A.F.M. Supplement

SUP2_AFM_DHR_P68ISAE_R0

RESEARCH INSTALLATION

- MEASUREMENT BAY installation
- EXPERIMENTATION BAY installation
- BALLAST installation

STC 00-001-19

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NOTE:

This supplement must be inserted in section 8 of the P68 VULCANAIR Aircraft Flight Manual.

APPROVAL

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LIST OF EFFECTIVE PAGES

This manual contains the pages identified on the following dates:

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LIST OF REVISIONS

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AFM	Aircraft Flight Manual

SECTION.1 GENERAL

This supplement is intended to inform the pilot about the equipment limitations, description and operations necessary to the operation when the aircraft is equipped with the option “RESEARCH INSTALLATION” as per change No. STC 00-001-19 Version B, C or D.

The General information hereafter supplement or replace those of the standard airplane described in Section 1 - General when the aircraft is equipped with the “RESEARCH INSTALLATION” as per change No. STC 00-001-19 version B, C or D.

▲ CAUTION ▲

This supplement #2 can only be used if Supplement #1 has been properly and completely filled and put in place in the aircraft .

▲

The “RESEARCH INSTALLATION” allows to collect data related to the aircraft.

The “RESEARCH INSTALLATION” consists in multiple possible equipment configurations:

EQUIPMENT CONFIGURATION	Measurement Bay	Experimentation Bay	Ballast
MEASUREMENT BAY . STC 00-001-19 Version B	Installed and operational	Removed	Removed (*)
EXPERIMENTATION BAY STC 00-001-19 Version C	Removed	Installed and operational	Removed (*)
BALLAST STC 00-001-19 Version D	Removed	Removed	Installed and operational
MEASUREMENT BAY + EXPERIMENTATION BAY + BALLAST STC 00-001-19 Version B + C +D	Installed and operational	Installed and operational	Installed and operational

Table 1 – Equipement configuration.

(*): The measurements bay or experimentation bay, alone, could be installed with or without the ballast.

NOTES, CAUTIONS AND WARNING

In this supplement the NOTE, CAUTION and WARNING indications are supplied in accordance with these definitions:

● **NOTE** ●	An operating procedure, technique or maintenance practice which is considered essential to emphasize.
▲ **CAUTION** ▲	An operating procedure, technique or maintenance practice which may result in a minor damage if not carefully followed.
▲ **WARNING** ▲	**An operating procedure, technique or maintenance practice which may result in personal injury or loss of life if not carefully followed.**

SECTION.2 OPERATING LIMITATIONS

The operating limitations hereafter supplement or replace those of the standard airplane described in Section 2 - Operating Limitations when the aircraft is equipped with the option “RESEARCH INSTALLATION” as per change No. STC 00-001-19 Version B, C or D.

The aircraft equipped with this modification remains in compliance with its Certificate of Airworthiness, without restriction.

2.1 Installation of equipment

Refer to the technical instruction TI1 DHR P68ISAE R0 for the proper installation of the “RESEARCH INSTALLATION” and the proper “AIRCRAFT CONFIGURATION FORM” (weight and balance and electrical consumption data) in regards to the installation available in the aircraft.

2.2 Weight limits

- for measurement bay: 58.5 kg (128.7 lbs)
- for experimentation bay: 50 kg (110 lbs)
- For lests on ballast frame: 100 kg (220 lbs)

2.3 Electrical limits.

The consumption of research equipment must not exceed 30 Amps for each BUS.

SECTION.3 EMERGENCY PROCEDURES

The emergency procedures hereafter supplement or replace those of the standard airplane described in Section 3 - Emergency procedures when the aircraft is equipped with the option “RESEARCH INSTALLATION” as per change No. STC 00-001-19 Version B, C or D.

3.1 Emergency procedures

3.1.1 Impact of “RESEARCH INSTALLATION” modification to existing procedures:

3.1.1.1 ENGINE FAILURE DURING CRUISE FLIGHT

No change to this procedure

3.1.1.2 ENGINE IN-AIR RESTART

Electrical consumption needs to be reduced for optimum use of available electricity for the engine startup.

AUX PWR (1) master switch.....OFF
AUX PWR (2) master switch.....OFF

3.1.1.3 IN-FLIGHT ENGINE FIRE

AUX PWR (1) master switch.....OFF
AUX PWR (2) master switch.....OFF

3.1.1.4 IN-FLIGHT ELECTRIC OR CABIN FIRE

AUX PWR (1) master switch.....OFF
AUX PWR (2) master switch.....OFF

If a cabin seat occupant detects a fume smell or smoke surrounding bays

Both bays emergency stop switch.....Push
The cabin occupant must advise the pilot of the situation

AUX PWR (1) master switch.....OFF
AUX PWR (2) master switch.....OFF

3.1.1.5 SINGLE ALTERNATOR FAILURE

No change to this procedure

3.1.1.6 DUAL ALTERNATOR FAILURE

Add this operation first at the beginning of the procedure to disconnect experimentation and measurement bays

An automatic cut off should have cut the power supply of the bays

Both bays shutdown ..... Check
MB and EB advisory lights off

AUX PWR (1) master switch ..... OFF
AUX PWR (2) master switch ..... OFF

3.1.1.7 COMPLETE ELECTRICAL FAILURE

Add this operation first at the beginning of the procedure to disconnect experimentation and measurement bays

AUX PWR (1) master switch ..... OFF
AUX PWR (2) master switch ..... OFF

3.1.2 New procedures created following “RESEARCH INSTALLATION” modification.

3.1.2.1 EXPERIMENTATION BAY FAILURE

Experimentation bay ..... Switch off
Push emergency stop switch
or AUX PWR (1) master switch

3.1.2.2 MEASUREMENT BAY FAILURE

Measurement bay ..... Switch off
Push emergency stop switch
or AUX PWR (2) master switch

3.1.2.3 COM/NAV interferences

Measurement bay and experimentation bay ..... Switch off

If interferences persist

Measurement bay and experimentation bay ..... Keep switched off

SECTION.4 NORMAL PROCEDURES

The normal procedures hereafter supplement or replace those of the standard airplane described in Section 4 – Normal procedures when the aircraft is equipped with the option “RESEARCH INSTALLATION” as per change No. STC 00-001-19 Version B, C or D.

4.1 Pre-flight checklist

COCKPIT

Measurement bay installation (if installed)..... Check
Attachment points, connecting wires and emergency stop switch unlocked off

Measurement bay switch (if installed)..... Check
Position of switch in accordance with the aircraft configuration form

Experimentation bay Installation (if installed)..... Check
Attachment points, connecting wires and emergency stop switch unlocked off.

● NOTE ●
Make sure that no connecting wires are loose when not connected
●

If a portable PC is installed on the experimentation bay, verify the correct attachment with velcro tape. Verify also connecting wires.

Ballast installation (if installed) ..... Check
Attachment points and securing pins

Weight security..... Check
Attachment points and securing pins

If required:

Measurement bay and experimentation bay.....Set ON
Verify that advisory lights are illuminated in accordance with power supply connection

Measurement bay and experimentation bay..... OFF

FUSELAGE

GPS Antenna ..... Check
Integrity, cleanliness

TM Antenna ..... Check
Integrity, cleanliness

NOSE SECTION

▲ **CAUTION** ▲
Sensors located on nose section are very fragile
▲

ALFG/ALFD/BET SENSORS ..... Check
Integrity, cleanliness

CABIN OCCUPANT BRIEFING

The pilot in command should brief the occupant of the possibilty to use the emergency stop switchs and to action them appropriatly.

In case the occupant uses the emergency stop switch during flight he must advise immediately the pilot about his action and the situation.

4.2 Before engine start

Measurement bay and experimentation bay..... Check OFF

4.3 After engine start

If required:
Measurement bay and experimentation bay.....Set ON
Advisory lights illuminated

If required:
Telemetry switch .....Set ON

4.4 Before landing

Portable PC..... Secured on experimentation bay
Properly velcroed

4.5 Before engine shutdown

Measurement bay and experimentation bay.....Set OFF
Advisory lights off

SECTION.5 PERFORMANCES

Operation of the airplane equipped with the “RESEARCH INSTALLATION” does not change the performance of the airplane described in section 5 - Performance of the basic A.F.M.

SECTION.6 WEIGHT AND BALANCE

The weight and balance hereafter supplement or replace those of the standard airplane described in Section 6 - Weight and balance when the aircraft is equipped with the option “RESEARCH INSTALLATION” as per change No. STC 00-001-19 Version B, C or D.

Item	Max. Weight (kg)	Weight (kg)	Arm (m)
Measurement bay	58,5		1,31
Experimentation Bay	50		0,67
Ballast	100		1,88
Seat		-10,5	0.87
Rails		1,7	1,55
Ballast frame		3,4	1,88

Table 2 – Weight and Balance

SECTION.7 DESCRIPTION

The description hereafter supplement or replace those of the standard airplane described in Section 7 - System description and operation when the aircraft is equipped with the “RESEARCH INSTALLATION” as per change No. STC 00-001-19 Version B, C or D.

7.1 General

The RESEARCH INSTALLATION consist of preparing the aircraft with the material necessary to perform the expected test flight.

The material consist of

Rails on floor attachment points.
Ballast support on rails.
Measurement bay on rails.
Experimentation bay.

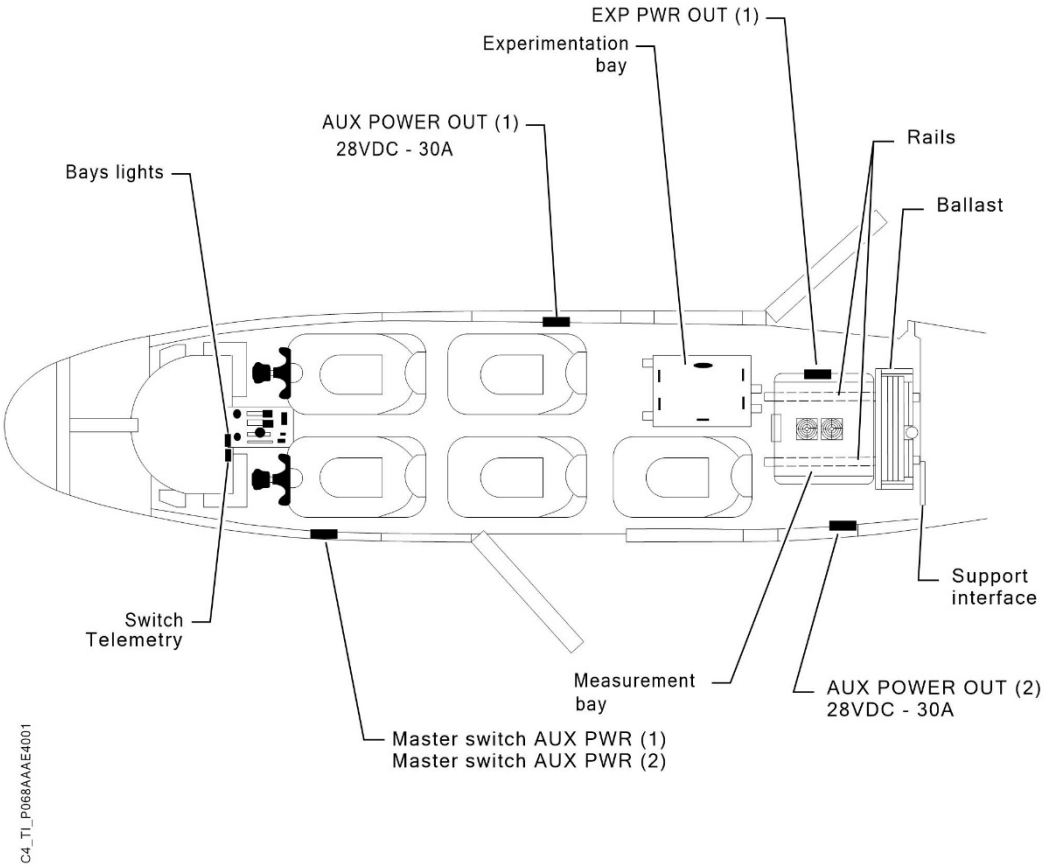

Figure 1 - Location of bays and ballast

● NOTE ●
Anticipate installation of experimentation bay first in the aircraft before measurement bay in case both bays are needed to be installed.
●

7.1.1 Installation of rails

Rails are installed on floor attachment points by means of 4 pins secured by safety pins.

Refer to the TI1_DHR_P68ISAE_R0 for the equipment installation procedure.

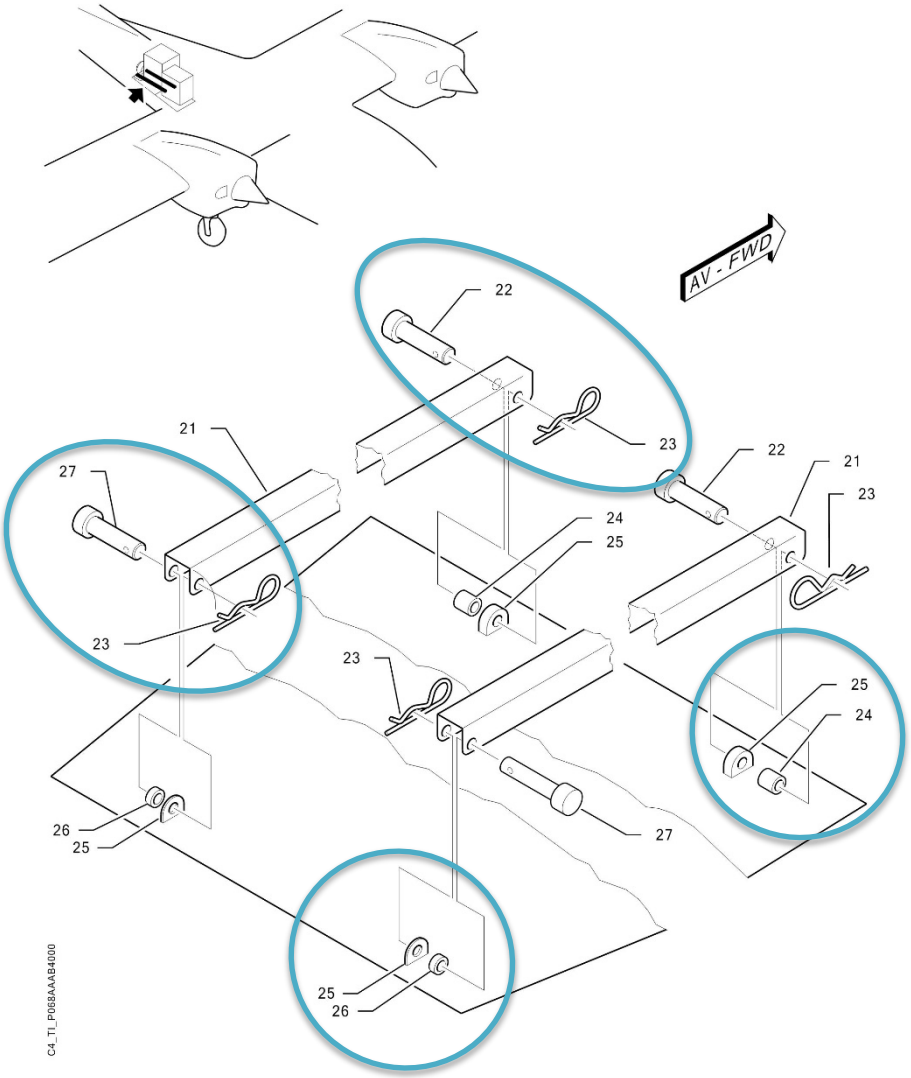

Figure 2 - Rails installation

7.1.2 Installation of ballast support on rails

The purpose of the ballast installation is to configure the weight and balance of the aircraft in regards to the expected tests to be performed. (refer to figure 3)

Refer to the TI1_DHR_P68ISAE_R0 for the equipment installation procedure.

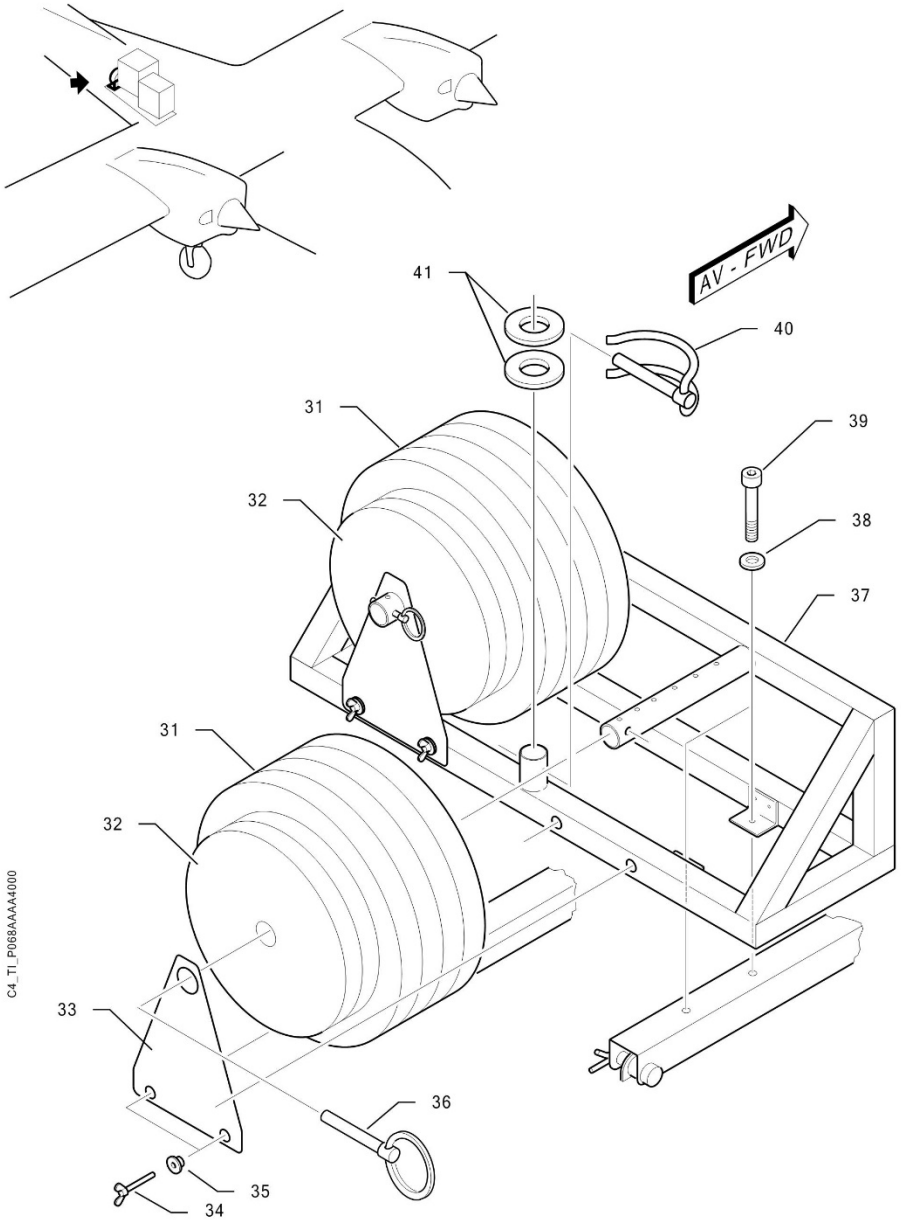

Figure 3 - Ballast Support installation

▲ CAUTION ▲

Make sure weights spacers (41) and safety pins (36 and 40) are properly in place before any flight.

▲

7.1.3 Installation of Measurement bay on rails.

7.1.3.1 Mechanical installation

Refer to the TI1_DHR_P68ISAE_R0 for the equipment installation procedure.

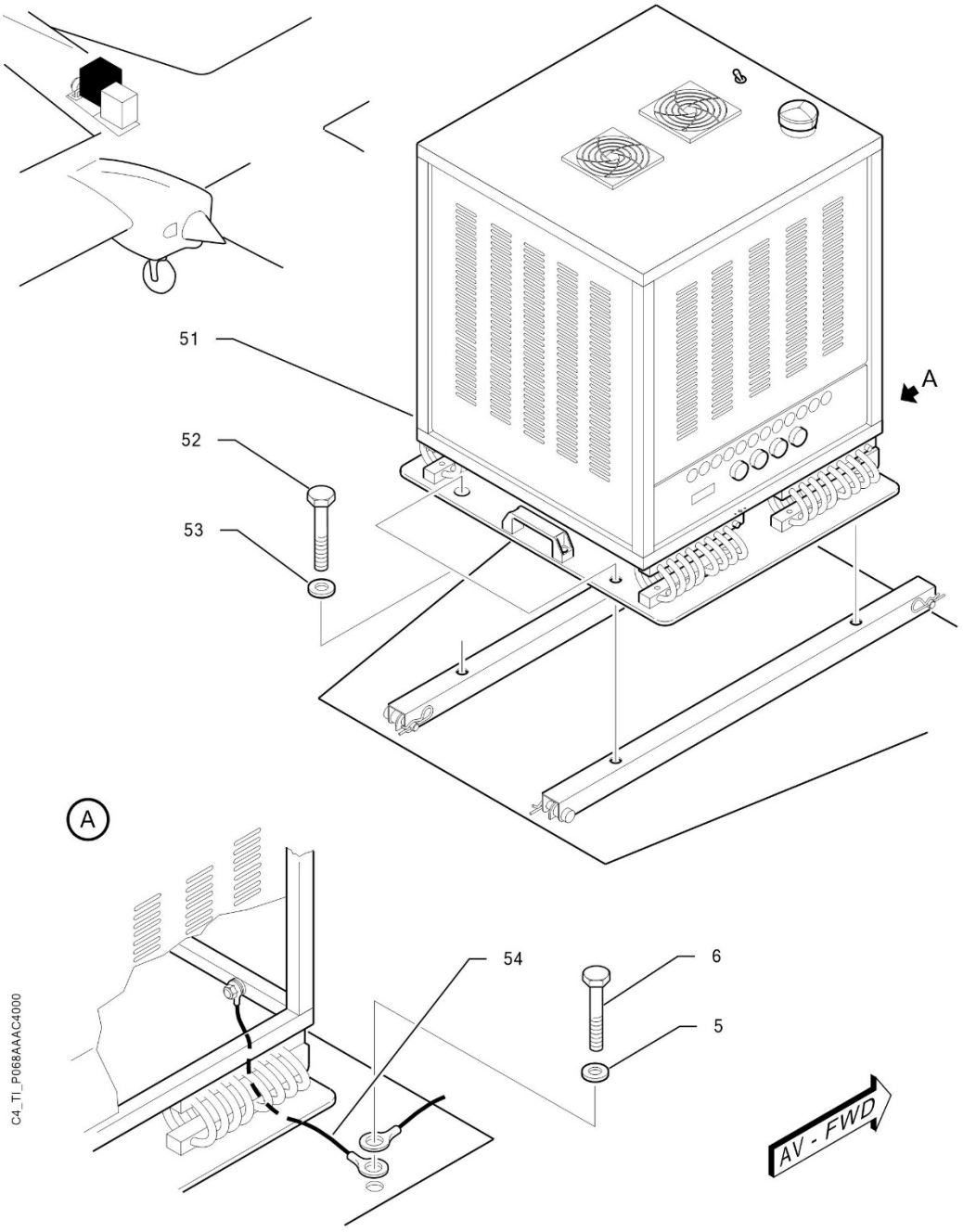

Figure 4 - Measurement bay

7.1.4 Installation of Experimentation bay

7.1.4.1 Mechanical installation

Refer to the TI1_DHR_P68ISAE_R0 for the equipment installation procedure.

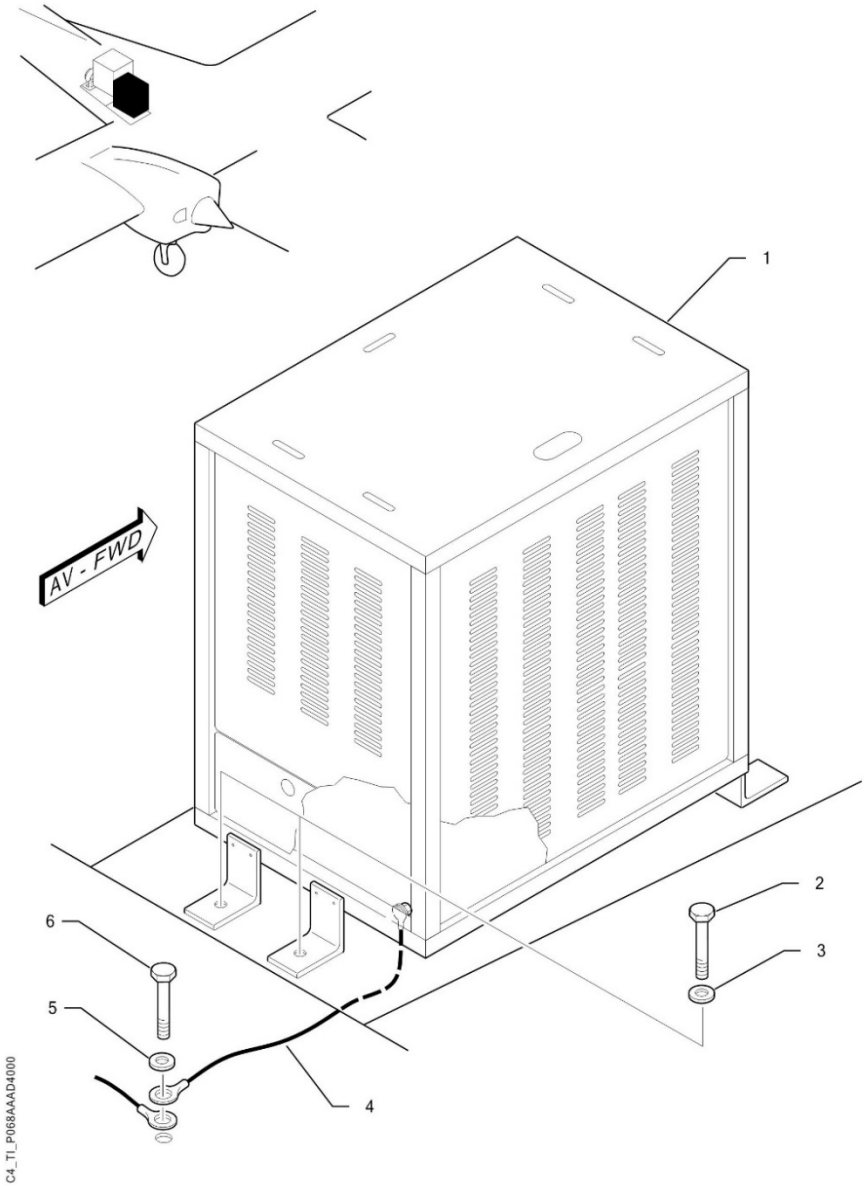

Figure 5 - Experimentation bay

7.2 Electrical system

7.2.1 Power supply

Two master switches labeled " AUX PWR (1) and AUX PWR (2)" are mounted on the cockpit left side panel to enable manual disconnection of electrical circuit of the measurement bay and the experimental bay during abnormal conditions.

When the switch is in OFF position, no electrical power is applied to the bays.

Connections of the bays on the power supplies ports are:

Measurement bay is only connected to:

The baggage compartment left side #2 AUX POWER 28VDC port, MAX 30 Amps for the bay, activated through AUX PWR (2) master switch

Experimentation bay can be connected to either:

The cabin right side #1 AUX POWER 28VDC port, activated through AUX PWR (1) master switch

MAX 30 Amps for the bay,

or,

Via the measurement bay (bay swichted ON) AUX POWER OUT 28 VDC, activated through AUX PWR (2) master switch

MAX 30 Amps for both bays

or,

Via the measurement bay (bay switched OFF) AUX POWER OUT 28 VDC, , activated through AUX PWR (2) master switch

MAX 30 Amps for experimentation bay

▲ CAUTION ▲

Care should be taken when measurement bay is connected to the experimentation bay to not exceed to power available.

▲

The BUS 1 et 2 are protected by two 30A breakers installed on the breaker panel located on the instrument panel copilot’s side

The telemetry system is equipped with one switch allowing its power up. The switch is located on the instrument panel.

7.2.2 Emergency stop switches

In case of abnormal situation detected in the cabin by one of the cabin seat occupant (fumes, smoke,..), each of the experimentation and measurement bays are equipped with a red emergency stop switch, labeled “EMERGENCY STOP”, to allow the occupant to cut off respectively their power supplies.

The pilot in command should brief the occupant of the possibilty to use these emergency stop switches and to action them appropriatly. In case the occupant uses the emergency stop switch during flight, he must advise immediately the pilot about his action and the situation.

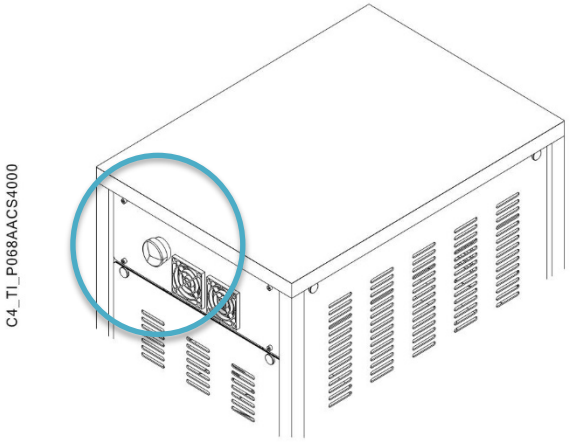

Figure 6 - Emergency stop switch on experimental bay

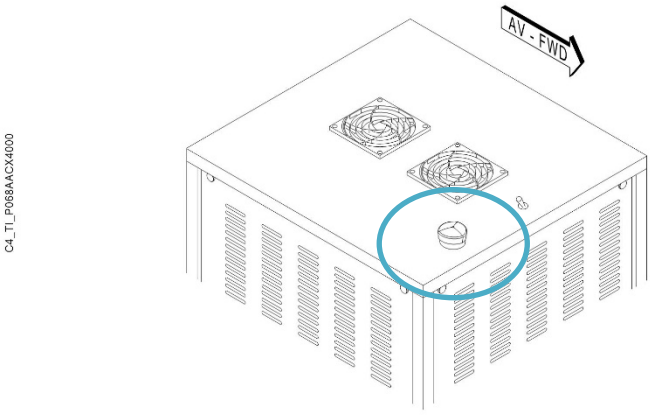

Figure 7 - Emergency stop switch on measurement bay

7.2.3 Automatic CUT OFF

There is an automatic cut off of the electrical supply in case of double alternator failure.

It concerns the equipment and systems listed below:

- AUX POWER 28 VDC socket @ 30A (130A alternators),
- Measurement bay,
- Experimentation Bay.

7.3 Installation of equipment in cockpit

7.3.1 Advisory lights for Experimentation and measurement bays

Advisory lights inform the pilot when the experimentation bay (EB) or the measurement bay (MB) are ON and supplied with electricity.

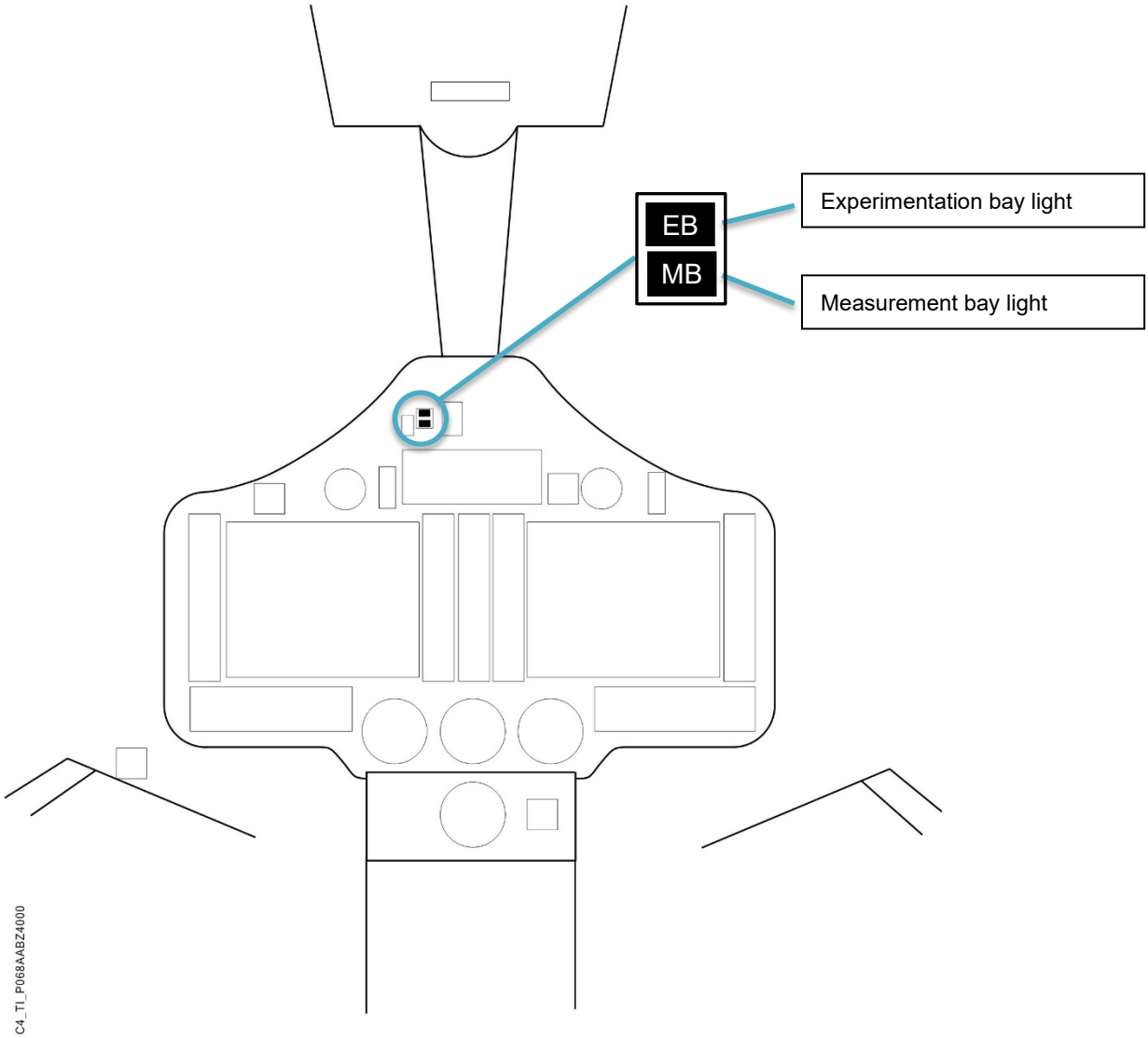

Figure 8- Advisory lights for experimentation and measurement bays

7.3.2 Telemetry switch

The switch allows to power up the telemetry system.

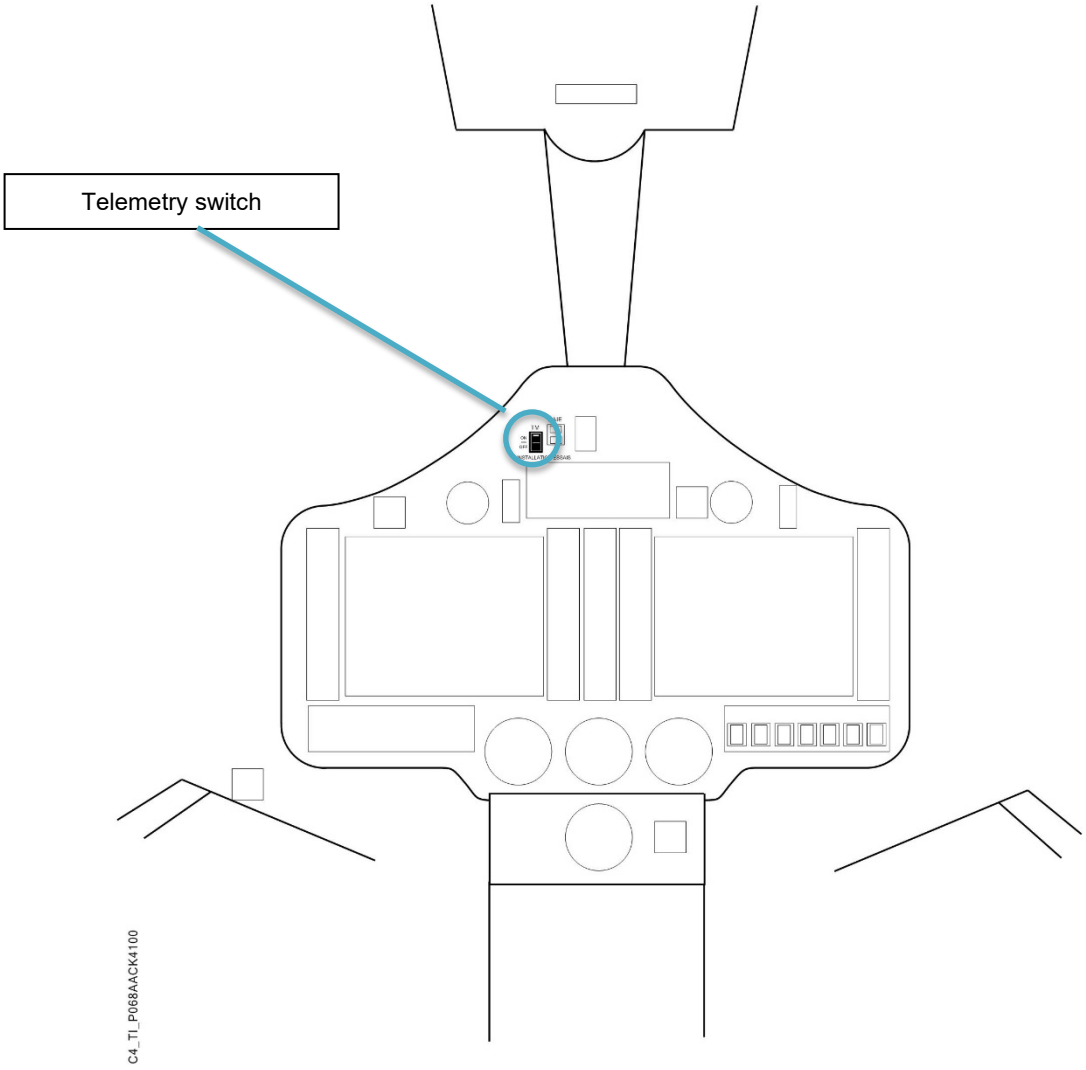

Figure 9 - Telemetry switch