

**SUPPLEMENT S07**

**TO THE AIRPLANE FLIGHT MANUAL**

**DA 42 NG**

**Recirculating Air - Cabin Cooling**

**Doc. No. : 7.01.16-E**

**Date of Issue : 06-Sep-2012**

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## 0.2 RECORD OF REVISIONS

Rev. No.	Reason	Chapter	Page(s)	Date of Revision	Approval Note	Date of Approval	Date Inserted	Signature
1	MÄM 42-659, MÄM 42-678, MÄM 42-759, OÄM 42-253, OÄM 42-260, Corrections	0, 2, 5	9-S07-01, 9-S07-02, 9-S07-03, 9-S07-06, 9-S07-14	01-Apr-2014	Rev. 1 to AFM Supplement S07 to AFM Doc. No. 7.01.16-E is approved by EASA under Approval No.10048945			

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### 0.3 LIST OF EFFECTIVE PAGES

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## 1. GENERAL

This Supplement describes the function of the Recirculating Air - Cabin Cooling System and supplies all information for the safe and efficient operation of the system.

This Supplement is a permanent part of the AFM and must remain in the AFM at all times when the Recirculating Air - Cabin Cooling System is installed.

## **2. OPERATING LIMITATIONS**

### **2.7 MASS (WEIGHT)**

- I Minimum flight mass : 1450 kg (3197 lb)

### **2.15 LIMITATION PLACARDS**

On the Instrument Panel:

THE AUX POWER SWITCH MUST BE SWITCHED OFF IN ALL EMERGENCIES, DURING TAKE-OFF, LANDING , GO-AROUND OR ABNORMAL OPERATING PROCEDURES, AT AIR TEMPERATURES BELOW 10 °C (50 °F), ABOVE 10.000 ft MSLAND IF ADF IS IN USE.

### **2.16 OTHER LIMITATIONS**

#### **I 2.16.12 RECIRCULATING AIR - CABIN COOLING**

The AUX POWER switch and the Recirculating Air - Cabin Cooling System must be switched OFF in all Emergencies, during Take-Off, Landing, Go-Around or Abnormal Operating Procedures, at outside air temperatures below 10 °C (50 °F), above 10.000 ft MSL and if ADF is in use.

The Recirculating Air - Cabin Cooling System adversely effects the accuracy of the ADF system (if installed) and the WX 500 stormscope (if installed). The AUX POWER switch must be switched OFF if the ADF system is used for navigation.

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### **3. EMERGENCY PROCEDURES**

#### **3.1 INTRODUCTION**

##### **3.1.1 GENERAL**

#### **CAUTION**

The AUX POWER switch and the Recirculating Air - Cabin Cooling System must be switched OFF in all Emergencies, during Take-Off, Landing, Go-Around or Abnormal Operating Procedures, at Outside Air Temperatures below 10 °C (50 °F), above 10.000 ft MSL and if ADF is in use.

AUX POWER switch ..... OFF

#### **3.12.10 RECIRCULATING AIR - CABIN COOLING SYSTEM FAILURES**

##### **Smoke and Fire**

AUX POWER switch ..... OFF

Continue with 3.11 - SMOKE AND FIRE.

##### **Excessive Noise or Vibration**

AUX POWER switch ..... OFF

## **4A NORMAL OPERATING PROCEDURES**

### **4A.6 CHECKLISTS FOR NORMAL OPERATING PROCEDURES**

#### **CAUTION**

The AUX POWER switch and the Recirculating Air - Cabin Cooling System must be switched OFF in all Emergencies, during Take-Off, Landing, Go-Around or Abnormal Operating Procedures, at Outside Air Temperatures below 10 °C (50 °F), above 10.000 ft MSL and if ADF is in use.

#### **4A.6.1 PRE-FLIGHT INSPECTION**

##### I. Cabin Check

***Item a1) is added:***

*On the LH sidewall:*

a1) AUX POWER switch ..... check OFF

##### II. Walk-Around Check, Visual Inspection

*4. Fuselage, left side, underside:*

***Items c1) and c2) are added:***

c1) Cabin cooling air outlet ..... visual inspection

c2) Cabin cooling air inlet ..... visual inspection



6. Fuselage, right side:

**Item a1) is added:**

a1) Cabin cooling air inlet/outlet . . . . . visual inspection

**4A.6.2 BEFORE STARTING ENGINE**

**Item 10A is added:**

10A. AUX POWER switch . . . . . check OFF

**4A.6.6 BEFORE TAKE-OFF**

**Item 9A is added:**

9A. AUX POWER switch . . . . . check OFF

**4A.6.11 APPROACH & LANDING**

*Approach:*

**Item 3A is added:**

3A. AUX POWER switch . . . . . check OFF

**4A.6.14 SHUT-DOWN**

**Item 4A is added:**

4A. AUX POWER switch . . . . . check OFF

**4A.6.22 RECIRCULATING AIR - CABIN COOLING SYSTEM GROUND  
OPERATION**

Ground Operation with External Power Unit

**NOTE**

The External Power Unit must be capable to supply a minimum of 100 A at 28 V DC to operate the RACC - System.

1. POWER lever . . . . . check IDLE
2. Parking brake . . . . . set
3. AVIONIC MASTER . . . . . check OFF
4. AUX POWER . . . . . check OFF
5. ELECT. MASTER . . . . . check OFF
6. ENGINE MASTER . . . . . check OFF

**CAUTION**

When switching the External Power Unit ON, the electrically driven hydraulic gear pump may activate itself for 5 to 20 seconds in order to restore the system pressure. Should the pump continue to operate continuously or periodically, terminate flight preparation. There is a malfunction in the landing gear system.

**NOTE**

When switching the External Power Unit ON, all electrical equipment, connected to the LH and RH main buses is powered.

**CONTINUED**

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7. External power . . . . . connect
8. Recirculating Air - Cabin Cooling switch . . . . ON
9. ELECT. MASTER . . . . . ON

Ground Operation with Engine Running

1. AUX POWER switch . . . . . ON
2. Recirculating Air - Cabin Cooling switch . . . . ON

Power Off

1. Recirculating Air - Cabin Cooling switch . . . . OFF
2. AUX POWER switch . . . . . OFF

**END OF CHECKLIST**

**4A.6.23 RECIRCULATING AIR - CABIN COOLING SYSTEM OPERATION IN FLIGHT**

**CAUTION**

The AUX POWER switch and the Recirculating Air - Cabin Cooling System must be switched OFF in all Emergencies, during Take-Off, Landing, Go-Around or Abnormal Operating Procedures, at Outside Air Temperatures below 10 °C (50 °F), above 10.000 ft MSL and if ADF is in use.

Power On

1. AUX POWER switch . . . . . ON
2. Recirculating Air - Cabin Cooling switch . . ON

Power Off

1. Recirculating Air - Cabin Cooling switch . . OFF
2. AUX POWER switch . . . . . OFF

**END OF CHECKLIST**

## **4B ABNORMAL OPERATING PROCEDURES**

### **CAUTION**

The AUX POWER switch and the Recirculating Air - Cabin Cooling System must be switched OFF in all Emergencies, during Take-Off, Landing, Go-Around or Abnormal Operating Procedures, at Outside Air Temperatures below 10 °C (50 °F), above 10.000 ft MSL and if ADF is in use.

## 5. PERFORMANCE

### **CAUTION**

The AUX POWER switch and the Recirculating Air - Cabin Cooling System must be switched OFF in all Emergencies, during Take-Off, Landing, Go-Around or Abnormal Operating Procedures, at Outside Air Temperatures below 10 °C (50 °F), above 10.000 ft MSL and if ADF is in use.

### 5.3.7 CLIMB PERFORMANCE (ALL ENGINES OPERATING)

#### **NOTE**

The Rate of Climb with the Recirculating Air - Cabin Cooling System switched ON is reduced by 70 ft/min.

### **I** 5.3.9 TIME, FUEL AND DISTANCE TO CLIMB

#### **NOTE**

**I** Performance information not published for this airplane configuration.

### **I** 5.3.10 CRUISE PERFORMANCE

#### **NOTE**

The Cruise Speed with the Recirculating Air - Cabin Cooling System switched OFF is reduced by 2 %.

#### **NOTE**

The Cruise Speed with the Recirculating Air - Cabin Cooling System switched ON is reduced by 5 %.

## 6. MASS AND BALANCE / EQUIPMENT LIST

No change.

## **7. DESCRIPTION OF THE AIRPLANE AND ITS SYSTEMS**

### **7.15 RECIRCULATING AIR - CABIN COOLING SYSTEM**

The Recirculating Air - Cabin Cooling System consists of the following main parts:

- AUX POWER switch and control panel (LH sidewall))
- Central unit (aft of the baggage compartment)
- Additional alternator (on the LH engine)

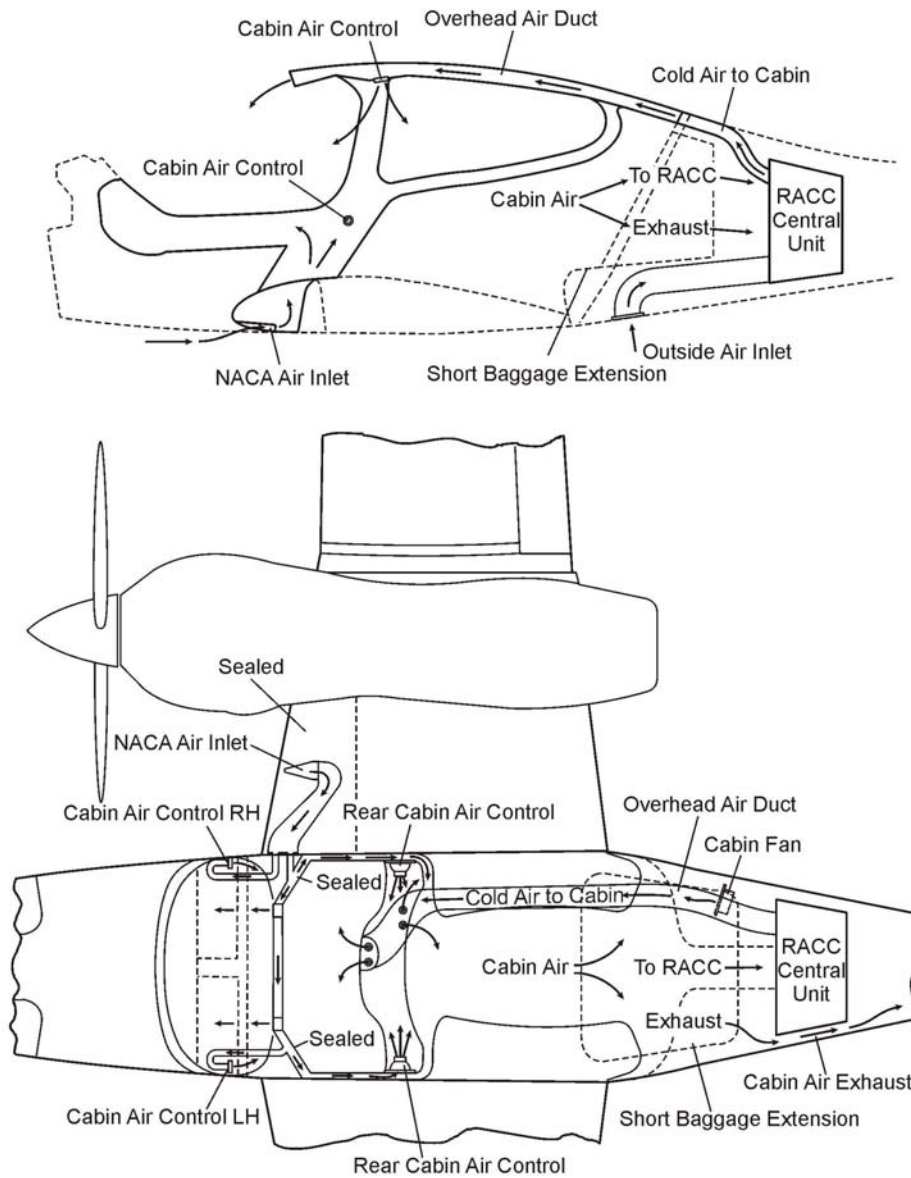
The Recirculating Air - Cabin Cooling System is not connected to the electrical system of the airplane. The additional alternator provides the electrical power to operate the Recirculating Air - Cabin Cooling System independently.

#### **NOTE**

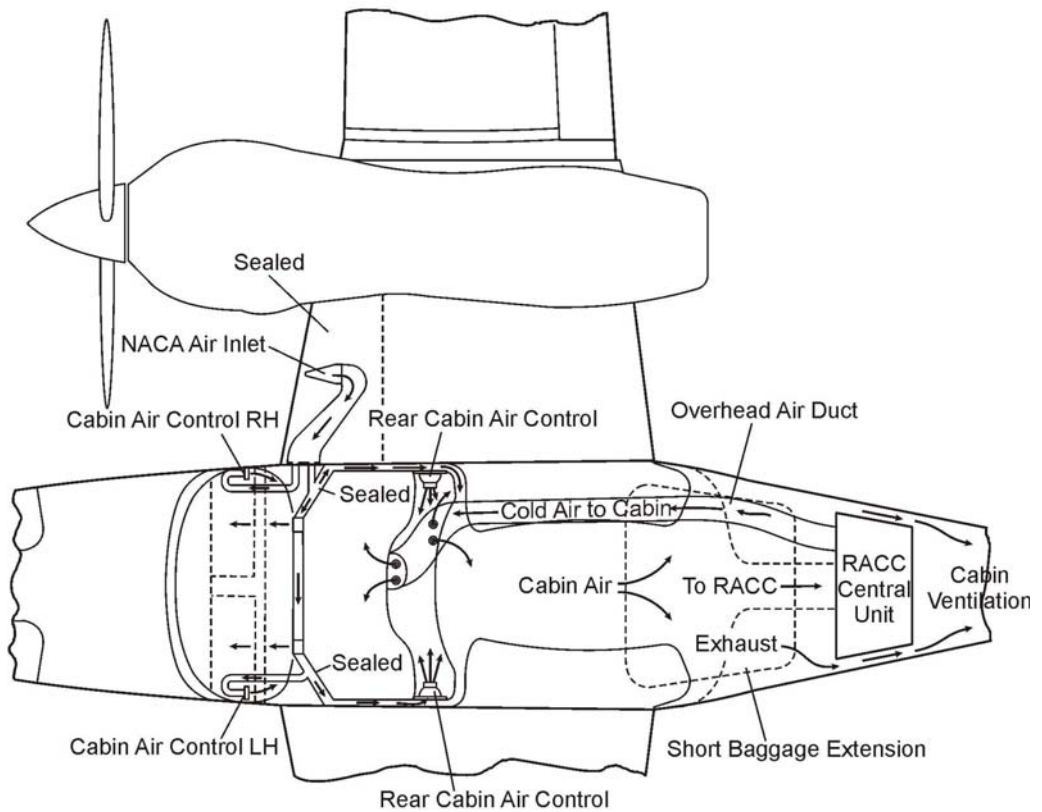
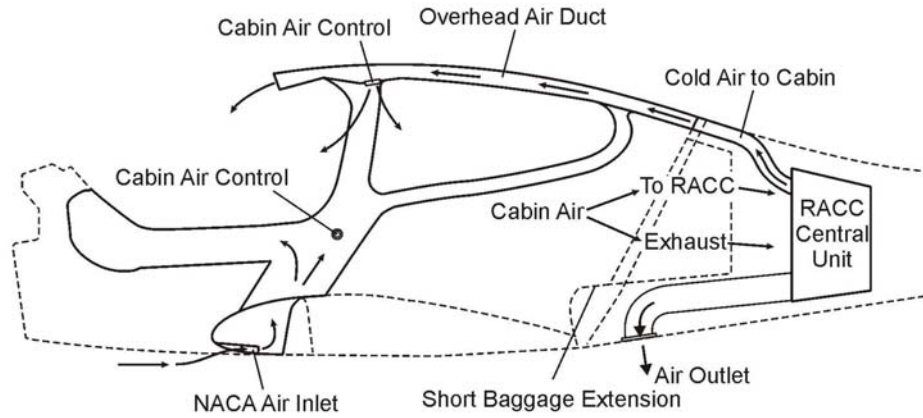
The Recirculating Air - Cabin Cooling System effects the performance of the airplane. Refer to Chapter 5 of this Supplement.



**Recirculating Air - Cabin Cooling Schematic**



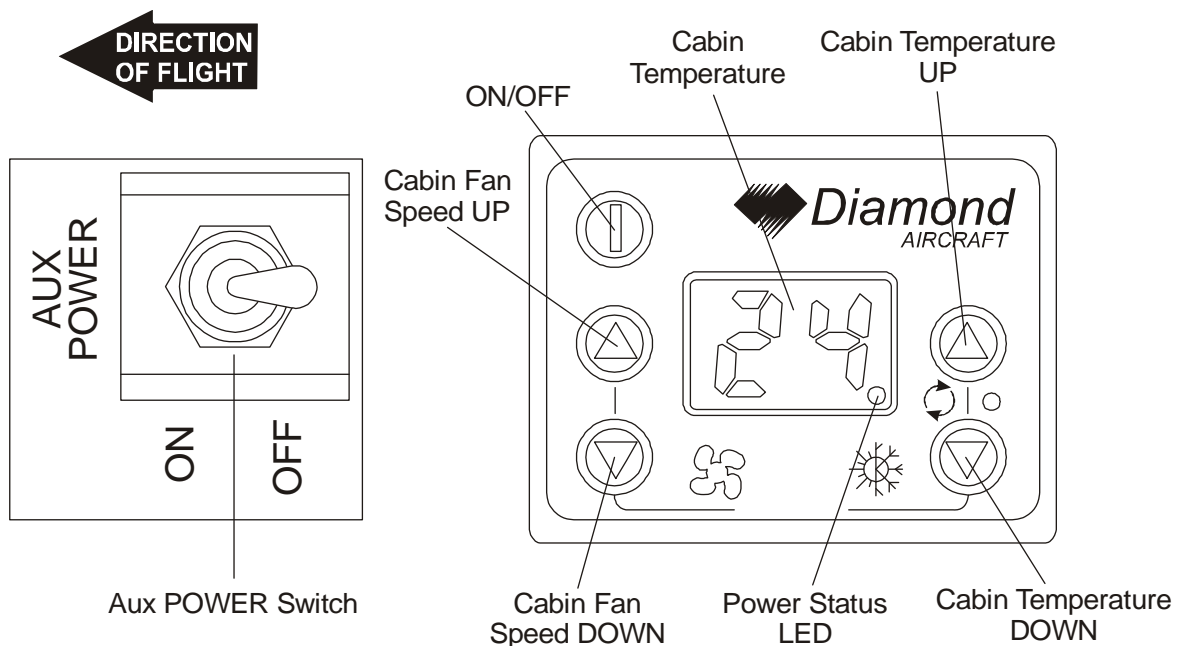
RACC System Schematic



RACC System Schematic (if OÄM 42-193/d or later is installed)

### Control Panel

The AUX POWER switch and the control panel are located on the LH sidewall. If the AUX POWER switch is set to ON, the Recirculating Air - Cabin Cooling System is electrically connected to the additional alternator which provides the electrical power for the system and the Power Status LED is flashing. To operate the Recirculating Air - Cabin Cooling System press the ON/OFF button once and wait until the display is permanently illuminated. The fan speed (three speed settings) is controlled with the UP and DOWN buttons to the left of the temperature display. The temperature preset buttons are located to the right of the temperature display. The preset cabin air temperature is shown on the temperature display in °F. If OÄM 42-193/d or later is installed, the temperature is shown in °C.



### **Central Unit**

The central unit is located behind the passenger seats and the short baggage extension. It takes cabin air from the aft portion of the short baggage extension and recirculates it through the central unit and via the overhead air duct to the cooling air nozzles in the overhead panel. The central unit consists of an electrically driven compressor, heat exchangers, air inlets, air outlets and a control box. According to the preset cabin air temperature on the control panel, the control box operates the compressor and all essential control elements of the central unit in order to achieve the preset cabin air temperature.

### **Additional Alternator**

The additional alternator is located at the front RH side of the LH engine next to the gearbox. The additional alternator is mounted to the engine via a single bolt at the bottom (this allows to rotate the alternator to tension the drive belt) and two bolts at the top which are connected to the engine gearbox via a bracket. A pulley is installed on a drive disc at the propeller shaft which drives the additional alternator via a V-belt. Connected to the propeller drive disc is an axial fan to provide engine gearbox cooling.

If the AUX POWER switch is set to ON, the additional alternator provides the electrical power for the Recirculating Air - Cabin Cooling System.

## 8. AIRPLANE HANDLING, CARE AND MAINTENANCE

No change.

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