PERFORMANCE INFORMATION

Contents

Subject

Subject

ENGINE PERFORMANCE

Two Engine Performance - Average Gross Weight - 25,200 Lb.

1.	Max. Speed at Rated Power (Altitude for Max. Speed: 8,500 ft.)	228 mph (198k) TAS
2.	Max. Cruising Speed (Max. Cruising Speed: 700 bhp each engine) (altitude for Max. Cruising Speed: 15,000 ft.)	205 mph (179k) TAS
3.	Fuel Consumption at QBA normal Cruising Power - 550 bhp/engine	73 gal/hr
4.	Mileage at QBA Normal Cruising Power at 6,000 ft.	2.23 mi./gal.
5.	Range at 6,000 feet altitude at 550 bhp per engine (No wind, no reserve, 670 Imperial gallons)	1500 miles approx.
6.	Initial Climb at Sea Level at Take-Off Power	1200 ft./min.
7.	Service Ceiling (100 ft./min. Climb)	20000 25000 ft.
8.	Absolute Ceiling	26400 ft.
9.	Take-off Ground Run at Sea Level (Still Air)	1500 ft.
10.	Take-off Ground Run at 5000 ft. Altitude (Still Air)	2100 ft.
11.	CAA take-off Distance over 50 ft. Obstacle at sea level	3900 ft.
12.	CAA Take-Off Distance over 50 ft. Obstacle at 3500 ft. Altitude	4900 ft.
13.	Landing Distance over 50 ft. Obstacle at sea level	2080 ft.
14.	CAA Landing Distance over 50 ft. Obstacle at Sea Level (Using only 60% of Effective Runway Lenght)	3450 ft.

Single Engine Performance - Propeller of Inoperative
Engine Feathered Maximum Continuous Power on Operative Engine

15. Initial Climb at Sea Level at Take-Off Power 300 ft./min.

16. Douglas C-47. Single Engine Performance - Usable ceiling

Ceiling	Weight	RPM	Man. Press.	T.I.A.S.	L.E. De-Icers
11,600 ft	25,200	2550	Full throttle	112 M.P.H.	Not operating
9,500 ft	26,900	2550	Full throttle	112 M.P.H.	Not operating

17. CONDITION FOR THE ABOVE PERFORMANCE

A) Standard air.

B) Either engine inoperative.

C) Inoperative engine propeller fully feathered

D) Carb. air intake "cold"

TAKE-OFF

1. The DC-3 at 26,200 lb. will attain an indicated airspeed of 100 mph at sea level, with no wind, after a take-off run of approximately 1,700 feet, using full take-off power of 48.0" MAP and 2,700 RPM. This figure will very slightly with changes in gross weight but will not be very noticeable in actual operations at sea level. At higher altitudes the take-off distance required to attain 100 mph I.A.S. will, of course, be materially greater. This is explained by the fact that at sea level the T.A.S. is approximately 100 mph when the I.A.S. reads 100 mph; however, as altitude is increased the T.A.S. is substantially greated than 100 mph for an I.A.S. of 100 mph For example of 5,000 feet altitude, the ground run to attain 100 mph I.A.S. is approximately 2,300 feet at a gross take-off weight of 26,200 lbs. At take-off, however, the Captain is only concerned with indicated airspeed but if the airport is at a high altitude, consideration must be given to the longer take-off run required to obtain 100 mph I.A.S.

2. Take-off power should always be used until the airplane has reached at least 100 mph I.A.S. and all obstructions have been cleared.

3. Graphs are provided in this Section showing the take-off distance required at various gross weights and altitude.

CLIMB

1. The normal climb power settings are 2,300 RPM and 36.0" MP and the normal rate of climb should not exceed 400 ft./min.

2. The speed for two-engine maximum rate of climb is 113 mph I.A.S. at 26,200 lb. decreasing to 107 mph I.A.S. at 23,000 lb. for altitudes from sea level to 7,000 feet.

3. If the air temperature is high and engine cooling difficulties are being encountered the airplane should be climbed at a speed over 130 mph I.A.S.

4. The power and Cruise Control Charts in this section should be consulted for particular conditions of flight. The manifold pressure setting should be adjusted:

   (1) At every 1,000 feet change in altitude.

   (2) When there is a change in outside air temperature.

   (3) When there is a change from, or to, the use of carburetor heat.

CRUISING

1. Normally, all flights will be planned using 550 BHP/eng.

2. The cruising speed varies with gross weight and the Cruise Control Chart, therefore, shown speeds for gross weights "Under 23,000 lb." and "Over 23,000 lb."

GLIDE

1. The maximum gliding range (power off) is 3.25 miles per 1,000 ft. descent. This range is not affected by gross weight of altitude but the I.A.S. desired is approximately 108 mph (94 knots) I.A.S. at 21,000 lbs. gross weight increasing to 122 MPH (106 knots) I.A.S. at 26,000 lb. gross weight (See performance Curves in this Section). For maximum gliding range, landing gear and flaps should be "FULLY UP" and Propeller Controls FULL DECREASE RPM" or, Propellers "FEATHERED", as circumstances require.

STALLING

POWER-OFF STALL

1. In all cases of power-off stall there is adequate warning of the approaching stall before control is lost. This warning is most pronounced with flaps and landing gear down. With flaps and landing gear up the stall is more abrupt and the airplane will tend to fall off on one wing.

2. Very little altitude is lost in regaining control from a power-off stall.

3. Charts in this section show the power-off stall speeds for various gross weights.

Power-on Stall

4. With power-on, the stalling speeds are reduced from 5-10 MPH below the power-off stalling speeds. The reduction varies with the amount of engine power being used as the increased propeller thrust reduced the stalling speed. However, with power-on stalls there is not as much warning of the stall and the stall is more abrupt. This is particularly true if the airplane in nosed up to induce the stall, which tends to be sudden and more violent. The airplane may tend to roll and more altitude is lost before control and level flight is regained.

5. The power-on stalling speeds will of course increase of the airplane is in other than level flight, particularly in climbing turns. In very steep turns the stall speed will increase to nearly 100 MPH (87 knots) I.A.S., and this condition is particularly critical if turns are made towards the dead engine when flying with one engine inoperative.

SINGLE ENGINE OPERATION

General

1. The absolute minimum airspeed, with one engine inoperative and METO power or less on operating engine, is 84 MPH (73 knots) I.A.S. With take-off power the I.A.S. should never be less than 93 MPH (81 knots) for controllability. Control of the airplane will be easier of it is flown with a 2° - 3° bank on the operating engine side.

Climb

2. The rate of climb of the DC-3, with the landing gear down and full flap, is practically zero. With the landing gear up and ¼ flap, the rate of climb is very low, therefore, during climbing operation on single engine the flaps and landing gear should be fully retracted. The minimum airspeed for climbing on single engine at METO power varies with gross weight but at 26,200 lbs. it should not be lower than 105 mph (90 knots) I.A.S. decreasing to not less than 100 MPH (87 knots) I.A.S. at 20,000 lbs. In rough air do not fly at the above speeds if control is inadequate.

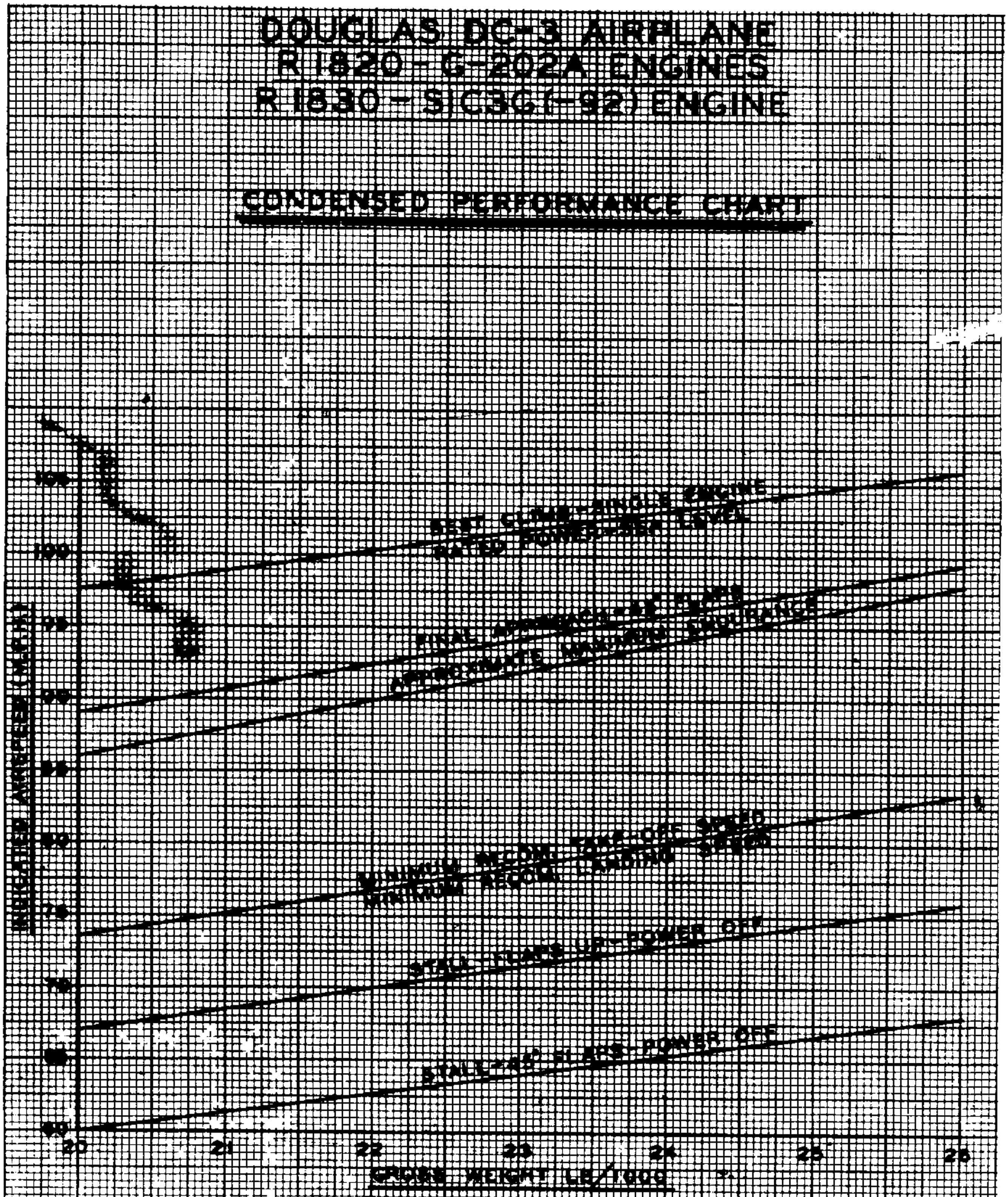
SPEED

Maximum Endurance (Two Engines)

1. In an emergency requiring the airplane to fly at maximum endurance, with minimum fuel consumption, the best speed is 86 MPH (75 knots) I.A.S. at 18,000 lb. gross weight, increasing to 98 MPH (85 knots) I.A.S. at 24,000 lb. gross weight, for any altitude.

Maximum Range (Two Engines - Zero Headwind)

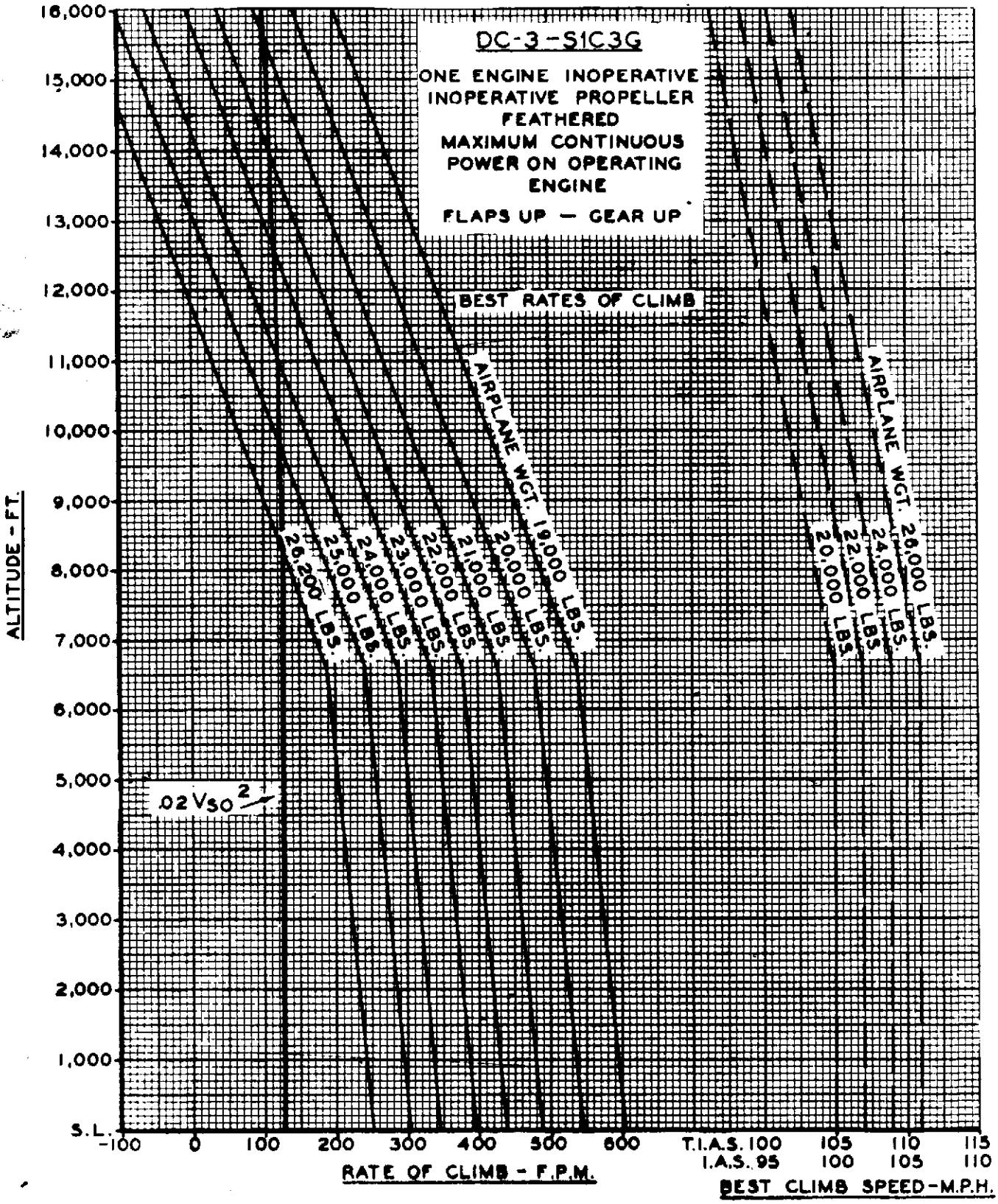
2. If a condition should arise requiring the airplane to be flown the maximum distance for a given amount of fuel, the best speed is 108 MPH (94 knots) I.A.S. at 18,000 lb. gross weight, increasing to 125 MPH (110 knots) I.A.S. at 24,000 lb. gross weight, at any altitude.


DOUGLAS DC-3 AIRPLANE
R 1820-G-202A ENGINES
R 1830-S1C3G(-92) ENGINE
CONDENSED PERFORMANCE CHART
BEST CLIMB-SINGLE ENGINE
RATED POWER-SEA LEVEL
FINAL APPROACH-45° FLAPS
APPROXIMATE MAXIMUM ENDURANCE
MINIMUM RECOM. TAKE-OFF SPEED
MINIMUM RECOM. LANDING SPEED
STALL-FLAPS UP-POWER OFF
STALL-45° FLAPS-POWER OFF
INDICATED AIRSPEED (M.P.H.)
GROSS WEIGHT LB/1000
20
21
22
23
24
25
26

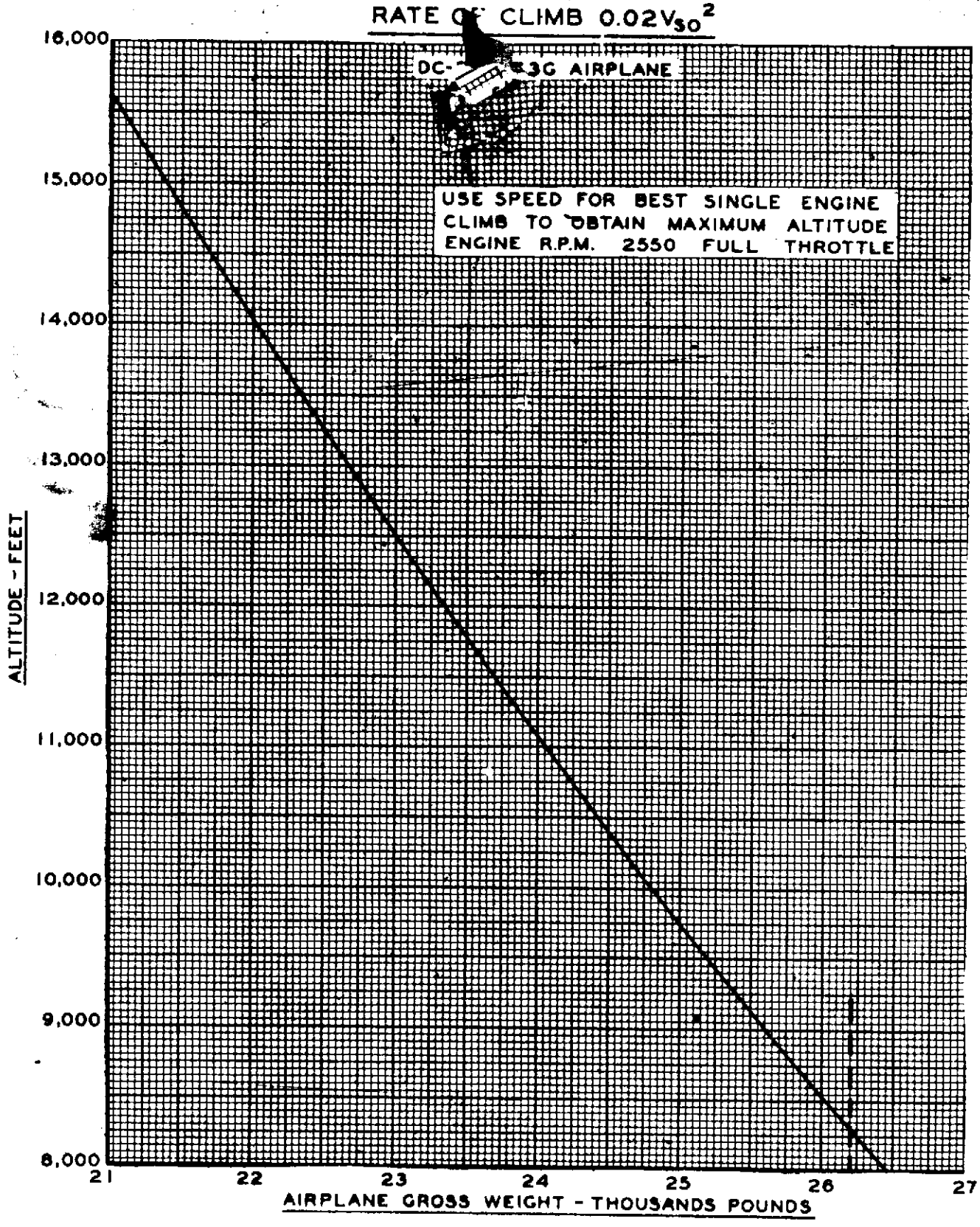
Standard Atmosphere Tables

Altitude Feet	Pressure inches Hg	Temperature Degrees C.	Temperature Degress F.	Density lbs. per cu. ft.
-2000	32.15	19	66.1	.08109
-1500	31.58	18	64.3	.07993
-1000	31.02	17	62.6	.07878
-500	30.47	16	60.8	.07764
SEA LEVEL	29.92	15	59.0	.07651
500	29.38	14	57.2	.07540
1000	28.86	13	55.4	.07430
1500	28.33	12	53.6	.07321
2000	27.82	11	51.9	.07213
2500	27.31	10	50.1	.07107
3000	26.81	9	48.3	.07001
3500	26.32	8	46.5	.06897
4000	25.84	7	44.7	.06794
4500	25.36	6	42.9	.06693
5000	24.89	5	41.2	.06592
5500	24.43	4	39.4	.06493
6000	23.98	3	37.6	.06395
6500	23.53	2	35.8	.06298
7000	23.09	1	34.0	.06202
7500	22.65	0	32.0	.06107
8000	22.22	-1	30.5	.06013
8500	21.80	-2	28.7	.05920
9000	21.38	-3	26.9	.05829
9500	20.98	-4	25.1	.05739
10000	20.58	-5	23.3	.05649
10500	20.18	-6	21.5	.05561
11000	19.79	-7	19.8	.05474
11500	19.40	-8	18.0	.05388
12000	19.03	-9	16.2	.05303
12500	18.65	-10	14.4	.05219
13000	18.29	-11	12.6	.05136
13500	17.93	-12	10.8	.05054
14000	17.57	-13	9.0	.04973
14500	17.22	-14	7.3	.04893
15000	16.88	-15	5.5	.04814
15500	16.54	-16	3.7	.04736
16000	16.21	-17	1.9	.04658

C.A.R. ENROUTE CLIMB



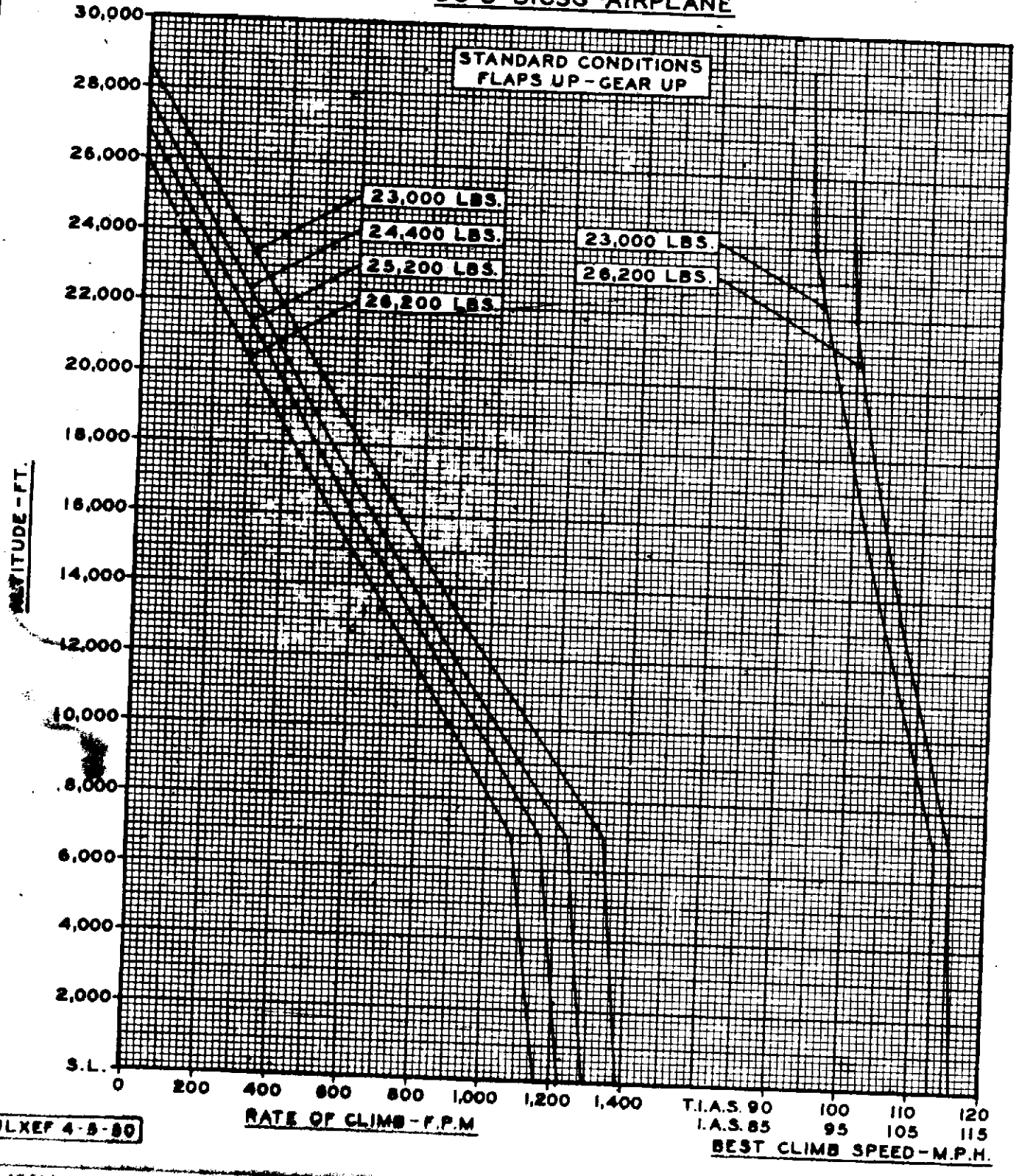
MAX. ONE ENGINE INOPERATIVE OPERATING ALTITUDE



2 ENGINE CLIMB

MAXIMUM CONTINUOUS POWER AT 2550 R.P.M.

DC-3-S1C3G AIRPLANE



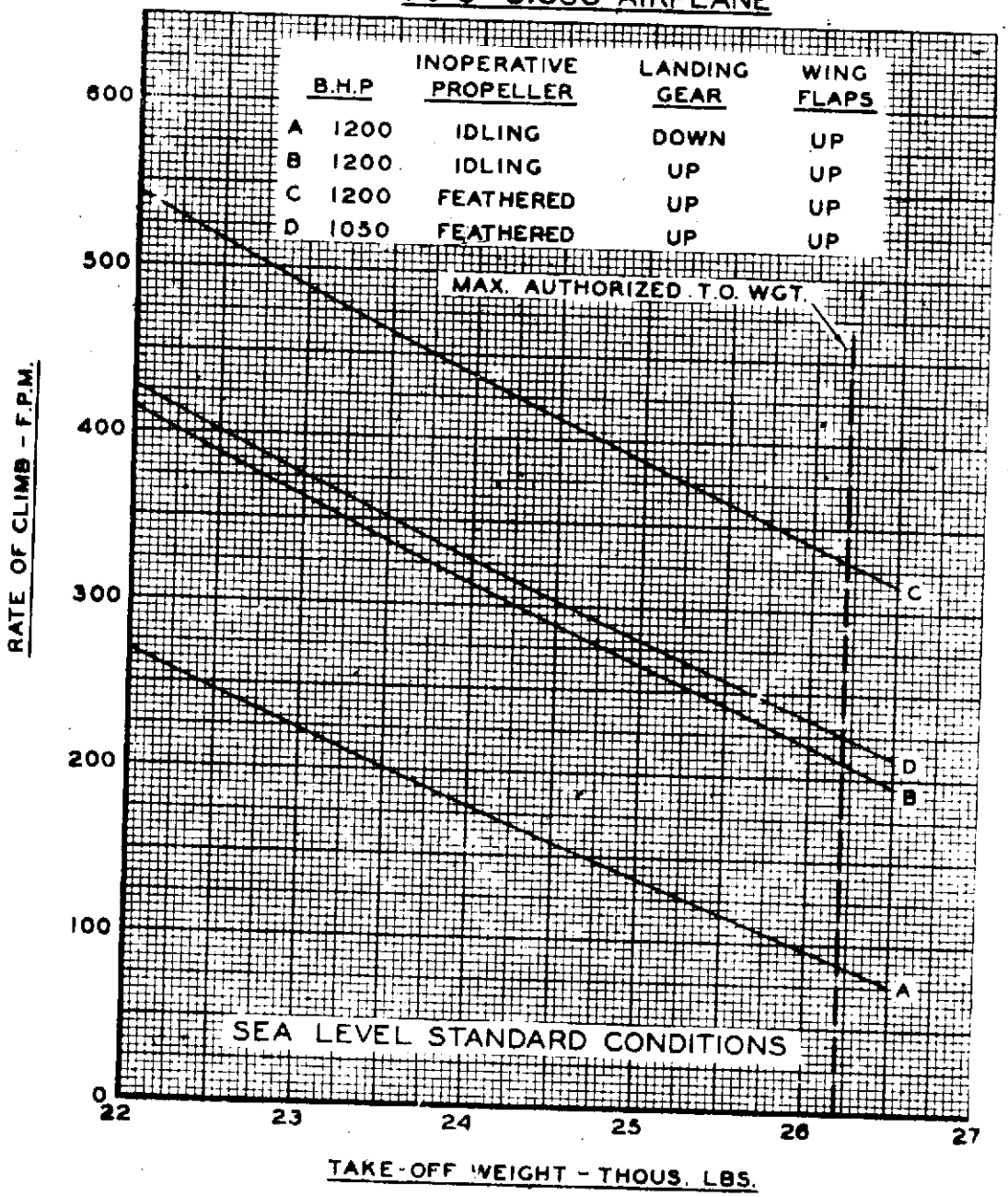
ULXEF 4-5-50

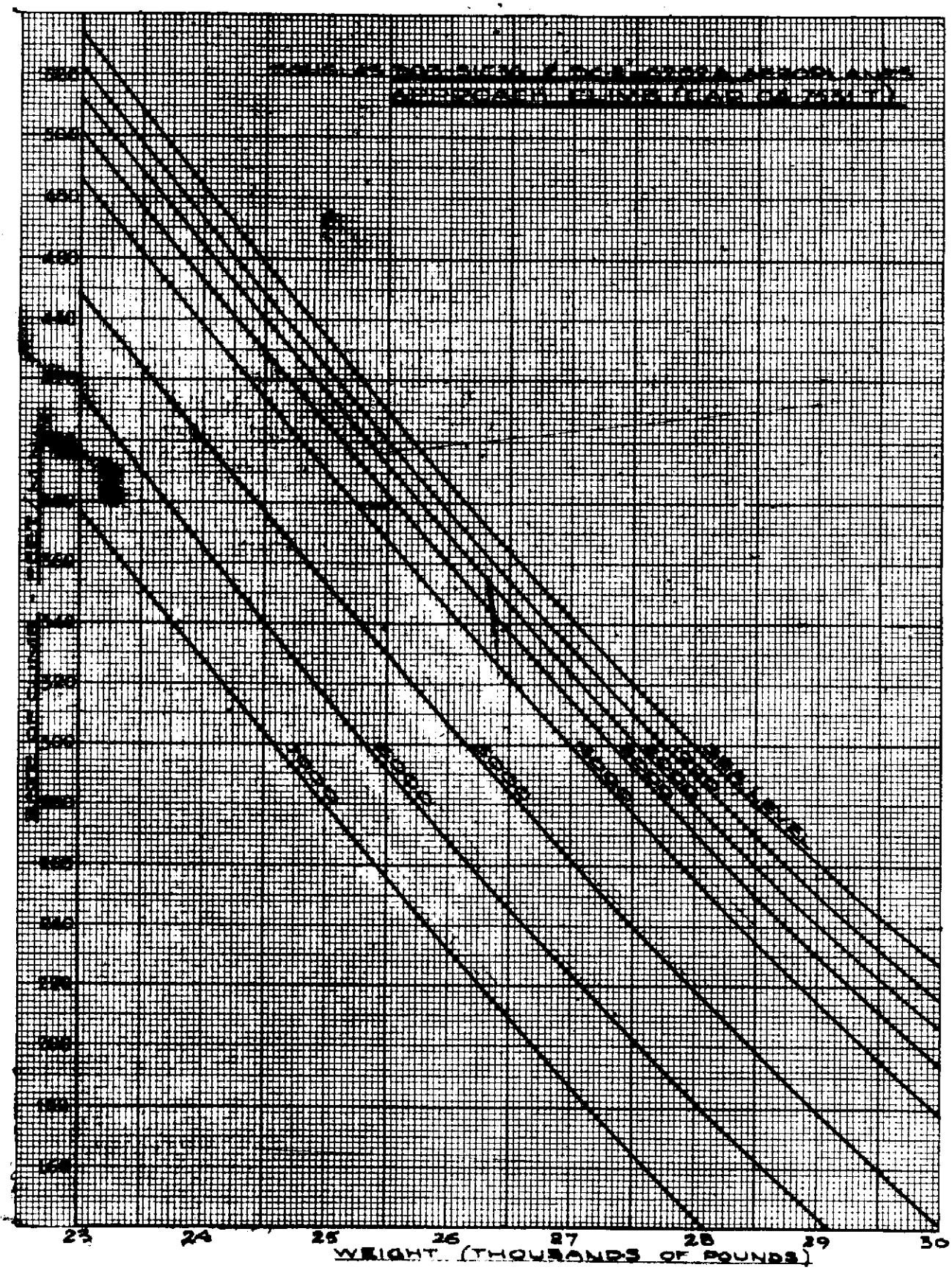
ISSUED 10 JAN 1950 EFFECTIVE 1 JAN 1950

PRINTED IN CANADA

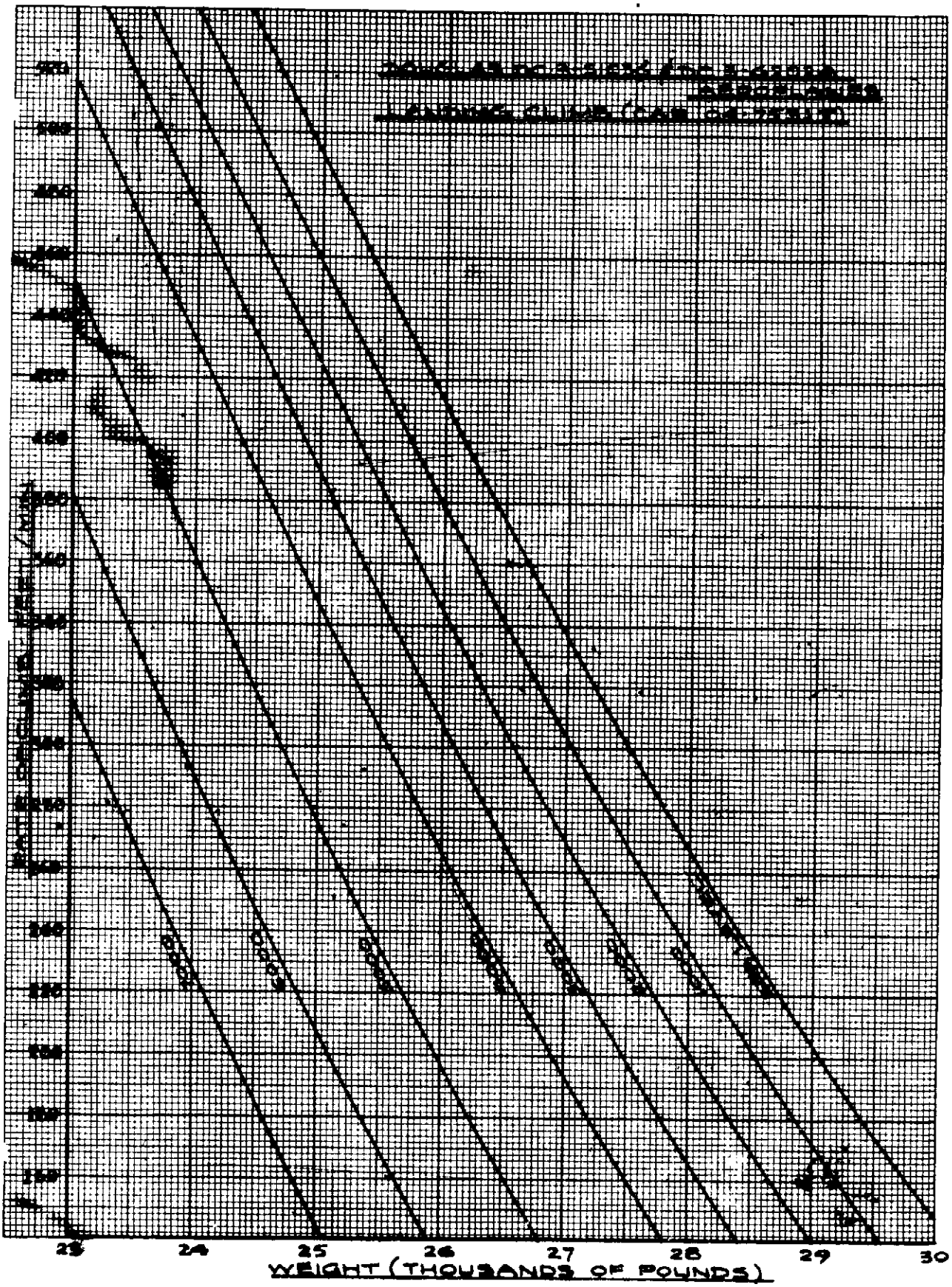
ONE ENGINE INOPERATIVE RATE OF CLIMB AT TAKE-OFF VS. GROSS WEIGHT

DC-3 - S1C3G AIRPLANE

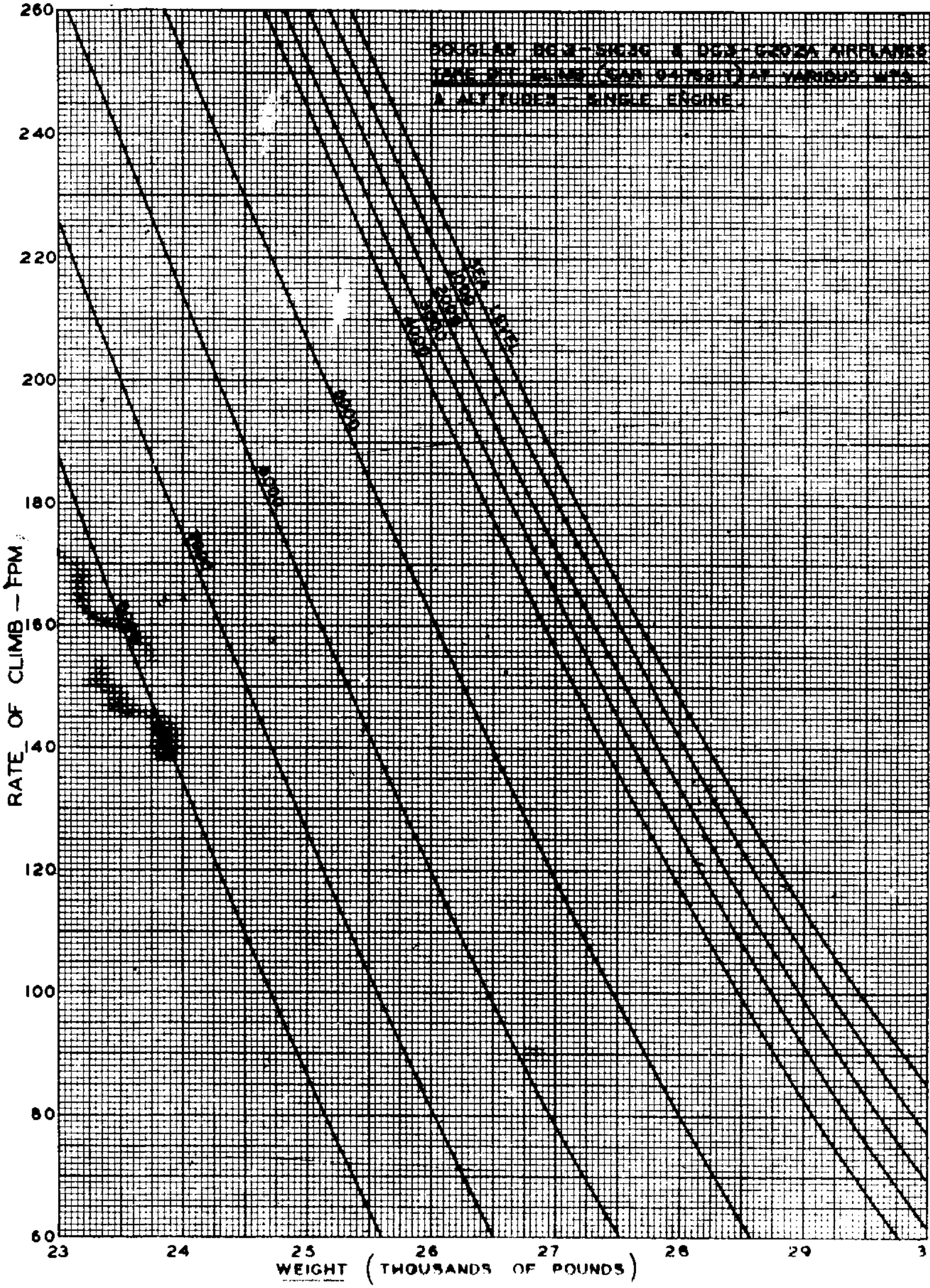




ISSUED: 10 JAN 1962 EFFECTIVE: 8 JAN 1962



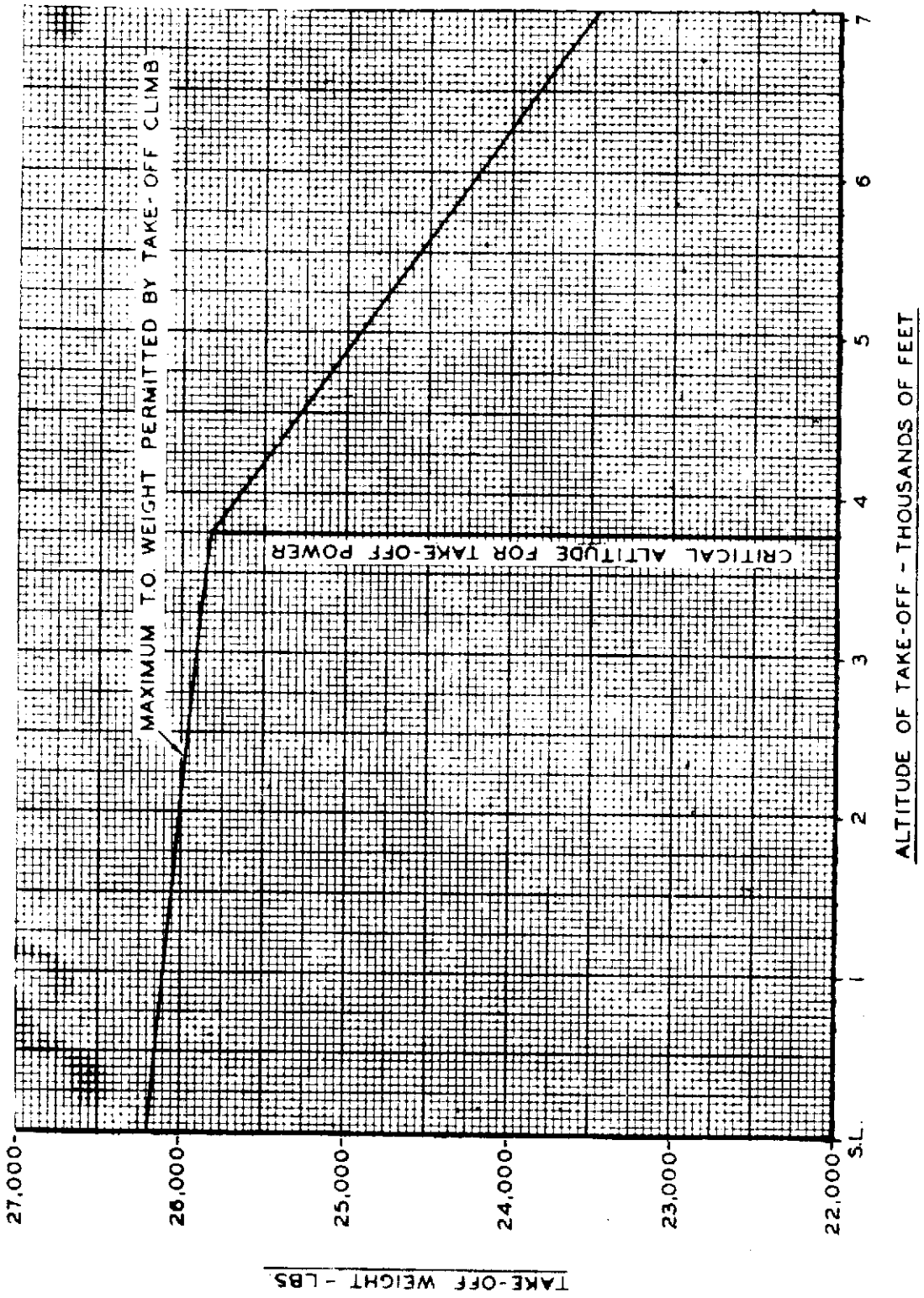
ISSUED: 30 JAN 1967 EFFECTIVE: 1 FEB 1967


A ALTITUDES - SINGLE ENGINE.
SEA LEVEL
4000
6000
8000
RATE OF CLIMB — FPM
260
240
220
200
180
160
140
120
100
80
60
23
24
25
26
27
28
29
30
WEIGHT (THOUSANDS OF POUNDS)

MAXIMUM TAKE-OFF WEIGHT

DOUGLAS DC-3-SIC3G AIRPLANE

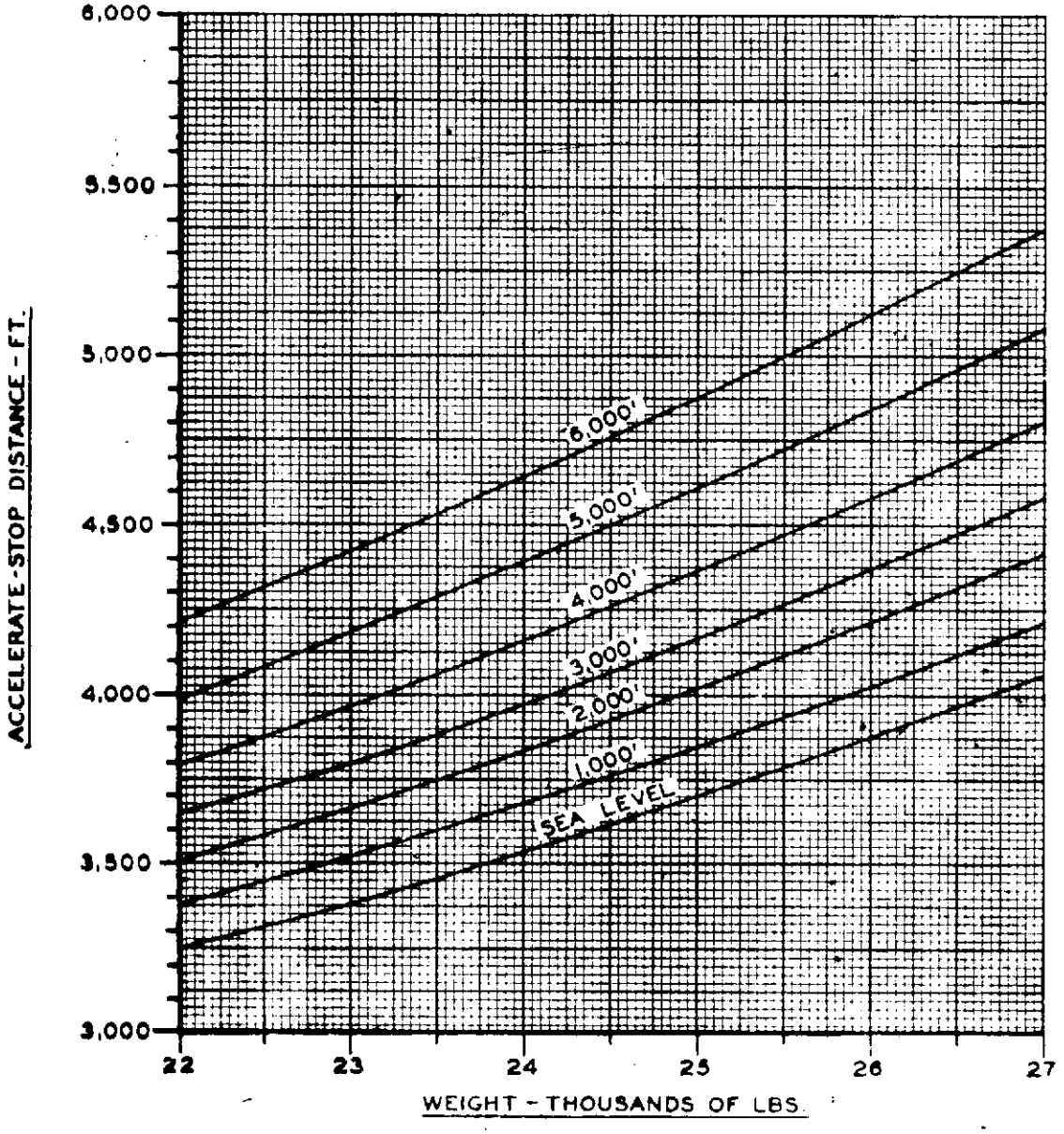
STANDARD ATMOSPHERE

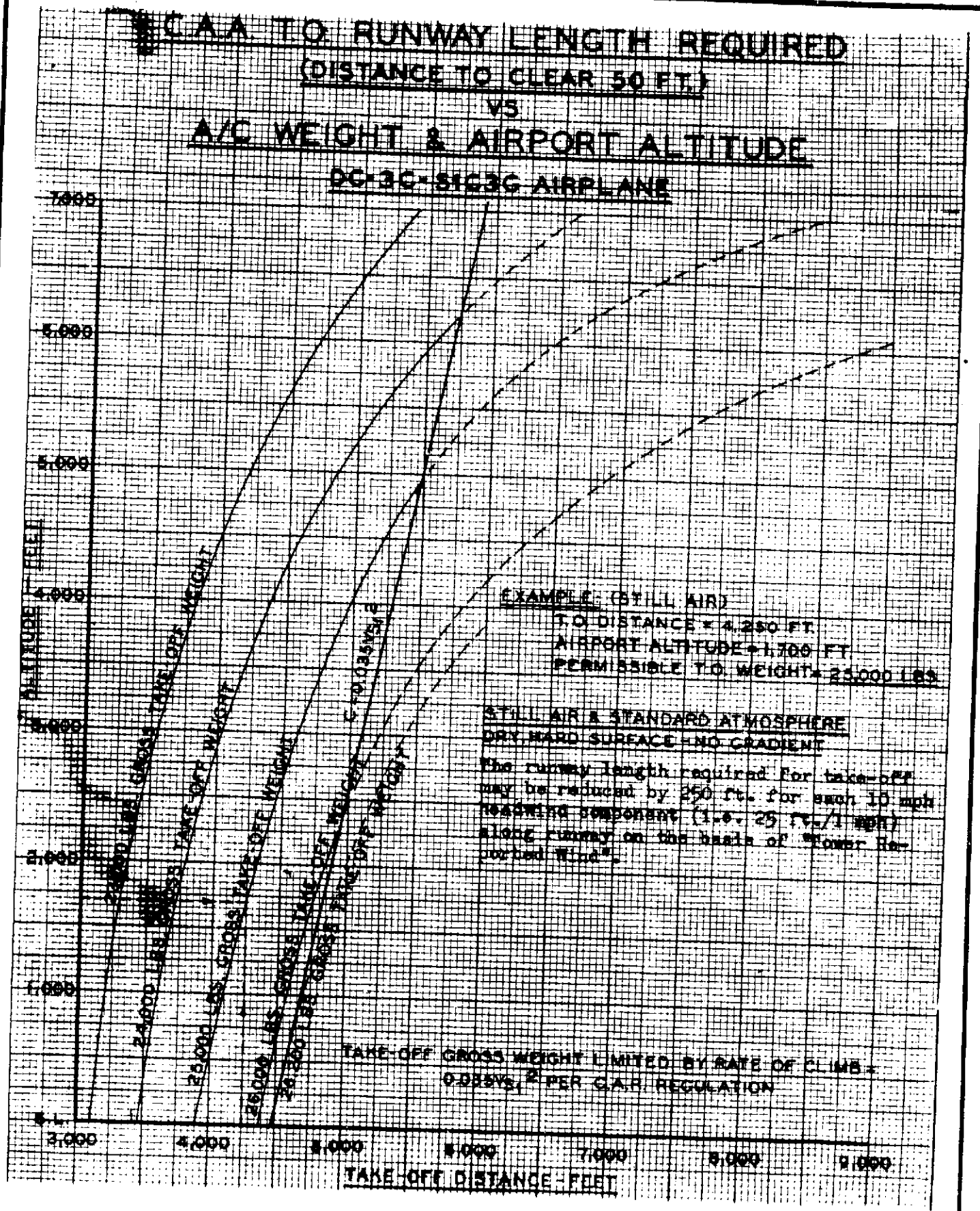


ACCELERATE-STOP DISTANCE

DOUGLAS DC-3-S1C3G & DC-3-G202A AIRPLANES

STANDARD ATMOSPHERE





ISSUED: 10 JAN 1967 EFFECTIVE: 1 JAN 1967

MAXIMUM PERMISSABLE TAKE-OFF
WEIGHT FOR AIRPORTS USED BY QUEBECAIR INC.

Below is a list of airports where Quebecair is authorized by the D.Q.T. to operate DC-3 aircrafts at the all-up-weight of 26,200 lbs.

QUEBEC CITY	-	FORESTVILLE
RIMOUSKI	-	MONT JOLI
MATANE	-	BAIE COMEAU
SEVEN ISLANDS	-	GASPE
PORT MENIER	-	TRINITY BAY
PENTECOTE		

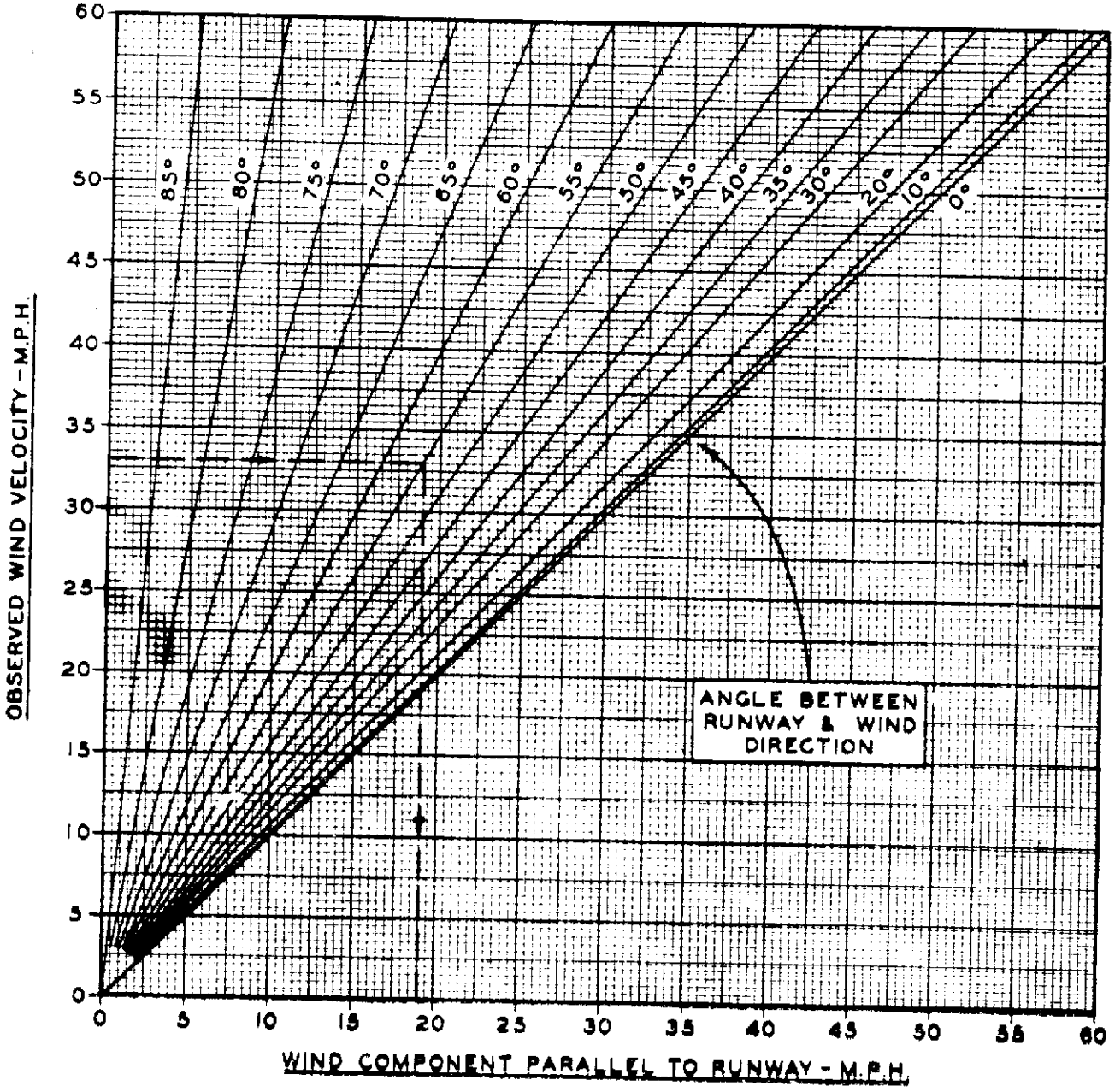
Because of the elevation of the airport at Knob Lake, the operation of the DC-3 into and out of that airport in restricted to 26,000 lbs.

NOTE: For all airports except those mentioned above the charts: pages 344 - 350 - 352- 364 - 366 - will apply

WIND COMPONENTS

PARALLEL TO RUNWAY

FOR VARIOUS WIND VELOCITIES & DIRECTIONS



EXAMPLE SHOWN

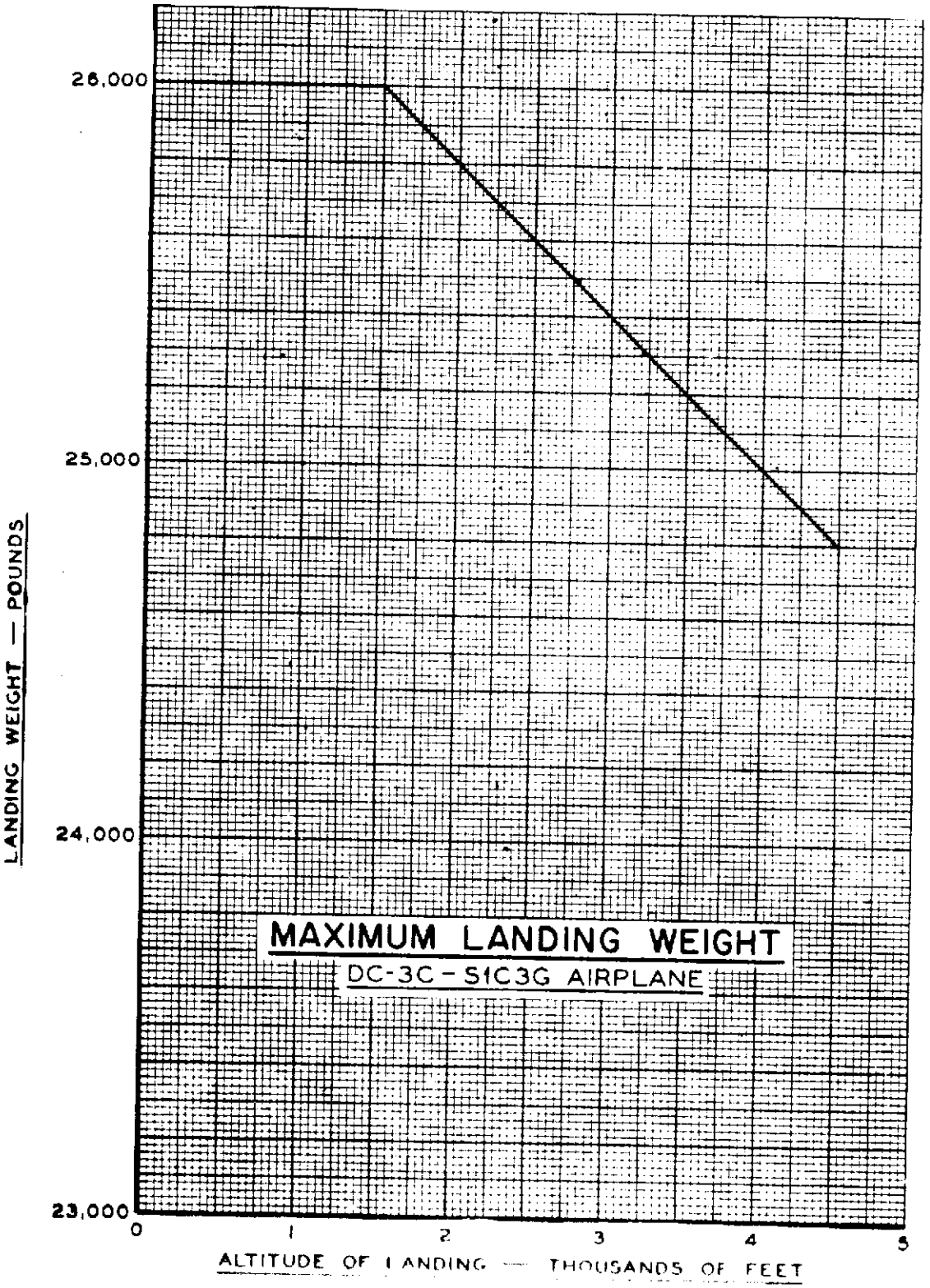
A 33 M.P.H. WIND AT 55° TO RUNWAY HAS A COMPONENT PARALLEL TO RUNWAY OF 19 M.P.H.

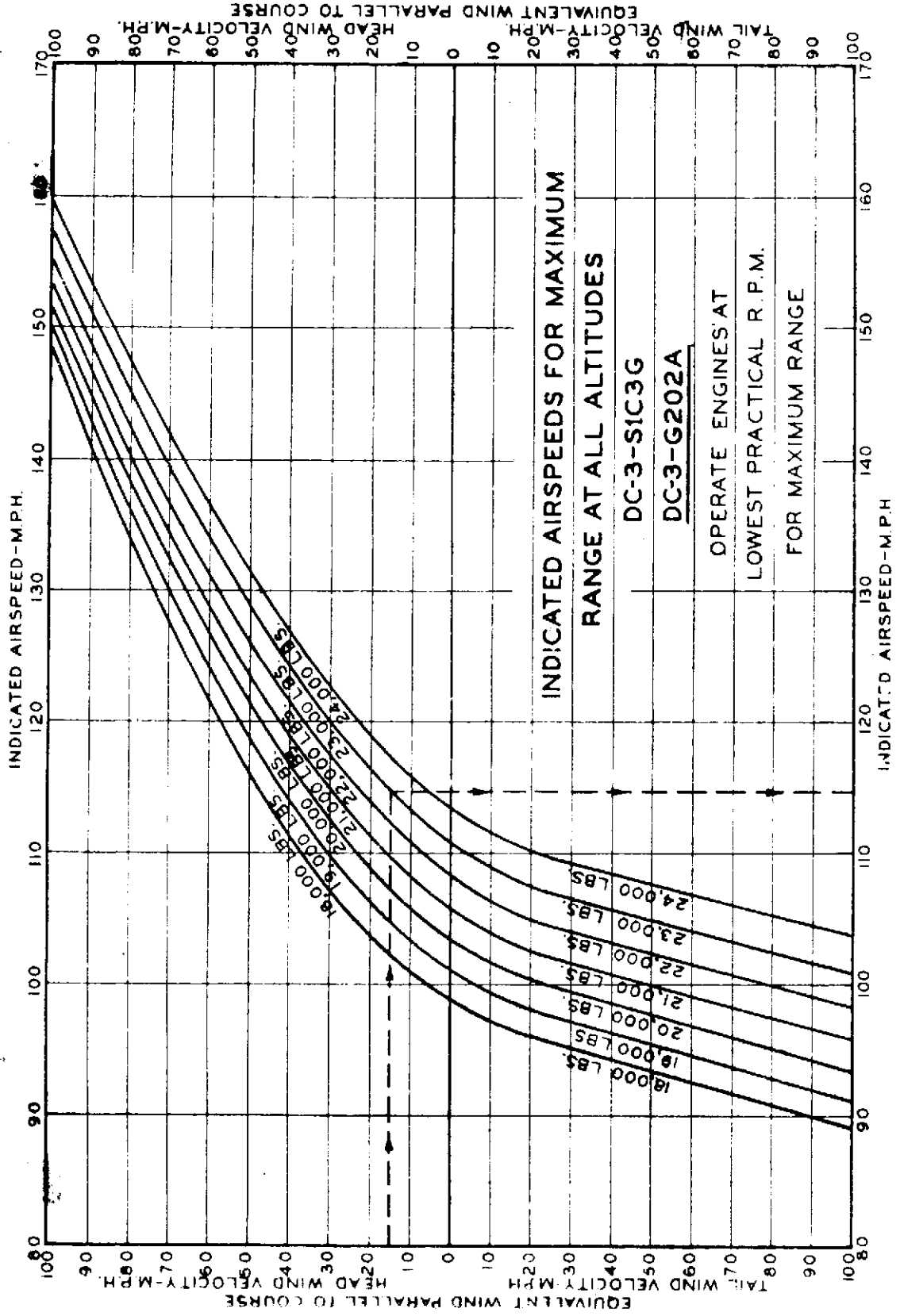
ULXEF 15-12-49

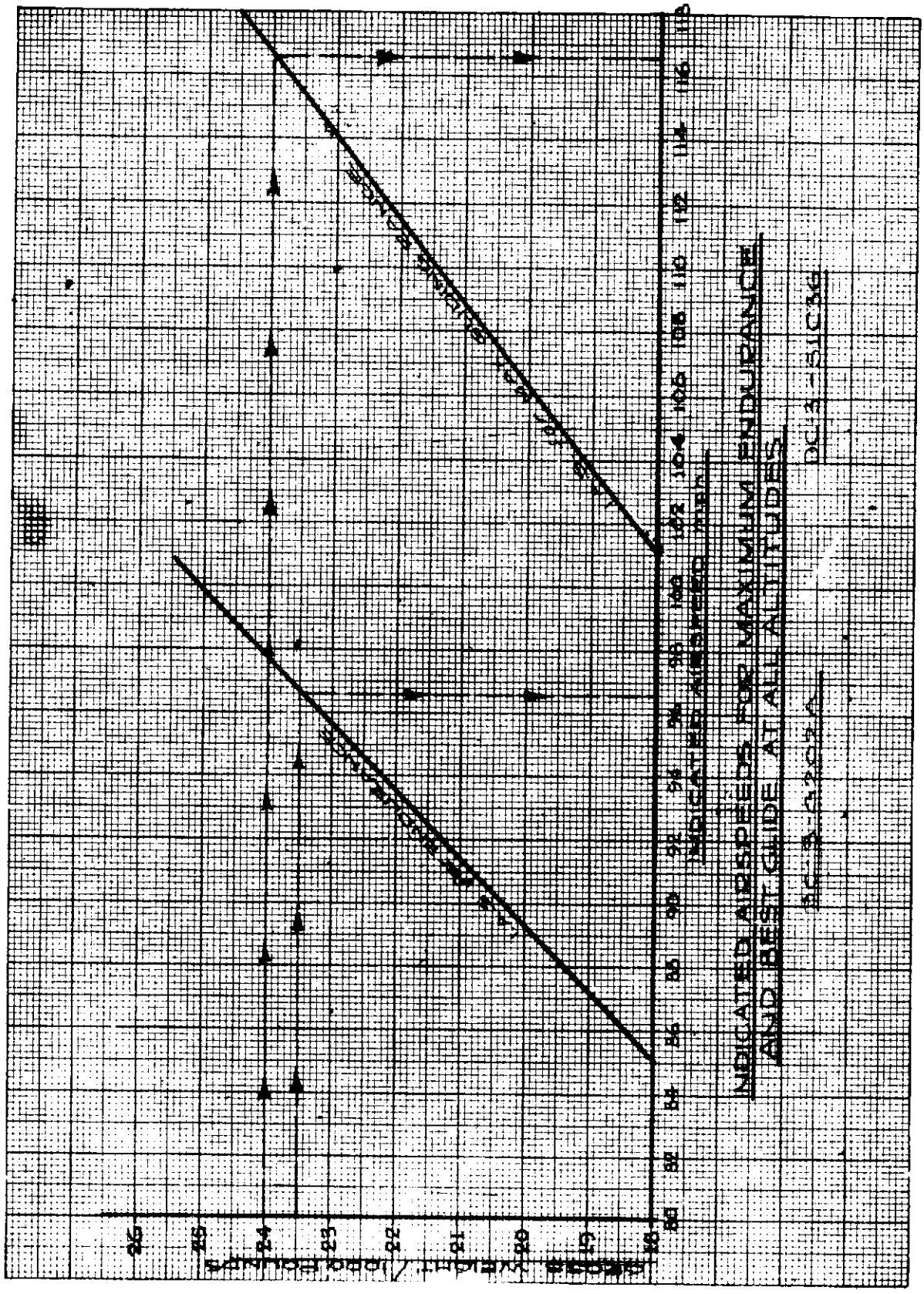
ISSUED

EFFECTIVE

1967


26,000
25,000
24,000
23,000
LANDING WEIGHT — POUNDS
0
1
2
3
4
5
ALTITUDE OF LANDING — THOUSANDS OF FEET
MAXIMUM LANDING WEIGHT
DC-3C - S1C3G AIRPLANE


INDICATED AIRSPEEDS FOR MAXIMUM RANGE AT ALL ALTITUDES
DC-3-S1C3G
DC-3-G202A
OPERATE ENGINES AT LOWEST PRACTICAL R.P.M. FOR MAXIMUM RANGE
INDICATED AIRSPEED-M.P.H.
EQUIVALENT WIND PARALLEL TO COURSE
HEAD WIND VELOCITY-M.P.H.
TAIL WIND VELOCITY-M.P.H.
24,000 LBS.
23,000 LBS.
22,000 LBS.
21,000 LBS.
20,000 LBS.
19,000 LBS.
18,000 LBS.



ISSUED: 1 JAN 1949 EFFECTIVE: 1 JAN 1949

REVISED - FEB 9 1947
APR 24 1947
WGE JUNE 27 1947
WGE DEC 18 1947
WGE OCT 28 948

QUEBECAIR

CRUISE CONTROL CHARTS

FOR DOUGLAS DC-3

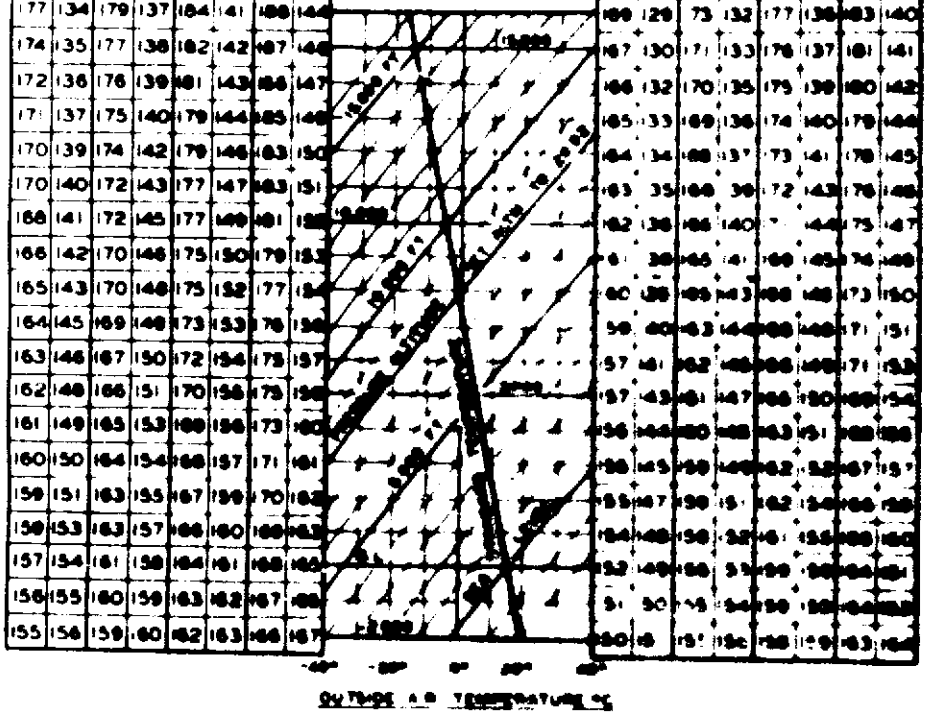
PRATT & WHITNEY R1830-SIC3G (1821) ENGINES
AUTO LEAN MIXTURE

GROSS WGT - UNDER 23000 LBS

BHP/ENG							
525		550		575		600	
TAS	IAS	TAS	IAS	TAS	IAS	TAS	IAS
177	134	179	137	184	141	188	144
174	135	177	138	182	142	187	146
172	136	176	139	181	143	186	147
171	137	175	140	179	144	185	148
170	139	174	142	179	146	183	150
170	140	172	143	177	147	183	151
168	141	172	145	177	149	181	153
166	142	170	146	175	150	179	153
165	143	170	146	175	152	177	154
164	145	169	148	173	153	176	156
163	146	167	150	172	154	175	157
162	148	166	151	170	156	175	158
161	149	165	153	169	156	173	160
160	150	164	154	168	157	171	161
159	151	163	155	167	159	170	162
158	153	163	157	166	160	169	163
157	154	161	158	164	161	168	165
156	155	160	159	163	162	167	166
155	156	159	160	162	163	166	167

GROSS WGT - OVER 23000 LBS

BHP/ENG							
525		550		575		600	
TAS	IAS	TAS	IAS	TAS	IAS	TAS	IAS
129		73	132	177	136	183	140
130		71	133	176	137	181	141
132		170	135	175	139	180	142
133		169	136	174	140	179	144
134		168	137	173	141	178	145
135		166	138	172	143	176	146
136		165	140		144	175	147
138		165	141	169	145	174	148
139		165	143	168	146	173	150
140		163	144	168	146	171	151
141		162	145	166	148	171	152
143		161	147	166	150	169	154
144		160	148	165	151	168	154
145		159	149	163	152	167	155
147		159	151	162	154	166	156
148		158	152	161	155	165	158
150		157	153	160	156	164	159
151		156	154	159	157	163	160
153		155	156	158	158	162	161



OUTSIDE AIR TEMPERATURE °C

POWER CONTROL CHART

PRESSURE ALTITUDE / Variation °C	BHP/ENG 525	550	575	600
SEA LEVEL	RPM	2050	2050	2050
+15	MP	29.5	29.25	30.25
	GAL/HR	73	75	77
1,000	RPM	2050	2050	2050
+13	MP	27.5	28.25	29.0	30.0
		71	73	75	77
2,000	RPM	2050	2050	2050	2050
+11	MP	27.25	28.0	28.75	28.75
		71	73	75	77
3,000	RPM	2050	2050	2050	2050
+9	MP	27.0	27.75	28.5	29.5
		71	73	75	77
4,000	RPM	2050	2050	2050	2050
+7	MP	26.75	27.5	28.5	29.25
		71	73	75	77
5,000	RPM	2050	2050	2050	2050
+5	MP	26.5	27.25	28.25	29.0
		71	73	75	77
6,000	RPM	2050	2050	2050	2050
+3	MP	26.25	27.0	28.0	28.75
		71	73	75	77
7,000	RPM	2050	2050	2050	2050
+1	MP	26.0	27.0	28.0	28.75
		71	73	75	77
8,000	RPM	2050	2050	2050	2050
-1	MP	25.75	26.75	27.75	28.5
		71	73	75	77
9,000	RPM	2050	2050	2050	2050
-3	MP	25.75	26.5	27.5	28.5
		71	73	75	77
10,000	RPM	2050	2050	2050	2050
-5	MP	25.5	26.25	27.5	28.25
		71	73	75	77
11,000	RPM	2050	2050	2050	2050
-7	MP	25.25	26.25	27.25	28.0
		71	73	75	77
12,000	RPM	2050	2050	2050	2050
-9	MP	25.0	26.0	27.0	28.0
		71	73	75	77
13,000	RPM	2050	2050	2050	2050
-11	MP	24.75	25.75	26.5	27.75
		71	73	75	77
14,000	RPM	2050	2050	2050	2100
-13	MP	24.5	25.75	26.5	27.0
		71	73	75	78
15,000	RPM	2080	2080	2100	2150
-15	MP	24.5	25.25	25.75	26.25
		71	73	76	78
16,000	RPM	2050	2100	2150	2200
-17	MP	24.25	24.75	25.25	25.5
		71	74	77	80

TO USE

1. FROM OUTSIDE AIR TEMPERATURE, MOVE VERTICALLY TO PRESSURE ALTITUDE TO FIND DENSITY ALTITUDE
2. FOLLOW ROW OF THIS DENSITY ALTITUDE TO VERTICAL COLUMN OF DESIRED BHP/ENG IN APPROPRIATE GROSS WEIGHT RANGE. NOTE FIXED TRUE AIRSPEED AND INDICATED AIRSPEED
3. REFER TO POWER CONTROL CHART FOR POWER SETTINGS AND FUEL CONSUMPTION FOR TWO ENGINES

NOTES:

THE CRUISING CHART MAY BE USED IN REVERSE TO FIND BHP/ENG FOR ANY GIVEN AIRSPEED BY INTERPOLATING REQUIRED

TAKE OFF 2700 RPM & 44 INCHES MANIFOLD PRESSURE
(APPLY CORRECTION TO MAN PRES FOR CARBURETOR AIR TEMPS BELOW -25°C)
AVERAGE FUEL CONSUMPTION RUN-UP, TAXIING & TAKE-OFF - 10 IMP GALLONS

CORRECTION FOR CARBURETOR AIR TEMPERATURE DIFFERENCE FROM STANDARD		
	PART THROTTLE	FULL THROTTLE
IF CARB AIR IS ABOVE STANDARD	ADD 0.5 IN MAN PRES FOR EACH 0°C ABOVE STD	ADD 25 RPM FOR EACH 10°C ABOVE STD
IF CARB AIR IS BELOW STANDARD	SUBT 0.5 IN MAN PRES FOR EACH 0°C BELOW STD	SUBT 25 RPM FOR EACH 10°C BELOW STD

ISSUED

EFFECTIVE