PR-407H-120M
[Rev. 5, 11/07/07]

PARAVION TECHNOLOGY, INC.
2001 AIRWAY AVENUE
FT. COLLINS, COLORADO 80524

INSTRUCTIONS FOR CONTINUED AIRWORTHINESS
407H-120M BLEED-AIR CABIN HEATER INSTALLATION

BELL MODEL 407 HELICOPTERS

Paravion® Technology Inc.

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RECORD OF REVISIONS

REVISION NO.	ISSUE DATE	DATE INSERTED	BY
1	09/25/97		
2, Reissue	01/30/98		
3	12/17/99		
4	08/19/05		
5	11/07/07		

REVISION CONTROL PROCEDURE

Revisions to this document are mailed to owner of record. Before inserting a change, ensure this manual is correct. Check the existing List of Effective Pages in this manual to ensure that all prior revisions are inserted. **Do not insert this revision if prior revisions are not inserted.**

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LIST OF EFFECTIVE PAGES

PAGE NO.	REVISION	DATE	PAGE NO.	REVISION	DATE
COVER	5	11/07/07	14	4	11/07/07
COVER (BLANK)	4	08/19/05	15	4	08/19/05
A	5	11/07/07	16	5	11/07/07
B (BLANK)	4	08/19/05	17	5	11/07/07
i	5	11/07/07	18	5	11/07/07
ii	4	08/19/05	19	5	11/07/07
1	5	11/07/07	20	5	11/07/07
2	4	08/19/05	21	4	08/19/05
3	4	08/19/05	22	4	08/19/05
4	4	08/19/05	23	4	08/19/05
5	4	11/07/07	24	4	08/19/05
6	4	08/19/05	25	4	08/19/05
7	4	08/19/05	26	4	08/19/05
8	5	11/07/07	27	4	08/19/05
9	4	08/19/05	28	4	08/19/05
10	4	08/19/05	29	5	11/07/07
11	5	11/07/07	30	5	11/07/07
12	4	08/19/05	31	5	11/07/07
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			33	5	11/07/07

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REFERENCE TO OTHER MANUALS

This manual makes reference to manufacturer's manuals BHT-407-MM-3, BHT-407-MM-5, BHT-407-MM-10, and BHT-407-ALL-SPM

AIRWORTHINESS LIMITATIONS

The Airworthiness Limitations Section is FAA approved and specifies inspections and other maintenance required under §§ 43.16 and 91.433 of the Federal Aviation Regulations unless an alternative program has been FAA approved.

No airworthiness limitation associated with this type design change.

This system has no life-limited components.

REVISION	DATE	APPROVED
N/C	04/21/97	Roger A. Caldwell
1	09/25/97	Roger A. Caldwell
2, Reissue	05/22/98	Melissa Sandow
3	12/17/99	Melissa Sandow
4	11/18/05	David T. Grossman
5	11/07/07	Refer to SB-407H-20071112 DL-407H-100 Rev. J

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CHAPTER 1

SYSTEM DESCRIPTION

1.1 CABIN HEATER INSTALLATION

The 407H-100 Bleed Air Heater installation uses hot compressed air taken from the engine compressor to provide cabin heat and windshield defrost.

1.2 CABIN HEATER CONTROL PANEL

1.2.1 407H-100-1/-2/-3

The Control Panel (Fig. 3, Page 21) is normally placed in the cockpit overhead fairing, forward of the rotor brake. Alternate location in the right side panel, aft of the compass, is acceptable.

The HI/OFF control switch, located at upper left in the panel, controls the amount of bleed air and is used to modulate cabin temperature. The AFT/FWD control switch, located at lower left in the panel, controls distribution of bleed air to the passenger and cockpit cabin areas. The center position on each switch indicates relative position of each control.

The DIM control switch, located at center left, dims the control position indicator lights for night operation.

The amber LED, located in the center right of the panel is connected to temperature-activated switches (Fig. 2, Pages 14 & 17). The OVERTEMP caution light will illuminate when temperatures near the bleed air plumbing reach 170º Fahrenheit. The lamp is tested by pressing the PTT (Press-To-Test) switch located beside it.

1.2.2 **[** 407H-100-4, -5 **]**

[These configurations incorporate manually operated valves to control heater operation. **]** The valve which controls the amount of bleed air **[**delivered to the cabin**]** is located in the cockpit overhead fairing aft of the rotor brake (Fig. 4, Page 28). The AFT/FWD control valve **[**controls distribution of bleed air to the passenger and cockpit cabin areas, and**]** is located at the forward edge of the pilot set box (Fig. 4, Page 29).

1.3 HEATER PLUMBING

Bleed air for the cabin heater installation (Fig. 1, Page 11) is taken from the TEE**[***] provided in the Particle Separator bleed air supply line, at the forward firewall. Bleed air is routed through insulated Stainless Steel tubing to the temperature control valve (Item 2), and through the vertical control tube tunnel to the selector valve (Item 3). The selector valve routes bleed air to the forward ejectors (Item 4), for cockpit heat and windshield defrost, and to the aft ejector assemblies (Item 5) **[**proportionately**]** according to its setting.

[*Aircraft W/O Particle Separator installed do not have the “TEE”, and will require the -5 installation to supply bleed air to the forward firewall.**]**

1.4 OVERTEMP CAUTION LIGHT

The OVERTEMP sensor system includes four (4) temperature activated switches (Fig. 2, Pages 14 & 17, Fig. 3, Page 22) which operate the OVERTEMP caution light circuit in the control panel assembly. These switches will close, illuminating the amber warning light (Fig. 3, Page 22) if temperature in these areas exceed 170º Fahrenheit.

CHAPTER 2

OPERATIONAL CHECK; ANNUAL /300 HR INSPECTION

2.1 OBJECTIVE

The objective of heater system inspection and maintenance is to assure that the plumbing system has no breaks or cracks, that connections are secure and tight, and that the heater is functioning properly.

[Table I, TROUBLESHOOTING PROCEDURE refers to the most likely problems that may be encountered, and outlines the appropriate corrective actions. Torque all loose and/or replaced fasteners per standardized torque values as shown in AC43-13.1, as revised.**]**

2.2 ACCESS AREAS

Remove cowlings and access panels. Refer to Fig. 1, Page 11, BHT-407-MM-3 and BHT-407-MM-5, as necessary to follow the bleed air tubing assemblies from the firewall to the ejector assemblies.

Assure that clearance requirements are maintained as specified (Fig. 2, Page 14).

Remove and replace tubing assemblies if end fittings, insulation, or tubing is chafed or cracked.

CAUTION: If tubing insulation is discolored, it must be pulled back to inspect tubing for a possible crack. Remove and replace the tubing assembly if a crack is found. If no discrepancy is found reposition insulation over tube. If the firesleeve insulation is broken or torn, replace the tube assembly.

2.3 TESTING HEATER FUNCTION

2.3.1 407H-100-1/-2/-3

To test heater function, refer to Fig, 3, Page 22 and the Cabin Heater Control Panel Description, Page 2.

CAUTION: The aircraft BATtery Switch must be on to test the control panel assembly and control circuits. Disconnect electrical power before a repair is made.

Verify operation of the Temperature control valve (Fig. 1, Page 11, Item 2). Operation of the HI/OFF control switch (Fig. 3, Page 22) to the HI position opens the valve (Linear Actuator extended, Ref. Fig. 2, Page 13. Operation of the HI/OFF switch to OFF closes the valve (Linear Actuator retracted). Moving the switch to center stops the valve at an intermediate position. The LED indicator bank located to the right of the switch illuminates progressively as the temperature control valve opens.

If the control panel assembly or temperature control valve does not function properly, refer to the troubleshooting procedure on Page 5.

Verify operation of the Selector valve (Fig. 1, Page 1, Item 3). Operation of the AFT/FWD control switch (Fig. 3, Page 22) to the AFT position increases bleed air flow into the passenger cabin. Operation of the switch to FWD increases the bleed air flow to the cockpit. Moving the switch to center stops the valve at an intermediate position. The LED indicator bank located to the right of the switch illuminates progressively as the selector valve moves.

If the control panel assembly or temperature control valve does not function properly, refer to the troubleshooting procedure on Page 5.

2.3.2 **[**407H-100-4/-5**]**

Verify operation of the ON/OFF valve (Fig 4, Page 28). Turning the ON/OFF valve to 90º in the clockwise direction turns the heater fully on. Turning the ON/OFF valve in the 90º in the counter clockwise position turns the heater off.

[Verify operation of the AFT/FWD selector valve (Fig. 4, Page 29). Turning the AFT/FWD selector valve clockwise to 90º directs all bleed air to the forward (FWD) cabin. Turning the AFT/FWD selector valve counterclockwise to 90º directs all bleed air to the passenger (AFT) cabin. **]**

If either valve fails to operate properly, refer to the troubleshooting procedure on Page 5.

2.4 TESTING OVERTEMP LIGHT

Verify operation of the OVERTEMP caution light (Fig. 3, Page 22). This circuit is tested by pressing the PTT switch. If the amber LED does not illuminate, replace the control panel assembly.

2.5 TESTING TEMPERATURE SWITCHES FOR OVERTEMP LIGHT

Place a jumper connection across the terminals at each temperature activated switch. This will verify electrical wiring integrity. If the amber Caution light in the control panel assembly does not illuminate, repair the electrical wiring.

TABLE I

TROUBLESHOOTING PROCEDURE		
PROBLEM	POSSIBLE CAUSE	CORRECTIVE ACTION
Insufficient Heat.	Ejector blockage and/or tubing blockage.	Remove blockage.
	Bleed Air leak.	Tighten fittings and/or replace cracked tubing assembly. Check integrity of Engine Compartment Bleed Air System.
Control Panel Assembly Inoperative.	Electrical power supply.	Verify electrical power to regulator (Fig. 3, Page 23). If no voltage or voltage does not reverse when switch position is reversed, replace control panel assembly.
	Electrical ground connection.	Check ground wire connection (Fig. 3, Page 23) from control panel assembly.
LED's do not illuminate.	Control panel assembly failure.	Replace control panel assembly.
LED's operation not progressive, all ON or all OFF.	Linear Actuator position sensor	Replace defective valve assembly.
PTT switch operation does not illuminate Caution Light.	Control panel assembly failure.	Replace control panel assembly.
Temperature Control inoperative and or Selector Valve inoperative.	Control panel assembly failure.	See Control Panel inoperative.
	Temperature control valve electrical wiring.	Verify motor voltage (Fig. 3, Page23) to control valve ($\pm$ 12V with control switch operation). Repair electrical wiring.
	Temperature control valve failure.	Inspect mechanical freedom of valve movement. Replace jammed valve.
		Verify Linear Actuator operation. Replace defective linear actuator.

NOTE: Battery must be connected and BATtery switch must be on to test electrical functions. Disconnect electrical power for repair operations.

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CHAPTER 3

COMPONENT REMOVAL AND REPLACEMENT

3.1 COMPONENT REMOVAL & REPLACEMENT

Gain access to component location. Refer to aircraft maintenance manual BHT-407-MM-3, BHT-407-MM-5, and BHT-407-MM-10 as appropriate.

3.2 PLUMBING INSTALLATION

3.2.1 REMOVAL

Remove any clamps and attaching hardware. **[**Refer to appropriate Page of Fig. 4**]**. For tube assembly removal, loosen "B" nuts and remove tube assembly.

3.2.2 REPLACEMENT

Assemble components, reinstall clamps, and attachment hardware.

NOTE: Use ANTI-SEIZE on "B" nuts and fittings to prevent galling of threads.

Refer to BHT-ALL-SPM standard practices manual for torque values. Refer to the appropriate Page of Fig. 2 or Fig. 4 for installation configuration and fastener specifications. Maintain specified clearances.

3.3 CONTROL PANEL ASSEMBLY

3.3.1 REMOVAL

CAUTION: Disconnect electrical power before electrical connectors are disassembled and reassembled.

1. Remove interior panel to access the controls. Refer to BHT-407-MM-3.
2. Disconnect electrical connectors.
3. Remove control panel assembly mounting hardware. Refer to Fig. 3, Page 22.
4. Remove control panel assembly.

3.3.2 REPLACMENT

1. Install control panel assembly.
2. Secure control panel assembly using indicated hardware.

3. Reconnect electrical connectors.

4. Reinstall interior panel. Refer to BHT-407-MM-3.

3.4 TEMPERATURE CONTROL VALVE

3.4.1 REMOVAL

1. Gain access to valve assembly. Refer to BHT-407-MM-5 and Fig. 1, Page 11.

2. Disconnect tube assemblies and electrical connectors. Refer to Fig. 2, Pages 12 & 13 or Fig. 4, Pages 27 & 28.

3. Remove screws.

3.4.2 REPLACMENT

1. Position the valve assembly, install using indicated fasteners.

2. Connect tube assemblies and electrical connectors. Refer to Fig. 2, Pages 12 & 13.

3. Replace aircraft cowlings. Refer to BHT-407-MM-5 and Fig. 1, Page 11 or Fig. 4, Pages 27 & 28.

3.5 SELECTOR VALVE

3.5.1 REMOVAL

1. Gain access. Refer to BHT-407-MM-3 and Fig. 2, Pages 15 & 17 of this manual or Fig. 4, Page 29.

2. Disconnect tube assemblies and electrical connectors.

3. Remove screws attaching valve to aircraft.

3.5.2 REPLACMENT

1. Position the valve assembly, install using indicated fasteners. Refer to Fig. 2, Page 15.

2. Connect tube assemblies and electrical connectors. Refer to Fig. 2, Pages 15 & 17.

3. Replace aircraft components removed for access to the Selector Valve Assembly. Refer to BHT-407-MM-3.

3.6 EJECTOR ASSEMBLIES

3.6.1 REMOVAL

1. Gain access to ejector assembly. Refer to BHT-407-MM-3 and Fig.1, Page 11, Fig. 2 Page17 or Fig. 4, Page 29 of this manual.

2. Disconnect tube assembly connections. Refer to paragraph 3.2.1 of this document.

3. Remove attaching hardware (screws and clamps).

3.6.2 REPLACMENT

1. Position ejector assembly, install using indicated fasteners. Refer to Fig. 1, Page 11 and Fig 2, Page 17 or Fig. 4, Page 29 of this manual.

   Note: If Bell Adjustable Pedal Assembly (P/N 407-001-012-101) is installed, compliance with Paravion Technology, Inc. SB-407H-20071112 may be required to avoid possible contact between heater components and controls. Service Bulletin compliance attaches forward heater ejectors to the aft panel of the battery box and orients the ejector assemblies vertically.

2. Connect tube assemblies. Refer to paragraph 3.2.2 of this document.

3. Finish component installation. Reference Fig. 2, Page 17.

3.7 ELECTRICAL WIRING

3.7.1 REMOVAL

1. Route electrical wiring reference Fig. 3, Page 21 & 23.

2. Assemble electrical connections to components. Reference BHT-407-MM-5, BHT-407-MM-10 and Fig. 3, Pages 21 & 23.

FIGURES

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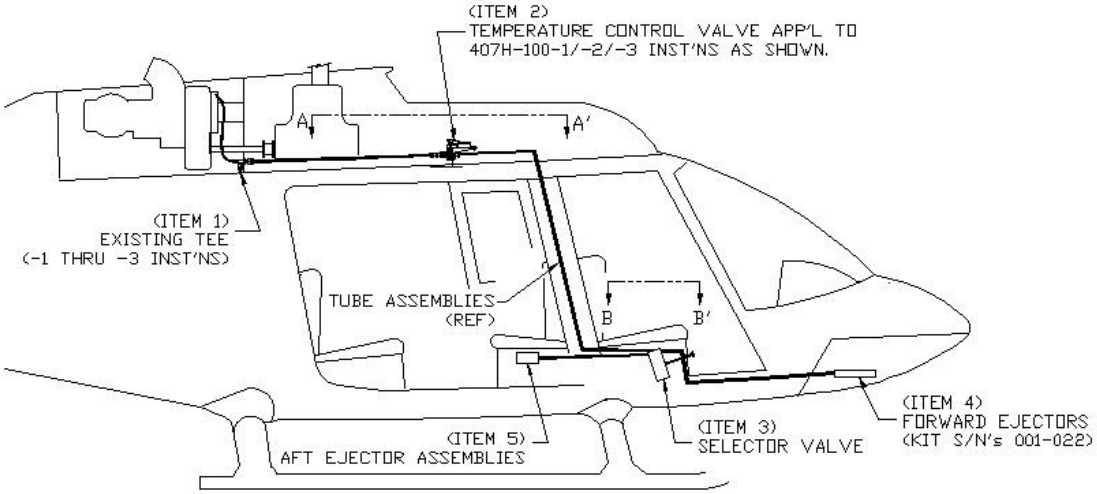
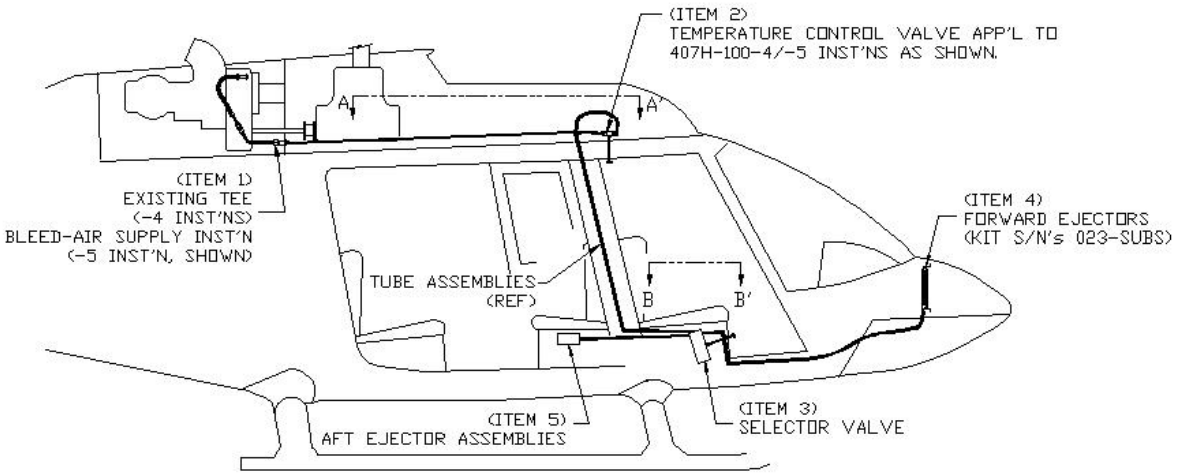


ELECTRONIC VALVE CONTROL
(APP'L: 407H-100-1/-2/-3)



MANUAL VALVE CONTROL
(APP'L: 407H-100-4/-5)

FIGURE 1
BLEED AIR HEATER INSTALLATION
SYSTEM CONFIGURATION

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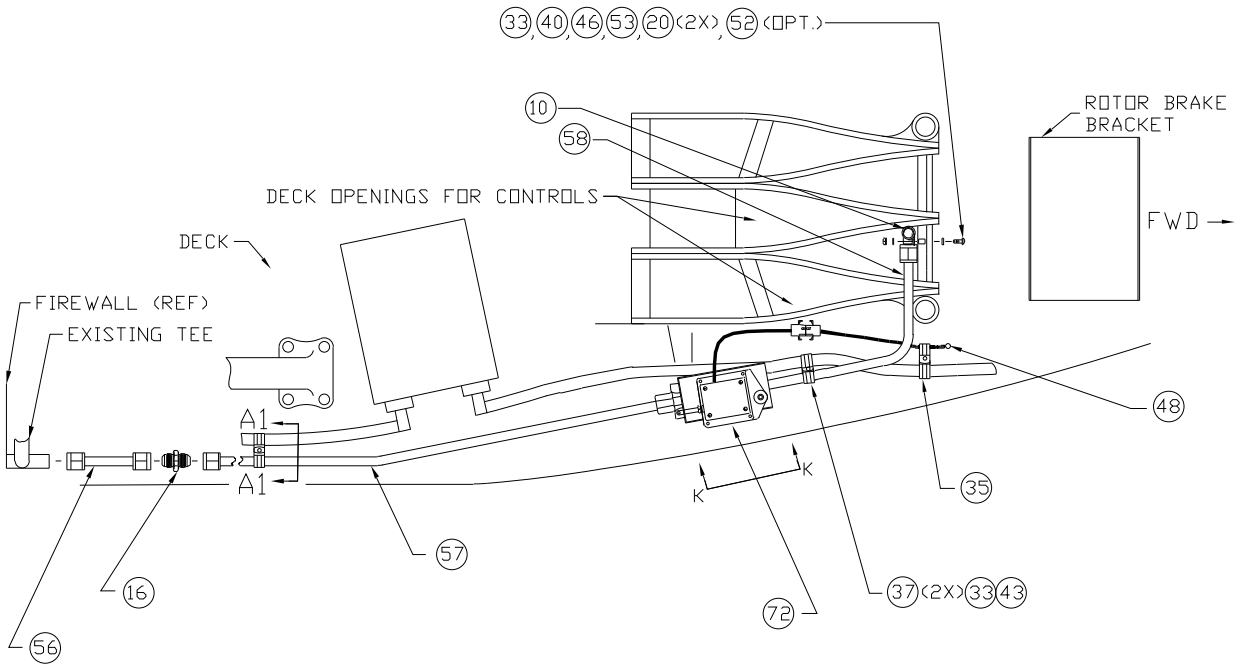
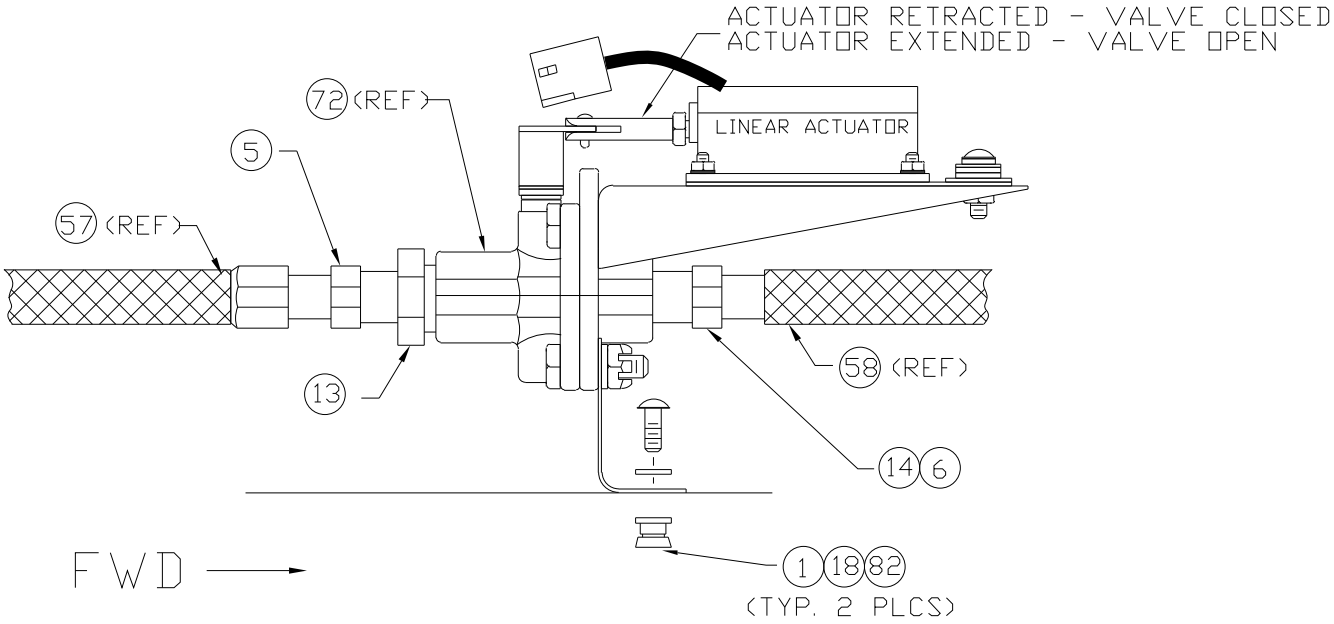


VIEW A-A FROM FIG. 1

SECTION A1-A1

FIGURE 2

PLUMBING INSTALLATION FOR 407H-100-1,-2,-3 INSTALLATIONS



VIEW K-K, FROM FIG. 2

FIGURE 2, (CONT'D.)

PLUMBING INSTALLATION FOR 407H-100-1,-2,-3 INSTNS

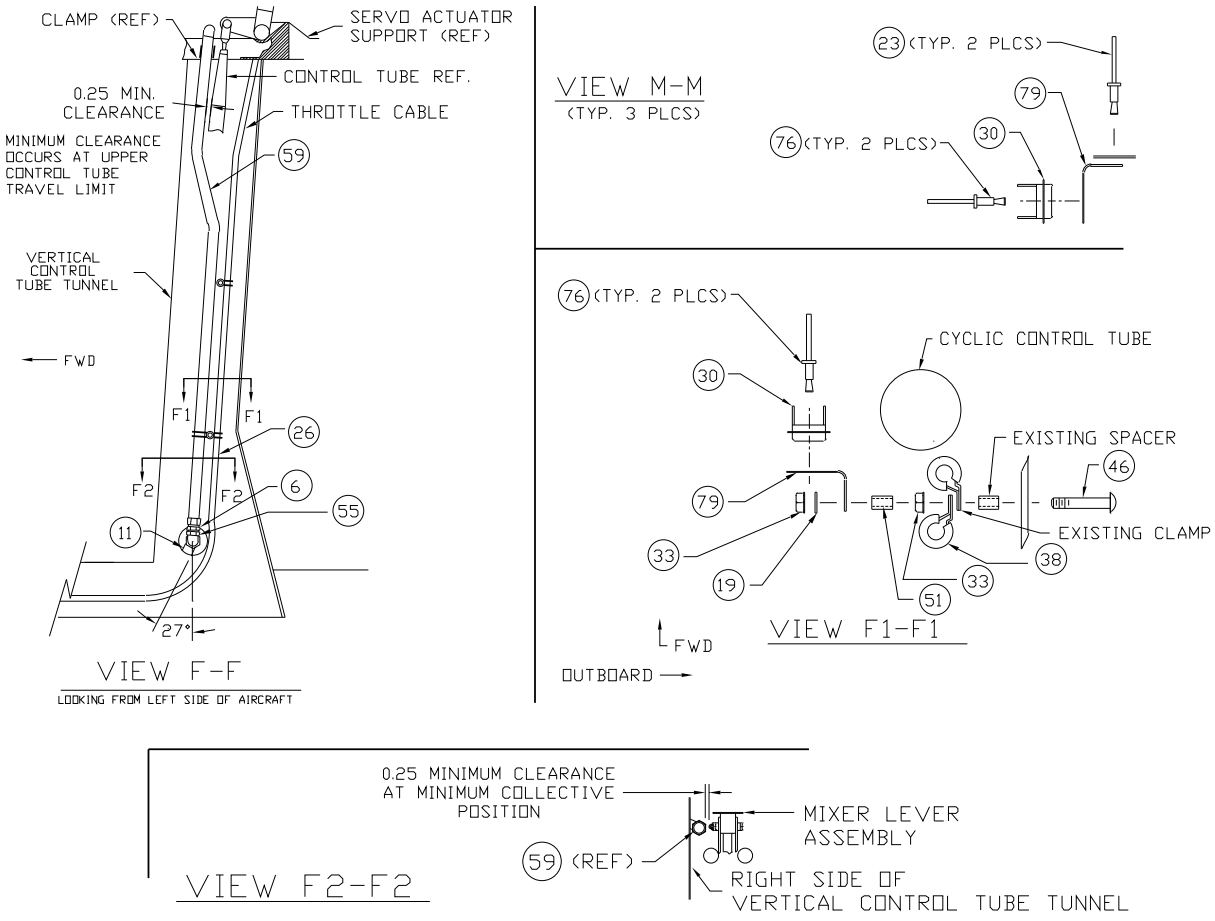
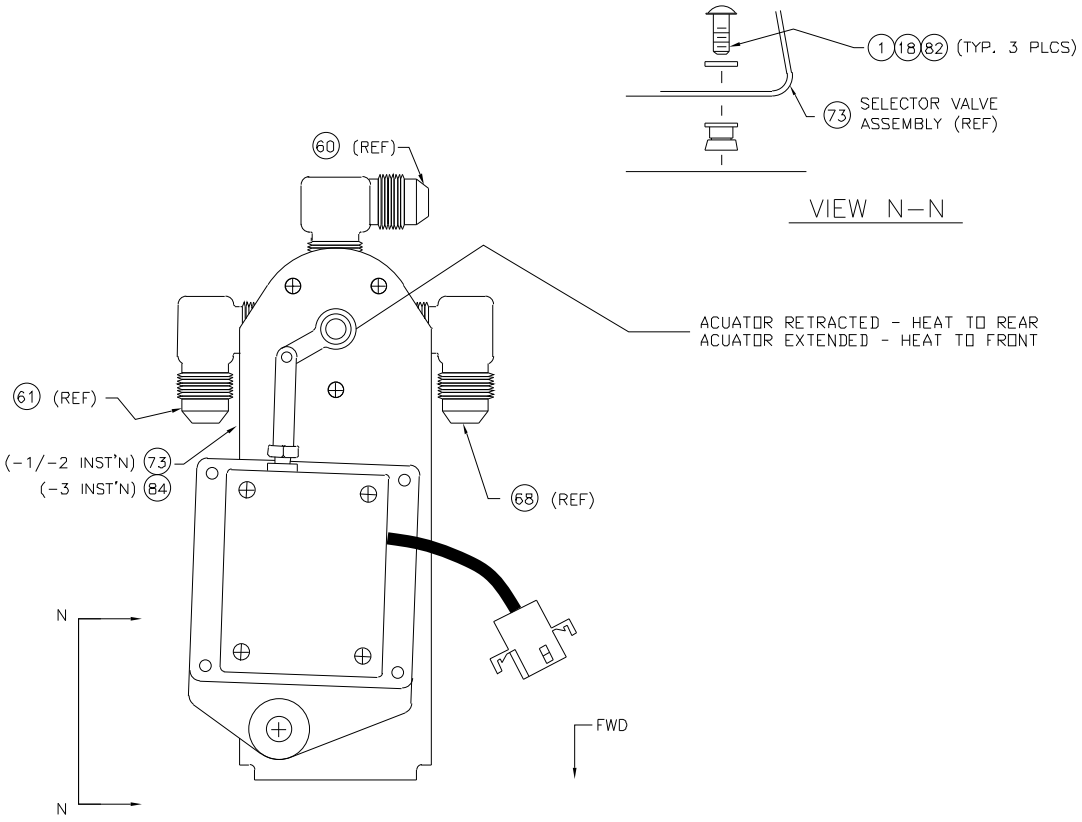


FIGURE 2, (CONT'D.)
PLUMBING INSTALLATION FOR 407H-100-1,-2,-3 INSTNS.



DETAIL H
SELECTOR VALVE TUBES INSTALLATION
(OVERHEAD VIEW)

FIGURE 2, (CONT'D.)

PLUMBING INSTALLATION FOR 407H–100–1,–2,–3 INSTNS.

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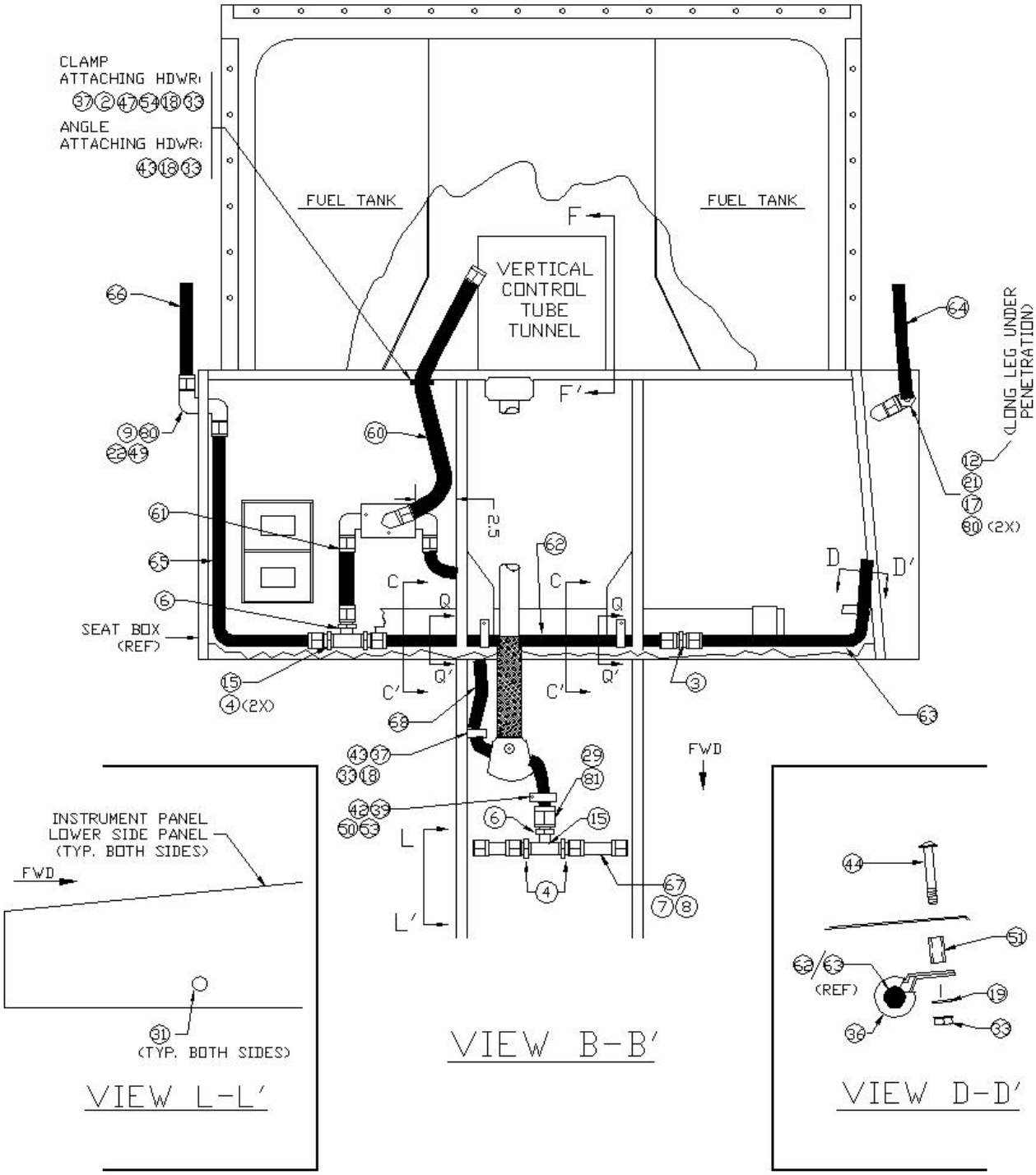

FIGURE 2 (CONT'D)
PLUMBING INSTALLATION FOR 407H-100-1,-2,-3 INSTN'S.

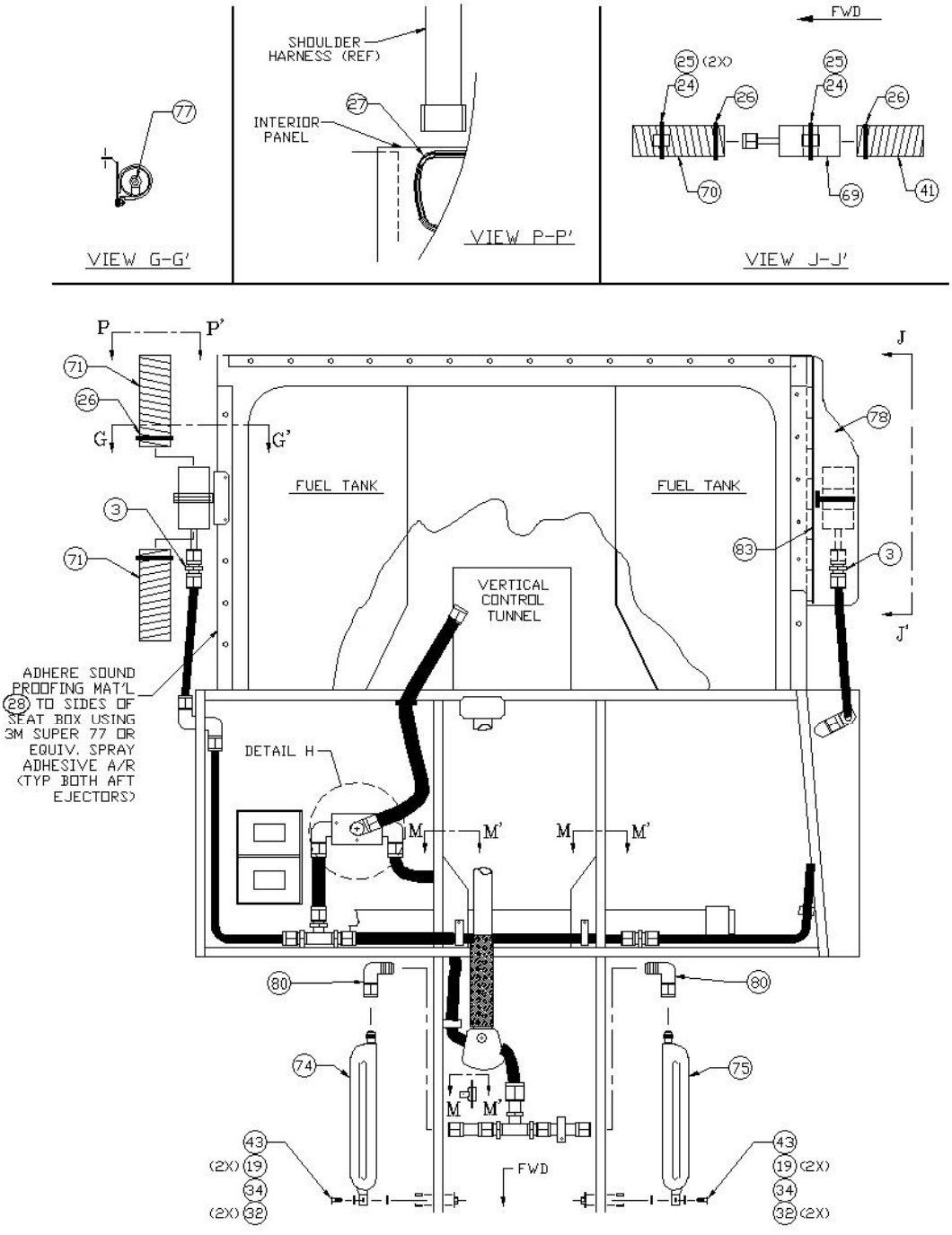

FIGURE 2 (CONT'D)
PLUMBING INSTALLATION FOR 407H-100-1,-2,-3 INSTN'S.

Parts List
FOR PAGES 12-17

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ITEM#	P/N	DESCRIPTION	QTY	TYPE
1	AN525-10R5	SCREW	5	EA.
2	AN743-12	BRACKET	1	EA.
3	AN815-6D	UNION	3	EA.
4	AN816-6-6D	NIPPLE	4	EA.
5	AN816-8	NIPPLE	1	EA.
6	AN816-8D	NIPPLE	4	EA.
7	AN818-6D	NUT (1)	2	EA.
8	AN819-6D	SLEEVE (1)	2	EA.
9	AN821-6D	ELBOW	1	EA.
10	AN821-8D	ELBOW	1	EA.
11	AN822-8D	ELBOW	1	EA.
12	AN833-6D	BULKHEAD ELBOW	1	EA.
13	AN912-4	REDUCER	1	EA.
14	AN912-4D	REDUCER	1	EA.
15	AN917-3D	TEE	2	EA.
16	AN919-15J	UNION	1	EA.
17	AN924-6D	NUT	1	EA.
18	NAS1149F0363P	WASHER	8	EA.
19	NAS1149F0332P	WASHER (1)	8	EA.
19	NAS1149F0363P	WASHER (2) and,	4	EA.
	NAS1149D0332J	WASHER (2)	8	EA.
20	NAS1149D0332J	WASHER	2	EA.
21	NAS1149F1032P	WASHER	1	EA.
22	BH-9	FIRESLEEVE	3	EA.
23	CR3212-4-2	RIVET	6	EA.
24	CTM-1	TIE MOUNT	2	EA.
25	CT6B	TYRAP	2	EA.
26	CT11B	TYRAP	13	EA.
27	ES00140-3	EXTRUSION	6	EA.
28	ES05000-1	FOAM (Sound Proofing) 24x30	1	EA.
29	ES39500-1	FERRULE	1	EA.
30	ES50201-1	TEMPERATURE ACTIVATED SWITCH	4	EA.
31	GM-32	CATAPILLAR GROMMET	11	EA.
32	MS20426AD3-4	RIVET (1)	4	EA.
33	MS21042L3	NUT	10	EA.

(1). Applicable to kit S/N's 001-022, prior to SB-407H-20071112 compliance.
(2). Applicable to kit S/N's 023-subs, or after SB-407H-20071112 compliance.

ITEM#	P/N	DESCRIPTION	QTY	TYPE
34	MS21059L3K	PLATE NUT (1)	2	EA.
34	MS21042L3	NUT (2)	4	EA.
35	MS21919DG2	CLAMP	1	EA.
36	MS21919DG10	CLAMP	3	EA.
37	MS21919DG12	CLAMP (1)	5	EA.
37	MS21919DG12	CLAMP (2) and,	4	EA.
	MS21919WDG12	CLAMP (2)	1	EA.
38	MS21919DG13	CLAMP	1	EA.
39	MS21919DG15	CLAMP (1)	1	EA.
40	MS21919DG16	CLAMP	1	EA.
41	S-9005EC-7	DUCT ASSEMBLY	1	EA.
42	MS27039-1-15	SCREW (1)	1	EA.
43	MS35207-264	SCREW (1)	5	EA.
43	MS35207-264	SCREW (2) and,	3	EA.
	MS35207-263	SCREW (2)	4	EA.
44	MS35207-265	SCREW	3	EA.
45	MS35207-267	SCREW	1	EA.
46	MS35207-268	SCREW	2	EA.
47	MS35207-270	SCREW	1	EA.
48	MS35489-1	GROMMET	1	EA.
49	MS35489-16	GROMMET	1	EA.
50	NAS1149D0363J	WASHER (1)	1	EA.
51	NAS43DD3-8	SPACER	4	EA.
52	NAS43DD3-16	SPACER	1	EA.
53	NAS43DD3-23	SPACER (1)	3	EA.
53	NAS43DD3-23	SPACER (2)	2	EA.
54	NAS43DD3-56	SPACER	1	EA.
55	S-5015-1	FITTING	1	EA.
56	S-5017-1	TUBE ASSEMBLY	1	EA.
57	S-5017-3	TUBE ASSEMBLY	1	EA.
58	S-5017-4	TUBE ASSEMBLY	1	EA.

(1). Applicable to kit S/N's 001-022, prior to SB-407H-20071112 compliance.
(2). Applicable to kit S/N's 023-subs, or after SB-407H-20071112 compliance.

Parts List
FOR PAGES 12-17

ITEM#	P/N	DESCRIPTION	QTY	TYPE
59	S-5017-5	TUBE ASSEMBLY	1	EA.
60	S-5017-6	TUBE ASSEMBLY	1	EA.
61	S-5017-7	TUBE ASSEMBLY	1	EA.
62	S-5017-8	TUBE ASSEMBLY	1	EA.
63	S-5017-9	TUBE ASSEMBLY	1	EA.
64	S-5017-10	TUBE ASSEMBLY	1	EA.
65	S-5017-11	TUBE ASSEMBLY	1	EA.
66	S-5017-12	TUBE ASSEMBLY	1	EA.
67	S-5017-13	TUBE ASSEMBLY (1)	2	EA.
67	63-190600-6	FITTING (2)	2	EA.
68	S-5019-1	HOSE ASSEMBLY	1	EA.
69	S-9004-1	EJECTOR ASSEMBLY	1	EA.
70	S-9005EC-1	DUCT ASSEMBLY	1	EA.
71	S-9005EC-2	DUCT ASSEMBLY	2	EA.
72	S-9100-1	VALVE ASSEMBLY	1	EA.
73	S-9110-1	VALVE ASSEMBLY (-1/-2 Inst'n-S/N 001-003)	1	EA.
74	S-9120-1	EJECTOR ASSY (1)	1	EA.
74	S-9120-4	EJECTOR ASSY (2)	1	EA.
75	S-9120-2	EJECTOR ASSY (1)	1	EA.
75	S-9120-3	EJECTOR ASSY (2)	1	EA.
76	SD42BS	RIVET	8	EA.
77	407H-2100-1	EJECTOR ASSEMBLY	1	EA.
78	407H-2110-1	DUCT ASSEMBLY	1	EA.
79	407H-2150-1	SENSOR BRACKET	4	EA.
80	6-C6X-S	ELBOW (1)	5	EA.
80	6-C6X-S	ELBOW (2)and,	3	EA.
	2807-6 (Alt: 919-6)	HOSE (2) and,	2	FT.
	MS35207-263	SCREW (2)	4	EA.
81	63-190600-8	FITTING (Alt: 20690-8-8)	1	EA.
82	80-004-2-6	INSERT	5	EA.
83	ES06100-2-1	HOOK TAPE	16	EA.
84	S-9110-2	VALVE ASSY (-3 Inst'n-S/N 004 & Subs.)	1	EA.

(1). Applicable to kit S/N's 001-022, prior to SB-407H-20071112 compliance.
(2). Applicable to kit S/N's 023-subs, or after SB-407H-20071112 compliance.

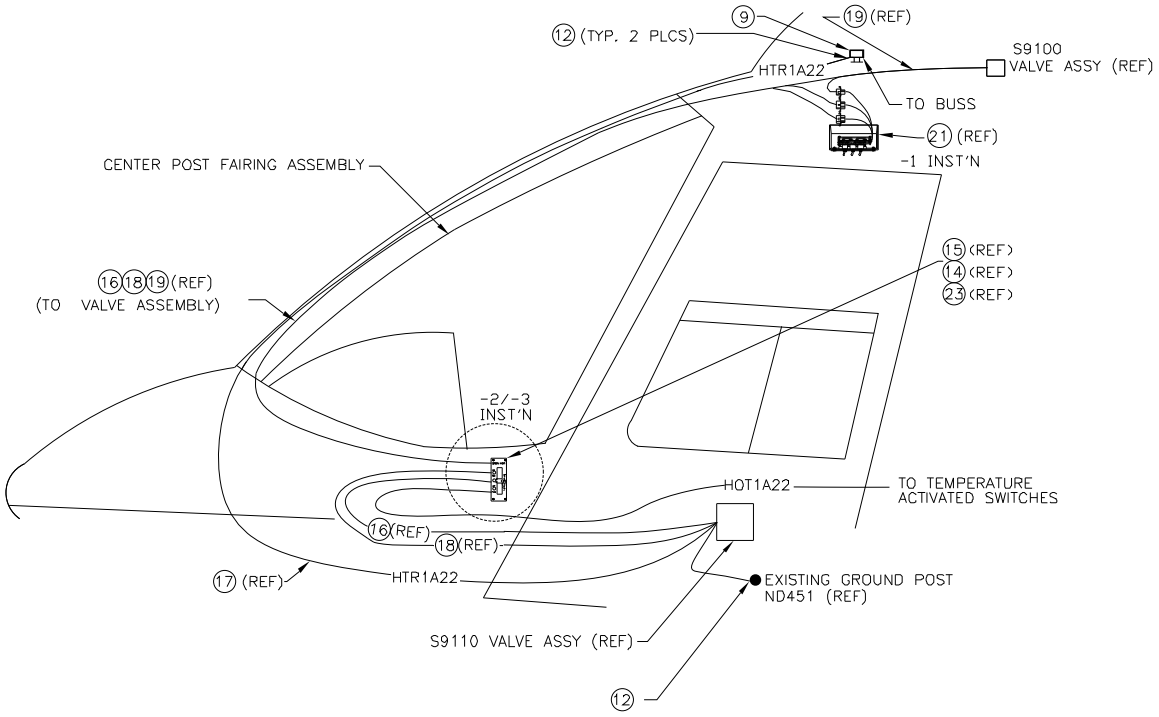
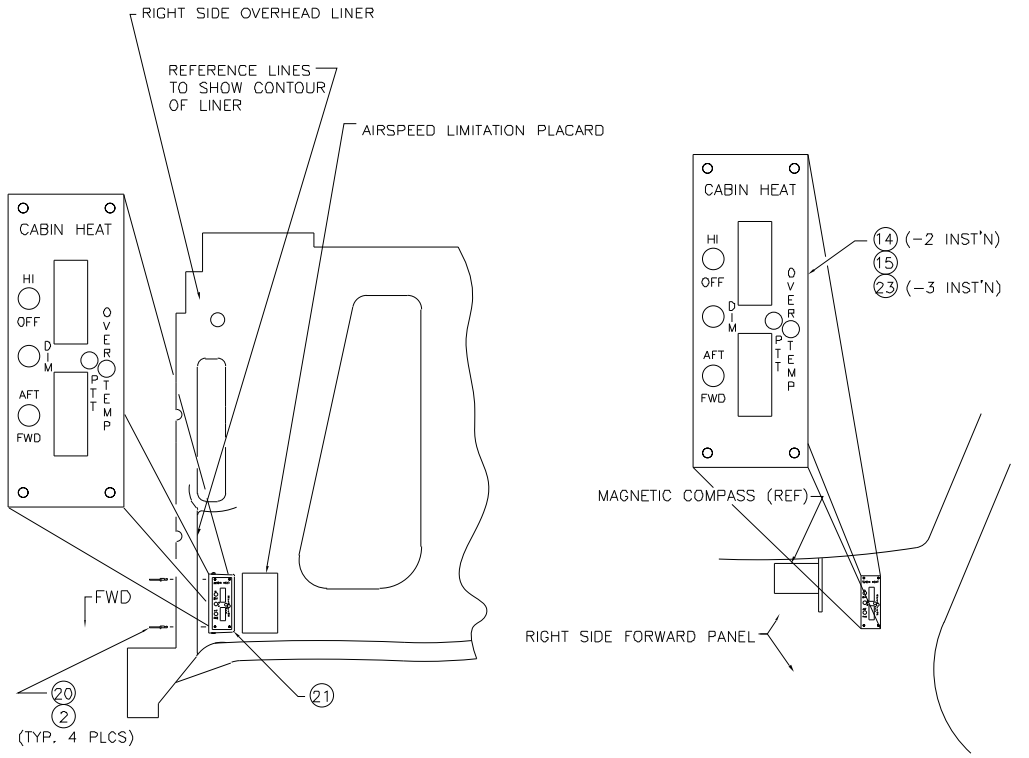


FIGURE 3

ELECTRICAL INSTALLATION
APPLICABLE TO 407H-100-1/-2/-3 INSTNS.



407H-100-1 INSTALLATION

407H-100-2/-3 INSTALLATION

FIGURE 3, (CONT'D.)
ELECTRICAL INSTALLATION

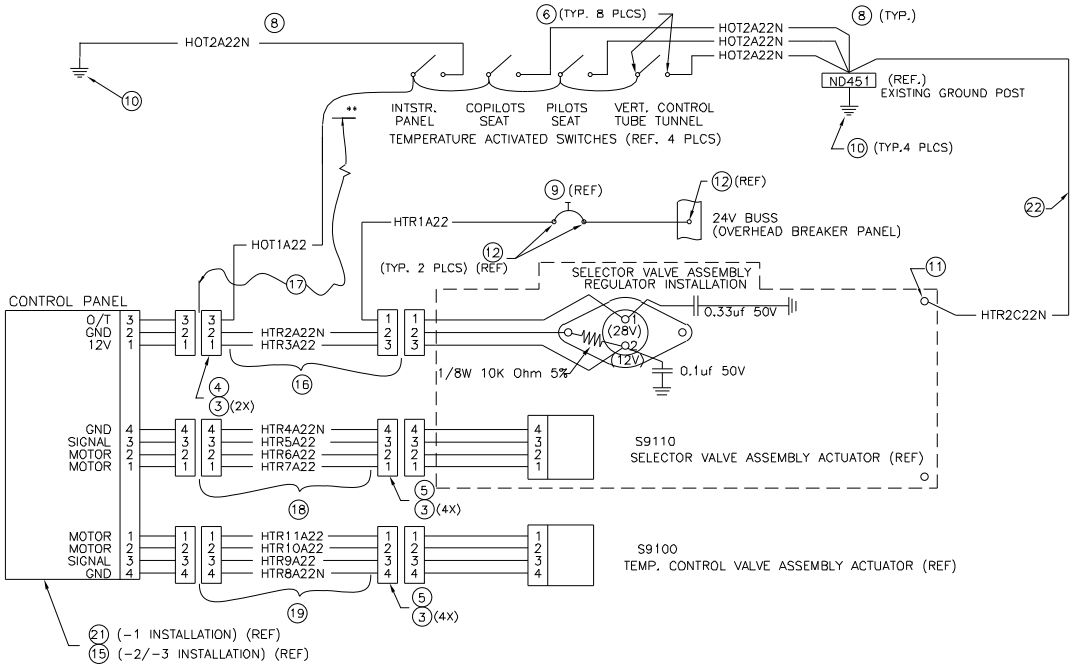


FIGURE 3, (CONT'D.)

ELECTRICAL INSTALLATION
407H-100-1, -2, -3

Parts List

FOR PAGES 21-23 (-1 INST'N)

Paravion® Technology Inc.

ITEM#	P/N	DESCRIPTION	QTY	TYPE
2	NAS1149DN416J	WASHER	4	EA.
3	ES50240-1	TERMINAL	10	EA.
4	ES50243-1	CASE	1	EA.
5	ES50244-1	CASE	2	EA.
6	KTN50	TERMINAL	8	EA.
8	MIL-W-22759/16-22-9	WIRE (Marked "HOT2A22N")	18	FT.
9	MS24510-5	BREAKER	1	EA.
10	MS25036-103	TERMINAL	5	EA.
11	MS25036-148	TERMINAL	1	EA.
12	MS25036-149	TERMINAL	3	EA.
16	S-3513-1	CABLE ASSEMBLY	1	EA.
17	S-3513-2	CABLE ASSEMBLY	1	EA.
18	S-3514-1	CABLE ASSEMBLY	1	EA.
19	S-3514-2	CABLE ASSEMBLY	1	EA.
20	1624-0411	RIVET	4	EA.
21	407H-3110-1	CONTROL PANEL ASSEMBLY	1	EA.
22	MIL-W-22759/16-22-9	WIRE (Marked "HTR2C22N")	2	FT.

ITEM#	P/N	DESCRIPTION	QTY	TYPE
1	NAS1149FN432P	WASHER	4	EA.
3	ES50240-1	TERMINAL	10	EA.
4	ES50243-1	CASE	1	EA.
5	ES50244-1	CASE	2	EA.
6	KTN50	TERMINAL	8	EA.
7	MS21042L04	NUT	4	EA.
8	MIL-W-22759/16-22-9	WIRE (Marked "HOT2A22N")	18	FT.
9	MS24510-5	BREAKER	1	EA.
10	MS25036-103	TERMINAL	5	EA.
11	MS25036-148	TERMINAL	1	EA.
12	MS25036-149	TERMINAL	3	EA.
13	MS35206-214	SCREW	4	EA.
14	S-2110-1	PLACARD	1	EA.
15	S-3130-1	PC BOARD	1	EA.
16	S-3513-1	CABLE ASSEMBLY	1	EA.
17	S-3513-2	CABLE ASSEMBLY	1	EA.
18	S-3514-1	CABLE ASSEMBLY	1	EA.
19	S-3514-2	CABLE ASSEMBLY	1	EA.
22	MIL-W-22759/16-22-9	WIRE (Marked "HTR2C22N")	2	FT.
24	NAS1149D0516J	WASHER	3	EA.

Parts List

FOR PAGES 21-23 (-3 INST'N)

Paravion® Technology Inc.

ITEM#	P/N	DESCRIPTION	QTY	TYPE
1	NAS1149FN432P	WASHER	4	EA.
3	ES50240-1	TERMINAL	10	EA.
4	ES50243-1	CASE	1	EA.
5	ES50244-1	CASE	2	EA.
6	KTN50	TERMINAL	8	EA.
7	MS21042L04	NUT	4	EA.
8	MIL-W-22759/16-22-9	WIRE (Marked "HOT2A22N")	18	FT.
9	MS24510-5	BREAKER	1	EA.
10	MS25036-103	TERMINAL	5	EA.
11	MS25036-148	TERMINAL	1	EA.
12	MS25036-149	TERMINAL	3	EA.
13	MS35206-214	SCREW	4	EA.
15	S-3130-1	PC BOARD	1	EA.
16	S-3513-1	CABLE ASSEMBLY	1	EA.
17	S-3513-2	CABLE ASSEMBLY	1	EA.
18	S-3514-1	CABLE ASSEMBLY	1	EA.
19	S-3514-2	CABLE ASSEMBLY	1	EA.
22	MIL-W-22759/16-22-9	WIRE (Marked "HTR2C22N")	2	FT.
23	S-2110-3	PLACARD	1	EA.

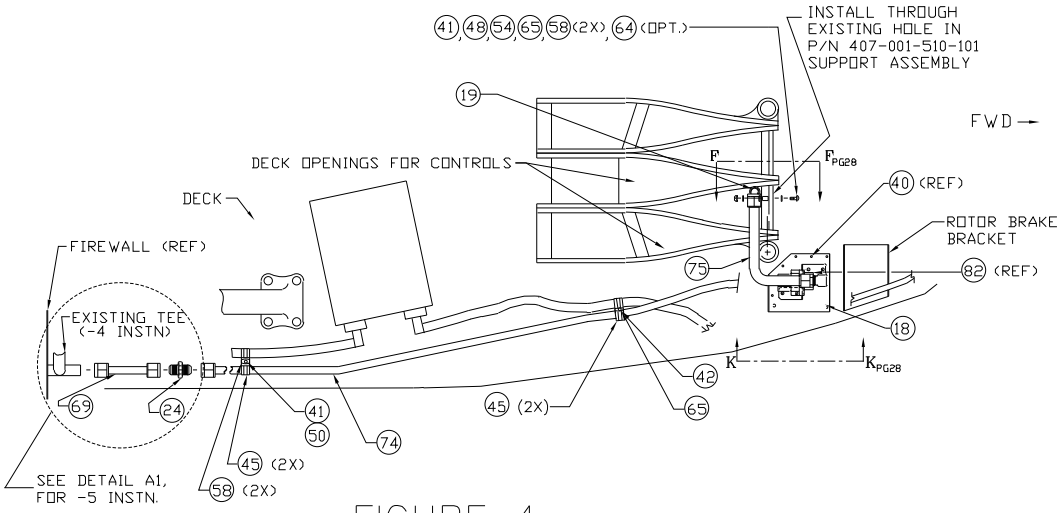
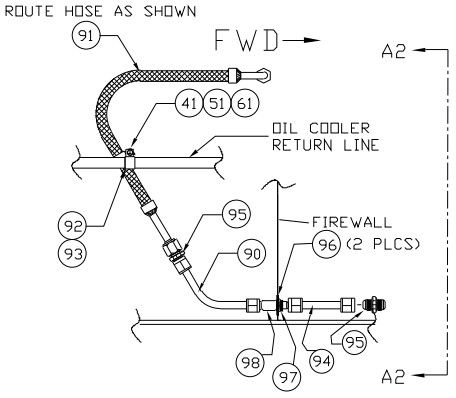


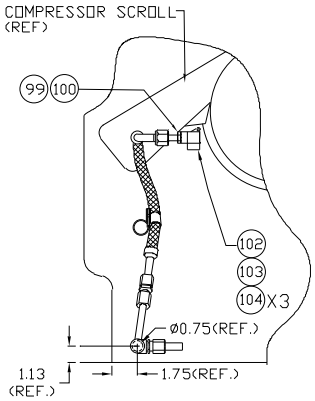
FIGURE 4
VIEW A-A, FROM FIG. 1

PLUMBING INSTALLATION FOR 407H-100-4, -5 INSTNS



DETAIL A1
407H-100-5 INSTALLATION ONLY

REF. B.H.T. SERVICE INSTRUCTION 407-11-3, REVISION 0 DATED 12-16-96, OR LATER FAA APPROVED REVISION. IF SERVICE INSTRUCTION HAS NOT BEEN ACCOMPLISHED THEN INSTALL THESE COMPONENTS



VIEW A2-A2

SAFETY WIRE HARDWARE AS APPLICABLE

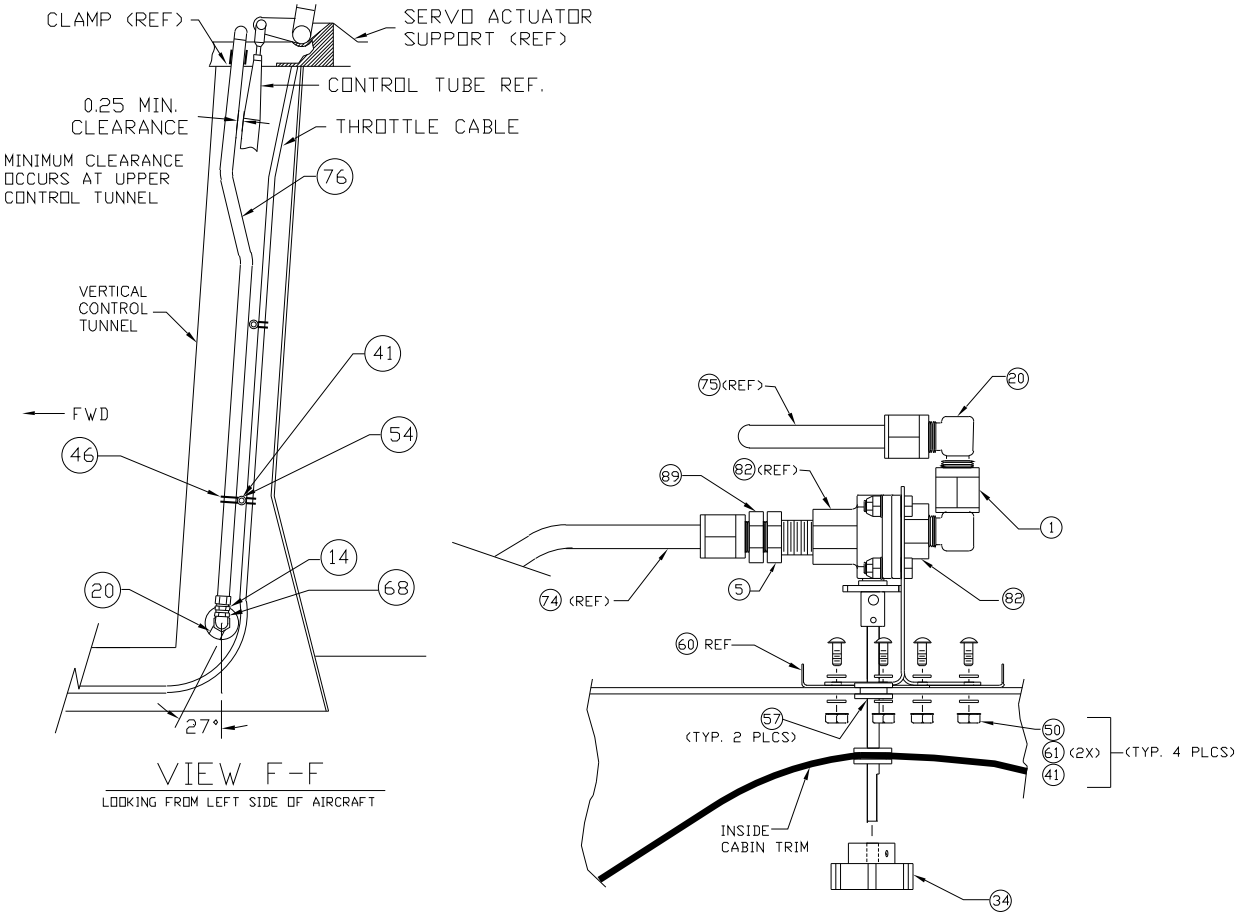


FIGURE 4, (CONT'D.)
PLUMBING INSTALLATION 407H-100-4, -5 INSTNS.

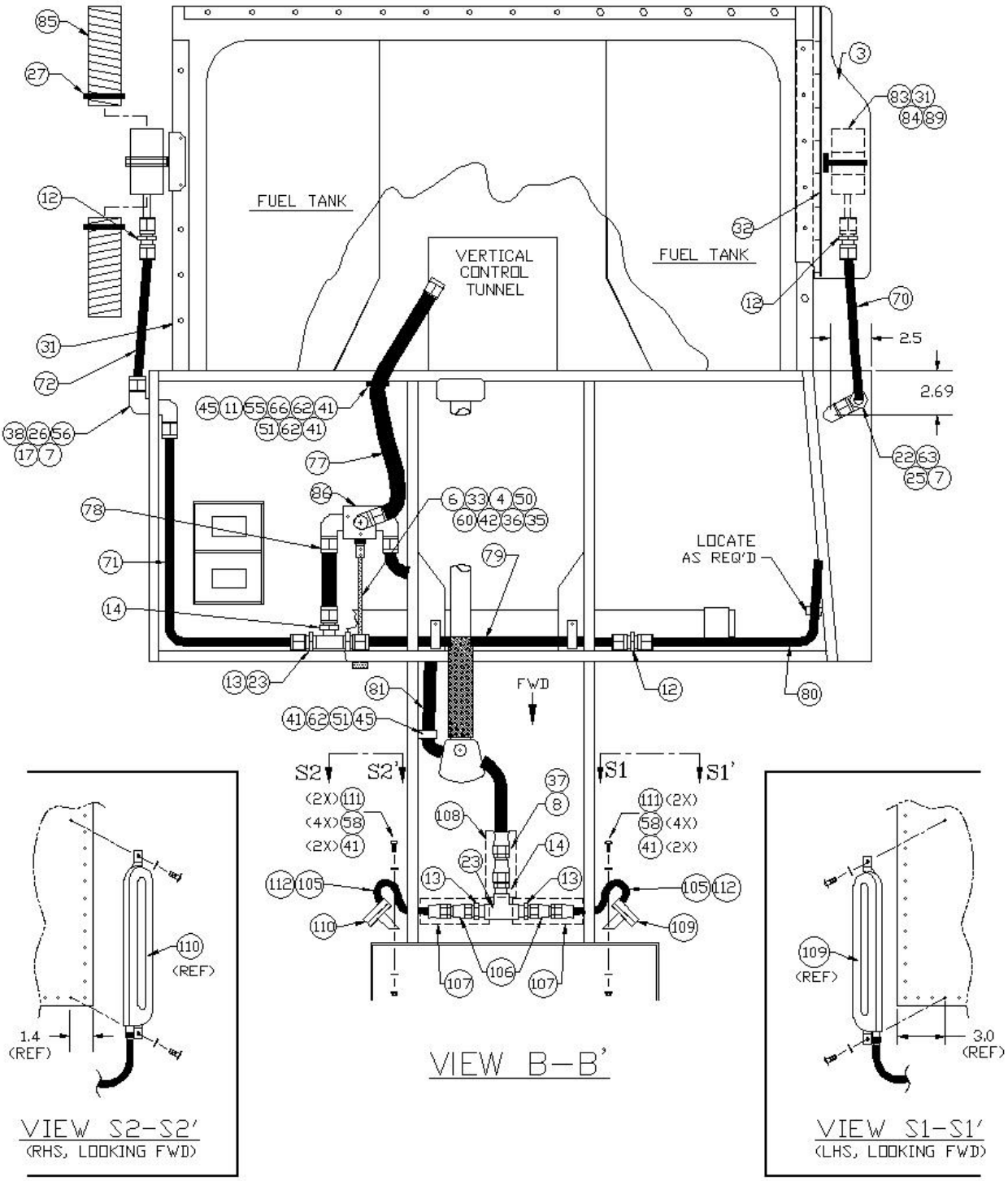


FIGURE 4 (CONT'D)

Parts List
FOR PAGES 27-29

ITEM#	P/N	DESCRIPTION	QTY	TYPE
1	2250-8-8S	SWIVEL ELBOW	1	EA.
2	407H-2100-1	EJECTOR ASSEMBLY	1	EA.
3	407H-2110-1	DUCT ASSEMBLY	1	EA.
4	407H-2160-1	DOUBLER	1	EA.
5	AN912-4	REDUCER	1	EA.
6	407H-2180-1	VALVE STEM	1	EA.
7	6-C6X-S	ELBOW	3	EA.
8	63-190600-8	FITTING (Alt: 20690-8-8)	1	EA.
9	80-004-2-6	INSERT	7	EA.
10	AN525-10R5	SCREW	7	EA.
11	AN743-12	BRACKET	1	EA.
12	AN815-6D	UNION	3	EA.
13	AN816-6-6D	NIPPLE	4	EA.
14	AN816-8D	NIPPLE	3	EA.
17	AN821-6D	ELBOW	1	EA.
18	AN821-8	ELBOW	1	EA.
19	AN821-8D	ELBOW	1	EA.
20	AN822-8D	ELBOW	1	EA.
22	AN833-6D	BULKHEAD ELBOW	1	EA.
23	AN917-3D	TEE	2	EA.
24	AN919-15J	UNION	1	EA.
25	AN924-6D	NUT	1	EA.
26	BH-9	FIRESLEEVE	3	IN.
27	CT11B	TYRAP	10	EA.
28	CT6B	TYRAP	2	EA.
29	CTM-1	TIE MOUNT	2	EA.
30	ES00140-3	EXTRUSION	6	IN.
31	ES05000-1	FOAM (Sound Proofing) 24x30	5	SQFT.
32	ES06100-2-1	HOOK TAPE	16	IN.
33	ES10100-1	COUPLER	1	EA.
34	ES39300-7	KNOB ASSEMBLY (ALT: ES39300-2)	1	EA.
35	ES39300-6	KNOB	1	EA.
36	ES39302-1	BEARING	1	EA.
37	ES39500-1	FERRULE	1	EA.
38	GM-32	CATAPILLAR GROMMET	11	IN.
40	MS20470AD4-4	RIVET	10	EA.

(1). Applicable to kit S/N's 001-022, prior to SB-407H-20071112 compliance.
(2). Applicable to kit S/N's 023-subs, or after SB-407H-20071112 compliance.

ITEM#	P/N	DESCRIPTION	QTY	TYPE
41	MS21059L3K	PLATE NUT (1) and,	2	EA.
	MS20426AD3-4	RIVET (1) and,	4	EA.
	MS21042L3	NUT (-4 Inst'n) (1) or,	9	EA.
	MS21042L3	NUT (-5 Inst'n) (1)	10	EA.
41	MS21042L3	NUT (-4 Inst'n) (2) or,	13	EA.
41	MS21042L3	NUT (-5 Inst'n) (2)	14	EA.
42	MS27039-1-13	SCREW	1	EA.
44	MS21919WDG10	CLAMP	3	EA.
45	MS21919WDG12	CLAMP	4	EA.
46	MS21919WDG13	CLAMP	1	EA.
48	MS21919WDG16	CLAMP	1	EA.
50	AN525-10R7	SCREW	5	EA.
51	MS35207-264	SCREW	2	EA.
52	MS35207-265	SCREW	3	EA.
53	S-9005EC-7	DUCT ASSEMBLY	1	EA.
54	MS35207-268	SCREW	2	EA.
55	MS35207-270	SCREW	1	EA.
56	MS35489-16	GROMMET	1	EA.
57	MS35489-9	GROMMET	2	EA.
58	NAS1149F0332P	WASHER (1)	4	EA.
58	NAS1149D0332J	WASHER (2)	8	EA.
60	S-9504EC-2	PLATE	1	EA.
61	NAS1149F0332P	WASHER (-4 Inst'n)	13	EA.
61	NAS1149F0332P	WASHER (-5 Inst'n)	14	EA.
62	NAS1149F0363P	WASHER	6	EA.
63	NAS1149F1032P	WASHER	1	EA.
64	NAS43DD3-16	SPACER	1	EA.
65	NAS43DD3-23	SPACER	2	EA.
66	NAS43DD3-56	SPACER	1	EA.
67	NAS43DD3-8	SPACER	3	EA.
68	S-5015-1	FITTING	1	EA.

(1). Applicable to kit S/N's 001-022, prior to SB-407H-20071112 compliance.
(2). Applicable to kit S/N's 023-subs, or after SB-407H-20071112 compliance.

Parts List
FOR PAGES 27-29

Paravion® Technology Inc.

ITEM#	P/N	DESCRIPTION	QTY	TYPE
69	S-5017-1	FITTING	1	EA.
70	S-5017-10	TUBE ASSEMBLY	1	EA.
71	S-5017-11	TUBE ASSEMBLY	1	EA.
72	S-5017-12	TUBE ASSEMBLY	1	EA.
74	S-5017-14	TUBE ASSEMBLY	1	EA.
75	S-5017-16	TUBE ASSEMBLY	1	EA.
76	S-5017-5	TUBE ASSEMBLY	1	EA.
77	S-5017-6	TUBE ASSEMBLY	1	EA.
78	S-5017-7	TUBE ASSEMBLY	1	EA.
79	S-5017-8	TUBE ASSEMBLY	1	EA.
80	S-5017-9	TUBE ASSEMBLY	1	EA.
81	S-5019-1	HOSE ASSEMBLY	1	EA.
82	S-9002EC-3	VALVE ASSEMBLY	1	EA.
83	S-9004-1	EJECTOR ASSEMBLY	1	EA.
84	S-9005EC-1	DUCT ASSEMBLY	1	EA.
85	S-9005EC-2	DUCT ASSEMBLY	2	EA.
86	S-9111-1	VALVE ASSEMBLY	1	EA.
89	AN816-8	UNION	1	EA.
90	S-5017-18	TUBE ASSEMBLY	1	EA.
91	S-5008EC-7	HOSE ASSEMBLY	1	EA.
92	MS21919H12	CLAMP	1	EA.
93	MS21919H13	CLAMP	1	EA.
94	S-5017-17	TUBE ASSY	1	EA.
95	AN815-8J	UNION	2	EA.
96	NAS1149F1290P	WASHER	2	EA.
97	AN924-8J	NUT (ALT: AN924-8)	1	EA.
98	S-5030-1	VALVE ASSEMBLY	1	EA.
99	AS3084-08	O-RING	1	EA.
100	S-5020EC-5	RESTRICTOR	1	EA.
102	S-9503EC-2	FITTING	1	EA.
103	S-9502EC-1	GASKET	1	EA.
104	MS9217-07	BOLT	3	EA.

(1). Applicable to kit S/N's 001-022, prior to SB-407H-20071112 compliance.
(2). Applicable to kit S/N's 023-subs, or after SB-407H-20071112 compliance.

ITEM#	P/N	DESCRIPTION	QTY	TYPE
105	6-C6X-S	ELBOW (1)	2	EA.
105	2807-6 (Alt: 919-6)	HOSE (2)	2	FT.
106	S-5017-13	TUBE ASSY (1) and,	2	EA.
	AN-818-6D	NUT (1) and,	2	EA.
	AN-819-6D	SLEEVE (1)	2	EA.
106	63-190600-6	FITTING (2)	2	EA.
107	BH-7	FIRESLEEVE (2)	1	FT.
108	BH-12	FIRESLEEVE (2)	6	IN.
109	S-9120-2	EJECTOR ASSY (1)	1	EA.
109	S-9120-3	EJECTOR ASSY (2)	1	EA.
110	S-9120-1	EJECTOR ASSY (1)	1	EA.
110	S-9120-4	EJECTOR ASSY (2)	1	EA.
111	MS35207-264	SCREW (1)	2	EA.
111	MS35207-263	SCREW (2)	4	EA.
112	MS35489-14	GROMMET (2)	2	EA.

(1). Applicable to kit S/N's 001-022, prior to SB-407H-20071112 compliance.

(2). Applicable to kit S/N's 023-subs, or after SB-407H-20071112 compliance.