

SECTION 1-05

FLIGHT PLANNING

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NOTE: Items marked with an asterisk (*) may not be present in this manual.

INTRODUCTION

This section presents climb, cruise, descent and holding performance data.

In addition, simplified flight planning and one engine inoperative are included.

NOTE: Airplanes equipped with Rolls Royce AE3007A1P engines should use the same simplified flight planning, climb, cruise, descent, holding, one engine inoperative performance, flight with landing gear down, flight with flaps locked at 9° and inflight diversion data applicable to airplanes equipped with Rolls Royce AE3007A1 engines.

SIMPLIFIED FLIGHT PLANNING

Simplified flight planning charts allow quick determination of estimated trip fuel and time from brake release to landing. The following phases are included: takeoff, climb, cruise, descent, approach and landing.

Charts are provided for Long Range Cruise (LRC) and Maximum Speed Cruise (MSC) at constant altitude.

Alternate fuel, holding, reserve fuel and other allowances (APU usage and taxi) should be added to the trip fuel in order to obtain the total fuel required.

To determine trip fuel enter trip ground distance, correct for wind condition and estimated landing weight, move as far as the line indicating cruise pressure altitude, and read the trip fuel.

To determine trip time, enter trip ground distance, correct for wind condition, move as far as the referring cruise pressure altitude, and read the trip time.

For winds greater than those shown, enter in the chart, directly, corrected ground distance, ignore wind correction reference line, to obtain the corrected ground distance, apply the following equation.

$$CGD = GD \times \left(\frac{TAS}{TAS + WIND} \right)$$

Where:

CGD: Corrected ground distance;

GD: Ground distance;

Head wind is negative;

Tail wind is positive.

The alternate fuel is determined by entering the LRC Simplified Flight Planning chart with the alternate distance and wind.

The holding fuel is determined from the holding table in this section. Depending upon national regulations, the holding fuel is normally calculated so that the aircraft can hold for 30 min., at 1500 ft above the alternate airport.

AIRPLANE OPERATIONS MANUAL



The reserve fuel is also dependant on national regulations and normally is the fuel required for flying 10% of the trip time (based on the latest fuel flow) or is equivalent to 5% of the trip fuel.

The allowances below may be used:

PHASE OF FLIGHT	FUEL CONSUMPTION (kg/min)
-----------------	------------------------------

TAXI	7.30
APU	1.24

EXAMPLE:

Given:

DESTINATION AIRPORT

Trip Distance	400 NM
Flight Level	FL 350
Cruise Speed	LRC
Wind	30 knots (head wind)
Estimated landing weight	17000 kg.

ALTERNATE AIRPORT

Distance	200 NM
Flight Level	FL 200
Speed to alternate airport	LRC
Wind	0
Estimated landing weight at alternate	16000 kg.

RESERVE FUEL	5% of trip fuel.
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HOLDING

Time	30 min.
Altitude	1500 ft
Estimated airplane weight at holding	16000 kg.

RESULTS

From Simplified Flight Planning Chart - Long Range Cruise:

Trip Fuel 1300 kg.

From Simplified Flight Planning Chart - Long Range Cruise:

Fuel to Alternate 700 kg.

Reserve Fuel 65 kg (5% of
Trip Fuel).

From Holding Tables:

Fuel consumption at 1500 ft 732 kg/h.

For 30 min of holding, fuel 366 kg.

To determine the TOTAL FUEL ON TAKEOFF, let's consider 5 minutes for taxi and an APU consumption equal to 50 kg.

TOTAL FUEL ON TAKEOFF = TRIP FUEL + FUEL TO ALTERNATE +
RESERVE FUEL + HOLDING + APU + TAXI

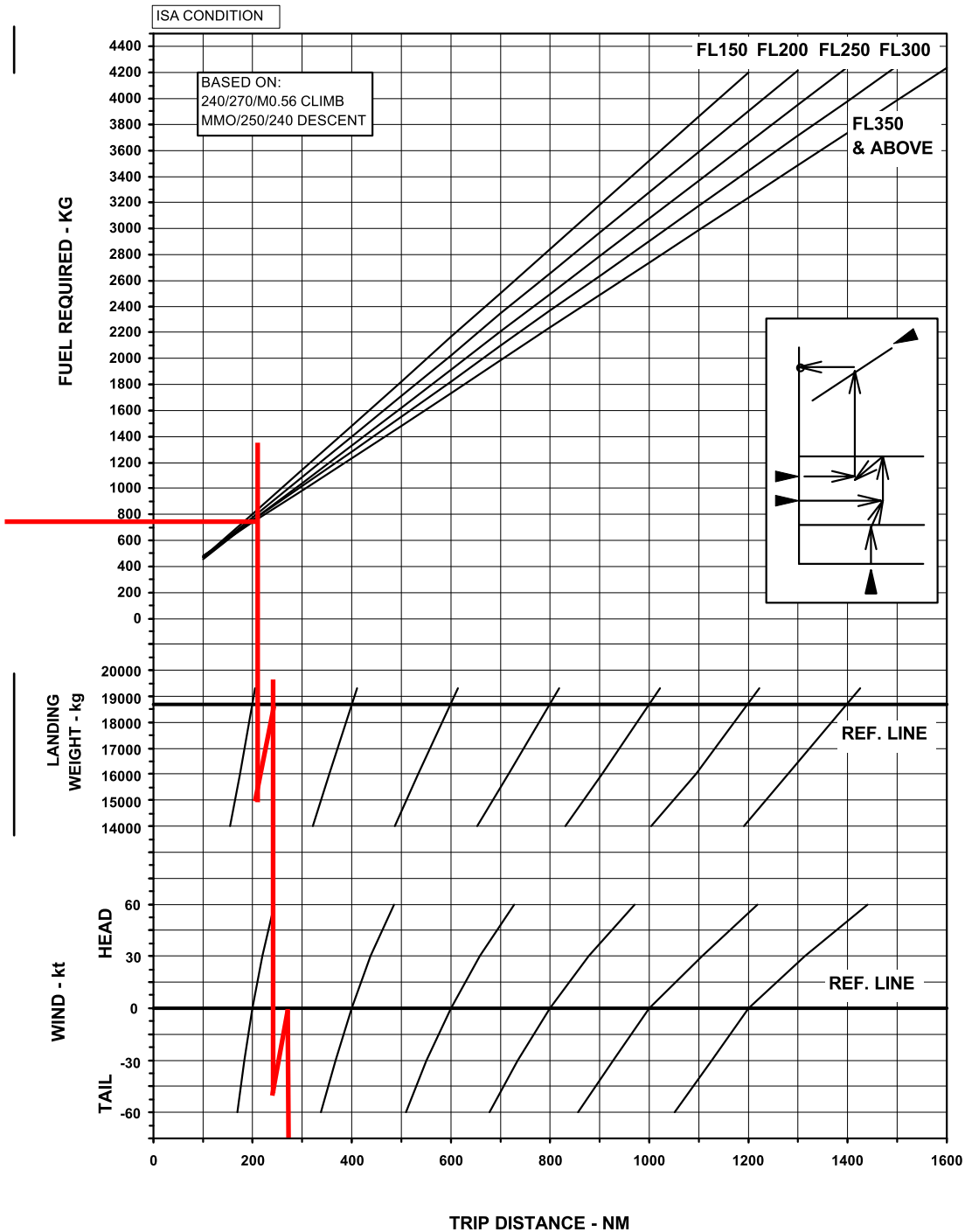
TOTAL FUEL ON TAKEOFF = 1300 + 700 + 65 + 366 + 50 + 36

TOTAL FUEL ON TAKEOFF = 2517 kg.

From Flight Time Chart - Long Range Cruise:

TRIP TIME 73 minutes

EMB-145 SIMPLIFIED FLIGHT PLANNING
AE3007A1 ENGINES
LONG RANGE CRUISE



145AOMCTA003 - 09OCT2002

ISA CONDITION

FUEL REQUIRED - KG

BASED ON:
240/270/M0.56 CLIMB
MMO/250/240 DESCENT

FL150 FL200 FL250 FL300 FL350 & ABOVE

LANDING WEIGHT - kg

REF. LINE

WIND - kt

HEAD
TAIL

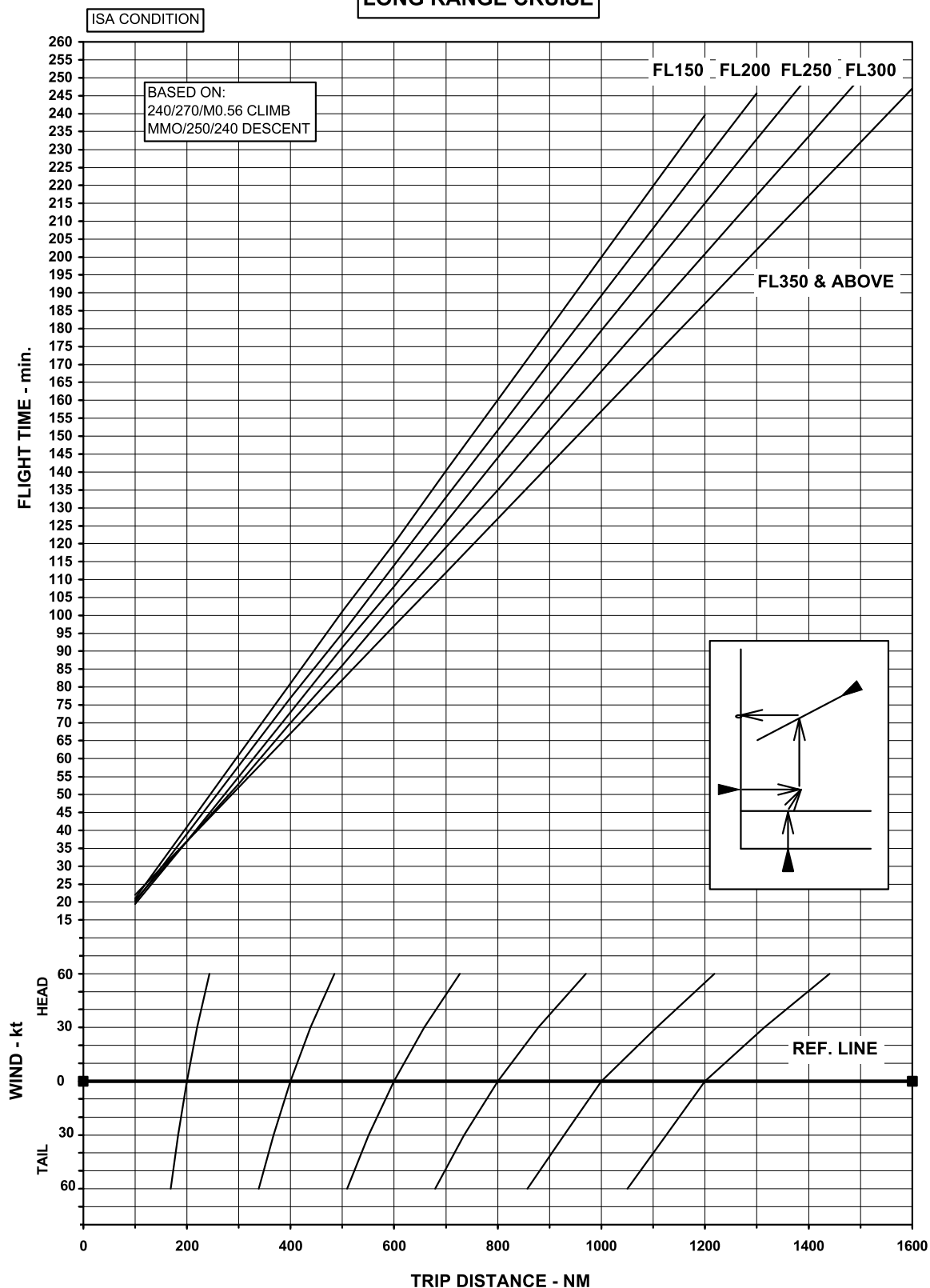
REF. LINE

TRIP DISTANCE - NM

AOM-145/1114

DECEMBER 20, 2002

**EMB-145 FLIGHT TIME
AE3007A1 ENGINE
LONG RANGE CRUISE**



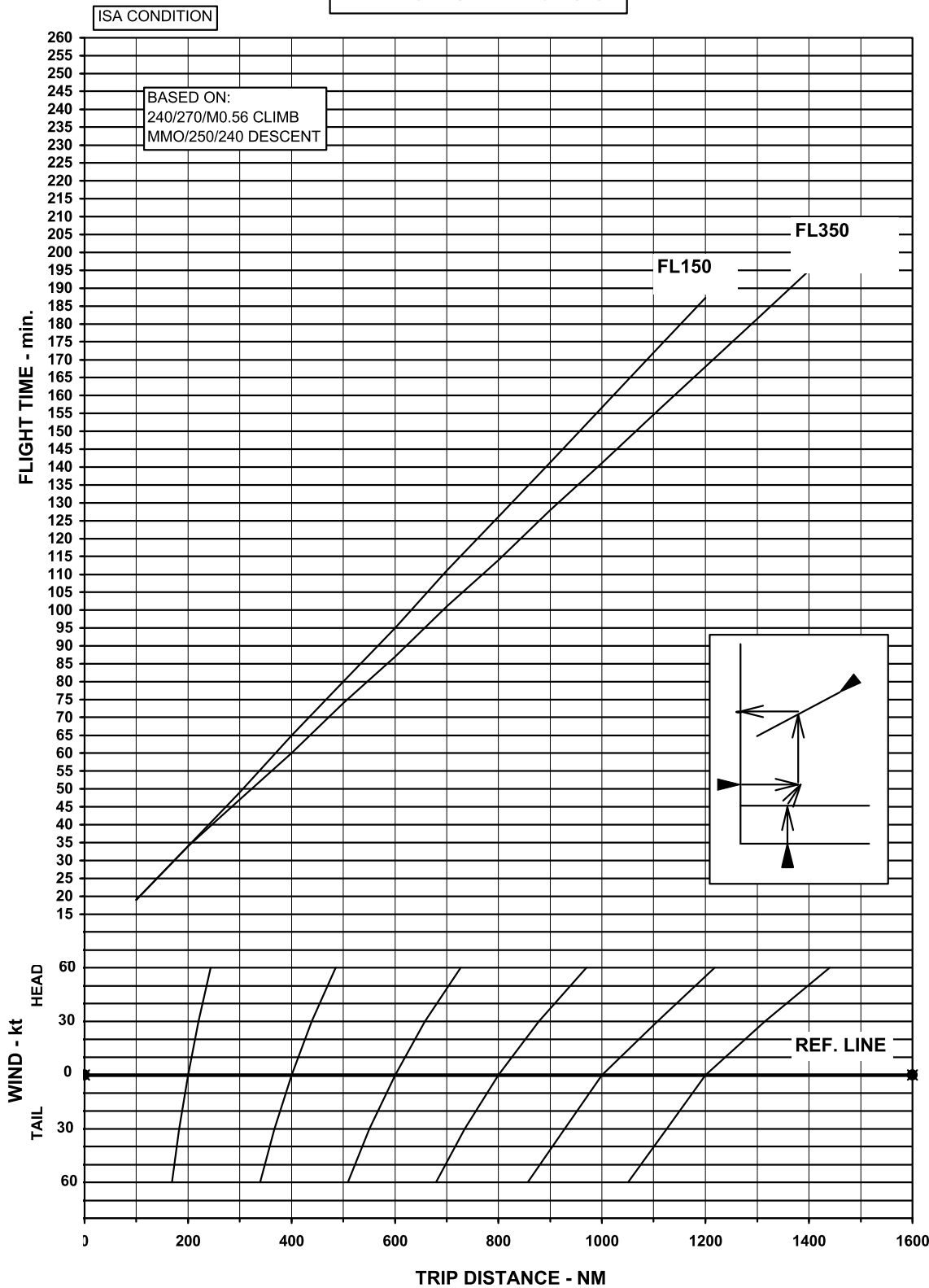
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EMB-145 FLIGHT TIME

AE3007A1 ENGINE

MAXIMUM SPEED CRUISE



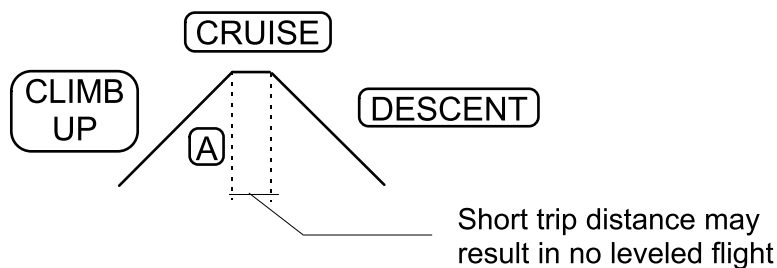
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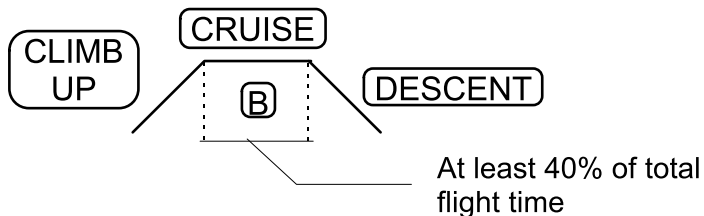
CRUISE - FLIGHT LEVEL TABLE

The table below permits quick determination of the cruise flight level for minimum fuel consumption, based on the trip distance and takeoff weight. For each takeoff weight two different flight levels are calculated (A or B) based on the following assumptions:

- Condition (A): The flight level was calculated based only on minimum fuel consumption. It may result on reduced time in leveled flight for short trip distances.



- Condition (B): The flight level was calculated based on a combination of minimum fuel consumption and at least 40% of the total flight time in cruise.



The table data are presented for ISA condition, all engine operating and Maximum Speed Cruise schedule.

FLIGHT LEVEL - ALL ENGINES OPERATING

AE3007A1 ENGINES, MAX SPEED CRUISE AND ISA CONDITIONS

		TRIP DISTANCE (NM)							
TOW (KG)		50	75	100	150	200	250	300	400
22000 (1)		-	-	-	-	-	-	-	-
21000 (2)		-	-	-	-	-	-	-	-
20000 (3)	A	-	-	-		360	370	370	370
	B	-	-	-	-	200	240	280	370
19000	A	80	170	220	280	360	370	370	370
	B	60	110	120	160	200	250	290	370
18000	A	80	180	230	320	370	370	370	370
	B	60	110	130	160	210	250	300	370
17000	A	70	170	240	330	370	370	370	370
	B	80	100	120	170	220	260	330	370
16000	A	140	190	250	340	370	370	370	370
	B	80	100	120	170	220	270	350	370

- (1) Due to MLW restrictions, it is only possible to takeoff with 22000 kg TOW if the trip distance is greater than 700 NM (for airplanes with 19300 Kg MLW).
- (2) Due to MLW restrictions, it is only possible to takeoff with 21000 kg TOW if the trip distance is greater than 500 NM (for airplanes with 19300 Kg MLW).
- (3) Due to MLW restrictions, it is only possible to takeoff with 20000 kg TOW if the trip distance is greater than 150 NM (for airplanes with 19300 Kg MLW) or 300 NM (for airplanes with 18700 Kg MLW).

CRUISE - ALTITUDE CAPABILITY TABLE

The table below permits quick determination of the altitude capability, based on the initial cruise weight. The table data are presented for various ISA conditions, all engines operating and Maximum Speed Cruise schedule.

The established associated conditions are:

- Flaps UP
- Gears UP
- Bleeds OPEN

CRUISE ALTITUDE CAPABILITY ALL ENGINES OPERATING

AE3007A1 ENGINES, MAX SPEED CRUISE, CRUISE THRUST LIMITED

Weight (kg)	ISA + °C									
	-10	-5	0	5	10	15	20	25	30	35
22000	370	370	370	370	370	370	360	340	310	290
21000	370	370	370	370	370	370	370	360	340	300
20000	370	370	370	370	370	370	370	370	360	330
19000	370	370	370	370	370	370	370	370	370	360
18000	370	370	370	370	370	370	370	370	370	370
17000	370	370	370	370	370	370	370	370	370	370
16000	370	370	370	370	370	370	370	370	370	370
15000	370	370	370	370	370	370	370	370	370	370
14000	370	370	370	370	370	370	370	370	370	370
13000	370	370	370	370	370	370	370	370	370	370

NOTE: The weight values refers to the initial cruise weight.