AIR COMM CORPORATION
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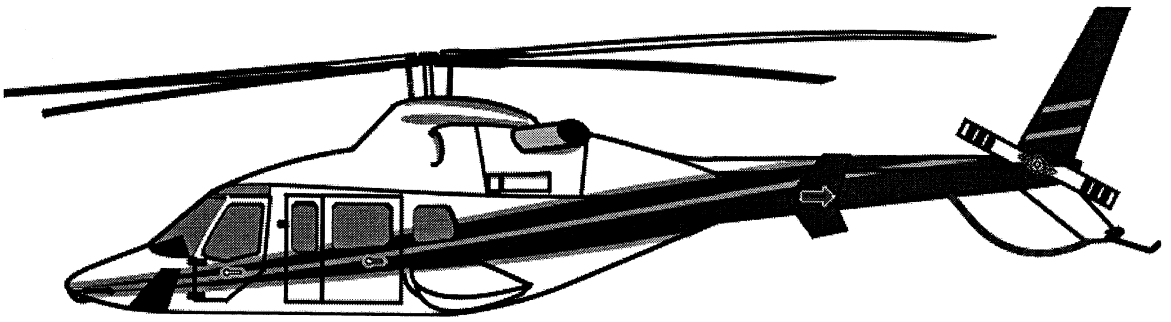
INSTRUCTIONS FOR CONTINUED AIRWORTHINESS
BELL HELICOPTER 430
HEATER SYSTEM



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RECORD OF REVISIONS

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LIST OF EFFECTIVE PAGES

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CHAPTER 0
INTRODUCTION

1. SCOPE

The scope of this manual encompasses the scheduled and unscheduled maintenance procedures for the continued airworthiness of the Air Comm Corporation heater system installed in the Bell 430 series helicopter.

2. PURPOSE

The purpose of this manual is to provide the aircraft mechanic in the field the necessary information to maintain the heater system.

3. ARRANGEMENT

This manual is arranged by chapters which are broken down into paragraphs and sub-paragraphs. All of the chapters and paragraphs are listed in the front of this manual in the Table of Contents, and are further identified by their individual page number.

4. APPLICABILITY

This manual is applicable to Bell Helicopter models 430 that are equipped with the Air Comm Corporation kit number 430H-201 heater system.

5. DEFINITIONS

The following terms are provided to give a ready reference to the meaning of some of the words contained within this manual. These definitions may differ from those given by a standard dictionary.

Ambient air temperature: The temperature of the air surrounding a person or object.

6. ABBREVIATIONS

Lbs:	Pounds
cm:	Centimeters

7. PRECAUTIONS

The following precautions may be found throughout this manual, and will vary depending on the seriousness of the Hazard or Condition:

WARNING: May be a maintenance procedure, practice, condition, etc., which could result in personal injury or loss of life.
CAUTION: May be a maintenance procedure, practice, condition, etc., which could result in damage or destruction of equipment.
NOTE: May be a maintenance procedure, practice, condition, etc., or a statement which needs to be highlighted.

8. UNITS OF MEASUREMENT

All measurements contained within this manual are given in the United States standard measurement, followed by the metric conversion in parentheses.

Chapter 0
Introduction (continued)

9. INFORMATION ESSENTIAL TO THE CONTINUED AIRWORTHINESS OF THE HEATER SYSTEM.

This manual provides information which is required for operation and maintenance of the Air Comm heater system installed in the Bell model 430 series helicopter. After completion of the heater installation this document must be placed with the appropriate existing aircraft documents.

10. REFERENCE DOCUMENT

The approval basis of the system covered by this ICA is Supplemental Type Certificate SH5226NM

11. DISTRIBUTION

This document is to be placed with the aircraft maintenance records at the time of system installation. It is not intended to update previously supplied manuals unless a change is required which involves safety issues. In this case a service bulletin shall be issued to provide the information.

12 CHANGES TO INSTRUCTIONS FOR CONTINUED AIRWORTHINESS

Changes made to a line or paragraph of this document will be indicated by a vertical bar in the right hand margin, while a complete page change will be indicated by a vertical bar next to the page number.

(Example: Any changes will appear with a vertical bar next to that change).

13. HEATING SYSTEM FEATURES

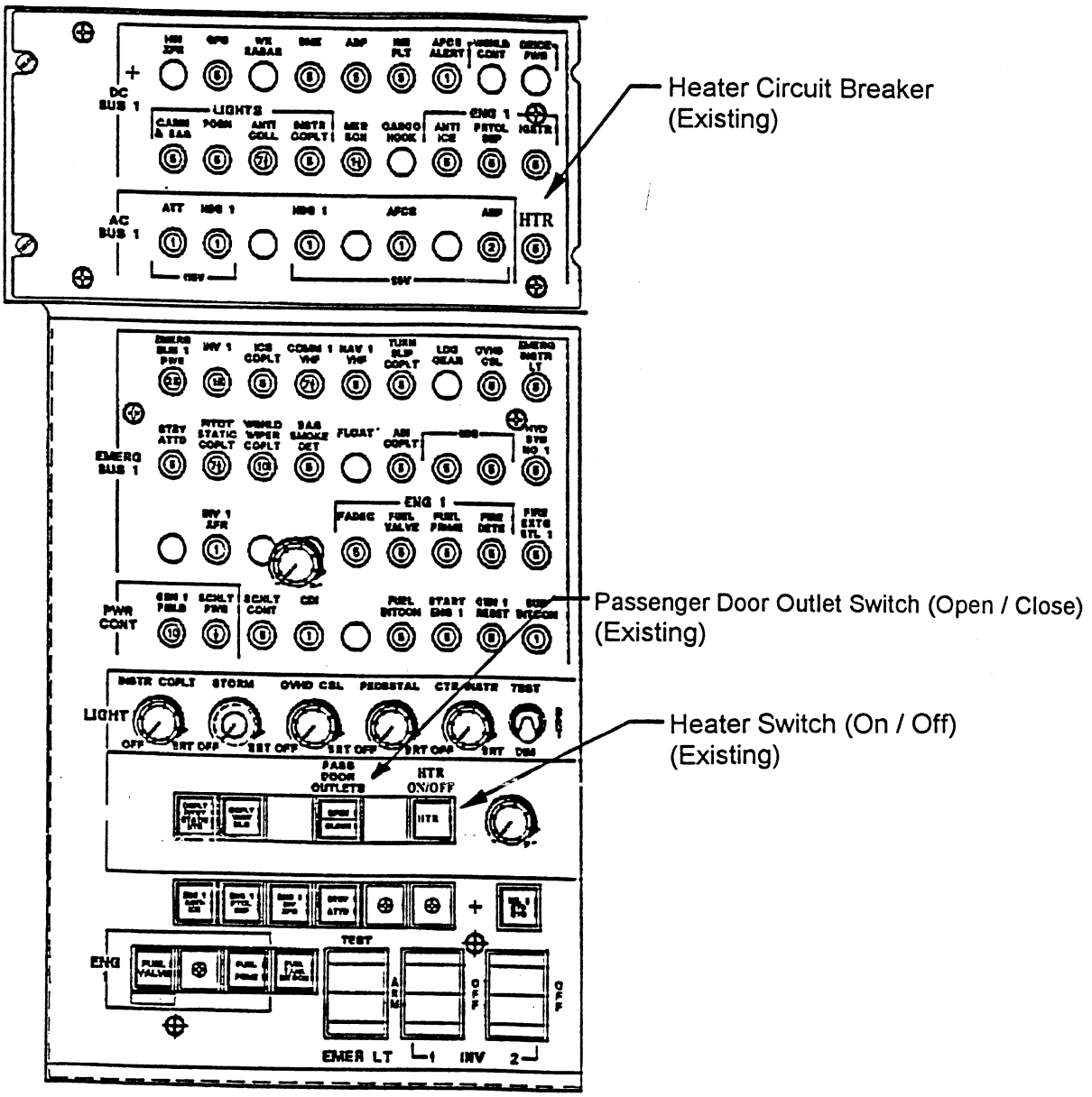
The bleed air heating system features two (2) heater ejectors installed below the cabin floor which are connected to the existing engine compartment bleed air system. The system is turned on & off via a switch in the overhead cockpit console.

(Continued)

13. HEATING SYSTEM FEATURES (CONTINUED)

The temperature is controlled manually by a mechanically operated valve and control knob located on the floor below the pilots collective flight control. These components combine to provide heating through the existing air distribution system when the engines are operating during both ground and flight operations.

In addition to the heater on / off switch located in the overhead console (Fig. 0-1), there is a passenger door outlet open / close switch (Fig 0-1). This switch allows the pilot to further control the distribution of the heat air within the main cabin.



OVERHEAD CONSOLE Fig 0-1

Chapter 0
Introduction (continued)

14. DESCRIPTION OF THE HEATER AND ITS INSTALLATION

The cabin heater system is shown schematically by figure 3-2.

The ACC heater system consists of bleed air plumbing, heater control valve, control valve actuator rod and actuator arm, two heater ejectors, two return air boxes and two heater duct overtemp sensors.

The ACC cabin heater system requires installation of the factory installed components as identified by figure 3-2. These components include all elements of the factory ECU system except the 222-706-018-117 Air Cycle Unit.

The ACC bleed air plumbing connects to the factory installed bleed line below the baggage floor at station 325. The heater plumbing is routed forward through the lower tunnel to the control valve, which is located at station 208.5.

From the control valve the bleed air is piped to the two ejectors which are installed in the existing heater ducts. The ejectors are located below the cabin floor at station 208.

The heater is operated by activating the heater ON/OFF switch, which opens the firewall shutoff valves, and then by moving the heater control to the desired position. This allows engine bleed air to flow into the ejectors.

The pumping action of the ejectors is provided by the bleed air pressure. Cabin "return air" is pulled through cabin mounted inlets, mixed with the bleed air and exhausted to the cabin by means of the existing heater air distribution system.

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CHAPTER 1
AIRWORTHINESS LIMITATION

1. AIRWORTHINESS LIMITATIONS

"No heater operation in hover."

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CHAPTER 2
INSPECTIONS

1. INSPECTION REQUIREMENTS

PERIODIC INSPECTIONS

Item	Annually Prior to Heating Season	Special Inspection Information
Heater Control Valve & Linkage	X	Check for operation and security.
*Bleed Air Plumbing	X	Check for security, and evidence of air leaks around fittings.
Heater Ejectors	X	Check for evidence of air leaks and corrosion around bleed air connection, and security. Check for evidence of deterioration and security of heater ejector acoustical felt inside heater ejectors.
Placards & Markings	X	Check for security and legibility.
Return Air Boxes	X	Check for security and condition of acoustical foam inside the return air boxes. Check the operation of the spring loaded door inside the return air box, ACC P/N 430H-950-1 installation only. (Spring loaded door inspection not required if air conditioner is installed.)

* Bleed Air Plumbing, refers to the portion of the heater system through which bleed air passes from the bleed connection ACC P/N 222H-9030-20 just forward of station #324, to the heater ejectors located at station #208. (See figure 3-2)

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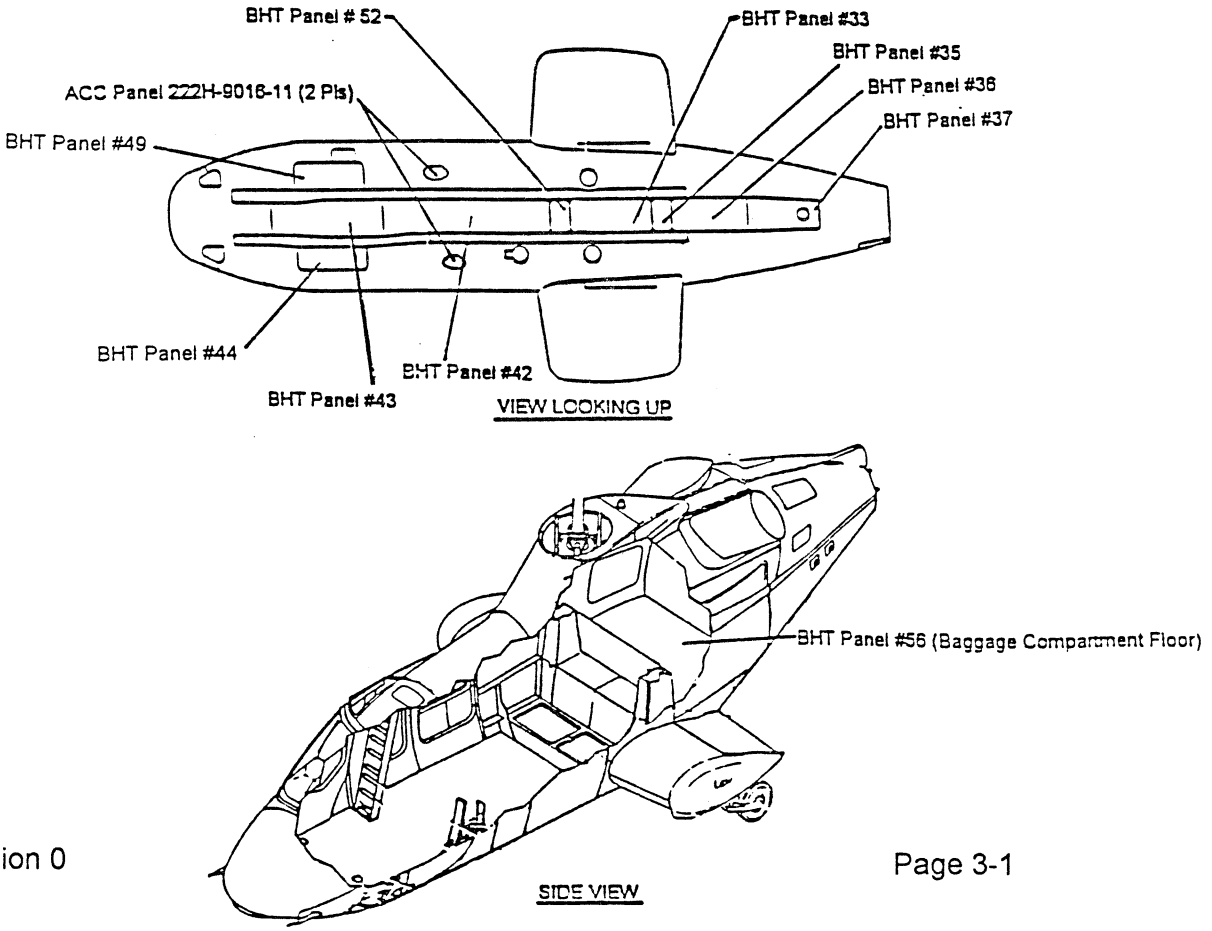
CHAPTER 3
LOCATION AND ACCESS

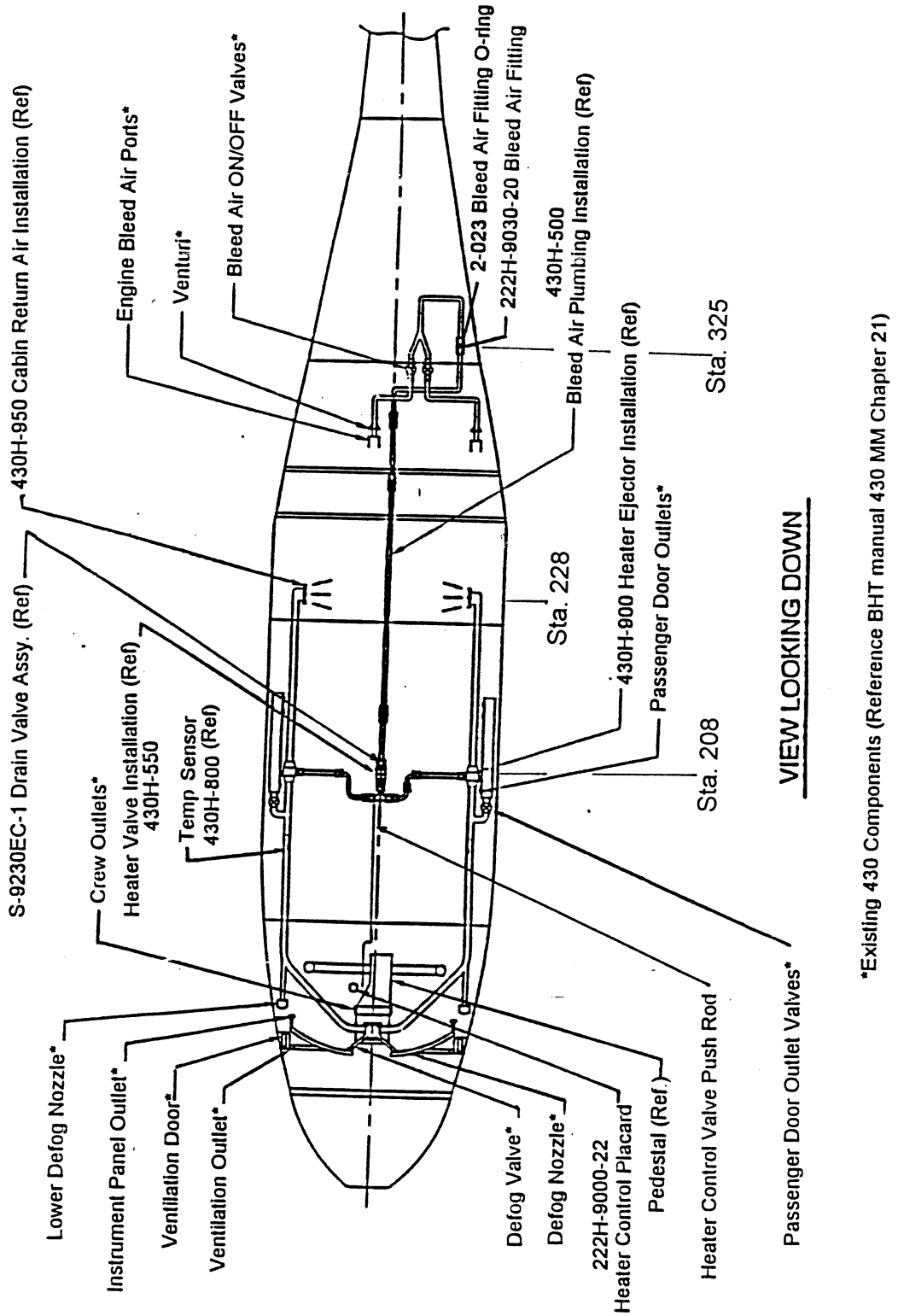
1. LOCATION OF HEATER FEATURES

Nomenclature	Description of Location
Heater Control Handle	Is located at next to the center pedestal, under the pilot's collective. (No special access)
Heater Ejectors	Are located at Sta. 208 under the cabin floor, one on each side of the aircraft (see Fig. 3-2). (Access to this component(s) is gained by removing coverplate(s) ACC P/N 222H-9016-11).
Heater Valve & Linkage.	The heater valve is located at Sta. 208 (see Fig. 3-2) under the cabin floor. (Access to the heater valve is gained by removing the BHT center belly panel #42). The linkage between the heater control handle and the heater valve is accessed by removing BHT center belly panel(s) #42, 43.
Air Return Boxes	Are located on each side of the cabin door post near the cabin floor Sta. 228 (see Fig. 3-2)
Bleed Air Plumbing	The bleed air plumbing runs from just forward of the bulkhead at Sta. 325 to the heater control valve at Sta. 208 (see Fig. 3-2) (Access to the bleed air plumbing can be gained by removing the center BHT belly panels numbers 33, 35, 36, 37, 42, 52 & 56).
Temperature Sensors	The temperature sensors are located forward of the heater ejectors in the existing heater ducting. (Access is gained by removing BHT belly panel(s) # 44, 49.

Fig. 3-1 Identification of BHT Panels (Ref. BHT-430 MM, Chapter 12)



2. General Layout of Bell 430 Heating System Fig. 3-2



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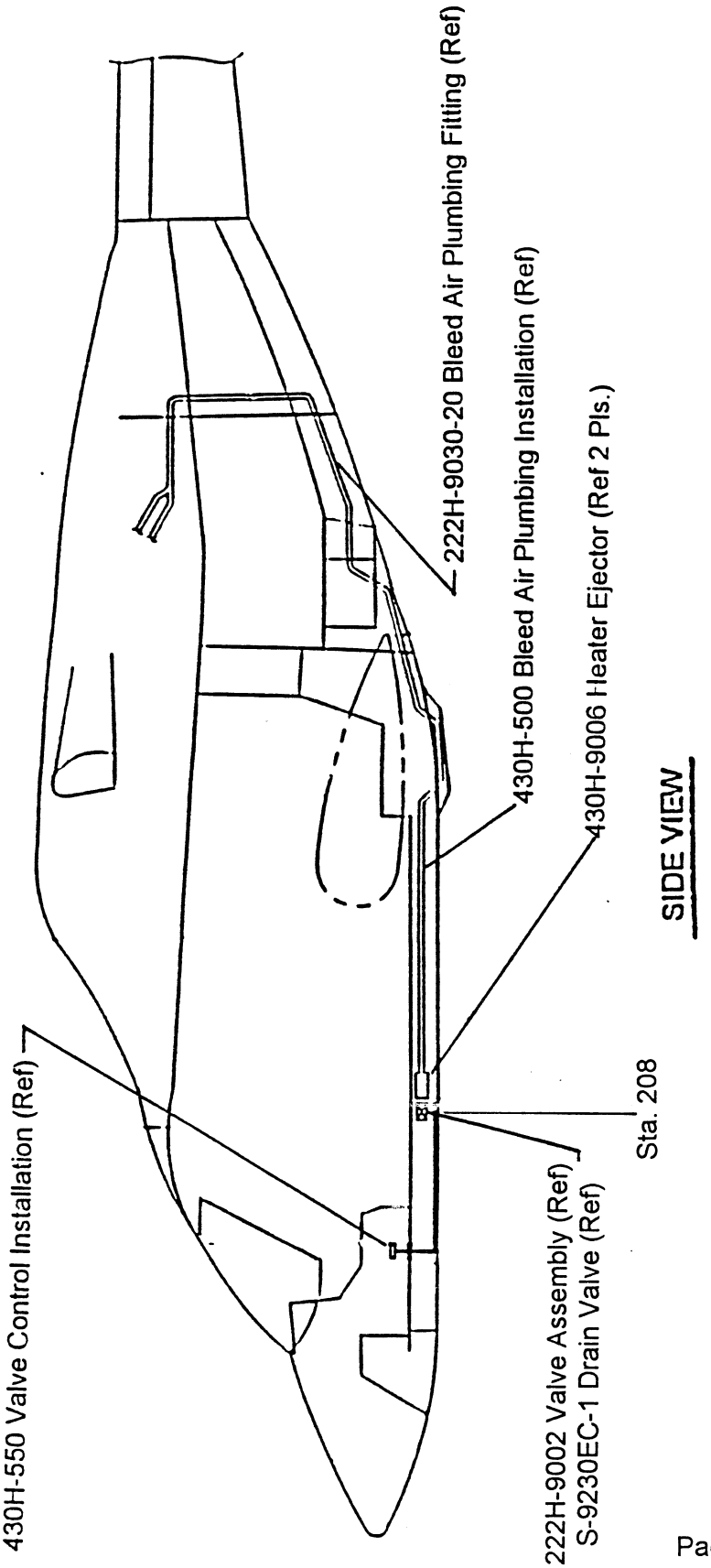
2. General Layout of Bell 430 Heating System Fig. 3-2 (continued)



CHAPTER 4
PLACARDS AND MARKINGS

1. PLACARD AND MARKING INFORMATION

Heater Control Placard (222H-9000-22)

Heater ON/OFF Placard (222AC-2504-2)

Heater Control Lens (222AC-2500-4)

Heater Circuit Breaker Placard (222AC-2500-10)

CHAPTER 5
SUGGESTED SPARES LIST

1. SUGGESTED SPARES LIST

Item	Part Number
Heater Control Placard	222H-9000-22
222H-9030-20 Bleed Air Fitting O-ring	2-023
Valve Assembly – Drain	S-9230EC-1
Over Temperature Sensor	ES52127-1
Ejector Acoustical Felt	MC8-4592B

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CHAPTER 6
STANDARD PRACTICES INFORMATION

1. B-NUT / FITTING SAFETY WIRE PROCEDURE

   A. Use MS20995C-32 per QQ-W-423B Cond A Safety wire (or Equivalent) to secure all B-nut / Fittings in the heater bleed air system.

   a. Cut safety wire with excess in mind.
   b. Thread through safety wire hole in B-nut (or fitting).
   c. Pull ends even. Twist tight to B-nut (or fitting).
   d. Twist wire to achieve 8 to 12 twist per inch (2.5 cm)
   e. Thread through safety wire hole in B-nut (or fitting).
   f. Twist wire again to achieve 8 to 12 twist per inch (2.5 cm), and cut to form "pigtail" of a minimum of 4 twist. Cut away excess.

2. REMOVAL, INSTALLATION / REPLACEMENT OF HEATER EJECTOR ASSEMBLY

   REMOVAL

   A. Remove heater ejector access panel ACC P/N 222H-9016-11from the ejector to be removed (see Fig. 3-1).

   B. Cut safety wire from B-nut to the ejector body.

   C. Drill out and remove the four (4) AA42-100 rivets that attach the ejector to the air distribution duct.

   D. Slide the ejector adapters away form the ejector body, and remove ejector.

   INSTALLATION / REPLACEMENT

   A. Install the heater ejector in the reverse order of its removal, installing four (4) each AA42-100 rivets into the existing ejector adapters. Safety per the instructions given on Page 6-1, a through f.

3. REMOVAL, INSTALLATION / REPLACEMENT OF HEATER EJECTOR ACOUSTICAL FELT

   REMOVAL

   A. See Removal, Installation / Replacement of heater ejector assembly (see paragraph. 2 chapter 6) prior to the removal / installation of the heater ejector acoustical felt.

NOTE

The acoustical felt should only be removed or replaced if it has deteriorated, or become detached from the heater ejector outlet tube wall.

   B. Remove the acoustical felt from the heater ejector outlet tube wall.

CAUTION

Care should be taken not to scratch or gouge the anodize coating of the ejector tube wall when removing the acoustical felt.

   C. Remove any excess adhesive that may have remained on the walls of the ejector with MEK (Methyl Ethyl Ketone)

WARNING

MEK is a health hazard, follow the manufacturer's handling instructions carefully!

(Continued)

3. REMOVAL, INSTALLATION / REPLACEMENT OF HEATER ACOUSTICAL FELT (CONTINUED)

INSTALLATION / REPLACEMENT

A. Apply Dow Corning® 732 RTV silicone rubber adhesive, or equivalent to a new acoustical felt pad (part # MC8-4592B), and bond into place to the ejector wall.

NOTE

Allow 24 hours for the adhesive to dry prior to heater operation.

B. Reinstall heater ejector assembly in the reverse order of its removal (see Removal, Installation / Replacement of Heater Ejector Assembly Page 6-1)

4. REMOVAL, INSTALLATION / REPLACEMENT OF HEATER VALVE ASSEMBLY

REMOVAL

A. Remove the center belly panel # 42 (see Fig. 3-1) from the area of Station 208 to gain access to the heater valve.

B. Cut the safety wire from the three (3) B-nuts that attach to the bleed air plumbing to the valve assembly.

C. Disconnect the valve control arm from the push / pull rod clevis end.

D. Remove the four (4) mounting bolts from the valve support bracket, and remove valve assembly from the aircraft.

INSTALLATION / REPLACEMENT

A. Install the heater valve assembly in the reverse order of its removal. Torque the mounting hardware to 50 – 70 inch lbs. (5.65 – 7.91 Newton meters).Torque the push / pull rod hardware finger tight plus one flat, and insure that there is no binding of the rod end.

B. Safety wire per instructions given on page 6-1, a through f.

5. REMOVAL, INSTALLATION / REPLACEMENT OF HEATER BLEED AIR PLUMBING

NOTE

This paragraph refers to the portion of the bleed air heater located between the fitting at station #325 under the baggage compartment floor, to the heater ejectors located at station #208 (see Fig. 3-2).

REMOVAL

A. Remove necessary center belly panel(s) to gain access to the required section(s) of heater bleed air plumbing to be removed.

B. Cut safety wire from B-nut, and remove desired heater bleed line.

INSTALLATION / REPLACEMENT

A. Install the affected bleed heater line(s) in the reverse order of its removal.

B. Apply a thin coat of Loctite® 567 Thread Sealant, or equivalent to all joints.

C. Safety wire per instructions given on page 6-1, a through f.

6. REMOVAL, INSTALLATION / REPLACEMENT OF HEATER VALVE PUSH / PULL ROD.

REMOVAL

A. It will be necessary to remove BHT belly panels # 42 & 43 (see Fig 3-1) to gain access to the heater valve push / pull rod assembly (see Fig 6-1).

B. Remove the bolt, nuts, and cotter pin attaching the push / pull rod to the heater control handle arm, and to the heater control valve arm.

NOTE

Prior to the removal of the heater valve push / pull rod, it is recommended that the position of the parts be carefully marked and the rod end setting be measured to facilitate the ease of its re-installation.

C. Remove the retaining screws from the 222H-9010 clamp assemblies (4 Pls), and remove the push / pull rod from the aircraft.

INSTALLATION / REPLACEMENT

A. Installation of the push / pull rod is the reverse order of its removal.

B. Re-Install the attaching bolt and nut into the heater control arm, and heater valve control valve arm. Tighten nut finger tight plus one castellation, and Install new cotter pin part # AN380-2-2.

C. Rig the push rod as defined below.

Push / Pull Rod Rigging Procedure
a. Adjust aft turnbuckle to the "full in" position.
b. Operate the valve to the full aft position.
c. The rod bend tangent must not pass beyond point "a" as shown by Fig 6-1, Adjust the aft turnbuckle outward if required to move the tangent point forward.

7. REMOVAL, INSTALLATION / REPLACEMENT OF HEATER OVER TEMPERATURE SENSORS.

REMOVAL

A. Remove BHT belly panels # 44 & 49 (see Fig. 3-1) to gain access to the heater over temperature sensors part # ES52127-1.

B. Unscrew the temperature sensor from the heater duct adapter, and remove.

Note

Test the temperature sensor prior to its being disconnected from the electrical system by applying heat from a heat gun. The switch should close at 220°F (104°C) ± 10°F (4° C) providing a ground to the overheat relay that will trip the HTR circuit breaker.

Warning

Do not use a torch or open flame to conduct this test.

C. If the temperature sensor is found to be inoperative, disconnect the terminals from the top of the sensor body, and replace sensor.

INSTALLATION / REPLACEMENT

A. Replace / reinstall in the reverse order of the removal of the temperature sensor (s).

8. PUSH / PULL ROD INSTALLATION

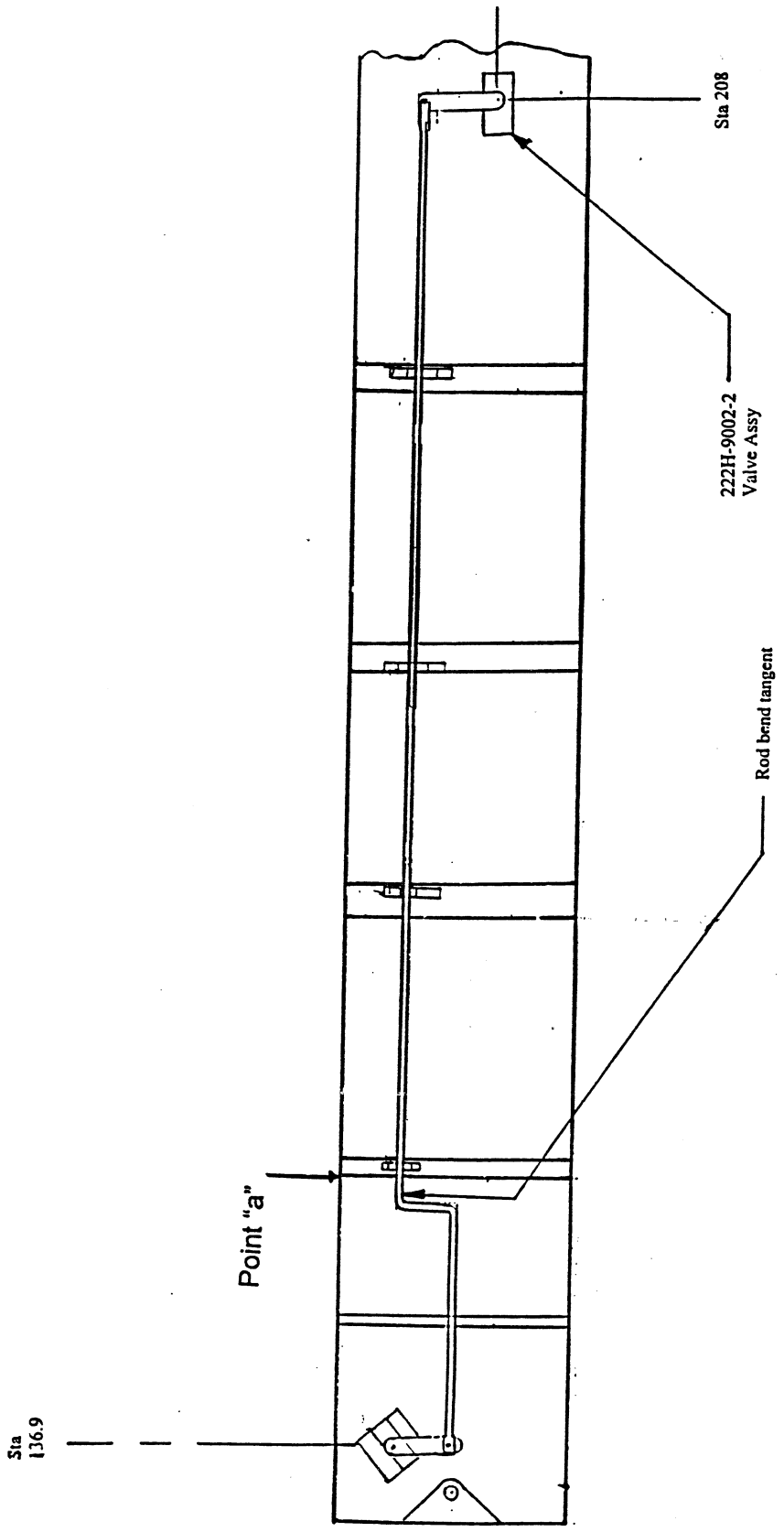

Fig 6-1 Pushrod Installation– View Looking Down On Tunnel Area

9. REMOVAL, INSTALLATION / REPLACEMENT OF S-9230EC-1 BLEED LINE DRAIN VALVE

REMOVAL

A. Remove the BHT # 42 belly panel (Fig. 3-1).

B. Remove the Drain Valve from the threaded fitting at the heater control valve inlet (Fig. 3-2).

INSTALLATION / REPLACEMENT

A. Installation of Drain Valve is the reverse order of its removal.

10. REMOVAL, INSTALLATION / REPLACEMENT BLEED LINE FITTING O-RING; P/N 2-032

REMOVAL

A. The 2-032 O-ring provides the seal for the ACC 222H-9030-20 Fitting (Fig 3-2).

B. Remove the ACC bleed air line at station 320.

C. Remove the AN3 bolt which secures the ACC 222H-9030-20 Fitting.

D. Slide the 222H-9030-20 Fitting forward to access the 2-032 O-ring.

INSTALLATION / REPLACEMENT

A. Slide the replacement 2-032 O-ring to the grove on the 222H-9030-20 Fitting.

B. Apply a thin film of high temperature RTV (Dow Corning® 732, or equivalent) to the O-ring and reinstall in the reverse order of its removal.

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11. REMOVAL, INSTALLATION / REPLACEMENT OF HEATER RETURN-AIR BOX(S)

REMOVAL

A. Remove the four screws which secure the air box inlet ring to the air box assembly.

B. Remove the inlet ring.

C. Remove the carpet trim panel.

D. Remove the air box mounting screws and remove the box assembly.

INSTALLATION / REPLACEMENT

A. Install the air box in the reverse order of its removal.

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CHAPTER 7
TROUBLESHOOTING

1. SYSTEM TROUBLESHOOTING

Prior to troubleshooting a defective system, it is advisable to conduct a visual inspection for general condition, and obvious signs of damage or failure.

The following matrix lists the easiest checks, and the most likely problems.

Problem	Probable Cause	Solution
No Heat	Bleed air shutoff valve(s) not open	Push heater switch to on position
No Heat	Manual heater valve in the off position	Push the heater valve to the on position
No Heat	Bleed air shutoff valve(s) have failed	Replace bleed air shutoff valve (See BHT 430 MM Manual Chapter 21)
No Heat	HTR Circuit breaker tripped	Reset breaker
No Heat (Main Cabin Only)	Passenger door outlet switch in closed position	Push Passenger door outlet switch to open position
No Heat (Main Cabin Only)	Passenger door shutoff valve(s) failed	See BHT 430 MM Manual Chapter 21
No Heat / HTR Circuit Breaker Tripped	Heater return air box(s) blocked causing the overtemp sensor to trip.	Remove any obstruction from the air path of the return air box(s)
No Heat / HTR Circuit Breaker Tripped	Heater duct blocked forward or aft of ejector	Remove obstruction from heater ducting
No Heat / HTR Circuit Breaker Tripped	Over Temp Sensor Failed	Replace Over Temp Sensor
Poor Performance	Leak in bleed air plumbing system	Tighten fittings that are suspected to be leaking
Poor Performance	Automatic drain valve stuck in the open position	Replace drain valve

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2. Fig 7-1 ELECTRICAL SCHEMATIC