

## PART V

# OPERATING DATA

### 81. Pressure error corrections

(i) The A.S.I. pressure error corrections at sea level are:—

From	150	200	250	300	350	400	knots
To	200	250	300	350	400	450	knots
Add	1	2	3	4	4	5	knots

(ii) The altimeter pressure error corrections near sea level are:—

At:	150	200	250	300	350	400	450	knots
Add:	0	40	60	90	120	160	210	ft.

### 82. Take-off distances

The approximate take-off distances (in yards) are given below:—

(a) Clean aircraft

Temperature °C.		−15	0	+15	+30	+45
Zero wind	Ground run	620	730	880	1,020	1,130
	To clear 50 ft.	1,180	1,350	1,580	1,760	2,020
30 knot wind	Ground run	350	400	480	560	620
	To clear 50 ft.	760	860	1,030	1,120	1,270

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### (b) With tip tanks

Temperature °C.		-15	0	+15	+30	+45
Zero wind	Ground run	780	910	1,090	1,280	1,420
	To clear 50 ft.	1,400	1,630	1,890	2,160	2,400
30 knot wind	Ground run	420	500	600	660	730
	To clear 50 ft.	900	1,030	1,200	1,400	1,500

### 83. Fuel consumptions

The approximate fuel consumptions in lb./min. for various engine speeds are given below. If it is required to know the consumptions in gall./min., divide the figures below by the weight of fuel/gallon.

$$\text{NORMAL AVTAG} = 7.7 \text{ lb./gall.}$$

$$\text{AVTUR} = 8.0 \text{ lb./gall.}$$

Height	at 10,250 r.p.m.	at 9,750 r.p.m.	at best range speed
Sea level	120	90	45
10,000 ft.	90	70	35
20,000 ft.	70	55	30
30,000 ft.	50	40	25
40,000 ft.	35	25	20

### 84. Flight planning data

- (i) The tables on pages 60, 61 and 62 show the climb, cruise and descent data in tabular form. Heights are given at 10,000 ft. intervals, but interpolation is possible for intermediate heights.
- (ii) The climb and descent data tables give the necessary information for climbing or descending from any one height to another. Climb distances are included where necessary in the cruise data table but not descent distances, since in some cases the descent may be made from

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overhead and in others some distance from the destination. Allowance is, however, made for fuel used on the descent.

(iii) The cruise data table consists of five separate altitude blocks. Each block shows:—

(a) The level flight range to the let-down point in nautical miles, at the particular height for various fuel states.

(b) The best range I.A.S. at the particular height together with approximate A.N.M. per 100 lb. fuel used and the approximate fuel consumption in lb./hr. (To convert ANM/100 lb. to A.N.M.P.G. multiply by the density (wt. per gall.) and divide by 100.)

(c) The range, *including* the distance covered on the climb, if a climb is made to any other altitude during flight.

(iv) *Use of the tables*

(a) *Pre-flight planning*

Enter the cruise data table in the sea-level block at the fuel state applying immediately after take-off. Select the height at which maximum range is available at that fuel state. The distance available includes distance covered on the climb, but not on the descent. (Absolute maximum range is obtained by adding on the descent distance, provided that the let-down is commenced at that distance from the destination.)

For short-range flights inspect the sea-level block and select the height at which the distance to be covered requires the least amount of fuel. This is the best altitude for the flight.

(b) *In-flight planning*

At any stage of a flight the available range may be ascertained by applying the fuel state to the level flight range in the particular altitude block.

*contd. on P.64*

*PART V — OPERATING DATA*  
**CLIMB DATA — WITH TIP TANKS**

**R.P.M. — 10,250 below 25,000' — 10,100 above 25,000'**

From	To	Lb.	Dist.	Mins.
<b>Sea Level</b>	10,000'	190	15	2
	20,000'	385	30	4.5
	30,000'	580	50	8.25
	40,000'	820	95	15
	45,000'	1100	160	24
<b>10,000 ft.</b>	20,000'	195	15	2.5
	30,000'	370	35	6.25
	40,000'	630	80	13
	45,000'	910	145	22
<b>20,000 ft.</b>	30,000'	195	20	3.75
	40,000'	435	65	10.5
	45,000'	715	130	19.5
<b>30,000 ft.</b>	40,000'	240	45	6.75
	45,000'	520	110	15.75
<b>40,000 ft.</b>	45,000'	280	65	9

TOTAL FUEL — — — — — 504 gall. 3,878 lb. AVTAG  
TAXY AND TAKE-OFF ALLOWANCE — 35 gall. 270 lb. AVTAG  
LANDING ALLOWANCE — — — — — 65 gall. 500 lb. AVTAG  
(Excluding descent fuel)

**DESCENT DATA**  
**CLEAN OR WITH TIP TANKS**

From	To	Lb.	Dist.	Mins.
<b>45,000 ft.</b>	40,000'	5	5	$\frac{1}{2}$
	30,000'	10	10	$1\frac{1}{2}$
	20,000'	20	20	$2\frac{1}{2}$
	10,000'	65	35	5
	Sea Level	130	45	$7\frac{1}{2}$
<b>40,000 ft.</b>	30,000'	5	5	1
	20,000'	15	15	2
	10,000'	60	30	$4\frac{1}{2}$
	Sea Level	125	40	7
<b>30,000 ft.</b>	20,000'	10	10	1
	10,000'	55	25	$3\frac{1}{2}$
	Sea Level	120	35	6
<b>20,000 ft.</b>	10,000'	45	15	$2\frac{1}{2}$
	Sea Level	110	25	5
<b>10,000 ft.</b>	Sea Level	65	10	$2\frac{1}{2}$

R.P.M. — — 7.000  
AIRBRAKES — OUT  
SPEED — — 0.75M above 20,000 ft.  
240 knots below 20,000 ft

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CRUISE DATA — WITH TIP TANKS

FUEL STATE—LB.		3600	3200	2800	2400	2000	1600	1200	800
<b>Sea Level</b>	Range	335	290	250	205	160	120	75	<b>32</b>
IAS 290K ANM/100 lb. 10.8 lb./hr. 2,700	10,000'	410	335	300	245	190	135	<b>80</b>	25
	20,000'	515	440	365	290	215	140	65	—
	30,000'	620	525	430	335	240	145	50	—
	40,000'	<b>770</b>	<b>650</b>	<b>525</b>	<b>400</b>	<b>280</b>	<b>155</b>	—	—
	45,000'	740	620	495	370	250	—	—	—
<b>10,000 ft.</b>	Range	—	370	315	260	200	145	90	<b>33</b>
IAS 250K ANM/100 lb. 14.1 lb./hr. 2,050	20,000'	—	460	385	310	235	160	<b>85</b>	—
	30,000'	—	555	460	365	270	175	80	—
	40,000'	—	<b>680</b>	<b>555</b>	<b>430</b>	<b>305</b>	<b>180</b>	55	—
	45,000'	—	655	530	405	280	155	—	—
<b>20,000 ft.</b>	Range	—	480	405	330	260	185	110	<b>35</b>
IAS 225K ANM/100 lb. 18.6 lb./hr. 1,600	30,000'	—	585	490	395	300	205	<b>110</b>	—
	40,000'	—	<b>725</b>	<b>600</b>	<b>475</b>	<b>350</b>	<b>225</b>	100	—
	45,000'	—	700	575	450	325	200	—	—
<b>30,000 ft.</b>	Range	—	610	515	420	325	230	135	<b>42</b>
IAS 210K ANM/100 lb. 23.6 lb./hr. 1,400	40,000'	—	—	<b>640</b>	<b>515</b>	<b>390</b>	<b>265</b>	<b>140</b>	—
	45,000'	—	—	615	490	365	240	115	—
<b>40,000 ft.</b>	Range	—	<b>795</b>	<b>670</b>	<b>550</b>	<b>425</b>	<b>305</b>	<b>180</b>	<b>54</b>
IAS 200K ANM/100 lb. 31 lb./hr. 1,250	45,000'	—	—	645	525	400	280	155	—
<b>45,000 ft.</b>	Range	—	<b>790</b>	<b>665</b>	<b>545</b>	<b>420</b>	<b>300</b>	<b>175</b>	<b>50</b>
IAS 195K ANM/100 lb. 31 lb./hr. 1,300									
<b>FUEL STATE</b>									
Galls AVTUR		450	400	350	300	250	200	150	100
Galls AVTAG		468	416	364	312	260	208	155	104

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**CLIMB DATA — CLEAN AIRCRAFT**

R.P.M. — 10,250 below 25,000' — 10,100 above 25,000'

From	To	Lb.	Dist.	Mins.
<b>Sea Level</b>	10,000'	155	10	1 $\frac{3}{4}$
	20,000'	310	25	3 $\frac{3}{4}$
	30,000'	465	45	6 $\frac{1}{2}$
	40,000'	650	75	11 $\frac{3}{4}$
	48,000'	950	160	23
<b>10,000 ft.</b>	20,000'	155	15	2
	30,000'	310	35	4 $\frac{3}{4}$
	40,000'	495	65	10
	48,000'	795	150	21 $\frac{1}{4}$
<b>20,000 ft.</b>	30,000'	155	20	2 $\frac{3}{4}$
	40,000'	340	50	8
	48,000'	640	135	19 $\frac{1}{4}$
<b>30,000 ft.</b>	40,000'	185	30	5 $\frac{1}{4}$
	48,000'	485	115	16 $\frac{1}{2}$
<b>40,000 ft.</b>	48,000'	300	85	11 $\frac{3}{4}$

TOTAL FUEL — — — — — 342 gall. 2,630 lb AVTAG  
 TAXY AND TAKE-OFF ALLOWANCE — 35 gall. 270 lb. AVTAG  
 LANDING ALLOWANCE — — — 65 gall. 500 lb. AVTAG  
 (Excluding descent fuel)

DESCENT DATA—CLEAN AIRCRAFT

As for tip tank case

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**CRUISE DATA — CLEAN AIRCRAFT**

FUEL STATE—LB.		2400	2000	1600	1200	800
<b>Sea Level</b>	Range	205	160	120	75	<b>32</b>
IAS 290K ANM/100 lb. 10.8 lb./hr. 2,700	10,000'	260	200	140	80	20
	20,000'	325	245	165	<b>85</b>	—
	30,000'	390	285	180	75	—
	40,000'	<b>440</b>	<b>310</b>	<b>180</b>	—	—
	48,000'	420	290	160	—	—
<b>10,000 ft.</b>	Range	—	215	155	95	<b>35</b>
IAS 250K ANM/100 lb. 15.3 lb./hr. 1,900	20,000'	—	265	185	105	25
	30,000'	—	315	210	<b>105</b>	—
	40,000'	—	<b>350</b>	<b>220</b>	90	—
	48,000'	—	330	200	—	—
<b>20,000 ft.</b>	Range	—	280	200	120	<b>38</b>
IAS 225K ANM/100 lb. 20 lb./hr. 1,500	30,000'	—	335	230	125	20
	40,000'	—	<b>385</b>	<b>255</b>	<b>125</b>	—
	48,000'	—	365	235	—	—
<b>30,000 ft.</b>	Range	—	360	255	150	<b>47</b>
IAS 210K ANM/100 lb. 26 lb./hr. 1300	40,000'	—	<b>410</b>	<b>280</b>	<b>150</b>	—
	48,000'	—	390	260	130	—
<b>40,000 ft.</b>	Range	—	<b>445</b>	<b>315</b>	<b>185</b>	<b>55</b>
IAS 195K ANM/100 lb. 32.5 lb./hr. 1150	48,000'	—	430	300	170	—
<b>48,000 ft.</b>	Range	—	<b>440</b>	<b>310</b>	<b>180</b>	<b>50</b>
IAS 175K ANM/100 lb. 32.5 lb./hr. 1150						
<b>FUEL STATE</b>						
Galls AVTUR		300	250	200	150	100
Galls AVTAG		312	260	208	155	104

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If an increase in range is required, or if a climb has to be made, the new available range may be obtained by entering the *existing* altitude block at the particular fuel state and moving vertically downwards *within* the block until the new altitude is reached. Figures in heavy type indicate the best altitude for the maximum increase in range. Above these heights no further range increase is possible.

If a descent is necessitated, the new range is found by moving direct from the existing altitude level-flight range for the particular fuel state to the new altitude level-flight range.

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