METRO AVIATION, INC.
1400 AIRPORT RD. #120
SHREVEPORT, LA 71101

REPORT # BO105M-10

EMS KIT INSTALLATION INSTRUCTIONS

WITH OPERATION AND INSTRUCTIONS FOR CONTINUED AIRWORTHINESS

BO105 SERIES AIRCRAFT

REV. A DATE: 1-26-95

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REVISIONS

REV.	DATE	DESCRIPTION	APPROVAL
N/C	3-87		MKG
A	1-26-95	A seat, floor, monitor mount, number pages. Revise all pages to Rev A level	

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METRO AVIATION, INC.
"METRO AVIATION EMERGENCY MEDICAL KIT"
KIT NO. 105M-101

I

DOCUMENTATION LIST

1. FAA Supplemental Type Certificate

2. Flight Manual Supplement No. 105M-5

3. Installation Instructions No. 105M-1

4. Operation & Instructions for Continued Airworthiness No. 105M-2

5. Metro Aviation, Inc. Drawings in accordance with latest Approved Drawing List.

6. Metro Aviation, Inc. Assembly Drawings in accordance with Latest approved Drawing List.

7. Metro Aviation, Inc. Process Specification Manual #EPS 105-1

II
105M-1

INSTALLATION INSTRUCTIONS FOR KIT 105M-101

TITLE: Installation Procedures for Emergency Medical System Kit No. 105M-101

Warning

Instructions for installing, testing, use and maintaining items described and included in the "KIT" are to be adhered to. Failure to install, maintain, test and use the "KIT" items in accordance with these instructions may result in failure of equipment.

NOTE:

Metro Aviation, Inc. offers free assistance to aid in installation of the "KIT" and also offers free training aids to all purchasers and users of the kit. Contact Metro Aviation, Inc., P.O. Box 7008 Shreveport, Louisiana 71137 for this assistance.

I. Planning Information
  A. Affectivity
    (1) The following aircraft are effected by the instructions:

    MODEL:
    BO105C with STC# SH1025EA Incorporated
    BO105S and BO105LS

    (2) It is recommended that ECD option no. 13 "Reversed Co-Pilot seat" to be accomplished in conjunction with installation of this kit.

  B. Reason
    (1) To adapt the BO105 helicopter to accommodate the transportation of medical personnel, patients, and equipment.

  C. Description
    (1) These instructions provide a summary of installation drawings and a suggested installation sequence.

**INSTALLATION INSTRUCTIONS
FOR KIT 105M-101
(cont)**

D. Compliance
(1) Installation of this kit is recommended for aero medical operations when safe efficient transport of medical personnel and patients is required.

E. Log Book Entry
(1) Upon compliance of the work described in this bulletin, record compliance of the change as required by FAR 43, as applicable.

**INSTALLATION INSTRUCTION
FOR KIT 105M-101
(cont)**

II. Accomplishment Instruction

A. Prepare the helicopter for safe ground maintenance

B. Remove the following components or assemblies to gain access to the rework areas. Refer to the BO105 MOM.

(1) Left and right cabin doors and sliding doors
(2) All interior paneling
(3) Left and right floor access panels
(4) Passenger bench seat leg fittings and belts
(5) Rear clamshell doors
(6) Rear floor protective strips
(7) Relocate equipment items in aft avionics bay as required

NOTE: If aft avionics shelf is not installed it will be necessary to install a shelf to facilitate mounting items of equipment used in this installation. Use methods and techniques found in the manufacturers maintenance manuals, and applicable FAR's and FAA advisory circulars. If shelf and previously mounted equipment is installed some relocation may be needed.

C. Consult drawing no. 105M-101 to familiarize personnel with general arrangement of items to be installed.

D. Fabricate and install wiring and associated equipment as shown on drawing no. 105M-380. Use acceptable and approved methods to tie, bundle and terminate wires.

E. Install the accessory panel assembly part no. 105M-7200-1 in accordance with drawing no. 105M-720. An optional accessory panel installed in accordance with drawing no. 105M-721 is also applicable.

F. Install IV rack in accordance with drawing no. 105M-400.

G. Install the 110 volt AC inverter in accordance with drawing no. 105M-310.

**INSTALLATION INSTRUCTION
FOR KIT 105M-101
(cont)**

II. Accomplishment Instruction (cont)

H. Install the suction pump in accordance with drawing no. 105M-340. Plumb tubing to accessory panel IAW acceptable methods.

I. Install gooseneck lamp IAW drawing no. 105M-350.

J. Install all potted inserts and other attaching hardware IAW drawing nos. 105M-740, 105M-745, 105M-780, and 105M-786. Reference drawing no. 105M-7800. For panel pin installation see drawing no. 105M-7801.

K. Install UC28-14KGS converter IAW drawing no. 105M-790.

L. Install floor pan IAW drawing no. 105M-780 or 105M-781. Locally manufacture a hole finder from two pieces of .040 aluminum sheet cut in 3" x 4' strips riveted at one end and a 5mm screw and nut on the locator end. This is used to locate holes required for equipment installation on cabin floor.

M. Fit isolation bulkhead IAW drawing no. 105M-700. Remove floor pan and isolation structure until all other work is accomplished and final inspections have been accomplished.

N. Install litters IAW drawing 105M-786. After final fit of litter fittings and rail assemblies, remove until after final inspections and installation of interior panels and floor pan.

O. Install equipment mount rack IAW drawing no. 105M-370 for Physio Control Life Pac 5 and life stat 100 installation. For Physio Control Life Pac 10 or Zoll Cardiac Monitor use drawing no. 105M-371.

P. Install auxiliary landing lights IAW drawing no. 105M-300. Final focusing of lamps to be accomplished during night test flight. No interference with pilots vision shall be noted.

**INSTALLATION INSTRUCTION
FOR KIT 105M-101
(cont)**

II. Accomplishment Instruction (cont)

Q. Remove forward right hand jack pad and install PA horn P/N SA340 IAW drawing no. 105M-800. Location and installation of control head P/N WS295 to be at the discretion of installer provided acceptable methods are observed and/or local FAA approval is obtained for installation. Retain previously removed jack pad with aircraft for future maintenance functions.

R. Perform final inspections of under floor areas for completeness and cleanliness of work.

S. Reinstall right and left floor access panels.

T. Install oxygen system IAW drawing no. 105M-762 & 768

NOTE: (1) Low pressure lines and tubing to be pressure tested to 150 PSI prior to final installation using dry shop air.

(2) Take all precautions necessary to prevent chaffing of oxygen lines.

(3) After fitting lines, remove, clean as per AC43.13-2A Chapter Six and reinstall permanently as per same. Leak check systems after final assembly with system oxygen pressure.

U. Perform final inspections of side and overhead areas for completeness and cleanliness of work. Reinstall all interior panels.

NOTE: Interior trim panels may have to be trimmed to accommodate the equipment installed in these instructions. Fit and clearance should be adjusted as required.

**INSTALLATION INSTRUCTION
FOR KIT 105M-101
(cont)**

II. Accomplishment Instruction (cont)

V. Perform final installation of:

(1) Floor pan IAW drawing no. 105M-780.

(2) Litters IAW drawing no. 105M-786.

(3) Isolation bulkhead IAW drawing no. 105M-700

(4) Side facing seat IAW drawing no. 105M-740

NOTE: On final installation of above items seal all areas that may allow fluids to leak under floor pan with 732 RTV sealant or Proseal 890.

W. Install placards listed on drawing no. 105M-850 or other drawings as applicable.

X. Function Checks

(1) Perform functional check of all aircraft systems removed or modified during this installation.

(2) Swing compass IAW, Manufacturers Maintenance Manual instructions.

(3) Perform functional check of the EMS system as follows;

(a) Energize aircraft electrical system with on board battery. All systems shall function except the on board 110 VAC inverter.

(b) Energize the aircraft electrical system with a external power cart.

(c) All installed equipment shall function.

**INSTALLATION INSTRUCTION
FOR KIT 105M-101
(cont)**

II. Accomplishment Instruction (cont)

(d) Operate aircraft with both engines and generators on line. Turn one generator off at a time, 110 VAC inverter shall not operate.

(e) Perform overload check of 110 VAC system by connecting a consumer known to draw more than 10 amps to the accessory bulkhead receptacles. The breakers shall trip, disconnect load, reset breaker and check normal operation.

(f) Perform overload check of UC28-14 converter system by connecting a 14 VDC consumer to accessory bulkhead receptacle that is known to draw more than 15 amps. The breaker shall trip, disconnect, load, reset breaker and check for normal operation.

(g) Leak check oxygen system plumbing IAW AC43.13-2A Chapter Six. No leaks shall be noted. Check function of on-off mechanism.

(h) Perform night flight to focus auxiliary landing lights. No interference to pilots vision to be noted.

(i) Perform routine check of all other equipment installed.

(j) Shut down aircraft systems.

(k) Re-weigh aircraft to obtain new empty weight and new empty weight C.G.

(l) Make all appropriate entries in the aircraft records IAW FAR 43.

INSTALLATION INSTRUCTION
FOR KIT 105M-101
(cont)

III. Material Information

A. The following support documents are included for operating and maintaining the Metro Aviation, Inc. EMS kit:

TITLE	MANUAL #	QTY.
Supplement to the LBA approved Flight Manual for the BO105C and BO105S helicopters, EMS kit installation # 105M-1	Flight Manual Supplement #1	1
Operation & Instructions For Continued Airworthiness	105M-2	1

IV. Special Tools

N.A.

V. Estimated Man-hours

Approximately 200 man-hours for a crew of 3 men are required to accomplish this installation.

VI. Approval

Approval for this modification was granted by the FAA under authority of STC# SH3663SW

VII. Weight and Balance

VIII. References

BO105 Maintenance & Overhaul Manuals
Associated Installation Manuals provided with items of Equipment
Applicable FAR's and advisory circulars

**INSTALLATION INSTRUCTION
FOR KIT 105M-101
(cont)**

IX. Publication Affected

BO105 Flight Manual
BO105 Maintenance and Overhaul Manual

Upon completion of the kit installation, incorporate the kit manual supplements into the manuals listed above.

III
105M-2

OPERATION AND INSTRUCTIONS FOR CONTINUED AIRWORTHINESS FOR THE METRO AVIATION, INC. EMS KIT # 105M-101

INTRODUCTION AND PURPOSE

1-1 INTRODUCTION

This report provides operation and maintenance instructions for the items of equipment in the P/N 105M-101 EMS kit.

1-2 PURPOSE

This kit is used to transport medical personnel and critically ill or injured persons and equipment to and from hospitals or on site emergency locations.

WARNING

Maintenance use of this "KIT" is to conform to instruction contained herein and all applicable Federal Aviation Regulations and Advisory Circulars. Failure to follow these guidelines, may result in failure of the kit or portions there of.

NOTE: Metro Aviation, Inc., offers free assistance to the original purchaser or any other users of the "KIT" on maintenance and use of items included in the "KIT".

OPERATION AND INSTRUCTIONS FOR CONTINUED AIRWORTHINESS FOR THE METRO AVIATION, INC. EMS KIT # 105M-101

DESCRIPTION AND OPERATION

2-1 GENERAL

This system consists of:

a) 2 Ferno model #9 litters & restraint systems
b) Side facing attendant seat with lap and shoulder harness
c) Leak proof floor pan and isolation structure
d) Accessory bulkhead with equipment rack and lighting
e) Auxiliary landing lights
f) PA/siren horn and control
g) Oxygen system
h) 110 VAC inverter
i) 14 VDC converter
j) Suction pump

2-2 DETAILED

a) The litter system consists of 2 foldable litters, 2 guide rail assemblies, and 2 retention systems for litters. The left and right litters are identical. To use the litters, unfold and slide the locking sleeves into position. Load the stretcher thru the rear clamshell doors using left or right guide rail to guide the litter into the forward stop. When litter is seated fully home forward, move the rear latch from the stowed position up and forward and seat hook firmly against rear of stretcher. To remove, depress rear latch release lever, slide hook to the rear and stow flat, remove stretcher. Slide locking sleeve out of locked position and fold stretcher. Stow accordingly. Failure to ensure litter is installed properly may result in injury to occupants.
Electrical load: N.A.

b) The side-facing seat is a standard aircraft type seat and seat belt and should harness assembly. Under seat storage is available thru the front of the seat.
Electrical load: N.A.

OPERATION AND INSTRUCTIONS FOR CONTINUED AIRWORTHINESS FOR THE METRO AVIATION, INC. EMS KIT # 105M-101

DESCRIPTION AND OPERATION (cont)

c) The stainless steel leak proof floor pan provides a positive method of preventing fluids from leaking into the forward cabin area and other areas below the floor. The isolation barrier provides a means of jamming controls.
Electrical load: N.A.

d) The accessory bulkhead and equipment rack assemblies provided a convenient means for medical personnel to store various pieces of equipment used in the care of critically ill or injured patients. It also has built in two light sources for patient examination at night. The bulkhead provides built in outlets for medical oxygen and suction and controls and outlets for 110 VAC, 12VDC and suction. An acceptable suction collection canister shall be used in series to prevent liquids from being introduced into suction system. Size and weight of items stored on bulkhead are to be such that no injuries may occur in the event of an emergency landing.
Electrical load: 8 AMP max.

e) The auxiliary landing light system provides and uncomplicated lighting system for use by the pilot for illuminating the landing area. The system provides 600,000 candle power of light. The system consists of four each lights mounted two each to the left and right jack pads, a relay box mounted on the airframe, structure right side and the momentary trigger switch on the pilot's collective pitch stick (standard equipment). To energize the lights the pilot pulls the collective mounted trigger. This energizes the relay in the relay box supplying power to the lights. The lights remain on as long as the trigger is depressed. The system has the feature of being available in case of dual electrical system failures or battery bus failure where the standard landing light is rendered useless.
Electrical load: 35 AMP max.

OPERATION AND INSTRUCTIONS FOR CONTINUED AIRWORTHINESS FOR THE METRO AVIATION, INC. EMS KIT # 105M-101

DESCRIPTION AND OPERATION (cont)

f) The PA/siren installation provides a method for the pilot to warn and issue instructions to ground personnel at a landing site. The control head has PA siren and radio monitoring capabilities that allow the pilot and passengers to leave the aircraft and still monitor incoming radio calls.
Electrical load: 5 AMP max.

g) The oxygen system consists of a 76.5 cu. ft. aircraft type oxygen cylinder and regulator assembly mounted to the exterior of the aircraft right side. A push pull shut off cable is located inside the cabin to allow the crew to control the flow of low pressure oxygen to the medical accessory bulkhead. A cylinder contents gauge is located in the cabin above the right hand opera window to allow the crew to monitor the amount of oxygen available for use. The oxygen cylinder is serviced through a calibrated fill port to a nominal pressure of 1859 PSI @ 70E F. Low pressure oxygen is supplied on demand at 45 to 65 PSI depending on altitude temperature and remaining contents in the cylinder.
Electrical load: N.A.

h) The Avionic Instruments, Inc. 110 volt AC inverter provided a source of power (10 amp max) for powering carry on life support equipment through two duplex hospital grade lighted plugs. The Metro Aviation, Inc. EMS kit also provides and external receptacle on the exterior of the aircraft to allow 110 volt AC power to be connected from an outside source (10 amp max). A relay in the system switches this power to the accessory panel and illuminates one of two indicator lights on the accessory panel. The external source has priority until it is disconnected from the aircraft. The on board inverter control circuit is connected to the aircraft auxiliary bus. In the event of an engine or generator failure, the inverter is shed from the aircraft electrical system automatically.
Electrical load: 35 AMP no load; 43 AMP max.

OPERATION AND INSTRUCTIONS FOR CONTINUED AIRWORTHINESS FOR THE METRO AVIATION, INC. EMS KIT # 105M-101

DESCRIPTION AND OPERATION (cont)

i) The KGS model UC28-14 converter provides 12 volt DC power to the accessory panel through one three pin locking connector (15 amp max). This provides a source of 12 volt DC power for carry-on life support equipment.
Electrical load: 8.7 AMPS max.

j) The Thomas suction pump model 907CDC22/24 volt pump is located on the upper deck aft of the left engine. The pump is controlled by an on/off switch and an "on" indicator light on the accessory panel. A standard "OHIO: outlet is also provided on the accessory panel for hook-up of flexible hoses and collection canister shall be provided to prevent fluids from entering the fixed portions of the installations.
Electrical load: 4.5 AMPS max

OPERATION AND INSTRUCTIONS FOR CONTINUED AIRWORTHINESS FOR THE METRO AVIATION, INC. EMS KIT # 105M-101

SPECIAL TOOLS AND TEST EQUIPMENT

3-1 No special tools required.

INSTRUCTIONS FOR CONTINUED AIRWORTHINESS

WARNING

FAILURE TO MAINTAIN THIS KIT IN ACCORDANCE WITH THESE AND OTHER APPLICABLE PUBLICATIONS MAY RESULT IN INJURY

4-1 INSPECTION

Inspection of installed items of this kit shall be in accordance with applicable equipment manufacturers instructions, this manual and acceptable date in applicable date FAR's and advisory circulars.

Compliance with the inspections and checks listed herein is to be carried out in unison with normally scheduled airframe maintenance periods.

4-2 PREFLIGHT CHECK (Carried out prior to first flight of day)

Check entire installation visible without disassembly for cleanliness and security of mounting.

4-3 100 HOUR CHECK

a) Inspect all wiring for condition and security

b) Inspect all plumbing for condition and security

c) Leak check all plumbing at normal working pressure oxygen system maintenance to be IAW AC43.13-2A Chapter Six.

OPERATION AND INSTRUCTIONS FOR CONTINUED AIRWORTHINESS FOR THE METRO AVIATION, INC. EMS KIT # 105M-101

SPECIAL TOOLS AND TEST EQUIPMENT (cont)

d) Functionally check items of installed equipment within normal operating parameters

e) Inspect all installed equipment for cleanliness and security of mounting

f) Inspect litters and restraint system for worn parts and proper operation. Repair or replace any stretcher or item associated with restraint system that may render the system unsafe for patient transport.

g) Inspect the oxygen cylinder for mounting security, operation of shut-off system and last cylinder test date. Testing and maintenance of cylinder assembly is to be IAW cylinder assembly manufacturers instructions and all applicable Federal and State regulations including AC43.13-2A Chapter Six.

4-4 MAINTENANCE

Repair or replace items of equipment found defective in accordance with the applicable manufacturers instructions or approved data or installation instructions for this kit.