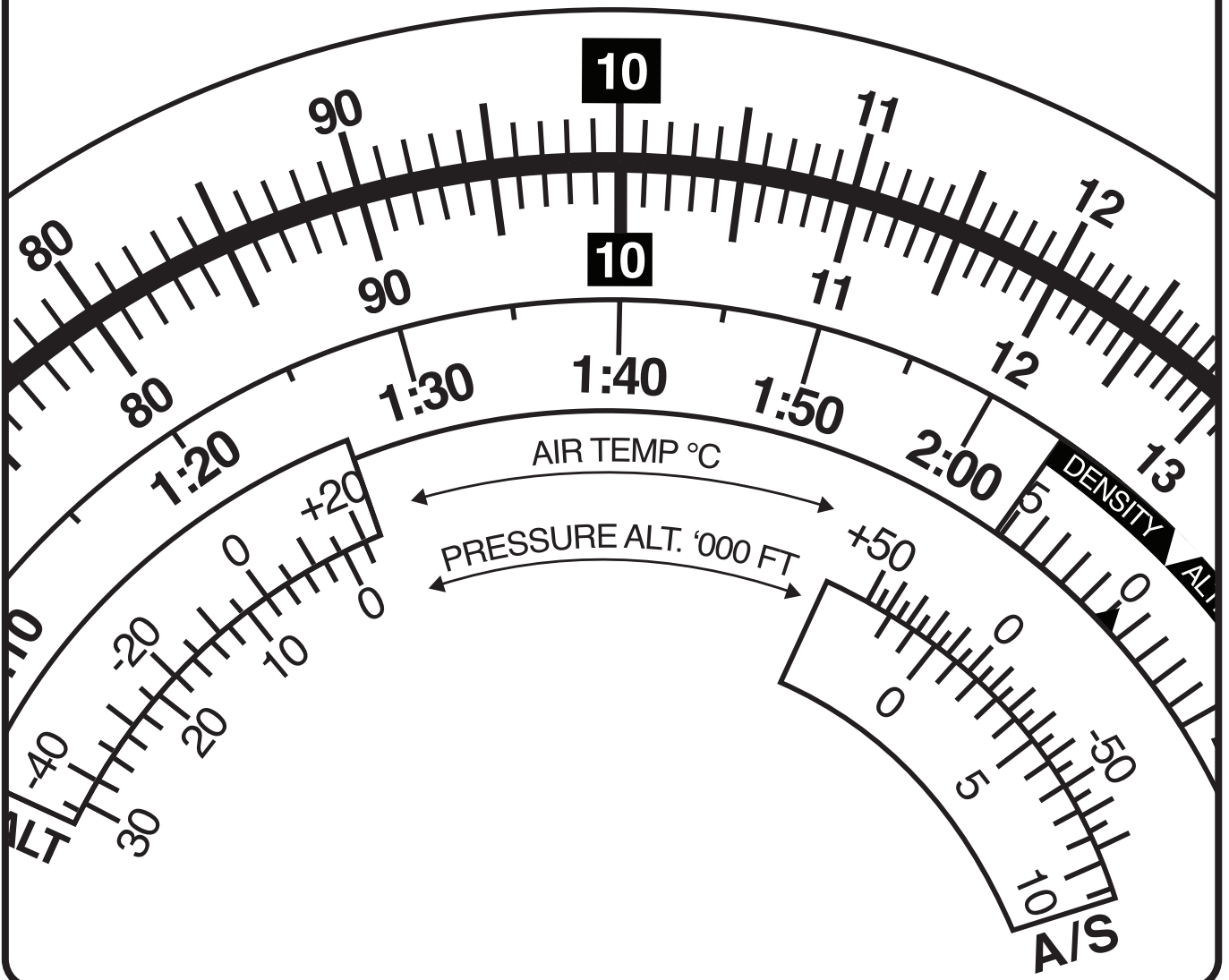


RPL/PPL WORKBOOK



RPL/PPL Workbook
First Edition

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Attribution:

This document is based on the original work of the Civil Aviation Safety Authority RPL, PPL & CPL (Aeroplane) Workbook.

INTRODUCTION

This workbook has been prepared for PilotTrain students studying online and in print for the recreational and private pilot licence examinations. This workbook is similar to the regulator’s examination booklet. Note that the tables and graphs in this booklet are samples for study purposes only and are not to be used in conjunction with flight operations or flight planning.

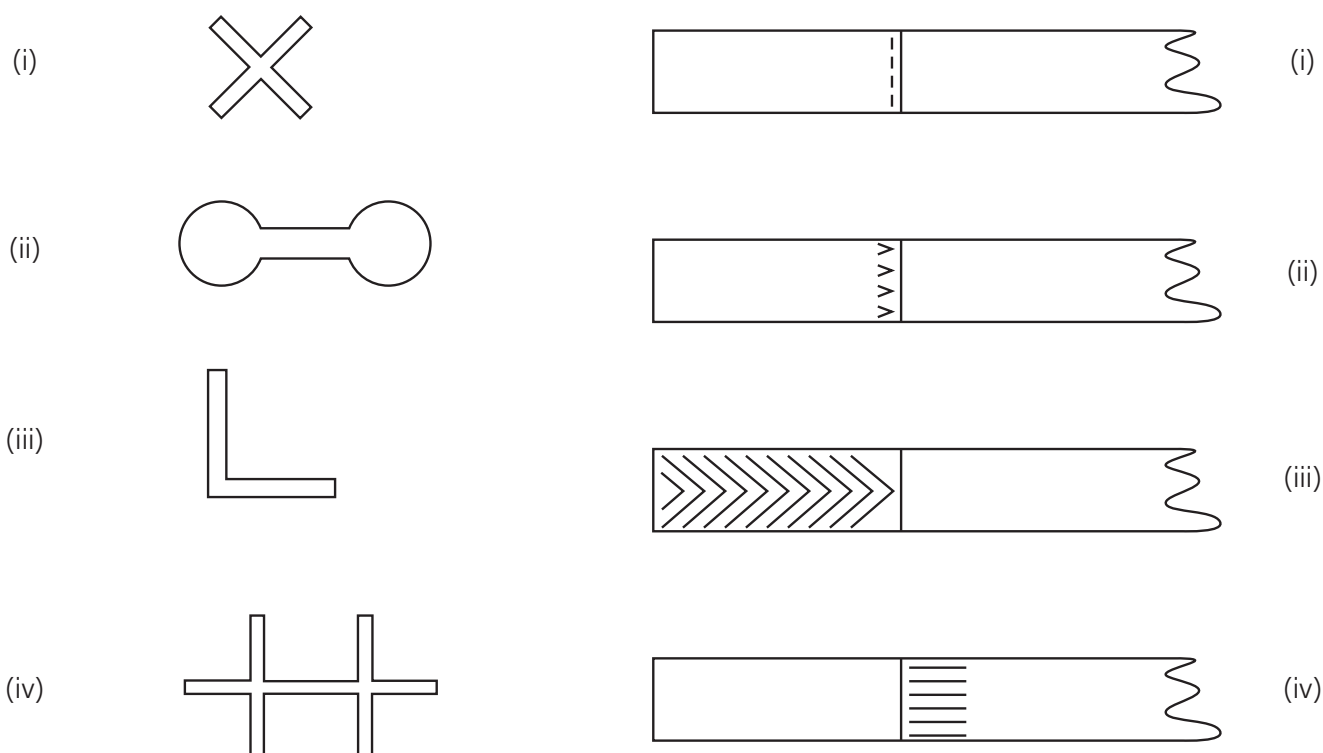
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AERODROME MARKERS AND MARKINGS

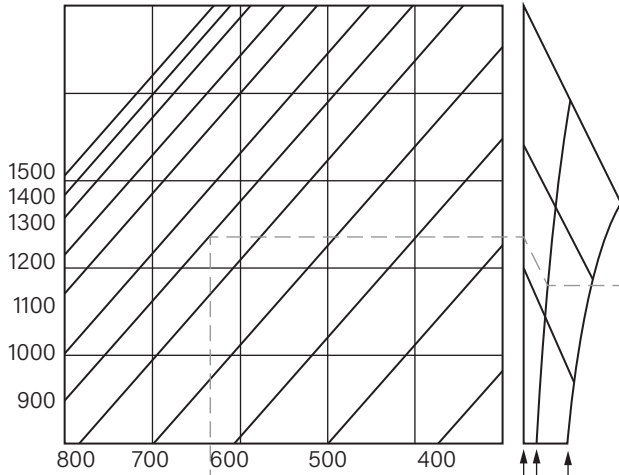
FIGURE GROUP 1

FIGURE GROUP 2

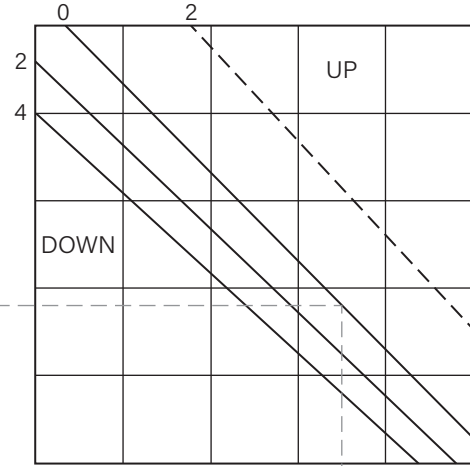


P-TYPE TAKE-OFF CHART

TAKE-OFF DISTANCE AVAILABLE (M)

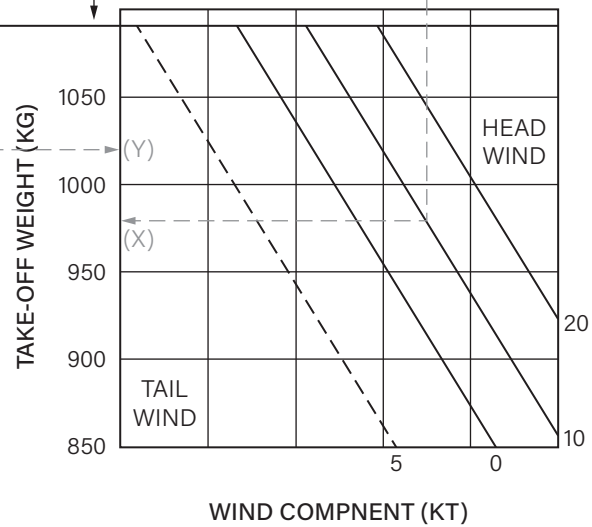
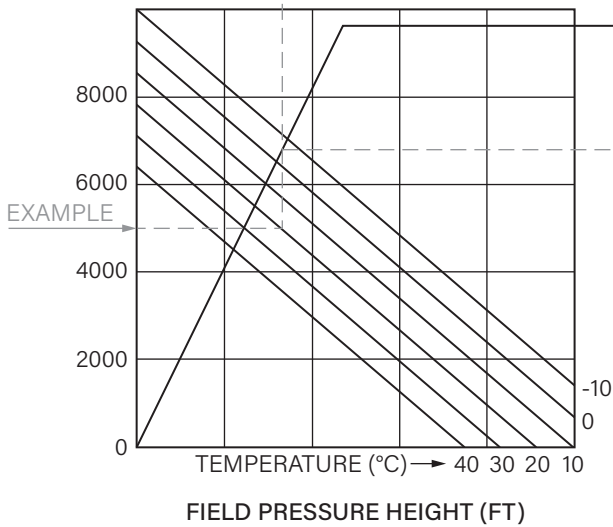


SLOPE PERCENT



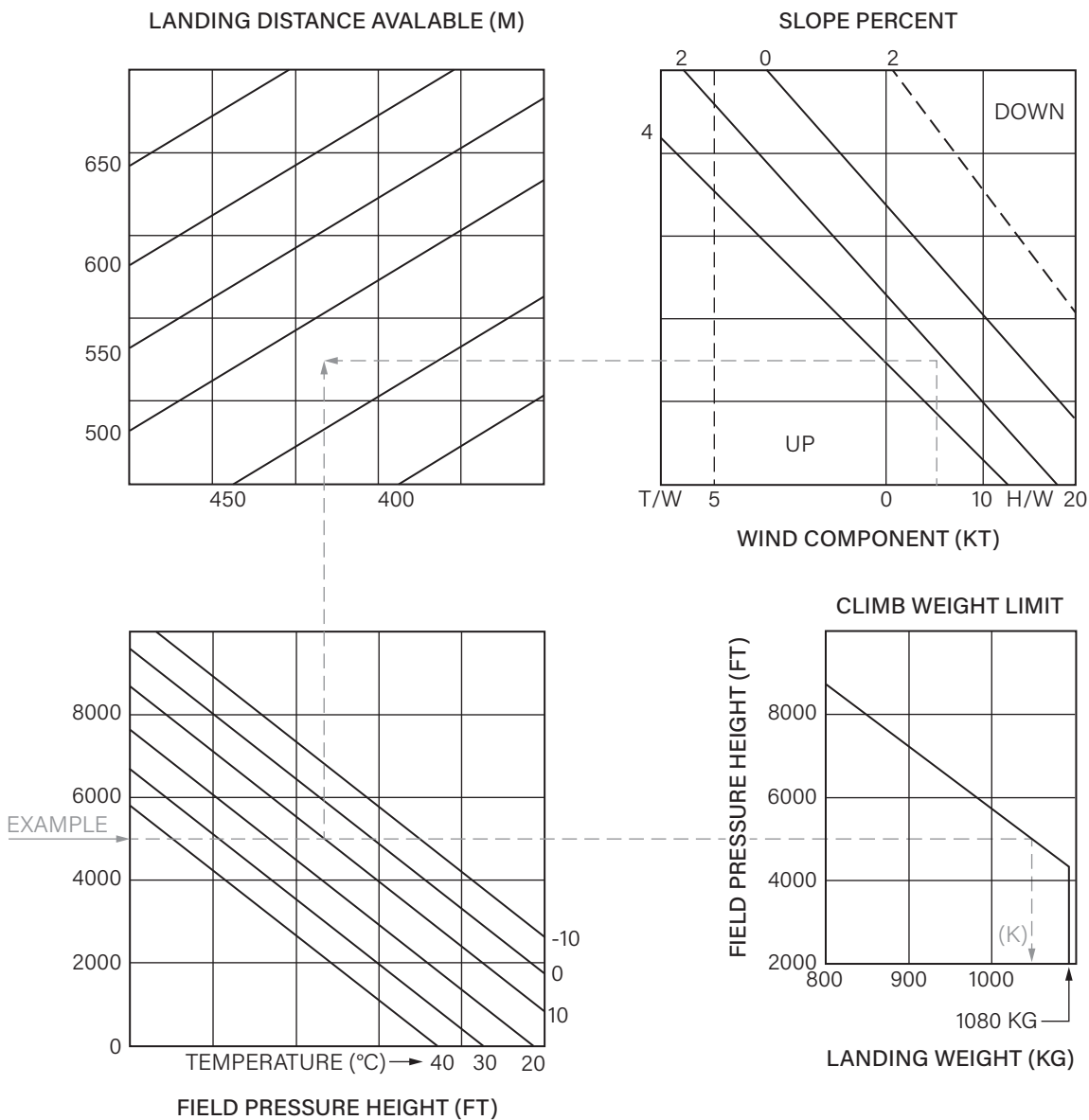
LONG WET GRASS
 LONG DRY OR SHORT WET GRASS
 REFERENCE LINE

1090 KG



POWER SETTING	MAXIMUM	1. THE MAXIMUM WEIGHT AT TAKE-OFF MUST NOT EXCEED THE LESSOR OF X AND Y. 2. THE MAXIMUM TAKE-OFF WEIGHT IS 1090 KG.
FLAP SETTING	10 DEGREES	
TAKE-OFF SAFETY SPEED	60 KIAS	
INCLUDED TAKE-OFF FACTOR	1.15	
MAXIMUM CROSS WIND	15 KT	

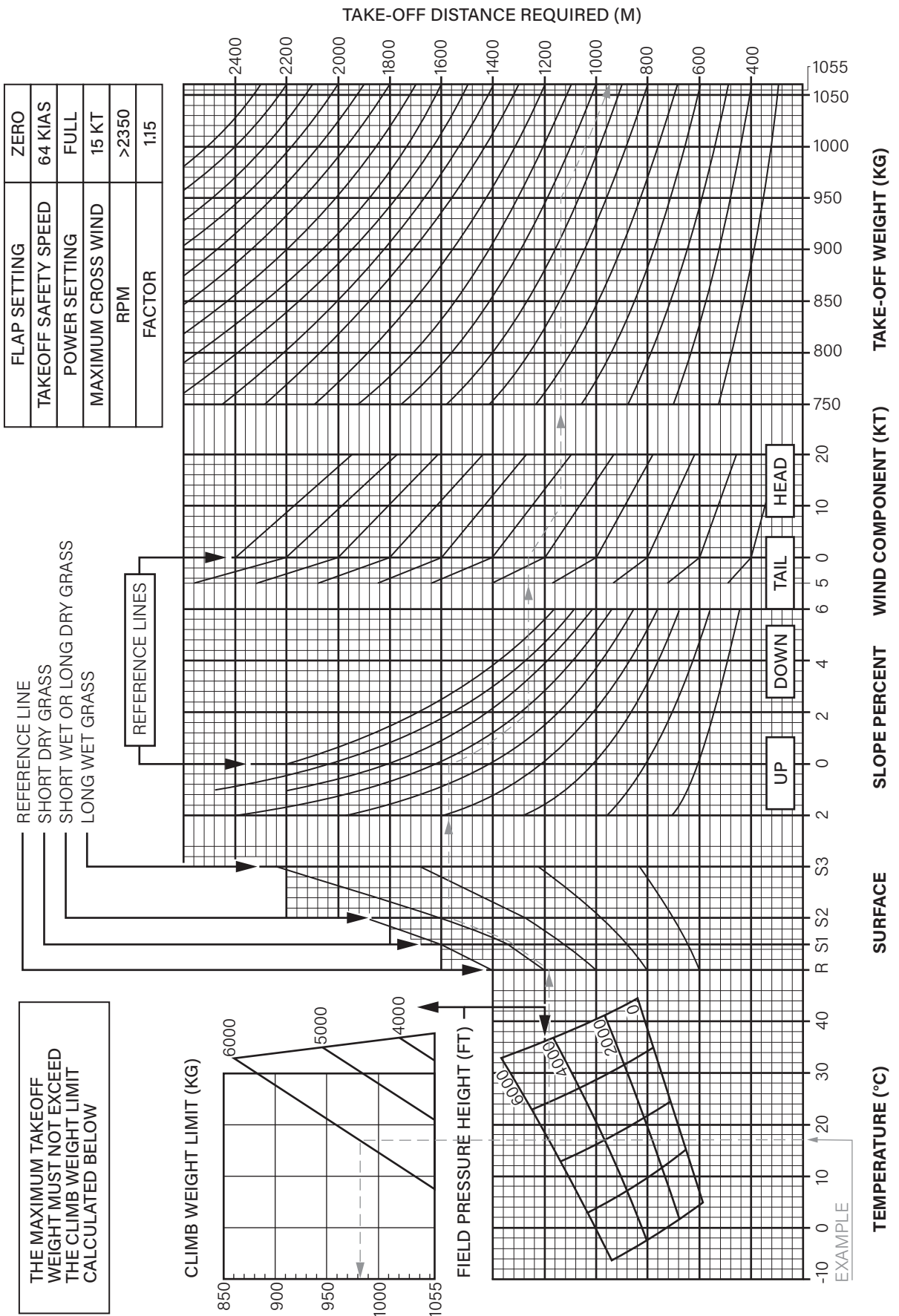
P-TYPE LANDING CHART



FLAP SETTING	30 DEGREES
APPROACH SPEED	58 KIAS
INCLUDED LANDING FACTOR	1.15
MAXIMUM CROSS WIND	15 KT

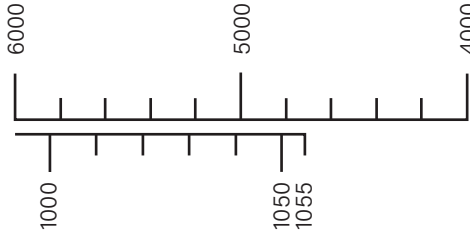
1. THE MAXIMUM WEIGHT AT LANDING MUST NOT EXCEED K.
2. LANDING DISTANCE REQ. DOES NOT VARY SIG. WITH WEIGHT.

LINEAR TAKE-OFF CHART

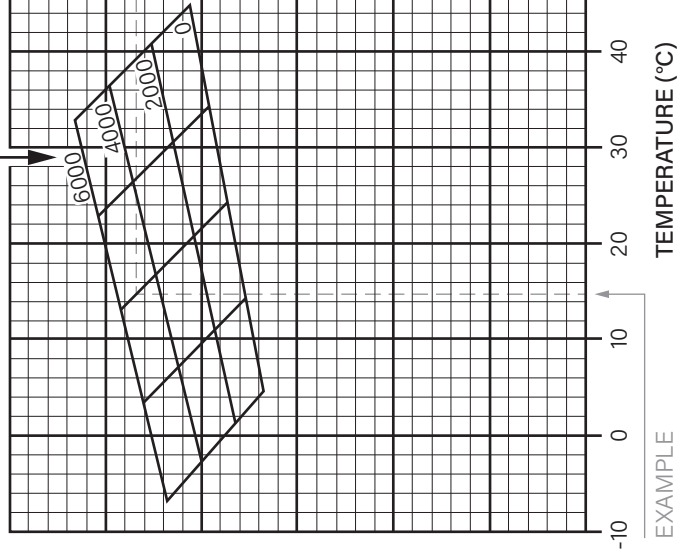


LINEAR LANDING CHART

CLIMB WEIGHT LIMIT (KG)



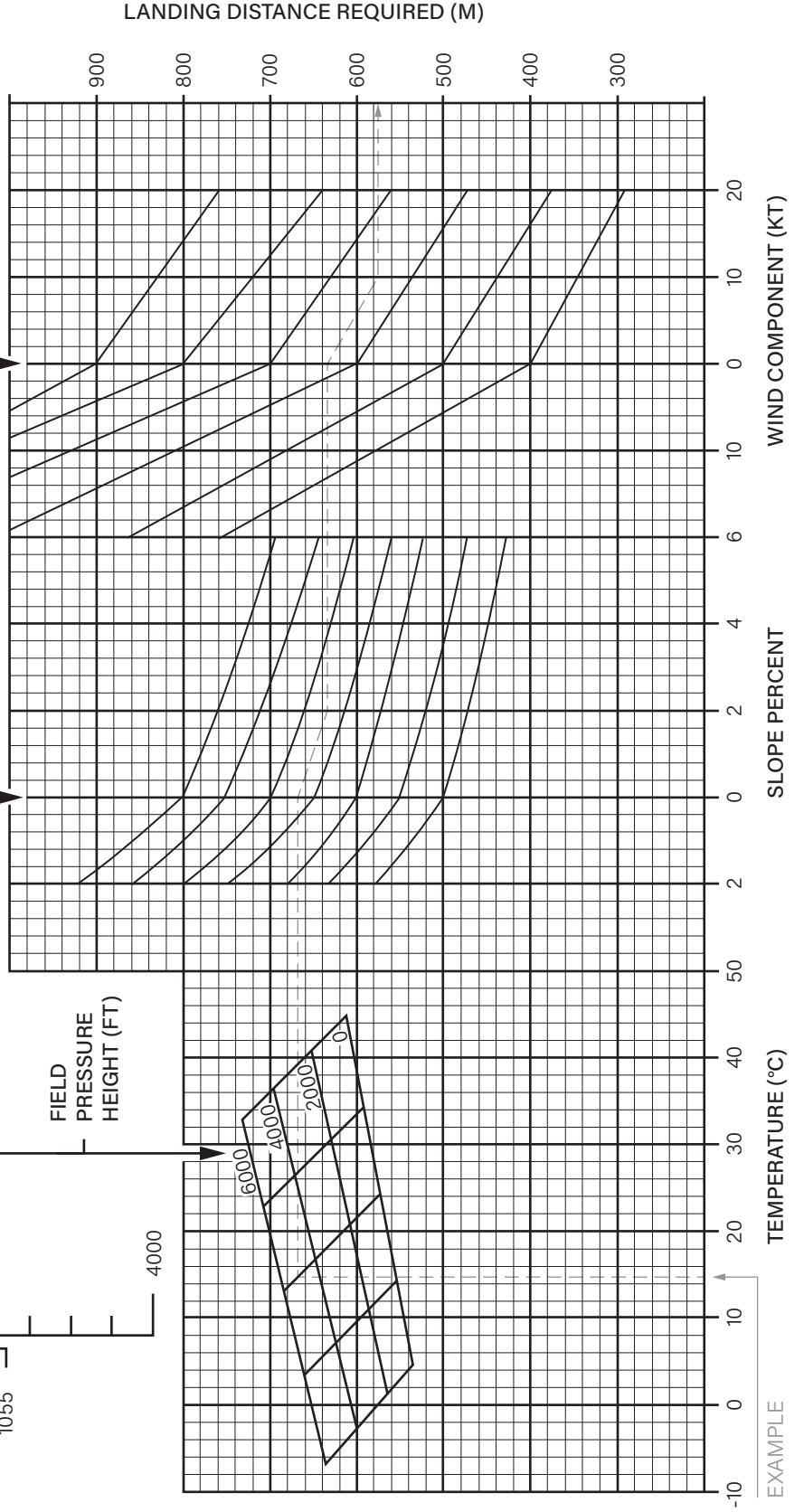
FIELD PRESSURE HEIGHT (FT)



FLAP SETTING	40 DEGREES
APPROACH SPEED	65 KIAS
INCLUDED LANDING FACTOR	1.15
MAXIMUM CROSS WIND	15 KT

1. THE MAXIMUM WEIGHT AT LANDING MUST NOT EXCEED CLIMB WEIGHT LIMIT.
2. LANDING DISTANCE REQ. DOES NOT VARY SIG. WITH WEIGHT.

REFERENCE LINES



EXAMPLE

LOADING SYSTEM ALPHA INSTRUCTIONS

Loading system alpha is a simple flow style chart. Use the following instructions to complete the flow chart and plot the blade correctly.

1. Obtain the Basic Empty Weight and Index Units of the aircraft from the flight manual/question.
2. Enter the Basic Empty Weight on the top scale and identify the Index Units location. Mark this point and draw a line vertically down to the next blade.
3. Enter weights of the loaded items required for flight in appropriate squares of right-hand column. Maximum weights for load items are indicated on Index Unit scales.
4. Total weights in right-hand column to obtain Zero Fuel Weight and Take-Off Weight. Do not exceed the maximum take-off weight as shown on the centre of gravity envelope.
5. Draw horizontal lines on CG Envelope graph corresponding to Zero Fuel Weight and Take-Off Weight.
6. Draw a line vertically down from point marked on Basic Empty Weight Index Units scale to first load item scale. Move to the left or right on this load item index scale as per arrow directions, and mark point as appropriate to the load indicated in the right-hand column. (e.g. 154 KG load at 77 KG per division = 2 divisions.)
7. Draw a line vertically down from the point marked on the first load item index scale to the second load item index scale and continue as per above. Continue down the scales to "Rear Baggage". Draw a line vertically from the "Rear Baggage" point down to intersect the Zero Fuel Weight line and Take-Off Weight line previously marked on the CG envelope graph.
8. The two intersection points as per 7, above must not exceed the boundaries of the centre of gravity envelope graph. If they do, re-organise the load in the aircraft and start again with steps 3 to 7.

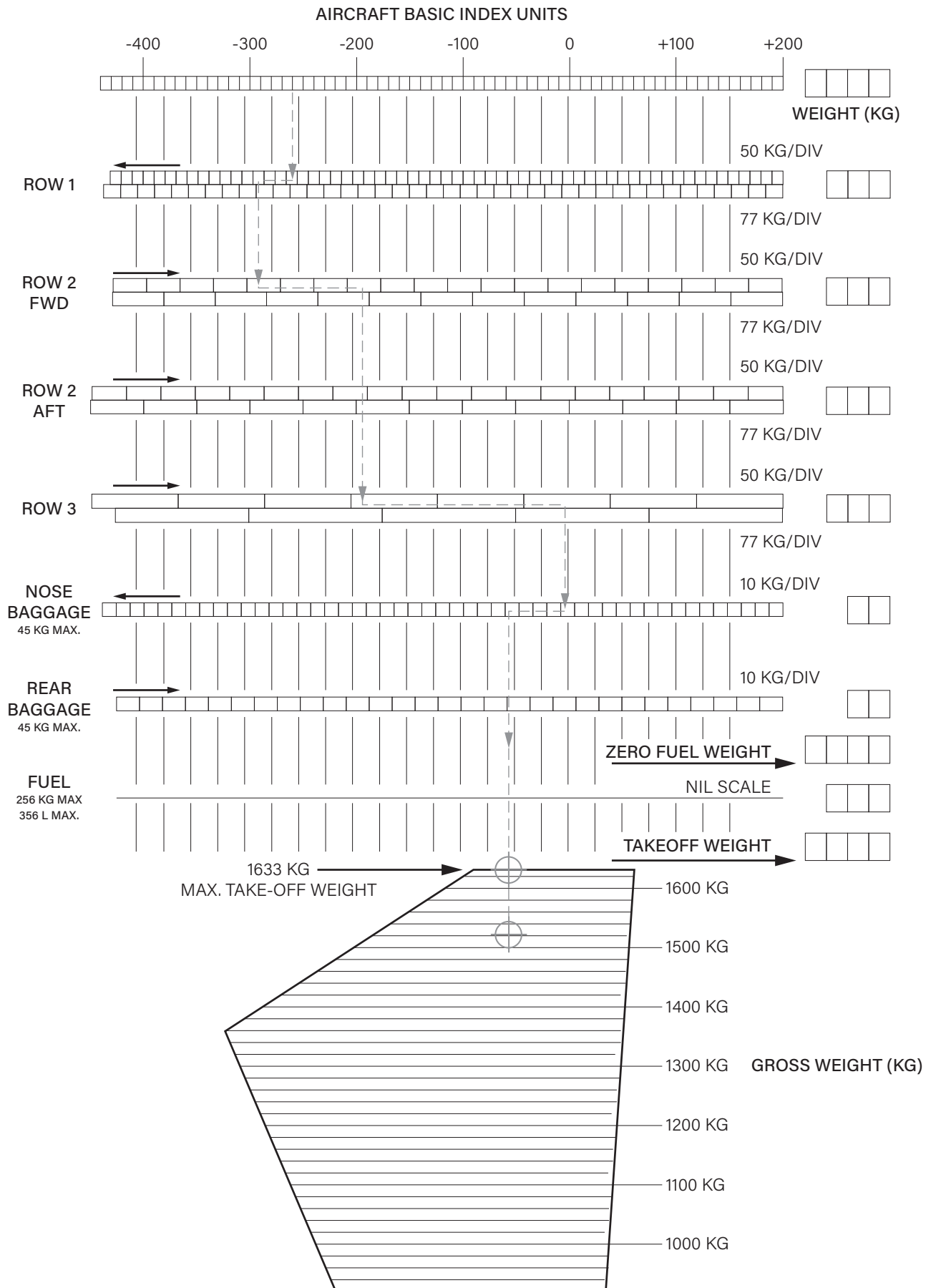
Do not exceed the maximum take-off weight as shown on the centre of gravity envelope diagram!

Example

Basic Empty Weight	1,050 KG
Empty Index Units	-260 IU
Row 1	150 KG
Row 2 (FWD)	160 KG
Row 2 (AFT)	NIL
Row 3	120 KG
Nose Baggage	40 KG
Rear Baggage	NIL
Zero Fuel Weight	1,520 KG
Fuel	113 KG
Take-off Weight	1,633 KG

Note: Basic Empty Weight includes unusable fuel and full oil.

LOADING SYSTEM ALPHA CHART



LOADING SYSTEM BRAVO INSTRUCTIONS

To check the loading of the aircraft before take-off, calculate the total weight and total moments as shown in the example below.

Plot the total weight and moment on the "Centre of Gravity" Envelope, and if the intersection point is within the envelope, the loading is acceptable for safe flight.

Aircraft Limitations

Maximum take-off weight	KG	lbs
Normal Category	1,000	2,200
Utility Category	841	1,850
Compartment Limitations	KG	lbs
Cargo compartment	154	339
Baggage compartment	54	120

Note:

1. The aircraft is fitted with standard tanks (37 USG at 6 lbs/gallon);
2. The aircraft is not fitted with optional fuel tanks.
3. Empty weight includes unusable fuel and undrainable oil; and
4. Obtain Moment/1000 inch pounds from the loading graph.

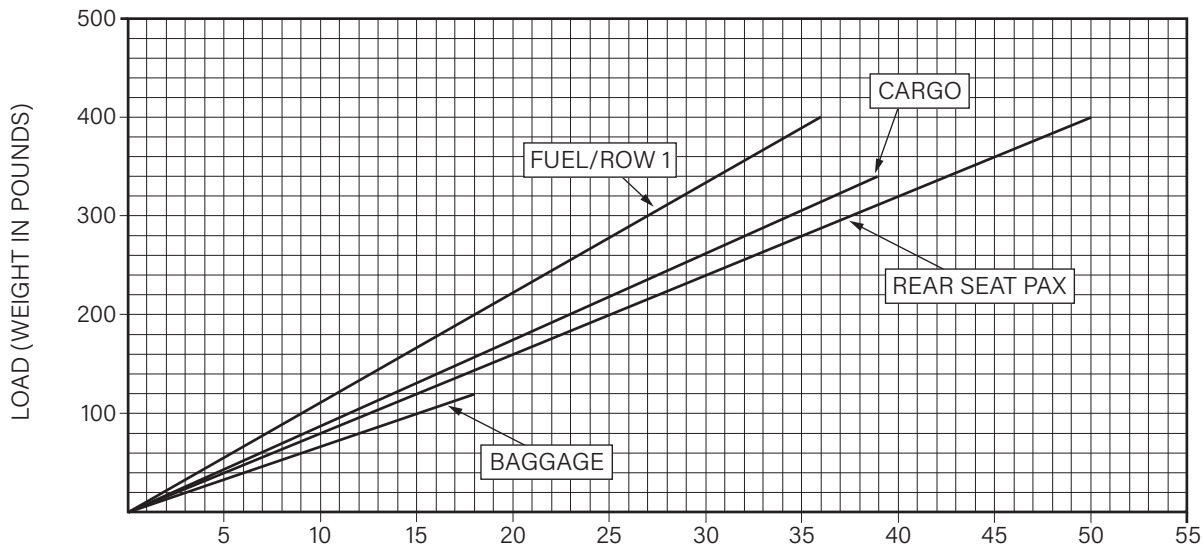
Example

	Weight (lbs)	Arm (in)	Moment/1,000 in lb
Basic Empty Weight	1,260	80	100.80
Oil	15	32	0.48
Row 1	320	91	29.12
Cargo	80	115	9.20
Row 2	250	126	31.50
Baggage	25	151	3.78
Zero Fuel Weight	1,950		174.88
Fuel	221	91	20.11
Take-off Weight	2,171		194.99

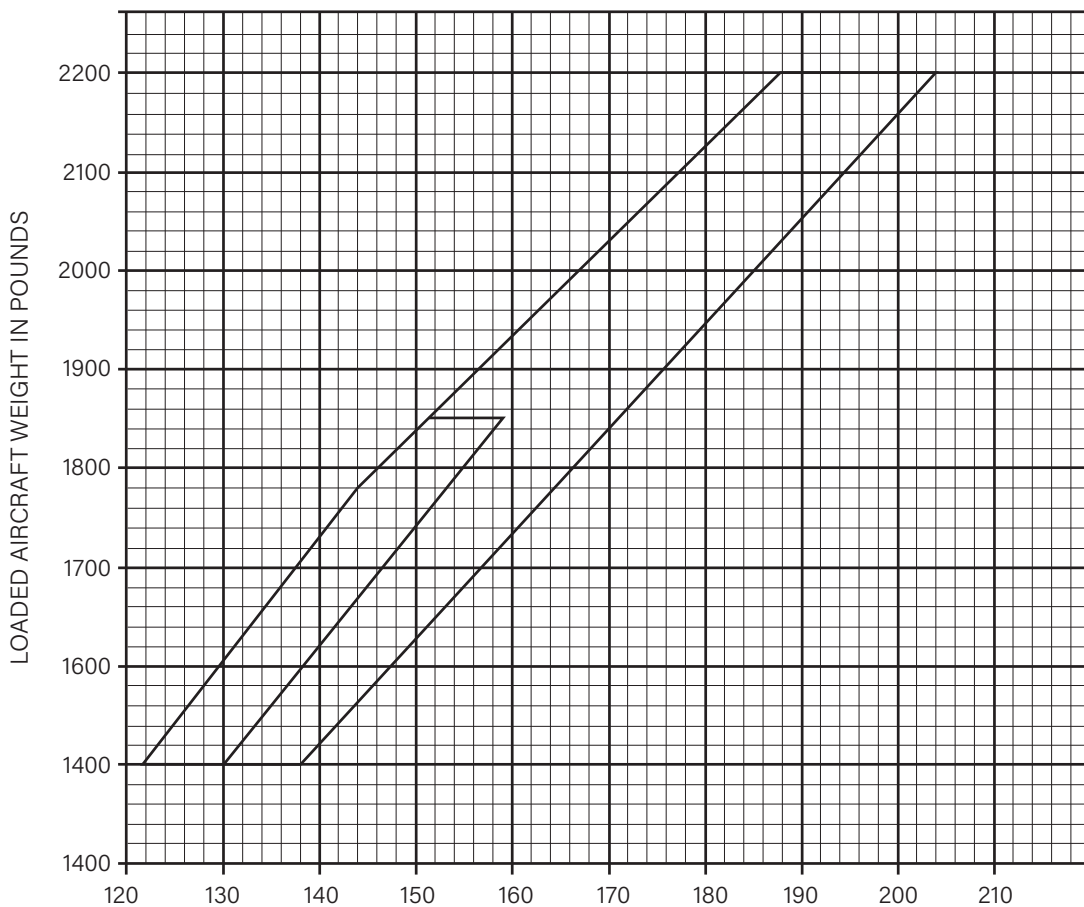
Check centre of gravity is within the envelope
at both ZFW and TOW.

LOADING SYSTEM BRAVO CHART

MOMENT/1000 INCH POUNDS
LOADING GRAPH



MOMENT/1000 INCH POUNDS
CENTRE OF GRAVITY ENVELOPE



ADD WEIGHT OF ITEMS TO BE CARRIED TO AEROPLANE EMPTY WEIGHT.
ADD MOMENT/1000 OF ITEMS TO BE CARRIED TO TOTAL AEROPLANE MOMENT/1000.
USE CENTRE OF GRAVITY ENVELOPE TO DETERMINE ACCEPTABILITY

LOADING SYSTEM CHARLIE INSTRUCTIONS

To check the loading of the aircraft before take-off, carry out a summation of weight and index units as shown in the example below. Check the centre of gravity of the aircraft at Zero Fuel Weight and Take-Off Weight by use of the following formula:

$$\text{CG (mm aft of datum)} = \frac{\text{Index Units} \times 100}{\text{Weight}}$$

The CG must be within the envelope given at all times.

Aircraft Limitations

Maximum take-off weight (normal category)	1,115 KG
Maximum take-off weight (utility category)	925 KG
Maximum load in baggage compartment	122 KG

Note:

1. Aircraft empty weight includes unusable fuel and undrainable oil
2. All arms are in mm aft of datum
3. 1 index unit = 100 KG mm

Quick Reference Tables

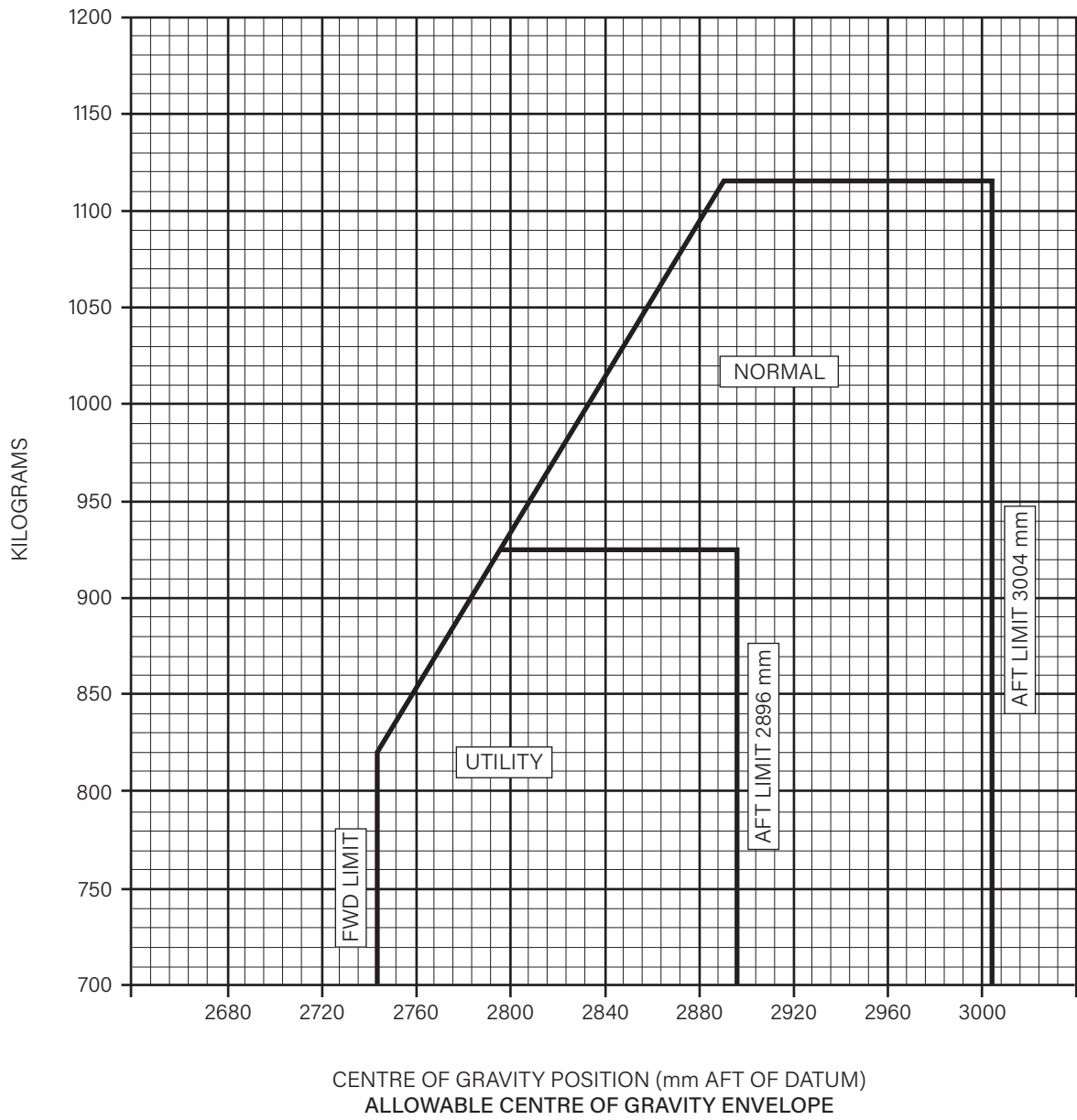
Fuel @0.72 ARM =2,950mm		
Litres	KG	Index Units
20	14.40	424.80
40	28.80	849.60
60	43.20	1,274.40
80	57.00	1,699.20
100	72.00	2,124.00
120	86.40	2,548.80
140	100.80	2,973.60
160	115.20	3,398.40
180	129.60	3,823.20
200	144.00	4,248.00
216	155.52	4,587.84

Baggage ARM=4,210mm	
Litres	Index Units
10	421
20	842
30	1,263
40	1,684
50	2,105
60	2,526
70	2,947
80	3,368
90	3,789
100	4,210
110	4,631
122	5,136

Aircraft Occupants		
KG	Row 1 ARM= 2,750 mm	Row 2 ARM= 3,600 mm
40	1,100	1,440
45	1,237	1,620
50	1,375	1,800
55	1,512	1,980
60	1,650	2,160
65	1,786	2,340
70	1,925	2,520
75	2,062	2,700
80	2,200	2,880
85	2,338	3,060
90	2,475	3,240

Oil ARM =1,230mm			
US Quarts	Litres	KG	Index Units
6	5.7	5.0	62
7	6.6	6.0	74
8	7.6	7.0	86

LOADING SYSTEM CHARLIE CHART



CENTRE OF GRAVITY POSITION (mm AFT OF DATUM)
ALLOWABLE CENTRE OF GRAVITY ENVELOPE

