EMB145

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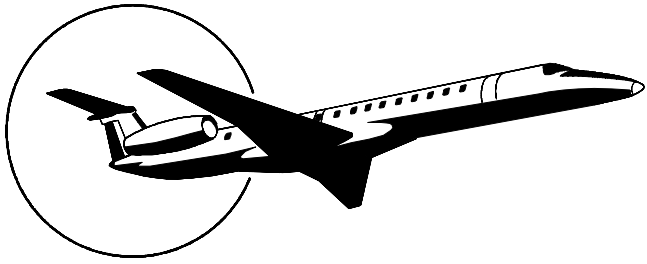

UNITED STATES

QUICK REFERENCE HANDBOOK

THIS PUBLICATION CANCELS AND SUPERSEDES THE QRH–145/1115 DATED APRIL 16, 2001; REVISION 8 DATED APRIL 04, 2005.

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APPLICABILITY

This handbook is applicable to the EMB -135, ERJ-140 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, ERJ-140 and EMB -145 models. These proc edures 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, there fore, 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-145/1153 or AFM-140/1330, 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 diamond 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

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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 procedure 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.

Shed Buses ..... OFF

Diversion ..... CONSIDER

Altitude ..... MAINTAIN

Delay the descent as long as possible.

NOTE: - The extinguishing agent duration is approximately 50 minutes.

- Advise ground crew of possible presence of Halon vapors and smoke in the compartment.

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

CONTINUES ON NEXT PAGE

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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

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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

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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

Bus Ties ..... OFF

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

CONTINUES ON NEXT PAGE

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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.

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

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NOTE: Landing gear lever can not be moved up.

Landing configuration:

Anticipate flap slower 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

IS SUITABLE AIRPORT DISTANT? **No**

Yes

Generators 2 and 4 .....PUSH IN

Battery 2 .....AUTO

CONTINUES ON NEXT PAGE

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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

Do not set Thrust Lever 1 below idle in flight.

Monitor fuel quantity indication 1 through FMS.

CONTINUES ON NEXT PAGE

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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 slower 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

Generators 1 and 3 .....PUSH IN

Battery 1 .....AUTO

Backup Battery .....PUSH OUT

WARNING: CONSIDER AN IMMEDIATE LANDING.

CONTINUES ON NEXT PAGE

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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.

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.

CONTINUES ON NEXT PAGE

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Landing configuration:

Anticipate flap slower 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

AIRPLANE OVERSPEED

Aural Warning: Voice Message HIGHSPEED

INDICATION: Airspeed and Mach indications in red range.

Airspeed.....MAX V_{MO}/M_{MO}

END

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 Button.....PUSH IN

APU Master Knob.....OFF

CAUTION: 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 (if applicable) ..... 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**

WARNING: 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 Button ..... PUSH IN**
- **Engine and APU Fire Extinguishing Bottles (if necessary) ..... DISCHARGE**
- **Fuel Pumps Pwr ..... OFF**
- **Hydraulic Elec Pumps ..... OFF**
- **EMERGENCY EVACUATION Procedure ..... ACCOMPLISH**

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**

CAUTION: 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 Button ..... **PUSH IN**

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

VTRL TK XFER (if applicable) ..... **OFF**

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

Hydraulic Elec Pumps 1 and 2 ..... **OFF**

Cabin Crew ..... **NOTIFY**

Emerg Lts ..... **ON**

EMERGENCY EVACUATION Procedure ..... **ACCOMPLISH**

ATC ..... **NOTIFY**

Before leaving the airplane:

Batteries 1 and 2 ..... **OFF**

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 Button ..... PUSH IN**
- **VTRL TK XFER (if applicable) ..... OFF**

When the airplane stops:

- **Engines and APU Fire Extinguishing Bottles (if necessary) ..... DISCHARGE**
- **Fuel Pumps Pwr 1 and 2 ..... OFF**
- **Hydraulic Elec Pumps 1 and 2 ..... OFF**
- **EMERGENCY EVACUATION Procedure ..... ACCOMPLISH**

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

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_{REF45} + 5 KIAS

CAUTION: MULTIPLY THE FLAPS 45° UNFACTORED LANDING 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

Airspeed.....MAX 200 KIAS

Pitch Trim.....AS REQUIRED

Avoid airports with anticipated turbulence or crosswind.

Landing configuration:

Landing Gear.....DOWN

Flaps.....22°

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

If both elevators are jammed, pitch trim may be used to land the airplane.

If left elevator is jammed, Stick Pusher will not be available.

Elevator authority to flare during landing may be reduced.

Do not reengage autopilot.

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 FREE? — **No** → (loop back)

Yes

END

Rudder Shutoff Sys 2 ..... PUSH IN

Rudder Shutoff Sys 1 ..... PUSH OUT

RUDDER FREE? — **No** → (loop back)

Yes

END

Airspeed ..... MAX 200 KIAS

Avoid airports with anticipated turbulence or crosswind.

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.

Landing configuration:

Landing Gear ..... DOWN

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 can be used.

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
If Emergency Descent is necessary:
- **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**

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

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

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-19).....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

N2 INDICATES ROTATION? **No**

Yes

.....WAIT 30 SECONDS

Associated Start/Stop Selector .....STOP

Ignition Selector.....AUTO

Engine .....START

END

Do not attempt another start.

ENGINE FAILURE/SHUTDOWN

Procedure (NAP-19).....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

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

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

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-32) ..... 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

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 (UNS-1K).

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

Affected ENGINE FAILURE/SHUTDOWN Procedure (NAP-19).....ACCOMPLISH

END

TCAS..... TA ONLY
Monitor engine vibration.

END

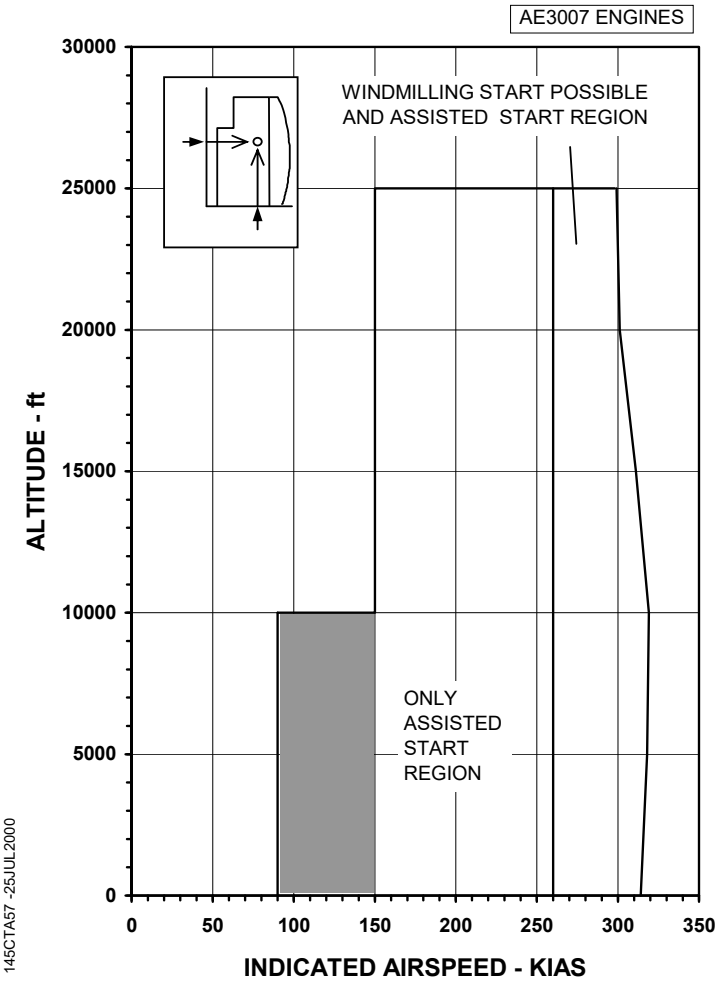
ENGINE AIRSTART

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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START PROCEDURE CONSIDERED?

Windmilling

APU Assisted

Crossbleed Assisted

APU ..... START
Operative engine:
Engine Bleed ..... PUSH OUT
APU Bleed ..... PUSH IN
XBleed ..... AUTO OR OPEN

ONLY THE APU GENERATOR IS AVAIABLE?

No

Yes

Windshield heating ..... OFF
Inoperative engine:
Electric Hydraulic Pump ..... OFF

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.
Affected ENGINE FAILURE/SHUTDOWN
Procedure (NAP-19) ..... AS REQUIRED

END

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

CONTINUES ON NEXT PAGE

Non Annunciated

CONTINUED FROM PREVIOUS PAGE

NORMAL START? — No

Yes

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

END

Consider another start procedure attempt.
Affected ENGINE FAILURE/SHUTDOWN Procedure (NAP-19).....AS REQUIRED

END

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 procedure attempt.
Affected ENGINE FAILURE/SHUTDOWN Procedure (NAP-19).....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

Affected ENGINE AIRSTART
Procedure (NAP-16).....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 .....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

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

Affected ENGINE FAILURE/SHUTDOWN Procedure (NAP-19) ..... ACCOMPLISH

END

ENGINE LOW OIL LEVEL

MFD Indication: Oil quantity enters amber range.

Affected ENGINE FAILURE/SHUTDOWN Procedure (NAP-19) .....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-19).....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

ERRONEOUS STALL PROTECTION ACTUATION

Condition: Inadvertent shaker and/or pusher actuation.

Immediately and simultaneously:

Quick Disconnect Button.....PRESS

Stall Protection Cutout 1 and 2 .....PUSH OUT

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

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 takeoff.

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

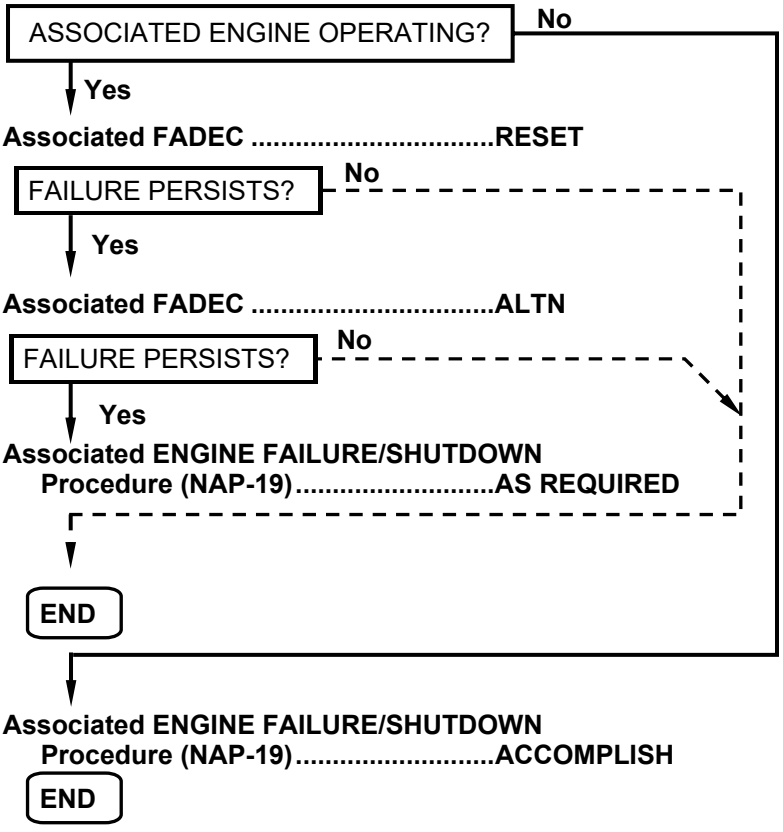
IRS/MSU FAILURE ANNUNCIATION

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.	Accomplish associated **IRS ALIGNMENT FAULT** Procedure (EAP 2-13)	– Flashes: – IRS data is not normal. – Accomplish associated **IRS OVERHEAT** Procedure (EAP 2-15)
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, do not takeoff.	– Associated with ALIGN annunciation: – Check 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, do not takeoff.	– Select the remaining IRU by pressing the IRS Button on the associated reversionary panel. – If necessary set mode select switch to ATT.
NO AIR	– Do not takeoff.	*******	– Operate IRU until flight completion. – If fault annunciator is ON or inertial data ceases to be transmitted by IRU, accomplish associated **IRS OVERHEAT** Procedure (EAP 2-15). IRS data is not normal.
BATT FAIL	– Do not takeoff.	*******	*******
ON BATT	– Check IRS CBs. – If the annunciator remains lighted, do not takeoff.	*******	Accomplish associated **IRS ON BATTERY** Procedure (EAP 2-14).

END

LOSS OF ENGINE INDICATIONS

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



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

If pressurization can not be maintained, refer to PRESSURIZATION AUTOMATIC SYSTEM FAILURE/CABIN DEPRESSURIZATION Procedure (EAP 1-13).

END

Non Annunciated

MAIN DOOR BLOCKED

Light: DOOR BLOCKED (Attendant's Panel).

CONDITION?

In Flight

On Ground

Hydraulic System 1.....OFF
Main Door Alternative Opening Valve.....TURN CLOCKWISE AND HOLD

.....WAIT 2 MINUTES
Outside Area.....CHECK CLEAR
Door.....OPEN

END

NAV/FLIGHT INSTRUMENTS FAILURE

ANNUNCIATOR/ FAILURE	LOCATION	ACTION
ATT: CAGE (amber)	**ISIS**	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 10s will be presented during this time. Use the primary indication source until attitude indication is available.
ATT, ALT, SPD, M, HDG (red)		Use the primary indication source. If on ground, do not takeoff.
MENU INOP (amber)	**MFD**	Do not takeoff.
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.

CONTINUES ON NEXT PAGE

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ANNUNCIATOR/ FAILURE	LOCATION	ACTION
HDG (amber)	**PFD MFD**	Identify the failed side by comparing data with the Magnetic Compass and use cross-side data by pressing the AHRS (IRS) on associated reversionary panel.
ALT, ATT, IAS, PIT or ROL (amber)	**PFD**	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.
ATT FAIL (red)		Push in the AHRS (IRS) button on associated reversionary panel or use standby attitude indicator.
RA (amber)		Compare both radio altimeter indications. If required, consider only the lower indication. Otherwise, disregard Radio Altitude. If RA is displayed in the center, the RA is failed.
RA1 (2) (amber)		Radio altimeter automatic reversion has occurred. No action is required.
VS (red)		Push in the ADC button on associated reversionary panel.
"X" (red) over IAS tape and/or altitude tape		Push in the ADC button on associated reversionary panel or use standby indications.
"X" (red) over course scale		Select another sensor.
Blank or "X" (red) on PFD or EICAS		Use the MFD Knob to present the required information on MFD.
Errors in attitude indication	**Standby Attitude Instrument**	Maintain a straight and leveled flight using the primary indication source. Wait 3 minutes. If error persists, cage the instrument and wait 5 min.

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-13).....AS REQUIRED

END

ONE ENGINE INOPERATIVE APPROACH AND LANDING

For CAT III mode 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

OVERWEIGHT LANDING

Before touchdown:

Emerg Lts ..... AS REQUIRED
APU Fuel Shutoff Button ..... PUSH IN
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 Button.....PUSH IN**
- **Engines and APU Fire Extinguishing Bottles (if necessary).....DISCHARGE**
- **Fuel Pumps Pwr 1 and 2.....OFF**
- **EMERGENCY EVACUATION Procedure.....ACCOMPLISH**

Before leaving the airplane:

- **Batteries 1 and 2.....OFF**

END

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

CONTINUES ON NEXT PAGE

Non Annunciated

CONTINUED FROM PREVIOUS PAGE

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)

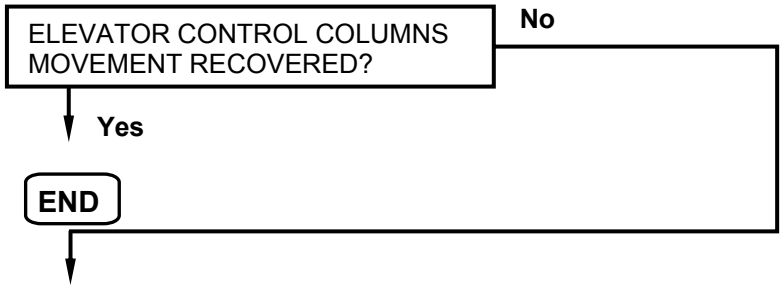
Autopilot ..... DISENGAGE

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.



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.

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

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-37) ..... ACCOMPLISH

Restore systems to normal operation.

ATC..... NOTIFY

END

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	PACK 1 OVLD	EAP 1-10
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	PTRIM F/O SW FAIL	EAP 8-8
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	RUDDER SYS 2 INOP	EAP 8-10
	SHED BUS 1 OFF	**Crew Awareness**
	SHED BUS 2 OFF	**Crew Awareness**
	SPBK LVR DISAGREE	EAP 8-10
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	SPS ADVANCED	EAP 14-5
	STAB A/ICE FAIL	EAP 11-8
	STEER INOP	EAP 12-7
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	WG A/ICE FAIL	EAP 11-8
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TYPE	MESSAGE	PAGE OR INSTRUCTION
ADVISORY	AHRS 1 ALN	Crew Awareness
	AHRS 1 ATT MODE	EAP 2-3
	AHRS 1 BASIC MODE	Crew Awareness
	AHRS 1 EXC MOTION	Crew Awareness
	AHRS 1 NO MAG HDG	Crew Awareness
	AHRS 1 NO PPOS	Crew Awareness
	AHRS 1 ON BATT	EAP 2-4
	AHRS 2 ALN	Crew Awareness
	AHRS 2 ATT MODE	EAP 2-3
	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
	AHRS 2 ON BATT	EAP 2-4
	AIII NOT AVAIL	Crew Awareness
	APU FUEL SOV CLSD	Crew Awareness
	BLD 1 VLV CLSD	EAP 1-7
	BLD 2 VLV CLSD	EAP 1-7
	CHECK A PERF	Crew Awareness
	CHECK A1 PERF	Crew Awareness
	CHECK A1/3 PERF	Crew Awareness
	CHECK A1P PERF	Crew Awareness
	CHECK A3 PERF	Crew Awareness
	CMC FAIL	Crew Awareness
	CONFIG MISMATCH	Crew Awareness
	CROSS BLD OPEN	Crew Awareness
	DAU1 B FAIL	Crew Awareness
	DAU 1 REVERSION	Crew Awareness
	DAU2 B FAIL	Crew Awareness
	DAU 2 REVERSION	Crew Awareness
	DU 1 FAN FAIL	Crew Awareness
	DU 1 OVHT	Crew Awareness
	DU 2 FAN FAIL	Crew Awareness
	DU 2 OVHT	Crew Awareness
	DU 3 FAN FAIL	Crew Awareness
	DU 3 OVHT	Crew Awareness
	DU 4 FAN FAIL	Crew Awareness
	DU 4 OVHT	Crew Awareness
	DU 5 FAN FAIL	Crew Awareness
	DU 5 OVHT	Crew Awareness
	E1 FUEL IMP BYP	EAP 6-9
	E1 FUELSOV CLSD	Crew Awareness
	E1 HYD PUMP FAIL	EAP 10-4
	E1 HYDSOV CLSD	Crew Awareness

TYPE	MESSAGE	PAGE OR INSTRUCTION
ADVISORY	E1 IDL STP FAIL	EAP 6-9
	E1 OIL IMP BYP	**Crew Awareness**
	E1 SHORT DISP	**Crew Awareness**
	E1-2 FUEL IMP BYP	EAP 6-9
	E1-2 HYD PUMP FAIL	EAP 10-4
	E2 FUEL IMP BYP	EAP 6-9
	E2 FUELSOV CLSD	**Crew Awareness**
	E2 HYD PUMP FAIL	EAP 10-4
	E2 HYDSOV CLSD	**Crew Awareness**
	E2 IDL STP FAIL	EAP 6-9
	E2 OIL IMP BYP	**Crew Awareness**
	E2 SHORT DISP	**Crew Awareness**
	ENG A/ICEOVERPRES	**Crew Awareness**
	FDAU FAIL	**Crew Awareness**
	FLAP LOW SPEED	EAP 8-8
	FUEL XFEED OPEN	**Crew Awareness**
	GEN1 BRG FAIL	**Crew Awareness**
	GEN2 BRG FAIL	**Crew Awareness**
	GEN3 BRG FAIL	**Crew Awareness**
	GEN4 BRG FAIL	**Crew Awareness**
	HYD PUMP SELEC OFF	**Crew Awareness**
	HYD1 LO QTY	EAP 10-7
	HYD2 LO QTY	EAP 10-7
	IC1 CONFIG FAIL	**Crew Awareness**
	IC 1 FAN FAIL	**Crew Awareness**
	IC2 CONFIG FAIL	**Crew Awareness**
	IC 2 FAN FAIL	**Crew Awareness**
	ICE CONDITION	**Crew Awareness**
	IRS 1 ALN	EAP 2-12
	IRS 1 ATT MODE	EAP 2-13
	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
	PACK 2 VLV CLSD	EAP 1-11
	RAD ALT 1 FAIL	EAP 2-16
	RAD ALT 2 FAIL	EAP 2-16
	RAD ALT FAIL	EAP 2-16
	SPS/ICE SPEEDS	**Crew Awareness**

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ANNUNCIATED PROCEDURES

NON ANNUNCIATED PROCEDURES

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 PERSISTS? **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 PERSISTS? — **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

CONTINUES ON NEXT PAGE

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

Yes

Associated ENGINE FAILURE/SHUTDOWN Procedure (NAP-19)..... 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
Affected Bleed ..... PUSH OUT
Altitude ..... MAX 25'000 FT, MIN MEA

SINGLE ENGINE BLEED OPERATION IN ICING CONDITIONS Procedure (NAP-34)..... 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

BLEED VALVE CLOSED

EICAS Advisory: BLD 1 (2) VLV CLSD

Confirm the closed side and, if required and situation permits:

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

Associated Bleed ..... PUSH IN

MESSAGE PERSISTS? **No**

Yes

Affected 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-34)..... AS REQUIRED

END

XBleed ..... OPEN
Altitude..... MAX 25'000 FT, MIN MEA
SINGLE ENGINE BLEED OPERATION IN ICING CONDITIONS Procedure (NAP-34)..... 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 ..... EXIT/AVOID
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

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

END

Associated 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
Associated Pack ..... PUSH OUT
..... WAIT 3 MINUTES
Associated Pack ..... PUSH IN

NOTE: In case the message remains displayed after reset, report to the maintenance personnel.

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

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

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:
Cabin ..... **DEPRESSURIZE**

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**
At least one bleed source must be kept open.
When reaching 10'000 ft:
Cabin ..... **DEPRESSURIZE**

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
Pressurization Mode Selector.....PUSH IN (MAN)
Pressurization Manual Controller.....AS REQUIRED
Wait for system response and stabilization.

MANUAL CONTROL POSSIBLE? **No**

Yes

Cabin Altitude.....CONTROL
Set and control cabin altitude according to the AIRPLANE/CABIN ALTITUDE conversion table on NAP-27.

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

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

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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 (ON)

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
At least one bleed source must be kept open.
When reaching 10’000 ft:
Cabin..... DEPRESSURIZE

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 (only below 2500 ft radio altitude, when autopilot is disconnected).

Autopilot .....DISENGAGE

Trim the airplane as required.

NOTE: If associated with autopilot hardover a sudden deviation from the expected flight path may occur.

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

AHRS Button on Associated 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 AFFECTED?

No

Yes

AHRS Button on Associated 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 SMOKE OR FIRE?

No

Yes

Associated Circuit Breaker .....PULL
Backup Battery.....PUSH OUT
AHRS FAIL Procedure (EAP 2-4) .....ACCOMPLISH

AHRS data are valid for 30 minutes.

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 and bleed 1 temperature.
- **Lost Messages:** FUEL TANK LO TEMP, E1 FUEL LO TEMP, BLEED 1 OVTEMP.
- 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 and 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, Landing Gear, Roll Trim, and the message EMERG LIGHT NOT ARMED.
- **Some messages and indications of the following system are lost:** Doors, Stall Protection, Electrical, Fire Protection, Fuel, APU, Power Plant, Thrust Reverser, Spoiler, Brakes, Air Conditioning, Ice and Rain Protection.

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, 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

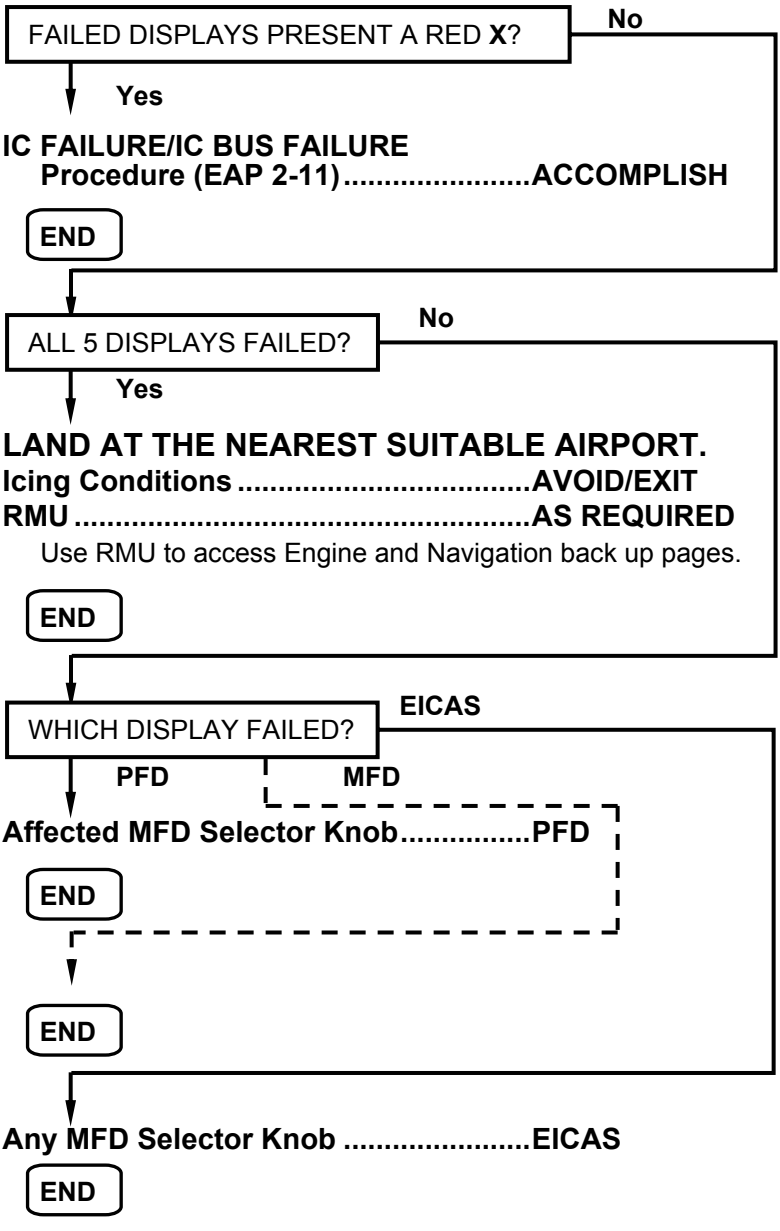
Analyze the situation before and after the reversion, and take the appropriate corrective action.

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 glareshield 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.

NOTE: For some EICAS versions this message will be presented if the crew turns the Flight Director off. In this case, the message must be disregarded.

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, and

- 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

IC 1 Circuit Breaker (C3).....PULL

Backup Battery.....PUSH OUT

SG 1 Button .....PRESS

SMOKE PERSISTS? **No**

Yes

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

END

IC 2 Circuit Breaker (D31 or D32).....PULL

SG 2 Button .....PRESS

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.

Relevant Inoperative Item: **Autopilot**

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 Button 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 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.

Relevant Inoperative Item: **Autopilot**

END

IRS ON BATTERY

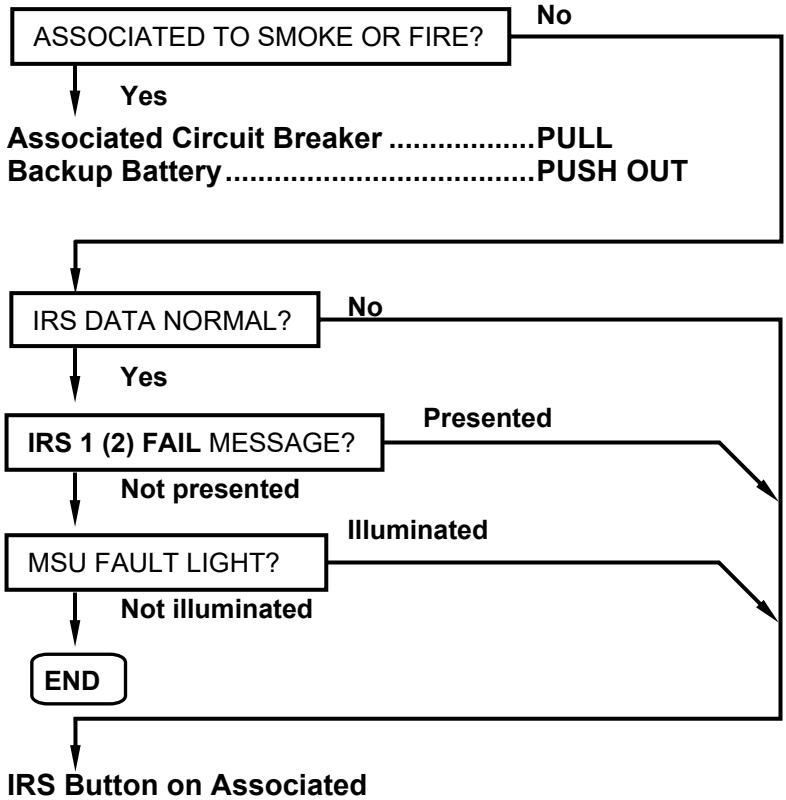
EICAS Advisory: IRS 1 (2) ON BATT

Associated IRU will operate for 40 minutes.

END

IRS OVERHEAT

EICAS Caution: IRS 1 (2) OVERHEAT



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

Affected IRU.....OFF

Autopilot .....DISENGAGE

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.

Relevant Inoperative Item: Autopilot

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 ALTIMETERS 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

Do not perform CAT III approaches.

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

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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 Button ..... PUSH 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 FIREDET FAIL** IS DISPLAYED? — **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
Condition: APU automatically shuts down.

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: - Up to three APU start attempts may be accomplished, including the first attempt in which the message was displayed.
- The APU Starter Cool-down Limit is 1 MINUTE OFF.

END

Do not try to restart the APU.

END

APU FUEL LOW PRESSURE

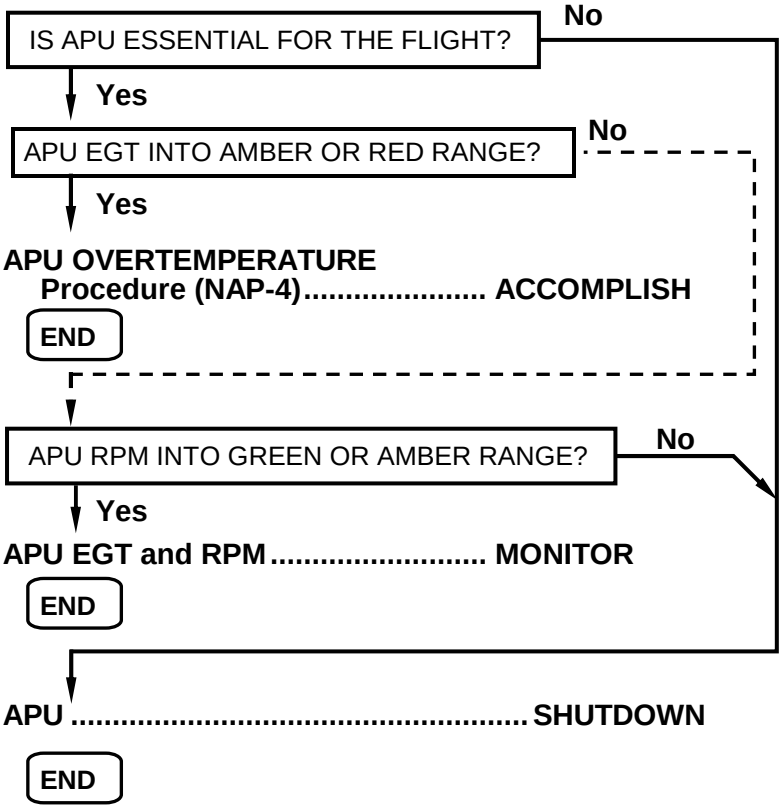
EICAS Caution: APU FUEL LO PRESS

Fuel Pump Sel 2 ..... SELECT ANOTHER
If the message persists, 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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ANNUNCIATED PROCEDURES

NON ANNUNCIATED PROCEDURES

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 — **No**

Yes

CABIN PRESSURIZATION NORMAL? — **No**

Yes

Cabin Pressure ..... MONITOR

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:

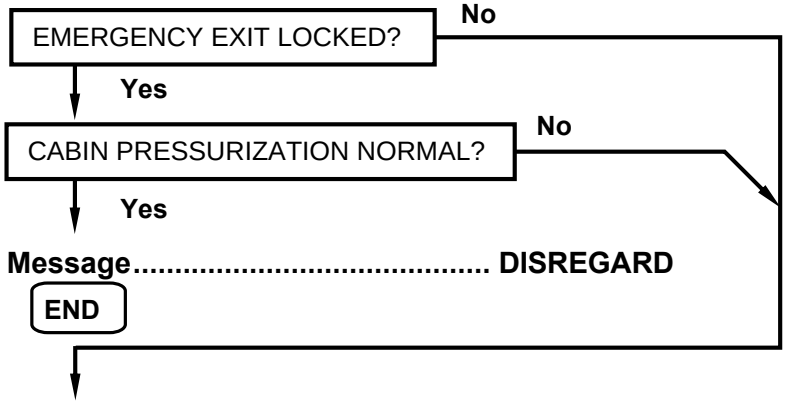
Cabin ..... DEPRESSURIZE

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.
Emergency exit handle ..... CHECK 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

QRH-145/1115

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

If no generator is available:

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

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**
Ventral Fuel Transfer Pump A and B (EMB-145XR only)		

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, MINIMUM MEA

At pilot's discretion:

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

Relevant Inoperative Items:

Ventral Fuel Transfer Pump A (EMB-145XR only)		
Autopilot	**W/S 1 Heating and Wiper**	**GPWS**
FMS 1	**Transponder 1**	**RA 1**
Speed Brake	**Main Pitch Trim**	**TCAS ***
Automatic Pressurization Control		**DME 1**
Thrust Reverser 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 slower 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 1.

END

DC BUS 2 OFF

EICAS Caution: DC BUS 2 OFF
MFD Indication: DC BUS may be amber.
MFD Indication: 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, MINIMUM 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 2 Heating and Wiper**	**Steering**
FMS 2	**Transponder 2**	**Pack 2**
ADF/DME/VHF/VOR/ILS/MB 2		
Thrust Reverser 2		

Do not set Thrust Lever 2 below idle in flight.
Affected Equipment (EAP 5-13) .....CHECK
Landing configuration:
Anticipate flap slower 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

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

At 10'000 ft:

Packs 1 and 2.....PUSH OUT

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

Pressurization Manual Controller .....FULL UP

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

END

EMERGENCY LIGHTS NOT ARMED

EICAS Caution: EMERG LT NOT ARMD

EMERG LT Switch .....ARM

MESSAGE PERSISTS? **No**

Yes

EMERG LTS 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, 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

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)	

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

EICAS DEENERGIZED? **No**

Yes

DAU 1 on EICAS Rev .....PUSH IN

At pilots's discretion:
MFD Knob on Reversionary Panel 1.....EICAS

CONTINUES ON NEXT PAGE

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Landing configuration:

Landing Gear .....DOWN

Flaps.....45°

Airspeed.....$V_{REF\ 45°}$

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 (except for EMB-145XR Model)	
APU Fire Detection System	**Pitot Heating 3**
ENG 2 Fire Detection System	**Standby Attitude Indicator**
APU Control	**RMU 2**
Audio System 2	

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

Landing configuration:

Landing Gear .....DOWN

Flaps.....45°

Airspeed.....$V_{REF\ 45°}$

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** → **Affected Generator ..... PUSH OUT, THEN PUSH IN**

Yes

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

END

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** → **Electrical Load (affected generator).... REDUCE**

Yes

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** → **APU GEN ..... PUSH IN**

Yes

APU ON? — **No** → **APU ..... START**

Yes

APU GEN ..... PUSH IN

END

END

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	BAGGAGE SMOKE DETECTOR
CREW PEDAL ADJUSTMENT	BRAKES TEMP INDICATION INBD
CREW SEAT ADJUSTMENT 1	CABIN RECIRCULATION
DME 1	CLEAR ICE DET - CHANNEL 2
EICAS POWER (DAU 1B)	CLOCK COPILOT'S
ELECTRICAL FLIGHT IDLE STOP 1	CREW SEAT ADJUSTMENT 2
ELECTRONIC BAY COOLING (EXHAUST 1 AND RECIRC 2)	DEFUELING
EMER/PARKING BRAKE	DISPLAY PRCS/CTRL PWR 2 (IC 2)
ENG 1 FUEL PUMPS 1C	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 PUMPS 2C
GROUND SPOILER OUTBD	ENGINE VIBRATION SENSORS
HEAD-UP GUIDANCE SYSTEM	ENGINE 2 ANTI-ICE
HYDR ELECTRIC PUMP 2	FLAP CHANNEL 2
HYDR GEN SYS 2 INDICATION	FMS SYSTEM 2 *
ICE DETECTOR 1	GASPER FAN
INVERTER	GPS *
LAVATORY FLUSH	GROUND SPOILER INBD
LAVATORY SMOKE DETECTOR	GUST LOCK (ELECTROMECHANICAL)
LAVATORY WATER DRAIN HEATER	HF POWER/CONTROL *
LIGHTING: CABIN 1, OVERHEAD PANEL, COCKPIT READING, COURTESY/STAIR 2, FLOOD/STORM, LAVATORY, LOGOTYPE	HYDR ELECTRIC PUMP 1
	HYDR GEN SYS 1 INDICATION
	ICE DETECTOR 2
LIGHTS: LANDING 1 & NAVIGATION	IRS 2
MAIN DOOR CONTROL 1	LANDING GEAR DOOR COMMAND
MFD 2 POWER	LIGHTING: OVERHEAD PANEL, COMPARTMENT, INSPECTION & PASSENGER CABIN 1/2/3
PACK VALVE 1	LIGHTS: RED BEACON & LANDING
PASSENGER SIGNS	MFD 1 POWER
PFD 1 POWER	OBSERVER'S DAP (INTPH 3)
PITCH TRIM MAIN	PACK VALVE 2
PITOT 1 HEATING	PFD 2 POWER
PNEUMATIC HSV 1	PITOT 2 HEATING
PUMP A (EMB-145XR)	PNEUMATIC HSV 2
RADAR SYSTEM	PUMP B (EMB-145XR)
RADIO ALTIMETER 1	RADIO ALTIMETER 2 *
SPEED BRAKE	ROLL TRIM SYSTEM
STATIC PORT HEATING 1	SENSORS HEATING CONTROL
STROBE LIGHTS	SPOILER INDICATION
TAT 1 SENSOR HEATING	SPS (SHAKER 2/CHANNEL 2)
TCAS 2000	SPS PUSHER
TRANSPONDER 1	STABILIZER ANTI-ICE
VHF SYSTEM 3 *	STATIC PORT HEATING 2
WINDSHIELD HEATING 1	STEERING
WINDSHIELD WIPER 1	TAT 2 SENSOR HEATING
WING ANTI-ICE	TRANSPONDER 2
YAW TRIM	TUNING BACKUP CONTROL HEAD
	VHF SYSTEM 2
	VOR 2/ILS 2/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 (DAU 1A)	ENG 2 FIRE DETECTION
EICAS DISPLAY	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
VHF SYSTEM 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
Engine 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-16)..... ACCOMPLISH

END

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

CONTINUES ON NEXT PAGE

CONTINUED FROM PREVIOUS PAGE

ENGINE 2 STARTS?

No

Yes

Do not alternate FADEC 2.

ENGINE 1 AIRSTART
Procedure (NAP-16)..... AS REQUIRED

END

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-16)..... AS REQUIRED

END

ENGINE FAILURE/SHUTDOWN
(inoperative engine)
Procedure (NAP-19)..... 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?

A1P, A1/3 or A1E

A, A1, A1/1 or A3

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) (may be presented)
Light: Engine Fire Handle (may be illuminated)
Aural Warning: BELL (in case of fire) (may sound)

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) FUEL SOV 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
Affected Bleed ..... PUSH OUT

CONTINUES ON NEXT PAGE

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Remaining Engine Thrust Rating ..... CON
APU ..... 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

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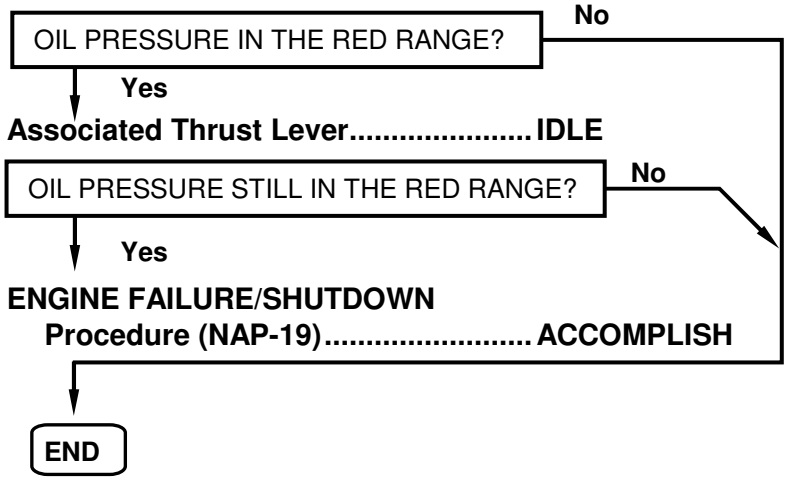
ENGINE OIL LOW PRESSURE

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

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

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

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

Icing Conditions ..... EXIT/AVOID

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.

Affected ENGINE FAILURE/SHUTDOWN Procedure (NAP-19) ..... 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

Affected ENGINE AIRSTART
Procedure (NAP-16)..... ACCOMPLISH

END

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

ICING CONDITIONS?

No

Yes

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.

Affected ENGINE FAILURE/SHUTDOWN Procedure (NAP-19)..... 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-19) ... 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-4)....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

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

END

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

Yes

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

END

The associated engine fire detection system is inoperative.

END

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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ANNUNCIATED PROCEDURES

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

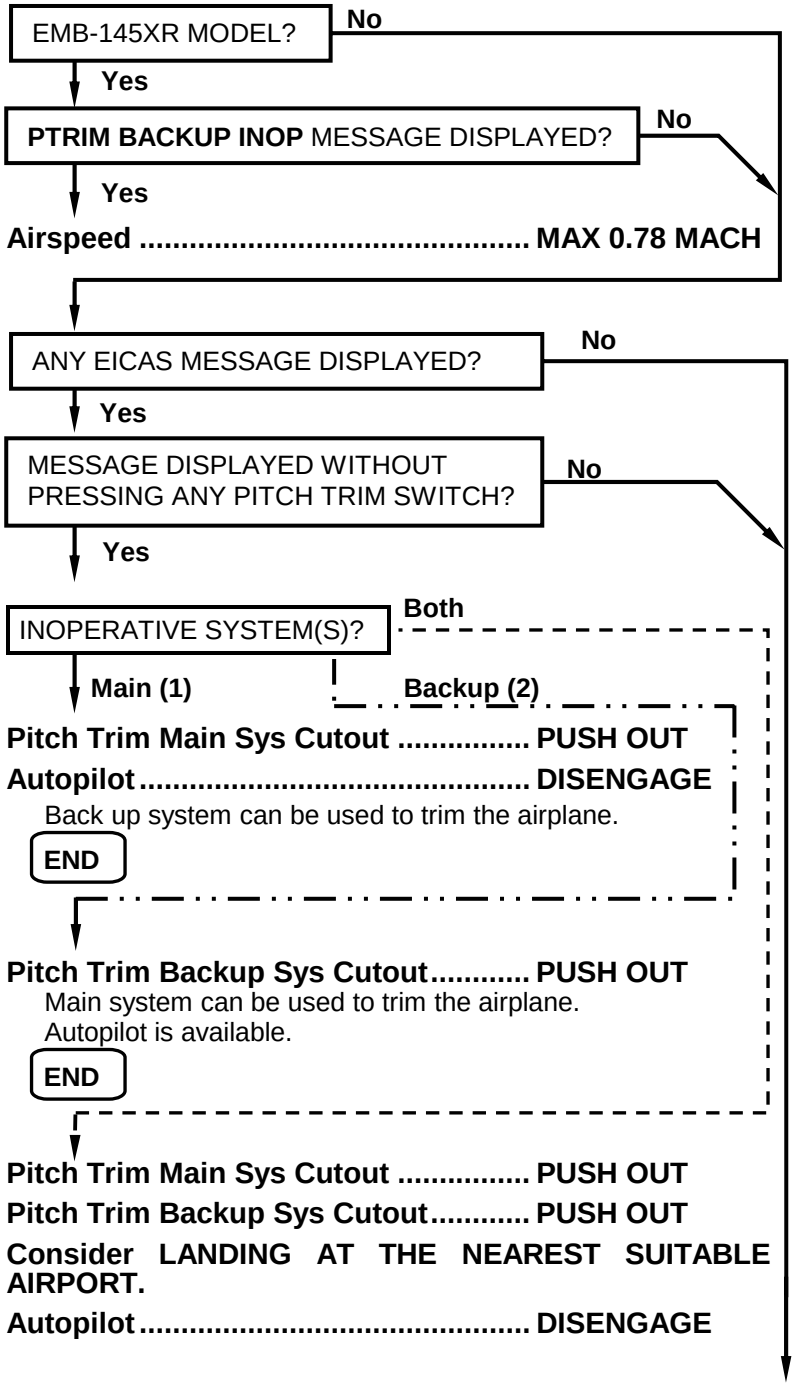
CAUTION: MULTIPLY THE FLAPS 45° UNFACTORED LANDING DISTANCE BY 1.45.

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).

EICAS Caution: AUTO TRIM FAIL (may be presented).



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AIRPLANE PITCH UP TENDENCY? **No**

Yes

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

Yes

Use the remaining Pitch Trim System.
If Main Pitch Trim System is inoperative, do not engage the Autopilot.

END

WARNING: **DO NOT OPEN SPEEDBRAKE.**

Airspeed..... REDUCE

Reduce airspeed to alleviate forward control column forces, observing Flap Maneuvering Speed (PD-2). Continuous turns also helps to alleviate forward control column forces. Extending flaps and landing gear helps to recover trimmed condition.

Landing Configuration:

Landing Gear ..... DOWN
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°

Landing Configuration:

Landing Gear ..... DOWN
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

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-145XR

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

EMB-145XR MODEL

FLAPS POSITION	MAXIMUM AIRSPEED	ABOVE 10'000 ft AND Y/D DISENGAGED
1° to 9°	250 KIAS	250 KIAS
10° to 22°	180 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 slower 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-33).....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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ANNUNCIATED PROCEDURES

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

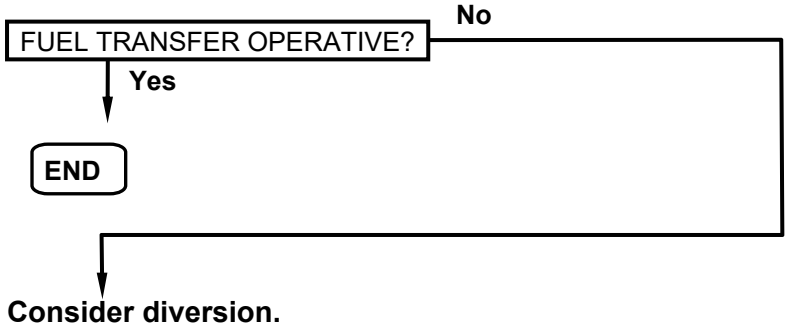
END

FUEL TRANSFER CRITICAL

EICAS Warning: FUEL XFER CRITICAL

Thrust Levers ..... LONG RANGE CRUISE

Fuel Transfer System..... CHECK STATUS



Consider diversion.

Remaining Fuel ..... CHECK

Avoid rapid maneuvers and flying in severe turbulence conditions.

Before touchdown:

Rate of Descent ..... MAX 450 FT/MIN

Touch smoothly the runway surface.

Reduce engine thrust only after touchdown.

END

APU FUEL SHUTOFF VALVE INOPERATIVE

EICAS Caution: APU FUEL SOV INOP

APU Fuel Shutoff Button ..... CHECK NOT PUSHED IN

APU RUNNING NORMALLY?

No

Yes

Disregard the message.

END

APU SHUTOFF VALVE REMAINS CLOSED?

No

Yes

APU Master Knob ..... OFF

END

DEFUEL VALVE NOT CLOSED

EICAS Caution: DEFUEL NOT CLOSED

CONDITION?

On Ground

In Flight

LAND AT THE NEAREST SUITABLE AIRPORT.

VTRL TK XFER ..... OFF
XFEED ..... OFF
Fuel Imbalance ..... MONITOR
Asymmetric Thrust ..... AS REQUIRED
Avoid uncoordinated maneuvers and negative g's.

END

Do not takeoff

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.
Associated ENGINE FAILURE/SHUTDOWN Procedure (NAP-19)..... 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 ..... OFF
Fuel Imbalance ..... CHECK
XFEED ..... 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.

ON GROUND? **No**

Yes

Do not take off.

END

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

END

FUEL TRANSFER ISOLATION FAILURE

EICAS Caution: XFER ISOL FAIL

CONDITION?

On Ground

In Flight

FUEL TRANSFER?

Operative

Not Operative

VTRL TK XFER.....OFF

FUEL XFER INOP message may appear.

Consider diversion.

Remaining Fuel.....CHECK

END

Do not take off.

END

FUEL TRANSFER OVERRIDE

EICAS Advisory: FUEL XFER OVRD

When Ventral Tank Fuel Quantity is lower than 220 lb:

VTRL TK XFER.....OFF

END

FUEL TRANSFER SYSTEM INOPERATIVE

EICAS Caution: FUEL XFER INOP

CONDITION?

On ground

In flight

VTRL TK XFER ..... AUTO

MESSAGE PERSISTS?

No

Yes

Pitch attitude ..... MAX 5° NOSE UP

..... WAIT 30 SECONDS

MESSAGE PERSISTS?

No

Yes

VTRL PUMP SEL ..... PRESS ONCE

MESSAGE PERSISTS?

No

Yes

VENTRAL TANK QUANTITY IS ABOVE 220 LB?

No

Yes

VTRL TK XFER ..... OVRD

Avoid pitch attitudes in excess of 5° nose up, uncoordinated maneuvers and negative g's.

When ventral tank fuel quantity is lower than 220 lb:

VTRL TK XFER..... OFF

Consider diversion.
Fuel Quantity..... MONITOR
Remaining Fuel ..... CHECK

Do not takeoff.

END

VENTRAL TANK VENTILATION OPEN

EICAS Caution: FUEL VENT OPEN

CONDITION?

On ground

In flight

While there is fuel in the Ventral Tank:

Pitch attitude .....MAX 10° NOSE DOWN

Avoid uncoordinated maneuvers.

END

Do not takeoff.

END

WING TANKS OVERFLOW

EICAS Caution: FUEL XFER OVERFLOW

VTRL TK XFER .....OFF
Wing Fuel Tank Quantity .....MONITOR
XFEED.....AS REQUIRED

When Wing Fuel Tanks quantity is at 4630 lb or below:

VTRL TK XFER .....AUTO
Fuel Imbalance .....MONITOR
XFEED.....AS REQUIRED

END

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ANNUNCIATED PROCEDURES

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

CAUTION: 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:

Landing gear retraction and extension normal operation	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.
Excessive flare may require a bigger landing distance.
Use rudder for directional control on ground.
During landing run, pull Emergency Brake Handle carefully.

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

ENGINE HYDRAULIC PUMP FAILURE

EICAS Advisory: E1 (2) HYD PUMP FAIL

Associated Hydraulic Elec Pump .....CHECK ON
Affected Hydraulic System.....MONITOR

HYD SYS 1 (2) FAIL MESSAGE PRESENTED?

No

Yes

Associated
HYDRAULIC SYSTEM 1 FAILURE (EAP 10-5) or
HYDRAULIC SYSTEM 2 FAILURE (EAP 10-6)
Procedure .....ACCOMPLISH

END

HYDRAULIC SYSTEM 1 FAILURE

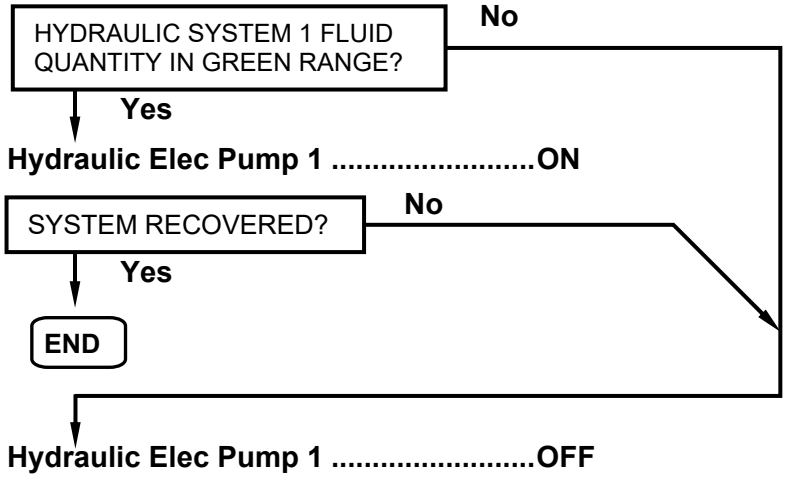
EICAS Caution: HYD SYS 1 FAIL

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	**Landing gear retraction and extension normal operation**	**Thurst reverser 1**
Steering	**Main door retraction**	**Outboard brakes**

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

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

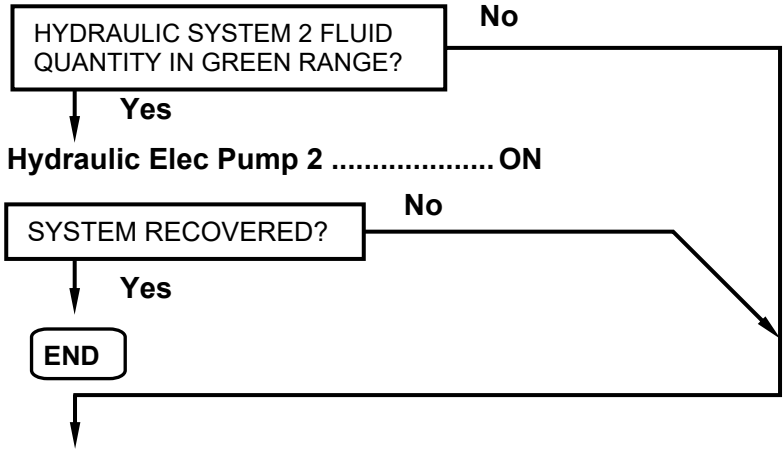
EICAS Caution: HYD SYS 2 FAIL
MFD Indication: Hydraulic pressure may be amber.

The following messages will be displayed:

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

EICAS Advisory: E2 HYD PUMP FAIL

CAUTION: 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.

HYD SYS 1 (2) FAIL MESSAGE PRESENTED?

No

Yes

Associated
HYDRAULIC SYSTEM 1 FAILURE (EAP 10-5) or
HYDRAULIC SYSTEM 2 FAILURE (EAP 10-6)
Procedure ..... ACCOMPLISH

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

CONDITION?

On Ground

In Flight

Ice Detection Override Knob ..... ALL
Icing Conditions ..... EXIT
Associated Failure Procedure ..... ACCOMPLISH

END

Thrust Levers ..... IDLE
Ice Detection Override Knob ..... AUTO
Ice Detection Test Knob ..... 1, FOR 5 SECONDS, THEN 2, FOR 5 SECONDS

ALL OPEN INSCRIPTIONS FLASH AT LEAST ONCE AND ICE DET 1 (OR 2) FAIL AND ICE CONDITION DISPLAYED?

No

Yes

ANTI-ICING SYSTEM EICAS MESSAGES DISAPPEAR WITHIN 60 SECONDS?

No

Yes

TAKEOFF Procedure ..... ACCOMPLISH

END

Do not takeoff.

END

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' information 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

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
Two minutes 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

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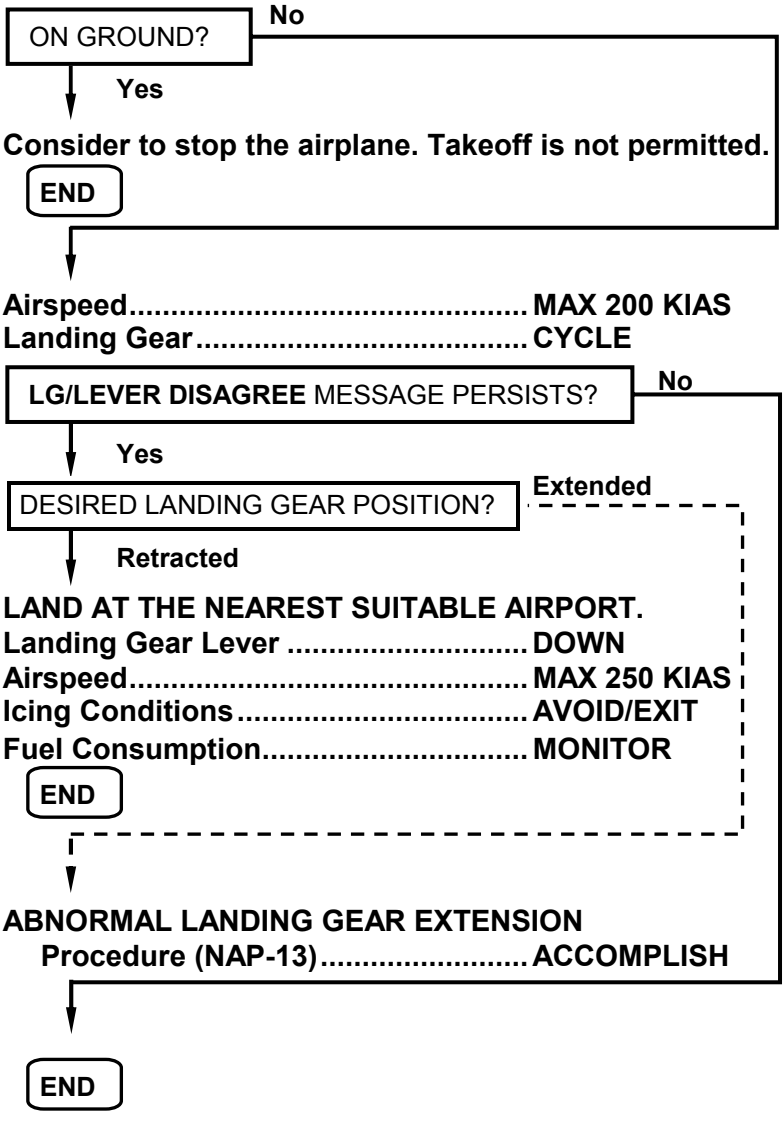
LIST OF EICAS MESSAGES

LANDING GEAR/LEVER DISAGREE

EICAS Warning: LG/LEVER DISAGREE
EICAS Caution: NLG UP/DOOR OPN may be displayed.
EICAS Indication: Landing gear abnormal indication.
Condition: Landing gear cannot move to desired position.



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
Thrust Rating ..... AS REQUIRED

END

BRAKES DEGRADED

EICAS Caution: BRAKE DEGRADED

Brake effectiveness and symmetry may be affected.

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

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:

Landing Gear .....DOWN

Flaps .....45°

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

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

NOTE: - Thrust Reversers 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 displayed.

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

Control the airplane using differential brakes and rudder.

Consider the use of differential thrust if serviceable.

END

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LIST OF EICAS MESSAGES

(CREW/PASSENGER) OXYGEN LOW PRESSURE

EICAS Caution: OXYGEN LO PRESS
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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LIST OF EICAS MESSAGES

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

Stall.....RECOVER

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

STICK PUSHER JAMMED? **No**

Yes

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

END

Both stick shaker 1 and 2 are still available.

Add 5 KIAS to V_{REF}, approach and approach-climb speeds.

CAUTION: MULTIPLY THE FLAPS 45° UNFACTORED LANDING DISTANCE BY 1.15.

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 take off.

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.

Do not perform CAT II or CAT III approaches.

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	5	5	6	6	7	8	9	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	11	12	13	13	14	15	15	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	16	18	20	22	23	25	25	15
20	20	19	(17)	15	13	10	7	3	-3	-7	-10	-13	-15	-17	-19	-20	(10)	7	13	15	15	17	19	20	20	22	24	26	29	31	33	34	20
25	25	23	22	19	16	13	9	4	-4	-9	-13	-16	-19	-22	-23	-25	13	9	16	19	19	22	23	25	25	27	30	33	36	39	41	42	25
30	30	28	26	23	19	15	10	5	-5	-10	-15	-19	-23	-26	-28	-30	15	10	19	23	23	26	28	30	30	33	36	39	43	47	49	51	30
35	34	33	30	27	22	18	12	6	-6	-12	-18	-22	-27	-30	-33	-34	18	12	22	27	27	30	33	34	35	38	42	46	50	54	57	59	35
40	39	38	35	31	26	20	14	7	-7	-14	-20	-26	-31	-35	-38	-39	20	14	26	31	31	35	38	39	40	44	48	52	57	62	65	67	40
45	44	42	39	34	29	23	15	8	-8	-15	-23	-29	-34	-39	-42	-44	23	15	29	34	34	39	42	44	45	49	54	59	64	70	73	76	45
50	49	47	43	38	32	25	17	9	-9	-17	-25	-32	-38	-43	-47	-49	25	17	32	38	38	43	47	49	50	55	60	65	71	77	81	84	50

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
EMB-135	CG POSITION (%)	LESS THAN OR EQUAL TO 26.5	26.6 UP TO 30.0	30.1 UP TO 33.0	33.1 UP TO 36.5	ABOVE OR EQUAL TO 36.6
PITCH TRIM UNITS		8	7	6	5	4

FLAP RETRACTION SCHEDULE		
ALL ENGINES	*For a flaps 9° takeoff:* Flaps 9° to UP	V_2 + 15 KIAS
A1P and A1/3 ENGINES	*For a flaps 18° takeoff:* Flaps 18° to 9° Flaps 9° to UP	V_2 + 10 KIAS V_2 + 30 KIAS
A, A1, A1/1 ENGINES	*For a flaps 22° takeoff:* Flaps 22° to 9° Flaps 9° to UP	V_2 + 5 KIAS V_2 + 25 KIAS
A1P ENGINES	*For a flaps 22° takeoff:* Flaps 22° to 9° Flaps 9° to UP	V_2 + 10 KIAS V_2 + 30 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-135 – Engine: AE3007A1/3 – Anti-Ice: OFF

PRESSURE ALTITUDE (ft)		WEIGHT (lb)			
		30000	35000	40000	45000
0 (240 KIAS)	Pitch (deg) V/S (ft/min)	13 4800	11 4000	10 3400	9 2900
10000 (240 KIAS)	Pitch (deg) V/S (ft/min)	9 3800	8 3100	8 2700	7 2200
20000 (0.56 M)	Pitch (deg) V/S (ft/min)	7 3500	6 2800	6 2300	5 1800
30000 (0.56 M)	Pitch (deg) V/S (ft/min)	7 2700	6 2000	6 1600	6 1200
37000 (0.56 M)	Pitch (deg) V/S (ft/min)	7 1800	7 1300	7 900	7 400

UNRELIABLE AIRSPEED TABLES (Cruise)

Airplane: EMB-135 – Engine: AE3007A1/3 – Anti-Ice: OFF

PRESSURE ALTITUDE (ft)		WEIGHT (lb)			
		30000	35000	40000	45000
15000 (250 KIAS)	Pitch (deg) N1 (%)	1 68.9	2 70.0	2 71.2	2 72.5
20000 (250 KIAS)	Pitch (deg) N1 (%)	1 72.1	2 73.5	2 74.9	2 76.5
25000 (250 KIAS)	Pitch (deg) N1 (%)	1 76.3	2 77.8	2 79.4	2 80.9
30000 (0.63 M)	Pitch (deg) N1 (%)	2 78.5	2 80.0	2 81.2	3 82.5
37000 (0.63 M)	Pitch (deg) N1 (%)	2 79.8	3 81.7	4 83.8	4 86.2

UNRELIABLE AIRSPEED TABLES (Flight Idle Descent)

Airplane: EMB-135 – Engine: AE3007A1/3 – Anti-Ice: OFF

PRESSURE ALTITUDE (ft)		WEIGHT (lb)			
		30000	35000	40000	45000
0 (240 KIAS)	Pitch (deg) V/S (ft/min)	-3 -1800	-2 -1700	-2 -1600	-1 -1600
10000 (240 KIAS)	Pitch (deg) V/S (ft/min)	-3 -2100	-2 -1900	-2 -1800	-1 -1800
20000 (240 KIAS)	Pitch (deg) V/S (ft/min)	-2 -2200	-2 -2100	-1 -2000	-1 -1900
30000 (240 KIAS)	Pitch (deg) V/S (ft/min)	-2 -2500	-2 -2400	-1 -2200	0 -2100
37000 (240 KIAS)	Pitch (deg) V/S (ft/min)	-2 -2400	-1 -2200	0 -2100	0 -2100

UNRELIABLE AIRSPEED TABLES (Holding)

Airplane: EMB-135 – Engine: AE3007A1/3 – Anti-Ice: OFF

PRESSURE ALTITUDE (ft)		WEIGHT (lb)			
		30000	35000	40000	45000
5000 (200 KIAS)	Pitch (deg) N1 (%)	3 54.1	3 55.9	4 57.9	5 59.9
10000 (200 KIAS)	Pitch (deg) N1 (%)	3 57.6	3 59.6	4 61.8	5 63.9

UNRELIABLE AIRSPEED TABLES (Terminal Area)					
Terminal Area (5000 ft) - %N1 for Level Flight					
Airplane: EMB-135 – Engine: AE3007A1/3 – Anti-Ice: OFF					
FLAP POSITION (V_{REF} + INCREMENT)		**WEIGHT (lb)**			
		30000	**35000**	**40000**	**45000**
0 (V_{REF45} + 30)	Pitch (deg) N1 (%)	7 48.9	7 52.5	7 55.7	7 58.8
9 (V_{REF45} + 15)	Pitch (deg) N1 (%)	7 51.4	8 55.1	8 58.2	8 61.3

UNRELIABLE AIRSPEED TABLES (Final Approach)					
Final Approach (1500 ft) - %N1 for 3° Glideslope					
Airplane: EMB-135 – Engine: AE3007A1/3 – Anti-Ice: OFF					
FLAP POSITION (V_{REF} + INCREMENT)		**WEIGHT (lb)**			
		30000	**35000**	**40000**	**45000**
22 (V_{REF22} + 10)	Pitch (deg) N1 (%)	3 47.5	3 50.8	4 53.5	4 56.0
45 (V_{REF45} + 10)	Pitch (deg) N1 (%)	0 59.5	0 63.4	0 66.7	0 69.6

UNRELIABLE AIRSPEED TABLES (CLB Thrust Mode)

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

PRESSURE ALTITUDE (ft)		WEIGHT (lb)					
		30000	35000	40000	45000	50000	55000
0 (240 KIAS)	Pitch (deg) V/S (ft/min)	13 4800	12 4000	11 3400	10 2900	10 2500	9 2200
10000 (240 KIAS)	Pitch (deg) V/S (ft/min)	10 3800	9 3100	8 2700	8 2200	8 1900	7 1600
20000 (0.56 M)	Pitch (deg) V/S (ft/min)	7 3500	6 2800	6 2300	5 1800	5 1500	5 1200
30000 (0.56 M)	Pitch (deg) V/S (ft/min)	7 2700	7 2000	7 1600	8 1200	7 900	7 600
37000 (0.56 M)	Pitch (deg) V/S (ft/min)	7 1800	7 1300	8 900	8 400	8 100	-

UNRELIABLE AIRSPEED TABLES (Cruise)

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

PRESSURE ALTITUDE (ft)		WEIGHT (lb)					
		30000	35000	40000	45000	50000	55000
15000 (250 KIAS)	Pitch (deg) N1 (%)	1 68.7	1 69.9	2 71.1	2 72.4	2 73.8	3 75.3
20000 (250 KIAS)	Pitch (deg) N1 (%)	1 72.0	1 73.3	2 74.8	2 76.4	2 78.0	3 79.6
25000 (250 KIAS)	Pitch (deg) N1 (%)	1 76.1	1 77.6	2 79.3	2 80.7	2 81.9	3 83.1
30000 (0.63 M)	Pitch (deg) N1 (%)	1 78.5	1 80.0	2 81.2	2 82.5	2 84.0	3 85.5
37000 (0.63 M)	Pitch (deg) N1 (%)	2 79.8	2 81.7	2 83.8	3 86.4	3 89.8	4 92.8

UNRELIABLE AIRSPEED TABLES (Flight Idle Descent)

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

PRESSURE ALTITUDE (ft)		WEIGHT (lb)					
		30000	35000	40000	45000	50000	55000
0 (240 KIAS)	Pitch (deg) V/S (ft/min)	-3 -1800	-2 -1700	-2 -1600	-1 -1500	-1 -1500	0 -1500
10000 (240 KIAS)	Pitch (deg) V/S (ft/min)	-3 -2000	-2 -1900	-2 -1800	-1 -1800	0 -1700	0 -1700
20000 (240 KIAS)	Pitch (deg) V/S (ft/min)	-2 -2200	-2 -2100	-1 -2000	-1 -1900	0 -1900	0 -1900
30000 (240 KIAS)	Pitch (deg) V/S (ft/min)	-2 -2500	-2 -2400	-1 -2200	0 -2100	0 -2100	1 -2000
37000 (240 KIAS)	Pitch (deg) V/S (ft/min)	-1 -2400	-1 -2200	0 -2100	0 -2100	1 -2000	1 -2000

UNRELIABLE AIRSPEED TABLES (Holding)

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

PRESSURE ALTITUDE (ft)		WEIGHT (lb)					
		30000	35000	40000	45000	50000	55000
5000 (200 KIAS)	Pitch (deg) N1 (%)	3 54.0	3 55.9	4 57.8	5 59.9	5 62.2	6 64.4
10000 (200 KIAS)	Pitch (deg) N1 (%)	3 57.5	3 59.5	4 61.8	5 63.9	5 66.2	6 68.4

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 (lb)**			
		30000	**35000**	**40000**	**45000**
0 (V_{REF45} + 30)	Pitch (deg) N1 (%)	7 48.9	7 52.5	7 55.7	8 58.8
9 (V_{REF45} + 15)	Pitch (deg) N1 (%)	7 51.6	7 55.3	7 58.6	8 61.7

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 (lb)**			
		30000	**35000**	**40000**	**45000**
22 (V_{REF22} + 10)	Pitch (deg) N1 (%)	3 47.7	3 51.1	3 53.9	3 56.6
45 (V_{REF45} + 10)	Pitch (deg) N1 (%)	-1 58.6	0 62.4	0 65.7	0 68.6

UNRELIABLE AIRSPEED TABLES (CLB Thrust Mode)

Airplane: EMB-145XR – Engine: AE3007A1E – Anti-Ice: OFF

PRESSURE ALTITUDE (ft)		WEIGHT (lb)					
		30000	35000	40000	45000	50000	55000
0 (240 KIAS)	Pitch (deg) V/S (ft/min)	11 4000	10 3400	9 3000	9 2600	9 2300	8 2000
10000 (240 KIAS)	Pitch (deg) V/S (ft/min)	8 3200	7 2700	7 2400	7 2000	7 1700	7 1500
20000 (0.56 M)	Pitch (deg) V/S (ft/min)	4 1800	4 1400	4 1200	4 1100	4 900	4 800
30000 (0.56 M)	Pitch (deg) V/S (ft/min)	6 1900	6 1400	6 1200	6 900	6 600	6 300
37000 (0.56 M)	Pitch (deg) V/S (ft/min)	6 1400	7 900	7 500	7 100	-	-

UNRELIABLE AIRSPEED TABLES (Cruise)

Airplane: EMB-145XR – Engine: AE3007A1E – Anti-Ice: OFF

PRESSURE ALTITUDE (ft)		WEIGHT (lb)					
		30000	35000	40000	45000	50000	55000
15000 (250 KIAS)	Pitch (deg) N1 (%)	1 79.1	2 79.2	2 79.5	2 79.9	3 80.4	3 81.0
20000 (250 KIAS)	Pitch (deg) N1 (%)	1 82.7	2 82.8	2 83.1	2 83.5	3 84.0	3 84.6
25000 (250 KIAS)	Pitch (deg) N1 (%)	1 86.0	2 86.2	2 86.5	2 86.9	3 87.5	3 88.2
30000 (0.63 M)	Pitch (deg) N1 (%)	2 86.6	2 86.9	2 87.5	3 88.4	3 89.8	-
37000 (0.63 M)	Pitch (deg) N1 (%)	3 85.7	3 87.4	4 89.9	4 92.0	-	-

UNRELIABLE AIRSPEED TABLES (Flight Idle Descent)

Airplane: EMB-145XR – Engine: AE3007A1E – Anti-Ice: OFF

PRESSURE ALTITUDE (ft)		WEIGHT (lb)					
		30000	35000	40000	45000	50000	55000
0 (240 KIAS)	Pitch (deg) V/S (ft/min)	-6 -3000	-5 -2800	-4 -2500	-3 -2300	-2 -2100	-1 -2000
10000 (240 KIAS)	Pitch (deg) V/S (ft/min)	-5 -3000	-4 -3000	-3 -2800	-2 -2500	-2 -2300	-1 -2100
20000 (240 KIAS)	Pitch (deg) V/S (ft/min)	-4 -3000	-3 -3000	-3 -2900	-2 -2700	-1 -2500	-1 -2400
30000 (240 KIAS)	Pitch (deg) V/S (ft/min)	-3 -3000	-2 -3000	-2 -3000	-1 -2900	-1 -2700	0 -2600
37000 (240 KIAS)	Pitch (deg) V/S (ft/min)	-2 -3000	-2 -3000	-1 -3000	-1 -2800	0 -2600	1 -2400

UNRELIABLE AIRSPEED TABLES (Holding)

Airplane: EMB-145XR – Engine: AE3007A1E – Anti-Ice: OFF

PRESSURE ALTITUDE (ft)		WEIGHT (lb)					
		30000	35000	40000	45000	50000	55000
5000 (200 KIAS)	Pitch (deg) N1 (%)	3 61.4	3 62.2	4 63.3	5 64.6	5 66.0	6 67.5
10000 (200 KIAS)	Pitch (deg) N1 (%)	3 65.1	3 66.0	4 67.0	5 68.2	5 69.6	6 71.1

UNRELIABLE AIRSPEED TABLES (Terminal Area)					
Terminal Area (5000 ft) - %N1 for Level Flight					
Airplane: EMB-145XR – Engine: AE3007A1E – Anti-Ice: OFF					
FLAP POSITION (V_{REF} + INCREMENT)		**WEIGHT (lb)**			
		30000	**35000**	**40000**	**45000**
0 (V_{REF45} + 30)	Pitch (deg) N1 (%)	7 51.4	7 54.8	7 57.9	8 60.9
9 (V_{REF45} + 15)	Pitch (deg) N1 (%)	7 49.3	7 52.8	8 56.0	8 58.8

UNRELIABLE AIRSPEED TABLES (Final Approach)					
Final Approach (1500 ft) - %N1 for 3° Glideslope					
Airplane: EMB-145XR – Engine: AE3007A1E – Anti-Ice: OFF					
FLAP POSITION (V_{REF} + INCREMENT)		**WEIGHT (lb)**			
		30000	**35000**	**40000**	**45000**
22 (V_{REF22} + 10)	Pitch (deg) N1 (%)	3 43.9	3 46.9	3 49.6	3 52.0
45 (V_{REF45} + 10)	Pitch (deg) N1 (%)	-1 57.1	0 60.8	0 63.9	0 66.7

UNRELIABLE AIRSPEED TABLES (CLB Thrust Mode)

Airplane: EMB-135 – Engine: AE3007A1/3 – Anti-Ice: ON

PRESSURE ALTITUDE (ft)		WEIGHT (lb)			
		30000	35000	40000	45000
0 (240 KIAS)	Pitch (deg) V/S (ft/min)	12 4700	11 3900	10 3400	9 2800
10000 (240 KIAS)	Pitch (deg) V/S (ft/min)	8 3500	8 2800	7 2400	7 1900
20000 (0.56 M)	Pitch (deg) V/S (ft/min)	6 3000	5 2300	5 1900	5 1500
30000 (0.56 M)	Pitch (deg) V/S (ft/min)	6 2000	5 1400	5 1100	5 700
37000 (0.56 M)	Pitch (deg) V/S (ft/min)	6 1200	6 700	6 400	6 0

UNRELIABLE AIRSPEED TABLES (Cruise)

Airplane: EMB-135 – Engine: AE3007A1/3 – Anti-Ice: ON

PRESSURE ALTITUDE (ft)		WEIGHT (lb)			
		30000	35000	40000	45000
15000 (250 KIAS)	Pitch (deg) N1 (%)	1 68.9	2 70.0	2 71.2	2 72.4
20000 (250 KIAS)	Pitch (deg) N1 (%)	1 72.2	2 73.5	2 74.9	2 76.5
25000 (250 KIAS)	Pitch (deg) N1 (%)	1 76.2	2 77.8	2 79.4	2 80.9
30000 (0.63 M)	Pitch (deg) N1 (%)	2 78.4	2 79.9	2 81.2	3 82.5
37000 (0.63 M)	Pitch (deg) N1 (%)	3 79.8	3 81.7	4 83.8	4 86.3

UNRELIABLE AIRSPEED TABLES (Flight Idle Descent)

Airplane: EMB-135 – Engine: AE3007A1/3 – Anti-Ice: ON

PRESSURE ALTITUDE (ft)		WEIGHT (lb)			
		30000	35000	40000	45000
0 (240 KIAS)	Pitch (deg) V/S (ft/min)	-1 -900	0 -900	0 -900	0 -900
10000 (240 KIAS)	Pitch (deg) V/S (ft/min)	-1 -1200	-1 -1200	0 -1200	0 -1200
20000 (240 KIAS)	Pitch (deg) V/S (ft/min)	-1 -1300	0 -1300	0 -1300	0 -1300
30000 (240 KIAS)	Pitch (deg) V/S (ft/min)	-1 -1400	0 -1400	0 -1400	1 -1400
37000 (240 KIAS)	Pitch (deg) V/S (ft/min)	-1 -1700	0 -1600	0 -1600	1 -1500

UNRELIABLE AIRSPEED TABLES (Holding)

Airplane: EMB-135 – Engine: AE3007A1/3 – Anti-Ice: ON

PRESSURE ALTITUDE (ft)		WEIGHT (lb)			
		30000	35000	40000	45000
5000 (200 KIAS)	Pitch (deg) N1 (%)	3 54.1	3 55.9	4 57.8	6 61.8
10000 (200 KIAS)	Pitch (deg) N1 (%)	3 57.5	3 59.6	4 61.8	6 65.8

UNRELIABLE AIRSPEED TABLES (Terminal Area)					
Terminal Area (5000 ft) - %N1 for Level Flight					
Airplane: EMB-135 – Engine: AE3007A1/3 – Anti-Ice: ON					
FLAP POSITION (V_{REF} + INCREMENT)		**WEIGHT (lb)**			
		30000	**35000**	**40000**	**45000**
0 (V_{REF45} + 30)	Pitch (deg) N1 (%)	7 48.9	7 52.5	7 55.7	7 61.3
9 (V_{REF45} + 15)	Pitch (deg) N1 (%)	7 51.5	8 55.1	8 58.3	8 63.9

UNRELIABLE AIRSPEED TABLES (Final Approach)					
Final Approach (1500 ft) - %N1 for 3° Glideslope					
Airplane: EMB-135 – Engine: AE3007A1/3 – Anti-Ice: ON					
FLAP POSITION (V_{REF} + INCREMENT)		**WEIGHT (lb)**			
		30000	**35000**	**40000**	**45000**
22 (V_{REF22} + 10)	Pitch (deg) N1 (%)	3 47.6	3 50.7	4 53.5	4 58.0
45 (V_{REF45} + 10)	Pitch (deg) N1 (%)	0 59.5	0 63.4	0 66.7	0 72.0

UNRELIABLE AIRSPEED TABLES (CLB Thrust Mode)

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

PRESSURE ALTITUDE (ft)		WEIGHT (lb)					
		30000	35000	40000	45000	50000	55000
0 (240 KIAS)	Pitch (deg)	13	11	10	10	9	9
	V/S (ft/min)	4700	3900	3400	2900	2500	2200
10000 (240 KIAS)	Pitch (deg)	8	8	7	7	7	6
	V/S (ft/min)	3500	2800	2400	1900	1600	1400
20000 (0.56 M)	Pitch (deg)	6	5	5	5	5	5
	V/S (ft/min)	3000	2300	1900	1500	1200	900
30000 (0.56 M)	Pitch (deg)	6	6	6	6	6	6
	V/S (ft/min)	2000	1400	1100	700	400	200
37000 (0.56 M)	Pitch (deg)	6	6	7	7	-	-
	V/S (ft/min)	1200	700	400	0		

UNRELIABLE AIRSPEED TABLES (Cruise)

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

PRESSURE ALTITUDE (ft)		WEIGHT (lb)					
		30000	35000	40000	45000	50000	55000
15000 (250 KIAS)	Pitch (deg)	1	1	2	2	2	3
	N1 (%)	68.7	69.9	71.1	72.4	73.8	75.3
20000 (250 KIAS)	Pitch (deg)	1	1	2	2	2	3
	N1 (%)	72.0	73.4	74.8	76.4	78.0	79.6
25000 (250 KIAS)	Pitch (deg)	1	1	2	2	2	3
	N1 (%)	76.1	77.6	79.3	80.7	81.9	83.1
30000 (0.63 M)	Pitch (deg)	1	1	2	2	2	3
	N1 (%)	78.5	79.9	81.2	82.5	84.0	85.5
37000 (0.63 M)	Pitch (deg)	2	2	2	3	3	4
	N1 (%)	79.8	81.7	83.8	86.4	89.8	92.8

UNRELIABLE AIRSPEED TABLES (Flight Idle Descent)

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

PRESSURE ALTITUDE (ft)		WEIGHT (lb)					
		30000	35000	40000	45000	50000	55000
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	2
	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 (lb)					
		30000	35000	40000	45000	50000	55000
5000 (200 KIAS)	Pitch (deg)	3	3	4	5	5	6
	N1 (%)	54.0	55.9	57.8	59.9	62.2	65.7
10000 (200 KIAS)	Pitch (deg)	3	3	4	5	5	6
	N1 (%)	57.5	59.5	61.8	65.7	66.2	69.7

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 (lb)			
		30000	35000	40000	45000
0 (V_{REF45} + 30)	Pitch (deg)	7	7	7	8
	N1 (%)	48.9	52.5	55.7	61.3
9 (V_{REF45} + 15)	Pitch (deg)	7	7	7	8
	N1 (%)	52.3	55.3	58.6	64.3

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 (lb)			
		30000	35000	40000	45000
22 (V_{REF22} + 10)	Pitch (deg)	3	3	3	3
	N1 (%)	48.9	52.5	55.7	61.3
45 (V_{REF45} + 10)	Pitch (deg)	-1	0	0	0
	N1 (%)	58.6	62.4	65.7	70.9

UNRELIABLE AIRSPEED TABLES (CLB Thrust Mode)

Airplane: EMB-145XR – Engine: AE3007A1E – Anti-Ice: ON

PRESSURE ALTITUDE (ft)		WEIGHT (lb)					
		30000	35000	40000	45000	50000	55000
0 (240 KIAS)	Pitch (deg)	10	10	9	9	8	8
	V/S (ft/min)	3800	3300	2900	2500	2200	1900
10000 (240 KIAS)	Pitch (deg)	7	7	6	6	6	6
	V/S (ft/min)	2700	2200	2000	1700	1400	1200
20000 (0.56 M)	Pitch (deg)	3	3	3	3	3	4
	V/S (ft/min)	900	800	700	600	400	300
30000 (0.56 M)	Pitch (deg)	4	4	5	5	-	-
	V/S (ft/min)	900	700	500	300		
37000 (0.56 M)	Pitch (deg)	5	5	-	-	-	-
	V/S (ft/min)	500	100				

UNRELIABLE AIRSPEED TABLES (Cruise)

Airplane: EMB-145XR – Engine: AE3007A1E – Anti-Ice: ON

PRESSURE ALTITUDE (ft)		WEIGHT (lb)					
		30000	35000	40000	45000	50000	55000
15000 (250 KIAS)	Pitch (deg)	1	2	2	2	3	3
	N1 (%)	79.1	79.2	79.5	79.9	80.4	81.0
20000 (250 KIAS)	Pitch (deg)	1	2	2	2	3	3
	N1 (%)	82.7	82.8	83.1	83.5	84.0	84.6
25000 (250 KIAS)	Pitch (deg)	1	2	2	2	3	3
	N1 (%)	86.0	86.2	86.5	86.9	87.5	88.2
30000 (0.63 M)	Pitch (deg)	2	2	2	3	3	-
	N1 (%)	86.6	86.9	87.5	88.4	89.8	
37000 (0.63 M)	Pitch (deg)	3	3	4	4	-	-
	N1 (%)	85.7	87.5	89.9	92.0		

UNRELIABLE AIRSPEED TABLES (Flight Idle Descent)

Airplane: EMB-145XR – Engine: AE3007A1E – Anti-Ice: ON

PRESSURE ALTITUDE (ft)		WEIGHT (lb)					
		30000	35000	40000	45000	50000	55000
0 (240 KIAS)	Pitch (deg)	-4	-3	-2	-1	-1	0
	V/S (ft/min)	-2400	-2000	-1800	-1700	-1600	-1500
10000 (240 KIAS)	Pitch (deg)	-4	-3	-2	-1	-1	0
	V/S (ft/min)	-2700	-2300	-2100	-1900	-1800	-1700
20000 (240 KIAS)	Pitch (deg)	-3	-2	-2	-1	0	0
	V/S (ft/min)	-2900	-2500	-2200	-2100	-2000	-1900
30000 (240 KIAS)	Pitch (deg)	-3	-2	-1	0	0	1
	V/S (ft/min)	-2900	-2500	-2300	-2100	-2000	-2000
37000 (240 KIAS)	Pitch (deg)	-2	-1	-1	0	0	1
	V/S (ft/min)	-3100	-2700	-2500	-2400	-2200	-2100

UNRELIABLE AIRSPEED TABLES (Holding)

Airplane: EMB-145XR – Engine: AE3007A1E – Anti-Ice: ON

PRESSURE ALTITUDE (ft)		WEIGHT (lb)					
		30000	35000	40000	45000	50000	55000
5000 (200 KIAS)	Pitch (deg)	3	3	4	5	5	6
	N1 (%)	61.4	62.2	63.3	64.6	66.0	68.4
10000 (200 KIAS)	Pitch (deg)	3	3	4	5	5	6
	N1 (%)	65.1	66.0	67.0	69.1	69.6	71.9

UNRELIABLE AIRSPEED TABLES (Terminal Area)					
Terminal Area (5000 ft) - %N1 for Level Flight					
Airplane: EMB-145XR – Engine: AE3007A1E – Anti-Ice: ON					
FLAP POSITION (V_{REF} + INCREMENT)		**WEIGHT (lb)**			
		30000	**35000**	**40000**	**45000**
0 (V_{REF45} + 30)	Pitch (deg) N1 (%)	7 51.4	7 54.8	7 57.9	8 63.4
9 (V_{REF45} + 15)	Pitch (deg) N1 (%)	7 49.9	7 52.8	8 56.0	8 61.2

UNRELIABLE AIRSPEED TABLES (Final Approach)					
Final Approach (1500 ft) - %N1 for 3° Glideslope					
Airplane: EMB-145XR – Engine: AE3007A1E – Anti-Ice: ON					
FLAP POSITION (V_{REF} + INCREMENT)		**WEIGHT (lb)**			
		30000	**35000**	**40000**	**45000**
22 (V_{REF22} + 10)	Pitch (deg) N1 (%)	3 51.4	3 54.8	3 57.9	4 63.4
45 (V_{REF45} + 10)	Pitch (deg) N1 (%)	-1 57.1	0 60.8	0 63.9	0 69.0

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	44	45	to	49	50	to	50	-		
1000 →	-40	to	41	42	to	47	48	to	48	-		
2000 →	-40	to	37	38	to	43	44	to	46	-		
3000 →	-40	to	33	34	to	40	41	to	44	-		
4000 →	-40	to	29	30	to	36	37	to	41	42	to	42
5000 →	-40	to	24	25	to	31	32	to	37	38	to	40
6000 →	-40	to	15	16	to	26	27	to	33	34	to	38
7000 →	-			-40	to	22	23	to	28	29	to	36
8000 →	-			-40	to	18	19	to	23	24	to	34
	↓			↓			↓			↓		
WEIGHT (lb)	**V1**	**VR**	**V2**	**V1**	**VR**	**V2**	**V1**	**VR**	**V2**	**V1**	**VR**	**V2**
28000	102	106	122	98	101	117	96	99	114	94	95	110
29000	102	105	122	98	101	117	97	100	114	96	98	111
30000	102	105	121	98	102	116	97	100	115	99	100	113
31000	101	105	121	99	102	117	99	102	116	101	103	115
32000	101	105	120	101	103	117	102	104	117	104	105	117
33000	103	106	121	103	105	119	104	106	119	106	107	119
34000	105	107	122	106	108	121	107	108	121	109	109	121
35000	107	109	123	108	110	122	109	110	122	111	112	122
36000	109	111	124	111	112	124	112	113	124	113	114	124
37000	111	113	126	113	114	126	114	115	126	115	116	126
38000	114	115	128	115	116	128	116	117	128	118	118	128
39000	116	117	129	117	118	129	118	119	129	120	120	129
40000	118	119	131	120	120	131	120	121	131	122	122	131
41000	121	121	132	122	122	132	122	123	132	123	124	132
42000	123	123	134	124	124	134	124	124	134	125	125	134
43000	125	125	135	126	126	136	126	126	136	127	127	136
44000	127	127	137	128	128	137	128	128	137	129	129	137
45000	128	128	138	129	129	139	130	130	139	131	131	139
46000	130	130	140	131	131	140	132	132	140	133	133	140
47000	132	132	141	133	133	141	133	133	141	134	134	142
48000	134	134	143	135	135	143	135	135	143	136	136	143
49000	135	135	144	136	136	144	137	137	144	138	138	144
50000	137	137	146	137	137	146	138	138	146	139	139	146

FINAL SEGMENT SPEED (V_{FS})

WEIGHT (lb)	V_{FS} (KIAS)	WEIGHT (lb)	V_{FS} (KIAS)
26000	132	39000	160
27000	134	40000	162
28000	136	41000	164
29000	139	42000	165
30000	141	43000	167
31000	142	44000	169
32000	145	45000	171
33000	147	46000	172
34000	150	47000	173
35000	152	48000	175
36000	154	49000	177
37000	156	50000	179
38000	158		

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	42	43	to	47	48	to	50		-	
1000 ➔	-40	to	42	43	to	45	46	to	48		-	
2000 ➔	-40	to	38	39	to	42	43	to	46		-	
3000 ➔	-40	to	34	35	to	38	39	to	44		-	
4000 ➔		-		-40	to	34	35	to	41	42	to	42
5000 ➔		-		-40	to	29	30	to	37	38	to	40
6000 ➔		-		-40	to	24	25	to	32	33	to	38
7000 ➔		-		-40	to	20	21	to	27	28	to	36
8000 ➔		-			-		-40	to	23	24	to	34
	↓			↓			↓			↓		
WEIGHT (lb)	**V1**	**VR**	**V2**	**V1**	**VR**	**V2**	**V1**	**VR**	**V2**	**V1**	**VR**	**V2**
28000	95	109	119	93	106	115	91	102	111	89	98	106
29000	95	108	118	93	106	115	91	102	111	90	99	107
30000	95	108	117	94	105	115	92	102	110	90	99	107
31000	96	108	117	94	105	114	93	102	110	92	100	107
32000	96	108	116	95	105	114	93	102	110	94	100	108
33000	97	107	116	96	105	113	95	103	110	96	102	109
34000	98	107	116	97	105	113	97	104	111	99	103	110
35000	99	107	116	98	105	114	98	105	112	102	105	111
36000	100	107	116	100	106	114	100	106	113	104	106	113
37000	101	108	116	101	107	115	103	107	114	107	108	114
38000	102	109	117	103	108	116	106	108	116	109	109	116
39000	104	110	118	105	110	117	108	110	117	111	111	117
40000	106	111	118	108	111	118	110	112	118	112	112	118
41000	108	112	120	110	113	120	112	113	120	114	114	120
42000	111	114	121	113	114	121	114	115	121	115	115	121
43000	114	115	122	115	115	122	116	116	122	117	117	122
44000	116	116	123	117	117	123	117	117	123	118	118	123
45000	117	118	124	118	118	124	119	119	124	119	119	124
46000	119	119	125	119	119	125	120	120	125	121	121	125
47000	120	120	126	121	121	126	121	121	126	122	122	126
48000	122	122	127	122	122	127	123	123	127	123	123	127
49000	123	123	128	123	123	128	124	124	128	124	124	128
50000	124	124	130	125	125	130	125	125	130	126	126	130

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	43	44	to	48	49	to	50		-	
1000 ➔	-40	to	43	44	to	45	46	to	48		-	
2000 ➔	-40	to	40	41	to	42	43	to	46		-	
3000 ➔	-40	to	36	37	to	38	39	to	44		-	
4000 ➔	-40	to	31	32	to	33	34	to	40	41	to	42
5000 ➔	-40	to	27	28	to	29	30	to	36	37	to	40
6000 ➔		-		-40	to	25	26	to	31	32	to	38
7000 ➔		-			-		-40	to	27	28	to	36
8000 ➔		-			-		-40	to	23	24	to	34
	↓			↓			↓			↓		
WEIGHT (lb)	**V1**	**VR**	**V2**	**V1**	**VR**	**V2**	**V1**	**VR**	**V2**	**V1**	**VR**	**V2**
28000	101	105	122	100	103	120	97	100	116	94	97	111
29000	101	105	121	100	103	119	97	100	116	96	98	112
30000	101	104	120	100	103	119	97	101	115	98	100	113
31000	101	104	120	100	103	118	99	102	116	100	102	115
32000	101	104	119	100	103	118	101	103	117	103	104	117
33000	103	106	121	103	105	119	104	105	119	105	107	119
34000	105	107	122	105	107	121	106	108	121	108	109	121
35000	107	109	123	108	109	123	109	110	122	110	111	122
36000	109	111	124	110	111	124	111	112	124	112	113	124
37000	112	113	126	112	113	126	113	114	126	115	115	126
38000	114	115	127	115	115	128	116	116	128	117	117	128
39000	116	117	129	117	117	129	118	118	129	119	119	129
40000	118	119	131	119	119	131	120	120	131	121	121	131
41000	121	121	132	121	121	132	122	122	132	123	123	132
42000	123	123	134	123	123	134	124	124	134	125	125	134
43000	124	125	135	125	125	135	126	126	136	127	127	136
44000	126	126	137	127	127	137	128	128	137	129	129	137
45000	128	128	138	129	129	139	129	129	139	130	130	139
46000	130	130	140	130	130	140	131	131	140	132	132	140
47000	132	132	141	132	132	141	133	133	141	134	134	142
48000	133	133	143	134	134	143	135	135	143	135	135	143
49000	135	135	144	135	135	144	136	136	144	137	137	144
50000	137	137	146	138	138	146	138	138	146	139	139	146

APPROACH CLIMB SPEED (V_{APPCLB}), LANDING CLIMB & REFERENCE SPEEDS (V_{REF}) and FINAL SEGMENT SPEED (V_{FS})				
Weight (lb)	**Approach Climb Speed (KIAS)**	**Landing Climb & Reference Speeds (KIAS)**		**V_{FS} (KIAS)**
	Flaps 9°	**Flaps 45°**	**Flaps 22°**	
27000	125	104	109	134
28000	128	106	111	136
29000	130	108	113	139
30000	132	109	114	141
31000	134	111	116	142
32000	136	113	118	145
33000	138	115	120	147
34000	140	117	121	150
35000	142	118	123	152
36000	144	120	125	154
37000	146	121	127	156
38000	148	123	128	158
39000	150	124	130	160
40000	152	126	131	162
41000	154	127	133	164
42000	156	128	134	165
43000	157	130	136	167
44000	159	131	137	169
45000	161	132	139	171
46000	163	134	140	172
47000	164	135	142	173
48000	166	136	143	175
49000	167	137	144	177
50000	167	137	144	179

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 (lb)			ALTITUDE (ft)								
			0	1500	5000	10000	15000	20000	25000	30000	37000
50000	IAS	kt	180	179	176	173	171	171	174	179	184
	N1	%	57.7	58.8	61.6	65.8	69.7	73.9	78.2	82.4	90.3
	FF	lb/h/En	1104	1090	1061	1032	1016	1013	1014	1027	1078
48000	IAS	kt	178	176	173	170	168	168	170	174	184
	N1	%	56.7	57.8	60.5	64.7	68.7	72.7	77.2	81.3	88.9
	FF	lb/h/En	1067	1052	1023	992	974	968	969	979	1024
46000	IAS	kt	175	174	170	167	165	164	166	170	180
	N1	%	55.6	56.7	59.3	63.6	67.6	71.5	76.2	80.2	87.3
	FF	lb/h/En	1031	1015	985	952	932	924	925	932	971
44000	IAS	kt	173	171	168	164	161	161	162	165	175
	N1	%	54.6	55.6	58.1	62.4	66.4	70.4	74.9	79.0	85.7
	FF	lb/h/En	995	979	947	913	892	881	881	886	919
42000	IAS	kt	170	169	165	161	158	157	158	161	169
	N1	%	53.5	54.5	56.9	61.0	65.2	69.2	73.6	77.9	84.4
	FF	lb/h/En	959	943	910	875	851	839	838	840	867
40000	IAS	kt	168	166	162	158	155	153	154	156	164
	N1	%	52.3	53.3	55.7	59.6	63.9	68.0	72.1	76.6	83.1
	FF	lb/h/En	924	907	874	836	811	797	794	795	817
38000	IAS	kt	166	164	160	155	152	150	150	151	158
	N1	%	51.1	52.1	54.5	58.2	62.6	66.6	70.7	75.4	81.9
	FF	lb/h/En	890	873	838	799	772	756	750	751	768
36000	IAS	kt	163	161	157	152	148	146	145	147	152
	N1	%	49.8	50.8	53.2	56.8	61.2	65.3	69.3	74.0	80.6
	FF	lb/h/En	856	838	802	762	734	716	708	708	720
34000	IAS	kt	161	159	154	149	145	142	141	142	147
	N1	%	48.6	49.5	51.9	55.4	59.5	63.8	67.9	72.4	79.1
	FF	lb/h/En	823	805	767	726	696	676	666	666	674
32000	IAS	kt	158	156	152	146	142	139	137	138	141
	N1	%	47.3	48.2	50.5	53.9	57.8	62.2	66.4	70.6	77.6
	FF	lb/h/En	790	772	733	690	658	637	625	622	628
30000	IAS	kt	156	154	149	143	139	135	133	133	136
	N1	%	46.0	46.8	49.0	52.4	56.2	60.6	64.7	68.9	76.0
	FF	lb/h/En	759	740	700	655	622	599	585	580	584
28000	IAS	kt	154	151	146	140	135	132	129	128	130
	N1	%	44.6	45.4	47.5	50.9	54.5	58.7	63.1	67.2	74.3
	FF	lb/h/En	728	708	668	621	586	561	546	538	540

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 (lb)			ALTITUDE (ft)								
			0	1500	5000	10000	15000	20000	25000	30000	37000
50000	IAS	kt	200	200	200	200	200	200	200	200	-
	N1	%	58.3	59.4	62.2	66.2	70.1	73.9	78.2	82.3	-
	FF	lb/h/En	1256	1238	1201	1160	1133	1123	1120	1133	-
48000	IAS	kt	200	200	200	200	200	200	200	200	-
	N1	%	57.5	58.6	61.3	65.3	69.2	73.0	77.3	81.3	-
	FF	lb/h/En	1225	1207	1169	1127	1098	1085	1082	1091	-
46000	IAS	kt	200	200	200	200	200	200	200	200	200
	N1	%	56.7	57.8	60.4	64.4	68.3	72.0	76.4	80.4	87.1
	FF	lb/h/En	1196	1177	1139	1095	1064	1049	1046	1051	1093
44000	IAS	kt	200	200	200	200	200	200	200	200	200
	N1	%	56.0	57.0	59.5	63.5	67.5	71.1	75.5	79.5	85.7
	FF	lb/h/En	1167	1148	1109	1064	1032	1014	1011	1013	1049
42000	IAS	kt	200	200	200	200	200	200	200	200	200
	N1	%	55.3	56.2	58.6	62.6	66.7	70.3	74.5	78.7	84.7
	FF	lb/h/En	1140	1121	1081	1035	1001	981	978	978	1007
40000	IAS	kt	200	200	200	200	200	200	200	200	200
	N1	%	54.4	55.5	57.8	61.7	65.8	69.4	73.5	77.8	83.7
	FF	lb/h/En	1114	1094	1054	1007	972	950	944	944	968
38000	IAS	kt	200	200	200	200	200	200	200	200	200
	N1	%	53.6	54.7	57.0	60.8	64.9	68.6	72.6	76.9	82.9
	FF	lb/h/En	1089	1069	1029	980	944	920	911	913	931
36000	IAS	kt	200	200	200	200	200	200	200	200	200
	N1	%	52.8	53.8	56.2	60.0	64.0	67.8	71.6	76.0	82.0
	FF	lb/h/En	1065	1045	1004	955	917	892	881	883	897
34000	IAS	kt	200	200	200	200	200	200	200	200	200
	N1	%	52.0	53.0	55.5	59.1	63.2	67.0	70.7	75.2	81.2
	FF	lb/h/En	1042	1023	981	931	892	865	852	855	865
32000	IAS	kt	200	200	200	200	200	200	200	200	200
	N1	%	51.3	52.3	54.8	58.3	62.3	66.2	69.9	74.2	80.4
	FF	lb/h/En	1021	1001	959	908	869	840	824	824	836
30000	IAS	kt	200	200	200	200	200	200	200	200	200
	N1	%	50.6	51.5	54.0	57.5	61.6	65.5	69.0	73.2	79.6
	FF	lb/h/En	1001	981	938	887	846	816	799	796	808
28000	IAS	kt	200	200	200	200	200	200	200	200	200
	N1	%	49.9	50.8	53.2	56.8	60.7	64.7	68.2	72.2	78.9
	FF	lb/h/En	981	961	919	867	825	794	774	769	783

DRIFTDOWN TABLE
ANTI-ICE OFF

WEIGHT (lb)		INITIAL DRIFTDOWN SPEED (KIAS)	GROSS LEVEL OFF ALTITUDE – FT (NET LEVEL OFF ALTITUDE - FT)		
START DRIFTDOWN	LEVEL OFF		ISA + 10 & BELOW	ISA + 15	ISA + 20
46000	44200	172	20770 (16010)	20640 (15930)	20220 (15690)
44000	42300	169	22030 (17490)	21880 (17390)	21470 (17180)
42000	40500	165	23430 (19400)	23050 (19250)	22710 (18760)
40000	38700	161	24860 (21055)	24520 (20910)	23950 (20410)
38000	36900	157	26440 (22460)	26170 (22260)	25470 (21950)
36000	34900	154	28150 (24110)	27520 (23730)	26920 (23250)
34000	33000	149	29820 (25850)	29220 (25560)	28260 (24890)
32000	31100	145	31870 (27550)	30784 (27000)	29680 (26410)

ANTI-ICE ON

WEIGHT (lb)		INITIAL SPEED (KIAS)	GROSS AND (NET) LEVEL OFF ALTITUDE - FT				
START DRIFTDOWN	LEVEL OFF		ISA – 10 & BELOW	ISA - 5	ISA	ISA + 5	ISA + 10
46000	43600	173	17190 (13220)	17090 (13030)	15980 (12280)	14260 (10670)	12630 (8550)
44000	42000	169	18730 (14620)	18540 (14410)	17480 (13460)	15620 (11890)	13850 (10330)
42000	40100	165	20390 (16150)	20200 (15940)	19200 (14940)	17370 (13260)	15350 (11750)
40000	38200	161	21790 (17840)	21450 (17780)	20600 (16620)	18920 (14830)	16960 (13220)
38000	36300	158	23180 (19780)	22730 (19570)	21840 (18350)	20540 (16590)	18450 (14670)
36000	34400	154	24590 (21390)	24300 (21050)	23150 (20270)	21850 (18450)	20010 (16400)
34000	32600	149	26080 (22990)	25340 (22580)	24420 (21670)	23190 (20370)	21410 (18250)
32000	30700	145	27370 (24460)	26550 (23900)	25660 (23020)	24390 (21700)	22690 (19810)

UNFACTORED LANDING DISTANCE

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

WEIGHT (lb)	ALTITUDE							
	0 ft				1000 ft			
	WIND				WIND			
	-10 kt	0 kt	10 kt	20 kt	-10 kt	0 kt	10 kt	20 kt
48000	3507	3025	2873	2726	3587	3098	2943	2794
46000	3399	2927	2778	2634	3476	2996	2845	2699
44000	3291	2829	2684	2543	3364	2895	2748	2605
42000	3184	2732	2589	2451	3253	2795	2650	2511
40000	3078	2636	2497	2362	3143	2695	2553	2417
38000	2978	2546	2409	2277	3039	2601	2463	2329
36000	2878	2454	2321	2191	2936	2507	2372	2241
34000	2773	2359	2229	2102	2829	2410	2278	2150
32000	2663	2260	2133	2009	2716	2308	2179	2054
30000	2551	2158	2034	1914	2601	2204	2078	1956
28000	2437	2055	1934	1817	2484	2098	1976	1857

WEIGHT (lb)	ALTITUDE							
	2000 ft				3000 ft			
	WIND				WIND			
	-10 kt	0 kt	10 kt	20 kt	-10 kt	0 kt	10 kt	20 kt
48000	3670	3173	3016	2865	3757	3252	3093	2939
46000	3555	3068	2915	2767	3638	3144	2988	2837
44000	3440	2964	2814	2669	3520	3036	2884	2737
42000	3326	2860	2714	2572	3401	2929	2780	2636
40000	3211	2757	2614	2475	3284	2822	2677	2536
38000	3103	2659	2518	2383	3170	2719	2577	2439
36000	2996	2562	2425	2292	3059	2619	2480	2346
34000	2886	2462	2328	2199	2946	2517	2381	2250
32000	2771	2358	2227	2101	2828	2409	2277	2149
30000	2653	2250	2123	2000	2707	2299	2171	2046
28000	2533	2142	2018	1899	2584	2188	2063	1942

WEIGHT (lb)	ALTITUDE							
	4000 ft				5000 ft			
	WIND				WIND			
	-10 kt	0 kt	10 kt	20 kt	-10 kt	0 kt	10 kt	20 kt
48000	3848	3334	3172	3015	3942	3420	3255	3096
46000	3725	3222	3064	2911	3815	3304	3143	2988
44000	3602	3111	2956	2807	3688	3189	3032	2880
42000	3480	3000	2849	2703	3562	3075	2921	2773
40000	3358	2890	2743	2600	3437	2961	2811	2666
38000	3238	2781	2637	2498	3311	2847	2701	2560
36000	3124	2678	2537	2401	3193	2740	2597	2459
34000	3008	2573	2435	2303	3073	2632	2493	2358
32000	2887	2463	2329	2200	2949	2519	2383	2252
30000	2763	2350	2220	2094	2821	2403	2271	2143
28000	2637	2236	2110	1987	2692	2286	2158	2034

NOTE: Landing distance in feet.

UNFACTORED LANDING DISTANCE

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

WEIGHT (lb)	ALTITUDE							
	6000 ft				7000 ft			
	WIND				WIND			
	-10 kt	0 kt	10 kt	20 kt	-10 kt	0 kt	10 kt	20 kt
48000	4041	3509	3342	3180	4143	3601	3431	3266
46000	3909	3389	3226	3067	4006	3477	3311	3150
44000	3778	3270	3110	2956	3871	3354	3192	3035
42000	3648	3152	2996	2845	3736	3233	3074	2921
40000	3518	3035	2882	2735	3602	3111	2956	2807
38000	3388	2917	2769	2625	3468	2990	2839	2693
36000	3264	2805	2660	2520	3338	2872	2725	2583
34000	3141	2693	2551	2415	3210	2756	2612	2474
32000	3013	2577	2439	2306	3079	2637	2497	2362
30000	2882	2458	2324	2195	2944	2515	2379	2248
28000	2750	2338	2208	2083	2809	2392	2260	2133

WEIGHT (lb)	ALTITUDE							
	8000 ft				8500 ft			
	WIND				WIND			
	-10 kt	0 kt	10 kt	20 kt	-10 kt	0 kt	10 kt	20 kt
46000	4108	3569	3400	3236	4161	3617	3447	3281
44000	3967	3442	3277	3117	4018	3488	3321	3160
42000	3828	3316	3155	2999	3876	3359	3197	3039
40000	3689	3190	3033	2881	3735	3231	3073	2920
38000	3551	3065	2912	2764	3595	3104	2950	2800
36000	3415	2941	2792	2648	3455	2978	2827	2682
34000	3282	2821	2675	2535	3319	2855	2708	2567
32000	3147	2698	2557	2420	3182	2730	2588	2450
30000	3009	2573	2436	2303	3042	2604	2465	2331
28000	2869	2447	2313	2184	2901	2475	2341	2211

NOTE: Landing distance in feet.

UNFACTORED LANDING DISTANCE

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

WEIGHT (lb)	ALTITUDE							
	0 ft				1000 ft			
	WIND				WIND			
	-10 kt	0 kt	10 kt	20 kt	-10 kt	0 kt	10 kt	20 kt
48000	4613	4011	3821	3636	4724	4112	3919	3731
46000	4445	3858	3673	3493	4551	3955	3766	3583
44000	4281	3709	3529	3353	4381	3800	3617	3438
42000	4123	3566	3390	3218	4218	3652	3473	3298
40000	3964	3421	3249	3081	4053	3502	3327	3158
38000	3810	3281	3114	2951	3895	3358	3188	3022
36000	3660	3145	2982	2823	3740	3217	3052	2890
34000	3507	3005	2846	2692	3581	3073	2912	2755
32000	3356	2869	2714	2563	3427	2932	2776	2623
30000	3212	2737	2587	2440	3278	2798	2645	2497
28000	3067	2606	2459	2317	3129	2662	2514	2369

WEIGHT (lb)	ALTITUDE							
	2000 ft				3000 ft			
	WIND				WIND			
	-10 kt	0 kt	10 kt	20 kt	-10 kt	0 kt	10 kt	20 kt
48000	4841	4218	4022	3830	4963	4329	4129	3934
46000	4661	4055	3863	3677	4776	4159	3965	3775
44000	4485	3895	3708	3527	4594	3994	3804	3620
42000	4316	3741	3559	3382	4419	3835	3650	3470
40000	4145	3586	3409	3236	4242	3674	3494	3319
38000	3982	3437	3265	3097	4073	3520	3346	3175
36000	3822	3292	3124	2961	3908	3370	3200	3034
34000	3659	3143	2980	2821	3740	3217	3052	2891
32000	3499	2998	2840	2685	3576	3068	2907	2750
30000	3346	2859	2705	2555	3418	2925	2768	2616
28000	3193	2720	2570	2424	3260	2781	2629	2481

WEIGHT (lb)	ALTITUDE							
	4000 ft				5000 ft			
	WIND				WIND			
	-10 kt	0 kt	10 kt	20 kt	-10 kt	0 kt	10 kt	20 kt
48000	******	4445	4241	4043	******	4567	4359	4158
46000	4897	4269	4071	3878	******	4384	4182	3986
44000	4707	4097	3904	3716	4827	4205	4009	3818
42000	4526	3932	3744	3562	4639	4034	3844	3658
40000	4343	3766	3583	3406	4450	3863	3677	3496
38000	4169	3607	3429	3256	4269	3698	3518	3342
36000	3998	3452	3279	3111	4092	3538	3362	3191
34000	3824	3294	3126	2962	3913	3374	3204	3038
32000	3655	3140	2976	2818	3738	3215	3050	2889
30000	3492	2992	2834	2679	3570	3063	2902	2746
28000	3330	2844	2690	2540	3402	2910	2754	2602

NOTE: Landing distance in feet.

UNFACTORED LANDING DISTANCE

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

WEIGHT (lb)	ALTITUDE							
	6000 ft				7000 ft			
	WIND				WIND			
	-10 kt	0 kt	10 kt	20 kt	-10 kt	0 kt	10 kt	20 kt
48000	******	4694	4483	4277	******	4827	4611	4402
46000	******	4504	4298	4099	******	4629	4419	4216
44000	4951	4319	4119	3925	******	4436	4233	4035
42000	4756	4141	3947	3758	4878	4252	4054	3862
40000	4560	3963	3774	3590	4675	4067	3875	3689
38000	4373	3793	3609	3431	4480	3891	3704	3523
36000	4190	3627	3449	3275	4292	3719	3538	3362
34000	4005	3458	3285	3117	4100	3545	3369	3198
32000	3824	3294	3126	2962	3913	3375	3204	3038
30000	3651	3136	2973	2815	3735	3213	3047	2886
28000	3478	2979	2821	2667	3557	3051	2890	2734

WEIGHT (lb)	ALTITUDE							
	8000 ft				8500 ft			
	WIND				WIND			
	-10 kt	0 kt	10 kt	20 kt	-10 kt	0 kt	10 kt	20 kt
46000	******	4759	4546	4338	******	4827	4612	4402
44000	******	4559	4352	4150	******	4623	4414	4211
42000	******	4367	4166	3971	******	4428	4225	4027
40000	4794	4176	3981	3790	4856	4232	4035	3844
38000	4593	3993	3803	3619	4651	4046	3855	3669
36000	4397	3815	3631	3452	4452	3865	3679	3499
34000	4199	3635	3456	3282	4251	3682	3502	3326
32000	4006	3459	3286	3118	4054	3503	3329	3159
30000	3822	3292	3124	2960	3867	3333	3164	2999
28000	3638	3124	2962	2803	3680	3163	2999	2839

NOTE: Landing distance in feet.

INTENTIONALLY BLANK

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 46	47 to 48	49 to 50	-
1000 →	-40 to 43	44 to 45	46 to 48	-
2000 →	-40 to 39	40 to 42	43 to 45	46 to 46
3000 →	-40 to 35	36 to 38	39 to 41	42 to 44
4000 →	-40 to 31	32 to 34	35 to 38	39 to 41
5000 →	-40 to 26	27 to 30	31 to 33	34 to 37
6000 →	-	-40 to 25	26 to 29	30 to 32
7000 →	-	-40 to 20	21 to 24	25 to 28
8000 →	-	-	-40 to 20	21 to 24
10000 →	-	-	-	-40 to 23
	↓	↓	↓	↓
WEIGHT (lb)	**V1 VR V2**	**V1 VR V2**	**V1 VR V2**	**V1 VR V2**
26500	100 104 122	98 102 119	97 100 117	95 98 114
27500	100 104 121	99 102 119	97 100 116	95 98 113
28500	100 104 120	99 102 118	97 100 115	95 98 113
29500	100 104 120	99 102 117	97 100 115	97 99 114
30500	100 103 119	98 101 117	98 101 115	99 101 115
31500	100 103 119	99 101 116	100 102 116	101 103 116
32500	101 103 118	102 104 118	103 104 118	103 105 118
33500	104 106 120	104 106 120	105 107 120	106 107 120
34500	106 108 122	107 108 122	108 109 122	108 109 122
35500	108 110 123	109 110 123	110 111 123	111 111 123
36500	111 112 125	111 112 125	112 113 125	113 114 125
37500	113 114 127	114 115 127	115 115 127	115 116 127
38500	115 116 128	116 117 128	117 117 128	117 118 128
39500	118 118 130	118 119 130	119 119 130	119 120 130
40500	120 120 132	120 121 132	121 121 132	121 122 132
41500	122 122 133	122 122 133	123 123 133	123 124 133
42500	124 124 135	124 124 135	125 125 135	125 125 135
43500	126 126 136	126 126 136	127 127 136	127 127 136
44500	128 128 138	128 128 138	129 129 138	129 129 138
45500	129 129 139	130 130 139	130 130 139	131 131 139
46500	131 131 141	132 132 141	132 132 141	133 133 141
47500	133 133 142	133 133 142	134 134 142	134 134 142
48500	134 134 144	135 135 144	135 135 144	136 136 144

FINAL SEGMENT SPEED (V_{FS})

WEIGHT (lb)	V_{FS} (KIAS)	WEIGHT (lb)	V_{FS} (KIAS)	WEIGHT (lb)	V_{FS} (KIAS)
26000	132	35000	152	44000	169
27000	134	36000	154	45000	171
28000	136	37000	156	46000	172
29000	139	38000	158	47000	173
30000	141	39000	160	48000	175
31000	142	40000	162	49000	177
32000	145	41000	164	50000	179
33000	147	42000	165		
34000	150	43000	167		

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 ➔	-	-	-
1000 ➔	-	-	-
2000 ➔	-	-	-
3000 ➔	-	-	-
4000 ➔	42 to 42	-	-
5000 ➔	38 to 40	-	-
6000 ➔	33 to 36	37 to 38	-
7000 ➔	29 to 32	33 to 35	36 to 36
8000 ➔	25 to 27	28 to 31	32 to 34
10000 ➔	-	22 to 25	26 to 32
	↓	↓	↓
WEIGHT (lb)	**V1 VR V2**	**V1 VR V2**	**V1 VR V2**
26500	94 96 112	92 94 109	91 92 107
27500	93 96 111	92 94 109	94 95 109
28500	94 96 111	95 97 111	96 98 111
29500	97 99 112	98 99 112	99 100 112
30500	99 101 114	100 102 114	101 102 114
31500	102 103 116	103 104 116	104 105 116
32500	104 106 118	105 106 118	106 107 118
33500	107 108 120	108 109 120	109 109 120
34500	109 110 122	110 111 122	111 111 122
35500	112 112 123	112 113 123	113 113 123
36500	114 114 125	115 115 125	115 115 125
37500	116 116 127	117 117 127	117 117 127
38500	118 118 128	119 119 128	119 119 128
39500	120 120 130	121 121 130	121 121 130
40500	122 122 132	123 123 132	123 123 132
41500	124 124 133	125 125 133	125 125 133
42500	126 126 135	126 126 135	127 127 135
43500	128 128 136	128 128 136	129 129 136
44500	130 130 138	130 130 138	131 131 138
45500	131 131 139	132 132 139	132 132 139
46500	133 133 141	134 134 141	134 134 141
47500	135 135 142	135 135 142	136 136 142
48500	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 9°					
PRESSURE ALTITUDE (ft)	STATIC AIR TEMPERATURE (°C)				
SL →	-40 to 39	40 to 44	45 to 48	49 to 50	-
1000 →	-40 to 35	36 to 40	41 to 44	45 to 48	-
2000 →	-40 to 30	31 to 36	37 to 41	42 to 46	-
3000 →	-	-40 to 32	33 to 37	38 to 42	43 to 44
4000 →	-	-40 to 27	28 to 33	34 to 38	39 to 42
5000 →	-	-	-40 to 28	29 to 34	35 to 40
6000 →	-	-	-40 to 24	25 to 30	31 to 36
7000 →	-	-	-	-40 to 25	26 to 31
8000 →	-	-	-	-40 to 21	22 to 27
10000 →	-	-	-	-	-40 to 26
	↓	↓	↓	↓	↓
WEIGHT (lb)	VR V2	VR V2	VR V2	VR V2	VR V2
26500	109 128	106 124	103 120	99 116	96 112
27500	109 127	105 123	102 119	99 115	96 111
28500	108 126	105 122	102 118	99 114	96 111
29500	108 125	105 121	102 117	98 114	98 113
30500	107 124	104 121	101 117	100 114	101 114
31500	107 124	104 120	101 116	102 116	103 116
32500	107 123	104 119	103 118	104 118	105 118
33500	107 123	105 120	106 120	107 120	108 120
34500	106 122	107 122	108 122	109 122	110 122
35500	108 123	109 123	110 123	111 123	112 123
36500	110 125	111 125	112 125	113 125	114 125
37500	112 127	113 127	114 127	115 127	116 127
38500	114 128	115 128	116 128	117 128	118 129
39500	116 130	117 130	118 130	119 130	120 130
40500	118 132	119 132	120 132	121 132	122 132
41500	120 133	121 133	122 133	123 133	124 133
42500	122 135	123 135	124 135	125 135	126 135
43500	124 136	125 136	126 136	127 136	128 136
44500	126 138	127 138	128 138	129 138	129 138
45500	128 139	129 139	129 139	130 139	131 139
46500	130 141	130 141	131 141	132 141	133 141
47500	131 142	132 142	133 142	134 142	135 142
48500	133 144	134 144	135 144	135 144	136 144

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.

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 41	42 to 48	49 to 50	-	-
1000 →	-40 to 38	39 to 45	46 to 48	-	-
2000 →	-40 to 33	34 to 41	42 to 46	-	-
3000 →	-40 to 29	30 to 37	38 to 44	-	-
4000 →	-	-40 to 33	34 to 41	42 to 42	-
5000 →	-	-40 to 29	30 to 37	38 to 40	-
6000 →	-	-40 to 24	25 to 33	34 to 38	-
7000 →	-	-	-40 to 28	29 to 36	-
8000 →	-	-	-40 to 24	25 to 32	33 to 34
10000 →	-	-	-	-40 to 25	26 to 33
	↓	↓	↓	↓	↓
WEIGHT (lb)	**VR V2**	**VR V2**	**VR V2**	**VR V2**	**VR V2**
26500	109 123	104 118	100 112	99 110	98 108
27500	108 122	104 117	101 113	100 111	98 109
28500	108 122	104 116	102 114	100 112	99 109
29500	108 121	104 117	103 115	102 113	101 110
30500	108 120	106 118	105 116	104 114	103 111
31500	108 121	107 119	106 117	105 115	104 112
32500	109 121	108 119	107 117	106 116	106 114
33500	110 122	109 120	108 118	108 116	107 115
34500	111 123	110 121	109 119	109 117	108 116
35500	112 124	111 122	110 120	110 118	110 117
36500	113 124	112 122	112 121	111 119	111 118
37500	114 125	113 123	113 121	112 120	112 119
38500	115 126	114 124	114 122	113 121	114 120
39500	116 126	115 125	115 123	115 122	115 122
40500	117 127	116 125	116 124	116 123	117 123
41500	118 128	117 126	117 125	118 125	118 124
42500	119 128	118 127	118 126	119 126	120 126
43500	120 129	119 128	120 127	121 127	122 127
44500	121 130	120 128	121 128	122 128	123 128
45500	121 130	122 130	123 130	124 130	125 130
46500	122 131	123 131	124 131	125 131	126 131
47500	124 132	125 132	126 132	127 132	128 132
48500	125 133	126 133	127 133	128 133	130 134

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.

TAKEOFF SPEEDS (Unbalanced Field Length)				
VR/V2 SPEEDS T/O-1 MODE - NORMAL V_2 - FLAPS 22°				
PRESSURE ALTITUDE (ft)	**STATIC AIR TEMPERATURE (°C)**			
SL →	-40 to 46	47 to 50	-	-
1000 →	-40 to 43	44 to 48	-	-
2000 →	-40 to 39	40 to 46	-	-
3000 →	-40 to 35	36 to 42	43 to 44	-
4000 →	-40 to 31	32 to 38	39 to 42	-
5000 →	-40 to 26	27 to 34	35 to 40	-
6000 →	-40 to 22	23 to 30	31 to 38	-
7000 →	-40 to 18	19 to 25	26 to 33	34 to 36
8000 →	-	-40 to 20	21 to 29	30 to 34
10000 →	-	-	-40 to 24	25 to 33
	↓	↓	↓	↓
WEIGHT (lb)	**VR V2**	**VR V2**	**VR V2**	**VR V2**
26500	96 107	94 104	93 102	92 101
27500	96 107	96 105	95 103	94 102
28500	98 108	97 106	96 104	95 103
29500	99 108	98 107	97 105	96 103
30500	100 109	99 108	98 106	98 104
31500	101 110	101 109	100 107	99 105
32500	103 111	102 109	101 108	101 107
33500	104 112	103 110	102 109	103 109
34500	105 113	104 111	104 110	105 110
35500	106 114	105 112	106 112	106 112
36500	107 114	106 113	107 113	108 113
37500	108 115	108 115	109 115	109 115
38500	109 116	109 116	110 116	111 116
39500	110 118	111 118	112 118	112 118
40500	112 119	112 119	113 119	114 119
41500	113 120	114 120	115 120	115 120
42500	115 121	115 121	116 121	117 121
43500	116 122	117 122	117 122	118 122
44500	117 123	118 123	119 123	119 124
45500	119 125	119 125	120 125	121 125
46500	120 126	121 126	121 126	122 126
47500	121 127	122 127	123 127	123 127
48500	122 128	123 128	124 128	124 128

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 (lb)	Approach Climb Speed (KIAS)	Landing Climb & Reference Speeds (KIAS)		V_{FS} (KIAS)
	Flaps 9°	Flaps 45°	Flaps 22°	
27000	125	104	109	134
28000	128	106	111	136
29000	130	108	113	139
30000	132	109	114	141
31000	134	111	116	142
32000	136	113	118	145
33000	138	115	120	147
34000	140	117	121	150
35000	142	118	123	152
36000	144	120	125	154
37000	146	121	127	156
38000	148	123	128	158
39000	150	124	130	160
40000	152	126	131	162
41000	154	127	133	164
42000	156	128	134	165
43000	157	130	136	167
44000	159	131	137	169
45000	161	132	139	171
46000	163	134	140	172
47000	164	135	142	173
48000	166	136	143	175
49000	167	137	144	177
50000	167	137	144	179

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 (lb)			ALTITUDE (ft)								
			0	5000	10000	15000	20000	25000	30000	35000	37000
49000	IAS	kt	179	174	171	169	170	172	177	185	184
	N1	%	57.2	61.0	65.3	69.1	73.2	77.9	82.0	86.6	89.6
	FF	lb/h/Eng	1072	1028	997	979	974	974	984	1011	1029
48000	IAS	kt	178	173	170	168	168	170	174	182	184
	N1	%	56.7	60.4	64.7	68.6	72.6	77.4	81.5	85.8	88.9
	FF	lb/h/Eng	1054	1009	977	959	952	952	961	985	1003
46000	IAS	kt	175	170	167	165	164	166	170	177	180
	N1	%	55.6	59.3	63.5	67.7	71.4	76.2	80.3	84.5	87.4
	FF	lb/h/Eng	1018	972	939	918	909	908	914	935	952
44000	IAS	kt	173	168	164	161	161	162	165	171	175
	N1	%	54.5	58.1	62.3	66.6	70.2	74.9	79.2	83.3	85.7
	FF	lb/h/Eng	983	935	900	878	867	866	869	885	900
42000	IAS	kt	170	165	161	158	157	158	161	166	169
	N1	%	53.3	56.8	61.0	65.3	69.1	73.6	78.1	82.1	84.2
	FF	lb/h/Eng	948	898	862	838	825	823	824	837	850
40000	IAS	kt	168	162	158	155	153	154	156	161	164
	N1	%	52.2	55.6	59.6	64.0	67.9	72.2	76.9	81.1	82.9
	FF	lb/h/Eng	914	863	825	799	784	780	780	790	801
38000	IAS	kt	166	160	155	152	150	150	151	155	158
	N1	%	50.9	54.3	58.2	62.6	66.8	70.7	75.6	79.7	81.7
	FF	lb/h/Eng	880	827	788	761	744	738	737	744	753
36000	IAS	kt	163	157	152	148	146	145	147	150	152
	N1	%	49.7	53.0	56.8	61.1	65.5	69.3	74.1	78.3	80.5
	FF	lb/h/Eng	847	793	752	723	705	696	695	699	707
34000	IAS	kt	161	154	149	145	142	141	142	145	147
	N1	%	48.5	51.6	55.4	59.6	64.0	67.9	72.5	76.9	79.0
	FF	lb/h/Eng	814	759	716	686	666	655	654	655	661
32000	IAS	kt	158	152	146	142	139	137	138	140	141
	N1	%	47.2	50.2	53.8	57.9	62.4	66.4	70.8	75.5	77.4
	FF	lb/h/Eng	782	725	682	650	628	615	611	612	616
30000	IAS	kt	156	149	143	139	135	133	133	135	136
	N1	%	45.9	48.7	52.3	56.2	60.7	65.0	69.0	73.9	75.9
	FF	lb/h/Eng	751	693	647	614	590	576	570	569	573
28000	IAS	kt	154	146	140	135	132	129	128	129	130
	N1	%	44.6	47.3	50.6	54.5	58.8	63.3	67.3	72.1	74.2
	FF	lb/h/Eng	721	661	614	579	554	537	529	528	530
26000	IAS	kt	151	144	137	132	128	125	124	124	125
	N1	%	43.2	45.7	48.9	52.7	56.8	61.4	65.5	70.0	72.4
	FF	lb/h/Eng	692	630	581	544	518	500	490	487	489

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 (lb)			ALTITUDE (ft)								
			0	5000	10000	15000	20000	25000	30000	35000	37000
49000	IAS	kt	200	200	200	200	200	200	200	200	200
	N1	%	58.4	62.2	66.4	69.9	74.0	78.8	83.0	88.1	91.4
	FF	lb/h/Eng	1227	1171	1128	1099	1087	1083	1092	1120	1141
48000	IAS	kt	200	200	200	200	200	200	200	200	200
	N1	%	57.9	61.7	65.9	69.5	73.5	78.4	82.5	87.2	90.8
	FF	lb/h/Eng	1212	1155	1112	1082	1069	1065	1072	1098	1117
46000	IAS	kt	200	200	200	200	200	200	200	200	200
	N1	%	57.1	60.8	65.0	68.8	72.6	77.4	81.5	85.7	89.3
	FF	lb/h/Eng	1183	1126	1081	1050	1034	1030	1033	1055	1073
44000	IAS	kt	200	200	200	200	200	200	200	200	200
	N1	%	56.3	59.9	64.1	68.1	71.6	76.5	80.6	84.7	87.6
	FF	lb/h/Eng	1155	1097	1051	1019	1000	996	997	1014	1030
42000	IAS	kt	200	200	200	200	200	200	200	200	200
	N1	%	55.5	59.1	63.3	67.3	70.8	75.4	79.7	83.8	85.9
	FF	lb/h/Eng	1129	1070	1023	989	968	963	962	975	989
40000	IAS	kt	200	200	200	200	200	200	200	200	200
	N1	%	54.6	58.3	62.4	66.5	69.9	74.4	78.9	82.9	84.8
	FF	lb/h/Eng	1103	1043	996	960	937	930	929	939	951
38000	IAS	kt	200	200	200	200	200	200	200	200	200
	N1	%	53.8	57.4	61.5	65.6	69.1	73.3	78.2	82.1	84.0
	FF	lb/h/Eng	1079	1018	970	933	908	899	899	905	916
36000	IAS	kt	200	200	200	200	200	200	200	200	200
	N1	%	53.1	56.6	60.6	64.8	68.4	72.4	77.3	81.1	83.1
	FF	lb/h/Eng	1055	995	945	907	881	869	870	874	882
34000	IAS	kt	200	200	200	200	200	200	200	200	200
	N1	%	52.3	55.8	59.7	63.9	67.7	71.4	76.4	80.2	82.3
	FF	lb/h/Eng	1033	972	922	883	855	841	842	844	851
32000	IAS	kt	200	200	200	200	200	200	200	200	200
	N1	%	51.6	55.0	58.9	63.1	67.0	70.6	75.3	79.4	81.4
	FF	lb/h/Eng	1012	951	900	859	830	814	813	817	823
30000	IAS	kt	200	200	200	200	200	200	200	200	200
	N1	%	50.9	54.3	58.1	62.3	66.3	69.7	74.3	78.7	80.5
	FF	lb/h/Eng	993	930	879	838	807	789	785	791	796
28000	IAS	kt	200	200	200	200	200	200	200	200	200
	N1	%	50.2	53.6	57.4	61.5	65.5	68.9	73.3	78.0	79.8
	FF	lb/h/Eng	974	911	859	817	785	765	759	768	772
26000	IAS	kt	200	200	200	200	200	200	200	200	200
	N1	%	49.5	52.8	56.6	60.7	64.8	68.2	72.3	77.3	79.1
	FF	lb/h/Eng	957	894	841	798	765	743	735	742	750

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 (lb)			ALTITUDE (ft)								
			0	5000	10000	15000	20000	25000	30000	35000	37000
49000	IAS	kt	200	200	200	200	200	200	200	200	200
	N1	%	58.4	62.2	66.4	69.9	74.0	78.8	83.0	88.1	91.4
	FF	lb/h/Eng	1358	1286	1227	1184	1159	1145	1148	1174	1195
48000	IAS	kt	200	200	200	200	200	200	200	200	200
	N1	%	57.9	61.7	65.9	69.5	73.5	78.4	82.5	87.2	90.8
	FF	lb/h/Eng	1344	1271	1212	1168	1141	1127	1127	1150	1170
46000	IAS	kt	200	200	200	200	200	200	200	200	200
	N1	%	57.1	60.8	65.0	68.8	72.6	77.4	81.5	85.7	89.3
	FF	lb/h/Eng	1316	1241	1181	1135	1106	1092	1088	1106	1123
44000	IAS	kt	200	200	200	200	200	200	200	200	200
	N1	%	56.3	59.9	64.1	68.1	71.6	76.5	80.6	84.7	87.6
	FF	lb/h/Eng	1288	1213	1152	1104	1073	1058	1050	1063	1078
42000	IAS	kt	200	200	200	200	200	200	200	200	200
	N1	%	55.5	59.1	63.3	67.3	70.8	75.4	79.7	83.8	85.9
	FF	lb/h/Eng	1262	1186	1123	1074	1040	1025	1015	1023	1036
40000	IAS	kt	200	200	200	200	200	200	200	200	200
	N1	%	54.6	58.3	62.4	66.5	69.9	74.4	78.9	82.9	84.8
	FF	lb/h/Eng	1236	1160	1097	1046	1010	991	982	986	996
38000	IAS	kt	200	200	200	200	200	200	200	200	200
	N1	%	53.8	57.4	61.5	65.6	69.1	73.3	78.2	82.1	84.0
	FF	lb/h/Eng	1212	1135	1071	1019	981	960	951	951	960
36000	IAS	kt	200	200	200	200	200	200	200	200	200
	N1	%	53.1	56.6	60.6	64.8	68.4	72.4	77.3	81.1	83.1
	FF	lb/h/Eng	1189	1112	1047	994	954	930	922	918	925
34000	IAS	kt	200	200	200	200	200	200	200	200	200
	N1	%	52.3	55.8	59.7	63.9	67.7	71.4	76.4	80.2	82.3
	FF	lb/h/Eng	1168	1090	1024	970	928	902	893	888	893
32000	IAS	kt	200	200	200	200	200	200	200	200	200
	N1	%	51.6	55.0	58.9	63.1	67.0	70.6	75.3	79.4	81.4
	FF	lb/h/Eng	1147	1068	1002	947	904	875	864	860	864
30000	IAS	kt	200	200	200	200	200	200	200	200	200
	N1	%	50.9	54.3	58.1	62.3	66.3	69.7	74.3	78.7	80.5
	FF	lb/h/Eng	1128	1049	981	925	881	850	836	834	836
28000	IAS	kt	200	200	200	200	200	200	200	200	200
	N1	%	50.2	53.6	57.4	61.5	65.5	68.9	73.3	78.0	79.8
	FF	lb/h/Eng	1109	1030	962	905	860	827	809	810	811
26000	IAS	kt	200	200	200	200	200	200	200	200	200
	N1	%	49.5	52.8	56.6	60.7	64.8	68.2	72.3	77.3	79.1
	FF	lb/h/Eng	1092	1012	944	886	840	805	785	784	789

DRIFTDOWN TABLE

ANTI-ICE OFF

WEIGHT (lb)		INITIAL DRIFTDOWN SPEED (KIAS)	GROSS LEVEL OFF ALTITUDE – FT (NET LEVEL OFF ALTITUDE - FT)		
START DRIFTDOWN	LEVEL OFF		ISA + 10 & BELOW	ISA + 15	ISA + 20
46000	44200	172	20770 (16010)	20640 (15930)	20220 (15690)
44000	42300	169	22030 (17490)	21880 (17390)	21470 (17180)
42000	40500	165	23430 (19400)	23050 (19250)	22710 (18760)
40000	38700	161	24860 (21055)	24520 (20910)	23950 (20410)
38000	36900	157	26440 (22460)	26170 (22260)	25470 (21950)
36000	34900	154	28150 (24110)	27520 (23730)	26920 (23250)
34000	33000	149	29820 (25850)	29220 (25560)	28260 (24890)
32000	31100	145	31870 (27550)	30784 (27000)	29680 (26410)

ANTI-ICE ON

WEIGHT (lb)		INITIAL SPEED (KIAS)	GROSS AND (NET) LEVEL OFF ALTITUDE - FT				
START DRIFTDOWN	LEVEL OFF		ISA – 10 & BELOW	ISA - 5	ISA	ISA + 5	ISA + 10
46000	43600	173	17190 (13220)	17090 (13030)	15980 (12280)	14260 (10670)	12630 (8550)
44000	42000	169	18730 (14620)	18540 (14410)	17480 (13460)	15620 (11890)	13850 (10330)
42000	40100	165	20390 (16150)	20200 (15940)	19200 (14940)	17370 (13260)	15350 (11750)
40000	38200	161	21790 (17840)	21450 (17780)	20600 (16620)	18920 (14830)	16960 (13220)
38000	36300	158	23180 (19780)	22730 (19570)	21840 (18350)	20540 (16590)	18450 (14670)
36000	34400	154	24590 (21390)	24300 (21050)	23150 (20270)	21850 (18450)	20010 (16400)
34000	32600	149	26080 (22990)	25340 (22580)	24420 (21670)	23190 (20370)	21410 (18250)
32000	30700	145	27370 (24460)	26550 (23900)	25660 (23020)	24390 (21700)	22690 (19810)

UNFACTORED LANDING DISTANCE

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

WEIGHT (lb)	ALTITUDE							
	0 ft				1000 ft			
	WIND				WIND			
	-10 kt	0 kt	10 kt	20 kt	-10 kt	0 kt	10 kt	20 kt
44000	3298	2830	2683	2540	3371	2896	2747	2603
42000	3190	2732	2588	2449	3260	2795	2650	2509
40000	3085	2637	2497	2360	3149	2695	2552	2415
38000	2984	2546	2408	2275	3046	2601	2462	2326
36000	2883	2454	2320	2189	2942	2507	2371	2239
34000	2778	2359	2227	2100	2834	2410	2277	2147
32000	2668	2259	2131	2006	2721	2307	2178	2051
30000	2555	2157	2032	1911	2605	2202	2076	1953
28000	2441	2054	1932	1813	2488	2097	1974	1854

WEIGHT (lb)	ALTITUDE							
	2000 ft				3000 ft			
	WIND				WIND			
	-10 kt	0 kt	10 kt	20 kt	-10 kt	0 kt	10 kt	20 kt
44000	3448	2965	2814	2668	3527	3037	2884	2735
42000	3333	2861	2714	2570	3409	2930	2780	2635
40000	3218	2758	2614	2473	3291	2823	2677	2534
38000	3110	2659	2518	2381	3176	2720	2576	2437
36000	3002	2562	2424	2290	3065	2620	2479	2344
34000	2892	2462	2327	2196	2952	2516	2380	2247
32000	2776	2358	2226	2098	2834	2409	2276	2147
30000	2657	2250	2122	1998	2712	2299	2169	2043
28000	2537	2141	2017	1896	2588	2188	2062	1939

WEIGHT (lb)	ALTITUDE							
	4000 ft				5000 ft			
	WIND				WIND			
	-10 kt	0 kt	10 kt	20 kt	-10 kt	0 kt	10 kt	20 kt
44000	3611	3113	2957	2806	3696	3191	3032	2879
42000	3488	3002	2849	2702	3570	3076	2921	2771
40000	3367	2891	2743	2599	3445	2962	2812	2665
38000	3247	2783	2638	2497	3319	2849	2701	2558
36000	3132	2679	2537	2400	3200	2741	2597	2458
34000	3015	2573	2436	2301	3080	2633	2493	2356
32000	2894	2464	2329	2197	2956	2519	2383	2250
30000	2768	2350	2220	2092	2827	2404	2271	2142
28000	2642	2236	2109	1984	2698	2286	2157	2032

NOTE: Landing distance in feet.

UNFACTORED LANDING DISTANCE

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

WEIGHT (lb)	ALTITUDE							
	0 ft				1000 ft			
	WIND				WIND			
	-10 kt	0 kt	10 kt	20 kt	-10 kt	0 kt	10 kt	20 kt
44000	4281	3709	3529	3353	4381	3800	3617	3438
42000	4123	3566	3390	3218	4218	3652	3473	3298
40000	3964	3421	3249	3081	4053	3502	3327	3158
38000	3810	3281	3114	2951	3895	3358	3188	3022
36000	3660	3145	2982	2823	3740	3217	3052	2890
34000	3507	3005	2846	2692	3581	3073	2912	2755
32000	3356	2869	2714	2563	3427	2932	2776	2623
30000	3212	2737	2587	2440	3278	2798	2645	2497
28000	3067	2606	2459	2317	3129	2662	2514	2369

WEIGHT (lb)	ALTITUDE							
	2000 ft				3000 ft			
	WIND				WIND			
	-10 kt	0 kt	10 kt	20 kt	-10 kt	0 kt	10 kt	20 kt
44000	4485	3895	3708	3527	4594	3994	3804	3620
42000	4316	3741	3559	3382	4419	3835	3650	3470
40000	4145	3586	3409	3236	4242	3674	3494	3319
38000	3982	3437	3265	3097	4073	3520	3346	3175
36000	3822	3292	3124	2961	3908	3370	3200	3034
34000	3659	3143	2980	2821	3740	3217	3052	2891
32000	3499	2998	2840	2685	3576	3068	2907	2750
30000	3346	2859	2705	2555	3418	2925	2768	2616
28000	3193	2720	2570	2424	3260	2781	2629	2481

WEIGHT (lb)	ALTITUDE							
	4000 ft				5000 ft			
	WIND				WIND			
	-10 kt	0 kt	10 kt	20 kt	-10 kt	0 kt	10 kt	20 kt
44000	4707	4097	3904	3716	4827	4205	4009	3818
42000	4526	3932	3744	3562	4639	4034	3844	3658
40000	4343	3766	3583	3406	4450	3863	3677	3496
38000	4169	3607	3429	3256	4269	3698	3518	3342
36000	3998	3452	3279	3111	4092	3538	3362	3191
34000	3824	3294	3126	2962	3913	3374	3204	3038
32000	3655	3140	2976	2818	3738	3215	3050	2889
30000	3492	2992	2834	2679	3570	3063	2902	2746
28000	3330	2844	2690	2540	3402	2910	2754	2602

NOTE: Landing distance in feet.

ADVISORY INFORMATION
EMB-145 UNFACTORED LANDING DISTANCES - CONTAMINATED RUNWAYS (ft)
ALL ENGINES TYPES – FAA CERTIFICATION
STANDING WATER 0.125 in/SLUSH 0.15 in
WET SNOW 0.25 in/DRY SNOW 0.625 in

WEIGHT (lb)	FLAP 22°	FLAP 45°
29000	6033	4822
30000	6194	4946
31000	6357	5071
32000	6532	5201
33000	6707	5330
34000	6883	5459
35000	7058	5589
36000	7245	5721
37000	7436	5852
38000	7627	5983
39000	7819	6114
40000	8010	6246
41000	8197	6377
42000	8383	6508
43000	8570	6639
44000	8757	6768
45000	8971	6914
46000	9188	7062
47000	9404	7210
48000	9621	7357

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 (ft)
ALL ENGINES TYPES – FAA CERTIFICATION
STANDING WATER 0.25 in/SLUSH 0.29 in
WET SNOW 0.50 in/DRY SNOW 1.25 in

WEIGHT (lb)	FLAP 22°	FLAP 45°
29000	5276	4357
30000	5411	4464
31000	5546	4571
32000	5693	4683
33000	5839	4794
34000	5986	4905
35000	6132	5016
36000	6289	5129
37000	6448	5243
38000	6608	5356
39000	6768	5470
40000	6928	5583
41000	7086	5697
42000	7243	5810
43000	7401	5923
44000	7559	6036
45000	7739	6163
46000	7922	6292
47000	8105	6421
48000	8288	6549

CORRECTIONS	
ALTITUDE:	LANDING DISTANCE + 3% per 1000 ft above sea level.
WIND:	LANDING DISTANCE + 11% per 5 kt tailwind.
OVERSPEED:	LANDING DISTANCE + 8% per 5 kt above V_{REF}.

ADVISORY INFORMATION
EMB-145 UNFACTORED LANDING DISTANCES - CONTAMINATED RUNWAYS (ft)
ALL ENGINES TYPES – FAA CERTIFICATION
STANDING WATER 0.50 in/SLUSH 0.59 in
WET SNOW 1.00 in/DRY SNOW 2.50 in

WEIGHT (lb)	FLAP 22°	FLAP 45°
29000	4411	3856
30000	4515	3943
31000	4619	4031
32000	4732	4122
33000	4845	4213
34000	4957	4304
35000	5070	4395
36000	5190	4488
37000	5313	4581
38000	5436	4674
39000	5559	4766
40000	5682	4859
41000	5804	4952
42000	5926	5044
43000	6048	5137
44000	6170	5229
45000	6310	5332
46000	6451	5437
47000	6593	5542
48000	6734	5647

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 (ft)

ALL ENGINES TYPES – FAA CERTIFICATION

COMPACTED SNOW

WEIGHT (lb)	FLAP 22°	FLAP 45°
29000	3944	3645
30000	4036	3734
31000	4129	3823
32000	4222	3909
33000	4315	3996
34000	4408	4082
35000	4501	4169
36000	4593	4250
37000	4685	4329
38000	4777	4409
39000	4868	4488
40000	4960	4567
41000	5052	4646
42000	5143	4726
43000	5235	4805
44000	5327	4884
45000	5417	4960
46000	5507	5035
47000	5597	5111
48000	5688	5186

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 (ft)
ALL ENGINES TYPES – FAA CERTIFICATION
ICE

WEIGHT (lb)	FLAP 22°	FLAP 45°
29000	11551	9411
30000	11556	9406
31000	11572	9412
32000	11656	9487
33000	11740	9561
34000	11824	9635
35000	11909	9709
36000	12032	9810
37000	12170	9921
38000	12308	10032
39000	12446	10143
40000	12584	10254
41000	12721	10365
42000	12859	10476
43000	12997	10587
44000	13135	10698
45000	13303	10826
46000	13473	10955
47000	13644	11084
48000	13814	11213

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

TAKEOFF SPEEDS (Balanced Field Length)

V1/VR/V2 SPEEDS
EMB-135 - T/O-1 MODE - NORMAL V_2 - FLAPS 9°

PRESSURE ALTITUDE (ft)	STATIC AIR TEMPERATURE (°C)				
SL ➔	-40 to 48	49 to 50	-	-	-
1000 ➔	-40 to 44	45 to 48	-	-	-
2000 ➔	-40 to 41	42 to 44	45 to 46	-	-
3000 ➔	-40 to 37	38 to 41	42 to 44	-	-
4000 ➔	-40 to 32	33 to 36	37 to 42	-	-
5000 ➔	-40 to 28	29 to 33	34 to 38	39 to 40	-
6000 ➔	-40 to 24	25 to 29	30 to 34	35 to 38	-
7000 ➔	-	-40 to 24	25 to 29	30 to 32	33 to 36
8000 ➔	-	-40 to 20	21 to 25	26 to 29	30 to 34
	↓	↓	↓	↓	↓
WEIGHT (lb)	**V1 VR V2**	**V1 VR V2**	**V1 VR V2**	**V1 VR V2**	**V1 VR V2**
28000	101 109 116	96 108 115	97 108 114	97 107 113	98 107 112
29000	100 110 118	98 110 116	99 109 115	100 109 114	100 109 113
30000	100 112 119	100 111 117	101 111 116	101 111 116	102 110 115
31000	102 114 120	102 113 119	103 113 118	103 112 117	104 112 116
32000	104 115 121	104 115 120	105 114 119	105 114 118	106 114 117
33000	106 117 122	107 116 121	107 116 120	108 116 119	108 116 119
34000	108 118 124	109 118 122	109 117 121	110 117 121	111 118 121
35000	110 120 125	111 119 124	111 119 123	112 119 122	113 120 122
36000	112 122 126	113 121 125	113 121 124	114 121 124	116 122 124
37000	114 123 127	115 123 126	115 123 126	117 123 126	118 123 126
38000	116 124 128	116 124 127	118 124 127	119 125 127	120 125 127
39000	118 126 129	118 126 129	120 126 129	121 127 129	123 127 129
40000	120 127 130	121 128 130	122 128 130	123 128 130	125 129 130
41000	122 129 132	123 129 132	124 130 132	125 130 132	127 131 132
42000	124 130 133	125 131 133	126 131 133	128 132 133	129 132 133
43000	126 132 135	127 133 135	128 133 135	129 134 135	131 134 135
44000	128 134 136	129 134 136	130 135 136	131 135 136	133 136 136
45000	130 135 137	131 136 137	132 136 137	133 137 137	135 137 137

FINAL SEGMENT SPEED (V_{FS})

WEIGHT (lb)	V_{FS} (KIAS)	WEIGHT (lb)	V_{FS} (KIAS)	WEIGHT (lb)	V_{FS} (KIAS)
26000	133	33000	148	40000	163
27000	135	34000	151	41000	164
28000	137	35000	153	42000	166
29000	140	36000	155	43000	168
30000	141	37000	157	44000	170
31000	143	38000	159	45000	171
32000	146	39000	161		

TAKEOFF SPEEDS (Balanced Field Length)

V1/VR/V2 SPEEDS
EMB-135 - ALT T/O-1 MODE - NORMAL V_2 - FLAPS 9°

PRESSURE ALTITUDE (ft)	STATIC AIR TEMPERATURE (°C)				
SL →	-40 to 48	49 to 50	-	-	-
1000 →	-40 to 44	45 to 48	-	-	-
2000 →	-40 to 41	42 to 44	45 to 46	-	-
3000 →	-40 to 37	38 to 41	42 to 44	-	-
4000 →	-40 to 32	33 to 36	37 to 42	-	-
5000 →	-40 to 28	29 to 33	34 to 38	39 to 40	-
6000 →	-40 to 24	25 to 29	30 to 34	35 to 38	-
7000 →	-	-40 to 24	25 to 29	30 to 32	33 to 36
8000 →	-	-40 to 20	21 to 25	26 to 29	30 to 34
	↓	↓	↓	↓	↓
WEIGHT (lb)	**V1 VR V2**	**V1 VR V2**	**V1 VR V2**	**V1 VR V2**	**V1 VR V2**
28000	99 108 115	96 108 114	97 107 113	97 107 112	98 107 111
29000	99 110 116	98 109 115	99 109 114	100 109 113	101 108 113
30000	101 111 117	101 111 116	101 110 116	102 110 115	103 110 114
31000	102 113 119	103 112 118	103 112 117	104 112 116	105 112 115
32000	104 115 120	105 114 119	105 114 118	106 113 117	107 114 117
33000	106 116 121	107 116 120	107 116 119	108 116 119	110 116 119
34000	108 118 122	109 118 121	110 117 121	111 118 121	112 118 121
35000	110 119 124	111 119 123	112 119 122	114 120 122	115 120 122
36000	112 121 125	113 121 124	115 121 124	116 122 124	117 122 124
37000	114 123 126	115 123 126	117 123 126	118 124 126	120 124 126
38000	116 124 127	117 124 127	119 125 127	120 125 127	122 126 127
39000	118 126 129	120 126 129	121 127 129	123 127 129	124 128 129
40000	120 127 130	122 128 130	124 129 130	125 129 130	126 129 130
41000	123 129 132	124 130 132	126 130 132	127 131 132	128 131 132
42000	125 131 133	127 132 133	128 132 133	129 132 133	130 133 133
43000	127 133 134	129 133 135	130 134 135	131 134 135	132 134 135
44000	130 134 136	131 135 136	132 135 136	133 136 136	134 136 136
45000	131 136 137	133 137 137	134 137 137	135 137 137	136 138 138

TAKEOFF SPEEDS (Unbalanced Field Length)				
VR/V2 SPEEDS EMB-135 - T/O-1 MODE - NORMAL V_2 - FLAPS 18° - STANDARD CG				
PRESSURE ALTITUDE (ft)	**STATIC AIR TEMPERATURE (°C)**			
SL →	-40 to 48	49 to 50	-	-
1000 →	-40 to 45	46 to 48	-	-
2000 →	-40 to 41	42 to 46	-	-
3000 →	-40 to 37	38 to 43	44 to 44	-
4000 →	-40 to 33	34 to 39	40 to 42	-
5000 →	-40 to 29	30 to 35	36 to 40	-
6000 →	-40 to 25	26 to 31	32 to 37	38 to 38
7000 →	-	-40 to 26	27 to 32	33 to 36
8000 →	-	-40 to 22	23 to 28	29 to 34
	↓	↓	↓	↓
WEIGHT (lb)	**VR V2**	**VR V2**	**VR V2**	**VR V2**
27500	108 116	107 115	106 113	105 111
28500	109 117	108 115	107 114	106 112
29500	110 118	109 116	108 114	107 113
30500	112 119	111 117	110 115	109 114
31500	113 120	112 118	111 116	110 115
32500	114 120	113 119	112 117	111 115
33500	114 120	114 119	113 118	112 116
34500	115 121	114 119	113 118	113 117
35500	116 121	115 120	114 119	114 118
36500	116 122	116 121	116 120	116 119
37500	117 122	117 121	117 121	117 120
38500	118 123	118 122	118 122	119 121
39500	119 124	120 123	120 123	120 123
40500	121 125	121 125	121 124	122 124
41500	122 126	122 126	123 126	123 125
42500	123 127	124 127	124 127	125 127
43500	125 128	125 128	126 128	126 128
44500	126 129	127 129	127 129	128 129
45500	128 131	128 131	129 131	129 131

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.

TAKEOFF SPEEDS (Unbalanced Field Length)				
VR/V2 SPEEDS BEM-135 - T/O-1 MODE - NORMAL V_2 - FLAPS 18° - CG 21.1%				
PRESSURE ALTITUDE (ft)	**STATIC AIR TEMPERATURE (°C)**			
SL →	-40 to 47	48 to 50	-	-
1000 →	-40 to 44	45 to 48	-	-
2000 →	-40 to 41	42 to 45	46 to 46	-
3000 →	-40 to 37	38 to 41	42 to 44	-
4000 →	-40 to 32	33 to 38	39 to 42	-
5000 →	-40 to 28	29 to 33	34 to 39	40 to 40
6000 →	-40 to 24	25 to 29	30 to 34	35 to 38
7000 →	-	-40 to 25	26 to 30	31 to 35
8000 →	-	-40 to 20	21 to 25	26 to 31
	↓	↓	↓	↓
WEIGHT (lb)	**VR V2**	**VR V2**	**VR V2**	**VR V2**
27500	102 111	99 108	98 107	98 106
28500	101 110	100 108	100 107	100 107
29500	102 110	102 109	102 109	101 108
30500	104 111	103 111	103 110	103 109
31500	105 112	105 112	105 111	104 110
32500	107 114	106 113	106 112	106 111
33500	108 115	108 114	108 113	108 113
34500	110 116	109 115	109 114	110 114
35500	111 117	111 116	111 116	112 116
36500	112 118	112 117	113 117	114 118
37500	114 119	114 119	115 119	115 119
38500	116 121	116 121	117 121	117 121
39500	118 122	118 122	119 122	119 122
40500	119 124	120 124	120 124	121 124
41500	121 125	122 125	122 125	123 125
42500	123 127	123 127	124 127	124 127
43500	125 128	125 128	126 128	126 128
44500	126 129	127 129	127 129	128 129
45500	128 131	128 131	129 131	129 131

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 (lb)	Approach Climb Speed (KIAS)	Landing Climb & Reference Speeds (KIAS)	V_{FS} (KIAS)
	Flaps 9°	Flaps 45°	
26000	125	103	133
27000	126	104	135
28000	128	106	137
29000	131	108	140
30000	133	110	141
31000	135	112	143
32000	137	113	146
33000	139	115	148
34000	142	117	151
35000	144	119	153
36000	145	120	155
37000	147	121	157
38000	149	122	159
39000	151	124	161
40000	153	126	163
41000	155	127	164
42000	157	128	166
43000	158	130	168
44000	159	131	170
45000	161	133	171
46000	163	134	173

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 (lb)			ALTITUDE (ft)								
			0	5000	10000	15000	20000	25000	30000	35000	37000
47000	IAS	kt	176	172	168	166	166	168	172	179	183
	N1	%	56.0	59.7	64.0	68.1	71.9	76.7	80.9	85.1	88.2
	FF	lb/h/Eng	1036	990	958	938	930	930	937	960	978
45000	IAS	kt	174	169	165	163	162	164	167	174	178
	N1	%	55.1	58.8	62.9	67.2	70.8	75.6	79.8	83.8	86.6
	FF	lb/h/Eng	1000	953	919	898	888	887	892	910	926
43000	IAS	kt	172	166	162	160	159	160	163	169	172
	N1	%	53.9	57.6	61.7	65.9	69.7	74.3	78.6	82.7	84.9
	FF	lb/h/Eng	965	917	881	858	846	844	846	861	875
41000	IAS	kt	169	164	159	156	155	156	158	163	166
	N1	%	52.8	56.3	60.3	64.7	68.5	72.9	77.5	81.6	83.5
	FF	lb/h/Eng	931	880	844	819	805	802	802	814	826
39000	IAS	kt	167	161	156	153	152	152	154	158	161
	N1	%	51.6	55.0	59.0	63.3	67.3	71.4	76.2	80.4	82.3
	FF	lb/h/Eng	897	845	807	780	764	759	759	767	777
37000	IAS	kt	164	158	154	150	148	147	149	153	155
	N1	%	50.4	53.7	57.5	61.9	66.2	70.0	74.9	79.0	81.1
	FF	lb/h/Eng	863	810	770	742	724	717	716	721	730
35000	IAS	kt	162	156	151	147	144	143	144	148	150
	N1	%	49.2	52.3	56.1	60.4	64.8	68.6	73.3	77.6	79.8
	FF	lb/h/Eng	831	776	734	704	685	675	674	677	684
33000	IAS	kt	160	153	148	143	141	139	140	142	144
	N1	%	47.9	50.9	54.6	58.8	63.2	67.1	71.7	76.2	78.2
	FF	lb/h/Eng	798	742	699	668	647	635	632	633	638
31000	IAS	kt	157	150	145	140	137	135	135	137	139
	N1	%	46.6	49.5	53.1	57.1	61.5	65.7	69.9	74.7	76.6
	FF	lb/h/Eng	767	709	664	632	609	595	590	590	594
29000	IAS	kt	155	148	142	137	133	131	131	132	133
	N1	%	45.3	48.1	51.5	55.3	59.8	64.2	68.1	73.1	75.1
	FF	lb/h/Eng	736	677	631	596	572	556	549	549	552
27000	IAS	kt	152	145	139	134	130	127	126	127	128
	N1	%	43.9	46.6	49.8	53.6	57.9	62.4	66.4	71.1	73.4
	FF	lb/h/Eng	706	645	598	561	535	518	509	508	510

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 (lb)			ALTITUDE (ft)								
			0	5000	10000	15000	20000	25000	30000	35000	37000
47000	IAS	kt	200	200	200	200	200	200	200	200	200
	N1	%	57.3	61.2	65.3	69.1	73.0	77.8	82.0	86.4	90.1
	FF	lb/h/Eng	1197	1141	1096	1066	1051	1047	1052	1076	1095
45000	IAS	kt	200	200	200	200	200	200	200	200	200
	N1	%	56.7	60.5	64.6	68.5	72.1	76.9	81.0	85.2	88.5
	FF	lb/h/Eng	1170	1112	1067	1035	1017	1013	1015	1035	1051
43000	IAS	kt	200	200	200	200	200	200	200	200	200
	N1	%	55.9	59.6	63.7	67.8	71.2	76.0	80.1	84.3	86.7
	FF	lb/h/Eng	1142	1084	1038	1004	984	981	980	995	1010
41000	IAS	kt	200	200	200	200	200	200	200	200	200
	N1	%	55.1	58.8	62.8	66.9	70.3	74.9	79.3	83.4	85.3
	FF	lb/h/Eng	1116	1057	1010	975	953	947	946	958	971
39000	IAS	kt	200	200	200	200	200	200	200	200	200
	N1	%	54.3	57.9	62.0	66.1	69.5	73.9	78.6	82.5	84.4
	FF	lb/h/Eng	1091	1032	983	947	924	915	915	923	934
37000	IAS	kt	200	200	200	200	200	200	200	200	200
	N1	%	53.5	57.1	61.1	65.2	68.8	72.9	77.7	81.6	83.5
	FF	lb/h/Eng	1068	1007	958	921	895	885	885	890	900
35000	IAS	kt	200	200	200	200	200	200	200	200	200
	N1	%	52.7	56.3	60.2	64.4	68.0	71.9	76.9	80.7	82.7
	FF	lb/h/Eng	1045	984	934	896	869	856	858	860	868
33000	IAS	kt	200	200	200	200	200	200	200	200	200
	N1	%	52.0	55.5	59.3	63.5	67.4	71.0	75.9	79.9	81.9
	FF	lb/h/Eng	1024	962	912	872	844	828	829	832	838
31000	IAS	kt	200	200	200	200	200	200	200	200	200
	N1	%	51.2	54.7	58.5	62.7	66.7	70.2	74.9	79.1	81.0
	FF	lb/h/Eng	1004	942	890	850	820	803	800	805	811
29000	IAS	kt	200	200	200	200	200	200	200	200	200
	N1	%	50.6	54.0	57.8	61.9	66.0	69.4	73.8	78.4	80.2
	FF	lb/h/Eng	985	922	870	829	798	778	773	781	785
27000	IAS	kt	200	200	200	200	200	200	200	200	200
	N1	%	49.9	53.3	57.0	61.1	65.2	68.6	72.8	77.7	79.4
	FF	lb/h/Eng	967	904	851	809	776	756	748	757	762

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 (lb)			ALTITUDE (ft)								
			0	5000	10000	15000	20000	25000	30000	35000	37000
47000	IAS	kt	200	200	-	200	-	200	200	-	200
	N1	%	57.3	61.2	-	71.1	-	79.6	83.4	-	91.3
	FF	lb/h/Eng	1329	1256	-	1152	-	1109	1107	-	1145
45000	IAS	kt	200	200	200	200	200	200	200	200	200
	N1	%	56.7	60.5	64.6	68.5	72.1	76.9	81.0	85.2	88.5
	FF	lb/h/Eng	1302	1228	1167	1120	1090	1075	1070	1085	1101
43000	IAS	kt	200	200	200	200	200	200	200	200	200
	N1	%	55.9	59.6	63.7	67.8	71.2	76.0	80.1	84.3	86.7
	FF	lb/h/Eng	1275	1200	1138	1090	1057	1042	1033	1044	1057
41000	IAS	kt	200	200	200	200	200	200	200	200	200
	N1	%	55.1	58.8	62.8	66.9	70.3	74.9	79.3	83.4	85.3
	FF	lb/h/Eng	1250	1174	1111	1061	1026	1009	999	1005	1017
39000	IAS	kt	200	200	200	200	200	200	200	200	200
	N1	%	54.3	57.9	62.0	66.1	69.5	73.9	78.6	82.5	84.4
	FF	lb/h/Eng	1225	1148	1084	1033	996	976	967	969	979
37000	IAS	kt	200	200	200	200	200	200	200	200	200
	N1	%	53.5	57.1	61.1	65.2	68.8	72.9	77.7	81.6	83.5
	FF	lb/h/Eng	1202	1125	1060	1007	968	946	937	935	943
35000	IAS	kt	200	200	200	200	200	200	200	200	200
	N1	%	52.7	56.3	60.2	64.4	68.0	71.9	76.9	80.7	82.7
	FF	lb/h/Eng	1180	1102	1036	983	942	917	909	904	910
33000	IAS	kt	200	200	200	200	200	200	200	200	200
	N1	%	52.0	55.5	59.3	63.5	67.4	71.0	75.9	79.9	81.9
	FF	lb/h/Eng	1159	1080	1014	959	917	889	880	875	880
31000	IAS	kt	200	200	200	200	200	200	200	200	200
	N1	%	51.2	54.7	58.5	62.7	66.7	70.2	74.9	79.1	81.0
	FF	lb/h/Eng	1139	1060	993	937	894	864	851	848	851
29000	IAS	kt	200	200	200	200	200	200	200	200	200
	N1	%	50.6	54.0	57.8	61.9	66.0	69.4	73.8	78.4	80.2
	FF	lb/h/Eng	1120	1041	973	917	872	840	824	823	825
27000	IAS	kt	200	200	200	200	200	200	200	200	200
	N1	%	49.9	53.3	57.0	61.1	65.2	68.6	72.8	77.7	79.4
	FF	lb/h/Eng	1102	1022	954	897	851	817	799	799	801

DRIFTDOWN TABLE
ANTI-ICE OFF

WEIGHT (lb)		INITIAL DRIFTDOWN SPEED (KIAS)	GROSS LEVEL OFF ALTITUDE – FT (NET LEVEL OFF ALTITUDE - FT)			
START DRIFTDOWN	LEVEL OFF		ISA & BELOW	ISA + 10	ISA + 15	ISA + 20
42000	40400	166	23940 (19710)	23890 (19610)	23580 (19450)	22790 (19040)
40000	38520	163	25310 (21300)	25260 (21220)	24920 (21080)	24100 (20470)
38000	36670	159	26560 (22780)	26440 (22710)	26070 (22490)	25290 (21790)
36000	34850	155	27910 (24270)	27770 (24230)	27240 (23910)	26440 (23110)
34000	32980	150	29630 (25740)	29210 (25690)	28620 (25340)	27910 (24530)
32000	31130	146	31790 (27540)	31630 (27290)	30690 (26810)	29540 (26120)
30000	29200	141	33470 (29560)	33510 (29130)	32350 (28580)	31340 (27870)

ANTI-ICE ON

WEIGHT (lb)		INITIAL SPEED (KIAS)	GROSS AND (NET) LEVEL OFF ALTITUDE - FT				
START DRIFTDOWN	LEVEL OFF		ISA – 10 & BELOW	ISA - 5	ISA	ISA + 5	ISA + 10
42000	40100	166	23290 (19060)	22560 (18920)	21650 (17580)	20360 (15670)	18240 (13900)
40000	38100	163	24480 (20700)	23670 (20470)	22730 (19380)	21540 (17520)	19650 (15390)
38000	36200	159	25570 (22140)	24730 (21630)	23820 (20700)	22570 (19110)	20890 (17000)
36000	34500	155	26710 (23550)	25820 (22810)	24920 (21890)	23780 (20610)	22080 (18570)
34000	32700	150	27940 (24860)	27050 (24050)	26180 (23110)	25010 (21920)	23410 (20150)
32000	30800	146	29470 (26390)	28590 (25520)	27730 (24630)	26700 (23450)	25080 (21800)
30000	28800	141	30910 (27900)	30000 (27020)	29240 (26150)	28300 (24970)	26870 (23360)

UNFACTORED LANDING DISTANCE

UNFACTORED LANDING DISTANCE (FT) – DRY RUNWAY
EMB-135 - FLAPS 45°
ISA CONDITIONS - SLOPE 0%

WEIGHT (lb)	ALTITUDE							
	0 ft				1000 ft			
	WIND				WIND			
	-10 kt	0 kt	10 kt	20 kt	-10 kt	0 kt	10 kt	20 kt
44000	3298	2830	2683	2540	3371	2896	2747	2603
42000	3190	2732	2588	2449	3260	2795	2650	2509
40000	3085	2637	2497	2360	3149	2695	2552	2415
38000	2984	2546	2408	2275	3046	2601	2462	2326
36000	2883	2454	2320	2189	2942	2507	2371	2239
34000	2778	2359	2227	2100	2834	2410	2277	2147
32000	2668	2259	2131	2006	2721	2307	2178	2051
30000	2555	2157	2032	1911	2605	2202	2076	1953
28000	2441	2054	1932	1813	2488	2097	1974	1854

WEIGHT (lb)	ALTITUDE							
	2000 ft				3000 ft			
	WIND				WIND			
	-10 kt	0 kt	10 kt	20 kt	-10kt	0 kt	10 kt	20 kt
44000	3448	2965	2814	2668	3527	3037	2884	2735
42000	3333	2861	2714	2570	3409	2930	2780	2635
40000	3218	2758	2614	2473	3291	2823	2677	2534
38000	3110	2659	2518	2381	3176	2720	2576	2437
36000	3002	2562	2424	2290	3065	2620	2479	2344
34000	2892	2462	2327	2196	2952	2516	2380	2247
32000	2776	2358	2226	2098	2834	2409	2276	2147
30000	2657	2250	2122	1998	2712	2299	2169	2043
28000	2537	2141	2017	1896	2588	2188	2062	1939

WEIGHT (lb)	ALTITUDE							
	4000 ft				5000 ft			
	WIND				WIND			
	-10 kt	0 kt	10 kt	20 kt	-10 kt	0 kt	10 kt	20 kt
44000	3611	3113	2957	2806	3696	3191	3032	2879
42000	3488	3002	2849	2702	3570	3076	2921	2771
40000	3367	2891	2743	2599	3445	2962	2812	2665
38000	3247	2783	2638	2497	3319	2849	2701	2558
36000	3132	2679	2537	2400	3200	2741	2597	2458
34000	3015	2573	2436	2301	3080	2633	2493	2356
32000	2894	2464	2329	2197	2956	2519	2383	2250
30000	2768	2350	2220	2092	2827	2404	2271	2142
28000	2642	2236	2109	1984	2698	2286	2157	2032

NOTE: Landing distance in feet.

UNFACTORED LANDING DISTANCE

UNFACTORED LANDING DISTANCE (FT) – DRY RUNWAY
EMB-135 - FLAPS 22°
ISA CONDITIONS - SLOPE 0%

WEIGHT (lb)	ALTITUDE							
	0 ft				1000 ft			
	WIND				WIND			
	-10 kt	0 kt	10 kt	20 kt	-10 kt	0 kt	10 kt	20 kt
44000	4281	3709	3529	3353	4381	3800	3617	3438
42000	4123	3566	3390	3218	4218	3652	3473	3298
40000	3964	3421	3249	3081	4053	3502	3327	3158
38000	3810	3281	3114	2951	3895	3358	3188	3022
36000	3660	3145	2982	2823	3740	3217	3052	2890
34000	3507	3005	2846	2692	3581	3073	2912	2755
32000	3356	2869	2714	2563	3427	2932	2776	2623
30000	3212	2737	2587	2440	3278	2798	2645	2497
28000	3067	2606	2459	2317	3129	2662	2514	2369

WEIGHT (lb)	ALTITUDE							
	2000 ft				3000 ft			
	WIND				WIND			
	-10 kt	0 kt	10 kt	20 kt	-10 kt	0 kt	10 kt	20 kt
44000	4485	3895	3708	3527	4594	3994	3804	3620
42000	4316	3741	3559	3382	4419	3835	3650	3470
40000	4145	3586	3409	3236	4242	3674	3494	3319
38000	3982	3437	3265	3097	4073	3520	3346	3175
36000	3822	3292	3124	2961	3908	3370	3200	3034
34000	3659	3143	2980	2821	3740	3217	3052	2891
32000	3499	2998	2840	2685	3576	3068	2907	2750
30000	3346	2859	2705	2555	3418	2925	2768	2616
28000	3193	2720	2570	2424	3260	2781	2629	2481

WEIGHT (lb)	ALTITUDE							
	4000 ft				5000 ft			
	WIND				WIND			
	-10 kt	0 kt	10 kt	20 kt	-10 kt	0 kt	10 kt	20 kt
44000	4707	4097	3904	3716	4827	4205	4009	3818
42000	4526	3932	3744	3562	4639	4034	3844	3658
40000	4343	3766	3583	3406	4450	3863	3677	3496
38000	4169	3607	3429	3256	4269	3698	3518	3342
36000	3998	3452	3279	3111	4092	3538	3362	3191
34000	3824	3294	3126	2962	3913	3374	3204	3038
32000	3655	3140	2976	2818	3738	3215	3050	2889
30000	3492	2992	2834	2679	3570	3063	2902	2746
28000	3330	2844	2690	2540	3402	2910	2754	2602

NOTE: Landing distance in feet.

ADVISORY INFORMATION
EMB-135 UNFACTORED LANDING DISTANCES - CONTAMINATED RUNWAYS (ft)
ALL ENGINES TYPES – FAA CERTIFICATION
STANDING WATER 0.125 in/SLUSH 0.15 in
WET SNOW 0.25 in/DRY SNOW 0.625 in

WEIGHT (lb)	FLAP 22°	FLAP 45°
29000	6323	4930
30000	6501	5059
31000	6682	5190
32000	6874	5330
33000	7065	5469
34000	7257	5609
35000	7449	5748
36000	7658	5890
37000	7873	6033
38000	8088	6175
39000	8303	6318
40000	8517	6457
41000	8725	6596
42000	8933	6735
43000	9141	6874
44000	9349	7013

CORRECTIONS	
ALTITUDE:	LANDING DISTANCE + 4% per 1000 ft above sea level.
WIND:	LANDING DISTANCE + 12% per 5 kt tailwind.
OVERSPEED:	LANDING DISTANCE + 8% per 5 kt above V_{REF}.

ADVISORY INFORMATION
EMB-135 UNFACTORED LANDING DISTANCES - CONTAMINATED RUNWAYS (ft)
ALL ENGINES TYPES – FAA CERTIFICATION
STANDING WATER 0.25 in/SLUSH 0.29 in
WET SNOW 0.50 in/DRY SNOW 1.25 in

WEIGHT (lb)	FLAP 22°	FLAP 45°
29000	5630	4558
30000	5783	4672
31000	5938	4788
32000	6103	4912
33000	6268	5035
34000	6433	5159
35000	6598	5282
36000	6777	5408
37000	6962	5534
38000	7147	5660
39000	7331	5786
40000	7516	5911
41000	7697	6036
42000	7878	6160
43000	8059	6285
44000	8241	6409

CORRECTIONS	
ALTITUDE:	LANDING DISTANCE + 4% per 1000 ft above sea level.
WIND:	LANDING DISTANCE + 12% per 5 kt tailwind.
OVERSPEED:	LANDING DISTANCE + 8% per 5 kt above V_{REF}.

ADVISORY INFORMATION
EMB-135 UNFACTORED LANDING DISTANCES - CONTAMINATED RUNWAYS
ALL ENGINES TYPES – FAA CERTIFICATION
STANDING WATER 0.50 in/SLUSH 0.59 in
WET SNOW 1.00 in/DRY SNOW 2.50 in

WEIGHT (lb)	FLAP 22°	FLAP 45°
29000	4885	4062
30000	5010	4160
31000	5137	4258
32000	5272	4363
33000	5407	4468
34000	5543	4573
35000	5678	4678
36000	5824	4784
37000	5976	4892
38000	6127	4999
39000	6278	5106
40000	6430	5213
41000	6579	5319
42000	6729	5425
43000	6879	5532
44000	7028	5638

CORRECTIONS	
ALTITUDE:	LANDING DISTANCE + 3% per 1000 ft above sea level.
WIND:	LANDING DISTANCE + 11% per 5 kt tailwind.
OVERSPEED:	LANDING DISTANCE + 8% per 5 kt above V_{REF}.

ADVISORY INFORMATION
EMB-135 UNFACTORED LANDING DISTANCES - CONTAMINATED RUNWAYS (ft)
ALL ENGINES TYPES – FAA CERTIFICATION
COMPACTED SNOW

WEIGHT (lb)	FLAP 22°	FLAP 45°
29000	4001	3650
30000	4095	3739
31000	4189	3828
32000	4284	3915
33000	4378	4002
34000	4473	4089
35000	4567	4176
36000	4662	4259
37000	4756	4340
38000	4850	4421
39000	4944	4502
40000	5039	4583
41000	5133	4664
42000	5227	4745
43000	5321	4826
44000	5415	4907

CORRECTIONS	
ALTITUDE:	LANDING DISTANCE + 3% per 1000 ft above sea level.
WIND:	LANDING DISTANCE + 11% per 5 kt tailwind.
OVERSPEED:	LANDING DISTANCE + 8% per 5 kt above V_{REF}.

ADVISORY INFORMATION
EMB-135 UNFACTORED LANDING DISTANCES - CONTAMINATED RUNWAYS (ft)
ALL ENGINES TYPES – FAA CERTIFICATION
ICE

WEIGHT (lb)	FLAP 22°	FLAP 45°
29000	11684	9401
30000	11691	9415
31000	11707	9436
32000	11775	9504
33000	11844	9572
34000	11913	9640
35000	11982	9708
36000	12110	9810
37000	12260	9924
38000	12410	10039
39000	12560	10153
40000	12710	10268
41000	12860	10383
42000	13010	10497
43000	13160	10612
44000	13310	10727

CORRECTIONS	
ALTITUDE:	LANDING DISTANCE + 3% per 1000 ft above sea level.
WIND:	LANDING DISTANCE + 24% per 5 kt tailwind.
OVERSPEED:	LANDING DISTANCE + 6% per 5 kt above V_{REF}.

UNFACTORED LANDING DISTANCE

UNFACTORED LANDING DISTANCE (FT) – DRY RUNWAY
EMB-145XR - FLAPS 45°
ISA CONDITIONS - SLOPE 0% – NO ICE ENCOUNTER

WEIGHT (lb)	ALTITUDE							
	0 ft				1000 ft			
	WIND				WIND			
	-10 kt	0 kt	10 kt	20 kt	-10kt	0 kt	10 kt	20 kt
45000	3326	2861	2715	2574	3399	2927	2779	2636
43000	3224	2769	2626	2488	3294	2833	2688	2547
41000	3124	2679	2539	2403	3190	2738	2596	2459
39000	3027	2591	2454	2321	3089	2646	2507	2373
37000	2932	2505	2370	2240	2992	2558	2422	2290
35000	2835	2416	2285	2157	2891	2468	2334	2205
33000	2730	2322	2193	2069	2784	2370	2240	2114
31000	2619	2221	2096	1974	2670	2267	2140	2017
29000	2506	2119	1997	1879	2555	2162	2039	1920

WEIGHT (lb)	ALTITUDE							
	2000 ft				3000 ft			
	WIND				WIND			
	-10 kt	0 kt	10 kt	20 kt	-10kt	0 kt	10 kt	20 kt
45000	3475	2996	2846	2700	3554	3068	2915	2767
43000	3367	2899	2751	2609	3442	2967	2817	2672
41000	3259	2801	2657	2517	3331	2866	2720	2578
39000	3153	2705	2564	2427	3221	2766	2623	2485
37000	3052	2613	2476	2342	3115	2670	2531	2395
35000	2950	2520	2385	2255	3010	2575	2438	2306
33000	2840	2421	2289	2161	2897	2473	2339	2210
31000	2723	2315	2186	2062	2777	2364	2234	2108
29000	2604	2207	2083	1962	2655	2254	2128	2005

WEIGHT (lb)	ALTITUDE							
	4000 ft				5000 ft			
	WIND				WIND			
	-10 kt	0 kt	10 kt	20 kt	-10kt	0 kt	10 kt	20 kt
45000	3637	3143	2988	2837	3723	3221	3063	2910
43000	3522	3039	2887	2740	3604	3113	2959	2809
41000	3407	2934	2786	2642	3485	3005	2855	2709
39000	3293	2831	2686	2546	3366	2898	2751	2608
37000	3182	2730	2589	2451	3250	2792	2649	2509
35000	3073	2633	2494	2360	3139	2692	2551	2415
33000	2958	2528	2393	2261	3020	2584	2447	2314
31000	2835	2416	2285	2157	2893	2469	2336	2207
29000	2710	2303	2175	2051	2766	2354	2224	2099

UNFACTORED LANDING DISTANCE

UNFACTORED LANDING DISTANCE (FT) – DRY RUNWAY
EMB-145XR - FLAPS 22°
ISA CONDITIONS - SLOPE 0% – NO ICE ENCOUNTER

WEIGHT (lb)	ALTITUDE							
	0 ft				1000 ft			
	WIND				WIND			
	-10 kt	0 kt	10 kt	20 kt	-10kt	0 kt	10 kt	20 kt
45000	4246	3674	3494	3318	4344	3763	3580	3401
43000	4094	3537	3361	3190	4188	3622	3443	3269
41000	3944	3402	3230	3063	4033	3482	3308	3138
39000	3796	3268	3101	2938	3880	3344	3174	3009
37000	3649	3135	2973	2814	3728	3207	3042	2881
35000	3502	3003	2845	2691	3577	3071	2910	2754
33000	3354	2870	2716	2566	3424	2933	2777	2625
31000	3205	2735	2585	2440	3271	2794	2643	2495
29000	3056	2601	2456	2314	3118	2656	2509	2366

WEIGHT (lb)	ALTITUDE							
	2000 ft				3000 ft			
	WIND				WIND			
	-10 kt	0 kt	10 kt	20 kt	-10kt	0 kt	10 kt	20 kt
45000	4447	3856	3669	3487	4554	3952	3762	3577
43000	4285	3709	3528	3351	4386	3800	3616	3436
41000	4125	3565	3388	3216	4220	3651	3471	3296
39000	3967	3422	3250	3082	4057	3504	3329	3158
37000	3810	3281	3114	2950	3895	3358	3188	3022
35000	3654	3140	2978	2819	3734	3213	3047	2886
33000	3497	2999	2840	2686	3572	3067	2906	2750
31000	3339	2856	2702	2553	3409	2919	2764	2612
29000	3181	2714	2565	2420	3247	2773	2622	2475

WEIGHT (lb)	ALTITUDE							
	4000 ft				5000 ft			
	WIND				WIND			
	-10 kt	0 kt	10 kt	20 kt	-10kt	0 kt	10 kt	20 kt
45000	4667	4054	3861	3673	4784	4160	3963	3772
43000	4493	3897	3709	3526	4604	3997	3806	3620
41000	4322	3743	3560	3382	4426	3837	3651	3470
39000	4153	3590	3412	3239	4251	3679	3498	3323
37000	3985	3439	3267	3098	4079	3523	3348	3177
35000	3820	3290	3122	2958	3907	3369	3198	3032
33000	3652	3139	2976	2817	3735	3213	3048	2887
31000	3484	2987	2830	2676	3561	3057	2897	2741
29000	3317	2836	2684	2535	3389	2902	2747	2596

UNFACTORED LANDING DISTANCE

UNFACTORED LANDING DISTANCE (FT) – DRY RUNWAY
EMB-145XR - FLAPS 22°
ISA CONDITIONS - SLOPE 0% – AFTER ICE ENCOUNTER

WEIGHT (lb)	ALTITUDE							
	0 ft				1000 ft			
	WIND				WIND			
	-10 kt	0 kt	10 kt	20 kt	-10kt	0 kt	10 kt	20 kt
45000	4546	3951	3763	3580	4653	4048	3857	3670
43000	4385	3806	3623	3445	4487	3898	3712	3531
41000	4224	3661	3483	3309	4321	3748	3567	3391
39000	4063	3515	3342	3173	4154	3598	3422	3250
37000	3904	3373	3204	3040	3990	3450	3279	3112
35000	3756	3239	3075	2915	3838	3313	3146	2984
33000	3599	3097	2938	2782	3675	3166	3005	2847
31000	3438	2953	2798	2647	3510	3018	2861	2708
29000	3278	2808	2658	2512	3345	2868	2717	2569

WEIGHT (lb)	ALTITUDE							
	2000 ft				3000 ft			
	WIND				WIND			
	-10 kt	0 kt	10 kt	20 kt	-10kt	0 kt	10 kt	20 kt
45000	4765	4149	3954	3765	4882	4254	4056	3863
43000	4593	3994	3804	3620	4704	4093	3900	3713
41000	4421	3839	3655	3475	4526	3933	3745	3563
39000	4249	3683	3504	3330	4347	3772	3590	3413
37000	4080	3531	3357	3188	4173	3615	3438	3266
35000	3922	3389	3220	3055	4010	3468	3296	3129
33000	3755	3238	3074	2914	3837	3312	3146	2983
31000	3585	3085	2926	2771	3662	3154	2993	2836
29000	3414	2931	2777	2627	3487	2996	2840	2688

WEIGHT (lb)	ALTITUDE							
	4000 ft				5000 ft			
	WIND				WIND			
	-10 kt	0 kt	10 kt	20 kt	-10kt	0 kt	10 kt	20 kt
45000	5000	4365	4163	3967	5100	4481	4275	4075
43000	4821	4199	4002	3811	4942	4308	4108	3913
41000	4636	4033	3842	3656	4751	4136	3942	3752
39000	4452	3866	3681	3501	4560	3963	3775	3591
37000	4271	3704	3524	3349	4373	3795	3612	3434
35000	4103	3552	3377	3207	4199	3638	3461	3288
33000	3925	3391	3222	3057	4015	3473	3301	3133
31000	3744	3228	3064	2905	3829	3304	3138	2976
29000	3563	3065	2907	2752	3642	3136	2976	2819

ADVISORY INFORMATION
EMB-145XR UNFACTORED LANDING DISTANCES - CONTAMINATED RUNWAYS (ft)
ALL ENGINES TYPES – FAA CERTIFICATION
STANDING WATER 0.125 in/SLUSH 0.15 in
WET SNOW 0.25 in/DRY SNOW 0.625 in

WEIGHT (lb)	FLAP 22°	FLAP 45°
32000	6674	5218
33000	6850	5343
34000	7027	5469
35000	7204	5594
36000	7397	5723
37000	7596	5851
38000	7796	5978
39000	7995	6104
40000	8194	6231
41000	8394	6358
42000	8593	6485
43000	8793	6612
44000	8988	6739
45000	9179	6869
46000	9370	6999
47000	9560	7130
48000	9751	7260
49000	9958	7398
50000	10180	7542
51000	10402	7684
52000	10625	7826
53000	10847	7967

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-145XR UNFACTORED LANDING DISTANCES - CONTAMINATED RUNWAYS (ft)
ALL ENGINES TYPES – FAA CERTIFICATION
STANDING WATER 0.25 in/SLUSH 0.29 in
WET SNOW 0.50 in/DRY SNOW 1.25 in

WEIGHT (lb)	FLAP 22°	FLAP 45°
32000	5889	4682
33000	6037	4790
34000	6184	4898
35000	6332	5006
36000	6493	5117
37000	6659	5228
38000	6826	5338
39000	6992	5448
40000	7159	5559
41000	7325	5669
42000	7491	5780
43000	7658	5890
44000	7822	6001
45000	7984	6114
46000	8145	6227
47000	8307	6341
48000	8468	6454
49000	8643	6574
50000	8831	6700
51000	9019	6825
52000	9207	6950
53000	9396	7074

CORRECTIONS	
ALTITUDE:	LANDING DISTANCE + 3% per 1000 ft above sea level.
WIND:	LANDING DISTANCE + 11% per 5 kt tailwind.
OVERSPEED:	LANDING DISTANCE + 8% per 5 kt above V_{REF}.

ADVISORY INFORMATION
EMB-145XR UNFACTORED LANDING DISTANCES - CONTAMINATED RUNWAYS (ft)
ALL ENGINES TYPES – FAA CERTIFICATION
STANDING WATER 0.50 in/SLUSH 0.59 in
WET SNOW 1.00 in/DRY SNOW 2.50 in

WEIGHT (lb)	FLAP 22°	FLAP 45°
32000	4946	4081
33000	5059	4169
34000	5171	4257
35000	5283	4346
36000	5406	4436
37000	5533	4527
38000	5660	4617
39000	5787	4708
40000	5913	4798
41000	6040	4888
42000	6167	4978
43000	6294	5069
44000	6420	5159
45000	6544	5251
46000	6669	5344
47000	6794	5437
48000	6919	5530
49000	7054	5628
50000	7199	5731
51000	7344	5833
52000	7490	5934
53000	7635	6036

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-145XR UNFACTORED LANDING DISTANCES - CONTAMINATED RUNWAYS (ft)
ALL ENGINES TYPES – FAA CERTIFICATION
COMPACTED SNOW

WEIGHT (lb)	FLAP 22°	FLAP 45°
32000	4368	3885
33000	4463	3972
34000	4558	4059
35000	4653	4146
36000	4744	4224
37000	4833	4299
38000	4923	4375
39000	5012	4450
40000	5101	4526
41000	5191	4601
42000	5280	4676
43000	5370	4752
44000	5459	4827
45000	5545	4899
46000	5631	4971
47000	5717	5042
48000	5803	5114
49000	5889	5184
50000	5974	5253
51000	6059	5322
52000	6144	5391
53000	6229	5460

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-145XR UNFACTORED LANDING DISTANCES - CONTAMINATED RUNWAYS (ft)
ALL ENGINES TYPES – FAA CERTIFICATION
ICE

WEIGHT (lb)	FLAP 22°	FLAP 45°
32000	12065	9554
33000	12089	9593
34000	12113	9632
35000	12137	9670
36000	12246	9757
37000	12387	9862
38000	12528	9967
39000	12669	10071
40000	12809	10176
41000	12950	10281
42000	13091	10386
43000	13232	10490
44000	13373	10595
45000	13532	10716
46000	13693	10839
47000	13855	10961
48000	14016	11084
49000	14183	11210
50000	14354	11341
51000	14525	11471
52000	14696	11601
53000	14868	11731

CORRECTIONS	
ALTITUDE:	LANDING DISTANCE + 3% per 1000 ft above sea level.
WIND:	LANDING DISTANCE + 26% per 5 kt tailwind.
OVERSPEED:	LANDING DISTANCE + 6% per 5 kt above V_{REF}.

INTENTIONALLY BLANK

EMERGENCY EVACUATION

Parking Brake ..... APPLY
Cabin ..... DEPRESSURIZE
Fire Extinguishing Handles ..... PULL
APU Fuel Shutoff Button ..... PUSH IN
Engines and APU Fire Extinguishing Bottles (if necessary) ..... DISCHARGE
Ventral Tank Transfer Knob (if applicable) ..... OFF
Fuel Pumps Pwr 1 and 2 ..... OFF
Hydraulic Elec Pumps 1 and 2 ..... OFF
Cabin Crew ..... NOTIFY
Emerg Lts ..... ON
EMERGENCY EVACUATION Procedure ..... ACCOMPLISH
ATC ..... NOTIFY
Before leaving the airplane:
Batteries 1 and 2 ..... OFF

END