

/2/ Oil System

The oil tank is located in the engine compartment in front of the firewall.

/3/ The fuel and oil system enable aerobatic maneuvers and inverted flights (in AEROBATIC and UTILITY categories only).

1.5.9. Equipment

/1/ Electrical System is of a single-wire type /+pole/. The - pole is conducted by the aircraft frame. Nominal DC voltage is 28 V. The primary power source is a 600 W dynamo, driven directly by the engine. The auxiliary power source is the 25 Ah capacity lead-acid type battery. For the connection of an external power source there is a standard socket located on the left side of the fuselage (protected against polarity inversion).

/2/ Fire - Extinguishing Equipment:

Hand-held fire extinguisher, located in the cockpit.

/3/ Heating and Ventilation System

The aircraft is equipped with an adjustable cockpit heating and ventilation system.

/4/ Lights

The aircraft is equipped with:

- Taxiing and landing lights,
- Position lights,
- Instrument panel lights /luminous intensity control/
- The "Map reading" light /luminous intensity control/ and
- Anticollision strobe system.

- Landing gear:
- wheel track 2.330 m 7.64 ft.
  - wheel base 1.660 m 5.45 ft.
  
  - wheel size:
    - main landing gear 420 x 150 mm  
16.5 in. x 5.9 in.
    - nose wheel 350 x 135 mm  
13.8 in. x 5.3 in.
  
  - tyre pressure:
    - main landing gear 190 kPa 27 p.s.i.
    - nose wheel 250 kPa 35.6 p.s.i.

1.6.2. Specific Loadings

Category	Specific wing loading		Specific power loading	
	kg/m <sup>2</sup>	lb/sq.ft.	kg/kW	lb/HP
Aerobatic /A/	73.8	15.1	6.3	10.4
Utility /U/	77.6	15.9	6.6	10.9
Normal /N/	82.9	17.0	7.1	11.7

1.6.3. Empty Weight

Refer to Sect. 6 for Standard and Basic Empty weight.

1.6.4. Power Plant

The M 337 AK engine:

Cylinder bore	105 mm	4.134 in.
Stroke	115 mm	4.528 in.
Total cylinder volume	5.97 litres	364.3 cub.in.
Compression ratio	6.3 : 1	
Sense of rotation	anticlockwise	

The V 500 A propeller:

Number of blades	2	
Propeller diameter	2000 mm	78.74 in.

Engine Power - Speed - Manifold Pressure:

Power setting - - Speed	Speed	Manifold pressure		Power		Super-charger	Note
	RPM	kPa	in.Hg	kW	Hp		
Maximum take-off	2750 $\pm$ 30	+1 118 $\pm$ 2	+0.3 35.0 $\pm$ 0.6	154.5 $\pm$ 2.5%	207 $\pm$ 2.5%	ON	max. 5 min.
Maximum continuous	2600 $\pm$ 3%	98 $\pm$ 2	29.0 $\pm$ 0.6	125 $\pm$ 2.5%	168 $\pm$ 2.5%	OFF	unli- mited
Maximum cruise	2400 $\pm$ 3%	90 $\pm$ 2	26.5 $\pm$ 0.6	103 $\pm$ 2.5%	138 $\pm$ 2.5%	OFF	(1)

**NOTE:**

(1) Maximum cruising power in altitude 0 m ISA.

1.7. CONVERSION OF UNITS

Following table is helpful for metric to the Imperial (and vice-versa) units conversion.

Units	Conversion factors			
Dimension, Distance	m - ft	3.2810	ft - m	0.3048
	km - Nm	0.5396	Nm - km	1.8532
	km - Stm	0.6214	Stm - km	1.6093
	cm - in.	0.3937	in. - cm	2.5400
Area, Surface	m <sup>2</sup> - sq.ft.	10.7600	sq.ft. - m <sup>2</sup>	0.0929
	m <sup>2</sup> - sq.in.	1550.0000	sq.in. - m <sup>2</sup>	0.0006
Volume, Capacity	m <sup>3</sup> - cub.ft.	35.3100	cub.ft. - m <sup>3</sup>	0.0283
	cm <sup>3</sup> - cub.in.	0.0610	cub.in. - cm <sup>3</sup>	16.3900
	l - cub.ft.	0.0353	cub.ft. - l	28.3200
	l - cub.in.	60.9756	cub.in. - l	0.0164
	l - US gal.	0.2642	US gal. - l	3.7850
Speed	km/h - knots	0.5396	knots - km/h	1.8532
	m/s - ft/min	196.8000	ft/min - m/s	0.0051
	m/s - knots	1.9426	knots - m/s	0.5148
	m/min - ft/min	3.2810	ft/min - m/min	0.3048
Pressure	kPa - p.s.i.	0.1450	p.s.i. - kPa	6.8966
	kPa - in.Hg	0.2953	in.Hg - kPa	3.3864
Weight	kg - lb	2.2046	lb - kg	0.4536
Static moment	kgm - lbft	7.2333	lbft - kgm	0.1382
Egine power	kW - HP	1.3410	HP - kW	0.7457
Tempera- ture	°C - °F	(°C x 9/5) + 32	°F - °C	(°F - 32) x 5/9

EXAMPLE: Task: Weight of variable load is M = 700 lb.  
----- M = ? kg.

Computation: M = 700 x 0.4536  
-----

Result: M = 700 lb = 317.5 kg  
=====

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## 2. OPERATING LIMITATIONS

### 2.1. VALIDITY OF OPERATING LIMITATIONS

- 2.1.1. Approved operating limitations Listed in the Section 2 apply to the - AEROBATIC /A/, UTILITY /U/ and NORMAL /N/ categories, unless stated otherwise.
- 2.1.2. Limitations associated with Optional Systems or equipment are provided in Section 7 SUPPLEMENTS.

### 2.2. KINDS OF OPERATION LIMITS

- 2.2.1 The following types of operations are approved when the required equipment is installed and operational as defined in the KINDS OF OPERATIONS EQUIPMENT LIST:
1. VFR Day
  2. VFR Night
  3. IFR Day
  4. IFR Night

FLIGHT INTO KNOWN ICING CONDITIONS IS PROHIBITED!

### 2.2.2 Kinds of Operation Equipment List

The following equipment list (KOEL) identifies the systems and equipment upon which Type Certification for each kind of operation was predicated. The systems and items of equipment must be installed and operable for the particular kind of operation indicated, unless:

- The airplane is approved to be operated in accordance with a current Minimum Equipment List (MEL) issued by the responsible Civil Aviation Authority, or
- An alternate procedure is provided in this AFM for the inoperative state of the listed equipment and all limitations are complied with.

**NOTE:**

The following KOEL may not include all equipment (as COMM/NAV etc.) required by the applicable Operating Requirements. It also does not include components obviously required for the airplane to be airworthy.

SYSTEM and/or COMPONENT	VFR Day			
	VFR Night			
	IFR Day		IFR Night	
<b>ELECTRICAL POWER</b>				
1. DC Generator	1	1	1	1
2. Battery	1	1	1	1
3. DC V-A Meter	1	1	1	1
4. Generator Annunciator	1	1	1	1
5. Emergency Power Source	0	1	1	1
6. Emergency Power Annunciator	0	1	1	1
<b>FIRE PROTECTION</b>				
1. Portable Fire Extinguisher	1	1	1	1
<b>FLIGHT CONTROLS</b>				
1. Trim Position Indicator (elevator, rudder)	2	2	2	2
2. Stall Warning Horn	1	1	1	1
3. Stall Warning failure Annunciator	1	1	1	1
<b>LIGHTS</b>				
1. Cockpit and Instrument Lighting	0	1	0	1
2. Landing/Taxi Lights	0	2	0	2
3. Position Lights	0	3	0	3
4. Anticollision System Lights	1	3	1	3
<b>NAVIGATION INSTRUMENTS</b>				
1. Airspeed Indicator	1	1	1	1
2. Sensitive Altimeter	1	1	1	1
3. Magnetic Compass	1	1	1	1
4. Gyro Turn/Slip/Skid Indicator	1	1	1	1

5. Gyro Bank and Pitch Indicator	0	1	1	1
6. Gyro Direction Indicator	0	1	1	1
7. Vertical speed Indicator	1	1	1	1
8. Outside Air Temperature Indicator	0	1	1	1
9. Clock	1	1	1	1
ENGINE/FUEL SYSTEM INDICATION				
1. Engine Speed Indicator	1	1	1	1
2. Oil Pressure Indicator	1	1	1	1
3. Oil Pressure Loss Annunciator	1	1	1	1
4. Oil Temperature Indicator	1	1	1	1
5. Fuel Pressure Indicator	1	1	1	1
6. Fuel Quantity Indicator (each Tank)	4	4	4	4
7. Fuel Low Level Annunciator (L/R)	2	2	2	2
8. Fuel Flow Indicator	1	1	1	1
9. Cylinder Temperature Indicator	1	1	1	1
MISCELLANEOUS				
1. Alternate Static Source	0	0	1	1
2. Static Ports Heating	0	1	1	1
3. Pitot Heating	0	1	1	1
4. ELT system	1	1	1	1

2.3. MAXIMUM TAKE-OFF AND LANDING WEIGHTS

Category	Maximum take-off weight kg/lb	Maximum landing weight kg/lb
Aerobatic /A/	970/2140	970/2140
Utility /U/	1020/2250	1020/2250
Normal /N/	1090/2400	1050/2315

2.4. MAXIMUM VARIABLE LOAD

Category	Maximum variable load kg/lb
Aerobatic /A/	240/530
Utility /U/	290/640
Normal /N/	360/795



PERMISSIBLE COCKPIT LOAD:

/1/ Occupants seats 2x100 kg /2x220 lb/

NOTE: THERE ARE PERMITTED OTHER COMBINATIONS OF VARIABLE LOAD UP TO MAX. WEIGHT 200 kg/440 lb/ on occupants seats

/2/ Baggage compartment 20 kg / 45 lb/  
/in NORMAL category only/

/3/ Maximum cockpit total load /1+2/ 220 kg /485 lb/  
/in NORMAL category only/

/4/ Check the centre of gravity position according to the chapter 6. for lightweight pilot !

2.5. CENTER OF GRAVITY POSITON

C/G limit position	% MAC
Forward	20
Aft	26

NOTE: C/G LIMITS ARE IDENTICAL FOR CATEGORY: AEROBATIC /A/, UTILITY /U/ AND NORMAL /N/.

2.6. POWER PLANT

2.6.1 Engine and Propeller Speed Limitation

Power setting - - Speed	Speed	Manifold pressure		Power		Super-charger	Note
	RPM	kPa	in.Hg	kW	Hp		
Maximum take-off	2750 $\pm$ 30	+1 118-2	+0.3 35.0-0.6	154.5 $\pm$ 2.5%	207 $\pm$ 2.5%	ON	max. 5 min.
Maximum continuous	2600 $\pm$ 3%	98 $\pm$ 2	29.0 $\pm$ 0.6	125 $\pm$ 2.5%	168 $\pm$ 2.5%	OFF	unli- mited
Maximum cruise	2400 $\pm$ 3%	90 $\pm$ 2	26.5 $\pm$ 0.6	103 $\pm$ 2.5%	138 $\pm$ 2.5%	OFF	(1)

NOTE:

(1) Maximum cruising power in altitude 0 m ISA.

CAUTION:

/1/ IN CASE OF EMERGENCY THE MAXIMUM TAKE-OFF POWER MAY BE USED FOR 10 MINUTES PERIOD ON CONDITION:

- (a) OTHER MAXIMUM OPERATING LIMITS ACCORDING TO THIS FLIGHT MANUAL ARE NOT EXCEEDED.
- (b) PROLONGED MAXIMUM TAKE-OFF POWER TIME IS RECORDED INTO THE ENGINE LOG-BOOK.
- (c) MIXTURE CONTROL ADJUSTMENT FOR THE MAXIMUM TAKE-OF AND CONTINUOUS POWER SETTING.

/2/ PERMITTED RPM OVERHANG:

- MAX. RPM 2860; MANIFOLD PRESSURE 83 kPa (24.5 in.Hg); SUPERCHARGER OFF; TIME LIMIT: FOR MAX. 30 sec.
- MAX. INSTANT RPM 3025; MANIFOLD PRESSURE 100 kPa (29.5 in.Hg); SUPERCHARGER OFF; TIME LIMIT: FOR MAX. 1 sec.

#### 2.6.2 Operating of Supercharger

- (1) The manifold pressure must be kept within the range specified for relevant engine power.
- (2) It is permitted to perform aerobatic manoeuvres with supercharger engaged on condition of no more than maximum continuous power setting, i.e. manifold pressure not exceeding 100 kPa (29.5 in.Hg) and engine speed 2600 RPM.

**2.7. POWER PLANT INSTRUMENTS MARKINGS**

Instrument	Unit	Red radial line		Yellow arc	Green arc
		min.	max.		
Engine speed indicator	R.P.M.	500	3025	2600-2860	500-2600
Manifold pressure indicator	kPa	-	118	98- 118	39 - 98
	in.HG	-	35.0	29.0-35.0	12.0-29.0
Oil temperature indicat.	°C	25	85	25 - 40 80 - 85	40 - 80
Cylinder head temperature indicator	°C	70	210+	70-140 185-210+	140 -185
Fuel pressure indicator	kPa	10	50	10-30 40-50	30 - 40
	P.S.I.	1.5	7	1.5-4 6-7	4 - 6
Oil pressure indicator	kPa	120	450	120-350 400-450	350-400
	P.S.I.	17	64	17-50 57-64	50 - 57
Markings reading		Limit values		Caution range	Normal operating range

**CAUTION:**

+ CYLINDER HEAD TEMPERATURE 185-210<sup>0</sup> C MAXIMUM DURATION 5 MIN. ONLY.

INTENTIONALLY LEFT BLANK

2.8. OTHER INSTRUMENTS MARKINGS

Instrument	Unit	Red radial line		Yellow arc	Green arc	Yellow radial line	
		min.	max			min.	max.
Accelerometer	"g"	-3.5	+6	-	-3.5 to +6	-	-
Nitrogen pressure indicator / main spar flange /	kPa	150	-	-	150-250	-	-
	P.S.I.	22	-	-	22-36	-	-
VA meter /+/ /++/	V	-	-	-	-	24	29
	A	-	-	-	-	-20	+22
Fuel quantity indicator /++/	litres	-	-	0-30	-	-	-
	US gal	-	-	0-8	-	-	-
Marking reading		Limit Values		Coution Range	Normal Operating	Normal operating Limits	

NOTES:

/+/  
 Battery charging: A-meter indicates charging current within the range 0 to -20 A.

Battery load: A-meter indicates the load within the range 0 to +22 A.

/++/ Only left wing tanks indicators are marked.

2.9. FUEL

Unleaded aviation gasoline - min. octane number 78 or higher grades.

2.14. AIRSPEED INDICATOR MARKINGS

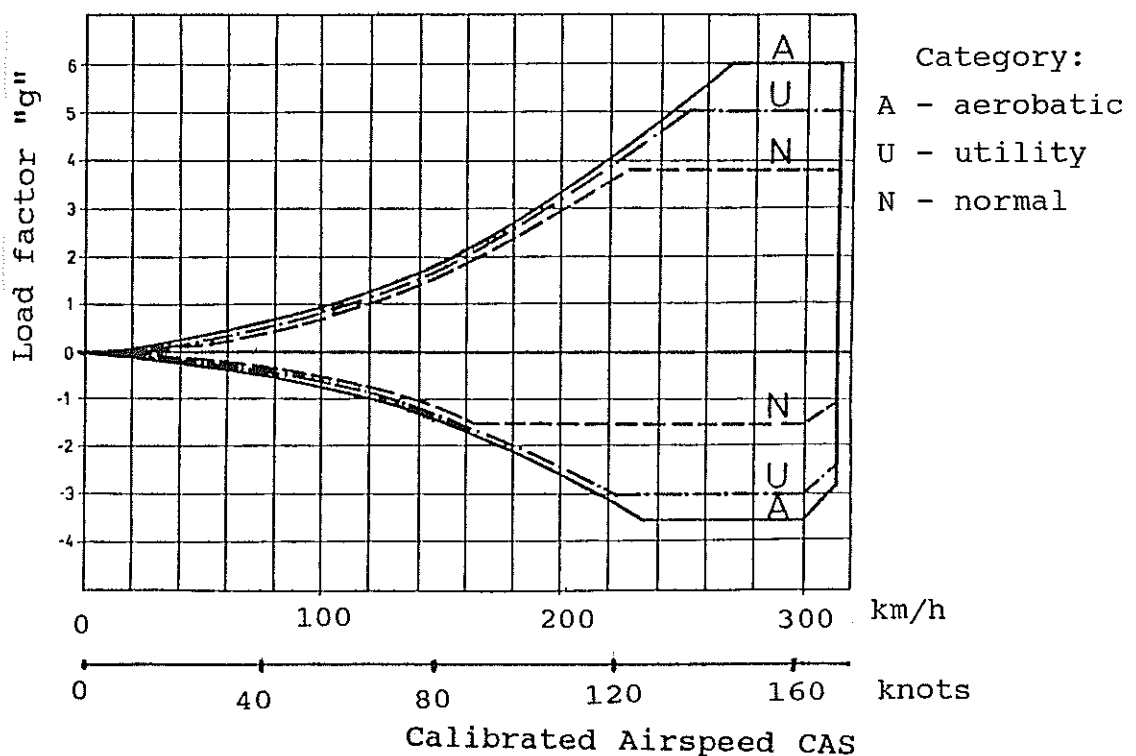
Item	Red radial line	Yellow arc	Green arc	White arc
Indicated Airspeed /knots/ IAS	180	147-180	55-147	48-102
Markings reading	Limit value	Caution range	Normal	Wing flaps extended
			Operating range	

2.15. LOAD FACTORS AND MANEUVERING ENVELOPE

2.15.1. Loads Factors

Category		Load factor "g"	
		+	-
Aerobatic	/A/	6	3.5
Utility	/U/	5	3
Normal	/N/	3.8	1.5

2.15.2. Maneuvering Envelope



5.3. TAKE-OFF RUN

		Category			
		Units	A	U	N
Distance	m	231	236	252	
	ft	758	774	827	

Conditions:

- altitude: 0 m ISA
- max. take-off power
- wing flaps: TAKE-OFF
- runway: level dry concrete

5.4. TAKE-OFF DISTANCE TO 50 ft

		Category			
		Units	A	U	N
Distance	m	510	560	620	
	ft	1675	1840	2035	
Lift nose wheel	knots	55			
Lift-Off	knots	67			

Conditions:

- altitude: 0 m ISA
- max. take-off power
- wing flaps: TAKE-OFF
- runway: level dry concrete

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6.2. STANDARD EMPTY WEIGHT AND CENTRE OF GRAVITY POSITION

Empty weight M	Arm $X_T$	Static moment S
kg	m	kgm
730	0.578	422
lb	ft	lbft
1609	1.896	3051

**NOTE:**

THESE VALUES ARE NOMINAL. WHEN CHECKING WEIGHTS AND CENTRES OF GRAVITY POSITION FOLLOW THE BASIC WEIGHT RECORDED IN SUBSECT. 6.7.1.

**CAUTION:**

(1) Above stated values apply to the empty aircraft in following configuration:

- (a) Standard aircraft equipment
- (b) Aircraft systems contain: - unusable fuel quantity  
- undrainable oil quantity
- (c) Brake system - filled with hydraulic fluid
- (d) Categories: Aerobatic (A)  
Utility (U) No fuel in  
Normal (N) auxiliary tanks
- (e) Seat position : Extreme front (without back cushions)
- (f) Canopy : Closed

(2) The weight and C/G position of this particular aircraft with installed optional equipment are contained in the lastly issued "Aircraft Weighing Record" and tabled in subsect. 6.7.1, "Basic Empty Weight and C/G", of this Flight Manual.

6.10. DIAGRAM No. 2/A - CENTRE OF GRAVITY CHECK  
 - Imperial Units System

