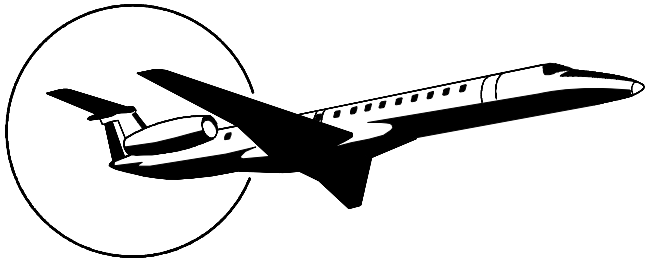
EMB145

EMBRAER



BRAZILIAN

QUICK REFERENCE HANDBOOK

THIS PUBLICATION CANCELS AND SUPERSEDES THE QRH–145/1167 DATED JANUARY 30, 2001; REVISION 9 DATED APRIL 06, 2005.

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JUNE 30, 2006

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APPLICABILITY

This handbook is applicable to the EMB-135 and the EMB-145 models.

The procedures contained in this handbook have been developed by the manufacturer for use during the operation of the EMB-135 and EMB-145 models. These procedures are provided as guidance and should not be construed as prohibiting the development of equivalent procedures.

The use of the on board checklist is based on the assumption that both pilots have been properly trained on the type of airplane and, therefore, have a through knowledge of the airplane's systems and procedures.

It further assumes that they know the consequences of not performing the right actions at the right time.

In case of conflicting information between this handbook and the AFM-145/1152, the AFM must prevail.

INTRODUCTION

The normal checklist is just a memory aid to assist the pilots so they do not forget actions which, if not carried out, can result in some type of risk to the airplane, to the operational environment, to any of its systems, to its occupants or to the passengers comfort. Specific regulations also ask for items to be included in the checklist.

The normal checklist assumes that the pilots previously accomplished all normal procedures.

The normal checklist is named and divided according to each specific phase of flight.

When a disagreement between the response and the checklist answer is found, the checklist should be interrupted until the item is resolved.

Upon completion of the checklist the pilot reading it should state: "_____Checklist Complete".

- ∗ **Items marked with an asterisk are to be performed at least once a day, by flight crew or maintenance personnel, at operator's discretion.**
- ♦ **Items marked with a lozenge are to be on through flights.**

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INTERNAL SAFETY INSPECTION

CHALLENGE	ACTION
Maintenance Status	**CKD**
Cockpit Emergency Equip	**CKD**
Reinforced Cockpit Door Vent Louver (if applicable)	**OPN**
Circuit Breakers	**CKD**
ELECTRIC Panel	**SET**
Emergency Lights	**OFF**
Fire Extinguishing Handle 1	**PUSHED IN**
FUEL Panel	**SET**
APU	**SET**
Ignitions	**AUTO**
START/STOP Selectors	**STOP**
Fire Extinguishing Handle 2	**PUSHED IN**
Ailerons & Rudders Shutoff	**PUSHED IN**
HYDRAULIC Panel	**SET**
Windshield Heating	**PUSHED OUT**
Sensors	**PUSHED IN**
Ice Detection Override	**AUTO**
AIR COND/PNEUM Panel	**SET**
Windshield Wipers (if installed)	**OFF**
Lights	**OFF**
ELT	**ARMED**
Weather Radar	**OFF**
Landing Gear Lever	**DOWN**
Crew Oxygen	**ON**
PASSENGER OXYGEN Panel	**SET**
Gust Lock	**LOCKED**
Speed Brake	**CLSD**
Emergency/Parking Brake	**AS RQRD**
FLAPS Selector Lever	**VERIFY POS**
Alternate Gear Extension Compartment	**CKD**

POWER UP

	CHALLENGE	ACTION/RESPONSE
	Batteries 1 & 2	AUTO
	Avionics Master 1 or 2	PUSHED IN
*	Batteries Voltage	CKD
*	Backup Battery (EMB XR only)	CKD
	GPU Voltage (if available)	CKD
	Avionics Master 1 & 2	PUSHED OUT
	GPU (if available)	PUSHED IN
	Fuel Pump Power Tank 2	AS RQRD
	Navigation Light	ON
*	FIRE EXTINGUISHER Panel	CKD
	APU	AS RQRD
	Avionics Master 1 & 2	PUSHED IN
	With APU Power	
	GPU (if available)	PUSHED OUT
	3 minutes After APU Start	
	APU Bleed	PUSHED IN
	Air Conditioning	AS RQRD

BEFORE START

	CHALLENGE	RESPONSE
	Manuals & Documents	ON BOARD
	CVR	CKD
	ELECTRICAL Panel	SET
	Emergency Lights	ARM
	Push Button Lights Test (if installed)	CKD
♦	FUEL Panel	SET
*	Fire Detection	CKD
	FIRE EXTINGUISHER Panel	CKD
	POWERPLANT Panel	SET
*	Elec Pump Sys 1 & 2	CKD
	Elec Pump Sys 1 & 2	OFF
♦	PAX SIGNS Panel	SET
	ICE PROTECTION Panel	SET
	AIR COND/PNEUM Panel	SET
	Oxy Masks & Regulators	CKD
	Weather Radar	TST/STBY
	Pitch Trim Cutout Buttons	CKD
	DISPLAY CONTROL Panel	SET
♦	Flight Number & Clocks	SET

CONTINUES ON NEXT PAGE

CHALLENGE	RESPONSE
AHRS (if applicable)	SET
IRS (if applicable)	NAV
Autopilot	CKD
Gust Lock	LOCKED
REVERSIONARY Panel	SET
♦ Flight Instruments	SET/X-CKD
♦ RMU	SET
Thrust Levers	IDLE
♦ Stall Protection System	CKD
TRIM Panel	CKD
♦ PRESSURIZATION Panel	SET
♦ FMS	SET
♦ Fuel QTY	CKD
♦ FMS	SET
♦ Speed Bugs	SET
♦ TRIM Panel	___SET/ZERO/ZERO
♦ Doors & Windows	CLSD
♦ Takeoff Briefing	COMPLETED
♦ Fuel Pump Power	ON
♦ Red Beacon	ON
♦ Emergency/Parking Brake	AS RQRD
♦ Steering	AS RQRD
Safety Pins	ON BOARD

AFTER START

CHALLENGE	RESPONSE
Ground Equipment	REMOVED
ELECTRICAL Panel	SET
APU	AS RQRD
FADEC	RST/ALTN
Elec Hyd Pumps	AUTO
Windshield Heating	AS RQRD
AIR COND/PNEUM Panel	SET
FLAPS	___SET
Flight Controls	CKD
Taxi Lights	ON

BEFORE TAKEOFF

CHALLENGE	ACTION/RESPONSE
Takeoff Briefing	PERFORM
Ice Protection Test	AS RQRD
Brakes Temperature	CKD
EICAS	CKD
Transponder	TA/RA
Takeoff Configuration	CKD
Gust Lock	UNLOCKED
Elevator	CKD

AFTER TAKEOFF

CHALLENGE	ACTION/RESPONSE
Landing Gear	UP
FLAPS	0
Thrust Rating	CLB
Windshield Heating	AS RQRD
AIR COND/PNEUM Panel	SET
Altimeters	SET/X-CKD
Pressurization	CKD
APU	AS RQRD

DESCENT

CHALLENGE	ACTION
Windshield Heating	PUSHED IN
Approach Briefing	COMPLETED
Speed Bugs	SET
PRESSURIZATION Panel	SET
External Lights	ON
Pax Signs	SET

APPROACH

CHALLENGE	ACTION/RESPONSE
PASS SIGNS Panel	SET
Altimeters	SET/X-CKD
Approach Aids	SET/X-CKD

BEFORE LANDING

CHALLENGE	ACTION
Landing Gear	DOWN
FLAPS	___SET
Lights	AS RQRD
AP/YD	OFF

SHUTDOWN

CHALLENGE	ACTION/RESPONSE
Thrust Levers	**IDLE**
Emergency/Parking Brake	**SET**
GPU/APU Generators	**PUSHED IN**
Shed Buses	**AS RQRD**
START/STOP Selectors	**STOP**
Red Beacon	**OFF**
FSTN BELTS	**OFF**
Fuel Pump Pwr	**AS RQRD**
Elec Hyd Pumps	**OFF**
Ice Protection Sys	**OFF**
AIR COND/PNEUM Panel	**SET**

LEAVING THE AIRPLANE

CHALLENGE	ACTION/RESPONSE
IRS (if applicable)	**OFF**
Avionics Master 1 & 2	**PUSHED OUT**
Emergency Lights	**OFF**
External & Internal Lights	**OFF**
PAX SIGNS Panel	**OFF**
Weather Radar	**OFF**
Standby Attitude (if applicable)	**CAGED**
GPU/APU	**OFF**
AIR COND/PNEUM Panel	**SET**
Fuel Pumps	**OFF**
Batteries	**OFF**

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INTRODUCTION

The Emergency/Abnormal Procedures published in the Quick Reference Handbook (QRH) are provided to pilots as quick guide to minimize the consequences of emergency and abnormal situations that might occur during airplane operation.

In case a discrepancy is found between the QRH and the approved Airplane Flight Manual (AFM), the AFM shall prevail.

Use the QRH requires proper training on the execution of all operational, emergency and abnormal procedures set forth in the AFM and a thorough knowledge of airplane systems.

The procedures set forth herein also require situational awareness for identification of an emergency or abnormal situations and pilot skills to guarantee safety. The Emergency Evacuation procedure accomplishment may be necessary in many situations and its need is at pilot's discretion.

It is EMBRAER recommendation that any unusual situation encountered should be reported as quickly as possible to Flight Operations and Maintenance Personnel.

Three blocks of procedures are contained in this manual:

- **Smoke Procedures: address all annunciated and non annunciated smoke related procedures.**
- **Non Annunciated Procedures: procedures that are not related to an EICAS message but rather to a condition present in the airplane. The Checklists are arranged in alphabetical order with Emergency Checklists first, followed by Abnormal Checklists.**
- **Annunciated Procedures: procedures related to EICAS message. These procedures are grouped by system and the system tabs are in alphabetical order. Each title prcedure is followed by the corresponding EICAS message identification. The Checklists for each System Tab are arranged in alphabetical order with the Emergency Checklists first followed by the Abnormal Checklists. The message provided for each procedure represents the root cause of the failure.**

The emergency evacuation procedure is repeated in the last page of QRH, after Performance Data to make it easier to find.

Some procedures can either be annunciated or non annunciated. In this case, the procedures are presented in the Annunciated block but are referenced in the Non Annunciated index.

In each Annunciated System Tab Index, the related non annunciated procedures are presented with a cross-reference to the Non Annunciated Tab page. The procedures index is classified into Emergency and Abnormal procedures, while EICAS Messages List is classified into Warning, Caution and Advisory messages.

Some EICAS messages do not have an associated QRH procedure. In those cases, "Crew Awareness" identifies the EICAS message as noted in the Index Table. If a Crew Awareness message is displayed on the EICAS, takeoff is prohibited, unless at least one of the following conditions is met:

- **The message is an expected result of an intentional operation;**
- **Flight crew action is taken to clear the message;**
- **Maintenance personnel take action to clear the message;**
- **The airplane is dispatched in accordance with all approved company MEL provisions.**

If one of the following Crew Awareness messages is presented after gate departure, the flight may continue only to the intended destination without further action:

- **AHRS BASIC MODE;**
- **DU 1 (2, 3, 4, 5) FAN FAIL;**
- **E1 (2) OIL IMP BYP;**
- **ENG A/ICEOVERPRES;**
- **IC 1 (2) FAN FAIL or**
- **GEN 1 (2, 3, 4) BRG FAIL.**

Some procedures include a characterization below the title if a relevant emergency/abnormal condition is present, such as aural warnings, lights, EICAS indications, flight instrument flags and the airplane condition itself.

The actions contained in the bold square boxes are recall items. They must be performed expeditiously, by memory.

Flying the airplane is always the priority in any emergency/abnormal situation. Checklists should be called after the flight path is under control, critical phases of flight (such as takeoff and landing) have ended and all recall items have been accomplished.

Some emergency and abnormal situations require landing at the nearest suitable airport. This statement will be listed at the beginning of a task checklist to give the crew proper time to plan the landing. Also, as an aid for planning the diversion airport, the landing distance correction factor will be presented together with the "Land at nearest suitable airport" statement.

Throughout this manual, a text followed by () means that either condition applies. A text followed by "-" means that both conditions apply simultaneously.

Some procedures require depressurizing the cabin. This will require either dumping the cabin air or the use of manual control to accomplish this task. In this situation, manual control depressurization is the recommended method to be used for passenger comfort and should be made by setting the pressurization mode selector to MAN and smoothly setting the controller to FULL UP. When there is a need to depressurize by a specific method, it will be clearly stated in the procedure.

The procedures contained herein assume that:

- **Airplane systems were operating normally prior to the failure.**
- **All emergency/abnormal actions are performed in the order they are listed in the procedure.**
- **Normal procedures have been properly performed.**
- **Aural warnings are silenced as necessary. Master Warning/Caution lights are reset as soon as the failure is recognized.**
- **All procedures are self-contained. All other messages that may be generated by a single failure do not require that procedures associated to those messages be accomplished in addition to the procedure addressing the root cause.**
- **Circuit breakers must not be pushed in if they pop up.**

All assigned tasks in the procedures have the indication END at the completion of each assigned task. No task is over until . END has been reached.

Upon completion of the checklist the pilot reading it should state: "(*Procedure Title)* Checklist Complete".

In the event of multiple failures (excluding cascade failures) with different landing configuration and/or landing distance correction factors, the crew should use good judgment to determine the safest action.

According to the QRH philosophy, Rejected Takeoff (at or below V_1) procedure is not considered in this manual. Indeed, should the flight crew decide to reject the takeoff; they will do it by memory, not by referring to the QRH. Consequently, Rejected Takeoff (at or below V1) procedure is a matter of flight crew training and is considered within the Standard Operating Procedures Manual, which contains the complete guidance to accomplish it.

Indentation exists when the information is displaced to the right relative to the paragraph that immediately precedes it. The indentation is used to establish a relationship between the indented and the preceding information. An indented information is normally preceded by a condition (e.g. "during landing", "if something is true", "when something happens"). When this is the case, observe the indented information when the preceding condition is satisfied.

TABLE OF CONTENTS

LIST OF EICAS MESSAGES

BAGGAGE SMOKE

EICAS Warning: BAGG SMOKE

Fire Extg Bagg Button (if installed).....PUSH IN

LAND AT THE NEAREST SUITABLE AIRPORT.

Altitude .....MAINTAIN

Delay the descent as long as possible.

NOTE: Advise Ground Crew of possible Halon vapors approximately 50 minutes after discharging fire extinguishing bottle.

END

LAVATORY SMOKE

EICAS Warning: LAV SMOKE (may be presented)

Lavatory Flush and Lavatory Light CB's (Located in Line E) .....PULL

Establish contact with the cabin crew.

If necessary:

Diversion .....CONSIDER

SMOKE EVACUATION Procedure (S-4) .....ACCOMPLISH

END

SMOKE EVACUATION

Condition: Smoke or odor inside the cabin and/or cockpit requiring smoke removal.

Crew Oxygen Masks.....DON, 100%
Smoke Goggles.....DON
Crew Communication....ESTABLISH

LAND AT THE NEAREST SUITABLE AIRPORT.

Cockpit Door .....CLOSE

Reinforced Cockpit Door Louver Vent (if applicable) .....CLOSE

Recirculation Fan.....PUSH OUT

Gasper Fan.....PUSH OUT

Pressurization Manual Controller.....1 O'CLOCK POSITION

.....WAIT 15 SECONDS

Pressurization Mode Selector .....PUSH IN (MAN)

Passenger Oxygen .....AS REQUIRED

CONTINUES ON NEXT PAGE

CONTINUED FROM PREVIOUS PAGE

DESIRED EVACUATION RATE?

Fast

Normal

Pressurization Manual Controller ..... AS REQUIRED

Turn the controller clockwise towards UP to adjust desired evacuation rate.

END

Pressurization Manual Controller ..... UP

Packs 1 and 2 ..... PUSH OUT

Bleeds (at least one) .... PUSH IN

Altitude ..... 10’000 FT OR MEA, WHICHEVER IS HIGHER

Recover cabin pressure as soon as smoke has been cleared.

EMERGENCY DESCENT Procedure (NAP-6) .... AS REQUIRED

END

SMOKE / FIRE / FUMES

Condition: Smoke fire or fumes visually confirmed or identified by odor without an EICAS warning.

Crew Oxygen Masks.....DON, 100%
Smoke Goggles.....DON
Crew Communication....ESTABLISH

LAND AT THE NEAREST SUITABLE AIRPORT.

Recirculation Fan.....PUSH OUT

Gasper Fan.....PUSH OUT

NOTE: Any time smoke becomes dense, perform **SMOKE EVACUATION Procedure(S-4)**.

SMOKE ORIGIN IS OBVIOUS AND CAN BE REMOVED? — **No**

Yes

Affected Source.....REMOVE

SMOKE STOPS OR DECREASES? — **No**

Yes

SMOKE EVACUATION Procedure (S-4).....AS REQUIRED

END

Cabin Crew.....NOTIFY

FSTN Belts.....ON

CONTINUES ON NEXT PAGE

CONTINUED FROM PREVIOUS PAGE

Thrust Levers ..... IDLE

Speed Brakes ..... OPEN

Airspeed ..... MAX 250 KIAS

Landing Gear ..... DOWN

Altitude ..... 10’000 FT OR MEA, WHICHEVER IS HIGHER

Transponder 7700

ATC ..... NOTIFY

Cockpit Door ..... CLOSE

Reinforced Cockpit Door Louver Vent (if applicable) ..... CLOSE

Pressurization Manual Controller ..... 1 O'CLOCK POSITION

..... WAIT 15 SECONDS

Pressurization Mode Selector ..... PUSH IN (MAN)

Passenger Oxygen ..... AS REQUIRED

Pressurization Manual Controller ..... FULL UP

Packs 1 and 2 ..... PUSH OUT

Shed Buses ..... OFF

CONTINUES ON NEXT PAGE

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Bus Ties.....OFF

VTRL PUMP SEL (if applicable) .....SET TO A

Fuel Pump 1 .....1A OR 1C

Fuel Pump 2 .....2B

Battery 2 .....OFF

Generators 2 and 4 .....PUSH OUT

Shed Buses, Central DC Bus, DC Bus 2 and Essential Bus 2 deenergized.

SMOKE STOPS OR DECREASES?

No

Yes

Icing Conditions.....EXIT/AVOID

Airspeed .....MAX 250 KIAS

SG On Reversionary Panel 2 .....PUSH IN

NOTE: PFD or MFD information is available in DU 4.

COM 1 on Digital Audio Panel 1.....PUSH IN

Do not set Thrust Lever 2 below idle in flight.

Monitor fuel quantity indication 2 through FMS.

CONTINUES ON NEXT PAGE

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Relevant Inoperative Items:

ADF 2/DME 2/VOR 2/VHF 2/ILS 2/MB 2	
Audio System 2	ISIS/Standby Altimeter
Brakes Inbd	RMU 2
DU 2 and 5	Standby Attitude Indicator
FMS 2	Steering
Ground Spoiler Inbd	Transponder 2

NOTE: Landing gear lever can not be moved up.

Landing configuration:

Anticipate flap actuation.

If landing gear has not been selected down:

Gear Electrical Override .....DOORS

.....WAIT 3 SECONDS

Gear Electrical Override .....GEAR/DOORS

Flaps .....45°

V_{REF} .....$V_{REF\ 45°}$ + 5 KIAS

CAUTION: MULTIPLY THE FLAPS 45° UNFACTORED LANDING DISTANCE BY 1.95.

Do not actuate Thrust Reverser 2.

Brake effectiveness will be reduced.

END

CONTINUES ON NEXT PAGE

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IS SUITABLE AIRPORT DISTANT?

No

Yes

Generators 2 and 4 ..... PUSH IN

Battery 2 ..... AUTO

Fuel Pump 1 ..... 1B

Fuel Pump 2 ..... 2A OR 2C

VTRL PUMP SEL (if applicable) ..... SET TO B

Battery 1 ..... OFF

Generators 1 and 3 ..... PUSH OUT

Shed Buses, Central DC Bus, DC Bus 1 and Essential Bus 1 deenergized.

Emergency lights ..... OFF

SMOKE STOPS OR DECREASES?

No

Yes

Icing Conditions ..... EXIT/AVOID

SG On Reversionary Panel 1 ..... PUSH IN

NOTE: PFD or MFD information is available in DU 2.

COM 2 on Digital Audio Panel 2 ..... PUSH IN

CONTINUES ON NEXT PAGE

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Do not set Thrust Lever 1 below idle in flight.

Monitor fuel quantity indication 1 through FMS.

Relevant Inoperative Items:

ADF 1/DME 1/VOR 1/VHF 1/ILS 1/MB 1	
Audio System 1	Ground Spoiler Outbd
Autopilot	Main Pitch Trim
Brakes Outbd	RMU 1
DU 1 and 4	Speed Brake
FMS 1	Transponder 1

NOTE: Landing gear lever can only be moved up using downlock release button (DN Lock Rel).

Landing configuration:

Anticipate flap actuation.

Emergency lights.....ON

Flaps .....45°

V_{REF} .....$V_{REF\ 45°}$ + 5 KIAS

CAUTION: MULTIPLY THE FLAPS 45° UNFACTORED LANDING DISTANCE BY 1.95.

Do not actuate Thrust Reverser 1.

Brake effectiveness will be reduced.

END

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Generators 1 and 3 .....PUSH IN

Battery 1 .....AUTO

Backup Battery .....PUSH OUT

<u>WARNING</u>: CONSIDER AN IMMEDIATE LANDING.

Landing configuration:

Emergency lights.....ON

Flaps .....45°

V_{REF} .....$V_{REF\ 45°}$

END

Icing Conditions.....EXIT/AVOID

Airspeed .....MAX 250 KIAS

SG On Reversionary Panel 2 .....PUSH IN

NOTE: PFD or MFD information is available in DU 4.

COM 1 on Digital Audio Panel 1.....PUSH IN

Do not set Thrust Lever 2 below idle in flight.

Monitor fuel quantity indication 2 through FMS.

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Relevant Inoperative Items:

ADF 2/DME 2/VOR 2/VHF 2/ILS 2/MB 2	
Audio System 2	ISIS/Standby Altimeter
Brakes Inbd	RMU 2
DU 2 and 5	Standby Attitude Indicator
FMS 2	Steering
Ground Spoiler Inbd	Transponder 2

NOTE: Landing gear lever can not be moved up.

Landing configuration:

Anticipate flap actuation.

If landing gear has not been selected down:

Gear Electrical Override .....DOORS

.....WAIT 3 SECONDS

Gear Electrical Override .....GEAR/DOORS

Flaps .....45°

V_{REF} .....$V_{REF45°}$ + 5 KIAS

CAUTION: MULTIPLY THE FLAPS 45° UNFACTORED LANDING DISTANCE BY 1.95.

Do not actuate Thrust Reverser 2.

Brake effectiveness will be reduced.

END

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AILERON RUNAWAY/ ROLL TRIM RUNAWAY

Condition: Sudden roll.

Quick Disconnect Button .....PRESS AND HOLD
Aileron Shutoff 1 and 2.....PUSH OUT

Roll Trim CB (F23).....PULL
Quick Disconnect Button .....RELEASE
Airspeed .....MAX 250 KIAS
Roll Trim Position .....CHECK

ROLL TRIM IN NEUTRAL POSITION? **No**

Yes

Roll Trim CB (F23).....PUSH
Prepare to overcome uncommanded roll.
Aileron Shutoff 1.....PUSH IN

RUNAWAY PERSISTS? **No**

Yes

Aileron Shutoff 1.....PUSH OUT
Prepare to overcome uncommanded roll.
Aileron Shutoff 2.....PUSH IN

RUNAWAY STILL PERSISTS? **No**

Yes

Aileron Shutoff 2.....PUSH OUT

Expect greater aileron control force. If required, both pilots should act together to control airplane.

Avoid airports with anticipated turbulence or crosswind.
Perform a long final approach.
Landing configuration:

Landing Gear .....DOWN
Flaps.....22°
V_{REF} .....V_{REF45} + 30 KIAS

CAUTION: MULTIPLY THE FLAPS 45° UNFACTORED LANDING DISTANCE BY 1.85.

END

Aileron Shutoff 1 and 2.....PUSH IN

Roll trim is inoperative. Use aileron and rudder to control the airplane.

END

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APU OVERTEMPERATURE

EICAS Indication: EGT enter amber or red range.
EICAS Caution: APU FAIL may be presented.

APU Bleed ..... PUSH OUT

..... WAIT 10 SECONDS

EGT REMAINS HIGH?

No

Yes

APU Fuel Shutoff Valve ..... PUSH IN
APU Master Knob ..... OFF

DO NOT ATTEMPT TO RESTART APU.

END

Consider the APU shutdown if it is not necessary.

END

DITCHING

ATC..... NOTIFY
Transponder 7700
FSTN Belts..... ON
Cabin Crew ..... NOTIFY
Passengers (and Crew) ..... PREPARE FOR DITCHING
Below 10'000 ft:
Pressurization Dump Button..... PUSH IN (ON)
GPWS CB (J7 or J8) ..... PULL
Aural Warn CBs (B4 and E30) .... PULL
Emerg Lts..... ON
ELT..... ON
At 1'000 ft:
Vtrl Tk Xfer Knob (only EMB-145XR)..... OFF
Packs 1 and 2..... PUSH OUT
Engine Bleeds 1 and 2 ..... PUSH OUT
Plan ditching parallel to the line of the wave crests. On final, level the wings and avoid skidding. Touchdown with 4° nose up attitude, and rate of descent less than 180 ft/min.
Ditching configuration:
Landing Gear ..... UP
Flaps..... 45°
If it is not possible to achieve the selected flap position, maintain airspeed according to the following:

FLAPS POSITION	MIN AIRSPEED
0 to 8°	V_{REF45} + 30 KIAS
9° to 21°	V_{REF45} + 10 KIAS
22° to 44°	V_{REF45} + 5 KIAS
45°	V_{REF45}

Just before touchdown:
Cabin ..... ANNOUNCE IMPACT
Use only overwing emergency exits for passenger evacuation. Do not open remaining doors.
Upon water contact:
Thrust Levers 1 and 2 ..... IDLE
Start/Stop Selectors 1 and 2..... STOP
APU SHUTDOWN
Fire Extinguishing Handles ..... PULL
APU Fuel Shutoff..... PUSH IN
Fuel Pumps Pwr ..... OFF
Hydraulic Elec Pumps..... OFF
Engine and APU Fire Extinguishing Bottles (if necessary) ..... DISCHARGE
Evacuation ..... INITIATE
Before leaving the airplane:
Batteries 1 and 2..... OFF

END

EMERGENCY DESCENT

Cabin Crew	**NOTIFY**
FSTN Belts	**ON**
Thrust Levers	**IDLE**
Speed Brakes	**OPEN**
Airspeed	**MAX 250 KIAS**
Landing Gear	**DOWN**
Descent	**INITIATE**
Altitude	**MEA OR 10'000 FT, WHICHEVER IS HIGHER**

Transponder 7700

ATC ..... NOTIFY

IF STRUCTURAL DAMAGE IS SUSPECTED, USE THE FLIGHT CONTROLS WITH CAUTION AVOIDING HIGH MANEUVERING LOADS AND REDUCING AIRSPEED AS APPROPRIATE.

END

EMERGENCY EVACUATION

Parking Brake	**APPLY**
Cabin	**DEPRESSURIZE**
Fire Extinguishing Handles	**PULL**
APU Fuel Shutoff Valve	**PUSH IN**
Fuel Pumps Pwr 1 and 2	**OFF**
Hydraulic Elec Pumps 1 and 2	**OFF**
Engines and APU Fire Extinguishing Bottles (if necessary)	**DISCHARGE**

Cabin Crew ..... NOTIFY

Emerg Lts ..... ON

Evacuation ..... INITIATE

ATC ..... NOTIFY

Before leaving the airplane:

Batteries 1 and 2 ..... OFF

NOTE: Cockpit door blow-out panels may be broken to be used as an alternative way to leave cockpit.

END

FORCED LANDING

ATC ..... NOTIFY

Transponder 7700

FSTN Belts ..... ON

Cabin Crew ..... NOTIFY

Passengers (and Crew) ..... PREPARE FOR FORCED LANDING

Below 10'000 ft:

Pressurization Dump Button ..... PUSH IN (ON)

GPWS CB (J7 or J8) ..... PULL

Aural Warn CBs (B4 and E30) ..... PULL

Emerg Lts ..... ON

ELT ..... ON

When committed to land:

Landing Gear ..... AS REQUIRED

The decision to land with all gear up or with any gear extended is left to pilots. The choice of configuration is based on the number of gear available, airplane load distribution, controllability and conditions of the landing field. Ground spoilers and thrust reversers will not operate if any main gear is up.

Flaps ..... 45°

If it is not possible to achieve the selected flap position, maintain airspeed according to the following:

FLAPS POSITION	MIN AIRSPEED
0 to 8°	V_{REF45} + 30 KIAS
9° to 21°	V_{REF45} + 10 KIAS
22° to 44°	V_{REF45} + 5 KIAS
45°	V_{REF45}

Just before touchdown:

Cabin ..... ANNOUNCE IMPACT

Fire Extinguishing Handles ..... PULL

APU Fuel Shutoff Valve ..... PUSH IN

Vtrl Tk Xfer Knob (only EMB-145XR) ..... OFF

When the airplane stops:

Fuel Pumps Pwr 1 and 2 ..... OFF

Hydraulic Elec Pumps 1 and 2 .... OFF

Engines and APU Fire Extinguishing Bottles (if necessary) ..... DISCHARGE

Evacuation ..... INITIATE

Before leaving the airplane:

Batteries 1 and 2 ..... OFF

END

FUEL LEAK

Condition:
- FMS Fuel Remaining quantity is above the MFD or EICAS total fuel indication.
- Excessive Fuel flow from one of the engines.
- Fuel imbalance develops.
- Fuel quantity of a tank decreases at an abnormal rate.

LAND AT THE NEAREST SUITABLE AIRPORT.

XFEED ..... OFF

Affected Fuel Tank..... IDENTIFY

Asymmetric Thrust ..... AS REQUIRED

LEAK ON THE RH TANK? **No**

Yes

APU..... OFF

LEAKAGE CONTINUES AND IS SEVERE? **No**

Yes

ENGINE SHUTDOWN IS CONSIDERED? **No**

Yes

At pilot's discretion:

Associated Thrust Lever .....IDLE

Start/Stop Selector.....STOP

Fire Extinguishing Handle.....PULL (DO NOT ROTATE)

Thrust Rating .....CON

TCAS.....TA ONLY

Altitude .....MAX 25'000 FT, MIN MEA

ICING CONDITIONS? **No**

Yes

XBleed ..... OPEN

Altitude ..... MAX 15'000 FT, MIN MEA

If it is not possible to descend below 15'000 ft:

Icing Conditions..... EXIT

ONE ENGINE INOPERATIVE APPROACH AND LANDING Procedure (NAP-30) .....ACCOMPLISH

END

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JAMMED AILERON

Condition: Both control wheels can not be moved to either side.

Aileron Disconnection Handle .....PRESS AND PULL

Autopilot.....DISENGAGE
Airspeed .....MAX 200 KIAS
If the right control wheel is jammed, roll trim and artificial feel are not available.
Maintain bank angle below 20°.
If both ailerons are jammed, use rudder to control the airplane.
Avoid abrupt and large aileron inputs.
Avoid airports with anticipated turbulence or crosswind.
Landing configuration:

Landing Gear .....DOWN
Flaps.....45°
V_{REF} .....$V_{REF\ 45}$ + 5 KIAS

CAUTION: MULTIPLY THE FLAPS 45° UNFACTORED ANDING DISTANCE BY 1.10.

END

JAMMED ELEVATOR

Condition: Both control columns can not be moved either forward or backward.

EICAS Warning: SPS 1-2 INOP may be presented.

EICAS Caution: STICK PUSHER FAIL may be presented.

Elevator Disconnection Handle .....PRESS AND PULL

Autopilot.....DISENGAGE
Pitch Trim .....AS REQUIRED
Elevator authority to flare during landing may be reduced.
If both elevators are jammed, pitch trim may be used to land the airplane.
Airspeed .....MAX 200 KIAS
If left elevator is jammed, Stick Pusher will not be available.
Avoid airports with anticipated turbulence or crosswind.
Landing configuration:

Flaps.....22°
V_{REF} .....V_{REF45} + 10 KIAS

CAUTION: MULTIPLY THE FLAPS 45° UNFACTORED LANDING DISTANCE BY 1.45.

END

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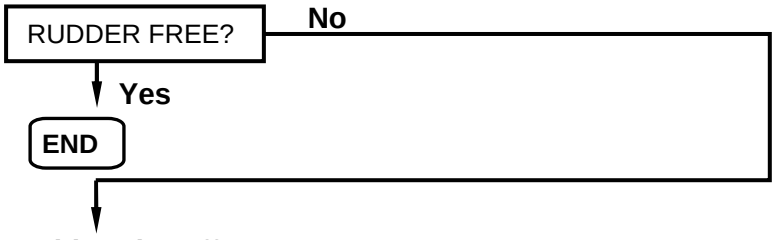
JAMMED RUDDER

Condition: Pedals can not be moved.

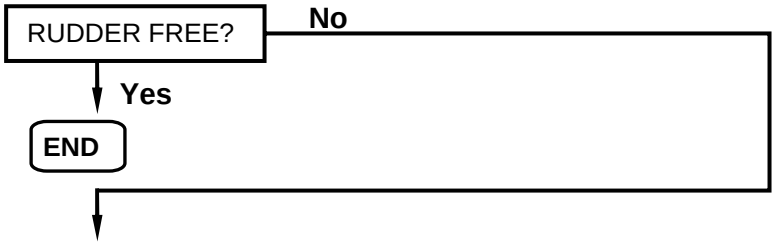
Command rudder through yaw trim.
If required, use asymmetric thrust to control the airplane. Maintain engine asymmetric thrust until nose gear contact in order to avoid lateral and directional miscontrol.

Rudder Shutoff Sys 2.....PUSH OUT



Rudder Shutoff Sys 2.....PUSH IN

Rudder Shutoff Sys 1.....PUSH OUT



Airspeed .....MAX 200 KIAS
During final approach and landing run:
Pilot not flying:
Steering Disengage Button .....PRESS AND HOLD
Steering Handle.....AS REQUIRED
Use Steering Handle still keeping the Steering Disengage Button pressed.

CAUTION: DO NOT RELEASE THE NOSEWHEEL STEERING HANDLE UNTIL THE AIRPLANE IS COMPLETELY STOPPED.

Thrust Levers .....IDLE
If necessary, use differential braking to steer the airplane.
Avoid landing at airports with anticipated turbulence or crosswind.
Landing configuration:

Flaps.....22°

V_{REF} .....V_{REF45} + 5 KIAS

CAUTION: MULTIPLY THE FLAPS 45° UNFACTORED LANDING DISTANCE BY 1.62.

END

PITCH TRIM RUNAWAY

Condition: Uncommanded pitch and trim indication changes.

EICAS Warning: AUTOPILOT FAIL may be presented.

EICAS Caution: AUTO TRIM FAIL may be presented.

Quick Disconnect Button ..... PRESS AND HOLD

NOTE: Do not change flap setting.

At safe altitude:

Pitch Trim Main Sys Cutout..... PUSH OUT
Pitch Trim Backup Sys Cutout ... PUSH OUT
Quick Disconnect Button..... RELEASE

WARNING: DO NOT OPEN SPEED BRAKE.

Prepare to overcome unwanted pitch change.
Pitch Trim Backup Sys Cutout..... PUSH IN

RUNAWAY PERSISTS?

No

Yes

Pitch Trim Backup Sys Cutout..... PUSH OUT
Prepare to overcome unwanted pitch change.
Pitch Trim Main Sys Cutout ..... PUSH IN

RUNAWAY STILL PERSISTS?

No

Yes

Pitch Trim Main Sys Cutout ..... PUSH OUT
PITCH TRIM INOPERATIVE
Procedure (EAP 8-4)..... ACCOMPLISH

END

Autopilot..... AS REQUIRED

END

Autopilot..... DISENGAGE

END

RAPID CABIN DEPRESSURIZATION

Aural Warning: Voice Message **CABIN**.
EICAS Indication: CAB ALT value in red.
Condition: Cabin altitude has exceeded 10'000 ft.

Crew Oxygen Masks .....DON
Crew Communication .....ESTABLISH

Passenger Oxygen.....AS REQUIRED
Altitude MEA OR 10'000 FT, WHICHEVER IS HIGHER
EMERGENCY DESCENT
Procedure (NAP-6) .....AS REQUIRED

END

ABNORMAL ENGINE START

Condition: Any abnormal engine indication during engine start.

To abort start:
Associated Thrust Lever.....IDLE
Associated Start/Stop Selector ..STOP

FIRE OCCURS OR ENGINE STILL RUNNING? — **No**

Yes

Fire Extinguishing Handle.....PULL
ENGINE FAILURE/SHUTDOWN
Procedure (NAP-18).....ACCOMPLISH

END

ANOTHER START CONSIDERED? — **No**

Yes

FADEC in Command.....CHECK
FADEC Control Knob.....ALTN

FADEC ALTERNATES? — **No**

Yes

Ignition.....OFF
Associated Start/Stop Selector.....START, THEN RUN

.....WAIT 10 SECONDS
N2 indication .....CHECK

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Non Annunciated

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N2 INDICATES ROTATION? — No

Yes

.....WAIT 30 SECONDS
Start/Stop Selector .....STOP
Ignition Selector.....AUTO
Engine .....START

END

Do not attempt another start.
ENGINE FAILURE/SHUTDOWN
Procedure (NAP-18) .....ACCOMPLISH

END

ABNORMAL LANDING GEAR EXTENSION

Condition: Landing gear has not extended by normal means.

HYDRAULIC SYSTEM 1 AVAILABLE AND ELECTRICAL POWER AVAILABLE? — No

Yes

NOTE: Hydraulic System 1 must be operative.

Airspeed .....MAX 250 KIAS
Landing Gear Lever .....DOWN
Continue accomplishing this procedure even if Landing Gear Lever cannot be moved DOWN.
Gear Electrical Override .....DOORS
.....WAIT 3 SECONDS
Gear Electrical Override .....GEAR/DOORS
.....WAIT 20 SECONDS
Landing Gear Indication .....CHECK

THREE LEGS DOWN? — No

Yes

END

Airspeed .....MAX 200 KIAS
Landing Gear Lever .....UP
Gear Electrical Override .....NORMAL
.....WAIT 10 SECONDS

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Free Fall Lever..... ACTUATE
Landing Gear Lever ..... DOWN
Landing Gear Indication..... CHECK

ANY LEG STILL UP? **No**

Yes

Free Fall Lever..... CYCLE

Cycle the free fall lever as necessary, limited to 10 times, leaving it at the latched position for 20 seconds between each cycle.

ANY LEG STILL UP? **No**

Yes

PARTIAL OR GEAR UP
LANDING Procedure (NAP-33) ... ACCOMPLISH

END

ADS-B OUT FAIL OR DEGRADED

Condition: ADS-B FAIL or ADS-B DGR annunciation displayed on the RMU Radio page or by ATC notification.

Transponder ..... SELECT ANOTHER

END

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AILERON ARTIFICIAL FEEL INOPERATIVE

Condition: Control Wheel excessively light and oversensitive.

Airspeed. .....MAX 200 KIAS
Do not make abrupt and large aileron inputs.

END

APPROACH WARNING

Combiner Message: APCH WARN

MISSED APPROACH Procedure .....PERFORM

A Missed Approach Procedure must be performed, unless the approach is continued under visual conditions and the airplane position and attitude assure a safe landing.

In this case, the AIII guidance must not be followed.

END

ASYMMETRIC RUDDER OPERATION

Condition: Rudder pedals heavier to be moved to one side than the other.

Rudder Shutoff Sys 2.....PUSH OUT
If the failure persists:

Rudder Shutoff Sys 2.....PUSH IN

END

CAS MESSAGE MISCOMPARISON

PFD Indication: CAS MSG in amber.

MFD Knob on Reversionary
Panel 1 .....EICAS
MFD Knob on Reversionary
Panel 2 .....EICAS

Pilot's/Copilot's EICAS messages..COMPARE

Discrepant message.....CHECK
Analyze the situation to check whether the discrepant message is spurious or not, and take the appropriate corrective action.

END

CDU DATA BUS FAIL FMS ANNUNCIATION

Condition: Affected FMS is not updating CDU.
CDU DATA BUS FAIL message presented on FMS.

Affected FMS..... OFF, then ON
Power down the FMS using the ON-OFF DIM key.
DO NOT use the circuit breaker to cycle power to the FMS.

CDU DATA BUS FAIL MESSAGE PERSISTS? **No**

Yes

Affected FMS..... OFF

END

EMERGENCY/PARKING BRAKE HANDLE DISAGREE

Light: BRAKE ON with Emergency/Parking Brake Handle not actuated.

Do not take off.

END

ENGINE ABNORMAL VIBRATION

EICAS Indication: Engine vibration enters amber range.

Associated Thrust Lever ..... REDUCE TO KEEP VIBRATION WITHIN LIMITS

VIBRATION REMAINS OUT OF LIMITS? **No**

Yes

ENGINE FAILURE/SHUTDOWN Procedure (NAP-18) ..... ACCOMPLISH

END

TCAS..... TA ONLY

Monitor engine vibration.

END

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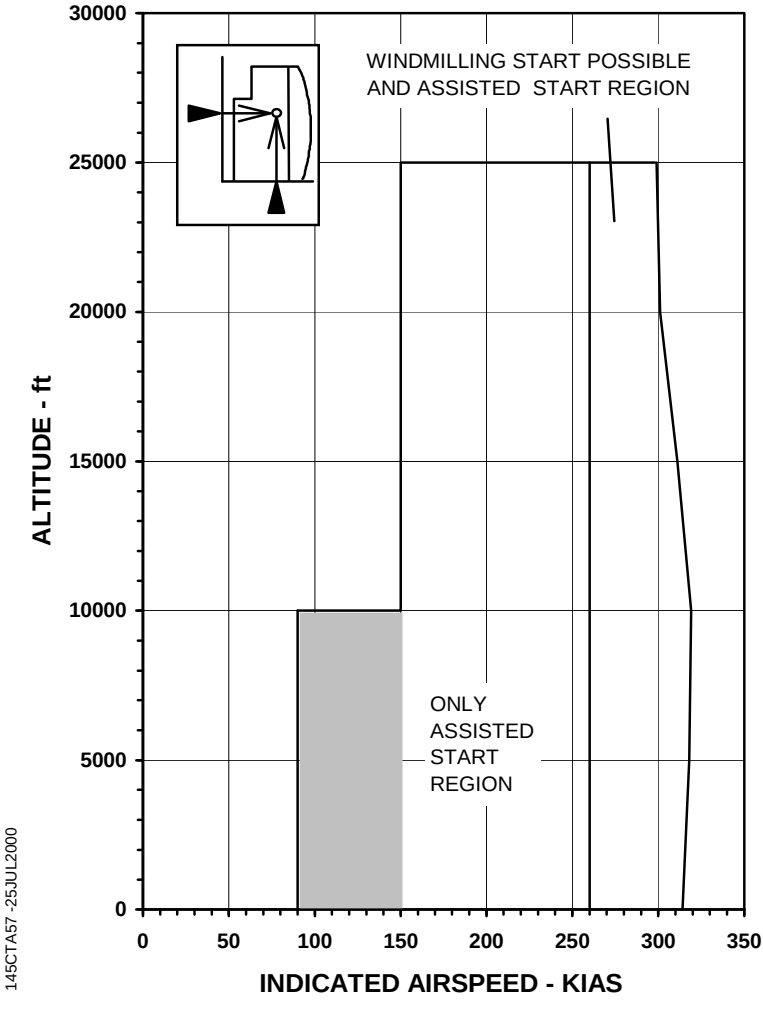
ENGINE AIRSTART

Inoperative engine:

Fuel Pump Selector.....A or B
Fuel Pump Pwr .....ON
Ignition.....AUTO
Start/Stop Selector.....STOP
Engine Bleed .....PUSH OUT
Thrust Lever .....IDLE

Engine Airstart Envelope .....CHECK

ENGINE AIRSTART ENVELOPE



NOTE: Shaded Area may be below 1.23 V_{SR}.

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Non Annunciated

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START PROCEDURE CONSIDERED?

Windmilling

APU Assisted

Crossbleed Assisted

APU ..... START
Operative engine:
Engine Bleed ..... PUSH OUT
APU Bleed ..... PUSH IN
XBleed ..... AUTO OR OPEN
Inoperative engine:
Start/Stop Selector ..... START, THEN RUN

NORMAL START?

No

Yes

Engine Bleeds 1 and 2 ..... AS REQUIRED
XBleed ..... AUTO
APU Bleed ..... AS REQUIRED

END

Do not alternate FADEC.
Consider another start procedure attempt.
ENGINE FAILURE/SHUTDOWN
Procedure (NAP-18) ..... AS REQUIRED

END

Operative engine:
N2 ..... MIN 80%
Engine Bleed ..... PUSH IN
XBleed ..... AUTO OR OPEN
Inoperative engine:
Start/Stop Selector ..... START, THEN RUN

NORMAL START?

No

Yes

Engine Bleeds 1 and 2 ..... AS REQUIRED
XBleed ..... AUTO
APU Bleed ..... AS REQUIRED

END

Consider another start procedure attempt.
ENGINE FAILURE/SHUTDOWN
Procedure (NAP-18) ..... AS REQUIRED

END

CONTINUES ON NEXT PAGE

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NOTE: Windmilling starts can be attempted in both engines simultaneously.

Airspeed .....MIN 260 KIAS

Inoperative engine:

N2 .....MIN 10%

Initiate windmilling start with N2 as high as possible. Once N2 is below 10%, it may not be recovered.

Start/Stop Selector .....START, THEN RUN

NORMAL START?

No

Yes

Engine Bleeds 1 and 2 .....AS REQUIRED
XBleed .....AUTO
APU Bleed .....AS REQUIRED

END

Consider another start attempt.
ENGINE FAILURE/SHUTDOWN
Procedure (NAP-18).....AS REQUIRED

END

ENGINE FAILURE/SHUTDOWN

Condition: Loss of thrust on an engine or abnormal engine indication or precautionary shutdown.

Associated Thrust Lever ..... IDLE

Associated Start/Stop Selector..... STOP

NOTE: If engine shutdown does not occur, pull the associated fire extinguishing handle.

Engine Thrust Rating..... CON

APU (if available) ..... START

APU Bleed ..... AS REQUIRED

XBleed ..... AS REQUIRED

Fuel ..... BALANCE

ENGINE RESTART CONSIDERED?

No

Yes

ENGINE AIRSTART
Procedure (NAP-15) ..... ACCOMPLISH

END

TCAS..... TA ONLY

LAND AT THE NEAREST SUITABLE AIRPORT.

CAUTION: MULTIPLY THE FLAPS 45° UNFACTORED LANDING DISTANCE BY 1.48.

Altitude ..... MAX 25’000 FT, MIN MEA

ICING CONDITIONS?

No

Yes

XBleed ..... OPEN

Altitude ..... MAX 15’000 FT, MIN MEA

If it is not possible to descend below 15’000 ft:

Icing Conditions ..... EXIT

ONE ENGINE INOPERATIVE
APPROACH AND LANDING
Procedure (NAP-30) ..... AS REQUIRED

END

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ENGINE HIGH OIL PRESSURE

EICAS Indication: Oil pressure pointer in amber range.

OIL TEMPERATURE, OIL LEVEL OR ENGINE VIBRATION OUT OF LIMITS?

No

Yes

Associated Procedure ..... ACCOMPLISH

END

ENGINE HIGH OIL TEMPERATURE

EICAS Indication: Oil temperature pointer and digits become red.

Associated Thrust Lever ..... REDUCE

FAILURE PERSISTS?

No

Yes

ABOVE 25'000 FT?

No

Yes

Altitude ..... MAX 25'000 FT
MINIMUM MEA

FAILURE PERSISTS?

No

Yes

ENGINE FAILURE/SHUTDOWN
Procedure (NAP-18)..... ACCOMPLISH

END

ENGINE LOW OIL LEVEL

MFD Indication: Oil quantity enters amber range.

ENGINE FAILURE/SHUTDOWN
Procedure (NAP-18)..... AS REQUIRED
Consider shutting the engine down to preserve oil quantity, and if required restart it prior to landing.

NOTE: The indication of oil-level is accurate above 3 quarts.

END

ENGINE OIL LOW PRESSURE

EICAS Indication: Oil pressure in amber range.

Associated Thrust Lever ..... REDUCE
Reduce N2 below 88%.

END

ENGINE OVERTEMPERATURE

Condition: ITT pointer and digits flashing amber or red.

Associated Thrust Lever ..... REDUCE

ITT INDICATION WITHIN LIMITS? **No**

Yes

Operate at reduced thrust to keep ITT within limits.

END

Associated Bleed ..... PUSH OUT

Altitude ..... MAX 25'000 FT, MIN MEA

ITT INDICATION STILL OUT OF LIMITS? **No**

Yes

ENGINE FAILURE/SHUTDOWN Procedure (NAP-18) ..... ACCOMPLISH

END

Operate at reduced thrust to keep ITT within limits.

TCAS ..... TA ONLY

END

ENGINE TAILPIPE FIRE

Condition: Tailpipe fire was detected visually by crew or ground personnel. No EICAS message displayed.

Affected engine:

- **Thrust Lever ..... IDLE**
- **Start/Stop Selector ..... STOP**
- **Ignition ..... OFF**
- **Fuel Pump ..... OFF**
- **XFeed Selector Knob ..... OFF**
- **Start/Stop Selector ..... START, THEN RUN**

ITT ..... MONITOR

ATC ..... NOTIFY

..... WAIT 90 SECONDS

Associated Start/Stop Selector ..... STOP

Associated Fire Extinguishing Handle ..... PULL (DO NOT ROTATE)

NOTE: If fire is not extinguished while the engine is motored, ground personnel support must be requested.

END

GEAR LEVER CANNOT MOVE UP AFTER TAKEOFF

Condition: Landing gear cannot be moved to up position after takeoff in the normal manner.

.....WAIT 10 SECONDS

LG AIR/GND FAIL MESSAGE DISPLAYED? **No**

Yes

Landing Gear Lever ..... DO NOT MOVE
LANDING GEAR AIR/GROUND SYSTEM FAILURE Procedure (EAP 12-6)..... ACCOMPLISH

END

Downlock Release Button (DN LOCK REL) ..... PRESS
Landing Gear Lever ..... UP

END

GUST LOCK FAILURE

Light: GUST LOCK (amber).

CONDITION? **On Ground**

In Flight

Consider diversion.
Do not push control column full Nose Down.
Avoid flying in turbulence conditions.
Avoid airports with anticipated turbulence or crosswind.

END

Do not take off.

END

IMPAIRED OR CRACKED WINDSHIELD

Associated Ice Protection
Windshield ..... PUSH OUT

Cockpit Door ..... CLOSE

ONLY OUTER LAYER CRACKED? — **No**

Yes

END

Oxygen Masks ..... AS REQUIRED

Smoke Goggle ..... DON

Airspeed ..... MAX 250 KIAS

Altitude ..... MEA OR 10'000 FT, WHICHEVER IS HIGHER

Pressurization Manual Controller ... 1 O'CLOCK POSITION

..... WAIT 15 SECONDS

Pressurization Mode Selector ..... PUSH IN (MAN)

Pressurization Manual Controller ... CAB MAX ΔP = 1 PSI

FORWARD VISIBILITY GOOD IN ONE SIDE? — **No**

Yes

Pilot flying must be on non impaired side.

END

When reaching 10'000 ft:

Pressurization Mode Selector .... PUSH OUT

Pressurization Dump Button ..... PUSH IN

During approach and landing, when visibility is required:

Airspeed ..... MAX 140 KIAS, MIN V_{REF45}

Check no loose objects in the cockpit.

Direct Vision Window ..... REMOVE

Landing must be made by looking through Direct Vision Window. Intercommunication will be impossible with window removed.

END

ERRONEOUS STALL PROTECTION ACTUATION

Condition: Inadvertent shaker and/or pusher actuation.

Quick Disconnect Button	**PRESS AND HOLD**
Stall Protection Cutout 1 and 2	**PUSH OUT**
Quick Disconnect Button	**RELEASE**

Minimum Airspeed ..... FLAP MANEUVERING SPEED (PD-2)

Avoid skidding the airplane.

To approach and go-around speeds, add 5 KIAS to V_{REF}.

Landing configuration:

Landing Gear ..... DOWN

Flaps ..... 45°

Airspeed ..... $V_{REF\ 45}$ + 5 KIAS

CAUTION: MULTIPLY THE FLAPS 45° UNFACTORED LANDING DISTANCE BY 1.10.

END

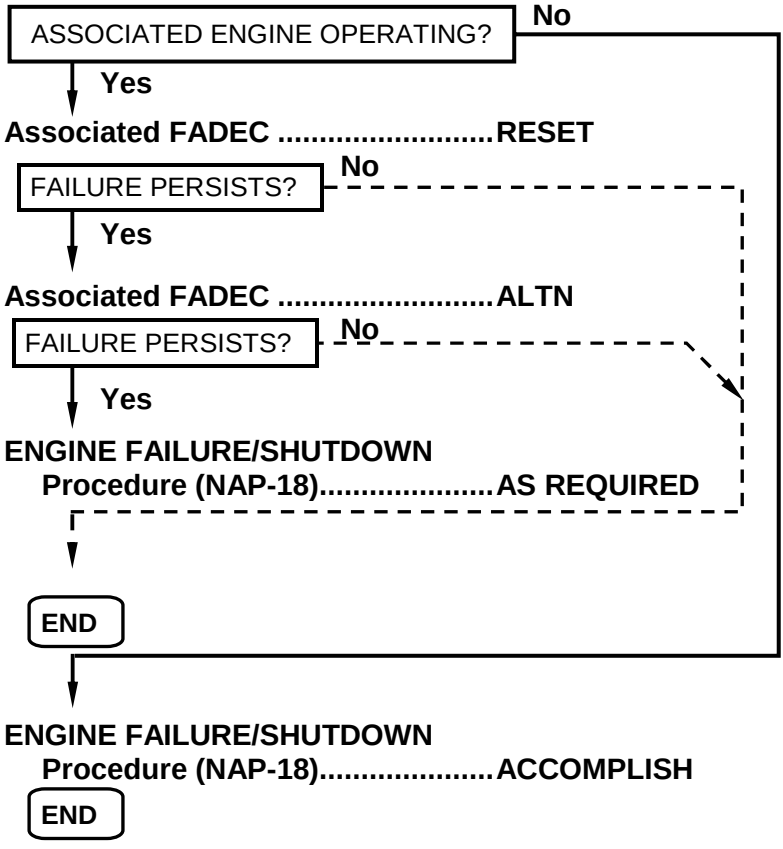
IRS/MSU FAILURE ANNUNCIATION

LIGHT	OPERATION PHASE		
	POWER ON	**ALIGNMENT**	**IN FLIGHT**
ALIGN	– No light: – Check IRS CBs. – Set mode select switch to ALIGN or NAV. – Press MSU Test switch. Annunciator bulb must be replaced if the other MSU annunciators do light.	– Flashes immediately after entry: – Check and reenter latitude or longitude. – Reenter same latitude or longitude. – Flashes at the end of alignment: – Enter latitude. – Check and reenter latitude. – Allow additional time for alignment.	– Flashes: – Select the remaining IRU by pressing the IRS Button on the associated reversionary panel. – If necessary set mode select switch to ATT.
FAULT	– Set mode select switch to OFF for at least 3 sec. Then set mode select switch back to ALIGN or NAV. – If the annunciator remains lighted, call the maintenance personnel.	– Associated with ALIGN annunciation: – Recheck coordinates and reenter latitude. – Allow additional time for alignment. – Try new alignment. Set mode select switch to OFF for at least 3 sec, then to ALIGN, and enter present position. – If on ground, call the maintenance personnel.	– Select the remaining IRU by pressing the IRS Button on the associated reversionary panel. – If necessary set mode select switch to ATT.
ON BATT	– Check IRS CBs. – If the annunciator remains lighted, call the maintenance personnel.	*******	– The IRU operates on backup DC power and will operate for 40 minutes.
BATT FAIL	– Call the maintenance personnel.	*******	*******
NO AIR	– Call the maintenance personnel.	*******	– Operate IRU until completion of flight. – If fault annunciator is ON or inertial data ceases to be transmitted by IRU, select the remaining IRU and set mode select switch for affected IRU to OFF. If IRU is OFF, the airplane is near the end of the flight and additional attitude reference is needed, set mode select switch to ATT.

END

LOSS OF ENGINE INDICATIONS

Condition: Loss of Thrust Mode, ITT, N1 and N2 indications.



Non Annunciated

LOSS OF PRESSURIZATION INDICATION

Condition: Cabin altitude or cabin ΔP is not being presented or during use of the pressurization manual control.

Use the remaining indications to maintain cabin altitude below 10'000 ft, according to the table below:

AIRPLANE/CABIN ALTITUDE CONVERSION TABLE

AIRPLANE ALTITUDE (ft)	CABIN ALTITUDE (ft)	DIFFERENTIAL PRESSURE (psi)
10000	300	4.4
11000	500	4.7
12000	700	5.0
13000	900	5.2
14000	1100	5.5
15000	1300	5.7
16000	1500	5.9
17000	1700	6.1
18000	1900	6.3
19000	2200	6.5
20000	2400	6.7
21000	2700	6.8
22000	2900	7.0
23000	3200	7.1
24000	3400	7.2
25000	3800	7.3
26000	4100	7.4
27000	4400	7.5
28000	4700	7.6
29000	5000	7.6
30000	5400	7.7
31000	5700	7.7
32000	6100	7.7
33000	6500	7.7
34000	6800	7.8
35000	7200	7.8
36000	7600	7.8
37000	8000	7.8

END

MAIN DOOR BLOCKED

Light: DOOR BLOCKED (Attendant's Panel).

To open the door:

Hydraulic Elec Pump 1.....OFF

Hydraulic System 1 .....OFF

This can be done by either shutting down the Engine 1 or by pushing in the Hydraulic Eng Pump Shutoff button.

Main Door Alternative

Opening Valve..... ACTUATE

Turn valve clockwise, and hold it for 2 minutes.

Outside Area.....CHECK CLEAR

Door.....OPEN

END

NAV/FLIGHT INSTRUMENTS FAILURE

ANNUNCIATOR/ FAILURE	LOCATION	ACTION
ATT FAIL (red)	**PFD**	Use cross-side attitude by pressing the AHRS (IRS) button on associated reversionary panel or use standby attitude indicator.
"X" (red) over IAS tape		Use cross-side airspeed by pressing the ADC button on associated reversionary panel or use standby airspeed indicator.
"X" (red) over altitude tape		Use cross-side altitude by pressing the ADC button on associated reversionary panel or use standby altimeter.
"X" (red) over course scale		Select another sensor.
VS (red)		Use cross-side vertical speed by pressing the ADC button on associated reversionary panel.
PFD or EICAS Blank or "X" (red)		Use the MFD Knob to present the required information on MFD.
RA1 (2) (amber)		Radio altimeter automatic reversion has occurred. No action is required.

CONTINUES ON NEXT PAGE

CONTINUED FROM PREVIOUS PAGE

ANNUNCIATOR/ FAILURE	LOCATION	ACTION
RA (amber)	**PFD**	Compare both Radio Altimeter indications. If required, consider only the lower indication. Otherwise, disregard Radio Altitude. If RA displayed in the center, the RA is failed.
ROL, PIT, ATT, IAS or ALT (amber)		Compare data with Standby Indicator. For altitude compare the PFD altimeters setting also. If required, use cross-side data by pressing the appropriate button on associated reversionary panel.
HDG FAIL (red)	**PFD MFD**	Use cross-side heading by pressing the AHRS (IRS) button on associated reversionary panel or use RMU or standby attitude indicator.
HDG (amber)		Compare data with the Magnetic Compass. After identifying the failed side, use cross-side data by pressing the AHRS (IRS) button on associated reversionary panel.
MENU INOP (amber)	**MFD**	Do not takeoff.
ATT, ALT, SPD, HDG (red)	**ISIS (Smiths)**	Use the primary indication source.
"X" (red) over Mach Number tape		Use the primary indication source.
"X" (red) over Altitude Readout (meters) tape		Use the primary indication source.
"X" (red) over barometric pressure tape		Use the primary indication source.

CONTINUES ON NEXT PAGE

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ANNUNCIATOR/ FAILURE	LOCATION	ACTION
ATT: CAGE (amber)	**ISIS (Smiths)**	Press the BRT button and then the STD button to enter the MENU mode. Rotate the BARO knob until the FAST ALIGN option is presented on the screen. A CONFIRM option is enunciated in cyan over the STD button. Press the STD button to confirm the selection of FAST ALIGN function. The menu functions will then be removed. The magnetic heading tape will be displayed, and the attitude symbology will be removed and replaced with an ALIGN warning. The fast alignment is completed within 10 seconds, provided that the airplane maintains a straight and leveled flight, non-accelerated. Until attitude indication is available again, use the primary indication source.
ATT: CAGE (amber)	**ISIS (Thales)**	Press the CAGE push button in order to recover attitude indication. Caging the ISIS in flight will result in loss of attitude indication for up to 10 seconds and the amber message ATT 10 s will be presented during this time. Until attitude indication is available again use the primary indication source.
ATT, ALT, SPD, M, HDG (red)		Use the primary indication source.
Errors in attitude indication	**Standby Attitude Instrument**	Maintain a straight and leveled flight using the primary indication source. Wait 3 min. If error persists, cage the instrument and wait 5 min. If error still persists, report to maintenance.

END

Non Annunciated

NOSE LANDING GEAR UP DOOR OPEN

Condition: Noise increase due to nose landing gear doors open.

Airspeed ..... MAX 250 KIAS
Icing Conditions..... AVOID/EXIT
Fuel Consumption ..... MONITOR
ABNORMAL LANDING GEAR EXTENSION
Procedure (NAP-12) ..... AS REQUIRED

END

ONE ENGINE INOPERATIVE APPROACH AND LANDING

For CAT III or CAT II approaches using HGS, the normal CAT III approach procedure must be used.
Approach:

Altimeters ..... SET AND CROSS CHECKED
Approach Aids..... SET AND CROSS CHECKED
Speed Bugs ..... SET
Pressurization ..... CHECK
Go-Around Procedure..... REVIEW

- Disengage Autopilot.
- Press Go-Around Button.
- Advance Operative Engine Thrust Lever to MAX.
- Rotate airplane to 10° nose up.
- Set flaps to 9°.

With positive rate of climb:

- Landing gear up.
- Maintain Approach Climb Speed until reaching acceleration altitude (level off).

Before Landing:
Inoperative Engine Thrust Lever..... IDLE
Landing Gear..... DOWN
Thrust Rating..... TAKEOFF MODE
Fuel XFeed..... OFF
Autopilot/Yaw Damper ..... DISENGAGE
Landing configuration:
Flaps ..... 22°
V_{REF}..... V_{REF45} + 10 KIAS

CAUTION: MULTIPLY THE FLAPS 45° UNFACTORED LANDING DISTANCE BY 1.48.

END

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OVERWEIGHT LANDING

Before touchdown:

Emerg Lts.....AS REQUIRED

APU Fuel Shutoff Valve.....CLOSE

Rate of Descent .....MAX 300 FT/MIN

Touch smoothly the runway surface.

Reduce the engine thrust only after the touchdown.

Landing configuration:

Flaps.....45°

V_{REF} .....V_{REF45}

CAUTION: MULTIPLY THE FLAPS 45° UNFACTORED LANDING DISTANCE BY AT LEAST 1.10.

END

OXYGEN LEAKAGE

Condition: Evidence of oxygen leakage through the crew mask, mask hose, flow indicator (blinker), or oxygen line.

No Smoking ..... ON

IS THE LEAKAGE IN THE CREW MASK, MASK HOSE, OR FLOW INDICATOR?

No

Yes

Affected Mask ..... REMOVE FROM STOWAGE BOX

Stowage Box Doors ..... CLOSE

Shutoff Sliding Control ..... ACTUATE

Oxygen Pressure ..... CHECK

OXYGEN PRESSURE BELOW MINIMUM REQUIRED FOR DISPATCH?

No

Yes

Altitude ..... MEA OR 10’000 FT, WHICHEVER IS HIGHER

END

Keep one Portable Oxygen Cylinder available for the pilot of the affected side. The oxygen supply by the Portable Oxygen Cylinder will last at least 30 minutes.

END

Oxygen Cylinder Shutoff Valve..... OFF

Altitude ..... MEA OR 10’000 FT, WHICHEVER IS HIGHER

END

PARTIAL OR GEAR UP LANDING

Condition: Airplane committed to land with gear up or in transit.

EICAS Indication: Abnormal landing gear position.

EICAS Warning: LG/LEVER DISAGREE (may be presented)

ATC ..... NOTIFY
Burn fuel to reduce touchdown speed.
Transponder 7700
FSTN Belts ..... ON
Cabin Crew ..... NOTIFY
Passengers (and Crew) ..... PREPARE FOR EMERGENCY LANDING AND EVACUATION

Below 10'000 ft:
- **GPWS CB (J7 or J8) ..... PULL**
- **Aural Warn CBs (B4 and E30) ..... PULL**
- **Emerg Lts ..... ON**
- **ELT ..... ON**

Prior to approach:
- **Hydraulic Elec Pumps 1 and 2 ..... OFF**
- **Cabin ..... DEPRESSURIZE**
- **Engine Bleeds 1 and 2 ..... PUSH OUT**

When committed to land:
- **Landing Gear ..... AS REQUIRED**
  The decision to land with all gear up or with any gear extended is left to pilots. Ground spoilers and thrust reversers will not operate if any main gear is up.
- **Flaps ..... 45°**
  If it is not possible to achieve the selected flap position, maintain airspeed according to the following:

FLAPS POSITION	MIN AIRSPEED
0 to 8°	V_{REF45} + 30 KIAS
9° to 21°	V_{REF45} + 10 KIAS
22° to 44°	V_{REF45} + 5 KIAS
45°	V_{REF45}

Just before touchdown:
- **Cabin ..... ANNOUNCE IMPACT**

Apply thrust reverser (if available) after touchdown.

When the airplane stops:
- **Fire Extinguishing Handles ..... PULL**
- **APU Fuel Shutoff Valve ..... CLOSE**
- **Fuel Pumps Pwr 1 and 2 ..... OFF**
- **Engines and APU Fire Extinguishing Bottles (if necessary) ..... DISCHARGE**
- **Evacuation ..... INITIATE**

Before leaving the airplane:
- **Batteries 1 and 2 ..... OFF**

END

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RUDDER ARTIFICIAL FEEL INOPERATIVE

Condition: Rudder pedals become light and do not center by themselves. Yaw trim does not operate properly.

Rudder Shutoff Sys 2 ..... PUSH OUT

FAILURE PERSISTS?

No

Yes

Rudder Shutoff Sys 1 ..... PUSH OUT

Expect greater rudder pedal force. If required, both pilots should act together to control the airplane.

Consider the use of aileron to help in yaw control, and asymmetric thrust to trim the airplane.

Avoid airports with anticipated turbulence or crosswind.

END

RUDDER/YAW TRIM RUNAWAY

Condition: Sudden uncommanded yaw.

EICAS Indication: Associated yaw trim indication changes.

Quick Disconnect Button .....PRESS AND HOLD
Rudder Shutoff Sys 1 and 2 .....PUSH OUT

Airspeed MAX 250 KIAS

Yaw Trim Position.....CHECK

YAW TRIM DISPLACED FROM NEUTRAL? — **No**

Yes

Yaw Trim CB (F12) .....PULL
Quick Disconnect Button .....RELEASE
Rudder Shutoff Sys 1 and 2 .....PUSH IN

END

Quick Disconnect Button .....RELEASE
Prepare to overcome uncommanded yaw.
Rudder Shutoff Sys 1.....PUSH IN

RUNAWAY PERSISTS? — **No**

Yes

Rudder Shutoff Sys 1.....PUSH OUT
Prepare to overcome uncommanded yaw.
Rudder Shutoff Sys 2.....PUSH IN

RUNAWAY STILL PERSISTS? — **No**

Yes

Rudder Shutoff Sys 2.....PUSH OUT

LAND AT NEAREST SUITABLE AIRPORT.

Expect greater rudder pedals force. If required, both pilots should act together to control airplane.

Consider the use of aileron to help in yaw control, and asymmetric thrust to trim the airplane.

Avoid airports with anticipated turbulence or crosswind.

END

SINGLE ENGINE BLEED OPERATION IN ICING CONDITIONS

XBleed ..... OPEN

Altitude ..... MAX 15’000 FT, MIN MEA

If it is not possible to descend below 15’000 ft:

Icing Conditions..... EXIT

END

STIFFENED ELEVATOR

Condition: Elevator control columns movement is stiffened.

EICAS Warning: AUTOPILOT FAIL (may be presented), SPS 1-2 INOP (may be presented)

EICAS Caution: STICK PUSHER FAIL (may be presented)

Autopilot..... DISENGAGE

Pitch Trim..... AS REQUIRED

Avoid abrupt and large elevator inputs.

Consider descent to a warmer altitude.

Freezing conditions may lead to de/anti-icing fluids residues to stiffen the elevator.

ELEVATOR CONTROL COLUMNS MOVEMENT RECOVERED?

No

Yes

END

JAMMED ELEVATOR

Procedure (NAP-8) ..... ACCOMPLISH

END

STRUCTURAL DAMAGE

LAND AT THE NEAREST SUITABLE AIRPORT.
At safe altitude, evaluate airplane aero dynamical behavior and take extra caution varying airspeed and attitude.
Use the flight controls with caution avoiding high maneuvering loads.

Airspeed.....MAX 200 KIAS

FUSELAGE DAMAGED OR SUSPECTED DAMAGED?

No

Yes

Oxygen Masks.....AS REQUIRED
Altitude.....MEA OR 10'000 FT, WHICHEVER IS HIGHER

When reaching 10'000 ft:

Pressurization Dump Button.....PUSH IN

Land as smooth as possible.

END

TRANSPONDER FAIL

Condition: The transponder mode annunciation is replaced with dashes on the RMU Radio page or by ATC notification.

TRANSPONDER..... SELECT ANOTHER

END

UNCOMMANDED ELEVATOR OR AILERON DISCONNECTION

Light: Amber ELEV DISC or AIL DISC on Pedestal.

Condition: One control column or control wheel moves independently of the other.

Affected Surface Disconnection Handle .....PULL

If aileron is affected, aileron artificial feel not available on left side.

Avoid airports with anticipated turbulence or crosswind.

END

Non Annunciated

UNRELIABLE AIRSPEED

Autopilot/Yaw Damper..... DISENGAGE

Both Flight Directors ..... OFF

SPEED INDICATION ON BOTH PFD BELOW 135 KIAS?

No

Yes

Rudder Shutoff Sys 1 ..... PUSH OUT

CAUTION: AVOID USING THE SPEEDBRAKE.

Attitude/Thrust ..... ADJUST

Maintain airplane control. Refer to Unreliable Airspeed tables in the Performance Data section. Altitude and/or Vertical Speed indications may also be unreliable.

Ground speed indication is available in the FMS for reference.

END

VOLCANIC ASH

LAND AT THE NEAREST SUITABLE AIRPORT.

Volcanic Ash Area ..... EXIT/AVOID

Consider performing a 180º turn.

Oxygen Masks (if necessary) ..... DON, 100%

If a significant amount of volcanic ash fills the cockpit or if there is a strong smell of sulphur, don an oxygen mask and select 100%.

APU ..... START

Ignitions ..... ON

Thrust Levers (if altitude permits) .... IDLE

Anti-Icing Buttons (Engine, Wing and Stabilizer) ..... CHECK PUSHED IN

Ice Detection Override Knob ..... ALL

ITT ..... MONITOR

ITT INCREASES? **No**

Yes

Affected Engine ..... SHUT DOWN

After affected engine has cooled down:

Affected Engine ..... RESTART

If the affected engine fails to restart, repeated attempts should be made immediately.

Airspeed ..... MONITOR

ABNORMAL AIRSPEED INDICATIONS? **No**

Yes

UNRELIABLE AIRSPEED Procedure (NAP-38) ..... ACCOMPLISH

Restore systems to normal operation.

ATC ..... NOTIFY

END

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TYPE	MESSAGE	PAGE OR INSTRUCTION
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	AHRS 1 EXC MOTION	**Crew Awareness**
	AHRS 1 NO MAG HDG	**Crew Awareness**
	AHRS 1 NO PPOS	**Crew Awareness**
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	AHRS 2 ATT MODE	EAP 2-4
	AHRS 2 BASIC MODE	**Crew Awareness**
	AHRS 2 EXC MOTION	**Crew Awareness**
	AHRS 2 NO MAG HDG	**Crew Awareness**
	AHRS 2 NO PPOS	**Crew Awareness**
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	DU 1 OVHT	**Crew Awareness**
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	DU 2 OVHT	**Crew Awareness**
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	DU 3 OVHT	**Crew Awareness**
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	DU 5 OVHT	**Crew Awareness**
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TYPE	MESSAGE	PAGE OR INSTRUCTION
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	E2 HYD PUMP FAIL	**Crew Awareness**
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	E2 OIL IMP BYP	**Crew Awareness**
	E2 SHORT DISP	**Crew Awareness**
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	IRS 1 EXC MOTION	**Crew Awareness**
	IRS 1 NO MAG HDG	**Crew Awareness**
	IRS 1 NO PPOS	**Crew Awareness**
	IRS 1 ON BATT	EAP 2-14
	IRS 2 ALN	EAP 2-12
	IRS 2 ATT MODE	EAP 2-13
	IRS 2 EXC MOTION	**Crew Awareness**
	IRS 2 NO MAG HDG	**Crew Awareness**
	IRS 2 NO PPOS	**Crew Awareness**
	IRS 2 ON BATT	EAP 2-14
	PACK 1 VLV CLSD	EAP 1-11
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ANNUNCIATED PROCEDURES

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LIST OF EICAS MESSAGES

BLEED APU LEAK

EICAS Warning: BLD APU LEAK

APU Bleed ..... PUSH OUT
Bleed 1 and 2 ..... AS REQUIRED

..... WAIT 3 MINUTES

MESSAGE PERSISTS? **No**

Yes

APU ..... SHUTDOWN

MESSAGE STILL **No**

Yes

BLEED ENGINE LEAK
Procedure (EAP 1-4) ..... ACCOMPLISH
Start the procedure considering BLD 1 LEAK.

END

END

BLEED ENGINE LEAK

EICAS Warning: BLD 1 (2) LEAK
Light : Red LEAK inscription in affected push button.

XBleed ..... CLOSED
Affected Bleed ..... PUSH OUT
APU Bleed ..... PUSH OUT
Altitude ..... MAX 25'000 FT, MIN MEA
Icing Conditions ..... EXIT/AVOID

..... WAIT 3 MINUTES

BLD 1 (2 or APU) LEAK MESSAGE EXTINGUISHES? — **No**

Yes

END

ASSOCIATED MESSAGE? — **BLD 1 (2) VLV FAIL**

BLD 1 (2) VLV CLSD

Opposite Bleed ..... PUSH OUT
Associated Bleed ..... PUSH IN

..... WAIT 3 MINUTES

BLD 1 (2 or APU) LEAK MESSAGE — **No**

Yes

Associated Bleed ..... PUSH OUT
Oxygen Masks ..... AS REQUIRED
Altitude ..... MEA OR 10'000 FT, WHICHEVER IS HIGHER

END

Associated Thrust Lever ..... IDLE

..... WAIT 3 MINUTES

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BLD 1 (2 or APU) LEAK MESSAGE PERSISTS? — **No**

Yes

ENGINE FAILURE/SHUTDOWN
Procedure (NAP-18)..... ACCOMPLISH

END

BLEED OVERTEMPERATURE

EICAS Warning: BLD 1 (2) OVTEMP

MFD Indication: Bleed Temp pointer may be in red range or out of view.

XBleed ..... OPEN
Associated Bleed ..... PUSH OUT
Altitude ..... MAX 25'000 FT, MIN MEA

SINGLE ENGINE BLEED OPERATION IN ICING CONDITIONS
Procedure (NAP-36)..... AS REQUIRED

END

APU BLEED VALVE FAILURE

EICAS Caution: APU BLD VLV FAIL

FAILED IN THE OPEN POSITION? — **No**

Yes

ANY BLEED LEAK EXISTS? — **No**

Yes

APU ..... SHUTDOWN

Bleeds 1 and 2 ..... AS REQUIRED

END

BLEED LOW TEMPERATURE

EICAS Caution: BLD 1 (2) LOW TEMP

MFD Indication: Pointer may be amber or may be out of view.

BLEED TEMP POINTER OUT OF VIEW OR IN GREEN RANGE? — **No**

Yes

Message ..... DISREGARD

END

Ice Detection Override Knob ..... ALL
Associated Thrust Lever ..... ADVANCE
Adjust affected Thrust Lever until message disappears or pointer of the affected side reaches green range or matches the opposite pointer.

..... WAIT 1 MINUTE

MESSAGE PERSISTS? — **No**

Yes

Affected Bleed ..... PUSH OUT
Altitude ..... MAX 25'000 FT, MIN MEA

ICING CONDITIONS? — **No**

Yes

XBleed ..... OPEN
Altitude ..... MAX 15'000 FT, MIN MEA
If it is not possible to descend below 15'000 ft:
Ice Conditions ..... EXIT

..... WAIT 2 MINUTES
Ice Detection Override Knob ..... AUTO

END

Ice Detection Override Knob ..... AUTO

END

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BLEED VALVE CLOSED

EICAS Advisory: BLD 1 (2) VLV CLSD

Associated Pack..... PUSH OUT, THEN PUSH IN
Associated Bleed ..... PUSH IN

MESSAGE PERSISTS? **No**

Yes

BLEED VALVE FAILURE
Procedure (EAP 1-7)..... AS REQUIRED

END

BLEED VALVE FAILURE

EICAS Caution: BLD 1 (2) VLV FAIL

BLD 1 (2) VLV CLSD MESSAGE PRESENTED? **No**

Yes

AFFECTED BLEED VALVE? **Bleed 2**

Bleed 1

APU SERVICEABLE? **No**

Yes

XBleed..... CLOSED
APU ..... START
APU Bleed..... PUSH IN
SINGLE ENGINE BLEED OPERATION
IN ICING CONDITIONS
Procedure (NAP-36)..... AS REQUIRED

END

XBleed..... OPEN
Altitude..... MAX 25’000 FT, MIN MEA
SINGLE ENGINE BLEED OPERATION
IN ICING CONDITIONS
Procedure (NAP-36)..... AS REQUIRED

END

CROSSBLEED FAILURE

EICAS Caution: CROSS BLD FAIL

CROSS BLD OPEN MESSAGE PRESENTED?
No
Yes

ANY BLEED LEAKAGE SUSPECTED OR ANNUNCIATED?
No
Yes

ANY ENGINE OVERTEMPERATURE INDICATED?
No
Yes

Bleeds 1 and 2.....PUSH OUT
APU Bleed.....PUSH OUT
Icing Conditions.....AVOID/EXIT
Oxygen Masks.....AS REQUIRED
Altitude .....MEA OR 10'000 FT, WHICHEVER IS HIGHER

END

HIGH STAGE VALVE FAILURE

EICAS Caution: HS VLV 1 (2) FAIL

ASSOCIATED MFD BLEED POINTER INDICATES?
White Range
Red Range

BLEED OVERTEMPERATURE
Procedure (EAP 1-5).....ACCOMPLISH

END

BLEED LOW TEMPERATURE
Procedure (EAP 1-6).....ACCOMPLISH

END

PACK OVERHEAT

EICAS Caution: PACK 1 (2) OVHT

Associated Temperature & Mode Selector ..... AUTO/FULL COLD
Affected Pack ..... PUSH OUT
..... WAIT 3 MINUTES
Affected Pack ..... PUSH IN

MESSAGE PERSISTS? **No**

Yes

Associated Temperature & Mode Selector ..... MANUAL/FULL COLD
Affected Pack ..... PUSH OUT
..... WAIT 3 MINUTES
Affected Pack ..... PUSH IN

MESSAGE PERSISTS? **No**

Yes

Affected Pack ..... PUSH OUT

BOTH PACKS AFFECTED? **No**

Yes

Oxygen Masks ..... AS REQUIRED
Altitude ..... MEA OR 10’000 FT, WHICHEVER IS HIGHER
At least one bleed source must be kept open.
When reaching 10’000 ft:
Cabin ..... DEPRESSURIZE

END

Altitude ..... MAX 25’000 FT, MIN MEA

END

END

PACK OVERLOAD

EICAS Caution: PACK 1 (2) OVLD

Recirculation Fan ..... PUSH IN
Associated Temperature & Mode Selector ..... AUTO/12 O'CLOCK POSITION
Affected Pack ..... PUSH OUT
..... WAIT 3 MINUTES
Affected Pack ..... PUSH IN

MESSAGE PERSISTS? **No**

Yes

Associated Temperature & Mode Selector ..... MANUAL/ 12 O'CLOCK POSITION
Affected Pack ..... PUSH OUT
..... WAIT 3 MINUTES
Affected Pack ..... PUSH IN

MESSAGE STILL PERSISTS? **No**

Yes

Affected Pack ..... PUSH OUT
Associated Engine Bleed ..... CHECK PUSHED IN

BOTH PACKS AFFECTED? **No**

Yes

Oxygen Masks ..... AS REQUIRED
Altitude ..... MEA OR 10'000 FT, WHICHEVER IS HIGHER
At least one bleed source must be kept open.
When reaching 10'000 ft:
Cabin ..... DEPRESSURIZE

END

Altitude ..... MAX 25'000 FT, MIN MEA

END

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PACK VALVE CLOSED

EICAS Advisory: PACK 1 (2) VLV CLSD

Associated Pack..... PUSH OUT, THEN PUSH IN

MESSAGE PERSISTS? **No**

Yes

BOTH PACKS AFFECTED? **No**

Yes

Oxygen Masks ..... AS REQUIRED
Altitude..... MEA OR 10'000 FT WHICHEVER IS HIGHER
When reaching 10'000 ft, if at least one bleed source is available:
Pressurization Mode Selector ..... PUSH IN
Pressurization Manual Controller .... AS REQUIRED
If required:
Pressurization Manual Controller . FULL UP

END

Altitude.....MAX 25'000 FT, MIN MEA

END

PACK VALVE FAILURE

EICAS Caution: PACK 1 (2) VLV FAIL

PACK 1 (2) VLV CLSD MESSAGE PRESENTED? — **No**

Yes

Altitude ..... **MAX 25'000 FT, MIN MEA**

BOTH PACKS AFFECTED? — **No**

Yes

Oxygen Masks ..... **AS REQUIRED**
Altitude ..... **MEA OR 10'000 FT, WHICHEVER IS HIGHER**

When reaching 10'000 ft, if at least one bleed source is available:

Pressurization Mode Selector ..... **PUSH IN**
Pressurization Manual Controller .... **AS REQUIRED**
If required:
Pressurization Manual Controller . **FULL UP**

END

NEED TO CLOSE THE AFFECTED PACK? — **No**

Yes

Altitude ..... **MAX 25'000 FT, MIN MEA**

AFFECTED PACK(S)? — **Pack 2**

Pack 1 or Both Packs

APU Bleed ..... **PUSH OUT**

XBleed ..... **CLOSED**
Associated Bleed(s) ..... **PUSH OUT**
Icing Conditions ..... **EXIT/AVOID**

BOTH PACKS AFFECTED? — **No**

Yes

Oxygen Masks ..... **AS REQUIRED**
Altitude ..... **MEA OR 10'000 FT, WHICHEVER IS HIGHER**

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When reaching 10'000 ft, if at least one bleed source is available:

Pressurization Mode Selector.....PUSH IN
Pressurization Manual Controller.....AS REQUIRED
If required:
Pressurization Manual Controller .FULL UP

END

PRESSURIZATION AUTOMATIC SYSTEM FAILURE/CABIN DEPRESSURIZATION/ CABIN RATE ABNORMAL FLUCTUATIONS

EICAS Caution: PRESN AUTO FAIL may be presented.

EICAS Indication: Abnormal cabin altitude (amber or red) may be presented.
Erratic cabin rate fluctuations may be presented.

Pressurization Manual Controller .....11 O'CLOCK POSITION

NOTE: At least one bleed source, engine or APU, must be kept open.

Pressurization Mode Selector .....PUSH IN
Pressurization Manual Controller .....AS REQUIRED

MANUAL CONTROL POSSIBLE? **No**

Yes

Cabin Altitude.....CONTROL
Set and control cabin altitude according to the AIRPLANE/CABIN ALTITUDE conversion table on NAP-26.

NOTE: On ground, select the manual controller to full up to avoid residual cabin pressure interfering on the door and cockpit slide windows operation.

END

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CABIN AURAL WARNING VOICE MESSAGE SOUNDS?

No

Yes

RAPID CABIN DEPRESSURIZATION
Procedure (NAP-11)..... ACCOMPLISH

END

Oxygen Masks..... AS REQUIRED
Altitude ..... MEA OR 10'000 FT, WHICHEVER IS HIGHER

At least one bleed source must be kept open.
When reaching 10'000 ft:
Pressurization Manual Controller .. DOWN
Pressurization Mode Selector ..... PUSH OUT
Pressurization Dump Button ..... PUSH IN

END

RAM AIR VALVE FAILURE

EICAS Caution: RAM AIR VLV FAIL

Air Conditioning System ..... MONITOR

ANY **PACK 1 (2) OVLD** OR **PACK 1 (2) OVHT** MESSAGE PRESENTED?

No

Yes

Associated Pack ..... PUSH OUT
Altitude ..... MAX 25'000 FT, MIN MEA

BOTH PACKS AFFECTED?

No

Yes

Oxygen Masks.....AS REQUIRED
Altitude .....MEA OR 10'000 FT, WHICHEVER IS HIGHER

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At least one bleed source must be kept open.
When reaching 10’000 ft:
Pressurization Mode selector.....PUSH IN
Pressurization Manual Controller . AS REQUIRED
If necessary:
Pressurization Manual Controller .....FULL UP

END

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ANNUNCIATED PROCEDURES

NON ANNUNCIATED PROCEDURES

LIST OF EICAS MESSAGES

AUTOPILOT FAILURE

EICAS Warning: AUTOPILOT FAIL
Aural Warning: **AUTOPILOT** Voice message

Autopilot .....DISENGAGE

END

AHRS ALIGNMENT FAULT

EICAS Caution: AHRS 1 (2) ALN FAULT

Check and reenter present position. If necessary, reenter present position once again.

END

AHRS ATTITUDE MODE

EICAS Advisory: AHRS 1 (2) ATT MODE

CROSS-SIDE AHRS AVAILABLE? **No**

Yes

Associated AHRS Button
on Reversionary Panel.....PUSH IN

END

Maintain wings level and constant airspeed until AHRS 1 (2) ALN message is no longer displayed and attitude is recovered (approximately 20 seconds).

CAUTION:
- ATTITUDE OUTPUTS ARE NOT AS ACCURATE AS IN THE NORMAL OPERATIONAL MODE.
- AHRS MAGNETIC HEADING IS NOT AVAILABLE.

NOTE: The Autopilot is not available while AHRS 1 (2) ALN message is being displayed.

END

AHRS FAIL

EICAS Caution: AHRS 1 (2) FAIL

Relevant Inoperative Item: **Autopilot**

ONLY ONE AHRS AFFECTED? **No**

Yes

Associated AHRS
on Reversionary Panel.....PUSH IN

END

Use standby instruments.

END

AHRS ON BATTERY

EICAS Advisory: AHRS 1 (2) ON BATT

Affected AHRS will operate for 40 minutes.

END

AHRS OVERHEAT

EICAS Caution: AHRS 1 (2) OVERHEAT

ASSOCIATED TO FIRE OR SMOKE? **No**

Yes

Associated CB (C2 or D33).....PULL

Backup Battery button.....PUSH OUT

END

AUTOPILOT AILERON MISTRIM

EICAS Caution: AP AIL MISTRIM for more than 10 s.

Condition: Autopilot is engaged with aileron out of trim.

Control Wheel.....HOLD FIRMLY
Quick Disconnect Button .....PRESS
Roll Trim.....AS REQUIRED
Yaw Trim .....AS REQUIRED
Autopilot .....AS REQUIRED

END

AUTOPILOT ELEVATOR MISTRIM

EICAS Caution: AP ELEV MISTRIM

Condition: Autopilot is engaged with pitch out of trim.

Control Column .....HOLD FIRMLY
Quick Disconnect Button .....PRESS
Pitch Trim.....AS REQUIRED
Autopilot .....AS REQUIRED

END

AUTOPILOT TRIM FAILED

EICAS Caution: AUTO TRIM FAIL

Control Column .....HOLD FIRMLY
Quick Disconnect Button .....PRESS
Pitch Trim.....AS REQUIRED
Autopilot .....AS REQUIRED

END

DAU FAILURE

EICAS Caution: DAU1 (2) A FAIL
EICAS Advisory: DAU1 (2) B FAIL

ONLY CHANNEL **B** AFFECTED? — **No**

Yes

END

ONLY CHANNEL **A** AFFECTED? — **No**

Yes

Associated DAU on
EICAS Rev (Pedestal Panel) .....PUSH IN

WHICH DAU IS AFFECTED? — **DAU 2**

DAU 1

- **Lost Indications**: engine 1 oil (temperature and pressure), battery 1 and 2 temperature, fuel tank temperature, roll trim position, cockpit temperature, bleed 1 temperature.
- **Lost Messages:**, BLEED 1 OVTEMP, E1 FUEL LO TEMP, FUEL TANK LO TEMP
- BLD 1 LOW TEMP message will appear.

END

- **Lost Indications:** Engine 2 oil (temperature and pressure), Hydraulic quantity 1 and 2, yaw trim position, cabin temperature, bleed 2 temperature.
- **Lost Messages:** BLEED 2 OVTEMP, E2 FUEL LO TEMP, HYD 1 LO QTY, HYD 2 LO QTY.
- BLD 2 LOW TEMP message will appear.
- APU OIL HI TEMP message will appear in case APU is OFF.

END

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LAND AT THE NEAREST SUITABLE AIRPORT.

WHICH DAU IS AFFECTED?

DAU 2

DAU 1

- **All messages and indications of the following systems are lost:** Oxygen, Steering, Pressurization, Landing Gear, Roll Trim, and the message EMERG LT NOT ARMD.
- **Some messages and indications of the following system are lost:** Doors, Stall Protection, Electrical, Fire Protection, Fuel, APU, Power Plant, Thrust Reverser, Flap, Spoiler, Brakes, Air Conditioning, Ice and Rain Protection, Hydraulic.

END

- **All messages and indications of the following systems are lost:** Smoke, Hydraulic, Rudder and Yaw Trim.
- **Some messages and indications of the following systems are lost:** Doors, Stall Protection, Electrical, Fire Protection, Fuel, APU, Power Plant, Thrust Reverser, Flap, Spoiler, Brakes, Air Conditioning, Ice and Rain Protection.

END

DAU MISCOMPARE

EICAS Caution: DAU1 (2) ENG MISCOMP or
DAU1 (2) SYS MISCOMP or
DAU1 (2) WRN MISCOMP

Associated DAU on
EICAS Rev (Pedestal Panel) .....PUSH IN

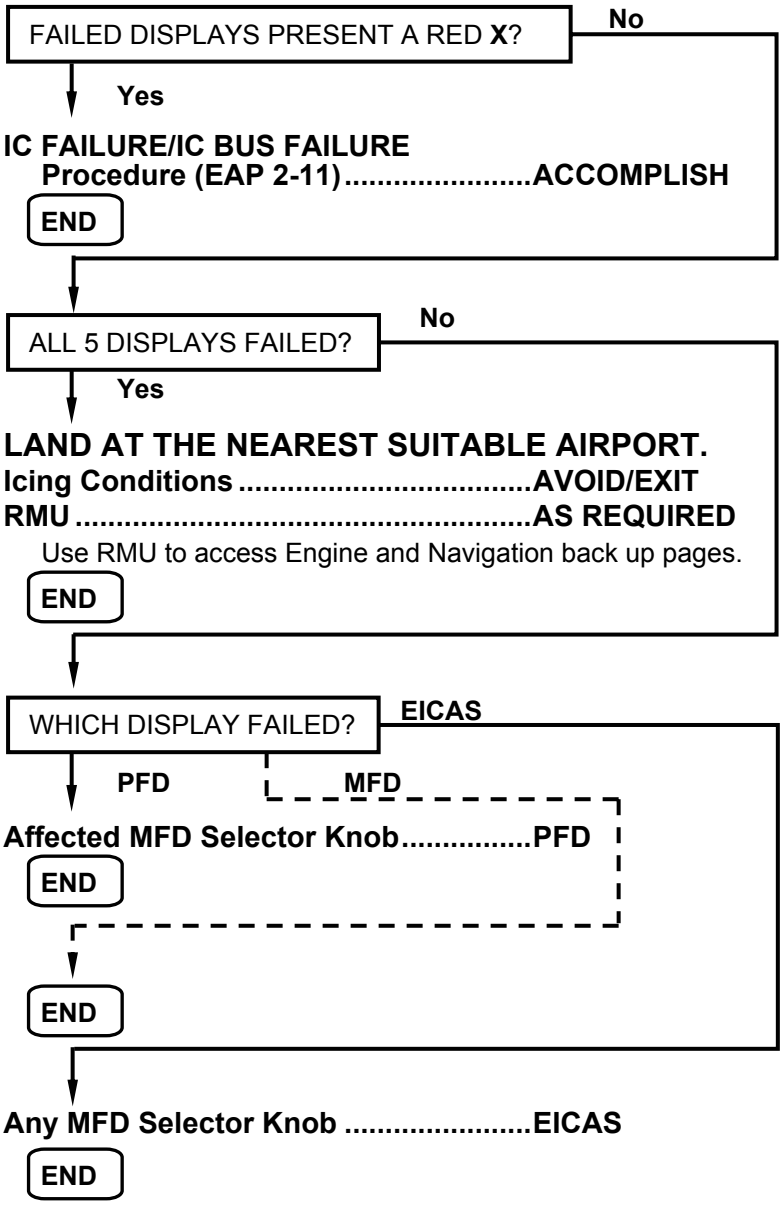
Analyze the situation before and after the reversion, and take the appropriate corrective action.

NOTE: For each miscompare message and each side, check the following parameters before and after the reversion:
- Engine: N1, N2, ITT.
- System: Battery voltage and temperature, Takeoff temperature, Hydraulic pressure, Oxygen pressure.
- Warning: all warning messages, if any.

END

DISPLAY FAILURE

EICAS Caution: CHECK PFD 1 (2) message is presented if PFD is the failed display.



ELECTRONIC BAY OVERTEMPERATURE

EICAS Caution: ELEKBAY OVTEMP

The following equipment is installed in the forward electronic compartment:

- Air Data Computer (ADC);
- Transponder Mode S;
- Integrated Communication Unit (ICU);
- Aural Warning Computer (AWC);
- Flight Management System (FMS);
- Attitude and Heading Reference System (AHRS);
- Passenger Address;
- Integrated Navigation Unit (INU);
- Inverters;
- Dimmers;
- Backup Battery.

It is recommended to turn off the systems that are unessential, using the table below to assess which system could be turned off. Turn off only systems that are unessential to the present phase of flight.

SYSTEM	POWER OFF CONTROL
Passenger Address	PA **CB** ..... PULL
Dimmers	Panel lights knob (pilot, pedestal and copilot) at left and right side of the glare shield panel ..... OFF OR PUSH BUTTONS **CB** ..... PULL
Integrated Navigation Unit	For INU 1: ADF 1 CB, DME 1 CB and VOR/ILS 1 **CB** ..... PULL OR For INU 2: ADF 2 CB, DME 2 CB and VOR/ILS 2 **CB** ..... PULL
Inverters	Push out AC PWR Push Button on overhead Electrical System panel. **NOTE**: TCAS and GPWS/Windshear may use 115V AC.

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MESSAGE PERSISTS? **No**

Yes

It is recommended to turn off the redundant system and unessential equipment, using the table below to assess which system or equipment could be turned off. Turn off only systems and equipment that are unessential to the present phase of flight.

SYSTEM	POWER OFF CONTROL

FMS	- For Honeywell FMS:
	  - For FMS 1: CMPTR 1 CB.
	  - For FMS 2: CMPTR 2 CB.
	- For Universal FMS:
	  - FMS 1 CB.
	  - FMS 2 CB.
	NOTE: Some airplanes may not be equipped with dual FMS.

Aural Warning Computer	AWS CB.
Transponder Mode S	- For Transponder 1: XPDR 1 CB. - For Transponder 2: XPDR 2 CB.
Integrated Communication Unit	- For ICU 1: XPDR 1 CB and VHF 1 CB. - For ICU 2: XPDR 2 CB and VHF 2 CB.
Attitude and Reference System	- AHRS 1 CB. - AHRS 2 CB.
Air Data Computer	- ADC 1 CB. - ADC 2 CB.
Backup Battery	Backup Power Push Button on overhead Electrical System panel.

MESSAGE PERSISTS? **No**

Yes

LAND AT THE NEAREST SUITABLE AIRPORT.

Maintain a cross-check between main and standby instruments. In case of disagreement, follow the standby instruments indication.

END

FD LATERAL MODE OFF/ FD VERTICAL MODE OFF

EICAS Caution: LATERAL MODE OFF or VERTICAL MODE OFF

At crew discretion, re-select the affected Flight Director or select the other.

END

IC FAILURE/IC BUS FAILURE

EICAS Caution: IC BUS FAIL may be presented.

Condition: Associated Display Units present a red X.

The following features will be inoperative:

- EICAS messages miscompare monitoring.
- Takeoff speeds synchronization.
- Flight Director mode synchronization.

FAILED DISPLAYS?

PFD 2 and MFD 2 (IC 2 Failed)

PFD 1, MFD 1 and EICAS (IC 1 Failed)

SG on Reversionary Panel 1 .....PUSH IN

NOTE: - The PIT TRIM 1 (2) INOP or PTRIM MAIN INOP and PTRIM BACKUP INOP messages may not be available.

- The autopilot is not available.

END

SG on Reversionary Panel 2 .....PUSH IN

END

IC OVERHEAT

EICAS Caution: IC 1 (2) OVERHEAT

ASSOCIATED WITH SMOKE? **No**

Yes

IC 1 AFFECTED? **No**

Yes

Backup Battery .....PUSH OUT

Associated CB (C3 or D31 or D32).....PULL

SG on Associated Reversionary Panel .....PUSH IN

SMOKE PERSISTS? **No**

Yes

SMOKE / FIRE / FUMES Procedure (S-6).....ACCOMPLISH

END

IRS ALIGNMENT

EICAS Advisory: IRS 1 (2) ALN

IRU mode select switch .....CHECK NAV

This message is only presented during alignment phase or while the IRU mode select switch is set at ALIGN position.

END

IRS ALIGNMENT FAULT

EICAS Caution: IRS 1 (2) ALN FAULT

Check and reenter present position. If necessary, reenter present position once again.

END

IRS ATTITUDE MODE

EICAS Advisory: IRS 1 (2) ATT MODE

CONDITION? **In Flight**

On Ground

Affected IRU.....OFF

Wait MSU lights extinguish.

Affected IRU.....NAV

END

IRS Button on Associated Reversionary Panel .....PUSH IN

REMAINING IRU DATA NORMAL? **No**

Yes

END

Maintain wings level and constant airspeed for approximately 20 seconds until IRS 1 (2) ALN message is no longer displayed and attitude is recovered.

Magnetic Heading .....ENTER

CAUTION: FOR IRS IN ATTITUDE MODE, NAVIGATION AND ATTITUDE OUTPUTS ARE NOT AS ACCURATE AS IN THE NAV MODE. MAGNETIC HEADING MUST BE ENTERED AND UPDATED PERIODICALLY FROM THE BEST AVAILABLE ALTERNATIVE SOURCE, THROUGH THE FMS CDU.

NOTE: The Autopilot is not available while IRS 1 (2) ALN is being displayed.

END

IRS FAIL

EICAS Caution: IRS 1 (2) FAIL

OPERATION PHASE?

In Flight

Power On or Alignment

Affected IRU.....OFF
Wait MSU lights extinguish.
Affected IRU.....NAV

END

IRS on Associated Reversionary Panel .....PUSH IN

REMAINING IRU DATA NORMAL?

No

Yes

END

Affected IRU.....ATT

Maintain wings level and constant airspeed for approximately 20 seconds.

Magnetic Heading .....ENTER

CAUTION: FOR IRS IN ATTITUDE MODE, NAVIGATION AND ATTITUDE OUTPUTS ARE NOT AS ACCURATE AS IN THE NAV MODE. MAGNETIC HEADING MUST BE ENTERED AND UPDATED PERIODICALLY FROM THE BEST AVAILABLE ALTERNATIVE SOURCE, THROUGH THE FMS CDU.

Relevant Inoperative Item: **Autopilot**

END

IRS ON BATTERY

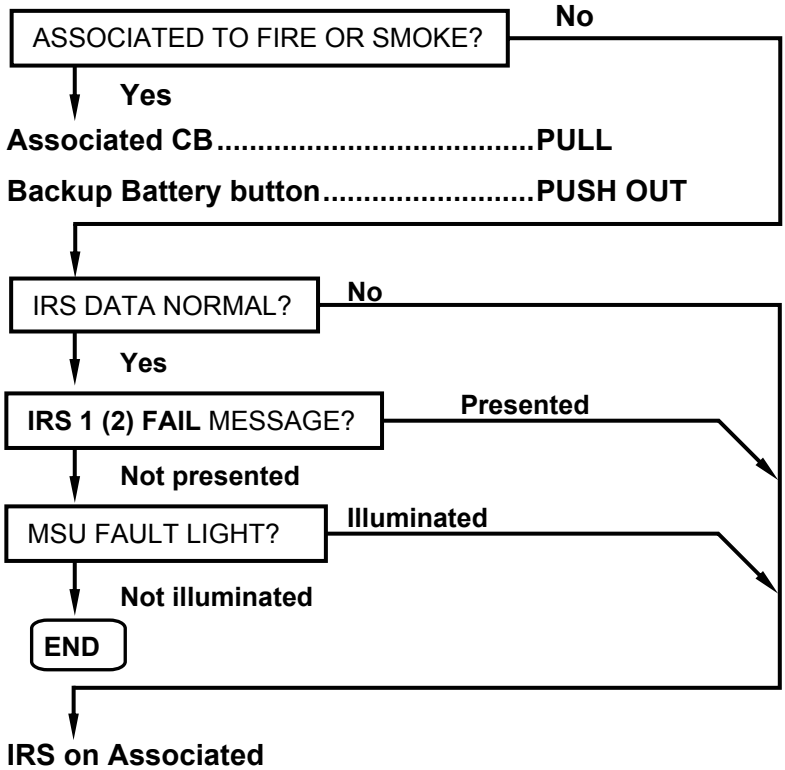
EICAS Advisory: IRS 1 (2) ON BATT

Associated IRU will operate for 40 minutes.

END

IRS OVERHEAT

EICAS Caution: IRS 1 (2) OVERHEAT



IRS on Associated
Reversionary Panel .....PUSH IN
Affected IRU.....OFF
Autopilot .....DISENGAGE

Relevant Inoperative Item: Autopilot

During final approach, if additional attitude reference is necessary:

Affected IRU .....ATT

For IRS in ATT mode, navigation and attitude outputs are not as accurate as in the NAV mode. Magnetic heading must be entered and updated periodically from the best available alternative source, through the FMS CDU.

END

RADIO ALTIMETER FAIL

EICAS Advisory: RAD ALT 1 (2) FAIL or
RAD ALT FAIL may be presented.

ASSOCIATED WITH ERRONEOUS EGPWS/GPWS ACTIVATION? — **No**

Yes

Consider pulling respective radio altimeter circuit breaker (D14 or D21) to inhibit undesired nuisance warnings.

ALL RADIO ALTIMETER(S) AFFECTED (**RAD ALT FAIL** MESSAGE PRESENTED)? — **No**

Yes

Do not perform CAT II or CAT III approaches.

END

RA1 (2) AMBER ANNUNCIATOR PRESENTED IN BOTH PFDs? — **No**

Yes

END

Do not perform CAT II or CAT III approaches.

END

YAW DAMPER FAILURE

EICAS Caution: YAW DAMPER FAIL

Yaw Damper.....DISENGAGE
Autopilot .....AS REQUIRED

FAILURE REOCCURS? — **No**

Yes

Autopilot .....DISENGAGE

END

QRH-145/1167

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ANNUNCIATED PROCEDURES

NON ANNUNCIATED PROCEDURES

LIST OF EICAS MESSAGES

APU FIRE

EICAS Warning: APU FIRE
Aural Warning: BELL

APU Fuel Shutoff Valve .....PUSHED IN

LAND AT THE NEAREST SUITABLE AIRPORT.

APU Master Knob.....OFF

APU FUEL SOV CLSD MESSAGE? — **Presented**

Not Presented

XFeed.....OFF
Fuel Pump Pwr 2.....OFF
Initiate the descent to MEA or 25'000 ft, whichever is higher.

.....WAIT 30 SECONDS

APU FIRE MESSAGE PERSISTS OR **APU FAIL** ASSOCIATED TO **APU FIREDET FAIL**? — **No**

Yes

APU Fire Extinguishing Button.....PRESS

WARNING: **DO NOT ATTEMPT TO RESTART APU.**

END

APU CONTACTOR CLOSED

EICAS Caution: APU CNTOR CLSD

Bus Ties ..... OFF
Battery 2 ..... OFF

END

APU FAIL

EICAS Caution: APU FAIL

SHUTDOWN DURING APU START CYCLE? **No**

Yes

OBVIOUS SAFETY HAZARD? **No**

Yes

Do not try to restart the APU.

END

APU Start ..... AS REQUIRED

NOTE: - Only three APU start attempts may be accomplished, counting the first attempt in which the message was presented.
- APU Starter Cooldown Limits .....**1 MINUTE OFF**

END

Do not try to restart the APU.

END

APU FUEL LOW PRESSURE

EICAS Caution: APU FUEL LO PRESS

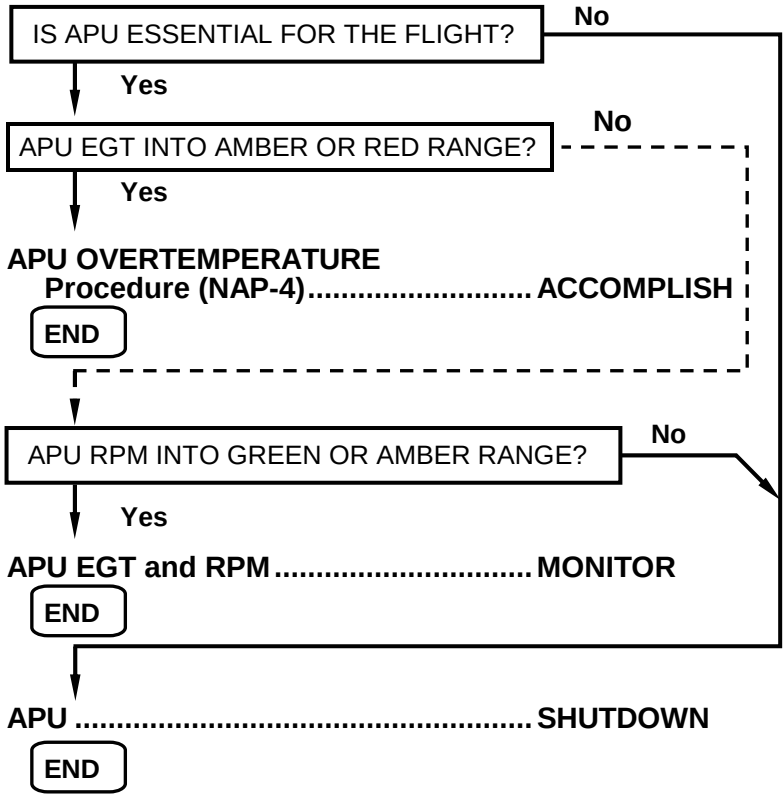
Fuel Pump Sel 2 ..... SELECT ANOTHER

If the message remains, repeat the procedure.

END

APU OIL LOW PRESSURE/ APU OIL HIGH TEMPERATURE

EICAS Caution: APU OIL LO PRESS and/or
APU OIL HI TEMP



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LIST OF EICAS MESSAGES

MAIN OR SERVICE DOOR OPEN

EICAS Warning: MAIN DOOR OPN or
SERVICE DOOR OPN

MFD Indication: Red DOOR OPEN

FSTN Belts.....ON
Door Alignment Red Marks .....CHECK

DOOR CONFIRMED LOCKED? **No**

Yes

CABIN PRESSURIZATION NORMAL? **No**

Yes

Message ..... DISREGARD

END

LAND AT THE NEAREST SUITABLE AIRPORT.

Oxygen Masks..... AS REQUIRED
Altitude ..... MEA OR 10’000 FT, WHICHEVER IS HIGHER

When reaching 10’000 ft:
Cabin ..... DEPRESSURIZE

END

ACCESS/BAGGAGE DOORS OPEN

EICAS Caution: ACCESS DOORS OPN or BAGGAGE DOOR OPN

MFD Indication: Red DOOR OPEN

Abrupt Maneuvers .....AVOID

CABIN PRESSURIZATION NORMAL?

No

Yes

Message .....DISREGARD

END

LAND AT THE NEAREST SUITABLE AIRPORT.

Oxygen Masks .....AS REQUIRED

Altitude.....MEA OR 10’000 FT, WHICHEVER IS HIGHER

When reaching 10’000 ft:

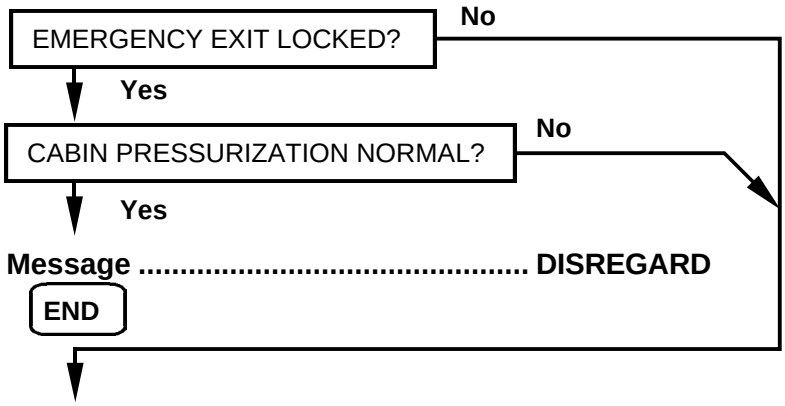
Cabin.....DEPRESSURIZE

END

EMERGENCY EXIT OPEN

EICAS Caution: EMERG EXIT OPN
MFD Indication: Red DOOR OPEN

FSTN Belts..... ON
Affected Exit..... CHECK
Remove passenger(s) from exit vicinity.
Verify emergency exit handle pushed in.



LAND AT THE NEAREST SUITABLE AIRPORT.

Oxygen Masks..... AS REQUIRED
Altitude ..... MEA OR 10’000 FT, WHICHEVER IS HIGHER

When reaching 10’000 ft:
Cabin ..... DEPRESSURIZE

END

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ANNUNCIATED PROCEDURES

ANNEX 01 - AFFECTED EQUIPMENT

LIST OF EICAS MESSAGES

BATTERY OVERTEMPERATURE

EICAS Warning: BATT 1 (2) OVTEMP

MFD Indication: Battery temperature in red.

Affected Battery ..... OFF

ASSOCIATED **BATT 1 (2) OFF BUS** MESSAGE DISPLAYED?

No

Yes

END

LAND AT THE NEAREST SUITABLE AIRPORT.

END

ELECTRIC ESSENTIAL TRANSFER FAILURE

EICAS Warning: ELEC ESS XFR FAIL

Essential Power ..... PUSH IN

MESSAGE PERSISTS?

No

Yes

Bus Ties ..... OFF

MESSAGE STILL PERSISTS?

No

Yes

LAND AT THE NEAREST SUITABLE AIRPORT.

Shed Buses ..... OFF

Turn off non essential equipment. Begin with DC Buses 1 and 2 (CB Panel rows D, E, F, G and H).

LOSS OF ALL GENERATORS
Procedure (EAP 5-4) ..... ACCOMPLISH

END

LOSS OF ALL GENERATORS

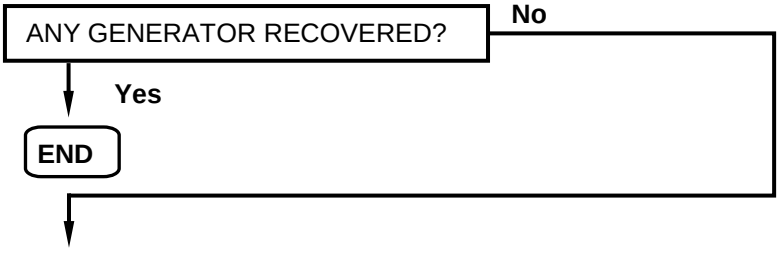
EICAS Caution: GEN 1-2-3-4 OFF BUS,
APU GEN OFF BUS may be presented.

Condition: Noise increase due to nose landing gear doors open.

Generators..... PUSH OUT, THEN PUSH IN

APU ..... AS REQUIRED

Remember APU Maximum Start Altitude limitation.



LAND AT THE NEAREST SUITABLE AIRPORT.

CAUTION: MULTIPLY THE FLAPS 45° UNFACTORED LANDING DISTANCE BY 1.95.

Airspeed ..... MAX 250 KIAS, MIN FLAP MANEUVERING SPEED (PD-2)

Altitude ..... MEA OR 10'000 FT, WHICHEVER IS HIGHER

Essential Power ..... PUSH IN

Crew Oxygen..... AS REQUIRED

Passenger Oxygen..... AS REQUIRED

Emerg Lts ..... OFF

If required, turn on Emergency Lights before landing.

Icing Conditions..... EXIT/AVOID

Use standby instruments and RMU Navigation Backup Page.

CAUTION: BATTERY DURATION IS 40 MINUTES.

Do not set Thrust Levers below idle in flight.

Relevant Inoperative Items:

Autopilot	**W/S 1 and 2 Heating and Wiper**	**GPWS**
FMS 1 and 2	**Transponder 1 and 2**	**RA 1**
Speed Brake	**Main Pitch Trim**	**TCAS**
Pack 1 and 2	**Stick Pusher**	**Steering**
Spoilers	**ADF/DME/VHF/VOR/ILS/MB 2 and DME 1**	**Flaps**

Affected Equipment (EAP 5-13 and 5-14)..... CHECK

CONTINUES ON NEXT PAGE

CONTINUED FROM PREVIOUS PAGE

Landing configuration:

Landing Gear ..... DOWN

If necessary:

LG WRN Cutout ..... PRESS

FLAPS POSITION	MINIMUM AIRSPEED
0 to 8°	$V_{REF\ 45}$ + 30 KIAS
9° to 21°	$V_{REF\ 45}$ + 10 KIAS
22° to 44°	$V_{REF\ 45}$ + 5 KIAS
45°	$V_{REF\ 45}$

CAUTION: MULTIPLY THE FLAPS 45° UNFACTORED LANDING DISTANCE BY 1.95.

Do not actuate Thrust Reversers.

END

115 V AC BUS OFF

EICAS Caution: 115 VAC BUS OFF

AC Power ..... PUSH OUT, THEN PUSH IN

MESSAGE PERSISTS? **No**

Yes

AC Power ..... PUSH OUT

Relevant Inoperative Items:

TCAS *	**Windshear Detection**	**GPWS**

* TCAS may be operative in some airplanes installations.

END

BACK-UP BATTERY OFF BUS

EICAS Caution: BKUP BATT OFF BUS

Backup Battery ..... CHECK PUSHED IN

END

BATTERY OFF BUS

EICAS Caution: BATT1 (2) OFF BUS
MFD Indication: Battery may be amber.

Affected Battery ..... AUTO

END

DC BUS 1 OFF

EICAS Caution: DC BUS 1 OFF
MFD Indication: DC BUS may be amber.

Bus Ties..... OVRD

MESSAGE PERSISTS? **No**

Yes

Bus Ties..... AUTO
Autopilot..... DISENGAGE
Icing Conditions..... EXIT/AVOID
Altitude ..... MAX 25'000 FT, MIN MEA

At pilot's discretion:

MFD 1 Knob on Reversionary Panel..... PFD

Relevant Inoperative Items:

Autopilot	**W/S Heating 1 and Wiper 1**	**GPWS**
FMS 1	**Transponder 1**	**RA 1**
Speed Brake	**Main Pitch Trim**	**TCAS ***
Automatic Pressurization Control		**DME 1**
Pack 1		

* TCAS may be operative in some airplanes installations.

Do not set Thrust Lever 1 below idle in flight.

Affected Equipment (EAP 5-13)..... CHECK

Landing configuration:

Anticipate flap actuation.

Landing gear..... DOWN

Flaps..... 22°

V_{REF} ..... $V_{REF\ 45°}$ + 10 KIAS

CAUTION: MULTIPLY THE FLAPS 45° UNFACTORED LANDING DISTANCE BY 1.50.

Do not actuate Thrust Reverser 1.

END

DC BUS 2 OFF

EICAS Caution: DC BUS 2 OFF

MFD Indication: DC BUS may be amber.

Condition: Noise increase due to nose landing gear doors open.

Bus Ties ..... OVRD

MESSAGE PERSISTS? **No**

Yes

Bus Ties ..... AUTO
Icing Conditions ..... EXIT/AVOID
Airspeed ..... MAX 250 KIAS
Altitude ..... MAX 25'000 FT, MIN MEA

The overhead panel lighting is inoperative, therefore, all striped bars will not illuminate.

SG on Reversionary Panel 2 ..... PUSH IN

At pilot's discretion:

MFD Knob on Reversionary Panel 2 ..... PFD

MFD Control is possible through MFD 1 Bezel.

Relevant Inoperative Items:

Stick Pusher	**W/S Heating 2 and Wiper 2**	**Steering**
FMS 2	**Transponder 2**	**Pack 2**
ADF 2/DME 2/VHF 2/VOR 2/ILS 2/MB 2		

Do not set Thrust Lever 2 below idle in flight.

Affected Equipment (EAP 5-13) ..... CHECK

Landing configuration:

Anticipate flap actuation.

Flaps ..... 22°

V_{REF} ..... $V_{REF\ 45°}$ + 10 KIAS

CAUTION: MULTIPLY THE FLAPS 45° UNFACTORED LANDING DISTANCE BY 1.50.

Do not actuate Thrust Reverser 2.

END

ELECTRICAL EMERGENCY ABNORMAL TRANSFER

EICAS Caution: ELEC EMERG ABNORM

Essential Power ..... CHECK PUSHED OUT

MESSAGE PERSISTS? **No**

Yes

LAND AT THE NEAREST SUITABLE AIRPORT.

Emerg Lts ..... OFF

If required, turn ON Emerg Lts just before landing.

Bus Ties ..... OFF

Batteries 1 and 2 ..... OFF

MESSAGE STILL PERSISTS? **No**

Yes

Bus Ties ..... AUTO

Batteries 1 and 2 ..... AUTO

APU (if serviceable) ..... START

APU Generator ..... CHECK PUSHED IN

CAUTION: IF APU GENERATOR IS NOT AVAILABLE AND THE MESSAGE REMAINS, BATTERIES DURATION WILL BE 40 MINUTES.

END

EMERGENCY LIGHTS NOT ARMED

EICAS Caution: EMERG LT NOT ARMD

EMERG LT Switch ..... ARM

MESSAGE PERSISTS? **No**

Yes

EMER LTS Switch on Forward Attendant Control Panel ..... CHECK NORM

END

ESSENTIAL BUS 1 OFF

EICAS Caution: ESS BUS 1 OFF

SG on Reversionary Panel 1..... PUSH IN
Fuel Pump 1..... 1B OR 1C
Fuel Pump 2..... 2A OR 2C
Altitude..... MAX 25'000 FT, MINIMUM MEA

ICING CONDITIONS? **No**

Yes

XBleed..... OPEN
Altitude..... MEA OR 15'000 FT, WHICHEVER IS HIGHER

If it is not possible to descend below 15'000 ft:
Icing Conditions ..... EXIT

Monitor fuel quantity indication 1 through FMS.

COM 2 on Digital Audio Panel 2..... PUSH IN
Relevant Inoperative Items:

ADF 1/VHF 1/VOR 1/ILS 1/MB 1	**Audio System 1**
ENG 1 Fire Detection System	**RMU 1**
Landing Gear Control (Down Override)	
Thrust Reverser 1	

Affected Equipment (EAP 5-14)..... CHECK

EICAS DEENERGIZED? **No**

Yes

DAU 1 on EICAS Rev..... PUSH IN
At pilots's discretion, on Reversionary Panel 1:
MFD Knob ..... EICAS

CAUTION: MULTIPLY THE FLAPS 45° UNFACTORED LANDING DISTANCE BY 1.45.

Brake effectiveness will be reduced.

END

ESSENTIAL BUS 2 OFF

EICAS Caution: ESS BUS 2 OFF
MFD Indication: ESS BUS may be amber.

Fuel Pump 1 .....1A OR 1C
Fuel Pump 2 .....2B OR 2C
Icing Conditions.....EXIT/AVOID
Altitude .....MAX 25'000 FT, MIN MEA

Monitor fuel quantity indication 2 through FMS.

CAUTION: DO NOT USE CROSSFEED**.**

Relevant Inoperative Items:

ISIS/Standby Altimeter *	**Audio System 2**
APU Fire Detection System	**Pitot Heating 3**
ENG 2 Fire Detection System	**Standby Attitude Indicator**
APU Control	**RMU 2**
Thrust Reverser 2	

* Inoperative ISIS - all models except EMB-145XR.

Affected Equipment (EAP 5-14).....CHECK

When necessary to extend landing gear:

Landing Gear Lever.....DOWN
Gear Electrical Override.....DOORS
 **.....WAIT 3 SECONDS**
Gear Electrical Override.....GEAR/DOORS

CAUTION: MULTIPLY THE FLAPS 45° UNFACTORED LANDING DISTANCE BY 1.45.

Brake effectiveness will be reduced.

END

ESSENTIAL BUS 1-2 OFF

EICAS Caution: ESS BUS 1-2 OFF

Bus Ties ..... OFF
MFD Electrical Page ..... CHECK

BOTH DC BUSES ENERGIZED?
No
Yes

Battery 1 and 2 ..... OFF

MESSAGE ESS BUS 1 OFF PERSISTS?
No
Yes

ESSENTIAL BUS 1 OFF
Procedure (EAP 5-9) ..... ACCOMPLISH

END

MESSAGE ESS BUS 2 OFF PERSISTS?
No
Yes

ESSENTIAL BUS 2 OFF
Procedure (EAP 5-10) ..... ACCOMPLISH

END

END

WHICH DC BUS IS ENERGIZED?
DC BUS 2
DC BUS 1

Battery 1 ..... OFF
Check which Essential Bus is off.
Associated ESSENTIAL BUS OFF
Procedure (EAP 5-9 or EAP 5-10) ... ACCOMPLISH

END

Battery 2 ..... OFF
Check which Essential Bus is off.
Associated ESSENTIAL BUS OFF
Procedure (EAP 5-9 or EAP 5-10) ... ACCOMPLISH

END

GENERATOR OFF BUS

EICAS Caution: GEN 1 (2, 3, 4) OFF BUS or APU GEN OFF BUS

MFD Indication: Generator voltage may be amber.

ALL GENERATORS OFF BUS? **No**

Yes

LOSS OF ALL GENERATORS
Procedure (EAP 5-4)..... ACCOMPLISH

END

Affected Generator ..... PUSH OUT, THEN PUSH IN
APU (if serviceable) ..... AS REQUIRED

END

GENERATOR OVERLOAD

EICAS Caution: GEN 1 (2, 3, 4) OVLD or APU GEN OVLD

MFD Indication: Generator may be amber.

Shed Buses ..... OFF

MESSAGE PERSISTS? **No**

Yes

Electrical Load (affected generator).... REDUCE

The equipments that require more electrical load and may be turned OFF, at pilot's discretion are: lights, hydraulic electric pump, ice protection and air conditioning related systems. Non-required equipment may also be turned OFF.

GEN 1 (2, 3, 4) OVLD EICAS MESSAGE DISPLAYED? **No**

Yes

APU ON? **No**

Yes

APU GEN ..... PUSH IN

END

APU ..... START
APU GEN ..... PUSH IN

END

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ANNEX 01

In case of electrical bus failure, refer to the following table to verify the affected equipment.

DC BUS 1	DC BUS 2
AILERON CONTROL SYSTEM 1	ADC 2
AIR/GND POSITION SYSTEM A	ADF 2 *
AOA 1 SENSOR HEATING	AHRS 2 or IRS 2
AUTOMATIC PRESSURIZATION CONTROL	AILERON CONTROL SYSTEM 2
AUTOPILOT 1	AIR/GND POSITION SYSTEM C
BRAKES TEMP INDICATION OUTBD	AOA 2 SENSOR HEATING
CLEAR ICE DET - CHANNEL 1	AURAL WARNING SYSTEM 2
CMC	AUTOPILOT 2
CREW PEDAL ADJUSTMENT	BAGGAGE SMOKE DETECTOR
CREW SEAT ADJUSTMENT 1	BRAKES TEMP INDICATION INBD
DME 1	CABIN RECIRCULATION
EICAS POWER (DAU 1B)	CLEAR ICE DET - CHANNEL 2
ELECTRICAL FLIGHT IDLE STOP 1	CLOCK COPILOT'S
ELECTRONIC BAY COOLING (EXHAUST 1 AND RECIRC 2)	CREW SEAT ADJUSTMENT 2
EMER/PARKING BRAKE	DEFUELING
ENG 1 FUEL PUMPS 1C	DISPLAY PRCS/CTRL PWR 2 (IC 2)
ENG 1 THRUST REVERSER COMMAND	DME 2
ENGINE 1 ANTI-ICE	EICAS POWER (DAU 2B)
FLAP CHANNEL 1	ELECTRICAL FLIGHT IDLE STOP 2
FMS SYSTEM 1 *	ELECTRONIC BAY COOLING (EXHAUST 2 AND RECIRC 1)
FUEL PRESSURE REFUELING 1/2	ENG 2 FUEL PUMP 2C
GROUND SPOILER OUTBD	ENG 2 THRUST REVERSER COMMAND
HEAD-UP GUIDANCE SYSTEM	ENGINE VIBRATION SENSORS
HYDR ELECTRIC PUMP 2	ENGINE 2 ANTI-ICE
HYDR GEN SYS 2 INDICATION	FLAP CHANNEL 2
ICE DETECTOR 1	FMS SYSTEM 2 *
INVERTER	GASPER FAN
LAVATORY FLUSH	GPS *
LAVATORY SMOKE DETECTOR	GROUND SPOILER INBD
LAVATORY WATER DRAIN HEATER	GUST LOCK ELECTROMECHANICAL
LIGHTING: CABIN 1, OVERHEAD PANEL, COCKPIT READING, COURTESY/STAIR 2, FLOOD/STORM, LAVATORY, LOGOTYPE	HF POWER/CONTROL *
	HYDR ELECTRIC PUMP 1
	HYDR GEN SYS 1 INDICATION
LIGHTS: LANDING 1 & NAVIGATION	ICE DETECTOR 2
MAIN DOOR CONTROL 1	IRS 2
MFD 2 POWER	LANDING GEAR DOOR COMMAND
PACK VALVE 1	LIGHTING: OVERHEAD PANEL, COMPARTMENT, INSPECTION & PASSENGER CABIN 1/2/3
PASSENGER SIGNS	
PFD 1 POWER	LIGHTS: RED BEACON & LANDING
PITCH TRIM MAIN	MFD 1 POWER
PITOT 1 HEATING	OBSERVER'S DAP (INTPH 3)
PNEUMATIC HSV 1	PACK VALVE 2
RADAR SYSTEM	PFD 2 POWER
RADIO ALTIMETER 1	PITOT 2 HEATING
SPEED BRAKE	PNEUMATIC HSV 2
STATIC PORT HEATING 1	RADIO ALTIMETER 2 *
STROBE LIGHTS	ROLL TRIM SYSTEM
TAT 1 SENSOR HEATING	SENSORS HEATING CONTROL
TCAS 2000	SPOILER INDICATION
TRANSPONDER 1	SPS (SHAKER 2/CHANNEL 2)
VHF SYSTEM 3 *	SPS PUSHER
WINDSHIELD HEATING 1	STABILIZER ANTI-ICE
WINDSHIELD WIPER 1	STATIC PORT HEATING 2
WING ANTI-ICE	STEERING
YAW TRIM	TAT 2 SENSOR HEATING
	TRANSPONDER 2
	TUNING BACKUP CONTROL HEAD
	VHF SYSTEM 2
	VOR/ILS/MB 2
	WINDSHIELD WIPER 2

Optional equipments are marked with an asterisk (*).

ANNEX 01

In case of electrical bus failure, refer to the following table to verify the affected equipment.

ESSENTIAL BUS 1	ESSENTIAL BUS 2
ADC 1	AIR/GND POSITION SYSTEM D
ADF 1	APU CONTROL
AHRS 1	APU FIRE DETECTION
AIR/GND POSITION SYSTEM B	APU FIRE EXTINGUISHING
APU BLEED	APU FUEL FEED
AURAL WARNING SYSTEM 1	BRAKES INBOARD
BRAKES OUTBOARD	CROSSBLEED
CLOCK PILOT'S	EICAS (DAU 2A)
DISPLAY PRCS/CTRL PWR 1 (IC 1)	ENG 1 FUEL PUMPS 1B
EICAS DISPLAY	ENG 2 FIRE DETECTION
EICAS (DAU 1A)	ENG 2 FUEL PUMPS 2A
ENG 1 FIRE DETECTION	ENGINE 2 STARTING
ENG 1 FUEL PUMPS 1A	ENGINES N2 SIGNALS 1B AND 2B
ENG 2 FUEL PUMPS 2B	ENGINES 1 AND 2 FADEC B
ENGINE 1 STARTING	FUEL CROSS FEED
ENGINES N2 SIGNALS 1A AND 2A	FUEL QUANTITY INDICATION 2
ENGINES 1 AND 2 FADEC A	ISIS (all models except for EMB-145XR)
FDR MANAGEMENT	LDG CONTROL
FUEL QUANTITY INDICATION 1	LDG NOSE INDICATION 2
IRS 1	LIGHTING EMERGENCY CTRL
LDG CONTROL (DOWN OVRD)	LIGHTING PANEL COPILOT'S AND PEDESTAL
LDG NOSE INDICATION 1	PASSENGER OXYGEN SYSTEM 2
LIGHTS COCKPIT DOME	PILOT/COPILOT'S DAP (INTPH 2)
PANEL LIGHTING PILOT'S	PITCH TRIM BACKUP
PASSENGER OXYGEN SYSTEM 1	PITOT HEATING 3
PILOT/COPILOT'S DAP (INTPH 1)	PNEUMATIC 2 (EBV 2)
PNEUMATIC 1 (EBV 1)	PUBLIC ADRESS
RAM AIR DISTRIBUTION	RMU 2
RMU 1	RUDDER CONTROL SYSTEM 1
RUDDER CONTROL SYSTEM 2	STANDBY ALTIMETER
SPS (SHAKER 1/CHANNEL 1)	STANDBY ATTITUDE INDICATOR
THRUST REVERSER 1	THRUST REVERSER 2
VHF 1	VOICE RECORDER
VOR/ILS/MB 1	

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ANNUNCIATED PROCEDURES

NON ANNUNCIATED PROCEDURES

LIST OF EICAS MESSAGES

ATTCS FAILURE

EICAS Warning: ATTCS FAIL

Thrust Levers ..... MAX

Another takeoff is not permitted.

END

DUAL ENGINE FAILURE

EICAS Warning: ENG 1-2 OUT may be presented.

Airspeed..... MIN 260 KIAS
Oxygen mask..... AS REQUIRED

Altitude..... MAX 25'000 FT
Fuel Pumps Selectors 1 and 2 ..... CHECK A or B
Fuel Pumps Pwr 1 and 2..... CHECK ON

APU SERVICEABLE? — **No**

Yes

Thrust Levers ..... IDLE
Engine 1 and 2 Start/Stop Selectors... STOP

APU Bleed..... PUSH IN
Engines Bleeds 1 and 2 ..... PUSH OUT
Below 25'000 ft:
Engine 1 Start/Stop Selector ..... START, THEN RUN

ENGINE 1 STARTS? — **No**

Yes

Do not alternate FADEC 1.
ENGINE 2 AIRSTART
Procedure (NAP-15)..... ACCOMPLISH

END

Engine 1 Start/Stop Selector ..... STOP
Engine 2 Start/Stop Selector ..... START, THEN RUN

ENGINE 2 STARTS? — **No**

Yes

Do not alternate FADEC 2.
ENGINE 1 AIRSTART
Procedure (NAP-15)..... AS REQUIRED

END

CONTINUES ON NEXT PAGE

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NOTE: Windmilling starts can be attempted in both engines simultaneously.

Airspeed ..... MIN 260 KIAS
Minimum N2 ..... 10%

Initiate windmilling start with N2 as high as possible.
Once N2 is below 10%, it may not be recovered.

Thrust Levers ..... IDLE
Engine 1 and 2 Start/Stop Selectors... STOP
Engine 1 and 2 Start/Stop Selectors... START, THEN RUN

ANY ENGINE STARTS? **No**

Yes

INOPERATIVE ENGINE START CONSIDERED? **No**

Yes

ENGINE AIRSTART (inoperative engine) Procedure (NAP-15)..... AS REQUIRED

END

ENGINE FAILURE/SHUTDOWN (inoperative engine) Procedure (NAP-18)..... AS REQUIRED

END

DITCHING (NAP-5) or FORCED LANDING (NAP-7) Procedure..... ACCOMPLISH

END

ENGINE ATTCS NO MARGIN

EICAS Warning: E1 (2) ATTCS NO MRGN

ENGINE MODEL?

A1E, A1P or A1/3

A, A1, A1/1 or A3

At crew's discretion, perform a Thrust Assurance Check, as described:

Associated Thrust Lever ..... MAX

ENGINE PARAMETERS IN NORMAL RANGE?

No

Yes

Another takeoff may be attempted. ALT T/O-1 mode is prohibited.

END

Do not takeoff.

END

ENGINE FIRE, SEVERE DAMAGE OR SEPARATION

EICAS Warning: ENG 1 (2) FIRE (in case of fire).
Light: Engine Fire Handle
Aural Warning: BELL (in case of fire)

Associated Thrust Lever ..... IDLE
Associated Start/Stop Selector..... STOP
Associated Fire Extinguishing Handle ..... PULL (DO NOT ROTATE)

LAND AT THE NEAREST SUITABLE AIRPORT.

E1 (2) FUELSOV CLSD MESSAGE? — **Displayed**

Not Displayed

XFeed Selector Knob..... OFF
Associated Fuel Pumps..... OFF

..... WAIT 30 SECS
Fire Extinguishing Handle (1st shot)... ROTATE
..... WAIT 30 SECS

FIRE PERSISTS? — **No**

Yes

Fire Extinguishing Handle (2nd shot) .. ROTATE

CONDITION? — **On Ground**

In Flight

TCAS ..... TA ONLY
Remaining Engine Thrust Rating..... CON
Associated Bleed ..... PUSH OUT

CONTINUES ON NEXT PAGE

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APU (if serviceable).....START
APU Bleed .....AS REQUIRED
XBleed .....AS REQUIRED

ICING CONDITIONS? — **No**

Yes

XBleed .....OPEN
Altitude .....MAX 15'000 FT, MIN MEA

If it is not possible to descend below 15'000 ft:
Icing Conditions.....EXIT

For CAT III or CAT II approaches using HGS, the normal CAT III approach procedure must be used.

Approach:

Altimeters .....SET AND CROSS CHECKED
Approach Aids.....SET AND CROSS CHECKED
Speed Bugs .....SET
Pressurization .....CHECK
Go-Around Procedure.....REVIEW

- Disengage Autopilot.
- Press Go-Around Button.
- Advance Operative Engine Thrust Lever to MAX.
- Rotate airplane to 10° nose up.
- Set flaps to 9°.

With positive rate of climb:

- Landing gear up.
- Maintain Approach Climb Speed until reaching acceleration altitude (level off).

Before Landing:

Inoperative Engine Thrust Lever.....IDLE
Landing Gear.....DOWN
Thrust Rating.....TAKEOFF MODE
Fuel XFeed.....OFF
Autopilot/Yaw Damper.....DISENGAGE

Landing configuration:

Flaps .....22°

V_{REF}.....V_{REF45} + 10 KIAS

CAUTION: MULTIPLY THE FLAPS 45° UNFACTORED LANDING DISTANCE BY 1.48.

EMERGENCY EVACUATION
Procedure (NAP-6) .....AS REQUIRED

END

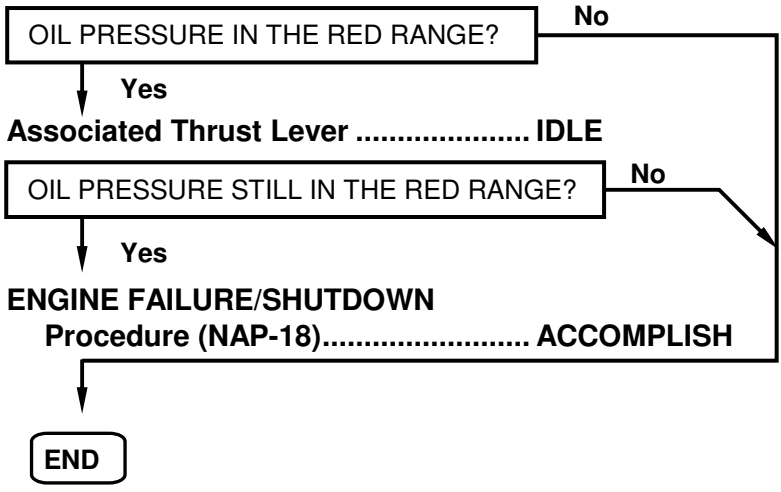
ENGINE OIL LOW PRESSURE

EICAS Warning: E1 (2) OIL LOW PRESS may be presented.

EICAS Indication: Oil pressure may be red.

Associated Thrust Lever ..... REDUCE

Reduce Thrust Lever to at least N2 below 88%, until pressure is within limits.



ENGINE ATS SHUTOFF VALVE OPEN

EICAS Caution: E1 (2) ATS SOV OPN

XBleed..... CLOSE
Associated Bleeds
(including APU bleed) ..... PUSH OUT

ON GROUND?

No

Yes

Thrust Levers ..... IDLE
Associated Start/Stop Selector ..... STOP

NOTE: If engine shutdown does not occur, pull the fire extinguishing handle.

END

Icing Conditions ..... EXIT/AVOID
Altitude..... MAX 25'000 FT, MIN MEA

END

ENGINE CONTROL FAILURE

EICAS Caution: E1 (2) CTL FAIL may be presented.

CAUTION: DO NOT MANUALLY ALTERNATE ASSOCIATED FADECS.

FADEC In Control..... CHECK
Associated FADEC..... RESET

FADEC IN CONTROL CHANGES? **No**

Yes

Avoid quick movements of the associated Thrust Lever.

NOTE: Thrust Lever movements may cause surge or an uncommanded engine shutdown.

ENGINE FAILURE/SHUTDOWN
Procedure (NAP-18)..... AS REQUIRED

END

Engine control recovered.

END

ENGINE FUEL FILTER IMPENDING BYPASS

EICAS Advisory: E1 (2) FUEL IMP BYP

BOTH FILTERS AFFECTED? **No**

Yes

LAND AT NEAREST SUITABLE AIRPORT.

END

ENGINE IDLE STOP FAILURE

EICAS Advisory: E1 (2) IDL STP FAIL

Protection against thrust lever movement below flight idle is not available.

CAUTION: NEVER SET THRUST LEVER BELOW IDLE INFLIGHT.

END

ENGINE OUT

EICAS Caution: ENG1 (2) OUT

Associated Thrust Lever ..... IDLE
Associated Start/Stop Selector..... STOP

NOTE: If engine shutdown does not occur, pull the associated fire extinguishing handle.

Engine Thrust Rating..... CON
APU (if available)..... START
APU Bleed..... AS REQUIRED
XBleed ..... AS REQUIRED
Fuel ..... BALANCE

ENGINE RESTART CONSIDERED?

No

Yes

ENGINE AIRSTART
Procedure (NAP-15)..... ACCOMPLISH

END

LAND AT THE NEAREST SUITABLE AIRPORT.
TCAS..... TA ONLY
Altitude ..... MAX 25'000 FT, MIN MEA

ICING CONDITIONS?

No

Yes

XBleed ..... OPEN
Altitude ..... MEA OR 15'000 FT, WHICHEVER IS HIGHER

If it is not possible to descend below 15'000 ft:
Icing Conditions ..... EXIT

ONE ENGINE INOPERATIVE

APPROACH AND LANDING
Procedure (NAP-30)..... AS REQUIRED

END

ENGINE THRUST LEVER FAILURE

EICAS Caution: ENG1 (2) TLA FAIL

Associated FADEC..... RESET

THRUST LEVER CONTROL RECOVERED?

No

Yes

END

Associated FADEC..... ALTN

THRUST LEVER CONTROL RECOVERED?

No

Yes

END

Thrust can be partially controlled through the Thrust Rating Buttons.

ENGINE FAILURE/SHUTDOWN
Procedure (NAP-18)..... AS REQUIRED

END

ENGINE THRUST REVERSER FAILURE/DISAGREE

EICAS Caution: ENG1 (2) REV DISAGREE or
ENG1 (2) REV FAIL

CONDITION?

In Flight

On Ground

Do not takeoff.

END

ASSOCIATED N1 INDICATION BELOW THRUST LEVER SETTING?

No

Yes

LAND AT THE NEAREST SUITABLE AIRPORT.

Associated Thrust Lever ..... IDLE

Airspeed ..... MAX 200 KIAS

Associated ENGINE FAILURE/ SHUTDOWN Procedure (NAP-18) ... ACCOMPLISH

END

Message..... DISREGARD

END

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ANNUNCIATED PROCEDURES

LIST OF EICAS MESSAGES

APU FIRE DETECTION FAILURE

EICAS Caution: APU FIREDET FAIL

ASSOCIATED TO APU FAILURE?

No

Yes

APU FIRE Procedure (EAP 3-3).....ACCOMPLISH

END

ASSOCIATED TO SUSPECTED APU FIRE OR OVERHEAT?

No

Yes

APU FIRE Procedure (EAP 3-3).....ACCOMPLISH

END

The APU fire detection system is inoperative.

END

APU FIRE EXTINGUISHING INOPERATIVE

EICAS Caution: APU EXTBTL INOP
Condition: Affected bottle has not been discharged intentionally.

APU fire protection is not available.
Consider shutting the APU down.

END

BAGGAGE COMPARTMENT FIRE EXTINGUISHING INOPERATIVE

EICAS Caution: BAGG EXTBTL INOP (if installed).
Condition: Affected bottle has not been discharged intentionally.

BAGG SMOKE MESSAGE DISPLAYED? — **No**

Yes

LAND AT THE NEAREST SUITABLE AIRPORT.
BAGGAGE SMOKE Procedure (S-3)....AS REQUIRED

END

Baggage fire protection is not available.

END

ENGINE FIRE DETECTION FAILURE

EICAS Caution: E1 (2) FIREDET FAIL

ASSOCIATED TO ENGINE FAILURE? — **No**

Yes

ENGINE FIRE, SEVERE DAMAGE OR SEPARATION Procedure (EAP 6-6).....ACCOMPLISH

END

ASSOCIATED TO SUSPECTED ENGINE FIRE OR OVERHEAT? — **No**

Yes

ENGINE FIRE, SEVERE DAMAGE OR SEPARATION Procedure (EAP 6-6).....ACCOMPLISH

END

The Associated engine fire detection system is inoperative.

END

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ENGINE FIRE EXTINGUISHING INOPERATIVE

EICAS Caution: E1 (2) EXTBTLA INOP or
E1 (2) EXTBTLB INOP

Condition: Affected bottle has not been discharged intentionally.

Only one bottle is available to protect both engines against fire.

END

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NON ANNUNCIATED PROCEDURES

LIST OF EICAS MESSAGES

INADVERTENT SPOILER OPEN

EICAS Caution: SPOILER FAIL may be presented.

Condition: Sudden airspeed or altitude loss, buffeting or roll tendency.

EICAS Indication: SPLRS **OPN**

Speed Brake ..... CLOSE

Spoilers CB's F13, F14 and F21 ..... PULL

Do not reduce Thrust during flare.

Landing Configuration:

Flaps ..... 22°

V_{REF45} ..... V_{REF45} + 10 KIAS

PANEL FAILURE MODE?

Jammed Open

Jammed Closed or Floating

CAUTION: MULTIPLY THE FLAPS 45° UNFACTORED LANDING DISTANCE BY 1.50.

END

CAUTION: MULTIPLY THE FLAPS 45° UNFACTORED LANDING DISTANCE BY 1.45.

END

PITCH TRIM INOPERATIVE

EICAS Warning: PTRIM MAIN INOP (may be presented) and/or PTRIM BACKUP INOP (may be presented) or PIT TRIM 1 (2) INOP (may be presented).

The following message may be displayed:

EICAS Caution: AUTO TRIM FAIL

EMB-145XR MODEL? **No**

Yes

PTRIM BACKUP INOP MESSAGE DISPLAYED? **No**

Yes

Airspeed ..... MAX 0.78 MACH

ANY EICAS MESSAGE DISPLAYED? **No**

Yes

MESSAGE DISPLAYED WITHOUT PRESSING ANY PITCH TRIM SWITCH? **No**

Yes

INOPERATIVE SYSTEM(S)? **Main and Backup (1 and 2)**

Main (1) **Backup (2)**

Pitch Trim Main Sys Cutout ..... PUSH OUT

Autopilot ..... DISENGAGE

Back up system can be used to trim the airplane.

END

Pitch Trim Backup Sys Cutout..... PUSH OUT

Main system can be used to trim the airplane.
Autopilot is available.

END

Pitch Trim Main Sys Cutout ..... PUSH OUT

Pitch Trim Backup Sys Cutout..... PUSH OUT

Consider LANDING AT THE NEAREST SUITABLE AIRPORT.

Autopilot ..... DISENGAGE

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AIRPLANE PITCH UP TENDENCY? — **No**

Yes

ANY PITCH TRIM SWITCH (PILOT, COPILOT OR BACKUP) WORKING? — **No**

Yes

Continue the flight using operative switch.
If Main Pitch Trim System is inoperative, do not engage the Autopilot.

END

WARNING: **DO NOT OPEN SPEEDBRAKE.**

Airspeed..... REDUCE

If it is necessary to reduce airspeed below 180 KIAS (or 200 KIAS in icing conditions), extend flaps to 9° (at 20000 ft maximum).

If it is necessary to reduce airspeed below 160 KIAS, extend flaps to 22°.

NOTE: Turning the airplane and extending the landing gear helps to maintain minimum airspeed with unwanted pitch up tendency.

Landing Configuration:

Flaps..... 22°

V_{REF} ..... V_{REF45} + 10 KIAS

CAUTION: MULTIPLY THE FLAPS 45° UNFACTORED LANDING DISTANCE BY 1.45.

END

WARNING: **DO NOT OPEN SPEEDBRAKE.**

AIRPLANE PITCH DOWN TENDENCY? — **No**

Yes

Airspeed..... REDUCE

Below 250 KIAS ..... FLAPS 9° (MAX 20'000 FT)

Below 200 KIAS ..... FLAPS 22°

Reducing speed and extending flaps helps to reduce control forces.

Landing Configuration:

Delay gear extension as long as possible.

Flaps..... 22°

V_{REF} ..... V_{REF45} + 25 KIAS

CAUTION: MULTIPLY THE FLAPS 45° UNFACTORED LANDING DISTANCE BY 1.75

END

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AILERON SYSTEM INOPERATIVE

EICAS Caution: AIL SYS 1 (2) INOP

Affected Aileron Shutoff ..... PUSH OUT
Airspeed..... MAX 250 KIAS

BOTH SYSTEMS FAILED?

No

Yes

Remaining Aileron Shutoff ..... PUSH OUT
Autopilot ..... DISENGAGE

Expect greater aileron control force. If required, both pilots should act together to control airplane.

Avoid landing at airports with anticipated turbulence, gusts or crosswind.

Perform a long final approach.

Landing Configuration:

Flaps..... 22°
V_{REF} ..... V_{REF45} + 30 KIAS

CAUTION: MULTIPLY THE FLAPS 45° UNFACTORED LANDING DISTANCE BY 1.85.

END

FLAP FAILURE

EICAS Caution: FLAP FAIL
Condition: Flap operation is not possible.
EICAS Indication: Flap position may become amber.

If flap indication on EICAS is not available, use the RMU Engine Backup Page 2 or flap position marks on the wing.

With flaps at intermediate positions, limit airspeed according to the following:

ALL MODELS EXCEPT EMB-145 XR

FLAPS POSITION	MAX AIRSPEED
1° to 9°	250 KIAS
10° to 22°	200 KIAS
23° to 45°	145 KIAS

EMB-145 XR MODEL

FLAPS POSITION	MAXIMUM AIRSPEED	ABOVE 10000 ft AND Y/D DISENGAGED
1° to 9°	**250 KIAS**	**250 KIAS**
10° to 22°	**200 KIAS**	**180 KIAS**
23° to 45°	**160 KIAS**	**145 KIAS**

V_{REF}:

FLAPS POSITION	V_{REF}
0 to 8°	V_{REF45} + 30 KIAS
9° to 21°	V_{REF45} + 10 KIAS
22° to 44°	V_{REF45} + 5 KIAS
45°	V_{REF45}

At crew discretion:

EGPWS/GPWS CB's (J7 or J8) ..... PULL

CAUTION: MULTIPLY THE FLAPS 45° UNFACTORED LANDING DISTANCE BY:

FLAPS POSITION	FACTOR
0 to 8°	1.65
9° to 21°	1.40
22° to 44°	1.40

END

FLAP LOW ACTUATION SPEED

EICAS Advisory: FLAP LOW SPEED

Anticipate flap actuation.

END

PITCH TRIM SWITCH INOPERATIVE

EICAS Caution: PTRIM CPT SW FAIL,
PTRIM F/O SW FAIL or
PTRIM BKP SW FAIL

CONDITION?

On Ground

In Flight

Use another serviceable switch.

END

Deenergize the airplane and energize it again.

END

RUDDER HARDOVER PROTECTION FAILURE

EICAS Caution: RUD HDOV PROTFAIL

Rudder hardover protection is not available.

END

RUDDER OVERBOOST

EICAS Caution: RUDDER OVERBOOST

Rudder Shutoff 2..... PUSH OUT

RUDDER OVERBOOST MESSAGE PERSISTS? **No**

Yes

Rudder Shutoff 2..... PUSH IN
Rudder Shutoff 1..... PUSH OUT
Below 135 KIAS:
Rudder Shutoff 1 ..... PUSH IN

END

Below 135 KIAS:
Rudder Shutoff 2 ..... PUSH IN

END

RUDDER SYSTEM INOPERATIVE

EICAS Caution: RUDDER SYS 1 (2) INOP or
RUDDER SYS 1-2 INOP

FOLLOWING A RUDDER RUNAWAY? — **No**

Yes

RUDDER/YAW TRIM RUNAWAY
Procedure (NAP-35)..... ACCOMPLISH

END

INOPERATIVE SYSTEM? — **Both (1 and 2)**

Only one (1 or 2)

Affected Rudder Shutoff..... PUSH OUT

END

Rudder Shutoff 2..... PUSH OUT

RUDDER 1-2 INOP MESSAGE PERSISTS? — **No**

Yes

Rudder Shutoff 1..... PUSH OUT
Rudder Shutoffs 1 and 2..... PUSH IN

RUDDER 1-2 INOP MESSAGE PERSISTS? — **No**

Yes

Expect heavier than normal rudder pedals. If required, combine effort of both pilots.

Consider use of aileron and asymmetric thrust to control the airplane.

Avoid airports with reported gusts, turbulence or crosswind.

END

SPEED BRAKE LEVER DISAGREE

EICAS Caution: SPBK LVR DISAGREE

Speed Brake Lever..... CLOSE

END

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LIST OF EICAS MESSAGES

FUEL LOW LEVEL

EICAS Warning: FUEL 1 (2) LO LEVEL
MFD Indication: Fuel quantity in red range.

LAND AT THE NEAREST SUITABLE AIRPORT.

Thrust Levers .....LONG RANGE CRUISE

Avoid attitudes in excess of 10° nose down or 12° nose up attitude, uncoordinated maneuvers and negative g's.

XFeed Operation .....AS REQUIRED

END

APU FUEL SHUTOFF VALVE INOPERATIVE

EICAS Caution: APU FUEL SOV INOP

APU Fuel Shutoff Button ..... CHECK NOT PRESSED

IS APU RUNNING NORMALLY?

No

Yes

Disregard the message.

END

APU SHUTOFF VALVE REMAINS CLOSED?

No

Yes

APU Master Knob ..... OFF

END

ENGINE FUEL LOW PRESSURE

EICAS Caution: E1 (2) FUEL LO PRESS

Condition: One or more affected tank electric fuel pump may be inoperative.

Associated Fuel Pump Sel..... SELECT ANOTHER

ALL PUMPS INOPERATIVE IN THE AFFECTED TANK?

No

Yes

Altitude ..... MAX 25'000 FT, MIN MEA

NOTE: If required, the flight may proceed above 25'000 ft using XFeed.

Avoid rapid thrust lever movements and set minimum required thrust.

END

END

ENGINE FUEL LOW TEMPERATURE

EICAS Caution: E1 (2) FUEL LO TEMP

WARNING: **IF NO ICING INHIBITOR WAS ADDED, ENGINE FLAMEOUT MAY OCCUR.**

ON GROUND?

No

Yes

Do not take off.

END

Descend to lower altitude and monitor engine indications as long as the message remains.

END

ENGINE FUEL SHUTOFF VALVE INOPERATIVE

EICAS Caution: E1 (2) FUEL SOV INOP

AFTER PULLING FIRE HANDLE? **No**

Yes

XFeed .....OFF
Associated Fuel Pump Pwr.....OFF

END

Fire Extinguishing Handle .....CHECK IN

ENGINE OPERATION NORMAL? **No**

Yes

Message.....DISREGARD

END

LAND AT THE NEAREST SUITABLE AIRPORT.
ENGINE FAILURE/SHUTDOWN
Procedure (NAP-18) .....ACCOMPLISH

END

FUEL CROSSFEED FAILURE

EICAS Caution: FUEL XFEED FAIL

Fuel Imbalance .....MONITOR
Asymmetric Thrust .....AS REQUIRED

END

FUEL CROSSFEED MISCOMMAND

EICAS Caution: FUEL EQ XFEED OPN

XFeed Selector Knob.....OFF
Fuel Imbalance .....CHECK
XFeed Selector Knob.....AS REQUIRED
Check XFeed selector knob properly positioned to correct wing fuel imbalance.

END

FUEL IMBALANCE

EICAS Caution: FUEL IMBALANCE

NOTE: Crossfeed must be off during takeoff and landing.

FUEL LEAK SUSPECTED? **No**

Yes

FUEL LEAK Procedure (NAP-8) ..... ACCOMPLISH

END

ATTITUDE ..... WINGS LEVELED

RH WING LOWER LEVEL? **No**

Yes

Fuel Xfeed Selector ..... LOW 2
Avoid rapid thrust levers movement.
Monitor fuel imbalance.
When the desired balance is achieved:
Fuel Xfeed Selector ..... OFF

END

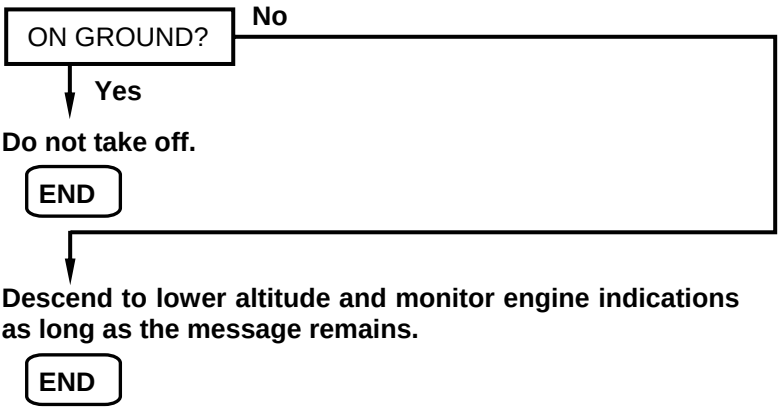
Fuel Xfeed Selector ..... LOW 1
Avoid rapid thrust levers movement.
Monitor fuel imbalance.
When the desired balance is achieved:
Fuel Xfeed Selector ..... OFF

END

FUEL TANK LOW TEMPERATURE

EICAS Caution: FUEL TANK LO TEMP
MFD Indication: Fuel temperature in amber range.

WARNING: **ENGINE FLAMEOUT MAY OCCUR.**



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LIST OF EICAS MESSAGES

BOTH HYDRAULIC SYSTEMS FAILURE

EICAS Caution: HYD SYS 1-2 FAIL
MFD Indication: Hydraulic pressure may be amber.
Condition: Noise increase due to nose landing gear doors open.

The following messages will be displayed:

- EICAS Caution: AIL SYS 1-2 INOP,
- RUDDER SYS 1-2 INOP
- EICAS Advisory: E1-2 HYD PUMP FAIL

NOTE: Do not open the Speed Brakes.

Airspeed..... MAX 250 KIAS

ANY HYDRAULIC SYSTEM FLUID QUANTITY IN GREEN RANGE?

No

Yes

System(s) in green range:
Hydraulic Elec Pump(s)..... ON

AT LEAST ONE SYSTEM RECOVERED?

No

Yes

WHICH SYSTEM RECOVERED?

Hydraulic 2

Hydraulic 1

HYDRAULIC SYSTEM 2 FAILURE
Procedure (EAP 10-6) ..... AS REQUIRED

END

HYDRAULIC SYSTEM 1 FAILURE
Procedure (EAP 10-5) ..... AS REQUIRED

END

LAND AT THE NEAREST SUITABLE AIRPORT.

CAUTION: MULTIPLY THE FLAPS 45° UNFACTORED LANDING DISTANCE BY 3.45.

Autopilot/Yaw Damper..... DISENGAGE
Both Hydraulic Elec Pumps..... OFF

Expect greater aileron and rudder control force. If required, both pilots should act together to control airplane. Consider using aileron and asymmetric thrust to help yaw control.

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Relevant Inoperative Items:

Normal gear extension	**Thrust reversers**	**Anti-skid**
Normal brakes	**Spoilers**	**Steering**
Main door retraction		

Approach:

APU..... AS REQUIRED
Altimeters..... SET AND CROSS CHECKED
Approach Aids ..... SET AND CROSS CHECKED
Speed Bugs..... SET
Pressurization..... CHECK
Go-Around Procedure ..... REVIEW

If necessary, accomplish a normal go-around procedure except that landing gear cannot be retracted.

Before Landing:

Free Fall Lever..... ACTUATE
Landing Gear Lever..... DOWN

Perform a long final approach.
Avoid landings at airports with anticipated crosswind or turbulence.
Use rudder for directional control on ground.
During landing run, pull Emergency Brake Handle carefully.

CAUTION: DO NOT FLARE.

Landing Configuration:

Landing Gear ..... DOWN
Flaps..... 22°
V_{REF} ..... V_{REF45} + 30 KIAS

CAUTION: MULTIPLY THE FLAPS 45° UNFACTORED LANDING DISTANCE BY 3.45.

END

HYDRAULIC SYSTEM 1 FAILURE

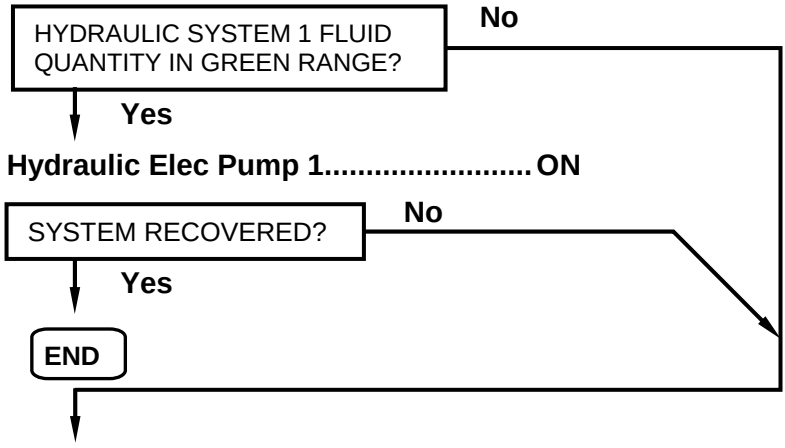
EICAS Caution: HYD SYS 1 FAIL

MFD Indication: Hydraulic pressure may be amber.
Condition: Noise increase due to nose landing gear doors open.

The following messages will be displayed:

- EICAS Caution: AIL SYS 1 INOP,
- RUDDER SYS 1 INOP

EICAS Advisory: E1 HYD PUMP FAIL



Hydraulic Elec Pump 1.....OFF
Airspeed.....MAX 250 KIAS
Relevant Inoperative Items:

Inboard Spoiler	**Normal gear extension**	**Thrust reverser 1**
Steering	**Main door retraction**	**Outboard brakes**

Before Landing:

Free Fall Lever .....ACTUATE

Landing Gear Lever.....DOWN

Brake effectiveness will be reduced.

Do not actuate engine 1 Thrust Reverser.

Landing Configuration:

Landing Gear .....DOWN

Flaps.....45°

V_{REF} ..... V_{REF45}

CAUTION: MULTIPLY THE FLAPS 45° UNFACTORED LANDING DISTANCE BY 1.60.

END

HYDRAULIC SYSTEM 2 FAILURE

EICAS Caution: HYD SYS 2 FAIL

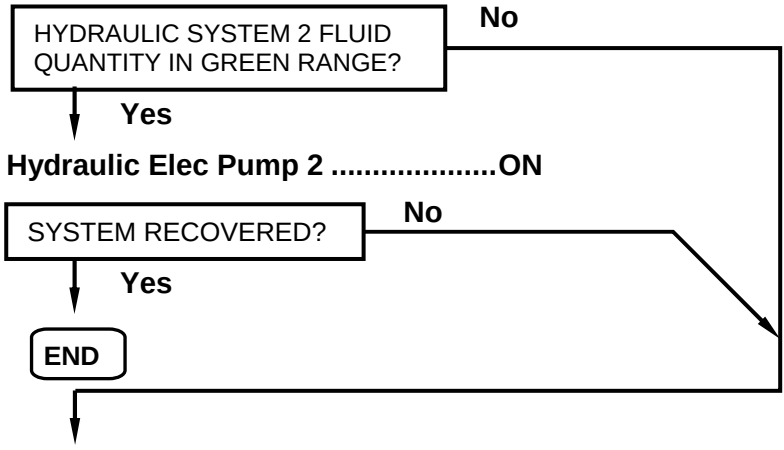
MFD Indication: Hydraulic pressure may be amber.

The following messages will be displayed:

EICAS Caution: AIL SYS 2 INOP,
RUDDER SYS 2 INOP

EICAS Advisory: E2 HYD PUMP FAIL

NOTE: Do not open the Speed Brakes.



Hydraulic Elec Pump 2 .....OFF
Airspeed .....MAX 250 KIAS
Relevant Inoperative Items:

Outboard Spoiler	**Thrust reverser 2**	**Inboard brakes**

The Emergency/Parking Brake has accumulator pressure only.

Brake effectiveness will be reduced.

Do not actuate engine 2 Thrust Reverser.

Landing Configuration:

Landing Gear .....DOWN
Flaps.....45°
V_{REF} .....V_{REF45}

CAUTION: MULTIPLY THE FLAPS 45° UNFACTORED LANDING DISTANCE BY 1.53.

END

HYDRAULIC SYSTEM LOW QUANTITY

EICAS Advisory: HYD1 (2) LO QTY

MFD Indication: Hydraulic fluid quantity may be amber.

Affected Hydraulic System ..... MONITOR

NOTE: If Hydraulic System 2 is affected, do not open the Speed Brakes.

END

HYDRAULIC SYSTEM OVERHEAT

EICAS Caution: HYD SYS 1 (2) OVHT

Turn the affected system OFF:

Associated Hydraulic Eng Pump Shutoff..... PUSH IN

Associated Hydraulic Elec Pump ..... OFF

EICAS Messages related to associated hydraulic system will be displayed while system is set to OFF.

Airspeed..... MAX 250 KIAS

For remainder of flight, if required:

Affected Hydraulic System..... 15 MINUTES OFF, 1 MINUTE ON

NOTE: To turn the hydraulic system ON, first turn the Hydraulic Elec Pump to AUTO. As soon as the system pressure is recovered, push out the Hydraulic Eng Pump Shutoff button.

During Approach and Landing or when required:

Affected Hydraulic System..... ON

After reaching taxi speed or when the system is no longer required:

Affected Hydraulic System..... OFF

END

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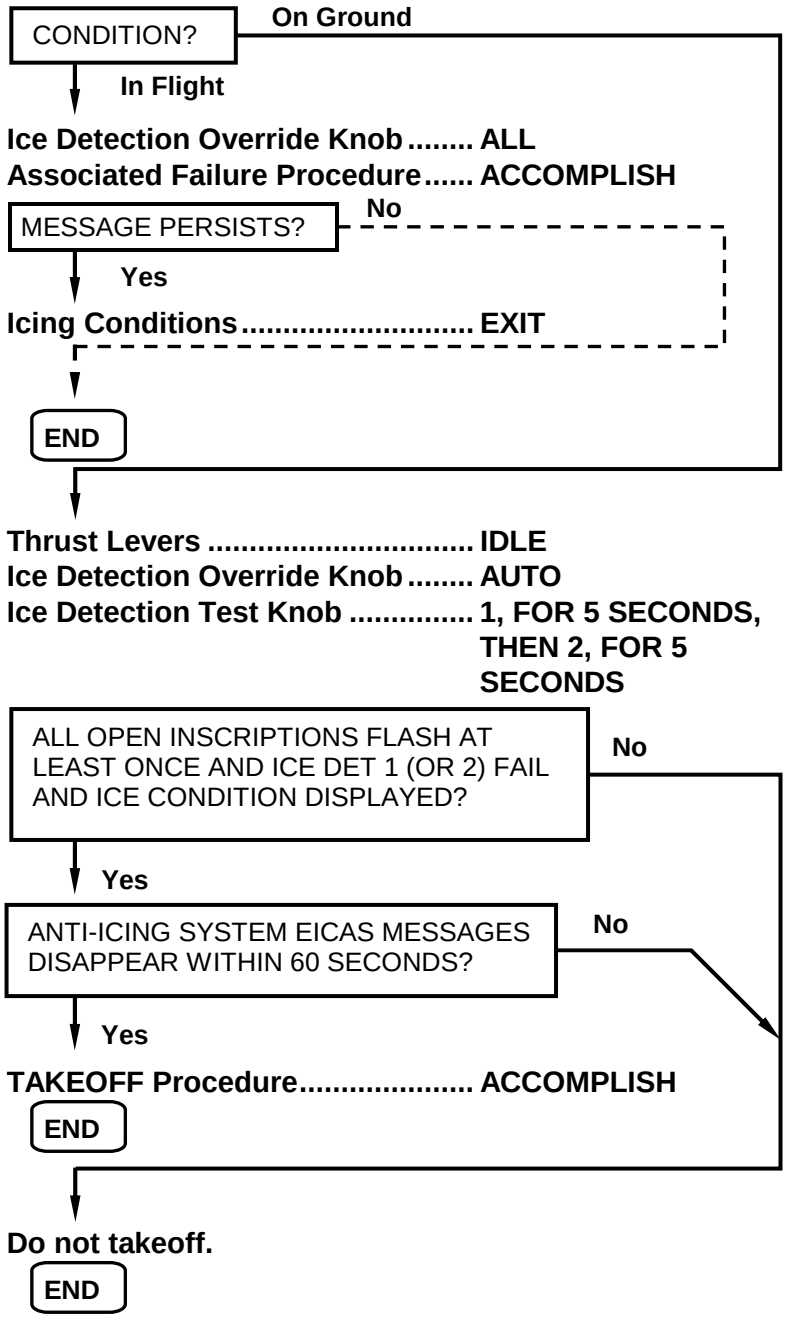
LIST OF EICAS MESSAGES

ICING CONDITIONS WITH ANTI-ICING INOPERATIVE

EICAS Warning: ICE COND-A/I INOP



ANTI-ICING LOW CAPACITY

EICAS Caution: A/ICE LOW CAPACIT

Thrust Levers .....ADVANCE
Advance Thrust Levers to at least 55% N1.

.....WAIT 5 SECONDS

MESSAGE PERSISTS?

No

Yes

WING ANTI-ICING FAILURE OR
STABILIZER ANTI-ICING FAILURE
Procedure (EAP 11-8).....AS REQUIRED

END

ANTI-ICING SWITCH OFF

EICAS Caution: A/ICE SWITCH OFF

All Ice Protection Buttons .....PUSH IN

END

AOA HEATING INOPERATIVE

EICAS Caution: AOA 1 (2) HEAT INOP

Minimum Airspeed.....FLAP MANEUVERING SPEED (PD-2)

END

ENGINE ANTI-ICING FAILURE

EICAS Caution: E1 (2) A/ICE FAIL

Thrust Levers ..... ADVANCE

MESSAGE PERSISTS? **No**

Yes

Ice Detection Override Knob ..... ALL

MESSAGE STILL PERSISTS? **No**

Yes

Ice Protection Engine Air Inlet ..... PUSH OUT, THEN PUSH IN

MESSAGE STILL PERSISTS? **No**

Yes

Icing Conditions ..... AVOID/EXIT

Two minutes after exiting icing conditions:

Ice Detection Override Knob ..... AUTO

Engine Vibration .....MONITOR

If vibration increases, advance thrust levers one at a time, to 60% N1 minimum for 5 seconds.

If vibration increases to unacceptable values or engine parameters indicate abnormal values, exit icing conditions.

END

ICE DETECTOR FAIL

EICAS Caution: ICE DET1 (2) FAIL or
ICE DETECTORS FAIL

When flying in icing conditions:

Ice Detection Override Knob ..... ALL

Two minutes after exiting icing conditions:

Ice Detection Override Knob ..... AUTO

END

NO ICE - ANTI-ICE ON

EICAS Caution: NO ICE-A/ICE ON

Ice Detection Override Knob.....AUTO

MESSAGE PERSISTS? **No**

Yes

ASSOCIATED TO EITHER **WG A/ICE FAIL** OR **STAB A/ICE FAIL** MESSAGE? **No**

Yes

Altitude .....MAX 25'000 FT, MIN MEA
APU .....START
APU Bleed .....PUSH IN
XBleed .....OPEN
Engine Bleeds.....PUSH OUT

END

Ice Protection Buttons.....PUSH OUT

Operate the Anti-Icing Systems through the buttons, pushing them in again whenever icing conditions are encountered.

END

PITOT HEATING INOPERATIVE

EICAS Caution: PITOT 1 (2, 3) INOP

Instruments supplied by the affected system may be unreliable. Cross-check and do not use the affected system if a disagreement is found.
If the Pitot 3 heating is inoperative, standby instruments and pressurization system may be affected.
If necessary:

ADC on Associated Reversionary Panel.....PUSH IN

END

TAT HEATING INOPERATIVE

EICAS Caution: TAT 1 (2) HEAT INOP

TAT, TAS and SAT indication may be unreliable.

END

WINDSHIELD HEATING FAILURE

EICAS Caution: W/S 1 (2) HEAT FAIL

Associated Ice Protection
Windshield ..... PUSH OUT

MESSAGE PERSISTS?

No

Yes

After landing:

WHICH WINDSHIELD IS AFFECTED?

Windshield 2

Windshield 1

Bus Ties ..... OFF
Generator 1 and 3..... PUSH OUT

END

Shed Buses..... OFF

END

..... WAIT 15 SECONDS
Associated Windshield Heating..... AS REQUIRED
IMPAIRED OR CRACKED WINDSHIELD
Procedure (NAP-22)..... AS REQUIRED

END

WING ANTI-ICING FAILURE OR STABILIZER ANTI-ICING FAILURE

EICAS Caution: STAB A/ICE FAIL or WG A/ICE FAIL

Ice Detector Override Knob.....ALL
Thrust Levers .....ADVANCE

MESSAGE PERSISTS? — **No**

Yes

Affected Ice Protection Button.....PUSH OUT, THEN PUSH IN

MESSAGE STILL PERSISTS? — **No**

Yes

Associated Ice Protection Button.....PUSH OUT
Icing Conditions .....AVOID/EXIT
After exiting icing conditions:
Ice Detector Override Knob .....AUTO
Maximum Bank Angle.....30°
Minimum Airspeed (Flaps 0° or 9°).....190 KIAS

LANDING IN ICING CONDITIONS OR WITH ICE ACCRETION? — **No**

Yes

AFFECTED SYSTEM(S)? — **Stab**

Wing or Wing+Stab

Landing configuration:
Flaps .....22°
V_{REF}.....V_{REF45} + 30 KIAS
CAUTION: MULTIPLY THE FLAPS 45° UNFACTORED LANDING DISTANCE BY 1.85.

END

Landing configuration:
Flaps .....22°
V_{REF}.....V_{REF45} + 15 KIAS
CAUTION: MULTIPLY THE FLAPS 45° UNFACTORED LANDING DISTANCE BY 1.55.

END

ORH-145/1167

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LIST OF EICAS MESSAGES

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LANDING GEAR/LEVER DISAGREE

EICAS Warning: LG/LEVER DISAGREE
EICAS Indication: Landing gear abnormal indication.
Condition: Landing gear cannot move to desired position.

ON GROUND? — **No**

Yes

Consider to stop the airplane. Takeoff is not permitted.

END

Airspeed..... MAX 200 KIAS
Landing Gear..... CYCLE

LG/LEVER DISAGREE MESSAGE PERSISTS? — **No**

Yes

DESIRED LANDING GEAR POSITION? — **Extended**

Retracted

LAND AT THE NEAREST SUITABLE AIRPORT.
Landing Gear Lever ..... DOWN
Airspeed..... MAX 250 KIAS
Icing Conditions..... AVOID/EXIT

END

ABNORMAL LANDING GEAR EXTENSION
Procedure (NAP-12)..... ACCOMPLISH

END

BRAKE OVERHEAT

EICAS Caution: BRAKE OVERHEAT

ON GROUND? **No**

Yes

If necessary, reduce brake pressure.
Use of full reverse thrust is recommended.
Airplane ..... STOP
Chocks..... ON
Parking Brake..... RELEASE

END

Airspeed ..... MAX 250 KIAS
Landing Gear Lever ..... DOWN
Brakes Temperature ..... CHECK IN THE GREEN RANGE

If MFD is not available, retract gear after message is removed.
Airspeed ..... MAX 200 KIAS
Landing Gear Lever ..... UP

END

ORH-145/1167

BRAKES DEGRADED

EICAS Caution: BRAKE DEGRADED

Brake effectiveness and symmetry may be affected.

Landing Configuration:

Landing Gear ..... DOWN
Flaps..... 45°
Airspeed..... $V_{REF\ 45}$

CAUTION: MULTIPLY THE FLAPS 45° UNFACTORED LANDING DISTANCE BY 1.24.

During landing run:

Brakes ..... APPLY NORMALLY
Use thrust reverser if available.

END

BRAKES INOPERATIVE

EICAS Caution: BRK OUTBD (INBD) INOP

Landing Configuration:

Landing Gear ..... DOWN
Flaps..... 45°
Airspeed..... $V_{REF\ 45}$

CAUTION: MULTIPLY THE FLAPS 45° UNFACTORED LANDING DISTANCE BY 1.45.

During landing run:

If available, use thrust reverser.

BRAKES INOPERATIVE?

Both (OUTBD and INBD)

Only one (OUTBD or INBD)

Brakes ..... APPLY NORMALLY

END

Emergency Brake Handle ..... PULL CAREFULLY

Relevant Inoperative Item: **Anti-skid**

END

EMERGENCY/PARKING BRAKE LOW PRESSURE

EICAS Caution: EMRG BRK LO PRES

Emergency/Parking Brake performance may be degraded.

When parking the airplane, use wheel chocks.

END

LANDING GEAR AIR/GROUND SYSTEM FAILURE

EICAS Caution: LG AIR/GND FAIL

Icing Conditions..... EXIT/AVOID

ICING CONDITIONS? **No**

Yes

Anti-Icing System..... MONITOR

If any anti-ice valve does not open or anti-ice failure messages appear, exit and avoid icing conditions.

After exiting icing conditions, proceed as follows:

Maximum Bank Angle..... 30°

Minimum Airspeed for Flaps up or 9° ..... 190 KIAS

Landing Configuration:

Flaps ..... 45°

Airspeed..... $V_{REF\ 45}$

CAUTION: MULTIPLY THE FLAPS 45° UNFACTORED LANDING DISTANCE BY 1.70.

- Thrust Reversers, Steering and Ground Spoiler may not be available.
- Depending on the failed condition, Ground Idle may not be selectable.
- If the message is presented on ground, a loss of the main brake capacity may occur (below 10 kt ground speed) and steering may not be available.
  Refer to the associated procedures for each case.

END

STEERING SYSTEM INOPERATIVE OR UNCOMMANDED SWERVING ON GROUND

EICAS Caution: STEER INOP may be presented.

Steering Handwheel..... DO NOT USE
Steering Disengagement Button..... PRESS

Control the airplane using differential brakes and rudder.

If serviceable, consider the use of differential thrust reverser.

END

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(CREW/PASSENGER) OXYGEN LOW PRESSURE

EICAS Caution: OXYGEN LO PRESS or
CREW (PAX) OXYGEN LO PRESS

MFD Indication: Oxygen pressure red or amber.

Altitude..... MEA OR 10’000 FT, WHICHEVER IS HIGHER

END

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STALL PROTECTION INOPERATIVE

EICAS Warning: SPS 1 (2) INOP
EICAS Caution: SPS ADVANCED

Affected Stall Protection Cutout Button ..... PUSH OUT

– The following messages will be displayed:
EICAS Warning: SPS 1 (2) INOP
EICAS Caution: STICK PUSHER FAIL

Minimum Airspeed ..... FLAP MANEUVERING SPEED (PD-2)

Avoid skidding the airplane.

Add 5 KIAS to approach and go-around speeds.

Landing configuration:

Landing Gear ..... DOWN
Flaps ..... 45°
Airspeed ..... $V_{REF\ 45}$ + 5 KIAS

NOTE: - The remaining stick shaker is available.
- Stick pusher is not available.

CAUTION: MULTIPLY THE FLAPS 45° UNFACTORED LANDING DISTANCE BY 1.10.

END

STICK PUSHER FAILURE

EICAS Warning: SPS 1-2 INOP
EICAS Caution: STICK PUSHER FAIL

Control Column..... TOWARD NEUTRAL

Minimum Airspeed..... FLAP MANEUVERING SPEED (PD-2)

CONTROL COLUMN JAMMED? **No**

Yes

JAMMED ELEVATOR
Procedure (NAP-8)..... ACCOMPLISH

END

Both stick shaker 1 and 2 are still available.

Add 5 KIAS to approach and go-around speeds.

Landing configuration:

Landing Gear..... DOWN
Flaps ..... 45°
Airspeed..... V_{REF45} + 5 KIAS

CAUTION: MULTIPLY THE FLAPS 45° UNFACTORED LANDING DISTANCE BY 1.10.

END

TAKEOFF CONFIGURATION WARNING

EICAS Warning: NO TAKEOFF CONFIG
Aural Warning: Voice Messages TAKEOFF-BRAKES, TAKEOFF-FLAPS, TAKEOFF-TRIM, TAKEOFF-SPOILERS
EICAS Indication: Spoiler and pitch trim may be red.

Do not takeoff.
Airplane Configuration ..... CORRECT
TO Config Button..... PRESS

END

ADVANCED STALL PROTECTION

EICAS Caution: SPS ADVANCED

Above 25’000 ft:
Minimum Airspeed .....150 KIAS

Below 25’000 ft:
Minimum Airspeed .....FLAP MANEUVERING SPEED (PD-2)

Add 5 KIAS to approach and go-around speeds.

Landing configuration:
Landing Gear .....DOWN
Flaps .....45°
Airspeed .....V_{REF45} + 5 KIAS

CAUTION: MULTIPLY THE FLAPS 45° UNFACTORED LANDING DISTANCE BY 1.10.

END

AURAL WARNING FAIL

EICAS Caution: AURAL WARN FAIL

Visually monitor every EICAS, MFD and PFD indication specially related to TCAS, Windshear Detection, GPWS, IC-600, Fire Detection, Stall Protection, Trims, Flaps, Brakes, Spoilers, Radio Altimeter, Autopilot, Landing gear, ADC, Pressurization, SELCAL. No aural warning will be available.

Do not perform CAT II or CAT III approaches.

END

GPWS INOPERATIVE

EICAS Caution: GPWS INOP or
GPWS INOP and TERR INOP (for EGPWS)

Monitor visually any trend toward terrain contact, excessive sink rate, marginal flight path and airplane configuration. No aural warning related to the system will be available.

END

WINDSHEAR DETECTION INOPERATIVE

EICAS Caution: WINDSHEAR INOP

Windshear detection is not available.

END

WIND COMPONENT TABLE

ANGLE BETWEEN WIND DIRECTION AND HEADING (LEFT OR RIGHT)

WIND SPEED (kt)	10	20	30	40	50	60	70	80	100	110	120	130	140	150	160	170	10	20	30	40	50	60	70	80	100	110	120	130	140	150	160	170	WIND SPEED (kt)
	HEADWIND COMPONENT (kt)								TAILWIND COMPONENT (kt)								CROSSWIND COMPONENT (kt)																
5	5	5	4	4	3	3	2	1	-1	-2	-3	-3	-4	-4	-5	-5	1	2	3	3	4	4	5	5	5	9	10	13	15	17	19	20	5
10	10	9	9	8	6	5	3	2	-2	-3	-5	-6	-8	-9	-9	-10	2	3	5	6	8	9	9	10	10	18	20	25	29	33	36	39	10
15	15	14	13	11	10	8	5	3	-3	-5	-8	-10	-11	-13	-14	-15	3	5	8	10	11	13	14	15	15	26	30	36	41	46	50	54	15
20	20	19	(17)	15	13	10	7	3	-3	-7	-10	-13	-15	-17	-19	-20	3	7	(10)	13	15	17	19	20	20	35	40	47	53	59	64	69	20
25	25	23	22	19	16	13	9	4	-4	-9	-13	-16	-19	-22	-23	-25	4	9	13	16	19	22	23	25	25	43	50	59	66	73	79	84	25
30	30	28	26	23	19	15	10	5	-5	-10	-15	-19	-23	-26	-28	-30	5	10	15	19	23	26	28	30	30	52	60	71	79	87	94	100	30
35	34	33	30	27	22	18	12	6	-6	-12	-18	-22	-27	-30	-33	-34	6	12	18	22	27	30	33	34	35	60	70	83	92	102	110	116	35
40	39	38	35	31	26	20	14	7	-7	-14	-20	-26	-31	-35	-38	-39	7	14	20	26	31	35	38	39	40	69	80	95	106	116	126	133	40
45	44	42	39	34	29	23	15	8	-8	-15	-23	-29	-34	-39	-42	-44	8	15	23	29	34	39	42	44	45	78	90	107	119	131	141	149	45
50	49	47	43	38	32	25	17	9	-9	-17	-25	-32	-38	-43	-47	-49	9	17	25	32	38	43	47	49	50	86	100	118	132	145	157	165	50
WIND SPEED (kt)	10	20	30	40	50	60	70	80	100	110	120	130	140	150	160	170	10	20	30	40	50	60	70	80	100	110	120	130	140	150	160	170	WIND SPEED (kt)

Example: Given Wind Speed=20 kt and Angle (between wind and nose)= 30°, the Headwind Component is 17 kt and the Crosswind component is 10 kt.

Shaded areas are not allowed for CAT II operations.

REFERENCE CROSSWIND VALUES

Surface Condition	Dry/ Wet	Compacted Snow	Standing Water/ Slush/ Dry Snow	-	Ice
Brake Action	-	Good	-	Medium	Poor
Friction Coeficient	-	0.40	-	0.30	<0.20
Reference Crosswind	30 kt	25 kt	20 kt	17 kt	10 kt

PITCH TRIM UNITS						
EMB-145	CG POSITION (%)	LESS THAN OR EQUAL TO 27.5	27.6 UP TO 32.5	32.6 UP TO 36.5	36.6 UP TO 41.5	ABOVE OR EQUAL TO 41.6
PITCH TRIM UNITS		8	7	6	5	4

FLAP RETRACTION SCHEDULE	
For a flaps 9° takeoff:	
Flaps 9° to UP	V_2 + 15 KIAS
For a flap 18° takeoff:	
Flaps 18° to 9°	V_2 + 10 KIAS
Flaps 9° to UP	V_2 + 30 KIAS
For a flaps 22° takeoff (ERJ-145 only)	
Flaps 22° to 9°	V_2 + 5 KIAS
Flaps 9° to UP	V_2 + 25 KIAS

FLAP MANEUVERING SPEED		
GEAR-FLAP	No Icing Conditions	Icing Conditions
UP-0°	180 KIAS	200 KIAS
UP/DN-9°	160 KIAS	160 KIAS
UP/DN-18°/22°	140 KIAS	150 KIAS
DN-45°	140 KIAS	140 KIAS

UNRELIABLE AIRSPEED TABLES (CLB Thrust Mode)

Airplane: EMB-145 – Engine: AE3007A1 & A1P – Anti-Ice: OFF

PRESSURE ALTITUDE (ft)		WEIGHT (kg)					
		14000	16000	18000	20000	22000	24000
0 (240 KIAS)	Pitch (deg)	13	12	11	10	10	9
	V/S (ft/min)	4700	4000	3400	3000	2600	2300
10000 (240 KIAS)	Pitch (deg)	10	9	8	8	8	7
	V/S (ft/min)	3700	3100	2700	2300	2000	1700
20000 (0.56 M)	Pitch (deg)	7	6	6	5	5	5
	V/S (ft/min)	3400	2800	2300	1900	1600	1300
30000 (0.56 M)	Pitch (deg)	7	7	7	8	7	7
	V/S (ft/min)	2600	2000	1600	1300	1000	700
37000 (0.56 M)	Pitch (deg)	7	7	7	8	8	-
	V/S (ft/min)	1700	1300	900	500	200	

UNRELIABLE AIRSPEED TABLES (Cruise)

Airplane: EMB-145 – Engine: AE3007A1 & A1P – Anti-Ice: OFF

PRESSURE ALTITUDE (ft)		WEIGHT (kg)					
		14000	16000	18000	20000	22000	24000
15000 (250 KIAS)	Pitch (deg)	1	1	2	2	2	3
	N1 (%)	68.9	69.9	71.0	72.2	73.3	74.6
20000 (250 KIAS)	Pitch (deg)	1	1	2	2	2	2
	N1 (%)	72.2	73.4	74.7	76.1	77.5	78.9
25000 (250 KIAS)	Pitch (deg)	1	1	2	2	2	2
	N1 (%)	76.3	77.7	79.2	80.5	81.5	82.6
30000 (0.63 M)	Pitch (deg)	1	1	2	2	2	2
	N1 (%)	78.7	80.0	81.1	82.3	83.5	84.9
37000 (0.63 M)	Pitch (deg)	2	2	2	3	3	3
	N1 (%)	80.1	81.8	83.6	85.8	89.0	91.6

UNRELIABLE AIRSPEED TABLES (Flight Idle Descent)

Airplane: EMB-145 – Engine: AE3007A1 & A1P – Anti-Ice: OFF

PRESSURE ALTITUDE (ft)		WEIGHT (kg)					
		14000	16000	18000	20000	22000	24000
0 (240 KIAS)	Pitch (deg)	-3	-2	-2	-1	-1	0
	V/S (ft/min)	-1800	-1700	-1600	-1500	-1500	-1500
10000 (240 KIAS)	Pitch (deg)	-3	-2	-2	-1	-1	0
	V/S (ft/min)	-2000	-1900	-1800	-1800	-1700	-1700
20000 (240 KIAS)	Pitch (deg)	-2	-2	-1	-1	0	0
	V/S (ft/min)	-2200	-2100	-2000	-1900	-1900	-1900
30000 (240 KIAS)	Pitch (deg)	-2	-1	-1	0	0	0
	V/S (ft/min)	-2500	-2400	-2200	-2100	-2100	-2000
37000 (240 KIAS)	Pitch (deg)	-1	-1	0	0	1	1
	V/S (ft/min)	-2400	-2200	-2100	-2100	-2000	-2000

UNRELIABLE AIRSPEED TABLES (Holding)

Airplane: EMB-145 – Engine: AE3007A1 & A1P – Anti-Ice: OFF

PRESSURE ALTITUDE (ft)		WEIGHT (kg)					
		14000	16000	18000	20000	22000	24000
5000 (200 KIAS)	Pitch (deg)	3	3	4	5	5	6
	N1 (%)	54.3	56.0	57.7	59.5	61.5	63.5
10000 (200 KIAS)	Pitch (deg)	3	3	4	5	5	6
	N1 (%)	57.8	59.7	61.6	63.5	65.5	67.5

UNRELIABLE AIRSPEED TABLES (Terminal Area)					
Terminal Area (5000 ft) - %N1 for Level Flight					
Airplane: EMB-145 – Engine: AE3007A1 & A1P – Anti-Ice: OFF					
FLAP POSITION (V_{REF} + INCREMENT)		**WEIGHT (kg)**			
		14000	**16000**	**18000**	**20000**
0 (V_{REF45} + 30)	Pitch (deg) N1 (%)	7 49.5	7 52.7	7 55.5	8 58.2
9 (V_{REF45} + 15)	Pitch (deg) N1 (%)	7 52.3	7 55.5	7 58.4	8 61.2

UNRELIABLE AIRSPEED TABLES (Final Approach)					
Final Approach (1500 ft) - %N1 for 3° Glideslope					
Airplane: EMB-145 – Engine: AE3007A1 & A1P – Anti-Ice: OFF					
FLAP POSITION (V_{REF} + INCREMENT)		**WEIGHT (kg)**			
		14000	**16000**	**18000**	**20000**
22 (V_{REF22} + 10)	Pitch (deg) N1 (%)	3 48.3	3 51.3	3 53.8	3 56.1
45 (V_{REF45} + 10)	Pitch (deg) N1 (%)	-1 59.3	0 62.6	0 65.6	0 68.1

UNRELIABLE AIRSPEED TABLES (CLB Thrust Mode)

Airplane: EMB-145 – Engine: AE3007A1 & A1P – Anti-Ice: ON

PRESSURE ALTITUDE (ft)		WEIGHT (kg)					
		14000	16000	18000	20000	22000	24000
0 (240 KIAS)	Pitch (deg)	12	11	10	10	9	9
	V/S (ft/min)	4600	3900	3400	3000	2600	2300
10000 (240 KIAS)	Pitch (deg)	8	8	7	7	7	6
	V/S (ft/min)	3400	2800	2400	2000	1700	1500
20000 (0.56 M)	Pitch (deg)	6	5	5	5	5	5
	V/S (ft/min)	2900	2300	1900	1600	1300	1000
30000 (0.56 M)	Pitch (deg)	6	6	6	6	6	6
	V/S (ft/min)	1900	1400	1100	800	500	300
37000 (0.56 M)	Pitch (deg)	6	6	7	7	-	-
	V/S (ft/min)	1100	700	400	100		

UNRELIABLE AIRSPEED TABLES (Cruise)

Airplane: EMB-145 – Engine: AE3007A1 & A1P – Anti-Ice: ON

PRESSURE ALTITUDE (ft)		WEIGHT (kg)					
		14000	16000	18000	20000	22000	24000
15000 (250 KIAS)	Pitch (deg)	1	1	2	2	2	3
	N1 (%)	68.9	69.9	71.0	72.2	73.3	74.6
20000 (250 KIAS)	Pitch (deg)	1	1	2	2	2	2
	N1 (%)	72.2	73.4	74.7	76.1	77.5	78.9
25000 (250 KIAS)	Pitch (deg)	1	1	2	2	2	2
	N1 (%)	76.3	77.7	79.2	80.5	81.5	82.6
30000 (0.63 M)	Pitch (deg)	1	1	2	2	2	2
	N1 (%)	78.7	80.0	81.1	82.3	83.5	84.9
37000 (0.63 M)	Pitch (deg)	2	2	2	3	3	3
	N1 (%)	80.1	81.8	83.6	85.8	89.0	91.6

UNRELIABLE AIRSPEED TABLES (Flight Idle Descent)

Airplane: EMB-145 – Engine: AE3007A1 & A1P – Anti-Ice: ON

PRESSURE ALTITUDE (ft)		WEIGHT (kg)					
		14000	16000	18000	20000	22000	24000
0 (240 KIAS)	Pitch (deg)	-1	0	0	0	1	1
	V/S (ft/min)	-900	-900	-900	-900	-900	-1000
10000 (240 KIAS)	Pitch (deg)	-1	0	0	0	1	1
	V/S (ft/min)	-1200	-1200	-1200	-1200	-1200	-1200
20000 (240 KIAS)	Pitch (deg)	-1	0	0	0	1	1
	V/S (ft/min)	-1300	-1300	-1300	-1300	-1300	-1400
30000 (240 KIAS)	Pitch (deg)	0	0	0	1	1	1
	V/S (ft/min)	-1400	-1400	-1400	-1400	-1400	-1400
37000 (240 KIAS)	Pitch (deg)	0	0	0	1	1	2
	V/S (ft/min)	-1700	-1600	-1600	-1500	-1500	-1500

UNRELIABLE AIRSPEED TABLES (Holding)

Airplane: EMB-145 – Engine: AE3007A1 & A1P – Anti-Ice: ON

PRESSURE ALTITUDE (ft)		WEIGHT (kg)					
		14000	16000	18000	20000	22000	24000
5000 (200 KIAS)	Pitch (deg)	3	3	4	5	5	6
	N1 (%)	54.3	56.0	57.7	59.5	61.5	63.5
10000 (200 KIAS)	Pitch (deg)	3	3	4	5	5	6
	N1 (%)	57.8	59.7	61.6	63.5	65.5	67.5

UNRELIABLE AIRSPEED TABLES (Terminal Area)					
Terminal Area (5000 ft) - %N1 for Level Flight					
Airplane: EMB-145 – Engine: AE3007A1 & A1P – Anti-Ice: ON					
FLAP POSITION (V_{REF} + INCREMENT)		**WEIGHT (kg)**			
		14000	**16000**	**18000**	**20000**
0 (V_{REF45} + 30)	Pitch (deg)	7	7	7	8
	N1 (%)	49.5	52.7	55.5	58.2
9 (V_{REF45} + 15)	Pitch (deg)	7	7	7	8
	N1 (%)	52.3	55.5	58.4	61.2

UNRELIABLE AIRSPEED TABLES (Final Approach)					
Final Approach (1500 ft) - %N1 for 3° Glideslope					
Airplane: EMB-145 – Engine: AE3007A1 & A1P – Anti-Ice: ON					
FLAP POSITION (V_{REF} + INCREMENT)		**WEIGHT (kg)**			
		14000	**16000**	**18000**	**20000**
22 (V_{REF22} + 10)	Pitch (deg)	3	3	3	3
	N1 (%)	48.3	51.3	53.8	56.1
45 (V_{REF45} + 10)	Pitch (deg)	-1	0	0	0
	N1 (%)	59.3	62.6	65.6	68.1

TAKEOFF SPEEDS (Balanced Field Length)

V1/VR/V2 SPEEDS
T/O-1 MODE - NORMAL V_2 - FLAPS 9°

PRESSURE ALTITUDE (ft)	STATIC AIR TEMPERATURE (°C)				
SL ➔	-40 to 45	46 to 49	50 to 50	-	-
1000 ➔	-40 to 42	43 to 46	47 to 48	-	-
2000 ➔	-40 to 38	39 to 43	44 to 46	-	-
3000 ➔	-40 to 34	35 to 39	40 to 44	-	-
4000 ➔	-40 to 29	30 to 35	36 to 40	41 to 42	-
5000 ➔	-40 to 25	26 to 30	31 to 36	37 to 40	-
6000 ➔	-40 to 21	22 to 26	27 to 32	33 to 37	38 to 38
7000 ➔	-	-40 to 21	22 to 27	28 to 33	34 to 36
8000 ➔	-	-40 to 17	18 to 22	23 to 28	29 to 34
	↓	↓	↓	↓	↓
WEIGHT (kg)	**V1 VR V2**	**V1 VR V2**	**V1 VR V2**	**V1 VR V2**	**V1 VR V2**
12000	101 104 122	98 101 118	96 98 113	94 95 109	92 93 107
12500	101 104 121	98 101 117	96 99 112	94 96 109	94 97 109
13000	101 104 120	98 102 116	95 100 112	95 100 111	97 101 111
13500	100 104 120	97 101 115	96 101 113	98 101 113	100 102 113
14000	100 104 119	98 101 115	100 102 115	101 103 115	103 104 115
14500	100 103 118	101 103 117	102 104 117	104 105 117	105 106 117
15000	102 105 119	104 106 119	105 107 119	107 108 119	108 109 119
15500	105 107 121	106 108 121	108 109 121	109 110 121	110 111 121
16000	108 110 123	109 110 123	111 111 123	112 112 123	113 113 123
16500	110 112 125	112 113 125	113 114 125	114 115 125	116 116 125
17000	113 114 127	114 115 127	116 116 127	117 117 127	118 118 127
17500	116 116 128	117 117 129	118 118 129	119 119 129	120 120 129
18000	118 119 130	119 119 130	120 120 130	121 121 130	122 122 130
18500	120 121 132	121 122 132	122 122 132	123 123 132	124 124 132
19000	123 123 134	124 124 134	125 125 134	125 125 134	126 126 134
19500	125 125 135	126 126 136	127 127 136	127 127 136	128 128 136
20000	127 127 137	128 128 137	129 129 137	130 130 137	130 130 137
20500	129 129 139	130 130 139	131 131 139	131 131 139	132 132 139
21000	131 131 140	132 132 140	133 133 141	133 133 141	134 134 141
21500	133 133 142	134 134 142	134 134 142	135 135 142	136 136 142
22000	135 135 144	135 135 144	136 136 144	137 137 144	138 138 144

FINAL SEGMENT SPEED (V_{FS})

WEIGHT (kg)	V_{FS} (KIAS)	WEIGHT (kg)	V_{FS} (KIAS)
12000	132	17500	159
12500	135	18000	161
13000	137	18500	163
13500	140	19000	165
14000	142	19500	167
14500	145	20000	169
15000	147	20500	171
15500	150	21000	172
16000	152	21500	174
16500	154	22000	176
17000	156		

TAKEOFF SPEEDS (Balanced Field Length)					
V1/VR/V2 SPEEDS T/O-1 MODE - NORMAL V_2 - FLAPS 22°					
PRESSURE ALTITUDE (ft)	**STATIC AIR TEMPERATURE (°C)**				
SL →	-40 to 45	46 to 49	50 to 50	-	-
1000 →	-40 to 41	42 to 46	47 to 48	-	-
2000 →	-40 to 38	39 to 42	43 to 46	-	-
3000 →	-40 to 33	34 to 38	39 to 43	44 to 44	-
4000 →	-40 to 29	30 to 34	35 to 39	40 to 42	-
5000 →	-40 to 24	25 to 30	31 to 35	36 to 40	-
6000 →	-40 to 20	21 to 25	26 to 31	32 to 36	37 to 38
7000 →	-	-40 to 21	22 to 26	27 to 32	33 to 36
8000 →	-	-40 to 17	18 to 21	22 to 27	28 to 34
	↓	↓	↓	↓	↓
WEIGHT (kg)	**V1 VR V2**	**V1 VR V2**	**V1 VR V2**	**V1 VR V2**	**V1 VR V2**
12000	104 107 118	101 104 114	99 101 110	96 98 107	94 95 103
12500	104 107 117	101 104 113	99 101 110	96 98 106	94 95 103
13000	103 107 116	101 104 113	98 101 109	96 98 106	94 96 104
13500	103 107 116	100 104 112	98 101 109	96 98 107	94 97 105
14000	102 106 115	100 103 112	98 100 109	95 99 107	93 98 106
14500	102 106 115	100 103 111	98 101 109	95 100 108	94 100 107
15000	102 106 114	100 103 111	98 102 110	96 102 109	98 102 108
15500	103 106 114	100 104 112	98 103 111	98 103 110	102 104 110
16000	103 106 114	100 105 113	98 105 112	102 105 112	105 106 112
16500	102 107 115	100 106 114	102 106 113	105 107 113	107 107 113
17000	102 107 116	102 107 115	105 108 115	108 108 115	109 109 115
17500	102 109 117	105 109 117	108 110 117	110 110 117	111 111 117
18000	105 110 118	108 111 118	111 111 118	112 112 118	112 112 118
18500	108 112 119	111 113 119	113 113 119	113 114 119	114 114 119
19000	111 114 121	114 114 121	115 115 121	115 115 121	116 116 121
19500	114 115 122	116 116 122	116 116 122	117 117 122	117 117 122
20000	117 117 123	117 117 123	118 118 123	118 118 123	119 119 123
20500	118 118 124	119 119 124	119 119 124	120 120 124	120 120 124
21000	120 120 126	120 120 126	121 121 126	121 121 126	122 122 126
21500	121 121 127	121 122 127	122 122 127	122 122 127	123 123 127
22000	122 122 128	123 123 128	123 123 128	124 124 128	124 124 128

TAKEOFF SPEEDS (Balanced Field Length)

V1/VR/V2 SPEEDS
ALT T/O-1 MODE - NORMAL V_2 - FLAPS 9°

PRESSURE ALTITUDE (ft)	STATIC AIR TEMPERATURE (°C)				
SL ➔	-40 to 47	48 to 50	-	-	-
1000 ➔	-40 to 44	45 to 47	48 to 48	-	-
2000 ➔	-40 to 40	41 to 44	45 to 46	-	-
3000 ➔	-40 to 37	38 to 41	42 to 44	-	-
4000 ➔	-40 to 32	33 to 37	38 to 41	42 to 42	-
5000 ➔	-40 to 28	29 to 33	34 to 37	38 to 40	-
6000 ➔	-40 to 24	25 to 28	29 to 33	34 to 38	-
7000 ➔	-	-40 to 24	25 to 29	30 to 33	34 to 36
8000 ➔	-	-40 to 19	20 to 24	25 to 29	30 to 34
	↓	↓	↓	↓	↓
WEIGHT (kg)	**V1 VR V2**	**V1 VR V2**	**V1 VR V2**	**V1 VR V2**	**V1 VR V2**
12000	101 104 121	98 101 118	96 98 114	94 96 111	91 93 108
12500	100 103 120	98 101 117	96 98 114	93 96 110	93 95 109
13000	100 103 119	98 101 116	95 98 113	95 97 111	96 98 111
13500	100 103 119	97 100 116	96 99 113	98 99 113	99 100 113
14000	99 103 118	98 100 115	99 101 115	101 102 115	102 103 115
14500	100 102 118	101 103 117	102 104 117	103 105 117	105 105 117
15000	103 105 119	104 105 119	105 106 119	106 107 119	107 108 119
15500	105 107 121	106 108 121	108 109 121	109 109 121	110 110 121
16000	108 109 123	109 110 123	110 111 123	111 112 123	112 113 123
16500	111 112 125	112 113 125	113 113 125	114 114 125	115 115 125
17000	113 114 127	114 115 127	115 116 127	116 116 127	117 117 127
17500	116 116 129	117 117 129	118 118 129	118 119 129	119 119 129
18000	118 119 130	119 119 130	120 120 130	121 121 130	121 121 130
18500	120 121 132	121 121 132	122 122 132	123 123 132	124 124 132
19000	123 123 134	123 124 134	124 124 134	125 125 134	126 126 134
19500	125 125 135	126 126 136	126 126 136	127 127 136	128 128 136
20000	127 127 137	128 128 137	128 128 137	129 129 137	130 130 137
20500	129 129 139	130 130 139	130 130 139	131 131 139	132 132 139
21000	131 131 140	132 132 140	132 132 141	133 133 141	134 134 141
21500	133 133 142	133 133 142	134 134 142	135 135 142	135 135 142
22000	135 135 144	135 135 144	136 136 144	137 137 144	137 137 144

TAKEOFF SPEEDS (Unbalanced Field Length)					
VR/V2 SPEEDS T/O-1 MODE - NORMAL V_2 - FLAPS 18°					
PRESSURE ALTITUDE (ft)	**STATIC AIR TEMPERATURE (°C)**				
SL →	-40 to 34	35 to 39	40 to 45	46 to 50	-
1000 →	-40 to 31	32 to 36	37 to 41	42 to 47	48 to 48
2000 →	-40 to 27	28 to 33	34 to 38	39 to 44	45 to 46
3000 →	-	-40 to 29	30 to 35	36 to 41	42 to 44
4000 →	-	-40 to 26	27 to 32	33 to 39	40 to 42
5000 →	-	-40 to 22	23 to 30	31 to 38	39 to 40
6000 →	-	-	-40 to 24	25 to 32	33 to 38
7000 →	-	-	-40 to 20	21 to 27	28 to 35
8000 →	-	-	-40 to 16	17 to 23	24 to 30
	↓	↓	↓	↓	↓
WEIGHT (kg)	**VR V2**	**VR V2**	**VR V2**	**VR V2**	**VR V2**
12000	104 117	100 112	99 110	98 108	97 105
12500	104 116	102 113	100 111	99 109	98 106
13000	104 116	103 114	102 112	101 110	100 107
13500	105 117	104 115	103 113	102 111	101 109
14000	107 118	106 116	105 114	104 112	103 110
14500	108 119	107 117	106 115	105 113	104 111
15000	109 120	108 118	107 116	107 114	106 112
15500	110 120	109 119	108 117	108 115	107 114
16000	111 121	110 119	110 118	109 117	109 115
16500	112 121	111 120	110 118	110 117	110 117
17000	112 122	112 120	111 119	111 118	112 118
17500	113 122	112 121	112 120	113 120	114 120
18000	114 123	113 122	114 121	115 121	116 121
18500	115 124	115 123	116 123	117 123	118 123
19000	116 125	117 125	118 125	119 125	120 125
19500	118 126	119 126	120 126	121 126	122 126
20000	120 128	121 128	122 128	123 128	124 128
20500	122 129	123 129	124 129	125 129	126 129
21000	124 131	124 131	125 131	127 131	128 131
21500	125 132	126 132	127 132	128 132	129 132
22000	127 134	128 134	129 134	130 134	131 134

NOTE: For determining V_1, enter the appropriate takeoff analysis with the Static Air Temperature and wind and read V_1 for the Maximum Takeoff Weight. Use the lower between this V_1 and the V_R obtained from the above table as the V_1 for the actual Takeoff Weight.

APPROACH CLIMB SPEED (V_{APPCLB}), LANDING CLIMB & REFERENCE SPEEDS (V_{REF}) and FINAL SEGMENT SPEED (V_{FS})				
Weight (kg)	**Approach Climb Speed (KIAS)**	**Landing Climb & Reference Speeds (KIAS)**		**V_{FS} (KIAS)**
	Flaps 9°	**Flaps 45°**	**Flaps 22°**	
12000	124	103	108	132
12500	127	105	110	135
13000	129	107	112	137
13500	132	109	114	140
14000	134	111	116	142
14500	136	113	118	145
15000	138	115	120	147
15500	141	117	122	150
16000	143	119	124	152
16500	145	120	126	154
17000	147	122	128	156
17500	149	124	130	159
18000	151	125	131	161
18500	153	127	133	163
19000	155	128	135	165
19500	157	130	136	167
20000	159	131	138	169
20500	161	133	140	171
21000	163	134	141	172
21500	165	135	143	174
22000	167	137	144	176

APPROACH SPEED (V_{APP})
$V_{APP} = V_{REF}$ + ½ headwind + full gust

HOLDING - (All Engines)

CRUISE CONFIGURATION, BLEED OPEN
ANTI-ICE: OFF
MINIMUM FUEL CONSUMPTION SPEED, STANDARD ATMOSPHERE

WEIGHT kg			ALTITUDE								
			0	1500	5000	10000	15000	20000	25000	30000	37000
22000	IAS	kt	178	177	174	170	169	169	171	176	184
	N1	%	57	58	60.7	65	68.9	72.9	77.6	81.8	89.3
	FF	kg/h/Eng	482	475	462	448	439	437	437	441	461
21000	IAS	kt	176	174	171	167	165	165	166	170	181
	N1	%	55.8	56.8	59.4	63.7	67.8	71.6	76.4	80.5	87.6
	FF	kg/h/Eng	464	457	443	428	419	415	415	418	435
20000	IAS	kt	173	171	168	164	161	161	162	165	175
	N1	%	54.5	55.6	58.1	62.4	66.6	70.3	75	79.2	85.8
	FF	kg/h/Eng	447	439	425	409	399	394	394	395	409
19000	IAS	kt	170	169	165	161	158	157	157	160	169
	N1	%	53.3	54.3	56.8	60.9	65.2	69	73.5	78	84.1
	FF	kg/h/Eng	429	422	407	390	379	373	372	373	384
18000	IAS	kt	168	166	162	157	154	153	153	155	163
	N1	%	52	52.9	55.4	59.4	63.8	67.7	72	76.7	82.7
	FF	kg/h/Eng	412	404	389	372	360	353	351	351	360
17000	IAS	kt	165	163	159	154	151	149	148	150	156
	N1	%	50.6	51.6	54	57.9	62.2	66.5	70.4	75.2	81.4
	FF	kg/h/Eng	395	387	371	353	341	333	330	329	336
16000	IAS	kt	162	160	156	151	147	145	144	145	150
	N1	%	49.3	50.2	52.5	56.3	60.6	65	68.8	73.6	80
	FF	kg/h/Eng	379	371	354	335	322	313	309	308	313
15000	IAS	kt	160	158	153	148	144	141	140	140	144
	N1	%	47.9	48.7	50.9	54.7	58.8	63.3	67.2	71.7	78.3
	FF	kg/h/Eng	363	354	337	318	303	294	289	288	290
14000	IAS	kt	157	155	150	145	140	137	135	135	138
	N1	%	46.5	47.3	49.3	52.9	56.9	61.4	65.6	69.8	76.5
	FF	kg/h/Eng	347	338	321	300	285	275	269	266	268
13000	IAS	kt	154	152	147	141	136	133	131	130	132
	N1	%	45	45.8	47.7	51.2	55.1	59.4	63.9	67.8	74.8
	FF	kg/h/Eng	332	323	305	283	268	257	249	246	247
12000	IAS	kt	152	149	144	138	133	129	126	125	126
	N1	%	43.5	44.2	46.1	49.3	53.1	57.3	61.9	65.9	72.8
	FF	kg/h/Eng	317	308	289	267	250	238	230	226	226

HOLDING - (All Engines)

CRUISE CONFIGURATION, BLEED OPEN
AIRSPEED: 1.3 V_S OR 200 KIAS WHICHEVER IS HIGHER
ANTI-ICE: ON (NO ICE ACCRETION)
STANDARD ATMOSPHERE

WEIGHT kg			ALTITUDE								
			0	1500	5000	10000	15000	20000	25000	30000	37000
22000	IAS	kt	200	200	200	200	200	200	200	200	200
	N1	%	58.1	59.2	62	66.1	69.7	73.8	78.6	82.7	91.1
	FF	kg/h/Eng	553	545	528	508	495	489	487	491	512
21000	IAS	kt	200	200	200	200	200	200	200	200	200
	N1	%	57.2	58.3	61	65.2	68.9	72.7	77.6	81.6	89.5
	FF	kg/h/Eng	539	530	513	493	478	471	469	471	489
20000	IAS	kt	200	200	200	200	200	200	200	200	200
	N1	%	56.3	57.4	60	64.2	68.1	71.7	76.5	80.6	87.7
	FF	kg/h/Eng	525	516	498	478	463	454	453	453	468
19000	IAS	kt	200	200	200	200	200	200	200	200	200
	N1	%	55.4	56.5	59	63.2	67.3	70.7	75.4	79.7	85.8
	FF	kg/h/Eng	511	503	485	463	448	438	436	436	448
18000	IAS	kt	200	200	200	200	200	200	200	200	200
	N1	%	54.5	55.6	58.1	62.2	66.3	69.8	74.2	78.8	84.7
	FF	kg/h/Eng	499	490	471	450	433	423	420	419	429
17000	IAS	kt	200	200	200	200	200	200	200	200	200
	N1	%	53.7	54.7	57.2	61.2	65.4	68.9	73.1	77.9	83.7
	FF	kg/h/Eng	486	478	459	437	420	409	404	404	411
16000	IAS	kt	200	200	200	200	200	200	200	200	200
	N1	%	52.8	53.8	56.3	60.3	64.4	68.1	72	77	82.8
	FF	kg/h/Eng	475	466	447	425	407	395	389	390	395
15000	IAS	kt	200	200	200	200	200	200	200	200	200
	N1	%	52	53	55.4	59.3	63.5	67.4	71	75.9	81.9
	FF	kg/h/Eng	464	455	436	413	395	383	376	376	380
14000	IAS	kt	200	200	200	200	200	200	200	200	200
	N1	%	51.2	52.2	54.6	58.4	62.6	66.7	70.1	74.7	80.9
	FF	kg/h/Eng	454	445	426	403	384	371	363	361	366
13000	IAS	kt	200	200	200	200	200	200	200	200	200
	N1	%	50.4	51.4	53.8	57.6	61.7	65.8	69.2	73.6	80
	FF	kg/h/Eng	445	436	416	393	374	359	351	348	354
12000	IAS	kt	200	200	200	200	200	200	200	200	200
	N1	%	49.7	50.6	53	56.8	60.8	64.9	68.4	72.5	79.2
	FF	kg/h/Eng	436	427	407	383	364	349	339	336	342

HOLDING - (All Engines)

CRUISE CONFIGURATION, BLEED OPEN
AIRSPEED: 1.3 V_S OR 200 KIAS WHICHEVER IS HIGHER
ANTI-ICE ON (WITH ICE ACCRETION)
STANDARD ATMOSPHERE

WEIGHT			ALTITUDE								
kg			0	1500	5000	10000	15000	20000	25000	30000	37000
22000	IAS	kt	200	200	200	200	200	200	200	200	200
	N1	%	58.1	59.2	62	66.1	69.7	73.8	78.6	82.7	91.1
	FF	kg/h/Eng	613	602	580	553	533	522	515	516	536
21000	IAS	kt	200	200	200	200	200	200	200	200	200
	N1	%	57.2	58.3	61	65.2	68.9	72.7	77.6	81.6	89.5
	FF	kg/h/Eng	599	588	565	538	517	504	498	496	513
20000	IAS	kt	200	200	200	200	200	200	200	200	200
	N1	%	56.3	57.4	60	64.2	68.1	71.7	76.5	80.6	87.7
	FF	kg/h/Eng	585	574	551	523	501	487	481	477	490
19000	IAS	kt	200	200	200	200	200	200	200	200	200
	N1	%	55.4	56.5	59	63.2	67.3	70.7	75.4	79.7	85.8
	FF	kg/h/Eng	572	561	537	509	487	471	464	460	469
18000	IAS	kt	200	200	200	200	200	200	200	200	200
	N1	%	54.5	55.6	58.1	62.2	66.3	69.8	74.2	78.8	84.7
	FF	kg/h/Eng	559	548	524	496	473	456	447	443	449
17000	IAS	kt	200	200	200	200	200	200	200	200	200
	N1	%	53.7	54.7	57.2	61.2	65.4	68.9	73.1	77.9	83.7
	FF	kg/h/Eng	547	536	512	483	459	442	432	428	431
16000	IAS	kt	200	200	200	200	200	200	200	200	200
	N1	%	52.8	53.8	56.3	60.3	64.4	68.1	72	77	82.8
	FF	kg/h/Eng	536	525	501	471	447	428	417	413	414
15000	IAS	kt	200	200	200	200	200	200	200	200	200
	N1	%	52	53	55.4	59.3	63.5	67.4	71	75.9	81.9
	FF	kg/h/Eng	525	514	490	460	435	416	403	399	399
14000	IAS	kt	200	200	200	200	200	200	200	200	200
	N1	%	51.2	52.2	54.6	58.4	62.6	66.7	70.1	74.7	80.9
	FF	kg/h/Eng	515	504	479	449	424	404	390	384	385
13000	IAS	kt	200	200	200	200	200	200	200	200	200
	N1	%	50.4	51.4	53.8	57.6	61.7	65.8	69.2	73.6	80
	FF	kg/h/Eng	506	494	470	439	414	393	378	371	372
12000	IAS	kt	200	200	200	200	200	200	200	200	200
	N1	%	49.7	50.6	53	56.8	60.8	64.9	68.4	72.5	79.2
	FF	kg/h/Eng	497	486	461	430	404	383	367	359	360

DRIFTDOWN TABLE

ANTI-ICE OFF

WEIGHT (KG)		INITIAL SPEED (KIAS)	GROSS LEVEL OFF ALTITUDE - FT (NET LEVEL OFF ALTITUDE - FT)		
START DRIFTDOWN	LEVEL OFF		ISA + 10 & BELOW	ISA + 15	ISA + 20
21000	20200	172	20570 (15800)	20450 (15720)	20100 (15470)
20000	19200	169	21980 (17430)	21820 (17330)	21380 (17100)
19000	18300	165	23510 (19510)	23130 (19380)	22770 (18870)
18000	17400	161	25100 (21270)	24770 (21110)	24180 (20600)
17000	16500	156	26870 (22900)	26500 (22610)	25860 (22330)
16000	15500	152	28740 (24700)	28120 (24330)	27440 (23790)
15000	14600	147	30850 (26620)	30040 (26310)	28900 (25640)
14000	13600	142	32740 (28580)	31600 (27950)	30520 (27300)

ANTI-ICE ON

WEIGHT (KG)		INITIAL SPEED (KIAS)	GROSS LEVEL OFF ALTITUDE - FT (NET LEVEL OFF ALTITUDE - FT)				
START DRIFTDOWN	LEVEL OFF		ISA - 10 & BELOW	ISA - 5	ISA	ISA + 5	ISA + 10
21000	19900	173	16970 (12990)	16870 (12820)	15760 (12100)	14040 (10470)	12450 (8240)
20000	19100	169	18650 (14550)	18470 (14350)	17420 (13400)	15560 (11840)	13790 (10270)
19000	18100	165	20470 (16250)	20270 (16040)	19320 (15020)	17470 (13340)	15440 (11830)
18000	17200	161	22000 (18130)	21670 (18030)	20780 (16910)	19170 (15060)	17200 (13420)
17000	16200	157	23570 (20240)	23060 (20060)	22200 (18960)	20880 (17130)	18820 (15090)
16000	15300	152	25160 (21970)	24540 (21630)	23600 (20740)	22380 (19110)	20570 (17100)
15000	14400	147	26690 (23730)	25900 (23180)	25010 (22350)	23750 (21030)	22000 (18950)
14000	13500	142	28260 (25410)	27340 (24770)	26460 (23810)	25250 (22620)	23510 (20810)

UNFACTORED LANDING DISTANCE

UNFACTORED LANDING DISTANCE (METERS) – DRY RUNWAY
EMB-145 - FLAPS 45°
ISA CONDITIONS - SLOPE 0%

WEIGHT (kg)	ALTITUDE							
	0 ft				1000 ft			
	WIND				WIND			
	-10 kt	0 kt	10 kt	20 kt	-10 kt	0 kt	10 kt	20 kt
20000	1007	864	819	776	1029	884	839	795
19000	971	831	788	745	992	851	806	763
18000	935	799	757	715	955	817	774	732
17000	902	769	727	687	920	786	743	702
16000	868	738	697	658	885	754	713	673
15000	832	705	666	627	848	720	680	641
14000	794	671	633	595	810	685	646	608
13000	756	637	599	563	770	650	612	575
12000	717	602	565	530	731	614	577	542

WEIGHT (kg)	ALTITUDE							
	2000 ft				3000 ft			
	WIND				WIND			
	-10 kt	0 kt	10 kt	20 kt	-10 kt	0 kt	10 kt	20 kt
20000	1053	906	859	815	1077	927	881	835
19000	1014	871	826	782	1037	891	846	802
18000	976	836	792	749	998	856	811	768
17000	940	803	760	719	959	821	778	735
16000	904	770	729	688	922	788	745	704
15000	866	736	695	656	884	752	711	671
14000	826	700	661	622	843	716	676	637
13000	786	664	626	588	802	678	640	602
12000	745	627	590	554	760	640	603	566

WEIGHT (kg)	ALTITUDE							
	4000 ft				5000 ft			
	WIND				WIND			
	-10 kt	0 kt	10 kt	20 kt	-10 kt	0 kt	10 kt	20 kt
20000	1102	951	903	857	1129	974	926	879
19000	1061	913	867	822	1086	936	889	843
18000	1020	876	831	787	1044	898	852	807
17000	980	840	796	753	1002	860	815	772
16000	942	806	763	721	963	824	781	738
15000	902	769	728	687	922	787	745	704
14000	861	732	691	652	879	748	707	667
13000	818	693	654	616	836	709	669	631
12000	776	655	617	580	792	669	631	593

UNFACTORED LANDING DISTANCE

UNFACTORED LANDING DISTANCE (METERS) – DRY RUNWAY
EMB-145 - FLAPS 22°
ISA CONDITIONS - SLOPE 0%

WEIGHT (kg)	ALTITUDE							
	0 ft				1000 ft			
	WIND				WIND			
	-10 kt	0 kt	10 kt	20 kt	-10 kt	0 kt	10 kt	20 kt
20000	1307	1132	1077	1024	1337	1160	1104	1050
19000	1254	1084	1031	978	1283	1110	1056	1003
18000	1200	1035	983	932	1227	1060	1007	955
17000	1149	989	938	889	1174	1012	961	910
16000	1099	943	894	846	1123	965	915	866
15000	1047	896	848	801	1069	916	867	820
14000	998	851	805	760	1018	870	823	777
13000	950	808	763	719	969	825	780	735
12000	900	762	718	676	917	778	734	691

WEIGHT (kg)	ALTITUDE							
	2000 ft				3000 ft			
	WIND				WIND			
	-10 kt	0 kt	10 kt	20 kt	-10 kt	0 kt	10 kt	20 kt
20000	1369	1189	1132	1077	1403	1219	1162	1105
19000	1312	1137	1082	1028	1344	1166	1110	1055
18000	1255	1085	1032	979	1284	1112	1057	1004
17000	1201	1036	984	933	1228	1061	1008	956
16000	1147	987	937	887	1173	1011	959	909
15000	1091	937	887	840	1116	958	909	860
14000	1040	889	842	795	1062	910	862	815
13000	989	843	797	752	1010	862	816	770
12000	936	795	750	707	955	813	767	723

WEIGHT (kg)	ALTITUDE							
	4000 ft				5000 ft			
	WIND				WIND			
	-10 kt	0 kt	10 kt	20 kt	-10 kt	0 kt	10 kt	20 kt
20000	1437	1251	1192	1135	1474	1284	1224	1166
19000	1376	1196	1138	1083	1410	1227	1169	1112
18000	1315	1140	1084	1030	1347	1169	1113	1058
17000	1257	1087	1033	981	1287	1114	1059	1006
16000	1200	1035	983	932	1228	1060	1008	956
15000	1140	981	931	881	1167	1005	954	904
14000	1085	931	882	834	1110	953	904	855
13000	1032	882	835	789	1054	903	855	808
12000	975	831	785	740	996	850	804	758

ADVISORY INFORMATION
EMB-145 UNFACTORED LANDING DISTANCES - CONTAMINATED RUNWAYS (m)
ALL ENGINES TYPES – ANAC CERTIFICATION
STANDING WATER 4 mm/SLUSH 4.7 mm
WET SNOW 8 mm/DRY SNOW 20 mm

WEIGHT (kg)	FLAP 22°	FLAP 45°
13000	1754	1415
13500	1806	1455
14000	1857	1495
14500	1913	1537
15000	1969	1578
15500	2025	1620
16000	2081	1661
16500	2143	1704
17000	2204	1746
17500	2265	1789
18000	2326	1831
18500	2386	1873
19000	2446	1916
19500	2506	1958
20000	2566	2000
20500	2635	2048
21000	2705	2095
21500	2774	2143
22000	2844	2191

CORRECTIONS	
ALTITUDE:	LANDING DISTANCE + 3% per 1000 ft above sea level.
WIND:	LANDING DISTANCE + 11% per 5 kt tailwind.
OVERSPEED:	LANDING DISTANCE + 9% per 5 kt above V_{REF}.

ADVISORY INFORMATION
EMB-145 UNFACTORED LANDING DISTANCES - CONTAMINATED RUNWAYS (m)
ALL ENGINES TYPES – ANAC CERTIFICATION
STANDING WATER 8 mm/SLUSH 9.4 mm
WET SNOW 16 mm/DRY SNOW 40 mm

WEIGHT (kg)	FLAP 22°	FLAP 45°
13000	1497	1258
13500	1539	1292
14000	1580	1325
14500	1625	1360
15000	1670	1395
15500	1715	1430
16000	1761	1464
16500	1810	1500
17000	1859	1536
17500	1908	1571
18000	1957	1607
18500	2006	1642
19000	2055	1678
19500	2104	1713
20000	2153	1749
20500	2209	1789
21000	2266	1830
21500	2323	1870
22000	2379	1911

CORRECTIONS	
ALTITUDE:	LANDING DISTANCE + 3% per 1000 ft above sea level.
WIND:	LANDING DISTANCE + 10% per 5 kt tailwind.
OVERSPEED:	LANDING DISTANCE + 8% per 5 kt above V_{REF}.

ADVISORY INFORMATION
EMB-145 UNFACTORED LANDING DISTANCES - CONTAMINATED RUNWAYS (m)
ALL ENGINES TYPES – ANAC CERTIFICATION
STANDING WATER 12 mm/SLUSH 14 mm
WET SNOW 24 mm/DRY SNOW 60 mm

WEIGHT (kg)	FLAP 22°	FLAP 45°
13000	1346	1172
13500	1381	1201
14000	1416	1231
14500	1455	1262
15000	1493	1293
15500	1532	1323
16000	1570	1354
16500	1612	1386
17000	1654	1417
17500	1696	1449
18000	1738	1480
18500	1780	1512
19000	1821	1543
19500	1863	1575
20000	1905	1606
20500	1953	1642
21000	2001	1678
21500	2050	1713
22000	2098	1749

CORRECTIONS	
ALTITUDE:	LANDING DISTANCE + 3% per 1000 ft above sea level.
WIND:	LANDING DISTANCE + 10% per 5 kt tailwind.
OVERSPEED:	LANDING DISTANCE + 8% per 5 kt above V_{REF}.

ADVISORY INFORMATION
EMB-145 UNFACTORED LANDING DISTANCES - CONTAMINATED RUNWAYS (m)
ALL ENGINES TYPES – ANAC CERTIFICATION
COMPACTED SNOW

WEIGHT (kg)	FLAP 22°	FLAP 45°
13000	1192	1101
13500	1223	1131
14000	1254	1161
14500	1286	1190
15000	1317	1219
15500	1348	1248
16000	1379	1278
16500	1410	1304
17000	1441	1331
17500	1472	1357
18000	1503	1384
18500	1533	1411
19000	1564	1437
19500	1595	1464
20000	1626	1491
20500	1656	1516
21000	1686	1541
21500	1717	1567
22000	1747	1592

CORRECTIONS	
ALTITUDE:	LANDING DISTANCE + 3% per 1000 ft above sea level.
WIND:	LANDING DISTANCE + 11% per 5 kt tailwind.
OVERSPEED:	LANDING DISTANCE + 7% per 5 kt above V_{REF}.

ADVISORY INFORMATION
EMB-145 UNFACTORED LANDING DISTANCES - CONTAMINATED RUNWAYS (m)
ALL ENGINES TYPES – ANAC CERTIFICATION
ICE

WEIGHT (kg)	FLAP 22°	FLAP 45°
13000	3520	2868
13500	3522	2867
14000	3523	2865
14500	3552	2890
15000	3580	2915
15500	3608	2940
16000	3636	2965
16500	3683	3002
17000	3729	3040
17500	3775	3077
18000	3822	3114
18500	3868	3152
19000	3914	3189
19500	3961	3226
20000	4007	3264
20500	4064	3307
21000	4122	3350
21500	4179	3394
22000	4236	3437

CORRECTIONS	
ALTITUDE:	LANDING DISTANCE + 3% per 1000 ft above sea level.
WIND:	LANDING DISTANCE + 24% per 5 kt tailwind.
OVERSPEED:	LANDING DISTANCE + 5% per 5 kt above V_{REF}.

INTENTIONALLY BLANK

EMERGENCY EVACUATION

Parking Brake ..... APPLY
Cabin ..... DEPRESSURIZE
Fire Extinguishing Handles ..... PULL
APU Fuel Shutoff Valve ..... PUSH IN
Fuel Pumps Pwr 1 and 2 ..... OFF
Hydraulic Elec Pumps 1 and 2 ..... OFF
Engines and APU Fire Extinguishing Bottles (if necessary) ..... DISCHARGE

Cabin Crew ..... NOTIFY
Emerg Lts ..... ON
Evacuation ..... INITIATE
ATC ..... NOTIFY
Before leaving the airplane:
Batteries 1 and 2 ..... OFF

NOTE: Cockpit door blow-out panels may be broken to be used as an alternative way to leave cockpit.

END