

SECTION 5 - PERFORMANCE

CONTENTS

Section	Page
5.1 General	5 - 3
5.29 Pressure altitude and air temperature	5 - 3
5.31 Wind velocities	5 - 4
5.37 Minimum performance presentations for single engine aircraft's	5 - 5

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5.1 GENERAL

The Section 5 is mentioned Performance Information required by appropriate paragraphs of FAR PART 23.

The performance information presented in this Section is based on measured flight tests data corrected to the ISA conditions. Some of the performance was reduced for various weights, altitudes, and temperatures of the ambient air.

5.29 PRESURE ALTITUDE AND AIR TEMPERATURE

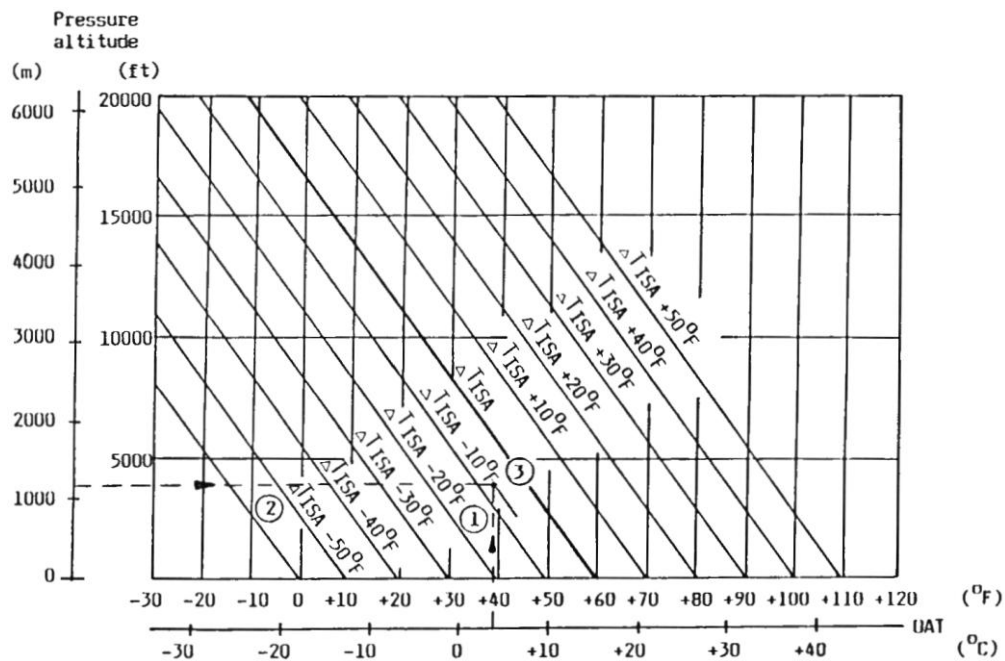


Fig. 5-1

NOTE:

After adjusting secondary pressure scale on 1013,25 hPa (29,92 in.Hg), read out the pressure altitude on your altimeter.

5.31 WIND VELOCITIES

5.31.1 Maximum demonstrated wind component

The demonstrated wind component perpendicular to the runway direction for take-off and landing is **20 knots** (10 m/s).

Explanation:

- α – Angle of the wind direction and the runway
- u – Wind velocity
- v – Crosswind component
- w – Headwind component

Example: (broken lines)

- (1) Wind velocity $u = 16$ knots
- (2) Angle of the wind direction and the runway $\alpha = 30^\circ$
- (3) Intersection determines the point (3). Parallel lines drawn from point (3) shown wind components:
- (4) Headwind component $w = 13,9$ knots
- (5) Crosswind component $v = 8$ knots

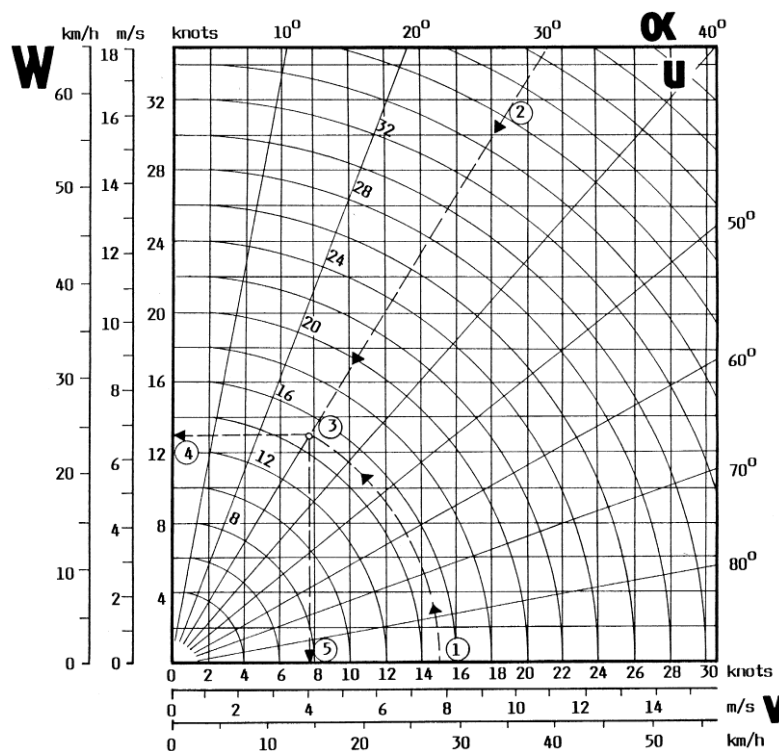


Fig. 5-2

5.37 MINIMUM PERFORMANCE PRESENTATIONS FOR SINGLE ENGINE AIRCRAFT'S

5.37.1 INTRODUCTION TO PERFORMANCE AND FLIGHT PLANNING

The mentioned performance is applied for the Z 242 L aircraft provided with noise silencer and with standard equipment with TEXTRON LYCOMING AEIO-360-A1B6 engine and MTV or HARTZELL propeller approved type, with the usual technique of piloting in calm air and with fuel mixture setting in adjusted with Subsect. 4.13.2.

Extrapolation of data contained in the graphs is not recommended.

Dashed lines present examples in the graphs and by arrows, the sequence of finding out the final value are given by the encircled numbers.

CAUTION:

THE TRUE PERFORMANCE OF THE AIRCRAFT MAY DIFFER FROM THAT GIVEN IN THIS SECTION. THE DIFFERENCE MAY RESULT FROM AIRCRAFT TECHNICAL CONDITION, ADJUSTING AND CONDITION OF THE ENGINE, THE PILOT'S SKILL, WIND EFFECT, RUNWAY SLOPE AND SURFACE, THE GRADE OF THE USED FUEL, ETC.

5.37.1.1 Flight planning

Aircraft configuration:

Take-off weight	970 kg (2140 lb)	1020 kg (2250 lb)	1090 kg (2400 lb)
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Flight:

Required procedure	Measured value		
Take-off run	210 m (689 ft)	233 m (764 ft)	266 m (873 ft)
Take-off distance to 50 ft (15 m) distance	450 m (1476 ft)	495 m (1624 ft)	565 m (1854 ft)
lift nose wheel speed	105-120 km/h (57-65 knots)		
lift-off safe speed	130-135 km/h (70-73 knots)		
Maximum Rate of Climb			
rate of Climb	5,5 m/s (1080 ft/min)	5,0 m/s (980 ft/min)	4,25 m/s (850 ft/min)
airspeed IAS	145 km/h (78 knots)		150 km/h (81 knots)
Cruising speed (altitude 500 m (1640 ft), FLAPS RETRACTED, P.C. SETTING	214 km/h (115 knots)	213 km/h (115 knots)	212 km/h (114 knots)
Max. airspeed in horizontal flight (altitude 500 m (1640 ft) FLAPS RETRACTED, MAX. POWER	236 km/h (127 knots)	232 km/h (125 knots)	230 km/h (124 knots)
Maximum permissible airspeed (V_{NE}) MAX. POWER	max. 319 km/h (172 knots)		
Stall speed (V_{SO}) FLAPS RETRACTED, BANK 0°	105 km/h (57 knots)	108 km/h (58 knots)	112 km/h (60 knots)
Landing distance(normal use of brake) distance	645 m (2115 ft)	680 m (2230 ft)	700 m (2300 ft)
approach speed	130-135 km/h (70-73 knots)		135-140 km/h 73-76 knots)
Landing run	395 m (1300 ft)	415 m (1360 ft)	425 m (1395 ft)

Fig. 5-3

5.37.2 AIRSPEED CALIBRATION

The aerodynamic corrections graph is applicable for:

- (1) Normal flight
- (2) A, U, N category
- (3) Full range of operating altitudes

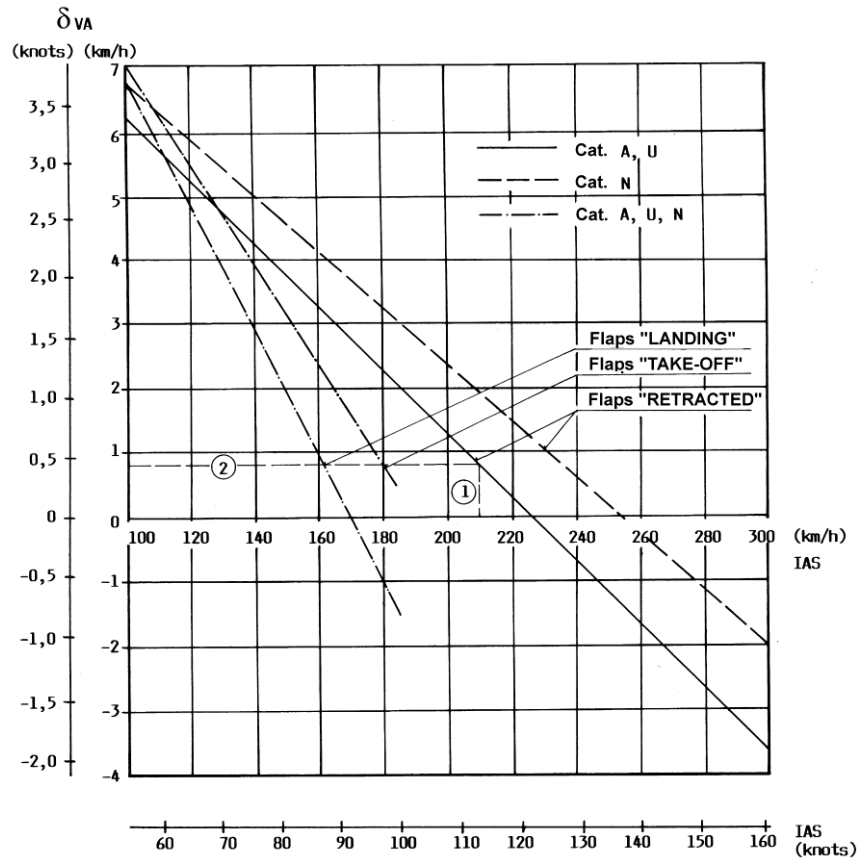


Fig. 5-4

The application of the graph: (broken line)

- (1) Draw the plumb line from pertinent IAS.
 (for examples IAS = 113 knots (210 km/h))
- (2) From intersection point of the plumb line and the Aerodynamic correction line (of pertinent flap position) draw the horizontal line toward left side of graph. There is the pertinent aerodynamic deviation (δ_{VA}).
 ($\delta_{VA} = -0,8 \text{ km/h} = 0,4 \text{ knot}$)

$$\text{CAS} = \text{IAS} + \delta_{VA}$$

$$\text{CAS} = 113 + 0,4 = 113,4 \text{ knots}$$

$$\text{CAS} = 210 + 0,8 = 210,8 \text{ km/h}$$

NOTE:

The aerodynamic correction in inverted flight is insignificant.

5.37.3 ALTIMETER CORRECTIONS

5.37.3.1 Altimeter error at switching over to alternate static pressure source (aircraft's from S/N 0651 incl. to S/N 0689 incl. with ASPS acc. to Draw. No. L242.8257 equipped)

In the case of ASPS using, for determine of actual altitude is necessary subtract the corrections given in follow table from the altitude indicated on the altimeter.

Airspeed IAS knots (km/h)	Altimeter deviation			
	Closed ventilation, closed/open heating, wing flaps "RETRACTED", engine MC		Closed ventilation, closed/open heating, wing flaps "RETRACTED", engine idling	
	H=0 ft MSA (0m)	H=8000 ft MSA (2500 m)	H=0 ft MSA (0 m)	H=8000 ft MSA (2500 m)
65 (120)	35 (10)	50 (15)	15 (5)	15 (5)
75 (140)	50 (15)	50 (15)	15 (5)	35 (10)
85 (160)	50 (15)	65 (20)	35 (10)	35 (10)
95 (180)	35 (10)	80 (25)	35 (10)	50 (15)
110 (200)	80 (25)	100 (30)	50 (15)	65 (20)
120 (220)	80 (25)	115 (35)	65 (20)	65 (20)
130 (240)	100 (30)	130 (40)	65 (20)	80 (25)
140 (260)	115 (35)	150 (45)	80 (25)	100 (30)
150 (280)	130 (40)	165 (50)	80 (25)	115 (35)
160 (300)	130 (40)	165 (50)	100 (30)	130 (40)

Fig. 5-5

NOTE:

Airspeeds IAS, given in the table are accordant with case of ASPS using.

Example:

After ASPS switch "ON", the airspeed indicated by airspeed indicator is **95 knots** (180 km/h) and the altitude indicated by altimeter is **8000 ft** (2500 m), (closed ventilation, open heating, engine MC).

True altitude is: **8000 ft** (2500 m) - **80 ft** (25 m) = **7920 ft** (2475 m).

5.37.3.2 Altimeter error at switching over to alternate static pressure source (aircraft's from S/N 0651 incl. to S/N 0689 incl. with ASPS acc. to Draw. No. L242.8258 or aircraft's from S/N 0691 incl. with ASPS acc. to Draw. No. L242.8259 equipped)

When switching to over to ASPS, it is not necessary to perform any correction of values indicated by the altimeter.

5.37.4 **STALL SPEEDS**

5.37.4.1 **Stall speeds at wings level and in turning flight**

Conditions:

- Engine: Idling

NOTE:

The specified stall speeds apply for all operating altitudes.

Category weight	Wing flaps position	Units	Stall speeds				
			Bank 0°		30°	45°	60°
			CAS	IAS	IAS	IAS	IAS
ACROBATIC (A) 970 kg (2140 lb)	RETRACTED 0°	knots km/h	60 111	57 105	65 121	72 134	86 159
	TAKE-OFF 14°	knots km/h	57 105	53 98	60 111	66 123	79 146
	LANDING 37°	knots km/h	50 94	47 87	54 101	60 112	72 133
UTILITY (U) 1020 kg (2250 lb)	RETRACTED 0°	knots km/h	62 114	58 108	68 124	73 137	87 163
	TAKE-OFF 14°	knots km/h	58 107	54 100	62 114	68 126	81 150
	LANDING 37°	knots km/h	52 97	48 89	56 104	63 115	73 136
NORMAL (N) 1090 kg (2400 lb)	RETRACTED 0°	knots km/h	64 118	60 112	65 121	73 135	88 163
	TAKE-OFF 14°	knots km/h	60 110	56 103	64 118	70 130	84 155
	LANDING 37°	knots km/h	54 100	50 93	58 108	65 119	76 140

Fig. 5-6

NOTE:

The altitude loss during stall ranges from 100-230 ft (30-70 m). The use of engine power to reduce the loss of height is allowed only after the control of the aircraft has been restored.

5.37.4.2 Diagram of stall speeds

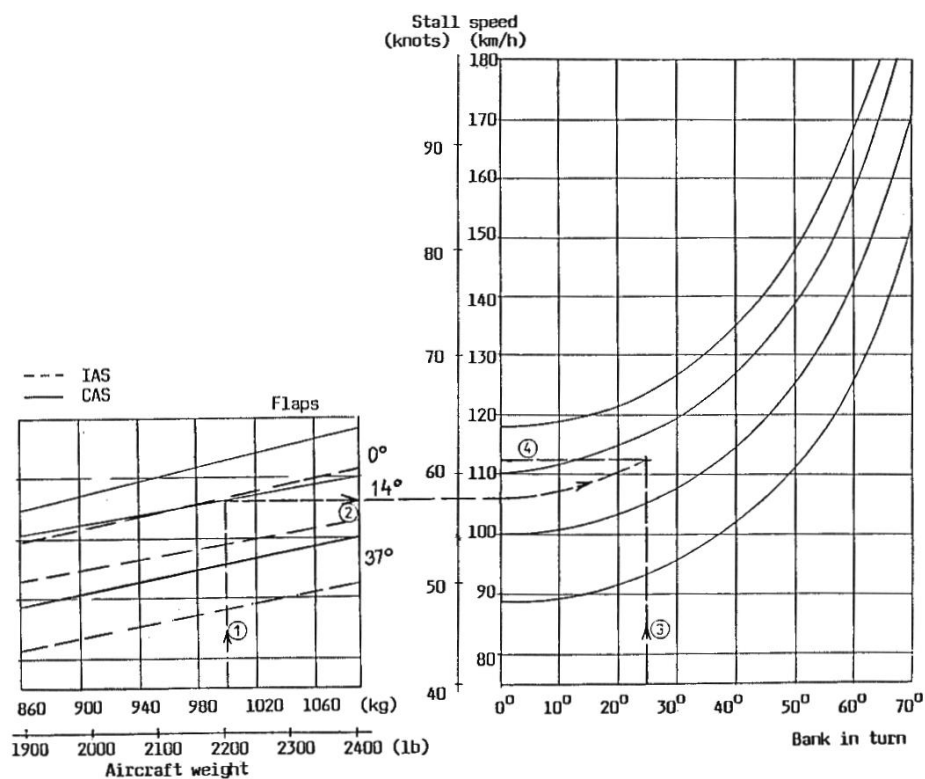


Fig. 5-7

5.37.5 TAKE-OFF DISTANCE

5.37.5.1 Take-off run

	Units	Category		
		A	U	N
Distance	ft	689	764	873
	m	210	233	266

Fig. 5-8

Conditions:

- Altitude 0 ft/m ISA
- Maximum Continuous power (MC)
- Wing flaps TAKE-OFF
- Dry, paved, level runway

E2) Take-off distance to 50 ft (15 m)

	Units	Category		
		A	U	N
Distance	ft	1476	1624	1854
	m	450	495	565
Lift nose wheel speed IAS	knots	57-65 (46-51*)		
	km/h	105-120 (85-95*)		
Lift-off safe speed IAS	knots	70-73		
	km/h	130-135		

* data marked by star are applicable for aircrafts equipped with Hartzell propeller.

Fig. 5-9

Conditions:

- Altitude 0 ft/m ISA
- Maximum Continuous Power (MC)
- Wing flaps TAKE-OFF
- Dry, paved, level runway
- Calm air
- Full power before brakes release

5.37.5.3 Diagram of take-off distance to 50 ft (15 m) graph

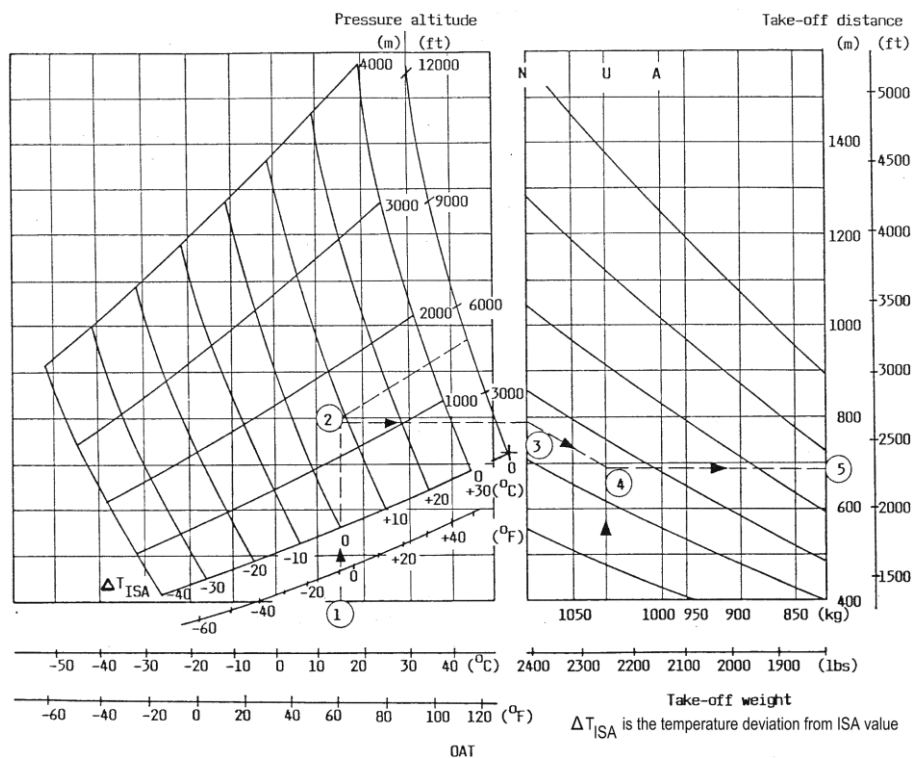


Fig. 5-10

5.37.6 RATE OF CLIMB

		Category		
	Units	A	U	N
Rate of Climb	ft/min	1080	980	850
	m/s	5,5	5,0	4,25
Airspeed IAS	knots	78		81
	km/h	145		150

Fig. 5-11

Conditions:

- Altitude 0 ft/m ISA
- Maximum Continuous Power (MC)
- Wing flaps RETRACTED

5.37.6.1 Diagram of rate of climb

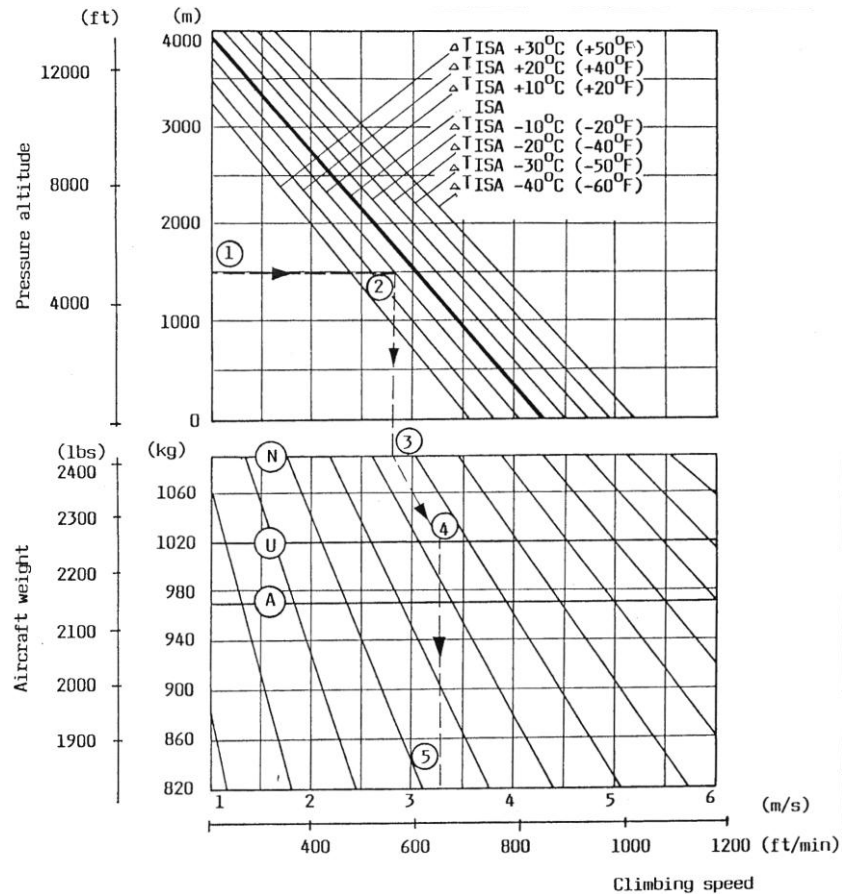


Fig. 5-12

5.37.6.2 Course of airspeed V_Y for maximum rate of climb

Flight altitude ISA		Recommended airspeed V_Y IAS knots (km/h)	
ft	m	Category A + U	Category N
0-3280	0-1000	78 (145)	81 (150)
3280-6560	1000-2000	78 (145)	81 (150)
6560-9840	2000-3000	75 (140)	81 (150)
9840-13120	3000-4000	73 (135)	78 (145)
13120-16400	4000-5000	70 (130)	-

Fig. 5-13

Conditions:

- Maximum Continuous Power (MC)
- Wing flaps RETRACTED

5.37.6.3 Course of airspeed V_x for maximum angle of climb

Flight level		Airspeed V_x IAS knots (km/h)
ft	m	Category A + U + N
0	0	59 (110)
1640	500	62 (115)
3280	1000	65 (120)
6560	2000	67 (125)

Fig. 5-14

Conditions:

- Maximum Continuous Power (MC)
- Wing flaps RETRACTED

CAUTION:

AIRSPED REDUCTION BELOW THE V_x SIGNIFICANTLY DECREASES CLIMBING ANGLE AND CLIMBING RATE OF THE AIRPLANE.

5.37.7 TIME, FUEL AND DISTANCE TO CLIMB

Category	R.P.M.	Manifold pressure	Fuel				Time and distance to climb (informative)	
			Consumption	Total usable fuel quantity	Fuel reserve	Usable fuel quantity for flight level	to 3500 ft (1066 m)	to 7000 ft (2133 m)
	R.P.M.	in.Hg.	US gal/h l/h	US gall l	US gall l	US gall l	min. sec // NM / km	
A	2700	MAX.	16,1 61	31 116	8 30	23 86	3° 30' // 4,6 / 8,5	9° 00' // 11,4 / 21
	2450	24,3	12,3 46,5					
	2350	22,9	9,5 36					
N	2700	MAX.	16,1 61	59 224	8 30	51 194	3° 30' // 4,6 / 8,5	9° 00' // 11,4 / 21
	2450	24,3	12,3 46,5					
	2350	22,9	9,5 36					

Fig. 5-15

Conditions:

- Wing flaps RETRACTED
- Calm air

5.37.8 CRUISE

Engine Setting	R.P.M.	Manifold pressure (in.Hg)	Altitude (ft) (m)	Airspeed in horizontal flight			
				Units	A	U	N
					TAS	TAS	TAS
MTV	2700	MAX.	0	knots (km/h)	127 236	126 233	125 231
CV	2450	24,3		knots (km/h)	113 209	112 208	112 207
EV	2350	22,9		knots (km/h)	100 185	97 180	95 176
MTV	2700	MAX.	1640 500	knots (km/h)	127 236	125 232	124 230
CV	2450	24,3		knots (km/h)	115 214	115 213	114 212
EV	2350	22,9		knots (km/h)	102 189	99 184	97 180
MTV	2700	MAX.	3280 1000	knots (km/h)	126 234	125 231	124 229
CV	2450	24,3		knots (km/h)	119 220	118 219	118 218
EV	2350	22,9		knots (km/h)	105 195	102 189	100 185
MTV	2700	MAX.	6560 2000	knots (km/h)	124 230	123 228	122 226
CV	2450	22,4		knots (km/h)	122 227	121 225	120 223
EV	2350	22,4		knots (km/h)	111 205	108 200	105 195

Fig. 5-16

Conditions:

- Wing flaps RETRACTED

5.37.8.1 Maximum gliding ratio

Wing flaps	Airspeed IAS - knots (km/h)			Gliding Ratio
	Category			
	A	U	N	
RETRACTED	68 (125)	70 (130)	73 (135)	8

Fig. 5-17

NOTE:

- (1) Speeds are rounded to **3 knots** (5 km/h).
- (2) Propeller is turning.

5.37.8.2 Minimum descent speed

Wing flaps	Airspeed IAS - knots (km/h)			V_{ymin} - ft/min (m/s)		
	Category			Category		
	A	U	N	A	U	N
RETRACTED	62 (115)	65 (120)	68 (125)	850 (4,3)	865 (4,4)	885 (4,5)

Fig. 5-18

NOTE:

- (1) Speeds are rounded to **3 knots** (5 km/h).
- (2) Propeller is turning.

5.37.9 RANGE PROFILES

Category	R.P.M.	Manifold pressure	Altitude			
			0m (0 ft)	500 (1640 ft)	1000 (3280 ft)	2000 (6560 ft)
			Range	Range	Range	Range
	R.P.M.	in.Hg.	Nm km	Nm km	Nm km	Nm km
A	2700	MAX.	127 236	127 236	179 333	177 328
	2450	24,3	211 391	215 400	221 411	228 424
	2350	22,9	241 447	246 456	254 471	267 495
N	2700	MAX.	398 738	396 735	395 732	389 722
	2450	24,3	468 868	479 889	493 914	504 935
	2350	22,9	514 953	526 975	540 1002	570 1056

Fig. 5-19

5.37.10 ENDURANCE PROFILE

Category	R.P.M.	Manifold pressure	Endurance
	R.P.M.	in.Hg.	hrs, min
A	2700	MAX.	1° 25'
	2450	24,3	1° 52'
	2350	22,9	2° 25'
N	2700	MAX.	3° 12'
	2450	24,3	4° 11'
	2350	22,9	5° 25'

Fig. 5-20

5.37.11 LANDING DISTANCE

5.37.11.1 Landing distance from 50 ft (15 m) - normal use of brakes

		Category		
	Units	A	U	N
Distance	ft	2115	2230	2300
	m	645	680	700
Approach speed IAS	knots	70-73		73-75
	km/h	130-135		135-140

Fig. 5-21

Conditions:

- Landing weight: acc. to subsect. 2.13.1
- Altitude 0 ft/m ISA
- Engine idling
- Wing flaps LANDING
- Dry, paved, level runway
- Calm air
- After landing normal use of brakes

5.37.11.2 Landing distance from 50 ft (15 m) - “Hot brakes”

		Category		
	Units	A	U	N
Distance	ft	1640	1720	1770
	m	500	525	540
Approach speed IAS	knots	70-73		73-76
	km/h	103-135		135-140

Fig. 5-22

Conditions:

- Landing weight: acc. to subsect. 2.13.1
- Altitude 0 ft/m ISA
- Engine idling
- Wing flaps LANDING
- Dry, paved, level runway
- Calm air
- After landing “hot brakes” application

5.37.11.3 Landing run distance - normal use of brakes

	Units	Category		
		A	U	N
Distance	ft	1300	1360	1395
	m	395	415	425

Fig. 5-23

Conditions:

- Landing weight: acc. to subsect. 2.13.1
- Altitude 0 ft/m ISA
- Engine idling
- Wing flaps LANDING
- Dry, paved, level runway
- Calm air
- After landing normal use of brakes

5.37.11.4 Landing run distance - “Hot brakes”

	Units	Category		
		A	U	N
Distance	ft	805	855	870
	m	245	260	265

Fig. 5-24

Conditions:

- Landing weight: acc. to subsect. 2.13.1
- Altitude 0 ft/m ISA
- Engine idling
- Wing flaps LANDING
- Dry, paved, level runway
- Calm air
- “Hot brakes” applied after touch-down

5.37.11.5 Diagram of landing distance from 50 ft (15 m) - normal use of brakes

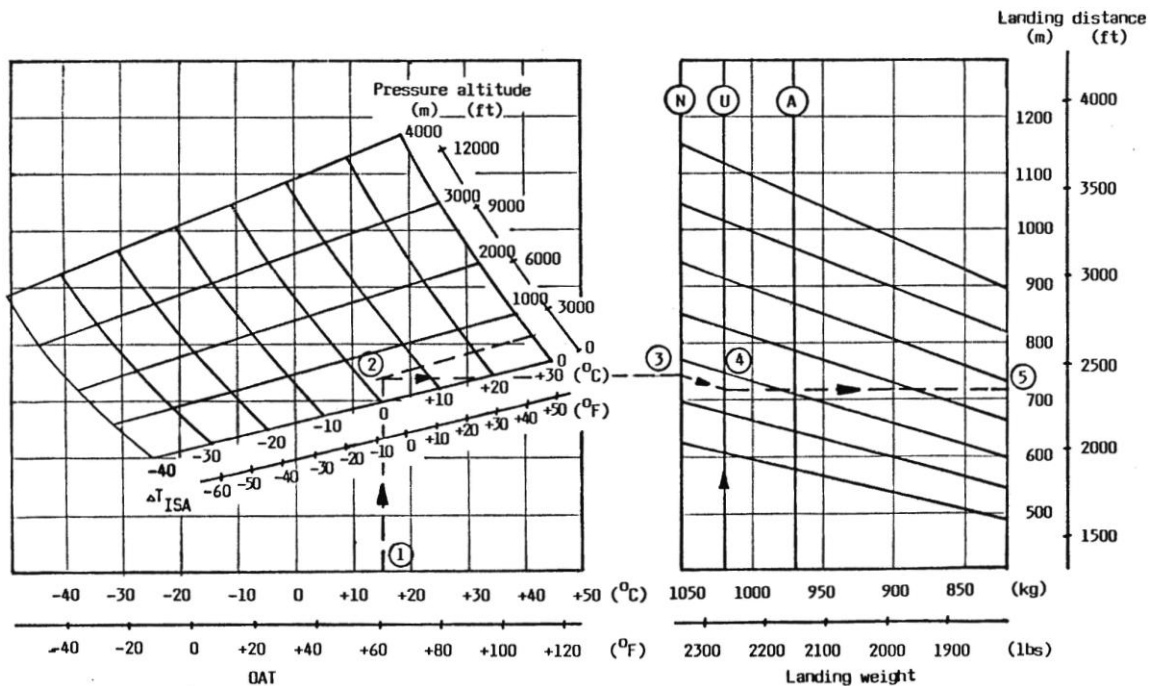


Fig. 5-25

5.37.11.6 Diagram of Landing distance from 50 ft (15 m) - Hot brakes

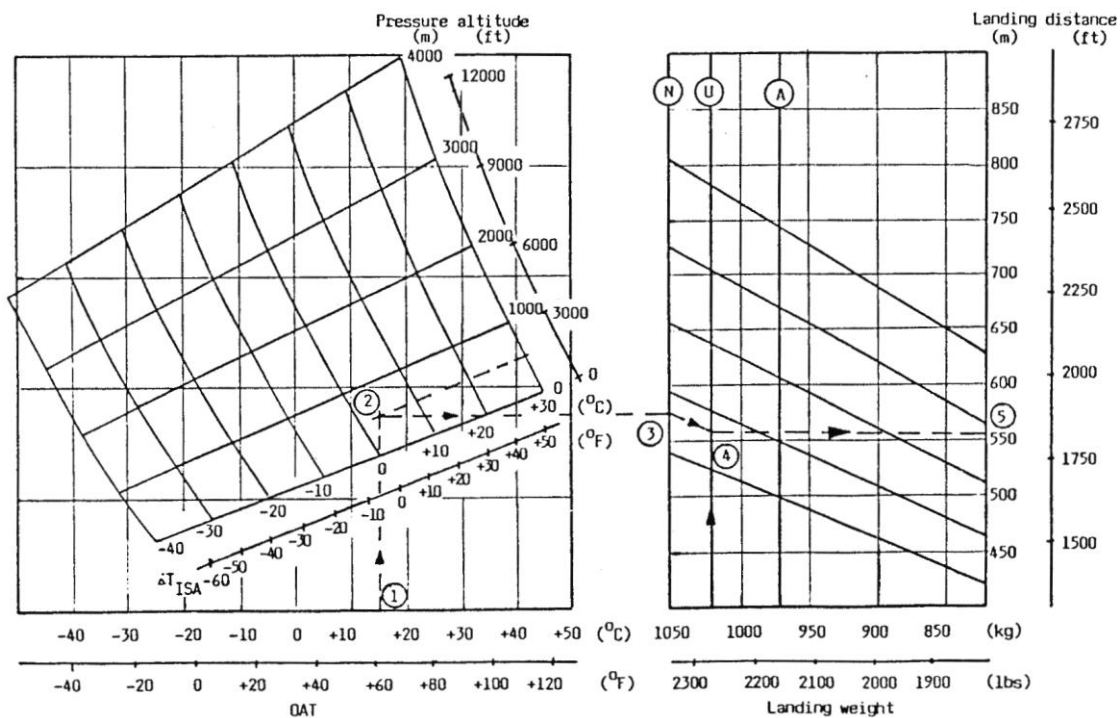


Fig. 5-26