

**FAA APPROVED  
ROTORCRAFT FLIGHT MANUAL  
SUPPLEMENT  
FOR THE  
BELL HELICOPTER MODEL B-429  
WHEN EQUIPPED WITH THE  
CABIN AIR CONDITIONER SYSTEM**

REGISTRATION #: \_\_\_\_\_ SERIAL #: \_\_\_\_\_

The information in this supplement is FAA approved material and must be attached to the FAA Approved Bell 429 Rotorcraft Flight Manual when the rotorcraft has been modified by the installation of Air Comm Corporation Cabin Air Conditioner System in accordance with:

**STC # SR00693DE**

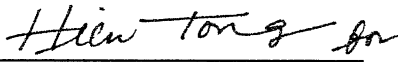
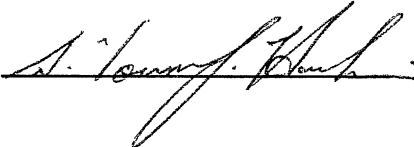
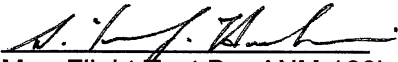
The information contained herein supplements or supersedes the information in the basic Rotorcraft Flight Manual only in those areas listed herein. For Limitations, Procedures and Performance information not contained in this Supplement, consult the basic Rotorcraft Flight Manual.

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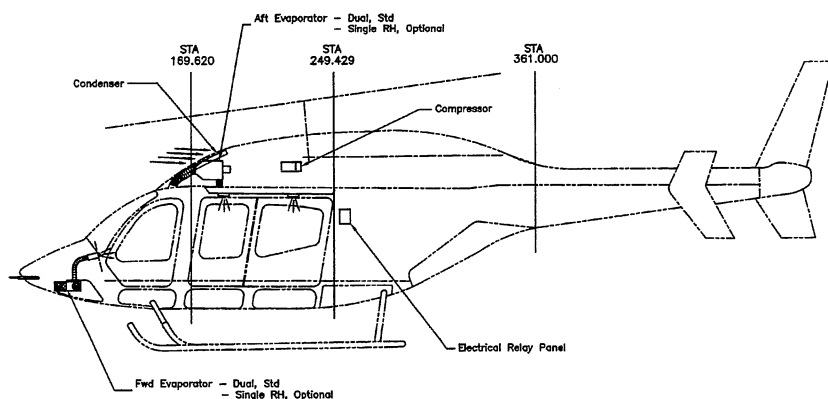
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## SYSTEM DESCRIPTION

The 429 air conditioner is a vapor cycle system which utilizes R134a refrigerant. There are two available configurations of the 429 air conditioning system: 1. A dual evaporator system with two standard forward evaporators and two standard aft evaporators. 2. An optional single RH forward evaporator and single RH aft evaporator configuration. The main components of this system, which is shown by Figure 0-1, are listed below:

- Compressor Installation
- Condenser Installation
- Evaporator Installations: Dual - two forward standard, Single - one forward optional
- Evaporator Installations: Dual - two aft standard, Single - one aft optional
- Plumbing Installation
- Electrical System Installation



**Figure 0-1. General Arrangement – Cabin Air Conditioner System**

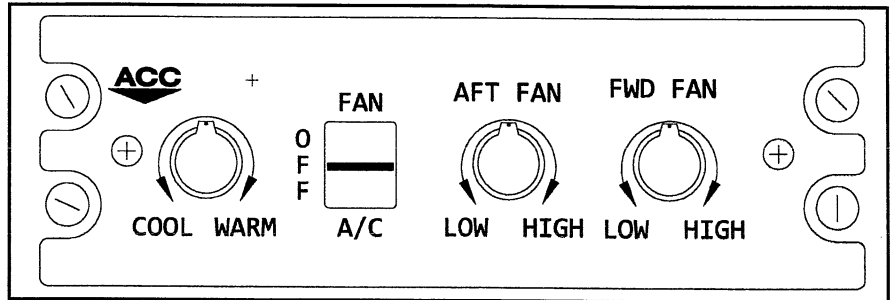
The compressor is belt driven and is mounted on the main rotor transmission.

The forward evaporator(s) is mounted on the side of the instrument panel support structure. Conditioned air is delivered to the crew by means of air outlets, which are located at the lower edge of the instrument panel (four places).

The aft evaporator(s) assembly is mounted above the cabin top. Conditioned air is provided to existing headliner ducting and air outlets.

The condenser is mounted inside the main rotor transmission fairing and is cooled by a DC blower.

The air conditioner controls include an AC-OFF-FAN switch; a temperature control selector; and separate fan speed controls for both the cockpit and the cabin, see Figure 0-2.



**Figure 0-2. Air Conditioning Control Panel - Center Console Aft**

In the FAN mode the cockpit and cabin fan are operated at the selected fan speed. In this mode the system can re-circulate cabin air.

The FWD & AFT FAN knobs control the fan speed. There is a lag in achieving the selected operating speed.

Fresh air can be circulated in the FAN mode by opening fresh air vents which are part of the aircraft type design. The VENT PULL control on the lower edge of the instrument panel allows fresh air into the cockpit and can be assisted by the FWD FAN blowers. The DEFOG PULL control should be in to divert air to the panel outlets.

Operation of the cabin overhead vent control, which is located in the crew overhead, allows fresh air to enter the cabin and can be assisted by the AFT FAN blowers.

In the AC mode all fans, including the condenser and the compressor are powered. In addition, the hot gas bypass valve meters refrigerant to the LH aft evaporator in response to operation of the COOL-WARM control knob, or the evaporator coil freeze switch.

The air conditioning system is connected to the non essential bus with circuit breakers located in the right-hand Power Distribution Panel in the baggage compartment, see Figure 0-3 & 0-4. The bus drops "off line" in case of a generator failure or an OEI occurrence and the air conditioning system is shed.

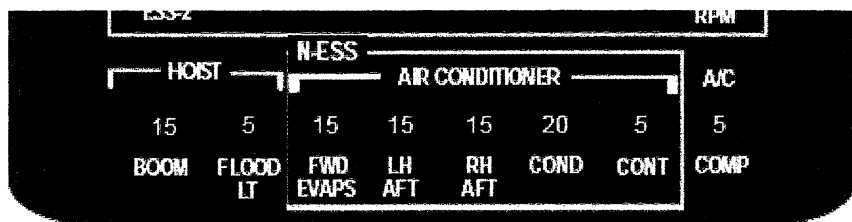
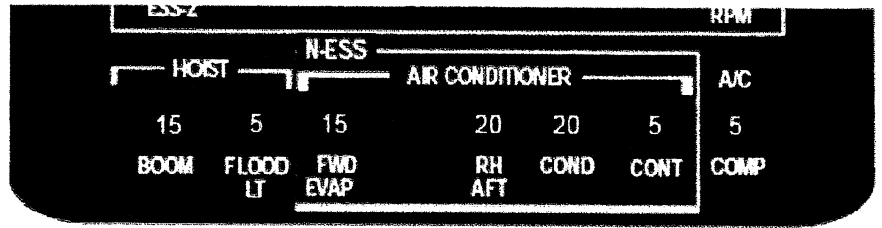
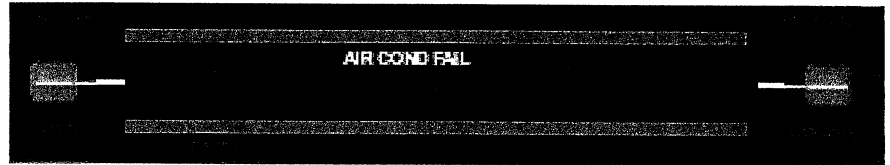


Figure 0-3. Standard Dual Evaporator AC Circuit System Breaker Panel



**Figure 0-4 Optional Single Evaporator AC System Circuit Breaker Panel**

The white message AIR COND FAIL illuminates on the DU as the result of loss of system refrigerant or excessive system discharge pressure. The compressor will disengage from the drive system, but the evaporator blowers will continue to operate.



**Figure 0-5. "AIR COND FAIL" – located on DU**

## **SECTION 1 – LIMITATIONS**

No change to the basic manual

## SECTION 2 – NORMAL PROCEDURES

### ENGINE PRESTART

- Check A/C–OFF–FAN – OFF

### BEFORE TAKEOFF & IN FLIGHT OPERATIONS

- A/C–OFF–FAN – As desired
- EVAP FANS – FAN SPEED SWITCH – As desired

#### NOTE

Total air conditioning system electrical load is less than 52 amps for the dual system & 38 amps for the single system. Monitor amps.

#### NOTE

Simultaneous operation of the cabin heater and air conditioner can be used to achieve cabin defogging

#### NOTE

If outlet air is not cool, place the A/C–OFF–FAN to the OFF or FAN position to preclude damage to the compressor.

#### NOTE

To ensure maximum system performance, close outside air vent.



### **SECTION 3 – EMERGENCY PROCEDURES**

#### **AIR COND FAIL advisory**

- Place the A/C-OFF-FAN to the OFF or FAN position.

#### **OEI or GENERATOR FAILURE**

- Place the A/C-OFF-FAN to the OFF position.

#### **NOTE**

Loss of generator output will activate the air conditioner auto load shed circuitry, which will de-energize the entire air conditioning system, including compressor clutch.

#### **NOTE**

If outlet air is not cool, place the A/C-OFF-FAN to the OFF or FAN position to preclude damage to the compressor.

### **SECTION 4 - PERFORMANCE**

When the air conditioner is operating, the performance data in the basic flight manual should be reduced as shown below:

#### **RATE OF CLIMB DEGRADATION**

Reduce the rate of climb in the basic Flight Manual by the amount shown below:

R/C Reduction ..... 54 ft/min (17 m/min)

## **HOVER CEILING IN GROUND EFFECT AND OUT OF GROUND EFFECT**

Add 68 lb (31 kg) to the aircraft weight and determine the hover ceiling from the performance curves in the basic aircraft flight manual. If the aircraft is to be operated at gross weight the hover performance is to be extrapolated.

### NOTE

Electrical loads are accounted for in the in the basic Flight Manual performance data.