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FAA APPROVED

HELICOPTER FLIGHT MANUAL SUPPLEMENT EC145 AC FMS

FOR

**EUROCOPTER HELICOPTER CORPORATION
EQUIPPED WITH THE VAPOR CYCLE AIR-CONDITRIONER
KIT# 117MM-100-2**

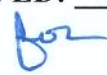
MODEL: MBB-BK117C-2

REGISTRATION NO.: _____

SERIAL NO.: _____

This supplement must be attached to the LBA/FAA approved Rotorcraft Flight Manual, when a Metro Aviation, Inc., vapor cycle air-conditioning system is installed in accordance with STC SH3880SW. The information contained herein supplements or supersedes 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: 


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LOG OF REVISIONS

<u>REVISIONS</u>	<u>DATE</u>	<u>PAGES AFFECTED</u>	<u>CHANGE</u>	<u>FAA APPROVED</u>
Original	16 April 2004		Original Release	16 Apr 2004
A	17 Mar 2009	ALL	corrected cover	17 Mar 2009
B	2 July 2010	ALL	add 3 evaporator sys	02 July 2010

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1.0 GENERAL

The installation consists of a vapor cycle air-conditioning system utilizing a compressor driven by “V” belt driven by the rotor brake disc.

Refrigerant is R-134a

The basic system consists of two separate evaporator/blower assemblies, one supplying the cockpit area and one supplying the cabin area. Each has separate two speed fan controls. An optional configuration adds a Third Evaporator in the center overhead cabin. This evaporator integrates with the existing fresh air system. If the third evaporator is installed, its fan is controlled with the aft evaporator fan control. The condenser is a continuous tube and fin type with a dual flat fan.

2.0 LIMITATIONS

- The air-conditioning system must be "OFF" during engine start.
- Operation of the air-conditioning system is not possible on one generator, except with a GPU connected and operating .

3.0 EMERGENCY PROCEDURES

3.1 EMERGENCY PROCEDURES

- In the event of an engine failure, turn air-conditioner "OFF".

3.2 D.C. GENERATOR FAILURE

- Automatic load shedding is provided as part of the basic electrical aircraft system. Select OFF.
- Load shedding of the air-conditioning system occurs if either generator fails.
- Air-conditioning system CAN NOT be operated, unless failed generator is able to re RESET.
- After generator is reset, the air-conditioning can be operated normally.

EMERGENCY PROCEDURES (continued)**3.3 EXCESSIVE TEMPERATURE, FIRE, SMOKE**

In the event of any of the following, turn air-conditioner 'OFF':

1. Cabin or other fire.
2. Presence of smoke.

3.4 FREON IN THE CABIN

In the event a leak of Freon into the cabin is suspected, perform the following immediately;

- Turn air-conditioner switch to "FAN" and place fan switch to "HIGH".
- Open all windows and vents.
- Land as soon as practical to vent cabin and cockpit.

3.5 CAD or VEMD OVERHEAT INDICATION

- Set forward Air Conditioner fan to HIGH

NOTE- The installed forward fan system is not part of the CAD ventilation system, however, operation of the fan at high, with the other Flight Manual procedures may reduce internal cockpit temperature

4.0 NORMAL PROCEDURES**4.1 GROUND OPERATION - ONE ENGINE - ONE GENERATOR**

- GPU "MUST" be utilized to operate air-conditioning system with only one generator on line.
- Electrical bus shedding precludes use of the air-conditioner on one generator, without a GPU attached to the aircraft and operating.

In overhead switch panel

- To turn air-conditioner "CONT" to "FAN" – for fan only operations
- For Air-conditioning, Move switch to "ON".
- Adjust "Air Condition" "FAN" to desired speed, "LO" or "HIGH"
- To turn air-conditioner off – Move Air conditioner "CONT" switch to "OFF".

4.2 GROUND AND FLIGHT OPERATION - TWO ENGINES - TWO GENERATORS

- In overhead switch panel
- To turn air-conditioner on move switch Air-condition switch "CONT" to "FAN" – for fan only operations
- For Air-conditioning, Move switch to "A/C".
- Adjust "Air Condition" "FAN" to desired speed, "LO" or "HIGH"
- To turn air-conditioner off – Move Air conditioner "CONT" switch to "OFF".
- Air-conditioning system may be operated during both take-off and landings.

5.0 PERFORMANCE:

With Air-conditioner operating;

Reduce hover gross weight obtained from the hover performance charts by 30 kg.

Reduce AEO climb by 50 fpm

6.0 PREFLIGHT CHECK

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

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 and mount through the upper transmission cowl.
- 2) Check security of the compressor drive belt..
- 3) Visually inspect evaporator fan scoop.
- 4) Check the security of the condenser through the battery access door.
- 5) Ensure that when the main rotor is turned that no rotation of the compressor driven plate.
- 6) Inspect air outlets for condition and operation.

A.0 SYSTEM AND DESCRIPTION

The air-conditioning installation consists of a vapor cycle air-conditioning system utilizing R-134a. A compressor with magnetic clutch has been located aft of the rotor mast on a bracket attached to the Main Transmission case and is driven by a “V” off the Rotor Brake Disc.

The air-conditioning system provides for cockpit and cabin comfort during all operations both on the ground and in flight, provided both generators are on line.

During ground operations when only one engine is running, and only one generator is operating, cooling may be provided, if an APU is utilized.

Controls for the air-conditioning system are mounted in the overhead electrical panel, above the pilot/copilot in the section Labeled “AIR CONDITION”. Two switches are provided. Control Selector consists of two toggle type switches, labeled "CONT" and "FAN". Selecting the “CONT” "FAN" position provides power to the evaporator blower circuit on the system's evaporator blower. After the “CONT” “ON” is selected, the compressor engages approximately 8 seconds later. There is an annunciation, “ECS”, indicating the compressor engagement on the CAD. The second toggle switch is provided for "HIGH" or "LOW" forward evaporator blower speed selection for the cockpit. The aft evaporator fan speed is controlled by a fan “HIGH” “LOW” switch located in a convenient place in the aft cabin. With the optional third evaporator installed, the fan speed is controlled by the aft evaporator fan speed selector.

The push-pull controls in the center console must be in the pulled up position to ensure the correct air flow. The cabin fresh air vents should also be closed for proper system operation.

A high pressure safety switch, located near the condenser, disengages the compressor and stops operation of the system in the event of excessive refrigerant pressures. This can occur due to failure of the condenser blower or restricted condenser air intake. The switch will reset itself. The “ECS” annunciation extinguishes. The pilot can reactivate the system by moving the “CONT” switch to “OFF” then back “ON”. However, this should only be done if cool air is necessary for the continued safety of the passengers. Any un-commanded occurrence of the system to deactivate should be investigated by an appropriately rated and trained technician.

A low pressure safety switch, located near the compressor, disengages the compressor and stops operation of the system in the event low refrigerant pressures occur. This can be caused by a restricted expansion valve, freeze up of the evaporator, or loss of refrigerant. The switch will automatically reset itself.

Air circulation is still provided.

The evaporator blower 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 1 each 40 amp..

Additionally, 3 each 15 amp, 1 each 5 amp circuit breakers labeled FWD EVAP, AFT EVAP, COND FAN, CLUTCH are located in the Air-Conditioning Master Electrical Control Box. This box is located in the LH cabin side wall.

| If the third evaporator is installed, an additional 7.5 Amp circuit breaker is installed on the #1 shed bus.

A.1 ELECTRICAL LOADING

| The maximum electrical requirements of the air-conditioning system is 35 amps for the dual evaporator system. The three evaporator system will require 39 Amps. The air conditioning replaces the factory forward vent blower that had a current draw of 21 amps.

Note: Time delay function is provided for condenser blower and clutch operations.

LOADING SHEDDING

Automatic electrical load shedding will occur if a D.C. generator failure occurs. The basic design of the aircraft's electrical system does not allow for the manual override of this function.

A.2 WEIGHT AND BALANCE

| Installation or removal of the system requires recalculation of the weight and balance report either by physical reweigh or calculation.