PART 7 - DESCENT

TABLE OF CONTENTS

LIST OF FIGURES

INTRODUCTION

This part contains all-engines operating and one-engine inoperative descent performance data applicable to the aircraft with flaps up, lading gear up and doors closed. Single-engine descent data assumes the propeller feathered on the inoperative engine.

NORMAL DESCENT, ALL ENGINES OPERATING

The two-engine normal descent is performed with flaps and landing gear up. Descent data will be presented for two options:

1. Descent speed is 180 KIAS and rate of descent in the 1200 by 1600 fpm range. PRS selector in CRZ1 (90% N_P) position.
2. Descent speed is 200 KIAS and flight idle (Hight-set Flight Idle) with PRS selector in CRZ1 (90%N_P) position.

FIXED RATE OF DESCENT

A summary of two-engine normal descent data, engine anti-ice off, from 30.000 ft to sea level, descent speed is 180 KIAS, standard day (ISA atmosphere), is given in Figure 7-1 for various values of rate of descent. The time, distance and total fuel used data is given in tabular form. The influence of the aircraft weight and ISA are negligible.

Drag Index Correction

The correction due to drag index on the two-engine descent at constant rate is:

- TIME AND DISTANCE: No correction required.
- FUEL USED: Increase by 11% per each 50 units of DI.

Effect of Engine Anti-Ice

The correction on the descent performance data due to engine anti-ice on is negligible.

FLIGHT IDLE POWER (90% N_P)

A summary of two-engine normal descent data, engine anti-ice off, from 30.000 ft to sea level, descent speed is 200 KIAS, standard day (ISA atmosphere), is given in Figure 7-2 for several aircraft weights. The time, distance and total fuel used data is given in tabular form. The influence of ISA is:

- ISA +20°C: increase by 4% the fuel used, by 3% the time and by 7% the horizontal distance.
- ISA -20°C: No change required to fuel used and time. Decrease by 4% the horizontal distance.

For other ISA deviation use the values interpolated linearly.

Drag Index Correction

The correction due to drag index on the two-engine descent performance at Flight Idle power is:

- FUEL, TIME and DISTANCE: Decrease by 8% per each 50 units of DI.

Effect of Engine Anti-Ice

The correction on the descent performance data due to engine anti-ice on is negligible.

FAST DESCENT, ALL ENGINES OPERATING

The two-engine fast descent is performed with flaps and landing gear up. Descent data will be presented for two options.

1. Descent speed is 200 KIAS and low flight idle (Low set Flight Idle). PRS selector in CRZ1 (90% N_P) position.
2. Descent speed is V_{MO} and low flight idle (Low-set Flight Idle). PRS selector in MCT (100% N_P) position.

In this type of descent, the aircraft rate of descent is in the 2000 - 4000 fpm range depending on the actual gross weight.

LOW FLIGHT IDLE AND CRZ1 (90% N_P)

A summary of two-engine fast descent data, engine anti-ice off, from 30.000 ft to sea level, descent speed is 200 KIAS, standard day (ISA atmosphere), is given in Figure 7-3 for several aircraft weights. The time, distance and used fuel data is given in graphic and tabular form.

The influence of ISA deviation is the same that in normal descent at Flight Idle power.

Drag Index Correction

The correction due to drag index is the same that in normal descent at Flight Idle power.

Effect of Engine Anti-Ice

The effect of the engine anti-ice on for the time, distance and total fuel used during descent is negligible.

LOW FLIGHT IDLE AND MCT (100% N_P) - EMERGENCY

A summary of two-engine fast descent data, engine anti-ice off, from 30.000 ft to sea level, descent speed is V_{MO}, standard day (ISA atmosphere), is given in Figure 7-4 for several aircraft weights. The time, distance and used fuel data is given in graphic and tabular form.

The influence of ISA deviation is the same that in normal descent at Flight Idle power.

Drag Index Correction

The correction due to drag index is the same that in normal descent at Flight Idle power.

Effect of Engine Anti-Ice

The effect of the engine anti-ice on for the time, distance and total fuel used during descent is negligible.

DESCENT FOR MAXIMUM RANGE, ALL ENGINES OPERATING

This type descent is used when maximum range is required for the aircraft to arrive at the destination airfield, a situation which may arise when fuel saving is desired or necessary. To obtain the maximum range performance for this aircraft, it is recommended to use long range speed on cruise followed by a normal descent with fixed rate of descent.

DESCENT, ONE ENGINE INOPERATIVE

Single-engine descent is performed with flaps and landing gear up, descent speed is 170 KIAS and flight idle with PRS selector in MCT (100% de N_P). The propeller of engine inoperative is feathered.

A summary of single-engine descent data, engine anti-ice off, from 25.000 ft to sea level, descent speed is 170 KIAS, standard day, is given in Figure 7-5. The time, distance and total fuel used are given in tabular form. The influence of ISA deviation is as follows:

- ISA +20°C: Increase by 8% the fuel used, by 5% the time and by 8% the horizontal distance.
- ISA -20°C: Decrease by 8% the fuel used by 5% the time and by 8% the horizontal distance.

For other ISA deviation use the values interpolated linearly.

Drag Index Correction

The correction due to drag index on single-engine descent and flight idle power with MCT (100% N_P) is:

- FUEL USED, TIME AND DISTANCE: Decrease by 7% per each 50 units of DI.

Effect of Engine Anti-Ice

The effect of the engine anti-ice on for time, distance and total fuel used during descent is negligible.

Example

Given:

1. Cruise altitude: 20.000 ft.
2. Descent to: 2.000 ft.
3. Two-engine normal descent and Standard day.
4. Rate of descent 1.200 fpm with Engine anti-ice off.

Results:

1.	Time (Figure 7-1) (17-0.8×2)	15 min 24 sec.
2.	Distance (Figure 7-1) (58-3×2)	52 NM
3.	Total fuel used (Figure 7-1) (97-6×2)	85 kg

TIME, DISTANCE AND FUEL TO DESCEND
2 ENGINES, NORMAL DESCENT CRZ1 (90% N_P)

DATE: FEB. 2000 **AIRCRAFT:** C-295M **FLAPS:** UP (0º)
DATA BASIS: FLIGHT TEST **ENGINES**: PW 127G **ENGINE A/I**: OFF
PROPELLERS: HS 568F-5 **SPEED:** 180 KIAS

FIX R/D **ISA**

Fuel (Kg)
Distance (NM) Time (min)

FL	RATE OF DESCENT – (FPM)	
	1200	1600
300	141 94 25	89 71 19
290	136 90 24	86 68 18
280	132 86 23	84 65 18
270	128 82 23	81 62 17
260	123 79 22	78 59 16
250	119 75 21	76 56 16
240	114 71 20	73 54 15
220	110 68 19	71 51 14
220	106 64 18	68 48 14
210	101 61 18	65 46 13
200	97 58 17	63 43 13
190	92 54 16	60 41 12
180	88 51 15	57 38 11
170	83 48 14	54 36 11
160	79 45 13	52 34 10
150	74 41 13	49 31 9
140	70 38 12	46 29 9
120	61 32 10	40 25 8
100	51 27 8	34 20 6
80	42 21 7	28 16 5
60	32 15 5	21 12 4
40	22 10 3	14 8 3
20	11 5 2	7 4 1

LANDING ALTITUDE CORRECTION
For each 1000 ft of landing altitude substract

6 3 0.8	4 2 0.6

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Figure 7-1 Time, Distance and Fuel. Normal Descent. (CRZ1). 2 Engines

TIME, DISTANCE AND FUEL TO DESCEND
2 ENGINES, NORMAL DESCENT, FLIGHT IDLE (90% N_P)

DATE: FEB. 2000 **AIRCRAFT:** C-295M **FLAPS:** UP (0º)
DATA BASIS: FLIGHT TEST **ENGINES:** PW 127G **ENGINE A/I:** OFF
PROPELLERS: HS 568F-5 **SPEED:** 200 KIAS

ISA

Fuel (Kg)	
Distance (NM)	Time (min)

FL	INITIAL WEIGHT (KG)					
	12000		17000		22000	
300	46	43 10	61	56 14	72	66 16
290	45	41 10	59	54 13	70	63 16
280	43	39 10	58	52 13	68	61 15
270	42	37 9	56	50 12	66	58 15
260	41	36 9	55	48 12	65	56 14
250	40	34 9	53	46 12	63	54 14
240	39	33 8	52	44 11	61	52 13
220	38	31 8	51	42 11	60	49 13
220	37	30 8	49	40 10	58	47 12
210	36	28 7	48	38 10	56	45 12
200	35	27 7	46	36 10	55	43 11
190	33	26 7	45	34 9	53	41 11
180	32	24 6	43	33 9	51	38 10
170	31	23 6	41	31 8	49	36 10
160	29	21 6	39	29 8	47	34 9
150	28	20 5	38	27 7	44	32 9
140	27	19 5	36	25 7	42	30 8
120	23	16 4	31	21 6	37	25 7
100	20	13 4	27	18 5	32	21 6
80	16	10 3	22	14 4	26	16 5
60	12	8 2	17	10 3	20	12 4
40	8	5 1	11	7 2	13	8 2
20	4	2 1	5	3 1	7	4 1

LANDING ALTITUDE CORRECTION For each 1000 ft of landing altitude substract		
2 1 0.4	3 2 0.5	3 2 0.6

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Figure 7-2 Time, Distance and Fuel. Normal Descent. Flight Idle. 2 Engines

TIME, DISTANCE AND FUEL TO DESCEND
2 ENGINES, FAST DESCENT, LOW IDLE (90% N_P)

DATE: FEB. 2000 **AIRCRAFT:** C-295M **FLAPS:** UP (0º)
DATA BASIS: FLIGHT TEST **ENGINES**: PW 127G **ENGINE A/I**: OFF
PROPELLERS: HS 568F-5 **SPEED:** 200 KIAS

ISA

Fuel (Kg)
Distance (NM) Time (min)

FL	INITIAL WEIGHT (KG)		
	12000	17000	22000
300	31 / 38 / 9	42 / 51 / 12	49 / 60 / 15
290	30 / 36 / 9	40 / 49 / 12	47 / 57 / 14
280	29 / 35 / 9	38 / 46 / 12	46 / 55 / 14
270	27 / 33 / 8	37 / 44 / 11	44 / 52 / 13
260	26 / 31 / 8	35 / 42 / 11	42 / 50 / 13
250	25 / 30 / 8	34 / 40 / 10	41 / 48 / 12
240	24 / 28 / 7	33 / 38 / 10	39 / 46 / 12
220	24 / 27 / 7	32 / 37 / 9	38 / 44 / 11
220	23 / 26 / 7	31 / 35 / 9	37 / 42 / 11
210	22 / 24 / 6	30 / 33 / 9	35 / 40 / 10
200	21 / 23 / 6	29 / 31 / 8	34 / 38 / 10
190	20 / 22 / 6	28 / 30 / 8	33 / 36 / 9
180	20 / 21 / 6	26 / 28 / 7	32 / 34 / 9
170	19 / 19 / 5	25 / 26 / 7	30 / 32 / 8
160	18 / 18 / 5	24 / 25 / 7	29 / 30 / 8
150	17 / 17 / 5	23 / 23 / 6	28 / 28 / 8
140	16 / 16 / 4	22 / 21 / 6	26 / 26 / 7
120	14 / 13 / 4	19 / 18 / 5	23 / 22 / 6
100	12 / 11 / 3	17 / 15 / 4	20 / 18 / 5
80	10 / 9 / 2	14 / 12 / 3	16 / 14 / 4
60	8 / 6 / 2	10 / 9 / 3	12 / 10 / 3
40	5 / 4 / 1	7 / 6 / 2	8 / 7 / 2
20	3 / 2 / 1	3 / 3 / 1	4 / 3 / 1

LANDING ALTITUDE CORRECTION For each 1000 ft of landing altitude substract		
1 / 1 / 0.3	2 / 1 / 0.4	2 / 2 / 0.5

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Figure 7-3 Time, Distance and Fuel. Fast Descent. Low Idle. 2 Engines

TIME, DISTANCE AND FUEL TO DESCEND
2 ENGINES EMERGENCY DESCENT
LOW IDLE (100% N_P)

DATE: FEB. 2000 **AIRCRAFT:** C-295M **FLAPS:** UP (0º)
DATA BASIS: FLIGHT TEST **ENGINES:** PW 127G **ENGINE A/I:** OFF
PROPELLERS: HS 568F-5 **SPEED:** V_{MO}

ISA

Fuel (Kg)	
Distance (NM)	Time (min)

FL	INITIAL WEIGHT (KG)		
	12000	17000	22000
300	20 / 28 / 6	28 / 38 / 8	34 / 46 / 10
290	19 / 26 / 6	26 / 36 / 8	32 / 44 / 9
280	18 / 25 / 5	25 / 34 / 7	31 / 42 / 9
270	17 / 23 / 5	24 / 32 / 7	29 / 40 / 9
260	17 / 22 / 5	23 / 31 / 7	28 / 38 / 8
250	16 / 21 / 5	22 / 29 / 6	27 / 36 / 8
240	15 / 20 / 4	21 / 28 / 6	26 / 34 / 7
220	14 / 19 / 4	20 / 26 / 6	25 / 33 / 7
220	14 / 18 / 4	19 / 25 / 5	24 / 31 / 7
210	13 / 17 / 4	18 / 23 / 5	23 / 29 / 6
200	13 / 16 / 3	18 / 22 / 5	22 / 28 / 6
190	12 / 15 / 3	17 / 21 / 5	21 / 26 / 6
180	12 / 14 / 3	16 / 20 / 4	20 / 25 / 5
170	11 / 13 / 3	15 / 19 / 4	19 / 24 / 5
160	11 / 13 / 3	15 / 18 / 4	19 / 22 / 5
150	10 / 12 / 3	14 / 16 / 4	18 / 21 / 5
140	10 / 11 / 2	13 / 15 / 3	17 / 19 / 4
120	9 / 9 / 2	12 / 13 / 3	15 / 17 / 4
100	7 / 8 / 2	10 / 11 / 3	13 / 14 / 3
80	6 / 6 / 1	8 / 9 / 2	11 / 11 / 3
60	5 / 5 / 1	7 / 7 / 2	8 / 8 / 2
40	3 / 3 / 1	5 / 4 / 1	6 / 6 / 1
20	2 / 2 / 0	2 / 2 / 1	3 / 3 / 1

LANDING ALTITUDE CORRECTION For each 1000 ft of landing altitude substract		
1 / 1 / 0.2	1 / 1 / 0.3	2 / 1 / 0.3

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Figure 7-4 Time, Distance and Fuel. Emergency Descent. Low Idle. 2 Engines

TIME, DISTANCE AND FUEL TO DESCEND
1 ENGINE FLIGHT IDLE (100% N_P)

DATE: FEB. 2000 **AIRCRAFT:** C-295M **FLAPS:** UP (0º)
DATA BASIS: FLIGHT TEST **ENGINES**: PW 127G **ENGINE A/I**: OFF
PROPELLERS: HS 568F-5 **SPEED:** 170 KIAS

ISA

Fuel (Kg)
Distance (NM) Time (min)

FL	INITIAL WEIGHT (KG)		
	12000	17000	22000
250	25 34 10	37 50 15	44 60 18
240	25 33 10	36 48 14	43 57 17
220	24 31 9	35 46 14	42 54 16
220	23 30 9	34 43 13	40 52 16
210	23 28 9	33 41 13	39 49 15
200	22 27 8	32 39 12	38 47 14
190	21 25 8	31 37 12	37 44 14
180	20 24 8	29 35 11	35 42 13
170	19 23 7	28 33 10	34 39 12
160	19 21 7	27 31 10	32 37 12
150	18 20 6	26 29 9	31 35 11
140	17 18 6	24 27 9	29 32 10
130	16 17 6	23 25 8	27 30 10
120	15 16 5	21 23 7	26 27 9
100	13 13 4	18 19 6	22 23 8
80	10 10 3	15 15 5	18 18 6
60	8 8 3	11 11 4	14 13 5
40	5 5 2	8 7 3	9 9 3
20	3 2 1	4 4 1	5 4 2

LANDING ALTITUDE CORRECTION For each 1000 ft of landing altitude substract		
1 1 0.4	2 2 0.6	2 2 0.8

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Figure 7-5 Time, Distance and Fuel to Descent- 1 Engine