

**Service Kit**

**FAA/DER APPROVED**

**Service Kit:** SK-427EC-800-2

**Title:** Replacement of Model 427 Air Conditioner Brush Type Evaporator & Condenser Blower Motors, with Brushless Motors.

**Date:** November 22, 2002

**Applicability:** Bell Model 427 equipped with HF Radio Equipment.

**Reference:** STC SR00418DE; Bell Model 427 Cabin Air Conditioner System.

**Compliance:** Optional, at the discretion of the operator.

**Purpose:** To eliminate RFI interference between 2 and 30 MHz with the Air Conditioner System Blower Motors and the HF Radio.

**Discussion:** This kit is to up-grade the existing brushed Air Conditioner Evaporator and Condenser Blower Motors with brush-less type motors. This change does require some minor modifications to the electrical installation of the air conditioner system, and minor installation and relocation of existing air conditioner components.

The details of the modifications that are required to up-grade the existing system to the 427EC-204 Configuration that are summarized below.

1. Remove and replace the forward evaporator blower motors.
2. Install new motor speed controllers for the new brush-less forward evaporator blower motors.
3. Remove and replace the aft R/H evaporator blower motor.
4. Remove and replace the aft L/H evaporator assembly. (The aft L/H evaporator has been modified to provide motor clearance with aircraft components).
5. Install new motor speed controllers for the new brush-less aft evaporator blower motors.
6. Relocation of the air conditioner relay panel.

## **Installation / Replacement Instructions**

### **CAUTION**

Handle blower wheel assembly with extreme care. Rough handling can cause the blower wheel to become unbalanced causing the wheel to vibrate or rub inside the blower housing.

### **NOTE**

Disconnect battery and remove external power source before starting work.

1. **Replacement of forward evaporator motors.** (Typical for both L/H and R/H forward evaporator motors).
  - a. Identify and cut forward evaporator blower motor power wires.
  - b. Remove the four (4) screws that secure the evaporator motors to the evaporator housing. Remove the blower motor & blower wheel assembly from the evaporator housing.
  - c. Push the previously cut motor power wires through the opening in the evaporator housing, and draw the wires through the opening in the blower housing. Cap both wires with Terminal Cap P/N 5B4486 (2 PIs). Secure wires inside the evaporator housing using Tywrap P/N CT43 (1 PIs).
  - d. Install the new brush-less motor (ES61080-1) & blower wheel assembly into the evaporator housing, and re-install the four (4) existing screws to retain the new motor assembly in place. See Figure 1-1 for blower wheel clearance criteria.
  - e. Install MS35489-1 Grommet in vacant hole in evaporator housing, and apply an ample amount of black RTV to the hole in the grommet from which the power wires to the motor were removed.
  - f. Install forward evaporator speed controllers I/A/W Drawing 427EC-604.
  - g. Connect power wires I/A/W Pages 6 thru 9 & drawing 427EC-804 Electrical System Installation.
  
2. **Replacement of R/H aft evaporator motor.**
  - a. Identify and disconnect R/H aft evaporator blower motor power wires at the Molex connector.
  - b. Remove the four (4) screws that secure the evaporator motors to the evaporator blower housing. Remove the blower motor & blower wheel assembly from the blower housing.
  - c. Install the new brush-less motor (ES61080-1) & blower wheel assembly into the evaporator blower housing, and re-install the four (4) existing screws to retain the new motor assembly in place.
  - d. Install aft evaporator speed controllers I/A/W drawing 427EC-624.
  - e. Connect power wires I/A/W Pages 6 thru 9 & drawing 427EC-804 Figure Electrical System Installation.
  - f. Note: It maybe necessary to relocate the air conditioner relay panel forward & outboard to provide clearance with the new evaporator motor.
  
3. **Replacement of L/H aft evaporator & blower assembly.**
  - a. Identify and disconnect L/H aft evaporator blower motor power wires at the Molex connector.

### **NOTE**

It will be necessary to discharge the system of refrigerant to replace the L/H evaporator Assembly. This should be done by qualified refrigeration personnel only!

*Continued*

## **Installation / Replacement Instructions (continued)**

- b. Reclaim refrigerant from the air conditioner system.
- c. Disconnect the refrigerant lines attaching to the L/H aft evaporator assembly.
- d. Remove the four (4) attaching Screws and washers that secure the L/H aft evaporator to the aircraft mounting bracket.
- e. Disconnect the Cat Ducting from the L/H aft evaporator blower outlet.
- f. Remove the screw that attaches the inlet air Y-fitting to the L/H aft evaporator.
- g. Remove the L/H aft evaporator assembly from the aircraft.
- h. Install new L/H aft evaporator assembly in the reverse order of the removal.
- i. Install aft evaporator speed controllers I/A/W drawing 427EC-624.
- j. Connect power wires I/A/W Pages 6 thru 9 & drawing 427EC-804 Electrical System Installation.

### **4. Replacement of the Condenser Blower Motor.**

- a. Remove the fourteen (14) panel screws that secure the condenser blower assembly to the belly of the aircraft, and lower the condenser blower assembly.

#### **CAUTION**

It is important to note that the condenser scoop assembly is not secured to the airframe once the panel screws are removed. It is therefore important to support the condenser assembly to insure it or the aircraft is not damaged during the removal or installation process.

- b. Disconnect the condenser blower at the Molex connector, and remove the condenser blower assembly from the aircraft.
- c. Cut the safety wire between the condenser blower retaining bolts (2 Pls) and remove the retaining bolts and blower & motor assembly from the condenser blower plate assembly.
- d. Install the new brush-less motor and blower assembly in the reverse order of its removal. Torque the blower assembly mounting bolts 50 to 70 inch lbs., and safety using .032 safety wire.
- e. Re-connect the Molex connector, and reinstall the fourteen (14) panel screws that secure the condenser blower assembly to the belly of the aircraft.
- f. Confirm the direction of rotation of the blower motor is pulling air into the condenser scoop.

### **5. Maintenance Operational Check (MOC)**

- a. Reconnect aircraft battery, or Ground power equipment.
- b. Recharge the air conditioner system I/A/W the Instructions for Continued Airworthiness manual 427EC-200M-1.
- c. Turn on aircraft power, and place the air conditioner control switches in the "blower" & "low" positions. Observe, and insure that both the cockpit and cabin blowers are all operational. With the system remaining in the "blower" position, place the cockpit and cabin blower switches in the "High" position, and again observe and insure that all blowers are operational. See note 3 of drawing 427EC-804 to confirm proper direction of rotation of the blower wheels.
- d. Next move the air conditioner control switch from "blower" to the "A/C" position, and again observe that both the cockpit, cabin, and condenser blowers are now functioning.
- e. Operate the HF radio along with the air conditioner system to insure there is no radio interference, and return the aircraft to service.

**Bill of Materials**

Item	Part Number	Description	Qty.
1	ES61080-1	Blower Motor Assembly	3
2	ES61080-2	Blower Motor Speed Controller	4
3	ES73190-1	Condenser Blower Assembly	1
4	427EC-6024-1	L/H Aft Evaporator Assembly	1
5	5B4486	Terminal Cap	4
6	CT7B	Tywrap	5
7	MIL-W-22759/41-14	Wire	20ft
8	33469	Splice	2
9	MS25036-108	Terminal	2
10	03-09-2032	Molex Connector	8
11	03-09-1032	Molex Connector	8
12	02-09-1104	Molex Pin (Male)	24
13	02-09-2103	Molex Pin (Female)	24
14	MS35489-1	Grommet	2
15	427EC-6034-1	Mount – Forward Speed Controller	2
16	427EC-6034-2	Mount – Aft Speed Controller	2
17	Documents:	Dwg. 427EC-208	1
		Dwg. 427EC-604	1
		Dwg. 427EC-624	1
		Dwg. 427EC-704	1
		Dwg. 427EC-804	1

**Weight and Balance**

The total change in the system weight is 2.2 lbs. This is considered to be a negligible change to system weight and therefore no adjustment to the weight and balance is required.

**Required Documents**

Dwg. # 427EC-204 General Arrangement  
Dwg. # 427EC-604 Forward Evaporator Installation  
Dwg. # 427EC-624 Aft Evaporator Installation  
Dwg. # 427EC-704 Condenser Installation  
Dwg. # 427EC-804 Electrical Installation

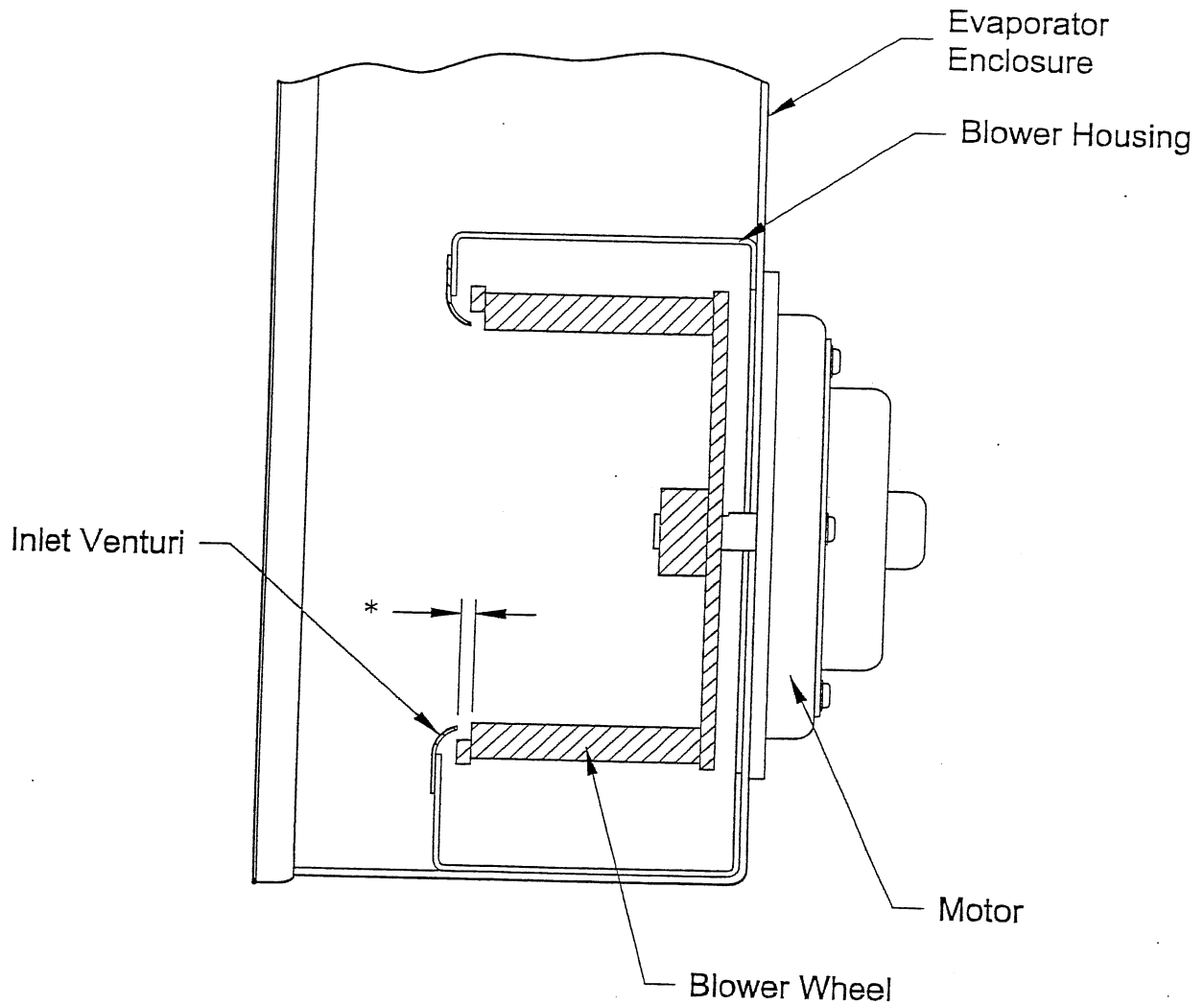
**Instructions for Continued Airworthiness**

This change has no effect on the maintenance procedures for the installation, thus the 427EC-200M-1 Instructions for Continued Airworthiness is applicable.

An exception to this statement is that items 1, 2 & 3 above are considered as suggested spares items.

Also, the electrical schematic was deviated as shown on Page 9 to route the power wire through the evaporator speed controller.

A copy of this service kit should be retained with the aircraft maintenance records.

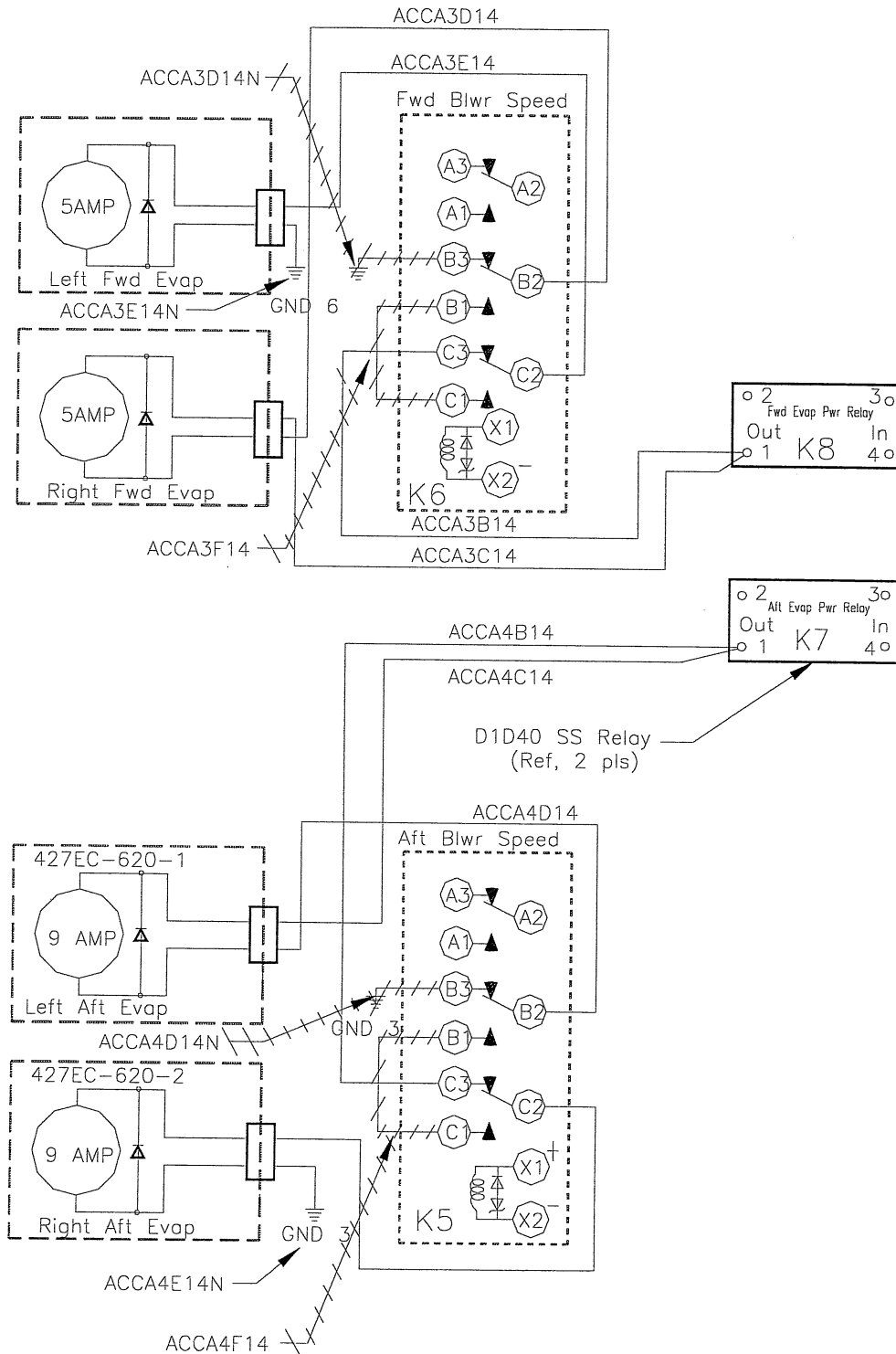


\* Blower Wheel fins should be located approximately .10 from edge of Inlet Venturi. BLOWER WHEEL MUST NOT RUB DURING OPERATION.

Figure 1-1 Blower Wheel Clearance Criteria

**At the Air Conditioner Relay Panel:**

1. At the K5 Relay: Remove and discard existing wires ACCA4D14N and ACCA4F14
2. At the K6 Relay: Remove and discard existing wires ACCA3D14N and ACCA3F14



EXISTING BRUSH-TYPE  
 BLOWER ELECTRICAL CONNECTION

**Following installation of the new forward evaporator blowers perform the following wire modifications:**

1. Reroute existing wire ACCA3E14 so that it connects terminal 1 of the K8 Power Relay located in the Air Conditioner Relay Panel to the RED wire of the Left Forward 2-Speed Blower Controller.
2. Reroute existing wire ACCA3C14 so that it connects terminal 1 of the K8 Power Relay located in the Air Conditioner Relay Panel to the RED wire of the Right Forward 2-Speed Blower Controller.
3. Reroute existing wire ACCA3B14 so that it connects terminal 1 of the K8 Power Relay to terminal A2 of the K6 Relay, both located in the Air Conditioner Relay Panel.
4. Reroute existing wire ACCA3D14 so that it connects terminal A1 of the K6 Relay located in the Air Conditioner Relay Panel to a location very near to the ORANGE wire of the Left Forward 2-Speed Blower Controller.
5. Add new wire ACCA3G14 so that it connects ACCA3D14 to the ORANGE wire of the Left Forward 2-Speed Blower Controller.
6. Add new wire ACCA3F14 so that it connects ACCA3D14 to the ORANGE wire of the Right Forward 2-Speed Blower Controller.

**NOTE: (Use AMP Splice 33469 or equivalent substitute to attach wires ACCA3G14 and ACCA3F14 to ACCA3D14)**

7. Reroute existing wire ACCA3E14N so that it connects aircraft ground GND 6 to the BLACK wire of the Left Forward 2-Speed Blower Controller.
8. Add new wire ACCA3C14N so that it connects aircraft ground GND 6 to the BLACK wire of the Right Forward 2-Speed Blower Controller.

**Following installation of the new aft evaporator blowers perform the following wire modifications:**

9. Reroute existing wire ACCA4C14 so that it connects terminal 1 of the K7 Power Relay located in the Air Conditioner Relay Panel to the RED wire of the Left Aft 2-Speed Blower Controller.
10. Reroute existing wire ACCA4E14 so that it connects terminal 1 of the K7 Power Relay located in the Air Conditioner Relay Panel to the RED wire of the Right Aft 2-Speed Blower Controller.
11. Reroute existing wire ACCA4B14 so that it connects terminal 1 of the K7 Power Relay to terminal A2 of the K5 Relay, both located in the Air Conditioner Relay Panel.
12. Reroute existing wire ACCA4D14 so that it connects terminal A1 of the K5 Relay located in the Air Conditioner Relay Panel to a location very near to the ORANGE wire of the Left Aft 2-Speed Blower Controller.

13. Add new wire ACCA4G14 so that it connects ACCA4D14 to the ORANGE wire of the Left Aft 2-Speed Blower Controller.
14. Add new wire ACCA4F14 so that it connects ACCA4D14 to the ORANGE wire of the Right Aft 2-Speed Blower Controller.

**NOTE: (Use AMP Splice 33469 or equivalent substitute to attach wires ACCA4G14 and ACCA4F14 to ACCA4D14)**

15. Reroute existing wire ACCA4C14N so that it connects aircraft ground GND 3 to the BLACK wire of the Left Aft 2-Speed Blower Controller.
16. Add new wire ACCA4E14N so that it connects aircraft ground GND 3 to the BLACK wire of the Right Aft 2-Speed Blower Controller.

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