

Air Comm Corporation
Boulder, CO 80301

S76H-204M

Installation Instructions –
Sikorsky S-76 Cabin Heater/Defroster
(Flight Deck Heater, Defroster, and Cabin Heater)

This document contains:

Installation Instructions
Weight & Balance Data
Service Manual Supplement
Flight Manual Supplement
STC Certificate

March 20, 1998

Revisions

<u>Rev</u>	<u>Date</u>	<u>Description</u>	<u>Appl</u>
A	10-11-05	Revised Page 3 of 5 Maintenance Instructions from annually to not to Exceed two years.	MS

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Introduction

This document presents a step-by-step procedure for installation of the ACC S76H-104 Cabin Heater System in the Sikorsky S-76 Helicopter. The instructions contained herein are intended to supplement the information contained on the installation drawings.

This manual provides additional information which is required for operation and maintenance of the aircraft. This data is contained in the last three sections of this report. After completion of this installation, the applicable sections are to be removed from this document and placed with the appropriate aircraft documents.

Reference Documents

Air Comm Corporation installation drawings:

- S76H-104; General Arrangement – Sikorsky S76 Cabin Heater
- S76H-520; Installation – S76A Bleed Air Plumbing, Flight Deck & Cabin Heater
- S76H-522; Installation – S76B Bleed Air Plumbing, Flight Deck & Cabin Heater
- S76H-524; Installation – S76C Bleed Air Plumbing, Flight Deck & Cabin Heater
- S76H-554; Installation – Heater Control Valve
- S76H-906; Installation – Flight Deck Heater
- S76H-965; Installation – Windshield Defroster

Installation Instructions

General Procedures

Before beginning the installation, it is suggested that the installer review the contents of this document and all drawings. Both the notes and the drawing details should be reviewed.

To insure that all drawing details are accomplished, it is suggested that these details be marked through with a "highlighter" as the installation progresses.

To accomplish the installation it is necessary to remove the headliner panels between Stations 120 and 215 and the floor panels between Stations 83 and 148.

Installation Procedures

The installation details are provided by the referenced installation drawings. The following step-by-step procedure is intended to supplement the data presented by the drawing.

1. The plumbing system should be installed first by starting at the station 215 bulkhead.
2. The tubing sections should be installed loose from station 215 to the valve installation.

Note

Form tubes as required to achieve tube fit alignment. Exact location of bulkhead penetrations should be determined by tube geometry.

Note

Install tube joint insulation (Firesleeve) Sections (see Dwg S76H-520 / 522 / 524) before joining tube sections.

3. Locate and install valve assembly according to drawing S76H-554.
4. Clamp plumbing from station 214 to the valve assembly.
5. Install plumbing to heater ejector assemblies.

Installation Instructions (cont'd)

Installation Procedures (cont'd)

6. Connect Flight Deck Heater Ejectors to plumbing and locate ejectors.

Note

Location of Flight Deck heaters is determined
After connection to plumbing (see Dwg S76H-906).

7. Connect plumbing to cabin heaters and locate Cabin Heater Ejectors.
8. Complete Cabin Heater installation.
9. Tighten all plumbing fittings and leak check using "shop air."
10. Drill two .50 Dia holes in floor panel for valve stem access. Also notch floor panel as required to provide clearance for the S-9837-8 Tube Assembly (Station 120). Edge seal all panel "cutouts" according to Sikorsky Service instructions.

Weight and Balance Data

Adjust aircraft licensed empty weight and CG as follows:

<u>Item</u>	<u>P/N</u>	<u>Wt.</u> <u>lb.</u>	<u>Arm</u> <u>(in)</u>	<u>Moment</u> <u>(In-lbs.)</u>
S76A Flight Deck & Cabin Htr. W/Defroster (Factory Heater Removed)	S76H-104-1	34.05	116.2	3957
S76A Flight Deck & Cabin Htr. W/Defroster (Factory Heater Not Removed)	S76H-104-2	34.05	116.2	3957
S76B Flight Deck & Cabin Htr. W/Defroster (Factory Heater Removed)	S76H-104-3	34.05	116.2	3957
S76B Flight Deck & Cabin Htr. W/Defroster (Factory Heater Not Removed)	S76H-104-4	34.05	116.2	3957
S76C Flight Deck & Cabin Htr. W/Defroster (factory heater removed)	S76H-104-5	34.05	116.2	3957
S76C Flight Deck & Cabin Htr. W/Defroster (factory heater Not removed)	S76H-104-6	34.05	116.2	3957

Service Manual Supplement

AIR COMM CORPORATION
Boulder, CO 80301

Document No. S76H-204M

INSTRUCTIONS FOR CONTINUED AIRWORTHINESS

for the

Sikorsky S-76A,B& C Flight Deck & Cabin Heater- W/ Defroster

March 20, 1998

Service Instructions
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Heater Ejector Acoustical Foam	

INTRODUCTION

This document provides maintenance and service information for the ACC S76H-104 cabin heater installation in the Sikorsky S-76 series helicopter.

REFERENCE DOCUMENTS

1. Sikorsky Service Instructions.
2. AC43.13.1A, Acceptable Practices, Aircraft Alternation and Repair.
3. ACC Drawings:
 - S76H-104; General Arrangement – Sikorsky S76 Cabin Heater
 - S76H-520; S-76A Bleed Air Plumbing, Flight Deck & Cabin Heater Installation
 - S76H-522; S-76B Bleed Air Plumbing, Flight Deck & Cabin Heater Installation
 - S76H-524; S-76C Bleed Air Plumbing, Flight Deck & Cabin Heater Installation
 - S76H-554; S-76 Installation- Heater Control Valve
 - S76H-906; Installation-Flight Deck Heater
 - S76H-965; Installation- Windshield Defroster

SYSTEM DESCRIPTION AND OPERATION

The ACC cabin heating system is a “bleed air” type, which consists of bleed air plumbing, a manually controllable bleed airflow control valve, and ejectors. This system is shown schematically on page 5.

The ACC heater system is installed either as an addition or as a replacement for the existing factory installed heater or ECU.

The original factory bleed air plumbing to the heater or ECU connection is retained. This includes the engine bleed port restrictors, check valves, firewall shutoff valve and stainless steel flex hose.

MAINTENANCE INSTRUCTIONS

Conduct the following inspection functions in conjunction with Sikorsky standard interior inspection practices. All inspections must not extend beyond two years from the previous inspection.

1. Inspect valves for – mounting security, leakage (some leakage is acceptable), and freedom of operation.
2. Inspect bleed plumbing for corrosion, insulation and security.
3. Verify security of control knobs and placards.
4. Remove Heater Ejectors. Inspect Nozzles for evidence of deterioration.
5. Verify that all placards are located where required.
6. Remove and replace the Acoustical Foam Liner from the S-9802 and S-6460 Ejector Assemblies if deterioration is evident.
7. Verify function and operation of the S-9230EC-1 Drain Valve Assembly. The valve should be disassembled, cleaned, and inspected for corrosion. The valve should open so that it will allow water to drain at or below 10 psi. The valve should be closed at pressures above 10 psi.

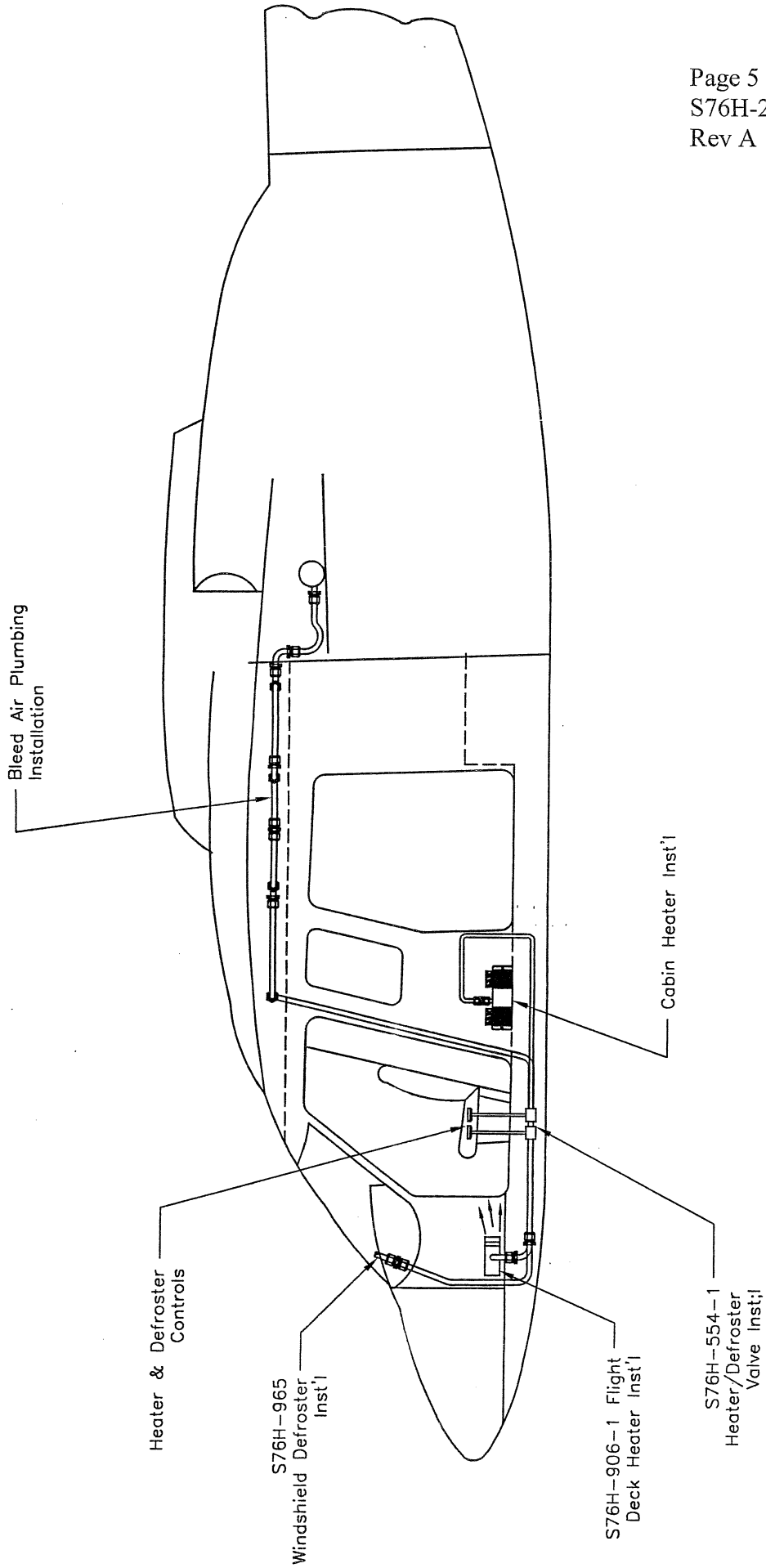
Note

The ACC cabin heater system is installed in combination with components of the original Sikorsky heater system. Therefore, the related sections of the Sikorsky Service Instructions are applicable when the ACC system is installed.

Maintenance Instructions (cont'd)

Spares List

<u>Item No.</u>	<u>Description</u>	<u>P/N</u>
1	Heater Control Valve Assy	S-9878-3
2	Placard (cabin heater)	S-9868-11
3	Placard (heater operation)	S-9868-14
4	Placard (flight deck htr. Defroster)	S-9868-15
5	Flight Deck Heater Ejector	S-9802-3
6	Cabin Heater Ejector (LH)	S-6460-1
7	Cabin Heater Ejector (RH)	S-6460-2
8	Drain Valve Assembly	S-9230EC-1



General Arrangement -S76H-104 Flight Deck & Cabin Heater System

Appendix A

SERVICE INSTRUCTIONS

No. SI-S76H-6

Date: October 17, 1995

Subject: Removal and Replacement Procedures – Heater Ejector Acoustical Foam

Applicability: S-76A, S-76B & S-76C Helicopters which are equipped with the ACC S76H-104 Cabin Heater System.

References:

Air Comm Corporation drawing S76H-104
FAA STC No. 4057NM

Effectivity:

Compliance with the rework instructions specified in this document is at the discretion of the operator.

Discussion:

The referenced cabin heater ejector assemblies are lined with a special acoustical Foam Rubber. This material is bonded in place using RTV.

It has been determined that the foam rubber degrades after several years of service.

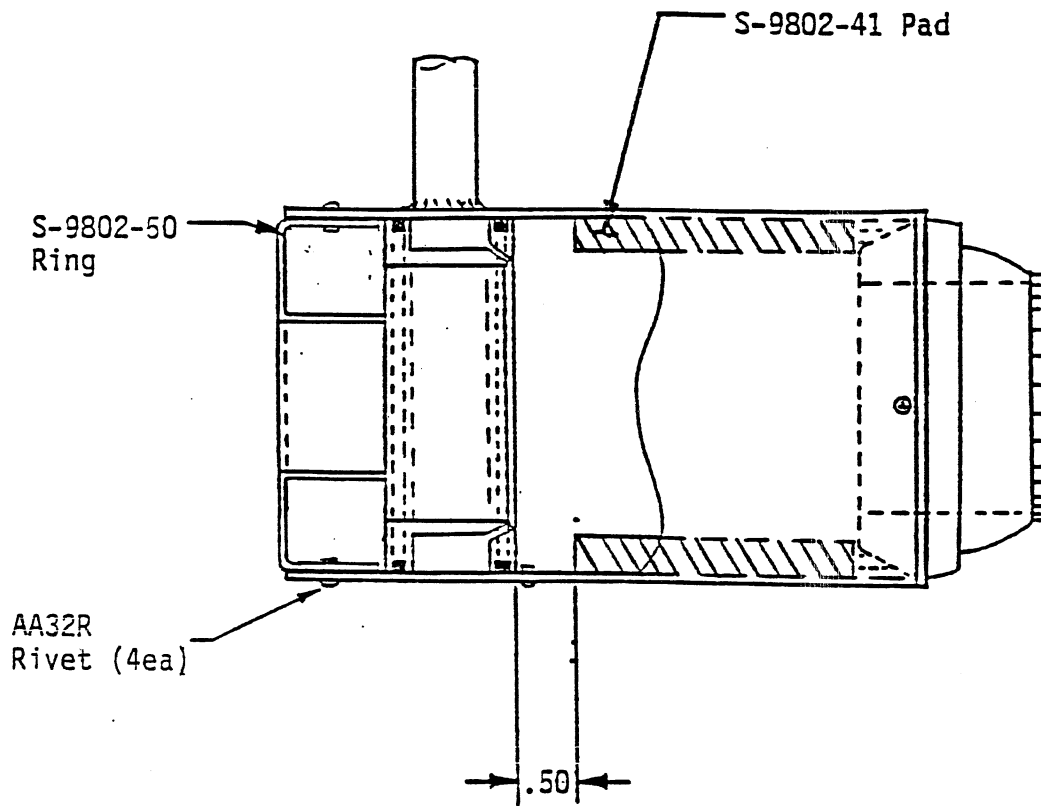
It is recommended that this material be replaced periodically to ensure proper operation of the Heater Ejectors.

SI-S76H-6 Kit List

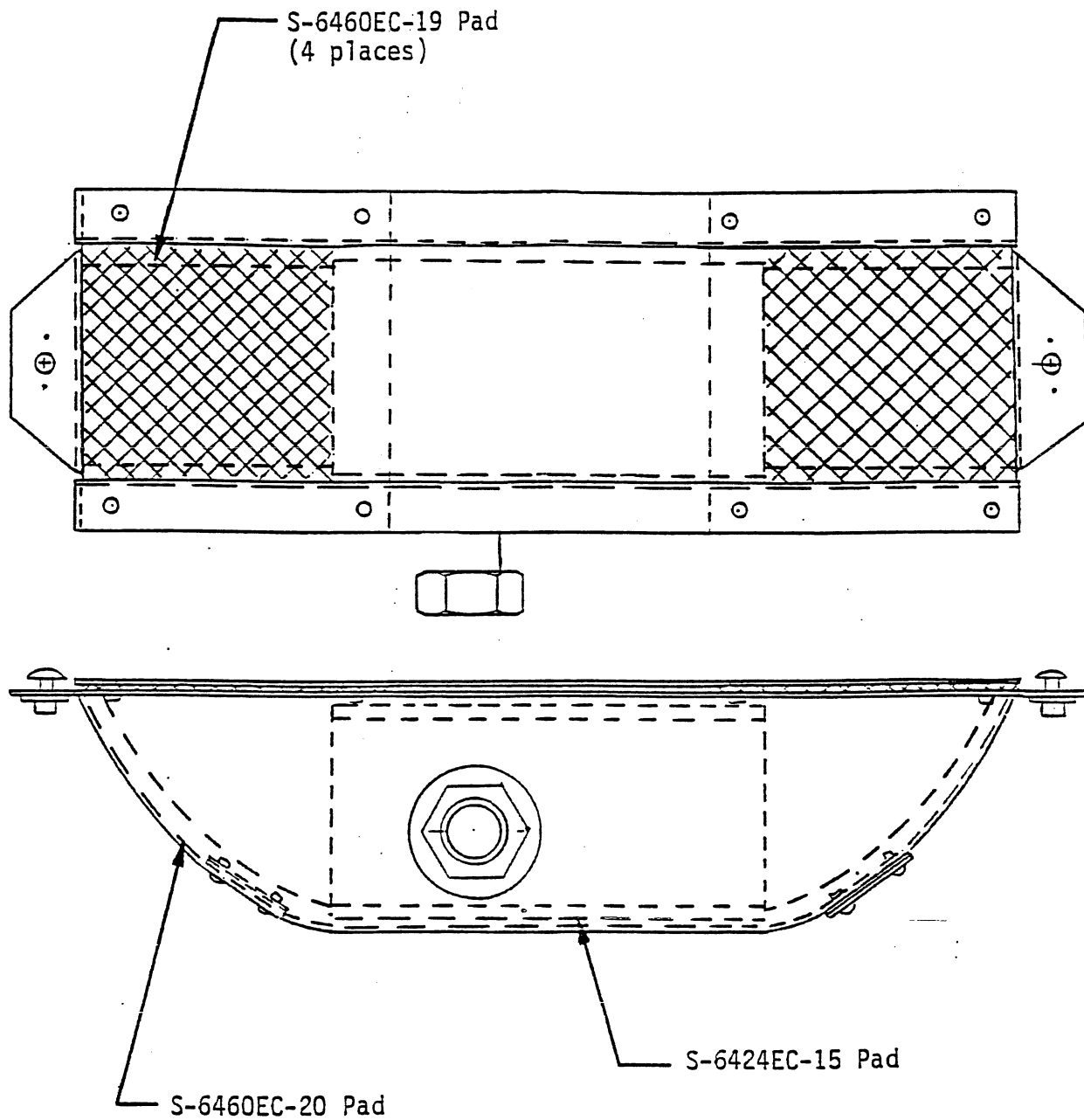
<u>Item</u>	<u>P/N</u>	<u>Description</u>	<u>Qty Rqd</u>
1	S-9802-50	Ring	2
2	S-9802-41	Pad	2
3	S-6460EC-19	Pad	4
4	S-6460EC-20	Pad	2
5	S-6424EC-15	Pad	2
6	AA32R	Rivet	4

Rework Instructions;

1. Thoroughly clean the Acoustical Foam faying surfaces prior to bonding. Wipe with MEK or Isopropyl Alcohol.
2. Bond Acoustical Foam parts in position shown using RTV.



S-9802EC-3 Ejector Assembly



S-6440EC-2/-3 Heater Assembly

Flight Manual Supplement

AIR COMM CORPORATION
BOULDER MUNICIPAL AIRPORT
3300 AIRPORT ROAD
BOULDER, CO 80301

SIKORSKY *
MODELS S-76A, S-76B & S-76C

FLIGHT MANUAL SUPPLEMENT
FOR
BLEED AIR CABIN HEATER

S76H-104

FAA APPROVED

The information contained in this document is FAA approved material, which must be carried in the basic Flight Manual after the rotorcraft has been modified by installation of the cabin heater system in accordance with Air Comm Corporation, STC No. SH4057NM.

The information in this document supplements or supersedes the basic manual only in the items contained herein. For limitations, procedures, and performance data not contained in this supplement, consult the basic Flight Manual.

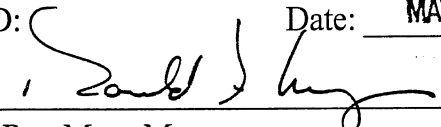
*Includes S-76A modified by installation of Arriel engine (see Sikorsky STC SH568NE).

FAA APPROVED MAY 14 1998

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MODEL S-76A, S-76B & S-76C
FLIGHT MANUAL

Bleed Air Cabin Heater

LOG OF REVISIONS				
Original0				
Rev. No.	Log of Pgs.	Pgs Rev.	Date	Approval
0	1-9		MAY 14 1998	
FAA APPROVED: _____ Date: <u>MAY 14 1998</u> Approved: <u></u> Ron May, Manager Denver Aircraft Certification Office, Northwest Mountain Region, Denver, Colorado				

FAA APPROVED
SUPPLEMENT

MODEL S-76A, S-76B & S-76C
FLIGHT MANUAL

Bleed Air Cabin Heater

Introduction

The S76H-104 cabin heating system is a bleed air type which consists of a bleed air plumbing system, a manually operated heater control valve and a system of heater ejectors. The system also includes a windshield defroster system. The system general arrangement is shown by Figure 1.

The system is available with flight deck and cabin heaters and a windshield defroster system.

The system is approved for installation as a supplement to the existing bleed air heater or ECU, or with the existing system removed. If the factory installed heater system is removed, the bleed air shut-off valves must be retained. In addition, the heater "low bleed air pressure" system is retained. The low pressure system includes the engine bleed low pressure switch, the heater shutoff valves, and the engine bleed air advisory light system. This system automatically shuts the heater system off, in case of low engine bleed pressure, or loss of engine power.

Bleed air flows from the engine compressors through the heater ON-OFF valves, the bleed air plumbing, and the heater control valves to the heater ejectors. The heater ejectors mix cabin air with the bleed air and exhausts the warm air to the cabin and across the windshield. The air is circulated by the pumping action of the ejectors.

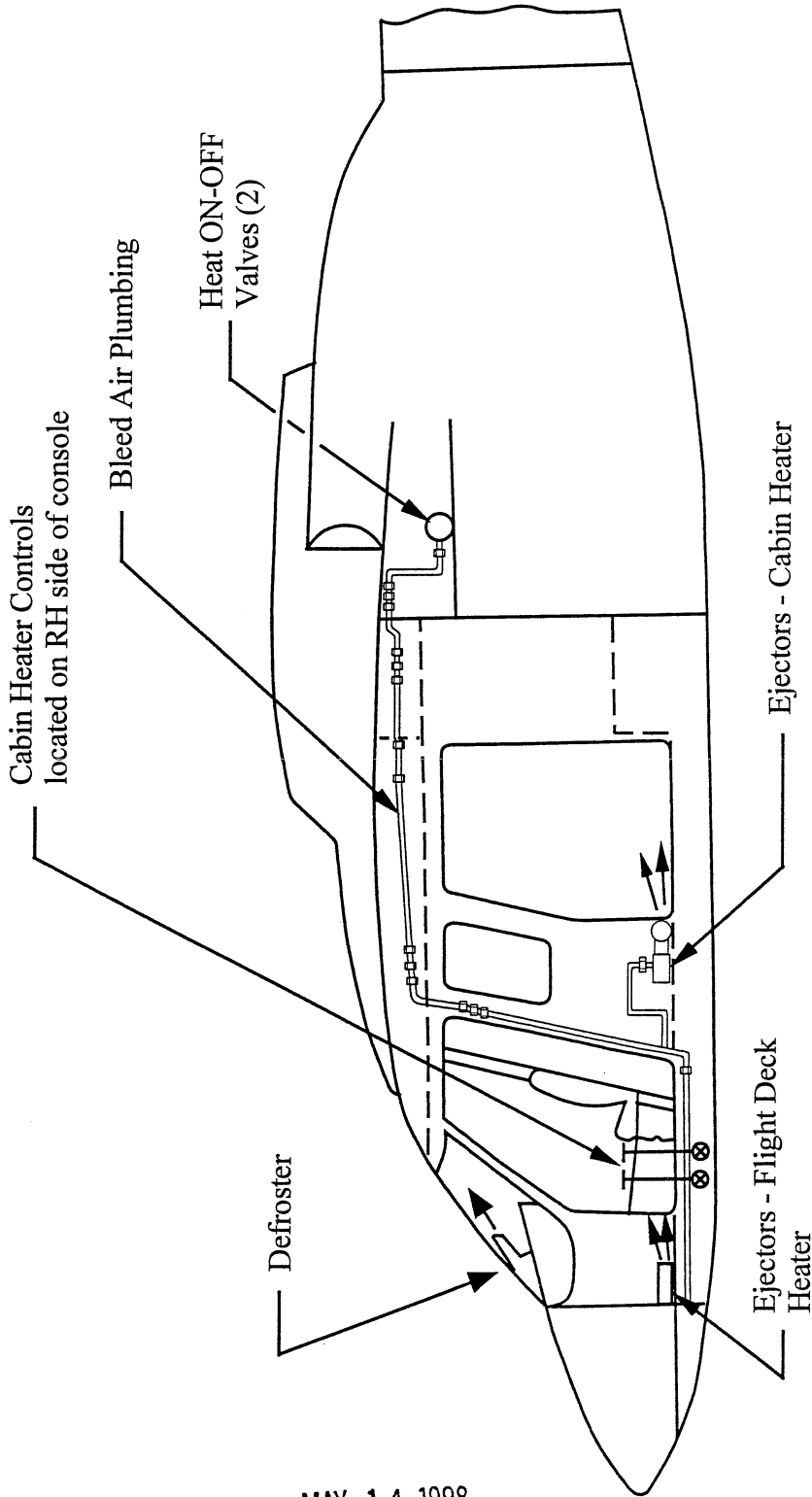


Figure 1, General Arrangement, S-76 Cabin Heater System

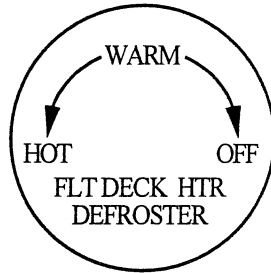
MODEL S-76A, S-76B & S-76C
FLIGHT MANUAL

Bleed Air Cabin Heater

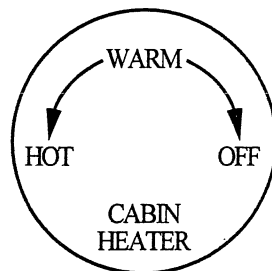
Section I

Operating Limitations

Placards and Markings:



Locate on heater control knob - RH side of center console



Located on aft heater control knob - RH side of center console

DO NOT BLOCK
HEATER VENT

LH & RH side panels directly
above heater inlets and outlets (4 total).

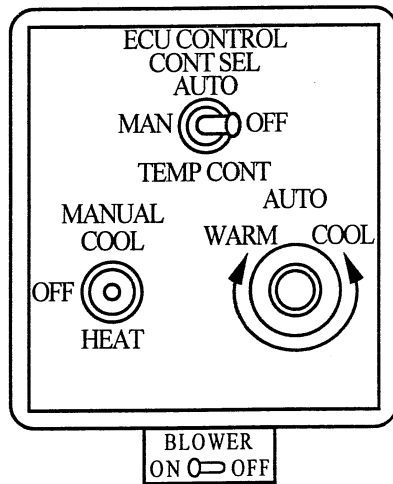
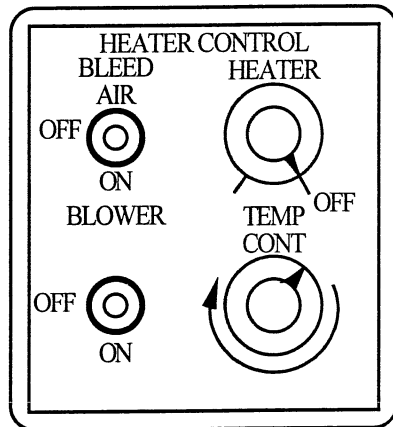
MODEL S-76A, S-76B & S-76C
FLIGHT MANUAL

Bleed Air Cabin Heater

Section I

Operating Limitations

Placards and Markings:



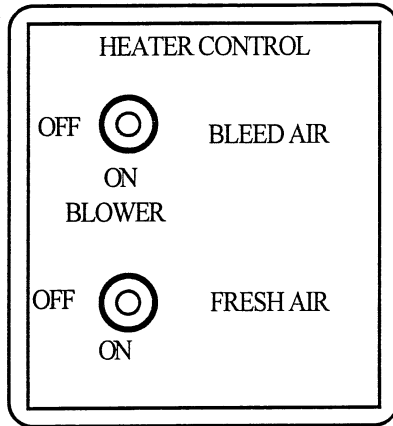
Existing Heater or ECU Control Panels if system is retained

MODEL S-76A, S-76B & S-76C
FLIGHT MANUAL

Bleed Air Cabin Heater

Section I (cont'd)

Operating Limitation



Overhead control panel if factory heater has been removed



Overhead control panel if factory ECU has been removed.

MODEL S-76A, S-76B & S-76C
FLIGHT MANUAL

Bleed Air Cabin Heater

Section II

Normal Procedures

Engine Prestart Check

Heater control bleed air switch OFF.
Heater/Defroster valves OFF.

Before Take-Off

Heater control bleed air switch OFF.
Heater/Defroster valves OFF.

In-flight Operations

Heater control bleed air switch ON as desired.
Heater/Defroster valves ON as desired.
Operate factory installed bleed air heater or ECU as desired
(if system has not been removed).

NOTE

The electrically operated bleed air valves, which are located at each engine, will automatically close if power is lost on either engine.

Descent and Landing

Heater control bleed air switch OFF.
Heater/Defroster valves OFF.

MODEL S-76A, S-76B & S-76C
FLIGHT MANUAL

Bleed Air Cabin Heater

Section III

Emergency Procedures

Operate the heater control bleed air switch and the cabin heater/defroster valves to OFF for any of the following emergencies:

- Engine failure.
- Engine over-temperature.
- Insufficient power.
- Onboard fire.

Section IV

Malfunction Procedures

No change.

Section V

No change in performance with heater OFF. Basic Flight Manual performance cannot be achieved with heater on.

STC Certificate

United States of America
Department of Transportation—Federal Aviation Administration
Supplemental Type Certificate

Number SH4057NM

This certificate, issued to Air Comm Corporation

certifies that the change in the type design for the following product with the limitations and conditions therefor as specified hereon meets the airworthiness requirements of Part 29 of the Federal Aviation Regulations.

Original Product—Type Certificate Number: H1NE
Make: Sikorsky Aircraft
Model: S-76A, S-76B, S-76C

Description of the Type Design Change:

Installation of bleed air cabin heater and windshield defrost system in accordance with Air Comm Corporation Drawing List DL-S76H, Revision H, FAA approved December 15, 1994, or later approved revision.

Limitations and Conditions:

1. FAA Approved Flight Manual Supplement S76H-100, dated December 16, 1994, or later approved revision is required.
2. FAA Approved Flight Manual Supplement S76H-102, dated December 31, 1997, or later approved revision is required for the S-76C without the windshield defrost system installed.
3. FAA Approved Flight Manual Supplement S76H-104, dated May 14, 1998, or later approved revision is required when the windshield defrost and cockpit heater controls are common and a separate control is provided for cabin heat.
4. Approval includes Model S-76A with the Arriel engine installed in accordance with STC SH568NE.
5. Approval of this change in type design applies to the above model aircraft only. This approval should not be extended to aircraft of this model on which other previously approved modifications are incorporated unless it is determined that the relationship between this change and any of those other previously approved modifications, including changes in type design, will introduce no adverse effect upon the airworthiness of that aircraft. A copy of this Certificate shall be maintained as part of the permanent records for the modified aircraft.
6. If the holder agrees to permit another person to use this certificate to alter the product, the holder shall give the other person written evidence of that permission.
7. A copy of this Certificate and Flight Manual Supplements, or later FAA approved revision, must be maintained as part of the permanent records for the modified aircraft.

This certificate and the supporting data which is the basis for approval shall remain in effect until surrendered, suspended, revoked, or a termination date is otherwise established by the Administrator of the Federal Aviation Administration.

Date of application: September 5, 1989

Date reissued:

Date of issuance: October 4, 1989

Date amended: 12/22/89, 12/16/94, 12/31/97, May 14, 1998



By direction of the Administrator

(Signature)
RONALD F. MAY Manager
Denver Aircraft Certification Office
Northwest Mountain Region, Denver, Colorado
(Title)

Any alteration of this certificate is punishable by a fine of not exceeding \$1,000, or imprisonment not exceeding 3 years, or both.

This certificate may be transferred in accordance with FAR 21.47.