Air Conditioning System Installation Manual

For MD 600N
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Getting Started

The air conditioning system installation instructions are laid out step-by-step starting with one (1) thru nine (9) for installation and ten (10) thru fifteen (15) for care and airworthiness, the instructions are designed to be easy – to – use.

The example below is designed to give you a basic overview of how the steps work.

Example: A. In the step below there is a number 5.1 The “5” stands for step 5 and the “1” stands for direction 1.

Installation of Aircraft Systems

Example: B. When the parts are called out in a step: 5.1, locate the part and parts that go with this step (5.1). It is best to organize your parts by step numbers so they can be drawn from as needed.

| 5.1  | Position the aft evaporator doubler, P/N 261370, on the upper transmission deck per the dimensions shown on drawing number 4-1EC130. Mark and remove all existing rivets, bolts, and nut plates to allow the doubler to sit flat on deck. |

Should you have any questions, problems or need technical support, do not hesitate to call, fax, E-mail, or write us:

Phone: 1-888-545-8371  
E-Mail: info@rotorcraftservices.com  
Fax: 1-817-624-6603
Integrated Flight Systems
KIT INVENTORY LIST- 600N Air Conditioning

Step 1

Kit Inventory List
Sales Order Number:________________________

Shipping Date:________________________________

Kit S/N Number:______________________________

Kit Model Number:____________________________

Customer:____________________________________

Customer PO:________________________________

Kit Specifics:__________________________________

_____________________________________________________________________

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## PARTS ASSEMBLIES

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## Refrigerant Hose Assemblies
(R-134a compatible)

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## INTEGRATED FLIGHT SYSTEMS
### KIT INVENTORY LIST 600N-00-011

| OIL BLOWER MODIFICATION | 8-600N 2 OF 2 | 1 |

## PAPERWORK

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CONDENSER BLOWER S/N: __________________________

AFT EVAPORATOR BLOWER S/N: ______________________

COMPRESSOR S/N: ________________________________
Step 2

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

Supplemental Type Certificate

Number  SRO9178RC

This certificate issued to
Integrated Flight Systems
6345 Blue Gill Dr.
Meadow Lake Airport
Falcon, CO 80831

certifies that the change in the type design for the following product with the limitations and conditions thereof as
specified herein meets the airworthiness requirements of Part 27 of the Federal Aviation Regulations.

Original Product - Type Certificate Number:  H3WE
Make:  McDonnell Douglas
Model:  600N

Description of Type Design Change:  Installation of a vapor-cycle air conditioning system with
a belt driven compressor, in accordance with Integrated Flight Systems, Inc., Master
Drawing list DL-44, Revision A, dated July 22, 1997, or later FAA approved revisions.

Limitations and Conditions:  FAA approved Rotorcraft Flight Manual supplement for 600N Air-
Conditioning dated October 21, 1997 or later FAA approved revision is required. Any
modification to the Electrical wire routing and/or electrical equipment modifications
for this installation shall require EMI testing including EMI effects on Full Authority
Digital Electronic Control (FADEC). Instructions for Continued Airworthiness dated
October 7, 1997, or later FAA accepted revision is required for this installation.
Compatibility of this design change with previously approved modifications must be
determined by the installer. 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.

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:  April 21, 1997
Date of issuance:  October 21, 1997
Date reissued:
Date amended:

By direction of the Administrator

(Signature)

Carl F. Mittag, Manager
Rotorcraft Certification Office
Southwest Region

(Title)

Any alteration of this certificate is punishable by a fine of not exceeding $10,000, or imprisonment not exceeding 3 years, or both.

FAA Form 8110-2130-051  Page 1 of 2  This certificate may be transferred in accordance with FAA 21.47.
Step 3

Flight Manual Supplement
INTEGRATED FLIGHT SYSTEMS, INC.
MEADOW LAKE AIRPORT
8345 BLUE GILL DRIVE
FALCON, CO 80831

FAA APPROVED

HELICOPTER FLIGHT MANUAL SUPPLEMENT

FOR

McDONNELL DOUGLAS HELICOPTER SYSTEMS

MODEL: 600N

REGISTRATION NO.:

SERIAL NO.:

This supplement must be attached to the FAA approved Rotorcraft Flight Manual dated MAY 15, 1997, when an Integrated Flight Systems, Inc., air conditioning system is installed in accordance with Supplemental Type Certificate number SR09178RC. The information contained herein supplements the basic Rotorcraft Flight Manual only in those areas listed. For limitations, procedures, and performance information not contained in this supplement, consult the basic Rotorcraft Flight Manual.

FAA APPROVED: [Signature]

Mr. Carl Mittag
Manager, Southwest Region Certification Office ASW-170
Ft. Worth, Texas 76193-170

DATE: OCT 21 1997
LOG OF REVISIONS

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NOTE: Revised portions of affected pages are identified by vertical black line in the margin adjacent to the change.

FAA APPROVED: OCT 21 1987
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1.0 GENERAL

1.1 System & Description

- The air conditioning installation consists of a vapor cycle (R-134a) air conditioning system featuring a belt driven compressor.

- The system as supplied, may be used without any heater installed. It is a stand alone system.

- The air conditioning system provides for cabin comfort during all operations both on the ground and in flight. During ground operations when the engine is running, cooling may be provided. Controls for the air conditioning system are located forward of the pilot for ease of use.

Two switches are provided. The Master control Selector consists of a rocker type switch, labeled "A/C", "OFF", and "FAN". Selecting the "A/C" position turns on the system's evaporator fans, and after a delay of several seconds the condenser blower, and belt driven compressor clutch. The second rocker switch provides for "HIGH" and "LOW" evaporator fan speed selection for the cockpit.

A rocker switch in the aft cabin provides blower speed control for passengers.

2.0 OPERATING LIMITATIONS

- The air conditioning system must be "OFF" during engine start.

- Operation of the air conditioning system is prohibited if the total electrical load will exceed 140 amps, continuous.
3.0 EMERGENCY PROCEDURES

- In the event of an engine failure, turn air conditioner "OFF", if time/crew workload permits.

3.1 D.C. Generator Failure

- Air conditioning - "OFF".

3.2 Excessive Temperature, Fire, Smoke.

In the event of any of the following, turn air conditioner "OFF".

1. Cabin or other fire.
4.0 NORMAL PROCEDURES

4.1 Ground Operation - Generator ON

- To turn air conditioner "ON" - Move switch to "A/C". Prior to "ON" ensure ammeter indicates 100 amps or less

- To turn air conditioner "OFF" - Move switch to "OFF".

- For air circulation without cooling - Move switch to "FAN".

- Select desired blower speed for cockpit.

- Select desired blower speed for cabin.

4.2 Ground and Flight Operations

- Ventilation Control - As desired. (Close windows for cockpit/cabin cooling.)

- Air Conditioning Control Switch - As desired.

- Air conditioning Fan Speed Control Switches - As desired. (cockpit and cabin)

- Monitor Electrical Load to ensure that it remains within approved limits.
5.0 PERFORMANCE

Air Conditioner must be "off" for take offs and landings above 9,000 feet pressure altitude.

6.0 WEIGHT and BALANCE

6.1 Pilot is responsible for insuring that helicopter C.G. and weight are within approved limits through each flight.
ii. Manufacturers Information

The installed unit is a vapor cycle air conditioner. Refrigerant utilized is the EPA approved R-134a. The compressor is belt driven utilizing a "custom designed flat belt". Point of drive is an IFS pulley just forward of the rotor brake. Compressor is mounted on the upper deck.

The system features dual evaporators, one for the cockpit located forward of the radio/instrument console and another under the right side cockpit seat. Separate fans are provided for each evaporator. Each contains multi speed blower motors.

The condenser is mounted above the cabin roof, forward of the mast.

Thermostatic temperature control is not provided.

Dual refrigerant pressure safety switches are provided. A high pressure safety switch disengages the compressor and stops operation of the refrigeration cycle in the event of excessive pressure. This can occur due to failure of the condenser blower or restricted condenser air intake.

A low pressure switch of similar design protects the system due to loss of refrigerant. Both switches will automatically reset.

However, the system will NOT cycle on again when the safety pressures are again within the preset perimeters, as in older IFS designs. In the "new" design a 1 amp circuit breaker is "TRIPPED" by a single occurrence of either a low or high pressure fault. The pilot can not reset the circuit breaker in flight.

Service ports, both high and low, are provided on the belly of the helicopter, just under the battery location. They are accessible through a hinged door. A sight glass is also provided.

The evaporator fan system may be used anytime air circulation is desired. This is accomplished by placing the selector switch in the "FAN" position.

System electrical protection is provided by two (2) each 15 amp, one (1) each 20 amp and one (1) each 1 amp circuit breakers, labeled EVAP, EVAP, COND and RESET in the Air Conditioning Master Electrical Control Panel. This panel is located just below the horizontal shelf, forward of the radio console. A 50 amp Master Air Conditioning system circuit breaker is provided next to the A/C control switches located immediately in front of the pilot's position. If this circuit breaker is pulled for any reason, all electrical power to the air conditioning system is disconnected.
ii. **Manufacturers Information** continued;

A "soft start mode" is provided electrically for this system. When the Master control selector labeled "A/C" is turned to "ON", both evaporator fans, having a total electrical requirement of 20 amps are immediately energized. A few seconds later, the condenser blower and compressor clutch are energized, which requires another 21 amps of electrical system capacity. Due to this "Delay Feature", electrical system "soft start" is provided.

iii. **Electrical Loading**

The maximum electrical requirements of the basic air conditioning system are as follows:

- Condenser Blower 1 each @ 13 amps = 13 amps
- Compressor Clutch 1 each @ 2 amps = 2 amps
- Evaporator Fan (forward) 1 each @ 7 amps = 7 amps
- Evaporator Blower 1 each @ 13 amps = 9 amps

**TOTAL SYSTEM** 41 AMPS
Step 4

Instructions for Continued
Airworthiness
INTEGRATED FLIGHT SYSTEMS, INC.

INSTRUCTIONS FOR CONTINUED AIRWORTHINESS

600N

VAPOR CYCLE AIR CONDITIONING KIT P/N 600N-00-011

REPORT 600N

ORIGINAL ISSUE

July 22, 1997

Prepared by:
Integrated Flight Systems, Inc.
8345 Blue Gill Dr.
Meadow Lake Airport
Falcon, Co.  80831
INSTRUCTIONS FOR CONTINUED AIRWORTHINESS

LOG OF ACCEPTED REVISIONS

Integrated Flight Systems, Inc. Instructions for Continued Airworthiness for MD600N rotorcraft have been reviewed and found to be acceptable to the Administrator. For the purpose of these instructions for Continued Airworthiness (ICA), acceptable to the Administrator means the ICA contains the applicable requirements specified in Appendix A to Federal Aviation Regulations Part 27 or 29, as appropriate, do not contain any incorrect references, and contain a Cover Page, Log of Accepted Revisions, Revision Control Procedure and Record of Revisions, a List of Effective Pages, and a Table of Contents. No determination as to correct spelling, proper grammar, or accuracy of the information was made by FTW-AEG.

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INSTRUCTIONS FOR CONTINUED AIRWORTHINESS

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05-00-00 GENERAL - TIME LIMITS/INSPECTIONS

6-1 Time Limits/Inspections - General

A. The checks, oil and lubricant changes, inspections and overhauls specified in Chapter 05 must be accomplished no later than the time limits specified in Sections 05-11-00, 05-12-00, 05-13-00 and 05-14-00 to ensure Continued Airworthiness of the Helicopter.

B. This chapter specifies certain actions to ensure the serviceability of the equipment. For the purposes of this section, "checks" can be accomplished by pilots or technicians, and "inspections" must be accomplished by maintenance technicians. All personnel shall have this and other documents available and shall be appropriately certified and or trained to accomplish the tasks.

6-2 Scheduled Checks and Inspections - General

A. The scheduled checks and inspections listed in this section are to be accomplished latest on reaching corresponding operating time of helicopter.

B. If the operating times of parts or components differ from those of the helicopter, then the operating times of these parts or components are applicable.

C. Inspection points of scheduled checks and inspections may be performed earlier. For this make sure that the specified time limits are not exceeded for those measures accomplished in advance.

6-3 Further Scheduled Measures - General

A. Section 05-12-00 contains the time limits for lubricant change.

B. Section 05-13-00 contains the time limits for overhaul-components. Overhauls are to be performed by the STC holder.

C. Section 05-14-00 contains the time limits for storage of parts and components.
6-4 Unscheduled Inspection - General

A. Section 05-11-00, 6-7 contains the Conditional Inspections to be performed after specific operational incidents either prior to the next flight or after specified time intervals. These Conditional Inspections ensure that airworthiness will be maintained between specific maintenance activities.

B. Section 05-11-00, 6-8 contains the Conditional Inspections that are to be performed as a result of specific maintenance activities.

6-5 Ground Run and Functional Check Flight - General

A. Section 21-00-00 contains the procedures for ground run and functional check flight for models 600N with this equipment installed. These serve to test the function and performance of the helicopter systems and equipment.

6-6 Information on Time Limits - General

A. All time limits requiring maintenance procedures are contained in Sections 05-11-00, 05-12-00, 05-13-00 and 05-14-00.

B. Time limits are defined as follows:

(1) If time limits are expressed in flight hours (Fh) they generally apply to the flight hours of the helicopter. If the flight hours are related to parts and components, this is explicitly stated. Flight hours are defined as the time between takeoff and landing of the helicopter.

(2) If time limits are expressed as calendar time, they generally apply to the helicopter. If the calendar time is related to parts and components, this is explicitly stated. Calendar time is the interval between mandatory checks, inspections and overhauls expressed in months (mo) or years (y).

C. Exceeding of time limits is defined as follows:

(1) Time limits can not be exceeded. If time limits are inadvertently exceeded, the over-the-limit times should be subtracted from the next check or inspection time interval.
Support Documentation

A. Below is listed additional documentation referenced in this manual (that is required to support this equipment.

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05-11-00 TIME LIMITS - SCHEDULED INSPECTIONS

6-1 Preflight Check - Time Limits

A. The Preflight Check is to be performed prior to the first flight of the day.

B. The Preflight Check is to be accomplished according to 05-21-00, 6-1.

6-2 Complementary Checks /Inspections - Time Limits

NOTE: Different time intervals apply to the complementary checks.

A. Every 50 flight hours a complementary check is to be performed according to 05-21-00, 6-2.

The time limit of 50 flight hours may not be exceeded.

If performed at the same due time, the Complementary Check every 50 Fh is done in addition to any other checks due.

6-3 Annual/100 Fh Inspection - Time Limit

A. A annual/100 Fh Inspection is to be performed according to section 05-21-00, 6-3

6-4 Intermediate Inspection - Time Limits

A. An Intermediate Inspection is to be performed according to section 05-21-00, 6-4;

- after 500 flight hours TSN and then each 500 flight hours.

The time limit of 500 flight hours may not be exceeded.

B. If performed at the same due time, the Intermediate Inspection is done in addition to any other inspections.

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6-7 Conditional Inspections after Operational Incidents - Time Limits

A. After any operational incident involving hard landings, sudden stoppage of the drive train or water immersion, the system must not be operated unless all requirements, inspections and overhauls are performed in accordance with Chapter 05-00-00.

B. Notification of incident must be made to the STC holder for additional requirements.

6-8 Conditional Inspections after Maintenance Activity - Time Limits

A. None
6-1 Lubrication of compressor pulley bearing - Time Limits

A. The pulley bearing is to be lubricated, according to 21-00-00, 3-5

- after 500 flight hours TSN or 24 months TSN, whichever occurs first.
6-1 Overhauls - Time Limits

A. After Time Between Overhaul (TBO) of a component has expired, the component must be removed and replaced by a new or overhauled component.

A scheduled inspection has no influence on the TBO of a component.

B. The given time limits may not be exceeded.

C. The TBO for specific components is given below.

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* Components must be returned to the STC holder for overhaul.
9-1 Storage Compressor - Time Limits

A. If the compressor is not operated within 2 years after installation, the compressor must be inspected in accordance with the 12 month inspected in this section.

9-2 5" Vane Axial Blower - Time Limits

A. If the 5" vane axial blower is not operated within 2 years after installation, the blower must be inspected in accordance with the 12 month inspection in this section.
6-1 Preflight Check - System

A. The preflight check shall be accomplished in accordance with this guide by a qualified technician.

The preflight check is not a detailed mechanical inspection, but essentially a visual check of the helicopter for correct condition.

The check shall be completed before the first flight of the day.

When unusual local conditions dictate, the extent and/or frequency of this check shall be increased as necessary to promote safe operation.

B. System Check:

The exterior check is laid out as walk-around check, starting forward right at the pilot's door, proceeding clockwise to the tail boom, to the left hand side (including the upper and lower areas of the helicopter) and is completed at the helicopter nose area.

Steps:

1) Check the security of mounting of the compressor to the airframe.

2) Check security of the condenser above the cabin roof and it's attachments.

3) Visually inspect condition of drive belt.

4) Inspect air outlets for condition and operation.

5) Blank

6) Blank
VAPOUR CYCLE AIR-CONDITIONING

6-2 Complementary inspection every 50 Flh.

A. This inspection is to be accomplished by a qualified technician.

B. In conjunction with this inspection, perform a complete pre-flight in accordance with 6-1 of this section.

STEPS;

1) Remove the upper condenser shroud and inspect the entire assembly for security, including support brackets and attachment fittings.

2) Inspect mounting of the condenser blower.

3) Visually inspect the security of the compressor and mount.

4) Reinstall shroud and return aircraft to service, making appropriate entries in the aircraft maintenance record.

6-3 Annual/100 Flh

A. This inspection is to be performed by a qualified technician.

B. In conjunction with this inspection a complete preflight and 50 hour complementary inspection are to be accomplished in accordance with this Chapter Section 6-1 and 6-2.

Steps:

1) Perform an operational test of the system in accordance with Chapter 21-00-00, Part II, 5-1.

2) Perform the functional test Part II in Chapter 21-00-00, 5-2.

3) Inspect both evaporators for security of attachment.

4) Inspect visible portions for cleanliness, security and evidence of leaks.

5) Correct any discrepancies noted.

6) Reinstall cowlings and panels and return aircraft to service making appropriate entries in aircraft maintenance record.
6-4 Intermediate Inspection - 500 FH

A. This inspection is to be accomplished by a qualified technician.

B. In conjunction with this inspection, perform the inspections contained in Sections 6-1, 6-2, and 6-3 respectively.

Steps:

1) Remove all interior panels and ceiling panels, as required, to gain access to refrigerant lines.

2) Inspect lines for chaffing, leaks and security.

3) Inspect wiring for chaffing and security.

4) Remove cover of air conditioner electrical panel assembly P/N: 540028-"C"-4 and inspect for condition.

5) On the operational test, manually trip the high and low pressure safety switches, one at a time to verify that the compressor clutch "reset" one (1) amp circuit breaker trips.
   Note: Move air conditioner switch to "off" prior to resetting breaker.

6) Comply with lubrication requirements of Section 05-12-00 as necessary.

7) Check time life limits of chapter 04-00-00. Replace components as necessary.

8) Check overhaul time limits in Section 05-13-00. Replace components as necessary.

9) Reinstall all covers and cowlings.

10) Return aircraft to service and make appropriate entries in aircraft maintenance records.
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### Vapor Cycle Air-Conditioning

#### Chapter 21 - Air-Conditioning

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### NOTE:

All servicing of the air-conditioning system involving refrigerant should be accomplished in accordance with and by Federal/State/Local rules, guidelines, and certified technicians. This guide does not qualify or authorize any person to perform servicing functions contrary to rules referenced above.
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INSTRUCTIONS FOR CONTINUED AIRWORTHINESS

VAPOR CYCLE AIR-CONDITIONING

21-00-00 TROUBLESHOOTING

1-1 General

A. References: Electrical Diagram Illustration No. MDHS 600N Sheet 3

B. Special Tools: Volt Ohm meter

C. Consumables: None

D. Procedure:

**Note:** Ground checks of electrical system requires GPU

(1) The high and low pressure safety switches should be checked if electrical power is lost to the compressor clutch. These are in series, and they should be checked from their electrical source which is the condenser/compressor circuit breaker.

(2) Always check system R134a pressure first, static pressure should read 80 to 100 PSI (or about the same in PSI as the ambient temperature in fahrenheit) as a leaking unit may have caused the low pressure safety switch to open. This switch is set at 10 to 15 PSI and requires that pressure, or greater, to close.

(3) Failure of the condenser blower or coil blockage could result in the high pressure safety switch opening. In the event either switch actuates, a one (1) amp circuit breaker in the Air-Conditioner master panel must be reset. The cause of the failure should be researched and the cause corrected.
1-2 Compressor and Drive Assy.

A. References: Electrical Diagram Illustration No. MDHS 600N Sheet 3

B. Special Tools: Air-conditioning gauges and Volt Ohm meter

C. Consumables: None

D. Procedure:

Note: Ground checks of electrical system require GPU.

(1) Install refrigerant pressure gauges with flexible hoses at the High/Low test/servicing ports located below the battery. Access is through a hinged door under the helicopter.

(2) With the aircraft operating, cycle the air-conditioner switch between the on and off positions, while visually verifying the compressor drive belt is driving the compressor. If the compressor is turning and no significant pressure changes are noted ensure that refrigerant is in the system. If all other components and systems appear to be operating normally, replace the compressor.

(3) If while the aircraft is operating, and during the actuation of the air-conditioner on-off switch, the compressor is not turning, check compressor/condenser clutch circuit breaker. If circuit breaker is in, check for power at the clutch coil. If power is present replace coil.

(4) If paragraphs 2 & 3 of this section reveal no abnormalities, contact the STC holder.
Evaporator Fans

A. References: Electrical Diagram Illustration No. MDHS 600N Sheet 3

B. Special Tools: Volt Ohm Meter

C. Consumables: None

D. Procedure:
   Note: Ground checks of electrical system requires GPU.

   (1) If either evaporator fan fails to run, confirm that the Aircraft Master Switch is in the "ON" position and the air-conditioning control switch is placed to "FAN". If the fan in question still does not run, determine that electrical power is available to the aircraft from an outside power source, such as a GPU or the aircraft power source. Inspect the circuit breakers marked "evap" in the Master Air-Conditioning Electrical Panel.

   (2) Determine if electrical power is being supplied to the wire, which is the power source to each fan's motor. If power is available, it will be necessary to test with a volt meter that electrical power is being supplied directly to the motor by the appropriate wire. If power is being supplied, and the motor is properly grounded, then it can be assumed that the motor has failed.

   (3) The fan motor may be disassembled from its housing and the screws in the motor case removed to allow removal of the motor. A replacement motor should be obtained from Integrated Flight Systems, Inc. and reinstalled in a similar manner. Do not attempt disassembly or field repair of any evaporator motor.
**Condenser Blower**

A. **References:**
   Electrical Diagram Illustration No. MDHS 600N
   Sheet 3

B. **Special Tools:**
   Volt Ohm Meter

C. **Consumables:**
   None

D. **Procedure:**

   **Note:** Ground checks of electrical system requires GPU.

1. The condenser blower may be checked by placing the Aircraft Master
   Switch "ON" and then placing the Air conditioning Control Switch to the
   "A/C" position. If the circuit breaker is not open, then power should be
   supplied directly to the condenser blower, which is mounted above the
   cabin roof, below the condenser. A time delay of 4 seconds or more may occur.

2. If air is not being exhausted, a volt meter should be utilized to determine
   if the power is being supplied through the switch and power relay to the
   appropriate wire. Check that all electrical terminals are secure and that
   power is directed to the motor's terminals. Inspect ground. If it is determined
   that the motor has failed, remove blower motor and replace with serviceable unit.
3-1 Reclaiming - Refrigerant

A. References: SAE J 1989

B. Special Tools: EPA approved reclaiming unit.

C. Consumable Materials: None

D. Procedure:

(1) Connect the EPA approved recovery unit services hoses, which shall have shut-off valves to the aircraft air-conditioning system service ports.

(2) Operate the recovery equipment as covered by the equipment manufacturers recommended procedure.

(3) Start the recovery process and remove the refrigerant from the aircraft A/C system. Operate the recovery unit until the aircraft system has been reduced from a pressure to a vacuum. With the recovery unit shut off for at least 5 minutes, determine that there is no refrigerant remaining in the aircraft A/C system. If the aircraft system has pressure, additional recovery operation is required to remove the remaining refrigerant. Repeat the operation until the aircraft A/C system vacuum level remains stable for 2 minutes.

(4) Close the valves in the service lines and then remove the service lines from the aircraft system. Proceed with the repair/service. If the recovery equipment has automatic closing valves, be sure they are properly operating.

(5) Technician shall store and use recycled refrigerant in accordance with the referenced SAE J 1989 specification. Information on proper handling of refrigerant can be obtained from:

IMACA
International Mobil Air-Conditioning Association
P.O. Box 9000
Ft. Worth, Texas 76147
Charging System

A. References: None

B. Special Tools: Evacuation pump - R134a Servicing gauge set

C. Consumable Materials: Refrigerant R134a

D. Procedure:

(1) Charging completely empty system.
   a) Install a set of charging gauges to the servicing ports and to the evacuation pump.
   b) Open both high and low pressure valves and turn pump on.
   c) Allow pump to operate until a low side gauge reading of approximately 30" of vacuum (at sea level) is obtained. Slightly less vacuum will be indicated at higher elevations.
   d) Close both valves, then turn vacuum pump off.

(2) Pressure test system.
   a) Flow a small quantity of refrigerant through system. Pressurize the system using dry nitrogen to 300 PSI. Using an electronic "Sniffer", check entire system for leaks.
   b) After leaks are located, use refrigerant reclaimer, reduce pressure to zero, and correct leaks, as necessary.
   c) Repeat steps a & b, as required, until all leaks are corrected.

(3) Adding refrigerant.
   a) Connect center hose of service gauge set to a suitable supply of refrigerant R134a.
   b) Open supply valve and purge line prior to opening low pressure servicing valve.
   c) Allow gas to flow until 50 PSI is read on gauges.
   d) Start aircraft and turn generator "ON".
   e) Open low pressure valve slowly to allow gas to flow into system.
   f) Allow gas to flow until the sight glass shows clear of bubbles. If the OAT is less than 100°F and more than 70°F add an additional 4oz. of R134a to system. If below 70°F a total of 8oz. can be added.
   g) Obtain a temperature reading at the evaporator intake and at the nearest air outlet.
h) The temperature differential (TD) should be 20° F at sea level and slightly less as altitude increases.

I) If the 20° TD cannot be obtained, check for blockage of condenser and proper operation of condenser and compressor.

(4) In-flight Check
a) Secure all open panels and cowlings and prepare ship for flight.
b) The gauges can remain attached to service ports during flight.
c) Fly the aircraft with air-conditioner operating and monitor gauge readings.
d) A slight decrease in gauge readings may occur.
e) Increases in pressure indicates possible defects in the system.

(5) Completion
a) After completion of servicing, remove all test equipment and perform a thorough preflight check of the system in accordance with Chapter 5 of this manual.

3-3 Servicing - Compressor Oil

A. References: None

B. Special Tools: None

C. Consumable Materials: Automotive Air-Conditioner Oil

CAUTION: Oil must be of the exact same type as shown on the compressor. If any doubt exists, contact the STC holder.

D. Procedure:
(1) Introduce approximately 2oz. of "Ester" type refrigerant oil during the initial changing phase found in Section 21-00-00, 3-2.
(2) Complete charging in accordance with 21-00-00, 3-2.
3-4 Blank

3-5 Servicing - Pulley Bearing

A. References: None

B. Special Tools: None

C. Consumable Materials: Mobil 28 grease

D. Procedure:

(1) With bearing removed from pulley, remove old grease from bearing and dry.

(2) Repack 40% to 50% of bearing cavity with Mobil 28 grease.

3-6 Blank
4-1  Removal/Installation - Dual Evaporators and Dual Fans

A.  References:  None

B.  Special Tools  Refrigerant Reclaimer

C.  Consumable Materials:  R134A

D.  Procedure:

Removal - Forward Unit

(1) Remove L.H. and R.H. console panels.

(2) Connect refrigerant reclaimer to system in accordance with Section 21-00-00, 3-1, and remove coolant from system. Comply with all Federal/ State and Local rules governing refrigerant handling.

(3) Remove bolts securing evaporator.

(4) Remove dual fan and evaporator enclosure.

(5) Support evaporator while removing lines and other duct work.

(6) Remove evaporator from aircraft.

(7) Cap all open lines on unit and aircraft.

(8) Disconnect electrical connections and remove evaporator fan.

Installation

(1) Reinstall dual fan in aircraft and connect electrical connections.

(2) Position evaporator against fan assembly and loosely install with securing hardware. Secure mounting hardware.

(3) Reinstall drain line.

(4) Connect duct work.
(5) Ensure refrigerant o-rings are installed and in good condition. Replace as necessary. Oil all o-rings and fittings with refrigerant oil of the same type listed on the compressor. Torque refrigerant lines: #6 11-13 Ft/lbs; #8 15-20 Ft/lbs; #10 21-27 Ft/lbs.

(6) After completing other system functions and maintenance service system in accordance with Section 21-00-00, 3-2.

(7) Check for leaks using R-134a Refrigerant "Sniffer".

Removal - Aft Unit

(1) Remove seat pan above evaporator and disconnect electrical connections.

(2) Connect refrigerant reclaimer to system in accordance with Section 21-00-00, 3-1, and remove coolant from system. Comply with all Federal/State and Local rules governing refrigerant handling.

(3) Remove blower fan and evaporator from aircraft.

(4) Support evaporator while removing lines and duct work.

(5) Cap all open lines on unit and aircraft.

Installation

(1) Reinstall fan/evaporator and connect electrical connections.

(2) Position evaporator and loosely install with securing hardware. Secure mounting hardware.

(3) Reinstall drain line.

(4) Connect duct work.

(5) Ensure refrigerant o-rings are installed and in good condition. Replace as necessary. Oil all o-rings and fittings with refrigerant oil of the same type listed on the compressor. Torque refrigerant lines: #6 11-13 Ft/lbs; #8 15-20 Ft/lbs; #10 21-27 Ft/lbs.

(6) After completing other system functions and maintenance service system in accordance with Section 21-00-00, 3-2.

(7) Check for leaks using R-134a Refrigerant "Sniffer".
Removal/Installation - Condenser Assembly and Condenser Blower

A. References: None
B. Special Tools: Refrigerant reclaimer
C. Consumable Materials: None
D. Procedure:

Removal

(1) Remove condenser shroud.

(2) Connect refrigerant reclaimer to system and evacuate system in accordance with Section 21-00-00, 3-1.

(3) Remove screws securing condenser assembly to airframe. Disconnect blower wires and both #6 and #8 refrigerant hoses.

(4) Slide condenser from upper deck.

(5) Cap all open lines on condenser and airframe.

Installation

(1) Slide condenser onto upper deck.

(2) Loosely install all hardware securing condenser assembly to deck. Tighten mounting screws only after all hardware is installed.

(3) Remove protective caps from refrigerant lines. Inspect that o-rings are installed and in good condition. Oil all o-rings and fittings with refrigerant oil of the same type listed on the compressor.

(4) Install refrigerant lines. Torque refrigerant lines as follows: #6 11-13 Ft/lbs; #8 15-20 Ft/lbs; #10 21-27 Ft/lbs. Do not over tighten.

(5) Service system in accordance with Section 21-00-00, 3-2.

(6) Install shroud. Ensure that all cam-locks are in place.
4-3  Removal/Installation - Compressor

A.  References:  None
B.  Special Tools:  Refrigerant reclaimer
C.  Consumable Materials:  None
D.  Procedure:

Removal

(1)  Remove upper transmission cowling.

(2)  Connect refrigerant reclaimer to system and evacuate in accordance with Section 21-00-00, 3-1.  Comply with all Federal/State and Local rules governing refrigerant handling.

(3)  Remove refrigerant lines from compressor and install protective caps to protect from foreign material entering system and compressor.

(4)  Disconnect drive belt to compressor.

(5)  Remove bolts securing compressor to mount and remove compressor.

Installation

(1)  Install compressor loosely on support frame with attaching hardware.

(2)  Install drive belt.

(3)  Tighten compressor bolts allowing compressor to "Seek" its own natural position on the frame.  Tighten compressor belt tensioning bolt to 50 lbs belt tension.

(4)  Tighten and safety all compressor mounting bolts.

(5)  Remove protective caps from refrigerant lines and compressor.  Inspect the o-rings for installation and condition.  Replace as necessary.

(6)  Oil all fittings and o-rings.
(7) Install refrigerant lines.

(8) Torque refrigerant lines: #6 11-13 Ft/lbs; #8 15-20 Ft/lbs; #10 21-27 Ft/lbs. Do not over torque.

(9) Service system in accordance with Section 21-00-00, 3-2.

(10) Install previously removed cowlings.

4-4 Removal/Installation - Pulley Bearing

A. References: None

B. Special Tools: None

C. Consumable Materials: None

D. Procedure:

Removal

(1) Remove transmission cowlings.

(2) Remove drive belt.

(3) Remove nut attaching pulley to compressor shaft.

(4) Remove snap ring which retains pulley onto compressor.

(5) Remove pulley.

(6) Press bearing from pulley.

Installation

(1) Press new or serviceable bearing into pulley.

(2) Install pulley onto compressor shaft.

(3) Install snap ring.
(4) Install retention nut.

(5) Reinstall belt. Tighten compressor belt tensioning bolt to 50 lbs belt tension.

(6) Reinstall cowlings.

4-5 Removal/Installation - Electrical Components

A. References: Illustrations MDHS 600N Sheet 1 Plumbing Routing and MDHS 600N Sheet 3 Electrical Diagram

B. Special Tools: None

C. Consumable Materials: None

D. Procedure:

Remove

(1) Remove any power to system and aircraft including disconnecting battery.

(2) Locate component or part requiring maintenance.

(3) After access is gained, remove part or component.

Installation

(1) Replace part with original serviceable or new or used serviceable part.

(2) After electrical connections are made ensure wiring is stowed and secured to preclude chaffing or contact with other components that could cause shorts or damage.

(3) Replace any covers or access panels.

(4) Test system as necessary in accordance with this manual.
4-6 Removal/Installation - Lines, Expansion valve and receiver drier.

A. References: Illustrations MDHS 600N Sheet 1 Plumbing Routing and MDHS 600N Sheet 2 Plumbing Diagram

B. Special Tools: None

C. Consumable Materials: Dish soap and water as necessary

D. Procedure:

Removal

(1) Remove panels as necessary to access the components to be changed.

(2) Evacuate system in accordance with Section 21-00-00, 3-1.

(3) Remove component or line to be replaced. Cap all exposed lines if system is not going to be reassembled immediately.

Installation

(1) Install components or lines securing with hardware removed previously.

(2) Inspect for o-ring on fitting and condition of o-rings. Replace with new as necessary. Oil fittings and o-rings.

(3) Torque line and fittings as follows: #6 11-13 Ft/lbs; #8 15-20 Ft/lbs; #10 21-27 Ft/lbs. Do not over tighten.

(4) Service system in accordance with Section 21-00-00, 3-2.

(5) Reinstall all cowls and panels previously removed.

4-7 Removal/Installation - Split Drive Pulley

A. References: Illustrations MDHS 600N Sheet 6 Compressor

B. Special Tools: None

C. Consumable Materials: None

D. Procedure:
Removal

(1) Remove panels as necessary to access the components to be changed.
(2) Remove drive belt.
(3) Remove four MS 21042-5 nuts and NAS 1305-10 bolts.
(4) Remove both pulley halves as an assembly.

Installation

(1) Install pulley assembly.
(2) Install four MS 21042-5 nuts and NAS 1305-10 bolts. Torque bolts in an alternating sequence 100 - 140 in/lbs.
(3) Install drive belt. Tighten compressor belt tensioning bolt to 50 lbs belt tension
(4) Reinstall all cowls and panels previously removed.
21-00-00 AIR-CONDITIONING-FUNCTIONAL TEST

5-1 Functional Test - Normal Operation

A. With the aircraft engine operating and electrical system on and functioning normally, move the air-conditioner control switch to the "FAN" position.

B. Move the cockpit fan switch from "Low to "High" speed and ensure that air output is present in all the forward air outlets. Repeat the test using the aft cabin fan speed selector switch for the aft cabin air outlets.

C. Reposition the air-conditioner control switch to the "A/C" position and repeat step B above. Cool air should be supplied to the cockpit and cabin vents, after a time delay of 4 to 8 seconds.

D. Turn Air-conditioner switch to "OFF" or the center position. Entire system should shut down.

E. If "A/C" switch in the "off" position does not turn air conditioner off, pull 50 amp master A/C circuit breaker located immediately to the left of the A/C control switches (left hand pilot in command installation).
5-2 Function Test - State of Charge

A. Connect a set of manifold gauges to the aircraft air-conditioner servicing ports located beneath the helicopters battery. Access is through a hinged door on the belly. Ensure that the valves are closed.

B. Start aircraft and bring to flight idle. Ensure generator and the electrical system are operating normally.

C. Move air-conditioner control switch to "A/C" position and stabilize system for at least 5 minutes. Run both evaporator fans on "High" speed.

D. Observe for the following conditions;

1) High pressure gauge indicates 250 to 300 lbs. at 100° F or less. Low pressure gauge reads 30 - 45 lbs. (This reading varies according to "load" on the evaporators and humidity). This indicates a normal system.

E. Obtain a thermometer with a remote probe and locate the probe at the inlet to the evaporator located under the pilot seat for the cabin. Locate another thermometer in the nearest air outlet.

F. With the system operating, at least a 20° temperature differential (T.D.) should be observed between the readings. 

Note: This reading may be lower (eg 16° at altitudes above sea level due to the thinner atmosphere). The test readings should be taken after 5 minutes of operation.

G. Retest in the same manner the cockpit evaporator located in the nose.

H. If readings are outside of these parameters or if the cooling is not sufficient the system may need further tests and servicing in accordance with Section 21-00-00.
21-00-00 AIR-CONDITIONING-CLEANING

7-1 Cleaning - Fans

A. References: None

B. Special Tools: None

C. Consumable Materials: None

D. Procedure:
   (1) Clean the blower by means of oil and water free pressurized air.
   (2) Clean all blades completely to ensure balance is not affected.

7-2 Cleaning Condenser or Evaporator coils.

A. References: None

B. Special Tools: None

C. Consumable Materials: Dish soap and water as necessary
                            EPA approved cleaning agents

D. Procedure:
   (1) Coils Installed.
       a) Gain access to both sides of coils by removing ducts as applicable.
       b) Use compressed air to blow loose dirt and dust from units.
       c) Reinstall ducting.
   (2) Remove
       a) After removal of coils in accordance with applicable sections of this
          manual, tightly cap all hose fitting.
       b) Spray or brush a soap and water mixture on coils. Let stand and
          rinse with fresh water.
       c) Blow dry with compressed air.
       d) Reinstall in accordance with applicable sections of this manual.
8-1 Repair

A. No repairs other than those that can be accomplished with normal methods or that are called out in this ICA should be attempted unless the STC holder is contacted and specific written instructions are provided.

Normal repairs would include paint touch up, sheet metal repairs to non structural components and fiberglass repairs to ducts and plenums done in accordance with generally accepted maintenance practices.
Step 5

ICA Illustrations & Diagrams
FORWARD EVAP
EXTREMELY IMPORTANT

FAILURE TO SECURE EXPANSION VALVE
SENSOR BULB, TIGHTLY, TO THE
RETURN LINE HOSE FITTING

AT 3 OR 9 O'CLOCK POSITION
WITH A STAINLESS STEEL CLAMP (AND INSULATE
SENSOR BULB AND LINE) WILL DRAMATICALLY
DECREASE THE PERFORMANCE OF THE AFT
(NOT FORWARD) EVAPORATOR.

CONDENSER ASSEMBLY

AFT EVAP
EXTREMELY IMPORTANT

FAILURE TO SECURE EXPANSION VALVE
SENSOR BULB, TIGHTLY, TO THE RETURN
LINE (VERTICAL COPPER TUBE) WITH
A STAINLESS STEEL CLAMP (AND INSULATE
SENSOR BULB AND LINE) WILL DRAMATICALLY
DECREASE THE PERFORMANCE OF THE FORWARD
(NOT AFT) EVAPORATOR.

LOW AND HIGH PRESSURE SWITCHES
ARE LOCATED ON COMPRESSOR
UNTIL COMPRESSORS ARE
INCORPORATED INTO THE SYSTEM
W/O PRESSURE PORTS.
AT THAT TIME PRESSURE SWITCHES
WILL BE LOCATED AS SHOWN.

INTEGRATED FLIGHT SYSTEMS
INC.

NOTE:
THIS DRAWING TO BE USED FOR PURPOSES OF CONTINUOUS AIRWORTHINESS INCLUDING COMPONENT REMOVAL AND REINSTALLATION.
Step 6

Operator’s Manual
INTEGRATED FLIGHT SYSTEMS, INC.
8345 BLUE GILL DRIVE
FALCON, CO 80831

OPERATOR'S MANUAL

FOR

VAPOR CYCLE
(R-134a)

AIR CONDITIONER

IN

McDONNELL DOUGLAS HELICOPTERS SYSTEMS

MODEL: 600N

WITH

KIT #600N-00-011

(SINGLE CONDENSER BLOWER)
By
Aerospace Systems & Components, Inc.

"ESTER OIL EQUIPPED COMPRESSOR"

ISSUED: October 21, 1997
(With EPA/R-134a data)
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20.0 HIGH PRESSURE SWITCH LIMITATIONS
ii. **STC, KITS, COMPANY NAME:**
The Federal Aviation Administration awarded a Supplemental Type Certificate for a belt driven compressor Vapor Cycle (R-134a) air conditioning system under STC# SRO9178RC, covering the McDonnell Douglas Helicopter Systems model 600N on October 21, 1997 to Integrated Flight Systems, Inc. of Falcon, Colorado.

All current models of the 600N helicopter are now covered by the STC.

Present management of Integrated Flight Systems, Inc. and the general location of the company are the same as in 1979 when the management's first Vapor Cycle air conditioner was awarded an STC by the Denver Aircraft Certification Office of the Federal Aviation Administration.

Numerous product improvements and manufacturing techniques have taken place since the first STC was awarded to the same management team. Many ABS/plastic parts that were formerly vacuum formed are now constructed of high quality fiberglass. This prevents warping, distortion and loss of aesthetic lines. The product has not only been enhanced, but the longevity of our products value has been greatly increased.

**KIT CONFIGURATIONS:**

Kit #600N-00-011 is applicable to all configurations of the model 600N helicopter. The same "KIT" is utilized in a "left hand command or right hand command" helicopter.

The same "KIT" is utilized:
  a) Without a rotor brake.
  b) With a LH rotor brake.
  c) With a RH rotor brake.

While no IFS "KIT" modifications are required, fiberglass panels that are a part of the McDonnell Douglas Helicopter Systems interior can be affected.

This kit is compatible with utility, corporate, and EMS configurations without any changes being required to the air conditioning system.

Border Patrol and some State Police operated helicopters will be operated with the Pilot In Command from the right side. This is the opposite of the PIC for most MDHS helicopters which are primarily considered to be left hand PIC aircraft. Due to the special missions of the above-mentioned helicopters, items such as monitors and other special surveillance equipment may be installed. IFS has customized and obtained FAA approval for the left hand air outlets in order to mate to this type equipment.
REFRIGERANT, HOSE & FITTINGS:
The refrigerant utilized is R-134a (non-CFC type).
The "KIT" requires one of the following type oils to be used.
   a) ESTER, Viscosity: ISO 100 - 500 SUS at 100 Degrees Fahrenheit;
   b) SP-20 Sanden oil (PAG OIL IS NOT TO BE USED). Type oil installed will be noted on the compressor.
   c) "O" ring seals (blue in color) are utilized.
   d) Barrier type hose is utilized to control leakage through hose lining and skin.
   e) Bubble type crimp fittings are utilized to control leakage at the fittings.
   f) Reduced size is employed to save weight.

iii. EPA STANDARDS - RULES

The refrigerant used in this cooling system is R-134a. NO OTHER REFRIGERANT may be substituted, directly for R-134a, at this time.

All EPA, city, State and local regulations in regard to refrigerant R-134a shall be complied with.

1.0 GENERAL DESCRIPTION:

The Integrated Flight Systems, Inc. air conditioning system covered by this report for the MDHS 600N model helicopters consists of six (6) major components. The kit for which this report is applicable is P/N: 600N-00-011.

The above kit is universal. It is designed to mate to the "Corporate, Utility, or EMS Versions" with a left hand pilot in command.

Components are:

1.1 The belt-driven compressor located immediately aft of the main transmission, on the upper deck.

1.2 The condenser coil and condenser blower mounted above the cabin roof, forward of the transmission.

1.3 Dual evaporator/blower assemblies. Forward evaporator is mounted on a sheet metal shelf, forward of the radio console.

1.4 Aft evaporator is mounted under the right side pilot's seat.

1.5 Aft evaporator blower is mounted directly to the aft side of the evaporator.

1.6 The refrigerant plumbing and electrical required for the above.
1.7 The forward evaporator is located at C.G. station 19.0, aft evaporator is mounted at C.G. station 120.1, compressor is located at C.G. station 147.80, and condenser is mounted at C.G. station 133.8.

1.8 The dual air distribution system consists of several air outlets. Two are located forward of the co-pilots' position and two are forward of the pilot's position. The aft evaporator provides airflow into a "NEW" overhead duct system, which incorporates three (3) to five (5) wemacs.

2.0 SPECIFIC FEATURES:

2.1 The condenser coil assembly mounted above the cabin roof area is attached to existing aircraft frames by new IFS provided aluminum sheet metal panels. The coil is bolted to an sheet metal enclosure that houses the condenser blower. A single five-inch diameter vane axial blower pulls air through the air inlet (upper) side of the coil and exhausts the air out the aft end of the condenser assembly.

2.2 The rear evaporator assembly consists of an evaporator coil and expansion valve. The coil is mounted inside a fiberglass case with a drain tube/outlet. The entire assembly mounts to a "C" shaped channel and is securely bolted in place. A "NEW" IFS fiberglass duct allows the cooled air to flow from the evaporator/blower into "NEW" ducts in the aft cabin overhead air distribution system.

2.3 Return air is drawn from the cabin through the "cyclic cover" (if installed) and then through the vertical IFS installed bulkhead doubler of the co-pilot's (L.H. PIC) seat. It then travels directly into the evaporator. No relocation of any cabin appointments is required.

2.4 The forward evaporator/fan is mounted forward of the radio console. It is supported on a "shelf". The entire evaporator assembly is contained within a fiberglass case. Air distribution is by way of: two (2) each 3" flexible hoses to large WEMAC type air outlets on either side of the instrument console.

2.5 The Cabin Environment Control Panel consists of a 50 amp "Master A/C system circuit breaker and two rocker type control switches located in the Instrument Panel.

2.6 The Sanden SD-507 compressor is mounted on a steel bracket, which is bolted directly to the upper deck. This bracket carries all loads imposed.

2.7 A flat belt is used to turn the compressor from the IFS designed pulley to the Sanden SD-507 compressor pulley, which has been modified to accept the flat belt. A belt tension adjusting bolt located at the aft left corner of the compressor allows for tightening of the drive belt.
2.8 The belt used to drive the compressor is manufactured by Habasit Belting, Inc. and is produced from A-2 type material. Should the drive belt fail for any reason the net result will simply be the loss of compressor drive and flow of refrigerant. Failure of the belt would not interfere with any other components or systems. Therefore, the belt is deemed to be "fail safe".

2.9 The electrical system for the air conditioning system consists of dual double throw rocker switches on the cabin Environment Control Panel. The "Master" control switch has three positions: "A/C", "OFF" and "FAN".

2.10 The "FAN" position allows the evaporator fan or blower to run for non-cooled air circulation. Evaporator fan/blowers are protected by two (2) each 15 amp circuit breakers. The "A/C" position turns on the condenser blower as well as the evaporator fans and provides electrical power to the compressor clutch for complete system operation. A 20 amp circuit breaker is provided for protection of the condenser blower.

2.11 A single throw rocker switch provides blower speed selection for the aft cabin.

2.12 A double throw rocker switch is mounted to provide "HIGH- MED-LOW" speed selection for the forward evaporator motor.

2.13 Plumbing of refrigerant lines is accomplished with standard air conditioning hose covered under SAE standard J51C.

2.14 Nylon "REDUCED BARRIER TYPE" hose utilizing "BUBBLE TYPE" crimped fittings with the ferrule made onto the fittings are utilized.

2.15 All lines are installed as per standard aircraft practice. Adel clamps or tie wraps are used as required. Butterflying of adel clamps and the use of standoffs are provided where required. Plumbing from the compressor is run down through a large hole in the transmission deck. Caterpillar grommet material or spiral wrap is used in all aircraft lightning holes to protect refrigerant hoses from chafing, as required. The refrigerant hoses are routed from the condenser to the receiver/drier. Compressor return line is routed below the cabin roof from a “T” near the aft evaporator up to the compressor, along the right side of the aircraft.

2.16 They are secured in accordance with typical hose supporting as shown in AC43.13-1A and -2A. This type hose is STC’d on several aircraft applications.

2.17 Appropriate decals and placards are provided where required. These include switch and circuit breaker identification.
2.18 The vane axial blower used on the **condenser** is purchased under IFS P/N: 580001. Blower is five inches (5") in diameter.

2.19 Blower used on the **aft evaporator** is under IFS P/N: 050085-1.

Aerospace Systems and Components, Inc. is the vendor for both blowers.

3.0 **SCOPE: CHARGING, SERVICING, MAINTENANCE:**

3.1 It is assumed by the following instructions that the personnel engaged in Charging, Servicing, or Maintenance of the system will be either an experienced air conditioning mechanics under the supervision of a qualified A&P mechanic or an A&P mechanic possessing good air conditioning skills.

3.2 Prior to charging the system with R-134a, the evaporator fan/blowers and condenser blower should be checked for operation and direction of airflow. This is most easily done by utilizing a GPU unit for electrical power. Since the compressor is belt driven, only those maintenance and operational functions that are electrically powered may be checked either in the hanger or on the ramp without running the engine.

3.3 After the GPU is connected to the aircraft and the Aircraft Master Switch is "ON", the air conditioning system may be turned "ON". Place the rocker switch on the Master Air Conditioning Control Panel to "A/C". It does not cause the compressor to run or refrigerant to be pumped. Aft evaporator blower and the forward evaporator fan should start immediately. The compressor clutch and condenser blower should activate after about a four (4) seconds.

3.4 Check airflow of each evaporator fan/blower. Determine that air is coming out of the cockpit and the cabin air outlets.

3.5 Check airflow into and out of condenser air openings.

3.6 All evaporator fan/blowers, condenser blowers and controls are 28 volt DC.

4.0 **CHARGING R-134a INTO SYSTEM:**

4.1 **Danger:** R-134a, particularly liquid R-134a, should never be allowed to come in contact with the eyes or skin. Under normal conditions, R-134a as a gas or vapor is an inert substance and non-poisonous. However, the discharge of the gas into an open flame or near by one can produce phosgene gas, which is highly poisonous and can cause blindness and/or death.
A flame-type leak detector should therefore **Never be used** for this reason and also because of the danger of fire or explosion around an aircraft. Several electronic leak detectors are available on the market, such as the Tiff Model 5500 and others. It is highly recommended that due to the time saved in locating leaks, that the money spent on an electronic leak detector is the best investment you can make.

4.2 Never heat a cylinder of R-134a to produce additional pressure or to squeeze that last bit of refrigerant from the cylinder. If the cylinder has become cooled to the point where additional refrigerant cannot be obtained from it, the only approved method is to place the entire cylinder in a container of **warm** water. **Do not exceed** 120 degrees Fahrenheit.

4.3 Never attempt to repair a leak requiring brazing or soldering within the aircraft structure as phosgene gas, fire, or explosion can result. Remove the entire assembly from the aircraft to a safe location before attempting such a procedure.

4.4 **Caution:** Should R-134a come in contact with the eyes or skin, **Do Not** attempt first aid beyond the immediate washing of the eye or skin with clear water. A doctor should be contacted immediately for diagnosis and treatment even though the injury may be considered slight.

**REPEAT - Do Not** attempt first aid for this condition.

4.5 The charging of the system should not be attempted unless two qualified individuals are present. **The refrigerant used in this system is R-134a, and no other refrigerant is to be considered.** Normal safety practices, such as wearing of gloves and the use of goggles, should be utilized as R-134a could freeze the eyeball instantly were it to come in contact with the eye. Also, frostbite could occur to areas of the skin if R-134a were allowed to come in contact.

4.6 Charging of the system is a simple procedure whether on initial charging or recharging after leakage repair. A set of refrigerant gauges with a minimum of three hoses should be connected to the high side and low side service ports provided.

4.7 The system is made up of two evaporator assemblies. One is mounted above the nose shelf, forward of the radios. The other is located under the right side pilot seat. Service ports are forward of the left side, aft cabin foot well. The high side and low side service ports are readily accessible.

**Note:** The sight glass is located vertically on the aft side of LH door post.

The high and low pressure safety switches are located on the compressor for ease of installation.
5.0 OIL CHARGING:

5.1 Prior to charging each system with any refrigerant, obtain TWO (2) ounces of ESTER type oil.

The Sankyo (Sanden) SD-507 compressor maybe operated with a variety of oil types. The type selected depends on the refrigerant selected (R-134a) and other factors. Integrated Flight Systems, Inc., after a thorough investigation, has selected ESTER type oil to be used with the R-134a refrigerant in its systems. Neither "PAG" nor any other type oil is to be utilized.

Approximately two (2) ounces of oil is distributed throughout the system in coating the inside of the hoses on a newly installed system. Additional oil will not be required during the refrigerant charging phase of the operation. The amount called out above is the correct amount for this installation due to the hose lengths employed. Oil should only be inserted into the high side.

6.0 INITIAL CHARGING:

6.1 After the system has had all lines completely installed, with the exception of the two (2) lines at the receiver/drier. Un-seal the receiver/drier. Place refrigerant oil on both line fittings and the male threads of the receiver/drier, and tighten the fittings. Connect the refrigerant charging manifold to a cylinder of R-134a. Connect an EPA approved R-134a recovery. Complete the connection of any open lines.

Allow R-134a, in the form of vapor, to flow through both sides of the manifold by opening each of the valves. This will flush any minor debris from the lines as well as expelling any air present and drying the system. Ensure that all R-134a is captured. Open both charging manifold valves and pressurize the system. Allow approximately 50 to 70 pounds of refrigerant pressure to build up within the system (about 12 ounces). Close the valve on the cylinder of R-134a. Close low side valve (left) at manifold. Failure to do so can cause high pressure to flow to the low side (left) gauge. Failure of gauge can result. Pressurize system to between 300 and 400 PSI. An electronic leak detector should be utilized to check all fittings and hoses.

Tighten any leaking connections or make repairs as necessary to eliminate leaks. Shut off and disconnect hose from the refrigerant cylinder. Connect to a regulator mounted on a cylinder of dry nitrogen. Purge regulator to center manifold hose.
6.2 After the system has been rechecked with an electronic leak detector and it is determined that no leaks exist, disconnect the charging hose from the manifold set to the cylinder of nitrogen. Open the valves allowing the R-134a and nitrogen within the system to be captured by an EPA approved recovery unit.

6.3 Connect a vacuum pump to the center manifold hose. Open both valves and evacuate the system for a minimum of twenty minutes. After twenty minutes of vacuum pump operation, the low side gauges should read approximately 30" of vacuum at sea level.

(Note: For each 1,000 foot rise in altitude above sea level a decrease below 30" of vacuum of 1" per one thousand feet will occur.)

Adding R-134a refrigerant to the system:

6.4 Close both the manifold valves and connect the center charging hose to a cylinder of R-134a. Open the valve on the cylinder. Purge the charging hose by loosening it at the charging manifold's center hose. Open the high side valve of the charging manifold only.

The combination of the vacuum still existing in the system and the pressure in the R-134a cylinder transfers the R-134a from the cylinder into the system without the compressor running. If a scale is available, the cylinder may be pre-weighted and four pounds of refrigerant R-134a added to the system. A total of approximately 4-1/2 pounds will be required. Additional refrigerant should be added only after the total system is in operation.

6.5 The system is now ready for operation. This must be performed on the flight line with the engine running at 100%. As soon as the "A/C" Master Control Switch is turned to "A/C" all 28, VDC evaporator blowers will immediately begin operation. The condenser blower and clutch have a time delay of several seconds built in (soft start).

6.6 If, after the system has been in the "A/C" mode for at least 2 minutes and cooling is not being accomplished, then check all circuit breakers. Determine that DC power is available for control circuitry, and check the operation of the relays and contactors.

6.7 After the compressor has come on line, the entire system is operational. Close the manifold valve on the high side. The R-134a cylinder valve should be closed initially in order to get an accurate reading on the low side gauge of the "system pressure".
The reading on the gauge should not be allowed to go below 10 PSI as this will allow the low pressure safety switch to disconnect the electrical power to the compressor clutch. Open or close the cylinder valve as required to monitor the flow of R-134a from the cylinder into the low side of the system. The sight glass located on the LH aft door post may be easily seen. The sight glass should be closely monitored and a stream of what would appear to be bubbles will be noted at this time. Continue charging the system with vapor R-134a with the cylinder in the upright position only. At no time should the cylinder be turned upside down to allow liquid to enter the system as this can cause "slugging" of the compressor and damage to the reed valves. It should be noted that pressure on the low side with the R-134a cylinder valve closed can vary depending on the temperature of the cabin continue charging the system until the stream of bubbles disappears and the sight glass becomes clear.

6.8 At this point, the minimum amount of R-134a is in the system and charging should cease temporarily. If the outside air temperature is 100 degrees F, or more, the amount of R-134a in the system with a clear sight glass, is satisfactory. If the temperature is less than 100 degrees F, particularly if it is in the 60-70 degree F range, approximately 8 ounces of additional R-134a should be added into the system, by weight.

6.9 A test sheet should be completed noting the average cabin temperature, the temperature of the return or entering air to both evaporators, and the discharge air from the evaporators, at the nearest point. If a temperature differential (T.D) of less than 15 degrees Fahrenheit is recorded through either of the evaporators at sea level, the system should be considered as having possible defects, which will need investigation. At altitudes above sea level, less than 15 degrees Fahrenheit temperature difference may be recorded. This is due to less dense air moving more rapidly through the evaporators.

7.0 RECHARGING OF THE SYSTEM:

7.1 If the system is found to be completely empty of R-134a, a set of charging gauges should be connected to both the high and low side service ports and to a cylinder of R-134a. Purge the charging hoses from the cylinder to the service ports with R-134a vapor. Open both the low and high side charging valves and allow pressure from the cylinder to equalize through the system until at least 50 PSI is noted. Utilizing an electronic leak detector, check all fittings on the system to determine the point of leakage. Any fitting indicating an oily or dirty condition is a prime suspect.
7.2 After the leaks have been found and corrected, pressurize the R-134a in the system with dry nitrogen as in 6.1. Re-check for leaks. Capture all of the R-134a in the system with an EPA approved recovery unit. Connect a vacuum pump to the center charging hose and evacuate the system for a minimum of 16 minutes from both the high and low sides. If the system has been allowed to become contaminated, then the receiver/drier should be replaced before recharging the system. In no case should the system be allowed to remain open for more than a few minutes without a new receiver/drier being installed.

7.3 It is always good air conditioning practice to replace the receiver/drier whenever it is suspected that moisture has contaminated the system.

7.4 The balance of the recharging procedure is exactly the same as pointed out previously under the Initial Charging Operation. A judgment must be made as to the amount of oil, if any, lost at the point of leakage. Additional oil may be required to be added to the system. If the refrigerant has been expelled rapidly by the rupture of a line or similar situation, then two (2) ounces of refrigerant oil of the type previously specified should be applied to the system at this time and immediately prior to charging of the system with R-134a.

8.0 SERVICE:

8.1 Normally service will not be required on a properly installed Integrated Flight Systems, Inc. unit. Routine and seasonally dictated operations, such as checking the R-134a refrigerant charge will be listed under the Maintenance section. The question is often asked, "How often should I add refrigerant to my system?" The answer is, "Never". Point is that either a system has a leak or it has none, therefore requiring no service. We recognize the fact that while the above is true, that due to helicopter vibration and the environment in which it is installed, leaks can occur, usually due to vibration. The location, type of equipment used, and other items will thus be addressed under the topic of maintenance.

9.0 MAINTENANCE: (To Accomplish Continued Airworthiness)

NOTE: A separate "Manual" titled "INSTRUCTIONS for CONTINUED AIRWORTHINESS" has been submitted to and "accepted" by the FAA. This manual, written by Integrated Flight Systems, Inc., in a ATA format is the only FAA approved data for maintaining the air conditioning system.

It is the "OWNERS" responsibility to ensure that the directions in the manual are followed. (See limitations section on STC.)
10.0 **TROUBLESHOOTING:**

10.1 Should the system not perform as expected, either because of unreasonably erratic pressure readings, total lack of cooling or reduced cooling, it will be necessary to obtain a trouble shooting guide if the A&P mechanic is unfamiliar with the characteristics of a mobile air conditioning unit. The symptoms, diagnosis and corrections are so numerous for various conditions that we will not attempt to list them all in this guide.

10.2 The high and low pressure safety switches should be checked if electrical power is lost to the compressor clutch. These are in series, and they should be checked from their electrical source, which is the 20 amp condenser circuit breaker.

**NOTE:** A one (1) amp circuit breaker will trip if the high pressure switch exceeds its upper setting. Power to the clutch and condenser blower will be interrupted.

10.3 Always check system R-134a pressure first, as a leaking unit may have caused the low pressure switch to open. This switch is set to open at 7 PSI and close at 22 PSI. It requires that pressure, or greater, to close.

10.4 Failure of the condenser blower or coil blockage could result in the high side switch opening. Both switches are designed to reset automatically.

**NOTE:** Internal blockage of the high pressure side of the refrigerant system can cause a very low pressure reading at the "low side" service gage and may also cause a low pressure reading at the "high side" service gage. This can occur when either or both of the two expansion valves in the system closes shut or they have foreign matter restricting them. The same reading would occur if the receiver/drier was clogged.

11.0 **COMPRESSOR:**

11.1 The compressor installed is a Model #SD-507 manufactured by Sanden (formerly Sankyo) International.

11.2 A copy of the Sanden Service Manual can be supplied.

11.3 No maintenance, other than "clutch bearing" or "coil replacement" should be attempted in the field.

11.4 **Drive belt is P/N: 060033.**
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12.0 REFRIGERANT CYCLE:

12.1 A typical mobile vapor cycle air conditioning schematic can be supplied. It is based on automotive applications, and thus the temperatures and pressures shown are not representative of the Integrated Flight Systems, Inc. system installed in this application.

13.0 EVAPORATOR FAN/BLOWER:

13.1 If either the forward evaporator fan or aft evaporator blower fails to run, confirm that the Aircraft Master Switch is in the "ON" position and the Air Conditioning control Switch is placed to "FAN". If the fan/blower still does not run, determine that electrical power is available to the aircraft from an outside power source, such as a GPU or the aircraft power source.

Inspect the circuit breakers in the Master Air Conditioning Electrical Panel. Determine if electrical power is being supplied to the wire, which is the power source to each motor. If power is available, it will be necessary to test with a volt meter that electrical power is being supplied directly to the motor by the appropriate wire. If power is being supplied, and the motor is properly grounded, then it can be assumed that the motor has failed.

13.2 The forward motor, P/N: 050127-1, maybe disassembled from its housing and the screws in the motor support plate loosened to allow removal of the motor. A replacement motor should be obtained from Integrated Flight Systems, Inc. and reinstalled in a similar manner. Do not attempt disassembly or field repair of this motor.

The aft evaporator blower motor should not be disassembled other than to inspect the brushes. The motor is ordered as a unit under P/N: 050028.

14.0 CONDENSER BLOWER:

14.1 The condenser blower may be checked by placing the Aircraft Master Switch "ON" and then placing the Air Conditioning Control Switch to the "A/C" position. If the 20 amp circuit breaker is not open, then power should be supplied directly to the condenser blower, which is mounted on the aft end of the condenser assembly.

14.2 If air is not being exhausted, a volt meter should be utilized to determine if the power is being supplied through the switch and relay to the appropriate wire. Check that all electrical terminals are secure and that power is
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14.2 If air is not being exhausted, a volt meter should be utilized to determine if the power is being supplied through the switch and relay to the appropriate wire. Check that all electrical terminals are secure and that power is
directed to the motor's terminals. **Inspect ground.** If it is determined that the motor has failed, the screws holding the blower assembly in place should be removed. The blower assembly must be removed as an entire assembly (for **WARRANTY purposes**) and should be replaced by ordering **P/N: 580001**.

15.0 **CONDENSER REMOVAL:**

15.1 To remove the condenser the entire assembly may be unbolted and removed once the refrigerant lines have been disconnected.

**NOTE:** Before removing any lines, bleed R-134a from the system slowly so as not to deplete the refrigerant oil. All refrigerant MUST BE CAPTURED using an EPA approved recovery unit.

Normally it would not be necessary to remove the condenser assembly unless high head pressures or physical examination indicates that severe damage has occurred.

If dirt or other obstructions have formed on the aluminum fins, thereby obstructing the flow of air and reducing the efficiency of the condenser, it can usually be cleaned in place.

16.0 **RECEIVER/DRIER:**

16.1 The receiver/drier may be replaced, if required, by discharging the R-134a from the system through a refrigerant hose or set of charging gauges. Again all R-134a refrigerant MUST BE CAPTURED. Normally, the receiver/drier will not need replacement unless one of two factors is present:

(a) The system has been left open for some time and may be contaminated by air and/or moisture.

(b) The receiver/drier has become plugged which is evident by a large temperature differential on either side of the receiver/drier. Normally, the liquid line to and from it would be of approximately equal temperature and will be quite warm. If one side is relatively warm and the other side is very cool or attempts to frost, then blockage of the receiver/drier has been determined. The receiver/drier should be removed and a new one installed in its place. The part number is, **P/N: 090016-5** ("O" ring type). The charging instructions found on Pages 7, 8, 9, 10 and 11 should be followed in recharging the system.
17.0 **EXPANSION VALVES:**

17.1 Both expansion valves are identical, "O" Ring type, P/N: 090002 xlink="P-265" "O".

17.2 **It is EXTREMELY IMPORTANT** that the sensing bulb be clamped tightly to the suction return line (with a steel clamp) in the same manner as removed. Also, the line is to be clean, so good contact takes place between the sensing bulb and the line. This area must be re-insulated as in the original manner. Recharge and leak test.

18.0 **REFRIGERANT HOSE:**

18.1 **NYLON "BARRIER TYPE" REDUCED SIZE HOSE** (for R-134a)

Nylon "Barrier type" hose with "Bubble" crimped ferrules are utilized with "O" ring type fittings. They are found at all fitting locations.

19.0 **SYSTEM OPERATING LIMITATIONS:**

19.1 Below 60 degrees Fahrenheit, it may be found that the air conditioning compressor will not come on line and remain in operation. This is due to the fact the coolness of the air available across the condenser does not allow the refrigerant system to maintain sufficient low side pressure to keep the safety low pressure switch from tripping the compressor "off line".

19.2 **Low pressure switch:**

This switch is a non-adjustable type (normally open) and is located on the compressor. P/N: is 050107 (set at 7 PSI out, 22 PSI in) or P/N 090014 (set at 6 PSI out, 34 PSI in). Both switches will automatically re-set to the closed position as soon as pressure is applied in psi, greater than the cut-in point.

P/N: 050107 or 090014 non-adjustable switches are now located on the compressor.

20.0 **HIGH PRESSURE SWITCH LIMITATIONS:**

20.1 **High pressure switch** (all years):

The switch is identified under P/N: 090004. It is a "normally closed" unit. This switch, which "opens" on a rise in pressure that exceeds the switches upper limit. Once the pressure has been reduced below the switches upper design point, it will again close, automatically.
Step 7

Master Parts List
MASTER PARTS LIST

Vapor Cycle Air Conditioner

IN

MODEL: 600N

FOR

KIT # 600N-00-011

with

(SINGLE CONDENSER BLOWER)

by

ASC

"ESTER OIL EQUIPPED COMPRESSOR"

OCTOBER 21, 1997
(With R-134a/EPA data)
MASTER PARTS LIST

600N 07/02/97

KIT #600-00-011

SINGLE CONDENSER BLOWER
(By: Aerospace Systems & Components, Inc.)

<table>
<thead>
<tr>
<th>ITEM</th>
<th>DESCRIPTION</th>
<th>REPLACEMENT PART NUMBER</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>BELT - FLAT</td>
<td>060033</td>
</tr>
<tr>
<td>2.</td>
<td><strong>SD 507 COMPRESSOR ASSEMBLY</strong> COMPLETE W/ FLAT PULLEY, 24 VDC COIL (FOR USE WITH R-134a ONLY)</td>
<td>590007-1</td>
</tr>
</tbody>
</table>

COMPRESSOR PARTS

FOR: SD 507 W/ 5.0" CLUTCH

<p>| 3.   | <strong>BEARING (ONLY): SD 507 COMPRESSOR W/ 5.0&quot; CLUTCH</strong>                        | 8543-0020               |
| 4.   | <strong>24 VDC COIL (GREEN WIRE)</strong>                                                | 9351-6040               |
| 5.   | <strong>IFS PULLEY w/BEARING</strong>                                                    | 300355                  |
| 6.   | <strong>PULLEY FACE PLATE 5.0&quot;</strong>                                                  | A6H65FM                 |
| 7.   | (Left Blank on Purpose)                                                     |                         |</p>
<table>
<thead>
<tr>
<th>ITEM</th>
<th>DESCRIPTION</th>
<th>REPLACEMENT PART NUMBER</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>EVAPORATOR PARTS</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>FORWARD EVAPORATOR</strong></td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td>MOTOR, FORWARD EVAPORATOR 24VDC, double shaft</td>
<td>050127-1</td>
</tr>
<tr>
<td>9.</td>
<td>WHEEL, FORWARD EVAPORATOR fan, metal, CC rotation, 5/16&quot; bore</td>
<td>040004-8</td>
</tr>
<tr>
<td>10.</td>
<td>WHEEL, FORWARD EVAPORATOR fan, metal, CCW rotation, 5/16&quot; bore</td>
<td>040004-7</td>
</tr>
<tr>
<td></td>
<td><strong>AFT EVAPORATOR</strong></td>
<td></td>
</tr>
<tr>
<td>11.</td>
<td>5&quot; VANE AXIAL BLOWER ASSY.</td>
<td>050085</td>
</tr>
<tr>
<td>12.</td>
<td>MOTOR: 5&quot; VANE AXIAL BLOWER FITS IFS P/N: 050085</td>
<td>0911008-6</td>
</tr>
<tr>
<td></td>
<td><strong>CONDENSER BLOWER PARTS</strong></td>
<td></td>
</tr>
<tr>
<td>13.</td>
<td>5&quot; VANE AXIAL BLOWER ASSY.</td>
<td>580001</td>
</tr>
<tr>
<td>14.</td>
<td>MOTOR: 5&quot; VANE AXIAL BLOWER FITS IFS P/N 580001</td>
<td>0911008-6</td>
</tr>
<tr>
<td>ITEM</td>
<td>DESCRIPTION</td>
<td>PART NUMBER</td>
</tr>
<tr>
<td>------</td>
<td>-----------------------------------------------------------------------------</td>
<td>-------------</td>
</tr>
<tr>
<td>15.</td>
<td><strong>METAL BLADE AND HUB ASSY.</strong> FITS 5&quot; VANE AXIAL BLOWER, MFG P/N 091-1or-2, IFS P/N 580001 or 050085</td>
<td>0911007-1</td>
</tr>
<tr>
<td>16.</td>
<td><strong>BRUSHES (2 EACH)/MOTOR</strong> FITS MFG P/N 091-1or-2, IFS P/N 580001 or 050085</td>
<td>0941101-1-2</td>
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**MISC. PARTS**

<table>
<thead>
<tr>
<th>ITEM</th>
<th>DESCRIPTION</th>
<th>PART NUMBER</th>
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</thead>
<tbody>
<tr>
<td>17.</td>
<td><strong>RECEIVER/DRIER</strong> “O” RING</td>
<td>090016-5</td>
</tr>
<tr>
<td>18.</td>
<td><strong>EXPANSION VALVE</strong> FWD. AND AFT EVAP. &quot;O&quot; RING TYPE</td>
<td>090002-&quot;O&quot;</td>
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<tr>
<td>19.</td>
<td><strong>HIGH PRESSURE SAFETY SWITCH</strong> (ALL YEARS)</td>
<td>090004</td>
</tr>
<tr>
<td>20.</td>
<td><strong>LOW PRESSURE SAFETY SWITCH</strong> NON-ADJUSTABLE (7 OUT/22 IN)</td>
<td>050107</td>
</tr>
<tr>
<td>21.</td>
<td><strong>LOW PRESSURE SAFETY SWITCH</strong> (ALTERNATE) NON-ADJUSTABLE (6 OUT/34 IN)</td>
<td>090014</td>
</tr>
</tbody>
</table>
Integrated Flight Systems, Inc.

Pressure Switch Identification

for all

vapor cycle air conditioning kits

using R-134a

Low Pressure Switch: IFS P/N 050107

Leads are: BLUE in color

Mfg. P/N on switch: 20PS003MA022C007C

Opens: 7PSI  Closes: 22 PSI

High Pressure Switch: IFS P/N 090004

Leads are: BLACK in color

Mfg. P/N on switch: 20PS104MB350K265K
Opens: 350 PSI  Closes: 265 PSI

ALT. Mfg. P/N on switch: 20PS002MB300K250K
Opens: 300 PSI  Closes: 250 PSI

IFS P/N 090004 (Both Types)
Step 8

A/C Configuration & Overview Drawings
### Configuration Control Table

<table>
<thead>
<tr>
<th>DRAWING NO.</th>
<th>DRAWING TITLE</th>
<th>NUMBER OF SHEETS</th>
<th>DRAWING DATE</th>
<th>REVISION</th>
<th>REVISION DATE</th>
<th>AIR CONDITIONING CONFIGURATION DESCRIPTION</th>
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<tr>
<td>1-1-WEHS 000</td>
<td>AIR CONDITIONING OVERVIEW</td>
<td>1</td>
<td>03/10/97</td>
<td>B</td>
<td>08/20/98</td>
<td>X</td>
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<td>1-2-WEHS 000</td>
<td>AIR CONDITIONING OVERVIEW</td>
<td>1</td>
<td>06/20/98</td>
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<td>X X</td>
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<td>2-1-WEHS 000</td>
<td>ELECTRICAL INSTALL</td>
<td>3</td>
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<td>3-1-WEHS 000</td>
<td>PLUMBING INSTALL</td>
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<td>4-1-WEHS 000</td>
<td>FMU CONDENSATE INSTALL</td>
<td>3</td>
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<td>B</td>
<td>08/20/98</td>
<td>X</td>
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<tr>
<td>4-2-WEHS 000</td>
<td>ART CONDENSATE INSTALL</td>
<td>3</td>
<td>03/10/97</td>
<td>B</td>
<td>08/20/98</td>
<td>X</td>
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<tr>
<td>4-3-WEHS 000</td>
<td>FMU CONDENSATE INSTALL</td>
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<td>X X</td>
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<td>08/20/98</td>
<td>N/C</td>
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<tr>
<td>5-1-WEHS 000</td>
<td>AIR DISTRIBUTION</td>
<td>4</td>
<td>03/10/97</td>
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<td>5-2-WEHS 000</td>
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<td>5-3-WEHS 000</td>
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<tr>
<td>6-1-WEHS 000</td>
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<tr>
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<td>X X X</td>
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<td>8-1-WEHS 000</td>
<td>SYSTEM MODIFICATION</td>
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<td>9-1-WEHS 000</td>
<td>OIL BLOWER MODIFICATION</td>
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<td>07/22/97</td>
<td>A</td>
<td>08/20/98</td>
<td>X X X</td>
</tr>
</tbody>
</table>

**Configuration Descriptions:**
- "X" Corp. Long Instrument Closout Panels.
- "X" N/P Pilot in Command (Law Enforcement/Border Patrol).
- "X" Modified W/H/S Instrument Closout Panels.
NOTES:

- All "datum lines are "fuselage stations" (STA or FT) and are not to be used to calculate C.G. for weight & balanced purposes.

- If a gyro compass system is to be installed, the flux valve must be located at STA 303.0, MLA 83.0 and RH in 3.0 at the access cover on top of the horizontal stabilizer.
Step 9

Electrical Installation

Drawings
NOTES:

ALL "DATUM LINES ARE "FUSELAGE STATIONS" (STA OR FS)
AND ARE NOT TO BE USED TO CALCULATE C.G. FOR WEIGHT & BALANCES PURPOSES."

ROUTE IFS 8 AWG FROM MDHS BUSS IN
FREE AIR UNDER THE FLOOR TO IFS 50 AMP
C/S IN CONSOLE
SEPARATE IFS WIRE FROM 3 EACH MDHS
10 AWG WIRES
ROUTE CONDENSER BLOWER AND COMPRESSOR CLUTCH WIRES UP DOOR POST, AFT ABOVE HEAD LOWER NEXT TO REFRIGERANT LINES TO COMPRESSOR, ROUTE WIRES FORWARD TO CONDENSER BLOWER.

IFSA P/N 540029-4 "C" MASTER A/C PANEL

IFSA P/N 65064 MASTER A/C PANEL

IFSA P/N 78.50 MASTER A/C PANEL

IFSA P/N 94.50 MASTER A/C PANEL

IFSA P/N 120.00 MASTER A/C PANEL

ALTERNATE LOCATION CONTROL PANEL FOR AIR CONDITIONING SYSTEM

LOCATE AFT EVAP FAN ASSY - 10 AWG WIRE TO MASTER A/C PANEL "C" FOR A/C PANEL TRIGGER.

MBHS BUSS UNDER SEAT

UNDER FLOOR

NOTES:
ROUTE IFSA 8 AWG FROM MDHS BUSS IN FREE AIR UNDER THE FLOOR TO IFSA 50 AMP C/B IN CONSOLE.

SEPARATE IFSA WIRE FROM EACH MDHS #10 AWG WIRES

LOCATE AFT EVAP FAN ASSY, C/B LOCATION, ABOVE & INBOARD OF CONSOLE ASSY FRAME, CUT & DRILL ALL HOLES, MOUNT COMPONENTS & PLACARD.

IFSA P/N 120115 AS TEMPLATE TO LOCATE SWITCH & C/B LOCATION, AFT EVAP FAN ASSY, INBOARD OF CONSOLE ASSY FRAME, CUT & DRILL ALL HOLES, MOUNT COMPONENTS & PLACARD.
Step 10

Plumbing Installation

Drawings
FORWARD EVAP EXTREMELY IMPORTANT

FAILURE TO SECURE EXPANSION VALVE SENSING BULB TIGHTLY TO THE RETURN LINE HOSE FITTING (AT 3 OR 9 O'CLOCK POSITION) WITH A STAINLESS STEEL CLAMP (AND INSULATE SENSING BULB AND LINE) WILL DRAMATICALLY DECREASE THE PERFORMANCE OF THE AFT (NOT FORWARD) EVAPORATOR.

AFT EVAP EXTREMELY IMPORTANT

FAILURE TO SECURE EXPANSION VALVE SENSING BULB TIGHTLY TO THE RETURN LINE WITH A STAINLESS STEEL CLAMP (AND INSULATE SENSING BULB AND LINE) WILL DRAMATICALLY DECREASE THE PERFORMANCE OF THE FORWARD (NOT AFT) EVAPORATOR.

LOW AND HIGH PRESSURE SWITCHES ARE LOCATED ON THE COMRESSOR UNIL THE COMRESSORS ARE INCORPORATED INTO THE SYSTEM W/G PRESSURE PORTS. AT THAT TIME PRESSURE SWITCHES WILL BE LOCATED AS SHOWN. LOW AND HIGH SERVICE PORTS WILL BE LOCATED IN THE SERVICE BOX OR AS AN ALTERNATE, IN THE LEFT FOOT WELL. THE SIGHT GLASS WILL BE LOCATED IN THE SERVICE BOX OR AS AN ALTERNATE, VERTICALLY ON THE AFT SIDE OF THE LH CABIN DOOR POST.
SERVICE BOX INSTALLATION

1. Remove and store battery.
2. Use doubler P/N 381060 as a template to layout hole through aircraft skin and establish vent pattern.
3. Place doubler outboard of stringer with edge at B.L. -3.5 and with aft edge against forming lip of frame.
4. Mark outline of doubler and first locations. Remove A/C skin inside doubler line.
5. Install service box assembly P/N 510001 on inside of aircraft.
6. Install doubler on outside of A/C skin. Mark, drill, doubler to A/C skin and service box. Install doubler and hardware as shown.
7. Install placard P/N 510011 next to door on outer skin.
8. As an alternate to service box installation, the high and low service ports may be located in the LH feed well, and the sight glass may be located vertically on aft side of the LH cabin door post.

PLUMBING ROUTING

INTEGRATED FLIGHT SYSTEMS INC.

PLUMBING INSTALL

APPLICATION:

DRAWING DATE:

DRAWING NUMBER:
Step 11

Forward & Aft Evaporator
Installation Drawings
1. #193/199 MATCH DRILL IFS SHELF TO INSTRUMENT PANEL 2 PLACES.
   ATTACH W/ 2X AN3-5A OR NAS1096-3-10 BOLTS, 4X AN860-10 WASHERS, AND 2X MS21044A3 NUTS.

2. LOCATE SHELF HORIZONTALLY AFTER POSITIONING ARMS.
   DRILL #193/199, SECURE WITH 2X AN3-5A OR NAS1096-3-10 BOLTS, 4X AN860-10 WASHERS, & 2X MS21044A3 NUTS.

3. DRILL OUT EXISTING LAST (2)
   LOWER RIVETS CONSOLE SIDE,
   LOCATE SUPPORT ARM.

4. UTILIZE 2X CR3243-4-4 RIVETS
   (TYP-BOTH ENDS, BOTH SIDES)

A. IFS PLACARD
   P/N 120113
   (PART OF SHELF ASSY.)

B. IFS PLACARD
   P/N 120114
   (PART OF SHELF ASSY.)

C. FRESH AIR DUCT

D. FORWARD EVAP SHELF ASSY
   IFS P/N 510032

E. LH SUPPORT ARM
   IFS P/N 261149-1
   SHOWN

F. RH SUPPORT ARM
   IFS P/N 261149-2
   OPPOSITE

LANDING LIGHT DELETED FOR CLARITY

DENOTES EXISTING FASTENER LOCATION
REPLACES EXISTING RIVETS

SHELF INSTALLATION
FWD, EVAP, ASSY
(IFS P/N 560056)

MATE FWD EVAP ASSY TO BLOWER ASSY, ATTACH USING INSTRUCTIONS FOR FWD EVAP MOUNT ASSY.

FRESH AIR DUCT
LOCATED BETWEEN
DUAL BLOWER HOUSING

BLOWER ASSEMBLY
(IFS P/N 490034)

CENTER BLOWER ASSY ON FWD SHELF ASSY AND SLIDE FORWARD TO
ACHIEVE DIMENSION SHOWN FROM FORWARD BULKHEAD. MATCH DRILL
FWD SHELF ASSY TO BLOWER ASSY AND ATTACH USING 4X AN3-4A
BOLTS AND 4X AN960-10 WASHERS.

LANDING LIGHT
DELETED FOR
CLARITY

FORWARD EVAP MOUNT ASSY
(IFS P/N 510305)

AFTER MATING FWD EVAP ASSY AND
BLOWER ASSY, CENTER FWD EVAP
MOUNT ASSY ON FWD SHELF ASSY
AND SLIDE FORWARD UNTIL THE FWD
EVAP ASSY IS SUPPORTED. MATCH
DRILL FWD SHELF ASSY TO FWD
EVAP MOUNT ASSY AND ATTACH
USING 4X AN3-4A BOLTS AND 4X
AN960-10 WASHERS. MATCH DRILL
FWD EVAP MOUNT ASSY SUPPORT
ARMS TO FWD EVAP ASSY AND
ATTACH USING 4X AN3-4A BOLTS
AND 4X AN960-10 WASHERS.

FORWARD SHELF ASSY
(IFS P/N 510302)

BLowers, MOTOR, AND FORWARD
EVAPORATOR ASSEMBLY NOT
SHOWN IN THIS VIEW FOR
CLARITY.
NOTE:
MEGA CYCLIC COVER NOT SHOWN ON THIS PAGE FOR CLARITY
SEE SHEET 3 OF 3 FOR CYCLIC COVER VARIATIONS

INSTALLATION INSTRUCTIONS.

1. TEMPORARILY REMOVE AIR RECEIVING.
2. REMOVE MCM CYCLIC PLUG (91000) AND EXISTING DOUBLER.
3. LOCATE EVAPORATOR RETURN AIR DOUBLER (PSZ T71032-13) ON SHEET 1, HEAT 2 OF 2. DRILL, REAM, AND INSTALL HOLE IN EXISTING STRUCTURE AND CHECK FOR INTERFERENCE WITH EXISTING HOLES.
4. CUT #8.5 HOLE IN EXISTING STRUCTURE.
5. INSTALL RETURN AIR DOUBLER (PSZ T71032-1) AND INNER SHIM (PSZ P/N 261168).
6. MATE EVAPORATOR ASY (PSZ P/N 5260005) TO EVAPORATOR RETURN AIR DOUBLER AND MOUNT DOUBLER EXISTING STRUCTURE TO THE EVAPORATOR ASSEMBLY TORSIONAL TUBE. ATTACH AIR SHEET 4 OF THIS DRAWING.
7. INSTALL THE EVAPORATOR MOUNT CHANNEL, ASY (PSZ P/N 810272) AND THE EVAP MOUNT ANGLE ASY (PSZ P/N 101277) FIRE AND AIR SHEET 1 OF THIS DRAWING AND MOUNTED EXISTING STRUCTURE TO THE TOP OF THE EVAPORATOR ASSEMBLY.
8. MATE DRILL THE EVAP MOUNT CHANNEL, ASY TO THE EVAPORATOR ASSEMBLY AND ATTACH AIR SHEET 1 OF THIS DRAWING.
9. MATE DRILL EXISTING STRUCTURE TO THE EVAP MOUNT CHANNEL, ASY AND THE EVAP MOUNT ANGLE ASY. MOUNT ANGLE ASY AND MOUNT TO EVAP MOUNT.
10. REINSTALL AIR RECEIVING.
11. RELOCATE AND INSTALL MCM CYCLIC PLUG (1100) AND NEXT SHEET 2 OF THIS DRAWING.
12. INSTALL BLOWER ASY (PSZ P/N 440032) AND SHEET 1 OF THIS DRAWING.

DETAILED CYCLIC PLUG INSTALLATION.

VIEW LOOKING AT STA 51.04

INTEGRATED FLIGHT SYSTEMS INC.

DRAWING NUMBER: 0-2 OF 3 SHEET: 2 OF 3 DRAWN BY: TWENZY

APPLICATION: SHEET: 1 OF 3 DRAWING NUMBER: AFT EVAPORATOR INSTALL

VIRGINIA BEACH, VA

DATE: 05/15/97
APPROVED BY: SHEET: 1 OF 3 SHEET: 2 OF 3 DRAWN BY: TWENZY

INTEGRATED FLIGHT SYSTEMS INC.

DRAWING NUMBER: AFT EVAPORATOR INSTALL

APPLICATION: SHEET: 1 OF 3 DRAWING NUMBER: AFT EVAPORATOR INSTALL

VIRGINIA BEACH, VA

DATE: 05/15/97
APPROVED BY: SHEET: 1 OF 3 SHEET: 2 OF 3 DRAWN BY: TWENZY

INTEGRATED FLIGHT SYSTEMS INC.

DRAWING NUMBER: AFT EVAPORATOR INSTALL

APPLICATION: SHEET: 1 OF 3 DRAWING NUMBER: AFT EVAPORATOR INSTALL

VIRGINIA BEACH, VA

DATE: 05/15/97
APPROVED BY: SHEET: 1 OF 3 SHEET: 2 OF 3 DRAWN BY: TWENZY

INTEGRATED FLIGHT SYSTEMS INC.

DRAWING NUMBER: AFT EVAPORATOR INSTALL

APPLICATION: SHEET: 1 OF 3 DRAWING NUMBER: AFT EVAPORATOR INSTALL

VIRGINIA BEACH, VA

DATE: 05/15/97
APPROVED BY: SHEET: 1 OF 3 SHEET: 2 OF 3 DRAWN BY: TWENZY
CYCLIC COVER SCREEN VARIATIONS
CYCLIC CONTROLS NOT SHOWN FOR CLARITY

SECTION A-A
Cyclical cover screen installation with slant radio panel installed.
View looking aft

SECTION B-B
Cyclical cover screen installation without slant radio panel installed.
View looking aft

RETURN AIR COVER ASSEMBLY
PT. F/N 520086

FLOOR

NO CYCLIC COVER INSTALLED
VIEW LOOKING AFT AT STA 65.04

INTEGRATED FLIGHT SYSTEMS INC.
DATE: 02/15/97 APPROVED BY: 1/7
IN: 3 OF 3
REV. DRAWN BY:
AFT EVAPORATOR INSTALL
APPLICATION: NOISE ECON
DRAWING NUMBER: 4-2-NOISE ECON
FWD. EVAP. ASSY
(IFS P/N 560056-3)
MATE FWD. EVAP ASSY TO BLOWER
ASSY. ATTACH USING INSTRUCTIONS
FOR FWD. EVAP MOUNT ASSY.

FRESH AIR DUCT
LOCATED BETWEEN
DUAL BLOWER HOUSING

BLOWER ASSEMBLY
(IFS P/N 490034)
CENTER BLOWER ASSY ON FWD
SHELF ASSY AND SLIDE FORWARD TO
ACHIEVE DIMENSION SHOWN FROM
FORWARD BULKHEAD. MATCH DRILL
FWD SHELF ASSY TO BLOWER ASSY
AND ATTACH USING 4X AN3-4A
BOLTS AND 4X AN960-10 WASHERS.

FORWARD SHELF ASSEMBLY
(IFS P/N 510302)

FORWARD EVAP MOUNT ASSY
(IFS P/N 510305)
AFTER MATING FWD. EVAP. ASSY AND
BLOWER ASSY, CENTER FWD. EVAP.
MOUNT ASSY ON FWD SHELF ASSY
AND SLIDE FORWARD UNTIL THE FWD
EVAP. ASSY IS SUPPORTED. MATCH
DRILL FWD SHELF ASSY TO FWD
EVAP. MOUNT ASSY AND ATTACH
USING 4X AN3-4A BOLTS AND 4X
AN960-10 WASHERS. MATCH DRILL
FWD. EVAP MOUNT ASSY SUPPORT
ARMS TO FWD. EVAP. ASSY AND
ATTACH USING 4X AN3-4A BOLTS
AND 4X AN960-10 WASHERS.

INTEGRATED FLIGHT SYSTEMS
INC.

FORWARD EVAPORATOR INSTALL
APPLICATION: 747-400S
31-4/ACTS 600N

DATE: 09/05/2005
REV: 2

FORWARDED TO: 3000
NOTE:
MHG CYCLIC COVER NOT SHOWN ON THIS PAGE FOR CLARITY
SEE SHEET 3 OF 3 FOR CYCLIC COVER VARIATIONS

INSTALLATION INSTRUCTIONS:
1. TEMPORARILY REMOVE ANU RECEPTACLE.
2. REMOVE MHG CYCLIC PLUG (1-08) AND EXISTING DOUBLER.
3. LOCATE EXISTING RETURN AIR DUCT (PS/PN 281132-1) IM NOT 1.
   USE 3/32" OF THIS DRAWING MARK HOLE HOLES ON EXISTING STRUCTURE AND
   CHECK FOR INTERFERENCE WITH EXISTING HOLES.
4. CUT HOLE IN EXISTING STRUCTURE.
5. INSTALL RETURN AIR DUCT (PS/PN 281132-1) AND INNER SHIM (PS/PN
   281195).
6. MAKE MHG CYLINDER ASSEY SST PN J-10-10-2 TO EXISTING RETURN AIR
   DUCT AND MAKE SHIM EXISTING STRUCTURE TO THE MHG CYLINDER ASSEY.
   FASTEN FLANGE. ATTACH AIR SHEET 1 OF THIS DRAWING.
7. INSTALL CYCLIC RETURN AIR DUCT (PS/PN 281227) AND THE CYCLIC
   MOUNT ANGLE ASSEY (PS/PN 281227) AND ATTACH AIR SHEET 1 OF THIS
   DRAWING VERTICALLY (UPSTAND WITH THE TOP OF THE CYCLIC RETURN AIR
   ASSEY.
8. SHIM CYCLIC RETURN AIR DUCT TO THE CYCLIC ASSEMBLY AND ATTACH AIR SHEET 1 OF THIS DRAWING.
9. INSTALL CYCLIC RETURN AIR DUCT TO THE CYCLIC ASSEMBLY AND
   MOUNT ANGLE ASSEY AND ATTACH TO CYCLIC ASSEY.
10. REMOVAL ANU RECEPTACLE.
11. REMOVAL AND INSTALL MHG CYCLIC PLUG (1-08) AW SHEET 2 OF THIS DRAWING.
12. INSTALL BLOWER ASSEY (PS/PN 280065-1, ALT: 280143) AW SHEET 1 OF THIS DRAWING.

DETAIL OF CYCLIC PLUG RELLOCATION
VIEW LOOKING AT STA 85.04

INTEGRATED FLIGHT SYSTEMS
INC.
NOTE: DRAWING NUMBER: 4-5/20/2011
INTEGRATOR INSTALL
APPLICABLE TO:
NOTE: DRAWING NUMBER: 6-5/20/2011
INTEGRATOR INSTALL
APPLICABLE TO:
NOTE: DRAWING NUMBER: 5-5/20/2011
CYCLIC COVER SCREEN VARIATIONS
CYCLIC CONTROLs NOT SHOWN FOR CLARITY

CYCLIC COVER SCREEN INSTALLATION
WITH SLANT RADIO PANEL INSTALLED.
VIEW LOOKING AFT

SECTION A-A

CYCLIC COVER SCREEN
RT'S P/N 300543
(TYP AS REQUIRED)

APPROXIMATELY 4.0 INCHES FOLLOWING CONTOUR OF CYCLIC SCREEN.

6.5 (THK)

6.0 ALONG CONTOUR

SECTION B-B

CYCLIC COVER SCREEN INSTALLATION
WITHOUT SLANT RADIO PANEL INSTALLED.
VIEW LOOKING AFT

RETURN AIR COVER ASSEMBLY
RT'S P/N 320586

ATTACH RETURN AIR COVER ASSEMBLY USING 20 A10 8D BOLTS AND 2X ANGLED 1950 SCREWS IN APPROXIMATE LOCATIONS SHOWN.

NO CYCLIC COVER INSTALLED
VIEW LOOKING AFT AT STA 65.04
Step 12

Air Distribution

Drawings
SECTION A—A

AFT DUCT INSTALLATION

NOTE:
1. SEAL ALL JOINTS W/ FOIL TAPE.
2. SECURE DUCTS TO AIR FRAME OR TO INTERIOR PANELS, AS MIOC.

USED WITH CORPORATE LONG INSTRUMENT CLOSEOUT PANELS.
2X NEW WEMACS PART OF RH CONSOLE SHROUD (IFS P/N 520084)

AFT CABIN DUCT (IFS P/N 250392-1

4X NEW WEMACS

LH CONSOLE SHROUD (IFS P/N 520083)

RH CONSOLE SHROUD (IFS P/N 520084)

ALTERNATE LOCATION
CONTROL PANEL FOR
AIR CONDITIONING SYSTEM
(SEE 2-1-MEWS SH. 2 OF 3)

COCKPIT CONSOLE
VIEW LOOKING FORWARD
SCALE 1/3

SECTURE 2 1/2 CAT-10 HOSE FROM EVAPORATOR MANIFOLD TO AIR OUTLET AS SHOWN. SECURE WITH 2 1/2 BAND CLAMP ON BOTH ENDS.

TOP VIEW

2X NEW WEMACS PART OF LH CONSOLE SHROUD (IFS P/N 520083)

LHMS HEADLINER DELETED FOR CLARITY

USED WITH CORPORATE LONG INSTRUMENT CLOSEOUT PANELS.

INTEGRATED FLIGHT SYSTEMS INC.

11/20/03/07
2 of 4
2 of 4

AIRCRAFT

APPLICATION:

MEWS BOOM

DRAWING NUMBER:
2-1-MEWS BOOM
SECTION A-A
AFT DUCT INSTALLATION

24.0 REF
4X NEW WEMACS (2 PER SIDE)

CABIN ROOF LINE
14.00
2.75
4.00

MDHS HEAT DUCT

EXISTING MDHS HEAD LINER
INSTALL IFS DUCT
(IFS P/N 250352-1) TO TOP SIDE OF MDHS PANEL
P/N MDS-6200-017

AS PART OF IFS INSTALLATION
1/4" THICK ON LOWER SURFACE

P/N 250364

P/N 250363

P/N 250362

P/N 250361-1

5" BAND CLAMP

P/N 050085-1 BLOWER
ALT: 050143

AFT EVAP ASSY
P/N 560057-2

P/N 281175
IF HEATER IS INSTALLED MATCH DRILL STRAP TO EXISTING HOLES AND ATTACH USING 2X AN525-10RB SCREWS. IF HEATER IS NOT INSTALLED, INSERT 2X 4102000 RIVETS IN BULKHEAD, MATCH DRILL STRAP AND ATTACH USING 2X AN525-10RB SCREWS.

NOTE:
1. SEAL ALL JOINTS W/ FOIL TAPE
2. SECURE DUCTS TO AIR FRAME OR TO INTERIOR PANELS, AS REQ.

RIGHT HAND PILOT IN COMMAND
(LAW ENFORCEMENT/BORDER PATROL)
RIGHT HAND PILOT IN COMMAND
(LAW ENFORCEMENT/U.S. BORDER PATROL)

INSTRUCTIONS:

1. Secure P/N 520001 to LH console shroud with four screws (two per side). Ensure screws are tight.

2. Ensure upper and lower mating surfaces of P/N 520001 into shroud.


INTEGRATED FLIGHT SYSTEMS INC.

AIR DISTRIBUTION
APPLICATION: USING OXON
MOUNTING NUMBER: 3-2-4324-0800

RIGHT HAND PILOT IN COMMAND
LAW ENFORCEMENT/U.S. BORDER PATROL

INSTRUCTIONS:

1. Secure P/N 520001 to LH console shroud with four screws (two per side). Ensure screws are tight.

2. Ensure upper and lower mating surfaces of P/N 520001 into shroud.

NOTES:

1. SECURE P/N S20092 TO LH CONSOLE SHROUD WITH ADHESIVE OR ONGO COMPATIBLE 3M DIET BRAY. ADHESIVE USE CLAMPS OR CLIPPER TO MOUNT IN PLACE PER ADHESIVE MFG'S OR POLAR SPECIFICATIONS
   1. SECURE HOE PANEL USING AN522-1/8 SCREWS AND ADHESIVE.
   2. SECURE PART USING AN522-1/4 SCREWS INTO MS20139B08 NUTPLATES

2. FEREATER UPPER AND LOWER MOUNTING LINES OF P/N S20092 INTO SHROUD.

3. FINE Powder P/N S20092 AND SHROUD BY APPLYING DEHINDER PANEL SPRAY
   P/N 83111-290095 PER LABEL INSTRUCTIONS. FINAL COLORED BLACK.

RIGHT HAND PILOT IN COMMAND
(LAW ENFORCEMENT/U.S. BORDER PATROL)
AFT DUCT INSTALLATION

4X NEW WEMACS P/N 2521
INSTALL IN MODIFIED
MOHS HEADLINER OR
PS P/N 030017 (WEMAC)
AND
PS P/N 030018 (FLANGE)

MOHS HEAT DUCT

CASIN ROOF LINE

EXISTING MOHS HEAD LINER

INSTALL IPS DUCT
(IPS P/N 250352-1) TO TOP
SIDE OF MOHS PANEL
P/N MDS-6200-017

AS PART OF IPS INSTALLATION
Y370 OR EQUAL INSULATION,
FOIL BACKED 1/4" THICK ON
LOWER SURFACE.

SECTION A---A

STANDARD MODIFIED MOHS INSTRUMENT
CLOSEOUT PANEL

P/N 250364

P/N 250363

P/N 250362

P/N 281175

IF HEATER IS INSTALLED MATCH
DRILL STRAP TO EXISTING HOLES
AND ATTACH USING 2X AN025-1088
SCREWS. IF HEATER IS NOT
INSTALLED, INSTALL 2X A1088
RESEOTS IN BULKHEAD, MATCH DRILL
STRAP AND ATTACH USING 2X
AN025-1088 SCREWS.

SECTION B---B

NOTE:
1. SEAL ALL JOINTS W/ FOIL TAPE
2. SECURE DUCTS TO AIR FRAME OR
   TO INTERIOR PANELS, AS REQ.

INTEGRATED FLIGHT SYSTEMS
NOTES:

1. Secure P/N 520062 to LH console shroud with adhesive or other comparable 2-part epoxy. Adhesive used should be compatible with panel structure materials. Attach console shroud using 12 AN530-6 bolts and AN530-68 washers and screws.

2. Finish P/N 520062 and shroud by applying a 1/4 coating of epoxy, P/N 01111.1-00450 per label instructions. Panel color, Black.

INTEGRATED FLIGHT SYSTEMS

AIR DISTRIBUTION
Step 13

Compressor Installation
Drawings
ALTERNATE AIR DOOR MODIFICATIONS

1. REMOVE AND REPLACE DOOR PER MOPS MAINTENANCE MANUAL INSTRUCTIONS.
2. ENSURE ALL HOLES ARE CLEAR OF PROBES PRIOR TO DETAIL "A".
3. INSTALL "B" DOOR.
4. CLEAR MOUNTING CLEATS FROM COMPRESSOR ENCLOSURE ASSEMBLY. REMOVE P/N 5202087 TO TOP EDGE OF MOPS FRAME. IN-HOLE 3128-4-4 IN ALIGNMENT WITH DOOR CUTOUT.
5. ENSURE THAT IT'S PART, WHEN INSTALLED, WILL ALLOW DOOR TO SEAL AS PER ORIGINAL DESIGN.
6. INSTALL P/N 5202087 UTILIZING NEW P/N 281166 AS AN INTERMEDIATE BEARING HUB.
7. THE NEW SHEET METAL STRAP IS USED TO SANDWICH THE NEW FIBERGLASS BAND TO THE EXISTING DOOR L.P. (SEE DETAIL "A-A").
8. CENTER COMPONENTS TOGETHER AT "A" LOCATION USING LOCATIONS SHOWN.
9. CENTER MAX SHEETS P/N 2342-4-2.
10. REPLACE DOOR AND PERFORM OPERATIONAL CHECK.

DETAILED VIEW LOOKING INBOARD

INTEGRATED FLIGHT SYSTEMS INC.

APPLICATION: MOVES 4000   DRAWING NUMBER: 6-1-MOPS 4000
ALTENATE AIR DOOR MODIFICATIONS

1. REMOVE AND REPLACE DOOR PER HONS MAINTENANCE MANUAL INSTRUCTION.
2. CUT DOOR IN PAIRS "A".
3. STRAP AIR DOOR P/N 5320087, P/N 532038 AS SHOWN.
4. ENSURE ALL DOORS WITH PROOF N. A.
5. REMOVE AND INSTALL COMPRESSION ENVELOPE ASSY, P/N 532038 TO LOWER EDGE OF AIRS FRAME 50-0001 3126-503 IN ALIGNMENT WITH DOOR CROSS=S.
6. ENSURE THAT ALL PARTS, WHEN INSTALLED, ALLOW DOOR TO SEAL AS PER ORIGINAL DESIGN.
7. REPLACE AIR DOOR ASSEMBLY F/N 5320087 UTILIZING NEW P/N 532158 AS AN OUTR.
8. THE OUTR SIDE METAL STRAP IS USED TO SECURE THE NEW PRECISES PART OF THE EXISTING DOOR LP (SEE SECTION A-A)
9. FABRIC COMPONENTS TOGETHER AT B EXISTING HOLE LOCATIONS UTILIZING CHERRY WAX PARTS P/N 30494-4.
10. REPLACE DOOR AND PERFORM OPERATIONAL CHECK.

DETAL B
TOP VIEW

SECTION A-A

DETAL A
TOP VIEW

SWIT DOOR AS SHOWN, LOCKED ENG AND APT TO AVOID THE COMPRESSOR TEMPERING AND WHEN DOOR IS IN THE OPEN POSITON.
Step 14

Condenser Installation

Drawings
INSTALLATION INSTRUCTIONS

1. Tack fit IPS condenser assy. All sheet metal existing holes vertical. Curved supports.

2. Align swash plate on C.O. of A/C unit. Connect most part of swash plate immediately aft of condenser.

3. Ensure that condenser clearance from swash plate is a minimum of 1.25 inches.

4. Indicating point of 1.25 inches clearance is critical to condenser installation.

5. Ensure that I.D. and end of condenser aligned clearance is a minimum of 22 inches to all control rood.

EXISTING IPS MOUNTING TABS

EXISTING TABS FOR SHOULDER MOUNTING ARE 5 3/8" FORWARD OF THE EXTENDED CANT LINE AS MEASURED ALONG THE CANT ROOD.

STA 705

CANT LINE

FWD
Step 15

Seat Pan & Oil
Modification Drawings
INSTALL INSTRUCTIONS

1. REFERENCE AVIATION MAINTENANCE MANUAL FOR ALL
2. REMOVE BLOWER HOUSING AS ATTACHMENT POINTS
3. INSTALL SCREEN ASSEMBLY, COMPONENTS (P/N 530083) AND INSTALLSCREEN ASSEMBLY (PARTS)
4. INSTALL SCREEN ASSEMBLY (PARTS)
5. INSTALL SCREEN ASSEMBLY TO BLOWER HOUSING.
6. INSTALL BLOWER.

CAUTION

SECURE SCREEN TO BLOWER HOUSING
IN 2 PLACES IN EXISTING SCREWS (FRONT AND REAR ONLY VERSION). W/O TIE-BACKS 2
DO NOT USE SCREWS THAT SUPPORT CENTER BLOWING HOUSING AS ATTACHMENT POINTS.

EXISTING W/O BLOWER HOUSING