LEONARDO

HELICOPTERS DIVISION

SAFETY NOTICE

S.N. N° **SN-189-22-001**
DATE December 20, 2021
REV. **0**

AW189

CRASH CARD

GROUND EMERGENCY AND RESCUE OPERATIONS

Disclaimer

"This crash rescue card version has been prepared by Leonardo Helicopters in order to provide stakeholders with general and safety information concerning aircraft layout, emergency ingress and egress, and emergency procedures for fuel and electrical power shutoff procedure user-friendly. Leonardo Helicopters to the extent permitted under the applicable laws, accepts no liability for any damage arising out or in any way connected with the use of this document. The personnel with crash-rescue responsibility shall receive a briefing by the pilot on the specific characteristics of the helicopter with which they are working."

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INTRODUCTION

The purpose and objective of this card is to support ground personnel to respond to accident or incident crash-rescue operations on AW189 within their capability and training and to be able to rescue survivors of a crash in a safe, efficient manner. This crash card is not intended to cover every contingency which may arise, nor does the card detail every safety emergency ingress and egress practice. Specialized basic aircraft firefighting training should be sought to supplement the information contained herein.

It is intended that the AW189 configuration herein covered is generic and it is under the Operators' responsibility to estimate the applicability on their current configurations.

Moreover, this document will not be updated to be personalized for each operator in terms of both language and configuration used.

GENERAL INFORMATION

WEIGHT	[kg]
Empty Weight	5120-6120
Max Take off Weight	8600

OCCUPANCY	[pax]
Max Crew (Cockpit)	2
Max Passengers (Cabin)	Max 16/19

OVERALL DIMENSIONS [mm]

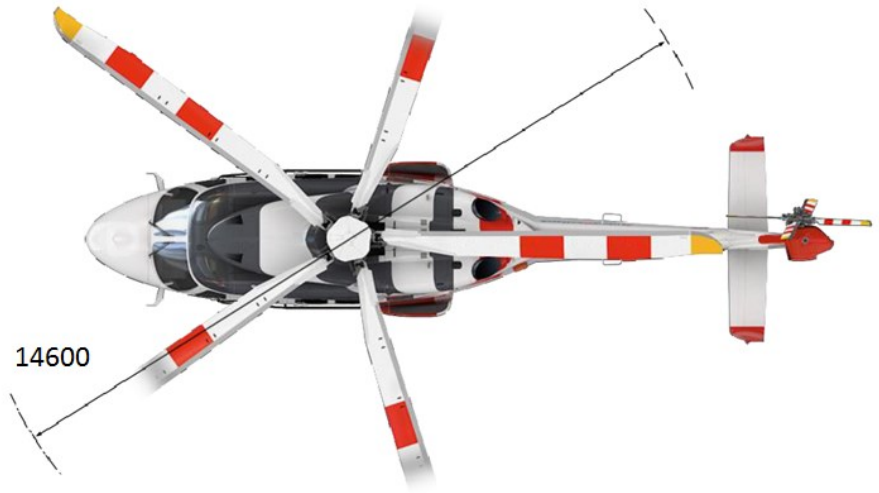


Figure 1 – Overall Dimensions [mm]

POWERPLANTS	#
GE CT7-2E1 or Safran Aneto-1K	2
APU Microturbo eAPU60H (between the engines)	1

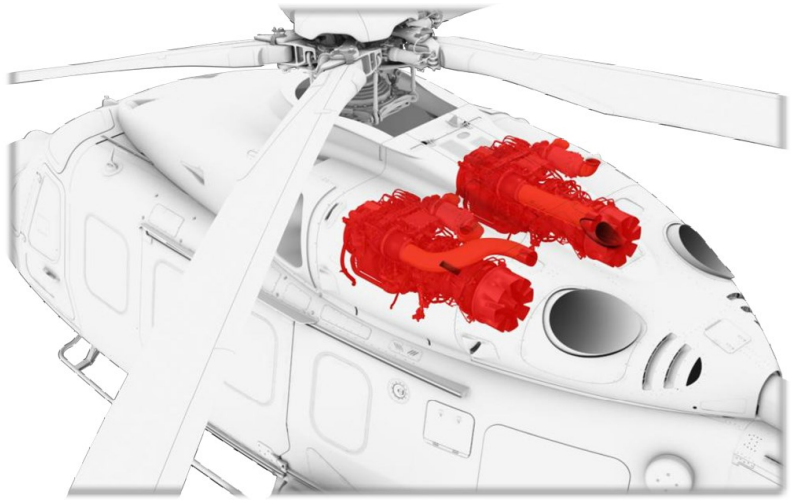


Figure 2 – Engines

FUEL SYSTEM

Maximum tank capacity: 1344 l

Figure 3 – Fuel Tank Location

OIL	Capacity [l]
Engine	6.4 (Safran) 6.9 (GE)
APU	2.8
MGB	27
TGB	1.22
IGB	1.87
Hydraulic system – max nominal pressure 207 bar	

AUXILIARY FUEL TANK INSTALLATION (KIT – STANDARD CONFIGURATION)

Auxiliary Central Tank (capacity 510 l)

Two Sub Floor Tanks (RH and LH – total capacity 270 l)

Figure 4 – Auxiliary Fuel Tank Location – Standard Configuration

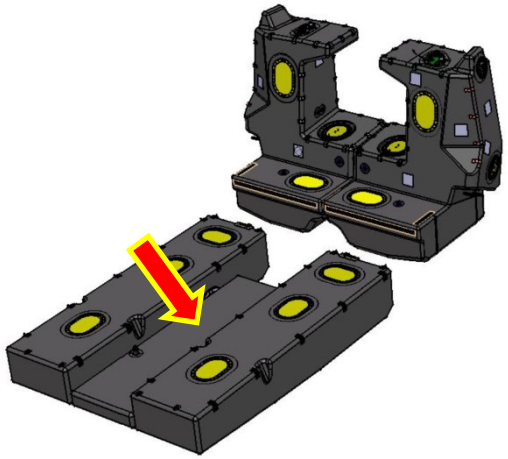
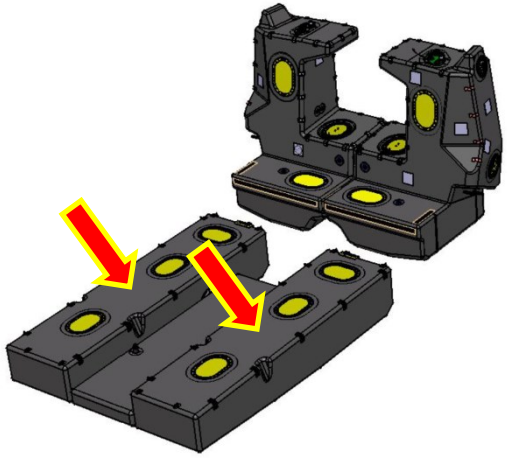
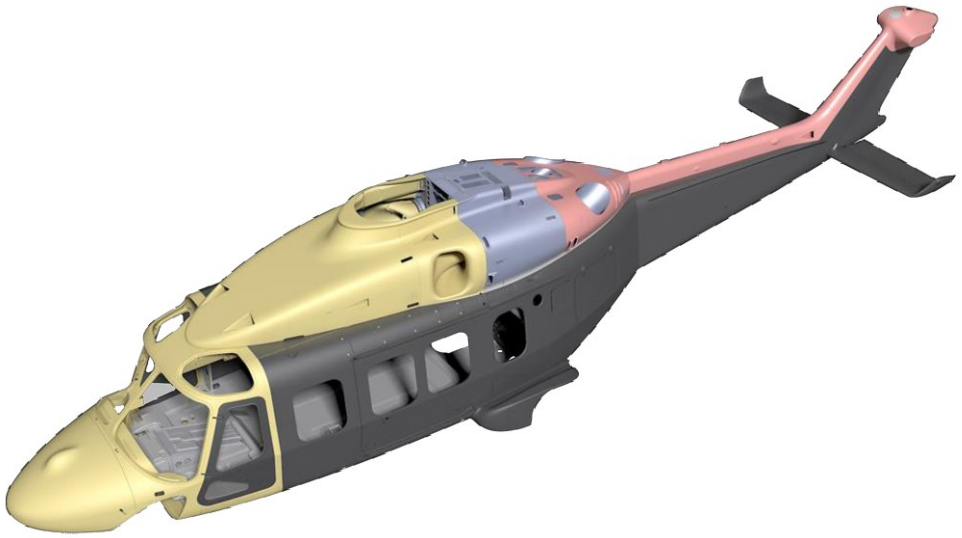
AUXILIARY FUEL TANK INSTALLATION (KIT – UNDERBELLY CONFIGURATION)

Sub Floor Central Tank (capacity 216 l)

Sub Floor RH and LH Tanks (total capacity 1062 l)

Figure 5 – Auxiliary Fuel Tank Location – Underbelly Configuration

STRUCTURAL MATERIALS

FUSELAGE

PRESENCE OF COMPOSITE MATERIAL



	Fibreglass/carbon
	Kevlar
	Titanium
	Carbon Fibre

Figure 6 – Structural Materials – Fuselage

MAIN ROTOR and TAIL ROTOR

PRESENCE OF COMPOSITE MATERIAL

blades in composite/metal material – hub/components in metal materials

DRIVE SYSTEM

PRESENCE OF MAGNESIUM

MAIN, INTERMEDIATE, TAIL GEAR BOX: metal material

Figure 7 – Structural Materials

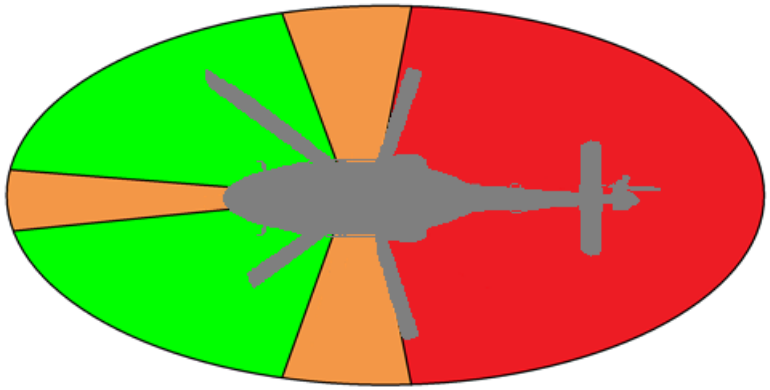
HAZARDS

HAZARDS – APPROACH CONES

THE APPROACH TO THE HELICOPTER IS SUBJECT TO THE AUTHORIZATION OF THE PILOT

in case of extreme urgency

consider the approach cones (flat area) as follows



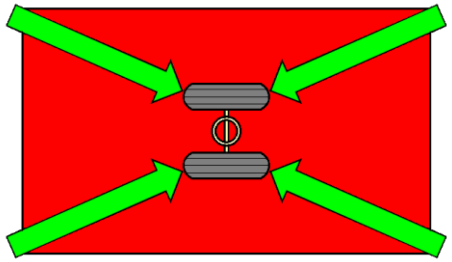
	SAFE AREA
	WARNING AREA
	DANGEROUS AREA

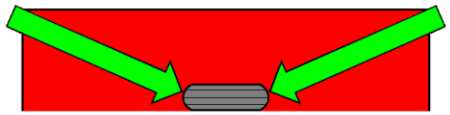
Figure 8 – Hazards – Approach Cones

HAZARD – FRAGMENTATION

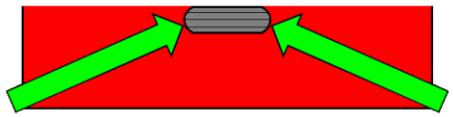
IN CASE OF WHEEL FIRE DEBRIS FROM RIMS AND TIRES MAY POSE A FRAGMENATION HAZARD

PRESSURIZED WHEELS (~5.9 BAR)





MLG Right Wheel



NLG approach path	MLG Left Wheel
	APPROACH PATH
	DANGEROUS AREA

Figure 9 – Hazards – Fragmentation

HAZARDS – PRESSURIZED RECIPIENTS

CHECK THE INTEGRITY OF THE AREAS ADJACENT TO THE PRESSURIZED RECIPIENTS AND APPROACH AS APPROPRIATE

SYSTEM (number of bottles)	REF IN FIGURE	Pressure [bar] @21 C
Floating (2)	①	>344
Liferaft (2)	②	>270
Engine Fire Extinguisher (2)	③	>24 (43 aneto)
APU Fire Extinguisher (1)	④	>24
Wheels (3)	-	~5.9
Cabin Fire Extinguisher (1 up to 3)	Inside cockpit (next to pilot's seat) and cabin, depending on configurations	9
Oxygen Bottles (1 up to 3)		200

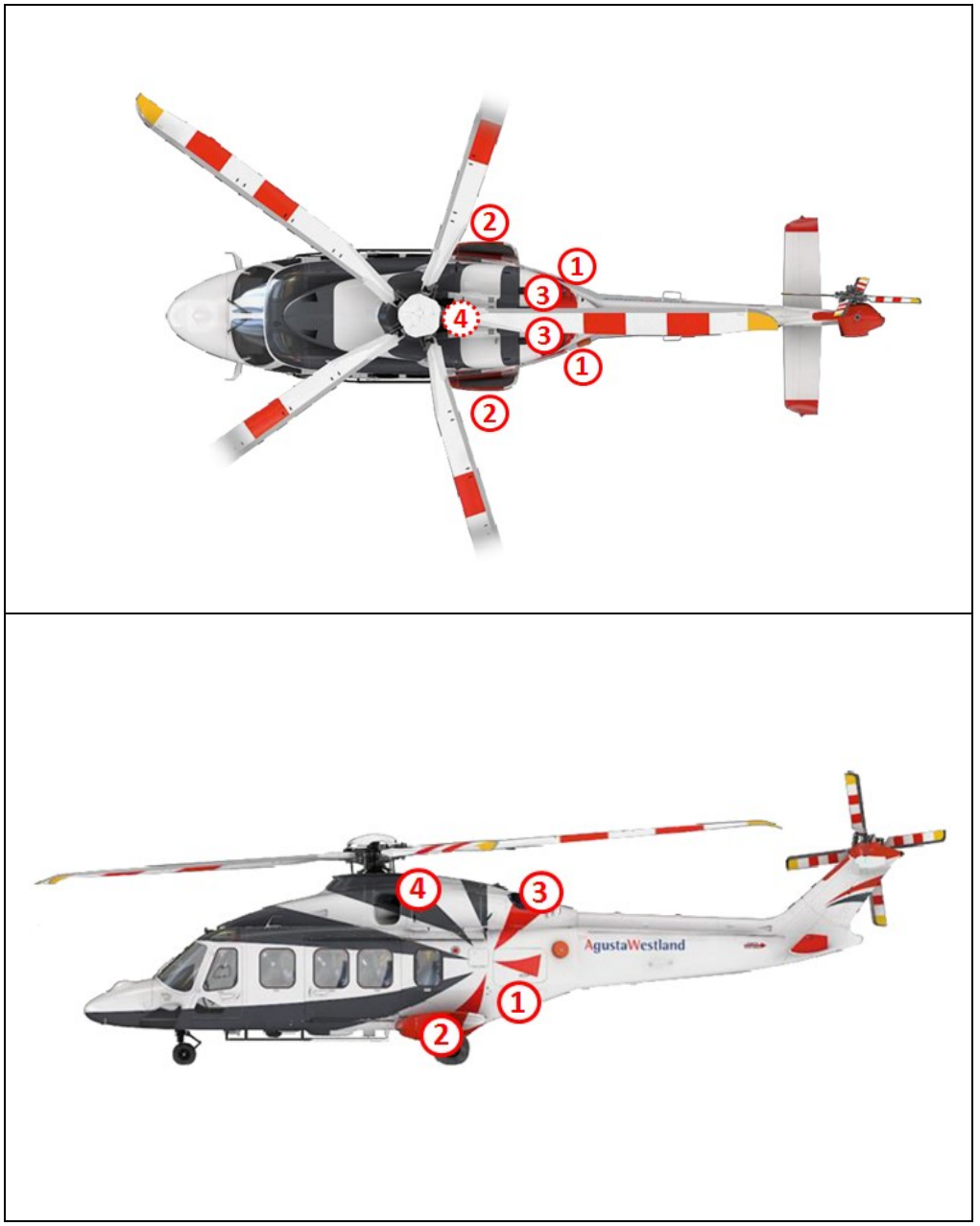


Figure 10 – Hazards – Pressure Recipients

HAZARDS – EXPLOSIVE CHARGES

PRESENCE OF EXPLOSIVE CHARGES
APPROACH AS APPROPRIATE

ACTIVATION (number of charges)	REF IN FIGURE	
Rescue Hoist (1)	①	right side
Cargo Hook (1)	②	bottom side
Engine Fire Extinguisher (2)	③	-
APU Fire Extinguisher (1)	③	In between

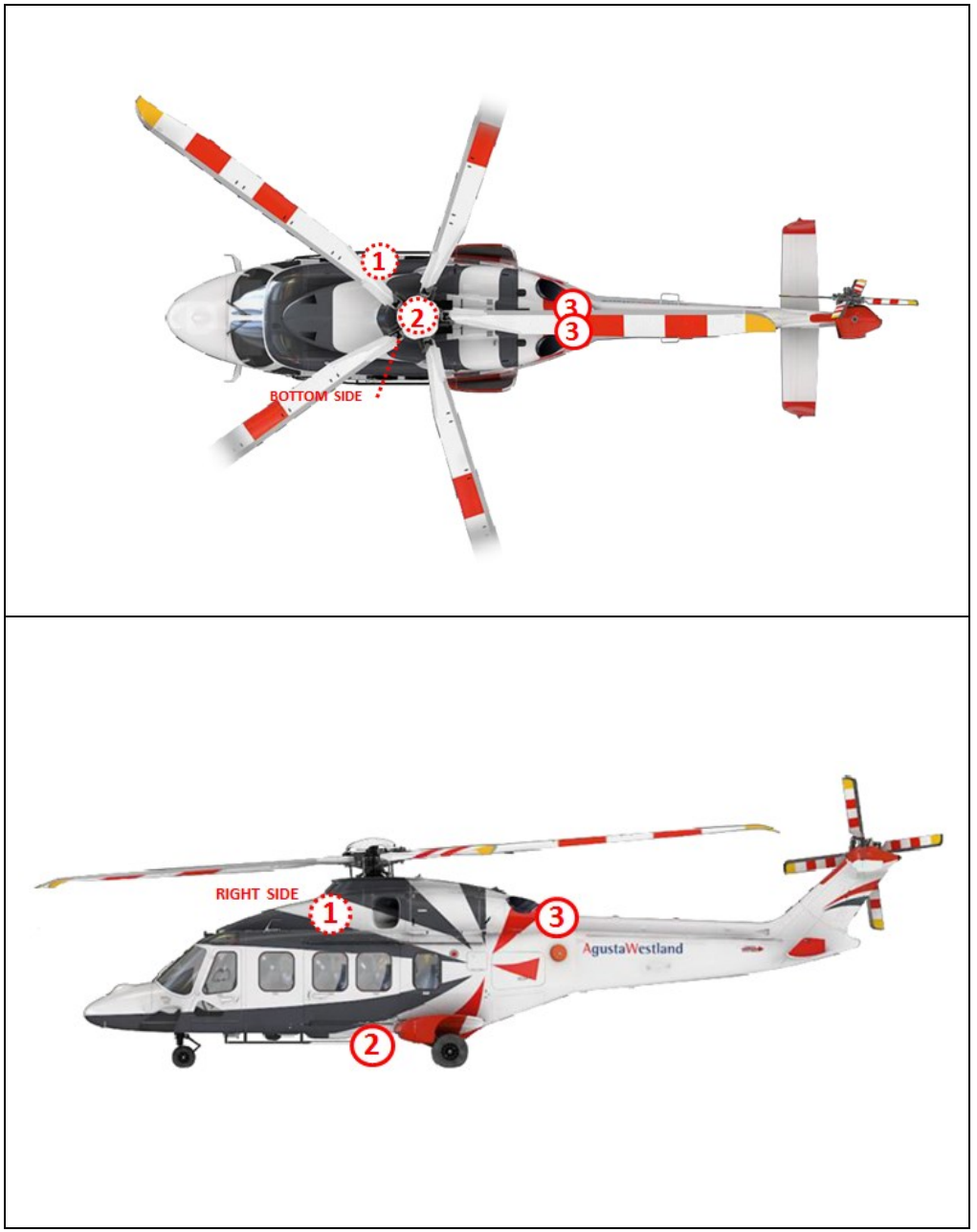


Figure 11 – Hazards – Explosive Charges

HAZARD – BATTERIES

BATTERIES MAY EXPLODE WITH FIRE

POSSIBLE RELEASE OF TOXIC GASES

BATTERY	REF IN FIGURE	
Main (1)	①	Nose Avionics Bay
Emergency Locator Transmitter, ELT (1) / ADELT (1)	②	Tail / Rear LH side of the fuselage
ADI STBY Emergency (1)	③	RH side of Nose Avionics Bay
Emergency Lights System Battery Pack (1)	④	Nose Avionics Bay
Helicopter Emergency Egress Lighting System Battery packs (6)	⑤	Inside Doors under window, under the two small windows of LH side of HC – depending on configuration
Flight Data Recorder (1)	⑥	Rear Avionic Bay
Life Raft ELT (2), Sea Light (2), Torch (4)	⑦	Sponsons

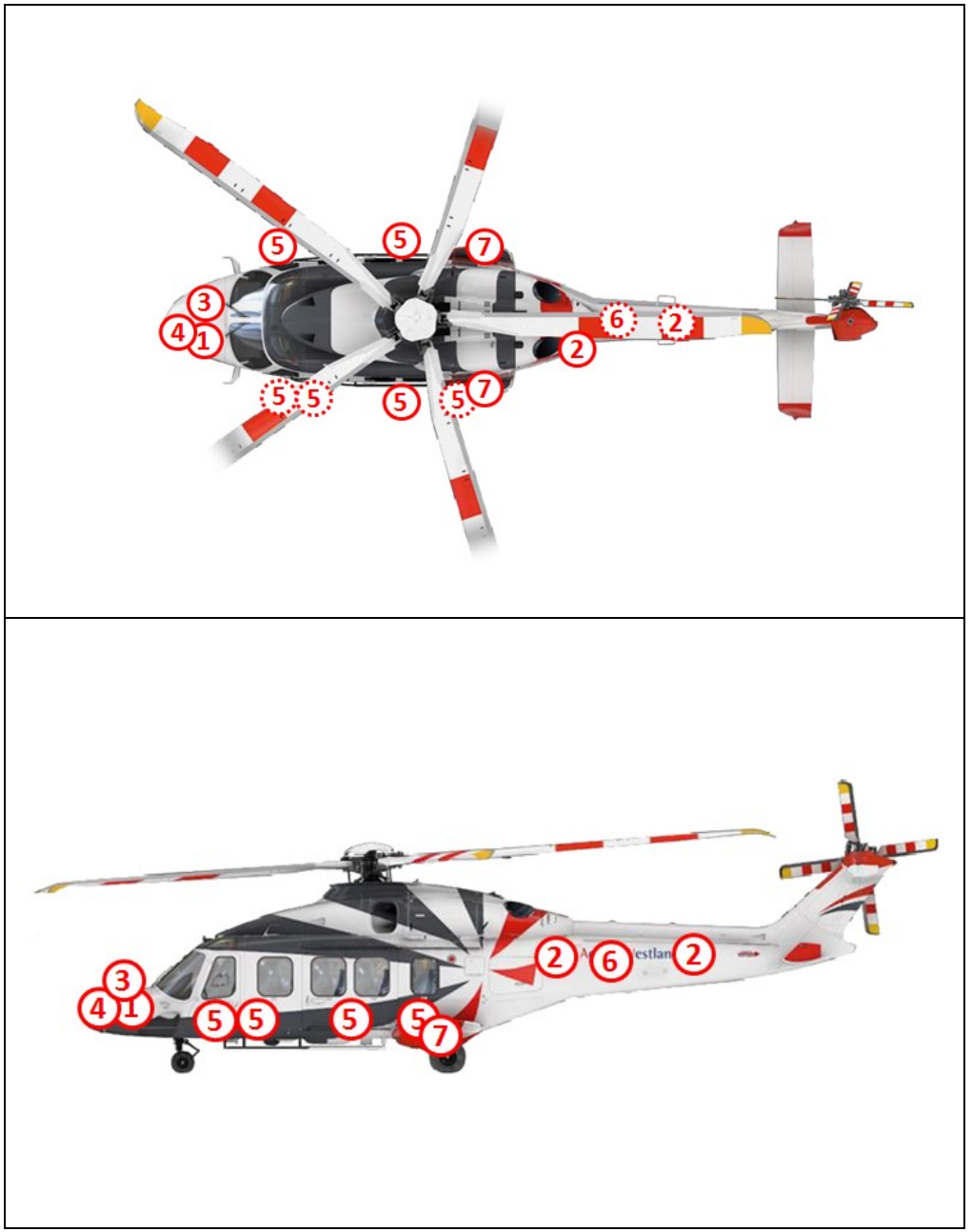


Figure 12 – Hazards – Batteries Location

HAZARDS – HOT SURFACES

PRESENCE OF HOT SURFACES	
SURFACE	**REF IN FIGURE**
Pitots (2, see Figure 16)	①
Engine exhausts (2)	②
APU exhaust (1)	③
Air intake (2)	④
Latches, handles, metallic components (in case of fire)	access doors/panels

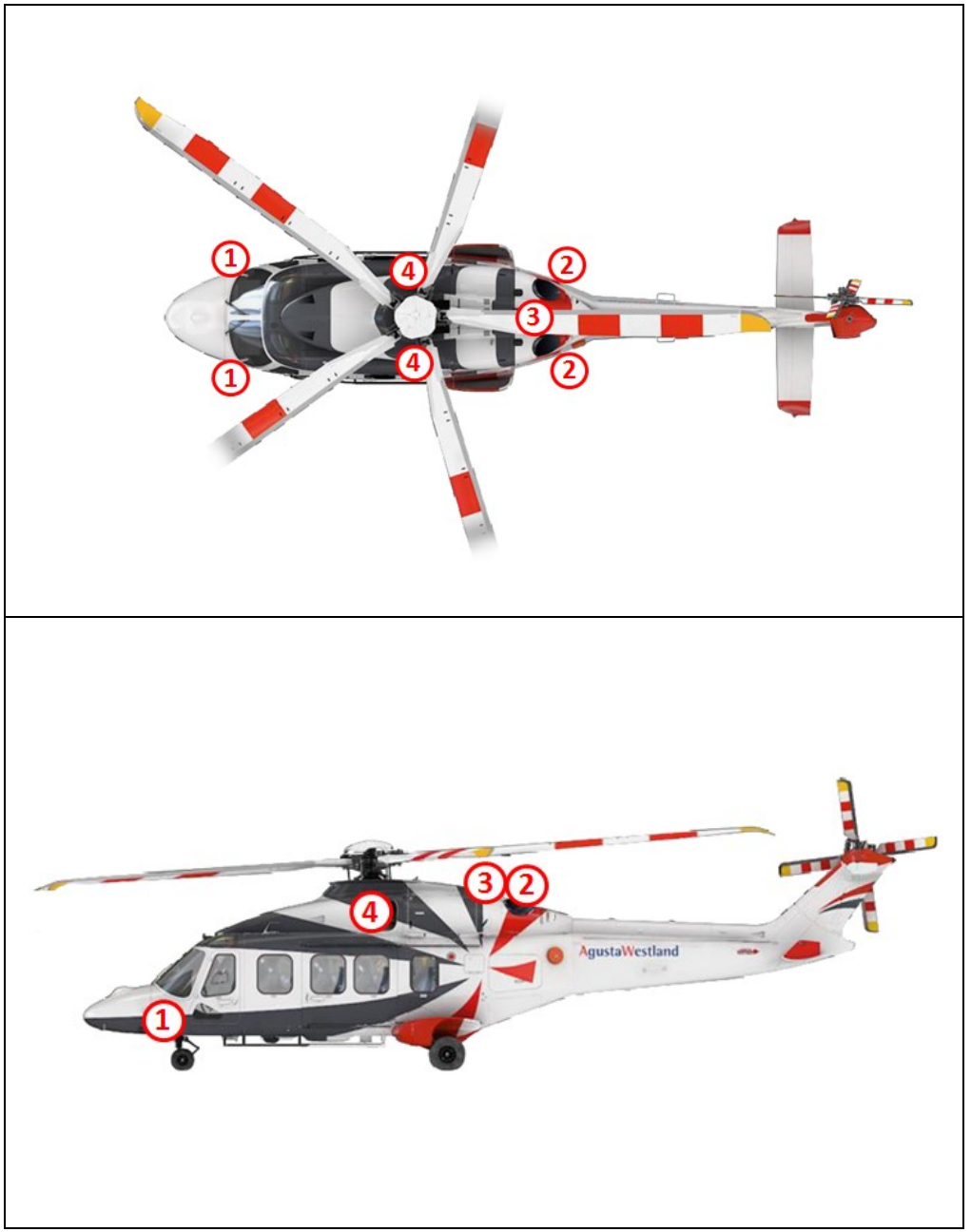


Figure 13 – Hazards – Hot Surfaces

HAZARD – FUEL AND LIQUIDS IN HYDRAULIC SYSTEM

PRESENCE OF FLAMMABLE LIQUIDS

MAX NOMINAL PRESSURE 207 BAR IN HYDRAULIC SYSTEM

FUEL TANK

max tank capacity: 1344 l (see Figure 3)

AUXILIARY FUEL TANK - KIT STANDARD CONFIGURATION

Auxiliary Central Tank (capacity 510 l, see Figure 4)

Sub Floor Tanks (total capacity 270 l, see Figure 4)

AUXILIARY FUEL TANK - KIT UNDERBELLY CONFIGURATION

Sub Floor Central Tank (capacity 216 l, see Figure 5)

Sub Floor Tanks (total capacity 1062 l, see Figure 5)

Figure 14 – Hazards – Fuel Location

HAZARDS – APU

HOT SURFACES

POSSIBLE RELEASE OF TOXIC GASES

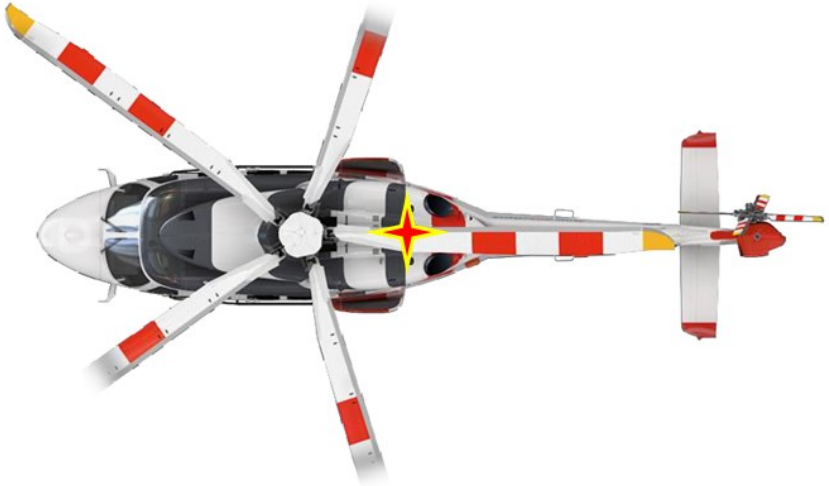


Figure 15 – Hazards – APU

HAZARDS – PITOTS

PITOTS ARE HEATED DURING COLD OPERATIONS

THE SHARP SHAPE CAN CAUSE INJURY

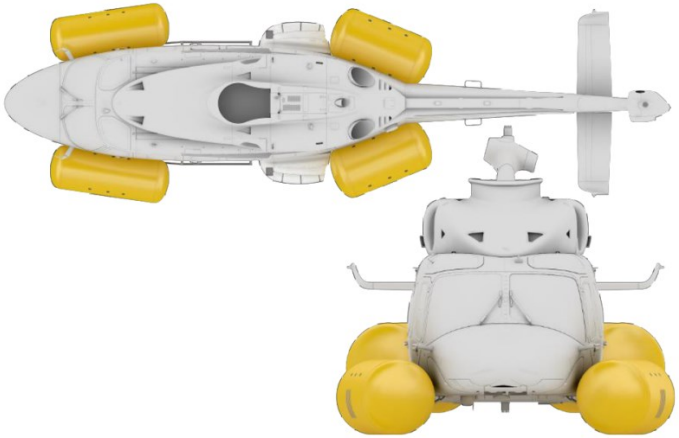
One Pitot for each side

Figure 16 – Hazards – Pitots

HAZARDS - EMERGENCY FLOATATION SYSTEM (EFS)

THE FRONT AND BACK BALOONS MAY INFLATE SUDDENLY

THE INFLATION BOTTLES INSTALLED RIGHT AFTER THE SPONSONS HAVE A PRESSURE ABOVE 344 BAR



Two Baloons for each side. See Figure 43 for the de-activation procedure

Figure 17 – Hazards – Emergency Floatation System

HAZARDS – EMERGENCY LIFE RAFTS

LIFE RAFTS MAY INFLATE SUDDENLY

PRESSURE OF THE INFLATION BOTTLES INSTALLED INSIDE THE SPONSON IS ABOVE 270 BAR

One Life Raft for each side

Figure 18 – Hazards – Emergency Life Rafts

HAZARDS - EMERGENCY LOCATION TRANSMITTER (ELT)

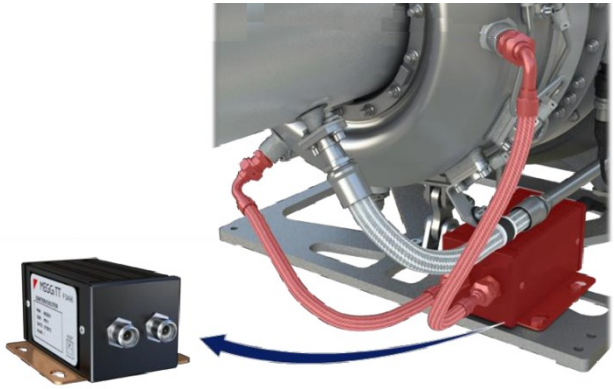
THE ELT BEACON MAY DEPLOY SUDDENLY

One ELT Beacon for the Helicopter

Figure 19 – Hazards – Emergency Location Transmitter

HAZARDS – IGNITER BOXES

VOLTAGE HIGH AMPERAGE OUTPUT
BEFORE SERVICING DISCONNECT INPUT CURRENT
BEFORE OPERATING CONNECT OUTPUT LEADS AND IGNITER PLUG

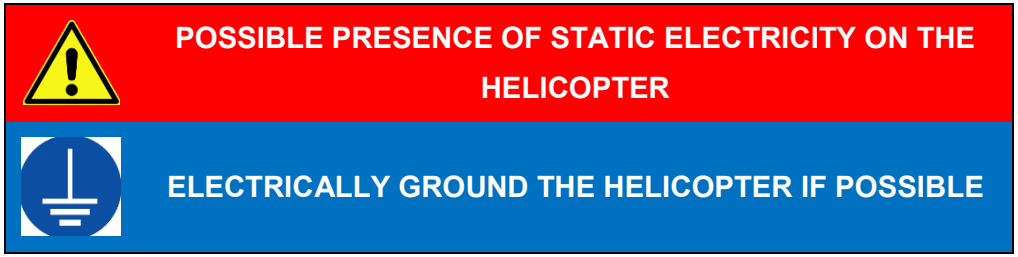


One Igniter Box for each engine

Figure 20 – Hazards – Igniter Boxes

SAFETY INFORMATION: GROUND STAFF (OUTSIDE

THE HELICOPTER)



ACCESS INTO THE HELICOPTER

USE NORMAL ACCESS

IF THE NORMAL ACCESS CANNOT BE USED, ACT ON THE EMERGENCY ACCESS DOORS

NORMAL ACCESS DOORS

Pilot and Copilot Doors (LH/RH) - Passenger Doors (RH/LH)

EMERGENCY ACCESS DOORS

Pilot and Copilot Emergency Windows (LH/RH)

Passenger Emergency Windows (4 RH/ 4 LH) (*)

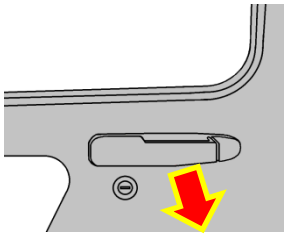
(*) STC configurations may differ from that reported in this document

Figure 21 – Normal and Emergency Access Doors Scheme

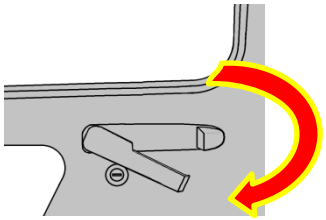
NORMAL ACCESS - OPEN THE PILOT/CO-PILOT DOOR

TYPE: HINGED DOOR LH/RH

FROM OUTSIDE

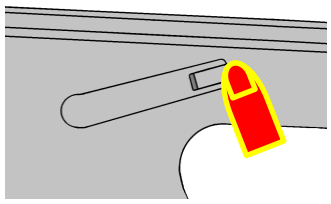


1) Pull the handle

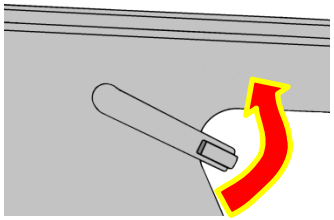


2) Turn the handle downwards

FROM INSIDE



1) Push the button on the handle



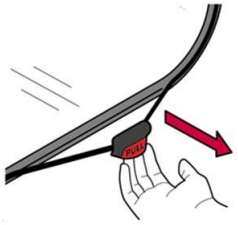
2) Rotate the handle upwards

Figure 22 – Pilot/Co-Pilot Door - Opening Procedure

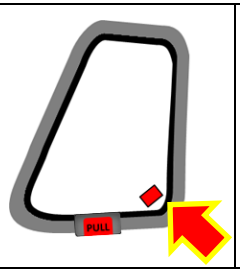
EMERGENCY ACCESS - OPEN THE PILOT/CO-PILOT EMERGENCY EXITS

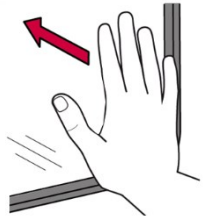
TYPE: HINGED DOOR LH/RH

FROM OUTSIDE (left side for clarity)



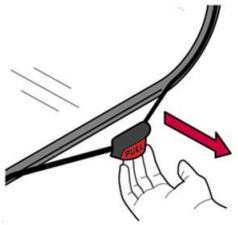
1) Pull tab to remove cord



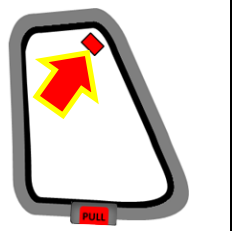


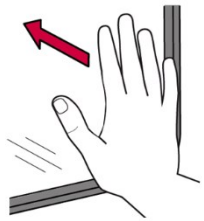
2) Push in window

FROM INSIDE (left side for clarity)



1) Pull tab to remove cord





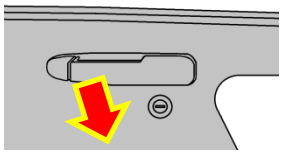
2) Push out window

Figure 23 – Pilot/Co-Pilot Emergency Exits - Opening Procedure

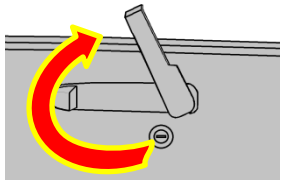
NORMAL ACCESS - OPEN THE PASSENGER DOOR

TYPE: SLIDING DOORS RH/LH

FROM OUTSIDE



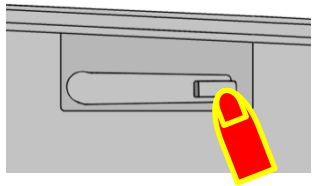
1) Pull the handle



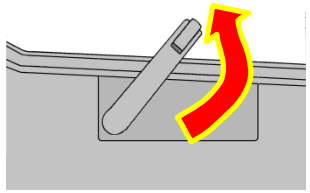
2) Turn the handle 90° upwards

3) Slide backwards

FROM INSIDE



1) Push the button on the handle



2) Rotate the handle upwards

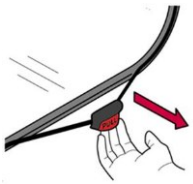
3) Slide backwards

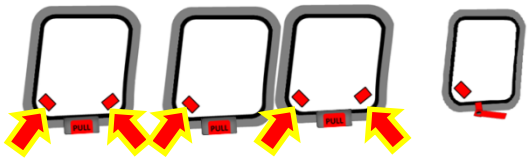
Figure 24 – Sliding Passenger Door - Opening Procedure

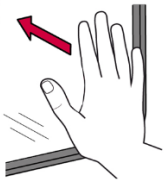
EMERGENCY ACCESS - OPEN THE PASSENGER EMERGENCY EXITS

TYPE: SLIDING DOORS RH/LH

FROM OUTSIDE (left side for clarity)

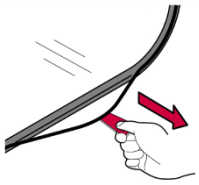


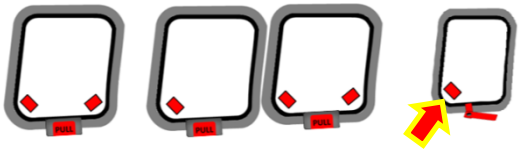


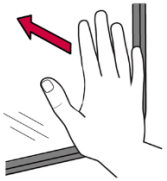


1) Pull tab to remove cord

2) Push in window



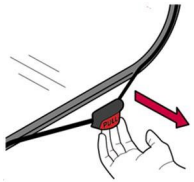


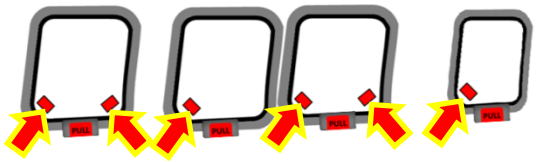


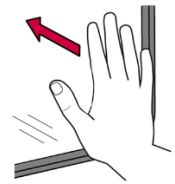
3) Pull strap to remove cord

4) Push in window

FROM INSIDE (left side for clarity)







1) Pull tab to remove cord

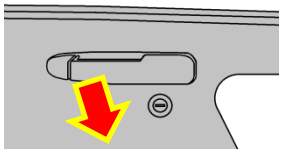
2) Push in window

Figure 25 – Sliding Passenger Emergency Exits - Opening Procedure

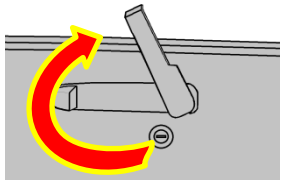
NORMAL ACCESS - OPEN THE PASSENGER DOOR

TYPE: HINGED DOOR LH/RH

FROM OUTSIDE

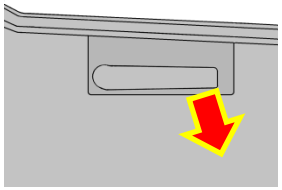


1) Pull the handle

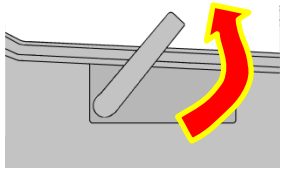


2) Turn the handle 90° upwards

FROM INSIDE



1) Pull the handle



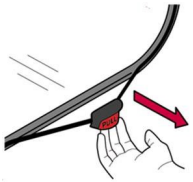
2) Rotate the handle upwards

Figure 26 – Hinged Passenger Door - Opening Procedure

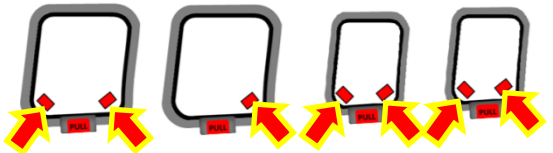
EMERGENCY ACCESS - OPEN THE PASSENGER EMERGENCY EXITS

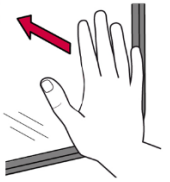
TYPE: HINGED DOOR LH/RH

FROM OUTSIDE (left side for clarity)



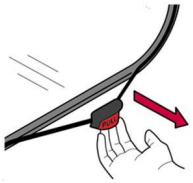
1) Pull tab to remove cord



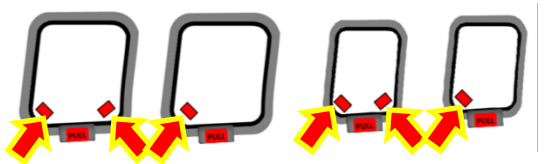


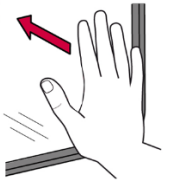
2) Push in window

FROM INSIDE (left side for clarity)



1) Pull tab to remove cord



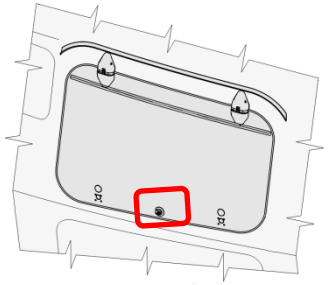


2) Push in window

Figure 27 – Hinged Passenger Emergency Exits - Opening Procedure

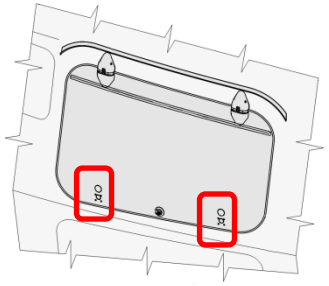
OPEN THE BAGGAGE DOOR

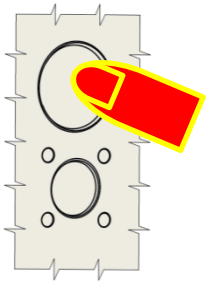
TYPE: HINGED DOOR LH/RH

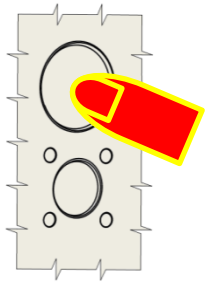


Unlock the door

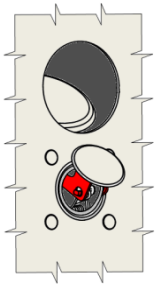
Operate the lock with the applicable key

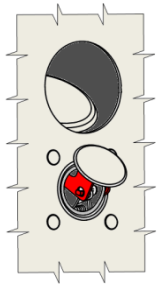






Push the two large sections





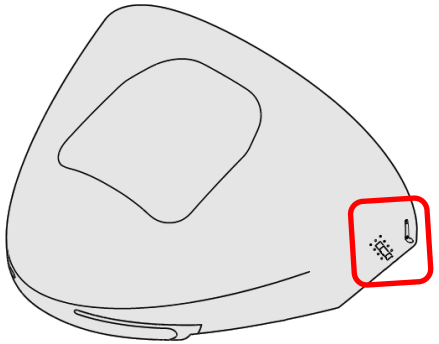
until the small ones come out

Lift the door with hands until the gas spring is in locked position

Figure 28 – Baggage Door - Opening Procedure

OPEN THE NOSE RADOME DOOR

TYPE: HINGED DOOR



Turnlock might be not installed

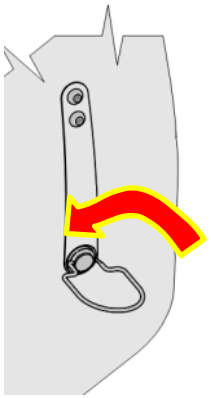
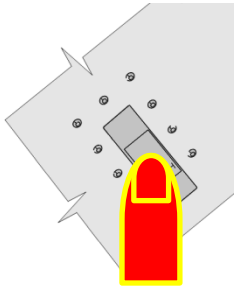
	Turn counterclockwise the thurnlock
	Push the large section of each latch with a finger until you disengage the hook of the latch. Pull the hook towards the large section. Open the door

Figure 29 – Nose Radome Door - Opening Procedure

ENGINE AND APU ACCESS

IGNITER BOXES - VOLTAGE HIGH AMPERAGE OUTPUT
BEFORE SERVICING DISCONNECT INPUT CURRENT
BEFORE OPERATING CONNECT OUTPUT LEADS AND IGNITER PLUG

ENGINE COWLINGS OPENING PROCEDURE

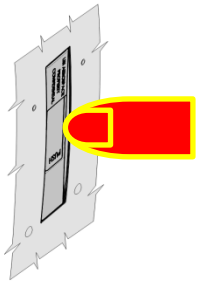
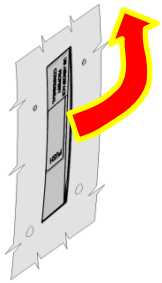
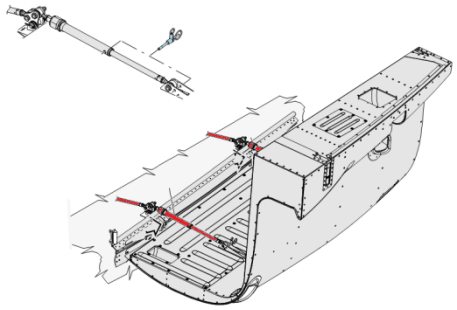
	
Push the PUSH section	Pull the small section to open the door
	Make sure that the two actuators are fully extended. Remove the two quick-release pins from the two supports and install them on the two actuators. *Make sure not to trip while using the platform*

Figure 30 – Engine Cowlings Opening Procedure

APU ACCESS DOOR OPENING PROCEDURE

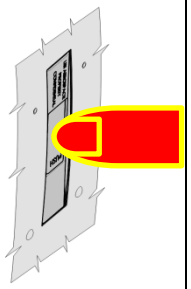
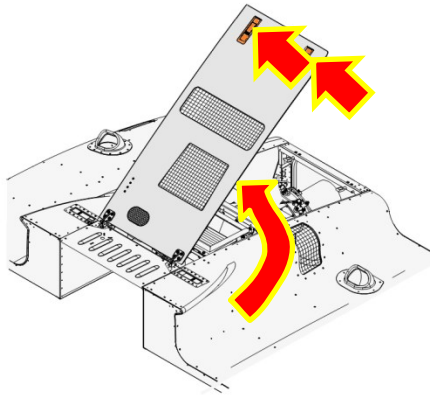
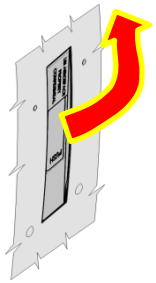
	1) Push the left and right PUSH sections	
	2) Pull the left and right small sections to open the door	3) Lift the door with hands until the locking rod is in the locked position.

Figure 31 – APU Cowling Opening Procedure

FIREFIGHTING RECOMMENDATIONS

FIRE IN THE BAGGAGE COMPARTMENT
 IF SMOKE/FIRE IS CONFIRMED USE THE EXTINGUISHER OTHERWISE OPEN THE BAGGAGE DOOR DIRECTLY
See Figure 28 for the baggage door opening procedure

RECOMMENDED FIRE FIGHTING AGENTS	
engine fires	HALON or dry chemicals
exhaust nozzle fire	HALON or dry chemicals
APU fire	HALON or dry chemicals
fuel fire	dry chemical for leaking fuel and foam on ground spill area
wheel and brake fires	water fog or dry powder
	approach landing gear as per Figure 9 strand upwind of fire to avoid hydraulic fluid fumes
electrical fires	HALON or dry chemicals
cockpit and cabin area fires	HALON 1211 or dry powder
baggage compartment fire	HALON
aft equipment compartment fire	HALON

Figure 32 – Recommended Fire Fighting Agents

SAFETY INFORMATION: GROUND STAFF (INSIDE THE HELICOPTER)

THE FOLLOWING PROCEDURES MUST BE CARRIED OUT

1) **IN CASE OF EMERGENCY ON GROUND**
2) **ONLY IF PILOTS ARE INCAPACITATED**
3) **STRICTLY IN ORDER OF PRESENTATION**

USE CAUTION WHEN MOVING INSIDE THE HELICOPTER, CHECKING THE STRUCTURE INTEGRITY. SIGNS COULD INCLUDE BUT ARE NOT LIMITED TO, DEFORMITY OF STRUCTURE, FLAME IMPINGEMENT OR UNEVEN SURFACES

IN CASE OF CHOCKS AVAILABILITY ACCESS THEIR NEED AND LOCK THE WHEELS

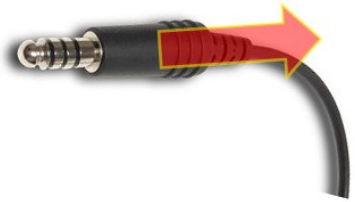
WHEN ENTERING THE COCKPIT AREA, BE CAREFUL NOT TO MOVE THE CYCLIC AND COLLECTIVE CONTROLS BEFORE SHUTTING DOWN THE ENGINES

PERSONNEL RESCUE

FLIGHT HELMET DISCONNECTION

THE DIRECTION OF THE PLUG MIGHT BE DIFFERENT FROM THAT OF THE PILOT/CO-PILOT'S EGRESS

Pilot/Copilot exit directions



Disconnect the Flight Helmet unplugging the jack from the Inter-Communication System along its direction

Figure 33 – Helmet Disconnection

SAFETY BELTS

Pilot/copilot seat belt

Passengers' seat belt

Rotate the gear of the buckle in ANY direction to unfasten the belt

Figure 34 – Opening of the Safety Belt

EMERGENCY APU AND ENGINE SHUTDOWN

PERFORM THIS PROCEDURE TO FAST SHUTDOWN THE ENGINE AND ALLOW QUICKLY THE OTHER RESCUE OPERATIONS

IN CASE THERE IS NO FIRE OR NO MAJOR EMERGENCY

SKIP STEPS FROM 1 TO 4

TO PRESERVE THE INTEGRITY OF THE SYSTEMS

AND PERFORM:

- **STEPS FROM 5 TO 7**
- **NEXT OPERATIONS**

IN CASE OF MAJOR EMERGENCY OR FIRE

PERFORM:

- **STEPS FROM 1 TO 4**
- **NEXT OPERATIONS**

STEP 1 – APU FUEL SUPPLY INTERRUPTION – MAJOR EMERGENCY/FIRE

THE USE OF HEAVY GLOVES MAY MAKE THE PROCEDURE DIFFICULT

APU Control Panel is located in the Interseat Console

	
Raise the guard switch	Press the FIRE/ARM push button to shutdown the APU

Figure 35 – APU Shutdown – Major Emergency/Fire

STEP 2 – ENGINE FUEL SUPPLY INTERRUPTION – MAJOR EMERGENCY/FIRE

THE USE OF HEAVY GLOVES MAY MAKE THE PROCEDURE DIFFICULT

Engine Fire Detect/Exting. Control Panel is located in the Instrument Panel

Raise the guard switches of both the engines (see ENG 1 in figure)

Press the FIRE/ARM push button of ***both*** the engines to shut off the valve

Figure 36 – Engine Fuel Supply Interruption – Major Emergency/Fire

STEP 3 – APU FIRE EXTINGUISHING – MAJOR EMERGENCY/FIRE

PERFORM THIS STEP ONLY IN CASE OF APU FIRE

Make sure to have performed step 1

Move the switch to BTL to charge the Bottle

Figure 37 – APU Fire Extinguishing – Major Emergency/Fire

STEP 4 – ENGINE FIRE EXTINGUISHING – MAJOR EMERGENCY/FIRE

PERFORM THIS STEP ONLY IN CASE OF ENGINE FIRE

Make sure to have performed step 2

Move the switch to BTL1 to charge Bottle 1.

If necessary do the same with BTL2

Figure 38 – Engine Fire Extinguishing – Major Emergency/Fire

STEP 5 - APU SHUTDOWN – MINOR EMERGENCY

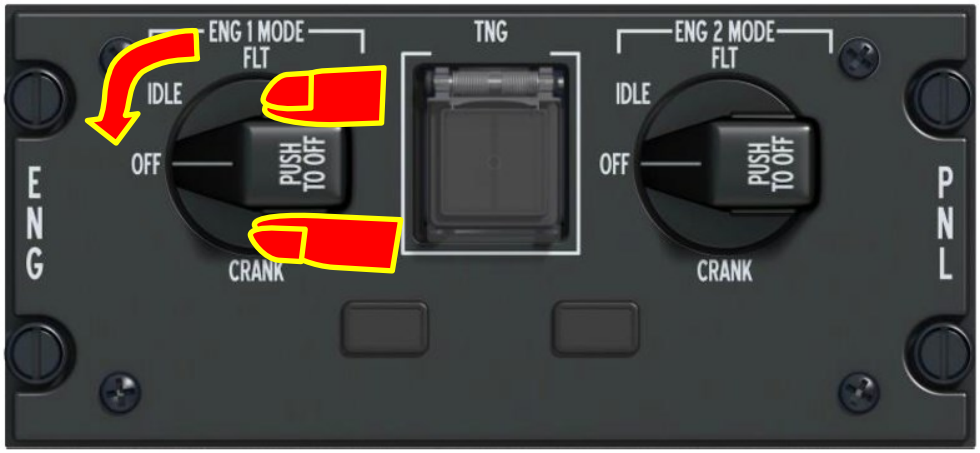
The Engine Control Panel is located in the Interseat Console

Push and rotate counterclockwise to switch off APU

Figure 39 – Normal APU Shutdown – Minor Emergency

STEP 6 - ENGINE SHUTDOWN – MINOR EMERGENCY

The Engine Control Panel is located in the Interseat Console



Push and rotate counterclockwise to switch off each engine

Figure 40 – Normal Engine Shutdown – Minor Emergency

STEP 7 – PUMP AND SHUT OFF VALVE CLOSURE – MINOR EMERGENCY

The Electronic Control Display Unit is located in the Interseat Console

Set the Pump 1 &2 to Off and the Shut Off Valve 1&2 to Close

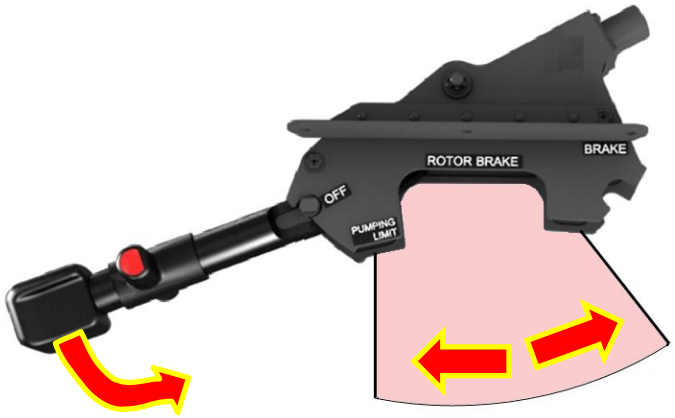
Figure 41 – Normal Pump and Shut Off Valve Closure – Minor Emergency

NEXT OPERATIONS

ROTOR BRAKE

THE PROCEDURE DOESN'T WORK WITH ENGINES STILL ON

The Rotor Brake lever is on the Overhead Console



Move the lever from OFF to the BRAKE position and pump within the indicated range if necessary

Figure 42 – Rotor Brake

EMERGENCY FLOATATION SYSTEM (EFS)

DE-ACTIVATE THE SYSTEM

The Floatation Control Panel is located in the Interseat Console.

Set the master switch to OFF position

Figure 43 – Floatation System – De-activation

EMERGENCY LOCATOR TRASMITTER (ELT)

DE-ACTIVATE THE SYSTEM AND INFORM THE AIR TRAFFIC CONTROL ABOUT THE AIRCRAFT EVENT AND LOCATION

The System Control Panel is

on the Instrument Panel

Set the switch to ARM

Figure 44 – ELT System – De-activation

INTERRUPTION OF THE POWER SUPPLY FROM THE CONTROL PANEL

PERFORM THIS PROCEDURE ONLY WHEN THE ENGINES ARE SWITCHED OFF AND THE ROTORS ARE STOPPED

Electrical Power Generation and Distribution System, EPGDS, location

Move the Battery Master lever to OFF

Figure 45 – Interruption of the Power Supply from the Control Panel

MANUAL DISCONNECTION OF THE BATTERIES

PERFORM THIS PROCEDURE ONLY WHEN THE ENGINES ARE SWITCHED OFF AND THE ROTORS ARE STOPPED

IN CASE OF NEED TO RECONNECT THE BATTERIES CONTACT LHD AI&P TEAM – RISK OF CVFDR DATA LOSS

See Figure 29 for the nose radome door opening procedure

Rotate counterclockwise the knob

Figure 46 – Battery Location and Disconnection Procedure

ADJUSTMENT OF THE PILOT SEATS

Raise the right-hand lever below the seat pan to unlock and move backward/forward the seat

Figure 47 – Adjustment of the Pilot Seats

REMOVAL OF THE PILOT SEAT

SEAT REMOVAL MAY REQUIRE THE USE OF THE SPREADER-CUTTER

Figure 48 – Removal of the Pilot Seats