



AIRPLANE FLIGHT MANUAL



BÖLKOW
BO 208 C

JUNIOR

BÖLKOW-APPARATEBAU GMBH

S.NO. 567-680

This Airplane Flight Manual is a translation of:

Flughandbuch Bölkow Bo 208 C Junior

DVL/PfL geprüft

Aircraft Nationality and
Registration Marks:

Factory Serial Number:

Year of Manufacture:

Type:	BÖLKOW BO 208 C JUNIOR
Product No.:	L - 644
Manufacturer:	BÖLKOW-APPARATEBAU GMBH Nabern/Teck Württ. Laupheim Plant
Applicable regulations:	CAR Part III, May 15, 1956 Amendments 3-1 through 3-7
Airworthiness group:	Normal and Utility Category
T.C. Data Sheet No.:	L - 644

This Flight Manual must be permanently kept aboard the aircraft

Compliance with all data listed herein is the sole responsibility
of the pilot.

DVL/PfL approved
19 May, 1965 PfL 48A

AMENDEMENTS

No.	Description	Page	DVL/PfL approved
1	Propeller	3, 20	20. 10. 1965
	Belts	21	20. 10. 1965
2	Placard	7	3. 2. 1966
	Fuel Warning Light	4	3. 2. 1966
	Ammeter	4	22. 6. 1966
	Equipment List	20	22. 6. 1966
3	Propeller	24	19. 7. 1966
4	Speeds	23	9. 1. 1967
5	Equipment List	20	12. 7. 1968
		21	
		22	

1. Limitations

The following limitations must be observed in the operation of this airplane

1.1 Powerplant

Continental O-200-A or Rolls-Royce O-200-A

Limit for all operations 2,750 rpm (100 H.P.)

1.2 Fuel

Aviation Gasoline

80/87 minimum octane

Fuel capacity 26.4 US gals. = 22.0 Imp. gals. = 100 l

Fuel usable 25.7 US gals. = 21.4 Imp. gals. = 97.5 l
= 159 lbs

1.3 Oil Grades

SAE 50 above 4°C = 40°F outside air temperature

SAE 30 below 4°C = 40°F

Maximum filling quantity 5 US qts. = 4.2 Imp. qts. = 4.7 l

Minimum quantity 2 US qts. = 1.7 Imp. qts. = 1.9 l

Quantity usable 3 US qts. = 2.5 Imp. qts. = 2.8 l

1.4 Propeller

1.4.1 Fixed metal propeller

Manufacturer McCauley

Type 1 A 100 MCM 6955

Static thrust 2,300 ⁺ 50 rpm

1.4.2 Fixed metal propeller (climb)

Manufacturer McCauley

Type 1 A 100 MCM 6950

Static thrust 2,450 ⁺ 50 rpm

1.4.3 Fixed metal propeller

Manufacturer McCauley

Type 1 A 100 MCM 6758

Static thrust 2,300 ⁺ 50 rpm

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1.5 Engine Instruments

<u>Fuel pressure</u>		psi	kg/cm ²
Maximum pressure	(red line)	6	0,42
Normal operating range	(green arc)	1.5-6	0,1-0.42
Minimum pressure	(red line)	1.5	0,1
<u>Oil Pressure (hot oil)</u>		psi	kg/cm ²
Maximum pressure	(red line)	60	4,2
Normal operating range	(green arc)	30-60	2,1-4,2
Minimum pressure idling	(red line)	10	0,7
<u>Oil Temperature</u>		°F	°C
Maximum temperature	(red line)	225	107
Normal operating range	(green arc)	75-225	30-107
Minimum temperature for take off	(red line)	75 [†]	30 [†]

[†]) this temperature is higher than specified in the engine handbook.
When obtaining readings, make sure pointer does no longer coincide with neutral position.

Revolution Indicator

Maximum rpm	(red line)	2,750 rpm
Normal operating cruising range	(green arc)	1,950 to 2,750 rpm

<u>Cylinder-Head Temperature</u> (optional equipment)		°F	°C
Maximum temperature	(red line)	525	274

Fuel Quantity Indicator

0 to 100 l

Scale calibrated in fractions

From serial number 595: Warning light for a fuel reserve of 2.2 Imp. Gal.

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Ammeter

1.6 Airspeed Limits (IAS) for Normal and Utility Category

	Symbol	Marking on Air Speed Indicator		
			mph	Knots
Never exceed	V_{ne}	red line	176	153
Caution range	$V_{ne} - V_{no}$	yellow arc	176-143	153-124
Normal range	$V_{ne} - V_{sl}$	green arc	143-67	124-58
Flap operating range	$V_{fe} - V_{so}$	white arc	91-59	79-51
Manoeuvring speed	V_p	-	122	106

(IAS = Indicated Air Speed)

1.7 Load Factor

Normal Category

Maximum limit load factor, positive $n = 3.8$

Maximum limit load factor, negative $n = 1.52$

Utility Category

Maximum limit load factor, positive $n = 4.4$

Maximum limit load factor, negative $n = 1.76$

1.8 Flight Manoeuvres

Normal Category:

All kinds of acrobatics including spins are not permitted.

Utility Category: see under para 1.12

1.9 Maximum ALL-UP Weight

Normal Category 1,390 lbs (630 kg)

Utility Category 1,320 lbs (600 kg)

1.10 Occupants

Minimum crew 1

Passengers 1

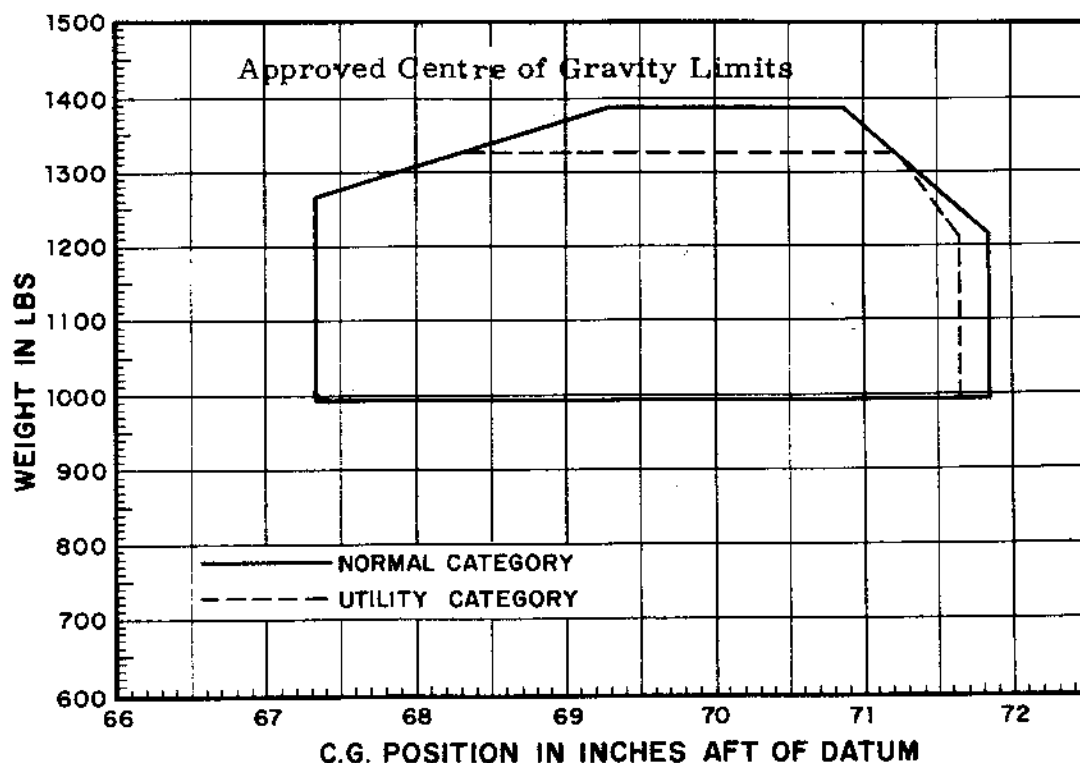
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1.11 C.G. Range

Datum (D):	75 in. in front of reference point (reference point: red encircled rivet on each fuselage side wall, located 4 in. forward of hole cen- ter of lower wing strut fitting.)
Levelling means:	rigging pegs on port fuselage side wall
Foremost location (normal category)	67 1/3 in. from D-weight 1,265 lbs 69 1/3 in. from D-weight 1,390 lbs
(utility category)	68 1/8 in. from D-weight 1,323 lbs 67 1/3 in. from D-weight 1,265 lbs 68 1/8 in. from D-weight 1,323 lbs
Rearmost location (normal category)	70 3/4 in. from D-weight 1,390 lbs 71 3/4 in. from D-weight 1,210 lbs
(utility category)	71 1/4 in. from D-weight 1,323 lbs 71 5/8 in. from D-weight 1,210 lbs

Straight line variation between points given.

Mean aerodynamic chord 48 in. (59 1/8 in. aft of datum)



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Responsibility for proper loading rests
with the pilot. For calculation of C.G.
positions see appendix A.

1. 11 Zulässiger Schwerpunktsbereich im Fluge

Bezugsebene (BE): 190 cm vor Markierung
(Markierung: rot umrandeter Niet an beiden Rumpfsseitenwänden, 10 cm vor Lochmitte des unteren Flügelstrebenbeschlages)

Horizontale Bezugsgerade Nivelliermarken an Rumpfsseitenwand links

Größte Vorlage Normalflugzeug: 171 cm von BE bei 574 kg
176 cm von BE bei 630 kg

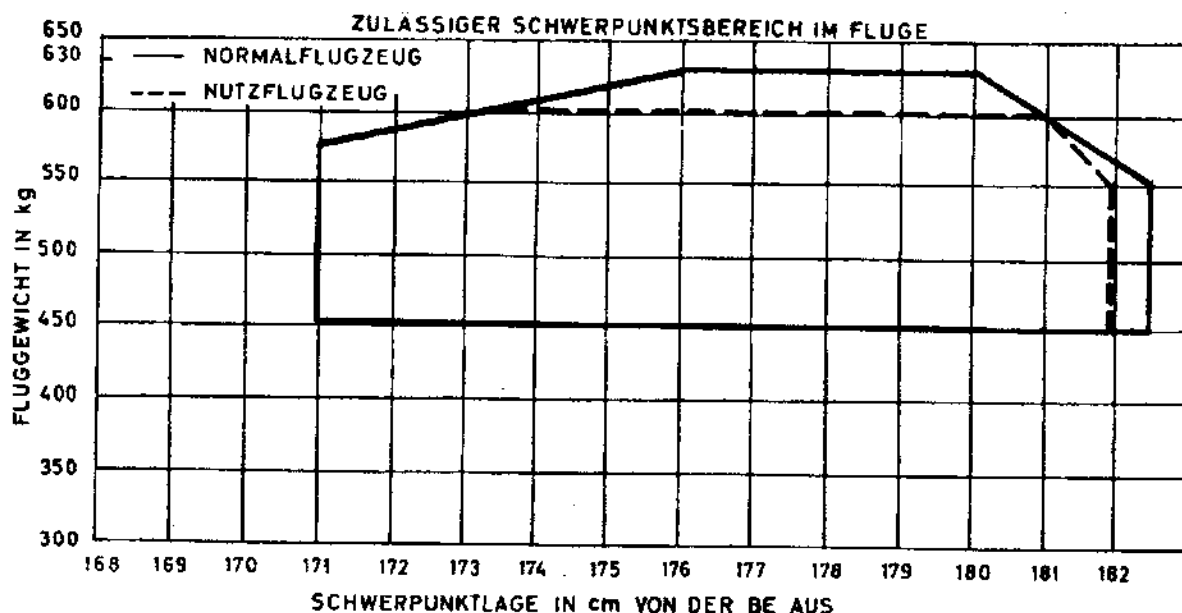
Nutzflugzeug: 171 cm von BE bei 574 kg
173,2 cm von BE bei 600 kg

Größte Rücklage Normalflugzeug: 180 cm von BE bei 630 kg
182,5 cm von BE bei 550 kg

Nutzflugzeug: 181 cm von BE bei 600 kg
182 cm von BE bei 550 kg

Zwischen den einzelnen Punkten gradlinige Veränderung.

Mittlere aerodynamische Flügeltiefe: 122 (150,2 cm hinter BE)



Der jeweilige Flugzeugführer ist für die richtige Beladung verantwortlich, Berechnung der Schwerpunktlagen siehe Anhang A zum Flughandbuch.

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1.12 Hinweisschilder

Am Instrumentenbrett im Blickfeld des Piloten:

Dieses Flugzeug muß als Normal- oder Nutzflugzeug in Übereinstimmung mit dem geprüften Flughandbuch betrieben werden.

Höchstzulässiges Fluggewicht:	Normalflugzeug	630 kg
	Nutzflugzeug	600 kg

+) Manövergeschwindigkeit V_p :

100 Kt (CAS)
122 MPH

Zulässige Seitenwindgeschwindigkeit: 20 Kt/23 MPH

Zulässige Betriebsarten:

Sichtflugregeln
Tag ohne Vereisung

Lufttüchtigkeitsgruppe Normalflugzeug:

Kunstflug einschließlich Trudeln nicht erlaubt.

Lufttüchtigkeitsgruppe Nutzflugzeug:

Zugelassene Flugfiguren und empfohlene Eingangsgeschwindigkeiten:

Trudeln ohne Klappen

Chandelle	110 Kt/127 MPH	Lazy Eight	110 Kt/127 MPH
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Gesteuerte Rolle	110 Kt/127 MPH	Steilkurven	110 Kt/127 MPH
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Turn	130 Kt/150 MPH	Looping	130 Kt/150 MPH
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Neben dem Kompaß:

Deviationstabelle

Am Gepäckraum:

Gepäck max 20 kg

Neben Kraftstoffvorratsanzeiger:

Kraftstoffvorrat voll 100 Liter
Nicht ausfliegbar 2,5 Liter

Bei der Kraftstoff-Warnlampe:

Achtung: Nur noch 10 l Kraftstoff

(ab Werk-Nr. 595)

Am linken Obergurt:

Schleppkupplung

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Revision: 3.2.66

+) Manövergeschwindigkeit ist die Geschwindigkeit, bis zu der volle Ruderausschläge gemacht werden dürfen.

1. 12. 1 Location of Placards

On instrument panel:

This airplane must be operated as a Normal or Utility Category Airplane in compliance with the Approved Airplane Flight Manual.

Maximum All-Up Weight:

Normal Category 1, 390 lbs.

Utility Category 1, 323 lbs.

Design manoeuvring speed V_p 122 mph (CAS) 106 kt ⁺

Demonstrated crosswind velocity 23 mph 20 kt

Type of operation approved - VFR/DAY No icing

No acrobatic manoeuvres including spins approved for Normal Category operation.

The following manoeuvres are approved for operation in the Utility Category only, with recommended entry speeds shown:

Spins without flaps	Lazy Eight	127 mph/110 kt
Chandelle	127 mph/110 kt	Steep turns 127 mph/110 kt
Aileron roll	127 mph/110 kt	Inside loop 150 mph/130 kt
Turn	150 mph/130 kt	

Adjacent to compass

Compass Correction

Near the baggage compartment:

Maximum capacity 45 lbs.

Adjacent to Fuel Quantity Indicator:

Fuel Quantity 26.4 US gals.
= 22.0 Imp. gals.
Not usable 0.6 US gals.
= 0.55 Imp. gals.

Adjacent to Fuel Warning Light:

Caution: Only 2.2 Imp. Gals. of fuel
(from serial number 595)

Upper left longeron:

Tow Coupling

(optional equipment)

⁺ Manoeuvring speed is defined as the speed at and below which full rudder deflections are permissible.

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2. Procedures

Notes on CAS, Utility Category Aircraft, Emergency Procedures.
The following directives are given for operating conditions other than normal.

2.1 Calibrated Airspeed (CAS)

Calibrated airspeed is equal to the airspeed indicator reading corrected for position and instrument error.
Consult table on page 9 for appropriate corrections.

2.2 Operating Limitations for Utility Category Aircraft

Be sure to meet the C. G. envelope requirements for utility category aircraft. In this category the C. G. range has been reduced, as outlined under para 1.11.

For approved manoeuvres including their recommended entry speed refer to placard on instrument panel and the corresponding para 1.12 in this Flight Manual.

Spins are permitted only with flaps retracted.

The aircraft recovers from spins instantly, if the stick is brought into neutral position and the rudder fully extended in the opposite direction to the spin.

Following acrobatic flight manoeuvres the oil level must be inspected during postflight check.

2.3 Emergency Procedures

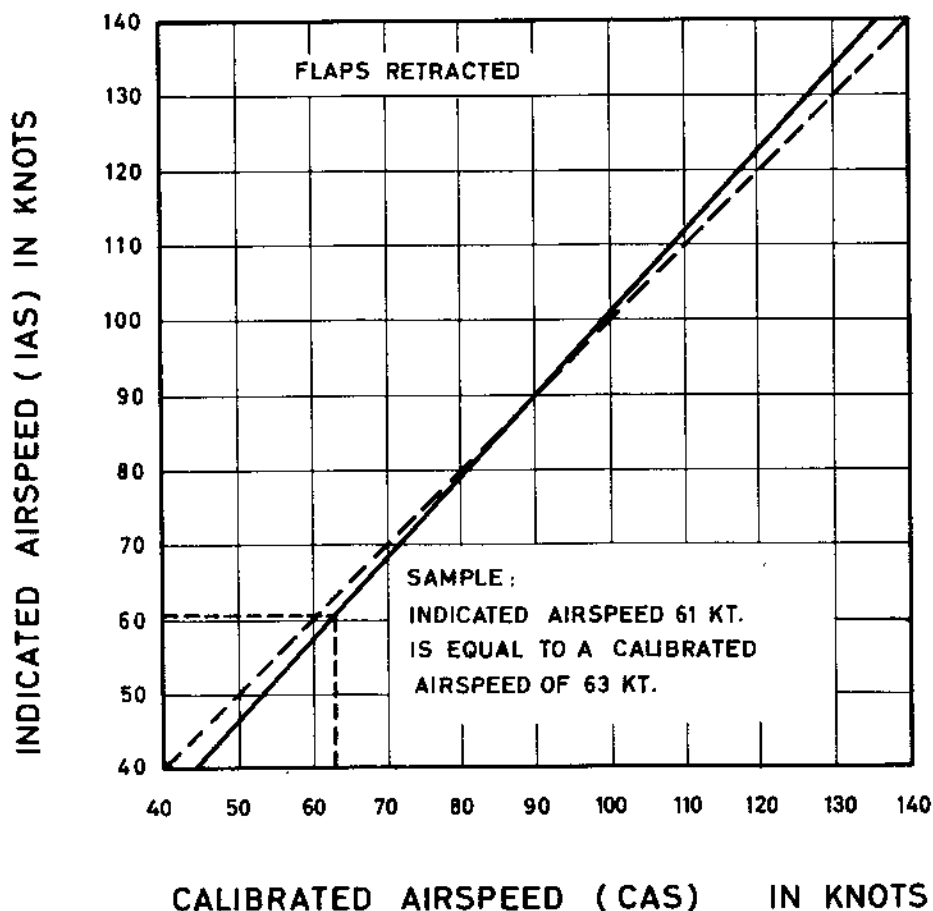
2.3.1 Go-around procedures

- a) Smoothly advance throttle
- b) Carburettor air heat "OFF"
- c) At speed above 63 mph (55 kt) retract landing flaps slowly

2.3.2 Fuel System

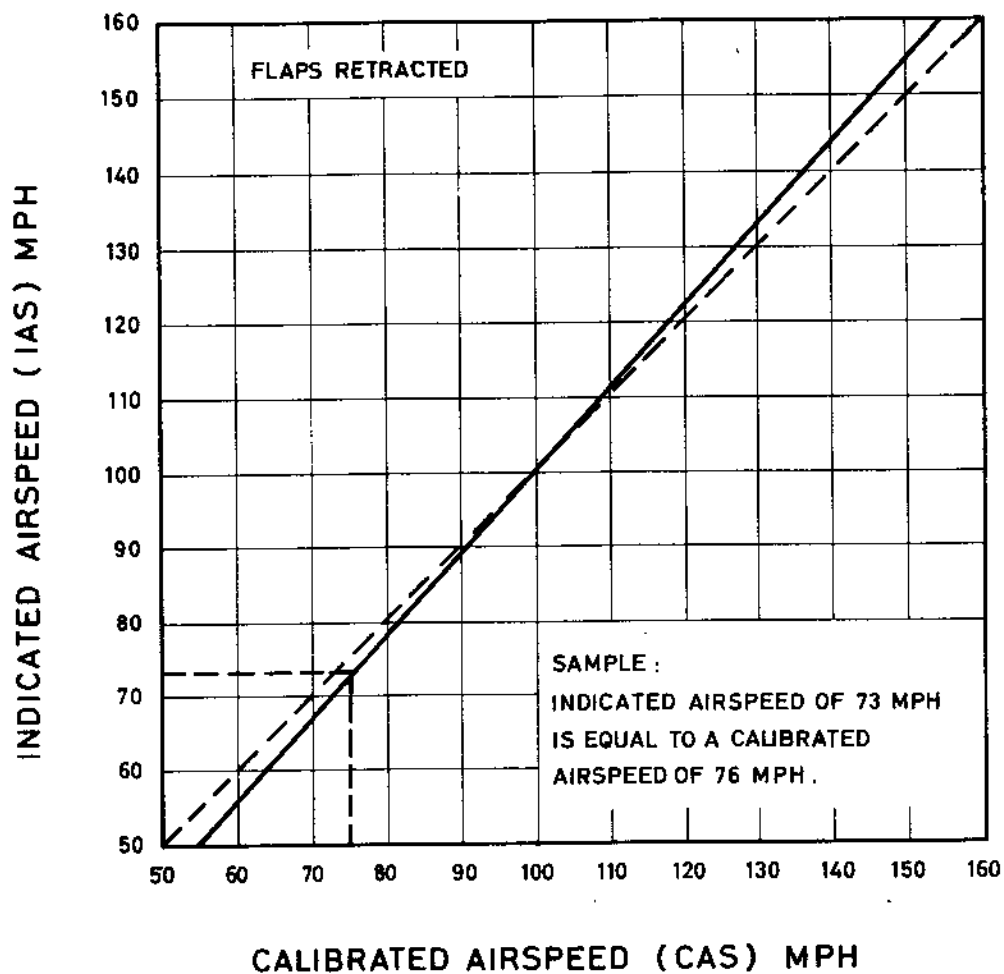
Auxiliary fuel pump "ON", if fuel pressure decreases below minimum pressure

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Figures for True Airspeeds (TAS), allowing for variations with altitude, are listed in the Operator's Handbook.

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Figures for True Airspeed (TAS), allowing for variations with altitude, are listed in the Operator's Handbook.

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3. Performance Characteristics

3.1 Flight Data

The following operational data have been calculated on the basis of flight data obtained during the course of type-testing the airplane.

They can be performed under the same conditions with airplane and engine in good condition using average piloting technique.

Performance figures are based on 1,390 lbs gross weight, zero wind velocity, hard surface runway and McCauley Propeller (see para. 1.4.1.)

When using the following table allowance should be made for prevailing conditions.

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Flugleistungstabelle

Leistungsart	Höhe (ft)	Außenluft-Temperatur °C				
		-15°	0°	+15°	+30°	+40°
Startstrecke (m) bis zum Überfliegen eines 15 m Hindernisses (Betonbahn)	0	334	372	410	450	482
	1000	360	400	442	488	518
	2000	398	432	478	528	565
Steigfluggeschw. 65 Kt/75 MPH (IAS) Vollgas	3000	418	466	516	575	-
Landeklappen 8°	5000	440	550	617	-	-
Startstrecke (m) bis zum Überfliegen eines 15 m Hinder- nisses (Grasbahn). Steigflug- geschw. 65 Kt/75 MPH (IAS)	0	369	408	450	498	528
	1000	399	438	485	536	571
	2000	429	476	524	584	621
Vollgas	3000	464	515	571	635	-
Landeklappen 8°	5000	545	609	686	-	-
Landestrecke (m) über ein 15 m Hindernis. Anschwebe- geschw. 70 Kt/81 MPH (IAS)	0	400	425	450	475	490
	1000	420	440	465	490	505
	2000	435	460	485	510	525
Landeklappen 35°	3000	450	475	500	530	-
	5000	485	510	540	-	-
Steiggeschw. (ft/min)	0	834	771	710	649	618
Fluggeschw. 65 Kt/75 MPH (IAS) Vollgas	1000	782	720	659	597	566
	2000	731	659	607	546	504
Landeklappen eingefahren	3000	669	607	545	494	-
	5000	566	494	442	-	-
Steiggeschw. (ft/min)	0	504	453	402	359	329
Fluggeschw. 55 Kt/63 MPH (IAS) Vollgas	1000	447	396	347	303	276
	2000	394	345	299	254	227
Landeklappen 35° ausgefahren	3000	345	296	250	205	-
	5000	245	197	151	-	-

Dienstgipfelhöhe (4000 m) 13 000 ft

Überziehgeschwindigkeit

Leerlauf, Landeklappen eingefahren, Fluggewicht 630 kg

Kurvenneigung (°)	0	20	40	50	60
IAS (Kt)	50	52	57	63	71
IAS (MPH)	57	60	65	73	82

Leerlauf, Landeklappen 35° =
43 Kt/49 MPH

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19.7.1965 P/L 48 A

Table of Performance Data

Performance	Altitude (ft)	Outside Air Temperature deg. C.				
		-15°	0°	+15°	+30°	+40°
		5°F	32°F	59°F	86°F	104°F
Take-off distance (ft) to clear 50 ft-obstacle. Concrete runway. Climbing speed 75 mph=65 kt (IAS) Full throttle. Flaps down 8°	0	1098	1220	1347	1475	1580
	1,000	1180	1310	1450	1600	1700
	2,000	1305	1420	1570	1730	1855
	3,000	1370	1530	1695	1885	
	5,000	1445	1805	2020		
Take-off distance (ft) to clear 50 ft-obstacle. Turf runway. Climbing speed 75 mph=65 kt IAS. Full throttle. Flaps down 8°	0	1210	1340	1478	1635	1732
	1,000	1310	1438	1590	1760	1875
	2,000	1408	1560	1720	1918	2020
	3,000	1522	1690	1872	2082	
	5,000	1788	1995	2250		
Landing distance (ft) clear 50 ft-obstacle. Approach speed 81 mph=70 kt (IAS) Flaps down 35°	0	1312	1395	1475	1560	1610
	1,000	1380	1445	1525	1610	1660
	2,000	1428	1510	1590	1675	1720
	3,000	1475	1560	1640	1740	
	5,000	1590	1675	1770		
Rate of climb (ft/min) Speed 75 mph=65 kt (IAS) Full throttle Flaps up	0	834	771	710	649	618
	1,000	782	720	659	597	566
	2,000	731	659	607	546	504
	3,000	669	607	545	494	
	5,000	566	494	442		
Rate of climb (ft/min) Speed 63 mph=55 kt (IAS) Full throttle Flaps down 35°	0	504	453	402	359	329
	1,000	447	396	347	303	276
	2,000	394	345	299	254	227
	3,000	345	296	250	205	
	5,000	245	197	151		

Service ceiling 13,000 ft (4000 m)

Stalling Speeds

Engine idling, flaps up, gross weight 1,390 lbs

Angle of bank deg.	0	20	40	50	60
IAS mph	57	60	65	73	82
kt	50	52	57	63	71

Engine idling, flaps 35° = 43 kt / 49 mph

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Space for Amendments

CALCULATION OF THE POSITION
OF THE CENTRE OF GRAVITY

ATTENTION !

The pilot is responsible for proper loading of the airplane. Centre of gravity locations beyond the limits shown in the following graphs will result in dangerous flight attitudes.

In order to calculate the C. G. moment, the following data are required:

- Current weight and balance report, Pfl approved
- Graph of weights and moments of disposable load
- Graph of permissible C. G. range.

To calculate the position of the centre of gravity proceed as follows:

- 1) Add up empty weight (as specified in weight and balance report) and individual weights of items loaded aboard. The sum arrived at, is the gross weight.
- 2) The moment of the empty weight is taken from the weight and balance report; to find the moments of the disposable load consult graph I. Add up the moments.
- 3) Both total weight and total moment must fall within the shaded area of graph II, if the centre of gravity is within the allowable limits.

If the centre of gravity is not found within the shaded area, the load must be changed.

Fuel is expressly mentioned in the following example, because it represents a variable (fuel on board decreases during flight). The centre of gravity has therefore to fall into the allowable range with both full and empty fuel tanks.

Sample Problem for C. G. Location:

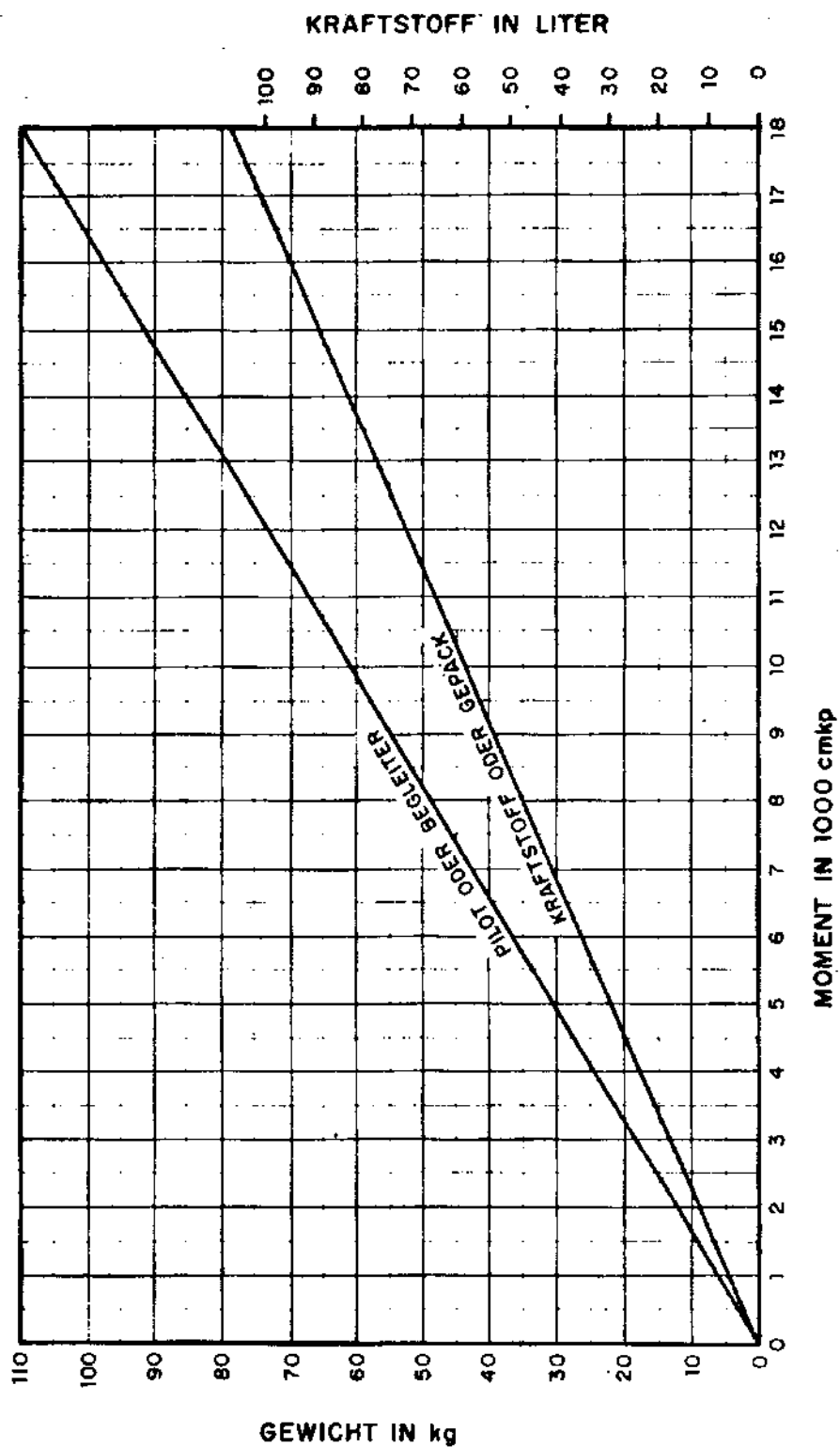
	WEIGHT		MOMENT	
	lb	kg	1,000 in. lb	1000 cmkg
Empty Weight ⁺⁾	815	370	56.5	64.0
Pilot	170	76	10.6	12.2
Passenger	154	70	10.1	11.6
Baggage	22	10	2.0	2.3
Total	1,161	526	79.2 Point I	90.1
Fuel (21.1 US gals) (17.6 Imp. gals)	159	72	14.55	16.7
Total	1,320	598	93.75 Point II	106.8

When checking graph II we will find that points I and II are well within the shaded area, as is required.

⁺⁾ Taken from the most recent weight and balance report.

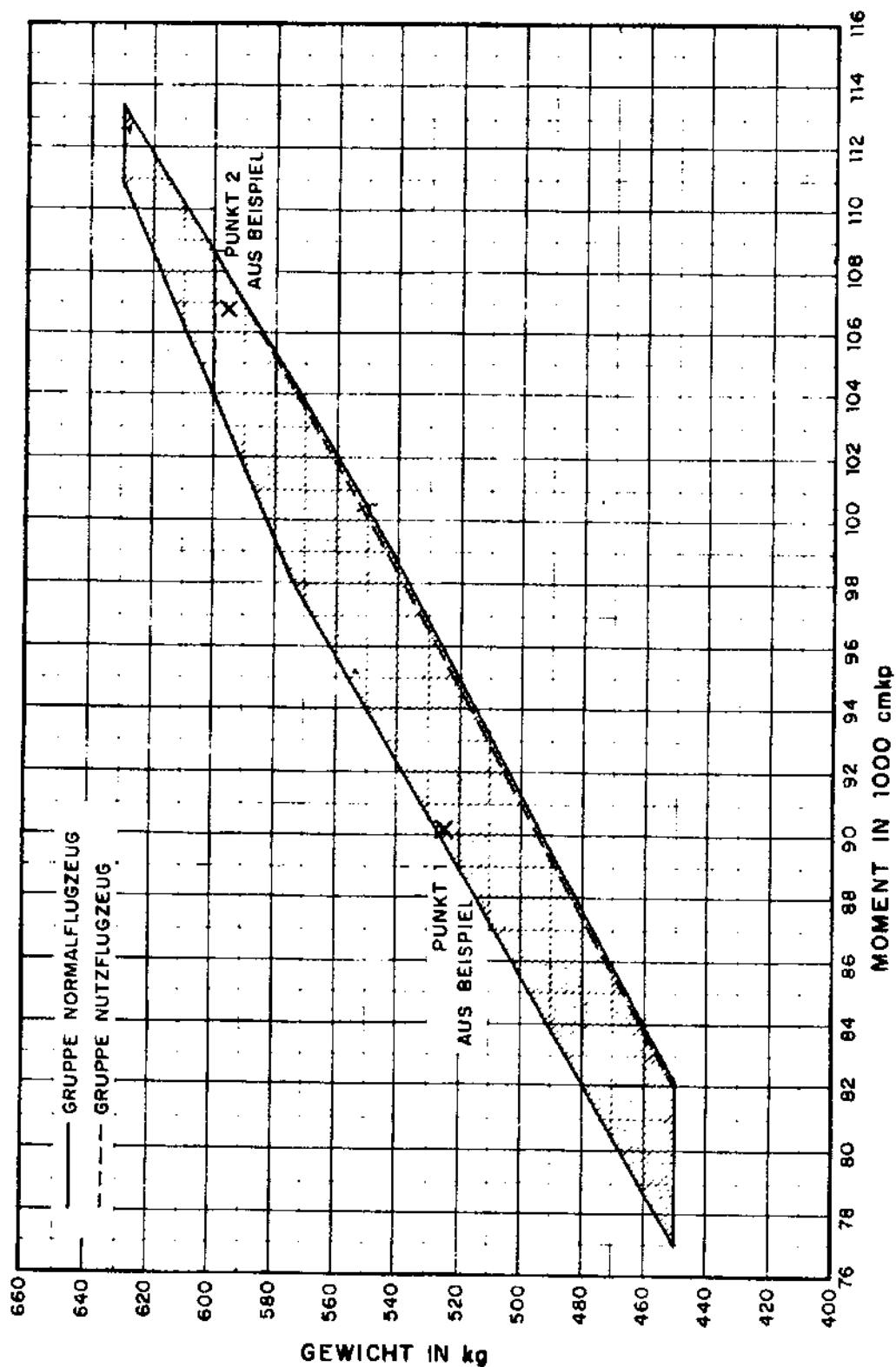
GEWICHTE UND MOMENTE DER ZULADUNG

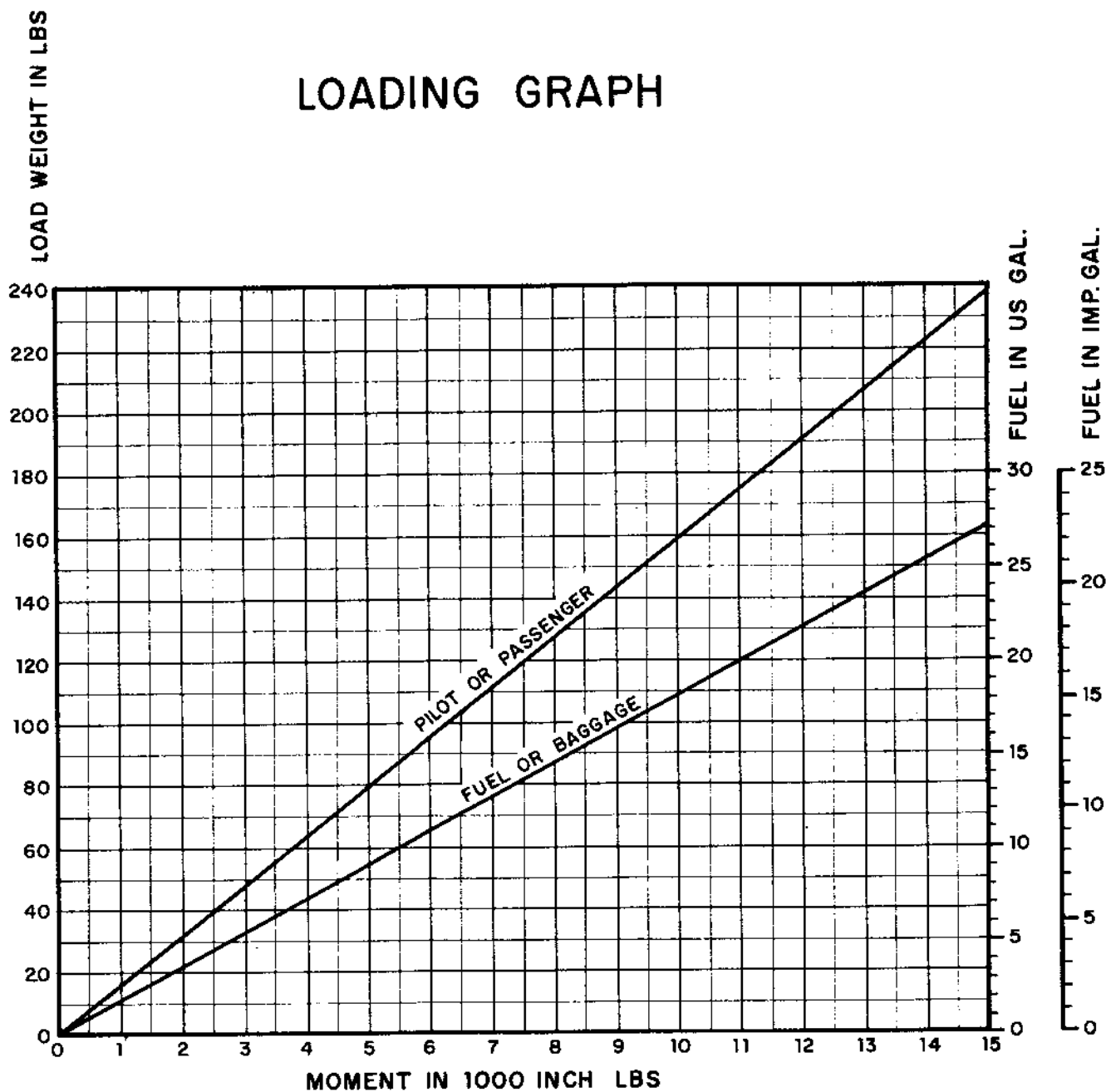
DIAGRAMM I



ZULÄSSIGER SCHWERPUNKTSBEREICH

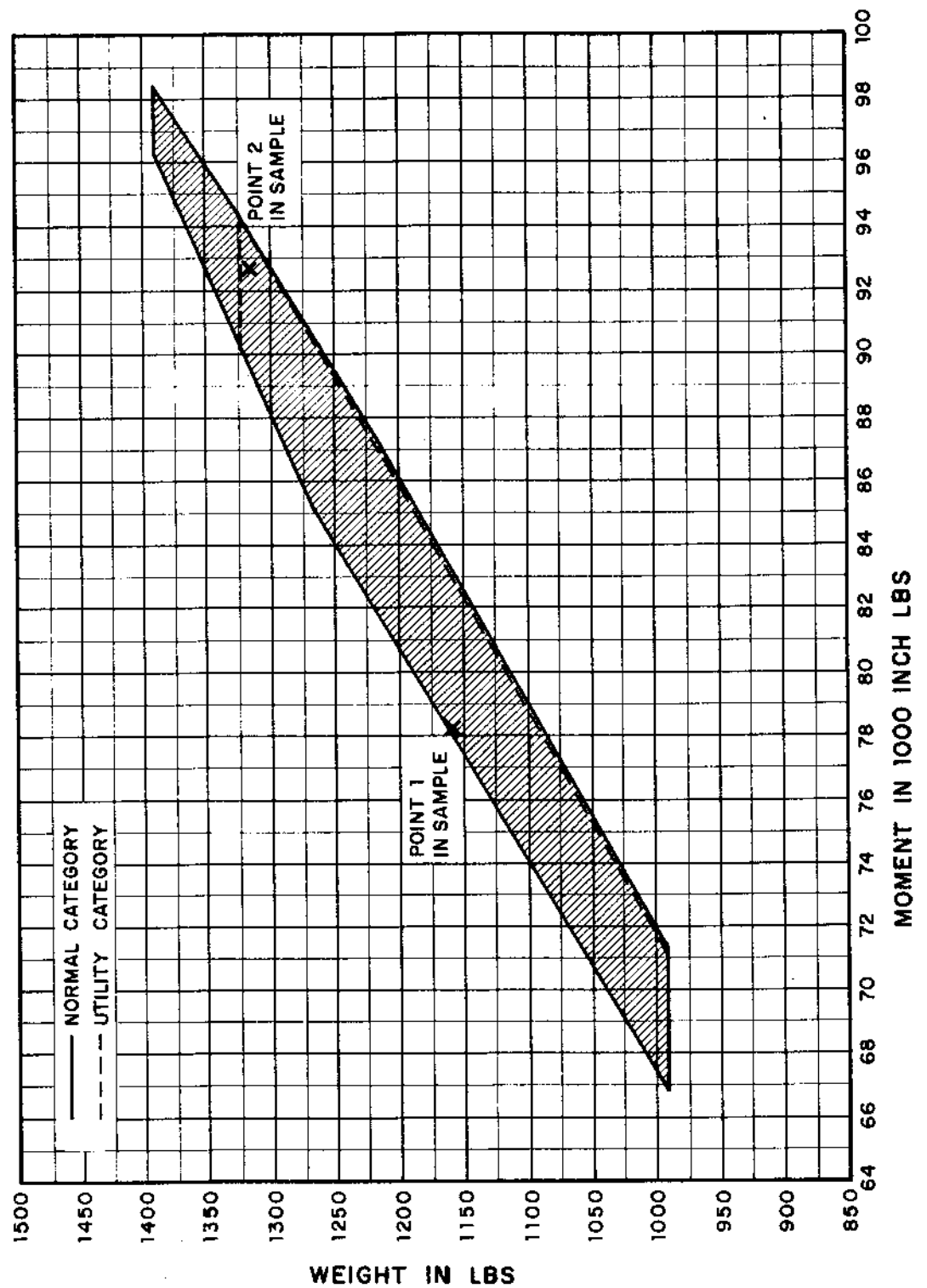
DIAGRAMM II





GRAPH 1: WEIGHT AND MOMENTS OF THE DISPOSABLE LOAD

CENTRE OF GRAVITY MOMENT ENVELOPE



GRAPH II: PERMISSABLE C.G. RANGE

Attach current weight
and balance report.

As a rule the weight and balance report is prepared as part of the annual inspection. However, a weight and balance report is required following the incorporation of modifications or the completion of major additional changes and the repair of damage sustained in an accident.

Enter data of current weight and balance report here as an aid to find the C. G. location.

Date of issuance	Empty weight	Moment of empty weight

EQUIPMENT LIST

Serial No.
Registration mark
Date

Items of equipment marked (x) factory-installed.

Items marked (0) are not factory-installed.

<u>Item No.</u>	<u>DESCRIPTION</u>
1. ...	Propeller McCauley 1 A 100 MCM 6955 Serial No.
...	McCauley 1 A 100 MCM 6950 Serial No.
...	McCauley 1 A 100 MCM 6758 Serial No.
2. ...	Generator Delco-Remy 11091890, 12 V, 20 A
3. ...	Voltage Regulator (Generator) Delco-Remy 1118736 D
4. ...	Magnetoes, two Scintilla S 4 LB-21
5. ...	Fuel Pump (engine-driven) AC-No. 40585
6. ...	Auxiliary Fuel Pump (electrically operated) Bendix 12 V E 111240
7. ...	Starter (including switch) Delco-Remy 1109656 12 V
8. ...	Battery Rëbat Executive S 25
9. ...	Relais, Battery Cutler-Hammer 12 V, 200 A, No. 6041-H 105 A
10. ...	Stall Warning Indicator Safe Flight Instr. Corp. Part No. C-75201 and 1-02-019
11. ...	Navigation Light, red Westf. Met. Ind. Z 202.01
...	Navigation Light, red Grimes A 1285 12 V
12. ...	Navigation Light, green Westf. Met. Ind. Z 202.01
...	Navigation Light, green Grimes A 1285 12 V
13. ...	Navigation Light, tail, white Westf. Met. Ind. Z 205.01
...	Navigation Light, tail, white Grimes A 2064 12 V
14. ...	Carburetter Marvel Schebler MA - 3 SPA
15. ...	Carburetter Air Filter Assey Type P-IS
16. ...	Fuel Filter Pioneer Aero Service PFF - 100 - 1
17. ...	Revolution Indicator, VDO KL 12.200.11/0915
17a ...	Revolution Indicator Shaft L 20.091.50/01.36

18. ... Oil Pressure Gauge VDO KL 35.100.12/0302
... Transmitter, Oil Pressure KL 36.055.81/2/1
19. ... Fuel Quantity Indicator VDO KL 30.100.12/10.01
... Transmitter KL 22.054.01/08
... Transmitter, (Warning Light)VDO 22.054.02/08
(from serial number 595)
... Warning Light, Messmer 5.352
20. ... Fuel Pressure Gauge VDO KL 35.100.12/01.07
... Transmitter, Fuel Pressure KL 36.055.81/2/4
21. ... Air Speed Indicator Winter 6 FM 5 (6 FMS 1)
22. ... Rate of Climb Indicator Winter 5 VM
23. ... Compass Ludolf FK 16
24. ... Altimeter Kelvin and Hughes KAA - 0901 PM/0
... Altimeter SP 5000 Kollsmann 371
25. ... Oil Temperature Gauge VDO KL 31 - 100-12/01.07
... Transmitter, Oil Temperature VDO KL 32.009.21/7/1
26. ... Lap Belts (two) Air Associates M 7500 M 13-60
... Lap Belts (two) Baisch Bagu IV 40.070/16
27. ... Shoulder Harness (two) Air Associates M 7700 M 2-34
... Shoulder Harness (two) Baisch Schugu II 40.071/05
28. ... Nose wheel (one) 5.00-5 Type III Cleveland 40-18
... Main wheels (two) 5.00-5 Type III Cleveland 40-12
29. ... Tyres, Main wheels:
Tubeless Continental Aircraft Tyres, 5.50-5 Type III 6 PR
No. K-30.261/39
... Continental Aircraft Tyres with Tube, 5.50-5 Type III
... Tyre, nose wheel:
Tubeless Continental Aircraft Tyres, 5.00-5 Type III 6 PR
No. K-30.261/18
... Continental Aircraft Tyres with Tube, 5.00-5 Typ III
30. ... Motor, Landing Flap System, Bosch 0132. 001. 004, 12 V, 40 W
31. ... Ammeter VDO-BE 401 (from serial number 595)

OPTIONAL EQUIPMENT

1. ... VHF Radio Communications Set Becker AR 12 M
- ... VHF Radio Communications Set Becker AR 380
2. ... VOR NARCO VOR - 4 complete, receiver DARE 480
3. ... VHF Communication Antenna Hirschmann Moba 210 Fa
4. ... Cylinder Head Temperature Gauge VDO KL-50T-300/1/3
5. ... Thermocouple DEGUSSA ET 17 S - 1026
6. ... Turn and Bank Indicator Gauting WZ 402/30
7. ...
8. ... Speaker Becker P 28 PL 007
9. ... Clock - Junghans Bo UK 1
- ... Clock Sinn Na Bo 16
10. ... Towing Equipment, Bölkow Drawing No. 208-22503
11. ... Rear View Mirror
12. ... Towing Equipment - Towing of Non-rigid Objects
(mirror, rope, anchor) Technical Bulletin No. 208-27/64
13. ... Gyro Horizon
14. ... Venturi Tube AN 5807-1 Friebe Nr. 9/988

CERTIFICATION FOR TOWING OF GLIDERS
AND NON-RIGID OBJECTS

1. Limitations - Glider Towing

1.1 Table of maximum permissible gross weights in lbs.

Tow plane	Sailplanes Towing Group Categories +)			
	a	b	c	d
1125 lbs	1100 lbs	1100 lbs	1060 lbs	1060 lbs

+)

These categories are established to classify sailplanes of German design in accordance with performance requirements necessary for towing.

1.2 Take-off

If maximum weights apply under normal conditions (still air, temperature 15° C (60° F), at 0 feet MSL, dry horizontal turf runway of normal surface condition) a take-off distance of 2600 ft must be available to clear a 50 ft obstacle.

1.3 Minimum speed of air train 54 kt (62 mph)

1.4 Maximum speed of air train (refer to Airworthiness Certificate of sailplane)

Glider towing is permitted only for sailplanes with an approved max. towing speed of at least 62 kt (71 mph) or above.

1.5 No other than fabric ropes should be used for towing.

1.6 Nominal breaking points

rope end nearest tow plane: Point II (1210... 1325 lbs)

rope end nearest sailplane: refer to sailplane certification

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2. Towing of Non-rigid Objects (e. g. banner towing)

2.1 Table of maximum permissible gross weights in lbs

Tow plane	maximum permissible drag force resulting from tow object at a speed of 54 kt (62 mph, 100 km/h)
510 kg=1.125 lbs	53 kg = 117 lbs

2.2 Minimum speed of air train 43 kt/50 mph

2.3 Safe approach speed, wind calm 80 kt/92 mph

2.4 Maximum weight of tow object including anchor and rope 33 lbs (15 kg)

2.5 Length of tow rope 100 to 165 ft (30-50 m)

2.6 Ultimate strength of rope 1, 210 to 1, 320 lbs (550 - 600 kg)

When using a stronger rope nominal breaking points for loads of 1, 210 to 1, 320 lbs shall be provided at the fore and aft ends of the rope. No other than fabric ropes should be used.

2.7 Prior to a low-level pick-up the pilot shall make certain that the rope is properly cast off and clear of the tail unit.

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3. Condition of the Airplane

3.1 Powerplant

Continental O-200-A or
Rolls-Royce O-200-A

3.2.1 Propeller

McCauley 1 A 100 MCM 6950 or

3.2.2 Propeller

McCauley 1 A 100 MCM 6955

3.3 Installation

Towing Attachment

Installation of towing attachment is to be done in compliance with DVL/PfL (Department for the Approval of Aeronautical Products) approved drawings of Bölkow GmbH.

Applicable Drawing or Parts List N^o.

208-22503 (coupling, complete)

208-22513 (release lever)

208-22523 (coupling)

208-22533 (cable installation)

208-22543 (cable installation)

3.4 A rear-view mirror is to be installed in such a manner, that it will provide an unimpaired view of the tow-object for the pilot.

3.5 A cylinder head thermometer is to be installed on the N^o.2 cylinder (critical). Do not exceed the maximum permissible cylinder head temperature of 525^oF (275^oC) (red line).

3.6 For low-level pick-up operations of non-rigid objects installation of a cast-off boom for tow rope and anchor together with a rear-view mirror on the port wing strut is required (applicable drawing N^o. 208-22563), in addition to DVL/PfL approved Bölkow drawings listed under para 3.1 thru 3.5.