate body of defective valve (1) behind panel and remove tubing from both ports in valve body.

(3) Remove, cut, and discard the two face seal O-rings (2). Bag or cap open ends of tubing.

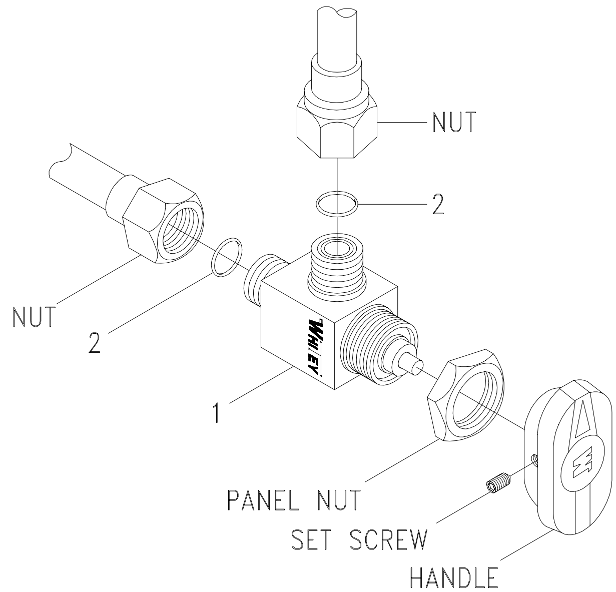
(4) Remove set screw and handle from valve stem.

(5) Holding valve body securely, remove panel nut and valve body from panel.

b. Install:

(1) Position body of replacement valve (1) in control panel and secure with panel nut.

(2) Install handle and secure with set screw.



Item	Description	CAGE Code	Part Number	Qty
1	Ball valve	02570	SS-43TVCO4-A-K	1
2	O-ring (face seal)	81349	M83248/2-010	2

Figure 6-37. Angle Ball Valves (ALP-V317, -V318, -V319)

WARNING

Different brands of MIL-G-27617 Type III greases should never be mixed. Ensure all old grease is removed prior to applying new grease.

(3) Apply a light coat of MIL-G-27617 Type III lubricant to two new face seal O-rings (2), install one O-ring in each port of ball valve (1), and attach tubing.

(4) Pressurize system. Using NID solution prepared in accordance with paragraph 4.7.3.2, leak test valve connections, and correct as necessary.

(5) Reinstall CCA panel in accordance with paragraph 6.8.2.1, step b.

(6) Complete re-entry control forms.

6.8.2.9 <u>In-line Filters (F-020)</u>. The CCA contains two in-line filters designated as F-020. The filter for the ***A SUPPLY*** line is located between shutoff valve (AHP-V301) and regulator valve (AHP-V303), and the filter for the ***B SUPPLY*** line is located between shutoff valve (AHP-V302) and regulator valve (AHP-V304). Both filters have removable elements that can be cleaned and reused, or replaced if desired. Positionable elbows are used to connect the tubing to both ends of each filter.

All callouts in the following procedure refer to the illustrated parts list in Figure 6-38. See Chapter 7 for additional ordering information.

WARNING

Do not disassemble components while the FADS III Air System is under pressure. Failure to observe this warning may result in injury or death to personnel.

This maintenance action involves entry into a certified boundary and approved re-entry control procedures must be followed.

a. Remove:

(1) Depressurize system and remove CCA control console panel assembly from its case in accordance with paragraph 6.8.2.1, step a.

(2) While maintaining a secure hold on in-line filter (1), remove tubing nuts from the two positionable elbows (2). Remove filter with elbows still attached.

(3) Remove, cut, and discard the two face seal O-rings (3). Bag or cap open ends of tubing.

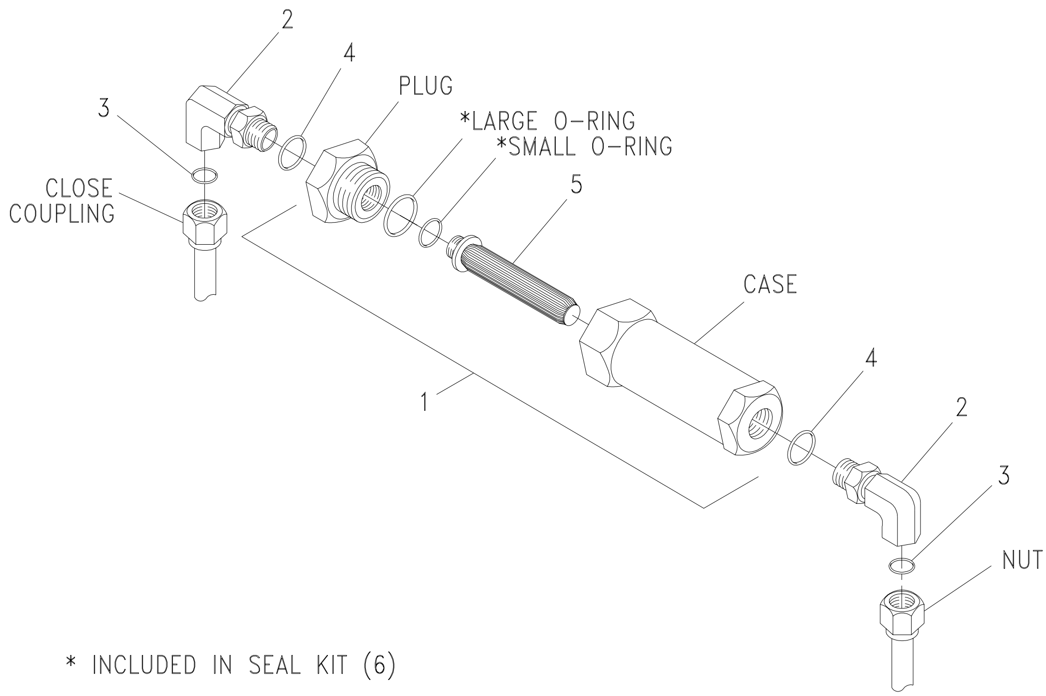
NOTE

If entire in-line filter (1) is to be replaced or cleaned, complete steps 4, 5, and 6, and then continue with step c.

(4) Remove the two positionable elbows (2) from in-line filter (1).

(5) Remove, cut, and discard the two straight thread O-rings (4). Bag the two positionable elbows (2).

(6) If required, send filter to NAVSEA authorized cleaning facility to be cleaned to MIL-STD-1330 or other approved NAVSEA cleaning procedure for diver life support systems.



Item	Description	CAGE Code	Part Number	Qty
1	Filter	59165	U-10003	1
2	Positionable elbow	02570	SS-8-VCO-9P-6ST	2
3	O-ring	81349	M83248/2-111	2
4	O-ring	81349	M83248/2-906	2
5	Element	59165	U-10007	1
6	Seal kit (large and small O-rings)	59165	U-10009	1

Figure 6-38. In-line Filters (F-020)

b. Filter element (5) cleaning or replacement:

(1) Remove plug from filter case as shown in Figure 6-38.

(2) Remove filter element (5) from plug; cut and discard large and small o-rings.

(3) Inspect filter element (5). If cleaning is indicated, send filter element to NAVSEA authorized cleaning facility to be cleaned per MIL-STD-1330 or other approved NAVSEA procedure for diver life support systems.

(4) Reassemble filter (1) using cleaned filter element (5) or new replacement element as follows:

WARNING

Different brands of MIL-G-27617 Type III greases should never be mixed. Ensure all old grease is removed prior to applying new grease.

(a) Apply a light coat of MIL-G-27617 Type III lubricant to new O-ring (small) from seal kit (6), and install O-ring on filter element (5).

(b) Install filter element (5) in plug, and torque to 5 ft-lb.

(c) Apply a light coat of MIL-G-27617 Type III lubricant to new O-ring (large) from seal kit (6), and install O-ring on plug.

(d) Install plug in filter case, and torque to 30-45 ft-lb.

c. Install filter:

(1) Apply a light coat of MIL-G-27617 Type III lubricant to two new O-rings (4) and install one O-ring on straight threads of each positionable elbow (2).

(2) Install positionable elbow (2) in each end of cleaned or replacement filter (1). Do not tighten at this point.

(3) Apply a light coat of MIL-G-27617 Type III lubricant to two new face seal O-rings (3) and install one O-ring in open port of each positionable elbow (2).

(4) Attach tubing nuts to positionable elbows (2); tighten tubing nuts securely.

(5) Tighten nuts on positionable elbows (2).

(6) Pressurize system. Using NID solution prepared in accordance with paragraph 4.7.3.2, leak test filter connections and correct as necessary.

(7) Reinstall CCA panel in accordance with paragraph 6.8.2.1, step b.

(8) Complete re-entry control forms.

6.8.2.10 <u>Diver Depth Gauges (ALP-G320, -G321, -G322)</u>. ALP-G320, -G321, and -G322 are the only three depth gauges used in the FADS III Air System. ALP-G320 indicates the depth of the yellow diver, ALP-G321 the depth of the green diver, and ALP-G322 the depth of the red diver. The back of each gauge contains a blow-out plug, which serves as a safety device in the event of overpressurization. Corrective maintenance for the diver depth gauges is limited to removal and replacement in accordance with the following procedure.

All callouts in the following procedure refer to the illustrated parts list in Figure 6-39. See Chapter 7 for additional ordering information.

WARNING

Do not disassemble components while the FADS III Air System is under pressure. Failure to observe this warning may result in injury or death to personnel.

This maintenance action involves entry into a certified boundary and approved re-entry control procedures must be followed.

a. Remove:

(1) Depressurize system and remove CCA control console panel assembly from its case in accordance with paragraph 6.8.2.1, step a.

(2) Loosen tubing nut and remove tubing from back of gauge (1).

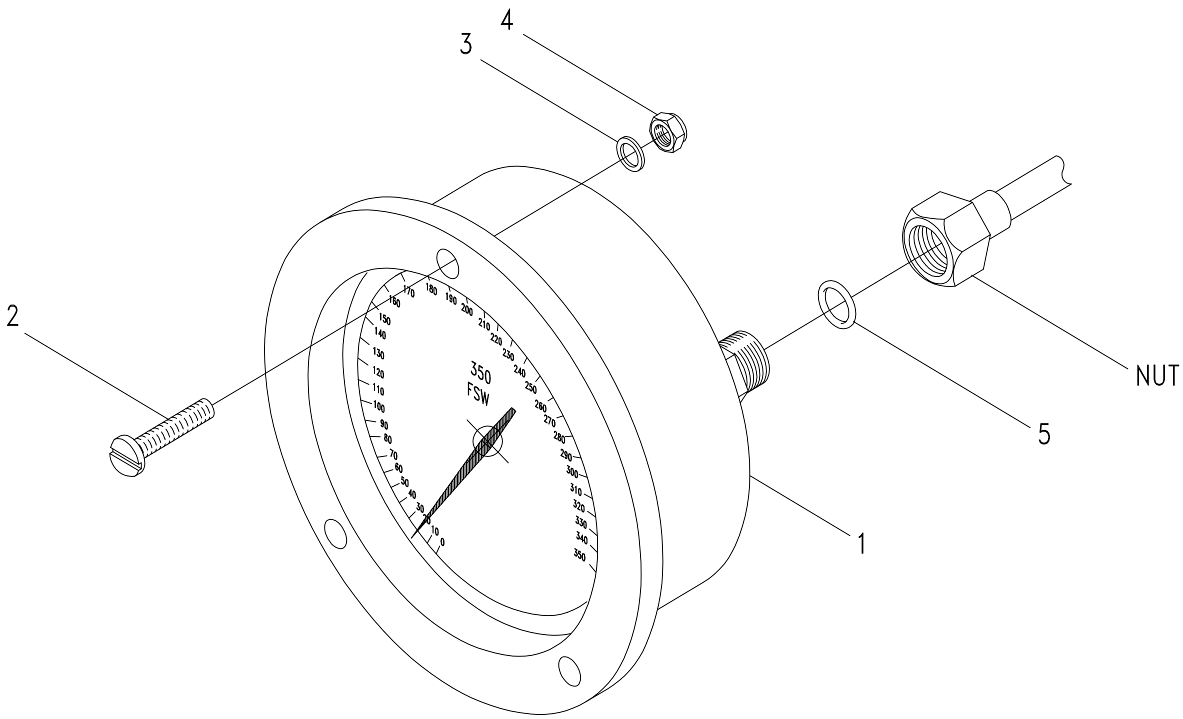
(3) Remove, cut, and discard face seal O-ring (5).

(4) Remove the three sets of screws (2), washers (3), and nuts (4) securing gauge (1) to panel. Remove gauge from panel.

(5) Bag all open connections and removed parts. If gauge is to be calibrated, tag and bag gauge in accordance with approved procedures and send to NAVSEA authorized calibration facility.

b. Install:

(1) Ensure gauge (1) shows current calibration date and has been cleaned in accordance with MIL-STD-1330 or other approved NAVSEA cleaning procedure for life support systems.



Item	Description	CAGE Code	Part Number	Qty
1	Gauge, 0-350 fsw, yellow (ALP-G320) Gauge, 0-350 fsw, green (ALP-G321) Gauge, 0-350 fsw, red (ALP-G322)	52159 52159 52159	25544-24B24-MCE 25544-24B22-MCE 25544-24B23-MCE	1 1 1
2	Screw, panhead, 0.190-24UNC-2A X 1.00 LG	96906	MS51957-67	3
3	Washer, flat	96906	MS15795-808	3
4	Nut, self-locking, 0.190-24UNC-3B	96906	MS17830-3C	3
5	O-ring	81349	M83248/2-010	1

Figure 6-39. Diver Depth Gauges (ALP-G320, -G321, -G322)

WARNING

Different brands of MIL-G-27617 Type III greases should never be mixed. Ensure all old grease is removed prior to applying new grease.

(2) Apply a light coat of MIL-G-27617 Type III lubricant to new face seal O-ring (5) and install O-ring in stem of replacement gauge (1).

WARNING

Ensure gauge is securely installed. Failure to tighten gauge securely may result in damage to equipment and injury or death to personnel.

(3) Install gauge (1) in panel and secure with the three sets of screws (2), washers (3), and nuts (4).

(4) Align tubing with gauge stem and secure with tubing nut.

(5) Pressurize system. Using NID solution prepared in accordance with paragraph 4.7.3.2, leak test gauge connections, and correct as necessary.

(6) Reinstall CCA panel in accordance with paragraph 6.8.2.1, step b.

(7) Complete re-entry control forms.

6.8.2.11 Pressure Gauges, 0-500 psi (ALP-G323, -G324). ALP-G323 and ALP-G324 are designated as the ***MANIFOLD PRESSURE*** gauges as they indicate the pressure of the LP air being delivered to the diver's air supply manifold via one of the regulator valves. The pressure of the LP air leaving regulator valve (AHP-V303) is indicated on ALP-G323 on the ***A SUPPLY*** side, and the pressure of the air leaving regulator valve (AHP-V304) is indicated on ALP-G324 on the ***B SUPPLY*** side. Corrective maintenance for these gauges is limited to removal and replacement.

All callouts in the following procedure refer to the illustrated parts list in Figure 6-40. See Chapter 7 for additional ordering information.

WARNING

Do not disassemble components while the FADS III Air System is under pressure. Failure to observe this warning may result in injury or death to personnel.

This maintenance action involves entry into a certified boundary and approved re-entry control procedures must be followed.

a. Remove:

(1) Depressurize system and remove CCA control console panel assembly from its case in accordance with paragraph 6.8.2.1, step a.

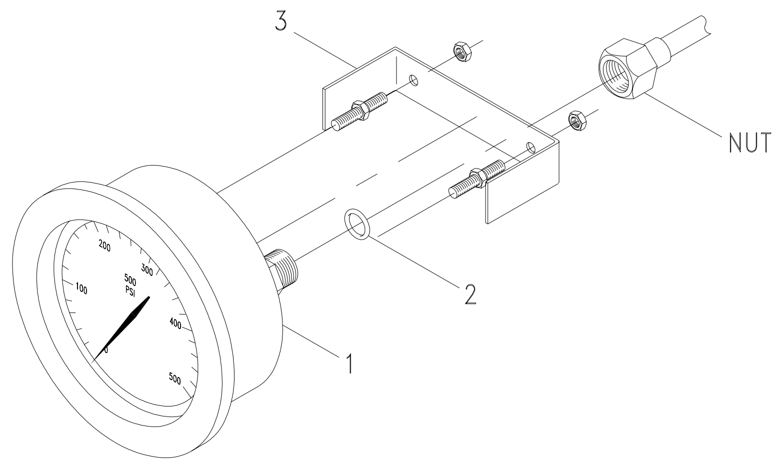
(2) Remove gauge mounting kit (3) and tubing from rear of gauge (1), and remove gauge from front of control panel.

(3) Remove, cut, and discard face seal O-ring (2).

(4) Bag all open connections and removed parts. If gauge is to be calibrated, tag and bag gauge in accordance with approved procedures and send to NAVSEA authorized calibration facility.

b. Replace:

(1) Ensure gauge (1) shows current calibration date and has been cleaned in accordance with MIL-STD-1330 or other approved NAVSEA cleaning procedure for life support systems.



Item	Description	CAGE Code	Part Number	Qty
1	Gauge, 0-500 psi	52159	25502-27B21-MCF	1
2	O-ring (face seal)	81349	M83248/2-010	1
3	Gauge mounting kit	52159	RS-426-1	1

Figure 6-40. Pressure Gauges, 0-500 psi (ALP-G323, -G324)

WARNING

Different brands of MIL-G-27617 Type III greases should never be mixed. Ensure all old grease is removed prior to applying new grease.

(2) Apply a light coat of MIL-G-27617 Type III lubricant to new face seal O-ring (2) and install O-ring in stem of gauge (1).

(3) Insert gauge (1) in control panel, and install tubing to gauge (1).

(4) Install gauge mounting kit (3).

(5) Pressurize system. Using NID solution prepared in accordance with paragraph 4.7.3.2, leak test gauge connections and correct as necessary.

(6) Reinstall CCA panel in accordance with paragraph 6.8.2.1, step b.

(7) Complete re-entry control forms.

6.8.2.12 <u>Pressure Gauges, 0-6,000 psi (AHP-G325, -G326)</u>. AHP-G325 and AHP-G326 are designated as the ***A SUPPLY*** and ***B SUPPLY*** gauges, respectively, as they indicate the pressure of the HP air entering the regulator valves. The pressure of the HP air entering regulator valve (AHP-V303) is indicated on AHP-G325 on the ***A SUPPLY*** side, and the pressure of the air entering regulator valve (AHP-V304) is indicated on AHP-G326 on the ***B SUPPLY*** side. Corrective maintenance for AHP-G325 and AHP-G326 is limited to removal and replacement.

All callouts in the following procedure refer to the illustrated parts list in Figure 6-41. See Chapter 7 for additional ordering information.

WARNING

Do not disassemble components while the FADS III Air System is under pressure. Failure to observe this warning may result in injury or death to personnel.

This maintenance action involves entry into a certified boundary and approved re-entry control procedures must be followed.

a. Remove:

(1) Depressurize system and remove CCA control console panel assembly from its case in accordance with paragraph 6.8.2.1, step a.

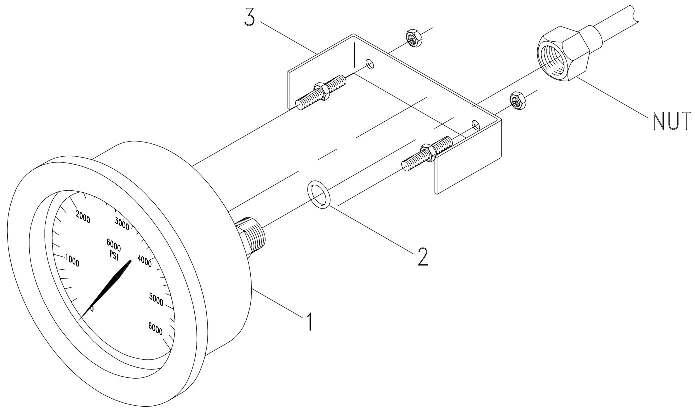
(2) Remove gauge mounting kit (3) and tubing from rear of gauge (1), and remove gauge from front of control panel.

(3) Remove, cut, and discard face seal O-ring (2).

(4) Bag all open connections and removed parts. If gauge is to be calibrated, tag and bag gauge in accordance with approved procedures and send to NAVSEA authorized calibration facility.

b. Replace:

(1) Ensure gauge (1) shows current calibration date and has been cleaned in accordance with MIL-STD-1330 or other approved NAVSEA cleaning procedure for life support systems.



Item	Description	CAGE Code	Part Number	Qty
1	Gauge, 0-6000 psi	52159	25502-36B21-MCF	1
2	O-ring	81349	M83248/2-010	1
3	Gauge mounting kit	52159	RS-426-1	1

Figure 6-41. Pressure Gauges, 0-6,000 psi (AHP-G325, -G326)

WARNING

Different brands of MIL-G-27617 Type III greases should never be mixed. Ensure all old grease is removed prior to applying new grease.

(2) Apply a light coat of MIL-G-27617 Type III lubricant to new face seal O-ring (2) and install O-ring in stem of gauge (1).

(3) Insert gauge (1) in control panel, and install tubing to gauge (1).

(4) Install gauge mounting kit (3).

(5) Pressurize system. Using NID solution prepared in accordance with paragraph 4.7.3.2, leak test gauge connections, and correct as necessary.

(6) Reinstall CCA panel in accordance with paragraph 6.8.2.1, step b.

(7) Complete re-entry control forms.

THIS PAGE INTENTIONALLY LEFT BLANK

6.8.3 <u>Volume Tank Assembly (VTA)</u>. Corrective maintenance for the VTA consists of repair or replacement of the following components. See Figure 6-42 for component locations.

- Para. 6.8.3.1—VTA Frame Assembly .... Pg 6-172
- Para. 6.8.3.2—Plug Valve (ALP-V201)... Pg 6-173
- Para. 6.8.3.3—LP Relief Valve (ALP-V202) .... Pg 6-176

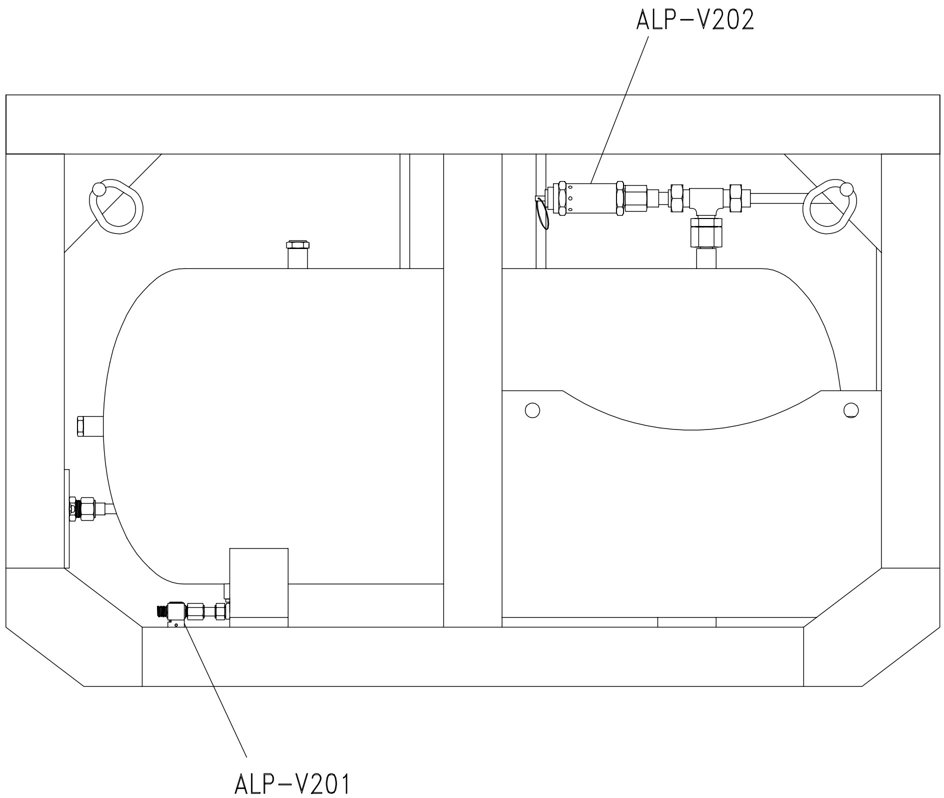
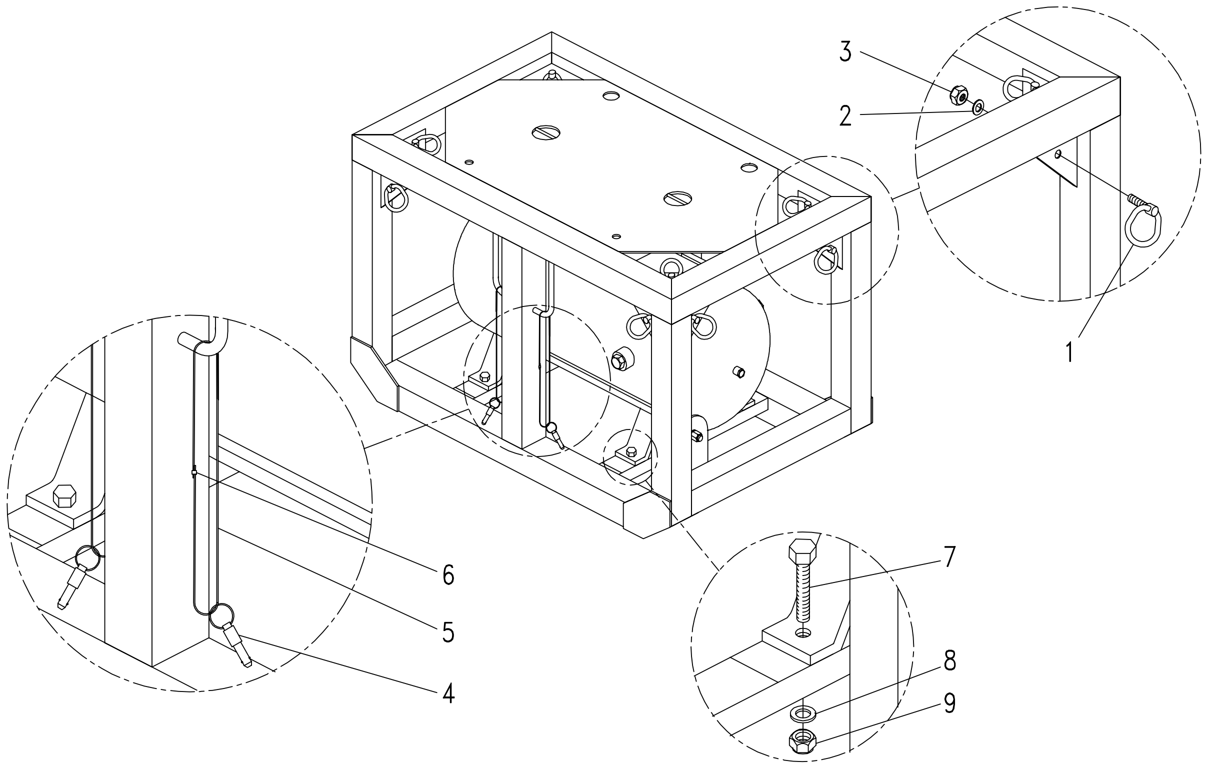


Figure 6-42. Volume Tank Assembly (VTA)

6.8.3.1 VTA Frame Assembly. Figure 6-43 provides an illustration and index of replacement parts for the VTA frame assembly. No procedure has been provided as the parts can easily be removed and replaced using maintenance procedures approved by the local command.



Item	Description	CAGE Code	Part Number	Qty
1	Ring-swivel bolt	80205	NAS1251-5-6	12
2	Washer, flat, 0.438 nom	96906	MS15795-816	12
3	Nut, self-locking, 0.438-20UNF-3B	96906	MS21044-C7	12
4	Quick release pin	96906	MS17990-C308	2
5	Cable, miniature, coated, finished dia. 0.062	39428	3423T29	AR
6	Sleeve, swaging	96906	MS51844-62	2
7	Bolt, hex head, 0.500-13UNC-2A X 1.75 LG	96906	MS16208-104	4
8	Washer, flat, 0.500 nom	96906	MS15795-817	4
9	Nut, self-locking, 0.500-13UNC-2B	96906	MS17830-8C	4

Figure 6-43. VTA Frame Assembly

6.8.3.2 <u>Plug Valve (ALP-V201)</u>. Plug valve (ALP-V201) serves as the condensate drain valve for the VTA. The valve, which is manually controlled, is located underneath the VTA (see Figure 6-50) to facilitate removal of the moisture that condenses inside the volume tank and accumulates in the bottom of the tank. Corrective maintenance for the plug valve consists of repair or replacement.

All callouts in the following procedure refer to the illustrated parts list in Figure 6-44. See Chapter 7 for additional ordering information.

WARNING

Do not disassemble components while the FADS III Air System is under pressure. Failure to observe this warning may result in injury or death to personnel.

This maintenance action involves entry into a certified boundary and approved re-entry control procedures must be followed.

a. Remove:

(1) Depressurize volume tank as required.

(2) Using a wrench, loosen union nut that secures close coupling (3) to plug valve (1), and remove plug valve.

(3) Remove, cut, and discard face seal O-ring (2).

b. Repair:

NOTE

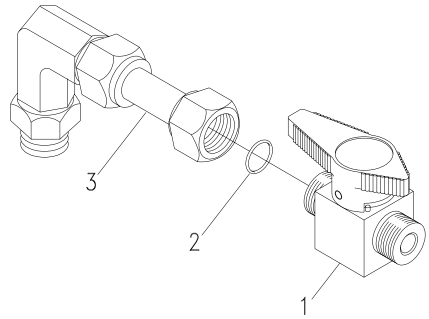
During disassembly it is not necessary to remove the handle and roll pin from the plug. If the plug requires replacement, order plug assembly (5), which includes a new plug, handle, roll pin, and O-rings already assembled.

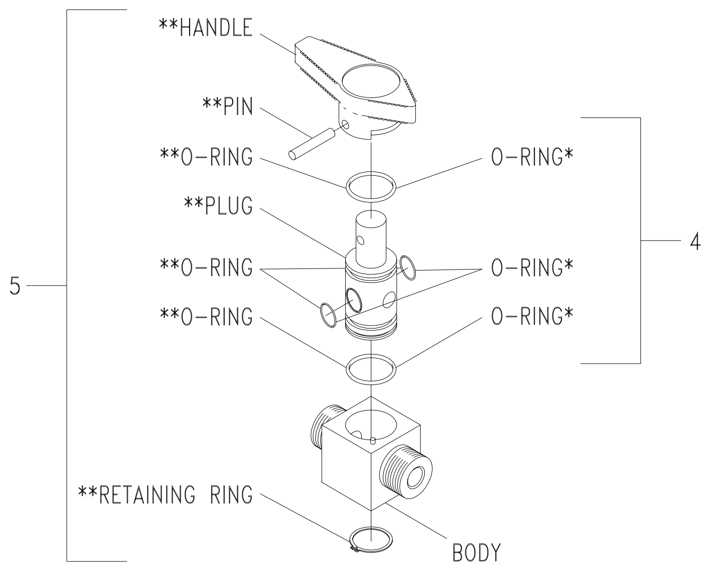
(1) Disassembly:

(a) Using outside snap ring pliers, remove retaining ring from end of plug.

(b) Remove remainder of plug assembly (5) from valve body.

(c) Remove all four O-rings from plug; cut and discard O-rings.





Item	Description	CAGE Code	Part Number	Qty
1	Plug valve	02570	SS-4P4T2-VCO	1
2	O-ring (face seal)	81349	M83248/2-010	1
3	Close coupling	02570	SS-4-WVCO-6-DF	1
*4	Seal kit (includes O-rings only)	02570	VI-P4T-K2	1
**5	Plug assembly (includes handle, pin, four O-rings, plug, and retaining ring)	02570	SS-P4T-K9	1

Figure 6-44. Plug Valve (ALP-V201)

(2) Reassembly:

WARNING

Different brands of MIL-G-27617 Type III greases should never be mixed. Ensure all old grease is removed prior to applying new grease.

(a) Apply a light coat of MIL-G27617 Type III lubricant to new O-rings and install onto plug.

(b) Install plug assembly (5) into valve body. Ensure correct orientation of handle.

WARNING

When installing plug into valve body, the retaining ring must be locked into the plug's retaining ring groove. Failure to properly lock the retaining ring in position may allow the plug to blow out during operation, causing death or injury to personnel.

(c) Using outside snap ring pliers, reinstall retaining ring on bottom of plug, ensuring retaining ring is locked onto plug.

c. Install repaired or replacement valve:

(1) Apply a light coat of MIL-G-27617 Type III lubricant to new face seal O-ring (2) and install O-ring in appropriate port in plug valve (1).

(2) Secure close coupling (3) to plug valve (1), and tighten union nut with wrench.

(3) Pressurize system. Using NID solution prepared in accordance with paragraph 4.7.3.2, leak test valve connections and correct as necessary.

(4) Complete re-entry control forms.

6.8.3.3 LP Relief Valve (ALP-V202). ALP-V202 is an automatic relief valve located on top of the volume tank (see Figure 6-50). The valve is set to relieve at 300 psi.

All callouts in the following procedure refer to the illustrated parts list in Figure 6-45. See Chapter 7 for additional ordering information.

WARNING

Do not disassemble components while the FADS III Air System is under pressure. Failure to observe this warning may result in injury or death to personnel.

This maintenance action involves entry into a certified boundary and approved re-entry control procedures must be followed.

a. Remove:

(1) Ensure volume tank is depressurized.

(2) Remove connector (2) and relief valve (1) as an assembly. Remove, cut, and discard O-ring.

(3) Remove relief valve (1) from connector (2), remove Teflon® tape from threads of adapter and relief valve.

b. Install:

WARNING

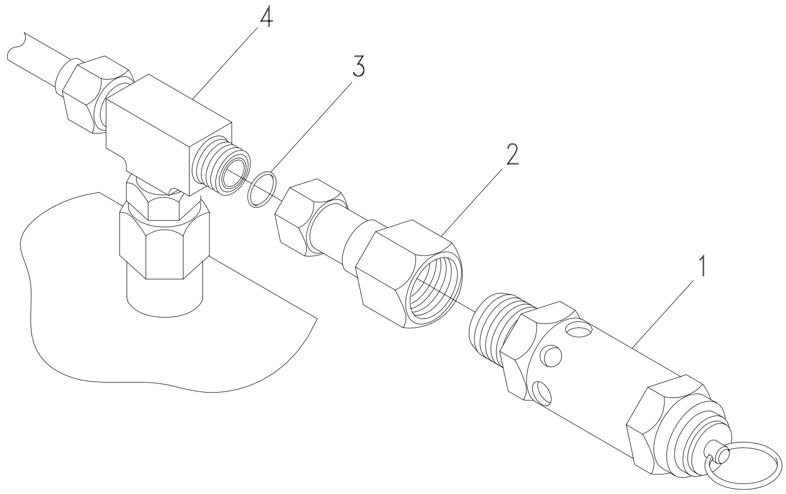
Different brands of MIL-G-27617 Type III greases should never be mixed. Ensure all old grease is removed prior to applying new grease.

CAUTION

Ensure new relief valve is tagged showing 300 ± 5 psi relief pressure.

(1) Beginning at second thread from end, wrap Teflon® tape 1-1/4 turns onto threaded portion of new relief valve in clockwise direction. Apply a light coat of MIL-G-27617 Type III lubricant to Teflon® tape.

(2) Install relief valve in connector (2) and hand tighten. Using the appropriate tool, tighten valve one complete revolution beyond hand-tight.



Item	Description	CAGE Code	Part Number	Qty
1	Relief valve	91816	M5132-N-6M(L)-300 ASME	1
2	Connector assembly	53711	53711-6961894-063/065/066	1
3	O-ring (face seal)	81349	M83248/2-019	1
4	Tee	99565	H815T-12-12-12-SS	1

Figure 6-45. LP Relief Valve (ALP-V202)

(3) Apply a light coat of MIL-G-27617 Type III lubricant to new face seal O-ring (3) and install O-ring in O-ring groove in tee (4).

(4) Secure connector (2) to tee (4).

(5) Pressurize volume tank. Using NID solution prepared in accordance with paragraph 4.7.3.2, leak test valve connections, and correct as necessary.

(6) Complete re-entry control forms.

THIS PAGE INTENTIONALLY LEFT BLANK

6.8.4 Air Hose Assemblies. This section contains strain relief lashing procedures and corrective procedures for the following FADS III Air System hose assemblies:

- Para. 6.8.4.1—Strain Relief Lashing Procedure .... Pg 6-180
- Para. 6.8.4.2—LP Air Hose Assembly (H-203) .... Pg 6-181
- Para. 6.8.4.3—SCUBA Charge Hose Assembly (H-406) .... Pg 6-183
- Para. 6.8.4.4—HP Air Hose Assemblies (H-436) .... Pg 6-185
- Para. 6.8.4.5—HP Air Hose Assembly (H-444) .... Pg 6-187

6.8.4.1 **Strain Relief Lashing Procedure.** The following strain relief lashing procedure should be followed when lashing is required for hose assembly maintenance. The procedural steps are illustrated in Figure 6-46.

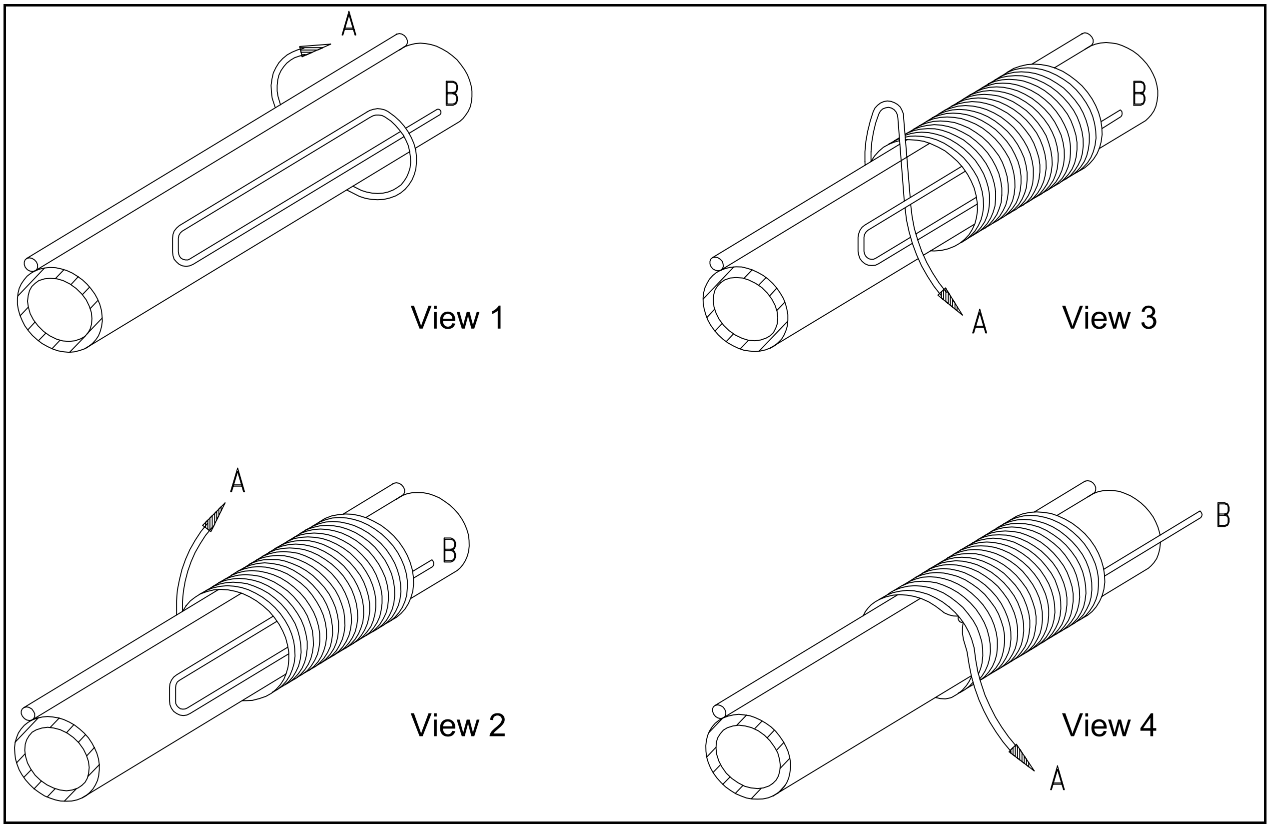


Figure 6-46. Strain Relief Lashing

a. (View 1) Using nylon cord, form a “U” 9 to 12 inches long and about 0.25 inch wide and place it on hose assembly as shown.

b. (View 2) Wrap end “A” of nylon cord around hose assembly as shown until lashing length is 3 inches ± 0.5 inch.

c. (View 3) Terminate the lashing by passing end “A” of nylon cord through the closed end of the “U” as shown.

d. (View 4) Pull end “B” of nylon cord until the closed end of the “U” is hidden as shown.

e. Cut off excess nylon cord and melt the ends.

6.8.4.2 LP Air Hose Assembly (H-203). H-203 is an LP air hose assembly that is used to connect the CCA to the VTA, and therefore will only be required if the optional VTA is used.

All callouts in the following procedure refer to the illustrated parts list in Figure 6-47. See Chapter 7 for additional ordering information.

WARNING

Do not disassemble components while the FADS III Air System is under pressure. Failure to observe this warning may result in injury or death to personnel.

This maintenance action involves entry into a certified boundary and approved re-entry control procedures must be followed.

a. Remove:

(1) Ensure that system is depressurized.

(2) Disconnect LP air hose assembly (1) and snap shackles (5) from CCA and VTA.

(3) Plug or cap both ends of LP air hose assembly (1) and interface ports on CCA and VTA.

b. Repair: Make necessary repairs to LP air hose assembly (1) using replacement parts shown in the parts list in Figure 6-47. If new strain relief lashing is required, see paragraph 6.8.4.1 for guidance.

c. Install:

(1) Ensure repaired or replacement LP air hose assembly (1) has been cleaned in accordance with MIL-STD-1330 or other approved NAVSEA cleaning procedure for life support systems and has met hydrostatic test requirements (see FADS III Air System drawing 53711-6962010).

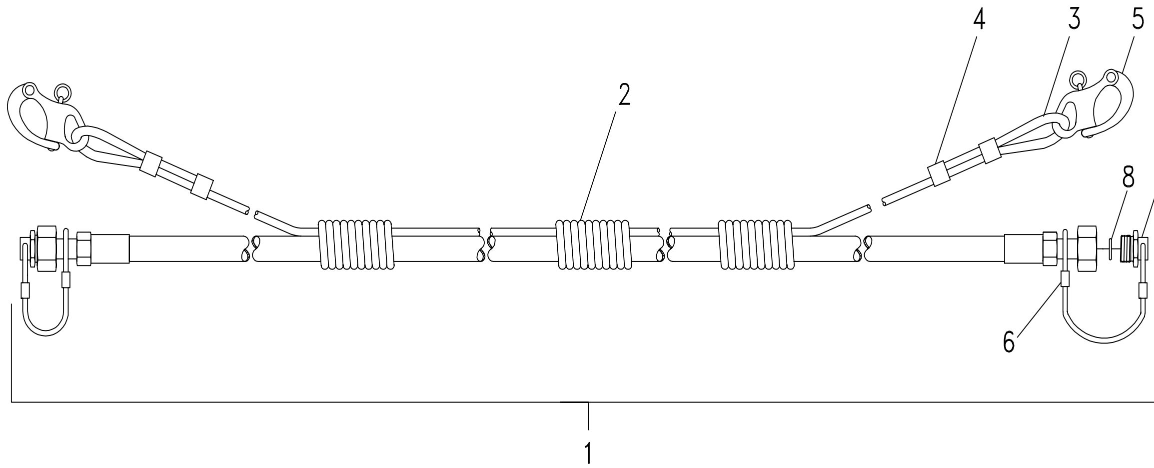
WARNING

Different brands of MIL-G-27617 Type III greases should never be mixed. Ensure all old grease is removed prior to applying new grease.

(2) Remove caps or plugs and install lubricated O-rings (8) at hose connections. Attach LP air hose assembly (1) to CCA and VTA interface ports. Ensure snap shackles (5) are secured to CCA and VTA.

(3) Pressurize system. Using NID solution prepared in accordance with paragraph 4.7.3.2, leak test hose connections and correct as necessary.

(4) Complete re-entry control forms.



Item	Description	CAGE Code	Part Number	Qty
1	LP air hose assembly	53711	53711-6962010	1
2	Cord, 0.190 dia.	81349	M5040-5N	AR
3	Wire rope	81349	M83420/4-004	AR
4	Swaging sleeve	96906	MS51844-63	AR
5	Snap shackle	63331	NF-16100	2
6	Swaging sleeve	96906	MS51844-60	AR
7	Plug assembly	02570	SS-8-VCO-BP	2
8	O-ring	81349	M83248/2-111	2

Figure 6-47. LP Air Hose Assembly (H-203)

6.8.4.3 SCUBA Charge Hose Assembly (H-406). H-406 is an HP air hose assembly that is semi-permanently connected to the AFRA and is used to charge Self-Contained Underwater Breathing Apparatus (SCUBA) cylinders. H-406 is also used in conjunction with HP air hose assembly (H-444) to charge the Transportable Recompression Chamber System (TRCS) Air Supply Rack Assembly. Corrective maintenance of H-406 is limited to replacement of those parts listed in Figure 6-48.

All callouts in the following procedure refer to the illustrated parts list in Figure 6-48. See Chapter 7 for additional ordering information.

WARNING

Do not disassemble components while the FADS III Air System is under pressure. Failure to observe this warning may result in injury or death to personnel.

NOTE

Re-entry control procedures do not apply to SCUBA charge hose assembly (H-406) as it is outside the certification boundaries for this system.

a. Remove:

(1) Ensure that system is depressurized.

(2) Disconnect SCUBA charge hose assembly (1) and snap shackle (5) from AFRA.

(3) Plug or cap both ends of SCUBA charge hose assembly (1) and interface port on AFRA.

b. Repair: Make necessary repairs to SCUBA charge hose assembly (1) using replacement parts shown in the parts list in Figure 6-48. If new strain relief lashing is required, see paragraph 6.8.4.1 for guidance.

c. Install:

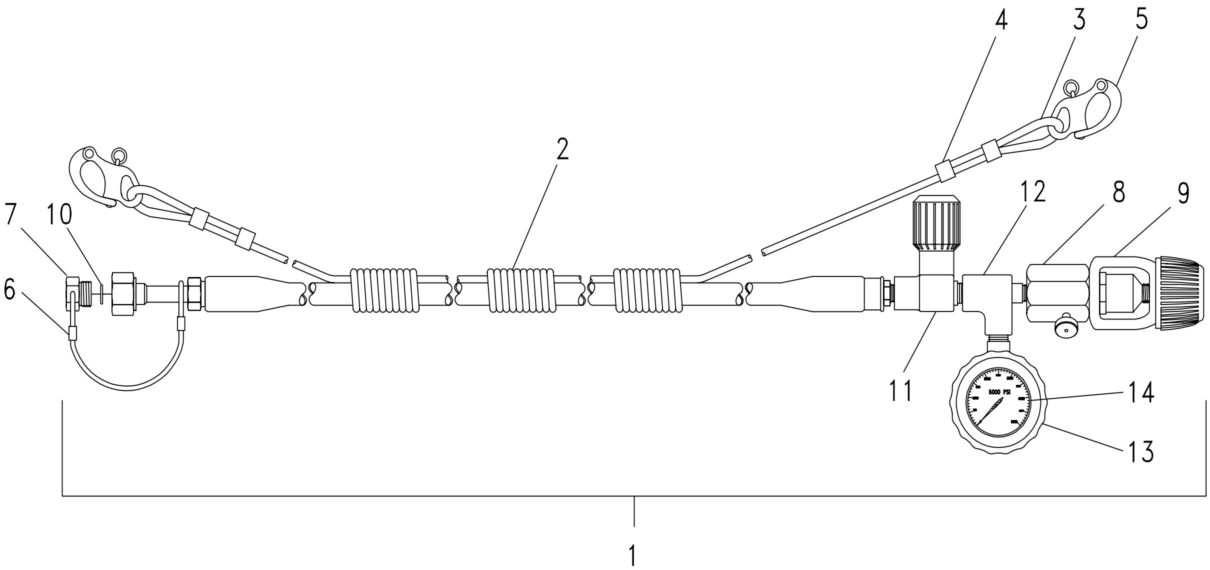
(1) Ensure repaired or replacement SCUBA charge hose assembly (1) has been cleaned in accordance with MIL-STD-1330 or other approved NAVSEA cleaning procedure for life support systems and has met hydrostatic test requirements (see FADS III Air System drawing 53711-6962020).

WARNING

Different brands of MIL-G-27617 Type III greases should never be mixed. Ensure all old grease is removed prior to applying new grease.

(2) Remove caps or plugs and install lubricated O-ring (10) at hose connection. Attach SCUBA charge hose assembly (1) to AFRA interface ports. Ensure snap shackle (5) is secured to AFRA.

(3) Pressurize system, and leak test hose connections using NID solution prepared in accordance with paragraph 4.7.3.2. Correct leaks as necessary.



Item	Description	CAGE Code	Part Number	Qty
1	SCUBA charge hose assembly	53711	53711-6962020	1
2	Cord, 0.190 dia.	81349	M5040-5N	AR
3	Wire rope	81349	M83420/4-004	AR
4	Swaging sleeve	96906	MS51844-63	AR
5	Snap shackle	63331	NF-16100	2
6	Swaging sleeve	96906	MS51844-60	AR
7	Plug assembly	02570	SS-4-VCO-BP	1
8	Yoke and bleeder valve	6S753	0101-03	1
9	Dust cap	6S753	0510-42	1
10	O-ring	81349	M83248/2-010	1
11	Line valve	6S753	9913-09	1
12	Tee	6S753	MRO-SS-1/4	1
13	Cover, 2.5-inch gauge	6S753	-	1
14	Gauge, 5,000 psi	6S753	711125205000	1

Figure 6-48. SCUBA Charge Hose Assembly (H-406)

6.8.4.4 <u>HP Air Hose Assemblies (H-436)</u>. There are three HP air hose assemblies designated as H-436 in the FADS III Air System. Two of the assemblies connect the CCA to the AFRA—one to the ***A SUPPLY*** interface ports and the other to the ***B SUPPLY*** interface ports. The third hose assembly connects the AFRA to the 5,000 psi Compressor System.

NOTE

The following procedure can also be used for corrective maintenance of TRCS HP air hose assembly (H-804), which is used in Configuration 2 (Appendix B).

All callouts in the following procedure refer to the illustrated parts list in Figure 6-49. See Chapter 7 for additional ordering information.

WARNING

Do not disassemble components while the FADS III Air System is under pressure. Failure to observe this warning may result in injury or death to personnel.

This maintenance action involves entry into a certified boundary and approved re-entry control procedures must be followed.

a. Remove:

(1) Ensure that system is depressurized.

(2) Disconnect HP air hose assembly (1) and snap shackles (5) from AFRA and CCA or compressor, whichever is applicable.

(3) Plug or cap both ends of HP air hose assembly (1) and interface ports on AFRA and CCA or compressor, whichever is applicable.

b. Repair: Make necessary repairs to HP air hose assembly (1) using replacement parts shown in the parts list in Figure 6-49. If new strain relief lashing is required, see paragraph 6.8.4.1 for guidance.

c. Install:

(1) Ensure repaired or replacement HP air hose assembly (1) has been cleaned in accordance with MIL-STD-1330 or other approved NAVSEA cleaning procedure for life support systems and has met hydrostatic test requirements (see FADS III Air System drawing 53711-6962000).

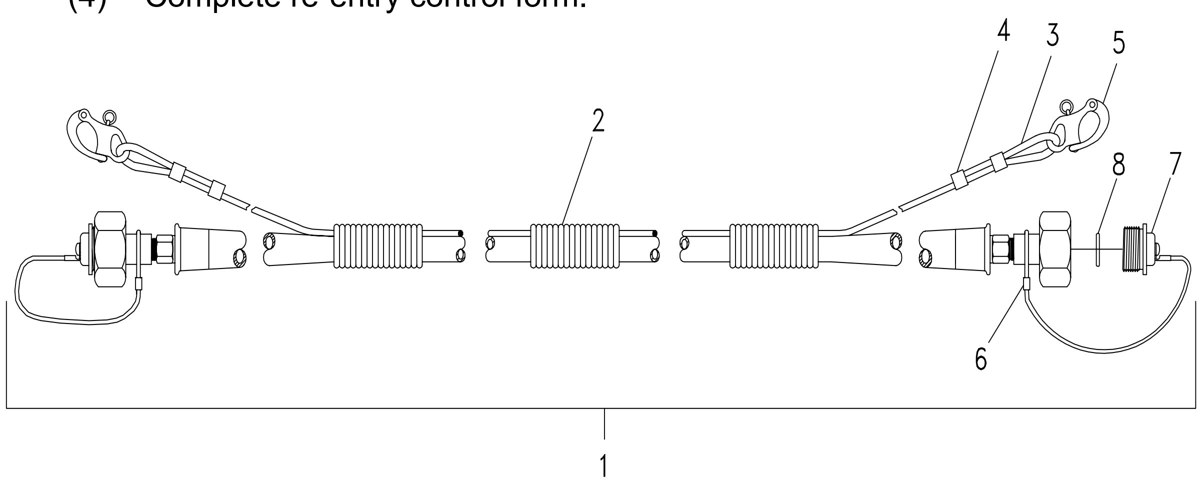
WARNING

Different brands of MIL-G-27617 Type III greases should never be mixed. Ensure all old grease is removed prior to applying new grease.

(2) Remove caps or plugs, install lubricated O-rings (8) at hose connections, and attach HP air hose assembly (1) to AFRA and CCA or compressor interface ports. Ensure snap shackles (5) are secured to the applicable components.

(3) Pressurize system, and leak test hose connections using NID solution prepared in accordance with paragraph 4.7.3.2. Correct leaks as necessary.

(4) Complete re-entry control form.



Item	Description	CAGE Code	Part Number	Qty
1	HP air hose assembly	53711	53711-6962000	1
2	Cord, 0.190 dia.	81349	M5040-5N	AR
3	Wire rope	81349	M83420/4-004	AR
4	Swaging sleeve	96906	MS51844-63	AR
5	Snap shackle	63331	NF-16100	2
6	Swaging sleeve	96906	MS51844-60	AR
7	Blank body	99565	12013-8-SS	2
8	O-ring	81349	M83248/2-015	2

Figure 6-49. HP Air Hose Assembly (H-436)

6.8.4.5 <u>HP Air Hose Assembly (H-444)</u>. H-444, which is rated to a working pressure of 3,000 psig, connects to SCUBA Charge Hose Assembly (H-406) and together they are used to deliver charging air from the ASRA to the TRCS Air Supply Rack Assembly. The charging setup is illustrated in Figure 3-4.

All callouts in the following procedure refer to the illustrated parts list in Figure 6-50. See Chapter 7 of this manual for additional ordering information.

WARNING

Do not disassemble components while the FADS III Air System and the TRCS MK 6 Mod 0/Mod 1 are under pressure. Failure to observe this warning may result in injury or death to personnel.

This maintenance action involves entry into a certified boundary and approved re-entry control procedures must be followed.

a. Remove:

(1) Ensure both systems are depressurized.

(2) Disconnect HP air hose assembly (1) and snap shackles (5) from TRCS and SCUBA Charge Hose Assembly (H-406).

(3) Plug or cap both ends of HP air hose assembly (1), interface port on TRCS, and end of SCUBA Charge Hose Assembly (H-406).

b. Repair: Make necessary repairs to HP air hose assembly (1) using replacement parts shown in the parts list in Figure 6-50. If new strain relief lashing is required, see paragraph 6.8.4.1 of this manual for guidance.

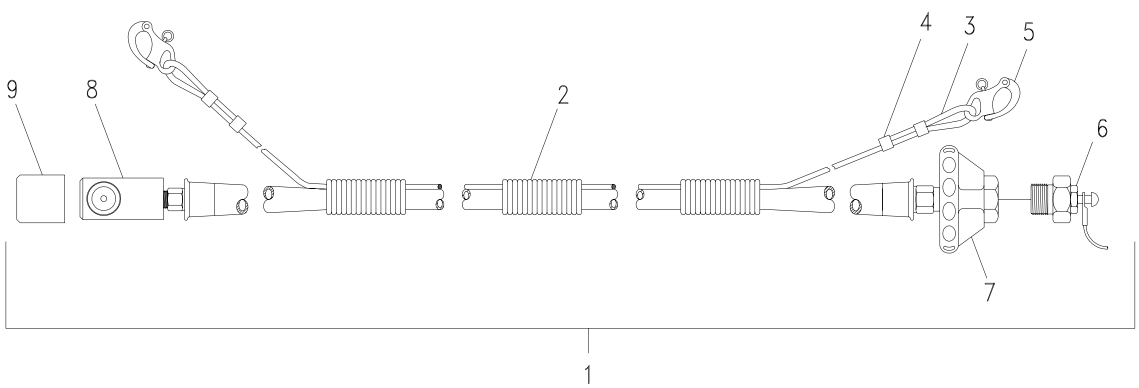
c. Install:

(1) Ensure repaired or replacement HP air hose assembly (1) has been cleaned in accordance with MIL-STD-1330 or other approved NAVSEA cleaning procedure for life support systems and has met hydrostatic test requirements (see FADS III Air System drawing 53711-6962070).

(2) Remove caps or plugs, and attach HP air hose assembly (1) to TRCS interface port and SCUBA Charge Hose Assembly (H-406). Ensure snap shackles (5) are secured to the applicable components.

(3) Pressurize systems and leak test hose connections using NID solution prepared in accordance with paragraph 4.7.3.2 of this manual. Tighten until no leaks are detected.

(4) Complete re-entry control forms.



Item	Description	Cage Code	Part Number	Qty
1	HP air hose assembly	53711	53711-6962070-6	1
2	Cord, nylon, 0.125 dia.	80064	4666860	AR
3	Wire rope	81349	M83420/4-004	AR
4	Swaging sleeve	96906	MS51844-63	AR
5	Snap shackle	63331	NF-16100	2
6	Plug assembly, CGA 346	53711	53711-6314683	1
7	Handwheel, CGA 346	53711	53711-6314702	1
8	SCUBA block	70292	9-3030-1	1
9	Dust Cap	70292	H3042-4	1

Figure 6-50. HP Air Hose Assembly (H-444)

CHAPTER 7

PARTS LISTS

7.1 INTRODUCTION

This chapter contains an index of replacement parts and a list of manufacturers and suppliers for the Fly Away Dive System (FADS) III Air System. The index of replacement parts, which is contained in Table 7-1, references the corrective maintenance procedures in Chapter 6, each of which contains exploded parts illustrations and parts lists for the major components of the FADS III Air System. The list of FADS III Air System manufacturers and suppliers is contained in Table 7-2.

7.2 INDEX OF REPLACEMENT PARTS

Table 7-1, which consists of multiple foldout pages, contains the index of replacement parts in tabular format with column headings denoting the following:

- ***Filter:*** Contains filter designators (F-XXX)
- ***Gauge:*** Contains gauge designators (-GXXX)
- ***Hose:*** Contains hose designators (H-XXX)
- ***Valve:*** Contains valve designators (-VXXX)
- ***Type:*** Contains component type—ALP (Air Low Pressure), AHP (Air High Pressure), LP (Low Pressure), or HP (High Pressure); all gauges and valves are designated ALP or AHP, and all hose assemblies are designated LP or HP
- ***Nomenclature:*** Contains official nomenclature of component as used in this manual
- ***Used On:*** Contains acronym of major assembly on which the component is used; ASRA (Air Supply Rack Assembly), CCA (Control Console Assembly), or VTA (Volume Tank Assembly)
- ***Chapter 6 References:*** Includes Chapter 6 paragraph and page numbers where parts illustrations and parts lists can be found
- ***Part Number:*** Contains the component's part number
- ***CAGE Code:*** Contains the manufacturer's Commercial and Government Entity (CAGE) code
- ***Mfr.:*** Contains an abbreviated form of the manufacturer's name
- ***Comments:*** Contains information that may be helpful in identifying components

7.3 LIST OF MANUFACTURERS AND SUPPLIERS

Table 7-2 contains the list of FADS III Air System manufacturers and suppliers arranged in order of CAGE codes. Contact information for ordering replacement parts is also included.

THIS PAGE INTENTIONALLY LEFT BLANK

Table 7-1. FADS III Air System Replacement Parts Index

Filter	Gauge	Hose	Valve	Type	Nomenclature	Used On	Chapter 6 References	Part Number	CAGE Code	Mfr.	Comments
F-020					Filter, In-line, A Supply	CCA	6.8.2.9 / 6-160	U-10003	59165	Norman	Between AHP-V301 and AHP-V303
F-020					Filter, In-line, B Supply	CCA	6.8.2.9 / 6-160	U-10003	59165	Norman	Between AHP-V302 and AHP-V304
F-040					Filter, In-line, Air Charge	ASRA	6.8.1.14 / 6-110	U-10002	59165	Norman	Between charging ports and AHP-V445
F-040					Filter, In-line, SCUBA Charge	ASRA	6.8.1.14 / 6-110	U-10002	59165	Norman	Between AHP-V431 and AHP-V432
	-G320			ALP	Gauge, Diver Depth, 0-350 fsw	CCA	6.8.2.10 / 6-163	25544-24B24-MCE	52159	3D	***YELLOW DIVER*** depth gauge
	-G321			ALP	Gauge, Diver Depth, 0-350 fsw	CCA	6.8.2.10 / 6-163	25544-24B22-MCE	52159	3D	***GREEN DIVER*** depth gauge
	-G322			ALP	Gauge, Diver Depth, 0-350 fsw	CCA	6.8.2.10 / 6-163	25544-24B23-MCE	52159	3D	***RED DIVER*** depth gauge
	-G323			ALP	Gauge, Press. (LP), 0-500 psi	CCA	6.8.2.11 / 6-166	25502-27B21-MCF	52159	3D	***MANIFOLD PRESSURE*** gauge – A Supply
	-G324			ALP	Gauge, Press. (LP), 0-500 psi	CCA	6.8.2.11 / 6-166	25502-27B21-MCF	52159	3D	***MANIFOLD PRESSURE*** gauge – B Supply
	-G325			AHP	Gauge, Press. (HP), 0-6000 psi	CCA	6.8.2.12 / 6-168	25502-36B21-MCF	52159	3D	***A SUPPLY*** gauge
	-G326			AHP	Gauge, Press. (HP), 0-6000 psi	CCA	6.8.2.12 / 6-168	25502-36B21-MCF	52159	3D	***B SUPPLY*** gauge
	-G436			AHP	Gauge, Press. (HP), 0-5000 psi	ASRA	6.8.1.15 / 6-113	25502-35B21-MCF	52159	3D	***SCUBA PRESSURE*** gauge
	-G437			AHP	Gauge, Press. (HP), 0-8000 psi	ASRA	6.8.1.16 / 6-115	25544-37B21-MCD	52159	3D	***BANK 1 PRESSURE*** gauge
	-G438			AHP	Gauge, Press. (HP), 0-8000 psi	ASRA	6.8.1.16 / 6-115	25544-37B21-MCD	52159	3D	***BANK 2 PRESSURE*** gauge
	-G439			AHP	Gauge, Press. (HP), 0-8000 psi	ASRA	6.8.1.16 / 6-115	25544-37B21-MCD	52159	3D	***BANK 3 PRESSURE*** gauge
		H-203		LP	Hose Assy, LP Air	VTA	6.8.4.2 / 6-181	53711-6962010	53711	NAVSEA	TP = 550 psi; WP = 275 psi (VTA to CCA)
		H-406		HP	Hose Assy, SCUBA Charge	ASRA	6.8.4.3 / 6-183	53711-6962020	53711	NAVSEA	TP = 6,000 psi; WP = 3,000 psi (ASRA to SCUBA cylinders)
		H-436		HP	Hose Assy, HP Air	ASRA	6.8.4.4 / 6-185	53711-6962000	53711	NAVSEA	TP = 10,000 psi; WP = 5,000 psi (ASRA to CCA or HPAC)
		H-444		HP	Hose Assy, TRCS Charge	ASRA	6.8.4.5 / 6-187	53711-6962070-6	53711	NAVSEA	TP = 6,000 psi; WP = 3,000 psi (H-406 to TRCS racks)
		H-804		HP	Hose Assy, TRCS Supply	ASRA	6.8.4.4 / 6-185	53711-6962000	53711	NAVSEA	TP = 10,000 psi; WP = 5,000 psi (ASRA to TRC and TL)
			-V201	ALP	Valve, Plug	VTA	6.8.3.2 / 6-173	SS-4P4T2-VCO	02570	Swagelok	Volume Tank Condensate Drain Valve
			-V202	ALP	Valve, Relief, LP	VTA	6.8.3.3 / 6-176	M5132-N-6M(L)-300 ASME	91816	Circle Seal	Set at 300 psi; used in 6.8.2.5 also
			-V301	AHP	Valve, Shutoff, Angle	CCA	6.8.2.2 A / 6-125 6.8.2.2 B / 6-130	HV09-15-1 PLB-12764-1	91816 99565	Circle Seal CPV	***A SUPPLY*** valve
			-V302	AHP	Valve, Shutoff, Angle	CCA	6.8.2.2 A / 6-125 6.8.2.2 B / 6-130	HV09-15-3 PLB-12764-3	91816 99565	Circle Seal CPV	***B SUPPLY*** valve
			-V303	AHP	Valve, Regulator (green handle or label)	CCA	6.8.2.3 A / 6-135 6.8.2.3 B / 6-142	PR50-6-1 44F5417T308	91816 13669	Circle Seal Tescom	***A REGULATOR*** valve
			-V304	AHP	Valve, Regulator (orange handle or label)	CCA	6.8.2.3 A / 6-135 6.8.2.3 B / 6-142	PR50-6-3 44F5417T308	91816 13669	Circle Seal Tescom	***B REGULATOR*** valve

NOTE: See List of Acronyms and Abbreviations in front matter of this manual for definitions of unfamiliar terms used in this table.

THIS PAGE INTENTIONALLY LEFT BLANK

Table 7-1. FADS III Air System Replacement Parts Index—Continued

Filter	Gauge	Hose	Valve	Type	Nomenclature	Used On	Chapter 6 References	Part Number	CAGE Code	Mfr.	Comments
			-V305	AHP	Valve, Gauge Stop	CCA	6.8.2.4 / 6-149	PLC-10669	99565	CPV	Isolates AHP-G325; also used in 6.8.1.7
			-V306	AHP	Valve, Gauge Stop	CCA	6.8.2.4 / 6-149	PLC-10669	99565	CPV	Isolates AHP-G326; also used in 6.8.1.7
			-V307	ALP	Valve, Gauge Stop	CCA	6.8.2.4 / 6-149	PLC-10669	99565	CPV	Isolates ALP-G323; also used in 6.8.1.7
			-V308	ALP	Valve, Gauge Stop	CCA	6.8.2.4 / 6-149	PLC-10669	99565	CPV	Isolates ALP-G324; also used in 6.8.1.7
			-V309	ALP	Valve, Relief, LP	CCA	6.8.2.5 / 6-152	M5132-N-6M(L)-300 ASME	91816	Circle Seal	Set at 300 psi; also used in 6.8.3.3
			-V310	ALP	Valve, Relief, LP	CCA	6.8.2.5 / 6-152	M5132-N-6M(L)-300 ASME	91816	Circle Seal	Set at 300 psi; also used in 6.8.3.3
			-V311	ALP	Valve, Ball, Angle	CCA	6.8.2.6 / 6-154	SS-45TVCO8-A-K	02570	Swagelok	***MANIFOLD SUPPLY*** valve (A Supply)
			-V312	ALP	Valve, Ball, Angle	CCA	6.8.2.6 / 6-154	SS-45TVCO8-A-K	02570	Swagelok	***MANIFOLD SUPPLY*** valve (B Supply)
			-V313	ALP	Valve, Ball	CCA	6.8.2.7 / 6-156	SS-45TVCO8-K	02570	Swagelok	***VOLUME TANK*** valve
			-V314	ALP	Valve, Ball, Angle	CCA	6.8.2.6 / 6-154	SS-45TVCO8-A-K	02570	Swagelok	***YELLOW SUPPLY*** valve
			-V315	ALP	Valve, Ball, Angle	CCA	6.8.2.6 / 6-154	SS-45TVCO8-A-K	02570	Swagelok	***GREEN SUPPLY*** valve
			-V316	ALP	Valve, Ball, Angle	CCA	6.8.2.6 / 6-154	SS-45TVCO8-A-K	02570	Swagelok	***RED SUPPLY*** valve
			-V317	ALP	Valve, Ball, Angle	CCA	6.8.2.8 / 6-158	SS-43TVCO4-A-K	02570	Swagelok	***PNEUMO*** valve (yellow diver)
			-V318	ALP	Valve, Ball, Angle	CCA	6.8.2.8 / 6-158	SS-43TVCO4-A-K	02570	Swagelok	***PNEUMO*** valve (green diver)
			-V319	ALP	Valve, Ball, Angle	CCA	6.8.2.8 / 6-158	SS-43TVCO4-A-K	02570	Swagelok	***PNEUMO*** valve (red diver)
			-V401	AHP	Valve, Shutoff, Triport (Flask Isolation)	ASRA	6.8.1.3 A / 6-30 6.8.1.3 B / 6-37	HV09-13-2 PLB-12760-2	91816 99565	Circle Seal CPV	***FLASK ISOLATION*** valve w/rupture disc; used in Bank 1
			-V402	AHP	Valve, Shutoff, Triport (Flask Isolation)	ASRA	6.8.1.3 A / 6-30 6.8.1.3 B / 6-37	HV09-13-2 PLB-12760-2	91816 99565	Circle Seal CPV	***FLASK ISOLATION*** valve w/rupture disc; used in Bank 1
			-V403	AHP	Valve, Shutoff, Triport (Flask Isolation)	ASRA	6.8.1.3 A / 6-30 6.8.1.3 B / 6-37	HV09-13-2 PLB-12760-2	91816 99565	Circle Seal CPV	***FLASK ISOLATION*** valve w/rupture disc; used in Bank 1
			-V404	AHP	Valve, Shutoff, Triport (Flask Isolation)	ASRA	6.8.1.3 A / 6-30 6.8.1.3 B / 6-37	HV09-13-2 PLB-12760-2	91816 99565	Circle Seal CPV	***FLASK ISOLATION*** valve w/rupture disc; used in Bank 2
			-V405	AHP	Valve, Shutoff, Triport (Flask Isolation)	ASRA	6.8.1.3 A / 6-30 6.8.1.3 B / 6-37	HV09-13-2 PLB-12760-2	91816 99565	Circle Seal CPV	***FLASK ISOLATION*** valve w/rupture disc; used in Bank 2
			-V406	AHP	Valve, Shutoff, Triport (Flask Isolation)	ASRA	6.8.1.3 A / 6-30 6.8.1.3 B / 6-37	HV09-13-2 PLB-12760-2	91816 99565	Circle Seal CPV	***FLASK ISOLATION*** valve w/rupture disc; used in Bank 2
			-V407	AHP	Valve, Shutoff, Triport (Flask Isolation)	ASRA	6.8.1.3 A / 6-30 6.8.1.3 B / 6-37	HV09-13-2 PLB-12760-2	91816 99565	Circle Seal CPV	***FLASK ISOLATION*** valve w/rupture disc; used in Bank 2
			-V408	AHP	Valve, Shutoff, Triport (Flask Isolation)	ASRA	6.8.1.3 A / 6-30 6.8.1.3 B / 6-37	HV09-13-2 PLB-12760-2	91816 99565	Circle Seal CPV	***FLASK ISOLATION*** valve w/rupture disc; used in Bank 3
			-V409	AHP	Valve, Shutoff, Triport (Flask Isolation)	ASRA	6.8.1.3 A / 6-30 6.8.1.3 B / 6-37	HV09-13-2 PLB-12760-2	91816 99565	Circle Seal CPV	***FLASK ISOLATION*** valve w/rupture disc; used in Bank 3

THIS PAGE INTENTIONALLY LEFT BLANK

Table 7-1. FADS III Air System Replacement Parts Index—Continued

Filter	Gauge	Hose	Valve	Type	Nomenclature	Used On	Chapter 6 References	Part Number	CAGE Code	Mfr.	Comments
			-V410	AHP	Valve, Shutoff, Triport (Flask Drain)	ASRA	6.8.1.4 A / 6-44 6.8.1.4 B / 6-51	HV09-14-2 PLB-12765-2	91816 99565	Circle Seal CPV	***FLASK DRAIN*** valve w/thermal safety device
			-V411	AHP	Valve, Shutoff. Triport (Flask Drain)	ASRA	6.8.1.4 A / 6-44 6.8.1.4 B / 6-51	HV09-14-2 PLB-12765-2	91816 99565	Circle Seal CPV	***FLASK DRAIN*** valve w/thermal safety device
			-V412	AHP	Valve, Shutoff, Triport (Flask Drain)	ASRA	6.8.1.4 A / 6-44 6.8.1.4 B / 6-51	HV09-14-2 PLB-12765-2	91816 99565	Circle Seal CPV	***FLASK DRAIN*** valve w/thermal safety device
			-V413	AHP	Valve, Shutoff, Triport (Flask Drain)	ASRA	6.8.1.4 A / 6-44 6.8.1.4 B / 6-51	HV09-14-2 PLB-12765-2	91816 99565	Circle Seal CPV	***FLASK DRAIN*** valve w/thermal safety device
			-V414	AHP	Valve, Shutoff, Triport (Flask Drain)	ASRA	6.8.1.4 A / 6-44 6.8.1.4 B / 6-51	HV09-14-2 PLB-12765-2	91816 99565	Circle Seal CPV	***FLASK DRAIN*** valve w/thermal safety device
			-V415	AHP	Valve, Shutoff, Triport (Flask Drain)	ASRA	6.8.1.4 A / 6-44 6.8.1.4 B / 6-51	HV09-14-2 PLB-12765-2	91816 99565	Circle Seal CPV	***FLASK DRAIN*** valve w/thermal safety device
			-V416	AHP	Valve, Shutoff, Triport (Flask Drain)	ASRA	6.8.1.4 A / 6-44 6.8.1.4 B / 6-51	HV09-14-2 PLB-12765-2	91816 99565	Circle Seal CPV	***FLASK DRAIN*** valve w/thermal safety device
			-V417	AHP	Valve, Shutoff, Triport (Flask Drain)	ASRA	6.8.1.4 A / 6-44 6.8.1.4 B / 6-51	HV09-14-2 PLB-12765-2	91816 99565	Circle Seal CPV	***FLASK DRAIN*** valve w/thermal safety device
			-V418	AHP	Valve, Shutoff, Triport (Flask Drain)	ASRA	6.8.1.4 A / 6-44 6.8.1.4 B / 6-51	HV09-14-2 PLB-12765-2	91816 99565	Circle Seal CPV	***FLASK DRAIN*** valve w/thermal safety device
			-V419	AHP	Valve, Shutoff, Angle	ASRA	6.8.1.5 A / 6-58 6.8.1.5 B / 6-63	HV09-15-2 PLB-12764-2	91816 99565	Circle Seal CPV	***SYSTEM DRAIN*** valve
			-V420	AHP	Valve, Shutoff, Triport	ASRA	6.8.1.6 A / 6-69 6.8.1.6 B / 6-76	HV09-16-2 PLB-12763-2	91816 99565	Circle Seal CPV	***BANK 1 MANIFOLD*** valve
			-V421	AHP	Valve, Shutoff, Triport	ASRA	6.8.1.6 A / 6-69 6.8.1.6 B / 6-76	HV09-16-2 PLB-12763-2	91816 99565	Circle Seal CPV	***BANK 2 MANIFOLD*** valve
			-V422	AHP	Valve, Shutoff, Triport	ASRA	6.8.1.6 A / 6-69 6.8.1.6 B / 6-76	HV09-16-2 PLB-12763-2	91816 99565	Circle Seal CPV	***PORT C*** valve
			-V423	AHP	Valve, Shutoff, Triport	ASRA	6.8.1.6 A / 6-69 6.8.1.6 B / 6-76	HV09-16-2 PLB-12763-2	91816 99565	Circle Seal CPV	***BANK 1 CHARGE*** valve
			-V424	AHP	Valve, Shutoff, Triport	ASRA	6.8.1.6 A / 6-69 6.8.1.6 B / 6-76	HV09-16-2 PLB-12763-2	91816 99565	Circle Seal CPV	***BANK 2 CHARGE*** valve
			-V425	AHP	Valve, Shutoff, Angle	ASRA	6.8.1.5 A / 6-58 6.8.1.5 B / 6-63	HV09-15-2 PLB-12764-2	91816 99565	Circle Seal CPV	***BANK 3 CHARGE*** valve
			-V426	AHP	Valve, Gauge Stop	ASRA	6.8.1.7 / 6-82	PLC-10669	99565	CPV	Isolates AHP-G437 (Bank 1); also used in 6.8.2.4
			-V427	AHP	Valve, Gauge Stop	ASRA	6.8.1.7 / 6-82	PLC-10669	99565	CPV	Isolates AHP-G438 (Bank 2); also used in 6.8.2.4
			-V428	AHP	Valve, Gauge Stop	ASRA	6.8.1.7 / 6-82	PLC-10669	99565	CPV	Isolates AHP-G439 (Bank 3); also used in 6.8.2.4

THIS PAGE INTENTIONALLY LEFT BLANK

Table 7-1. FADS III Air System Replacement Parts Index—Continued

Filter	Gauge	Hose	Valve	Type	Nomenclature	Used On	Chapter 6 References	Part Number	CAGE Code	Mfr.	Comments
			-V429	AHP	Valve, Shutoff, Angle	ASRA	6.8.1.5 A / 6-58 6.8.1.5 B / 6-63	HV09-15-2 PLB-12764-2	91816 99565	Circle Seal CPV	***PORT B*** valve
			-V430	AHP	Valve, Relief, HP	ASRA	6.8.1.8 / 6-85	SS-4R3A-1509-H	02570	Swagelok	Set at 5,500 psi; between AHP-V445 and AHP-V423
			-V431	AHP	Valve, Shutoff, Angle	ASRA	6.8.1.5 A / 6-58 6.8.1.5 B / 6-63	HV09-15-2 PLB-12764-2	91816 99565	Circle Seal CPV	***SCUBA SUPPLY*** valve
			-V432	AHP	Valve, Regulator	ASRA	6.8.1.9 / 6-88	PR50-18-2	91816	Circle Seal	***SCUBA REGULATOR*** (reduces 5,000 psi to 3,000 psi)
			-V433	AHP	Valve, Relief, HP	ASRA	6.8.1.10 / 6-95	SS-4R3A-1509-F	02570	Swagelok	Set at 3,300 psi; attached to AHP-V434
			-V434	AHP	Valve, Shutoff, Triport	ASRA	6.8.1.6 A / 6-69 6.8.1.6 B / 6-76	HV09-16-2 PLB-12763-2	91816 99565	Circle Seal CPV	***SCUBA OUTLET*** valve
			-V435	AHP	Valve, Gauge Stop	ASRA	6.8.1.7 / 6-82	PLC-10669	99565	CPV	Isolates AHP-G436; also used in 6.8.2.4
			-V440	AHP	Valve, Vent (Bleed)	ASRA	6.8.1.11 / 6-98	SS-3NBVCO4	02570	Swagelok	***PORT C BLEED*** valve
			-V441	AHP	Valve, Vent (Bleed)	ASRA	6.8.1.11 / 6-98	SS-3NBVCO4	02570	Swagelok	***PORT B BLEED*** valve
			-V442	AHP	Valve, Vent (Bleed)	ASRA	6.8.1.11 / 6-98	SS-3NBVCO4	02570	Swagelok	***PORT A BLEED*** valve
			-V443	AHP	Valve, Shutoff, Angle	ASRA	6.8.1.5 A / 6-58 6.8.1.5 B / 6-63	HV09-15-2 PLB-12764-2	91816 99565	Circle Seal CPV	***PORT A*** valve
			-V444	AHP	Valve, Shutoff	ASRA	6.8.1.12 / 6-102	HV09-17-2	91816	Circle Seal	***MANIFOLD*** valve; no alternate PN
			-V445	AHP	Valve, Check	ASRA	6.8.1.13 / 6-107	SS-CHVCO8-50	02570	Swagelok	
MISCELLANEOUS MAINTENANCE ITEMS											
					Air Flask Rack Assembly	ASRA	6.8.1.1 / 6-15	53711-6961898-1	53711	NAVSEA	Removal from/installation in Rack Enclosure Assembly
					Control Console Panel Assy	CCA	6.8.2.1 / 6-120	53711-6961930	53711	NAVSEA	Removal from/installation in CCA case
					Flasks, HP Air, Composite Carbon Fiber Kevlar®	ASRA	6.8.1.2 / 6-19	 53711-6961914-1 53711-6961959	53711	NAVSEA	Removal from/installation in AFRA
					Rack Enclosure Assembly	ASRA	6.8.1.1 / 6-15	53711-6961897	53711	NAVSEA	Removal/installation of AFRA
					Volume Tank Frame Assy	VTA	6.8.3.1 / 6-172	N/A	N/A	N/A	Replacement parts only

THIS PAGE INTENTIONALLY LEFT BLANK

Table 7-2. List of Manufacturers and Suppliers

CAGE Code	Manufacturer/Supplier Name, Address, and Telephone #
02570	SWAGELOK CO 29500 SOLON RD SOLON OH 44139-3449 **Phone: 440-349-5934**
0KZS2	S.S. WHITE TECHNOLOGIES INC 151 OLD NEW BRUNSWICK RD PISCATAWAY NJ 08854-3761 **Phone: 732-474-1705**
13669	TESCOM CORP INDUSTRIAL CONTROLS DIV 12616 INDUSTRIAL BLVD ELK RIVER MN 55330-2445 **Phone: 763-241-3253**
39428	MCMASTER-CARR SUPPLY CO INC 600 COUNTY LINE RD ELMHURST IL 60126-2034 **Phone: 630-833-0300**
50599	PARKER HANNIFIN CORP DBA STRATOFLEX PRODUCT DIV 2575 W 5TH ST JACKSONVILLE FL 32254-2066 **Phone: 904-389-3400**
52159	3D INSTRUMENTS LLC DBA SIERRA PRECISION 2900 E WHITE STAR AVE ANAHEIM CA 92806-2627 **Phone: 714-399-9200**
53711	NAVAL SEA SYSTEMS COMMAND 1333 ISAAC HULL AVE SE WASHINGTON NAVY YARD DC 20376 **Phone: 202-781-1731**
59165	NORMAN FILTER CO LLC 9850 S INDUSTRIAL DR BRIDGEVIEW IL 60455-2324 **Phone: 708-233-5521**
6S753	AMRON INTL DIVING SUPPLY INC 1380 ASPEN WAY VISTA CA 92081-8349 **Phone: 760-208-6500**

CAGE Code	Manufacturer/Supplier Name, Address, and Telephone #
70292	HARSCO CORP SHERWOOD DIV 2111 LIBERTY DR NIAGARA FALLS NY 14304-3744 **Phone: 716-283-1010**
7R019	ATLANTA HARDWARE SPECIALTY CO DIV OF HARDWARE SPECIALTY CO 1701 OAKBROOK DR NORCROSS GA 30093-1897 **Phone: 770-449-3000**
80205	NATIONAL AEROSPACE STANDARDS COMMITTEE AEROSPACE INDUS-TRIES ASSOCIATION OF AMERICA INC **(no other information available)**
81349	MILITARY SPECIFICATIONS PROMULGATED BY MILITARY DEPARTMENTS/AGENCIES UNDER AUTHORITY OF DEFENSE STANDARDIZATION MANUAL 4120 3-M **(no other information available)**
85446	BOKERS INC 3104 SNELLING AVE MINNEAPOLIS MN 55406-1913 **Phone: 612-729-9365**
91816	CIRCOR AEROSPACE INC DBA CIRCLE SEAL CONTROLS 2301 WARDLOW RD CORONA CA 92880-2894 **Phone: 951-270-6200**
96906	MILITARY STANDARDS PROMULGATED BY MILITARY DEPARTMENTS UNDER AUTHORITY OF DEFENSE STANDARDIZATION MANUAL 4120 3-M **(no other information available)**
99237	AIR FORCE-NAVY AERONAUTICAL DESIGN STANDARD **(No other information available)**
99565	CPV MANUFACTURING INC 851 PRESTON ST PHILADELPHIA PA 19104-1563 **Phone: 215-386-6508**

THIS PAGE INTENTIONALLY LEFT BLANK

CHAPTER 8

INSTALLATION, DEPLOYMENT, AND STORAGE

8.1 INTRODUCTION

This chapter provides information and procedures for installation, deployment, and storage of the Fly Away Dive System (FADS) III Air System. The information in this chapter is arranged in the following sequence:

- Para. 8.2—Installation .... Page 8-1
- Para. 8.3—Deployment .... Page 8-4
- Para. 8.4—Storage .... Page 8-8

8.2 INSTALLATION

Since the FADS III Air System is a lightweight, highly mobile configuration that facilitates rapid deployment, permanent installation is not required nor recommended. For the purposes of this manual, installation will include initial inventory, inspection, and certification. Upon receipt of the FADS III Air System, all components must be inventoried, inspected, and certified as outlined in the following paragraphs.

8.2.1 INVENTORY. Conduct a visual inventory of the shipment to ensure that all items have been received. Verify that each item of equipment shipped appears on the packing lists included in the shipping documentation and that all serial numbers correspond to those on the packing lists. The initial FADS III Air System shipment should consist of the items shown in Table 8-1. See Table 1-3 for further breakdowns and part numbers.

Table 8-1. FADS III Air System Initial Inventory

Items	Total Qty.	Required for Diving Setup
MAJOR ASSEMBLIES		
Air Supply Rack Assembly (ASRA)	1	Yes
Control Console Assembly (CCA)	1	Yes
Volume Tank Assembly (VTA)	1	Optional
5,000 psi* Compressor System (Bauer or Mako electric or diesel, or other approved 5,000 psi compressor system)	1	Optional

* All the acronyms and abbreviations used in this table are defined in the list of Acronyms and Abbreviations located in the Front Matter of this manual.

Table 8-1. FADS III Air System Initial Inventory—Continued

Items	Total Qty.	Required For Diving Setup
INTERCONNECTING HOSE ASSEMBLIES		
H-203—VTA to CCA—275 psig working pressure, 73.0 in. ± 1.0 in. long, 1/2 in. ID, 1/2 in. VCO fitting	1	If VTA used
H-401—ASRA Flask Drain Valves—5,000 psig working pressure, 16.0 in. long, 1/4 in. ID, 1/4 in. VCO fitting	9	Yes
H-402—ASRA Flask Isolation Valves—5,000 psig working pressure, 16.0 in. long, 3/8 in. ID, 1/2 in. VCO fitting	6	Yes
H-403—ASRA Bank 1 Supply—5,000 psig working pressure, 30.0 in. long, 3/8 in. ID, 1/2 in. VCO fitting	1	Yes
H-404—ASRA Bank 2 Supply—5,000 psig working pressure, 39.0 in. long, 3/8 in. ID, 1/2 in. VCO fitting	1	Yes
H-405—ASRA Bank 3 Supply—5,000 psig working pressure, 35.0 in. long, 3/8 in. ID, 1/2 in. VCO fitting	1	Yes
H-406—SCUBA Charge Hose Assembly—3,000 psig working pressure, 77.5 in. ± 1.0 in. long, 1/4 in. ID, 1/4 in. VCO and NPTM fittings	1	SCUBA/TRCS Charging only
H-436—ASRA to CCA—5,000 psig working pressure, 504.0 in. ± 6.0 in. long, 3/8 in. ID, 1/2 in. CPV fitting	2	Yes
H-436—ASRA to Compressor—5,000 psig working pressure, 504.0 in. ± 6.0 in. long, 3/8 in. ID, 1/2 in. CPV fitting	1	ASRA Charging only
H-444—SCUBA Charge Hose to TRCS Flask Rack Assembly—3,000 psig working pressure, 504.0 in. long, 3/8 in. ID, 1/4 MPT and CGA-346 fitting	1	TRCS Charging only
H-804—ASRA to Tee Plate to TRCS—5,000 psig working pressure, 504.0 in. ± 6.0 in. long, 3/8 in. ID, 1/2 in. CPV fitting	6	TRCS OPs only (Appx B)
AIR SYSTEM MAINTENANCE KIT		
Air System Maintenance Kit, consisting of: – FADS III TRCS Air Supply Hose Kit • H-444—SCUBA Charge Hose to TRCS Flask Rack • H-804—ASRA to Tee Plate Assembly • H-804—Tee Plate Assembly to TRCS • Tee Plate Assemblies – Storage Container – Storage Container Lid – Air Hose Connectors	1 1 1 2 4 2 1 1 2	As Required
DOCUMENTATION		
Fly Away Dive System (FADS) III Air System Technical Manual	1	Yes
Applicable Compressor Manual	1	ASRA Charging only

8.2.2 INSPECTION. Remove each item from its packing crate and perform a thorough inspection for any deviation from good manufacturing and packaging processes, such as incompleteness of assembly, faulty workmanship, rust, dirt, cracks, deterioration, and corrosion. Also ensure that all required documentation is in order. Specific items to be inspected are indicated in the following paragraphs.

8.2.2.1 Air Supply Rack Assembly (ASRA). The ASRA must be in good condition and suitable for use in accordance with U.S. Navy specifications. Inspect as follows:

a. Check unit exterior for signs of deterioration or damage.
b. Ensure door hinges and latches operate smoothly.
c. Inspect port connections for damaged threads and missing or damaged caps.
d. Check unit for missing knobs and handles.
e. Check valves to ensure smooth and proper operation.
f. Inspect for loose, damaged, or missing, nuts, bolts, or screws.
g. Check pressure gauges for damage.
h. Ensure gauges have a current calibration date.
i. Ensure relief valve is tagged in accordance with Volume I of Topside Tech Notes (see Table 1-4 for reference information).
j. Inspect Self-Contained Underwater Breathing Apparatus (SCUBA) yoke bracket for damage.
k. Conduct external inspection of high-pressure (HP) air flasks in accordance with Appendix F of this manual.
l. Inspect hose assemblies in accordance with paragraph 8.2.2.5.

8.2.2.2 Control Console Assembly (CCA). The CCA must be in good condition and suitable for use in accordance with U.S. Navy specifications. Inspect as follows:

a. Ensure CCA case lid fits properly and is undamaged.
b. Remove CCA case lid, which is held in place by eight side latches, and check unit for signs of deterioration or damage.
c. Check to ensure support legs are present inside lid.
d. Check unit for missing knobs and handles.
e. Check valves to ensure smooth and proper operation.
f. Check pressure gauges for damage.
g. Check depth gauges for damage.
h. Ensure gauges have a current calibration date.
i. Remove the five captive screws from rear of CCA case and open external door.
j. Ensure blowout plug is installed and undamaged.
k. Inspect port connections for damaged threads and missing or damaged caps.
l. Inspect for loose, damaged, or missing, nuts, bolts, or screws.
m. Close external door and secure with the five captive screws. Place lid over front panel and secure with the eight side latches.

8.2.2.3 Volume Tank Assembly (VTA). The VTA must be in good condition and suitable for use in accordance with U.S. Navy specifications. Inspect as follows:

a. Check assembly for signs of deterioration or damage.
b. Inspect port connection for damaged threads and missing or damaged cap.
c. Check drain valve to ensure smooth and proper operation.
d. Ensure relief valve is present, undamaged, and has been tagged in accordance with Volume I of Topside Tech Notes (see Table 1-4).
e. Inspect for loose, damaged, or missing nuts, bolts, or screws.
f. Inspect hose assemblies in accordance with paragraph 8.2.2.5.

8.2.2.4 5,000 psi Compressor System. The 5,000 psi compressor system selected for use must be in good condition and suitable for use in accordance with U.S. Navy specifications. Inspect in accordance with the accompanying compressor manual.

8.2.2.5 Interconnecting Hoses. All interconnecting hoses—including the flask whips, flex shaft adapters and assemblies, the SCUBA charge hose assembly, and the Transportable Recompression Chamber System (TRCS) hose assemblies in the Air System Maintenance Kit—must be in good condition and suitable for use in accordance with U.S. Navy specifications. Inspect as follows:

a. Inspect hose connectors for chips, dents, scratches, or gouges.
b. Inspect each hose for blisters or abrasions.
c. Inspect each hose for cuts, cracks, or other damage.
d. Inspect each hose for coupling pull-out.
e. Ensure each hose has a current clean and hydrostatic test date. Ensure hoses have been tagged in accordance with *Flexible Hoses and Umbilicals for DLSS,* Volume III of Topside Tech Notes (see Table 1-4).

8.2.3 SYSTEM CERTIFICATION. Each Command that receives a FADS III Air System is responsible for seeing that the system is certified by Naval Sea Systems Command (NAVSEA) 00C4, the System Certification Authority (SCA), before placing the system in service. For more information, click on 00C4 Certification at http://www.supsalv.org.

8.3 DEPLOYMENT

The FADS III Air System may be transported by air, sea, rail, or overland conveyances in accordance with the procedures in the following paragraphs.

8.3.1 START-UP MAINTENANCE (DEPRESERVATION). If the FADS III Air System has been in long-term storage, perform start-up maintenance as prescribed in the following Maintenance Requirement Cards (MRCs), which are identified initially by the controlling Maintenance Index Page (MIP).

FADS III Start-Up

- MIP 5921/181, MRC SU-1 (9JXG): Inspect and perform start-up maintenance on FADS III prior to returning to operational use.

Compressor Start-Up

- MIP 5921/036, MRC SU-1, 2, 3, and OT-1 (9KZG): Inspect and perform start-up maintenance on compressor system prior to returning to operational use.
- MIP 5921/063, MRC SU-1, 2, 3, and OT-1 (6JGW): Inspect and perform start-up maintenance on compressor system prior to returning to operational use.
- MIP 5921/101, MRC S-1R (3BQD): Obtain sample from divers air source for analysis if period of inactivity exceeded 90 days, if contamination of air is suspected, or if periodicity has lapsed (from date of last air sample).

Diesel Engine Start-Up

- MIP 5921/009, MRC SU-1 (9KJC): Inspect and perform start-up maintenance on engine prior to returning to operational use.

8.3.2 PRE-DEPLOYMENT PROCEDURES. Table 8-2 contains detailed procedures for preparing the FADS III Air System for deployment.

Table 8-2. FADS III Air System Pre-Deployment Procedures

Step	Procedure
AIR SUPPLY RACK ASSEMBLY (ASRA)	
1	Remove storage cover and open ASRA doors.
2	Open ***GAUGE STOP*** valves (AHP-V426, AHP-V427, and AHP-V428).
3	Slowly open ***FLASK ISOLATION*** valves (AHP-V401 thru AHP-V409).
4	Record pressures (minimum 2,800 psi) on ***BANK 1*** gauge (AHP-G437), ***BANK 2*** gauge (AHP-G438), and ***BANK 3*** gauge (AHP-G439). AHP-G437 __________AHP-G438 __________ AHP-G439 __________
NOTE:	If any bank does not have enough pressure for the required dive, charge in accordance with FADS III Air OP-6 in Appendix A.
5	Close ***FLASK ISOLATION*** valves (AHP-V401 thru AHP-V409).
6	Open ***PORT C*** valve (AHP-V422).
7	Open ***PORT C BLEED*** valve (AHP-V440), allow to depressurize, and close.
8	Close ***PORT C*** valve (AHP-V422).
9	Open ***BANK 2 MANIFOLD*** valve (AHP-V421).
10	Open ***PORT B*** valve (AHP-V429).
11	Open ***PORT B BLEED*** valve (AHP-V441), allow to depressurize, and close.

Table 8-2. FADS III Air System Pre-Deployment Procedures—Continued

Step	Procedure
	AIR SUPPLY RACK ASSEMBLY (ASRA)—Continued
12	Close ***PORT B*** valve (AHP-V429).
13	Close ***BANK 2 MANIFOLD*** valve (AHP-V421).
14	Open ***BANK 1 MANIFOLD*** valve (AHP-V420).
15	Open ***PORT A*** valve (AHP-V443).
16	Open ***PORT A BLEED*** valve (AHP-V442), allow to depressurize, and close.
17	Close ***PORT A*** valve (AHP-V443).
18	Close ***BANK 1 MANIFOLD*** valve (AHP-V420).
19	Close ***GAUGE STOP*** valves (AHP-V426, AHP-V427, and AHP-V428).
20	Remove the three HP air hose assemblies (H-436) from inside ASRA doors. Inspect hoses for cuts and abrasions and ensure both ends of hoses have protective plugs installed. Return hose assemblies to storage racks inside ASRA doors.
21	Inspect SCUBA Charge Hose Assembly (H-406) for visible damage. Ensure SCUBA yoke is installed on ASRA yoke bracket.
22	Ensure ***SCUBA REGULATOR*** (AHP-V432) is fully backed off fully counterclockwise (CCW) and that all valves listed below are closed fully clockwise (CW): Bank 3 Isolation Valves AHP-V409 AHP-V408 Bank 2 Isolation Valves AHP-V407 AHP-V406 AHP-V405 AHP-V404 Bank 1 Isolation Valves AHP-V403 AHP-V402 AHP-V401 Bank Charge Valves AHP-V425 AHP-V424 AHP-V423 Gauge Stop Valves AHP-V428 AHP-V427 AHP-V426 AHP-V435 Manifold Valves AHP-V421 AHP-V420 AHP-V444 SCUBA Valves AHP-V431 AHP-V434 Port Valves AHP-V422 AHP-V429 AHP-V443 Port Bleed Valves AHP-V440 AHP-V441 AHP-V442 Flask Drain Valves AHP-V418 AHP-V417 AHP-V416 AHP-V415 AHP-V414 AHP-V413 AHP-V412 AHP-V411 AHP-V410 System Drain Valve AHP-V419
23	Ensure caps are installed on all upper and lower ports (***PORT A***, ***PORT B***, ***PORT C***, and ***CHARGE PORT***).
24	Inspect remainder of ASRA for visible damage. Replace components as necessary.
25	Close and latch ASRA doors.
26	Install storage cover on ASRA.
	CONTROL CONSOLE ASSEMBLY (CCA)
27	Open the eight side latches and remove lid from CCA case.
28	Ensure the two support legs are securely stowed in lid.

Table 8-2. FADS III Air System Pre-Deployment Procedures—Continued

Step	Procedure
CONTROL CONSOLE ASSEMBLY (CCA)—Continued	
29	Ensure ***A REGULATOR*** (AHP-V303) and ***B REGULATOR*** (AHP-V304) are fully backed off (fully CCW) and that all valves listed below are closed (fully CW): Diver Supply & Pneumo Valves ALP-V316 ALP-V319 ALP-V315 ALP-V318 ALP-V314 ALP-V317 Volume Tank Valve ALP-V313 Gauge Stop Valves ALP-V307 AHP-V305 ALP-V308 AHP-V306 Supply Valves ALP-V311 AHP-V301 ALP-V312 AHP-V302
30	Loosen the five captive screws on bottom of CCA case and open external door.
31	Ensure caps are installed on all ports located on rear panel of CCA.
32	Ensure blowout plug is installed.
33	Inspect CCA for visible damage. Replace components as required.
34	Close external door on bottom of CCA case and secure with the five captive screws.
35	Install lid on CCA case and secure with the eight side latches.
VOLUME TANK ASSEMBLY (VTA)—OPTIONAL	
36	Remove storage cover from VTA.
37	Open condensate drain valve (ALP-V201), allow moisture to drain, and close.
38	Remove low-pressure (LP) air hose assembly (H-203) from VTA frame and inspect hose for damage. Ensure both ends of hose have protective plugs installed. Return hose to storage rack.
39	Inspect VTA for visible damage. Replace components as required.
40	Install storage cover on VTA.
5,000 PSI COMPRESSOR SYSTEM	
41	Prepare compressor system for deployment in accordance with procedures in compressor's operation and maintenance manual or Planned Maintenance System (PMS).
MAINTENANCE BOX AND CONSUMABLES	
42	Inventory components of maintenance box and replenish as necessary. Ensure technical documentation is available for all equipment.
43	Review consumables (diesel fuel and oil, filters, soft goods kits, etc.) and ensure ample materials are available at mission site.

8.3.3 <u>HANDLING</u>. The FADS III Air System is a NAVSEA-certified diving life support system, and careful handling of its components is required. The type of handling method and equipment will depend largely on the equipment's size and weight (see Table 1-1). The compressor, ASRA, and VTA may all be moved using equipment with lift cables attached to the integrated lifting rings on each piece of equipment. The compressor and the ASRA may also be moved using a forklift.

8.3.4 TRANSPORTATION DOCUMENTATION. Since each Transportation Management Office (TMO) operates under slightly different regulations, the shipping organization shall contact the TMO in advance to ensure that all local, military, or commercial shipping requirements are met prior to requesting shipment of the FADS III Air System. As a minimum, the shipping organization is responsible for preparing and/or possessing the documents listed in Table 8-3. These documents shall accompany the FADS III Air System for shipment.

Table 8-3. Minimum Shipping Documents Required

Type of Document	Type of Shipment	Prepared By
Shipper's Declaration for Dangerous Goods	Air Shipment	Shipping Organization
Air Waybill	Air Shipment	Shipping Organization
U.S. Department of Transportation (DOT) Composite Flask Special Permits (see Appendix G for Web addresses) DOT-SP 10915 – Luxfer – carbon fiber cylinders DOT-SP 10945 – SCI – carbon fiber cylinders DOT-SP 10970 – Luxfer – Kevlar® cylinders DOT-SP 8162 – SCI – Kevlar® cylinders	All Shipments	U.S. Department of Transportation
Report of Manufacturer, by Serial Number, of Gas Flasks Being Shipped	All Shipments	Manufacturer
Report of Depot, by Serial Number, of Gas Flasks Being Shipped	All Shipments	Depot

8.4 STORAGE

The FADS III Air System is a NAVSEA-certified diving life support system, and careful storage of its components is required. Specific long-term storage requirements for certain components are covered by the MRCs in the applicable PMS packages (see paragraph 8.4.2 for details). This section covers both short-term and long-term storage, periodic maintenance, and long-term storage precautions.

8.4.1 SHORT-TERM STORAGE. When the FADS III Air System is to be stored for less than three months, use the postmission procedures in FADS III Air OP-4 in Appendix A to prepare the equipment for storage.

8.4.2 LONG-TERM STORAGE AND PERIODIC MAINTENANCE. If the FADS III Air System is to be stored for a period of three months or more, prepare the system for storage using the lay-up maintenance (preservation) procedures in the following MRCs, which are identified initially by the controlling MIP. Note that the diesel engine requires periodic maintenance.

FADS III Lay-Up

- MIP 5921/181, MRC LU-1 (9JXF): Prepare FADS III for storage.

Compressor Lay-Up

- MIP 5921/036, MRC LU-1 and 2 (9KZF): Prepare compressor system for inactive storage, and change compressor oil and oil filter.
- MIP 5921/063, MRC LU-1, 2, 3 and PM-1 (6JGU): Move equipment to a clean storage area, clean externally, preserve, and replace lube oil and filter.

Diesel Engine Lay-Up

- MIP 5921/009, MRC LU-1 (9KJA): Prepare engine for inactive storage.

Diesel Engine Periodic Maintenance

- MIP 5921/009, MRC PM-1 (9KJB): Test operate engine; accomplish when unit has been idle for 6 months.

8.4.3 LONG-TERM STORAGE PRECAUTIONS. General precautions to be observed while equipment is in long-term storage are as follows:

- Components shall not be stored in temperatures higher than 120°F (48.8°C) or lower than 0°F (-17°C).
- Components shall not be stored in direct sunlight due to the deteriorating effect of sunlight on rubber components.
- Components shall be dry and clean when stored.
- Flexible parts shall not be subjected to continuous distortion when stored.
- Ensure storage area is well ventilated.

THIS PAGE INTENTIONALLY LEFT BLANK

APPENDIX A

FADS III AIR SYSTEM
OPERATING AND EMERGENCY
PROCEDURES
FOR
CONFIGURATION 1:
DIVING THE FADS III AIR SYSTEM
IN THE STAND-ALONE DIVING SETUP

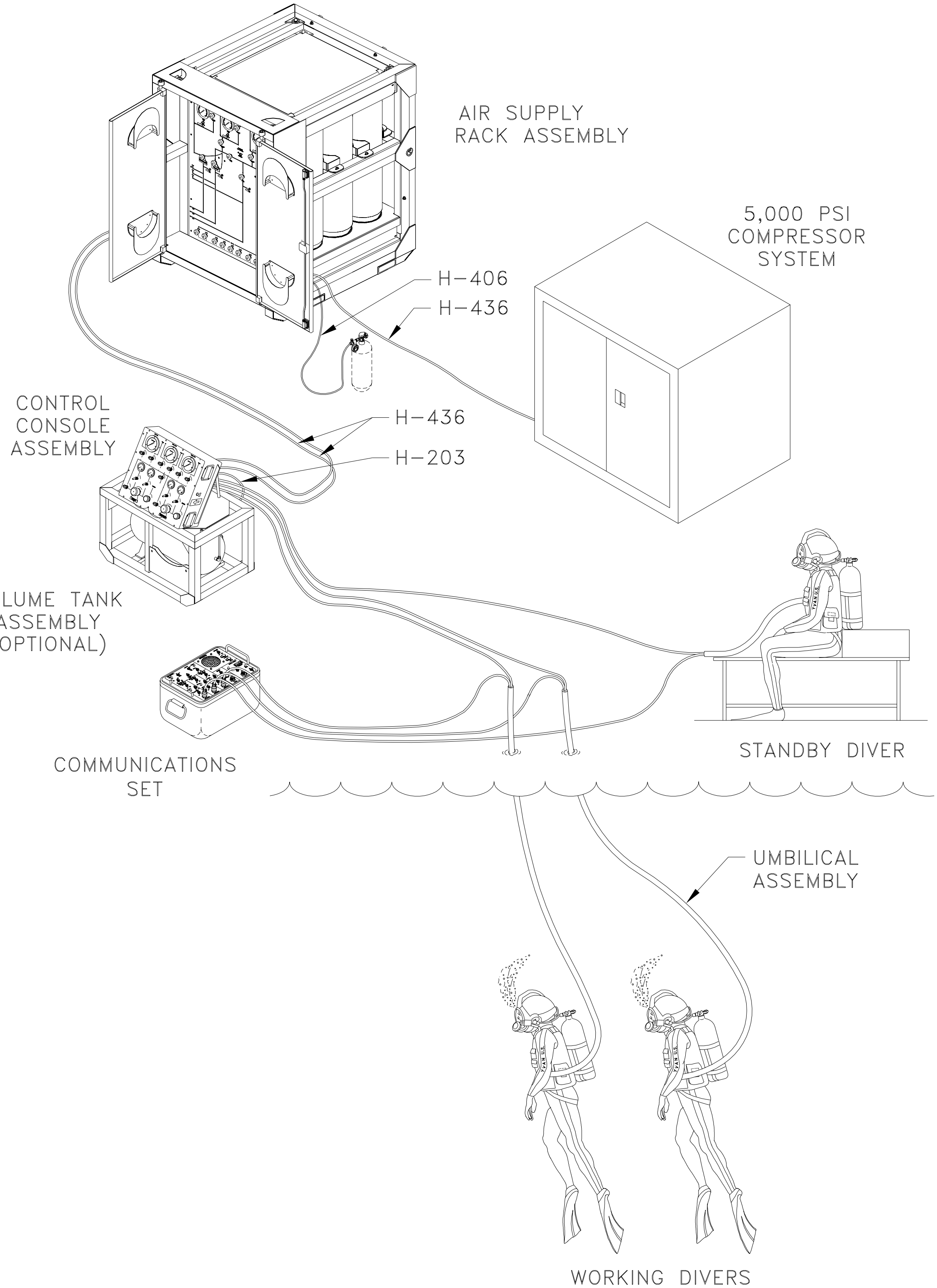


Figure A-1. Configuration 1: Diving the FADS III Air System in the Stand-Alone Diving Setup

APPENDIX A
FADS III AIR SYSTEM
OPERATING AND EMERGENCY PROCEDURES
FOR CONFIGURATION 1: DIVING THE FADS III AIR SYSTEM
IN THE STAND-ALONE DIVING SETUP

This appendix contains the nine Operating Procedures (OPs) and one Emergency Procedure (EP) that shall be used when diving the Fly Away Dive System (FADS) III Air System in Configuration 1.

Table A-1 provides an index identifying each procedure in this appendix by its number, title, and location, and the following pages provide guidance on how to use the checklists and related documents in this appendix.

Table A-1. Index of Configuration 1 Procedures

Procedure No.	Title	Page No.
C1 / OP-1	Premission Procedures	A-7
C1 / OP-2	Predive Start-Up Procedures	A-13
C1 / OP-2M	Modified Predive Start-Up Procedures	A-19
C1 / OP-3	Shutdown Procedures	A-23
C1 / OP-3M	Modified Shutdown Procedures	A-27
C1 / OP-4	Postmission Procedures	A-29
C1 / OP-5	HP Air Flask Charging Procedures for Bank 1, 2, or 3 with ASRA On-Line	A-33
C1 / OP-6	HP Air Flask Charging Procedures with ASRA Off-Line	A-39
C1 / OP-7	SCUBA Cylinder Charging Procedures	A-45
C1 / EP-1	Emergency Procedure: Loss of Primary Air to Divers	A-49

USING THE CHECKLISTS AND RELATED DOCUMENTS

This appendix contains an equipment setup illustration, a status sheet, nine OP checklists, one EP checklist, and a flow chart of operations for Configuration 1. Instructions for using the illustration, status sheet, OP/EP checklists, and flow chart are provided in the following paragraphs:

Equipment Setup Illustration: The equipment setup illustration located in Figure A-1 presents a typical layout of equipment in Configuration 1.

Status Sheet: The reproducible status sheet in Figure A-2 provides a central location for designating the banks and ports to be utilized during system line-up with the OPs, and provides a snapshot of the dive system's line-up condition during diving operations. The status sheet may be filled out prior to premission setup and signed by the Diving Supervisor. Once established, a status sheet may continue to be used for successive dives as long as the designations do not change. If changes are required, the current status sheet should be updated or a new one prepared.

Guidance for selecting banks and ports on the FADS III Air Supply Rack Assembly (ASRA) and the Control Console Assembly (CCA) is provided on the Status Sheet in Figure A-2.

Flow Chart of Operations: For assistance in determining which OPs to perform and the order of their performance, refer to the flow chart in Figure A-3 and to NOTE 1 of each OP for specific guidance.

OP/EP Checklists: The checklists in this appendix are designed to be reproduced for use in the performance of the operating and emergency procedures. The following information covers the elements of each checklist and indicates what type of action, if any, is required:

a. **Signature block (located on checklist cover sheet):** Operators/checkers print and sign names and enter date checklist is completed. Diving Supervisor signs and dates checklist to verify that all actions have been performed and all deficiencies and problems have been noted.

b. **NOTE 1:** Contains pertinent information about the OP/EP.

c. **NOTE 2:** Contains a reminder to record notes and deficiencies in the REMARKS section at the end of each OP/EP.

d. **ITEM:** Contains the numerical identifier for each item.

e. **COMPONENT:** Contains the nomenclature of the component(s) involved in each item. If a choice of components is given, circle the appropriate component(s).

CONFIGURATON 1
STATUS SHEET

1. <u>MAKE ASRA BANK SELECTIONS</u>

Designate Primary and Back-Up banks to CCA by circling the appropriate label.

Bank 1 –	Primary	Back-Up
Bank 2 –	Primary	Back-Up
Bank 3 –	Always supplies secondary air	

2. <u>MAKE ASRA PORT SELECTIONS</u>

Designate Primary port to CCA by circling the appropriate label. Circle whether the upper or lower port is being used for each operation.

Port A –	Primary	UPPER	LOWER
Port B –	Primary	UPPER	LOWER
Port C –	Secondary	UPPER	LOWER

3. <u>MAKE CCA PORT SELECTIONS</u>

Designate Primary and Secondary ports on the CCA by circling the appropriate label.

A Supply –	Primary	Secondary
B Supply –	Primary	Secondary

Diving Supervisor: Determine the minimum air pressure allowed in banks to ensure required air is available for planned dives, and record below:

Indicate status of AHP-V444 here: OPEN CLOSED

Minimum Air Pressure Allowed: ASRA Bank 1 AHP-G437 __________ psig

ASRA Bank 2 AHP-G438 __________ psig

ASRA Bank 3 AHP-G439 __________ psig

Diving Supervisor ____ Date ___________

Printed name and signature

Figure A-2. Configuration 1 Status Sheet

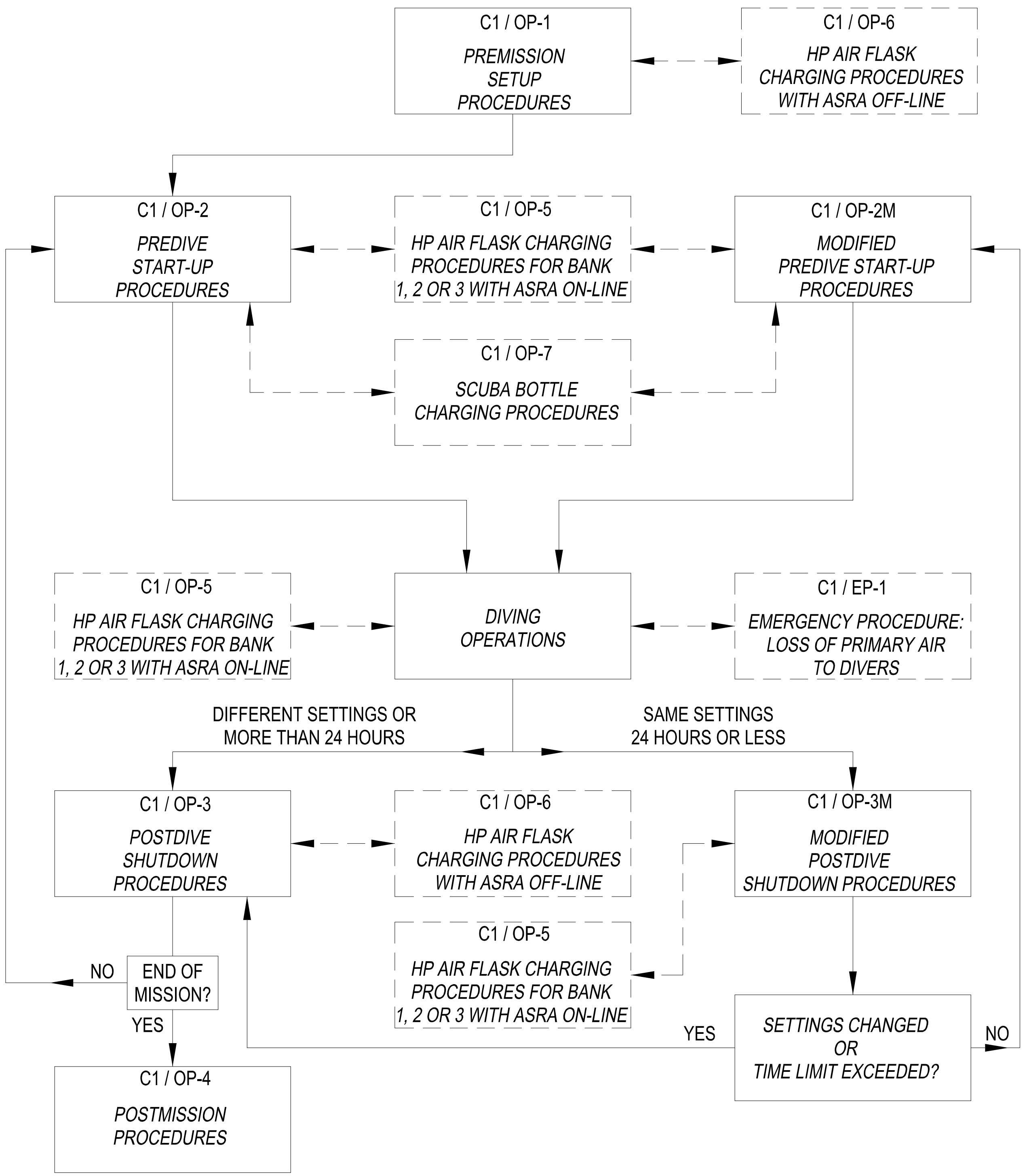


Figure A-3. Flow Chart of Operations for Configuration 1: Diving the FADS III Air System in the Stand-Alone Diving Setup

f. **DESCRIPTION:** Contains valve, gauge, and hose numbers (if applicable) of the component(s) involved and any other information that may be helpful. If a choice of components is given, circle the appropriate component(s).

g. **PROCEDURE:** Contains a brief reminder of actions to be performed by the appropriate personnel.

h. **LOCATION:** Contains the name of assembly/assemblies involved.

i. **CHECK:** The operator initials this column as each item is completed. If the item does not apply, the operator enters N/A (not applicable).

j. **NOTE:** The operator places a check mark in this column to indicate that a note has been included in the REMARKS section at the end of the procedure.

k. **REMARKS (last page of OP/EP):** The operator uses this section to document any deficiencies or problems found during performance of a particular item. The operator should begin each note with the item number involved.

WARNING

The operating procedures in this appendix are designed for use with equipment setups featuring the FADS III CCA and VTA only. Use of any other control console or volume tank assembly not capable of handling 5,000 psi service may result in equipment damage and personnel injury or death.

THIS PAGE INTENTIONALLY LEFT BLANK

FADS III AIR SYSTEM
CONFIGURATION 1 / OP-1

PREMISSION PROCEDURES
FOR STAND-ALONE DIVING SETUP

REVISED 14 MARCH 2008

SPECIAL INSTRUCTIONS

1. Ensure this OP is valid by comparing the revision date above with the master file.
2. Check each item individually.
3. Sign and date below when OP has been completed.
4. Report any discrepancy to the Diving Supervisor.

Operator No. 1 ______________________________ Date ____________
Printed name and signature

Operator No. 2 ______________________________ Date ____________
Printed name and signature

Diving Supervisor ______________________________ Date ____________
Printed name and signature

FADS III AIR SYSTEM CONFIGURATION 1 / OP-1 ***Page 1 of 5***

PREMISSION PROCEDURES FOR STAND-ALONE DIVING SETUP

NOTE 1: Premission setup involves physical placement, inspection, and interconnection of the equipment prior to a mission.

NOTE 2: Record notes and deficiencies in section provided at the end of this operating procedure.

NOTE 3: Complete the following using Configuration 1 Status Sheet (Figure A-2):

Designate Primary and Back-Up banks to CCA by circling the appropriate label.

ASRA Banks

Bank 1 – Primary Back-Up

Bank 2 – Primary Back-Up

Bank 3 – Always supplies secondary air

Designate Primary port to CCA by circling the appropriate label. Circle whether the upper or lower port is being used for each operation.

ASRA Ports

Port A – Primary UPPER LOWER

Port B – Primary UPPER LOWER

Port C – Secondary UPPER LOWER

Designate Primary and Secondary ports on the CCA by circling the appropriate label.

CCA Ports

A Supply – Primary Secondary

B Supply – Primary Secondary

ITEM	COMPONENT	DESCRIPTION	PROCEDURE	LOCATION	CHECK	NOTE
WARNING: **All FADS III Air System equipment must be positioned and secured before operation as movement during operation could result in equipment damage and injury or death to personnel.**						
POSITION ASSEMBLIES						
1	ASRA CCA VTA (if used) HPAC	Position all assemblies within reach of interface hoses (40 feet maximum).		ASRA CCA VTA HPAC		
2	ASRA CCA VTA (if used) HPAC	Secure equipment in place.		ASRA CCA VTA HPAC		
SET UP CONTROL CONSOLE ASSEMBLY (CCA) AND VOLUME TANK ASSEMBLY (VTA)						
3	CCA Lid and Stowed Legs	Remove lid from CCA case. Remove the two stowed legs from lid.		CCA		

FADS III AIR SYSTEM CONFIGURATION 1 / OP-1

PREMISSION PROCEDURES FOR STAND-ALONE DIVING SETUP—Continued

ITEM	COMPONENT	DESCRIPTION	PROCEDURE	LOCATION	CHECK	NOTE
4	CCA External Door	Open external door on bottom of CCA case by loosening the five captive screws.		CCA		
WARNING: **Blowout plug must be removed before pressurization of CCA to allow operation of relief valves. Failure to remove blowout plug can result in equipment damage or injury or death to personnel.**						
5	CCA Blowout Plug	Remove blowout plug from back of CCA.		CCA		
6	CCA	Inspect CCA for damage.		CCA		
7	VTA	Inspect VTA (if used) for damage.		VTA		
8	CCA/VTA	Set CCA on top of VTA frame (or suitable structure) such that console is at ~60° angle and the two rubber feet on CCA case fit in the two holes in VTA frame (if utilized). Secure in place.		CCA/VTA		
SET UP AIR SUPPLY RACK ASSEMBLY (ASRA)						
9	ASRA Doors	N/A	Open.	ASRA		
10	ASRA	N/A	Inspect ASRA for damage.	ASRA		
WARNING: **PRIMARY, BACK-UP, and SECONDARY tags must be affixed to ASRA PORT A, PORT B, and PORT C valve handles and to CCA A REGULATOR and B REGULATOR. Removal or swapping of tags can result in injury or death.**						
11	Port A Valve	AHP-V443	Tag with PRIMARY or BACK-UP tag according to dive plan.	ASRA		
12	Port B Valve	AHP-V429	Tag with PRIMARY or BACK-UP tag according to dive plan.	ASRA		
13	Port C Valve	AHP-V422	Tag with SECONDARY tag.	ASRA		
14	A Regulator	AHP-V303	Tag with PRIMARY or SECONDARY tag according to dive plan.	CCA		
15	B Regulator	AHP-V304	Tag with PRIMARY or SECONDARY tag according to dive plan.	CCA		
16	Gauge Stop Valves	AHP-V426 AHP-V427 AHP-V428	Open.	ASRA		

FADS III AIR SYSTEM CONFIGURATION 1 / OP-1

PREMISSION PROCEDURES FOR STAND-ALONE DIVING SETUP—Continued

ITEM	COMPONENT	DESCRIPTION	PROCEDURE	LOCATION	CHECK	NOTE
17	ASRA Valves and Regulators	As required	Ensure that all remaining ASRA valves are closed and all regulators are backed off fully CCW.	ASRA		
WARNING: **Failure to connect hose assembly strain relief can cause personnel injury or death should the hose separate or burst.** WARNING: **Ports A, B, and C on the ASRA must be depressurized whenever a port cap or hose is removed from a port connector. Removal of a port cap or hose when supply piping is pressurized can result in injury or death.** WARNING: **Fitting threads and O-rings must be inspected for damage and fittings must be properly tightened to ensure seating of O-rings. Fittings and O-rings that are not properly installed can allow HP air to escape and result in injury or death.**						
18	Primary HP Air Hose Assembly	H-436	Remove from ASRA door. Inspect for cuts and abrasions.	ASRA		
CONNECT PRIMARY HP AIR SUPPLY HOSE FROM ASRA TO CCA						
19	Port A or Port B Bleed Valve	AHP-V442 or AHP-V441	Open, allow pressure to bleed off, and close.	ASRA		
20	Primary HP Air Hose Assembly	H-436	Connect hose to designated port and tighten 3/8 to 1/2 turn after O-ring engagement. Connect strain relief.	ASRA Upper A B Lower A B (Circle designated port)		
21	Primary HP Air Hose Assembly	H-436	Connect hose to designated port and tighten 3/8 to 1/2 turn after O-ring engagement. Connect strain relief.	CCA A or B (Circle designated port)		
CONNECT SECONDARY HP AIR SUPPLY HOSE FROM ASRA TO CCA						
22	Secondary HP Air Hose Assy	H-436	Remove from ASRA door. Inspect for cuts and abrasions.	ASRA		
23	Port C Bleed Valve	AHP-V440	Open, allow pressure to bleed off, and close.	ASRA		

FADS III AIR SYSTEM CONFIGURATION 1 / OP-1

PREMISSION PROCEDURES FOR STAND-ALONE DIVING SETUP—Continued

ITEM	COMPONENT	DESCRIPTION	PROCEDURE	LOCATION	CHECK	NOTE
24	Secondary HP Air Hose Assy	H-436	Connect hose to Port C and tighten 3/8 to 1/2 turn after O-ring engagement. Connect strain relief.	ASRA Lower Port C Upper Port C (Circle designated port)		
25	Secondary HP Air Hose Assy	H-436	Connect hose to designated port and tighten 3/8 to 1/2 turn after O-ring engagement. Connect strain relief.	CCA A or B (Circle designated port)		
CONNECT LP AIR SUPPLY HOSE FROM VTA TO CCA (IF NOT USING VTA, SKIP TO ITEM 30)						
26	Condensate Drain Valve	ALP-V201	Open, allow pressure to bleed off, and close.	VTA		
27	LP Air Hose Assembly	H-203	Remove stowed hose from VTA. Inspect for cuts and abrasions.	VTA		
28	LP Air Hose Assembly	H-203	Connect hose to VTA port and tighten 3/8 to 1/2 turn after O-ring engagement. Connect strain relief.	VTA		
29	LP Air Hose Assembly	H-203	Connect hose to CCA port and tighten 3/8 to 1/2 turn after O-ring engagement. Connect strain relief.	CCA		
30	A Supply Valve	AHP-V301	Verify closed.	CCA		
31	B Supply Valve	AHP-V302	Verify closed.	CCA		
32	Gauge Stop Valves	AHP-V305 AHP-V306 ALP-V307 ALP-V308	Open.	CCA		
33	CCA Valves and Regulators	As Required	Ensure that all remaining CCA valves are in closed position and all regulators are backed off fully CCW.	CCA		
END OF PROCEDURE						

FADS III AIR SYSTEM CONFIGURATION 1 / OP-1

PREMISSION PROCEDURES FOR STAND-ALONE DIVING SETUP—Continued

REMARKS: (Using item number as a reference, list any deficiencies or problems found during performance of this procedure.)

FADS III AIR SYSTEM
CONFIGURATION 1 / OP-2

PREDIVE START-UP PROCEDURES
FOR STAND-ALONE DIVING SETUP

REVISED 14 MARCH 2008

SPECIAL INSTRUCTIONS

1. Ensure this OP is valid by comparing the revision date above with the master file.
2. Check each item individually.
3. Sign and date below when OP has been completed.
4. Report any discrepancy to the Diving Supervisor.

Operator No. 1 ________________________________ Date ____________
Printed name and signature

Operator No. 2 ________________________________ Date ____________
Printed name and signature

Diving Supervisor ________________________________ Date ____________
Printed name and signature

FADS III AIR SYSTEM CONFIGURATION 1 / OP-2

Page 1 of 4

PREDIVE START-UP PROCEDURES FOR STAND-ALONE DIVING SETUP

NOTE 1: Predive start-up involves lining up the ASRA, primary/secondary HP air supplies, and CCA. This OP shall always be performed before the first dive of the mission and before each new dive after shutdown procedures in Configuration 1/OP-3 have been performed.

NOTE 2: Record notes and deficiencies in section provided at the end of this operating procedure.

NOTE 3: Complete the following using Configuration 1 Status Sheet (Figure A-2):

Designate Primary and Back-Up banks to CCA by circling the appropriate label.

<u>ASRA Banks</u>

Bank 1 – Primary Back-Up

Bank 2 – Primary Back-Up

Bank 3 – Always supplies secondary air

Designate Primary port to CCA by circling the appropriate label. Circle whether the upper or lower port is being used for each operation.

<u>ASRA Ports</u>

Port A – Primary UPPER LOWER

Port B – Primary UPPER LOWER

Port C – Secondary UPPER LOWER

Designate Primary and Secondary ports on the CCA by circling the appropriate label.

<u>CCA Ports</u>

A Supply – Primary Secondary

B Supply – Primary Secondary

ITEM	COMPONENT	DESCRIPTION	PROCEDURE	LOCATION	CHECK	NOTE
1	System Drain Valve	AHP-V419	Open.	ASRA		
2	Flask Drain Valves	AHP-V410 AHP-V411 AHP-V412 AHP-V413 AHP-V414 AHP-V415 AHP-V416 AHP-V417 AHP-V418	Open, drain, and close.	ASRA		
3	System Drain Valve	AHP-V419	Close.	ASRA		

SET UP PORT C OF ASRA FOR SECONDARY SUPPLY TO CCA

NOTE 4: Ensure Banks 1, 2, and 3 are charged to a minimum of 2800 psi or as determined by Diving Supervisor. Recharging of banks can be conducted using FADS III Air System Configuration 1/OP-5.

FADS III AIR SYSTEM CONFIGURATION 1 / OP-2

Page 2 of 4

PREDIVE START-UP PROCEDURES FOR STAND-ALONE DIVING SETUP—Continued

ITEM	COMPONENT	DESCRIPTION	PROCEDURE	LOCATION	CHECK	NOTE
4	Flask Isolation Valves	AHP-V408 AHP-V409	Open slowly.	ASRA		
5	Bank 3 Gauge	AHP-G439	Record pressure (min. pressure ________ psig) AHP-G439 ________ psig	ASRA		
6	Port C Valve	AHP-V422	Open slowly.	ASRA		
SET UP BANK 1 FOR PORT A OF ASRA						
NOTE 5: When primary bank pressure reaches 1000 psi, shift to back-up by closing primary bank manifold valve and opening the back-up bank manifold valve. Tag this valve as PRIMARY. Recharging of banks can be conducted using FADS III Configuration 1/OP-5.						
7	Bank 1 Flask Isolation Valves	AHP-V401 AHP-V402 AHP-V403	Open slowly.	ASRA		
8	Bank 1 Gauge	AHP-G437	Record pressure (min. pressure ________ psig) AHP-G437 ________ psig	ASRA		
9	Bank 1 Manifold Valve	AHP-V420	Open if Bank 1 is designated as primary.	ASRA		
			Verify closed if Bank 1 is designated as back-up.	ASRA		
SET UP BANK 2 FOR PORT B OF ASRA						
10	Bank 2 Flask Isolation Valves	AHP-V404 AHP-V405 AHP-V406 AHP-V407	Open slowly.	ASRA		
11	Bank 2 Gauge	AHP-G438	Record pressure (min. pressure ________ psig) AHP-G438 ________ psig	ASRA		
12	Bank 2 Manifold Valve	AHP-V421	Open if Bank 2 is designated as primary.	ASRA		
			Verify closed if Bank 2 is designated as back-up.	ASRA		
13	Manifold Valve	AHP-V444	Open slowly.	ASRA		
OPEN PRIMARY SUPPLY TO CCA						
14	Port A Valve or Port B Valve	AHP-V443 or AHP-V429	Slowly open designated port valve for primary air to CCA. (Circle opened valve)	ASRA		

FADS III AIR SYSTEM CONFIGURATION 1 / OP-2

PREDIVE START-UP PROCEDURES FOR STAND-ALONE DIVING SETUP—Continued

ITEM	COMPONENT	DESCRIPTION	PROCEDURE	LOCATION	CHECK	NOTE
15	Red, Green, and Yellow Diver Supply and Pneumo Ports	Port Caps	Remove port caps and check for damaged threads.	CCA Rear Panel		
16	A Supply Valve	AHP-V301	Open slowly.	CCA		
17	A Supply Gauge	AHP-G325	Record pressure: ________________ psig	CCA		
18	Bank 1 Gauge Bank 2 Gauge Bank 3 Gauge	AHP-G437 AHP-G438 AHP-G439	Compare reading with bank supplying CCA A Supply. (Circle bank in use)	ASRA		
19	A Regulator	AHP-V303	Slowly adjust manifold pressure as directed by Diving Supervisor. Final pressure: ________________ psig	CCA		
SET UP CCA B SUPPLY						
20	B Supply Valve	AHP-V302	Open slowly.	CCA		
21	B Supply Gauge	AHP-G326	Record pressure: ________________ psig	CCA		
22	Bank 1 Gauge Bank 2 Gauge Bank 3 Gauge	AHP-G437 AHP-G438 AHP-G439	Compare reading with bank supplying CCA B Supply. (Circle bank in use)	ASRA		
23	B Regulator	AHP-V304	Slowly adjust manifold pressure as directed by Diving Supervisor. Final pressure: ________________ psig	CCA		
24	Manifold Supply Valve	ALP-V311 -or- ALP-V312	Open selected secondary supply valve. (Circle opened valve)	CCA		
NOTE 6: If VTA is used, complete Items 25-26 and skip Item 27. If VTA is not used, skip items 25-26 and complete Item 27.						
25	Volume Tank Valve	ALP-V313	Slowly open valve and charge volume tank. Ensure regulator tracks.	CCA		
26	Condensate Drain Valve	ALP-V201	Open after pressure equalizes, drain, and close.	VTA		
27	Yellow Supply Valve	ALP-V314	Open slowly, blow down secondary supply, and close. Ensure regulator tracks.	CCA		

FADS III AIR SYSTEM CONFIGURATION 1 / OP-2 *Page 4 of 4*

PREDIVE START-UP PROCEDURES FOR STAND-ALONE DIVING SETUP—Continued

ITEM	COMPONENT	DESCRIPTION	PROCEDURE	LOCATION	CHECK	NOTE
28	Manifold Supply Valve	ALP-V311 -or- ALP-V312	Close secondary supply valve.	CCA		
29	Manifold Supply Valve	ALP-V311 -or- ALP-V312	Open selected primary supply valve. (Circle opened valve)	CCA		
30	Yellow Supply Valve	ALP-V314	Open slowly, blow down primary supply, and close. Ensure regulator tracks.	CCA		
31	Red, Green, and Yellow Diver Supply Hoses	N/A	Remove plugs and check hose fittings for damaged threads. Connect hoses and tighten wrench-tight.	CCA		
32	Red, Green, and Yellow Diver Pneumo Hoses	N/A	Remove plugs and check hose fittings for damaged threads. Connect hoses and tighten wrench-tight.	CCA		
WARNING: **When purging umbilical hoses, maintain a firm grip on the hose and point the free end away from personnel to avoid injury from flying debris.** WARNING: **When purging pneumo hoses, do not fully open pneumo valves (ALP-V317, ALP-V318, and ALP-V319). Failure to comply will damage the diver depth gauges and may cause injury to personnel.**						
33	Yellow, Green, and Red Diver Pneumo Valves	ALP-V317 ALP-V318 ALP-V319	Crack open valves one at a time, purge corresponding pneumo hose, and close.	CCA		
34	Yellow, Green, and Red Diver Supply Valves	ALP-V314 ALP-V315 ALP-V316	Crack open valves one at a time, purge corresponding supply hose, and close.	CCA		
END OF PROCEDURE						

REMARKS: (Using item number as a reference, list any deficiencies or problems found during performance of this procedure.)

THIS PAGE INTENTIONALLY LEFT BLANK

FADS III AIR SYSTEM
CONFIGURATION 1 / OP-2M

MODIFIED PREDIVE START-UP PROCEDURES
FOR STAND-ALONE DIVING SETUP

REVISED 14 MARCH 2008

SPECIAL INSTRUCTIONS

1. Ensure this OP is valid by comparing the revision date above with the master file.
2. Check each item individually.
3. Sign and date below when OP has been completed.
4. Report any discrepancy to the Diving Supervisor.

Operator No. 1 ____ Date ____________
Printed name and signature

Operator No. 2 ____ Date ____________
Printed name and signature

Diving Supervisor ____ Date ____________
Printed name and signature

FADS III AIR SYSTEM CONFIGURATION 1 / OP-2M

MODIFIED PREDIVE START-UP PROCEDURES FOR STAND-ALONE DIVING SETUP

NOTE 1: This OP provides modified start-up procedures for the ASRA, CCA, and VTA that are to be performed after the system was placed in a modified shutdown condition utilizing Configuration 1/OP-3M.

NOTE 2: This OP may be performed only if 24 hours or less have elapsed. If more than 24 hours have elapsed, perform the postdive shutdown procedures in Configuration 1/OP-3 and continue the normal sequence of operations from that point.

NOTE 3: Record notes and deficiencies in section provided at the end of this operating procedure.

NOTE 4: Complete the following using Configuration 1 Status Sheet (Figure A-2):

Designate Primary and Back-Up banks to CCA by circling the appropriate label.

<u>ASRA Banks</u>

Bank 1 – Primary Back-Up

Bank 2 – Primary Back-Up

Bank 3 – Always supplies secondary air

Designate Primary port to CCA by circling the appropriate label. Circle whether the upper or lower port is being used for each operation.

<u>ASRA Ports</u>

Port A – Primary UPPER LOWER

Port B – Primary UPPER LOWER

Port C – Secondary UPPER LOWER

Designate Primary and Secondary ports on the CCA by circling the appropriate label.

<u>CCA Ports</u>

A Supply – Primary Secondary

B Supply – Primary Secondary

ITEM	COMPONENT	DESCRIPTION	PROCEDURE	LOCATION	CHECK	NOTE
SET UP ASRA BANKS 1, 2, AND 3 TO SUPPLY PORTS A, B, AND C						
NOTE 5: Ensure Banks 1, 2, and 3 are charged to a minimum of 2800 psi or as determined by Diving Supervisor. Recharging of banks can be conducted using FADS III Air System Configuration 1/OP-5.						
1	Bank 1 Gauge	AHP-G437	Record pressure (min. pressure ________ psig) AHP-G437 __________ psig	ASRA		
	Bank 2 Gauge	AHP-G438	Record pressure (min. pressure ________ psig) AHP-G438 __________ psig	ASRA		
	Bank 3 Gauge	AHP-G439	Record pressure (min. pressure ________ psig) AHP-G439 __________ psig	ASRA		

FADS III AIR SYSTEM CONFIGURATION 1 / OP-2M ***Page 2 of 3***

MODIFIED PREDIVE START-UP PROCEDURES FOR STAND-ALONE DIVING SETUP—Continued

ITEM	COMPONENT	DESCRIPTION	PROCEDURE	LOCATION	CHECK	NOTE
2	Bank 1 Manifold Valve	AHP-V420	Verify open if Bank 1 is designated as primary.	ASRA		
			Verify closed if Bank 1 is designated as back-up.	ASRA		
3	Bank 2 Manifold Valve	AHP-V421	Verify open if Bank 2 is designated as primary.	ASRA		
			Verify closed if Bank 2 is designated as back-up.	ASRA		
4	Manifold Valve	AHP-V444	Verify open.	ASRA		
5	Port A Valve or Port B Valve	AHP-V443 or AHP-V429	Slowly open designated port valve for primary air to CCA. (Circle opened valve)	ASRA		
6	Port C Valve	AHP-V422	Open slowly.	ASRA		
SET UP CCA A SUPPLY						
7	A Supply Valve	AHP-V301	Verify open.	CCA		
8	A Supply Gauge	AHP-G325	Compare reading with bank supplying CCA A Supply.	CCA		
9	A Regulator	AHP-V303	Slowly adjust manifold pressure as directed by Diving Supervisor. Record pressure: ________________ psig	CCA		
SET UP CCA B SUPPLY						
10	B Supply Valve	AHP-V302	Verify open.	CCA		
11	B Supply Gauge	AHP-G326	Compare reading with bank supplying CCA B Supply.	CCA		
12	B Regulator	AHP-V304	Slowly adjust manifold pressure as directed by Diving Supervisor. Record pressure: ________________ psig	CCA		
13	Manifold Supply Valve	ALP-V311 (A SUPPLY) -or- ALP-V312 (B SUPPLY)	Open valve designated as secondary supply valve and tag with SECONDARY tag. (Circle opened valve)	CCA		
14	Volume Tank Valve	ALP-V313	Open if VTA used.	CCA		
			Verify closed if VTA not used.			

FADS III AIR SYSTEM CONFIGURATION 1 / OP-2M ***Page 3 of 3***

MODIFIED PREDIVE START-UP PROCEDURES FOR STAND-ALONE DIVING SETUP—Continued

ITEM	COMPONENT	DESCRIPTION	PROCEDURE	LOCATION	CHECK	NOTE
15	Condensate Drain Valve	ALP-V201	If VTA used: open valve, drain tank, and close.	VTA		
WARNING: **When purging umbilical hoses, maintain a firm grip on the hose and point the free end away from personnel to avoid injury from flying debris.** WARNING: **When purging pneumo hoses, do not fully open pneumo valves (ALP-V317, ALP-V318, and ALP-V319). Failure to comply will damage the diver depth gauges and may cause injury to personnel.**						
16	Yellow, Green, and Red Pneumo Valves	ALP-V317 ALP-V318 ALP-V319	Crack open valves one at a time, purge corresponding pneumo hose, and close. Ensure secondary regulator tracks.	CCA		
17	Manifold Supply Valve	ALP-V311 (A SUPPLY) -or- ALP-V312 (B SUPPLY)	Close secondary supply valve.	CCA		
18	Manifold Supply Valve	ALP-V311 (A SUPPLY) -or- ALP-V312 (B SUPPLY)	Open valve designated as primary supply valve and tag with PRIMARY tag. (Circle opened valve)	CCA		
19	Yellow, Green, and Red Diver Supply Valves	ALP-V314 ALP-V315 ALP-V316	Crack open valves one at a time, purge corresponding supply hose, and close. Ensure primary regulator tracks.	CCA		

END OF PROCEDURE

REMARKS: (Using item number as a reference, list any deficiencies or problems found during performance of this procedure.)

____

____

____

____

____

____

FADS III AIR SYSTEM
CONFIGURATION 1 / OP-3

SHUTDOWN PROCEDURES
FOR STAND-ALONE DIVING SETUP

REVISED 14 MARCH 2008

SPECIAL INSTRUCTIONS

1. Ensure this OP is valid by comparing the revision date above with the master file.
2. Check each item individually.
3. Sign and date below when OP has been completed.
4. Report any discrepancy to the Diving Supervisor.

Operator No. 1 ______________________________ Date ____________
Printed name and signature

Operator No. 2 ______________________________ Date ____________
Printed name and signature

Diving Supervisor ______________________________ Date ____________
Printed name and signature

FADS III AIR SYSTEM CONFIGURATION 1 / OP-3

SHUTDOWN PROCEDURES FOR STAND-ALONE DIVING SETUP

NOTE 1: Ensure Configuration 1/OP-2 has been completed prior to commencing this OP.

NOTE 2: Record notes and deficiencies in section provided at the end of this operating procedure.

NOTE 3: If the Diving Supervisor determines that the ASRA flasks need to be charged after performance of this procedure, refer to Configuration 1/ OP-6, HP Air Flask Charging Procedure. Ensure all valves are returned to their previous settings prior to the next procedure.

ITEM	COMPONENT	DESCRIPTION	PROCEDURE	LOCATION	CHECK	NOTE
SHUT DOWN ASRA						
1	Manifold Valve	AHP-V444	Close.	ASRA		
2	Bank 1 Flask Isolation Valves	AHP-V401 AHP-V402 AHP-V403	Close.	ASRA		
3	Bank 1 Manifold Valve	AHP-V420	Open or verify opened.	ASRA		
4	Port A Valve	AHP-V443	Open or verify opened.	ASRA		
5	Port A Bleed Valve	AHP-V442	Open, depressurize until AHP-G437 reads 0 psig, close.	ASRA		
6	Port A Valve	AHP-V443	Close.	ASRA		
7	Bank 1 Manifold Valve	AHP-V420	Close.	ASRA		
8	Bank 2 Flask Isolation Valves	AHP-V404 AHP-V405 AHP-V406 AHP-V407	Close.	ASRA		
9	Bank 2 Manifold Valve	AHP-V421	Open or verify opened.	ASRA		
10	Port B Valve	AHP-V429	Open or verify opened.	ASRA		
11	Port B Bleed Valve	AHP-V441	Open, depressurize until AHP-G438 reads 0 psig, close.	ASRA		
12	Port B Valve	AHP-V429	Close.	ASRA		
13	Bank 2 Manifold Valve	AHP-V421	Close.	ASRA		
14	Bank 3 Flask Isolation Valves	AHP-V408 AHP-V409	Close.	ASRA		
15	Port C Bleed Valve	AHP-V440	Open, depressurize until AHP-G439 reads 0 psig, close.	ASRA		
16	Port C Valve	AHP-V422	Close.	ASRA		

FADS III AIR SYSTEM CONFIGURATION 1 / OP-3

SHUTDOWN PROCEDURES FOR STAND-ALONE DIVING SETUP—Continued

ITEM	COMPONENT	DESCRIPTION	PROCEDURE	LOCATION	CHECK	NOTE
SHUT DOWN CCA						
17	Yellow, Green, and Red Diver Supply Valves	ALP-V314 ALP-V315 ALP-V316	Close.	CCA		
18	Yellow, Green, and Red Pneumo Valves	ALP-V317 ALP-V318 ALP-V319	Ensure closed.	CCA		
19	Volume Tank Supply Valve	ALP-V313	If VTA not used, verify valve is closed.	CCA		
			If VTA required for next dive, close valve.	CCA		
20	Condensate Drain Valve	ALP-V201	If VTA used, open valve, drain condensate, and close.	VTA		
21	Diver UBAs, Umbilicals, and Pneumo Hoses	N/A	Disconnect as required in preparation of bleeding down CCA to 0 psig.	CCA		
22	Manifold Supply Valves	ALP-V311 ALP-V312	Open.	CCA		
23	Yellow Diver Supply Valve	ALP-V314	Open, depressurize until all CCA pressure gauges read 0 psig, and close.	CCA		
24	Volume Tank Valve	ALP-V313	Close valve if VTA used.	CCA		
25	A Regulator B Regulator	AHP-V303 AHP-V304	Back off fully CCW.	CCA		
26	A Supply Valve B Supply Valve	AHP-V301 AHP-V302	Close.	CCA		
27	Manifold Supply Valve	ALP-V311 ALP-V312	Close.	CCA		
28	Diver & Pneumo CCA Ports and/or Umbilical Connections	N/A	Reinstall plugs and caps as required.	CCA		
NOTE 4: Items 29 thru 30 are optional but highly recommended if equipment is likely to be exposed to saltwater contamination for any length of time.						
29	ASRA Doors	N/A	Close.	ASRA		

FADS III AIR SYSTEM CONFIGURATION 1 / OP-3

SHUTDOWN PROCEDURES FOR STAND-ALONE DIVING SETUP—Continued

ITEM	COMPONENT	DESCRIPTION	PROCEDURE	LOCATION	CHECK	NOTE
30	CCA Blowout Plug	N/A	Install.	CCA Rear Panel		
31	CCA Case Lid	N/A	Install.	CCA		

NOTE 5: If dive mission is complete, proceed to Configuration 1/OP-4 (Postmission Procedure). If dive mission is not complete, perform all required items in Configuration 1/OP-2 (Predive Start-Up) prior to next dive.

END OF PROCEDURE

REMARKS: (Using item number as a reference, list any deficiencies or problems found during performance of this procedure.)

FADS III AIR SYSTEM
CONFIGURATION 1 / OP-3M

MODIFIED SHUTDOWN PROCEDURES FOR STAND-ALONE DIVING SETUP

REVISED 14 MARCH 2008

SPECIAL INSTRUCTIONS

1. Ensure this OP is valid by comparing the revision date above with the master file.
2. Check each item individually.
3. Sign and date below when OP has been completed.
4. Report any discrepancy to the Diving Supervisor.

Operator No. 1 ______________________________ Date ____________
Printed name and signature

Operator No. 2 ______________________________ Date ____________
Printed name and signature

Diving Supervisor ______________________________ Date ____________
Printed name and signature

FADS III AIR SYSTEM CONFIGURATION 1 / OP-3M — *Page 1 of 1*

MODIFIED SHUTDOWN PROCEDURES FOR STAND-ALONE DIVING SETUP

NOTE 1: This OP may be used any time the equipment will be used again within 24 hours. If it is anticipated that more than 24 hours will pass before using the equipment again, the postdive shutdown procedures in Configuration 1/ OP-3 must be performed instead.

NOTE 2: Record notes and deficiencies in section provided at the end of this operating procedure.

NOTE 3: Umbilical air and pneumofathometer hoses can remain either connected or capped at the diver's end.

NOTE 4: If the Diving Supervisor determines that the ASRA flasks need to be charged after performance of this procedure, refer to Configuration 1/ OP-5, HP Air Flask Charging Procedure. Ensure all valves are returned to their previous settings prior to the next procedure.

ITEM	COMPONENT	DESCRIPTION	PROCEDURE	LOCATION	CHECK	NOTE
PERFORM MODIFIED CCA SHUTDOWN						
1	Yellow, Green, and Red Diver Supply Valves	ALP-V314 ALP-V315 ALP-V316	Close.	CCA		
2	Volume Tank Supply Valve	ALP-V313	Close or verify closed if VTA not used.	CCA		
3	B Regulator	AHP-V304	Ensure backed off fully CCW.	CCA		
4	B Manifold Supply Valve	ALP-V312	Close.	CCA		
5	A Regulator	AHP-V303	Ensure backed off fully CCW.	CCA		
6	A Manifold Supply Valve	ALP-V311	Close.	CCA		
PERFORM MODIFIED ASRA SHUTDOWN						
7	Port A Valve Port B Valve Port C Valve	AHP-V443 AHP-V429 AHP-V422	Close.	ASRA		
END OF PROCEDURE						

REMARKS: (Using item number as a reference, list any deficiencies or problems found during performance of this procedure.)

FADS III AIR SYSTEM
CONFIGURATION 1 / OP-4

POSTMISSION PROCEDURES
FOR STAND-ALONE DIVING SETUP

REVISED 14 MARCH 2008

SPECIAL INSTRUCTIONS

1. Ensure this OP is valid by comparing the revision date above with the master file.
2. Check each item individually.
3. Sign and date below when OP has been completed.
4. Report any discrepancy to the Diving Supervisor.

Operator No. 1 ______________________________ Date ____________
Printed name and signature

Operator No. 2 ______________________________ Date ____________
Printed name and signature

Diving Supervisor ______________________________ Date ____________
Printed name and signature

FADS III AIR SYSTEM CONFIGURATION 1 / OP-4

Page 1 of 3

POSTMISSION PROCEDURES FOR STAND-ALONE DIVING SETUP

NOTE 1: This OP contains the procedures to be performed at the end of every mission. Ensure that Configuration 1/OP-3 has been completed prior to beginning this OP as it contains items that are essential to proper shutdown of the equipment.

NOTE 2: Record notes and deficiencies in section provided at the end of this operating procedure.

ITEM	COMPONENT	DESCRIPTION	PROCEDURE	LOCATION	CHECK	NOTE
WARNING: **Ports A, B, and C on the ASRA must be depressurized whenever a port cap or hose is removed from a port connector. Removal of a port cap or hose when supply piping is pressurized can result in injury or death.**						
WARNING: **Before bleeding HP air, ensure all personnel are clear of area to avoid injury from flying debris. Operator must wear protective eye wear when bleeding system.**						
CAUTION: Tighten hose plugs and port caps to proper torque as excessive tightening can damage threads.						
PERFORM POSTMISSION SHUTDOWN PROCEDURES						
1	SCUBA Regulator	AHP-V432	Ensure backed off (fully CCW).	ASRA		
2	All Other ASRA Valves	As Required	Ensure closed.	ASRA		
3	A Regulator B Regulator	AHP-V303 AHP-V304	Back off (turn fully CCW).	CCA		
4	All Other CCA Valves	As Required	Ensure closed.	CCA		
5	Condensate Drain Valve	ALP-V201	If VTA was used, ensure moisture has been drained and valve is closed.	VTA (if used)		
DISCONNECT UMBILICAL ASSEMBLIES FROM CCA						
6	Yellow/Green/ Red Diver and Pneumo Ports	N/A	Disconnect umbilical hoses from diver and pneumo ports.	CCA Rear Panel		
7	Yellow/Green/ Red Diver, Pneumo, and Umbilical Ports	N/A	Cap diver and pneumo ports, and bag or cap open ends of umbilical hoses.	CCA Rear Panel		
NOTE 3: If VTA was not used, omit Items 8 and 9.						
DISCONNECT LP AIR SUPPLY HOSE FROM VTA AND CCA						
8	LP Air Hose Assembly	H-203	Disconnect hose and strain relief. Install port cap and hose plug.	VTA		

FADS III AIR SYSTEM CONFIGURATION 1 / OP-4 *Page 2 of 3*

POSTMISSION PROCEDURES FOR STAND-ALONE DIVING SETUP—Continued

ITEM	COMPONENT	DESCRIPTION	PROCEDURE	LOCATION	CHECK	NOTE
9	LP Air Hose Assembly	H-203	Disconnect hose and strain relief. Install port cap and hose plug.	CCA Rear Panel		
DISCONNECT SECONDARY HP AIR SUPPLY HOSE FROM ASRA AND CCA						
10	Port C Bleed Valve	AHP-V440	Open, verify pressure bleeds off, and close.	ASRA		
11	Secondary HP Air Hose Assy	H-436 to ASRA Port C	Remove hose from port and disconnect strain relief. Install port cap and tighten 3/8 to 1/2 turn after O-ring engagement. Install plug or bag hose.	ASRA		
12	Secondary HP Air Hose Assy	H-436 to CCA Port A or B	Remove hose from port and disconnect strain relief. Install port cap and tighten 3/8 to 1/2 turn after O-ring engagement. Install plug or bag hose.	CCA Rear Panel		
DISCONNECT PRIMARY HP AIR SUPPLY HOSE FROM ASRA AND CCA						
13	Port A or Port B Bleed Valve	AHP-V442 or AHP-V441	Open valve that corresponds to ASRA port where H-436 is connected. Verify pressure bleeds off, and close.	ASRA		
14	Primary HP Air Hose Assembly	H-436 to ASRA Port A or B	Remove hose from port and disconnect strain relief. Install port cap and tighten 3/8 to 1/2 turn after O-ring engagement. Install plug or bag hose.	ASRA		
15	Primary HP Air Hose Assembly	H-436 to CCA Port A or B	Remove hose from port and disconnect strain relief. Install port cap and tighten 3/8 to 1/2 turn after O-ring engagement. Install plug or bag hose.	CCA Rear Panel		
DISCONNECT HP CHARGING HOSE FROM ASRA AND HPAC						
16	System Outlet Bleed Valve	N/A	Open, bleed down system, and close.	HPAC		
17	HP Air Hose Assembly	H-436 to HPAC Charge Port	Remove hose from port and disconnect strain relief. Install port cap and tighten 3/8 to 1/2 turn after O-ring engagement. Install plug or bag hose.	HPAC		

FADS III AIR SYSTEM CONFIGURATION 1 / OP-4

POSTMISSION PROCEDURES FOR STAND-ALONE DIVING SETUP—Continued

ITEM	COMPONENT	DESCRIPTION	PROCEDURE	LOCATION	CHECK	NOTE
18	HP Air Hose Assembly	H-436 to ASRA Charge Port	Remove hose from port and disconnect strain relief. Install port cap and tighten 3/8 to 1/2 turn after O-ring engagement. Install plug or bag hose.	ASRA		
STOW SYSTEM OR PREPARE EQUIPMENT FOR DEPLOYMENT						
19	ASRA CCA VTA (if used)	N/A	Stow equipment or prepare for deployment in accordance with procedures in Chapter 8.	ASRA CCA VTA		
END OF PROCEDURE						

REMARKS: (Using item number as a reference, list any deficiencies or problems found during performance of this procedure.)

FADS III AIR SYSTEM
CONFIGURATION 1 / OP-5

HP AIR FLASK CHARGING PROCEDURES
FOR BANK 1, 2, OR 3 WITH ASRA ON-LINE

REVISED 14 MARCH 2008

SPECIAL INSTRUCTIONS

1. Ensure this OP is valid by comparing the revision date above with the master file.
2. Check each item individually.
3. Sign and date below when OP has been completed.
4. Report any discrepancy to the Diving Supervisor.

Operator No. 1 ____ Date ____________
Printed name and signature

Operator No. 2 ____ Date ____________
Printed name and signature

Diving Supervisor ______________________________________ Date ____________
Printed name and signature

FADS III AIR SYSTEM CONFIGURATION 1 / OP-5

HP AIR FLASK CHARGING PROCEDURES FOR BANK 1, 2, OR 3 WITH ASRA ON-LINE

NOTE 1: This OP should be performed when the ASRA is on-line; for off-line procedures, use Configuration 1/ OP-6.

NOTE 2: Record notes and deficiencies in section provided at the end of this operating procedure.

ITEM	COMPONENT	DESCRIPTION	PROCEDURE	LOCATION	CHECK	NOTE
WARNING: **Use only an Authorized for Navy Use (ANU) approved compressor with proof of a current air analysis. Use of an unapproved compressor could result in injury or death to personnel breathing the air.**						
WARNING: **Fittings, threads, and O-rings must be inspected for damage and fittings properly tightened to ensure seating of O-rings. Fittings and O-rings that are not properly installed can allow HP air to escape and result in injury or death.**						
WARNING: **Failure to connect hose assembly strain reliefs can cause personnel injury or death should the hose separate or burst.**						
WARNING: **The bank being charged must not be the active bank providing air to personnel. Failure of a bank during charging and while providing air to personnel can result in injury or death.**						
WARNING: **Before bleeding HP air, ensure all personnel are clear of area to avoid injury from flying debris. Operator must wear protective eye wear when bleeding system.**						
CONNECT CHARGING HOSES AND START HP AIR COMPRESSOR (HPAC)						
NOTE 3: If system is lined up in accordance with Configuration 4 (FADS III with SNDLRCS support), complete items 1 and 2 as required due to bank configuration with Banks 2 and 3 lined up together as primary air through charging valves.						
1	Bank 2 Charge Valve	AHP-V424	Close.	ASRA		
2	Bank 3 Charge Valve	AHP-V425	Close.	ASRA		
3	HP Air Hose Assembly	H-436	Remove from ASRA door. Inspect for cuts and abrasions.	ASRA		
4	HP Air Hose Assembly	H-436 to ASRA Charge Port	Remove cap and plug from charge port and hose. Connect hose and tighten 3/8 to 1/2 turn after O-ring engagement. Attach strain relief.	ASRA		
5	HP Air Hose Assembly	H-436 to HPAC Charge Port	Remove cap and plug from charge port and hose. Connect hose and tighten 3/8 to 1/2 turn after O-ring engagement. Attach strain relief.	HPAC		
6	HPAC	N/A	Start up in accordance with appropriate technical manual.	HPAC		
7	HP Air Hose Assembly	H-436	Check for leaks.	ASRA		

FADS III AIR SYSTEM CONFIGURATION 1 / OP-5 *Page 2 of 4*

HP AIR FLASK CHARGING PROCEDURES FOR BANK 1, 2, OR 3 WITH ASRA ON-LINE—Continued

ITEM	COMPONENT	DESCRIPTION	PROCEDURE	LOCATION	CHECK	NOTE
NOTE 4: Check status sheet to identify which bank is being used as primary supply. Only charge back-up or off-line bank; consult Diving Supervisor if in doubt. Bank 1: Complete items 8 thru 17. Bank 2: Complete items 18 thru 27. **NOTE 5:** Bank 3 may be charged in between dives when there are no requirements for immediate secondary air; consult Diving Supervisor if in doubt. Bank 3: Complete items 28 thru 37.						
CHARGE BANK 1 WHILE BANK 2 IS IN USE						
8	Bank 1	N/A	Verify Bank 1 is not primary or in use.	ASRA		
9	Bank 1 Manifold Valve	AHP-V420	Close.	ASRA		
10	Bank 2 Manifold Valve	AHP-V421	Ensure open.	ASRA		
11	Bank 1 Gauge Stop Valve	AHP-V426	Ensure open.	ASRA		
12	Bank 1 Flask Isolation Valves	AHP-V401 AHP-V402 AHP-V403	Ensure open.	ASRA		
13	Bank 1 Charge Valve	AHP-V423	Open.	ASRA		
14	HP Air Flasks	N/A	Charge to 5,000 psig maximum.	ASRA		
15	Bank 1 Charge Valve	AHP-V423	Close.	ASRA		
NOTE 6: If charging is complete, perform Items 16 thru 17 and return to normal operating status. If Bank 2 or 3 is to be charged, omit Items 16 and 17 and continue with Item 18 (Bank 2) or Item 28 (Bank 3).						
16	HPAC	N/A	Shut down in accordance with appropriate technical manual.	HPAC		
17	System Outlet Bleed Valve	N/A	Open, bleed down system, and close.	HPAC		
CHARGE BANK 2 WHILE BANK 1 IS IN USE						
18	Bank 2	N/A	Verify Bank 2 is not primary or in use.	ASRA		
19	Bank 2 Manifold Valve	AHP-V421	Close.	ASRA		
20	Bank 1 Manifold Valve	AHP-V420	Ensure open.	ASRA		

FADS III AIR SYSTEM CONFIGURATION 1 / OP-5 *Page 3 of 4*

HP AIR FLASK CHARGING PROCEDURES FOR BANK 1, 2, OR 3 WITH ASRA ON-LINE—Continued

ITEM	COMPONENT	DESCRIPTION	PROCEDURE	LOCATION	CHECK	NOTE
21	Bank 2 Gauge Stop Valve	AHP-V427	Ensure open.	ASRA		
22	Bank 2 Flask Isolation Valves	AHP-V404 AHP-V405 AHP-V406 AHP-V407	Ensure open.	ASRA		
23	Bank 2 Charge Valve	AHP-V424	Open.	ASRA		
24	HP Air Flasks	N/A	Charge to 5,000 psig maximum.	ASRA		
25	Bank 2 Charge Valve	AHP-V424	Close.	ASRA		
NOTE 7: If charging is complete, perform Items 26 and 27 and return to normal operating status. If Bank 1 or Bank 3 is to be charged, omit Items 26 and 27, resume charging with Item 8 (Bank 1) or Item 28 (Bank 3).						
26	HPAC	N/A	Shut down in accordance with appropriate technical manual.	HPAC		
27	System Outlet Bleed Valve	N/A	Open, bleed down system, and close.	HPAC		
CHARGE BANK 3 BETWEEN DIVES						
28	Bank 3	N/A	Verify no secondary air requirement exists.	ASRA		
29	Port C Valve	AHP-V422	Close.	ASRA		
30	Bank 3 Gauge Stop Valve	AHP-V428	Ensure open.	ASRA		
31	Bank 3 Flask Isolation Valves	AHP-V408 AHP-V409	Ensure open.	ASRA		
32	Bank 3 Charge Valve	AHP-V425	Open.	ASRA		
33	HP Air Flasks	N/A	Charge to 5,000 psig maximum.	ASRA		
34	Bank 3 Charge Valve	AHP-V425	Close.	ASRA		
35	Port C Valve	AHP-V422	Open.	ASRA		
NOTE 8: If charging is complete, perform Items 36 and 37 and return to normal operating status. If Bank 1 or Bank 2 is to be charged, omit Items 36 and 37, resume charging with Item 8 (Bank 1) or Item 18 (Bank 2).						

FADS III AIR SYSTEM CONFIGURATION 1 / OP-5 ***Page 4 of 4***

HP AIR FLASK CHARGING PROCEDURES FOR BANK 1, 2, OR 3 WITH ASRA ON-LINE—Continued

ITEM	COMPONENT	DESCRIPTION	PROCEDURE	LOCATION	CHECK	NOTE
36	HPAC	N/A	Shut down in accordance with appropriate technical manual.	HPAC		
37	System Outlet Bleed Valve	N/A	Open, bleed down system, and close.	HPAC		
END OF PROCEDURE						

REMARKS: (Using item number as a reference, list any deficiencies or problems found during performance of this procedure.)

THIS PAGE INTENTIONALLY LEFT BLANK

FADS III AIR SYSTEM
CONFIGURATION 1 / OP-6

HP AIR FLASK CHARGING PROCEDURES
WITH ASRA OFF-LINE

REVISED 14 MARCH 2008

SPECIAL INSTRUCTIONS

1. Ensure this OP is valid by comparing the revision date above with the master file.
2. Check each item individually.
3. Sign and date below when OP has been completed.
4. Report any discrepancy to the Diving Supervisor.

Operator No. 1 ____ Date ____________
Printed name and signature

Operator No. 2 ____ Date ____________
Printed name and signature

Diving Supervisor ______________________________________ Date ____________
Printed name and signature

FADS III AIR SYSTEM CONFIGURATION 1 / OP-6 ***Page 1 of 5***

HP AIR FLASK CHARGING PROCEDURES WITH ASRA OFF-LINE

NOTE 1: This OP should be performed when the ASRA is off-line; for on-line procedures, use Configuration 1/ OP-5.

NOTE 2: Record notes and deficiencies in section provided at the end of this operating procedure.

ITEM	COMPONENT	DESCRIPTION	PROCEDURE	LOCATION	CHECK	NOTE
WARNING: **Use only an Authorized for Navy Use (ANU) approved compressor with proof of a current air analysis. Use of an unapproved compressor could result in injury or death to personnel breathing the air.**						
WARNING: **Fittings, threads, and O-rings must be inspected for damage and fittings properly tightened to ensure seating of O-rings. Fittings and O-rings that are not properly installed can allow HP air to escape and result in injury or death.**						
WARNING: **Failure to connect hose assembly strain reliefs can cause personnel injury or death should the hose separate or burst.**						
WARNING: **Before bleeding HP air, ensure all personnel are clear of area to avoid injury from flying debris. Operator must wear protective eye wear when bleeding system.**						
CONNECT CHARGING HOSES AND START HP AIR COMPRESSOR (HPAC)						
1	HP Air Hose Assembly	H-436	Remove from ASRA door. Inspect for cuts and abrasions.	ASRA		
2	HP Air Hose Assembly	H-436 to ASRA Charge Port	Remove cap and plug from charge port and hose. Connect hose and tighten 3/8 to 1/2 turn after O-ring engagement. Attach strain relief.	ASRA		
3	HP Air Hose Assembly	H-436 to HPAC Charge Port	Remove cap and plug from charge port and hose. Connect hose and tighten 3/8 to 1/2 turn after O-ring engagement. Attach strain relief.	HPAC		
4	Bank 2 Manifold Valve	AHP-V421	Ensure closed.	ASRA		
5	Bank 1 Manifold Valve	AHP-V420	Ensure closed.	ASRA		
6	Port C Valve	AHP-V422	Ensure closed.	ASRA		
7	HPAC	N/A	Start up in accordance with appropriate technical manual.	HPAC		
8	HP Air Hose Assembly	H-436	Check for leaks.	ASRA		

NOTE 3: Banks can be charged together or separately. To charge all banks, perform remaining items of OP in sequence shown. To charge banks separately, charge the desired bank beginning with the item shown: Bank 1 (Item 9), Bank 2 (Item 15), and Bank 3 (Item 21).

FADS III AIR SYSTEM CONFIGURATION 1 / OP-6

HP AIR FLASK CHARGING PROCEDURES WITH ASRA OFF-LINE—Continued

ITEM	COMPONENT	DESCRIPTION	PROCEDURE	LOCATION	CHECK	NOTE
CHARGE BANK 1						
9	Gauge Stop Valve	AHP-V426	Open.	ASRA		
10	Flask Isolation Valves	AHP-V401 AHP-V402 AHP-V403	Open.	ASRA		
11	Bank 1 Charge Valve	AHP-V423	Open.	ASRA		
12	HP Air Flasks	N/A	Charge to 5,000 psig maximum.	ASRA		
13	Flask Isolation Valves	AHP-V401 AHP-V402 AHP-V403	Close.	ASRA		
14	Bank 1 Charge Valve	AHP-V423	Close.	ASRA		
NOTE 4: Continue with Item 15 if charging Bank 2 or with Item 21 if charging Bank 3. If charging is complete, proceed to Item 27.						
CHARGE BANK 2						
15	Gauge Stop Valve	AHP-V427	Open.	ASRA		
16	Flask Isolation Valves	AHP-V404 AHP-V405 AHP-V406 AHP-V407	Open.	ASRA		
17	Bank 2 Charge Valve	AHP-V424	Open.	ASRA		
18	HP Air Flasks	N/A	Charge to 5,000 psig maximum.	ASRA		
19	Flask Isolation Valves	AHP-V404 AHP-V405 AHP-V406 AHP-V407	Close.	ASRA		
20	Bank 2 Charge Valve	AHP-V424	Close.	ASRA		
NOTE 5: Continue with Item 21 if charging Bank 3. If charging is complete, proceed to Item 27.						
CHARGE BANK 3						
21	Gauge Stop Valve	AHP-V428	Open.	ASRA		
22	Flask Isolation Valves	AHP-V408 AHP-V409	Open.	ASRA		

FADS III AIR SYSTEM CONFIGURATION 1 / OP-6

Page 3 of 5

HP AIR FLASK CHARGING PROCEDURES WITH ASRA OFF-LINE—Continued

ITEM	COMPONENT	DESCRIPTION	PROCEDURE	LOCATION	CHECK	NOTE
23	Bank 3 Charge Valve	AHP-V425	Open.	ASRA		
24	HP Air Flasks	N/A	Charge to 5,000 psig maximum.	ASRA		
25	Flask Isolation Valves	AHP-V408 AHP-V409	Close.	ASRA		
26	Bank 3 Charge Valve	AHP-V425	Close.	ASRA		
DISCONTINUE CHARGING						
27	HPAC	N/A	Shut down in accordance with appropriate technical manual.	HPAC		
NOTE 6: Continue with Items 28 thru 30 if no further air charging is required.						
28	System Outlet Bleed Valve	N/A	Open, bleed down system, and close.	HPAC		
29	HP Air Hose Assembly	H-436 to ASRA Charge Port	Remove hose from charge port and disconnect strain relief. Install port cap and tighten 3/8 to 1/2 turn after O-ring engage-ment. Install plug or bag charge hose.	ASRA		
30	HP Air Hose Assembly	H-436 to HPAC Charge Port	Remove hose from charge port and disconnect strain relief. Install port cap and tighten 3/8 to 1/2 turn after O-ring engage-ment. Install plug or bag charge hose.	HPAC		
BLEED PRESSURE FROM BANK 1						
NOTE 7: Perform Items 31 thru 35 only if Bank 1 was charged.						
31	Bank 1 Manifold Valve	AHP-V420	Open slowly.	ASRA		
32	Port A Valve	AHP-V443	Open slowly.	ASRA		
33	Port A Bleed Valve	AHP-V442	Open, bleed pressure, and close.	ASRA		
34	Port A Valve	AHP-V443	Close.	ASRA		
35	Bank 1 Manifold Valve	AHP-V420	Close.	ASRA		

FADS III AIR SYSTEM CONFIGURATION 1 / OP-6

HP AIR FLASK CHARGING PROCEDURES WITH ASRA OFF-LINE—Continued

ITEM	COMPONENT	DESCRIPTION	PROCEDURE	LOCATION	CHECK	NOTE
BLEED PRESSURE FROM BANK 2						
NOTE 8: Perform Items 36 thru 40 only if Bank 2 was charged.						
36	Bank 2 Manifold Valve	AHP-V421	Open slowly.	ASRA		
37	Port B Valve	AHP-V429	Open slowly.	ASRA		
38	Port B Bleed Valve	AHP-V441	Open, bleed pressure, and close.	ASRA		
39	Port B Valve	AHP-V429	Close.	ASRA		
40	Bank 2 Manifold Valve	AHP-V421	Close.	ASRA		
BLEED PRESSURE FROM BANK 3						
NOTE 9: Perform Items 41 thru 43 only if Bank 3 was charged.						
41	Port C Valve	AHP-V422	Open slowly.	ASRA		
42	Port C Bleed Valve	AHP-V440	Open, bleed pressure, and close.	ASRA		
43	Port C Valve	AHP-V422	Close.	ASRA		
SHUT DOWN GAUGES AND DRAIN CONDENSATE						
44	Gauge Stop Valves	AHP-V426 AHP-V427 AHP-V428	Close.	ASRA		
45	System Drain Valve	AHP-V419	Open.	ASRA		
46	Flask Drain Valves	AHP-V410 AHP-V411 AHP-V412 AHP-V413 AHP-V414 AHP-V415 AHP-V416 AHP-V417 AHP-V418	Open valves one at a time, allow to drain, and close.	ASRA		
47	System Drain Valve	AHP-V419	Close.	ASRA		
END OF PROCEDURE						

FADS III AIR SYSTEM CONFIGURATION 1 / OP-6

HP AIR FLASK CHARGING PROCEDURES WITH ASRA OFF-LINE—Continued

REMARKS: (Using item number as a reference, list any deficiencies or problems found during performance of this procedure.)

FADS III AIR SYSTEM
CONFIGURATION 1 / OP-7

SCUBA CYLINDER
CHARGING PROCEDURES

REVISED 14 MARCH 2008

SPECIAL INSTRUCTIONS

1. Ensure this OP is valid by comparing the revision date above with the master file.
2. Check each item individually.
3. Sign and date below when OP has been completed.
4. Report any discrepancy to the Diving Supervisor.

Operator No. 1 ____ Date ____________
Printed name and signature

Operator No. 2 ____ Date ____________
Printed name and signature

Diving Supervisor ______________________________________ Date ____________
Printed name and signature

FADS III AIR SYSTEM CONFIGURATION 1 / OP-7 ***Page 1 of 3***

SCUBA CYLINDER CHARGING PROCEDURES

NOTE 1: SCUBA cylinder charging is normally performed during predive start-up.

NOTE 2: Record notes and deficiencies in section provided at the end of this operating procedure.

NOTE 3: Flasks from Banks 1 and 2 can be used to charge SCUBA cylinders. Circle bank that will be used for charging: 1 or 2

If Bank 1 is selected, perform Items 1 thru 4 and then proceed to Item 10.
If Bank 2 is selected, perform Items 5 thru 9 and continue with Item 10.

ITEM	COMPONENT	DESCRIPTION	PROCEDURE	LOCATION	CHECK	NOTE
SET UP BANK 1 TO SUPPLY SCUBA CHARGE AIR						
1	Gauge Stop Valves	AHP-V426	Open slowly.	ASRA		
2	Flask Isolation Valves	AHP-V401 AHP-V402 AHP-V403	Slowly open desired valve(s). Circle opened valve(s).	ASRA		
3	Bank 1 Gauge	AHP-G437	Record pressure: _______ psig	ASRA		
4	Bank 1 Manifold Valve	AHP-V420	Open.	ASRA		
SET UP BANK 2 TO SUPPLY SCUBA CHARGE AIR						
5	Gauge Stop Valve	AHP-V427	Open slowly.	ASRA		
6	Flask Isolation Valves	AHP-V404 AHP-V405 AHP-V406 AHP-V407	Slowly open desired valve(s). Circle opened valve(s).	ASRA		
7	Bank 2 Gauge	AHP-G438	Record pressure: _______ psig	ASRA		
8	Bank 2 Manifold Valve	AHP-V421	Open.	ASRA		
9	Manifold Valve	AHP-V444	Open.	ASRA		
CHARGE SCUBA CYLINDERS						
10	Gauge Stop Valve	AHP-V435	Open slowly.	ASRA		
11	SCUBA Supply Valve	AHP-V431	Open slowly.	ASRA		
12	SCUBA Regulator	AHP-V432	Slowly adjust until SCUBA Pressure Gauge (AHP-G436) reads 3,000 psig.	ASRA		
13	SCUBA Charge Hose Assembly	H-406	Attach H-406 to SCUBA cylinder. Attach strain relief.	ASRA		
14	SCUBA Cylinder Valve	N/A	Open.	ASRA		

FADS III AIR SYSTEM CONFIGURATION 1 / OP-7

SCUBA CYLINDER CHARGING PROCEDURES—Continued

ITEM	COMPONENT	DESCRIPTION	PROCEDURE	LOCATION	CHECK	NOTE
15	SCUBA Charge Hose Assembly	H-406	Open line valve on SCUBA charging yoke.	ASRA		
16	SCUBA Outlet Valve	AHP-V434	Open slowly. Allow air to cascade into SCUBA cylinder until filled. Close valve.	ASRA		
17	SCUBA Charge Hose Assembly	H-406	Close line valve on SCUBA charging yoke.	ASRA		
18	SCUBA Cylinder Valve	N/A	Close.	ASRA		
19	SCUBA Charge Hose Assembly	H-406	Open bleeder screw, bleed hose, and close bleeder screw.	ASRA		
20	SCUBA Charge Hose Assembly	H-406	Remove strain relief cable and SCUBA charging yoke from SCUBA cylinder.	ASRA		
NOTE 4: Repeat Items 13 thru 20 for each additional SCUBA cylinder that needs to be charged.						
SHUT DOWN CHARGING COMPONENTS						
21	SCUBA Charge Hose Assembly	H-406	Attach yoke to yoke bracket.	ASRA		
22	Flask Isolation Valves	AHP-V401 AHP-V402 AHP-V403 AHP-V404 AHP-V405 AHP-V406 AHP-V407	Close if open.	ASRA		
23	Port A Valve	AHP-V443	Open.	ASRA		
24	Port A Bleed Valve	AHP-V442	Open, bleed pressure, and close.	ASRA		
25	Port A Valve	AHP-V443	Close.	ASRA		
26	Bank 1 Manifold Valve	AHP-V420	Close if open.	ASRA		
27	Bank 2 Manifold Valve	AHP-V421	Close if open.	ASRA		
28	SCUBA Supply Valve	AHP-V431	Close.	ASRA		
29	SCUBA Regulator	AHP-V432	Back off (fully CCW).	ASRA		
30	Manifold Valve	AHP-V444	Close if open.	ASRA		

FADS III AIR SYSTEM CONFIGURATION 1 / OP-7

SCUBA CYLINDER CHARGING PROCEDURES—Continued

ITEM	COMPONENT	DESCRIPTION	PROCEDURE	LOCATION	CHECK	NOTE
31	Gauge Stop Valves	AHP-V426 AHP-V427 AHP-V435	Close.	ASRA		
END OF PROCEDURE						

REMARKS: (Using item number as a reference, list any deficiencies or problems found during performance of this procedure.)

FADS III AIR SYSTEM
CONFIGURATION 1 / EP-1

EMERGENCY PROCEDURE:
LOSS OF PRIMARY AIR TO DIVERS

REVISED 14 MARCH 2008

SPECIAL INSTRUCTIONS

1. Ensure this EP is valid by comparing the revision date above with the master file.
2. Check each item individually.
3. Sign and date below when EP has been completed.
4. Report any discrepancy to the Diving Supervisor.

Operator No. 1 ______________________________ Date ____________
Printed name and signature

Operator No. 2 ______________________________ Date ____________
Printed name and signature

Diving Supervisor ______________________________ Date ____________
Printed name and signature

FADS III AIR SYSTEM CONFIGURATION 1 / EP-1

Page 1 of 1

EMERGENCY PROCEDURE:
LOSS OF PRIMARY AIR TO DIVERS

NOTE 1: Record notes and deficiencies in section provided at the end of this emergency procedure.

ITEM	COMPONENT	DESCRIPTION	PROCEDURE	LOCATION	CHECK	NOTE
WARNING: **If primary supply pressure drops below minimum manifold pressure, immediately perform the procedure below. Failure to perform this procedure could result in injury or death to divers.**						
1	Manifold Supply Valve	ALP-V311 or ALP-V312	Close valve designated as primary.	CCA		
2	Manifold Supply Valve	ALP-V311 or ALP-V312	Open valve designated as secondary.	CCA		
3	Divers	N/A	Notify and retrieve.	Underwater		

NOTE 2: Upon recovery of the divers, isolate the cause of the failure and repair or replace the failed component. Refer to Chapter 5 of this manual for troubleshooting procedures and to Chapter 6 for corrective maintenance procedures.

END OF PROCEDURE

REMARKS: (List conditions, problems, or deficiencies that may have contributed to the emergency.)

APPENDIX B

FADS III AIR SYSTEM
OPERATING AND MAINTENANCE
SUPPLEMENT
FOR
CONFIGURATION 2:
DIVING THE FADS III AIR SYSTEM
WITH TRCS SUPPORT

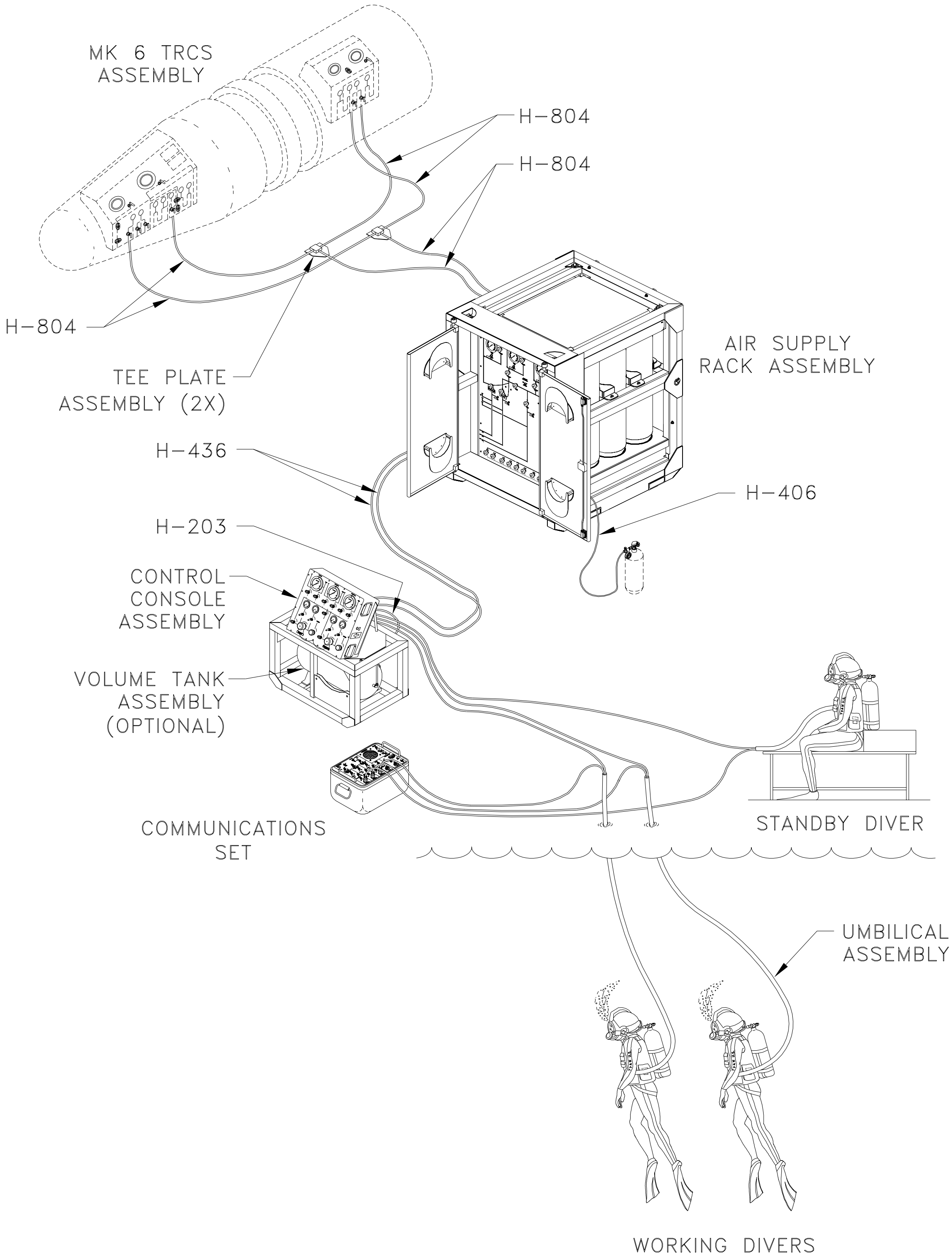


Figure B-1. Configuration 2: Diving the FADS III Air System with TRCS Support

APPENDIX B

FADS III AIR SYSTEM OPERATING AND MAINTENANCE SUPPLEMENT FOR CONFIGURATION 2: DIVING THE FADS III AIR SYSTEM WITH TRCS SUPPORT

WARNING

Use of Transportable Recompression Chamber Systems (TRCSs) that have not been upgraded to 5,000 psig service may result in equipment damage and personnel injury or death. TRCSs that do not have 5,000 psig upgrade may be utilized only when selected supply bank pressure is reduced to 3,000 psig.

NOTE

The information in this appendix is intended to supplement the information provided for the Configuration 1 Stand-Alone Diving Setup, which is located in the main body of this manual. Every effort has been made to avoid duplication of information; therefore, it may be necessary to reference the Configuration 1 information to obtain a better understanding of the system.

B.1 INTRODUCTION

This appendix contains the supplemental information needed to operate and maintain the equipment used in Configuration 2 of the Fly Away Dive System (FADS) III Air System, which supports both diving and Transportable Recompression Chamber System (TRCS) MK 6 Mod 0/Mod 1 operations as shown in Figure B-1. To help determine which components are required for use in each of the operations, refer to Table B-1.

Table B-1. Configuration 2 Equipment List

Item	Component/Description	Total Qty.	Used In	
			Diving Operations	TRCS Operations
FADS III AIR SYSTEM ASSEMBLIES				
1	Air Supply Rack Assembly (ASRA) • Connect to CCA using 2 HP air hose assemblies H-436. • Connect to TRCS using 2 tee plate assemblies and 6 HP air hose assemblies H-804. • If charging air flasks, connect to Compressor System using HP air hose assembly H-436. • If charging SCUBA cylinder, connect to SCUBA cylinder using SCUBA Charge Hose Assembly H-406.	1	Yes	Yes

Table B-1. Configuration 2 Equipment List—Continued

Item	Component/Description	Total Qty.	Used In	
			Diving Operations	TRCS Operations
FADS III AIR SYSTEM ASSEMBLIES—*Continued*				
2	Control Console Assembly (CCA)	1	Yes	No
3	Volume Tank Assembly (VTA) • If used, connect to CCA using LP air hose assembly H-203.	1	Optional	No
4	5,000 psi Compressor System (Bauer or Mako electric or diesel, or other approved 5,000 psi compressor system)	1	Optional	Optional
TRCS MK 6 MOD 0/MOD 1 ASSEMBLIES				
1	Transportable Recompression Chamber (TRC)	1	No	Yes
2	Transfer Lock (TL)	1	No	Yes
3	CAOS Oxygen Supply Rack	4	No	Yes
4	Bulk Oxygen Supply	AR**	No	Optional
INTERCONNECTING HOSE ASSEMBLIES				
1	H-201 – CAOS Oxygen Supply Rack to TRCS – 3,000 psig working pressure, 30 ft. long, 1/4 in. ID, CGA 540 fittings (53711-6768204-1)	4	No	Yes
NOTE:	H-201 is also used with a Bulk Oxygen Supply that has a CGA 540 connection and a working pressure greater than or equal to 3,000 psig. Hose assembly 6768204-2 is used with a Bulk Oxygen Supply that has a CGA 540 connection and a working pressure less than 3,000 psig. A check valve is installed in the hose assembly to protect the Bulk Oxygen Supply from overpressurization.			
2	H-203 – VTA to CCA – 275 psig working pressure, 6 ft. long, 1/2 in. ID, 1/2 in. VCO fitting (53711-6962010)	1	If VTA is used	No
3	H-406 – SCUBA Charge Hose Assembly – 3,000 psig working pressure, 6 ft. long, 1/4 in. ID, 1/4 in. VCO and NPTM fittings (53711-6962020)	1	If cylinder charging required	No
4	H-436 – ASRA to CCA – 5,000 psig working pressure, 42 ft. ± 6 in. long, 3/8 in. ID, 1/2 in. CPV fitting (53711-6962000)	2	Yes	No
5	H-436 – ASRA to Compressor – 5,000 psig working pressure, 42 ft. ± 6 in. long, 3/8 in. ID, 1/2 in. CPV fitting (53711-6962000)	1	If flask charging required	If flask charging required
6	*H-804 – ASRA to Tee Plate (2), Tee Plate to TRC (2), and Tee Plate to TL (2) – 5,000 psig working pressure, 42 ft. ± 6 in. long, 3/8 in. ID, 1/2 in. CPV fitting (53711-6962000)	6	No	Yes
7	*Air Tee Plate Assembly (53711-6962055-1)	2	No	Yes
DOCUMENTATION				
1	FADS III Air System Technical Manual	1	Yes	Yes
2	TRCS MK 6 Mod 0/Mod 1 Technical Manual	1	No	Yes
3	Applicable Compressor Manual	1	AR	AR

* Included in FADS III Air System Maintenance Kit
** AR = As required

The information in this appendix is presented as follows:

a. Para. B.2—Safety Precautions .... Page B-3
b. Para. B.3—General Description .... Page B-3
c. Para. B.4—Reference Data .... Page B-4
d. Para. B.5—Controls and Indicators .... Page B-4
e. Para. B.6—Operation .... Page B-8
f. Para. B.7—Functional Description .... Page B-8
g. Para. B.8—Scheduled Maintenance .... Page B-16
h. Para. B.9—Troubleshooting .... Page B-16
i. Para. B.10—Corrective Maintenance .... Page B-16
j. Para. B.11—Parts Lists .... Page B-16
k. Para. B.12—Installation, Deployment, and Storage .... Page B-16
l. Para. B.13—Operating and Emergency Procedures .... Page B-19

B.2 SAFETY PRECAUTIONS

Refer to the Safety Summary and Chapter 1 of this manual for general safety precautions and definitions of warnings, cautions, and notes.

B.3 GENERAL DESCRIPTION

B.3.1 FADS III AIR SYSTEM. Refer to Chapter 3 of this manual for a general description of the FADS III Air System.

B.3.2 TRCS MK 6 MOD 0/MOD 1. The TRCS consists of two pressure chambers: the Transportable Recompression Chamber (TRC) and the Transfer Lock (TL). The TRC is designed for surface decompression and recompression treatment for incidents of decompression sickness or arterial gas embolism. The TL is designed for either surface decompression or to allow transfer of personnel in and out of the TRC when it is under pressure. The TL can also be used for treatment of a second patient when the system is mated and a carbon dioxide (CO2) scrubber is installed.

The TRCS consists of the following major components:

a. **TRC Major Components**
- Control Panel
- CO2 Scrubber
- Communication System
- Built-In Breathing System (BIBS)

b. **TL Major Components**
- Control Panel
- CO2 Scrubber (if modified)
- Built-In Breathing System (BIBS)

c. **Air System:** In Configuration 2, the FADS III Air Supply Rack Assembly (ASRA) supplies both primary and secondary air for chamber pressurization, CO2 canister operation, and air BIBS for both the TRC and TL, in addition to supplying primary and secondary air to the FADS III CCA and optional VTA.

d. **Oxygen System:** The primary and secondary oxygen supplies to the BIBS in both the TRC and the TL are provided by a minimum of one stackable Chamber Air and Oxygen Supply (CAOS) high-pressure (HP) oxygen supply rack per chamber and/or by optional bulk oxygen.

Additional information concerning TRCS components is contained in the TRCS MK 6 Mod 0/ Mod 1 operation and maintenance manual (NAVY SS500-AW-MMM-010 / MARINE CORPS TM 10114A-14&P/1-1).

B.4 REFERENCE DATA

All reference data for the FADS III Air System is contained in Chapter 1 in the main body of this manual, and reference data for the TRCS is contained in the TRCS MK 6 Mod 0/Mod 1 operation and maintenance manual (NAVY SS500-AW-MMM-010 / MARINE CORPS TM 10114A-14&P/1-1).

B.5 CONTROLS AND INDICATORS

Chapter 2 of this manual presents the FADS III CCA and VTA controls and indicators that are standard for all diving operations in the four FADS III Air System configurations, and Table B-2 presents the controls and indicators for the FADS III ASRA as they relate to Configuration 2. Although the controls and indicators for Configurations 1 and 2 are basically the same and Table 2-5 is valid for all diving operations, Banks 1 and 2 are configured separately for CCA and TRCS operations in Configuration 2 and different tags are required to identify the primary air supplies to the CCA and TRCS. Table B-2 and Figure B-2 identify these differences where necessary. The controls and indicators for the TRCS equipment supporting chamber operations are presented in the TRCS operation and maintenance manual (NAVY SS500-AW-MMM-010 / MARINE CORPS TM 10114A-14&P/1-1).

Table B-2. ASRA Controls and Indicators in Configuration 2
(Refer to Figure B-2)

Index No.	Panel Label	Component	Designator	Function	Normal Operating Condition
1	**PRIMARY TO TRCS**	Tag	N/A	Identifies circuit chosen to supply primary air to TRCS	Hung on appropriate **PORT (A/B)** valve
2	**SECONDARY**	Tag	N/A	Identifies circuit chosen to supply secondary air to CCA or TRCS	Hung on **PORT C** valve (AHP-V422)
3	**PORT B**	Valve	AHP-V429	Controls primary HP air flow through **PORT B** to CCA or TRCS	OPEN (only if chosen for primary supply currently in use)
4	**PORT C**	Valve	AHP-V422	Controls secondary HP air flow through **PORT C** to CCA or TRCS	OPEN
5	**PORT A**	Valve	AHP-V443	Controls HP air flow through **PORT A** to CCA or TRCS	OPEN (only if chosen for primary supply currently in use)
6	**BANK 2 MANIFOLD**	Valve	AHP-V421	Controls primary air flow from Bank 2 flasks to the manifold delivering air to CCA or TRCS	OPEN if Bank 2 is delivering air CLOSED if off-line
7	**GAUGE STOP** (BANK 3)	Valve	AHP-V428	Controls flow of HP air to **BANK 3** gauge (AHP-G439)	OPEN
8	**BANK 3**	Gauge	AHP-G439	Indicates pressure of air in Bank 3 flasks	VARIABLE
9	**FLASK ISOLATION** (BANK 3)	Valve	AHP-V409	Controls flow of air from corresponding flask in Bank 3 to **PORT C** valve (AHP-V422)	OPEN if flask is delivering air CLOSED if off-line
10	**FLASK ISOLATION** (BANK 3)	Valve	AHP-V408	Controls flow of air from corresponding flask in Bank 3 to **PORT C** valve (AHP-V422)	OPEN if flask is delivering air CLOSED if off-line
11	**BANK 3 CHARGE**	Valve	AHP-V425	Controls flow of charging air to Bank 3 flasks	CLOSED
12	**FLASK ISOLATION** (BANK 2)	Valve	AHP-V407	Controls flow of air from corresponding flask in Bank 2 to **BANK 2 MANIFOLD** valve (AHP-V421)	OPEN if flask is delivering air CLOSED if off-line
13	**FLASK ISOLATION** (BANK 2)	Valve	AHP-V406	Controls flow of air from corresponding flask in Bank 2 to **BANK 2 MANIFOLD** valve (AHP-V421)	OPEN if flask is delivering air CLOSED if off-line
14	**BANK 2**	Gauge	AHP-G438	Indicates pressure of air in Bank 2 flasks	VARIABLE
15	**FLASK ISOLATION** (BANK 2)	Valve	AHP-V405	Controls flow of air from corresponding flask in Bank 2 to **BANK 2 MANIFOLD** valve (AHP-V421)	OPEN if flask is delivering air CLOSED if off-line

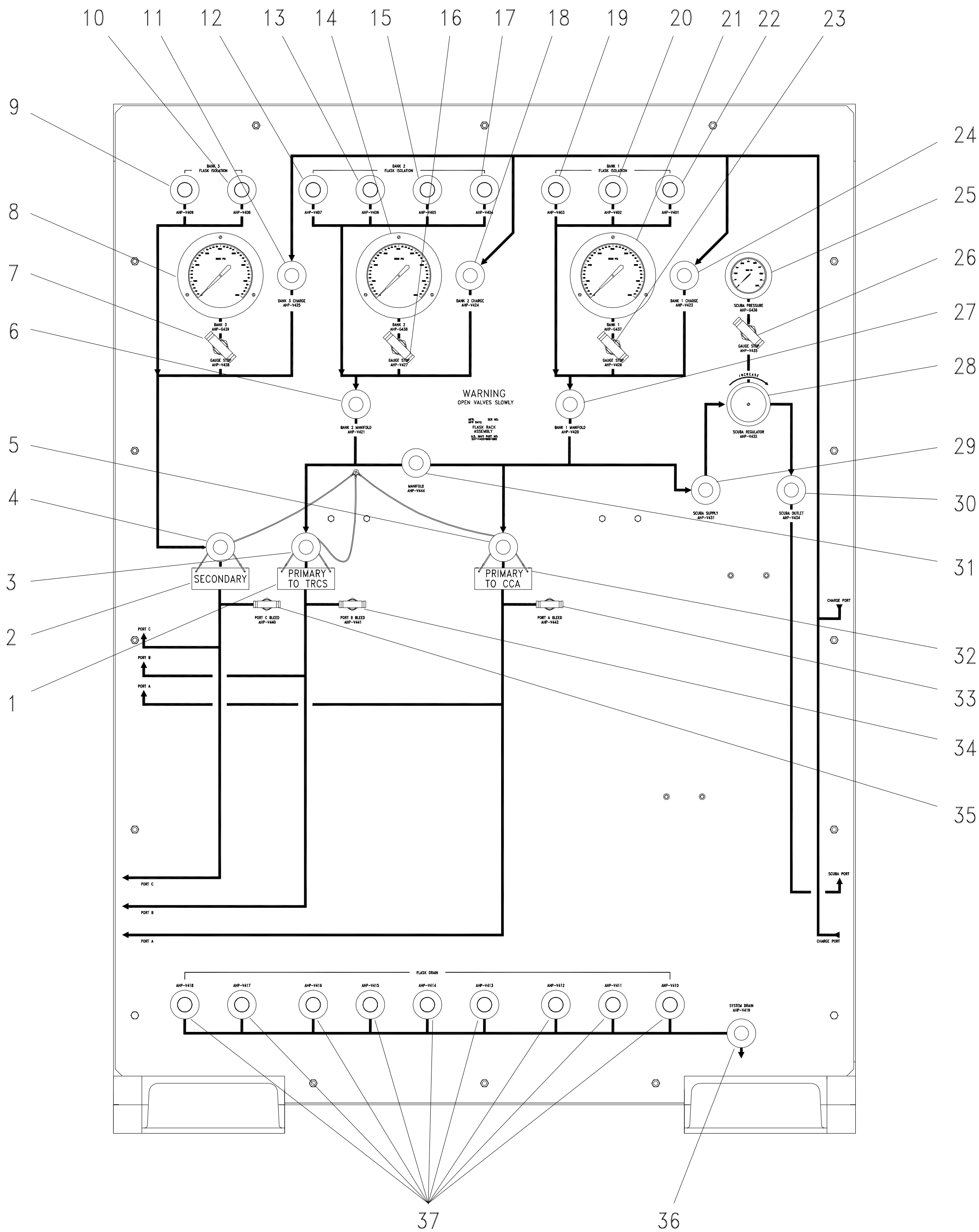


Figure B-2. ASRA Controls and Indicators in Configuration 2

Table B-2. ASRA Controls and Indicators in Configuration 2—Continued
(Refer to Figure B-2)

Index No.	Panel Label	Component	Designator	Function	Normal Operating Condition
16	**GAUGE STOP** (BANK 2)	Valve	AHP-V427	Controls flow of HP air to **BANK 2** gauge (AHP-G438)	OPEN if Bank 2 is primary and in use
17	**FLASK ISOLATION** (BANK 2)	Valve	AHP-V404	Controls flow of air from corresponding flask in Bank 2 to **BANK 2 MANIFOLD** valve (AHP-V421)	OPEN if flask is delivering air CLOSED if off-line
18	**BANK 2 CHARGE**	Valve	AHP-V424	Controls flow of charging air to Bank 2 flasks	CLOSED; OPEN if charging Bank 2
19	**FLASK ISOLATION** (BANK 1)	Valve	AHP-V403	Controls flow of air from corresponding flask in Bank 1 to **BANK 1 MANIFOLD** valve (AHP-V420)	OPEN if flask is delivering air CLOSED if off-line
20	**FLASK ISOLATION** (BANK 1)	Valve	AHP-V402	Controls flow of air from corresponding flask in Bank 1 to **BANK 1 MANIFOLD** valve (AHP-V420)	OPEN if flask is delivering air CLOSED if off-line
21	**BANK 1**	Gauge	AHP-G437	Indicates pressure of air in Bank 1 flasks	VARIABLE
22	**FLASK ISOLATION** (BANK 1)	Valve	AHP-V401	Controls flow of air from corresponding flask in Bank 1 to **BANK 1 MANIFOLD** valve (AHP-V420)	OPEN if flask is delivering air CLOSED if off-line
23	**GAUGE STOP** (BANK 1)	Valve	AHP-V426	Controls flow of HP air to **BANK 1** gauge (AHP-G437)	OPEN if Bank 1 is primary and in use
24	**BANK 1 CHARGE**	Valve	AHP-V423	Controls flow of charging air to Bank 1 flasks	CLOSED; OPEN if charging Bank 1
25	**SCUBA PRESSURE**	Gauge	AHP-G436	Indicates pressure of air flowing to **SCUBA PORT**	VARIABLE when charging SCUBA cylinders
26	**GAUGE STOP** (SCUBA)	Valve	AHP-V435	Controls flow of HP air to **SCUBA PRESSURE** gauge (AHP-G436)	CLOSED; OPEN when charging SCUBA cylinders
27	**BANK 1 MANIFOLD**	Valve	AHP-V420	Controls primary air flow from Bank 1 flasks to the manifold delivering air to CCA or TRCS	OPEN if Bank 1 is delivering air CLOSED if off-line
28	**SCUBA REGULATOR**	Valve	AHP-V432	Reduces 5,000 psi air to SCUBA charge pressure	CLOSED; VARIABLE when charging SCUBA cylinders
29	**SCUBA SUPPLY**	Valve	AHP-V431	Controls flow of HP air to **SCUBA REGULATOR** valve (AHP-V432)	CLOSED; OPEN when charging SCUBA cylinders

Table B-2. ASRA Controls and Indicators in Configuration 2—Continued
(Refer to Figure B-2)

Index No.	Panel Label	Component	Designator	Function	Normal Operating Condition
30	**SCUBA OUTLET**	Valve	AHP-V434	Controls flow of HP air to **SCUBA PORT**	CLOSED; OPEN when charging SCUBA cylinders
31	**MANIFOLD** (BANKS 1&2)	Valve	AHP-V444	If open, allows air from both Banks 1 and 2 to flow to manifold(s) delivering air to the CCA	ALWAYS CLOSED IN CONFIGURATION 2
32	**PRIMARY TO CCA**	Tag	N/A	Identifies circuit chosen to supply primary air to CCA	Hung on appropriate **PORT (A/B)** valve
33	**PORT A BLEED**	Valve	AHP-V442	Controls depressurization of **PORT A**	CLOSED
34	**PORT B BLEED**	Valve	AHP-V441	Controls depressurization of **PORT B**	CLOSED
35	**PORT C BLEED**	Valve	AHP-V440	Controls depressurization of **PORT C**	CLOSED
36	**SYSTEM DRAIN**	Valve	AHP-V419	Back-up valve for **FLASK DRAIN** valves	CLOSED
37	**FLASK DRAIN**	Valve	AHP-V410 thru AHP-V418	Flask condensate drain valve	CLOSED

B.6 OPERATION

Refer to paragraph B.13 in this appendix for the operating and emergency procedures to be used during Configuration 2 operations.

B.7 FUNCTIONAL DESCRIPTION

The FADS III Air System's main function in Configuration 2 is to support surface-supplied air diving operations taking two working divers and one standby diver to a maximum depth of 190 fsw, while at the same time supporting the TRCS for surface decompression and recompression treatment for incidents of decompression sickness or arterial gas embolism. Since Chapter 3 of this manual presents a comprehensive functional description of the FADS III Air System components, this section will be dedicated to the primary and secondary air flow paths between the FADS III ASRA and the CCA or TRCS. For a functional description of the TRCS and its internal air flow paths, refer to the TRCS operation and maintenance manual (NAVY SS500-AW-MMM-010 / MARINE CORPS TM 10114A-14&P/1-1).

B.7.1 PRIMARY AND SECONDARY AIR FLOW – DIVING WITH TRCS SUPPORT. In this configuration, Banks 1 and 2 are always configured separately for the primary air supply with one bank supporting the CCA/divers and the other supporting the TRCS. This configuration makes simultaneous operations possible in cases where a diver is still at depth and immediate treatment in the TRCS needs to begin on another diver. The following paragraphs present a typical scenario for diving the FADS III Air System with TRCS support and trace the flow of primary and secondary breathing air from source to end user.

B.7.1.1 Predive Planning Procedure. The following procedure outlines the steps necessary to make bank and port selections for the FADS III ASRA and CCA in Configuration 2. The procedure parallels the process outlined on the Configuration 2 Status Sheet in Figure B-6, which accompanies the Operating Procedures (OPs) located at the end of this appendix.

a. **Make ASRA primary bank and port selections:** Since the CCA and the TRCS each need their own primary air supply, Banks 1 and 2 must be configured separately. This means that ***MANIFOLD*** valve (AHP-V444) is always closed in Configuration 2. This in turn forces Bank 1 to always use Port A and Bank 2 to always use Port B to deliver primary air. Therefore, if Bank 1 and Port A are selected to deliver primary air to the TRCS, then Bank 2 and Port B will deliver primary air to the CCA, or vice versa. Make the appropriate determination and record it on the status sheet in Figure B-6.

b. **Assign port connections to the CCA and TRCS:** There are two sets of ports used for hose connections on the ASRA (as shown in Figure B-3). The lower set is installed vertically and the upper set horizontally. Each set contains a ***PORT A-HP*** (Figure B-3, 1), a ***PORT B-HP*** (2), and a ***PORT C-HP*** (3). Determine which set will be assigned to the CCA and which will be assigned to the TRCS. Record the results on the status sheet in Figure B-6.

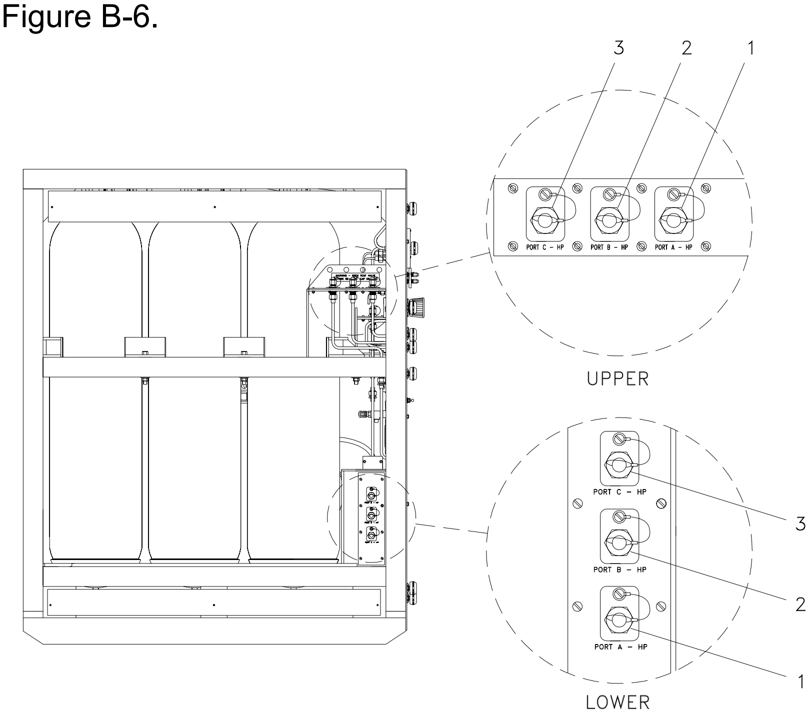


Figure B-3. ASRA Interface Ports

c. **Make ASRA secondary port selections:** Bank 3 and Port C are always reserved for the secondary air supply, regardless of the configuration. In Configuration 2, assignments must be made for the CCA and TRCS. If an upper port has been assigned to the CCA in Step a, then upper Port C should be reserved for the CCA secondary hose connection, and the lower Port C for the TRCS secondary hose connection. Record the selections on the status sheet in Figure B-6.

d. **Make CCA port selections:** Determine which supply port will receive primary air from the ASRA and which will receive secondary air. If the A Supply is designated as primary, then the B Supply will be secondary, or vice versa. Make the determination and record on the status sheet in Figure B-6.

e. **Determine minimum air pressure:** The Diving Supervisor is responsible for calculating the air requirements for each dive to ensure the required air is available. The minimum air pressure required for each bank shall be recorded on the status sheet in Figure B-6.

B.7.1.2 Sample Scenario for Configuration 2 Operations. Using the guidance in paragraph B.7.1.1, the following selections have been made for the sample scenario upon which the primary and secondary air flow paths in paragraphs B.7.1.3 and B.7.1.4 are based:

a. **ASRA Bank 1 –** Primary to CCA using lower Port A

b. **ASRA Bank 2 –** Primary to TRCS using upper Port B

c. **ASRA Bank 3 –** Secondary to TRCS using upper Port C

d. **ASRA Bank 3 –** Secondary to CCA using lower Port C

e. **ASRA *PORT A* Valve (AHP-V443) –** Tagged with PRIMARY to CCA tag.

f. **ASRA *PORT B* Valve (AHP-V429) –** Tagged with PRIMARY to TRCS tag.

g. **ASRA *PORT C* Valve (AHP-V422) –** Tagged with SECONDARY tag.

h. **CCA *A REGULATOR* (AHP-V303) –** Tagged with SECONDARY tag.

i. **CCA *B REGULATOR* (AHP-V304) –** Tagged with PRIMARY tag.

j. **VTA –** The Diving Supervisor has opted not to use the VTA.

k. **Hose Connections –** The following hose connections have been made in accordance with the selections in a – j:

<u>To CCA and Divers</u>

- Primary H-436 from ASRA's lower Port A to CCA's ***B SUPPLY*** port
- Secondary H-436 from ASRA's lower Port C to CCA's ***A SUPPLY*** port
- Umbilical hoses from CCA to divers

<u>To TRCS</u>

- Primary H-804 from ASRA's upper Port B to tee plate assembly
- Primary H-804 from tee plate assembly to TRC panel port (AHP-C-1)
- Primary H-804 from tee plate assembly to TL panel port (AHP-C-3)
- Secondary H-804 from ASRA's upper Port C to tee plate assembly
- Secondary H-804 from tee plate assembly to TRC panel port (AHP-C-2)
- Secondary H-804 from tee plate assembly to TL panel port (AHP-C-4)

NOTE

Hose connections will differ depending on bank and port selections.

If VTA is used, H-203 will be connected between the VTA and the CCA.

B.7.1.3 <u>Primary Air Flow for Diving with TRCS Support</u> . The following steps outline the flow of primary air to the CCA, TRC, and TL, and correspond to the air flow paths shown in Figure B-4.

a. **<u>Primary Air Flow to CCA</u>:**

(1) High-pressure air flows from the three flasks in Bank 1 through ***FLASK ISOLATION*** valves (AHP-V401, -V402, -V403) via interconnecting hose assemblies to ***BANK 1 MANIFOLD*** valve (AHP-V420).

(2) The air from AHP-V420 flows through ***PORT A*** valve (AHP-V443) to lower ***PORT A***, where it enters primary air hose assembly (H-436).

(3) High-pressure air flows through H-436 to the rear panel of the CCA, enters the ***B SUPPLY*** port, and flows through ***B SUPPLY*** valve (AHP-V302) to ***B REGULATOR*** valve (AHP-V304) where it is regulated to a lower pressure determined by the Diving Supervisor. The pressure of the air entering AHP-V304 is measured by ***B SUPPLY*** gauge (AHP-G326), which may be isolated using ***GAUGE STOP*** valve (AHP-V306).

(4) The low-pressure (LP) air leaving AHP-V304 flows to ***MANIFOLD SUPPLY*** valve (ALP-V312). The pressure of the air is measured by ***MANIFOLD PRESSURE*** gauge (ALP-G324), which may be isolated using ***GAUGE STOP*** valve (ALP-V308). If the pressure exceeds 300 psi, the excess pressure is vented through relief valve (ALP-V310).

(5) The LP air from ALP-V312 flows to a manifold for use by the ***RED SUPPLY***, ***GREEN SUPPLY,*** and ***YELLOW SUPPLY*** valves (ALP-V316, -V315, -V314) and the three ***PNEUMO*** valves (ALP-V319, -V318, -V317). Air from the supply valves is delivered to the divers' Underwater Breathing Apparatuses (UBAs) through their respective umbilical assemblies. Air is used by the pneumofathometer valves and hoses only during depth checks. The depth of each diver is indicated on the corresponding ***RED DIVER***, ***GREEN DIVER***, or ***YELLOW DIVER*** depth gauge (ALP-G322, -G321, -G320, respectively).

NOTE

Air in the manifold is also available to ***VOLUME TANK*** valve (ALP-V313); however, since the Diving Supervisor opted not to use the VTA, the valve is closed and that path is blocked.

b. **Primary Air Flow to TRC and TL:**

(1) High pressure air flows from the four flasks in Bank 2 through ***FLASK ISOLATION*** valves (AHP-V404, -V405, -V406, -V407) via interconnecting hose assemblies to ***BANK 2 MANIFOLD*** valve (AHP-V421).

(2) The air from AHP-V421 flows through ***PORT B*** valve (AHP-V429) to upper ***PORT B***, where it enters primary air hose assembly (H-804).

(3) Air flows through H-804 to a tee plate assembly and two other hose assemblies (also designated H-804) to AHP-C-1 on the TRC panel and AHP-C-3 on the TL panel. Once inside the TRCS, the air flow follows the paths described in Chapter 2 of the TRCS MK 6 Mod 0/Mod 1 technical manual (NAVY SS500-AW-MMM-010 / MARINE CORPS TM 10114A-14&P/1-1).

B.7.1.4 Secondary Air Flow for Diving with TRCS Support. Although Bank 3 serves as the secondary air supply to both the divers and the TRCS, it will normally not be necessary to supply secondary air to both operations at the same time. In the unlikely event that diving and chamber operations are both being conducted off Bank 3, it will be imperative that the Diving Supervisor monitor and manage air requirements accordingly. The procedures for switching from primary air to secondary air are outlined below:

- For failure of the primary air supply to the divers: If the primary air supply pressure drops below minimum manifold pressure, close CCA primary ***MANIFOLD SUPPLY*** valve (in this case, ALP-V312), open CCA secondary ***MANIFOLD SUPPLY*** valve (in this case, ALP-V311), and notify the divers.

- For failure of the primary air supply to the TRCS: If the primary air supply pressure drops below acceptable levels, switch the TRCS to the secondary supply by following the procedures in TRCS EP-6, *Loss of TRC Primary Air Supply*, and TRCS EP-7, *Loss of TL Primary Air Supply*.

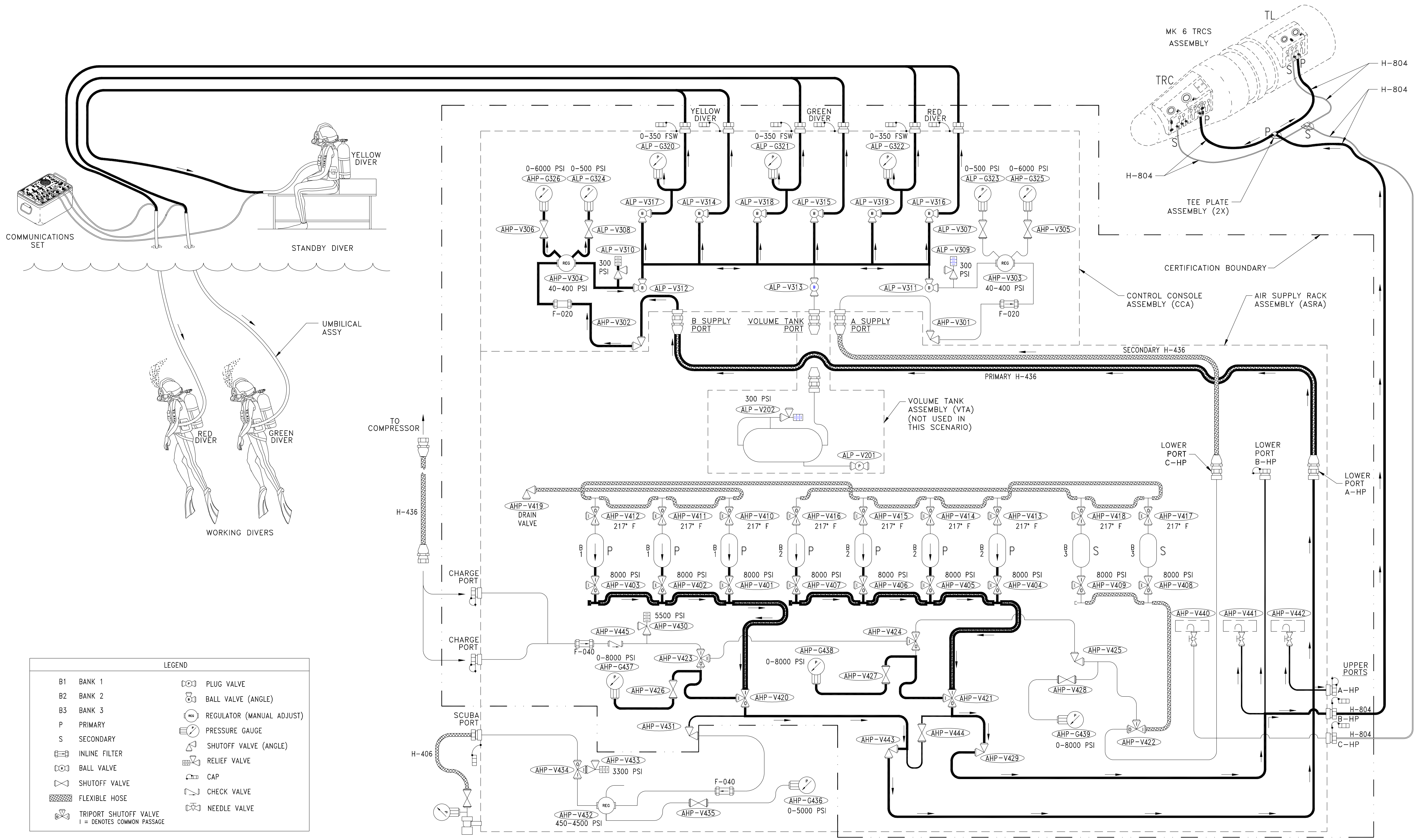


Figure B-4. Primary Air Flow Paths for Configuration 2: Diving the FADS III Air System with TRCS Support

THIS PAGE INTENTIONALLY LEFT BLANK

The following steps trace the path of the secondary air supply for Configuration 2 (see also Figure B-5):

a. High pressure air flows from the two flasks in Bank 3 through ***FLASK ISOLATION*** valves (AHP-V408 and AHP-V409) via interconnecting hose assemblies to ***PORT C*** valve (AHP-V422).

b. Air leaving AHP-V422 flows to ***PORT C BLEED*** valve (AHP-V440) and both upper and lower ***PORT C.*** The path of secondary air going through the lower port is traced in the *Secondary Air Flow to CCA* section and the path of secondary air going through the upper port is traced in the *Secondary Air Flow to TRC and TL* section.

c. **Secondary Air Flow to CCA:**

(1) High-pressure air flows through lower ***PORT C*** and enters secondary air hose assembly (H-436).

(2) High-pressure air flows through H-436 to the rear panel of the CCA, enters the ***A SUPPLY*** port, and flows through ***A SUPPLY*** valve (AHP-V301) and in-line filter (F-020) to ***A REGULATOR*** valve (AHP-V303) where it is regulated to a lower pressure determined by the Diving Supervisor. The pressure of the air entering AHP-V303 is measured by ***A SUPPLY*** gauge (AHP-G325), which may be isolated using ***GAUGE STOP*** valve (AHP-V305).

(3) The LP air leaving AHP-V303 flows to ***MANIFOLD SUPPLY*** valve (ALP-V311), which was opened upon failure of the primary air supply. The pressure of the air is measured by ***MANIFOLD PRESSURE*** gauge (ALP-G323), which may be isolated using ***GAUGE STOP*** valve (ALP-V307). If the pressure exceeds 300 psi, the excess pressure is vented through relief valve (ALP-V309).

(4) The LP air from ALP-V311 flows to the divers' manifold, which functions as described in paragraph B.7.1.3, step a(5).

NOTE

Air in the manifold is also available to ***VOLUME TANK*** valve (ALP-V313); however, since the Diving Supervisor opted not to use the VTA, the valve is closed and that path is blocked.

d. **Secondary Air Flow to TRC and TL:**

(1) High-pressure air flows through upper ***PORT C*** and enters secondary air hose assembly (H-804).

(2) Air flows through H-804 to a tee plate assembly and two other hose assemblies (also designated H-804) to AHP-C-2 on the TRC panel and AHP-C-4 on the TL panel. Once inside the TRCS, the air flow follows the paths described in Chapter 2 of the TRCS MK 6 Mod 0/Mod 1 technical manual (NAVY SS500-AW-MMM-010 / MARINE CORPS TM 10114A-14&P/1-1).

B.8 SCHEDULED MAINTENANCE

Scheduled maintenance for Configuration 2 components is covered in Chapter 4 of this manual and also in Chapter 4 of the TRCS operation and maintenance manual.

B.9 TROUBLESHOOTING

Troubleshooting analysis is covered in Chapter 5 of this manual and also in Chapter 5 of the TRCS operation and maintenance manual.

B.10 CORRECTIVE MAINTENANCE

Corrective maintenance actions are covered in Chapter 6 of this manual and also in Chapter 6 of the TRCS operation and maintenance manual. The only component not identified in either manual is HP air hose assembly (H-804). However, since it is identical in design to hose assembly H-436, the corrective maintenance procedure presented in Paragraph 6.8.4.4 of this manual can be used for H-804 also.

B.11 PARTS LISTS

Parts lists for the FADS III Air System are presented in Chapter 6 and referenced in a maintenance index in Chapter 7 of this manual. Parts lists for the TRCS are presented in Chapter 7 and Appendix G of the TRCS operation and maintenance manual.

B.12 INSTALLATION, DEPLOYMENT, AND STORAGE

Installation, deployment, and storage information is provided in Chapter 8 of this manual and also in Chapter 8 of the TRCS operation and maintenance manual.

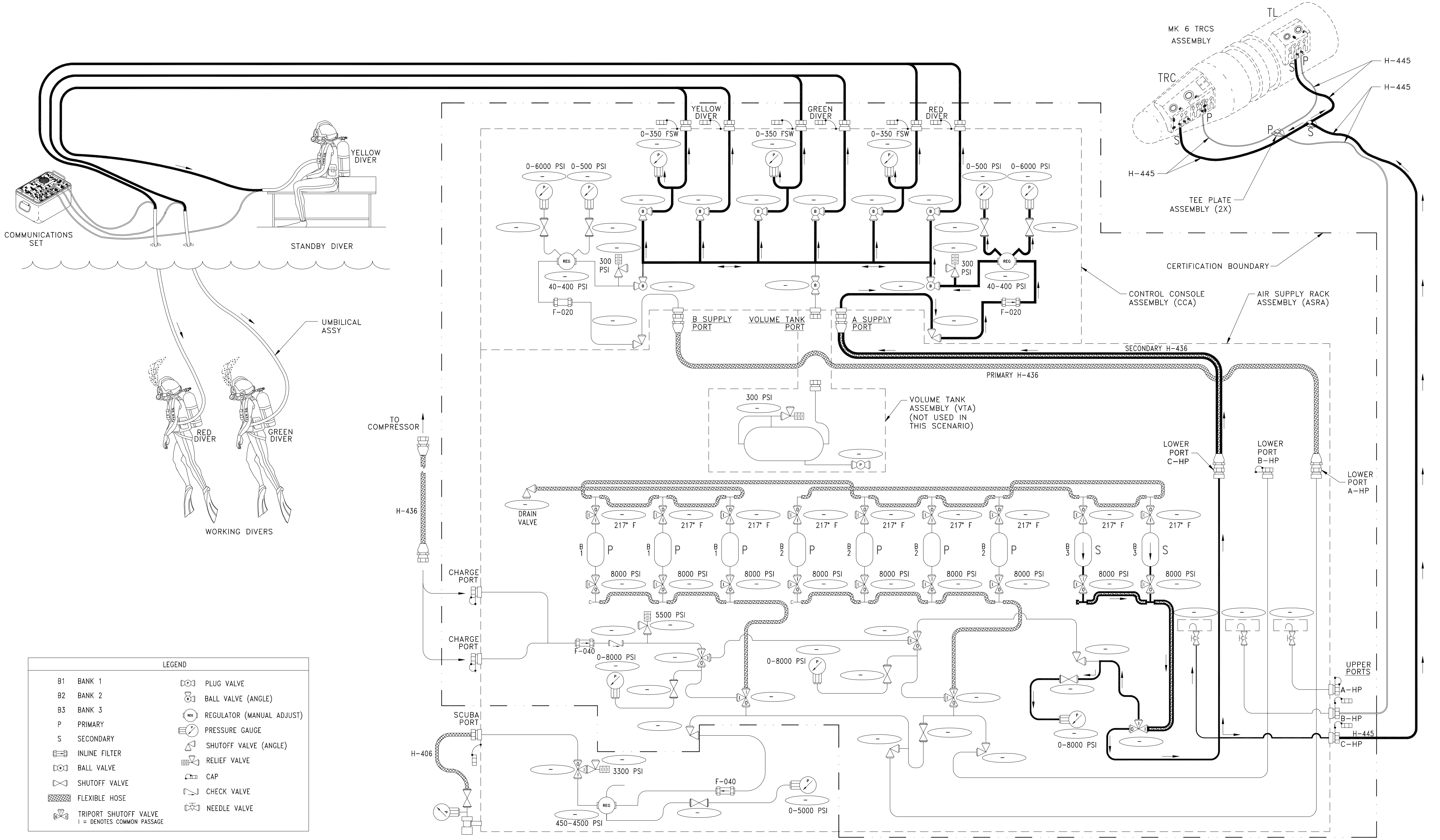


Figure B-5. Secondary Air Flow Paths for Configuration 2: Diving the FADS III Air System with TRCS Support

THIS PAGE INTENTIONALLY LEFT BLANK

B.13 OPERATING AND EMERGENCY PROCEDURES

B.13.1 INTRODUCTION. Efficient operations in Configuration 2 require the use of Operating Procedures (OPs) and Emergency Procedures (EPs) from both the FADS III Air System and the TRCS MK 6 Mod 0 / Mod 1 operation and maintenance manuals. The OPs and EPs are provided in reproducible checklist form and must be pulled from several locations as indicated in Table B-3 and the note that follows the table. Note that C2 before a specific procedure number indicates that the OP is dedicated to Configuration 2 and is located in this appendix. C1 before a specific procedure number indicates that the procedure is located in Appendix A of this manual, which contains the procedures for Configuration 1. However, by referencing a C1 procedure here, it becomes common to both configurations.

Table B-3 provides an index identifying each procedure in Appendix B by its number, title, and location, and referencing the Configuration 1 procedures in Appendix A that are common to both configurations.

Table B-3. Index of Configuration 2 Procedures

Procedure No.	Title	Page No.
*C2 / OP-1	Premission Procedures	B-25
*C2 / OP-2	FADS III Predive Start-Up Procedures	B-33
*C2 / OP-2M	FADS III Modified Predive Start-Up Procedures	B-39
*C2 / OP-3A	TRC Predive Start-Up Procedures	B-43
*C2 / OP-3B	TL Predive Start-Up Procedures	B-55
*C2 / OP-3M	TRC & TL Modified Predive Start-Up Procedures	B-65
*C2 / OP-4	Shutdown Procedures	B-71
*C2 / OP-4M	Modified Shutdown Procedures	B-79
**C1 / OP-5	HP Air Flask Charging Procedures for Bank 1, 2, or 3 with ASRA On-Line	A-33
**C1 / OP-6	HP Air Flask Charging Procedures with ASRA Off-Line	A-39
**C1 / OP-7	SCUBA Cylinder Charging Procedures	A-45
*C2 / OP-8	Postmission Procedures	B-83
**C1 / EP-1	Emergency Procedure: Loss of Primary Air to Divers	A-49

*C2 = Configuration 2 procedures (provided in this appendix)
**C1 = Configuration 1 procedures common to both C1 and C2 (see Appendix A)

NOTE

The following TRCS OPs and EPs will be utilized as required in the Configuration 2 procedures. Refer to Appendix A of the TRCS technical manual for the OPs and to Appendix B of the same manual for the EPs.

OP-3	TRC Operation
OP-3A	TL Operation
OP-4	TL Mating to TRC and TL Operation
OP-7	Charging HP Oxygen Flasks
EP-1	Rapid Loss of Chamber Pressure
EP-2	Increase in Chamber Pressure
EP-3	Contaminated Atmosphere
EP-4	Fire in TRCS
EP-5	Loss of Oxygen in TRCS
EP-6	Loss of TRC Primary Air Supply
EP-7	Loss of TL Primary Air Supply

B.13.2 USING THE CHECKLISTS AND RELATED DOCUMENTS. This section contains instructions for using the status sheet, the flow chart of operations, and the nine reproducible OP checklists included in this appendix.

B.13.2.1 Status Sheet. The reproducible status sheet in Figure B-6 provides a central location for designating the banks and ports to be utilized during system line-up with the OPs, and provides a snapshot of the dive system's line-up condition during diving operations. The status sheet may be filled out prior to premission setup and signed by the Diving Supervisor. Once established, a status sheet may continue to be used for successive dives as long as the designations do not change. If changes are required, the current status sheet should be updated or a new one prepared.

Guidance for selecting banks and ports on the FADS III ASRA and the CCA is provided on the status sheet in Figure B-6 and also in paragraph B.7.1.1 of this appendix.

B.13.2.2 Flow Chart of Operations. The flow chart in Figure B-7 provides visual guidance for help in determining which OPs to perform and the order of their performance. If additional assistance is required, refer to Note 1 of the OP(s) in question.

B.13.2.3 OP Checklists. The checklists in this appendix are designed to be reproduced for use in the performance of the operating procedures. The following information covers the elements of each checklist and indicates what type of action, if any, is required:

a. **Signature block (located on checklist cover sheet):** Operators/checkers print and sign names and enter date checklist is completed. Diving Supervisor signs and dates checklist to verify that all actions have been performed and all deficiencies and problems have been noted.

CONFIGURATON 2
STATUS SHEET

1. <u>MAKE ASRA PRIMARY BANK AND PORT SELECTIONS</u>

When the TRCS is used, Banks 1 and 2 must be aligned separately to Ports A and B, respectively. Assign each bank as primary to TRCS or CCA and circle the appropriate label for each. Also circle whether the upper or lower port is being used.

BANK 1:	Primary to TRCS	Primary to CCA	(using)	Upper	/	Lower	**PORT A**
BANK 2:	Primary to TRCS	Primary to CCA	(using)	Upper	/	Lower	**PORT B**

2. <u>MAKE ASRA SECONDARY PORT SELECTIONS</u>

In Configuration 2, Bank 3 and Port C are reserved to supply secondary air to the TRCS and the CCA. Circle whether the upper or lower port is being used for each operation.

BANK 3:	Secondary to TRCS	(using)	Upper	/	Lower	**PORT C**
	Secondary to CCA	(using)	Upper	/	Lower	**PORT C**

3. <u>MAKE CCA PORT SELECTIONS</u>

Circle appropriate label for each supply.

A Supply:	Primary	Secondary
B Supply:	Primary	Secondary

Diving Supervisor:

- **Identify the maximum allowed inlet pressure to TRCS: 3,000 psig / 5,000 psig**
  (circle one)
- **Determine the minimum air pressure allowed in banks to ensure required air is available for planned dives, and record below:**

Minimum Air Pressure Allowed: ASRA Bank 1 AHP-G437 __________ psig

ASRA Bank 2 AHP-G438 __________ psig

ASRA Bank 3 AHP-G439 __________ psig

Diving Supervisor ____ Date ___________
Printed name and signature

Figure B-6. Configuration 2 Status Sheet

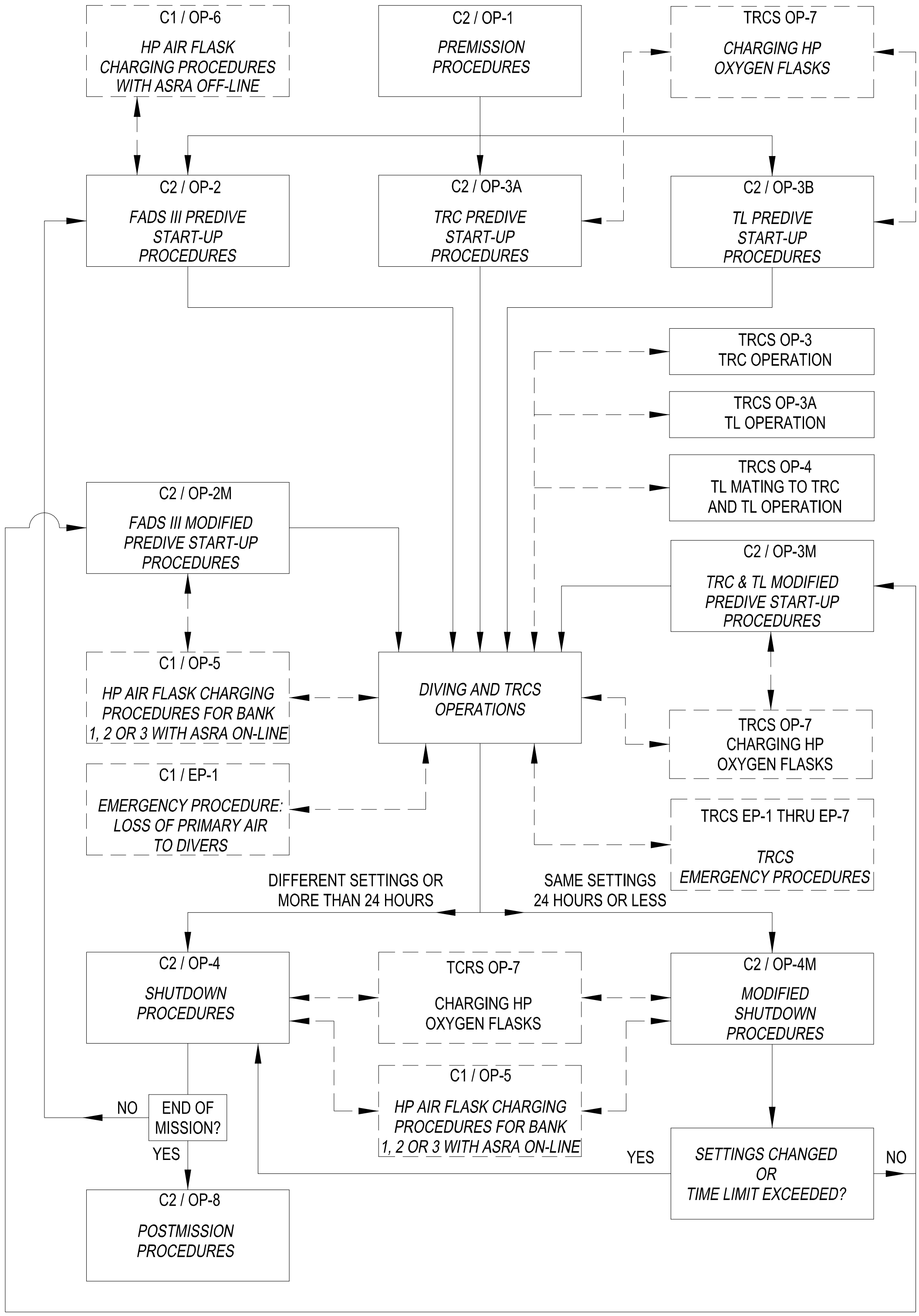


Figure B-7. Flow Chart of Operations for Configuration 2: Diving the FADS III Air System with TRCS Support

b. **NOTE 1:** Contains pertinent information about the OP.

c. **NOTE 2:** Contains a reminder to record notes and deficiencies in the REMARKS section at the end of each OP.

d. **ITEM:** Contains the numerical identifier for each item.

e. **COMPONENT:** Contains the nomenclature of the component(s) involved in each item. If a choice of components is given, circle the appropriate component(s).

f. **DESCRIPTION:** Contains valve, gauge, and hose numbers (if applicable) of the component(s) involved and any other information that may be helpful. If a choice of components is given, circle the appropriate component(s).

g. **PROCEDURE:** Contains a brief description of actions to be performed by the appropriate personnel.

h. **LOCATION:** Contains the name of assembly/assemblies involved.

i. **CHECK:** The operator initials this column as each item is completed. If the item does not apply, the operator enters N/A (not applicable).

j. **NOTE:** The operator places a check mark in this column to indicate that a note has been included in the REMARKS section at the end of the procedure.

k. **REMARKS (last page of OP):** The operator uses this section to document any deficiencies or problems found during performance of a particular item. The operator should begin each note with the item number involved.

WARNING

Use of Transportable Recompression Chamber Systems (TRCSs) that have not been upgraded to 5000 psig service may result in equipment damage and personnel injury or death. TRCSs that do not have 5000 psig upgrade may be utilized only when selected supply bank pressure is reduced to 3000 psig.

B.13.3 <u>CONFIGURATION 2 OPERATING PROCEDURES</u>. The remainder of this appendix is dedicated to the nine OP checklists that shall be used when diving the FADS III Air System with TRCS Support.

THIS PAGE INTENTIONALLY LEFT BLANK

FADS III AIR SYSTEM
CONFIGURATION 2 / OP-1

PREMISSION PROCEDURES
FOR DIVING THE FADS III AIR SYSTEM
WITH TRCS SUPPORT

REVISED 14 MARCH 2008

SPECIAL INSTRUCTIONS

1. Ensure this OP is valid by comparing the revision date above with the master file.
2. Check each item individually.
3. Sign and date below when OP has been completed.
4. Report any discrepancy to the Diving Supervisor.

Operator No. 1 ______________________________ Date ____________
Printed name and signature

Operator No. 2 ______________________________ Date ____________
Printed name and signature

Diving Supervisor ______________________________ Date ____________
Printed name and signature

FADS III AIR SYSTEM CONFIGURATION 2 / OP-1

PREMISSION PROCEDURES
FOR DIVING THE FADS III AIR SYSTEM WITH TRCS SUPPORT

NOTE 1: Premission setup involves physical placement and inspection of the equipment, installation of the air interface hoses, and alignment of the TRCS valves prior to a mission.

NOTE 2: Record notes and deficiencies in section provided at the end of this operating procedure.

NOTE 3: When the TRCS is used, ASRA Banks 1 and 2 must be aligned to Ports A and B separately. Complete the following using Configuration 2 Status Sheet (Figure B-6).

<u>ASRA Primary Bank and Port Selections</u>

Designate which bank has been chosen as primary to TRCS and which has been chosen as primary to CCA by circling the appropriate label. Also circle whether the upper or lower port is being used.

BANK 1:	Primary to TRCS	Primary to CCA	(using)	Upper	/	Lower	**PORT A**
BANK 2:	Primary to TRCS	Primary to CCA	(using)	Upper	/	Lower	**PORT B**

<u>ASRA Secondary Port Selections</u>

Circle whether the upper or lower port is being used for each operation.

BANK 3:	Secondary to TRCS	(using)	Upper	/	Lower	**PORT C**
	Secondary to CCA	(using)	Upper	/	Lower	**PORT C**

<u>CCA Port Selections</u>

Designate which port on the CCA has been chosen as primary and which has been chosen as secondary by circling the appropriate label.

A Supply:	Primary	Secondary
B Supply:	Primary	Secondary

ITEM	COMPONENT	DESCRIPTION	PROCEDURE	LOCATION	CHECK	NOTE
WARNING: **All FADS III Air System equipment must be positioned and secured before operation as movement during operation could result in equipment damage and injury or death to personnel.**						
POSITION ASSEMBLIES						
1	ASRA CCA VTA (if used) HPAC TRCS	Position all assemblies within reach of interface hoses (40 feet maximum).		ASRA CCA VTA HPAC TRCS		

FADS III AIR SYSTEM CONFIGURATION 2 / OP-1 *Page 2 of 7*

PREMISSION PROCEDURES FOR DIVING THE FADS III AIR SYSTEM WITH TRCS SUPPORT—Continued

ITEM	COMPONENT	DESCRIPTION	PROCEDURE	LOCATION	CHECK	NOTE
2	ASRA CCA VTA (if used) HPAC TRCS	Secure equipment in place.		ASRA CCA VTA HPAC TRCS		
SET UP CCA AND VTA						
3	CCA Lid and Stowed Legs	Remove lid from CCA case. Remove the two stowed legs from lid.		CCA		
4	CCA External Door	Open external door on bottom of CCA case by loosening the five captive screws.		CCA		
WARNING: **Blowout plug must be removed before pressurization of CCA to allow operation of relief valves. Failure to remove blowout plug can result in equipment damage or injury or death to personnel.**						
5	CCA Blowout Plug	Remove blowout plug from back of CCA.		CCA		
6	CCA	Inspect CCA for damage.		CCA		
7	VTA	Inspect VTA (if used) for damage.		VTA		
8	CCA/VTA	Set CCA on top of VTA frame (or suitable structure) such that console is at ~60º angle and the two rubber feet on CCA case fit in the two holes in VTA frame (if utilized). Secure in place.		CCA/VTA		
SET UP ASRA						
9	ASRA Doors	Open.		ASRA		
10	ASRA	Inspect system for damage.		ASRA		
WARNING: **PRIMARY and SECONDARY tags must be affixed to ASRA PORT A, PORT B, and PORT C valve handles and to CCA A REGULATOR and B REGULATOR. Removal or swapping of tags can result in injury or death.**						
11	Port A Valve	AHP-V443	Tag with PRIMARY TO CCA or TRCS tag according to dive plan.	ASRA		
12	Port B Valve	AHP-V429	Tag with PRIMARY TO CCA or TRCS tag according to dive plan.	ASRA		
13	Port C Valve	AHP-V422	Tag with SECONDARY tag.	ASRA		
14	A Regulator	AHP-V303	Tag with PRIMARY or SECONDARY tag according to dive plan.	CCA		

FADS III AIR SYSTEM CONFIGURATION 2 / OP-1

PREMISSION PROCEDURES
FOR DIVING THE FADS III AIR SYSTEM WITH TRCS SUPPORT—Continued

ITEM	COMPONENT	DESCRIPTION	PROCEDURE	LOCATION	CHECK	NOTE
15	B Regulator	AHP-V304	Tag with PRIMARY or SECONDARY tag according to dive plan.	CCA		
16	Gauge Stop Valves	AHP-V426 AHP-V427 AHP-V428	Open.	ASRA		
17	ASRA Valves and Regulators	Ensure that all remaining ASRA valves are closed and all regulators are backed off fully CCW.		ASRA		
WARNING: **Failure to connect hose assembly strain relief can cause personnel injury or death should the hose separate or burst.** WARNING: **Ports A, B, and C on the ASRA must be depressurized whenever a port cap or hose is removed from a port connector. Removal of a port cap or hose when supply piping is pressurized can result in injury or death.** WARNING: **Fitting threads and O-rings must be inspected for damage and fittings must be properly tightened to ensure seating of O-rings. Fittings and O-rings that are not properly installed can allow HP air to escape and result in injury or death.**						
18	Primary HP Air Hose Assembly	H-436	Remove from ASRA door. Inspect for cuts and abrasions.	ASRA		
CONNECT PRIMARY HP AIR SUPPLY HOSE FROM ASRA TO CCA						
19	Port A or Port B Bleed Valve	AHP-V442 -or- AHP-V441	Open, allow pressure to bleed off, and close.	ASRA		
20	Primary HP Air Hose Assembly	H-436	Connect hose to designated port and tighten 3/8 to 1/2 turn after O-ring engagement. Connect strain relief.	ASRA Upper A B Lower A B (Circle designated port)		
21	Primary HP Air Hose Assembly	H-436	Connect hose to designated port and tighten 3/8 to 1/2 turn after O-ring engagement. Connect strain relief.	CCA A or B (Circle designated port)		

FADS III AIR SYSTEM CONFIGURATION 2 / OP-1 *Page 4 of 7*

PREMISSION PROCEDURES
FOR DIVING THE FADS III AIR SYSTEM WITH TRCS SUPPORT—Continued

ITEM	COMPONENT	DESCRIPTION	PROCEDURE	LOCATION	CHECK	NOTE
CONNECT SECONDARY HP AIR SUPPLY HOSE FROM ASRA TO CCA						
22	Secondary HP Air Hose Assy	H-436	Remove from ASRA door. Inspect for cuts and abrasions.	ASRA		
23	Port C Bleed Valve	AHP-V440	Open, allow pressure to bleed off, and close.	ASRA		
24	Secondary HP Air Hose Assy	H-436	Connect hose to PORT C and tighten 3/8 to 1/2 turn after O-ring engagement. Connect strain relief.	ASRA Lower Port C Upper Port C (Circle designated port)		
25	Secondary HP Air Hose Assy	H-436	Connect hose to designated port and tighten 3/8 to 1/2 turn after O-ring engagement. Connect strain relief.	CCA A or B (Circle designated port)		
CONNECT LP AIR SUPPLY HOSE FROM VTA TO CCA (IF NOT USING VTA, SKIP TO ITEM 30)						
26	Condensate Drain Valve	ALP-V201	Open, allow pressure to bleed off, and close.	VTA		
27	LP Air Hose Assembly	H-203	Remove stowed hose from VTA. Inspect for cuts and abrasions.	VTA		
28	LP Air Hose Assembly	H-203	Connect hose to VTA port and tighten 3/8 to 1/2 turn after O-ring engagement. Connect strain relief.	VTA		
29	LP Air Hose Assembly	H-203	Connect hose to CCA port and tighten 3/8 to 1/2 turn after O-ring engagement. Connect strain relief.	CCA		
30	A Supply Valve	AHP-V301	Verify closed.	CCA		
31	B Supply Valve	AHP-V302	Verify closed.	CCA		
32	Gauge Stop Valves	AHP-V305 AHP-V306 ALP-V307 ALP-V308	Open.	CCA		
33	CCA Valves and Regulators	Ensure that all remaining CCA valves are in closed position and all regulators are backed off fully CCW.		CCA		

FADS III AIR SYSTEM CONFIGURATION 2 / OP-1 ***Page 5 of 7***

PREMISSION PROCEDURES FOR DIVING THE FADS III AIR SYSTEM WITH TRCS SUPPORT—Continued

ITEM	COMPONENT	DESCRIPTION	PROCEDURE	LOCATION	CHECK	NOTE
CONNECT PRIMARY HP AIR SUPPLY TO TRC AND TL						
34	HP Air Hose Assemblies	H-804	Inspect the 6 HP air hoses for damage. Ensure both ends of hoses have protective caps installed.	TRCS Air Supply Hose Kit		
35	Primary HP Air Hose Assembly (ASRA to Tee Plate)	H-804	Connect hose to designated port and tighten 3/8 to 1/2 turn after O-ring engagement. Connect strain relief.	ASRA Upper A B Lower A B (Circle designated port)		
36	Primary HP Air Hose Assembly (ASRA to Tee Plate)	H-804	Connect hose to inlet of tee plate and tighten 3/8 to 1/2 turn after O-ring engagement. Connect strain relief.	Primary Tee Plate		
37	Primary HP Air Hose Assembly (Tee Plate to TRC Panel)	H-804	Connect hose to outlet of tee plate and tighten 3/8 to 1/2 turn after O-ring engagement. Connect strain relief.	Primary Tee Plate		
38	Primary HP Air Hose Assembly (Tee Plate to TRC Panel)	H-804	Connect hose to AHP-C-1 on TRC panel and tighten 3/8 to 1/2 turn after O-ring engagement. Connect strain relief.	TRC Panel		
39	Primary Air Regulator	AHP-R-1	Ensure backed off (CCW).	TRC Panel		
40	Primary Air Pressurization Valve	ALP-V-3	Close.	TRC Panel		
41	Primary Air Cross Connect Valve	ALP-V-1	Close.	TRC Panel		
42	Primary HP Air Hose Assembly (Tee Plate to TL Panel)	H-804	Connect hose to outlet of tee plate and tighten 3/8 to 1/2 turn after O-ring engagement. Connect strain relief.	Primary Tee Plate		
43	Primary HP Air Hose Assembly (Tee Plate to TL Panel)	H-804	Connect hose to AHP-C-3 on TL panel and tighten 3/8 to 1/2 turn after O-ring engagement. Connect strain relief.	TL Panel		

FADS III AIR SYSTEM CONFIGURATION 2 / OP-1 *Page 6 of 7*

PREMISSION PROCEDURES FOR DIVING THE FADS III AIR SYSTEM WITH TRCS SUPPORT—Continued

ITEM	COMPONENT	DESCRIPTION	PROCEDURE	LOCATION	CHECK	NOTE
44	Primary Air Regulator	AHP-R-3	Ensure backed off (CCW).	TL Panel		
45	Primary Pressurization Supply Control Valve	ALP-V-16	Close.	TL Panel		
CONNECT SECONDARY AIR SUPPLY TO TRC AND TL						
46	Secondary HP Air Hose Assy (ASRA to Tee Plate)	H-804	Connect hose to designated Port C and tighten 3/8 to 1/2 turn after O-ring engagement. Connect strain relief.	ASRA Lower Port C Upper Port C (Circle designated port)		
47	Secondary HP Air Hose Assy (ASRA to Tee Plate)	H-804	Connect hose to inlet of tee plate and tighten 3/8 to 1/2 turn after O-ring engagement. Connect strain relief.	Secondary Tee Plate		
48	Secondary HP Air Hose Assy (Tee Plate to TRC Panel)	H-804	Connect hose to outlet of tee plate and tighten 3/8 to 1/2 turn after O-ring engagement. Connect strain relief.	Secondary Tee Plate		
49	Secondary HP Air Hose Assy (Tee Plate to TRC Panel)	H-804	Connect hose to AHP-C-2 on TRC Panel and tighten 3/8 to 1/2 turn after O-ring engagement. Connect strain relief.	TRC Panel		
50	Secondary Air Regulator	AHP-R-2	Ensure backed off (CCW).	TRC Panel		
51	Secondary Air Pressurization Hull Stop Valve	ALP-V-7	Close.	On Hull under TRC Panel		
52	Secondary Air Cross Connect Valve	ALP-V-6	Close.	TRC Panel		
53	BIBS Air Hull Stop Valve	ALP-V-13	Close.	On Hull under TRC Panel		
54	Secondary HP Air Hose Assy (Tee Plate to TL Panel)	H-804	Connect hose to outlet of tee plate and tighten 3/8 to 1/2 turn after O-ring engagement. Connect strain relief.	Secondary Tee Plate		

FADS III AIR SYSTEM CONFIGURATION 2 / OP-1

PREMISSION PROCEDURES
FOR DIVING THE FADS III AIR SYSTEM WITH TRCS SUPPORT—Continued

ITEM	COMPONENT	DESCRIPTION	PROCEDURE	LOCATION	CHECK	NOTE
55	Secondary HP Air Hose Assy (Tee Plate to TL Panel)	H-804	Connect hose to AHP-C-4 on TL panel and tighten 3/8 to 1/2 turn after O-ring engagement. Connect strain relief.	TL Panel		
56	Secondary Air Regulator	AHP-R-4	Ensure backed off (CCW).	Bottom of TL Panel		
57	BIBS Air Hull Stop Valve	ALP-V-20	Close.	On Hull under TL Panel		
END OF PROCEDURE						

REMARKS: (Using item number as a reference, list any deficiencies or problems found during performance of this procedure.)

FADS III AIR SYSTEM
CONFIGURATION 2 / OP-2

FADS III PREDIVE START-UP PROCEDURES

REVISED 14 MARCH 2008

SPECIAL INSTRUCTIONS

1. Ensure this OP is valid by comparing the revision date above with the master file.
2. Check each item individually.
3. Sign and date below when OP has been completed.
4. Report any discrepancy to the Diving Supervisor.

Operator No. 1 ______________________________ Date ____________
Printed name and signature

Operator No. 2 ______________________________ Date ____________
Printed name and signature

Diving Supervisor ______________________________ Date ____________
Printed name and signature

FADS III AIR SYSTEM CONFIGURATION 2 / OP-2

FADS III PREDIVE START-UP PROCEDURES

NOTE 1: Predive start-up involves lining up the ASRA, primary/secondary HP air supplies, and CCA. This OP shall always be performed before the first dive of the mission and before each new dive that required the shutdown procedures in C2/OP-4 to be performed.

NOTE 2: Record notes and deficiencies in section provided at the end of this operating procedure.

NOTE 3: When the TRCS is used, ASRA Banks 1 and 2 must be aligned to Ports A and B separately. Complete the following using Configuration 2 Status Sheet (Figure B-6).

<u>ASRA Primary Bank and Port Selections</u>

Designate which bank has been chosen as primary to TRCS and which has been chosen as primary to CCA by circling the appropriate label. Also circle whether the upper or lower port is being used.

BANK 1:	Primary to TRCS	Primary to CCA	(using)	Upper	/	Lower	**PORT A**
BANK 2:	Primary to TRCS	Primary to CCA	(using)	Upper	/	Lower	**PORT B**

<u>ASRA Secondary Port Selections</u>

Circle whether the upper or lower port is being used for each operation.

BANK 3:	Secondary to TRCS	(using)	Upper	/	Lower	**PORT C**
	Secondary to CCA	(using)	Upper	/	Lower	**PORT C**

<u>CCA Port Selections</u>

Designate which port on the CCA has been chosen as primary and which has been chosen as secondary by circling the appropriate label.

A Supply:	Primary	Secondary
B Supply:	Primary	Secondary

ITEM	COMPONENT	DESCRIPTION	PROCEDURE	LOCATION	CHECK	NOTE
1	System Drain Valve	AHP-V419	Open.	ASRA		
2	Flask Drain Valves	AHP-V410 AHP-V411 AHP-V412 AHP-V413 AHP-V414 AHP-V415 AHP-V416 AHP-V417 AHP-V418	Open, drain, and close.	ASRA		

FADS III AIR SYSTEM CONFIGURATION 2 / OP-2

FADS III PREDIVE START-UP PROCEDURES—Continued

ITEM	COMPONENT	DESCRIPTION	PROCEDURE	LOCATION	CHECK	NOTE
3	System Drain Valve	AHP-V419	Close.	ASRA		
4	Manifold Valve	AHP-V444	Close.	ASRA		
SET UP PORT C OF ASRA FOR SECONDARY SUPPLY TO CCA						
NOTE 4: Ensure Banks 1, 2, and 3 are charged to a minimum of 4600 psi or as determined by Diving Supervisor. Recharging of banks can be conducted using FADS III Air System Configuration 1/OP-6.						
5	Flask Isolation Valves	AHP-V408 AHP-V409	Open slowly.	ASRA		
6	Bank 3 Gauge	AHP-G439	Record pressure (min. pressure ________ psig) AHP-G439 _________ psig	ASRA		
CAUTION: Prior to completing Item 7, notify personnel conducting C2/OP-3A (TRC start-up) and C2/OP-3B (TL start-up) that secondary air is being provided to TRC and TL control panels.						
7	Port C Valve	AHP-V422	Open slowly.	ASRA		
SET UP BANK 1 FOR PORT A OF ASRA						
8	Bank 1 Flask Isolation Valves	AHP-V401 AHP-V402 AHP-V403	Open slowly.	ASRA		
9	Bank 1 Gauge	AHP-G437	Record pressure (min. pressure ________ psig) AHP-G437 _________ psig	ASRA		
10	Bank 1 Manifold Valve	AHP-V420	Open slowly.	ASRA		
SET UP BANK 2 FOR PORT B OF ASRA						
11	Bank 2 Flask Isolation Valves	AHP-V404 AHP-V405 AHP-V406 AHP-V407	Open slowly.	ASRA		
12	Bank 2 Gauge	AHP-G438	Record pressure (min. pressure ________ psig) AHP-G438 _________ psig	ASRA		
13	Bank 2 Manifold Valve	AHP-V421	Open slowly.	ASRA		

FADS III AIR SYSTEM CONFIGURATION 2 / OP-2 *Page 3 of 5*

FADS III PREDIVE START-UP PROCEDURES—Continued

ITEM	COMPONENT	DESCRIPTION	PROCEDURE	LOCATION	CHECK	NOTE
OPEN PRIMARY SUPPLY TO CCA						
14	Port A Valve or Port B Valve	AHP-V443 or AHP-V429	Slowly open designated port valve for primary air to CCA. (Circle opened valve)	ASRA		
15	Yellow, Green, and Red Diver Supply and Pneumo ports	Remove port caps and check for damaged threads.		CCA Rear Panel		
16	A Supply Valve	AHP-V301	Open slowly.	CCA		
17	A Supply Gauge	AHP-G325	Record pressure: _________________ psig	CCA		
18	Bank 1 Gauge Bank 2 Gauge Bank 3 Gauge	AHP-G437 AHP-G438 AHP-G439	Compare reading with bank supplying CCA A Supply. (Circle bank in use)	ASRA		
19	A Regulator	AHP-V303	Slowly adjust manifold pressure as directed by Diving Supervisor. Final pressure: _________________ psig	CCA		
SET UP CCA B SUPPLY						
20	B Supply Valve	AHP-V302	Open slowly.	CCA		
21	B Supply Gauge	AHP-G326	Record pressure: _________________ psig	CCA		
22	Bank 1 Gauge Bank 2 Gauge Bank 3 Gauge	AHP-G437 AHP-G438 AHP-G439	Compare reading with bank supplying CCA B Supply. (Circle bank in use)	ASRA		
23	B Regulator	AHP-V304	Slowly adjust manifold pressure as directed by Diving Supervisor. Final pressure: _________________ psig	CCA		
24	Manifold Supply Valve	ALP-V311 -or- ALP-V312	Open selected secondary supply valve.	CCA		
NOTE 5: If VTA is used, complete Items 25-26 and skip Item 27. If VTA is not used, skip Items 25-26 and complete Item 27.						
25	Volume Tank Valve	ALP-V313	Slowly open valve and charge volume tank. Ensure regulator tracks.	CCA		

FADS III AIR SYSTEM CONFIGURATION 2 / OP-2 *Page 4 of 5*

FADS III PREDIVE START-UP PROCEDURES—Continued

ITEM	COMPONENT	DESCRIPTION	PROCEDURE	LOCATION	CHECK	NOTE
26	Condensate Drain Valve	ALP-V201	Open after pressure equalizes, drain, and close.	VTA		
27	Yellow Supply Valve	ALP-V314	Open slowly, blow down secondary supply, and close. Ensure regulator tracks.	CCA		
28	Manifold Supply Valve	ALP-V311 -or- ALP-V312	Close secondary supply valve.	CCA		
29	Manifold Supply Valve	ALP-V311 -or- ALP-V312	Open selected primary supply valve.	CCA		
30	Yellow Supply Valve	ALP-V314	Open slowly, blow down primary supply, and close. Ensure regulator tracks.	CCA		
31	Red, Green, and Yellow Diver Supply Hoses	Remove plugs and check hose fittings for damaged threads. Connect hoses and tighten wrench-tight.		CCA		
32	Red, Green, and Yellow Diver Pneumo Hoses	Remove plugs and check hose fittings for damaged threads. Connect hoses and tighten wrench-tight.		CCA		
WARNING: **When purging umbilical hoses, maintain a firm grip on the hose and point the free end away from personnel to avoid injury from flying debris.** WARNING: **When purging pneumo hoses, do not fully open pneumo valves (ALP-V317, ALP-V318, and ALP-V319). Failure to comply will damage the diver depth gauges and may cause injury to personnel.**						
33	Yellow, Green, and Red Diver Pneumo Valves	ALP-V317 ALP-V318 ALP-V319	Crack open valves one at a time, purge corresponding pneumo hose, and close.	CCA		
34	Yellow, Green, and Red Diver Supply Valves	ALP-V314 ALP-V315 ALP-V316	Crack open valves one at a time, purge corresponding supply hose, and close.	CCA		
END OF PROCEDURE						

FADS III AIR SYSTEM CONFIGURATION 2 / OP-2 *Page 5 of 5*

FADS III PREDIVE START-UP PROCEDURES—Continued

REMARKS: (Using item number as a reference, list any deficiencies or problems found during performance of this procedure.)

FADS III AIR SYSTEM
CONFIGURATION 2 / OP-2M

FADS III MODIFIED PREDIVE
START-UP PROCEDURES

REVISED 14 MARCH 2008

SPECIAL INSTRUCTIONS

1. Ensure this OP is valid by comparing the revision date above with the master file.
2. Check each item individually.
3. Sign and date below when OP has been completed.
4. Report any discrepancy to the Diving Supervisor.

Operator No. 1 ____ Date ____________
Printed name and signature

Operator No. 2 ____ Date ____________
Printed name and signature

Diving Supervisor ______________________________________ Date ____________
Printed name and signature

FADS III AIR SYSTEM CONFIGURATION 2 / OP-2M

FADS III MODIFIED PREDIVE START-UP PROCEDURES

NOTE 1: This OP provides modified start-up of the ASRA, CCA, and VTA, and may be used only if the system was previously placed in a modified shutdown condition utilizing C2/OP-4M.

NOTE 2: Record notes and deficiencies in section provided at the end of this operating procedure.

NOTE 3: When the TRCS is used, ASRA Banks 1 and 2 must be aligned to Ports A and B separately. Complete the following using Configuration 2 Status Sheet (Figure B-6).

ASRA Primary Bank and Port Selections

Designate which bank has been chosen as primary to TRCS and which has been chosen as primary to CCA by circling the appropriate label. Also circle whether the upper or lower port is being used.

BANK 1:	Primary to TRCS	Primary to CCA	(using)	Upper	/	Lower	**PORT A**
BANK 2:	Primary to TRCS	Primary to CCA	(using)	Upper	/	Lower	**PORT B**

ASRA Secondary Port Selections

Circle whether the upper or lower port is being used for each operation.

BANK 3:	Secondary to TRCS	(using)	Upper	/	Lower	**PORT C**
	Secondary to CCA	(using)	Upper	/	Lower	**PORT C**

CCA Port Selections

Designate which port on the CCA has been chosen as primary and which has been chosen as secondary by circling the appropriate label.

A Supply:	Primary	Secondary
B Supply:	Primary	Secondary

ITEM	COMPONENT	DESCRIPTION	PROCEDURE	LOCATION	CHECK	NOTE
SET UP ASRA BANKS 1, 2, AND 3 TO SUPPLY PORTS A, B, AND C						
NOTE 4: Ensure Banks 1, 2, and 3 are charged to a minimum of 4600 psi or as determined by Diving Supervisor. Recharging of banks can be conducted using FADS III Air System Configuration 1/OP-5.						
1	Bank 1 Gauge	AHP-G437	Record pressure (min. pressure ________ psig) AHP-G437 _________ psig	ASRA		

FADS III AIR SYSTEM CONFIGURATION 2 / OP-2M *Page 2 of 3*

FADS III MODIFIED PREDIVE START-UP PROCEDURES—Continued

ITEM	COMPONENT	DESCRIPTION	PROCEDURE	LOCATION	CHECK	NOTE
2	Bank 2 Gauge	AHP-G438	Record pressure (min. pressure ________ psig) AHP-G438 ___________ psig	ASRA		
3	Bank 3 Gauge	AHP-G439	Record pressure (min. pressure ________ psig) AHP-G439 ___________ psig	ASRA		
4	Bank 1 Manifold Valve	AHP-V420	Verify open.	ASRA		
5	Bank 2 Manifold Valve	AHP-V421	Verify open.	ASRA		
CAUTION: Prior to completing Item 6, notify personnel conducting C2/OP-3M (TRC and TL modified pre-dive start-up) that primary and secondary air is being provided to TRC and TL control panels.						
6	Port A Valve Port B Valve Port C Valve	AHP-V443 AHP-V429 AHP-V422	Open slowly.	ASRA		
SET UP CCA A SUPPLY						
7	A Supply Valve	AHP-V301	Open slowly.	CCA		
8	A Supply Gauge	AHP-G325	Compare reading with bank supplying CCA A Supply.	CCA		
9	A Regulator	AHP-V303	Slowly adjust manifold pressure as directed by Diving Supervisor. Record pressure: _________________ psig	CCA		
SET UP CCA B SUPPLY						
10	B Supply Valve	AHP-V302	Open slowly.	CCA		
11	B Supply Gauge	AHP-G326	Compare reading with bank supplying CCA B Supply.	CCA		
12	B Regulator	AHP-V304	Slowly adjust manifold pressure as directed by diving supervisor. Record pressure: _________________ psig	CCA		
13	Manifold Supply Valve	ALP-V311 -or- ALP-V312	Open valve designated as secondary supply valve and tag with SECONDARY tag. (Circle opened valve)	CCA		
14	Volume Tank Valve	ALP-V313	Open if VTA used.	CCA		
			Verify closed if VTA not used.	CCA		

FADS III AIR SYSTEM CONFIGURATION 2 / OP-2M *Page 3 of 3*

FADS III MODIFIED PREDIVE START-UP PROCEDURES—Continued

ITEM	COMPONENT	DESCRIPTION	PROCEDURE	LOCATION	CHECK	NOTE
15	Condensate Drain Valve	ALP-V201	If VTA used; open valve, drain tank, and close.	VTA		
WARNING: **When purging umbilical hoses, maintain a firm grip on the hose and point the free end away from personnel to avoid injury from flying debris.** WARNING: **When purging pneumo hoses, do not fully open pneumo valves (ALP-V317, ALP-V318, and ALP-V319). Failure to comply will damage the diver depth gauges and may cause injury to personnel.**						
16	Yellow, Green, and Red Pneumo Valves	ALP-V317 ALP-V318 ALP-V319	Crack open valves one at a time, purge corresponding pneumo hose, and close. Ensure secondary regulator tracks.	CCA		
17	Manifold Supply Valve	ALP-V311 -or- ALP-V312	Close secondary supply valve.	CCA		
18	Manifold Supply Valve	ALP-V311 -or- ALP-V312	Open valve designated as primary supply valve and tag with PRIMARY tag. (Circle opened valve)	CCA		
19	Yellow, Green, and Red Diver Supply Valves	ALP-V314 ALP-V315 ALP-V316	Crack open valves one at a time, purge corresponding supply hose, and close. Ensure primary regulator tracks.	CCA		
END OF PROCEDURE						

REMARKS: (Using item number as a reference, list any deficiencies or problems found during performance of this procedure.)

FADS III AIR SYSTEM
CONFIGURATION 2 / OP-3A

TRC PREDIVE START-UP PROCEDURES

REVISED 14 MARCH 2008

SPECIAL INSTRUCTIONS

1. Ensure this OP is valid by comparing the revision date above with the master file.
2. Check each item individually.
3. Sign and date below when OP has been completed.
4. Report any discrepancy to the Diving Supervisor.

Operator No. 1 ____ Date ____________
Printed name and signature

Operator No. 2 ____ Date ____________
Printed name and signature

Diving Supervisor ______________________________________ Date ____________
Printed name and signature

FADS III AIR SYSTEM CONFIGURATION 2 / OP-3A

TRC PREDIVE START-UP PROCEDURES

NOTE 1: TRC predive start-up involves lining up the ASRA, oxygen racks, and TRC air for diving.

NOTE 2: Record notes and deficiencies in section provided at the end of this operating procedure.

NOTE 3: When the TRCS is used, ASRA Banks 1 and 2 must be aligned to Ports A and B separately. Complete the following using Configuration 2 Status Sheet (Figure B-6).

ASRA Primary Bank and Port Selections

Designate which bank has been chosen as primary to TRCS and which has been chosen as primary to CCA by circling the appropriate label. Also circle whether the upper or lower port is being used.

BANK 1:	Primary to TRCS	Primary to CCA	(using)	Upper	/	Lower	**PORT A**
BANK 2:	Primary to TRCS	Primary to CCA	(using)	Upper	/	Lower	**PORT B**

ASRA Secondary Port Selections

Circle whether the upper or lower port is being used for each operation.

BANK 3:	Secondary to TRCS		(using)	Upper	/	Lower	**PORT C**
	Secondary to CCA		(using)	Upper	/	Lower	**PORT C**

ITEM	COMPONENT	DESCRIPTION	PROCEDURE	LOCATION	CHECK	NOTE
WARNING: **All FADS III Air System and TRCS equipment must be positioned and secured before operation as movement during operation could result in equipment damage and injury or death to personnel.**						
CONDUCT PREDIVE CHECK						
1	TRC and Oxygen Gas Racks	Conduct visual inspection of TRC and oxygen gas racks for damage.		TRC and Oxygen Gas Racks		
NOTE 4: Any damage to the TRC shell or oxygen gas racks must be reported to NAVSEA 00C prior to conducting chamber operations.						
2	TRC	Secure chamber by removing wheels or using skid tiedowns or wheel chocks.		TRC		
SET UP TRC CHAMBER						
3	Door Equalization Stop Valve, Inner	EQ-V-4	Close.	Inside TRC Door		

FADS III AIR SYSTEM CONFIGURATION 2 / OP-3A

TRC PREDIVE START-UP PROCEDURES—Continued

ITEM	COMPONENT	DESCRIPTION	PROCEDURE	LOCATION	CHECK	NOTE
4	Door Equalization Stop Valve, Outer	EQ-V-5	Close.	Outside TRC Door		
5	TRC Slow Exhaust Hull Stop Valve	EXH-V-5	Open.	TRC Panel		
6	TRC Fast Exhaust Hull Stop Valve	EXH-V-4	Close.	TRC Panel		
7	TRC Slow Exhaust Control Valve	EXH-V-6	Close.	TRC Panel		
8	TRC Pressure Relief Hull Stop Valve	ATM-V-1	Ensure wired open.	On Hull Under TRC Panel		
9	BIBS Exhaust Hull Stop Valve, Inner	EXH-V-1	Open.	Inside TRC		
10	BIBS Exhaust Hull Stop Valve, Outer	EXH-V-2	Open.	On Hull Under TRC Panel		
11	TRC Gas Sample Hull Stop Valve	ATM-V-4	Open.	On Hull Above TRC Panel		
12	TRC Gas Sample Flow Meter	ATM-FM-1	Close.	Right Side TRC Panel		
13	Medical Lock Equalization Hull Stop Valve, Inner	EQ-V-2	Open.	Inside TRC		
14	Medical Lock Equalization Control Valve	EQ-V-1	Close.	Left Side Medical Lock		
15	Medical Lock Vent Valve	EXH-V-3	Close.	Right Side Medical Lock		
16	Medical Lock Inner and Outer Doors	N/A	Ensure closed and latched.	Medical Lock		
17	Secondary Depth Gauge Hull Stop Valve	ATM-V-3	Open.	On Hull Above TRC Panel		

FADS III AIR SYSTEM CONFIGURATION 2 / OP-3A *Page 3 of 10*

TRC PREDIVE START-UP PROCEDURES—Continued

ITEM	COMPONENT	DESCRIPTION	PROCEDURE	LOCATION	CHECK	NOTE
18	CO2 Scrubber Pressurization Hull Stop Valve	ALP-V-10	Open.	On Hull Under TRC Panel		
19	CO2 Scrubber Pressurization Control Valve	ALP-V-9	Close.	TRC Panel		
20	Primary Pressurization Control Valve	ALP-V-3	Verify closed.	TRC Panel		
21	Primary Pressurization Hull Stop Valve	ALP-V-4	Open.	On Hull Under TRC Panel		
22	Primary Air Regulator	AHP-R-1	Verify backed off.	Bottom of TRC Panel		
23	Secondary Air Regulator	AHP-R-2	Verify backed off.	Bottom of TRC Panel		
24	Secondary Pressurization Hull Stop/ Control Valve	ALP-V-7	Verify closed.	On Hull Under TRC Panel		
25	BIBS Air Hull Stop Valve	ALP-V-13	Close.	On Hull Under TRC Panel		
26	Primary Air Cross Connect Valve	ALP-V-1	Open.	TRC Panel		
27	Secondary Air Cross Connect Valve	ALP-V-6	Verify closed.	TRC Panel		
28	BIBS Oxygen Hull Stop Valve	OLP-V-3	Close.	On Hull Under TRC Panel		
29	Secondary BIBS Oxygen Supply Control Valve	OLP-V-2	Close.	TRC Panel		
30	Primary BIBS Oxygen Supply Control Valve	OLP-V-1	Close.	TRC Panel		
31	BIBS Mixed Gas Supply Control Valve	MLP-V-4	Close.	TRC Panel		

FADS III AIR SYSTEM CONFIGURATION 2 / OP-3A *Page 4 of 10*

TRC PREDIVE START-UP PROCEDURES—Continued

ITEM	COMPONENT	DESCRIPTION	PROCEDURE	LOCATION	CHECK	NOTE
32	BIBS Mixed Gas Hull Stop Valve	MLP-V-2	Close.	On Hull Under TRC Panel		
CONNECT OXYGEN SUPPLY HOSES FROM OXYGEN RACKS TO TRC CHAMBER						
33	Primary LP Oxygen Whip	OLP-H-1	Connect to OLP-CO-1.	Primary Oxygen Bank		
34	Primary LP Oxygen Whip	OLP-H-1	Connect to OLP-C-1.	Under TRC Panel		
35	Secondary LP Oxygen Whip	OLP-H-2	Connect to OLP-CO-2.	Secondary Oxygen Bank		
36	Secondary LP Oxygen Whip	OLP-H-2	Connect to OLP-C-2.	Under TRC Panel		
SET UP OXYGEN RACK						
NOTE 5: HP oxygen regulators are shipped with vent plugs installed. Prior to operation, remove plugs. Individual commands shall take proper precaution to prevent vent hole blockage as appropriate.						
NOTE 6: If primary or secondary oxygen pressure is less than 2800 psig and K-bottles are not being used as an oxygen source, stop and recharge in accordance with TRCS OP-7.						
37	Primary Oxygen Charge Valve	OHP-V-101	Close.	Oxygen Rack		
38	Primary Oxygen Supply Valve	OLP-V-113	Close.	Oxygen Rack		
39	Primary Oxygen Regulator	OHP-REG-109	Back off.	Oxygen Rack		Note 5
40	Primary HP Oxygen Gauge Stop Valve	OHP-V-102	Open.	Oxygen Rack		
41	Primary LP Oxygen Gauge Stop Valve	OLP-V-111	Open.	Oxygen Rack		
42	Secondary Oxygen Charge Valve	OHP-V-103	Close.	Oxygen Rack		
43	Secondary Oxygen Supply Valve	OLP-V-112	Close.	Oxygen Rack		

FADS III AIR SYSTEM CONFIGURATION 2 / OP-3A ***Page 5 of 10***

TRC PREDIVE START-UP PROCEDURES—Continued

ITEM	COMPONENT	DESCRIPTION	PROCEDURE	LOCATION	CHECK	NOTE
44	Secondary Oxygen Regulator	OHP-REG-108	Back off.	Oxygen Rack		Note 5
45	Secondary HP Oxygen Gauge Stop Valve	OHP-V-104	Open.	Oxygen Rack		
46	Secondary LP Oxygen Gauge Stop Valve	OLP-V-110	Open.	Oxygen Rack		
47	Primary Flask Stop Valve	OHP-V-105	Open slowly.	Oxygen Rack		
48	Primary Flask Stop Valve	OHP-V-106	Open slowly.	Oxygen Rack		
49	Secondary Flask Stop Valve	OHP-V-107	Open slowly.	Oxygen Rack		
50	Primary HP Oxygen Pressure Gauge	OHP-G-114	Record pressure: __________________ psig	Oxygen Rack		Note 6
51	Secondary HP Oxygen Pressure Gauge	OHP-G-115	Record pressure: __________________ psig	Oxygen Rack		Note 6
SET UP PRIMARY AND SECONDARY BULK OXYGEN (IF REQUIRED)						
NOTE 7: Bulk oxygen or K-bottles may be connected to either primary and/or secondary oxygen supply. Complete Items 52 thru 58 if utilizing primary bulk oxygen and/or Items 59 thru 64 if utilizing secondary bulk oxygen. Continue with Item 65 if bulk oxygen is not utilized.						
WARNING: **Bulk oxygen or K-bottles may have a lower rated pressure than that of the oxygen flask rack. To avoid overcharging of K-bottles, ensure that interface hose is equipped with in-line check valve.**						
52	Primary Flask Stop Valve	OHP-V-105	Close.	Oxygen Rack		
53	Primary Flask Stop Valve	OHP-V-106	Close.	Oxygen Rack		
54	Primary Oxygen Charge Valve	OHP-V-101	Open, bleed down pressure, verify 0 psig on OHP-G-114, and close.	Oxygen Rack		

FADS III AIR SYSTEM CONFIGURATION 2 / OP-3A *Page 6 of 10*

TRC PREDIVE START-UP PROCEDURES—Continued

ITEM	COMPONENT	DESCRIPTION	PROCEDURE	LOCATION	CHECK	NOTE
55	Primary Bulk Oxygen Supply Hose	OLP-CC-1/Bulk Oxygen Supply Connection	Connect oxygen clean whip and strain relief.	Oxygen Rack/ Bulk Oxygen		
56	Primary Bulk Oxygen Supply Valve	Open slowly.		Primary Bulk Oxygen		
57	Primary Oxygen Charge Valve	OHP-V-101	Open slowly.	Oxygen Rack		
58	Primary HP Oxygen Pressure Gauge	OHP-G-114	Record pressure: ________________ psig	Oxygen Rack		
SET UP SECONDARY BULK OXYGEN						
59	Secondary Flask Stop Valve	OHP-V-107	Close.	Oxygen Rack		
60	Secondary Oxygen Charge Valve	OHP-V-103	Open, bleed down pressure, verify 0 psig on OHP-G-115, and close.	Oxygen Rack		
61	Secondary Bulk Oxygen Supply Hose	OLP-CC-2/Bulk Oxygen Supply Connection	Connect oxygen clean whip and strain relief.	Oxygen Rack/ Bulk Oxygen		
62	Secondary Bulk Oxygen Supply Valve	Open slowly.		Secondary Bulk Oxygen		
63	Secondary Oxygen Charge Valve	OHP-V-103	Open slowly.	Oxygen Rack		
64	Secondary HP Oxygen Pressure Gauge	OHP-G-115	Record pressure: ________________ psig	Oxygen Rack		
65	Primary Oxygen Regulator	OHP-REG-109	Load to 75 psig.	Oxygen Rack		
66	Primary LP Oxygen Pressure Gauge	OLP-G-117	Record pressure: ________________ psig	Oxygen Rack		

FADS III AIR SYSTEM CONFIGURATION 2 / OP-3A *Page 7 of 10*

TRC PREDIVE START-UP PROCEDURES—Continued

ITEM	COMPONENT	DESCRIPTION	PROCEDURE	LOCATION	CHECK	NOTE
67	Secondary Oxygen Regulator	OHP-REG-108	Load to 75 psig.	Oxygen Rack		
68	Secondary LP Oxygen Pressure Gauge	OLP-G-116	Record pressure: _________________ psig	Oxygen Rack		
SET UP ASRA AIR TO TRCS						
69	Bank 1 -or- Bank 2 Manifold Valve	AHP-V420 -or- AHP-V421	Verify selected manifold valve for TRCS is open. (Circle selected valve)	ASRA		
CAUTION: Prior to completing Item 70, notify personnel conducting C2/OP-3B (TL Predive) that primary air is being supplied to TL control panel.						
70	Port A Valve -or- Port B Valve	AHP-V443 -or- AHP-V429	Slowly open selected port valve for TRCS. (Circle selected valve)	ASRA		
71	Port C Valve	AHP-V422	Verify open.	ASRA		
THIS COMPLETES SETUP OF PRIMARY AND SECONDARY AIR AND OXYGEN WITH GAS PRESSURE UP TO: AHP-R-1 Primary TRC Air Regulator AHP-R-2 Secondary TRC Air Regulator AHP-R-3 Primary TL Air Regulator AHP-R-4 Secondary TL Air Regulator AND OLP-V-113 Primary TRC Oxygen Supply Valve OLP-V-112 Secondary TRC Oxygen Supply Valve						
72	Primary Air Regulator	AHP-R-1	Load to 200 psig as read on gauge ALP-G-1.	Bottom of TRC Panel		
73	Secondary Air Regulator	AHP-R-2	Load to 200 psig as read on gauge ALP-G-2.	Bottom of TRC Panel		
74	Ventilate chamber with TRC door open, briefly crack open ALP-V-7 secondary chamber pressurization valve, and verify that secondary air regulator tracks.			TRC		
CHECK BIBS AIR						
75	BIBS Supply	Connect BIBS mask supply to ALP-QD-1 and ALP-QD-2.		Inside TRC		
76	BIBS Exhaust	Connect BIBS exhaust line to EXH-QD-1 and EXH-QD-2.		Inside TRC		
77	BIBS Air Hull Stop Valve	ALP-V-13	Open.	On Hull Under TRC Panel		
78	BIBS	Check for audible gas leaks.		Inside TRC		

FADS III AIR SYSTEM CONFIGURATION 2 / OP-3A *Page 8 of 10*

TRC PREDIVE START-UP PROCEDURES—Continued

ITEM	COMPONENT	DESCRIPTION	PROCEDURE	LOCATION	CHECK	NOTE
79	BIBS Masks	Breathe several times on each mask to ensure good BIBS supply.		Inside TRC		
80	BIBS Air Hull Stop Valve	ALP-V-13	Close.	On Hull Under TL Panel		
81	BIBS Masks	Breathe down each mask.		Inside TRC		
82	BIBS Supply	Disconnect BIBS mask supply from ALP-QD-1 and ALP-QD-2.		Inside TRC		
83	BIBS Supply	Connect BIBS mask supply to OLP-QD-1 and OLP-QD-2.		Inside TRC		
CHECK BIBS OXYGEN						
84	Primary Oxygen Outlet Valve	OLP-V-113	Open slowly.	Oxygen Rack		
85	Secondary Oxygen Outlet Valve	OLP-V-112	Open slowly.	Oxygen Rack		
86	Secondary BIBS Oxygen Supply Control Valve	OLP-V-2	Open.	TRC Panel		
87	Oxygen Supply LP Gauge	OLP-G-1	Check for 75 psig.	TRC Panel		
88	BIBS Oxygen Hull Stop Valve	OLP-V-3	Open.	On Hull Under TRC Panel		
89	BIBS	Check for audible gas leaks.		Inside TRC		
90	BIBS Masks	Breathe several times on each mask to ensure good BIBS supply and verify that secondary regulator tracks.		Inside TRC		
91	Secondary BIBS Oxygen Supply Control Valve	OLP-V-2	Close.	TRC Panel		
92	Primary BIBS Oxygen Supply Control Valve	OLP-V-1	Open.	TRC Panel		
93	Oxygen Supply LP Gauge	OLP-G-1	Check for 75 psig.	TRC Panel		
94	BIBS Mask	Breathe several times on each mask to ensure good BIBS supply and verify that primary regulator tracks.		Inside TRC		

FADS III AIR SYSTEM CONFIGURATION 2 / OP-3A *Page 9 of 10*

TRC PREDIVE START-UP PROCEDURES—Continued

ITEM	COMPONENT	DESCRIPTION	PROCEDURE	LOCATION	CHECK	NOTE
95	Primary BIBS Oxygen Supply Control Valve	OLP-V-1	Close.	TRC Panel		
PERFORM GAS ANALYSIS CALIBRATION						
96	CO2 and O2 Analyzers	Set up analyzers in accordance with manufacturer's instructions.		TRC		
PERFORM COMMUNICATIONS CHECK						
97	Handsets and Communication	Ensure headsets are installed inside and outside the TRC. Check communications and adjust volumes as necessary.		TRC		
PERFORM TRC AND MEDICAL LOCK SEAL CHECK						
98	Complete chamber predive checklist in accordance with the U.S. Navy Diving Manual.			TRC		
NOTE 8: Conduct chamber seal and medical lock check by pressurizing TRC to a minimum depth of 5 fsw. Check for leaks and ensure that there is no loss of pressure for a 10-minute period.						
99	Primary Pressurization Control Valve	ALP-V-3	Open as required to obtain depth of 5 fsw and verify that primary air regulator tracks.	TRC Panel		
100	Medical Lock Equalization Control Valve	EQ-V-1	Open slowly.	Left Side of Medical Lock		
RETURN CHAMBER AND MEDICAL LOCK TO THE SURFACE						
101	TRC Fast Exhaust Hull Stop Valve	EXH-V-4	Open, surface chamber, and close.	TRC Panel		
102	Medical Lock Equalization Control Valve	EQ-V-1	Close.	Left Side of Medical Lock		
NOTE 9: The TRC is now set up for operations to be conducted in accordance with TRCS OP-3 and OP-4.						
END OF PROCEDURE						

FADS III AIR SYSTEM CONFIGURATION 2 / OP-3A *Page 10 of 10*

TRC PREDIVE START-UP PROCEDURES—Continued

REMARKS: (Using Item number as a reference, list any deficiencies or problems found during performance of this procedure.)

THIS PAGE INTENTIONALLY LEFT BLANK

FADS III AIR SYSTEM
CONFIGURATION 2 / OP-3B

TL PREDIVE START-UP PROCEDURES

REVISED 14 MARCH 2008

SPECIAL INSTRUCTIONS

1. Ensure this OP is valid by comparing the revision date above with the master file.
2. Check each item individually.
3. Sign and date below when OP has been completed.
4. Report any discrepancy to the Diving Supervisor.

Operator No. 1 ____ Date ____________
Printed name and signature

Operator No. 2 ____ Date ____________
Printed name and signature

Diving Supervisor ______________________________________ Date ____________
Printed name and signature

FADS III AIR SYSTEM CONFIGURATION 2 / OP-3B

TL PREDIVE START-UP PROCEDURES

NOTE 1: TL predive start-up involves lining up the oxygen racks and TL air for diving.

NOTE 2: Record notes and deficiencies in section provided at the end of this operating procedure.

NOTE 3: When the TRCS is used, ASRA Banks 1 and 2 must be aligned to Ports A and B separately. Complete the following using Configuration 2 Status Sheet (Figure B-6).

ASRA Primary Bank and Port Selections

Designate which bank has been chosen as primary to TRCS and which has been chosen as primary to CCA by circling the appropriate label. Also circle whether the upper or lower port is being used.

BANK 1:	Primary to TRCS	Primary to CCA	(using)	Upper	/	Lower	**PORT A**
BANK 2:	Primary to TRCS	Primary to CCA	(using)	Upper	/	Lower	**PORT B**

ASRA Secondary Port Selections

Circle whether the upper or lower port is being used for each operation.

BANK 3:	Secondary to TRCS	(using)	Upper	/	Lower	**PORT C**
	Secondary to CCA	(using)	Upper	/	Lower	**PORT C**

ITEM	COMPONENT	DESCRIPTION	PROCEDURE	LOCATION	CHECK	NOTE
WARNING: **All FADS III Air System and TRCS equipment must be positioned and secured before operation as movement during operation could result in equipment damage and injury or death to personnel.**						
CONDUCT PREDIVE CHECK						
1	TL and Oxygen Racks	Conduct visual inspection of TL and oxygen racks for damage.		TL and Oxygen Racks		
NOTE 4: Any damage to the TL shell or oxygen racks must be reported to NAVSEA 00C prior to conducting chamber operations.						
2	TL	Secure chamber by removing wheels or using skid tiedowns or wheel chocks.		TL		
SET UP TL CHAMBER VALVES						
3	Door Equalization Stop Valve, Inner	EQ-V-6		Close.	Inside TL Door	
4	Door Equalization Stop Valve, Outer	EQ-V-7		Close.	Outside TL Door	

FADS III AIR SYSTEM CONFIGURATION 2 / OP-3B *Page 2 of 8*

TL PREDIVE START-UP PROCEDURES—Continued

ITEM	COMPONENT	DESCRIPTION	PROCEDURE	LOCATION	CHECK	NOTE
5	TL Slow Exhaust Control Valve	EXH-V-9	Close.	TL Panel		
6	TL Pressure Relief Hull Stop Valve	ATM-V-8	Ensure wired open.	On Hull Under TL Panel		
7	BIBS Exhaust Hull Stop Valve, Inner	EXH-V-7	Open.	Inside TL		
8	TL Gas Sample Hull Stop Valve	ATM-V-9	Open.	On Hull Above TL Panel		
9	TL Gas Sample Flow Meter	ATM-FM-2	Close.	Right Side TL Panel		
10	Primary Depth Gauge Hull Stop Valve	ATM-V-6	Open.	On Hull Above TL Panel		
11	Secondary Depth Gauge Hull Stop Valve	ATM-V-7	Open.	On Hull Above TL Panel		
12	TL Pressuriza-tion Supply Control Valve	ALP-V-16	Verify closed.	TL Panel		
13	Scrubber Control Valve	ALP-V-22	Verify closed.	Inside TL		
14	BIBS Air Hull Stop Valve	ALP-V-20	Verify closed.	On Hull Under TL Panel		
15	BIBS Oxygen Hull Stop Valve	OLP-V-9	Open.	On Hull Under TL Panel		
16	Primary BIBS Oxygen Supply Control Valve	OLP-V-6	Close.	TL Panel		
17	Secondary BIBS Oxygen Supply Control Valve	OLP-V-7	Close.	TL Panel		
CONNECT OXYGEN SUPPLY HOSES FROM OXYGEN RACKS TO TL CHAMBER						
18	Primary LP Oxygen Whip	OLP-H-1	Connect to OLP-CO-1.	Primary Oxygen Bank		
19	Primary LP Oxygen Whip	OLP-H-1	Connect to OLP-C-3.	Under TL Panel		
20	Secondary LP Oxygen Whip	OLP-H-2	Connect to OLP-CO-2.	Secondary Oxygen Bank		

FADS III AIR SYSTEM CONFIGURATION 2 / OP-3B *Page 3 of 8*

TL PREDIVE START-UP PROCEDURES—Continued

ITEM	COMPONENT	DESCRIPTION	PROCEDURE	LOCATION	CHECK	NOTE
21	Secondary LP Oxygen Whip	OLP-H-2	Connect to OLP-C-4.	Under TL Panel		
SET UP OXYGEN RACK						
NOTE 5: HP oxygen regulators are shipped with vent plugs installed. Prior to operation, remove plugs. Individual commands shall take proper precaution to prevent vent hole blockage as appropriate.						
NOTE 6: If primary or secondary oxygen pressure is less than 2800 psig and bulk oxygen is not to be used as an oxygen source, stop and recharge in accordance with TRCS OP-7.						
22	Primary Oxygen Charge Valve	OHP-V-101	Close.	Oxygen Rack		
23	Primary Oxygen Supply Valve	OLP-V-113	Close.	Oxygen Rack		
24	Primary Oxygen Regulator	OHP-REG-109	Back off.	Oxygen Rack		Note 5
25	Primary HP Oxygen Gauge Stop Valve	OHP-V-102	Open.	Oxygen Rack		
26	Primary LP Oxygen Gauge Stop Valve	OLP-V-111	Open.	Oxygen Rack		
27	Secondary Oxygen Charge Valve	OHP-V-103	Close.	Oxygen Rack		
28	Secondary Oxygen Supply Valve	OLP-V-112	Close.	Oxygen Rack		
29	Secondary Oxygen Regulator	OHP-REG-108	Back off.	Oxygen Rack		Note 5
30	Secondary HP Oxygen Gauge Stop Valve	OHP-V-104	Open.	Oxygen Rack		
31	Secondary LP Oxygen Gauge Stop Valve	OLP-V-110	Open.	Oxygen Rack		
32	Primary Flask Stop Valve	OHP-V-105	Open slowly.	Oxygen Rack		
33	Primary Flask Stop Valve	OHP-V-106	Open slowly.	Oxygen Rack		

FADS III AIR SYSTEM CONFIGURATION 2 / OP-3B ***Page 4 of 8***

TL PREDIVE START-UP PROCEDURES—Continued

ITEM	COMPONENT	DESCRIPTION	PROCEDURE	LOCATION	CHECK	NOTE
34	Secondary Flask Stop Valve	OHP-V-107	Open slowly.	Oxygen Rack		
35	Primary HP Oxygen Pressure Gauge	OHP-G-114	Record pressure: ________________ psig	Oxygen Rack		Note 6
36	Secondary HP Oxygen Pressure Gauge	OHP-G-115	Record pressure: ________________ psig	Oxygen Rack		Note 6
SET UP PRIMARY AND SECONDARY BULK OXYGEN (IF REQUIRED)						
NOTE 7: Bulk oxygen or K-bottles may be connected to either primary and/or secondary oxygen supply. Complete Items 37 thru 43 if utilizing primary bulk oxygen and/or Items 44 thru 49 if utilizing secondary bulk oxygen. Continue with Item 50 if bulk oxygen is not utilized.						
WARNING: **Bulk oxygen or K-bottles may have a lower rated pressure than that of the oxygen flask rack. To avoid overcharging of K-bottles, ensure that interface hose is equipped with in-line check valve.**						
SET UP PRIMARY BULK OXYGEN						
37	Primary Flask Stop Valve	OHP-V-105	Close.	Oxygen Rack		
38	Primary Flask Stop Valve	OHP-V-106	Close.	Oxygen Rack		
39	Primary Oxygen Charge Valve	OHP-V-101	Open, bleed down pressure, verify 0 psig on OHP-G-114, and close.	Oxygen Rack		
40	Primary Bulk Oxygen Supply Hose	OLP-CC-1/ Bulk Oxygen Supply Connection	Connect oxygen clean whip and strain relief.	Oxygen Rack/ Bulk Oxygen		
41	Primary Bulk Oxygen Supply Valve	Open slowly.		Primary Bulk Oxygen		
42	Primary Oxygen Charge Valve	OHP-V-101	Open slowly.	Oxygen Rack		
43	Primary HP Oxygen Pressure Gauge	OHP-G-114	Record pressure: ________________ psig	Oxygen Rack		
SET UP SECONDARY BULK OXYGEN						
44	Secondary Flask Stop Valve	OHP-V-107	Close.	Oxygen Rack		
45	Secondary Oxygen Charge Valve	OHP-V-103	Open, bleed down pressure, verify 0 psig on OHP-G-115, and close.	Oxygen Rack		

FADS III AIR SYSTEM CONFIGURATION 2 / OP-3B *Page 5 of 8*

TL PREDIVE START-UP PROCEDURES—Continued

ITEM	COMPONENT	DESCRIPTION	PROCEDURE	LOCATION	CHECK	NOTE
46	Secondary Bulk Oxygen Supply Hose	OLP-CC-2/ Bulk Oxygen Supply Connection	Connect oxygen clean whip and strain relief.	Oxygen Rack/ Bulk Oxygen		
47	Secondary Bulk Oxygen Supply Valve	Open slowly.		Secondary Bulk Oxygen		
48	Secondary Oxygen Charge Valve	OHP-V-103	Open slowly.	Oxygen Rack		
49	Secondary HP Oxygen Pressure Gauge	OHP-G-115	Record pressure: ________________ psig	Oxygen Rack		
50	Primary Oxygen Regulator	OHP-REG-109	Load to 75 psig.	Oxygen Rack		
51	Primary LP Oxygen Pressure Gauge	OLP-G-117	Record pressure: ________________ psig	Oxygen Rack		
52	Secondary Oxygen Regulator	OHP-REG-108	Load to 75 psig.	Oxygen Rack		
53	Secondary LP Oxygen Pressure Gauge	OLP-G-116	Record pressure: ________________ psig	Oxygen Rack		
54	Primary Oxygen Bank Outlet Valve	OLP-V-113	Open slowly.	Oxygen Rack		
55	Secondary Oxygen Bank Outlet Valve	OLP-V-112	Open slowly.	Oxygen Rack		
VERIFY SETUP OF ASRA AIR						
56	Bank 1 -or- Bank 2 Manifold Valve	AHP-V420 -or- AHP-V421	Verify selected manifold valve for TRCS is open. (Circle selected valve)	ASRA		
57	Port A Valve -or- Port B Valve	AHP-V443 -or- AHP-V429	Verify selected port valve for TRCS is open. (Circle selected valve)	ASRA		
58	Port C Valve	AHP-V422	Verify open.	ASRA		

THIS COMPLETES SETUP OF PRIMARY AND SECONDARY AIR AND OXYGEN WITH GAS PRESSURE UP TO:

	AHP-R-3	Primary Air Regulator
	AHP-R-4	Secondary Air Regulator
AND	OLP-V-6	Primary Oxygen BIBS Supply Valve
	OLP-V-7	Secondary Oxygen BIBS Supply Valve

FADS III AIR SYSTEM CONFIGURATION 2 / OP-3B *Page 6 of 8*

TL PREDIVE START-UP PROCEDURES—Continued

ITEM	COMPONENT	DESCRIPTION	PROCEDURE	LOCATION	CHECK	NOTE
59	Secondary Air Regulator	AHP-R-4	Load to 200 psig as read on gauge ALP-G-7.	TL Panel		
60	Ventilate chamber with TL doors open, briefly crack open ALP-V-16 chamber pressurization valve, and verify that secondary air regulator tracks.			TL		
PERFORM COMMUNICATIONS CHECK						
61	Handsets and Communication	Ensure handsets are installed inside and outside the TL. Check communications.		TL		
CHECK BIBS AIR						
62	BIBS Supply	Connect BIBS mask supply to ALP-QD-5 and ALP-QD-6.		Inside TL		
63	BIBS Exhaust	Connect BIBS exhaust line to EXH-QD-3 and EXH-QD-4.		Inside TL		
64	BIBS Air Hull Stop Valve	ALP-V-20	Open.	On Hull Under TL Panel		
65	BIBS	Check for audible gas leaks.		Inside TL		
66	BIBS Masks	Breathe several times on each mask to ensure good BIBS supply.		Inside TL		
67	BIBS Air Hull Stop Valve	ALP-V-20	Close.	On Hull Under TL Panel		
68	BIBS Masks	Breathe down each mask.		Inside TL		
69	BIBS Masks	Disconnect BIBS mask supply from ALP-QD-5 and ALP-QD-6.		Inside TL		
70	Secondary Air Regulator	AHP-R-4	Back off.	Bottom of TL Panel		
71	TL Pressurization Supply Control Valve	ALP-V-16	Open and vent pressure to 100 psig as read on gauge ALP-G-7.	TL Panel		
CHECK BIBS OXYGEN						
72	Secondary Oxygen Supply Valve	OLP-V-7	Open slowly.	TL Panel		
73	Oxygen Supply LP Gauge	OLP-G-3	Verify 75 psig.	TL Panel		
74	BIBS Supply	Connect BIBS mask supply to OLP-QD-3 & OLP-QD-4.		Inside TL		
75	BIBS	Check for audible gas leaks.		Inside TL		
76	BIBS Masks	Breathe several times on each mask to ensure good BIBS supply and verify that secondary regulator tracks.		Inside TL		

FADS III AIR SYSTEM CONFIGURATION 2 / OP-3B *Page 7 of 8*

TL PREDIVE START-UP PROCEDURES—Continued

ITEM	COMPONENT	DESCRIPTION	PROCEDURE	LOCATION	CHECK	NOTE
77	Secondary Oxygen Supply Valve	OLP-V-7	Close.	TL Panel		
78	BIBS Masks	Breathe each mask down until OLP-G-3 reads zero.		Inside TL		
79	Primary Oxygen Supply Valve	OLP-V-6	Open slowly.	TL Panel		
80	Oxygen Supply LP Gauge	OLP-G-3	Verify 75 psig.	TL Panel		
81	BIBS Masks	Breathe several times on each mask to ensure good BIBS supply and verify that primary regulator tracks.		Inside TL		
82	Primary Oxygen Supply Valve	OLP-V-6	Close.	TL Panel		
PERFORM CHAMBER SEAL CHECK						
NOTE 8: If the transfer lock is not equipped with a CO2 scrubber, skip Item 83 and continue with Item 84.						
83	CO2 Scrubber Canister	Install CO2 scrubber canister.		Inside TL		
84	Complete chamber predive checklist in accordance with the U.S. Navy Diving Manual.			TL		
85	Primary Air Regulator	AHP-R-3	Load to 200 psig on gauge ALP-G-7.	Bottom of TL Panel		
86	TL Pressurization Supply Valve	ALP-V-16	Open as required to obtain min. depth of 5 fsw. Check for leaks and ensure no loss of pressure for 10-minute period. Ensure primary air regulator tracks.	TL Panel		
87	TL Slow Exhaust Control Valve	EXH-V-9	Open, surface chamber, and close.	TL Panel		
NOTE 9: The TL is now lined up for operations to be conducted in accordance with TRCS OP-3A and OP-4.						
END OF PROCEDURE						

FADS III AIR SYSTEM CONFIGURATION 2 / OP-3B *Page 8 of 8*

TL PREDIVE START-UP PROCEDURES—Continued

REMARKS: (Using Item number as a reference, list any deficiencies or problems found during performance of this procedure.)

THIS PAGE INTENTIONALLY LEFT BLANK

FADS III AIR SYSTEM
CONFIGURATION 2 / OP-3M

TRC & TL MODIFIED PREDIVE START-UP PROCEDURES

REVISED 14 MARCH 2008

SPECIAL INSTRUCTIONS

1. Ensure this OP is valid by comparing the revision date above with the master file.
2. Check each item individually.
3. Sign and date below when OP has been completed.
4. Report any discrepancy to the Diving Supervisor.

Operator No. 1 ______________________________ Date __________
Printed name and signature

Operator No. 2 ______________________________ Date __________
Printed name and signature

Diving Supervisor ______________________________ Date __________
Printed name and signature

FADS III AIR SYSTEM CONFIGURATION 2 / OP-3M **Page 1 of 4**

TRC & TL MODIFIED PREDIVE START-UP PROCEDURES

NOTE 1: This OP presents the modified predive start-up procedures for the TRC and TL.

NOTE 2: Record notes and deficiencies in section provided at the end of this operating procedure.

NOTE 3: When the TRCS is used, ASRA Banks 1 and 2 must be aligned to Ports A and B separately. Complete the following using Configuration 2 Status Sheet (Figure B-6).

ASRA Primary Bank and Port Selections

Designate which bank has been chosen as primary to TRCS and which has been chosen as primary to CCA by circling the appropriate label. Also circle whether the upper or lower port is being used.

BANK 1:	Primary to TRCS	Primary to CCA	(using)	Upper	/	Lower	**PORT A**
BANK 2:	Primary to TRCS	Primary to CCA	(using)	Upper	/	Lower	**PORT B**

ASRA Secondary Port Selections

Circle whether the upper or lower port is being used for each operation.

BANK 3:	Secondary to TRCS	(using)	Upper	/	Lower	**PORT C**
	Secondary to CCA	(using)	Upper	/	Lower	**PORT C**

NOTE 4: If the Diving Supervisor determines that the oxygen flasks need to be charged before, during, or after performance of this procedure, refer to TRCS OP-7, Charging HP Oxygen Flasks. Ensure that valves are returned to their previous settings prior to continuing this procedure or beginning the next one.

ITEM	COMPONENT	DESCRIPTION	PROCEDURE	LOCATION	CHECK	NOTE
PERFORM TRC GAS ANALYSIS CALIBRATION						
1	CO2 and O2 Analyzers	Set up analyzers in accordance with manufacturer's instructions.		TRC		
PERFORM COMMUNICATIONS CHECK						
2	Comms Box	Turn switch to ON and perform communications check.		TRC Control Panel		
INSTALL CO2 SCRUBBER CANISTER (IF REQUIRED)						
3	CO2 Scrubber Canister	Install canister at Diving Supervisor's discretion.		Inside TRC		
SET UP TRC AIR						
4	Bank 1 -or- Bank 2 Manifold Valve	AHP-V420 -or- AHP-V421	Verify selected manifold valve for TRCS is open. (Circle selected valve)	ASRA		

FADS III AIR SYSTEM CONFIGURATION 2 / OP-3M *Page 2 of 4*

TRC & TL MODIFIED PREDIVE START-UP PROCEDURES—Continued

ITEM	COMPONENT	DESCRIPTION	PROCEDURE	LOCATION	CHECK	NOTE
5	Port A Valve -or- Port B Valve	AHP-V443 -or- AHP-V429	Verify selected port valve for TRCS is open. (Circle selected valve)	ASRA		
6	Port C Valve	AHP-V422	Verify open.	ASRA		
7	Secondary Air Inlet Pressure Gauge	AHP-G-2	Record pressure: __________________ psig	TRC Control Panel		
8	Secondary HP Air Regulator	AHP-R-2	Load to 200 psig as read on ALP-G-2.	Under TRC Control Panel		
9	TRC Secondary Pressurization Control Valve	ALP-V-7	Open, blow down chamber, and close. Verify secondary regulator tracks.	Under TRC Control Panel		
10	Primary Air Inlet Pressure Gauge	AHP-G-1	Record pressure: __________________ psig	TRC Control Panel		
11	Primary HP Air Regulator	AHP-R-1	Load to 200 psig as read on ALP-G-1.	Under TRC Control Panel		
12	TRC Primary Pressurization Control Valve	ALP-V-3	Open, blow down chamber, and close. Verify primary regulator tracks.	TRC Control Panel		
SET UP TRC OXYGEN						
NOTE 5: If bulk oxygen is being used to supply primary and/or secondary oxygen, open K-bottle stop valve(s) slowly and continue with Item 13.						
13	Primary HP Oxygen Bank Pressure Gauge	OHP-G-114	Record pressure: __________________ psig	TRC Oxygen Supply Rack		
14	Secondary HP Oxygen Bank Pressure Gauge	OHP-G-115	Record pressure: __________________ psig	TRC Oxygen Supply Rack		
15	Primary Oxygen Regulator	OHP-REG-109	Load to 75 psig as read on gauge OLP-G-117.	TRC Oxygen Supply Rack		
16	Secondary Oxygen Regulator	OHP-REG-108	Load to 75 psig as read on gauge OLP-G-116.	TRC Oxygen Supply Rack		
17	Primary Oxygen Bank Outlet Valve	OLP-V-113	Open.	TRC Oxygen Supply Rack		
18	Secondary Oxygen Bank Outlet Valve	OLP-V-112	Open.	TRC Oxygen Supply Rack		

FADS III AIR SYSTEM CONFIGURATION 2 / OP-3M *Page 3 of 4*

TRC & TL MODIFIED PREDIVE START-UP PROCEDURES—Continued

ITEM	COMPONENT	DESCRIPTION	PROCEDURE	LOCATION	CHECK	NOTE
19	Secondary Oxygen Supply Valve	OLP-V-2	Open, and verify 75 psig on gauge OLP-G-1.	TRC Control Panel		
20	BIBS Masks	Breathe each mask to ensure good supply.		Inside TRC		
21	Secondary Oxygen Supply Valve	OLP-V-2	Close, and breathe mask until OLP-G-1 reads 0 psig.	TRC Control Panel		
22	Primary Oxygen Supply Valve	OLP-V-1	Open, and verify 75 psig on gauge OLP-G-1.	TRC Control Panel		
23	BIBS Masks	Breathe each mask to ensure good supply.		Inside TRC		
24	Primary Oxygen Supply Valve	OLP-V-1	Close.	TRC Control Panel		
SET UP TL AIR						
25	Communication Handset	Perform communications check.		TL Control Panel		
26	CO2 Scrubber Canister	Install canister at Diving Supervisor's discretion.		Inside TL		
27	Secondary Air Bank Pressure Gauge	AHP-G-4	Record pressure: ________________ psig	TL Control Panel		
28	Secondary HP Air Regulator	AHP-R-4	Load to 200 psig as read on gauge ALP-G-7.	Under TL Control Panel		
29	TL Pressurization Control Valve	ALP-V-16	Open, blow down chamber, and close. Verify secondary regulator tracks.	TL Control Panel		
30	Secondary HP Air Regulator	AHP-R-4	Back off regulator AHP-R-4. Vent using primary air supply valve ALP-V-16 until 100 psig is maintained on gauge ALP-G-7.	Under TL Control Panel		
31	Primary HP Air Regulator	AHP-R-3	Load to 200 psig as read on gauge ALP-G-7.	Under TL Control Panel		
32	TL Pressurization Control Valve	ALP-V-16	Open, blow down chamber, and close. Verify primary regulator tracks.	TL Control Panel		
SET UP TL OXYGEN						
NOTE 6: If bulk oxygen is being used to supply primary and/or secondary oxygen, open K-bottle stop valve(s) slowly and continue with Item 33.						
33	Primary HP Oxygen Bank Pressure Gauge	OHP-G-114	Record pressure: ________________ psig	TL Oxygen Supply Rack		

FADS III AIR SYSTEM CONFIGURATION 2 / OP-3M

TRC & TL MODIFIED PREDIVE START-UP PROCEDURES—Continued

ITEM	COMPONENT	DESCRIPTION	PROCEDURE	LOCATION	CHECK	NOTE
34	Secondary HP Oxygen Bank Pressure Gauge	OHP-G-115	Record pressure: ____________________ psig	TL Oxygen Supply Rack		
35	Primary Oxygen Regulator	OHP-REG-109	Load to 75 psig as read on gauge OLP-G-117.	TL Oxygen Supply Rack		
36	Secondary Oxygen Regulator	OHP-REG-108	Load to 75 psig as read on gauge OLP-G-116.	TL Oxygen Supply Rack		
37	Primary Oxygen Bank Outlet Valve	OLP-V-113	Open.	TL Oxygen Supply Rack		
38	Secondary Oxygen Bank Outlet Valve	OLP-V-112	Open.	TL Oxygen Supply Rack		
39	Secondary Oxygen Supply Valve	OLP-V-7	Open, and verify 75 psig on gauge OLP-G-3.	TL Control Panel		
40	BIBS Masks	Breathe each mask to ensure good supply.		Inside TL		
41	Secondary Oxygen Supply Valve	OLP-V-7	Close, and breathe mask until OLP-G-3 reads 0 psig.	TL Control Panel		
42	Primary Oxygen Supply Valve	OLP-V-6	Open, and verify 75 psig on gauge OLP-G-3.	TL Control Panel		
43	BIBS Masks	Breathe each mask to ensure good supply.		Inside TL		
44	Primary Oxygen Supply Valve	OLP-V-6	Close.	TL Control Panel		

END OF PROCEDURE

REMARKS: (Using Item number as a reference, list any deficiencies or problems found during performance of this procedure.)

____

____

____

____

THIS PAGE INTENTIONALLY LEFT BLANK

FADS III AIR SYSTEM
CONFIGURATION 2 / OP-4

SHUTDOWN PROCEDURES
FOR
DIVING THE FADS III AIR SYSTEM
WITH TRCS SUPPORT

REVISED 14 MARCH 2008

SPECIAL INSTRUCTIONS

1. Ensure this OP is valid by comparing the revision date above with the master file.
2. Check each item individually.
3. Sign and date below when OP has been completed.
4. Report any discrepancy to the Diving Supervisor.

Operator No. 1 ______________________________ Date ____________
Printed name and signature

Operator No. 2 ______________________________ Date ____________
Printed name and signature

Diving Supervisor ______________________________ Date ____________
Printed name and signature

FADS III AIR SYSTEM CONFIGURATION 2 / OP-4

SHUTDOWN PROCEDURES
FOR DIVING THE FADS III AIR SYSTEM WITH TRCS SUPPORT

NOTE 1: Ensure C2/OP-1, OP-2, OP-3A, and OP-3B have been completed prior to commencing this OP.

NOTE 2: Record notes and deficiencies in section provided at the end of this operating procedure.

NOTE 3: If the Diving Supervisor determines that the ASRA flasks need to be charged prior to performance of this procedure, refer to C1/OP-5. Ensure all valves are returned to their previous settings prior to the next procedure.

ITEM	COMPONENT	DESCRIPTION	PROCEDURE	LOCATION	CHECK	NOTE
SHUT DOWN ASRA						
1	Manifold Valve	AHP-V444	Verify closed.	ASRA		
NOTE 4: Do not complete Items 2 thru 6 if Bank 1 is lined up for TRCS and if C2/OP-8 (Postmission Procedures) is to be completed immediately following completion of this OP (bank will be required to pressurize TRC and TL for shipment/lay-up). Instead, proceed to Item 7.						
SHUT DOWN BANK 1						
2	Bank 1 Flask Isolation Valves	AHP-V401 AHP-V402 AHP-V403	Close.	ASRA		
3	Bank 1 Manifold Valve	AHP-V420	Verify open.	ASRA		
4	Port A Bleed Valve	AHP-V442	Open, depressurize until AHP-G437 reads 0 psig, close.	ASRA		
5	Port A Valve	AHP-V443	Close.	ASRA		
6	Bank 1 Manifold Valve	AHP-V420	Close.	ASRA		
NOTE 5: Do not complete Items 7 thru 11 if Bank 2 is lined up for TRCS and if C2/OP-8 (Postmission Procedures) is to be completed immediately following completion of this OP (bank will be required to pressurize TRC and TL for shipment/lay-up). Instead, proceed to Item 12.						
SHUT DOWN BANK 2						
7	Bank 2 Flask Isolation Valves	AHP-V404 AHP-V405 AHP-V406 AHP-V407	Close.	ASRA		
8	Bank 2 Manifold Valve	AHP-V421	Verify open.	ASRA		
9	Port B Bleed Valve	AHP-V441	Open, depressurize until AHP-G438 reads 0 psig, close.	ASRA		
10	Port B Valve	AHP-V429	Close.	ASRA		
11	Bank 2 Manifold Valve	AHP-V421	Close.	ASRA		

FADS III AIR SYSTEM CONFIGURATION 2 / OP-4 *Page 2 of 6*

SHUTDOWN PROCEDURES
FOR DIVING THE FADS III AIR SYSTEM WITH TRCS SUPPORT—Continued

ITEM	COMPONENT	DESCRIPTION	PROCEDURE	LOCATION	CHECK	NOTE
SHUT DOWN BANK 3						
12	Bank 3 Flask Isolation Valves	AHP-V408 AHP-V409	Close.	ASRA		
13	Port C Bleed Valve	AHP-V440	Open, depressurize until AHP-G439 reads 0 psig, close.	ASRA		
14	Port C Valve	AHP-V422	Close.	ASRA		
SHUT DOWN CCA						
15	Yellow Supply Green Supply Red Supply Valves	ALP-V314 ALP-V315 ALP-V316	Close.	CCA		
16	Pneumo Valves	ALP-V317 ALP-V318 ALP-V319	Ensure closed.	CCA		
17	Volume Tank Valve	ALP-V313	If VTA not used, verify valve is closed.	CCA		
			If VTA required for next dive, close valve.	CCA		
			If VTA used and not required for next dive, open valve.	CCA		
18	Condensate Drain Valve	ALP-V201	If VTA used, open valve, drain condensate, and close.	VTA		
19	Diver UBAs, Umbilicals, and Pneumo Hoses	Disconnect as required in preparation of bleeding down CCA to 0 psig.		CCA		
20	Manifold Supply Valves	ALP-V311 ALP-V312	Open.	CCA		
21	Yellow Diver Supply Valve	ALP-V314	Open, depressurize until all CCA pressure gauges read 0 psig, and close.	CCA		
22	Volume Tank Valve	ALP-V313	Close valve if opened in Item 17.	CCA		
23	A Regulator B Regulator	AHP-V303 AHP-V304	Back off fully CCW.	CCA		
24	A Supply Valve B Supply Valve	AHP-V301 AHP-V302	Close.	CCA		
25	Manifold Supply Valve	ALP-V311 ALP-V312	Close.	CCA		

FADS III AIR SYSTEM CONFIGURATION 2 / OP-4

SHUTDOWN PROCEDURES
FOR DIVING THE FADS III AIR SYSTEM WITH TRCS SUPPORT—Continued

ITEM	COMPONENT	DESCRIPTION	PROCEDURE	LOCATION	CHECK	NOTE
26	Diver and Pneumo CCA Ports and/or Umbilical Connections	Reinstall plugs and caps as required.		CCA		
NOTE 6: Items 27 thru 29 are optional but highly recommended if equipment is likely to be exposed to salt-water contamination for any length of time.						
27	ASRA Doors	Close.		ASRA		
28	CCA Blowout Plug	Install.		CCA Rear Panel		
29	CCA Case Lid	Install.		CCA		
SHUT DOWN TRC						
NOTE 7: If Diving Supervisor determines that oxygen flasks need to be charged, refer to TRCS OP-7, Charging HP Oxygen Flasks. Ensure that valves are returned to previous settings prior to the next procedure.						
30	O2/CO2 Analyzer	Turn switch to OFF.		TRC Control Panel		
31	Comms Box	Turn switch to OFF.		TRC Control Panel		
32	CO2 Scrubber Canister	Remove / double bag if installed.		CO2 Scrubber Inside TRC		
33	Secondary Pressurization Control Valve	ALP-V-7	Open, depressurize until ALP-G-2 reads 0 psig, close.	TRC Panel		
34	Secondary HP Air Regulator	AHP-R-2	Ensure backed off fully CCW.	Under TRC Control Panel		
NOTE 8: Do not complete Items 35 and 36 if C2/OP-8 (Postmission Procedures) is to be completed immediately following completion of this OP (primary air will be required to pressurize TRC for shipment/lay-up). Instead, proceed to Item 37.						
35	Primary Pressurization Control Valve	ALP-V-3	Open, depressurize until AHP-G-1 and ALP-G-1 read 0 psig, close.	TRC Panel		
36	Primary HP Regulator	AHP-R-1	Ensure backed off fully CCW.	Under TRC Control Panel		
NOTE 9: If bulk O2 is being used to supply primary and/or secondary O2, close stop valve on K-bottle(s).						
37	Primary Flask Stop Valve	OHP-V-105	Close.	Oxygen Rack		
38	Primary Flask Stop Valve	OHP-V-106	Close.	Oxygen Rack		

FADS III AIR SYSTEM CONFIGURATION 2 / OP-4

SHUTDOWN PROCEDURES FOR DIVING THE FADS III AIR SYSTEM WITH TRCS SUPPORT—Continued

ITEM	COMPONENT	DESCRIPTION	PROCEDURE	LOCATION	CHECK	NOTE
39	Secondary Flask Stop Valve	OHP-V-107	Close.	Oxygen Rack		
40	BIBS Primary Oxygen Supply Control Valve	OLP-V-1	Open.	TRC Panel		
41	BIBS Secondary Oxygen Supply Control Valve	OLP-V-2	Open and bleed down BIBS until OHP-G-114, OHP-G-116, and OLP-G-1 read 0 psig.	TRC Panel		
42	BIBS Secondary Oxygen Supply Control Valve	OLP-V-2	Close.	TRC Panel		
43	BIBS Oxygen Hull Stop Valve	OLP-V-3	Close.	On Hull Under TRC Panel		
44	BIBS Primary Oxygen Supply Control Valve	OLP-V-1	Close.	TRC Panel		
45	Primary Oxygen Charge Valve	OHP-V-101	Close or verify closed.	Oxygen Rack		
46	Primary Oxygen Supply Valve	OLP-V-113	Close.	Oxygen Rack		
47	Secondary Oxygen Charge Valve	OHP-V-103	Close or verify closed.	Oxygen Rack		
48	Secondary Oxygen Supply Valve	OLP-V-112	Close.	Oxygen Rack		
49	Primary Oxygen Supply Regulator	OHP-REG-109	Back off fully CCW.	Oxygen Rack		
50	Secondary Oxygen Supply Regulator	OHP-REG-108	Back off fully CCW.	Oxygen Rack		
51	TRC Door	Secure in closed position.		TRC		
SHUT DOWN TL						
52	TL Door	Open.		Both Ends of TL		

FADS III AIR SYSTEM CONFIGURATION 2 / OP-4

SHUTDOWN PROCEDURES FOR DIVING THE FADS III AIR SYSTEM WITH TRCS SUPPORT—Continued

ITEM	COMPONENT	DESCRIPTION	PROCEDURE	LOCATION	CHECK	NOTE
NOTE 10: Do not complete Items 53 and 54 if C2/OP-8 (Postmission Procedures) is to be completed immediately following completion of this OP (primary air will be required to pressurize TL for shipment/lay-up). Instead, proceed to Item 55.						
53	TL Pressurization Supply Control Valve	ALP-V-16	Open; depressurize until AHP-G-3, AHP-G-4, and ALP-G-7 read 0 psig; close.	TL Panel		
54	Primary HP Air Regulator	AHP-R-3	Verify backed off fully CCW.	Under TL Control Panel		
55	Secondary HP Air Regulator	AHP-R-4	Verify backed off fully CCW.	Under TL Control Panel		
NOTE 11: If bulk O2 is being used to supply primary and/or secondary O2, close stop valve on K-bottle(s).						
56	Primary Flask Stop Valve	OHP-V-105	Close.	Oxygen Rack		
57	Primary Flask Stop Valve	OHP-V-106	Close.	Oxygen Rack		
58	Secondary Flask Stop Valve	OHP-V-107	Close.	Oxygen Rack		
59	BIBS Secondary Oxygen Supply Control Valve	OLP-V-7	Open slowly.	TL Panel		
60	BIBS Primary Oxygen Supply Control Valve	OLP-V-6	Open slowly.	TL Panel		
61	BIBS Oxygen Hull Stop Valve	OLP-V-9	Open slowly.	On Hull Under TL Panel		
62	BIBS Oxygen Quick Disconnects	OLP-QD-3 OLP-QD-4	Install BIBS mask and bleed down pressure until OHP-G-102, OHP-G-115, and OLP-G-3 read 0 psig.	Inside TL		
63	BIBS Oxygen Hull Stop Valve	OLP-V-9	Close.	On Hull Under TL Panel		
64	BIBS Primary Oxygen Supply Control Valve	OLP-V-6	Close.	TL Panel		
65	BIBS Secondary Oxygen Supply Control Valve	OLP-V-7	Close.	TL Panel		

FADS III AIR SYSTEM CONFIGURATION 2 / OP-4 *Page 6 of 6*

SHUTDOWN PROCEDURES
FOR DIVING THE FADS III AIR SYSTEM WITH TRCS SUPPORT—Continued

ITEM	COMPONENT	DESCRIPTION	PROCEDURE	LOCATION	CHECK	NOTE
66	Primary Oxygen Charge Valve	OHP-V-101	Close.	Oxygen Rack		
67	Primary Oxygen Supply Valve	OLP-V-113	Close.	Oxygen Rack		
68	Primary Oxygen Regulator	OHP-REG-109	Back off fully CCW.	Oxygen Rack		
69	Secondary Oxygen Charge Valve	OHP-V-103	Close.	Oxygen Rack		
70	Secondary Oxygen Bank Outlet Valve	OHP-V-112	Close.	Oxygen Rack		
71	Secondary Oxygen Regulator	OHP-REG-108	Back off fully CCW.	Oxygen Rack		
72	TL Doors	Secure in closed position.		TL		

NOTE 12: If dive mission is complete, proceed to C2/OP-8 (Postmission Procedures). If dive mission is not complete, perform all required Items in C2/OP-2, OP-3A, and OP-3B prior to next dive.

END OF PROCEDURE

REMARKS: (Using Item number as a reference, list any deficiencies or problems found during performance of this procedure.)

THIS PAGE INTENTIONALLY LEFT BLANK

FADS III AIR SYSTEM
CONFIGURATION 2 / OP-4M

MODIFIED SHUTDOWN PROCEDURES
FOR
DIVING THE FADS III AIR SYSTEM
WITH TRCS SUPPORT

REVISED 14 MARCH 2008

SPECIAL INSTRUCTIONS

1. Ensure this OP is valid by comparing the revision date above with the master file.
2. Check each item individually.
3. Sign and date below when OP has been completed.
4. Report any discrepancy to the Diving Supervisor.

Operator No. 1 ______________________________________ Date ____________
Printed name and signature

Operator No. 2 ______________________________________ Date ____________
Printed name and signature

Diving Supervisor ____________________________________ Date ____________
Printed name and signature

FADS III AIR SYSTEM CONFIGURATION 2 / OP-4M

MODIFIED SHUTDOWN PROCEDURES FOR DIVING THE FADS III AIR SYSTEM WITH TRCS SUPPORT

NOTE 1: Ensure C2/OP-1, OP-2, OP-3A, and OP-3B have been completed prior to commencing this OP.

NOTE 2: Record notes and deficiencies in section provided at the end of this operating procedure.

NOTE 3: Umbilical air and pneumofathometer hoses can remain either connected or capped at the diver's end.

NOTE 4: If the Diving Supervisor determines that the ASRA flasks need to be charged before or after performance of this procedure, refer to C1/OP-5. Ensure all valves are returned to their previous settings prior to the next procedure.

NOTE 5: If the Diving Supervisor determines that the oxygen flasks need to be charged after performance of this procedure, refer to TRCS OP-7, Charging HP Oxygen Flasks. Ensure all valves are returned to their previous settings prior to the next procedure.

ITEM	COMPONENT	DESCRIPTION	PROCEDURE	LOCATION	CHECK	NOTE
PERFORM MODIFIED CCA SHUTDOWN						
1	Yellow Supply Green Supply Red Supply Valves	ALP-V314 ALP-V315 ALP-V316	Close.	CCA		
2	Volume Tank Supply Valve	ALP-V313	Close or verify closed.	CCA		
3	B Supply Valve	AHP-V302	Close.	CCA		
4	B Regulator	AHP-V304	Ensure backed off fully CCW.	CCA		
5	B Manifold Supply Valve	ALP-V312	Close.	CCA		
6	A Supply Valve	AHP-V301	Close.	CCA		
7	A Regulator	AHP-V303	Ensure backed off fully CCW.	CCA		
8	A Manifold Supply Valve	ALP-V311	Close.	CCA		
PERFORM MODIFIED ASRA SHUTDOWN						
9	Port A Valve Port B Valve Port C Valve	AHP-V443 AHP-V429 AHP-V422	Close.	ASRA		
PERFORM MODIFIED TRC SHUTDOWN						
10	O2/CO2 Analyzer	Turn switch to OFF.		TRC Control Panel		
11	Comms Box	Turn switch to OFF.		TRC Control Panel		
12	CO2 Scrubber Canister	Remove; double bag if installed.		CO2 Scrubber Inside TRC		
13	Primary HP Air Regulator	AHP-R-1	Ensure backed off fully CCW.	Under TRC Control Panel		

FADS III AIR SYSTEM CONFIGURATION 2 / OP-4M *Page 2 of 2*

MODIFIED SHUTDOWN PROCEDURES FOR DIVING THE FADS III AIR SYSTEM WITH TRCS SUPPORT—Continued

ITEM	COMPONENT	DESCRIPTION	PROCEDURE	LOCATION	CHECK	NOTE
14	Secondary HP Air Regulator	AHP-R-2	Ensure backed off fully CCW.	Under TRC Control Panel		
NOTE 6: If bulk O2 is being used to supply primary and/or secondary O2, close stop valve on K-bottle(s).						
15	Primary Oxygen Bank Outlet Valve	OLP-V-113	Close.	TRC Oxygen Supply Rack		
16	Secondary Oxygen Bank Outlet Valve	OLP-V-112	Close.	TRC Oxygen Supply Rack		
17	Primary Oxygen Regulator	OHP-REG-109	Ensure backed off fully CCW.	TRC Oxygen Supply Rack		
18	Secondary Oxygen Regulator	OHP-REG-108	Ensure backed off fully CCW.	TRC Oxygen Supply Rack		
PERFORM MODIFIED TL SHUTDOWN						
19	Primary HP Air Regulator	AHP-R-3	Ensure backed off fully CCW.	Under TL Control Panel		
20	Secondary HP Air Regulator	AHP-R-4	Ensure backed off fully CCW.	Under TL Control Panel		
NOTE 7: If bulk O2 is being used to supply primary and/or secondary O2, close stop valve on K-bottle(s).						
21	Primary Oxygen Bank Outlet Valve	OLP-V-113	Close.	TL Oxygen Supply Rack		
22	Secondary Oxygen Bank Outlet Valve	OLP-V-112	Close.	TL Oxygen Supply Rack		
23	Primary Oxygen Regulator	OHP-REG-109	Ensure backed off fully CCW.	TL Oxygen Supply Rack		
24	Secondary Oxygen Regulator	OHP-REG-108	Ensure backed off fully CCW.	TL Oxygen Supply Rack		
END OF PROCEDURE						

REMARKS: (Using Item number as a reference, list any deficiencies or problems found during performance of this procedure.)

____

____

THIS PAGE INTENTIONALLY LEFT BLANK

FADS III AIR SYSTEM
CONFIGURATION 2 / OP-8

POSTMISSION PROCEDURES
FOR
DIVING THE FADS III AIR SYSTEM
WITH TRCS SUPPORT

REVISED 14 MARCH 2008

SPECIAL INSTRUCTIONS

1. Ensure this OP is valid by comparing the revision date above with the master file.
2. Check each item individually.
3. Sign and date below when OP has been completed.
4. Report any discrepancy to the Diving Supervisor.

Operator No. 1 ____ Date ____________
Printed name and signature

Operator No. 2 ____ Date ____________
Printed name and signature

Diving Supervisor ______________________________________ Date ____________
Printed name and signature

FADS III AIR SYSTEM CONFIGURATION 2 / OP-8 ***Page 1 of 8***

POSTMISSION PROCEDURES FOR DIVING THE FADS III AIR SYSTEM WITH TRCS SUPPORT

NOTE 1: Ensure Configuration 2/OP-4 has been completed prior to commencing this OP as it contains Items that are essential to proper shutdown of the ASRA, CCA, VTA, and TRCS.

NOTE 2: Record notes and deficiencies in section provided at the end of this operating procedure.

ITEM	COMPONENT	DESCRIPTION	PROCEDURE	LOCATION	CHECK	NOTE
PERFORM TRC CHAMBER SHUTDOWN						
NOTE 3: If the TRC and TL are de-mated, omit Item 1 and proceed with Item 2.						
1	Female Bayonet Connector Interlock	ATM-IL-1	Press in on interlock piston, then rotate bayonet ring CW until stop is contacted.	Mating End of TL		Note 3
2	Door Equalization Stop Valve, Inner	EQ-V-4	Close.	Inside TRC Door		
3	Door Equalization Stop Valve, Outer	EQ-V-5	Close.	Outside TRC Door		
4	TRC Fast Exhaust Hull Stop Valve	EXH-V-4	Close.	TRC Panel		
5	TRC Slow Exhaust Hull Stop Valve	EXH-V-5	Close.	TRC Panel		
6	TRC Slow Exhaust Control Valve	EXH-V-6	Close.	TRC Panel		
7	BIBS Exhaust Hull Stop Valve, Outer	EXH-V-2	Close.	On Hull Under TRC Panel		
8	BIBS Exhaust Hull Stop Valve, Inner	EXH-V-1	Close.	Inside TRC		
9	Medical Lock Hull Stop Valve	EQ-V-2	Close.	Inside TRC		
10	TRC Gas Sample Hull Stop Valve	ATM-V-4	Close.	On Hull Above TRC Panel		
11	TRC Gas Sample Flow Meter	ATM-FM-1	Close.	Right Side of TRC Panel		
12	BIBS Secondary Oxygen Supply Control Valve	OLP-V-2	Close.	TRC Panel		

FADS III AIR SYSTEM CONFIGURATION 2 / OP-8 ***Page 2 of 8***

POSTMISSION PROCEDURES FOR DIVING THE FADS III AIR SYSTEM WITH TRCS SUPPORT—Continued

ITEM	COMPONENT	DESCRIPTION	PROCEDURE	LOCATION	CHECK	NOTE
13	BIBS Oxygen Hull Stop Valve	OLP-V-3	Close.	On Hull Under TRC Panel		
14	BIBS Primary Oxygen Supply Control Valve	OLP-V-1	Close.	TRC Panel		
15	BIBS Mixed Gas Supply Control Valve	MLP-V-4	Close.	TRC Panel		
16	BIBS Mixed Gas Hull Stop Valve	MLP-V-2	Close.	On Hull Under TRC Panel		
17	BIBS Air Hull Stop Valve	ALP-V-13	Close.	On Hull Under TRC Panel		
18	Secondary Air Cross Connect Valve	ALP-V-6	Close.	TRC Panel		
19	Primary Air Cross Connect Valve	ALP-V-1	Close.	TRC Panel		
20	CO2 Scrubber Pressurization Hull Stop Valve	ALP-V-10	Close.	On Hull Under TRC Panel		
21	CO2 Scrubber Pressurization Control Valve	ALP-V-9	Close.	TRC Panel		
22	Medical Lock Equalization Control Valve	EQ-V-1	Close.	Left Side of Medical Lock		
23	Medical Lock Vent Valve	EXH-V-3	Close.	Right Side of Medical Lock		
24	Secondary Air Regulator	AHP-R-2	Verify backed off fully CCW.	Bottom of TRC Panel		
25	NATO Flange Protector	Install on mating ring.		TRC		
NOTE 4:	Prepare Nonionic Detergent (NID) solution by mixing 1 teaspoon of nonionic detergent with 1 gallon of warm, fresh water.					
26	TRC Interior	Clean chamber interior with NID solution.		Inside TRC		
27	BIBS Masks	Disconnect BIBS mask, and remove, disinfect, and reinstall oral-nasal mask.		Inside TRC		

FADS III AIR SYSTEM CONFIGURATION 2 / OP-8 ***Page 3 of 8***

POSTMISSION PROCEDURES
FOR DIVING THE FADS III AIR SYSTEM WITH TRCS SUPPORT—Continued

ITEM	COMPONENT	DESCRIPTION	PROCEDURE	LOCATION	CHECK	NOTE
28	Communications and Head Sets	Secure communications and stow head sets.		Inside TRC		
29	Bunk and Loose Equipment	Secure bunk and loose equipment inside chamber to prevent damage during shipment.		Inside TRC		
30	Oxygen Monitor	Turn oxygen monitor power switch to OFF.		Inside TRC		
31	CO2 Canister	Remove canister and empty CO2 absorbent material. Rinse canister with water. Dry and reinstall canister.		Inside TRC		
32	TRC Door	Close door and ensure strong-back is installed on chamber door.		Outside TRC		
PERFORM TL CHAMBER SHUTDOWN						
33	BIBS Oxygen Hull Stop Valve	OLP-V-9	Close.	On Hull Under TL Panel		
34	BIBS Primary Oxygen Supply Control Valve	OLP-V-6	Close.	TL Panel		
35	BIBS Secondary Oxygen Supply Control Valve	OLP-V-7	Close.	TL Panel		
36	BIBS Air Hull Stop Valve	ALP-V-20	Close.	On Hull Under TL Panel		
37	TL Pressurization Supply Control Valve	ALP-V-16	Close.	TL Panel		
38	TL Exhaust Valve	EXH-V-9	Verify closed.	TL Panel		
39	Door Equalization Stop Valve, Outer	EQ-V-7	Verify closed.	Outside TL Door		
40	Door Equalization Stop Valve, Inner	EQ-V-6	Verify closed.	Inside TL Door		
41	TL Gas Sample Hull Stop Valve	ATM-V-9	Close.	On Hull Above TL Panel		
42	TL Gas Sample Flow Meter	ATM-FM-2	Verify closed.	TL Panel		
43	BIBS Exhaust Hull Stop Valve	EXH-V-7	Close.	Inside TL		
44	BIBS Exhaust Hull Stop Valve	EXH-V-8	Close.	On Hull Under TL Panel		

FADS III AIR SYSTEM CONFIGURATION 2 / OP-8 *Page 4 of 8*

POSTMISSION PROCEDURES FOR DIVING THE FADS III AIR SYSTEM WITH TRCS SUPPORT—Continued

ITEM	COMPONENT	DESCRIPTION	PROCEDURE	LOCATION	CHECK	NOTE
45	TL Interior	Clean chamber interior with NID solution.		Inside TL		
46	BIBS Masks	Disconnect BIBS masks and remove, disinfect, and reinstall oral-nasal masks.		Inside TL		
47	Communications and Hand Sets	Secure communications and stow hand sets.		Inside TL		
48	Loose Equipment	Secure loose equipment inside chamber to prevent damage during shipment.		Inside TL		
49	TL Doors	Close doors and ensure strong-backs are installed on chamber doors.		Outside TL		
SET UP ASRA FOR TRC AND TL PRESSURIZATION						
50	Manifold Valve	AHP-V444	Verify closed.	ASRA		
NOTE 5: Complete Items 51 thru 53 if ASRA was completely shut down during C2/OP-4 and Bank 1 was utilized as primary air for TRCS. Proceed to Item 48 if Bank 1 was not secured during C2/OP-4 shutdown.						
51	Bank 1 Flask Isolation Valves	AHP-V401 AHP-V402 AHP-V403	Open.	ASRA		
52	Bank 1 Manifold Valve	AHP-V420	Open.	ASRA		
53	Port A Valve	AHP-V443	Open.	ASRA		
NOTE 6: Complete Items 54 thru 56 if ASRA was completely shut down during C2/OP-4 and Bank 2 was utilized as primary air for TRCS. Proceed to Item 51 if Bank 2 was not secured during C2/OP-4 shutdown.						
54	Bank 2 Flask Isolation Valves	AHP-V404 AHP-V405 AHP-V406 AHP-V407	Close.	ASRA		
55	Bank 2 Manifold Valve	AHP-V421	Open.	ASRA		
56	Port B Valve	AHP-V429	Open slowly.	ASRA		
PRESSURIZE TRC TO 30 FSW OR LESS FOR SHIPMENT/LAY-UP						
57	Primary Air Regulator	AHP-R-1	Load to 200 psig.	Bottom of TRC Panel		
58	Primary Pressurization Control Valve	ALP-V-3	Open slowly until 30 fsw or less on D-G-1 or D-G-2.	TRC Panel		
59	Primary Air Regulator	AHP-R-1	Back off fully CCW.	Bottom of TRC Panel		

FADS III AIR SYSTEM CONFIGURATION 2 / OP-8 *Page 5 of 8*

POSTMISSION PROCEDURES
FOR DIVING THE FADS III AIR SYSTEM WITH TRCS SUPPORT—Continued

ITEM	COMPONENT	DESCRIPTION	PROCEDURE	LOCATION	CHECK	NOTE
PRESSURIZE TL TO 30 FSW OR LESS FOR SHIPMENT/LAY-UP						
60	Primary Air Regulator	AHP-R-3	Load to 200 psig.	Bottom of TL Panel		
61	TL Pressurization Supply Control Valve	ALP-V-16	Open slowly until 30 fsw or less on D-G-3 or D-G-4.	TL Panel		
62	Primary Air Regulator	AHP-R-3	Back off fully CCW.	Bottom of TL Panel		
NOTE 7: Complete Items 63 thru 68 if Bank 1 was utilized for pressurization of TRC and TL.						
63	Bank 1 Flask Isolation Valves	AHP-V401 AHP-V402 AHP-V403	Close.	ASRA		
64	Bank 1 Manifold Valve	AHP-V420	Verify open.	ASRA		
65	Port A Bleed Valve	AHP-V442	Open, depressurize until AHP-G437 reads 0 psig, close.	ASRA		
66	Port A Valve	AHP-V443	Close.	ASRA		
67	Bank 1 Manifold Valve	AHP-V420	Close.	ASRA		
68	All Other ASRA Valves and Regulator	Verify valves closed and SCUBA regulator backed off CCW.		ASRA		
NOTE 8: Complete Items 69 thru 74 if Bank 2 was utilized for pressurization of TRC and TL.						
69	Bank 2 Flask Isolation Valves	AHP-V404 AHP-V405 AHP-V406 AHP-V407	Close.	ASRA		
70	Bank 2 Manifold Valve	AHP-V421	Verify open.	ASRA		
71	Port B Bleed Valve	AHP-V441	Open, depressurize until AHP-G438 reads 0 psig, close.	ASRA		
72	Port B Valve	AHP-V429	Close.	ASRA		
73	Bank 2 Manifold Valve	AHP-V421	Close.	ASRA		
74	All Other ASRA Valves and Regulator	Verify valves closed and SCUBA regulator backed off CCW.		ASRA		

POSTMISSION PROCEDURES FOR DIVING THE FADS III AIR SYSTEM WITH TRCS SUPPORT—Continued

ITEM	COMPONENT	DESCRIPTION	PROCEDURE	LOCATION	CHECK	NOTE
PERFORM CCA SHUTDOWN						
75	All CCA Valves and Regulators	Verify valves closed and regulators backed off CCW.		CCA		
76	Condensate Drain Valve	ALP-V201	If VTA was used, ensure moisture has been drained and valve is closed.	VTA		
77	Red, Green, and Yellow Diver and Pneumo Hoses	Disconnect umbilicals from CCA ports.		CCA		
78	Red, Green, and Yellow Diver and Pneumo Hoses and Ports	Cap diver and pneumo ports. Bag or plug open ends of umbilical hoses.		CCA		
79	VTA Supply Hose	H-203	Disconnect from VTA and CCA. Install caps on CCA/VTA port and bag or plug open ends of hose. Stow hose within framework of VTA.	CCA/VTA		
DISCONNECT PRIMARY AND SECONDARY AIR SUPPLY HOSES FROM ASRA AND CCA						
80	Port A Bleed Port B Bleed Port C Bleed Valves	AHP-V442 AHP-V441 AHP-V440	Open, bleed down, and close.	ASRA		
81	Primary HP Air Hose Assembly	H-436	Disconnect from ASRA and CCA ports. Install port caps and hose plugs, and tighten 3/8 to 1/2 turn past O-ring engagement.	ASRA/CCA		
82	Secondary HP Air Hose Assembly	H-436	Disconnect from ASRA and CCA ports. Install port caps and hose plugs, and tighten 3/8 to 1/2 turn past O-ring engagement.	ASRA/CCA		
DISCONNECT PRIMARY AIR SUPPLY HOSES FROM ASRA, TRC, AND TEE PLATE						
83	Primary HP Air Hose Assembly (ASRA to Tee Plate)	H-804	Disconnect hose from ASRA port and inlet of tee plate assembly. Install port caps and tighten 3/8 to 1/2 turn after O-ring has engaged.	ASRA/Tee Plate		

FADS III AIR SYSTEM CONFIGURATION 2 / OP-8 *Page 7 of 8*

POSTMISSION PROCEDURES FOR DIVING THE FADS III AIR SYSTEM WITH TRCS SUPPORT—Continued

ITEM	COMPONENT	DESCRIPTION	PROCEDURE	LOCATION	CHECK	NOTE
84	Primary HP Air Hose Assembly (Tee Plate to TRC Panel)	H-804	Disconnect hose from outlet of tee plate and AHP-C-1 on TRC panel. Install port caps and tighten 3/8 to 1/2 turn after O-ring has engaged.	Tee Plate/TRC		
85	Primary HP Air Hose Assembly (Tee Plate to TL Panel)	H-804	Disconnect hose from outlet of tee plate and AHP-C-3 on TL panel. Install port caps and tighten 3/8 to 1/2 turn after O-ring has engaged.	Tee Plate/TL		
DISCONNECT SECONDARY AIR SUPPLY HOSES FROM ASRA, TEE PLATE, AND TL						
86	Secondary HP Air Hose Assembly (ASRA to Tee Plate)	H-804	Disconnect hose from ASRA port and inlet of tee plate assembly. Install port caps and tighten 3/8 to 1/2 turn after O-ring has engaged.	ASRA/Tee Plate		
87	Secondary HP Air Hose Assembly (Tee Plate to TRC Panel)	H-804	Disconnect hose from outlet of tee plate and AHP-C-2 on TRC panel. Install port caps and tighten 3/8 to 1/2 turn after O-ring has engaged.	Tee Plate/TRC		
88	Secondary HP Air Hose Assembly (Tee Plate to TL Panel)	H-804	Disconnect hose from outlet of tee plate and AHP-C-4 on TL panel. Install port caps and tighten 3/8 to 1/2 turn after O-ring has engaged.	Tee Plate/TL		
DISCONNECT OXYGEN SUPPLY HOSES FROM OXYGEN RACKS AND TRC						
NOTE 9: If bulk O2 or K-bottles were used as an oxygen source, disconnect spare whips from OLP-CC-1, OLP-CC-2, and all K-bottle flask valves.						
89	Primary Oxygen Hose Assembly (Oxygen Rack to TRC)	OLP-H-1	Disconnect from primary oxygen rack OLP-CO-1 and OLP-C-1 on TRC panel. Install caps/plugs and tighten wrench-tight.	Oxygen Rack/ TRC		
90	Secondary Oxy-gen Hose Assembly (Oxygen Rack to TRC)	OLP-H-2	Disconnect from secondary oxygen rack OLP-CO-2 and OLP-C-2 on TRC panel. Install caps/plugs and tighten wrench-tight.	Oxygen Rack/ TRC		
DISCONNECT OXYGEN SUPPLY HOSES FROM OXYGEN RACKS AND TL						
NOTE 10: If bulk O2 or K-bottles were used as an oxygen source, disconnect spare whips from OLP-CC-1, OLP-CC-2, and all K-bottle flask valves.						

FADS III AIR SYSTEM CONFIGURATION 2 / OP-8 ***Page 8 of 8***

POSTMISSION PROCEDURES
FOR DIVING THE FADS III AIR SYSTEM WITH TRCS SUPPORT—Continued

ITEM	COMPONENT	DESCRIPTION	PROCEDURE	LOCATION	CHECK	NOTE
91	Primary Oxygen Hose Assembly (Oxygen Rack to TL)	OLP-H-3	Disconnect from primary oxygen rack OLP-CO-1 and OLP-C-3 on TL panel. Install caps/plugs and tighten wrench-tight.	Oxygen Rack/ TL		
92	Secondary Oxygen Hose Assembly (Oxygen Rack to TL)	OLP-H-4	Disconnect from secondary oxygen rack OLP-CO-2 and OLP-C-4 on TL panel. Install caps/plugs and tighten wrench-tight.	Oxygen Rack/ TL		
93	Air and Oxygen Hoses	Coil and stow hoses in their designated locations.		ASRA/TRCS		
STOW SYSTEM OR PREPARE EQUIPMENT FOR DEPLOYMENT						
94	ASRA CCA VTA (if used) TRCS	Stow equipment or prepare for deployment in accordance with procedures in Chapter 8.		ASRA CCA VTA TRCS		

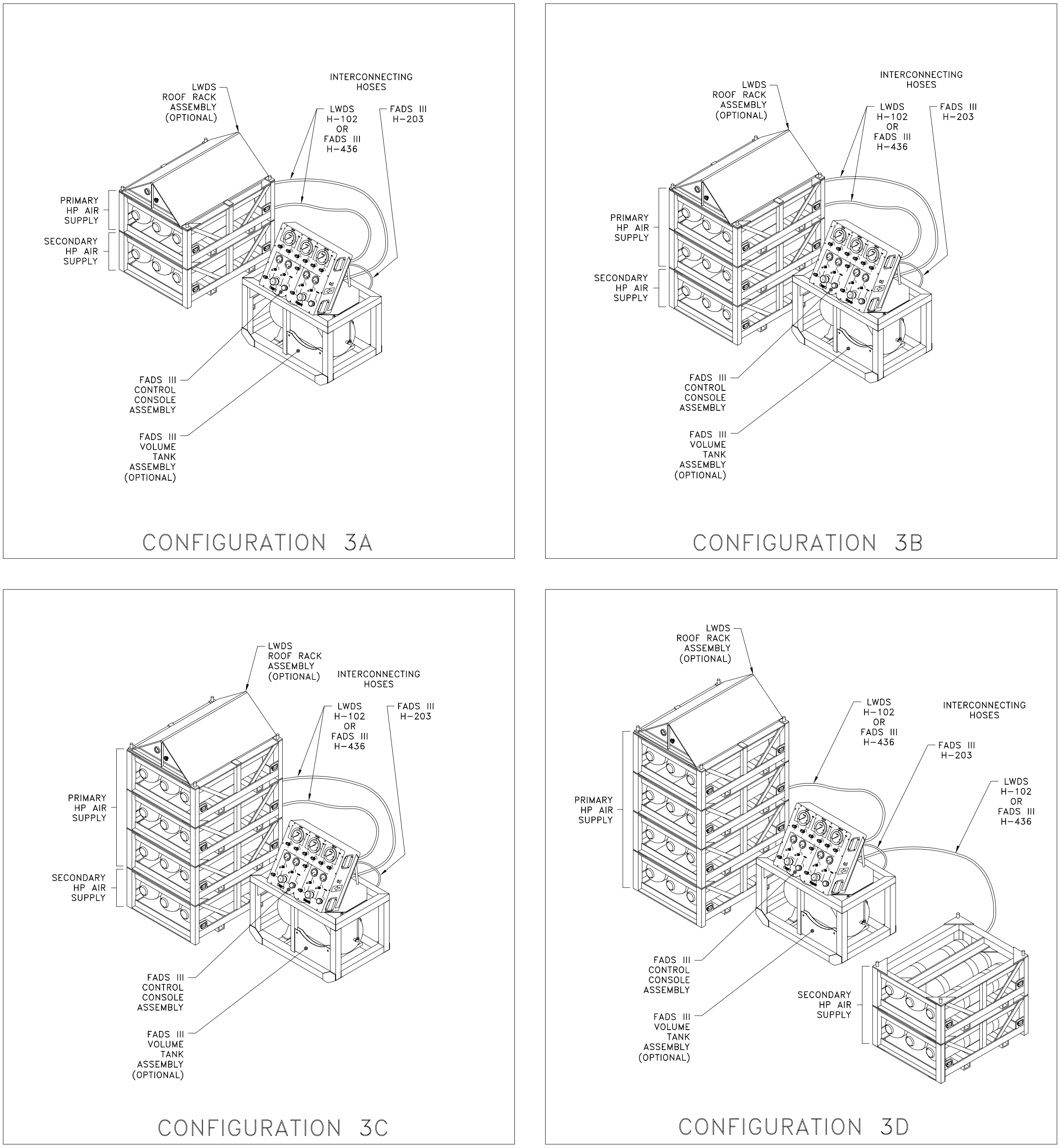
END OF PROCEDURE

REMARKS: (Using Item number as a reference, list any deficiencies or problems found during performance of this procedure.)

THIS PAGE INTENTIONALLY LEFT BLANK

APPENDIX C

FADS III AIR SYSTEM
OPERATING AND MAINTENANCE
SUPPLEMENT
FOR
CONFIGURATION 3:
DIVING THE FADS III CCA/VTA WITH
THE LWDS MK 3 MOD 0
FLASK RACK ASSEMBLIES



(MINIMUM REQUIREMENTS)

Figure C-1. Configuration 3: Diving the FADS III CCA/VTA with the LWDS MK 3 Mod 0 Flask Rack Assemblies

APPENDIX C

FADS III AIR SYSTEM
OPERATING AND MAINTENANCE SUPPLEMENT
FOR CONFIGURATION 3:
DIVING THE FADS III CCA/VTA WITH THE
LWDS MK 3 MOD 0 FLASK RACK ASSEMBLIES

NOTE

The information in this appendix is intended to supplement the information provided for the Configuration 1 Stand-Alone Diving Setup, which is located in the main body of this manual. Every effort has been made to avoid duplication of information; therefore, it may be necessary to reference the Configuration 1 information to obtain a better understanding of the system.

C.1 INTRODUCTION

This appendix contains the supplemental information needed to operate and maintain the Fly Away Dive System (FADS) III Air System and Lightweight Dive System (LWDS) MK 3 Mod 0 equipment used in the Configuration 3 arrangement.

Configuration 3 utilizes the FADS III Control Console Assembly (CCA), the optional FADS III Volume Tank Assembly (VTA), and the LWDS Flask Rack Assemblies in one of four different subconfigurations (as shown in Figure C-1) to support two working divers and one standby diver to a maximum depth of 60 feet of seawater (fsw) in Configurations 3A and 3B and 190 fsw in Configurations 3C and 3D. To help determine which components are required for use in Configuration 3 operations, refer to Table C-1 and Figure C-1.

Table C-1. Configuration 3 Equipment List

Item	Component/Description	Total Quantity	Required
FADS III AIR SYSTEM ASSEMBLIES			
1	Air Supply Rack Assembly (ASRA)	1	No
2	Control Console Assembly (CCA)	1	Yes
3	Volume Tank Assembly (VTA)	1	Optional
4	5,000 psi Compressor System (Bauer or Mako electric or diesel, or other approved 5,000 psi compressor system)	1	No

Table C-1. Configuration 3 Equipment List—Continued

Item	Component/Description	Total Quantity	Required
LWDS MK 3 MOD 0 ASSEMBLIES			
1	HP Air Flask Rack Assemblies Configuration 3A: 1 primary, 1 secondary Configuration 3B: 2 primary, 1 secondary Configuration 3C: 3 primary, 1 secondary Configuration 3D: minimum of 4 primary, 2 secondary	(see below) 2 3 4 Min. 6	Yes
2	Roof Rack Assembly	1	Optional
3	HP Air Compressor (must be approved for use with the LWDS)	1	Optional
INTERCONNECTING HOSE ASSEMBLIES AND ADAPTERS			
1	FADS III H-203 – VTA to CCA – 275 psig working pressure, 6 ft. long, 1/2 in. ID, 1/2 in. VCO fitting (53711-6962010)	1	If VTA used
2	FADS III H-436 – LWDS Flask Rack Assembly to FADS III CCA – 5,000 psig working pressure, 42 ft. long, 3/8 in. ID, 1/2 in. CPV fitting (53711-6962000)	1 Primary 1 Secondary	If LWDS H-102 not used
3	LWDS H-102 – LWDS Flask Rack Assembly to FADS III CCA – 3,000 psig working pressure, 30 ft. long, 3/8 in. ID, 37º flare fittings with 9/16-18 threads (53711-6314700)	1 Primary 1 Secondary	If FADS III H-436 not used
4	LWDS H-105 – Interconnects multiple LWDS Primary Flask Rack Assemblies – 3,000 psig working pressure, user-defined length, 3/8 in. ID, CGA-346 fittings (53711-6314703)	As Required	If multiple racks are used
5	Hose Adapters (53711-7022773) – Used at flask rack end if using FADS III H-436 or at CCA end if using LWDS H-102	2	Yes
DOCUMENTATION			
1	FADS III Air System Technical Manual	1	Yes
2	LWDS MK 3 Mod 0 Technical Manual	1	Yes
3	Applicable Compressor Manual	1	As Required

The information in this appendix is presented as follows:

a. Para. C.2 — Safety Precautions .... Page C-3
b. Para. C.3 — General Description .... Page C-3
c. Para. C.4 — Reference Data .... Page C-3
d. Para. C.5 — Controls and Indicators .... Page C-3
e. Para. C.6 — Operation .... Page C-4
f. Para. C.7 — Functional Description .... Page C-4
g. Para. C.8 — Scheduled Maintenance .... Page C-8

h. Para. C.9 — Troubleshooting .... Page C-8
i. Para. C.10 — Corrective Maintenance .... Page C-8
j. Para. C.11 — Parts Lists .... Page C-8
k. Para. C.12 — Installation, Deployment, and Storage .... Page C-8
l. Para. C.13 — Operating and Emergency Procedures .... Page C-11

C.2 SAFETY PRECAUTIONS

Refer to the Safety Summary and Chapter 1 of this manual for general safety precautions and the definitions of warnings, cautions, and notes.

C.3 GENERAL DESCRIPTION

C.3.1 FADS III AIR SYSTEM. Refer to Chapter 3 of this manual for a general description of the FADS III Air System.

C.3.2 LWDS MK 3 MOD 0. A single flask rack assembly consists of three interconnected composite flasks, which each contain 191 standard cubic feet (scf) of air at 3,000 pounds per square inch gauge (psig). Additional flask rack assemblies may be added as required but each stack of flask rack assemblies shall not exceed four high. If multiple stacks are used, the stacks are interconnected by a hose assembly and the roof rack assembly, if used, is placed on the last stack. The flask rack assemblies are interconnected and cascaded, which enables a single pressure reading to be taken from the roof rack assembly and also enables the flasks to be charged before, during, or after a mission.

Additional information concerning general descriptions of the LWDS is contained in the LWDS MK 3 Mod 0 operation and maintenance manual (NAVSEA SS500-HK-MMO-010) and the specific requirements for the Configuration 3 subconfigurations are detailed in paragraph C.7 of this manual.

C.4 REFERENCE DATA

All reference data for the FADS III Air System is contained in Chapter 1 in the main body of this manual, and reference data for the LWDS is contained in Chapter 1 of the LWDS MK 3 Mod 0 operation and maintenance manual (NAVSEA SS500-HK-MMO-010).

C.5 CONTROLS AND INDICATORS

The controls and indicators for the FADS III Air System Control Console Assembly (CCA) and Volume Tank Assembly (VTA) are identified in Chapter 2 of this manual as they are standard in each of the four configurations. The descriptions and locations of the controls and indicators for the LWDS are contained in Chapter 2 of the LWDS MK 3 Mod 0 operation and maintenance manual (NAVSEA SS500-HK-MMO-010).

C.6 OPERATION

Refer to paragraph C.13 in this appendix for the operating and emergency procedures to be used during Configuration 3 operations.

C.7 FUNCTIONAL DESCRIPTION

The FADS III Air System's main function in Configuration 3 is to use the CCA and optional VTA to provide primary and secondary diver-regulated air, which is supplied by the LWDS flask rack assemblies, and to monitor diver depths during diving operations. Together, the two systems provide breathing quality air to two working divers and one standby diver, and can be arranged in four different subconfigurations to accomplish this function. The subconfiguration used is determined by the maximum depth limit of the dive mission and the amount of air that is required to complete the dive. Paragraphs C.7.1 through C.7.4 describe the physical layout of each subconfiguration, paragraph C.7.5 describes the hose connections, and paragraph C.7.6 covers the primary and secondary air flow paths for Configuration 3.

Complete functional descriptions for the FADS III CCA and VTA are contained in Chapter 3 of this manual, and the functional descriptions for the LWDS components are contained in Chapter 3 of the LWDS MK 3 Mod 0 operation and maintenance manual.

C.7.1 CONFIGURATION 3A. Configuration 3A (Figure C-1) is used for dive missions limited to a maximum dive depth of 60 fsw. The primary high-pressure (HP) air supply is provided by a single LWDS flask rack assembly. The secondary HP air supply is also provided by a single LWDS flask rack assembly and is normally placed on the bottom if stacked with the primary air rack. The roof rack assembly, if used, is placed on top of the stack. For hose connections, see paragraph C.7.5.

C.7.2 CONFIGURATION 3B. Configuration 3B (Figure C-1) is also used for dive missions limited to a maximum dive depth of 60 fsw. The primary HP air supply is provided by two vertically stacked LWDS flask rack assemblies. The secondary HP air supply is provided by a single LWDS flask rack assembly and is normally placed on the bottom if stacked with the primary air racks. The roof rack assembly, if used, is placed on top of the stack. For hose connections, see paragraph C.7.5.

C.7.3 CONFIGURATION 3C. Configuration 3C (Figure C-1) is used for dive missions limited to a maximum dive depth of 190 fsw. The primary HP air supply is provided by three vertically stacked LWDS flask rack assemblies. The secondary HP air supply is provided by a single LWDS flask rack assembly and is normally placed on the bottom if stacked with the primary air racks. The roof rack assembly, if used, is placed on top of the stack. For hose connections, see paragraph C.7.5.

C.7.4 CONFIGURATION 3D. Configuration 3D (Figure C-1) is also used for dive missions limited to a maximum dive depth of 190 fsw. The primary HP air supply is provided by a minimum of four vertically stacked LWDS flask rack assemblies. If additional flask racks are required, a second stack of flask rack assemblies may be used with neither stack exceeding four racks in height. The stacks are interconnected using LWDS hose assembly (H-105), and the roof rack assembly, if used, is placed on the last stack of flask rack assemblies. The secondary HP air supply is provided by a minimum of two vertically stacked flask rack assemblies. For hose connections, see paragraph C.7.5.

C.7.5 <u>INTERCONNECTING HOSE ASSEMBLIES</u>. The primary and secondary air supplies are each connected to the FADS III CCA using two FADS III hose assemblies (H-436) or two LWDS hose assemblies (H-102). The flask rack end of each hose will connect to the lowest primary and secondary flask rack assembly in the stack and the CCA end of each hose will connect to the ***A SUPPLY*** and ***B SUPPLY*** ports on the CCA in accordance with the dive plan. A hose adapter (53711-7022773) is required at each flask rack end if using the FADS III hose assemblies or at each CCA end if using the LWDS hose assemblies. (See paragraph C.7.4 for additional requirements for multiple stacks.)

C.7.6 <u>PRIMARY AND SECONDARY AIR FLOW</u>. This section is dedicated to the primary and secondary air flow paths via the interfaces between the FADS III CCA/optional VTA and the LWDS flask rack assemblies in Configuration 3. Refer to the following paragraphs and to Figure C-2 on page C-9 to trace the flow of primary and secondary air through the FADS III and LWDS components. Although only the requirements for Configuration 3D are shown, the paths for the other configurations (3A, 3B, and 3C) can be easily traced as each one builds up one primary rack from the previous number of racks as shown below:

- Configuration 3A = 1 Primary, 1 Secondary
- Configuration 3B = 2 Primary, 1 Secondary
- Configuration 3C = 3 Primary, 1 Secondary
- Configuration 3D = 4 Primary, 2 Secondary (minimum requirements)

C.7.6.1 <u>Sample Scenario for Configuration 3 Operations</u>. The following selections and hose connections have been made for the sample scenario upon which the primary and secondary air flow paths in paragraphs C.7.6.2 and C.7.6.3 are based:

a. **<u>Configuration Selection</u>**: In accordance with mission scenario requirements, Configuration 3D has been selected. The Primary HP Air Supply consists of one stack containing 4 flask rack assemblies, and the Secondary HP Air Supply consists of a separate stack containing 2 flask rack assemblies. The Diving Supervisor has opted to use the roof rack assembly and it has been placed on top of the stack, as indicated in Figure C-2.

b. **<u>CCA Primary Supply Selection</u>:** The ***A SUPPLY*** port has been selected to supply primary air to the divers for this scenario.

c. **<u>CCA Secondary Supply Selection</u>:** The ***B SUPPLY*** port has been selected to supply secondary air to the divers for this scenario.

d. **<u>VTA</u> –** The Diving Supervisor has opted to use the VTA for this scenario.

e. **<u>Hose Connections</u> –** The following hose connections have been made in accordance with the selections in a – d:

<u>Primary Supply</u>

- LWDS flask whip from lowest primary rack's ***AIR SUPPLY NEXT RACK*** valve (AHP-V501) to next rack's ***AIR SUPPLY OUT*** valve (AHP-V502); same connections are made for second and third racks
- LWDS flask whip from fourth primary rack's ***AIR SUPPLY NEXT RACK*** valve (AHP-V501) to roof rack's ***AHP OUT*** port
- FADS III H-436 from lowest primary rack's ***AIR SUPPLY OUT*** valve (AHP-V502) to CCA's ***A SUPPLY*** port; hose adapter required at flask rack end of hose

<u>Secondary Supply</u>

- LWDS flask whip from lowest secondary rack's ***AIR SUPPLY NEXT RACK*** valve (AHP-V501) to next rack's ***AIR SUPPLY OUT*** valve (AHP-V502)
- FADS III H-436 from secondary rack's ***AIR SUPPLY OUT*** valve (AHP-V502) to CCA's ***B SUPPLY*** port; hose adapter required at flask rack end of hose

<u>VTA</u>

- FADS III H-203 from ***VOLUME TANK*** port on CCA to ***CONTROL CONSOLE*** port on VTA

<u>Divers</u>

- Umbilical hoses from CCA's ***YELLOW DIVER***, ***GREEN DIVER***, and ***RED DIVER*** ports to divers

NOTE

LWDS H-102 may be used instead of FADS III H-436 to connect the flask rack assemblies to the CCA. If H-102 is preferred, the hose adapter must be used at the CCA end of the hose.

C.7.6.2 <u>Primary Air Flow for Configuration 3</u>. The following steps outline the flow of primary air to the CCA and the divers in Configuration 3 and correspond to the primary air flow paths shown in Figure C-2.

a. HP air flows from the LWDS Primary HP Air Supply through the lowest rack's ***AIR SUPPLY OUT*** valve (AHP-V502) via FADS III hose assembly (H-436) to ***A SUPPLY*** port on rear panel of CCA.

b. HP air from ***A SUPPLY*** port flows through ***A SUPPLY*** valve (AHP-V301) and in-line filter (F-020) to ***A REGULATOR*** valve (AHP-V303), where it is regulated to a lower pressure determined by the Diving Supervisor. Pressure of the air entering AHP-V303 is measured by ***A SUPPLY*** gauge (AHP-G325), which may be isolated using ***GAUGE STOP*** valve (AHP-V305).

c. Low-pressure (LP) air leaving AHP-V303 flows to ***MANIFOLD SUPPLY*** valve (ALP-V311). The pressure of the air is measured by ***MANIFOLD PRESSURE*** gauge (ALP-

G323), which may be isolated using ***GAUGE STOP*** valve (ALP-V307). If the pressure exceeds 300 psi, the excess pressure is vented through relief valve (ALP-V309).

d. LP air from ALP-V311 flows to a manifold for use by ***RED SUPPLY***, ***GREEN SUPPLY,*** and ***YELLOW SUPPLY*** valves (ALP-V316, -V315, -V314) and ***PNEUMO*** valves (ALP-V319, -V318, -V317). Air from the supply valves is delivered to the divers' Underwater Breathing Apparatuses (UBAs) through their respective umbilical assemblies. Air is used by the pneumofathometer valves and hoses only during depth checks. The depth of each diver is indicated on the corresponding ***RED DIVER***, ***GREEN DIVER***, or ***YELLOW DIVER*** depth gauge (ALP-G322, -G321, -G320, respectively).

e. In this scenario, LP air in the manifold also flows through ***VOLUME TANK*** valve (ALP-V313) to the volume tank, where it can be stored and used as needed by moving back through ALP-V313 to the manifold. If the pressure in the tank exceeds 300 psi, the excess pressure is vented through relief valve (ALP-V202).

C.7.6.3 <u>Secondary Air Flow for Configuration 3</u>. If the primary air supply pressure drops below minimum manifold pressure, close the CCA's primary ***MANIFOLD SUPPLY*** valve (in this case, ALP-V311), open the CCA's secondary ***MANIFOLD SUPPLY*** valve (in this case, ALP-V312), and notify the divers.

The following steps trace the path of the secondary air supply for Configuration 3 (see also Figure C-2):

a. HP air flows from the LWDS Secondary HP Air Supply through the lowest rack's ***AIR SUPPLY OUT*** valve (AHP-V502) via FADS III hose assembly (H-436) to ***B SUPPLY*** port on rear panel of CCA.

b. HP air from ***B SUPPLY*** port flows through ***B SUPPLY*** valve (AHP-V302) and in-line filter (F-020) to ***B REGULATOR*** valve (AHP-V304), where it is regulated to a lower pressure determined by the Diving Supervisor. The pressure of the air entering AHP-V304 is measured by ***B SUPPLY*** gauge (AHP-G326), which may be isolated using ***GAUGE STOP*** valve (AHP-V306).

c. LP air leaving AHP-V304 flows to ***MANIFOLD SUPPLY*** valve (ALP-V312), which was opened upon failure of the primary air supply. The pressure of the air is measured by ***MANIFOLD PRESSURE*** gauge (ALP-G324), which may be isolated using ***GAUGE STOP*** valve (ALP-V308). If the pressure exceeds 300 psi, the excess pressure is vented through relief valve (ALP-V310).

d. LP air from ALP-V312 flows to a manifold for use by ***RED SUPPLY***, ***GREEN SUPPLY,*** and ***YELLOW SUPPLY*** valves (ALP-V316, -V315, -V314) and ***PNEUMO*** valves (ALP-V319, -V318, -V317). Air from the supply valves is delivered to the divers' UBAs through their respective umbilical assemblies until they are safely recovered.

e. In this scenario, LP air in the manifold also flows through ***VOLUME TANK*** valve (ALP-V313) to the volume tank, where it can be stored and used as needed by moving back through ALP-V313 to the manifold. If the pressure in the tank exceeds 300 psi, the excess pressure is vented through relief valve (ALP-V202).

C.8 SCHEDULED MAINTENANCE

Scheduled maintenance for Configuration 3 components is covered in Chapter 4 of this manual and also in Chapter 4 of the LWDS MK 3 Mod 0 operation and maintenance manual (NAVSEA SS500-HK-MMO-010).

C.9 TROUBLESHOOTING

Troubleshooting analysis is covered in Chapter 5 of this manual and also in Chapter 5 of the LWDS MK 3 Mod 0 operation and maintenance manual.

C.10 CORRECTIVE MAINTENANCE

Corrective maintenance actions are covered in Chapter 6 of this manual and also in Chapter 6 of the LWDS MK 3 Mod 0 operation and maintenance manual.

C.11 PARTS LISTS

Parts lists for the FADS III Air System are presented in Chapter 6 and referenced in a maintenance index in Chapter 7 of this manual. Parts lists for the LWDS are presented in Chapter 7 of the LWDS MK 3 Mod 0 operation and maintenance manual.

C.12 INSTALLATION, DEPLOYMENT, AND STORAGE

Installation, deployment, and storage information for the FADS III CCA/VTA is provided in Chapter 8 of this manual. Installation and storage of the LWDS flask rack assemblies is covered in Chapter 8 of the LWDS operation and maintenance manual.

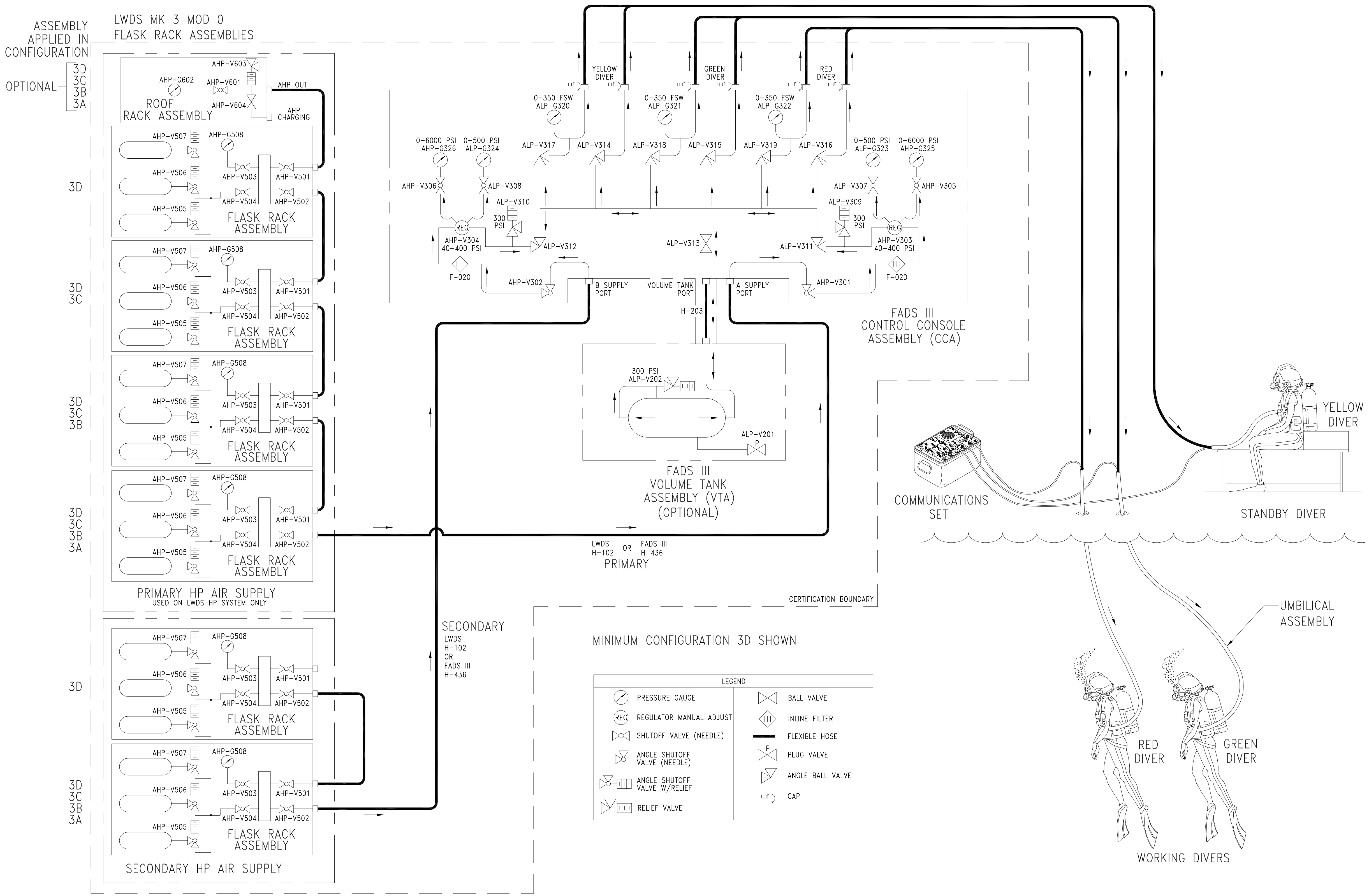


Figure C-2. Primary and Secondary Air Flow Paths for Configuration 3

THIS PAGE INTENTIONALLY LEFT BLANK

C.13 OPERATING AND EMERGENCY PROCEDURES

C.13.1 INTRODUCTION. Efficient operations using the equipment in Configuration 3 require the use of the five Operating Procedures (OPs) located in this appendix and one Emergency Procedure (EP), which is located in Appendix A of this manual. The OPs and EP are provided in reproducible checklist form and must be pulled from several locations as indicated in Table C-2 and the note that follows the table. Table C-2 provides an index identifying each procedure for Configuration 3 by its number, title, and location. C3 before a specific procedure number indicates that the OP is dedicated to Configuration 3 and is located in this appendix. C1 before a specific procedure number indicates that the procedure is located in Appendix A of this manual, which contains the procedures for Configuration 1. However, by referencing a C1 procedure here, it becomes common to both configurations.

Table C-2. Index of Configuration 3 Procedures

Procedure No.	Title	Page No.
C3 / OP-1	Premission Procedures	C-15
C3 / OP-2	Predive Start-Up Procedures	C-21
C3 / OP-2M	Modified Predive Start-Up Procedures	C-27
C3 / OP-3	Postdive Shutdown Procedures	C-31
C3 / OP-3M	Modified Postdive Shutdown Procedures	C-37
C1 / EP-1*	Emergency Procedure: Loss of Primary Air to Divers	A-49

* Included in Appendix A of the FADS III Air System technical manual

NOTE

The following OPs from Revision 2 of the LWDS MK 3 Mod 0 technical manual will be utilized as required in the Configuration 3 procedures:

OP-3 Predive/Postdive: HP Flask Charging Procedure
OP-5 During OPs: HP Flask Charging Procedure

C.13.2 USING THE CHECKLISTS AND RELATED DOCUMENTS. This section contains instructions for using the status sheet, the flow chart of operations, and the five reproducible OP checklists included in this appendix.

C.13.2.1 Status Sheet. The reproducible status sheet in Figure C-3 provides a central location for designating the racks and ports to be utilized during system line-up with the OPs, and provides a snapshot of the dive system's line-up condition during diving operations. The status sheet allows the Diving Supervisor to post the minimum allowable air pressure required in the racks prior to the start of a diving evolution. The status sheet may be filled out prior to premission setup and signed by the Diving Supervisor. Once established, a status sheet may continue to be used for successive dives as long as the designations do not change. If changes are required, the current status sheet should be updated or a new one prepared. Guidance for designating the configuration and making port selections for the FADS III CCA is provided on the status sheet in Figure C-3.

C.13.2.2 Flow Chart of Operations. The flow chart in Figure C-4 provides visual guidance for help in determining which OPs to perform and the order of their performance. If additional assistance is required, refer to Note 1 of the OP(s) in question.

C.13.2.3 OP Checklists. The checklists in this appendix are designed to be reproduced for use in the performance of the operating procedures. The following information covers the elements of each checklist and indicates what type of action, if any, is required:

a. **Signature block (located on checklist cover sheet):** Operators/checkers print and sign names and enter date checklist is completed. Diving Supervisor signs and dates checklist to verify that all actions have been performed and all deficiencies and problems have been noted.

b. **NOTE 1:** Contains pertinent information about the OP.

c. **NOTE 2:** Contains a reminder to record notes and deficiencies in the REMARKS section at the end of each OP.

d. **ITEM:** Contains the numerical identifier for each item.

e. **COMPONENT:** Contains the nomenclature of the component(s) involved in each item. If a choice of components is given, circle the appropriate component(s).

f. **DESCRIPTION:** Contains valve, gauge, and hose numbers (if applicable) of the component(s) involved and any other information that may be helpful. If a choice of components is given, circle the appropriate component(s).

g. **PROCEDURE:** Contains a brief description of actions to be performed by the appropriate personnel.

h. **LOCATION:** Contains the name of assembly/assemblies involved.

i. **CHECK:** The operator initials this column as each item is completed. If the item does not apply, the operator enters N/A (not applicable).

j. **NOTE:** The operator places a check mark in this column to indicate that a note has been included in the REMARKS section at the end of the procedure.

k. **REMARKS (last page of OP):** The operator uses this section to document any deficiencies or problems found during performance of a particular item. The operator should begin each note with the item number involved.

CONFIGURATION 3
STATUS SHEET

1. CONFIGURATION SELECTION

At a minimum, one Primary and one Secondary Flask Rack Assembly will be used with or without the Roof Rack Assembly, with a depth restriction of 60 fsw.

Designate which LWDS Flask Rack Configuration is to be utilized by circling the appropriate label.

Configuration 3A – 2 Flask Rack Assemblies (1 Primary, 1 Secondary)
(Depth limitation of 60 fsw)

Configuration 3B – 3 Flask Rack Assemblies (2 Primary, 1 Secondary)
(Depth limitation of 60 fsw)

Configuration 3C – 4 Flask Rack Assemblies (3 Primary, 1 Secondary)
(Depth limitation of 190 fsw)

Configuration 3D – Minimum of 6 Flask Rack Assemblies (4 Primary, 2 Secondary)
(Depth limitation of 190 fsw)

2. ROOF RACK ASSEMBLY

Designate whether or not a Roof Rack Assembly is to be utilized by circling the appropriate label.

Roof Rack Assembly to be utilized: YES NO

3. CCA PORT SELECTIONS

Designate primary and secondary ports on the CCA by circling the appropriate label.

A Supply – Primary Secondary

B Supply – Primary Secondary

Diving Supervisor: Determine the minimum air pressure allowed in racks to ensure that the air required for planned dives is available, and record below.

Minimum Air Pressure Allowed: Primary Rack(s): AHP-G508/G602 __________ psig

Secondary Rack(s): AHP-G508__________ psig

Diving Supervisor ____ Date ____________
Printed name and signature

Figure C-3. Configuration 3 Status Sheet

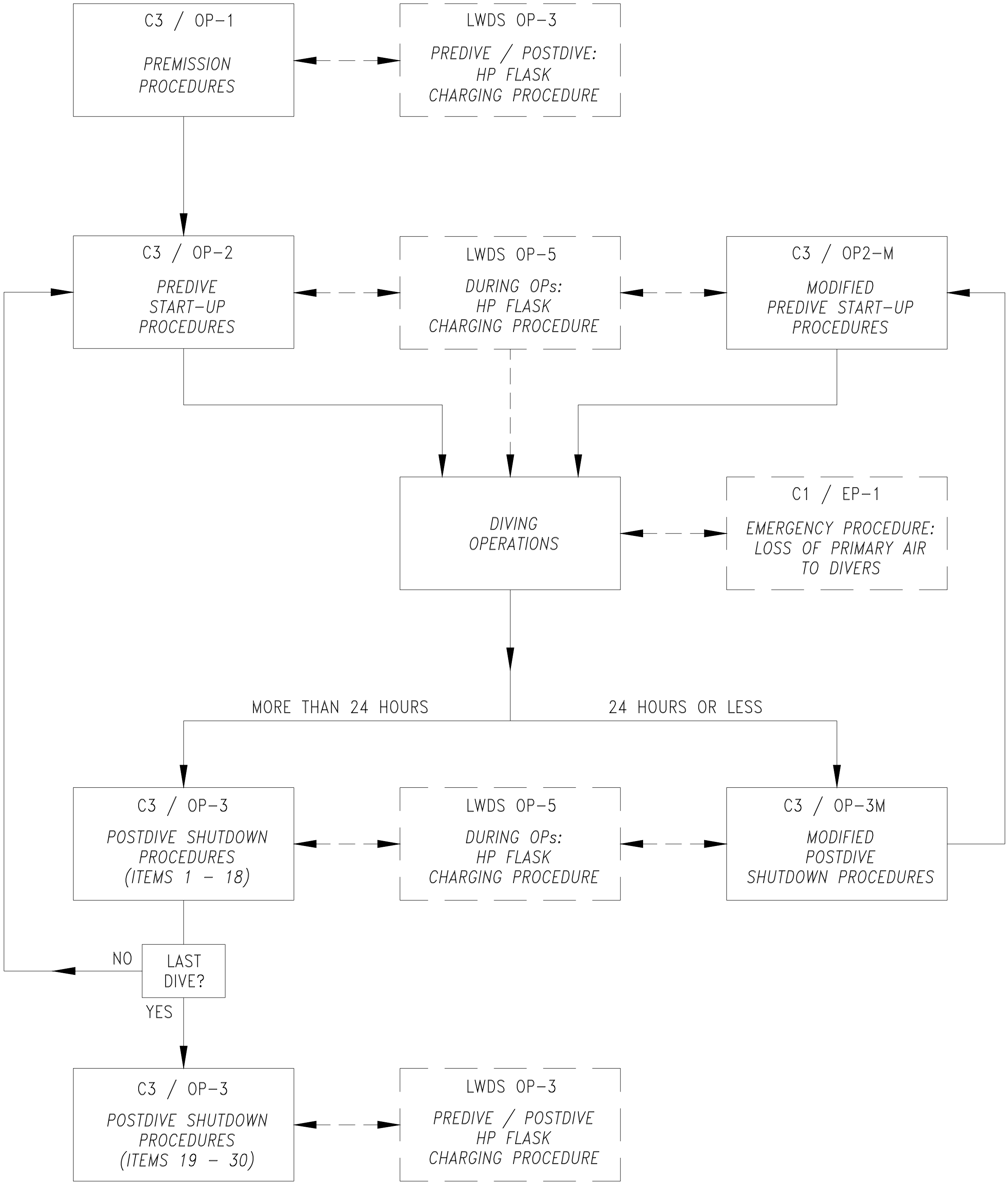


Figure C-4. Flow Chart of Operations for Configuration 3: Diving the FADS III CCA/VTA with the LWDS MK 3 Mod 0 Flask Rack Assemblies

FADS III AIR SYSTEM
CONFIGURATION 3 / OP-1

PREMISSION PROCEDURES
FOR DIVING THE FADS III CCA/VTA
WITH THE LWDS FLASK RACKS

REVISED 14 MARCH 2008

SPECIAL INSTRUCTIONS

1. Ensure this OP is valid by comparing the revision date above with the master file.
2. Check each step individually.
3. Sign and date below when OP has been completed.
4. Report any discrepancy to the Diving Supervisor.

Operator No. 1 ____ Date ____________
Printed name and signature

Operator No. 2 ____ Date ____________
Printed name and signature

Diving Supervisor ______________________________________ Date ____________
Printed name and signature

FADS III AIR SYSTEM CONFIGURATION 3 / OP-1

PREMISSION PROCEDURES FOR DIVING THE FADS III CCA/VTA WITH THE LWDS FLASK RACKS

NOTE 1: Premission setup involves physical placement and inspection of the equipment and installation of the air interface hoses to the FADS III CCA/VTA and the LWDS MK 3 Mod 0 Primary and Secondary Flask Rack Assemblies prior to a mission.

NOTE 2: Record notes and deficiencies in section provided at the end of this operating procedure.

NOTE 3: At a minimum, one Primary and one Secondary Flask Rack Assembly will be used with or without the Roof Rack Assembly, with a depth restriction of 60 fsw.

NOTE 4: If Diving Supervisor determines that flasks need to be charged before, during, or after performance of this procedure, refer to OP-3 of Revision 2 of the LWDS MK 3 Mod 0 technical manual for the Predive/Postdive: HP Flask Charging Procedure. Ensure that valves are returned to previous settings prior to continuing this procedure or beginning the next procedure.

NOTE 5: Designate selected LWDS Flask Rack Configuration by circling the appropriate label.

Configuration 3A – 2 Flask Rack Assemblies (1 Primary, 1 Secondary) (60 fsw limit)

Configuration 3B – 3 Flask Rack Assemblies (2 Primary, 1 Secondary) (60 fsw limit)

Configuration 3C – 4 Flask Rack Assemblies (3 Primary, 1 Secondary) (190 fsw limit)

Configuration 3D – Min. 6 Flask Rack Assemblies (4 Primary, 2 Secondary) (190 fsw limit)

NOTE 6: Designate which port on the CCA has been chosen as primary and which has been chosen as secondary by circling the appropriate label.

A Supply – Primary Secondary

B Supply – Primary Secondary

ITEM	COMPONENT	DESCRIPTION	PROCEDURE	LOCATION	CHECK	NOTE
WARNING: **All FADS III and LWDS equipment must be positioned and secured before operation as movement during operation could result in equipment damage and injury or death to personnel.**						
POSITION ASSEMBLIES						
1	LWDS Racks CCA VTA (if used)	Position all assemblies within reach of interface hoses (40 feet maximum).		LWDS Racks CCA VTA (if used)		
WARNING: **Use of the roof rack assembly is optional. If not used, charging source must be installed with a 3,300 psig relief setting to prevent overpressurization of flasks during charging.** CAUTION: Do not exceed a total stacked height of four flask rack assemblies (not including the roof rack assembly).						
2	Primary and Secondary Flask Rack Assemblies	• In Configurations 3A thru 3C, stack flask rack assemblies with secondary flask rack on the bottom followed by the primary flask racks on top. • In Configuration 3D, stack primary and secondary flask rack assemblies separately.				

FADS III AIR SYSTEM CONFIGURATION 3 / OP-1 *Page 2 of 5*

PREMISSION PROCEDURES
FOR DIVING THE FADS III CCA/VTA WITH THE LWDS FLASK RACKS—Continued

ITEM	COMPONENT	DESCRIPTION	PROCEDURE	LOCATION	CHECK	NOTE
NOTE 7: Complete Item 3 only if roof rack assembly is utilized. Ensure roof rack is positioned with gauged end away from flask rack controls.						
3	Roof Rack Assembly	• In Configurations 3A thru 3C, install roof rack assembly on top of primary flask rack assemblies. • In Configuration 3D, install roof rack assembly on last stack of primary flask rack assemblies.				
4	LWDS Racks CCA VTA (if used)	Secure equipment in place.		LWDS Racks CCA VTA (if used)		
SET UP CCA AND VTA						
WARNING: **Blowout plug must be removed before pressurization of CCA to allow operation of relief valves. Failure to remove blowout plug can result in equipment damage or injury or death to personnel.**						
5	CCA Lid and Stowed Legs	Remove lid from CCA case. Remove the two stowed legs from lid.		CCA		
6	CCA External Door	Open external door on bottom of CCA case by loosening the five captive screws.		CCA		
7	CCA Blowout Plug	Remove blowout plug from back of CCA.		CCA		
8	CCA	Inspect CCA for damage.		CCA		
9	VTA	Inspect VTA (if used) for damage.		VTA		
10	CCA/VTA	Set CCA on top of VTA frame (or suitable structure) such that console is at ~60º angle. Secure in place.		CCA/VTA		
WARNING: **Primary and Secondary tags must be affixed to A and B Regulators of CCA. Removal or swapping of tags can result in injury or death.**						
11	A Regulator	AHP-V303	Tag with Primary or Secondary tag according to dive plan.	CCA		
12	B Regulator	AHP-V304	Tag with Primary or Secondary tag according to dive plan.	CCA		
13	A Supply Valve	AHP-V301	Verify closed.	CCA		
14	B Supply Valve	AHP-V302	Verify closed.	CCA		
15	Gauge Isolation Valves	AHP-V305 AHP-V306 ALP-V307 ALP-V308	Open.	CCA		

FADS III AIR SYSTEM CONFIGURATION 3 / OP-1

PREMISSION PROCEDURES
FOR DIVING THE FADS III CCA/VTA WITH THE LWDS FLASK RACKS—Continued

ITEM	COMPONENT	DESCRIPTION	PROCEDURE	LOCATION	CHECK	NOTE
16	CCA Valves and Regulators	Ensure that all remaining CCA valves are in closed position and all regulators are backed off fully CCW.		CCA		
WARNING: **Failure to connect hose assembly strain relief can cause personnel injury or death should the hose separate or burst.** WARNING: **Fitting threads and O-rings must be inspected for damage and fittings must be properly tightened to ensure seating of O-rings. Fittings and O-rings that are not properly installed can allow HP air to escape and result in injury or death.**						
CONNECT LWDS PRIMARY AND SECONDARY INTERFACE HOSES						
17	Flask Whips	AHP-V501 Next Rack to AHP-V502 Outlet Valves	Connect whip(s) from lower rack to upper rack (if more than one rack is used). Tighten connectors.	Primary Flask Rack Assembly		
		AHP-V501 Next Rack to AHP-601 Outlet Valves	Connect whip from upper rack to roof rack (if utilized).	Roof Rack Assembly		
18	Flask Whip	AHP-V501 Next Rack to AHP-V502 Outlet Valves	Connect whip(s) from lower rack to upper rack (if more than one rack is used). Tighten connectors.	Secondary Flask Rack Assembly		
19	Gauge Isolation Valves	AHP-V503	Open.	Primary Flask Rack Assemblies		
		AHP-V503	Open.	Secondary Flask Rack Assemblies		
		AHP-V601	Open (if roof rack is used).	Roof Rack Assembly		
20	Ensure that all remaining LWDS primary and secondary flask rack and roof rack assembly valves are in closed position.			LWDS		
NOTE 8: Either set of FADS III HP air hose assemblies or LWDS deck hoses may be used as interconnecting hoses when used with appropriate adapters.						
CONNECT PRIMARY HP AIR SUPPLY HOSE FROM FLASK RACK ASEMBLIES TO CCA						
21	Primary HP Air Hose Assembly	H-436 or H-102	Inspect for cuts and abrasions.	Primary HP Air Hose Assembly		

FADS III AIR SYSTEM CONFIGURATION 3 / OP-1 ***Page 4 of 5***

PREMISSION PROCEDURES
FOR DIVING THE FADS III CCA/VTA WITH THE LWDS FLASK RACKS—Continued

ITEM	COMPONENT	DESCRIPTION	PROCEDURE	LOCATION	CHECK	NOTE
22	Primary HP Air Hose Assembly	H-436 or H-102	Remove connection cap and hose plug; check for damaged threads. Connect hose and tighten. Connect strain relief.	LWDS Primary Air Rack Supply Out Connector AHP-V502		
23	Primary HP Air Hose Assembly	H-436 or H-102	Remove designated port cap and hose plug; check for damaged threads. Connect hose and tighten 3/8 to 1/2 turn after O-ring engagement. Connect strain relief.	CCA A or B (Circle designated port)		
CONNECT SECONDARY HP AIR SUPPLY HOSE FROM FLASK RACK ASEMBLIES TO CCA						
24	Secondary HP Air Hose Assembly	H-436 or H-102	Inspect for cuts and abrasions.	Secondary HP Air Hose Assembly		
25	Secondary HP Air Hose Assembly	H-436 or H-102	Remove connection cap and hose plug; check for damaged threads. Connect hose and tighten. Connect strain relief.	LWDS Secondary Air Supply Outlet Connector		
26	Secondary HP Air Hose Assembly	H-436 or H-102	Remove designated port cap and hose plug; check for damaged threads. Connect hose and tighten 3/8 to 1/2 turn after O-ring engagement. Connect strain relief.	CCA A or B (Circle designated port)		
CONNECT LP AIR SUPPLY HOSE FROM VTA TO CCA (IF NOT USING VTA, SKIP ITEMS 27 THRU 30)						
27	Condensate Drain Valve	ALP-V201	Open, allow pressure to bleed off, and close.	VTA		
28	LP Air Hose Assembly	H-203	Remove stowed hose from VTA. Inspect for cuts and abrasions.	VTA		
29	LP Air Hose Assembly	H-203	Remove port cap and hose plug; inspect for damaged threads. Connect hose to VTA port and tighten 3/8 to 1/2 turn after O-ring engagement. Connect strain relief.	VTA		

FADS III AIR SYSTEM CONFIGURATION 3 / OP-1 *Page 5 of 5*

PREMISSION PROCEDURES FOR DIVING THE FADS III CCA/VTA WITH THE LWDS FLASK RACKS—Continued

ITEM	COMPONENT	DESCRIPTION	PROCEDURE	LOCATION	CHECK	NOTE
30	LP Air Hose Assembly	H-203	Connect hose to CCA port and tighten 3/8 to 1/2 turn after O-ring engagement. Connect strain relief.	CCA		

END OF PROCEDURE

REMARKS: (Using item number as a reference, list any deficiencies or problems found during performance of this procedure.)

FADS III AIR SYSTEM
CONFIGURATION 3 / OP-2

PREDIVE START-UP PROCEDURES
FOR DIVING THE FADS III CCA/VTA
WITH THE LWDS FLASK RACKS

REVISED 14 MARCH 2008

SPECIAL INSTRUCTIONS

1. Ensure this OP is valid by comparing the revision date above with the master file.
2. Check each step individually.
3. Sign and date below when OP has been completed.
4. Report any discrepancy to the Diving Supervisor.

Operator No. 1 ____ Date ____________
Printed name and signature

Operator No. 2 ____ Date ____________
Printed name and signature

Diving Supervisor ______________________________________ Date ____________
Printed name and signature

FADS III AIR SYSTEM CONFIGURATION 3 / OP-2

PREDIVE START-UP PROCEDURES FOR DIVING THE FADS III CCA/VTA WITH THE LWDS FLASK RACKS

NOTE 1: This OP involves lining up the FADS III CCA/VTA with the LWDS MK 3 Mod 0 Primary/Secondary Flask Rack Assemblies. This OP shall always be performed before the first dive of the mission and before each new dive after Configuration 3/OP-3 shutdown procedures have been performed.

NOTE 2: Record notes and deficiencies in section provided at the end of this operating procedure.

NOTE 3: If Diving Supervisor determines that flasks need to be charged during or after performance of this procedure, refer to OP-5 of Revision 2 of the LWDS MK3 Mod 0 technical manual for the During OPs: HP Flask Charging Procedure. Ensure that valves are returned to previous settings prior to continuing this procedure or beginning the next procedure.

NOTE 4: Designate selected LWDS Flask Rack Configuration by circling the appropriate label.

Configuration 3A – 2 Flask Rack Assemblies (1 Primary, 1 Secondary) (60 fsw limit)

Configuration 3B – 3 Flask Rack Assemblies (2 Primary, 1 Secondary) (60 fsw limit)

Configuration 3C – 4 Flask Rack Assemblies (3 Primary, 1 Secondary) (190 fsw limit)

Configuration 3D – Min. 6 Flask Rack Assemblies (4 Primary, 2 Secondary) (190 fsw limit)

NOTE 5: Designate which port on the CCA has been chosen as primary and which has been chosen as secondary by circling the appropriate label.

A Supply – Primary Secondary

B Supply – Primary Secondary

ITEM	COMPONENT	DESCRIPTION	PROCEDURE	LOCATION	CHECK	NOTE
NOTE 6: Ensure primary and secondary flask racks are charged to a minimum of 2800 psig or at Diving Supervisor's discretion. Charge flasks in accordance with LWDS OP-5, During OPs: HP Flask Charging Procedure.						
SET UP SECONDARY AIR SUPPLY TO CCA						
1	Air Supply This Rack Valve	AHP-V504	Open.	Secondary Flask Rack Assembly		
2	Flask Shutoff Valves	AHP-V505 AHP-V506 AHP-V507	Open.	Secondary Flask Rack Assembly		
3	Air Supply Next Rack Valves	AHP-V501	Open lower rack if two racks are used.	Secondary Flask Rack Assembly		
4	Air Supply Out Valves	AHP-V502	Open all racks.	Secondary Flask Rack Assembly		
5	Manifold Pressure Gauge	AHP-G508	Record rack pressure (2800 psig min): ___________psig	Secondary Flask Rack Assembly		

FADS III AIR SYSTEM CONFIGURATION 3 / OP-2 ***Page 2 of 4***

PREDIVE START-UP PROCEDURES
FOR DIVING THE FADS III CCA/VTA WITH THE LWDS FLASK RACKS—Continued

ITEM	COMPONENT	DESCRIPTION	PROCEDURE	LOCATION	CHECK	NOTE
SET UP PRIMARY AIR SUPPLY TO CCA						
6	Air Supply This Rack Valve	AHP-V504	Open (all racks).	Primary Flask Rack Assembly		
7	Flask Shutoff Valves	AHP-V505 AHP-V506 AHP-V507	Open.	Primary Flask Rack Assembly		
8	Air Supply Next Rack Valves	AHP-V501	Open all racks **(WITH THE EXCEPTION OF TOP RACK IF ROOF RACK IS NOT INSTALLED).**	Primary Flask Rack Assembly		
9	Air Supply Out Valves	AHP-V502	Open all racks.	Primary Flask Rack Assembly		
10	Manifold Pressure Gauge	AHP-G508 or AHP-G602 (if roof rack is installed)	Record rack pressure (3000 psig max): ___________psig	Primary Flask Rack Assembly		
SET UP CCA A SUPPLY						
11	Yellow, Green, Red Diver and Pneumo Ports	Port Caps	Remove port caps and check for damaged threads.	CCA Rear Panel		
12	A Supply Valve	AHP-V301	Open slowly.	CCA		
13	A Supply Gauge	AHP-G325	Record pressure: ____________psig	CCA		
14	Primary or Secondary Pressure Gauge (circle one)	AHP-G508	Compare reading with flasks supplying CCA B supply.	Primary Flask Rack Assembly or Secondary Flask Rack Assembly		
15	A Regulator	AHP-V303	Slowly adjust manifold pressure as directed by Diving Supervisor. Final pressure: ____________psig	CCA		
SET UP CCA B SUPPLY						
16	B Supply Valve	AHP-V302	Open slowly.	CCA		
17	B Supply Gauge	AHP-G326	Record pressure: ____________psig	CCA		

FADS III AIR SYSTEM CONFIGURATION 3 / OP-2 ***Page 3 of 4***

PREDIVE START-UP PROCEDURES
FOR DIVING THE FADS III CCA/VTA WITH THE LWDS FLASK RACKS—Continued

ITEM	COMPONENT	DESCRIPTION	PROCEDURE	LOCATION	CHECK	NOTE
18	Primary or Secondary Pressure Gauge (circle one)	AHP-G508	Compare reading with flasks supplying CCA B supply.	Primary Flask Rack Assembly or Secondary Flask Rack Assembly		
19	B Regulator	AHP-V304	Slowly adjust manifold pressure as directed by Diving Supervisor. Final pressure: ____________psig	CCA		
20	Manifold Supply Valve	ALP-V311 or ALP-312	Open selected secondary supply.	CCA		
NOTE 7: If VTA is used, complete Items 21-22 and skip Item 23. If VTA is not used, skip Items 21-22 and complete Item 23.						
21	Volume Tank Valve	ALP-V313	Slowly open valve and charge volume tank. Ensure regulator tracks.	CCA		
22	Condensate Drain Valve	ALP-V201	Open after pressure equalizes, drain, and close.	VTA		
23	Yellow Supply Valve	ALP-V314	Open slowly, blow down secondary supply, and close. Ensure regulator tracks.	CCA		
24	Manifold Supply Valve	ALP-V311 or ALP-V312	Close secondary supply valve.	CCA		
25	Manifold Supply Valve	ALP-V311 or ALP-V312	Open selected primary supply valve. (Circle opened valve)	CCA		
26	Yellow Supply Valve	ALP-V314	Open slowly, blow down primary supply, and close. Ensure regulator tracks.	CCA		
27	Red, Green, and Yellow Diver Supply Hoses	Remove plugs and check hose fittings for damaged threads. Connect hoses and tighten wrench-tight.		CCA		
28	Red, Green, and Yellow Diver Pneumo Hoses	Remove plugs and check hose fittings for damaged threads. Connect hoses and tighten wrench-tight.		CCA		

FADS III AIR SYSTEM CONFIGURATION 3 / OP-2 *Page 4 of 4*

PREDIVE START-UP PROCEDURES
FOR DIVING THE FADS III CCA/VTA WITH THE LWDS FLASK RACKS—Continued

ITEM	COMPONENT	DESCRIPTION	PROCEDURE	LOCATION	CHECK	NOTE
WARNING: **When purging umbilical hoses, maintain a firm grip on the hose and point the free end away from personnel to avoid injury from flying debris.**						
WARNING: **When purging pneumo hoses do not fully open pneumo valves (ALP-V317, ALP-318 and ALP-V319). Failure to comply will damage the diver depth gauges and may cause injury to personnel.**						
29	Yellow, Green, and Red Diver Pneumo Valves	ALP-V317 ALP-V318 ALP-V319	Crack open valves one at a time, purge corresponding pneumo hose, and close.	CCA		
30	Yellow, Green, and Red Diver Supply Valves	ALP-V314 ALP-V315 ALP-V316	Crack open valves one at a time, purge corresponding supply hose, and close.	CCA		
END OF PROCEDURE						

REMARKS: (Using item number as a reference, list any deficiencies or problems found during performance of this procedure.)

THIS PAGE INTENTIONALLY LEFT BLANK

FADS III AIR SYSTEM
CONFIGURATION 3 / OP-2M

MODIFIED PREDIVE START-UP PROCEDURES
FOR DIVING THE FADS III CCA/VTA
WITH THE LWDS FLASK RACKS

REVISED 14 MARCH 2008

SPECIAL INSTRUCTIONS

1. Ensure this OP is valid by comparing the revision date above with the master file.
2. Check each step individually.
3. Sign and date below when OP has been completed.
4. Report any discrepancy to the Diving Supervisor.

Operator No. 1 ____ Date ____________
Printed name and signature

Operator No. 2 ____ Date ____________
Printed name and signature

Diving Supervisor ______________________________________ Date ____________
Printed name and signature

FADS III AIR SYSTEM CONFIGURATION 3 / OP-2M ***Page 1 of 3***

MODIFIED PREDIVE START-UP PROCEDURES FOR DIVING THE FADS III CCA/VTA WITH THE LWDS FLASK RACKS

NOTE 1: This OP provides modified startup procedures for diving the FADS III CCA/VTA with the LWDS Primary/Secondary Flask Rack Assemblies, but only after the system was placed in a modified shutdown condition utilizing Configuration 3/OP-3M.

NOTE 2: Record notes and deficiencies in section provided at the end of this operating procedure.

NOTE 3: This OP may be performed only if 24 hours or less have elapsed. If more than 24 hours have elapsed, perform the postdive shutdown procedures in Configuration 3/OP-3 and continue the normal sequence of operations from that point.

NOTE 4: Designate selected LWDS Flask Rack Configuration by circling the appropriate label.

Configuration 3A – 2 Flask Rack Assemblies (1 Primary, 1 Secondary) (60 fsw limit)

Configuration 3B – 3 Flask Rack Assemblies (2 Primary, 1 Secondary) (60 fsw limit)

Configuration 3C – 4 Flask Rack Assemblies (3 Primary, 1 Secondary) (190 fsw limit)

Configuration 3D – Min. 6 Flask Rack Assemblies (4 Primary, 2 Secondary) (190 fsw limit)

NOTE 5: Designate which port on the CCA has been chosen as primary and which has been chosen as secondary by circling the appropriate label.

A Supply – Primary Secondary

B Supply – Primary Secondary

ITEM	COMPONENT	DESCRIPTION	PROCEDURE	LOCATION	CHECK	NOTE
NOTE 6: Ensure primary and secondary flask racks are charged to a minimum of 2800 psig or at Diving Supervisor’s discretion. Recharging of flask racks can be conducted using OP-5 of the LWDS MK 3 Mod 0 technical manual for During OPs: HP Flask Charging Procedure. Ensure that valves are returned to previous settings prior to continuing this procedure or beginning the next procedure.						
SET UP CCA A SUPPLY						
1	Air Supply Out Valve	AHP-V502	Open (lowest rack).	Primary or Secondary Flask Rack Assembly		
2	Primary or Secondary Pressure Gauge (circle one)	AHP-G508	Record pressure (min. pressure __________ psig) AHP-G508 _________ psig	Primary or Secondary Flask Rack Assembly		
3	A Supply Valve	AHP-V301	Verify open.	CCA		
4	A Supply Gauge	AHP-G325	Compare reading with racks supplying CCA A supply.	CCA		

FADS III AIR SYSTEM CONFIGURATION 3 / OP-2M *Page 2 of 3*

MODIFIED PREDIVE START-UP PROCEDURES FOR DIVING THE FADS III CCA/VTA WITH THE LWDS FLASK RACKS—Continued

ITEM	COMPONENT	DESCRIPTION	PROCEDURE	LOCATION	CHECK	NOTE
5	A Supply Regulator	AHP-V303	Slowly adjust manifold pressure as directed by dive supervisor. Final pressure: ___________psig	CCA		
SET UP CCA B SUPPLY						
6	Air Supply Out Valve	AHP-V502	Open (lowest rack).	Primary or Secondary Flask Rack Assembly		
7	Primary or Secondary Pressure Gauge (circle one)	AHP-G508	Record pressure (min. pressure __________ psig) AHP-G508 _________ psig	Primary or Secondary Flask Rack Assembly		
8	B Supply Valve	AHP-V302	Verify open.	CCA		
9	B Supply Gauge	AHP-G326	Compare reading with racks supplying CCA B supply.	CCA		
10	B Supply Regulator	AHP-V304	Slowly adjust manifold pressure as directed by dive supervisor. Final pressure: ___________psig	CCA		
11	Manifold Supply Valve	ALP-V311 or ALP-V312	Open valve designated as secondary supply valve and tag with Secondary tag. (Circle opened valve)	CCA		
12	Volume Tank Valve	ALP-V313	Open if VTA used.	CCA		
			Verify closed if VTA not used.	CCA		
13	Condensate Drain Valve	ALP-V201	If VTA used, open valve, drain tank, and close.	VTA		
WARNING: **When purging umbilical hoses, maintain a firm grip on the hose and point the free end away from personnel to avoid injury from flying debris.** WARNING: **When purging pneumo hoses do not fully open pneumo valves (ALP-V317, ALP-318 and ALP-V319). Failure to comply will damage the diver depth gauges and may cause injury to personnel.**						
14	Yellow, Green, and Red Pneumo Valves	ALP-V317 ALP-V318 ALP-V319	Crack open valves one at a time, purge corresponding pneumo hose, and close. Ensure secondary regulator tracks.	CCA		

FADS III AIR SYSTEM CONFIGURATION 3 / OP-2M *Page 3 of 3*

MODIFIED PREDIVE START-UP PROCEDURES FOR DIVING THE FADS III CCA/VTA WITH THE LWDS FLASK RACKS—Continued

ITEM	COMPONENT	DESCRIPTION	PROCEDURE	LOCATION	CHECK	NOTE
15	Manifold Supply Valve	ALP-V311 or ALP-V312	Close secondary supply valve.	CCA		
16	Manifold Supply Valve	ALP-V311 or ALP-V312	Open valve designated as primary supply valve and tag with Primary tag. (Circle opened valve)	CCA		
17	Yellow, Green, and Red Diver Supply Valves	ALP-V314 ALP-V315 ALP-V316	Crack open valves one at a time, purge corresponding supply hose, and close. Ensure primary regulator tracks.	CCA		

END OF PROCEDURE

REMARKS: (Using item number as a reference, list any deficiencies or problems found during performance of this procedure.)

____

____

____

____

____

____

____

____

____

____

____

____

____

____

FADS III AIR SYSTEM
CONFIGURATION 3 / OP-3

POSTDIVE SHUTDOWN PROCEDURES
FOR DIVING THE FADS III CCA/VTA
WITH THE LWDS FLASK RACKS

REVISED 14 MARCH 2008

SPECIAL INSTRUCTIONS

1. Ensure this OP is valid by comparing the revision date above with the master file.
2. Check each step individually.
3. Sign and date below when OP has been completed.
4. Report any discrepancy to the Diving Supervisor.

Operator No. 1 ____ Date ____________
Printed name and signature

Operator No. 2 ____ Date ____________
Printed name and signature

Diving Supervisor ______________________________________ Date ____________
Printed name and signature

FADS III AIR SYSTEM CONFIGURATION 3 / OP-3 *Page 1 of 4*

POSTDIVE SHUTDOWN PROCEDURES FOR DIVING THE FADS III CCA/VTA WITH THE LWDS FLASK RACKS

NOTE 1: Ensure Configuration 3/OP-2, has been completed prior to commencing this OP, which should be completed if last dive of mission or more than 24 hours will elapse before next dive. If 24 hours or less will elapse before next dive, OP-3M may be performed instead.

NOTE 2: Record notes and deficiencies in section provided at the end of this operating procedure.

NOTE 3: If Diving Supervisor determines that flasks need to be charged before, during, or after performance of this procedure, refer to OP-5 of the LWDS MK 3 Mod 0 technical manual for the During OPs: HP Flask Charging Procedure. Ensure that valves are returned to previous settings prior to continuing this procedure or beginning the next procedure.

ITEM	COMPONENT	DESCRIPTION	PROCEDURE	LOCATION	CHECK	NOTE
BLEED DOWN CCA/VTA AND FLASK RACKS						
1	Flask Shutoff Valves	AHP-V505 AHP-V506 AHP-V507	Close.	Primary Flask Rack Assembly		
2	Flask Shutoff Valves	AHP-V505 AHP-V506 AHP-V507	Close.	Secondary Flask Rack Assembly		
3	Yellow, Green, and Red Diver Supply Valves	ALP-V314 ALP-V315 ALP-V316	Close.	CCA		
4	Yellow, Green, and Red Pneumo Valves	ALP-V317 ALP-V318 ALP-V319	Ensure closed.	CCA		
5	Volume Tank Supply Valve	ALP-V313	If VTA not used, verify valve is closed.	CCA		
			If VTA required for next dive, close valve.	CCA		
6	Condensate Drain Valve	ALP-V201	If VTA used, open valve, drain condensate, and close.	VTA		
7	Diver UBAs, Umbilicals, and Pneumo Hoses	N/A	Disconnect as required in preparation of bleeding down CCA and Primary/Secondary air supply racks.	CCA		
8	Manifold Supply Valves	ALP-V311 ALP-V312	Open.	CCA		
9	Yellow Diver Supply Valve	ALP-V314	Open, depressurize system until all CCA and air supply rack pressure gauges read 0 psig, and close.	CCA		

FADS III AIR SYSTEM CONFIGURATION 3 / OP-3 *Page 2 of 4*

POSTDIVE SHUTDOWN PROCEDURES FOR DIVING THE FADS III CCA/VTA WITH THE LWDS FLASK RACKS—Continued

ITEM	COMPONENT	DESCRIPTION	PROCEDURE	LOCATION	CHECK	NOTE
SHUT DOWN CCA/VTA AND FLASK RACKS						
10	Volume Tank Valve	ALP-V313	Close valve if VTA used.	CCA		
11	A Regulator B Regulator	AHP-V303 AHP-V304	Back off fully CCW.	CCA		
12	A Supply Valve B Supply Valve	AHP-V301 AHP-V302	Close.	CCA		
13	Manifold Supply Valve	ALP-V311 ALP-V312	Close.	CCA		
14	Diver and Pneumo CCA Ports and/or Umbilical Connections	N/A	Reinstall plugs and caps as required.	CCA		
15	Air Supply This Rack Valve	AHP-V504	Close (all racks).	Primary and Secondary Flask Rack Assemblies		
16	Air Supply Next Rack Valves	AHP-V501	Close (all racks).	Primary and Secondary Flask Rack Assemblies		
17	Air Supply Out Valves	AHP-V502	Close (all racks).	Primary and Secondary Flask Rack Assemblies		
NOTE 4: Items 18 and 19 are optional but highly recommended if equipment is likely to be exposed to salt-water contamination for any length of time.						
18	CCA Blowout Plug	N/A	Install.	CCA rear panel		
19	CCA Case Lid	N/A	Install.	CCA		
NOTE 5: If dive mission is complete, perform Items 20-31. If dive mission is not complete, perform all required items in Configuration 3/OP-2 (Predive Start-Up) prior to next dive.						
WARNING: **Before bleeding HP air, ensure all personnel are clear of area to avoid injury from flying debris. Operator must wear protective eye wear when bleeding system.** CAUTION: Tighten hose plugs and port caps to proper torque as excessive tightening can damage threads.						
NOTE 6: If VTA was not used, omit Items 20 and 21.						

FADS III AIR SYSTEM CONFIGURATION 3 / OP-3 *Page 3 of 4*

POSTDIVE SHUTDOWN PROCEDURES FOR DIVING THE FADS III CCA/VTA WITH THE LWDS FLASK RACKS—Continued

ITEM	COMPONENT	DESCRIPTION	PROCEDURE	LOCATION	CHECK	NOTE
DISCONNECT LP AIR SUPPLY HOSE FROM VTA AND CCA						
20	LP Air Hose Assembly	H-203	Disconnect hose and strain relief. Install port cap and hose plug.	VTA		
21	LP Air Hose Assembly	H-203	Disconnect hose and strain relief. Install port cap and hose plug.	CCA Rear Panel		
DISCONNECT PRIMARY AND SECONDARY HOSES FROM FLASK RACKS AND CCA						
22	Primary HP Air Hose Assembly	H-436 or H-102	Remove hose from port and disconnect strain relief. Install port cap and tighten 3/8 to 1/2 turn after O-ring engagement. Install plug or bag hose.	CCA		
23	Primary HP Air Hose Assembly	H-436 or H-102	Remove hose from outlet connection, install cap and disconnect strain relief. Install plug or bag hose.	Primary Flask Rack Assembly		
24	Secondary HP Air Hose Assembly	H-436 or H-102	Remove hose from port and disconnect strain relief. Install port cap and tighten 3/8 to 1/2 turn after O-ring engagement. Install plug or bag hose.	CCA		
25	Secondary HP Air Hose Assembly	H-436 or H-102	Remove hose from outlet connection, install cap and disconnect strain relief. Install plug or bag hose.	Secondary Flask Rack Assembly		
DISCONNECT INTERFACE FLASK RACK HOSES						
26	Flask Whips	AHP-V501 Next Rack to AHP-V502 Outlet Valves	Disconnect and secure whips. Cap AHP OUT.	Primary Flask Rack/Roof Rack Assemblies		
27	Flask Whips	AHP-V501 Next Rack to AHP-V502 Outlet Valves	Disconnect and secure whips. Cap AHP OUT.	Secondary Flask Rack Assembly		
28	Unstack roof rack assembly and primary and secondary flask rack assemblies.					
NOTE 7: NID wash solution is prepared by mixing 1 teaspoon nonionic detergent (NID) to 1 gallon of warm water.						
29	Wash, rinse, and inspect all assemblies.					
30	Reinstall covers and stow equipment.					

FADS III AIR SYSTEM CONFIGURATION 3 / OP-3 ***Page 4 of 4***

POSTDIVE SHUTDOWN PROCEDURES
FOR DIVING THE FADS III CCA/VTA WITH THE LWDS FLASK RACKS—Continued

ITEM	COMPONENT	DESCRIPTION	PROCEDURE	LOCATION	CHECK	NOTE
31	Flask Shutoff Valves	AHP-V505 AHP-V506 AHP-V507	Drain moisture from flasks in accordance with MIP 5921/171, MRC R-1C.	Primary / Secondary Flask Rack Assemblies		
END OF PROCEDURE						

REMARKS: (Using item number as a reference, list any deficiencies or problems found during performance of this procedure.)

THIS PAGE INTENTIONALLY LEFT BLANK

FADS III AIR SYSTEM
CONFIGURATION 3 / OP-3M

MODIFIED POSTDIVE SHUTDOWN PROCEDURES FOR DIVING THE FADS III CCA/VTA WITH THE LWDS FLASK RACKS

REVISED 14 MARCH 2008

SPECIAL INSTRUCTIONS

1. Ensure this OP is valid by comparing the revision date above with the master file.
2. Check each step individually.
3. Sign and date below when OP has been completed.
4. Report any discrepancy to the Diving Supervisor.

Operator No. 1 ______________________________ Date __________
Printed name and signature

Operator No. 2 ______________________________ Date __________
Printed name and signature

Diving Supervisor ______________________________ Date __________
Printed name and signature

FADS III AIR SYSTEM CONFIGURATION 3 / OP-3M

Page 1 of 1

MODIFIED POSTDIVE SHUTDOWN PROCEDURES FOR DIVING THE FADS III CCA/VTA WITH THE LWDS FLASK RACKS

NOTE 1: This OP may be used any time the equipment will be used again within 24 hours. If it is anticipated that more than 24 hours will pass before using the equipment again, the postdive shutdown procedures in Configuration 3/OP-3 must be performed instead. Ensure Configuration 3/OP-1 and OP-2 have been completed prior to commencing this OP.

NOTE 2: Record notes and deficiencies in section provided at the end of this operating procedure.

NOTE 3: If Diving Supervisor determines that flasks need to be charged before, during, or after performance of this procedure, refer to OP-5 of the LWDS MK 3 Mod 0 technical manual for the During OPs: HP Flask Charging Procedure. Ensure that valves are returned to previous settings prior to continuing this procedure or beginning the next procedure.

ITEM	COMPONENT	DESCRIPTION	PROCEDURE	LOCATION	CHECK	NOTE
PERFORM MODIFIED CCA/VTA SHUTDOWN						
1	Yellow, Green, and Red Supply Valves	ALP-V314 ALP-V315 ALP-V316	Close.	CCA		
2	Volume Tank Supply Valve	ALP-V313	Close or verify closed.	CCA		
3	B Regulator	AHP-V304	Ensure backed off fully CCW.	CCA		
4	B Manifold Supply Valve	ALP-V312	Close.	CCA		
5	A Regulator	AHP-V303	Ensure backed off fully CCW.	CCA		
6	A Manifold Supply Valve	ALP-V311	Close.	CCA		
PERFORM MODIFIED LWDS PRIMARY AND SECONDARY FLASK RACK SHUTDOWN						
7	Air Supply Out Valve	AHP-V502	Close (lowest racks).	Primary / Secondary Flask Rack Assembly		
END OF PROCEDURE						

REMARKS: (Using item number as a reference, list any deficiencies or problems found during performance of this procedure.)

____

____

____

APPENDIX D

FADS III AIR SYSTEM
OPERATING AND MAINTENANCE
SUPPLEMENT
FOR
CONFIGURATION 4:
DIVING THE FADS III AIR SYSTEM
WITH SNDLRCS SUPPORT

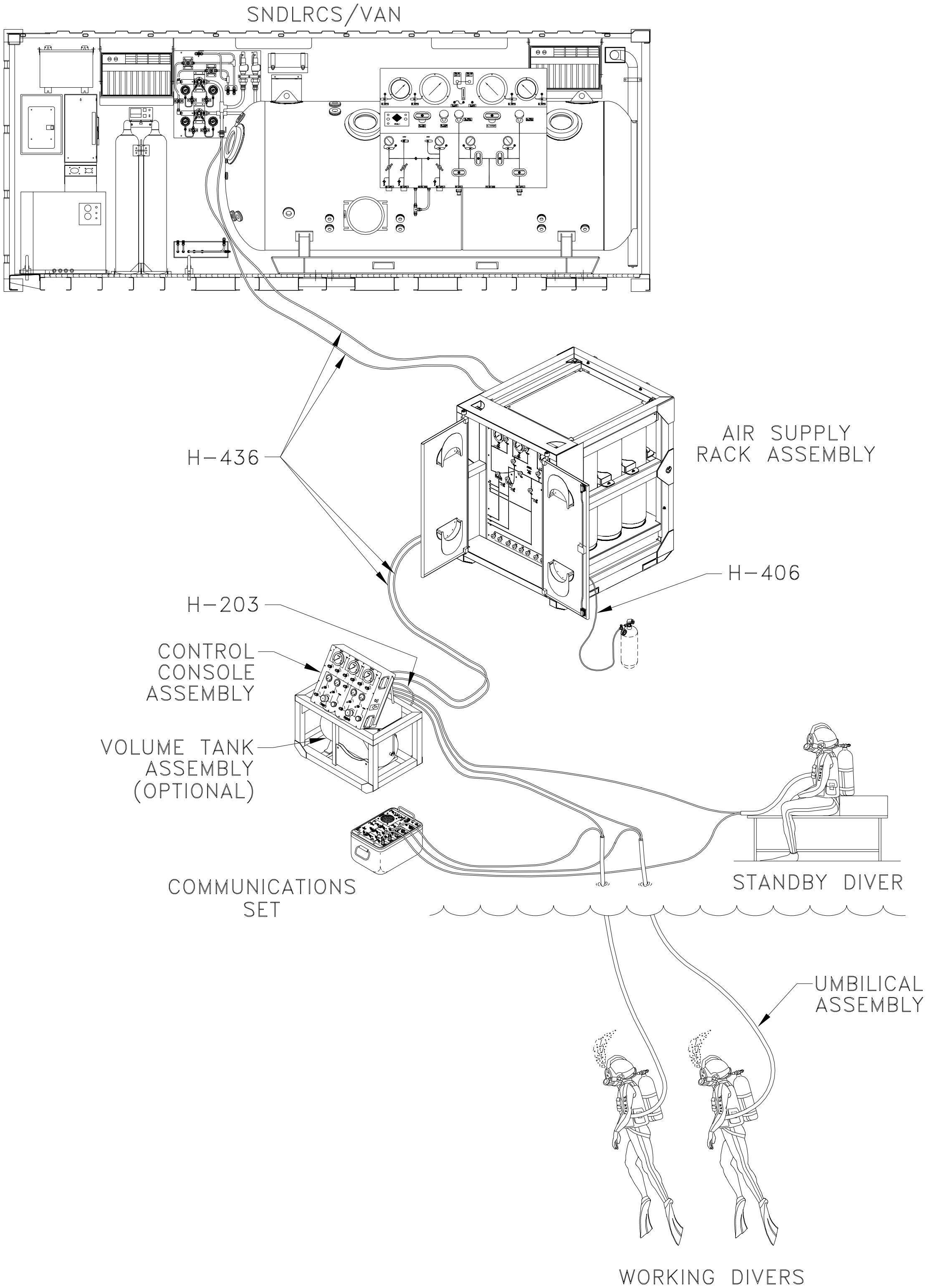


Figure D-1. Configuration 4: Diving the FADS III Air System with SNDLRCS Support

APPENDIX D

FADS III AIR SYSTEM
OPERATING AND MAINTENANCE SUPPLEMENT
FOR CONFIGURATION 4:
DIVING THE FADS III AIR SYSTEM WITH SNDLRCS SUPPORT

NOTE

The information in this appendix is intended to supplement the information provided for the Configuration 1 Stand-Alone Diving Setup, which is located in the main body of this manual. Every effort has been made to avoid duplication of information; therefore, it may be necessary to reference the Configuration 1 information to obtain a better understanding of the system.

D.1 INTRODUCTION

This appendix contains the supplemental information needed to operate and maintain the equipment used in Configuration 4 of the Fly Away Dive System (FADS) III Air System, which supports both diving and Standard Navy Double-Lock Recompression Chamber System (SNDLRCS) operations as shown in Figure D-1. To help determine which components are required for use in each of the operations, refer to Table D-1.

Table D-1. Configuration 4 Equipment List

Item	Component/Description	Total Quantity	Required
FADS III AIR SYSTEM ASSEMBLIES			
1	Air Supply Rack Assembly (ASRA)	1	Yes
2	Control Console Assembly (CCA)	1	Yes
3	Volume Tank Assembly (VTA)	1	Optional
4	5,000 psi Compressor System (Bauer or Mako electric or diesel, or other approved 5,000 psi compressor system)	As required	Optional
SNDLRCS ASSEMBLIES			
1	Standard Navy Double-Lock (SNDL)	1	Yes
2	Bulk Oxygen Supply / FADS III Mixed Gas System (FMGS), Oxygen Supply Rack Assembly (OSRA) / Chamber Air and Oxygen Supply (CAOS), OSRA	As required	Optional
3	FMGS, Helium-Oxygen Supply Rack Assembly (HOSRA)	As required	Optional

Table D-1. Configuration 4 Equipment List—Continued

Item	Component/Description	Total Quantity	Required
INTERCONNECTING HOSE ASSEMBLIES			
1	H-203 – VTA to CCA – 275 psig working pressure, 6 ft. long, 1/2 in. ID, 1/2 in. VCO fitting (53711-6962010)	1	Yes
2	H-406 – SCUBA Charge Hose Assembly – 3,000 psig working pressure, 6 ft. long, 1/4 in. ID, 1/4 in. VCO and NPTM fittings (53711-6962020)	1	Yes
3	H-436 – ASRA to CCA and SNDLRCS – 5,000 psig working pressure, 42 ft. long, 3/8 in. ID, 1/2 in. CPV fitting (53711-6962000)	4	Yes
4	H-436 – ASRA to Compressor – 5,000 psig working pressure, 42 ft. long, 3/8 in. ID, 1/2 in. CPV fitting (53711-6962000)	1	If compressor used
DOCUMENTATION			
1	FADS III Air System Technical Manual	1	Yes
2	SNDLRCS Technical Manual	1	Yes
3	Applicable Compressor Manual	1	As required

The information in this appendix is presented as follows:

a. Para. D.2 — Safety Precautions .... Page D-2
b. Para. D.3 — General Description .... Page D-3
c. Para. D.4 — Reference Data .... Page D-3
d. Para. D.5 — Controls and Indicators .... Page D-3
e. Para. D.6 — Operation .... Page D-8
f. Para. D.7 — Functional Description .... Page D-8
g. Para. D.8 — Scheduled Maintenance .... Page D-12
h. Para. D.9 — Troubleshooting .... Page D-12
i. Para. D.10 — Corrective Maintenance .... Page D-12
j. Para. D.11 — Parts Lists .... Page D-17
k. Para. D.12 — Installation, Deployment, and Storage .... Page D-17
l. Para. D.13 — Operating and Emergency Procedures .... Page D-17

D.2 SAFETY PRECAUTIONS

Refer to the Safety Summary and Chapter 1 of this manual for general safety precautions and the definitions of warnings, cautions, and notes.

D.3 GENERAL DESCRIPTION

D.3.1 FADS III Air System. Refer to Chapter 3 of this manual for a general description of the FADS III Air System.

D.3.2 SNDLRCS. The SNDLRCS consists of a Standard Navy Double-Lock (SNDL) recompression chamber housed in an International Organization for Standards (ISO) container and an oxygen/air supply system designed to support training, surface decompression, and recompression treatment operations. A FADS III Air Supply Rack Assembly (ASRA) supplies high-pressure (HP) air to the system. Oxygen is supplied from four oxygen bottles mounted within the van or by other certified oxygen sources. The SNDLRCS is also capable of providing mixed gas to the chamber and has an Environmental Control System (ECS) that provides temperature and humidity control for the chamber.

The SNLDRCS consists of the following major components:

- SNDLRCS Van
- SNDL Recompression Chamber and Control Panel
- Air System, consisting of FADS III ASRA and HP Air Reducing Station
- Environmental Control System (ECS)
- Electrical System
- Oxygen System, consisting of Oxygen Reducing Station, Oxygen Flasks, and Optional Oxygen Racks

Additional information concerning a general description of the SNDLRCS is contained in the SNDLRCS operation and maintenance manual (NAVSEA SS500-B1-MMM-010).

D.4 REFERENCE DATA

All reference data for the FADS III Air System is contained in Chapter 1 in the main body of this manual, and reference data for the SNDLRCS is contained in the SNDLRCS operation and maintenance manual (NAVSEA SS500-B1-MMM-010).

D.5 CONTROLS AND INDICATORS

The controls and indicators for the FADS III Air System Control Console Assembly (CCA) and Volume Tank Assembly (VTA) are identified in Chapter 2 of this manual as they are standard in each of the four configurations. However, since the controls and indicators for the FADS III ASRA include different tags and some have slightly different functions in Configuration 4, they are identified in Table D-2 in their entirety, along with the ASRA interface ports for Configuration 4 in Table D-3.

The descriptions and locations of the controls and indicators for the SNDLRCS equipment supporting chamber operations are contained in the SNDLRCS operation and maintenance manual (NAVSEA SS500-B1-MMM-010).

Table D-2. ASRA Controls and Indicators in Configuration 4
(Refer to Figure D-2)

Index No.	Panel Label	Component	Designator	Function	Normal Operating Condition
1	**PRIMARY TO SNDL**	Tag	N/A	Identifies circuit chosen to supply primary air to SNDL	Hung on **PORT B** valve (AHP-V429)
2	**SECONDARY TO SNDL**	Tag	N/A	Identifies circuit chosen to supply secondary air to SNDL	Hung on **PORT C** valve (AHP-V422)
3	**PORT C**	Valve	AHP-V422	Controls secondary air flow from Bank 3 flasks to SNDL	OPEN
4	**PORT B**	Valve	AHP-V429	Controls air flow from Bank 2 manifold to SNDL (primary) or CCA/VTA (secondary)	OPEN
5	**PORT A**	Valve	AHP-V443	Controls primary air flow from Bank 1 manifold to CCA/VTA	OPEN
6	**BANK 2 MANIFOLD**	Valve	AHP-V421	Controls primary (SNDL) and secondary (CCA/VTA) air flow from Bank 2 flasks to manifold delivering air to **PORT B** valve	OPEN
7	**GAUGE STOP** (BANK 3)	Valve	AHP-V428	Controls flow of HP air to **BANK 3** gauge (AHP-G439)	OPEN
8	**BANK 3**	Gauge	AHP-G439	Indicates pressure of air in Bank 3 flasks	VARIABLE
9	**FLASK ISOLATION** (BANK 3)	Valve	AHP-V409	Controls flow of air from corresponding flask in Bank 3 to **PORT C** valve (AHP-V422)	OPEN if flask is delivering air CLOSED if off-line
10	**FLASK ISOLATION** (BANK 3)	Valve	AHP-V408	Controls flow of air from corresponding flask in Bank 3 to **PORT C** valve (AHP-V422)	OPEN if flask is delivering air CLOSED if off-line
11	**BANK 3 CHARGE**	Valve	AHP-V425	Controls flow of charging air to Bank 3 flasks	CLOSED
12	**FLASK ISOLATION** (BANK 2)	Valve	AHP-V407	Controls flow of air from corresponding flask in Bank 2 to **BANK 2 MANIFOLD** valve (AHP-V421)	OPEN if flask is delivering air CLOSED if off-line
13	**FLASK ISOLATION** (BANK 2)	Valve	AHP-V406	Controls flow of air from corresponding flask in Bank 2 to **BANK 2 MANIFOLD** valve (AHP-V421)	OPEN if flask is delivering air CLOSED if off-line
14	**BANK 2**	Gauge	AHP-G438	Indicates pressure of air in Bank 2 flasks	VARIABLE
15	**FLASK ISOLATION** (BANK 2)	Valve	AHP-V405	Controls flow of air from corresponding flask in Bank 2 to **BANK 2 MANIFOLD** valve (AHP-V421)	OPEN if flask is delivering air CLOSED if off-line

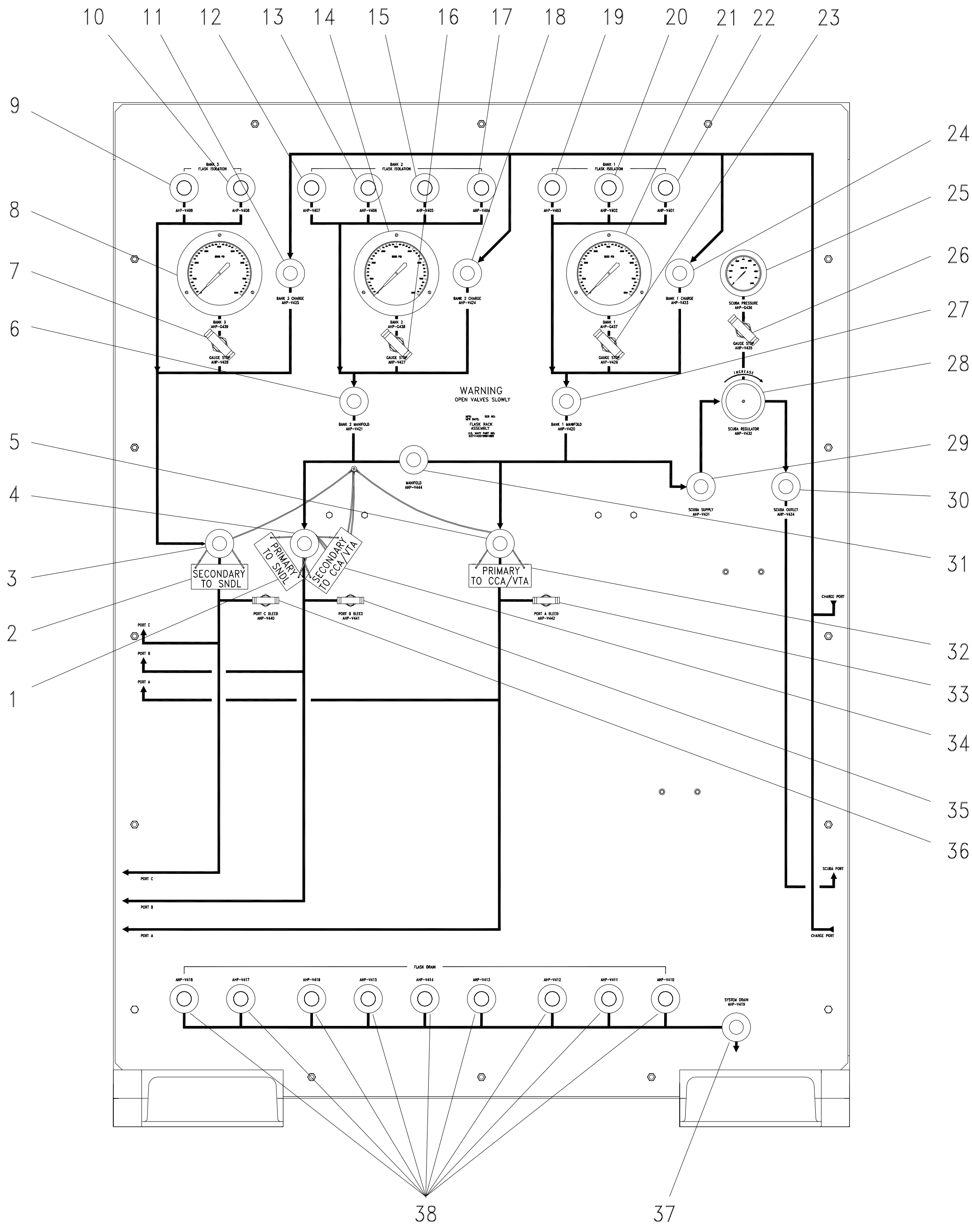


Figure D-2. ASRA Controls and Indicators in Configuration 4

Table D-2. ASRA Controls and Indicators in Configuration 4—Continued
(Refer to Figure D-2)

Index No.	Panel Label	Component	Designator	Function	Normal Operating Condition
16	**GAUGE STOP** (BANK 2)	Valve	AHP-V427	Controls flow of HP air to **BANK 2** gauge (AHP-G438)	OPEN if Bank 2 is primary and in use
17	**FLASK ISOLATION** (BANK 2)	Valve	AHP-V404	Controls flow of air from corresponding flask in Bank 2 to **BANK 2 MANIFOLD** valve (AHP-V421)	OPEN if flask is delivering air CLOSED if off-line
18	**BANK 2 CHARGE**	Valve	AHP-V424	Controls flow of charging air to Bank 2 flasks	CLOSED; OPEN if charging Bank 2
19	**FLASK ISOLATION** (BANK 1)	Valve	AHP-V403	Controls flow of air from corresponding flask in Bank 1 to **BANK 1 MANIFOLD** valve (AHP-V420)	OPEN if flask is delivering air CLOSED if off-line
20	**FLASK ISOLATION** (BANK 1)	Valve	AHP-V402	Controls flow of air from corresponding flask in Bank 1 to **BANK 1 MANIFOLD** valve (AHP-V420)	OPEN if flask is delivering air CLOSED if off-line
21	**BANK 1**	Gauge	AHP-G437	Indicates pressure of air in Bank 1 flasks	VARIABLE
22	**FLASK ISOLATION** (BANK 1)	Valve	AHP-V401	Controls flow of air from corresponding flask in Bank 1 to **BANK 1 MANIFOLD** valve (AHP-V420)	OPEN if flask is delivering air CLOSED if off-line
23	**GAUGE STOP** (BANK 1)	Valve	AHP-V426	Controls flow of HP air to **BANK 1** gauge (AHP-G437)	OPEN if Bank 1 is primary and in use
24	**BANK 1 CHARGE**	Valve	AHP-V423	Controls flow of charging air to Bank 1 flasks	CLOSED; OPEN if charging Bank 1
25	**SCUBA PRESSURE**	Gauge	AHP-G436	Indicates pressure of air flowing to **SCUBA PORT**	VARIABLE when charging SCUBA cylinders
26	**GAUGE STOP** (SCUBA)	Valve	AHP-V435	Controls flow of HP air to **SCUBA PRESSURE** gauge (AHP-G436)	CLOSED; OPEN when charging SCUBA cylinders
27	**BANK 1 MANIFOLD**	Valve	AHP-V420	Controls primary air flow from Bank 1 flasks to the manifold delivering air to **PORT A** valve	OPEN
28	**SCUBA REGULATOR**	Valve	AHP-V432	Reduces 5,000 psi air to SCUBA charge pressure	CLOSED; VARIABLE when charging SCUBA cylinders
29	**SCUBA SUPPLY**	Valve	AHP-V431	Controls flow of HP air to **SCUBA REGULATOR** valve (AHP-V432)	CLOSED; OPEN when charging SCUBA cylinders

Table D-2. ASRA Controls and Indicators in Configuration 4—Continued

(Refer to Figure D-2)

Index No.	Panel Label	Component	Designator	Function	Normal Operating Condition
30	**SCUBA OUTLET**	Valve	AHP-V434	Controls flow of HP air to **SCUBA PORT**	CLOSED; OPEN when charging SCUBA cylinders
31	**MANIFOLD** (BANKS 1&2)	Valve	AHP-V444	Cross-connects Banks 1 and 2	CLOSED
32	**PRIMARY TO CCA/VTA**	Tag	N/A	Identifies circuit chosen to supply primary air to CCA	Hung on **PORT A** valve (AHP-V443)
33	**PORT A BLEED**	Valve	AHP-V442	Controls depressurization of **PORT A**	CLOSED
34	**SECONDARY TO CCA/VTA**	Tag	N/A	Identifies circuit chosen to supply secondary air to CCA/VTA	Hung on **PORT B** valve (AHP-V429)
35	**PORT B BLEED**	Valve	AHP-V441	Controls depressurization of **PORT B**	CLOSED
36	**PORT C BLEED**	Valve	AHP-V440	Controls depressurization of **PORT C**	CLOSED
37	**SYSTEM DRAIN**	Valve	AHP-V419	Back-up valve for **FLASK DRAIN** valves	CLOSED
38	**FLASK DRAIN**	Valve	AHP-V410 thru AHP-V418	Flask condensate drain valve	CLOSED

Table D-3. ASRA Interface Ports to CCA/VTA and SNDLRCS in Configuration 4

(Refer to Figure D-3)

Index No.	Panel Label	Function in Configuration 4
1	**PORT A - HP**	Upper Port A unused Lower Port A selected to support divers with primary air via CCA/VTA
2	**PORT B - HP**	Upper Port B selected to support SNDLRCS with primary air Lower Port B selected to support CCA/VTA with secondary air
3	**PORT C - HP**	Upper Port C selected to support SNDLRCS with secondary air Lower Port C unused

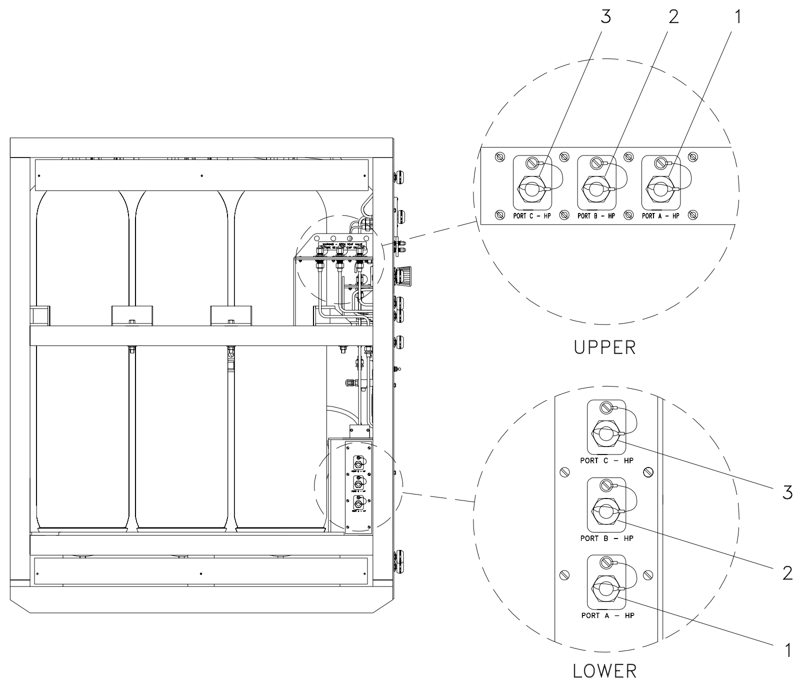


Figure D-3. ASRA Interface Ports

D.6 OPERATION

Refer to paragraph D.13 in this appendix for the operating and emergency procedures to be used during Configuration 4 operations.

D.7 FUNCTIONAL DESCRIPTION

The FADS III Air System's main function in Configuration 4 is to support surface-supplied air diving operations taking two working divers and one standby diver to a maximum depth of 190 fsw, while at the same time supporting the SNDLRCS for surface decompression and recompression treatment for incidents of decompression sickness or arterial gas embolism. This section contains references for the equipment functional descriptions (paragraph D.7.1) and the primary and secondary air flow paths in Configuration 4 (paragraph D.7.2).

D.7.1 EQUIPMENT FUNCTIONAL DESCRIPTIONS. Refer to the SNDLRCS operation and maintenance manual (NAVSEA SS500-B1-MMM-010) and Chapter 3 of this manual for comprehensive functional descriptions of the equipment used in Configuration 4.

D.7.2 PRIMARY AND SECONDARY AIR FLOW – DIVING WITH SNDLRCS SUPPORT. In this configuration, Banks 1 and 2 are always configured separately with Bank 1 providing primary air to the divers via the CCA/VTA and Bank 2 providing primary air to the SNDLRCS and secondary air to the divers via the CCA/VTA. Bank 3 provides secondary air to the SNDLRCS. This configuration makes simultaneous operations possible in cases where a diver is still at depth and immediate treatment in the SNDLRCS needs to begin on another diver. The following paragraphs present a typical scenario for diving the FADS III Air System with SNDLRCS support and trace the flow of primary and secondary breathing air from source to end user.

D.7.2.1 **Sample Scenario for Configuration 4 Operations.** The following selections and hose connections have been made for the sample scenario upon which the primary and secondary air flow paths in paragraphs D.7.2.2 and D.7.2.3 are based:

a. **ASRA Primary Supply Standard Selections:**
- Primary to CCA and divers using lower Port A
- Primary to SNDLRCS using upper Port B

b. **ASRA Secondary Supply Standard Selections:**
- Secondary to CCA and divers using lower Port B
- Secondary to SNDLRCS using upper Port C

c. **CCA Primary Supply Selection:** The ***B SUPPLY*** port has been selected to supply primary air to the divers for this scenario.

d. **CCA Secondary Supply Selection:** The ***A SUPPLY*** port has been selected to supply secondary air to the divers for this scenario.

e. **VTA –** The Diving Supervisor has opted not to use the VTA.

f. **Hose Connections –** The following hose connections have been made in accordance with the selections in a – d:

To CCA and Divers
- Primary H-436 from ASRA's lower Port A to CCA's ***B SUPPLY*** port
- Secondary H-436 from ASRA's lower Port B to CCA's ***A SUPPLY*** port
- Umbilical hoses from CCA to divers

To SNDLRCS, ASRA Located Inside Van
- Primary H-436 from ASRA's upper Port B to HP Air Reducing Station
- Secondary H-436 from ASRA's upper Port C to HP Air Reducing Station

To SNDLRCS, ASRA Located Outside Van
- Primary H-436 from ASRA's upper Port B to Van BKHD Transition Panel
- Secondary H-436 from ASRA's upper Port C to Van BKHD Transition Panel

NOTE

If VTA is used, H-203 will be connected between the VTA and the CCA.

D.7.2.2 Primary Air Flow for Diving with SNDLRCS Support . The following steps outline the flow of primary air to the CCA and SNDLRCS and correspond to the air flow paths shown in Figure D-4 on page D-13.

a. **Primary Air Flow to CCA:**

(1) High-pressure air flows from the three flasks in Bank 1 through ***FLASK ISOLATION*** valves (AHP-V401, -V402, -V403) via interconnecting hose assemblies to ***BANK 1 MANIFOLD*** valve (AHP-V420).

(2) The air from AHP-V420 flows through ***PORT A*** valve (AHP-V443) to lower ***PORT A***, where it enters primary air hose assembly (H-436).

(3) High-pressure air flows through H-436 to the rear panel of the CCA, enters the ***B SUPPLY*** port, and flows through ***B SUPPLY*** valve (AHP-V302) and in-line filter (F-020) to ***B REGULATOR*** valve (AHP-V304), where it is regulated to a lower pressure determined by the Diving Supervisor. The pressure of the air entering AHP-V304 is measured by ***B SUPPLY*** gauge (AHP-G326), which may be isolated using ***GAUGE STOP*** valve (AHP-V306).

(4) The low-pressure (LP) air leaving AHP-V304 flows to ***MANIFOLD SUPPLY*** valve (ALP-V312). The pressure of the air is measured by ***MANIFOLD PRESSURE*** gauge (ALP-G324), which may be isolated using ***GAUGE STOP*** valve (ALP-V308). If the pressure exceeds 300 pounds per square inch (psi), the excess pressure is vented through relief valve (ALP-V310).

(5) The LP air from ALP-V312 flows to a manifold for use by the ***RED SUPPLY***, ***GREEN SUPPLY,*** and ***YELLOW SUPPLY*** valves (ALP-V316, -V315, -V314) and the three ***PNEUMO*** valves (ALP-V319, -V318, -V317). Air from the supply valves is delivered to the divers' Underwater Breathing Apparatuses (UBAs) through their respective umbilical assemblies. Air is used by the pneumofathometer valves and hoses only during depth checks. The depth of each diver is indicated on the corresponding ***RED DIVER***, ***GREEN DIVER***, or ***YELLOW DIVER*** depth gauge (ALP-G322, -G321, -G320, respectively).

NOTE

Air in the manifold is also available to ***VOLUME TANK*** valve (ALP-V313); however, since the Diving Supervisor opted not to use the VTA, the valve is closed and that path is blocked.

b. **Primary Air Flow to SNDLRCS:**

(1) High-pressure air flows from the four flasks in Bank 2 through ***FLASK ISOLATION*** valves (AHP-V404, -V405, -V406, -V407) via interconnecting hose assemblies to ***BANK 2 MANIFOLD*** valve (AHP-V421).

(2) The air from AHP-V421 flows through ***PORT B*** valve (AHP-V429) to upper ***PORT B***, where it enters primary air hose assembly (H-436).

(3) High-pressure air flows through H-436 to HP Air Reducing Station connection and Primary HP Air shutoff valve (AHP-V101). Once inside the reducing station, the air flow follows the paths described in Chapter 3 of the SNDLRCS operation and maintenance manual (NAVSEA SS500-B1-MMM-010).

D.7.2.3 Secondary Air Flow for Diving with SNDLRCS Support. Although Bank 2 serves as the secondary air supply for the divers and the primary air supply for the SNDLRCS, it will normally not be necessary to supply air to both operations at the same time. In the unlikely event that diving and chamber operations are both being conducted off Bank 2, it will be imperative that the Diving Supervisor monitor and manage air requirements accordingly. The procedures for switching from primary air to secondary air are outlined below:

- For failure of the primary air supply to the CCA and divers: If the primary air supply pressure drops below minimum manifold pressure, close CCA primary ***MANIFOLD SUPPLY*** valve (in this case, ALP-V312), open CCA secondary ***MANIFOLD SUPPLY*** valve (in this case, ALP-V311), and notify the divers.

- For failure of the primary air supply to the SNDLRCS: If the primary air supply pressure drops below acceptable levels, switch the SNDLRCS to the secondary supply by following the procedures in SNDLRCS EP-6, *Loss of Primary Air Supply*.

The following steps trace the path of the secondary air supply (see Figure D-5 on page D-15):

a. **Secondary Air Flow to CCA:**

(1) High-pressure air flows from the four flasks in Bank 2 through ***FLASK ISOLATION*** valves (AHP-V404, -V405, -V406, -V407) via interconnecting hose assemblies to ***BANK 2 MANIFOLD*** valve (AHP-V421).

(2) Air from AHP-V421 flows through ***PORT B*** valve (AHP-V429) to lower ***PORT B*** where it enters secondary air hose assembly (H-436).

(3) High-pressure air flows through H-436 to the rear panel of the CCA, enters the ***A SUPPLY*** port, and flows through ***A SUPPLY*** valve (AHP-V301) and in-line filter (F-020) to ***A REGULATOR*** valve (AHP-V303), where it is regulated to a lower pressure determined by the Diving Supervisor. The pressure of the air entering AHP-V303 is measured by ***A SUPPLY*** gauge (AHP-G325), which may be isolated using ***GAUGE STOP*** valve (AHP-V305).

(4) The LP air leaving AHP-V303 flows to ***MANIFOLD SUPPLY*** valve (ALP-V311), which was opened upon failure of the primary air supply. The pressure of the air is measured by ***MANIFOLD PRESSURE*** gauge (ALP-G323), which may be isolated using ***GAUGE STOP*** valve (ALP-V307). If the pressure exceeds 300 psi, the excess pressure is vented through relief valve (ALP-V309).

(5) The LP air from ALP-V311 flows to the divers' manifold, which functions as described in paragraph D.7.2.2, step a(5).

NOTE

Air in the manifold is also available to ***VOLUME TANK*** valve (ALP-V313); however, since the Diving Supervisor opted not to use the VTA, the valve is closed and that path is blocked.

b. **Secondary Air Flow to SNDLRCS:**

(1) High-pressure air flows from the two flasks in Bank 3 through ***FLASK ISOLATION*** valves (AHP-V408, -V409) via interconnecting hose assemblies to ***PORT C*** valve (AHP-V422).

(2) Air from AHP-V422 flows through upper ***PORT C*** and enters secondary air hose assembly (H-436).

(3) High-pressure air flows through H-436 to HP Air Reducing Station connection and Secondary HP Air shutoff valve (AHP-V102). Once inside the reducing station, the air flow follows the paths described in Chapter 3 of the SNDLRCS operation and maintenance manual (NAVSEA SS500-B1-MMM-010).

D.8 SCHEDULED MAINTENANCE

Scheduled maintenance for Configuration 4 components is covered in Chapter 4 of this manual and also in Chapter 4 of the SNDLRCS operation and maintenance manual.

D.9 TROUBLESHOOTING

Troubleshooting analysis is covered in Chapter 5 of this manual and also in Chapter 5 of the SNDLRCS operation and maintenance manual.

D.10 CORRECTIVE MAINTENANCE

Corrective maintenance actions are covered in Chapter 6 of this manual and also in Chapter 6 of the SNDLRCS operation and maintenance manual.

D.11 PARTS LISTS

Parts lists for the FADS III Air System are presented in Chapter 6 and referenced in a maintenance index in Chapter 7 of this manual. Parts lists for the SNDLRCS are presented in Chapter 7 and Appendix G of the SNDLRCS operation and maintenance manual.

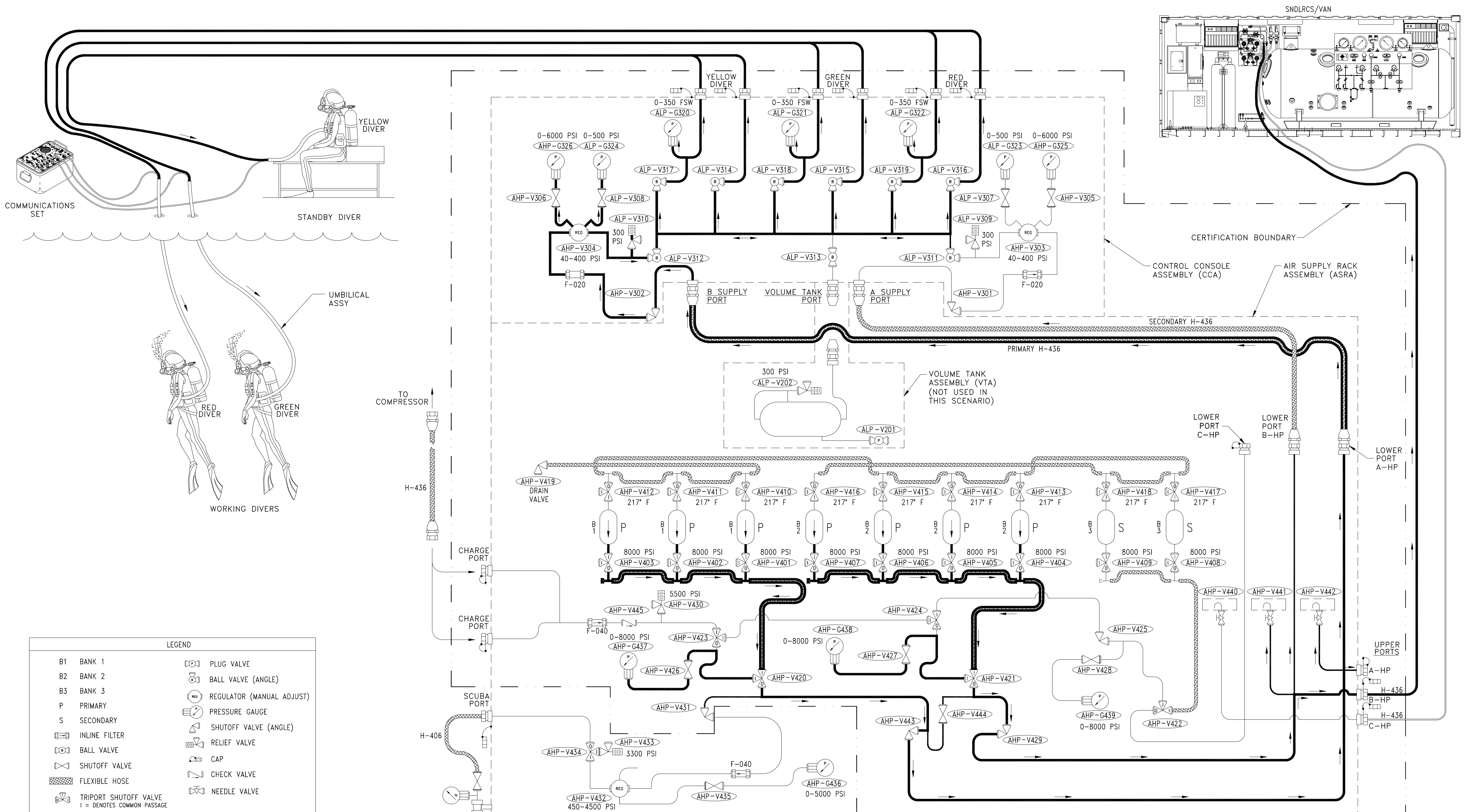


Figure D-4. Primary Air Flow Paths for Configuration 4: Diving the FADS III Air System with SNDLRCS Support

THIS PAGE INTENTIONALLY LEFT BLANK

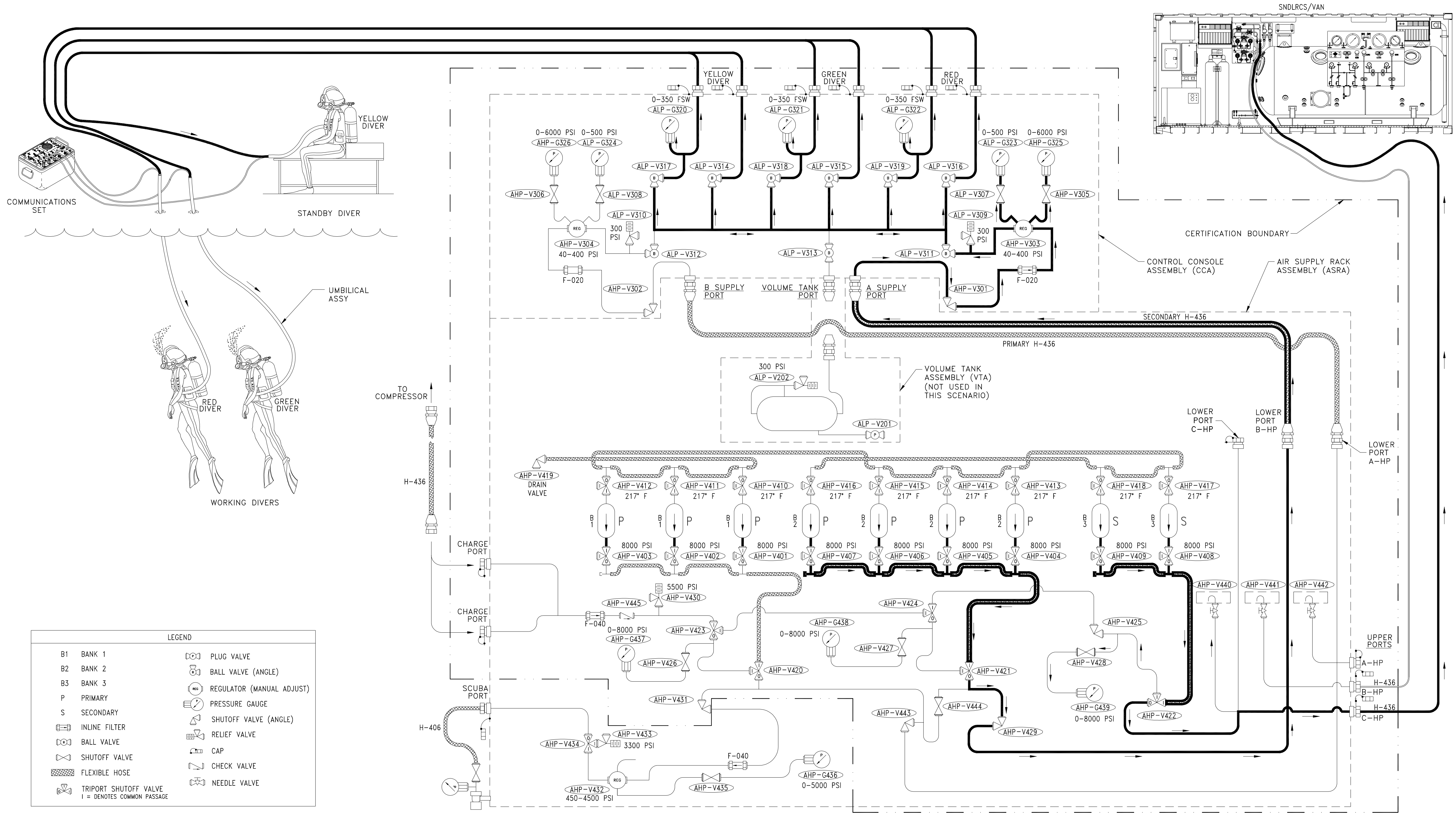


Figure D-5. Secondary Air Flow Paths for Configuration 4: Diving the FADS III Air System with SNDLRCS Support

THIS PAGE INTENTIONALLY LEFT BLANK

D.12 INSTALLATION, DEPLOYMENT, AND STORAGE

Installation, deployment, and storage information is provided in Chapter 8 of this manual and also in Chapter 8 and Appendix E of the SNDLRCS operation and maintenance manual.

D.13 OPERATING AND EMERGENCY PROCEDURES

D.13.1 INTRODUCTION. Efficient operations using the equipment in Configuration 4 require the use of Operating Procedures (OPs) and Emergency Procedures (EPs) from both the FADS III Air System and the SNDLRCS operation and maintenance manuals. The OPs and EPs are provided in reproducible checklist form and must be pulled from several locations as indicated in Table D-4 and the note that follows the table. Table D-4 provides an index identifying each procedure in Appendix D by its number, title, and location, and referencing the Configuration 1 procedures in Appendix A that are common to both configurations. C4 before a specific procedure number indicates that the OP is dedicated to Configuration 4 and is located in this appendix. C1 before a specific procedure number indicates that the procedure is located in Appendix A of this manual, which contains the procedures for Configuration 1. However, by referencing a C1 procedure here, it becomes common to both configurations.

Table D-4. Index of Configuration 4 Procedures

Procedure No.	Title	Page No.
C4 / OP-1	Premission Procedures	D-23
C4 / OP-2A	Predive Start-Up Procedures for the FADS III Air System	D-31
C4 / OP-2B	Predive Start-Up Procedures for the SNDLRCS	D-37
C4 / OP-2M	Modified Predive Start-Up Procedures for the FADS III and SNDLRCS	D-45
C4 / OP-3	Shutdown Procedures	D-51
C4 / OP-3M	Modified Shutdown Procedures	D-59
C4 / OP-4	Postmission Procedures	D-63
C1 / OP-5*	HP Air Flask Charging Procedures for Bank 1, 2, or 3 with ASRA On-Line	A-33
C1 / OP-6*	HP Air Flask Charging Procedures with ASRA Off-Line	A-39
C1 / OP-7*	SCUBA Cylinder Charging Procedures	A-45
C1 / EP-1*	Emergency Procedure: Loss of Primary Air to Divers	A-49

* Included in Appendix A of the FADS III Air System technical manual

NOTE

The following SNDLRCS OPs will be utilized as required in the Configuration 4 procedures:

OP-2	Medical Lock Operation
OP-9	Oxygen Bottle In-Place Charging Procedures
EP-1	Rapid Loss of Chamber Pressure
EP-2	Increase in Chamber Pressure
EP-3	Contaminated Atmosphere
EP-4	Fire in Chamber
EP-5	Loss of Oxygen
EP-6	Loss of Primary Air Supply
EP-7	Loss of Primary Power

D.13.2 USING THE CHECKLISTS AND RELATED DOCUMENTS. This section contains instructions for using the status sheet, the flow chart of operations, and the seven reproducible OP checklists included in this appendix.

D.13.2.1 Status Sheet. The reproducible status sheet in Figure D-6 provides a central location for designating the banks and ports to be utilized during system line-up with the OPs, and provides a snapshot of the dive system's line-up condition during diving operations. The status sheet may be filled out prior to premission setup and signed by the Diving Supervisor. Once established, a status sheet may continue to be used for successive dives as long as the designations do not change. If changes are required, the current status sheet should be updated or a new one prepared.

Guidance for selecting banks and ports on the FADS III ASRA and CCA is provided on the status sheet in Figure D-6.

D.13.2.2 Flow Chart of Operations. The flow chart in Figure D-7 provides visual guidance for help in determining which OPs to perform and the order of their performance. If additional assistance is required, refer to Note 1 of the OP(s) in question.

D.13.2.3 OP Checklists. The checklists in this appendix are designed to be reproduced for use in the performance of the operating procedures. The following information covers the elements of each checklist and indicates what type of action, if any, is required:

a. **Signature block (located on checklist cover sheet):** Operators/checkers print and sign names and enter date checklist is completed. Diving Supervisor signs and dates checklist to verify that all actions have been performed and all deficiencies and problems have been noted.

b. **NOTE 1:** Contains pertinent information about the OP.

CONFIGURATION 4
STATUS SHEET

1. ASRA BANK SELECTIONS

The following ASRA bank designations are standard when using the SNDLRCS:

BANK 1	Primary Air to CCA/VTA
BANK 2	Secondary Air to CCA/VTA
BANK 2	Primary Air to SNDLRCS
BANK 3	Secondary Air to SNDLRCS

2. ASRA PORT SELECTIONS

The following ASRA port designations are standard when using the SNDLRCS:

PORT A (LOWER)	Primary Air to CCA/VTA
PORT B (LOWER)	Secondary Air to CCA/VTA
PORT B (UPPER)	Primary Air to SNDLRCS
PORT C (UPPER)	Secondary Air to SNDLRCS

3. CCA PORT SELECTIONS

Designate primary and secondary ports on the CCA by circling the appropriate label.

A Supply –	Primary	Secondary
B Supply –	Primary	Secondary

Diving Supervisor: Determine the minimum air pressure allowed in banks to ensure that the required air for planned dives is available, and record below.

Minimum Air Pressure Allowed: ASRA Bank 1 AHP-G437 __________ psig

ASRA Bank 2 AHP-G438 __________ psig

ASRA Bank 3 AHP-G439 __________ psig

Diving Supervisor ____ Date ____________

Printed name and signature

Figure D-6. Configuration 4 Status Sheet

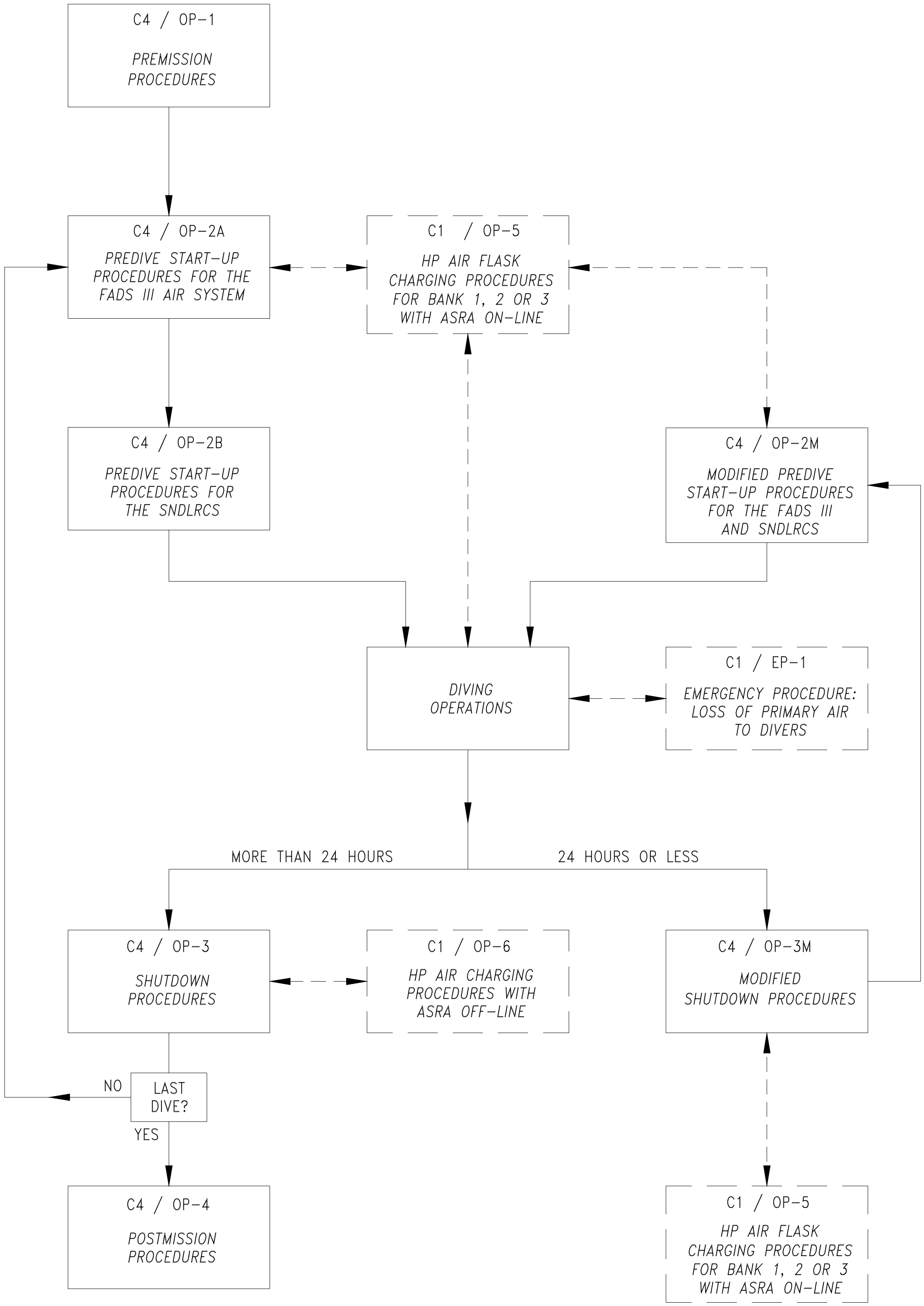


Figure D-7. Flow Chart of Operations for Configuration 4: Diving the FADS III Air System with SNDLRCS Support

c. **NOTE 2:** Contains a reminder to record notes and deficiencies in the REMARKS section at the end of each OP.

d. **ITEM:** Contains the numerical identifier for each item.

e. **COMPONENT:** Contains the nomenclature of the component(s) involved in each item. If a choice of components is given, circle the appropriate component(s).

f. **DESCRIPTION:** Contains valve, gauge, and hose numbers (if applicable) of the component(s) involved and any other information that may be helpful. If a choice of components is given, circle the appropriate component(s).

g. **PROCEDURE:** Contains a brief description of actions to be performed by the appropriate personnel.

h. **LOCATION:** Contains the name of assembly/assemblies involved.

i. **CHECK:** The operator initials this column as each item is completed. If the item does not apply, the operator enters N/A (not applicable).

j. **NOTE:** The operator places a check mark in this column to indicate that a note has been included in the REMARKS section at the end of the procedure.

k. **REMARKS (last page of OP):** The operator uses this section to document any deficiencies or problems found during performance of a particular item. The operator should begin each note with the item number involved.

WARNING

The operating procedures in this appendix are designed for use with equipment setups featuring the FADS III CCA and VTA only. Use of any other control console or volume tank assembly not capable of handling 5,000 psi service may result in equipment damage and personnel injury or death.

D.13.3 <u>CONFIGURATION 4 OPERATING PROCEDURES</u>. The remainder of this appendix is dedicated to the seven OP checklists that shall be used when diving the FADS III Air System with SNDLRCS support.

THIS PAGE INTENTIONALLY LEFT BLANK

FADS III AIR SYSTEM
CONFIGURATION 4 / OP-1

PREMISSION PROCEDURES
FOR DIVING THE FADS III AIR SYSTEM
WITH SNDLRCS SUPPORT

REVISED 14 MARCH 2008

SPECIAL INSTRUCTIONS

1. Ensure this OP is valid by comparing the revision date above with the master file.
2. Check each item individually.
3. Sign and date below when OP has been completed.
4. Report any discrepancy to the Diving Supervisor.

Operator No. 1 ____ Date ____________
Printed name and signature

Operator No. 2 ____ Date ____________
Printed name and signature

Diving Supervisor ______________________________________ Date ____________
Printed name and signature

FADS III AIR SYSTEM CONFIGURATION 4 / OP-1

PREMISSION PROCEDURES FOR DIVING THE FADS III AIR SYSTEM WITH SNDLRCS SUPPORT

NOTE 1: Premission setup involves physical placement and inspection of the equipment, installation of the air interface hoses, and alignment of valves prior to a mission.

NOTE 2: Record notes and deficiencies in section provided at the end of this operating procedure.

NOTE 3: When the SNDLRCS is used, the following ASRA bank and port designations are standard:

ASRA BANKS

BANK 1 Primary Air to CCA/VTA

BANK 2 Secondary Air to CCA/VTA

BANK 2 Primary Air to SNDLRCS

BANK 3 Secondary Air to SNDLRCS

ASRA PORTS

PORT A (LOWER) Primary Air to CCA/VTA

PORT B (LOWER) Secondary Air to CCA/VTA

PORT B (UPPER) Primary Air to SNDLRCS

PORT C (UPPER) Secondary Air to SNLDRCS

NOTE 4: Designate which port on the CCA has been chosen as Primary and which has been chosen as Secondary by circling the appropriate label.

CCA PORTS

A Supply – Primary Secondary

B Supply – Primary Secondary

ITEM	COMPONENT	DESCRIPTION	PROCEDURE	LOCATION	CHECK	NOTE
WARNING: **All FADS III Air System and SNDLRCS equipment must be positioned and secured before operation as movement during operation could result in equipment damage and injury or death to personnel.**						
CONDUCT INSPECTION AND POSITION ASSEMBLIES						
1	ASRA CCA VTA (if used) HPAC SNDLRCS	Conduct visual inspection of all assemblies for damage.		ASRA CCA VTA HPAC SNDLRCS		
NOTE 5: Any damage to SNDLRCS shell and FADS III system must be reported to NAVSEA 00C prior to conducting chamber operations.						
2	ASRA CCA VTA (if used) HPAC SNDLRCS	Position all assemblies within reach of interface hoses (40 feet maximum).		ASRA CCA VTA HPAC SNDLRCS		

FADS III AIR SYSTEM CONFIGURATION 4 / OP-1 *Page 2 of 7*

PREMISSION PROCEDURES FOR DIVING THE FADS III AIR SYSTEM WITH SNDLRCS SUPPORT—Continued

ITEM	COMPONENT	DESCRIPTION	PROCEDURE	LOCATION	CHECK	NOTE
SET UP SNDLRCS VAN						
3	ASRA CCA VTA (if used) HPAC SNDLRCS	Secure all FADS III and SNDLRCS assemblies in place.		ASRA CCA VTA HPAC SNDLRCS		
4	O2 Monitor	Remove from van.		SNDLRCS Van		
5	O2 Analyzer On/Off Power Switch	Hold down switch in the “BATT” position. Check battery condition; replace batteries if necessary.		Oxygen Analyzer		
6	O2 Analyzer Calibration Dial	Calibrate analyzer in ambient air. Adjust the “CALIBRATE” control knob until meter reads 21%.		Oxygen Analyzer		
7	O2 Analyzer High Alarm	Check “HI ALARM” by setting “HI ALARM” set point below 21%. Audible and visual alarms should activate. Readjust “HI ALARM” set point to 23%.		Oxygen Analyzer		
8	O2 Analyzer Low Alarm	Ensure “LO ALARM” set point is below 21%.		Oxygen Analyzer		
9	O2 Monitor	Reinstall in mount.		SNDLRCS Van		
10	AC and ECS	Remove AC and ECS access covers, and uncap AC drains.		SNDLRCS Van		
11	Chamber Exhaust	Remove cap from chamber exhaust and install elbow/screen assembly.		SNDLRCS Van		
12	Manway Access Cover	Remove manway access cover from van.		SNDLRCS Van		
SET UP SNDLRCS VAN ELECTRICAL SYSTEM						
WARNING: **Incorrect electrical hookup will cause equipment damage and/or personnel injury. It is imperative that the power source (ship, shore, or generator), the power panel receptacle and power cable, and the breaker are all set for the same voltage (either 440V or 220V).** CAUTION: The SNDLRCS van must be grounded to an earth ground. Ensure external earth ground system is connected to ground lug in power entry panel. **NOTE 6:** For shipboard use, detach grounding cable from grounding rod and attach grounding cable to suitable shipboard ground.						
13	Manual Bus Switch	Ensure OFF.		Manual Bus Transfer Switch Panel		

FADS III AIR SYSTEM CONFIGURATION 4 / OP-1

PREMISSION PROCEDURES FOR DIVING THE FADS III AIR SYSTEM WITH SNDLRCS SUPPORT—Continued

ITEM	COMPONENT	DESCRIPTION	PROCEDURE	LOCATION	CHECK	NOTE
14	Main Breaker	Ensure OFF.		120/240 Load Distribution Panel		
15	Van Electrical Cable	Connect SNDLRCS van to primary power source. Have secondary power source ready.		440V Source		
				220V Source		
16	Manual Bus Switch	Turn to selected primary power source (440V or 220V).		Manual Bus Transfer Switch Panel		
17	Main Breaker & All Breakers to be Used	Switch ON.		120/240 Load Distribution Panel		
18	On/Off/Test Button	Press and release to turn ON.		UPS		
SET UP CCA AND VTA						
19	CCA Lid and Stowed Legs	Remove lid from CCA case. Remove the two stowed legs from lid.		CCA		
20	CCA External Door	Open external door on bottom of CCA case by loosening the five captive screws.		CCA		
WARNING:	**Blowout plug must be removed before pressurization of CCA to allow operation of relief valves. Failure to remove blowout plug can result in equipment damage or injury or death to personnel.**					
21	CCA Blowout Plug	Remove blowout plug from back of CCA.		CCA		
22	CCA	Inspect CCA for damage.		CCA		
23	VTA	Inspect VTA (if used) for damage.		VTA		
24	CCA/VTA	Set CCA on top of VTA frame (or suitable structure) such that console is at ~60º angle and secure in place.		CCA/VTA		
SET UP ASRA						
25	ASRA Doors	Open.		ASRA		
26	ASRA	Inspect system for damage.		ASRA		
WARNING:	**PRIMARY and SECONDARY tags must be affixed to ASRA PORT A, PORT B, and PORT C valve handles and to CCA A REGULATOR and B REGULATOR. Removal or swapping of tags can result in injury or death.**					
27	Port A Valve	AHP-V443	Tag with PRIMARY TO CCA/VTA tag.	ASRA		

FADS III AIR SYSTEM CONFIGURATION 4 / OP-1 *Page 4 of 7*

PREMISSION PROCEDURES FOR DIVING THE FADS III AIR SYSTEM WITH SNDLRCS SUPPORT—Continued

ITEM	COMPONENT	DESCRIPTION	PROCEDURE	LOCATION	CHECK	NOTE
28	Port B Valve	AHP-V429	Tag with PRIMARY TO SNDL and SECONDARY TO CCA/VTA tags.	ASRA		
29	Port C Valve	AHP-V442	Tag with SECONDARY TO SNDL tag.	ASRA		
30	A Regulator	AHP-V303	Tag with PRIMARY or SECONDARY tag according to dive plan.	CCA		
31	B Regulator	AHP-V304	Tag with PRIMARY or SECONDARY tag according to dive plan.	CCA		
32	Gauge Stop Valves	AHP-V426 AHP-V427 AHP-V428	Open.	ASRA		
33	ASRA Valves and Regulators	Ensure that all remaining ASRA valves are closed and all regulators are backed off fully CCW.		ASRA		

WARNING: **Failure to connect hose assembly strain relief can cause personnel injury or death should the hose separate or burst.**

WARNING: **Ports A, B, and C on the ASRA must be depressurized whenever a port cap or hose is removed from a port connector. Removal of a port cap or hose when supply piping is pressurized can result in injury or death.**

WARNING: **Fitting threads and O-rings must be inspected for damage and fittings must be properly tightened to ensure seating of O-rings. Fittings and O-rings that are not properly installed can allow HP air to escape and result in injury or death.**

NOTE 7: ASRA can be set up inside or outside of SNDLRCS Van. Connect hoses according to location of ASRA.

CONNECT PRIMARY HP AIR SUPPLY HOSES FROM ASRA TO SNDL REDUCING STATION OR VAN OUTSIDE BULKHEAD PANEL

ITEM	COMPONENT	DESCRIPTION	PROCEDURE	LOCATION	CHECK	NOTE
34	HP Air Hose Assemblies	H-436	Remove from ASRA door. Inspect for cuts and abrasions.	ASRA		
35	Port B Bleed Valve	AHP-V441	Open, allow pressure to bleed off, and close.	ASRA		
36	Primary HP Air Hose Assembly	H-436	Connect hose to Port B and tighten 3/8 to 1/2 turn after O-ring engagement. Connect strain relief.	ASRA Upper Port B		

FADS III AIR SYSTEM CONFIGURATION 4 / OP-1 *Page 5 of 7*

PREMISSION PROCEDURES FOR DIVING THE FADS III AIR SYSTEM WITH SNDLRCS SUPPORT—Continued

ITEM	COMPONENT	DESCRIPTION	PROCEDURE	LOCATION	CHECK	NOTE
37	Primary HP Air Hose Assembly	H-436	Connect hose to Primary air supply fitting and tighten wrench-tight. Connect strain relief.	Air Reducing Station Van, BKHD Transition Panel Primary Port		
38	Primary HP Air Supply Valve	AHP-V101	Close.	Air Reducing Station		
CONNECT SECONDARY HP AIR SUPPLY HOSES FROM ASRA TO SNDL REDUCING STATION OR VAN OUTSIDE BULKHEAD PANEL						
39	Port C Bleed Valve	AHP-V440	Open, allow pressure to bleed off, and close.	ASRA		
40	Secondary HP Air Hose Assembly	H-436	Connect hose to Port C and tighten 3/8 to 1/2 turn after O-ring engagement. Connect strain relief.	ASRA Upper Port C		
41	Secondary HP Air Hose Assembly	H-436	Connect hose to secondary air supply fitting and tighten wrench-tight. Connect strain relief.	Air Reducing Station Van, BKHD Transition Panel Sec-ondary Port		
42	Secondary HP Air Supply Valve	AHP-V102	Close.	Air Reducing Station		
NOTE 8: ASRA can be set up inside or outside of SNDLRCS Van. Connect hoses accordingly. **NOTE 9:** Ensure Primary and Secondary hoses are properly labeled at FADS III CCA.						
CONNECT PRIMARY HP AIR SUPPLY HOSE FROM ASRA TO CCA						
43	Port A Bleed Valve	AHP-V442	Open, allow pressure to bleed off, and close.	ASRA		
44	Primary HP Air Hose Assembly	H-436	Connect hose to Port A and tighten 3/8 to 1/2 turn after O-ring engagement. Connect strain relief.	ASRA Lower Port A		
45	Primary HP Air Hose Assembly	H-436	Connect hose to designated Primary port and tighten 3/8 to 1/2 turn after O-ring engagement. Connect strain relief.	CCA Port A Port B (Circle one)		

FADS III AIR SYSTEM CONFIGURATION 4 / OP-1

PREMISSION PROCEDURES FOR DIVING THE FADS III AIR SYSTEM WITH SNDLRCS SUPPORT—Continued

ITEM	COMPONENT	DESCRIPTION	PROCEDURE	LOCATION	CHECK	NOTE
CONNECT SECONDARY HP AIR SUPPLY HOSE FROM ASRA TO CCA						
46	Port B Bleed Valve	AHP-V442	Open, allow pressure to bleed off, and close.	ASRA		
47	Secondary HP Air Hose Assembly	H-436	Connect hose to Port B and tighten 3/8 to 1/2 turn after O-ring engagement. Connect strain relief.	ASRA Lower Port B		
48	Secondary HP Air Hose Assembly	H-436	Connect hose to designated Secondary port and tighten 3/8 to 1/2 turn after O-ring engagement. Connect strain relief.	CCA Port A Port B (Circle one)		
CONNECT LP AIR SUPPLY HOSE FROM VTA TO CCA (IF NOT USING VTA, SKIP TO ITEM 53)						
49	Condensate Drain Valve	ALP-V201	Open, allow pressure to bleed off, and close.	VTA		
50	LP Air Hose Assembly	H-203	Remove stowed hose from VTA. Inspect for cuts and abrasions.	VTA		
51	LP Air Hose Assembly	H-203	Connect hose to VTA port and tighten 3/8 to 1/2 turn after O-ring engagement. Connect strain relief.	VTA		
52	LP Air Hose Assembly	H-203	Connect hose to CCA port and tighten 3/8 to 1/2 turn after O-ring engagement. Connect strain relief.	CCA		
SET UP CCA						
53	A Supply Valve	AHP-V301	Verify closed.	CCA		
54	B Supply Valve	AHP-V302	Verify closed.	CCA		
55	Gauge Stop Valves	AHP-V305 AHP-V306 ALP-V307 ALP-V308	Open.	CCA		
56	CCA Valves and Regulators	Ensure that all remaining CCA valves are in closed position and all regulators are backed off fully CCW.		CCA		
END OF PROCEDURE						

FADS III AIR SYSTEM CONFIGURATION 4 / OP-1

PREMISSION PROCEDURES FOR DIVING THE FADS III AIR SYSTEM WITH SNDLRCS SUPPORT—Continued

REMARKS: (Using item number as a reference, list any deficiencies or problems found during performance of this procedure.)

FADS III AIR SYSTEM
CONFIGURATION 4 / OP-2A

PREDIVE START-UP PROCEDURES
FOR THE FADS III AIR SYSTEM

REVISED 14 MARCH 2008

SPECIAL INSTRUCTIONS

1. Ensure this OP is valid by comparing the revision date above with the master file.
2. Check each item individually.
3. Sign and date below when OP has been completed.
4. Report any discrepancy to the Diving Supervisor.

Operator No. 1 ____ Date ____________
Printed name and signature

Operator No. 2 ____ Date ____________
Printed name and signature

Diving Supervisor ______________________________________ Date ____________
Printed name and signature

FADS III AIR SYSTEM CONFIGURATION 4 / OP-2A

PREDIVE START-UP PROCEDURES FOR THE FADS III AIR SYSTEM

NOTE 1: Predive start-up for the FADS III Air System involves setting up the ASRA, Primary/Secondary HP Air Supplies, CCA, and VTA (if utilized); see Configuration 4/OP-2B for predive start-up of the SNDLRCS. This OP shall always be performed before the first dive of the mission and before each new dive after the shutdown procedures in Configuration 4/OP-3 have been performed.

NOTE 2: Record notes and deficiencies in section provided at the end of this operating procedure.

NOTE 3: When the SNDLRCS is used, the following ASRA bank and port designations are standard:

<u>ASRA BANKS</u>

BANK 1 Primary Air to CCA/VTA

BANK 2 Secondary Air to CCA/VTA

BANK 2 Primary Air to SNDLRCS

BANK 3 Secondary Air to SNDLRCS

<u>ASRA PORTS</u>

PORT A (LOWER) Primary Air to CCA/VTA

PORT B (LOWER) Secondary Air to CCA/VTA

PORT B (UPPER) Primary Air to SNDLRCS

PORT C (UPPER) Secondary Air to SNLDRCS

NOTE 4: Designate which port on the CCA has been chosen as Primary and which has been chosen as Secondary by circling the appropriate label.

<u>CCA PORTS</u>

A Supply – Primary Secondary

B Supply – Primary Secondary

ITEM	COMPONENT	DESCRIPTION	PROCEDURE	LOCATION	CHECK	NOTE
1	System Drain Valve	AHP-V419	Open.	ASRA		
2	Flask Drain Valves	AHP-V410 AHP-V411 AHP-V412 AHP-V413 AHP-V414 AHP-V415 AHP-V416 AHP-V417 AHP-V418	Open, drain, and close.	ASRA		
3	System Drain Valve	AHP-V419	Close.	ASRA		

FADS III AIR SYSTEM CONFIGURATION 4 / OP-2A *Page 2 of 4*

PREDIVE START-UP PROCEDURES
FOR THE FADS III AIR SYSTEM—Continued

ITEM	COMPONENT	DESCRIPTION	PROCEDURE	LOCATION	CHECK	NOTE
SET UP ASRA BANKS 1, 2, AND 3						
NOTE 5: Ensure Banks 1, 2, and 3 are charged to a minimum of 4800 psi or at Diving Supervisor's discretion. Recharging of banks can be conducted using FADS III Air System Configuration 1/OP-5.						
4	Flask Isolation Valves	AHP-V401 AHP-V402 AHP-V403 AHP-V404 AHP-V405 AHP-V406 AHP-V407 AHP-V408 AHP-V409	Open slowly.	ASRA		
5	Bank 1 Gauge	AHP-G437	Record pressure (min. pressure ________ psig): AHP-G437 _________ psig	ASRA		
6	Bank 2 Gauge	AHP-G438	Record pressure (min. pressure ________ psig): AHP-G438 _________ psig	ASRA		
7	Bank 3 Gauge	AHP-G439	Record pressure (min. pressure ________ psig): AHP-G439 _________ psig	ASRA		
8	Manifold Valve	AHP-V444	Verify closed. **Failure to do so will cascade Primary and Secondary Air Banks.**	ASRA		
CAUTION: Prior to completing Items 9 and 11, notify personnel conducting Configuration 4/OP-2B (SNDLRCS Start-up) that Secondary and Primary air is being provided to SNDLRCS air reducing station.						
SET UP BANK 1 PRIMARY AIR TO CCA/VTA						
9	Bank 1 Manifold Valve	AHP-V420	Open slowly.	ASRA		
10	Port A Valve	AHP-V443	Open slowly.	ASRA		
SET UP BANK 2 PRIMARY AIR TO SNDLRCS AND SECONDARY AIR TO CCA/VTA						
11	Bank 2 Manifold Valve	AHP-V421	Open slowly.	ASRA		
12	Port B Valve	AHP-V429	Open slowly.	ASRA		
SET UP BANK 3 SECONDARY AIR TO SNDLRCS						
13	Port C Valve	AHP-V422	Open slowly.	ASRA		

FADS III AIR SYSTEM CONFIGURATION 4 / OP-2A *Page 3 of 4*

PREDIVE START-UP PROCEDURES FOR THE FADS III AIR SYSTEM—Continued

ITEM	COMPONENT	DESCRIPTION	PROCEDURE	LOCATION	CHECK	NOTE
SET UP CCA A SUPPLY						
14	Red, Green, and Yellow Diver Supply and Pneumo Ports	Remove port caps and check for damaged threads.		CCA Rear Panel		
15	A Supply Valve	AHP-V301	Open slowly.	CCA		
16	A Supply Gauge	AHP-G325	Record pressure: _________________ psig	CCA		
17	Bank 1 Gauge Bank 2 Gauge	AHP-G437 AHP-G438	Compare reading with bank supplying CCA A Supply. (Circle bank in use)	ASRA		
18	A Regulator	AHP-V303	Slowly adjust manifold pressure as directed by Diving Supervisor. Final pressure: _________________ psig	CCA		
SET UP CCA B SUPPLY						
19	B Supply Valve	AHP-V302	Open slowly.	CCA		
20	B Supply Gauge	AHP-G326	Record pressure: _________________ psig	CCA		
21	Bank 1 Gauge Bank 2 Gauge	AHP-G437 AHP-G438	Compare reading with bank supplying CCA B Supply. (Circle bank in use)	ASRA		
22	B Regulator	AHP-V304	Slowly adjust manifold pressure as directed by Diving Supervisor. Final pressure: _________________ psig	CCA		
23	Manifold Supply Valve	ALP-V311 -or- ALP-V312	Open selected secondary supply valve. (Circle opened valve)	CCA		
NOTE 6: If VTA is used, complete Items 24-25 and skip Item 26. If VTA is not used, skip Items 24-25 and complete Item 26.						
24	Volume Tank Valve	ALP-V313	Slowly open valve and charge volume tank. Ensure regulator tracks.	CCA		
25	Condensate Drain Valve	ALP-V201	Open after pressure equalizes, drain, and close.	VTA		

FADS III AIR SYSTEM CONFIGURATION 4 / OP-2A *Page 4 of 4*

PREDIVE START-UP PROCEDURES FOR THE FADS III AIR SYSTEM—Continued

ITEM	COMPONENT	DESCRIPTION	PROCEDURE	LOCATION	CHECK	NOTE
26	Yellow Supply Valve	ALP-V314	Open slowly, blow down secondary supply, and close. Ensure regulator tracks.	CCA		
27	Manifold Supply Valve	ALP-V311 -or- ALP-V312	Close selected secondary supply valve. (Circle opened valve)	CCA		
28	Manifold Supply Valve	ALP-V311 -or- ALP-V312	Open selected primary supply valve. (Circle opened valve)	CCA		
29	Yellow Supply Valve	ALP-V314	Open slowly, blow down primary supply, and close. Ensure regulator tracks.	CCA		
30	Red, Green, and Yellow Diver Supply Hoses	Remove plugs and check hose fittings for damaged threads. Connect hoses and tighten wrench-tight.		CCA		
31	Red, Green, and Yellow Diver Pneumo Hoses	Remove plugs and check hose fittings for damaged threads. Connect hoses and tighten wrench-tight.		CCA		
WARNING: **When purging umbilical hoses, maintain a firm grip on the hose and point the free end away from personnel to avoid injury from flying debris.** WARNING: **When purging pneumo hoses, do not fully open pneumo valves (ALP-V317, ALP-V318, and ALP-V319). Failure to comply will damage the diver depth gauges and may cause injury to personnel.**						
32	Yellow, Green, and Red Diver Pneumo Valves	ALP-V317 ALP-V318 ALP-V319	Crack open valves one at a time, purge corresponding pneumo hose, and close.	CCA		
33	Yellow, Green, and Red Diver Supply Valves	ALP-V314 ALP-V315 ALP-V316	Crack open valves one at a time, purge corresponding supply hose, and close.	CCA		
END OF PROCEDURE						

REMARKS: (Using item number as a reference, list any deficiencies or problems found during performance of this procedure.)

____

____

THIS PAGE INTENTIONALLY LEFT BLANK

FADS III AIR SYSTEM
CONFIGURATION 4 / OP-2B

PREDIVE START-UP PROCEDURES
FOR THE SNDLRCS

REVISED 14 MARCH 2008

SPECIAL INSTRUCTIONS

1. Ensure this OP is valid by comparing the revision date above with the master file.
2. Check each item individually.
3. Sign and date below when OP has been completed.
4. Report any discrepancy to the Diving Supervisor.

Operator No. 1 ____ Date ____________
Printed name and signature

Operator No. 2 ____ Date ____________
Printed name and signature

Diving Supervisor ______________________________________ Date ____________
Printed name and signature

FADS III AIR SYSTEM CONFIGURATION 4 / OP-2B

PREDIVE START-UP PROCEDURES FOR THE SNDLRCS

NOTE 1: Start-up of the SNDLRCS involves setting up the Air, Oxygen, and Chamber valves for operation and pressure testing.

NOTE 2: Record notes and deficiencies in section provided at the end of this operating procedure.

ITEM	COMPONENT	DESCRIPTION	PROCEDURE	LOCATION	CHECK	NOTE
1	ECS Hot or Cold Water Supply	ECS-V-1	Open.	End of Chamber		
2	ECS Hot or Cold Water Return	ECS-V-2	Open.	End of Chamber		
3	IL BIBS Exhaust Hull Stop Valve	EXH-V-2	Verify open.	End of Chamber		
4	Pressure Relief Hull Stop Valve	ATM-V-9	Wired open.	Under Control Console		
5	Medical Lock Doors	Ensure inner and outer doors closed with safety interlock engaged.		Medical Lock		
6	IL Exhaust Valve	EXH-V-7	Verify open.	Under Control Console		
7	OL Exhaust Valve	EXH-V-9	Verify open.	Under Control Console		
8	OL BIBS Exhaust Hull Stop Valve	EXH-V-4	Verify open.	Under Control Console		
9	Gas Sample Hull Stop Valve	ATM-V-11	Verify open.	Top of Chamber		
10	Gas Sample Hull Stop Valve	ATM-V-13	Verify open.	Top of Chamber		
11	IL BIBS Backpressure Regulator Tracking Hull Valve	ATM-V-12	Verify open.	Top of Chamber		
12	OL BIBS Backpressure Regulator Tracking Hull Valve	ATM-V-14	Verify open.	Top of Chamber		
13	IL Primary Depth Gauge Hull Stop Valve	ATM-V-2	Verify open.	Top of Chamber		

FADS III AIR SYSTEM CONFIGURATION 4 / OP-2B

PREDIVE START-UP PROCEDURES FOR THE SNDLRCS—Continued

ITEM	COMPONENT	DESCRIPTION	PROCEDURE	LOCATION	CHECK	NOTE
14	IL Secondary Depth Gauge Hull Stop Valve	ATM-V-4	Verify open.	Top of Chamber		
15	OL Primary Depth Gauge Hull Stop Valve	ATM-V-6	Verify open.	Top of Chamber		
16	OL Secondary Depth Gauge Hull Stop Valve	ATM-V-8	Verify open.	Top of Chamber		
17	OL Primary Depth Gauge Valve	ATM-V-5	Verify open.	Control Console		
18	IL Primary Depth Gauge Valve	ATM-V-1	Verify open.	Control Console		
19	IL Secondary Depth Gauge Valve	ATM-V-3	Verify open.	Control Console		
20	Chamber Lights, Scrubber, and Temperature Indicator	Turn on chamber lights and scrubber; ensure they are working. Verify temperature indicator is working.		Chamber		
21	Chamber Communications Equipment	Ensure headsets are installed inside IL, OL, and outside the chamber. Check communications and adjust volume as necessary. Check sound-powered phone.		IL, OL, and Outside Chamber		
22	Scrubber Canister	Ensure installed.		Chamber		
PERFORM ECS START-UP						
23	ECS On/Off Switch	Switch ON.		Control Console		
24	ECS	Ensure coolant fluid level is visible in sight glass.		ECS		
25	ECS On/Off Remote Switch	Switch ON.		ECS		
26	ECS Flow Indicator	Verify flow.		End of Chamber		
27	ECS Hot/Cool Switch	Switch to COOL; verify unit works.		ECS		

FADS III AIR SYSTEM CONFIGURATION 4 / OP-2B ***Page 3 of 7***

PREDIVE START-UP PROCEDURES FOR THE SNDLRCS—Continued

ITEM	COMPONENT	DESCRIPTION	PROCEDURE	LOCATION	CHECK	NOTE
28	ECS On/Off Switch	Switch to OFF.		Control Console		
29	ECS On/Off Remote Switch	Switch to OFF.		ECS		
PERFORM OXYGEN ANALYZER START-UP						
30	Oxygen Analyzer On/Off Switch	Switch ON.		Control Console		
31	Oxygen Analyzer	Remove sampling cap to expose analyzer sensor to clean air for two minutes and adjust calibration knob until display reads correct oxygen level (20.9% at sea level).		Control Console		
32	Oxygen Analyzer	Reinstall sampling cap on analyzer sensor.		Control Console		
PERFORM CARBON DIOXIDE ANALYZER START-UP						
33	Warm up CO2 Analyzer (Analox CO2 Buddy) as follows: a. Press and hold CO2 button. b. All lights will flash 4 times and buzzer will sound 4 beeps. c. Warm-up takes 40 seconds; yellow fault light will extinguish and green "OK" light will flash every 2 seconds.			Control Console		
34	Perform Calibration Check as follows: a. Connect CO2 calibration gas to flow meter (ATM-FL-1). b. Adjust flow meter to 0.5 liters per minute. c. Let analyzer stabilize. d. Alarm's red warning light will flash and buzzer will sound every 2 seconds. e. Verify analyzer reads within 0.1% of calibration gas percentage. f. Disconnect calibration gas and remove flow adapter to clear calibration gas from analyzer. g. Replace flow adapter once analyzer green "OK" light returns.			Control Console		
PERFORM SNDLRCS PRIMARY AIR START-UP						
35	Primary HP Air Supply Valve	AHP-V101	Open slowly. Tag as PRIMARY AIR.	Air Reducing Station		
36	Primary HP Air Supply Gauge	AHP-G102	Record pressure: ____________ psig	Air Reducing Station		
37	Primary HP Air Regulator	AHP-R108	Load to 250 psig.	Air Reducing Station		

FADS III AIR SYSTEM CONFIGURATION 4 / OP-2B *Page 4 of 7*

PREDIVE START-UP PROCEDURES FOR THE SNDLRCS—Continued

ITEM	COMPONENT	DESCRIPTION	PROCEDURE	LOCATION	CHECK	NOTE
38	Primary LP Air Supply Gauge	ALP-G101	Record pressure: ____________ psig	Air Reducing Station		
39	Primary LP Air Supply Gauge	ALP-G-1	Record pressure: ____________ psig	Control Console		
PERFORM SNDLRCS SECONDARY AIR START-UP						
40	Primary LP Air Shutoff Valve	ALP-V-3	Verify closed.	Control Console		
41	Primary LP Air Cross Connect	ALP-V-4	Open.	Control Console		
42	Secondary HP Air Supply Valve	AHP-V102	Open slowly. Tag as SECONDARY AIR.	Air Reducing Station		
43	Secondary HP Air Supply Gauge	AHP-G103	Record pressure: ____________ psig	Air Reducing Station		
44	Secondary HP Air Regulator	AHP-R109	Load to 250 psig.	Air Reducing Station		
45	Secondary LP Air Supply Gauge	ALP-G104	Record pressure: ____________ psig	Air Reducing Station		
46	Secondary LP Air Supply Gauge	ALP-G-2	Record pressure: ____________ psig	Control Console		
47	Secondary LP Air Cross Connect	ALP-V-10	Open.	Control Console		
48	Secondary LP Air Shutoff Valve	ALP-V-9	Open.	Control Console		
PERFORM SNDRLCS OXYGEN START-UP						
49	Primary and Secondary HP Hose Assemblies	H-218 H-219 H-220 H-221	Ensure hoses to oxygen flask stop valves are attached.	Oxygen Bottles		
50	Primary O2 Supply Flask Stop Valves	Open slowly.		Oxygen Bottles		
51	Primary HP Oxygen Supply Gauge	OHP-G201	Record pressure: ____________ psig	Oxygen Reducing Station		

FADS III AIR SYSTEM CONFIGURATION 4 / OP-2B *Page 5 of 7*

PREDIVE START-UP PROCEDURES FOR THE SNDLRCS—Continued

ITEM	COMPONENT	DESCRIPTION	PROCEDURE	LOCATION	CHECK	NOTE
52	Secondary O2 Supply Flask Stop Valve	Open slowly.		Oxygen Bottles		
53	Secondary HP Oxygen Supply Gauge	OHP-G202	Record pressure: ____________ psig	Oxygen Reducing Station		
54	Primary HP Oxygen Regulator	OHP-R206	Load to 75-100 psig.	Oxygen Reducing Station		
55	Primary LP Oxygen Supply Gauge	OLP-G204	Record pressure: ____________ psig	Oxygen Reducing Station		
56	Secondary HP Oxygen Regulator	OHP-R205	Load to 75-100 psig.	Oxygen Reducing Station		
57	Secondary LP Oxygen Supply Gauge	OLP-G203	Record pressure: ____________ psig	Oxygen Reducing Station		
NOTE 3: This completes setup of Primary and Secondary Air and Oxygen pressures to: ALP-V-3 Primary Air ALP-V-9 Secondary Air OLP-V-2 Primary Oxygen OLP-V-4 Secondary Oxygen						
PERFORM BIBS CHECK – AIR						
58	BIBS Masks	Ensure all four BIBS masks are connected to air BIBS manifold in the IL, and all three BIBS masks are connected to air BIBS manifold in the OL.		IL and OL		
59	IL BIBS Exhaust BPR Bypass Valve	EXH-V-1	Shut.	Under Control Console		
60	IL BIBS Air Supply Stop Valve	ALP-V-11	Open.	Under Control Console		
61	OL BIBS Exhaust BPR Bypass Valve	EXH-V-3	Shut.	Under Control Console		
62	OL BIBS Air Supply Stop Valve	ALP-V-15	Open.	Under Control Console		
63	Conduct audible check for gas leaks.					

FADS III AIR SYSTEM CONFIGURATION 4 / OP-2B *Page 6 of 7*

PREDIVE START-UP PROCEDURES FOR THE SNDLRCS—Continued

ITEM	COMPONENT	DESCRIPTION	PROCEDURE	LOCATION	CHECK	NOTE
64	BIBS Masks	Breathe several times on each mask to verify good BIBS supply. Disconnect all BIBS masks from IL and OL air BIBS manifold.		IL and OL		
NOTE 4: Circle the Oxygen Supply that will be "In Use" and the Oxygen Supply that will be used for "Standby": In-Use Supply: Primary Secondary Standby Supply: Primary Secondary						
PERFORM BIBS CHECK – OXYGEN STANDBY SUPPLY						
65	BIBS Masks	Ensure all four BIBS masks are connected to O2 BIBS manifold in the IL, and all three BIBS masks are connected to O2 BIBS manifold in the OL.		IL and OL		
66	IL BIBS Oxygen Hull Stop Valve	OLP-V-6	Open.	Under Control Console		
67	OL BIBS Oxygen Hull Stop Valve	OLP-V-8	Open.	Under Control Console		
68	Primary or Secondary LP Oxygen Supply Valve	OLP-V-2 -or- OLP-V-4 (Circle one)	Open. Tag as STANDBY.	Control Console		
69	LP Oxygen Supply Gauge	OLP-G-1	Record pressure: __________ psig	Control Console		
70	Conduct audible check for gas leaks.					
71	BIBS Masks	Breathe several times on each mask to verify good BIBS supply.		IL and OL		
72	Primary or Secondary LP Oxygen Supply Valve	OLP-V-2 -or- OLP-V-4 (Circle one)	Shut.	Control Console		
PERFORM BIBS CHECK – OXYGEN IN-USE SUPPLY						
73	Primary or Secondary LP Oxygen Stop Valve	OLP-V-2 -or- OLP-V-4 (Circle one)	Open. Tag as IN USE.	Control Console		
74	LP Oxygen Supply Gauge	OLP-G-1	Record pressure: __________ psig	Control Console		

FADS III AIR SYSTEM CONFIGURATION 4 / OP-2B ***Page 7 of 7***

PREDIVE START-UP PROCEDURES FOR THE SNDLRCS—Continued

ITEM	COMPONENT	DESCRIPTION	PROCEDURE	LOCATION	CHECK	NOTE
75	Conduct audible check for gas leaks.					
76	BIBS Masks	Breathe several times on each mask to verify good BIBS supply.		IL and OL		
PERFORM CHAMBER AND MEDICAL LOCK SEAL CHECK						
77	Ventilate chamber with door open. Briefly crack open ALP-V-5 and ALP-V-13 pressurization valves. Verify Secondary regulator tracks.					
78	Secondary LP Air Shutoff Valve	ALP-V-9	Close.	Control Console		
79	Primary LP Air Shutoff Valve	ALP-V-3	Open.	Control Console		
80	Complete CHAMBER PRE-DIVE CHECKLIST.					
81	Ensure chamber door seals are lubricated with MIL-G-27617 Type 2 or 3.					
82	Pressurize chamber and medical lock to 10 fsw, check for audible leaks, and ensure there is no significant loss of pressure for a 5-minute period. Verify Primary regulator tracks.					
END OF PROCEDURE						

REMARKS: (Using item number as a reference, list any deficiencies or problems found during performance of this procedure.)

____

____

____

____

____

____

____

____

____

FADS III AIR SYSTEM
CONFIGURATION 4 / OP-2M

MODIFIED PREDIVE
START-UP PROCEDURES
FOR THE FADS III AND SNDLRCS

REVISED 14 MARCH 2008

SPECIAL INSTRUCTIONS

1. Ensure this OP is valid by comparing the revision date above with the master file.
2. Check each item individually.
3. Sign and date below when OP has been completed.
4. Report any discrepancy to the Diving Supervisor.

Operator No. 1 ______________________________ Date __________
Printed name and signature

Operator No. 2 ______________________________ Date __________
Printed name and signature

Diving Supervisor ______________________________ Date __________
Printed name and signature

FADS III AIR SYSTEM CONFIGURATION 4 / OP-2M

MODIFIED PREDIVE START-UP PROCEDURES FOR THE FADS III AND SNDLRCS

NOTE 1: This OP provides modified start-up procedures for the FADS III ASRA, CCA, and optional VTA, and for the SNDLRCS. The modified start-up procedures can only be used after the system was placed in a modified shutdown condition utilizing Configuration 4/OP-3M.

NOTE 2: Record notes and deficiencies in section provided at the end of this operating procedure.

NOTE 3: This OP may be performed only if 24 hours or less have elapsed. If more than 24 hours have elapsed, perform the shutdown procedures in Configuration 4/OP-3 and continue the normal sequence of operations from that point.

NOTE 4: When the SNDLRCS is used, the following ASRA bank and port designations are standard:

ASRA BANKS

BANK 1	Primary Air to CCA/VTA
BANK 2	Secondary Air to CCA/VTA
BANK 2	Primary Air to SNDLRCS
BANK 3	Secondary Air to SNDLRCS

ASRA PORTS

PORT A (LOWER)	Primary Air to CCA/VTA
PORT B (LOWER)	Secondary Air to CCA/VTA
PORT B (UPPER)	Primary Air to SNDLRCS
PORT C (UPPER)	Secondary Air to SNLDRCS

NOTE 5: Designate which port on the CCA has been chosen as Primary and which has been chosen as Secondary by circling the appropriate label.

CCA PORTS

A Supply –	Primary	Secondary
B Supply –	Primary	Secondary

ITEM	COMPONENT	DESCRIPTION	PROCEDURE	LOCATION	CHECK	NOTE
SET UP ASRA BANKS 1, 2, AND 3						
NOTE 6: Ensure Banks 1, 2, and 3 are charged to a minimum of 4800 psi or at Diving Supervisor's discretion. Recharging of banks can be conducted using FADS III Air System Configuration 1/OP-5.						
1	Bank 1 Gauge	AHP-G437	Record pressure (min. pressure ________psig): AHP-G437 _________ psig	ASRA		
2	Bank 2 Gauge	AHP-G438	Record pressure (min. pressure ________ psig): AHP-G438 _________ psig	ASRA		

FADS III AIR SYSTEM CONFIGURATION 4 / OP-2M *Page 2 of 5*

MODIFIED PREDIVE START-UP PROCEDURES FOR THE FADS III AND SNDLRCS—Continued

ITEM	COMPONENT	DESCRIPTION	PROCEDURE	LOCATION	CHECK	NOTE
3	Bank 3 Gauge	AHP-G439	Record pressure (min. pressure ________ psig): AHP-G439 __________ psig	ASRA		
4	Manifold Valve	AHP-V444	Verify closed.	ASRA		
5	Bank 1 Manifold Valve	AHP-V420	Verify open.	ASRA		
6	Port A Valve	AHP-V443	Open slowly.	ASRA		
SET UP BANK 2 PRIMARY AIR TO SNDLRCS AND SECONDARY AIR TO CCA/VTA						
7	Bank 2 Manifold Valve	AHP-V421	Verify open.	ASRA		
8	Port B Valve	AHP-V429	Open slowly.	ASRA		
SET UP BANK 3 SECONDARY AIR TO SNDLRCS						
9	Port C Valve	AHP-V422	Open slowly.	ASRA		
SET UP CCA A SUPPLY						
10	A Supply Valve	AHP-V301	Verify open.	CCA		
11	A Supply Gauge	AHP-G325	Compare reading with bank supplying CCA A Supply.	CCA		
12	A Regulator	AHP-V303	Slowly adjust manifold pressure as directed by Diving Supervisor. Record pressure: _________________ psig	CCA		
SET UP CCA B SUPPLY						
13	B Supply Valve	AHP-V302	Verify open.	CCA		
14	B Supply Gauge	AHP-G326	Compare reading with bank supplying CCA B Supply.	CCA		
15	B Regulator	AHP-V304	Slowly adjust manifold pressure as directed by diving supervisor. Record pressure: _________________ psig	CCA		
16	Manifold Supply Valve	ALP-V311 -or- ALP-V312	Open valve designated as secondary supply valve and tag with SECONDARY tag. (Circle opened valve)	CCA		

FADS III AIR SYSTEM CONFIGURATION 4 / OP-2M

MODIFIED PREDIVE START-UP PROCEDURES FOR THE FADS III AND SNDLRCS—Continued

ITEM	COMPONENT	DESCRIPTION	PROCEDURE	LOCATION	CHECK	NOTE
17	Volume Tank Valve	ALP-V313	Open if VTA used.	CCA		
			Verify closed if VTA not used.	CCA		
18	Condensate Drain Valve	ALP-V201	If VTA used, open valve, drain tank, and close.	VTA		
WARNING: **When purging umbilical hoses, maintain a firm grip on the hose and point the free end away from personnel to avoid injury from flying debris.** WARNING: **When purging pneumo hoses do not fully open pneumo valves (ALP-V317, ALP-V318, and ALP-V319). Failure to comply will damage the diver depth gauges and may cause injury to personnel.**						
19	Yellow, Green, and Red Pneumo Valves	ALP-V317 ALP-V318 ALP-V319	Crack open valves one at a time, purge corresponding pneumo hose, and close. Ensure Secondary regulator tracks.	CCA		
20	Manifold Supply Valve	ALP-V311 -or- ALP-V312	Close Secondary supply valve.	CCA		
21	Manifold Supply Valve	ALP-V311 -or- ALP-V312	Open valve designated as Primary supply valve and tag with PRIMARY tag. (Circle opened valve)	CCA		
22	Yellow, Green, and Red Diver Supply Valves	ALP-V314 ALP-V315 ALP-V316	Crack open valves one at a time, purge corresponding supply hose, and close. Ensure Primary regulator tracks.	CCA		
PERFORM SNDLRCS START-UP						
23	Warm up CO2 Analyzer (Analox CO2 Buddy) as follows: a. Press and hold CO2 button. b. All lights will flash 4 times and buzzer will sound 4 beeps. c. Warm-up takes 40 seconds; yellow fault light will extinguish and green “OK” light will flash every 2 seconds.			Control Console		

FADS III AIR SYSTEM CONFIGURATION 4 / OP-2M ***Page 4 of 5***

MODIFIED PREDIVE START-UP PROCEDURES FOR THE FADS III AND SNDLRCS—Continued

ITEM	COMPONENT	DESCRIPTION	PROCEDURE	LOCATION	CHECK	NOTE
24	Perform Calibration Check as follows: a. Connect CO2 calibration gas to flow meter (ATM-FL-1). b. Adjust flow meter to 0.5 liters per minute. c. Let analyzer stabilize. d. Alarm's red warning light will flash and buzzer will sound every 2 seconds. e. Verify analyzer reads within 0.1% of calibration gas percentage. f. Disconnect calibration gas and remove flow adapter to clear calibration gas from analyzer. g. Replace flow adapter once analyzer green "OK" light returns.			Control Console		
25	O2 Analyzer On/Off Switch	Switch ON.		Control Console		
26	IL Light Switch	Switch ON.		Control Console		
27	OL Light Switch	Switch ON.		Control Console		
28	Chamber Communications	Switch ON.		Control Console		
PERFORM SNDLRCS AIR START-UP						
29	Secondary HP Air Regulator	AHP-R109	Load to 250 psig.	Air Reducing Station		
30	Secondary LP Air Supply Gauge	ALP-G104	Record pressure: __________ psig	Air Reducing Station		
31	Primary HP Air Regulator	AHP-R108	Load to 250 psig.	Air Reducing Station		
32	Primary LP Air Supply Gauge	ALP-G101	Record pressure: __________ psig	Air Reducing Station		
33	Primary LP Air Shutoff Valve	ALP-V-3	Open.	Control Console		
34	Secondary LP Air Shutoff Valve	ALP-V-9	Verify shut.	Control Console		
PERFORM SNDLRCS OXYGEN START-UP						
35	Oxygen Flask Stop Valves	Open.		Oxygen Bottles		

FADS III AIR SYSTEM CONFIGURATION 4 / OP-2M *Page 5 of 5*

MODIFIED PREDIVE START-UP PROCEDURES FOR THE FADS III AND SNDLRCS—Continued

ITEM	COMPONENT	DESCRIPTION	PROCEDURE	LOCATION	CHECK	NOTE
36	Primary HP Oxygen Regulator	OHP-R206	Load to 75-100 psig.	Oxygen Reducing Station		
37	Primary LP Oxygen Supply Gauge	OLP-G204	Record pressure: __________ psig	Oxygen Reducing Station		
38	Secondary HP Oxygen Regulator	OHP-R205	Load to 75-100 psig.	Oxygen Reducing Station		
39	Secondary LP Oxygen Supply Gauge	OLP-G203	Record pressure: __________ psig	Oxygen Reducing Station		
PERFORM SNDLRCS CHAMBER START-UP						
40	IL CO2 Scrubber	Install CO2 canister into scrubber assembly.		Inside IL		
41	Perform communications check.					
42	IL BIBS Masks	Breathe each mask to verify good O2 supply.		IL		
43	OL BIBS Masks	Breathe each mask to verify good O2 supply.		OL		
44	ECS	Switch ON as required.		ECS Unit		
45	ECS	Switch ON as required.		Control Console		
46	Complete CHAMBER PRE-DIVE CHECKLIST.					
47	Ensure chamber door seals are lubricated with MIL-G-27617 Type 2 or 3.					
48	Pressurize chamber and medical lock to 10 fsw, check for audible leaks, and ensure there is no significant loss of pressure for a 5-minute period.					
END OF PROCEDURE						

REMARKS: (Using item number as a reference, list any deficiencies or problems found during performance of this procedure.)

____

____

____

____

____

FADS III AIR SYSTEM
CONFIGURATION 4 / OP-3

SHUTDOWN PROCEDURES
FOR DIVING THE FADS III AIR SYSTEM
WITH SNDLRCS SUPPORT

REVISED 14 MARCH 2008

SPECIAL INSTRUCTIONS

1. Ensure this OP is valid by comparing the revision date above with the master file.
2. Check each item individually.
3. Sign and date below when OP has been completed.
4. Report any discrepancy to the Diving Supervisor.

Operator No. 1 ______________________________________ Date ___________
Printed name and signature

Operator No. 2 ______________________________________ Date ___________
Printed name and signature

Diving Supervisor ____________________________________ Date ___________
Printed name and signature

FADS III AIR SYSTEM CONFIGURATION 4 / OP-3

SHUTDOWN PROCEDURES
FOR DIVING THE FADS III AIR SYSTEM WITH SNDLRCS SUPPORT

NOTE 1: Ensure Configuration 4/OP-2A and OP-2B were completed prior to commencing this OP, which must be used if last dive of mission or more than 24 hours will elapse before next dive. If 24 hours or less will elapse before next dive, Configuration 4/OP-3M may be used instead.

NOTE 2: Record notes and deficiencies in section provided at the end of this operating procedure.

NOTE 3: If the Diving Supervisor determines that the ASRA flasks need to be charged after performance of this procedure, refer to Configuration 1/OP-6, HP Air Flask Charging Procedures with ASRA Off-Line. Ensure all valves are returned to their previous settings prior to the next procedure.

ITEM	COMPONENT	DESCRIPTION	PROCEDURE	LOCATION	CHECK	NOTE
PERFORM ASRA SHUTDOWN						
1	Flask Isolation Valves	AHP-V401 AHP-V402 AHP-V403 AHP-V404 AHP-V405 AHP-V406 AHP-V407 AHP-V408 AHP-V409	Close.	ASRA		
WARNING: **Ports A, B, and C on the ASRA must be depressurized whenever a port hose is removed from a port connector. Failure to depressurize the system may result in damage to equipment, or injury or death to personnel.**						
BLEED DOWN BANK 1 (PRIMARY TO CCA/VTA AIR)						
2	Port A Bleed Valve	AHP-V442	Open, depressurize until AHP-G437 reads 0 psig, and close.	ASRA		
3	Port A Valve	AHP-V443	Close.	ASRA		
4	Bank 1 Manifold Valve	AHP-V420	Close.	ASRA		
5	Manifold Valve	AHP-V444	Verify closed.	ASRA		
BLEED DOWN BANK 2 (PRIMARY TO SNDLRCS AND SECONDARY TO CCA/VTA AIR)						
6	Port B Bleed Valve	AHP-V441	Open, depressurize until AHP-G438 reads 0 psig, and close.	ASRA		
7	Port B Valve	AHP-V429	Close.	ASRA		
8	Bank 2 Manifold Valve	AHP-V421	Close.	ASRA		
BLEED DOWN BANK 3 (SECONDARY TO SNDLRCS AIR)						
9	Port C Bleed Valve	AHP-V440	Open, depressurize until AHP-G439 reads 0 psig, and close.	ASRA		

FADS III AIR SYSTEM CONFIGURATION 4 / OP-3 ***Page 2 of 6***

SHUTDOWN PROCEDURES
FOR DIVING THE FADS III AIR SYSTEM WITH SNDLRCS SUPPORT—Continued

ITEM	COMPONENT	DESCRIPTION	PROCEDURE	LOCATION	CHECK	NOTE
10	Port C Valve	AHP-V422	Close.	ASRA		
PERFORM CCA SHUTDOWN						
11	Yellow, Green, and Red Diver Supply Valves	ALP-V314 ALP-V315 ALP-V316	Close.	CCA		
12	Yellow, Green, and Red Pneu-mo Valves	ALP-V317 ALP-V318 ALP-V319	Ensure closed.	CCA		
13	Volume Tank Supply Valve	ALP-V313	If VTA not used, verify valve is closed.	CCA		
			If VTA required for next dive, close valve.	CCA		
14	Condensate Drain Valve	ALP-V201	If VTA used, open valve, drain condensate, and close.	VTA		
15	Disconnect diver UBAs, umbilicals, and pneumo hoses as required in preparation for bleeding down CCA.			CCA		
16	Manifold Supply Valves	ALP-V311 ALP-V312	Open.	CCA		
17	Yellow Diver Supply Valve	ALP-V314	Open, depressurize until all CCA pressure gauges read 0 psig, and close.	CCA		
18	Volume Tank Valve	ALP-V313	Close (if VTA used).	CCA		
19	A Regulator B Regulator	AHP-V303 AHP-V304	Back off fully CCW.	CCA		
20	A Supply Valve B Supply Valve	AHP-V301 AHP-V302	Close.	CCA		
21	Manifold Supply Valve	ALP-V311 ALP-V312	Close.	CCA		
22	Reinstall plugs and caps on CCA diver and pneumo ports and/or umbilical connections as required.			CCA		
NOTE 4: Items 23 thru 25 are optional but highly recommended if equipment is likely to be exposed to salt water contamination for any length of time.						
23	Close ASRA doors.			ASRA		
24	Install CCA blowout plug.			CCA Rear Panel		
25	Install lid on CCA case.			CCA		

FADS III AIR SYSTEM CONFIGURATION 4 / OP-3 *Page 3 of 6*

SHUTDOWN PROCEDURES FOR DIVING THE FADS III AIR SYSTEM WITH SNDLRCS SUPPORT—Continued

ITEM	COMPONENT	DESCRIPTION	PROCEDURE	LOCATION	CHECK	NOTE
PERFORM SNDLRCS AIR SHUTDOWN						
26	Secondary LP Air Shutoff Valve	ALP-V-9	Open.	Control Console		
27	IL Primary LP Air Pressurization Valve	ALP-V-5	Open, bleed down, and shut. Ensure 0 psig on ALP-G-1 and ALP-G-2.	Control Console		
28	Secondary LP Air Shutoff Valve	ALP-V-9	Ensure closed.	Control Console		
29	Primary HP Air Supply Valve	AHP-V101	Ensure closed.	Air Reducing Station		
30	Primary HP Air Regulator	AHP-R108	Back off fully.	Air Reducing Station		
31	Secondary HP Air Supply Valve	AHP-V102	Shut.	Air Reducing Station		
32	Secondary HP Air Regulator	AHP-R109	Back off fully.	Air Reducing Station		
PERFORM SNDLRCS OXYGEN SHUTDOWN						
WARNING: **When using SNDLRCS van oxygen bottles, remove caps for Primary and Secondary Oxygen on the outside of the Bulkhead Transition Panel to provide a vent path outside the van before bleeding down oxygen pressure. Failure to vent the system outside the van could cause a fire hazard due to release of oxygen into the space.**						
33	Shut primary and secondary oxygen bottle shutoff valves.			Oxygen Bottles		
34	Primary HP Oxygen External Supply Shutoff Valve	OHP-V201	Open slowly, bleed down, and shut.	Oxygen Reducing Station		
35	Secondary HP Oxygen External Supply Shutoff Valve	OHP-V203	Open slowly, bleed down, and shut.	Oxygen Reducing Station		
36	Install primary and secondary caps.			Outside Bulkhead Transition Panel		
37	Primary HP Oxygen Regulator	OHP-R206	Back off fully.	Oxygen Reducing Station		

FADS III AIR SYSTEM CONFIGURATION 4 / OP-3

SHUTDOWN PROCEDURES FOR DIVING THE FADS III AIR SYSTEM WITH SNDLRCS SUPPORT—Continued

ITEM	COMPONENT	DESCRIPTION	PROCEDURE	LOCATION	CHECK	NOTE
38	Secondary HP Oxygen Regulator	OHP-R205	Back off fully.	Oxygen Reducing Station		
39	Breathe down BIBS masks.			Inside Chamber		
40	Oxygen LP Gauge	OLP-G-1	Verify 0 psig.	Control Console		
41	Medical Lock Pressure Gauge Isolation Valve	EQ-V-3	Verify open.	Medical Lock		
42	Medical Lock Inner & Outer Doors		Shut.	Medical Lock		
43	IL Fast Exhaust Valve	EXH-V-5	Shut.	Control Console		
44	OL Fast Exhaust Valve	EXH-V-8	Shut.	Control Console		
45	Primary LP Air Shutoff Valve	ALP-V-3	Shut.	Control Console		
46	Secondary LP Air Shutoff Valve	ALP-V-9	Shut.	Control Console		
47	Secondary LP Air Cross Connect Valve	ALP-V-10	Shut.	Control Console		
48	Primary LP Air Cross Connect Valve	ALP-V-4	Shut.	Control Console		
49	LP Mixed Gas Shutoff Valve	MLP-V-2	Shut.	Control Console		
50	LP Mixed Gas Hull Stop Valve	MLP-V-4	Shut.	Control Console		
51	Primary LP Oxygen Supply Valve	OLP-V-2	Shut.	Control Console		
52	Secondary LP Oxygen Supply Valve	OLP-V-4	Shut.	Control Console		

FADS III AIR SYSTEM CONFIGURATION 4 / OP-3 *Page 5 of 6*

SHUTDOWN PROCEDURES
FOR DIVING THE FADS III AIR SYSTEM WITH SNDLRCS SUPPORT—Continued

ITEM	COMPONENT	DESCRIPTION	PROCEDURE	LOCATION	CHECK	NOTE
53	IL BIBS Oxygen Hull Stop Valve	OLP-V-6	Shut.	Under Control Console		
54	OL BIBS Oxygen Hull Stop Valve	OLP-V-8	Shut.	Under Control Console		
55	ECS Hot or Cold Water Supply Valve	ECS-V-1	Shut.	End of Chamber		
56	ECS Hot or Cold Water Return Valve	ECS-V-2	Shut.	End of Chamber		
57	Oxygen Analyzer	Ensure OFF.		Control Console		
58	CO2 Analyzer	Press and hold CO2 button. Release after display turns off. If unit fails to turn off within 4 seconds, place unit into charger. After 10 seconds, repeat procedure.		Control Console		
59	CO2 Scrubber Switch	Ensure OFF.		Control Console		
60	ECS	Ensure OFF.		ECS Unit and Control Console		
61	CO2 Scrubber Canister	Remove canister and dump absorbent. Clean and stow canister.		Chamber		
62	Chamber Communications	Ensure OFF.		Control Console		
63	IL Lighting	Ensure OFF.		Control Console		
64	OL Lighting	Ensure OFF.		Control Console		
65	AC/Heater Unit	Ensure OFF.		SNDLRCS Van		
66	Main Breaker and All Circuit Breakers	Ensure OFF.		120/240 Load Distribution Panel		
67	Manual Bus Transfer Switch	Ensure OFF.		Manual Bus Transfer Switch Panel		
END OF PROCEDURE						

FADS III AIR SYSTEM CONFIGURATION 4 / OP-3

SHUTDOWN PROCEDURES FOR DIVING THE FADS III AIR SYSTEM WITH SNDLRCS SUPPORT—Continued

REMARKS: (Using item number as a reference, list any deficiencies or problems found during performance of this procedure.)

THIS PAGE INTENTIONALLY LEFT BLANK

FADS III AIR SYSTEM
CONFIGURATION 4 / OP-3M

MODIFIED SHUTDOWN PROCEDURES
FOR DIVING THE FADS III AIR SYSTEM
WITH SNDLRCS SUPPORT

REVISED 14 MARCH 2008

SPECIAL INSTRUCTIONS

1. Ensure this OP is valid by comparing the revision date above with the master file.
2. Check each item individually.
3. Sign and date below when OP has been completed.
4. Report any discrepancy to the Diving Supervisor.

Operator No. 1 ______________________________ Date __________
Printed name and signature

Operator No. 2 ______________________________ Date __________
Printed name and signature

Diving Supervisor ______________________________ Date __________
Printed name and signature

FADS III AIR SYSTEM CONFIGURATION 4 / OP-3M *Page 1 of 3*

MODIFIED SHUTDOWN PROCEDURES FOR DIVING THE FADS III AIR SYSTEM WITH SNDLRCS SUPPORT

NOTE 1: This OP may be used any time the equipment will be used again within 24 hours. If it is anticipated that more than 24 hours will pass before using the equipment again, the shutdown procedures in Configuration 4/ OP-3 must be performed instead.

NOTE 2: Record notes and deficiencies in section provided at the end of this operating procedure.

NOTE 3: Umbilical air and pneumofathometer hoses can remain either connected or capped at the diver's end.

NOTE 4: If the Diving Supervisor determines that the ASRA flasks need to be charged before or after the performance of this procedure, refer to Configuration 1/ OP-5, HP Air Flask Charging Procedure for Bank 1, 2, or 3 with ASRA On-Line. Ensure all valves are returned to their previous settings prior to the next procedure.

ITEM	COMPONENT	DESCRIPTION	PROCEDURE	LOCATION	CHECK	NOTE
PERFORM MODIFIED CCA SHUTDOWN						
1	Yellow, Green, and Red Diver Supply Valves	ALP-V314 ALP-V315 ALP-V316	Close.	CCA		
2	Volume Tank Supply Valve	ALP-V313	Close or verify closed if not used.	CCA		
3	B Regulator	AHP-V304	Ensure backed off fully CCW.	CCA		
4	B Manifold Supply Valve	ALP-V312	Close.	CCA		
5	A Regulator	AHP-V303	Ensure backed off fully CCW.	CCA		
6	A Manifold Supply Valve	ALP-V311	Close.	CCA		
PERFORM MODIFIED ASRA SHUTDOWN						
7	Port A Valve Port B Valve Port C Valve	AHP-V443 AHP-V429 AHP-V422	Close.	ASRA		
PERFORM SNDLRCS MODIFIED AIR SHUTDOWN						
8	Secondary Air Shutoff Valve	ALP-V-9	Open.	Control Console		
9	Primary Air Shutoff Valve	ALP-V-3	Open.	Control Console		
10	IL Primary Pressurization Valve	ALP-V-5	Open, bleed down, and close.	Control Console		
11	Primary LP Air Shutoff Valve	ALP-V-3	Ensure closed.	Control Console		
12	Secondary Air Shutoff Valve	ALP-V-9	Ensure closed.	Control Console		

FADS III AIR SYSTEM CONFIGURATION 4 / OP-3M *Page 2 of 3*

MODIFIED SHUTDOWN PROCEDURES FOR DIVING THE FADS III AIR SYSTEM WITH SNDLRCS SUPPORT—Continued

ITEM	COMPONENT	DESCRIPTION	PROCEDURE	LOCATION	CHECK	NOTE
13	Primary HP Air Regulator	AHP-R108	Back off fully.	Air Reducing Station		
14	Secondary HP Air Regulator	AHP-R109	Back off fully.	Air Reducing Station		
PERFORM SNDLRCS MODIFIED OXYGEN SHUTDOWN						
15	Oxygen Flask Stop Valves	Ensure closed.		Oxygen Bottles		
16	Primary HP Oxygen Regulator	OHP-R206	Back off fully.	Oxygen Reducing Station		
17	Secondary HP Oxygen Regulator	OHP-R205	Back off fully.	Oxygen Reducing Station		
18	IL Oxygen BIBS Masks	Bleed down.		Inside IL		
19	OL Oxygen BIBS Masks	Bleed down.		Inside OL		
PERFORM SNDLRCS MODIFIED CHAMBER SHUTDOWN						
20	IL Fast Exhaust Valve	EXH-V-5	Ensure closed.	Control Console		
21	IL Slow Exhaust Valve	EXH-V-6	Ensure closed.	Control Console		
22	OL Exhaust Valve	EXH-V-8	Ensure closed.	Control Console		
23	CO2 Analyzer	Press and hold CO2 button until analyzer turns OFF.		Control Console		
24	Oxygen Analyzer	Ensure OFF.		Control Console		
25	Chamber Communicator	Ensure OFF.		Control Console		
26	IL Light Switch	Ensure OFF.		Control Console		
27	OL Light Switch	Ensure OFF.		Control Console		
28	IL Scrubber Switch	Ensure OFF.		Control Console		
29	ECS Switch	Ensure OFF.		Control Console		

FADS III AIR SYSTEM CONFIGURATION 4 / OP-3M ***Page 3 of 3***

MODIFIED SHUTDOWN PROCEDURES FOR DIVING THE FADS III AIR SYSTEM WITH SNDLRCS SUPPORT—Continued

ITEM	COMPONENT	DESCRIPTION / PROCEDURE	LOCATION	CHECK	NOTE
30	ECS Switch	Ensure OFF.	ECS Unit		
31	IL Scrubber Canister	Remove from scrubber assembly and double bag.	Inside OL		
32	OL Door	Shut.	Outside OL		
		END OF PROCEDURE			

REMARKS: (Using item number as a reference, list any deficiencies or problems found during performance of this procedure.)

FADS III AIR SYSTEM
CONFIGURATION 4 / OP-4

POSTMISSION PROCEDURES
FOR DIVING THE FADS III AIR SYSTEM
WITH SNDLRCS SUPPORT

REVISED 14 MARCH 2008

SPECIAL INSTRUCTIONS

1. Ensure this OP is valid by comparing the revision date above with the master file.
2. Check each item individually.
3. Sign and date below when OP has been completed.
4. Report any discrepancy to the Diving Supervisor.

Operator No. 1 ____ Date ____________
Printed name and signature

Operator No. 2 ____ Date ____________
Printed name and signature

Diving Supervisor ____ Date ____________
Printed name and signature

FADS III AIR SYSTEM CONFIGURATION 4 / OP-4

Page 1 of 4

POSTMISSION PROCEDURES
FOR DIVING THE FADS III AIR SYSTEM WITH SNDLRCS SUPPPORT

NOTE 1: This OP contains the procedures to be performed at the end of every mission. Ensure that Configuration 4/OP-3 has been completed prior to beginning this OP as it contains items that are essential to proper shutdown of the equipment.

NOTE 2: Record notes and deficiencies in section provided at the end of this operating procedure.

ITEM	COMPONENT	DESCRIPTION	PROCEDURE	LOCATION	CHECK	NOTE
WARNING: **Ports A, B, and C on the ASRA must be depressurized whenever a port cap or hose is removed from a port connector. Removal of a port cap or hose when supply piping is pressurized can result in injury or death.**						
WARNING: **Before bleeding HP air, ensure all personnel are clear of area to avoid injury from flying debris. Operator must wear protective eye wear when bleeding system.**						
CAUTION: Tighten hose plugs and port caps to proper torque as excessive tightening can damage threads.						
PERFORM FADS III POSTMISSION SHUTDOWN PROCEDURES						
1	SCUBA Regulator	AHP-V432	Ensure backed off (fully CCW).	ASRA		
2	All Other ASRA Valves	Ensure closed.		ASRA		
3	A Regulator B Regulator	AHP-V303 AHP-V304	Back off (turn fully CCW).	CCA		
4	All Other CCA Valves	Ensure closed.		CCA		
5	Condensate Drain Valve	ALP-V201	If VTA was used, ensure moisture has been drained and valve is closed.	VTA		
DISCONNECT UMBILICAL ASSEMBLIES FROM CCA						
6	Yellow, Green, Red Diver and Pneumo Ports	Disconnect umbilical hoses from diver and pneumo ports.		CCA Rear Panel		
7	Yellow, Green, Red Diver, Pneumo, and Umbilical Ports	Cap diver and pneumo ports, and bag or cap open ends of umbilical hoses.		CCA Rear Panel		
NOTE 3: If VTA was not used, skip Items 8 and 9.						
DISCONNECT LP AIR SUPPLY HOSE FROM VTA AND CCA						
8	LP Air Hose Assembly	H-203	Disconnect hose and strain relief. Install port cap and hose plug.	VTA		
9	LP Air Hose Assembly	H-203	Disconnect hose and strain relief. Install port cap and hose plug.	CCA Rear Panel		

FADS III AIR SYSTEM CONFIGURATION 4 / OP-4 *Page 2 of 4*

POSTMISSION PROCEDURES FOR DIVING THE FADS III AIR SYSTEM WITH SNDLRCS SUPPORT—Continued

ITEM	COMPONENT	DESCRIPTION	PROCEDURE	LOCATION	CHECK	NOTE
DISCONNECT PRIMARY HP AIR SUPPLY HOSE FROM ASRA AND CCA						
10	Port A Bleed Valve	AHP-V442	Open, verify pressure bleeds off, and close.	ASRA		
11	Primary HP Air Hose Assembly	H-436 to ASRA	Remove hose from port and disconnect strain relief. Install port cap and tighten 3/8 to 1/2 turn after O-ring engagement. Install plug or bag hose.	ASRA		
12	Primary HP Air Hose Assembly	H-436 to CCA Port A or B	Remove hose from port and disconnect strain relief. Install port cap and tighten 3/8 to 1/2 turn after O-ring engagement. Install plug or bag hose.	CCA Rear Panel		
DISCONNECT SECONDARY HP AIR SUPPLY HOSE FROM ASRA AND CCA						
13	Port B Bleed Valve	AHP-V441	Open, verify pressure bleeds off, and close.	ASRA		
14	Secondary HP Air Hose Assembly	H-436	Remove hose from port and disconnect strain relief. Install port cap and tighten 3/8 to 1/2 turn after O-ring engagement. Install plug or bag hose.	ASRA		
15	Secondary HP Air Hose Assembly	H-436 to CCA Port A or B	Remove hose from port and disconnect strain relief. Install port cap and tighten 3/8 to 1/2 turn after O-ring engagement. Install plug or bag hose.	CCA Rear Panel		
NOTE 4: If ASRA was set up inside of SNDLRCS Van, skip Items 16 thru 20 and continue with Item 21.						
DISCONNECT PRIMARY HP AIR SUPPLY HOSE FROM ASRA AND VAN BKHD TRANSITION PANEL						
16	Primary HP Air Hose Assembly	H-436	Remove hose from port and disconnect strain relief. Install port cap and tighten 3/8 to 1/2 turn after O-ring engagement. Install plug or bag hose.	ASRA Upper Port B		
17	Primary HP Air Hose Assembly	H-436	Remove hose from port and disconnect strain relief. Install port cap and tighten 3/8 to 1/2 turn after O-ring engagement. Install plug or bag hose.	Van, BKHD Transition Panel		

FADS III AIR SYSTEM CONFIGURATION 4 / OP-4 *Page 3 of 4*

POSTMISSION PROCEDURES
FOR DIVING THE FADS III AIR SYSTEM WITH SNDLRCS SUPPORT—Continued

ITEM	COMPONENT	DESCRIPTION	PROCEDURE	LOCATION	CHECK	NOTE
DISCONNECT SECONDARY HP AIR SUPPLY HOSE FROM ASRA AND VAN BULKHEAD TRANSITION PANEL						
18	Port C Bleed Valve	AHP-V440	Open, verify pressure bleed off and close.	ASRA		
19	Secondary HP Air Hose Assembly	H-436	Remove hose from port and disconnect strain relief. Install port cap and tighten 3/8 to 1/2 turn after O-ring engagement. Install plug or bag hose.	ASRA Upper Port C		
20	Secondary HP Air Hose Assembly	H-436	Remove hose from port and disconnect strain relief. Install port cap and tighten 3/8 to 1/2 turn after O-ring engagement. Install plug or bag hose.	Van, BKHD Transition Panel		
DISCONNECT HP CHARGING HOSE FROM ASRA AND HPAC						
21	System Outlet Bleed Valve	Open, bleed down system, and close.		HPAC		
22	HP Air Hose Assembly	H-436	Remove hose from port and disconnect strain relief. Install port cap and tighten 3/8 to 1/2 turn after O-ring engagement. Install plug or bag hose.	HPAC Charge Port		
23	HP Air Hose Assembly	H-436	Remove hose from port and disconnect strain relief. Install port cap and tighten 3/8 to 1/2 turn after O-ring engagement. Install plug or bag hose.	ASRA Charge Port		
PERFORM SNDLRCS POSTMISSION SHUTDOWN PROCEDURES						
24	Van Electrical Cable	Disconnect from primary power source.		440V / 220V Source		
25	O2 Monitor	Turn OFF.		SNDLRCS Van		
26	Chamber Exhaust	Remove exhaust elbow/screen assembly and install cap.		SNDLRCS Van		
27	AC and ECS	Install AC drain plugs, and then close AC and ECS access covers.		SNDLRCS Van		
28	Manway Access Cover	Install.		SNDLRCS Van		

FADS III AIR SYSTEM CONFIGURATION 4 / OP-4

POSTMISSION PROCEDURES FOR DIVING THE FADS III AIR SYSTEM WITH SNDLRCS SUPPORT—Continued

ITEM	COMPONENT	DESCRIPTION	PROCEDURE	LOCATION	CHECK	NOTE
STOW SYSTEM OR PREPARE EQUIPMENT FOR DEPLOYMENT						
29	ASRA CCA VTA (if used) SNDLRCS	Stow equipment or prepare for deployment in accordance with procedures in Chapter 8.		ASRA CCA VTA SNDLRCS		
END OF PROCEDURE						

REMARKS: (Using item number as a reference, list any deficiencies or problems found during performance of this procedure.)

THIS PAGE INTENTIONALLY LEFT BLANK

APPENDIX E

INTERNAL INSPECTION PROCEDURES
FOR KEVLAR® AND
CARBON FIBER HP COMPOSITE FLASKS

THIS PAGE INTENTIONALLY LEFT BLANK

APPENDIX E

INTERNAL INSPECTION PROCEDURES FOR KEVLAR® AND CARBON FIBER HP COMPOSITE FLASKS

E.1 INTRODUCTION

This appendix provides procedures for internal inspection of the high-pressure (HP) composite flasks used in the U.S. Navy Dive Systems. External inspection procedures are provided in Appendix F.

E.2 INTERNAL INSPECTION OF HP COMPOSITE FLASKS

The following internal inspection procedures, which apply to both Kevlar® and carbon fiber-reinforced flasks, are recommended by the Compressed Gas Association's publication, CGA C-6.2, *Guidelines for Visual Inspection & Requalification of Fiber Reinforced High Pressure Cylinders.*

a. **Threads:** Inspect threads for nicks, cuts, cracks, corrosion, and damage.

b. **O-ring Gland:** Ensure O-ring gland is clean and free from damage.

c. **Flask Interior:** Using a borescope, inspect flask interior for evidence of the following:

(1) **Moisture:** If moisture appears in flask, a review of the filter charging system is required to prevent further flask damage.

(2) **Pitting:** Any pitting in a new flask is unacceptable and requires the flask to be returned to depot or manufacturer. Random, minor, and shallow pitting is acceptable in used flasks; however, groups of shallow pits, lines of shallow pits, or deep pits (with shadows cast in bottom of pits) are unacceptable and may require the flask to be returned to depot or manufacturer for further evaluation.

(3) **Dents:** Dents visible on interior surfaces are cause for condemnation and disposal of flask (see paragraph E.3).

(4) **Cracks:** Cracks visible on interior surfaces are cause for condemnation and disposal of flask (see paragraph E.3).

(5) **Foreign Material:** If any foreign material is found in the flask, it must be identified and its source located. The flask must be returned to a repair activity for cleaning before further use of the flask.

E.3 CONDEMNATION AND DISPOSAL OF FLASKS

If a flask contains dents or cracks that render it unfit for continued service, discovery of such damage shall be recorded in writing by the inspector, including notation of the flask serial number. The flask must be depressurized and condemned by drilling a hole through the inspector's mark on the manufacturer's label. The flask is then disposed of in accordance with applicable ship/facility procedures.

APPENDIX F

EXTERNAL INSPECTION PROCEDURES FOR KEVLAR® AND CARBON FIBER HP COMPOSITE FLASKS

THIS PAGE INTENTIONALLY LEFT BLANK

APPENDIX F

EXTERNAL INSPECTION PROCEDURES FOR KEVLAR® AND CARBON FIBER HP COMPOSITE FLASKS

F.1 INTRODUCTION

This appendix provides procedures for external inspection of the Kevlar® and carbon fiber high-pressure (HP) air flasks used in the U.S. Navy Dive Systems. Internal inspection of both types of flasks is presented in Appendix E.

a. **Composite Flasks:** The composite flasks used in the Fly Away Dive System (FADS) III Air System are produced by an application of resin-impregnated, high-strength, continuous organic aramid (Kevlar®) or carbon fibers over an inner aluminum liner. The primary structural layer of Kevlar® or carbon fiber is covered by a single layer (dual direction) of glass fiber. This outer layer of glass fiber provides damage protection to the inner layers of structural fiber.

b. **Kevlar® Flasks:** Kevlar® composite flasks [DOT-SP 8162/DOT-E 8162 (SCI) and DOT-SP 10970/DOT-E 10970 (Luxfer)] were originally provided up until the late 1990s, at which time carbon fiber wrapped flasks were introduced. The carbon fiber flasks now serve as replacement flasks when the Kevlar® flasks reach the end of their service life of 15 years.

c. **Carbon Fiber Flasks:** Carbon composite flasks [DOT-SP 10945/DOT-E 10945 (SCI) and DOT-SP 10915/DOT-E 10915 (Luxfer)] provide a superior replacement for Kevlar® flasks. Some of the characteristics associated with carbon composite flasks are:

- The outer layer of glass fiber serves primarily as a protective layer to the carbon composite. This layer is limited in the amount of strength it can contribute to the design.
- Discoloration of the clear-coated surface can be more notable.
- Areas of nonstructural disbond (void) between the outer glass fiber and the inner carbon layer can be visible and vary in size and shape.
- The flasks have a service life of 15 years with a 5-year hydrostatic test periodicity requirement. Instead of the 5% permanent expansion criterion that applies to Kevlar® flasks, the carbon fiber flasks use a Rejection Elastic Expansion (REE) value (shown on the manufacturer's label) as the acceptance criterion.

F.2 EXTERNAL INSPECTION OF HP COMPOSITE FLASKS

The exterior surface of a fiber-reinforced flask does not look or feel the same as an all-metal flask; therefore, personnel should be aware of differences in appearance and acceptance criteria. The HP air flasks shall be inspected to ensure they are in good condition and suitable for use in accordance with U.S. Navy specifications. Ensure flasks are clean and free from any dirt, labels, or attachments that may interfere with visual inspection; however, do not remove any paint nor the flask manufacturer's label (see paragraph F.2.5).

F.2.1 TYPES OF EXTERNAL DAMAGE. The following types of external damage may occur to fiber-reinforced flasks:

a. **Scuffs:** Minor abrasions (Level 1 Damage) to protective flask coating (i.e., paint).

b. **Abrasions:** Greater loss of surface with numerous fibers visible; can be caused by sliding contact with a rough surface. Flat spots evident on surface could indicate excessive loss of composite thickness.

c. **Cuts:** Damage caused by sharp object.

d. **Impact Damage:** Impact damage in the form of dents, bruises, or delamination can be caused by dropping or by a blow from a blunt object.

(1) **Dents or Bruises:** Damage may appear as crazing (hairline cracking) or frosting of the resin.

(2) **Delamination:** Delamination is a separation between the plies of the overwrap or at the overwrap-liner interface. Damage may appear as a whitish patch, or like a blister or air space beneath the surface.

e. **Structural Damage:** Indicates severe damage to the flask. This damage is extreme and may involve damage to the liner as well as the outer composite.

f. **Fire Damage:** Flasks with signs of fire damage will be condemned.

F.2.2 LEVELS OF EXTERNAL DAMAGE. The following are the levels of external damage that may occur to fiber-reinforced flasks:

a. **Level 1 Damage (Acceptable):** Level 1 damage is minor and is considered normal and as having no adverse effects on the safety of the flask and its continued use. Scratched paint, nicks, or dings that have no appreciable depth, or no significant quantity of frayed fibers, are considered in this category. The repair procedure for flasks with Level 1 damage is presented in paragraph 6.8.1.2, step b.

b. **Level 2 Damage (Rejectable, additional inspection or repairs required):** Level 2 damage may be cuts or gouges that are deeper or longer than those of Level 1, or may include a group of severed fibers. This level of damage may be repairable. If an evaluation is made that the flask has Level 2 damage, it should be returned to an authorized repair facility or depot for further evaluation and repair.

c. **Level 3 Damage (Condemned, not repairable):** Level 3 damage is a flask that has been rendered unfit for continued service and cannot be repaired. Discovery of such damage shall be recorded in writing by the inspector, including notation of the flask serial number. The flask must be depressurized and condemned by drilling a hole through the inspector's mark on the manufacturer's label. The flask is then disposed of in accordance with applicable ship/facility procedures.

F.2.3 EXTERNAL INSPECTION CRITERIA. The following external inspection criteria apply to carbon fiber and Kevlar® composite flasks and are summarized in Table F-1, which appears at the end of this paragraph.

a. **Abrasions:**

(1) **Level 1 Damage (Carbon Fiber and Kevlar®):** Minor abrasions, such as scuffs, are acceptable if they do not exceed a depth of 0.005 inch. Repair in accordance with paragraph 6.8.1.2, step b.

(2) **Level 2 Damage (Kevlar®, DOT-SP 8162):** Abrasions with isolated groups of fibers exposed or flat spots with depths greater than 0.005 inch but less than 0.020 inch and a maximum length of 1 inch transverse to the fiber.

(3) **Level 2 Damage (Kevlar®, DOT-SP 10970):** Abrasions with isolated groups of fibers exposed or flat spots with depths greater than 0.005 inch but less than 0.035 inch in the cylindrical section and 0.020 inch in the dome section and a maximum length of 1 inch transverse to the fiber.

(4) **Level 2 Damage (Carbon Fiber):** Abrasions or flat spots that do not penetrate completely through the outer glass fiber layers so that carbon fiber has been exposed or that exceed depths greater than 0.005 inch but less than 0.045 inch.

(5) **Level 3 Damage (Carbon Fiber and Kevlar®):** Flasks with abrasions deeper than Level 2 damage must be condemned and disposed of in accordance with paragraph F.2.2.c.

b. **Cuts:**

(1) **Level 1 Damage (Carbon Fiber and Kevlar®):** Cuts or scratches less than 0.005 inch deep are acceptable regardless of length, number, or direction. Repair in accordance with paragraph 6.8.1.2, step b.

(2) **Level 2 Damage (Kevlar®, DOT-SP 8162):** Cuts or gouges with depths greater than 0.005 inch but less than 0.040 inch and a maximum length of 1 inch transverse to the fiber.

(3) **Level 2 Damage (Kevlar®, DOT-SP 10970):** Cuts or gouges with depths greater than 0.005 inch but less than 0.070 inch in the cylindrical section and 0.040 inch in the dome section and a maximum length of 1 inch transverse to the fiber.

(4) **Level 2 Damage (Carbon Fiber):** Cuts or gouges with depths greater than 0.005 inch but less than 0.045 inch that do not penetrate completely through the outer glass fiber layers so that carbon fiber has been exposed or cut.

(5) **Level 3 Damage (Carbon Fiber and Kevlar®):** Flasks with cuts deeper than Level 2 damage or that expose the metal liner must be condemned and disposed of in accordance with paragraph F.2.2.c.

c. **Impact Damage (Carbon Fiber and Kevlar®):**

(1) **Level 1 Damage:** Frosted appearance in the impact area that shows no indication of cutting, delamination/peeling of the fibers, or indentation.

(2) **Level 2 Damage:** Level 2 impact damage is not assessable for the actual degree of impact. Other damage resulting from the impact shall be evaluated per Level 2 criteria for abrasions (paragraph F.2.3.a) and cuts (paragraph F.2.3.b). Flask must be sent to an authorized repair facility or depot for further evaluation.

(3) **Level 3 Damage:** If the impact affects structural configuration or exhibits a flat indentation of the composite material, cuts in excess of Level 2 acceptability, delamination/peeling bands of fiber, or liner indentation as noted by internal inspection, the flask must be condemned and disposed of in accordance with paragraph F.2.2.c.

d. **Delamination:** Delaminations are acceptable only if repaired by coating all exposed fibers with epoxy. Flasks with signs of delamination must be sent to an authorized repair facility or depot for further evaluation, possible repair, and hydrostatic testing if repaired. If the delaminated area shows evidence of broken fibers or flaw growth after hydrostatic testing, the flask must be condemned and disposed of in accordance with paragraph F.2.2.c.

e. **Structural Damage-Level 3 Damage:** Structural damage is severe damage, usually with visible evidence of a change in the original cylindrical shape. A flask must be condemned if bulges, a cocked end fitting, or concave areas are evident on the domes or on the flask section. If visual inspection of the flask interior (Appendix E) shows evidence of exterior damage causing deformation of the liner, the flask must be condemned. All flasks with structural damage must be condemned and disposed of in accordance with paragraph F.2.2.c.

f. **Chemical Exposure Damage-Level 3 Damage:** Chemicals can dissolve, corrode, remove, or ruin flask materials. They can also cause bubbling, pitting, or deterioration of resin, and can create multiple fractures transverse to the direction of the fiber. All flasks with evidence of such damage must be condemned and disposed of in accordance with paragraph F.2.2.c.

g. **Heat Exposure:**

(1) **Level 1 Damage:** Light discoloration of the clear coat or painted surface may be evaluated by using a fine grit scrubbing pad and liquid dish detergent mixed with warm water to clean the surface. An immediate color change back to an off-white color indicates that the cause of the discoloration has no significant depth and is acceptable.

(2) **Level 3 Damage:** Flasks that have been subjected to excessive heat exposure or left unattended in a fire and exhibit evidence of heat damage shall be condemned. Other evidence includes charring, melting, blistering of the composite or attachments, or loss of resin. The manufacturer's label also can appear discolored or illegible due to deterioration of the resin. The composite will appear dark brown or black and will remain unchanged when evaluated in accordance with F.2.3.g.(1). All flasks with evidence of such damage must be condemned and disposed of in accordance with paragraph F.2.2.c.

h. **Fire Damage-Level 3 Damage:** Flasks that have been subjected to prolonged flame impingement shall be condemned. Evidence of fire damage similar to that noted in F.2.3.g.(2) can include actual burning of the material. Fire damage can occur in an isolated area on the flask surface. All flasks with evidence of such damage must be condemned and disposed of in accordance with paragraph F.2.2.c.

i. **General Acceptable Conditions:** All conditions and/or indications described in this section are cosmetic in nature and have no detrimental effect on the structural performance of the composite flask.

(1) **Craze Cracking:** Circumferential craze cracking of the resin, mainly on the flask sidewall usually occurs in line with the fiber direction and does not cause fiber damage. Actual fiber damage or fracturing usually occurs transverse (across) to the direction of the fiber and is evident by fiber fuzzing, lifting, or peeling.

(2) **Disbonding:** Frosted white areas not associated with delamination as caused by physical damage.

(3) **Voids and Surface Cracks:** Fully wrapped flasks have fibers running in the longitudinal direction. As these fibers close around the neck base, they stack up and cross over each other. Consequently these two areas are prone to voids or surface cracks. Most filler materials are subject to expansion or age cracking that can result in cracking of the coating. Any natural void or surface crack determined not to be associated with actual fiber damage or actual pitting of the composite is considered a Level 1 indication and does not require any rework.

(4) **Water Seepage from Composite:** Water or moisture seeping from the composite can be noted immediately following a hydrostatic test or at anytime during in-service pressurizations. Water seepage is considered to be normal depending on the cylinder type.

Table F-1. Summary of External Inspection Criteria for Fully-Wound Composite Flasks

PART A - LEVEL 1 DAMAGE Acceptable		
Composite Material	**Inspection Criteria and Type of Damage**	**Maintenance Action**
All Composite Flasks	**Abrasions** must not exceed a depth of 0.005 inch; if they do, refer to Part B - Level 2 Damage.	Depth less than 0.005 inch, repair per paragraph 6.8.1.2.b.
	Cuts must not exceed a depth of 0.005 inch; if they do, refer to Part B - Level 2 Damage.	Depth less than 0.005 inch, repair per paragraph 6.8.1.2.b.
	Impact damage is a white, frosted area that shows no indication of cutting, delamination/peeling of the fibers, or indentation.	None
	Loose or broken fibers must not exceed a depth of 0.005 inch; if they do, refer to Part B - Level 2 Damage.	Depth less than 0.005 inch, repair per paragraph 6.8.1.2.b.
	All information on manufacturer's label must be legible; if it is not, refer to paragraph F.2.5.	Prepare new label; see paragraph F.2.5.
	Hydrostatic test date must not have expired; if it has, refer to Part B - Level 2 Damage.	Do not use flask; see Part B - Level 2 Damage.
	Heat exposure shows a light discoloration of the clear coat or painted surface.	Evaluate per paragraph F.2.3.g.(1).
PART B - LEVEL 2 DAMAGE Rejectable—additional inspection or repairs required		
Composite Material	**Inspection Criteria and Type of Damage**	**Maintenance Action**
Kevlar® DOT-SP 8162 (SCI)	**Abrasions** with isolated groups of fibers exposed or flat spots with depths greater than 0.005 but less than 0.020 inch and a maximum length of 1 inch transverse to the fiber; if exceeded, refer to Part C - Level 3 Damage.	Send to authorized repair facility or depot for further evaluation, repair, and hydrostatic testing.
Kevlar® DOT-SP 10970 (Luxfer)	**Abrasions** with isolated groups of fibers exposed or flat spots with depths greater than 0.005 but less than 0.035 inch in the cylindrical section and 0.020 inch in the dome section and a maximum length of 1 inch transverse to the fiber; if exceeded, refer to Part C - Level 3 Damage.	
Carbon Fiber DOT-SP 10945 (SCI) and DOT-SP 10915 (Luxfer)	**Abrasions** or flat spots that do not penetrate completely through outer glass fiber layers so that carbon fiber is exposed, or that exceed depths greater than 0.005 inch but less than 0.045 inch; if exceeded refer to Part C – Level 3 Damage.	
Kevlar® DOT-SP 8162 (SCI)	**Cuts** or gouges with depths greater than 0.005 inch but less than 0.040 inch and a maximum length of 1 inch transverse to the fiber; if exceeded, refer to Part C – Level 3 Damage.	

Table F-1. Summary of External Inspection Criteria for Fully-Wound Composite Flasks—Continued

PART B - LEVEL 2 DAMAGE—Continued

Composite Material	Inspection Criteria and Type of Damage	Maintenance Action
Kevlar® DOT-SP 10970 (Luxfer)	**Cuts** or gouges with depths greater than 0.005 inch but less than 0.070 inch in the cylindrical section and 0.020 inch in the dome section and a maximum length of 1 inch transverse to the fiber; if exceeded, refer to Part C – Level 3 Damage.	Send to authorized repair facility or depot for further evaluation, repair, and hydrostatic testing.
Carbon Fiber DOT-SP 10945 (SCI) and DOT-SP 10915 (Luxfer)	**Cuts** or gouges with depths greater than 0.005 inch but less than 0.045 inch that do not penetrate completely through outer glass fiber layers so that carbon fiber is exposed or cut; if exceeded, refer to Part C – Level 3 Damage.	
All Composite Flasks	**Impact Damage** is not assessable for the actual degree of impact. Other damage resulting from impact shall be evaluated per Level 2 criteria for abrasions and cuts.	

PART C - LEVEL 3 DAMAGE
Condemned—not repairable

Composite Material	Inspection Criteria and Type of Damage	Maintenance Action
All Composite Flasks	**Abrasions** exceeding Level 2 acceptability; not repairable.	Depressurize flask and drill hole in flask through manufacturer's label. Dispose of flask in accordance with applicable ship/facility procedures.
	Cuts exceeding Level 2 acceptability or exposing metal liner; not repairable.	
	Impact Damage that includes a flat indentation of the composite material, cuts in excess of Level 2 acceptability, delaminated/peeling bands of fiber, or liner indentation as noted by internal inspection.	
	Structural Damage that changes the original cylindrical shape of the flask.	
	Chemical Damage that causes corrosion, bubbling, pitting, deterioration of resin, or multiple fractures transverse to the direction of the fiber.	
	Heat Damage that includes charring, melting or blistering of the composite.	
	Fire Damage to cylinders that have been subjected to prolonged flame impingement and show evidence of actual burning or evidence of Level 3 Heat Damage.	
	Bare metal that is visible through the composite wrapping.	
	Manufacturer's label missing.	

F.2.4 HYDROSTATIC TESTING.

a. Kevlar® flasks designated DOT-SP 10970 shall be hydrostatically tested every three years or whenever any Level 2 repair has been made.

b. Kevlar® flasks designated DOT-SP 8162 that were hydrostatically tested prior to 1 July 2006 shall be hydrostatically tested every three years. Flasks that have been hydrostatically tested after 1 July 2006 have been extended and shall be hydrostatically tested every five years or whenever any Level 2 repair has been made.

c. Carbon fiber flasks designated DOT-SP 10915 or DOT-SP 10945 shall be hydrostatically tested every five years or whenever any Level 2 repair has been made.

d. The test facility must be authorized by the Department of Transportation (DOT) as a Class B retester capable of hydrostatic testing using the water jacket volumetric expansion method as defined in Compressed Gas Association (CGA) pamphlet C-1, *Methods of Hydrostatic Testing of Compressed Gas Cylinders*, with the following exceptions as noted in CGA pamphlet C-6.2, *Guidelines for Visual Inspection and Requalification of Fiber Reinforced High Pressure Cylinders*, and respective DOT Special Permits.

NOTE

Kevlar® flasks must be condemned if the permanent expansion exceeds 5% of the total expansion. Carbon fiber flasks must be condemned if the expansion exceeds the REE value identified on the individual flask.

e. Reclean flask as required. Hydrostatically testing with Grade B water may eliminate the need for recleaning provided no contamination is suspected.

A list of authorized retesters is available on-line at http://hazmat.dot.gov/sp_app/approvals/hydro/hydro_retesters.htm. Technicians may search for testers by identification number or by state listing. Each section provides tester identification number, tester name, facility address, tester class, and effective date.

F.2.5 MANUFACTURER'S LABEL. The manufacturer’s label is located on the sidewall near the end of the flask containing the valve outlet. If the manufacturer’s label is missing, the flask must be condemned and disposed of in accordance with paragraph F.2.2.c. If the label is illegible, the manufacturer shall be asked for the information. The missing data shall be placed on a label, and the label shall be securely affixed to the flask and coated with epoxy. The manufacturer’s label contains the following information:

- DOT special permit number followed by service pressure. (The most current DOT special permits are available on-line as shown in Appendix G. A printed copy of the applicable special permit is required when using commercial transportation.)
- Numerical serial number followed by inspector’s mark.
- Manufacturer’s identification.
- Date of manufacture.

APPENDIX G

U.S. DEPARTMENT OF TRANSPORTATION (DOT) COMPOSITE FLASK SPECIAL PERMITS AND ASSOCIATED DOCUMENTS

THIS PAGE INTENTIONALLY LEFT BLANK

APPENDIX G

U.S. DEPARTMENT OF TRANSPORTATION (DOT) COMPOSITE FLASK SPECIAL PERMITS AND ASSOCIATED DOCUMENTS

G.1 INTRODUCTION

According to U.S. Department of Transportation (DOT) regulations, a current copy of all applicable special permits (formerly exemptions) must accompany the commercial transportation of composite flasks. To help meet this requirement, on-line addresses have been provided in this appendix to allow access to the most current special permits and the associated documents that apply to the composite flasks used in the U.S. Navy Dive Systems.

NOTE

The U.S. DOT has reclassified the authorization of non-DOT specifications from exemptions to special permits. Flasks permanently marked with an exemption classification (DOT-E XXXX) may continue to be used under the associated special permit (DOT-SP XXXX) for the remaining service life of that flask or until the special permit is no longer valid.

Manual holders must assume the responsibility for ensuring the most current copy of each special permit is always available by accessing the on-line addresses provided in this appendix on a timely basis (i.e., weekly, monthly, or immediately before transportation of the flasks). The expiration date should not be relied upon as the basis for checking for new revisions as the special permit may be revised long before the indicated expiration date. This appendix may be used to store printed copies of each special permit, and the originals may be used to make the required number of copies.

The flask special permits listed in paragraph G.2 apply to the two types of flasks that are approved for use in U.S. Navy Dive Systems. To determine which DOT special permit applies to the flask to be transported, check the flask label for the special permit or exemption number. To verify that your printed copy of the special permit is current, access the on-line address provided in paragraph G.2 and then select the appropriate special permit. Compare the stamped date (usually in upper right-hand corner), the revision number (e.g., EIGHTEENTH REVISION), and the expiration date on the printed copy with that on the on-screen copy. If the numbers match, your printed copy is current and you can simply make the appropriate number of copies. If the numbers are different, print out the new revision, make the required number of copies, and replace the old revision with the new one. If additional guidance is needed for packaging, marking, etc., read the instructions given in the special permit.

G.2 COMPOSITE FLASK SPECIAL PERMITS

Refer to http://hazmat.dot.gov/sp_app/special_permits/exe_10000.htm for the following:

- **DOT-SP 10915:** Luxfer Gas Cylinders special permit for non-DOT specification fully wrapped carbon-fiber reinforced aluminum lined cylinders (conforming to DOT-CFFC)

- **DOT-SP 10945:** Structural Composite Industries (SCI) special permit for non-DOT specification fully wrapped carbon-fiber reinforced aluminum lined cylinders (conforming to DOT-CFFC)

- **DOT-SP 10970:** Luxfer Gas Cylinders exemption for non-DOT specification fiber reinforced plastic full composite cylinders (conforming to DOT FRP-1 Standard)

Refer to http://hazmat.dot.gov/sp_app/special_permits/exe_8000.htm#e08000 for the following:

- **DOT-SP 8162:** Structural Composite Industries (SCI) special permit for non-DOT specification fiber reinforced plastic full composite cylinders (conforming to DOT FRP-1 Standard)

G.3 ASSOCIATED DOCUMENTS

For the following documents, refer to http://hazmat.dot.gov/enforce/forms/ohmforms.htm#-guidance and then scroll down to OHM Guidance Documents.

- **DOT-CFFC:** Appendix A, Basic Requirements for Fully Wrapped Carbon-Fiber Reinforced Aluminum Lined Cylinders (DOT-CFFC)

- **DOT FRP-1 STANDARD:** Basic Requirements for Fiber Reinforced Plastic (FRP) Type 3FC Composite Cylinders

NOTE

If unable to access a document using the given address, go to http://hazmat.dot.gov and choose Special Permits & Approvals for special permits or Library for the DOT-CFFC or DOT FRP-1 Standard.

(Insert Classification of Publication Here) CLASSIFICATION:
Ref: NAVSEAINST 4160.3A NAVSEA S0005-AA-PRO-010/TMMP

NAVSEA/SPAWAR TECHNICAL MANUAL DEFICIENCY/EVALUATION REPORT (TMDER)

INSTRUCTION: Continue on 8 ½" x 11" paper if additional space is needed.

1. Use this report to indicate deficiencies, problems, and recommendations relating to a publication.
2. For CLASSIFIED TMDERs see OPNAVINST 5510H for mailing requirements.
3. Print clearly and carefully.
4. For TMDERs that affect more than one publication, submit a separate TMDER for each.
5. Submit TMDERs at web site https://nsdsa2.phdnswc.navy.mil/ or mail to address on reverse.

1. PUBLICATION NO.	2. VOL/PART	3. REV/DATE or CHG/DATE	4. SYSTEM/EQUIPMENT ID

5. TITLE OF PUBLICATION	6. REPORT CONTROL NUMBER (6 digit UIC-YY-any four: xxxxxx-01-xxxx)

7. RECOMMENDED CHANGES TO PUBLICATION

7a Page #	7b Para #	7c RECOMMENDED CHANGES AND REASONS

8. ORIGINATOR'S NAME and WORK CENTER	9. DATE	10. PHONES Commercial/DSN/FAX Include extensions	11. TMMA of manual (NSDSA will complete)

12. Ship or Activity Name and Address (Include UIC/CAGE/HULL)	13. ORIGINATOR'S E-MAIL ADDRESS

FOLD HERE AND TAPE SECURELY
PLEASE DO NOT STAPLE

INCLUDE COMPLETE ADDRESS

USE
PROPER
POSTAGE

FOR OFFICIAL USE ONLY

COMMANDER
NAVAL SURFACE WARFARE CENTER DIVISION
NAVAL SYSTEMS DATA SUPPORT ACTIVITY
4363 MISSILE WAY
PORT HUENEME CA 93043-4307

FOLD HERE AND TAPE SECURELY
PLEASE DO NOT STAPLE

S9592-B1-MMO-010 — REVISION 2

FLY AWAY DIVE SYSTEM (FADS) III AIR SYSTEM

S9592-B1-MMO-010 — REVISION 2

FLY AWAY DIVE SYSTEM (FADS) III AIR SYSTEM

S9592-B1-MMO-010 — REVISION 2

FLY AWAY DIVE SYSTEM (FADS) III AIR SYSTEM